Features:

- 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

Applications:

- Eliminate ground loops
- Level shifting
- Line receiver
- Switching power supplies
- Motor control

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

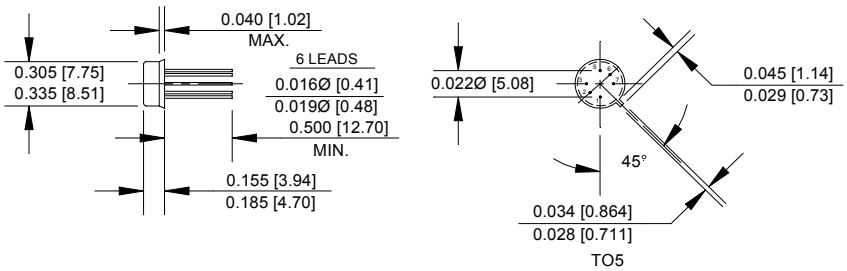
Input to Output Voltage	±1kV
Emitter-Collector Voltage	4V
Collector-Emitter Voltage	35V
Collector-Base Voltage	35V
Reverse Input Voltage	2V
Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 1)	40mA
Peak Forward Input Current (Value applies for tw ≤ 1μs, PRR < 300 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.

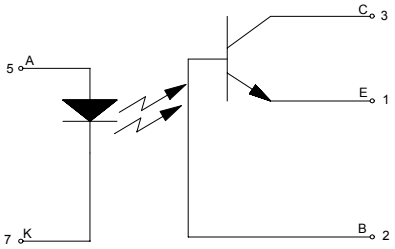
* JEDEC registered data

Package Dimensions



NOTE: ALL LINEAR DIMENSIONS ARE IN INCHES (MILLIMETERS)

Schematic Diagram



***ELECTRICAL CHARACTERISTICS INPUT LED** $T_A = 25^{\circ}C$ Unless otherwise specified

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

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

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

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

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

NOTES:

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

RECOMMENDED OPERATING CONDITIONS:

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I_{FL}	0	100	μA
Input Current, High Level	I_{FH}	2	10	mA
Supply Voltage	V_{CE}	5	10	V

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
JAN4N22A	4N22A Optocoupler, JAN Screening level
JAN4N23A	4N23A Optocoupler, JAN Screening level
JAN4N24A	4N24A Optocoupler, JAN Screening level
JANTX4N22A	4N22A Optocoupler, JANTX Screening level
JANTX4N23A	4N23A Optocoupler, JANTX Screening level
JANTX4N24A	4N24A Optocoupler, JANTX Screening level
JANTXV4N22A	4N22A Optocoupler, JANTXV Screening level
JANTXV4N23A	4N23A Optocoupler, JANTXV Screening level
JANTXV4N24A	4N24A Optocoupler, JANTXV Screening level

* JEDEC registered data