4N47BU ***4N48BU*** ***4N49BU***	**JAN, JANTX, JANTXV, AND JANS OPTOCOUPLERS**	**OPTOELECTRONIC PRODUCTS DIVISION**

08/05/2014

Features:

- Certified to MIL-PRF-19500/548
- High reliability
- Base lead provided for conventional transistor biasing
- High blocking 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 GaAlAs infrared LED optically coupled to an N-P-N silicon phototransistor packaged in a hermetically sealed 6-pin leadless chip carrier. The ***4N47BU***, ***4N48BU*** and ***4N49BU*** optocouplers can be supplied to customer specifications as well as JAN, JANTX, JANTXV, and JANS quality levels.

*ABSOLUTE MAXIMUM RATINGS

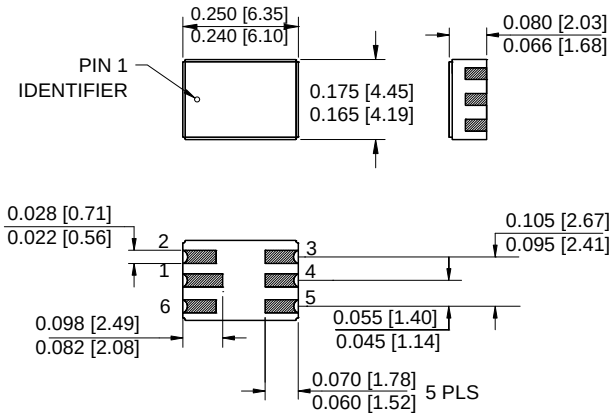
Input to Output Voltage	1 kV
Collector-Base Voltage	60 V
Collector-Emitter Voltage	60 V
Emitter-Base Voltage	7 V
Input Diode Reverse Voltage	2 V
Input Diode Continuous Forward Current at (or below) 25°C Free-Air Temperature (see note 1)	40 mA
Continuous Collector Current	50 mA
Peak Diode Current (Value Applies for $t_W \leq 1$ μs, PRR < 300pps)	1 A
Continuous Transistor Power Dissipation at (or below) 25°C Free-Air Temperature (see Note 2)	300 mW
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.

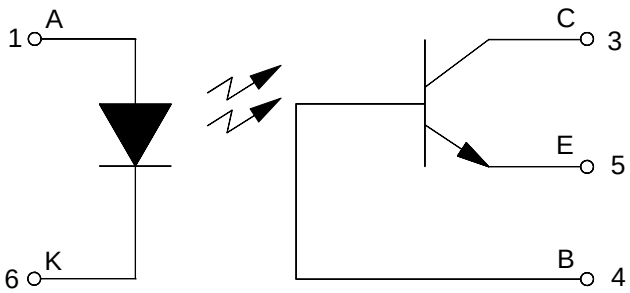
* JEDEC registered data

Package Dimensions



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

Schematic Diagram



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ELECTRICAL CHARACTERISTICS T_A = 25°C Unless otherwise specified

PARAMETER		SYMBOL	MIN	TYP	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	1.0	1.4	1.7	V	I_F = 10 mA	
	+25°C		0.8		1.5			
	+100°C		0.7		1.3			

OUTPUT TRANSISTOR T_A = 25°C Unless otherwise specified

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	60			V	I_C = 100 µA, I_E = 0, I_F = 0	
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	60			V	I_C = 1 mA, I_B = 0, I_F = 0	
Emitter-Collector Breakdown Voltage	$V_{(BR)EBO}$	7			V	I_C = 0, I_B = 100 µA, I_F = 0	

COUPLED CHARACTERISTICS T_A = 25°C Unless otherwise specified

PARAMETER		SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
On State Collector Current	4N47BU	$I_{C(ON)}$	0.5			mA	V_{CE} = 5 V, I_B = 0, I_F = 1 mA	
	4N48BU		1.0		5			
	4N49BU		2.0		10			
On State Collector Current	4N47BU	$I_{C(ON)}$	0.7			mA	V_{CE} = 5 V, I_B = 0, I_F = 2 mA	
-55°C	4N48BU		1.4					
	4N49BU		2.8					
On State Collector Current	4N47BU	$I_{C(ON)}$	0.5			mA	V_{CE} = 5 V, I_B = 0, I_F = 2 mA	2
+100°C	4N48BU		1.0					
	4N49BU		2.0					
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	4N47BU	$V_{CE(SAT)}$			0.3	V	I_C = 0.5 mA, I_B = 0, I_F = 2 mA	
	4N48BU				0.3		I_C = 1 mA, I_B = 0, I_F = 2 mA	
	4N49BU				0.3		I_C = 2 mA, I_B = 0, I_F = 2 mA	
Input to Output Resistance		R_{I-O}	10^{11}				V_{IN-OUT} = 1 kV	1
Input to Output Capacitance		C_{I-O}			5	pF	f = 1 MHz, V_{IN-OUT} = 1 kV	1
Rise Time/ Fall Time	4N47BU	t_r / t_f			20	µs	V_{CC} = 10 V, I_F = 10 mA, R_L = 100 Ω	
Phototransistor Operation	4N48BU				25			
	4N49BU				25			
Rise Time/ Fall Time	4N47BU	t_r / t_f			0.85	µs	V_{CC} = 10 V, I_F = 10 mA, R_L = 100 Ω	
Photodiode Operation	4N48BU				0.85			
	4N49BU				0.85			

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 =100 µs, 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

MICROPAC PART NUMBER	INDUSTRY PART NUMBER	PART DESCRIPTION
66138-017	4N47BU	Commercial
66138-018	4N48BU	Commercial
66138-019	4N49BU	Commercial
66138-617	JAN4N47BU	JAN Screened
66138-618	JAN4N48BU	JAN Screened
66138-619	JAN4N49BU	JAN Screened
66138-717	JANTX4N47BU	JANTX Screened
66138-718	JANTX4N48BU	JANTX Screened
66138-719	JANTX4N49BU	JANTX Screened
66138-817	JANTXV4N47BU	JANTXV Screened
66138-818	JANTXV4N48BU	JANTXV Screened
66138-819	JANTXV4N49BU	JANTXV Screened
66138-317	JANS4N47BU	JANS Screened
66138-318	JANS4N48BU	JANS Screened
66138-319	JANS4N49BU	JANS Screened

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