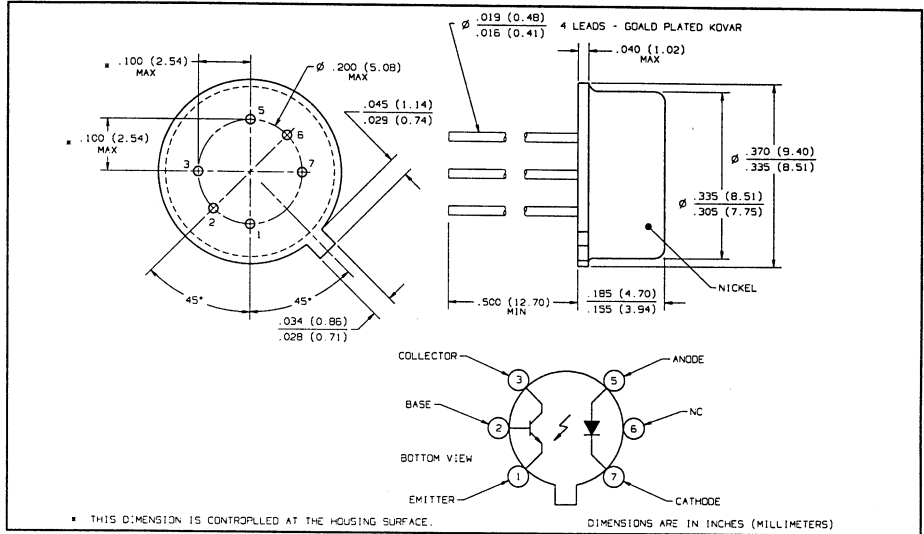
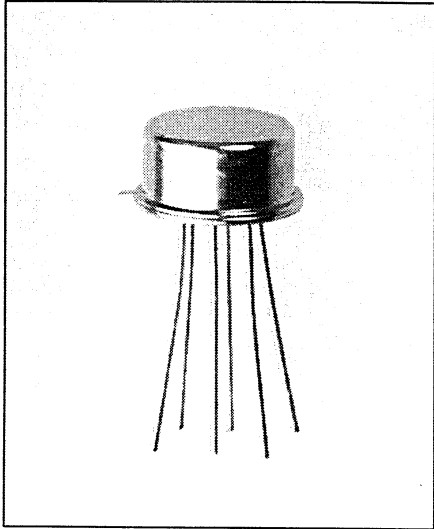


# Optically Coupled Isolators

## Types 4N22A, 4N23A, 4N24A, JANTX, JANTXV-4N22A, 4N23A, 4N24A



### Features

- TX and TXV versions are processed to MIL-PRF-19500/486
- 1 kV electrical isolation
- Base contact is provided for conventional transistor biasing
- Patent number 4124860

### Description

This series of the 4N22A, 4N23A and 4N24A are JEDEC registered, optically coupled isolators. DESC qualified TX and TXV versions are available per MIL-PRF-19500/486. Typical Screening and lot acceptance tests are provided on page 13-4.

Each device in the series consists of an infrared emitting diode and a NPN silicon phototransistor mounted in a hermetically sealed TO-78 package. The suffix letter "A" denotes the collector is electrically isolated from the case.

The non JAN versions are built on the same manufacturing line as the JAN components.

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

Input-to-Output Isolation Voltage .....  $\pm 1.00\text{ kVDC}^{(1)}$   
 Storage and Operating Temperature Range .....  $-65^\circ\text{C}$  to  $+125^\circ\text{C}$   
 Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron] .....  $240^\circ\text{C}^{(2)}$

#### Input Diode

Forward DC Current ( $65^\circ\text{C}$  or below) ..... 40 mA  
 Reverse Voltage ..... 2.0 V  
 Peak Forward Current (1  $\mu\text{s}$  pulse width, 300 pps) ..... 1.00 A  
 Power Dissipation .....  $60\text{ mW}^{(3)}$

#### 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 .....  $300\text{ mW}^{(4)}$

#### Notes:

- (1) Measured with input diode leads shorted together and output leads shorted together.
- (2) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
- (3) Derate linearly  $1.0\text{ mW}/^\circ\text{C}$  above  $65^\circ\text{C}$ .
- (4) Derate linearly  $3.0\text{ mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (5) Not 100% tested.

