INCH-POUND

MIL-PRF-19500/463M
3 March 2021
SUPERSEDING
MIL-PRF-19500/463L
4 February 2016

PERFORMANCE SPECIFICATION SHEET

SEMICONDUCTOR DEVICE, DIODE, SILICON, CURRENT REGULATOR, ENCAPSULATED (THROUGH-HOLE AND SURFACE MOUNT PACKAGES) AND UN-ENCAPSULATED (DIE), TYPES 1N5283 THROUGH 1N5314 AND 1N7048 THROUGH 1N7055, QUALITY LEVELS JAN, JANTX, JANTXV, JANS, JANHC, AND JANKC

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 100 volt, silicon, current regulator diodes (see 6.7). Four levels of product assurance (JAN, JANTX, JANTXV, and JANS) are provided for each encapsulated device type as specified in MIL-PRF-19500. Two levels of product assurance (JANHC and JANKC) are provided for each unencapsulated device type.

1.2 Physical dimensions.

1.2.1 Package outlines. The device package for the encapsulated device types are as follows: Axial leaded DO-204AA (formerly DO-7) in accordance with figure 1, round end cap surface mount version DO-213AB in accordance with figure 2, and unleaded surface mount version UB in accordance with figure 3.

1.2.2 Un-encapsulated die. The dimensions and topography for JANHC and JANKC un-encapsulated die are as follows: A version die in accordance with figure 4 and B version die in accordance with figure 5.

1.3 Maximum ratings. Maximum ratings are as shown in maximum test ratings (see 3.8) and as follows:

a. P_T = 500 mW (DO-7) at T_L = +50 °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 to 0 at +175 °C).

b. P_T = 500 mW (DO-213AB) at T_{EC} = +125 °C. (Derate to 0 at +175 °C).

c. P_T = 500 mW (UB) at T_{SP} = +125 °C. (Derate to 0 at +175 °C)

d. For axial devices: -65 °C ≤ T_J ≤ +175 °C; -65°C ≤ T_{STG} ≤ +175 °C.

For UB devices: -65 °C ≤ T_J ≤ +175 °C; -65 °C ≤ T_{STG} ≤ +175 °C.

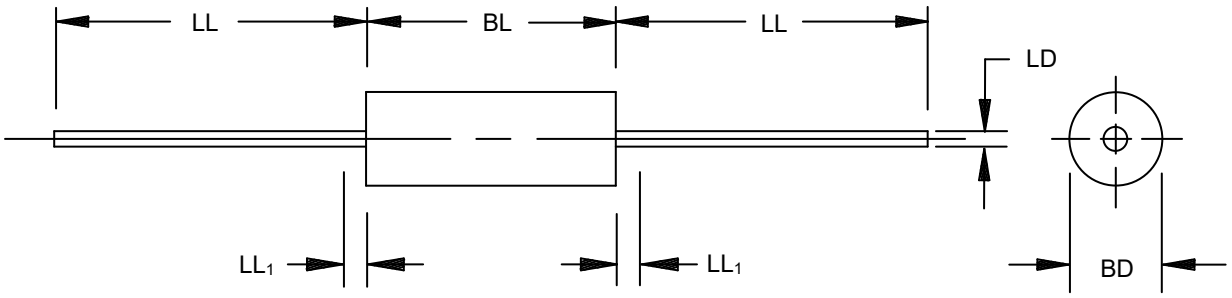
Comments, suggestions, or questions on this document should be addressed to DLA Land and Maritime, ATTN: VAC, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to Semiconductor@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST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

1.4 Primary electrical characteristics. Primary electrical ratings are as shown in maximum test ratings (see 3.8) and as follows, (nominally .22 mA dc ≤ I_S ≤ 4.70 mA dc, (symbol "I_P" may be used in place of symbol "I_S"):

a. $R_{\theta JL}$ = 250 °C/W (maximum) at L = .375 inch (9.53 mm) (DO-204AA).

b. $R_{\theta JEC}$ = 100 °C/W (maximum) junction to end-caps (DO-213AB).

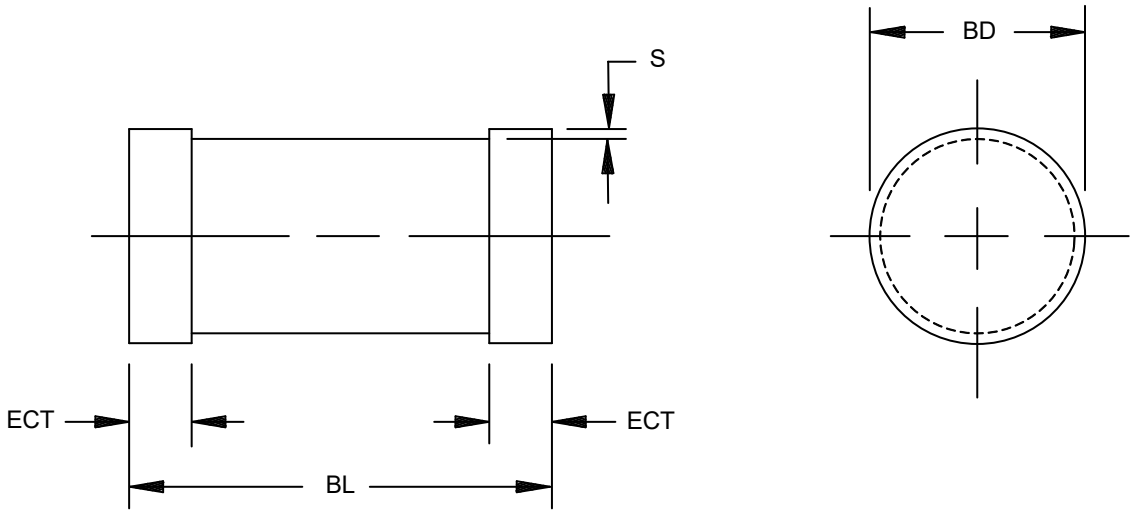
c. $R_{\theta JSP(IS)}$ = 100 °C/W (maximum) junction to solder pad (infinite sink) (UB).



Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
BD	.060	.107	1.52	2.72
BL	.120	.300	3.05	7.62
LD	.018	.023	0.46	0.58
LL	1.000	1.500	25.40	38.10
LL_1		0.050		1.27

NOTES:
1. Dimensions are in inches. Millimeters are given for general information only.
2. Dimensions are pre-solder dip.
3. The minimum body diameter shall be maintained over .15 inch (3.81 mm) inch of body length.
4. The specified lead diameter applies in the zone between .050 inch (1.27 mm) and the end of the lead. Outside of this zone the lead diameter shall not exceed dimension LD.
5. Both leads shall be within the specified dimension.
6. In accordance with ASME Y14.5, diameters are equivalent to Øx symbology.

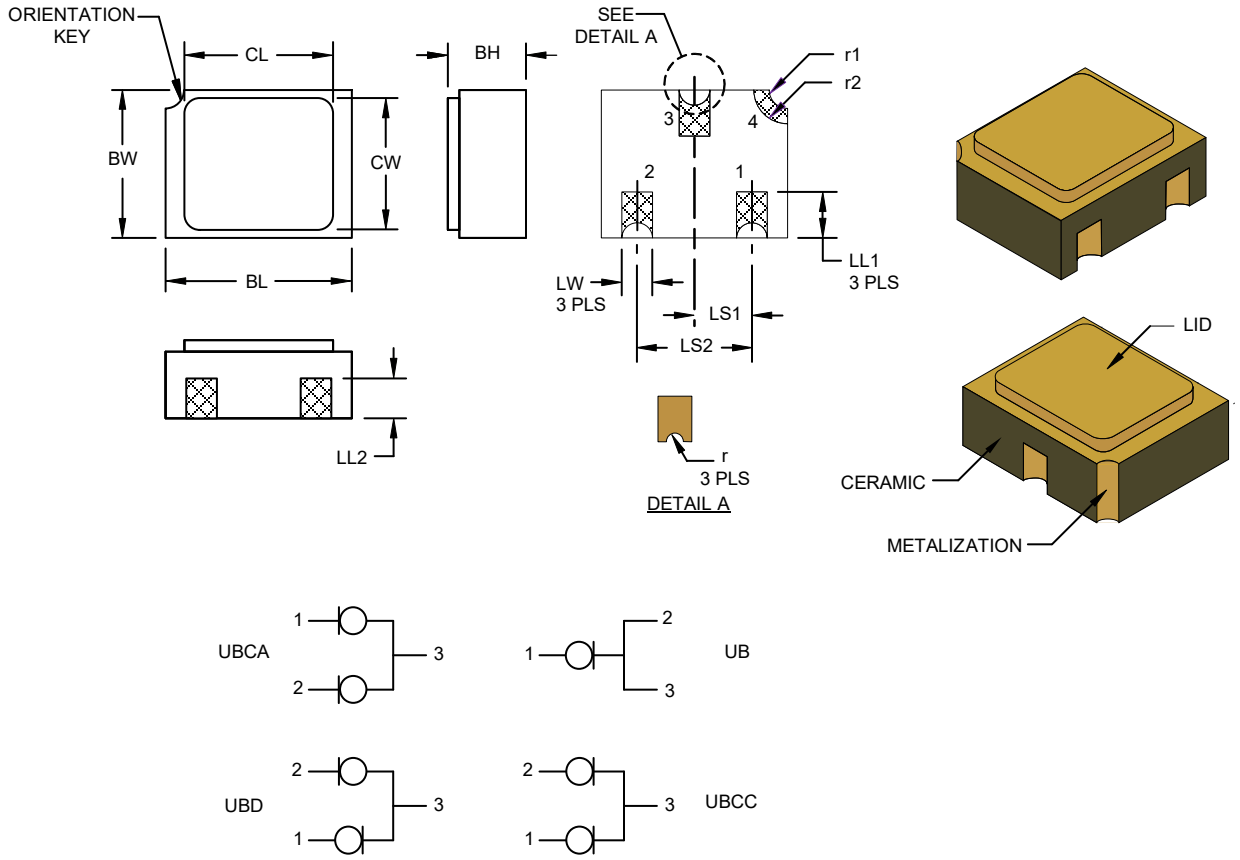
FIGURE 1. Physical dimensions of axial lead package (DO-204AA, formerly DO-7).



Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
BD	.094	.105	2.39	2.67
BL	.189	.205	4.80	5.21
ECT	.016	.022	0.41	0.55
S	.001 min		0.03 min	

NOTES:
1. Dimensions are in inches. Millimeters are given for general information only.
2. Dimensions are pre-solder dip.
3. Dimension S is optional however the glass body diameter shall not exceed endcap diameter.
4. In accordance with ASME Y14.5, diameters are equivalent to Øx symbology.

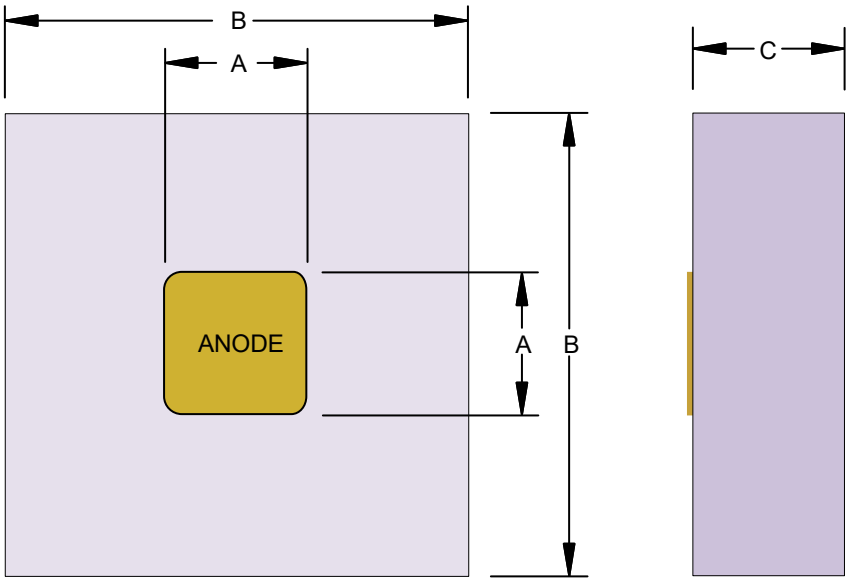
FIGURE 2. Physical dimensions of round end cap surface mount package (DO-213AB).



Symbol	Dimensions				Symbol	Dimensions			
	Inches		Millimeters			Inches		Millimeters	
	Min	Max	Min	Max		Min	Max	Min	Max
BH	.046	.056	1.17	1.42	LS1	.035	.039	0.89	0.99
BL	.115	.128	2.92	3.25	LS2	.071	.079	1.80	2.01
BW	.085	.108	2.16	2.74	LW	.016	.024	0.41	0.61
CL		.128		3.25	r		.008		0.20
CW		.108		2.74	r1		.012		0.31
LL1	.022	.038	0.56	0.97	r2		.022		0.56
LL2	.017	.035	0.43	0.89					

NOTES:
1. Dimensions are in inches. Millimeters are given for general information only.
2. Ceramic package only.
3. Hatched areas on package denote metallized areas. Pad 4 = shielding, connected to the lid.
4. Dimensions are pre-solder dip.
5. In accordance with ASME Y14.5, diameters are equivalent to Øx symbology.

FIGURE 3. Physical dimensions of surface mount package (UB version).



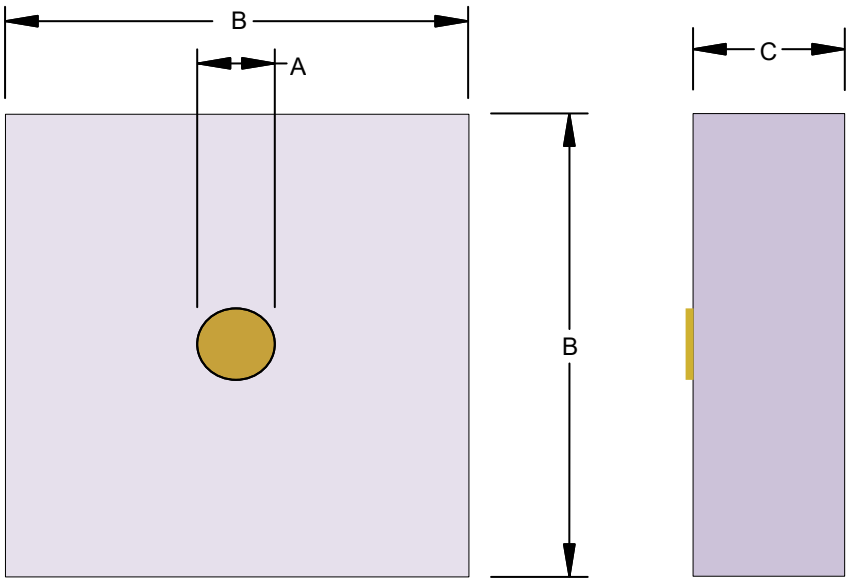
Letter	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	.012	.014	0.305	0.355
B	.026	.030	0.660	0.762
C	.008	.012	0.203	0.305

Design data

Metallization:
Top: (Anode) ..... Al
Back: (Cathode) .... Au
Al thickness ..... 25000 Å Min
Gold thickness ..... 4000 Å Min

NOTES:
1. Dimensions are in inches. Millimeters are given for general information only.
2. In accordance with ASME Y14.5, diameters are equivalent to Øx symbology.

FIGURE 4. Physical dimensions, version A die (JANHCA and JANKCA).



Letter	Inches		Millimeters	
	Min	Max	Min	Max
A	.006	.007	0.152	0.178
B	.022	.026	0.559	0.660
C	.008	.012	0.203	0.305

Design data

Metallization:
Top: (Anode) ..... Al
Back: (Cathode) .... Au
Al thickness ..... 25000 Å Min
Gold thickness ..... 4000 Å Min

NOTES:
1. Dimensions are in inches. Millimeters are given for general information only.
2. In accordance with ASME Y14.5, diameters are equivalent to Øx symbology.

FIGURE 5. Physical dimensions, version B die (JANHCB and JANKCB).

1.5 Part or Identifying Number (PIN). The PIN is in accordance with MIL–PRF–19500, and as specified herein. See 6.4 for PIN construction example and 6.5 for a list of available PINs.

1.5.1 JAN certification mark and quality level.

1.5.1.1 Quality level designators for encapsulated devices. The quality level designators for encapsulated devices that are applicable for this specification sheet from the lowest to the highest level are as follows: "JAN", "JANTX", "JANTXV", and "JANS".

1.5.1.2 Quality level designators for unencapsulated devices (die). The quality level designators for unencapsulated devices (die) that are applicable for this specification sheet from the lowest to the highest level are as follows: "JANHC" and "JANKC".

1.5.2 Device type. The designation system for the device types covered by this specification sheet are as follows.

1.5.2.1 First number and first letter symbols. The diode of this specification sheet use the first number and letter symbols "1N".

1.5.2.2 Second number symbols. The second number symbols covered by this specification sheet are as follows: "5283" through "5314", and "7048" through "7055".

1.5.3 Suffix symbols. The following suffix symbols are incorporated in the PIN as applicable.

1.5.3.1 Package designator. The suffix symbols that designate the package outline for the devices covered by this specification sheet are as follows:

-1	Indicates a axial leaded DO-204AA package (see figure 1) using a high temperature metallurgical bond of type I or II (see 3.4.2 and 6.6 herein).
UR-1	Indicates a surface mount, round endcap, package (see figure 2).
UB	Indicates a surface mount UB package (see figure 3).

1.5.3.2 Internal schematic designator (UB package only). The suffix symbol(s) that designate different internal schematics for UB packages of devices covered by this specification sheet are as follows:

Blank	No designator (blank) identifies a single diode internal circuit configuration.
CA	This designator identifies a dual diode, common anode internal circuit schematic configuration.
CC	This designator identifies a dual diode, common cathode internal circuit schematic configuration.
D	This designator identifies a dual diode, doubler internal circuit schematic configuration.

