66191

PROTON RADIATION TOLERANT OPTOCOUPLER
(Single Channel, Electrical EQUIVALENT TO 66099)

OPTOELECTRONIC PRODUCTS DIVISION

REVISION A 7/14/00

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

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. Figures 1 and 2 from the 66099 data sheet illustrate the radiation performance of the device

ABSOLUTE MAXIMUM RATINGS (t_a = 25°C unless otherwise noted)

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
Input to output Isolation Voltage.....(see Note 1).....+1kVdc

* **Input Diode**

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

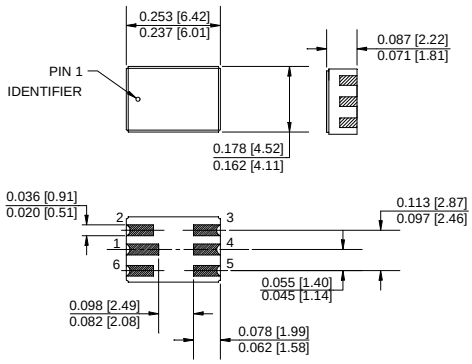
***Output Photodetector**

Continuous Collector Current.....50mA
Collector-Emitter Voltage 40V
Emitter-Collector Voltage 5V
Collector-Base Voltage.....40V
Power Dissipation.....(see Note 3).....300mW

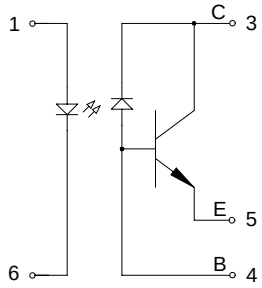
Notes:

1. Measured with input diode leads shorted together and output leads shorted together
2. Derate linearly 0.80mW/°C above 25°C.
3. Derate linearly 3.0mW/°C above 25°C.

Package Dimensions



Schematic Diagram



66191

PROTON RADIATION TOLERANT OPTOCOUPLER. SINGLE CHANNEL

REVISION A 7/14/00

ELECTRICAL CHARACTERISTICS

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

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Diode Static Reverse Current	I_R			100	µA	$V_R = 3V$	
Input Diode Static Forward Voltage	V_F	.8	1.8	2	V	$I_F = 10mA$	

OUTPUT TRANSISTOR

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

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

COUPLED CHARACTERISTICS

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

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

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	°C

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
66191-001	Proton radiation tolerant optocoupler, commercial
66191-101	Proton radiation tolerant optocoupler, -55 to +100°C Temperature range (JAN equivalent)
66191-103	Proton radiation tolerant optocoupler , 100% JANTX screened
66191-105	Proton radiation tolerant optocoupler , 100% JANTXV screened