

SFH620AA/AGB

5.3 kV TRIOS® Optocoupler

AC Voltage Input

FEATURES

- **High Current Transfer Ratios**
at 5 mA: 50–600%
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**
- **Field-effect Stable by TRIOS (TRansparent ION Shield)**
- **Temperature Stable**
- **Low Coupling Capacitance**
- **End-stackable, .100" (2.54 mm) Spacing**
- **High Common-mode Interference Immunity (Unconnected Base)**
- **Underwriters Lab File #52744**
-  **VDE 0884 Available with Option 1**
- **SMD Option, See SFH6206 Data Sheet**

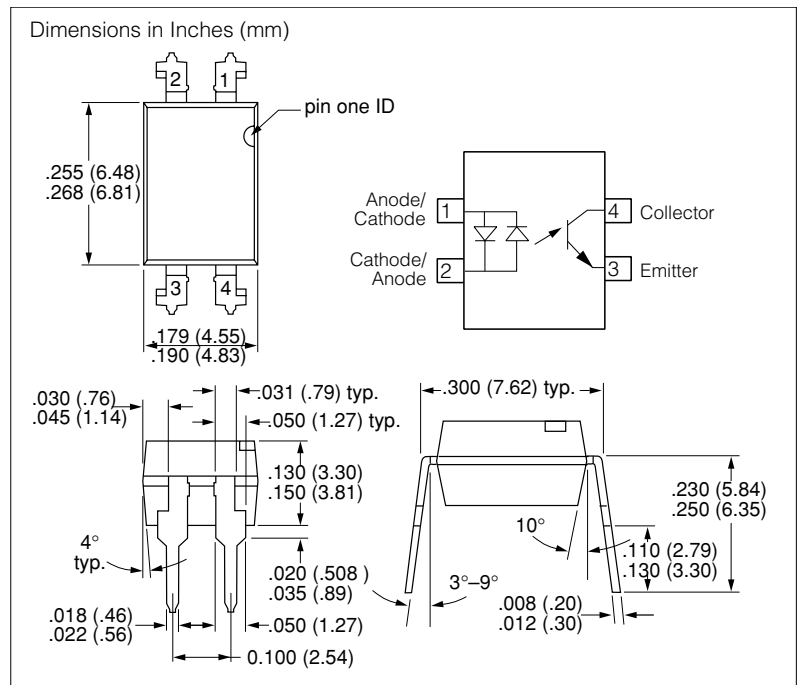
DESCRIPTION

The SFH620AA/AGB 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.

Creepage and clearance distances of >8.0 mm are achieved with option 6. This version complies with IEC 950 (DIN VDE 0805) for reinforced insulation up to an operation voltage of 400 V_{RMS} or DC.



Maximum Ratings

Emitter

Reverse Voltage.....	±60 mA
Surge Forward Current (t _p ≤10 μs)	±2.5 A
Total Power Dissipation.....	100 mW

Detector

Collector-emitter Voltage	70 V
Emitter-collector Voltage.....	7.0 V
Collector Current	50 mA
Collector Current (t _p ≤1.0 ms).....	100 mA
Total Power Dissipation.....	150 mW

Package

Isolation Test Voltage between Emitter and

Detector, refer to Climate DIN 40046,	
part 2, Nov. 74.....	5300 VAC _{RMS}
Creepage.....	≥7.0 mm
Clearance	≥7.0 mm
Insulation Thickness between Emitter and Detector	0.4 mm
Comparative Tracking Index	
per DIN IEC 112/VDE0 303, part 1	175
Isolation Resistance	
V _{IO} =500 V, T _A =25°C	≥10 ¹² Ω
V _{IO} =500 V, T _A =100°C	≥10 ¹¹ Ω
Storage Temperature Range	-55 to +150°C
Ambient Temperature Range.....	-55 to +100°C
Junction Temperature	100°C
Soldering Temperature (max. 10 s. Dip Soldering	
Distance to Seating Plane ≥1.5 mm).....	260°C

Characteristics (T_A=25°C)

Description	Symbol		Unit	Condition
Emitter				
Forward Voltage	V _F	1.25 (≤1.65)	V	I _F =±60 mA
Capacitance	C ₀	50	pF	V _R =0 V, f=1.0 MHz
Thermal Resistance	R _{thJA}	750	K/W	—
Detector				
Capacitance	C _{CE}	6.8	pF	V _{CE} =5.0 V, f=1.0 MHz
Thermal Resistance	R _{thJA}	500	K/W	—
Package				
Collector-Emitter Saturation Voltage	V _{CEsat}	0.25 (≤0.4)	V	I _F =10 mA, I _C =2.5 mA
Coupling Capacitance	C _C	0.2	pF	—

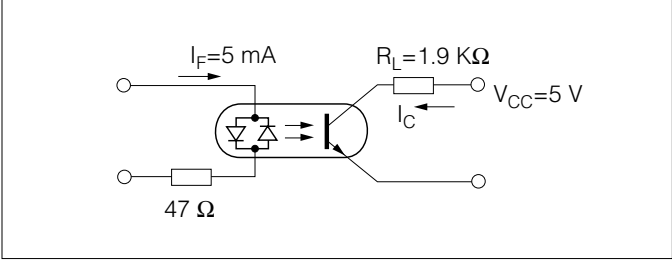
Note: 1. Still air, coupler soldered to PCB or base.

