

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

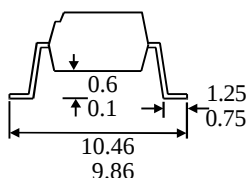
### FEATURES

- Options :-  
10mm lead spread - add G after part no.  
Surface mount - add SM after part no.  
Tape&reel - add SMT&R after part no.
- High Current Transfer Ratio (50% min)
- High Isolation Voltage (5.3kV<sub>RMS</sub>, 7.5kV<sub>PK</sub>)
- High BV<sub>CEO</sub> (35Vmin)
- All electrical parameters 100% tested
- Custom electrical selections available

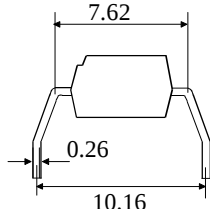
### APPLICATIONS

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

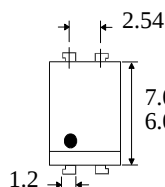
**OPTION SM  
SURFACE MOUNT**



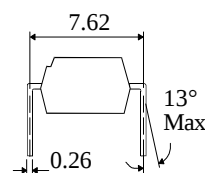
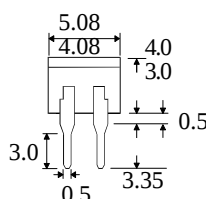
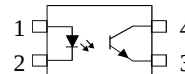
**OPTION G**



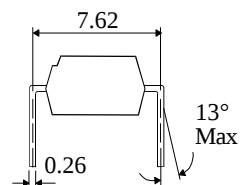
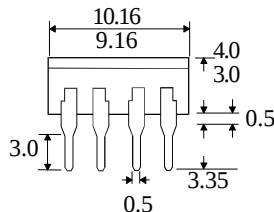
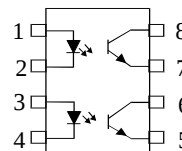
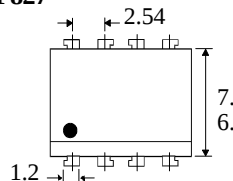
### ISP817X ISP817



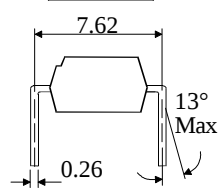
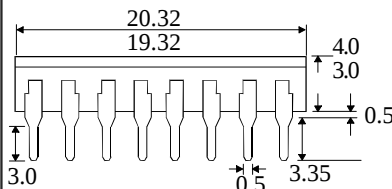
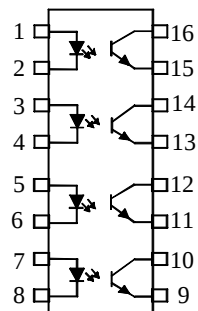
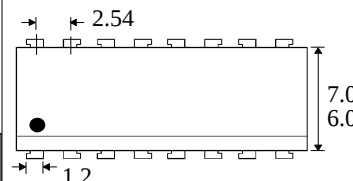
**Dimensions in mm**



### ISP827X ISP827



### ISP847X ISP847



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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 $BV_{CEO}$ | _____ | 35V   |
| Emitter-collector Voltage $BV_{ECO}$ | _____ | 6V    |
| Power Dissipation                    | _____ | 150mW |

**POWER DISSIPATION**

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

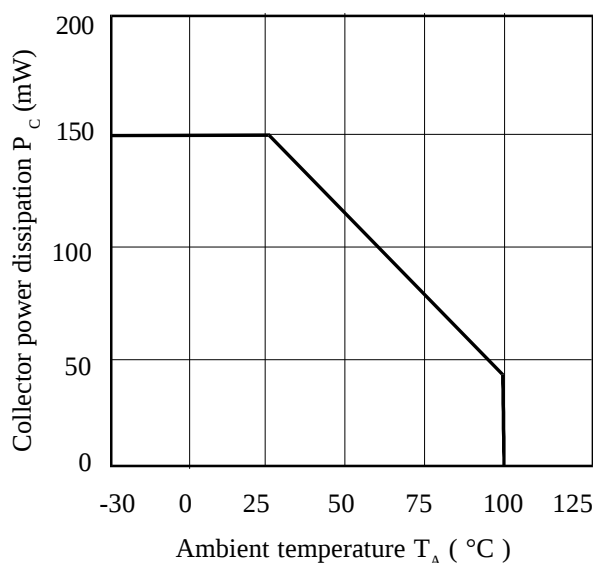
**ELECTRICAL CHARACTERISTICS (  $T_A = 25^\circ\text{C}$  Unless otherwise noted )**

| PARAMETER |                                                                 | MIN                | TYP | MAX | UNITS                 | TEST CONDITION                                                    |
|-----------|-----------------------------------------------------------------|--------------------|-----|-----|-----------------------|-------------------------------------------------------------------|
| Input     | Forward Voltage ( $V_F$ )                                       | 6                  | 1.2 | 1.4 | V                     | $I_F = 20\text{mA}$<br>$I_R = 10\mu\text{A}$<br>$V_R = 6\text{V}$ |
|           | Reverse Voltage ( $V_R$ )                                       |                    |     |     | V                     |                                                                   |
|           | Reverse Current ( $I_R$ )                                       |                    |     | 10  | $\mu\text{A}$         |                                                                   |
| Output    | Collector-emitter Breakdown ( $BV_{CEO}$ )<br>( Note 2 )        | 35                 |     |     | 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)<br>ISP817, ISP827, ISP847 | 50                 |     | 600 | %                     | 5mA $I_F$ , 5V $V_{CE}$                                           |
|           | ISP817GB, ISP827GB, ISP847GB                                    | 100                |     | 600 | %                     | 5mA $I_F$ , 5V $V_{CE}$                                           |
|           | ISP817BL, ISP827BL, ISP847BL                                    | 200                |     | 600 | %                     | 5mA $I_F$ , 5V $V_{CE}$                                           |
|           | Collector-emitter Saturation Voltage $V_{CE(SAT)}$              |                    |     | 0.2 | V                     | 20mA $I_F$ , 1mA $I_C$                                            |
|           | Input to Output Isolation Voltage $V_{ISO}$                     | 5300<br>7500       |     |     | $V_{RMS}$<br>$V_{PK}$ | See note 1<br>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  | $\mu\text{s}$         | $I_C = 2\text{mA}$ , $R_L = 100\Omega$                            |

