66099	**RADIATION TOLERANT OPTOCOUPLER**	**OPTOELECTRONIC PRODUCTS DIVISION**

Features:	**Applications:**
• Meets or exceeds MIL-PRF-19500 radiation requirements • Current Transfer Ratio-150% typical • 1kVdc electrical input to output isolation • Base lead provided for conventional transistor biasing	• Eliminate ground loops • Level shifting • Line receiver • Switching power supplies • Motor control

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 that the 4N49 optocouplers. The 66099 Optocoupler consist of a GaAIA's LED optically coupled to a photodiode detector circuit mounted in a hermetic TO-5 package. Figures 1 and 2 illustrate the radiation performance of the device. Micropac's 66099 performs beyond the levels shown in MIL-PRF-19500 for a level H (total dose>10^6 rads, neutron fluence >1X10^{12} n/cm^2) RHA designation.

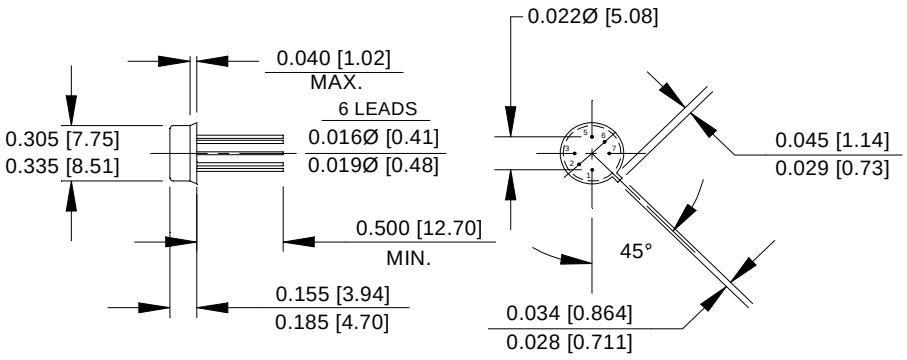
ABSOLUTE MAXIMUM RATINGS

Storage Temperature	-65°C to +150°C
Operating Free-Air Temperature Range	-55°C to +100°C
Lead Solder Temperature (1/16" (1.6mm) from case for 10 seconds)	240°C
Input Diode Forward DC Current	40mA
Input Power Dissipation (see Note 1)	80mW
Reverse Input Voltage	3V
Collector-Base Voltage	40V
Collector-Emitter Voltage	40V
Emitter-Base Voltage	4V
Continuous Collector Current	50mA
Continuous Transistor Power Dissipation (see Note 2)	300mW

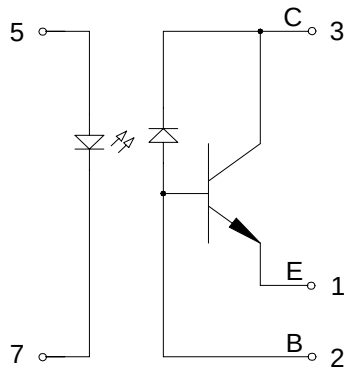
Notes:

1. Derate linearly 0.80 mW/°C above 25°C.
2. Derate linearly 3.0 mW/°C above 25°C.

Package Dimensions



Schematic Diagram



NOTE: ALL LINEAR DIMENSIONS ARE IN INCHES (MILLIMETERS)

66099

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

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode Static Reverse Current	I_R			100	µA	$V_R = 2V$
Input Diode Static Forward Voltage	V_F	0.8		2	V	$I_F = 10mA$

OUTPUT TRANSISTOR CHARACTERISTICS $T_A = 25^{\circ}C$ unless otherwise noted

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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-Base Breakdown Voltage	$V_{(BR)EBO}$	4			V	$I_C = 0mA$, $I_E = 100\mu A$, $I_F = 0$
Collector-Emitter Cutoff Current	I_{CEO}			100	nA	$V_{CE} = 20V$

COUPLED CHARACTERISTICS $T_A = 25^{\circ}C$ unless otherwise noted

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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_{ISO}			100	nA	$V_{I-O} = 1000V$
Rise Time	t_r			20	µs	$V_{CC} = 10V$, $I_F = 10mA$, $R_L = 100\Omega$
Fall Time	t_f			20	µs	$V_{CC} = 10V$, $I_F = 10mA$, $R_L = 100\Omega$

Figure 1: Mii Optocoupler Neutron Fluence Response

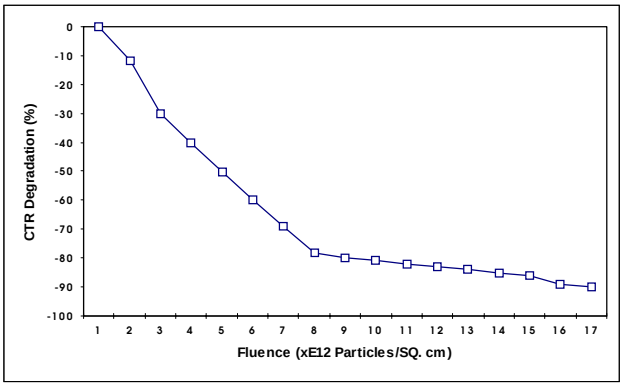
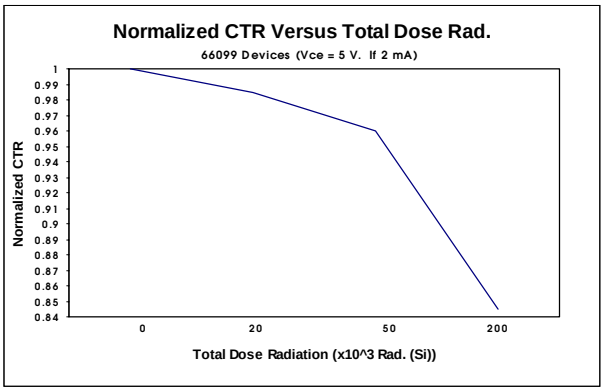


Figure 2: Mii Optocoupler Total Dose Radiation Response



RHA LEVEL DESIGNATOR	RADIATION AND TOTAL DOSE (rads)	LEVEL OF THE NEUTRON FLUENCE (n/cm^2)
/	No RHA	No RHA
M	3000	$2x10^{12}$
D	10^4	$2x10^{12}$
R	10^5	$1x10^{12}$
H	10^6	$1x10^{12}$

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
Operating Temperature	T_A	-55	100	°C

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
66099-003	Single Channel Commercial Optocoupler (0 to 70°C)
66099-101	Single Channel Optocoupler with TX screening plus QCI (Group A, B & C)
66099-103	Single Channel Optocoupler with TX screening plus Group A
66099-105	Single Channel Optocoupler with TXV screening plus Group A