VISHAY INTERTECHNOLOGY, INC.

INTERACTIVE
data book

SMD MAGNETICS, INDUCTORS AND FERRITE BEADS

VISHAY DALE

VSE-DB0059-0610

Notes:

1. To navigate:
   a) Click on the Vishay logo on any datasheet to go to the Contents page for that section. Click on the Vishay logo on any Contents page to go to the main Table of Contents page.
   b) Click on the products within the Table of Contents to go directly to the datasheet.
   c) Use the scroll or page up/page down functions.
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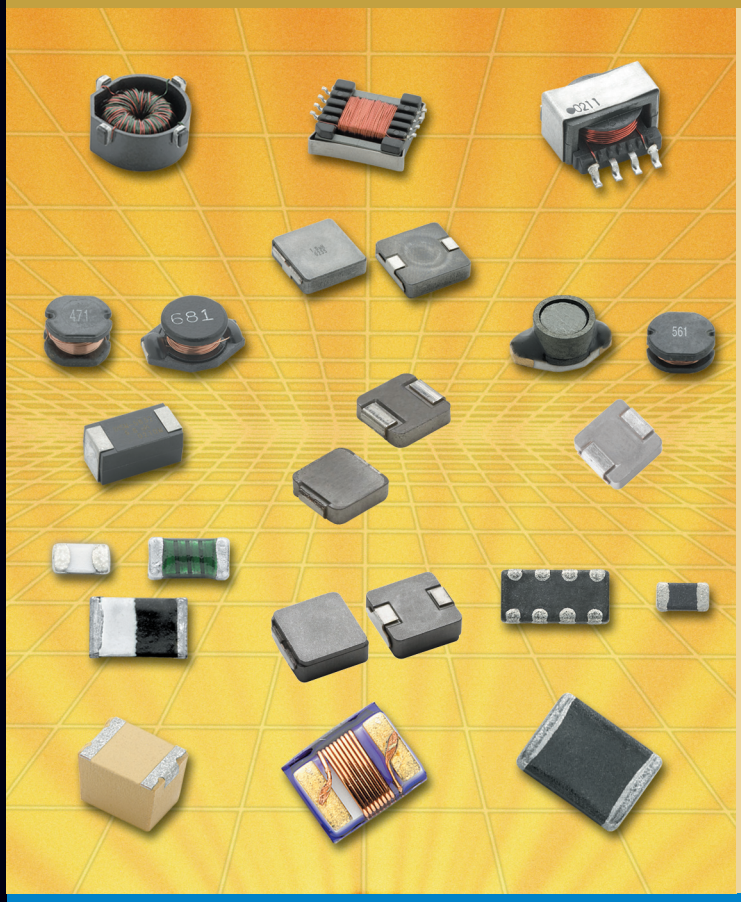
VISHAY INTERTECHNOLOGY, INC.



SMD MAGNETICS, INDUCTORS AND FERRITE BEADS

VISHAY DALE

High Current Inductors

RF Inductors

Multilayer Inductors

Multilayer Ferrite Beads

Transformers

www.vishay.com

SEMICONDUCTORS

RECTIFIERS
- Schottky (single, dual)
- Standard, Fast, and Ultra-Fast Recovery (single, dual)
- Bridge
- Superectifier®
- Sinterglass Avalanche Diodes

SMALL-SIGNAL DIODES
- Schottky and Switching (single, dual)
- Tuner/Capacitance (single, dual)
- Bandswitching
- PIN

ZENER AND SUPPRESSOR DIODES
- Zener (single, dual)
- TVS (TRANSZORB®, Automotive, ESD, Arrays)

MOSFETs
- Power MOSFETs
- JFETs

RF TRANSISTORS
- Bipolar Transistors (AF and RF)
- Dual Gate MOSFETs
- MOSMICs®

OPTOELECTRONICS
- IR Emitters and Detectors, and IR Receiver Modules
- Optocouplers and Solid-State Relays
- Optical Sensors
- LEDs and 7-Segment Displays
- Infrared Data Transceiver Modules
- Custom Products

ICs
- Power ICs
- Analog Switches
- DC/DC Converters
- RF Transceivers
- ICs for Optoelectronics

PASSIVE COMPONENTS

RESISTIVE PRODUCTS
- Foil Resistors
- Film Resistors
  - Metal Film Resistors
  - Thin Film Resistors
  - Thick Film Resistors
  - Metal Oxide Film Resistors
  - Carbon Film Resistors
- Wirewound Resistors
- Power Metal Strip® Resistors
- Chip Fuses
- Variable Resistors
  - Cermet Variable Resistors
  - Wirewound Variable Resistors
  - Conductive Plastic Variable Resistors
- Networks/Arrays
- Non-Linear Resistors
  - NTC Thermistors
  - PTC Thermistors
  - Varistors

MAGNETICS
- Inductors
- Transformers

CAPACITORS
- Tantalum Capacitors
  - Molded Chip Tantalum Capacitors
  - Coated Chip Tantalum Capacitors
  - Solid Through-Hole Tantalum Capacitors
  - Wet Tantalum Capacitors
- Ceramic Capacitors
  - Multilayer Chip Capacitors
  - Disc Capacitors
- Film Capacitors
- Power Capacitors
- Heavy-Current Capacitors
- Aluminum Capacitors
- Silicon RF Capacitors

STRAIN GAGE TRANSDUCERS AND STRESS ANALYSIS SYSTEMS
- PhotoStress®
- Strain Gages
- Load Cells
- Force Transducers
- Instruments
- Weighing Systems
- Specialized Strain Gage Systems

SMD Magnetics, Inductors and Ferrite Beads

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www.vishay.com

SMD MAGNETICS, INDUCTORS AND FERRITE BEADS

POWER INDUCTORS

HIGH FREQUENCY INDUCTORS

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Vishay Dale

SMD MAGNETICS, INDUCTORS AND FERRITE BEADS

SMD MAGNETICS, INDUCTORS AND FERRITE BEADS

SMD MAGNETICS, INDUCTORS AND FERRITE BEADS

Power Inductors

Contents

IHLP-1616AB-01

Vishay Dale

Low Profile, High Current Inductor

Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

APPLICATIONS

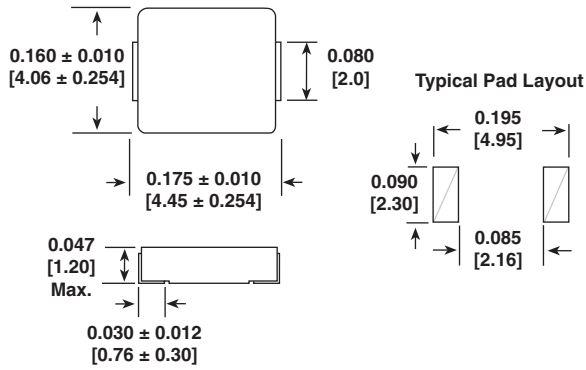
- PDA/Notebook/Desktop/Server applications
- High current POL converters
- Low profile, high current power supplies
- Battery powered devices
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Array (FPGA)

STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ TYPICAL 25 °C	DCR mΩ MAX 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.047	3.25	3.75	13.0	32.0
0.10	5.50	6.00	11.5	25.0
0.22	10.0	11.0	8.5	20.0
0.47	20.0	22.0	5.0	13.0
1.00	45.0	50.0	4.0	8.5

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

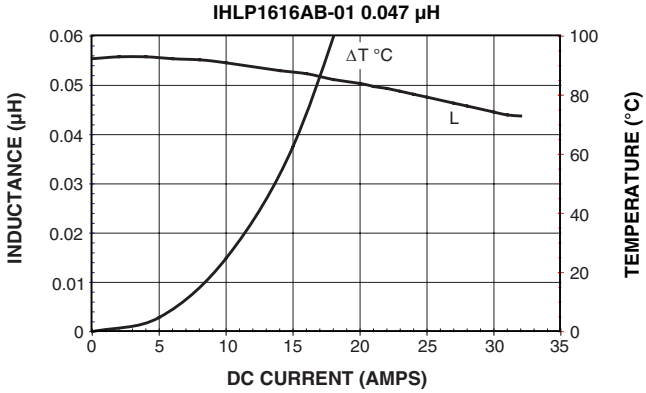
IHLP-1616AB-01	0.47 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

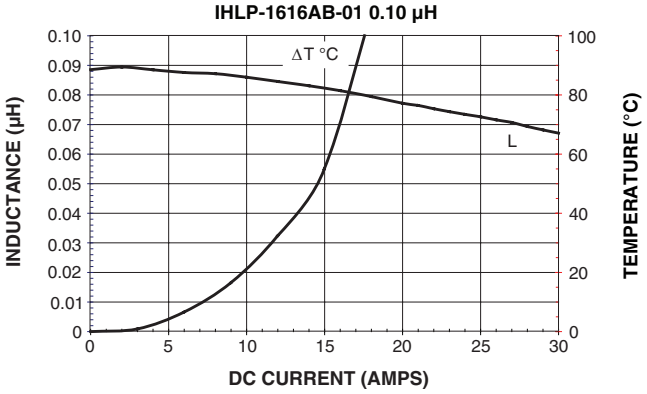
GLOBAL PART NUMBER

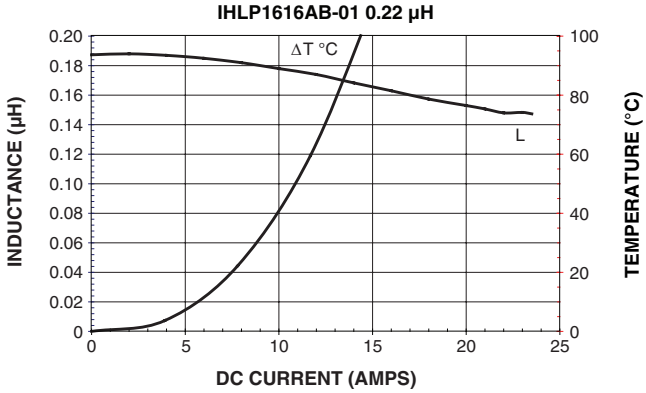
I	H	L	P	1	6	1	6	A	B	E	R	R	4	7	M	0	1
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

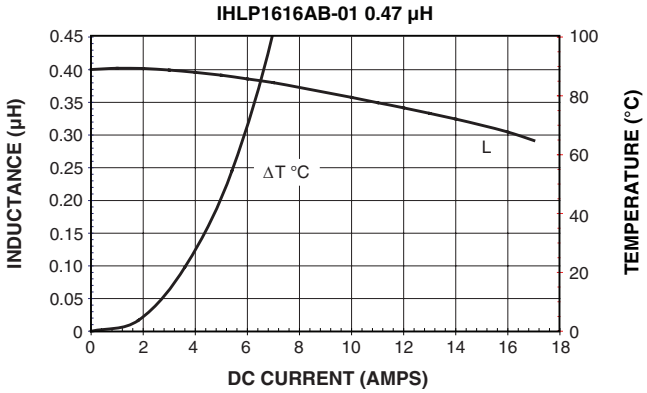
For technical questions, contact: magnetics@vishay.com

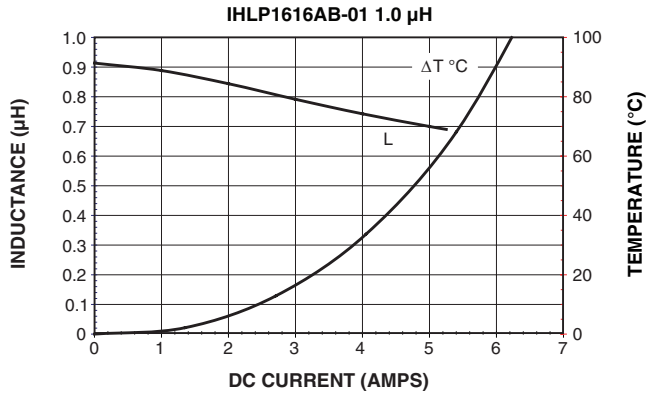
PERFORMANCE GRAPHS











Low Profile, High Current Inductor

Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Shielded construction
- Frequency range up to 1.0 MHz
- Lowest DCR/µH, in this package size
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- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS
COMPLIANT

APPLICATIONS

- PDA/Notebook/Desktop/Server applications
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- DC/DC converters in distributed power systems
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STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ TYPICAL 25 °C	DCR mΩ MAX 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.047	3	3.3	15.0	15.0
0.10	5	5.5	12.0	12.0
0.22	9.5	10.5	9.5	9.5
0.47	19	21	6.0	6.0
1.0	43	47	4.2	4.5
1.2	50	55	3.75	3.75
1.5	68	75	3.25	3.25
2.2	90	100	2.75	3.00

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
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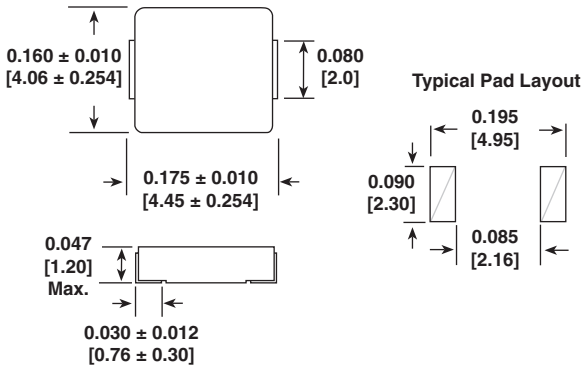
DIMENSIONS in inches [millimeters]



DESCRIPTION

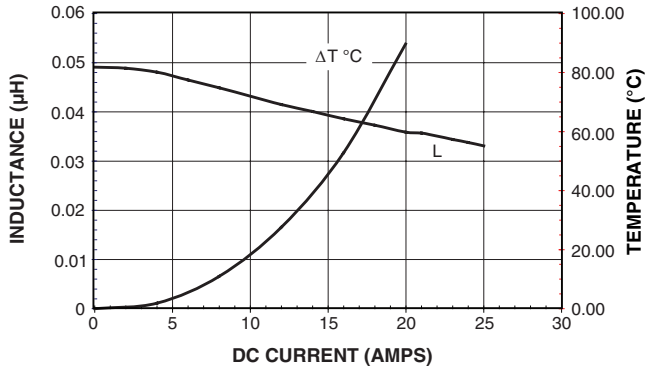
IHLP-1616AB-11	2.2 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

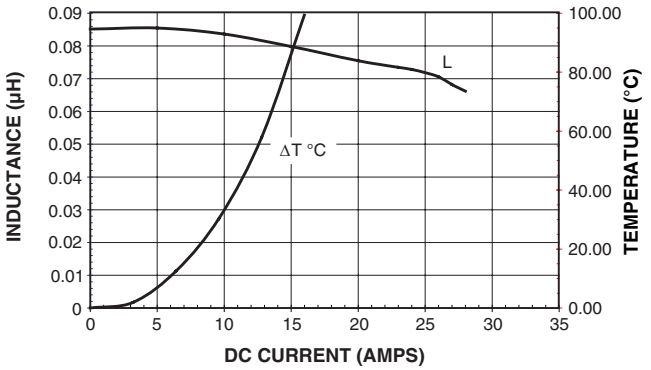
I	H	L	P	1	6	1	6	A	B	E	R	2	R	2	M	1	1
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

PERFORMANCE GRAPHS

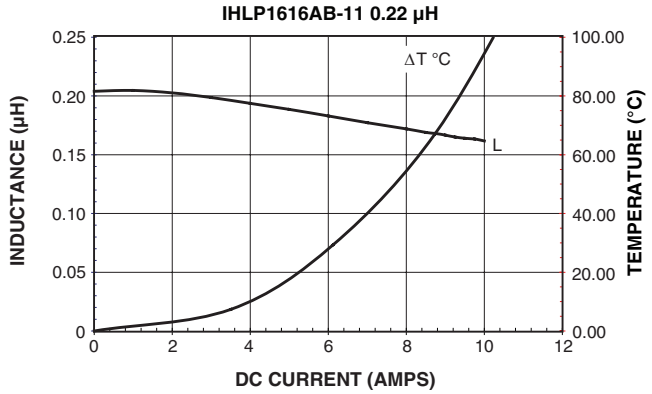
IHLP1616AB-11 0.047 µH



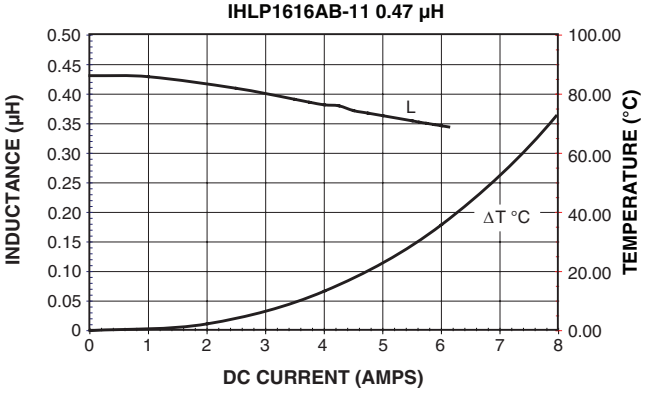
IHLP1616AB-11 0.1 µH



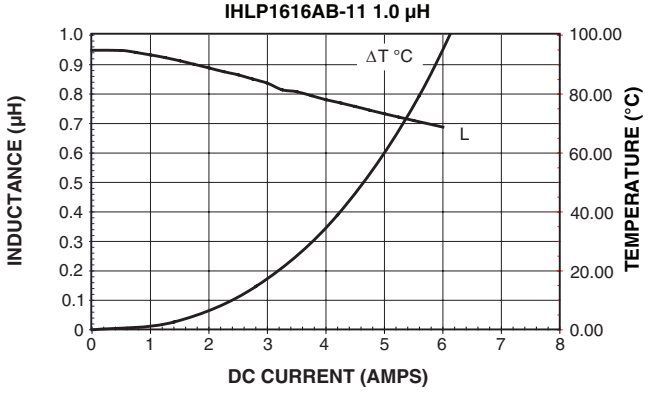
IHLP1616AB-11 0.22 µH



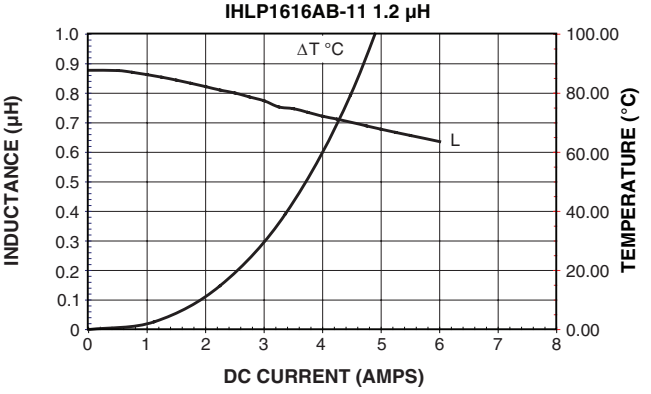
IHLP1616AB-11 0.47 µH



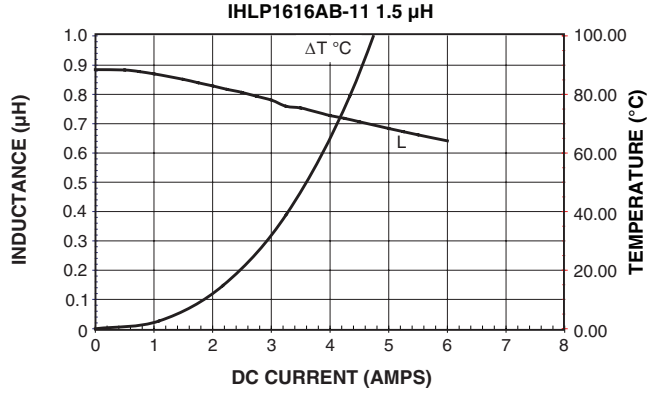
IHLP1616AB-11 1.0 µH



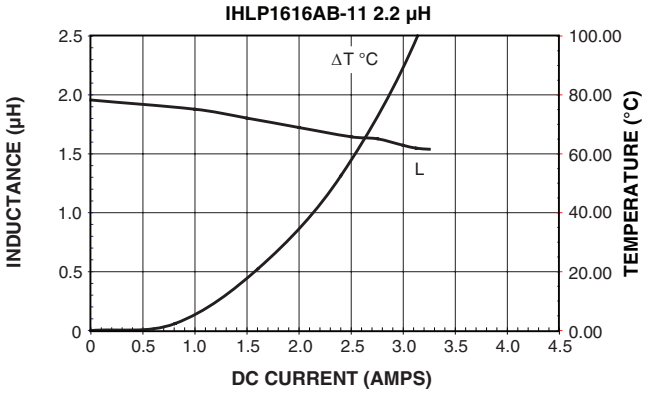
IHLP1616AB-11 1.2 µH



IHLP1616AB-11 1.5 µH



IHLP1616AB-11 2.2 µH



IHLP-1616BZ-01

Vishay Dale

Low Profile, High Current Inductor

Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Shielded construction
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Pb-free
RoHS COMPLIANT

APPLICATIONS

- PDA/Notebook/Desktop/Server applications
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0.10	4.50	5.00	11.0	35.0
0.22	6.00	6.60	13.0	24.0
0.47	16.0	18.0	5.60	11.50
1.00	33.0	37.0	3.75	8.50
2.20	80.0	90.0	2.85	6.00

NOTES:

1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
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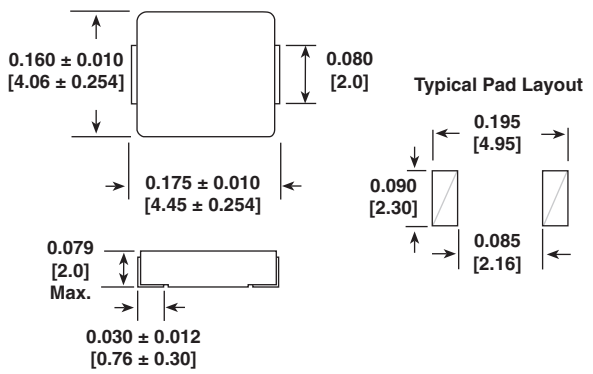


DESCRIPTION

IHLP-1616BZ-01	0.47 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

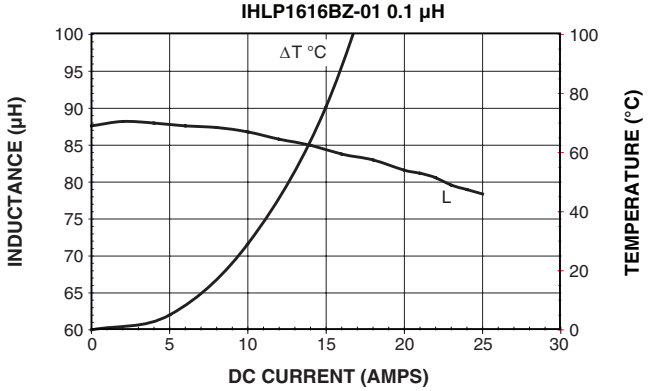
GLOBAL PART NUMBER

I	H	L	P	1	6	1	6	B	Z	E	R	R	4	7	M	0	1
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

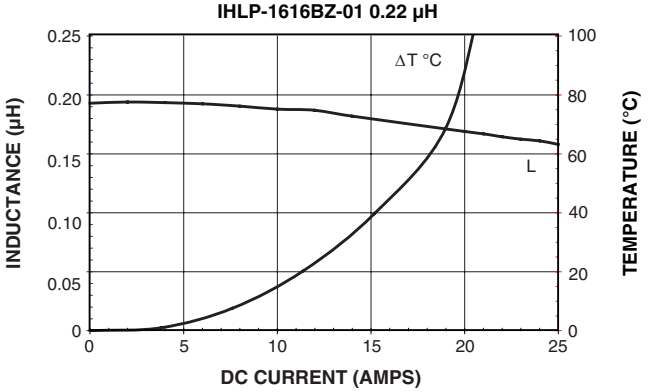
For technical questions, contact: magnetics@vishay.com

PERFORMANCE GRAPHS

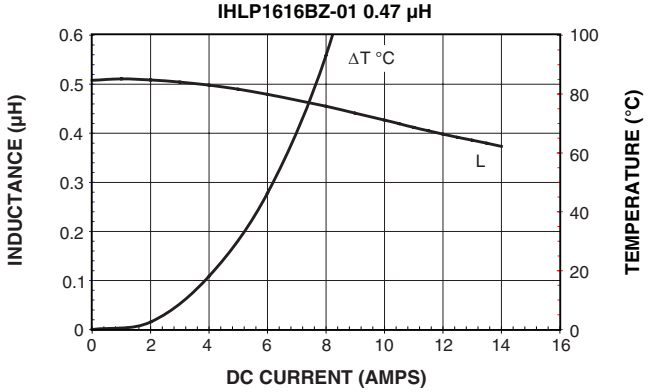
IHLP1616BZ-01 0.1 µH



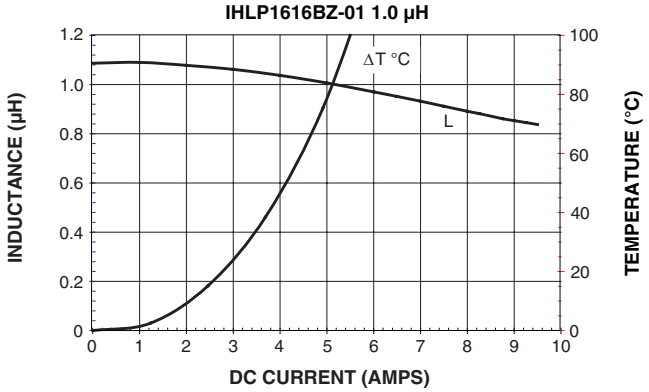
IHLP-1616BZ-01 0.22 µH



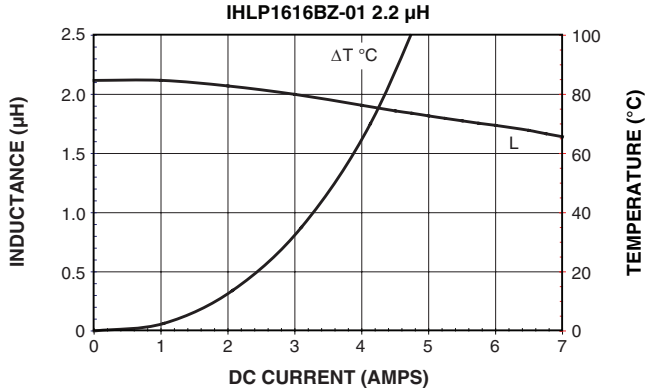
IHLP1616BZ-01 0.47 µH



IHLP1616BZ-01 1.0 µH



IHLP1616BZ-01 2.2 µH



Low Profile, High Current Inductor

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Pb-free

RoHS COMPLIANT

APPLICATIONS

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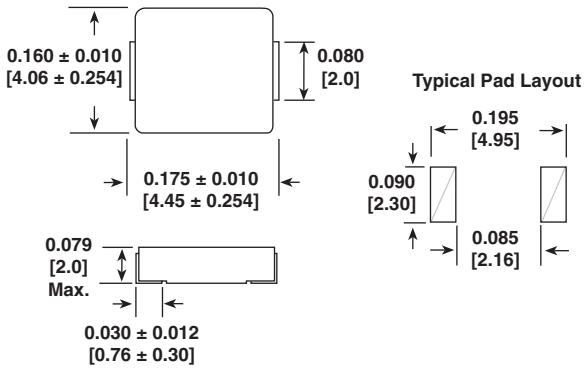
Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ TYPICAL 25 °C	DCR mΩ MAX 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.10	4.1	4.5	12.0	12.0
0.22	7.6	8.5	9.0	9.0
0.47	14.5	16	7.0	7.0
1.0	24	27	4.5	5.0
2.2	61	68	3.25	3.25
4.7	140	150	2.00	1.75

NOTES:

1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

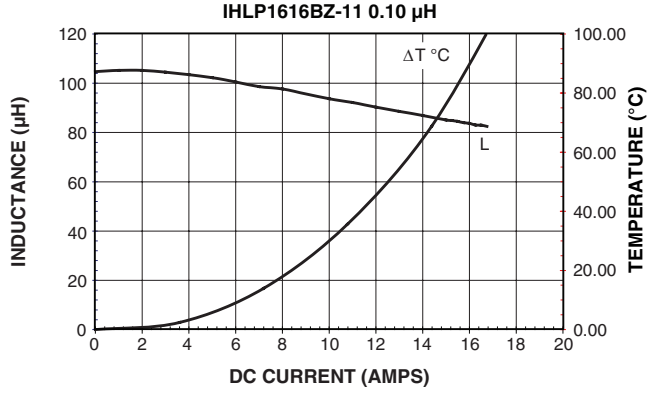
IHLP-1616BZ-11	4.7 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

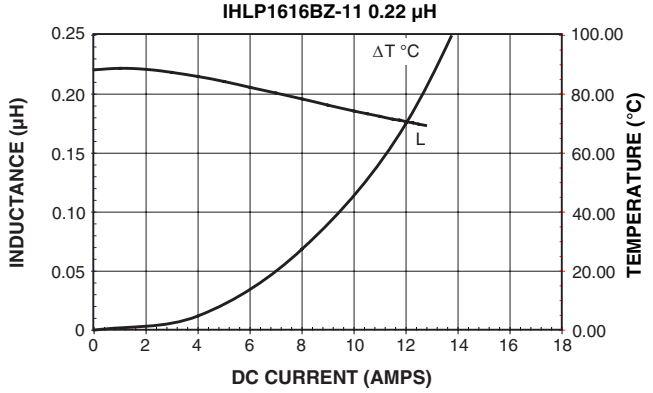
I	H	L	P	1	6	1	6	B	Z	E	R	4	R	7	M	1	1
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

PERFORMANCE GRAPHS

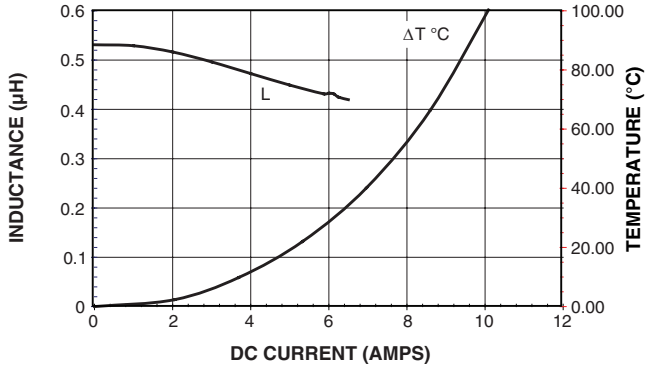
IHLP1616BZ-11 0.10 µH



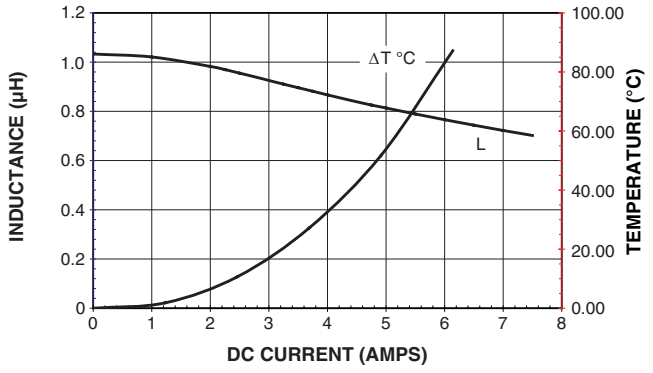
IHLP1616BZ-11 0.22 µH



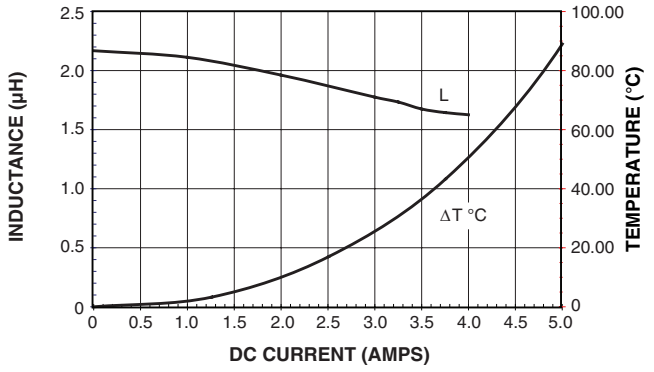
IHLP1616BZ-11 0.47 µH



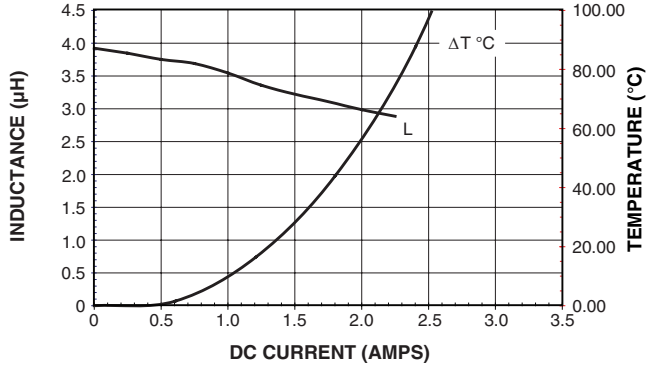
IHLP1616BZ-11 1.0 µH



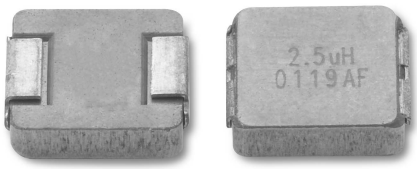
IHLP1616BZ-11 2.2 µH



IHLP1616BZ-11 4.7 µH



Low Profile, High Current Inductor



Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Lowest height (1.8 mm) in this package footprint
- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

APPLICATIONS

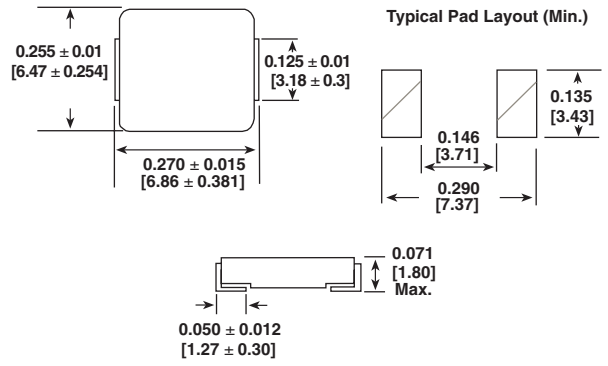
- PDA/Notebook/Desktop/Server applications
- High current POL converters
- Low profile, high current power supplies
- Battery powered devices
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Array (FPGA)

STANDARD ELECTRICAL SPECIFICATIONS

VALUE (µH)	TYPICAL DCR (mΩ)	MAX DCR (mΩ)	HEAT RATING CURRENT[3] (Amps)	SATURATION CURRENT[4] (Amps)
0.1	3.0	3.5	18	40
0.15	4.7	5.2	15	38
0.22	5.3	5.7	14	26
0.33	6.6	7.0	12	18
0.47	8.4	9.3	11	18
0.68	12.7	13.9	9	17
0.82	13.8	15.9	8	17
1.0	17.5	18.3	7	14
1.5	32.6	34.0	4	11.5
2.2	40.3	46.0	3.75	13
2.5	49.9	52.4	3.5	10.4
3.3	56.2	60.1	3.25	10
4.7	76.6	78.0	3	8

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

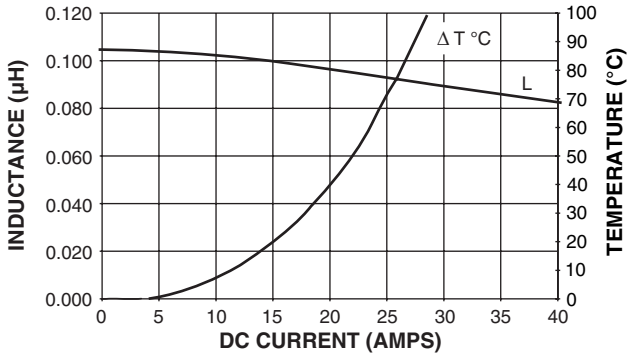
IHLP-2525AH-01	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

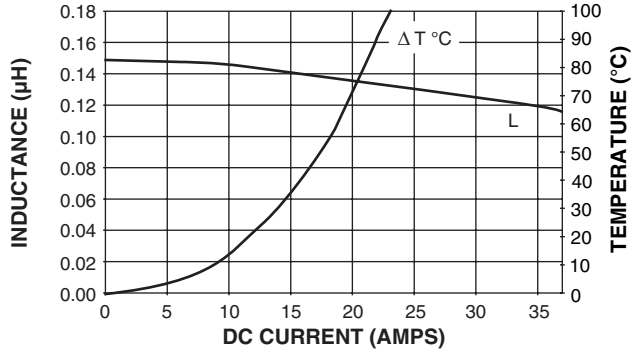
I	H	L	P	2	5	2	5	A	H	E	R	1	R	0	M	0	1
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

PERFORMANCE GRAPHS

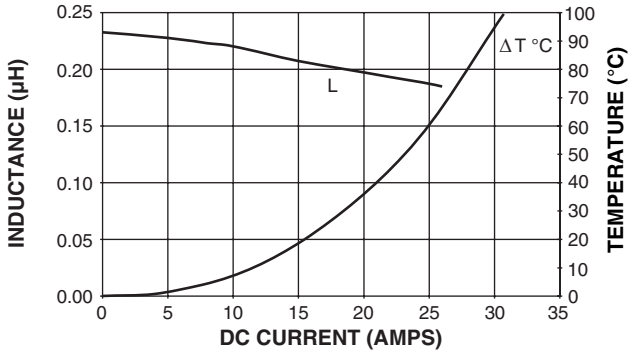
IHLP-2525AH-01 0.1 µH



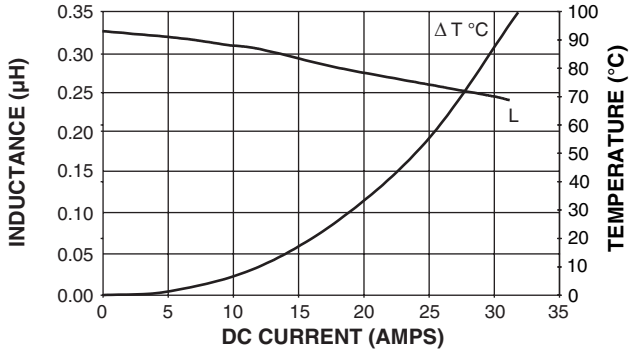
IHLP-2525AH-01 0.15 µH



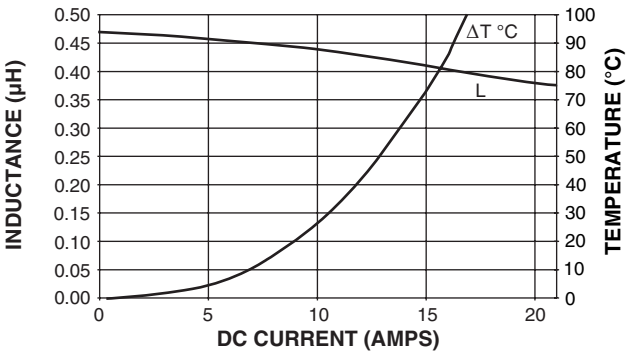
IHLP-2525AH-01 0.22 µH



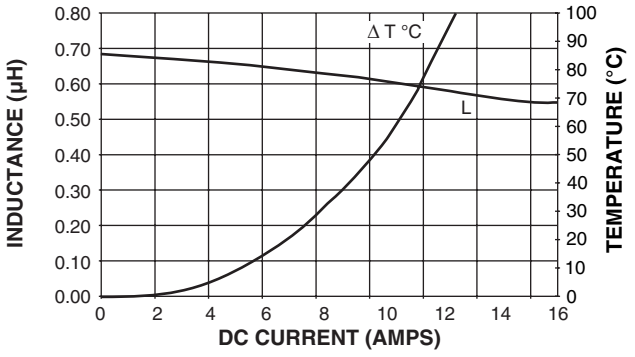
IHLP-2525AH-01 0.33 µH



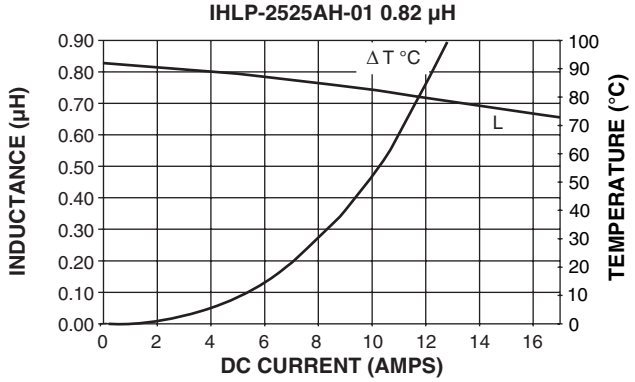
IHLP-2525AH-01 0.47 µH



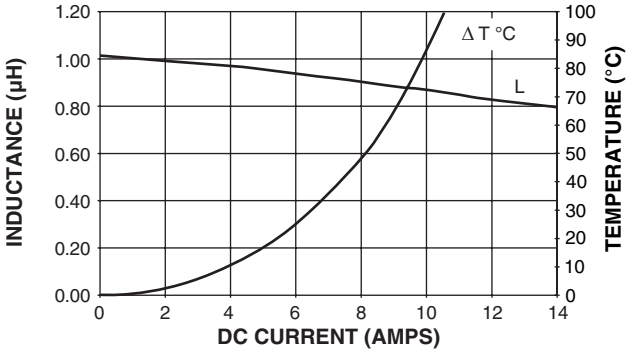
IHLP-2525AH-01 0.68 µH



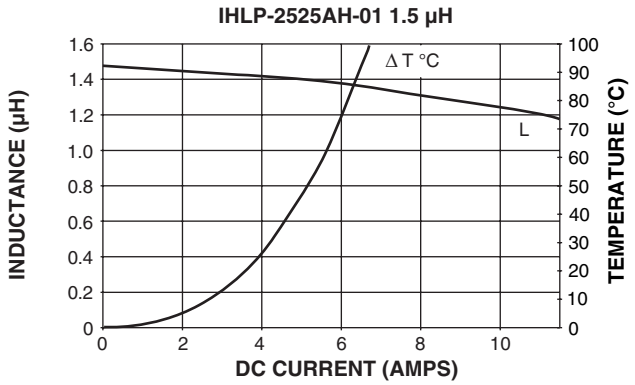
IHLP-2525AH-01 0.82 µH

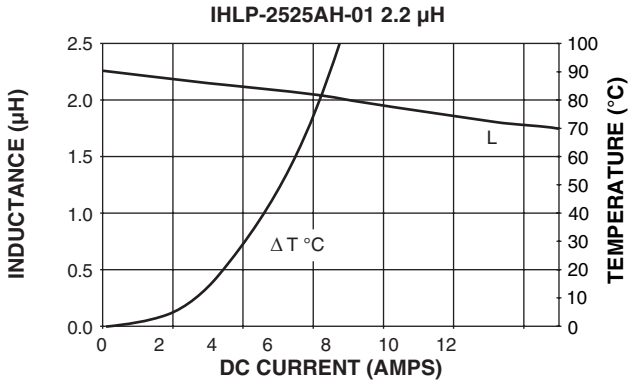


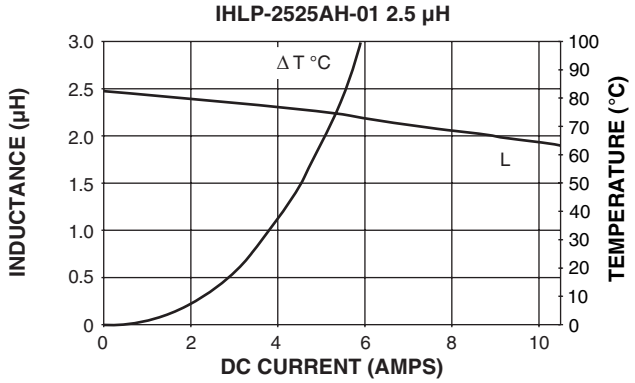
IHLP-2525AH-01 1.0 µH

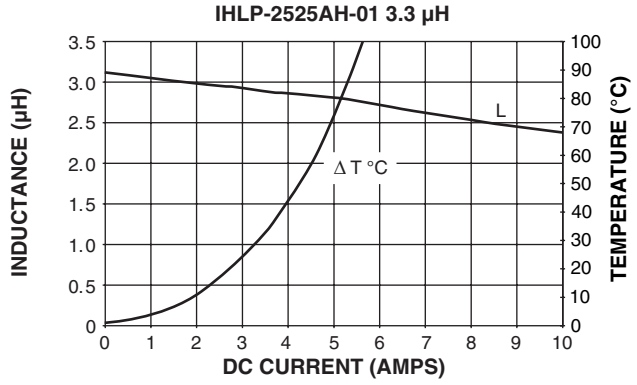


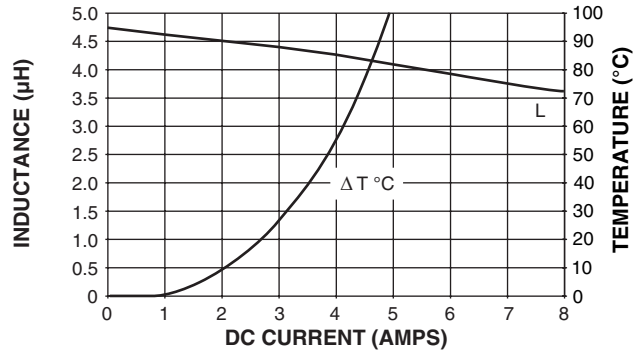
PERFORMANCE GRAPHS



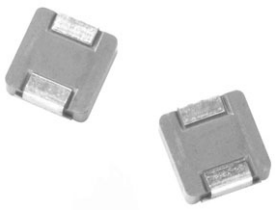








Low Profile, High Current Inductor



Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Lowest height (2.4 mm) in this package footprint
- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

APPLICATIONS

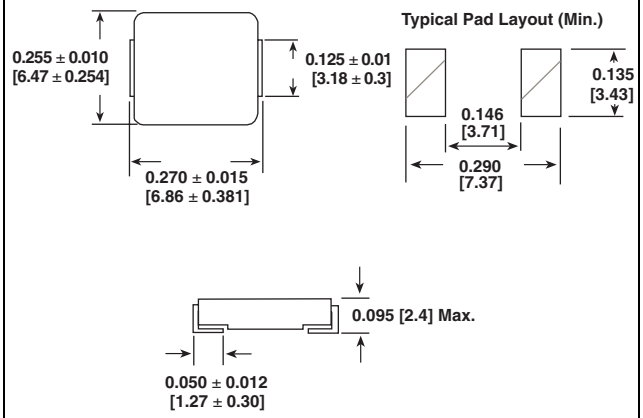
- PDA/Notebook/Desktop/Server applications
- High current POL converters
- Low profile, high current power supplies
- Battery powered devices
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Array (FPGA)

STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ TYPICAL 25 °C	DCR mΩ MAX 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.1	1.5	1.7	30	50
0.22	2.9	3.2	21	34
0.33	3.7	4.1	18	22
0.47	6	6.5	13.5	21
0.68	8.7	9.4	11	18
0.82	10.6	11.8	10	17
1.0	13.1	14.2	9.0	16
1.5	18.5	21.2	7.5	15
2.2	28	34	6.5	14
3.3	36.5	51.6	5.0	13
4.7	45.2	63	4.5	10
6.8	72.5	95	3.5	9
8.2	84.2	106	3.0	8
10	115.6	129	2.5	7

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

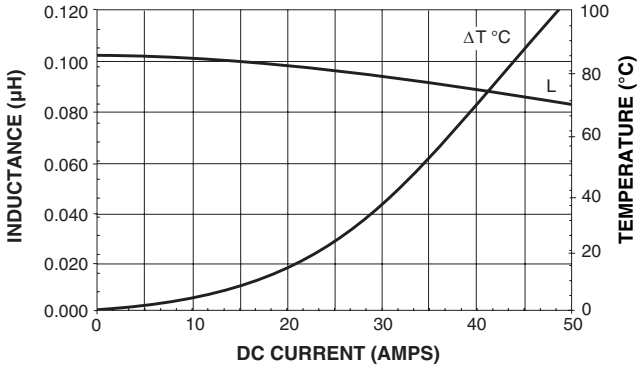
IHLP-2525BD-01	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

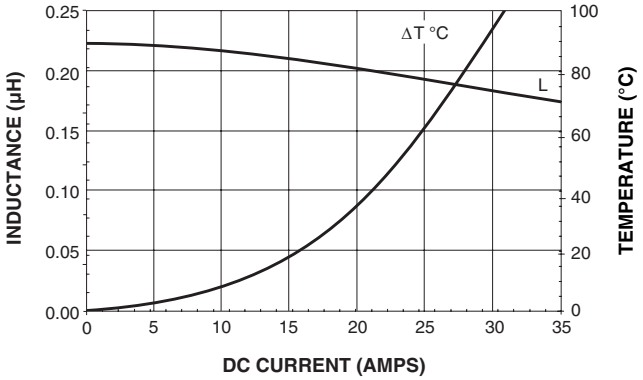
I	H	L	P	2	5	2	5	B	D	E	R	1	R	0	M	0	1
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

PERFORMANCE GRAPHS

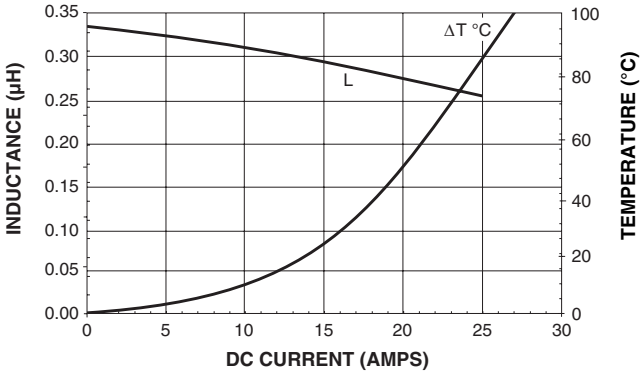
IHLP-2525BD-01 0.1 µH



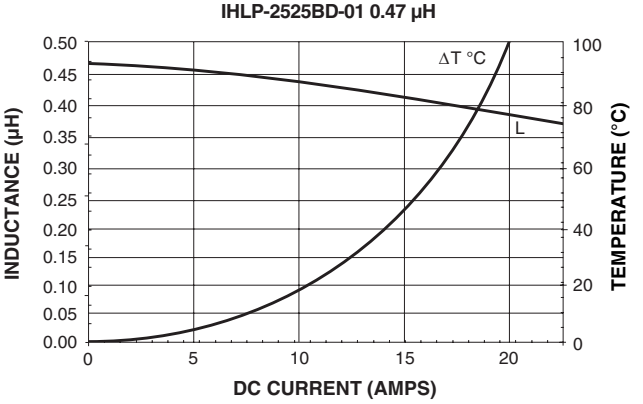
IHLP-2525BD-01 0.22 µH



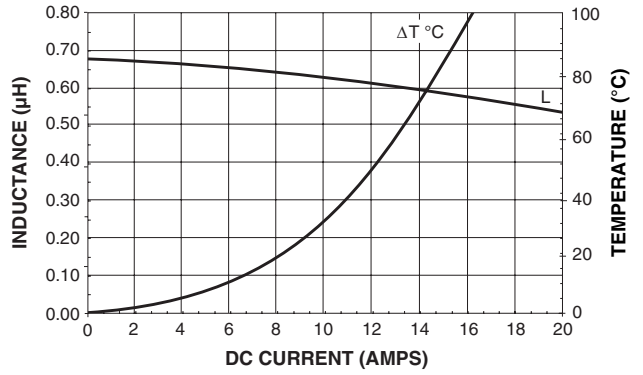
IHLP-2525BD-01 0.33 µH



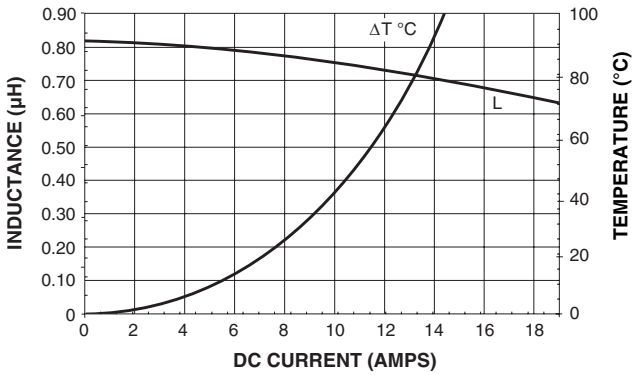
IHLP-2525BD-01 0.47 µH



IHLP-2525BD-01 0.68 µH

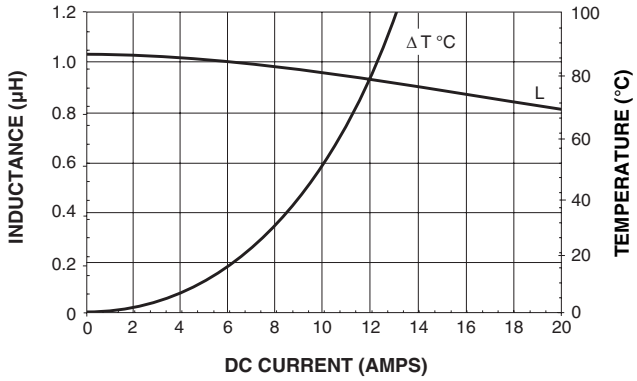


IHLP-2525BD-01 0.82 µH

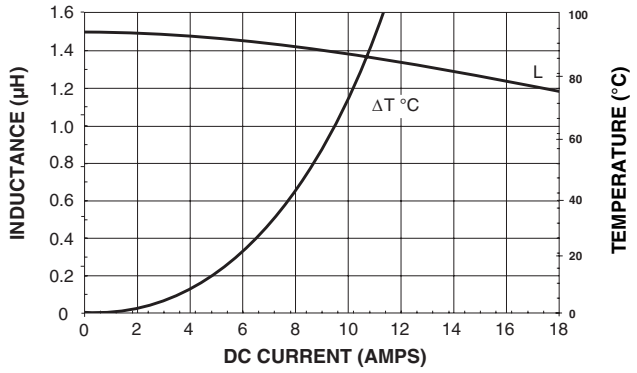


PERFORMANCE GRAPHS

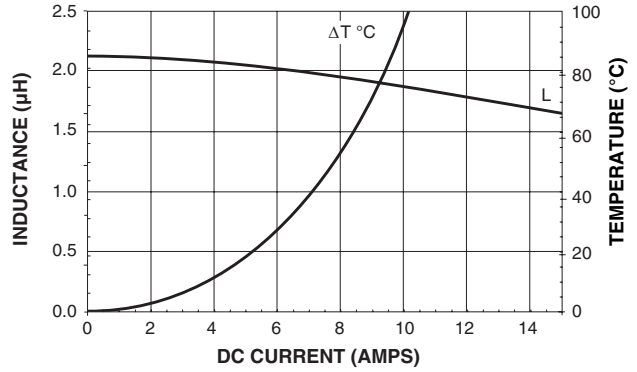
IHLP-2525BD-01 1.0 µH



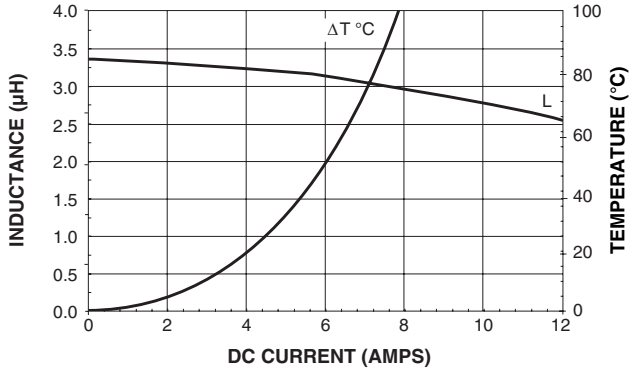
IHLP-2525BD-01 1.5 µH



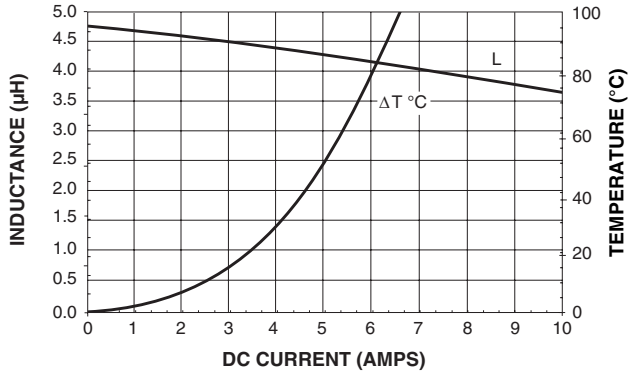
IHLP-2525BD-01 2.2 µH



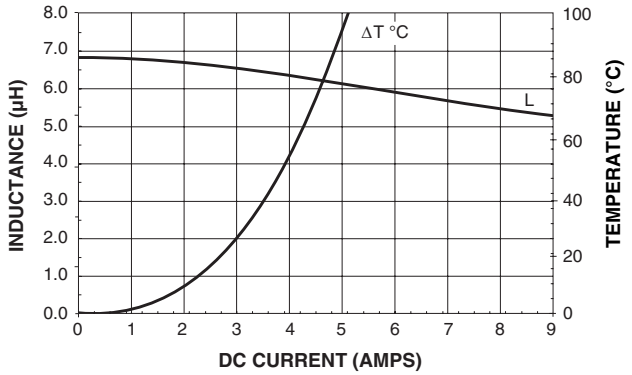
IHLP-2525BD-01 3.3 µH



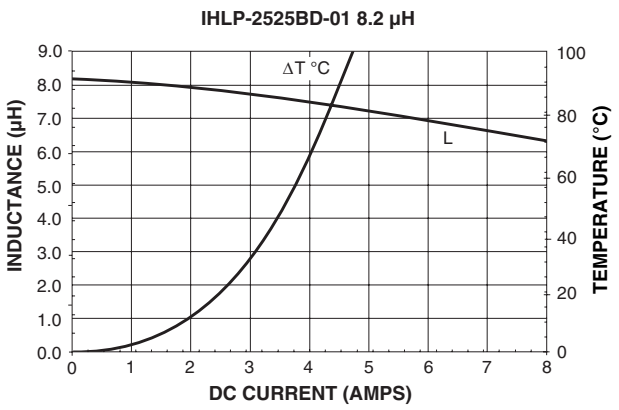
IHLP-2525BD-01 4.7 µH

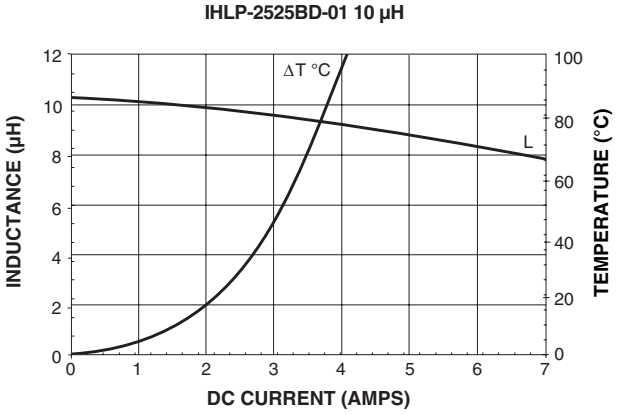


IHLP-2525BD-01 6.8 µH

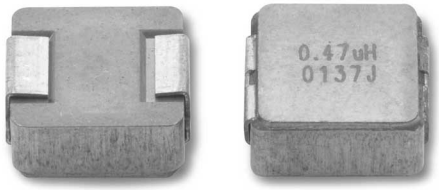


PERFORMANCE GRAPHS





Low Profile, High Current Inductor



Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Lowest height (3.0 mm) in this package footprint
- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

APPLICATIONS

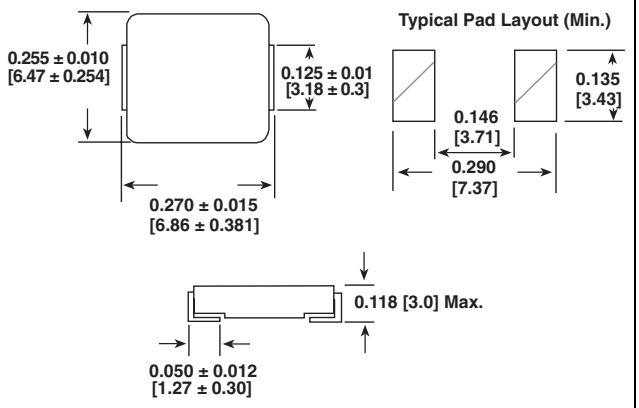
- PDA/Notebook/Desktop/Server applications
- High current POL converters
- Low profile, high current power supplies
- Battery powered devices
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Array (FPGA)

STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ TYPICAL 25 °C	DCR mΩ MAX 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.10	1.5	1.7	32.5	60
0.15	1.9	2.5	26	52
0.20	2.4	3.0	24	41
0.22	2.5	2.8	23	40
0.33	3.5	3.9	20	30
0.47	4	4.2	17.5	26
0.68	5	5.5	15.5	25
0.82	6.7	8	13	24
1.0	9	10	11	22
1.5	14	15	9	18
2.2	18	20	8	14
3.3	28	30	6	13.5
4.7	37	40	5.5	10
6.8	54	60	4.5	8
8.2	64	68	4	7.5
10	102	105	3	7.0

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔGT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

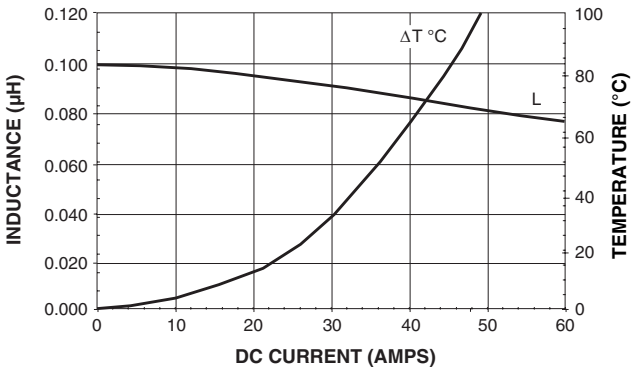
IHLP-2525CZ-01	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

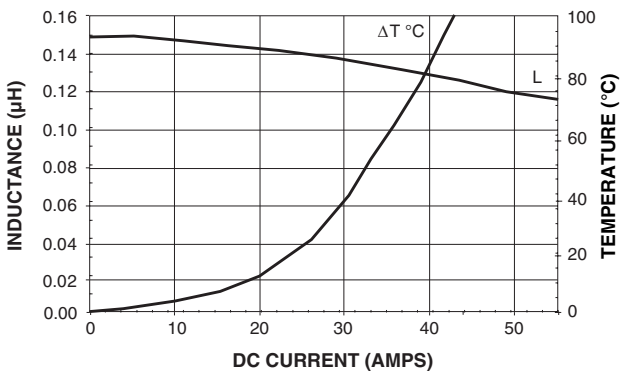
I	H	L	P	2	5	2	5	C	Z	E	R	1	R	0	M	0	1
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

PERFORMANCE GRAPHS

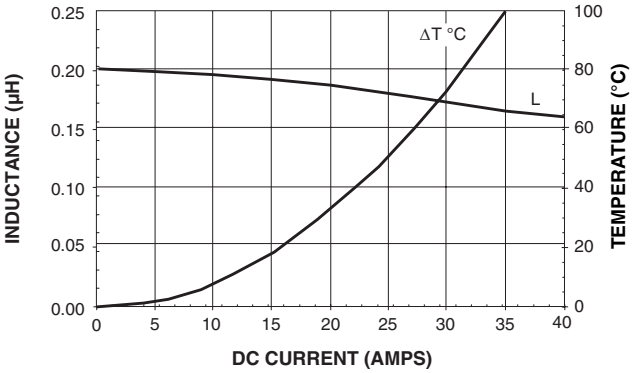
IHLP-2525CZ-01 0.10 µH



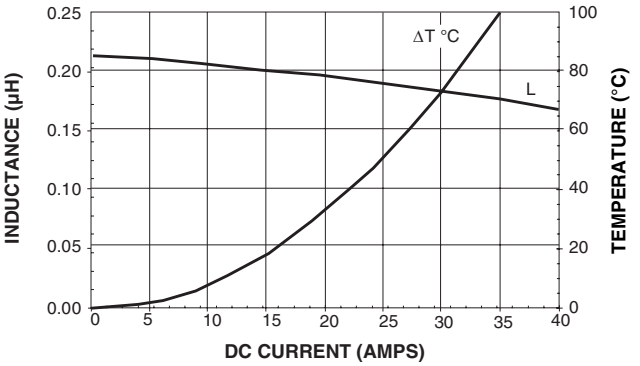
IHLP-2525CZ-01 0.15 µH



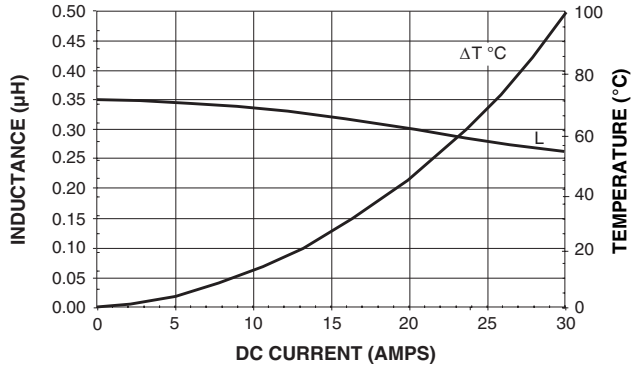
IHLP-2525CZ-01 0.20 µH



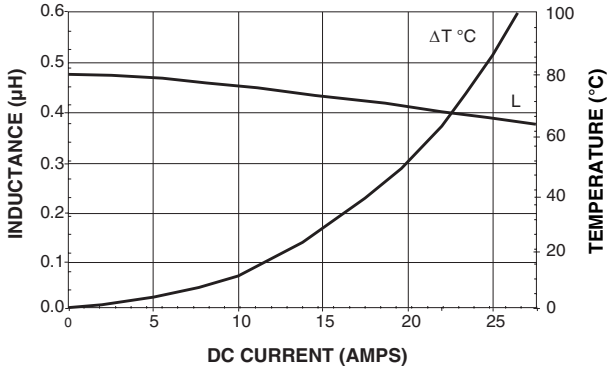
IHLP-2525CZ-01 0.22 µH



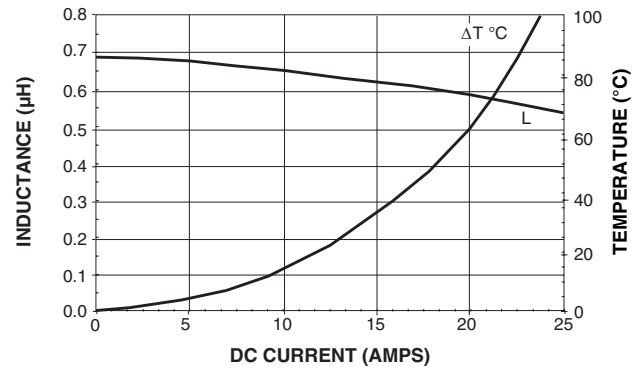
IHLP-2525CZ-01 0.33 µH



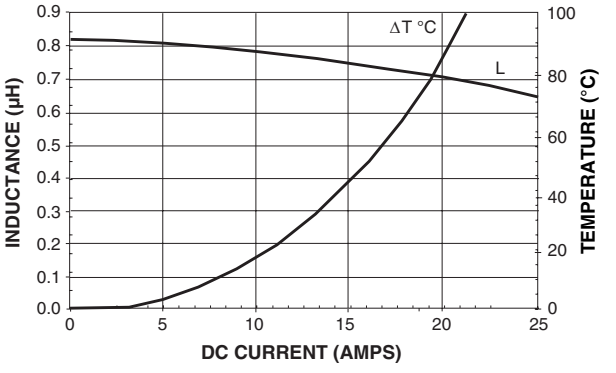
IHLP-2525CZ-01 0.47 µH



IHLP-2525CZ-01 0.68 µH

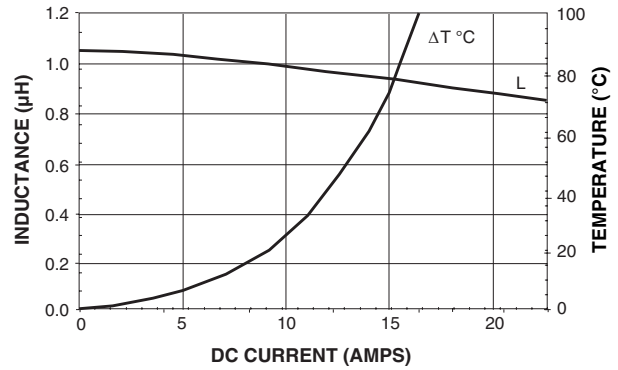


IHLP-2525CZ-01 0.82 µH

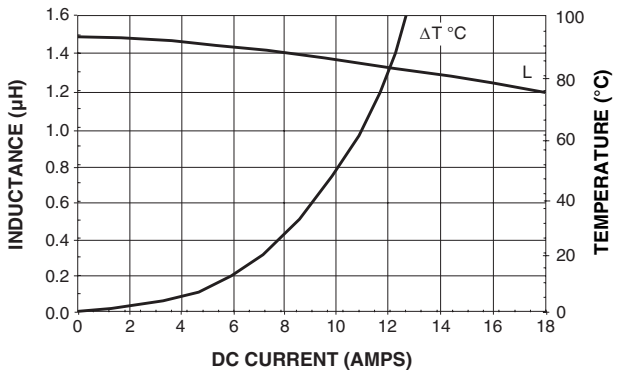


PERFORMANCE GRAPHS

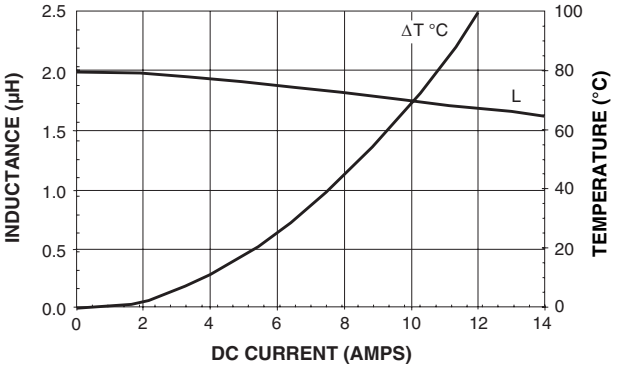
IHLP-2525CZ-01 1.00 µH



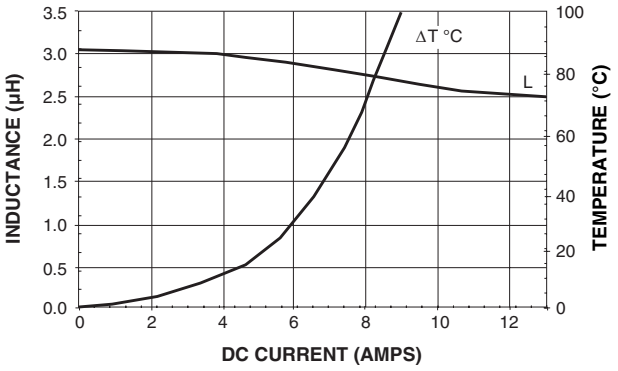
IHLP-2525CZ-01 1.5 µH



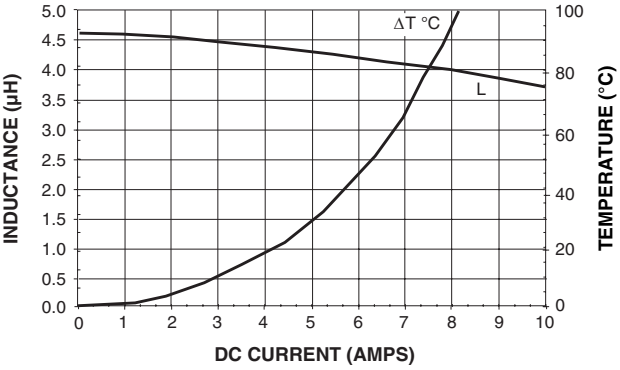
IHLP-2525CZ-01 2.2 µH



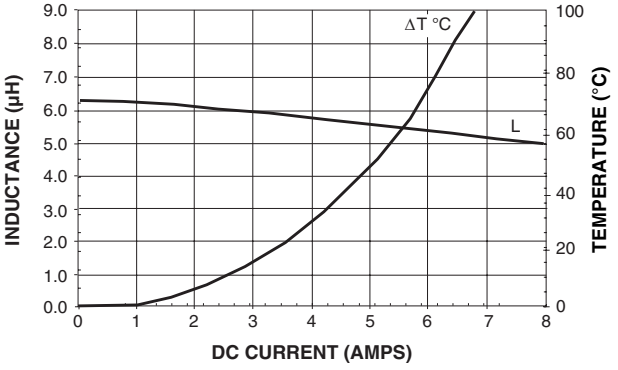
IHLP-2525CZ-01 3.3 µH



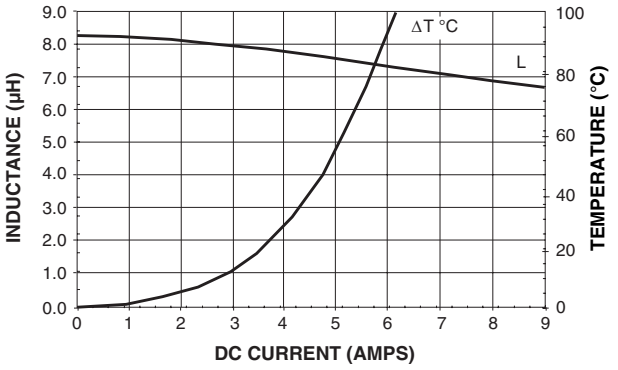
IHLP-2525CZ-01 4.7 µH



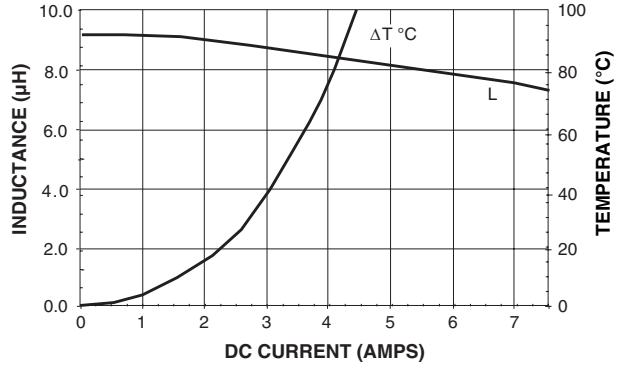
IHLP-2525CZ-01 6.8 µH



IHLP-2525CZ-01 8.2 µH



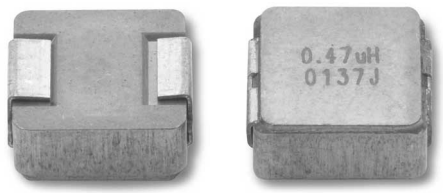
IHLP-2525CZ-01 10.0 µH



IHLP-2525CZ-11

Vishay Dale

Low Profile, High Current Inductor



Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Shielded construction
- Frequency range up to 1 MHz
- Lowest DCR/µH, in this package size
- Powdered iron composition provides soft saturation
- Handles high transient current spikes without hard saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

APPLICATIONS

- PDA/Notebook/Desktop/Server applications
- High current POL converters
- Low profile, high current power supplies
- Battery powered devices
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Array (FPGA)

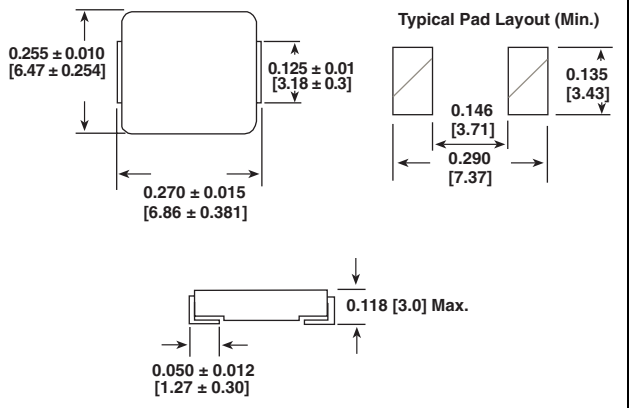
STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ TYPICAL 25 °C	DCR mΩ MAX 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
1.0	7.6	8.0	12.5	9.5
2.2	15.7	16.5	9.0	7.0
3.3	24.8	26.0	7.0	6.5
4.7	31.8	33.4	6.0	4.0
6.8	44.6	46.8	5.5	4.0
8.2	52.3	54.9	5.0	4.0
10	67.8	71.2	4.0	3.5
22	128.9	135.0	2.9	2.5

NOTES:

1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

IHLP-2525CZ-11	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

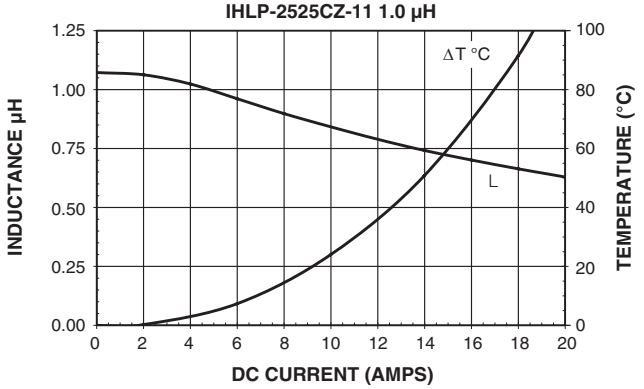
I	H	L	P	2	5	2	5	C	Z	E	R	1	R	0	M	1	1
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

For technical questions, contact: magnetics@vishay.com

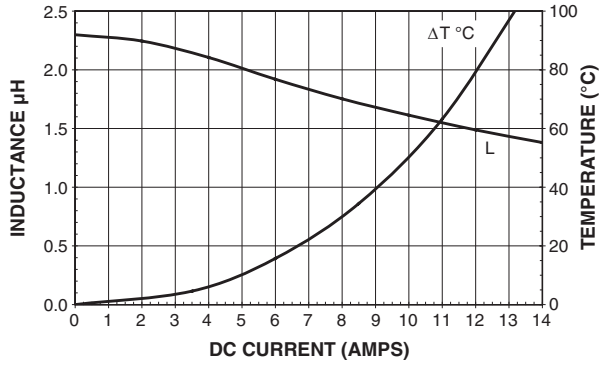
Document Number: 34190
Revision: 10-Aug-06

PERFORMANCE GRAPHS

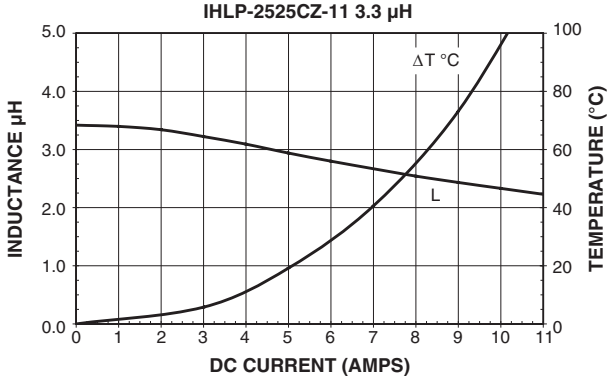
IHLP-2525CZ-11 1.0 µH



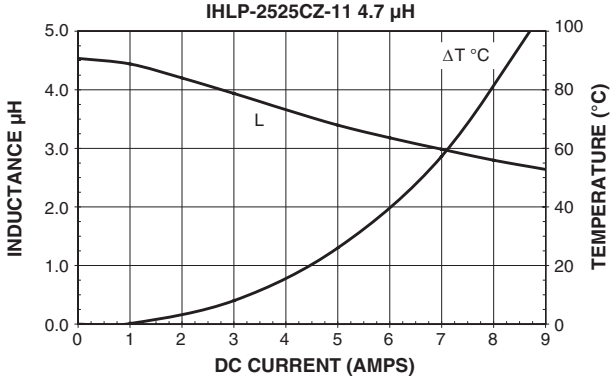
IHLP-2525CZ-11 2.2 µH



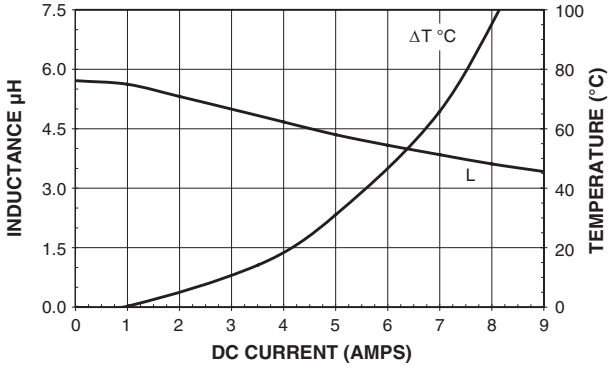
IHLP-2525CZ-11 3.3 µH



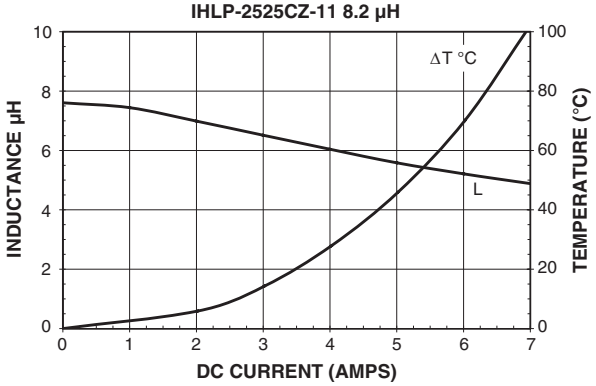
IHLP-2525CZ-11 4.7 µH



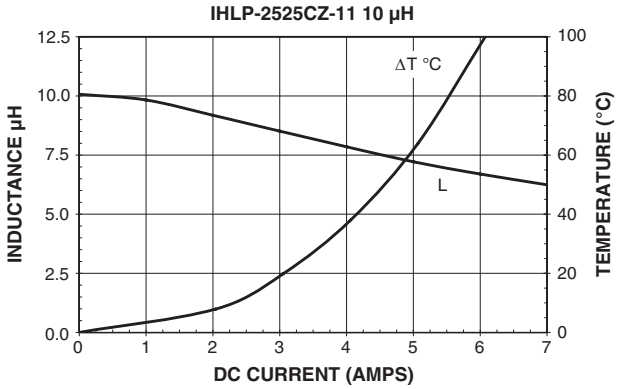
IHLP-2525CZ-11 6.8 µH



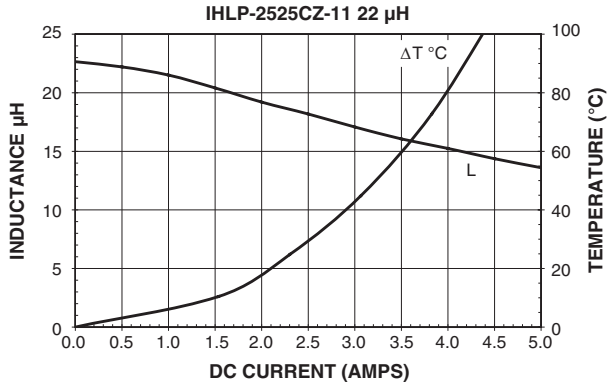
IHLP-2525CZ-11 8.2 µH



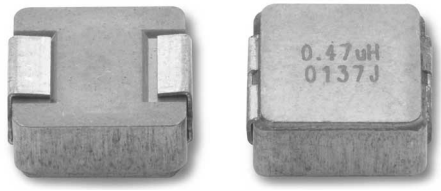
IHLP-2525CZ-11 10 µH



IHLP-2525CZ-11 22 µH



10 % DCR Tolerance, Low Profile, Power Inductor



Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Lowest height (3.0 mm) in this package footprint
- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS
COMPLIANT

APPLICATIONS

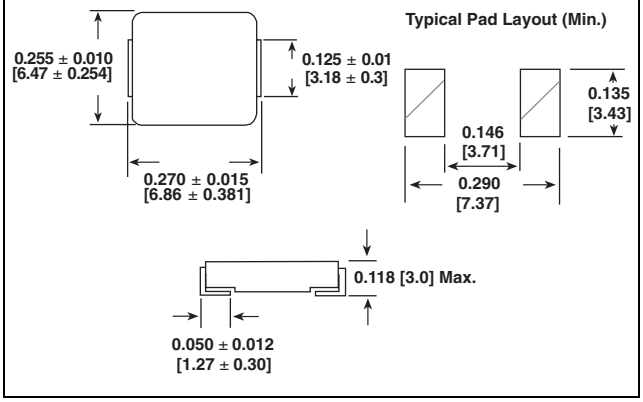
- Tolerance DCR for current sense applications
- Improved current balance in phased power supplies
- Improved thermal management
- PDA/Notebook/Desktop/Server and Battery powered devices
- High current, Low profile POL converters
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Arrays (FPGA)

STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ ± 10 % at 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.10	1.37	32.5	60
0.20	2.34	24	41
0.33	3.20	20	30
0.47	3.86	17.5	26
0.68	5.20	15.5	25
0.82	7.41	13	24
1.0	8.44	11	22
1.5	14.50	9	18
2.2	17.73	8	14
3.3	28.21	6	13.5
4.7	37.11	5.5	10
8.2	61.47	4	7.5
10	97.71	3	7.0

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

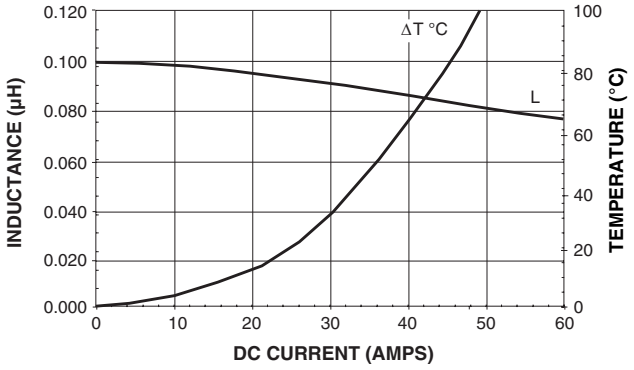
IHLP-2525CZ-06	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

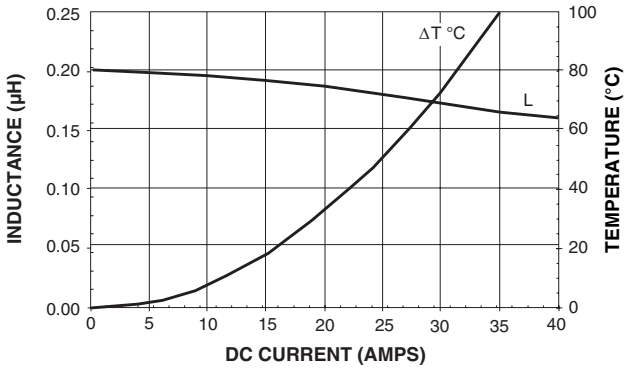
I	H	L	P	2	5	2	5	C	Z	E	R	1	R	0	M	0	6
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

PERFORMANCE GRAPHS

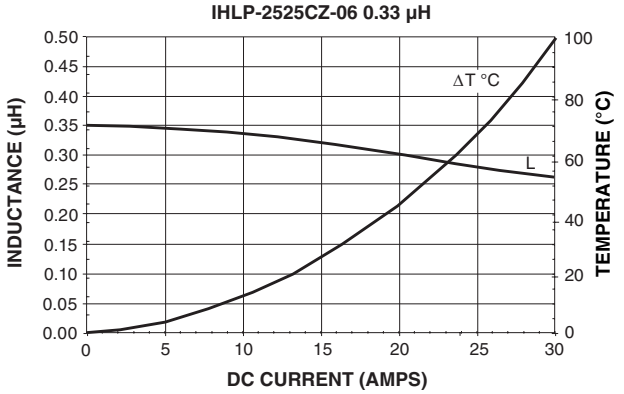
IHLP-2525CZ-06 0.10 µH



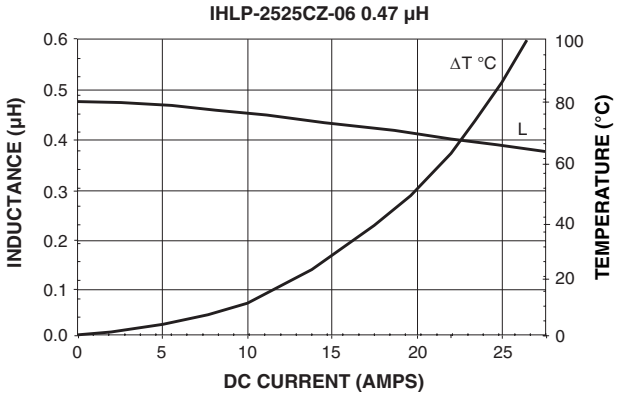
IHLP-2525CZ-06 0.20 µH



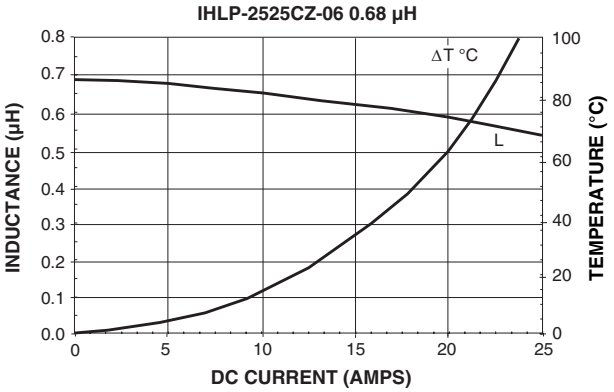
IHLP-2525CZ-06 0.33 µH



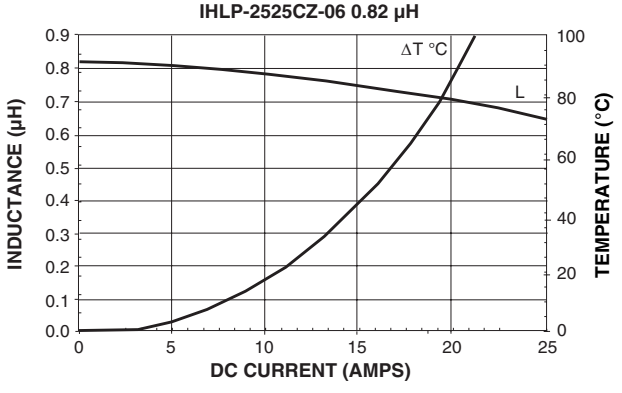
IHLP-2525CZ-06 0.47 µH



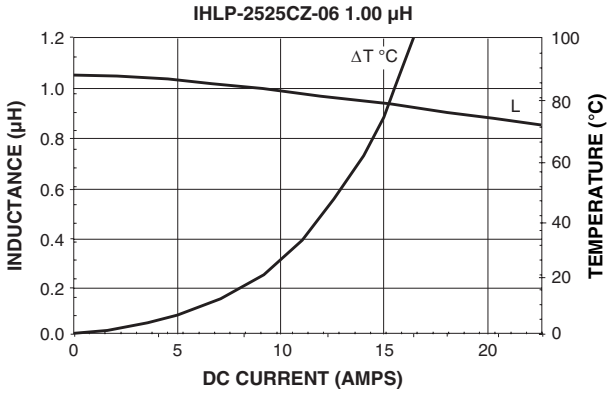
IHLP-2525CZ-06 0.68 µH



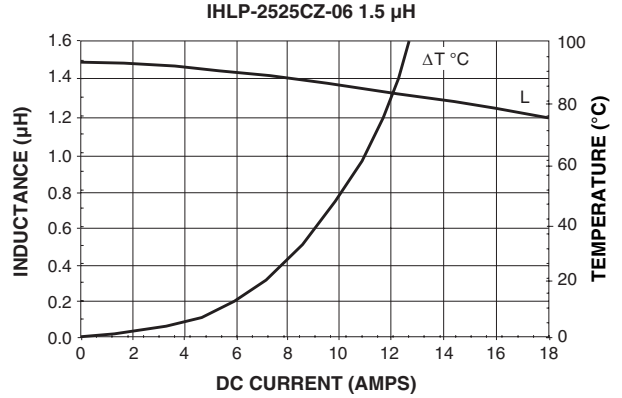
IHLP-2525CZ-06 0.82 µH



IHLP-2525CZ-06 1.00 µH

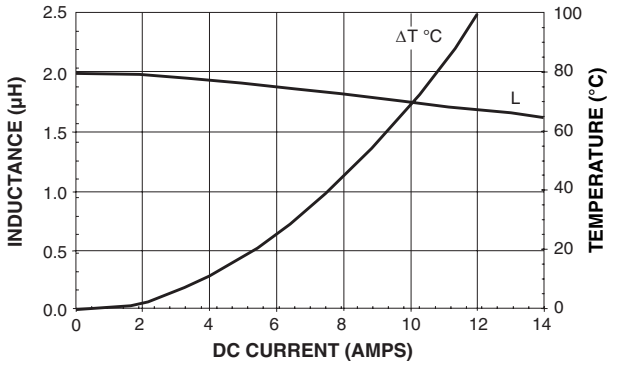


IHLP-2525CZ-06 1.5 µH

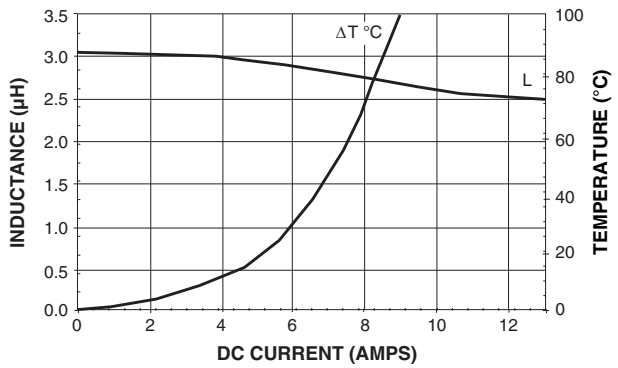


PERFORMANCE GRAPHS

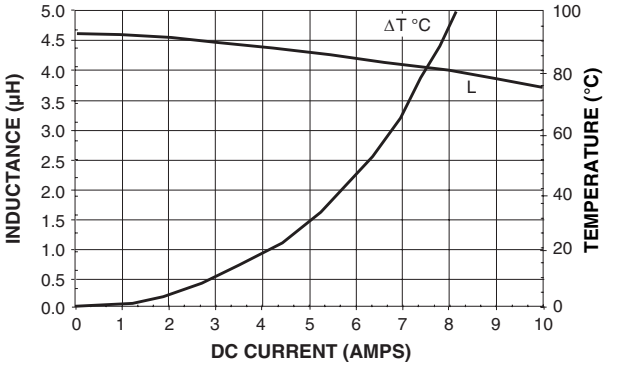
IHLP-2525CZ-06 2.2 µH



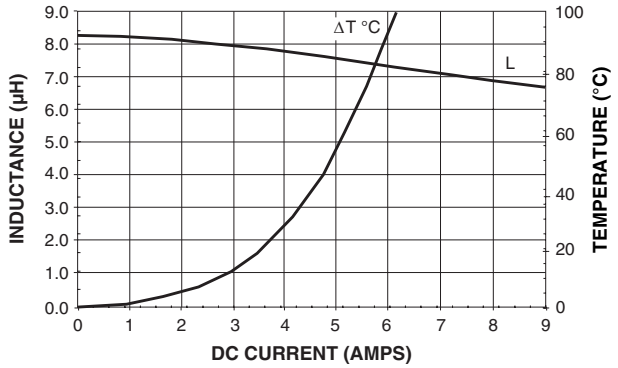
IHLP-2525CZ-06 3.3 µH



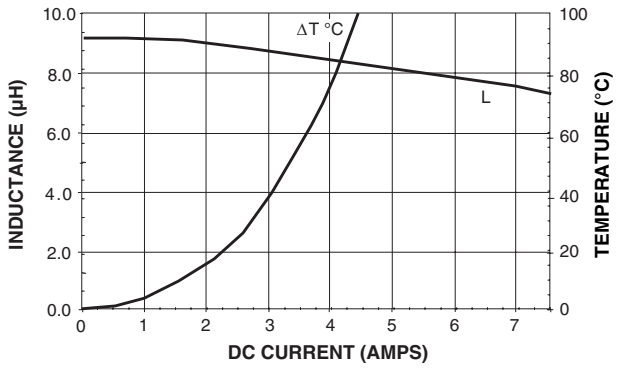
IHLP-2525CZ-06 4.7 µH



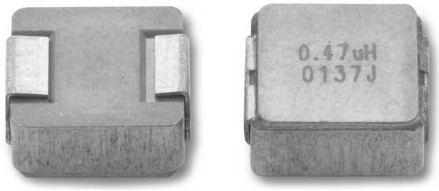
IHLP-2525CZ-06 8.2 µH



IHLP-2525CZ-06 10.0 µH



5 % DCR Tolerance, Low Profile, Power Inductor



Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Lowest height (3.0 mm) in this package footprint
- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