1.5.4 Lead finish. The lead finishes applicable to this specification sheet are listed on QPDSIS-19500.

1.5.5 Die identifiers for unencapsulated devices (manufacturers and critical interface identifiers). The manufacturer die identifiers that are applicable for this specification sheet are "A" and "B" (see figures 4, 5 and 6.5.2).

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 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 and 4 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 https://quicksearch.dla.mil.)

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 manufacturers list (QML) before contract award (see 4.2 and 6.3).

3.3 Abbreviations, symbols, and definitions. Abbreviations, symbols, and definitions shall be as specified in MIL-PRF-19500 and as follows:

I_P	Pinch-off current. I_P pinch-off current is defined as the regulator current at specified test voltage, V_S.
ΔI_P	Regulator current variation.
α_{IP}	Temperature coefficient of regulator current.
I_S	Pinch-off current. I_S pinch-off current is defined as the regulator current at specified test voltage, V_S. I_S is the preferred symbol, however I_P may be used as an alternate symbol.
ΔI_S	Regulator current variation. ΔI_S is the preferred symbol, however symbol ΔI_P may be used as an alternate symbol.
α_{IS}	Temperature coefficient of regulator current. α_{IS} is the preferred symbol, however symbol α_{IP} may be used as an alternate symbol.
L	Lead thermal path length. Lead thermal path length is the distance from the end of the diode body to the point of lead-temperature measurement. For purposes of this measurement, the same heat sinking at the same distance from the diode body shall be applied to each lead. No heat sinking shall occur between the diode body and the point of lead-temperature measurement. This measurement may be made from either end of the diode body. (The diode body includes slugs, if any, but does not include braze fillet, paint, etc., within the zone of uncontrollable lead diameter.)
P_D	Steady-state power dissipation. Power dissipated under steady-state conditions.
T_L	Lead temperature. Lead temperature is the temperature of the lead measured at the lead thermal path length, L. Lead temperature shall be measured by means of a No. 30 copper-constantan thermocouple, or equivalent. All reference to T_L is changed to T_{EC} for end cap temperature on "UR" devices and T_{SP} for solder pad temperature on "UB" devices.
V_{POV}	Peak operating voltage. Peak operating voltage is the maximum voltage that shall be applied to the device.

3.4 Interface and physical dimensions. Interface and physical dimensions shall be as specified in MIL-PRF-19500, figures 1 (DO-204AA), 2 (DO-213AB), 3 (UB), 4 (JANHCA and JANKC die), and 5 (JANKCB and JANKCB) herein.

3.4.1 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).

3.4.2 Diode construction. These devices shall be constructed in a manner and using materials which enable the diodes to meet the applicable requirements of MIL-PRF-19500 and this document. For normal operation, the cathode is biased negative for normal operation as a current regulator (see figure 6).

a. The dash one axial leaded versions shall be of double plug construction utilizing high temperature metallurgical bonding between both sides of the silicon die and terminal pins. The metallurgical bond shall be in accordance with the requirements of category I or II in appendix A of MIL-PRF-19500.

b. The 'UB' devices shall be eutectically mounted and wire bonded in a ceramic package.

c. The 'UR' version shall be structurally identical to the axial leaded versions except for end-cap lead attachment.

3.4.3 Encapsulant material. In addition to those categories of hermetically sealed package requirements specified in MIL-PRF-19500, fused-metal-oxide to metal shall also be acceptable.

3.5 Marking. Marking shall be in accordance with MIL-PRF-19500. Manufacturers identification and date code shall be marked on the devices. No color coding shall be permitted for part identification marking. Initial container unit package marking shall be in accordance with MIL-PRF-19500. The prefixes JAN, JANTX, JANTXV, and JANS can be abbreviated as J, JX, JV, and JS respectively. (For example: The part identification marking may be reduced to J5314, JX5314, JV5314 or JS5314). All device PIN marking, except for polarity and serial numbers, shall appear on the unit package used as the initial protection for delivery.

3.5.1 UR devices. At the option of the manufacturer, 'UR' devices may include laser marking on an end-cap, to include the PIN and lot date code for all quality levels. JANS devices which are laser marked shall also include serialization.

3.5.2 Polarity. The polarity of axial leaded and UR devices shall be indicated with a contrasting color band to denote the cathode end. Alternatively, for UR devices, a minimum of three contrasting color dots spaced around the periphery on the cathode end may be used. 'UB' devices do not require polarity marking.

3.6 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in 1.3, 1.4, and table I and the electrical characteristics table herein.

3.7 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table I herein.

3.8 Maximum test ratings. Test ratings shall be as shown in the electrical characteristics table (table II).

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).

d. Element evaluation (see 4.6).

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 inspection shall be performed for qualification or re-qualification only. In case qualification was awarded to a prior revision of the specification sheet that did not request the performance of group E tests, the tests specified in 4.4.4 herein shall be performed on the first inspection lot to this revision to maintain qualification.

4.2.2 JANHC and JANKC devices. Qualification for un-encapsulated die shall be in accordance with appendix G of MIL-PRF-19500.

4.3 Screening (quality levels JAN, JANTXV, JANTX, and JANS 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	Measurement		
	JANS	JANTX and JANTXV levels	JAN level (1)
3a	Temperature cycling	Temperature cycling	Temperature cycling (in accordance with MIL-PRF-19500, JANTX level)
(2) 3c	Thermal impedance (see 4.3.2)	Thermal impedance (see 4.3.2)	Thermal impedance (see 4.3.2)
9	I_{S1} (3)	Not applicable	Not applicable
10	V_{POV} = Col 11 of table II at T_A = +25 °C; t = 48 hours	V_{POV} = Col 11 of table II at T_A = +25 °C; t = 48 hours	V_{POV} = Col 11 of table II at T_A = +25 °C; t = 48 hours
11	Subgroup 2 of table I herein $\Delta I_{S1} \leq$ 5 percent of initial value. (4)	Subgroup 2 of table I herein	Subgroup 2 of table I herein
12	See 4.3.1	See 4.3.1	Not applicable
(5) 13	Subgroup 2 of table I herein; $\Delta I_{S1} \leq$ 5 percent of initial value. (4)	Subgroup 2 of table I herein; $\Delta I_{S1} \leq$ 5 percent of initial value. (4)	Not applicable

(1) Screens 3a, 3c, 10, and 11 are the only screens required for quality level JAN devices.
(2) Thermal impedance shall be performed any time after temperature cycling, screen 3a. Quality levels JANTX and JANTXV levels do not need to be repeated in screening requirements.
(3) Symbol "I_{P1}" may be used in place of "I_{S1}".
(4) Symbol "ΔI_{P1}" may be used in place of "ΔI_{S1}".
(5) When thermal impedance is performed prior to screen 13, it is not required to be repeated in screen 13.

4.3.1 Power burn-in conditions. Power burn-in shall be in accordance with the mounting and tests of condition B of method 1038 of MIL-STD-750. The following conditions shall apply: I_R = 200 mA dc minimum; T_{EC} = +75 °C to +125 °C for 'UR' surface mount devices. T_A = room ambient as defined in the general requirements of 4.5 of MIL-STD-750.

4.3.2 Thermal impedance measurements. The thermal impedance measurements shall be performed in accordance with method 3101 of MIL-STD-750, (V_R to be used in lieu of V_F). The details of 4.5.1 and those that follow shall apply:

a. I_M measurement current — 1 mA to 10 mA.

b. I_H forward heating current — .5 A to 1.0 A.

c. t_H heating time — 10 ms.

d. t_{MD} measurement delay time — 70 µs maximum.

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 herein.

4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in tables E-VIA (for quality level JANS) and E-VIB (for quality levels JAN, JANTX and JANTXV) of MIL-PRF-19500, and as follows.

4.4.2.1 Quality level JANS (table E-VIA of MIL-PRF-19500).

Subgroup	Method	Condition
B4	1037	2,000 cycles; t_{on} = t_{off} 30 seconds minimum.
B5	1027	I_R = 200 mA dc; T_A = +125 °C or adjusted as required to give an average lot T_J = +175 °C. Marking legibility requirements shall not apply.

4.4.2.2 Quality levels JAN, JANTX and JANTXV (table E- VIB of MIL-PRF-19500).

Subgroup	Method	Condition
B3	1027	V_{POV} = Col 11 of table II; T_A = +25 °C; L = .375 inch (9.53 mm) (non-surface mount), L = 0 inch for surface mount (UR and UB).
B5		Not applicable.
B6	1032	T_A = +175 °C.

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.

Subgroup	Method	Condition
C2	2036	Axial devices - Tension: test condition A; weight = 10 pounds (4.54 Kg), t = 15 s; lead fatigue = condition E (not applicable to 'UR' suffix types).
C5	3101 or 4081	$R_{\theta JL}$ at L = .375 inch (9.52 mm) ≤ 250 °C/W. $R_{\theta JEC}$ at L = 0 lead length ≤ 100 °C/W, see 4.5.2. $R_{\theta JEC}$ = 100 °C/W (maximum) at zero lead length (for UR). $R_{\theta JSP(IS)}$ = 100 °C/W (maximum) (for UB). $R_{\theta JSP(IS)}$ can be calculated but shall be measured once in the same package with a similar die size to confirm calculations (may apply to multiple specification sheets).
C6	1026	V_{POV} = Col 11 of table II; T_A = +25 °C; L = .375 inch (9.53 mm) (non-surface mount), L = 0 inch for surface mount (UR and UB).
C8		See 4.5.3; sampling plan: 22 devices, c = 0.

