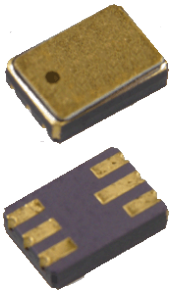
Surface Mount Optically Coupled Isolator

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:

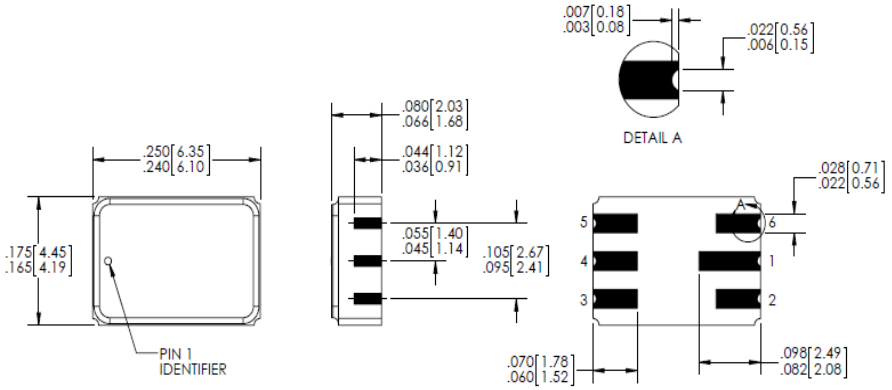
Each isolator in this series consists of an infrared emitting diode and a NPN silicon phototransistor, which are mounted in a hermetically sealed Surface Mount, 6 Pin package. Devices are designed for military and/or harsh environments.

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.

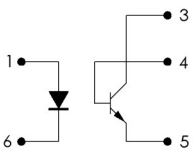
Please contact your local representative for more information.

Applications:

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



DIMENSIONS ARE IN INCHES [MM]



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

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Electrical Specifications

Absolute Maximum Ratings (T_A = 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(1)
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 seconds with soldering iron]	260° C(2)
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(3)

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(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-195000**
JAN4N22U	**1**	**10 / 40**	**40**	**486**
JANTX4N22U				
JANTXV4N22U				
JAN4N23U				
JANTX4N23U				
JANTXV4N23U				
JAN4N24U				
JANTX4N24U				
JANTXV4N24U				

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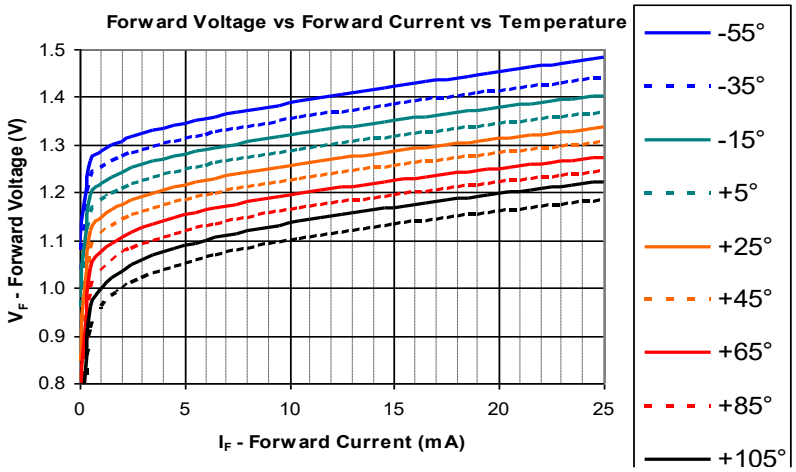
Electrical Characteristics (T_A = 25°C unless otherwise noted)

