MIL-S-19500/280A(EC)
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SUPERSEDING
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MILITARY SPECIFICATION

SEMICONDUCTOR DEVICES, THYRISTOR (CONTROLLED RECTIFIER), SILICON TYPES 2N3091, 2N3093, 2N3095, 2N3097, 2N3098, 2N3099, 2N3101, 2N3103, 2N3105, AND 2N3106

This specification is approved for use by Naval Electronic Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the detail requirements for silicon thyristors, types 2N3091, 2N3093, 2N3095, 2N3097, 2N3098, 2N3099, 2N3101, 2N3103, 2N3105, and 2N3106 and is in accordance with MIL-S-19500, except as otherwise specified herein.

1.2 Physical dimensions. See figure 1.

1.3 Characteristics. The following devices have characteristics at 25° ±3°C, unless otherwise specified herein.

Characteristic	Conditions	Symbol	Min	Max	Units
On state voltage	I_{TM} = 220 A(pk)	V_{TM}	---	1.7	$V_{(pk)}$
Holding current		I_H	---	40	mAdc
Trigger voltage	V_{AA} = 6.0 Vdc T_A = -40° to +125°C.	V_{GT}	0.25	3.0	Vdc
Trigger current	V_{AA} = 6.0 Vdc V_{GT} = 3.0 Vdc max	I_{GT}	5	70	mAdc
Turn-off time	---	t_q	---	47	us

1.4 Maximum ratings.

I_O 1/	I_{TSM} 2/	V_{GM}	V_{DM}	P_{GM}	$P_{G(AV)}$	T_{STG}	T_J	Stud torque	Maximum operating altitude
A	A(1 cycle)	V	V	W	W	°C	°C	lb-in	mmHg
50	1000	5	10	5	0.5	-40 to +125	-40 to +125	150	15

1/ This average on-state current is for a maximum allowable case temperature of 93°C and 180 electrical degrees of half sine wave conduction. For other maximum operating conditions, see figure 2.
2/ Surge rating is nonrecurrent and applies only with device in conducting state.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Naval Electronic Systems Command, ATTN: ELEX 5043, Department of the Navy, Washington DC 20360, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document, or by letter.

Type	$V_{T(RMS)}$	V_{RRM} 1/	V_{DRM} 1/	$V_{(BR)R}$ 2/	$V_{(BR)R}$ 2/	Units
				min	max	
2N3091	420	600	600	700	---	V
2N3093	560	800	800	900	---	V
2N3095	700	1000	1000	1100	---	V
2N3097	840	1200	1200	1300	---	V
2N3098	910	1300	1300	1400	---	V
2N3099	420	600	600	700	900	V
2N3101	560	800	800	900	1100	V
2N3103	700	1000	1000	1100	1300	V
2N3105	840	1200	1200	1300	1500	V
2N3106	910	1300	1300	1400	1600	V

1/ Values apply for zero or negative gate voltage ($-V_G$).

2/ Reverse breakdown voltage.

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

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.)

2.2 Other publications. The following document forms a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

National Bureau of Standards

Handbook H28 - Screw-Thread Standards for Federal Services.

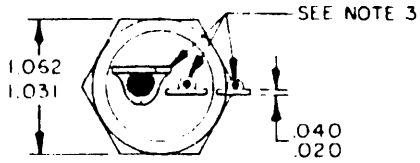
(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, DC 20402.)

