SFH691AT

AC Input Phototransistor Optocoupler Miniflat SOP Package

FEATURES

- **Current Transfer Ratio, 50% to 300%**
- **SOP (Small Outline Package)**
- **Isolation Test Voltage, 3750 V_{RMS} (1.0 s)**
- **High Collector-Emitter Breakdown Voltage, V_{CEO}=70 V**
- **Bidirectional AC Input**
- **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**
- **Underwriters Lab File #52744**

APPLICATIONS

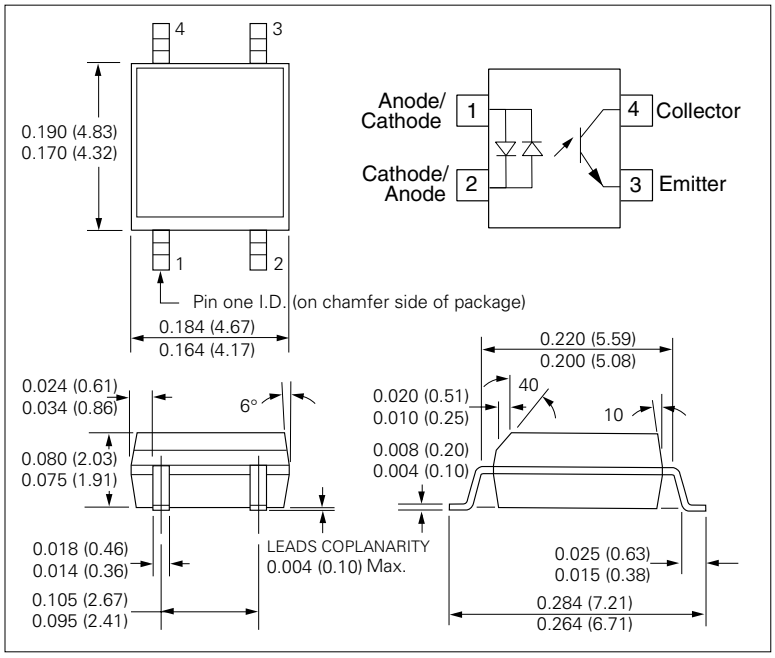
- **High density mounting or space sensitive PCBs**
- **PLCs**
- **Telecommunication**

DESCRIPTION

The SFH691AT has a GaAs infrared emitting diode emitter, which is optically coupled to a silicon planar phototransistor detector, and is incorporated in a 4 pin 100 mil lead pitch miniflat package. It features a high current transfer ratio, low coupling capacitance, and high isolation voltage.

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

The SFH691AT will be offered in tape and reel format only. There are 2000 parts per reel.



Absolute Maximum Ratings, T_A=25°C (except where noted)

Emitter

DC Forward Current ..... 50 mA
Surge Forward Current (t_P≤10 µs) ..... 2.5 A
Total Power Dissipation ..... 80 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 (1.0 s) ..... 3750 V_{RMS}
Creepage ..... ≥5.0 mm
Clearance ..... ≥5.5 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

Table 1. Electrical Characteristics, T_A=25°C (except where noted)

Description	Symbol	Min.	Typ.	Max.	Unit	Condition
Emitter (IR GaAs)						
Forward Voltage	V_F	—	1.15	1.4	V	I_F=±5 mA
Capacitance	C_0	—	29	—	pF	V_R=0.0 V, f=1.0 MHz
Thermal Resistance	R_{thJA}	—	750	—	K/W	—
Detector (Si Phototransistor)						
Leakage Current, Collector-emitter	I_{CEO}	—	—	100	nA	V_{CE}=20 V
Capacitance	C_{CE}	—	5.0	—	pF	V_{CE}=5.0 V, f=1.0 MHz
Thermal Resistance	R_{thJA}	—	500	—	K/W	—
Package						
Collector-emitter Saturation Voltage	V_{CESAT}	—	0.1	0.3	V	I_F=10 mA, I_C=2.0 mA
Coupling Capacitance	C_C	—	0.4	—	pF	f=1.0 MHz
Current Transfer Ratio	CTR	50	120	300	%	I_F=±5.0 mA, V_{CE}=5.0 V
CTR_1/CTR_2	—	0.3	—	3.0	—	$CTR1=\frac{I_{C1}}{I_{F1}}$, $CTR2=\frac{I_{C2}}{I_{F2}}$

Switching Times (Typical)

Figure 1. Linear operation (without saturation)

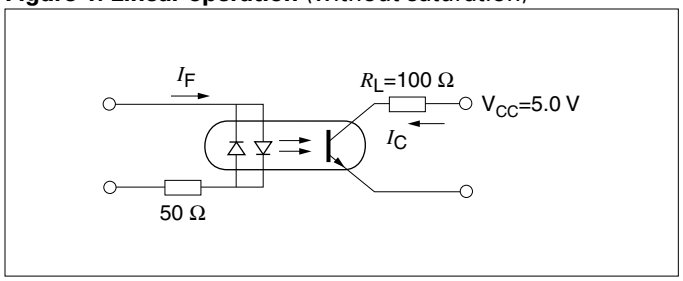


Table 2. Switching Times, I_F=5.0 mA, V_{CC}=5.0 V, T_A=25°C

Parameter	Symbol	Value	Unit
Load Resistance	R_L	100	Ω
Rise Time	t_r	3.0	µs
Fall Time	t_f	4.0	
Turn-on Time	t_{on}	5.0	
Turn-off Time	t_{off}	3.0	