



Option Information

Optocoupler lead-bend configurations are available as options. In addition, partial discharge testing as per VDE/IEC is also available as an option.

See the order information section in the data sheet to determine if and which options are available to a specific product. Contact the Vishay sales office for other option configurations. The options are:

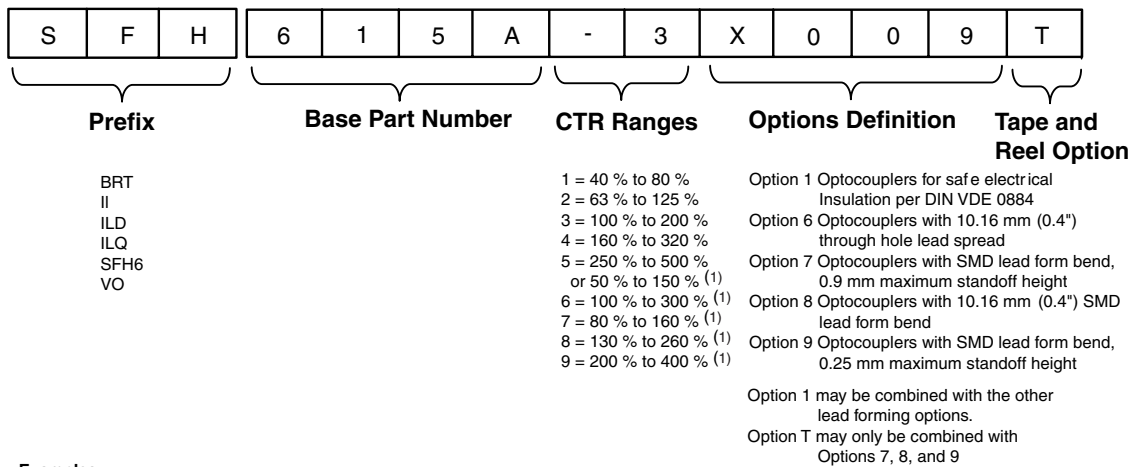
- Option 1 VDE option
- Option 6 400 mil (10.16 mm) lead spread DIP configuration
- Option 7 Surface mount, gull wing DIP configuration with standoff

Option 8 Surface mount, gull wing DIP configuration with increased clearance

Option 9 Surface mount, gull wing DIP configuration

ORDERING OPTIONS

A specific option or combination of options can be ordered by add the options definition field following the base part number and CTR range (if applicable) as presented in the following example:



Examples:
 CNY17F-2X017T
 4N35-X016
 SFH615-3X001
 VO615A-9X007T

Note
⁽¹⁾ Used on selected products, consult data sheet for details

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This field is always 4 characters long and commences with the character X. In the case of surface mounted products in Tape and Reel format, the tape and reel option character "T" will follow this field. The possible combinations for these Fields ⁽¹⁾ are:

X001, X006, X007, X008, X009, X001T², X007T, X008T, X009T, X016, X017, X018, X019, X017T, X018T, X019T

Notes

- ⁽¹⁾ Not all options are available for all product types.
- ⁽²⁾ The X001T option is only available on products that are available on the following SMD products SFH6106, SFH6156, SFH6186, SFH6206 and SFH6286 series, e.g. SFH6106-3X001T .

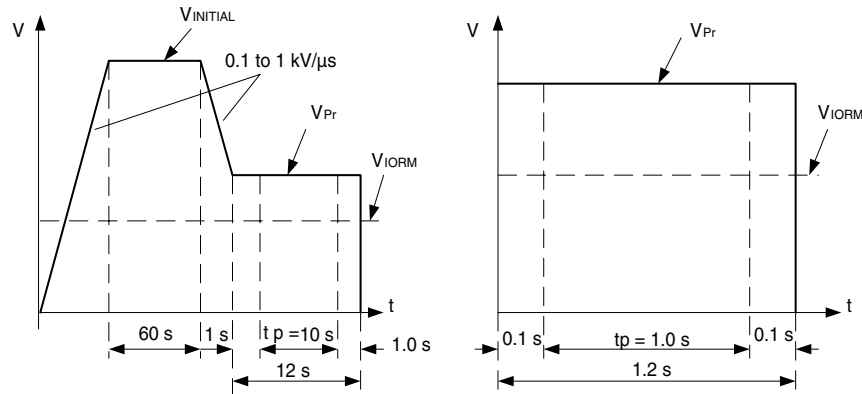
OPTION 1 OPTOCOUPLED FOR SAFE ELECTRICAL INSULATION PER DIN EN 60747-5-2 (VDE 0884)/DIN EN 60747-5-5 PENDING ⁽¹⁾

The optocoupler listed are suitable for safe electrical insulation only within the safety maximum ratings. Compliance with the safety maximum ratings must be ensured by protective circuits.

