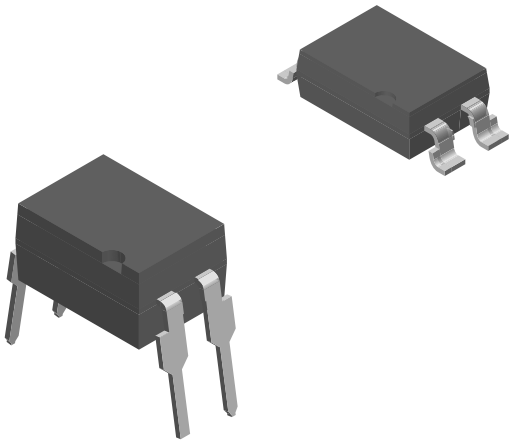
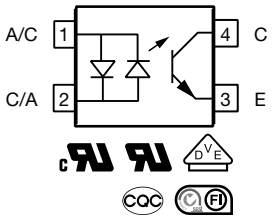
Optocoupler, Phototransistor Output, AC Input, 5300 V_{RMS}





LINKS TO ADDITIONAL RESOURCES

Product Page | Design Tools | Footprints | SPICE Models

DESCRIPTION

The SFH620AA, SFH620AGB features a high 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. This version complies with IEC 60950 (DIN VDE 0805) for reinforced insulation up to an operation voltage of 400 V_{RMS} or DC.

FEATURES

Pb-free

e3

RoHS COMPLIANT

- High current transfer ratios
  - at 5 mA: 50 to 600 %
  - at 1.0 mA: 45 % typical (> 13)
- Low CTR degradation
- Good CTR linearity depending on forward current
- Isolation test voltage, 5300 V_{RMS}
- 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 base)
- SMD option, see SFH620A, SFH6206 datasheet
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AGENCY APPROVALS

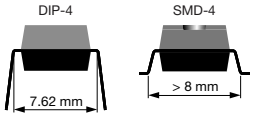
- UL
- cUL
- DIN EN 60747-5-5 (VDE 0884-5), available with option 1
- BSI
- CQC
- FIMKO

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ORDERING INFORMATION

S	F	H	6	2	0	A	x	x	-	X	0	0	1
PART NUMBER										PACKAGE OPTION			



AGENCY CERTIFIED / PACKAGE	CTR (%) ± 5 mA	
UL, cUL, BSI, FIMKO, CQC	**50 to 600**	**100 to 600**
DIP-4	SFH620AA	SFH620AGB
UL, cUL, BSI, FIMKO, CQC, VDE (option 1)	**50 to 600**	**100 to 600**
DIP-4	-	SFH620AGB-X001
SMD-4, option 9	-	SFH620AGB-X019T

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
INPUT				
DC forward current		I_F	± 60	mA
Surge forward current	$t_p \leq 1.0$ µs	I_{FSM}	± 2.5	A
Total power dissipation		P_{diss}	100	mW
OUTPUT				
Collector emitter voltage		V_{CE}	70	V
Emitter collector voltage		V_{EC}	7	V
Collector current		I_C	50	mA
	$t_p \leq 1.0$ ms	I_C	100	mA
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
Insulation thickness between emitter and detector			≥ 0.4	mm
Comparative tracking index per DIN IEC 112/VDE 0303 part 1		CTI	≥ 175	
Isolation resistance	V_{IO} = 500 V, T_{amb} = 25 °C	R_{IO}	≥ 10^{12}	Ω
	V_{IO} = 500 V, T_{amb} = 100 °C	R_{IO}	≥ 10^{11}	Ω
Storage temperature		T_{stg}	-55 to +150	°C
Ambient temperature		T_{amb}	-55 to +100	°C
Junction temperature		T_j	100	°C
Soldering temperature (1)	Max. 10 s, dip soldering distance to seating plane ≥ 1.5 mm	T_{sld}	260	°C

Notes

- 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.

(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).

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ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
INPUT							
Forward voltage	I_F = ± 60 mA		V_F	-	1.25	1.65	V
Capacitance	V_R = 0 V, f = 1 MHz		C_O	-	50	-	pF
Thermal resistance			R_{thja}	-	750	-	K/W
OUTPUT							
Collector emitter capacitance	V_{CE} = 5 V, f = 1 MHz		C_{CE}	-	6.8	-	pF
Thermal resistance			R_{thja}	-	500	-	K/W
COUPLER							
Collector emitter saturation voltage	I_F = ± 10 mA, I_C = 2.5 mA		V_{CEsat}	-	0.25	0.4	V
Coupling capacitance			C_C	-	0.2	-	pF
Collector emitter leakage current	V_{CE} = 10 V	SFH620AA	I_{CEO}	-	10	100	nA
		SFH620AGB	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.

