

The documentation and process conversion measures necessary to comply with this revision shall be completed by 12 January 1998.

INCH-POUND

MIL-PRF-19500/463E
12 October 1997
SUPERSEDING
MIL-S-19500/463D
22 November 1993

PERFORMANCE SPECIFICATION SHEET

SEMICONDUCTOR DEVICE, DIODE, SILICON, CURRENT REGULATOR,
TYPES 1N5283-1 THROUGH 1N5314-1, AND 1N5283UR-1 THROUGH 1N5314UR-1
JAN, JANTX, JANTXV, JANS, JANHC, AND JANKC

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

1. SCOPE

1.1 Scope. This specification covers the performance requirements for 100 volt, silicon, current regulator diodes. Four levels of product assurance are provided for each encapsulated device type as specified in MIL-PRF-19500. Two level of product assurance are provided each unencapsulated device type.

1.2 Physical dimensions. See 3.3 (D0-7, D0-213AB, and JANC).

1.3 Maximum ratings. Maximum ratings are as shown in table II herein and as follows:

$P_T = 500 \text{ mW}$ (D0-7) at $T_L = +50^\circ\text{C}$, $L = 0.375''$ (9.53 mm); both ends of case or diode body to heat sink at $L = 0.375''$ (9.53 mm). (Derate to 0 at $+175^\circ\text{C}$).

$P_T = 500 \text{ mW}$ (D0-213AB) at $T_{EC} = +125^\circ\text{C}$. (Derate to 0 at $+175^\circ\text{C}$).

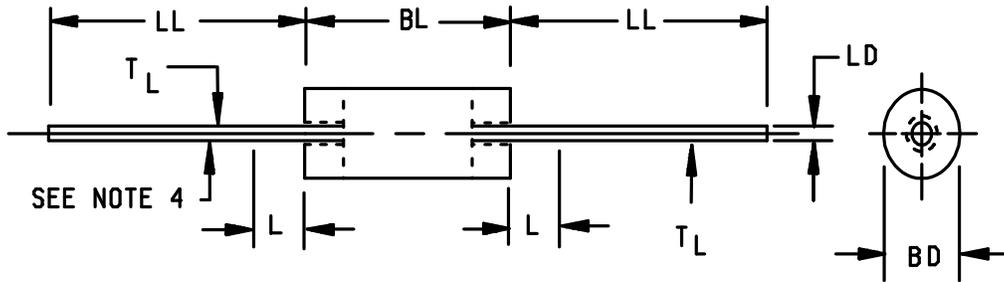
$-65^\circ\text{C} \leq T_{op} \leq +175^\circ\text{C}$; $-65^\circ\text{C} \leq T_{STG} \leq +175^\circ\text{C}$.

1.4 Primary electrical characteristics. Primary electrical characteristic are as shown in column 2 of table II herein (nominally 0.22 mA dc $\leq I_p \leq 4.70 \text{ mA dc}$).

$R_{\theta JL} = 250^\circ\text{C/W}$ (maximum) at $L = .375 \text{ inch}$ (9.53 mm) (D0-7).

$R_{\theta JEC} = 100^\circ\text{C/W}$ (maximum) junction to endcaps (D0-213AB).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center Columbus ATTN: DSCC-VAT 3990 E. Broad Street Columbus, OH 43216-5000 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

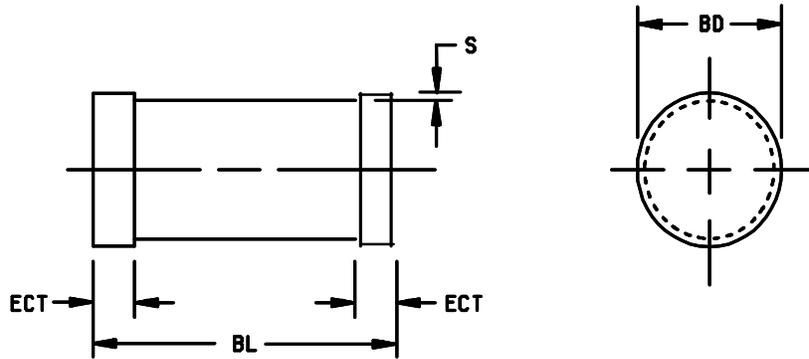


Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
LD	.018	.022	0.46	0.56	3,4
BD	.085	.107	2.16	2.72	5
BL	.230	.300	5.84	7.62	
LL	1.000	1.300	25.4	38.1	

