

**LOW INPUT CURRENT  
PHOTODARLINGTON 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. P01102465  
Fimko - Certificate No. FI18162  
Semko - Reference No. 0202041/01-25  
Demko - Certificate No. 311161-01
- BSI approved - Certificate No. 8001

**DESCRIPTION**

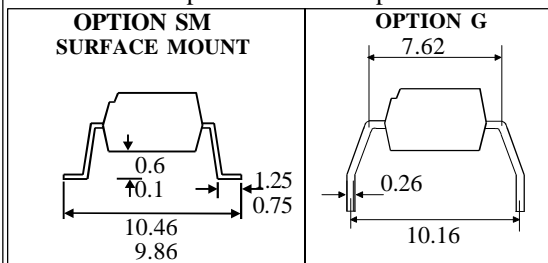
The ISP815-3,-2,-1, ISP825-3,-2,-1, ISP845-3,-2,-1 series of optically coupled isolators consist of infrared light emitting diodes and NPN silicon photodarlington transistors in space efficient dual in line plastic packages.

**FEATURES**

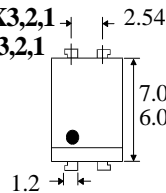
- Options :-  
10mm lead spread - add G after part no.  
Surface mount - add SM after part no.  
Tape&reel - add SMT&R after part no.
- Low input current 0.25mA  $I_F$
- High Current Transfer Ratio (200% min)
- High Isolation Voltage (5.3kV<sub>RMS</sub>)
- High BV<sub>CEO</sub> (70V min)
- All electrical parameters 100% tested
- Custom electrical selections available

**APPLICATIONS**

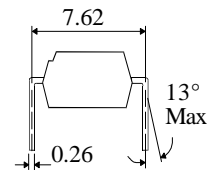
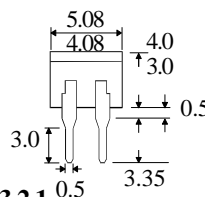
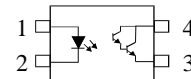
- Computer terminals
- Industrial systems controllers
- Measuring instruments
- Signal transmission between systems of different potentials and impedances



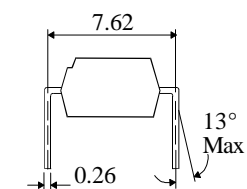
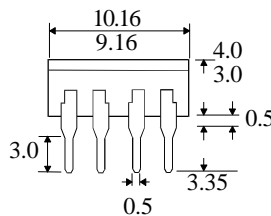
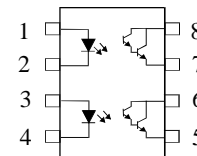
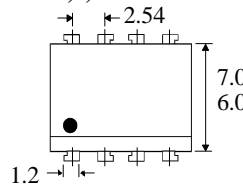
ISP815X3,2,1  
ISP815-3,2,1



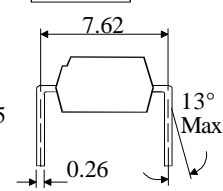
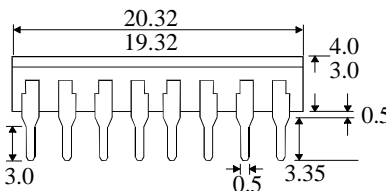
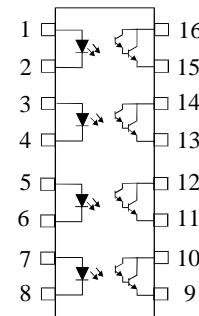
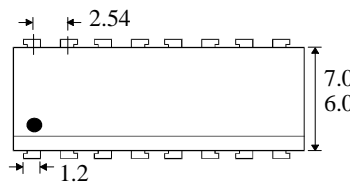
Dimensions in mm



ISP825X3,2,1  
ISP825-3,2,1



ISP845X3,2,1  
ISP845-3,2,1



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**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)

