

MTL6400U

SINGLE CHANNEL OPTOCOUPLER

(Electrically similar to 6N140)



Features:

- High Reliability
- High Current Ratio: 300% Typical
- Rugged surface mount package
- Low Input current requirement: 0.5mA
- +1.5kV electrical isolation

Applications:

- Military and Space
- Level shifting
- Line receiver
- Switching power supplies
- Communication Systems

DESCRIPTION

The **MTL6400U** contains a gallium aluminum arsenide LED optically coupled to a silicon photodarlington detector. The optocoupler is built in a 6-pin leadless chip carrier. This optocoupler is capable of transmitting signals between two galvanic sources. The potential difference between transmitter and receiver should not go over the maximum isolation voltage. Also available screened to MIL-STD-883.

ABSOLUTE MAXIMUM RATINGS

Input Diode

Peak Forward Input Current (Value applies for $t_w \leq 1\text{ms}$, 500 pps)20mA

Average Input Current, I_F (Note 1)..... 10mA

Reverse Input Voltage, V_R5V

Output Photodetector

Output Current, I_O40mA

Output Voltage, V_O-0.5V to 18V

Supply Voltage, V_{CC}-0.5V to 20V

Output Power Dissipation (Note 2).....75mW

Storage Temperature..... -65°C to +150°C

Operating Free-Air Temperature Range.....-55°C to +125°C

Lead Solder Temperature (vapor phase reflow for 30 sec.)215°C

Notes:

1. Derate I_F at 0.66mA/°C above 110°C
2. Output power is collector output power plus one half of the total supply power. Derate at 5mW/°C above 110°C.

RECOMMENDED OPERATING CONDITIONS:

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I_{FL}	0	1	μA
Input Current, High Level	I_{FH}	0.5	5	mA
Supply Voltage	V_{CE}	5	18	V
Operating Temperature	T_A	-55	125	°C

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
MTL64X0U.001.X	Single Channel optocoupler, commercial (0° to +70°C operating temperature range)
MTL64X0U.002.X	Single Channel optocoupler, commercial (-40° to +85°C operating temperature range)
MTL64X0U.003.X	Single Channel optocoupler, commercial (-55° to +125 operating temperature range)
MTL64X0U.004.X	Single Channel optocoupler, w/100% device screening -55° to +125°C operating temperature range)

NOTE: Replace first X with 0 or 2 to indicate type of part required

X at end of part number represents lead finish. Replace with A for gold or S for solder.

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ELECTRICAL CHARACTERISTICS

INPUT DIODE

T_A = 25°C unless otherwise specified.

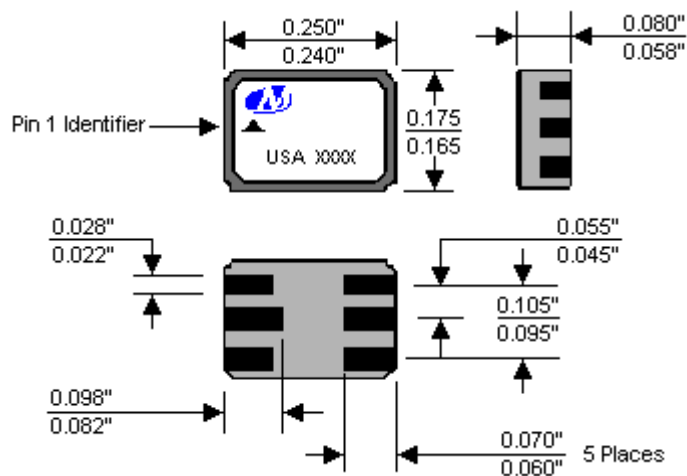
PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Reverse Breakdown Voltage	BV _R	5			V	I _R = 10μA
Input Diode Static Forward Voltage	V _F			1.8	V	I _F = 1.6mA
Input Diode Static Forward Voltage -55°C	V _F		1.5	1.8	V	I _F = 1.6mA
Input Diode Static Forward Voltage +100°C	V _F		1.2	1.8	V	I _F = 1.6mA

COUPLED CHARACTERISTICS

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Current Transfer Ratio	CTR	300	1500		%	I _F = 0.5mA, V _O = 0.4V, V _{CC} = 4.5V
		300	1000		%	I _F = 1.6mA, V _O = 0.4V, V _{CC} = 4.5V
		200	500		%	I _F = 5.0mA, V _O = 0.4V, V _{CC} = 4.5V
Logic Low Output Voltage	V _{OL}		0.1	0.4	V	I _F = 0.5mA, I _{OL} = 1.5mA, V _{CC} = 4.5V
Logic Low Output Voltage	V _{OL}		0.2	0.4	V	I _F = 0.5mA, I _{OL} = 10mA, V _{CC} = 4.5V
Logic High Output Current	I _{OH}		0.01	250	μA	V _O = V _{CC} = 18V
Logic Low Supply Current	I _{CC}		0.4	1.0	mA	I _F = 1.6mA, V _{CC} = 18V
Logic High Supply Current	I _{CH}		0.01	10	μA	I _F = 0mA, V _{CC} = 18V
Input-Output Insulation Leakage Current	I _{I-O}			1.0	μA	45% Relative Humidity, T _A = 25°C t = 5sec, V _{I-O} = 1500Vdc
Resistance (Input-Output)	R _{I-O}	10 ¹²			Ω	V _{I-O} = 500V
Input to Output Capacitance	C _{IO}		1.5		pF	f = 1MHz, T _A = 25°C
Propagation Delay Time to High Output Level	t _{PLH}		6.0	60	μs	V _{CC} = 5V, I _F = 0.5mA, R _L = 4.7kΩ
			4.0	20	μs	V _{CC} = 5V, I _F = 5mA, R _L = 680Ω
Propagation Delay Time to Low Output Level	t _{PHL}		30	100	μs	V _{CC} = 5V, I _F = 0.5mA, R _L = 4.7kΩ
			2.0	5.0	μs	V _{CC} = 5V, I _F = 5mA, R _L = 680Ω
Common Mode Transient Immunity At High Output Level	CM _H	500	1000		V/μs	V _{CM} = 50Vp-p, V _{CC} = 5.0V R _L = 1.5KΩ, I _F = 0mA
Common Mode Transient Immunity At Low Output Level	CM _L	500	1000		V/μs	V _{CM} = 50Vp-p, V _{CC} = 5.0V R _L = 1.5KΩ, I _F = 1.69mA

Package Dimensions



Schematic Diagram

