

The documentation and process conversion measures necessary to comply with this revision shall be completed by 3 August 2004.

INCH-POUND

MIL-PRF-19500/127P  
3 May 2004  
SUPERSEDING  
MIL-PRF-19500/127N  
09 July 1999

## PERFORMANCE SPECIFICATION SHEET

SEMICONDUCTOR DEVICES, DIODE, SILICON, VOLTAGE REGULATOR,  
TYPES 1N4370A-1 THROUGH 1N4372A-1, AND 1N746A-1 THROUGH 1N759A-1, 1N4370AUR-1 THROUGH  
1N4372AUR-1 AND 1N746AUR-1 THROUGH 1N759AUR-1, 1N4370C-1 THROUGH 1N4372C-1, AND 1N746C-1  
THROUGH 1N759C-1, 1N4370CUR-1 THROUGH 1N4372CUR-1 AND 1N746CUR-1 THROUGH 1N759CUR-1,  
1N4370D-1, THROUGH 1N4372D-1, AND 1N746D-1 THROUGH 1N759D-1, 1N4370DUR-1 THROUGH  
1N4372DUR-1 AND 1N746DUR-1 THROUGH 1N759DUR-1,  
JAN, JANTX, JANTXV, JANHC, AND JANKC

JANS level (see 6.4).

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 500 milliwatt, silicon, voltage regulator diodes with voltage tolerances of 5, 2, and 1 percent. Three levels of product assurance are provided for each encapsulated device type as specified in MIL-PRF-19500. Two level of product assurance is provided for each unencapsulated device .

1.2 Physical dimensions. See 3.4 and figure 1 (similar to DO-35) and figure 2 (similar to DO-213AA), and figures 3 and 4 for die.

\* 1.3 Maximum ratings. Maximum ratings are as shown in maximum and primary test ratings (see 3.9) herein and as follows:

$P_T = 500$  mW, (DO-35) at  $T_L = +50^\circ\text{C}$ ,  $L = .375$  inch (9.53 mm); both ends of case or diode body to heat sink at  $L = .375$  inch (9.53 mm). Derate  $I_Z$  to 0.0 mA dc at  $+175^\circ\text{C}$ .  
 $P_T = 500$  mW, (DO-213AA) at  $T_{EC} = +125^\circ\text{C}$ , derate to 0 at  $+175^\circ\text{C}$ .  $-65^\circ\text{C} \leq T_J \leq +175^\circ\text{C}$ ;  $-65^\circ\text{C} \leq T_{STG} \leq +175^\circ\text{C}$ .

\* Comments, suggestions, or questions on this document should be addressed to Defense Supply Center, Columbus, ATTN: DSCC-VAC, P.O. Box 3990, Columbus, OH 43216-5000, or emailed to [Semiconductor@dscclia.mil](mailto:Semiconductor@dscclia.mil). Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <http://www.dodssp.daps.mil>.

\* 1.4 Primary electrical characteristics. Primary electrical characteristics are as shown in maximum and primary test ratings (see 3.9) herein and as follows:

2.4 V dc  $\leq$   $V_Z \leq$  12 v dc.

1N4370A-1 through 1N4372A-1 and 1N746A-1 through 1N759A-1 are  $\pm 5$  percent voltage tolerance.

1N4370C-1 through 1N4372C-1 and 1N746C-1 through 1N759C-1 are  $\pm 2$  percent voltage tolerance.

1N4370D-1 through 1N4372D-1 and 1N746D-1 through 1N759D-1 are  $\pm 1$  percent voltage tolerance.

Thermal resistance:

$R_{\theta JL} = 250^\circ\text{C/W}$  maximum at  $L = .375$  inch (9.53 mm) (D0-35).

$R_{\theta JEC} = 100^\circ\text{C/W}$  maximum. Junction to end-caps (D0-213AA).

## 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.

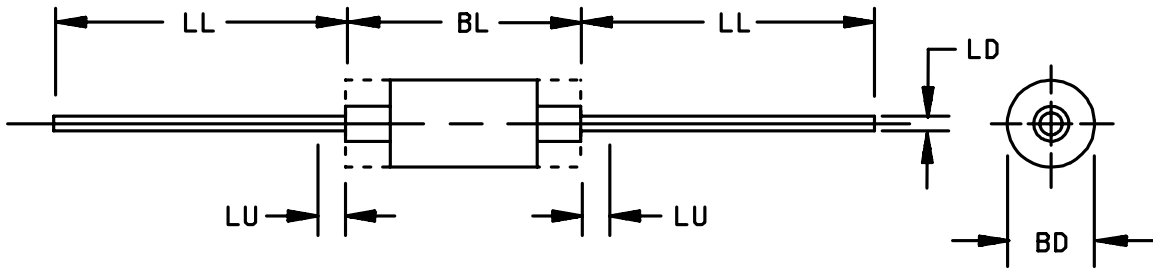
\* (Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or <http://www.dodssp.daps.mil> from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. 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).

