MIL-S-19500/236A
20 October 1970
SUPERSEDING
MIL-S-19500/236
23 April 1962

MILITARY SPECIFICATION

SEMICONDUCTOR DEVICE, DIODE, SILICON

TYPE 1N31

This specification is mandatory for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the detail requirements for a silicon semiconductor diode for use as a video detector.

1.2 Physical dimensions. See figure 1.

1.3 Ratings and characteristics.

Limits	R_V	M
	Ohms	
Min.	6,000	55
Max.	23,000	---

OPERATING AMBIENT TEMPERATURE: -65° to +70°C.

STORAGE TEMPERATURE: -65° to +70°C.

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

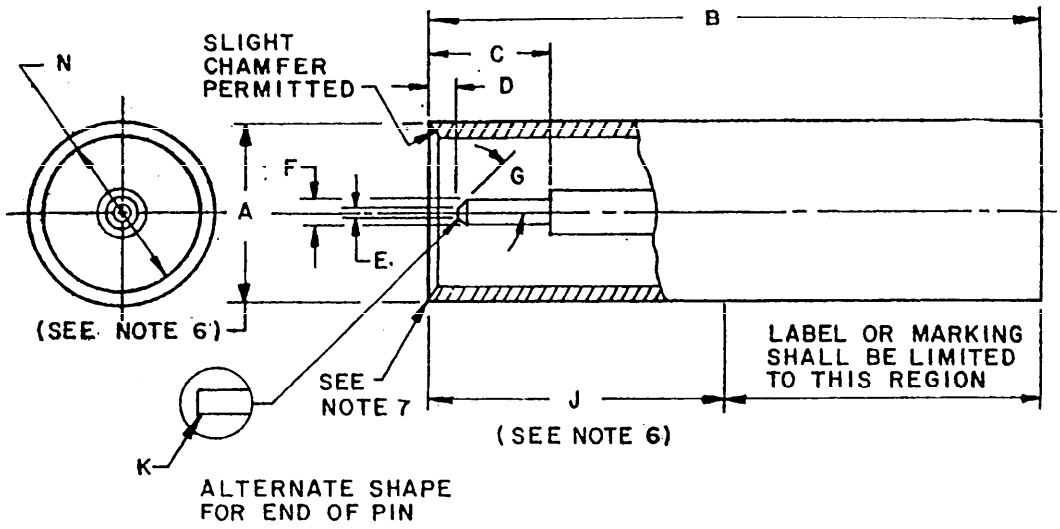
MIL-STD-750 - Test Methods for Semiconductor Devices.

DRAWING

ARMED SERVICES ELECTRO-STANDARDS AGENCY

118-JAN - Holder, Test, Figure of Merit; for Crystal Diode Type 1N31.

(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.)



DIMENSIONS				
LTR	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.215	.220	5.46	5.58
B	.734	.766	18.64	19.45
C	.147		3.73	
D	.011	.028	.28	.71
E	.007	.017	.18	.43
F	.031	.033	.78	.84
G	42°	48°	42°	48°
J	.406		10.31	
K	.007	.017	.18	.43
N	.179	.189	4.55	4.80

NOTES:
1. Dimensions are in inches.
2. Metric equivalents (to the nearest .01 mm) are given for general information only and are based upon 1 inch = 25.4 mm.
3. Finish: .0002 (.01 mm) tin plate over nickel flash, or .001 (.03 mm) gold plate or .0001 (.00 mm) silver plate.
4. Axis of center conductor (pin) not to deviate from axis of outer conductor referred to its outside diameter more than .004 (.10 mm).
5. Forward polarity units shall have the cathode connected to the center pin.
6. Outside diameter, .215 (5.46 mm) to .220 (5.59 mm), applies for length of dimension "J."
7. This device shall be free of sharp edges and burrs.

FIGURE 1. Semiconductor device, diode, type 1N31.

3. REQUIREMENTS

3.1 General. Requirements 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, and as follows:

M	Figure of merit.
R_A	Noise-generating resistance.
R_V	Video resistance.

3.3 Design, construction, and physical dimensions. The diode shall be of the design, construction, and physical dimensions specified on figure 1.

3.3.1 Plating. The diode shall be plated as specified on figure 1.

3.4 Performance characteristics. Performance characteristics shall be as specified in tables I and II.

3.5 Marking. The marking shall be as specified in MIL-S-19500, except that the country of origin may be omitted.

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 Test conditions. Unless otherwise specified herein, the test conditions, when applicable, shall be as follows:

P = 5 μW max

f = 9,375 ± 10 MHz

R_A = 1,200 ohms

Holder 118-JAN

4.3 Qualification inspection. Qualification inspection shall consist of the examinations and tests specified in tables I and II.

4.4 Quality conformance inspection. Quality conformance inspection shall consist of the examinations and tests specified in groups A and B.

4 4.1 Group A inspection. Group A inspection shall consist of the examinations and tests specified in table I.