3. REQUIREMENTS

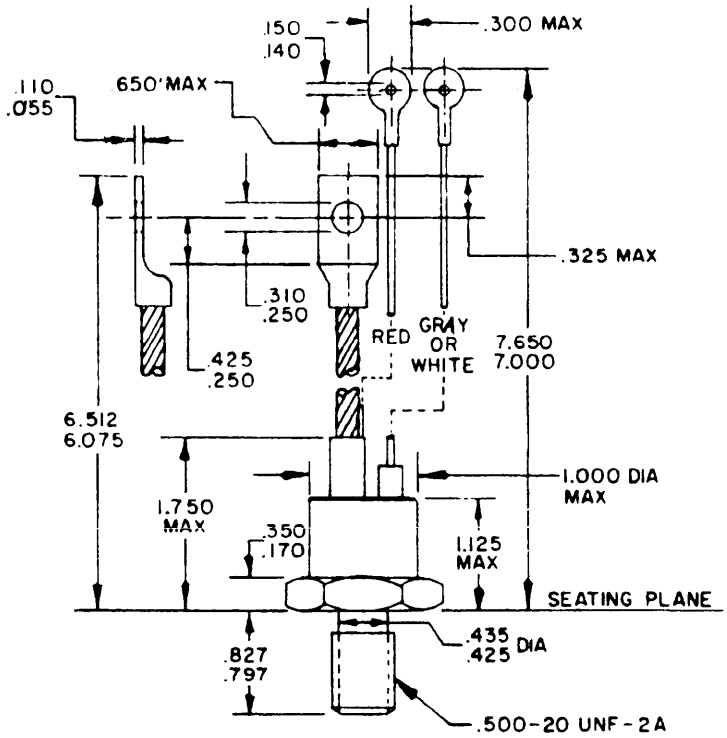
3.1 General. The devices shall be in accordance with MIL-S-19500 and as specified herein.

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

3.3 Symbol. The symbol for thyristors shall be as shown on figure 3.



INCHES	MM
.020	.51
.040	1.02
.055	1.40
.110	2.79
.140	3.56
.150	3.81
.170	4.32
.250	6.35
.300	7.62
.310	7.87
.325	8.26
.350	8.89
.425	10.80
.435	11.05
.4675	11.874
.500	12.70
.650	16.51
.797	20.24
.827	21.01
1.000	25.40
1.031	26.19
1.062	26.97
1.125	28.58
1.750	44.45
6.075	154.30
6.512	165.40
7.000	177.80
7.650	194.31



NOTES:
1. Complete threads to extend within 2.50 threads of seating plane.
2. Maximum pitch diameter of plated threads shall be basic pitch diameter .4675 (11.874 mm) Ref. (Screw Thread Standards for Federal Services 1969) Handbook H28, P1.
3. Angular orientation of these terminals is undefined. Square or radius on end of terminal is optional.
4. A chamfer or undercut on one or both ends of hex portions is optional.
5. Dimensions are in inches.
6. Metric equivalents are given for general information only and are based upon 1.00 inch = 25.4 mm.

FIGURE 1. Dimensions of thyristors, types 2N3091, 2N3093, 2N3095, 2N3097, 2N3098, 2N3099, 2N3101, 2N3103, 2N3105 and 2N3106 - Continued.

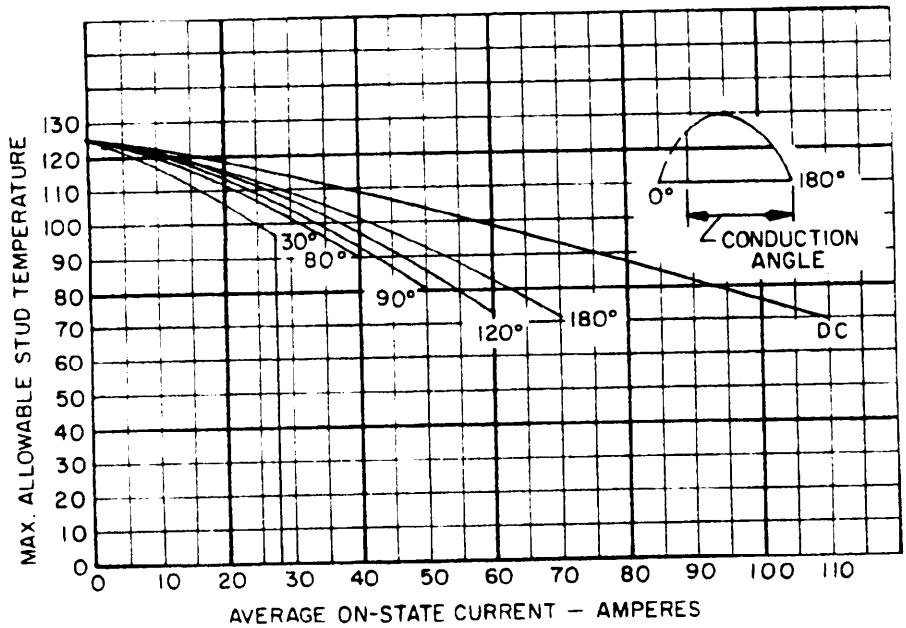


FIGURE 2. Maximum allowable case temperature.

