

SFH617G-1X, SFH617G-2X, SFH617G-3X, SFH617G-4X  
 SFH617G-1, SFH617G-2, SFH617G-3, SFH617G-4



**LOW INPUT CURRENT  
 PHOTOTRANSISTOR  
 OPTICALLY COUPLED ISOLATORS**

**APPROVALS**

- UL recognised, File No. E91231
- 'X' SPECIFICATION APPROVALS**
- VDE0884
  - Certified to EN60950 by the following Test Bodies :-  
 Nemko - Certificate No. P01102465  
 Fimko - Certificate No. FI18162  
 Semko - Reference No. 0202041/01-25  
 Demko - Certificate No. 311161-01

**DESCRIPTION**

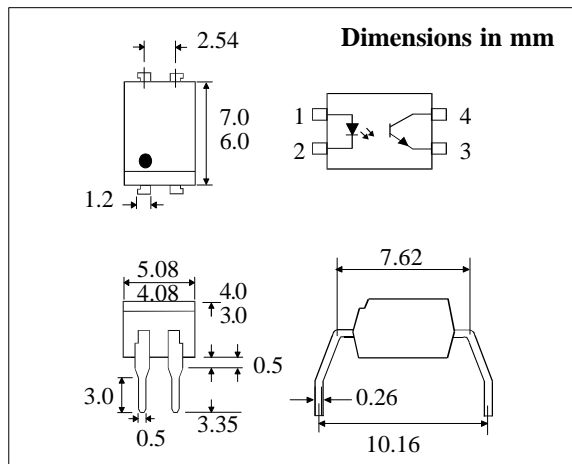
The SFH617G series of optically coupled isolators consist of infrared light emitting diodes and NPN silicon photo transistors in space efficient dual in line plastic packages.

**FEATURES**

- 10mm lead spread
- Low input current 1mA  $I_F$
- High Current Transfer Ratios (40-320% at 10mA, 13% min at 1mA)
- High Isolation Voltage (5.3kV<sub>RMS</sub>, 7.5kV<sub>PK</sub>)
- High  $BV_{CEO}$  (70V min)
- All electrical parameters 100% tested
- Custom electrical selections available

**APPLICATIONS**

- Computer terminals
- Industrial systems controllers
- Measuring instruments
- Signal transmission between systems of different potentials and impedances



**ABSOLUTE MAXIMUM RATINGS  
 (25°C unless otherwise specified)**

Storage Temperature \_\_\_\_\_ -55°C to + 125°C  
 Operating Temperature \_\_\_\_\_ -30°C to + 100°C  
 Lead Soldering Temperature  
 (1/16 inch (1.6mm) from case for 10 secs) 260°C

**INPUT DIODE**

Forward Current \_\_\_\_\_ 50mA  
 Reverse Voltage \_\_\_\_\_ 6V  
 Power Dissipation \_\_\_\_\_ 70mW

**OUTPUT TRANSISTOR**

Collector-emitter Voltage  $BV_{CEO}$  \_\_\_\_\_ 70V  
 Emitter-collector Voltage  $BV_{ECO}$  \_\_\_\_\_ 6V  
 Power Dissipation \_\_\_\_\_ 150mW

**POWER DISSIPATION**

Total Power Dissipation \_\_\_\_\_ 200mW  
 (derate linearly 2.67mW/°C above 25°C)

**ISOCOM COMPONENTS LTD**  
 Unit 25B, Park View Road West,  
 Park View Industrial Estate, Brenda Road  
 Hartlepool, Cleveland, TS25 1YD  
 Tel: (01429) 863609 Fax :(01429) 863581

**ISOCOM INC**  
 1024 S. Greenville Ave, Suite 240,  
 Allen, TX 75002 USA  
 Tel: (214) 495-0755 Fax: (214) 495-0901  
 e-mail info@isocom.com  
 http://www.isocom.com