The partial discharge measurement ensures that no partial discharge occurs during operation at maximum permissible operating insulation voltage (V_{IORM}). Permanent partial discharge affects the insulating materials and can result in a high voltage breakdown.

It is recommended that tests with the insulation test voltage (V_{ISOL}) should not be made, otherwise partial discharge may occur impairing the insulation characteristics. Thus partial discharges also may occur at the maximum permissible operating insulation voltage.

The insulation test per DIN EN 60747-5-2 (VDE 0884)/DIN EN 60747-5-5 pending is carried out after all the other tests



tp: measuring time for partial discharge

tp: measuring time for partial discharge

Procedure a.
Type and sampling tests, destructive tests

Procedure b.
Routine tests, non-destructive tests

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Fig. 3 - Time Voltage Diagram per DIN EN 60747-5-2 (VDE 0884)/DIN EN 60747-5-5 pending ⁽¹⁾

Note

⁽¹⁾ DIN EN 60747-5-2 (VDE 0884)/ DIN EN 60747-5-5 pending. Edition January 2003

DESCRIPTION	SYMBOL	SYSTEM 1			UNIT
		DIP4	DIP8	DIP16	
		SFH610A-..	ILCT6	ILQ1/2/5/74	
		SFH615A-..	ILD1/2/5/74	ILQ30/31/55	
		SFH615AA-..	ILD30/31/55	ILQ32	
		SFH615AGB-..	ILD32	ILQ66-..	
		SFH615AGR-..	ILD66-..	ILQ615-..	
		SFH617A-..	ILD250/1/2	ILQ620-..	
		SFH618A-..	ILD255	ILQ620GB-..	
		SFH620A-..	ILD621GB-..	ILQ621-..	
		SFH620AA-..	ILD621-..	ILQ621GB-..	
		SFH620AGB-..	ILD621GB-..		
		SFH628A-..	ILD755-..		
		SFH6106-..	ILD766-..		
		SFH6116-..	MCT6		
		SFH6156-..			
		SFH6186-..			
		SFH6206-..			
		SFH6286-..			
Installation category (DIN VDE 0110)					
For rated line voltages ≤ 300 V _{RMS}			I - IV		
For rated line voltages ≤ 600 V _{RMS}			I - IV		
For rated line voltages ≤ 1000 V _{RMS}					
IEC climatic category (DIN IEC 60068 Part 1/9.80)			55/100/21		
Pollution degree (DIN VDE 0110 Part 1/1.89)			2		
Maximum operation insulating voltage ⁽¹⁾	V _{IORM}		890		V
Test voltage input/output, procedure b ⁽¹⁾ V _{Pr} = 1.875 x V _{IORM} , routine 100 % test, t _p = 1 s, partial discharge < 5 pC	V _{Pr}		1669		V



DESCRIPTION	SYMBOL	SYSTEM 1		UNIT
Test voltage input/output, procedure a ⁽¹⁾ $V_{Pr} = 1.5 \times V_{IORM}$, type and sampling test $t_p = 60$ s, partial discharge < 5 pC	V_{Pr}	1335		V
Maximum permissible overvoltage (transient overvoltage)	V_{IOTM}	8000		V
Partial discharge test voltage ⁽¹⁾	$V_{INITIAL}$	8000		V
Safety maximum ratings (maximum permissible ratings in case of a fault, also refer to dDiagram) Package temperature Current (input current I_F , $P_{Si} = 0$, $T_A = 25$ °C) Derating with higher ambient temperature Power (output or total power dissipation, $T_A = 25$ °C) Derating with higher ambient temperature	T_{Si} I_{Si} DI_{Si} P_{Si} ΔP_{Si}	175 275 - 1.83 400 - 2.67		°C mA mA/K mW mW/K
Insulation resistance at T_{Si} $V_{I/O} = 500$ V	R_{IS}	> 10^9		W

