

66177

**GULL WING HERMETICALLY SEALED,
SINGLE CHANNEL OPTOCOUPLER
(Electrically Similar To 4N47, 4N48, 4N49)**



01/23/2007

Features:

- High Reliability
- Base lead provided for conventional transistor biasing
- Very high gain, high voltage transistor
- Stability over wide temperature range.
- High voltage electrical isolation

Applications:

- Eliminate ground loops
- Level shifting
- Line receiver
- Switching power supplies
- Motor control

DESCRIPTION

The **66177** single channel optocoupler consists of an LED optically coupled to a high gain silicon phototransistor. The 66177 is electrically equivalent to the 4N47 (-X01), 4N48 (-X02) and the 4N49 (-X03), but is screened to MIL-PRF-38534 which includes high temperature testing at +125°C. Available in standard and screened versions.

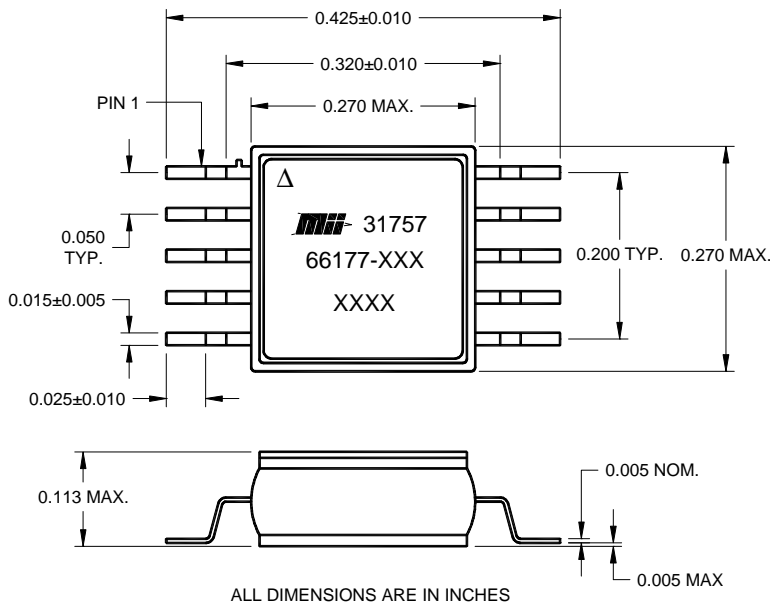
ABSOLUTE MAXIMUM RATINGS

| | |
|---|-----------------|
| Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 1) | 40 mA |
| Input Power Dissipation | 35 mW |
| Reverse Input Voltage | 3 V |
| Collector-Base Voltage | 45 V |
| Collector-Emitter Voltage | 40 V |
| Emitter-Base Voltage | 7 V |
| Continuous Collector Current | 50 mA |
| Continuous Transistor Power Dissipation at (or below) 25°C Free-Air Temperature (see Note 2)..... | 300 mW |
| Storage Temperature | -65°C to +150°C |
| Operating Free-Air Temperature Range..... | -55°C to +125°C |
| Lead Solder Temperature (10 seconds, 1/16" from case) | 240°C |

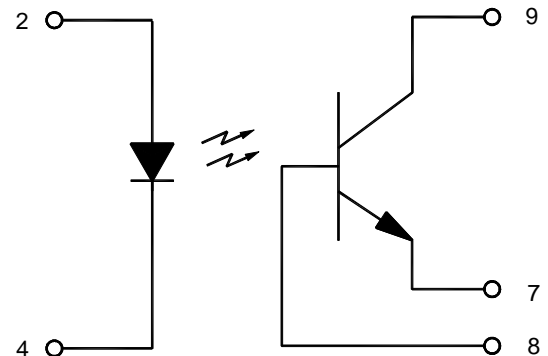
Notes:

1. Derate linearly to 125°C free-air temperature at the rate of 1.1 mA/°C.
2. Derate linearly to 125°C free-air temperature at the rate of 4.0 mW/°C.

