

66058**SINGLE/DUAL CHANNEL, LOW-INPUT CURRENT,
OPTOCOUPLER** (Electrically similar to 6N140)**Mii****OPTOELECTRONIC PRODUCTS
DIVISION****Features:**

- DSCC Approved 8978501PX (Dual) and 8981001PX (Single)
- High current transfer ratio: 1000% typical
- 1500 Vdc isolation test voltage
- Low input current requirement: 0.5mA

Applications:

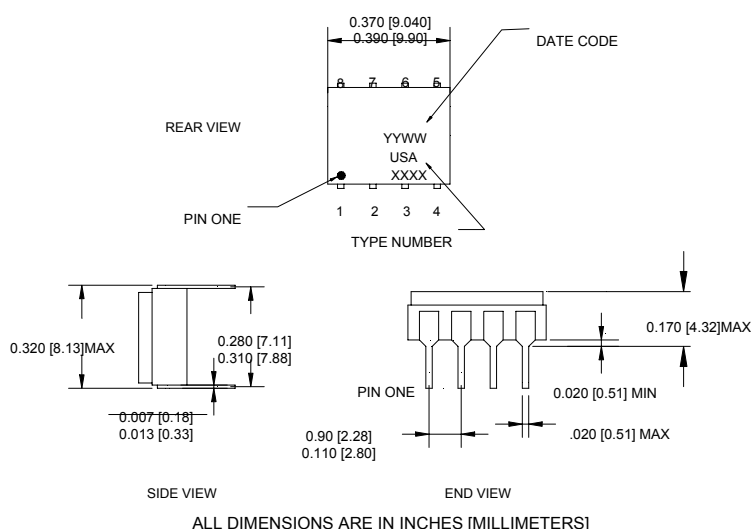
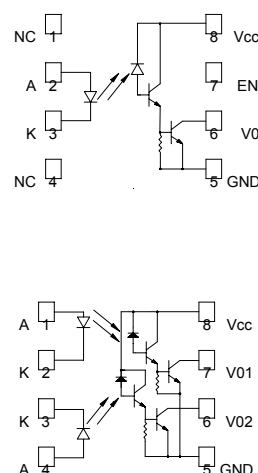
- Telephone ring detection
- Voltage level shifting
- Isolated receiver input
- Communication systems
- Medical systems

DESCRIPTION

The **66058** single/dual optocoupler utilizes infrared LEDs optically coupled to high gain photodarlington detectors. This unique optocoupler provides high CTR and low leakage current over the full military temperature range (-55° to +125°C). The 66058 is a 8 pin dual-in-line, 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 (each channel)	20mA (1ms duration)
Average Forward Input Current	(see Note 1) 10mA
Reverse Input Voltage	5V
Output Current - I_O (each channel)	40mA
Output Power Dissipation (each channel)	(see Note 2) 50mW
Supply Voltage - V_{CC}	(see Note 3) 0.5 to 20V
Output Voltage - V_O (each channel).....	(see Note 3) -0.5 to 20V

Package Dimensions**Schematic Diagram****Notes:**

1. Derate I_F at 0.33 mA/°C above 110°C.
2. Collector output power plus one half of the total supply power is total output power. Derate at 1.66mW/°C above 110°C.
3. The lowest total I_{OH} over temperature is developed by keeping V_{CC} as low as possible, but greater than 2 volts. The negative voltage at the detector side should be applied to Pin 10.

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 = 0.5mA, V _O = 0.4V, V _{CC} = 4.5V	1,2
		300	750		%	I _F = 1.6mA, V _O = 0.4V, V _{CC} = 4.5V	1,2
		200	400		%	I _F = 5.0mA, V _O = 0.4V, V _{CC} = 4.5V	1,2
Logic Low Output Voltage	V _{OL}		0.1	0.4	V	I _F = 0.5mA, I _{OL} = 1.5mA, V _{CC} = 4.5V	1
			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	1,3
High Level Output Current	I _{CCH}	-XX1 -XX2	.01	10	μA	I _{F1} = 0mA, V _{CC} = 18V	
				20	μA	I _{F1} = I _{F2} = 0mA, V _{CC} = 18V	
Low Level Supply Current	I _{CCL}	-XX1 -XX2	.01	2	mA	I _{F1} = 1.6mA, V _{CC} = 18V	
				4	mA	I _{F1} = I _{F2} = 1.6mA, V _{CC} = 18V	
Input Forward Voltage	V _F		1.4	1.7	V	I _F = 1.6mA	1
Input Reverse Breakdown Voltage	BV _R	5			V	I _R = 10μA	1
Input-Output Insulation Leakage Current	I _{I-O}			1.0	μA	V _{I-O} = 1500Vdc, Relative Humidity = 45% t _A = 25°C, t = 5s	4
Propagation Delay Time To High Output Level	t _{PLH}		6	60	μs	I _F = 0.5mA, V _{CC} = 5.0V, R _L = 4.7kΩ	
			6	50	μs	I _F = 1.6mA, V _{CC} = 5.0V, R _L = 1.5kΩ	
			4	30	μs	I _F = 5mA, V _{CC} = 5.0V, R _L = 680Ω	
Propagation Delay Time To Low Output Level	t _{PHL}		8	100	μs	I _F = 0.5mA, V _{CC} = 5.0V, R _L = 4.7kΩ	
			3	30	μs	I _F = 1.6mA, V _{CC} = 5.0V, R _L = 1.5kΩ	
			2	10	μs	I _F = 5mA, V _{CC} = 5.0V, R _L = 680Ω	

TYPICAL CHARACTERISTICST_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	1
Capacitance (Input-Output)	C _{I-O}		1.5		pF	f = 1MHz, t _a = 25°C	1, 5
Input Diode Temperature Coefficient	$\frac{\Delta V_F}{\Delta T_A}$		-1.8		mV/°C	I _F = 1.6mA	1
Resistance (Input-Output)	R _{I-O}		10 ¹²		Ω	V _{I-O} = 500V, t _a = 25°C	1, 5
Resistance (Input-Input)	R _{I-I}		10 ¹²		Ω	V _{I-I} = 500V, t _a = 25°C	6
Input-Input Insulation Leakage Current	I _{I-I}		0.5		nA	Relative Humidity = 45% V _{I-I} = 500V, t = 5s	6
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 = 0mA, t _a = 25°C	7,9
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	8,9

NOTES:

- Each channel.
- CURRENT TRANSFER RATIO is defined as the ratio of output collector current, I_O, to the forward LED input current, I_F, times 100%.
- I_F = 2μA for channel under test. For all other channels, I_F = 10mA.
- Device considered a two-terminal device.
- Measured between each input pair shorted together and all output pins shorted together.
- Measured between each input pair shorted together.
- CM_H is the maximum tolerable common mode transient to assure that the output will remain in a high logic state (ie. V_O > @.0V).
- CM_L is the maximum tolerable common mode transient to assure that the output will remain in a low logic state (ie. V_O < 0.8V).
- 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 IC's from destructively high surge currents. The recommended value is R_{CC} = $\frac{1V}{0.6I_F}$ = kΩ

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