



**HIGH DENSITY MOUNTING  
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
  - Certified to EN60950 by the following Test Bodies :-
    - Nemko - Certificate No. P96102022
    - Fimko - Registration No. 192313-01..25
    - Semko - Reference No. 9639052 01
    - Demko - Reference No. 305969

**DESCRIPTION**

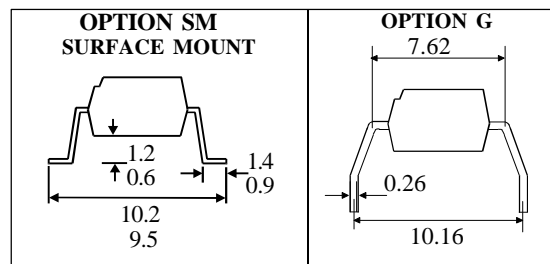
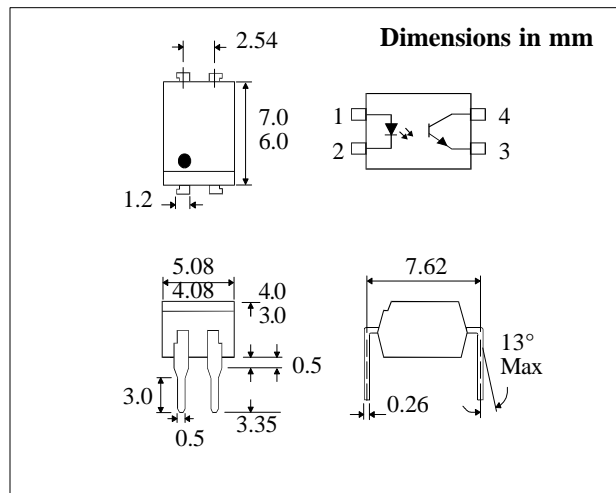
The ISP321-1-88XSM is an optically coupled isolator consisting of infrared light emitting diodes and NPN silicon photo transistors in a space efficient dual in line plastic package.

**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.
- High Current Transfer Ratio ( 80 - 400% )
- High Isolation Voltage ( 5.3kV<sub>RMS</sub> , 7.5kV<sub>PK</sub> )
- High BV<sub>CEO</sub> ( 80Vmin )
- All electrical parameters 100% tested
- External Creepage ≥ 7mm

**APPLICATIONS**

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



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**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 $BV_{CEO}$	80V
Emitter-collector Voltage $BV_{ECO}$	6V
Power Dissipation	150mW

**POWER DISSIPATION**

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

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

PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITION
Input	Forward Voltage ( $V_F$ )	1.0	1.15	1.3	V	$I_F = 10\text{mA}$
	Reverse Voltage ( $V_R$ )	5			V	$I_R = 10\mu\text{A}$
	Reverse Current ( $I_R$ )			10	$\mu\text{A}$	$V_R = 5\text{V}$
Output	Collector-emitter Breakdown ( $BV_{CEO}$ ) ( Note 2 )	80			V	$I_C = 0.5\text{mA}$
	Emitter-collector Breakdown ( $BV_{ECO}$ )	6			V	$I_E = 100\mu\text{A}$
	Collector-emitter Dark Current ( $I_{CEO}$ )			100	nA	$V_{CE} = 48\text{V}$
Coupled	Current Transfer Ratio (CTR) (Note 2)	80		400	%	$5\text{mA } I_F, 5\text{V } V_{CE}$
	Collector-emitter Saturation Voltage $V_{CE(SAT)}$			0.4	V	$8\text{mA } I_F, 2.4\text{mA } I_C$
	Input to Output Isolation Voltage $V_{ISO}$	5300 7500			$V_{RMS}$ $V_{PK}$	See note 1
	Input-output Isolation Resistance $R_{ISO}$	$5 \times 10^{10}$			$\Omega$	$V_{IO} = 500\text{V}$ (note 1)
	Rise Time tr		2		$\mu\text{s}$	$V_{CC} = 10\text{V}$ ,
	Fall Time tf		3		$\mu\text{s}$	$I_C = 2\text{mA}, R_L = 100\Omega$
	Turn-on Time ton		3		$\mu\text{s}$	
Turn-off Time toff		3		$\mu\text{s}$		