CURRENT TRANSFER RATIO (T_{amb} = 25 °C, unless otherwise specified)							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
I_C/I_F	I_F = ± 5 mA, V_{CE} = 5 V	SFH620AA	CTR	50	-	600	%
		SFH620AGB		100	-	600	%

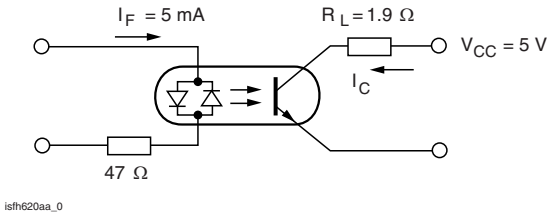


Fig. 1 - Switching Times (Typical Values)
Linear Operation (Saturated)

SWITCHING CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Turn-on time	I_F = ± 5 mA, R_L = 1.9 kΩ, V_{CC} = 5 V	t_{on}	-	2	-	µs
Turn-off time	I_F = ± 5 mA, R_L = 1.9 kΩ, V_{CC} = 5 V	t_{off}	-	25	-	µs

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SAFETY AND INSULATION RATINGS						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Climatic classification (according to IEC 68 part 1)			-	55 / 100 / 21	-	
Comparative tracking index		CTI	175	-	399	
V_{IOTM}			10000	-	-	V
V_{IORM}			890	-	-	V
P_{SO}			-	-	400	mW
I_{SI}			-	-	275	mA
T_{SI}			-	-	175	°C
Creepage distance	standard DIP-4		7	-	-	mm
Clearance distance	standard DIP-4		7	-	-	mm
Insulation thickness, reinforced rated	per IEC 60950 2.10.5.1		0.4	-	-	mm

Note

- As per IEC 60747-5-5, this optocoupler is suitable for “safe electrical insulation” only within the safety ratings. Compliance with the safety ratings shall be ensured by means of protective circuits.

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

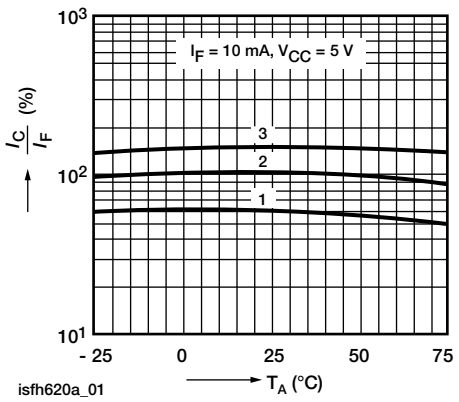


Fig. 2 - Current Transfer Ratio (CTR) vs. Temperature

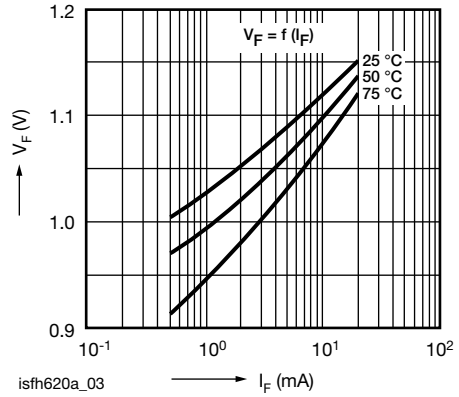


Fig. 4 - Diode Forward Voltage (Typ.) vs. Forward Current

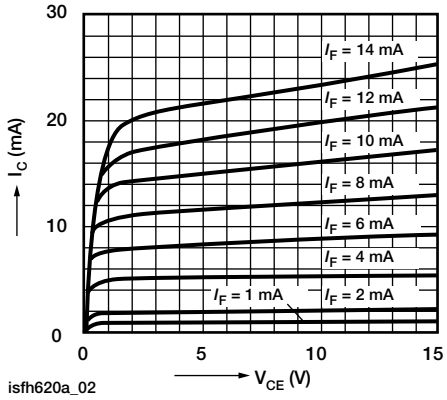


Fig. 3 - Output Characteristics (Typ.) Collector Current vs. Collector Emitter Voltage

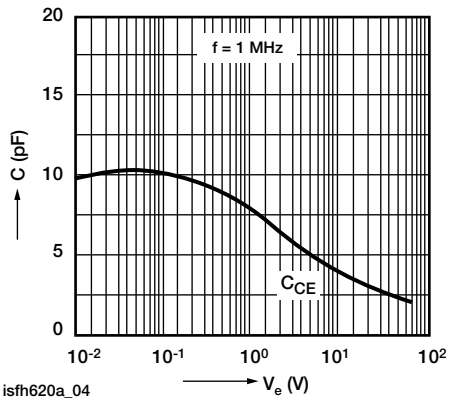


Fig. 5 - Transistor Capacitance (Typ.) vs. Collector Emitter Voltage

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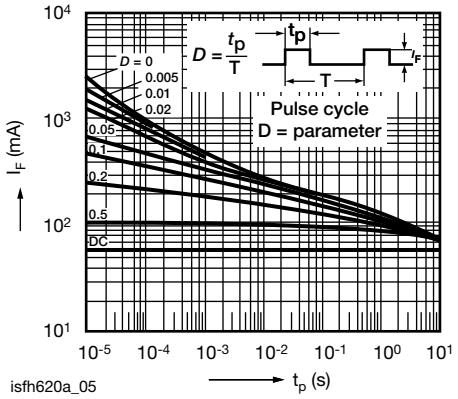