# Types 4N22A, 4N23A, 4N24A, JANTX, JANTXV - 4N22A, 4N23A, 4N24A

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

Symbol	Parameter	JANTX, JANTXV						Units	Test Conditions
		4N22A		4N23A		4N24A			
		Min	Max	Min	Max	Min	Max		
<b>Input Diode</b>									
$V_F$	Forward Voltage	0.80	1.30	0.80	1.30	0.80	1.30	V	$I_F = 10.0\text{ mA}$
		1.00	1.50	1.00	1.50	1.00	1.50	V	$I_F = 10.0\text{ mA}, T_A = -55^\circ\text{C}^{(5)}$
		0.70	1.20	0.70	1.20	0.70	1.20	V	$I_F = 10.0\text{ mA}, T_A = 100^\circ\text{C}^{(5)}$
$I_R$	Reverse Current		100		100		100	$\mu\text{A}$	$V_R = 2.0\text{ V}$
<b>Output Phototransistor</b>									
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	35		35		35		V	$I_C = 1.0\text{ mA}, I_B = 0, I_F = 0$
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	35		35		35		V	$I_C = 100\ \mu\text{A}, I_B = 0, I_F = 0$
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	4.0		4.0		4.0		V	$I_E = 100\ \mu\text{A}, I_C = 0, I_F = 0$
$I_{CEO}$	Collector-Emitter Dark Current		100 100		100 100		100 100	nA $\mu\text{A}$	$V_{CE} = 20\text{ V}, I_B = 0, I_F = 0$ $V_{CE} = 20\text{ V}, I_B = 0, I_F = 0,$ $T_A = 100^\circ\text{C}$
<b>Coupled</b>									
$I_{C(ON)}$	On-State Collector Current	0.15		0.20		0.40		mA	$I_F = 2.0\text{ mA}, V_{CE} = 5\text{ V}, I_B = 0$
		2.50		6.00		10.0		mA	$I_F = 10.0\text{ mA}, V_{CE} = 5\text{ V}, I_B = 0$
		1.00		2.50		4.00		mA	$I_F = 10.0\text{ mA}, V_{CE} = 5\text{ V}, I_B = 0,$ $T_A = -55^\circ\text{C}$
		1.00		2.50		4.00		mA	$I_F = 10.0\text{ mA}, V_{CE} = 5\text{ V}, I_B = 0,$ $T_A = 100^\circ\text{C}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage		0.30		0.30		0.30	V	$I_F = 20\text{ mA}, I_C = 2.5\text{ mA}, I_B = 0$ $I_F = 20\text{ mA}, I_C = 5.0\text{ mA}, I_B = 0$ $I_F = 20\text{ mA}, I_C = 10.0\text{ mA}, I_B = 0$
$h_{FE}$	DC Current Gain	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)	$10^{11}$		$10^{11}$		$10^{11}$		$\Omega$	$V_{IO} = \pm 1.0\text{ VDC}^{(1)}$
$C_{IO}$	Capacitance (Input to Output)		5.0		5.0		5.0	pF	$V_{IO} = 0\text{ V}, f = 1.0\text{ MHz}^{(1)}$
$t_r$ $t_f$	Output Rise Time		15.0		15.0		20.0	$\mu\text{s}$	$V_{CC} = 10.0\text{ V}, I_F = 10.0\text{ mA},$ $R_L = 100\ \Omega$
	Output Fall Time		15.0		15.0		20.0	$\mu\text{s}$	

HI-REL OPTO COMPONENTS