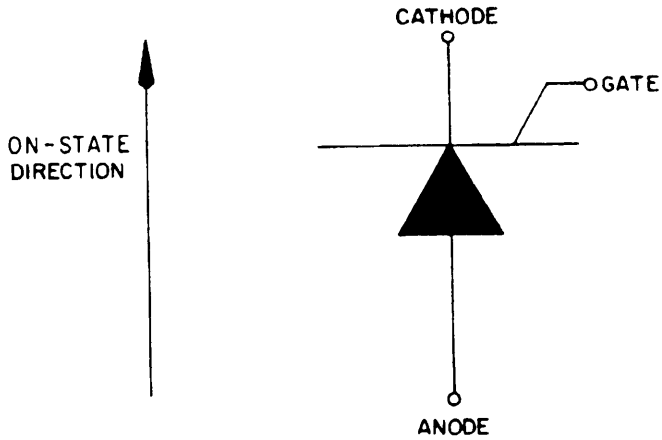


FIGURE 3. Symbol for thyristors.

3.4 Design, construction, and physical dimensions. Thyristors shall be of the design, construction, and physical dimensions shown on figure 1.

3.5 Performance characteristics. The performance characteristics of thyristors shall be as specified in 4.3.1, 4.3.2, and 4.3.3.

3.6 Marking. The following marking specified in MIL-S-19500 may be omitted from the devices:

a. Manufacturer's identification.
b. Country of origin.

3.6.1 Polarity marking on thyristors. The polarity shall be indicated by marking the body with the graphical symbol for thyristors so oriented that the arrow points in the direction of easy flow of the conventional current (on-state direction).

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection shall be in accordance with MIL-S-19500 and as specified herein.

4.2 Qualification inspection. Qualification inspection shall consist of the examinations and tests specified in tables I, II, and III.

4.2.1 Qualification testing. Qualification testing shall consist of the following:

a. All structurally identical device types that specify a maximum reverse breakdown voltage may be used to qualify device types that do not specify a maximum reverse breakdown voltage.
b. Subgroups 1 and 4 of group B inspection and subgroup 4 of group C inspection may be performed on any type to qualify that type and all lower voltage types or shall be performed on a "lot" basis.
c. Subgroup 2 of group B inspection shall be performed on a "sublot" basis.
d. Subgroup 3 of group B inspection and subgroups 1 and 2 of group C inspection may be performed on any type to qualify all types under this specification.
e. Subgroup 3 of group C inspection may be performed on any type to qualify that type and all lower voltage types.

4.3 Quality conformance inspection. Quality conformance inspection shall consist of group A, B, and C inspections.

4.3.1 Group A inspection. Group A inspection shall consist of the examinations and tests specified in table I.

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

4.3.3 Group C inspection. Group C inspection shall consist of the examinations and tests specified in table III.

4.4 Methods of examination and test. Methods of examination and test shall be as specified in table I, II, and III and as follows:

4.4.1 Intermittent life. The thyristors shall be operated in a single phase circuit as shown on figure 4 with 165 ±15 degree conduction angle. Device case temperature shall be maintained at 80° ±5°C as measured with a thermocouple rigidly attached to the case hex. Peak input voltage from a 60 hertz (Hz) sinusoidal blocking voltage power supply shall be equal to rated blocking voltage. Average forward current shall be 50 amperes per device from the 60 Hz sinusoidal forward current supply. The blocking voltage supply shall be phase delayed 90 electrical degrees with respect to the forward current supply in order to impose both off-state and reverse blocking duty on the devices under test. The on-state current supply consists of a low voltage transformer with a means of adjusting the secondary voltage. The blocking voltage supply consists of a high voltage transformer with a synchronous switch connected in series with one of the secondary transformer leads. The synchronous switch is set to conduct for 165 ±15 electrical degrees during the interval when terminal A is negative with respect to terminal C. A minimum of two and a maximum of five electrical degrees off-time shall be allowed after on-state current conduction before blocking voltage is applied by the synchronous switch. The gate trigger pulses shall be delivered from a trigger circuit having an open circuit voltage of 7.0 ±3.0 volts and a short circuit current of 1.2 ±0.8 amperes. The gate pulse average power input shall not exceed 0.5 watts. The gate trigger supply shall be in phase with the device forward current supply.