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.

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

4.5.1 Thermal impedance. The following details shall apply for thermal impedance testing.

4.5.1.1 For screening. The maximum thermal impedance limit (not to exceed the table I, subgroup 2 limit) shall be derived by each vendor by means of statistical process control. When the process has exhibited control and capability, the capability data shall be used to establish the fixed thermal impedance limit.

4.5.1.2 For conformance inspection. After a fixed thermal impedance limit has been established, all future sealing lots shall be monitored using a random sample of 5 devices from each lot to be plotted on the applicable $\overline{X}$, R chart. 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.

4.5.1.3 For initial qualification or requalification. Thermal impedance read and record data shall be supplied to the qualifying activity on one lot (random sample of 500 devices minimum) prior to shipment. A sample of 22 devices shall be serialized and provided to the qualifying activity for test correlation.

4.5.2 Thermal resistance. Thermal resistance measurement shall be in accordance with method 3101 or 4081 of MIL-STD-750.

4.5.2.1 For conformance inspection. 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 °C/W, $R_{\theta JEC}$ = 100 °C/W or $R_{\theta JSP(IS)}$ = 100 °C/W. The following conditions shall apply:

a. I_H 200 mA to 400 mA.

b. I_M 1 mA to 10 mA.

c. t_H 30 seconds minimum.

d. t_{MD} 70 µs maximum.

4.5.2.2 For initial qualifications and re-qualifications. Read and record data in accordance with 4.5.1.3 herein and shall be included in the qualification report.

4.5.3 Temperature coefficient of regulator current.

4.5.3.1 Testing conditions. The temperature coefficient of regulator current shall be tested under the following conditions:

a. Test 1: V_S = 25 V dc, T_{L1} = -55 °C, T_{L2} = +25 °C, L = .375 inch (9.53 mm) (non-surface mount), L = 0 inch (surface mount) (see 3.3 and 4.5.3.2) with the maximum limit in accordance with column 8 of table II herein.

b. Test 2: V_S = 25 V dc, T_{L1} = +25 °C, T_{L2} = +150 °C, L = .375 inch (9.53 mm) (non-surface mount), L = 0 inch (surface mount) (see 3.3 and 4.5.3.2) with the maximum limit in accordance with column 9 of table II herein.

4.5.3.2 Equation for calculating temperature coefficient of regulator current (α_{IS}). The temperature coefficient of regulator current shall be calculated as follows:

$$\alpha_{IS} = \frac{I_S(T_{L2}) - I_S T_{L1}}{I_S(T_L = +25°C)\Delta T_L} \text{ X } 100$$

4.5.3.3 Alternate equation for calculating temperature coefficient of regulator current (α_{IS}). Temperature coefficient of regulator current is allowed to also be calculated as follows:

$$\alpha_{IS} = \frac{I_P(T_{L2}) - I_P(T_{L1})}{I_P(T_L = +25°C)\Delta T_L} \text{ X } 100$$

4.5.4 Regulator current. The regulator current shall be tested using the procedure and test circuit of figure 6 and the following conditions: T_L = +30 °C ±3 °C; the pulse measurement (t) shall be as follows:

a. For types 1N5283-1 through 1N5314-1: t = 90 s or thermal equilibrium.

b. For types 1N7048-1 through 1N7055-1: t = 10 ms maximum.

The device is acceptable if the regulator current falls within the limits specified.

4.5.5 Limiting voltage. The limiting voltage test shall be performed using the procedure and test circuit of figure 7. The device is acceptable if the limiting voltage is less than the limit specified.

4.5.6 Regulator impedance (Z_S) at test voltage V_S. The regulator impedance test shall be performed using the procedure and test circuit of figure 8 . The value for Z_S shall be calculated using the following equation:

$$Z_S = V_{S(mod)} \text{ x } (R_1 / V_{ac})$$

Where:
$V_{S(mod)}$ = a 90 Hz ac signal with rms value equal to 10 percent of test voltage V_S.
V_{ac} = the voltage across R_1.

The device is acceptable if the regulator impedance is greater than or equal to the specified minimum limit.

4.5.7 Knee impedance (Z_k) at test voltage V_K. The knee impedance test shall be performed using the procedure and test circuit of figure 9. The value for Z_K shall be calculated using the following equation:

$$Z_K = V_{K(mod)} \text{ x } (R_1 / V_{ac})$$

Where:
$V_{K(mod)}$ = a 90 Hz ac signal with rms value equal to 10 percent of test voltage V_K.
V_{ac} = the voltage across R_1.

The device is acceptable if the knee impedance is greater than or equal to the specified minimum limit.

4.6 Element evaluation of un-encapsulated die. The element evaluation of un-encapsulated die shall be in accordance with appendix G of MIL-PRF-19500. The element evaluation may be accomplished utilizing a TO-205 package in lieu of the DO-204, DO-213, or UB packages.

TABLE I. Group A inspection.

Inspection 1/	MIL-STD-750		Symbol	Limit 2/		Unit
	Method	Conditions		Min	Max	
Subgroup 1						
Visual and mechanical examination	2071					
Subgroup 2						
Regulator current		See 4.5.4; V_S = 25 V dc	I_{S1} 3/	Column 3	Column 4	mA dc
Limiting voltage		See 4.5.5	V_L		Column 7	V dc
Reverse voltage		I_R = 200 mA	V_R		2.5	V dc
Thermal impedance	3101	See 4.3.2 Axial and US UB	 $Z_{\theta JX}$ $Z_{\theta JX}$		 25 40	 °C/W °C/W
Subgroup 3						
Not applicable						
Subgroup 4						
Regulator impedance		See 4.5.6; V_S = 25 V dc	Z_S	Column 5		MΩ
Knee impedance		See 4.5.7; V_K = 6.0 V dc	Z_k	Column 6		MΩ
Subgroups 5 and 6						
Not applicable						
Subgroup 7						
Regulator current		See 4.5.4; V_S = column 11 of table II	I_{S2} 4/		Column 10	mA dc

1/ For sampling plan, see MIL-PRF-19500.
2/ Column references are to table II herein.
3/ Symbol "I_{P1}" may be used in place of "I_{S1}".
4/ Symbol "I_{P2}" may be used in place of "I_{S2}".

TABLE II. Electrical characteristics. 1/

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8		Col 9		Col 10	Col 11
Type (Electrical characteristics for "UR", "UB", and "-1" suffix devices are identical.)	I_{S1} regulator current (mA) at V_S = 25 V 2/			Z_S minimum regulator impedance at V_S = 25 V	Z_k minimum knee impedance at V_K = 6 V	V_L maximum limiting voltage at I_L = 0.8 I_{S1} (min) 2/	α_{IS} maximum regulator current T_C at V_S = 25V		α_{IS} maximum regulator current T_C at V_S = 25V		I_{S2} regulator current (mA) at V_S = Col 11 3/	V_{POV} peak operating volts (DC)
							-55°C	+25°C	+25°C	+150°C		
							(%/°C)		(%/°C)			
	Nom	Min	Max	MΩ	MΩ	Volts	Min	Max	Min	Max	Max	Volts
1N5283-1	0.22	0.198	0.242	25.0	2.75	1.00	-.20	1.15	-.16	0.60	.27	100
1N5284-1	0.24	0.216	0.264	19.0	2.35	1.00	-.20	1.05	-.20	0.56	.30	100
1N5285-1	0.27	0.243	0.297	14.0	1.95	1.00	-.30	0.95	-.22	0.48	.33	100
1N5286-1	0.30	0.270	0.330	9.0	1.60	1.00	-.35	0.85	-.25	0.42	.36	100
1N5287-1	0.33	0.297	0.363	6.6	1.35	1.00	-.40	0.75	-.26	0.37	.40	100
1N5288-1	0.39	0.351	0.429	4.10	1.00	1.05	-.50	0.62	-.30	0.28	.47	100
1N5289-1	0.43	0.387	0.473	3.30	0.870	1.05	-.52	0.55	-.32	0.23	.52	100
1N5290-1	0.47	0.423	0.517	2.70	0.750	1.05	-.55	0.50	-.33	0.18	.57	100
1N5291-1	0.56	0.504	0.616	1.90	0.560	1.10	-.60	0.35	-.36	0.10	.68	100
1N5292-1	0.62	0.558	0.682	1.55	0.470	1.13	-.62	0.25	-.37	0.05	.75	100
1N5293-1	0.68	0.612	0.748	1.35	0.400	1.15	-.65	0.20	-.38	0.02	.82	100
1N5294-1	0.75	0.675	0.825	1.15	0.335	1.20	-.70	0.15	-.40	-.03	.91	100
1N5295-1	0.82	0.738	0.902	1.00	0.290	1.25	-.72	0.07	-.41	-.07	.99	100
1N5296-1	0.91	0.819	1.001	0.880	0.240	1.29	-.76	0.0	-.42	-.10	1.10	100
1N5297-1	1.00	0.900	1.100	0.800	0.205	1.35	-.78	0.05	-.44	-.10	1.21	100
1N5298-1	1.10	0.990	1.210	0.700	0.180	1.40	-.80	-.10	-.46	-.10	1.33	100
1N5299-1	1.20	1.08	1.32	0.640	0.155	1.45	-.83	-.15	-.47	-.10	1.45	100
1N5300-1	1.30	1.17	1.43	0.580	0.135	1.50	-.85	-.20	-.48	-.10	1.57	100
1N5301-1	1.40	1.26	1.54	0.540	0.115	1.55	-.88	-.20	-.49	-.10	1.69	100
1N5302-1	1.50	1.35	1.65	0.510	0.105	1.60	-.90	-.20	-.50	-.10	1.81	100

