

4N38X, 4N38AX  
4N38, 4N38A



**ISOCOM**  
COMPONENTS



**OPTICALLY COUPLED  
ISOLATOR  
PHOTOTRANSISTOR OUTPUT**

**APPROVALS**

- UL recognised, File No. E91231  
Package Code " GG "
- '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. P01102464

**DESCRIPTION**

The 4N38, 4N38A series of optically coupled isolators consist of infrared light emitting diode and NPN silicon photo transistor in a standard 6 pin dual in line plastic package.

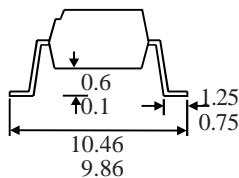
**FEATURES**

- 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  $BV_{CEO}$  (80V min)
- High Isolation Voltage ( $5.3kV_{RMS}, 7.5kV_{PK}$ )
- All electrical parameters 100% tested
- Custom electrical selections available

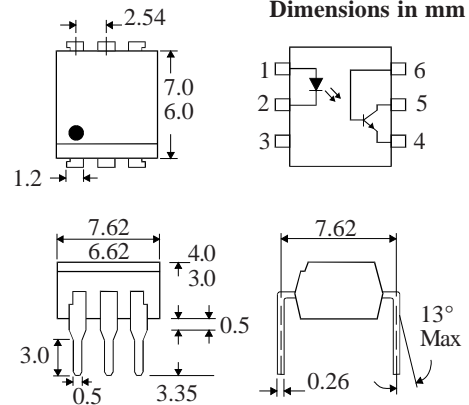
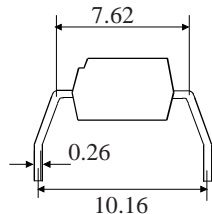
**APPLICATIONS**

- DC motor controllers
- Industrial systems controllers
- Measuring instruments
- Signal transmission between systems of different potentials and impedances

**OPTION SM  
SURFACE MOUNT**



**OPTION G**



**ABSOLUTE MAXIMUM RATINGS  
(25°C unless otherwise specified)**

Storage Temperature \_\_\_\_\_ -55°C to +150°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 \_\_\_\_\_ 60mA  
Reverse Voltage \_\_\_\_\_ 6V  
Power Dissipation \_\_\_\_\_ 105mW

**OUTPUT TRANSISTOR**

Collector-emitter Voltage  $BV_{CEO}$  \_\_\_\_\_ 80V  
Collector-base Voltage  $BV_{CBO}$  \_\_\_\_\_ 80V  
Emitter-collector Voltage  $BV_{ECO}$  \_\_\_\_\_ 6V  
Collector Current \_\_\_\_\_ 50mA  
Power Dissipation \_\_\_\_\_ 160mW

**POWER DISSIPATION**

Total Power Dissipation \_\_\_\_\_ 200mW  
(derate linearly 2.67mW/°C above 25°C)

**ISOCOM COMPONENTS 2004 LTD**

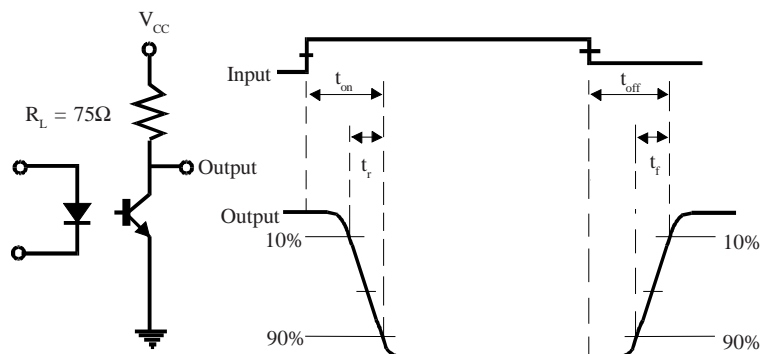
Unit 25B, Park View Road West,  
Park View Industrial Estate, Brenda Road  
Hartlepool, Cleveland, TS25 1UD  
Tel: (01429) 863609 Fax: (01429) 863581

