THE DATASHEET OF

VO615A-2X006

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

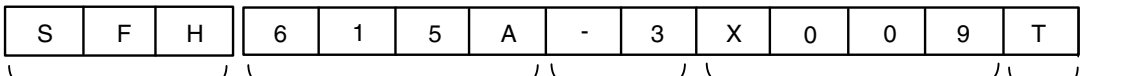
Option 7 Surface mount, gull wing DIP configuration with standoff

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:



BRT
II
ILD
ILQ
SFH6
VO

1 = 40 % to 80 %
2 = 63 % to 125 %
3 = 100 % to 200 %
4 = 160 % to 320 %
5 = 250 % to 500 % or 50 % to 150 % (1)
6 = 100 % to 300 % (1)
7 = 80 % to 160 % (1)
8 = 130 % to 260 % (1)
9 = 200 % to 400 % (1)

Option 1 Optocouplers for safe electrical Insulation per DIN VDE 0884
Option 6 Optocouplers with 10.16 mm (0.4") through hole lead spread
Option 7 Optocouplers with SMD lead form bend, 0.9 mm maximum standoff height
Option 8 Optocouplers with 10.16 mm (0.4") SMD lead form bend
Option 9 Optocouplers with SMD lead form bend, 0.25 mm maximum standoff height

Option 1 may be combined with the other lead forming options.
Option T may only be combined with Options 7, 8, and 9

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, X001T (2), 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
OPTOCOUPLERS FOR SAFE ELECTRICAL INSULATION PER DIN EN 60747-5-5 (VDE 0884) (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 60747-5-5 (VDE 0884) is carried out after all the other tests

For technical questions, contact: optocoupleranswers@vishay.com

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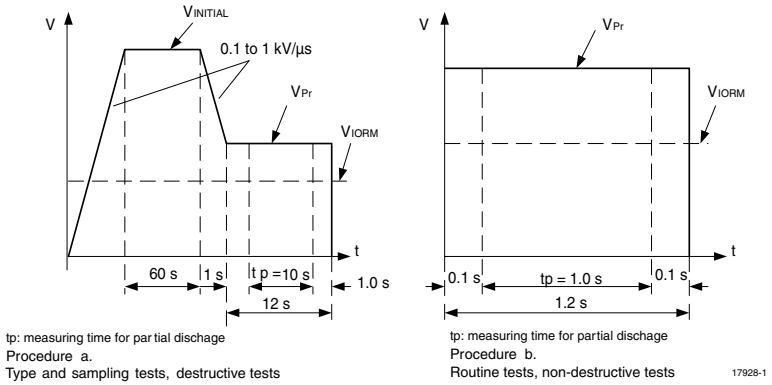

Fig. 1 - Time Voltage Diagram per DIN EN 60747-5-5

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 to IV			
For rated line voltages ≤ 600 V_{RMS}		I to 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_{peak}
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_{peak}
Test voltage input/output, procedure a (1) V_{Pr} = 1.6 x V_{IORM}, type and sampling test t_p = 60 s, partial discharge < 5 pC	V_{Pr}	1424			V_{peak}
Maximum permissible overvoltage (transient overvoltage)	V_{IOTM}	10 000			V_{peak}
Partial discharge test voltage (1)	$V_{INITIAL}$	8000			V_{peak}
Safety maximum ratings (maximum permissible ratings in case of a fault, also refer to d diagram) 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} ΔI_{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

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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	VO610A...	
		IL2B-..	MCT270/271	VO615A...	
		IL30/31/55	MCT272	VO617A...	
		IL55B-..	MCT273/274	VO618A...	
		IL66-..	MCT275	VO615C...	
		IL66B-..	MCT276/277	VO617C...	
		IL201/202/203			
Installation category (DIN VDE 0110)					
For rated line voltages ≤ 300 V_{RMS}		I to IV			
For rated line voltages ≤ 600 V_{RMS}		I to 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_{peak}
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_{peak}
Test voltage input/output, procedure a (1) V_{Pr} = 1.6 x V_{IORM}, type and sampling test t_p = 60 s, partial discharge < 5 pC	V_{Pr}	1424			V_{peak}
Maximum permissible overvoltage (transient overvoltage)	V_{IOTM}	8000			V_{peak}
Partial discharge test voltage (1)	$V_{INITIAL}$	8000			V_{peak}
Safety maximum ratings (maximum permissible ratings in case of a fault, also refer to diagram) 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}	 175 400 -2.67 700 -4.67			 °C mA mA/K mW mW/K
Insulation resistance at T_{Si} $V_{I/O}$ = 500 V	R_{IS}	> 10^9			W

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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		
			6N137...		
			VO2601...		
			VO2611...		
			VO2630...		
			VO2631...		
			VO4661...		
Installation category (DIN VDE 0110)					
For rated line voltages ≤ 300 V_{RMS}		I to IV	I to IV	I to IV	
For rated line voltages ≤ 600 V_{RMS}		I to III	I to IV	I to 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}	890	890	890	V_{peak}
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	1669	1669	V_{peak}
Test voltage input/output, procedure a (1) V_{Pr} = 1.6 x V_{IORM}, type and sampling Test t_p = 60 s, partial discharge < 5 pC	V_{Pr}	1424	1424	1424	V_{peak}
Maximum permissible overvoltage (transient overvoltage)	V_{IOTM}	8000	8000	8000	V_{peak}
Partial discharge test voltage (1)	$V_{INITIAL}$	8000	8000	8000	V_{peak}
Safety maximum ratings (maximum permissible ratings in case of a fault, also refer to diagram) 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}	 175 250 -1.65 500 -3.33	 175 300 -2 500 -3.33	 165 235 -1.57 465 -3.1	 °C mA mA/K mW 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

