



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

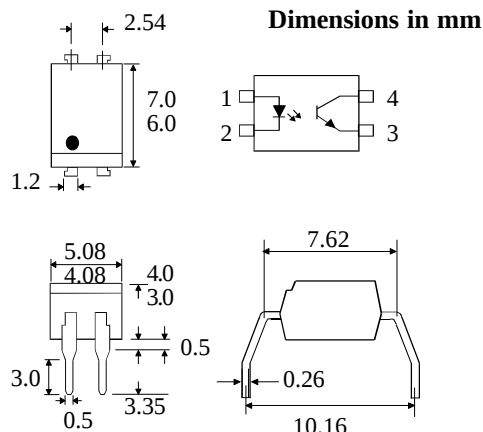
The SFH617G series of optically coupled isolators consist of infrared light emitting diodes and NPN silicon photo transistors in space efficient dual in line plastic packages.

FEATURES

- 10mm lead spread
- Low input current $1\text{mA } I_F$
- High Current Transfer Ratios (40-320% at 10mA, 13% min at 1mA)
- High Isolation Voltage ($5.3\text{kV}_{\text{RMS}}, 7.5\text{kV}_{\text{PK}}$)
- 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)

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

PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITION
Input	Forward Voltage (V _F)	6		1.65	V	I _F = 50mA
	Reverse Voltage (V _R)			V	I _R = 10μA	
	Reverse Current (I _R)			10	μA	V _R = 6V
Output	Collector-emitter Breakdown (BV _{CEO}) (Note 2)	70			V	I _C = 1mA
	Emitter-collector Breakdown (BV _{ECO})	6			V	I _E = 100μA
	Collector-emitter Dark Current (I _{CEO})					
	SFH617G-1,2	50		nA	V _{CE} = 10V	
	SFH617G-3,4	100		nA		
Coupled	Current Transfer Ratio (CTR) (Note 2)					
	SFH617G-1	40		80	%	10mA I _F , 5V V _{CE}
	SFH617G-2	63		125	%	
	SFH617G-3	100		200	%	
	SFH617G-4	160		320	%	
	SFH617G-1	13			%	1mA I _F , 5V V _{CE}
	SFH617G-2	22			%	
	SFH617G-3	34			%	
	SFH617G-4	56			%	
	Collector-emitter Saturation Voltage V _{CESAT}			0.4	V	10mA I _F , 2.5mA 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}	5x10 ¹⁰		Ω	V _{IO} = 500V (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	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

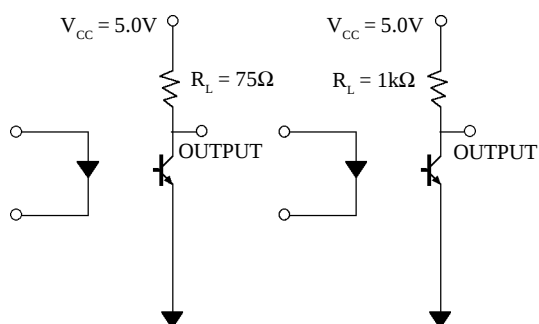
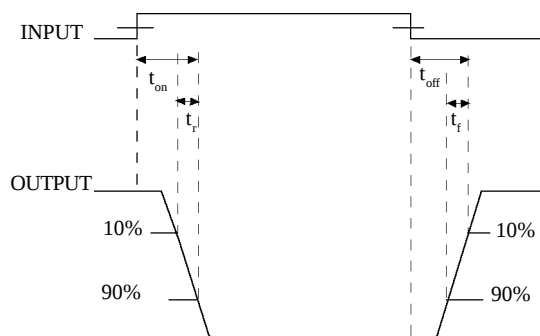


