

The documentation and process conversion measures necessary to comply with this amendment shall be completed by 2 November 1993

[INCH-POUND]

MIL-S-19500/452C
2 August 1993
SUPERSEDING
MIL-S-19500/452B
25 August 1990

MILITARY SPECIFICATION

SEMICONDUCTOR DEVICE, DIODE, SILICON, LOW LEVEL, VOLTAGE-REFERENCE
TYPES 1N4565A THROUGH 1N4584A, 1N4565A-1 THROUGH 1N4584A-1,
AND 1N4565AUR-1 THROUGH 1N4584AUR-1,
JAN, JANTX, JANTXV, JANS, AND JANC

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 detail requirements for 6.4 volts ± 5 percent, low bias current, silicon voltage-reference diodes. Four levels of product assurance are provided for each device type as specified in MIL-S-19500, and one level of product assurance for die (element evaluation).

1.2 Physical dimensions. See figures 1 and 2, and 3.2.

1.3 Maximum ratings. $T_A = +25^\circ\text{C}$, unless otherwise specified.

PT	TSTG and Top	I _{ZM}	Power derating above $T_A = +25^\circ\text{C}$ (see 6.3)
<u>mW</u>	<u>°C</u>	<u>mA dc</u>	<u>mW/°C</u>
475	-65 to +175	70	3.16

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: NASA/Parts Projects Office (NPPPO), NASA Goddard Space Flight Center, Code 310.A, Greenbelt, MD 20771 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

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FSC 5961

MIL-S-19500/452C

1.4 Primary electrical characteristics.

Type 1/	ΔV_Z (voltage- temperature stability)	Z_Z $I_Z = 0.5 \text{ mA dc}$	V_Z $I_Z = 0.5 \text{ mA dc}$		I_R $V_R = 3 \text{ V dc}$
			Min	Max	
	<u>V dc</u>	<u>ohms</u>	<u>volts</u>	<u>volts</u>	<u>μA</u>
1N4565A, 1N4565A-1, 1N4565AUR-1	0.100	200	6.08	6.72	2.0
1N4566A, 1N4566A-1, 1N4566AUR-1	0.050	"	"	"	"
1N4567A, 1N4567A-1, 1N4567AUR-1	0.020	"	"	"	"
1N4568A, 1N4568A-1, 1N4568AUR-1	0.010	"	"	"	"
1N4569A, 1N4569A-1, 1N4569AUR-1	0.005	"	"	"	"

Type 1/	ΔV_Z (voltage- temperature stability)	Z_Z $I_Z = 1.0 \text{ mA dc}$	V_Z $I_Z = 1.0 \text{ mA dc}$		I_R $V_R = 3 \text{ V dc}$
			Min	Max	
	<u>V dc</u>	<u>ohms</u>	<u>volts</u>	<u>volts</u>	<u>μA</u>
1N4570A, 1N4570A-1, 1N4570AUR-1	0.100	100	6.08	6.72	2.0
1N4571A, 1N4571A-1, 1N4571AUR-1	0.050	"	"	"	"
1N4572A, 1N4572A-1, 1N4572AUR-1	0.020	"	"	"	"
1N4573A, 1N4573A-1, 1N4573AUR-1	0.010	"	"	"	"
1N4574A, 1N4574A-1, 1N4574AUR-1	0.005	"	"	"	"

Type 1/	ΔV_Z (voltage- temperature stability)	Z_Z $I_Z = 2.0 \text{ mA dc}$	V_Z $I_Z = 2.0 \text{ mA dc}$		I_R $V_R = 3 \text{ V dc}$
			Min	Max	
	<u>V dc</u>	<u>ohms</u>	<u>volts</u>	<u>volts</u>	<u>μA</u>
1N4575A, 1N4575A-1, 1N4575AUR-1	0.100	50	6.08	6.72	2.0
1N4576A, 1N4576A-1, 1N4576AUR-1	0.050	"	"	"	"
1N4577A, 1N4577A-1, 1N4577AUR-1	0.020	"	"	"	"
1N4578A, 1N4578A-1, 1N4578AUR-1	0.010	"	"	"	"
1N4579A, 1N4579A-1, 1N4579AUR-1	0.005	"	"	"	"

