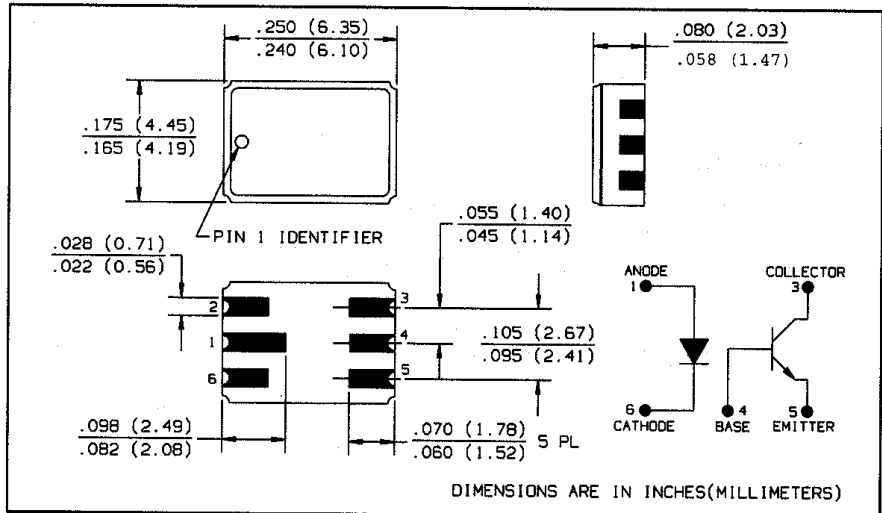
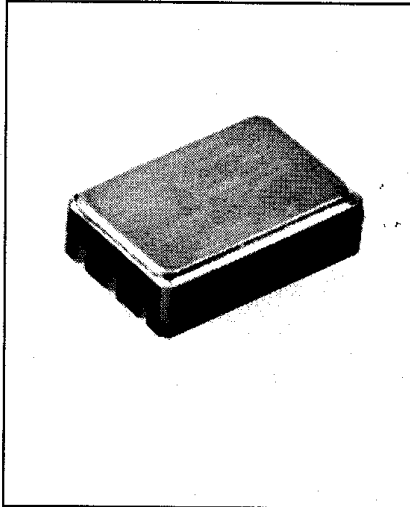


# Surface Mount Optically Coupled Isolators

## Types JANTX, JANTXV, 4N47U, 4N48U, 4N49U



### Features

- JANTX, JANTXV versions qualified per MIL-PRF-19500/548
- Surface Mountable
- High current transfer ratio
- Hermetic seal
- 1 kV Electrical Isolation
- Base contact provided for conventional transistor biasing
- Available with or without TX or TXV processing

### Description

The JANTX and JANTXV series 4N47U, 4N48U, and 4N49U are DESC qualified, surface mount optically coupled isolators. High reliability processing on the devices is performed in accordance with MIL-PRF-19500/548.

Each device in the series consists of an infrared emitting diode and an NPN silicon phototransistor mounted in a hermetically sealed ceramic surface mount package. The suffix letter "U" denotes surface mount package.

When ordering parts without processing, do not use a JAN prefix.

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

Input-to-Output Isolation Voltage .....	± 1.0 kVDC <sup>(1)</sup>
Storage and Operating Temperature Range .....	-65° C to +125° C
Soldering Temperature (vapor phase reflow) .....	215° C
Soldering Temperature (heated collet for 5 sec.) .....	260° C
<b>Input Diode</b>	
Forward DC Current (65° C or below) .....	40 mA <sup>(2)</sup>
Reverse Voltage .....	2.0 V
<b>Output Phototransistor</b>	
Continuous Collector Current .....	50 mA
Collector-Base Voltage .....	45 V
Collector-Emitter Voltage .....	40 V
Emitter-Base Voltage .....	7.0 V
Power Dissipation .....	300 mW <sup>(3)</sup>

#### Notes:

- (1) Measured with input leads shorted together and output leads shorted together.
- (2) Derate linearly 0.67 mA/° C above 65° C.
- (3) Derate linearly 3.0 mW/° C above 25° C.