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. The specified lead diameter applies in the zone between .050 (1.27 mm) and 1.00 (25.4 mm) from the diode body. Outside of this zone the lead diameter is not controlled.
4. Both leads shall be within the specified dimension.
5. The minimum body diameter shall be maintained over 0.15 (0.38 mm) inch of body length.
6. See 3.2.1 and 3.2.2 for L and T_L explanations.

FIGURE 1. Physical dimensions (1N5283-1 through 1N5314-1).

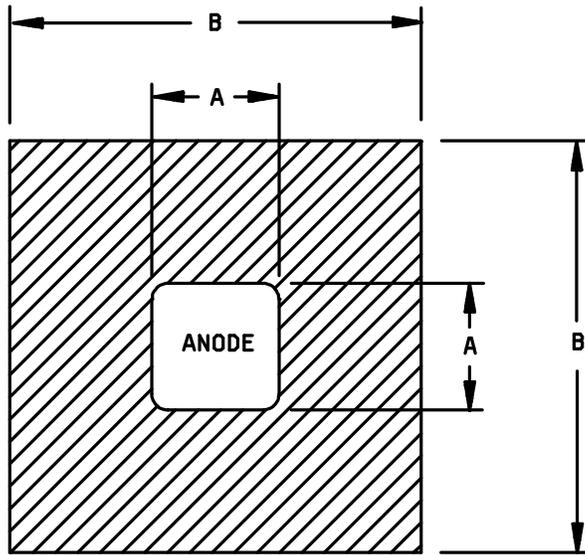


Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
BD	.094	.105	2.39	2.67
ECT	.016	.022	0.41	0.55
BL	.189	.205	4.80	5.21
S	.001 min		0.03 min	

NOTES:

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

FIGURE 2. Physical dimensions (1N5283UR-1 through 1N5314UR-1).



Symbo	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	.012	.014	.305	.355
B	.026	.030	.660	.7623

Design data

Metallization:

Top: (Anode) Al
 Back: (Cathode) Au
 Al thickness 25000 Å Min.
 Gold thickness 4000 Å Min.
 Chip thickness010 ±.002 inch.

NOTES:

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

FIGURE 3. Physical dimensions, JANHCA and JANKCA die.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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 listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATION

MILITARY

MIL-PRF-19500 - Semiconductor Devices, General Specification for.

STANDARD

MILITARY

MIL-STD-750 - Test Methods for Semiconductor Devices.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Associated specification. The individual item requirements shall be in accordance with MIL-PRF-19500, and as specified herein.

3.2 Abbreviations, symbols, and definitions. Abbreviations, symbols, and definitions shall be as specified in MIL-PRF-19500.

3.2.1 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.)

3.2.2 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 will be T_{end-cap} for "UR" devices.

3.2.3 I_p - Pinch-off current. Pinch-off current is defined as the regulator current at specified test voltage, V_S.

3.2.4 V_{POV} - Peak operating voltage. Peak operating voltage is the maximum voltage that shall be applied to the device.

3.2.5 P_D - Steady-state power dissipation.

3.3 Interface requirements and physical dimensions. The Interface requirements and physical dimensions shall be as specified in MIL-PRF-19500, and figure 1 (D0-7), figure 2 (D0-213AB), and figure 3 (JANHNC and JANKC die) herein.

3.3.1 Lead finish. Lead finish shall be solderable in accordance with MIL-STD-750 and MIL-PRF-19500, and herein.

3.3.2 Dash one construction. These devices shall be of double plug construction utilizing high temperature metallurgical bonding between both sides of the silicon die and terminal pins.