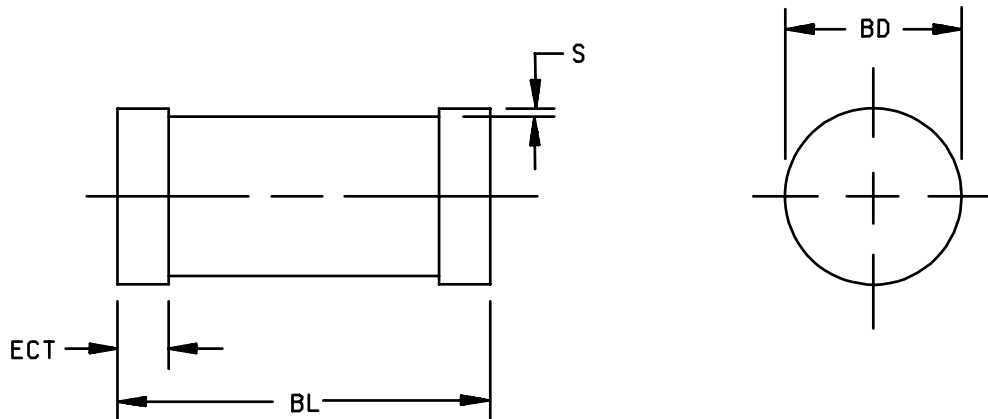


Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
BD	.055	.090	1.40	2.29	3
BL	.120	.200	3.05	5.08	
LD	.018	.023	0.46	0.56	
LL	1.000	1.500	25.40	38.10	
LU		.050		1.27	

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Symbol BD shall be measured at the largest diameter.
4. Within LU, lead diameter may vary to allow for flash, lead finish build-up, and minor irregularities other than heat slugs.
5. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi X$  symbology.

FIGURE 1. Physical dimensions for types 1N4370A-1 through 1N4372A-1, 1N4370C-1 through 1N4372C-1, 1N4370D-1 through 1N4372D-1, 1N746A-1 through 1N759A-1, 1N746C-1 through 1N759C-1, and 1N746D-1 through 1N759D-1 (DO-35).

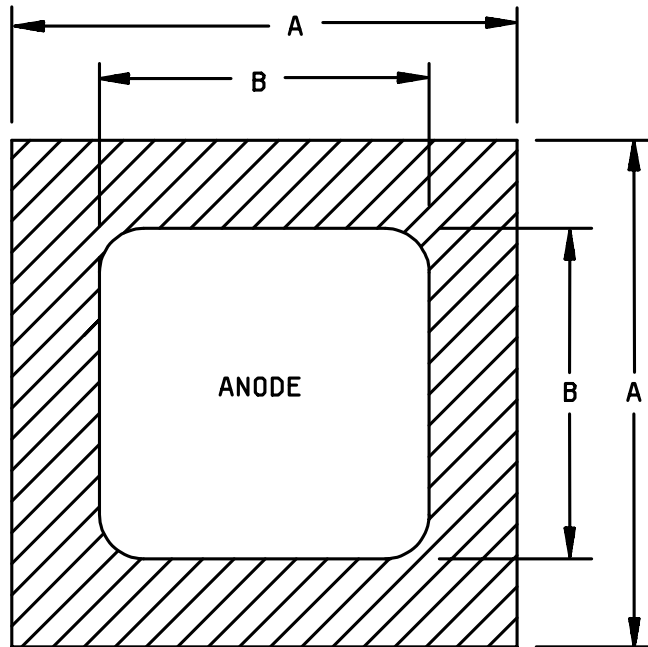


Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
BL	.130	.146	3.30	3.70
BD	.063	.067	1.60	1.70
ECT	.016	.022	0.41	0.55
S	.001 min		0.03 min	

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi X$  symbology.

FIGURE 2. Physical dimensions for types 1N4370AUR-1 through 1N4372AUR-1, 1N4370CUR-1 through 1N4372CUR-1, 1N4370DUR-1 through 1N4372DUR-1, 1N746AUR-1 through 1N759AUR-1, 1N746CUR-1 through 1N759CUR-1, and 1N746DUR-1 through 1N759DUR-1 (DO-213AA).