Type 1/	ΔV_Z (voltage- temperature stability)	Z_Z $I_Z = 4.0 \text{ mA dc}$	V_Z $I_Z = 4.0 \text{ mA dc}$		I_R $V_R = 3 \text{ V dc}$
			Min	Max	
	<u>V dc</u>	<u>ohms</u>	<u>volts</u>	<u>volts</u>	<u>μA</u>
1N4580A, 1N4580A-1, 1N4580AUR-1	0.100	25	6.08	6.72	2.0
1N4581A, 1N4581A-1, 1N4581AUR-1	0.050	"	"	"	"
1N4582A, 1N4582A-1, 1N4582AUR-1	0.020	"	"	"	"
1N4583A, 1N4583A-1, 1N4583AUR-1	0.010	"	"	"	"
1N4584A, 1N4584A-1, 1N4584AUR-1	0.005	"	"	"	"

1/ Electrical characteristics and test conditions for "A, A-1, and AUR-1" devices are identical.

MIL-S-19500/452C

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

3.2 Abbreviations, symbols, and definitions. Abbreviations, symbols, and definitions used herein shall be as specified in MIL-S-19500.

3.3 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-S-19500, and figures 1, 2, 3, and 4 herein.

3.3.1 Lead finish. Lead finish shall be solderable as defined in MIL-S-19500, MIL-STD-750, and herein. When a choice of lead finish is desired, it shall be specified in the acquisition requirements (see 6.2).

3.3.2 Dash-one construction. These devices shall be category I or II metallurgical bond in accordance with MIL-S-19500.

3.4 Marking. Marking shall be in accordance with MIL-S-19500. At the option of the manufacturer, the following markings may be omitted from the device (nonsurface mount):

- a. Country of origin.
- b. "1N" portion of type designation.
- c. The DO-35 versions may leave off "-" portion of type designation (example: JANTX1N4565A1).

3.4.1 UR devices. For "UR" devices only, all marking (except polarity) may be omitted from the body, but shall be retained on the initial container.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection shall be in accordance with MIL-S-19500, and as specified herein, except that the lot accumulation period requirement shall be 6 months in lieu of 6 weeks.

MIL-S-19500/452C

4.2 Qualification inspection. Qualification inspection shall be in accordance with MIL-S-19500. Subgroups 3 and 6 of group B inspection and subgroup 6 of group C inspection shall be performed on a full sample size of the highest voltage temperature stability type (lowest ΔV_Z) of each bias current to qualify that type and all lower voltage-temperature stability types of that bias current.

4.2.1 Group E inspection. Qualification inspection shall be in accordance with table VII of MIL-S-19500 and as follows. Electrical measurements (end points) and delta requirements shall be in accordance with the applicable steps of table II herein.

Subgroup	Method	Condition	Qualification conformance inspection
E1	1051	500 cycles	22 devices, $c = 0$.
E2	1038	Condition A, 1,000 hours	22 devices, $c = 0$.
E3, E4, E5, & E6	---	---	Not applicable

4.2.2 JANC devices. Qualification for JANC devices shall be in accordance with appendix H of MIL-S-19500. This testing may be performed on a TO-5 package in lieu of the DO-7, DO-35, or the DO-213AA packages.

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

Screen (see table II of MIL-S-19500)	Measurement	
	JANS level	JANTX and JANTXV levels
3a	Temperature cycling	Temperature cycling
11	V_Z, Z_Z, I_R	V_Z, Z_Z, I_R
12	See 4.3.1	See 4.3.1
13	Subgroups 2 and 3 of table I herein; $\Delta V_Z \leq \pm 0.005$ V dc from initial value, $\Delta Z_Z \leq \pm 15$ percent of initial value.	Subgroup 2 of table I herein; $\Delta V_Z \leq \pm 0.005$ V dc from initial value, $\Delta Z_Z \leq \pm 15$ percent of initial value.

