

SH 1
5727462
DWG NO.

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	REV	DESCRIPTION	DATE	APPROVED
		-	RELEASED	82-08-11	J.N.
		A	SEE ECP HA80002R2/NOR 68359A	89-08-17	R.L. MRC
		B	SEE ECP HA95155/NOR 86151	89-11-09	R.L. MRC
		C	SEE ECP HA05053R1/NOR 92646	91-06-12	R.L. MRC
		D	SEE ECP 48/NGC16024/ NOR 48/NGC16024-001	16-11-29	CS (MRC)
		E	SEE ECP 48/NUE17014R2A1/ NOR 48/NUE17014-001R1	17-09-14	JAC (MRC)

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SPECIFICATION CONTROL DRAWING

UNCLASSIFIED

REV STATUS OF SHEETS	REVISION	E	D	D	E	C	D	C	D
	SHEET	1	2	3	4	5	6	7	8

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONS ± - ANGLES - 3 PLACE DECIMALS ± - 2 PLACE DECIMALS ± -	NAVAL UNDERSEA WARFARE CENTER DIVISION, NEWPORT NEWPORT, RHODE ISLAND 02841-1708	DEPARTMENT OF THE NAVY NAVAL SEA SYSTEMS COMMAND WASHINGTON, D.C. 20376
DO NOT SCALE THIS DRAWING	APPROVED	DIODE, SILICON, POWER RECTIFIER
INTERPRET DWG IAW STDS PRESCRIBED BY ASME Y14.100	APPROVED E.S. 82-08-10	
MATERIAL:	CHECKED A.B. 82-08-06	
	DRAWN D.D. 82-08-04	
	APPROVED FOR NSSC <i>JAC</i> 82-08-11	SIZE A CAGE CODE 53711 DWG NO. 5727462
MATERIALS ENGINEER		SCALE - SHEET 1 OF 8
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NOTES:

- SCOPE. THE DETAIL SPECIFICATION COVERS POWER RECTIFIERS SIMILAR TO 1N2133A. THE DEVICES SHALL BE SUPPLIED IN ACCORDANCE WITH MIL-PRF-19500/297, JANTX PRODUCT ASSURANCE LEVEL, EXCEPT AS SPECIFIED HEREIN.
- MANUFACTURER'S CERTIFICATION AND DEVICE QUALIFICATION. REQUIREMENTS FOR MANUFACTURER'S CERTIFICATION AND DEVICE QUALIFICATION SHALL NOT APPLY
- CERTIFICATION. THE MANUFACTURER SHALL CERTIFY WITH EACH SHIPMENT THAT THE APPLICABLE QUALITY CONFORMANCE INSPECTION REQUIREMENTS OF THE REFERENCED SPECIFICATION AND THE REQUIREMENTS HEREIN HAVE BEEN MET.
- STANDARD TYPE. DEVICES SUPPLIED TO THIS SPECIFICATION SHALL BE STANDARD TYPES; THE CATHODE SHALL BE CONNECTED TO THE STUD.
- RATINGS AND CHARACTERISTICS. THE MAXIMUM RATINGS SHALL BE AS FOLLOWS:

V_R	300 Vdc
$I_F(AV) (T_C \leq 140^\circ C)$	60 Adc
$I_F(SURGE) \text{ AT } 8.3 \text{ ms, } T_C = 140^\circ C$	900 A
$I^2 \sqrt{t} \text{ FOR } 0.1 \text{ TO } 10 \text{ ms}$	$52500 \text{ A}^2 \sqrt{\text{SEC}} \frac{1}{}$
$I^2 t \text{ FOR } 5 \text{ TO } 8.3 \text{ ms}$	$3400 \text{ A}^2 \text{ sec}$
$R_{\theta JC}$	0.7° C/W
OPERATING TEMPERATURE RANGE	$T_C = -65 \text{ TO } +150^\circ C$
STORAGE TEMPERATURE RANGE	$T_C = -65 \text{ TO } +175^\circ C$
BAROMETRIC PRESSURE REDUCED (ALTITUDE OPERATION)	8 mm Hg MINIMUM

$\frac{1}{}$ MAXIMUM $I^2 t$ FOR INDIVIDUAL DEVICE FUSING FOR TIME $t_x = I^2 \sqrt{t} \cdot \sqrt{t_x}$

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6. MARKING:

PART: THE FOLLOWING INFORMATION SHALL BE LEGIBLY MARKED ON THE PART IN ACCORDANCE WITH MIL-PRF-19500:

- A. MANUFACTURER'S NAME OR SYMBOL
 - B. MANUFACTURER'S PART NUMBER
 - C. LOT IDENTIFICATION
 - D. POLARITY INDICATED BY A GRAPHIC SYMBOL
- "TX" MARKING SHALL NOT APPLY.

