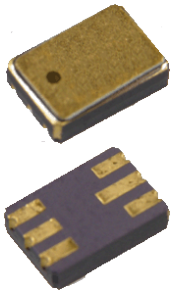
Surface Mount Optically Coupled Isolator

JAN/JANTX/JANTXV 4N47U, 4N48U, 4N49U



Features:

- Surface Mount (SM), Leadless Chip Carrier (LCC)
- 1 kV electrical isolation
- Base contact provided for conventional transistor biasing
- JANTX and JANTXV devices are processed to MIL-PRF-19500

Description:

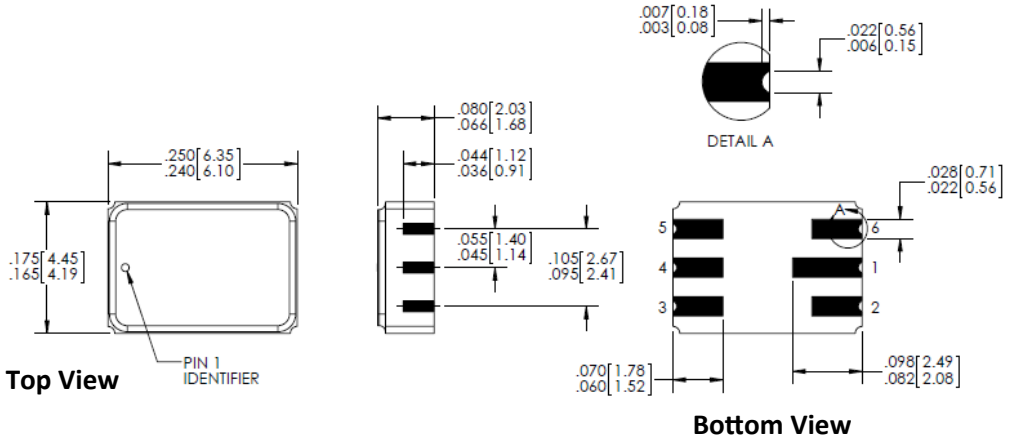
Each isolator in this series consists of an infrared emitting diode and a NPN silicon phototransistor, which are mounted in a hermetically sealed Surface Mount, 6 Pin package. Devices are designed for military and/or harsh environments.

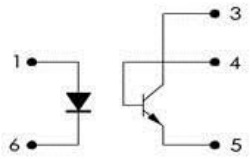
The JAN / JANTX / JANTXV 4N47U, 4N48U and 4N49U devices are processed to MIL-PRF-19500/548.
This series of 4N products are JEDEC registered, DSCC qualified.

Please contact your local representative for more information.

Applications:

- Military equipment
- High-Reliability environments
- High voltage isolation between input and output
- Electrical isolation in dirty environments
- Industrial equipment
- Medical equipment
- Office equipment





DIMENSIONS ARE IN INCHES [MM]

Pin #	LED	Pin #	Transistor
3	Collector	2	N/A
4	Base	1	Anode
5	Emitter	6	Cathode

General Note
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Electrical Specifications

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Storage Temperature Range	-55° C to +150° C
Operating Temperature Range	-55° C to +125° C
Input-to-Output Isolation Voltage	± 1.00 kVDC(1)
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 seconds with soldering iron]	260° C(2)

Input Diode

Forward DC Current (65° C or below)	40 mA
Reverse Voltage	2 V
Power Dissipation	60 mW(3)

Output Phototransistor:

Continuous Collector Current	50 mA
Collector-Emitter Voltage	40 V
Collector-Base Voltage	45 V
Emitter-Base Voltage	7.0 V
Power Dissipation	300 mW(4)

Notes:
1. Measured with input leads shorted together and output leads shorted together.
2. RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
3. Derate linearly 1.0 mW/° C above 65° C.
4. Derate linearly 3.0 mW/° C above 25° C.

