

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.

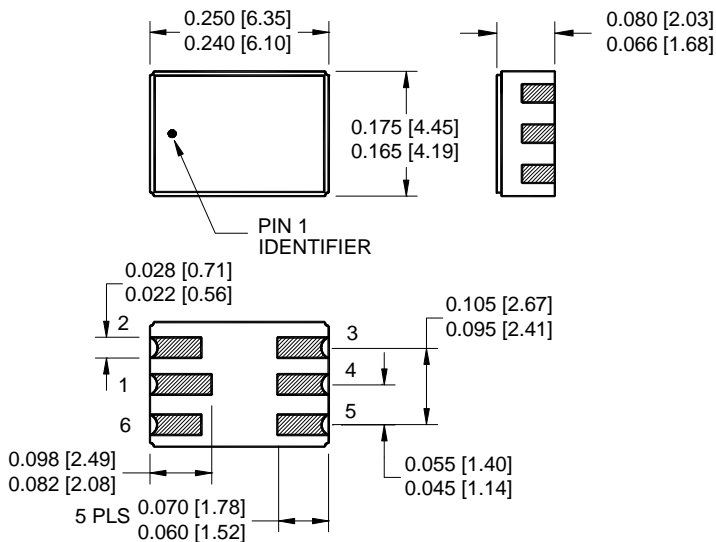
ABSOLUTE MAXIMUM RATINGS

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:

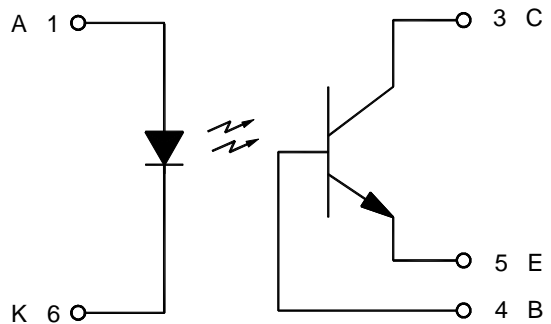
1. Derate linearly at the rate of 1.33 mW/°C above 65°C case.
2. Derate linearly at the rate of 3 mW/°C above 25°C case.

Package Dimensions



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

Schematic Diagram



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ELECTRICAL CHARACTERISTICS

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Diode Static Reverse Current	I _R			10	μA	V _R = 5 V	
Input Diode Static Forward Voltage -55°C	V _F	1.0		2.2	V	I _F = 10 mA	
Input Diode Static Forward Voltage +25°C	V _F	0.8	1.8	2.0	V	I _F = 10 mA	
Input Diode Static Forward Voltage +100°C	V _F	0.8		2.2	V	I _F = 10 mA	

OUTPUT TRANSISTOR

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Collector-Base Breakdown Voltage - 011, -108	V _{(BR)CBO}	45 60			V	I _C = 100 μA, I _B = 0, I _F = 0	
Collector-Emitter Breakdown Voltage - 011, -108	V _{(BR)CEO}	40 60			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	
Off-State Collector Current +100°C	I _{CEO} I _{CEO}			100 100	nA μA	V _{CE} = 20 V, I _F = 0 mA, I _B = 0 V _{CE} = 20 V, I _F = 0 mA, I _B = 0	

COUPLED CHARACTERISTICS

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
On State Collector Current	I _{C(ON)}	2.0			mA	V _{CE} = 5 V, I _F = 1 mA, I _B = 0	
On State Collector Current +100°C	I _{C(ON)}	2.0			mA	V _{CE} = 5.0 V, I _F = 2 mA, I _B = 0	
On State Collector Current -55°C	I _{C(ON)}	2.8			mA	V _{CE} = 5 V, I _F = 2 mA, I _B = 0	
Collector-Emitter Saturation Voltage	V _{CE(SAT)}			0.3	V	I _F = 2 mA, I _C = 2 mA	
Input to Output Isolation Voltage	V _{I-O}	1000			V	I _{I-O} = 100 nA	1
Input to Output Capacitance	C _{IO}		2.5	5	pF	f = 1MHz, V _{I-O} = 1000 V	1
Rise Time-Phototransistor Operation	t _r		10	25	μs	V _{CC} = 10 V, I _F = 10 mA, R _L = 100 Ω, I _B = 0	2
Fall Time-Phototransistor Operation	t _f		10	25	μs	V _{CC} = 10V, I _F = 10mA, R _L = 100 Ω, I _B = 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_W = 100μs duty cycle ≤ 1%).

RECOMMENDED OPERATING CONDITIONS:

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I _{FL}	0	90	μA
Input Current, High Level	I _{FH}	2	10	mA
Supply Voltage	V _{CE}	5	10	V
Operating Temperature	T _A	-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