3.3.3 JANS construction. Construction shall be dash one, category I or II metallurgical bond in accordance with MIL-PRF-19500, appendix A.

3.4 Marking. Marking shall be in accordance with MIL-PRF-19500.

3.4.1 Marking of UR version devices. For UR version devices only, all marking, except polarity (and Serial Number for JANS) may be omitted from the body, but shall be retained on the initial container.

3.5 Electrical test requirements. The electrical test requirements shall be the subgroups specified in paragraphs 4.4.2 and 4.4.3.

3.6 Qualification. Devices furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award (see 4.2 and 6.2).

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 inspection. Qualification inspection shall be in accordance with MIL-PRF-19500 and 4.4.1 herein.

4.2.2 JANHC and JANKC devices. Qualification for shall be in accordance with Appendix G of MIL-PRF-19500.

4.3 Screening (JAN, JANTXV, JANTX, and JANS levels only). Screening shall be in accordance with MIL-PRF-19500 (table IV), 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		
	JANS	JANTX and JANTXV levels	JAN Level
3a	Temperature cycling	Temperature cycling	Temperature cycling (in accordance with MIL-PRF-19500 JANTX level)
3c 1/	Thermal impedance (see 4.5.4)	Thermal impedance (see 4.5.4)	Thermal impedance (see 4.5.4)
9	I_{P1}	Not applicable	Not applicable
10	$V_{POV} = 100 \text{ V dc at } T_A = +25^\circ\text{C}$ $t=48 \text{ hours}$	$V_{POV} = 100 \text{ V dc at } T_A = +25^\circ\text{C}$ $t=48 \text{ hours}$	$V_{POV} = 100 \text{ V dc at } T_A = +25^\circ\text{C}$ $t=48 \text{ hours}$
11	Subgroup 2 of table I herein ; $\Delta I_{P1} \leq 5\% \text{ of initial value}$	Subgroup 2 of table I herein	Subgroup 2 of table I herein
12	See 4.3.2	See 4.3.2	
13 2/	Subgroup 2 of table I herein; $\Delta I_{P1} \leq 5\% \text{ of initial value.}$	Subgroup 2 of table I herein; $\Delta I_{P1} \leq 5\% \text{ of initial value.}$	

1/ Thermal impedance may be performed any time after sealing provided temperature cycling is performed in accordance with MIL-PRF-19500, screen 3 prior to this thermal test.

4.3.1 Screening (JANHC or JANKC). Screening of die shall be in accordance with MIL-PRF-19500, appendix G. As a minimum, die shall be 100-percent probed to ensure compliance with group A, subgroup 2 (with the exception of Thermal Impedance).

4.3.2 Power burn-in conditions. Power burn-in conditions are as follows: $I_R = 200 \text{ mA dc}$ minimum; mounting and test conditions in accordance with MIL-STD-750, method 1038, test condition B, $TEC = +75^\circ\text{C}$ to $+125^\circ\text{C}$ for surface mount devices. $T_A = \text{Room ambient}$ as defined in the general requirements of MIL-STD-750, 4.5.

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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 table VIa (JANS) and VIb (JAN, JANTX and JANTXV) of MIL-PRF-19500, and as follows. Electrical measurements (endpoints) and delta requirements shall be in accordance group A, subgroup 2 herein.

4.4.2.1 Group B inspection, table VIa (JANS) of MIL-PRF-19500.

Subgroup	Method	Condition
B4	1037	Test conditions in accordance with 4.3.2; $t_{on} = t_{off} = 3$ minutes minimum for 2,000 cycles.
B5	1027	$I_R = 200$ mA dc, $T_A = +125^\circ\text{C}$ or adjusted as required to give an average lot $T_J = +175^\circ\text{C}$. Marking legibility requirements shall not apply.
B6	3101 or 4081	$R_{\theta JL} = 250^\circ\text{C/W}$.375 inch (9.52 mm) lead length (non surface mount). $R_{\theta JEC} = 100^\circ\text{C/W}$ (surface mount).

