

**4N22U**  
**4N23U**  
**4N24U**

**6 PIN LCC OPTOCOUPLERS**



05/29/03

**Features:**

- MIL-PRF-19500/486 Qualified
- Base lead provided for conventional transistor biasing
- High gain, high voltage transistor
- Miniature package saves circuit board area
- High voltage electrical isolation...1KV rating

**Applications:**

- Line Receivers
- Switchmode Power Supplies
- Signal ground isolation
- Process Control input/output isolation
- Motor control

**DESCRIPTION**

High gain optocoupler utilizing GaAIAs infrared LED optically coupled to an N-P-N silicon phototransistor in a 6-pin leadless chip carrier. The **4N22U**, **4N23U** and **4N24U** optocouplers can be supplied to customer specifications as well as JAN, JANS, JANTX, and JANTXV quality levels.

**\*ABSOLUTE MAXIMUM RATINGS**

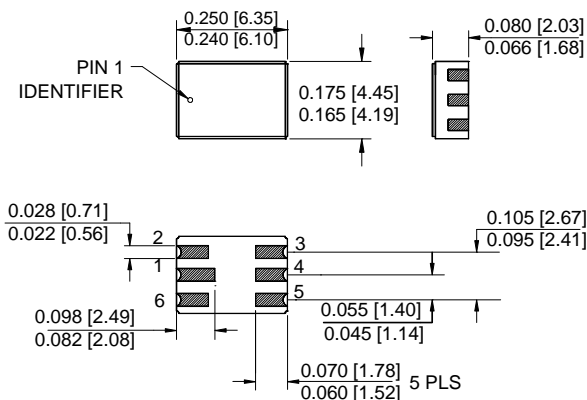
Input to Output Voltage .....	±1000V
Collector-Base Voltage .....	35V
Collector-Emitter Voltage .....	35V
Emitter-Collector Voltage .....	4V
Input Diode Reverse Voltage .....	2V
Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 1) .....	40mA
Continuous Collector Current .....	50mA
Peak Diode Current .....	1A
Continuous Transistor Power Dissipation at (or below) 25°C Free-Air Temperature (see Note 2) .....	300mW
Operating Free-Air Temperature Range.....	-55°C to +125°C
Storage Temperature.....	-65°C to +125°C
Solder Temperature (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 3 mW/°C above 65°C.

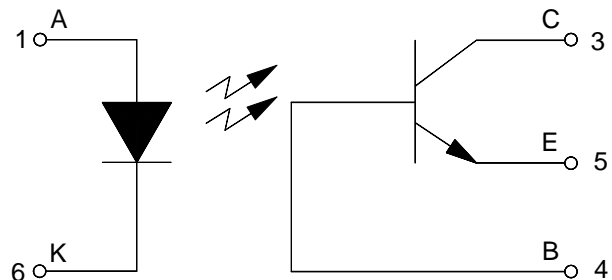
\* JEDEC registered data

**Package Dimensions**



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

**Schematic Diagram**



# 4N22U, 4N23U, and 4N24U

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## ELECTRICAL CHARACTERISTICS INPUT LED

T<sub>A</sub> = 25°C Unless otherwise specified

PARAMETER	SYMBOL	MIN	MAX	UNITS	TEST CONDITIONS	NOTE
Input Diode Static Reverse Current	I <sub>R</sub>		100	μA	V <sub>R</sub> = 2V	
Input Diode Static Forward Voltage	V <sub>F</sub>	1.0	1.5	V	I <sub>F</sub> = 10mA	
		0.8	1.3			
		0.7	1.2			

## OUTPUT TRANSISTOR

T<sub>A</sub> = 25°C Unless otherwise specified

PARAMETER	SYMBOL	MIN	MAX	UNITS	TEST CONDITIONS	NOTE
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	35		V	I <sub>C</sub> = 100μA, I <sub>B</sub> = 0, I <sub>F</sub> = 0	
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	35		V	I <sub>C</sub> = 1mA, I <sub>B</sub> = 0, I <sub>F</sub> = 0	
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	4		V	I <sub>C</sub> = 0, I <sub>E</sub> = 100μA, I <sub>F</sub> = 0	

## COUPLED CHARACTERISTICS

T<sub>A</sub> = 25°C Unless otherwise specified

PARAMETER	SYMBOL	MIN	MAX	UNITS	TEST CONDITIONS	NOTE
On State Collector Current	I <sub>C(ON)</sub>	0.15		mA	V <sub>CE</sub> = 5V, I <sub>B</sub> = 0, I <sub>F</sub> = 2mA	
		0.2				
		0.4				
On State Collector Current	I <sub>C(ON)</sub>	2.5		mA	V <sub>CE</sub> = 5V, I <sub>B</sub> = 0, I <sub>F</sub> = 10mA	
		6.0				
		10.0				
On State Collector Current	I <sub>C(ON)</sub>	1.0		mA	V <sub>CE</sub> = 5V, I <sub>B</sub> = 0, I <sub>F</sub> = 10mA	
-55°C		2.5				
		4.0				
On State Collector Current	I <sub>C(ON)</sub>	1.0		mA	V <sub>CE</sub> = 5V, I <sub>B</sub> = 0, I <sub>F</sub> = 10mA	
+100°C		2.5				
		4.0				
Off State Collector Current	I <sub>C(OFF)</sub>		100	nA	V <sub>CE</sub> = 20V, I <sub>B</sub> = 0, I <sub>F</sub> = 0mA	
+25°C			100	μA	V <sub>CE</sub> = 20V, I <sub>B</sub> = 0, I <sub>F</sub> = 0mA	
+100°C						
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>		0.3	V	I <sub>C</sub> = 2.5mA, I <sub>B</sub> = 0, I <sub>F</sub> = 20mA	
			0.3	V	I <sub>C</sub> = 5mA, I <sub>B</sub> = 0, I <sub>F</sub> = 20mA	
			0.3	V	I <sub>C</sub> = 10mA, I <sub>B</sub> = 0, I <sub>F</sub> = 20mA	
Input to Output Resistance	R <sub>I-O</sub>	10 <sup>11</sup>		Ω	V <sub>IN-OUT</sub> = 1kV	1
Input to Output Capacitance	C <sub>I-O</sub>		5	pF	f = 1MHz, V <sub>IN-OUT</sub> = 1kV	1
Rise Time	t <sub>r</sub>		15	μs	V <sub>CC</sub> = 10V, I <sub>F</sub> = 10mA, R <sub>L</sub> = 100Ω	
			15	μs		
			20	μs		
Fall Time	t <sub>f</sub>		15	μs	V <sub>CC</sub> = 10V, I <sub>F</sub> = 10mA, R <sub>L</sub> = 100Ω	
			15	μs		
			20	μs		

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

## SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
4N22U	Commercial
4N23U	Commercial
4N24U	Commercial
JAN4N22U	JAN Screened
JAN4N23U	JAN Screened
JAN4N24U	JAN Screened
JANTX4N22U	JANTX Screened
JANTX4N23U	JANTX Screened
JANTX4N24U	JANTX Screened
JANTXV4N22U	JANTXV Screened
JANTXV4N23U	JANTXV Screened
JANTXV4N24U	JANTXV Screened
JANS4N22U	JANS Screened
JANS4N23U	JANS Screened
JANS4N24U	JANS Screened

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