

ISP817X,ISP827X,ISP847X3,2,1  
ISP817,ISP827,ISP847-3,-2,-1



**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
- 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 ISP817-3,-2,-1, ISP827-3,-2,-1, ISP847-3,-2,-1 series of optically coupled isolators consist of infrared light emitting diodes and NPN silicon photo transistors in space efficient dual in line plastic packages.

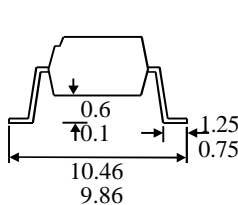
**FEATURES**

- 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 0.5mA  $I_F$
- High Current Transfer Ratio (50% min)
- High Isolation Voltage (5.3kV<sub>RMS</sub>, 7.5kV<sub>PK</sub>)
- High BV<sub>CEO</sub> (70V min)
- All electrical parameters 100% tested
- Custom electrical selections available

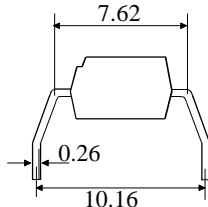
**APPLICATIONS**

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

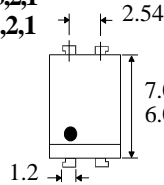
**OPTION SM  
SURFACE MOUNT**



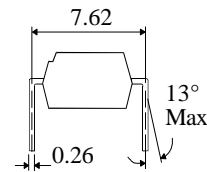
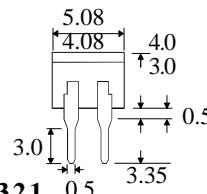
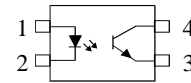
**OPTION G**



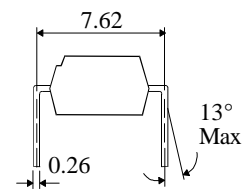
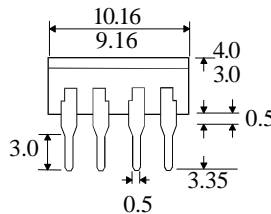
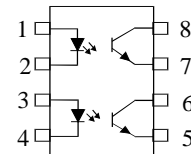
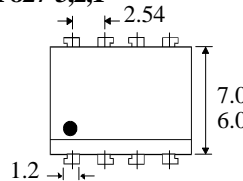
**ISP817X3,2,1  
ISP817-3,2,1**



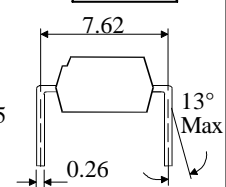
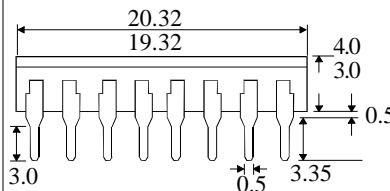
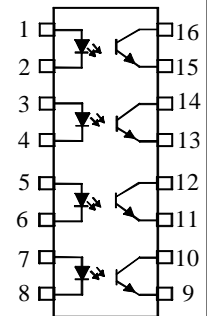
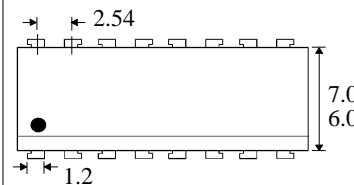
**Dimensions in mm**



**ISP827X3,2,1  
ISP827-3,2,1**



**ISP847X3,2,1  
ISP847-3,2,1**



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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	10V
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)	

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

PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITION
Input	Forward Voltage ( $V_F$ )		1.2	1.4	V	$I_F = 20\text{mA}$
	Reverse Voltage ( $V_R$ )	10			V	$I_R = 10\mu\text{A}$
	Reverse Current ( $I_R$ )			10	$\mu\text{A}$	$V_R = 10\text{V}$
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 ( $I_{CEO}$ )			100	nA	$V_{CE} = 20\text{V}$
Coupled	Current Transfer Ratio (CTR) (Note 2)				%	
	ISP817-3, ISP827-3, ISP847-3	70			%	$0.5\text{mA } I_F, 0.4\text{V } V_{CE}$
		100			%	$1.0\text{mA } I_F, 0.4\text{V } V_{CE}$
	ISP817-2, ISP827-2, ISP847-2	50			%	$0.5\text{mA } I_F, 0.4\text{V } V_{CE}$
	ISP817-1, ISP827-1, ISP847-1	50			%	$1.0\text{mA } I_F, 0.4\text{V } V_{CE}$
	Collector-emitter Saturation Voltage -3			0.4	V	$0.5\text{mA } I_F, 0.35\text{mA } I_C$
	-2			0.4	V	$0.5\text{mA } I_F, 0.25\text{mA } I_C$
	-1			0.4	V	$1.0\text{mA } I_F, 0.5\text{mA } I_C$
	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)	
Output Rise Time $t_r$		4	18	$\mu\text{s}$	$V_{CE} = 2\text{V}$ ,	
Output Fall Time $t_f$		3	18	$\mu\text{s}$	$I_C = 0.2\text{mA}, R_L = 100\Omega$	

