SFH692AT

Photodarlington Optocoupler
High BV_{CEO} Voltage
Miniflat SOP Package

FEATURES

- **Current Transfer Ratio, min. 1000%**
- **SOP (Small Outline Package)**
- **Isolation Test Voltage, 3750 V_{RMS} (1.0 s)**
- **High Collector-Emitter Breakdown Voltage, V_{CEO}=300 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**
- **Underwriters Lab File #52744**

APPLICATIONS

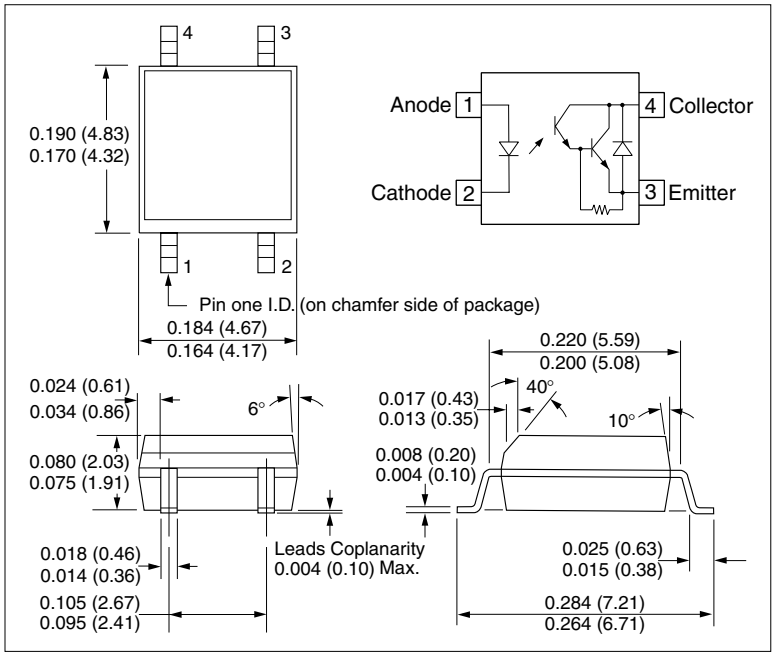
- **High density mounting or space sensitive PCBs**
- **PLCs**
- **Telecommunication**

DESCRIPTION

The SFH692AT has a GaAs infrared emitting diode emitter, which is optically coupled to a silicon planar photodarlington 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 SFH692AT 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
Reverse Voltage ..... 6.0 V
Surge Forward Current ($t_P \leq 10$ µs) ..... 2.5 A
Total Power Dissipation ..... 80 mW

Detector

Collector-Emitter Voltage ..... 300 V
Emitter-Collector Voltage ..... 0.3 V
Collector Current ..... 50 mA
Collector Current ($t_P \leq 1.0$ ms) ..... 150 mA
Total Power Dissipation ..... 200 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 ..... $\geq 10^{12}\ \Omega$
V_{IO}=500 V, T_A=100°C ..... $\geq 10^{11}\ \Omega$
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	—	1.2	1.5	V	I_F=10 mA
Reverse Current	I_R	—	0.01	10	µA	V_R=6.0 V
Capacitance	C_0	—	14	—	pF	V_R=0.0 V, f=1.0 MHz
Thermal Resistance	R_{thJA}	—	750	—	K/W	—
Detector (Si Photodarlington)						
Leakage Current, Collector-emitter	I_{CEO}	—	—	200	nA	V_{CE}=200 V
Capacitance	C_{CE}	—	39	—	pF	V_{CE}=5.0 V, f=1.0 MHz
Thermal Resistance	R_{thJA}	—	500	—	K/W	—
Package						
Collector-emitter Saturation Voltage	V_{CESAT}	—	—	1.0	V	I_F=1.0 mA, I_C=10 mA
Collector-emitter Saturation Voltage	V_{CESAT}	0.3	—	1.2	V	I_F=10 mA, I_C=100 mA
Coupling Capacitance	C_C	—	0.6	—	pF	f=1.0 MHz, V_{I-O}=0 V
Current Transfer Ratio	CTR	1000	—	—	%	I_F=1.0 mA, V_{CE}=1.0 V
Saturated CTR	$CTR_{(SAT)}$	500	—	—	%	I_F=10 mA, V_{CE}=1.0 V

Switching Times (Typical)

Figure 1. Linear operation (without saturation)

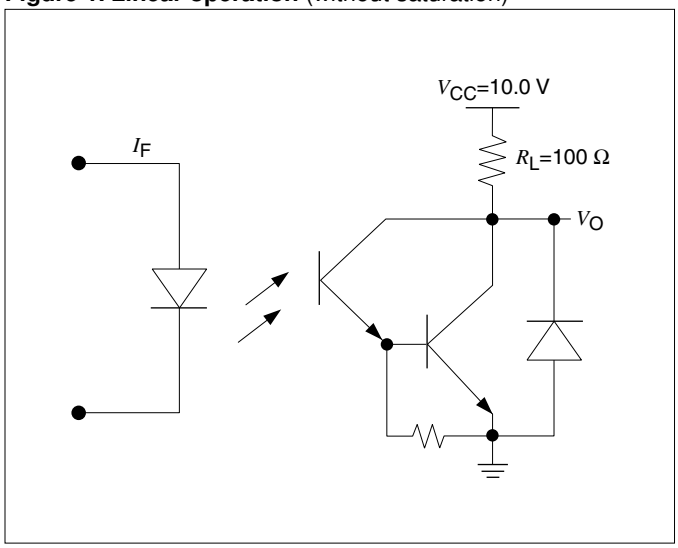


Table 2. Switching Times, I_F=10.0 mA, V_{CC}=10.0 V, T_A=25°C

Parameter	Symbol	Value	Unit
Load Resistance	R_L	100	Ω
Rise Time	t_r	3.5	µs
Fall Time	t_f	14.5	
Turn-on Time	t_{on}	4.5	
Turn-off Time	t_{off}	29.0	

Table 3. Switching Times, I_F=16.0 mA, V_{CC}=10.0 V, T_A=25°C

Parameter	Symbol	Value	Unit
Load Resistance	R_L	180	Ω
Rise Time	t_r	1.0	µs
Fall Time	t_f	20.5	
Turn-on Time	t_{on}	1.5	
Turn-off Time	t_{off}	53.5	