4N47U ***4N48U*** ***4N49U***	**JAN, JANTX, JANTXV, AND JANS OPTOCOUPLERS**	**OPTOELECTRONIC PRODUCTS DIVISION**

06/23/03

Features:

- Certified to MIL-PRF-14500/548
- High reliability
- Base lead provided for conventional transistor biasing
- Very high gain, high voltage transistor
- Hermetically sealed for reliability and stability
- Stability over wide temperature range
- High voltage electrical isolation

Applications:

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

DESCRIPTION

Very high gain optocoupler utilizing GaAIAs infrared LED optically coupled to an N-P-N silicon phototransistor packaged in a hermetically sealed 6-pin leadless chip carrier. The ***4N47U***, ***4N48U*** and ***4N49U*** optocouplers can be supplied to customer specifications as well as JAN, JANTX, JANTXV, and JANS quality levels.

*ABSOLUTE MAXIMUM RATINGS

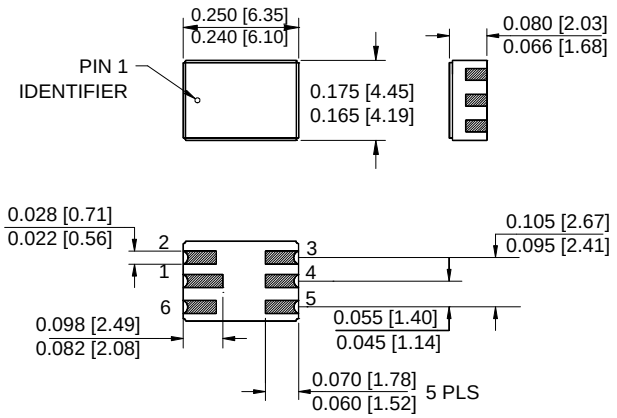
Input to Output Voltage	1kV
Collector-Base Voltage	45V
Collector-Emitter Voltage	40V
Emitter-Base Voltage	7V
Input Diode Reverse Voltage	2V
Input Diode Continuous Forward Current at (or below) 25°C Free-Air Temperature (see note 1)	40mA
Continuous Collector Current	50mA
Peak Diode Current (Value Applies for $t_W \leq 1$ µs, PRR < 300pps)	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
Lead Temperature (10 seconds maximum)	240°C

Notes:

1. Derate linearly to 125°C free-air temperature at the rate of 0.40 mA/°C.
2. Derate linearly to 125°C free-air temperature at the rate of 3 mW/°C.

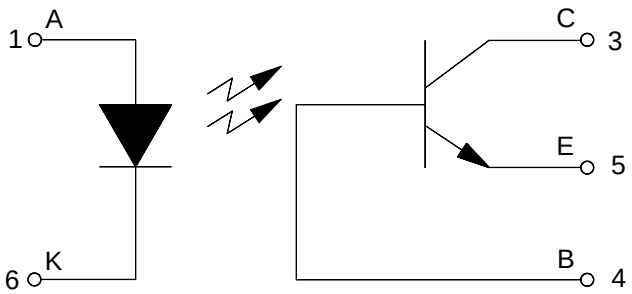
* JEDEC registered data

Package Dimensions



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

Schematic Diagram



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

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Diode Static Reverse Current	I_R			100	NA	V_R = 2V	
Input Diode Static Forward Voltage -55°C	V_F	1.0	1.4	1.7	V	I_F = 10mA	
+25°C		0.8		1.5			
+100°C		0.7		1.3			

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

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

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

PARAMETER		SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
On State Collector Current	4N47U	$I_{C(ON)}$	0.5			MA	V_{CE} = 5V, I_B = 0, I_F = 1mA	
	4N48U		1.0		5			
	4N49U		2.0		10			
On State Collector Current -55°C	4N47U	$I_{C(ON)}$	0.7			MA	V_{CE} = 5V, I_B = 0, I_F = 2mA	
	4N48U		1.4					
	4N49U		2.8					
On State Collector Current +100°C	4N47U	$I_{C(ON)}$	0.5			MA	V_{CE} = 5V, I_B = 0, I_F = 2mA	2
	4N48U		1.0					
	4N49U		2.0					
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	4N47U	$V_{CE(SAT)}$			0.3	V	I_C = 0.5mA, I_B = 0, I_F = 2mA	
	4N48U	$V_{CE(SAT)}$			0.3	V	I_C = 1mA, I_B = 0, I_F = 2mA	
	4N49U	$V_{CE(SAT)}$			0.3	V	I_C = 2mA, I_B = 0, I_F = 2mA	
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/ Fall Time Phototransistor Operation	4N47U	t_r / t_f			20	µs	V_{CC} = 10V, I_F = 10mA, R_L = 100Ω	
	4N48U	t_r / t_f			25	µs		
	4N49U	t_r / t_f			25	µs		
Rise Time/ Fall Time Photodiode Operation	4N47U	t_r / t_f			0.85	µs	V_{CC} = 10V, I_F = 10mA, R_L = 100Ω	
	4N48U	t_r / t_f			0.85	µs		
	4N49U	t_r / t_f			0.85	µs		

NOTES:

1. These parameters are measured between all phototransistor leads shorted together and with both input diode leads shorted together.
2. This parameter measured using pulse techniques t_w =100µs, duty cycle ≤ 1%.

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
4N47U	Commercial
4N48U	Commercial
4N49U	Commercial
JAN4N47U	JAN Screened
JAN4N48U	JAN Screened
JAN4N49U	JAN Screened
JANTX4N47U	JANTX Screened
JANTX4N48U	JANTX Screened
JANTX4N49U	JANTX Screened
JANTXV4N47U	JANTXV Screened
JANTXV4N48U	JANTXV Screened
JANTXV4N49U	JANTXV Screened
JANS4N47U	JANS Screened
JANS4N48U	JANS Screened
JANS4N49U	JANS Screened