

**66252**

**6 PIN LCC, HERMETICALLY SEALED,  
SINGLE CHANNEL OPTOCOUPLER  
(Electrically Similar To 6N140)**



06/07/2017

**Features:**

- High current transfer ratio: 1000% typical
- 1000 Vdc isolation test voltage
- Low input current requirement: 0.5 mA
- Low power consumption
- High radiation immunity
- Faraday shield to provide high common mode rejection

**Applications:**

- Military and space
- High reliability systems
- Voltage level shifting
- Isolated receiver input
- Communication systems
- Medical systems

**DESCRIPTION**

The **66252** single channel optocoupler consists of an LED optically coupled to a high gain photon detector. This unique device provides high CTR and low leakage currents over the full military temperature range (-55°C to +125°C). The 66252 is in a 6 pin LCC hermetically sealed package and is available in standard and screened versions or tested to customer specifications.

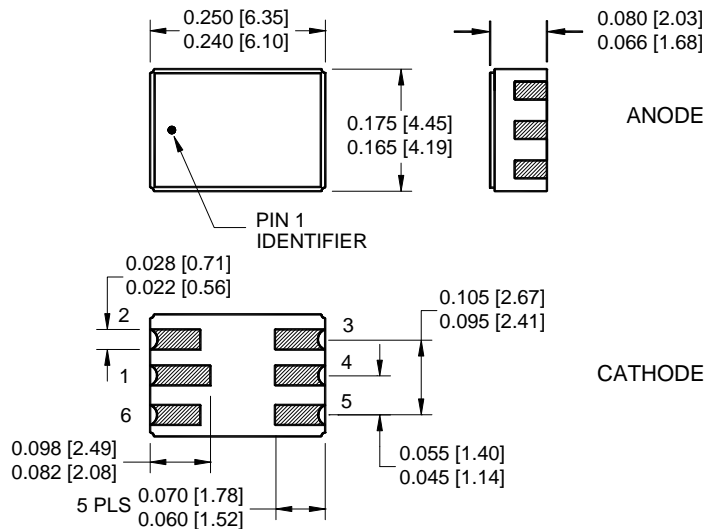
**ABSOLUTE MAXIMUM RATINGS**

Peak Forward Input Current (<1ms duration).....	20 mA
Average Forward Input Current (Note 1).....	10 mA
Reverse Input Voltage .....	5 V
Supply Voltage - V <sub>CC</sub> (Note 2) .....	-0.5 to 20 V
Output Current - I <sub>O</sub> .....	40 mA
Output Power Dissipation (Note 3).....	50 mW
Output Voltage - V <sub>O</sub> (Note 2) .....	-0.5 to 20 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" below seating plane).....	260°C

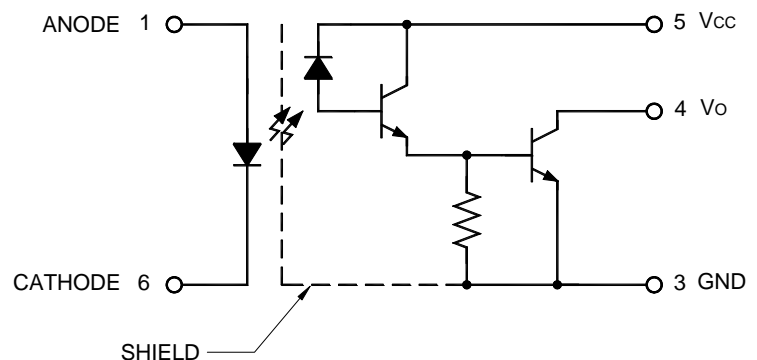
Notes:

1. Derate I<sub>F</sub> at a rate of 0.33 mA/°C above 110°C.
2. Pin 3 should be the most negative voltage at the detector side. The lowest total I<sub>OH</sub> over temperature is developed by keeping V<sub>CC</sub> as low as possible, but greater than 2.0 V.
3. Collector output power plus supply power is total output power. Derate at rate of 0.5 mW/°C above 25°C.

**Package Dimensions**



**Schematic Diagram**



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

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6 PIN LCC, HERMETICALLY SEALED, SINGLE CHANNEL OPTOCOUPLER (Electrically Similar To 6N140)