4.4.2 Hermetic seal tests. All devices shall be subjected to hermetic seal tests (fine-leak followed by gross-leak) with test conditions as specified in 4.4.2.1 and 4.4.2.2. Failed devices from either test shall be removed from the lot.

4.4.2.1 Hermetic seal (fine-leak) test. All devices shall be fine leak tested in accordance with MIL-STD-750, method 1071, test condition G or H. The leak-rate rejection criterion shall be 5×10^{-7} cubic centimeters of helium per second when measured at a differential pressure of one atmosphere.

4.4.2.2 Hermetic seal (gross-leak) test. All devices shall be tested for gross-leaks in accordance with MIL-STD-750, method 1071, test conditions A, C, D, or F.

4.4.3 Blocking life. The specified peak voltage shall be applied from anode to cathode with the gate terminal open circuited. The voltage shall be a 60 Hz sine wave. The device case temperature shall be maintained at the specified value throughout the specified test time. A resistor of 50 ohms shall be connected in series with the voltage power supply to limit current in the event of device voltage breakdown. The basic circuit shown on figure 5 may be used.

4.4.4 Breakover voltage. This test shall be performed by applying a full wave rectified 60 Hz sine wave of voltage that exceeds the breakover voltage of the device and will turn it on. The on-state current shall then be adjusted to 100 milliamperes (pk), minimum. The duration of this test shall be no less than 5 seconds. This test shall be performed with the gate terminal open circuited. The circuit shown on figure 6 may be used for this test.

4.4.5 Reverse breakdown voltage. This test shall be performed by applying a full wave rectified 60 Hz sine wave of voltage that exceeds the reverse breakdown voltage of the device and will drive it into the reverse breakdown mode. The peak power dissipation shall be 20 watts peak minimum. This test shall be performed with the gate terminal open circuited. The circuit shown on figure 6 may be used for this test.

TABLE I. Group A inspection.

Examination or test	MIL-STD-750 Method	MIL-STD-750 Details	LTPD	Symbol	Limits Min	Limits Max	Unit
Subgroup 1			5				
Visual and mechanical examination	2071						
Subgroup 2			5				
Breakover voltage (See 4.4.4)		60 Hz full wave rectified ac,100 mA peak, 5 s minimum duration		$V_{(BO)}$			
2N3091					600	---	V(pk)
2N3093					800	---	V(pk)
2N3095					1000	---	V(pk)
2N3097					1200	---	V(pk)
2N3098					1300	---	V(pk)
2N3099					600	---	V(pk)
2N3101					800	---	V(pk)
2N3103					1000	---	V(pk)
2N3105					1200	---	V(pk)
2N3106					1300	---	V(pk)
Forward blocking current	4206	AC method, bias condition D f = 60 Hz		I_{DRM}			
2N3091		V_{DRM} = 600 V(pk)			---	2	mA(pk)
2N3093		V_{DRM} = 800 V(pk)			---	2	mA(pk)
2N3095		V_{DRM} = 1000 V(pk)			---	2	mA(pk)
2N3097		V_{DRM} = 1200 V(pk)			---	2	mA(pk)
2N3098		V_{DRM} = 1300 V(pk)			---	2	mA(pk)
2N3099		V_{DRM} = 600 V(pk)			---	2	mA(pk)
2N3101		V_{DRM} = 800 V(pk)			---	2	mA(pk)
2N3103		V_{DRM} = 1000 V(pk)			---	2	mA(pk)
2N3105		V_{DRM} = 1200 V(pk)			---	2	mA(pk)
2N3106		V_{DRM} = 1300 V(pk)			---	2	mA(pk)
Reverse breakdown voltage (See 4.4.5)	---	60 Hz full wave rectified ac,20 watt peak,5 s minimum duration		$V_{(BR)R}$			
2N3091					700	---	V(pk)
2N3093					900	---	V(pk)
2N3095					1100	---	V(pk)
2N3097					1300	---	V(pk)
2N3098					1400	---	V(pk)
2N3099					700	900	V(pk)
2N3101					900	1100	V(pk)
2N3103					1100	1300	V(pk)
2N3105					1300	1500	V(pk)
2N3106					1400	1600	V(pk)
Reverse blocking current	4211	AC method, bias condition D f = 60 Hz		I_{RRM}			
2N3091		V_{RRM} = 600 V(pk)			---	2	mA(pk)
2N3093		V_{RRM} = 800 V(pk)			---	2	mA(pk)
2N3095		V_{RRM} = 1000 V(pk)			---	2	mA(pk)
2N3097		V_{RRM} = 1200 V(pk)			---	2	mA(pk)
2N3098		V_{RRM} = 1300 V(pk)			---	2	mA(pk)
2N3099		V_{RRM} = 600 V(pk)			---	2	mA(pk)
2N3101		V_{RRM} = 800 V(pk)			---	2	mA(pk)
2N3103		V_{RRM} = 1000 V(pk)			---	2	mA(pk)
2N3105		V_{RRM} = 1200 V(pk)			---	2	mA(pk)
2N3106		V_{RRM} = 1300 V(pk)			---	2	mA(pk)

