

**66183**

**PROTON RADIATION TOLERANT OPTOCOUPLER**  
(Single Channel, Electrically Similar to 4N49)



10/17/06

**Features:**

- High Reliability
- Base lead provided for conventional transistor biasing
- Rugged package
- Stability over wide temperature
- +1000V electrical isolation

**Applications:**

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

**DESCRIPTION**

The **66183** is a single channel device electrically similar to the 4N49. This product has been designed to be more tolerant to proton radiation. The 66183 optocoupler is packaged in a hermetically sealed 6 pin leadless chip carrier (LCC). This device can be supplied to customer specifications as well as tested in accordance with MIL-PRF-19500 to Class S level.

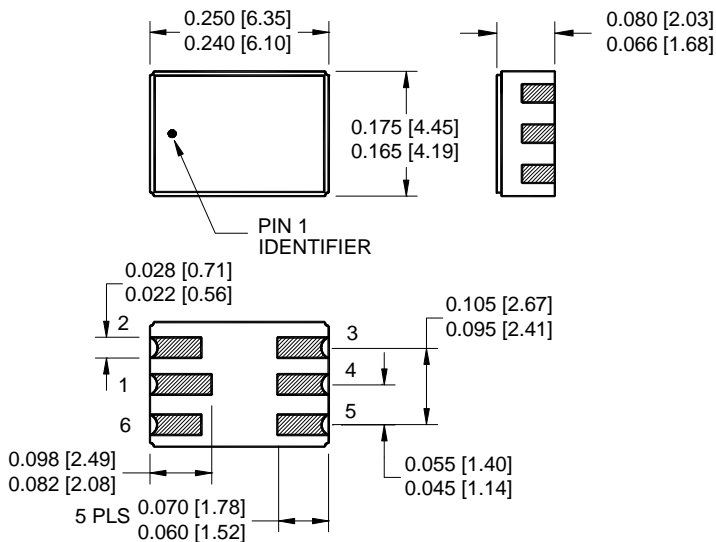
**ABSOLUTE MAXIMUM RATINGS**

Input to Output Isolation Voltage .....	1kV
Input Diode Continuous Forward Current .....	40 mA
Peak Forward Input Current (value applies for $t_w \leq 10\mu s$ , PRR < 300 pps) .....	1 A
Reverse Input Voltage .....	2 V
Input Power Dissipation (Note 1) .....	80 mW
Emitter-Base Voltage .....	7 V
Collector-Emitter Voltage (Value applies to emitter-base open-circuited and the input diode equal to zero).....	60 V
Collector-Base Voltage .....	60 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 max.).....	240°C

**Notes:**

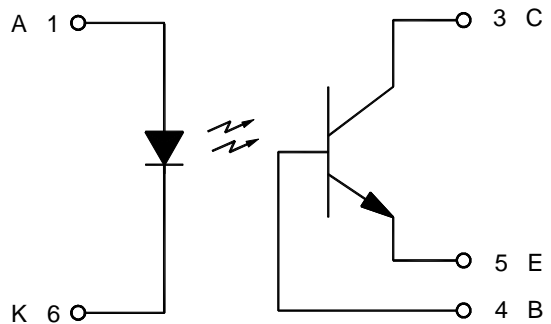
1. Derate linearly at the rate of 1.33 mW/°C above 65°C case.
2. Derate linearly at the rate of 3 mW/°C above 25°C case.

**Package Dimensions**



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

**Schematic Diagram**



# 66183

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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>			10	μA	V <sub>R</sub> = 5 V	
Input Diode Static Forward Voltage -55°C	V <sub>F</sub>	1.0		2.2	V	I <sub>F</sub> = 10 mA	
Input Diode Static Forward Voltage +25°C	V <sub>F</sub>	0.8	1.8	2.0	V	I <sub>F</sub> = 10 mA	
Input Diode Static Forward Voltage +100°C	V <sub>F</sub>	0.8		2.2	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 - 011, -108	V <sub>(BR)CBO</sub>	45 60			V	I <sub>C</sub> = 100 μA, I <sub>B</sub> = 0, I <sub>F</sub> = 0	
Collector-Emitter Breakdown Voltage - 011, -108	V <sub>(BR)CEO</sub>	40 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 +100°C	I <sub>CEO</sub> I <sub>CEO</sub>			100 100	nA μA	V <sub>CE</sub> = 20 V, I <sub>F</sub> = 0 mA, I <sub>B</sub> = 0 V <sub>CE</sub> = 20 V, I <sub>F</sub> = 0 mA, I <sub>B</sub> = 0	

### 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 V, I <sub>F</sub> = 1 mA, I <sub>B</sub> = 0	
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, I <sub>B</sub> = 0	
On State Collector Current -55°C	I <sub>C(ON)</sub>	2.8			mA	V <sub>CE</sub> = 5 V, I <sub>F</sub> = 2 mA, I <sub>B</sub> = 0	
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>			0.3	V	I <sub>F</sub> = 2 mA, I <sub>C</sub> = 2 mA	
Input to Output Isolation Voltage	V <sub>I-O</sub>	1000			V	I <sub>I-O</sub> = 100 nA	1
Input to Output Capacitance	C <sub>IO</sub>		2.5	5	pF	f = 1MHz, V <sub>I-O</sub> = 1000 V	1
Rise Time-Phototransistor Operation	t <sub>r</sub>		10	25	μs	V <sub>CC</sub> = 10 V, I <sub>F</sub> = 10 mA, R <sub>L</sub> = 100 Ω, I <sub>B</sub> = 0	2
Fall Time-Phototransistor Operation	t <sub>f</sub>		10	25	μs	V <sub>CC</sub> = 10V, I <sub>F</sub> = 10mA, R <sub>L</sub> = 100 Ω, I <sub>B</sub> = 0	2

#### NOTES:

- These parameters are measured between all phototransistor leads shorted together and with both input diode leads shorted together.
- This parameter must be measured using pulse techniques (t<sub>W</sub> = 100μs duty cycle ≤ 1%).

### 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
66183-001	Single channel proton radiation tolerant optocoupler - commercial
66183-011	Single channel proton radiation tolerant optocoupler – commercial, 60 Volt Breakdown
66183-101	Single channel proton radiation tolerant optocoupler - screened to JAN level
66183-103	Single channel proton radiation tolerant optocoupler - screened to JANTX level
66183-105	Single channel proton radiation tolerant optocoupler - screened to JANTXV level
66183-108	Single channel proton radiation tolerant optocoupler - screened to JANTXV level, 60 Volt Breakdown