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

Subgroup	Method	Condition
B3	1027	$V_{POV} = 100$ V dc; $T_A = +25^\circ\text{C}$; $L = 3/8$ inch (non surface mount), $L = 0''$ for surface mount.
B4 and B5	----	Not applicable.
B6	1052	$T_A = +175^\circ\text{C}$.

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) and delta requirements shall be in accordance with table I, group A, subgroup 2 herein.

Subgroup	Method	Condition
C2	2036	(Not applicable to surface mount devices); Lead fatigue conditions: Test condition E; .062 inch (1.57 mm) lead restriction from case. Tension conditions: Test condition A; 4 pounds, 15 seconds.
C6	1026	$V_{POV} = 100$ V dc; $T_A = +25^\circ\text{C}$; $L = 3/8$ inch (non surface mount), $L = 0''$ for surface mount.
C7	----	See 4.6 and 4.5.3

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. Electrical measurements (end points) and delta requirements shall be in accordance with the applicable steps and footnotes of table I, group A, subgroup 2 herein.

4.4.4.1 Group E inspection, table IX of MIL-PRF-19500.

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>	<u>Sampling plan</u>
E1	1051	500 cycles	45 devices, c = 0
E2	1037	6,000 cycles(see 4.3.1)	45 devices, c = 0
E3	----	Not Applicable	
E4	3101 or 4081	R _{ΘJEC} = 100°C/W (maximum) at zero lead length. +25°C ≤ T _R ≤ +35°C, (see 4.5.5), at T _H ≥ 30 s. (surface mount only)	22 devices, c = 0
E4	3101 or 4081	R _{ΘJL} = 250°C/W (maximum) at .375 inches lead length +25°C ≤ T _R ≤ +35°C (see 4.5.5), at T _H ≥ 30 s in still air (non surface mount only)	22 devices, c = 0

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

4.5.1 Knee ac impedance (z_k) at test voltage V_k. To test for z_k, a 90 Hz signal V_k (mod) with rms value equal to 10 percent of test voltage, V_k, is superimposed on the test voltage (see figure 5).

4.5.2 Regulator impedance (z_s) at test voltage V_s. To test for z_s, a 90 Hz signal V_s (mod) with rms value equal to 10 percent of test voltage, V_s, is superimposed on the test voltage (see figure 6).

4.5.3 Temperature coefficient of regulator current (α_{IS}). Temperature coefficient of regulator current shall be calculated as follows:

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

4.5.4 Thermal impedance Z_{ΘJX} measurements for screening. The Z_{ΘJX} measurements shall be performed in accordance with MIL-STD-750, method 3101 (V_R to be used in lieu of V_F). The maximum limit (not to exceed the group A, subgroup 2 limit) for Z_{ΘJX} in screening (table IV of MIL-PRF-19500) 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 screening limit. In addition to screening, once a fixed limit has been established, monitor all future sealing lots using a random five piece sample from each lot to be plotted on the applicable 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.

- 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 μs maximum.

4.5.4.1 For initial qualification or requalification. Read and record data (Z_{ΘJX}) shall be supplied to the qualifying activity on one lot (random sample of 500 devices minimum). Twenty-two serialized devices shall be sent to the qualifying activity for test correlation.

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

- a. I_M ----- 1 mA to 10 mA
- b. I_H ----- 200 mA to 400 mA
- c. t_H ----- 30 seconds minimum
- d. t_{MD} ----- 70 μs maximum

LS = Lead spacing = 3/8 inch for non surface mount and 0 inch for surface mount (see figure 4 below):

