

The documentation and process conversion measures necessary to comply with this revision shall be completed by 24 August 2013.

INCH-POUND

MIL-PRF-19500/286K  
 24 May 2013  
 SUPERSEDING  
 MIL-PRF-19500/286J  
 28 October 2011

PERFORMANCE SPECIFICATION SHEET

SEMICONDUCTOR DEVICE, DIODE, SILICON, POWER RECTIFIER,  
 TYPES 1N4245 THROUGH 1N4249, JAN, JANTX, JANTXV, AND JANHC

These devices are inactive for new design, preferred devices are 1N5614, 1N5616, 1N5618, 1N5620, 1N5622 of [MIL-PRF-19500/427](#).

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and [MIL-PRF-19500](#).

1. SCOPE

1.1 Scope. This specification covers the performance requirements for silicon, power rectifier, medium-recovery diodes. Four levels of product assurance are provided for each device type as specified in [MIL-PRF-19500](#).

1.2 Physical dimensions. See [figure 1](#) and [figure 2](#).

1.3 Maximum ratings.

Type	V <sub>R</sub>	V <sub>RWM</sub>	I <sub>O</sub> (1) T <sub>A</sub> = 55°C (2)	I <sub>FSM</sub> I <sub>O</sub> = 1.0 A dc t <sub>p</sub> = 8 ms
	V dc	V (pk)	A dc	A (pk)
1N4245	200	200	1.0	25
1N4246	400	400	1.0	25
1N4247	600	600	1.0	25
1N4248	800	800	1.0	25
1N4249	1,000	1,000	1.0	25

Types	Barometric pressure (reduced)	T <sub>STG</sub> and T <sub>J</sub>	R <sub>θJL</sub> at L = .375 inch (9.53 mm)	Z <sub>θJX</sub>	t <sub>rr</sub>
	mm Hg	°C	°C/W	°C/W	μs
1N4245	8	-65 to +175	42	4.5	5.0
1N4246	8	-65 to +175	42	4.5	5.0
1N4247	8	-65 to +175	42	4.5	5.0
1N4248	33	-65 to +175	42	4.5	5.0
1N4249	33	-65 to +175	42	4.5	5.0

See notes on next page.

\* Comments, suggestions, or questions on this document should be addressed to DLA Land and Maritime, ATTN: VAC, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to [Semiconductor@dla.mil](mailto:Semiconductor@dla.mil). Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.dla.mil/>.

1.3 Maximum ratings - Continued.

- (1)  $I_O$  rating is independent of heat sinking, special mounting, or forced air across the body or leads of the device.
- (2) Derate linearly at 8.33 mA/°C between  $T_A = +55^\circ\text{C}$  to  $+175^\circ\text{C}$ .

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

[MIL-PRF-19500](#) - Semiconductor Devices, General Specification for.

DEPARTMENT OF DEFENSE STANDARDS

[MIL-STD-750](#) - Test Methods for Semiconductor Devices.

\* (Copies of these documents are available online at <http://quicksearch.dla.mil/> or <https://assist.dla.mil/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

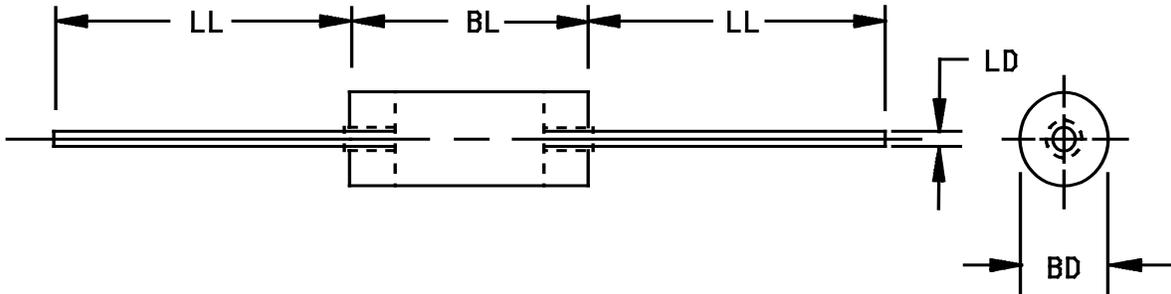
2.3 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 General. The individual item requirements shall be as specified in [MIL-PRF-19500](#) and as modified herein.