DESCRIPTION	SYMBOL	SYSTEM 2			UNIT
		4N25/26/27/28	IL250	MCT5210	
		4N35/36/37/38/39	IL251	MCT5211	
		4N32/33	IL252	SFH600-..	
		CNY17-..	IL255-..	SFH601-..	
		CNY17F-..	IL400	SFH608-..	
		H11A-..	IL755-..	SFH640-..	
		H11AA1-..	IL755B-..	MOC8050	
		H11B-..	IL766-..	IL56B-..	
		H11B1-..	IL766B-..	MOC8021	
		H11C-..	MCA230/231	MOC8112	
		H11D-..	MCA255	MOC8102/03/04/05	
		IL1/2/5/74	MCT2/2E		
		IL2B-..	MCT270/271		
		IL30/31/55	MCT272		
		IL55B-..	MCT273/274		
		IL66-..	MCT275		
		IL66B-..	MCT276/277		
		IL201/202/203			
Installation category (DIN VDE 0110)					
For rated line voltages ≤ 300 V_{RMS}		I - IV			
For rated line voltages ≤ 600 V_{RMS}		I - IV			
For rated line voltages ≤ 1000 V_{RMS}					
IEC climatic category (DIN IEC 60068 Part 1/9.80)		55/100/21			
Pollution degree (DIN VDE 0110 Part 1/1.89)		2			
Maximum operation insulating voltage ⁽¹⁾	V_{IORM}	890		V	
Test voltage input/output, procedure b ⁽¹⁾ $V_{Pr} = 1.875 \times V_{IORM}$, routine 100 % test, $t_p = 1$ s, partial discharge < 5 pC	V_{Pr}	1669		V	
Test voltage input/output, procedure a ⁽¹⁾ $V_{Pr} = 1.5 \times V_{IORM}$, type and sampling test $t_p = 60$ s, partial discharge < 5 pC	V_{Pr}	1335		V	



DESCRIPTION	SYMBOL	SYSTEM 2	UNIT
Maximum permissible overvoltage (transient overvoltage)	V_{IOTM}	8000	V
Partial discharge test voltage ⁽¹⁾	$V_{INITIAL}$	8000	V
Safety maximum ratings (maximum permissible ratings in case of a fault, also refer to diagram)			
Package temperature	T_{Si}	175	°C
Current (input current I_F , $P_{Si} = 0$, $T_A = 25$ °C)	I_{Si}	400	mA
Derating with higher ambient temperature	DI_{Si}	- 2.67	mA/K
Power (output or total power dissipation, $T_A = 25$ °C)	P_{Si}	700	mW
Derating with higher ambient temperature	ΔP_{Si}	- 4.67	mW/K
Insulation resistance at T_{Si} $V_{I/O} = 500$ V	R_{IS}	$> 10^9$	W

DESCRIPTION	SYMBOL	SYSTEM 4 ⁽²⁾	SYSTEM 5	SYSTEM 7	UNIT
		IL410	6N135	IL300	
		IL420	6N136	IL300E	
		IL4116	SFH6135	IL300F	
		IL4117	SFH6136	IL300EF	
		IL4118	6N138	IL300DEFG	
		IL4216	SFH6138		
		IL4217	SFH6139		
		IL4218	6N139		
			SFH6345		
Installation category (DIN VDE 0110)					
For rated line voltages ≤ 300 V_{RMS}		I - IV	I - IV	I - IV	
For rated line voltages ≤ 600 V_{RMS}		I - III	I - IV	I - IV	
For rated line voltages ≤ 1000 V_{RMS}					
IEC climatic category (DIN IEC 60068 Part 1/9.80)		55/100/21	55/100/21	55/100/21	
Pollution degree (DIN VDE 0110 Part 1/1.89)		2	2	2	
Maximum operation insulating voltage ⁽¹⁾	V_{IORM}	850	630	890	V
Test voltage input/output, procedure b ⁽¹⁾ $V_{Pr} = 1.875 \times V_{IORM}$, routine 100 % test, $t_p = 1$ s, partial discharge < 5 pC	V_{Pr}	1594	1181	1669	V
Test voltage input/output, procedure a ⁽¹⁾ $V_{Pr} = 1.5 \times V_{IORM}$, type and sampling Test $t_p = 60$ s, partial discharge < 5 pC	V_{Pr}	1275	945	1335	V
Maximum permissible overvoltage (transient overvoltage)	V_{IOTM}	6000	8000	8000	V
Partial discharge test voltage ⁽¹⁾	$V_{INITIAL}$	6000	8000	8000	V
Safety maximum ratings (maximum permissible ratings in case of a fault, also refer to diagram)					
Package temperature	T_{Si}	175	175	165	°C
Current (input current I_F , $P_{Si} = 0$, $T_A = 25$ °C)	I_{Si}	250	300	235	mA
Derating with higher ambient temperature	DI_{Si}	- 1.65	- 2	- 1.57	mA/K
Power (output or total power dissipation, $T_A = 25$ °C)	P_{Si}	500	500	465	mW
Derating with higher ambient temperature	ΔP_{Si}	- 3.33	- 3.33	- 3.1	mW/K
Insulation resistance at T_{Si} $V_{I/O} = 500$ V	R_{IS}	$> 10^9$	$> 10^9$	$> 10^9$	W

Notes

All voltages referred to are peak values except otherwise specified.

