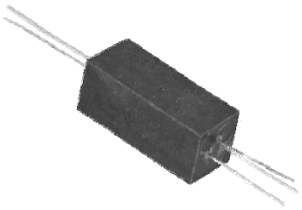
High Reliability Optically Coupled Isolator

OPI120TX, OPI120TXV



Features:

- High current transfer ratio
- 15 kV electrical isolation
- Base lead provided for conventional transistor biasing
- TX and TXV devices processed to MIL-PRF-19500

Description:

Each **OPI120TX** and **OPI120TXV** is an optically coupled isolator that consists of a gallium aluminum arsenide infrared light emitting diode (OP235 TX or OP235TXV) and an NPN silicon phototransistor (OP804TX or OP804TXV), which are sealed in a high dielectric plastic housing. This series is designed for applications that require high voltage isolation between input and output.

TX and TXV devices are processed to OPTEK's military screening program patterned after MIL-PRF-19500.

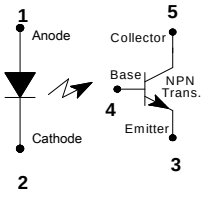
Please refer to Application Bulletins 208 and 210 for additional design information and reliability (degradation) data.

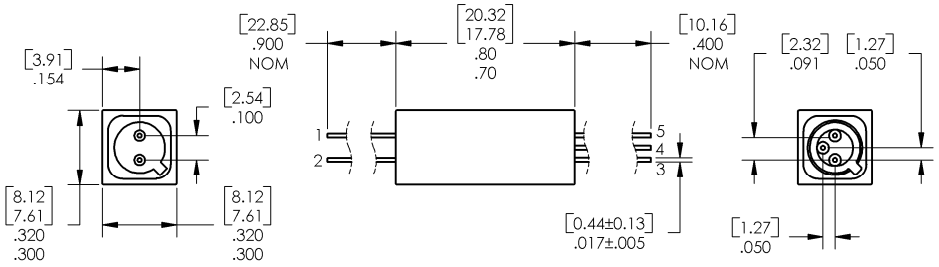
Contact your local representative or OPTEK for more information.

Applications:

- Requiring high voltage isolation between input and output
- Electrical isolation in dirty environments
- Industrial equipment
- Medical equipment
- Office equipment

Part Number	LED Peak Wavelength	Sensor	Isolation Voltage (,000)	CTR Min	I_F (mA) Typ / Max	V_{CE} (Volts) Max	Lead Length / Spacing
OPI120TX	890 nm	Transistor	15	20	10 / 50	25	0.40" / 0.75"
OPI120TXV							





Note: This is an "unsealed view" of the isolator

DIMENSIONS ARE IN: [MILLIMETERS] INCHES

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Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Operating Temperature Range	-65° C to +125° C
Storage Temperature Range	-65° C to +150° C
Input-to-Output Isolation Voltage[1]	±15 kVDC
Lead Soldering Temperature [1/16 inch (1.6 mm) from the case for 5 seconds with soldering iron]	260° C

Input Diode

Forward DC Current	100 mA
Reverse Voltage	2 V
Power Dissipation[2]	200 mW

Output Phototransistor

Continuous Collector Current	50 mA
Collector-Base Voltage	30 V
Collector-Emitter Voltage	30 V
Emitter-Base Voltage	5 V
Power Dissipation[3]	250 mW

Electrical Characteristics (T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode (See OP236TX and OP236TXV for additional information - for reference only)						
V_F	Forward Voltage[4]	1.00	1.40	1.70	V	I_F = 30 mA
		1.20	1.60	1.90		I_F = 30 mA, T_A = -55° C
		0.90	1.15	1.50		I_F = 30 mA, T_A = 100° C
I_R	Reverse Current	-	0.1	10	µA	V_R = 2 V
Output Phototransistor (See OP804TX, OP805TX and OP804TXV for additional information - for reference only)						
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	30	40	-	V	I_C = 100 µA , I_E = 0, I_F = 0
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30	40	-	V	I_C = 100 µA , I_B = 0, I_F = 0
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	5	-	-	V	I_C = 100 µA , I_C = 0, I_F = 0
$I_{C(OFF)}$	Collector-Emitter Dark Current	-	0.2	100	na	V_{CE} = 10 V, I_B = 0, I_F = 0
$I_{CB(OFF)}$		-	10	100	µA	V_{CE} = 10 V, I_B = 0, I_F = 0, T_A = 100° C
	Collector-Base Dark Current	-	0.1	10	nA	V_{CB} = 10 V, I_E = 0, I_F = 0

Notes:

(1) Measured with input leads shorted together and output leads shorted together in air with a maximum relative humidity of 50%. If suitably encapsulated or oil-immersed, the isolation voltage is increased to at least 25 kV.

(2) Derate linearly 2.0 mW/° C above 25° C.

(3) Derate linearly 2.5 mW/° C above 25° C.

(4) Methanol or isopropanol are recommended as cleaning agents.

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Electrical Characteristics (T_A = 25°C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Combined						
$I_{C(ON)}$	On-State Collector Current [1]	2.00	-	-	mA	V_{CE} = 5 V, I_B = 0, I_F = 10 mA
		1.20	-	-		V_{CE} = 5 V, I_B = 0, I_F = 10 mA, T_A = -55° C
		1.20	-	-		V_{CE} = 5 V, I_B = 0, I_F = 10 mA, T_A = 100° C
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	-	0.25	0.30	V	I_C = 2 mA, I_B = 0, I_F = 20 mA
V_{ISO}	Isolation Voltage (Input to Output)[1]	15	30	-		See note 1.
t_r	Output Rise Time	-	8	15	µs	V_{CC} = 10 V, I_C = 2 mA, R_L = 100Ω
t_f	Output Fall Time	-	8	15		

Notes:

(1) Measurement is taken during the last 500 µs of a single 1.0 ms test pulse. Heating due to increased pulse rate or pulse width can cause change in measurement results.

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