

MILITARY SPECIFICATION  
SEMICONDUCTOR DEVICE, DIODE, TYPE 1N995M

1. SCOPE

1.1 Scope. This specification covers the detail requirements for a germanium switching diode and is in accordance with Specification MIL-S-19500, except as otherwise specified herein.

1.2 Maximum ratings.

Type	V <sub>R</sub>	I <sub>0</sub>	I <sub>T</sub> (surge) (1 sec)	Max Temp. Range	Power Dissipation
	Vdc	mA	mA	°C	mW <sup>1/</sup>
1N995M	15	30	200	-55 to 90	50

<sup>1/</sup> For power ratings above 25°C, derate at 2/3 mW/°C.

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issue in effect on date of invitation for bids, form a part of this specification to the extent specified herein:

SPECIFICATION

MILITARY  
MIL-S-19500 - Semiconductor Devices, General Specification for.

STANDARD

MILITARY  
MIL-STD-750 - Test Methods For Semiconductor Devices.

(Copies of specifications, standards, drawings and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 General. Diodes shall be in accordance with Specification MIL-S-19500 and as specified herein.

3.2 Design and construction. Semiconductor diodes shall be of the design, construction and physical dimensions as shown on Figure 1.

3.3 Performance characteristics. Performance characteristics shall be as specified in 4.3 and 4.4.

3.4 Marking. Diodes shall be marked USN "1N995M". No color coding shall be permitted. The following items may be omitted from the device: country of origin and manufacturer's identification.

4. QUALITY ASSURANCE PROVISIONS

4.1 Qualification tests. Qualification tests shall be conducted at a laboratory satisfactory to the Bureau of Ships. Qualification tests shall consist of the tests specified in 4.3 and 4.4. (Application for qualification tests shall be made in accordance with "Provisions Governing Qualification" (see 6.1)).

**MIL-S-19500/227(NAVY)**

**4.2 Acceptance inspection.** Acceptance inspection shall consist of examinations and tests specified in 4.3 and 4.4.

**4.2.1 Acceptance procedure.** When a second sample is chosen, the total sample shall be that sample associated with an acceptance number of one less than the minimum rejection numbers specified in tables I and II.

**4.2.2 Acceptance-inspection information.** When specified in the contract or order, one copy of the acceptance-inspection data pertinent to the inspection lot shall accompany the shipments.

**4.3 Group A inspection.** Group A inspection shall consist of the examinations and tests specified in Table I.

**4.4 Group B inspection.** Group B inspection shall consist of the examinations and tests specified in table II.

**4.4.1 Destructive Tests.** The tests in subgroups 4 and 5 of Group B inspection are considered to be destructive.

**4.4.2 Salt atmosphere.** The device shall be examined for destructive corrosion and illegible marking

**5. PREPARATION FOR DELIVERY**

**5.1** See Specification MIL-S-19500

**6. NOTES**

**6.1** The activity responsible for the qualified products list is the Bureau of Ships, Department of the Navy, Washington 25, D.C., and information pertaining to qualification of products may be obtained from that activity. Application for qualification tests shall be made in accordance with "Provisions Governing Qualification". (Copies of "Provisions Governing Qualification" may be obtained upon application to Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia 20, Pa.)

**Notice.** - When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Preparing activity:  
Navy - Ships  
(Project 5960-N260(NAVY))

Table I - Group A Inspection.

EXAMINATION OR TEST	CONDITIONS		LTPD	MIN REJ. NO.	SYMBOL	LIMITS		UNITS
	MIL-STD-750 REF. METHOD	SPECIFIC CONDITIONS				MIN	MAX	
<u>Subgroup 1</u>								
Visual and mechanical examination	2071		5	6				
<u>Subgroup 2</u>								
Forward voltage	4011	$I_F = 10\text{mA}$	5	6	$V_F$	0.3	0.5	Vdc
Saturation current	4076	$V_R = 6\text{Vdc}$			$I_g$	---	10.0	uAde
Saturation current	4076	$T_A = 70^\circ\text{C}$ $V_R = 6\text{Vdc}$			$I_g$	---	100.0	uAde
<u>Subgroup 3</u>								
Reverse recovery time	4031	$I_F = 10\text{mA}$ $V_R = 6\text{Vdc}$  Loop impedance = 75 ohms	5	6	$t_{rr}$	---	6.0	nsec
Forward recovery voltage	4026	$I_F = 30\text{mA}$ $t_r = 0.1\text{usec}$			$V_F$	---	1.2	Vdc
Capacitance	4001	$V_R = 1.5\text{Vdc}$ $f = 100\text{kc}$			C	---	0.7	pf
	4001	$V_R = 9.0\text{Vdc}$  $f = 100\text{kc}$	C	---	0.5	pf		

Table II - Group B Inspection.