3.2 Qualification. Devices furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable qualified manufacturer's list (QML) before contract award (see [4.2](#) and [6.3](#)).

3.3 Abbreviations, symbols, and definitions. Abbreviations, symbols, and definitions used herein shall be as specified in [MIL-PRF-19500](#).

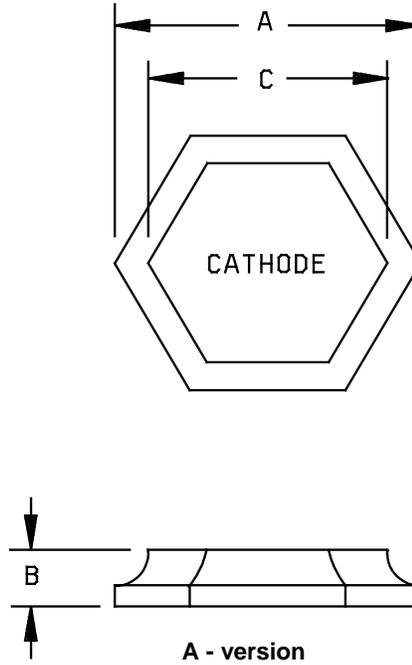


Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
BD	.065	.110	1.65	2.79	3
* BL	.125	.250	3.18	6.35	4
* LD	.027	.032	0.69	0.81	
* LL	.70	1.30	17.78	33.02	

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Dimension BD shall be measured at the largest diameter.
4. The BL dimension shall include the entire body including slugs and sections of the leads over which the diameter is uncontrolled. This uncontrolled area is defined as the zone between the edge of the diode body and extending .050 inch (1.27 mm) onto the leads.
5. The shape of the body, within the bounds of the dimensions is optional.
6. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi$ x symbology.

\* FIGURE 1. Physical dimensions.



Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	.047	.053	1.19	1.35
B	.007	.011	0.18	0.28
C	.033	.037	0.84	0.94

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. The physical characteristics of the die are:  
 Top metal: Gold 10,000 Å minimum.  
 Back metal: Gold 4,000 Å minimum.
4. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi X$  symbology.

FIGURE 2. JANHC (A-version) die dimensions.

3.4 Diode construction. Except for the JANHC devices, these devices shall be constructed utilizing metallurgically bonded, thermally matched, non-cavity, double-plug construction. The metallurgical bond between the chip and the plug shall meet the category I requirement of [MIL-PRF-19500](#), appendix A.

3.5 Interface and physical dimensions. Interface and physical dimensions shall be as specified in [MIL-PRF-19500](#), and on [figure 1](#) and [figure 2](#). No lead (Pb) shall be used in the construction of the die bonds.

3.5.1 Lead finish. Lead finish shall be solderable in accordance with [MIL-PRF-19500](#), [MIL-STD-750](#), and herein. Where a choice of lead finish is desired, it shall be specified in the acquisition document (see [6.2](#)).

3.6 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in [1.3](#) and [table I](#).

3.7 Electrical test requirements. The electrical test requirements shall be group A as specified herein.

3.8 Marking. Marking shall be in accordance with [MIL-PRF-19500](#). At the option of the manufacturer, marking may be omitted from the body, but shall be retained on the initial container.

3.9 Workmanship. Semiconductor devices shall be processed in such a manner as to be uniform in quality and shall be free from other defects that will affect life, serviceability, or appearance.

#### 4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Qualification inspection (see [4.2](#)).
- b. Screening (see [4.3](#)).
- c. Conformance inspection (see [4.4](#)).

4.2 Qualification inspection. Qualification inspection shall be in accordance with [MIL-PRF-19500](#) and as specified herein.

4.2.1 Group E qualification. Group E qualification shall be performed herein for qualification or requalification only. In case qualification was awarded to a prior revision of the specification sheet that did not request the performance of [table II](#) tests, the tests specified in [table II](#) herein that were not performed in the prior revision shall be performed on the first inspection lot to this revision to maintain qualification.