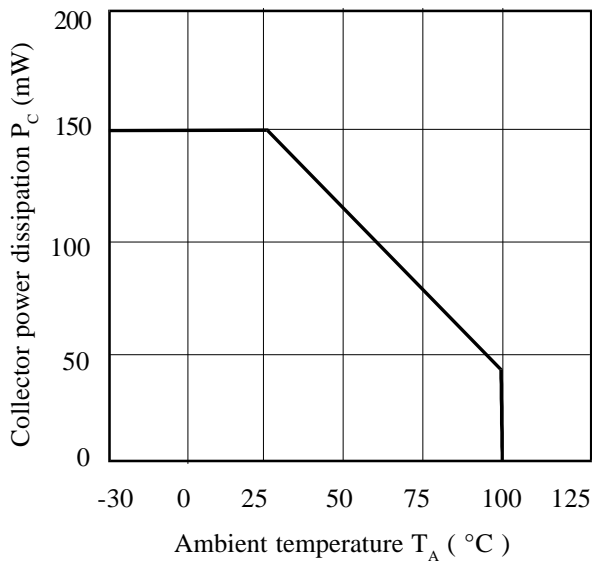
**ELECTRICAL CHARACTERISTICS (  $T_A = 25^\circ\text{C}$  Unless otherwise noted )**

PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITION	
Input	Forward Voltage ( $V_F$ )		1.2	1.4	V	$I_F = 20\text{mA}$	
	Reverse Current ( $I_R$ )			10	$\mu\text{A}$	$V_R = 4\text{V}$	
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) ISP815-3, ISP825-3, ISP845-3	200			%	0.25mA $I_F$ , 1.0V $V_{CE}$	
		400			%	0.5mA $I_F$ , 1.0V $V_{CE}$	
		800			%	1.0mA $I_F$ , 1.0V $V_{CE}$	
	ISP815-2, ISP825-2, ISP845-2	400			%	0.5mA $I_F$ , 1.0V $V_{CE}$	
		800			%	1.0mA $I_F$ , 1.0V $V_{CE}$	
	ISP815-1, ISP825-1, ISP845-1	800			%	1.0mA $I_F$ , 1.0V $V_{CE}$	
	Collector-emitter Saturation Voltage -3 -2 -1			1.0		V	0.25mA $I_F$ , 0.5mA $I_C$
				1.0		V	0.5mA $I_F$ , 2mA $I_C$
				1.0		V	1.0mA $I_F$ , 8mA $I_C$
	Input to Output Isolation Voltage $V_{ISO}$	5300				$V_{RMS}$	See note 1
Input-output Isolation Resistance $R_{ISO}$	$5 \times 10^{10}$				$\Omega$	$V_{IO} = 500\text{V}$ (note 1)	
Output Rise Time tr		60	300		$\mu\text{s}$	$V_{CE} = 2\text{V}$ ,	
Output Fall Time tf		53	250		$\mu\text{s}$	$I_C = 10\text{mA}, R_L = 100\Omega$	

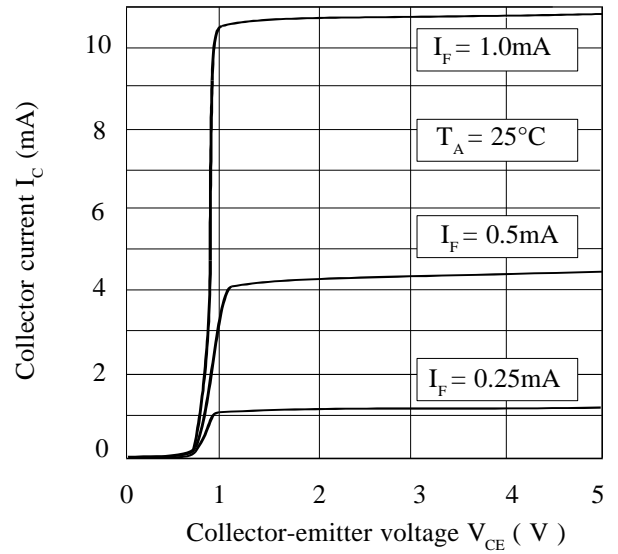
Note 1 Measured with input leads shorted together and output leads shorted together.