**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    | 1.5 | V                              | $I_F = 10\text{mA}$  |
|           | Reverse Current ( $I_R$ )                                |                    |        | 10  | $\mu\text{A}$                  | $V_R = 6\text{V}$  |
| Output    | Collector-emitter Breakdown ( $BV_{CEO}$ )<br>( note 2 ) | 80                 |        |     | V                              | $I_C = 1\text{mA}$   |
|           | Collector-base Breakdown ( $BV_{CBO}$ )                  | 80                 |        |     | V                              | $I_C = 100\mu\text{A}$   |
|           | Emitter-collector Breakdown ( $BV_{ECO}$ )               | 6                  |        |     | V                              | $I_E = 100\mu\text{A}$   |
|           | Collector-emitter Dark Current ( $I_{CEO}$ )             |                    |        | 50  | nA                             | $V_{CE} = 60\text{V}$  |
|           | Collector-base Dark Current ( $I_{CBO}$ )                |                    |        | 20  | nA                             | $V_{CE} = 60\text{V}$  |
| Coupled   | Current Transfer Ratio (CTR)                             | 20                 |        |     | %                              | $10\text{mA } I_F, 10\text{V } V_{CE}$                                   |
|           | Collector-emitter Saturation Voltage $V_{CE(SAT)}$       |                    |        | 1.0 | V                              | $20\text{mA } I_F, 4\text{mA } I_C$                                      |
|           | 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)  |
|           | Response Time (rise)<br>Response Time (fall)             |                    | 2<br>2 |     | $\mu\text{s}$<br>$\mu\text{s}$ | $V_{CC} = 5\text{V}$ ,<br>$I_F = 10\text{mA}, R_L = 75\Omega$<br>(FIG 1) |

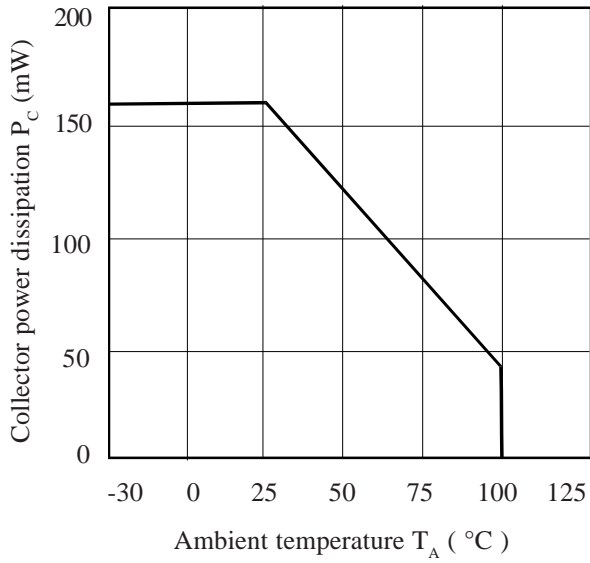
Note 1 Measured with input leads shorted together and output leads shorted together.