APPLICATIONS

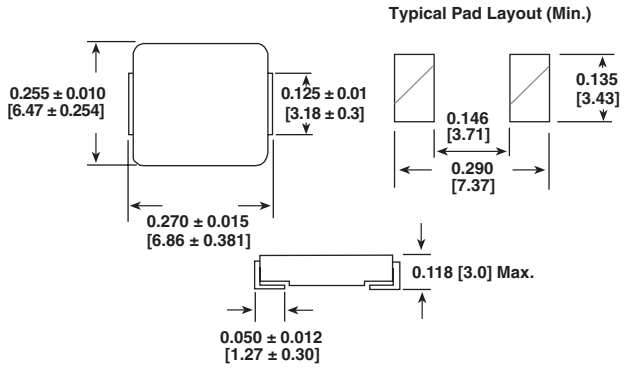
- Tolerance DCR for current sense applications
- Improved current balance in phased power supplies
- Improved thermal management
- PDA/Notebook/Desktop/Server and Battery powered devices
- High current, Low profile POL converters
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Arrays (FPGA)

STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ ± 5 % at 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.10	1.37	32.5	60
0.15	1.85	26	52
0.20	2.34	24	41
0.33	3.20	20	30
0.47	3.86	17.5	26
0.68	5.20	15.5	25
0.82	7.41	13	24
1.0	8.44	11	22
1.5	14.50	9	18
2.2	17.73	8	14
3.3	28.21	6	13.5
4.7	37.11	5.5	10
8.2	61.47	4	7.5
10	97.71	3	7.0

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

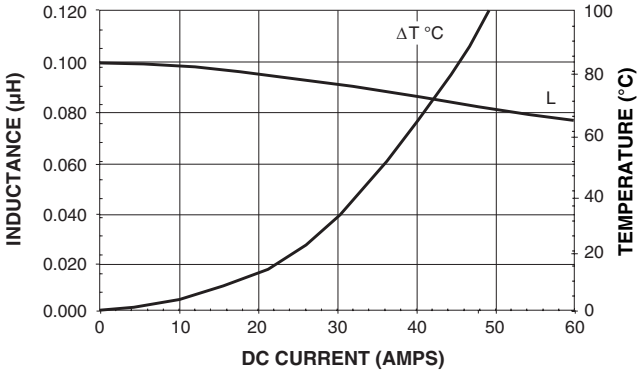
IHLP-2525CZ-07	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

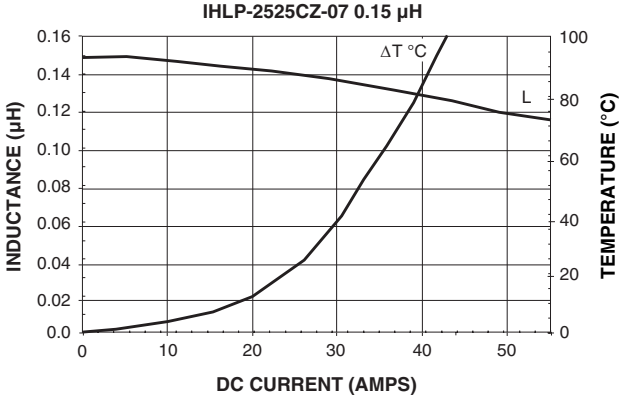
I	H	L	P	2	5	2	5	C	Z	E	R	1	R	0	M	0	7
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

PERFORMANCE GRAPHS

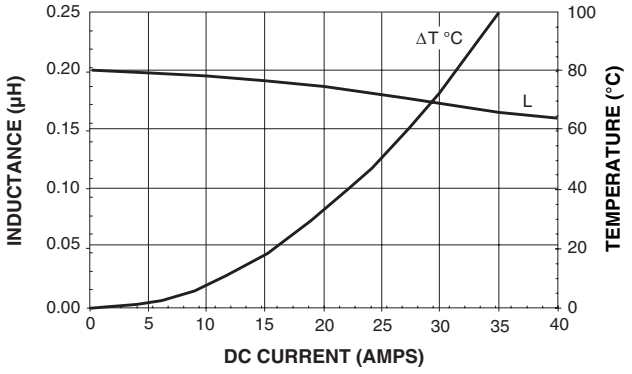
IHLP-2525CZ-07 0.10 µH



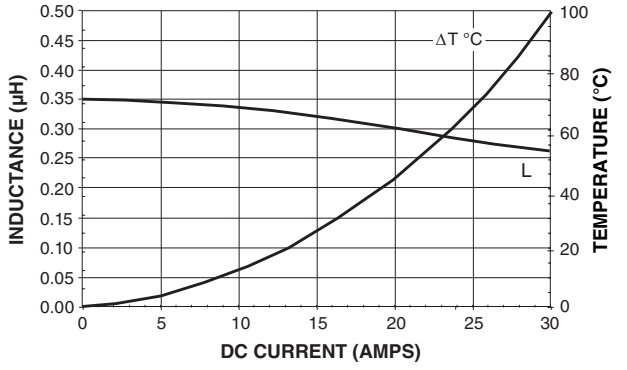
IHLP-2525CZ-07 0.15 µH



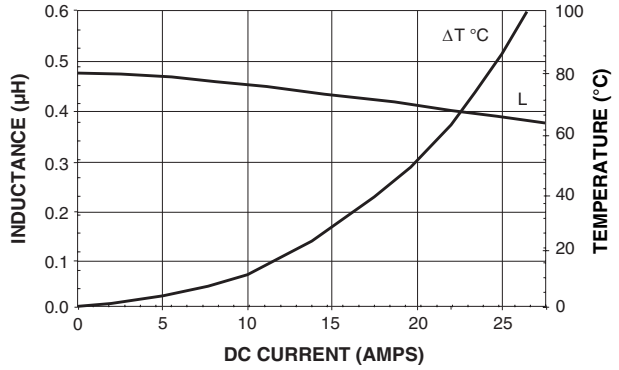
IHLP-2525CZ-07 0.20 µH



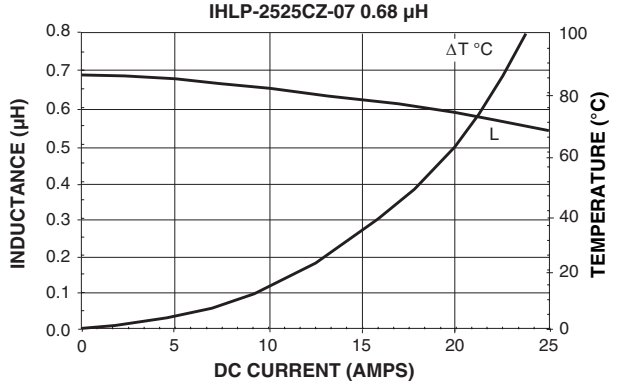
IHLP-2525CZ-07 0.33 µH



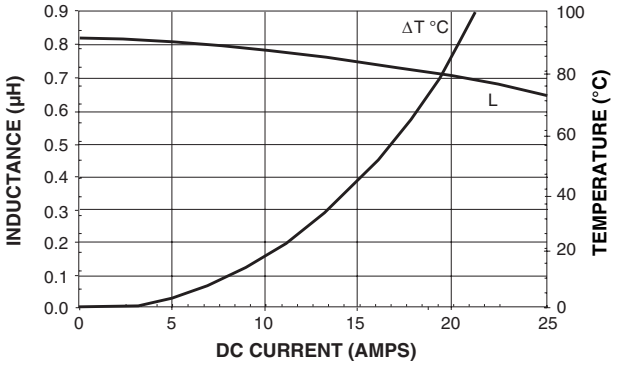
IHLP-2525CZ-07 0.47 µH



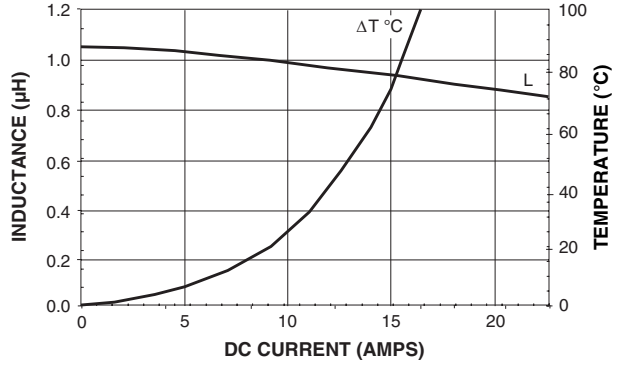
IHLP-2525CZ-07 0.68 µH



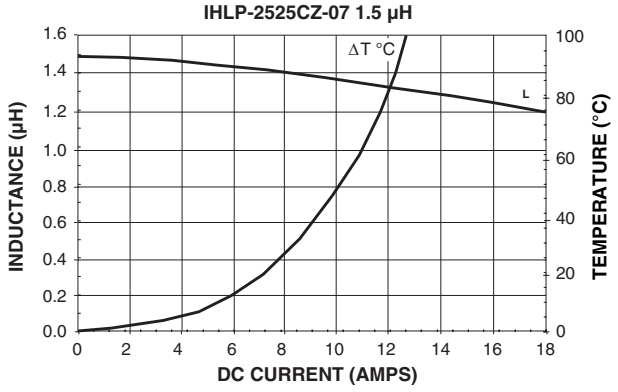
IHLP-2525CZ-07 0.82 µH

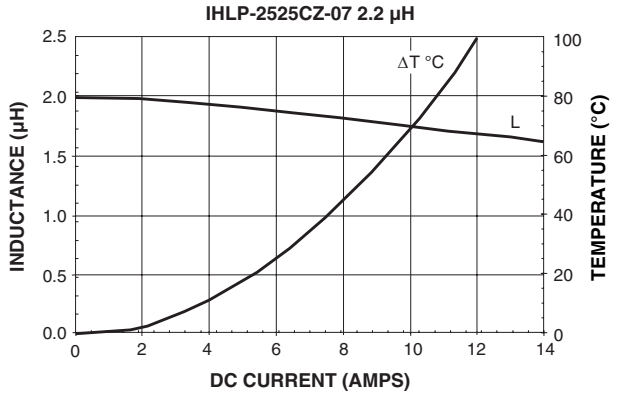


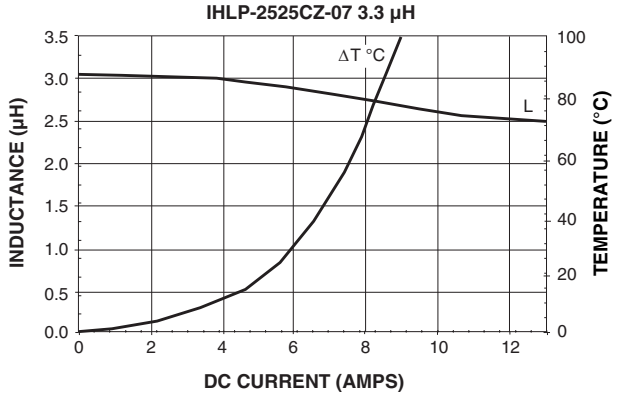
IHLP-2525CZ-07 1.00 µH

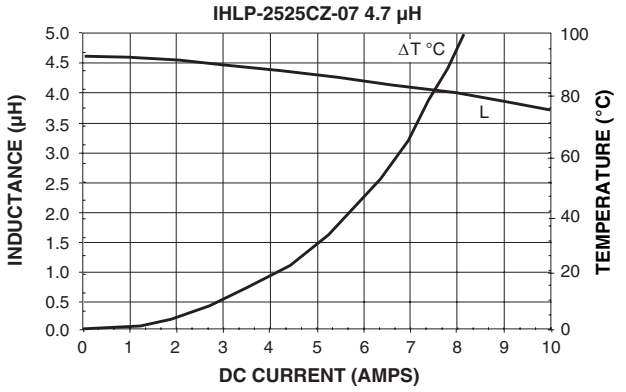


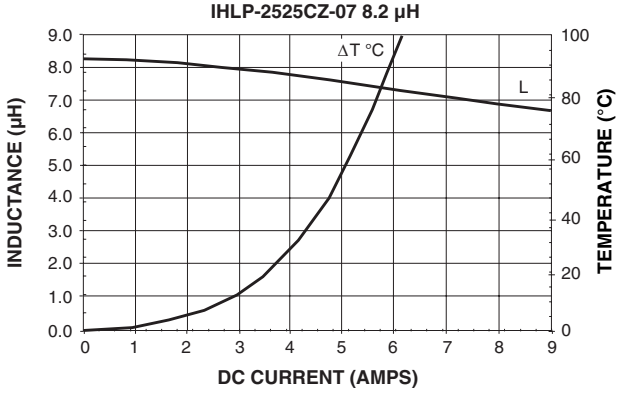
PERFORMANCE GRAPHS

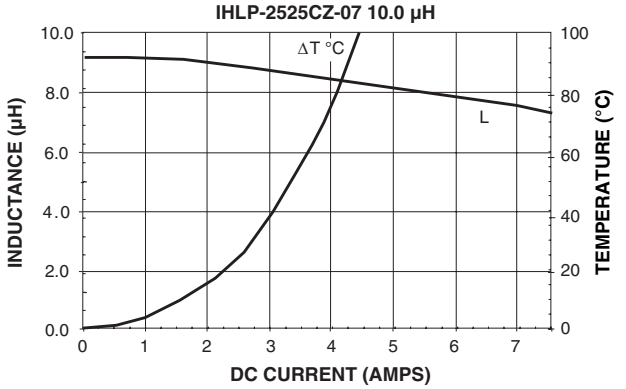








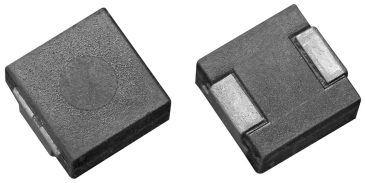




IHLM-2525CZ-01

Vishay Dale

Molded, Low Profile, High Current Inductor



Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Lowest molded height (3.0 mm) in this package footprint
- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant
- Encapsulated body offers improved environmental protection and moisture resistance
- Higher dielectric withstanding voltage vs IHLP
- Flame retardant encapsulant (UL 94V-0)
- Corrosion resistant package

RoHS COMPLIANT

APPLICATIONS

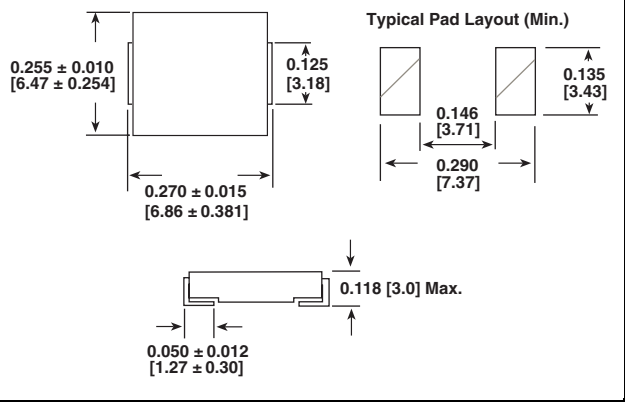
- PDA/Notebook/Desktop/Server applications
- High current POL converters
- Low profile, high current power supplies
- Battery powered devices
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Array (FPGA)
- Harsh environments including moisture, chemicals and salt spray

STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ TYPICAL 25 °C	DCR mΩ MAX 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.10	1.5	1.7	32.5	60
0.15	1.9	2.5	26	52
0.20	2.4	3.0	24	41
0.22	2.5	2.8	23	40
0.33	3.5	3.9	20	30
0.47	4	4.2	17.5	26
0.68	5	5.5	15.5	25
0.82	6.7	8	13	24
1.0	9	10	11	22
1.5	14	15	9	18
2.2	18	20	8	14
3.3	28	30	6	13.5
4.7	37	40	5.5	10
6.8	54	60	4.5	8
8.2	64	68	4	7.5
10	102	105	3	7.0

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

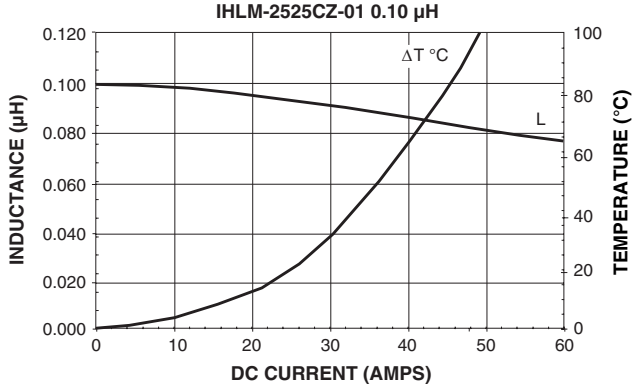
IHLM-2525CZ-01	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

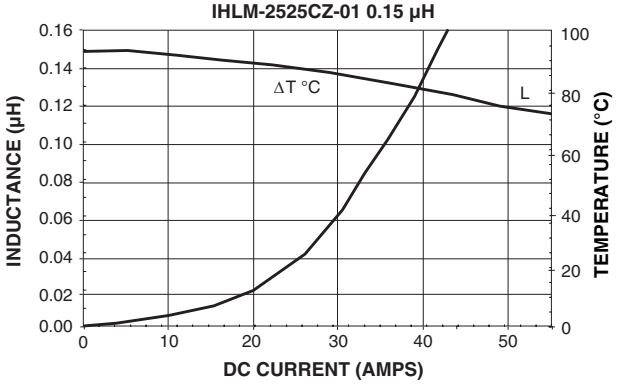
I	H	L	M	2	5	2	5	C	Z	E	R	1	R	0	M	0	1
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

PERFORMANCE GRAPHS

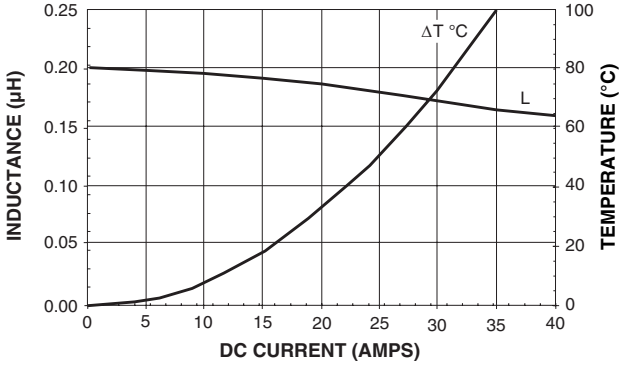
IHLM-2525CZ-01 0.10 µH



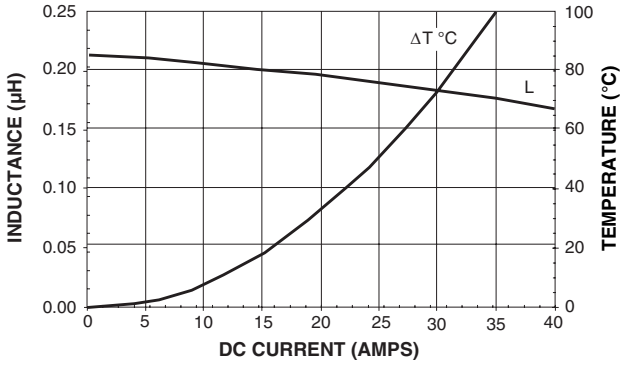
IHLM-2525CZ-01 0.15 µH



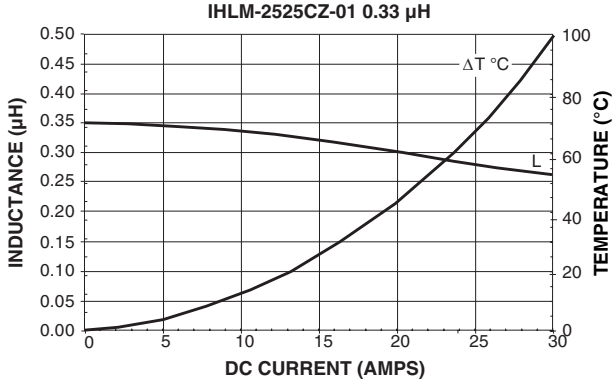
IHLM-2525CZ-01 0.20 µH



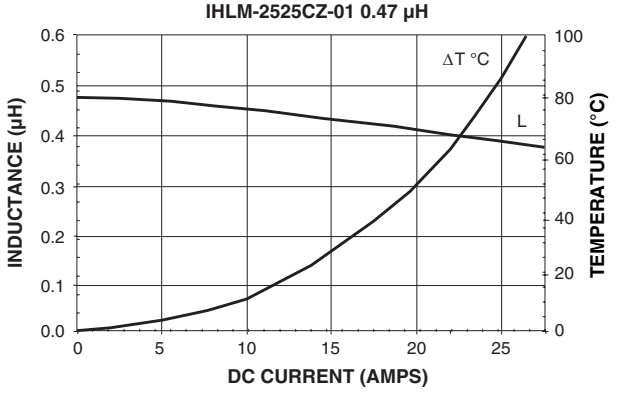
IHLM-2525CZ-01 0.22 µH



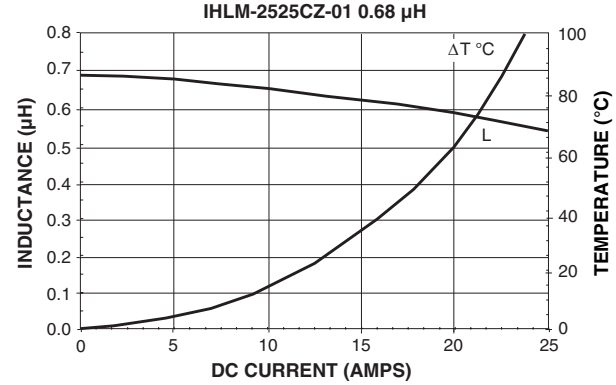
IHLM-2525CZ-01 0.33 µH



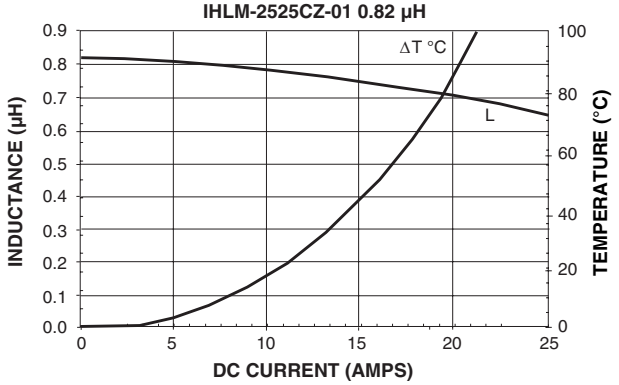
IHLM-2525CZ-01 0.47 µH



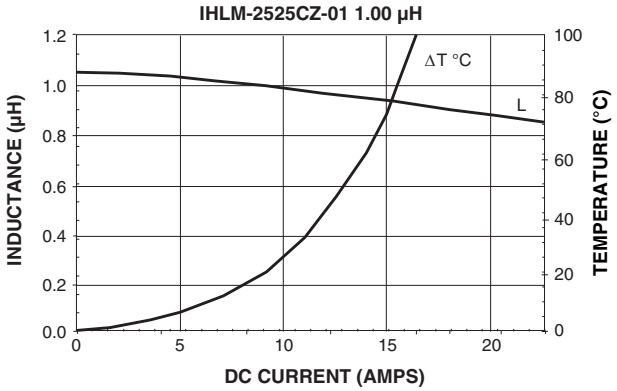
IHLM-2525CZ-01 0.68 µH

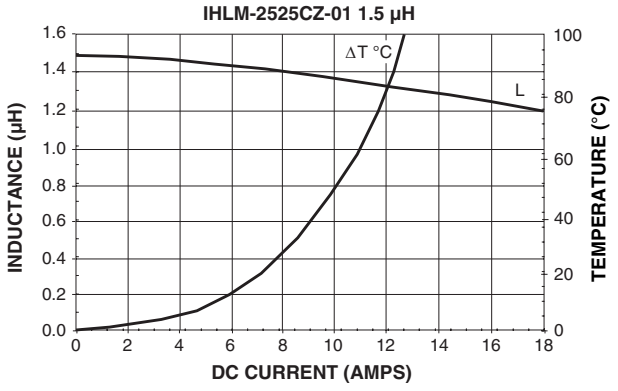


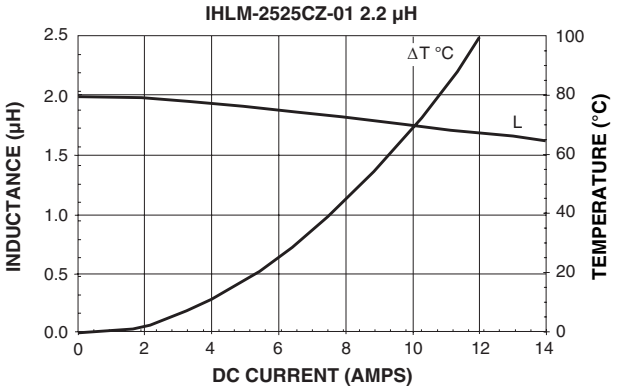
IHLM-2525CZ-01 0.82 µH

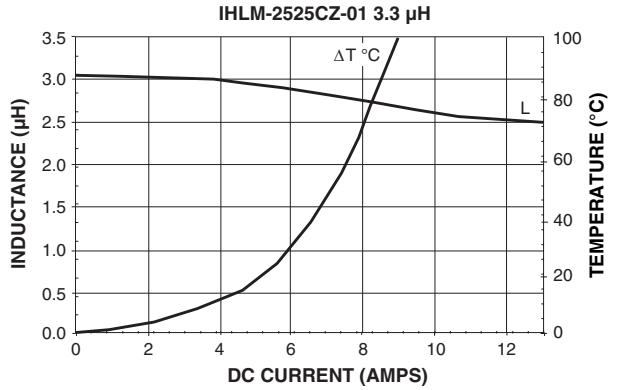


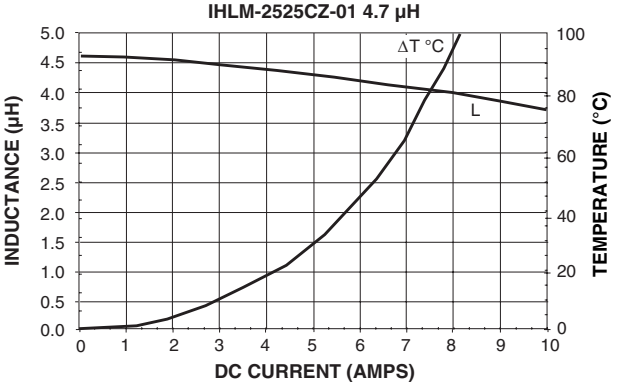
PERFORMANCE GRAPHS

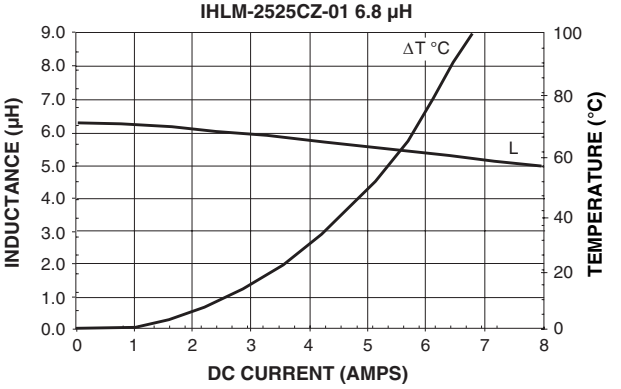


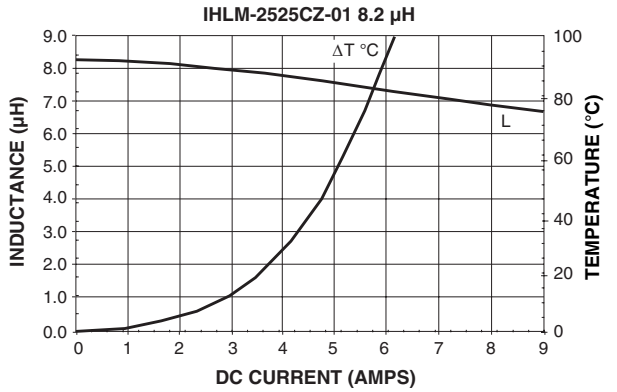


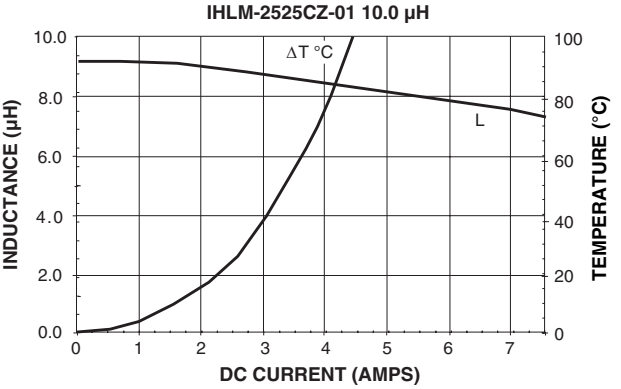




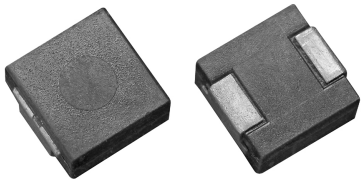








10 % DCR Tolerance, Low Profile, Power Inductor



Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Lowest molded height (3.0 mm) in this package footprint
- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- Encapsulated body offers improved environmental protection and moisture resistance
- Higher dielectric withstanding voltage vs IHLP
- Flame retardant encapsulant (UL 94V-0)
- Corrosion resistant package
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

APPLICATIONS

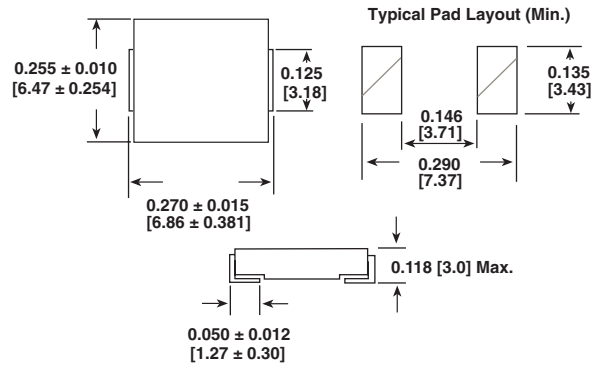
- Tolerance DCR for current sense applications
- Improved current balance in phased power supplies
- Improved thermal management
- PDA/Notebook/Desktop/Server and Battery powered devices
- High current, Low profile POL converters
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Arrays (FPGA)

STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ ± 10 % at 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.10	1.37	32.5	60
0.20	2.34	24	41
0.33	3.20	20	30
0.47	3.86	17.5	26
0.68	5.20	15.5	25
0.82	7.41	13	24
1.0	8.44	11	22
1.5	14.50	9	18
2.2	17.73	8	14
3.3	28.21	6	13.5
4.7	37.11	5.5	10
8.2	61.47	4	7.5
10	97.71	3	7.0

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

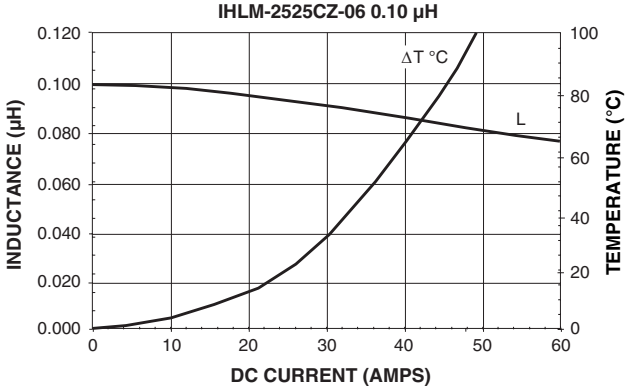
IHLM-2525CZ-06	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

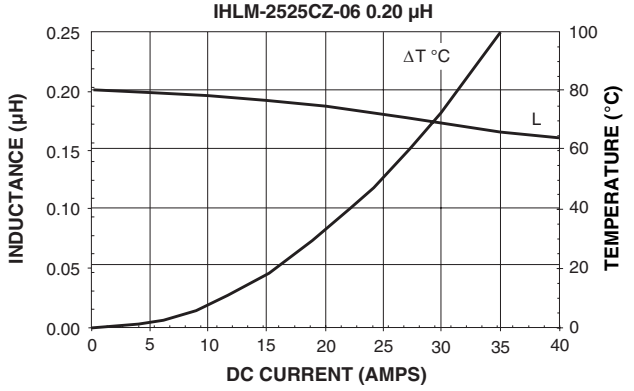
I	H	L	M	2	5	2	5	C	Z	E	R	1	R	0	M	0	6
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

PERFORMANCE GRAPHS

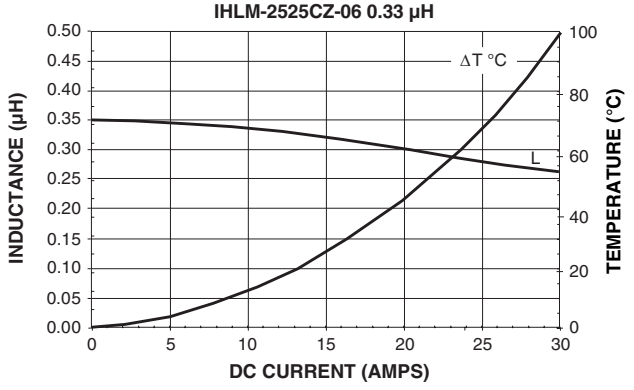
IHLM-2525CZ-06 0.10 µH



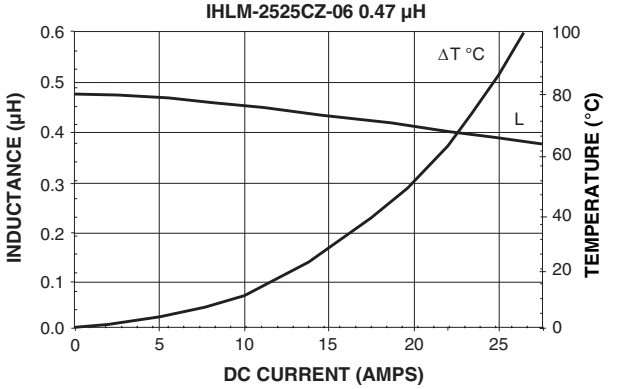
IHLM-2525CZ-06 0.20 µH



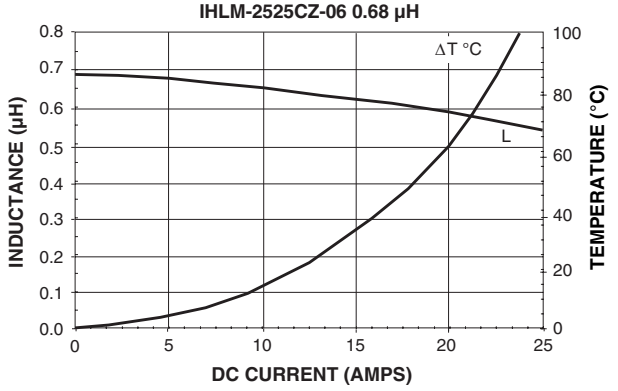
IHLM-2525CZ-06 0.33 µH



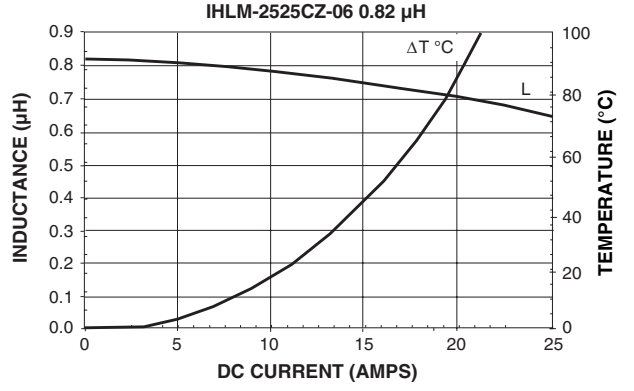
IHLM-2525CZ-06 0.47 µH



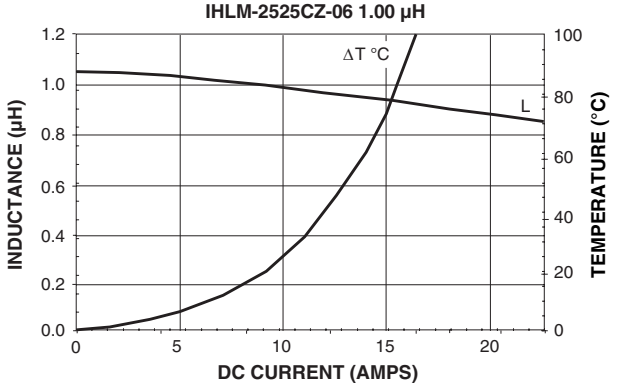
IHLM-2525CZ-06 0.68 µH



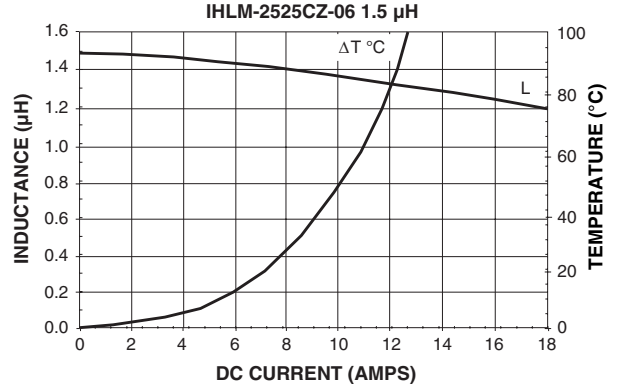
IHLM-2525CZ-06 0.82 µH



IHLM-2525CZ-06 1.00 µH

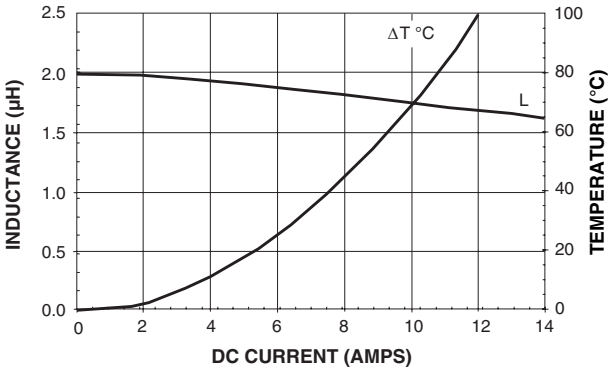


IHLM-2525CZ-06 1.5 µH

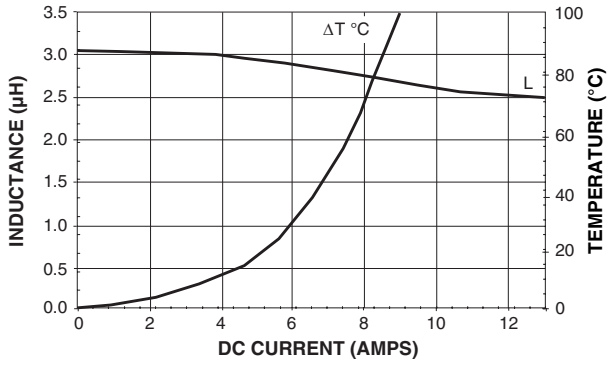


PERFORMANCE GRAPHS

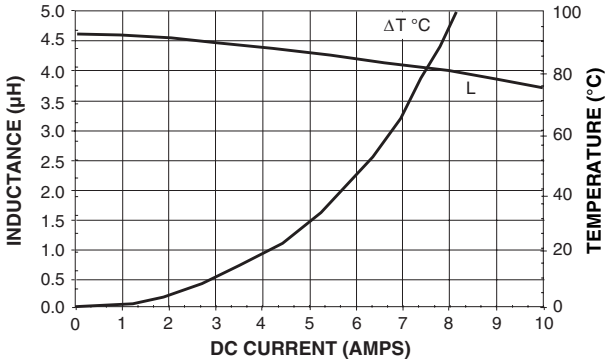
IHLM-2525CZ-06 2.2 µH



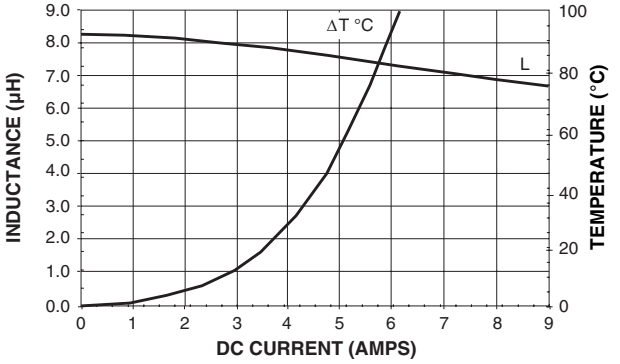
IHLM-2525CZ-06 3.3 µH



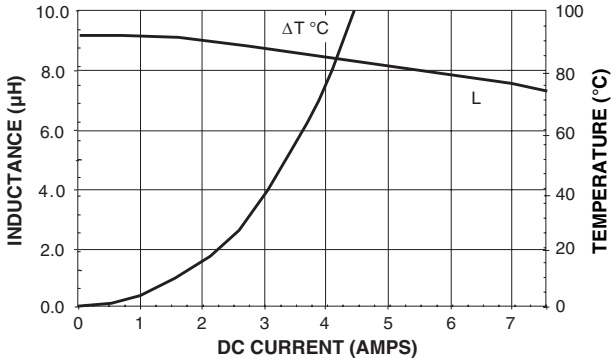
IHLM-2525CZ-06 4.7 µH



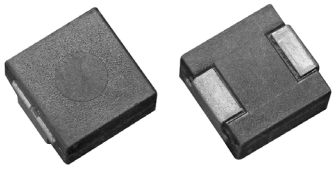
IHLM-2525CZ-06 8.2 µH



IHLM-2525CZ-06 10.0 µH



5 % DCR Tolerance, Low Profile, Power Inductor



Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Lowest molded height (3.0 mm) in this package footprint
- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- Encapsulated body offers improved environmental protection and moisture resistance
- Higher dielectric withstanding voltage vs IHLP
- Flame retardant encapsulant (UL 94V-0)
- Corrosion resistant package
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

APPLICATIONS

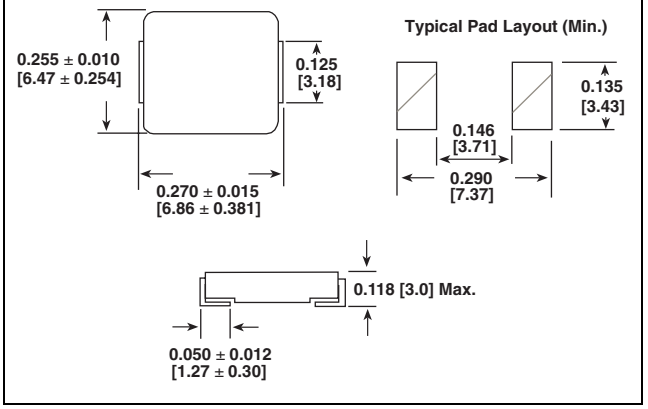
- Tolerance DCR for current sense applications
- Improved current balance in phased power supplies
- Improved thermal management
- PDA/Notebook/Desktop/Server and Battery powered devices
- High current, Low profile POL converters
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Arrays (FPGA)

STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ ± 5 % at 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.10	1.37	32.5	60
0.15	1.85	26	52
0.20	2.34	24	41
0.33	3.20	20	30
0.47	3.86	17.5	26
0.68	5.20	15.5	25
0.82	7.41	13	24
1.0	8.44	11	22
1.5	14.50	9	18
2.2	17.73	8	14
3.3	28.21	6	13.5
4.7	37.11	5.5	10
8.2	61.47	4	7.5
10	97.71	3	7.0

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

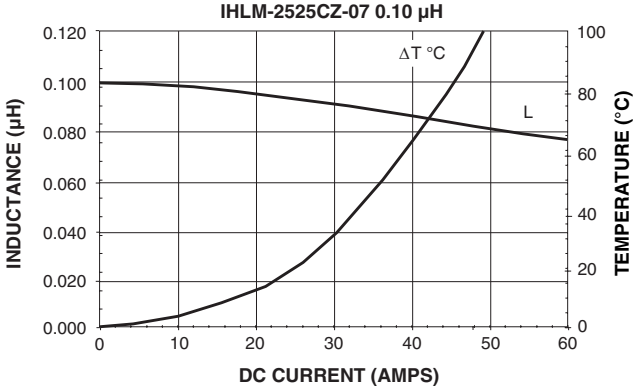
IHLM-2525CZ-07	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

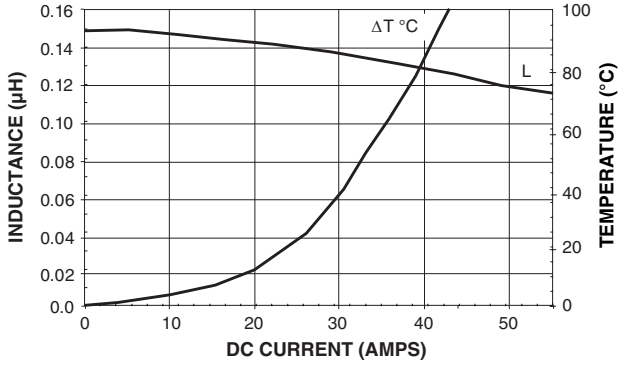
I	H	L	M	2	5	2	5	C	Z	E	R	1	R	0	M	0	7
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

PERFORMANCE GRAPHS

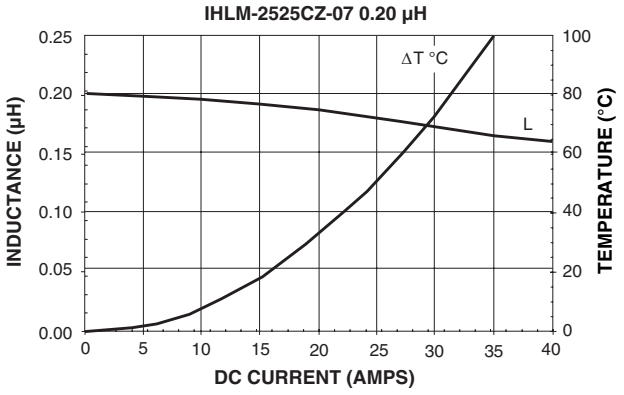
IHLM-2525CZ-07 0.10 µH



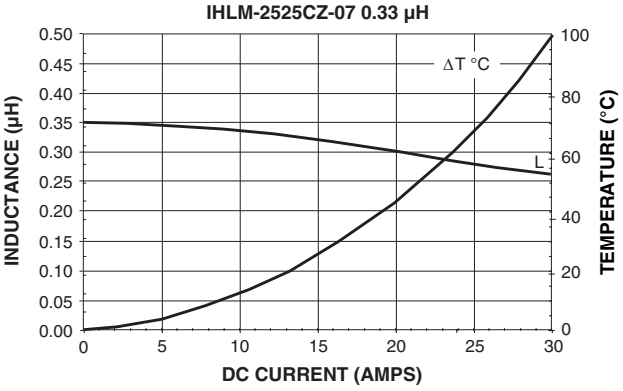
IHLM-2525CZ-07 0.15 µH



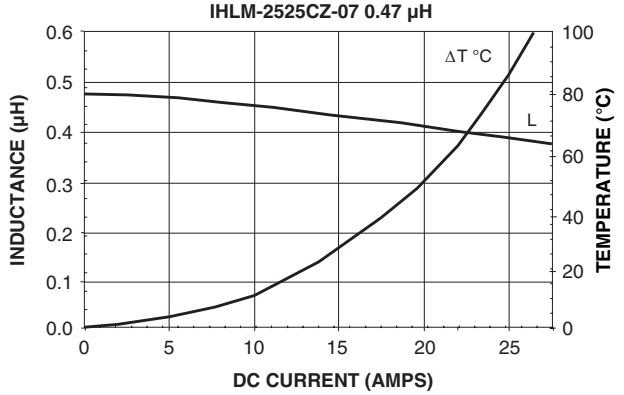
IHLM-2525CZ-07 0.20 µH



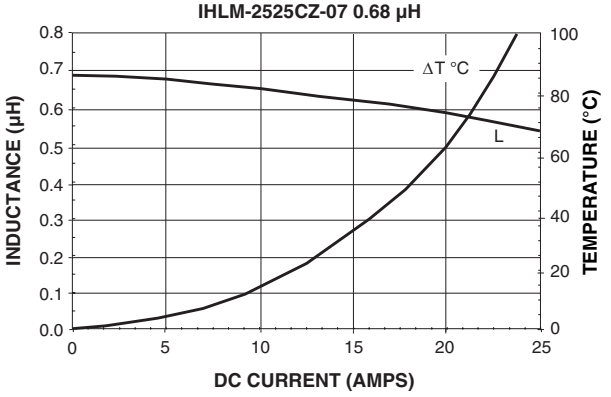
IHLM-2525CZ-07 0.33 µH



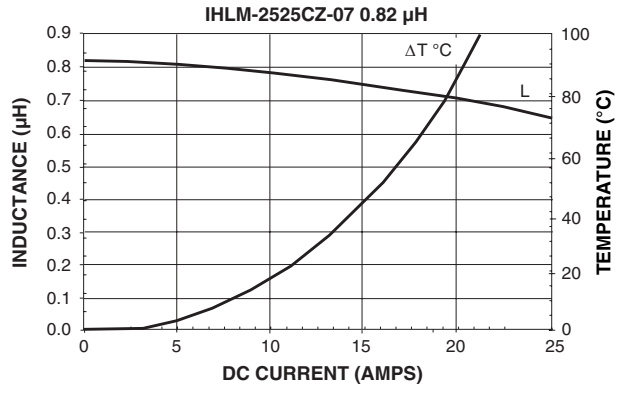
IHLM-2525CZ-07 0.47 µH



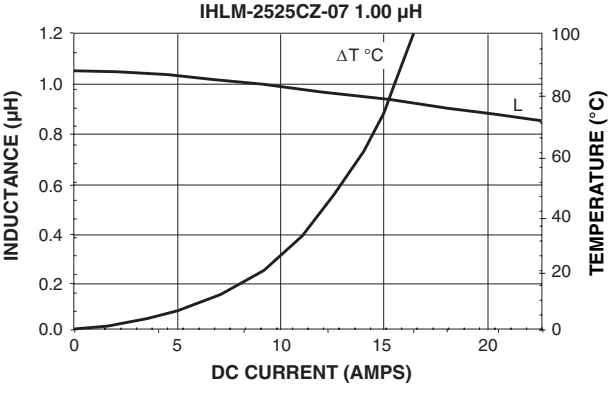
IHLM-2525CZ-07 0.68 µH



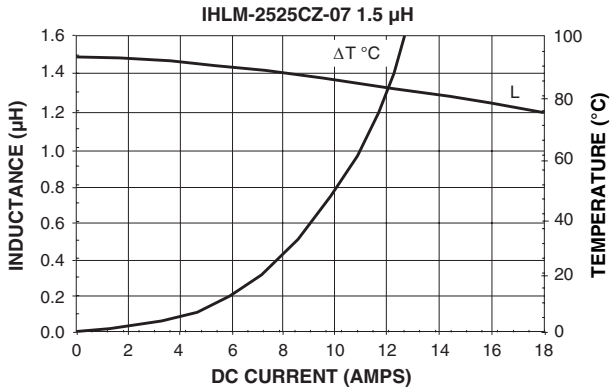
IHLM-2525CZ-07 0.82 µH

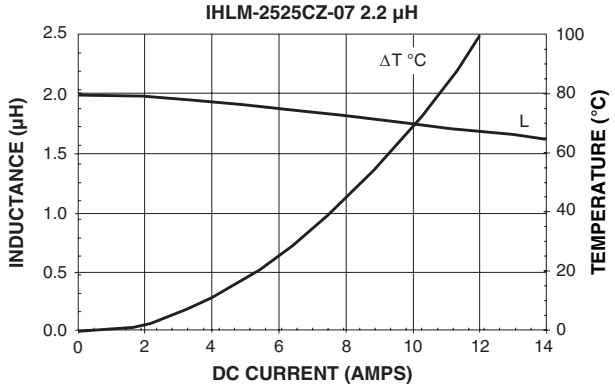


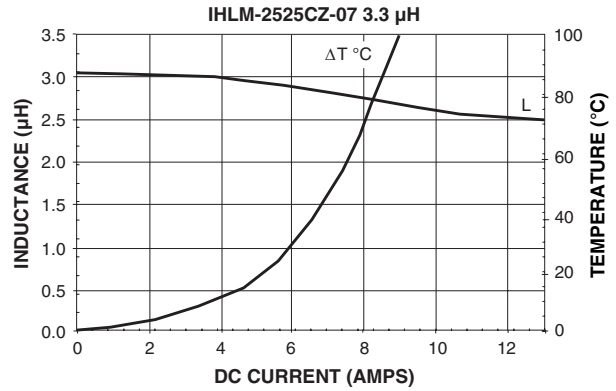
IHLM-2525CZ-07 1.00 µH

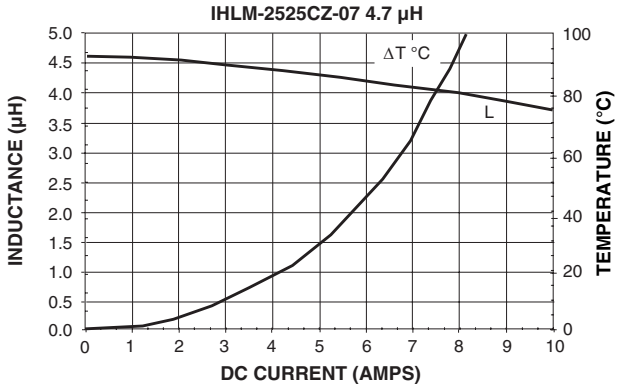


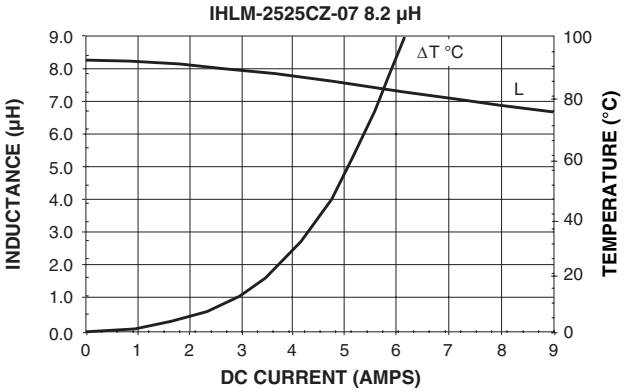
PERFORMANCE GRAPHS

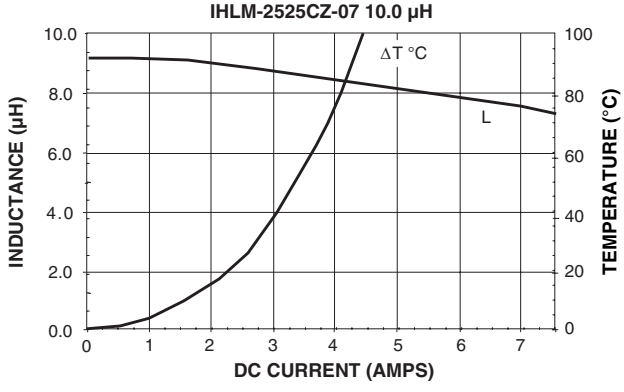




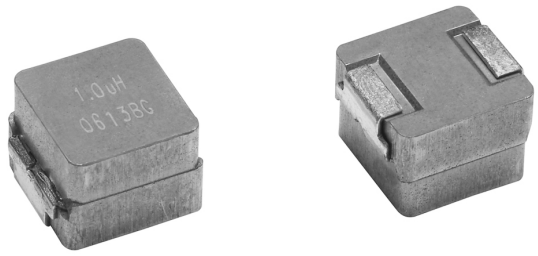








Low Profile, High Current Inductor



Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Shielded construction
- Frequency range below 1 MHz
- Lowest DCR/µH, in this package size
- Powdered iron composition provides soft saturation
- Handles high transient current spikes without hard saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

APPLICATIONS

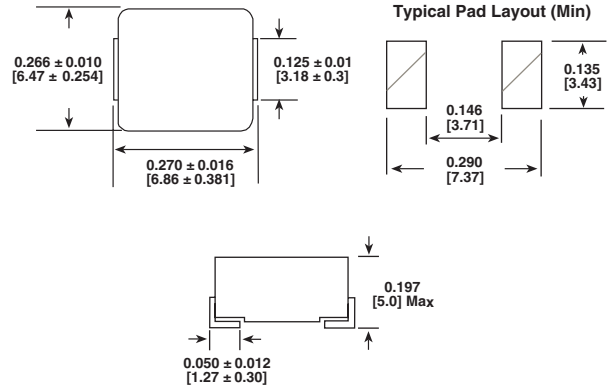
- Notebook/Desktop/Server applications
- High current POL converters
- Low profile, high current power supplies
- Battery powered devices
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Array (FPGA)

STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz 0.25 V, 0 A	DCR mΩ TYPICAL 25 °C	DCR mΩ MAX 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.56	3.4	3.6	20	12
0.68	4.2	4.5	18	11.5
0.82	4.6	4.9	16.5	13
1.0	5.6	6.5	13	15
1.5	8.6	9.0	12	12
2.2	13.0	13.6	10	10
3.3	19.9	20.9	8	8
4.7	28.9	30.3	6.5	7
5.6	32.7	34.4	6	7
6.8	42.5	44.6	5.5	5.5
8.2	43.5	45.6	5.5	5.5
10.0	67.9	71.3	4.5	4.5

NOTES:
1. All test data is referenced to 25 °C ambient.
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C.
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

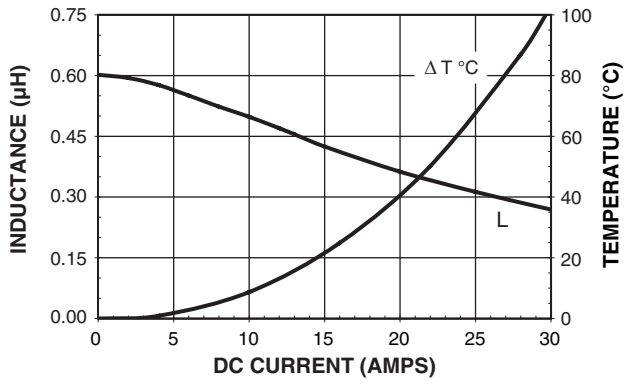
IHLP-2525EZ-01	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

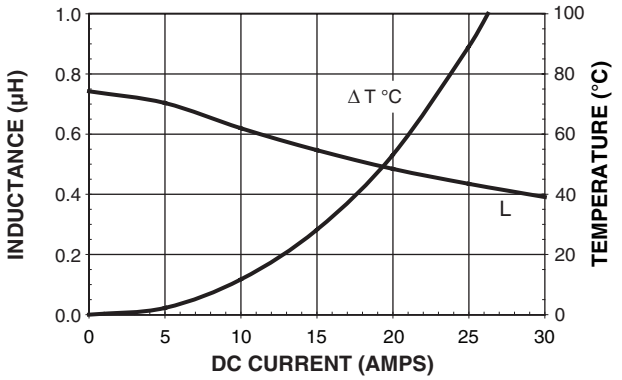
I	H	L	P	2	5	2	5	E	Z	E	R	1	R	0	M	0	1
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

PERFORMANCE GRAPHS

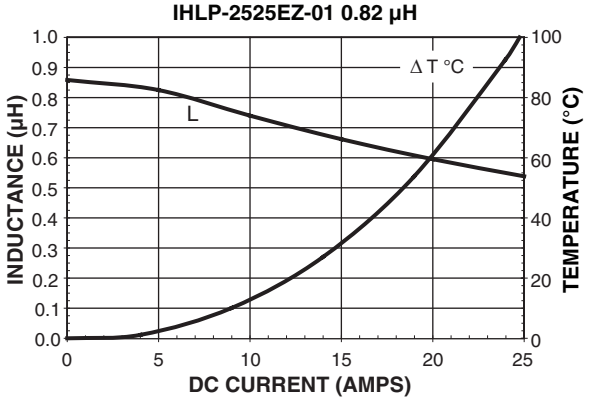
IHLP-2525EZ-01 0.56 µH



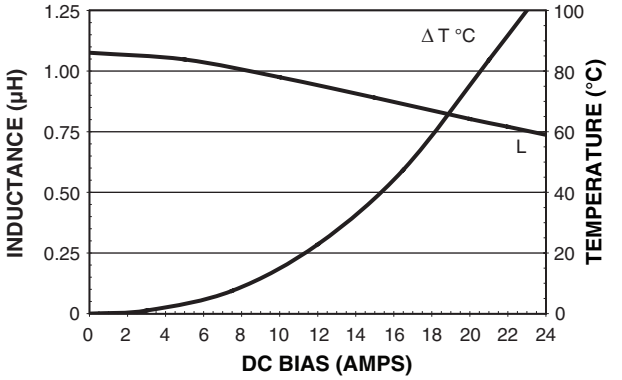
IHLP-2525EZ-01 0.68 µH



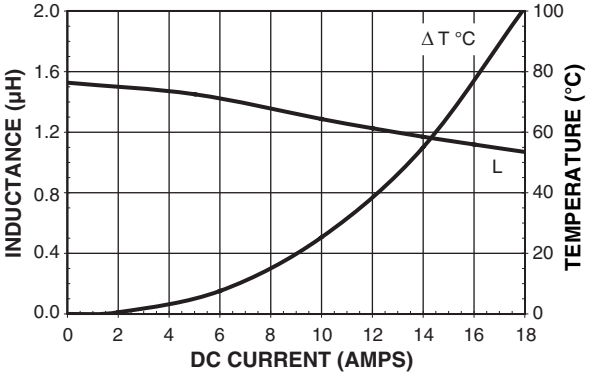
IHLP-2525EZ-01 0.82 µH



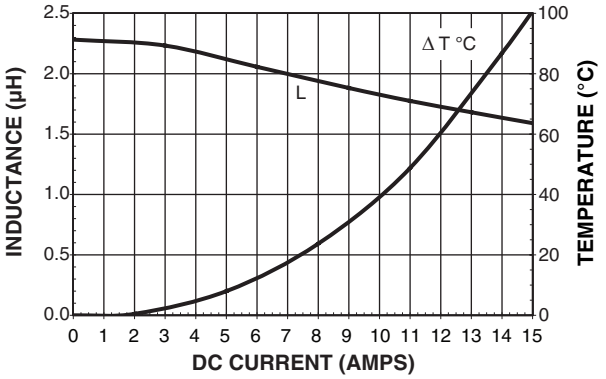
IHLP-2525EZ-01 1.0 µH



IHLP-2525EZ-01 1.5 µH

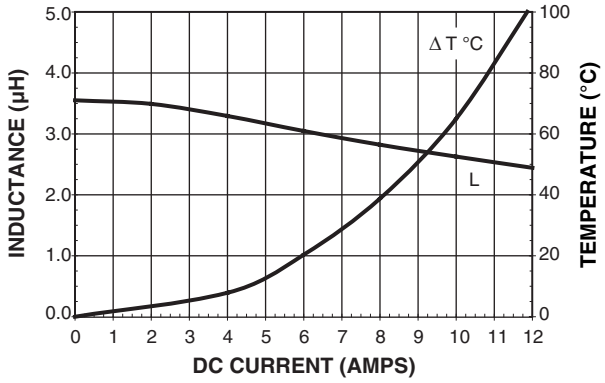


IHLP-2525EZ-01 2.2 µH

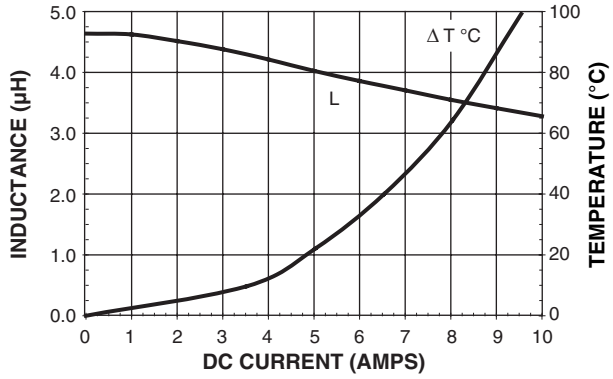


PERFORMANCE GRAPHS

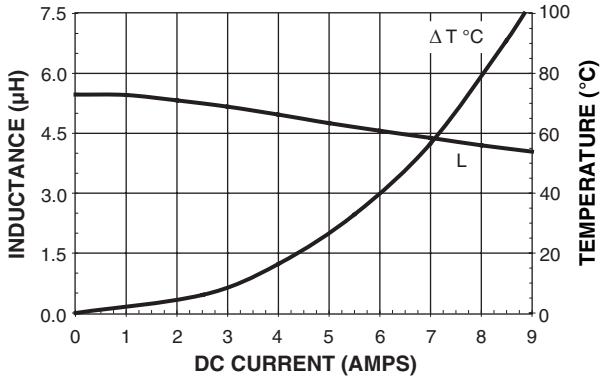
IHLP-2525EZ-01 3.3 µH



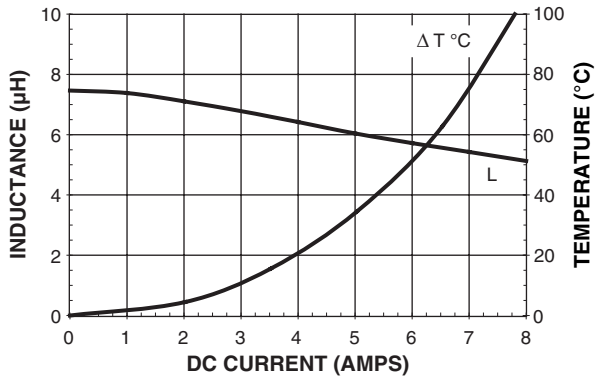
IHLP-2525EZ-01 4.7 µH



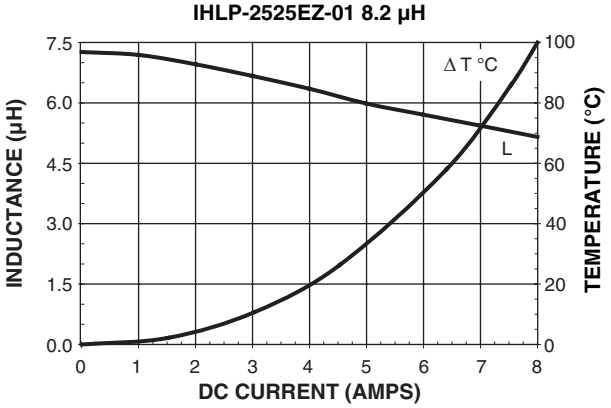
IHLP-2525EZ-01 5.6 µH



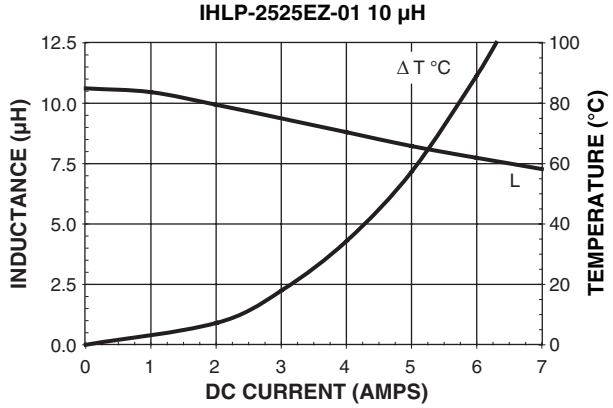
IHLP-2525EZ-01 6.8 µH



IHLP-2525EZ-01 8.2 µH



IHLP-2525EZ-01 10 µH



IHLP-4040DZ-01

Vishay Dale

Low Profile, High Current Inductor

Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS
COMPLIANT

APPLICATIONS

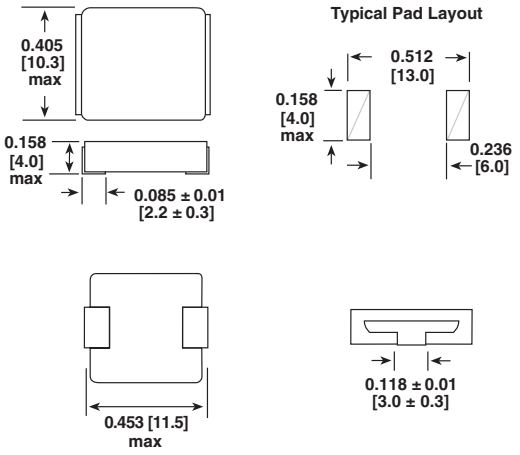
- PDA/Notebook/Desktop/Server applications
- High current POL converters
- Low profile, high current power supplies
- Battery powered devices
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Array (FPGA)

STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ TYPICAL 25 °C	DCR mΩ MAX 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.19	0.875	0.95	40.0	90.0
0.36	1.30	1.40	31.5	60.0
0.56	1.70	1.80	27.5	49.0
1.0	3.70	4.10	17.5	36.0
1.5	5.30	5.80	15.0	27.5
2.2	8.20	9.00	12.0	25.6
3.3	10.80	11.80	10.0	18.6
4.7	15.00	16.50	9.5	17.0
5.6	17.60	19.30	8.5	16.0
6.8	21.20	23.30	8.0	13.5
10	33.20	36.50	6.8	12.0

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

IHLP-4040DZ-01	6.8 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

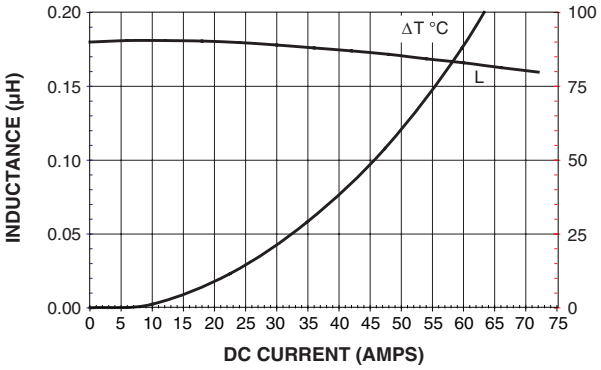
GLOBAL PART NUMBER

I	H	L	P	4	0	4	0	D	Z	E	R	6	R	8	M	0	1
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

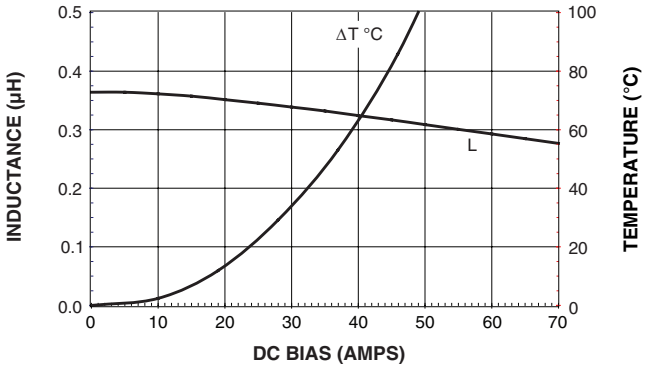
For technical questions, contact: magnetics@vishay.com

PERFORMANCE GRAPHS

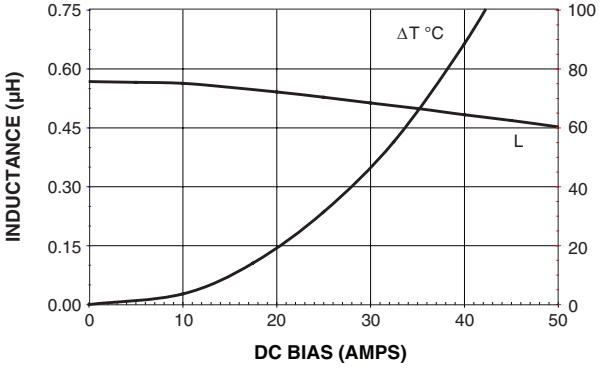
IHLP-4040DZ-01 0.19 µH



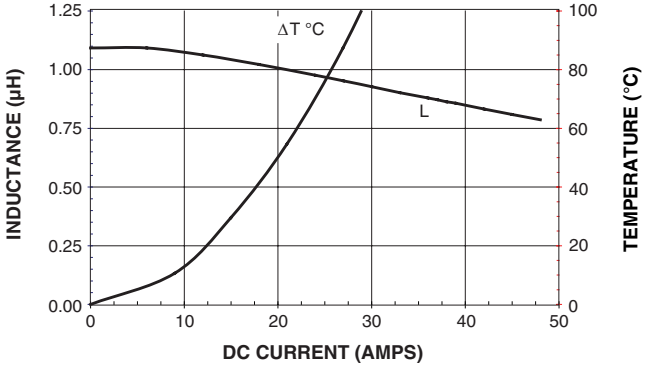
IHLP-4040DZ-01 0.36 µH



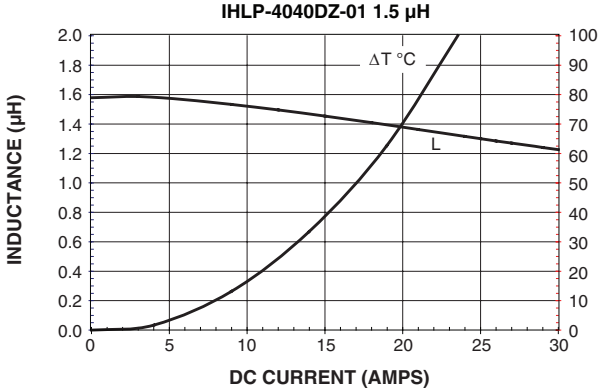
IHLP-4040DZ-01 0.56 µH



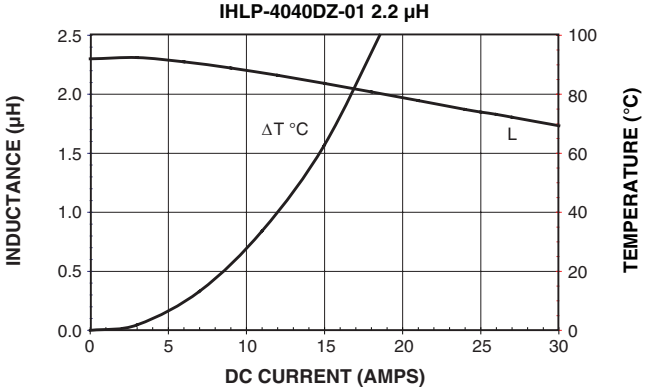
IHLP-4040DZ-01 1.0 µH



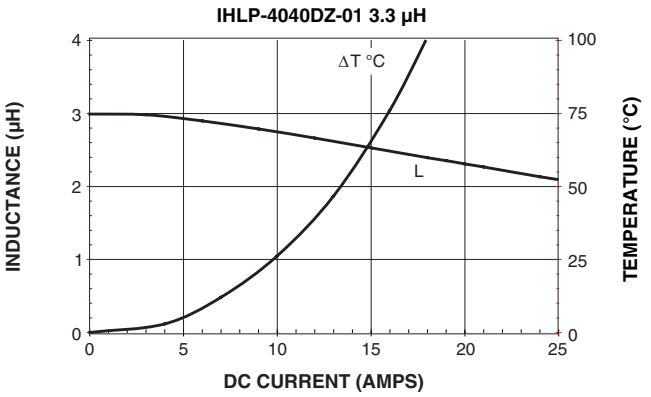
IHLP-4040DZ-01 1.5 µH

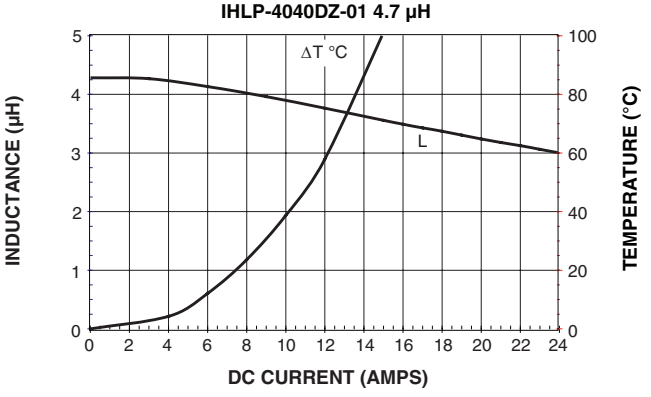


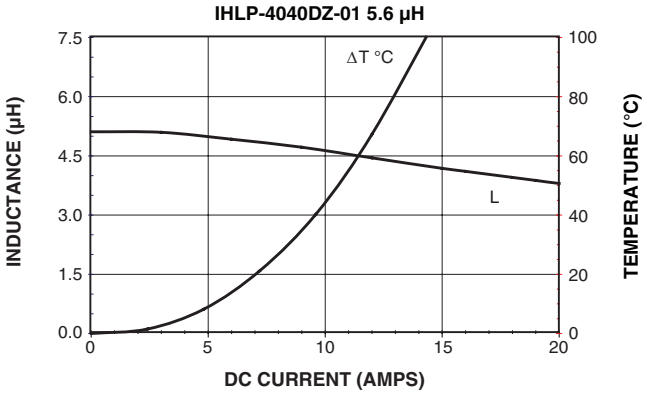
IHLP-4040DZ-01 2.2 µH

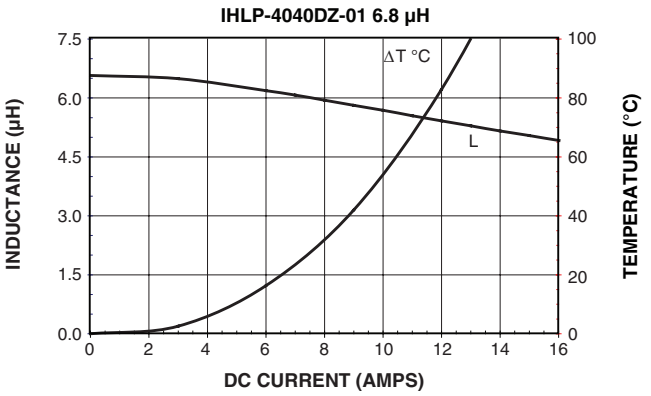


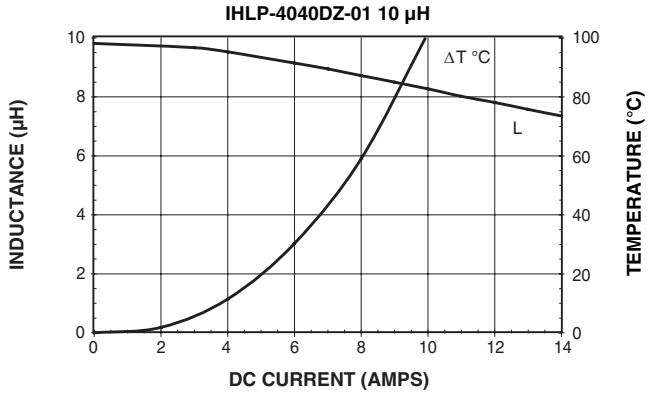
PERFORMANCE GRAPHS











Low Profile, High Current Inductor

Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Shielded construction
- Frequency range up to 1.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

APPLICATIONS

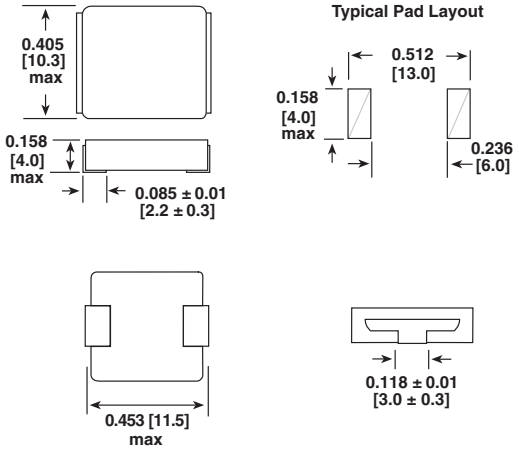
- PDA/Notebook/Desktop/Server applications
- High current POL converters
- Low profile, high current power supplies
- Battery powered devices
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Array (FPGA)

STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ TYPICAL 25 °C	DCR mΩ MAX 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.19	0.70	0.80	40	46
0.24	0.85	0.95	33	44
0.36	1.05	1.15	32	30
0.47	1.53	1.68	30	30
0.56	1.55	1.70	32	22
0.78	1.80	1.90	27	22
1.0	2.30	2.50	25	20
1.8	4.50	5.00	17	16
2.0	5.20	5.80	16	14
4.7	12.90	14.20	9.5	7.6
6.8	17.50	19.30	9.0	7.5
10.0	27.80	30.50	7.5	7.1
22	60.40	66.0	5.0	4.5
47	174.0	191.0	3.3	3.0
100	249.0	270.0	2.5	2.25

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

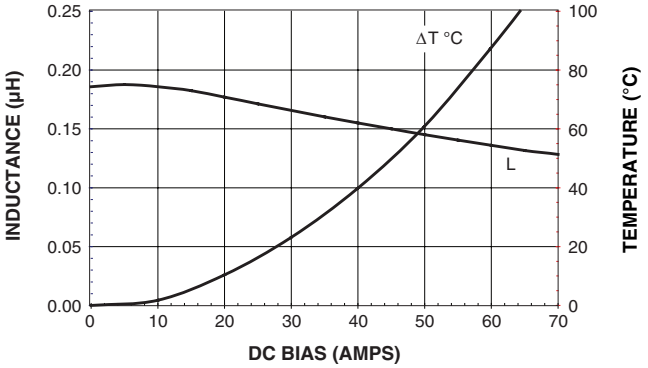
IHLP-4040DZ-11	2.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

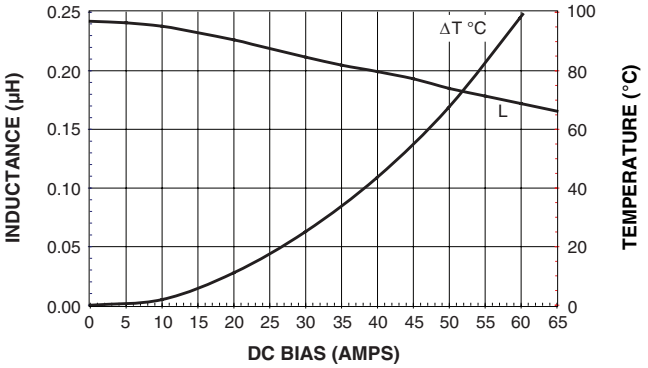
I	H	L	P	4	0	4	0	D	Z	E	R	2	R	0	M	1	1
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

PERFORMANCE GRAPHS

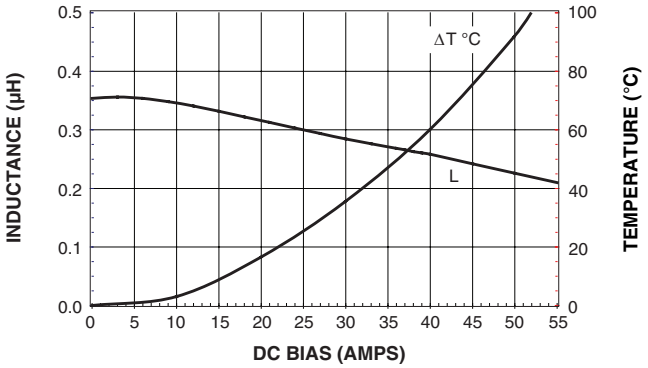
IHLP-4040DZ-11 0.19 µH



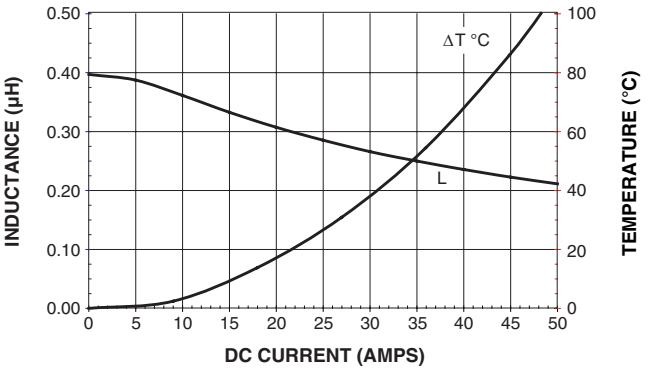
IHLP-4040DZ-11 0.24 µH



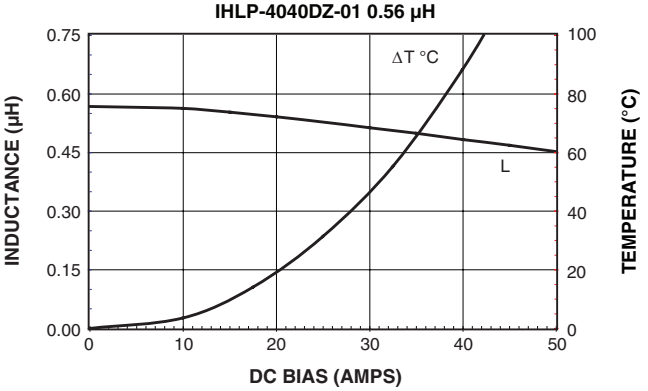
IHLP-4040DZ-11 0.36 µH



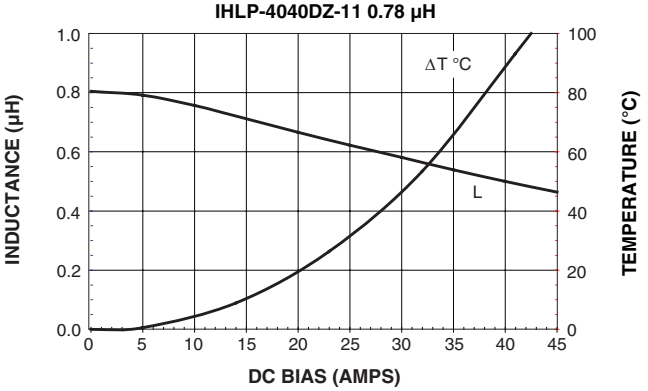
IHLP-4040DZ-11 0.47 µH



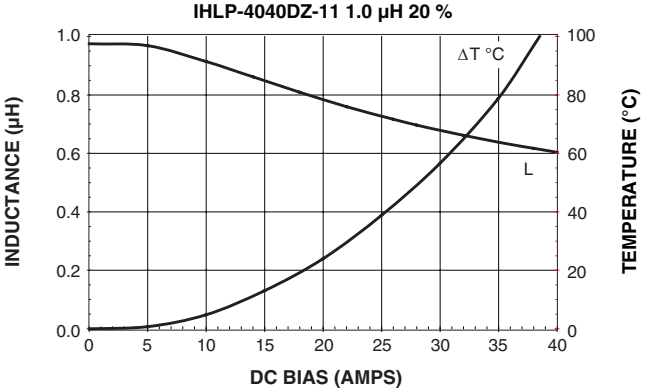
IHLP-4040DZ-01 0.56 µH



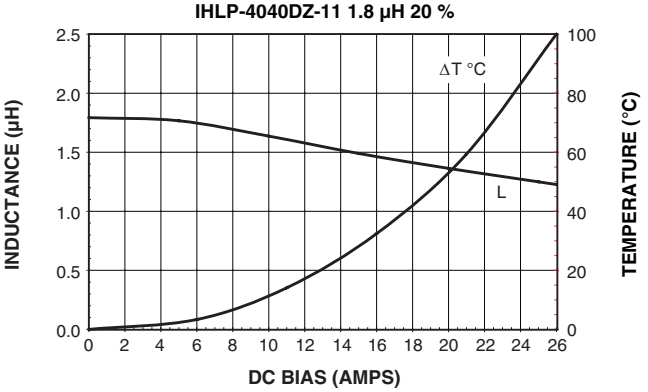
IHLP-4040DZ-11 0.78 µH



IHLP-4040DZ-11 1.0 µH 20 %

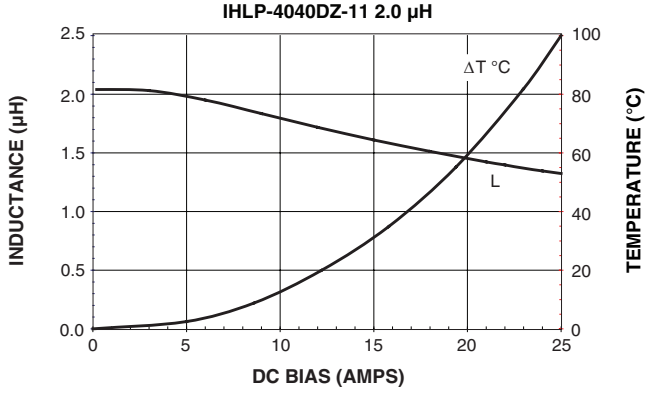


IHLP-4040DZ-11 1.8 µH 20 %

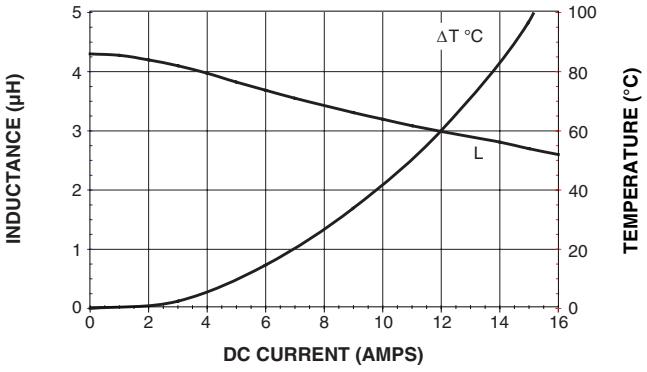


PERFORMANCE GRAPHS

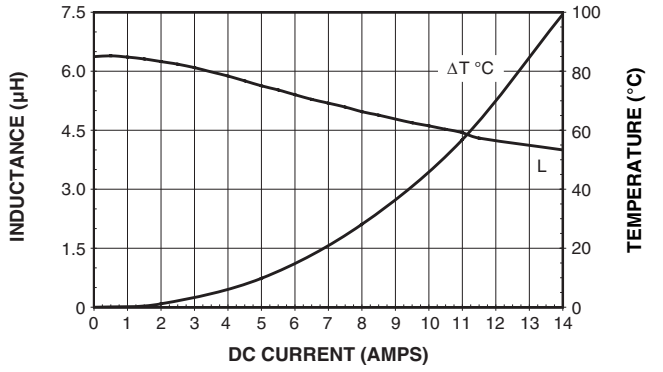
IHLP-4040DZ-11 2.0 µH



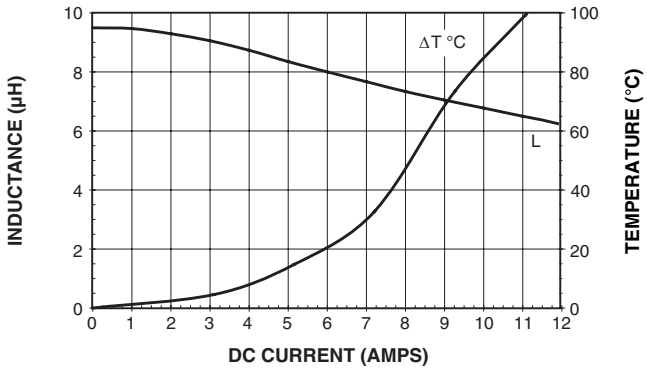
IHLP-4040DZ-11 4.7 µH



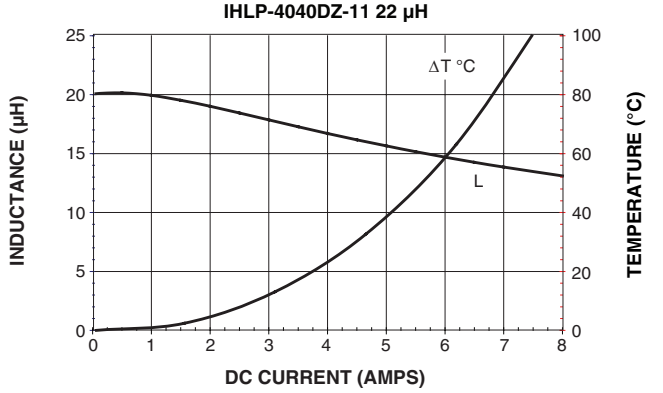
IHLP-4040DZ-11 6.8 µH



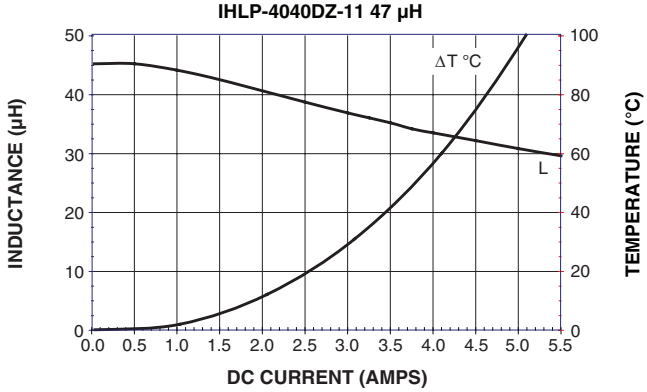
IHLP-4040DZ-11 10 µH



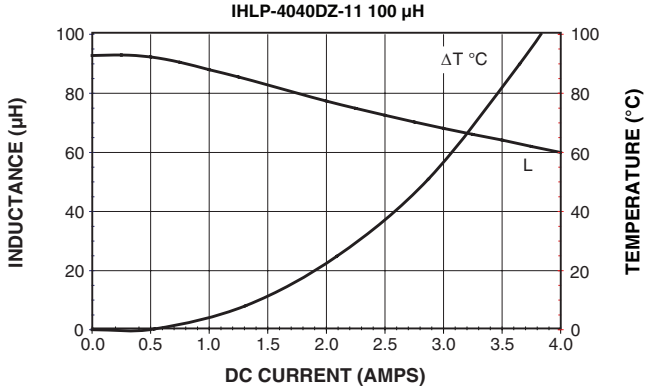
IHLP-4040DZ-11 22 µH



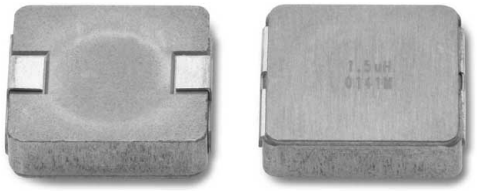
IHLP-4040DZ-11 47 µH



IHLP-4040DZ-11 100 µH



Low Profile, High Current Inductor



Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Lowest height (3.5 mm) in this package footprint
- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

APPLICATIONS

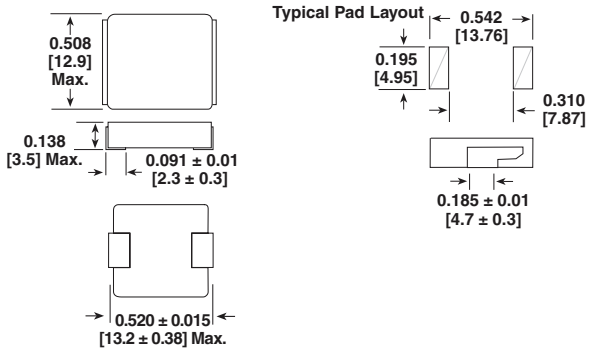
- PDA/Notebook/Desktop/Server applications
- High current POL converters
- Low profile, high current power supplies
- Battery powered devices
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Array (FPGA)

STANDARD ELECTRICAL SPECIFICATIONS

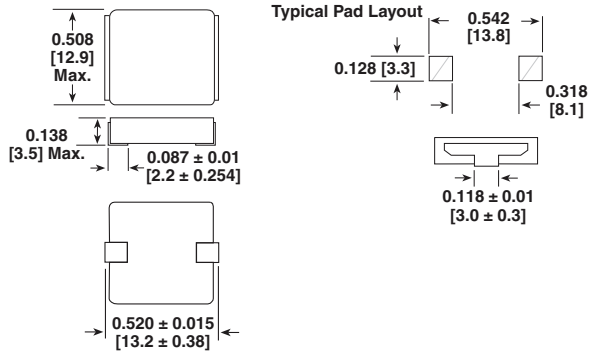
Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ TYPICAL 25 °C	DCR mΩ MAX 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.10	0.8	0.96	43	84
0.15	1	1.2	41	75
0.22	1.1	1.3	38.5	65
0.33	1.3	1.5	36.5	62
0.47	1.6	2	32	55
0.60	1.8	2.2	29	51
0.68	2.3	2.5	28	49
0.82	2.6	3	25	44
1.0	3.3	3.5	24	40
1.5	5.1	5.5	19	35
1.8	6.5	7	16.5	30
2.2	7.2	8	16	29
3.3	11	12	12	27
4.7	14.3	15	10	24
5.6	18.3	19	9.5	19
6.8	19.8	22	9	18
8.2	24.8	28	8.5	16
10	30.4	34	7	14

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



The diagram above applies to values 0.6 µH and below.



The diagram above applies to values 0.68 µH and above.

