

**66099**

**RADIATION TOLERANT TO-5 OPTOCOUPLER**



09/09/03

**Features:**

- 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

**Applications:**

- Eliminate ground loops
- Level shifting
- Line receiver
- Switching power supplies
- Motor control

**DESCRIPTION**

The **66099** 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. Available as standard and high voltage and commercial or screened levels.

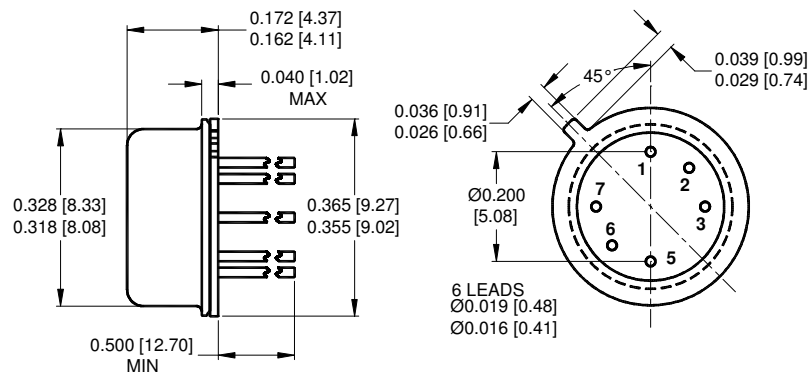
**ABSOLUTE MAXIMUM RATINGS**

Input Diode Forward DC Current.....	40 mA
Input Power Dissipation (Note 1) .....	.80 mW
Input-Output Isolation Voltage .....	1000 V
Reverse Input Voltage .....	3 V
Collector-Base Voltage -00X, -10X.....	40 V
Collector-Base Voltage -40X .....	150 V
Collector-Emitter Voltage -00X, -10X .....	40 V
Collector-Emitter Voltage -40X .....	150 V
Emitter-Base Voltage -00X, -10X.....	4 V
Emitter-Base Voltage -40X .....	6 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 +100°C
Lead Solder Temperature (10 seconds, 1/16" from case) .....	240°C

**Notes:**

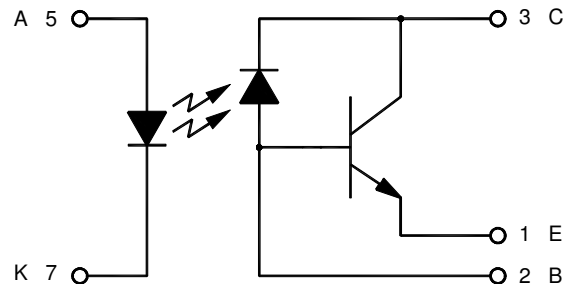
1. Derate linearly 1.0 mW/°C above 25°C.
2. Derate linearly 4.0 mW/°C above 25°C.

**Package Dimensions**



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

**Schematic Diagram**



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

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode Static Reverse Current	$I_R$			100	$\mu\text{A}$	$V_R = 2\text{V}$
Input Diode Static Forward Voltage	$V_F$	0.8		2	V	$I_F = 10\text{mA}$

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

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	40			V	$I_C = 100\mu\text{A}, I_E = 0, I_F = 0$
		40				
		150				
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40			V	$I_C = 1\text{mA}, I_B = 0, I_F = 0$
		40				
		150				
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	4			V	$I_C = 0\text{mA}, I_E = 100\mu\text{A}, I_F = 0$
		4				
		6				
Collector-Emitter Cutoff Current	$I_{CEO}$			100	nA	$V_{CE} = 20\text{V}$

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

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

**RECOMMENDED OPERATING CONDITIONS:**

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	$I_{FL}$	0	10	$\mu\text{A}$
Input Current, High Level	$I_{FH}$	1	20	mA
Operating Temperature	$T_A$	-55	100	$^\circ\text{C}$

**SELECTION GUIDE**

PART NUMBER	PART DESCRIPTION
66099-003	Commercial
66099-101	Screened
66099-103	TX screening plus Group A
66099-105	TXV screening plus Group A
66099-401	High Voltage, Commercial
66099-415	High voltage, Screened