Typical screening and lot acceptance tests are provided on page 13-4. The burn-in condition is VCE = 10 V, IF = 40 mA, Pt = 275 mW, TA = 25° C. In addition to the standard TX and TXV flow, these parts receive 100% electrically monitored temperature cycling. Refer to MIL-PRF-19500/548 for complete requirements.

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Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Type	Min	Typ	Max	Units	Test Conditions
<b>Input Diode</b>							
$V_F$	Forward Voltage		0.80		1.50	V	$I_F = 10.0\text{ mA}$
			1.00		1.70	V	$I_F = 10.0\text{ mA}, T_A = -55^\circ\text{C}$
			0.70		1.30	V	$I_F = 10.0\text{ mA}, T_A = 100^\circ\text{C}$
$I_R$	Reverse Current			100	$\mu\text{A}$	$V_R = 2.0\text{ V}$	
<b>Output Phototransistor</b>							
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage		45			V	$I_C = 100\ \mu\text{A}, I_E = 0, I_F = 0$
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage		40			V	$I_C = 1.0\text{ mA}, I_B = 0, I_F = 0$
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage		7.0			V	$I_E = 100\ \mu\text{A}, I_C = 0, I_F = 0$
$I_{C(OFF)}$	Collector-Emitter Dark Current				100	nA	$V_{CE} = 20\text{ V}, I_B = 0, I_F = 0$
					100	$\mu\text{A}$	$V_{CE} = 20\text{ V}, I_B = 0, I_F = 0, T_A = 100^\circ\text{C}$
$I_{CB(OFF)}$	Collector-Base Dark Current			10	nA	$V_{CB} = 20\text{ V}, I_B = 0, I_F = 0$	
<b>Coupled</b>							
$I_{C(ON)}$	On-State Collector Current	4N47U	0.5			mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 1.0\text{ mA}$
			0.7			mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 2.0\text{ mA}, T_A = -55^\circ\text{C}$
			0.5			mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 2.0\text{ mA}, T_A = 100^\circ\text{C}$
		4N48U	1.0		5.0	mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 1.0\text{ mA}$
			1.4			mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 2.0\text{ mA}, T_A = -55^\circ\text{C}$
			1.0			mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 2.0\text{ mA}, T_A = 100^\circ\text{C}$
		4N49U	2.0		10.0	mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 1.0\text{ mA}$
			2.8			mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 2.0\text{ mA}, T_A = -55^\circ\text{C}$
			2.0			mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 2.0\text{ mA}, T_A = 100^\circ\text{C}$
$I_{CB(ON)}$	On-State Collector Base Current		30		$\mu\text{A}$	$V_{CB} = 5.0\text{ V}, I_E = 0, I_F = 10\text{ mA}$	
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	4N47U			0.30	V	$I_C = 0.5\text{ mA}, I_B = 0, I_F = 2.0\text{ mA}$
		4N48U			0.30	V	$I_C = 1.0\text{ mA}, I_B = 0, I_F = 2.0\text{ mA}$
		4N49U			0.30	V	$I_C = 2.0\text{ mA}, I_B = 0, I_F = 2.0\text{ mA}$
$h_{FE}$	DC Current Gain	4N47U	100				$V_{CE} = 5.0\text{ V}, I_C = 10.0\text{ mA}, I_F = 0\text{ mA}$
		4N48U	100				
		4N49U	100				
$R_{IO}$	Resistance (Input to Output)		$10^{11}$			$\Omega$	$V_{IO} = \pm 1000\text{ Vdc}^{(1)}$
$C_{IO}$	Capacitance (Input to Output)				5.0	pF	$V_{IO} = 0.0\text{ V}, f = 1.0\text{ MHz}^{(1)}$
$t_r$	Output Rise Time	4N47U			20.0	$\mu\text{s}$	$V_{CC} = 10.0\text{ V}, I_F = 5.0\text{ mA}, R_L = 100\ \Omega$
		4N48U			20.0	$\mu\text{s}$	
		4N49U			25.0	$\mu\text{s}$	
$t_f$	Output Fall Time	4N47U			20.0	$\mu\text{s}$	
		4N48U			20.0	$\mu\text{s}$	
		4N49U			25.0	$\mu\text{s}$	