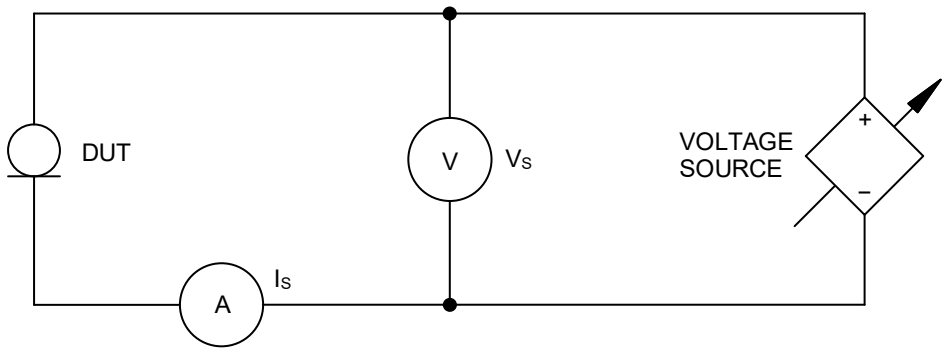
TABLE II. Electrical characteristics - Continued. 1/

Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8		Col 9		Col 10	Col 11
Type (Electrical characteristics for "UR", "UB", and "-1" suffix devices are identical)	I_{S1} regulator current (mA) at V_S = 25 V 2/			Z_S minimum regulator impedance at V_S = 25 V	Z_k minimum knee impedance at V_K = 6 V	V_L maximum limiting voltage at I_L = 0.8 I_{S1} (min) 2/	αIS maximum regulator current T_C at V_S = 25V		αIS maximum regulator current T_C at V_S = 25V		I_{S2} regulator current (mA) at V_S = Col 11 3/	V_{POV} peak operating volts (DC)
							-55°C	+25°C	+25°C	+150°C		
							(%/°C)		(%/°C)			
	Nom	Min	Max	MΩ	MΩ	Volts	Min	Max	Min	Max	Max	Volts
1N5303-1	1.60	1.44	1.76	0.475	0.092	1.65	-.90	-.20	-.50	-.10	1.92	100
1N5304-1	1.80	1.62	1.98	0.420	0.074	1.75	-.92	-.20	-.51	-.10	2.18	100
1N5305-1	2.00	1.80	2.20	0.395	0.061	1.85	-.95	-.20	-.52	-.10	2.42	100
1N5306-1	2.20	1.98	2.42	0.370	0.052	1.95	-.96	-.20	-.52	-.10	2.66	100
1N5307-1	2.40	2.16	2.64	0.345	0.044	2.00	-.98	-.20	-.53	-.10	2.90	100
1N5308-1	2.70	2.43	2.97	0.320	0.035	2.15	-1.0	-.20	-.53	-.10	3.27	100
1N5309-1	3.00	2.70	3.30	0.300	0.029	2.25	-1.01	-.20	-.53	-.10	3.63	100
1N5310-1	3.30	2.97	3.63	0.280	0.024	2.35	-1.02	-.20	-.54	-.10	3.99	100
1N5311-1	3.60	3.24	3.96	0.265	0.020	2.50	-1.03	-.20	-.54	-.10	4.36	100
1N5312-1	3.90	3.51	4.29	0.255	0.017	2.60	-1.04	-.20	-.55	-.10	4.72	100
1N5313-1	4.30	3.87	4.73	0.245	0.014	2.75	-1.05	-.20	-.55	-.10	5.20	100
1N5314-1	4.70	4.23	5.17	0.235	0.012	2.90	-1.06	-.20	-.55	-.10	5.69	100
1N7048-1	5.1	4.59	5.61	0.100	0.004	3.67	-1.06	-.20	-.55	-.10	6.89	80
1N7049-1	5.6	5.04	6.16	0.090	0.004	4.03	-1.06	-.20	-.55	-.10	7.54	80
1N7050-1	6.2	5.58	6.82	0.080	0.003	4.46	-1.06	-.20	-.55	-.10	8.38	70
1N7051-1	6.8	6.12	7.48	0.070	0.002	4.90	-1.06	-.20	-.55	-.10	9.20	70
1N7052-1	7.5	6.75	8.25	0.050	0.0015	5.40	-1.06	-.20	-.55	-.10	10.20	60
1N7053-1	8.2	7.38	9.02	0.030	0.0015	5.90	-1.06	-.20	-.55	-.10	11.20	60
1N7054-1	9.1	8.19	10.01	0.020	0.001	6.55	-1.06	-.20	-.55	-.10	12.40	50
1N7055-1	10.0	9.00	11.10	0.010	0.001	7.20	-1.06	-.20	-.55	-.10	14.40	50

1/ Electrical characteristics are for all package styles.
2/ Symbol "I_{P1}" may be used in place of "I_{S1}".
3/ Symbol "I_{P2}" may be used in place of "I_{S2}".

TABLE III. Group E inspection qualification and requalification (all product assurance levels).

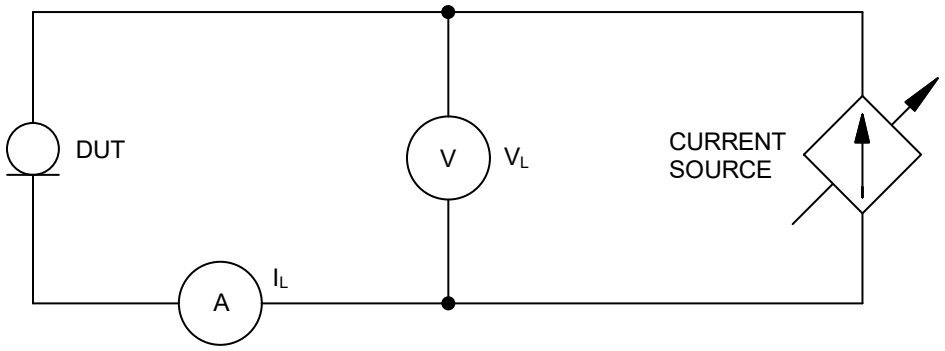
Inspection	MIL-STD-750		Sampling plan
	Method	Conditions	
Subgroup 1			45 devices, c = 0
Temperature cycling (air to air)	1051	500 cycles.	
Electrical measurements		See table I, subgroup 2 herein.	
Subgroup 2			45 devices, c = 0
Intermittent operating life	1037	6,000 cycles; $t_{on} = t_{off} = 30$ seconds minimum.	
Subgroups 4			
Thermal impedance curves		See table E-IX of MIL-PRF-19500, subgroup 4.	
Subgroup 6			
ESD	1020	As applicable.	



PROCEDURE:
1. Adjust voltage source so that V_S = 25 V dc.
2. Measure regulator current I_S.
3. The device is acceptable if the regulator current falls within the limits specified.

NOTES:
1. Symbol "I_{P1}" or "I_{P2}" may be used in place of "I_{S1}" or "I_{S2}".
2. The ammeter shall represent essentially a short-circuit to the terminals between which the current is being measured. If not, the voltmeter reading shall be corrected for the drop across the ammeter.

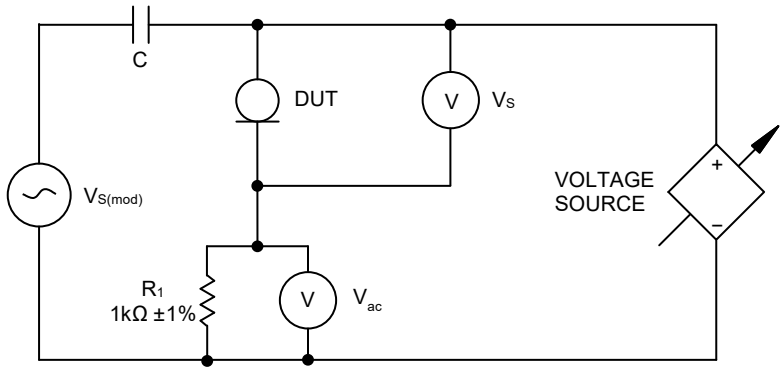
FIGURE 6. Regulator current test circuit.