06/07/2017

**ELECTRICAL CHARACTERISTICS**T<sub>a</sub> = -55°C to 125°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Current Transfer Ratio	CTR	300	1000		%	I <sub>F</sub> = 0.5 mA, V <sub>O</sub> = 0.4 V, V <sub>CC</sub> = 4.5 V I <sub>F</sub> = 1.6 mA, V <sub>O</sub> = 0.4 V, V <sub>CC</sub> = 4.5 V I <sub>F</sub> = 5.0 mA, V <sub>O</sub> = 0.4 V, V <sub>CC</sub> = 4.5 V	1
Logic Low Output Voltage	V <sub>OL</sub>		0.1	0.4	V	I <sub>F</sub> = 0.5 mA, I <sub>OL</sub> = 1.5 mA, V <sub>CC</sub> = 4.5 V I <sub>F</sub> = 5.0 mA, I <sub>OL</sub> = 10 mA, V <sub>CC</sub> = 4.5 V	
Logic High Output Current	I <sub>OH</sub>		0.005	250	μA	I <sub>F</sub> = 2 μA, V <sub>O</sub> = V <sub>CC</sub> = 18 V	
Logic High Supply Current	I <sub>CCH</sub>		0.010	40	μA	I <sub>F</sub> = 0 mA, V <sub>CC</sub> = 18 V	
Low Level Supply Current	I <sub>CCL</sub>		0.8	4	mA	I <sub>F</sub> = 1.6 mA, V <sub>CC</sub> = 18 V	
Input Forward Voltage	V <sub>F</sub>		1.4	1.7	V	I <sub>F</sub> = 1.6 mA	
Input Reverse Breakdown Voltage	BV <sub>R</sub>	5			V	I <sub>R</sub> = 10 μA	
Input-Output Insulation Leakage Current	I <sub>I-O</sub>			0.5	μA	V <sub>I-O</sub> = 1000 Vdc, Relative Humidity = 45% t <sub>a</sub> = 25°C, t = 1 s	2
Propagation Delay Time To High Output Level	t <sub>PLH</sub>		5	60	μs	I <sub>F</sub> = 0.5 mA, V <sub>CC</sub> = 5.0 V, R <sub>L</sub> = 4.7 kΩ I <sub>F</sub> = 5 mA, V <sub>CC</sub> = 5.0 V, R <sub>L</sub> = 680 kΩ	
Propagation Delay Time To Low Output Level	t <sub>PHL</sub>		8	100	μs	I <sub>F</sub> = 0.5 mA, V <sub>CC</sub> = 5.0 V, R <sub>L</sub> = 4.7 kΩ I <sub>F</sub> = 5 mA, V <sub>CC</sub> = 5.0 V, R <sub>L</sub> = 680 kΩ	

**TYPICAL CHARACTERISTICS**T<sub>a</sub> = 25°C, V<sub>CC</sub> = 5V Each Channel

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Capacitance	C <sub>IN</sub>		60		pF	V <sub>F</sub> = 0, f = 1 MHz, t <sub>a</sub> = 25°C	
Capacitance (Input-Output)	C <sub>I-O</sub>		1.5		pF	f = 1 MHz, t <sub>a</sub> = 25°C	2
Input Diode Temperature Coefficient	$\frac{\Delta V_F}{\Delta T_A}$		-1.8		mV/°C	I <sub>F</sub> = 1.6 mA	
Resistance (Input-Output)	R <sub>I-O</sub>		10 <sup>12</sup>		Ω	V <sub>I-O</sub> = 500 V, t <sub>a</sub> = 25°C	2
Common Mode Transient immunity at High Output Level	CM <sub>H</sub>	500	1000		V/μs	V <sub>CM</sub> = 50 V P-P, V <sub>CC</sub> = 5.0 V, R <sub>L</sub> = 1.5 kΩ, I <sub>F</sub> = 0 mA t <sub>a</sub> = 25°C	3, 5
Common Mode Transient Immunity at Low Output Level	CM <sub>L</sub>	500	1000		V/μs	V <sub>CM</sub> = 50 V P-P, V <sub>CC</sub> = 5.0 V, R <sub>L</sub> = 1.5 kΩ, I <sub>F</sub> = 1.6 mA t <sub>a</sub> = 25°C	4, 5

**NOTES:**

- CURRENT TRANSFER RATIO is defined as the ratio of output collector current, I<sub>O</sub>, to the forward LED input current, I<sub>F</sub>, times 100%.
- Device considered a two-terminal device. Pins 1 and 6 are shorted together and pins 3-5 are shorted together.
- CM<sub>H</sub> is the maximum tolerable common mode transient to assure that the output will remain in a high logic state (i.e. V<sub>O</sub> > 2.0V).
- CM<sub>L</sub> is the maximum tolerable common mode transient to assure that the output will remain in a low logic state (i.e. V<sub>O</sub> < 0.8V).
- In applications where dv/dt may exceed 50,000 V/μs (such as static discharge) a series resistor, R<sub>CC</sub>, should be included to protect the detector ICs from destructively high surge currents. The recommended value is R<sub>CC</sub> =  $\frac{1 \text{ V} \cdot \text{k}\Omega}{0.6 \text{ I}_F(\text{mA})}$

**RECOMMENDED OPERATING CONDITIONS:**

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I <sub>FL</sub>	0	2	μA
Input Current, High Level	I <sub>FH</sub>	0.5	5	mA
Supply Voltage	V <sub>CC</sub>	2.0	18	V

**SELECTION GUIDE**

PART NUMBER	PART DESCRIPTION
66252-000	Screened, full mil-temp (-55° to +125°C)
66252-002	Military operating range (-55° to +125°C)
66252-003	Commercial

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