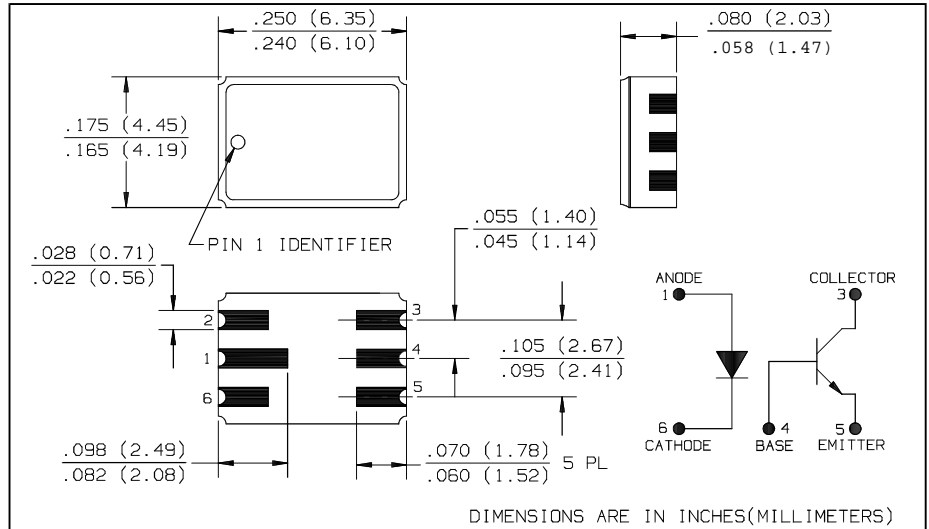


Surface Mount Optically Coupled Isolators

Types JANTX, JANTXV, 4N22AU, 4N23AU, 4N24AU



Features

- JANTX, JANTXV qualified per MIL-PRF-19500/486
- Surface Mountable
- 1 kV Electrical Isolation
- Base contact provided for conventional transistor biasing

Description

The 4N22AU, 4N23AU, and 4N24AU series are DESC qualified, surface mount optically coupled isolators. High reliability processing on the devices is performed in accordance with MIL-PRF-19500/486.

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.

Typical screening and lot acceptance tests are provided on page 13-4. The burn-in condition is $V_{CE} = 10\text{ V}$, $I_F = 40\text{ mA}$, $P_D = 275\text{ mW}$, $T_A = 25^\circ\text{ C}$. Refer to MIL-PRF-19500/486 for complete requirements.

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

Absolute Maximum Ratings ($T_A = 25^\circ\text{ C}$ unless otherwise noted)

Input-to-Output Isolation Voltage	$\pm 1.0\text{ kVDC}^{(1)}$
Storage and Operating Temperature Range	-65° C to $+125^\circ\text{ C}$
Soldering Temperature (vapor phase reflow)	215° C
Soldering Temperature (heated collet for 5 sec)	260° C

Input Diode

Forward DC Current (65° C or below)	$40\text{ mA}^{(2)}$
Reverse Voltage	2.0 V
Peak Forward Current (1 μs pulse width, 300 pps)	1.00 A

Output Sensor

Continuous Collector Current	50 mA
Collector-Emitter Voltage	35 V
Collector-Base Voltage	35 V
Emitter-Base Voltage	4.0 V
Power Dissipation	$300\text{ mW}^{(3)}$

Notes:

- (1) Measured with input diode leads shorted together and output leads shorted together.
- (2) Derate linearly $0.67\text{ mA}/^\circ\text{ C}$ above 65° C .
- (3) Derate linearly $3.0\text{ mW}/^\circ\text{ C}$ above 25° C .