(1) See time-test voltage diagram

(2) In preparation

Testing input/output voltage requires all input pins and all output pins to be shorted

Option 1: Tested per DIN EN 60747-5-2 (VDE 0884)/DIN EN 60747-5-5 pending

Option 6: Wide lead spacing (10.16 mm creepage/clearance distances > 8 mm)

Option 7: Surface mount leads (creepage/clearance distances > 8 mm)

Option 8: Surface mount leads

Option 9: Surface mount leads

See CECC 00802, edition 1, for soldering conditions for SMT devices (option 7 and 9).

"-." means dash selections

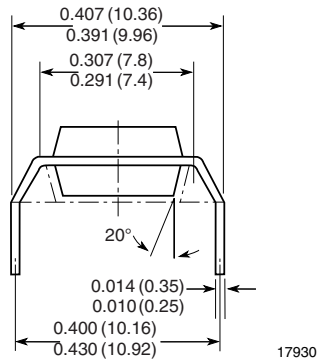
**OPTION 6
DIP OPTOCOUPLED WITH 0.4" (10.16 mm)
LEAD SPREAD**

The leads of the optocouplers are bent according to a spacing of 0.4" (10.16 mm). Dimensions deviating from the standard type are:

- Lead spacing 10.16 mm (0.4")
- Creepage distance > 8.0 mm
- Clearance > 8.0 mm

This version additionally complies with the following standards:

- IEC 60950 DIN VDE 0805/05 90 (System 2 and 3 only)
Reinforced insulation up to an operating voltage of 400 V_{RMS} or DC



Clearance-creepage distance = 8.0 min.
See standard version for pin configuration

**OPTION 7
LEAD BENDS FOR SURFACE MOUNT
OPTOCOUPLEDERS**

These optocouplers are suitable for surface mounting. Dimensions deviating from the standard type are:

- Creepage distance > 8.0 mm
- Clearance distance > 8.0 mm

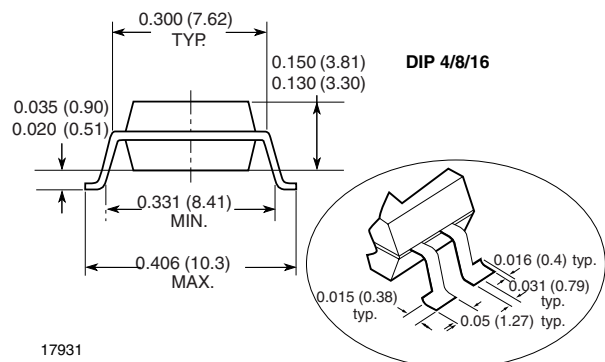
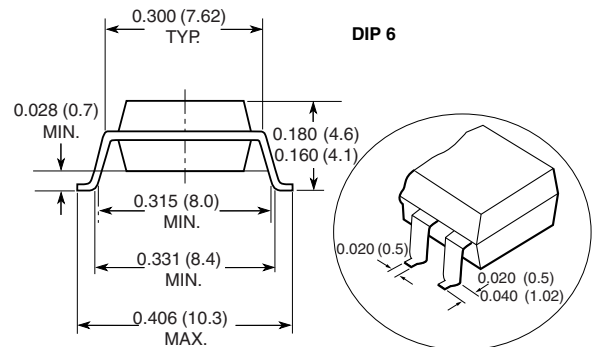
This version additionally complies with the following standards:

- IEC 60950 DIN VDE 0805/05 90 (system 2 and 3 only)
Reinforced insulation up to an operating voltage of 400 V_{RMS} or DC

During the soldering process, the package should not be wetted with tin-lead solder to prevent the impairment of the isolation features. Apart from iron soldering, only reflow soldering methods (vapor phase, infrared and hot gas) are permissible.