DESCRIPTION

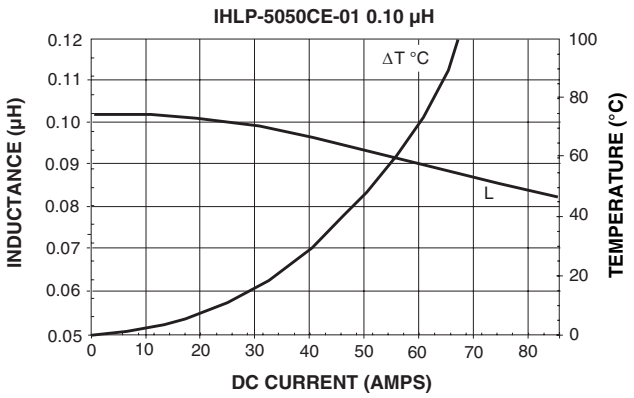
IHLP-5050CE-01	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

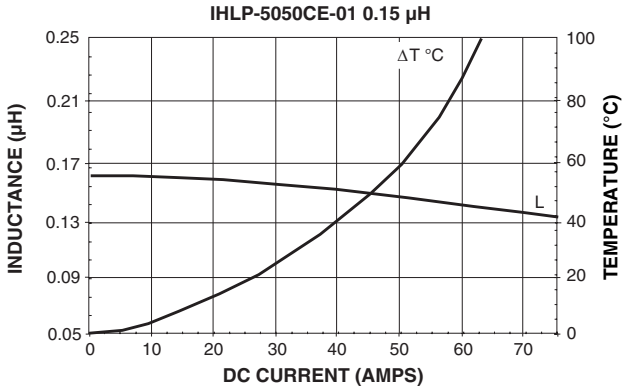
GLOBAL PART NUMBER

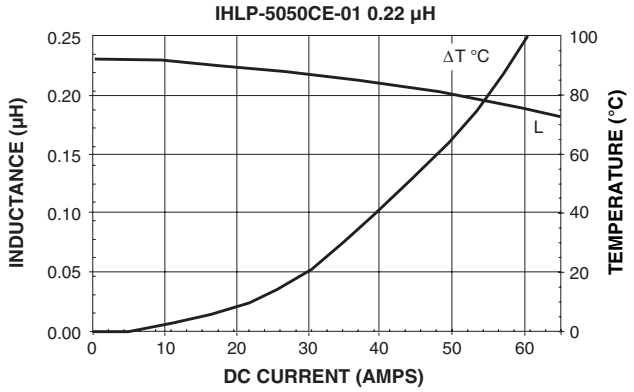
I	H	L	P	5	0	5	0	C	E	E	R	1	R	0	M	0	1
PRODUCT FAMILY				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

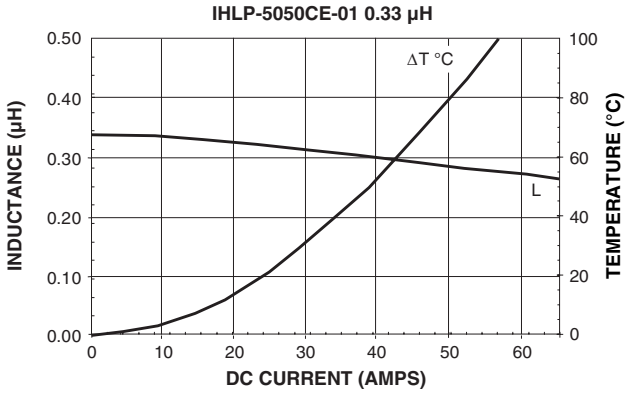
For technical questions, contact: magnetics@vishay.com

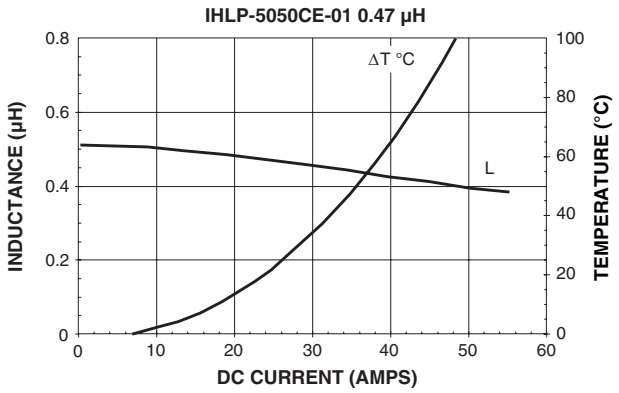
PERFORMANCE GRAPHS

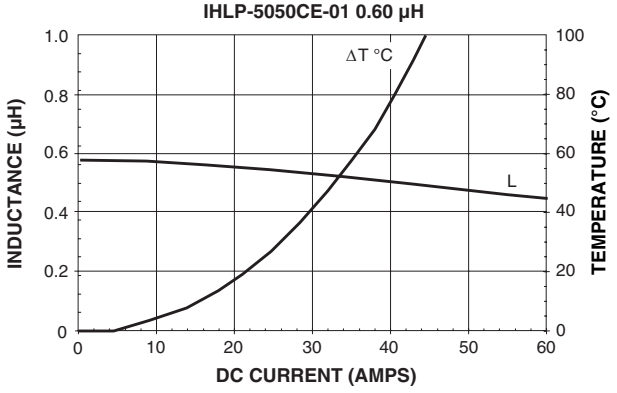






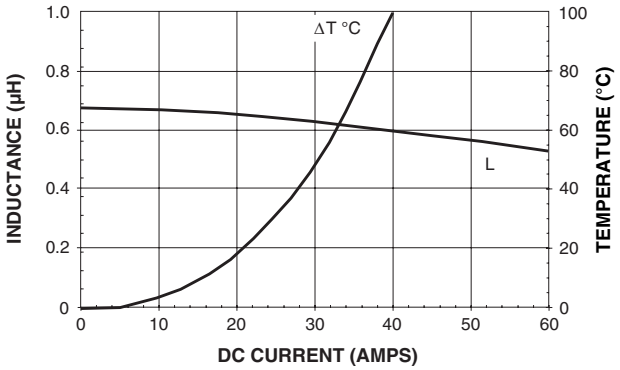




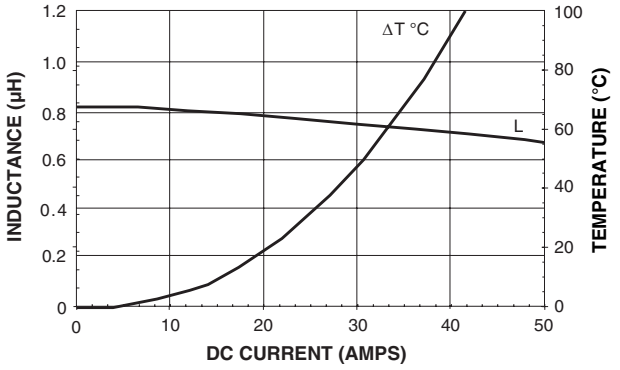


PERFORMANCE GRAPHS

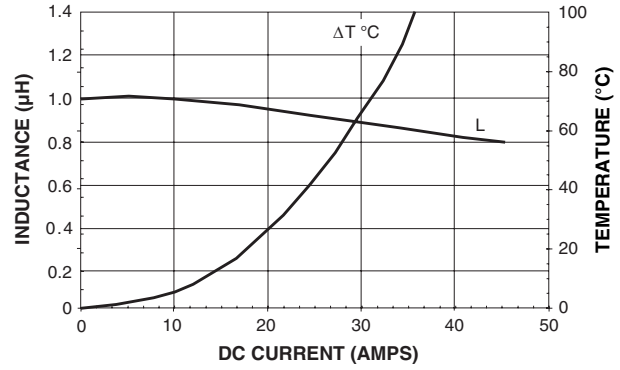
IHLP-5050CE-01 0.68 µH



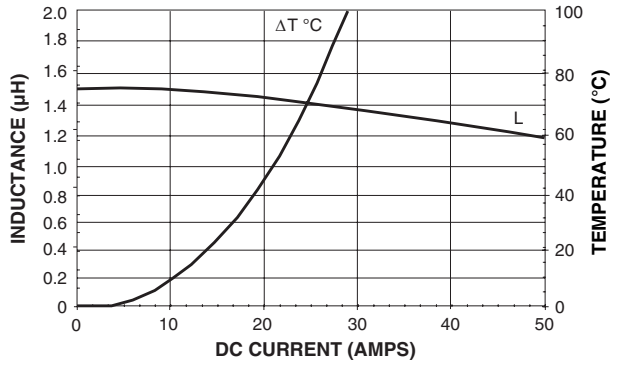
IHLP-5050CE-01 0.82 µH



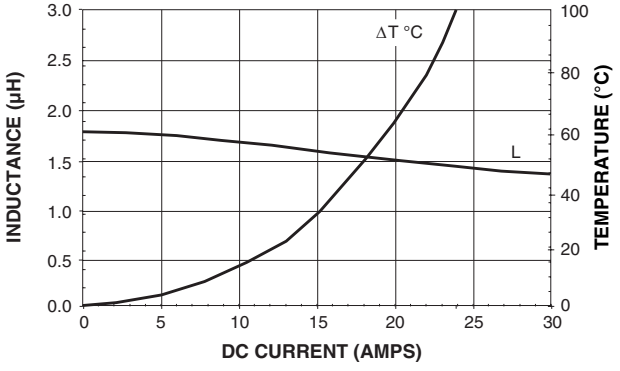
IHLP-5050CE-01 1.0 µH



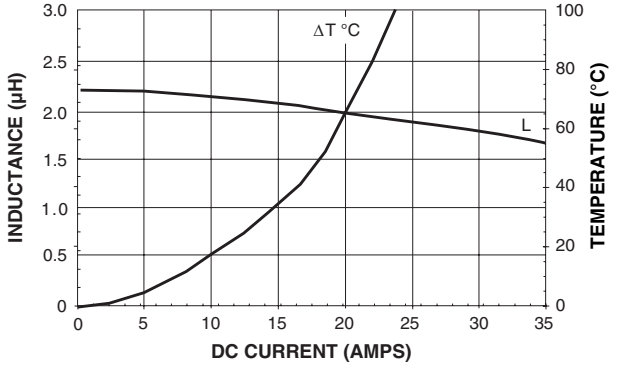
IHLP-5050CE-01 1.5 µH



IHLP-5050CE-01 1.8 µH

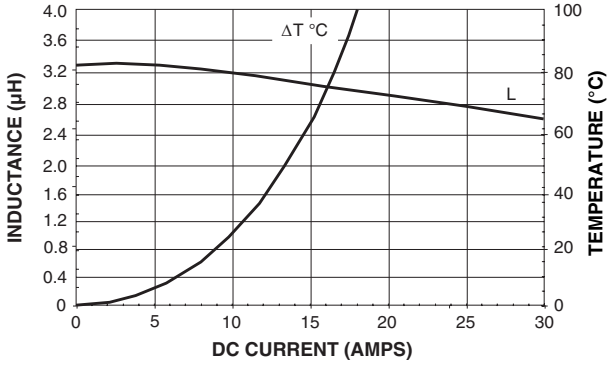


IHLP-5050CE-01 2.2 µH

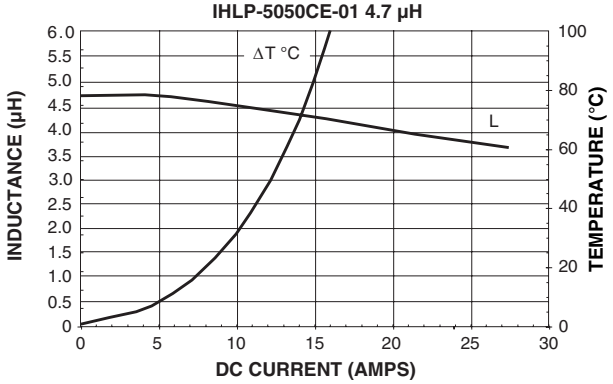


PERFORMANCE GRAPHS

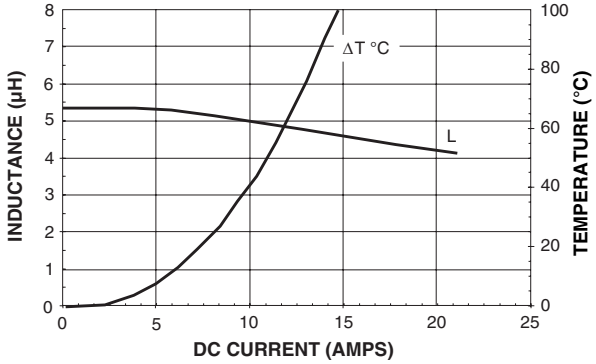
IHLP-5050CE-01 3.3 µH



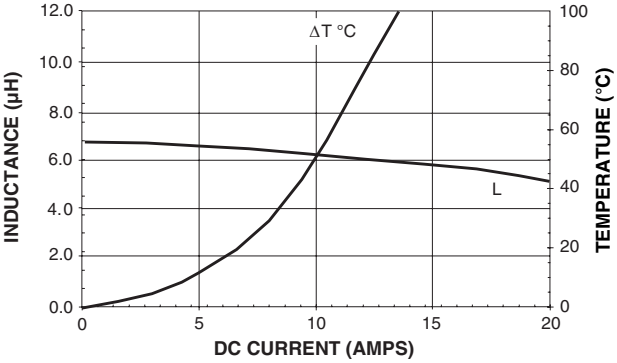
IHLP-5050CE-01 4.7 µH



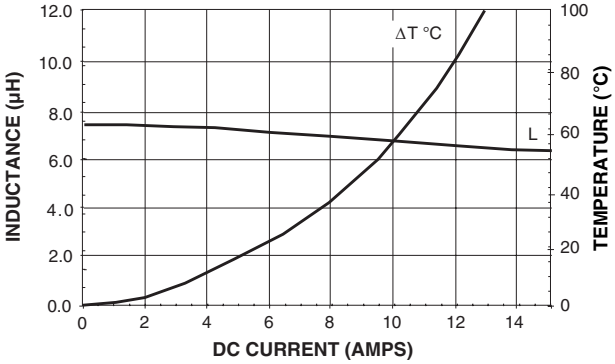
IHLP-5050CE-01 5.6 µH



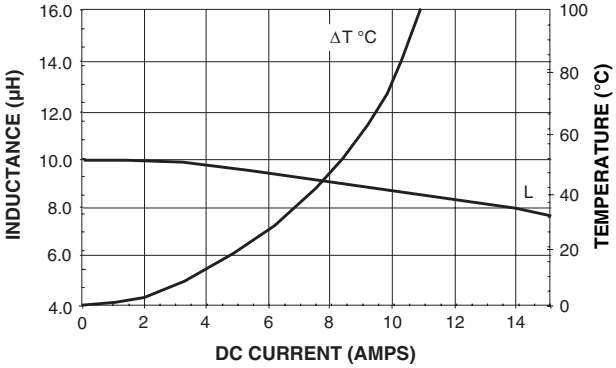
IHLP-5050CE-01 6.8 µH



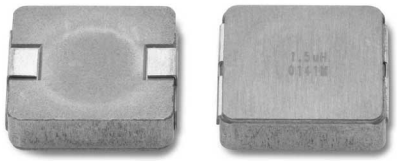
IHLP-5050CE-01 8.2 µH



IHLP-5050CE-01 10 µH



10 % DCR Tolerance, Low Profile, Power Inductor



Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Lowest height (3.5 mm) in this package footprint
- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

APPLICATIONS

- Tolerance DCR for current sense applications
- Improved current balance in phased power supplies
- Improved thermal management
- PDA/Notebook/Desktop/Server and Battery powered devices
- High current, Low profile POL converters
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Arrays (FPGA)

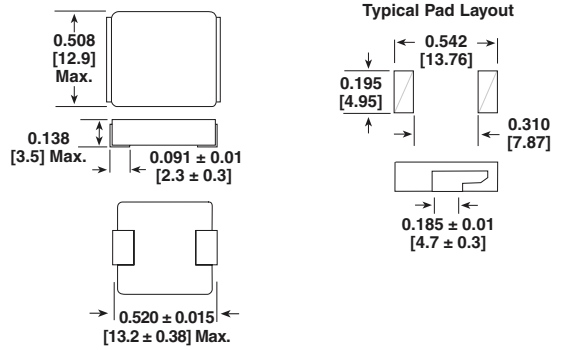
STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ ± 10 % at 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.60	1.85	29	51
0.68	2.34	28	49
1.0	3.21	24	40
1.5	4.97	19	35
2.2	7.20	16	29
3.3	10.69	12	27
4.7	14.27	10	24
5.6	18.19	9.5	19
10	30.86	7	14

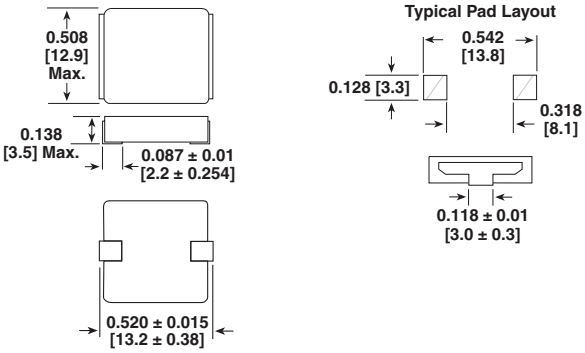
NOTES:

1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



The diagram above applies to values 0.6 µH and below.



The diagram above applies to values 0.68 µH and above.

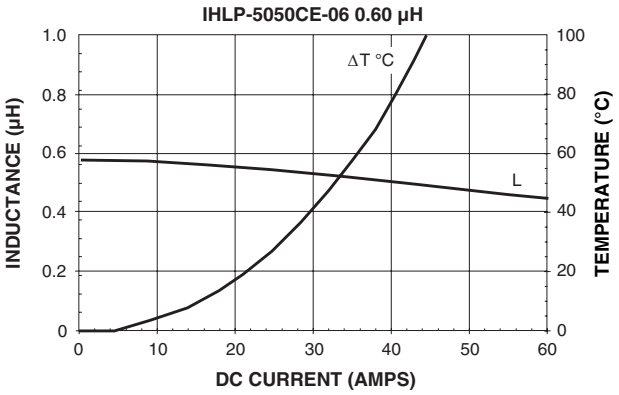
DESCRIPTION

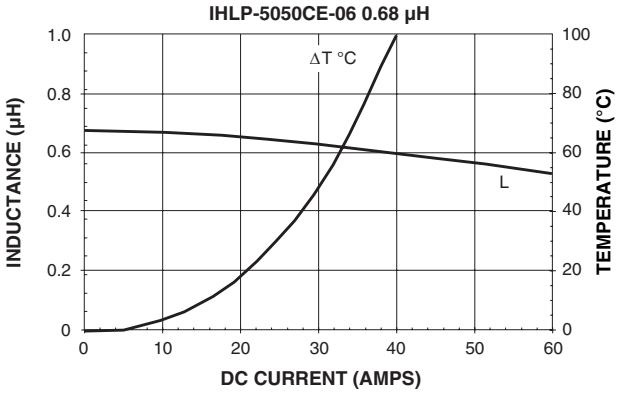
IHLP-5050CE-06	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

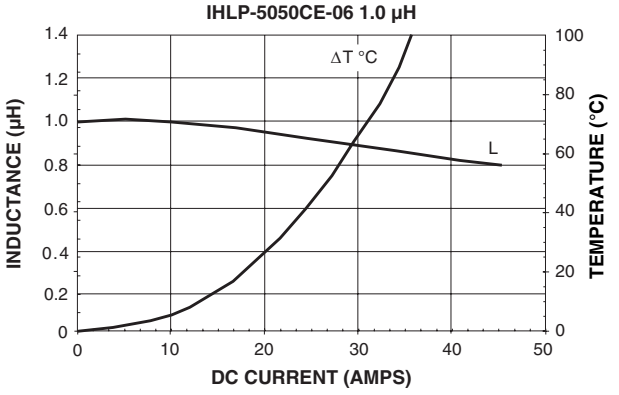
GLOBAL PART NUMBER

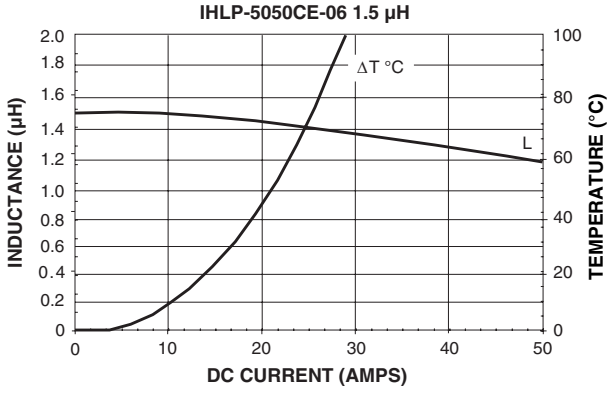
I	H	L	P	5	0	5	0	C	E	E	R	1	R	0	M	0	6
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

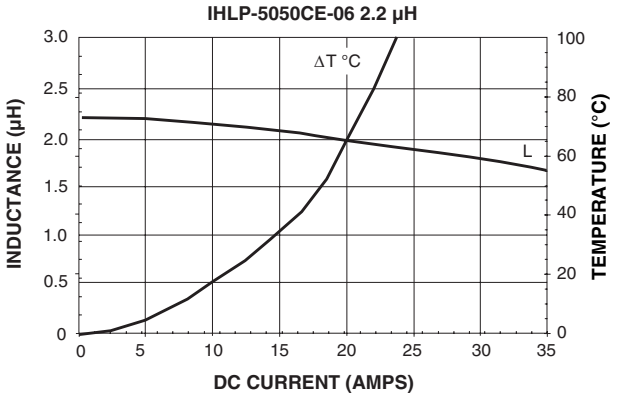
PERFORMANCE GRAPHS

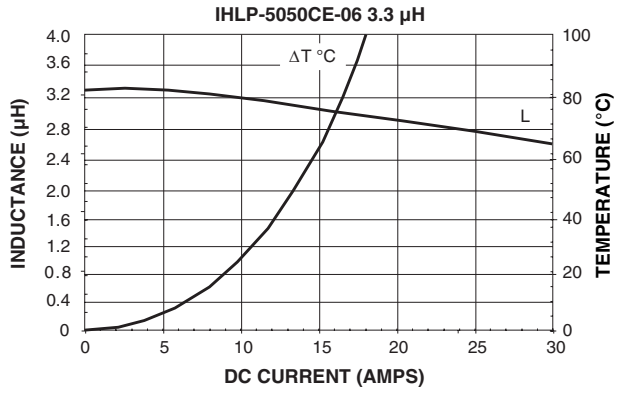




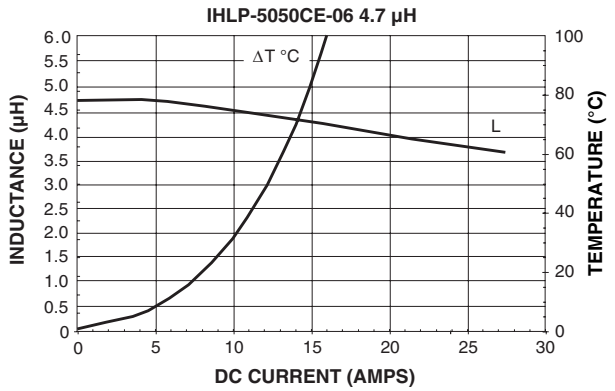


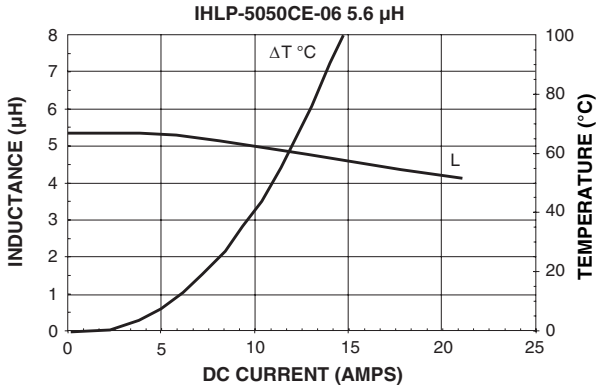


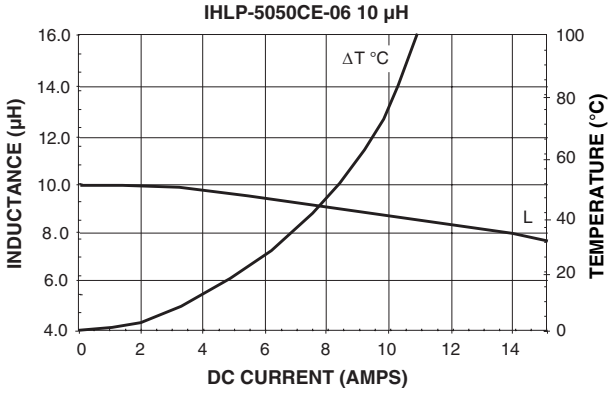




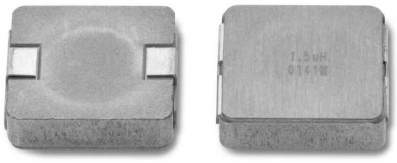
PERFORMANCE GRAPHS







5 % DCR Tolerance, Low Profile, Power Inductor



Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Lowest height (3.5 mm) in this package footprint
- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

APPLICATIONS

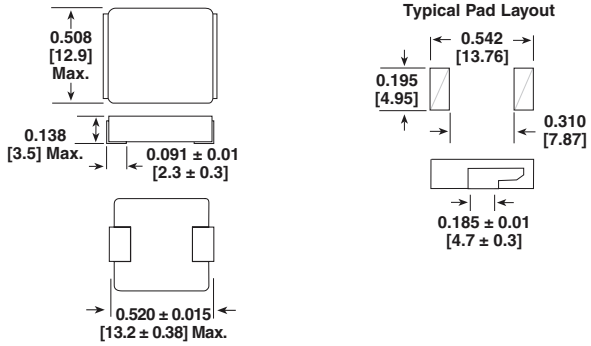
- Tolerance DCR for current sense applications
- Improved current balance in phased power supplies
- Improved thermal management
- PDA/Notebook/Desktop/Server and Battery powered devices
- High current, Low profile POL converters
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Arrays

STANDARD ELECTRICAL SPECIFICATIONS

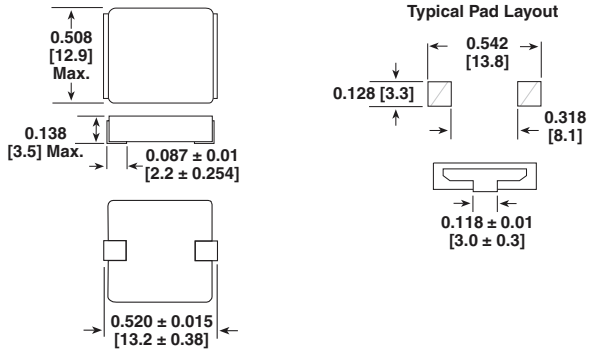
Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ ± 5 % at 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.60	1.85	29	51
0.68	2.34	28	49
1.0	3.21	24	40
1.5	4.97	19	35
2.2	7.20	16	29
3.3	10.69	12	27
4.7	14.27	10	24
5.6	18.19	9.5	19
10	30.86	7	14

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



The diagram above applies to values 0.6 µH and below.



The diagram above applies to values 0.68 µH and above.

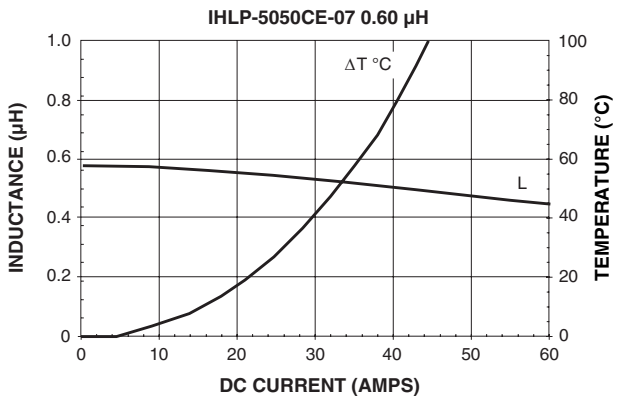
DESCRIPTION

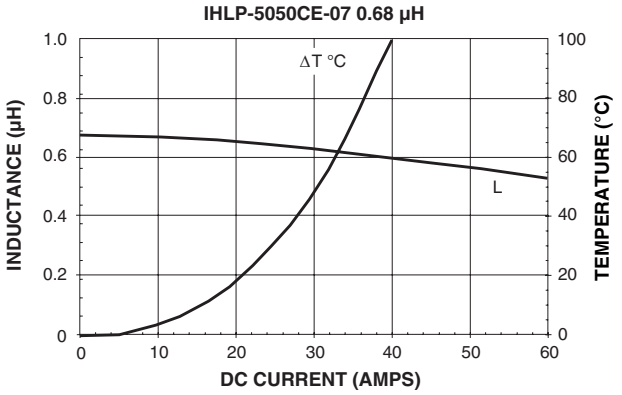
IHLP-5050CE-07	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

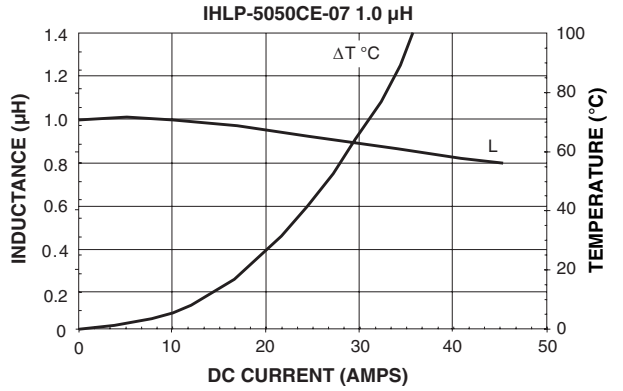
GLOBAL PART NUMBER

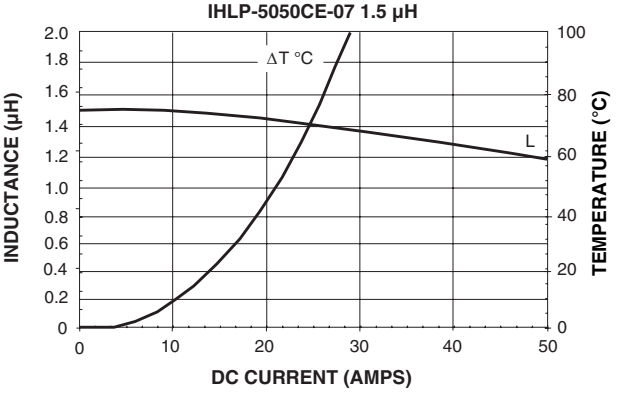
I	H	L	P	5	0	5	0	C	E	E	R	1	R	0	M	0	7
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

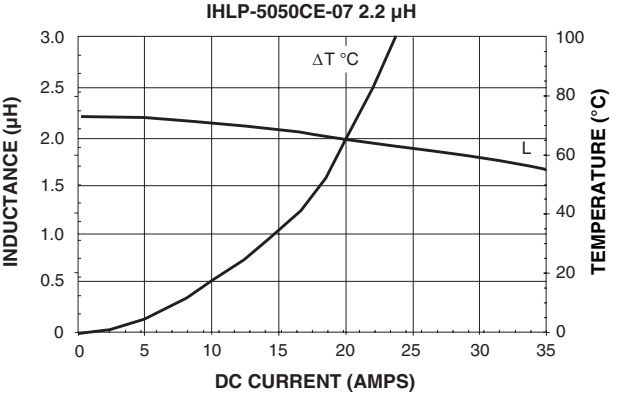
PERFORMANCE GRAPHS

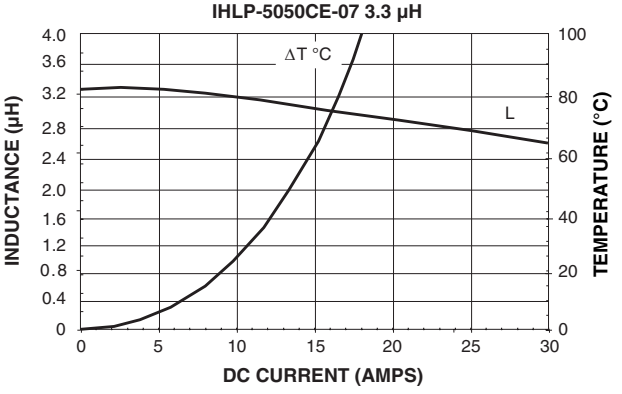




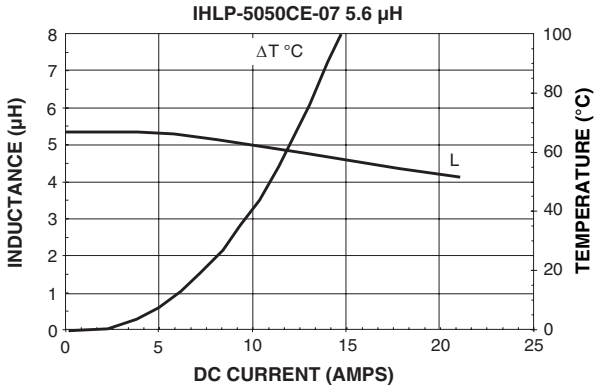


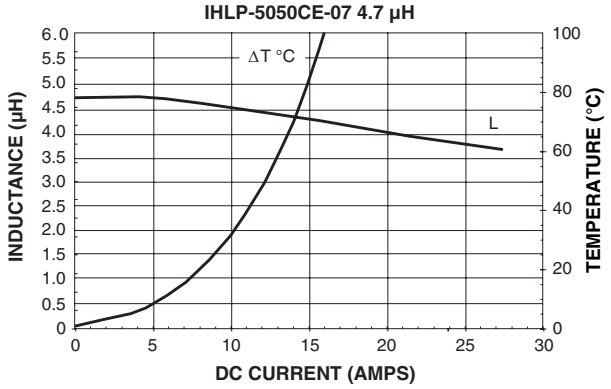


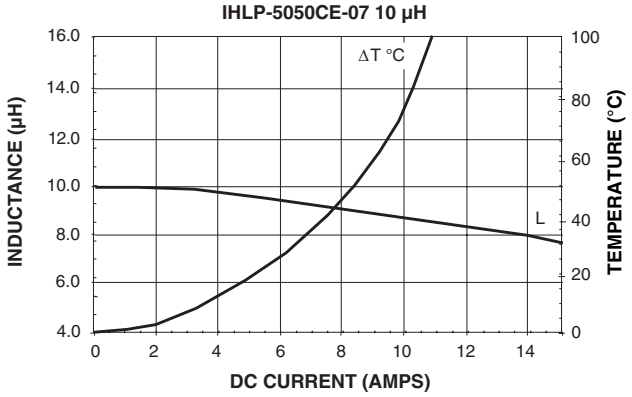




PERFORMANCE GRAPHS



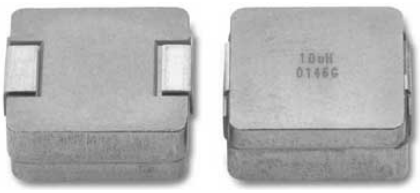




IHLP-5050EZ-01

Vishay Dale

Low Profile, High Current Inductor



Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

APPLICATIONS

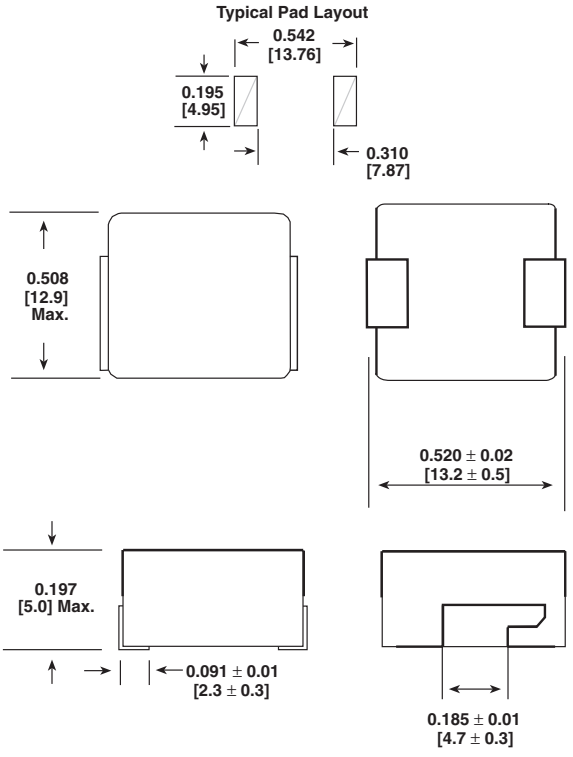
- Notebook/Desktop/Server applications
- High current POL converters
- Low profile, high current power supplies
- Battery powered devices
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Array (FPGA)

STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ TYPICAL 25 °C	DCR mΩ MAX 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.10	0.53	0.60	55	118
0.22	0.64	0.80	51	110
0.33	0.85	1.1	42	80
0.47	1.1	1.3	38	65
0.56	1.3	1.5	36	55
0.68	1.5	1.7	34	54
0.82	2.0	2.3	31	53
1.0	2.1	2.5	29	50
1.5	3.4	4.1	23	48
1.8	4.2	4.9	19	40
2.2	4.6	5.5	20	32
3.3	7.7	9.2	15	32
4.7	12.8	15.0	12	27
5.6	14.0	16.5	11.5	22
6.8	15.4	18.5	11	21
7.8	17.2	20.5	10	18
8.2	18.9	22.5	9.5	18
10	21.4	25.5	9.0	16

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

IHLP-5050EZ-01	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

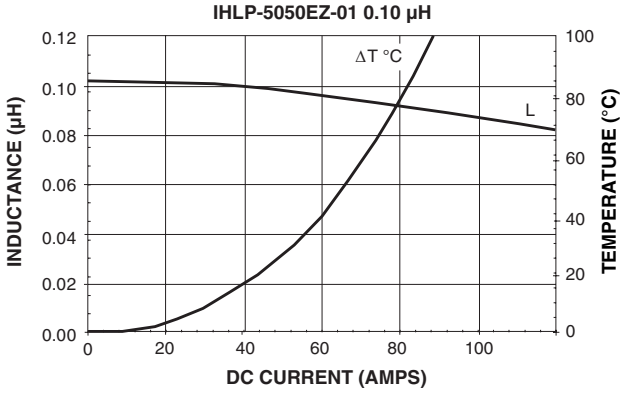
GLOBAL PART NUMBER

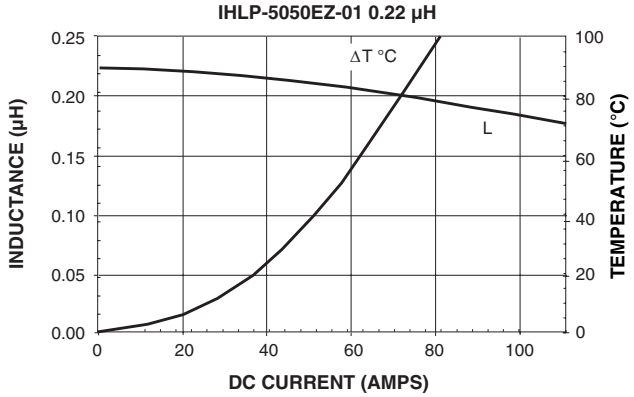
I	H	L	P	5	0	5	0	E	Z	E	R	1	R	0	M	0	1
PRODUCT FAMILY				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE		SERIES

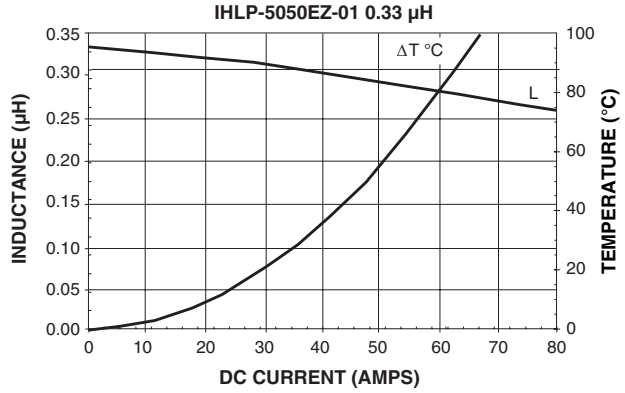
For technical questions, contact: magnetics@vishay.com

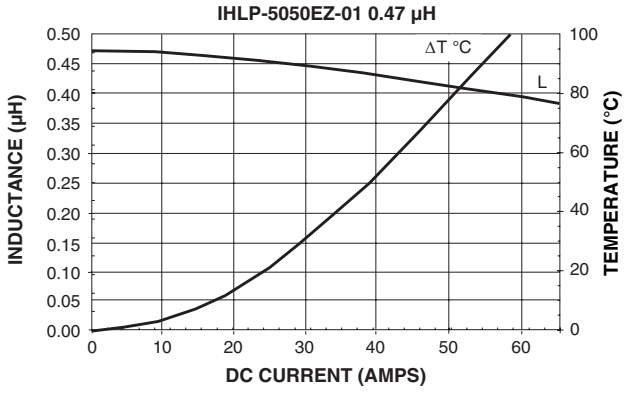
Document Number: 34126
Revision: 21-Feb-06

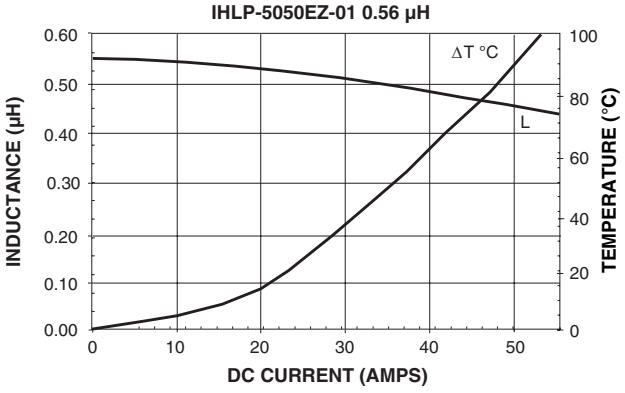
PERFORMANCE GRAPHS

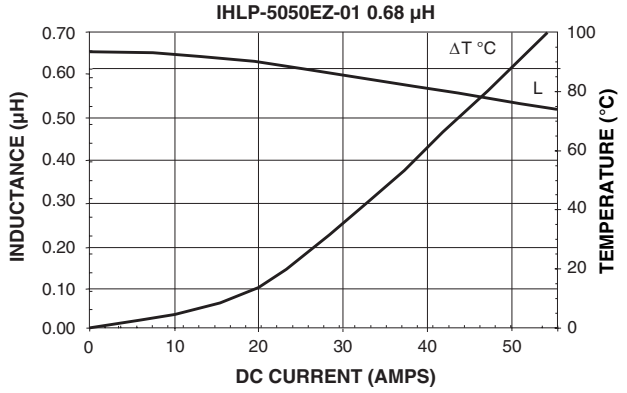






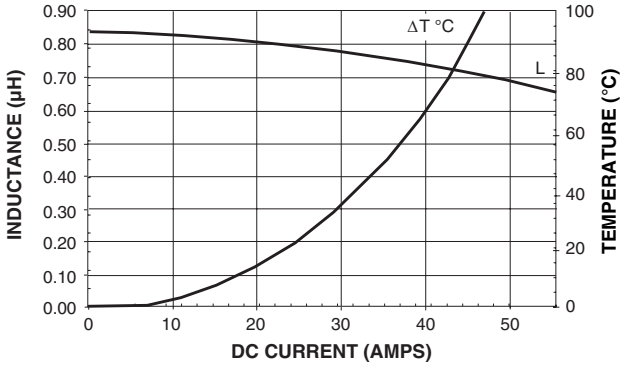




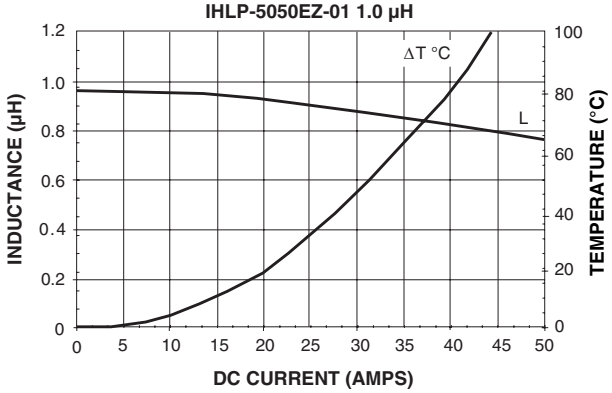


PERFORMANCE GRAPHS

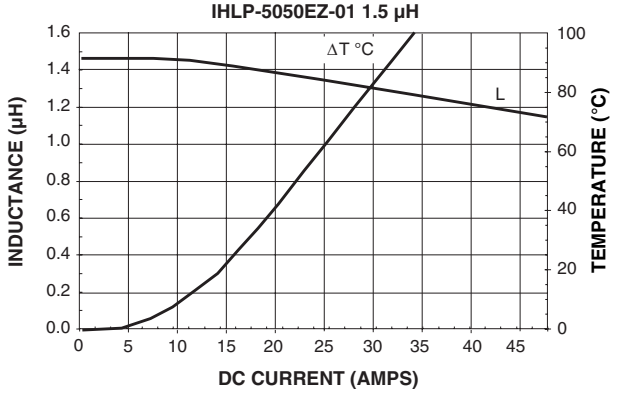
IHLP-5050EZ-01 0.82 µH



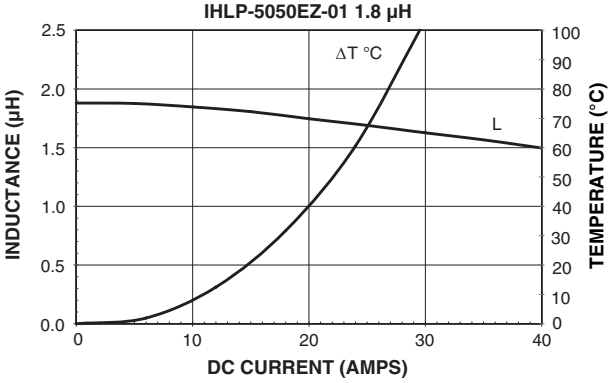
IHLP-5050EZ-01 1.0 µH



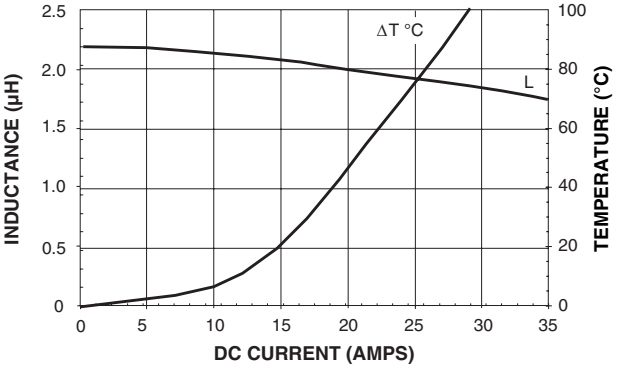
IHLP-5050EZ-01 1.5 µH



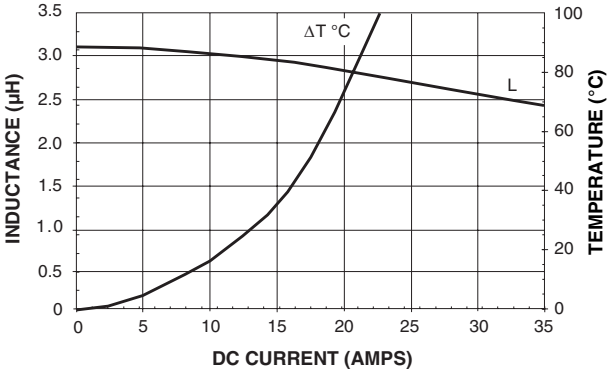
IHLP-5050EZ-01 1.8 µH



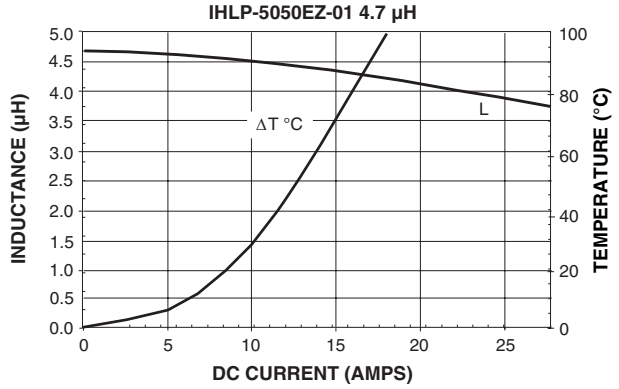
IHLP-5050EZ-01 2.2 µH

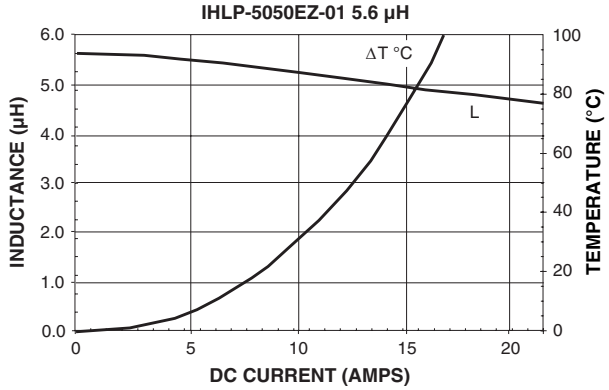


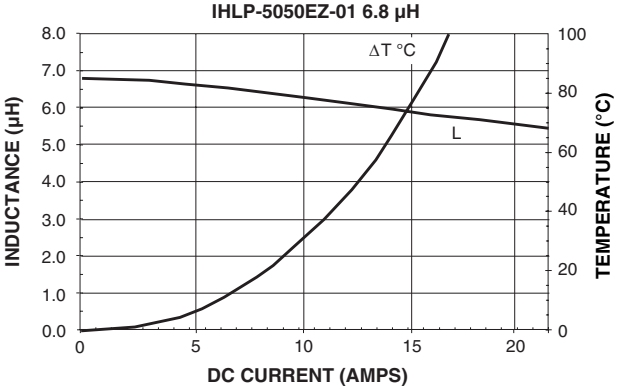
IHLP-5050EZ-01 3.3 µH

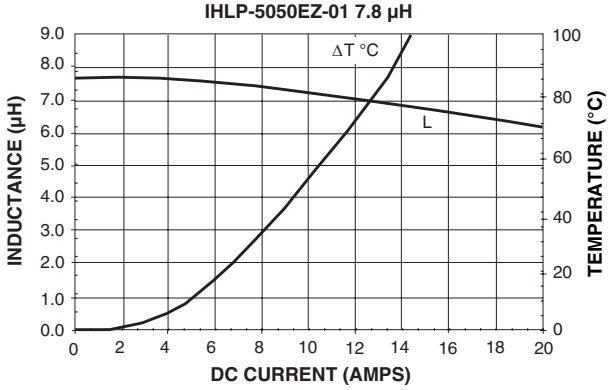


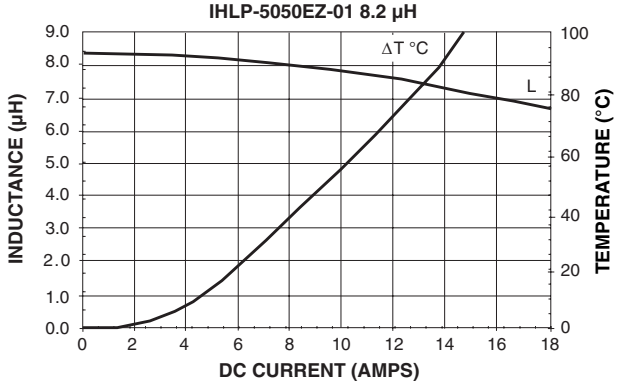
PERFORMANCE GRAPHS

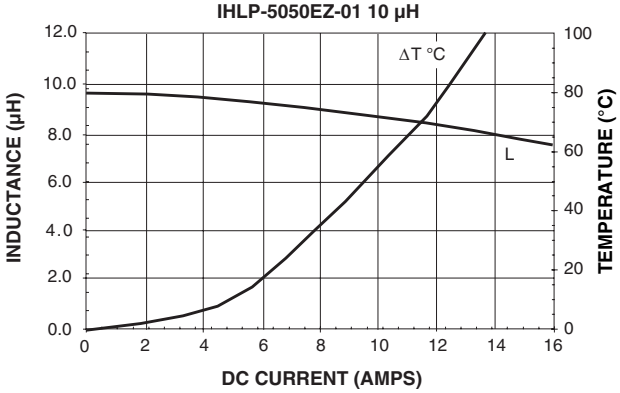












IHLP-5050FD-01

Vishay Dale

Low Profile, High Current Inductor

Manufactured under one or more of the following:
US Patents; 6,198,375/6,204,744/6,449,829/6,460,244.
Several foreign patents, and other patents pending.

FEATURES

- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/µH, in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

APPLICATIONS

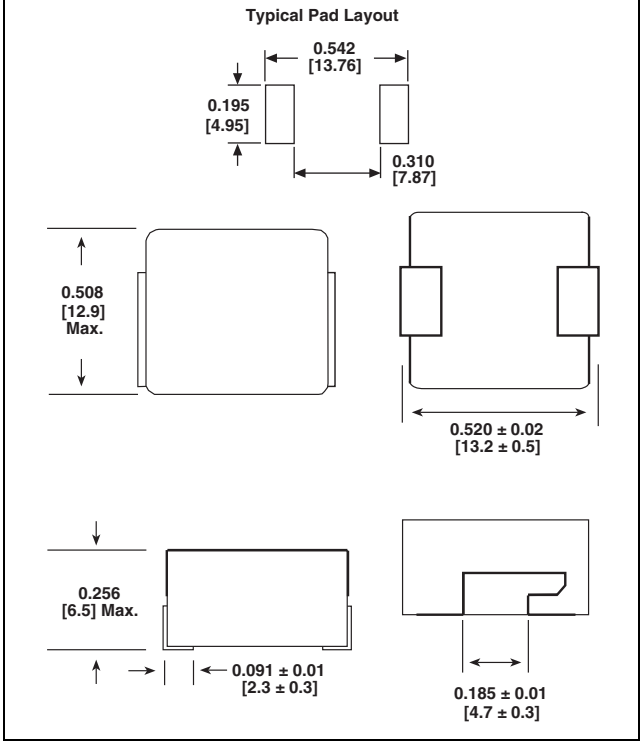
- Notebook/Desktop/Server applications
- High current POL converters
- Low profile, high current power supplies
- Battery powered devices
- DC/DC converters in distributed power systems
- DC/DC converter for Field Programmable Gate Array (FPGA)

STANDARD ELECTRICAL SPECIFICATIONS

Lo INDUCTANCE µH ± 20 % at 100 kHz, 0.25 V, 0 A	DCR mΩ TYPICAL 25 °C	DCR mΩ MAX 25 °C	HEAT RATING CURRENT DC AMPS[3] TYPICAL	SATURATION CURRENT DC AMPS[4] TYPICAL
0.10	0.47	0.50	60	120
0.15	0.53	0.60	55	118
0.22	0.63	0.70	53	112
0.30	0.70	0.80	48	72
0.33	0.83	0.90	46	65
0.40	0.90	1.0	44	64
0.47	1.0	1.2	41	63
0.56	1.2	1.4	37	62
0.68	1.4	1.6	35	60
0.82	1.6	1.9	33	50
1.0	1.7	2.0	32	49
1.2	2.1	2.5	30	48
1.5	2.5	3.0	27	45
1.8	2.8	3.2	24	41
2.2	3.5	4.2	22	40
3.3	5.7	6.8	18	35
4.7	9.3	11.2	13.5	30
5.6	9.3	10	13.5	26.5
6.8	13.1	14	11.5	16.5
8.2	14.5	15.5	10.5	16
10	15.8	16.8	10	15.5

NOTES:
1. All test data is referenced to 25 °C ambient
2. Operating Temperature Range - 55 °C to + 125 °C
3. DC current (A) that will cause an approximate ΔT of 40 °C
4. DC current (A) that will cause Lo to drop approximately 20 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

DIMENSIONS in inches [millimeters]



DESCRIPTION

IHLP-5050FD-01	1.0 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

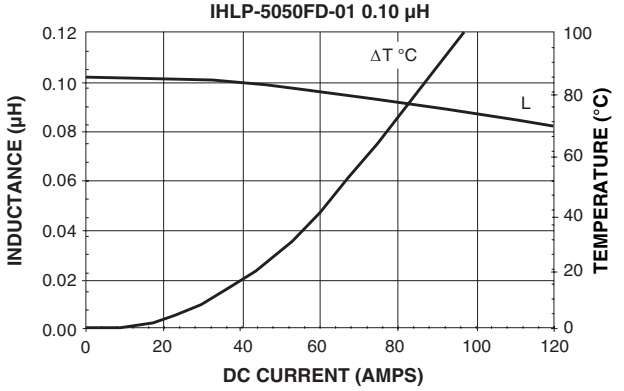
GLOBAL PART NUMBER

I	H	L	P	5	0	5	0	F	D	E	R	1	R	0	M	0	1
MODEL				SIZE						PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE	SERIES	

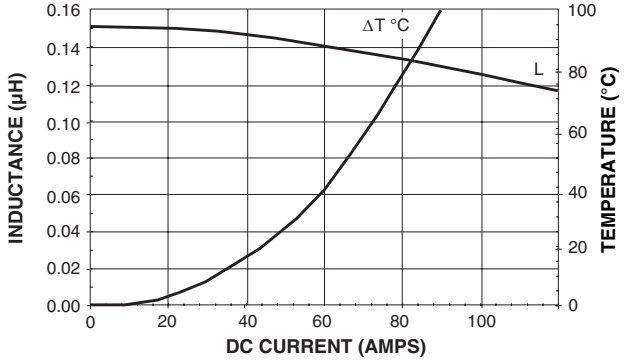
For technical questions, contact: magnetics@vishay.com

PERFORMANCE GRAPHS

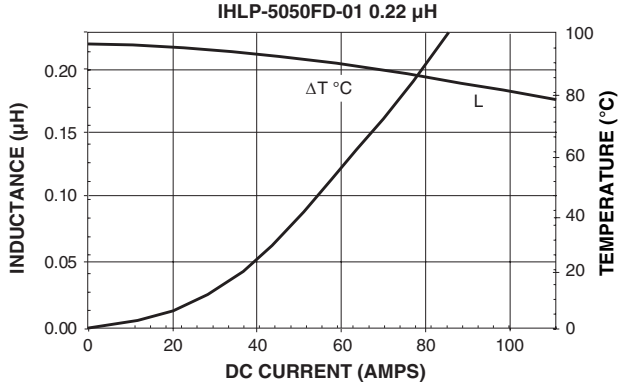
IHLP-5050FD-01 0.10 µH



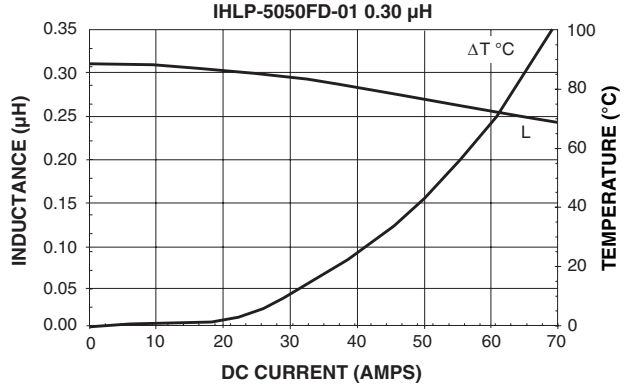
IHLP-5050FD-01 0.15 µH



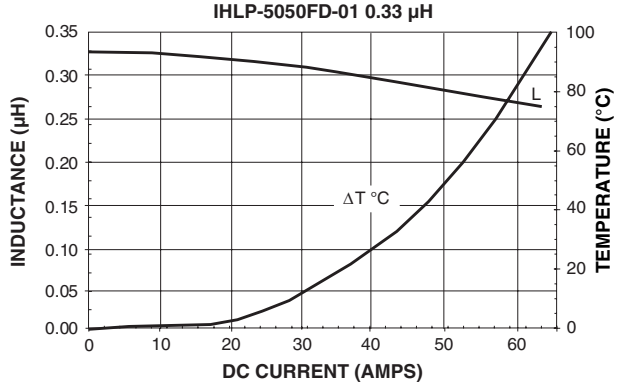
IHLP-5050FD-01 0.22 µH



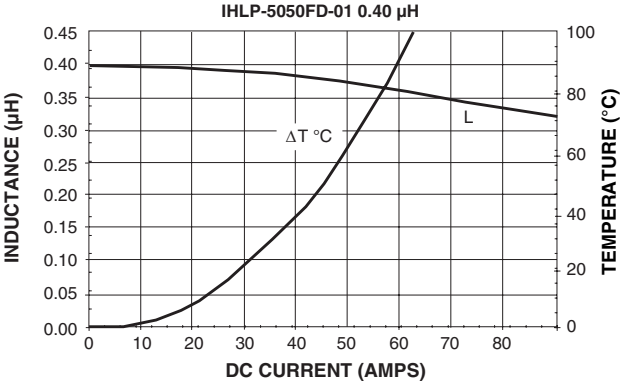
IHLP-5050FD-01 0.30 µH



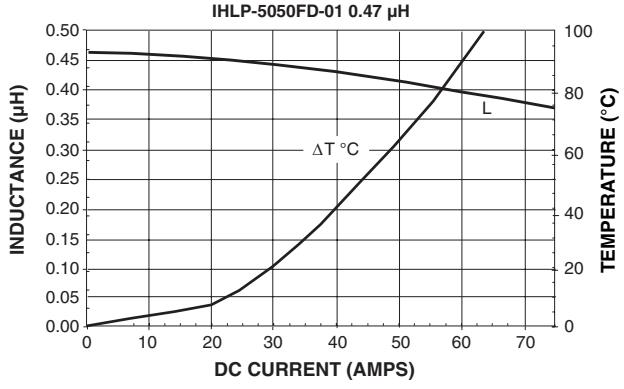
IHLP-5050FD-01 0.33 µH



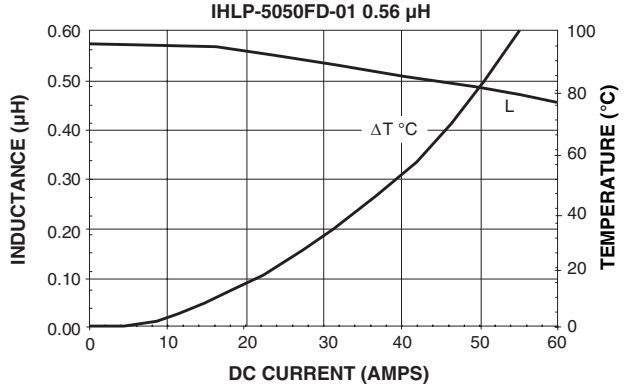
IHLP-5050FD-01 0.40 µH



IHLP-5050FD-01 0.47 µH

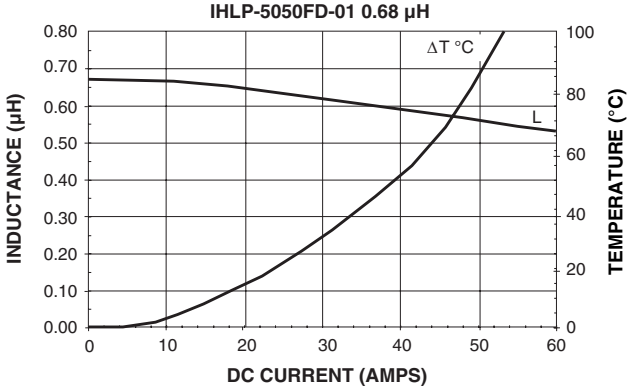


IHLP-5050FD-01 0.56 µH

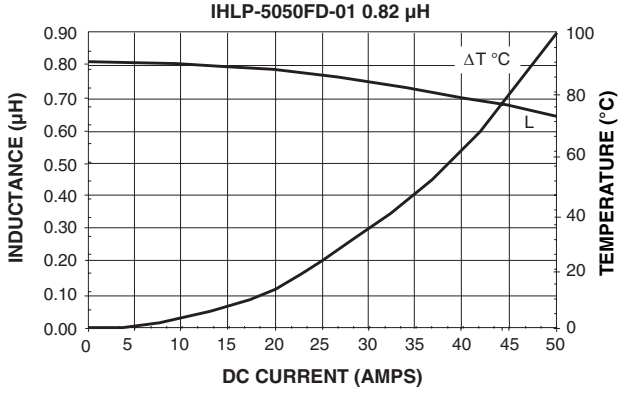


PERFORMANCE GRAPHS

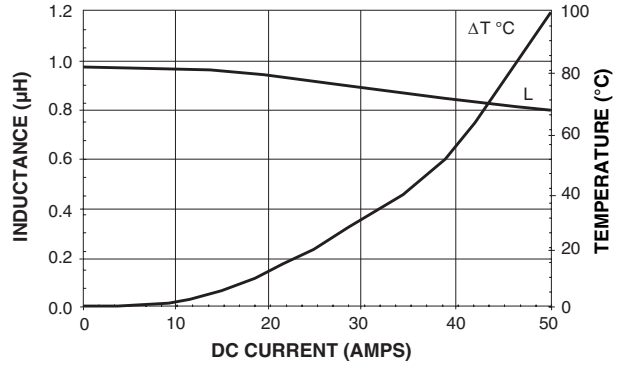
IHLP-5050FD-01 0.68 µH



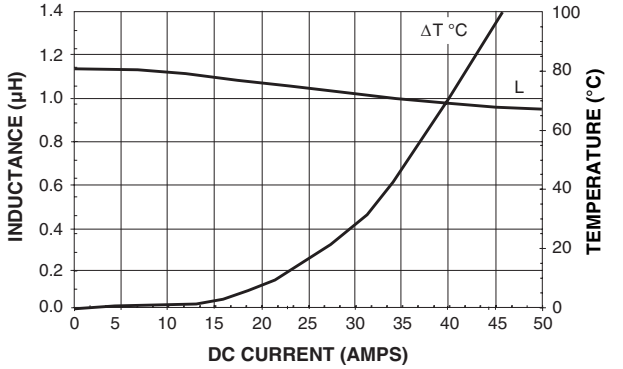
IHLP-5050FD-01 0.82 µH



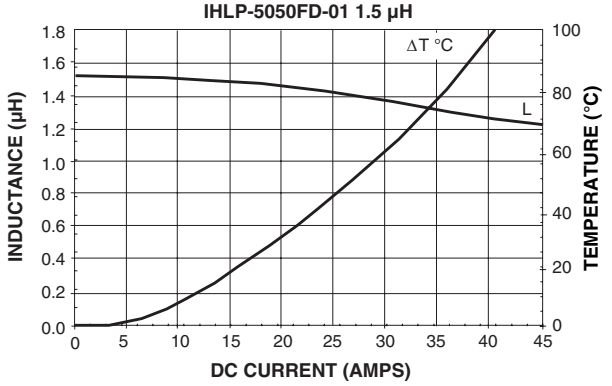
IHLP-5050FD-01 1.0 µH



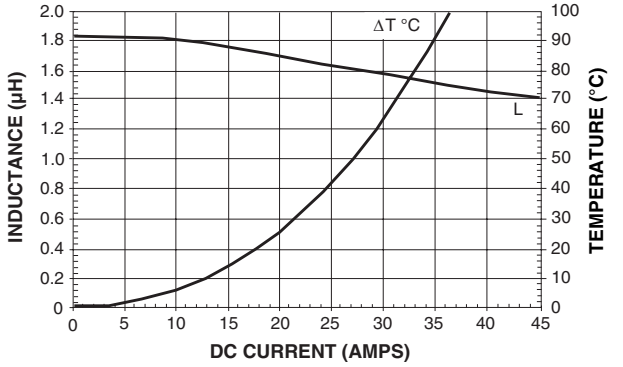
IHLP-5050FD-01 1.2 µH



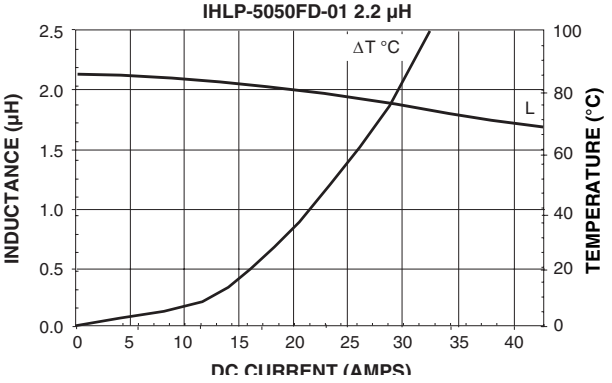
IHLP-5050FD-01 1.5 µH



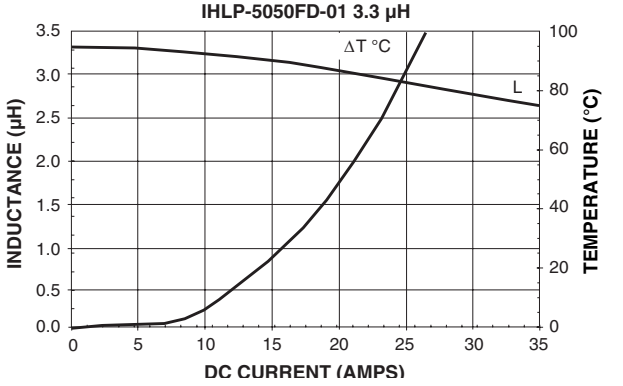
IHLP-5050FD-01 1.8 µH



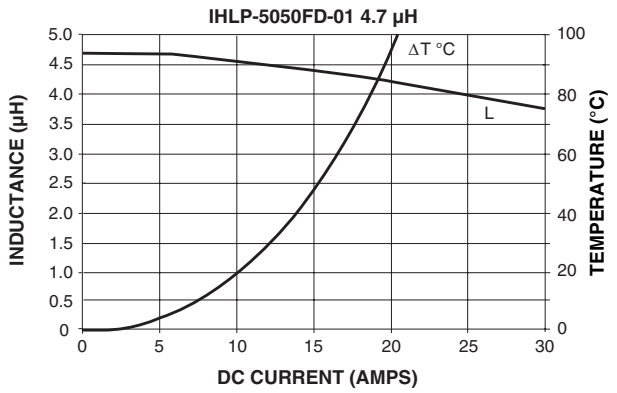
IHLP-5050FD-01 2.2 µH

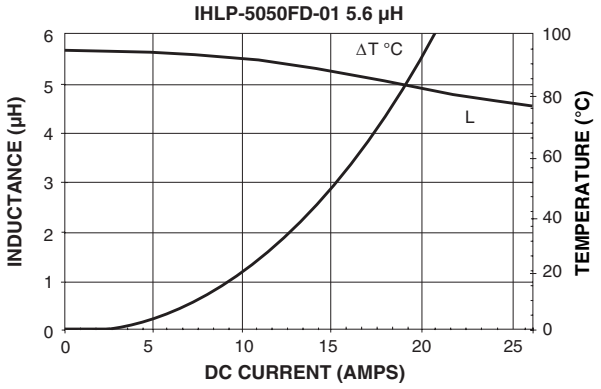


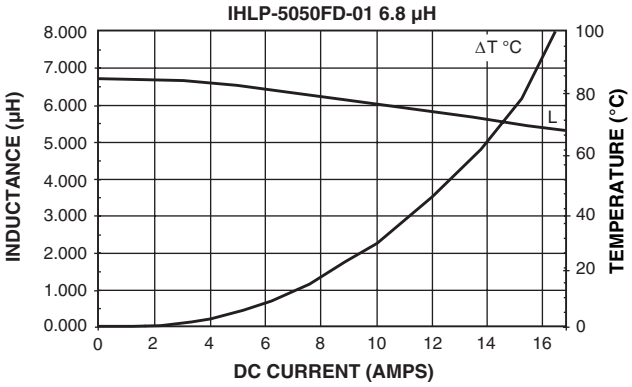
IHLP-5050FD-01 3.3 µH

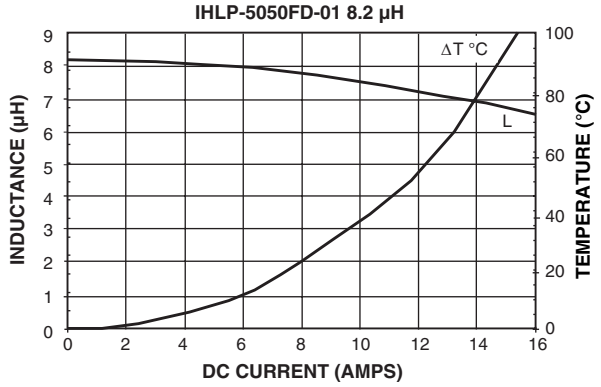


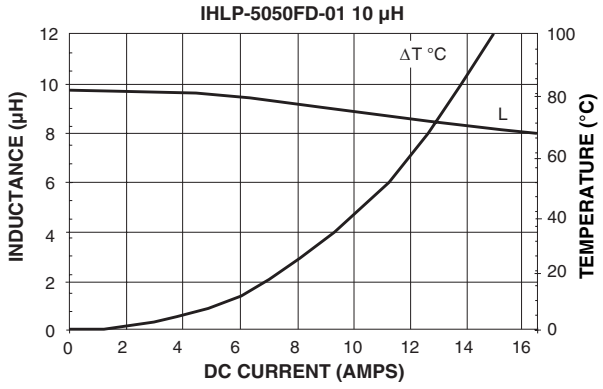
PERFORMANCE GRAPHS











IHSM-3825

Vishay Dale

High Current, Surface Mount Inductor

FEATURES

- Flame retardant encapsulant (UL 94V-0)
- Completely encapsulated winding provides superior environmental protection and moisture resistance
- High current unit in surface mount package printed with model, inductance value and date code
- Compatible with infrared or conventional reflow soldering methods
- Pick and place compatible

RoHS COMPLIANT

APPLICATIONS

Excellent power line noise filters, filters for switching regulated power supplies, DC/DC converters, SCR and Triac controls and RFI suppression.

ELECTRICAL SPECIFICATIONS

Inductance: Measured at 1 volt with no DC current
Inductance Tolerance: ± 15 %
Incremental Current: The typical current at which the inductance will be decreased by 5 % from its initial zero DC value
Operating Temperature: - 55 °C to + 125 °C (no load); - 55 °C to + 85 °C (at full rated current)

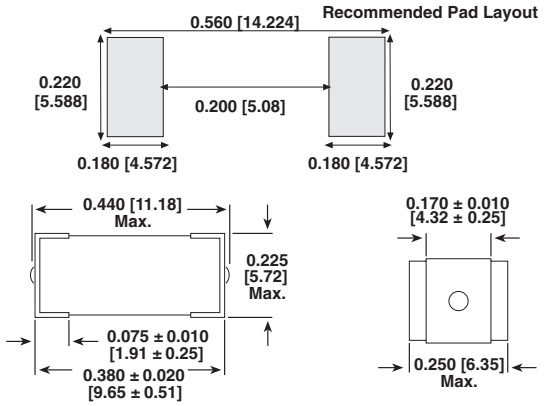
MATERIAL SPECIFICATIONS

Core: High resistivity ferrite core
Encapsulant: Epoxy
Terminals: 100 % Sn over Ni

STANDARD ELECTRICAL SPECIFICATIONS

IND. at 1 kHz (µH)	DCR MAX. (Ohms)	RATED CURRENT (Max. Amps)	INCREMENTAL CURRENT (Amps Approx.)
1.0	0.015	5.11	4.41
1.2	0.016	4.93	4.11
1.5	0.017	4.63	3.66
1.8	0.022	4.27	3.22
2.2	0.031	3.61	2.62
2.7	0.038	3.18	2.40
3.3	0.045	2.94	2.13
3.9	0.062	2.57	2.05
4.7	0.083	2.17	1.93
5.6	0.091	2.08	1.79
6.8	0.101	1.94	1.62
8.2	0.118	1.83	1.50
10.0	0.126	1.74	1.36
12.0	0.170	1.50	1.26
15.0	0.228	1.29	1.11
18.0	0.306	1.13	1.05
22.0	0.336	1.05	0.96
27.0	0.389	0.98	0.86
33.0	0.440	0.92	0.75
39.0	0.490	0.86	0.72
47.0	0.646	0.74	0.68
56.0	0.845	0.65	0.64
68.0	1.040	0.61	0.58
82.0	1.240	0.56	0.51
100.0	1.440	0.48	0.42
120.0	2.180	0.45	0.40
150.0	2.900	0.38	0.37
180.0	3.280	0.36	0.33
220.0	3.650	0.34	0.28
270.0	4.400	0.29	0.26
330.0	5.070	0.27	0.23
390.0	5.900	0.23	0.20
470.0	7.670	0.22	0.19
560.0	8.850	0.21	0.17
680.0	10.20	0.18	0.15
820.0	11.58	0.17	0.14
1000.0	12.97	0.16	0.13

DIMENSIONS in inches [millimeters]



PART MARKING

- Model
- Inductance value
- Date code

DESCRIPTION

IHSM-3825	3.9 µH	± 15 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

SAP PART NUMBERING GUIDELINES (INTERNAL)

I	H	S	M	3	8	2	5	E	R	3	R	9	L
PRODUCT FAMILY				SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

For technical questions, contact: magnetics@vishay.com

High Current, Surface Mount Inductor

FEATURES

- Flame retardant encapsulant (UL 94V-0)
- Completely encapsulated winding provides superior environmental protection and moisture resistance
- High current unit in surface mount package printed with model, inductance value and date code
- Compatible with infrared or conventional reflow soldering methods
- Pick and place compatible
- Tape and reel packaging for automatic handling

RoHS COMPLIANT

APPLICATIONS

Excellent power line noise filters, filters for switching regulated power supplies, DC/DC converters, SCR and Triac controls and RFI suppression.

ELECTRICAL SPECIFICATIONS

Inductance: Measured at 1 volt with no DC current
Inductance Tolerance: ± 15 %
Incremental Current: The typical current at which the inductance will be decreased by 5 % from its initial zero DC value
Operating Temperature: - 55 °C to + 125 °C (no load); - 55 °C to + 85 °C (at full rated current)

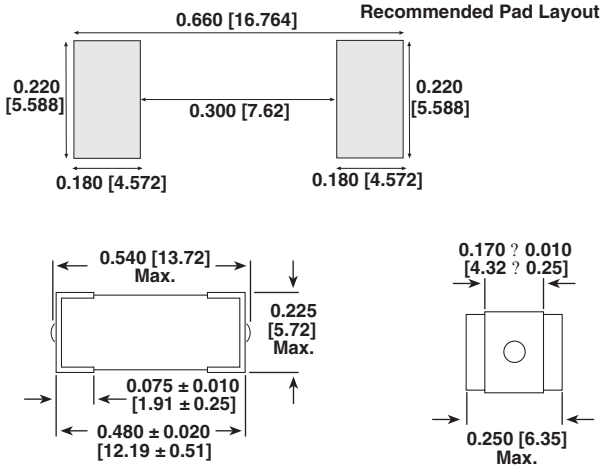
MATERIAL SPECIFICATIONS

Core: High resistivity ferrite core
Encapsulant: Epoxy
Terminals: 100 % Sn over Ni

STANDARD ELECTRICAL SPECIFICATIONS

IND. at 1 kHz (µH)	DCR MAX. (Ohms)	RATED CURRENT (Max. Amps)	INCREMENTAL CURRENT (Amps Approx.)
1.0	0.013	8.6	4.1
1.2	0.018	7.6	3.8
1.5	0.02	6.9	3.5
1.8	0.021	6.5	3.2
2.2	0.029	5.7	2.9
2.7	0.034	5.1	2.6
3.3	0.038	4.6	2.4
3.9	0.042	4.3	2.2
4.7	0.047	4.0	2.0
5.6	0.051	3.8	1.9
6.8	0.058	3.5	1.7
8.2	0.063	3.3	1.5
10.0	0.071	3.1	1.4
12.0	0.079	2.7	1.3
15.0	0.089	2.3	1.2
18.0	0.119	1.9	1.1
22.0	0.152	1.7	1.02
27.0	0.179	1.6	0.95
33.0	0.222	1.3	0.88
39.0	0.315	1.19	0.8
47.0	0.362	1.07	0.74
56.0	0.397	0.95	0.68
68.0	0.446	0.87	0.62
82.0	0.604	0.8	0.56
100.0	0.672	0.73	0.5
120.0	0.735	0.66	0.45
150.0	0.998	0.58	0.4
180.0	1.37	0.5	0.35
220.0	1.58	0.46	0.32
270.0	1.77	0.41	0.3
330.0	2.51	0.37	0.28
390.0	2.73	0.34	0.26
470.0	3.36	0.32	0.24
560.0	3.75	0.3	0.23
680.0	4.31	0.28	0.2
820.0	6.04	0.26	0.17
1000.0	6.9	0.24	0.15

DIMENSIONS in inches [millimeters]



PART MARKING

- Model
- Inductance value
- Date code

DESCRIPTION

IHSM-4825	3.9 µH	± 15 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

SAP PART NUMBERING GUIDELINES (INTERNAL)

I	H	S	M	4	8	2	5	E	R	3	R	9	L
PRODUCT FAMILY				SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

IHSM-5832

Vishay Dale

High Current, Surface Mount Inductor

FEATURES

- Flame retardant encapsulant (UL 94V-0)
- Completely encapsulated winding provides superior environmental protection and moisture resistance
- High current unit in surface mount package printed with model, inductance value and date code
- Compatible with infrared or conventional reflow soldering methods
- Pick and place compatible
- Tape and reel packaging for automatic handling

RoHS COMPLIANT

APPLICATIONS

Excellent power line noise filters, filters for switching regulated power supplies, DC/DC converters, SCR and Triac controls and RFI suppression.

ELECTRICAL SPECIFICATIONS

Inductance: Measured at 1 volt with no DC current
Inductance Tolerance: ± 15 %
Incremental Current: The typical current at which the inductance will be decreased by 5 % from its initial zero DC value
Operating Temperature: - 55 °C to + 125 °C (no load); - 55 °C to + 85 °C (at full rated current)

MATERIAL SPECIFICATIONS

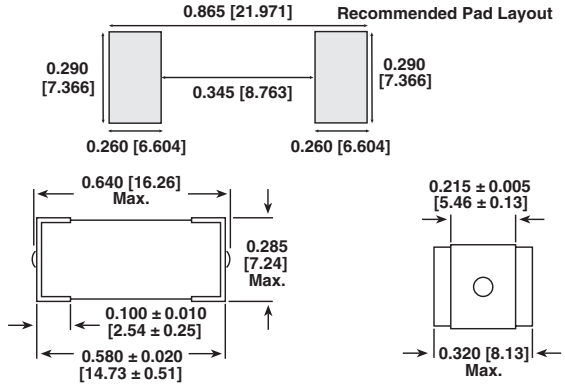
Core: High resistivity ferrite core
Encapsulant: Epoxy
Terminals: 100 % Sn over Ni

STANDARD ELECTRICAL SPECIFICATIONS

IND. at 1 kHz (µH)	DCR MAX. (Ohms)	RATED CURRENT (Max. Amps)	INCREMENTAL CURRENT (Amps Approx.)
1.0	0.010	9.0	6.2
1.2	0.011	8.8	5.6
1.5	0.012	8.7	5.0
1.8	0.013	8.6	4.4
2.2	0.015	8.5	4.0
2.7	0.017	8.4	3.7
3.3	0.020	8.3	3.4
3.9	0.021	7.9	3.1
4.7	0.023	7.4	2.8
5.6	0.024	7.0	2.6
6.8	0.038	6.1	2.3
8.2	0.047	5.1	2.0
10.0	0.053	4.3	1.8
12.0	0.068	3.9	1.7
15.0	0.078	3.5	1.6
18.0	0.083	3.2	1.5
22.0	0.12	2.8	1.3
27.0	0.14	2.3	1.2
33.0	0.17	1.9	1.1
39.0	0.19	1.8	1.03
47.0	0.215	1.77	0.93
56.0	0.236	1.71	0.90
68.0	0.305	1.43	0.82
82.0	0.357	1.14	0.75
100.0	0.452	0.95	0.68
120.0	0.530	0.88	0.63
150.0	0.609	0.82	0.58
180.0	0.809	0.75	0.54
220.0	1.10	0.69	0.48
270.0	1.27	0.64	0.43
330.0	1.42	0.59	0.38
390.0	1.89	0.54	0.34
470.0	2.21	0.49	0.31
560.0	2.42	0.46	0.28
680.0	2.73	0.43	0.25
820.0	3.78	0.40	0.23
1000.0	4.20	0.37	0.21
1200.0	5.51	0.32	0.19
1500.0	7.35	0.29	0.17
1800.0	8.66	0.25	0.16
2200.0	9.71	0.22	0.14
2700.0	11.29	0.20	0.13
3300.0	15.60	0.18	0.12
3900.0	20.74	0.16	0.11
4700.0	23.10	0.14	0.10

* Contact factory for values above 47 000 µH.

DIMENSIONS in inches [millimeters]



PART MARKING

- Model
- Inductance value
- Date code

DESCRIPTION

IHSM-5832	3.9 µH	± 15 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

SAP PART NUMBERING GUIDELINES (INTERNAL)

I	H	S	M	5	8	3	2	E	R	3	R	9	L
PRODUCT FAMILY				SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

High Current, Surface Mount Inductor

FEATURES

- Flame retardant encapsulant (UL 94V-0)
- Completely encapsulated winding provides superior environmental protection and moisture resistance
- High current unit in surface mount package printed with model, inductance value and date code
- Compatible with infrared or conventional reflow soldering methods
- Pick and place compatible
- Tape and reel packaging for automatic handling

RoHS COMPLIANT

APPLICATIONS

Excellent power line noise filters, filters for switching regulated power supplies, DC/DC converters, SCR and Triac controls and RFI suppression.

