66168

PROTON RADIATION TOLERANT OPTOCOUPLER
(Pin-for-Pin Replacement for 4N49)

09/09/03

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 ***66168*** is a 4N49 using an LED designed to be more tolerant to proton radiation. The 66168 optocoupler is packaged in a hermetically sealed TO-5. This device can be supplied to customer specifications as well as screened to JAN, JANTX, JANTXV and JANS levels.

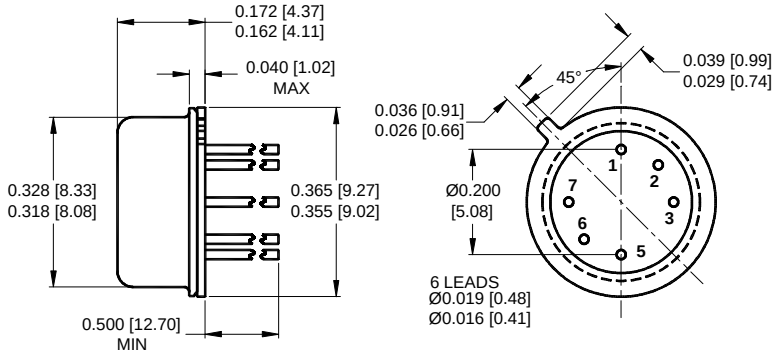
ABSOLUTE MAXIMUM RATINGS

Input to Output Voltage	±1 kV
Emitter-Base Voltage	7 V
Collector-Emitter Voltage	40 V
Collector-Base Voltage	45 V
Reverse Input Voltage	2V
Input Diode Continuous Forward Current (Note 1)	40 mA
Peak Forward Input Current	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 Range	-55°C to +100°C
Lead Solder Temperature (10 seconds, 1/16" from case)	240°C

Notes:

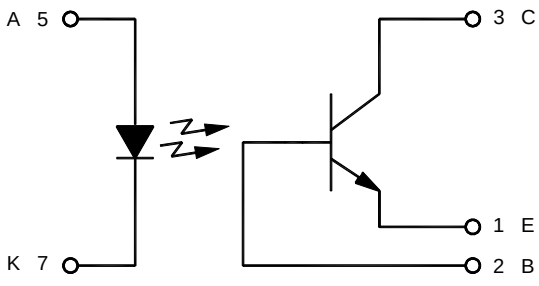
1. Derate linearly to 100°C free-air temperature at the rate of 0.53 mA/°C above 65°C.
2. Derate linearly to 100°C free-air temperature at the rate of 4 mW/°C.

Package Dimensions



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

Schematic Diagram



COLLECTOR IS COMMON TO CASE

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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			100	µA	V_R = 2V	
Input Diode Static Forward Voltage -55°C	V_F	1.0		2.4	V	I_F = 10mA	
Input Diode Static Forward Voltage +25°C	V_F	0.8	1.7	2.2	V	I_F = 10mA	
Input Diode Static Forward Voltage +100°C	V_F	0.7		2.0	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 +25°C	$I_{C(OFF)}$			100	nA	V_{CE} = 20V, I_F = 0mA, I_B = O	
+100°C	$I_{C(OFF)}$			100	µA	V_{CE} = 20V, I_F = 0mA, I_B = O	

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			mA	V_{CE} = 5.0 V, I_F = 1mA	
On State Collector Current +100°C	$I_{C(ON)}$	2.0			mA	V_{CE} = 5.0 V, I_F = 2mA	
On State Collector Current -55°C	$I_{C(ON)}$	2.8			mA	V_{CE} = 5V, I_F = 2 mA	
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_{IN-OUT} = 500V	1
Input to Output Capacitance	C_{IO}		2.5	5	pF	f = 1MHz, V_{IN-OUT} = 1kV	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.

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	10	V
Operating Temperature	T_A	-55	100	°C

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
66168-001	Commercial
66168-101	Screened to JAN level
66168-103	Screened to JANTX level
66168-105	Screened to JANTXV level
66168-300	Screened to JANS level