

FTO-1221U

SINGLE CHANNEL-SURFACE MOUNT OPTOCOUPLER

FORCE
TECHNOLOGIES LTD
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Features:

- High Reliability
- No base lead for improved noise immunity
- Rugged surface mount package
- Stability over wide temperature
- +1kV ELECTRICAL isolation

Applications:

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

DESCRIPTION

The **FTO-1221U** contains a gallium aluminum arsenide LED optically coupled to a silicon planar phototransistor. The optocoupler is built in a 4 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. The internal base connection has been eliminated for improved noise immunity.

ABSOLUTE MAXIMUM RATINGS

Input to Output Voltage.....	1000V
Emitter-Collector Voltage.....	5V
Collector-Emitter Voltage (Value applies to emitter-base open-circuited & the input-diode equal to zero).....	35V
Reverse Input Voltage	2V
Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 1)	40mA
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 +125°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	UNIT
Input Current, Low Level	I_{FL}	0	1	μ A
Input Current, High Level	I_{FH}	1.5	10	mA
Supply Voltage	V_{CE}	5	50	V
Operating Temperature	T_A	-55	125	°C

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
FTO-1221U-001	Single Channel optocoupler, commercial (-55° to +125°C operating temperature range)
FTO-1221U-101	Single Channel optocoupler, TX Processed (-55° to +125°C operating temperature range)



FTO-1221

SINGLE CHANNEL OPTOCOUPLER

ELECTRICAL CHARACTERISTICS

INPUT DIODE

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	MAX	UNIT	TEST CONDITIONS
Input Diode Static Reverse Current	I _R		100	μA	V _R = 2.0V
Input Diode Static Forward Voltage	V _F		1.5	V	I _F = 10mA
Input Diode Static Forward Voltage 55°C	V _F		1.7	V	I _F = 10mA
Input Diode Static Forward Voltage +125°C	V _F		1.3	V	I _F = 10mA

OUTPUT TRANSISTOR

T_A = 25°C unless otherwise specified.

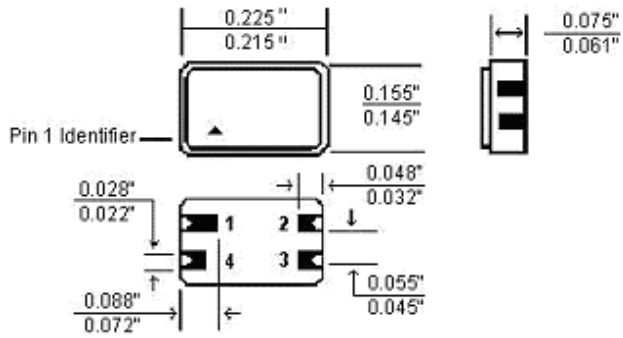
PARAMETER	SYMBOL	MIN	MAX	UNIT	TEST CONDITIONS
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	30		V	I _C = 1mA, I _B = 0, I _F = 0
Emitter-Collector Breakdown Voltage	V _{(BR)ECO}	5		V	I _C = 0mA, I _E = 100μA, I _F = 0
Collector-Emitter Dark Current 55°C +125°C	I _{CEO1} I _{CEO2} I _{CEO3}		100 100 100	nA nA μA	V _{CE} = 20V, I _F = 0mA

COUPLED CHARACTERISTICS

T_A = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	MAX	UNIT	TEST CONDITIONS
On State Collector Current	I _{C(ON)1}	2.0		mA	V _{CE} = 1V, I _F = 1.0mA
On State Collector Current	I _{C(ON)2}	15.0		mA	V _{CE} = 1V, I _F = 15mA
On State Collector Current	I _{C(ON)3}	40.0		mA	V _{CE} = 5V, I _F = 10.0mA
On State Collector Current	I _{C(ON)4}	15.0		mA	V _{CE} = 5V, I _F = 15mA
On State Collector Current	I _{C(ON)5}	1.0		mA	V _{CE} = 15V, I _F = 1.0mA
On State Collector Current	I _{C(ON)}	2.5		mA	V _{CE} = 5V, I _F = 1.5mA, T _A = -55°C
On State Collector Current	I _{C(ON)}	2.5		mA	V _{CE} = 5V, I _F = 1.5mA, T _A = +125°C
Collector-Emitter Saturation Voltage	V _{CE(SAT)}		0.22	V	I _F = 20mA, I _C = 10mA
Isolation Resistance	R _{ISO}	10 ⁵		Ω	V _{IN-OUT} = 500V
Isolation Voltage	V _{ISO}	1050			t = 5s
Propagation Delay H-L	t _{PHL}		4.0		V _{CC} =10V, I _F = 10.0mA, R _L =100Ω
Propagation Delay L-H	t _{PLH}		4.0		V _{CC} =10V, I _F = 10.0mA, R _L =100Ω
Rise Time	t _r		20	μs	V _{CC} =10V, I _F = 10.0mA, R _L =100Ω
Fall Time	t _f		20	μs	V _{CC} =10V, I _F = 10.0mA, R _L =100Ω

Package Dimensions



Schematic Diagram

