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

# LOW INPUT CURRENT PHOTOTRANSISTOR OPTICALLY COUPLED ISOLATORS

ROHS COMPLIANT

## 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 Nemko - Certificate No. P01102465

## 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.

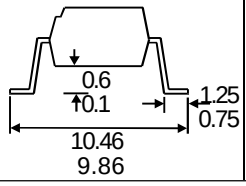
## FEATURES

- 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 ($5.3kV_{RMS}$, $7.5kV_{PK}$)
- High $BV_{CEO}$ (70V min)
- All electrical parameters 100% tested
- Custom electrical selections available

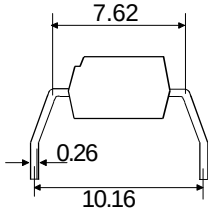
## APPLICATIONS

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

**OPTION SM**
**SURFACE MOUNT**

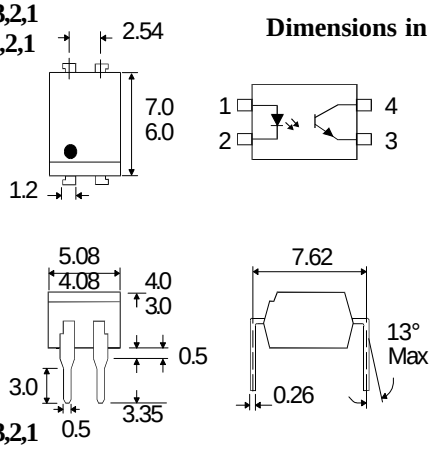



**OPTION G**

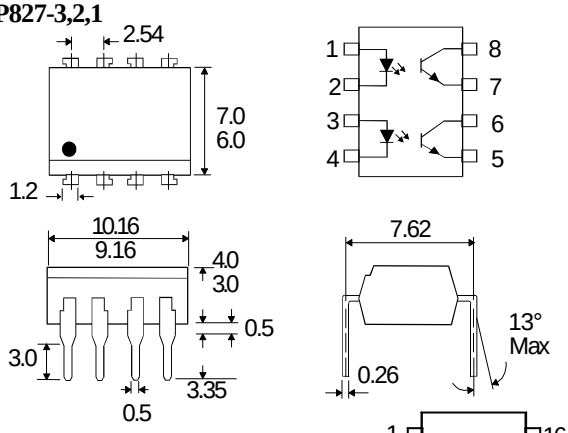



**ISP817X3,2,1**
**ISP817-3,2,1**

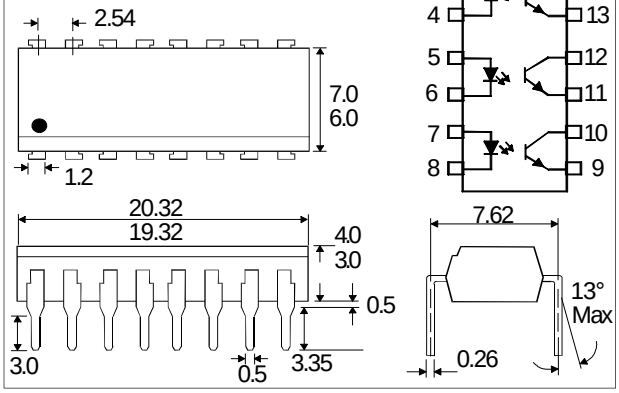
**Dimensions in mm**




**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 | -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 |
| Collector Current | 50mA |
| Power Dissipation | 150mW |

