

**66227**

**PROTON RADIATION TOLERANT OPTOCOUPLER  
(Pin-For- Pin Replacement For 4N49)**



06/20/2011

**Features:**

- Current Transfer Ratio-200% typical
- 1kVdc electrical input to output isolation
- Base lead provided for conventional transistor biasing
- Proton radiation tolerant

**Applications:**

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

**DESCRIPTION**

The **66227** Optocoupler consists of an 850nm GaAlAs LED optically coupled to a phototransistor mounted in a hermetic TO-5 package. Test studies have shown this LED to be even more radiation tolerant than the 660nm LED typically used in radiation tolerant applications. Available in commercial or screened levels.

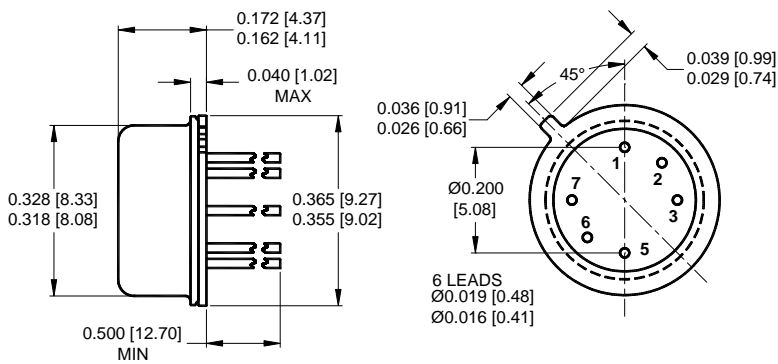
**ABSOLUTE MAXIMUM RATINGS**

Input Diode Forward DC Current.....	40 mA
Input Power Dissipation (Note 1) .....	80 mW
Input-Output Isolation Voltage .....	1000 V
Reverse Input Voltage .....	3 V
Collector-Base Voltage .....	60 V
Collector-Emitter Voltage .....	60 V
Emitter-Base Voltage.....	7 V
Continuous Collector Current .....	50 mA
Continuous Transistor Power Dissipation (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:**

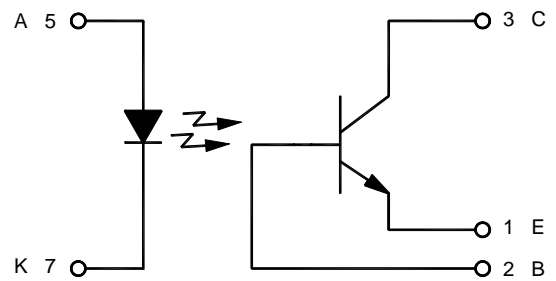
1. Derate linearly 0.8 mW/°C above 25°C.
2. Derate linearly 3.0 mW/°C above 25°C.

**Package Dimensions**



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

**Schematic Diagram**



COLLECTOR IS COMMON TO CASE

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**ELECTRICAL CHARACTERISTICS**T<sub>A</sub> = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Diode Static Reverse Current	I <sub>R</sub>			100	μA	V <sub>R</sub> = 2 V	
Input Diode Static Forward Voltage -55°C	V <sub>F</sub>	1.0		1.7	V	I <sub>F</sub> = 10 mA	
Input Diode Static Forward Voltage +25°C	V <sub>F</sub>	0.8		1.45	V	I <sub>F</sub> = 10 mA	
Input Diode Static Forward Voltage +100°C	V <sub>F</sub>	0.7		1.3	V	I <sub>F</sub> = 10 mA	

**OUTPUT TRANSISTOR**T<sub>A</sub> = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	60			V	I <sub>C</sub> = 100 μA, I <sub>B</sub> = 0, I <sub>F</sub> = 0	
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	60			V	I <sub>C</sub> = 1 mA, I <sub>B</sub> = 0, I <sub>F</sub> = 0	
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	7			V	I <sub>C</sub> = 0 mA, I <sub>E</sub> = 100 μA, I <sub>F</sub> = 0	
Off-State Collector Current +25°C	I <sub>C(OFF)</sub>			100	nA	V <sub>CE</sub> = 20 V, I <sub>F</sub> = 0 mA, I <sub>B</sub> = 0	
+100°C				100	μA		

**COUPLED CHARACTERISTICS**T<sub>A</sub> = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
On State Collector Current	I <sub>C(ON)</sub>	2.0			mA	V <sub>CE</sub> = 5.0 V, I <sub>F</sub> = 1 mA	
On State Collector Current +100°C	I <sub>C(ON)</sub>	2.0			mA	V <sub>CE</sub> = 5.0 V, I <sub>F</sub> = 2 mA	
On State Collector Current -55°C	I <sub>C(ON)</sub>	2.0			mA	V <sub>CE</sub> = 5 V, I <sub>F</sub> = 2 mA	
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>			0.3	V	I <sub>F</sub> = 2 mA, I <sub>C</sub> = 2 mA, I <sub>B</sub> = 0	
Input to Output Internal Resistance	R <sub>IO</sub>	10 <sup>11</sup>			Ω	V <sub>IN-OUT</sub> = 1000 V	1
Input to Output Capacitance	C <sub>IO</sub>		2.5	5	pF	f = 1 MHz	1
Rise Time-Phototransistor Operation	t <sub>r</sub>		10	15	μs	V <sub>CC</sub> = 10 V, I <sub>F</sub> = 5 mA, R <sub>L</sub> = 100 Ω, I <sub>B</sub> = 0	
Fall Time-Phototransistor Operation	t <sub>f</sub>		10	15	μs	V <sub>CC</sub> = 10 V, I <sub>F</sub> = 5 mA, R <sub>L</sub> = 100 Ω, I <sub>B</sub> = 0	
Rise Time-Photodiode Operation	t <sub>r</sub>		0.85	3	μs	V <sub>CC</sub> = 10 V, I <sub>F</sub> = 5 mA, R <sub>L</sub> = 100 Ω, I <sub>E</sub> = 0	
Fall Time-Photodiode Operation	t <sub>f</sub>		0.85	3	μs	V <sub>CC</sub> = 10 V, I <sub>F</sub> = 5 mA, R <sub>L</sub> = 100 Ω, I <sub>E</sub> = 0	

**NOTES:**

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

**RECOMMENDED OPERATING CONDITIONS:**

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I <sub>FL</sub>	0	90	μA
Input Current, High Level	I <sub>FH</sub>	2	10	mA
Supply Voltage	V <sub>CE</sub>	5	10	V
Operating Temperature	T <sub>A</sub>	-55	100	°C

**SELECTION GUIDE**

PART NUMBER	PART DESCRIPTION
66227-001	Commercial
66227-101	Commercial with Group A
66227-103	Screened to TX level
66227-105	Screened to TXV level