

The documentation and process conversion measures necessary to comply with this revision shall be completed by 20 September 1997

INCH POUND

MIL-PRF-19500/124H  
20 June 1997  
SUPERSEDING  
MIL-S-19500/124G  
15 October 1992

## PERFORMANCE SPECIFICATION

SEMICONDUCTOR DEVICE, DIODE, SILICON, VOLTAGE REGULATOR B AND RB  
TYPES 1N2970 THROUGH 1N2977, 1N2979, 1N2980, 1N2982, 1N2984  
THROUGH 1N2986, 1N2988 THROUGH 1N2993, 1N2995, 1N2997, 1N2999  
THROUGH 1N3005, 1N3007, 1N3008, 1N3009, 1N3011, 1N3012, 1N3014, 1N3015,  
PLUS A AND RA TYPES 1N3993 THROUGH 1N3998, JAN, JANTX, JANTXV, AND JANS

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 10 watt, silicon, voltage regulator diodes: B type (standard polarity); RB type (reverse polarity). Four levels of product assurance are provided for each encapsulated device type as specified in MIL-PRF-19500.

1.2 Physical dimensions. See figure 1 (D0-4).

1.3 Maximum ratings. Maximum ratings are as shown in columns 4, 8, and 10 of table III herein and as follows:

$-65^{\circ}\text{C} \leq T_J \leq +175^{\circ}\text{C}$ ;  $P_T = 10 \text{ W}$  at  $T_C = +55^{\circ}\text{C}$ ; derate at  $.083 \text{ W}/^{\circ}\text{C}$  above  $+55^{\circ}\text{C}$ .  
 $-65^{\circ}\text{C} \leq T_{\text{STG}} \leq +200^{\circ}\text{C}$ .

1.4 Primary electrical characteristics. Primary electrical characteristics are as shown in columns 2, 9, 12, and 14 of table III herein, and as follows:

Thermal resistance ( $R_{\theta\text{JC}}$ ) =  $12^{\circ}\text{C}/\text{W}$  maximum.

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 East 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.

## 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 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 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

##### DEPARTMENT OF DEFENSE

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

#### STANDARD

##### MILITARY

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

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available 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 (except for related associated specifications or specification sheets), 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 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 6.3).

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

3.3 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein shall be as specified in MIL-PRF-19500.

3.4 Design, construction, and physical dimensions. The design, construction, and physical dimensions for the purpose of interchangeability shall be as specified on figure 1 herein.

- a. Device types 1N2970B through 1N3015B and 1N3993RA through 1N3998RA shall have the anode connected to the stud.
- b. Device types 1N2970RB through 1N3015RB and 1N3993A through 1N3998A shall have the cathode connected to the stud.

3.4.1 Lead finish. Unless otherwise specified, lead finish shall be solderable in accordance with MIL-PRF-19500, MIL-STD-750, and herein. Lead finish shall be gold, silver, or tin plated. Where a choice of lead finish is desired, it shall be specified in the contract (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.

3.5 Marking. Devices shall be marked as specified in MIL-PRF-19500.

3.6 Reverse polarity. Reverse polarity units (see 3.3, a and b) shall be marked with an "R" preceding the "A" or "B" in the type designation, as applicable.

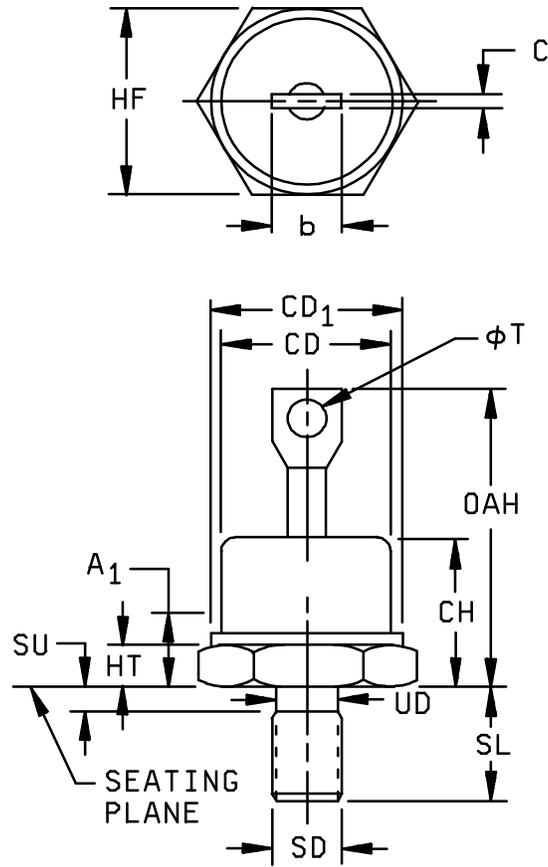


FIGURE 1. Physical dimensions.

Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CH	.300	.405	7.62	10.29	
C	.012	.065	0.30	1.65	
HF	----	.505	----	12.83	
HF <sub>1</sub>	.255	.424	6.48	10.77	
E	.423	.438	10.74	11.13	
HT	.075	.175	1.90	4.44	
HT <sub>1</sub>	.060	.175	1.52	4.44	2
DAH	.600	.800	15.24	20.32	
UD	.163	.189	4.14	4.80	1
SD	----	----	----	----	5
m	----	.250	----	6.35	3
SL	.422	.453	10.72	11.51	
SU	----	.078	----	1.98	4
Øt	.060	.095	1.52	2.41	
W	----	----	----	----	

## NOTES:

1. Complete threads to extend to within 2.5 threads of seating plane.
2. Chamfer on undercut on one or both ends of hexagonal base is optional.
3. Angular orientation of this terminal is undefined.
4. Length of incomplete or undercut threads of UD.
5. 10-32- UNF-2A maximum pitch diameter of plated threads shall be basic pitch diameter .1697 (4.310 mm) reference. (Screw thread standards for Federal Services 1957) Handbook H28 P1.
6. Metric equivalents are given for general information only.
7. Dimensions are in inches.

FIGURE 1. Physical dimensions. - Continued.

4. QUALITY ASSURANCE PROVISIONS

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.

4.3 Screening (JANS, JANTXV, JANTX levels only). Screening shall be in accordance with MIL-PRF-19500, appendix E, (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 appendix E, table IV of MIL-PRF-19500)	Measurement	
	JANS level	JANTX and JANTXV levels
7.(b)	MIL-STD-750, test method 1071, condition C, step 2	MIL-STD-750, test method 1071, condition C, step 2
9	$I_R$ and $V_Z$ (for devices with $V_{Z(nom)} \geq 10$ V dc; see column 2 of table III)	Not applicable
11	$I_R$ and $V_Z$ ; $\Delta I_R = 100$ percent of initial value or 1 of column 12 of table III, whichever is greater, $\Delta V_Z = \pm 2.5$ of initial value (for devices with $V_{Z(nom)} \geq 10$ V dc, see column 2 of table III)	$I_R$ and $V_Z$
12	See 4.2.1	See 4.2.1
13	Subgroups 2, 3, and 4 of table I herein; $\Delta I_R = 100$ percent of initial value or 1 of column 12 of table III, whichever is greater; $\Delta V_Z = \pm 2.5$ of initial value.	Subgroup 2 of table I herein; $\Delta I_R = 100$ percent of initial value or 1 of column 12 of table III, whichever is greater; $\Delta V_Z = \pm 2.5$ of initial value

4.3.1 Power burn-in conditions. Power burn-in conditions are as follows:

$$I_z = \text{Column 15 of table III}; V_z = \text{Column 2 of table III}; T_c = 150 \pm 5^\circ\text{C}.$$

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500.

4.4.1 Group A inspection. Group A inspection shall be conducted in accordance with appendix E, table V of MIL-PRF-19500 and table I herein. End-point electrical measurements shall be in accordance with the applicable steps of table IV herein.

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4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in appendix E, table VIa (JANS) and table VIb (JAN, JANTX, and JANTXV), of MIL-PRF-19500, and as follows. Electrical measurements (end points) and delta requirements shall be in accordance with the applicable steps of table II herein.

4.4.3.1 Group B inspection, appendix E, table VIa of MIL-PRF-19500.

Subgroup	Method	Conditions
B2	2026	Dwell time = $10 \pm 1$ s; immersion to cover flat portion of terminal only.
B4	1037	$I_z$ = column 8 of table III, $t_{on} = t_{off} = 3$ minutes minimum for 2,000 cycles. $T_C = 30 \pm 3^\circ\text{C}$ .
B5	1027	$I_z$ = column 15 of table III for 96 hours, $T_A = +125^\circ\text{C}$ or adjusted, as required, to give an average lot $T_J = +225^\circ\text{C}$
B6	4081	$R_{\theta_{JC}} = 12^\circ\text{C/W}$ maximum, $T_C = 30 \pm 3^\circ\text{C}$ . For purposes of this test "junction to case" shall be used in lieu of "junction to lead" and " $R_{\theta_{JC}}$ " shall be used in lieu of " $R_{\theta_{JL}}$ ". The case shall be the reference point for calculation of junction to case thermal resistance ( $R_{\theta_{JC}}$ ). The mounting arrangement shall be with heat sink to case.