\* 4.2.2 JANHC die. Qualification shall be in accordance with appendix G of [MIL-PRF-19500](#).

4.3 Screening (JANTX, and JANTXV levels only). Screening shall be in accordance with table E-IV of MIL-PRF-19500 and as specified herein. The following measurements shall be made in accordance with table I herein. Devices that exceed the limits of table I herein shall not be acceptable.

Screen (see appendix E, table E-IV of MIL-PRF-19500)	Measurement
	JANTX and JANTXV levels
(1) 3c	See 4.3.2
7a	Not applicable
7b	Optional
9	Not applicable
10	Method 1038 of MIL-STD-750, condition A
11	$I_{R1}$ and $V_{F1}$
12	See 4.3.1
(2) 13	Subgroup 2 of table I herein. $\Delta V_{F1} \leq +.1, -.2$ V dc; $\Delta I_{R1} \leq 100$ percent of initial values or $\pm 100$ nA dc, whichever is greater. Scope display evaluation (see 4.5.3)
14a	Not applicable
(3) 14b	Required

- (1) Shall be performed anytime after temperature cycling, screen 3a, and does not need to be repeated in screening requirements.
- (2) Thermal impedance is not required in screen 13, if it has already previously performed.
- (3) For clear glass diodes, the hermetic seal (gross leak) may be performed at anytime after temperature cycling.

4.3.1 Power burn-in conditions. Power burn-in conditions are as follows (see 4.5.2):  $I_{O(min)} = \text{Rated } I_O$  (see 1.3 herein).  $T_A = 55^\circ\text{C}$  maximum. Test conditions in accordance with method 1038 of MIL-STD-750, condition B. Adjust  $I_O$  or  $T_A$  to achieve the required  $T_J$ .  $T_J = 135^\circ\text{C}$  minimum. With approval of the qualifying activity and preparing activity, alternate burn-in criteria (hours, bias conditions,  $T_J$ , mounting conditions) may be used for JANTX and JANTXV quality levels. A justification demonstrating equivalence is required. In addition, the manufacturing site's burn-in data and performance history will be essential criteria for burn-in modification approval.

4.3.2 Thermal impedance. The thermal impedance measurements shall be performed in accordance with method 3101 or 4081 as applicable of MIL-STD-750 using the guidelines in that method for determining  $I_M$ ,  $I_H$ ,  $t_H$ , and K factor where appropriate. Measurement delay time ( $t_{MD}$ ) = 70  $\mu\text{s}$  max. See table II, subgroup 4 herein. Thermal impedance limit used by supplier shall not exceed the thermal impedance graph, see figure 3 herein.

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500 and as specified herein.

4.4.1 Group A inspection. Group A inspection shall be conducted in accordance with MIL-PRF-19500 and table I.

\* 4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in table E-VIB (JAN, JANTX, and JANTXV) of MIL-PRF-19500, and as follows. Electrical measurements (end-points) shall be in accordance with table I, subgroup 2 herein.

Subgroup	Method	Inspection
B2	4066	$I_{FSM} = 25$ A (pk), ten surges of 1/120 s each at 1 minute intervals, superimposed on $I_0 = 1.0$ A dc, $V_R = \text{rated } V_{RWM}$ (see 1.3).
B3	1027	$I_0 = 1.0$ A dc minimum; $T_A = +55^\circ\text{C}$ (max.); $T_J = +150^\circ\text{C}$ minimum; $f = 50 - 60$ Hz; $V_R = \text{rated } V_{RWM}$ (see 1.3). Adjust $I_0$ to achieve a $T_J = +150^\circ\text{C}$ minimum.

4.4.3 Group C inspection. Group C inspection shall be conducted in accordance with the conditions specified for subgroup testing in table E-VII of [MIL-PRF-19500](#), and as follows. Electrical measurements (end-points) shall be in accordance with of [table I](#), subgroup 2 herein.

\* 4.4.3.1 Group C inspection, table E-VII, of [MIL-PRF-19500](#).