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

4.5 Methods of examination and test. Methods of examination and test shall be as specified in tables I and II.

TABLE I. Group A inspection

Examination or test	MIL-STD-750		LTPD	Symbol	Limits		Unit
	Method	Details			Min	Max	
Subgroup 1			5				
Visual and mechanical examination	2071			---	---	---	---
Video resistance	4131	Test method A or B V = 5mV, max		R_V	6,000	23,000	Ohms
Figure of merit (see 4.2)	4111			M	55	---	---

TABLE II. Group B inspection

Examination or test	MIL-STD-750		LTPD	Symbol	Limits		Unit
	Method	Details			Min	Max	
Subgroup 1							
Physical dimensions	2066	(See figure 1)					
		Dim. A, C, D, F, and N	7	---	---	---	---
		Dim. B, J, and note 2; (Dim. E, G, K, and note 1 are for qualification only.)	20	---	---	---	---
Subgroup 2			20				
Thermal shock (temperature cycling)	1051	Test cond F; T(high) = +70°C		---	---	---	---
Immersion	1011	Test cond. A, 1 cycle; T = 40°C max.		---	---	---	---
End points:							
Video resistance	4131	Test method A or B V = 5mV, max		R_V	5,000	24,000	Ohms
Figure of merit (see 4.2)	4111			M	50	---	---
Subgroup 3			20				
Burnout by repetitive pulsing	4141	t = 1 minute; V_F = 1.5 Vdc; R_g = 25 ohms; t_p = 1.0 µsec; PRF = 800 - 1,000 pps (See figure 2)		---	---	---	---
End points:							
(Same as for subgroup 2)							
Subgroup 4			20				
Shock	2016	Nonoperating; 500 G; t ≅ 0.5 msec; 5 blows in each orientation: X_1, Y_1, and Y_2		---	---	---	---

TABLE II. Group B inspection - Continued

Examination or test	MIL-STD-750		LTPD	Symbol	Limits		Unit
	Method	Details			Min	Max	
Subgroup 4 - Continued							
Vibration, variable frequency	2056	50 to 2,000 Hz		---	---	---	---
Constant acceleration	2006	Nonoperating; 5,000 G; in X_1, Y_1, and Y_2 orientations		---	---	---	---
End points:							
(Same as for subgroup 2)							
Subgroup 5			$\lambda = 20$				
High temperature life (nonoperating)	1031	$T_A = 70°C$		---	---	---	---
End points:							
(Same as for subgroup 2)							

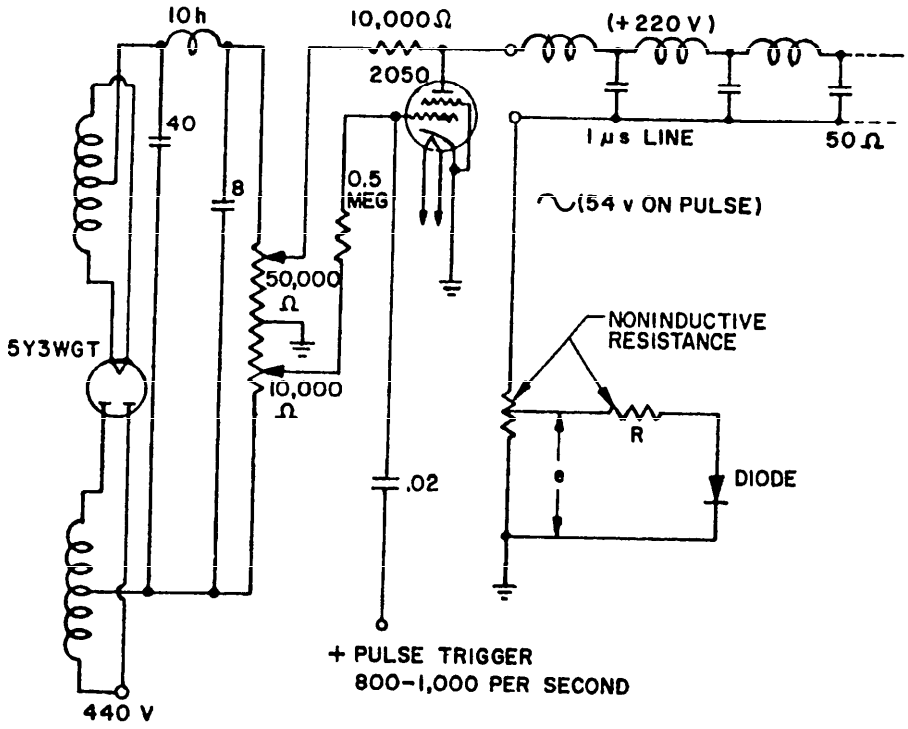


FIGURE 2. Pulse circuit for test burnout.

5. PREPARATION FOR DELIVERY

5.1 Preparation for delivery. Preparation for delivery shall be in accordance with MIL-S-19500.

6. NOTES

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

Custodians:
Army - EL
Navy - EC
Air Force - 17

Review activities:
Army - MI, MU
Air Force - 11, 80
DSA - ES

User activities:
Army - SM
Navy - AS, OS, MC, CG, SH
Air Force - 13, 15, 19

Preparing activity:
Navy - EC

Agent:
DSA - ES

(Project 5961-0195-7)

SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 119-R004

INSTRUCTIONS

This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity *(as indicated on reverse hereof)*.

SPECIFICATION

ORGANIZATION *(Of submitter)* | CITY AND STATE

CONTRACT NO. | QUANTITY OF ITEMS PROCURED | DOLLAR AMOUNT .$

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3. IS THE SPECIFICATION RESTRICTIVE?

☐ YES ☐ NO IF "YES", IN WHAT WAY?

4. REMARKS *(Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)*

SUBMITTED BY *(Printed or typed name and activity)* | DATE

DD FORM 1 APR 63 1426 REPLACES NAVSHIPS FORM 4863, WHICH IS OBSOLETE

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