4N22 ***4N23*** ***4N24*** **JAN, JANTX, JANTXV, AND JANS SINGLE CHANNEL OPTOCOUPLERS**	**OPTOELECTRONIC PRODUCTS DIVISION**

01/14/2011

Features:

- Qualified to MIL-PRF-19500/486
- Collector in electrical contact with case
- Overall current gain: 1.5 typical (4N24)
- Base lead provided for conventional transistor biasing
- Rugged package
- High gain, high voltage transistor
- ±1 kV electrical isolation

Applications:

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

DESCRIPTION

A Gallium Aluminum Arsenide (GaAlAs) infrared LED and a high gain N-P-N silicon phototransistor packaged in a hermetically sealed metal case. The ***4N22***, ***4N23*** and ***4N24***'s can be tested to customer specifications.

*ABSOLUTE MAXIMUM RATINGS

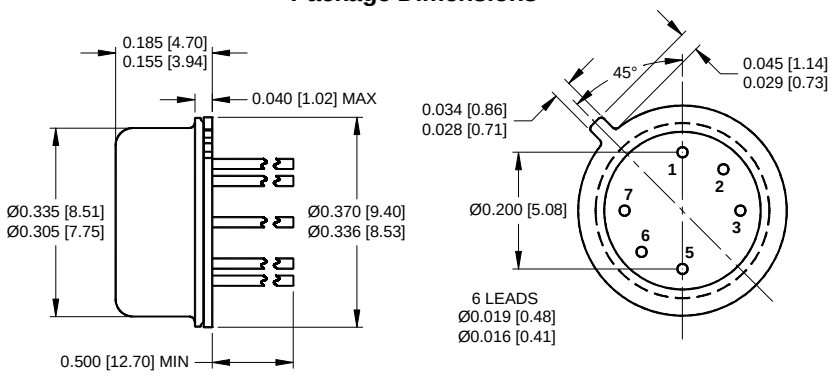
Input to Output Voltage	±1 kV
Emitter-Collector Voltage	7 V
Collector-Emitter Voltage	40 V
Collector-Base Voltage	45 V
Reverse Input Voltage	2 V
Input Diode Continuous Forward Current at (or below) 25°C Free-Air Temperature (Note 1)	40mA
Peak Forward Input Current (Value applies for tw ≤ 1µs PRR < 300 pps)	1 A
Continuous Collector Current	50 mA
Continuous Transistor Power Dissipation at (or below) 25°C Free-Air Temperature (Note 2)	300 mW
Storage Temperature	-65°C to +125°C
Operating Free-Air Temperature Range	-55°C to +125°C
Lead Solder Temperature (10 seconds max., 1/16" from case)	240°C

Notes:

1. Derate linearly to 125°C free-air temperature at the rate of 0.40 mA/°C above 65°C.
2. Derate linearly to 125°C free-air temperature at the rate of 5 mW/°C above 65°C.

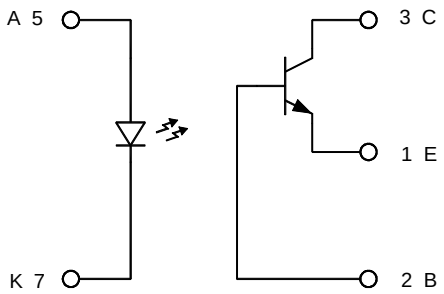
- JEDEC registered data

Package Dimensions



ALL LINEAR DIMENSIONS ARE IN INCHES [MILLIMETERS].

Schematic Diagram



COLLECTOR IS COMMON TO CASE.

***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	nA	V_R = 2 V	
Input Diode Static Forward Voltage	-55°C	V_F	1	1.7	V	I_F = 10 mA	
	+25°C		0.8	1.5			
	+125°C		0.7	1.3			

