

## LOW INPUT CURRENT PHOTOTRANSISTOR OPTICALLY COUPLED ISOLATORS

### APPROVALS

- UL recognised, File No. E91231
- 'X' SPECIFICATION APPROVALS
  - VDE 0884 in 3 available lead forms : -
    - STD
    - G form
    - SMD approved to CECC 00802
- IS204X is 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
  - ISD204X - EN60950 pending
  - ISQ204X - EN60950 pending

### DESCRIPTION

The IS204-3,-2,-1, ISD204-3,-2,-1, ISQ204-3,-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.

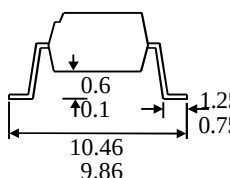
### FEATURES

- 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)

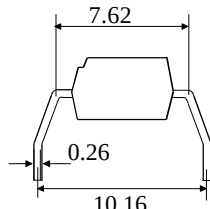
### APPLICATIONS

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

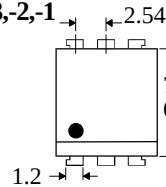
#### OPTION SM SURFACE MOUNT



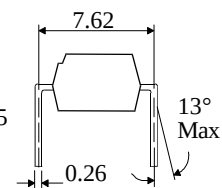
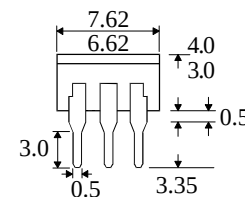
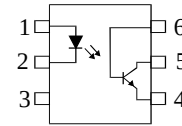
#### OPTION G



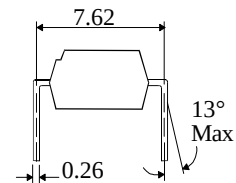
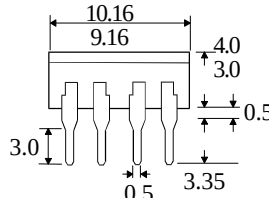
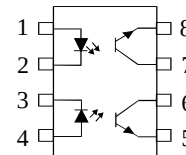
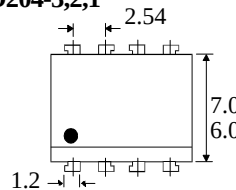
#### IS204X3,2,1 IS204-3,-2,-1



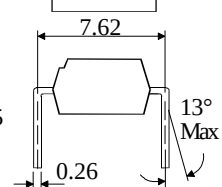
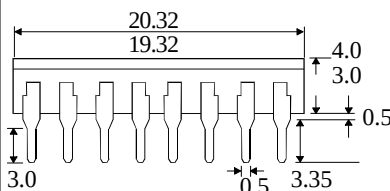
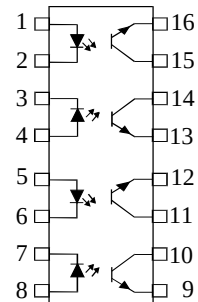
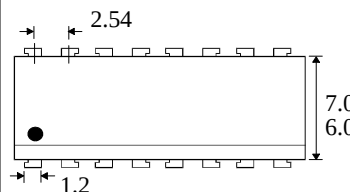
#### Dimensions in mm



#### ISD204X3,2,1 ISD204-3,2,1



#### ISQ204X3,2,1 ISQ204-3,2,1



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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)

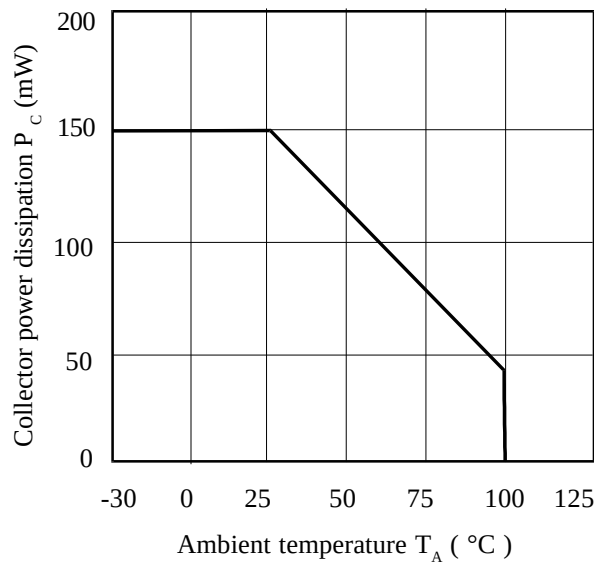
**ELECTRICAL CHARACTERISTICS (  $T_A = 25^\circ\text{C}$  Unless otherwise noted )**

| PARAMETER |                                                                      | MIN                | TYP | MAX | UNITS                 | TEST CONDITION                           |
|-----------|----------------------------------------------------------------------|--------------------|-----|-----|-----------------------|------------------------------------------|
| Input     | Forward Voltage ( $V_F$ )                                            | 10                 | 1.2 | 1.4 | V                     | $I_F = 20\text{mA}$                      |
|           | Reverse Voltage ( $V_R$ )                                            |                    |     |     | V                     | $I_R = 10\mu\text{A}$                    |
|           | Reverse Current ( $I_R$ )                                            |                    |     | 10  | $\mu\text{A}$         | $V_R = 10\text{V}$                       |
| Output    | Collector-emitter Breakdown ( $BV_{CEO}$ )<br>( 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)<br>IS204-3, ISD204-3, ISQ204-3 | 70                 |     |     | %                     | 0.5mA $I_F$ , 0.4V $V_{CE}$              |
|           |                                                                      | 100                |     |     | %                     | 1.0mA $I_F$ , 0.4V $V_{CE}$              |
|           | IS204-2, ISD204-2, ISQ204-2                                          | 50                 |     |     | %                     | 0.5mA $I_F$ , 0.4V $V_{CE}$              |
|           | IS204-1, ISD204-1, ISQ204-1                                          | 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<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  | $\mu\text{s}$         | $I_C = 0.2\text{mA}$ , $R_L = 100\Omega$ |

