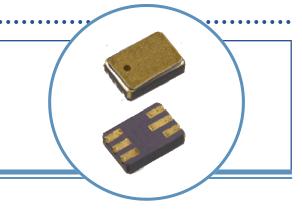
### **Surface Mount Optically Coupled Isolator** JAN / JANTX / JANTXV 4N22U, 4N23U, 4N24U



### Features:

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



### **Description:**

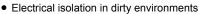
Each isolator in this series consists of an infrared emitting diode and a NPN silicon phototransistor, which are mounted in a hermetically sealed Surface Mount, 6 Pin package. Devices are designed for military and/or harsh environments.

The JAN / JANTX / JANTXV 4N22U, 4N23U and 4N24U devices are processed to MIL-PRF-19500/486. This series of 4N products are JEDEC registered, DSCC qualified.

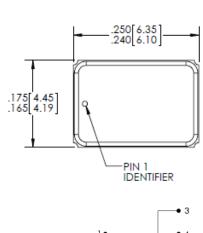
Please contact your local representative or OPTEK for more information.

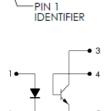
### Applications:

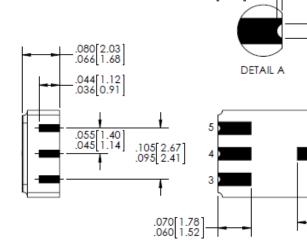
- · Military equipment
- · High-Reliability environments
- · High voltage isolation between input and output



- Industrial equipment
- · Medical equipment
- Office equipment







.007[0.18

.003 0.08



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

This product is built, tested and shipped from the USA



OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

.082 2.08

### **Surface Mount Optically Coupled Isolator** JAN / JANTX / JANTXV 4N22U, 4N23U, 4N24U



**Absolute Maximum Ratings** (T<sub>A</sub> = 25° C unless otherwise noted)

Storage Temperature Range	-65° C to +150° C
Operating Temperature Range	-55° C to +125° C
Input-to-Output Isolation Voltage	± 1.00 kVDC <sup>(1)</sup>
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 seconds with soldering iron]	260° C <sup>(2)</sup>
ESD Class	1C

### **Input Diode**

Forward DC Current (65° C or below)	40 mA
Reverse Voltage	2 V
Peak Forward Current (1 µs pulse width, 300 pps)	1 A
Power Dissipation	60 mW <sup>(3)</sup>

### **Output Sensor:**

Continuous Collector Current	50 mA
Collector-Emitter Voltage	40 V
Collector-Base Voltage	45 V
Emitter-Base Voltage	4 V
Power Dissipation	300 mW <sup>(4)</sup>

### 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)	1 ( )		Processing MIL-PRF- 195000		
JAN4N22U		10 / 40	40	486		
JANTX4N22U						
JANTXV4N22U						
JAN4N23U						
JANTX4N23U	1					
JANTXV4N23U						
JAN4N24U						
JANTX4N24U						
JANTXV4N24U						

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## Surface Mount Optically Coupled Isolator JAN / JANTX / JANTXV 4N22U, 4N23U, 4N24U



### Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Onput Di	ode	•				
$V_{F}$	Forward Voltage	0.80 1.00 0.70	- - -	1.50 1.70 1.30	V	$I_F = 10.0 \text{ mA}$ $I_F = 10.0 \text{ mA}, T_A = -55^{\circ} \text{ C}^{(1)}$ $I_F = 10.0 \text{ mA}, T_A = +100^{\circ} \text{ C}^{(1)}$
I <sub>R</sub>	Reverse Current	-	-	100	μA	V <sub>R</sub> = 2.0 V
Output P	hototransistor					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	40	-	-	V	I <sub>C</sub> = 1.0 mA, I <sub>B</sub> = 0, I <sub>F</sub> = 0
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage	45	-	-	V	I <sub>C</sub> = 100 μA, I <sub>B</sub> = 0, I <sub>F</sub> = 0
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	7	-	-	V	I <sub>E</sub> = 100 μA, I <sub>C</sub> = 0, I <sub>F</sub> = 0
I <sub>C(OFF)</sub>	Collector-Emitter Dark Current	-	-	100 100	nΑ μΑ	V <sub>CE</sub> = 20 V, I <sub>B</sub> = 0, I <sub>F</sub> = 0 V <sub>CE</sub> = 20 V, I <sub>B</sub> = 0, I <sub>F</sub> = 0, T <sub>A</sub> = 100°C
I <sub>CB(OFF)</sub>	Collector-Base Dark Current	-	-	100	nA	$V_{CB} = 20 \text{ V}, I_{E} = 0, I_{F} = 0 \Omega$
Coupled						
	On-State Collector Current JAN / JANTX / JANTXV 4N22 [A]	0.15 2.50 1.00 1.00	- - -	- - -		$\begin{split} I_F &= 2.0 \text{ mA} \text{ , } V_{CE} = 5 \text{ V, } I_B = 0 \\ I_F &= 10.0 \text{ mA} \text{ , } V_{CE} = 5 \text{ V, } I_B = 0 \\ I_F &= 10.0 \text{ mA} \text{ , } V_{CE} = 5 \text{ V, } I_B = 0, T_A = -55^{\circ} \text{ C}^{(1)} \\ I_F &= 10.0 \text{ mA} \text{ , } V_{CE} = 5 \text{ V, } I_B = 0, T_A = 100^{\circ} \text{ C}^{(1)} \end{split}$
I <sub>C(ON)</sub>	JAN / JANTX / JANTXV 4N23 [A]	0.20 6.00 2.50 2.50	- - -	- - -	mA	$\begin{split} I_F &= 2.0 \text{ mA} \text{ , } V_{CE} = 5 \text{ V, } I_B = 0 \\ I_F &= 10.0 \text{ mA , } V_{CE} = 5 \text{ V, } I_B = 0 \\ I_F &= 10.0 \text{ mA , } V_{CE} = 5 \text{ V, } I_B = 0, T_A = -55^{\circ} \text{ C}^{(1)} \\ I_F &= 10.0 \text{ mA , } V_{CE} = 5 \text{ V, } I_B = 0, T_A = 100^{\circ} \text{ C}^{(1)} \end{split}$
	JAN / JANTX / JANTXV 4N24 [A]	0.40 10.0 4.00 4.00	- - -	- - -		$\begin{split} I_F &= 2.0 \text{ mA} \text{ , } V_{CE} = 5 \text{ V, } I_B = 0 \\ I_F &= 10.0 \text{ mA , } V_{CE} = 5 \text{ V, } I_B = 0 \\ I_F &= 10.0 \text{ mA , } V_{CE} = 5 \text{ V, } I_B = 0, T_A = -55^{\circ} \text{ C}^{(1)} \\ I_F &= 10.0 \text{ mA , } V_{CE} = 5 \text{ V, } I_B = 0, T_A = 100^{\circ} \text{ C}^{(1)} \end{split}$
V <sub>CE(SAT)</sub>	Collector-Emitter Saturation Voltage JAN / JANTX / JANTXV 4N22 [A] JAN / JANTX / JANTXV 4N23 [A] JAN / JANTX / JANTXV 4N24 [A]	- - -		0.30 0.30 0.30	V	$I_F = 20 \text{ mA}$ , $I_C = 2.5 \text{ mA}$ , $I_B = 0$ $I_F = 20 \text{ mA}$ , $I_C = 5.0 \text{ mA}$ , $I_B = 0$ $I_F = 20 \text{ mA}$ , $I_C = 10.0 \text{ mA}$ , $I_B = 0$
H <sub>FE</sub>	DC Current Gain	100	-	-	V	$V_{CE}$ = 5.0 V , $I_{C}$ = 10.0 mA, $I_{F}$ = 0 mA
R <sub>IO</sub>	Resistance (Input-to-Output)	10 <sup>11</sup>	-	-	Ω	V <sub>10</sub> = ± 1.0 VDC <sup>(3)</sup>
C <sub>IO</sub>	Capacitance (Input-to-Output)	-	-	5	pF	V <sub>I-O</sub> = 0 V, f = 1.0 MHz <sup>(3)</sup>
$T_{R,}T_{F}$	Output Rise and Fall Time	-	-	20	μs	$V_{CC}$ = 10.0 V , $I_F$ = 10.0 mA, $R_L$ = 100 $\Omega$