**ELECTRICAL CHARACTERISTICS (  $T_A = 25^\circ\text{C}$  Unless otherwise noted )**

| PARAMETER                                   |   | MIN       | TYP | MAX      | UNITS                           | TEST CONDITION  |
|---|---|-----------|-----|----------|---------------------------------|---|
| Input                                       | Forward Voltage ( $V_F$ )                                   |           |     | 1.65     | V                               | $I_F = 50\text{mA}$<br>$I_R = 10\mu\text{A}$<br>$V_R = 6\text{V}$     |
|   | Reverse Voltage ( $V_R$ )                                   | 6         |     |          | V                               |   |
|   | Reverse Current ( $I_R$ )                                   |           |     | 10       | $\mu\text{A}$                   |   |
| Output                                      | Collector-emitter Breakdown ( $BV_{CEO}$ )<br>( Note 2 )    | 70        |     |          | V                               | $I_C = 1\text{mA}$<br>$I_E = 100\mu\text{A}$<br>$V_{CE} = 10\text{V}$ |
|   | Emitter-collector Breakdown ( $BV_{ECO}$ )                  | 6         |     |          | V                               |   |
|   | Collector-emitter Dark Current ( $I_{CEO}$ )<br>SFH617G-1,2 |           |     | 50       | nA                              |   |
|   | SFH617G-3,4   |           |     | 100      | nA                              |   |
| Coupled                                     | Current Transfer Ratio (CTR) (Note 2)                       | SFH617G-1 | 40  | 80       | %                               | $10\text{mA } I_F, 5\text{V } V_{CE}$                                 |
|   |   | SFH617G-2 | 63  | 125      | %                               |   |
|   |   | SFH617G-3 | 100 | 200      | %                               |   |
|   |   | SFH617G-4 | 160 | 320      | %                               |   |
|   |   | SFH617G-1 | 13  |          | %                               | $1\text{mA } I_F, 5\text{V } V_{CE}$                                  |
|   |   | SFH617G-2 | 22  |          | %                               |   |
|   |   | SFH617G-3 | 34  |          | %                               |   |
|   |   | SFH617G-4 | 56  |          | %                               |   |
|   | Collector-emitter Saturation Voltage $V_{CESAT}$            |           |     | 0.4      | V                               | $10\text{mA } I_F, 2.5\text{mA } I_C$                                 |
|   | Input to Output Isolation Voltage $V_{ISO}$                 | 5300      |     |          | $V_{RMS}$                       | See note 1  |
|   | 7500  |           |     | $V_{PK}$ | See note 1                      |   |
| Input-output Isolation Resistance $R_{ISO}$ | $5 \times 10^{10}$  |           |     | $\Omega$ | $V_{IO} = 500\text{V}$ (note 1) |   |

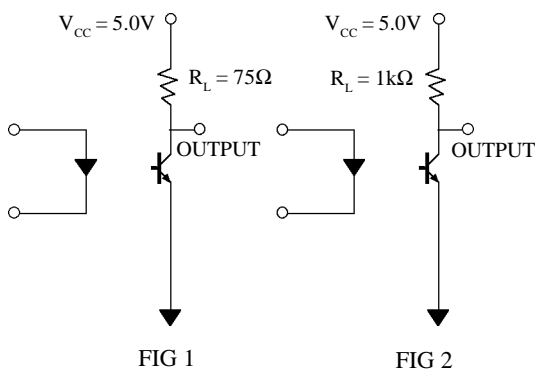
Note 1 Measured with input leads shorted together and output leads shorted together.

Note 2 Special Selections are available on request. Please consult the factory.

