

SFH620A

5.3 kV TRIOS® Optocoupler

AC Voltage Input

FEATURES

- **High Current Transfer Ratios**
 - at 10 mA: 40–320%
 - 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**
(TTransparent IO n 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**

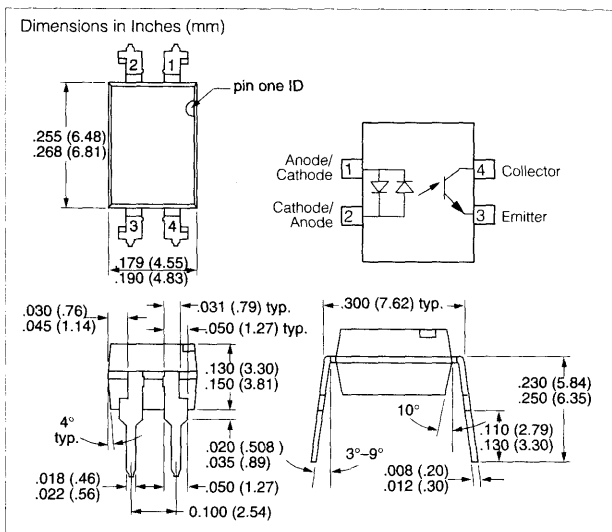
DESCRIPTION

The SFH620A 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.....	6.0 V
DC Forward Current.....	±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 V _{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 ($T_A=25^\circ\text{C}$)

Description	Symbol		Unit	Condition
Emitter				
Forward Voltage	V_F	1.25 (≤ 1.65)	V	$I_F = \pm 60$ 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: 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 by Dash Number

Description	-1	-2	-3	
I_C/I_F ($I_F = \pm 10$ mA)	40–125	63–200	100–320	%
I_C/I_F ($I_F = \pm 10$ mA)	30 (> 13)	45 (> 22)	70 (> 34)	%
Collector-emitter Leakage Current, I_{CEO} $V_{CE} = 10$ V	2.0 (≤ 50)	2.0 (≤ 50)	5.0 (≤ 100)	nA

Figure 1. Current Transfer Ratio (typ.) vs. Temperature
 $I_F=10 \text{ mA}$, $V_{CE}=5.0 \text{ V}$

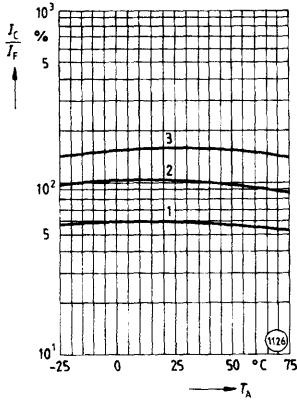


Figure 4. Transistor Capacitance (typ.) vs. Collector-emitter Voltage
 $T_A=25^\circ\text{C}$, $f=1.0 \text{ MHz}$

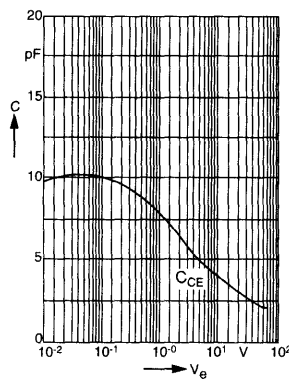


Figure 7. Permissible Diode Forward Current vs. Ambient Temperature

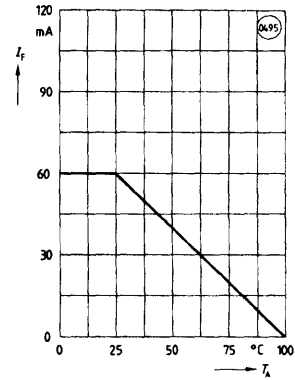


Figure 2. Output Characteristics (typ.) Collector Current vs. Collector-emitter Voltage
 $T_A=25^\circ\text{C}$

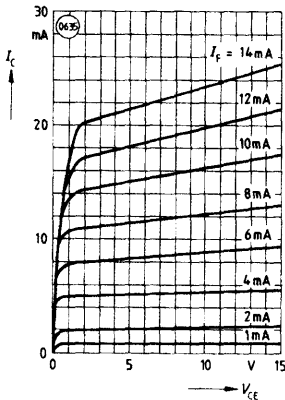


Figure 5. Permissible Pulse Handling Capability. Fwd. Current vs. Pulse Width
Pulse cycle D=parameter, $T_A=25^\circ\text{C}$

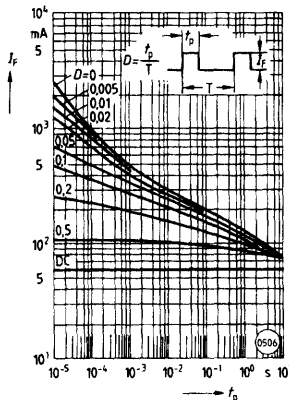
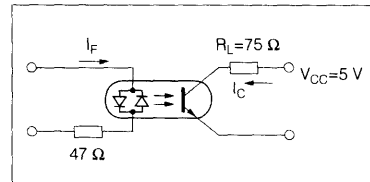


Figure 8. Switching Times Linear Operation (without saturation)



$I_F=10 \text{ mA}$, $V_{CC}=5.0 \text{ V}$, $T_A=25^\circ\text{C}$

Load Resistance	R_L	75	Ω
Turn-on Time	t_{on}	3.0	μs
Rise Time	t_r	2.0	μs
Turn-off Time	t_{off}	2.3	μs
Fall Time	t_f	2.0	μs
Cut-off Frequency	F_{CO}	250	kHz

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

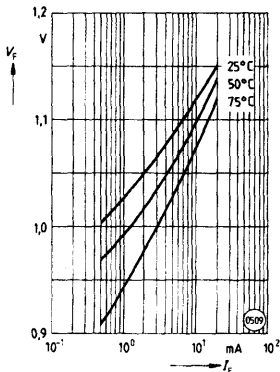


Figure 6. Permissible Power Dissipation vs. Ambient Temperature