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

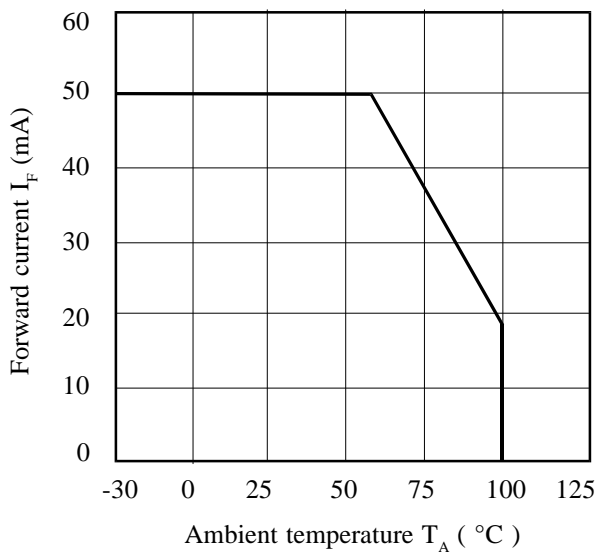
**Collector Power Dissipation vs. Ambient Temperature**



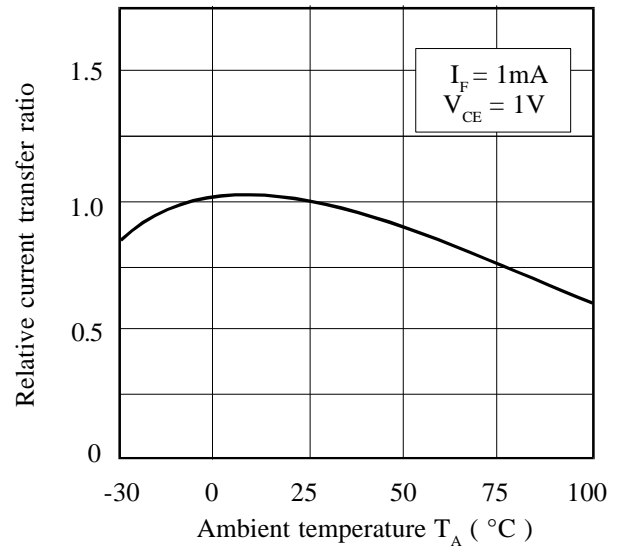
**Collector Current vs. Collector-emitter Voltage**



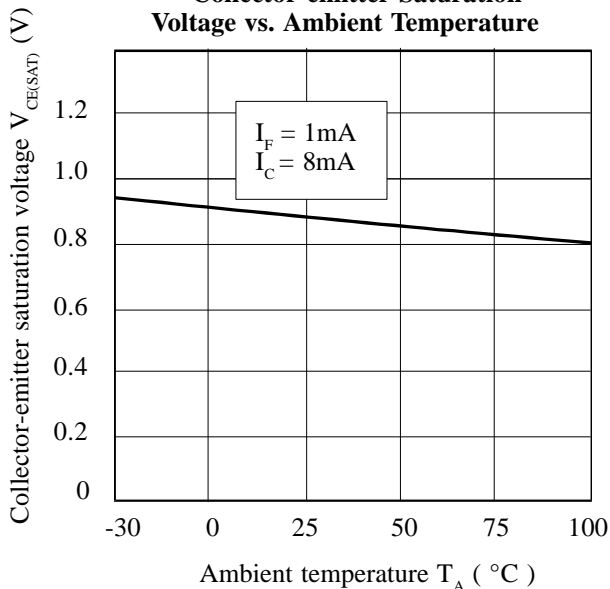
**Forward Current vs. Ambient Temperature**



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



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



**Current Transfer Ratio vs. Forward Current**