ELECTRICAL SPECIFICATIONS

Inductance: Measured at 1 volt with no DC current
Inductance Tolerance: ± 15 %
Incremental Current: The typical current at which the inductance will be decreased by 5 % from its initial zero DC value
Operating Temperature: - 55 °C to + 125 °C (no load); - 55 °C to + 85 °C (at full rated current)

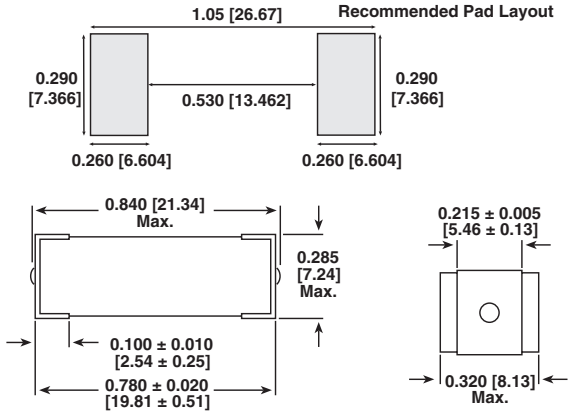
MATERIAL SPECIFICATIONS

Core: High resistivity ferrite core
Encapsulant: Epoxy
Terminals: 100 % Sn over Ni

STANDARD ELECTRICAL SPECIFICATIONS

IND. at 1 kHz (µH)	DCR MAX. (Ohms)	RATED CURRENT (Max. Amps)	INCREMENTAL CURRENT (Amps Approx.)
1.0	0.011	9.0	5.3
1.2	0.012	8.8	4.8
1.5	0.012	8.6	4.4
1.8	0.013	8.5	4.0
2.2	0.014	8.4	3.6
2.7	0.016	8.2	3.2
3.3	0.017	8.1	2.8
3.9	0.02	7.3	2.6
4.7	0.023	6.7	2.4
5.6	0.025	6.0	2.3
6.8	0.028	5.6	2.1
8.2	0.032	5.3	1.9
10.0	0.036	5.0	1.7
12.0	0.04	4.8	1.5
15.0	0.043	4.5	1.4
18.0	0.047	4.2	1.3
22.0	0.054	3.8	1.2
27.0	0.074	3.4	1.1
33.0	0.084	3.0	0.99
39.0	0.095	2.8	0.93
47.0	0.12	2.6	0.87
56.0	0.14	2.4	0.82
68.0	0.16	2.1	0.76
82.0	0.184	1.9	0.72
100.0	0.226	1.7	0.68
120.0	0.305	1.5	0.61
150.0	0.362	1.4	0.54
180.0	0.399	1.3	0.48
220.0	0.536	1.1	0.44
270.0	0.599	0.95	0.4
330.0	0.714	0.86	0.36
390.0	0.819	0.8	0.33
470.0	1.1	0.74	0.31
560.0	1.2	0.68	0.29
680.0	1.58	0.63	0.26
820.0	2.08	0.573	0.23
1000.0	2.42	0.51	0.21
1200.0	2.68	0.46	0.19
1500.0	3.15	0.4	0.17
1800.0	4.2	0.34	0.15
2200.0	4.62	0.31	0.135
2700.0	6.3	0.29	0.12
3300.0	7.09	0.27	0.11
3900.0	9.14	0.25	0.1
4700.0	10.6	0.23	0.09
5600.0	11.8	0.21	0.08
6800.0	15.8	0.19	0.0775
8200.0	21.8	0.17	0.0725
10 000.0	24.6	0.16	0.07
12 000.0	28.4	0.14	0.0625
15 000.0	37.8	0.12	0.055
18 000.0	44.1	0.11	0.05

DIMENSIONS in inches [millimeters]



PART MARKING

- Model - Inductance value - Date code

DESCRIPTION

IHSM-7832	3.9 µH	± 15 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

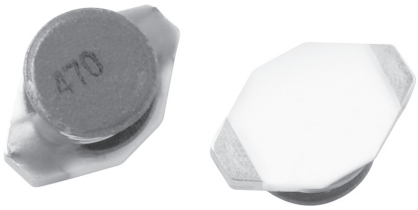
SAP PART NUMBERING GUIDELINES (INTERNAL)

I	H	S	M	7	8	3	2	E	R	3	R	9	L
PRODUCT FAMILY				SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

IDC-2512

Vishay Dale

High Current, Surface Mount Inductor



FEATURES

- High energy storage
- Low resistance
- Tape and reel packaging for automatic handling
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 1.0 µH to 1000 µH, tested at 1.0 Vrms
Inductance Tolerance: 20 %, tighter tolerances available upon request
Operating Temperature: - 40 °C to + 125 °C
Resistance to Solder Heat: 260 °C for 10 seconds

MATERIALS

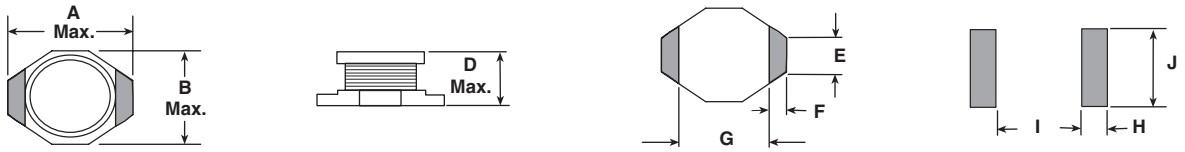
Core: Ferrite
Wire: Enamelled copper wire
Base: Ceramic
Terminal: Gold over Nickel
Adhesive: Epoxy resin

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (µH)	TOLERANCE	TEST FREQUENCY L (kHz)	DCR MAXIMUM (Ohms)	Isat (Amps)	Irms (Amps)
1.0	± 20 %	100	0.05	2.9	2.9
1.5	± 20 %	100	0.05	2.6	2.8
2.2	± 20 %	100	0.07	2.3	2.4
3.3	± 20 %	100	0.08	2.0	2.0
4.7	± 20 %	100	0.09	1.5	1.5
6.8	± 20 %	100	0.13	1.2	1.4
10	± 20 %	100	0.16	1.1	1.1
15	± 20 %	100	0.23	0.90	1.2
22	± 20 %	100	0.37	0.70	0.80
33	± 20 %	100	0.51	0.58	0.60
47	± 20 %	100	0.64	0.50	0.50
68	± 20 %	100	0.86	0.40	0.40
100	± 20 %	100	1.27	0.31	0.30
150	± 20 %	100	2.00	0.27	0.25
220	± 20 %	100	3.11	0.22	0.20
330	± 20 %	100	3.80	0.18	0.16
470	± 20 %	100	5.06	0.16	0.15
680	± 20 %	100	9.20	0.14	0.12
1000	± 20 %	100	13.8	0.10	0.07

Inductance drop = 10 % typ. at Isat
∆T = 15 °C typ. at Irms

DIMENSIONS in inches [millimeters]



A (Max.)	B (Max.)	D (Max.)	E	F	G	H	I	J
0.260 [6.60]	0.175 [4.45]	0.115 [2.92]	0.050 [1.27]	0.040 [1.02]	0.170 [4.32]	0.055 [1.40]	0.160 [4.06]	0.140 [3.56]

DESCRIPTION

IDC-2512	10 µH	± 20 %	ER	e4
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	D	C	2	5	1	2	E	R	1	0	0	M
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

For technical questions, contact: magnetics@vishay.com

Document Number: 34006
Revision: 12-Apr-05

High Current, Surface Mount Inductor

FEATURES

- High energy storage
- Low resistance
- Tape and reel packaging for automatic handling
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 1.0 H to 1000 µH, tested at 1.0 Vrms
Inductance Tolerance: 20 %, tighter tolerances available upon request
Operating Temperature: - 40 °C to + 125 °C
Resistance to Solder Heat: 260 °C for 10 seconds

MATERIALS

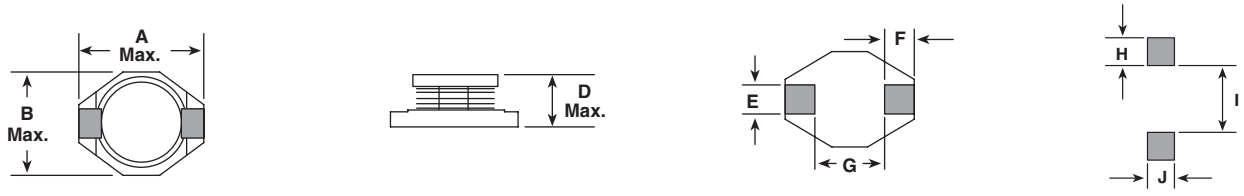
Core: Ferrite
Wire: Enamelled copper wire Base: LCP
Terminal: Nickel bronze
Adhesive: Epoxy resin

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (µH)	TOLERANCE	TEST FREQUENCY L (kHz)	DCR MAXIMUM (Ohms)	Isat (Amps)	Irms (Amps)
1.0	± 20 %	100	0.009	9.0	6.8
1.5	± 20 %	100	0.010	8.0	6.4
2.2	± 20 %	100	0.012	7.0	6.1
3.3	± 20 %	100	0.015	6.4	5.4
4.7	± 20 %	100	0.018	5.4	4.8
6.8	± 20 %	100	0.027	4.6	4.4
10	± 20 %	100	0.038	3.8	3.9
15	± 20 %	100	0.046	3.0	3.1
22	± 20 %	100	0.085	2.6	2.7
33	± 20 %	100	0.10	2.0	2.1
47	± 20 %	100	0.14	1.6	1.8
68	± 20 %	100	0.20	1.4	1.5
100	± 20 %	100	0.28	1.2	1.3
150	± 20 %	100	0.40	1.0	1.0
220	± 20 %	100	0.61	0.8	0.8
330	± 20 %	100	1.02	0.6	0.6
470	± 20 %	100	1.27	0.5	0.5
680	± 20 %	100	2.02	0.4	0.4
1000	± 20 %	100	3.00	0.3	0.3

Inductance drop = 10 % typ. at Isat
ΔGT = 15°C typ. at Irms

DIMENSIONS in inches [millimeters]



A (Max.)	B (Max.)	D (Max.)	E	F	G	H	I	J
0.510 [12.95]	0.370 [9.40]	0.205 [5.21]	0.100 [2.54]	0.100 [2.54]	0.300 [7.62]	0.115 [2.92]	0.290 [7.37]	0.110 [2.79]

DESCRIPTION

IDC-5020	10 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	D	C	5	0	2	0	E	R	1	0	0	M
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

IDC-7328

Vishay Dale

High Current, Surface Mount Inductor

FEATURES

- High energy storage
- Low resistance
- Tape and reel packaging for automatic handling
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 1.0 H to 1000 µH, tested at 1.0 Vrms
Inductance Tolerance: 20 %, tighter tolerances available upon request
Operating Temperature: - 40 °C to + 125 °C
Resistance to Solder Heat: 260 °C for 10 seconds

MATERIALS

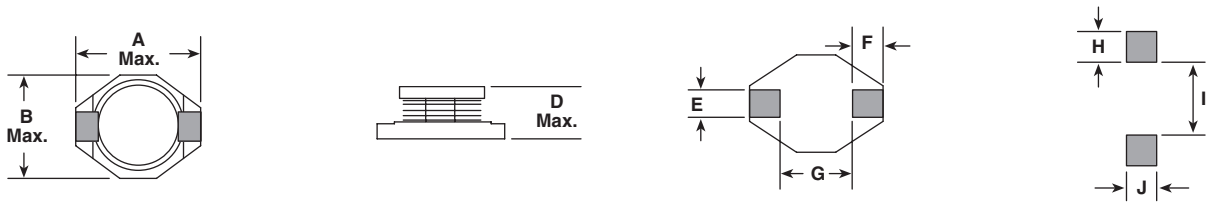
Core: Ferrite
Wire: Enamelled copper wire
Base: LCP
Terminal: Nickel bronze
Adhesive: Epoxy resin

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (µH)	TOLERANCE	TEST FREQUENCY L (kHz)	DCR MAXIMUM (Ohms)	Isat (Amps)	Irms (Amps)
1.0	± 20 %	100	0.009	20.0	8.6
2.2	± 20 %	100	0.014	16.0	7.1
3.3	± 20 %	100	0.018	14.0	6.2
5.6	± 20 %	100	0.020	12.0	5.3
10	± 20 %	100	0.031	10.0	4.3
15	± 20 %	100	0.036	8.0	4.0
22	± 20 %	100	0.047	7.0	3.5
33	± 20 %	100	0.066	5.5	3.0
47	± 20 %	100	0.086	4.5	2.6
68	± 20 %	100	0.13	3.5	2.3
100	± 20 %	100	0.19	3.0	1.8
150	± 20 %	100	0.25	2.6	1.5
220	± 20 %	100	0.38	2.4	1.2
330	± 20 %	100	0.56	1.9	1.0
470	± 20 %	100	0.85	1.4	0.82
680	± 20 %	100	1.1	1.2	0.72
1000	± 20 %	100	1.8	1.0	0.56

Inductance drop = 10 % typ. at Isat
ΔT = 40°C typ. at Irms

DIMENSIONS in inches [millimeters]



A (Max.)	B (Max.)	D (Max.)	E	F	G	H	I	J
0.730 [18.54]	0.600 [15.24]	0.280 [7.11]	0.100 [2.54]	0.100 [2.54]	0.500 [12.70]	0.115 [2.92]	0.490 [12.45]	0.110 [2.79]

DESCRIPTION

IDC-7328	10 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

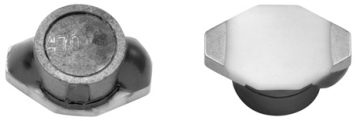
GLOBAL PART NUMBER

I	D	C	7	3	2	8	E	R	1	0	0	M
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

For technical questions, contact: magnetics@vishay.com

Document Number: 34008
Revision: 16-Jan-06

High Current, Shielded, Surface Mount Inductor



FEATURES

- High energy storage
- Low resistance
- Magnetically shielded
- Tape and reel packaging for automatic handling
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 1.0 µH to 10 000 µH, tested at 1.0 Vrms
Inductance Tolerance: 20 %, tighter tolerances available upon request
Operating Temperature: - 40 °C to + 125 °C
Resistance to Solder Heat: 260 °C for 10 seconds

MATERIALS

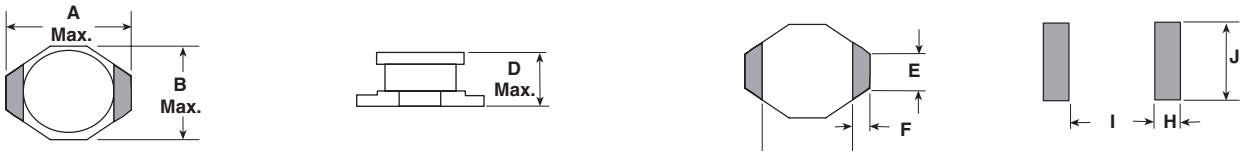
Core: Ferrite
Wire: Enamelled copper wire
Base: Ceramic
Terminal: Gold over Nickel
Adhesive: Epoxy resin

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (µH)	TOLERANCE	TEST FREQUENCY L (kHz)	DCR MAXIMUM (Ohms)	RATED DC CURRENT* (Amps)
1.0	± 20 %	100	0.040	3.0
1.5	± 20 %	100	0.045	2.8
2.2	± 20 %	100	0.050	1.8
3.3	± 20 %	100	0.055	1.6
4.7	± 20 %	100	0.060	1.4
6.8	± 20 %	100	0.065	1.2
10	± 20 %	100	0.075	1.0
15	± 20 %	100	0.090	0.80
22	± 20 %	100	0.11	0.70
33	± 20 %	100	0.19	0.60
47	± 20 %	100	0.23	0.50
68	± 20 %	100	0.29	0.40
100	± 20 %	100	0.48	0.30
150	± 20 %	100	0.59	0.26
220	± 20 %	100	0.77	0.22
330	± 20 %	100	1.4	0.20
470	± 20 %	100	1.8	0.19
680	± 20 %	100	2.2	0.18
1000	± 20 %	100	3.4	0.15
1500	± 20 %	100	4.2	0.12
2200	± 20 %	100	8.5	0.10
3300	± 20 %	100	11.0	0.08
4700	± 20 %	100	13.9	0.06
6800	± 20 %	100	25.0	0.04
10 000	± 20 %	100	32.8	0.02

* 30 °C temperature rise

DIMENSIONS in inches [millimeters]



A (Max.)	B (Max.)	D (Max.)	E	F	G	H	I	J
0.260 [6.60]	0.175 [4.45]	0.115 [2.92]	0.050 [1.27]	0.040 [1.02]	0.170 [4.32]	0.055 [1.40]	0.160 [4.06]	0.140 [3.56]

DESCRIPTION

IDCS-2512	10 µH	20 %	ER	e4
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	D	C	S	2	5	1	2	E	R	1	0	0	M
MODEL				SIZE				PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE

IDCS-5020

Vishay Dale

High Current, Surface Mount Inductor

FEATURES

- High energy storage
- Low resistance
- Magnetically shielded
- Tape and reel packaging for automatic handling
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 1.0 µH to 390.0 µH, tested at 1.0 Vrms
Inductance Tolerance: 20 %, tighter tolerances available upon request
Operating Temperature: - 40 °C to + 125 °C
Resistance to Solder Heat: 260 °C for 10 seconds

MATERIALS

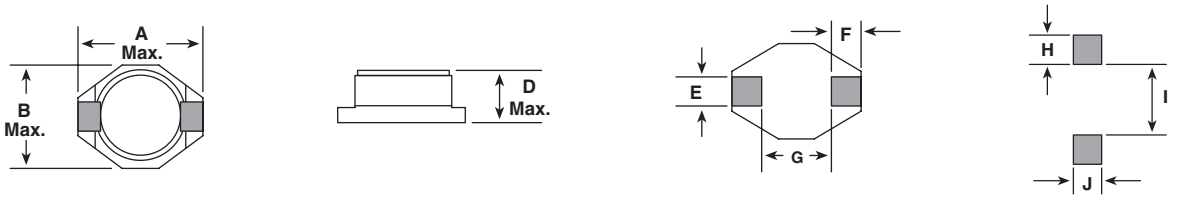
Core: Ferrite
Wire: Enamelled copper wire
Base: LCP
Terminal: Nickel bronze
Adhesive: Epoxy resin

STANDARD ELECTRICAL SPECIFICATIONS

IND. (µH)	TOLERANCE	TEST FREQUENCY L (kHz)	DCR MAX. (Ohms)	Isat (Amps)	Irms (Amps)
1.0	± 20 %	100	0.021	5.6	5.0
1.5	± 20 %	100	0.022	5.2	4.5
2.2	± 20 %	100	0.032	5.0	3.8
3.3	± 20 %	100	0.039	3.9	3.3
4.7	± 20 %	100	0.054	3.2	2.7
6.8	± 20 %	100	0.075	2.8	2.2
10	± 20 %	100	0.101	2.4	2.0
15	± 20 %	100	0.150	2.0	1.5
22	± 20 %	100	0.207	1.6	1.3
33	± 20 %	100	0.334	1.4	1.1
47	± 20 %	100	0.472	1.0	0.80
56	± 20 %	100	0.210	0.95	0.90
68	± 20 %	100	0.340	0.90	0.82
82	± 20 %	100	0.380	0.85	0.75
100	± 20 %	100	0.420	0.80	0.68
120	± 20 %	100	0.460	0.70	0.60
150	± 20 %	100	0.520	0.60	0.55
180	± 20 %	100	0.700	0.65	0.50
220	± 20 %	100	0.800	0.50	0.45
270	± 20 %	100	1.100	0.45	0.40
330	± 20 %	100	1.200	0.40	0.35
390	± 20 %	100	1.400	0.35	0.33

Inductance drop = 10 % typ. at Isat ΔT = 15 °C typ. at Irms

DIMENSIONS in inches [millimeters]



A (Max.)	B (Max.)	D (Max.)	E	F	G	H	I	J
0.510 [12.95]	0.370 [9.40]	0.200 [5.08]	0.100 [2.54]	0.100 [2.54]	0.300 [7.62]	0.115 [2.92]	0.290 [7.37]	0.110 [2.79]

DESCRIPTION

IDCS-5020	10 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	D	C	S	5	0	2	0	E	R	1	0	0	M
MODEL				SIZE				PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE

For technical questions, contact: magnetics@vishay.com

Document Number: 34010
Revision: 16-Jan-06

High Current, Shielded, Surface Mount Inductor

FEATURES

- High energy storage
- Low resistance
- Magnetically shielded
- Tape and reel packaging for automatic handling
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 10 µH to 1000 µH, tested at 1.0 Vrms
Inductance Tolerance: 20 %, tighter tolerances available upon request
Operating Temperature: - 40 °C to + 125 °C
Resistance to Solder Heat: 260 °C for 10 seconds

MATERIALS

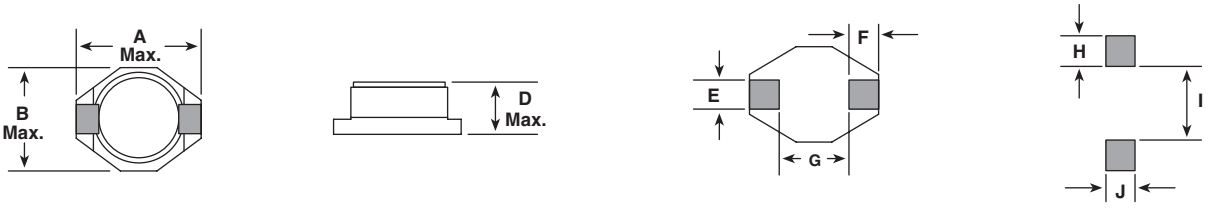
Core: Ferrite
Wire: Enamelled copper wire
Base: LCP
Terminal: Nickel bronze
Adhesive: Epoxy resin

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (µH)	TOLERANCE	TEST FREQUENCY L (kHz)	DCR MAXIMUM (Ohms)	Isat (Amps)	Irms (Amps)
10	± 20 %	100	0.040	8.0	3.9
15	± 20 %	100	0.048	7.0	3.4
22	± 20 %	100	0.059	6.0	3.1
33	± 20 %	100	0.075	5.0	2.8
47	± 20 %	100	0.097	4.0	2.4
68	± 20 %	100	0.138	3.0	2.0
100	± 20 %	100	0.207	2.4	1.7
150	± 20 %	100	0.293	2.1	1.3
220	± 20 %	100	0.47	1.9	1.1
330	± 20 %	100	0.78	1.1	0.86
470	± 20 %	100	1.08	1.1	0.73
680	± 20 %	100	1.40	0.96	0.64
1000	± 20 %	100	2.01	0.80	0.53

Inductance drop = 10 % typ. at Isat
ΔGT = 40 °C typ. at Irms

DIMENSIONS in inches [millimeters]



A (Max.)	B (Max.)	D (Max.)	E	F	G	H	I	J
0.730 [18.54]	0.600 [15.24]	0.300 [7.62]	0.100 [2.54]	0.100 [2.54]	0.500 [12.70]	0.115 [2.92]	0.490 [12.45]	0.110 [2.79]

DESCRIPTION

IDCS-7328	10 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD FREE STANDARD

GLOBAL PART NUMBER

I	D	C	S	7	3	2	8	E	R	1	0	0	M
MODEL				SIZE				PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE

IDCP-1813

Vishay Dale

High Current, Surface Mount Inductor

FEATURES

- High energy storage
- Low resistance
- Tape and reel packaging for automatic handling
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 1.0 µH to 68 µH
Inductance Tolerance: 20 %
Operating Temperature: - 25 °C to + 105 °C
Storage Temperature: - 40 °C to 125 °C
Resistance to Solder Heat: 260 °C for 10 seconds

MATERIALS

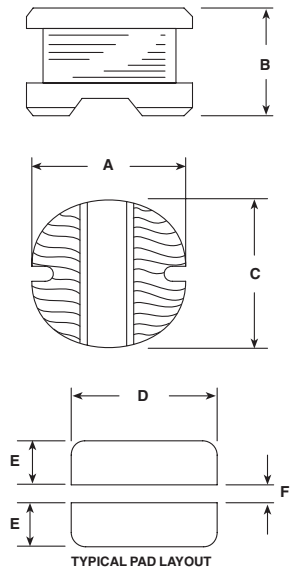
Core: Ferrite
Wire: Enamelled copper wire
Terminal: Ag + Sn/Ag/Cu

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (µH)	TEST FREQUENCY L	DCR MAXIMUM (Ohms)	RATED DC CURRENT* (A)
1.0	7.96 MHz	0.033	3.80
1.4	7.96 MHz	0.038	3.30
1.8	7.96 MHz	0.042	2.91
2.2	7.96 MHz	0.047	2.60
2.7	7.96 MHz	0.052	2.43
3.3	7.96 MHz	0.058	2.15
3.9	7.96 MHz	0.076	1.98
4.7	7.96 MHz	0.094	1.70
5.6	7.96 MHz	0.101	1.60
6.8	7.96 MHz	0.117	1.41
8.2	7.96 MHz	0.132	1.26
10.0	2.52 MHz	0.182	1.15
12.0	2.52 MHz	0.210	1.05
15.0	2.52 MHz	0.235	0.92
18.0	2.52 MHz	0.338	0.84
22.0	2.52 MHz	0.378	0.76
27.0	2.52 MHz	0.522	0.71
33.0	2.52 MHz	0.540	0.64
39.0	2.52 MHz	0.587	0.59
47.0	2.52 MHz	0.844	0.54
56.0	2.52 MHz	0.937	0.50
68.0	2.52 MHz	1.117	0.46

*Rated Current: Value obtained when current flows and the temperature has risen 40 °C or when DC current flows and the initial value of inductance has fallen by 10 %, whichever is smaller.

DIMENSIONS in inches [millimeters]



TYPICAL PAD LAYOUT

A	B	C
0.178 ± 0.01 [4.5 ± 0.3]	0.126 ± 0.01 [3.2 ± 0.3]	0.158 ± 0.01 [4.0 ± 0.3]
D	**E**	**F**
0.178 [4.5]	0.069 [1.75]	0.059 [1.5]

DESCRIPTION

IDCP-1813	10 µH	± 20 %	ER	e1
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	D	C	P	1	8	1	3	E	R	1	0	0	M
MODEL				SIZE				PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE

For technical questions, contact: magnetics@vishay.com

Document Number: 34094
Revision: 09-Jun-05

High Current, Surface Mount Inductor

FEATURES

- High energy storage
- Low resistance
- Tape and reel packaging for automatic handling
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 10 µH to 220 µH
Inductance Tolerance: 20 %
Operating Temperature: - 25 °C to + 105 °C
Storage Temperature: - 40 °C to + 125 °C
Resistance to Solder Heat: 260 °C for 10 seconds

MATERIALS

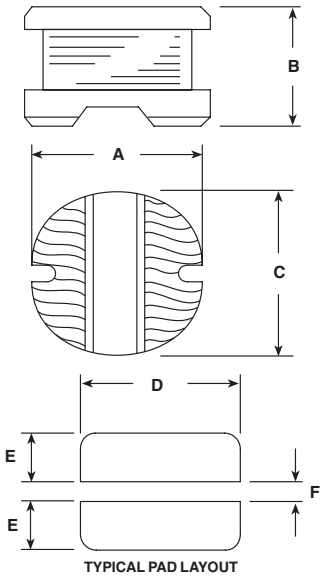
Core: Ferrite
Wire: Enamelled copper wire
Terminal: Ni + Sn/Ag/Cu

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (µH)	TEST FREQUENCY L	DCR MAXIMUM (Ohms)	RATED DC CURRENT* (A)
10.0	2.52 MHz	0.10	1.44
12.0	2.52 MHz	0.12	1.40
15.0	2.52 MHz	0.14	1.30
18.0	2.52 MHz	0.15	1.23
22.0	2.52 MHz	0.18	1.11
27.0	2.52 MHz	0.20	0.97
33.0	2.52 MHz	0.23	0.88
39.0	2.52 MHz	0.32	0.80
47.0	2.52 MHz	0.37	0.72
56.0	2.52 MHz	0.42	0.68
68.0	2.52 MHz	0.46	0.61
82.0	2.52 MHz	0.60	0.58
100.0	1 KHz	0.70	0.52
120.0	1 KHz	0.93	0.48
150.0	1 KHz	1.10	0.40
180.0	1 KHz	1.38	0.38
220.0	1 KHz	1.57	0.35

*Rated Current: Value obtained when current flows and the temperature has risen 40 °C or when DC current flows and the initial value of inductance has fallen by 10 %, whichever is smaller.

DIMENSIONS in inches [millimeters]



TYPICAL PAD LAYOUT

A	B	C
0.229 ± 0.01 [5.8 ± 0.3]	0.177 ± 0.01 [4.5 ± 0.35]	0.205 ± 0.01 [5.2 ± 0.3]
D	**E**	**F**
0.217 [5.5]	0.085 [2.15]	0.067 [1.7]

DESCRIPTION

IDCP-2218	10 µH	± 20 %	ER	e1
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	D	C	P	2	2	1	8	E	R	1	0	0	M
MODEL				SIZE				PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE

IDCP-3020

Vishay Dale

High Current, Surface Mount Inductor

FEATURES

- High energy storage
- Low resistance
- Tape and reel packaging for automatic handling
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 10.0 µH to 470 µH
Inductance Tolerance: 20 %
Operating Temperature: - 25 °C to + 105 °C
Storage Temperature: - 40 °C to 125 °C
Resistance to Solder Heat: 260 °C for 10 seconds

MATERIALS

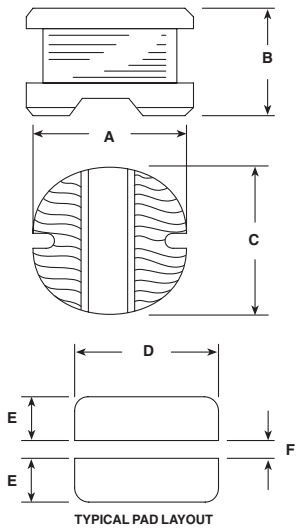
Core: Ferrite
Wire: Enamelled copper wire
Terminal: Ni + Sn/Ag/Cu

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (µH)	TEST FREQUENCY L	DCR MAXIMUM (Ohms)	RATED DC CURRENT* (A)
10.0	2.52 MHz	0.07	2.30
12.0	2.52 MHz	0.08	2.00
15.0	2.52 MHz	0.09	1.80
18.0	2.52 MHz	0.10	1.60
22.0	2.52 MHz	0.11	1.50
27.0	2.52 MHz	0.12	1.30
33.0	2.52 MHz	0.13	1.20
39.0	2.52 MHz	0.16	1.10
47.0	2.52 MHz	0.18	1.10
56.0	2.52 MHz	0.24	0.94
68.0	2.52 MHz	0.28	0.85
82.0	2.52 MHz	0.37	0.78
100.0	1 kHz	0.43	0.72
120.0	1 kHz	0.47	0.66
150.0	1 kHz	0.64	0.58
180.0	1 kHz	0.71	0.51
220.0	1 kHz	0.96	0.49
270.0	1 kHz	1.11	0.42
330.0	1 kHz	1.26	0.40
390.0	1 kHz	1.77	0.36
470.0	1 kHz	1.96	0.34

*Rated Current: Value obtained when current flows and the temperature has risen 40 °C or when DC current flows and the initial value of inductance has fallen by 10 %, whichever is smaller.

DIMENSIONS in inches [millimeters]



A	B	C
0.307 ± 0.01 [7.8 ± 0.3]	0.197 ± 0.02 [5.0 ± 0.5]	0.276 ± 0.01 [7.0 ± 0.3]
D	**E**	**F**
0.296 [7.5]	0.118 [3.0]	0.079 [2.0]

DESCRIPTION

IDCP-3020	10 µH	± 20 %	ER	e1
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	D	C	P	3	0	2	0	E	R	1	0	0	M
MODEL				SIZE				PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE

For technical questions, contact: magnetics@vishay.com

Document Number: 34092
Revision: 09-Jun-05

High Current, Surface Mount Inductor

FEATURES

- High energy storage
- Low resistance
- Tape and reel packaging for automatic handling
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 10.0 µH to 330 µH
Inductance Tolerance: 20 %
Operating Temperature: - 25 °C to + 105 °C
Storage Temperature: - 40 °C to 125 °C
Resistance to Solder Heat: 260 °C for 10 seconds

MATERIALS

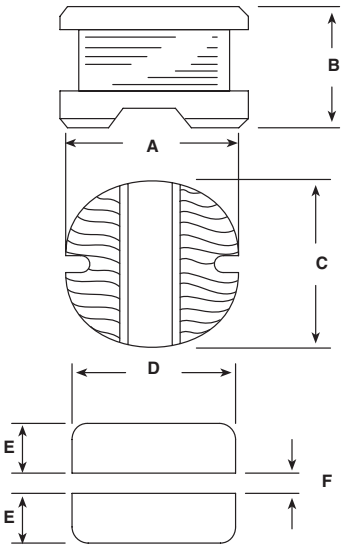
Core: Ferrite
Wire: Enamelled copper wire
Terminal: Ni + Sn/Ag/Cu

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (µH)	TEST FREQUENCY L	DCR MAXIMUM (Ohms)	RATED DC CURRENT* (A)
10.0	2.52 MHz	0.08	1.44
12.0	2.52 MHz	0.09	1.39
15.0	2.52 MHz	0.10	1.24
18.0	2.52 MHz	0.11	1.12
22.0	2.52 MHz	0.13	1.07
27.0	2.52 MHz	0.15	0.94
33.0	2.52 MHz	0.17	0.85
39.0	2.52 MHz	0.22	0.74
47.0	2.52 MHz	0.25	0.68
56.0	2.52 MHz	0.28	0.64
68.0	2.52 MHz	0.33	0.59
82.0	2.52 MHz	0.41	0.54
100.0	1 kHz	0.48	0.51
120.0	1 kHz	0.54	0.49
150.0	1 kHz	0.75	0.40
180.0	1 kHz	1.02	0.36
220.0	1 kHz	1.20	0.31
270.0	1 kHz	1.31	0.29
330.0	1 kHz	1.50	0.28

*Rated Current: Value obtained when current flows and the temperature has risen 40 °C or when DC current flows and the initial value of inductance has fallen by 10 %, whichever is smaller.

DIMENSIONS in inches [millimeters]



TYPICAL PAD LAYOUT

A	B	C
0.307 ± 0.01 [7.8 ± 0.3]	0.138 ± 0.02 [3.5± 0.5]	0.276 ± 0.01 [7.0 ± 0.3]
D	**E**	**F**
0.296 [7.5]	0.118 [3.0]	0.079 [2.0]

DESCRIPTION

IDCP-3114	10 µH	± 20 %	ER	e1
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

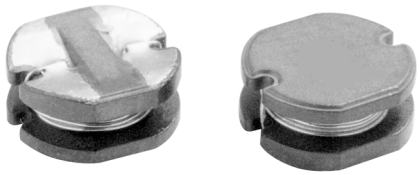
GLOBAL PART NUMBER

I	D	C	P	3	1	1	4	E	R	1	0	0	M
MODEL				SIZE				PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE

IDCP-3722

Vishay Dale

High Current, Surface Mount Inductor



FEATURES

- High energy storage
- Low resistance
- Tape and reel packaging for automatic handling
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 10.0 µH to 820 µH
Inductance Tolerance: 20 %
Operating Temperature: - 25 °C to + 105 °C
Storage Temperature: - 40 °C to + 125 °C
Resistance to Solder Heat: 260 °C for 10 seconds

MATERIALS

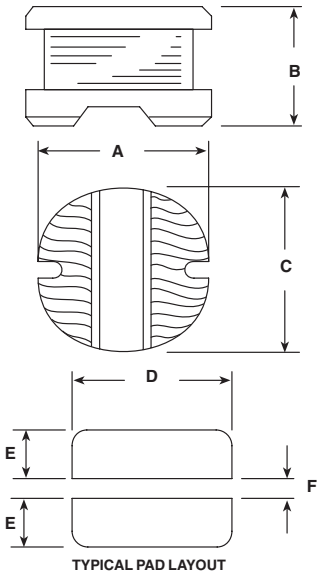
Core: Ferrite
Wire: Enamelled copper wire
Terminal: Ni + Sn/Ag/Cu

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (µH)	TEST FREQUENCY L	DCR MAXIMUM (Ohms)	RATED DC CURRENT* (A)
10.0	2.52 MHz	0.06	2.60
12.0	2.25 MHz	0.07	2.45
15.0	2.25 MHz	0.08	2.27
18.0	2.25 MHz	0.09	2.15
22.0	2.25 MHz	0.10	1.95
27.0	2.25 MHz	0.11	1.76
33.0	2.25 MHz	0.12	1.50
39.0	2.25 MHz	0.14	1.37
47.0	2.25 MHz	0.17	1.28
56.0	2.25 MHz	0.19	1.17
68.0	2.25 MHz	0.22	1.11
82.0	2.25 MHz	0.25	1.00
100.0	1 kHz	0.35	0.97
120.0	1 kHz	0.40	0.89
150.0	1 kHz	0.47	0.78
180.0	1 kHz	0.63	0.72
220.0	1 kHz	0.73	0.66
270.0	1 kHz	0.97	0.57
330.0	1 kHz	1.15	0.52
390.0	1 kHz	1.30	0.48
470.0	1 kHz	1.48	0.42
560.0	1 kHz	1.90	0.33
680.0	1 kHz	2.25	0.28
820.0	1 kHz	2.55	0.24

*Rated Current: Value obtained when current flows and the temperature has risen 40 °C or when DC current flows and theinitial value of inductance has fallen by 10 %, whichever is smaller.

DIMENSIONS in inches [millimeters]



TYPICAL PAD LAYOUT

A	B	C
0.394 ± 0.02 [10.0 ± 0.4]	0.213 ± 0.02 [5.4 ± 0.4]	0.355 ± 0.02 [9.0 ± 0.4]
D	**E**	**F**
0.374 [9.5]	0.148 [3.75]	0.099 [2.5]

DESCRIPTION

IDCP-3722	10 µH	± 20 %	ER	e1
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	D	C	P	3	7	2	2	E	R	1	0	0	M
MODEL				SIZE				PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE

For technical questions, contact: magnetics@vishay.com

Document Number: 34090
Revision: 16-Jan-06

High Current, Surface Mount Inductor

FEATURES

- High energy storage
- Low resistance
- Tape and reel packaging for automatic handling
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 10.0 µH to 560 µH
Inductance Tolerance: 20 %
Operating Temperature: - 25 °C to + 105 °C
Storage Temperature: - 40 °C to 125 °C
Resistance to Solder Heat: 260 °C for 10 seconds

MATERIALS

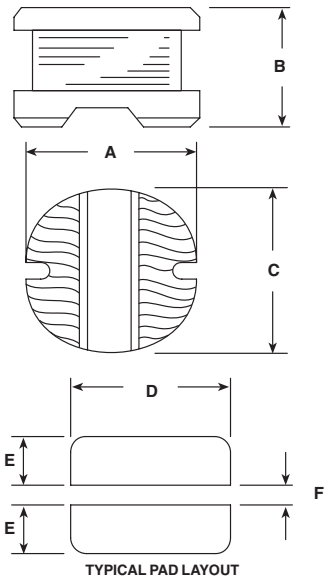
Core: Ferrite
Wire: Enamelled copper wire
Terminal: Ni + Sn/Ag/Cu

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (µH)	TEST FREQUENCY L	DCR MAXIMUM (Ohms)	RATED DC CURRENT* (A)
10.0	2.52 MHz	0.05	2.38
12.0	2.52 MHz	0.06	2.13
15.0	2.52 MHz	0.07	1.87
18.0	2.52 MHz	0.08	1.73
22.0	2.52 MHz	0.09	1.60
27.0	2.52 MHz	0.10	1.44
33.0	2.52 MHz	0.12	1.26
39.0	2.52 MHz	0.15	1.20
47.0	2.52 MHz	0.17	1.10
56.0	2.52 MHz	0.20	1.01
68.0	2.52 MHz	0.22	0.91
82.0	2.52 MHz	0.25	0.85
100.0	1 kHz	0.34	0.74
120.0	1 kHz	0.40	0.69
150.0	1 kHz	0.54	0.61
180.0	1 kHz	0.62	0.56
220.0	1 kHz	0.72	0.53
270.0	1 kHz	0.95	0.45
330.0	1 kHz	1.10	0.42
390.0	1 kHz	1.24	0.38
470.0	1 kHz	1.53	0.35
560.0	1 kHz	1.90	0.32

*Rated Current: Value obtained when current flows and the temperature has risen 40 °C or when DC current flows and the initial value of inductance has fallen by 10 %, whichever is smaller.

DIMENSIONS in inches [millimeters]



TYPICAL PAD LAYOUT

A	B	C
0.394 ± 0.01 [10.0 ± 0.3]	0.158 ± 0.02 [4.0 ± 0.5]	0.355 ± 0.01 [9.0 ± 0.3]
D	**E**	**F**
0.374 [9.5]	0.148 [3.75]	0.099 [2.5]

DESCRIPTION

IDCP-3916	10 µH	± 20 %	ER	e1
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	D	C	P	3	9	1	6	E	R	1	0	0	M
MODEL				SIZE				PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE

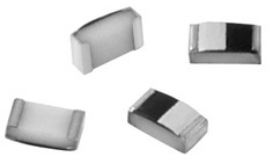
High Frequency Inductors

Contents

IFC-0603

Vishay Dale

High Q/SRF, Low Value Chip Inductors



FEATURES

- High reliability
- Surface mountable
- High self-resonant frequency
- 2 % tolerance available
- Temperature range: - 40 °C to + 125 °C (no load)
  - 40 °C to + 85 °C (full rated current)
- Lead (Pb)-free terminations and RoHS compliant

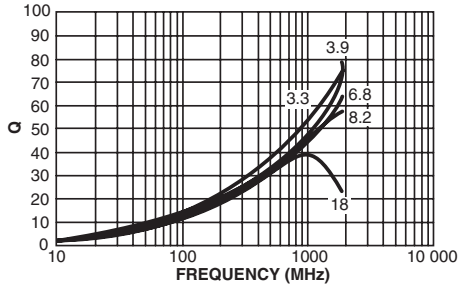
RoHS COMPLIANT

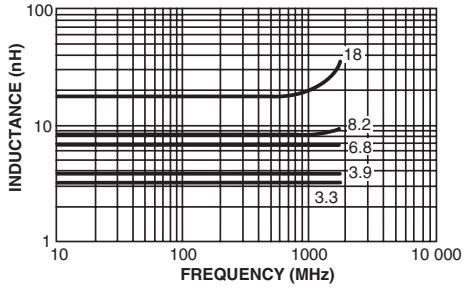
STANDARD ELECTRICAL SPECIFICATIONS

MODEL	L 100 MHz (nH)	L TOL.	Q 100 MHz (Typ.)	Q 800 MHz (Typ.)	Q 1700 MHz (Typ.)	SRF MHz (Typ.)	DCR Ohms (Max.)	RATED DC CURRENT (mA)
IFC-0603	1.5	0.3 nH	11	38	42	> 15 000	0.06	1000
	1.8	0.3 nH	10	35	50	> 15 000	0.06	1000
	2.2	0.3 nH	10	40	47	14 000	0.08	1000
	2.7	0.3 nH	10	38	51	13 000	0.12	1000
	3.3	5 %, 10 %	10	41	53	10 000	0.15	1000
	3.9	5 %, 10 %	10	36	51	8000	0.20	500
	4.7	5 %, 10 %	10	38	55	7000	0.21	500
	5.6	5 %, 10 %	10	38	48	5100	0.29	500
	6.8	5 %, 10 %	10	38	47	4900	0.32	500
	8.2	5 %, 10 %	10	38	58	3700	0.35	500
	10	5 %, 10 %	10	34	40	3600	0.42	500
	12	5 %, 10 %	11	36	45	3200	0.50	500
	15	5 %, 10 %	12	32	24	2600	0.60	400
	18	5 %, 10 %	11	30	23	2500	0.75	400

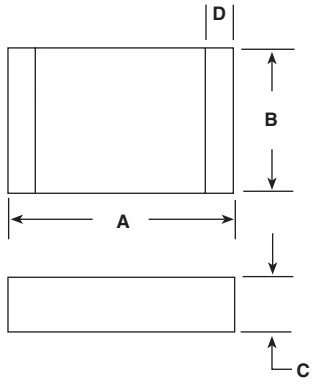
L, Q, SRF measured on HP-4291A and HP-8753D

PERFORMANCE GRAPHS: INDUCTANCE AND Q VS FREQUENCY





DIMENSIONS in inches [millimeters]



MODEL	A	B	C	D
IFC-0603	0.063 ± 0.004 [1.60 ± 0.1]	0.031 ± 0.004 [0.80 ± 0.1]	0.020 ± 0.004 [0.50 ± 0.1]	0.015 Max. [0.38 Max.]

DESCRIPTION

IFC-0603	10 nH	± 5 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

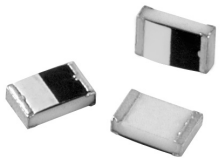
GLOBAL PART NUMBER

I	F	C	0	6	0	3	E	R	1	0	N	J
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

For technical questions, contact: magnetics@vishay.com

Document Number: 34012
Revision: 10-Aug-06

High Q/SRF, Low Value Chip Inductors



FEATURES

- High reliability
- Surface mountable
- High self-resonant frequency
- 2 % tolerance available
- Temperature range: - 40 °C to + 125 °C (no load)
  - 40 °C to + 85 °C (full rated current)
- Lead (Pb)-free terminations and RoHS compliant

RoHS COMPLIANT

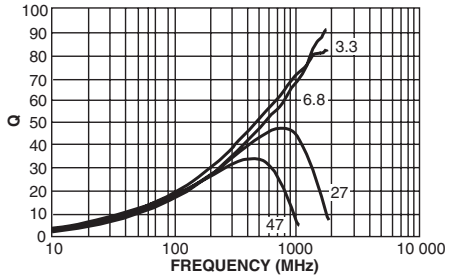
STANDARD ELECTRICAL SPECIFICATIONS

MODEL	L 100 MHz (nH)	L TOL.	Q 100 MHz (Typ.)	Q 800 MHz (Typ.)	Q 1700 MHz (Typ.)	SRF MHz (Typ.)	DCR Ohms (Max.)	RATED DC CURRENT (mA)
IFC-0805	1.5	0.3 nH	18	57	125	> 15 000	0.04	1000
	1.8	0.3 nH	12	45	58	> 15 000	0.06	1000
	2.2	0.3 nH	12	45	68	> 15 000	0.09	1000
	2.7	0.3 nH	12	46	71	12 000	0.11	1000
	3.3	5 %, 10 %	12	46	67	11 000	0.13	1000
	3.9	5 %, 10 %	15	55	80	9000	0.13	500
	4.7	5 %, 10 %	15	53	78	7000	0.16	500
	5.6	5 %, 10 %	13	53	80	6500	0.17	500
	6.8	5 %, 10 %	14	53	65	4800	0.20	500
	8.2	5 %, 10 %	15	50	77	3600	0.25	500
	10	5 %, 10 %	13	48	67	3500	0.36	500
	12	5 %, 10 %	14	48	68	3400	0.41	500
	15	5 %, 10 %	15	48	59	3100	0.49	400
	18	5 %, 10 %	14	48	48	2550	0.69	400
	22	5 %, 10 %	16	39	–	1750	0.70	400
	27	5 %, 10 %	16	41	–	1600	0.95	300
	33	5 %, 10 %	16	39*	–	1300	1.1	300
	39	5 %, 10 %	18	32*	–	1200	1.1	300
	47	5 %, 10 %	17	30*	–	1060	1.2	300

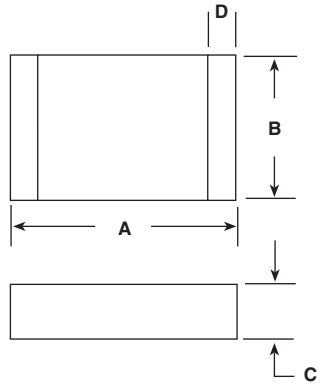
L, Q, SRF measured on HP-4291A and HP-8753D

* 500 MHz

PERFORMANCE GRAPHS: INDUCTANCE AND Q VS FREQUENCY



DIMENSIONS in inches [millimeters]



MODEL	A	B	C	D
IFC-0805	0.079 ± 0.006 [2.00 ± 0.15]	0.049 ± 0.006 [1.25 ± 0.15]	0.020 ± 0.006 [0.50 ± 0.15]	0.015 Max. [0.38 Max.]

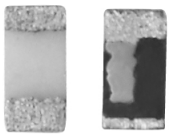
DESCRIPTION

IFC-0805	10 nH	± 5 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	F	C	0	8	0	5	E	R	1	0	N	J
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

Thin Film Chip Inductor



FEATURES

- Tight tolerance
- Self-resonant frequency controlled within 10 %
- Stable inductance over high frequencies
- Compatible with reflow or flow soldering
- 100 % lead (Pb)-free and RoHS compliant
- Temperature range: - 40 °C to + 125 °C (no load)
  - 40 °C to + 85 °C (full rated current)

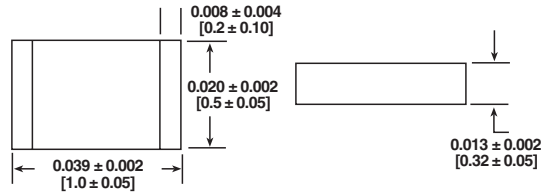
Pb-free

RoHS COMPLIANT

APPLICATIONS

- Cellular telephone, pagers and GPS products
- Wireless LAN and other communication appliances
- VCO, TCXO circuit and RF transceiver module

DIMENSIONS in inches [millimeters]

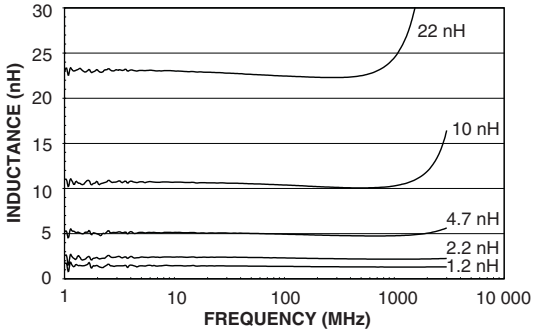


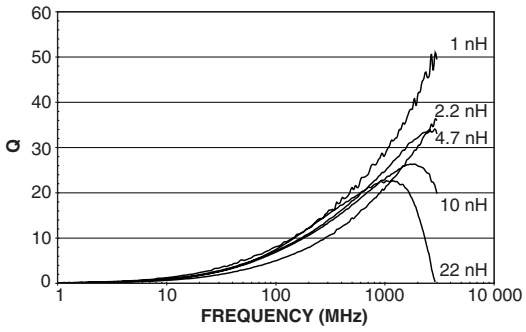
STANDARD ELECTRICAL SPECIFICATIONS

L 500 MHz (nH)	L TOL.	Q 100 MHz (Typ.)	Q 800 MHz (Typ.)	Q 1700 MHz (Typ.)	SRF MHz (Typ.)	DCR Ohms (Max.)	RATED DC CURRENT (mA)
1.0	0.3 nH	7	21	33	12 000	0.15	700
1.2	0.3 nH	7	21	33	12 000	0.15	700
1.5	0.3 nH	7	21	33	10 000	0.25	700
1.8	0.3 nH	7	21	33	10 000	0.25	560
2.2	0.3 nH	7	21	33	8000	0.35	440
2.7	0.3 nH	7	21	33	8000	0.35	440
3.3	0.3 nH	7	21	28	6000	0.45	380
3.9	0.3 nH	7	21	28	6000	0.55	340
4.7	0.3 nH	7	21	28	6000	0.65	320
5.6	0.3 nH	7	21	28	6000	0.85	280
6.8	0.3 nH	7	21	28	6000	1.05	260
8.2	0.3 nH	7	21	28	5500	1.25	220
10	2 %, 5 %	7	21	26	4500	1.35	200
12	2 %, 5 %	5	21	26	3700	1.55	180
15	2 %, 5 %	5	21	26	3300	1.75	130
18	2 %, 5 %	5	21	21	3100	2.15	100
22	2 %, 5 %	5	21	19	2800	2.65	90

Test Equipment: HP4287 and Agilent 16196B

PERFORMANCE GRAPHS: INDUCTANCE AND Q VS FREQUENCY





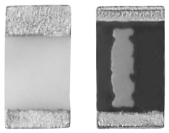
DESCRIPTION

IFCB-0402	10 nH	± 5 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	F	C	B	0	4	0	2	E	R	1	0	N	J
PRODUCT FAMILY				SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

Thin Film Chip Inductor



FEATURES

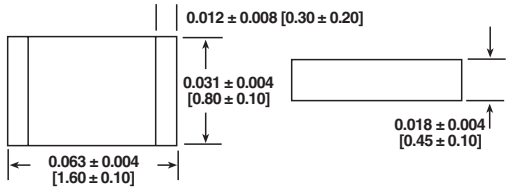
- Tight tolerance
- Self-resonant frequency controlled within 10 %
- Stable inductance over high frequencies
- Compatible with reflow or flow soldering
- 100 % lead (Pb)-free and RoHS compliant
- Temperature range: - 40 °C to + 125 °C (no load)
  - 40 °C to + 85 °C (full rated current)

Pb-free
RoHS COMPLIANT

APPLICATIONS

- Cellular telephone, pagers and GPS products
- Wireless LAN and other communication appliances
- VCO, TCXO circuit and RF transceiver module

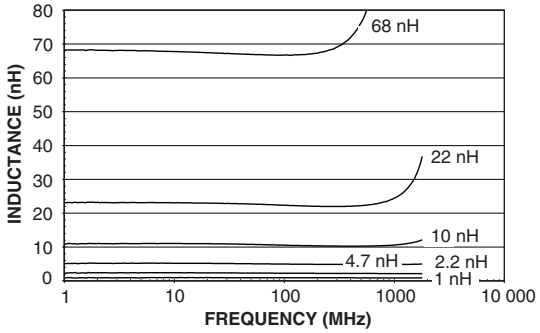
DIMENSIONS in inches [millimeters]

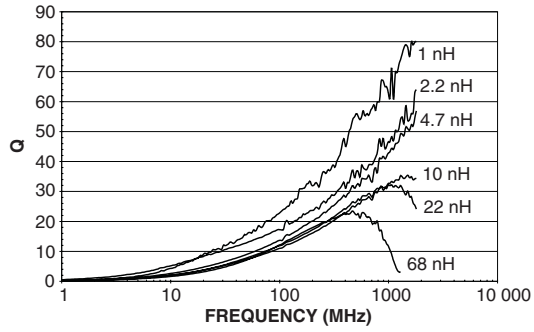


STANDARD ELECTRICAL SPECIFICATIONS

L 500 MHz (nH)	L TOL.	Q 100 MHz (Typ.)	Q 800 MHz (Typ.)	Q 1700 MHz (Typ.)	SRF MHz (Typ.)	DCR Ohms (Max.)	RATED DC CURRENT (mA)
1.0	0.3 nH	13	34	49	13 000	0.35	800
1.2	0.3 nH	13	34	49	13 000	0.35	800
1.5	0.3 nH	13	34	49	10 000	0.35	800
1.8	0.3 nH	13	34	49	10 000	0.35	300
2.2	0.3 nH	13	34	49	8000	0.35	300
2.7	0.3 nH	13	34	49	6000	0.45	300
3.3	0.3 nH	13	34	49	6000	0.45	300
3.9	0.3 nH	13	34	49	6000	0.45	300
4.7	0.3 nH	13	34	41	5000	0.55	300
5.6	0.3 nH	13	34	41	5000	0.65	300
6.8	0.3 nH	13	34	41	5000	0.75	300
8.2	0.3 nH	13	34	41	4000	0.95	300
10	2 %, 5 %	13	34	30	4000	0.95	300
12	2 %, 5 %	13	30	30	3000	1.05	300
15	2 %, 5 %	13	30	30	3000	1.35	300
18	2 %, 5 %	13	30	25	2000	1.65	300
22	2 %, 5 %	13	30	25	2000	1.95	250
27	2 %, 5 %	10	45	25	2000	2.35	250
33	2 %, 5 %	10	45	6	1500	2.75	250
39	2 %, 5 %	10	45	1	1500	3.0	200
47	2 %, 5 %	10	45	1	1500	3.0	200
56	2 %, 5 %	10	26	4	1000	5.0	150
68	2 %, 5 %	10	26	6	1000	5.0	150

PERFORMANCE GRAPHS: INDUCTANCE AND Q VS FREQUENCY





DESCRIPTION

IFCB-0603	10 nH	± 5 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	F	C	B	0	6	0	3	E	R	1	0	N	J
PRODUCT FAMILY				SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

ILC-0402

Vishay Dale

Surface Mount, Multi Layer High Frequency Ceramic Inductor

FEATURES

- High reliability
- Surface mountable
- Reflow or wave solderable
- Tape and reel packaging per EIA specifications: 4000 pieces on 7" reel
- 100 % lead (Pb)-free and RoHS compliant

Flex: 0.0788" [2.0 mm] minimum mounted on 0.063" [1.6 mm] thick PC board

Pb-free

RoHS COMPLIANT

MECHANICAL SPECIFICATIONS

Solderability: 90 % coverage after 5 second dip in 235 °C solder following 60 second preheat at 120 °C and type R flux dip
Resistance to Solder Heat: 10 seconds in 260 °C solder, after preheat and flux above
Terminal Strength: 0.2 kg (0.44 pounds) for 30 seconds
Beam Strength: 0.2 kg (0.44 pounds)

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: - 55 °C to + 125 °C
Thermal Shock: 100 cycles, - 40 °C to + 85 °C
Humidity: + 40 °C, 85 % RH, 1000 hours at full rated current
Load Life: 85 °C for 1000 hours full rated current

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (nH)	TOL.	Q (MIN.)	TEST FREQUENCY L + Q (MHz)	Q (TYPICAL)						SRF (MHz)		DCR MAX. (OHMS)	RATED CURRENT (mA)
				100 MHz	300 MHz	500 MHz	800 MHz	1000 MHz	1800 MHz	MIN	TYP		
1.0	± 0.3 nH	8	100	11	20	26	34	39	30	10 000	13 000	0.12	300
1.2	± 0.3 nH	8	100	11	20	26	34	39	30	10 000	13 000	0.12	300
1.5	± 0.3 nH	8	100	11	20	26	34	39	30	6000	13 000	0.13	300
1.8	± 0.3 nH	8	100	11	18	24	30	35	30	6000	11 000	0.14	300
2.2	± 0.3 nH	8	100	10	17	24	29	35	30	6000	10 000	0.16	300
2.7	± 0.3 nH	8	100	10	17	23	29	34	30	6000	9000	0.17	300
3.3	± 0.3 nH	8	100	10	17	23	28	34	30	6000	8000	0.19	300
3.9	± 0.3 nH	8	100	10	17	23	28	33	30	4000	7000	0.22	300
4.7	± 0.3 nH	8	100	10	17	23	28	33	30	4000	6000	0.24	300
5.6	± 0.3 nH	8	100	10	17	22	28	33	30	4000	5700	0.27	300
6.8	± 10 %, ± 5 %	8	100	10	16	22	27	33	30	3900	5500	0.32	250
8.2	± 10 %, ± 5 %	8	100	10	17	22	28	32	30	3600	4900	0.37	250
10	± 10 %, ± 5 %	8	100	10	17	22	30	32	28	3200	4300	0.42	250
12	± 10 %, ± 5 %	8	100	11	18	24	31	34	28	2700	3900	0.50	250
15	± 10 %, ± 5 %	8	100	11	18	24	30	33	27	2300	3500	0.55	250
18	± 10 %, ± 5 %	8	100	11	18	24	30	32	20	2100	3100	0.65	200
22	± 10 %, ± 5 %	8	100	11	18	24	30	31	13	1900	2800	0.80	200
27	± 10 %, ± 5 %	8	100	11	18	23	27	29	10	1600	2300	0.90	200
33	± 10 %, ± 5 %	8	100	11	18	22	25	25	-	1300	1900	1.00	200
39	± 10 %, ± 5 %	8	100	11	18	22	24	23	-	1200	1700	1.20	150
47	± 10 %, ± 5 %	8	100	11	18	21	23	21	-	1000	1500	1.30	150
56	± 10 %, ± 5 %	8	100	11	18	20	21	19	-	750	1300	1.40	150
68	± 10 %, ± 5 %	8	100	11	17	19	19	16	-	750	1200	1.40	150
82	± 10 %, ± 5 %	8	100	10	17	19	16	10	-	600	1100	1.60	100
100	± 10 %, ± 5 %	8	100	10	16	18	10	-	-	600	1000	1.60	100

DIMENSIONS in inches [millimeters]

DESCRIPTION

ILC-0402	10 nH	± 10 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	L	C	0	4	0	2	E	R	1	0	N	K
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

Surface Mount, Multi Layer High Frequency Ceramic Inductor

FEATURES

- High reliability
- Surface mountable
- Reflow or wave solderable
- Tape and reel packaging per EIA specifications: 4000 pieces on 7" reel
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

Beam Strength: 0.3 kg (0.66 pounds)
Flex: 0.0788" [2.0 mm] minimum mounted on 0.063" [1.6 mm] thick PC board

MECHANICAL SPECIFICATIONS

Solderability: 90 % coverage after 5 second dip in 235 °C solder following 60 seconds preheat at 120 °C and type R flux dip
Resistance to Solder Heat: 10 seconds in 260 °C solder, after preheat and flux above
Terminal Strength: 0.3 kg (0.66 pounds) for 30 seconds

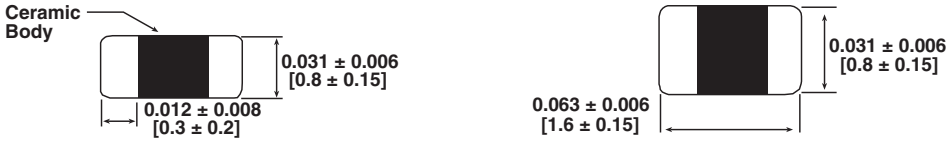
ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: - 55 °C to + 125 °C
Thermal Shock: 100 cycles, - 40 °C to + 85 °C
Humidity: + 40 °C, 85 % RH, 1000 hours at full rated current
Load Life: 85 °C for 1000 hours full rated current

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (nH)	TOL.	Q (MIN.)	TEST FREQUENCY L + Q (MHz)	Q (TYPICAL)						SRF (MHz)		DCR MAX. (OHMS)	RATED CURRENT (mA)
				100 MHz	300 MHz	500 MHz	800 MHz	1000 MHz	1800 MHz	MIN	TYP		
1.0	± 0.3 nH	8	100	14	30	40	70	90	50	10 000	13 000	0.05	300
1.2	± 0.3 nH	8	100	14	30	40	70	90	50	10 000	13 000	0.05	300
1.5	± 0.3 nH	8	100	14	26	34	47	50	50	6000	13 000	0.10	300
1.8	± 0.3 nH	8	100	10	18	24	30	34	50	6000	13 000	0.10	300
2.2	± 0.3 nH	8	100	12	22	29	37	40	50	6000	12 000	0.10	300
2.7	± 0.3 nH	10	100	13	24	32	41	45	55	6000	11 000	0.10	300
3.3	± 0.3 nH	10	100	14	25	33	42	47	55	6000	9000	0.12	300
3.9	± 0.3 nH	10	100	13	25	33	42	46	55	6000	8000	0.14	300
4.7	± 0.3 nH	10	100	13	25	33	42	47	55	4000	6500	0.16	300
5.6	± 0.3 nH	10	100	14	25	33	42	46	55	4000	5800	0.18	300
6.8	± 10 %, ± 5 %	10	100	14	25	33	43	47	50	4000	5600	0.22	300
8.2	± 10 %, ± 5 %	10	100	14	26	34	44	48	40	3500	5200	0.24	300
10	± 10 %, ± 5 %	12	100	14	26	34	43	47	40	3400	4600	0.26	300
12	± 10 %, ± 5 %	12	100	14	27	35	45	49	35	2600	4000	0.28	300
15	± 10 %, ± 5 %	12	100	15	28	37	46	51	20	2300	3400	0.32	300
18	± 10 %, ± 5 %	12	100	15	27	36	44	48	15	2000	3000	0.35	300
22	± 10 %, ± 5 %	12	100	16	28	36	44	47	-	1600	2900	0.40	300
27	± 10 %, ± 5 %	12	100	16	29	37	45	46	-	1400	2200	0.45	300
33	± 10 %, ± 5 %	12	100	17	31	40	46	47	-	1200	1800	0.55	300
39	± 10 %, ± 5 %	12	100	18	31	39	44	44	-	1100	1600	0.60	300
47	± 10 %, ± 5 %	12	100	17	28	34	35	34	-	900	1600	0.70	300
56	± 10 %, ± 5 %	12	100	17	28	34	34	31	-	900	1400	0.75	300
68	± 10 %, ± 5 %	12	100	18	29	34	30	22	-	700	1200	0.85	300
82	± 10 %, ± 5 %	12	100	18	28	33	27	-	-	600	1100	0.95	300
100	± 10 %, ± 5 %	12	100	18	27	28	16	-	-	600	1000	1.00	300
120	± 10 %, ± 5 %	8	50	16	24	23	-	-	-	500	800	1.20	300
150	± 10 %, ± 5 %	8	50	13	19	16	-	-	-	500	800	1.20	300
180	± 10 %, ± 5 %	8	50	13	18	12	-	-	-	400	700	1.30	300
220	± 10 %, ± 5 %	8	50	12	16	-	-	-	-	400	600	1.50	300

DIMENSIONS in inches [millimeters]



DESCRIPTION

ILC-0603	10 nH	± 10 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD FREE STANDARD

GLOBAL PART NUMBER

I	L	C	0	6	0	3	E	R	1	0	N	K
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

Surface Mount, Multi Layer High Frequency Ceramic Inductor

FEATURES

- High reliability
- Surface mountable
- Reflow or wave solderable
- Tape and reel packaging per EIA specifications: 4000 pieces on 7" reel
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

MECHANICAL SPECIFICATIONS

Solderability: 90 % coverage after 5 second dip in 235 °C solder following 60 seconds preheat at 120 °C and type R flux dip
Resistance to Solder Heat: 10 seconds in 260 °C solder, after preheat and flux above.
Termination: 100 % tin
Terminal Strength: 0.6 kg (1.32 pounds) for 30 seconds
Beam Strength: 1.0 kg (2.20 pounds)
Flex: 0.0788" [2.0 mm] minimum mounted on 0.063" [1.6 mm] thick PC board

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: - 55 °C to + 125 °C
Thermal Shock: 100 cycles, - 40 °C to + 85 °C
Humidity: + 40 °C, 85 % RH, 1000 hours at full rated current
Load Life: 85 °C for 1000 hours full rated current

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (nH)	TOL.	Q (MIN.)	TEST FREQUENCY L + Q (MHz)	Q (TYPICAL)						SRF (MHz)		DCR MAX. (OHMS)	RATED CURRENT (mA)
				100 MHz	300 MHz	500 MHz	800 MHz	1000 MHz	1800 MHz	MIN	TYP		
1.5	± 0.3 nH	10	100	21	39	57	61	68	50	4000	6000	0.10	300
1.8	± 0.3 nH	10	100	18	35	49	55	59	50	4000	6000	0.10	300
2.2	± 0.3 nH	10	100	18	33	46	53	58	60	4000	6000	0.10	300
2.7	± 0.3 nH	12	100	19	36	50	56	60	70	4000	6000	0.10	300
3.3	± 0.3 nH	12	100	16	29	40	47	51	50	4000	6000	0.13	300
3.9	± 0.3 nH	12	100	18	33	46	54	60	50	4000	6000	0.15	300
4.7	± 0.3 nH	12	100	18	34	46	55	60	56	3500	6000	0.20	300
5.6	± 0.3 nH	15	100	20	38	51	60	66	48	3200	5400	0.23	300
6.8	± 10 %, 5 %	15	100	20	39	52	63	69	26	2800	4200	0.25	300
8.2	± 10 %, 5 %	15	100	21	40	54	63	70	45	2400	3700	0.28	300
10	± 10 %, 5 %	15	100	20	38	51	60	67	36	2100	3100	0.30	300
12	± 10 %, 5 %	15	100	21	39	52	60	67	37	1900	3000	0.35	300
15	± 10 %, 5 %	15	100	22	42	55	63	72	23	1600	2600	0.40	300
18	± 10 %, 5 %	15	100	24	44	57	63	72	14	1500	2300	0.45	300
22	± 10 %, 5 %	18	100	23	43	55	60	69	-	1400	2100	0.50	300
27	± 10 %, 5 %	18	100	23	42	53	58	68	-	1300	1800	0.55	300
33	± 10 %, 5 %	18	100	24	43	54	55	60	-	1200	1700	0.60	300
39	± 10 %, 5 %	18	100	23	41	50	47	47	-	1000	1400	0.65	300
47	± 10 %, 5 %	18	100	23	41	49	43	41	-	900	1200	0.70	300
56	± 10 %, 5 %	18	100	23	42	48	39	38	-	800	1100	0.75	300
68	± 10 %, 5 %	18	100	25	42	45	30	-	-	700	900	0.80	300
82	± 10 %, 5 %	18	100	24	41	41	-	-	-	600	800	0.90	300
100	± 10 %, 5 %	18	100	23	37	37	-	-	-	600	800	0.90	300
120	± 10 %, 5 %	13	50	22	33	29	-	-	-	500	700	0.95	300
150	± 10 %, 5 %	13	50	22	34	26	-	-	-	500	700	1.0	300
180	± 10 %, 5 %	13	50	23	34	20	-	-	-	400	600	1.1	300
220	± 10 %, 5 %	12	50	20	23	-	-	-	-	350	550	1.2	300
270	± 10 %, 5 %	12	50	20	19	-	-	-	-	300	480	1.3	300

DIMENSIONS in inches [millimeters]

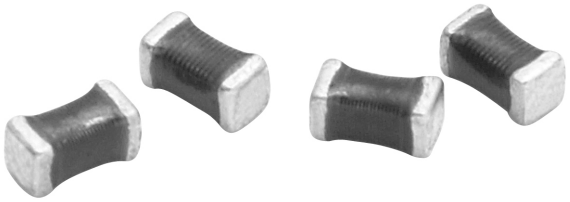
DESCRIPTION

ILC-0805	10 nH	± 10 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	L	C	0	8	0	5	E	R	1	0	N	K
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

High Frequency, Surface Mount, Laser Spiral, Coated Inductors



FEATURES

- Very small in size
- High self-resonant frequency values
- High Q values relative to size at higher frequencies
- Coated coil provides protection and moisture resistance
- Compatible with vapor phase and infrared reflow soldering
- Tape and reel packaging for automatic handling, 10 000/reel, EIA-481
- L and Q value not affected by mounting orientation
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 1.0 nH to 100 nH
Inductance and Tolerance: ± 0.3 nH for 1.0 - 5.6 nH
± 5 % for 6.8 nH to 100 nH
Operating Temperature: - 40 °C to + 100 °C
Core Material: Ceramic

TEST EQUIPMENT

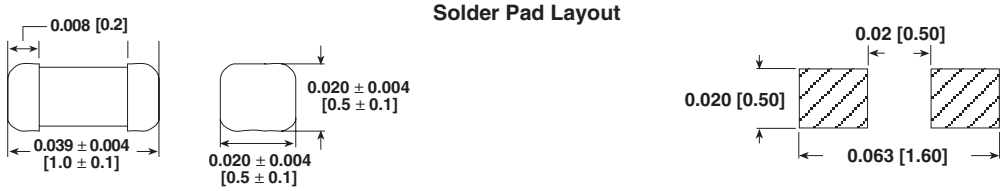
- Inductance and Q measured on HP4291B
- SRF measured on HP8753E
- DCR measured on HP4338B

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (nH)	TOLERANCE	TEST FREQUENCY L (MHz)	Q TYPICAL	TEST FREQUENCY Q (MHz)	SELF-RESONANT FREQUENCY MINIMUM (MHz)	DCR MAXIMUM (Ohms)	RATED DC* CURRENT (mA)
1.0	± 0.3 nH, 0.2 nH	100	21	800	6000	0.05	400
1.2	± 0.3 nH, 0.2 nH	100	21	800	6000	0.06	400
1.5	± 0.3 nH, 0.2 nH	100	21	800	6000	0.07	400
1.8	± 0.3 nH, 0.2 nH	100	21	800	6000	0.08	400
2.2	± 0.3 nH, 0.2 nH	100	21	800	6000	0.09	400
2.7	± 0.3 nH, 0.2 nH	100	21	800	5500	0.10	400
3.3	± 0.3 nH, 0.2 nH	100	21	800	5500	0.12	400
3.9	± 0.3 nH, 0.2 nH	100	20	800	5200	0.15	360
4.7	± 0.3 nH, 0.2 nH	100	20	800	4800	0.17	360
5.6	± 0.3 nH, 0.2 nH	100	20	800	4600	0.19	340
6.8	± 5 %	100	19	800	4000	0.30	320
8.2	± 5 %	100	19	800	3500	0.35	320
10	± 5 %, 2 %	100	19	800	2800	0.41	320
12	± 5 %, 2 %	100	19	800	2800	0.45	320
15	± 5 %, 2 %	100	19	800	2500	0.60	240
18	± 5 %, 2 %	100	19	800	2200	0.70	240
22	± 5 %, 2 %	100	19	800	2000	0.80	200
27	± 5 %, 2 %	100	19	800	1800	1.20	200
33	± 5 %, 2 %	100	18	800	1800	1.40	170
39	± 5 %, 2 %	100	18	800	1800	1.70	150
47	± 5 %, 2 %	100	17	800	1800	2.10	140
56	± 5 %, 2 %	100	17	800	1500	2.50	130
68	± 5 %, 2 %	100	15	800	1500	4.00	120
82	± 5 %, 2 %	100	15	800	1400	4.50	110
100	± 5 %, 2 %	100	14	800	1200	5.50	90

*Value obtained when current flows and temperature has risen 15 °C

DIMENSIONS in inches [millimeters]



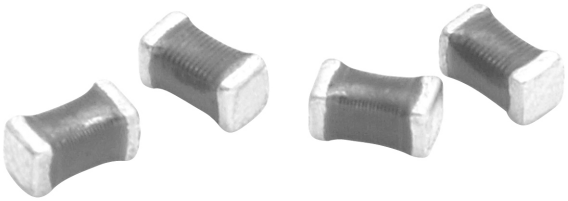
DESCRIPTION

IMC-0402	10 nH	± 5 %	ER	e4
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	M	C	0	4	0	2	E	R	1	0	N	J
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

High Frequency, Surface Mount, Laser Spiral Coated Inductors



FEATURES

- Very small in size
- High self-resonant frequency values
- High Q values relative to size at higher frequencies
- Coated coil provides protection and moisture resistance
- Compatible with vapor phase and infrared reflow soldering
- Tape and reel packaging for automatic handling, 3000/reel, EIA-481
- L and Q value not affected by mounting orientation
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 1.0 nH to 220 nH
Inductance Tolerance: ± 0.3 nH for 1.0 - 3.3 nH
± 5 % for 3.9 nH to 220 nH
Operating Temperature: - 40 °C to + 100 °C Core
Material: Ceramic

TEST EQUIPMENT

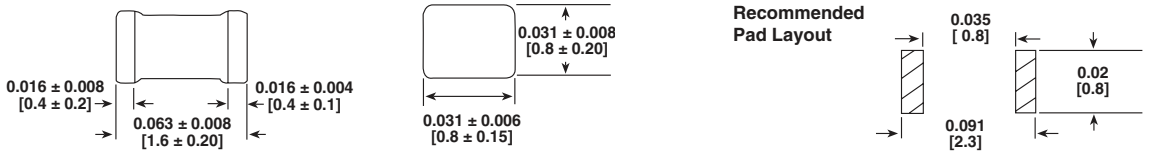
- Inductance and Q measured on HP4291B
- SRF measured on HP8753E
- DCR measured on HP4338B

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (nH)	TOLERANCE	TEST FREQ. L (MHz)	Q MINIMUM	TEST FREQ. Q (MHz)	SELF-RESONANT FREQ. MIN. (MHz)	DCR MAXIMUM (Ohms)	RATED DC CURRENT * (mA)
1.0	± 0.3 nH, 0.2 nH	100	30	1000	6000	0.06	500
1.2	± 0.3 nH, 0.2 nH	100	30	1000	6000	0.06	500
1.5	± 0.3 nH, 0.2 nH	100	30	1000	6000	0.07	500
1.8	± 0.3 nH, 0.2 nH	100	30	1000	6000	0.08	500
2.2	± 0.3 nH, 0.2 nH	100	30	1000	6000	0.09	500
2.7	± 0.3 nH, 0.2 nH	100	30	1000	6000	0.10	500
3.3	± 0.3 nH, 0.2 nH	100	30	1000	5500	0.12	500
3.9	± 5 %	100	30	1000	5500	0.15	450
4.7	± 5 %	100	30	1000	4800	0.17	450
5.6	± 5 %	100	30	1000	4600	0.18	430
6.8	± 5 %	100	30	1000	3550	0.20	430
8.2	± 5 %	100	30	1000	3500	0.28	400
10	± 5 %, 2 %	100	30	500	2800	0.32	400
12	± 5 %, 2 %	100	30	500	2800	0.35	400
15	± 5 %, 2 %	100	30	500	2500	0.41	350
18	± 5 %, 2 %	100	30	500	2300	0.45	350
22	± 5 %, 2 %	100	30	500	2000	0.50	300
27	± 5 %, 2 %	100	30	500	2000	0.55	300
33	± 5 %, 2 %	100	30	500	1800	0.60	300
39	± 5 %, 2 %	100	30	500	1800	0.80	300
47	± 5 %, 2 %	100	30	500	1800	0.95	250
56	± 5 %, 2 %	100	30	500	1800	1.20	250
68	± 5 %, 2 %	100	30	500	1500	1.30	250
82	± 5 %, 2 %	100	30	500	1500	1.50	250
100	± 5 %, 2 %	100	26	500	1300	1.80	200
120	± 5 %, 2 %	100	26	500	1200	3.00	130
150	± 5 %, 2 %	100	26	500	1100	4.50	100
180	± 5 %, 2 %	100	20	500	1000	6.5	80
220	± 5 %, 2 %	100	20	500	900	7.5	70

*Value obtained when current flows and the temperature has risen 15 °C

DIMENSIONS in inches [millimeters]



DESCRIPTION

IMC-0603	10 nH	± 5 %	ER	e4
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	M	C	0	6	0	3	E	R	1	0	N	J
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

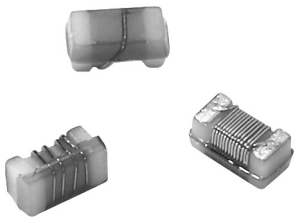
Wirewound Inductors

Contents

IMC-0402-01

Vishay Dale

Surface Mount Inductor, Wirewound



FEATURES

- Excellent solderability and resistance to soldering heat
- Suitable for reflow soldering
- High reliability and easy surface mount assembly
- Wide range of inductance values available
- Tape and reel packaging for automatic handling, 10 000/reel, EIA 481
- Lead (Pb)-free construction

Pb-free

RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 1 nH to 47 nH
Operating Temperature: - 40 °C to + 125 °C
Storage Temperature: - 40 °C to + 125 °C

TEST EQUIPMENT

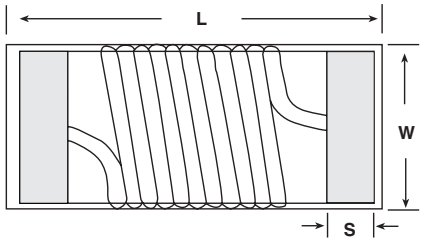
- Inductance is measured in HP-4287A RF LCR meter with HP-16193 fixture
- Q is measured in HP-4287A RF LCR meter with HP-16193 fixture
- SRF is measured in HP-8753E RF network analyzer
- DCR is measured in HP-4338B millohmeter

STANDARD ELECTRICAL SPECIFICATIONS

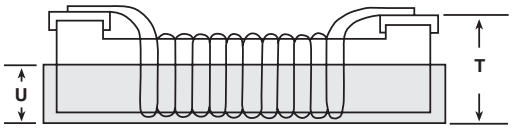
IND. (nH)	TOL.	TEST FREQ. L and Q (MHz)	Q MIN	SELF-RESONANT FREQ. MIN. (MHz)	DCR MAX. (Ohms)	*RATED DC CURRENT (mA)
1.0	± 0.3 nH, 0.2 nH	250	13	6000	0.045	1360
2.0	± 0.3 nH, 0.2 nH	250	16	6000	0.070	1040
2.2	± 0.3 nH, 0.2 nH	250	18	6000	0.070	960
3.3	± 0.3 nH, 0.2 nH	250	20	6000	0.066	840
3.6	± 0.3 nH, 0.2 nH	250	20	6000	0.066	840
3.9	± 0.3 nH, 0.2 nH	250	20	5800	0.066	840
5.1	± 10 %, 5 %	250	23	5800	0.083	800
5.6	± 10 %, 5 %	250	23	5800	0.083	760
6.2	± 10 %, 5 %	250	23	5800	0.083	760
7.5	± 10 %, 5 %	250	25	5800	0.104	680
8.2	± 10 %, 5 %	250	25	4400	0.104	680
9.0	± 10 %, 5 %	250	25	4160	0.104	680
10.0	± 5 %, 2 %	250	23	3900	0.195	480
11.0	± 5 %, 2 %	250	26	3680	0.120	640
12.0	± 5 %, 2 %	250	26	3600	0.120	640
15.0	± 5 %, 2 %	250	26	3280	0.172	560
19.0	± 5 %, 2 %	250	26	3040	0.202	480
23.0	± 5 %, 2 %	250	26	2720	0.214	400
27.0	± 5 %, 2 %	250	26	2480	0.298	400
36.0	± 5 %, 2 %	250	26	2320	0.403	320
40.0	± 5 %, 2 %	250	26	2240	0.438	320
47.0	± 5 %, 2 %	200	26	2100	0.830	150

* for a 15 °C rise.

DIMENSIONS in inches [millimeters]



L	W	S
0.039 ± 0.004 [1.00 ± 0.1]	0.022 ± 0.004 [0.55 ± 0.1]	0.008 ± 0.004 [0.20 ± 0.1]



U	T
0.010 ref. [0.25]	0.020 ± 0.004 [0.5 ± 0.1]

DESCRIPTION

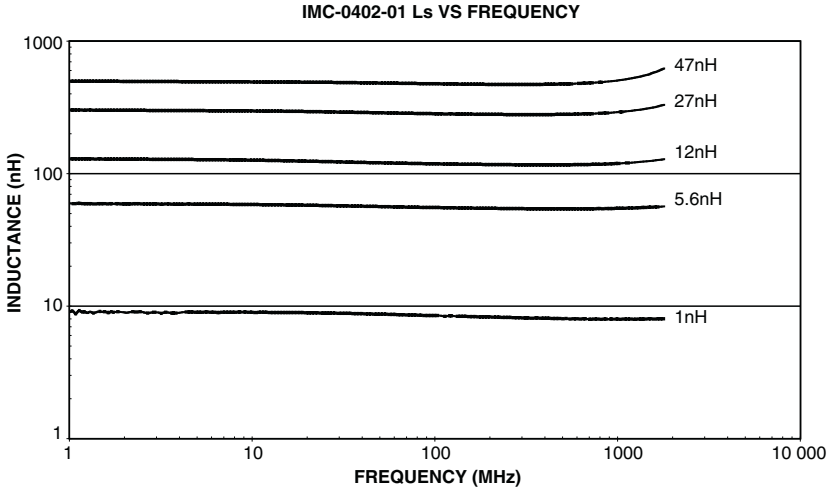
IMC-0402-01	10 nH	± 5 %	ER	e4
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD FREE STANDARD

GLOBAL PART NUMBER

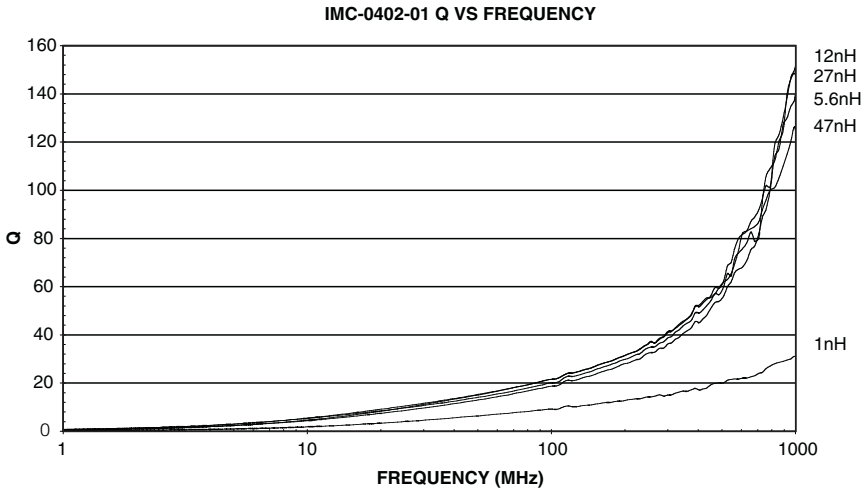
I	M	C	0	4	0	2	E	R	I	O	N	J	0	1
MODEL			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.	SERIES	

PERFORMANCE GRAPHS

IMC-0402-01

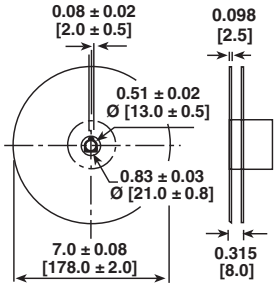


IMC-0402-01

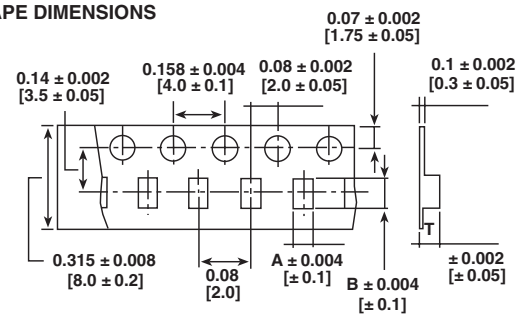


TAPE AND REEL SPECIFICATIONS in inches [millimeters]

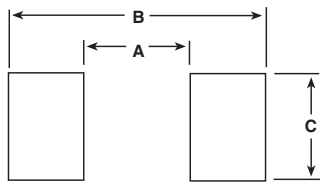
REEL DIMENSIONS



TAPE DIMENSIONS



RECOMMENDED PATTERN



MODEL	UNITS PER REEL
IMC-0402-01	10 000

MODEL	A	B	T
IMC-0402-01	0.028 [0.7]	0.047 [1.2]	0.028 [0.7]

MODEL	A	B	C
IMC-0402-01	0.018 [0.45]	0.063 [1.6]	0.256 [0.65]

IMC-0603-01

Vishay Dale

Surface Mount Inductor, Wirewound

FEATURES

- Excellent solderability and resistance to soldering heat
- Suitable for reflow soldering
- High reliability and easy surface mount assembly
- Wide range of inductance values available
- Tape and reel packaging for automatic handling, 3000/reel, EIA 481
- Lead (Pb)-free construction

Pb-free

RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 2 nH to 270 nH
Operating Temperature: - 40 °C to + 125 °C
Storage Temperature: - 40 °C to + 125 °C

TEST EQUIPMENT

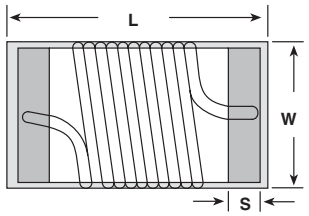
- Inductance is measured in HP-4287A RF LCR meter with HP-16193 fixture
- Q is measured in HP-4287A RF LCR meter with HP-16193 fixture
- SRF is measured in HP-8753E RF network analyzer
- DCR is measured in HP-4338B millohmeter

STANDARD ELECTRICAL SPECIFICATIONS

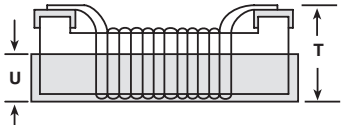
IND. (nH)	TOL.	TEST FREQ L and Q (MHz)	Q MIN	SELF-RESONANT FREQ. MIN. (MHz)	DCR MAX. (Ohms)	*RATED DC CURRENT (mA)
2.0	± 0.3 nH, 0.2 nH	250	16	6900	0.08	700
3.9	± 0.3 nH, 0.2 nH	250	22	6900	0.08	700
4.7	± 0.3 nH, 0.2 nH	250	20	5800	0.11	700
6.8	± 10 %, 5 %	250	30	5800	0.11	700
8.2	± 10 %, 5 %	250	30	4600	0.10	700
10.0	± 5 %, 2 %	250	30	4800	0.13	700
12.0	± 5 %, 2 %	250	35	4000	0.13	700
15.0	± 5 %, 2 %	250	35	4000	0.17	700
18.0	± 5 %, 2 %	250	38	3100	0.17	700
22.0	± 5 %, 2 %	250	38	3000	0.22	700
27.0	± 5 %, 2 %	250	40	2800	0.22	600
33.0	± 5 %, 2 %	250	43	2300	0.22	600
39.0	± 5 %, 2 %	250	43	2200	0.25	600
47.0	± 5 %, 2 %	200	40	2000	0.28	600
56.0	± 5 %, 2 %	200	40	1900	0.31	600
68.0	± 5 %, 2 %	200	40	1700	0.34	600
72.0	± 5 %, 2 %	150	35	1700	0.49	400
82.0	± 5 %, 2 %	150	35	1700	0.54	400
100.0	± 5 %, 2 %	150	35	1400	0.63	400
120.0	± 5 %, 2 %	150	35	1300	0.65	300
150.0	± 5 %, 2 %	150	35	1000	0.92	280
180.0	± 5 %, 2 %	100	30	1000	1.25	240
220.0	± 5 %, 2 %	100	30	1000	1.70	200
270.0	± 5 %, 2 %	100	30	1000	1.80	170

* for a 15 °C rise.

DIMENSIONS in inches [millimeters]



L	W	S
0.063 ± 0.008 [1.60 ± 0.2]	0.041 ± 0.008 [1.05 ± 0.2]	0.014 ± 0.004 [0.35 ± 0.1]



U	T
0.02 ref. [0.5]	0.041 ± 0.008 [1.05 ± 0.2]

DESCRIPTION

IMC-0603-01	10 nH	± 5 %	ER	e4
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD FREE STANDARD

GLOBAL PART NUMBER

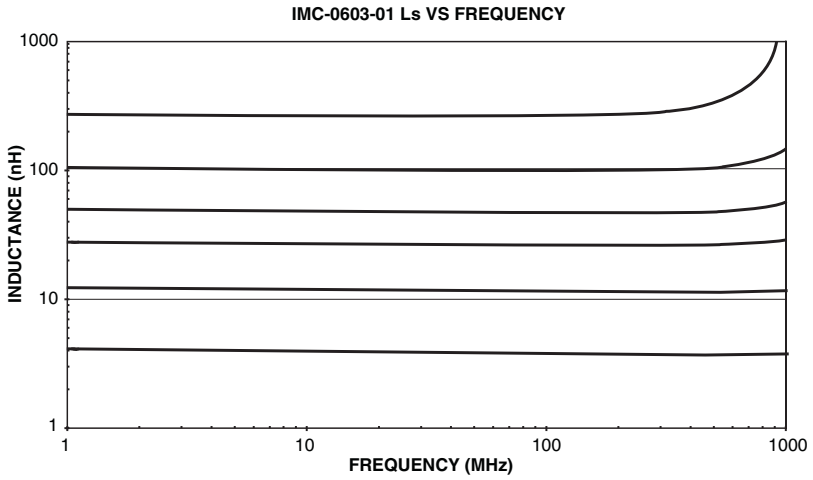
I	M	C	0	6	0	3	E	R	I	O	N	J	0	1
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.	SERIES	

For technical questions, contact: magnetics@vishay.com

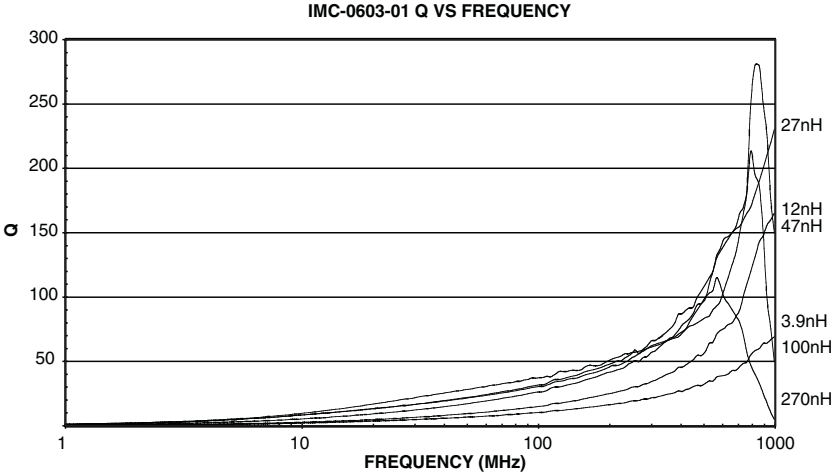
Document Number: 34164
Revision: 14-Mar-06

PERFORMANCE GRAPHS

IMC-0603-01

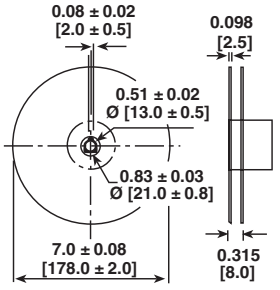


IMC-0603-01

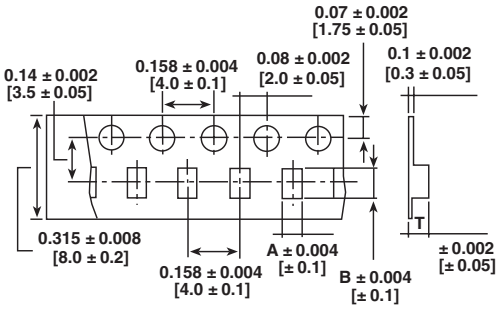


TAPE AND REEL SPECIFICATIONS in inches [millimeters]

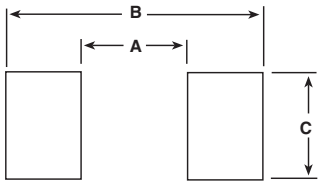
REEL DIMENSIONS



TAPE DIMENSIONS



RECOMMENDED PATTERN



MODEL	UNITS PER REEL
IMC-0603-01	3000

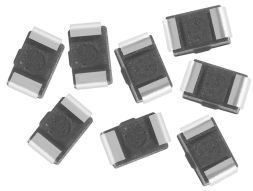
MODEL	A	B	T
IMC-0603-01	0.039 [1.0]	0.07 [1.8]	0.039 [1.0]

MODEL	A	B	C
IMC-0603-01	0.039 [1.0]	0.083 [2.1]	0.03 [0.8]

IMC-0805

Vishay Dale

High Frequency, Surface Mount, Molded Inductors



FEATURES

- High self-resonant frequency values
- High Q values at higher frequencies
- Molded construction provides superior strength and moisture resistance
- Wirewound construction
- Tape and reel packaging for automatic handling, 3000/reel, EIA481
- Compatible with vapor phase and infrared reflow soldering
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 3.9 nH to 1000 nH
Inductance Tolerance: ± 20 % for 3.9 nH to 8.2 nH
± 10 % for 6.8 nH to 1000 nH
± 5 % for 33 nH to 1000 nH
Temperature Range: - 40 °C to + 105 °C (no load). - 40 °C to + 85 °C (at full rated current)
Core Material: Non-magnetic

TEST EQUIPMENT

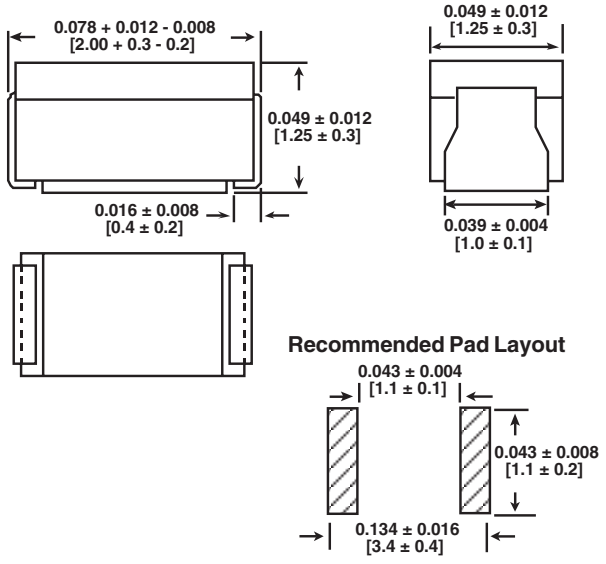
- Inductance and Q measured on HP4191A
- SRF measured on HP8753B

STANDARD ELECTRICAL SPECIFICATIONS

IND. (nH)	TOL.	TEST FREQ. L & Q (MHz)	Q MIN.	Q TYPICAL 100 MHz	Q TYPICAL 800 MHz	Q TYPICAL 1.8 GHz	SELF-RESONANT FREQ. MIN. (MHz)	DCR ± 30 % (Ohms)	RATED* DC CURRENT (mA)
10	± 10 %	100	10	22	65	110	3300	0.14	540
12	± 10 %	100	10	22	65	105	3300	0.18	535
15	± 10 %	100	12	23	70	100	3000	0.18	520
18	± 10 %	100	12	25	75	95	3000	0.22	480
22	± 10 %	100	15	25	75	80	2600	0.22	465
27	± 10 %	100	15	25	75	-	2500	0.26	455
33	± 5 %, ± 10 %	100	15	28	80	-	2050	0.30	395
39	± 5 %, ± 10 %	100	15	28	70	-	2000	0.31	390
47	± 5 %, ± 10 %	100	15	28	70	-	1650	0.35	385
56	± 5 %, ± 10 %	100	15	28	60	-	1550	0.39	360
68	± 5 %, ± 10 %	100	15	28	-	-	1450	0.44	340
82	± 5 %, ± 10 %	100	15	28	-	-	1100	0.48	330
100	± 5 %, ± 10 %	25.2	8	25	-	-	800	0.66	285
120	± 5 %, ± 10 %	25.2	8	24	-	-	600	0.76	275
150	± 5 %, ± 10 %	25.2	10	25	-	-	600	1.13	230
180	± 5 %, ± 10 %	25.2	10	25	-	-	600	1.24	195
220	± 5 %, ± 10 %	25.2	10	25	-	-	500	1.41	170
270	± 5 %, ± 10 %	25.2	10	25	-	-	300	1.50	165
330	± 5 %, ± 10 %	25.2	10	20	-	-	200	1.66	160
390	± 5 %, ± 10 %	25.2	10	20	-	-	150	1.82	150
470	± 5 %, ± 10 %	25.2	10	18	-	-	150	1.97	145
560	± 5 %, ± 10 %	25.2	10	15	-	-	100	2.07	140
680	± 5 %, ± 10 %	25.2	10	-	-	-	100	2.32	130
820	± 5 %, ± 10 %	25.2	10	-	-	-	80	2.60	125
1000	± 5 %, ± 10 %	7.96	8	-	-	-	80	2.98	120

NOTE: Tighter tolerance product may be substituted based on availability.

DIMENSIONS in inches [millimeters]



DESCRIPTION

IMC-0805	10 nH	± 5 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	M	C	0	8	0	5	E	R	I	O	N	J
MODEL			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

For technical questions, contact: magnetics@vishay.com

Document Number: 34040
Revision: 18-Mar-06

High Frequency, Surface Mount Inductor

FEATURES

- High self-resonant frequency values
- High Q values at higher frequencies
- Wirewound construction
- Tape and reel packaging for automatic handling, 2000/reel
- Compatible with vapor phase and infrared reflow soldering

Pb-free
RoHS COMPLIANT

STANDARD ELECTRICAL SPECIFICATIONS

IND. (nH)	TOL.	TEST FREQ. L (MHz)	Q MIN.	TEST FREQ. Q (MHz)	SELF-RESONANT FREQ. MIN. (MHz)	DCR MAX. (Ohms)	RATED DC CURRENT (mA)
2.2	± 0.3 nH, 0.2 nH	250	50	1000	6000	0.06	800
2.7	± 0.3 nH, 0.2 nH	250	35	1000	6000	0.08	800
3.3	± 0.3 nH, 0.2 nH	250	60	1000	6000	0.08	800
3.9	± 0.3 nH, 0.2 nH	250	60	1000	6000	0.06	600
4.7	± 0.3 nH, 0.2 nH	250	60	1000	5800	0.06	600
5.6	± 5 %, 2 %	250	60	1000	5800	0.08	600
6.8	± 5 %, 2 %	250	60	1000	5500	0.06	600
8.2	± 5 %, 2 %	250	60	1000	5500	0.06	600
10	± 5 %, 2 %	250	60	500	4800	0.08	600
12	± 5 %, 2 %	250	60	500	4100	0.08	600
15	± 5 %, 2 %	250	60	500	3600	0.08	600
18	± 5 %, 2 %	250	60	500	3400	0.08	600
22	± 5 %, 2 %	250	60	500	3300	0.10	600
27	± 5 %, 2 %	250	60	500	2600	0.12	600
33	± 5 %, 2 %	250	60	500	2400	0.15	500
39	± 5 %, 2 %	250	60	500	2100	0.18	500
47	± 5 %, 2 %	200	60	500	1700	0.15	500
56	± 5 %, 2 %	200	60	500	1600	0.25	500
68	± 5 %, 2 %	200	60	500	1450	0.27	500
82	± 5 %, 2 %	150	60	500	1350	0.32	500
100	± 5 %, 2 %	150	60	500	1200	0.43	500
120	± 5 %, 2 %	150	50	250	1100	0.48	500
150	± 5 %, 2 %	100	50	250	950	0.56	400
180	± 5 %, 2 %	100	50	250	900	0.78	400
220	± 5 %, 2 %	100	50	250	860	1.00	400
270	± 5 %, 2 %	100	45	250	850	1.46	350
330	± 5 %, 2 %	100	45	250	800	1.65	300
390	± 5 %, 2 %	100	45	250	780	2.20	210
470	± 5 %, 2 %	25.2	45	100	375	0.95	500
560	± 5 %, 2 %	25.2	45	100	340	1.10	450
680	± 5 %, 2 %	25.2	35	100	188	1.20	400
820	± 5 %, 2 %	25.2	35	100	215	1.50	300
1000	± 5 %, 2 %	25.2	35	50	200	2.13	180
1200	± 5 %, 2 %	7.96	15	7.96	200	2.38	150
1500	± 5 %, 2 %	7.96	15	7.96	200	2.90	130
1800	± 5 %, 2 %	7.96	15	7.96	120	3.00	120
2200	± 5 %, 2 %	7.96	15	7.96	110	3.10	110
2700	± 5 %, 2 %	7.96	15	7.96	100	3.50	100
3300	± 5 %, 2 %	7.96	15	7.96	70	2.30	210
3900	± 5 %, 2 %	7.96	15	7.96	60	2.50	200
4700	± 5 %, 2 %	7.96	15	7.96	50	2.80	180
5600	± 5 %, 2 %	7.96	15	7.96	45	3.00	160
6800	± 5 %, 2 %	7.96	15	7.96	45	3.20	130
8200	± 5 %, 2 %	7.96	15	7.96	40	3.50	120
10 000	± 5 %, 2 %	2.52	10	2.52	40	5.00	80

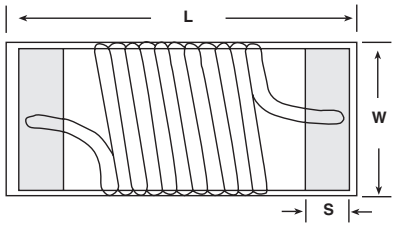
ELECTRICAL SPECIFICATIONS

Inductance Range: 2.2 nH to 10 000 nH
Inductance Tolerance: 0.3 nH for 2.2 - 4.7 nH
± 5 % for 5.6 nH to 10 000 nH
Temperature Range: - 40 °C to 125 °C
Core Material: Ceramic for 2.2 nH to 390 nH
Ferrite for 470 nH to 10 000 nH

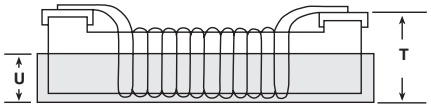
TEST EQUIPMENT

- Inductance and Q measured on HP4286A (2.2 nH - 390 nH) and HP4285A (470 nH - 10 000 nH)
- SRF measured on HP8753E
- DCR measured on HP4338B

DIMENSIONS in inches [millimeters]



L	W	S
0.079 ± 0.008 [2.00 ± 0.2]	0.050 ± 0.008 [1.25 ± 0.2]	0.016 ± 0.008 [0.40 ± 0.2]



U	T
0.02 [0.5]	0.048 ± 0.008 [1.20 ± 0.2]

DESCRIPTION

IMC-0805-01	10 nH	± 5 %	ER	e4*
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

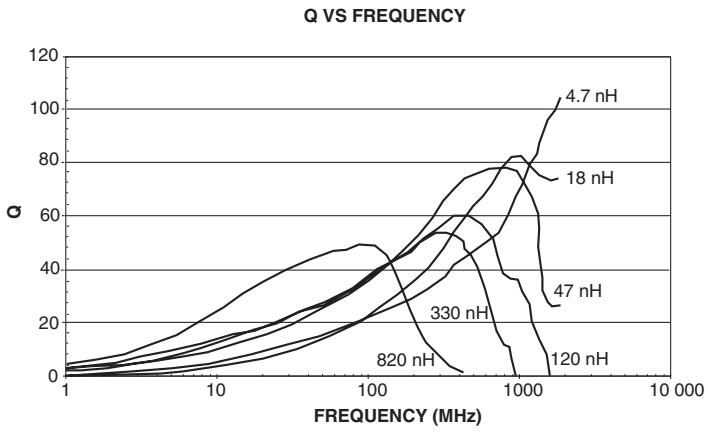
*NOTE: For parts within 2.2 nH to 390 nH please use e4 for JEDEC lead (Pb)-free standard. For parts within 470 nH to 10 000 nH please use e3 for JEDEC lead (Pb)-free standard.