TABLE I. Group A inspection - Continued

Examination or test	MIL-STD-750 Method	MIL-STD-750 Details	LTPD	Symbol	Limits Min	Limits Max	Unit
Subgroup 2 (cont'd)							
High temperature forward blocking current	4206	AC method, bias condition D T_C = 125°C, f = 60 Hz		I_{DRM}			
2N3091		V_{DRM} = 600 V(pk)			---	15	mA(pk)
2N3093		V_{DRM} = 800 V(pk)			---	15	mA(pk)
2N3095		V_{DRM} = 1000 V(pk)			---	15	mA(pk)
2N3097		V_{DRM} = 1200 V(pk)			---	15	mA(pk)
2N3098		V_{DRM} = 1300 V(pk)			---	15	mA(pk)
2N3099		V_{DRM} = 600 V(pk)			---	15	mA(pk)
2N3101		V_{DRM} = 800 V(pk)			---	15	mA(pk)
2N3103		V_{DRM} = 1000 V(pk)			---	15	mA(pk)
2N3105		V_{DRM} = 1200 V(pk)			---	15	mA(pk)
2N3106		V_{DRM} = 1300 V(pk)			---	15	mA(pk)
High temperature reverse blocking current	4211	AC method, bias condition D T_C = 125°C, f = 60 Hz		I_{RRM}			
2N3091		V_{RRM} = 600 V(pk)			---	15	mA(pk)
2N3093		V_{RRM} = 800 V(pk)			---	15	mA(pk)
2N3095		V_{RRM} = 1000 V(pk)			---	15	mA(pk)
2N3097		V_{RRM} = 1200 V(pk)			---	15	mA(pk)
2N3098		V_{RRM} = 1300 V(pk)			---	15	mA(pk)
2N3099		V_{RRM} = 600 V(pk)			---	15	mA(pk)
2N3101		V_{RRM} = 800 V(pk)			---	15	mA(pk)
2N3103		V_{RRM} = 1000 V(pk)			---	15	mA(pk)
2N3105		V_{RRM} = 1200 V(pk)			---	15	mA(pk)
2N3106		V_{RRM} = 1300 V(pk)			---	15	mA(pk)
Exponential rate of voltage rise	4231	T_C = 125°C, bias condition D $\frac{dv}{dt}$ = 200 V/µs		V_D			
2N3091		V_{AA} = 600 Vdc			570	---	Vdc
2N3093		V_{AA} = 800 Vdc			760	---	Vdc
2N3095		V_{AA} = 1000 Vdc			950	---	Vdc
2N3097		V_{AA} = 1200 Vdc			1140	---	Vdc
2N3098		V_{AA} = 1300 Vdc			1235	---	Vdc
2N3099		V_{AA} = 600 Vdc			570	---	Vdc
2N3101		V_{AA} = 800 Vdc			760	---	Vdc
2N3103		V_{AA} = 1000 Vdc			950	---	Vdc
2N3105		V_{AA} = 1200 Vdc			1140	---	Vdc
2N3106		V_{AA} = 1300 Vdc			1235	---	Vdc
		C = 1 µF, R_L = 50 ohms Repetition rate = 60 pps Test duration - 15 s					
Subgroup 3			5				
Gate trigger voltage and gate trigger current	4221	V_2 = 6.0 Vdc R_L - 10 ohms; R_E = 20 ohms		V_{GT}	---	3.0	Vdc
				I_{GT}	5	70	mAdc
On-state voltage	4226	I_{TM} = 220 A(pk), pulse PW = 8.5 ms (max) duty cycle = 2% (max)		V_{TM}	---	1.7	V(pk)