Package Dimensions



Schematic Diagram



66177

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ELECTRICAL CHARACTERISTICST_A = -55°C to 125°C unless otherwise specified.

| PARAMETER | SYMBOL | MIN | TYP | MAX | UNITS | TEST CONDITIONS | NOTE |
|--------------------------------------|----------------------|------------------|-----|-----|-------|--|------|
| Input Diode Static Reverse Current | I _R | | | 100 | μA | V _R = 2 V | |
| Input Diode Static Forward Voltage | V _F | | 1.0 | 1.7 | V | I _F = 10 mA | |
| | | | 0.8 | 1.4 | V | | |
| | | | 0.7 | 1.3 | V | | |
| Input to Output Resistance | R _{IO} | 10 ¹¹ | | | Ω | V _{IN-OUT} = 1 kV | 1 |
| Input to Output Capacitance | C _{IO} | | 2.5 | 5 | pF | f = 1 MHz, V _{IN-OUT} = 0 | 1 |
| Collector-Emitter Saturation Voltage | V _{CE(SAT)} | | | 0.3 | V | I _F = 2 mA, I _C = 0.5 mA, I _B = 0 | |
| | V _{CE(SAT)} | | | 0.3 | V | I _F = 2 mA, I _C = 1 mA, I _B = 0 | |
| | V _{CE(SAT)} | | | 0.3 | V | I _F = 2 mA, I _C = 2 mA, I _B = 0 | |

TYPICAL CHARACTERISTICSAt T_A = 25°C, V_{CC} = 5 V Each Channel

| PARAMETER | SYMBOL | MIN | TYP | MAX | UNITS | TEST CONDITIONS | NOTE |
|---|----------------------|-----|------|-----|-------|---|------|
| Collector-Base Breakdown Voltage | V _{(BR)CBO} | 45 | | | V | I _C = 100 μA, I _B = 0, I _F = 0 | |
| Collector-Emitter Breakdown Voltage | V _{(BR)CEO} | 40 | | | V | I _C = 1 mA, I _B = 0, I _F = 0 | |
| Emitter-Base Breakdown Voltage | V _{(BR)EBO} | 7 | | | V | I _C = 0 mA, I _E = 100 μA, I _F = 0 | |
| On State Collector Current | I _{C(ON)} | 0.5 | | - | mA | V _{CE} = 5 V, I _B = 0, I _F = 1 mA | |
| | | 1.0 | | 5 | | | |
| | | 2.0 | | 10 | | | |
| On State Collector Current | I _{C(ON)} | 0.7 | | | mA | V _{CE} = 5 V, I _B = 0, I _F = 2 mA | |
| T _a = -55°C | | 1.4 | | | | | |
| | | 2.8 | | | | | |
| On State Collector Current | I _{C(ON)} | 0.5 | | | mA | V _{CE} = 5 V, I _B = 0, I _F = 2 mA | |
| T _a = +125°C | | 1.0 | | | | | |
| | | 2.0 | | | | | |
| Off State Collector Current | I _{C(OFF)} | | | 100 | nA | V _{CE} = 20 V, I _B = 0, I _F = 0 mA | |
| Off State Collector Current, T _a = 125°C | I _{C(OFF)} | | | 100 | μA | V _{CE} = 20 V, I _B = 0, I _F = 0 mA | |
| Rise Time (Phototransistor Operation) | t _r | | 10 | 20 | μs | V _{CC} = 10 V, I _B = 0, I _F = 5 mA, R _L = 100 Ω | |
| or | or | | 10 | 20 | | | |
| Fall Time | t _f | | 15 | 25 | | | |
| Rise Time (Photodiode Operation) | t _r | | 0.85 | 3 | μs | V _{CC} = 10 V, I _E = 0, I _F = 5 mA, R _L = 100 Ω | |
| or | or | | 0.85 | 3 | | | |
| Fall Time | t _f | | 0.85 | 3 | | | |

NOTES:

- These parameters are measured between all phototransistor leads shorted together and with both input diode leads shorted together.

RECOMMENDED OPERATING CONDITIONS:

| PARAMETERS | SYMBOL | MIN | MAX | UNITS |
|---------------------------|-----------------|-----|-----|-------|
| Input Current, Low Level | I _{FL} | 0 | 100 | μA |
| Input Current, High Level | I _{FH} | 1 | 10 | mA |
| Supply Voltage | V _{CC} | 5.0 | 20 | V |
| Operating Temperature | T _A | -55 | 125 | °C |

SELECTION GUIDE

| PART NUMBER | PART DESCRIPTION |
|-------------|----------------------|
| 66177-001 | 4N47, Commercial |
| 66177-101 | 4N47, Screened |
| 66177-201 | 4N47(-55° to +125°C) |
| 66177-301 | 4N47 (-40° to +85°C) |
| 66177-002 | 4N48, Commercial |
| 66177-102 | 4N48, Screened |
| 66177-202 | 4N48(-55° to +125°C) |
| 66177-302 | 4N48 (-40° to +85°C) |
| 66177-003 | 4N49, Commercial |
| 66177-103 | 4N49, Screened |
| 66177-203 | 4N49(-55° to +125°C) |
| 66177-303 | 4N49 (-40° to +85°C) |