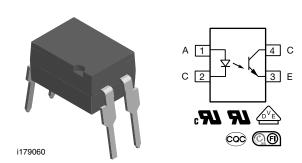
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Optocoupler, Phototransistor Output, High Reliability, 5300 V_{RMS}



LINKS TO ADDITIONAL RESOURCES







DESCRIPTION

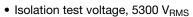
The SFH615XXX features a large assortment of current transfer ratio, low coupling capacitance and high isolation voltage. These couplers have a GaAs infrared emitting diode emitter, which is optically coupled to a silicon planar phototransistor detector, and is incorporated in a plastic DIP-4 package.

The coupling devices are designed for signal transmission between two electrically separated circuits.

The couplers are end-stackable with 2.54 mm lead spacing. Creepage and clearance distances of >8 mm are achieved with option 6. This version complies with 60950 (DIN VDE 0805) for reinforced insulation up to operation voltage of 400 $V_{\mbox{\footnotesize{RMS}}}$ or DC.

FEATURES

- Low CTR degradation
- Good CTR linearity depending on forward current



- High collector emitter voltage, V_{CEO} = 70 V
- Low saturation voltage
- · Fast switching times
- Temperature stable
- Low coupling capacitance
- End stackable, 0.100" (2.54 mm) spacing
- High common mode interference immunity (unconnected
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AGENCY APPROVALS

- UL
- cUL 1577
- DIN EN 60747-5-5 (VDE 0884) available with option 1

SFH615AGR-X007T

100 to 300

SFH615AGR-X017T (1)

SFH615AY-X008T

50 to 150

SFH615AY-X018T

SFH615AY-X019T

- CQC
- BSI
- FIMKO

SFH615AGB-X009T (1)

100 to 600

ORDERING INFORMATION S F Н 6 5 Α X Χ 0 0 # Х PART NUMBER PACKAGE OPTION CTR (%) **AGENCY CERTIFIED / PACKAGE** 5 mA UL, cUL, CQC, CSA, FIMKO 100 to 600 50 to 600 100 to 300 50 to 150 DIP-4 SFH615AA SFH615AGR SFH615AY

SFH615AA-X007

50 to 600

Notes

SMD-4, option 7 SMD-4, option 8

SMD-4, option 9

VDE (option 1)

SMD-4, option 7 SMD-4, option 8

SMD-4, option 9

UL, cUL, CQC, CSA, FIMKO,

- · Additional options may be possible, please contact sales office
- (1) Also available in tubes; do not add T to end



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PARAMETER	TEST CONDITION SYMBOL		VALUE	UNIT	
INPUT					
Reverse voltage		V _R	6	V	
DC forward current		l _F	60	mA	
Surge forward current	t _P ≤ 10 ms	I _{FSM}	2.5	А	
Power dissipation		P _{diss}	100	mW	
OUTPUT					
Collector emitter voltage		V_{CEO}	70	V	
Emitter collector voltage		V _{ECO}	7	V	
Collector current		Ic	50	mA	
Collector current	t _P ≤ 10 ms	I _C	100	mA	
Total power dissipation		P _{diss}	150	mW	
COUPLER					
Isolation test voltage between emitter and detector		V_{ISO}	5300	V _{RMS}	
Creepage distance			≥7	mm	
Clearance distance			≥7	mm	
Isolation thickness between emitter and detector Comparative tracking index per DIN IEC 112/VDE 0303, part 1		СТІ	≥ 175		
Isolation resistance	$V_{IO} = 500 \text{ V}, T_{amb} = 25 ^{\circ}\text{C}$	R _{IO}	≥ 10 ¹²	Ω	
isolation resistance	$V_{IO} = 500 \text{ V}, T_{amb} = 100 ^{\circ}\text{C}$	R _{IO}	≥ 10 ¹¹	Ω	
Storage temperature range		T _{stg}	-55 to +150	°C	
Ambient temperature range		T _{amb}	-55 to +100	°C	
Soldering temperature (1)	Max. 10 s, dip soldering distance to seating plane ≥ 1.5 mm	T _{sld}	260	°C	

Notes

⁽¹⁾ Refer to reflow profile for soldering conditions for surface mounted devices (SMD). Refer to wave profile for soldering conditions for through hole devices (DIP).

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT					'	•	I.
Forward voltage	I _F = 60 mA		V_{F}	-	1.25	1.65	V
Reverse current	V _R = 6 V		I _R	-	0.01	10	μΑ
Capacitance	V _R = 0 V, f = 1 MHz		Co	-	13	-	pF
Thermal resistance			R _{thja}	-	750	-	K/W
OUTPUT							
Collector emitter capacitance	V _{CE} = 5 V, f = 1 MHz		C _{CE}	-	5.2	-	pF
Thermal resistance			R _{thja}	-	500	-	K/W
Collector emitter saturation voltage	$I_F = 10 \text{ mA}, I_C = 2.5 \text{ mA}$		V _{CEsat}	-	0.25	0.4	V
Coupling capacitance			C _C	-	0.4	-	pF
COUPLER							
Collector emitter leakage current	V 10 V	SFH615AA	I _{CEO}	-	10	100	nA
		SFH615AGB	I _{CEO}	-	10	100	nA
	$V_{CEO} = 10 \text{ V}$	SFH615AGR	I _{CEO}	-	10	10 100	nA
	ļ	SFH615AY	I _{CEO}	-	10	100	nA

Note

Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering
evaluation. Typical values are for information only and are not part of the testing requirements.