4.3.1 Power burn-in conditions. Power burn-in conditions are as follows (applies to A, A-1, and AUR-1 versions):

1N4565 through 1N4569: $I_Z = 0.5 \pm 0.05$ mA dc, $T_A = +150^\circ\text{C}, +5^\circ\text{C}, -0^\circ\text{C}$.
 1N4570 through 1N4574: $I_Z = 1.0 \pm 0.1$ mA dc, $T_A = +150^\circ\text{C}, +5^\circ\text{C}, -0^\circ\text{C}$.
 1N4575 through 1N4579: $I_Z = 2.0 \pm 0.2$ mA dc, $T_A = +150^\circ\text{C}, +5^\circ\text{C}, -0^\circ\text{C}$.
 1N4580 through 1N4584: $I_Z = 4.0 \pm 0.4$ mA dc, $T_A = +150^\circ\text{C}, +5^\circ\text{C}, -0^\circ\text{C}$.

4.3.2 Screening (JANC). Screening of JANC die shall be in accordance with MIL-S-19500, appendix H. As a minimum, die shall be 100-percent probed in accordance with group A, subgroup 2.

4.4 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-S-19500.

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

MIL-S-19500/452C

4.4.2 Group B inspection for JANS. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in table IVa (JANS) of MIL-S-19500, and as follows. Electrical measurements (end points) and delta requirements shall be as specified in footnote 2/ of table II herein.

4.4.2.1 Group B inspection, table IVa (JANS) of MIL-S-19500.

Subgroup	Method	Condition
B3	1071	Gross leak conditions: Condition E.
B4	1037	$I_{ZM} = 70$ mA dc at $T_A = +25^\circ\text{C}$; $t_{on} = t_{off} = 3$ minutes minimum for 2,000 cycles, no forced air cooling on the device shall be permitted.
B5	1027	$I_{ZM} = 70$ mA dc for 96 hours; $T_A = +75^\circ\text{C}$ or adjusted as required, to give an average lot $T_J = +200^\circ\text{C}$.
B6	---	Not applicable.

4.4.3 Group B inspection for JAN, JANTX, and JANTXV. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in table IVb (JAN, JANTX, and JANTXV) of MIL-S-19500, and as follows. Electrical measurements (end points) and delta requirements shall be as specified in footnote 3/ of table II herein.

4.4.3.1 Group B inspection, table IVb (JAN, JANTX, and JANTXV) of MIL-S-19500.

Subgroup	Method	Condition
B3	1027	Conditions for A, A-1, and AUR-1 versions of: 1N4565 through 1N4569: $I_Z = 0.5$ mA dc; $T_A = +100^\circ\text{C}$. 1N4570 through 1N4574: $I_Z = 1.0$ mA dc; $T_A = +100^\circ\text{C}$. 1N4575 through 1N4579: $I_Z = 2.0$ mA dc; $T_A = +100^\circ\text{C}$. 1N4580 through 1N4584: $I_Z = 4.0$ mA dc; $T_A = +100^\circ\text{C}$.
B4, B5	---	Not applicable.

4.4.4 Group C inspection. Group C inspection shall be conducted in accordance with the conditions specified for subgroup testing in table V of MIL-S-19500, and as follows. Electrical measurements (end points) and delta requirements shall be as specified in footnote 4/ of table II herein.

