

IS609



**MICROPROCESSOR COMPATIBLE  
SCHMITT TRIGGER OPTICALLY  
COUPLED ISOLATOR**

**APPROVALS**

- UL recognised, File No. E91231

**DESCRIPTION**

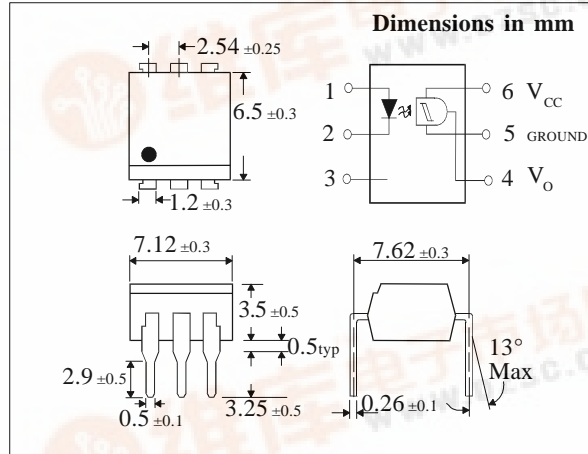
The IS609 is an optically coupled isolator consisting of a Gallium Arsenide infrared emitting diode and a Microprocessor Compatible Schmitt trigger output mounted in a standard 6 pin dual in line package.

**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 data rate, 1MHz typical (NRZ)
- Microprocessor compatible drive
- Logic compatible output sinks 16 milliamperes at 0.4 volts maximum
- High Isolation Voltage (5.3kV<sub>RMS</sub>, 7.5kV<sub>PK</sub>)
- High common mode rejection ratio
- Fast switching :  $t_{rise}, t_{fall} = 100nS$  typical
- Wide supply voltage capability, compatible with all popular logic systems
- Guaranteed On / Off threshold hysteresis

**APPLICATIONS**

- Logic to logic isolator
- Line receiver-eliminates noise and transient problems
- Programmable current level sensor
- AC to TTL conversion - square wave shaping
- Digital programming of power supplies
- Interfaces computers with peripherals



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

Storage Temperature \_\_\_\_\_ -40°C to + 125°C  
 Operating Temperature \_\_\_\_\_ -25°C to + 85°C  
 Lead Soldering Temperature  
 (1/16 inch (1.6mm) from case for 10 secs) 260°C

**INPUT DIODE**

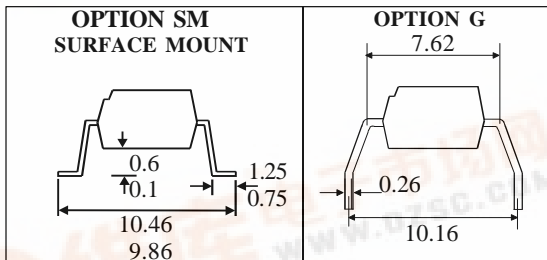
Forward Current, I<sub>F</sub> \_\_\_\_\_ 50mA  
 Peak forward current  
 (Pulse width ≤ 100uS, Duty ratio=0.001) — 1A  
 Reverse Voltage, V<sub>R</sub> \_\_\_\_\_ 6V  
 Power Dissipation  
 (derate linearly 1.41mW / °C above 25°C) — 70mW

**OUTPUT DETECTOR**

Output Voltage, V<sub>CC</sub> \_\_\_\_\_ 16V  
 Supply Voltage, V<sub>OH</sub> \_\_\_\_\_ 16V  
 Output current, I<sub>OL</sub> \_\_\_\_\_ 50mA  
 Power Dissipation  
 (derate linearly 2mW / °C above 25°C) — 150mW

**POWER DISSIPATION**

Total Power Dissipation  
 (derate linearly 2.94mW / °C above 25°C) — 170mW



**ISOCOM COMPONENTS LTD**

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



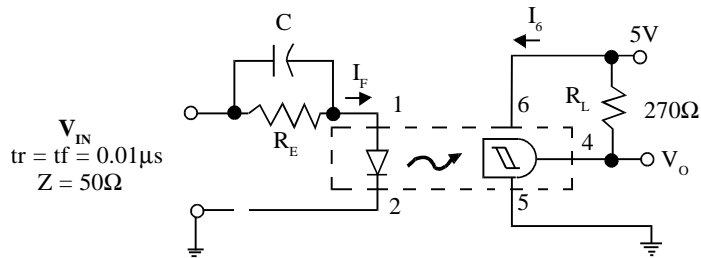
**ELECTRICAL CHARACTERISTICS (  $T_A = 25^\circ\text{C}$  Unless otherwise noted )**

