

4N22A
4N23A
4N24A

JAN, JANTX, JANTXV, AND JANS
SINGLE CHANNEL OPTOCOUPLEDERS



02/12/2020

Features:

- Qualified to MIL-PRF-19500/486
- 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
- ± 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 4N22A, 4N23A, and 4N24A differ from the 4N22, 4N23, and 4N24 only in that the collector of the transistor is isolated from the case. The **4N22A**, **4N23A** and **4N24A** can be tested to customer specifications.

***ABSOLUTE MAXIMUM RATINGS**

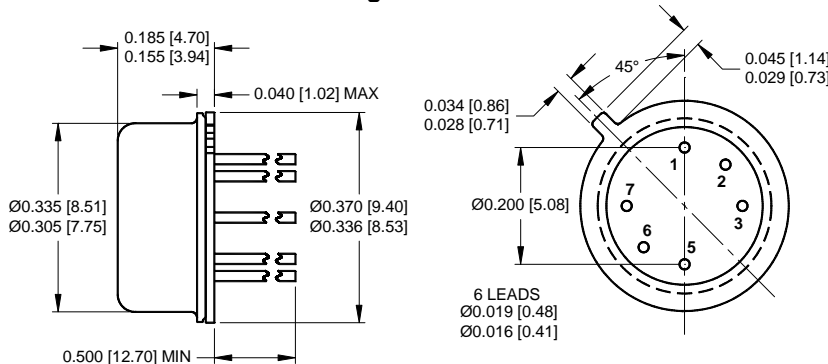
Input to Output Voltage.....	± 1 kV
Emitter-Collector Voltage.....	7 V
Collector-Emitter Voltage.....	40 V
Collector-Base Voltage.....	45 V
Reverse Input Voltage	2 V
Input Diode Continuous Forward Current at (or below) 25°C Free-Air Temperature (see note 1)	40 mA
Peak Forward Input Current (Value applies for $t_w \leq 1\mu s$ PRR < 300 pps).....	1 A
Continuous Collector Current.....	50 mA
Continuous Transistor Power Dissipation at (or below) 25°C Free-Air Temperature (see 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 0.67 mA/°C above 65°C.
2. Derate linearly to 125°C free-air temperature at the rate of 3 mW/°C above 65°C.

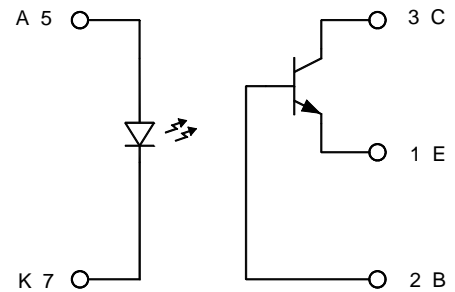
- JEDEC registered data

Package Dimensions



ALL LINEAR DIMENSIONS ARE IN INCHES [MILLIMETERS].

Schematic Diagram



THE COLLECTOR OF THE TRANSISTOR IS ISOLATED FROM THE CASE.

4N22A, 4N23A, and 4N24A

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***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	0.9	1.7	V	$I_F = 10\text{ mA}$	
		0.8	1.5			
		0.7	1.3			

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

PARAMETER	SYMBOL	MIN	MAX	UNITS	TEST CONDITIONS	NOTE
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	45		V	$I_C = 100\ \mu\text{A}, I_E = 0, I_F = 0$	
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40		V	$I_C = 1\text{ mA}, I_B = 0, I_F = 0$	
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7		V	$I_B = 0, I_E = 100\ \mu\text{A}, I_F = 0$	

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

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

NOTES:

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

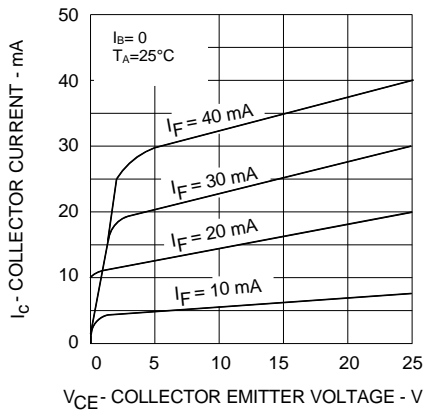
RECOMMENDED OPERATING CONDITIONS:

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

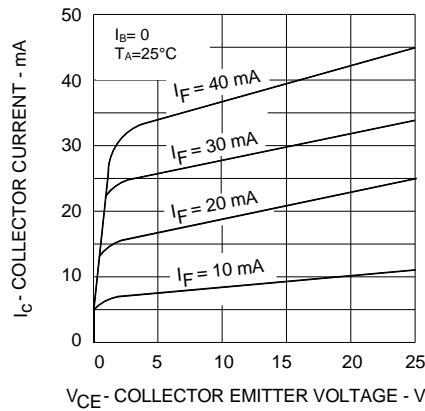
SELECTION GUIDE

JEDEC PART NUMBER	MICROPAC PART NUMBER	PART DESCRIPTION
JAN4N22A	66092-602	JAN Screened
JAN4N23A	66092-603	JAN Screened
JAN4N24A	66092-604	JAN Screened
JANTX4N22A	66092-702	JANTX Screened
JANTX4N23A	66092-703	JANTX Screened
JANTX4N24A	66092-704	JANTX Screened
JANTXV4N22A	66092-802	JANTXV Screened
JANTXV4N23A	66092-803	JANTXV Screened
JANTXV4N24A	66092-804	JANTXV Screened
JANS4N22A	66092-342	JANS Screened
JANS4N23A	66092-343	JANS Screened
JANS4N24A	66092-344	JANS Screened

4N22A
COLLECTOR CURRENT
VS
COLLECTOR-EMITTER VOLTAGE



4N23A
COLLECTOR CURRENT
VS
COLLECTOR-EMITTER VOLTAGE



4N24A
COLLECTOR CURRENT
VS
COLLECTOR-EMITTER VOLTAGE