Permissible soldering conditions for SMD bending options: please see reflow soldering profile

The soldering process may be repeated two times at the most. Attention must be paid to the cooling down of the device to 25 °C between the soldering processes.



Clearance and creepage distances must be considered for the solder pad design.

Clearance-creepage distance = 8.0 min.
See standard version for pin configuration.



OPTION 8 LEAD BENDS FOR SURFACE MOUNT OPTOCOUPLEDERS

These optocouplers are suitable for surface mounting. Dimensions deviating from the standard type are:
Creepage distance > 8.0 mm
Clearance distance > 8.0 mm

This version additionally complies with the following standards:

- IEC 60950 DIN VDE 0805/05 90 (system 2 and 3 only)
Reinforced insulation up to an operating voltage of 400 V_{RMS} or DC

During the soldering process, the package should not be wetted with tin-lead solder to prevent the impairment of the isolation features. Apart from iron soldering, only reflow soldering methods (vapor phase, infrared and hot gas) are permissible.

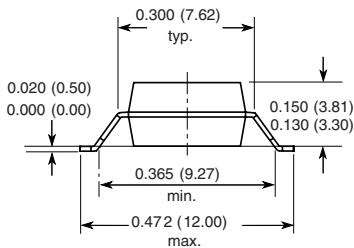
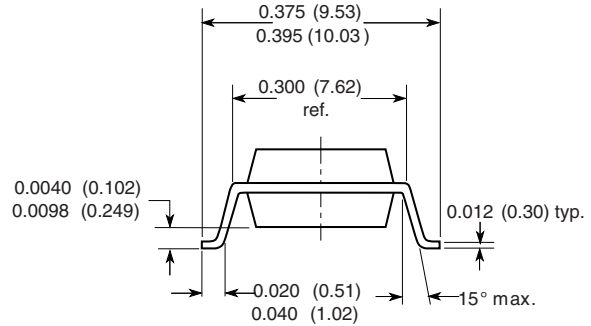
Permissible soldering conditions for SMD bending options: please see reflow soldering profile

The soldering process may be repeated two times at the most. Attention must be paid to the cooling down of the device to 25 °C between the soldering processes

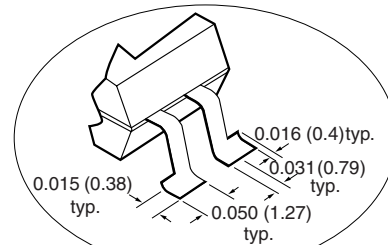
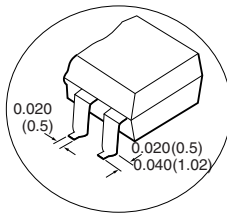
permissible.

Permissible soldering conditions for SMD bending options: please see reflow soldering profile

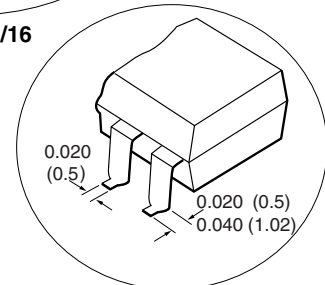
The soldering process may be repeated two times at the most. Attention must be paid to the cooling down of the device to 25 °C between the soldering processes.



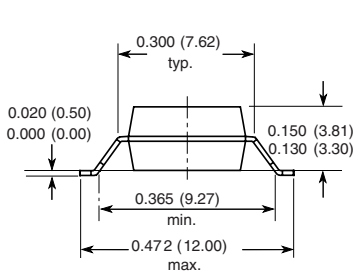
DIP 6



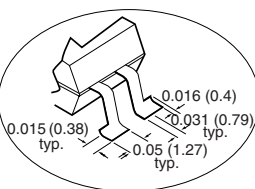
DIP 4/ 8/16



DIP 6



DIP 4



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MARKINGS

The following table defines the option information that is marked on the product.

OPTION TYPE	MARKING
X001, X001T	X001
X006	No mark
X007, X007T	X007
X008, X008T	X008
X009, X009T	No Mark
X016	X001
X017, X017T	X017
X018, X018T	X018
X019, X019T	X001

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Clearance and creepage distances must be considered for the solder pad design.

Clearance-creepage distance = 8.0 min.

See standard version for pin configuration.

OPTION 9 LEAD BENDS FOR SURFACE MOUNT OPTOCOUPLEDERS

During the soldering process, the package should not be wetted with tin-lead solder to prevent the impairment of the isolation features. Apart from iron soldering, only reflow soldering methods (vapor phase, infrared and hot gas) are