BACKSIDE IS CATHODE

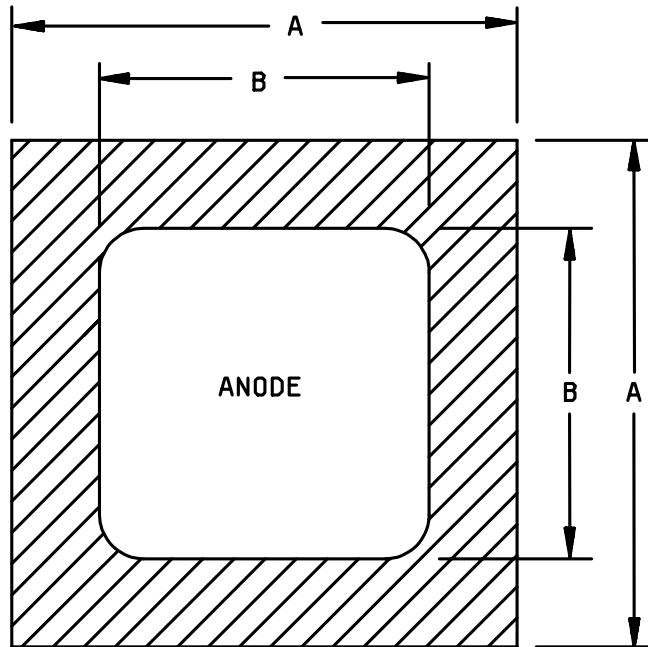
(A – version)

Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	.021	.025	0.53	0.63
B	.013	.017	0.33	0.43

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. The physical characteristics of the die thickness are  $.010 \pm .002$  (0.25 mm  $\pm 0.051$  mm). Metallization is top = (anode)-AL, back: (cathode)-AU. AL thickness = 25,000 Å minimum, AU thickness = 4,000 Å minimum.
4. Circuit layout data: For zener operation, cathode must be operated positive with respect to anode.

FIGURE 3. Physical dimensions (JANHCA and JANKCA die dimensions).



BACKSIDE IS CATHODE

(B – version)

Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	.024	.028	0.61	0.71
B	.017	.021	0.43	0.53

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. The physical characteristics of the die thickness are  $.010 \pm .002$  (0.25 mm  $\pm$  0.051 mm). Metallization is top = (anode)-AL, back: (cathode)-AU. AL thickness = 40,000 Å minimum, AU thickness = 5,000 Å minimum.
4. Circuit layout data: For zener operation, cathode must be operated positive with respect to anode.

FIGURE 4. Physical dimensions (JANHCB and JANKCB die dimensions).

3.3 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-PRF-19500, and as follows.

EC - - - - end-caps

3.4 Interface and physical dimensions. The interface and physical dimensions shall be specified in MIL-PRF-19500 and figures 1 and 2 (similar to DO-35 and DO-213AA), and figures 3 and 4 (die) herein.

3.4.1 Lead finish. Lead finish shall be solderable as defined in 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).

\* 3.4.2 Diode construction. All devices shall be metallurgically bonded double plug construction in accordance with the requirements of category I, II, or III (see MIL-PRF-19500).

3.5 Marking. Devices shall be marked in accordance with MIL-PRF-19500. At the option of the manufacturer, the DO-35 version may leave off “-” portion of the type designator (example: JANTX1N4370A1).

3.5.1 Marking of UR-1 version devices. For UR-1 version devices only, all marking (except polarity) may be omitted from the body, but shall be retained on the initial container.

3.6 Selection of tight tolerance devices. The C and D suffix devices shall be selected from JAN, JANTX, or JANTXV devices, which have successfully completed all applicable screening, and groups A, B, and C testing as 5 percent tolerance devices. All sublots of C and D suffix devices shall pass table I, subgroup 2, at tightened tolerances. Tighter tolerances for mounting clip temperature shall be maintained for reference purpose to establish correlation. For C and D tolerance levels,  $T_L = +25^{\circ}\text{C} \pm 2^{\circ}\text{C}$  at .375 inch (9.53 mm) from body or equivalent.

\* 3.7 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in 1.3, 1.4, table I and table II.

3.8 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table III herein.

\* 3.9 Maximum and primary test ratings. Maximum and primary test ratings for voltage regulator diodes are specified in table III herein.

3.10 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).

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4.2 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-19500 and as specified herein.

4.2.1 JANHC and JANKC devices. JANHC and JANKC devices shall be qualified in accordance with appendix G of MIL-PRF-19500.

4.2.2 Construction verification. Cross sectional photos from three devices shall be submitted in the qualification report.

4.3 Screening (JAN, JANTX, and JANTXV levels only). Screening shall be in accordance with table 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 table IV of MIL-PRF-19500)	Measurement	
	JANTX and JANTXV levels	JAN level
3a	Temperature cycling	Temperature cycling (in accordance with JANTX level of MIL-PRF-19500).
(1) 3c	Thermal impedance (see 4.3.2)	Thermal impedance (see 4.3.2).
9	Not applicable	Not applicable
11	$I_{R1}$ and $V_{Z2}$	Not applicable
12	See 4.3.3, $t = 48$ hours	Not applicable
(2) 13	$\Delta I_{R1} \leq 100$ percent of initial reading or 50 nA dc, whichever is greater. $\Delta V_{Z2} \leq \pm 2$ percent initial reading. Subgroup 2 of table I herein.	Not applicable

- (1) Thermal impedance shall be performed any time after sealing provided temperature cycling is performed in accordance with MIL-PRF-19500, screen 3 prior to this thermal test.
- (2) PDA = 5 percent for screen 13 applies to  $\Delta I_{R1}$  and  $\Delta V_{Z2}$ , and  $I_{R1}$  and  $V_{Z2}$ . Thermal impedance ( $Z_{\theta JX}$ ) is not required in screen 13.