Current Transfer Ratio (I_C/I_F at V_{CE}=5.0 V) and Collector-emitter Leakage Current

Description	AA	AGB	Unit
I _C /I _F (I _F =±5 mA)	50–600	100–600	%
Collector-Emitter Leakage Current, I _{CEO} V _{CE} =10 V	10 (≤100)	10 (≤100)	nA

Switching Times (Typical Values)

Linear Operation (saturated)



Turn-on Time	t _{on}	2.0	μs
Turn-off Time	t _{off}	25	μs

Figure 1. Current Transfer Ratio (typ.) vs. Temperature

$I_F = 10 \text{ mA}$, $V_{CE} = 5.0 \text{ V}$

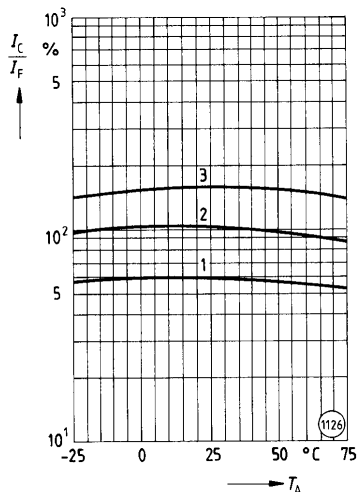


Figure 2. Output Characteristics (typ.) Collector Current vs. Collector-emitter Voltage $T_A = 25^\circ\text{C}$

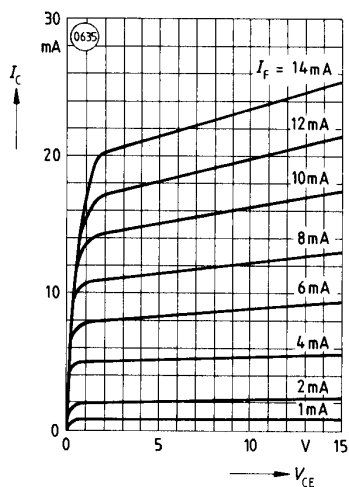


Figure 3. Diode Forward Voltage (typ.) vs. Forward Current

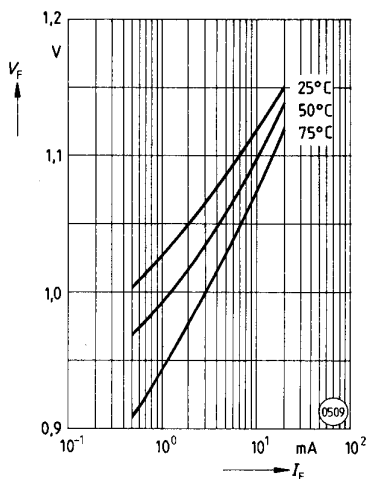


Figure 4. Transistor Capacitance (typ.) vs. Collector-emitter Voltage

$T_A = 25^\circ\text{C}$, $f = 1.0 \text{ MHz}$

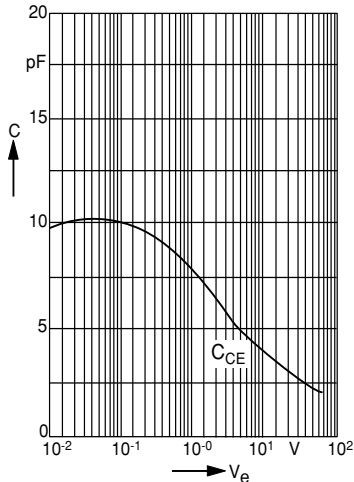


Figure 5. Permissible Pulse Handling Capability. Fwd. Current vs. Pulse Width
Pulse cycle D=parameter, $T_A = 25^\circ\text{C}$

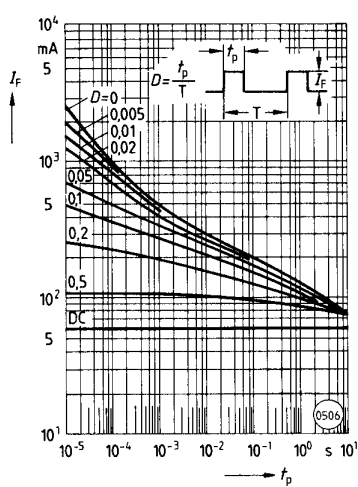


Figure 6. Permissible Power Dissipation vs. Ambient Temperature

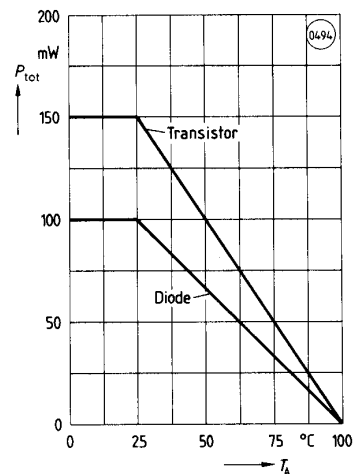


Figure 7. Permissible Diode Forward Current vs. Ambient Temperature