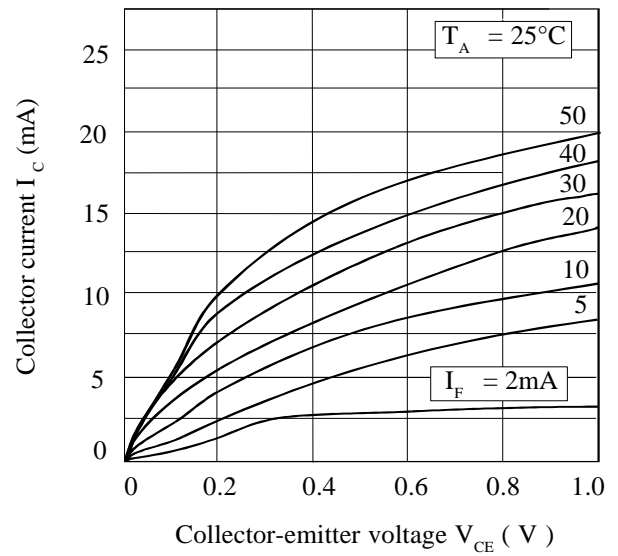
Note 1 Measured with input leads shorted together and output leads shorted together.

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

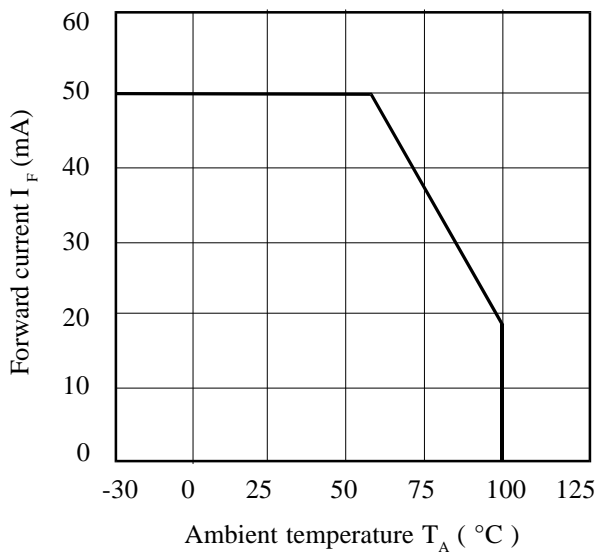
**Collector Power Dissipation vs. Ambient Temperature**



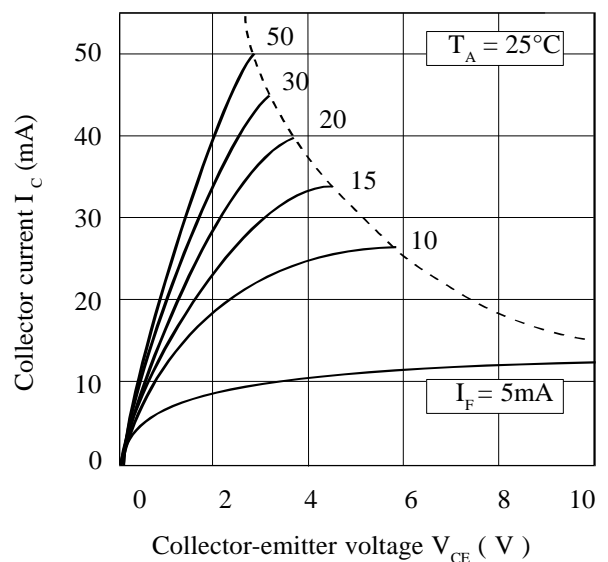
**Collector Current vs. Low Collector-emitter Voltage**



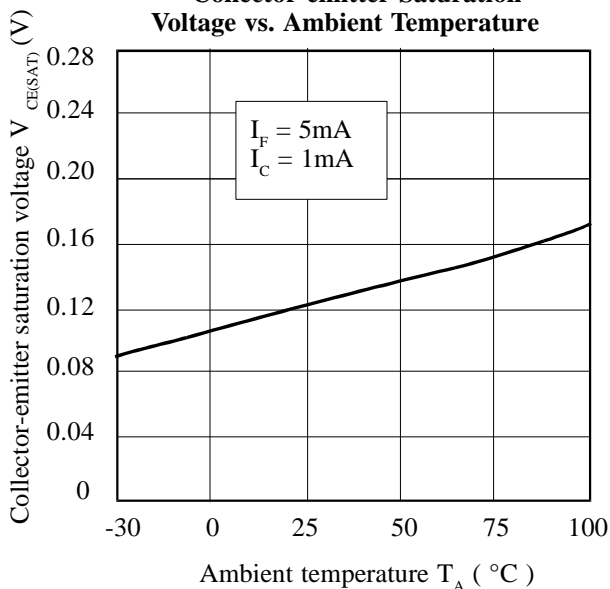
**Forward Current vs. Ambient Temperature**



**Collector Current vs. Collector-emitter Voltage**



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



**Current Transfer Ratio vs. Forward Current**