GLOBAL PART NUMBER

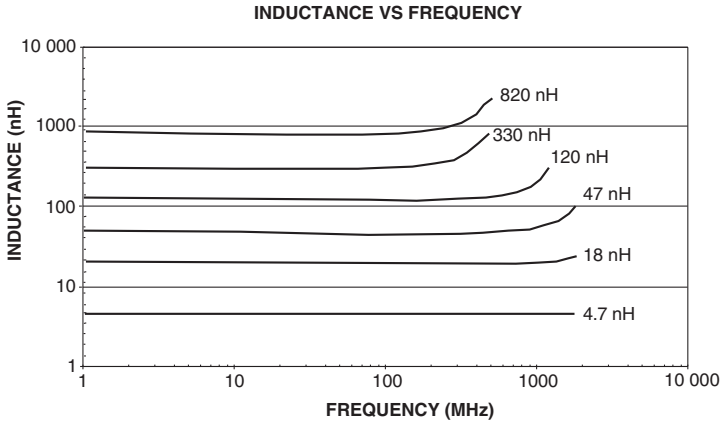
I	M	C	0	8	0	5	E	R	I	O	N	J	0	1
MODEL			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.	SERIES	

PERFORMANCE GRAPHS

IMC-0805-01

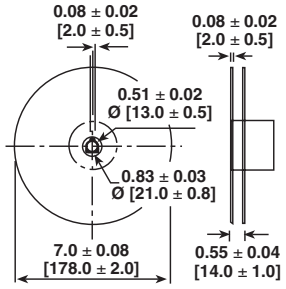


IMC-0805-01

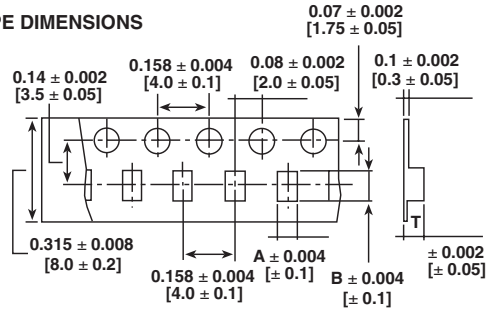


TAPE AND REEL SPECIFICATIONS in inches [millimeters]

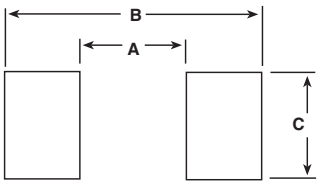
REEL DIMENSIONS



TAPE DIMENSIONS



RECOMMENDED PATTERN

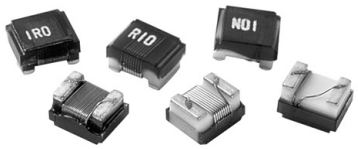


MODEL	UNITS PER REEL
IMC-0805-01	2000

MODEL	A	B	T
IMC-0805-01	0.055 [1.4]	0.091 [2.3]	0.055 [1.4]

MODEL	A	B	C
IMC-0805-01	0.047 [1.20]	0.102 [2.6]	0.047 [1.20]

High Frequency, Surface Mount Inductor



FEATURES

- High self-resonant frequency values
- High Q values at higher frequencies
- Wirewound construction
- Tape and reel packaging for automatic handling, 2000/reel
- Compatible with vapor phase and infrared reflow soldering

Pb-free

RoHS COMPLIANT

STANDARD ELECTRICAL SPECIFICATIONS

IND. (nH)	TOL.	TEST FREQ. L (MHz)	Q MIN.	TEST FREQ. Q (MHz)	SELF-RESONANT FREQ. MIN. (MHz)	DCR MAX. (Ohms)	RATED DC CURRENT (mA)
3.3	0.3 nH	100	50	1000	6000	0.06	1000
6.8	± 5 %	100	50	1000	5500	0.06	1000
8.2	± 5 %	100	50	1000	5500	0.06	1000
10	± 5 %	100	50	1000	4300	0.08	1000
12	± 5 %	100	60	500	3600	0.08	1000
15	± 5 %	100	60	500	2700	0.08	1000
18	± 5 %	100	60	350	2700	0.10	1000
22	± 5 %	100	60	350	2500	0.10	1000
27	± 5 %	100	60	350	1800	0.10	1000
33	± 5 %	100	60	350	1700	0.10	1000
39	± 5 %	100	60	350	1500	0.10	1000
47	± 5 %	100	60	350	1500	0.10	1000
56	± 5 %	100	60	350	1350	0.12	1000
68	± 5 %	100	60	350	1300	0.15	1000
82	± 5 %	100	60	350	1100	0.18	1000
100	± 5 %	100	60	350	1100	0.18	1000
120	± 5 %	25	45	100	950	0.20	800
150	± 5 %	25	45	100	880	0.22	800
180	± 5 %	25	45	100	800	0.33	800
220	± 5 %	25	45	100	730	0.45	800
270	± 5 %	25	45	100	650	0.75	600
330	± 5 %	25	45	100	570	0.90	500
390	± 5 %	25	45	100	530	1.06	470
470	± 5 %	25	45	100	480	1.17	420
560	± 5 %	25	45	100	430	1.50	310
680	± 5 %	25	45	100	380	2.06	230
750	± 5 %	25	45	100	360	2.20	200
820	± 5 %	25	45	100	350	2.30	180
910	± 5 %	25	45	100	330	3.18	150
1000	± 5 %	25	35	50	310	3.30	120
1200	± 5 %	7.96	20	7.96	280	1.30	230
1500	± 5 %	7.96	20	7.96	250	1.65	220
1800	± 5 %	7.96	20	7.96	200	2.20	210
2200	± 5 %	7.96	20	7.96	160	2.35	200
2700	± 5 %	7.96	20	7.96	130	2.60	195
3300	± 5 %	7.96	20	7.96	80	2.85	185
3900	± 5 %	7.96	20	7.96	50	4.00	180
4700	± 5 %	7.96	20	7.96	45	4.30	175
5600	± 5 %	7.96	20	7.96	42	2.60	170
6800	± 5 %	7.96	20	7.96	39	2.80	165
8200	± 5 %	7.96	20	7.96	36	3.05	160
10 000	± 5 %	2.52	15	2.52	33	3.50	150
12 000	± 5 %	2.52	15	2.52	30	3.60	140
15 000	± 5 %	2.52	15	2.52	26	4.00	130
18 000	± 5 %	2.52	15	2.52	24	4.50	120
22 000	± 5 %	2.52	15	2.52	22	4.80	110
27 000	± 5 %	2.52	15	2.52	21	5.30	95
33 000	± 5 %	2.52	15	2.52	20	6.10	85
39 000	± 5 %	2.52	15	2.52	18	8.30	60
47 000	± 5 %	2.52	15	2.52	17	12.00	45

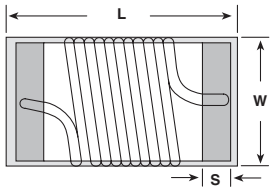
ELECTRICAL SPECIFICATIONS

Inductance Range: 3.3 nH to 47 000 nH **Inductance Tolerance:** 0.3 nH for 3.3 nH
± 5 % for 6.8 nH to 47 000 nH
Operating Temperature: - 40 °C to 125 °C
Core Material: Ceramic from 3.3 nH to 1000 nH
Ferrite from 1200 nH to 47 000 nH

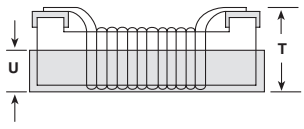
TEST EQUIPMENT

- Inductance and Q measured on HP4286A
- SRF measured on HP8753D

DIMENSIONS in inches [millimeters]



L	W	S
0.098 ± 0.012 [2.50 ± 0.3]	0.079 ± 0.012 [2.00 ± 0.3]	0.020 ± 0.008 [0.5 ± 0.2]



U	T
0.02 [0.5]	0.063 ± 0.012 [1.60 ± 0.3]

DESCRIPTION

IMC-1008	10 nH	± 5 %	ER	e4*
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

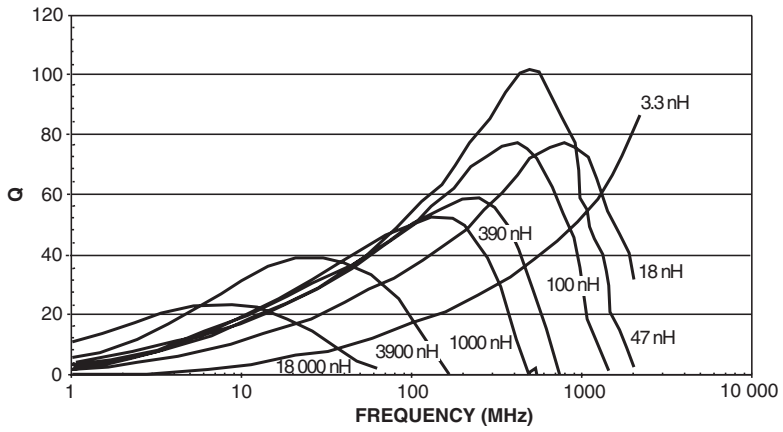
*NOTE: For parts within 3.3 nH to 910 nH please use e4 for JEDEC lead free standard. For parts within 1 µH to 47 µH please use e3 for JEDEC lead free standard.

GLOBAL PART NUMBER

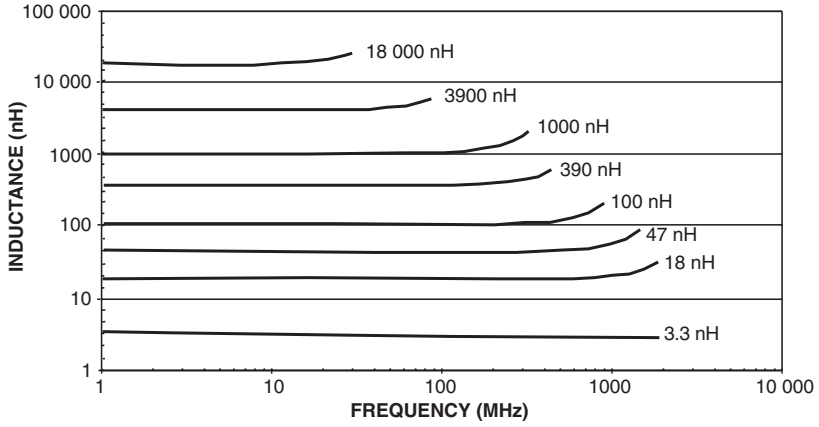
I	M	C	1	0	0	8	E	R	I	O	N	J
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

PERFORMANCE GRAPHS

IMC-1008

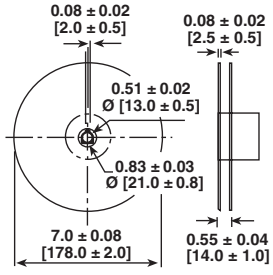


IMC-1008

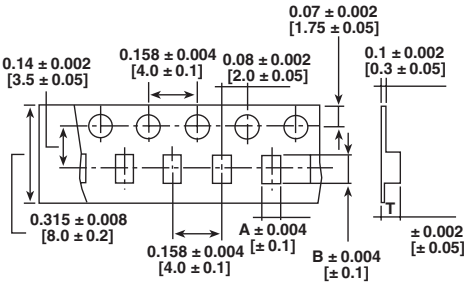


TAPE AND REEL SPECIFICATIONS in inches [millimeters]

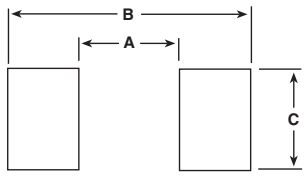
REEL DIMENSIONS



TAPE DIMENSIONS



RECOMMENDED PATTERN

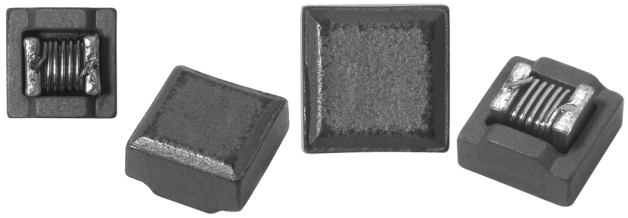


MODEL	UNITS PER REEL
IMC-1008	2000

MODEL	A	B	T
IMC-1008	0.087 [2.2]	0.110 [2.80]	0.071 [1.8]

MODEL	A	B	C
IMC-1008	0.047 [1.20]	0.150 [3.8]	0.100 [2.54]

Surface Mount Wirewound Shielded Inductor



FEATURES

- Excellent solderability and resistance to soldering heat
- Suitable for reflow soldering
- High reliability and easy surface mount assembly
- Wide range of inductance values available
- Tape and reel packaging for automatic handling, 750/reel, EIA 481
- 100 % Lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

STANDARD ELECTRICAL SPECIFICATIONS

IND. (µH) at 100 kHz	TOL.	Q MIN. at 1 MHz	SELF-RESONANT FREQ. MIN. (MHz)	DCR MAX. (Ohms)	*RATED DC CURRENT (mA)
1.0	± 20 %	35	344	0.05	1000
1.5	± 20 %	35	260	0.06	800
1.8	± 20 %	35	225	0.09	680
2.7	± 20 %	38	185	0.14	650
3.9	± 20 %	38	175	0.26	650
4.7	± 20 %	38	160	0.35	500
5.6	± 20 %	38	150	0.40	450
6.8	± 20 %	38	120	0.60	400
10	± 20 %	38	100	0.95	250
15	± 20 %	38	35	1.15	220
22	± 20 %	40	26	1.40	180
33	± 20 %	45	20	1.60	150
39	± 20 %	45	14	1.85	130
47	± 20 %	45	14	2.50	110
68	± 20 %	45	12	3.80	100
82	± 20 %	45	9.0	4.20	100
100	± 20 %	45	7.0	5.80	80
120	± 20 %	45	6.0	6.20	60
150	± 20 %	40	5.6	7.50	50
220	± 20 %	40	4.0	10.0	50
330	± 20 %	40	3.8	11.5	50
470	± 20 %	35	2.0	16.5	50
560	± 20 %	35	2.0	18.0	30
680	± 20 %	30	1.8	24.0	30
820	± 20 %	30	1.5	26.0	30
1000	± 20 %	30	1.3	30.0	30

*For 15 °C rise

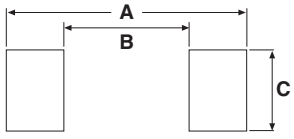
ELECTRICAL SPECIFICATIONS

Inductance Range: 1 µH to 1000 µH
Operating Temperature: - 40 °C to 85 °C
Storage Temperature: - 40 °C to 125 °C
Material: Ferrite with magnetic shield

TEST EQUIPMENT

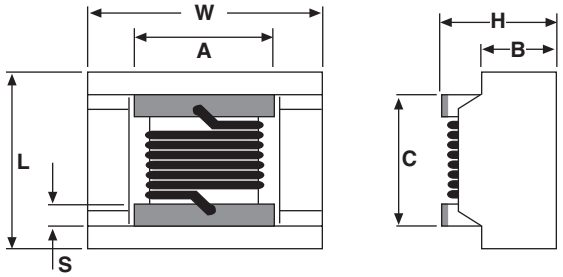
- Inductance and Q is measured in HP-4286A RF LCR meter with HP-16193 fixture
- SRF is measured in HP-8753E RF network analyzer
- DCR is measured in HP-4338B millohmeter

RECOMMENDED PATTERN



A	B	C
0.128 [3.25]	0.049 [1.25]	0.098 [2.50]

DIMENSIONS in inches [millimeters]



LENGTH (L)	WIDTH (W)	HEIGHT (H)	TERMINAL (S)
0.142 ± 0.008 [3.60 ± 0.2]	0.142 ± 0.008 [3.60 ± 0.2]	0.098 ± 0.008 [2.50 ± 0.2]	0.020 ± 0.004 [0.50 ± 0.1]

A	B	C
0.080 ± 0.004 [2.00 ± 0.1]	0.063 ± 0.008 [1.60 ± 0.2]	0.098 ± 0.004 [2.50 ± 0.1]

DESCRIPTION

ISC-1008	10 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

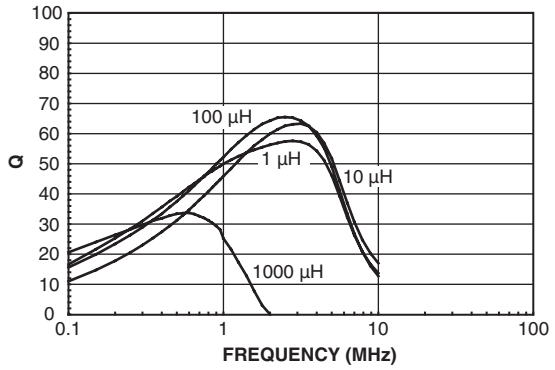
GLOBAL PART NUMBER

I	S	C	1	0	0	8	E	R	1	0	0	M
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

PERFORMANCE GRAPHS

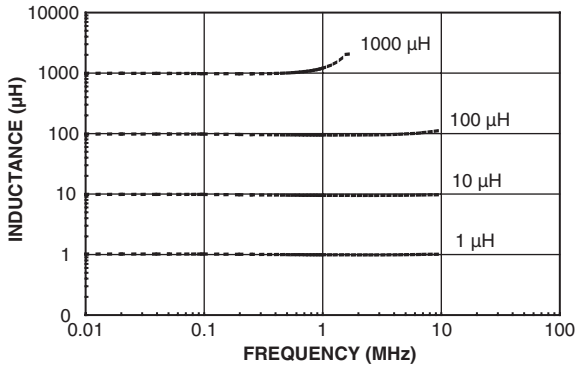
ISC-1008

Q vs FREQUENCY



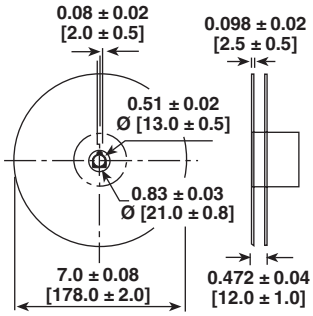
ISC-1008

INDUCTANCE vs FREQUENCY

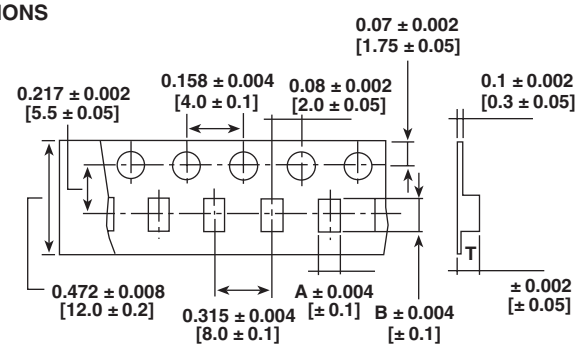


TAPE AND REEL SPECIFICATIONS in inches [millimeters]

REEL DIMENSIONS

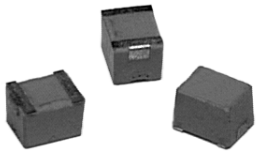


TAPE DIMENSIONS



MODEL	UNITS PER REEL	MODEL	A	B	T
ISC-1008	750	**ISC-1008**	0.150 [3.8]	0.157 [4.0]	0.098 [2.5]

Surface Mount, Molded Inductor



STANDARD ELECTRICAL SPECIFICATIONS

IND. (µH)	TOL.	Q MIN.	TEST FREQ. L & Q (MHz)	SELF-RESONANT FREQ. MIN. (MHz)	DCR MAX. (Ohms)	RATED* DC CURRENT (mA)
0.010	± 20 %	30	50.0	1000	0.13	734
0.012	± 20 %	30	50.0	1000	0.14	707
0.015	± 20 %	30	50.0	1000	0.16	661
0.018	± 20 %	30	50.0	1000	0.18	624
0.022	± 20 %	30	50.0	1000	0.20	592
0.027	± 20 %	30	50.0	1000	0.22	564
0.033	± 20 %	30	50.0	1000	0.24	540
0.039	± 20 %	30	50.0	1000	0.27	530
0.047	± 20 %	30	50.0	1000	0.30	483
0.056	± 20 %	30	50.0	1000	0.33	470
0.068	± 20 %	30	50.0	1000	0.36	450
0.082	± 20 %	30	50.0	900	0.40	450
0.10	± 20 %	30	50.0	700	0.44	450
0.12	± 20 %	30	25.2	500	0.22	584
0.15	± 20 %	30	25.2	450	0.25	548
0.18	± 20 %	30	25.2	400	0.28	518
0.22	± 20 %	30	25.2	350	0.32	484
0.27	± 20 %	30	25.2	320	0.36	456
0.33	± 20 %	30	25.2	300	0.40	453
0.39	± 20 %	30	25.2	250	0.45	450
0.47	± 20 %	30	25.2	220	0.50	450
0.56	± 20 %	30	25.2	180	0.55	450
0.68	± 20 %	30	25.2	160	0.60	450
0.82	± 20 %	30	25.2	140	0.67	450
1.0	± 10 %	30	7.96	120	0.70	400
1.2	± 10 %	30	7.96	100	0.75	390
1.5	± 10 %	30	7.96	85.0	0.85	370
1.8	± 10 %	30	7.96	80.0	0.90	350
2.2	± 10 %	30	7.96	75.0	1.0	320
2.7	± 10 %	30	7.96	70.0	1.1	290
3.3	± 10 %	30	7.96	60.0	1.2	260
3.9	± 10 %	30	7.96	55.0	1.3	250
4.7	± 10 %	30	7.96	50.0	1.5	224
5.6	± 10 %	30	7.96	45.0	1.6	217
6.8	± 10 %	30	7.96	40.0	1.8	204
8.2	± 10 %	30	7.96	38.0	2.0	194
10.0	± 10 %	30	2.52	33.0	2.1	189
12.0	± 10 %	30	2.52	30.0	2.5	173
15.0	± 10 %	30	2.52	21.0	2.8	164
18.0	± 10 %	30	2.52	20.0	3.3	151
22.0	± 10 %	30	2.52	19.0	3.7	145
27.0	± 10 %	30	2.52	18.0	5.0	122
33.0	± 10 %	30	2.52	16.0	6.0	112
39.0	± 10 %	30	2.52	15.0	7.0	104
47.0	± 10 %	30	2.52	14.0	9.0	91
56.0	± 10 %	30	2.52	12.0	10.0	87
68.0	± 10 %	30	2.52	11.0	11.0	83
82.0	± 10 %	30	2.52	10.0	12.0	79
100.0	± 10 %	20	0.796	9.0	14.0	73
120.0	± 10 %	15	0.796	8.0	11.0	70
150.0	± 10 %	15	0.796	6.5	15.0	65
180.0	± 10 %	15	0.796	6.0	17.0	60
220.0	± 10 %	15	0.796	6.0	21.0	50

*Rated DC Current based on the maximum temperature rise, not to exceed 40 °C at + 85 °C ambient.

FEATURES

- Printed marking
- Compatible with vapor phase and infrared reflow soldering
- Molded construction provides superior strength and moisture resistance
- Tape and reel packaging for automatic handling, 2000/reel, EIA 481
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

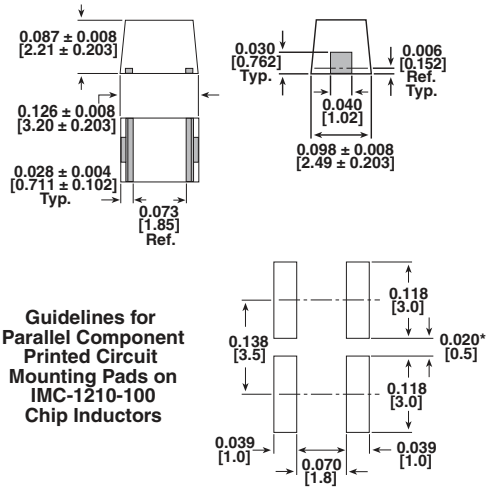
ELECTRICAL SPECIFICATIONS

Inductance Range: 0.01 µH to 220 µH
Inductance Tolerance: ± 20 % for 0.01 µH to 0.82 µH ± 10 % for 1.0 µH to 220 µH standard. Special tolerances available
Temperature Range: - 55 °C to + 125 °C
Coilform Material: Non-magnetic for 0.01 µH to 0.10 µH Powdered Iron for 0.12 µH to 100 µH. Ferrite for 120 µH through 220 µH

TEST EQUIPMENT

- H/P 4342A Q meter with Vishay Dale test fixture or equivalent
- H/P 4191A RF Impedance Analyzer (for SRF measurements)
- Wheatstone bridge

DIMENSIONS in inches [millimeters]



*Recommended spacing between components

PART MARKING

- Vishay Dale
- Inductance value
- Date code

DESCRIPTION

IMC-1210	10 µH	± 10 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)FREE STANDARD

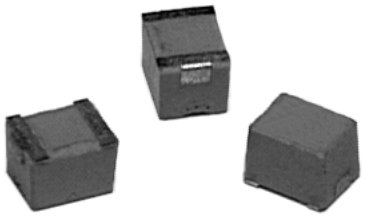
GLOBAL PART NUMBER

I	M	C	1	2	1	0	E	R	1	0	0	K
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

IMC-1210-100

Vishay Dale

Surface Mount, Molded Inductor



FEATURES

- Molded construction provides superior strength and moisture resistance
- Tape and reel packaging for automatic handling, 2000/reel, EIA 481
- Printed marking
- Compatible with vapor phase and infrared reflow soldering
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

STANDARD ELECTRICAL SPECIFICATIONS

IND. (µH)	Q MIN.	TEST FREQ. L & Q (MHz)	SELF-RESONANT FREQ. MIN. (MHz)	DCR MAX. (Ohms)	RATED DC CURRENT (mA)
0.010	15	100.0	2500*	0.13	734
0.012	17	100.0	2300*	0.14	707
0.015	19	100.0	2100*	0.16	661
0.018	21	100.0	1900*	0.18	624
0.022	23	100.0	1700*	0.20	592
0.027	23	100.0	1500*	0.22	564
0.033	25	100.0	1400*	0.24	540
0.039	25	100.0	1300*	0.27	530
0.047	26	100.0	1200*	0.30	483
0.056	26	100.0	1100*	0.33	470
0.068	27	100.0	1000	0.36	450
0.082	27	100.0	900	0.40	450
0.100	28	100.0	700	0.44	450

*All SRF values above 1000 MHz are typical minimums

PART MARKING

- Vishay Dale
- Inductance value
- Date code

ELECTRICAL SPECIFICATIONS

Inductance Tolerance: ± 20 % for 0.010 µH to 0.100 µH standard. ± 10 % for 0.010 µH to 0.100 µH and ± 5 % for 0.027 µH to 0.100 µH optional

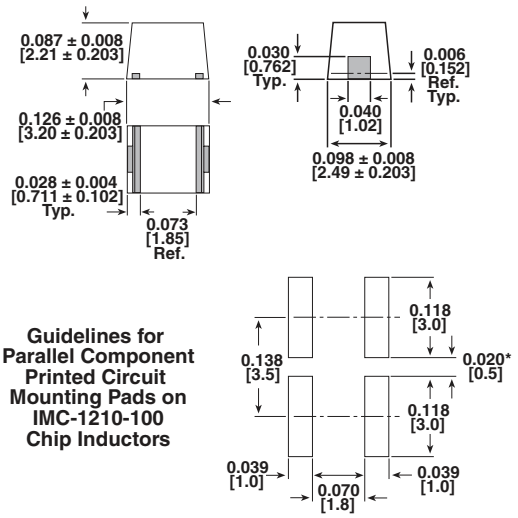
Temperature Range: - 55 °C to + 125 °C

Core Material: Non-magnetic for 0.010 µH to 0.100 µH

TEST EQUIPMENT

- L, Q, SRF: H/P 4191A RF Impedance Analyzer
- DCR: Wheatstone bridge or equivalent

DIMENSIONS in inches [millimeters]



*Recommended minimum spacing between components

DESCRIPTION

IMC-1210-100	0.010 µH	± 20 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I M C	1 2 1 0	E R	1 0 N	M	1 0 0
PRODUCT FAMILY	SIZE	PACKAGE CODE	INDUCTANCE VALUE	TOL.	SERIES

For technical questions, contact: magnetics@vishay.com

Document Number: 34042
Revision: 16-Jan-06

Surface Mount, Molded, Shielded Inductor

FEATURES

- Molded construction provides superior strength and moisture resistance
- Tape and reel packaging for automatic handling, 2000/reel, EIA 481
- Compatible with vapor phase, infrared and wave soldering methods
- Shielded construction minimizes coupling to other components
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 0.01 µH to 100 µH
Inductance Tolerance: ± 20 % for 0.01 µH to 0.82 µH
± 10 % for 1.0 µH to 100 µH standard. 3 % and 5 % tolerances available
Temperature Range: - 55 °C to + 125 °C
Coilform Material: Non-magnetic for 0.01 µH to 0.10 µH
Powdered Iron for 0.12 µH to 100 µH

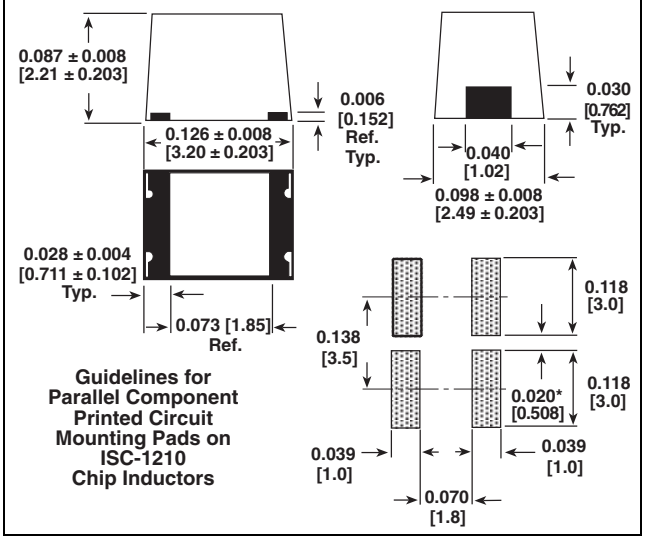
TEST EQUIPMENT

- H/P 4342A Q meter with Vishay Dale test fixture or equivalent
- H/P 4191A RF Impedance Analyzer (for SRF measurements)
- Wheatstone Bridge

STANDARD ELECTRICAL SPECIFICATIONS

IND. (µH)	TOL.	Q MIN.	TEST FREQ. L & Q (MHz)	SELF-RESONANT FREQ. MIN. (MHz)	DCR MAX. (Ohms)	RATED* DC CURRENT (mA)
0.010	± 20 %	50	50	1000	0.10	810
0.012	± 20 %	50	50	1000	0.11	750
0.015	± 20 %	50	50	1000	0.12	720
0.018	± 20 %	50	50	1000	0.13	690
0.022	± 20 %	45	50	1000	0.15	640
0.027	± 20 %	45	50	1000	0.17	610
0.033	± 20 %	45	50	1000	0.18	585
0.039	± 20 %	40	50	1000	0.24	530
0.047	± 20 %	40	50	1000	0.26	495
0.056	± 20 %	40	50	1000	0.28	485
0.068	± 20 %	40	50	1000	0.35	475
0.082	± 20 %	38	50	900	0.45	460
0.10	± 20 %	36	50	700	0.50	450
0.12	± 20 %	40	25.2	500	0.20	630
0.15	± 20 %	40	25.2	470	0.20	600
0.18	± 20 %	40	25.2	400	0.24	580
0.22	± 20 %	40	25.2	330	0.30	565
0.27	± 20 %	40	25.2	310	0.33	500
0.33	± 20 %	40	25.2	280	0.36	475
0.39	± 20 %	40	25.2	230	0.40	465
0.47	± 20 %	40	25.2	220	0.44	460
0.56	± 20 %	40	25.2	200	0.46	455
0.68	± 20 %	40	25.2	180	0.48	450
0.82	± 20 %	40	25.2	160	0.50	450
1.0	± 10 %	30	7.96	120	0.60	400
1.2	± 10 %	30	7.96	110	0.65	390
1.5	± 10 %	30	7.96	90.0	0.75	370
1.8	± 10 %	30	7.96	85.0	0.85	350
2.2	± 10 %	30	7.96	65.0	0.90	320
2.7	± 10 %	30	7.96	60.0	1.00	290
3.3	± 10 %	30	7.96	60.0	1.10	270
3.9	± 10 %	30	7.96	58.0	1.20	250
4.7	± 10 %	30	7.96	52.0	1.25	220
5.6	± 10 %	30	7.96	50.0	1.40	210
6.8	± 10 %	30	7.96	40.0	1.60	205
8.2	± 10 %	30	7.96	35.0	1.65	195
10.0	± 10 %	30	2.52	30.0	2.00	185
12.0	± 10 %	30	2.52	24.0	2.30	175
15.0	± 10 %	30	2.52	20.0	2.50	165
18.0	± 10 %	30	2.52	17.0	2.70	155
22.0	± 10 %	30	2.52	16.0	3.10	150
27.0	± 10 %	30	2.52	14.5	3.30	125
33.0	± 10 %	30	2.52	14.5	5.10	115
39.0	± 10 %	30	2.52	14.0	5.90	105
47.0	± 10 %	30	2.52	13.0	8.00	100
56.0	± 10 %	30	2.52	11.5	10.0	95
68.0	± 10 %	30	2.52	11.0	10.0	90
82.0	± 10 %	30	2.52	11.0	11.0	85
100.0	± 10 %	30	0.796	6.0	12.0	80

DIMENSIONS in inches [millimeters]



*Recommended minimum spacing between components.

PART MARKING

- Dale
- Inductance value
- Date code

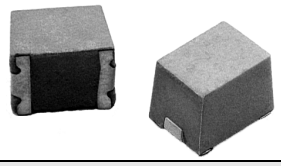
DESCRIPTION

ISC-1210	10 µH	± 10 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	S	C	1	2	1	0	E	R	1	0	0	K
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

Surface Mount, Molded Inductor



STANDARD ELECTRICAL SPECIFICATIONS

IND. (µH)	TOL.	Q MIN.	TEST FREQ. L & Q (MHz)	SELF-RESONANT FREQ. MIN. (MHz)	DCR MAX. (Ohms)	RATED* DC CURRENT (mA)
0.010	± 20 %	50	50.0	1000	0.20	450
0.012	± 20 %	50	50.0	1000	0.20	450
0.018	± 20 %	50	50.0	1000	0.20	450
0.022	± 20 %	50	50.0	1000	0.20	450
0.027	± 20 %	50	50.0	1000	0.20	450
0.033	± 20 %	50	50.0	1000	0.30	450
0.039	± 20 %	50	50.0	1000	0.30	450
0.047	± 20 %	50	50.0	1000	0.30	450
0.056	± 20 %	40	50.0	900	0.35	450
0.068	± 20 %	40	50.0	800	0.35	450
0.082	± 20 %	40	50.0	700	0.40	450
0.10	± 20 %	30	25.2	650	0.32	450
0.12	± 20 %	30	25.2	600	0.30	450
0.15	± 20 %	30	25.2	500	0.30	450
0.18	± 20 %	30	25.2	400	0.35	450
0.22	± 20 %	30	25.2	350	0.40	450
0.27	± 20 %	30	25.2	300	0.45	450
0.33	± 20 %	30	25.2	250	0.55	430
0.39	± 20 %	30	25.2	220	0.70	380
0.47	± 10 %	30	25.2	190	0.80	355
0.56	± 10 %	30	25.2	170	1.20	285
0.68	± 10 %	30	25.2	150	1.40	270
0.82	± 10 %	30	25.2	140	1.60	250
1.0	± 10 %	50	7.96	100	0.50	450
1.2	± 10 %	50	7.96	80.0	0.55	430
1.5	± 10 %	50	7.96	70.0	0.60	410
1.8	± 10 %	50	7.96	60.0	0.65	390
2.2	± 10 %	50	7.96	55.0	0.70	380
2.7	± 10 %	50	7.96	50.0	0.75	370
3.3	± 10 %	50	7.96	45.0	0.80	355
3.9	± 10 %	50	7.96	40.0	0.90	330
4.7	± 10 %	50	7.96	35.0	1.00	315
5.6	± 10 %	50	7.96	33.0	1.10	300
6.8	± 10 %	50	7.96	27.0	1.20	285
8.2	± 10 %	50	7.96	25.0	1.40	270
10.0	± 10 %	50	2.52	20.0	1.60	250
12.0	± 10 %	50	2.52	18.0	2.00	225
15.0	± 10 %	50	2.52	17.0	2.50	200
18.0	± 10 %	50	2.52	15.0	2.80	190
22.0	± 10 %	50	2.52	13.0	3.20	180
27.0	± 10 %	50	2.52	12.0	3.60	170
33.0	± 10 %	50	2.52	11.0	4.00	160
39.0	± 10 %	50	2.52	11.0	4.50	150
47.0	± 10 %	50	2.52	10.0	5.00	140
56.0	± 10 %	50	2.52	9.0	5.50	135
68.0	± 10 %	50	2.52	9.0	6.00	130
82.0	± 10 %	50	2.52	8.0	7.00	120
100.0	± 10 %	40	0.79	8.0	8.00	110
120.0	± 10 %	40	0.79	6.0	8.00	110
150.0	± 10 %	40	0.79	5.0	9.00	105
180.0	± 10 %	40	0.79	5.0	9.50	102
220.0	± 10 %	40	0.79	4.0	10.0	100
270.0	± 10 %	40	0.79	4.0	12.0	92
330.0	± 10 %	40	0.79	3.5	14.0	85
390.0	± 10 %	40	0.79	3.0	16.0	80
470.0	± 10 %	40	0.79	3.0	26.0	62
560.0	± 10 %	30	0.79	3.0	30.0	50
680.0	± 10 %	30	0.79	3.0	30.0	50
820.0	± 10 %	30	0.79	2.5	35.0	30
1000.0	± 10 %	30	0.25	2.5	40.0	30

FEATURES

- Molded construction provides superior strength and moisture resistance
- Tape and reel packaging for automatic handling, 2000/reel, EIA 481
- Printed marking
- Compatible with vapor phase and infrared reflow soldering
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance Range: 0.010 µH to 1000 µH

Inductance Tolerance: ± 20 % for 0.010 µH to 0.39 µH
± 10 % for 0.47 µH to 1000 µH standard
± 10 %, ± 5 %, ± 3 % available

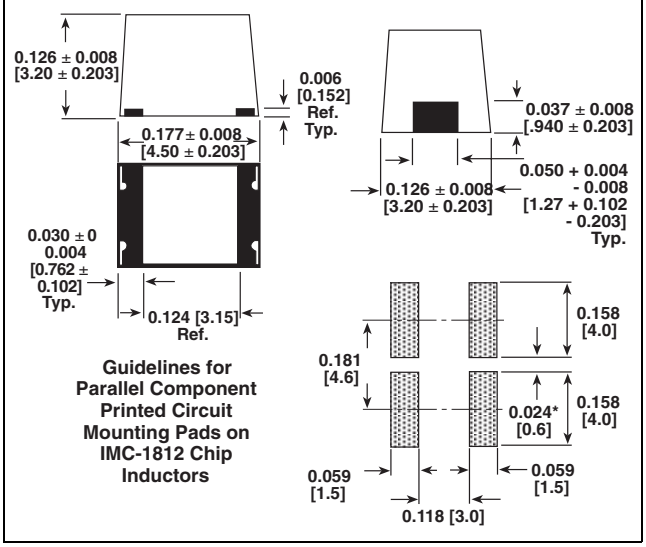
Temperature Range: - 55 °C to + 125 °C

Coilform Material: Non-magnetic for 0.010 µH to 0.82 µH
Powdered Iron for 1.0 µH to 120 µH. Ferrite for 150 µH to 1000 µH

TEST EQUIPMENT

- H/P 4342A Q meter with Vishay Dale test fixture or equivalent
- H/P 4191A RF Impedance Analyzer (for SRF measurements)
- Wheatstone bridge

DIMENSIONS in inches [millimeters]



Guidelines for Parallel Component Printed Circuit Mounting Pads on IMC-1812 Chip Inductors

* Recommended minimum spacing between components

PART MARKING

- Vishay Dale
- Inductance value
- Date code

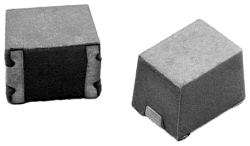
DESCRIPTION

IMC-1812	10 µH	± 10 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD FREE STANDARD

GLOBAL PART NUMBER

I	M	C	1	8	1	2	E	R	1	0	0	K
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

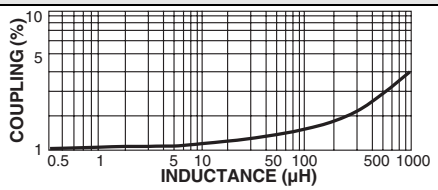
Surface Mount, Molded, Shielded Inductors



STANDARD ELECTRICAL SPECIFICATIONS

IND. (µH)	TOL.	Q MIN.	TEST FREQ. L & Q (MHz)	SELF-RESONANT FREQ. MIN. (MHz)	DCR MAX. (Ohms)	RATED* DC CURRENT (mA)
0.10	± 20 %	30	25.2	460	0.23	552
0.12	± 20 %	30	25.2	400	0.26	519
0.15	± 20 %	30	25.2	390	0.29	491
0.18	± 20 %	30	25.2	350	0.32	468
0.22	± 20 %	30	25.2	310	0.36	441
0.27	± 20 %	30	25.2	280	0.40	418
0.33	± 20 %	30	25.2	240	0.45	394
0.39	± 20 %	30	25.2	215	0.60	342
0.47	± 20 %	30	25.2	205	0.75	306
0.56	± 20 %	30	25.2	195	0.80	296
0.68	± 20 %	30	25.2	165	0.95	271
0.82	± 20 %	30	25.2	155	1.20	242
1.0	± 10 %	30	7.96	140	0.35	447
1.2	± 10 %	30	7.96	120	0.38	429
1.5	± 10 %	30	7.96	100	0.40	418
1.8	± 10 %	30	7.96	90.0	0.43	403
2.2	± 10 %	30	7.96	80.0	0.46	390
2.7	± 10 %	30	7.96	67.0	0.49	378
3.3	± 10 %	30	7.96	61.0	0.55	357
3.9	± 10 %	30	7.96	56.0	0.59	344
4.7	± 10 %	30	7.96	50.0	0.62	336
5.6	± 10 %	30	7.96	40.0	0.69	333
6.8	± 10 %	30	7.96	32.0	0.75	306
8.2	± 10 %	30	7.96	30.0	0.82	292
10.0	± 10 %	50	2.52	25.0	0.90	279
12.0	± 10 %	50	2.52	22.0	1.0	265
15.0	± 10 %	50	2.52	18.0	1.10	252
18.0	± 10 %	50	2.52	15.0	1.24	238
22.0	± 10 %	50	2.52	14.0	1.36	227
27.0	± 10 %	50	2.52	13.0	1.56	212
33.0	± 10 %	50	2.52	12.0	1.72	202
39.0	± 10 %	50	2.52	11.0	1.89	192
47.0	± 10 %	50	2.52	9.0	2.10	183
56.0	± 10 %	50	2.52	8.0	2.34	173
68.0	± 10 %	50	2.52	7.6	2.60	164
82.0	± 10 %	50	2.52	7.2	2.86	156
100.0	± 10 %	50	0.796	7.0	3.25	147
120.0	± 10 %	50	0.796	6.0	3.64	139
150.0	± 10 %	50	0.796	5.0	4.16	130
180.0	± 10 %	40	0.796	4.5	5.72	111
220.0	± 10 %	40	0.796	4.2	6.30	105
270.0	± 10 %	40	0.796	4.0	6.90	101
330.0	± 10 %	40	0.796	3.7	7.54	96
390.0	± 10 %	40	0.796	3.5	8.20	92
470.0	± 10 %	40	0.796	3.3	9.20	87
560.0	± 10 %	40	0.796	2.8	10.50	82
680.0	± 10 %	40	0.796	2.6	12.0	76
820.0	± 10 %	40	0.796	2.2	13.50	72
1000.0	± 10 %	40	0.252	2.0	16.0	66

COUPLING SPECIFICATIONS [maximum]



FEATURES

- Molded construction provides superior strength and moisture resistance
- Tape and reel packaging for automatic handling, 2000/reel, EIA 481
- Compatible with vapor phase and infrared reflow soldering
- Shielded construction minimizes coupling to other components
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

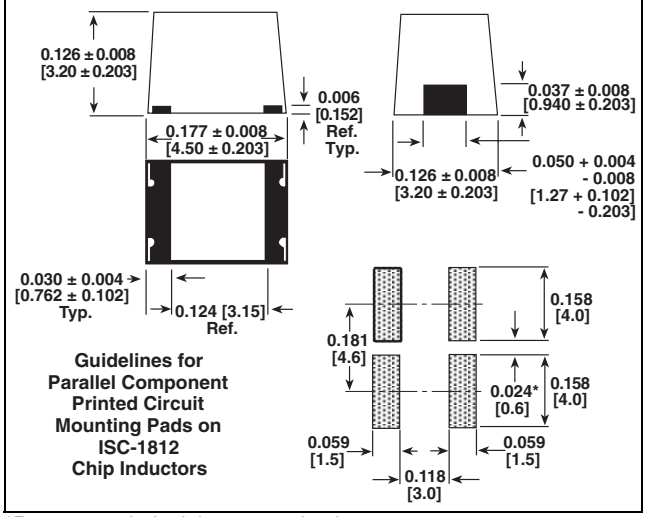
ELECTRICAL SPECIFICATIONS

Inductance Range: 0.10 µH to 1000 µH
Inductance Tolerance: ± 20 % for 0.10 µH to 0.82 µH
± 10 % for 1.0 µH to 1000 µH standard
± 10 %, ± 5 % and ± 3 % available
Temperature Range: - 55 °C to + 125 °C
Coilform Material: Non-Magnetic for 0.10 µH to 0.82 µH
Powdered iron for 1.0 µH to 22 µH. Ferrite for 27 µH to 1000 µH

TEST EQUIPMENT

- H/P 4342A Q-meter with Vishay Dale test fixture or equivalent
- H/P 4191A RF Impedance Analyzer (for SRF measurements)
- Wheatstone bridge

DIMENSIONS in inches [millimeters]



*Recommended minimum spacing between components

PART MARKING

- Vishay Dale
- Inductance value
- Date code

DESCRIPTION

ISC-1812	10 µH	± 10 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	S	C	1	8	1	2	E	R	1	0	0	K
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

IMCH-1812

Vishay Dale

Surface Mount, Molded Inductors

FEATURES

- Molded construction provides superior strength and moisture resistance
- Tape and reel packaging for automatic handling, 500/reel, EIA-481
- Compatible with vapor phase, infrared and wave soldering methods

Pb-free

RoHS COMPLIANT

STANDARD ELECTRICAL SPECIFICATIONS

IND. (µH)	TOL.*	Q MIN.	TEST FREQ. L & Q (MHz)	SELF-RESONANT FREQ. MIN. (MHz)	DCR MAX. (Ohms)	RATED* DC CURRENT (mA)
1.0	± 10 %	10	7.96	200	0.11	1050
1.2	± 10 %	10	7.96	160	0.12	1000
1.5	± 10 %	10	7.96	130	0.15	950
1.8	± 10 %	10	7.96	100	0.16	900
2.2	± 10 %	10	7.96	60.0	0.18	850
2.7	± 10 %	10	7.96	60.0	0.20	800
3.3	± 10 %	10	7.96	45.0	0.22	750
3.9	± 10 %	10	7.9	40.0	0.24	700
4.7	± 10 %	10	7.96	35.0	0.3	650
5.6	± 10 %	10	7.96	30.0	0.3	650
6.8	± 10 %	10	7.96	28.0	0.4	600
8.2	± 10 %	10	7.96	25.0	0.4	600
10	± 10 %	10	2.52	22.0	0.5	550
12	± 10 %	10	2.52	21.0	0.6	500
15	± 10 %	10	2.52	20.0	0.7	450
18	± 10 %	10	2.52	19.0	0.8	400
22	± 10 %	10	2.52	18.0	0.9	370
27	± 10 %	10	2.52	16.0	1.2	330
33	± 10 %	10	2.52	14.0	1.4	300
39	± 10 %	10	2.52	12.0	1.6	280
47	± 10 %	10	2.52	11.5	1.9	260
56	± 10 %	10	2.52	11.0	2.2	240
68	± 10 %	10	2.52	10.0	2.6	220
82	± 10 %	10	2.52	9.0	3.5	200
100	± 10 %	20	0.796	8.0	4.0	180
120	± 10 %	20	0.796	6.5	4.5	160
150	± 10 %	20	0.796	7.0	6.5	140
180	± 10 %	20	0.796	5.5	7.5	120
220	± 10 %	20	0.796	5.5	9	120
270	± 10 %	20	0.796	5.0	11	100
330	± 10 %	20	0.796	4.0	13	90

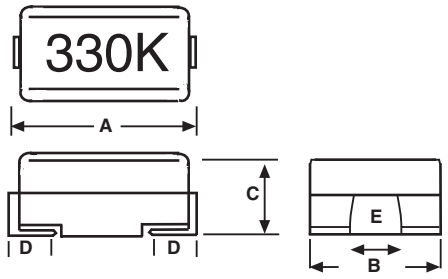
ELECTRICAL SPECIFICATIONS

Inductance: 1 uH to 330 uH
Inductance Tolerance: ± 10 %
Operating Temperature: - 25 °C to 85 °C Storage
Temperature: - 40 °C to + 100 °C

TEST EQUIPMENT

L & Q: H/P 4285A
SRF: H/P 4286A
DCR: H/P 34401

DIMENSIONS in inches [millimeters]



A	B	C
0.177 ± 0.012 [4.5 ± 0.3]	0.126 ± 0.008 [3.2 ± 0.2]	0.126 ± 0.008 [3.2 ± 0.2]
D	**E**	
0.035 ± 0.008 [0.9 ± 0.2]	0.055 ± 0.008 [1.4 ± 0.2]	

EIA PART MARKING

- Inductance Value

DESCRIPTION

IMCH-1812	22 µF	± 10 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	M	C	H	1	8	1	2	E	R	2	2	0	K
MODEL				SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.

For technical questions, contact: magnetics@vishay.com

Document Number: 34152
Revision: 18-Mar-06

Surface Mount, Molded Inductors

FEATURES

- Molded construction provides superior strength and moisture resistance
- Tape and reel packaging for automatic handling, 1000/reel, EIA-481
- Compatible with vapor phase infrared and wave soldering methods, (100 % tin plating)
- Lead (Pb)-free terminations and RoHS compliant

Pb-free

RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Inductance: 1.0 uH to 10 000 uH
Inductance Tolerance: ± 10 %, ± 5 %
Operating Temperature: - 25 °C to 85 °C
Storage Temperature: - 40 °C to + 100 °C

TEST EQUIPMENT

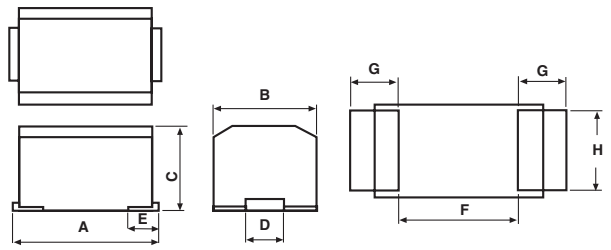
L & Q: H/P 4191
SRF: H/P 3577
DCR: H/P 34401

STANDARD ELECTRICAL SPECIFICATIONS

IND. (µH)	TOL.	Q MIN.	TEST FREQ. L & Q (MHz)	SELF-RESONANT FREQ. MIN. (MHz)	DCR MAX. (Ohms)	RATED* DC CURRENT (mA)
1.0	± 10 %	10	7.96	95.0	0.030	1800
1.2	± 10 %	10	7.96	70.0	0.035	1700
1.5	± 10 %	10	7.96	55.0	0.040	1600
1.8	± 10 %	10	7.96	47.0	0.050	1400
2.2	± 10 %	10	7.96	42.0	0.060	1300
2.7	± 10 %	10	7.96	37.0	0.070	1200
3.3	± 10 %	10	7.96	34.0	0.080	1120
3.9	± 10 %	10	7.96	32.0	0.090	1050
4.7	± 10 %	10	7.96	29.0	0.110	950
5.6	± 10 %	10	7.96	26.0	0.130	880
6.8	± 10 %	10	7.96	24.0	0.150	810
8.2	± 10 %	10	7.96	22.0	0.180	750
10	± 10 %	10	2.52	19.0	0.210	690
12	± 10 %	10	2.52	17.0	0.250	630
15	± 10 %	10	2.52	16.0	0.300	580
18	± 10 %	10	2.52	14.0	0.360	530
22	± 10 %	10	2.52	13.0	0.430	480
27	± 10 %	10	2.52	11.5	0.520	440
33	± 10 %	10	2.52	10.5	0.620	400
39	± 10 %	10	2.52	9.5	0.720	370
47	± 10 %	10	2.52	8.5	0.850	340
56	± 10 %	10	2.52	7.8	1.00	310
68	± 10 %	10	2.52	7.0	1.20	290
82	± 10 %	10	2.52	6.4	1.40	270
100	± 10 %	20	0.796	6.0	1.60	250
120	± 10 %	20	0.796	5.4	1.90	230
150	± 10 %	20	0.796	4.8	2.20	210
180	± 10 %	20	0.796	4.4	2.80	190
220	± 10 %	20	0.796	3.9	3.40	170
270	± 10 %	20	0.796	3.6	4.20	155
330	± 10 %	20	0.796	3.2	4.90	140
390	± 10 %	20	0.796	2.9	5.80	130
470	± 10 %	20	0.796	2.6	7.00	120
560	± 10 %	20	0.796	2.4	8.50	110
680	± 10 %	20	0.796	2.2	10.0	100
820	± 10 %	20	0.796	2.0	13.0	90
1000	± 10 %	20	0.252	1.8	15.0	85
1200	± 5 %	30	0.252	1.5	17.0	75
1500	± 5 %	30	0.252	1.4	20.0	70
1800	± 5 %	30	0.252	1.3	30.0	60
2200	± 5 %	30	0.252	1.2	35.0	55
2700	± 5 %	30	0.252	1.1	55.0	45
3300	± 5 %	30	0.252	1.0	60.0	40
3900	± 5 %	30	0.252	1.0	70.0	38
4700	± 5 %	30	0.252	0.9	78.0	36
5600	± 5 %	30	0.252	0.8	85.0	33
6800	± 5 %	30	0.252	0.7	110.0	30
8200	± 5 %	30	0.252	0.6	125.0	28
10000	± 5 %	20	0.0796	0.5	150.0	25

*Special tolerances available on request

DIMENSIONS in inches [millimeters]



A	B	C	D
0.221 ± 0.012 [5.6 ± 0.3]	0.197 ± 0.012 [5.0 ± 0.3]	0.197 ± 0.012 [5.0 ± 0.3]	0.083 ± 0.001 [2.1 ± 0.2]
E	**F**	**G**	**H**
0.051 ± 0.001 [1.3 ± 0.2]	0.1182 [3.0]	0.1024 [2.6]	0.1773 [4.5]

EIA PART MARKING

- Inductance Value

DESCRIPTION

IMC-2220	22 µH	± 10 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	M	C	2	2	2	0	E	R	2	2	0	K
MODEL			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL

Common Mode Chokes

Contents

ICM-0805

Vishay Dale

Surface Mount Common Mode Choke

FEATURES

- Operating temperature - 40 °C to + 85 °C
- Excellent solderability and resistance to soldering heat
- Suitable for flow and reflow soldering
- High reliability and easy surface mount assembly
- Lead (Pb)-free construction

Pb-free

RoHS COMPLIANT

APPLICATIONS

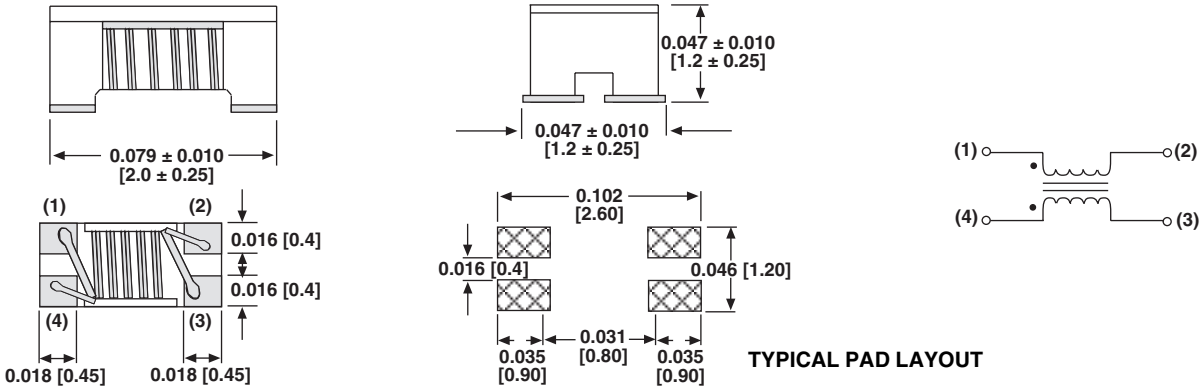
- USB2.0 and IEEE1394
- Notebook and Personal Computer
- Digital Camera
- Scanner

STANDARD ELECTRICAL SPECIFICATIONS

COMMON MODE[1] IMPEDANCE (Ω) AT 100 MHz, ± 20 %	RATED VOLTAGE V (DC)	WITHSTANDING VOLTAGE V (DC)	RATED[2] CURRENT MAX (mA)	DC RESISTANCE MAX (Ω)	INSULATION RESISTANCE MIN (MΩ)
30	50	125	450	0.20	10
67	50	125	400	0.25	10
90	50	125	330	0.35	10
120	50	125	370	0.30	10
160	50	125	350	0.35	10
180	50	125	330	0.35	10
260	50	125	300	0.40	10
370	50	125	280	0.45	10

1. Impedance is measured in HP4287A at frequency of 100 MHz.
2. For 15 °C rise.

DIMENSIONS in inches [millimeters]



DESCRIPTION

ICM-0805	120	20 %	ER	e3
MODEL	IMPEDANCE VALUE	TOLERANCE	PACKAGE CODE	JEDEC LEAD FREE STANDARD

GLOBAL PART NUMBER

I	C	M	0	8	0	5	E	R	1	2	1	M
MODEL			SIZE				PACKAGE CODE		IMPEDANCE			TOLERANCE

For technical questions, contact: magnetics@vishay.com

Document Number: 34159
Revision: 01-Mar-06

Surface Mount Common Mode Choke

FEATURES

- Operating temperature - 40 °C to + 85 °C
- Excellent solderability and resistance to soldering heat
- Suitable for flow and reflow soldering
- High reliability and easy surface mount assembly
- Lead (Pb)-free construction

RoHS COMPLIANT

APPLICATIONS

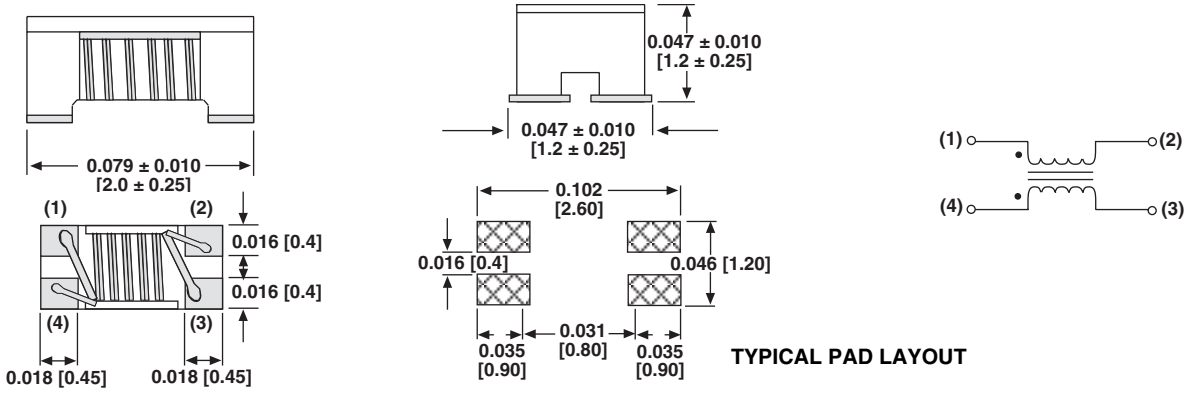
- USB2.0 and IEEE1394
- Notebook and Personal Computer
- Digital Camera
- Scanner

STANDARD ELECTRICAL SPECIFICATIONS

COMMON MODE[1] IMPEDANCE (Ω) AT 100 MHz, ± 20 %	RATED VOLTAGE V (DC)	WITHSTANDING VOLTAGE V (DC)	RATED[2] CURRENT MAX (mA)	DC RESISTANCE MAX (Ω)	INSULATION RESISTANCE MIN (MΩ)
90	50	125	370	0.3	10
160	50	125	340	0.4	10
260	50	125	310	0.5	10
600	50	125	260	0.8	10
1000	50	125	230	1.0	10
2200	50	125	200	1.2	10

1. Impedance is measured in HP4287A at frequency of 100 MHz.
2. For 15 °C rise.

DIMENSIONS in inches [millimeters]



DESCRIPTION

ICM-1206	600	20 %	ER	e3
MODEL	IMPEDANCE VALUE	TOLERANCE	PACKAGE CODE	JEDEC LEAD FREE STANDARD

GLOBAL PART NUMBER

I	C	M	1	2	0	6	E	R	6	0	1	M
MODEL			SIZE				PACKAGE CODE		IMPEDANCE			TOLERANCE

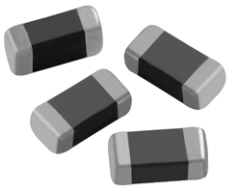
Multilayer Ferrite Inductors and Beads

Contents

ILSB-0603

Vishay Dale

Monolithic Chip Inductors



FEATURES

- High reliability
- Surface mountable
- Magnetically self shielded
- Nickel barrier plating virtually eliminates silver migration
- 100 % Lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

MECHANICAL SPECIFICATIONS

Solderability: 90 % coverage after 5 second dip in 235 °C solder following 60 second preheat at 120 °C to 150 °C and type R flux dip

Resistance To Solder Heat: 10 seconds in 260 °C solder after preheat and flux per above

Termination: 100 % Sn

Terminal Strength: 0.5 kg for 30 seconds

Beam Strength: 0.3 kg

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: - 55 °C to + 125 °C

Thermal Shock: - 40 °C to + 85 °C

Humidity: 90 % RH at 40 °C, 1000 hours at full rated current

Load Life: 85 °C for 1000 hours full rated current

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (µH) ± 10 %	TOLERANCE	THICKNESS "D" Inches [mm]	Q (Min.)	TEST FREQUENCY L & Q (MHz)	MIN. SELF- RESONANT FREQUENCY (MHz)	MAX. DCR (Ohms)	RATED (mA)
0.047	± 20 %	0.031 ± 0.008 [0.80 ± 0.2]	10	50	260	0.15	50
0.068	± 20 %	0.031 ± 0.008 [0.80 ± 0.2]	10	50	250	0.25	50
0.082	± 20 %	0.031 ± 0.008 [0.80 ± 0.2]	10	50	245	0.25	50
0.10	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	15	25	276	0.50	50
0.12	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	15	25	236	0.50	50
0.15	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	15	25	207	0.60	50
0.18	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	15	25	190	0.60	50
0.22	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	15	25	173	0.80	50
0.27	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	15	25	157	0.80	50
0.33	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	15	25	144	0.85	35
0.39	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	15	25	127	1.00	35
0.47	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	15	25	121	1.35	35
0.56	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	15	25	110	1.55	35
0.68	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	15	25	104	1.70	35
0.82	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	15	25	98	2.10	35
1.0	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	35	10	87	0.60	25
1.2	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	35	10	74	0.80	25
1.5	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	35	10	69	0.80	25
1.8	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	35	10	64	0.95	25
2.2	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	35	10	58	1.15	15
2.7	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	35	10	52	1.35	15
3.3	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	35	10	46	1.55	15
3.9	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	35	10	41	1.70	15
4.7	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	35	10	38	2.10	15
5.6	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	30	4.0	22	1.55	15
6.8	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	30	4.0	20	1.70	15
8.2	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	30	4.0	18	2.10	15
10.0	± 10 %	0.031 ± 0.008 [0.80 ± 0.2]	30	2.0	17	2.55	15

DESCRIPTION

ILSB-0603	3.3 µH	± 10 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

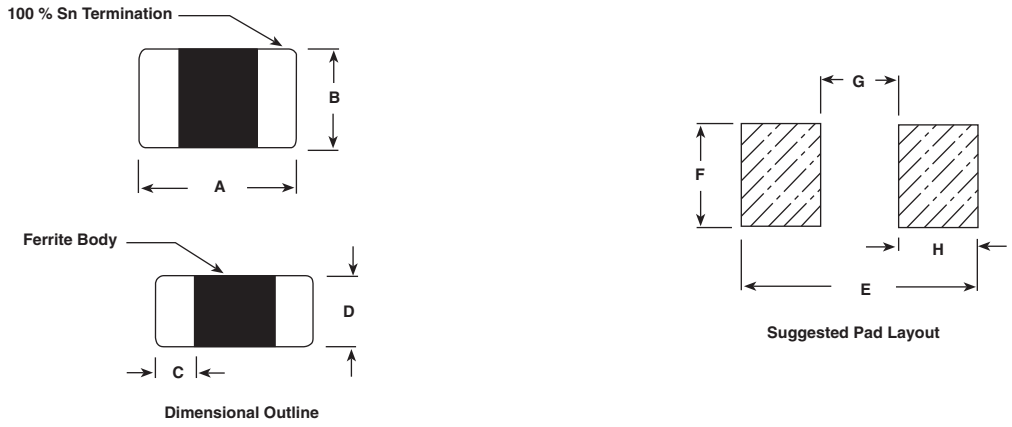
GLOBAL PART NUMBER

I	L	S	B	0	6	0	3	E	R	3	R	3	K
MODEL				SIZE				PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE

For technical questions, contact: magnetics@vishay.com

Document Number: 34027
Revision: 19-Jun-06

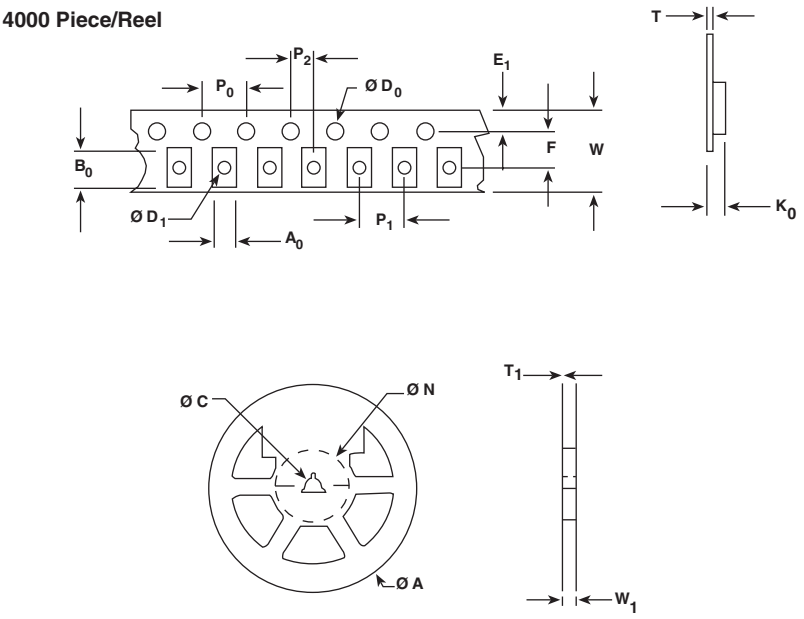
DIMENSIONS in inches [millimeters]



A	B	C	D	E	F	G	H
0.063 ± 0.006 [1.6 ± 0.15]	0.031 ± 0.006 [0.8 ± 0.15]	0.012 ± 0.006 [0.3 ± 0.15]	0.031 ± 0.008 [0.8 ± 0.2]	0.105 [2.7]	0.035 [0.9]	0.025 [0.64]	0.040 [1.0]

TAPE AND REEL SPECIFICATIONS 0603 SIZE PER EIA-481-1 in inches [millimeters]

4000 Piece/Reel

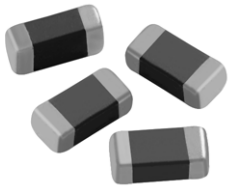


A_0	0.045 ± 0.004 [1.14 ± 0.1]
B_0	0.068 ± 0.004 [1.75 ± 0.1]
D_0	0.059 ± 0.005/ -0.000 [1.5 ± 0.127]
D_1	0.039 Min. [1.0 Min.]
E_1	0.069 ± 0.004 [1.75 ± 0.1]
F	0.138 ± 0.002 [3.50 ± 0.05]
K_0	0.045 ± 0.002 [1.15 ± 0.05]
P_0	0.157 ± 0.004 [4.00 ± 0.1]
P_1	0.157 ± 0.004 [4.00 ± 0.1]
P_2	0.079 ± 0.002 [2.00 ± 0.05]
W	0.327 Max. [8.3 Max.]
T	0.008 ± 0.002 [0.2 ± 0.05]
A	7.000 ± 0.079 [178 ± 2.0]
N	2.500 [63.5]
C	0.512 ± 0.020 [13.00 ± 0.05]
W_1	0.315 + 0.059/- 0.00 [8.00 ± 1.5]
T_1	0.079 ± 0.002 [2.00 ± 0.05]

ILSB-0805

Vishay Dale

Monolithic Chip Inductors



FEATURES

- High reliability
- Surface mountable
- Magnetically self shielded
- Nickel barrier plating virtually eliminates silver migration
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

MECHANICAL SPECIFICATIONS

Solderability: 90 % coverage after 5 second dip in 235 °C solder following 60 second preheat at 120 °C to 150 °C and type R flux dip

Resistance To Solder Heat: 10 seconds in 260 °C solder after preheat and flux per above

Termination: 100 % Sn

Terminal Strength: 0.6 kg for 30 seconds

Beam Strength: 1.0 kg

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: - 55 °C to + 125 °C

Thermal Shock: - 40 °C to + 85 °C

Humidity: 90 % RH at 40 °C, 1000 hours at full rated current

Load Life: 85 °C for 1000 hours full rated current

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (µH) ± 10 %	TOLERANCE	THICKNESS "D" Inches [mm]	Q (Min.)	TEST FREQUENCY L & Q (MHz)	MIN. SELF- RESONANT FREQUENCY (MHz)	MAX. DCR (Ohms)	RATED DC CURRENT (mA)
0.047	± 20 %	0.035 ± 0.008 [0.90 ± 0.2]	15	50	320	0.20	300
0.056	± 20 %	0.035 ± 0.008 [0.90 ± 0.2]	15	50	300	0.20	300
0.068	± 20 %	0.035 ± 0.008 [0.90 ± 0.2]	15	50	280	0.20	300
0.082	± 20 %	0.035 ± 0.008 [0.90 ± 0.2]	15	50	255	0.20	300
0.10	± 10 %	0.035 ± 0.008 [0.90 ± 0.2]	20	25	279	0.30	250
0.12	± 10 %	0.035 ± 0.008 [0.90 ± 0.2]	20	25	253	0.30	250
0.15	± 10 %	0.035 ± 0.008 [0.90 ± 0.2]	20	25	230	0.40	250
0.18	± 10 %	0.035 ± 0.008 [0.90 ± 0.2]	20	25	213	0.40	250
0.22	± 10 %	0.035 ± 0.008 [0.90 ± 0.2]	20	25	196	0.50	250
0.27	± 10 %	0.035 ± 0.008 [0.90 ± 0.2]	20	25	173	0.50	250
0.33	± 10 %	0.035 ± 0.008 [0.90 ± 0.2]	20	25	167	0.55	250
0.39	± 10 %	0.035 ± 0.008 [0.90 ± 0.2]	25	25	156	0.65	200
0.47	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	25	25	144	0.65	200
0.56	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	25	25	133	0.75	150
0.68	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	25	25	121	0.80	150
0.82	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	25	25	115	1.00	150
1.0	± 10 %	0.035 ± 0.008 [0.90 ± 0.2]	45	10	87	0.40	50
1.2	± 10 %	0.035 ± 0.008 [0.90 ± 0.2]	45	10	75	0.50	50
1.5	± 10 %	0.035 ± 0.008 [0.90 ± 0.2]	45	10	69	0.50	50
1.8	± 10 %	0.035 ± 0.008 [0.90 ± 0.2]	45	10	64	0.60	50
2.2	± 10 %	0.035 ± 0.008 [0.90 ± 0.2]	45	10	58	0.65	30
2.7	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	45	10	52	0.75	30
3.3	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	45	10	48	0.80	30
3.9	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	45	10	44	0.90	30
4.7	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	45	10	41	1.00	30
5.6	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	45	4	37	0.90	15
6.8	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	45	4	34	1.00	15
8.2	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	45	4	30	1.10	15
10.0	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	50	2	28	1.15	15
12.0	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	50	2	26	1.25	15
15.0	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	30	1	22	0.80	5
18.0	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	30	1	21	0.90	5
22.0	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	30	1	19	1.10	5
27.0	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	30	1	17	1.15	5
33.0	± 10 %	0.049 ± 0.008 [1.25 ± 0.2]	30	0.4	13	1.25	5

DESCRIPTION

ILSB-0805	3.3 µH	± 10 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

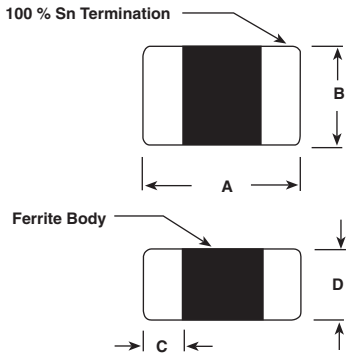
GLOBAL PART NUMBER

I	L	S	B	0	8	0	5	E	R	3	R	3	K
MODEL				SIZE				PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE

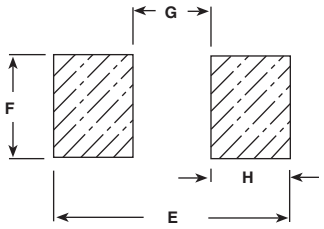
For technical questions, contact: magnetics@vishay.com

Document Number: 34028
Revision: 19-Jun-06

DIMENSIONS in inches [millimeters]



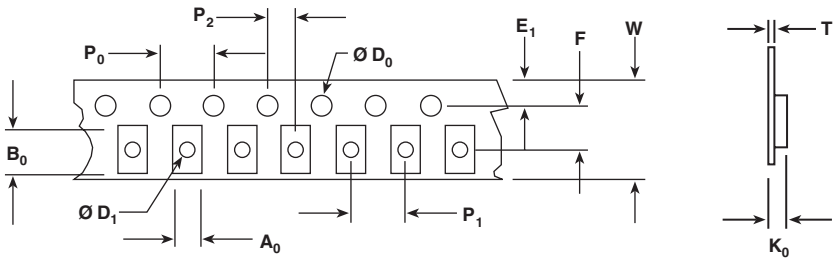
Dimensional Outline

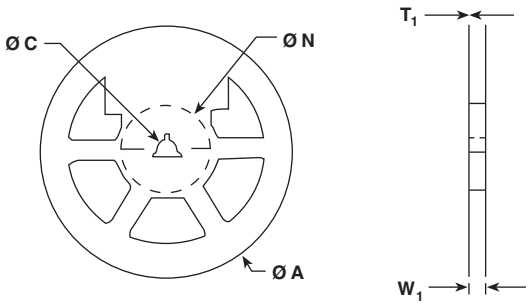


Suggested Pad Layout

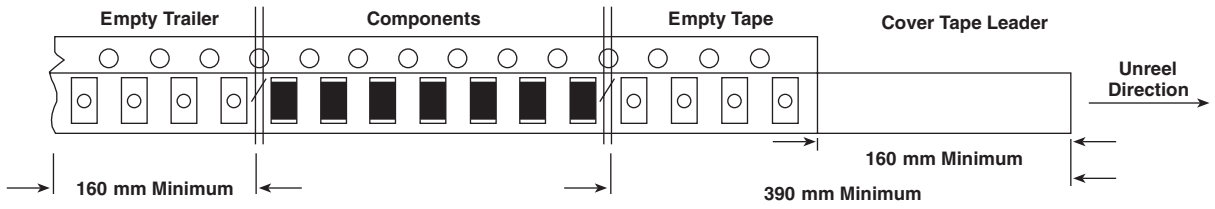
A	B	C	D	E	F	G	H
0.079 ± 0.008 [2.0 ± 0.2]	0.049 ± 0.008 [1.25 ± 0.2]	0.020 ± 0.12 [0.5 ± 0.3]	See Electrical Specs	0.120 [3.0]	0.051 [1.3]	0.040 [1.0]	0.040 [1.0]

TAPE AND REEL SPECIFICATIONS 0603 SIZE PER EIA-481-1 in inches [millimeters]

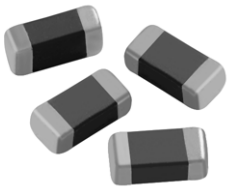




A_0	0.059 ± 0.004 [1.50 ± 0.1]
B_0	0.092 ± 0.004 [2.34 ± 0.1]
D_0	0.059 + 0.005/- 0.000 [1.5 + 0.127]
D_1	0.039 Min. [1.0 Min.]
E_1	0.069 ± 0.004 [1.75 ± 0.1]
F	0.138 ± 0.002 [3.50 ± 0.05]
K_0	0.049 ± 0.002 [1.24 ± 0.05]
P_0	0.157 ± 0.004 [4.00 ± 0.1]
P_1	0.157 ± 0.004 [4.00 ± 0.1]
P_2	0.079 ± 0.002 [2.00 ± 0.05]
W	0.327 Max. [8.3 Max.]
T	0.008 ± 0.002 [0.2 ± 0.05]
A	7.000 ± 0.078 [178 ± 2.0]
N	2.500 [63.5]
C	0.512 ± 0.020 [13.00 + 0.50]
W_1	0.315 + 0.059/- 0.00 [8.00 + 1.50]
T_1	0.079 ± 0.002 [2.00 ± 0.05]



Monolithic Chip Inductors



FEATURES

- High reliability
- Surface mountable
- Magnetically self shielded
- Nickel barrier plating virtually eliminates silver migration
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

MECHANICAL SPECIFICATIONS

Solderability: 90 % coverage after 5 second dip in 235 °C solder following 60 second preheat at 120 °C to 150 °C and type R flux dip

Resistance To Solder Heat: 10 seconds in 260 °C solder after preheat and flux per above

Termination: 100 % Sn

Terminal Strength: 0.1 kg for 30 seconds

Beam Strength: 2.5 kg

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: - 55 °C to + 125 °C

Thermal Shock: - 40 °C to + 85 °C

Humidity: 90 % RH at 40 °C, 1000 hours at full rated current

Load Life: 85 °C for 1000 hours full rated current

STANDARD ELECTRICAL SPECIFICATIONS

INDUCTANCE (µH) ± 10 %	TOLERANCE	THICKNESS "D" Inches [mm]	Q (Min.)	TEST FREQUENCY L & Q (MHz)	MIN. SELF- RESONANT FREQUENCY (MHz)	MAXIMUM DCR (Ohms)	RATED DC CURRENT (mA)
0.047	± 20 %	0.043 ± 0.012 [1.10 ± 0.3]	20	50	368	0.15	300
0.068	± 20 %	0.043 ± 0.012 [1.10 ± 0.3]	20	50	322	0.25	300
0.10	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	20	25	271	0.25	250
0.12	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	20	25	253	0.30	250
0.15	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	20	25	230	0.30	250
0.18	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	20	25	213	0.40	250
0.22	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	20	25	196	0.40	250
0.27	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	20	25	173	0.50	250
0.33	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	20	25	167	0.60	250
0.39	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	25	25	156	0.50	200
0.47	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	25	25	144	0.60	200
0.56	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	25	25	133	0.70	150
0.68	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	25	25	121	0.80	150
0.82	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	25	25	115	0.90	150
1.0	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	10	87	0.40	100
1.2	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	10	75	0.50	100
1.5	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	10	69	0.50	50
1.8	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	10	64	0.50	50
2.2	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	10	58	0.50	50
2.7	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	10	52	0.60	50
3.3	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	10	48	0.70	50
3.9	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	10	44	0.80	50
4.7	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	10	41	0.90	50
5.6	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	4	37	0.70	25
6.8	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	4	34	0.80	25
8.2	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	4	30	0.90	25
10.0	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	2	28	1.00	25
12.0	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	2	26	1.05	15
15.0	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	1	22	0.70	5
18.0	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	45	1	21	0.70	5
22.0	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	35	1	19	0.90	5
27.0	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	35	1	17	0.90	5
33.0	± 10 %	0.043 ± 0.012 [1.10 ± 0.3]	35	1	15	1.05	5

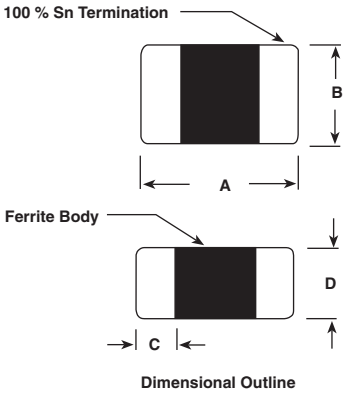
DESCRIPTION

ILSB-1206	3.3 µH	± 10 %	ER	e3
MODEL	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

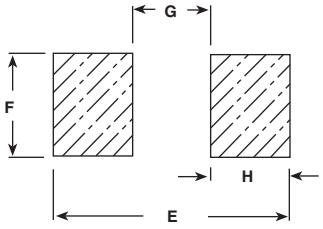
GLOBAL PART NUMBER

I	L	S	B	1	2	0	6	E	R	3	R	3	K
MODEL				SIZE				PACKAGE CODE		INDUCTANCE VALUE			INDUCTANCE TOLERANCE

DIMENSIONS in inches [millimeters]



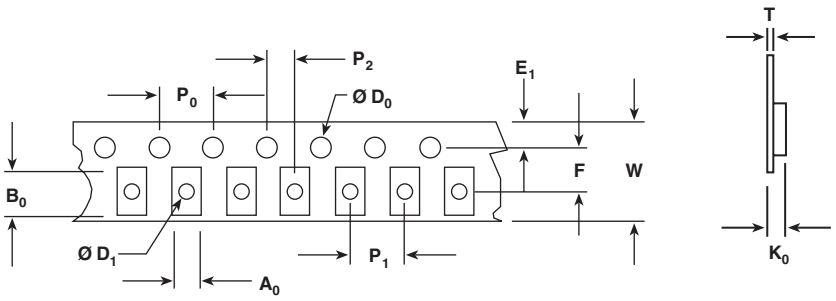
Dimensional Outline

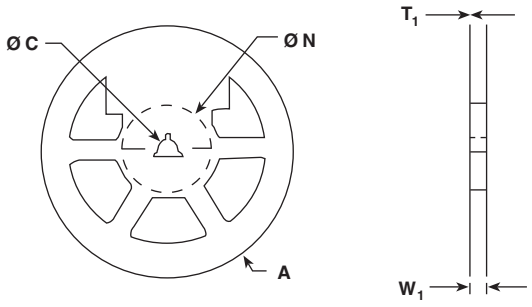


Suggested Pad Layout

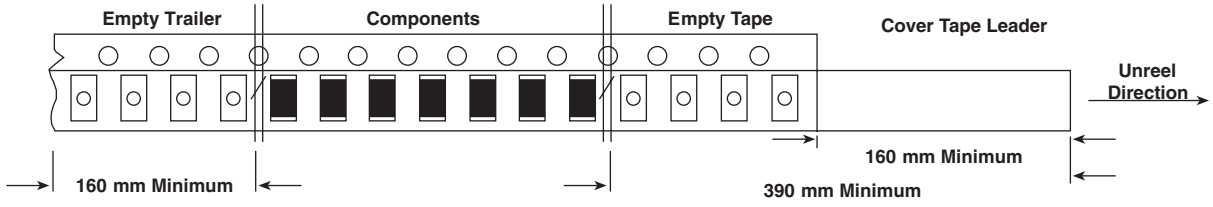
A	B	C	D	E	F	G	H
0.126 ± 0.008 [3.2 ± 0.2]	0.063 ± 0.008 [1.6 ± 0.2]	0.020 ± 0.012 [0.5 ± 0.3]	0.043 ± 0.012 [1.10 ± 0.3]	0.185 [4.7]	0.070 [1.8]	0.087 [2.2]	0.047 [1.2]

TAPE AND REEL SPECIFICATIONS 0603 SIZE PER EIA-481-1 in inches [millimeters]





A_0	0.073 ± 0.004 [1.85 ± 0.1]
B_0	0.135 ± 0.004 [3.43 ± 0.1]
D_0	0.059 + 0.005/-0.000 [1.5 + 0.127]
D_1	0.039 Min. [1.0] Min.
E_1	0.069 ± 0.004 [1.75 ± 0.1]
F	0.138 ± 0.002 [3.50 ± 0.05]
K_0	0.048 ± 0.002 [1.22 ± 0.05]
P_0	0.157 ± 0.004 [4.00 ± 0.1]
P_1	0.157 ± 0.004 [4.00 ± 0.1]
P_2	0.079 ± 0.002 [2.00 ± 0.05]
W	0.327 Max. [8.3] Max.
T	0.008 ± 0.002 [0.2 ± 0.05]
A	7.000 ± 0.079 [178 ± 2.0]
N	2.500 [63.5]
W_1	0.315 + 0.059/- 0.00 [8.00 + 1.50]
T_1	0.079 ± 0.002 [2.00 ± 0.05]



ILBB-0402

Vishay Dale

Surface Mount, Multilayer Ferrite Beads

FEATURES

- High reliability
- Surface mountable
- Magnetically self shielded
- Nickel barrier plating virtually eliminates silver migration
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

MECHANICAL SPECIFICATIONS

Solderability: 90 % coverage after 5 second dip in 235 °C solder following 60 second preheat at 120 °C to 150 °C and type R flux dip

Resistance To Solder Heat: 10 seconds in 260 °C solder after preheat and flux per above

Terminal Strength: 0.2 kg for 30 seconds

Beam Strength: 0.2 kg

Flex: 0.2 mm minimum mounted on a 1.6 mm thick PC board

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: - 55 °C to + 125 °C

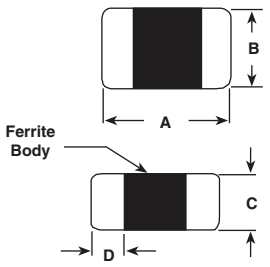
Thermal Shock: 100 cycles, - 40 °C to + 125 °C

Biased Huminidy: 85 % RH at 85 °C, 1000 hours at full rated current

STANDARD ELECTRICAL SPECIFICATIONS

Z AT 100 MHz (± 25 %)	DCR MAX. (Ohms)	RATED DC CURRENT (mA)
20	0.13	300
30	0.20	300
40	0.20	300
60	0.30	300
70	0.30	300
120	0.45	300
240	0.70	200
300	0.80	200
600	1.00	200

DIMENSIONS in inches [millimeters]



A	B	C	D
0.04 ± 0.004 [1.0 ± 0.1]	0.02 ± 0.004 [0.5 ± 0.1]	0.02 ± 0.004 [0.5 ± 0.1]	0.01 ± 0.004 [0.25 ± 0.1]

DESCRIPTION

ILBB-0402	120	± 25 %	ER	e3
MODEL	IMPEDANCE VALUE	IMPEDANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

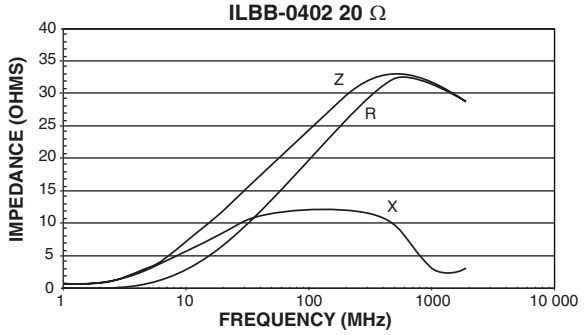
I	L	B	B	0	4	0	2	E	R	1	2	1	V
PRODUCT FAMILY				SIZE				PACKAGE CODE		IMPEDANCE VALUE			IMPEDANCE TOLERANCE

For technical questions, contact: magnetics@vishay.com

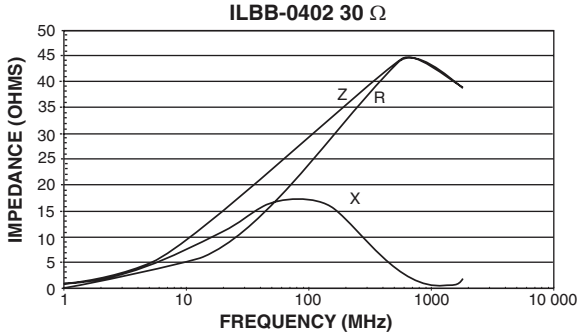
Document Number: 34146
Revision: 10-Aug-06

TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF R, X AND Z

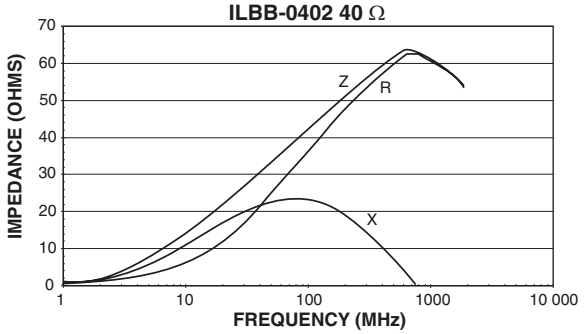
ILBB-0402 20 Ω



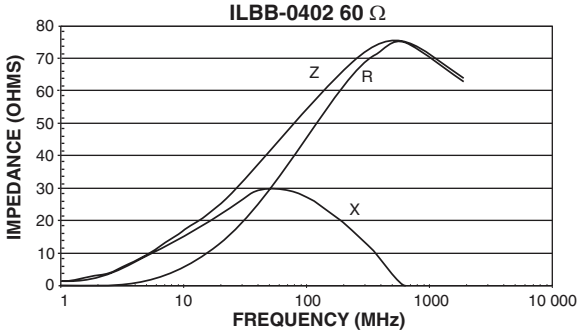
ILBB-0402 30 Ω



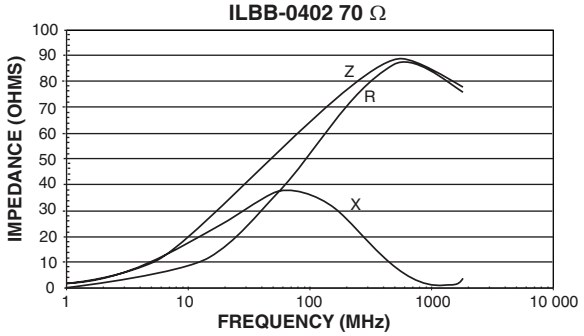
ILBB-0402 40 Ω



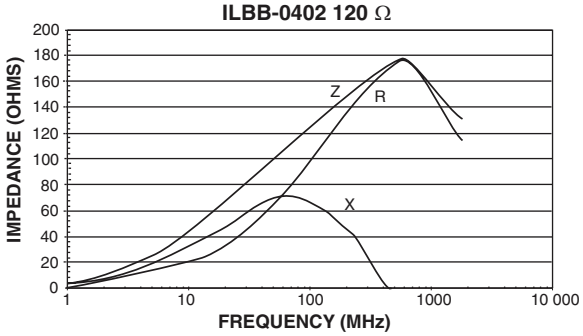
ILBB-0402 60 Ω



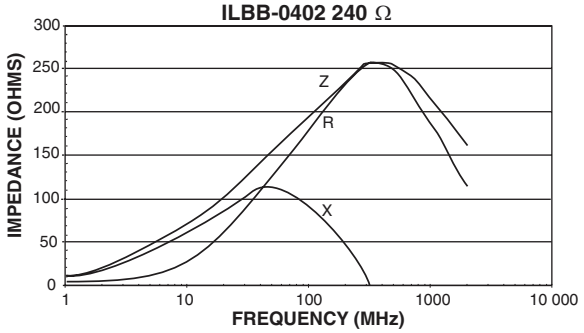
ILBB-0402 70 Ω



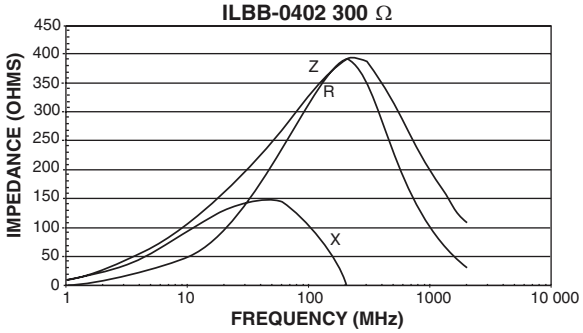
ILBB-0402 120 Ω



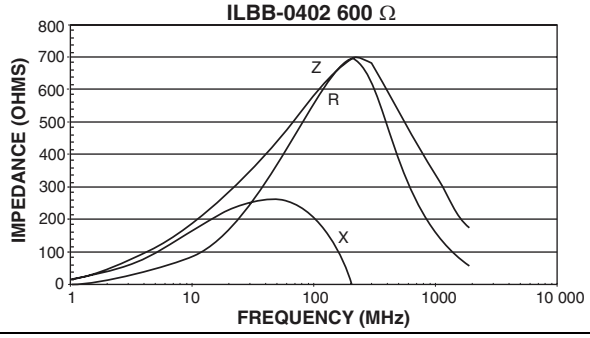
ILBB-0402 240 Ω



ILBB-0402 300 Ω



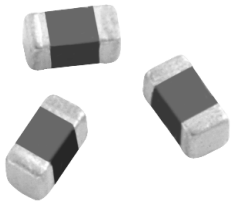
ILBB-0402 600 Ω



ILBB-0603

Vishay Dale

Multilayer Ferrite Beads



FEATURES

- High reliability
- Surface mountable
- Magnetically self shielded
- Nickel barrier plating virtually eliminates silver migration
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

MECHANICAL SPECIFICATIONS

Solderability: 90 % coverage after 5 second dip in 235 °C solder following 60 second preheat at 120 °C to 150 °C and type R flux dip

Resistance To Solder Heat: 10 seconds in 260 °C solder after preheat and flux per above

Terminal Strength: 0.3 kilograms (0.66 pounds) minimum for 30 seconds

Beam Strength: 0.3 kilogram (0.66 pounds) minimum

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: - 55 °C to + 125 °C

Thermal Shock: 100 cycles, - 40 °C to + 125 °C

Biased Humidity: 85 % RH at 85 °C, 1000 hours at full rated current

STANDARD ELECTRICAL SPECIFICATIONS

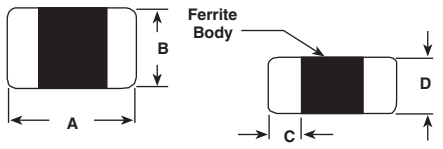
Z at 100 MHz (± 25 %)	DCR MAX. (Ohms)	RATED DC CURRENT. (mA)
10	0.05	500
30	0.09	500
40	0.10	400
60	0.10	400
68	0.10	200
80	0.20	150
120	0.20	150
150	0.30	150
180	0.30	150
220	0.30	150
300	0.35	150
420	0.40	150
450	0.40	100
600	0.45	100
750	0.60	100
1000	0.60	100
1500	0.70	50
2000	0.80	50

PACKAGING OPTIONS

- Tape and Reel:
  Embossed plastic carrier tape
  Per EIA481-1
  4000 pieces on a 7" [178 mm] reel

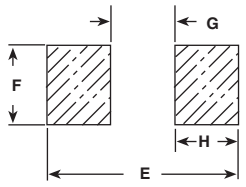
DIMENSIONS in inches [millimeters]

Dimensional Outline



A	B	C	D
0.063 ± 0.006 [1.6 ± 0.15]	0.032 ± 0.006 [0.8 ± 0.15]	0.014 ± 0.006 [0.36 ± 0.15]	0.032 ± 0.006 [0.8 ± 0.15]

Suggested Pad Layout



E	F	G	H
0.102 [2.6]	0.031 [0.8]	0.023 [0.6]	0.039 [1.0]

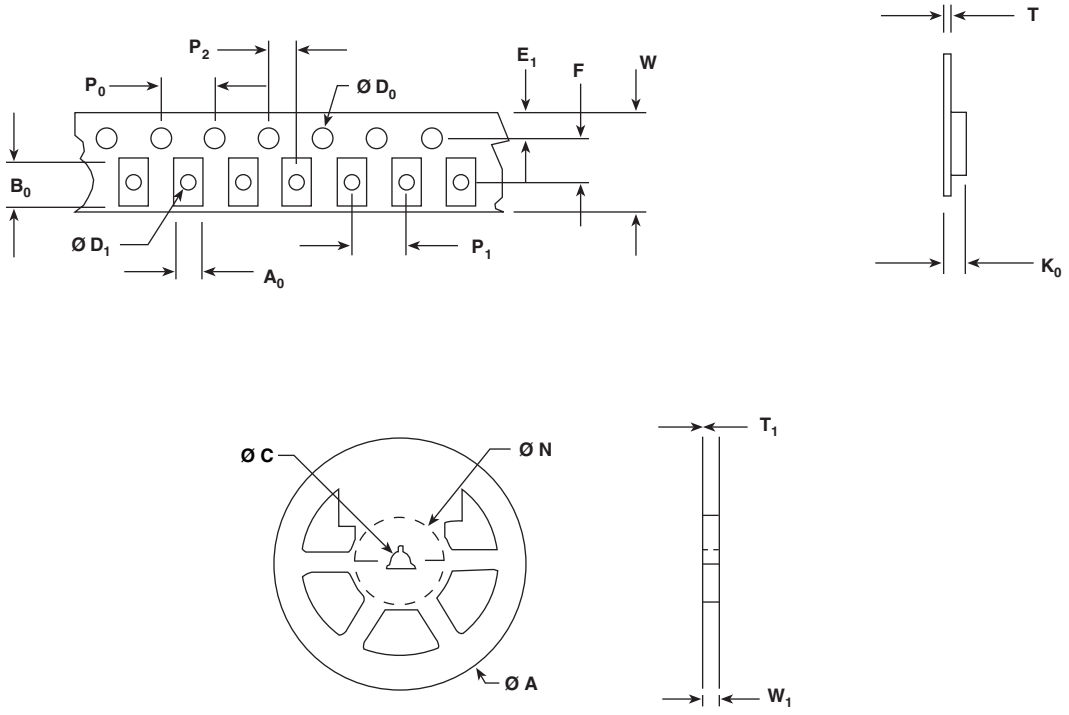
DESCRIPTION

ILBB-0603	30	± 25 %	ER	e3
MODEL	IMPEDANCE VALUE	IMPEDANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

I	L	B	B	0	6	0	3	E	R	3	0	0	V
MODEL				SIZE				PACKAGE CODE		IMPEDANCE VALUE			IMPEDANCE TOLERANCE

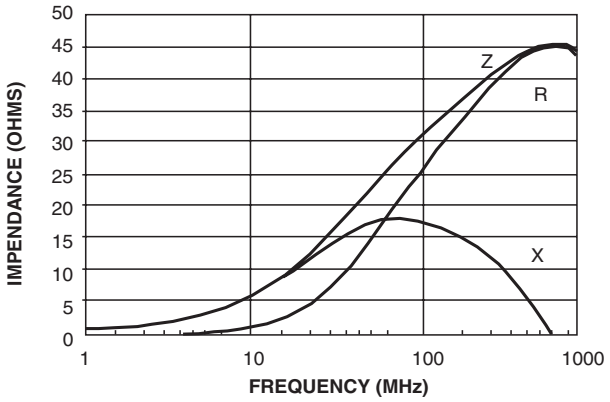
TAPE AND REEL SPECIFICATIONS 0603 SIZE PER EIA-481-1 in inches [millimeters]