PACKAGE: THE SMALLEST PACKAGE USED FOR SHIPPING THE DIODES SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 AND SHALL INCLUDE THE FOLLOWING:

- A. NAVSEA PART NUMBER
- B. MANUFACTURER'S PART NUMBER

7. QUALIFICATION INSPECTION: QUALIFICATION INSPECTION DOES NOT APPLY.

8. GROUP A INSPECTION: GROUP A INSPECTION SHALL BE PER TABLE 1 HEREIN.

9. GROUP B INSPECTION: GROUP B INSPECTION SHALL BE IN ACCORDANCE WITH MIL-PRF-19500/297 AND AS SPECIFIED HEREIN. THE TEST CONDITIONS SPECIFIED IN TABLE II HEREIN SHALL BE SUBSTITUTED WHEN REQUIRED FOR GROUP B INSPECTION.

10. GROUP C INSPECTION: GROUP C INSPECTION SHALL BE IN ACCORDANCE WITH MIL-PRF-19500/297 AND AS SPECIFIED HEREIN. THE TEST CONDITIONS SPECIFIED IN TABLE II HEREIN SHALL BE SUBSTITUTED WHEN REQUIRED FOR GROUP C INSPECTION.

11. BAROMETRIC PRESSURE REDUCED (ALTITUDE OPERATION): THE ALLOWABLE CHANGE IN I_R FROM A PRESSURE OF 760 mm Hg TO 8 mm Hg SHALL BE AS FOLLOWS:

$$\Delta I_R = 10\% \text{ OR } 100 \mu \text{ A dc, WHICHEVER IS GREATER.}$$

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TABLE I. GROUP A INSPECTION

EXAMINATION OR TEST	MIL-STD-750		1/ LTPD	SYMBOL	LIMITS		UNIT
	METHOD	DETAILS			MIN	MAX	
<u>SUBGROUP 1</u> VISUAL AND MECHANICAL EXAMINATION	2071	-		-	-	-	-
<u>SUBGROUP 2</u> FORWARD VOLTAGE	4011	$T_C = 25^\circ\text{C}$ $I_F = 188\text{a(pk)}$, $t_p \leq 8.3 \text{ ms}$, DUTY CYCLE $\leq 2\%$		V_F	-	1.4	V (pk)
REVERSE CURRENT	4016	$T_C = 25^\circ\text{C}$ D_C METHOD $V_R = 300\text{Vdc}$		I_R	-	1.0	m Adc
<u>SUBGROUP 3</u> REVERSE CURRENT	4016	$T_C = 150^\circ\text{C}$ D_C METHOD $V_R = 300\text{Vdc}$		I_R	-	25	m Adc

1/ FOR LTPD NUMBERS, REFERENCE MIL-S-19500.

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TABLE II. TEST CONDITIONS

EXAMINATION OR TEST	MIL-STD-750		1/ LTPD	SYMBOL	LIMITS		UNIT
	METHOD	DETAILS			MIN	MAX	
INTERMITTENT OPER. LIFE	1037	$V_r=300v$ (PK)					
BURN-IN	1038	$V_R=300$ Vdc					
THERMAL RESISTANCE	4081	$I_{F1}=60$ A MAX FCA T_C (INIT)=25°C		RθJC	-	0.7	°C/W
OR THERMAL RESPONSE	OR 3101	$I_{F2}=100$ mA dc MIN T_C (FINAL)=120°C $I_M=50$ mA $I_M=50$ A $t_H=150$ TO 400ms $t_{MD}=50$ TO 100 μs		RθJC	-	0.7	°C/W

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TABLE II. TEST CONDITIONS (CONT'D)

EXAMINATION OR TEST	MIL-STD-750		1/ LTPD	SYMBOL	LIMITS		UNIT
	METHOD	DETAILS			MIN	MAX	
BAROMETRIC PRESSURE, REDUCED (ALTITUDE OPERATION)	1001						
MEASUREMENT DURING TEST							
REVERSE CURRENT	4016	DC METHOD; $V_R=300$ Vdc		I_R		<u>2/</u>	
INTERMITTENT OPERATION LIFE	1036	$V_R=300v(PK)$					

1/ FOR LTPD NUMBERS, REFERENCE MIL-PRF-19500.