TABLE I. Group A inspection - Continued

Examination or test	MIL-STD-750		LTPD	Symbol	Limits		Unit
	Method	Details			Min	Max	
Subgroup 3 (cont'd)							
Gate trigger voltage	4221	T_C = 125°C, R_e = 20Ω max $V_2 = V_{DRM}$ (see 1.4), R_2 = 1 kΩ		V_{GT}	0.25		Vdc
Holding current	4201	V_{AA} = 22.5 Vdc Gate trigger source voltage = 6.0 Vdc I_{F1} = 10 Adc I_{F2} = 500 mAdc R_2 = 50 ohms condition D		I_H	---	40	mAdc
Turn-off time	4224	I_{TM} = 50 Apk, t_{on} = 100 ±50 µs max, $V_{RM} = V_{RRM}$, T_C = 125°C $\frac{dv}{dt}$ = 20 V/µs, $V_{DM} = V_{DRM}$ (see 1.4) repetition rate = 60 pps max, gate source voltage = 0 volts, gate source resistance = 100Ω		t_q		47	µs

TABLE II. Group B inspection

Examination or test	MIL-STD-750		LTPD	Symbol	Limits		Unit
	Method	Details			Min	Max	
Subgroup 1			10				
Reverse gate current	4219	V_G = -5.0 Vdc		$-I_G$	---	300	mAdc
Surge current	4066	I_{TSM} = 1,000 Adc 10 surges total 1 surge per minute 1/120 s duration T_C = 125°C, rated V_{RRM}					
End points:							
Reverse blocking current	4211	AC method, bias condition D f = 60 Hz		I_{RRM}			
2N3091		V_{RRM} = 600 V(pk)			---	4	mA(pk)
2N3093		V_{RRM} = 800 V(pk)			---	4	mA(pk)
2N3095		V_{RRM} = 1000 V(pk)			---	4	mA(pk)
2N3097		V_{RRM} = 1200 V(pk)			---	4	mA(pk)
2N3098		V_{RRM} = 1300 V(pk)			---	4	mA(pk)
2N3099		V_{RRM} = 600 V(pk)			---	4	mA(pk)
2N3101		V_{RRM} = 800 V(pk)			---	4	mA(pk)
2N3103		V_{RRM} = 1000 V(pk)			---	4	mA(pk)
2N3105		V_{RRM} = 1200 V(pk)			---	4	mA(pk)
2N3106		V_{RRM} = 1300 V(pk)			---	4	mA(pk)

TABLE II. Group B inspection - Continued

Examination or test	MIL-STD-750		LTPD		Limits		
	Method	Details		Symbol	Min	Max	Unit
Subgroup 1 (cont'd)							
End points: (cont'd)							
Forward blocking current	4206	AC method, bias condition D f = 60 Hz		I_{DRM}			
2N3091		V_{DRM} = 600 V pk)			---	4	mA(pk)
2N3093		V_{DRM} = 800 V(pk)			---	4	mA(pk)
2N3095		V_{DRM} = 1000 V(pk)			---	4	mA(pk)
2N3097		V_{DRM} = 1200 V(pk)			---	4	mA(pk)
2N3098		V_{DRM} = 1300 V(pk)			---	4	mA(pk)
2N3099		V_{DRM} = 600 V(pk)			---	4	mA(pk)
2N3101		V_{DRM} = 800 V(pk)			---	4	mA(pk)
2N3103		V_{DRM} = 1000 V(pk)			---	4	mA(pk)
2N3105		V_{DRM} = 1200 V(pk)			---	4	mA(pk)
2N3106		V_{DRM} = 1300 V(pk)			---	4	mA(pk)
Subgroup 2			10				
Low temperature reverse blocking current	4211	T_C = -40° ±3°C. AC method, bias condition D f = 60 Hz		I_{RRM}			
2N3091		V_{RRM} = 600 V(pk)			---	2	mA(pk)
2N3093		V_{RRM} = 800 V(pk)			---	2	mA(pk)
2N3095		V_{RRM} = 1000 V(pk)			---	2	mA(pk)
2N3097		V_{RRM} = 1200 V(pk)			---	2	mA(pk)
2N3098		V_{RRM} = 1300 V(pk)			---	2	mA(pk)
2N3099		V_{RRM} = 600 V(pk)			---	2	mA(pk)
2N3101		V_{RRM} = 800 V(pk)			---	2	mA(pk)
2N3103		V_{RRM} = 1000 V(pk)			---	2	mA(pk)
2N3105		V_{RRM} = 1200 V(pk)			---	2	mA(pk)
2N3106		V_{RRM} = 1300 V(pk)			---	2	mA(pk)
Low temperature forward blocking current	4206	T_C = -40° ±3°C AC method, bias condition D f = 60 Hz		I_{DRM}			
2N3091		V_{DRM} = 600 V(pk)			---	2	mA(pk)
2N3093		V_{DRM} = 800 V(pk)			---	2	mA(pk)
2N3095		V_{DRM} = 1000 V(pk)			---	2	mA(pk)
2N3097		V_{DRM} = 1200 V(pk)			---	2	mA(pk)
2N3098		V_{DRM} = 1300 V(pk)			---	2	mA(pk)
2N3099		V_{DRM} = 600 V(pk)			---	2	mA(pk)
2N3101		V_{DRM} = 800 V(pk)			---	2	mA(pk)
2N3103		V_{DRM} = 1000 V(pk)			---	2	mA(pk)
2N3105		V_{DRM} = 1200 V(pk)			---	2	mA(pk)
2N3106		V_{DRM} = 1300 V(pk)			---	2	mA(pk)
Low temperature gate trigger voltage and gate trigger current	4221	R_L = 10 ohms max R_E = 20 ohms V_2 = 6.0 Vdc T_C = -40° ±3°C		V_{GT} I_{GT}	--- ---	3.0 130	Vdc mAdc
End points (Same as subgroup 1)							