Ordering Information

Part Number	Isolation Voltage (kV)	I_F (mA) Typ / Max	V_{CE} (Volts) Max	Processing MIL-PRF-19500
JAN4N47U	1	1 / 40	40	548
JANTX4N47U				
JANTXV4N47U				
JAN4N48U				
JANTX4N48U				
JANTXV4N48U				
JAN4N49U				
JANTX4N49U				
JANTXV4N49U				

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Electrical Characteristics (T_A = 25°C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage	0.80 1.00 0.70	- - -	1.50 1.70 1.30	V	I_F = 10.0 mA I_F = 10.0 mA, T_A = -55° C(1) I_F = 10.0 mA, T_A = 100° C(1)
I_R	Reverse Current	-	-	100	µA	V_R= 2.0 V
Output Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	40	-	-	V	I_C = 1.0 mA, I_B= 0, I_F= 0
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	45	-	-	V	I_C = 100 µA, I_B= 0, I_F= 0
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	7	-	-	V	I_E = 100 µA, I_C= 0, I_F= 0
$I_{C(OFF)}$ 1	Collector-Emitter Dark Current	-	-	100	nA	V_{CE} = 20 V, I_B= 0, I_F= 0
$I_{C(OFF)}$ 2	Collector-Emitter Dark Current	-	-	100	µA	V_{CE} = 20 V, I_B= 0, I_F= 0, T_A = 100° C(1)
$I_{CB(OFF)}$	Collector-Base Dark Current	-	-	10	nA	V_{CB} = 20 V, I_E= 0, I_F= 0
Coupled						
$I_{C(ON)}$	On-State Collector Current JAN / JANTX / JANTXV 4N47 [U]	0.50 0.70 0.50	- - -	- - -	mA	I_F = 1.0 mA, V_{CE} = 5.0 V, I_B = 0 I_F = 2.0 mA, V_{CE} = 5.0 V, I_B = 0, T_A = -55° C(1) I_F = 2.0 mA, V_{CE} = 5.0 V, I_B = 0, T_A = 100° C(1)
	JAN / JANTX / JANTXV 4N48 [U]	1.00 1.40 1.00	- - -	5 - -		I_F = 1.0 mA, V_{CE} = 5.0 V, I_B = 0 I_F = 2.0 mA, V_{CE} = 5.0 V, I_B = 0, T_A = -55° C(1) I_F = 2.0 mA, V_{CE} = 5.0 V, I_B = 0, T_A = 100° C(1)
	JAN / JANTX / JANTXV 4N49 [U]	2.00 2.80 2.00	- - -	10 - -		I_F = 1.0 mA, V_{CE} = 5.0 V, I_B = 0 I_F = 2.0 mA, V_{CE} = 5.0 V, I_B = 0, T_A = -55° C(1) I_F = 2.0 mA, V_{CE} = 5.0 V, I_B = 0, T_A = 100° C(1)
$I_{CB(ON)}$	On-State Collector Base	30	-	-	µA	V_{CB} = 5 V, I_E = 0, I_F = 10 mA
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage JAN / JANTX / JANTXV 4N47 [U] JAN / JANTX / JANTXV 4N48 [U] JAN / JANTX / JANTXV 4N49 [U]	- - -	- - -	0.30 0.30 0.30	V	I_F = 2.0 mA, I_C = 0.5 mA, I_B = 0 I_F = 2.0 mA, I_C = 1.0 mA, I_B = 0 I_F = 2.0 mA, I_C = 2.0 mA, I_B = 0
H_{FE}	DC Current Gain	100	-	-	V	V_{CE} = 5.0 V , I_C = 10.0 mA, I_F = 0 mA
R_{IO}	Resistance (Input-to-Output)	10^{11}	-	-	Ω	V_{I-O} = ± 1000 VDC(3)
C_{IO}	Capacitance (Input-to-Output)	-	-	5	pF	V_{I-O} = 0 V, f = 1.0 MHz(3)
T_R, T_F	Rise and Fall Time	-	-	20	µs	V_{CC} = 10.0 V , I_F = 5.0 mA, R_L = 100 Ω

Notes:

1. Guaranteed but not tested.
2. Sample tested, LTPD = 10.
3. Measured with input leads shorted together and output leads shorted together.