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

PARAMETER	SYMBOL	MIN	MAX	UNITS	TEST CONDITIONS	NOTE
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	45		V	I_C = 100 µA, I_E = 0, I_F = 0	
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40		V	I_C = 1 mA, I_B = 0, I_F = 0	
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7		V	I_B = 0, I_E = 100 µA, 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	4N22	$I_{C(ON)}$	0.15		mA	V_{CE} = 5 V, I_B = 0, I_F = 2 mA	
	4N23		0.2				
	4N24		0.4				
On State Collector Current	4N22	$I_{C(ON)}$	2.5		mA	V_{CE} = 5 V, I_B = 0, I_F = 10 mA	
	4N23		6				
	4N24		10				
On State Collector Current -55°C	4N22	$I_{C(ON)}$	1		mA	V_{CE} = 5 V, I_B = 0, I_F = 10 mA	
	4N23		2.5				
	4N24		4				
On State Collector Current +100°C	4N22	$I_{C(ON)}$	1		mA	V_{CE} = 5 V, I_B = 0, I_F = 10 mA	
	4N23		2.5				
	4N24		4				
Off State Collector Current +25°C		$I_{C(OFF)}$		100	nA	V_{CE} = 20 V, I_B = 0, I_F = 0 mA	
Off State Collector Current +100°C		$I_{C(OFF)}$		100	µA	V_{CE} = 20 V, I_B = 0, I_F = 0 mA	
Collector-Emitter Saturation Voltage	4N22	$V_{CE(SAT)}$		0.3	V	I_C = 2.5 mA, I_B = 0, I_F = 20 mA	
	4N23	$V_{CE(SAT)}$		0.3	V	I_C = 5 mA, I_B = 0, I_F = 20 mA	
	4N24	$V_{CE(SAT)}$		0.3	V	I_C = 10 mA, I_B = 0, I_F = 20 mA	
Input to Output Resistance	ALL	R_{I-O}	10^{11}		Ω	V_{IN-OUT} = 1 kV	1
Input to Output Capacitance	ALL	C_{I-O}		5	pF	F = 1 MHz, V_{IN-OUT} = 1 kV	1
Rise Time	4N22	t_r		15	µs	V_{CC} = 10 V, I_F = 10 mA, R_L = 100 Ω	
	4N23			15			
	4N24			20			
Fall Time	4N22	t_f		15	µs	V_{CC} = 10 V, I_F = 10 mA, R_L = 100 Ω	
	4N23			15			
	4N24			20			

NOTES:

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

RECOMMENDED OPERATING CONDITIONS:

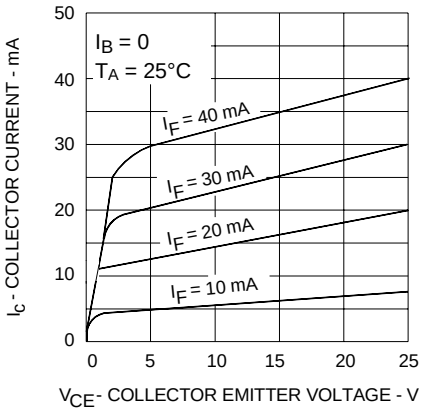
PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I_{FL}	0	1	µA
Input Current, High Level	I_{FH}	2	10	mA
Supply Voltage	V_{CC}	5	10	V

SELECTION GUIDE

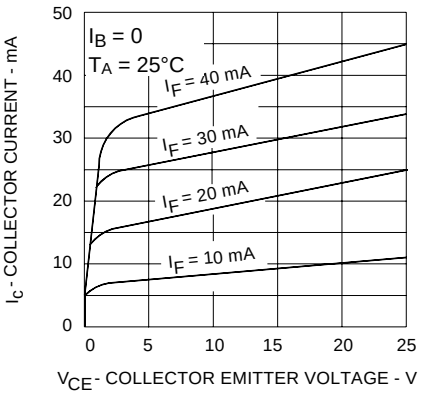
PART NUMBER	PART DESCRIPTION
4N22	Commercial
4N23	Commercial
4N24	Commercial
JAN4N22	JAN Screened
JAN4N23	JAN Screened
JAN4N24	JAN Screened
JANTX4N22	JANTX Screened
JANTX4N23	JANTX Screened
JANTX4N24	JANTX Screened
JANTXV4N22	JANTXV Screened
JANTXV4N23	JANTXV Screened
JANTXV4N24	JANTXV Screened
JANS4N22	JANS Screened
JANS4N23	JANS Screened
JANS4N24	JANS Screened

* JEDEC registered

4N22
COLLECTOR CURRENT
VS
COLLECTOR-EMITTER VOLTAGE



4N23
COLLECTOR CURRENT
VS
COLLECTOR-EMITTER VOLTAGE



4N24
COLLECTOR CURRENT
VS
COLLECTOR-EMITTER VOLTAGE