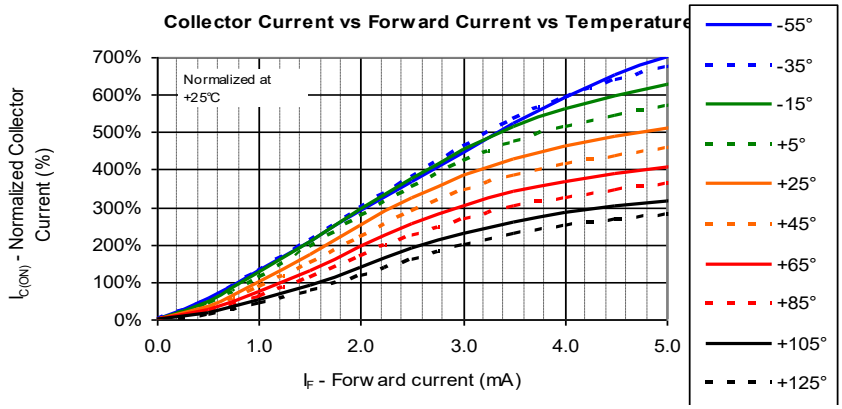
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Onput Diode						
V_F	Forward Voltage	0.80 1.00 0.70	- - -	1.50 1.70 1.30	V	I_F = 10.0 mA I_F = 10.0 mA, T_A = -55° C(1) I_F = 10.0 mA, T_A = +100° C(1)
I_R	Reverse Current	-	-	100	µA	V_R= 2.0 V
Output Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter 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
$I_{C(OFF)}$	Collector-Emitter Dark Current	-	-	100 100	nA µA	V_{CE} = 20 V, I_B= 0, I_F= 0 V_{CE} = 20 V, I_B= 0, I_F= 0, T_A = 100ºC
$I_{CB(OFF)}$	Collector-Base Dark Current	-	-	100	nA	V_{CB} = 20 V, I_E= 0, I_F= 0 Ω
Coupled						
$I_{C(ON)}$	On-State Collector Current JAN / JANTX / JANTXV 4N22 [A]	 0.15 2.50 1.00 1.00	 - - - -	 - - - -	mA	 I_F = 2.0 mA , V_{CE} = 5 V, I_B = 0 I_F = 10.0 mA , V_{CE} = 5 V, I_B = 0 I_F = 10.0 mA , V_{CE} = 5 V, I_B = 0, T_A = -55° C(1) I_F = 10.0 mA , V_{CE} = 5 V, I_B = 0, T_A = 100° C(1)
	JAN / JANTX / JANTXV 4N23 [A]	0.20 6.00 2.50 2.50	- - - -	- - - -		I_F = 2.0 mA , V_{CE} = 5 V, I_B = 0 I_F = 10.0 mA , V_{CE} = 5 V, I_B = 0 I_F = 10.0 mA , V_{CE} = 5 V, I_B = 0, T_A = -55° C(1) I_F = 10.0 mA , V_{CE} = 5 V, I_B = 0, T_A = 100° C(1)
	JAN / JANTX / JANTXV 4N24 [A]	0.40 10.0 4.00 4.00	- - - -	- - - -		I_F = 2.0 mA , V_{CE} = 5 V, I_B = 0 I_F = 10.0 mA , V_{CE} = 5 V, I_B = 0 I_F = 10.0 mA , V_{CE} = 5 V, I_B = 0, T_A = -55° C(1) I_F = 10.0 mA , V_{CE} = 5 V, I_B = 0, T_A = 100° C(1)
$V_{CE(SAT)}$	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 mA , I_C = 2.5 mA, I_B = 0 I_F = 20 mA , I_C = 5.0 mA, I_B = 0 I_F = 20 mA , I_C = 10.0 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_{10} = ± 1.0 VDC(3)
C_{IO}	Capacitance (Input-to-Output)	-	-	5	pF	V_{I-O} = 0 V, f = 1.0 MHz(3)
T_R, T_F	Output Rise and Fall Time	-	-	20	µs	V_{CC} = 10.0 V , I_F = 10.0 mA, R_L = 100 Ω

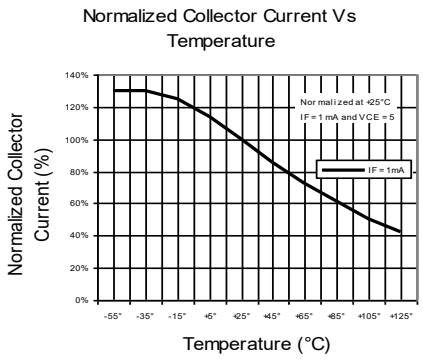
Notes:

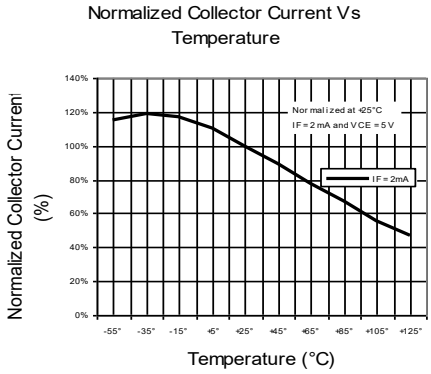
1. Guaranteed but not tested.
2. Sample tested, LTPD = 10.
3. Measured with input leads shorted together and output leads shorted together.

Typical Performance Curves









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Revision	Change Description	ECN	Date	Approved
A	Initial Release	N/A	03/31/2019	N/A
B	Delete CTR% column for all products	N/A	08/27/2010	S. De La Garza
C	**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.	N/A	08/19/2011	K. Bland / Sergio
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.	N/A	02/26/2014	Sergio De La Garza
E	Corrected drawings on page 1	N/A	04/28/2015	Sergio De La Garza
F	Add ESD class to Absolute Maximum Ratings	N/A	N/A	N/A
G	Updated to new template with new logo and fonts	N/A	05/08/2019	Brooke Combs
H	Updated Document to New Format; removed "This Product is build, tested and shipped from the USA "on all effected pages	071619	07/19/2019	Wayne Pace

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