66228 3C91C TYPE PROTON RADIATION TOLERANT OPTOCOUPLER

OPTOELECTRONIC PRODUCTS DIVISION

09/22/2010

Features:

- High Reliability
- Base lead eliminated for improved noise immunity
- Rugged package
- Stability over wide temperature
- +500 V electrical isolation

Applications:

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

DESCRIPTION

The ***66228*** optocoupler consists of an 850 nm GaAlAs LED optically coupled to a silicon planar phototransistor. This LED has proven to be highly tolerant to proton radiation and to be more tolerant of operating temperatures over 100°C than the more commonly used 660 nm LED. The optocoupler is built on a TO-72 header. The anode of the LED is electrically connected to the case. The internal base connection has been eliminated for improved noise immunity.

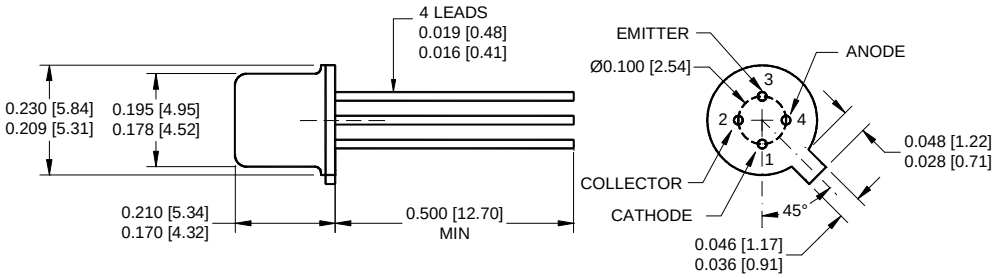
ABSOLUTE MAXIMUM RATINGS

Emitter-Collector Voltage	7 V
Collector-Emitter Voltage	60 V
Reverse Input Voltage	7 V
Input Diode Continuous Forward Current (Note 1)	50 mA
Peak Forward Input Current (value applies for tw ≤ 1µs, PRR < 300 pps)	500 mA
Continuous Collector Current	50 mA
Continuous Transistor Power Dissipation (Note 2)	230 mW
Input to Output Isolation Voltage	1000 V
Storage Temperature	-65°C to +150°C
Operating Free-Air Temperature Range	-55°C to +125°C
Lead Solder Temperature (10 seconds, 1/16" from case)	260°C

Notes:

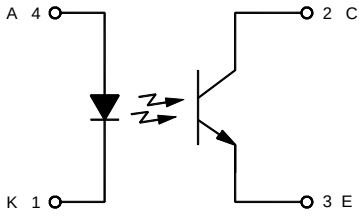
1. Derate linearly to 125°C free-air temperature at the rate of 0.5 mA/°C.
2. Derate linearly to 125°C free-air temperature at the rate of 2.3 mW/°C.

Package Dimensions



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

Schematic Diagram



ANODE ELECTRICALLY CONNECTED TO CASE.

ELECTRICAL CHARACTERISTICS

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode Static Reverse Current	I_R			1	µA	V_R = 3 V
Input Diode Static Forward Voltage	V_F		1.15	1.2	V	I_F = 2 mA
Input Diode Static Forward Voltage	V_F		1.5	1.8	V	I_F = 50 mA
Reverse Breakdown Voltage	B_{VR}	6	12		V	I_R = 8 µA
Input Diode Capacitance	C_{IN}		25		pF	V = 0 V, f = 1 MHz

OUTPUT TRANSISTOR

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	50			V	I_C = 1 mA, I_B = 0, I_F = 0
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	7			V	I_C = 10 µA, I_E = 10 µA, I_F = 0
Collector-Emitter Dark Current	I_{CEO1} I_{CEO2}			50 10	nA nA	V_{CE} = 50 V, I_F = 0 mA V_{CE} = 5 V, I_F = 0 mA

COUPLED CHARACTERISTICS

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
On State Collector Current	$I_{C(ON)}$	4			mA	V_{CE} = 5 V, I_F = 10 mA
On State Collector Current	$I_{C(ON)}$	3		20	mA	V_{CE} = 0.4 V, I_F = 10 mA
On State Collector Current -55°C	$I_{C(ON)}$	2			mA	V_{CE} = 5 V, I_F = 10 mA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$			0.4	V	I_F = 50 mA, I_C = 10 mA
Isolation Resistance	R_{ISO}	10^9			Ω	V_{IN-OUT} = 1000 V
Input to Output Capacitance	C_{IO}		2	2.5	pF	f = 1 MHz
Delay Time	t_d		2	4	µs	V_{CE} = 5 V, I_F = 2 mA, R_L = 100 Ω
Storage Time	t_s		0.2	0.5	µs	V_{CE} = 5 V, I_F = 2 mA, R_L = 100 Ω
Rise Time	t_r		3	5	µs	V_{CE} = 5 V, I_F = 2 mA, R_L = 100 Ω
Fall Time	t_f		4	5	µs	V_{CE} = 5 V, I_F = 2 mA, R_L = 100 Ω

RECOMMENDED OPERATING CONDITIONS:

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I_{FL}	0	1	µA
Input Current, High Level	I_{FH}	2	10	mA
Supply Voltage	V_{CE}	5	50	V
Operating Temperature	T_A	-55	125	°C

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
66228-001	Commercial
66228-101	Screened