Subgroup	Method	Condition
C2	2036	Lead fatigue: Test condition E; tension: test condition A; 4 pounds, 15 ± 3 seconds (lead fatigue and tension tests do not apply to surface mount devices)
C5	---	Not applicable.
C6	1026	Conditions for A, A-1, and AUR-1 versions of: 1N4565 through 1N4569: $I_Z = 0.5$ mA dc; $T_A = +100^\circ\text{C}$. 1N4570 through 1N4574: $I_Z = 1.0$ mA dc; $T_A = +100^\circ\text{C}$. 1N4575 through 1N4579: $I_Z = 2.0$ mA dc; $T_A = +100^\circ\text{C}$. 1N4580 through 1N4584: $I_Z = 4.0$ mA dc; $T_A = +100^\circ\text{C}$.

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

4.5.1 Voltage-temperature stability. The breakdown voltage of each diode type shall be measured and recorded at each of the specified temperatures. The lowest measured voltage shall be subtracted from the highest measured voltage for each diode. The difference value obtained shall not exceed the specified ΔV_Z per diode type.

MIL-S-19500/452C

4.5.2 Reference voltage time stability. The breakdown voltage shall be measured prior to life testing, at 340 hours, and at the conclusion of the life test. The 340-hour reading shall be compared with the 0-hour reading and the 1,000-hour reading compared with the 340-hour reading. The change in breakdown voltage shall not exceed the limits specified. The test temperature for breakdown voltage shall be the same as the specified ambient life-test temperature.

4.5.3 Reference voltage. The test current shall be applied until thermal equilibrium is attained (15 s maximum) prior to reading the reference voltage. For this test, the diode shall be suspended by its' leads with mounting clips whose inside edge is located at 0.375 inch (9.53 mm) from the body and the mounting clips shall be maintained at the specified temperature. This measurement may be performed after a shorter time following application of the test current than that which provides thermal equilibrium if correlation to stabilized readings can be established to the satisfaction of the Government.

MIL-S-19500/452C

TABLE I. Group A inspection.

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u>						
Visual and mechanical inspection	2071					
<u>Subgroup 2</u>						
Reference voltage	4022	(See 4.5.3)	V _Z			
1N4565 through 1N4569		I _Z = 0.5 ± 0.01 mA dc		6.08	6.72	V dc
1N4570 through 1N4574		I _Z = 1.0 ± 0.01 mA dc		6.08	6.72	V dc
1N4575 through 1N4579		I _Z = 2.0 ± 0.01 mA dc		6.08	6.72	V dc
1N4580 through 1N4584		I _Z = 4.0 ± 0.01 mA dc		6.08	6.72	V dc
Small-signal breakdown impedance	4051					
1N4565 through 1N4569		I _Z = 0.5 ± 0.01 mA dc I _{SIG} = 0.05 mA rms		---	200	Ω
1N4570 through 1N4574		I _Z = 1.0 ± 0.01 mA dc I _{SIG} = 0.1 mA rms		---	100	Ω
1N4575 through 1N4579		I _Z = 2.0 ± 0.01 mA dc I _{SIG} = 0.2 mA rms		---	50	Ω
1N4580 through 1N4584		I _Z = 4.0 ± 0.01 mA dc I _{SIG} = 0.4 mA rms		---	25	Ω
Reverse current leakage	4016	DC method; V _R = 3.0 V dc	I _R	---	2.0	μA
<u>Subgroup 3</u>						
Voltage-temperature stability (see 4.5.1 and 4.5.3)		T _A = -55°C, +0°C, +25°C, +75°C, +100°C, ±2°C	ΔV _Z			
1N4565A, 1N4565A-1, 1N4565AUR-1				---	100	mV dc
1N4570A, 1N4570A-1, 1N4570AUR-1					"	
1N4575A, 1N4575A-1, 1N4575AUR-1					"	
1N4580A, 1N4580A-1, 1N4580AUR-1					"	
1N4566A, 1N4566A-1, 1N4566AUR-1				---	50	mV dc
1N4571A, 1N4571A-1, 1N4571AUR-1					"	
1N4576A, 1N4576A-1, 1N4576AUR-1					"	
1N4581A, 1N4581A-1, 1N4581AUR-1					"	
1N4567A, 1N4567A-1, 1N4567AUR-1				---	20	mV dc
1N4572A, 1N4572A-1, 1N4572AUR-1					"	
1N4577A, 1N4577A-1, 1N4577AUR-1					"	
1N4582A, 1N4582A-1, 1N4582AUR-1					"	

See footnote at end of table.

