

66223

RADIATION TOLERANT OPTOCOUPLER



09/11/03

Features:

- Meets or exceeds MIL-PRF-19500 radiation requirements
- High Reliability
- Base lead provided for conventional transistor biasing
- Rugged package
- Stability over wide temperature
- +1000V electrical isolation

Applications:

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

DESCRIPTION

The **66223** optocoupler consists of an 850 nm GaAlAs LED optically coupled to a photodiode detector driving a radiation tolerant transistor. Test studies have proven this configuration to be even more tolerant to both proton and total dose radiation than configurations using a 660 nm LED. The 66223 optocoupler is packaged in a hermetically sealed TO-5 and is a pin for pin replacement for the 4N49. This device can be supplied to customer specifications as well as tested in accordance with MIL-PRF-19500/548.

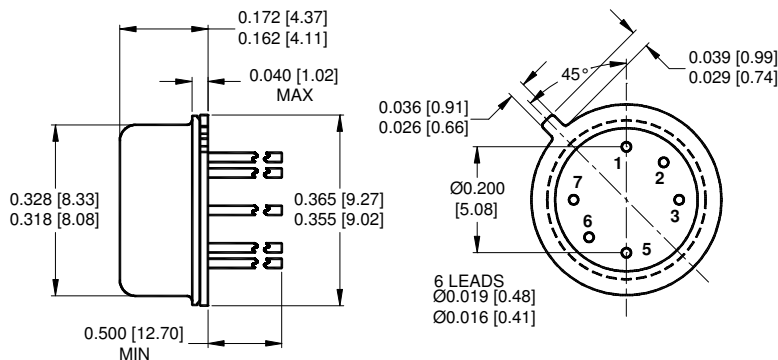
ABSOLUTE MAXIMUM RATINGS

Input to Output Voltage	±1 kV
Emitter-Base Voltage	4 V
Collector-Emitter Voltage	40 V
Collector-Base Voltage	40 V
Reverse Input Voltage	3 V
Input Diode Continuous Forward Current (Note 1)	50 mA
Peak Forward Input Current (Value applies for $t_w \leq 1 \mu s$, PRR < 300 pps)	1 A
Continuous Collector Current	50 mA
Continuous Transistor Power Dissipation (Note 2)	300 mW
Storage Temperature	-65°C to +125°C
Operating Free-Air Temperature	-55°C to +125°C
Lead Solder Temperature (10 seconds, 1/16" from case)	240°C

Notes:

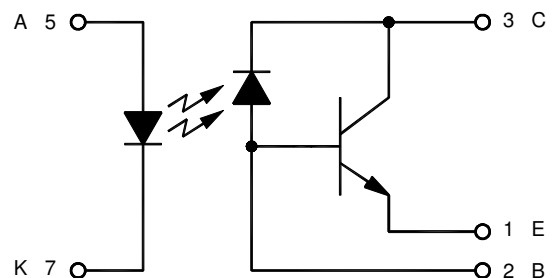
1. Derate linearly to 125°C free-air temperature at the rate of 0.5 mA/°C above 65°C.
2. Derate linearly to 125°C free-air temperature at the rate of 3 mW/°C.

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	μA	$V_R = 2\text{V}$
Input Diode Static Forward Voltage	V_F	0.8		1.6	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	$I_C = 100\mu\text{A}, I_E = 0, I_F = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40			V	$I_C = 1\text{mA}, I_B = 0, I_F = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	4			V	$I_C = 0\text{mA}, I_E = 100\mu\text{A}, I_F = 0$
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	μs	$V_{CC} = 10\text{V}, I_F = 10\text{mA}, R_L = 100\Omega$
Fall Time	t_f			20	μs	$V_{CC} = 10\text{V}, I_F = 10\text{mA}, R_L = 100\Omega$

RECOMMENDED OPERATING CONDITIONS:

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I_{FL}	0	10	μA
Input Current, High Level	I_{FH}	1	20	mA
Operating Temperature	T_A	-55	125	$^\circ\text{C}$

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
66223-001	Commercial
66223-101	Screened