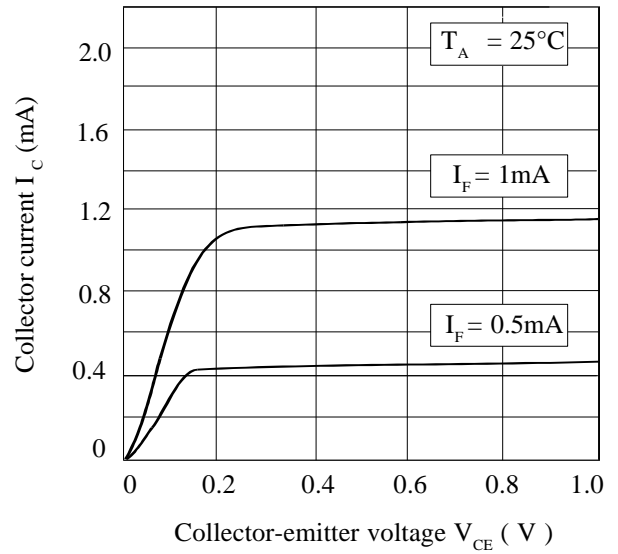
Note 1 Measured with input leads shorted together and output leads shorted together.

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

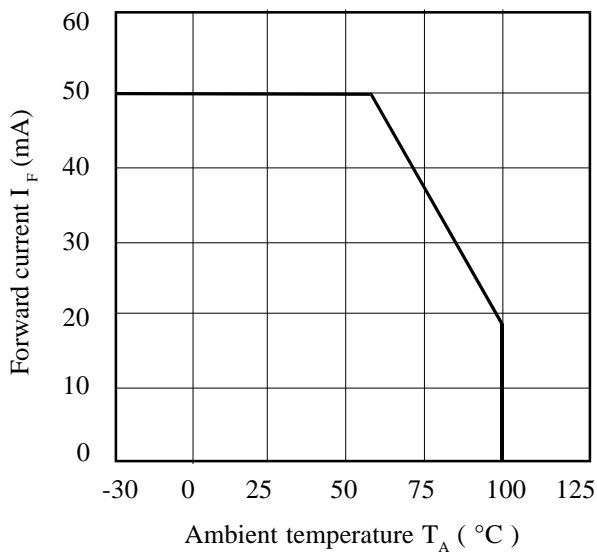
**Collector Power Dissipation vs. Ambient Temperature**



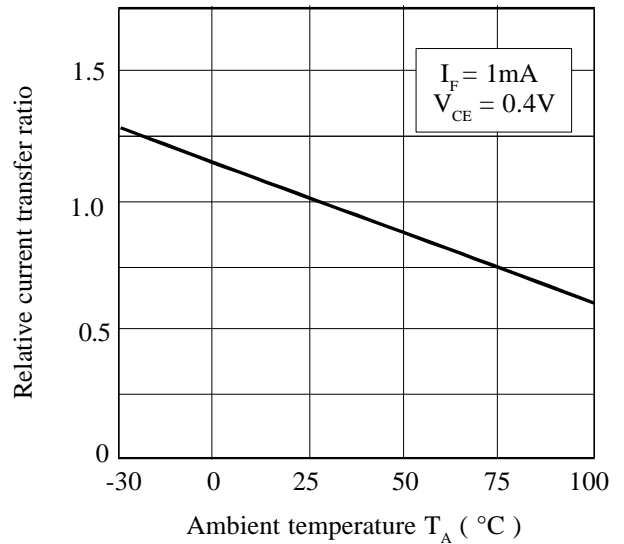
**Collector Current vs. Low Collector-emitter Voltage**



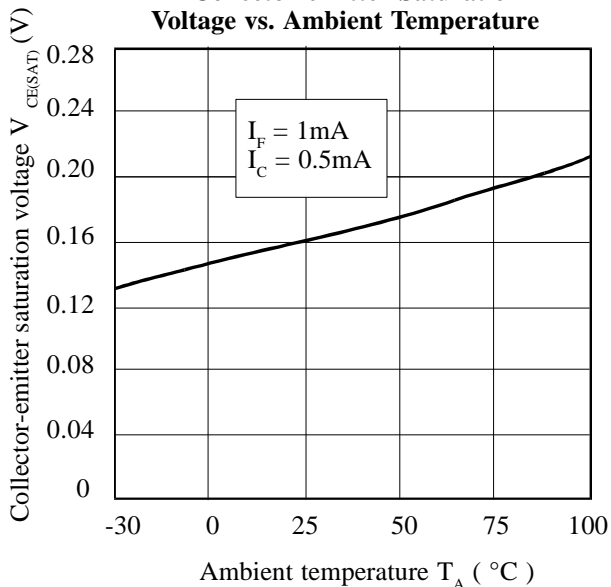
**Forward Current vs. Ambient Temperature**



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



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



**Current Transfer Ratio vs. Forward Current**

