

4N22A
4N23A JAN, JANTX, JANTXV, SINGLE CHANNEL OPTOCOUPLERS
4N24A

<p>Features:</p> <ul style="list-style-type: none"> • Collector is electrically isolated from the case. • Overall current gain...1.5 typical (4N24A) • Base lead provided for conventional transistor biasing • Rugged package • High gain, high voltage transistor • +1kV electrical isolation 	<p>Applications:</p> <ul style="list-style-type: none"> • Eliminate ground loops • Level shifting • Line receiver • Switching power supplies • Motor control
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DESCRIPTION

Gallium Aluminum Arsenide (GaAlAs) infrared LED and a high gain N-P-N silicon phototransistor packaged in a hermetically sealed metal case. The **4N22A**, **4N23A** and **4N24A** can be tested to customer specifications, as well as to MIL-PRF-19500 JAN, JANS, JANTX, and JANTXV quality levels.

***ABSOLUTE MAXIMUM RATINGS**

Input to Output Voltage.....	±1kV
Emitter-Collector Voltage.....	4V
Collector-Emitter Voltage.....	35V
Collector-Base Voltage.....	35V
Reverse Input Voltage.....	2V
Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 1).....	40mA
Peak Forward Input Current (Value applies for $t_w \leq 1\mu s$, PRR < 300 pps).....	1A
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 +125°C
Operating Free-Air Temperature Range.....	-55°C to +125°C
Lead Solder Temperature (1/16" (1.6mm) from case for 10 seconds).....	240°C

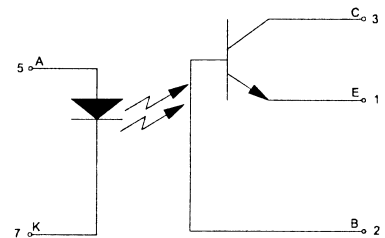
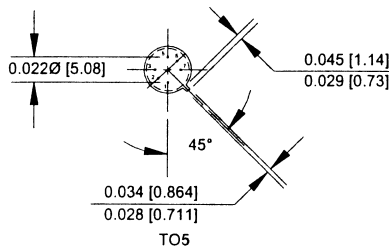
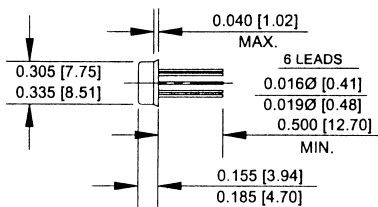
Notes:

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 5 mW/°C.

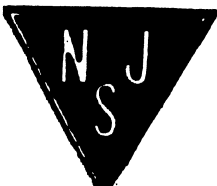
* JEDEC registered data

Package Dimensions

Schematic Diagram



NOTE: ALL LINEAR DIMENSIONS ARE IN INCHES (MILLIMETERS)



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

4N22A, 4N23A, and 4N24A
JAN, JANTX, JANTXV, SINGLE CHANNEL OPTOCOUPLEDERS
***ELECTRICAL CHARACTERISTICS INPUT LED** $T_A = 25^\circ\text{C}$ Unless otherwise specified

PARAMETER	SYMBOL	MIN	MAX	UNITS	TEST CONDITIONS	NOTE
Input Diode Static Reverse Current	I_R		100	μA	$V_R = 2\text{V}$	
Input Diode Static Forward Voltage	V_F	1	1.5	V	$I_F = 10\text{mA}$	
		-55°C	0.8			
		+25°C	1.3			
		+125°C	0.7	1.2		

***OUTPUT TRANSISTOR** $T_A = 25^\circ\text{C}$ Unless otherwise specified

PARAMETER	SYMBOL	MIN	MAX	UNITS	TEST CONDITIONS	NOTE
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	35		V	$I_C = 100\mu\text{A}, I_B = 0, I_F = 0$	
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	35		V	$I_C = 1\text{mA}, I_B = 0, I_F = 0$	
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	4		V	$I_C = 0, I_E = 100\mu\text{A}, I_F = 0$	

***COUPLED CHARACTERISTICS** $T_A = 25^\circ\text{C}$ Unless otherwise specified

PARAMETER	SYMBOL	MIN	MAX	UNITS	TEST CONDITIONS	NOTE
On State Collector Current	$I_{C(ON)}$	0.15		mA	$V_{CE} = 5\text{V}, I_B = 0, I_F = 2\text{mA}$	
		4N22A	0.2			
		4N23A	0.4			
		4N24A				
On State Collector Current	$I_{C(ON)}$	2.5		mA	$V_{CE} = 5\text{V}, I_B = 0, I_F = 10\text{mA}$	
		4N22A	6			
		4N23A	10			
		4N24A				
On State Collector Current	$I_{C(ON)}$	1		mA	$V_{CE} = 5\text{V}, I_B = 0, I_F = 10\text{mA}$	
-55°C		4N22A	2.5			
		4N23A	4			
		4N24A				
On State Collector Current	$I_{C(ON)}$	1		mA	$V_{CE} = 5\text{V}, I_B = 0, I_F = 10\text{mA}$	
+100°C		4N22A	2.5			
		4N23A	4			
		4N24A				
Off State Collector Current	$I_{C(OFF)}$		100	nA	$V_{CE} = 20\text{V}, I_B = 0, I_F = 0\text{mA}$	
+25°C						
Off State Collector Current	$I_{C(OFF)}$		100	μA	$V_{CE} = 20\text{V}, I_B = 0, I_F = 0\text{mA}$	
+100°C						
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$		0.3	V	$I_C = 2.5\text{mA}, I_B = 0, I_F = 20\text{mA}$	
		4N22A	0.3	V	$I_C = 5\text{mA}, I_B = 0, I_F = 20\text{mA}$	
		4N23A	0.3	V	$I_C = 10\text{mA}, I_B = 0, I_F = 20\text{mA}$	
		4N24A				
Input to Output Resistance	R_{I-O}	10^{11}			$V_{IN-OUT} = 1\text{kV}$	1
Input to Output Capacitance	C_{I-O}		5	pF	$F = 1\text{MHz}, V_{IN-OUT} = 1\text{kV}$	1
Rise Time	t_r		15	μs	$V_{CC} = 10\text{V}, I_F = 10\text{mA}, R_L = 100\Omega$	
		4N22A	15	μs		
		4N23A	20	μs		
		4N24A				
Fall Time	t_f		15	μs	$V_{CC} = 10\text{V}, I_F = 10\text{mA}, R_L = 100\Omega$	
		4N22A	15	μs		
		4N23A	20	μs		
		4N24A				

NOTES:

- These parameters are measured between all phototransistor leads shorted together and with both input diode leads shorted together.