

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

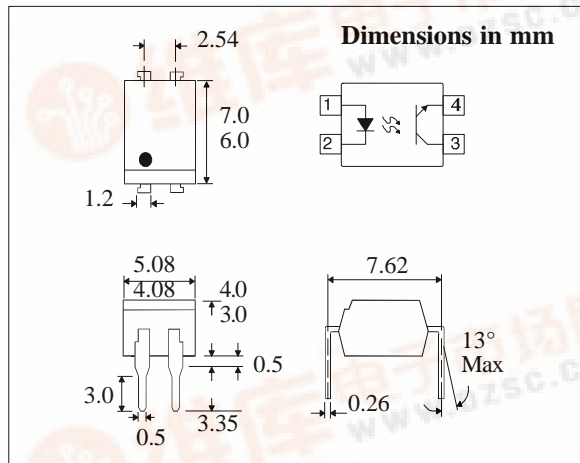
The SFH610 series of optically coupled isolators consist of infrared light emitting diodes and NPN silicon photo transistors in space efficient dual in line plastic packages.

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 1mA I_F
- High Current Transfer Ratios (63-320% at 10mA, 22% min at 1mA)
- High Isolation Voltage (5.3kV_{RMS}, 7.5kV_{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

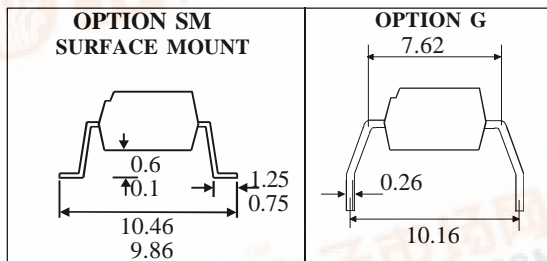
Forward Current	50mA
Reverse Voltage	6V
Power Dissipation	70mW

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)	



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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	$I_F = 50\text{mA}$ $I_R = 10\mu\text{A}$ $V_R = 6\text{V}$
	Reverse Voltage (V_R)				V	
	Reverse Current (I_R)			10	μA	
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

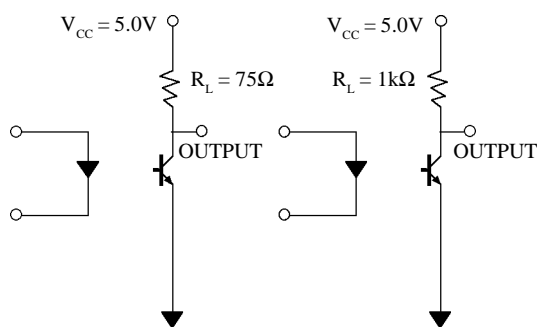
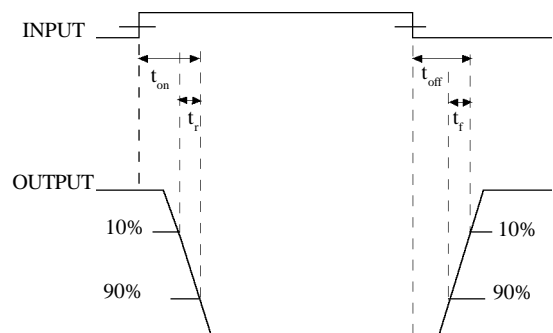