<u>Subgroup</u>	<u>Method</u>	<u>Inspection</u>
C2	2036	Tension: Test condition A; weight = 10 pounds; t = 15 seconds. Lead fatigue: Test condition E; weight 2 pounds.
C5	4081	+25°C ≤ T <sub>R</sub> ≤ 35°C, R <sub>θJL</sub> ≤ 42°C/W, L = .375 inch (9.525 mm) (see <a href="#">1.3</a> and <a href="#">4.3.2</a> ).
C6	1026	I <sub>O</sub> = 1.0 A dc minimum; T <sub>A</sub> = +55°C (max.); T <sub>J</sub> = +150°C minimum; f = 50 - 60 Hz; V <sub>R</sub> = rated V <sub>RWM</sub> (see <a href="#">1.3</a> ). Adjust I <sub>O</sub> to achieve a T <sub>J</sub> = +150°C minimum.

4.4.4 Group E inspection. Group E inspection shall be conducted in accordance with the conditions specified for subgroup testing in table E-IX of [MIL-PRF-19500](#) and [table II](#) herein. Electrical measurements (end-points) shall be in accordance with the applicable inspections of [table I](#), subgroup 2 herein.

4.5 Methods of inspection. Methods of inspection shall be as specified in the appropriate tables and as follows.

4.5.1 Inspection conditions. Unless otherwise specified, all inspections shall be conducted at T<sub>A</sub> = room ambient as defined in the general requirements of 4.5 of [MIL-STD-750](#).

4.5.2 Free air power burn-in and life tests. The use of a current limiting or ballast resistor is permitted provided that each DUT still sees the full P<sub>t</sub> (minimum) and that the minimum applied voltage, where applicable, is maintained through out the burn-in period. Use method 3100 of [MIL-STD-750](#) to measure T<sub>J</sub>.

4.5.2.1 Mounting configurations. Any clips or heat sink mounting configurations may be utilized provided that I<sub>O</sub> is adjusted such that the junction temperature of each diode is maintained at T<sub>J</sub> = +135°C minimum for burn-in screening and T<sub>J</sub> = +150°C minimum for JAN, JANTX and JANTXV life testing.

4.5.3 Scope display evaluation. Scope display evaluation shall be sharp and stable in accordance with method 4023 of [MIL-STD-750](#). Scope display may be performed on ATE (automatic test equipment) for screening only with the approval of the qualifying activity. Scope display in [table I](#), group A, subgroup 4 shall be performed on a scope. Reverse current over the knee shall be 500 μA peak.

4.5.4 Peak reverse power test. This test shall be measured as on the [figure 4](#) test circuit, or equivalent. A 20 microsecond half-sine waveform of current shall be used and peak reverse power shall be determined by the product of peak reverse voltage and peak reverse current.

4.5.5 Pulse measurements. Conditions for pulse measurement shall be as specified in section 4 of [MIL-STD-750](#).

TABLE I. Group A inspection.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
Subgroup 1						
Visual and mechanical inspection	2071					
Subgroup 2 <u>2/</u>						
Thermal impedance	3101	See 4.3.2	$Z_{\theta JX}$		4.5	$^{\circ}\text{C/W}$
Forward voltage	4011	$I_F = 1 \text{ A dc}$ (pulsed, see 4.5.5); duty cycle = 2 percent maximum	$V_{F1}$	0.6	1.3	V (pk)
Forward voltage	4011	$I_F = 3 \text{ A (pk)}$ , duty cycle $\leq 2$ percent pulsed, $t_p \leq 8.3 \text{ ms}$	$V_{F2}$	0.8	1.3	V (pk)
Reverse current leakage	4016	DC method; $V_R = \text{rated}$ (see 1.3)	$I_{R1}$		1.0	$\mu\text{A dc}$
Breakdown voltage	4021	$I_R = 100 \mu\text{A dc}$	$V_{(BR)}$			
1N4245				240		V
1N4246				480		V
1N4247				720		V
1N4248				960		V
1N4249				1,150		V
Subgroup 3						
High temperature operation:		$T_A = +125^{\circ}\text{C}$				
Reverse current leakage	4016	DC method, $V_R = \text{rated}$ (see 1.3)	$I_{R2}$		150	$\mu\text{A dc}$
Low temperature operation:		$T_A = -55^{\circ}\text{C}$				
Forward voltage	4011	$I_F = 3.0 \text{ A (pk)}$ , duty cycle $\leq 2$ percent pulsed, $t_p \leq 8.3 \text{ ms}$	$V_{F3}$		1.5	V dc

See footnotes at end of table.