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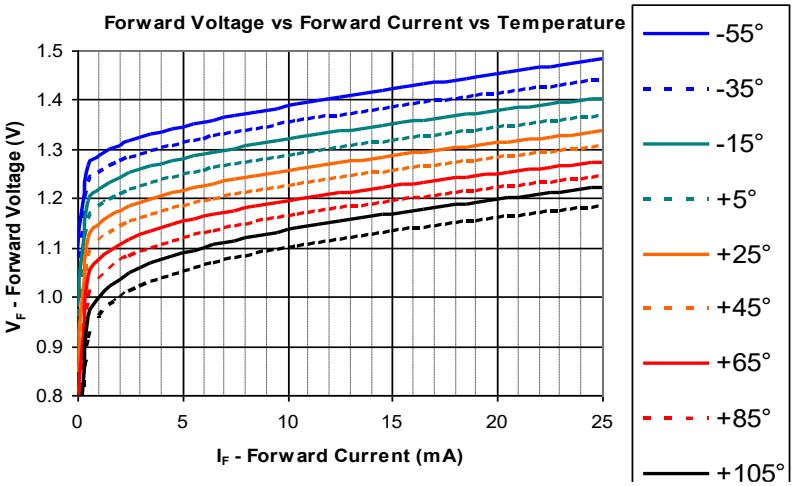
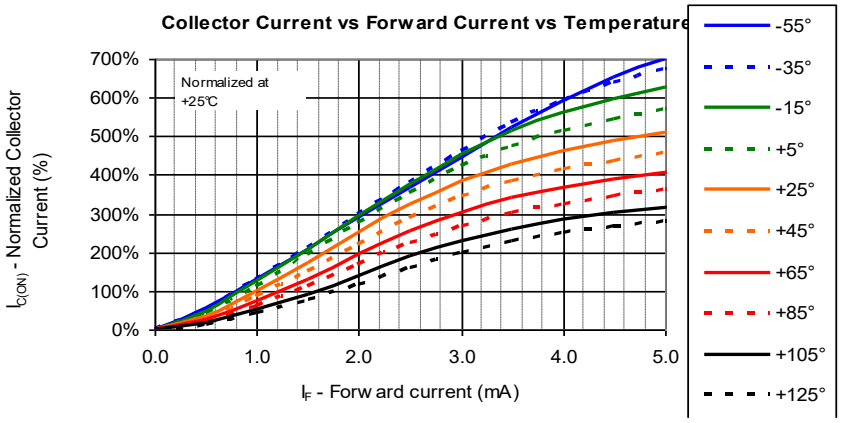
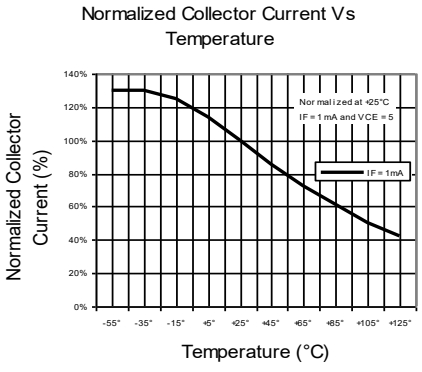
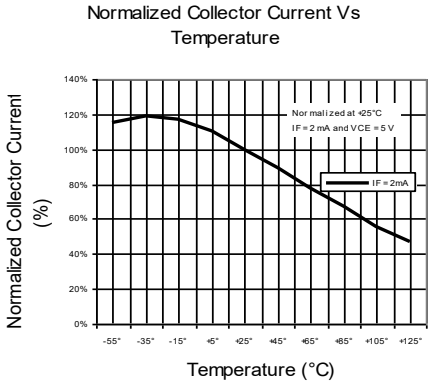
Typical Performance Curves









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