PROCEDURE:
1. Adjust current source so that I_L = 0.8 $I_{S1(min)}$ where $I_{S1(min)}$ is in accordance with column 3 of table II.
2. Measure limiting voltage V_L.
3. The device is acceptable if the limiting voltage is less than the limit specified.

NOTES:
1. Symbol "I_{P1}" may be used in place of "I_{S1}".
2. The ammeter shall represent essentially a short-circuit to the terminals between which the current is being measured. If not, the voltmeter reading shall be corrected for the drop across the ammeter.

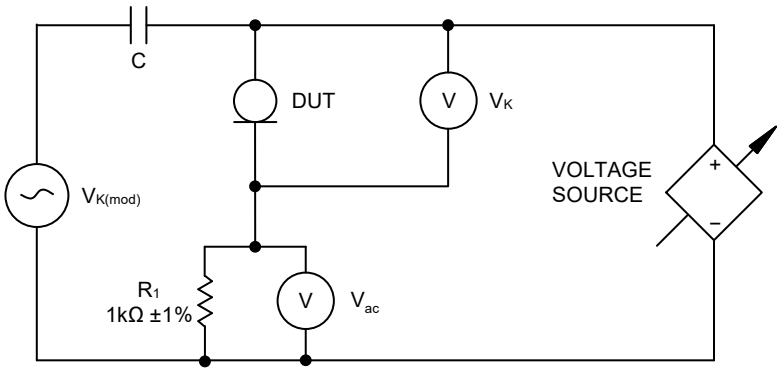
FIGURE 7. Limiting voltage test circuit.



PROCEDURE:
1. Adjust voltage source so that test voltage V_S = 25 V dc.
2. Apply $V_{S(mod)}$ through an isolating capacitor C.
3. Measure the ac rms voltage V_{ac}.

NOTES
1. Calculate Z_S in accordance with 4.5.6.
2. The voltage meter across R_1 shall be capable of measuring mV.

FIGURE 8. Regulator impedance test circuit.



PROCEDURE:
1. Adjust voltage source so that test voltage V_K = 6.0 V dc.
2. Apply $V_{K(mod)}$, through an isolating capacitor C.
3. Measure the ac rms voltage V_{ac}.

NOTES:
1. Calculate Z_K in accordance with 4.5.7.
2. The voltage meter across R_1 shall be capable of measuring mV.

FIGURE 9. Knee impedance test circuit.

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 devices 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).

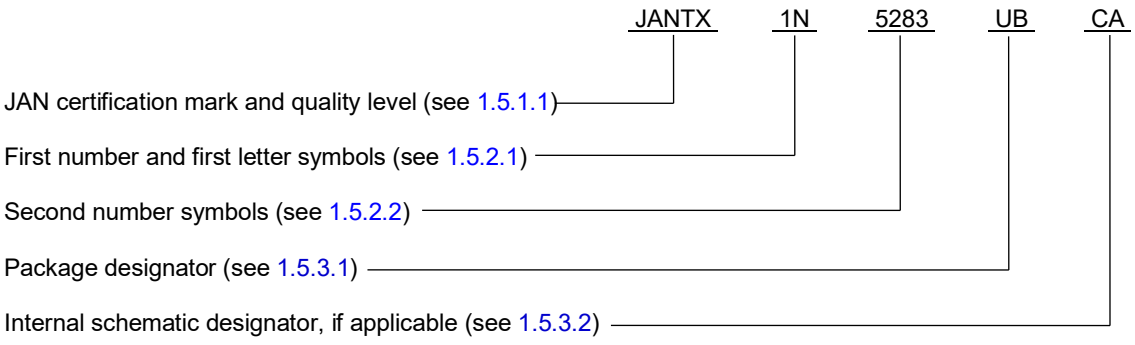
c. Lead finish (see 3.4.1).

d. The complete PIN, see 1.5 and 6.4.

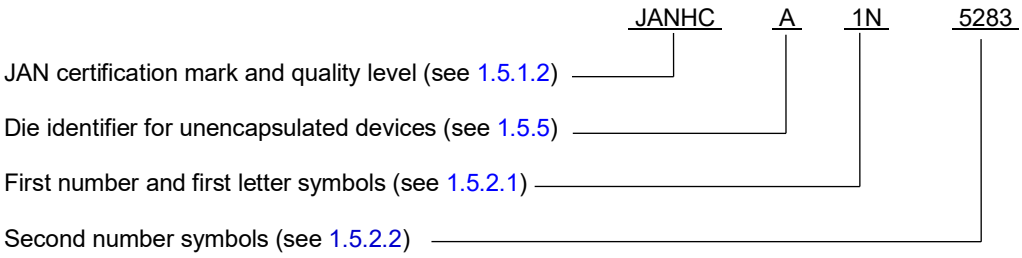
6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List (QML 19500) whether or not such products have actually been so listed by that date. The attention 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. An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at https://qpldocs.dla.mil.

6.4 PIN construction examples.

6.4.1 Encapsulated devices The PINs for encapsulated devices are constructed using the following form.



6.4.2 Un-encapsulated devices. The PINs for un-encapsulated devices are constructed using the following form.



6.5 List of PINs.

6.5.1 List of PINs for encapsulated devices. The following is a list of possible PINs for encapsulated devices available on this specification sheet.

PINs for devices of the base quality level (1)				PINs for devices of the "TX" quality level (1)		
JAN1N5283-1	JAN1N5283UR-1	JAN1N5283UB		JANTX1N5283-1	JANTX1N5283UR-1	JANTX1N5283UB
JAN1N5284-1	JAN1N5284UR-1	JAN1N5284UB		JANTX1N5284-1	JANTX1N5284UR-1	JANTX1N5284UB
JAN1N5285-1	JAN1N5285UR-1	JAN1N5285UB		JANTX1N5285-1	JANTX1N5285UR-1	JANTX1N5285UB
JAN1N5286-1	JAN1N5286UR-1	JAN1N5286UB		JANTX1N5286-1	JANTX1N5286UR-1	JANTX1N5286UB
JAN1N5287-1	JAN1N5287UR-1	JAN1N5287UB		JANTX1N5287-1	JANTX1N5287UR-1	JANTX1N5287UB
JAN1N5288-1	JAN1N5288UR-1	JAN1N5288UB		JANTX1N5288-1	JANTX1N5288UR-1	JANTX1N5288UB
JAN1N5289-1	JAN1N5289UR-1	JAN1N5289UB		JANTX1N5289-1	JANTX1N5289UR-1	JANTX1N5289UB
JAN1N5290-1	JAN1N5290UR-1	JAN1N5290UB		JANTX1N5290-1	JANTX1N5290UR-1	JANTX1N5290UB
JAN1N5291-1	JAN1N5291UR-1	JAN1N5291UB		JANTX1N5291-1	JANTX1N5291UR-1	JANTX1N5291UB
JAN1N5292-1	JAN1N5292UR-1	JAN1N5292UB		JANTX1N5292-1	JANTX1N5292UR-1	JANTX1N5292UB
JAN1N5293-1	JAN1N5293UR-1	JAN1N5293UB		JANTX1N5293-1	JANTX1N5293UR-1	JANTX1N5293UB
JAN1N5294-1	JAN1N5294UR-1	JAN1N5294UB		JANTX1N5294-1	JANTX1N5294UR-1	JANTX1N5294UB
JAN1N5295-1	JAN1N5295UR-1	JAN1N5295UB		JANTX1N5295-1	JANTX1N5295UR-1	JANTX1N5295UB
JAN1N5296-1	JAN1N5296UR-1	JAN1N5296UB		JANTX1N5296-1	JANTX1N5296UR-1	JANTX1N5296UB
JAN1N5297-1	JAN1N5297UR-1	JAN1N5297UB		JANTX1N5297-1	JANTX1N5297UR-1	JANTX1N5297UB
JAN1N5298-1	JAN1N5298UR-1	JAN1N5298UB		JANTX1N5298-1	JANTX1N5298UR-1	JANTX1N5298UB
JAN1N5299-1	JAN1N5299UR-1	JAN1N5299UB		JANTX1N5299-1	JANTX1N5299UR-1	JANTX1N5299UB
JAN1N5300-1	JAN1N5300UR-1	JAN1N5300UB		JANTX1N5300-1	JANTX1N5300UR-1	JANTX1N5300UB
JAN1N5301-1	JAN1N5301UR-1	JAN1N5301UB		JANTX1N5301-1	JANTX1N5301UR-1	JANTX1N5301UB
JAN1N5302-1	JAN1N5302UR-1	JAN1N5302UB		JANTX1N5302-1	JANTX1N5302UR-1	JANTX1N5302UB
JAN1N5303-1	JAN1N5303UR-1	JAN1N5303UB		JANTX1N5303-1	JANTX1N5303UR-1	JANTX1N5303UB
JAN1N5304-1	JAN1N5304UR-1	JAN1N5304UB		JANTX1N5304-1	JANTX1N5304UR-1	JANTX1N5304UB
JAN1N5305-1	JAN1N5305UR-1	JAN1N5305UB		JANTX1N5305-1	JANTX1N5305UR-1	JANTX1N5305UB
JAN1N5306-1	JAN1N5306UR-1	JAN1N5306UB		JANTX1N5306-1	JANTX1N5306UR-1	JANTX1N5306UB
JAN1N5307-1	JAN1N5307UR-1	JAN1N5307UB		JANTX1N5307-1	JANTX1N5307UR-1	JANTX1N5307UB
JAN1N5308-1	JAN1N5308UR-1	JAN1N5308UB		JANTX1N5308-1	JANTX1N5308UR-1	JANTX1N5308UB
JAN1N5309-1	JAN1N5309UR-1	JAN1N5309UB		JANTX1N5309-1	JANTX1N5309UR-1	JANTX1N5309UB
JAN1N5310-1	JAN1N5310UR-1	JAN1N5310UB		JANTX1N5310-1	JANTX1N5310UR-1	JANTX1N5310UB
JAN1N5311-1	JAN1N5311UR-1	JAN1N5311UB		JANTX1N5311-1	JANTX1N5311UR-1	JANTX1N5311UB
JAN1N5312-1	JAN1N5312UR-1	JAN1N5312UB		JANTX1N5312-1	JANTX1N5312UR-1	JANTX1N5312UB
JAN1N5313-1	JAN1N5313UR-1	JAN1N5313UB		JANTX1N5313-1	JANTX1N5313UR-1	JANTX1N5313UB
JAN1N5314-1	JAN1N5314UR-1	JAN1N5314UB		JANTX1N5314-1	JANTX1N5314UR-1	JANTX1N5314UB
JAN1N7048-1	JAN1N7048UR-1	JAN1N7048UB		JANTX1N7048-1	JANTX1N7048UR-1	JANTX1N7048UB
JAN1N7049-1	JAN1N7049UR-1	JAN1N7049UB		JANTX1N7049-1	JANTX1N7049UR-1	JANTX1N7049UB
JAN1N7050-1	JAN1N7050UR-1	JAN1N7050UB		JANTX1N7050-1	JANTX1N7050UR-1	JANTX1N7050UB
JAN1N7051-1	JAN1N7051UR-1	JAN1N7051UB		JANTX1N7051-1	JANTX1N7051UR-1	JANTX1N7051UB
JAN1N7052-1	JAN1N7052UR-1	JAN1N7052UB		JANTX1N7052-1	JANTX1N7052UR-1	JANTX1N7052UB