4.3.1 Screening (JANHC and JANKC). Screening of JANHC and JANKC die shall be in accordance with appendix G of MIL-PRF-19500.



4.3.2 Thermal impedance ( $Z_{\theta JX}$ ). The  $Z_{\theta JX}$  measurements shall be performed in accordance with method 3101 of MIL-STD-750 to remove atypical devices. The maximum limit shall not exceed the group A subgroup 2 limit. If a lot exhibits an out of control condition, the entire lot shall be removed from the line and held for engineering evaluation and disposition.

- a.  $I_M$  measurement current ..... 1 mA - 10 mA.
- b.  $I_H$  forward heating current ..... .5 A - 1.0 A.
- c.  $t_H$  heating time ..... 10 ms.
- d.  $t_{MD}$  measurement delay time ..... 70  $\mu$ s maximum.

\* 4.3.3 Power burn-in conditions. Power burn-in conditions are as follows:  $I_Z$  = column 8 of table IV minimum;  $T_A$  shall be room ambient in accordance with MIL-STD-750, section 4.5. Mounting and test conditions in accordance with method 1038 of MIL-STD-750, condition B. Adjust  $I_Z$  or  $T_A$  to achieve the required  $T_J$ . Use method 3100 of MIL-STD 750 to measure  $T_J$ .  $T_J = 125^\circ\text{C}$  minimum.

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500 and as specified herein. Group A inspection shall be performed on each subplot.

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

4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in table VIb (JAN, JANTX, and JANTXV) of MIL-PRF-19500 and 4.4.2.1 herein. Electrical measurements (end-points) shall be in accordance with the applicable inspections of table I, subgroup 2 herein. ( $Z_{\theta JX}$  applies to B3 only.)

\* 4.4.2.1 Group B inspection, table VIb (JAN, JANTX and JANTXV) of MIL-PRF-19500.

	<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
	B2	1056	0°C to +100°C, 10cycles.
	B2	1051	-55°C to +175°C, 25 cycles.
	B2	4066	See 4.5.1.
*	B3	1027	$I_{ZM}$ = Column 8 of table III minimum. Adjust $I_{ZM}$ or $T_A$ to ensure a $T_J = 150^\circ\text{C}$ (minimum).
	B4	2075	See 4.5.6.
	B6	1032	$T_A = 175^\circ\text{C}$

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\*4.4.3 Group C inspection. Group C inspection shall be conducted in accordance with the conditions specified for subgroup testing in table VII of MIL-PRF-19500, and as follows. Electrical measurements (end-points) shall be in accordance with table I, subgroup 2 herein. ( $Z_{\theta JX}$  applies to C6 only.)

Subgroup	Method	Condition
C2	1056	0°C to +100°C, 10 cycles.
C2	1051	-55°C to +175°C, 20 cycles.
C2	2036	Tension: Test condition A; weight = 4 pounds, t = 15 seconds. Lead fatigue: Test condition E. (Tension and lead fatigue are not required for UR-1 suffix devices)
C2	1071	Test condition E.
C3		Not applicable.
*	C5 3101 or 4081	See 4.5.5 herein.
*	C6	$I_{ZM}$ = Column 8 of table III minimum. Adjust $I_{ZM}$ or $T_A$ to ensure a $T_J = 150^\circ\text{C}$ (minimum).
	C7	Not applicable.
	C8	$I_Z = 7.5$ mA dc, $T_1 = +25^\circ\text{C} \pm 5^\circ\text{C}$ , $T_2 = +125^\circ\text{C} \pm 5^\circ\text{C}$ . (Max limit in accordance with columns 13 and 14 of table III). Sample size = 22, 0 rejects allowed.

4.4.4 Group E inspection. Group E inspection shall be conducted in accordance with the conditions specified for subgroup testing in table IX of MIL-PRF-19500 and table II herein.

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

4.5.1 Surge current ( $I_{ZSM}$ ). The peak currents shown in column 10 of table III shall be applied in the reverse direction and these shall be imposed on the current ( $I_Z = 20$  mA dc) a total of 5 surges at 1-minute intervals. Each individual surge shall be one-half square-wave-pulse of one one-hundred twenty second duration or an equivalent one-half sine wave with the same effective rms current.  $T_A = +25^\circ\text{C} \pm 5^\circ\text{C}$ .