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

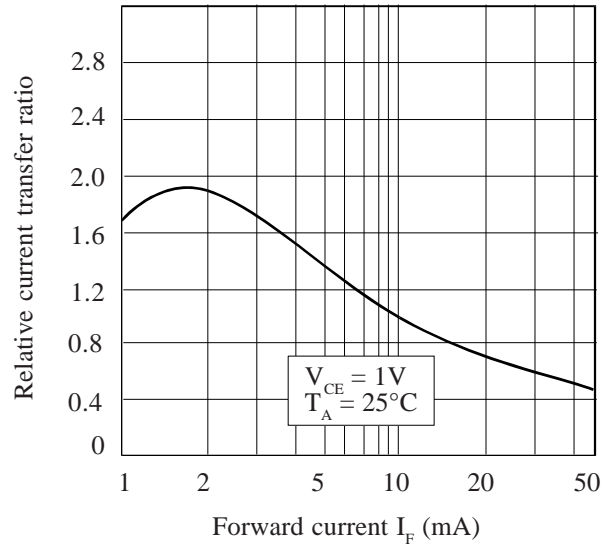


**FIG 1**

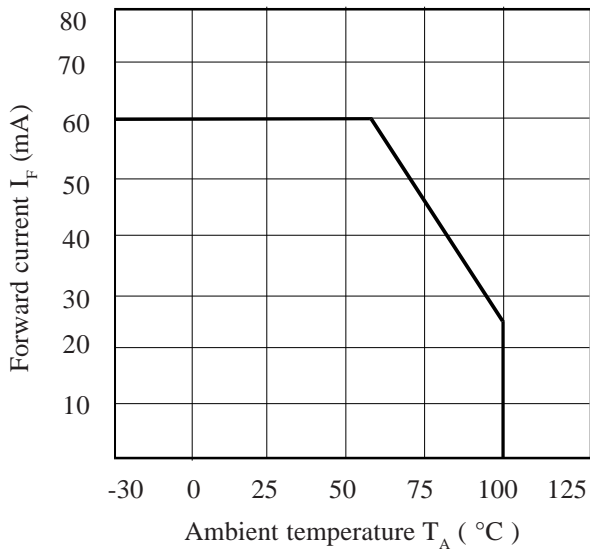
**Collector Power Dissipation vs. Ambient Temperature**



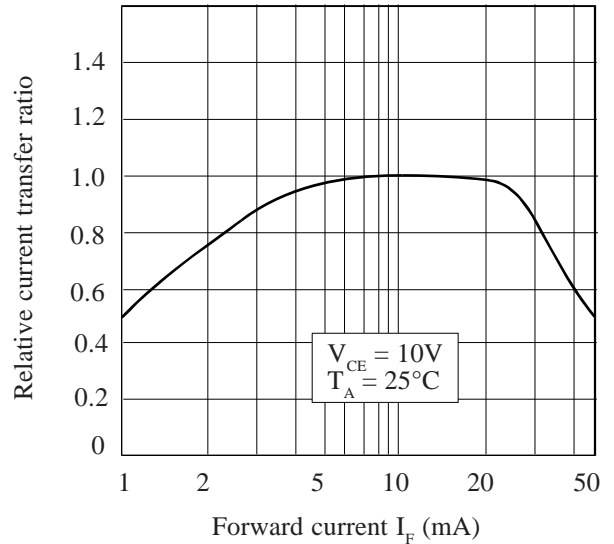
**Relative Current Transfer Ratio vs. Forward Current**



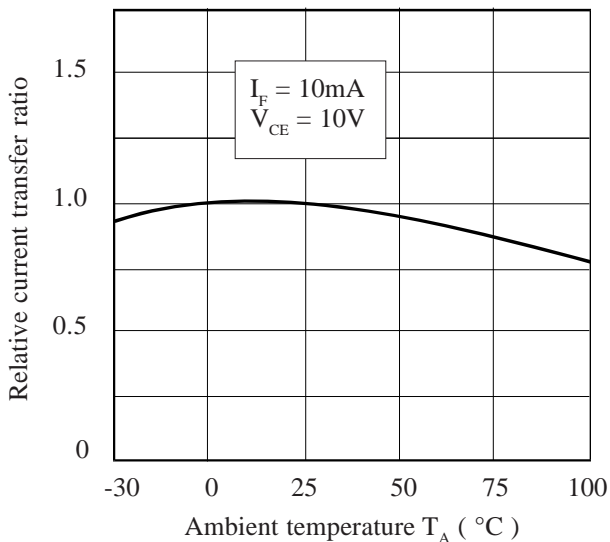
**Forward Current vs. Ambient Temperature**



**Relative Current Transfer Ratio vs. Forward Current**



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



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