MIL-S-19500/452C

TABLE I. Group A inspection - Continued.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 3 - Continued</u>						
Voltage-temperature stability (see 4.5.1 and 4.5.3)		$T_A = -55^\circ\text{C}, +0^\circ\text{C}, +25^\circ\text{C},$ $+75^\circ\text{C}, +100^\circ\text{C}, \pm 2^\circ\text{C}$	ΔV_Z			
1N4568A, 1N4568A-1, 1N4568AUR-1 1N4573A, 1N4573A-1, 1N4573AUR-1 1N4578A, 1N4578A-1, 1N4578AUR-1 1N4583A, 1N4583A-1, 1N4583AUR-1				---	10 " " "	mV dc
1N4569A, 1N4569A-1, 1N4569AUR-1 1N4574A, 1N4574A-1, 1N4574AUR-1 1N4579A, 1N4579A-1, 1N4579AUR-1 1N4584A, 1N4584A-1, 1N4584AUR-1				---	5 " " "	mV dc

1/ For sampling plan, see MIL-S-19500.TABLE II. Groups A, B, C, and E electrical measurements.

Step	Inspection	MIL-STD-750		Symbol	Limits		Unit
		Method	Conditions <u>1/</u>		Min	Max	
1.	Reference voltage	4022	(see 4.5.3)	V_Z			
	1N4565 through 1N4569		$I_Z = 0.5 \pm 0.01$ mA dc		6.08	6.72	V dc
	1N4570 through 1N4574		$I_Z = 1.0 \pm 0.01$ mA dc		6.08	6.72	V dc
	1N4575 through 1N4579		$I_Z = 2.0 \pm 0.01$ mA dc		6.08	6.72	V dc
2.	Small-signal breakdown impedance	4051					
	1N4565 through 1N4569		$I_Z = 0.5 \pm 0.01$ mA dc ISIG = 0.05 mA rms		---	200	Ω
	1N4570 through 1N4574		$I_Z = 1.0 \pm 0.01$ mA dc ISIG = 0.1 mA rms		---	100	Ω
	1N4575 through 1N4579		$I_Z = 2.0 \pm 0.01$ mA dc ISIG = 0.2 mA rms		---	50	Ω
3.	Reverse current Leakage	4016	DC method; $V_R = 3.0$ V dc	I_R	---	2.0	μA
	1N4580 through 1N4584		$I_Z = 4.0 \pm 0.01$ mA dc ISIG = 0.4 mA rms		---	25	Ω

See footnotes at end of table.

MIL-S-19500/452C

TABLE II. Groups A, B, C, and E electrical measurements - Continued.

