

**66123**

**DUAL-CHANNEL, VERY HIGH SPEED , LEADLESS  
CHIP CARRIER OPTOCOUPLER**

**Mii**

**OPTOELECTRONIC PRODUCTS  
DIVISION**

**Features:**

- DSCC Approved 81028032X
- 5 MHz bandwidth typical
- Electrically similar to 6N134
- 1500 Vdc isolation test voltage
- TTL compatible input and output
- 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**

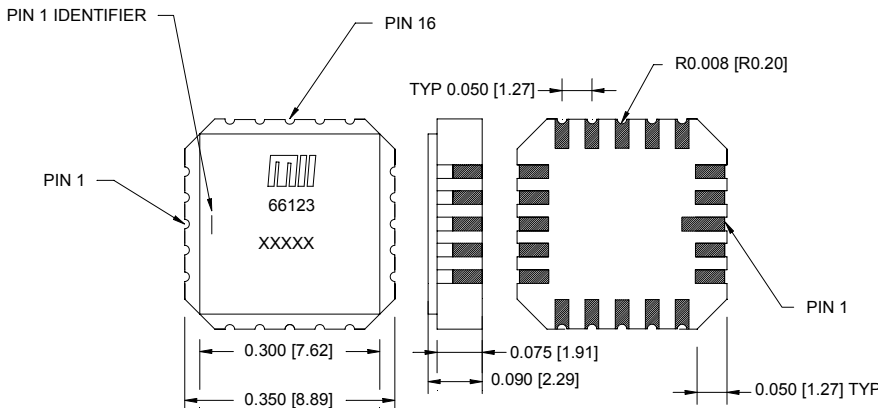
The **66123** dual channel optocoupler consists of two LEDs optically coupled to two high speed, high gain inverting detector gates. Maximum isolation can be achieved while providing TTL outputs capable of switching with propagation delays of 55ns typical. The 66123 is a 20 pin leadless chip carrier hermetically sealed package and is available in standard and screened versions or tested to customer specifications. MIL-PRF-38534 Qualified.

**ABSOLUTE MAXIMUM RATINGS**

(No derating required up to 125°C)

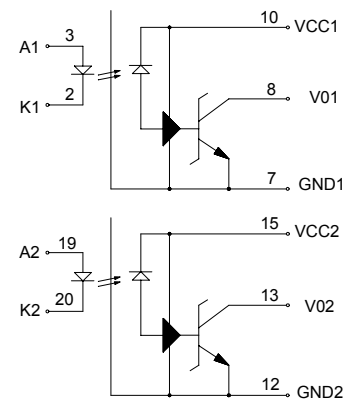
Storage Temperature .....	-65°C to +150°C
Operating Free-Air Temperature Range .....	-55°C to +125°C
Lead Solder Temperature .....	260°C for 10s (1.6mm below seating plane)
Peak Forward Input Current (each channel).....	40mA (<1ms duration)
Average Forward Input Current (each channel) .....	20mA
Input Power Dissipation (each channel) .....	35mW
Reverse Input Voltage (each channel) .....	5V
Supply voltage - V <sub>CC</sub> .....	7V(1 minute maximum)
Output Current - I <sub>O</sub> (each channel) .....	25mA
Output Power Dissipation (each channel) .....	40mW
Output Voltage - V <sub>O</sub> (each channel).....	7V
Total Power Dissipation (both channels) .....	350mW

**Package Dimensions**



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

**Schematic Diagram**



NOTE:  
A 0.01 TO 0.1 uF Bypass capacitor must be connected between Vcc and Gnd

**ELECTRICAL CHARACTERISTICS**  $T_a = -55^\circ\text{C}$  to  $125^\circ\text{C}$  unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP**	MAX	UNITS	TEST CONDITIONS	NOTE
High Level Output Current	$I_{OH}$		5	250	$\mu\text{A}$	$V_{CC} = 5.5\text{V}$ , $V_O = 5.5\text{V}$ , $I_F = 250\mu\text{A}$	1
Low Level Output Voltage	$V_{OL}$		0.35	0.6	V	$V_{CC} = 5.5\text{V}$ , $I_F = 10\text{mA}$ $I_{OL}$ (Sinking) = $10\text{mA}$	1,9
High Level Supply Current	$I_{CCH}$		18	28	mA	$V_{CC} = 5.5\text{V}$ , $I_F = 0$ (Each Channel)	
Low Level Supply Current	$I_{CCL}$		26	36	mA	$V_{CC} = 5.5\text{V}$ , $I_F = 20\text{mA}$ (Each Channel)	
Input Forward Voltage	$V_F$		1.5	1.75	v	$I_F = 20\text{mA}$ , $T_A = -25^\circ\text{C}$	1
Input Reverse Breakdown Voltage	$BV_R$	5			v	$I_R = 10\mu\text{A}$ , $T_A = -25^\circ\text{C}$	
Input-Output Insulation Leakage Current	$I_{I-O}$			1.0	$\mu\text{A}$	$V_{I-O} = 1500\text{Vdc}$ , Relative Humidity = 45% $T_A = 25^\circ\text{C}$ , $t = 5\text{s}$	2
Propagation Delay Time To High Output Level	$t_{PLH}$		65	100	ns	$R_L = 510\Omega$ , $C_L = 15\text{pF}$ , $I_F = 13\text{mA}$ , $T_A = 25^\circ\text{C}$	5
Propagation Delay Time To Low Output Level	$t_{PHL}$		55	100	ns	$R_L = 510\Omega$ , $C_L = 15\text{pF}$ , $I_F = 13\text{mA}$ , $T_A = 25^\circ\text{C}$	6