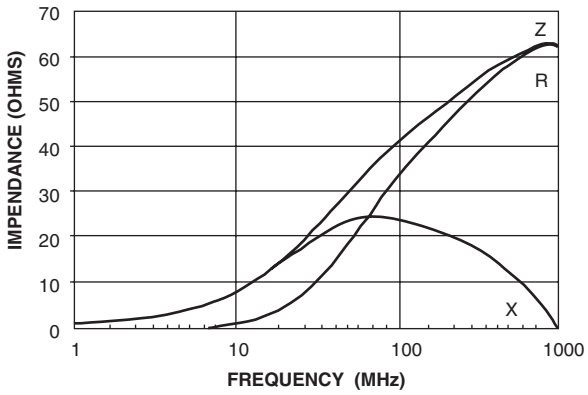
A_0	0.045 ± 0.004 [1.14 ± 0.1]	P_2	0.079 ± 0.002 [2.00 ± 0.05]
B_0	0.071 ± 0.008 [1.80 ± 0.2]	W	0.327 Max. [8.3 Max.]
D_0	0.059 + 0.004/- 0.000 [1.5 + 0.1]	T	0.008 ± 0.002 [0.2 ± 0.05]
D_1	0.039 Min. [1.0 Min.]	A	7.000 ± 0.079 [178.0 ± 2.0]
E_1	0.069 ± 0.004 [1.75 ± 0.1]	N	2.500 [63.5] Min.
F	0.138 ± 0.002 [3.50 ± 0.05]	C	0.51 + 0.02/- 0.008 [13 + 0.5]
K_0	0.045 ± 0.002 [1.15 ± 0.05]	W_1	0.315 + 0.059/- 0.00 [8.00 ± 1.50]
P_0	0.157 ± 0.004 [4.00 ± 0.1]	T_1	0.079 ± 0.002 [2.00 ± 0.05]
P_1	0.157 ± 0.004 [4.00 ± 0.1]		

TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF R, X AND Z

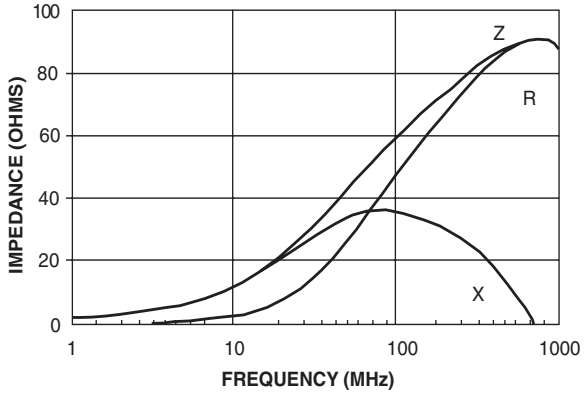
ILBB-0603 30 Ω



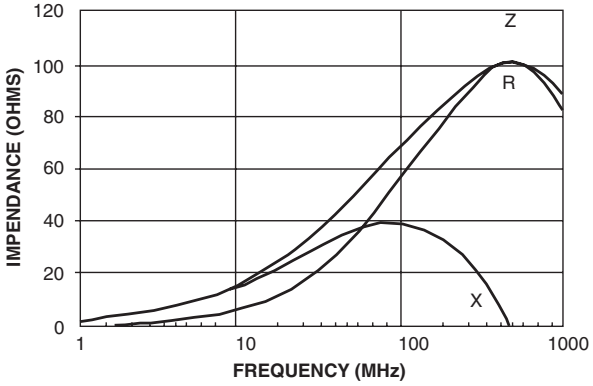
ILBB-0603 40 Ω



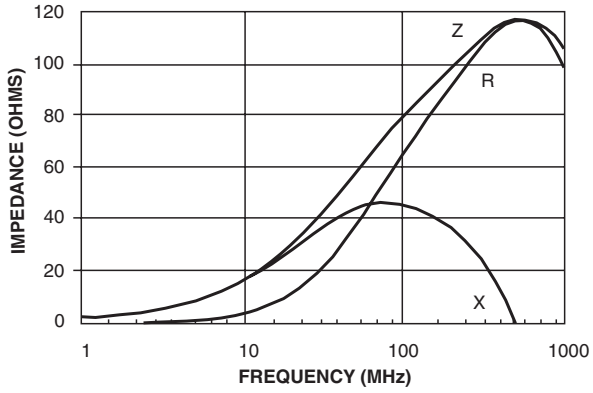
ILBB-0603 60 Ω



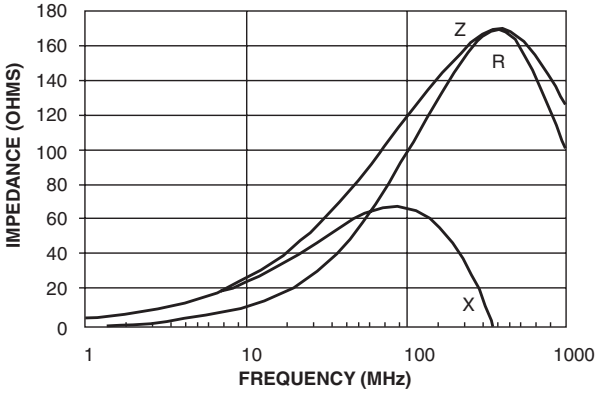
ILBB-0603 68 Ω



ILBB-0603 80 Ω

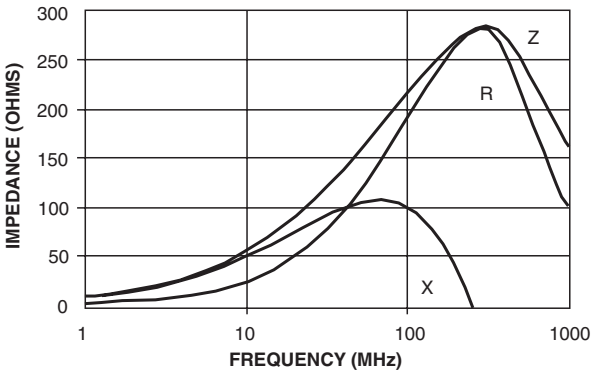


ILBB-0603 120 Ω

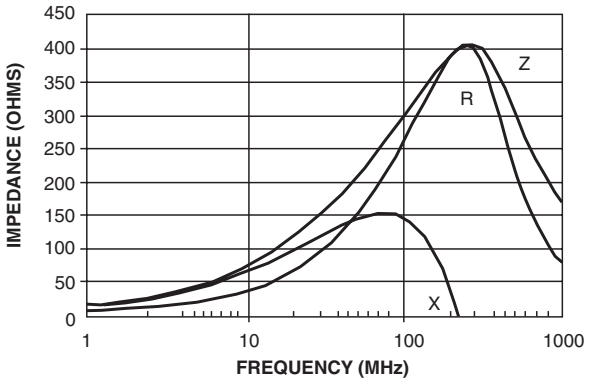


TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF R, X AND Z

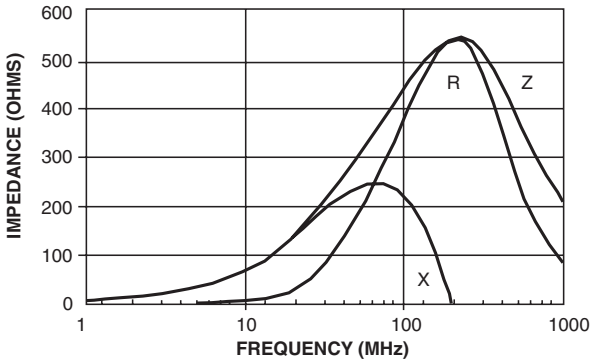
ILBB-0603 220 Ω



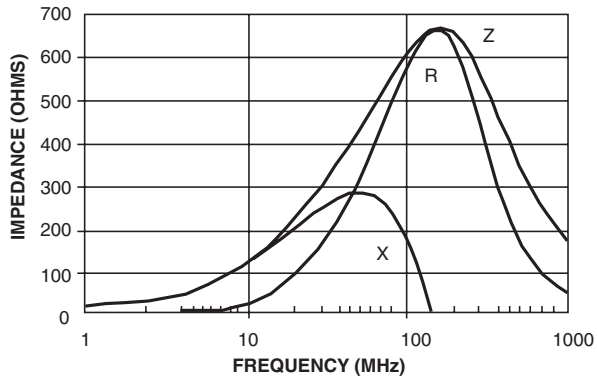
ILBB-0603 300 Ω



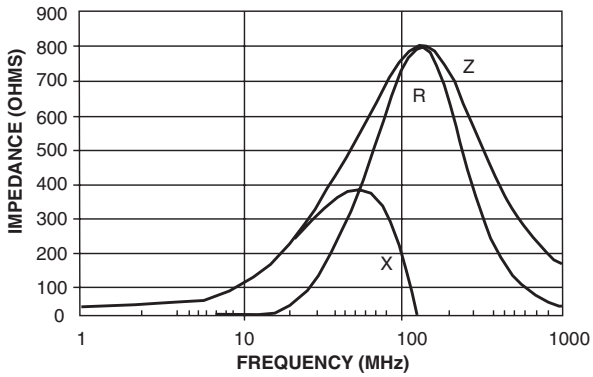
ILBB-0603 450 Ω



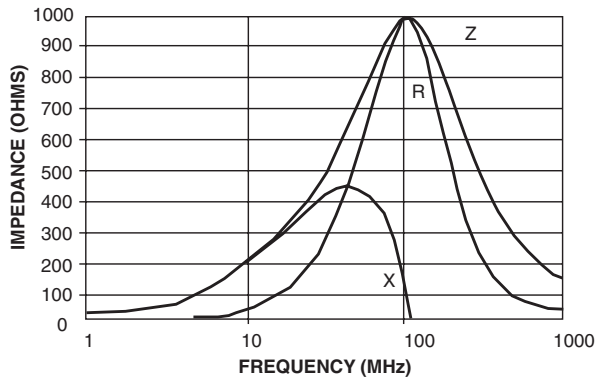
ILBB-0603 600 Ω



ILBB-0603 750 Ω



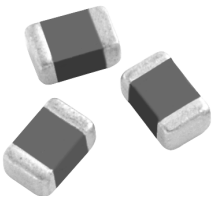
ILBB-0603 1000 Ω



ILBB-0805

Vishay Dale

Multilayer Ferrite Beads



FEATURES

- High reliability
- Surface mountable
- Magnetically self shielded
- Nickel barrier plating virtually eliminates silver migration
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

MECHANICAL SPECIFICATIONS

Solderability: 90 % coverage after 5 second dip in 235 °C solder following 60 second preheat at 120 °C to 150 °C and type R flux dip
Resistance To Solder Heat: 10 seconds in 260 °C solder after preheat and flux per above
Terminal Strength: 0.6 kilograms (1.32 pounds) minimum for 30 seconds
Beam Strength: 1 kilogram (2.2 pounds) minimum
Flex: 0.079" [2 mm] minimum mounted on 0.063" [1.6 mm] thick PC board

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: - 55 °C to + 125 °C
Thermal Shock: 100 cycles, - 40 °C to + 125 °C
Biased Humidity: 85 % RH at 85 °C, 1000 hours at full rated current

STANDARD ELECTRICAL SPECIFICATIONS

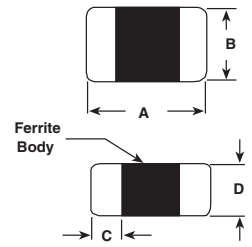
Z at 100 MHz (± 25 %)	DCR MAX. (OhMs)	RATED DC CURRENT (mA)
7	0.06	600
11	0.06	600
17	0.06	600
26	0.06	600
32	0.06	600
40	0.15	300
50	0.15	300
60	0.15	300
75	0.15	300
80	0.15	300
90	0.15	300
100	0.15	300
120	0.15	300
150	0.15	300
180	0.20	200
220	0.20	200
300	0.20	200
400	0.30	200
420	0.30	200
600	0.30	200
1000	0.35	100
1500	0.40	100
2000	0.50	80
2200	0.60	80

PACKAGING OPTIONS

- Tape and Reel:
  Embossed plastic carrier tape
  Per EIA481-1
  4000 pieces on a 7" [178 mm] reel

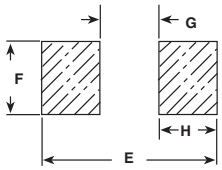
DIMENSIONS in inches [millimeters]

Dimensional Outline



A	B	C	D
0.079 ± 0.008 [2.0 ± 0.2]	0.049 ± 0.008 [1.25 ± 0.2]	0.020 ± 0.012 [0.5 ± 0.3]	0.035 ± 0.008 [0.9 ± 0.2]

Suggested Pad Layout



E	F	G	H
0.120 [3.0]	0.039 [1.0]	0.039 [1.0]	0.039 [1.0]

DESCRIPTION

ILBB-0805	11	± 25 %	ER	e3
MODEL	IMPEDANCE VALUE	IMPEDANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

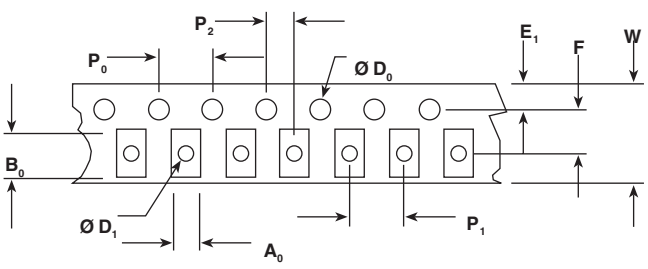
GLOBAL PART NUMBER

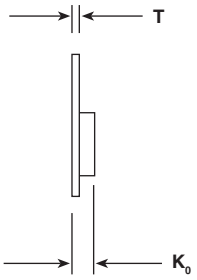
I	L	B	B	0	8	0	5	E	R	1	1	0	V
MODEL				SIZE				PACKAGE CODE		IMPEDANCE VALUE			IMPEDANCE TOLERANCE

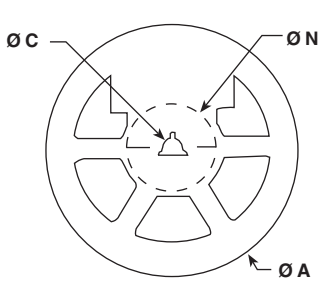
For technical questions, contact: magnetics@vishay.com

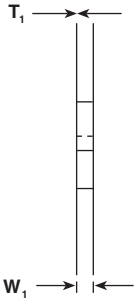
Document Number: 34025
Revision: 14-Mar-06

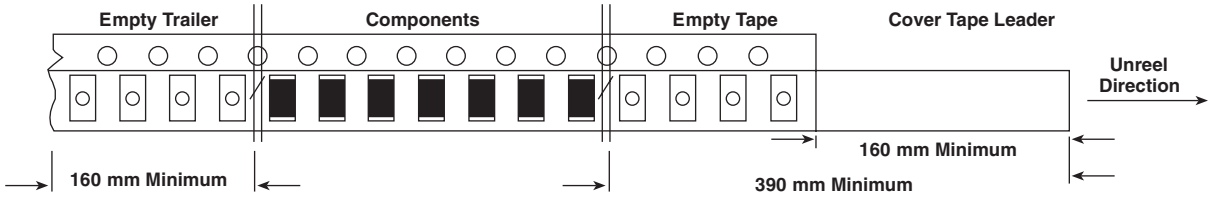
TAPE AND REEL SPECIFICATIONS 0805 SIZE PER EIA-481-1 in inches [millimeters]







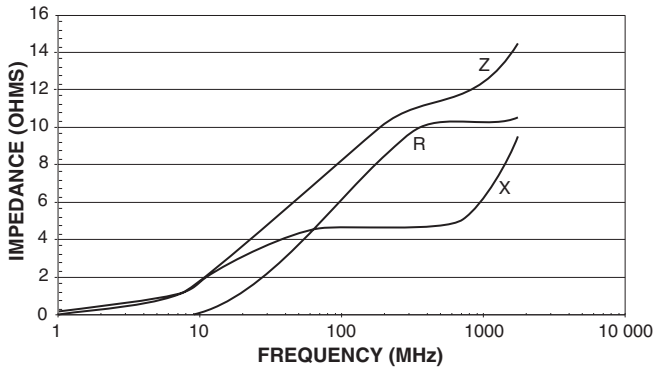




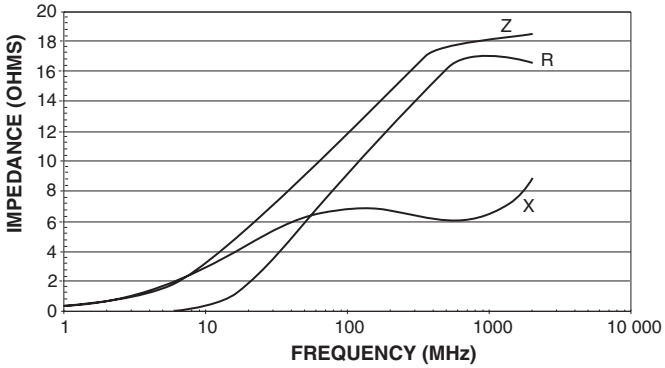
A_0	0.059 ± .004 [1.50 ± 0.1]	P_2	0.079 ± .002 [2.00 ± 0.05]
B_0	0.093 ± .006 [2.35 ± 0.15]	W	0.327 Max. [8.3 Max.]
D_0	0.059 + .004/- 0.000 [1.5 + 1/- 0.0]	T	0.008 ± .002 [0.2 ± 0.05]
D_1	0.039 Min. [1.0 Min.]	A	7.000 ± .079 [178 ± 2.0]
E_1	0.069 ± .004 [1.75 ± 0.1]	N	2.500 [63.5]
F	0.138 ± .002 [3.50 ± 0.05]	C	0.512 ± .020/- 0.008 [13 + 0.5/- 0.2]
K_0	0.049 ± .002 [1.24 ± 0.05]	W_1	0.315 + 0.059/- 0.00 [8.00 + 1.50]
P_0	0.157 ± .004 [4.00 ± 0.1]	T_1	0.079 ± .002 [2.00 ± 0.05]
P_1	0.157 ± .004 [4.00 ± 0.1]		

TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF R, X AND Z

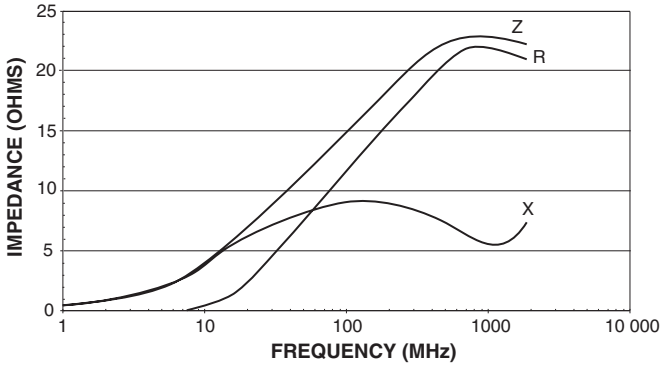
ILBB-0805 7 Ω



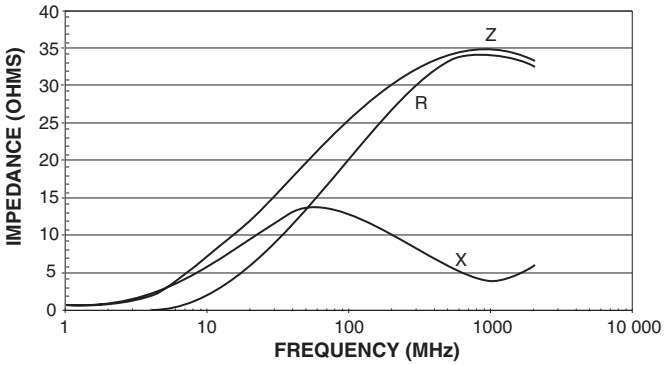
ILBB-0805 11 Ω



ILBB-0805 17 Ω



ILBB-0805 26 Ω



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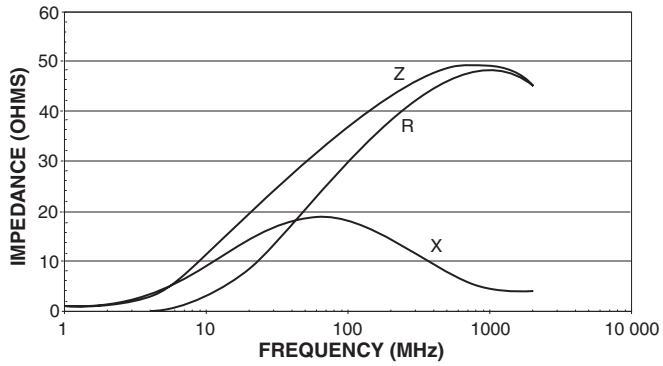

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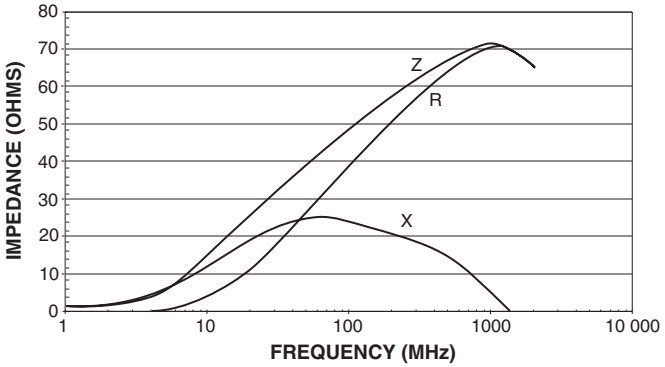
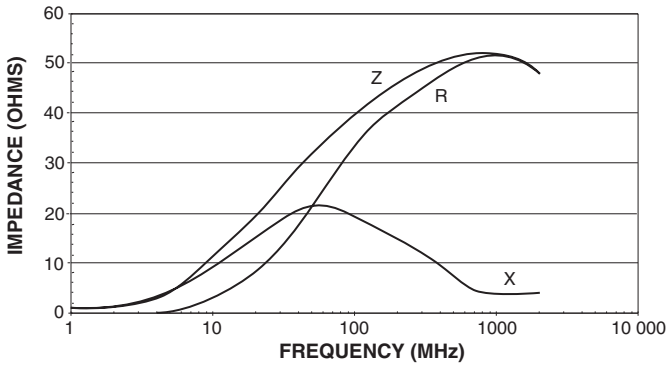


TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF R, X AND Z

ILBB-0805 50 Ω



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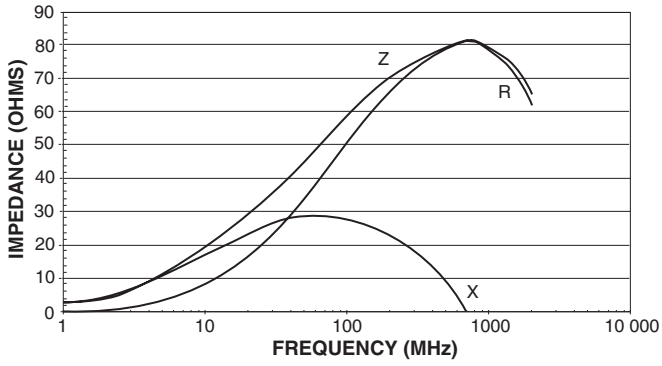
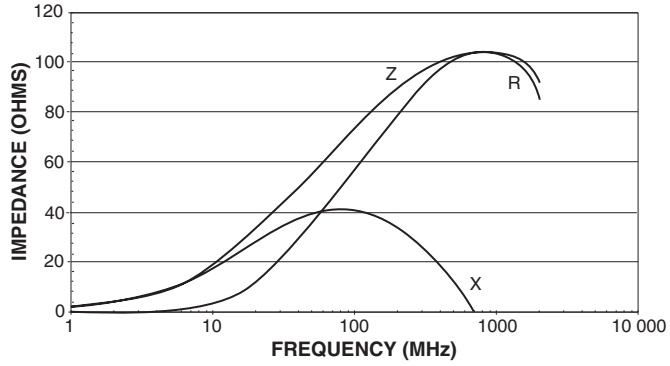
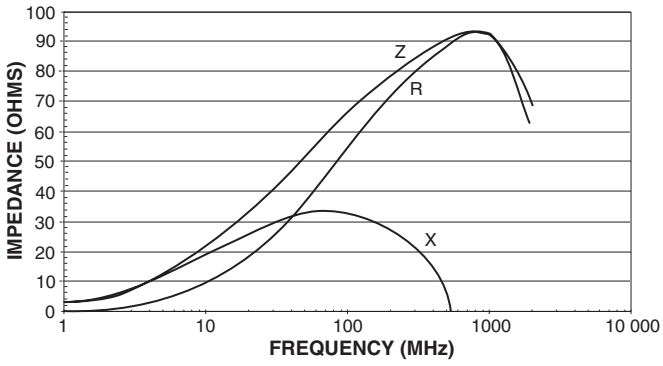


ILBB-0805 75 Ω



ILBB-0805 80 Ω



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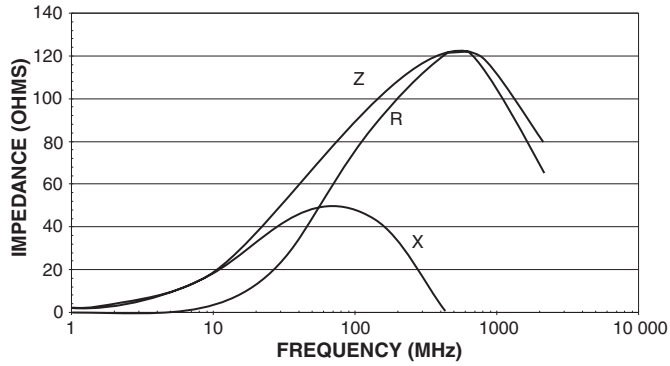
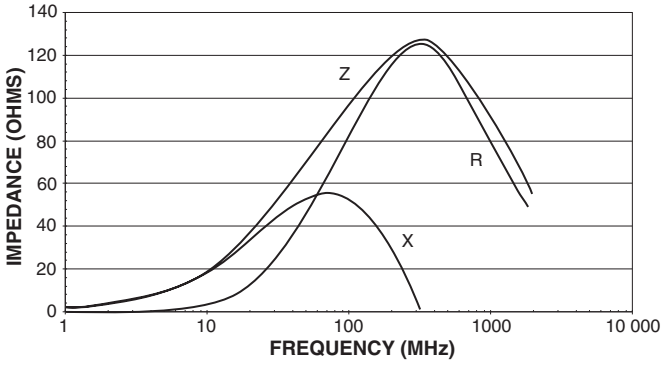
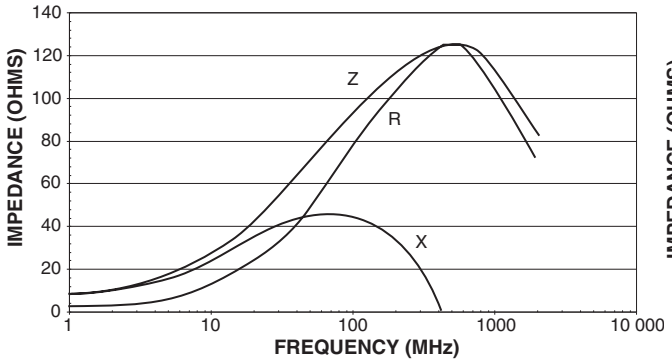


ILBB-0805 100 Ω

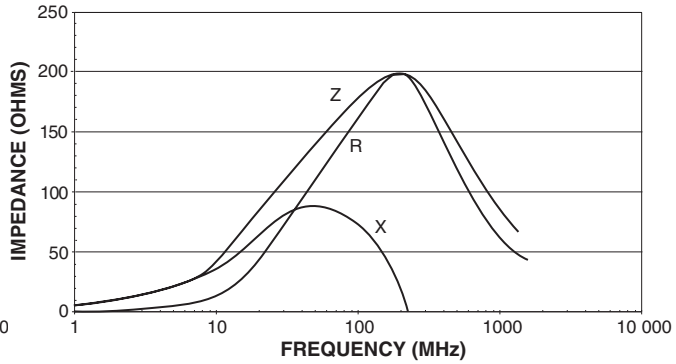


TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF R, X AND Z

ILBB-0805 120 Ω



ILBB-0805 150 Ω



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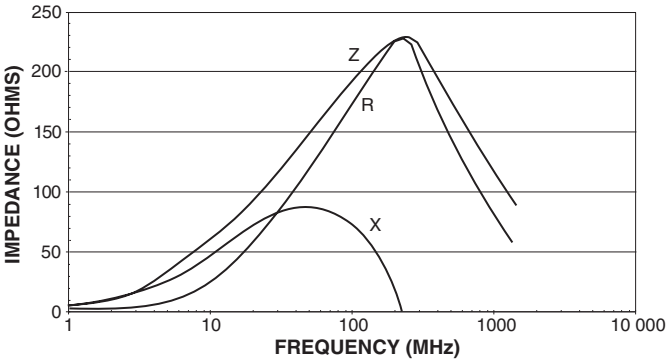

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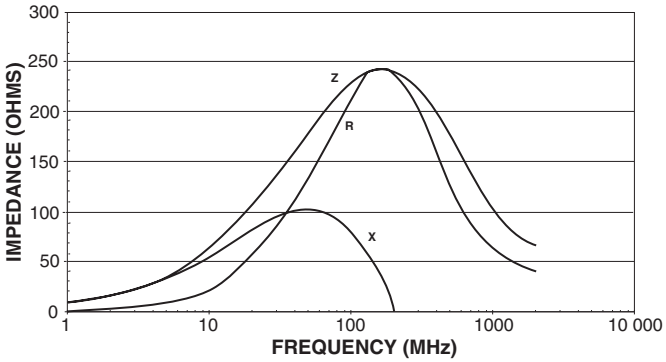

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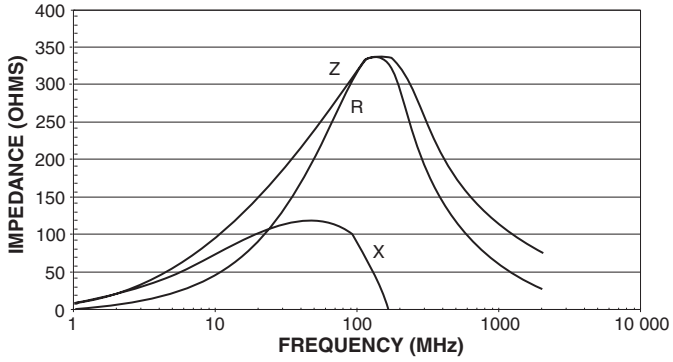

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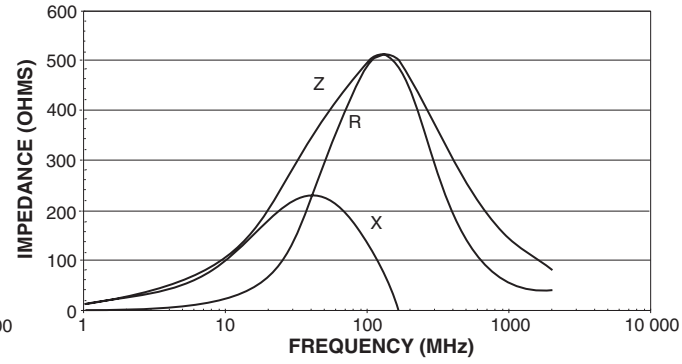
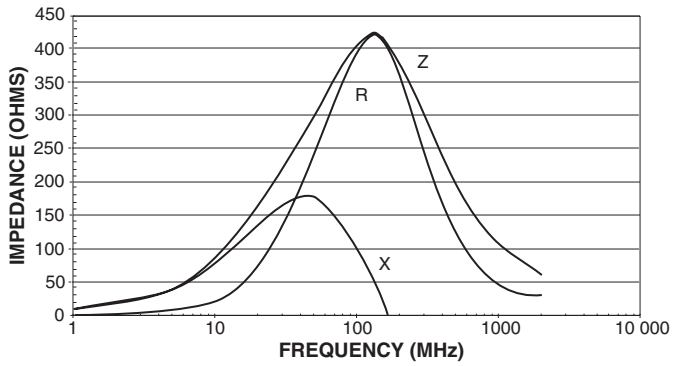
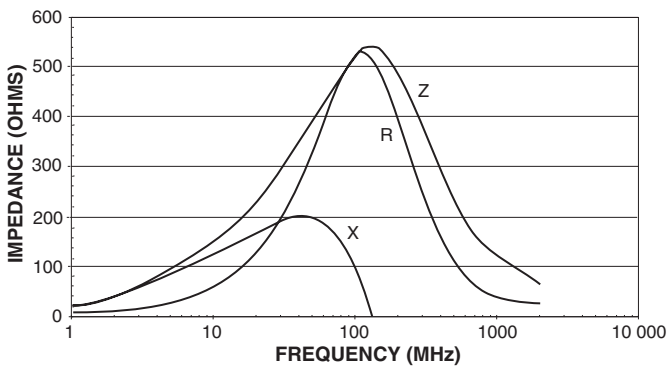


TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF R, X AND Z

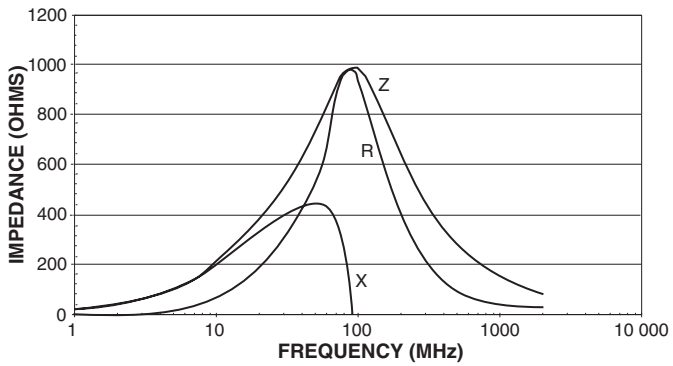
ILBB-0805 420 Ω



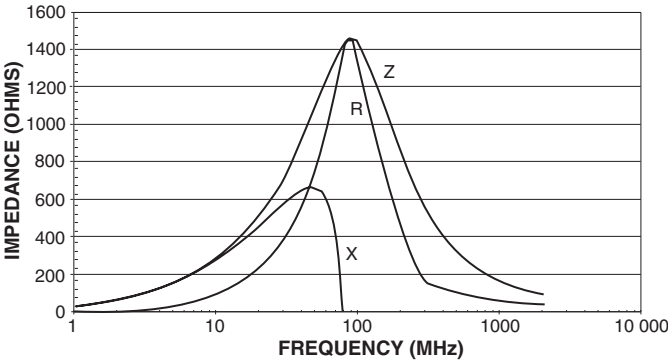
ILBB-0805 600 Ω



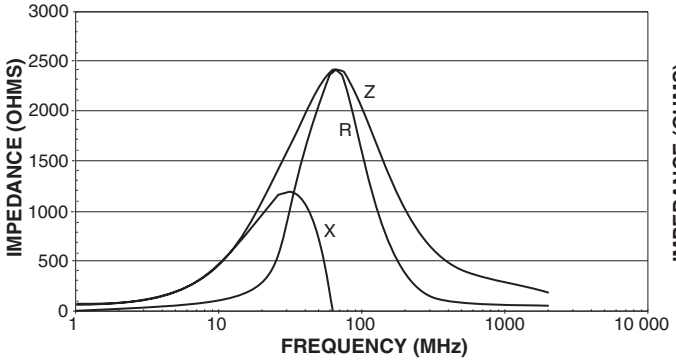
ILBB-0805 1000 Ω



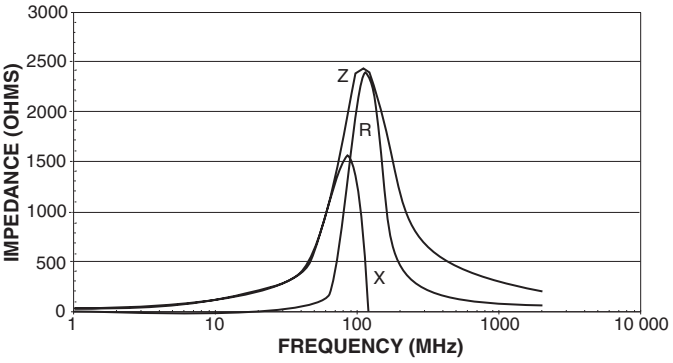
ILBB-0805 1500 Ω



ILBB-0805 2000 Ω



ILBB-0805 2200 Ω



Multilayer Ferrite Beads

FEATURES

- High reliability
- Surface mountable
- Magnetically self shielded
- Nickel barrier plating virtually eliminates silver migration
- 100 % lead (Pb)-free and RoHS compliant

Pb-free RoHS COMPLIANT

MECHANICAL SPECIFICATIONS

Solderability: 90 % coverage after 5 second dip in 235 °C solder following 60 second preheat at 120 °C to 150 °C and type R flux dip
Resistance To Solder Heat: 10 seconds in 260 °C solder after preheat and flux per above
Terminal Strength: 1.0 kilograms (2.2 pounds) minimum for 30 seconds
Beam Strength: 2.0 kilograms (4.4 pounds) minimum

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: - 55 °C to + 125 °C
Thermal Shock: 300 cycles, - 40 °C to + 125 °C
Biased Humidity: 85 % RH at 85 °C, 1000 hours at full rated current

STANDARD ELECTRICAL SPECIFICATIONS

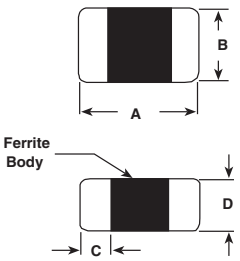
IMPEDANCE (Ohms)	TOL.	FREQUENCY (MHz)	DCR MAX. (Ohms)	RATED DC CURRENT (mA)
19	± 25 %	100	0.05	500
26	± 25 %	100	0.05	500
31	± 25 %	100	0.05	500
50	± 25 %	100	0.10	600
60	± 25 %	100	0.10	600
70	± 25 %	100	0.10	600
80	± 25 %	100	0.20	400
90	± 25 %	100	0.20	400
100	± 25 %	100	0.20	400
120	± 25 %	100	0.20	400
150	± 25 %	100	0.20	300
200	± 25 %	100	0.20	300
300	± 25 %	100	0.30	300
500	± 25 %	100	0.30	200
600	± 25 %	100	0.30	200
800	± 25 %	100	0.30	200
1000	± 25 %	100	0.40	200
1200	± 25 %	100	0.40	100
1500	± 25 %	50	0.50	100
2000	± 25 %	30	0.50	100

PACKAGING OPTIONS

- Bulk: 1000 pieces per plastic bag
- Tape and Reel: Paper carrier tape, 3000 pieces per reel

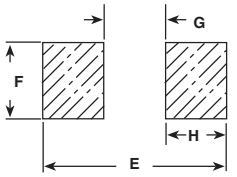
DIMENSIONS in inches [millimeters]

Dimensional Outline



A	B	C	D
0.126 ± 0.008 [3.20 ± 0.2]	0.063 ± 0.008 [1.6 ± 0.2]	0.02 ± 0.012 [0.5 ± 0.3]	0.043 ± 0.008 [1.1 ± 0.2]

Suggested Pad Layout



E	F	G	H
0.173 [4.4]	0.055 [1.4]	0.087 [2.2]	0.043 [1.1]

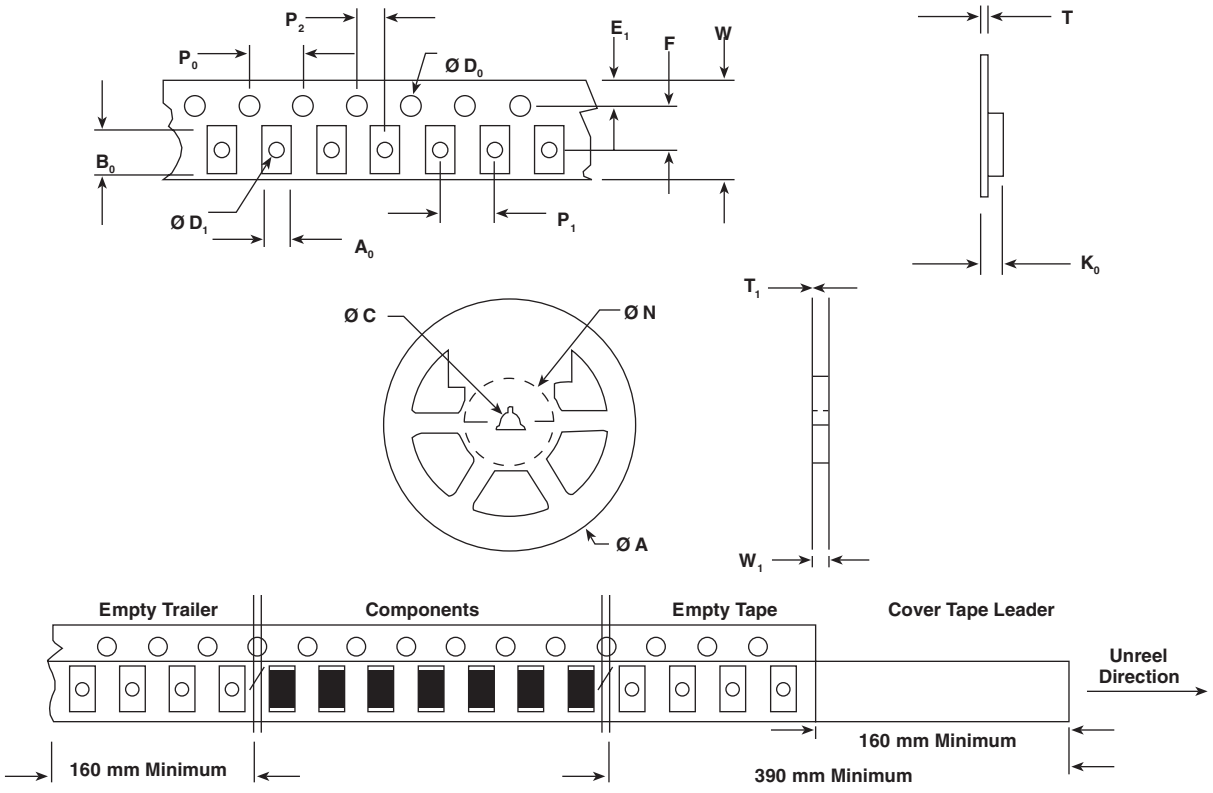
DESCRIPTION

ILB-1206	19 Ω	± 25 %	ER	e3
MODEL	IMPEDANCE VALUE	IMPEDANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

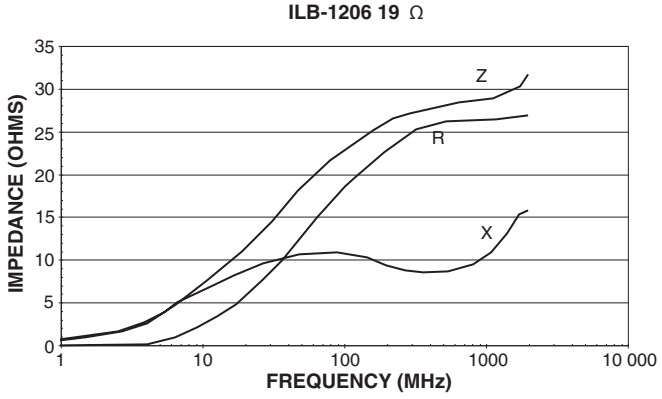
I	L	B	1	2	0	6	E	R	1	9	0	V
PRODUCT FAMILY			SIZE				PACKAGE CODE		IMPEDANCE VALUE			IMPEDANCE TOLERANCE

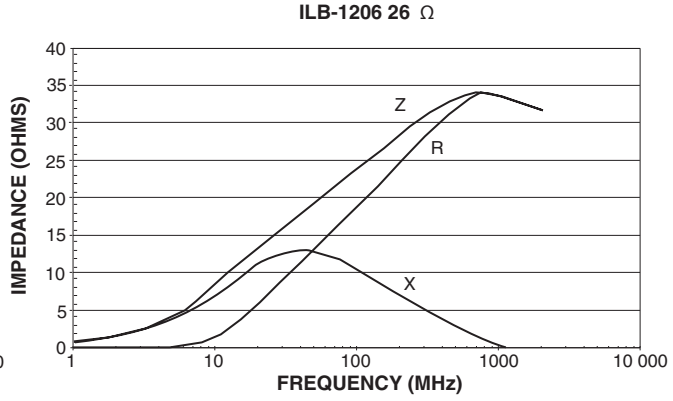
TAPE AND REEL SPECIFICATIONS in inches [millimeters]



A_0	0.071 ± 0.008 [1.8 ± 0.2]	P_2	0.079 ± .002 [2.00 ± 0.05]
B_0	0.14 ± .006 [3.45 ± 0.15]	W	0.327 Max. [8.3 Max.]
D_0	0.059 + .005/- 0.000 [1.5 + 0.127]	T	0.009 ± .002 [0.2 ± 0.05]
D_1	0.039 Min. [1.0 Min.]	A	7.000 ± .079 [178 ± 2.0]
E_1	0.069 ± .004 [1.75 ± 0.1]	N	2.500 [63.5]
F	0.138 ± .002 [3.50 ± 0.05]	C	0.512 ± .020 [13.00 + 0.50]
K_0	0.049 ± .002 [1.24 ± 0.05]	W_1	0.315 + 0.059/- 0.00 [8.00 + 1.50]
P_0	0.157 ± .004 [4.00 ± 0.1]	T_1	0.079 ± .002 [2.00 ± 0.05]
P_1	0.157 ± .004 [4.00 ± 0.1]		

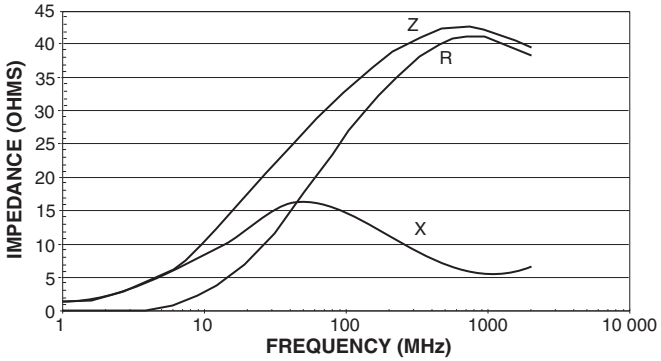
TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF Z, X AND R



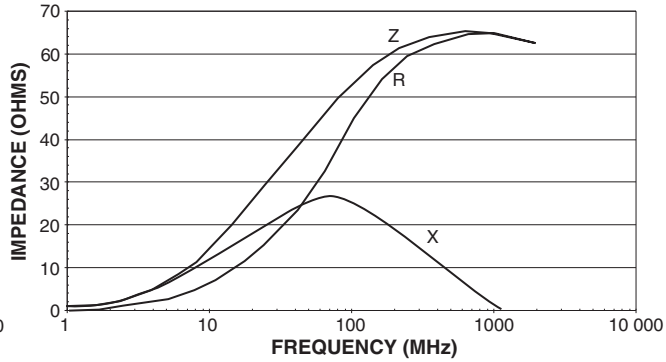


TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF Z, X AND R

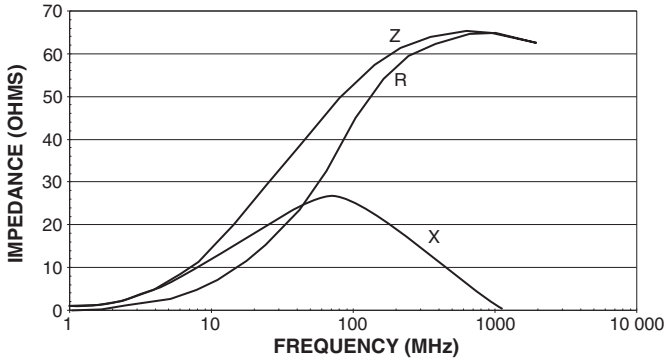
ILB-1206 31 Ω



ILB-1206 50 Ω



ILB-1206 60 Ω



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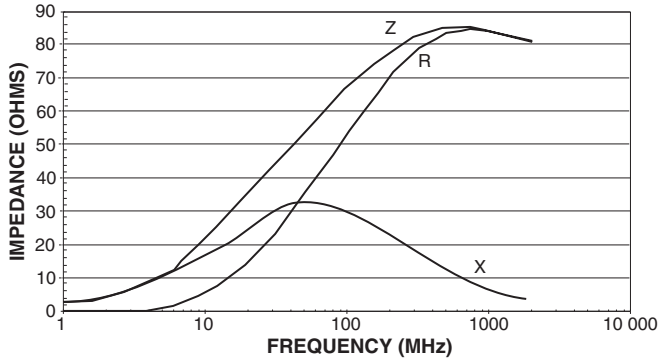

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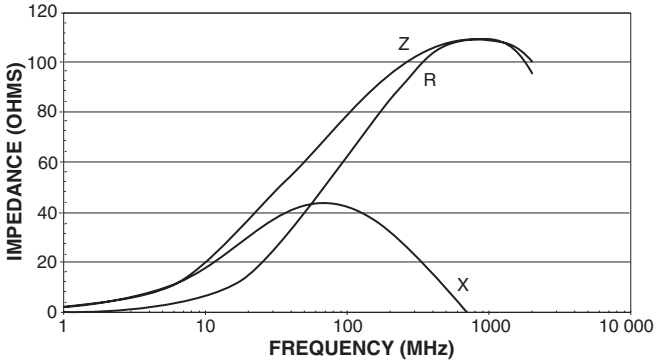

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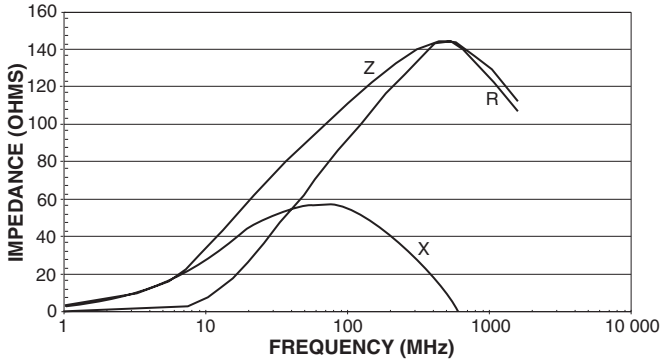
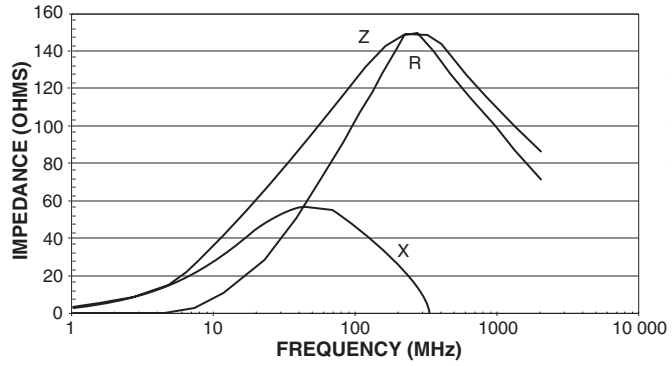
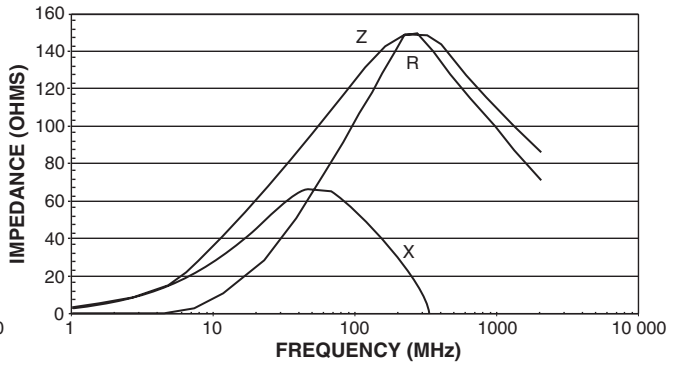


TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF Z, X AND R

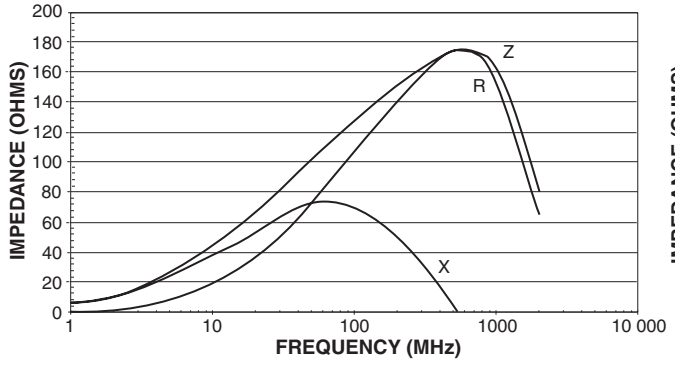
ILB-1206 100 Ω



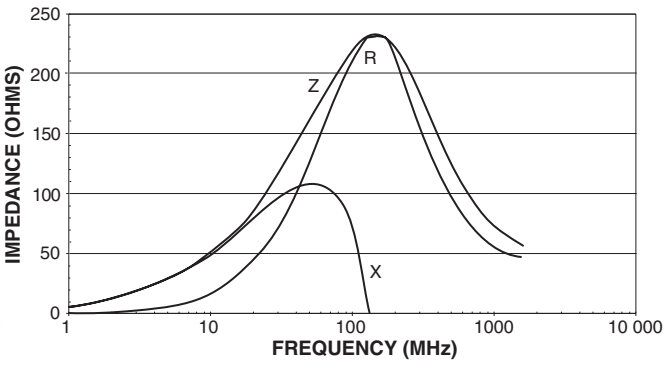
ILB-1206 120 Ω



ILB-1206 150 Ω



ILB-1206 200 Ω



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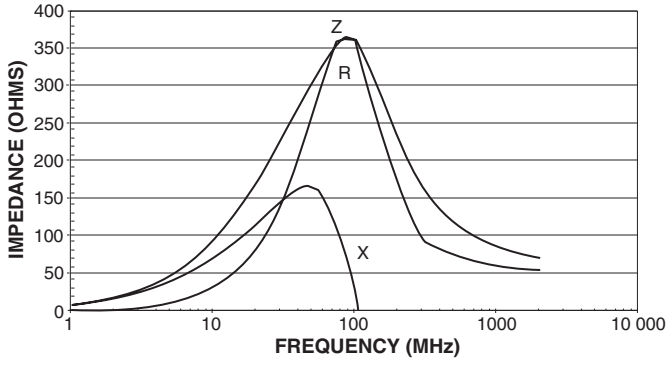
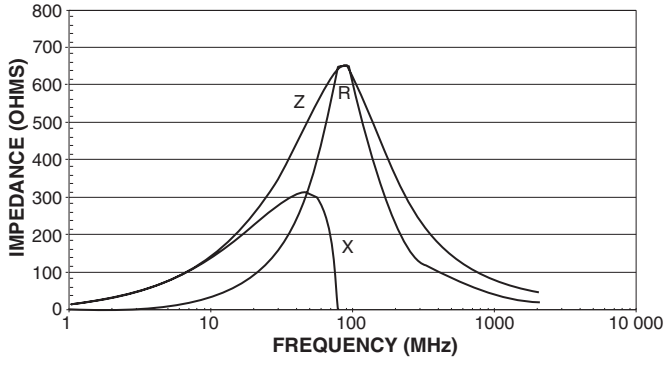
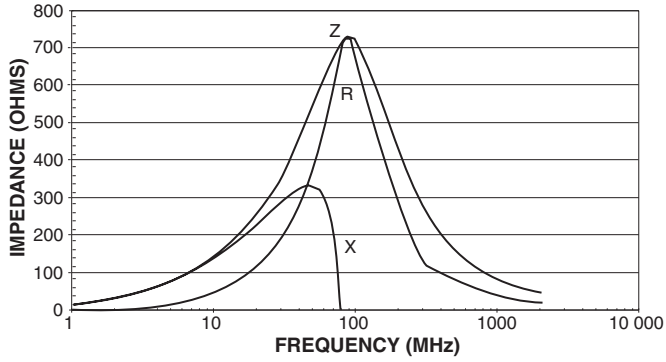


ILB-1206 500 Ω

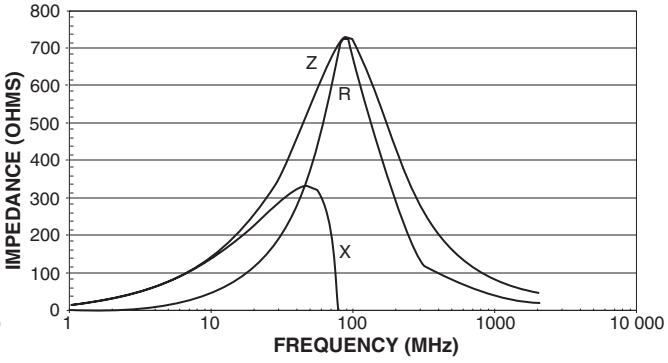


TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF Z, X AND R

ILB-1206 600 Ω



ILB-1206 800 Ω



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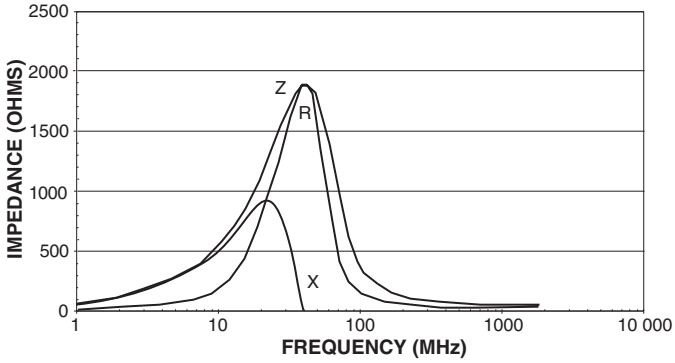
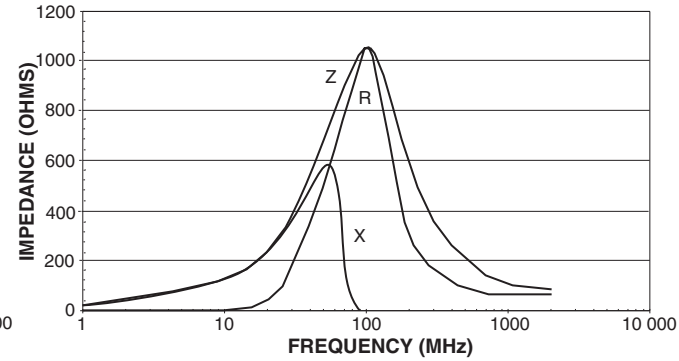
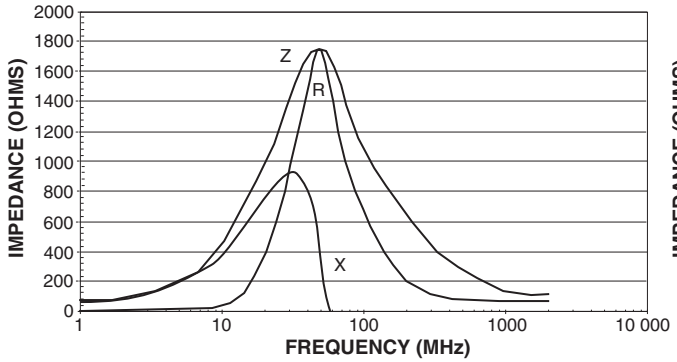


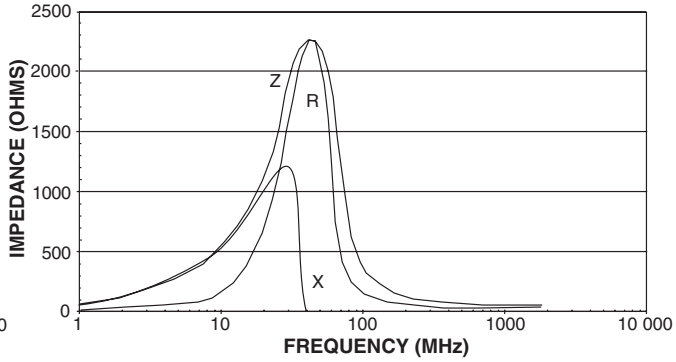
ILB-1206 1200 Ω



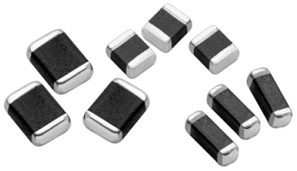
ILB-1206 1500 Ω



ILB-1206 2000 Ω



Surface Mount, Multilayer Ferrite Beads



FEATURES

- High reliability
- Surface mountable
- Magnetically self shielded
- Nickel barrier plating virtually eliminates silver migration
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

MECHANICAL SPECIFICATIONS

Solderability: 90 % coverage after 5 second dip in 235 °C solder following 60 second preheat at 120 °C to 150 °C and type R flux dip
Resistance To Solder Heat: 10 seconds in 260 °C solder after preheat and flux per above
Terminal Strength: (1210) 1.0 kg, (1806) 1.0 kg, (1812) 1.5 kg for 30 seconds
Beam Strength: (1210) 2.5 kg, (1806) 2.5 kg, (1812) 2.5 kg

ENVIRONMENTAL SPECIFICATIONS

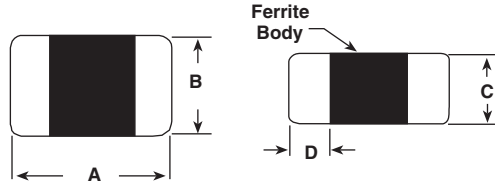
Operating Temperature: - 55 °C to + 125 °C
Thermal Shock: 300 cycles, - 40 °C to + 125 °C
Biased Humidity: 85 % RH at 85 °C, 1000 hours at full rated current

STANDARD ELECTRICAL SPECIFICATIONS

PART NUMBER	Z at 100 MHz (± 25 %)	DCR MAX. (Ohms)	RATED DC CURRENT (mA)
ILBB-1210	31	0.30	400
ILBB-1210	60	0.30	400
ILBB-1210	90	0.30	400
ILBB-1806	80	0.30	400
ILBB-1806	100	0.30	300
ILBB-1806	150	0.50	200
ILBB-1812	70	0.40	200
ILBB-1812	120	0.40	200

DIMENSIONS in inches [millimeters]

Dimensional Outline



SIZE	A	B	C	D
1210	0.126 ± 0.008 [3.2 ± 0.2]	0.098 ± 0.008 [2.5 ± 0.2]	0.051 ± 0.008 [1.3 ± 0.02]	0.020 ± 0.012 [0.5 ± 0.3]
1806	0.177 ± 0.010 [4.5 ± 0.25]	0.063 ± 0.008 [1.6 ± 0.2]	0.063 ± 0.008 [1.6 ± 0.2]	0.024 ± 0.016 [0.6 ± 0.4]
1812	0.177 ± 0.010 [4.5 ± 0.25]	0.126 ± 0.010 [3.2 ± 0.25]	0.059 ± 0.010 [1.5 ± 0.25]	0.024 ± 0.016 [0.6 ± 0.4]

DESCRIPTION

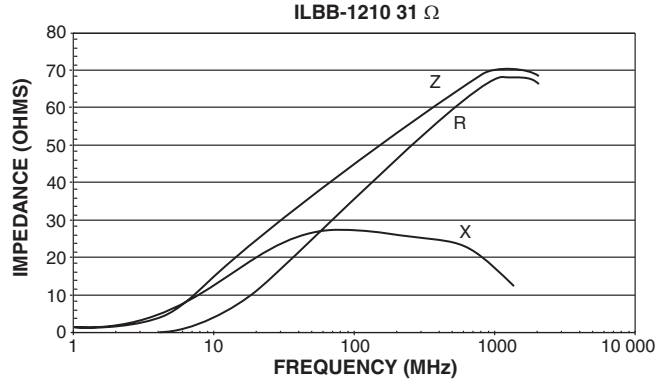
ILBB	1806	80	± 25 %	ER	e3
MODEL	SIZE	IMPEDANCE VALUE	IMPEDANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

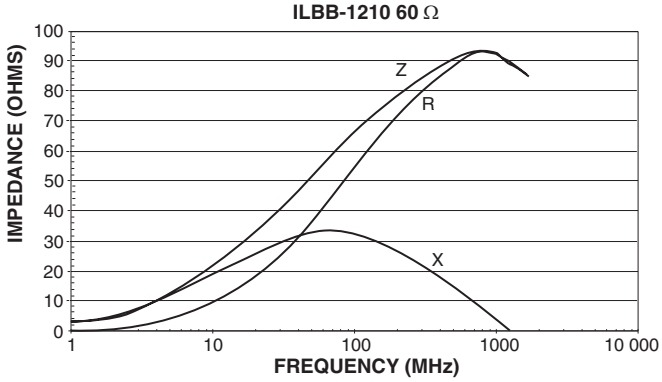
I	L	B	B	1	8	0	6	E	R	8	0	0	V
MODEL				SIZE				PACKAGE CODE		IMPEDANCE VALUE			IMPEDANCE TOLERANCE

TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF Z, X AND R

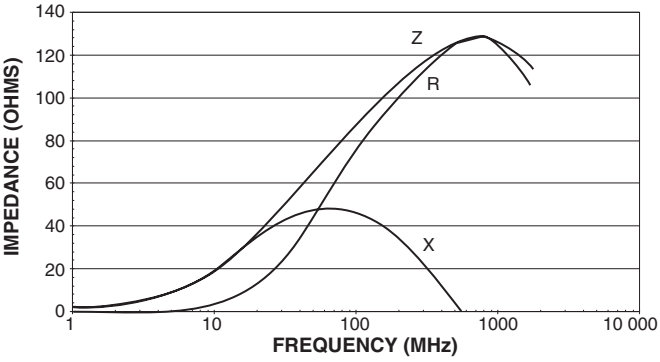
ILBB-1210 31 Ω



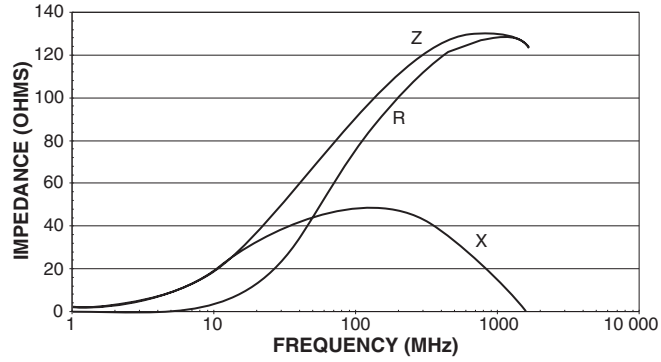
ILBB-1210 60 Ω



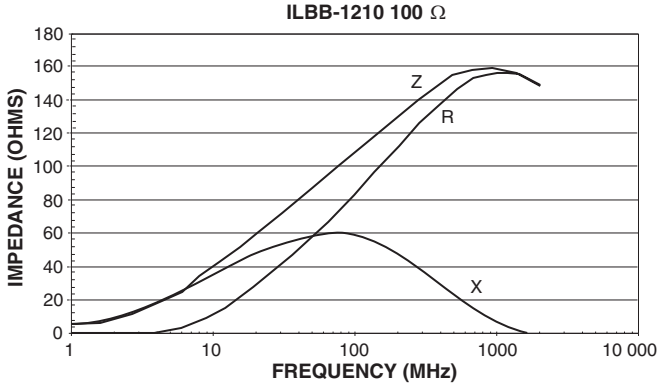
ILBB-1210 90 Ω



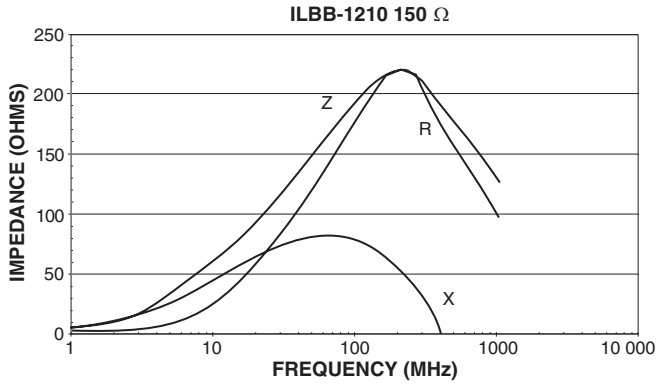
ILBB-1210 80 Ω



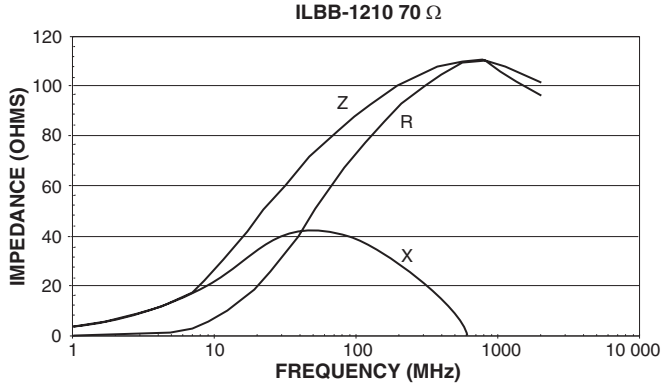
ILBB-1210 100 Ω



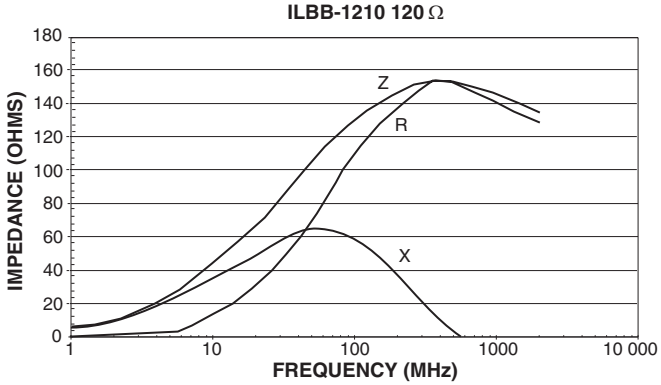
ILBB-1210 150 Ω



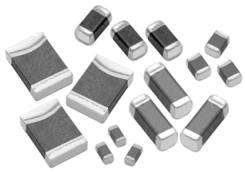
ILBB-1210 70 Ω



ILBB-1210 120 Ω



Surface Mount, High Current Multilayer Ferrite Beads



FEATURES

- High reliability
- Surface mountable
- Current rating up to 6 amps
- Magnetically self shielded
- Nickel barrier plating virtually eliminates silver migration
- 100 % lead (Pb)-free and RoHS compliant

Pb-free
RoHS COMPLIANT

MECHANICAL SPECIFICATIONS

Solderability: 90 % coverage after 5 second dip in 235 °C solder following 60 second preheat at 120 °C type R flux dip
Resistance To Solder Heat: 10 seconds in 260 °C solder after preheat and flux per above
Terminal Strength: (0603) 0.3 kg, (0805) 0.6 kg, (1206) 1.0 kg, (1806) 1.0 kg, (1812) 1.5 kg for 30 seconds
Beam Strength: (0603) 0.3 kg, (0805) 1.0 kg, (1206) 2.0 kg, (1806) 2.5 kg, (1812) 2.5 kg

ENVIRONMENTAL SPECIFICATIONS

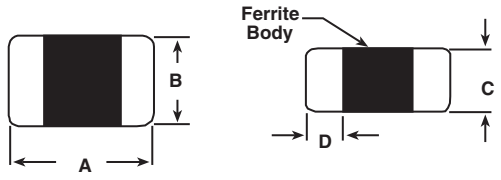
Operating Temperature: - 55 °C to + 125 °C
Thermal Shock: 100 cycles, - 40 °C to + 125 °C
Biased Humidity: 85 % RH at 85 °C, 1000 hours at full rated current

STANDARD ELECTRICAL SPECIFICATIONS

PART NUMBER	IMPEDANCE (± 25 %)	IMPEDANCE FREQUENCY (MHz)	DCR MAX. (Ohms)	RATED DC CURRENT
ILHB-0603	60	100	0.10	2000
ILHB-0603	120	100	0.10	2000
ILHB-0805	30	100	0.015	6000
ILHB-0805	60	100	0.03	3000
ILHB-0805	90	100	0.025	5000
ILHB-0805	120	100	0.03	5000
ILHB-0805	250	100	0.04	3000
ILHB-0805	600	100	0.10	2000
ILHB-1206	50	100	0.02	6000
ILHB-1206	75	100	0.03	3000
ILHB-1206	120	100	0.02	6000
ILHB-1206	500	100	0.06	2500
ILHB-1206	600	100	0.10	2500
ILHB-1806	60	100	0.02	6000
ILHB-1812	120	100	0.02	6000
ILHB-1812	600	50	0.04	3000
ILHB-1812	1300	60	0.05	3000

DIMENSIONS in inches [millimeters]

Dimensional Outline



SIZE	A	B	C	D
0603	0.06 ± 0.006 [1.6 + 0.15]	0.03 ± 0.006 [0.8 ± 0.15]	0.03 ± 0.006 [0.8 ± 0.15]	0.012 ± 0.008 [0.30 ± 0.20]
0805	0.079 ± 0.008 [2.0 ± 0.2]	0.049 ± 0.008 [1.25 ± 0.2]	0.035 + 0.008 [0.9 ± 0.2]	0.02 ± 0.012 [0.50 ± 0.30]
1206	0.126 ± 0.008 [3.2 ± 0.2]	0.063 ± 0.008 [1.6 ± 0.2]	0.043 ± 0.008 [1.1 ± 0.2]	0.02 ± 0.012 [0.50 ± 0.30]
1806	0.177 ± 0.010 [4.5 ± 0.25]	0.063 ± 0.008 [1.6 ± 0.2]	0.063 ± 0.008 [1.6 ± 0.2]	0.024 ± 0.016 [0.60 ± 0.40]
1812	0.177 ± 0.010 [4.5 ± 0.25]	0.126 ± 0.010 [3.2 ± 0.25]	0.06 ± 0.01 [1.5 ± 0.25]	0.024 ± 0.016 [0.60 ± 0.40]

DESCRIPTION

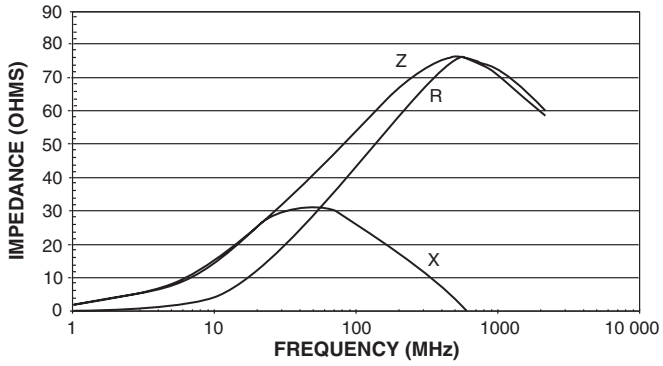
ILHB	1206	120	± 25 %	ER	e3
MODEL	SIZE	IMPEDANCE VALUE	IMPEDANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

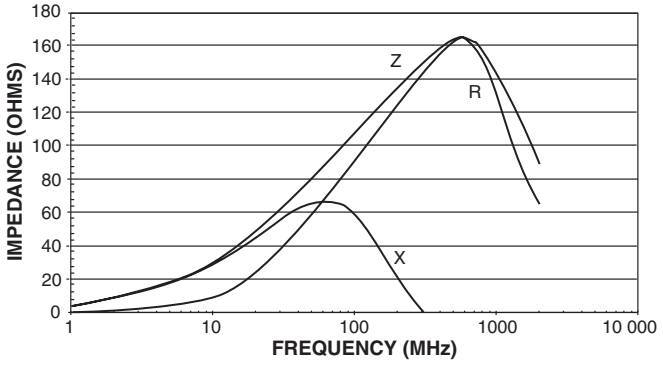
I	L	H	B	1	2	0	6	E	R	1	2	1	V
MODEL				SIZE				PACKAGE CODE		IMPEDANCE VALUE			IMPEDANCE TOLERANCE

TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF R, X AND Z

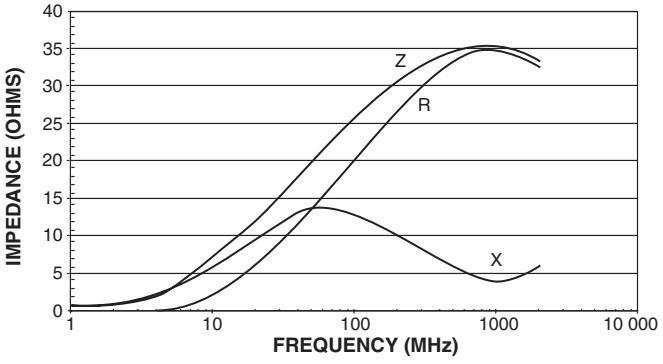
ILHB-0603 60 Ω



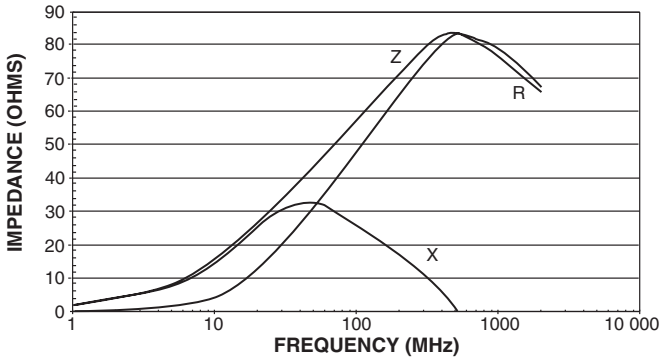
ILHB-0603 120 Ω



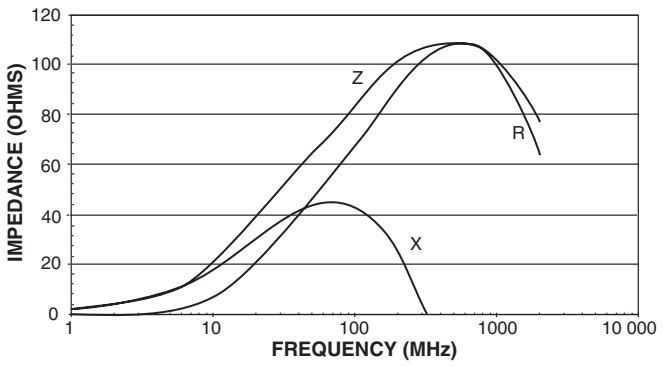
ILHB-0805 30 Ω



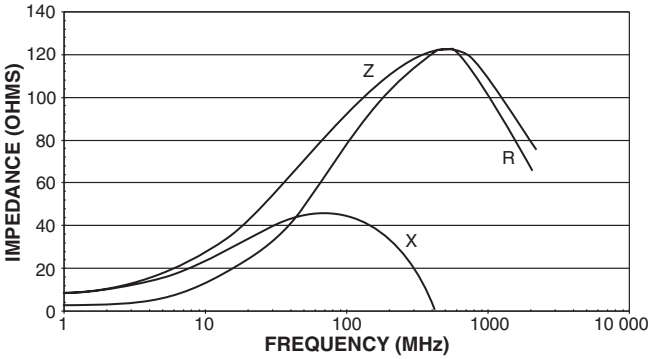
ILHB-0805 60 Ω



ILHB-0805 90 Ω

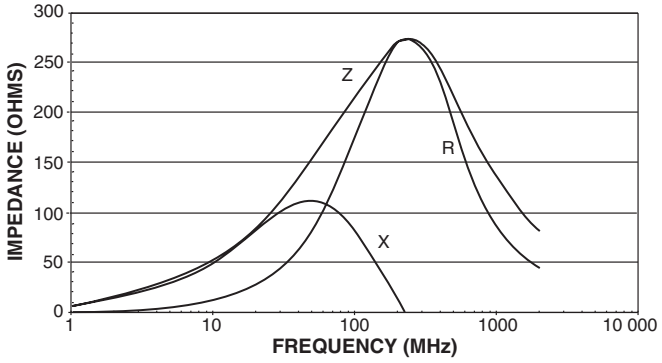


ILHB-0805 120 Ω

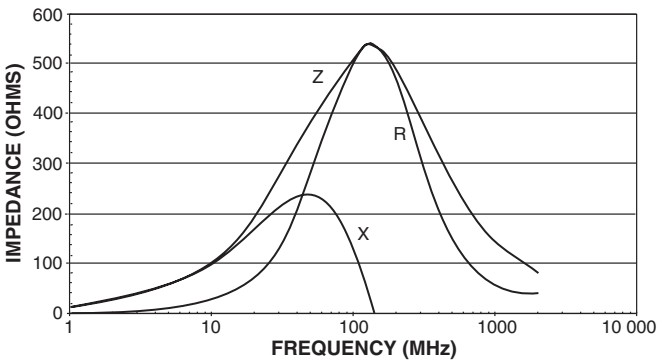


TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF R, X AND Z

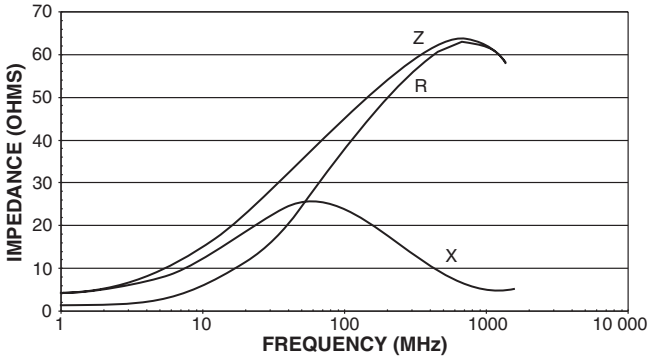
ILHB-0805 250 Ω



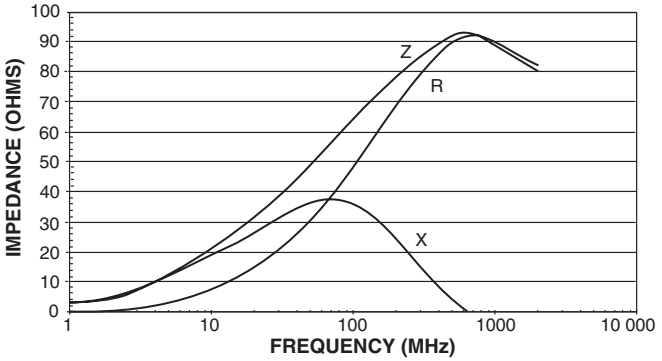
ILHB-0805 600 Ω



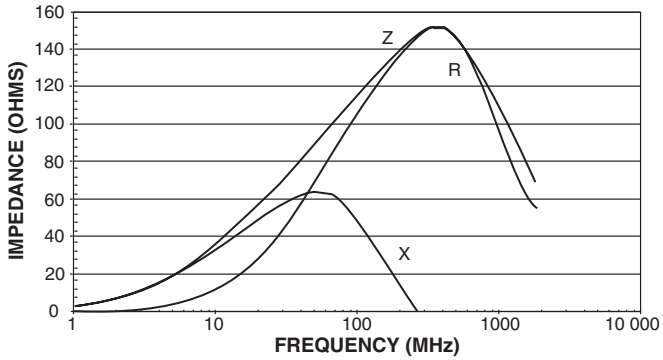
ILHB-1206 50 Ω



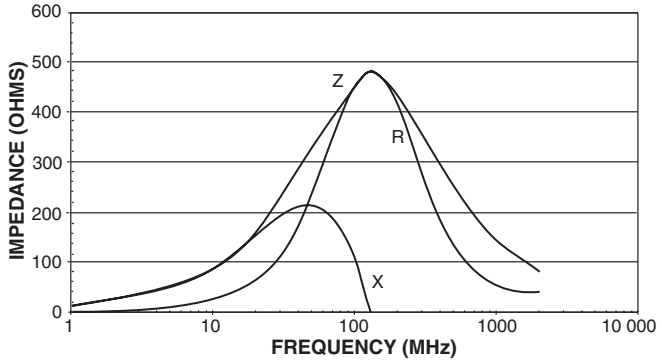
ILHB-1206 75 Ω



ILHB-1206 120 Ω

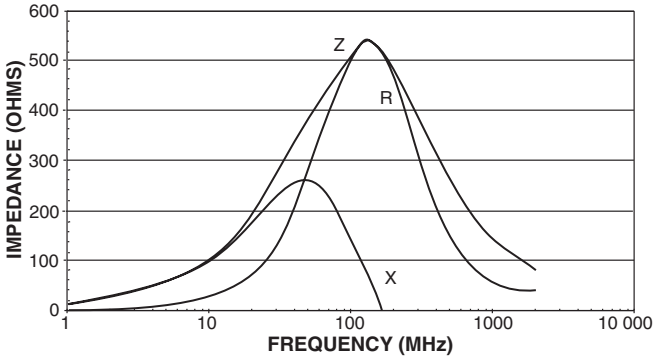


ILHB-1206 500 Ω

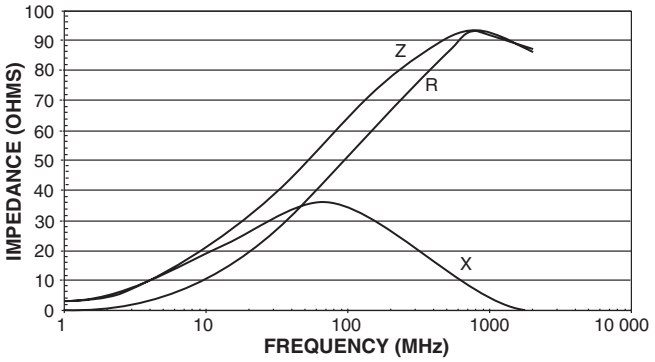


TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF R, X AND Z

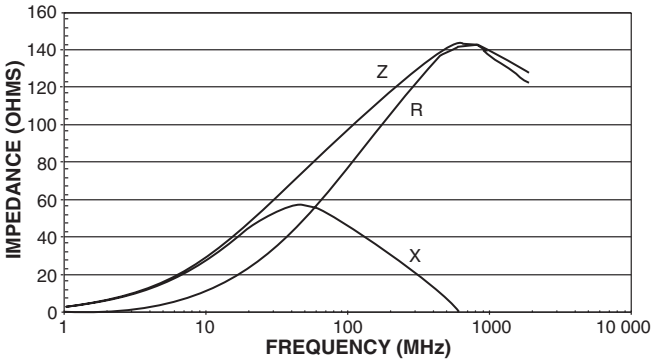
ILHB-1206 600 Ω



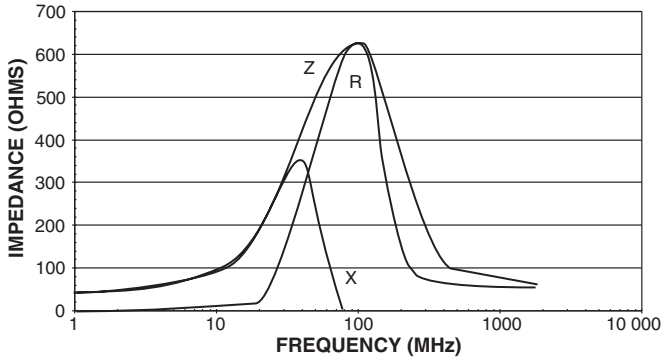
ILHB-1806 60 Ω



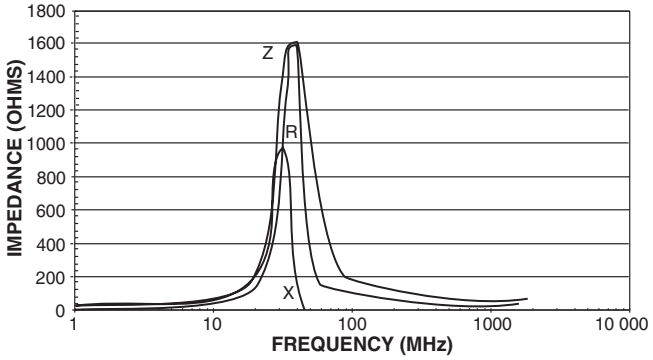
ILHB-1812 120 Ω



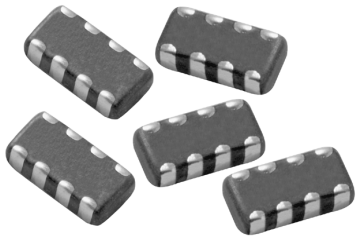
ILHB-1812 600 Ω



ILHB-1812 1300 Ω



Chip Array Ferrite Bead



FEATURES

- Combines four single 0603 chips into one package to reduce board space and placement time
- Highly effective in high density applications
- 0.031" [0.8 mm] terminal pitch makes it easy to apply EMI prevention in multiple-lines such as connectors and IC pins
- Material and construction design minimize crosstalk between adjacent circuits
- 100 % lead (Pb)-free and RoHS compliant

Pb-free

RoHS COMPLIANT

MECHANICAL SPECIFICATIONS

Solderability: 90 % coverage after 5 seconds dip in 235 °C solder following 60 second preheat at 120 °C to 150 °C and type R flux dip
Resistance to Solder Heat: 10 seconds in 260 °C solder after preheat and flux per above
Terminal Strength: 1.2 kg (2.64 pounds) for 30 seconds
Beam Strength: 2.0 kg (4.4 pounds) minimum
Flex: 0.79 (2 mm) minimum mounted on 0.63 (1.6 mm) thick PC board

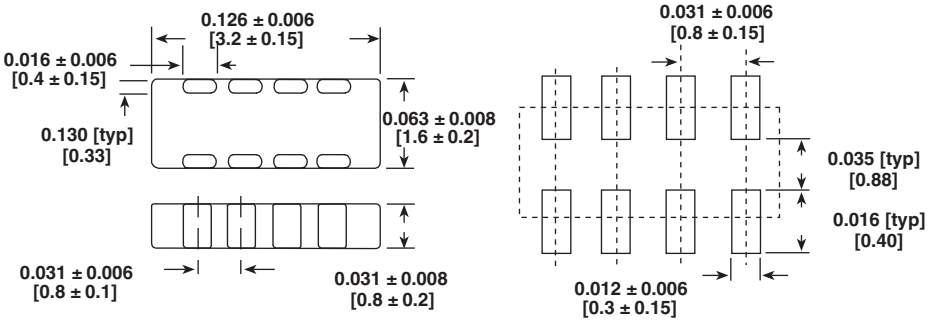
ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: - 55 °C to + 125 °C
Thermal Shock: 300 cycles, - 40 °C to + 125 °C
Biased Humidity: 85 % RH at 85 °C, 1000 hours at full rated current

STANDARD ELECTRICAL SPECIFICATIONS

PART NUMBER	PACKAGE SIZE	Z at 100 MHz (± 25 %)	DCR MAX. (Ohms)	RATED DC CURRENT (mA)	SIGNAL SPEED
ILAS	1206	60	0.12	300	STANDARD
		120	0.2	150	
		300	0.4	100	
		600	0.6	100	
		1000	0.8	50	

DIMENSIONS in inches [millimeters]



DESCRIPTION

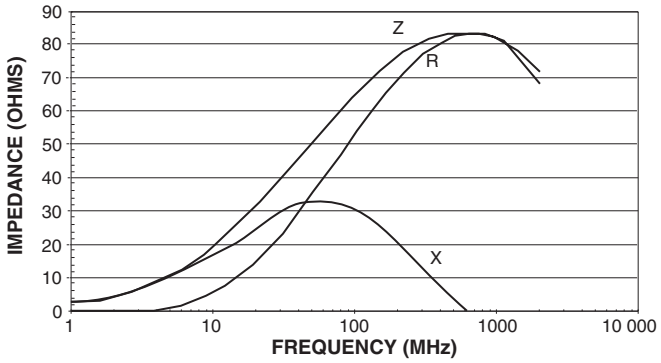
ILAS-1206	120	± 25 %	ER	e3
MODEL	IMPEDANCE VALUE	IMPEDANCE TOLERANCE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

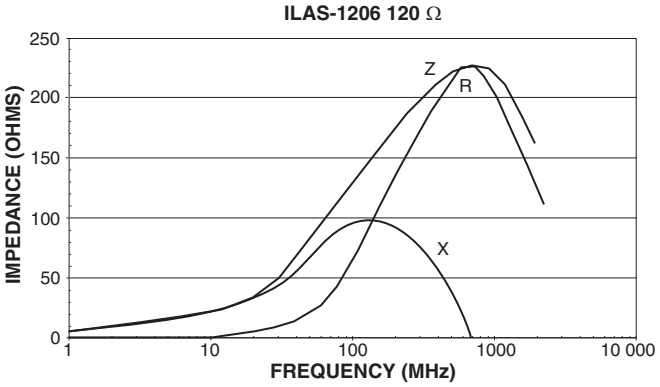
I	L	A	S	1	2	0	6	E	R	1	2	1	V
PRODUCT FAMILY				SIZE				PACKAGE CODE		IMPEDANCE VALUE			IMPEDANCE TOLERANCE

TYPICAL CURVES - FREQUENCY CHARACTERISTICS OF Z, X AND R

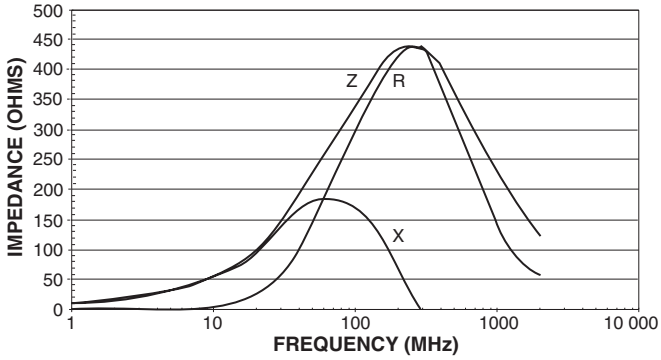
ILAS-1206 60 Ω



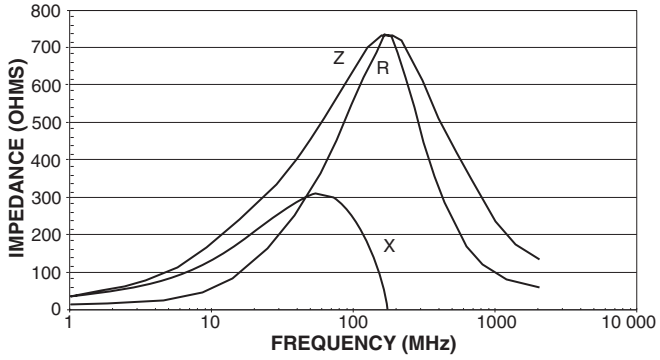
ILAS-1206 120 Ω



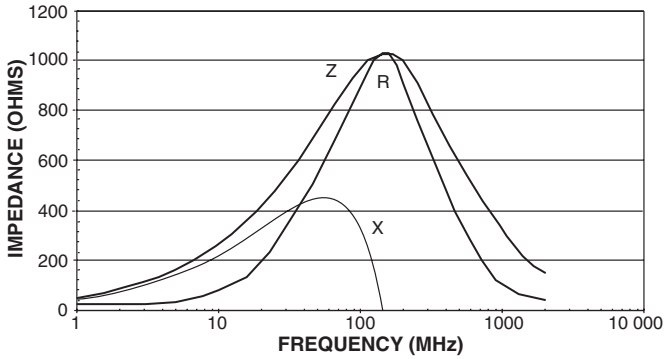
ILAS-1206 300 Ω



ILAS-1206 600 Ω



ILAS-1206 1000 Ω



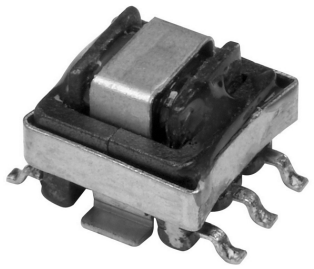
Transformers/ Inductors

Contents

LPE-3325-CST

Vishay Dale

Surface Mount Current Sense Transformers



FEATURES

- Surface mount design
- Compatible with surface mount process temperatures
- Designed for switching supply applications
- Optimal performance at 100 kHz and above
- Five standard turns ratios
- Custom Designs available
- Lead (Pb)-free construction

Pb-free

RoHS COMPLIANT

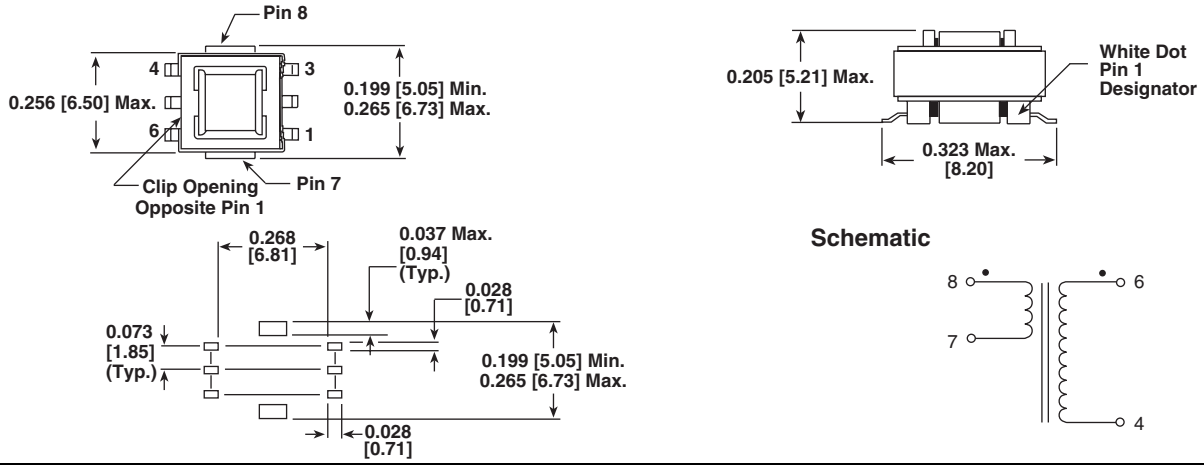
APPLICATIONS

- Switching power supplies
- AC current detection
- Output supply for control circuitry
- Appliances
- Medical equipment
- Office equipment

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	TURNS RATIO	SECONDARY INDUCTANCE AT 100 kHz, 0.1 V MIN. (µH)	SECONDARY DC RESISTANCE MAX. (Ohms)	PRIMARY AMPS
LPE-3325-CST030	30	180	1.00	6
LPE-3325-CST040	40	320	1.35	6
LPE-3325-CST050	50	500	2.50	6
LPE-3325-CST070	70	980	4.71	6
LPE-3325-CST125	125	3000	7.70	6

DIMENSIONS in inches [millimeters]



DESCRIPTION

LPE-3325	CST	125	ER	e2
MODEL	SERIES	TURNS RATIO	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

L	P	E	3	3	2	5	E	R	1	2	5	C	S	T
MODEL			SIZE				PACKAGE CODE		TURNS RATIO			SERIES		

Surface Mount Transformers/Inductors, Gapped and Ungapped, Custom Configurations Available

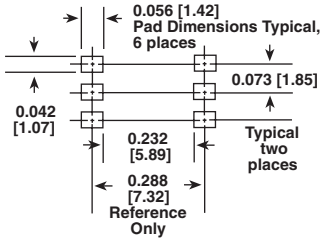
ELECTRICAL SPECIFICATIONS

Inductance Range: 10 µH to 3900 µH, measured at 0.10 V RMS at 10 kHz without DC current, using an HP 4263A or 4284A impedance analyzer
DC Resistance Range: 0.06 Ω to 18.0 Ω, measured at + 25 °C ± 5 °C
Rated Current Range: 1.00 amps to 0.06 amps
Dielectric Withstanding Voltage: 500 V RMS, 60 Hz, 5 seconds

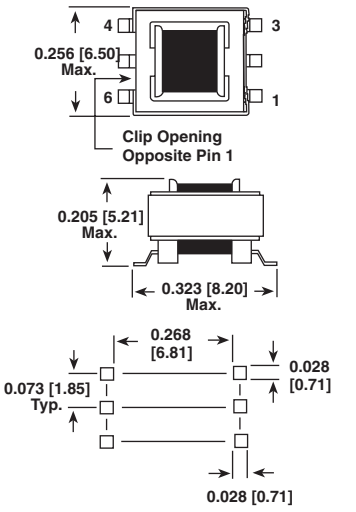
Pb-free
RoHS COMPLIANT

DIMENSIONS in inches [millimeters]

Pad Layout



Dimensional Outline



NOTE: Pad layout guidelines per MIL-STD-275E (printed wiring for electronic equipment).