TABLE I. Group A inspection - Continued.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 4</u>						
Reverse recovery time	4031	Condition B, $I_F = 0.5$ A, $I_R = 1.0$ A, $I_{(REC)} = 0.25$ A	$t_{rr}$		5	$\mu$ s
Scope display	4023	Sharp and stable, $n = 116$ ; $c = 0$				
<u>Subgroup 5</u>						
Not applicable						
<u>Subgroup 6</u>						
Forward surge	4066	$I_{FSM} = 25$ A (pk); ten surges of 8.3 ms each at 1 minute intervals, superimposed on $I_O =$ 1 A  $V_{RWM} =$ rated (see 1.3); $T_A = +55^\circ\text{C}$				
Electrical measurements		See <a href="#">table I</a> , subgroup 2				
<u>Subgroup 7</u>						
Not applicable						

1/ For sampling plan, see [MIL-PRF-19500](#).

- \* 2/ This test required for the following end-point measurement only:  
Group B, subgroups 2 and 3 (JAN, JANTX, and JANTXV).  
Group C, subgroup 2.  
Group E, subgroup 1.

MIL-PRF-19500/286K

\* TABLE II. Group E inspection (all quality levels) for qualification and requalification only.

Inspection	MIL-STD-750		Sampling plan
	Method	Conditions	
<u>Subgroup 1A</u>			
Temperature cycling (air to air)	1/ 1051	20 cycles, except high temperature shall be 150°C and low temperature shall be -195°C.	45 devices c = 0
Hermetic seal <u>2/</u>	1071		
Electrical measurements		See <a href="#">table I</a> , subgroup 2 and <a href="#">table III</a> , steps 1 and 2.	
<u>Subgroup 1B</u>			
Temperature cycling (air to air)	1051	500 cycles, condition C, -65°C to +175°C.	45 devices c = 0
Hermetic seal <u>2/</u>	1071		
Electrical measurements		See <a href="#">table I</a> , subgroup 2 and <a href="#">table III</a> , steps 1 and 2.	
<u>Subgroup 2</u>			
Steady-state dc blocking life	1048	T <sub>A</sub> = +150°C; t = 1,000 hours +65, -0 hours; dc = 80 - 85 percent rated V <sub>RWM</sub> (see <a href="#">1.3</a> ).	22 devices c=0
Electrical measurements		See <a href="#">table I</a> , subgroup 2 and <a href="#">table III</a> , steps 1 and 2.	
<u>Subgroup 4</u>			
Thermal impedance		See <a href="#">MIL-PRF-19500</a> .	
<u>Subgroup 5</u>			
Barometric pressure (reduced)	1001	Pressure = 8 mm Hg for 1N4245, 1N4246, and 1N4247. Pressure = 33 mm Hg for 1N4248 and 1N4249.	22 devices c = 0

See footnotes at end of table.

\* TABLE II. Group E inspection (all quality levels) for qualification and requalification only – Continued.

Inspection	MIL-STD-750		Sampling plan
	Method	Conditions	
<u>Subgroup 8</u> Peak reverse power	4065	Peak reverse power ( $P_{RM}$ ) = shall be characterized by the supplier and the data shall be available to the Government. Test shall be performed on each subplot.	45 devices c = 0
Electrical measurements		During the $P_{RM}$ test, the voltage ( $V_{BR}$ ) shall be monitored to verify it has not collapsed. Any collapse in $V_{BR}$ during or after the $P_{RM}$ test, or rise in leakage current ( $I_R$ ) after the test, that exceeds $I_{R1}$ in <a href="#">table I</a> herein shall be considered a failure to that level of applied $P_{RM}$ . Progressively higher levels of $P_{RM}$ shall be applied until failure occurs on all devices within the chosen sample size.	
<u>Subgroup 9</u> Resistance to glass cracking	1057	Test condition B. Step stress to destruction by increasing cycles or up to a maximum of 25 cycles.	45 devices c = 0
<u>Subgroup 10</u> Forward surge	4066	$I_{FSM}$ = rated (see <a href="#">1.3</a> ); ten surges of 8.3 ms each at 1 minute intervals superimposed on $I_O = 1.0$ A (see <a href="#">1.3</a> ); $V_{RWM}$ = rated (see <a href="#">1.3</a> ); $T_A = + 55^\circ\text{C}$ .	22 devices c = 0
Electrical measurement		See <a href="#">table I</a> , subgroup 2.	

