66177	**GULL WING HERMETICALLY SEALED, SINGLE CHANNEL OPTOCOUPLER (Electrically Similar To 4N47, 4N48, 4N49)**	**Mii** OPTOELECTRONIC PRODUCTS DIVISION

REV A 5/7/01

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) and is available in standard and screened versions.

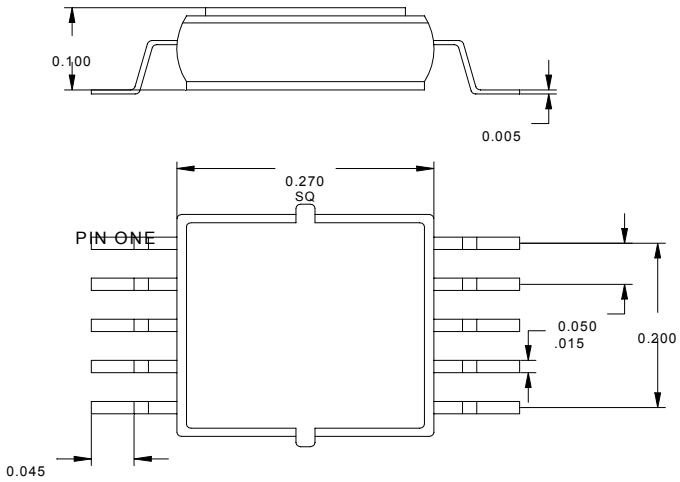
ABSOLUTE MAXIMUM RATINGS

Storage Temperature ..... -65°C to +150°C
Operating Free-Air Temperature Range ..... -55°C to +125°C
Lead Solder Temperature(10 seconds maximum) ..... 240°C
Peak Forward Input Current ..... 40mA (1ms duration)
Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 2) 20mA
Input Power Dissipation 35mW
Reverse Input Voltage 2V
Collector-Base Voltage 45V
Collector-Emitter Voltage (See note 1) 40V
Emitter-Base Voltage 7V
Continuous Collector Current 50mA
Continuous Transistor Power Dissipation at (or below) 25°C Free-Air Temperature (see Note 3) 300mW

Notes:

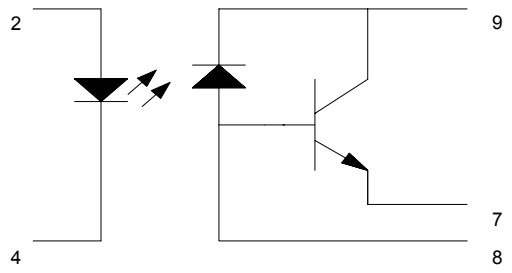
1. This value applies with the emitter-base diode open-circuited and the input-diode current equal to zero.
2. Derate linearly to 125°C free-air temperature at the rate of 0.2mA/°C.
3. Derate linearly to 125°C free-air temperature at the rate of 3mW/°C.

Package Dimensions



DIMENSIONS ARE IN INCHES

Schematic Diagram



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 = 2V	
Input Diode Static Forward Voltage	-55°C	V_F		1.0	1.7	V	I_F = 10mA	
	+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} = 1kV	
Input to Output Capacitance		C_{IO}		2.5	5	pF	f = 1MHz, V_{IN-OUT} = 0	1
Collector-Emitter Saturation Voltage	66177-X01	$V_{CE(SAT)}$			0.3	V	I_F = 2mA, I_C = 0.5mA, I_B = 0	
	66177-X02	$V_{CE(SAT)}$			0.3	V	I_F = 2mA, I_C = 1mA, I_B = 0	
	66177-X03	$V_{CE(SAT)}$			0.3	V	I_F = 2mA, I_C = 2mA, I_B = 0	

TYPICAL CHARACTERISTICS

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

PARAMETER		SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Collector-Base Breakdown Voltage		$V_{(BR)CBO}$	45			V	I_C = 100µA, I_B = 0, I_F = 0	
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	40			V	I_C = 1mA, I_B = 0, I_F = 0	
Emitter-Base Breakdown Voltage		$V_{(BR)EBO}$	7			V	I_C = 0mA, I_E = 100µA, I_F = 0	
On State Collector Current	66177-X01	$I_{C(ON)}$	0.5		-	mA	V_{CE} = 5V, I_B = 0, I_F = 1mA	
	66177-X02		1.0		5			
	66177-X03		2.0		10			
On State Collector Current	66177-X01	$I_{C(ON)}$	0.7			mA	V_{CE} = 5V, I_B = 0, I_F = 2mA	
T_a = -55°C	66177-X02		1.4					
	66177-X03		2.8					
On State Collector Current	66177-X01	$I_{C(ON)}$	0.5			mA	V_{CE} = 5V, I_B = 0, I_F = 2mA	2
T_a = +125°C	66177-X02		1.0					
	66177-X03		2.0					
Off State Collector Current		$I_{C(OFF)}$			100	nA	V_{CE} = 20V, I_B = 0, I_F = 0mA	
Off State Collector Current, T_a = 125°C		$I_{C(OFF)}$			100	µA	V_{CE} = 20V, I_B = 0, I_F = 0mA	
Rise Time (Phototransistor Operation)	66177-X01	t_r		10	20	µs	V_{CC} = 10V, I_B = 0, I_F = 5mA, R_L=100Ω	
or	66177-X02	or		10	25			
Fall Time	66177-X03	t_f		10	25			
Rise Time (Photodiode Operation)	66177-X01	t_r		0.85	3	µs	V_{CC} = 10V, I_E = 0, I_F = 5mA, R_L = 100Ω	
or	66177-X02	or		0.85	3			
Fall Time	66177-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.
2. This parameter must be measured using pulse techniques t_w = 100µs, duty cycle ≤ 1%.

RECOMMENDED OPERATING CONDITIONS:

PARAMETERS	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I_{FL}	0	100	µA
Input Current, High Level	I_{FH}	1	2	mA
Supply Voltage	V_{CC}	5.0	20	V
Operating Temperature	T_A	-55	125	°C

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
66177-001	Single Channel (4N47) optocoupler, Commercial
66177-101	Single Channel (4N47) optocoupler, full mil-temp (-55° to +125°C) with 100% device screening
66177-201	Single Channel (4N47) optocoupler, military operating range (-55° to +125°C)
66177-301	Single Channel (4N47) optocoupler, extended temperature range (-40° to +85°C)
66177-002	Single Channel (4N48) optocoupler, Commercial
66177-102	Single Channel (4N48) optocoupler, full mil-temp (-55° to +125°C) with 100% device screening
66177-202	Single Channel (4N48) optocoupler, military operating range (-55° to +125°C)
66177-302	Single Channel (4N48) optocoupler, extended temperature range (-40° to +85°C)
66177-003	Single Channel (4N49) optocoupler, Commercial
66177-103	Single Channel (4N49) optocoupler, full mil-temp (-55° to +125°C) with 100% device screening
66177-203	Single Channel (4N49) optocoupler, military operating range (-55° to +125°C)
66177-303	Single Channel (4N49) optocoupler, extended temperature range (-40° to +85°C)