\*\* All typical values are at  $V_{CC} = 5\text{V}$ ,  $T_A = 25^\circ\text{C}$

**TYPICAL CHARACTERISTICS**  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 5\text{V}$  EACH CHANNEL

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Capacitance	$C_{IN}$		60		pF	$V_F = 0$ , $f = 1\text{MHz}$	1
Input Diode Temperature Coefficient	$\frac{\Delta V_F}{\Delta T_A}$		-1.9		$\text{mV}/^\circ\text{C}$	$I_F = 20\text{mA}$	1
Resistance (Input-Output)	$R_{I-O}$		$10^{12}$		$\Omega$	$V_{I-O} = 500\text{V}$	3
Capacitance (Input-Output)	$C_{I-O}$		1.7		pF	$f = 1\text{MHz}$	3
Input-Input Insulation Leakage Current	$I_{I-I}$		0.5		nA	Relative Humidity = 45% $V_{I-I} = 500\text{V}$ , $t = 5\text{s}$	4
Resistance (Input-Input)	$R_{I-I}$		$10^{12}$		$\Omega$	$V_{I-I} = 500\text{V}$	4
Capacitance (Input-Input)	$C_{I-I}$		0.80		pF	$f = 1\text{MHz}$	4
Output-Rise-Fall Time (10-90%)	$t_r$ , $t_f$		35		ns	$R_L = 510\Omega$ , $C_L = 15\text{pF}$ $I_F = 13\text{mA}$	
Common Mode Transient Immunity At High Output Level	$CM_H$	1000	10000		$\text{V}/\mu\text{s}$	$V_{CM} = 10\text{V}$ (peak), $V_O$ (min) = $2\text{V}$ , $R_L = 510\Omega$ , $I_F = 0\text{mA}$	7
Common On Mode Transient Immunity At Low Output Level	$CM_L$	1000	10000		$\text{V}/\mu\text{s}$	$V_{CM} = 10\text{V}$ (peak), $V_O$ (max) = $0.8\text{V}$ , $R_L = 510\Omega$ , $I_F = 10\text{mA}$	8

**NOTES:**

- Each Channel
- Measured between PINS 1 through 8 shorted together and PINS 9 through 16 shorted together.
- Measured between PINS 9 and 10 or 11 and 12 shorted together, and PINS 9 through 16 shorted together.
- Measured between PINS 9 and 10 shorted together, and PINS 11 and 12 shorted together.
- The  $t_{PLH}$  propagation delay is measured from the 6.5mA point on the trailing edge of the input pulse to the 1.5V point on the trailing edge of the output pulse.
- The  $t_{PHL}$  propagation delay is measured from the 6.5mA point on the leading edge of the input pulse to the 1.5V point on the leading edge of the output pulse.
- $CM_H$  is the max. tolerable common mode transient to assure that the output will remain in a high logic state (i.e.  $V_O > 2.0\text{V}$ ).
- $CM_L$  is the max. tolerable common mode transient to assure that the output will remain in a low logic state (i.e.  $V_O < 0.8\text{V}$ ).
- It is essential that a bypass capacitor (.01 TO  $0.1\mu\text{F}$  Ceramic) be connected from PIN1 to PIN4.

**RECOMMENDED OPERATING CONDITIONS:**

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level Each Channel	$I_{FL}$	0	250	$\mu\text{A}$
Input Current, High Level Each Channel	$I_{FH}$	12.5	20	mA
Supply Voltage	$V_{CC}$	4.5	5.5	V
Fan Out (TTL load) Each Channel	N		6	
Operating Temperature	$T_A$	-55	125	$^\circ\text{C}$