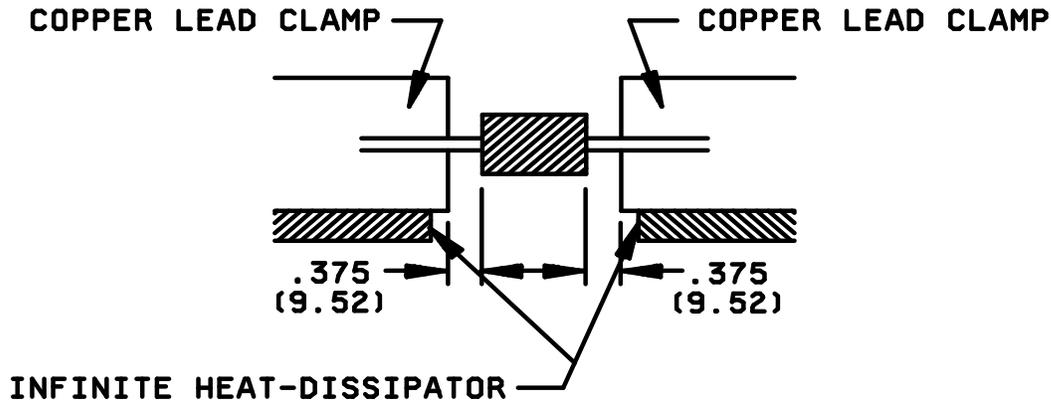


FIGURE 4. Mounting conditions.

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

4.6 Temperature coefficient of regulator current. The temperature coefficient of regulator current shall be tested under the following conditions: (sampling plan: 22 devices, $c = 0$)

Test 1: $V_S = 25$ V dc, $T_{L1} = -55^{\circ}\text{C}$, $T_{L2} = +25^{\circ}\text{C}$, $L = 3/8$ inch (nonsurface mount), $L = 0$ " (surface mount)
(see 3.2.2 and 4.5.3) with the maximum limit per column 8 of table II.

Test 2: $V_S = 25$ V dc, $T_{L1} = +25^{\circ}\text{C}$, $T_{L2} = +150^{\circ}\text{C}$, $L = 3/8$ inch (nonsurface mount), $L = 0$ " (surface mount)
(see 3.2.2 and 4.5.3) with the maximum limit per column 9 of table II.

TABLE I. Group A inspection.

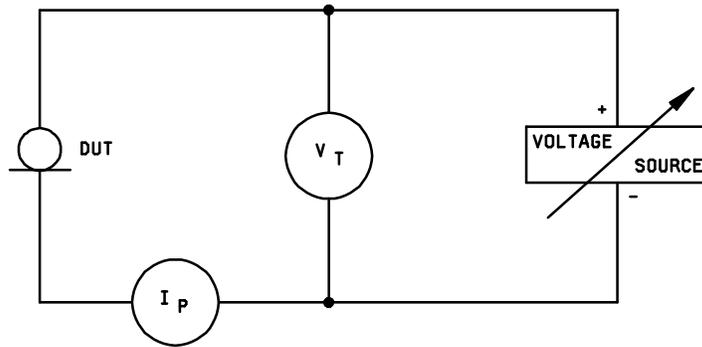
Inspection 1/	MIL-STD-750		Symbol	/2 Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u> Visual and mechanical examination	2071					
<u>Subgroup 2</u> Regulator current (see 4.5.2)		$V_S = 25 \text{ V dc}$, $t = 90 \text{ s}$ or thermal equilibrium, $T_L = +30^\circ\text{C} \pm 3^\circ\text{C}$ (see figure 5)	I_{P1}	Column 3	Column 4	mA dc
Limiting voltage		$I_L = 0.8 I_p$ (min) col. 3 of table II (see figure 6)	V_L		Column 7	V dc
Reverse voltage		$I_R = 200 \text{ mA}$	V_R		2.5	V dc
Thermal impedance	3101	See 4.5.4	$Z_{\Theta JX}$		25	$^\circ\text{C/W}$
<u>Subgroup 3</u> Not applicable						
<u>Subgroup 4</u> Regulator impedance		$V_S = 25 \text{ V dc}$; (see figure 7 and 4.5.2)	Z_S	Column 5		$\text{M}\Omega$
Knee impedance		$V_K = 6.0 \text{ V dc}$ (see figure 8 and 4.5.1)	Z_K	Column 6		$\text{M}\Omega$
<u>Subgroups 5. and 6</u> Not Applicable						
<u>Subgroup 7</u> Regulator current		$V_S = 100 \text{ V dc}$ (pulsed)	I_{P2}		Column 10	mA dc

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

2/ Column references are to table II herein.