Fig. 6 - Permissible Pulse Handling Capability Forward Current vs. Pulse Width

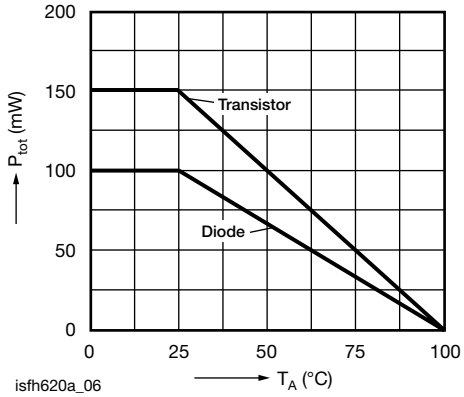


Fig. 7 - Permissible Power Dissipation vs. Ambient Temperature

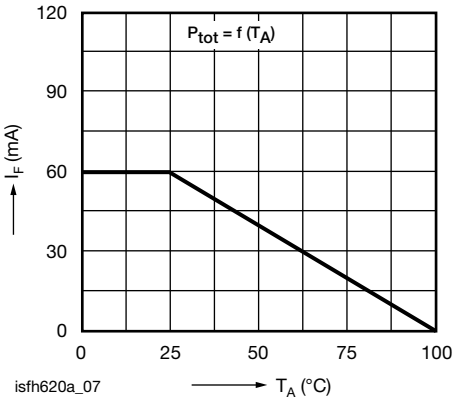
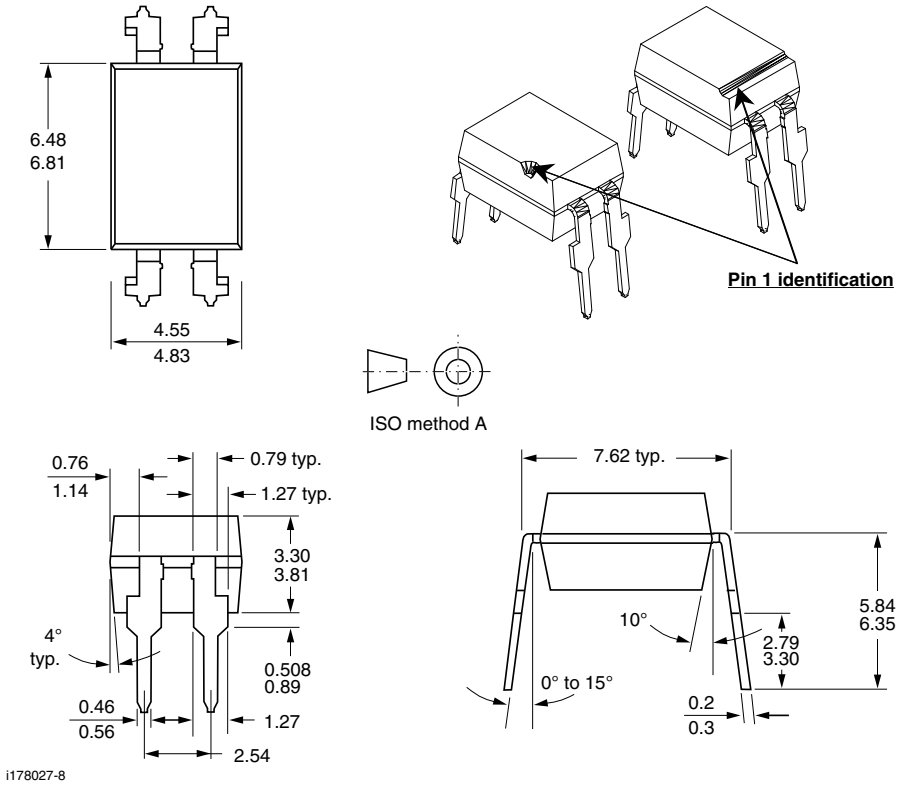