Tolerances: xx ± 0.01" [± 0.25 mm]. xxx ± 0.005" [± 0.12 mm]

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	IND. (µH)	IND. TOL.	SCHEMATIC LETTER	DCR MAX. (Ohms)	MAX. RATED* DC CURRENT (Amps)	SATURATING CURRENT** (Amps)
Ungapped Models						
LPE-3325-100NA	10	± 30 %	A	0.06	1.01	N/A
LPE-3325-150NA	15	± 30 %	A	0.08	0.91	N/A
LPE-3325-220NA	22	± 30 %	A	0.09	0.83	N/A
LPE-3325-330NA	33	± 30 %	A	0.11	0.75	N/A
LPE-3325-470NA	47	± 30 %	A	0.14	0.69	N/A
LPE-3325-680NA	68	± 30 %	A	0.16	0.63	N/A
LPE-3325-101NA	100	± 30 %	A	0.20	0.57	N/A
LPE-3325-151NA	150	± 30 %	A	0.76	0.29	N/A
LPE-3325-221NA	220	± 30 %	A	0.92	0.26	N/A
LPE-3325-331NA	330	± 30 %	A	1.13	0.24	N/A
LPE-3325-471NA	470	± 30 %	A	1.35	0.22	N/A
LPE-3325-681NA	680	± 30 %	A	1.62	0.20	N/A
LPE-3325-102NA	1000	± 30 %	A	1.97	0.18	N/A
LPE-3325-152NA	1500	± 30 %	A	2.41	0.16	N/A
LPE-3325-222NA	2200	± 30 %	A	3.00	0.15	N/A
LPE-3325-332NA	3300	± 30 %	A	5.96	0.10	N/A
LPE-3325-392NA	3900	± 30%	A	7.00	0.10	N/A
Gapped Models						
LPE-3325-100MB	10	± 20 %	A	0.22	0.54	1.480
LPE-3325-150MB	15	± 20 %	A	0.27	0.48	1.240
LPE-3325-220MB	22	± 20 %	A	0.42	0.39	1.050
LPE-3325-330MB	33	± 20 %	A	0.65	0.31	0.872
LPE-3325-470MB	47	± 20 %	A	0.97	0.26	0.740
LPE-3325-680MB	68	± 20 %	A	1.45	0.21	0.622
LPE-3325-101MB	100	± 20 %	A	2.22	0.17	0.518
LPE-3325-151MB	150	± 20 %	A	3.55	0.13	0.426
LPE-3325-221MB	220	± 20 %	A	4.31	0.12	0.354
LPE-3325-331MB	330	± 20 %	A	6.72	0.10	0.290
LPE-3325-471MB	470	± 20 %	A	9.83	0.08	0.244
LPE-3325-681MB	680	± 20 %	A	14.8	0.07	0.204
LPE-3325-102MB	1000	± 20 %	A	18.0	0.06	0.169

* DC current that will create a maximum temperature rise of 30 °C when applied at + 25 °C ambient. ** DC current that will typically reduce the initial inductance by 20 %.

UNGAPPED MODELS: Highest possible inductance with the lowest DCR and highest Q capability. Beneficial in filter, impedance matching and line coupling devices.
GAPPED MODELS: Capable of handling large amounts of DC current, tighter inductance tolerance with better temperature stability than ungapped models. Beneficial in DC to DC converters or other circuits carrying DC currents or requiring inductance stability over a temperature range.

DESCRIPTION

LPE	3325	1000 µH	± 30 %	A	ER	e2
MODEL	SIZE	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	CORE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

L	P	E	3	3	2	5	E	R	1	0	2	N	U
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.	CORE

SCHEMATIC (TOP VIEW)

Schematic A

NOTE: Schematic A for both Gapped and Ungapped LPE Series

ENVIRONMENTAL PERFORMANCE

TEST	CONDITIONS
Thermal Cycling	Withstands - 55 °C to + 125 °C
Operating Temperature	- 55 °C to + 125 °C*
High Humidity	85 %
Soldering Heat	Tested to + 230 °C
Mechanical Shock	Per MIL-STD-202, Method 213 (100G)
Vibration	Per MIL-STD-202, Method 204 (20G)
Solderability	Per industry standards

* Must be checked in end use application

PART MARKING

- Vishay Dale
- Date code
- Marking code (Suffix of model #)
- Pin 1 indicator

PACKAGING

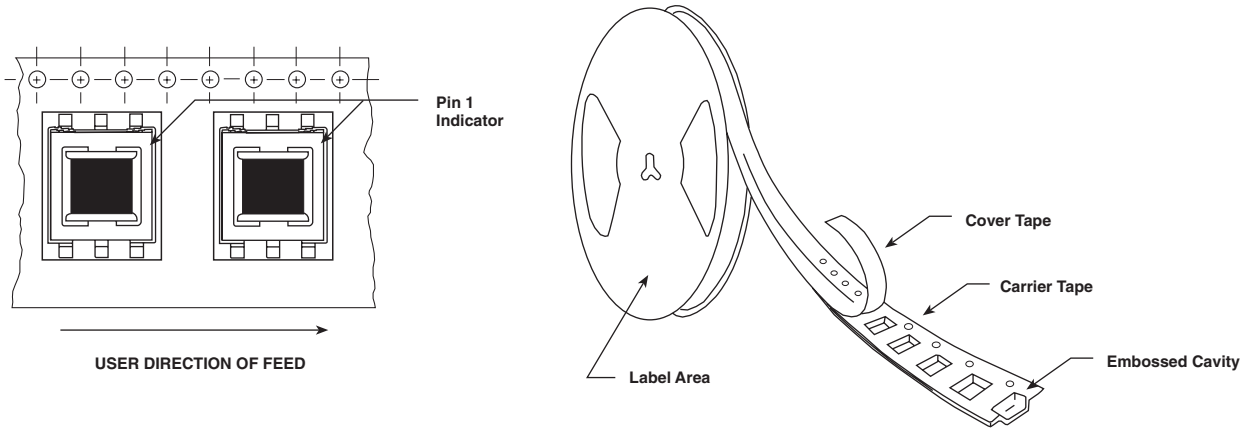
TAPE SPECIFICATIONS:
Carrier Tape Type: Conductive
Cover Tape Type: Anti-static
Cover Tape Adhesion to Carrier: 40 ± 30 grams

REEL SPECIFICATIONS:
Diameter (flange): 13" [330.2 mm]
Maximum Width (over flanges): 1.197" [30.4 mm]

STANDARDS: All embossed carrier tape packaging will be accomplished in compliance with latest revision of EIA-481 "Taping of Surface Mount Components for Automatic Placement".

MODEL	TAPE WIDTH	COMPONENT PITCH	UNITS PER 13 INCH REEL
LPE-3325	24 mm	12 mm	1000

Tape and Reel Orientation



NOTE: Top view shown with cover tape removed

Surface Mount Transformers/Inductors, Gapped and Ungapped Custom Configurations Available

ELECTRICAL SPECIFICATIONS

Inductance Range: 10 µH to 47 000 µH, measured at 0.10 V RMS at 10 kHz without DC current, using an HP 4263A or HP 4284A impedance analyzer

DC Resistance Range: 0.03 Ω to 19.1 Ω, measured at + 25 °C ± 5 °C

Rated Current Range: 2.00 amps to 0.09 amps

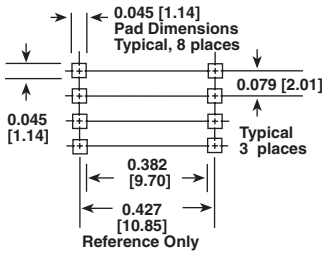
Dielectric Withstanding Voltage: 500 V RMS, 60 Hz, 5 seconds

Pb-free

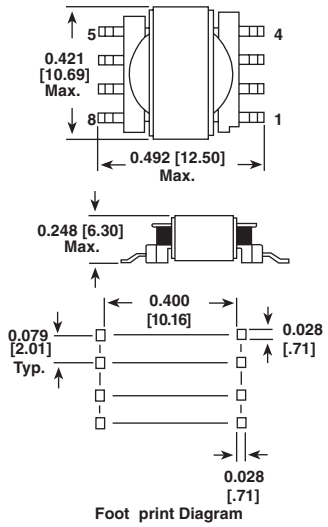
RoHS COMPLIANT

DIMENSIONS in inches [millimeters]

Pad Layout



Dimensional Outline



NOTE: Pad layout guidelines per MIL-STD-275E (printed wiring for electronic equipment).

Tolerances: xx ± 0.01" [± 0.25 mm]; xxx ± 0.005" [± 0.12 mm]

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	IND. (µH)	IND. TOL.	SCHEMATIC LETTER	DCR MAX. (Ohms)	MAX. RATED* DC CURRENT (Amps)	SATURATING CURRENT** (Amps)
Ungapped Models						
LPE-4841-101NA	100	± 30 %	A	0.17	0.88	N/A
LPE-4841-151NA	150	± 30 %	A	0.21	0.79	N/A
LPE-4841-221NA	220	± 30 %	A	0.25	0.721	N/A
LPE-4841-331NA	330	± 30 %	A	0.30	0.65	N/A
LPE-4841-471NA	470	± 30 %	A	0.36	0.60	N/A
LPE-4841-681NA	680	± 30 %	A	0.44	0.54	N/A
LPE-4841-102NA	1000	± 30 %	A	0.53	0.49	N/A
LPE-4841-152NA	1500	± 30 %	A	0.65	0.45	N/A
LPE-4841-222NA	2200	± 30 %	A	0.79	0.40	N/A
LPE-4841-332NA	3300	± 30 %	A	1.55	0.29	N/A
LPE-4841-472NA	4700	± 30 %	A	1.85	0.26	N/A
LPE-4841-682NA	6800	± 30 %	A	4.36	0.17	N/A
LPE-4841-103NA	10 000	± 30 %	A	5.29	0.16	N/A
LPE-4841-153NA	15 000	± 30 %	A	6.48	0.14	N/A
LPE-4841-223NA	22 000	± 30 %	A	13.1	0.10	N/A
LPE-4841-333NA	33 000	± 30 %	A	16.0	0.09	N/A
LPE-4841-473NA	47 000	± 30 %	A	19.1	0.08	N/A
Gapped Models						
LPE-4841-100MB	10	± 20 %	B	0.03	2.03	2.320
LPE-4841-150MB	15	± 20 %	B	0.04	1.84	1.925
LPE-4841-220MB	22	± 20 %	C	0.07	1.32	1.610
LPE-4841-330MB	33	± 20 %	C	0.09	1.20	1.330
LPE-4841-470MB	47	± 20 %	D	0.13	0.98	1.125
LPE-4841-680MB	68	± 20 %	D	0.21	0.79	0.941
LPE-4841-101MB	100	± 20 %	E	0.35	0.58	0.781
LPE-4841-151MB	150	± 20 %	E	0.48	0.52	0.641
LPE-4841-221MB	220	± 20 %	E	0.73	0.42	0.532
LPE-4841-331MB	330	± 20 %	E	1.14	0.34	0.436
LPE-4841-471MB	470	± 20 %	E	1.36	0.31	0.366
LPE-4841-681MB	680	± 20 %	E	2.07	0.25	0.305
LPE-4841-102MB	1000	± 20 %	E	3.15	0.20	0.252
LPE-4841-152MB	1500	± 20 %	E	4.76	0.16	0.206
LPE-4841-222MB	2200	± 20 %	E	7.29	0.13	0.170
LPE-4841-332MB	3300	± 20 %	E	11.7	0.11	0.139
LPE-4841-472MB	4700	± 20 %	E	17.7	0.09	0.117

* DC current that will create a maximum temperature rise of 30 °C when applied at + 25 °C ambient. ** DC current that will typically reduce the initial inductance by 20 %.

UNGAPPED MODELS: Highest possible inductance with the lowest DCR and highest Q capability. Beneficial in filter, impedance matching and line coupling devices.

GAPPED MODELS: Capable of handling large amounts of DC current, tighter inductance tolerance with better temperature stability than ungapped models. Beneficial in DC to DC converters or other circuits carrying DC currents or requiring inductance stability over a temperature range.

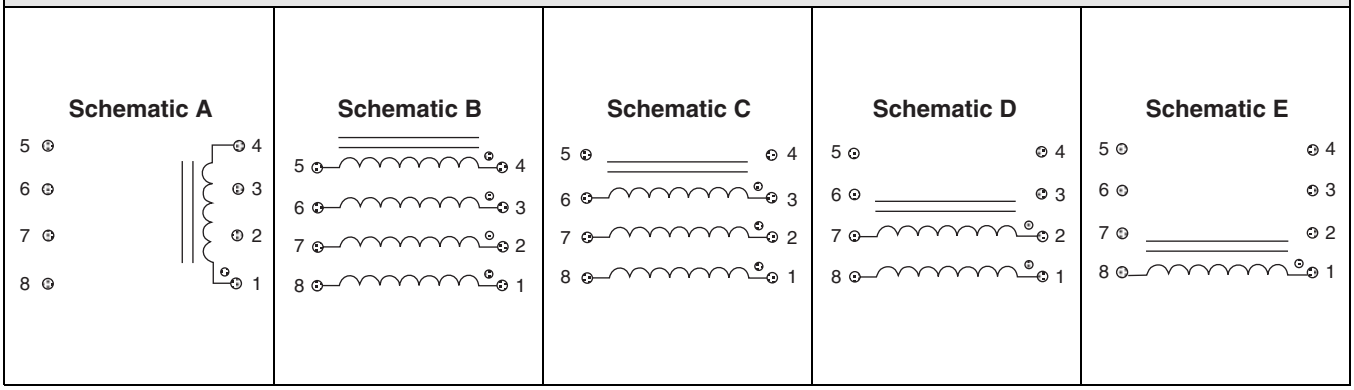
DESCRIPTION

LPE	4841	1000 µH	± 30 %	A	ER	e2
MODEL	SIZE	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	CORE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

L	P	E	4	8	4	1	E	R	1	0	2	N	U
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.	CORE

SCHEMATIC (TOP VIEW)



NOTE: Schematic A is for Ungapped LPE Series

ENVIRONMENTAL PERFORMANCE

TEST	CONDITIONS
Thermal Cycling	Withstands - 55 °C to + 125 °C
Operating Temperature	- 55 °C to + 125 °C*
High Humidity	85 %
Soldering Heat	Tested to + 230 °C
Mechanical Shock	Per MIL-STD-202, Method 213 (100G)
Vibration	Per MIL-STD-202, Method 204 (20G)
Solderability	Per industry standards

* Must be checked in end use application

PART MARKING

- Vishay Dale
- Date code
- Marking code (Suffix of model #)
- Pin 1 indicator

PACKAGING

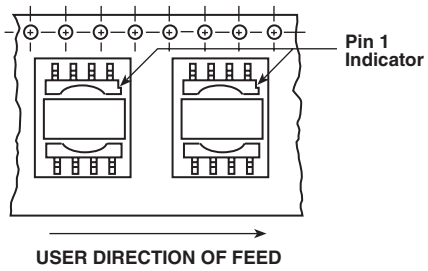
TAPE SPECIFICATIONS:
Carrier Tape Type: Conductive
Cover Tape Type: Anti-static
Cover Tape Adhesion to Carrier: 40 ± 30 grams

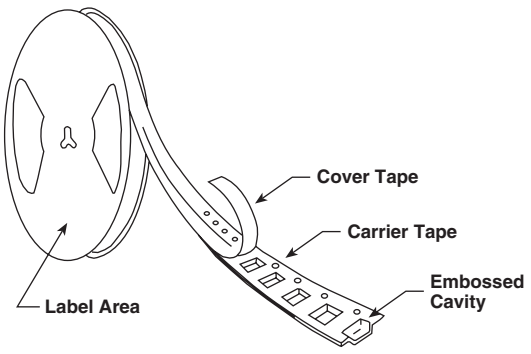
REEL SPECIFICATIONS:
Diameter (flange): 13" [330.2 mm]
Maximum Width (over flanges): 1.197" [30.4 mm]

STANDARDS: All embossed carrier tape packaging will be accomplished in compliance with latest revision of EIA-481 Taping of Surface Mount Components for Automatic Placement".

MODEL	TAPE WIDTH	COMPONENT PITCH	UNITS PER 13 INCH REEL
LPE-4841	24 mm	16 mm	600

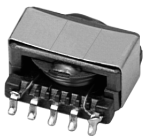
Tape and Reel Orientation





NOTE: Top view shown with cover tape removed

Surface Mount Transformers/Inductors, Gapped and Ungapped Custom Configurations Available



ELECTRICAL SPECIFICATIONS

(Multiple winds are connected in parallel)

Inductance Range: 10 µH to 68 000 µH, measured at 0.10 V RMS at 10 kHz without DC current, using an HP 4263A or HP 4284A impedance analyzer

DC Resistance Range: 0.03 Ω to 24.1 Ω, measured at + 25 °C ± 5 °C

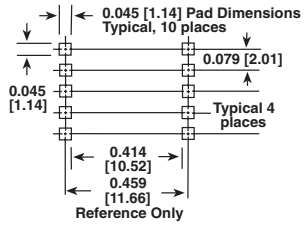
Rated Current Range: 2.29 amps to 0.07 amps

Dielectric Withstanding Voltage: 500 V RMS, 60 Hz, 5 seconds

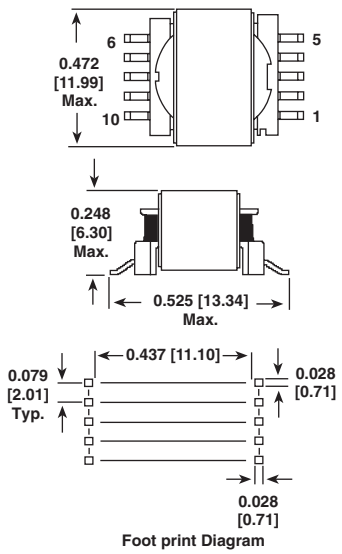
Pb-free
RoHS COMPLIANT

DIMENSIONS in inches [millimeters]

Pad Layout



Dimensional Outline



Foot print Diagram

NOTE: Pad layout guidelines per MIL-STD-275E (printed wiring for electronic equipment).

Tolerances: xx ± 0.01" [± 0.25 mm]; xxx ± 0.005" [± 0.12 mm]

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	IND. (µH)	IND. TOL.	SCHEMATIC LETTER	DCR MAX. (Ohms)	MAX. RATED* DC CURRENT (Amps)	SATURATING CURRENT** (Amps)
Ungapped Models						
LPE-5047-151NA	150	± 30 %	A	0.20	0.79	N/A
LPE-5047-221NA	220	± 30 %	A	0.24	0.72	N/A
LPE-5047-331NA	330	± 30 %	A	0.29	0.65	N/A
LPE-5047-471NA	470	± 30 %	A	0.35	0.59	N/A
LPE-5047-681NA	680	± 30 %	A	0.42	0.54	N/A
LPE-5047-102NA	1000	± 30 %	A	0.51	0.49	
LPE-5047-152NA	1500	± 30 %	A	0.63	0.44	N/A
LPE-5047-222NA	2200	± 30 %	A	0.76	0.40	N/A
LPE-5047-332NA	3300	± 30 %	A	1.00	0.35	N/A
LPE-5047-472NA	4700	± 30 %	A	2.24	0.24	N/A
LPE-5047-682NA	6800	± 30 %	A	2.70	0.21	N/A
LPE-5047-103NA	10 000	± 30 %	A	3.27	0.19	N/A
LPE-5047-153NA	15 000	± 30 %	A	6.26	0.14	N/A
LPE-5047-223NA	22 000	± 30 %	A	7.58	0.13	N/A
LPE-5047-333NA	33 000	± 30 %	A	9.50	0.11	N/A
LPE-5047-473NA	47 000	± 30 %	A	18.5	0.08	N/A
LPE-5047-683NA	68 000	± 30 %	A	24.1	0.07	N/A
Gapped Models						
LPE-5047-100MB	10	± 20 %	B	0.03	2.29	2.690
LPE-5047-150MB	15	± 20 %	B	0.04	2.07	2.230
LPE-5047-220MB	22	± 20 %	B	0.05	1.68	1.860
LPE-5047-330MB	33	± 20 %	C	0.09	1.35	1.540
LPE-5047-470MB	47	± 20 %	D	0.13	1.11	1.300
LPE-5047-680MB	68	± 20 %	D	0.15	1.01	1.085
LPE-5047-101MB	100	± 20 %	D	0.24	0.81	0.900
LPE-5047-151MB	150	± 20 %	D	0.37	0.65	0.740
LPE-5047-221MB	220	± 20 %	E	0.55	0.53	0.610
LPE-5047-331MB	330	± 20 %	E	0.85	0.43	0.500
LPE-5047-471MB	470	± 20 %	E	1.29	0.35	0.420
LPE-5047-681MB	680	± 20 %	E	1.96	0.28	0.350
LPE-5047-102MB	1000	± 20 %	E	2.38	0.26	0.290
LPE-5047-152MB	1500	± 20 %	E	3.66	0.21	0.240
LPE-5047-222MB	2200	± 20 %	E	5.47	0.17	0.195
LPE-5047-332MB	3300	± 20 %	E	8.48	0.14	0.160
LPE-5047-472MB	4700	± 20 %	E	13.2	0.11	0.135

* DC current that will create a maximum temperature rise of 30 °C when applied at + 25 °C ambient. ** DC current that will typically reduce the initial inductance by 20 %

UNGAPPED MODELS: Highest possible inductance with the lowest DCR and highest Q capability. Beneficial in filter, impedance matching and line coupling devices.

GAPPED MODELS: Capable of handling large amounts of DC current, tighter inductance tolerance with better temperature stability than ungapped models. Beneficial in DC to DC converters or other circuits carrying DC currents or requiring inductance stability over a temperature range.

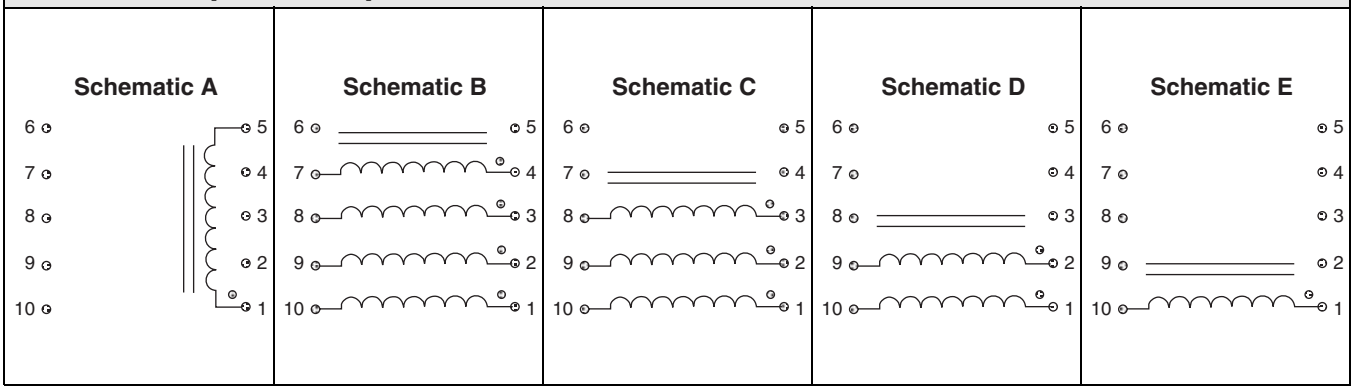
DESCRIPTION

LPE	5047	1000 µH	± 30 %	A	ER	e2
MODEL	SIZE	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	CORE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

L	P	E	5	0	4	7	E	R	1	0	2	N	U
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.	CORE

SCHEMATIC (TOP VIEW)



NOTE: Schematic A is for Ungapped LPE Series

ENVIRONMENTAL PERFORMANCE

TEST	CONDITIONS
Thermal Cycling	Withstands - 55 °C to + 125 °C
Operating Temperature	- 55 °C to + 125 °C*
High Humidity	85 %
Soldering Heat	Tested to + 230 °C
Mechanical Shock	Per MIL-STD-202, Method 213 (100G)
Vibration	Per MIL-STD-202, Method 204 (20G)
Solderability	Per industry standards

* Must be checked in end use application

PART MARKING

- Vishay Dale
- Date code
- Marking code (Suffix of model #)
- Pin 1 indicator

PACKAGING

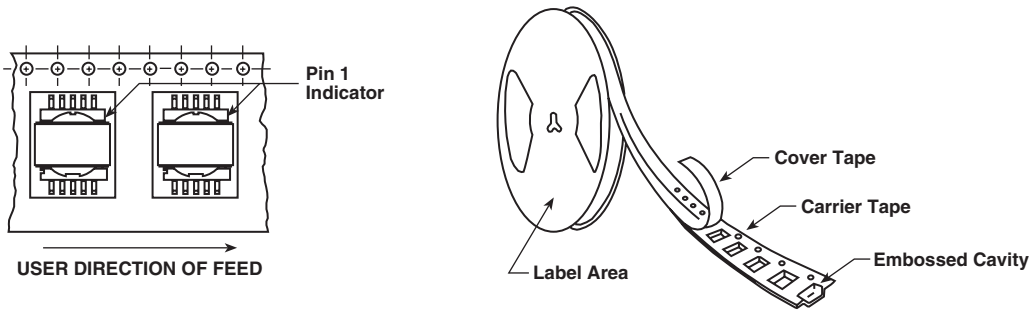
TAPE SPECIFICATIONS:
Carrier Tape Type: Conductive
Cover Tape Type: Anti-static
Cover Tape Adhesion to Carrier: 40 ± 30 grams

REEL SPECIFICATIONS:
Diameter (flange): 13" [330.2 mm]
Maximum Width (over flanges): 1.197" [30.4 mm]

STANDARDS: All embossed carrier tape packaging will be accomplished in compliance with latest revision of EIA-481 "Taping of Surface Mount Components for Automatic Placement".

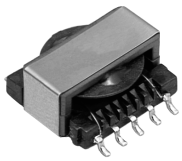
MODEL	TAPE WIDTH	COMPONENT PITCH	UNITS PER 13 INCH REEL
LPE-5047	24 mm	16 mm	600

Tape and Reel Orientation



NOTE: Top view shown with cover tape removed

Surface Mount Transformers/Inductors, Gapped and Ungapped, Custom Configurations Available

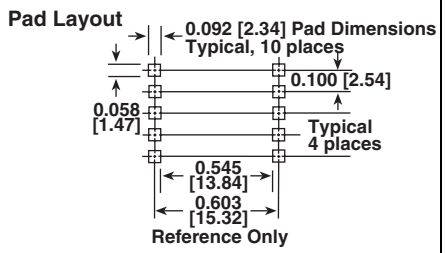


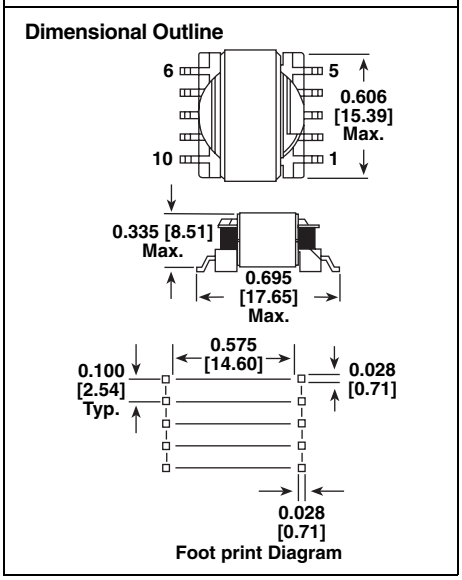
ELECTRICAL SPECIFICATIONS

(Multiple winds are connected in parallel)
Inductance Range: 10 µH to 330 000 µH, measured at 0.10 V RMS at 10 kHz without DC current, using an HP 4263A or HP 4284A impedance analyzer
DC Resistance Range: 0.03 Ω to 53.7 Ω, measured at + 25 °C ± 5 °C
Rated Current Range: 3.00 amps to 0.06 amps
Dielectric Withstanding Voltage: 500 V RMS, 60 Hz, 5 seconds

Pb-free
RoHS COMPLIANT

DIMENSIONS in inches [millimeters]





NOTE: Pad layout guidelines per MIL-STD-275E (printed wiring for electronic equipment). Tolerances: xx ± 0.01" [± 0.25 mm]. xxx ± 0.005" [± 0.12 mm]

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	IND. (µH)	IND. TOL.	SCHEMATIC LETTER	DCR MAX. (Ω)	MAX. RATED* DC CURRENT (Amps)	SATURATING CURRENT** (Amps)
Ungapped Models						
LPE-6562-221NA	220	± 30 %	A	0.28	0.90	N/A
LPE-6562-331NA	330	± 30 %	A	0.34	0.81	N/A
LPE-6562-471NA	470	± 30 %	A	0.40	0.74	N/A
LPE-6562-681NA	680	± 30 %	A	0.48	0.67	N/A
LPE-6562-102NA	1000	± 30 %	A	0.59	0.61	
LPE-6562-152NA	1500	± 30 %	A	0.72	0.55	N/A
LPE-6562-222NA	2200	± 30 %	A	0.87	0.50	N/A
LPE-6562-332NA	3300	± 30 %	A	1.07	0.45	N/A
LPE-6562-472NA	4700	± 30 %	A	1.27	0.41	N/A
LPE-6562-682NA	6800	± 30 %	A	1.53	0.38	N/A
LPE-6562-103NA	10 000	± 30 %	A	1.86	0.34	N/A
LPE-6562-153NA	15 000	± 30 %	A	2.27	0.31	N/A
LPE-6562-223NA	22 000	± 30 %	A	8.67	0.16	N/A
LPE-6562-333NA	33 000	± 30 %	A	10.6	0.14	N/A
LPE-6562-473NA	47 000	± 30 %	A	12.7	0.13	N/A
LPE-6562-683NA	68 000	± 30 %	A	15.2	0.12	N/A
LPE-6562-104NA	10 000	± 30 %	A	18.5	0.11	N/A
LPE-6562-154NA	150 000	± 30 %	A	37.7	0.08	N/A
LPE-6562-224NA	220 000	± 30 %	A	45.6	0.07	N/A
LPE-6562-334NA	330 000	± 30 %	A	53.7	0.06	N/A
Gapped Models						
LPE-6562-100MB	10	± 20 %	B	0.03	3.09	5.055
LPE-6562-150MB	15	± 20 %	B	0.04	2.79	4.160
LPE-6562-220MB	22	± 20 %	B	0.05	2.26	3.460
LPE-6562-330MB	33	± 20 %	B	0.08	1.81	2.840
LPE-6562-470MB	47	± 20 %	D	0.12	1.48	2.390
LPE-6562-680MB	68	± 20 %	C	0.19	1.20	1.990
LPE-6562-101MB	100	± 20 %	D	0.29	0.98	1.650
LPE-6562-151MB	150	± 20 %	E	0.45	0.78	1.350
LPE-6562-221MB	220	± 20 %	E	0.54	0.71	1.115
LPE-6562-331MB	330	± 20 %	E	0.84	0.57	0.912
LPE-6562-471MB	470	± 20 %	E	1.24	0.47	0.765
LPE-6562-681MB	680	± 20 %	E	1.89	0.38	0.637
LPE-6562-102MB	1000	± 20 %	E	2.91	0.31	0.526
LPE-6562-152MB	1500	± 20 %	E	4.50	0.25	0.430
LPE-6562-222MB	2200	± 20 %	E	6.90	0.20	0.355
LPE-6562-332MB	3300	± 20 %	E	10.4	0.16	0.290
LPE-6562-472MB	4700	± 20 %	E	15.7	0.13	0.243

* DC current that will create a maximum temperature rise of 30 °C when applied at + 25 °C ambient. ** DC current that will typically reduce the initial inductance by 20 %.
UNGAPPED MODELS: Highest possible inductance with the lowest DCR and highest Q capability. Beneficial in filter, impedance matching and line coupling devices.
GAPPED MODELS: Capable of handling large amounts of DC current, tighter inductance tolerance with better temperature stability than ungapped models. Beneficial in DC to DC converters or other circuits carrying DC currents or requiring inductance stability over a temperature range.

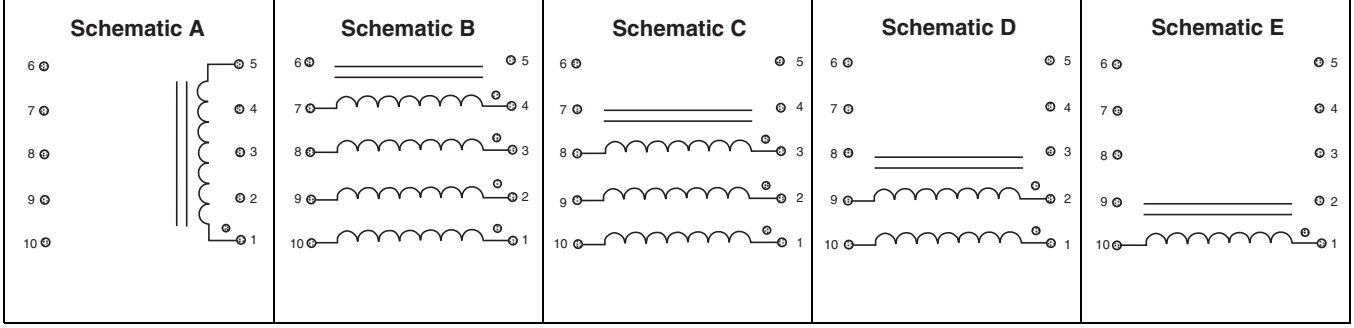
DESCRIPTION

LPE	6562	1000 µH	± 30 %	A	ER	e2
MODEL	SIZE	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	CORE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

L	P	E	6	5	6	2	E	R	1	0	2	N	T
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.	CORE

SCHEMATIC (TOP VIEW)



NOTE: Schematic A is for Ungapped LPE Series

ENVIRONMENTAL PERFORMANCE

TEST	CONDITIONS
Thermal Cycling	Withstands - 55 °C to + 125 °C
Operating Temperature	- 55 °C to + 125 °C*
High Humidity	85 %
Soldering Heat	Tested to + 230 °C
Mechanical Shock	Per MIL-STD-202, Method 213 (100G)
Vibration	Per MIL-STD-202, Method 204 (20G)
Solderability	Per industry standards

* Must be checked in end use application

PART MARKING

- Vishay Dale
- Date code
- Marking code (Suffix of model #)
- Pin 1 indicator

PACKAGING

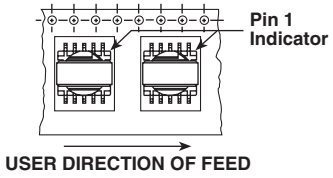
TAPE SPECIFICATIONS:
Carrier Tape Type: Conductive
Cover Tape Type: Anti-static
Cover Tape Adhesion to Carrier: 40 ± 30 grams

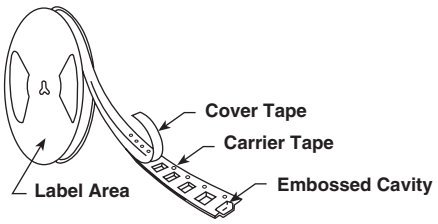
REEL SPECIFICATIONS:
Diameter (flange): 13" [330.2 mm]
Maximum Width (over flanges): 1.197" [30.4 mm]

STANDARDS: All embossed carrier tape packaging will be accomplished in compliance with latest revision of EIA-481 "Taping of Surface Mount Components for Automatic Placement".

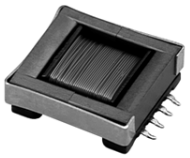
MODEL	TAPE WIDTH	COMPONENT PITCH	UNITS PER 13 INCH REEL
LPE-6562	32 mm	20 mm	300

Tape and Reel Orientation





Surface Mount Transformers/Inductors, Gapped and Ungapped, Custom Configurations Available



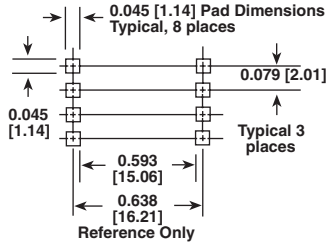
ELECTRICAL SPECIFICATIONS

(Multiple winds are connected in parallel)
Inductance Range: 10 µH to 150 000 µH, measured at 0.10 V RMS at 10 kHz without DC current, using an HP 4263 or HP 4284A impedance analyzer
DC Resistance Range: 0.02 Ω to 46.2 Ω, measured at + 25 °C ± 5 °C
Rated Current Range: 3.20 amps to 0.17 amps
Dielectric Withstanding Voltage: 500 V RMS, 60 Hz, 5 seconds

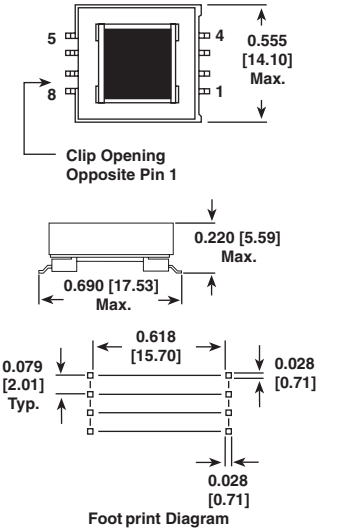
Pb-free
RoHS COMPLIANT

DIMENSIONS in inches [millimeters]

Pad Layout



Dimensional Outline



NOTE: Pad layout guidelines per MIL-STD- 275E (printed wiring for electronic equipment).
Tolerances: xx ± 0.01" [± 0.25 mm]. xxx ± 0.005" [± 0.12 mm].

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	IND. (µH)	IND. TOL.	SCHEMATIC LETTER	DCR MAX. (Ohms)	MAX. RATED* DC CURRENT (Amps)	SATURATING CURRENT** (Amps)
Ungapped Models						
LPE-6855-151NA	150	± 30 %	A	0.28	0.84	N/A
LPE-6855-221NA	220	± 30 %	A	0.34	0.76	N/A
LPE-6855-331NA	330	± 30 %	A	0.41	0.69	N/A
LPE-6855-471NA	470	± 30 %	A	0.49	0.63	N/A
LPE-6855-681NA	680	± 30 %	A	0.59	0.57	N/A
LPE-6855-102NA	1000	± 30 %	A	0.72	0.52	N/A
LPE-6855-152NA	1500	± 30 %	A	0.88	0.47	N/A
LPE-6855-222NA	2200	± 30 %	A	1.07	0.43	N/A
LPE-6855-332NA	3300	± 30 %	A	1.31	0.39	N/A
LPE-6855-472NA	4700	± 30 %	A	1.56	0.35	N/A
LPE-6855-682NA	6800	± 30 %	A	1.88	0.32	N/A
LPE-6855-103NA	10 000	± 30 %	A	7.17	0.16	N/A
LPE-6855-153NA	15 000	± 30 %	A	8.78	0.15	N/A
LPE-6855-223NA	22 000	± 30 %	A	10.6	0.14	N/A
LPE-6855-333NA	33 000	± 30 %	A	13.0	0.12	N/A
LPE-6855-473NA	47 000	± 30 %	A	15.5	0.11	N/A
LPE-6855-683NA	68 000	± 30 %	A	18.7	0.10	N/A
LPE-6855-104NA	100 000	± 30 %	A	37.7	0.07	N/A
LPE-6855-154NA	150 000	± 30 %	A	46.2	0.06	N/A
Gapped Models						
LPE-6855-100MB	10	± 20 %	B	0.02	3.21	3.375
LPE-6855-150MB	15	± 20 %	B	0.03	2.90	2.790
LPE-6855-220MB	22	± 20 %	B	0.04	2.64	2.325
LPE-6855-330MB	33	± 20 %	B	0.05	2.12	1.910
LPE-6855-470MB	47	± 20 %	B	0.08	1.73	1.610
LPE-6855-680MB	68	± 20 %	B	0.12	1.41	1.350
LPE-6855-101MB	100	± 20 %	B	0.15	1.28	1.120
LPE-6855-151MB	150	± 20 %	C	0.23	1.02	0.915
LPE-6855-221MB	220	± 20 %	D	0.35	0.83	0.757
LPE-6855-331MB	330	± 20 %	D	0.55	0.67	0.620
LPE-6855-471MB	470	± 20 %	D	0.82	0.54	0.520
LPE-6855-681MB	680	± 20 %	E	1.23	0.45	0.433
LPE-6855-102MB	1000	± 20 %	E	1.89	0.36	0.358
LPE-6855-152MB	1500	± 20 %	E	2.90	0.29	0.292
LPE-6855-222MB	2200	± 20 %	E	4.50	0.23	0.242
LPE-6855-332MB	3300	± 20 %	E	5.50	0.21	0.197
LPE-6855-472MB	4700	± 20 %	E	8.30	0.17	0.166

* DC current that will create a maximum temperature rise of 30 °C when applied at + 25 °C ambient. ** DC current that will typically reduce the initial inductance by 20 %.
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GAPPED MODELS: Capable of handling large amounts of DC current, tighter inductance tolerance with better temperature stability than ungapped models. Beneficial in DC to DC converters or other circuits carrying DC currents or requiring inductance stability over a temperature range.

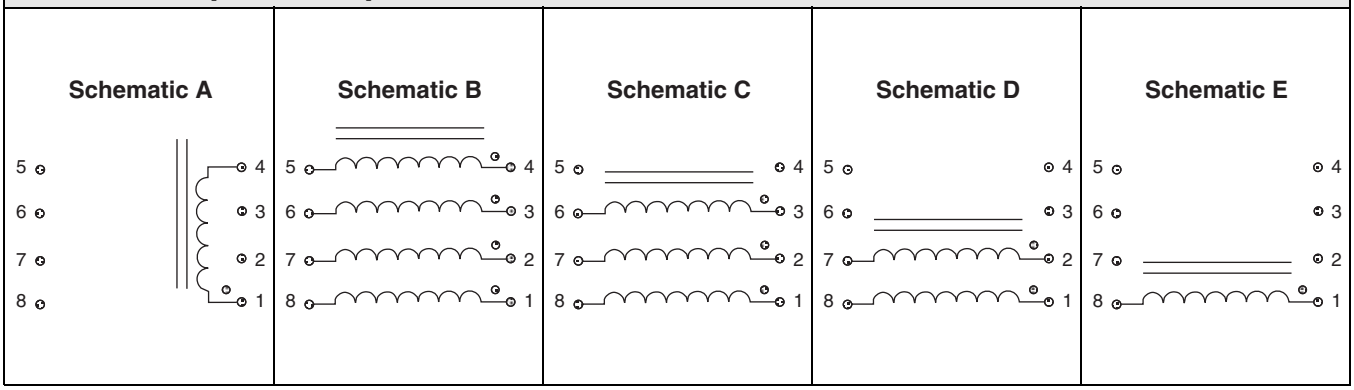
DESCRIPTION

LPE	6855	1000 µH	± 30 %	A	ER	e2
MODEL	SIZE	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	CORE	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

GLOBAL PART NUMBER

L	P	E	6	8	5	5	E	R	1	0	2	N	U
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.	CORE

SCHEMATIC (TOP VIEW)



NOTE: Schematic A is for Ungapped LPE Series

ENVIRONMENTAL PERFORMANCE

TEST	CONDITIONS
Thermal Cycling	Withstands - 55 °C to + 125 °C
Operating Temperature	- 55 °C to + 125 °C
High Humidity	85 %
Soldering Heat	Tested to + 230 °C
Mechanical Shock	Per MIL-STD-202, Method 213 (100G)
Vibration	Per MIL-STD-202, Method 204 (20G)
Solderability	Per industry standards

* Must be checked in end use application

PART MARKING

- Vishay Dale
- Date code
- Marking code (Suffix of model #)
- Pin 1 indicator

PACKAGING

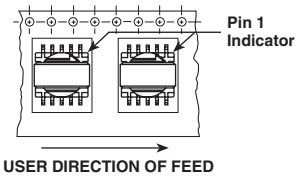
TAPE SPECIFICATIONS:
Carrier Tape Type: Conductive
Cover Tape Type: Anti-static
Cover Tape Adhesion to Carrier: 40 ± 30 grams

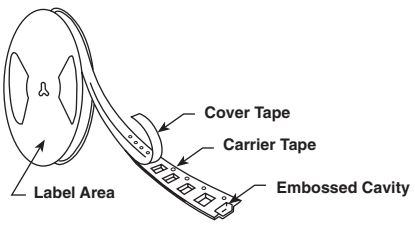
REEL SPECIFICATIONS:
Diameter (flange): 13" [330.2 mm]
Maximum Width (over flanges): 1.197" [30.4 mm]

STANDARDS: All embossed carrier tape packaging will be accomplished in compliance with latest revision of EIA-481 "Taping of Surface Mount Components for Automatic Placement".

MODEL	TAPE WIDTH	COMPONENT PITCH	UNITS PER 13 INCH REEL
LPE-6855	32 mm	20 mm	450

Tape and Reel Orientation





Inductors/Transformers Customizable, Surface Mount Torodial, Kool Mu®*, Powered Iron and MPP Cores

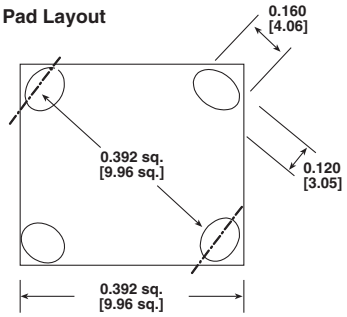
FEATURES

- Toroidal design for minimal EMI radiation in DC to DC converter applications
- Designed to support the growing need for efficient DC to DC converters in battery operated equipment
- Two separate windings provide versatility by ability to connect windings in series or parallel
- Operating Temperature Range: - 40 °C to + 125 °C
- Supplied on tape and reel and is designed to be pick and place compatible
- Custom versions and turns ratios available. Contact the factory with your specifications

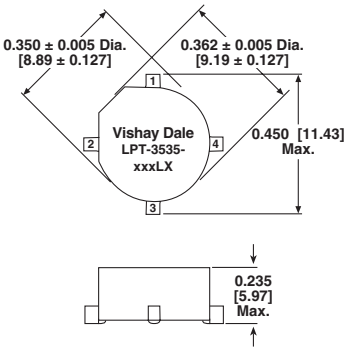
Pb-free
RoHS COMPLIANT

DIMENSIONS in inches [millimeters]

Pad Layout



Dimensional Outline



STANDARD ELECTRICAL SPECIFICATIONS

MODEL LA = KOOL MU® CORE	STANDARD IND. VALUES	ACTUAL IND. - µH (LOC) ± 15 %	RATED IDC (40 °C)	IND. AT IDC (L_{BIAS}) [30 %]	DCR Ω
LPT-3535-1R0LA	1.0	0.800	6.42	0.48 at 7.05	0.005
LPT-3535-1R5LA	1.5	1.80	4.77	1.07 at 4.70	0.009
LPT-3535-2R5LA	2.5	2.45	4.45	1.46 at 4.03	0.011
LPT-3535-3R3LA	3.3	3.20	3.73	1.90 at 3.52	0.015
LPT-3535-5R0LA	5.0	5.00	3.01	2.98 at 2.82	0.023
LPT-3535-100LA	10	11.3	1.95	6.69 at 1.88	0.055
LPT-3535-150LA	15	16.2	1.59	9.64 at 1.57	0.081
LPT-3535-250LA	25	26.5	1.25	15.7 at 1.23	0.131
LPT-3535-330LA	33	33.8	1.05	20.1 at 1.08	0.182
LPT-3535-500LA	50	51.2	0.84	30.5 at 0.88	0.280
LPT-3535-101LA	100	101	0.63	60.2 at 0.63	0.514
LPT-3535-151LA	150	151	0.57	90.0 at 0.51	0.775
LPT-3535-251LA	250	252	0.40	150.0 at 0.40	1.279
LPT-3535-331LA	330	328	0.33	195.0 at 0.35	1.837
LB = POWDER IRON					
LPT-3535-1R0LB	1.0	0.882	5.10	0.56 at 4.29	0.004
LPT-3535-1R5LB	1.5	1.57	4.48	0.99 at 3.21	0.005
LPT-3535-2R5LB	2.5	2.45	3.58	1.54 at 2.57	0.009
LPT-3535-3R3LB	3.3	3.53	2.96	2.22 at 2.14	0.013
LPT-3535-5R0LB	5.0	4.80	2.41	3.03 at 1.84	0.018
LPT-3535-100LB	10	10.8	1.58	6.81 at 1.22	0.043
LPT-3535-150LB	15	15.3	1.29	9.65 at 1.03	0.064
LPT-3535-250LB	25	25.1	1.03	15.8 at 0.80	0.103
LPT-3535-330LB	33	33.5	0.85	21.1 at 0.70	0.147
LPT-3535-500LB	50	51.8	0.68	32.7 at 0.56	0.230
LPT-3535-101LB	100	104	0.51	65.2 at 0.40	0.424
LPT-3535-151LB	150	153	0.41	96.3 at 0.33	0.645
LPT-3535-251LB	250	250	0.33	157.0 at 0.25	1.031
LPT-3535-331LB	330	330	0.27	208.0 at 0.22	1.463
LC = MPP					
LPT-3535-1R0LC	1.0	0.800	6.45	0.52 at 7.05	0.005
LPT-3535-1R5LC	1.5	1.80	4.80	1.16 at 4.70	0.009
LPT-3535-2R5LC	2.5	2.45	4.46	1.58 at 4.03	0.011
LPT-3535-3R3LC	3.3	3.20	3.73	2.06 at 3.52	0.015
LPT-3535-5R0LC	5.0	5.00	3.02	3.22 at 2.82	0.023
LPT-3535-100LC	10	11.3	1.94	7.25 at 1.88	0.055
LPT-3535-150LC	15	16.2	1.59	10.43 at 1.57	0.081
LPT-3535-250LC	25	26.5	1.26	17.0 at 1.23	0.131
LPT-3535-330LC	33	33.8	1.05	21.8 at 1.08	0.182
LPT-3535-500LC	50	51.2	0.84	33.0 at 0.88	0.280
LPT-3535-101LC	100	101	0.64	97.4 at 0.51	0.514
LPT-3535-151LC	150	151	0.52	65.2 at 0.63	0.775
LPT-3535-251LC	250	252	0.40	162.0 at 0.51	1.279
LPT-3535-331LC	330	328	0.33	211.0 at 0.35	1.837

DESCRIPTION

LPT	3535	100 µH	± 15 %	LA/LB/LC	ER	e2
MODEL	SIZE	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	CORE/HEIGHT LA = KOOL MU® LB = POWER IRON LC = MPP	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

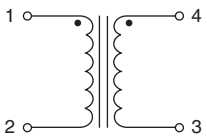
GLOBAL PART NUMBER

L	P	T	3	5	3	5	E	R	1	0	1	L	K
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.	CORE

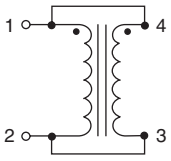
* Kool Mu® is a registered trademark of Spang & Company

SCHEMATICS - CONNECTION DIAGRAMS

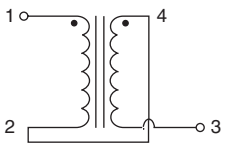
Transformer



Parallel



Series

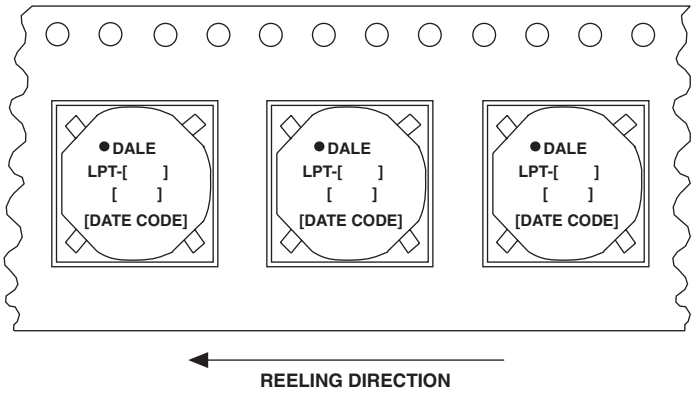


PART MARKING

- Vishay Dale
- Model number
- Pin 1 identification

PACKAGING in inches [millimeters]

Pocket Tape Orientation



Carrier Tape Width	0.945 [24.0]
Pitch	0.630 [16.0]
Parts per 13" [330.2] Reel	600

All embossed carrier tape packaging will be in compliance with the latest revision of EIA-481.

Inductors/Transformers, Customizable, Surface Mount Toroidal, Kool Mu®*, Powered Iron and MPP Cores

FEATURES

- Toroidal design for minimal EMI radiation in DC to DC converter applications
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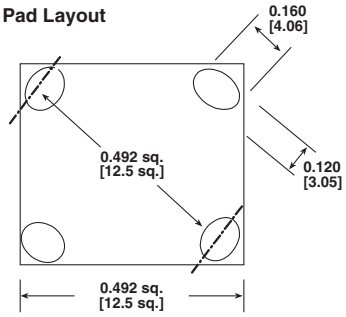
- Custom versions and turns ratios available. Contact the factory with your specifications

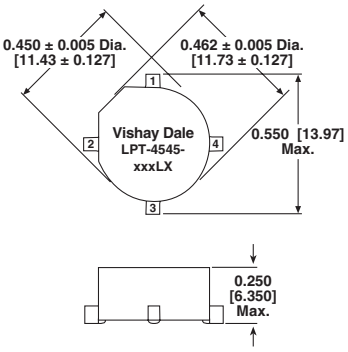
Pb-free
RoHS COMPLIANT

DIMENSIONS in inches [millimeters]

Pad Layout



Dimensional Outline



STANDARD ELECTRICAL SPECIFICATIONS

MODEL LA=KOOL MU®CORE	STANDARD IND. VALUES	ACTUAL IND. - µH (L_{OC}) ± 15 %	RATED IDC (40 °C)	IND. at IDC (L_{BIAS}) [30 %]	DCR Ω
LPT-4545-1R0LA	1.0	0.832	6.90	0.51 at 7.62	0.003
LPT-4545-1R5LA	1.5	1.30	6.45	0.80 at 6.10	0.004
LPT-4545-2R5LA	2.5	2.55	5.75	1.57 at 4.35	0.006
LPT-4545-3R3LA	3.3	3.33	5.50	2.05 at 3.81	0.007
LPT-4545-5R0LA	5.0	5.20	4.45	3.20 at 3.05	0.011
LPT-4545-100LA	10	10.2	3.45	6.28 at 2.18	0.019
LPT-4545-150LA	15	15.0	2.79	9.26 at 1.79	0.029
LPT-4545-200LA	20	20.8	2.61	12.4 at 1.53	0.038
LPT-4545-250LA	25	25.2	2.25	15.5 at 1.39	0.048
LPT-4545-330LA	33	32.5	1.85	20.0 at 1.22	0.068
LPT-4545-500LA	50	50.0	1.50	30.8 at 0.98	0.107
LPT-4545-101LA	100	101	1.15	62.0 at 0.69	0.195
LPT-4545-151LA	150	152	0.92	93.4 at 0.56	0.302
LPT-4545-251LA	250	248	0.73	153.0 at 0.44	0.491
LPT-4545-301LA	300	300	0.63	179.0 at 0.40	0.670
LPT-4545-331LA	330	333	0.60	205.0 at 0.38	0.706
LB=POWDER IRON					
LPT-4545-1R0LB	1.0	0.838	6.61	0.53 at 7.09	0.004
LPT-4545-1R5LB	1.5	1.21	6.08	0.76 at 5.91	0.005
LPT-4545-2R5LB	2.5	2.71	5.01	1.71 at 3.94	0.009
LPT-4545-3R3LB	3.3	3.35	4.22	2.11 at 3.54	0.012
LPT-4545-5R0LB	5.0	5.66	3.32	3.57 at 2.73	0.019
LPT-4545-100LB	10	10.9	2.52	6.84 at 1.97	0.034
LPT-4545-150LB	15	14.8	2.10	9.31 at 1.69	0.049
LPT-4545-250LB	25	26.3	1.61	16.5 at 1.27	0.084
LPT-4545-330LB	33	34.3	1.34	21.6 at 1.11	0.119
LPT-4545-500LB	50	51.0	1.09	32.1 at 0.91	0.180
LPT-4545-101LB	100	105	0.81	66.2 at 0.63	0.342
LPT-4545-151LB	150	150	0.66	94.7 at 0.53	0.509
LPT-4545-251LB	250	248	0.52	156.0 at 0.41	0.831
LPT-4545-331LB	330	335	0.43	211.0 at 0.35	1.194
LC=MPP					
LPT-4545-1R0LC	1.0	0.838	7.54	0.54 at 11.11	0.004
LPT-4545-1R5LC	1.5	1.30	6.82	0.84 at 8.89	0.004
LPT-4545-2R5LC	2.5	2.55	5.84	1.64 at 6.35	0.007
LPT-4545-3R3LC	3.3	3.33	5.49	2.14 at 5.56	0.008
LPT-4545-5R0LC	5.0	5.20	4.37	3.35 at 4.45	0.012
LPT-4545-100LC	10	10.2	3.32	6.56 at 3.18	0.022
LPT-4545-150LC	15	15.0	2.69	9.68 at 2.61	0.033
LPT-4545-250LC	25	25.2	2.12	16.2 at 2.02	0.054
LPT-4545-330LC	33	32.5	1.76	20.9 at 1.78	0.076
LPT-4545-500LC	50	50.0	1.41	32.2 at 1.43	0.119
LPT-4545-101LC	100	101	1.07	64.8 at 1.01	0.219
LPT-4545-151LC	150	152	0.86	97.7 at 0.82	0.340
LPT-4545-251LC	250	248	0.67	159.0 at 0.64	0.551
LPT-4545-331LC	330	333	0.56	214.0 at 0.56	0.788

DESCRIPTION

LPT	4545	100 µH	± 15 %	LA/LB/LC	ER	e2
MODEL	SIZE	INDUCTANCE VALUE	INDUCTANCE TOLERANCE	CORE/HEIGHT LA = KOOL MU® LB = POWER IRON LC = MPP	PACKAGE CODE	JEDEC LEAD (Pb)-FREE STANDARD

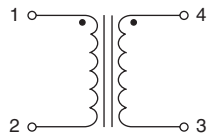
GLOBAL PART NUMBER

L	P	T	4	5	4	5	E	R	1	0	1	L	K
PRODUCT FAMILY			SIZE				PACKAGE CODE		INDUCTANCE VALUE			TOL.	CORE

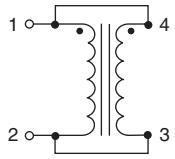
* Kool Mu® is a registered trademark of Spang & Company

SCHEMATICS - CONNECTION DIAGRAMS

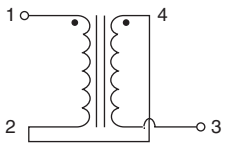
Transformer



Parallel



Series

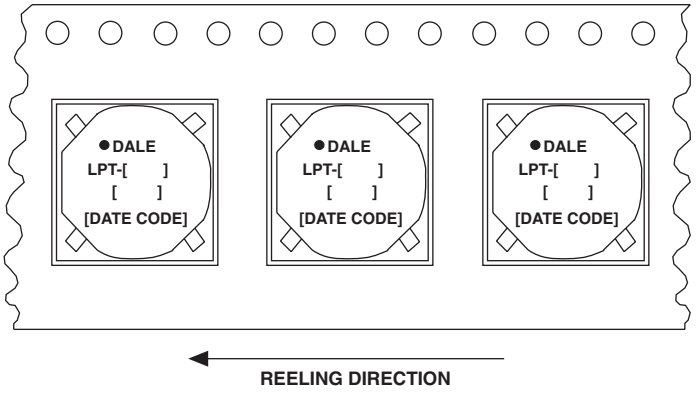


PART MARKING

- Vishay Dale
- Model number
- Pin 1 identification

PACKAGING in inches [millimeters]

Pocket Tape Orientation



Carrier Tape Width	0.945 [24.0]
Pitch	0.630 [16.0]
Parts per 13" [330.2] Reel	600

All embossed carrier tape packaging will be in compliance with the latest revision of EIA-481.

Reference Information

Contents

Magnetic Components

Switch Mode Magnetics

Air Core Inductors

Switch Mode Magnetics

CUSTOM DESIGN AND PRODUCTION

Vishay Dale has extensive facilities for custom design and production of custom magnetics. Design applications include:

- PWM, PSM and FM Transformers
- Pulse and Trigger Transformers
- Test Measurement Transformers
- Power Transformers
- Power, Filter and Switchmode Inductors
- Telecommunications/Audio Transformers

Design Input forms for the above design applications follow:

PACKAGE DESIGN AND MATERIALS

If you have your own electrical design we can add value by assisting you with selection of the most economical materials and efficient packaging design.

Vishay Dale can provide designs to meet UL, CSA, IEEE and VDE requirements.

Produced to your specifications for a wide range of high frequency applications including: Television, Radio (2-way, scanners, AM/FM), Satellite Communication, Cable TV Systems, Microwave, Test Equipment.

ELECTRICAL SPECIFICATIONS

Frequency: to 500 MHz

Current: 10 amp maximum

Temperature: to + 130 °C

MECHANICAL SPECIFICATIONS

Winding: 1 to 32 turns, clockwise or counter-clockwise with variable pitch

Wire Gauge: #18 to #32

Leads: Automatically tinned. Various configurations available

Coil Inside Diameter: 0.079" to 0.354" [2.01 mm to 8.99 mm]

Coil Length: up to 1.26" [32.0 mm]

Can't find it in the catalog? Vishay Dale has the custom capability to design and produce a wide range of magnetic components to your requirements.

POWER TRANSFORMERS

50 to 400 Hz, VA ratings to 100 VA. Specialty models in Low Profile and PC Mount.

INDUCTORS

Inductance values to 20 H, current ratings to 60 amps. Capability of many styles including: Toroidal, Laminated, E Core, Pot Core, Slug Core, Air Core

AUDIO TRANSFORMERS

Coupling Transformers and Hybrid Transformers available in PC Mount, Leadset and Low Profile

TRANSFORMERS

Switching Magnetics, Converter Transformers, Pulse Transformers, High Voltage Transformers

Power Transformer Design Information

CONTACT INFORMATION

Contact Person _____ E-Mail _____

Phone # _____ - _____ - _____ Fax # _____ - _____ - _____ Company _____

General Application of this product: _____

ELECTRICAL REQUIREMENTS

Approximate Output Power: _____ VA

Minimum Line Frequency (Hz):
50 60 400 1K 100K 150K 250K Other: _____

Maximum Temperature Rise (°C):
10 20 30 40 50 Other: _____

Efficiency: _____ %

Isolation Voltage: _____ Vac/Vdc

Interwinding Capacitance (Ciw): _____ pF

Duty Cycle: _____ %

Primary Input Voltage:
90 100 115 120 200 230 240 115/230 Other: _____

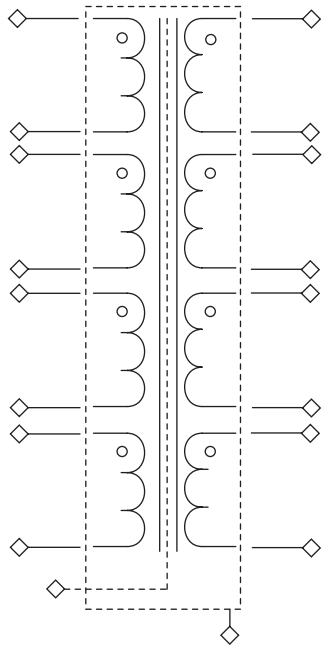
Protection (Resettable or Single Use):
Thermal Fused Other: _____

Regulation: _____ %

Agency Requirements: UL VDE CSA IEC

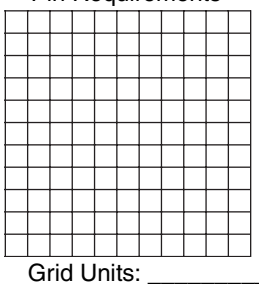
Leakage Ind. (LI): _____ µH

SCHEMATIC



Voltage: _____	Voltage: _____	AC or DC	Other Requirements:	
Current: _____	Current: _____	Rms or Peak	_____	
L: _____	Rect: _____	HW FW FWB	_____	
Voltage: _____	Voltage: _____	AC or DC	Other Requirements:	
Current: _____	Current: _____	Rms or Peak	_____	
L: _____	Rect: _____	HW FW FWB	_____	
Voltage: _____	Voltage: _____	AC or DC	Other Requirements:	
Current: _____	Current: _____	Rms or Peak	_____	
L: _____	Rect: _____	HW FW FWB	_____	
Voltage: _____	Voltage: _____	AC or DC	Budgetary/Target Price:	
Current: _____	Current: _____	Rms or Peak	_____ at _____ pcs	
L: _____	Rect: _____	HW FW FWB		
Screen or Shield	Outer Shield			
Thick: _____	Thick: _____			
Material: _____	Material: _____			

Pin Requirements



Grid Units: _____

PHYSICAL REQUIREMENTS

Flame Retardant: Yes No
Standard Varnish: Yes No
Encapsulated: Yes No
Hermetically Sealed: Yes No
Shielded: Yes No

Mounting Style:
Thru Hole Surface Mount Flying Leads Other

Length (Max.): _____
Width (Max.): _____
Height (Max.): _____

Temperature Class (°C):
105 130 155 180 200

OTHER REQUIREMENTS

_____
_____
_____
_____ (Continue on seperate sheet if necessary)

PRIORITIZATION (1-HIGHEST)

_____ Size
_____ Efficiency
_____ Cost

Power Transformer Design Information

CONTACT INFORMATION

Contact Person _____ E-Mail _____

Phone # _____ - _____ - _____ Fax # _____ - _____ - _____ Company _____

General Application of this product: _____

ELECTRICAL REQUIREMENTS

Approximate Output Power: _____ VA

Minimum Line Frequency (Hz):
50 60 400 1K 100K 150K 250K Other: _____

Maximum Temperature Rise (°C):
10 20 30 40 50 Other: _____

Efficiency: _____ %

Isolation Voltage: _____ Vac/Vdc

Interwinding Capacitance (Ciw): _____ pF

Duty Cycle: _____ %

Primary Input Voltage:
90 100 115 120 200 230 240 115/230 Other: _____

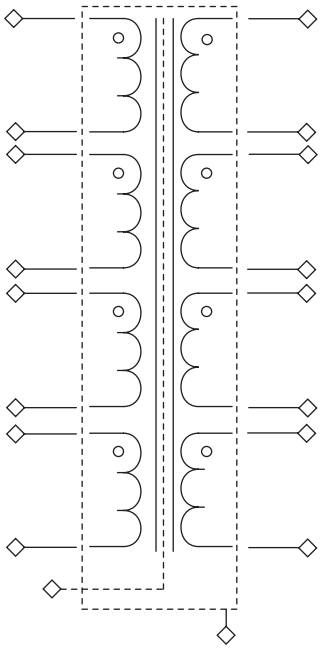
Protection (Resettable or Single Use):
Thermal Fused Other: _____

Regulation: _____ %

Agency Requirements: UL VDE CSA IEC

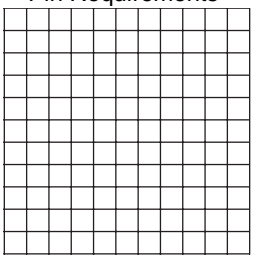
Leakage Ind. (LI): _____ µH

SCHEMATIC



Voltage: _____	Voltage: _____	AC or DC	Other Requirements:	
Current: _____	Current: _____	Rms or Peak	_____	
L: _____	Rect: _____	HW FW FWB	_____	
Voltage: _____	Voltage: _____	AC or DC	Other Requirements:	
Current: _____	Current: _____	Rms or Peak	_____	
L: _____	Rect: _____	HW FW FWB	_____	
Voltage: _____	Voltage: _____	AC or DC	Other Requirements:	
Current: _____	Current: _____	Rms or Peak	_____	
L: _____	Rect: _____	HW FW FWB	_____	
Voltage: _____	Voltage: _____	AC or DC	Budgetary/Target Price:	
Current: _____	Current: _____	Rms or Peak	_____ at _____ pcs	
L: _____	Rect: _____	HW FW FWB		
Screen or Shield	Outer Shield			
Thick: _____	Thick: _____			
Material: _____	Material: _____			

Pin Requirements



Grid Units: _____

PHYSICAL REQUIREMENTS

Flame Retardant: Yes No
Standard Varnish: Yes No
Encapsulated: Yes No
Hermetically Sealed: Yes No
Shielded: Yes No

Mounting Style:
Thru Hole Surface Mount Flying Leads Other

Length (Max.): _____
Width (Max.): _____
Height (Max.): _____

Temperature Class (°C):
105 130 155 180 200

OTHER REQUIREMENTS

_____

_____

_____

_____ (Continue on separate sheet if necessary)

PRIORITIZATION (1-HIGHEST)

_____ Size

_____ Efficiency

_____ Cost

PWM, PSM & FM Transformer Design Information

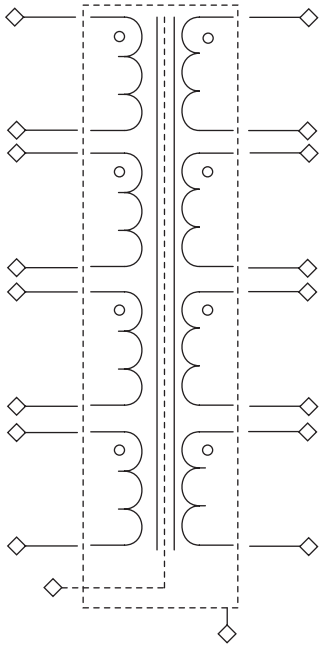
CONTACT INFORMATION

Contact Person _____ E-Mail _____
Phone # _____ - _____ - _____ Fax # _____ - _____ - _____ Company _____
General Application of this product: _____

ELECTRICAL REQUIREMENTS

Primary Voltage _____ Vac/Vdc Frequency: _____ Hz
Secondary Voltage _____ Vac/Vdc
Secondary Current _____ A (Max.)
Driver Current _____ A (Max.)
Size of Storage Capacitors _____ F
Maximum Temperature rise (°C)
10 20 30 40 50 Other _____
Isolation Voltage: _____ Vac/Vdc
Duty Cycle: _____ %
Circuit Type: PWM PSM FM Other: _____
Driver Type: SCR FET PWM Other: _____
Protection (Resettable or Single Use):
Thermal Fused Other _____
Build to Agency Requirements: UL VDE CSA IEC MIL-Spec _____
Certify to Agency Requirements: UL VDE CSA IEC MIL-Spec _____
Leakage L: _____ µH (Max.) Ciw: _____ pF (Max.) ET: _____ V-µsec

SCHEMATIC



Voltage: _____	Voltage: _____	AC or DC	Other Requirements:
Current: _____	Current: _____	Rms or Peak	_____
L: _____	Rect: _____	HW FW FWB	_____
Voltage: _____	Voltage: _____	AC or DC	Other Requirements:
Current: _____	Current: _____	Rms or Peak	_____
L: _____	Rect: _____	HW FW FWB	_____
Voltage: _____	Voltage: _____	AC or DC	Other Requirements:
Current: _____	Current: _____	Rms or Peak	_____
L: _____	Rect: _____	HW FW FWB	_____
Voltage: _____	Voltage: _____	AC or DC	Budgetary/Target Price:
Current: _____	Current: _____	Rms or Peak	_____ at _____ pcs
L: _____	Rect: _____	HW FW FWB	
Screen or Shield	Outer Shield		
Thick: _____	Thick: _____		
Material: _____	Material: _____		

PHYSICAL REQUIREMENTS

Flame Retardant: Yes No
Standard Varnish: Yes No
Encapsulated: Yes No
Hermetically Sealed: Yes No
Shielded: Yes No

Mounting Style:
Thru Hole Surface Mount Flying Leads Other
Length (Max.): _____
Width (Max.): _____
Height (Max.): _____

Temperature Class (°C):
105 130 155 180 200

Grid Units: _____

OTHER REQUIREMENTS

_____
_____
_____
_____ (Continue on seperate sheet if necessary)

PRIORITIZATION (1-HIGHEST)

_____ Size
_____ Efficiency
_____ Cost

Power, Filter and Switchmode Inductor Design Information

CONTACT INFORMATION

Contact Person _____ E-Mail _____

Phone # _____ - _____ - _____ Fax # _____ - _____ - _____ Company _____

General Application of this product: _____

ELECTRICAL REQUIREMENTS

L: _____ H

DC Bias: _____ Adc

L at DC Bias: _____ H

Q Min. at nominal L: _____

% of Saturation (Max.):_____ %

AC Current or Voltage Level:_____ Aac or Vac

DC Current or Voltage Level:_____ Adc or Vdc

Impedance: _____ Ohms at _____ Hz

Frequency (range): _____ Hz

SRF: _____ Hz

ET: _____ V-µsec

DCR (Max.): _____ Ohms

Dielectric Range: _____ Vac/Vdc

Operating Temperature Range: _____ to _____

Maximum Temperature Rise (°C): 10 20 30 40 50 _____

SCHEMATIC

Voltage: _____ AC or DC

Current: _____ Rms or Peak

Other: _____

Voltage: _____ AC or DC

Current: _____ Rms or Peak

Other: _____

Voltage: _____ AC or DC

Current: _____ Rms or Peak

Other: _____

Voltage: _____ AC or DC

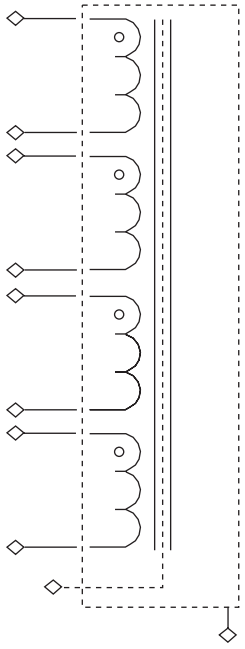
Current: _____ Rms or Peak

Other: _____

Screen or Shield

Thick: _____

Material: _____



Outer Shield

Thick: _____

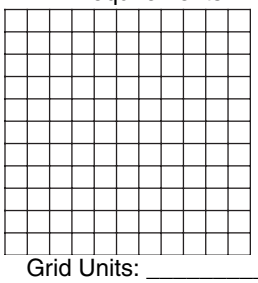
Material: _____

BUCK AND BOOST INDUCTORS		
Input Voltage	_____	V
Output Voltage	_____	V
Switching Frequency:	_____	Hz
Maximum DC Output Current:	_____	A
Minimum DC Output Current:	_____	A
Maximum Duty Cycle:	_____	%
Minimum Duty Cycle:	_____	%
AC Ripple:	_____	%

Budgetary/Target Price:

_____ at _____ pcs.

Pin Requirements



Grid Units: _____

PHYSICAL REQUIREMENTS

Flame Retardant: Yes No

Standard Varnish: Yes No

Encapsulated: Yes No

Hermetically Sealed: Yes No

Shielded: Yes No

Mounting Style: Vertical or Horizontal

Thru Hole Surface Mount Flying Leads Other

Inside Diameter (Min.): _____

Length (Max.): _____

Width (Max.): _____

Height (Max.): _____

Temperature Class (°C):

105 130 155 180 200

OTHER REQUIREMENTS

_____

_____

_____

_____ (Continue on seperate sheet if necessary)

PRIORITIZATION (1-HIGHEST)

_____ Size

_____ Efficiency

_____ Cost

Telecommunications/Audio Transformer Design Information

CONTACT INFORMATION

Contact Person _____ E-Mail _____

Phone # _____ - _____ - _____ Fax # _____ - _____ - _____ Company _____

General Application of this product: _____

ELECTRICAL REQUIREMENTS

Application Type: Modem Audio xDSL

Power Rating: _____ Watts

Primary Voltage: _____ Vac/Vdc

Primary Impedance: _____ Ohms

Secondary Impedance: _____ Ohms

Turns Ratio: _____ (if known)

Isolation Voltage: _____ Vac/Vdc

DC Loop Current: _____ mA dc

Maximum Drive Level: _____ dbm Vrms

ref Resistance: _____ Ohms

Return Loss: _____ db (Min.)

Frequency Range: _____ Hz to _____ Hz

Frequency Response: ref ____ Hz ± ____ db from ____ Hz to ____ Hz

Insertion/Transducer Loss: ± ____ db (Max.) or ± ____ db at ____ Hz

Longitudinal Transverse Balance:

_____ db (Min.) from _____ Hz to _____ Hz

_____ db (Min.) from _____ Hz to _____ Hz

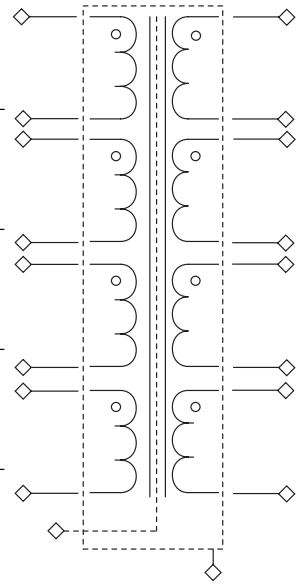
Crosstalk: _____ db or better from _____ Hz to _____ Hz

w/ _____ spacing.

Distortion: _____ % Maximum

Leakage L: _____ µH (Max.) Ciw: _____ pF (Max.) DCR: _____ Ohms

SCHEMATIC



Z:_____
L:_____
DC current: _____
Z:_____
L:_____
DC current: _____
Z:_____
L:_____
DC current: _____
Z:_____
L:_____
DC current: _____
Screen or Shield
Thick: _____
Material: _____

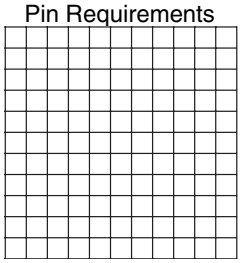
Z:_____
L:_____
Output: Single Push-Pull
Z:_____
L:_____
Output: Single Push-Pull
Z:_____
L:_____
Output: Single Push-Pull
Z:_____
L:_____
Output: Single Push-Pull
Outer Shield
Thick: _____
Material: _____

Build or Certify to Agency Requirements:
UL/CSA FCC BABT Other
_____

Modem Specifications:
V.22 V.29 V.32 V.34 V.90

Budgetary/Target Price:
_____ at _____ pcs.

Pin Requirements



Grid Units: _____

PHYSICAL REQUIREMENTS

Flame Retardant: Yes No
Standard Varnish: Yes No
Encapsulated: Yes No
Hermetically Sealed: Yes No
Shielded: Yes No

Mounting Style:
Thru Hole Surface Mount Flying Leads Other

Length (Max.): _____
Width (Max.): _____
Height (Max.): _____

Temperature Class (°C):
105 130 155 180 200

OTHER REQUIREMENTS

_____
_____
_____
_____ (Continue on seperate sheet if necessary)

PRIORITIZATION (1-HIGHEST)

_____ Size
_____ Efficiency
_____ Cost

Test and Measurement Transformer Design Information

CONTACT INFORMATION

Contact Person _____ E-Mail _____

Phone # _____ - _____ - _____ Fax # _____ - _____ - _____ Company _____

General Application of this product: _____

ELECTRICAL REQUIREMENTS

Primary Voltage: _____ Vac/Vdc

Primary Current Range: _____ Ohms

Desired Secondary Voltage: _____ Ohms

Turns Ratio: _____ (if known)

Accuracy Required: _____ %

Ratio Error: _____ at 10 %

_____ at 100 %

Dielectric Rating: _____ Vac/Vdc

Frequency range: _____ Hz to _____ ref _____ Hz

Load/Burden Resistance: _____ Ohms

Isolation Voltage: _____ Vac/Vdc

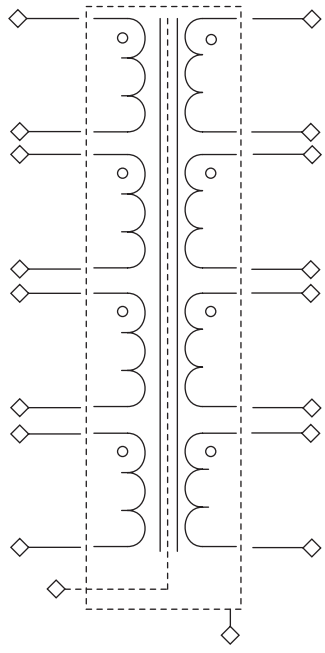
DC Current: _____ mAdc

Maximum Phase Error Angle: _____ at 10 %

_____ at 100 %

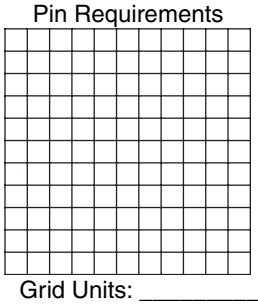
Operating Temperature Range: _____ to _____

SCHEMATIC



Voltage: _____	Voltage: _____	AC or DC	Other Requirements:
Current: _____	Current: _____	Rms or Peak	_____
Other: _____	RL: _____	Ohms	_____
Voltage: _____	Voltage: _____	AC or DC	Other Requirements:
Current: _____	Current: _____	Rms or Peak	_____
Other: _____	RL: _____	Ohms	_____
Voltage: _____	Voltage: _____	AC or DC	Other Requirements:
Current: _____	Current: _____	Rms or Peak	_____
Other: _____	RL: _____	Ohms	_____
Voltage: _____	Voltage: _____	AC or DC	Budgetary/Target Price:
Current: _____	Current: _____	Rms or Peak	_____ at _____ pcs
Other: _____	RL: _____	Ohms	
Screen or Shield	Outer Shield		
Thick: _____	Thick: _____		
Material: _____	Material: _____		

Pin Requirements



Grid Units: _____

PHYSICAL REQUIREMENTS

Flame Retardant: Yes No

Standard Varnish: Yes No

Encapsulated: Yes No

Hermetically Sealed: Yes No

Shielded: Yes No

Mounting Style: Vertical or Horizontal

Thru Hole Surface Mount Flying Leads Other _____

Inside Diameter (Min.): _____

Length (Max.):_____

Width (Max.): _____

Height (Max.): _____

Temperature Class (°C):

105 130 155 180 200

OTHER REQUIREMENTS

_____

_____

_____

_____ (Continue on seperate sheet if necessary)

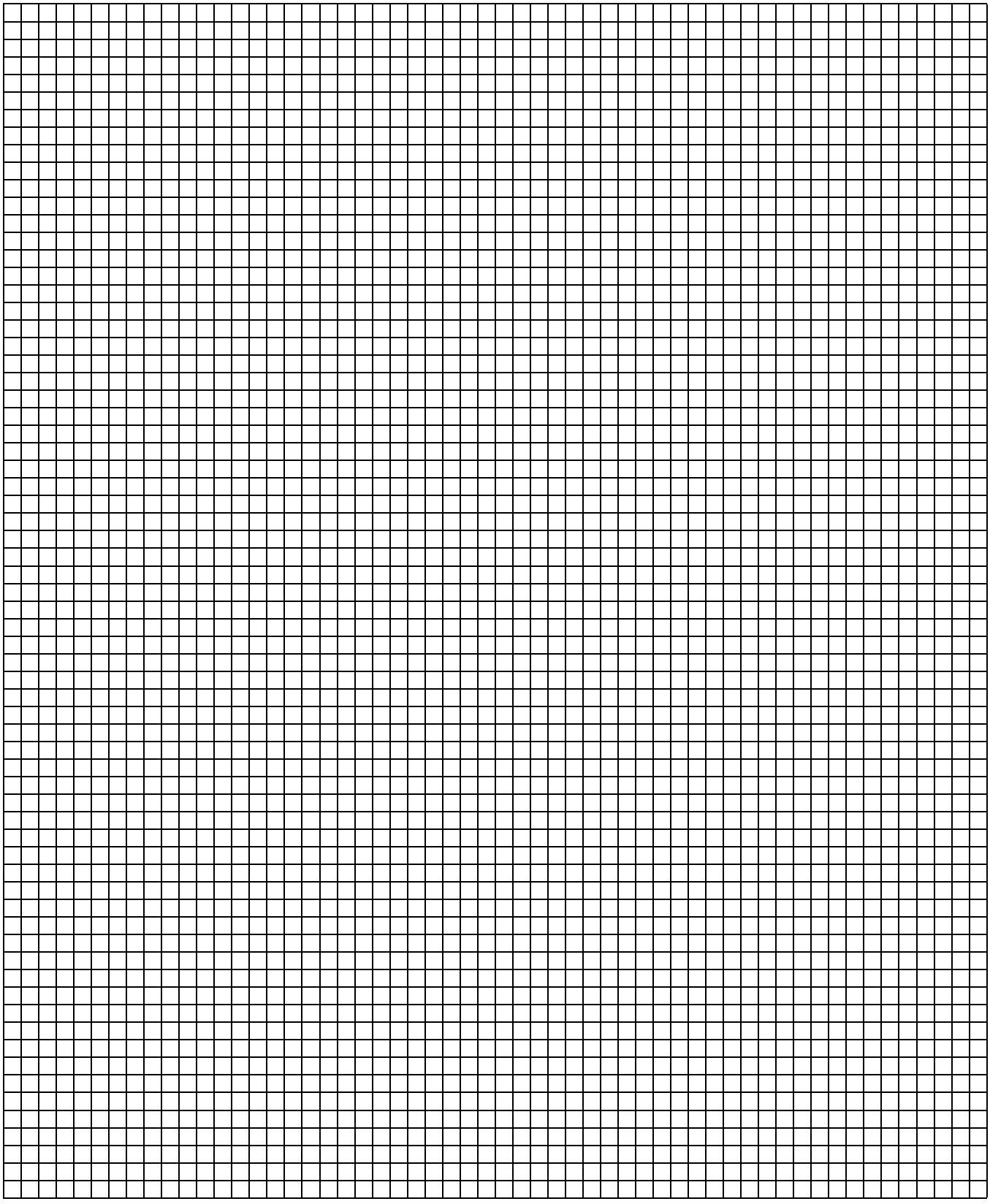
PRIORITIZATION (1-HIGHEST)

_____ Size

_____ Efficiency

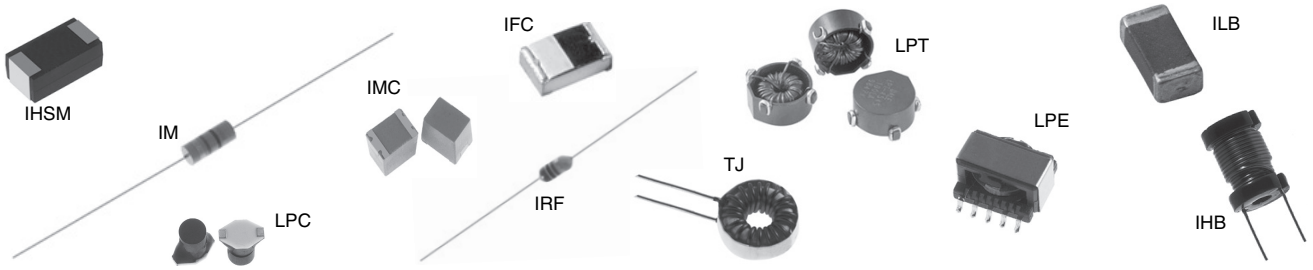
_____ Cost

Custom Design Grid



Inductor and Magnetic Product Terminology

INTRODUCTION



The scope of this application note is to define the terminology associated with inductors and their applications. Some of these terms are listed in the component data sheets. Many terms go beyond the specification of inductors. These terms describe issues associated with inductor design and performance, magnetic materials and theory and applications. A thorough understanding of these terms and definitions will aid in the selling, procurement and application of inductor products.

DEFINITIONS

AIR CORE INDUCTORS

(see Ceramic Core and Phenolic Core)

AMBIENT TEMPERATURE

The temperature of still air immediately surrounding a component or circuit. A typical method to measure ambient temperature is to record the temperature that is approximately 1/2 inch from the body of the component or circuit.

ATTENUATION

The relative decrease in amplitude of a given parameter. Attenuation measurements are common for voltage, current and power. It is usually expressed in units of decibels (dB). For a power ratio, one dB = 10 $Log_{10}(P_1/P_2)$.

A dB is equal to 20 Log_{10} (I_1/I_2) for current and 20 Log_{10} (V_1/V_2) for voltage ratios.

AXIAL INDUCTOR

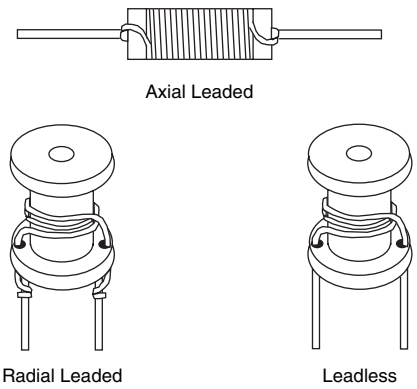
An inductor constructed on a core with concentric leads on opposite ends of the core. Axial inductors are available for both power applications and RF applications, and are available in many core materials including the basic phenolic, ferrite and powdered iron types. Both rod and bobbin shapes are utilized. Axial inductors are very suitable for tape and reel packaging for auto placement. (see Inductor).

Axial Leaded Inductor

BOBBIN CORE

A core with the shape of a bobbin or spool which contains flanges. Bobbin cores are available with and without leads and in the axial and radial form. (see Axial Inductor and Radial Inductor)

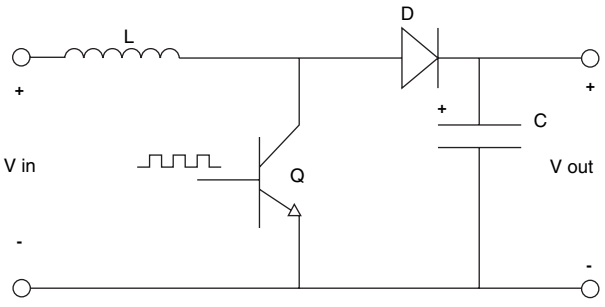
Bobbins



BOOST REGULATOR (DC-DC)

A basic DC-DC switching converter topology that takes an unregulated input voltage, and produces a higher, regulated output voltage. This higher output voltage is achieved by storing energy in an input inductor and then transferring the energy to the output by turning a shunt switch (transistor) on and off.

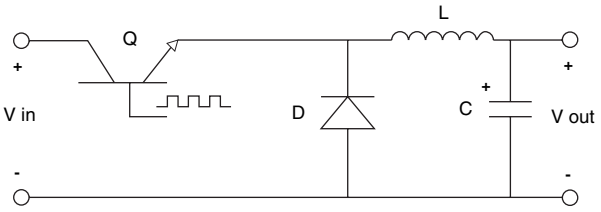
Simplified Boost Regulator



BUCK REGULATOR (DC-DC)

A basic DC-DC switching converter topology that takes an unregulated input voltage, and produces a lower, regulated output voltage. This output voltage is achieved by chopping the input voltage with a series connected switch (transistor) which applies pulses to an averaging inductor and capacitor circuit.

Simplified Buck Regulator



CERAMIC CORES

Ceramic is one of the common materials used for inductor cores. Its main purpose is to provide a form for the coil. In some designs it also provides the structure to hold the terminals in place. Ceramic has a very low thermal coefficient of expansion. This allows for relatively high inductance stability over the operating temperature ranges.

Ceramic has no magnetic properties. Thus, there is no increase in permeability due to the core material.

Ceramic core inductors are often referred to as “air core” inductors. Ceramic core inductors are most often used in high frequency applications where low inductance values, very low core losses and high Q values are required.

CHOKE

(see RF Choke)

CLOSED MAGNETIC PATH

Magnetic core shapes designed to contain all of the magnetic flux generated from an excited winding(s). Inductors made with these core types are considered to be shielded inductors. Shielding, however, is a matter of degree. Common core shapes that are considered to have closed magnetic paths are toroids, E-cores and most pot cores. Shielded bobbins also offer a high degree of shielding and may be considered to have closed magnetic paths for most practical purposes. Common core shapes that are considered to have open magnetic flux paths are rod cores and unshielded bobbin cores. (see Shielded Inductor)

COILS

Another common name for inductors. (see Inductor)

COLOR CODES

Inductor color codes have been standardized. The color marks or bands represent the inductor's value and tolerance. Following is a table that translates the colors and numbers:

COLOR CODE CHART			
COLOR	SIGNIFICANT FIGURES OR DECIMAL POINT	MULTIPLIER	INDUCTANCE TOLERANCE
Black	0	1	-
Brown	1	10	± 1 %
Red	2	100	± 2 %
Orange	3	1000	± 3 %
Yellow	4	10 000	± 4 %
Green	5	-	-
Blue	6	-	-
Violet	7	-	-
Gray	8	-	-
White	9	-	-
None	-	-	± 20 %
Silver	-	-	± 10 %
Gold			± 5 %

COMMON-MODE NOISE

Noise or electrical interference that is common to both electrical lines in relation to earth ground.

COPPER LOSS

The power lost by current flowing through the winding. The power loss is equal to the square of the current multiplied by the resistance of the wire (I^2R). This power loss is transferred into heat.

CORE LOSSES

Core losses are caused by an alternating magnetic field in the core material. The losses are a function of the operating frequency and the total magnetic flux swing. The total core losses are made up of three main components: Hysteresis, eddy current and residual losses. These losses vary considerably from one magnetic material to another. Applications such as higher power and higher frequency switching regulators and RF designs require careful core selection to yield the highest inductor performance by keeping the core losses to a minimum.

CORE SATURATION

(see Saturation Current)

CURIE TEMPERATURE

The temperature above which a ferrite core loses its magnetic properties. The core's permeability typically increases dramatically as the core temperature approaches the curie temperature which causes the inductance to increase. The permeability drops to near unity at the curie temperature which causes the inductance to drop dramatically. The curie point is the temperature at which the initial permeability has dropped to 10 % of its original value at room temperature.

DC-DC CONVERTER

A circuit or device that converts a DC input voltage to a regulated output voltage. The output voltage may be lower, higher or the same as the input voltage. Switching regulator DC-DC circuits most often require an inductor or transformer to achieve the regulated output voltage. Switching regulator circuits can achieve a higher level of power efficiency when compared to non-switching techniques. (see Boost Regulator and Buck Regulator)

DCR (DC RESISTANCE)

The resistance of the inductor winding measured with no alternating current. The DCR is most often minimized in the design of an inductor. The unit of measure is ohms, and it is usually specified as a maximum rating.

