

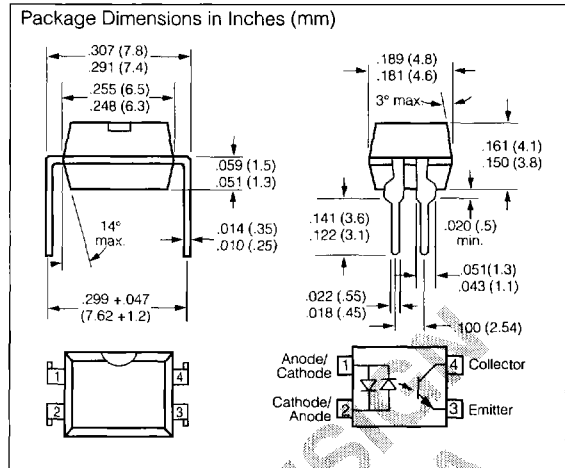
## SFH 628 PHOTOTRANSISTOR, 5.3 KV, TRIOS®\* LOW CURRENT, AC INPUT OPTOCOUPLER

### FEATURES

- **Very High CTR at  $I_F=1$  mA**  
SFH628-2, 63-200%
- **SFH628-3, 100-320%**
- **SFH628-4, 160-500%**
- **Specified Minimum CTR at  $I_F=0.5$  mA,  $V_{CE}=1.5$  V:  $\geq 50\%$  (typ. 160%)**
- **Good CTR Linearity with Forward Current**
- **Low CTR Degradation**
- **High Collector-Emitter Voltage  $V_{CEO}=55$  V**
- **Isolation Test Voltage: 5300 V**
- **AC-Input with Two Bidirectional GaAs-IR-Emitters**
- **Low Coupling Capacitance**
- **High Common Mode Transient Immunity**
- **Phototransistor Optocoupler in 4 Pin DIP Package**
- **End-stackable, 0.100" (2.54 mm) Spacing**
- **Applications**
  - Telecom
  - Industrial Controls
  - Line Monitoring
- **VDE #0884 Available with Option 1**

### DESCRIPTION

The SFH 628 is an optical coupler with two GaAs infrared LEDs and a silicon NPN phototransistor. Signal information, including a DC level, can be transmitted by the device while maintaining a high degree of electrical isolation between input and output.



### Maximum Ratings ( $T_A=25^\circ\text{C}$ )

#### Emitter

DC Forward Current	$\pm 50$ mA
Surge Forward Current: ( $t_r < 10 \mu\text{s}$ )	$\geq 5$ A
Total Power Dissipation at $25^\circ\text{C}$	70 mW

#### Detector

Collector-Emitter Voltage	55 V
Emitter-Collector Voltage	7 V
Collector Current	10 mA
Surge Collector Current: ( $t_r < 10 \mu\text{s}$ )	100 mA
Total Power Dissipation at $25^\circ\text{C}$	150 mW

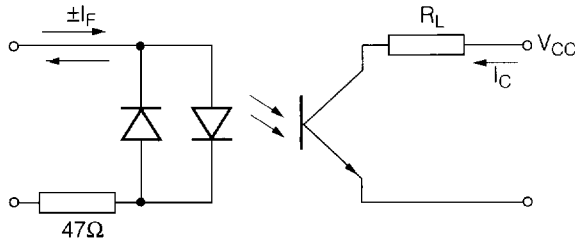
#### Package

Isolation Test Voltage (between emitter and detector referred to climate DIN 40046 part 2 Nov. 74) ( $t=1$ sec.)	7500 VAC <sub>PK</sub> /5300 VAC <sub>RMS</sub>
Isolation Resistance	
$V_{IO}=500$ V, $T_A=25^\circ\text{C}$	$\geq 10^{12} \Omega$
$V_{IO}=500$ V, $T_A=100^\circ\text{C}$	$\geq 10^{11} \Omega$
Creepage	7 mm
Clearance	7 mm
Comparative Tracking Index per DIN IEC 112/VDE 0303, part 1	175
Storage Temperature Range	$-55^\circ\text{C}$ to $+150^\circ\text{C}$
Operating Temperature Range	$-55^\circ\text{C}$ to $+100^\circ\text{C}$
Junction Temperature	$100^\circ\text{C}$
Soldering Temperature (max. 10 sec., dip soldering: distance to seating plane $> 1.5$ mm)	$260^\circ\text{C}$

\*TRansparent IO n Shield

**Characteristics** ( $T_A=25^\circ\text{C}$ , if not otherwise specified)

	Symbol	Typ.	Unit	Condition
<b>Emitter</b>				
Forward Voltage	$V_F$	$\pm 1.1$ ( $\leq 1.5$ )	V	$I_F = \pm 5$ mA
Capacitance	$C_O$	45	pF	$V_R = 0$ V, $f = 1$ MHz
Thermal Resistance	$R_{thJA}$	1070	K/W	
<b>Detector</b>				
Collector-Emitter Voltage	$V_{CEO}$	$\geq 55$	V	$I_{CE} = 10$ $\mu$ A
Emitter-Collector Voltage	$V_{ECO}$	$\geq 7$	V	$I_{EC} = 10$ $\mu$ A
Capacitance	$C_{CE}$	7	pF	$V_{CE} = 5$ V, $f = 1$ MHz
Thermal Resistance	$R_{thJA}$	500	K/W	
<b>Package</b>				
Coupling-Capacitance	$C_C$	0.25	pF	
Coupling Transfer Ratio				
SFH 628-2	$I_C/I_F$	63-200	%	$I_F = \pm 1$ mA, $V_{CE} = 0.5$ V
		100 ( $\geq 32$ )	%	$I_F = \pm 0.5$ mA, $V_{CE} = 1.5$ V
SFH 628-3	$I_C/I_F$	100-320	%	$I_F = \pm 1$ mA, $V_{CE} = 0.5$ V
		160 ( $\geq 50$ )	%	$I_F = \pm 0.5$ mA, $V_{CE} = 1.5$ V
SFH 628-4	$I_C/I_F$	160-500	%	$I_F = \pm 1$ mA, $V_{CE} = 0.5$ V
		250 ( $\geq 80$ )	%	$I_F = \pm 0.5$ mA, $V_{CE} = 1.5$ V
Collector-Emitter Saturation Voltage				
SFH 628-2	$V_{CEsat}$	0.25 ( $\leq 0.4$ )	V	$I_C = 0.5$ mA, $I_F = \pm 1$ mA
SFH 628-3	$V_{CEsat}$	0.25 ( $\leq 0.4$ )	V	$I_C = 0.8$ mA, $I_F = \pm 1$ mA
SFH 628-4	$V_{CEsat}$	0.25 ( $\leq 0.4$ )	V	$I_C = 1.25$ mA, $I_F = \pm 1$ mA



Switching Times, Typical

$V_{CC} = 5$  V,  $I_C = 2$  mA,  $R_L = 100$   $\Omega$ ,  $T_A = 25^\circ\text{C}$

Turn-On Time	$t_{ON}$	6.0	$\mu$ s
Rise Time	$t_R$	3.5	$\mu$ s
Turn-Off Time	$t_{OFF}$	5.5	$\mu$ s
Fall Time	$t_F$	5.0	$\mu$ s