FIG 1

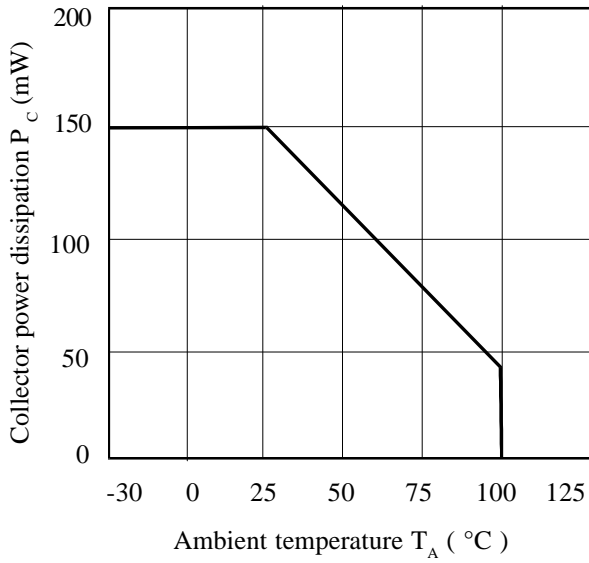
FIG 2

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

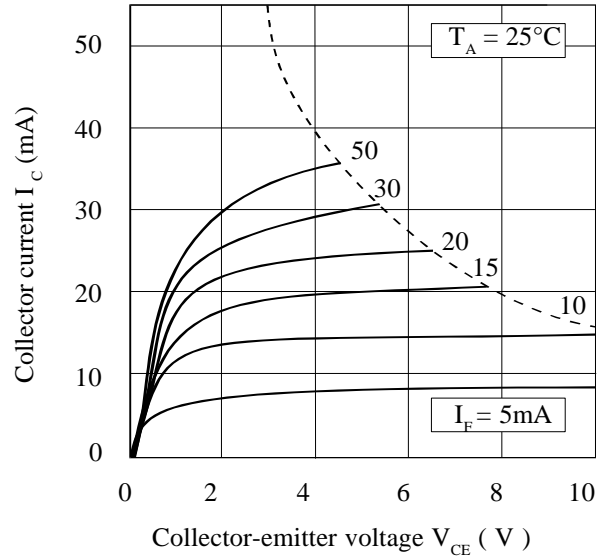
GROUP	-1 ($I_F = 20\text{mA}$)	-2 and -3 ($I_F = 10\text{mA}$)	-4 ($I_F = 5\text{mA}$)	UNITS	
Turn-on Time	t_{on}	3.0	4.2	6.0	μs
Rise Time	t_r	2.0	3.0	4.6	μs
Turn-off Time	t_{off}	18	23	25	μs
Fall Time	t_f	11	14	15	μs
	V_{CESAT}	≤ 0.4			V



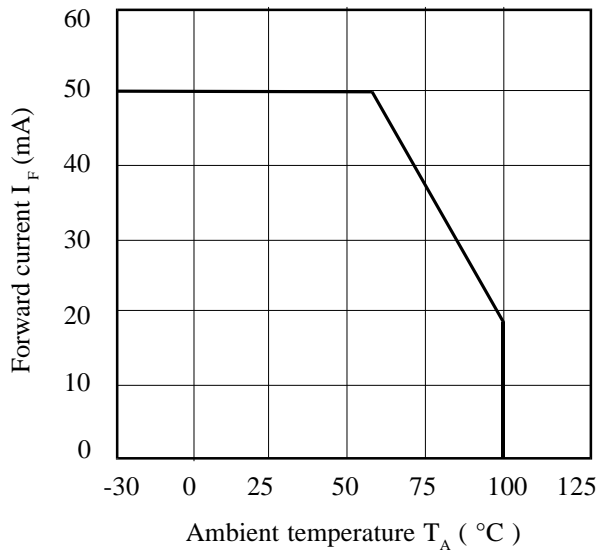
Collector Power Dissipation vs. Ambient Temperature



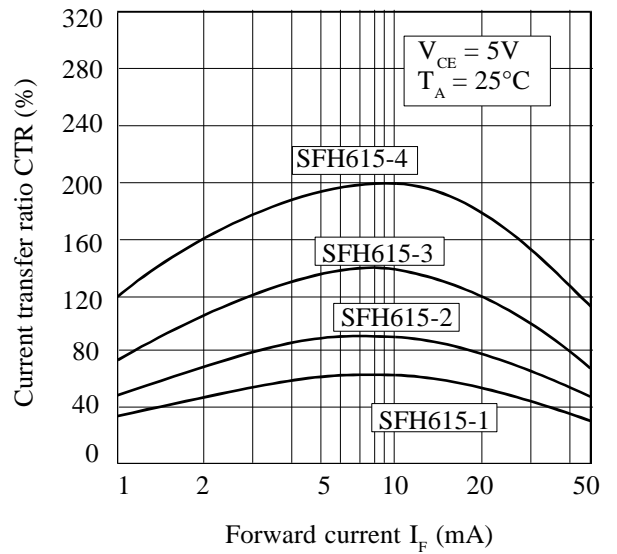
Collector Current vs. Collector-emitter Voltage (normalised to SFH615-3)



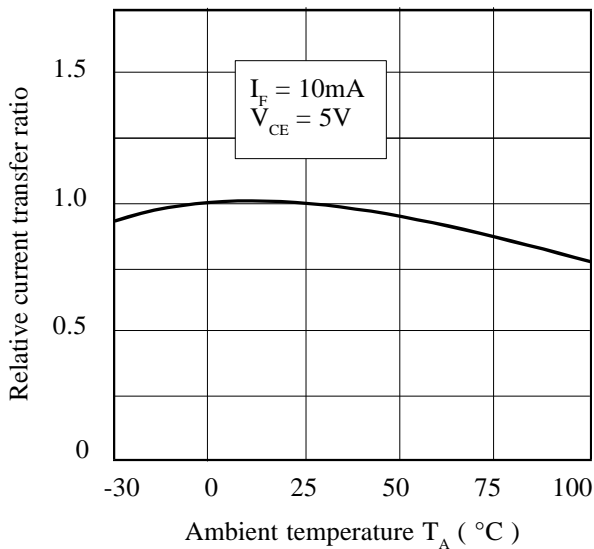
Forward Current vs. Ambient Temperature



Current Transfer Ratio vs. Forward Current



Relative Current Transfer Ratio vs. Ambient Temperature



Collector-emitter Saturation Voltage vs. Ambient Temperature