4.5.2 Regulator voltage measurements. The test current shall be applied until thermal equilibrium is attained (20  $\pm 2$  seconds) prior to reading the breakdown voltage. For this test, the diode shall be suspended by its leads with mounting clips whose inside edge is located at .375 inch (9.53 mm) from the body (UR version = 0 lead length) and the mounting clips shall be maintained at a temperature of +25°C +8°C, and -2°C. This measurement may be performed after a shorter time following application of the test current than that which provides thermal equilibrium if correlation to stabilized readings can be established to the satisfaction of the Government. JANHC and JANKC shall be pulse tested at 10 ms maximum.

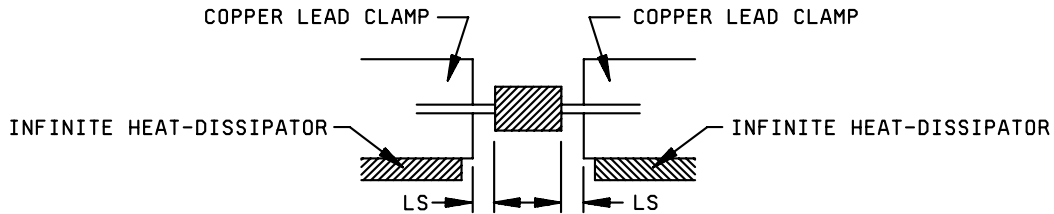
4.5.3 Voltage regulation  $V_Z(\text{reg})$ . Voltage regulation shall be determined by the difference of the regulator voltage measured at different currents as specified in table I, subgroup 7. Both test shall be performed at thermal equilibrium. This  $\Delta V_Z$  shall not exceed column 7 of table III.

4.5.4 Temperature coefficient of regulator voltage ( $\alpha V_Z$ ). The device shall be temperature stabilized with current applied prior to reading regulator voltage at the specified ambient temperature as specified in paragraph 4.4.3, group C, subgroup 8.

4.5.5 Thermal resistance. Thermal resistance measurement shall be performed in accordance with method 3101 or 4081 of MIL-STD-750. Forced moving air or draft shall not be permitted across the device during test. The maximum limit for  $R_{\theta JL}$  under these test conditions shall be  $R_{\theta JL(max)} = 250^{\circ}C/W$  or  $R_{\theta JEC(max)} = 100^{\circ}C/W$ . The following conditions shall apply when using method 3101:

- a.  $I_M$  ..... 1 mA to 10 mA.
- b.  $I_H$  ..... 200 mA to 400 mA.
- c.  $t_H$  ..... 25 seconds minimum.
- d.  $t_{MD}$  ..... 70  $\mu s$  maximum.

LS = Lead spacing = .375 inch as defined on figure 5 below:  
 LS = 0 inch for "UR" suffix devices.



NOTES:

- 1. Dimensions are in inches.
- 2. Millimeter equivalents are given for general information only.

FIGURE 5. Mounting conditions.

4.5.5.1 For initial qualification and requalification. Read and record data in accordance with table II herein and shall be included in the qualification report.

4.5.6 Decap internal visual scribe and break. Scratch glass at cavity area with diamond scribe. Carefully snap open. Using 30X magnification examine the area where die (or bonding material) are in contact with the plugs, verify metallurgical bonding area. If the verification of the metallurgical bonding area is in question, test method 3101 of MIL-STD-750; and limits herein ( $Z_{\theta JX}$ ) shall be used to determine suitability for use.

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TABLE I. Group A inspection.

Inspection 1/	MIL-STD-750		Symbol	Limits 2/		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u>						
Visual and mechanical examination	2071					
<u>Subgroup 2</u>						
Forward voltage	4011	$I_F = 200 \text{ mA dc.}$	$V_F$		1.1	V dc
Reverse current	4016	DC method, $V_R =$ column 11 of table III.	$I_{R1}$		Col. 12	$\mu\text{A dc}$
Regulator voltage (see 4.5.2)	4022	$I_{Z1} = 250 \mu\text{A dc.}$	$V_{Z1}$	Col. 9	Col. 4	V dc
Regulator voltage (see 4.5.2)	4022	$I_{Z2} = 20 \text{ mA dc.}$	$V_{Z2}$	Col. 3	Col. 4	V dc
Thermal impedance -1 suffix	3101	See 4.3.2, not applicable for JANHC and JANKC.	$Z_{\theta JX}$		35	$^{\circ}\text{C/W}$
<u>Subgroup 3</u>						
High temperature operation		$T_A = 150^{\circ}\text{C}$				
Reverse current	4016	DC method, $V_R =$ column 11 of table III.	$I_{R2}$		Col. 5	$\mu\text{A dc}$
<u>Subgroup 4</u>						
Small-signal reverse breakdown impedance	4051	$I_Z = 20 \text{ mA dc,}$ $I_{SIG} = 10 \text{ percent of } I_Z \text{ ac.}$	$Z_Z$		Col. 6	ohm
<u>Subgroups 5</u>						
Not applicable						

See footnotes at end of table.

TABLE I. Group A inspection - Continued.

