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.

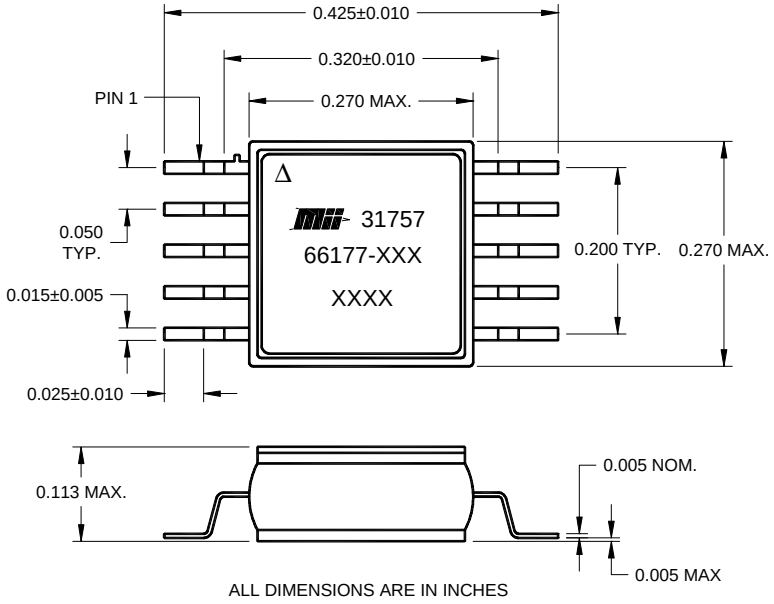
ABSOLUTE MAXIMUM RATINGS

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

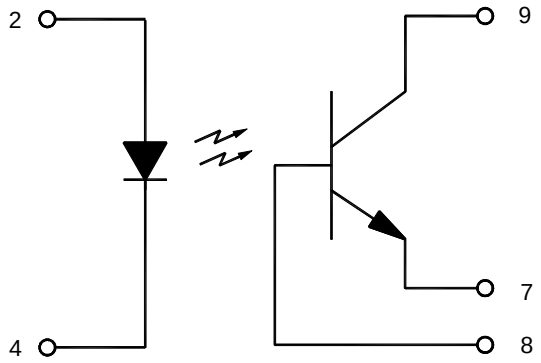
Notes:

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



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ELECTRICAL CHARACTERISTICS

T_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	-55°C	V_F		1.0	1.7	V	I_F = 10 mA	
	+25°C			0.8	1.4	V		
	+125°C			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	-X01	$V_{CE(SAT)}$			0.3	V	I_F = 2 mA, I_C = 0.5 mA, I_B = 0	
	-X02	$V_{CE(SAT)}$			0.3	V	I_F = 2 mA, I_C = 1 mA, I_B = 0	
	-X03	$V_{CE(SAT)}$			0.3	V	I_F = 2 mA, I_C = 2 mA, I_B = 0	

TYPICAL CHARACTERISTICS

At 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	-X01	$I_{C(ON)}$	0.5		-	mA	V_{CE} = 5 V, I_B = 0, I_F = 1 mA	
	-X02		1.0		5			
	-X03		2.0		10			
On State Collector Current	-X01	$I_{C(ON)}$	0.7			mA	V_{CE} = 5 V, I_B = 0, I_F = 2 mA	
T_a = -55°C	-X02		1.4					
	-X03		2.8					
On State Collector Current	-X01	$I_{C(ON)}$	0.5			mA	V_{CE} = 5 V, I_B = 0, I_F = 2 mA	
T_a = +125°C	-X02		1.0					
	-X03		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)	-X01	t_r		10	20	µs	V_{CC} = 10 V, I_B = 0, I_F = 5 mA, R_L=100 Ω	
or	-X02	or		10	20			
Fall Time	-X03	t_f		15	25			
Rise Time (Photodiode Operation)	-X01	t_r		0.85	3	µs	V_{CC} = 10 V, I_E = 0, I_F = 5 mA, R_L = 100 Ω	
or	-X02	or		0.85	3			
Fall Time	-X03	t_f		0.85	3			

NOTES:

1. 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)