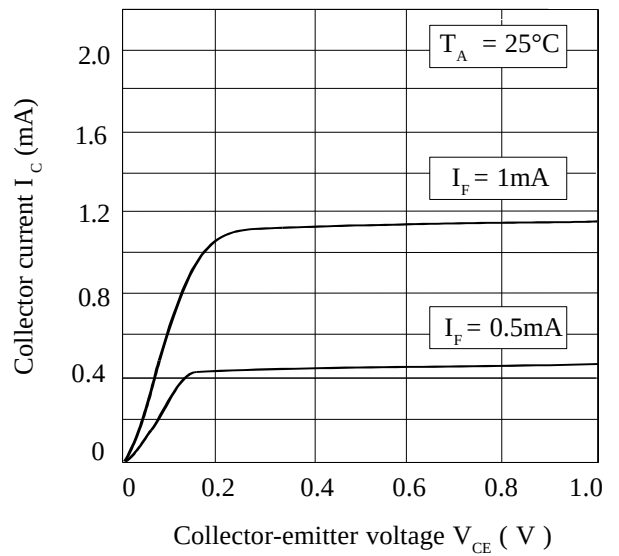
Note 1 Measured with input leads shorted together and output leads shorted together.

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

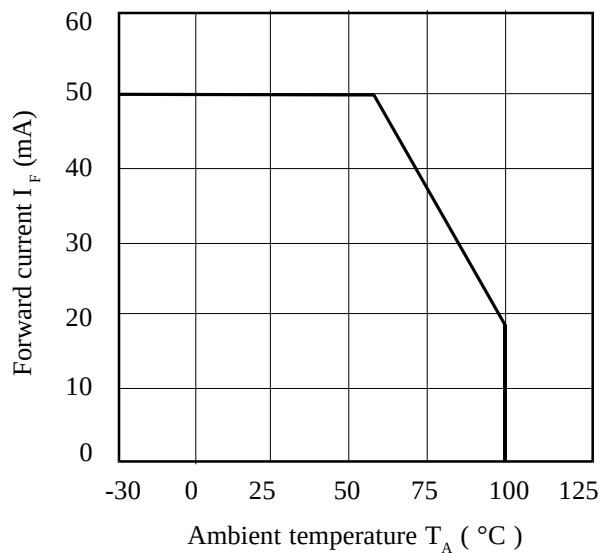
**Collector Power Dissipation vs. Ambient Temperature**



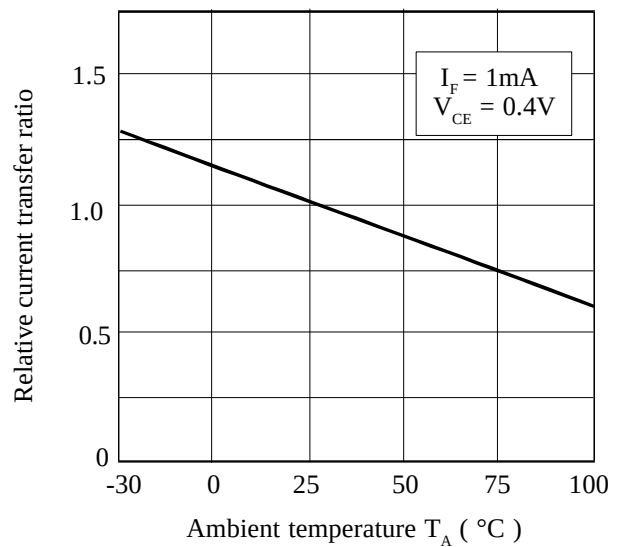
**Collector Current vs. Low Collector-emitter Voltage**



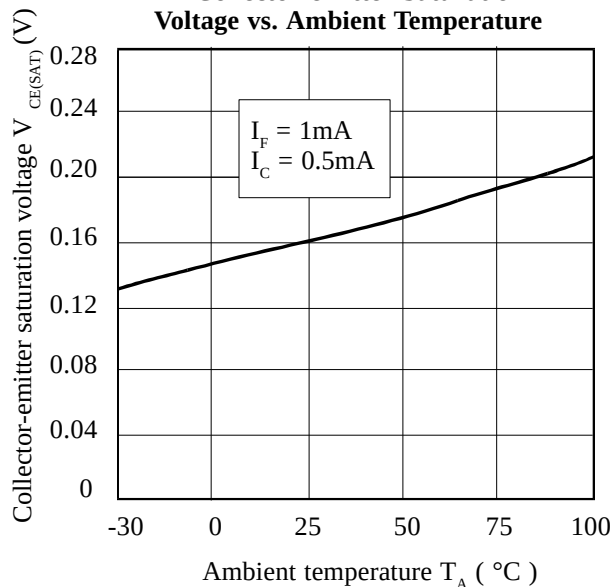
**Forward Current vs. Ambient Temperature**



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



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



**Current Transfer Ratio vs. Forward Current**