4.4.3.2 Group B inspection, appendix E, table VIb of MIL-PRF-19500.

Subgroup	Method	Conditions
B2	4066	$I_{ZSM}$ = column 10 of table III.
B3	1027	$I_z$ = column 15 of table III, $T_C = 150 \pm 5^\circ\text{C}$ .
B5	4081	$R_{\theta_{JC}} = 12^\circ\text{C/W}$ maximum; $T_C = 30 \pm 3^\circ\text{C}$ . For purposes of this test "junction to case" shall be used in lieu of "junction to lead" and " $R_{\theta_{JC}}$ " shall be used in lieu of " $R_{\theta_{JL}}$ ". The case shall be the reference point for calculation of junction to case thermal resistance ( $R_{\theta_{JC}}$ ). The mounting arrangement shall be with heat sink to case.
B6	1032	$T_A = +200^\circ\text{C}$

4.4.3 Group C inspection. Group C inspection shall be conducted in accordance with the conditions specified for subgroup testing in appendix E, table VII of MIL-PRF-19500 and as follows. Electrical measurements (end points) and delta requirements shall be in accordance with the applicable steps of table II herein.

4.4.3.1 Group C inspection, appendix E, table VII of MIL-PRF-19500.

Subgroup	Method	Conditions
C2	2036	Tension: Test condition A; 20 pounds; $t = 15 \pm 3$ s.
C2	2036	Torque (terminal): Test condition D <sub>1</sub> ; 10 ounce-inch; $t = 15 \pm 3$ s.
C2	2036	Torque (stud): Test condition D <sub>2</sub> ; 15 pound-inch; $t = 30 \pm 3$ s.
C2	2036	Bending stress: Test condition F; 3 pounds; $t = 15 \pm 3$ s, method B.
C6	1026	$I_z$ = column 15 of table III, $T_C = +150 \pm 5^\circ\text{C}$ .

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 currents specified in column 10 of table III shall be applied in the reverse direction and shall be superimposed on the current ( $I_Z$  = column 5 of table III) a total of five surges at 1-minute intervals. Each individual surge shall be a one-half square wave pulse of 1/120-second duration or an equivalent one-half sine wave with the same effective (rms) current.

4.5.2 Voltage regulation  $V_Z(\text{reg})$ . A current at 10 percent of  $I_Z$  (column 8) shall be maintained until thermal equilibrium is obtained, and the  $V_Z$  shall then be increased to a level of 50 percent of  $I_Z$  (column 8) and maintained at this level for a period of time until thermal equilibrium is obtained at which time the voltage change shall not exceed column 9 of table III. During this test, the case temperature ( $T_C$ ) of the diode shall be equal to  $30 \pm 3^\circ\text{C}$ .

4.5.3 Regulator voltage. The  $I_Z$  test current (column 5 of table III) shall be applied until thermal equilibrium is obtained prior to reading the regulator voltage. During this test, the case temperature ( $T_C$ ) of the diode shall be equal to  $30 \pm 3^\circ\text{C}$ .

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 case temperatures.

4.5.5 Inspection condition. Unless otherwise specified in MIL-PRF-19500 or herein, all inspections shall be made at case temperature ( $T_C$ ) of  $30 \pm 3^\circ\text{C}$ .

TABLE I. Group A inspection.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limits <u>2/</u>		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u>						
Visual and mechanical inspection	2071					
<u>Subgroup 2</u>						
Forward voltage	4011	$I_F = 2 \text{ A dc}$	$V_F$		1.5	V dc
Reverse current	4016	$V_R =$ column 11 of table III, DC method	$I_{R1}$		column 12	A dc
Regulator voltage (see 4.5.3)	4022	$I_Z =$ column 5 of table III	$V_Z$	column 3	column 4	V dc
<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	$I_{R2}$		500	$\mu\text{A dc}$
<u>Subgroup 4</u>						
Small-signal breakdown impedance	4051	$I_Z =$ column 5 of table III; $I_{\text{sig}} = 10 I_Z$	$Z_Z$		column 6	ohms
Knee impedance	4051	$I_{ZK} = 1 \text{ mA dc}$ , $I_{\text{sig}} = 10 I_{ZK}$	$Z_{ZK}$		column 7	ohms
<u>Subgroup 5</u>						
Not applicable						
<u>Subgroup 6</u>						
Surge current (see 4.5.1)	4066	$T_C = +25^\circ\text{C}$ ; $I_{ZSM} =$ column 10 of table III				
End-point electrical measurements		See table II, steps 1, 3, and 4				
<u>Subgroup 7</u>						
Voltage regulation (see 4.5.2)		$V_{Z(\text{reg})}$			column 9	V dc
Temperature coefficient of breakdown voltage (see 4.5.4)	4071	$I_Z =$ column 5 of table III; $T_1 = 30^\circ\text{C}$ ; $T_2 = T_1 + 100^\circ\text{C}$	$\alpha V_Z$		column 14	$\% / ^\circ\text{C}$

