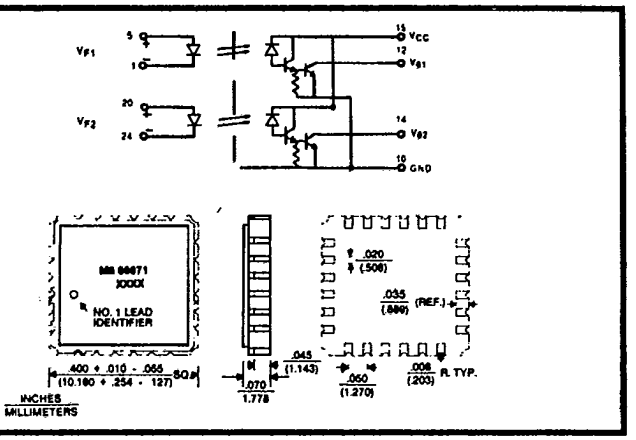
66071 DUAL-CHANNEL, LOW-INPUT CURRENT, LEADLESS CHIP CARRIER OPTOCOUPLER

OPTOELECTRONIC PRODUCTS DIVISION

FEATURES

- Electrically similar to 6N140
- Hermetically sealed 24 Pin LCC
- High density packaging
- High current transfer ratio: 500% typical
- CTR and I_{OH} guaranteed over temperature range (-55°C to +125°C)
- Standard and high reliability screened parts available
- 1000 Vdc isolation test voltage
- Low input current requirement: 0.5mA
- Low output saturation voltage: 0.1V typical
- Low power consumption
- Faraday shield provides high common mode rejection



DESCRIPTION:

The 66071 optocoupler contains two infrared LEDs optically coupled to two corresponding high gain photon detectors. This unique dual optocoupler provides high CTR and low leakage currents over the full military temperature range (−55°C to +125°C). The 66071 is a 24 pin hermetically sealed leadless chip carrier and is available in standard and screened versions or tested to customer specifications.

RECOMMENDED OPERATING CONDITIONS

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

ABSOLUTE MAXIMUM RATINGS:

Output current, - I_O (each channel) 40mA
Output voltage, - V_O (each channel) ..... -0.5 to 20V (1)
Supply voltage, - V_{CC} ..... -0.5 to 20V (1)
Output power dissipation (each channel) 50mW (2)
Storage temperature ..... -65°C to +150°C
Operating temperature ..... -55°C to +125°C
Lead solder temperature ..... 260°C for 10 sec.
Peak input current (each channel, < 1ms duration) 20mA
Reverse input voltage, V_R (each channel) 5V
Average input current, I_F (each channel) 10mA (3)

Notes:

1. The lowest total I_{OH} over temperature is developed by keeping V_{CC} as low as possible, but greater than 2.0 volts. The negative voltage at the detector side should be applied to PIN 10.
2. Collector output power plus one fourth of the total supply power is total output power. Derate at 0.46mW/°C above 25°C.
3. Derate I_F at 0.05mA/°C above 25°C.

66071 DUAL-CHANNEL, LOW-INPUT CURRENT, LEADLESS CHIP CARRIER OPTOCOUPLER, *Continued*

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	300 300 200	1000 750 400		% % %	I_F = 0.5mA, V_O = 0.4V, V_{CC} = 4.5V I_F = 1.6mA, V_O = 0.4V, V_{CC} = 4.5V I_F = 5mA, V_O = 0.4V, V_{CC} = 4.5V	1, 2
Logic Low Output Voltage	V_{OL}		0.1 0.2	0.4 0.4	V V	I_F = .5mA, I_{OL} = 1.5mA, V_{CC} = 4.5V I_F = 5mA, I_{OL} = 10mA, V_{CC} = 4.5V	1
Logic High Output Current	I_{OH}		.005	250	µA	I_F = 2µA V_O = V_{CC} = 18V	1, 3
Logic Low Supply Current	I_{CCL}		2	4	mA	I_{F1} = I_{F2} = 1.6mA V_{CC} = 18V	
Logic High Supply Current	I_{CCH}		.010	20	µA	I_{F1} = I_{F2} = 0 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	45% Relative Humidity, T_A = 25°C, t = 5s, V_{I-O} = 1000Vdc	4
Propagation Delay Time To Logic High at Output	t_{PLH}		25	60	µs	I_F = 0.5mA, R_L = 4.7kΩ, V_{CC} = 5.0V	
			10	20	µs	I_F = 5mA, R_L = 680Ω, V_{CC} = 5.0V	
Propagation Delay Time To Logic Low at Output	t_{PHL}		35	100	µs	I_F = 0.5mA, R_L = 4.7kΩ, V_{CC} = 5.0V	
			2	5	µs	I_F = 5mA, R_L = 680Ω, V_{CC} = 5.0V	
Common Mode Transient Immunity at High Output	CM_H	500	1000		V/µs	I_F = 0mA, R_L = 1.5kΩ V_{CM} = $50V_{p-p}$, V_{CC} = 5.0V, T_A = 25°C	6
Common Mode Transient Immunity at Low Output	CM_L	-500	-1000		V/µs	I_F = 1.6mA, R_L = 1.5kΩ V_{CM} = $50V_{p-p}$, V_{CC} = 5.0V, T_A = 25°C	7

**All typical values are at V_{CC} = 5V, T_A = 25°C

TYPICAL CHARACTERISTICS

T_A = 25°C, V_{CC} = 5V EACH CHANNEL

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS	NOTE
Resistance (Input-Output)	R_{I-O}		10^{12}		Ω	V_{I-O} = 500Vdc, T_A = 25°C	1, 5
Capacitance (Input-Output)	C_{I-O}		1.5		pF	f = 1MHz, T_A = 25°C	1, 5
Temperature Coefficient of Forward Voltage	$\frac{\Delta VF}{\Delta TA}$		-1.8		mV/°C	I_F = 1.6mA	1
Input Capacitance	C_{IN}		60		pF	f = 1MHz, V_F = 0, T_A = 25°C	1

NOTES:

1. Each channel.
2. CURRENT TRANSFER RATIO is defined as the ratio of output collector current I_O, to the forward LED input current, I_F, times 100%.
3. I_F = 2µA for channel under test. For other channel I_f = 10mA.
4. Device considered a two-terminal device. Input pins are shorted together and output pins are shorted together.
5. Measured between each input pair shorted together and all output pins.
6. 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 > 2.0V).
7. 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).