

SFH610-2X, SFH610-3X, SFH610-4X
SFH610-2, SFH610-3, SFH610-4



LOW INPUT CURRENT PHOTOTRANSISTOR OPTICALLY COUPLED ISOLATORS

APPROVALS

- UL recognised, File No. E91231

'X' SPECIFICATION APPROVALS

- VDE 0884 in 3 available lead form : -
 - STD
 - G form
 - SMD approved to CECC 00802

DESCRIPTION

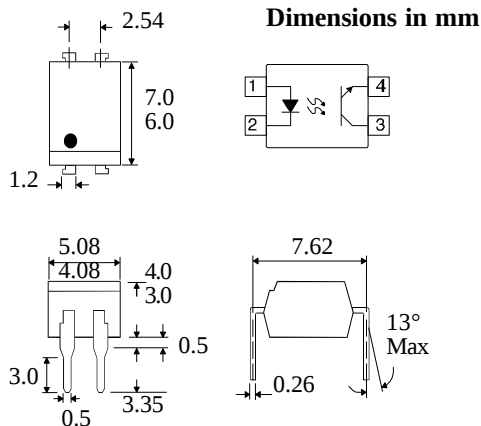
The SFH610 series of optically coupled isolators consist of infrared light emitting diodes and NPN silicon photo transistors in space efficient dual in line plastic packages.

FEATURES

- Options :-
 - 10mm lead spread - add G after part no.
 - Surface mount - add SM after part no.
 - Tape&reel - add SMT&R after part no.
- Low input current $1\text{mA } I_F$
- High Current Transfer Ratios (63-320% at 10mA, 22% 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 _____ -55°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

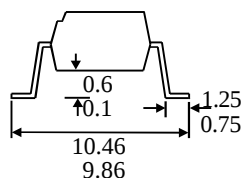
OUTPUT TRANSISTOR

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

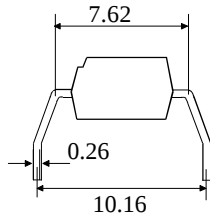
POWER DISSIPATION

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

OPTION SM SURFACE MOUNT



OPTION G



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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	$I_F = 50\text{mA}$
	Reverse Voltage (V_R)			V	$I_R = 10\mu\text{A}$	
	Reverse Current (I_R)			10	μA	$V_R = 6\text{V}$
Output	Collector-emitter Breakdown (BV_{CEO}) (Note 2)	70			V	$I_C = 1\text{mA}$
	Emitter-collector Breakdown (BV_{ECO})	6			V	$I_E = 100\mu\text{A}$
	Collector-emitter Dark Current (I_{CEO}) SFH610-2			50	nA	$V_{CE} = 10\text{V}$
	SFH610-3,4			100	nA	
Coupled	Current Transfer Ratio (CTR) (Note 2)					
	SFH610-2	63		125	%	$10\text{mA } I_F, 5\text{V } V_{CE}$
	SFH610-3	100		200	%	
	SFH610-4	160		320	%	
	SFH610-2	22			%	$1\text{mA } I_F, 5\text{V } V_{CE}$
	SFH610-3	34			%	
	SFH610-4	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}	5×10^{10}		Ω	$V_{IO} = 500\text{V}$ (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	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

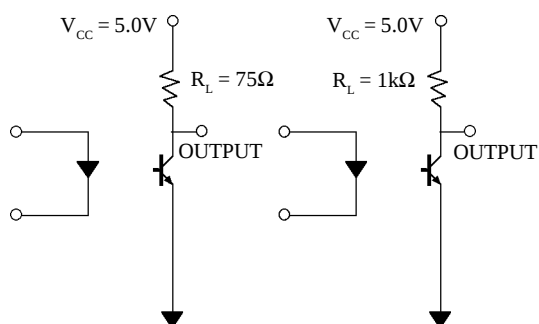
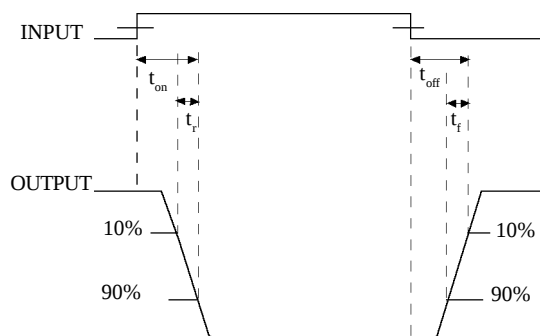