|         | PARAMETER                                   | MIN          | TYP  | MAX | UNITS                 | TEST CONDITION   |               |
|---------|---|--------------|------|-----|-----------------------|--|---------------|
| Input   | Forward Voltage ( $V_F$ )                   | 0.75         |      |     | V                     | $I_F = 0.3\text{mA}$<br>$I_F = 10\text{mA}$<br>$V_R = 3\text{V}$<br>$V = 0, f = 1\text{MHz}$   |               |
|         | Forward Voltage ( $V_F$ )                   |              |      | 1.5 | V                     |  |               |
|         | Reverse Current ( $I_R$ )                   |              |      | 10  | $\mu\text{A}$         |  |               |
|         | Capacitance ( $C_J$ )                       |              |      | 100 | pF                    |  |               |
| Output  | Operating Voltage Range ( $V_{CC}$ )        | 3            |      | 15  | V                     | $I_F = 0\text{mA}, V_{CC} = 5\text{V}$<br>$I_F = 0\text{mA}, V_{CC} = V_O = 15\text{V}$  |               |
|         | Supply Current $I_6$ (off)                  |              |      | 1.6 | 5                     |  | mA            |
|         | Output Current High ( $I_{OH}$ )            |              |      |     | 100                   |  | $\mu\text{A}$ |
| Coupled | Supply Current $I_6$ (on)                   |              | 1.6  | 5   | mA                    | $I_F = 10\text{mA}, V_{CC} = 5\text{V}$<br>$R_L = 270\Omega, V_{CC} = 5\text{V}$<br>$I_F = I_{F(\text{on})} \text{ max}$<br>$R_L = 270\Omega, V_{CC} = 5\text{V}$<br>$R_L = 270\Omega, V_{CC} = 5\text{V}$<br>$R_L = 270\Omega, V_{CC} = 5\text{V}$<br>See note 1<br>See note 1<br>$R_E = 1200\Omega$<br>$C = 270\text{pF}$<br>$f \leq 100\text{kHz}$<br>$t_p = 1\mu\text{s}$ or greater |               |
|         | Output Voltage, Low ( $V_{OL}$ )            |              |      | 0.4 | V                     |  |               |
|         | Turn-on Threshold Current $I_F$ (on)        |              |      | 1.6 | mA                    |  |               |
|         | Turn-off Threshold Current $I_F$ (off)      | 0.3          |      |     | mA                    |  |               |
|         | Hysteresis Ratio $I_F$ (off) / $I_F$ (on)   | 0.5          |      | 0.9 |                       |  |               |
|         | Input to Output Isolation Voltage $V_{ISO}$ | 5300<br>7500 |      |     | $V_{RMS}$<br>$V_{PK}$ |  |               |
|         | Turn-on Time                                | $t_{on}$     | 0.57 |     | $\mu\text{s}$         |  |               |
|         | Fall Time                                   | $t_f$        | 0.09 |     | $\mu\text{s}$         |  |               |
|         | Turn-off Time                               | $t_{off}$    | 1.40 |     | $\mu\text{s}$         |  |               |
|         | Rise Time                                   | $t_r$        | 0.05 |     | $\mu\text{s}$         |  |               |

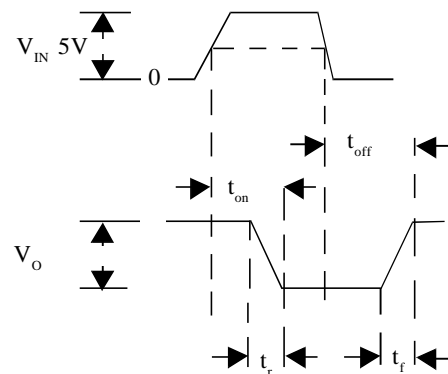
Note 1 Measured with input leads shorted together and output leads shorted together.

