

## 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 ISP621-1, ISP621-2, ISP621-4 series of optically coupled isolators consist of infrared light emitting diodes and NPN silicon photo transistors in space efficient dual in line plastic packages.

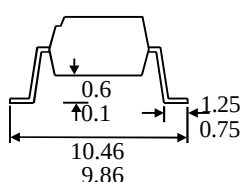
### FEATURES

- 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> ( 55Vmin )
- All electrical parameters 100% tested
- Custom electrical selections available

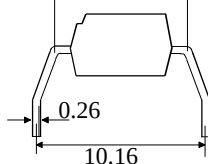
### APPLICATIONS

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

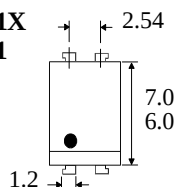
#### OPTION SM SURFACE MOUNT



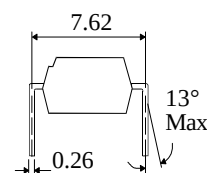
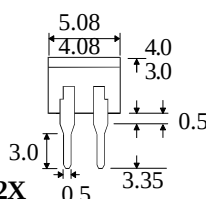
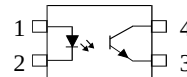
#### OPTION G SURFACE MOUNT



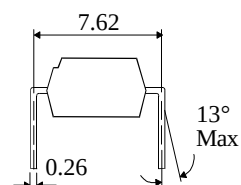
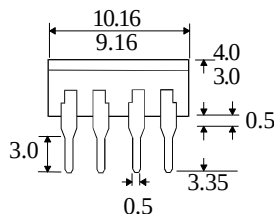
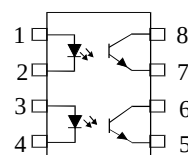
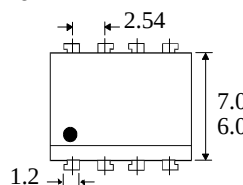
#### ISP621-1X ISP621-1



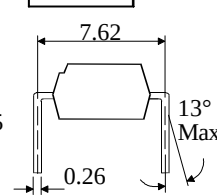
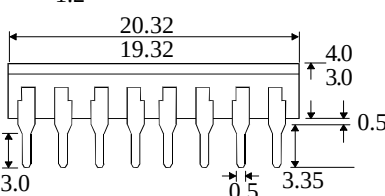
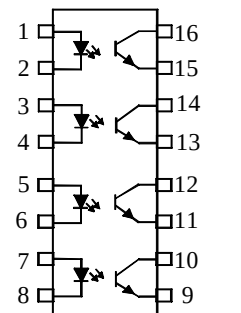
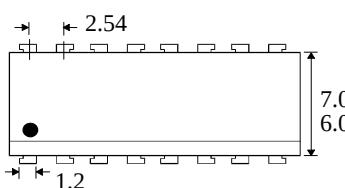
#### Dimensions in mm



#### ISP621-2X ISP621-2



#### ISP621-4X ISP621-4



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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                | _____ | 260°C            |
| (1/16 inch (1.6mm) from case for 10 secs) |       |                  |

**INPUT DIODE**

|                   |       |      |
|-------------------|-------|------|
| Forward Current   | _____ | 50mA |
| Reverse Voltage   | _____ | 5V   |
| Power Dissipation | _____ | 70mW |

**OUTPUT TRANSISTOR**

|                                      |       |       |
|--------------------------------------|-------|-------|
| Collector-emitter Voltage $BV_{CEO}$ | _____ | 55V   |
| Emitter-collector Voltage $BV_{ECO}$ | _____ | 6V    |
| Power Dissipation                    | _____ | 150mW |

**POWER DISSIPATION**

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

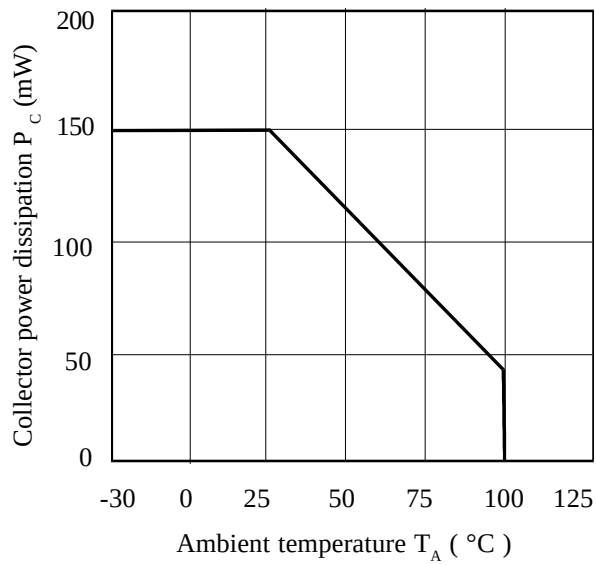
**ELECTRICAL CHARACTERISTICS (  $T_A = 25^\circ\text{C}$  Unless otherwise noted )**

| 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 ( $BV_{CEO}$ )<br>( Note 2 ) | 55                 |      |     | 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            | $V_{CE} = 24\text{V}$                  |
| Coupled   | Current Transfer Ratio (CTR) (Note 2)                    |                    |      |     |               |                                        |
|           | ISP621-1, ISP621-2, ISP621-4                             | 50                 |      | 600 | %             | $5\text{mA } I_F, 5\text{V } V_{CE}$   |
|           | CTR selection available GB                               | 100                |      | 600 | %             |                                        |
|           | BL                                                       | 200                |      | 600 | %             |                                        |
|           | GB                                                       | 30                 |      |     | %             | $1\text{mA } I_F, 0.4\text{V } V_{CE}$ |
|           | Collector-emitter Saturation Voltage $V_{CE(SAT)}$       |                    |      | 0.4 | V             | $8\text{mA } I_F, 2.4\text{mA } I_C$   |
|           | GB                                                       |                    |      | 0.4 | V             | $1\text{mA } I_F, 0.2\text{mA } I_C$   |
|           | 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)        |
|           | 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    |     | $\mu\text{s}$ |                                        |