FIG 1

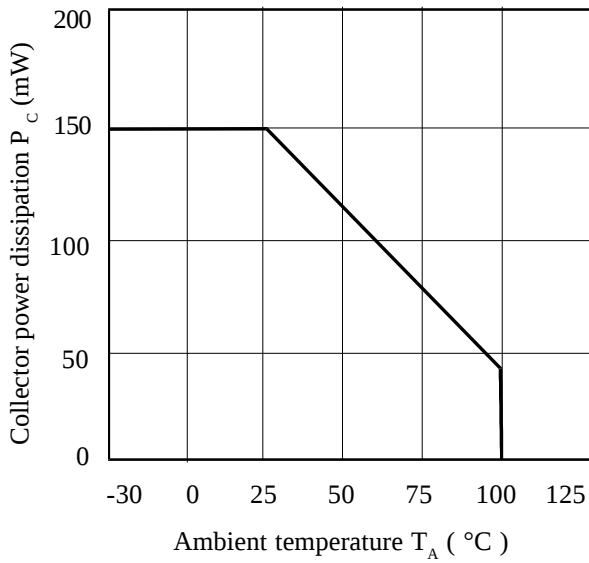
FIG 2

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

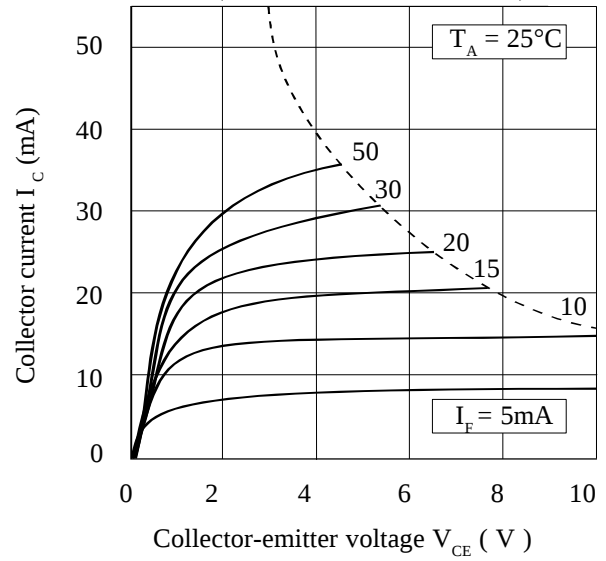
GROUP	-1 ($I_F = 20\text{mA}$)	-2 and -3 ($I_F = 10\text{mA}$)	-4 ($I_F = 5\text{mA}$)	UNITS
Turn-on Time t_{on}	3.0	4.2	6.0	μs
Rise Time t_r	2.0	3.0	4.6	μs
Turn-off Time t_{off}	18	23	25	μs
Fall Time t_f	11	14	15	μs
V_{CESAT}	≤ 0.4			V



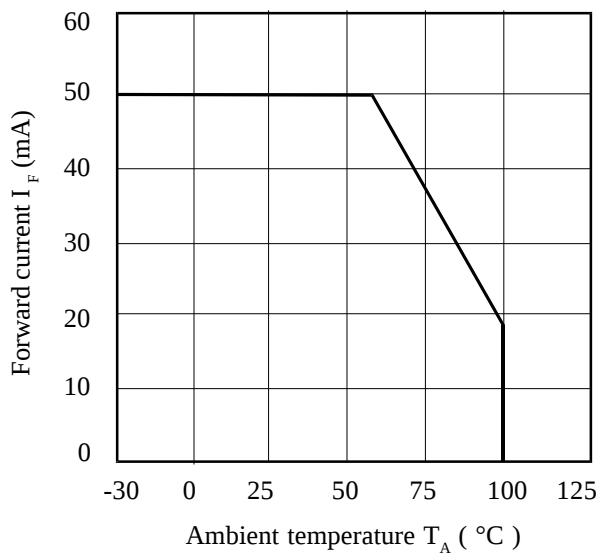
Collector Power Dissipation vs. Ambient Temperature



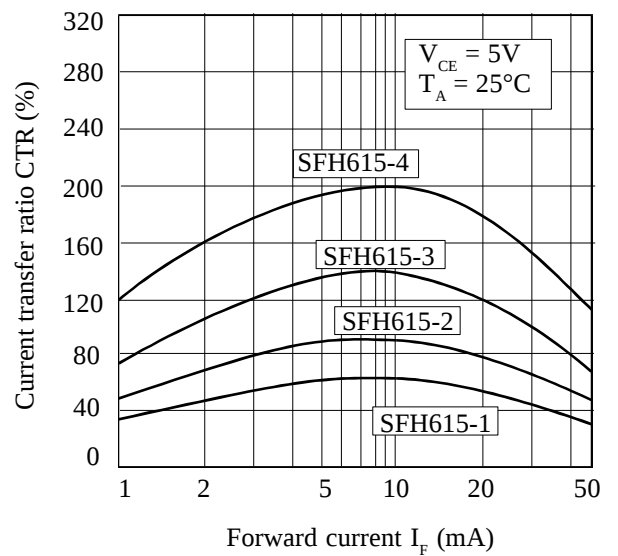
Collector Current vs. Collector-emitter Voltage (normalised to SFH615-3)



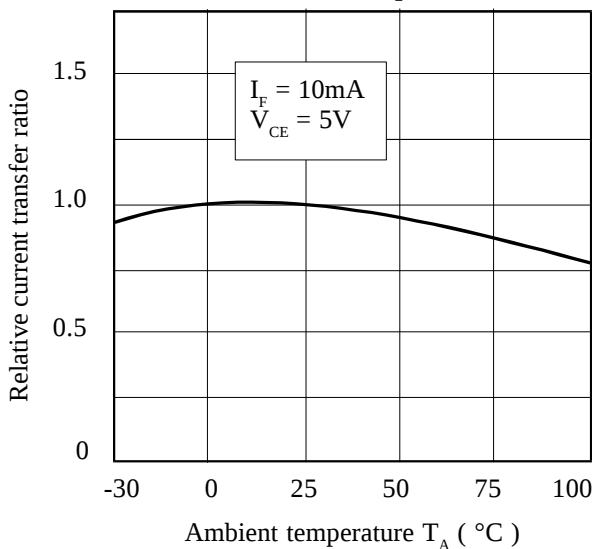
Forward Current vs. Ambient Temperature



Current Transfer Ratio vs. Forward Current



Relative Current Transfer Ratio vs. Ambient Temperature



Collector-emitter Saturation Voltage vs. Ambient Temperature

