66170	GULL WING HERMETICALLY SEALED, SINGLE CHANNEL OPTOCOUPLER (Electrically Similar To 6N140)	Mii OPTOELECTRONIC PRODUCTS DIVISION

Features:

- High current transfer ratio: 1000% typical
- 1500 Vdc isolation test voltage
- Low input current requirement: 0.5mA
- Low power consumption
- High radiation immunity

Applications:

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

DESCRIPTION

The ***66170*** 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 66170 is an 10 pin gull wing hermetically sealed package and is available in standard and screened versions or tested to customer specifications.

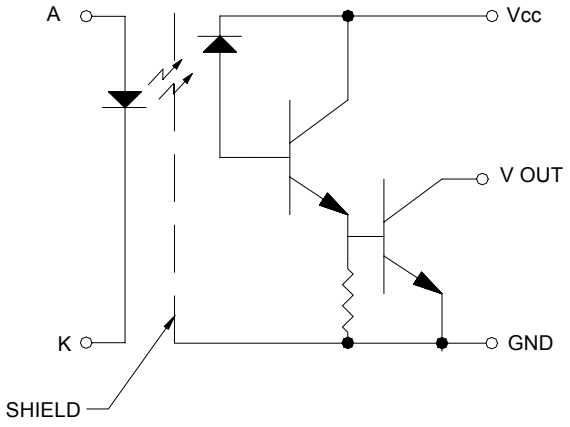
ABSOLUTE MAXIMUM RATINGS

Storage Temperature..... -65°C to +150°C
Operating Free-Air Temperature Range ..... -55°C to +125°C
Lead Solder Temperature..... 260°C for 10s (1.6mm below seating plane)
Peak Forward Input Current ..... 40mA (<1ms duration)
Average Forward Input Current ..(Derate I_F at a rate of 0.05 mA/°C) 20mA
Reverse Input Voltage 5V
Supply Voltage - V_{CC} ..(The lowest total I_{OH} over temperature is developed by keeping V_{CC} as low as possible, but greater that 2.0V) -0.5 TO 20V Output
Output Current - I_O 40mA
Output Power Dissipation (Collector output power +1/4 of the total supply power is total output power. Derate @ rate of 1.66mA/°C above 110°C) 50mW
Output Voltage - V_O.....(The lowest total I_{OH} over temperature is developed by keeping V_{CC} as low as possible, but greater that 2.0V) ...-0.5 TO 20V

Package Dimensions

CONTACT FACTORY
FOR PACKAGE
AND PIN OUT
INFORMATION

Schematic Diagram



ELECTRICAL CHARACTERISTICS

T_a = -55°C to 125°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Current Transfer Ratio	CTR	300	1000		%	I_F = 0.5mA, V_O = 0.4V, V_{CC} = 4.5V	1
		300	750		%	I_F = 1.6mA, V_O = 0.4V, V_{CC} = 4.5V	1
		200	400		%	I_F = 5.0mA, V_O = 0.4V, V_{CC} = 4.5V	1
Logic Low Output Voltage	V_{OL}		0.1	0.4	V	I_F = 0.5mA, I_{OL} = 1.5mA, V_{CC} = 4.5V	
			0.2	0.4	V	I_F = 5.0mA, I_{OL} = 10mA, V_{CC} = 4.5V	
Logic High Output Current	I_{OH}		.005	250	µA	I_F = 2µA, V_O = V_{CC} = 18V	2
Logic High Supply Current	I_{CCH}		.010	40	µA	I_F = 0mA, V_{CC} = 18V	
Low Level Supply Current	I_{CCL}		0.8	2	mA	I_F = 1.6mA, V_{CC} = 18V	
Input Forward Voltage	V_F		1.4	1.8	V	I_F = 1.6mA	
Input Reverse Breakdown Voltage	BV_R	5			V	I_R = 10µA	
Input-Output Insulation Leakage Current	$I_{I—O}$			1.0	µA	$V_{I—0}$ = 1500Vdc, Relative Humidity = 45% t_A = 25°C, t = 5s	3
Propagation Delay Time To High Output Level	t_{PLH}		5	60	µs	I_F = 0.5mA, V_{CC} = 5.0V, R_L = 4.7kΩ	
			4	20	µs	I_F = 5mA, V_{CC} = 5.0V, R_L = 680kΩ	
Propagation Delay Time To Low Output Level	t_{PHL}		8	100	µs	I_F = 0.5mA, V_{CC} = 5.0V, R_L = 4.7kΩ	
			2	5	µs	I_F = 5mA, V_{CC} = 5.0V, R_L = 680kΩ	

TYPICAL CHARACTERISTICS

T_a = 25°C, V_{CC} = 5V Each Channel

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Capacitance	C_{IN}		60		pF	V_F = 0, f = MHz, t_a = 25°C	
Capacitance (Input-Output)	C_{I-O}		1.5		pF	f = 1MHz, t_a = 25°C	4
Input Diode Temperature Coefficient	$\frac{\Delta V_F}{\Delta T_A}$		-1.8		mV/°C	I_F = 1.6mA	
Resistance (Input-Output)	R_{I-0}		10^{12}		Ω	$V_{I—O}$ = 500V, t_a = 25°C	4
Common Mode Transient immunity at High Output Level	CM_H	500	1000		V/µs	V_{CM} = 50V $_{P-P}$,V_{CC} = 5.0V, R_L = 1.5kΩ, I_F = OmA t_a = 25°C	5, 7
Common Mode Transient Immunity at Low Output Level	CM_L	500	1000		V/µs	V_{CM} = 50V $_{P-P}$,V_{CC} = 5.0V, R_L = 1.5kΩ, I_F = 1.6mA t_a = 25°C	6, 7

NOTES:

1. CURRENT TRANSFER RATIO is defined as the ratio of output collector current, I_O, to the forward LED input current., I_F , times 100%.
2. I_F = 2µA for channel under test. For all other channels, I_F = 10mA.
3. Device considered a two-terminal device. Pins 1-6 and 16 are shorted together and pins 7-14 are shorted together.
4. Measured between each input pair shorted together.
5. CM_H is the maximum tolerable common mode transient to assure that the output will remain in a high logic state (i.e. V_O > @.0V).
6. CM_L is the maximum tolerable common mode transient to assure that the output will remain in a low logic state (i.e. V_O < 0.8V).
7. In applications where dv/dt may exceed 50,000 V/µs (such as static discharge) a series resistor, R_{CC} , should be included to protect the detector ICs from destructively high surge currents. The recommended value is $R_{CC} = \frac{1V}{0.6I_F\ (mA)} = k\Omega$

RECOMMENDED OPERATING CONDITIONS:

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I_{FL}	0	2	µA
Input Current, High Level	I_{FH}	0.5	5	mA
Supply Voltage	V_{CC}	2.0	18	V

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
66170-000	Single Channel optocoupler, full mil-temp (-55° to +125°C) with 100% device screening
66170-002	Single Channel optocoupler, military operating range (-55° to +125°C)
66170-003	Single Channel optocoupler, commercial (0° to 70°C)
66170-004	Single Channel optocoupler, extended temperature range (-40° to +85°C)