**SWITCHING CHARACTERISTICS**

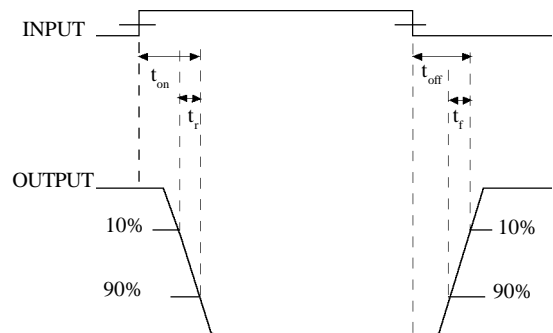
1. Linear Operation (without saturation) Fig 1.  
 $I_F = 10\text{mA}$ ,  $V_{CC} = 5\text{V}$ ,  $R_L = 75\Omega$

|                   |           |     | UNITS         |
|-------------------|-----------|-----|---------------|
| Turn-on Time      | $t_{on}$  | 3.0 | $\mu\text{s}$ |
| Rise Time         | $t_r$     | 2.0 | $\mu\text{s}$ |
| Turn-off Time     | $t_{off}$ | 2.3 | $\mu\text{s}$ |
| Fall Time         | $t_f$     | 2.0 | $\mu\text{s}$ |
| Cut-off Frequency | $F_{CO}$  | 250 | kHz           |

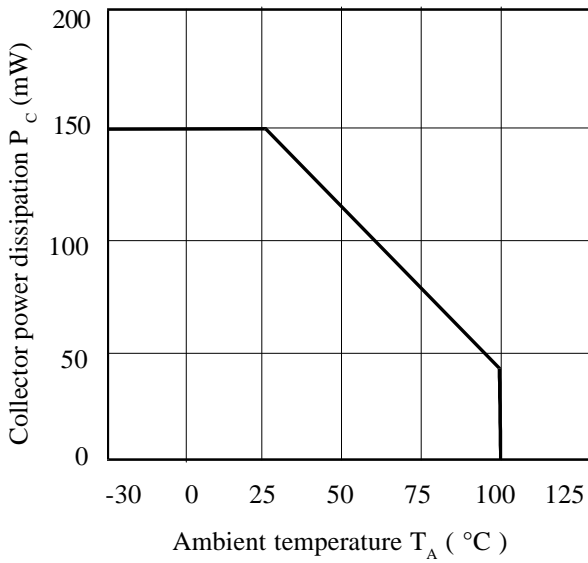


2. Switching Operation (with saturation) Fig 2  
 $V_{CC} = 5\text{V}$ ,  $R_L = 1\text{k}\Omega$

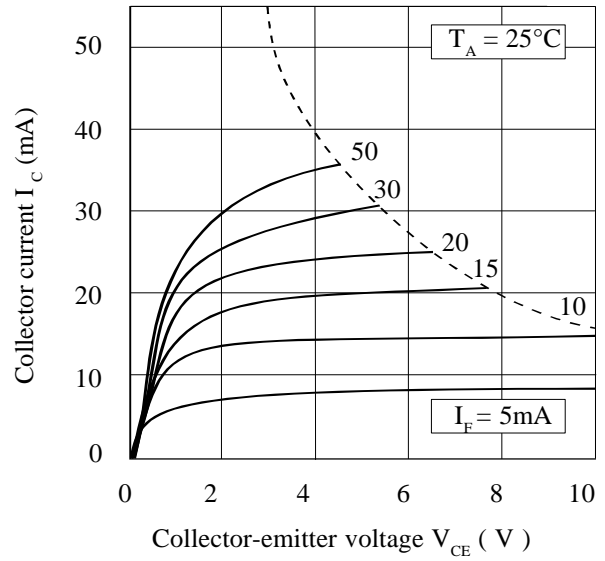
| GROUP         | -1<br>( $I_F=20\text{mA}$ ) | -2 and -3<br>( $I_F=10\text{mA}$ ) | -4<br>( $I_F=5\text{mA}$ ) | UNITS      |               |
|---------------|-----------------------------|------------------------------------|----------------------------|------------|---------------|
| Turn-on Time  | $t_{on}$                    | 3.0                                | 4.2                        | 6.0        | $\mu\text{s}$ |
| Rise Time     | $t_r$                       | 2.0                                | 3.0                        | 4.6        | $\mu\text{s}$ |
| Turn-off Time | $t_{off}$                   | 18                                 | 23                         | 25         | $\mu\text{s}$ |
| Fall Time     | $t_f$                       | 11                                 | 14                         | 15         | $\mu\text{s}$ |
| $V_{CESAT}$   |                             |                                    |                            | $\leq 0.4$ | V             |