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

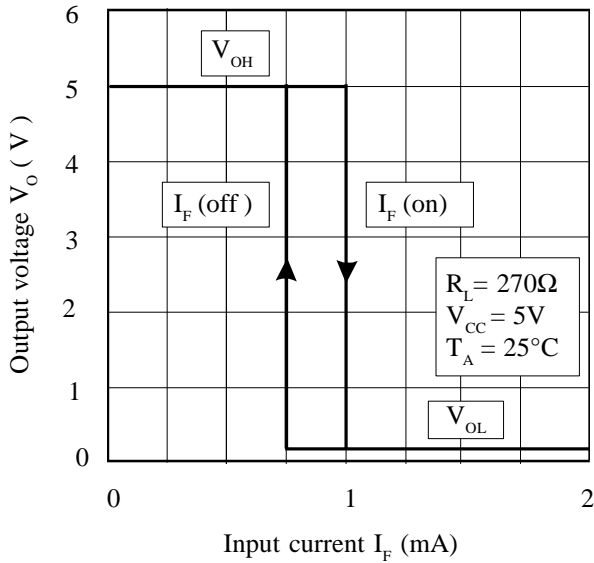
**SWITCHING CHARACTERISTICS**



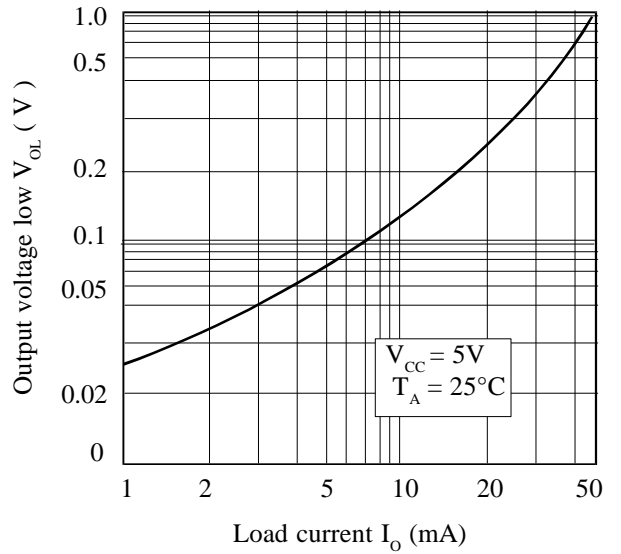
**SWITCHING TEST CIRCUIT**



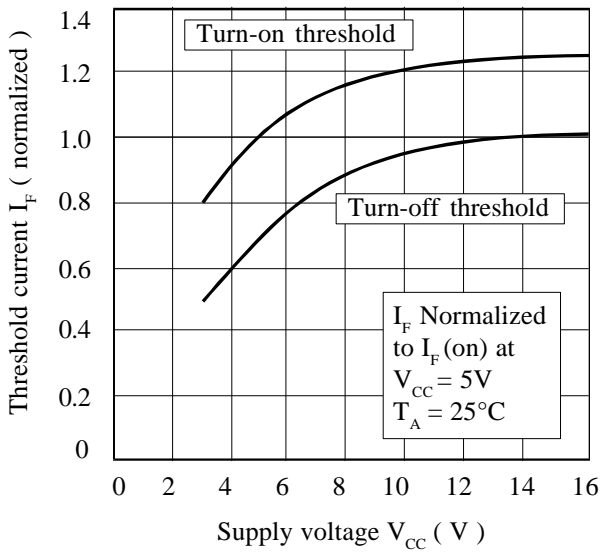
**Transfer Characteristics**



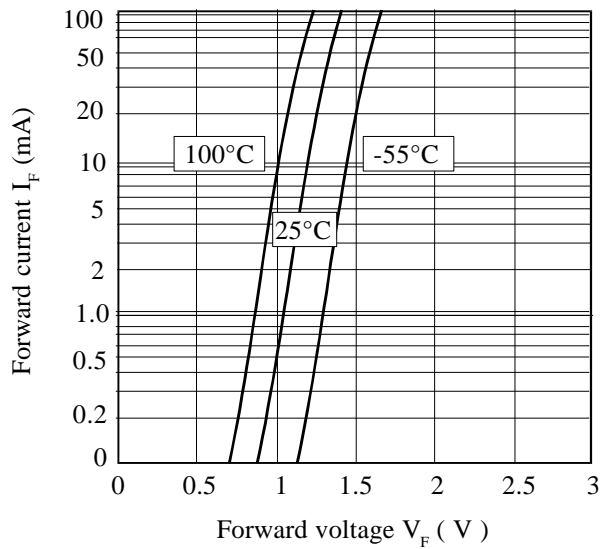
**On Voltage vs. Load Current**



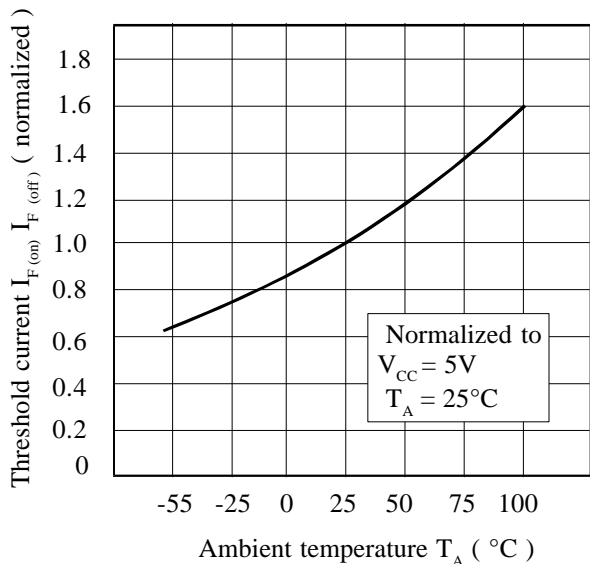
**Threshold Current vs. Supply Voltage**



**Forward Voltage vs. Forward Current**



**Threshold Current vs. Ambient Temperature**



**Supply Current vs. Supply Voltage**