**POWER DISSIPATION**

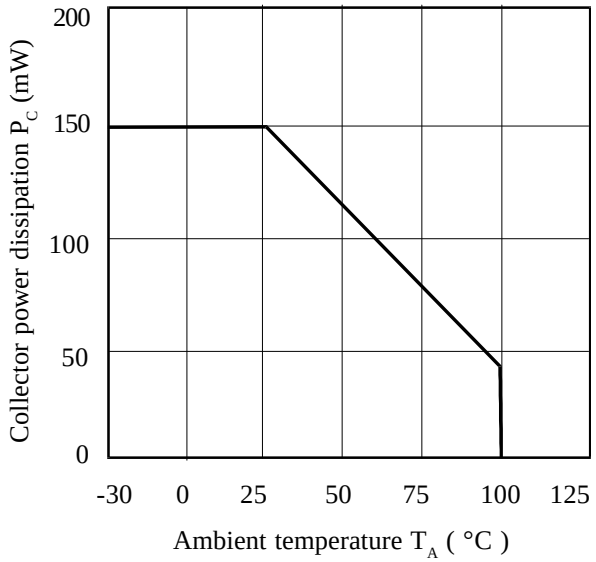
| | |
|---|---|
| Total Power Dissipation | 200mW |
| (derate linearly 2.67mW/°C above 25°C) | |

**ELECTRICAL CHARACTERISTICS ( $T_A$ = 25°C Unless otherwise noted )**

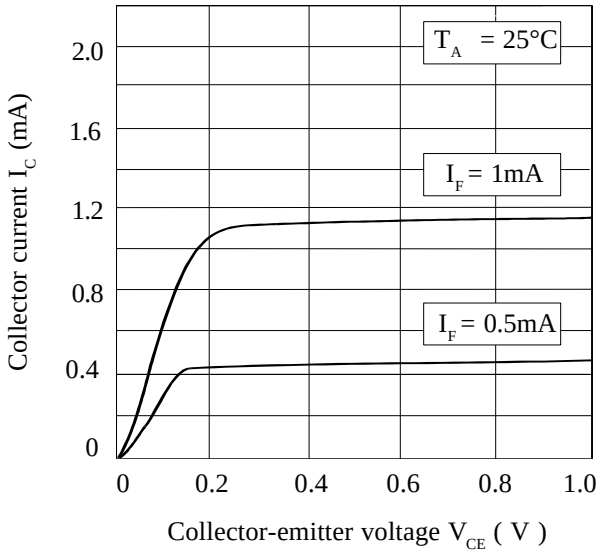
| PARAMETER | | MIN | TYP | MAX | UNITS | TEST CONDITION |
|---|---|---|---|---|---|---|
| Input | Forward Voltage ($V_F$) | | 1.2 | 1.4 | V | $I_F$ = 20mA |
| | Reverse Current ($I_R$) | | | 10 | µA | $V_R$ = 4V |
| Output | Collector-emitter Breakdown ($BV_{CEO}$) ( Note 2 ) | 70 | | | V | $I_C$ = 1mA |
| | Emitter-collector Breakdown ($BV_{ECO}$) | 6 | | | V | $I_E$ = 10µA |
| | Collector-emitter Dark Current ($I_{CEO}$) | | | 100 | nA | $V_{CE}$ = 20V |
| Coupled | Current Transfer Ratio (CTR) (Note 2) | | | | | |
| | ISP817-3, ISP827-3, ISP847-3 | 70 | | | % | 0.5mA $I_F$, 0.4V $V_{CE}$ |
| | | 100 | | | % | 1.0mA $I_F$, 0.4V $V_{CE}$ |
| | ISP817-2, ISP827-2, ISP847-2 | 50 | | | % | 0.5mA $I_F$, 0.4V $V_{CE}$ |
| | ISP817-1, ISP827-1, ISP847-1 | 50 | | | % | 1.0mA $I_F$, 0.4V $V_{CE}$ |
| | Collector-emitter Saturation Voltage -3 | | | 0.4 | V | 0.5mA $I_F$, 0.35mA $I_C$ |
| | -2 | | | 0.4 | V | 0.5mA $I_F$, 0.25mA $I_C$ |
| | -1 | | | 0.4 | V | 1.0mA $I_F$, 0.5mA $I_C$ |
| | Input to Output Isolation Voltage $V_{ISO}$ | 5300 | | | $V_{RMS}$ | See note 1 |
| | | 7500 | | | $V_{PK}$ | See note 1 |
| | Input-output Isolation Resistance $R_{ISO}$ | $5x10^{10}$ | | | Ω | $V_{IO}$ = 500V (note 1) |
| | Output Rise Time tr | | 4 | 18 | µs | $V_{CE}$ = 2V , |
| | Output Fall Time tf | | 3 | 18 | µs | $I_C$ = 2mA, $R_L$ = 100Ω |

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.

