66224

PROTON RADIATION TOLERANT OPTOCOUPLER
(Single Channel, Electrically Similar to 4N49)

09/24/03

Features:

- 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 ***66224*** is a single channel device electrically similar to the 4N49. This product has been designed to be more tolerant to proton radiation. The 66224 optocoupler is packaged in a hermetically sealed 6 pin leadless chip carrier (LCC). This device available as commercial or screened levels.

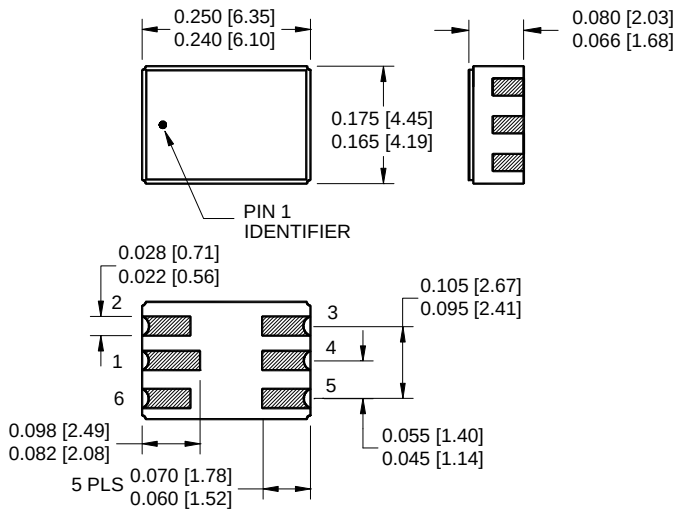
ABSOLUTE MAXIMUM RATINGS

Input to Output Voltage	1kV
Emitter-Base Voltage	7V
Collector-Emitter Voltage (Value applies to emitter-base open-circuited & the input-diode equal to zero)	40V
Collector-Base Voltage	45V
Reverse Input Voltage	2V
Input Diode Continuous Forward Current (Note 1)	50mA
Peak Forward Input Current (Value applies for tw ≤1µs, PRR < 300 pps)	1A
Continuous Collector Current	50mA
Continuous Transistor Power Dissipation (Note 2)	300mW
Storage Temperature	-55°C to +150°C
Operating Free-Air Temperature Range	-55°C to +125°C
Lead Solder Temperature (10 seconds max.).0	240°C

Notes:

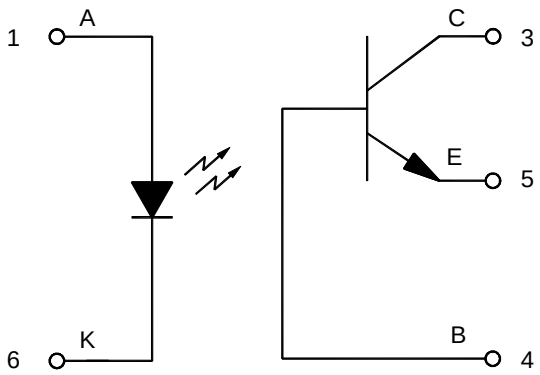
1. Derate linearly to 125°C free-air temperature at the rate of 0.50 mW/°C above 25°C.
2. Derate linearly to 125°C free-air temperature at the rate of 3 mW/°C above 25°C.

Package Dimensions



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

Schematic Diagram



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ELECTRICAL CHARACTERISTICS

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Diode Static Reverse Current	I_R			8	µA	V_R = 6V	
Input Diode Static Forward Voltage -55°C	V_F			1.8	V	I_F = 10mA	
Input Diode Static Forward Voltage +25°C	V_F			1.6	V	I_F = 10mA	
Input Diode Static Forward Voltage +100°C	V_F			1.4	V	I_F = 10mA	

OUTPUT TRANSISTOR

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	45			V	I_C = 100µA, I_B = 0, 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	$V_{(BR)EBO}$	7			V	I_C = 0mA, I_E = 100µA, I_F = 0	
Off-State Collector Current	I_{CEO}			100	nA	V_{CE} = 20V, I_F = 0mA, I_B = 0	
+100°C	I_{CEO}			100	µA	V_{CE} = 20V, I_F = 0mA, I_B = 0	

COUPLED CHARACTERISTICS

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
On State Collector Current	$I_{C(ON)}$	2.0		10	mA	V_{CE} = 5V, I_F = 1mA, I_B=0	2
On State Collector Current +100°C	$I_{C(ON)}$	0.5			mA	V_{CE} = 0.4V, I_F = 2mA, I_B=0	2
On State Collector Current -55°C	$I_{C(ON)}$	0.7			mA	V_{CE} = 5V, I_F = 2mA,	2
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$			0.3	V	I_F = 2mA, I_C= 2mA, I_B=0	
Input to Output Internal Resistance	R_{IO}	10^{11}			Ω	V_{I-O} = 500V	1
Input to Output Capacitance	C_{IO}		2.5	5	pF	f = 1MHz, V_{I-O} = 1000V	1
Rise Time- Phototransistor Operation	t_r		10	25	µs	V_{CC} = 10V, I_F = 5mA, R_L = 100Ω, I_B = 0	
Fall Time-Phototransistor Operation	t_f		10	25	µs	V_{CC} = 10V, I_F = 5mA, R_L = 100Ω, I_B = 0	
Rise Time-Photodiode Operation	t_r		0.85	3	µs	V_{CC} = 10V, I_F = 5mA, R_L = 100Ω, I_E = 0	
Fall Time-Photodiode Operation	t_f		0.85	3	µs	V_{CC} = 10V, I_F = 5mA, R_L = 100Ω, I_E = 0	

NOTES:

1. These parameters are measured between all phototransistor leads shorted together and with both input diode leads shorted together.
2. This parameter must be measured using pulse techniques (t_W = 100µs duty cycle ≤ 1%).

RECOMMENDED OPERATING CONDITIONS:

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I_{FL}	0	90	µA
Input Current, High Level	I_{FH}	2	10	mA
Supply Voltage	V_{CE}	5	30	V
Operating Temperature	T_A	-55	125	°C

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
66224-001	Commercial
66224-101	Screened