#### Notes:

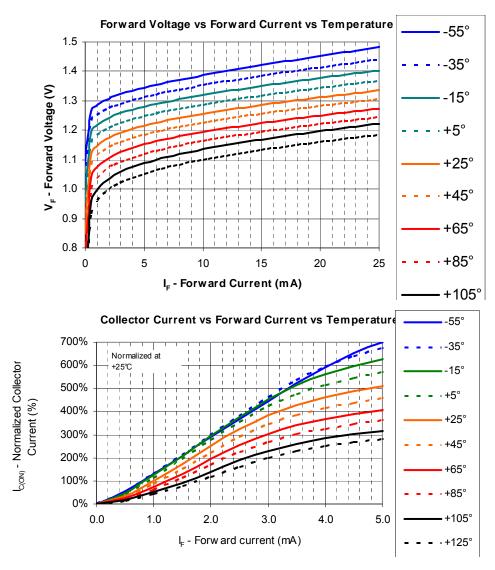
- Guaranteed but not tested.
- Sample tested, LTPD = 10.
- 3. Measured with input leads shorted together and output leads shorted together.

This product is built, tested and shipped from the USA

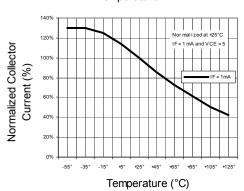




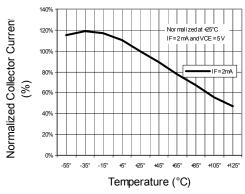
### **Typical Performance Curves**



### Normalized Collector Current Vs Temperature



#### Normalized Collector Current Vs Temperature



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# Surface Mount Optically Coupled Isolator JAN / JANTX / JANTXV 4N22U, 4N23U, 4N24U



Issue	Change Description	Approval	Date
Α	Initial Release		05/08/07
A.1	Updated graphs on page 2		03/31/2009
В	Delete CTR% column for all products	S. De La Garza	8/27/2010
С	Master Page: Changed from Issue B 08/2010 to Issue C 06/2011. Header: Added JAN to TX & TXV . Page 1: Description: Added 4N products are JEDEC registered, DSCC qualified. Ordering Information table: Added "JAN" to TX & TXV. Combined JANTX & JANTXV ordering lines and moved to Page 2. Inserted new mechanical drawing. Removed PB /RoHS symbols from left bottom corner. Page 2: Moved "NOTES" from Page 3 to Page 2 / added 7th note. Moved colored graphs from Page 2 to Page 3. Page 3: Vf table: Removed [A] and added U to part #s. Changed (1) to (7). Iceo table: Changed (1) to (7). Page 4: Added table header. Ic(on) table: Added (7). Page 5: Removed all "A" / [A] from table. Ic(on) table: Added (7). R10 table: Added (1). Page 7: Added Packaging Options.	K. Bland / Sergio	8/19/11
D	Add JAN to all headers, to Features and Description Add the Made in USA test at the bottom of every page. Update the VCE volts from 35 to 40. Change the Collector-Emitter voltage from 35 to 40 and the Collector-Base voltage from 35 to 45.	Sergio De La Gar- za	2/26/14
Е	Corrected drawings on page 1	Sergio De La Gar- za	4/28/15
F	Add ESD class to Absolute Maximum Ratings		

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