Fig. 8 - Permissible Diode Forward Current vs. Ambient Temperature

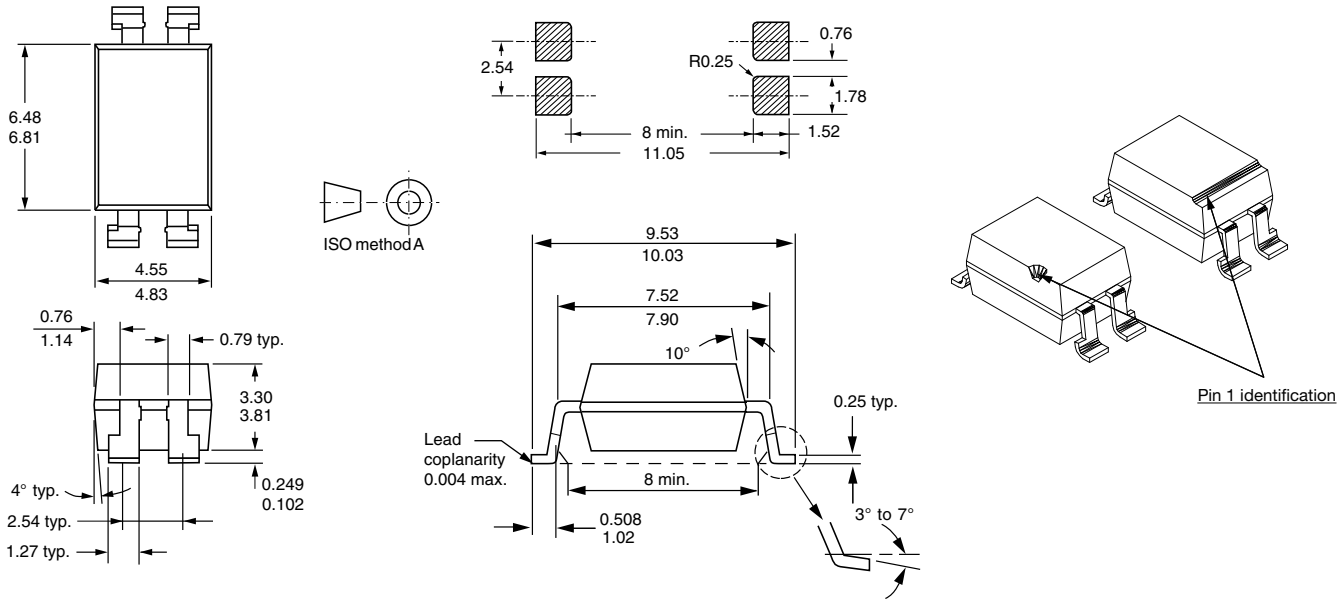
PACKAGE DIMENSIONS in millimeters

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DIP-4



SMD-4, Option 9

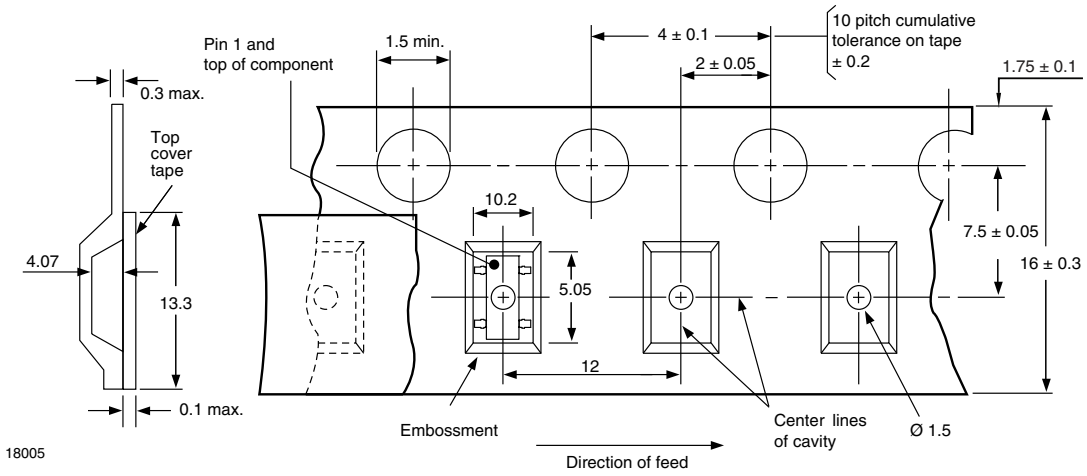


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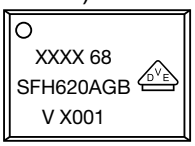
TAPE AND REEL PACKAGING (in millimeters)

The tape is 16 mm and is wound on a 33 cm reel. There are 1000 parts per reel. Taped and reeled 4 pin optocouplers conform to EIA-481-2 and IEC60286-3.

SMD-4 ("T")



PACKAGE MARKING (example of SFH620AGB-X001)



Notes

- XXXX = LMC (lot marking code)
- The VDE logo is only marked on option1 parts.

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