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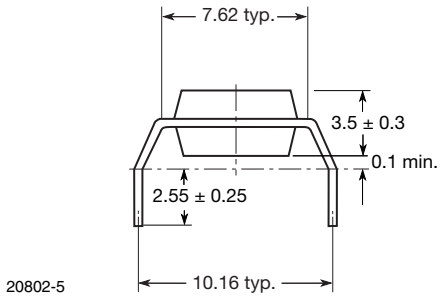
OPTION 6
DIP OPTOCOUPLERS WITH 0.4" (10.16 mm) LEAD SPREAD

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 mm
Clearance	> 8 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 mm min.
See standard version for pin configuration

OPTION 7
LEAD BENDS FOR SURFACE MOUNT OPTOCOUPLERS

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

Creepage distance > 8 mm
Clearance distance > 8 mm

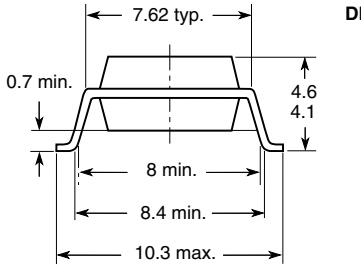
This version additionally complies with the following standards:

- 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

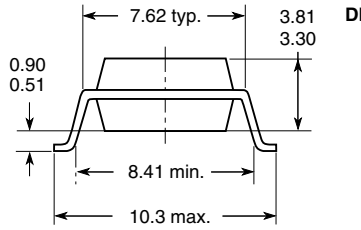
During the soldering process, the package should not be wetted with tin-lead solder to prevent the impairment of the isolation features. Apart from iron soldering, only reflow soldering methods (vapor phase, infrared and hot gas) are permissible.

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

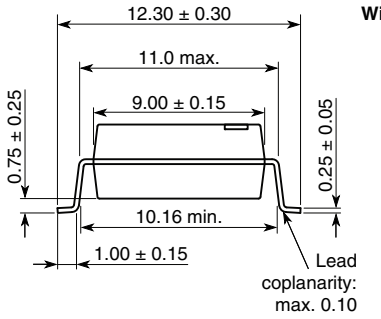
The soldering process may be repeated two times at the most. Attention must be paid to the cooling down of the device to 25 °C between the soldering processes.



DIP 6



DIP 4, DIP 8, DIP 16



Wide Body, Option 7

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

Clearance-creepage distance = 8 mm min.

See standard version for pin configuration.

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OPTION 8
LEAD BENDS FOR SURFACE MOUNT OPTOCOUPLERS

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

Creepage distance > 8 mm
Clearance distance > 8 mm

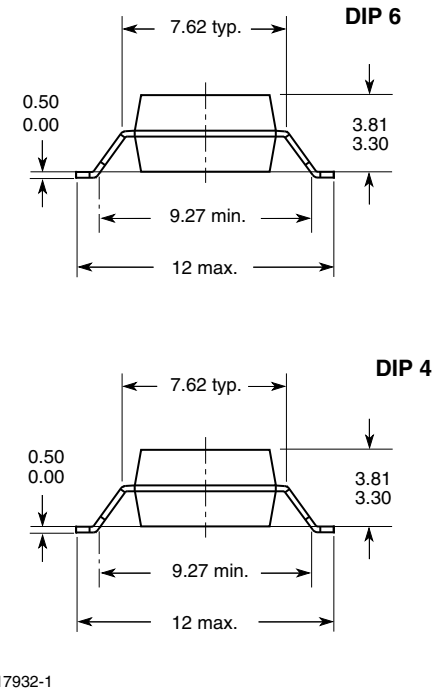
This version additionally complies with the following standards:

- 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.



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

Clearance-creepage distance = 8 mm min.

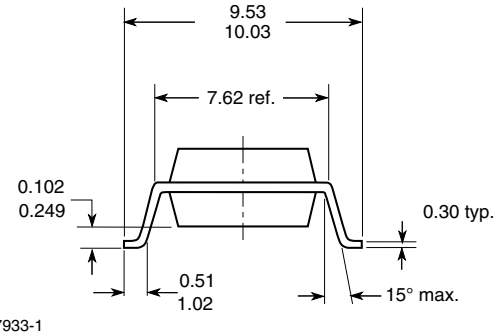
See standard version for pin configuration.

OPTION 9
LEAD BENDS FOR SURFACE MOUNT OPTOCOUPLERS

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.



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MARKINGS

Product marking is defined in the datasheets. In the cases where marking is not defined in the datasheet, the following table defines the option information that is marked on the product.

OPTION TYPE	MARKING
X001, X001T	X001, X1 [1]
X006	No mark
X007, X007T	X007
X008, X008T	X008
X009, X009T	No mark
X016	X001
X017, X017T	X017
X018, X018T	X018
X019, X019T	X001

Note

[1] X1 is used on the SOP and SOIC-8 where there are space constraints.

Note

The information in this document provides generic information on options but for specific information on a product the appropriate product datasheet should be used.

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