6.5.1 List of PINs for encapsulated devices − Continued.

PINs for devices of the base quality level (1)				PINs for devices of the "TX" quality level (1)		
JAN1N7053-1	JAN1N7053UR-1	JAN1N7053UB		JANTX1N7053-1	JANTX1N7053UR-1	JANTX1N7053UB
JAN1N7054-1	JAN1N7054UR-1	JAN1N7054UB		JANTX1N7054-1	JANTX1N7054UR-1	JANTX1N7054UB
JAN1N7055-1	JAN1N7055UR-1	JAN1N7055UB		JANTX1N7055-1	JANTX1N7055UR-1	JANTX1N7055UB
PINs for devices of the "TXV" quality level (1)				PINs for devices of the "S" quality level (1)		
JANTXV1N5283-1	JANTXV1N5283UR-1	JANTXV1N5283UB		JANS1N5283-1	JANS1N5283UR-1	JANS1N5283UB
JANTXV1N5284-1	JANTXV1N5284UR-1	JANTXV1N5284UB		JANS1N5284-1	JANS1N5284UR-1	JANS1N5284UB
JANTXV1N5285-1	JANTXV1N5285UR-1	JANTXV1N5285UB		JANS1N5285-1	JANS1N5285UR-1	JANS1N5285UB
JANTXV1N5286-1	JANTXV1N5286UR-1	JANTXV1N5286UB		JANS1N5286-1	JANS1N5286UR-1	JANS1N5286UB
JANTXV1N5287-1	JANTXV1N5287UR-1	JANTXV1N5287UB		JANS1N5287-1	JANS1N5287UR-1	JANS1N5287UB
JANTXV1N5288-1	JANTXV1N5288UR-1	JANTXV1N5288UB		JANS1N5288-1	JANS1N5288UR-1	JANS1N5288UB
JANTXV1N5289-1	JANTXV1N5289UR-1	JANTXV1N5289UB		JANS1N5289-1	JANS1N5289UR-1	JANS1N5289UB
JANTXV1N5290-1	JANTXV1N5290UR-1	JANTXV1N5290UB		JANS1N5290-1	JANS1N5290UR-1	JANS1N5290UB
JANTXV1N5291-1	JANTXV1N5291UR-1	JANTXV1N5291UB		JANS1N5291-1	JANS1N5291UR-1	JANS1N5291UB
JANTXV1N5292-1	JANTXV1N5292UR-1	JANTXV1N5292UB		JANS1N5292-1	JANS1N5292UR-1	JANS1N5292UB
JANTXV1N5293-1	JANTXV1N5293UR-1	JANTXV1N5293UB		JANS1N5293-1	JANS1N5293UR-1	JANS1N5293UB
JANTXV1N5294-1	JANTXV1N5294UR-1	JANTXV1N5294UB		JANS1N5294-1	JANS1N5294UR-1	JANS1N5294UB
JANTXV1N5295-1	JANTXV1N5295UR-1	JANTXV1N5295UB		JANS1N5295-1	JANS1N5295UR-1	JANS1N5295UB
JANTXV1N5296-1	JANTXV1N5296UR-1	JANTXV1N5296UB		JANS1N5296-1	JANS1N5296UR-1	JANS1N5296UB
JANTXV1N5297-1	JANTXV1N5297UR-1	JANTXV1N5297UB		JANS1N5297-1	JANS1N5297UR-1	JANS1N5297UB
JANTXV1N5298-1	JANTXV1N5298UR-1	JANTXV1N5298UB		JANS1N5298-1	JANS1N5298UR-1	JANS1N5298UB
JANTXV1N5299-1	JANTXV1N5299UR-1	JANTXV1N5299UB		JANS1N5299-1	JANS1N5299UR-1	JANS1N5299UB
JANTXV1N5300-1	JANTXV1N5300UR-1	JANTXV1N5300UB		JANS1N5300-1	JANS1N5300UR-1	JANS1N5300UB
JANTXV1N5301-1	JANTXV1N5301UR-1	JANTXV1N5301UB		JANS1N5301-1	JANS1N5301UR-1	JANS1N5301UB
JANTXV1N5302-1	JANTXV1N5302UR-1	JANTXV1N5302UB		JANS1N5302-1	JANS1N5302UR-1	JANS1N5302UB
JANTXV1N5303-1	JANTXV1N5303UR-1	JANTXV1N5303UB		JANS1N5303-1	JANS1N5303UR-1	JANS1N5303UB
JANTXV1N5304-1	JANTXV1N5304UR-1	JANTXV1N5304UB		JANS1N5304-1	JANS1N5304UR-1	JANS1N5304UB
JANTXV1N5305-1	JANTXV1N5305UR-1	JANTXV1N5305UB		JANS1N5305-1	JANS1N5305UR-1	JANS1N5305UB
JANTXV1N5306-1	JANTXV1N5306UR-1	JANTXV1N5306UB		JANS1N5306-1	JANS1N5306UR-1	JANS1N5306UB
JANTXV1N5307-1	JANTXV1N5307UR-1	JANTXV1N5307UB		JANS1N5307-1	JANS1N5307UR-1	JANS1N5307UB
JANTXV1N5308-1	JANTXV1N5308UR-1	JANTXV1N5308UB		JANS1N5308-1	JANS1N5308UR-1	JANS1N5308UB
JANTXV1N5309-1	JANTXV1N5309UR-1	JANTXV1N5309UB		JANS1N5309-1	JANS1N5309UR-1	JANS1N5309UB
JANTXV1N5310-1	JANTXV1N5310UR-1	JANTXV1N5310UB		JANS1N5310-1	JANS1N5310UR-1	JANS1N5310UB
JANTXV1N5311-1	JANTXV1N5311UR-1	JANTXV1N5311UB		JANS1N5311-1	JANS1N5311UR-1	JANS1N5311UB
JANTXV1N5312-1	JANTXV1N5312UR-1	JANTXV1N5312UB		JANS1N5312-1	JANS1N5312UR-1	JANS1N5312UB
JANTXV1N5313-1	JANTXV1N5313UR-1	JANTXV1N5313UB		JANS1N5313-1	JANS1N5313UR-1	JANS1N5313UB
JANTXV1N5314-1	JANTXV1N5314UR-1	JANTXV1N5314UB		JANS1N5314-1	JANS1N5314UR-1	JANS1N5314UB
JANTXV1N7048-1	JANTXV1N7048UR-1	JANTXV1N7048UB		JANS1N7048-1	JANS1N7048UR-1	JANS1N7048UB
JANTXV1N7049-1	JANTXV1N7049UR-1	JANTXV1N7049UB		JANS1N7049-1	JANS1N7049UR-1	JANS1N7049UB
JANTXV1N7050-1	JANTXV1N7050UR-1	JANTXV1N7050UB		JANS1N7050-1	JANS1N7050UR-1	JANS1N7050UB
JANTXV1N7051-1	JANTXV1N7051UR-1	JANTXV1N7051UB		JANS1N7051-1	JANS1N7051UR-1	JANS1N7051UB
JANTXV1N7052-1	JANTXV1N7052UR-1	JANTXV1N7052UB		JANS1N7052-1	JANS1N7052UR-1	JANS1N7052UB
JANTXV1N7053-1	JANTXV1N7053UR-1	JANTXV1N7053UB		JANS1N7053-1	JANS1N7053UR-1	JANS1N7053UB
JANTXV1N7054-1	JANTXV1N7054UR-1	JANTXV1N7054UB		JANS1N7054-1	JANS1N7054UR-1	JANS1N7054UB
JANTXV1N7055-1	JANTXV1N7055UR-1	JANTXV1N7055UB		JANS1N7055-1	JANS1N7055UR-1	JANS1N7055UB

(1) For UB suffix devices, UBCA, UBCC, and UBDD suffix devices are also available.