Step	Inspection	MIL-STD-750		Symbol	Limits		Unit				
		Method	Conditions ^{1/}		Min	Max					
4.	Voltage-temperature stability (see 4.5.1 and 4.5.3)		T _A = -55°C, +0°C, +25°C, +75°C, +100°C, ±2°C	ΔV _Z							
								1N4565, 1N4570, 1N4575, 1N4580	---	100	mV dc
								1N4566, 1N4571, 1N4576, 1N4581	---	50	mV dc
								1N4567, 1N4572, 1N4577, 1N4582	---	20	mV dc
								1N4568, 1N4573, 1N4578, 1N4583	---	10	mV dc
1N4569, 1N4574, 1N4579, 1N4584	---	5	mV dc								
5.	Reference-voltage stability		T _A = +100°C, ±2°C; (0 to 340 hours); (see 4.5.2 and 4.5.3)	ΔV _Z							
								1N4565, 1N4570, 1N4575, 1N4580	---	10	mV dc
								1N4566, 1N4571, 1N4576, 1N4581	---	8	mV dc
								1N4567, 1N4572, 1N4577, 1N4582	---	7	mV dc
								1N4568, 1N4573, 1N4578, 1N4583	---	6	mV dc
1N4569, 1N4574, 1N4579, 1N4584	---	5	mV dc								
6.	Reference-voltage stability		T _A = +100°C, ±2°C, (340 to 1,000 hours); (see 4.5.2 and 4.5.3)	ΔV _Z							
								1N4565, 1N4570, 1N4575, 1N4580	---	5	mV dc
								1N4566, 1N4571, 1N4576, 1N4581	---	4	mV dc
								1N4567, 1N4572, 1N4577, 1N4582	---	4	mV dc
								1N4568, 1N4573, 1N4578, 1N4583	---	3	mV dc
1N4569, 1N4574, 1N4579, 1N4584	---	3	mV dc								

^{1/} Electrical characteristics and test conditions for "A, A-1, and AUR-1" devices are identical.

^{2/} The electrical measurements for table IVa (JANS) of MIL-S-19500 are as follows:

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

^{3/} The electrical measurements for table IVb (JANTX and JANTXV) of MIL-S-19500 are as follows:

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

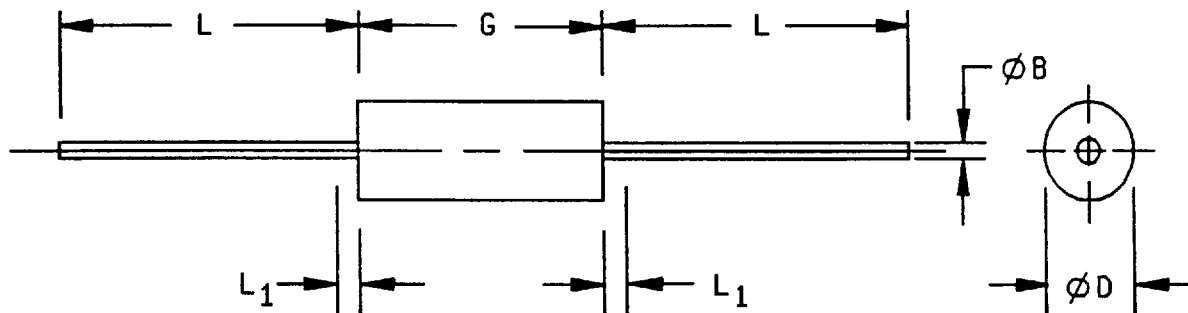
^{4/} The electrical measurements for table V of MIL-S-19500 are as follows:

- a. Subgroup 2, see table II herein, steps 1, 2, 3, and 4.
- b. Subgroup 3, see table II herein, steps 1, 2, 3, and 4.
- c. Subgroup 6, (0 to 340 hours) see table II herein, step 5; (340 to 1,000 hours) steps 1, 2, 3, 4, and 6.

^{5/} The electrical measurements for table VII of MIL-S-19500 are as follows:

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

MIL-S-19500/452C



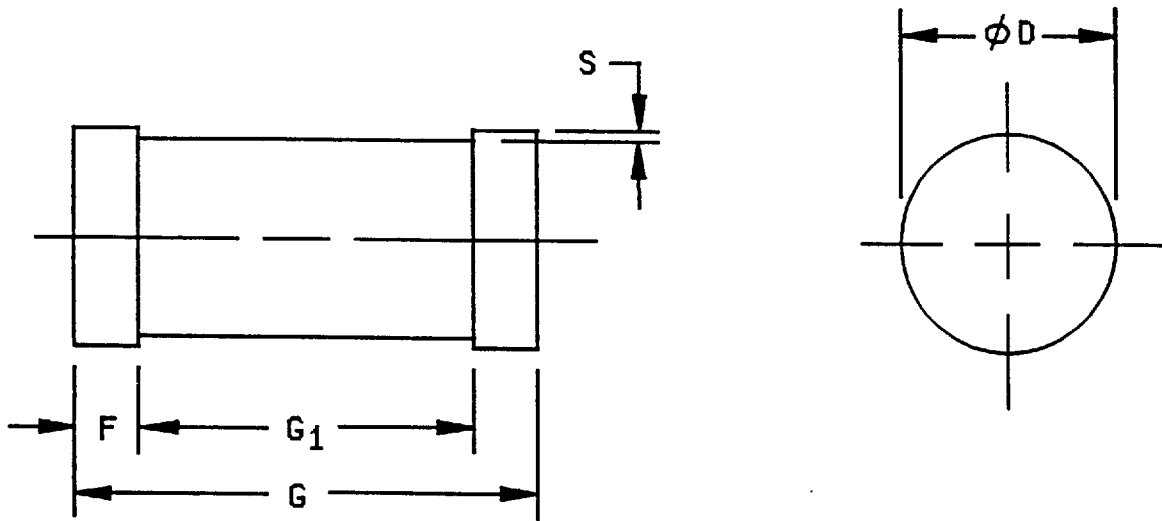
Dimensions					
Ltr	Inches		Millimeters		Notes
	Min	Max	Min	Max	
ϕB	.018	.023	0.46	0.58	
ϕD	.060	.107	1.52	2.71	3
G	.120	.300	3.05	7.62	3
L	1.000	1.500	25.40	38.10	
L ₁		0.50		1.27	4

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Package contour optional within ϕD and length G. Heat slugs, if any, shall be included within this cylinder but shall not be subject to minimum limit of ϕD .
4. Within this zone, lead diameter may vary to allow for lead finishes and irregularities, other than heat slugs.

FIGURE 1. Physical dimensions, 1N4565A through 1N4584A, 1N4565A-1 through 1N4584A-1 (DO-7 and DO-35).

MIL-S-19500/452C



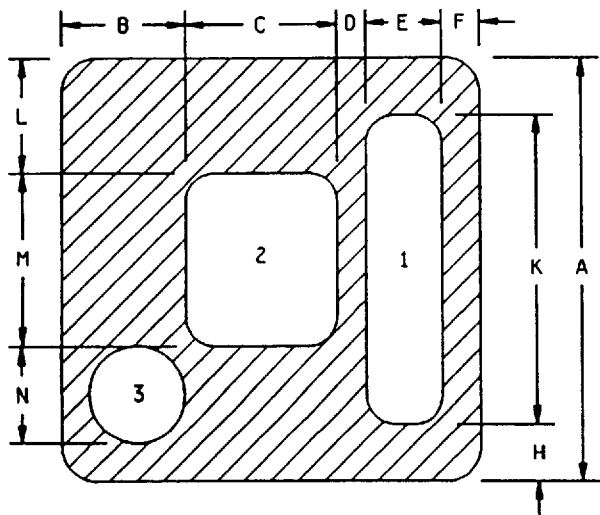
Dimensions				
Ltr	Inches		Millimeters	
	Min	Max	Min	Max
ϕD	.063	.067	1.60	1.70
F	.016	.022	0.41	0.55
G	.130	.146	3.30	3.71
G1	.100 Ref		2.54 Ref	
S	.001 Min		0.03 Min	

NOTES:

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

FIGURE 2. Physical dimensions, 1N4565AUR-1 through 1N4584AUR-1 (DO-213AA).

MIL-S-19500/452C



BACKSIDE MUST BE ELECTRICALLY ISOLATED

Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	.028	.032	.71	.81
B	.008	.010	.20	.25
C	.0104	.0106	.264	.269
D	.0019	.0021	.048	.053
E	.0054	.0056	.137	.142
F	.002	.004	.05	.10
H	.003	.005	.08	.13
K	.0209	.0211	.531	.536
L	.008	.010	.20	.25
M	.0104	.0106	.264	.269
N	.0059	.0061	.150	.155

DESIGN DATA

Metallization:

Circuit layout data:

For zener operation, cathode must be operated positive with respect to anode.