Inspection 1/	MIL-STD-750		Symbol	Limits 2/		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 6</u>						
Surge	4066	See 4.5.1				
Electrical measurements		See table I, subgroup 2.				
Surge	4066	See 4.5.1				
<u>Subgroup 7</u>						
Voltage regulation (see 4.5.3)		$I_{Z3} = 2 \text{ mA dc}; I_{Z4} = 20 \text{ mA dc}$	$V_Z \text{ (reg)}$		Col. 7	V dc

1/ For sampling plan, see MIL-PRF-19500.

2/ Column references are to table III.

\* TABLE II. Group E inspection qualification and requalification (all product assurance levels).

Inspection 1/	MIL-STD-750		Qualification conformance inspection (sampling plan)
	Method	Conditions	
<u>Subgroup 1</u> Temperature cycling	1051	500 cycles, -55°C to +175°C.	45 devices, c = 0
Electrical measurements		See table I, subgroup 2 herein.	
<u>Subgroup 2</u> Intermittent operation life	1037	6,000 cycles. I <sub>z</sub> = column 8 of table III.	22 devices, c = 0
Electrical measurements		See table I, subgroup 2 herein.	
<u>Subgroup 3</u> Decap analysis	2101	Cross section and scribe and break. Separate samples shall be used for each test.	3 devices, c = 0
<u>Subgroup 4</u> Thermal impedance curves		Each supplier shall submit their (typical) maximum design thermal impedance curves. In addition, the optimal test conditions and Z <sub>θJX</sub> limit shall be provided to the qualifying activity in the qualification report.	N/A
<u>Subgroups 5 and 6</u> Not applicable			
<u>Subgroup 8</u> Resistance to glass cracking	1057	Condition B. Cool down after solder immersion is permitted. Test until failure occurs on all devices with the chosen sample or to a maximum of 25 cycles, whichever comes first.	45 devices, c = 0

TABLE III. Electrical characteristics (5 percent tolerance diodes).

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9	Col 10	Col 11	Col 12	Col 13	Col 14
Type	$V_{Z2}$ nom at $I_Z = 20$ mA	$V_{Z2}$ min	$V_{Z1}$ and $V_{Z2}$ max	$I_{R2}$ at $T_A = +150^\circ\text{C}$ $V_R =$ col 11	$Z_Z$ at $I_Z = 20$ mA	$V_Z$ (reg)	$I_{ZM}$	$V_{Z1}$ (min)	$I_{ZSM}$	$V_R$	$I_{R1}$ at $T_A = +25^\circ\text{C}$ $V_R =$ col 11	$\alpha V_Z$ neg. limit	$\alpha V_Z$ pos. limit
	Volts	Volts	Volts	$\mu\text{A}$	$\Omega$	Volts	mA	Volts	mA	Volts	$\mu\text{A}$	%/°C	%/°C
1N4370A-1	2.4	2.28	2.52	200	30	1.0	155	1.1	1000	1.0	100	-0.085	0
1N4371A-1	2.7	2.57	2.83	150	30	1.0	140	1.2	1000	1.0	60	-0.080	0
1N4372A-1	3.0	2.85	3.15	100	29	1.0	125	1.3	1000	1.0	30	-0.075	0
1N746A-1	3.3	3.14	3.46	30	24	1.0	120	1.5	1000	1.0	5	-0.070	0
1N747A-1	3.6	3.42	3.78	30	22	1.0	110	1.8	1000	1.0	3	-0.065	0
1N748A-1	3.9	3.71	4.09	30	20	1.0	100	2.0	1000	1.0	2	-0.060	0
1N749A-1	4.3	4.09	4.51	50	18	1.0	90	2.4	990	1.0	2	-0.055	+0.020
1N750A-1	4.7	4.47	4.93	50	15	1.0	85	2.8	980	1.5	5	-0.043	+0.025
1N751A-1	5.1	4.85	5.35	50	14	0.8	75	3.3	960	2.0	5	-0.030	+0.030
1N752A-1	5.6	5.32	5.88	50	8	0.8	70	4.3	950	2.5	5	-0.028	+0.036
1N753A-1	6.2	5.89	6.51	50	3	0.6	65	5.2	910	3.5	5	0	+0.045
1N754A-1	6.8	6.46	7.14	50	3	0.4	60	6.0	870	4.0	2	0	+0.050
1N755A-1	7.5	7.13	7.87	50	4	0.4	55	6.6	810	5.0	2	0	+0.058
1N756A-1	8.2	7.79	8.61	50	5	0.4	50	7.5	740	6.0	1	0	+0.062
1N757A-1	9.1	8.65	9.55	50	6	0.5	45	8.4	650	7.0	1	0	+0.068
1N758A-1	10.0	9.50	10.50	50	7	0.7	40	9.1	540	8.0	1	0	+0.076
1N759A-1	12.0	11.40	12.60	50	10	1.0	35	11.0	400	9.0	1	0	+0.08

TABLE III. Electrical characteristics (2 percent tolerance diodes) – Continued.