TABLE II. Group B inspection - Continued

Examination or test	MIL-STD-750		LTPD	Symbol	Limits		Unit
	Method	Details			Min	Max	
Subgroup 3			20				
Thermal shock (temperature cycling)	1051	Test condition B, except T_{min} = -40°C					
Thermal shock (glass strain)	1056	Test condition A					
Hermetic seal	1071	Test condition G or H for fine leaks Test condition A, C, D, or E for gross leaks (see 4.4.2)				5×10^{-7}	cm^2/s
End points (Same as subgroup 1)							
Subgroup 4			10				
Blocking life (see 4.4.3)	---	$V_{DRM} = V_{RRM}$ T_C = 125° ±1.5°C t = 500 hours					
Gate trigger voltage and gate trigger current	4227	V_D = 6.0 Vdc R_L = 10 ohms R_E = 20 ohms		V_{GT} I_{GT}	--- 5	3.0 70.0	Vdc mAdc
On state voltage	4226	I_{TM} = 220 Adc pulse width = 8.5 ms duty cycle = 2% max		V_{TM}		1.7	V(pk)
End points (Same as subgroup 1)							

TABLE III. Group C inspection.

Examination or test	MIL-STD-750		LTPD	Symbol	Limits		Unit
	Method	Details			Min	Max	
Subgroup 1			20				
Physical dimensions	2066						
End points (Same as subgroup 1 of group B)							
Subgroup 2			20				
Shock	2016	Nonoperating, 5 blows each Y_1, Y_2, Z_1 500 g 1.0 ms					
Vibration fatigue	2046	Nonoperating, 5 g (Leads secured or removed)					
Vibration, variable frequency	2056	5 g, 100 to 1000 Hz (Leads secured or removed)					
Constant acceleration	2006	2500 g Y_1, Y_2, Z_1 (Leads secured or removed)					
End points (Same as subgroup 1 of group B)							
Subgroup 3			20				
Barometric pressure (reduced)	1001	15 mmHg V_{RRM} (see 4.4), 60 seconds					
Salt spray (corrosion)	1046	Test condition A					
Terminal strength (Stud torque)	2036	150 lb-in 15 seconds Test condition D2					
End points (Same as subgroup 1 of group B)							
Subgroup 4			20				
Intermittent life	---	50 min on, 10 min off (See 4.4.1)					
End points (Same as subgroup 1 of group B)							