6.5.2 List of PINs for un-encapsulated devices. The following is a list of possible PINs available on this specification sheet. The qualified die suppliers with the applicable letter version (e.g., JANHCA1N5283) will be identified on the QML.

JANC ordering information		
PIN	Manufacturer CAGE	
	43611 (1)	52GC4 (1)
1N5283-1	JANHCA1N5283	JANHCB1N5283
1N5284-1	JANHCA1N5284	JANHCB1N5284
1N5285-1	JANHCA1N5285	JANHCB1N5285
1N5286-1	JANHCA1N5286	JANHCB1N5286
1N5287-1	JANHCA1N5287	JANHCB1N5287
1N5288-1	JANHCA1N5288	JANHCB1N5288
1N5289-1	JANHCA1N5289	JANHCB1N5289
1N5290-1	JANHCA1N5290	JANHCB1N5290
1N5291-1	JANHCA1N5291	JANHCB1N5291
1N5292-1	JANHCA1N5292	JANHCB1N5292
1N5293-1	JANHCA1N5293	JANHCB1N5293
1N5294-1	JANHCA1N5294	JANHCB1N5294
1N5295-1	JANHCA1N5295	JANHCB1N5295
1N5296-1	JANHCA1N5296	JANHCB1N5296
1N5297-1	JANHCA1N5297	JANHCB1N5297
1N5298-1	JANHCA1N5298	JANHCB1N5298
1N5299-1	JANHCA1N5299	JANHCB1N5299
1N5300-1	JANHCA1N5300	JANHCB1N5300
1N5301-1	JANHCA1N5301	JANHCB1N5301
1N5302-1	JANHCA1N5302	JANHCB1N5302
1N5303-1	JANHCA1N5303	JANHCB1N5303
1N5304-1	JANHCA1N5304	JANHCB1N5304
1N5305-1	JANHCA1N5305	JANHCB1N5305
1N5306-1	JANHCA1N5306	JANHCB1N5306
1N5307-1	JANHCA1N5307	JANHCB1N5307
1N5308-1	JANHCA1N5308	JANHCB1N5308
1N5309-1	JANHCA1N5309	JANHCB1N5309
1N5310-1	JANHCA1N5310	JANHCB1N5310
1N5311-1	JANHCA1N5311	JANHCB1N5311
1N5312-1	JANHCA1N5312	JANHCB1N5312
1N5313-1	JANHCA1N5313	JANHCB1N5313
1N5314-1	JANHCA1N5314	JANHCB1N5314
1N7048-1	JANHCA1N7048	JANHCB1N7048
1N7049-1	JANHCA1N7049	JANHCB1N7049
1N7050-1	JANHCA1N7050	JANHCB1N7050
1N7051-1	JANHCA1N7051	JANHCB1N7051
1N7052-1	JANHCA1N7052	JANHCB1N7052
1N7053-1	JANHCA1N7053	JANHCB1N7053
1N7054-1	JANHCA1N7054	JANHCB1N7054
1N7055-1	JANHCA1N7055	JANHCB1N7055

(1) For JANKC level, replace "JANHC" with "JANKC".

6.6 Substitutability of dash-one parts. Non-dash-one devices have been deleted from this specification. Dash-one devices are a direct substitute for non dash-one devices and are preferred.

Superseded part number	Superseding part number		Superseded part number	Superseding part number		Superseded part number	Superseding part number
1N5283	1N5283-1		1N5294	1N5294-1		1N5305	1N5305-1
1N5283UR	1N5283UR-1		1N5294UR	1N5294UR-1		1N5305UR	1N5305UR-1
1N5284	1N5284-1		1N5295	1N5295-1		1N5306	1N5306-1
1N5284UR	1N5284UR-1		1N5295UR	1N5295UR-1		1N5306UR	1N5306UR-1
1N5285	1N5285-1		1N5296	1N5296-1		1N5307	1N5307-1
1N5285UR	1N5285UR-1		1N5296UR	1N5296UR-1		1N5307UR	1N5307UR-1
1N5286	1N5286-1		1N5297	1N5297-1		1N5308	1N5308-1
1N5286UR	1N5286UR-1		1N5297UR	1N5297UR-1		1N5308UR	1N5308UR-1
1N5287	1N5287-1		1N5298	1N5298-1		1N5309	1N5309-1
1N5287UR	1N5287UR-1		1N5298UR	1N5298UR-1		1N5309UR	1N5309UR-1
1N5288	1N5288-1		1N5299	1N5299-1		1N5310	1N5310-1
1N5288UR	1N5288UR-1		1N5299UR	1N5299UR-1		1N5310UR	1N5310UR-1
1N5289	1N5289-1		1N5300	1N5300-1		1N5311	1N5311-1
1N5289UR	1N5289UR-1		1N5300UR	1N5300UR-1		1N5311UR	1N5311UR-1
1N5290	1N5290-1		1N5301	1N5301-1		1N5312	1N5312-1
1N5290UR	1N5290UR-1		1N5301UR	1N5301UR-1		1N5312UR	1N5312UR-1
1N5291	1N5291-1		1N5302	1N5302-1		1N5313	1N5313-1
1N5291UR	1N5291UR-1		1N5302UR	1N5302UR-1		1N5313UR	1N5313UR-1
1N5292	1N5292-1		1N5303	1N5303-1		1N5314	1N5314-1
1N5292UR	1N5292UR-1		1N5303UR	1N5303UR-1		1N5314UR	1N5314UR-1
1N5293	1N5293-1		1N5304	1N5304-1			
1N5293UR	1N5293UR-1		1N5304UR	1N5304UR-1			

6.7 Current regulator diodes (CRDs).

6.7.1 General. CRDs are also known as a constant-current diodes, diode-connected transistors, or current-limiting diodes. CRDs are actually n-channel JFET transitor with their gate shorted to the source and function as a two terminal device. The device symbol used on figures 3, 6, 7, 8 and 9 reflect the CRD symbol versus the traditional diode symbol.

6.7.2 Operation and usage. CRDs are devices that maintain a constant current flow despite changes or fluctuations in the voltage. CRDs allow a current through them to rise to a certain value and then level off at a specific value (see figure 10). CRDs are analogous to a voltage-limiting Zener diode. However, unlike Zener diodes, a CRD maintains the current constant instead of the voltage constant. For CRDs, the anode is biased positive relative to the cathode unlike Zener voltage regulator diodes that operate in the opposite.

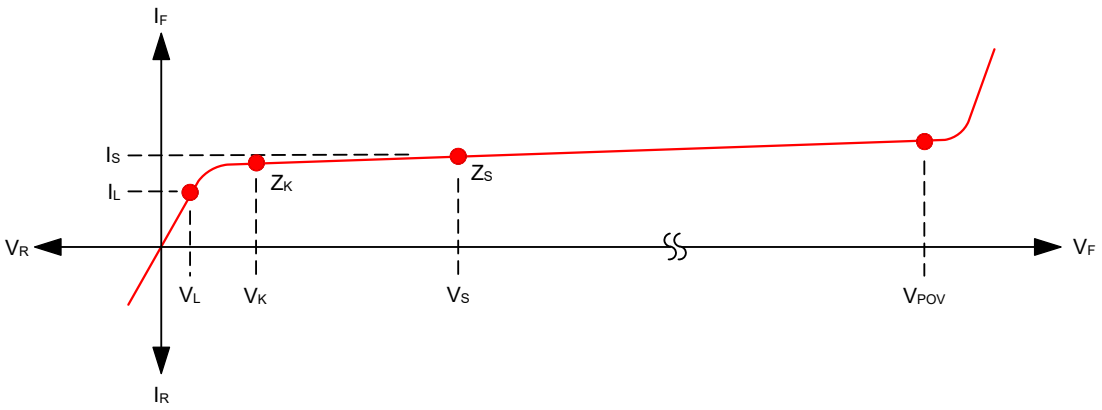


FIGURE 10. Current to voltage characteristics for CRD devices.

6.8 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodians:
Army − CR
Navy − SH
Air Force − 85
NASA − NA
DLA − CC

Review activities:
Army − AR, MI, SM
Navy − AS, MC
Air Force − 19

Preparing activity:
DLA − CC

(Project 5961−2021−017)

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.