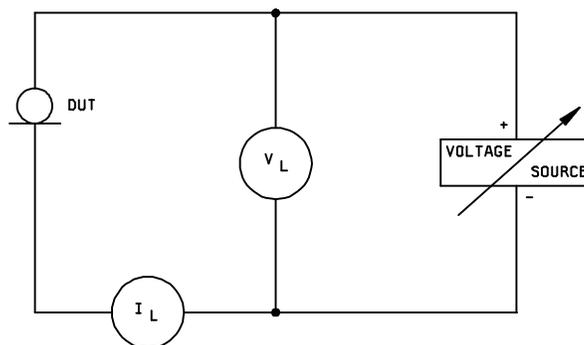
TABLE II. Electrical characteristics.

Col 1 Type (Electrical characteristics for "UR" and "-1" suffix devices are identical.)	Col 2 Ip1	Col 3 Regulator current (mA) at VS = 25 V	Col 4		Col 5 Zs Minimum regulator impedance at VS = 25 V	Col 6 Zk knee impedance at VK = 6 V	Col 7 VL maximum limiting voltage at IL = 0.8	Col 8		Col 9 αIS Maximum regulator current TC at VS = 25V +25°C +150°C	Col 10 IP2 Regulator current (mA) at VS = 100 V	
			Min	Max				Min	Max			Min
1N5283-1	0.22	0.198	0.242	0.242	25.0	2.75	1.00	-0.20	1.15	-0.16	0.60	0.27
1N5284-1	0.24	0.216	0.264	0.264	19.0	2.35	1.00	-0.20	1.05	-0.20	0.56	0.30
1N5285-1	0.27	0.243	0.297	0.297	14.0	1.95	1.00	-0.30	0.95	-0.22	0.48	0.33
1N5286-1	0.30	0.270	0.330	0.330	9.0	1.60	1.00	-0.35	0.85	-0.25	0.42	0.36
1N5287-1	0.33	0.297	0.363	0.363	6.6	1.35	1.00	-0.40	0.75	-0.26	0.37	0.40
1N5288-1	0.39	0.351	0.429	0.429	4.10	1.00	1.05	-0.50	0.62	-0.30	0.28	0.47
1N5289-1	0.43	0.387	0.473	0.473	3.30	0.870	1.05	-0.52	0.55	-0.32	0.23	0.52
1N5290-1	0.47	0.423	0.517	0.517	2.70	0.750	1.05	-0.55	0.50	-0.33	0.18	0.57
1N5291-1	0.56	0.504	0.616	0.616	1.90	0.560	1.10	-0.60	0.35	-0.36	0.10	0.60
1N5292-1	0.62	0.558	0.682	0.682	1.55	0.470	1.13	-0.62	0.25	-0.37	0.05	0.75
1N5293-1	0.68	0.612	0.748	0.748	1.35	0.400	1.15	-0.65	0.20	-0.38	0.02	0.82
1N5294-1	0.75	0.675	0.825	0.825	1.15	0.335	1.20	-0.70	0.15	-0.40	-0.03	0.91
1N5295-1	0.82	0.738	0.902	0.902	1.00	0.290	1.25	-0.72	0.07	-0.41	-0.07	0.99
1N5296-1	0.91	0.819	1.001	1.001	0.880	0.240	1.29	-0.76	0.0	-0.42	-0.10	1.10
1N5297-1	1.00	0.900	1.100	1.100	0.800	0.205	1.35	-0.78	0.05	-0.44	-0.10	1.21
1N5298-1	1.10	0.990	1.210	1.210	0.700	0.180	1.40	-0.80	-0.10	-0.46	-0.10	1.33
1N5299-1	1.20	1.08	1.32	1.32	0.640	0.155	1.45	-0.83	-0.15	-0.47	-0.10	1.45
1N5300-1	1.30	1.17	1.43	1.43	0.580	0.135	1.50	-0.85	-0.20	-0.48	-0.10	1.57
1N5301-1	1.40	1.26	1.54	1.54	0.540	0.115	1.55	-0.88	-0.20	-0.49	-0.10	1.69
1N5302-1	1.50	1.35	1.65	1.65	0.510	0.105	1.60	-0.90	-0.20	-0.50	-0.10	1.81
1N5303-1	1.60	1.44	1.76	1.76	0.475	0.092	1.65	-0.90	-0.20	-0.50	-0.10	1.92
1N5304-1	1.80	1.62	1.98	1.98	0.420	0.074	1.75	-0.92	-0.20	-0.51	-0.10	2.18
1N5305-1	2.00	1.80	2.20	2.20	0.395	0.061	1.85	-0.95	-0.20	-0.52	-0.10	2.42
1N5306-1	2.20	1.98	2.42	2.42	0.370	0.052	1.95	-0.96	-0.20	-0.52	-0.10	2.66
1N5307-1	2.40	2.16	2.64	2.64	0.345	0.044	2.00	-0.98	-0.20	-0.53	-0.10	2.90
1N5308-1	2.70	2.43	2.97	2.97	0.320	0.035	2.15	-1.0	-0.20	-0.53	-0.10	3.27
1N5309-1	3.00	2.70	3.30	3.30	0.300	0.029	2.25	-1.01	-0.20	-0.53	-0.10	3.63
1N5310-1	3.30	2.97	3.63	3.63	0.280	0.024	2.35	-1.02	-0.20	-0.54	-0.10	3.99
1N5311-1	3.60	3.24	3.96	3.96	0.265	0.020	2.50	-1.03	-0.20	-0.54	-0.10	4.36
1N5312-1	3.90	3.51	4.29	4.29	0.255	0.017	2.60	-1.04	-0.20	-0.55	-0.10	4.72
1N5313-1	4.30	3.87	4.73	4.73	0.245	0.014	2.75	-1.05	-0.20	-0.55	-0.10	5.20
1N5314-1	4.70	4.23	5.17	5.17	0.235	0.012	2.90	-1.06	-0.20	-0.55	-0.10	5.69



