

MIL-S-19500/167B(NAVY)
 19 February 1968
 SUPERSEDING
 MIL-S-19500/167A(NAVY)
 11 May 1964
 (See 6.2)

MILITARY SPECIFICATION
 SEMICONDUCTOR DEVICES, DIODE, TYPE 1N560
 AND 1N561

1. SCOPE

1.1 Scope. - This specification covers the detail requirements for 0.250 amp silicon power rectifiers and is in accordance with MIL-S-19500, except as otherwise specified herein.

1.2 Maximum ratings. -

Type	V_R	I_O	I_{at}^O TA=150° C	if (surge) 1/120 sec.
	Vdc	Adc	Adc	A
1N560	800	0.75	0.250	25
1N561	1000	.75	.250	25

Operating temperature: - 65° C to + 175° C
 Storage temperature: - 65° C to + 175° C
 Barometric pressure, reduced:

1N560 30 mm Hg
 1N561 54 mm Hg

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of the 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 suppliers 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 MIL-S-19500 and as specified herein.

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3.2 Abbreviations and symbols. - The abbreviations and symbol used herein are defined in MIL-S-19500.

3.3 Design, construction and physical dimensions. - Semiconductor diodes shall be of the design, construction and physical dimensions of JEDEC outline DO-1.

3.4 Performance characteristics. - Performance characteristics shall be as specified in 4.4 and 4.5.

3.5 Marking. - Diodes shall be marked in accordance with MIL-S-19500 except that the Country of origin and Manufacturer's identification may be omitted from the device. The polarity shall be indicated by conventional diode symbol. No color coding will be permitted.

4. QUALITY ASSURANCE PROVISIONS

4.1 Qualification tests. - Qualification tests shall be conducted at a laboratory satisfactory to the Naval Electronics Systems Command. Qualification tests shall consist of the tests specified in 4.4 and 4.5. Application for qualification tests shall be made in accordance with "Provisions Governing Qualification, SD -6 (see 6.1).

4.2 Quality conformance inspection. - Quality conformance inspection shall consist of the examinations and tests specified in 4.4 and 4.5.

4.3 Quality conformance inspection information. - When specified in the contract or order, one copy of the quality conformance inspection data pertinent to the inspection lot shall accompany the shipments.

4.4 Group A inspection. - Group A inspection shall consist of the examinations and test shown in table I.

4.5 Group B inspection. - Group B inspection shall consist of the examinations and tests shown in table II.

Table I -Group A inspection

Examination or test	MIL-STD-750		LTPD	Symbol	Limits		
	Method	Details			Min.	Max.	Units
<u>Subgroup 1</u>			5				
Visual and mechanical examination	2071						
<u>Subgroup 2</u>			5				
Forward voltage drop	4011	$I_F = 500 \text{ mAdc}$		V_F	---	1.1	Vdc
Reverse current	4016			I_R	---	5	μAdc
1N560		$V_R = 800 \text{ Vdc}$		I_R	---	5	μAdc
1N561		$V_R = 1000 \text{ Vdc}$		I_R	---	5	μAdc
Breakdown voltage	4021			I_R	---	100	μAdc
1N560		$V_R = 1000 \text{ Vdc}$		I_R	---	100	μAdc
1N561		$V_R = 1250 \text{ Vdc}$		I_R	---	100	μAdc
<u>Subgroup 3</u>			5				
High temperature operation		$T_A = 175^\circ \text{C}$					
Reverse current	4016			I_R	---	500	μAdc
1N560		$V_R = 800 \text{ Vdc}$		I_R	---	500	μAdc
1N561		$V_R = 1000 \text{ Vdc}$		I_R	---	500	μAdc
Forward voltage, full cycle average	4011	$T_A = 150^\circ \text{C}$		V_F	---	0.5	V
1N560		$I_A = 250 \text{ mAdc}$		V_F	---	0.5	V
1N561		$V_o = 560 \text{ Vac}$		V_F	---	0.5	V
Reverse current, full cycle average resistive load	4016			I_R	---	200	μA
1N560		$T_A = 150^\circ \text{C}$		I_R	---	200	μA
1N561		$I_A = 250 \text{ mAdc}$		I_R	---	200	μA
		$V_o = 560 \text{ Vac}$		I_R	---	200	μA
		$V = 707 \text{ Vac}$		I_R	---	200	μA