1/ Test method 1056 of [MIL-STD-750](#), condition D, using liquid nitrogen, may be used in lieu of test method 1051.

2/ For opaque glass diodes use test method 2068 of [MIL-STD-750](#).

TABLE III. Groups A, B, C, and E delta measurements. 1/ 2/ 3/ 4/

Step	Inspection	MIL-STD-750		Symbol	Limits		Unit
		Method	Conditions		Min	Max	
1.	Forward voltage	4011	$I_F = 3.0$ A dc pulse width = 8.3 ms maximum, duty cycle = 2 percent maximum.	$\Delta V_{F2}$	$\pm 0.1$ V dc maximum     $\pm 50$ nA dc or $\pm 100$ percent of initial value, whichever is greater.		
2.	Reverse current	4016	DC method; $V_R =$ rated (see 1.3).	$\Delta I_{R1}$			

- 1/ Devices that exceed the [table I](#), subgroup 2 limits for this test shall not be accepted.
- 2/ The delta measurements for group B inspection in table E-VIB (JAN and JANTX) of [MIL-PRF-19500](#) are as follows: Subgroup 3 and 6, see [table III](#) herein, steps 1 and 2.
- 3/ The delta measurements for group C inspection in table E-VII of [MIL-PRF-19500](#) are as follows: Subgroup 6, see [table III](#) herein, steps 1 and 2.
- 4/ The delta measurements for group E inspection in table E-IX of [MIL-PRF-19500](#) are as follows:
- Subgroup 1, see [table III](#) herein, steps 1 and 2.
  - Subgroup 2, see [table III](#) herein, steps 1 and 2.

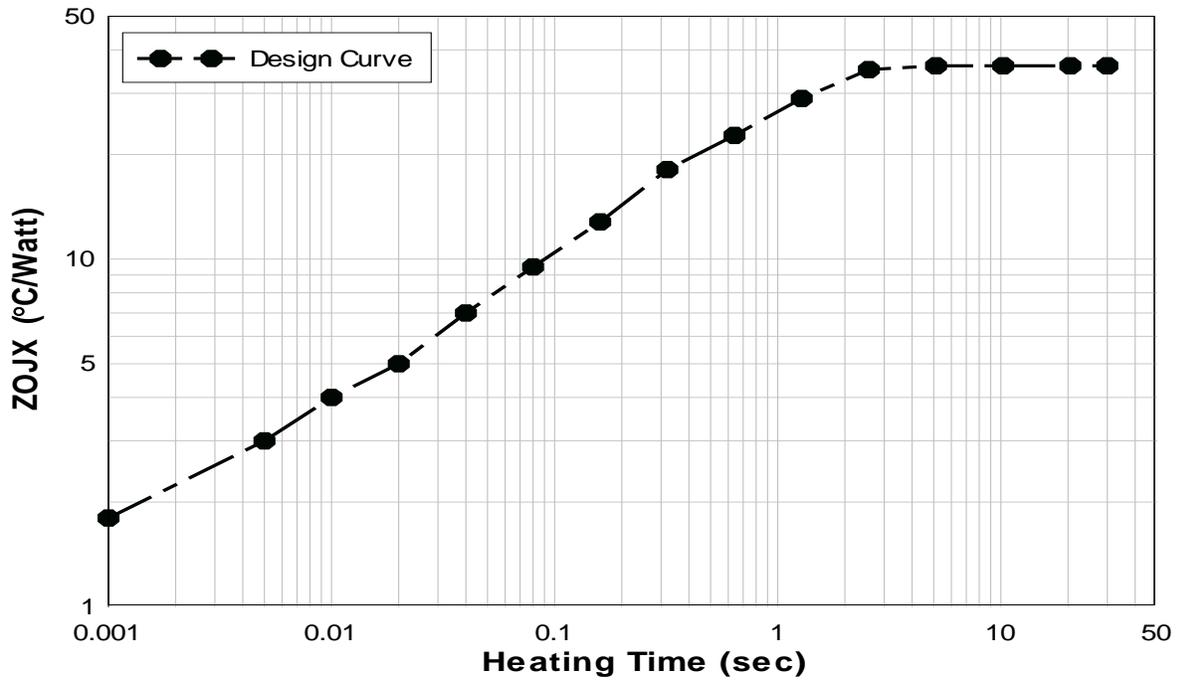
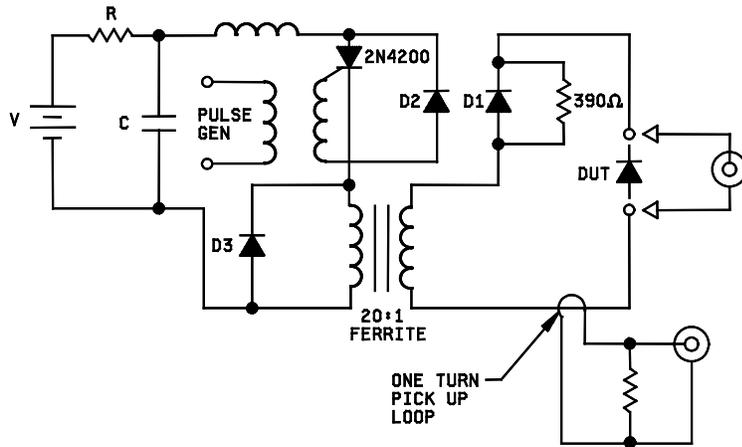