2/Δ $I_R = 10\%$ OR $100 \mu A$ dc, WHICHEVER IS GREATER.

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12. PREBURN-IN TEST, BURN-IN TEST, AND GROUPS B AND C ELECTRICAL END POINT MEASUREMENTS SHALL BE AS FOLLOWS:

TABLE III. BURN-IN TEST AND GROUPS B AND C ELECTRICAL END POINT MEASUREMENTS

TEST	MIL-STD-750		SYMBOLS	LIMITS		UNIT
	METHOD	DETAILS		MIN	MAX	
REVERSE CURRENT	4016	T _c =25°C DC METHOD, V _R =300Vdc	IR	-	1.0	mA dc
FORWARD VOLTAGE	4011	T _c =25°C I _F =188 a(pk) (PULSE) PULSE WIDTH ≤ 8.3 ms MAX, DUTY CYCLE ≤ 2%	VF	-	1.4	v(pk)

13. BURN-IN TEST. EXCEPTIONS TO BURN-IN TEST CONDITIONS: V_r=300v(pk)

14. POST BURN-IN TESTS. EXCEPTIONS TO POST BURN-IN TESTS ARE AS FOLLOWS:

$\Delta I_R = 100$ PERCENT OR 250 μ A dc MAX, WHICHEVER IS GREATER.

$\Delta V_f = 0.1$ v(pk) FROM THE INITIAL VALUE

15. GENERIC TEST DATA. UPON REQUEST AND APPROVAL FROM THE PROCURING ACTIVITY, GENERIC TEST DATA MAY BE USED TO SATISFY THE REQUIREMENTS OF GROUP B AND GROUP C QUALITY CONFORMANCE INSPECTION PROVIDED THE FOLLOWING CRITERIA IS MET.

15A. GROUP B GENERIC TEST DATA. GROUP B GENERIC TEST DATA MAY BE USED TO SATISFY THE REQUIREMENTS OF GROUP B INSPECTION PROVIDED THAT THE DATA IS FROM THE SAME PRODUCT GROUP (THAT IS, THE SAME DIE GEOMETRY AND PACKAGE), MANUFACTURED ON THE SAME PRODUCTION LINE(S) THROUGH FINAL SEAL BY THE SAME FABRICATION TECHNIQUE AND TO THE SAME DEVICE DESIGN WITH THE SAME MATERIAL REQUIREMENTS AND WITHIN THE SAME 6-WEEK PERIOD.

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- 15B. GROUP C GENERIC TEST DATA. GROUP C GENERIC TEST DATA MAY BE USED TO SATISFY THE REQUIREMENTS OF GROUP C INSPECTION PROVIDED THAT THE DATA IS NO MORE THAN SIX (6) MONTHS OLD AND ON THE SAME PACKAGE TYPE, WITH THE SAME MATERIAL, DESIGN AND PROCESS, AND FROM THE SAME PLANT THE PRODUCT REPRESENTS. ELECTRICAL END POINT DATA FROM THESE EQUIVALENT PACKAGE TYPE PRODUCT WILL BE ACCEPTABLE.
16. QUALITY ASSURANCE PROVISIONS:
 ALL CHARACTERISTICS ARE SUBJECT TO INSPECTION UNDER THE CONTRACTOR'S INSPECTION OR QUALITY SYSTEM.

IDENTIFICATION OF THE SUGGESTED SOURCE(S) OF SUPPLY HEREON IS NOT TO BE CONSTRUED AS A GUARANTEE OF PRESENT OR CONTINUED AVAILABILITY AS A SOURCE OF SUPPLY FOR THE ITEM(S)

SUGGESTED SOURCE(S) OF SUPPLY		
CAGE CODE	PART NO.	NAME AND ADDRESS
43611	5727462-1	MICROSEMI CORP. 6 LAKE ST. LAWRENCE, MA 01841-3032

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