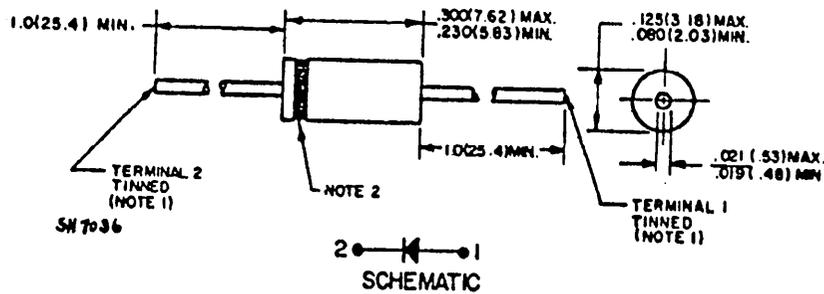
EXAMINATION OR TEST	CONDITIONS		LTPD or $\lambda$	MIN REJ. NO.	SYMBOL	LIMITS		UNITS
	MIL-STD-750 REF. METHOD	SPECIFIC CONDITIONS				MIN	MAX	
<u>Subgroup 1</u>								
Physical dimensions	2066		10	5	---	---	---	---
<u>Subgroup 2</u>								
Solderability	2026				---	---	---	---
Temperature cycling	1051 Condition A	5 cycles $T(\text{high}) = 90^\circ\text{C}$			---	---	---	---

Table II - Group B inspection (Cont'd.)

EXAMINATION OR TEST	CONDITIONS		LTPD or $\lambda$	MIN REJ. NO.	SYMBOL	LIMITS		UNITS
	MIL-STD-750 REF. METHOD	SPECIFIC CONDITIONS				MIN	MAX	
<u>Subgroup 2</u> (Cont'd.)								
Thermal shock	1056 Condition A		10	5	---	---	---	---
Moisture resistance	1021				---	---	---	---
<u>Subgroup 3</u>								
Shock	2021	1000 G 5 blows X1, Y1, Y2				---	---	---
Vibration, variable frequency	2056	10G	10	5		---	---	---
Vibration fatigue	2046	10G				---	---	---
Constant acceleration	2006	10000G X1, Y1, Y2				---	---	---
<u>Subgroup 4</u>								
Lead fatigue	2036 Condition E		10	5		---	---	---
<u>Subgroup 5</u>								
Salt atmosphere	1041		10	5		---	---	---
<u>Subgroup 6</u>								
Surge current	4066	$I_O = 3C \text{ mA}$ $i(\text{surge}) = 200\text{mA}$ ten 1 sec surges 1 surge/min	10	5		---	---	---
<u>Subgroup 7</u>								
Steady state operation life	1026	$I_O = 30\text{mA}$ $f = 60 \text{ cps}$ $V = 10 \text{ Vac(rms)}$	5	5		---	---	---
<u>Subgroup 8</u>								
High temperature life (non-operating)	1031	$T_A = 100^\circ\text{C.}$	10	5		---	---	---
End points (subgroup 2, 3 & 6)								
Forward voltage	4011	$I_F = 10\text{mAdc}$	---	---	$V_F$	0.3	0.5	Vdc
Saturation current	4076	$V_R = 6 \text{ Vdc}$	---	---	$I_S$	---	10.0	uAdc

Table II - Group B inspection (Cont'd.)

EXAMINATION OR TEST	CONDITIONS		LTPD or $\lambda$	MIN REJ. NO.	SYMBOL	LIMITS		UNITS
	MIL-STD-750 REF. METHOD	SPECIFIC CONDITIONS				MIN	MAX	
<u>Subgroup 8</u> (Cont'd.)								
End points (Subgroup 7 & 8)								
Forward voltage	4011	$I_F = 10\text{mAdc}$	---	---	$V_F$	0.3	0.5	Vdc
Saturation current	4076	$V_R = 6\text{ Vdc}$	---	---	$I_S$	---	20:0	$\mu\text{Adc}$
Capacitance	4001	$V_R = 1.5\text{ Vdc}$ $f = 100\text{ kc}$	---	---	C	---	0.7	pF



Notes:

1. Gold plated leads may be substituted when specified in the contract or order providing gold plated units conform to subgroups 4 and 5 of group B inspection.
2. Band (color optional) indicates negative terminal when diode is forward biased.
3. The minimum body diameter shall be maintained over 0.15 inch of body length.
4. Dimensions are in inches. Dimensions in parenthesis are in millimeters.

Figure 1 - Outline dimensions of diode, type 1N995M.