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not
implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute
maximum ratings for extended periods of the time can adversely affect reliability.

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CURRENT TRANSFER RATIO								
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT	
I _C /I _F	I _E = 5 mA, V _{CE} = 5 V	SFH615AA	CTR	50	-	600	%	
		SFH615AGB	CTR	100		600	%	
	IF = 3 IIIA, VCE = 3 V	SFH615AGR	CTR	100	-	300	%	
		SFH615AY	CTR	50	-	150	%	

SWITCHING CHARACTERISTICS							
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT	
Turn-on time	I _F = 5 mA	t _{on}	-	2	-	μs	
Turn-off time	$I_F = 5 \text{ mA}$	t _{off}	-	25	-	μs	

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

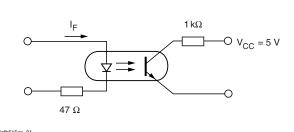


Fig. 1 - Switching Operation (with saturation)

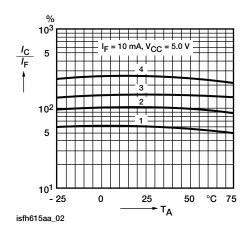


Fig. 2 - Current Transfer Ratio (typ.) vs. Temperature

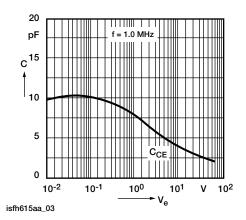


Fig. 3 - Transistor Capacitance (typ.) vs. Collector Emitter Voltage

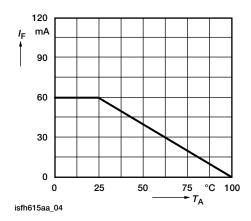


Fig. 4 - Permissible Diode Forward Current vs.
Ambient Temperature

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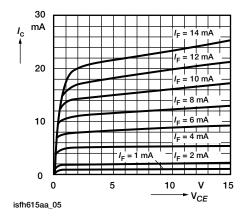


Fig. 5 - Output Characteristics (typ.) Collector Current vs. Collector Emitter Voltage

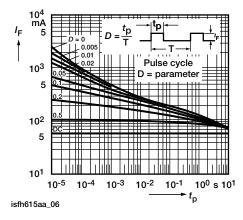


Fig. 6 - Permissible Pulse Handling Capability Forward Current vs. Pulse Width

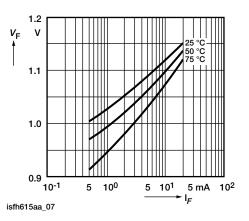


Fig. 7 - Diode Forward Voltage (typ.) vs. Forward Current

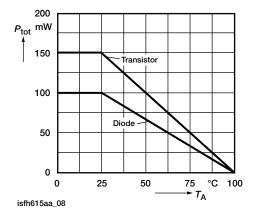


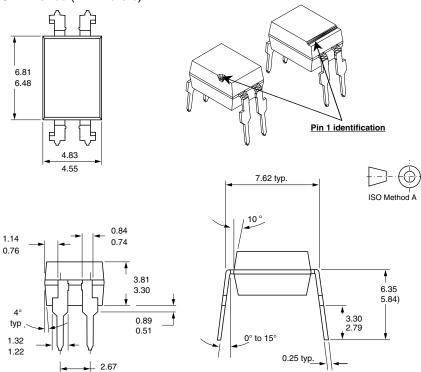
Fig. 8 - Permissible Power Dissipation vs. Temperature

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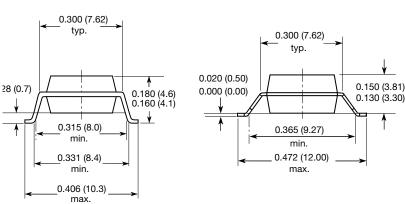
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PACKAGE DIMENSIONS in inches (millimeters)



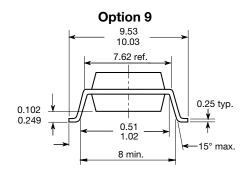
Option 7

i178027-1



Option 8

2.41



PACKAGE MARKING (Example of SFH615AGR-X017T)



Notes

- XXXX = LMC (lot marking code)
- VDE logo is only marked on option 1 parts
- Tape and reel suffix (T) is not part of the package marking



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