FIGURE 3. Thermal impedance graph  $R_{\theta JL}$  36°C/W.



NOTES:

L = 13T H22 on 1 inch (25.4 mm) diameter form (air core).

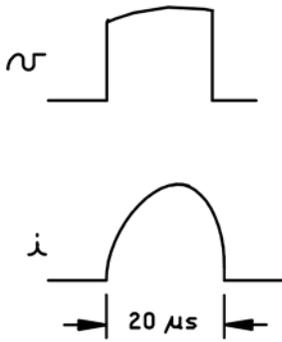
C ~ 1 to 10  $\mu$ fd to give 20  $\mu$ s pulse width.

V - Adjustable to 200 volts for power desired in DUT.

D1 - 3 kV; 600 mA (1N3647 or equivalent).

D2, D3 - 600 V; 3A (1N5552 or equivalent).

Values not stated are determined at the time of test.



TYPICAL WAVEFORMS

FIGURE 4. Peak reverse power measurement circuit and waveform.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the Military Service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory. The notes specified in MIL-PRF-19500 are applicable to this specification.)

6.1 Intended use. Semiconductors conforming to this specification are intended for original equipment design applications and logistic support of existing equipment.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Packaging requirements (see 5.1).
- c. Lead finish (see 3.5.1).
- d. Product assurance level and type designator.

\* 6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List (QML 19500) whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from DLA Land and Maritime, ATTN: VQE, P.O. Box 3990, Columbus, OH 43218-3990 or e-mail [vqe.chief@dla.mil](mailto:vqe.chief@dla.mil). An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at <https://assist.dla.mil>.

6.4 Substitution information. Devices covered by this specification are substitutable for the manufacturer's and user's Part or Identifying Number (PIN). This information in no way implies that manufacturer's PINs are suitable as a substitute for the military PIN.

6.5 Suppliers of die (if applicable).

JANC ordering information	
PIN	Manufacturer
	14552
1N4245	JANHCA4245
1N4246	JANHCA4246
1N4247	JANHCA4247
1N4248	JANHCA4248
1N4249	JANHCA4249

6.6 Changes from previous issue. The margins of this specification are marked with asterisks to indicate modifications generated by this amendment. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

Custodians:

Army - CR  
Navy - EC  
Air Force - 85  
DLA - CC

Preparing activity:

DLA - CC

(Project 5961-2012-096)

Review activities:

Army - AR, MI  
Navy - AS, MC  
Air Force - 19, 99

\* NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil/>.