FIG 1

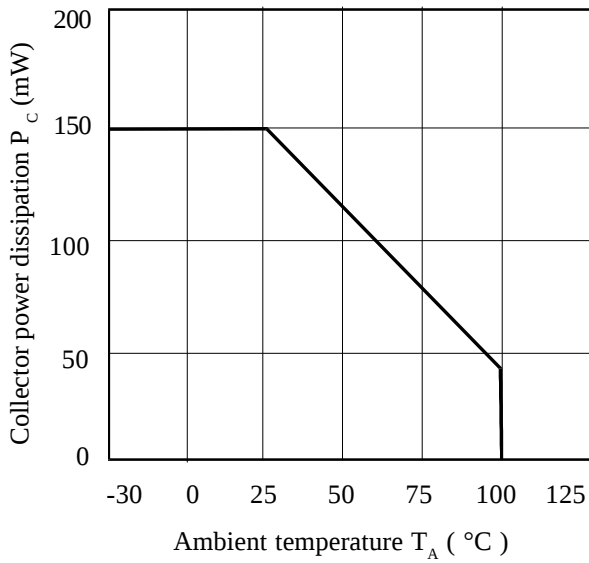
FIG 2

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

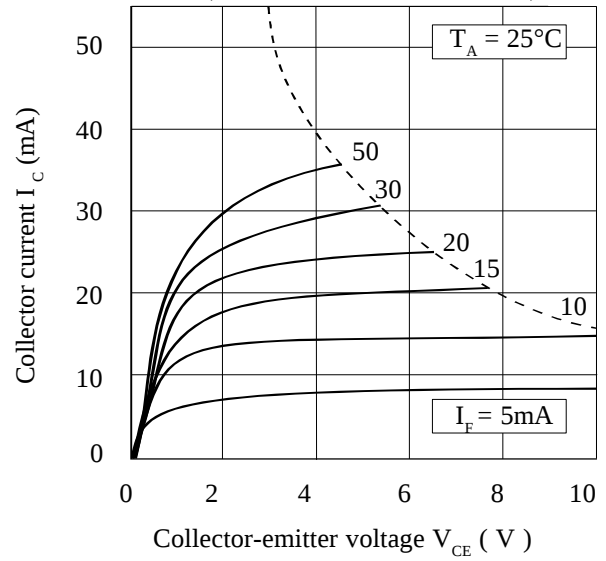
GROUP	-1 ($I_F = 20\text{mA}$)	-2 and -3 ($I_F = 10\text{mA}$)	-4 ($I_F = 5\text{mA}$)	UNITS
Turn-on Time t_{on}	3.0	4.2	6.0	μs
Rise Time t_r	2.0	3.0	4.6	μs
Turn-off Time t_{off}	18	23	25	μs
Fall Time t_f	11	14	15	μs
V_{CESAT}	≤ 0.4			V



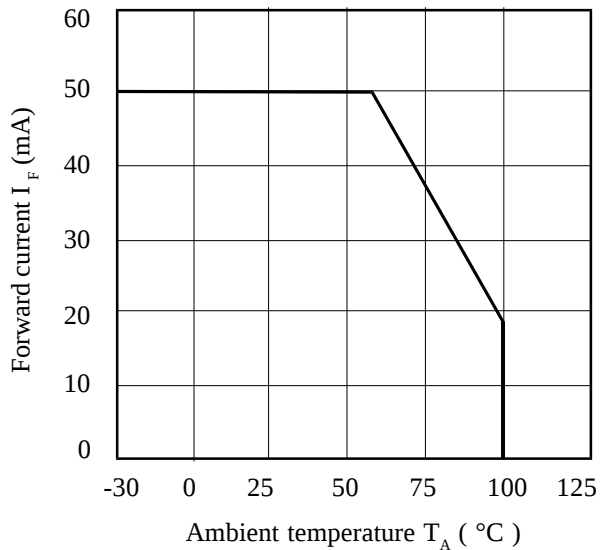
Collector Power Dissipation vs. Ambient Temperature



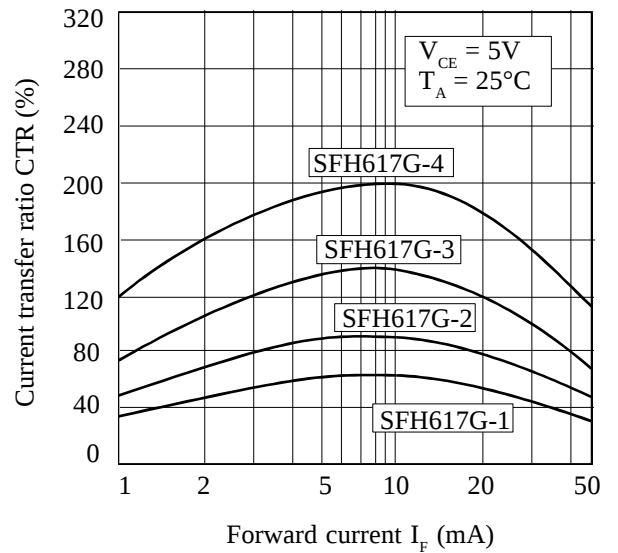
**Collector Current vs. Collector-emitter Voltage
(normalised to SFH617G-3)**



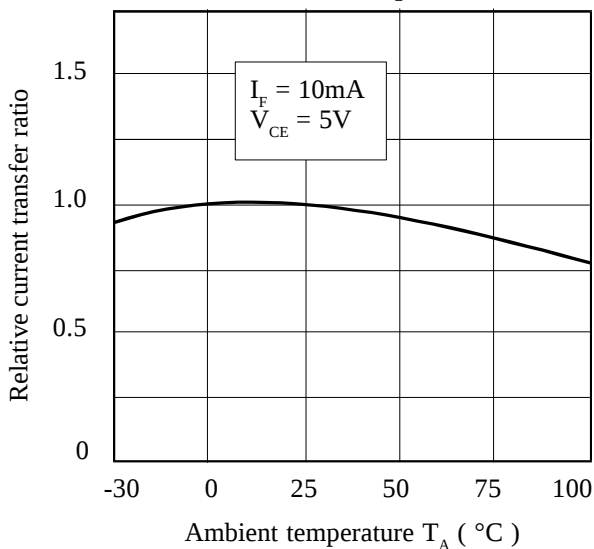
Forward Current vs. Ambient Temperature



Current Transfer Ratio vs. Forward Current



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



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