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9	Col 10	Col 11	Col 12	Col 13	Col 14
Type	V <sub>Z2</sub> nom at I <sub>Z</sub> = 20 mA	V <sub>Z2</sub> min	V <sub>Z1</sub> and V <sub>Z2</sub> max	I <sub>E2</sub> at T <sub>A</sub> = +150°C V <sub>R</sub> = col 11	Z <sub>Z</sub> at I <sub>Z</sub> = 20 mA	V <sub>Z</sub> (reg)	I <sub>ZM</sub>	V <sub>Z1</sub> (min)	I <sub>ZSM</sub>	V <sub>R</sub>	I <sub>R1</sub> at T <sub>A</sub> = +25°C V <sub>R</sub> = col 11	αV <sub>Z</sub> neg. limit	αV <sub>Z</sub> pos. limit
	Volts	Volts	Volts	μA	Ω	Volts	mA	Volts	mA	Volts	μA	%/°C	%/°C
1N4370C-1	2.4	2.352	2.448	200	30	1.0	155	1.1	1000	1.0	100	-0.085	0
1N4371C-1	2.7	2.646	2.754	150	30	1.0	140	1.2	1000	1.0	60	-0.080	0
1N4372C-1	3.0	2.94	3.06	100	29	1.0	125	1.3	1000	1.0	30	-0.075	0
1N746C-1	3.3	3.234	3.366	30	24	1.0	120	1.5	1000	1.0	5	-0.070	0
1N747C-1	3.6	3.528	3.672	30	22	1.0	110	1.8	1000	1.0	3	-0.065	0
1N748C-1	3.9	3.822	3.978	30	20	1.0	100	2.0	1000	1.0	2	-0.060	0
1N749C-1	4.3	4.214	4.386	50	18	1.0	90	2.4	990	1.0	2	-0.055	+0.020
1N750C-1	4.7	4.606	4.794	50	15	1.0	85	2.8	980	1.5	5	-0.043	+0.025
1N751C-1	5.1	4.998	5.202	50	14	0.8	75	3.3	960	2.0	5	-0.030	+0.030
1N752C-1	5.6	5.488	5.712	50	8	0.8	70	4.3	950	2.5	5	-0.028	+0.036
1N753C-1	6.2	6.076	6.324	50	3	0.6	65	5.2	910	3.5	5	0	+0.045
1N754C-1	6.8	6.664	6.936	50	3	0.4	60	6.0	870	4.0	2	0	+0.050
1N755C-1	7.5	7.357	7.650	50	4	0.4	55	6.6	810	5.0	2	0	+0.058
1N756C-1	8.2	8.036	8.364	50	5	0.4	50	7.5	740	6.0	1	0	+0.062
1N757C-1	9.1	8.918	9.282	50	6	0.5	45	8.4	650	7.0	1	0	+0.068
1N758C-1	10.0	9.80	10.20	50	7	0.7	40	9.1	540	8.0	1	0	+0.076
1N759C-1	12.0	11.76	12.24	50	10	1.0	35	11.0	400	9.0	1	0	+0.08



TABLE III. Electrical characteristics (1 percent tolerance diodes) – Continued.

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9	Col 10	Col 11	Col 12	Col 13	Col 14
Type	V <sub>z</sub> nom at I <sub>z</sub> = 20 mA	V <sub>z</sub> min	V <sub>z1</sub> and V <sub>z2</sub> max	I <sub>R2</sub> at T <sub>A</sub> = +150°C V <sub>R</sub> = col 11	Z <sub>z</sub> at I <sub>z</sub> = 20 mA	V <sub>z</sub> (reg)	I <sub>ZM</sub>	V <sub>z</sub> (min)	I <sub>ZSM</sub>	V <sub>R</sub>	I <sub>R1</sub> at T <sub>A</sub> = +25°C V <sub>R</sub> = col 11	αV <sub>Z</sub> neg. limit	αV <sub>Z</sub> pos. limit
	Volts	Volts	Volts	μA	Ω	Volts	mA	Volts	mA	Volts	μA	%/°C	%/°C
1N4370D-1	2.4	2.376	2.424	200	30	1.0	155	1.1	1000	1.0	100	-0.085	0
1N4371D-1	2.7	2.673	2.727	150	30	1.0	140	1.2	1000	1.0	60	-0.080	0
1N4372D-1	3.0	2.970	3.030	100	29	1.0	125	1.3	1000	1.0	30	-0.075	0
1N746D-1	3.3	3.267	3.333	30	24	1.0	120	1.5	1000	1.0	5	-0.070	0
1N747D-1	3.6	3.564	3.636	30	22	1.0	110	1.8	1000	1.0	3	-0.065	0
1N748D-1	3.9	3.861	3.939	30	20	1.0	100	2.0	1000	1.0	2	-0.060	0
1N749D-1	4.3	4.257	4.343	50	18	1.0	90	2.4	990	1.0	2	-0.055	+0.020
1N750D-1	4.7	4.653	4.747	50	15	1.0	85	2.8	980	1.5	5	-0.043	+0.025
1N751D-1	5.1	5.049	5.151	50	14	0.8	75	3.3	960	2.0	5	-0.030	+0.030
1N752D-1	5.6	5.544	5.656	50	8	0.8	70	4.3	950	2.5	5	-0.028	+0.036
1N753D-1	6.2	6.138	6.262	50	3	0.6	65	5.2	910	3.5	5	0	+0.045
1N754D-1	6.8	6.732	6.868	50	3	0.4	60	6.0	870	4.0	2	0	+0.050
1N755D-1	7.5	7.425	7.575	50	4	0.4	55	6.6	810	5.0	2	0	+0.058
1N756D-1	8.2	8.118	8.282	50	5	0.4	50	7.5	740	6.0	1	0	+0.062
1N757D-1	9.1	9.009	9.191	50	6	0.5	45	8.4	650	7.0	1	0	+0.068
1N758D-1	10.0	9.90	10.10	50	7	0.7	40	9.1	540	8.0	1	0	+0.076
1N759D-1	12.0	11.88	12.12	50	10	1.0	35	11.0	400	9.0	1	0	+0.08

