

66170

GULL WING HERMETICALLY SEALED, SINGLE CHANNEL OPTOCOUPLER (Electrically Similar to 6N140)



01/23/2007

Features:

- High current transfer ratio: 1000% typical
- 1500 Vdc isolation test voltage
- Low input current requirement: 0.5 mA
- 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.

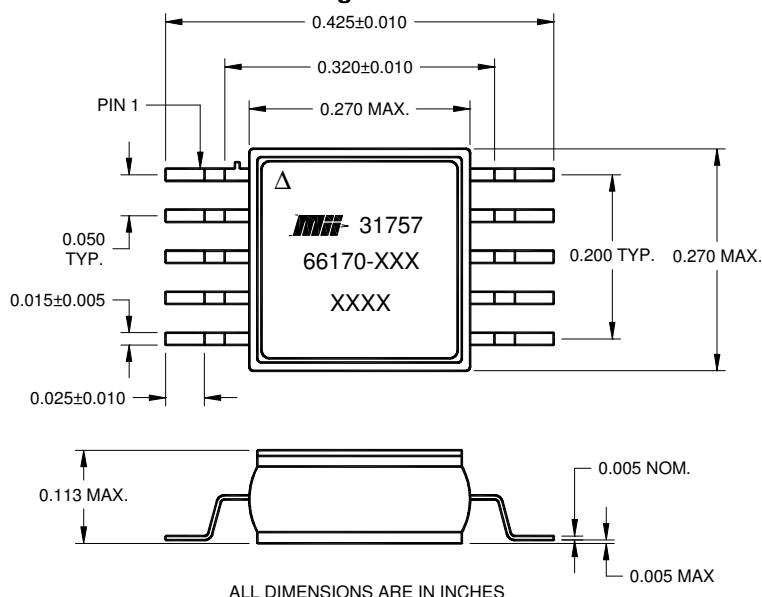
ABSOLUTE MAXIMUM RATINGS

Power Dissipation	.200 mW
Peak Forward Input Current (<1ms duration)	20 mA
Average Forward Input Current ..(Note 3)	10 mA
Reverse Input Voltage	5 V
Supply Voltage - V _{CC} (Note 1)	-0.5 to 20 V Out
Output Current - I _O	40 mA
Output Power Dissipation (Note 2)	50 mW
Output Voltage-V _O (Note 1)	-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" from case)	260°C

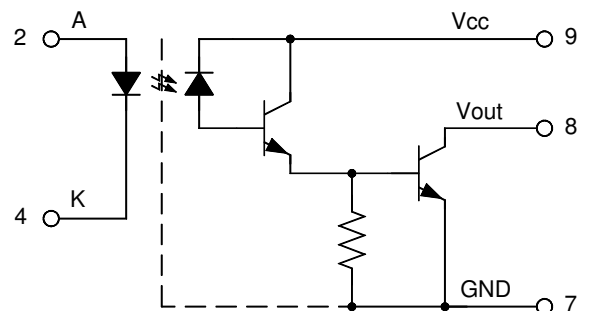
Notes:

1. The lowest total I_{OH} over temperature is developed by keeping V_{CC} as low as possible, but greater than 2.0 V
2. Output Power is collector output power plus total supply power.
3. Derate at the rate of 0.33 mA/°C above 25°C.

Package Dimensions



Schematic Diagram



66170

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ELECTRICAL CHARACTERISTICST_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 = 0.5 mA, V _O = 0.4 V, V _{CC} = 4.5 V	1
		300	750		%	I _F = 1.6 mA, V _O = 0.4 V, V _{CC} = 4.5 V	1
		200	400		%	I _F = 5.0 mA, V _O = 0.4 V, V _{CC} = 4.5 V	1
Logic Low Output Voltage	V _{OL}		0.1	0.4	V	I _F = 0.5 mA, I _{OL} = 1.5 mA, V _{CC} = 4.5 V	
			0.2	0.4	V	I _F = 5.0 mA, I _{OL} = 10 mA, V _{CC} = 4.5 V	
Logic High Output Current	I _{OH}		0.005	50	μA	I _F = 2 μA, V _O = V _{CC} = 18 V	
Logic High Supply Current	I _{CCH}		0.010	40	μA	I _F = 0 mA, V _{CC} = 18 V	
Low Level Supply Current	I _{CCL}		0.8	4	mA	I _F = 1.6 mA, V _{CC} = 18 V	
Input Forward Voltage	V _F		1.4	1.8	V	I _F = 1.6 mA	
Input Reverse Breakdown Voltage	BV _R	5			V	I _R = 10 μA	
Input-Output Insulation Leakage Current	I _{I-O}			1.0	μA	V _{I-O} = 1500 Vdc, Relative Humidity = 45% t _A = 25°C, t = 5 s	2
Propagation Delay Time To High Output Level	t _{PLH}		17	60	μs	I _F = 0.5 mA, V _{CC} = 5.0 V, R _L = 4.7 kΩ	
			8	20	μs	I _F = 5 mA, V _{CC} = 5.0 V, R _L = 680 kΩ	
Propagation Delay Time To Low Output Level	t _{PHL}		30	100	μs	I _F = 0.5 mA, V _{CC} = 5.0 V, R _L = 4.7 kΩ	
			2	5	μs	I _F = 5 mA, V _{CC} = 5.0 V, R _L = 680 kΩ	

TYPICAL CHARACTERISTICST_a = 25°C, V_{CC} = 5 V Each Channel

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

NOTES:

- CURRENT TRANSFER RATIO is defined as the ratio of output collector current, I_O, to the forward LED input current, I_F, times 100%.
- Device considered a two-terminal device. Pins 2 and 4 are shorted together and pins 7, 8 and 9 are shorted together.
- 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 > 2 V).
- 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 < 0.8 V).
- 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 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	Screened
66170-002	-55° to +125°C
66170-003	Commercial (0° to 70°C)
66170-004	-40° to +85°C