DIFFERENTIAL-MODE NOISE

Also known as normal-mode noise, it is electrical interference that is not common to both electrical lines but present between both electrical lines.

DISTRIBUTED CAPACITANCE

In the construction of an inductor, each turn of wire or conductor acts as a capacitor plate. The combined effects of each turn can be represented as a single capacitance known as the distributed capacitance. This capacitance is in parallel with the inductor. This parallel combination will resonate at some frequency which is called the self-resonant frequency (SRF). Lower distributed capacitances for a given inductance value will result in a higher SRF value for the inductor and vice versa. (see SRF)

EMI

EMI is an acronym for Electromagnetic Interference. It is unwanted electrical energy in any form. EMI is often used interchangeably with “Noise”.

EDDY CURRENT LOSSES

Eddy current losses are present in both the magnetic core and winding of an inductor. Eddy currents in the winding (or conductor) contribute to two main types of losses: losses due to proximity effects and skin effects. As for the core losses, an electric field around the flux lines in the magnetic field is generated by alternating magnetic flux. This will result in eddy currents if the magnetic core material has electrical conductivity. Losses result from this phenomenon since the eddy currents flow in a plane that is perpendicular to the magnetic flux lines.

EPOXY COATED INDUCTOR

Inductors that have been coated with epoxy as opposed to having a molded case, shrink wrapped tubing or left with an open construction body. Epoxy coated inductors typically have smooth edges and surfaces. The epoxy coat acts as an insulation. Both radial and axial styles can be found with epoxy coated surfaces.

FERRITE CORE

Ferrite is a magnetic material which consists of a mixed oxide of iron and other elements that are made to have a crystalline molecular structure. The crystalline structure is created by firing the ferrite material at a very high temperature for a specified amount of time and profile. The general composition of ferrites is $xxFe_2O_4$ where xx represents one or several metals. The most popular metal combinations are manganese and zinc (MnZn) and nickel and zinc (NiZn). These metals can be easily magnetized.

FILTER

A circuit or device whose purpose is to control electrical energy at a given frequency or over a range of frequencies. Groups of passive components are commonly used to construct many types of filters. These passive components include resistors, capacitors and inductors.

IMPEDANCE

The impedance of an inductor is the total resistance to the flow of current, including the AC and DC component. The DC component of the impedance is simply the DC resistance of the winding. The AC component of the impedance includes the inductor reactance. The following formula calculates the inductive reactance of an ideal inductor (i.e., one with no losses) to a sinusoidal AC signal.

$$Z = X_L = 2\pi fL$$

L is in henries and *f* is in hertz. This equation indicates that higher impedance levels are achieved by higher inductance values or at higher frequencies. Skin effect and core losses also add to the impedance of an inductor. (see Skin Effect and Core Losses)

IMPEDANCE ANALYZER

Test instrument capable of measuring a wide range of impedance parameters, gain and phase angle. In testing inductors, impedance analyzers can measure inductance, Q, SRF, insertion loss, impedance and capacitance. They operate in a much more automatic fashion in comparison to Q Meters. Some impedance analyzers have a wider test frequency range than a Q meter.

INCREMENTAL CURRENT

The DC bias current flowing through the inductor which causes an inductance drop of 5% from the initial zero DC bias inductance value. This current level indicates where the inductance can be expected to drop significantly if the DC bias current is increased further. This applies mostly to ferrite cores in lieu of powdered iron. Powdered iron cores exhibit “soft” saturation characteristics. This means their inductance drop from higher DC levels is much more gradual than ferrite cores. The rate at which the inductance will drop is also a function of the core shape. (see Saturation Current)

INDUCTANCE

The property of a circuit element which tends to oppose any change in the current flowing through it. The inductance for a given inductor is influenced by the core material, core shape and size, the turns count and the shape of the coil. Inductors most often have their inductances expressed in microhenries (µH). The following table can be used to convert units of inductance to microhenries. Thus, 47 mH would equal 47 000 µH.

1 henry (H) = 10^6 µH
1 millihenry (mH) = 10^3 µH
1 microhenry (µH) = 1 µH
1 nanohenry (nH) = 10^{-3} µH

INDUCTANCE TOLERANCE

Standard inductance tolerances are typically designated by a tolerance letter. Standard inductance tolerance letters include (see Color Codes):

LETTER	TOLERANCE
F	± 1 %
G	± 2 %
H	± 3 %
J	± 5%
K	± 10 %
L	± 15 %*
M	± 20 %

* L = ± 20 % for some Military Products

INDUCTOR

A passive component designed to resist changes in current. Inductors are often referred to as “AC Resistors”. The ability to resist changes in current and the ability to store energy in its magnetic field, account for the bulk of the useful properties of inductors. Current passing through an inductor will produce a magnetic field. A changing magnetic field induces a voltage which opposes the field-producing current. This property of impeding changes of current is known as inductance. The voltage induced across an inductor by a change of current is defined as:

$$V = L \, di/dt$$

Thus, the induced voltage is proportional to the inductance value and the rate of current change. (see Inductance)

INPUT LINE FILTER

A power filter placed on the input to a circuit or assembly that attenuates noise introduced from the power bus. The filter is designed to reject noise within a frequency band. Typically these filters are low-pass filters meaning they pass low frequency signals such as the DC power and attenuate higher frequency signals which consist of mainly noise. Band pass or low pass filters are commonly made up of inductor and capacitor combinations. (also see Noise, Attenuation, EMI and Pi-Filter)

*KOOL MU® CORE

Kool Mu® is a magnetic material that has an inherent distributed air gap. The distributed air gap allows the core to store higher levels of magnetic flux when compared to other magnetic materials such as ferrites. This characteristic allows a higher DC current level to flow through the inductor before the inductor saturates.

Kool Mu® material is an alloy that is made up of basically nickel and iron powder (approx. 50 % of each) and is available in several permeabilities. It has a higher permeability than powdered iron and also lower core losses. Kool Mu® is required to be pressed at a much higher pressure than powdered iron material. The manufacturing process includes an annealing step that relieves the pressure put onto the powdered metals which restores their desirable magnetic properties. Thus, the powdered particles require a high temperature insulation as compared to powdered iron.

Kool Mu® performs well in power switching applications. The relative cost is significantly higher than powdered iron.

LAMINATED CORES

Cores constructed by stacking multiple laminations on top of each other. The laminations are offered in a variety of materials and thicknesses. Some laminations are made to have the grains oriented to minimize the core losses and give higher permeabilities. Each lamination has an insulated surface which is commonly an oxide finish. Laminated cores are used in some inductor designs but are more common in a wide variety of transformer applications.

LITZ WIRE

Wire consisting of a number of separately insulated strands that are woven or bunched together such that each strand tends to take all possible positions in the cross section of the wire as a whole. The current through each individual strand is divided equally since this wire design equalizes the flux linkages and reactance of the individual strands. In other words, a Litz conductor has lower AC losses than comparable solid wire conductors which becomes important as the operating frequency increases. (see Skin Effect)

MAGNETIC WIRE

Wire used to create a magnetic field such as those in magnetic components (inductors and transformers). Magnet wire is nearly 100 % copper and must be made from virgin copper. It is offered with a number of different organic polymer film coatings.

MATCHED IMPEDANCE

The condition that exists when two coupled circuits are adjusted so that the output impedance of one circuit equals the input impedance of the other circuit connected to the first. There is a minimum power loss between two circuits when their connecting impedances are equal.

MOLDED INDUCTOR

An inductor whose case has been formed via a molding process. Common molding processes include injection and transfer molding. Molded inductors typically have well defined body dimensions which consist of smooth surfaces and sharper corners as compared to other case types such as epoxy coated and shrink wrap coatings. (see Inductor)

MONOLITHIC INDUCTOR

(see Multilayer Inductor)

MPP CORE

MPP is an acronym for molypermalloy powder. It is a magnetic material that has an inherent distributed air gap. The distributed air gap allows the core to store higher levels of magnetic flux when compared to other magnetic materials such as ferrites. This characteristic allows a higher DC current level to flow through the inductor before the inductor saturates.

The basic raw materials are nickel, iron and molybdenum. The ratios are: approximately 80 % nickel, 2 % - 3 % molybdenum, and the remaining is iron. The manufacturing process includes an annealing step as discussed in the Kool Mu® definition. MPP stores higher amounts of energy and has a higher permeability than Kool Mu®.

Cores are offered in 10 or more permeability selections. The core characteristics allow inductors to perform very well in switching power applications. Since higher energy can be stored by the core, more DC current can be passed through the inductor before the core saturates. The cost of MPP is significantly higher than Kool Mu®, powdered irons and most ferrite cores with similar sizes. (see Saturation Current)

MULTILAYER INDUCTOR

An inductor constructed by layering the coil between layers of core material. The coil typically consists of a bare metal material (no insulation). This technology is sometimes referred to as “non-wirewound”. The inductance value can be made larger by adding additional layers for a given spiral pattern.

NOISE

Unwanted electrical energy in a circuit that is unrelated to the desired signal. Sources of noise are most often generated by some type of switching circuit. Common sources include switching voltage regulators and clocked signals such as digital circuits.

* Kool Mu® is a registered trademark of Spang & Company

OHM

The unit of measurement for resistance and impedance.

Resistance is calculated by Ohm's Law:

R = V/I where R = resistance
V = voltage
I = current

OPERATING TEMPERATURE RANGE

Range of ambient temperatures over which a component can be operated safely. The operating temperature is different from the storage temperature in that it accounts for the component's self temperature rise caused by the winding loss from a given DC bias current. This power loss is referred to as the “copper” loss and is equal to:

$$\text{Power Loss} = (\text{DCR})\ (I^2_{dc})$$

This power loss results in an increase to the component temperature above the given ambient temperature. Thus, the maximum operating temperature will be less than the maximum storage temperature:

Maximum Operating Temperature =
Storage Temperature - Self Temperature Rise

(see Core Losses)

PERMEABILITY (CORE)

The permeability of a magnetic core is the characteristic that gives the core the ability to concentrate lines of magnetic flux. The core material, as well as the core geometry, affect the core's “effective permeability”. For a given core shape, size and material, and a given winding, higher permeability magnetic materials result in higher inductance values as opposed to lower permeability materials.

PHENOLIC CORE

Phenolic is a common material used for inductor cores. Many are made of a polyester base that have high temperature characteristics. It is also common for phenolic cores to have high flammability ratings such as UL94V-0. Phenolic cores also provide high strength and are more economical than ceramic cores.

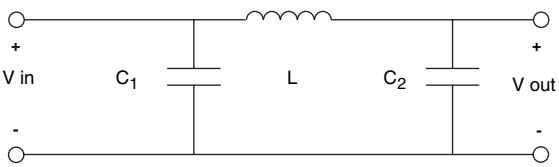
Phenolic has no magnetic properties. Thus, there is no increase in permeability due to the core material.

Phenolic core inductors are often referred to as “air core” inductors and are most often used in high frequency applications where low inductance values, very low core losses and high Q values are required.

PI-FILTER

A filter consisting of two capacitors connected in parallel with a series inductor. These filters are commonly found near DC-DC converters to filter ripple current and voltage.

Basic Pi-Filter



POLYOLEFIN TUBING

A common shrink wrap (tubing) used in the electronic industry. It is often used to provide insulation or protect wire insulation such as coil windings. Polyolefin tubing is a polymer which can be provided to meet various degrees of flammability requirements.

POWERED IRON CORE

Powdered iron is a magnetic material that has an inherent distributed air gap. The distributed air gap allows the core to store higher levels of magnetic flux when compared to other magnetic materials such as ferrites. This characteristic allows a higher DC current level to flow through the inductor before the inductor saturates.

Powdered iron cores are made of nearly 100 % iron. The iron particles are insulated from each other, mixed with a binder (such as phenolic or epoxy) and pressed into the final core shape. The cores are cured via a baking process. Other characteristics of powdered iron cores include: they are typically the lowest cost alternative and their permeabilities typically have a more stable temperature coefficient than ferrites. (see Saturation Current)

Q

The Q value of an inductor is a measure of the relative losses in an inductor. The Q is also known as the “quality factor” and is technically defined as the ratio of inductive reactance to effective resistance and is represented by:

$$Q = \frac{X_L}{Re} = \frac{2\pi fL}{Re}$$

Since X_L and Re are functions of frequency, the test frequency must be given when specifying Q. X_L typically increases with frequency at a faster rate than Re at lower frequencies, and vice versa at higher frequencies. This results in a bell shaped curve for Q vs frequency. Re is mainly comprised of the DC resistance of the wire, the core losses and skin effect of the wire.

Based on the above formula, it can be shown that the Q is zero at the self resonant frequency since the inductance is zero at this point.

Q METER

A standard instrument used to measure the inductance and Q of small RF inductors. The Q meter is based on a stable, continuously variable oscillator and a resonant circuit which is connected to the part to be tested.

The Q is proportional to the voltage across the internal calibrated variable capacitor. The voltage is measured by an internal RF voltmeter. The capable test frequency range is near 22 kHz to 70 MHz.

RF CHOKE

Another name for a radio frequency inductor which is intended to filter or choke out signals. (see Inductor)

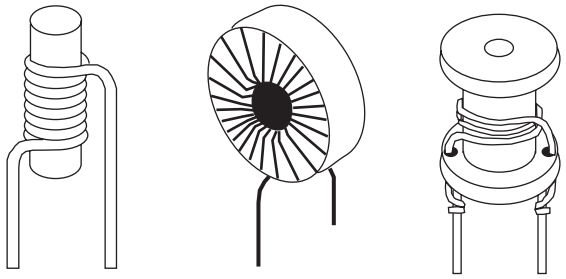
RFI

RFI is an acronym for Radio-Frequency Interference. It is an older and more restrictive term that is used interchangeably with “EMI”. (see EMI)

RADIAL INDUCTOR

An inductor constructed on a core with leads exiting from the same side of the inductor body as to be mounted in the same plane. Radial inductors most often refer to two leaded devices but technically include devices with more than two leads as well. Some common core shapes include rod cores, bobbins and toroids. (see Inductor)

Radial Inductor Styles



RATED CURRENT

The level of continuous DC current that can be passed through the inductor. This DC current level is based on a maximum temperature rise of the inductor at the maximum rated ambient temperature. The rated current is related to the inductor's ability to minimize the power losses in the winding by having a low DC resistance. It is also related to the inductor's ability to dissipate this power lost in the windings. Thus, the rated current can be increased by reducing the DC resistance or increasing the inductor size.

For low frequency current waveforms, the RMS current can be substituted for the DC rated current. The rated current is not related to the magnetic properties of the inductor. (see Incremental Current and Saturation Current)

REACTANCE

The imaginary part of the impedance. (see Impedance)

RIPPLE VOLTAGE

The periodic alternating voltage imposed on the voltage output of a switching voltage converter. The ripple voltage is normally specified as a peak-to-peak value.

SATURATION CURRENT

The DC bias current flowing through the inductor which causes the inductance to drop by a specified amount from the initial zero DC bias inductance value. Common specified inductance drop percentages include 10 % and 20 %. It is useful to use the 10 % inductance drop value for ferrite cores and 20 % for powdered iron cores in energy storage applications.

The cause of the inductance to drop due to the DC bias current is related to the magnetic properties of the core. The core, and some of the space around the core, can only store a given amount of magnetic flux density.

Beyond the maximum flux density point, the permeability of the core is reduced. Thus, the inductance is caused to drop. Core saturation does not apply to “air-core” inductors. (see Incremental Current and Permeability)

SRF (SELF-RESONANT FREQUENCY)

The frequency at which the inductor's distributed capacitance resonates with the inductance. It is at this frequency that the inductance is equal to the capacitance and they cancel each other. The inductor will act purely resistive with a high impedance at the SRF point.

The distributed capacitance is caused by the turns of wire layered on top of each other and around the core. This capacitance is in parallel to the inductance. At frequencies above the SRF, the capacitive reactance of the parallel combination will become the dominant component.

Also, the Q of the inductor is equal to zero at the SRF point since the inductive reactance is zero. The SRF is specified in MHz and is listed as a minimum value on product data sheets. (also see Distributed Capacitance)

SHIELDED INDUCTOR

An inductor designed for its core to contain a majority of its magnetic field. Some inductor designs are self shielding. Examples of these are magnetic core shapes which include toroids, pot cores and E-cores. Magnetic core shapes such as slug cores and bobbins require the application of a magnetic sleeve or similar method to yield a shielded inductor.

It should be noted that magnetic shielding is a matter of degree. A certain percentage of the magnetic field will escape the core material. This is even applicable for toroidal cores as lower core permeabilities will have higher fringing fields than will high permeability toroidal cores. (see Closed Magnetic Path)

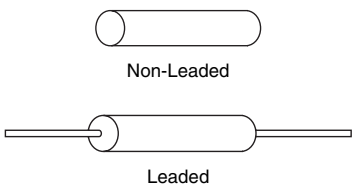
SKIN EFFECT

Skin effect is the tendency for alternating current to flow near the surface of the conductor in lieu of flowing in a manner as to utilize the entire cross-sectional area of the conductor. This phenomenon causes the resistance of the conductor to increase. The magnetic field associated with the current in the conductor causes eddy currents near the center of the conductor which opposes the flow of the main current near the center of the conductor. The main current flow is forced further to the surface as the frequency of the alternating current increases. (see Litz Wire)

SLUG CORE

A core with the shape of a cylindrical rod. Slug cores typically refer to cores with no leads. Axial leaded slug cores are very common. Non-leaded slug cores are typically used in power filtering applications. They exhibit higher flux density characteristics than other core shapes as most of the magnetic energy is stored in the air around the core. (see Axial Inductors and Radial Inductors)

Slug Cores



STORAGE TEMPERATURE RANGE

Range of ambient temperatures over which a component can be stored safely. (see Operating Temperature Range)

SWITCHING FREQUENCY

The operating frequency of a switching regulator.

SWITCHING REGULATOR

A circuit that is designed to regulate the output voltage, from a given input voltage, by using a closed control loop design. The most common switching regulator types involve a magnetic component, such as an inductor or transformer, that is used to store and transfer energy to the output by having the current switched on and off. (see Boost Regulator and Buck Regulator)

TAPE WOUND CORES

Cores made by rolling strips of alloy iron into a toroidal shape. The metal strips have a precisely controlled thickness which are coated with a very thin insulation material to prevent the metal in the layers to make contact with each other. The finished cores have an outside coating to protect the metal layers and they are offered in a variety of material mixes. Tape wound cores are capable of storing high amounts of energy and contain a high permeability. Their major disadvantage is that they are relatively expensive when compared to other core types. (see Toroidal Inductor)

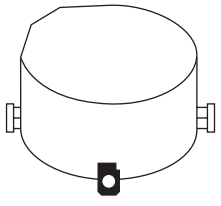
TEMPERATURE RISE

The increase in surface temperature of a component in air due to the power dissipation in the component. The power dissipation for an inductor includes both copper and core losses.

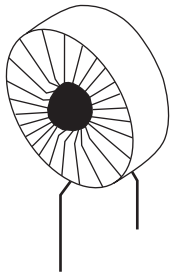
TOROIDAL INDUCTOR

An inductor constructed by placing a winding(s) on a core that has a donut shaped surface. Toroidal cores are available in many magnetic core materials within the four basic types: Ferrite, Powdered Iron, Alloy and High Flux and Tape Wound. Characteristics of toroidal inductors include: self shielding (closed magnetic path), efficient energy transfer, high coupling between windings and early saturation.

Toroidal Inductors



Surface Mount



Through Hole

TEST FREQUENCY

The frequency at which inductors are tested for either inductance or Q or both. Some test frequencies used widely in the industry include:

COMMON TEST FREQUENCIES	
TEST FREQUENCY	**INDUCTOR/VALUE MEASURED**
1 kHz	Power Inductors (Wide Value Range)
0.079 MHz	RF Inductors (above 10 000 µH to 100 000 µH)
0.250 MHz	RF Inductors (above 1000 µH to 10 000 µH)
0.790 MHz	RF Inductors (above 100 µH to 1000 µH)
2.5 MHz	RF Inductors (above 10 µH to 100 µH)
7.9 MHz	RF Inductors (above 1 µH to 10 µH)
25 MHz	RF Inductors (above 0.10 µH to 1 µH)
50 MHz	RF Inductors (0.01 µH to 0.1 µH)

Most of these test frequencies have been designated by military specifications. However, there are some conflicting frequency assignments among the military specifications. There is a present trend to assign test frequencies that match the user frequencies. This is particularly true for very low values. These user frequencies do not match those listed above.

VOLT MICROSECOND CONSTANT

The product of the voltage applied across the winding and the time for the magnetizing current to reach 1.5 times the linear extrapolation of the current waveform. This constant is a measure of the energy handling capability of a transformer or inductor. It is dependent upon the core area, core material (including the saturation flux density of the core), the number of turns of the winding and the duty cycle of the applied pulse.

VOLUME RESISTIVITY (CORE)

The ability of a core to resist the flow of electrical current either through the bulk of the material or on its surface. The unit of the volume resistivity is Ohm - cm.

Core volume resistivity becomes an issue in inductor designs where the leads/terminals come in contact with the core material. This type includes axial and radial inductors that have leads epoxied into the core. As for core materials, high permeability ferrites present the most concern as their volume resistivity is typically the lowest.

Under certain conditions, a low resistive path can be realized between two inductor terminals if they are in contact with a low resistivity core. The inductor, under these conditions, will lose its higher impedance characteristics.

Circuit Simulation of Surface Mount Inductors and Impedance Beads

INTRODUCTION

With the advent of higher component densities, smaller components, and reduced design to market times, many of today's complex circuits are designed using a computer and circuit simulation software rather actual physical bread boarding.

Inductors can be one of the most difficult passive components to accurately simulate, due to their inherent parasitic capacitive and resistive elements. These parasitic elements are the result of the resistance and turn-to-turn capacitance of the current conductor, which will affect the characteristic impedance of the inductor, particularly at higher frequencies. Figure 1 illustrates the equivalent circuit model for a real inductor with parasitic elements.

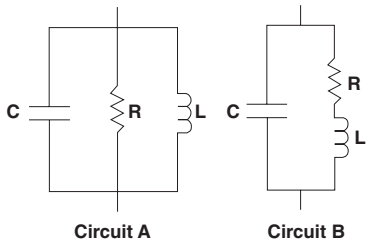


Figure 1. Equivalent Circuit for a Real Inductor

SIMULATING THE PERFORMANCE OF AN INDUCTOR

In many computer based circuit simulators, if a single element inductor is placed in the circuit, it will be represented as an ideal inductor. This may be acceptable if the simulation is at a frequency well below the series resonant frequency (SRF) of the inductor, as the impedance curve for the ideal and the real inductors are identical over frequency until a point that is about 20 % of the inductor's SRF. At this point, the impedance curves diverge due to the effects of the parasitic elements.
However, the accuracy of the ideal inductor model will begin to increase beyond 20 % of the inductor's SRF.

Figure 2 is a graph of the impedance versus frequency characteristics of a real and ideal inductor.

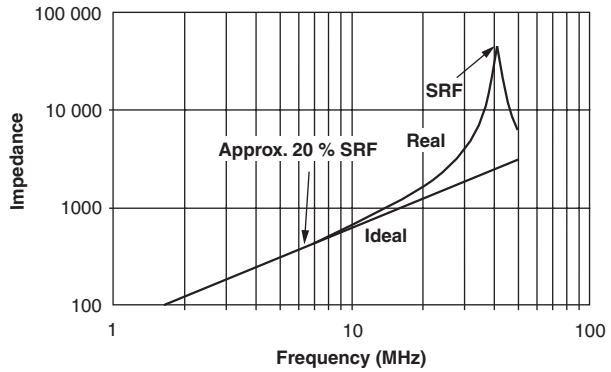


Figure 2. Impedance/Frequency Curves of Real and Ideal 10 µH Inductor

Most inductors can be represented with an acceptable degree of accuracy by one of the circuits shown in Figure 1. Circuit A typically represents an inductor that uses a magnetic core material such as ferrite or powdered iron. Circuit B will accurately represent most nonmagnetic core inductors commonly referred to as "air cores." If the equivalent circuit values of the parasitic capacitance and resistance are known along with the effective inductance, the inductor model can be inserted in the circuit simulator and provide an accurate representation of the inductor's true performance in the A circuit.

Vishay Dale has generated the equivalent circuit values for many of its surface mount product lines. A table illustrating the equivalent circuit values for each of the current Vishay Dale product lines follows this discussion.

LIMITATIONS OF INDUCTOR MODELS

Most inductors are used well below their series resonant frequency (SRF) and these basic, three element inductor models will be very accurate under these simulation conditions. The SRF of the inductor occurs when the inductivereactance (X_L) is equal to the capacitive reactance (X_C) of the conductor. The impedance of the inductor is at its maximum and would be infinite if there were no core loss or if the resistance of the conductor were zero. Above the SRF, the X_C exceeds X_L and the inductor behaves like a capacitor. As the frequency increases above the SRF point, the inductor will go through several more resonant phases as a result of secondary parasitic elements which require a more complex equivalent circuit. For this reason, the typical useful range for the three element inductor models is the SRF of the inductor plus about 25 %.

IMC-0402

	EQUIVALENT CIRCUIT DATA			
NOMINAL INDUCTANCE (nH)	CIRCUIT	RESISTANCE (Ω)	CAPACITANCE (pF)	INDUCTANCE (nH)
1.2	B	75.790	2.12680	0.896
1.5	B	50.568	1.48730	1.254
1.8	B	69.254	1.32050	1.469
2.2	B	72.762	0.91637	2.115
2.7	B	79.357	0.82001	2.356
3.3	B	87.174	0.66923	2.929
3.9	B	86.272	0.57138	3.452
4.7	B	123.660	0.47681	4.150
5.6	B	143.730	0.38200	5.255
6.8	B	171.930	0.31975	6.376
8.2	B	230.000	0.28377	7.329
10.0	B	213.970	0.23723	8.904
12.0	B	312.950	0.19187	11.175
18.0	B	554.440	0.13639	16.818
33.0	B	792.650	0.08367	30.769
39.0	B	1.059	0.07628	35.933
47.0	B	1.832	0.06090	45.300
56.0	B	1.987	0.05267	54.122

IMC-0603

	EQUIVALENT CIRCUIT DATA			
NOMINAL INDUCTANCE (nH)	CIRCUIT	RESISTANCE (mΩ)	CAPACITANCE (pF)	INDUCTANCE (nH)
1.5	B	0.0319	0.0000	1.34
1.8	B	0.0485	0.0000	1.65
2.2	B	0.0557	0.0000	1.98
2.7	B	0.0554	0.0125	2.52
3.3	B	0.0374	0.0118	3.15
3.9	B	0.0541	0.0232	3.68
4.7	B	0.0834	0.0362	4.40
5.6	B	0.1197	0.0439	5.46
6.8	B	0.1209	0.0486	6.54
8.2	B	0.1256	0.0515	7.82
10.0	B	0.1806	0.0555	9.64
12.0	B	0.2173	0.0620	11.55
15.0	B	0.2812	0.0630	14.64
18.0	B	0.3140	0.0647	17.45
22.0	B	0.3322	0.0698	21.26
27.0	B	0.4009	0.0683	25.98
33.0	B	0.5273	0.0740	31.95
39.0	B	0.5809	0.0694	37.29
47.0	B	0.7227	0.0723	45.30
56.0	B	0.9117	0.0667	53.70
68.0	B	1.0948	0.0717	63.19
82.0	B	1.4347	0.0684	76.62
100.0	B	1.5531	0.0709	93.26

IMC-0805-01				
	EQUIVALENT CIRCUIT DATA			
NOMINAL INDUCTANCE (nH)	CIRCUIT	RESISTANCE (É¹)	CAPACITANCE (pF)	INDUCTANCE (nH)
3.9	B	0.0884	0.0075	4.3
4.7	B	0.0958	0.0061	4.6
5.6	B	0.1053	0.0325	5.5
6.8	B	0.1297	0.0320	5.2
8.2	B	0.1472	0.0398	8.1
10	B	0.1468	0.1445	11.2
12	B	0.1749	0.0598	12.6
15	B	0.1861	0.0836	16.4
18	B	0.2194	0.0698	18.8
22	B	0.2420	0.0837	22.4
27	B	0.2638	0.0921	27.4
33	B	0.2814	0.1046	33.4
39	B	0.3282	0.0924	39.0
47	B	0.3432	0.0975	45.3
56	B	0.4023	0.0927	55.7
68	B	0.4356	0.0936	67.9
82	B	0.4880	0.1503	79.8
100	B	0.5968	0.0968	94.4
120	B	0.7235	0.1994	97.7
150	B	1.1647	0.1295	132.9
180	B	1.2414	0.1698	150.2
220	B	1.3983	0.1719	194.2
270	A	17.7k	0.4812	230.6
330	A	16.4k	0.5637	274.2
390	A	12.6k	0.8714	331.9
470	A	10.5k	1.5701	425.7
560	A	10.9k	1.2488	491.0
680	A	12.1k	1.3662	592.1
820	A	13.5k	1.1962	737.5
1000	A	12.5k	1.4749	859.1

IMC-1210				
	EQUIVALENT CIRCUIT DATA			
NOMINAL INDUCTANCE (µH)	CIRCUIT	RESISTANCE (Ω)	CAPACITANCE (pF)	INDUCTANCE (H)
0.010	B	89.79 m	0.0984	6.83 n
0.012	B	107.98 m	0.0965	9.09 n
0.015	B	119.35 m	0.1285	11.09 n
0.018	B	138.90 m	0.1390	14.62 n
0.022	B	135.92 m	0.1827	18.48 n
0.027	B	172.43 m	0.2258	22.37 n
0.033	B	218.71 m	0.1876	30.59 n
0.039	B	209.12 m	0.2440	35.42 n
0.047	B	215.71 m	0.2882	37.57 n
0.056	B	308.05 m	0.3251	46.38 n
0.068	B	224.86 m	0.3369	54.42 n
0.082	B	359.50 m	0.2936	63.2 n

IMC-1210

	EQUIVALENT CIRCUIT DATA			
NOMINAL INDUCTANCE (µH)	CIRCUIT	RESISTANCE (Ω)	CAPACITANCE (pF)	INDUCTANCE (H)
0.100	B	353.36 m	0.3709	80.52 n
0.120	B	363.80 m	0.5019	103.4 n
0.150	B	229.68 m	0.6020	139.55 n
0.180	B	312.54 m	0.6353	159.31 n
0.220	B	269.10 m	0.7814	205.23 n
0.270	A	5.98 k	0.6474	253.82 n
0.330	A	4.11 k	0.6869	309.87 n
0.390	A	4.59 k	0.7050	375.18 n
0.470	A	7.48 k	0.7929	439.72 n
0.560	A	9.09 k	0.9563	523.33 n
0.680	A	10.66 k	0.8764	646.61 n
0.820	A	11.24 k	0.7070	751.05 n
1.0	A	14.21 k	1.2100	0.99 µ
1.2	A	13.73 k	0.9900	1.15 µ
1.5	A	15.51 k	1.5800	1.46 µ
1.8	A	18.89 k	1.4300	1.72 µ
2.2	A	20.98 k	1.1200	2.11 µ
2.7	A	25.90 k	0.9800	2.66 µ
3.3	A	24.65 k	1.5200	3.16 µ
3.9	A	27.80 k	1.6900	3.67 µ
4.7	A	26.43 k	1.4100	4.5 µ
5.6	A	35.52 k	1.3400	5.28 µ
6.8	A	38.26 k	1.5700	6.32 µ
5.2	A	37.93 k	1.3500	7.52 µ
10.0	A	46.21 k	1.5200	9.43 µ

IMC-1210-100

	EQUIVALENT CIRCUIT DATA			
NOMINAL INDUCTANCE (µH)	CIRCUIT	RESISTANCE (Ω)	CAPACITANCE (pF)	INDUCTANCE (H)
0.010	B	64.1	0.1357	9.9 n
0.012	B	88.7	0.1463	11.8 n
0.015	B	130.7	0.1746	14.6 n
0.018	B	143.7	0.1926	17.4 n
0.022	B	200.2	0.1892	21.3 n
0.027	B	156.7	0.2227	29.2 n
0.033	B	273.4	0.1597	38.4 n
0.039	B	197.6	0.2976	34.0 n
0.047	B	212.7	0.2630	44.2 n
0.056	B	277.6	0.3289	48.1 n
0.068	B	314.1	0.2958	61.8 n
0.082	B	325.6	0.2483	84.9 n
0.100	B	412.8	0.3469	84.9 n
0.10	A	11.46	0.5351	0.0935 µ
0.12	A	13.69	0.4697	0.1177 µ
0.15	A	13.69	0.4757	0.1424 µ
0.18	A	18.45	0.5231	0.1623 µ
0.22	A	28.14	0.4544	0.2012 µ
0.27	A	45.62	0.4926	0.2408 µ

IMC-1812

	EQUIVALENT CIRCUIT DATA			
NOMINAL INDUCTANCE (µH)	CIRCUIT	RESISTANCE (kΩ)	CAPACITANCE (pF)	INDUCTANCE (µH)
0.33	A	28.00	0.5365	0.2957
0.39	A	29.24	0.5127	0.3429
0.47	A	29.47	0.5427	0.4508
0.56	A	41.36	0.4498	0.5104
0.68	A	32.51	0.4792	0.6067
0.82	A	32.76	0.4674	0.7412
1.00	A	12.40	1.6920	0.9513
1.20	A	12.33	1.6740	1.1640
1.50	A	14.92	1.6930	1.4020
1.80	A	18.89	1.4410	1.7370
2.20	A	23.51	1.6220	2.1300

ILBB-0603

	EQUIVALENT CIRCUIT DATA			
NOMINAL IMPEDANCE	CIRCUIT	RESISTANCE (Ω)	CAPACITANCE (pF)	INDUCTANCE (µH)
40	A	65	0.900	0.0952
60	A	80	0.900	0.1533
68	A	100	0.900	0.1779
80	A	118	1.000	0.1993
120	A	157	1.200	0.3356
220	A	315	0.900	0.6037
300	A	420	0.800	0.7954
450	A	545	0.800	1.1186
600	A	690	0.800	1.4531
750	A	810	0.900	2.0182
1000	A	1.1k	0.658	2.4001

ILBB-0805

	EQUIVALENT CIRCUIT DATA			
NOMINAL IMPEDANCE	CIRCUIT	RESISTANCE (Ω)	CAPACITANCE (pF)	INDUCTANCE (µH)
11	A	18	0.90	0.0273
32	A	50	0.85	0.1053
60	A	82	0.70	0.2114
90	A	125	1.00	0.2836
120	A	165	1.00	0.2969
150	A	208	1.00	0.4437
300	A	350	1.00	0.8621
400	A	510	0.90	1.3274
600	A	636	1.20	1.3454
1000	A	975	1.00	2.7573
1500	A	1600	1.00	4.7412
2000	A	2500	0.90	7.4365

ILB-1206

	EQUIVALENT CIRCUIT DATA			
NOMINAL IMPEDANCE	CIRCUIT	RESISTANCE (Ω)	CAPACITANCE (pF)	INDUCTANCE (H)
19	A	27	0.9	63.51 n
26	A	37	0.8	75.00 n
50	A	75	0.4	109.60 n
31	A	37	1.0	73.34 n
70	A	95	0.2	174.12 n
120	A	150	1.5	352.33 n
150	A	180	0.9	492.76 n
300	A	330	1.8	1.05 µ
500	A	485	2.1	1.69 µ
600	A	610	2.0	2.49 µ

ISC-1210 0.10 µH - 1 µH

	EQUIVALENT CIRCUIT DATA			
NOMINAL INDUCTANCE	CIRCUIT	RESISTANCE (Ω)	CAPACITANCE (pF)	INDUCTANCE (µH)
0.010	A	1.04	0.1003	0.00741
0.012	A	1.21	0.1051	0.00782
0.015	A	1.80	0.2178	0.01284
0.018	A	2.50	0.2487	0.01564
0.022	A	2.35	0.2434	0.01889
0.027	A	3.00	0.2279	0.02466
0.033	A	3.07	0.1983	0.03188
0.039	A	3.63	0.4437	0.03427
0.047	A	4.39	0.2873	0.03947
0.056	A	5.47	0.4233	0.04478
0.068	A	4.74	0.3259	0.06028
0.082	A	10.12	0.3506	0.07696
0.100	A	7.50	0.4130	0.08288
0.120	A	2.39	0.5536	0.12007
0.150	A	3.37	0.5382	0.14700
0.180	A	3.20	0.6848	0.16420
0.220	A	3.99	0.6573	0.22131
0.270	A	4.27	0.6229	0.25678
0.330	A	4.75	0.6377	0.31673
0.390	A	3.00	0.9118	0.39058
0.470	A	7.49	1.1016	0.44061
0.560	A	6.19	0.9598	0.50199
0.680	A	7.79	0.7370	0.62592
0.820	A	6.85	1.0187	0.80402
1.000	A	10.40	1.3400	0.98740

IFC-0805/0603

Contact Factory for Current Data

FREQUENTLY ASKED QUESTIONS

Why is the equivalent circuit inductance less than the nominal value of the inductor? For instance, the equivalent circuit inductance listed for an IMC-1210 0.82 µH inductor is only 0.74 µH.

The effective inductance of a component can be adversely affected by the parasitic elements. Capacitance cancels out some of the inductive reactance and reduces the effective inductance of the device. Throughout a family of inductors, wire size, core size, core material and number of turns will be varied to achieve the proper inductance. The most efficient inductors (with smallest parasitic element) have the lowest number of turns, the largest wire and the optimum core dimensions.

Since it is not economically feasible to have ideal core and wire sizes for each inductance value in a series, some values will have more significant parasitic elements that affect the performance of the inductor. For example, one core and wire size may be used for as many as 5 adjacent values in an inductor series. The number of turns is varied to achieve the higher inductance values. An inductor with more turns will have more inter-winding capacitance so the highest inductor with the same core and wire size will typically be more affected by the winding capacitance than the lower values.

I would like to perform a Monte Carlo analysis that will examine my circuit over the tolerance range of all my components. How much can I expect the parasitic elements to change due to manufacturing tolerances?

This is a tough question to answer.

Vishay Dale and other inductor manufacturers sell inductors based on four major specifications:

Inductance ± a percentage tolerance

Minimum Q at a specified frequency

Maximum DCR of the winding or conductor

Minimum SRF

In order to achieve these specifications, core size and material, wire size, and number of turns can be varied. Due to manufacturing tolerances on all of the inductor components, wire size and/or number of turns may vary on the same value across production lots. Varying the wire size and/or turns will affect the values of the parasitic components, however, the specified L, Q, DCR, and SRF will always be in tolerance. Vishay Dale designs and manufactures inductors with respect for the behavior of parasitic elements. Typically, the basic tolerance of the purchased inductor (i.e., 10 µH ± 10 %) can be applied to all the equivalent circuit elements in the inductor model with good success.

I use "S" parameters in my circuit simulator. Are they available for Vishay Dale inductors?

Because of the complexity of distributing "S" parameters for all the inductor series, we have opted not to provide "S" parameters for these products. As an alternative, most circuit simulation programs will generate "S" parameters for a simulated circuit. The equivalent circuit elements for the Vishay Dale inductors can be entered as a separate circuit into the simulator which can in turn generate a table or file of "S" parameters for the inductor model.

I am interested in simulating the performance of a Vishay Dale inductor that is not on the charts contained within this application note. How can I get equivalent circuit information for this inductor?

Vishay Dale will be adding equivalent circuit information for other products as demand requires. If there is a specific inductor you would like information on that has not been published, we can normally supply this information within one week of the request.

My circuit simulator already contains a library of inductive components models from Vishay Dale and other vendor products. How do I know if these are accurate models?

Some component libraries contain models that have been empirically generated from catalog specifications, and so these models may not accurately depict product performance. To have full confidence in your library of inductive component models, we strongly suggest that you contact the vendor of your circuit simulator to determine the source of the supplied inductor model data. All data included here in our Application Note has been generated by testing normally processed product and represents the typical performance you can expect from the Vishay Dale product.

Electro-Magnetic Interference and Electro-Magnetic Compatibility (EMI/EMC)

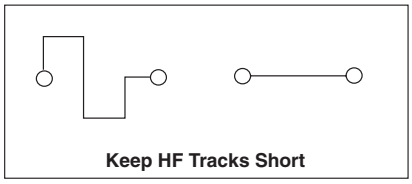
INTRODUCTION

Manufacturers of electrical and electronic equipment regularly submit their products for EMI/EMC testing to ensure
regulations on electromagnetic compatibility are met.
Inevitably, some equipment will fail, as the interference transmitted on cables connected to the equipment exceeds regulated limits, resulting in radiated emissions failure.
Additional problems can occur when connected equipment causes interference problems with the equipment under test resulting in component malfunction.
There are many ways to reduce the level of conducted and radiated interference, especially during the initial design of the circuit board.
These techniques include proper routing of tracks, proper use of ground planes, power supply impedance matching, and reducing logic frequency to a minimum.
Even with the most diligent employment of good EMI/EMC circuit design practices, not all interference or compatibility issues can be eliminated. At this point, additional components can be added, allowing the circuit to comply with design and regulation limits for EMI/EMC.
This engineering note will review both initial circuit board design practices and identify some after design components that can be used to solve EMI/EMC problems.

CIRCUIT DESIGN TIPS TO REDUCE EMI/ EMC PROBLEMS

There are several areas where good circuit design practices are critical to the reduction or elimination of EMI/EMC problems. How the PCB layout is approached - not simply in the design but also the choice of components - directly affects the degree of EMI/EMC interference. Another area of concern is the circuit design of the power supply.
PCB Design Tips
• Avoid slit apertures in PCB layout, particularly in ground planes or near current paths
• Areas of high impedance give rise to high EMI, so use wide tracks for power lines on the trace sides
• Make signal tracks stripline and include ground plane and power plane whenever possible
• Keep HF and RF tracks as short as possible, and lay out the HF tracks first (Figure 1)

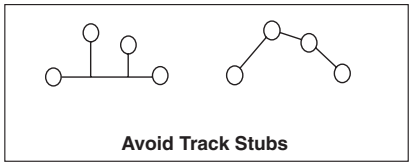
Figure 1



Keep HF Tracks Short

- Avoid track stubs, as they cause reflections and harmonics (Figure 2)

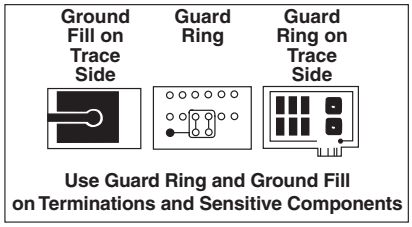
Figure 2



Avoid Track Stubs

- On sensitive components and terminations, use surrounding guard ring and ground fill where possible
- A guard ring around trace layers reduces emission out of the board; also,connect to ground only at a single point and make no other use of the guard ring (Figure 3)

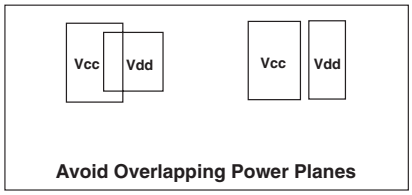
Figure 3



Use Guard Ring and Ground Fill on Terminations and Sensitive Components

- When you have separate power planes, keep them over a common ground to reduce system noise and power coupling (Figure 4)

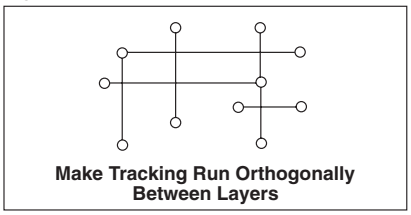
Figure 4



Avoid Overlapping Power Planes

- The power plane conductivity should be high, so avoid localized concentrations of via and through hole pads (surface mount is preferred mounting method)
- Track mitering (beveling of edges and corners) reduces field concentration
- If possible, make tracks run orthogonally between adjacent layers (Figure 5)

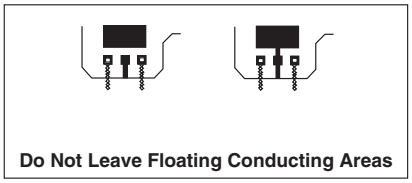
Figure 5



Make Tracking Run Orthogonally Between Layers

- Do not loop tracks, even between layers, as this forms a receiving or radiating antenna.
- Do not leave floating conductor areas, as they act as EMI radiators; if possible connect to ground plane (often, these sections are placed for thermal dissipation, so polarity should not be a consideration, but verify with component data sheet). (Figure 6)

Figure 6

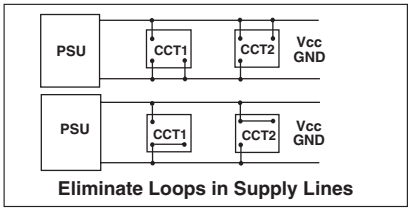


Do Not Leave Floating Conducting Areas

Power Supply Considerations

- Eliminate loops in the supply lines. (Figure 7)

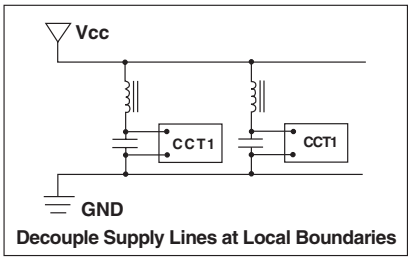
Figure 7



Eliminate Loops in Supply Lines

- Decouple supply lines at local boundaries. (Figure 8)

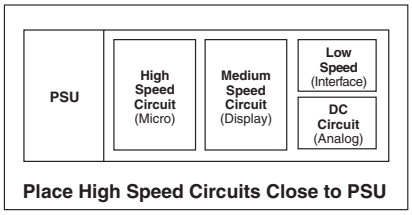
Figure 8



Decouple Supply Lines at Local Boundaries

- Place high speed circuits close to Power Supply Unit (PSU and slowest sections furthest away to reduce power plane transients. (Figure 9)

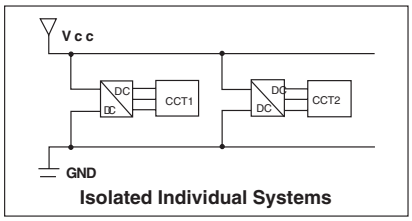
Figure 9



Place High Speed Circuits Close to PSU

- Isolate individual systems where possible (especially analog and digital systems) on both power supply and signal lines. (Figure 10)

Figure 10

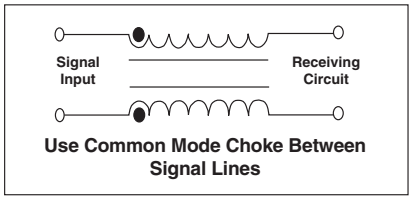


Isolated Individual Systems

Component Considerations

- Locate biasing and pull up/down components close to driver/bias points.
- Minimize output drive from clock circuits.
- Use common mode chokes (Vishay Dale series LPT4545 or LPT3535 or the LPE series of surface mount transformers) between current carrying and signal lines to increase coupling and cancel stray fields. (Figure 11)

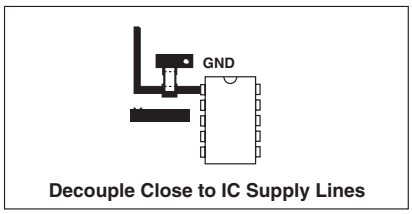
Figure 11



Use Common Mode Choke Between Signal Lines

- Decouple close to chip supply lines, to reduce component noise and power line transients. (Figure 12)

Figure 12



Decouple Close to IC Supply Lines

- Use low impedance capacitors for de-coupling and bypassing (ceramic multilayer capacitors, like those offered by Vishay Vitramon are preferred, offering high resonant frequencies and stability).
- Use discrete components for filters where possible (surface mount is preferable due to lower parasitic and aerial effects of termination's compared to through hole components).
- Ensure filtering of cables and overvoltage protection at the terminations (this is especially true of cabling that is external to the system, if possible all external cabling should be isolated at the equipment boundary).
- Minimize capacitive loading on digital output by minimizing fanout, especially on CMOS ICs (this reduces current loading and surge per IC).

If available, use shielding on fast switching circuits, main power supply components and low power circuitry (shielding is expensive and should be considered a "last resort" option).

MAGNETIC COMPONENTS FOR ELECTRO MAGNETIC INTERFERENCE REDUCTION AND ELECTRO MAGNETIC COMPATIBILITY

Products that use magnetics to reduce electro-magnetic interference and improve electro magnetic compatibility within the circuit can be classified into several categories: inductors, chokes, transformers, ferrite beads, capacitors, and integrated passive devices that can incorporate any or all of the above devices. When considering any of these EMI/EMC components, it is necessary to identify circuit paths or areas likely to conduct or radiate noise.

Inductors

The most common magnetic EMI filter is the inductor or choke. Inductors are used for both line filtering and energy storage. If a circuit is suspected of being a source for EMI, often, selection of the right inductor can help eliminate the problem. For radiated interference, the choice of a shielded or toroidal inductor can often eliminate (or at least greatly reduce) the offending frequency. In fact, toroidal inductors like Vishay Dale's LPT-4545 and LPT-3535 surface mount, or Vishay Dale's TE, TD, or TJ series of leaded toroids virtually eliminate radiated fields because of the toroid's unique ability to contain the magnetic flux within its core.

LPT 4545 Toroidal Inductor

The toroid is also less susceptible to induced noise from other components as the applied magnetic field would induce equal and opposite currents inside the toroid, thus canceling the induced interference.

Chokes

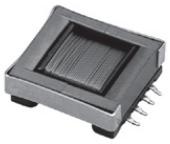
Common mode and differential mode chokes are used to eliminate noise on a pair of conductors. Common mode noise is defined as noise that is present or "common" to both conductors, and can be the result of induced noise caused by the "antenna" effect of a conductor or PC trace. Common mode noise is typically "in phase" within the conductors, while differential noise is present on only one conductor or present in opposite phase in both conductors. Common mode chokes use the properties of two closely coupled magnetic fields to eliminate the interference problem by canceling the noise within the magnetic fields. They are best employed to eliminate noise or EMI on cables or signal tracks. The choke should be located as close to the driver or receiver circuit as possible, or at the signal entry point of the circuit board. The proper selection of inductive component can also help in matching line impedance and can act as a bandwidth filter for the circuit. Vishay Dale's LPT and LPE series products can be configured in the common or differential mode depending on your application.

Transformers

The main benefit of using a transformer for EMI/EMC is that it can provide an isolation barrier between a signal line and the signal processing circuit (particularly where the signal line exits the board or system). This is true of signals being driven or received, since isolating the line reduces common mode noise and eliminates ground (or signal return) potential differences between systems.

One particular area where high noise immunity is essential is in thyristor/triac driving circuits. Here the transformer provides an isolation between the driven load and a logic based controller. The isolating pulse transistor provides much better noise immunity than an insulated gate bipolar transistor (IGBT) due to inherently lower coupling capacitance (typically 10's of pF for a pulse transformer compared to nF for a power IGBT device). The lower coupling capacitance improves the circuit's
immunity from noise from the main power supply or from power switching devices. Vishay Dale's LPE and PT transformers can be used to meet your transformer needs. Many more EMI/EMC configurations can be provided through our custom magnetic design department.

LPE Series Transformer



Surface Mount Ferrite Beads

Chip impeders, also called ferrite chip beads, perform the function of removing RF energy that exists within a transmission line structure (printed circuit board trace). To remove unwanted RF energy, chip beads are used as high frequency resistors (attenuators) that allow DC to pass while absorbing the RF energy and dissipating that energy in the form of heat.

ILBB/ILB Ferrite Beads

Surface mount ferrite beads have many advantages:

- Small and light weight
- Inexpensive
- High impedance values removes broad range of RF energy
- Closed magnetic circuit eliminates cross talk
- Beads are inherently shielded
- Low DCR ratings minimizes desired signal degradation
- Excellent current carrying capacity compared to alternatives
- Outstanding performance at removing RF energy
- Spurious circuit oscillations or resonances are reduced because of the bead's resistive characteristics at RF frequencies
- Broad impedance ranges (several ohms to 2000 ohms)
- Operates effectively from several MHz to 1GHz

To chose the proper bead, you should consider the following:

1. What is the range of unwanted frequencies?
2. What is the source of the EMI?
3. How much attenuation is required?
4. What are the environmental and electrical conditions for the circuit (temperature DC voltage, DC bias currents, maximum operating currents, field strengths, etc...)?
5. What is the maximum allowable profile and board real estate for using this component?

Selection of the right bead for your particular frequencies is not a simple process. In most cases, since beads are only rated for impedance at 100 MHz, you will need to look at several graphs to determine the best bead for your frequency if it is different than 100 MHz.

This is a time consuming but necessary process to select the correct bead value since the highest impedance bead at 100 MHz is not necessarily the highest impedance bead at higher or lower frequencies. DC bias will also lower the effective impedance of the device. (Vishay Dale has developed a Surface Mount Ferrite Bead Designer's Kit that includes product samples, electrical data and a slide chart design aid that allows you to calculate the impedance of a surface mounted ferrite bead at a designated frequency. This kit allows quick selection of the correct bead from Vishay's line of surface mount beads without the time consuming process of looking at a multitude of graphs. The Surface Mount Ferrite Bead Designer's Kit (available upon request, call 605-665-9301) also calculates the DC bias derating percentage for a range of bias currents.

EMI/EMC Component Selection

Before incorporating EMI/EMC components, it is necessary to identify the circuit paths and circuit areas most likely to conduct noise, and to identify circuit areas likely to act as antennas and radiate noise. At this point the most appropriate location for the chosen components can be determined.

The actual components chosen are determined by the frequency and signal level of the noise to be eliminated. Consideration should also be given for the frequencies that are to remain intact.

For attenuation less than 5dB inductive, EMI components are generally the best choice. For attenuation less than 5dB, circuit type must first be considered.

Working with a high speed signal circuit, your best choice is a complex filter consisting of inductive and capacitive components (such as an LCR Filter). If your circuit is a general signal type (i.e., not a high speed circuit) grounding stability must first be determined. For stable grounds, capacitive EMI components are an excellent choice.

However, if the circuit has an unstable ground, high impedance inductive components should be considered for EMI suppression needs.

Designing equipment and choosing components is not an easy process. Often, the only measure of design success is the overall radiation level from your equipment. Trial and error is a long tedious process that can take several months to complete, and choosing the wrong component can waste time.

Here are three suggestions for more effective design:

- Always place EMI/EMC components as close as possible to the noise source.
- Select EMI/EMC components that match the impedance of the noise conduction path, not necessarily that of the circuit path. Remember that common mode noise often travels a different path than the circuit current.
- Start with EMI/EMC components that offer sufficient performance to meet your design standards. Component costs can be reduced once you have a working design.

VISHAY COMPONENTS FOR EMI/EMC COMPLIANCE

Surface Mount Ferrite Beads
ILB-1206, ILBB-0402 to 1812
Surface Mount, High Current Ferrite Beads
ILHB-0603 to 1812
Surface Mount Bead Arrays
ILAS-1206
Surface Mount Ferrite Inductors and Chokes
LPT-4545, LPT-3535
Surface Mount Transformers
LPE Series

Surface Mount Ceramic and Tantalum Capacitors

Ferrite Beads for EMI/EMC Compliance

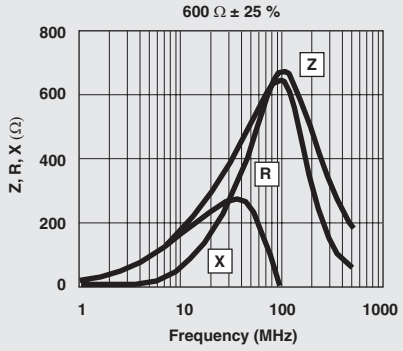
One of the simplest and most effective ways to reduce EMI is through the use of ferrite beads. Initially, EMI suppression consisted of a small bead-shaped ferrite (hence the name bead) with a hole through the middle. The ferrite bead was slipped over the suspected "noisy" wire or component lead and EMI was reduced.

Today, beads are available in a variety of styles including the original through-hole model, multiple apertures and surface mount configurations.

How Ferrite Beads Work

The best way to conceptualize a bead is as a frequency dependent resistor. An equivalent circuit for a bead consists of a resistor and inductor in series. The resulting change (of impedance over frequency) is directly associated with the frequency dependent complex impedance of the ferrite material.

At low frequencies (below 10 MHz) the inductive impedance is 10 ohms or less, as shown below. At higher frequencies, the impedance of the bead increases to over 100 ohms, and becomes mostly resistive above 100 MHz.



Since the bead's impedance is essentially resistive to high frequency circuits, the problem of resonance experienced by other EMI filtering choices like capacitors and inductors is eliminated. Often the bead is the only practical solution to an EMI problem.

When used as a high frequency filter, ferrite beads provide a resistive loss that attenuates the unwanted frequencies through minute heating of the bead's ferrite material due to eddy currents. At the same time, the bead presents minimal series impedance to the lower frequency or direct currents of the circuit.

USEFUL TABLES FOR EMI/EMC DESIGNS

DECIBELS

dß	POWER RATIO	VOLTAGE CURRENT RATIO	dß	POWER RATIO	VOLTAGE CURRENT RATIO
0	1.0	1.0	0	1.0	1.0
3	2.0	1.4	- 3	0.50	0.71
6	4.0	2.0	- 6	0.25	0.50
10	10.0	3.2	- 10	0.10	0.32
12	16.0	4.0	- 12	0.05	0.25
14	25.0	5.0	- 14	0.04	0.20
20	10^2	10	- 20	10^{-2}	0.10
30	10^3	32	- 30	10^{-3}	0.03
40	10^4	10^2	- 40	10^{-4}	10^{-2}
60	10^6	10^3	- 60	10^{-6}	10^{-3}
80	10^8	10^4	- 80	10^{-8}	10^{-4}
100	10^{10}	10^5	- 100	10^{-10}	10^{-5}
120	10^{12}	10^6	- 120	10^{-12}	10^{-6}
140	10^{14}	10^7	- 140	10^{-14}	10^{-7}

$$dB = 10 \log_{10} \frac{P_1}{P_2} \qquad dB = 20 \log_{10} \frac{V_1}{V_2} = 20 \log_{10} \frac{I_1}{I_2}$$

FREQUENCY VS. WAVELENGTH

F	λ	λ/2	λ/20
10 Hz	30 000 km	4800 km	1500 km
60 Hz	5000 km	800 km	250 km
100 Hz	3000 km	480 km	150 km
400 Hz	750 km	120 km	37 km
1 kHz	300 km	48 km	15 km
10 kHz	30 km	4.8 km	1.5 km
100 kHz	3 km	480 m	150 m
1 MHz	300 m	48 m	15 m
10 MHz	30 m	4.8 m	1.5 m
100 MHz	3 m	0.48 m	15 cm
1 GHz	30 cm	4.8 cm	1.5 cm
10 GHz	3 cm	4.8 mm	1.5 mm

F = Frequency
λ = Wavelength
λ/2π = Near Field to Far Field Distance
λ/20 = Antenna Effects of Wires and Slots

ELECTRIC FIELD LEVELS

Watts	1 m	10 m	100 m	1 km	10 km
1 W	5.5 V/m	0.55 V/m	0.05 V/m	5.5 V/m	0.55 mV/m
10 W	17.4 V/m	1.7 V/m	0.17 V/m	17 V/m	1.7 mV/m
100 W	55 V/m	5.5 V/m	0.55 V/m	55 V/m	5.5 mV/m
1 kW	174 V/m	17.4 V/m	1.74 V/m	170 V/m	17 mV/m
10 kW	550 V/m	55 V/m	5.5 V/m	550 V/m	55 mV/m
100 kW	1740 V/m	174 V/m	17.4 V/m	1.74 V/m	174 mV/m

Table assumes an antenna gain of one.

$$E = \frac{5.5\sqrt{PA}}{d}$$

P = Power at Antenna in Watts
d = Distance from Antenna in Meters (Valid when $d > \lambda/2\pi$)
E = Electric Field in Volts/meter
A = Antenna gain (1 for Table)

CAPACITOR SELF RESONANCE

Farads	TOTAL LEAD LENGTH 1/4"	1/2"	1"
500 pF	100 MHz	72 MHz	50 MHz
1000 pF	72	51	36
0.01 F	23	16	11
0.1 F	7.2	5.1	3.6
0.3 F	4.2	2.9	2.1
0.5 F	3.2	2.3	1.6

$$f = \frac{1}{2\pi\sqrt{LC}} \qquad L = 20 \text{ nh/inch}$$

CISPR 22 LIMITS

	FREQ - MHz	CLASS A	CLASS B
RADIATED	30 - 230	40 dB πV/m	30 dB V/m
	230 - 1000	47 dB πV/m	37 dB V/m
	Quasi-Peak, Antenna at 10 Meters		
	FREQ - MHz	**CLASS A**	**CLASS B**
CONDUCTED	0.15 - 0.50	66 dB πV/m	56 to 46 dB πV/m
	0.50 - 5	60 dB πV/m	46 dB πV/m
	5 - 30	60 dB πV/m	50 dB πV/m
	Average		

RISE TIMES • FREQUENCY • LENGTH

t_r	f_{eq}	L_{cross}	$L_{cross/2}$	L_{term}
1 nsec	318 MHz	1.0 ft.	6 in.	3 in.
3 nsec	95 MHz	3.0 ft.	1.5 ft.	9 in.
10 nsec	32 MHz	10 ft.	5 ft.	2.5 ft.
30 nsec	9.5 MHz	30 ft.	15 ft.	7.5 ft.
100 nsec	3.2 MHz	100 ft.	50 ft.	25 ft.
300 nsec	950 MHz	300 ft.	150 ft.	75 ft.
1 usec	320 MHz	1000 ft.	500 ft.	250 ft.

t_r = rise time
f_{eq} = equivalent frequency $1/\pi tr$
L_{cross} = length of one rise time in free space
$L_{cross/2}$ = typical length of rise time on cable or printed circuit board (crosstalk)
L_{term} = length of terminate on cable or printed circuit board

Frequency Dependance of Inductor Testing and Correlation of Results Between Q Meters and Impedance Meters

This engineering note is in response to questions raised regarding differences of inductance testing results between Vishay Dale products tested using a “Q” meter as the standard and similar inductor products produced by other manufacturers that use an impedance meter as the standard. It will also discuss the frequency dependance of inductance and Q (Quality Factor) when testing.

The primary values used to specify an inductor or coil are inductance, Q, Self-Resonant Frequency (SRF), and Direct Current Resistance (DCR). The first two parameters, inductance and Q, are very dependant on the testing frequency and the instrument used for testing. Inductance is specified in Henries, usually with a tolerance. Q, being an indication of relative losses within an inductor, is unitless, and is based on the ratio of inductive reactance (XL) and effective resistance (Re) at frequency (XL/Re). As can be seen from this formula, Q is very dependent on frequency. At lower frequencies, the inductive reactance (XL) changes faster than effective resistance (Re); at higher frequencies, the reverse is true. SRF is specified in Hertz and DCR in Ohms.

Many Vishay Dale leaded and surface mount inductors are referenced from what has been the industry standard test instrument: the HP4342A Q meter (it is important to note that using the Q meter as the standard does not mean that the product is necessarily tested on that meter, but only that values are referenced back to what a Q meter would read if it was testing the part). This common industry test method/instrument has historical ties back to military specifications and standards and is still in wide use throughout the industry as the standard by which values are determined. Recently, the impedance analyzer has been gaining preference as the new standard for inductance measurements of radio frequency coils (especially commercial surface mount products). The following is a brief description of the reasons for this trend.

The Q meter is made up of a variable frequency signal generator, a calibrated variable capacitor, and a high impedance RF voltmeter. There are several sources of error when testing with a Q meter. The first is Residual Inductance which is defined as the sum of the internal inductance of the Q meter as well as the inductance of any test leads or fixtures. It is determined by using a shorting bar with a known inductance value. This value is then subtracted from any Measured Inductance to give the Effective Inductance. The next error is called Distributed Capacitance which is defined as the total distributed capacitance of the inductor under test. Distributed Capacitance is only a concern with inductors with large inductance values (typically above 1mH).

The fundamental difficulty with measuring inductance and Q is that coil inductance, parasitics[1] of the coil and test fixture, and Q are highly dependant on the test frequency and the configuration of the test instrument and fixture. Q meters require the use of a test fixture that has parasitics that can vary from one test fixture to another. This variance requires compensation before testing to get accurate and repeatable results. It is also important to understand that the Q meter operates by resonating the coil under test with a variable capacitor. At resonance, the meter indicates the capacitance value on a dial that the test operator must judge by reading the dial. The resolution of the analog dial often introduces parallax errors that add to the inaccuracy in the measurement.

[1] Unwanted stray inductance and capacitance inherent in the product's construction.

Engineering Note

Vishay Dale

Frequency Dependance of Inductor Testing and Correlation of Results Between Q Meters and Impedance Meters

Commercially available Q meters have inductance measurement accuracies of no better than 3 %. The accuracy can be improved by the use of setup standards called correlation pieces or samples. The correlation samples are used as the standard for a specific component value and are then used to “calibrate” the meter every time testing of components is performed. The use of correlation samples has been the traditional industry test method used to improve accuracy of Q meters, and results in little error and provides consistent readings. However, this correlation process has significant disadvantages. For the best accuracy, correlation sample standards must be established and shared between the manufacturer and the customer. Also, each Q meter must be “calibrated” with the correlation standard before each test.

Because of the inherent difficulties in using a Q meter accurately, the use of impedance analyzers as the standard has become much more common. Impedance analyzers (i.e., HP4191, HP4194) have accuracies that can be better than ± 1 % for impedances near 50 ohms and a machine to machine repeatability of approximately 1 %. Overall session-to-session test repeatability on the same instrument is also 1 %. The use of impedance analyzers also eliminates the need for correlation samples. In addition, the analyzers have digital readouts which remove the potential for problems associated with dial reading/parallax errors.

Selection of a test instrument will influence test results. Different instruments have different capabilities and accuracies. As stated, the frequency used during testing will also cause a variation in test results. Even the tolerance of a coil will change with frequency because of the variances in parasitics within the coil (i.e., a 5 % tolerance coil tested at one frequency may only be a 10 % tolerance coil at another frequency). Below is a table that shows the typical variations that can be expected for the same coil tested on different instruments and at different frequencies.

TYPICAL VARIATIONS

INSTRUMENT	FREQUENCY	INDUCTANCE
HP4342A Q meter	25 MHz	682.3 nH
HP4192A	0.130 MHz	607.0 nH
HP4192A	10 MHz	592.7 nH
Booton 62AD	1 MHz	594.0 nH
Tektronix LC130	0.130 MHz	1300.0 nH
HP4191A	100 MHz	1065.0 nH

As can be seen in the table above, it is difficult to get similar results between two different meters or by testing at two different frequencies. This difference is more pronounced when using meters with different test methods (Q meter versus impedance analyzer). If the testing instrument and or method is different between the manufacturer and the customer, it is possible to establish a correlation between the two readings by testing a controlled set of parts on both machines and averaging the difference to establish a correlation factor. This is only recommended when the test instruments are different and should not be used when different testing frequencies are involved.

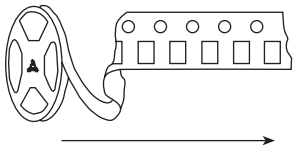
Following the trend toward the use of impedance analyzers as the standardized industry test method, and to eliminate correlation issues, Vishay Dale offers testing (at customer request) using the impedance analyzer as the standard in lieu of the Q meter. However, because reliable Q measurements can be made on the Q meter, and because of the number of existing customer designs that are based on this standard, the HP4342A Q meter will remain the reference instrument for all Q measurements. If the alternate test method is desired, then we can accommodate customer needs by designating the product with a special part number or by linking the special testing requirements to the customer part number. The IMC-1812-91, IMC-1210-91, ISC-1812-91, and ISC-1210-91 are among several parts that reflect this test method and should be considered for future use if the customer requires value testing based on the impedance analyzer standard. It should be noted that changing from standard product to the special “-” series of products like the -91 will, in most cases, have little or no impact on price or delivery. Vishay Dale will continue to monitor testing trends and will make changes as required to meet overall customer needs.

If you have further questions regarding this issue, please contact the factory at (605) 665-9301.

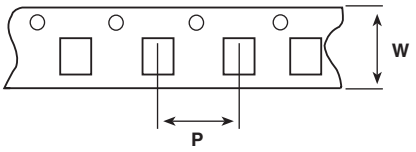
SMD Magnetics Packaging Methods

TAPE AND REEL in inches [millimeters]

Tape and Reel



User Direction of Feed



Carrier Dimensions

MODEL	PACKAGE CODE			REEL SIZE	CARRIER TAPE WIDTH (W)	COMPONENT PITCH (P)	UNITS/ REEL	PACKAGE CODE			UNITS/ BULK
	PREVIOUS CODE	GLOBAL CODE LEAD BEARING	GLOBAL CODE LEAD (Pb)-FREE					PREVIOUS CODE	GLOBAL CODE LEAD BEARING	GLOBAL CODE LEAD (Pb)-FREE	
IHLP-2525AH	-	-	ER	13	0.630 [16.0]	0.315 [8.0]	2000	-	-	EB	100
IHLP-2525BD	-	-	ER	13	0.630 [16.0]	0.315 [8.0]	2000	-	-	EB	100
IHLP-2525CZ	-	-	ER	13	0.630 [16.0]	0.315 [8.0]	2000	-	-	EB	100
IHLP-2525EZ	-	-	ER	13	0.630 [16.0]	0.472 [12.0]	500	-	-	EB	100
IHLP-4040DZ	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	500	-	-	EB	100
IHLP-5050CE	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	500	-	-	EB	100
IHLP-5050EZ	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	250	-	-	EB	100
IHLP-5050FD	-	-	ER	13	0.945 [24.0]	0.630 [16.0]	250	-	-	EB	100
IHLM-2525CZ	-	-	ER	13	0.630 [16.0]	0.315 [8.0]	2000	-	-	EB	100
IHSM-3825	RC2	RE	ER	13	0.945 [24.0]	0.472 [12.0]	750	P09	PJ	EB	100
IHSM-4825	RC2	RE	ER	13	0.945 [24.0]	0.472 [12.0]	750	P09	PJ	EB	100
IHSM-5832	RC3	RF	ER	13	1.26 [32.0]	0.472 [12.0]	500	P09	PJ	EB	100
IHSM-7832	RC4	RG	ER	13	1.73 [44.0]	0.472 [12.0]	500	P09	PJ	EB	100
IDC-2512	R96	NB	ER	13	0.630 [16.0]	0.315 [8.0]	2000	-	-	-	-
IDC-5020	R96	NB	ER	13	0.630 [16.0]	0.472 [12.0]	500	-	-	-	-
IDC-7328	R96	NB	ER	13	0.945 [24.0]	0.945 [24.0]	250	-	-	-	-
IDCS-2512	R96	NB	ER	13	0.630 [16.0]	0.315 [8.0]	2000	-	-	-	-
IDCS-5020	R96	NB	ER	13	0.630 [16.0]	0.472 [12.0]	500	-	-	-	-
IDCS-7328	R96	NB	ER	13	0.945 [24.0]	0.945 [24.0]	250	-	-	-	-
IDCP-1813	R96	NB	ER	13	0.472 [12.0]	0.315 [8.0]	2000	-	-	-	-
IDCP-2218	R96	NB	ER	13	0.472 [12.0]	0.315 [8.0]	1500	-	-	-	-
IDCP-3114	R96	NB	ER	13	0.630 (16.0)	0.472 [12.0]	1000	-	-	-	-
IDCP-3020	R96	NB	ER	13	0.630 (16.0)	0.472 [12.0]	1000	-	-	-	-
IDCP-3722	R96	NB	ER	13	0.945 [24.0]	0.472 [12.0]	800	-	-	-	-
IDCP-3916	R96	NB	ER	13	0.945 [24.0]	0.472 [12.0]	800	-	-	-	-
IFC-0603	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	5000	-	-	-	-
IFC-0805	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	5000	-	-	-	-
IFCB-0402	-	-	ER	7	0.315 [8.0]	0.079 [2.0]	10 000	-	-	-	-
IFCB-0603	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	5000	-	-	-	-
ILC-0402	-	-	ER	7	0.315 [8.0]	0.079 [2.0]	10 000	-	-	-	-
ILC-0603	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	4000	-	-	-	-
IMC-0402	-	-	ER	7	0.315 [8.0]	0.079 [2.0]	10 000	-	-	-	-
IMC-0402-01	-	-	ER	7	0.315 [8.0]	0.079 [2.0]	10 000	-	-	-	-
IMC-0603	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	3000	-	-	-	-
IMC-0603-01	-	-	ER	7	0.315 [8.0]	0.079 [2.0]	3000	-	-	-	-
IMC-0805	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	3000	-	-	-	-
IMC-0805-01	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	2000	-	-	-	-
IMC-1008	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	2000	-	-	-	-
IMC-1210	R98/RB3 R99/RB4	SY/AN SZ/R9	ER/ET ES/EU	7 13	0.315 [8.0] 0.315 [8.0]	0.157 [4.0] 0.157 [4.0]	2000 7500	B13	BN	EB	500
IMC-1210-100	R98/RB3 R99/RB4	SY/AN SZ/R9	ER/ET ES/EU	7 13	0.315 [8.0] 0.315 [8.0]	0.157 [4.0] 0.157 [4.0]	2000 7500	B13	BN	EB	500

TAPE AND REEL in inches [millimeters]

MODEL	PACKAGE CODE			REEL SIZE	CARRIER TAPE WIDTH (W)	COMPONENT PITCH (P)	UNITS/ REEL	PACKAGE CODE			UNITS/ BULK
	PREVIOUS CODE	GLOBAL CODE LEAD BEARING	GLOBAL CODE LEAD FREE					PREVIOUS CODE	GLOBAL CODE LEAD BEARING	GLOBAL CODE LEAD FREE	
IMC-1812	R73/R92 R13/R91	RV/RX RQ/RW	ER/ET ES/EU	7 13	0.472 [12.0] 0.472 [12.0]	0.315 [8.0] 0.315 [8.0]	500 2000	B13	BN	EB	500
IMCH-1812	-	-	ER	7	0.472 [12.0]	0.315 [8.0]	500	-	-	-	-
IMC-2220	-	-	ER	13	0.630 [16.0]	0.472 [12.0]	1000	-	-	-	-
ISC-1008	-	-	ER	13	0.472 [12.0]	0.157 [4.0]	750	-	-	-	-
ISC-1210	R98/RB3 R99/RB4	SY/AN SZ/R9	ER/ET ES/EU	7 13	0.315 [8.0] 0.315 [8.0]	0.157 [4.0] 0.157 [4.0]	2000 7500	B13	BN	EB	500
ISC-1812	R73/R92 R13/R91	RV/RX RQ/RW	ER/ET ES/EU	7 13	0.472 [12.0] 0.472 [12.0]	0.315 [8.0] 0.315 [8.0]	500 2000	B13	BN	EB	500
ICM-0805	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	2000	-	-	-	-
ICM-1206	-	-	ER	7	0.315 [8.0]	0.157 [4.0]	2000	-	-	-	-
ILSB-0603	RC8	RK	ER	7	0.315 [8.0]	0.157 [4.0]	4000	-	-	-	-
ILSB-0805 (0.047 - 0.39 µH, 1.0 - 2.2 µH)	RC8	RK	ER	7	0.315 [8.0]	0.157 [4.0]	4000	-	-	-	-
ILSB-0805 (0.47 - 0.82 µH, 2.7 - 33 µH)	RC8	RK	ER	7	0.315 [8.0]	0.157 [4.0]	3000	-	-	-	-
ILSB-1206	RC8	RK	ER	7	0.315 [8.0]	0.157 [4.0]	3000	-	-	-	-
ILBB-0402	RC8	RK	ER	7	0.315 [8.0]	0.157 [4.0]	10 000	-	-	-	-
ILBB-0603	RC8	RK	ER	7	0.315 [8.0]	0.157 [4.0]	4000	-	-	-	-
ILBB-0805	RC8	RK	ER	7	0.315 [8.0]	0.157 [4.0]	4000	-	-	-	-
ILB-1206	RC8 RT4	RK ND	ER ES	7 13	0.315 [8.0] 0.315 [8.0]	0.157 [4.0] 0.157 [4.0]	3000 10 000	-	-	-	-
ILBB-1210	RC8	RK	ER	7	0.315 [8.0]	0.157 [4.0]	2000	-	-	-	-
ILBB-1806	RC8	RK	ER	7	0.472 [12.0]	0.157 [4.0]	2000	-	-	-	-
ILBB-1812	RC8	RK	ER	7	0.472 [12.0]	0.157 [4.0]	1000	-	-	-	-
ILHB-0603	RC8	RK	ER	7	0.315 [8.0]	0.157 [4.0]	4000	-	-	-	-
ILHB-0805	RC8	RK	ER	7	0.315 [8.0]	0.157 [4.0]	4000	-	-	-	-
ILHB-1206	RC8	RK	ER	7	0.315 [8.0]	0.157 [4.0]	3000	-	-	-	-
ILHB-1806	RC8	RK	ER	7	0.315 [8.0]	0.157 [4.0]	2000	-	-	-	-
ILHB-1812	RC8	RK	ER	7	0.315 [8.0]	0.157 [4.0]	1000	-	-	-	-
ILAS-1206	RC8	RK	ER	7	0.315 [8.0]	0.157 [4.0]	3000	-	-	-	-
LPE-3325	R94	RY	ER	13	0.945 [24.0]	0.472 [12.0]	1000	S51	SM	EB	10
LPE-4841	R94	RY	ER	13	0.945 [24.0]	0.630 [16.0]	600	S51	SM	EB	10
LPE-5047	R94	RY	ER	13	0.945 [24.0]	0.630 [16.0]	600	S51	SM	EB	10
LPE-6562	R94	RY	ER	13	1.26 [32.0]	0.787 [20.0]	300	S51	SM	EB	10
LPE-6855	R94	RY	ER	13	1.26 [32.0]	0.787 [20.0]	450	S51	SM	EB	10
LPE-3325-CST	-	-	ER	13	0.945 [24.0]	0.472 [12.0]	1000	-	-	EB	10
LPT-3535	RC5	RH	ER	13	0.945 [24.0]	0.630 [16.0]	600	S51	SM	EB	10
LPT-4545	RC5	RH	ER	13	0.945 [24.0]	0.630 [16.0]	600	S51	SM	EB	10

SMD Magnetics Conversion Tables

INDUCTANCE CODES

nH	µH	SAP
1		1N0
1.2		1N2
1.5		1N5
1.8		1N8
2.2		2N2
2.7		2N7
3.3		3N3
3.9		3N9
4.7		4N7
5.6		5N6
6.8		6N8
8.2		8N2
10	0.01	10N
12	0.012	12N
15	0.015	15N
18	0.018	18N
22	0.022	22N
27	0.027	27N
33	0.033	33N
39	0.039	39N
47	0.047	47N
56	0.056	56N
68	0.068	68N
82	0.082	82N
100	0.1	R10
120	0.12	R12
150	0.15	R15
180	0.18	R18
220	0.22	R22
270	0.27	R27
330	0.33	R33
390	0.39	R39
470	0.47	R47
560	0.56	R56
680	0.68	R68

nH	µH	SAP
820	0.82	R82
	1	1R0
	1.2	1R2
	1.5	1R5
	1.8	1R8
	2.2	2R2
	2.7	2R7
	3.3	3R3
	3.9	3R9
	4.7	4R7
	5.6	5R6
	6.8	6R8
	8.2	8R2
	10	100
	12	120
	15	150
	18	180
	22	220
	27	270
	33	330
	39	390
	47	470
	56	560
	68	680
	82	820
	100	101
	120	121
	150	151
	180	181
	220	221
	270	271
	330	331
	390	391
	470	471

nH	µH	SAP
	560	561
	680	681
	820	821
	1000	102
	1200	122
	1500	152
	1800	182
	2200	222
	2700	272
	3300	332
	3900	392
	4700	472
	5600	562
	6800	682
	8200	822
	10 000	103
	12 000	123
	15 000	153
	18 000	183
	22 000	223
	27 000	273
	33 000	333
	39 000	393
	47 000	473
	56 000	563
	68 000	683
	82 000	823
	100 000	104
	120 000	124
	150 000	154
	180 000	184
	220 000	224
	270 000	274
	330 000	334

TOLERANCE CODES

B = ± 0.15 nH
C = ± 0.2 nH
S = ± 0.3 nH
D = ± 0.5 nH
F = ± 1 %
G = ± 2 %
H = ± 3 %
J = ± 5 %
K = ± 10 %
L = ± 15 %
M = ± 20 %
V = ± 25 %
N = ± 30 %

PACKAGE CODES

See Packaging Methods for conversion.

Models Listed in Linear Tech Publication

MAGNETICS PRODUCTS	DESCRIPTION	IC TYPE	CIRCUIT DESCRIPTION
IHSM-4825	High Current, Molded, Inductor	LT1507	Representative Surface Mount Units
IHSM-4825 10 µH	High Current, Molded, Inductor	LT1375/LT1376	1.5 A, 500 kHz Step-Down Switching Regulator
IHSM-4825 10 µH	High Current, Molded, Inductor	LT1507	500 kHz Monlithic Buck Mode Switching Regulator
IHSM-4825 2.7 µH	High Current, Molded, Inductor	LT1374	4.5 A, 500 kHz Step-Down Switching Regulator
IHSM-4825 2.7 µH	High Current, Molded, Inductor	LT1506	4.5 A, 500 kHz Step-Down Switching Regulator
IHSM-4825 22 µH	High Current, Molded, Inductor	LT1375/LT1376	1.5 A, 500 kHz Step-Down Switching Regulator
IHSM-4825 4.7 µH	High Current, Molded, Inductor	LT1374	4.5 A, 500 kHz Step-Down Switching Regulator
IHSM-4825 4.7 µH	High Current, Molded, Inductor	LT1506	4.5 A, 500 kHz Step-Down Switching Regulator
IHSM-5832	High Current, Molded, Inductor	LT1507	Auxiliary 5 V/3 A, 3.3 V/3.5 A, 12 V/0.2 A Regulator
IHSM-5832 10 µH	High Current, Molded, Inductor	LT1374	4.5 A, 500 kHz Step-Down Switching Regulator
IHSM-5832 10 µH	High Current, Molded, Inductor	LT1375/LT1376	1.5 A, 500 kHz Step-Down Switching Regulator
IHSM-5832 10 µH	High Current, Molded, Inductor	LT1506	4.5 A, 500 kHz Step-Down Switching Regulator
IHSM-5832 10 µH	High Current, Molded, Inductor	LT1507	500 kHz Monlithic Buck Mode Switching Regulator
IHSM-5832 15 µH	High Current, Molded, Inductor	LT1374	4.5 A, 500 kHz Step-Down Switching Regulator
IHSM-5832 15 µH	High Current, Molded, Inductor	LT1506	4.5 A, 500 kHz Step-Down Switching Regulator
IHSM-5832 22 µH	High Current, Molded, Inductor	LT1375/LT1376	1.5 A, 500 kHz Step-Down Switching Regulator
IHSM-7832 22 µH	High Current, Molded, Inductor	LT1374	4.5 A, 500 kHz Step-Down Switching Regulator
IHSM-7832 22 µH	High Current, Molded, Inductor	LT1375/LT1376	1.5 A, 500 kHz Step-Down Switching Regulator
IHSM-7832 22 µH	High Current, Molded, Inductor	LT1506	4.5 A, 500 kHz Step-Down Switching Regulator
ILB-1206 19 Ohm 25 %	Chip Bead	LTC1550-4.1	Low Noise, Regulated, Switched-Capacitor Voltage Inverter
ILB-1206 31 Ohm 25 %	Chip Bead	LTC1174CS8	Low Noise, High Efficiency Step-Down Regulator for Personal Communications Devices
ILS-3825-01	Multilayer Power Inductor	LT1106	Micropower Step-Up DC/DC Converter of PCMCIA Card Flash Memory, 12 V, 60 mA Flash Memory Programming Supply
ILS-3825-01	Multilayer Power Inductor	LT1106	Flash Memory VPP Generator
LPE-3325-A142	SMD Current Sense Transformer	LT1431CS8	35 W Isolated DC/DC Converter
LPE-3325-A190	SMD Transformer	LT1307	High Voltage Flyback Converter
LPE-3325-A205	SMD Transformer	LTC1304 LTC-1304-3.3 LT1304-5	Electroluminescent Panel Driver with 200 Hz Oscillator
LPE-4841-100MB	SMD Inductor/Transformer	LT1372/LT1377	Dual Output Flyback Converter with Overvoltage Protection
LPE-4841-100MB	SMD Inductor/Transformer	LT1373	Dual Output Flyback Converter with Overvoltage Protection
LPE-4841-330MB	SMD Inductor/Transformer	LT1425	Isolated Flyback Switching Regulator 5 V to Isolated - 9 Vout
LPE-4841-A307	SMD Transformer	LT1424-5	Isolated Flyback Switching Regulator with 5 V Output
LPE-4841-A307	SMD Transformer	LT1425	- 9 V Isolate LAN Supply
LPE-4841-A307	SMD Transformer	LT1425	1.5 V to - 9 V/250 mA Isolated LAN Supply
LPE-4841-A307	SMD Transformer	LTC1435	Dual Output 5 V and Synchronous 12 V Application
LPE-4841-A313	SMD Transformer	LT1316	Nonisolated - 48 V to 5 V Flyback Converter
LPE-4841-A313	SMD Transformer	LT1316	50 V to 6 V Isolated Flyback Converter
LPE-4841-A313	SMD Transformer	LT1316	- 48 V to 5 V Flyback Converter

MAGNETICS PRODUCTS	DESCRIPTION	IC TYPE	CIRCUIT DESCRIPTION
LPE-5047-100MB	SMD Inductor/Transformer	LT1370	Dual Output Flyback Converter with Overvoltage Protection
LPE-5047-100MB	SMD Inductor/Transformer	LT1371	Dual Output Flyback Converter with Overvoltage Protection
LPE-5047-100MB	SMD Inductor/Transformer	LT1371	Compact Dual Output, 500 kHz 5 V to ± 15 V Flyback Converter
LPE-5047-A045 SAME AS: LPE-5047-100MB	SMD Transformer	LT1300	LCD Contrast Supply
LPE-5047-A045 SAME AS: LPE-5047-100MB	SMD Transformer	LT1301	LCD Contrast Supply
LPE-5047-A045 SAME AS: LPE-5047-100MB	SMD Transformer	LT1301	Micropower LCD Contrast Supply Use only 10 µA in a Shutdown
LPE-5047-A132	SMD Transformer	LT1303	EL Panel Driver
LPE-5047-A132	SMD Transformer	LT1303	High-Efficiency EL Driver Circuit
LPE-5047-A132	SMD Transformer	LT1305	EL Panel Driver
LPE-5047-A132	SMD Transformer	LT1305	EL Panel Driver for Large Display Area
LPE-5047-A132	SMD Transformer	LT1305	Circuit for Driving Electroluminescent Panels in Portable Devices
LPE-5047-A132	SMD Transformer	LT1303	EL Panel Driver
LPE-6562-220MB	SMD Inductor/Transformer	LTC1149-5	Ultra Wide Input Range (5.5 V to 25 V) High Efficiency 5 V Regulator
LPE-6562-220MB	SMD Inductor/Transformer	LTC1149-5	Ultra Wide Input Range (5.5 V to 25 V) High Efficiency 5 V Regulator
LPE-6562-A026	SMD Transformer	1/2LTC1142HV (5 V REG)	Deriving 14 V Power from an Auxiliary Winding on the LTC1142HV 5 V Regulator
LPE-6562-A026	SMD Transformer	LTC1142	Triple Output Regulator with Switched 12 V Output
LPE-6562-A026	SMD Transformer	LTC1142	Auxiliary Winding Power Supply Deriving 14 V Power from a 5 V Auxiliary Winding
LPE-6562-A026	SMD Transformer	LTC1142	Auxiliary Winding Power Supply Deriving 14 V Power from a 3.3 V Auxiliary Winding
LPE-6562-A026	SMD Transformer	LTC1142	Triple Output Buck Converter (6.5 V - 14 V to 3.3 V/2 A, 5 V/2 A, 12 V/0.15 A)
LPE-6562-A026	SMD Transformer	LTC1142	Triple Output High Efficiency Power Supply
LPE-6562-A026	SMD Transformer	LTC1142, LT1121	High-Efficiency Power Supply
LPE-6562-A026	SMD Transformer	LTC1142HV	Dual Slot PCMCIA Driver/Regulator Powered from Auxililary Winding on the LTC1142HV 5 V Regulator
LPE-6562-A026	SMDTransformer	LTC1142HV	Deriving 14 V Power from an Auxiliary Winding on the LTC1142HV 5 V Regulator
LPE-6562-A026	SMD Transformer	LTC1142HV	Auxiliary Winding Power Supply
LPE-6562-A026	SMD Transformer	LTC1142HV	PCMCIA VPP Supply Generated from Switching Regulator Auxiliary Winding
LPE-6562-A026	SMD Transformer	LTC1142HV	High Voltage Triple Output Buck Converter (6.5 V - 18 V to 3.3 V/2 A, 5 V/2 A, 12 V/0.15 A)
LPE-6562-A026	SMD Transformer	LTC1148	Deriving Auxiliary 14 V Power from an LTC1148 5 V Regulator
LPE-6562-A026	SMD Transformer	LTC1148-3.3	Auxiliary Winding Power Supply Deriving 14 V Power from a 3.3 V Auxiliary Winding
LPE-6562-A026	SMD Transformer	LTC1148-5	Auxiliary Winding Power Supply Deriving 14 V Power from a 5 V Auxiliary Winding

Linear Tech Cross Reference

Vishay Dale — Models Listed in Linear Tech Publication

MAGNETICS PRODUCTS	DESCRIPTION	IC TYPE	CIRCUIT DESCRIPTION
LPE-6562-A026	SMD Transformer	LTC1471 & LT1313	Dual Socket Design for Applications Requiring Two PC Card Sockets
LPE-6562-A069	SMD Inductor	LT1302	3 Cell to 3.3 V Buck-Boost Converter with Auxiliary 12 V Regulated Output
LPE-6562-A086	SMD Transformer	LTC1142HV	Deriving 14 V Auxiliary 14 V Power from an LTC1142HV 3.3 V Regulator
LPE-6562-A092	SMD Transformer	LTC1434	2.5 V/5 A Adjustable Output with 5 V Auxiliary Output
LPE-6562-A092	SMD Transformer	LTC1435	Dual Output 5 V and 12 V Application
LPE-6562-A092	SMD Transformer	LTC1435A	Dual Output 5 V and 12 V Application
LPE-6562-A092	SMD Transformer	LTC1436	2.9 V/5 A Adjustable with 5 V Auxiliary Output
LPE-6562-A092	SMD Transformer	LTC1436	3.3 V/4 A fixed Output with 5 V Auxiliary Output
LPE-6562-A092	SMD Transformer	LTC1436	5 V/3 A Fixed Output with 12 V Auxiliary Output
LPE-6562-A092	SMD Transformer	LTC1436A-PLL	5 V/3 A Fixed Output with 12 V Auxiliary Output an Uncommitted Comparator
LPE-6562-A092	SMD Transformer	LTC1436-PLL	2.5 V/5 A Adjustable Output with Foldback Current limiting and 5 V Auxiliary Output
LPE-6562-A092	SMD Transformer	LTC1436-PLL	Fixed Output with 12 V/200 mA Auxiliary Output and Uncommitted comparator
LPE-6562-A092	SMD Transformer	LTC1437A	5 V/3 A Fixed Output with 12 V Auxiliary Output
LPE-6562-A092	SMD Transformer	LTC1439	3.3 V and 5 V Dual Output Step-Down Switching Regulator with 12 V Regulated Auxiliary
LPE-6562-A214	SMD Transformer	LTC1439	4-Output High Efficiency Low Noise 5 V/3 A, 3.3 V/3 A, 2.9 V/2.6 A, 12 V/200 mA Notebook Computer Power Supply
LPE-6562-A214	SMD Transformer	LTC1538	High Efficiency 5 V/20 mA Standby, 3.3 V/2.5 V Regulator with Low Noise 12 V Linear Regulator
LPE-6562-A214	SMD Transformer	LTC1539	High Efficiency 5 V/20 mA Standby, 3.3 V/2.5 A Regulator with Low Noise 12 V Linear Regulator
LPE-6562-A236	SMD Transformer	LTC1435	Dual Output 5 V and Synchronous 12 V Application
LPE-6562-A236	SMD Transformer	LTC1435A	Dual Output 5 V and Synchronous 12 V Application
LPE-6562-A236	SMD Transformer	LTC1438	Representative Surface Mount Units
LPE-6562-A236	SMD Transformer	LTC1539	5-Output High Efficiency Low Noise 5 V/3 A, 3.3 V/3 A, 2.9 V/2.6 A, 12 V/200 mA, 5 V/20 mA Notebook Computer Power Supply
LPE-6562-A262	SMD Transformer	LT1539	High Efficiency Low Noise 5 V/20 mA Standby, 5 V/3 A, 3.3 V/3.5 A and 12 V/200 mA Regulator
LPE-6562-A262	SMD Transformer	LTC1438	High Efficiency Low Noise 5 V/3 A, 3.3 V/3.5 A and 12 V/200 mA Regulator
LPE-6562-A262	SMD Transformer	LTC1539	High Efficiency Low Noise 5 V/20 mA Standby, 5 V/3 A, 3.3 V/3.5 A and 12 V/200 mA Regulator
LPE-6562-A262	SMD Transformer	LT1538	High Efficiency Low Noise 5 V/20 mA Standby, 5 V/3 A, 3.3 V/3.5 A and 12 V/200 mA Regulator
LPE-6562-A262	SMD Transformer	LTC1538-AUX	5 V/3 A, 3.3 V/3.5 A, 12 V/0.2 A Regulator
LPT-4545-100LA	SMD Toroidal Inductor	LT1302	Micropower High Output Current Step-Up Adjustable and Fixed 5 V DC/DC Converters
LPT-4545-101LA	SMD Toroidal Inductor	LTC1433	9 V to 12 V, - 12 V Outputs
LPT-4545-101LA	SMD Toroidal Inductor	LTC1433 LTC1434	9 V to 12 V, - 12 V Outputs
LPT-4545-200LA	SMD Toroidal Inductor	LT1302	Micropower High Output Current Step-Up Adjustable and Fixed 5 V DC/DC Converters

MAGNETICS PRODUCTS	DESCRIPTION	IC TYPE	CIRCUIT DESCRIPTION
LPT-4545-200LA	SMD Toroidal Inductor	LTC1433	5 V to ± 5 V Outputs
LPT-4545-200LA	SMD Toroidal Inductor	LTC1433 LTC1434	5 V to ± 5 V Outputs
LPT-4545-330LA	SMD Toroidal Inductor	LTC1265	5 V Buck-Boost Converter
LPT-4545-330LA	SMD Toroidal Inductor	LTC1265	Logic Selectable 0 V/3.3 V/5 V 700 mA Regulator
LPT-4545-330LA	SMD Toroidal Inductor	LTC1626	Single Li-Ion to 3.3 V Buck-Boost Converter
LPT-4545-330LA	SMD Toroidal Inductor	LTC1626	Single Li-Ion to 3.3 V Buck-Boost Converter
LPT-4545-500LA	SMD Toroidal Inductor	LTC1265	9 V to 12 V and - 12 V Outputs
LPT-4545-500LA	SMD Toroidal Inductor	LTC1265-5	Positive-to-Negative (- 5 V) Converter
LPT-4545-500LA	SMD Toroidal Inductor	LTC1265-5	Positive (+ 3.5 to 7.5 V) to Negative (- 5 V) Converter
LPT-4545-A001	SMD Toroidal Inductor	LTC1266-3.3	Low Dropout, 3.3 V/3 A High Efficiency Regulator
LPT-4545-A002	SMD Toroidal Inductor	LTC1266	5 V to 12 V/500 mA High Efficiency Boost Regulator
TC-10-04	Leaded Converter Transformer	LT1013	5 V Powered EEPROM Pulse Generator
TE-3Q3TA	Leaded Toriodal Inductor	LT1013	Low Power 9 V to 5 V Converter
TJ4-100-1 µH	Leaded Toriodal Inductor	LTC1159	High Efficiency 12 V to -12 V 1 A Converter
TJ4-100-1 µH	Leaded Toriodal Inductor	LTC1159	High Efficiency 12 V to - 12 V Converter

ONLINE INFORMATION

For product information and a current list of sales offices,
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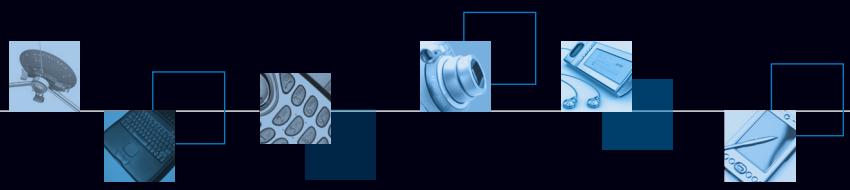

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