4N22U ***4N23U*** ***4N24U***	**6 PIN LCC OPTOCOUPLERS**	**OPTOELECTRONIC PRODUCTS DIVISION**

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 GaAlAs 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

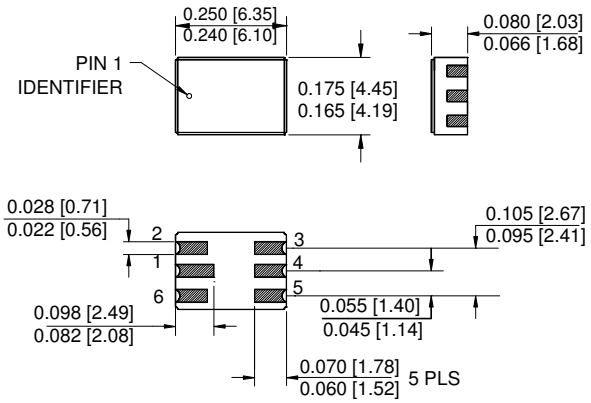
Input to Output Voltage	±1000V
Collector-Base Voltage	35V
Collector-Emitter Voltage	35V
Emitter-Collector Voltage	4V
Input Diode Reverse Voltage	2V
Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 1)	40mA
Continuous Collector Current	50mA
Peak Diode Current	1A
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.

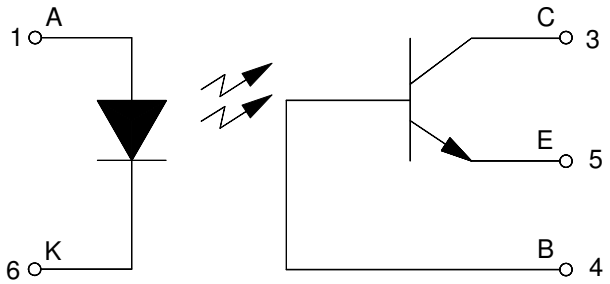
* JEDEC registered data

Package Dimensions



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

Schematic Diagram



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	1.0	1.5	V	I_F = 10mA	
	+25°C		0.8	1.3			
	+100°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	4N22U	$I_{C(ON)}$	0.15		mA	V_{CE} = 5V, I_B = 0, I_F = 2mA	
	4N23U		0.2				
	4N24U		0.4				
On State Collector Current	4N22U	$I_{C(ON)}$	2.5		mA	V_{CE} = 5V, I_B = 0, I_F = 10mA	
	4N23U		6.0				
	4N24U		10.0				
On State Collector Current -55°C	4N22U	$I_{C(ON)}$	1.0		mA	V_{CE} = 5V, I_B = 0, I_F = 10mA	
	4N23U		2.5				
	4N24U		4.0				
On State Collector Current +100°C	4N22U	$I_{C(ON)}$	1.0		mA	V_{CE} = 5V, I_B = 0, I_F = 10mA	
	4N23U		2.5				
	4N24U		4.0				
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	4N22U	$V_{CE(SAT)}$		0.3	V	I_C = 2.5mA, I_B = 0, I_F = 20mA	
	4N23U	$V_{CE(SAT)}$		0.3	V	I_C = 5mA, I_B = 0, I_F = 20mA	
	4N24U	$V_{CE(SAT)}$		0.3	V	I_C = 10mA, I_B = 0, I_F = 20mA	
Input to Output Resistance	ALL	R_{I-O}	10^{11}		Ω	V_{IN-OUT} = 1kV	1
Input to Output Capacitance	ALL	C_{I-O}		5	pF	f = 1MHz, V_{IN-OUT} = 1kV	1
Rise Time	4N22U	t_r		15	µs	V_{CC} = 10V, I_F = 10mA, R_L = 100Ω	
	4N23U	t_r		15	µs		
	4N24U	t_r		20	µs		
Fall Time	4N22U	t_f		15	µs	V_{CC} = 10V, I_F = 10mA, R_L = 100Ω	
	4N23U	t_f		15	µs		
	4N24U	t_f		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
JANTXV4N23	JANTXV Screened
JANTXV4N24U	JANTXV Screened
JANS4N22U	JANS Screened
JANS4N23U	JANS Screened
JANS4N24U	JANS Screened