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

2/ Column references are to table III herein.

TABLE II. Groups B and C electrical measurements. 1/ 2/ 3/

Step	Inspection	MIL-STD-750		Symbol	Limits 4/		Unit
		Method	Conditions		Min	Max	
1.	Reverse current	4016	DC method; $V_R$ = column 11 of table III	$I_{R1}$		column 12	A dc
2.	Reverse current	4016	DC method; $V_R$ = column 11 of table III	$I_{R1}$		column 13	A dc
3.	Breakdown voltage	4022	$I_Z$ = column 5 of table III	$V_Z$	column 3	column 4	V dc
4.	Small-signal break-down impedance	4051	$I_Z$ = column 5 of table III; $I_{sig} = 10 I_Z$	$Z_Z$		column 6	ohms
5.	Knee impedance	4051	$I_{ZK} = 1$ mA dc $I_{sig} = 10 I_{ZK}$	$Z_{ZK}$		column 7	ohms
6.	Forward voltage	4011	$I_F = 2$ A dc	$V_F$ 5/		$\pm 50$ mV dc change from previously measured value	

1/ The electrical measurements for appendix E, table VIa (JANS) of MIL-PRF-19500 are as follows:

- a. Subgroup 3, see table II herein, steps 1, 3, 4, 5 and 6.
- b. Subgroup 4, see table II herein, steps 1, 3, 4, 5 and 6.
- c. Subgroup 5, see table II herein, steps 2, 3, 4, 5 and 6.

2/ The electrical measurements for appendix E, table VIb (JANTX and JANTXV) of MIL-PRF-19500 are as follows:

- a. Subgroup 2, see table II herein, steps 1, 3 and 4.
- b. Subgroup 3, see table II herein, steps 2, 3 and 4.
- c. Subgroup 6, see table II herein, steps 2, 3 and 4.

3/ The electrical measurements for appendix E, table VII of MIL-PRF-19500 are as follows:

- a. Subgroup 2, see table II herein, steps 1, 3, 4, 5 and 6 (JANS) and steps 1, 3 and 4 (JAN, JANTX and JANTXV).
- b. Subgroup 3, see table II herein, steps 1, 3, 4, 5 and 6 (JANS), 1, 3 and 4 (JAN, JANTX and JANTXV).
- c. Subgroup 6, see table II herein, steps 2, 3, 4, 5 and 6 (JANS) steps 2, 3 and 4 (JAN, JANTX and JANTXV).

4/ Column references are to table III.

5/ Devices which exceed the group A limits for this test shall not be accepted.