Types JANTX, JANTXV, 4N22AU, 4N23AU, 4N24AU

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

Symbol	Parameter	Type	Min	Typ	Max	Units	Test Conditions
Input Diode							
V_F	Forward Voltage		0.80		1.30	V	$I_F = 10.0\text{ mA}$
			1.00		1.50	V	$I_F = 10.0\text{ mA}$, $T_A = -55^\circ\text{C}$
			0.70		1.20	V	$I_F = 10.0\text{ mA}$, $T_A = 100^\circ\text{C}$
I_R	Reverse Current			100	μA	$V_R = 2.0\text{ V}$	
Output Phototransistor							
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage		35			V	$I_C = 100\ \mu\text{A}$, $I_E = 0$, $I_F = 0$
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage		35			V	$I_C = 1.0\text{ mA}$, $I_B = 0$, $I_F = 0$
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage		4.0			V	$I_E = 100\ \mu\text{A}$, $I_C = 0$, $I_F = 0$
$I_{C(OFF)}$	Collector-Emitter Dark Current				100 100	nA μA	$V_{CE} = 20\text{ V}$, $I_B = 0$, $I_F = 0$ $V_{CE} = 20\text{ V}$, $I_B = 0$, $I_F = 0$, $T_A = 100^\circ\text{C}$
Coupled							
$I_{C(ON)}$	On-State Collector Current	4N22AU	0.15 2.50 1.00 1.00			mA mA mA mA	$V_{CE} = 5.0\text{ V}$, $I_B = 0$, $I_F = 2.0\text{ mA}$ $V_{CE} = 5.0\text{ V}$, $I_B = 0$, $I_F = 10.0\text{ mA}$ $V_{CE} = 5.0\text{ V}$, $I_B = 0$, $I_F = 10.0\text{ mA}$, $T_A = -55^\circ\text{C}$ $V_{CE} = 5.0\text{ V}$, $I_B = 0$, $I_F = 10.0\text{ mA}$, $T_A = 100^\circ\text{C}$
		4N23AU	0.20 6.00 2.50 2.50			mA mA mA mA	$V_{CE} = 5.0\text{ V}$, $I_B = 0$, $I_F = 2.0\text{ mA}$ $V_{CE} = 5.0\text{ V}$, $I_B = 0$, $I_F = 10.0\text{ mA}$ $V_{CE} = 5.0\text{ V}$, $I_B = 0$, $I_F = 10.0\text{ mA}$, $T_A = -55^\circ\text{C}$ $V_{CE} = 5.0\text{ V}$, $I_B = 0$, $I_F = 10.0\text{ mA}$, $T_A = 100^\circ\text{C}$
		4N24AU	0.40 10.00 4.00 4.00			mA mA mA mA	$V_{CE} = 5.0\text{ V}$, $I_B = 0$, $I_F = 2.0\text{ mA}$ $V_{CE} = 5.0\text{ V}$, $I_B = 0$, $I_F = 10.0\text{ mA}$ $V_{CE} = 5.0\text{ V}$, $I_B = 0$, $I_F = 10.0\text{ mA}$, $T_A = -55^\circ\text{C}$ $V_{CE} = 5.0\text{ V}$, $I_B = 0$, $I_F = 10.0\text{ mA}$, $T_A = 100^\circ\text{C}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	4N22AU 4N23AU 4N24AU			0.30 0.30 0.30	V	$I_C = 2.5\text{ mA}$, $I_B = 0$, $I_F = 20.0\text{ mA}$ $I_C = 5.0\text{ mA}$, $I_B = 0$, $I_F = 20.0\text{ mA}$ $I_C = 10.0\text{ mA}$, $I_B = 0$, $I_F = 20.0\text{ mA}$
h_{FE}	DC Current Gain	4N22AU 4N23AU 4N24AU	200 300 400				$V_{CE} = 5.0\text{ V}$, $I_C = 10.0\text{ mA}$, $I_F = 0\text{ mA}$
R_{IO}	Resistance (Input to Output)		10^{11}			Ω	$V_{IO} = \pm 1000\text{ Vdc}^{(1)}$
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	4N22AU			15.0	μs	$V_{CC} = 10.0\text{ V}$, $I_F = 10.0\text{ mA}$, $R_L = 100\ \Omega$
		4N23AU			15.0	μs	
		4N24AU			20.0	μs	
t_f	Output Fall Time	4N22AU			15.0	μs	
		4N23AU			15.0	μs	
		4N24AU			20.0	μs	

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