## 5. PACKAGING

\* 5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual 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.)

6.1 Intended use. The notes specified in MIL-PRF-19500 are applicable to this specification.

\* 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 3.4.1).
- 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 No. 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 Defense Supply Center, Columbus, ATTN: DSCC/VQE, P.O. Box 3990, Columbus, OH 43216-5000 or e-mail vqe.chief@dla.mil.

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6.4 Cross reference substitution list. Devices required for space flight applications are found in MIL-PRF-19500/533. Existing supplies of parts can be used until existing supplies are exhausted. A PIN for PIN replacement table follows, and these devices are directly interchangeable:

JANS superseded PIN	JANS superseding PIN
1N4370A-1, C-1 or D-1	1N6309, C, D
1N4371A-1, C-1 or D-1	1N6310, C, D
1N4372A-1, C-1 or D-1	1N6311, C, D
1N746A-1, C-1 or D-1	1N6312, C, D
1N747A-1, C-1 or D-1	1N6313, C, D
1N748A-1, C-1 or D-1	1N6314, C, D
1N749A-1, C-1 or D-1	1N6315, C, D
1N750A-1, C-1 or D-1	1N6316, C, D
1N751A-1, C-1 or D-1	1N6317, C, D
1N752A-1, C-1 or D-1	1N6318, C, D
1N753A-1, C-1 or D-1	1N6319, C, D
1N754A-1, C-1 or D-1	1N6320, C, D
1N755A-1, C-1 or D-1	1N6321, C, D
1N756A-1, C-1 or D-1	1N6322, C, D
1N757A-1, C-1 or D-1	1N6323, C, D
1N758A-1, C-1 or D-1	1N6324, C, D
1N759A-1, C-1 or D-1	1N6326, C, D

\* 6.5 Suppliers of JANHC and JANKC die. The qualified JANHC and JANKC die suppliers with the applicable letter version (example JANHCA1N4370A) will be identified on the QML.

JANHC ordering information (1) (2)		
PIN	Manufacture CAGE	
	43611	12954
1N4370	JANHCA1N4370	JANHCB1N4370
1N4371	JANHCA1N4371	JANHCB1N4371
1N4372	JANHCA1N4372	JANHCB1N4372
1N746	JANHCA1N746	JANHCB1N746
1N747	JANHCA1N747	JANHCB1N747
1N748	JANHCA1N748	JANHCB1N748
1N749	JANHCA1N749	JANHCB1N749
1N750	JANHCA1N750	JANHCB1N750
1N751	JANHCA1N751	JANHCB1N751
1N752	JANHCA1N752	JANHCB1N752
1N753	JANHCA1N753	JANHCB1N753
1N754	JANHCA1N754	JANHCB1N754
1N755	JANHCA1N755	JANHCB1N755
1N756	JANHCA1N756	JANHCB1N756
1N757	JANHCA1N757	JANHCB1N757
1N758	JANHCA1N758	JANHCB1N758
1N759	JANHCA1N759	JANHCB1N759

- (1) Suffixes can be "A", "C", or "D".
- (2) Replace "HC" with "KC" when ordering JANKC die.

6.6 Changes from previous issue. The margins of this specification are marked with asterisks to indicate where changes from the previous issue were made. 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 and relationship to the last previous issue.

Custodians:

Army - CR  
Navy - EC  
Air Force - 11  
DLA - CC

Preparing activity:

DLA - CC

Review activities:

Army – AR, AV, MI, SM  
Air Force – 19  
Navy – AS, MC

(Project 5961-2725)

\* 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 <http://www.dodssp.daps.mil>.