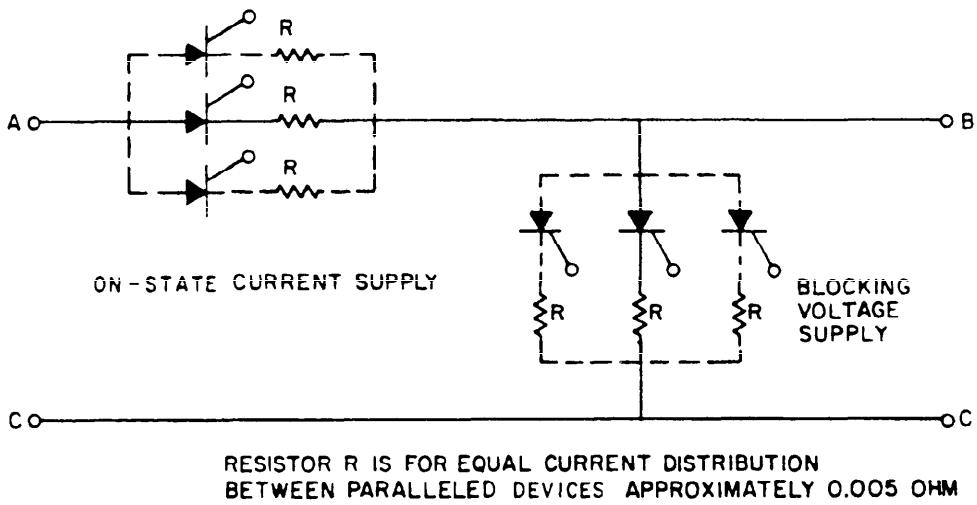
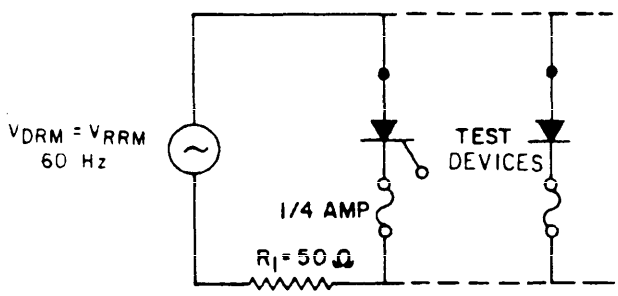


FIGURE 4. Basic test circuit for intermittent life test.



NOTE: A .25 amp fuse shall also be connected in series with each device to serve as an indicator of device voltage breakdown. Failure shall be indicated by either a blown fuse or failure to meet the specified end point test limits. The equipment shall be designed to limit peak transient voltage values to the device voltage rating ($V_{DRM} = V_{RRM}$).

FIGURE 5. Basic circuit for blocking life test.

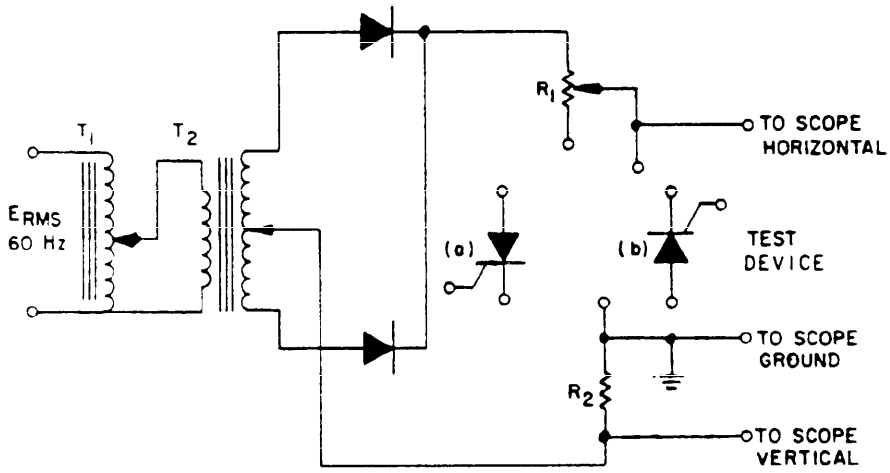


FIGURE 6. Breakover (a) and reverse breakdown (b) tester.

4.4.6 Ambient temperature. Where tests are specified at ambient temperature, sufficient time shall be allowed for the device case temperature to stabilize at the specified ambient temperature before measurements are taken.

5. PACKAGING

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

6. NOTES

6.1 Notes. The notes specified in MIL-S-19500 are applicable to this specification.

6.2 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.

Custodian:
Navy - EC

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

Preparing activity:
Navy - EC

Agent:
DLA - ES

(Project 5961-0649)

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

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