

66189 RADIATION TOLERANT OPTOCOUPLER PIN FOR PIN REPLACEMENT FOR 3C91C	 OPTOELECTRONIC PRODUCTS DIVISION
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Revision B 7/14/00

Features: • High Reliability • Base lead eliminated for improved noise immunity • Proton & Total Dose Tolerant • Stability over wide temperature • +500V electrical isolation	Applications: • Eliminate ground loops • Level shifting • Line receiver • Switching power supplies • Motor control
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DESCRIPTION

The **66189** contains a proton tolerant LED optically coupled to a silicon photodiode detector circuit. The optocoupler is built on a TO-72 header. The anode of the LED is electrically connected to the case. This optocoupler is capable of transmitting signals between two galvanic sources. The potential difference between transmitter and receiver should not go over the maximum isolation voltage. The internal base connection has been eliminated for improved noise immunity.

ABSOLUTE MAXIMUM RATINGS

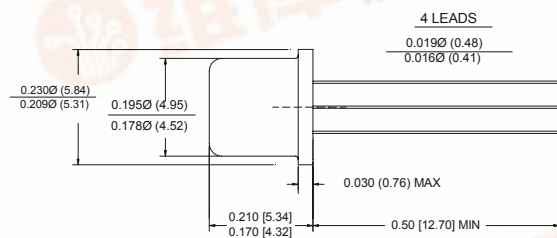
Input to Output Voltage.....	500V
Emitter-Collector Voltage.....	5V
Collector-Emitter Voltage	40V
Reverse Input Voltage	7V
Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 1)	50mA
Peak Forward Input Current (Value applies for $t_w \leq 1\mu s$, PRR < 300 pps)	1A
Continuous Collector Current	50mA
Continuous Transistor Power Dissipation at (or below) 25°C Free-Air Temperature (see Note 2)	230mW
Storage Temperature.....	-55°C to +150°C
Operating Free-Air Temperature Range	-55°C to +100°C
Lead Solder Temperature (10 seconds max.)	260°C

Notes:

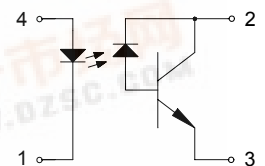
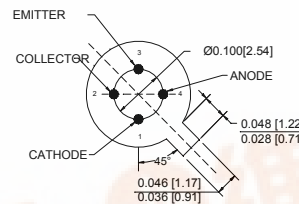
1. Derate linearly to 100°C free-air temperature at the rate of 0.67 mW/°C above 65°C.
2. Derate linearly to 100°C free-air temperature at the rate of 2.3 mW/°C.

Package Dimensions

Schematic Diagram



DIMENSIONS ARE IN INCHES (MILLIMETERS)



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RADIATION TOLERANT OPTOCOUPLER**ELECTRICAL CHARACTERISTICS** $T_A = 25^\circ\text{C}$ unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode Static Reverse Current	I_R			1	μA	$V_R = 3\text{V}$
Input Diode Static Forward Voltage	V_F		1.8	2.0	V	$I_F = 10\text{mA}$
Input Diode Static Forward Voltage	V_F		1.9	2.2	V	$I_F = 20\text{mA}$
Reverse Breakdown Voltage	B_{VR}	7	12		V	$I_R = 100\mu\text{A}$
Input Diode Capacitance	C_{IN}		25		pF	$V = 0\text{V}$, $f = 1\text{MHz}$

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

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40	48		V	$I_C = 1\text{mA}$, $I_B = 0$, $I_F = 0$
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	5	7		V	$I_C = 0\text{mA}$, $I_E = 10\mu\text{A}$, $I_F = 0$
Collector-Emitter Dark Current	I_{CEO}			50	nA	$V_{CE} = 40\text{V}$, $I_F = 0\text{mA}$
	I_{CEO}			10	nA	$V_{CE} = 5\text{V}$, $I_F = 0\text{mA}$

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

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
On State Collector Current	$I_{C(ON)}$	4			mA	$V_{CE} = 5\text{V}$, $I_F = 10\text{mA}$
On State Collector Current	$I_{C(ON)}$	3			mA	$V_{CE} = 0.4\text{V}$, $I_F = 10\text{mA}$
On State Collector Current -55°C	$I_{C(ON)}$	2			mA	$V_{CE} = 5\text{V}$, $I_F = 10\text{mA}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$			0.4	V	$I_F = 50\text{mA}$, $I_C = 10\text{mA}$
Isolation Resistance	R_{ISO}	10^9			Ω	$V_{IN-OUT} = 500\text{V}$
Input to Output Capacitance	C_{IO}		2	2.5	pF	$f = 1\text{MHz}$
Delay Time	t_d		2	4	μs	$V_{CE} = 5\text{V}$, $I_F = 2\text{mA}$, $R_L = 100\Omega$
Storage Time	t_s		0.2	0.5	μs	$V_{CE} = 5\text{V}$, $I_F = 2\text{mA}$, $R_L = 100\Omega$
Rise Time	t_r		3	5	μs	$V_{CE} = 5\text{V}$, $I_F = 2\text{mA}$, $R_L = 100\Omega$
Fall Time	t_f		4	7	μs	$V_{CE} = 5\text{V}$, $I_F = 2\text{mA}$, $R_L = 100\Omega$

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I_{FL}	0	1	μA
Input Current, High Level	I_{FH}	2	20	mA
Supply Voltage	V_{CE}	5	50	V
Operating Temperature	T_A	-55	100	$^\circ\text{C}$

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
66189-001	Commercial optocoupler with 100% testing
66189-101	Optocoupler with Group "A" testing
66189-103	Optocoupler screened to JANTX
66189-105	Optocoupler screened to JANTXV