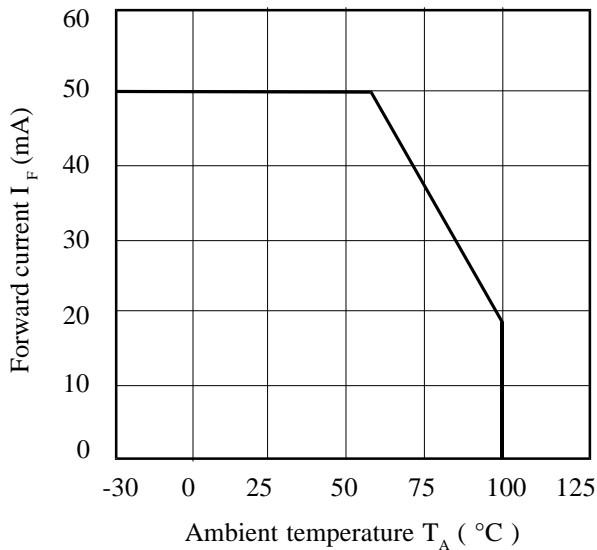
**Collector Power Dissipation vs. Ambient Temperature**



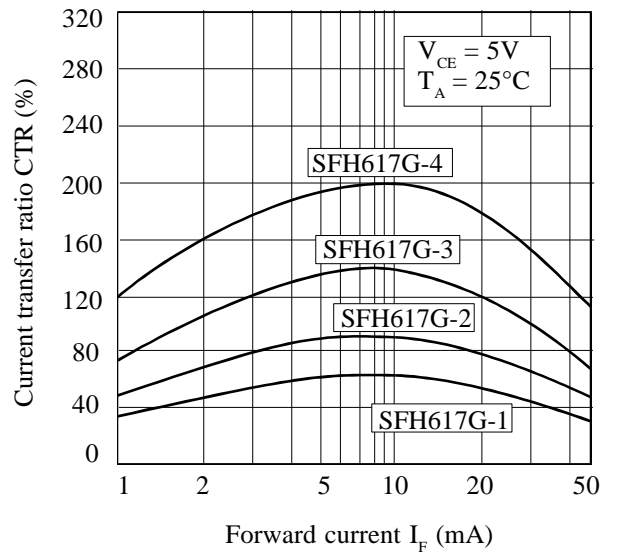
**Collector Current vs. Collector-emitter Voltage (normalised to SFH617G-3)**



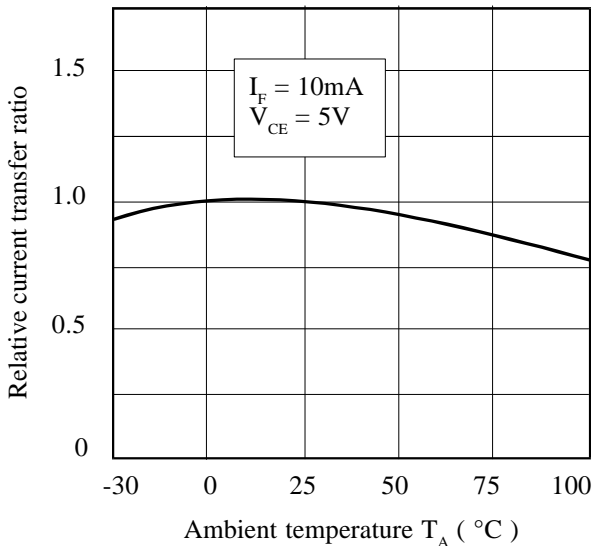
**Forward Current vs. Ambient Temperature**



**Current Transfer Ratio vs. Forward Current**



**Relative Current Transfer Ratio vs. Ambient Temperature**



**Collector-emitter Saturation Voltage vs. Ambient Temperature**

