

MTL3C91

SINGLE CHANNEL OPTOCOUPLER
(Direct Replacement for 3C91C)



Features:

- High Reliability
- Base lead eliminated for improved noise immunity
- Rugged package
- Stability over wide temperature
- +500V electrical isolation

Applications:

- Eliminate ground loops
- Level shifting
- Line receiver
- Switching power supplies
- Motor control

DESCRIPTION

The **MTL3C91** contains a gallium arsenide infrared LED optically coupled to a silicon planar phototransistor. The optocoupler is built on a TO-46 header. The anode of the LED is electrically connected to the case. 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. The internal base connection has been eliminated for improved noise immunity.

ABSOLUTE MAXIMUM RATINGS

Input to Output Voltage.....	500V
Emitter-Collector Voltage.....	.5V
Collector-Emitter Voltage (Value applies to emitter-base open-circuited & the input-diode equal to zero).....	.60V
Reverse Input Voltage.....	.7V
Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 1).....	.50mA
Peak Forward Input Current (Value applies for $t_w \leq 1\mu s$, $PRR < 300$ pps).....	.1A
Continuous Collector Current.....	.50mA
Continuous Transistor Power Dissipation at (or below) 25°C Free-Air Temperature (see Note 2).....	.300mW
Storage Temperature.....	-65°C to +150°C
Operating Free-Air Temperature Range.....	-55°C to +100°C
Lead Solder Temperature (10 seconds max.).....	240°C

Notes:

1. Derate linearly to 125°C free-air temperature at the rate of 0.67 mA/°C above 65°C.
2. Derate linearly to 125°C free-air temperature at the rate of 3 mW/°C.

RECOMMENDED OPERATING CONDITIONS:

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I_{FL}	0	1	μA
Input Current, High Level	I_{FH}	2	10	mA
Supply Voltage	V_{CE}	5	50	V
Operating Temperature	T_A	-55	125	°C

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
MTL3C91.001.X	Single Channel optocoupler, commercial (0° to+70°C operating temperature range)
MTL3C91.002.X	Single Channel optocoupler, commercial (-40° to +85°C operating temperature range)
MTL3C91.003.X	Single Channel optocoupler, commercial (-55° to +125°C operating temperature range)
MTL3C91.004.X	Single Channel optocoupler, screened to JANTX level (-55° to +125°C operating temperature range)

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

MTL3C91

SINGLE CHANNEL OPTOCOUPLER (Direct Replacement for 3C91C)

ELECTRICAL CHARACTERISTICS

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode Static Reverse Current	I _R			1	μA	V _R = 3V
Input Diode Static Forward Voltage	V _F		1.15	1.2	V	I _F = 2mA
Input Diode Static Forward Voltage	V _F		1.3	1.5	V	I _F = 50mA
Reverse Breakdown Voltage	B _{VR}	7	12		V	I _R = 100μA
Input Diode Capacitance	C _{IN}		25		pF	V = 0V, f = 1MHz

OUTPUT TRANSISTOR

T_A = 25°C unless otherwise specified.

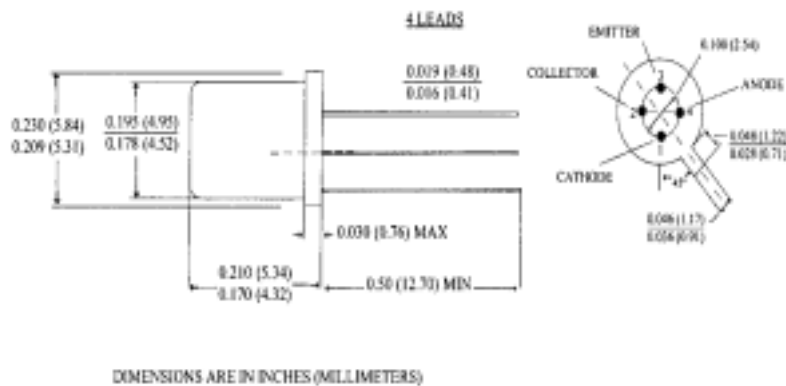
PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	50			V	I _C = 1mA, I _B = 0, I _F = 0
Emitter-Collector Breakdown Voltage	V _{(BR)ECO}	5			V	I _C = 0mA, I _E = 10μA, I _F = 0
Collector-Emitter Dark Current	I _{CEO1}			60	nA	V _{CE} = 50V, I _F = 0mA
	I _{CEO2}			10	nA	V _{CE} = 5V, I _F = 0mA

COUPLED CHARACTERISTICS

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
On State Collector Current	I _{C(ON)}	4			mA	V _{CE} = 5V, I _F = 10mA
On State Collector Current	I _{C(ON)}	3		20	mA	V _{CE} = 0.4V, I _F = 10mA
On State Collector Current	I _{C(ON)}	2			mA	V _{CE} = 5V, I _F = 10mA
Collector-Emitter Saturation Voltage	V _{CE(SAT)}			0.4	V	I _F = 50mA, I _C = 10mA
Isolation Resistance	R _{ISO}	10 ⁹			Ω	V _{IN-OUT} = 500V
Input to Output Capacitance	C _{IO}		2	2.5	pF	f = 1MHz
Delay Time	t _d		2	4	μs	V _{CE} = 5V, I _F = 2mA, R _L = 100Ω
Storage Time	t _s		0.2	0.5	μs	V _{CE} = 5V, I _F = 2mA, R _L = 100Ω
Rise Time	t _r		3	5	μs	V _{CE} = 5V, I _F = 2mA, R _L = 100Ω
Fall Time	t _f		4	5	μs	V _{CE} = 5V, I _F = 2mA, R _L = 100Ω

Package Dimensions



Schematic Diagram

