

**66183**

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

**Mii**  
OPTOELECTRONIC PRODUCTS  
DIVISION

REVISION C 5/6/02

**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.

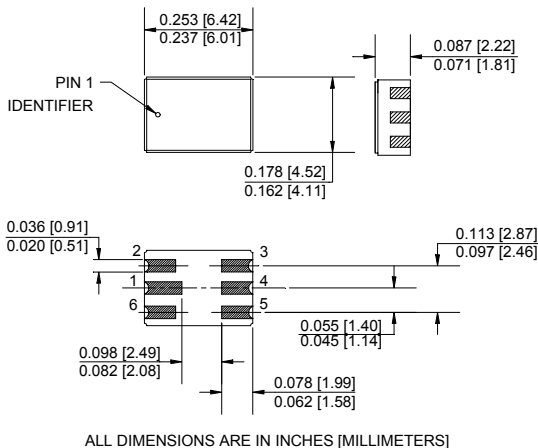
**ABSOLUTE MAXIMUM RATINGS**

Input to Output Voltage .....	1kV
Emitter-Base Voltage .....	7V
Collector-Emitter Voltage (Value applies to emitter-base open-circuited & the input-diode equal to zero) .....	40V
Collector-Base Voltage .....	45V
Reverse Input Voltage .....	2V
Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 1) .....	50mA
Peak Forward Input Current (Value applies for $t_w \leq 1\mu s$ , PRR < 300 pps) .....	1A
Continuous Collector Current .....	50mA
Continuous Transistor Power Dissipation at (or below) 25°C Free-Air Temperature (see Note 2) .....	300mW
Storage Temperature .....	-55°C to +150°C
Operating Free-Air Temperature Range .....	-55°C to +100°C
Lead Solder Temperature (10 seconds max.) .....	240°C

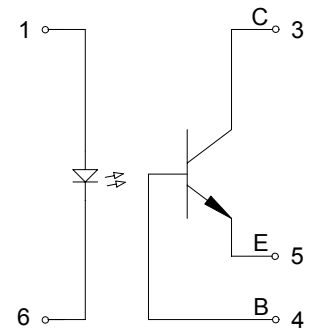
**Notes:**

1. Derate linearly to 100°C free-air temperature at the rate of 0.80 mW/°C above 25°C.
2. Derate linearly to 100°C free-air temperature at the rate of 3 mW/°C above 25°C.

**Package Dimensions**



**Schematic Diagram**



**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> = 3V	
Input Diode Static Forward Voltage -55°C	V <sub>F</sub>	1.0		2.2	V	I <sub>F</sub> = 10mA	
Input Diode Static Forward Voltage +25°C	V <sub>F</sub>	0.8	1.8	2.0	V	I <sub>F</sub> = 10mA	
Input Diode Static Forward Voltage +100°C	V <sub>F</sub>	0.8		2.2	V	I <sub>F</sub> = 10mA	

**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>	45			V	I <sub>C</sub> = 100μA, I <sub>B</sub> = 0, I <sub>F</sub> = 0	
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	40			V	I <sub>C</sub> = 1mA, I <sub>B</sub> = 0, I <sub>F</sub> = 0	
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	2			V	I <sub>C</sub> = 0mA, I <sub>E</sub> = 100μA, I <sub>F</sub> = 0	
Off-State Collector Current	I <sub>CEO</sub>			100	nA	V <sub>CE</sub> = 20V, I <sub>F</sub> = 0mA, I <sub>B</sub> = 0	
+100°C	I <sub>CEO</sub>			100	μA	V <sub>CE</sub> = 20V, I <sub>F</sub> = 0mA, 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> = 5V, I <sub>F</sub> = 1mA, I <sub>B</sub> = 0	
On State Collector Current +100°C	I <sub>C(ON)</sub>	2.0			mA	V <sub>CE</sub> = 5.0V, I <sub>F</sub> = 2mA, I <sub>B</sub> = 0	
On State Collector Current -55°C	I <sub>C(ON)</sub>	2.8			mA	V <sub>CE</sub> = 5V, I <sub>F</sub> = 2mA, I <sub>B</sub> = 0	
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>			0.3	V	I <sub>F</sub> = 2mA, I <sub>C</sub> = 2mA	
Input to Output Internal Resistance	R <sub>IO</sub>	10 <sup>11</sup>			Ω	V <sub>IN-OUT</sub> = 1000V	1
Input to Output Capacitance	C <sub>IO</sub>		2.5	5	pF	f = 1MHz, V <sub>IN-OUT</sub> = 1000V	1
Rise Time-Phototransistor Operation	t <sub>r</sub>		10	25	μs	V <sub>CC</sub> = 10V, I <sub>F</sub> = 10mA, R <sub>L</sub> = 100Ω, I <sub>B</sub> = 0	
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> = 100Ω, I <sub>B</sub> = 0	

**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
66183-101	Single channel proton radiation tolerant optocoupler – screened to JAN
66183-103	Single channel proton radiation tolerant optocoupler – screened to JANTX
66183-105	Single channel proton radiation tolerant optocoupler – screened to JANTXV