VISHAY INTERTECHNOLOGY, INC.

PASSIVE COMPONENTS

WIRE BONDABLE PASSIVE COMPONENTS PRODUCT FAMILY

Vishay Electro-Films

PRODUCT OVERVIEW

www.vishay.com

INTRODUCTION

Vishay Electro-Films (EFI) offers a full range of wire bondable passive components that includes thin film resistors, MOS and MNOS capacitors, and thin film spiral inductors. All members of this product family share Vishay EFI's high standards for performance and quality.

In addition to the standard products listed here, Vishay EFI offers custom designs with unique values, sizes and configurations. Custom products also offer the option of a wide range of substrate materials and film compositions that provide maximum flexibility for high-end applications.

A detailed description of layout guidelines for custom parts can be found at:

http://www.vishay.com/docs/49271/hdi.pdf

http://www.vishay.com/substrates/list/product-61053/

Typical Applications

- High-reliability military, space, and medical components
- Hybrid applications where epoxy die attach and wire bonding are the assembly technique
- Lumped element filters
- Impedance tuning networks
- Analog designs requiring high precision and/or high levels of customization
- Applications requiring miniature form factors

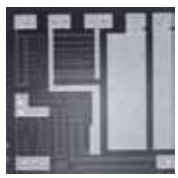
Datasheets available at: www.vishay.com

CUSTOM THIN FILM RESISTOR / CAPACITOR / INDUCTOR NETWORKS

In many state-of-the-art designs miniaturization has become a critical factor. Embedding passive component networks in a common substrate achieves high levels of miniaturization without compromising performance. Custom embedded RLC networks free designers from constraints in value selection and layout guidelines.
Vishay EFI has the capability to insure excellent performance by implementing 100 % testing at frequencies ranging from DC to microwave.

Features

- Alumina, AIN, silicon, or quartz substrates available
- Laser trim capabilities for tight tolerance
- Product testing available from DC to RF



THIN FILM WIRE BONDABLE RESISTORS

Vishay EFI offers standard thin film wire bondable resistors to fit a variety of hybrid circuit applications. Standard products are fabricated on an oxidized silicon substrate using tantalum nitride as the resistor element and with aluminum contact pads. However, these resistors may be customized for other applications by using different materials. The resistors are also available on quartz, alumina, and AlN substrates; the resistor film can be nickel chromium; gold contact pads are also available, and gold backing can be provided. Please consult the Vishay website for Vishay EFI's complete resistor product offering.

Features

- Small size
- Tight value tolerance
- Low TCR (Temperature Coefficient of Resistance)
- Excellent life value stability
- High reliability
- Good power handling capabilities (to 1 W)
- Wide range of values and topologies

Family	Size (mils)	Value Range (Ω)	Best TCR (ppm/°C)	Best Tolerance (%)	Features
SFM 	20 x 20	1 to 1 M	± 25	± 0.1	Small size power handling 250 mW
BCR 	20 x 20	10 to 1 M	± 25	± 0.1	Only one bond required
SFX 	40 x 40	510 K to 20 M	± 50	± 0.1	High value resistor in small size
CTR 	30 x 30	1 to 1 M	± 25	± 0.1	Voltage divider with tight resistor ratio (R1 = R2)
STR 	30 x 30	1 to 1 M	± 25	± 0.1	Voltage divider with tight resistor ratio (R1 < R2)
MTR / MTT 	30 x 30/ 38 x 38	100 to 240 K/ 1.1 K to 275 K	± 100	± 5/ ± 2	Selectable values by wire bonding
CLA / CLB 	60 x 90	20 to 1 M	± 25	± 0.1	8 resistor array available either isolated or bussed

MOS AND MNOS WIRE BONDABLE CAPACITORS

Vishay EFI capacitors are based on Silicon Oxide and Silicon Oxide / Nitride combinations. The high-quality dielectric film deposited by our state-of-the-art equipment is the key factor for the high performance that characterizes these capacitors.

A wide range of values and sizes helps simplify the integration of these products into new and existing applications.

Features

- Sizes range from 20 by 20 mils to 60 by 60 mils
- Tight value tolerance
- Low TCC (Temperature Coefficient of Capacitance): (+ 45 ± 25 ppm/°C MNOS, + 15 ± 25 ppm°/C MOS)
- Excellent life value stability
- Wide range of values (0.5 pF to 1000 pF)

Family	Size (mils)	Value Range (pF)	Best Tolerance (%)	Features
NCAA 	20 x 20	0.5 to 51	5	Single capacitor
NCBB 	30 x 30	33 to 100	2.5	Single capacitor
NCCC 	40 x 40	56 to 220	2.5	Single capacitor
NCDD 	55 x 55	150 to 510	2.5	Single capacitor
NCEE 	60 x 60	360 to 1000	2.5	Single capacitor
CBA 	19 x 30	3.75 & 15	10	4 capacitors in binary increments
CBB 	19 x 48	31	10	5 capacitors in binary increments
CBC 	44 x 44	93	10	5 capacitors in binary increments

THIN FILM SPIRAL INDUCTORS

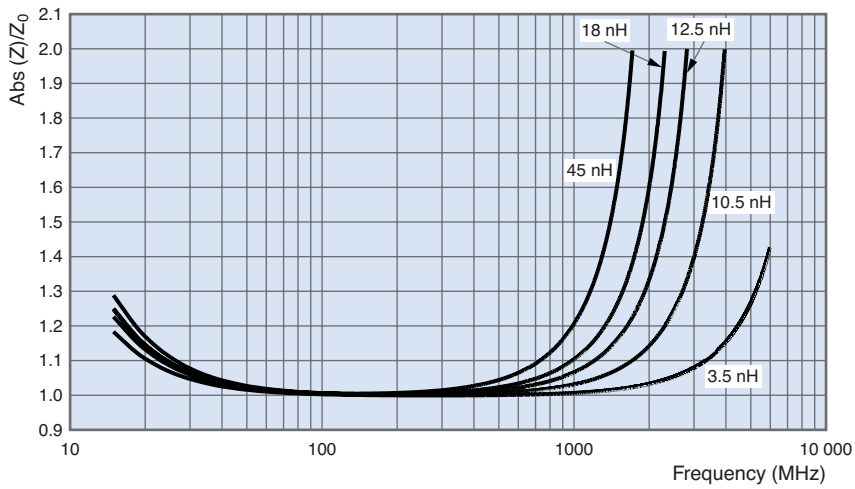
Vishay EFI offers a family of thin film spiral inductors for wire bondable applications. An equivalent circuit model is provided to allow designers to improve the design accuracy and shorten development time by utilizing computer simulation tools.

Features

- RF modeled to facilitate computer simulation
- Small size
- Low DCR, high Q (DCR as low as 0.25 Ω, Q of 14 @ 1 GHz)
- High SRF (10 GHz)
- Excellent life value stability
- High reliability
- Good power handling capabilities
- Wide range of values

Family	Size (mils)	Value Range (nH)	Best Tolerance (%)
PSC	45 x 45	3 to 50	10
RFLW	30 x 30/ 50 x 50	3 to 30/ 20 to 150	10

PSC COMPONENT PERFORMANCE



Relative Impedance vs. Frequency

SEMICONDUCTORS:
Rectifiers • High-Power Diodes and Thyristors • Small-Signal Diodes • Zener and Suppressor Diodes • FETs • Optoelectronics • ICs • Modules

PASSIVE COMPONENTS:
Resistive Products • Magnetics • Capacitors

One of the World's Largest Manufacturers of
Discrete Semiconductors and Passive Components

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