

6N138

LOW INPUT CURRENT HIGH GAIN OPTOCOUPLERS

ISOCOM[®] LTD

| PACKAGES | CIRCUIT |
|----------|---------|
| | |

DESCRIPTION

The 6N138 is an optically coupled isolator. It consists of an infrared emitting diode and an integrated high gain photon detector to provide 3000Vdc electrical insulation, 500V/ μ S common mode transient immunity and extremely high current transfer ratio between input and output. Separate pins for the photodiode and output stage result in TTL compatible saturation voltages and high speed operation. Where desired the V_{CC} and V_O terminals may be tied together to achieve conventional photodarlington operation. A base access terminal allows a gain bandwidth adjustment to be made.

Isocom Ltd supplies a multitude of plastic optocouplers for all applications varying from standard transistor optos through to Darlington and Schmitt Trigger devices. It's massive family of optos vary in speed allowing maximum opportunity to engineers worldwide.

All devices are performance guaranteed between -20°C and +80°C and have completed rigorous testing. The Company's customers can be assured of our commitment to stringent quality, reliability and inspection standards, as demonstrated by our existing approvals. Other customer specific options can also be offered.

FEATURES

- High CTR - 600% Typical
- 3000V Isolation
- High Output Current - 60mA
- Low Input Current Requirement - 0.5mA

Isocom Ltd reserves the right to change the details on this specification without notice. Please consult Isocom Ltd prior to use. Isocom Ltd cannot accept liability for any errors or omissions.

For sales enquiries, or further information, please contact our sales office at:

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Or go to the Isocom Website @: [Http://www.isocom.uk.com](http://www.isocom.uk.com)

ABSOLUTE MAXIMUM RATINGS

| | |
|-----------------------------------|-------------------------------|
| Storage Temperature | -55°C to +125°C |
| Operating Temperature | 0°C to +70°C |
| Lead Soldering Temperature | 260°C 1.6mm from case for 10S |
| Input-to-Output Isolation Voltage | 3000V |

Input Diode

| | | |
|----------------------|------|-------------------|
| Forward DC Current | 20mA | |
| Reverse DC Voltage | 5V | |
| Peak forward Current | 1.0A | ≤1μS p.w. 300 pps |
| Power Dissipation | 35mW | |

Output Transistor

| | | |
|---|--------------|----------------|
| Current | 60mA | I _O |
| Emitter-Base Reverse Voltage (pin 5-7) | 0.5V | |
| Supply and Output Voltage- V _{CC} (pin 8-5), V _O (pin 6-5) | -0.5 to 7.0V | |
| Power Dissipation | 35mW | |

ELECTRICAL CHARACTERISTICS

T_A = 25°C U.O.S. (each channel where appropriate).

Input Diode Electrical Characteristics

| Parameter | Symbol | Test Conditions | Device | Min | Typ | Max | Units |
|---------------------------|-----------------|---|--------|-----|-----|-----|-------|
| Forward Voltage | V _F | I _F = 1.6, T _A = 25°C | | | 1.4 | 1.7 | V |
| Reverse Breakdown Voltage | BV _R | I _R = 10μA T _A = 25°C | | 5.0 | | | V |

Coupled Electrical Characteristics

| | | | | | | | |
|---|------------------|---|--|------|------------------|-----|----|
| DC Current Transfer Ratio | CTR | I _F = 1mA, V _O = 0.4V V _{CC} = 4.5V | | 300 | 600 | | % |
| Logic Low Output Voltage | V _{OL} | I _F = 1.6mA, I _O = 4.8mA, V _{CC} = 4.5V | | | 0.1 | 0.4 | V |
| Logic High Output Current | I _{OH} | I _F = 0, V _O = V _{CC} = 7V | | | 0.1 | 250 | μA |
| Logic Low Supply Current | I _{CCL} | I _F = 1.6mA, V _O = open V _{CC} = 5.0V | | | 0.2 | | mA |
| Logic High Supply Current | I _{CCH} | I _F = 0mA, V _O = open V _{CC} = 5.0V | | | 10 | | nA |
| Input Capacitance | C _{IN} | f = 1Mhz, v _F = 0 | | | 60 | | pF |
| Input-Output Insulation Leakage Current | I _{IO} | 45% Relative Humidity, T _A = 25°C, t = 5S, V _{IO} = 3KVdc | | | | 1.0 | μA |
| Input-to-Output Isolation Resistance | R _{IO} | V _{IO} = 500V | | | 10 ¹¹ | | Ω |
| Capacitance | C _{IO} | f = 1Mhz | | | 0.6 | | pF |
| Delay Time High-Low | t _{PHL} | I _F = 1.6 mA, R _L = 2.2KΩ | | | 1 | 10 | μS |
| Delay Time Low-High | t _{PLH} | | | | 4 | 35 | μS |
| Input-to-Output Isolation Voltage | | | | 3000 | | | V |

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