TABLE III. Test ratings: 1/

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	Col. 15
Voltage group	V <sub>Z</sub>	V <sub>Z</sub>	V <sub>Z</sub>	I <sub>Z</sub>	Z <sub>Z</sub>	Z <sub>ZK</sub>	I <sub>ZM2</sub> /Max. dc current T <sub>C</sub> = 30 +3°C	V <sub>Z(Reg)</sub>	I <sub>ZSM</sub>	V <sub>R</sub>	I <sub>R1</sub>	I <sub>R1</sub>	V <sub>Z</sub>	I <sub>Z</sub>
	Nom.	Min.	Max.	Test current max	Impedance max	Knee impedance	T <sub>C</sub> = 30 +3°C	Voltage regulation	T <sub>C</sub> = 30 ±3°C max.	Reverse voltage	Reverse current dc max.	Reverse current dc max (after life test)	Temperature coefficient max.	Max dc current T <sub>C</sub> = 150 +5,-0°C
	volts	volts	volts	mA	ohms	ohms	mA	volts	mA	volts	A	A	%/°C	mA
1N3993A	3.9	3.70	4.10	640	2.0	400	2440	0.80	12000	.5	100	200	-.060	610
1N3994A	4.3	4.08	4.52	580	1.5	400	2200	0.72	11000	.5	100	200	-.050	550
1N3995A	4.7	4.45	4.94	530	1.2	550	2000	0.68	10000	1.0	50	100	+0.025	500
1N3996A	5.1	4.84	5.36	490	1.1	550	1840	0.64	9000	1.0	10	20	+0.030	460
1N3997A	5.6	5.32	5.88	445	1.0	600	1680	0.60	8000	1.0	10	20	+0.040	420
1N3998A	6.2	5.89	6.51	405	1.1	700	1520	0.56	7000	2.0	10	20	+0.045	380
1N2970B	6.8	6.46	7.14	370	1.2	500	1500	0.4	7500	5.2	150	300	+0.057	370
1N2971B	7.5	7.13	7.87	335	1.3	250	1350	0.45	6750	5.7	100	200	+0.067	335
1N2972B	8.2	7.79	8.61	305	1.5	250	1180	0.5	5900	6.2	50	100	+0.070	305
1N2973B	9.1	8.65	9.55	275	2.0	250	1100	0.55	5500	6.9	25	50	+0.075	275
1N2974B	10	9.50	10.50	250	3.0	250	980	0.6	4900	7.6	25	50	+0.081	250
1N2975B	11	10.45	11.55	230	3.0	250	890	0.7	4450	8.4	10	20	+0.085	230
1N2976B	12	11.40	12.60	210	3.0	250	820	0.8	4100	9.1	10	20	+0.079	210
1N2977B	13	12.35	13.65	190	3.0	250	750	0.85	3750	9.9	10	20	+0.080	190
1N2979B	15	14.25	15.75	170	3.0	250	640	1.0	3200	11.4	10	20	+0.082	170
1N2980B	16	15.20	16.80	155	4.0	250	605	1.1	3000	12.2	10	20	+0.083	155
1N2982B	18	17.10	18.90	140	4.0	250	525	1.25	2600	13.7	10	20	+0.085	140
1N2984B	20	19.0	21.0	125	4.0	250	480	1.35	2400	15.2	10	20	+0.086	125
1N2985B	22	20.9	23.1	115	5.0	250	435	1.5	2180	16.7	10	20	+0.087	115
1N2986B	24	22.8	25.2	105	5.0	250	400	1.65	2000	18.2	10	20	+0.088	105
1N2988B	27	25.7	28.3	95	7.0	250	340	1.92	1700	20.6	10	20	+0.090	95
1N2989B	30	28.5	31.5	85	8.0	300	320	2.15	1600	22.8	10	20	+0.091	85
1N2990B	33	31.4	34.6	75	9.0	300	300	2.30	1500	25.1	10	20	+0.092	75
1N2991B	36	34.2	37.8	70	10.0	300	260	2.45	1300	27.4	10	20	+0.093	70
1N2992B	39	37.1	40.9	65	11.0	300	240	2.55	1200	29.7	10	20	+0.094	65
1N2993B	43	40.9	45.1	60	12.0	400	220	2.75	1100	32.7	10	20	+0.095	60
1N2995B	47	44.7	49.3	55	14.0	400	200	3.0	1000	35.8	10	20	+0.095	55
1N2997B	51	48.5	53.5	50	15.0	500	185	3.1	925	38.8	10	20	+0.096	50
1N2999B	56	53.2	58.8	45	16.0	500	170	3.3	850	42.6	10	20	+0.096	45
1N3000B	62	58.9	65.1	40	17	600	150	3.5	750	47.1	10	20	+0.097	40
1N3001B	68	64.6	71.4	37	18	600	137	3.8	685	51.7	10	20	+0.097	37

See notes at end of table.