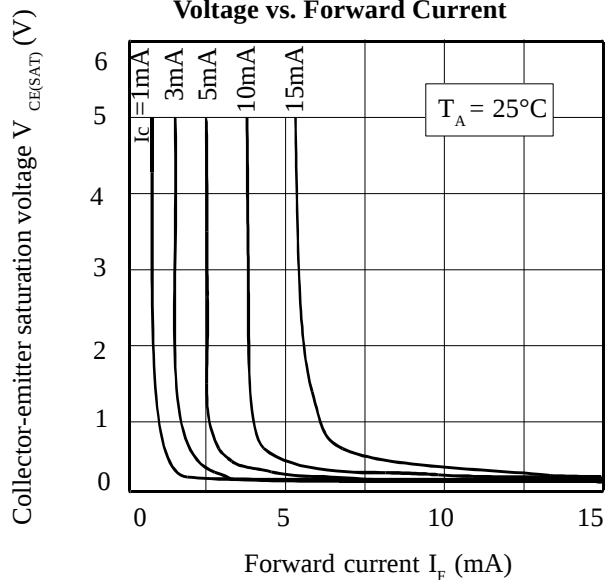
Note 1 Measured with input leads shorted together and output leads shorted together.

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

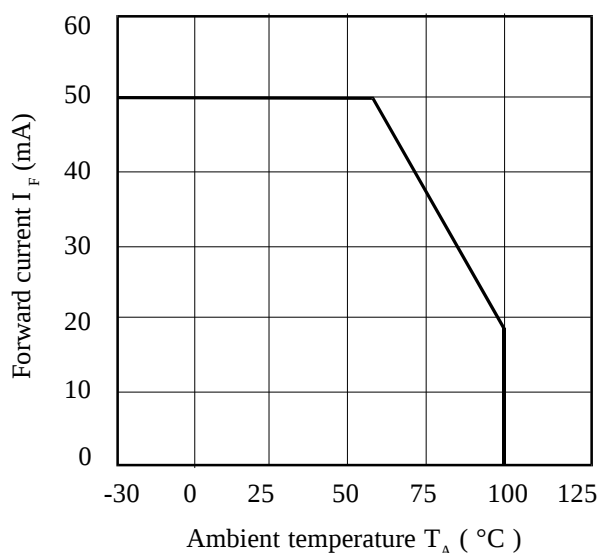
**Collector Power Dissipation vs. Ambient Temperature**



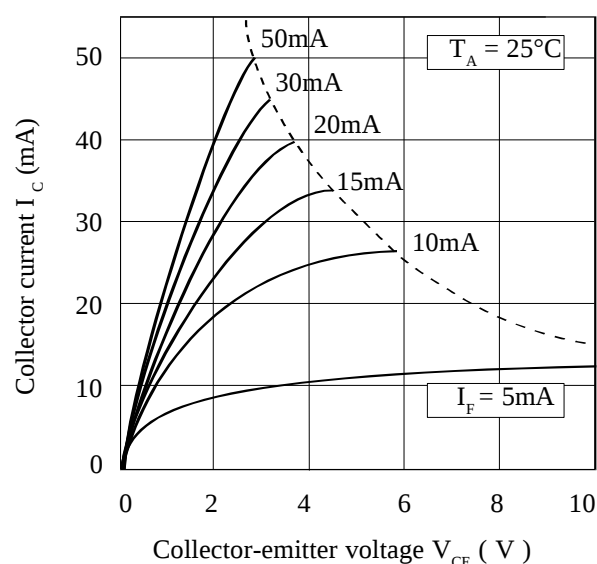
**Collector-emitter Saturation Voltage vs. Forward Current**



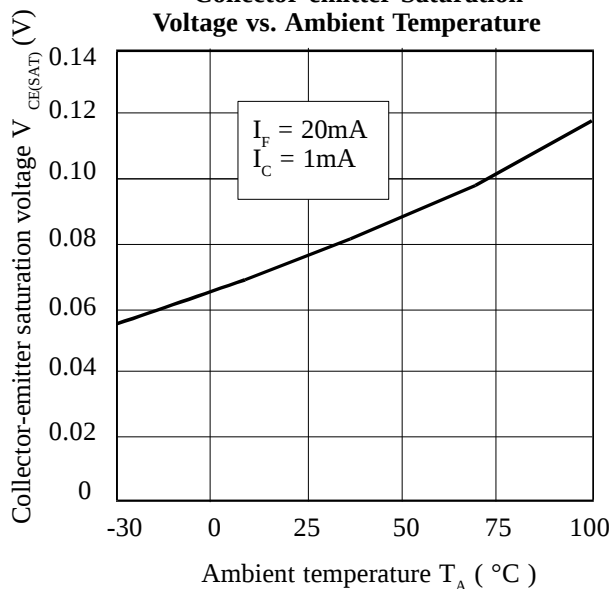
**Forward Current vs. Ambient Temperature**



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



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



**Current Transfer Ratio vs. Forward Current**