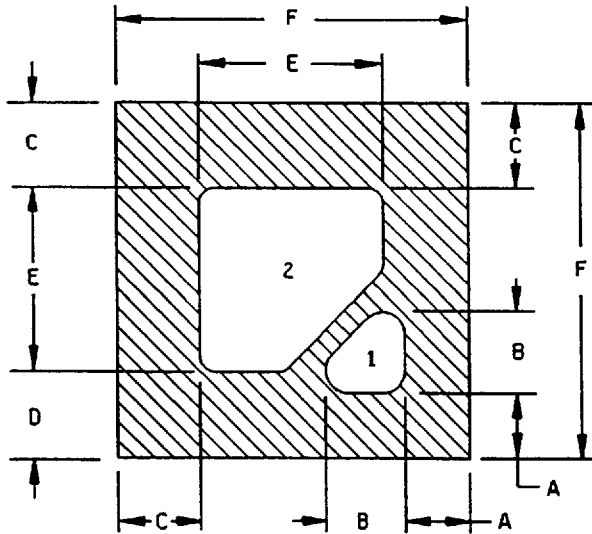
Top: 1 (Cathode) - - - - Al
 2 (Anode) - - - - Al
 3 (Test pad) - - - - Al
 Back - - - - - Au
 Al thickness - - - - - 12,000 Å minimum
 Gold thickness - - - - - 3,000 Å minimum
 Chip thickness - - - - - 10 mils ±2 mils

NOTES:

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

FIGURE 3. JANC (A-version) die dimensions.

MIL-S-19500/452C



Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	.0035	.0065	.088	.165
B	.0050	.0080	.127	.200
C	.0050	.0065	.127	.165
D	.0050	.0065	.127	.165
E	.0150	.0165	.381	.419
F	.0260	.0290	.660	.737

BACKSIDE MUST BE ELECTRICALLY ISOLATED

DESIGN DATA

Metallization:

Circuit layout data:

For zener operation, cathode must be operated positive with respect to anode.

- Top: 1 (Cathode) - - - - - Al
- 2 (Anode) - - - - - Al
- Back - - - - - Au
- Al thickness - - - - - 40,000 Å minimum
- Gold thickness - - - - - 5,000 Å minimum
- Chip thickness - - - - - 10 mils ±2 mils

NOTES:

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

FIGURE 4. JANC (B-version) die dimensions.

MIL-S-19500/452C

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-S-19500.

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-S-19500 are applicable to this specification.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of the specification.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1).
- c. Lead finish (see 3.2.1).
- d. Product assurance level and type designator.
- e. For die acquisition, the JANC letter version (see 6.3 and figures 3 and 4).

6.3 Voltage-temperature stability. This parameter will be within the limits of the specification provided temperature extremes of -55°C to $+100^{\circ}\text{C}$ are not exceeded (see 4.5.2).

6.4 Suppliers of JANC die. The qualified JANC suppliers with the applicable letter version (example, JANCA4565A) will be identified on the Qualified Products List. The Part or Identifying Number (PIN) is indicated below:

JANC ordering information		
PIN	Manufacturer	
	55801	12954
1N4565A through 1N4584A	A4565A through A4584A	B4565A through B4584A

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

CONCLUDING MATERIAL

Custodians:

Army - ER
Navy - EC
Air Force - 17
NASA - NA

Preparing activity:

NASA - NA

Agent:

DLA - ES

Review activities:

Army - AR, MI
Air Force - 85, 99
DLA - ES

(Project 5961-1431)

User activities:

Army - SM
Navy - AS, CG, MC, OS
Air Force - 19