TABLE III. Test ratings - Continued. 1/

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	Col. 15
V <sub>Z</sub>	V <sub>Z</sub>	V <sub>Z</sub>	V <sub>Z</sub>	I <sub>Z</sub>	Z <sub>Z</sub>	Z <sub>ZK</sub>	I <sub>ZM</sub> 2/	V <sub>Z(Reg)</sub>	I <sub>ZSM</sub>	V <sub>R</sub>	I <sub>R1</sub>	I <sub>R1</sub>	V <sub>Z</sub>	I <sub>Z</sub>
Nom.	Min.	Max.	Test current max.	Impedance max.	Impedance max.	Knee impedance	dc current max. T <sub>C</sub> = 30 +3°C	Voltage regulation	T <sub>C</sub> = 30 ±3°C max.	Reverse voltage	Reverse current dc max.	Reverse current (after life test)	Temperature coefficient max.	Max dc current T <sub>C</sub> = 150 +5,-0°C
volts	volts	volts	mA	ohms	ohms	ohms	mA	volts	mA	volts	A	A	%/°C	mA
1N3002B	75	71.3	78.7	33	22	600	125	4.4	625	56.0	10	20	+098	33
1N3003B	82	77.9	86.1	30	25	700	115	4.7	575	62.2	10	20	+098	30
1N3004B	91	86.5	95.5	28	35	800	97	5.1	485	69.2	10	20	+099	28
1N3005B	100	95.0	105.0	25	40	900	91	6.1	450	76.0	10	20	+110	25
1N3007B	110	104.5	115.5	23	55	1100	82	6.9	410	83.6	10	20	+110	23
1N3008B	120	114.0	126.0	20	75	1200	77	7.9	380	91.2	10	20	+110	20
1N3009B	130	123.5	136.5	19	100	1300	71	8.8	350	98.8	10	20	+110	19
1N3011B	150	142.5	157.5	17	175	1500	62	11.0	310	114.0	10	20	+110	17
1N3012B	160	152.0	168.0	16	200	1600	58	11.8	290	121.6	10	20	+110	16
1N3014B	180	171.0	189.0	14	260	1850	52	13.8	260	136.8	10	20	+110	14
1N3015B	200	190.0	210.0	12	300	2000	46	14.8	230	152.0	10	20	+110	12

1/ The test ratings are applicable to B and RB devices.  
 2/ Derate I<sub>Z</sub> linearly to 0.0 mA dc at +175°C, for T<sub>C</sub> > +55°C.

5. PACKAGING

5.1 Packaging. Packaging shall prevent mechanical damage of the devices during shipping and handling and shall not be detrimental to the device. 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.

5.2 Marking. Unless otherwise specified (see 6.2), marking shall be in accordance with MIL-STD-129.

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. See MIL- PRF-19500.

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 Products List QPL 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 purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Commander, Defense Supply Center Columbus, ATTN: DSCC-VQE, 3990 East Broad Street, Columbus, OH 43216-5000.

6.3.1 Substitutability. The following parts are acceptable substitutions for types 1N3999 and 1N4000, which are no longer available:

<u>Part number</u>	<u>required substitute</u>
1N3999A	1N2970RB
1N3999RA	1N2970B
1N4000A	1N2971RB
1N4000RA	1N2971B

6.4 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.

6.4 MIL-S-19500/272 for Part or Identifying Number (PIN) 1N3993A, RA through 1N4000A, RA has been obsoleted. PINs 1N3993A, RA through 1N3998A, RA have been incorporated into MIL-PRF-19500/124. PINs 1N3999A, RA and 1N4000A, RA have been deleted, as they are redundant to 1N2970RB, B and 1N2971RB, B respectively.

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 - 13, 15, 19, 85, 99

(Project 5961-1873)

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.

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I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER  
MIL-PRF-19500/124H

2. DOCUMENT DATE (YYMMDD)  
970620

3. DOCUMENT TITLE

SEMICONDUCTOR DEVICE, DIODE, SILICON, VOLTAGE REGULATOR B AND RB, TYPES 1N2970 THROUGH 1N2977, 1N2979, 1N2980, 1N2982, 1N2984 THROUGH 1N2986, 1N2988 THROUGH 1N2993, 1N2995, 1N2997, 1N2999 THROUGH 1N3005, 1N3007, 1N3008, 1N3009, 1N3011, 1N3012, 1N3014, 1N3015, PLUS A AND RA TYPES 1N3993 THROUGH 1N3998, JAN, JANTXV, AND JANS

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)

7. DATE SUBMITTED  
(YYMMDD)

(1) Commercial

(2) AUTOVON  
(If applicable)

8. PREPARING ACTIVITY

a. NAME Alan Barone

b. TELEPHONE (Include Area Code)

(1) Commercial

(2) AUTOVON

614-962-0510

850-0510

c. ADDRESS (Include Zip Code)  
Commander, Defense Supply Center  
Columbus, ATTN: DSCC-VAT, 3990 East  
Broad Street, Columbus, OH 43216-5000

IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:  
Defense Quality and Standardization Office  
5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466  
Telephone (703) 756-2340 AUTOVON 289-2340