Table II - Group B inspection

Examination or Test	MIL.-STD-750		LTPD	Symbol	Limits		
	Metno..	Details			Min.	Max.	Units
<u>Subgroup 1</u>			20				
Physical dimensions	2066						
<u>Subgroup 2</u>			20				
Solderability	2026						
Thermal shock (temperature cycling)	1051	Test cond C, except T (high) = 175° C					
Thermal shock (glass strain)	1056						
Moisture resistance	1021	Condition A					
<u>Subgroup 3</u>			20				
Shock	2016	(nonoperating) 500C, 5 shocks, 1 msec 2 major axis					
Vibration fatigue	2046	(nonoperating) 10G					
Vibration, variable frequency	2056	(nonoperating) 10G					
Constant acceleration	2006	10,000G (nonoperating) Orientations X_1, Y_1, Z_1					
<u>Subgroup 4</u>			20				
Terminal strength (tension)	2036	4 lbs, 15 sec					
Terminal strength (lead fatigue)	2036	4 arcs each lead					
		Condition A					
		Condition E					
<u>Subgroup 5</u>			20				
Barometric pressure, reduced	1001						
1N560		$V_R = 800$ Vdc 30mm Hg					
1N561		$V_R = 1,000$ Vdc, 54mm Hg					
Salt atmosphere	1041						
<u>Subgroup 6</u>			10				
Surge current	4066	$T_A = 150^\circ$ C. $i(\text{surge}) = 25$ A $I_F = 250$ mAdc					
Endpoints (Subgroups 2, 3, 5 and 6)							
Forward voltage drop	4011	$I_F = 500$ mA		V_F	---	1.1	Vdc

Table II --Group B inspection--Continued

Examination or test	MIL-STD-750		LTPD	Symbol	Limits		
	Method	Details			Min.	Max.	Units
Reverse current 1N560 1N561 <u>Subgroup 7</u>	4016	$V_R = 800 \text{ Vdc}$ $V_R = 1,000 \text{ Vdc}$	$\lambda = 10$	I_R I_R	---	5 5	$\mu \text{ Adc}$ $\mu \text{ Adc}$
Steady state operation life 1N560 1N561 <u>Subgroup 8</u>	1026	$T_A = 150^\circ \text{C.}$ $I_A = 250 \text{ mAdc}$ $f^o = 60 \text{ Hz}$ $V = 560 \text{ Vac}$ $V = 707 \text{ Vac}$	$\lambda = 10$				
High temperature life (nonoperating) Endpoints (Subgroups 7 and 8)	1031	$T_A = 175^\circ \text{C.}$					
Forward voltage drop	4011	$I_F = 500 \text{ mA}$		V_F	---	1.2	Vdc
Reverse current: 1N560 1N561	4016	$V_R = 800 \text{ Vdc}$ $V_R = 1,000 \text{ Vdc}$		I_R I_R	---	10 10	$\mu \text{ Adc}$ $\mu \text{ Adc}$

5. PREPARATION FOR DELIVERY

5.1 See MIL-S-19500.

6. NOTES

6.1 The activity responsible for the qualified products list is the Naval Electronics Systems Command, Department of the Navy, Washington, D. C., 20360, 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 SD-6". (Copies of "Provisions Governing Qualification SD-6" may be obtained upon application to Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120.)

6.2 CHANGES FROM PREVIOUS ISSUE. THE EXTENT OF CHANGES (DELETIONS, ADDITIONS, ETC.) PRECLUDE THE ANNOTATION OF THE INDIVIDUAL CHANGES FROM THE PREVIOUS ISSUE OF THIS DOCUMENT.

Review activities:
Navy - SH, EC
User activities:
Navy - AS, OS, MC, CG

Preparing activity:
Navy - EC
(Project 5961-N051 (NAVY))