

MTL4N22 MTL4N23 MTL4N24

SINGLE CHANNEL OPTOCOUPLES



Features:

- Overall current gain ... 1.5 typical
- Base lead provided for conventional transistor biasing
- Rugged package
- High gain, high voltage transistor
- +1kV electrical isolation

Applications:

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

DESCRIPTION:

The **MTL4N22-4's** are very high gain optocouplers that utilize a GaAlAs infrared LED optically coupled to an N-P-N silicon phototransistor packaged in a hermetically sealed T0-5 package. The MTL4N22, MTL4N23 and MTL4N24 optocouplers can be supplied to customer specifications as well as tested and screened in accordance with MIL-PRF-19500 to JANTX level.

ABSOLUTE MAXIMUM RATINGS

Input to Output Voltage	+1kV
Emitter-Base Voltage4V
Collector-Emitter Voltage (Value applies to emitter-base open-circuited & the input-diode equal to zero).....	35V
Collector-Base Voltage.....	35V
Reverse Input Voltage2V
Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 1).....	40mA
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 +125°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 mW/°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	10	V

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
MTL4N22.001X	Single Channel Commercial Optocoupler (0° to +70°C operating temperature range)
MTL4N22.002X	Single Channel Commercial Optocoupler (-40° to +85°C operating temperature range)
MTL4N22.003X	Single Channel Commercial Optocoupler (-55° to 125°C operating temperature range)
MTL4N22.004X	Single Channel Optocoupler Screened to JANTX level (-55° to 125°C operating temperature range)
MTL4N23.001X	Single Channel Commercial Optocoupler (0° to +70°C operating temperature range)
MTL4N23.002X	Single Channel Commercial Optocoupler (-40° to +85°C operating temperature range)
MTL4N23.003X	Single Channel Commercial Optocoupler (-55° to 125°C operating temperature range)
MTL4N23.004X	Single Channel Optocoupler Screened to JANTX level (-55° to 125°C operating temperature range)
MTL4N24.001X	Single Channel Commercial Optocoupler (0° to +70°C operating temperature range)
MTL4N24.002X	Single Channel Commercial Optocoupler (-40° to +85°C operating temperature range)
MTL4N24.003X	Single Channel Commercial Optocoupler (-55° to 125°C operating temperature range)
MTL4N24.004X	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 and S for solder.

MTL4N22, MTL4N23 & MTL4N24

SINGLE CHANNEL OPTOCOUPLER

ELECTRICAL CHARACTERISTICS

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Diode Static Reverse Current	I _R			100	µA	V _R = 2V	
Input Diode Static Forward Voltage -55°C	V _F	1.0		1.5	V	I _F = 10mA	
Input Diode Static Forward Voltage +25°C	V _F	0.8		1.3	V	I _F = 10mA	
Input Diode Static Forward Voltage +100°C	V _F	0.7		1.2	V	I _F = 10mA	

OUTPUT TRANSISTOR

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Collector-Base Breakdown Voltage	V _{(BR)CBO}	35			V	I _C = 100µA, I _B = 0, I _F = 0	
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	35			V	I _C = 1mA, I _B = 0, I _F = 0	
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	4			V	I _C = 0mA, I _E = 100µA, I _F = 0	
Off-State Collector Current +25°C	I _{C(OFF)}			100	nA	V _{CE} = 20V, I _F = 0mA, I _B = 0	
+100°C	I _{C(OFF)}			100	µA	V _{CE} = 20V, I _F = 0mA, I _B = 0	

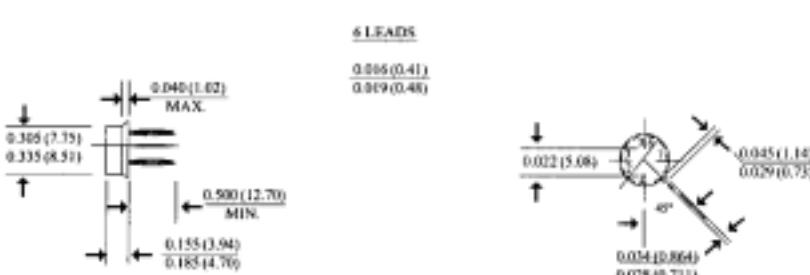
COUPLED CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
On State Collector Current MTL4N22	I _{C(ON)}	0.15			mA	V _{CE} = 5V, I _F = 2mA	
MTL4N23		0.2					
MTL4N24		0.4					
On State Collector Current MTL4N22	I _{C(ON)}	2.5			mA	V _{CE} = 5V, I _F = 10mA	
MTL4N23		6					
MTL4N24		10					
On State Collector Current -55°C & +100°C MTL4N22	I _{C(ON)}	1			mA	V _{CE} = 5V, I _F = 10mA	
MTL4N23		2.5					
MTL4N24		4					
Collector-Emitter Saturation Voltage MTL4N22	V _{CE(SAT)}			0.3	V	I _F = 20mA, I _C = 2.5mA, I _B = 0	
MTL4N23	V _{CE(SAT)}			0.3	V	I _F = 20mA, I _C = 5mA, I _B = 0	
MTL4N24	V _{CE(SAT)}			0.3	V	I _F = 20mA, I _C = 10mA, I _B = 0	
Input to Output Internal Resistance	R _{IO}	10 ¹¹				V _{IN-OUT} = 1kV	1
Input to Output Capacitance	C _{IO}			5	pF	f = 1MHz, V _{IN-OUT} = 1kV	1
Rise Time-Phototransistor Operation MTL4N22	t _r			15	µs	V _{CC} = 10V, I _F = 10mA, R _L = 100Ω,	
MTL4N23				15			
MTL4N24				20			
Fall Time-Phototransistor Operation MTL4N22	t _f			15	µs	V _{CC} = 10V, I _F = 10mA, R _L = 100Ω,	
MTL4N23				15			
MTL4N24				20			

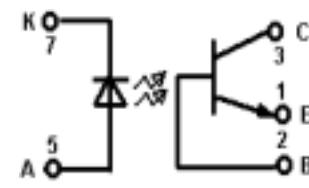
NOTES:

- These parameters are measured between all phototransistor leads shorted together and with both input diode leads shorted together.

Package Dimensions



Schematic Diagram



NOTE: ALL LINEAR DIMENSIONS ARE IN INCHES (MILLIMETERS)