

66191**PROTON RADIATION TOLERANT OPTOCOUPLER
(Single Channel, Electrical Equivalent To 66099)**

09/24/03

Features:

- Current transfer ratio: 150% typical
- Base lead provided for conventional transistor biasing
- Low power consumption
- High radiation immunity
- 1000 Vdc isolation test voltage

Applications:

- Military and Space
- High Reliability Systems
- Voltage Level Shifting
- Isolated Receiver Inputs
- Communication Systems

DESCRIPTION

The **66191** Optocoupler consists of a 660 nm GaAlAs LED optically coupled to a photodiode detector driving a radiation tolerant transistor. This configuration has proven to be highly tolerant to both proton and total dose radiation. Radiation tests performed on the 66099 optocoupler have shown that the electrical performance of the device after irradiation is an order of magnitude better than the 4N49 optocouplers. The 66191 has the same components and layout in a 6 pin, hermetically sealed leadless chip carrier package. Available as commercial or screened levels.

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)*** Input Diode**

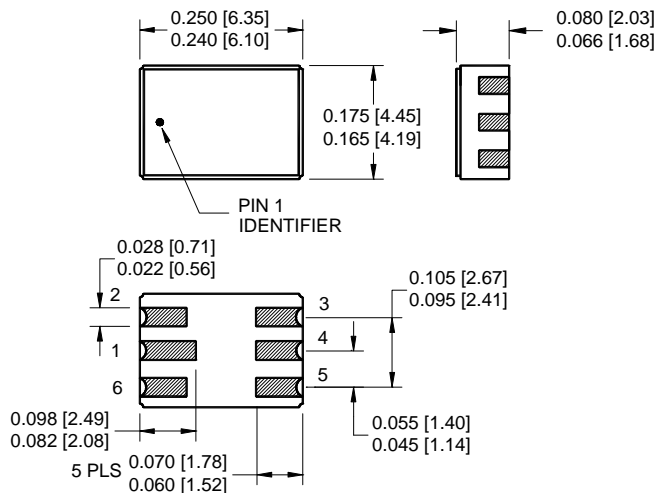
Peak Forward Input Current.....	50mA
Reverse Input Voltage.....	7V
Input Power Dissipation (Note 2).....	80mW

***Output Photodetector**

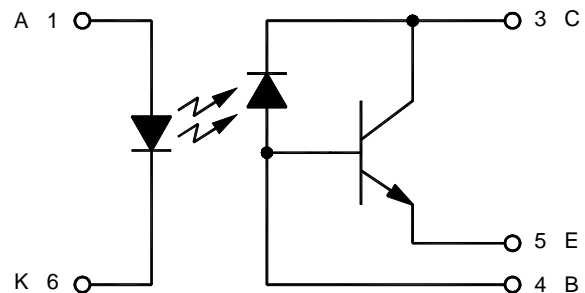
Continuous Collector Current.....	50mA
Collector-Emitter Voltage.....	40V
Emitter-Collector Voltage.....	5V
Collector-Base Voltage.....	40V
Power Dissipation. (Note 3).....	300mW
Input to output Isolation Voltage (Note 1).....	+1kVdc
Storage Temperature.....	-55°C to +150°C
Operating Temperature.....	-55°C to +100°C
Lead Solder Temperature (10 seconds, 1/16" from case).....	240°C

Notes:

1. Measured with input diode leads shorted together and output leads shorted together
2. Derate linearly 1.0 mW/°C above 25°C to 100°C.
3. Derate linearly 4.0mW/°C above 25°C to 100°C.

Package Dimensions

ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

Schematic Diagram

09/24/03

ELECTRICAL CHARACTERISTICS

INPUT DIODE

 $T_A = 25^\circ\text{C}$ unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Diode Static Reverse Current	I_R			10	μA	$V_R = 3\text{V}$	
Input Diode Static Forward Voltage	V_F	.8	1.8	2	V	$I_F = 10\text{mA}$	

OUTPUT TRANSISTOR

 $T_A = 25^\circ\text{C}$ unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	40			V	$I_C = 100\mu\text{A}, I_F = 0$	
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40			V	$I_C = 1\text{mA}, I_B = 0, I_F = 0$	
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	5			V	$I_E = 100\mu\text{A}, I_F = 0$	
Collector-Emitter Dark Current +100°C	I_{CEO}			100 20	nA μA	$V_{CE} = 20\text{V},$	

COUPLED CHARACTERISTICS

 $T_A = 25^\circ\text{C}$ unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Current Transfer Ratio	CTR	100			%	$V_{CE} = 1\text{V}, I_F = 10\text{mA}$	
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$			0.3	V	$I_F = 20\text{mA}, I_C = 10\text{mA}$	
Input -Output Isolation Voltage	V_{I-O}			1000	V	$I_{I-O} = 100\text{nA}$	1
Input to Output Capacitance	C_{I-O}		2.5	5	pF	$f = 1\text{MHz}, V_{I-O} = 1\text{kV}$	1
Rise Time	t_r			20	μs	$V_{CC} = 10\text{V}, I_F = 10\text{mA},$ $R_L = 100\Omega$	
Fall Time	t_f			20	μs	$V_{CC} = 10\text{V}, I_F = 10\text{mA},$ $R_L = 100\Omega$	

NOTES:

1) 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_{FL}	0	100	μA
Input Current, High Level	I_{FH}	10	20	mA
Supply Voltage	V_{CE}	5	20	V
Operating Temperature	T_A	-55	+100	$^\circ\text{C}$

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
66191-001	Commercial
66191-101	Screened to JAN level
66191-103	Screened to JANTX level
66191-105	Screened to JANTXV level