NOTES:

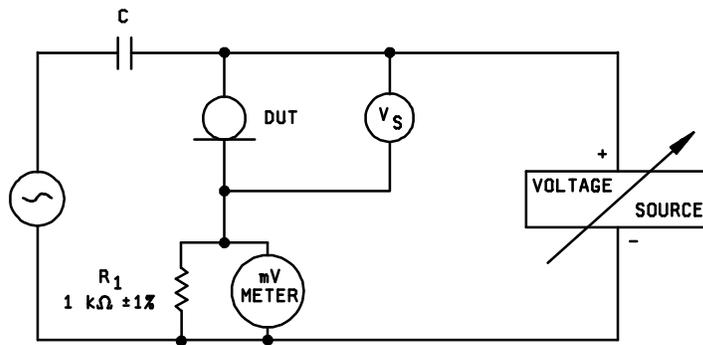
1. Adjust voltage source so that $V_S = 25$ V dc.
2. Measure current I_p .
3. The device is acceptable if the current falls within the limits specified.
4. The ammeter shall represent essentially a short-circuit to the terminals between which the current is being measured. If not, the voltmeter reading shall be corrected for the drop across the ammeter.

FIGURE 5. Regulator current test circuit.

NOTES:

1. Adjust current source to I_L of table V, column 7.
2. Measure voltage V_L .
3. The device is acceptable, if the voltage is less than the limits specified.
4. 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.