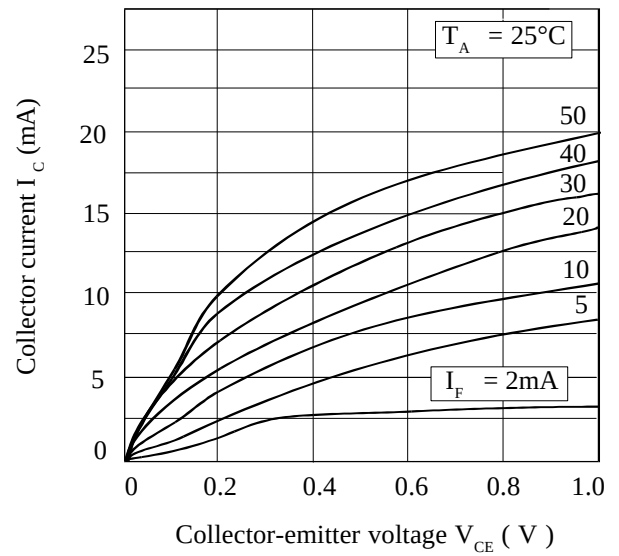
Note 1 Measured with input leads shorted together and output leads shorted together.

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

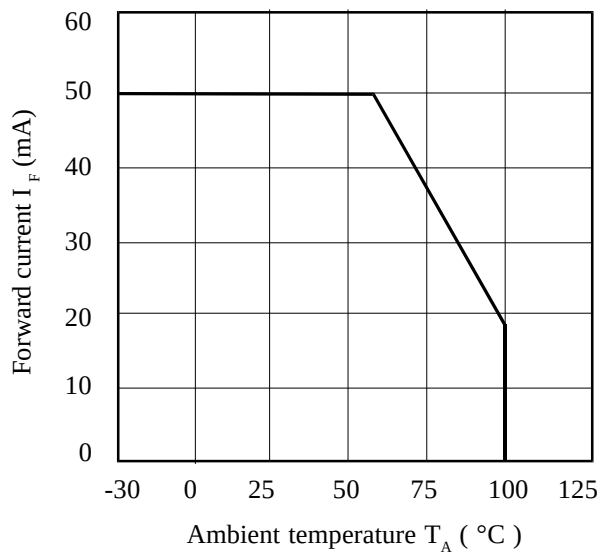
**Collector Power Dissipation vs. Ambient Temperature**



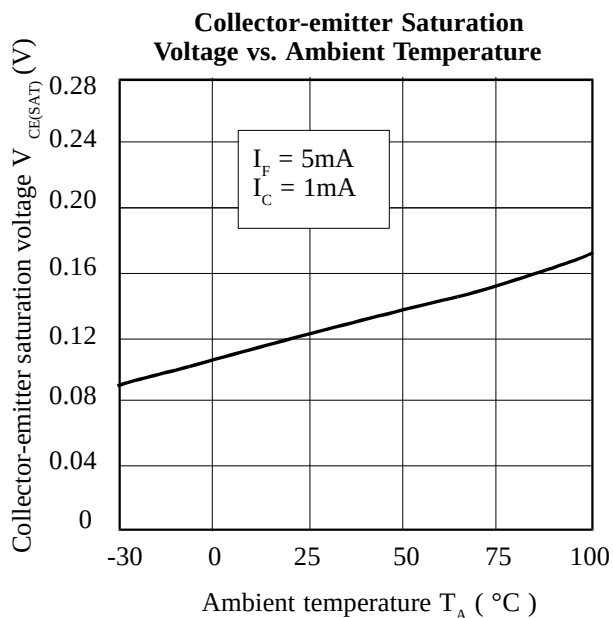
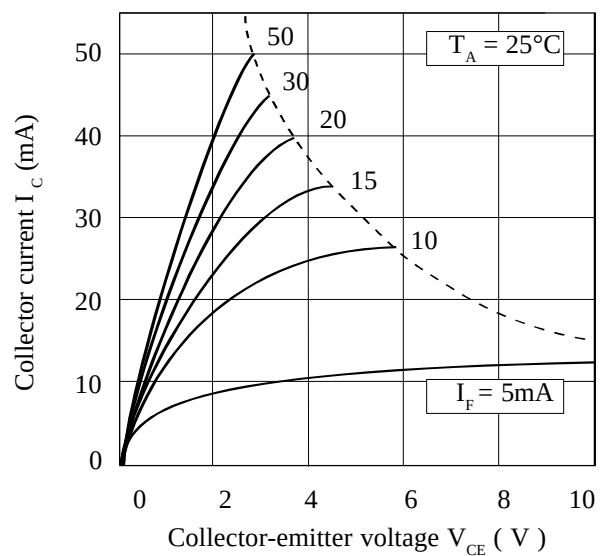
**Collector Current vs. Low Collector-emitter Voltage**



**Forward Current vs. Ambient Temperature**



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



**Current Transfer Ratio vs. Forward Current**