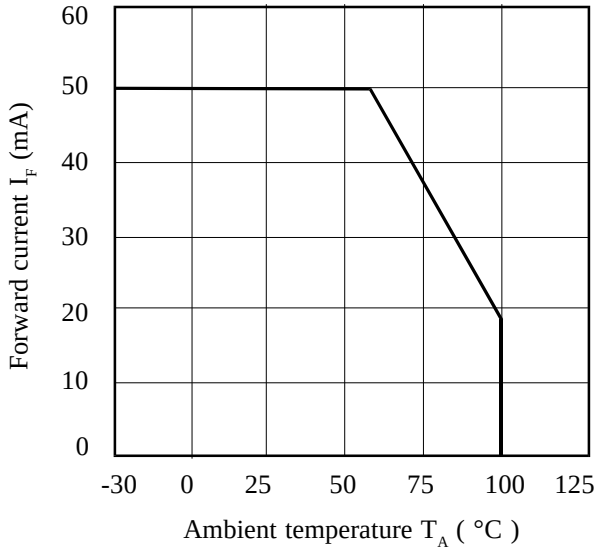
**Collector Power Dissipation vs. Ambient Temperature**



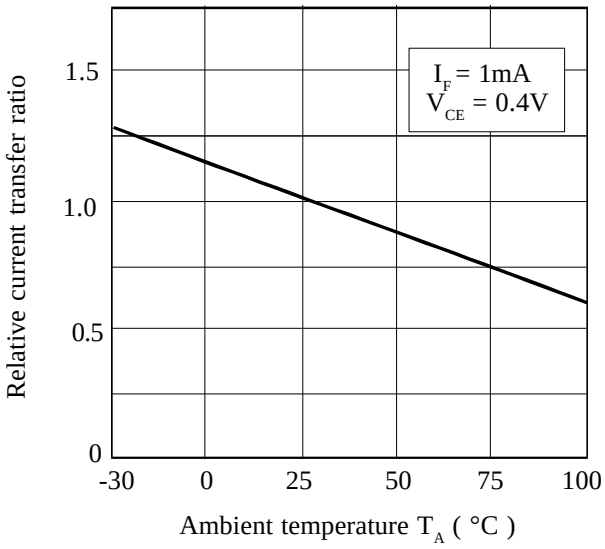

**Collector Current vs. Low Collector-emitter Voltage**



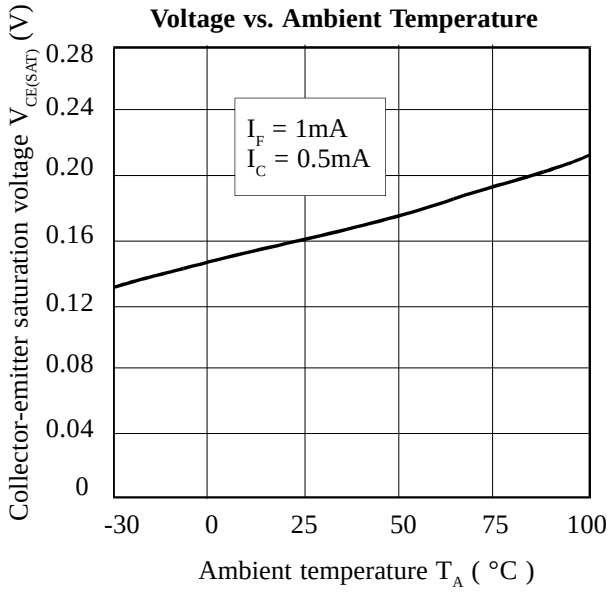

**Forward Current vs. Ambient Temperature**




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




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




**Current Transfer Ratio vs. Forward Current**