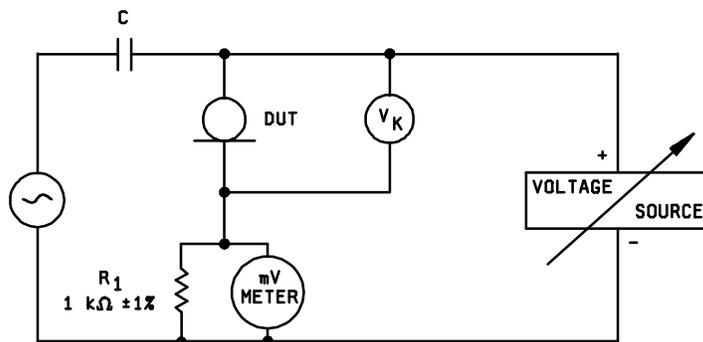
FIGURE 6. Limiting voltage test circuit.



NOTES:

1. Adjust voltage source so that $V_S = 25\text{ V dc}$.
2. Apply an ac signal of 2.5 V rms at 90 Hz through an isolating capacitor C.
3. Measure the ac rms voltage.
4. $z_S = V_S \text{ mod } \times (R_1 \div V \text{ ac})$ where $V_S \text{ mod}$ equals ac signal for note 2 and $V \text{ ac}$ equals the voltage across R_1 .
5. Device is acceptable if the regulator impedance meets the specified minimum limit.

FIGURE 7. Regulator impedance test circuit.



NOTES:

1. Adjust voltage source so that $V_K = 6.0\text{ V dc}$.
2. Apply an ac signal of 0.6 V rms at 90 Hz through an isolating capacitor C.
3. Measure the ac rms voltage.
4. $z_K = V_K \text{ mod } \times (R_1 \div V \text{ ac})$ where $V_K \text{ mod}$ equals ac signal for note 2 and $V \text{ ac}$ equals the voltage across R_1 .
5. Device is acceptable if the knee impedance meets the specified minimum limits.

FIGURE 8. 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 actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Points' packaging activity within the Military Department or Defense Agency, or within the Military Departments' System Command. Packaging data retrieval is available from the managing Military Departments' 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 Notes. The notes specified in MIL-PRF-19500 are applicable to this specification.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Issue of DODISS to be cited in the solicitation.
- b. Lead finish (see 3.3.1).
- c. For die acquisition, the JANHC or JANKC designation should be specified (see figure 3).
- d. Product assurance level and type designation.

6.3 Suppliers of die. The qualified die suppliers with the applicable letter version (example JANHCA1N5283) will be identified on the QPL.

JANC ordering information	
PIN	Manufacturer
1N5283-1 through 1N5314-1	55801 JANHCA1N5283 through JANHCA1N5314
1N5283-1 through 1N5314-1	JANKCA1N5283 through JANKCA1N5314

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

6.5 Substitutability. 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. Devices in stock are acceptable provided the date code does not exceed 01JULY1995 (The implementation date of MIL-S-19500/463D). Existing supplies of the non dash-one parts may be used until exhausted.

6.6 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 Products List QPL-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 purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Defense Supply Center Columbus, DSCC-VQE, Columbus, OH 43216

CONCLUDING MATERIAL

Custodians:
 Army - CR
 Navy - EC
 Air Force - 17
 NASA - NA

Preparing activity:
 DLA - CC

Review activities:
 Army - AR, MI, SM
 Navy - AS, CG, MC
 Air Force - 19, 85, 99

(Project 5961-1907)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER
MIL-PRF-19500/463E

2. DOCUMENT DATE
(YYMMDD) 97/10/12

3. DOCUMENT TITLE SEMICONDUCTOR DEVICE, DIODE, SILICON, CURRENT REGULATOR, TYPES 1N5283-1 THROUGH 1N5314-1, AND 1N5283UR-1 THROUGH 1N5314UR-1 JAN, JANTX, JANTXV, JANS, JANHC, AND JANKC

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION**6. SUBMITTER**

a. NAME (Last, First, Middle initial)

b. ORGANIZATION

c. ADDRESS (Include Zip Code)

d. TELEPHONE (Include Area Code)
(1) Commercial
(2) AUTOVON
(If applicable)

7. DATE SUBMITTED
(YYMMDD)

8. PREPARING ACTIVITY

a. NAME
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b. TELEPHONE (Include Area Code)
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614-692-0510 850-0510

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