MILITARY SPECIFICATION

CV 7389

SEMICONDUCTOR DEVICE, DIODE

Description:- This specification covers the detail requirements for a germanium gold bonded diode and is in accordance with K1007, Issue 3 except as otherwise stated.

Mechanical Dimensions and Outlines:- K1007, Section B 10.3.3.4.

Connections:- K1007, Section B, 1.3.4.4.

Absolute Maximum Ratings:-

Rating	V_R	I_{FAV}	I_{FM}	T_S	$T_{(op)}$	$T_{(stg)}$	Shock	Vibration
Unit	V	mA	mA	°C	°C	°C	g	g
Min.	-	-	-	-	-55	-55	-	-
Max.	8	30	100	75	75	75	1500	20
Note		1	2				3	

NOTES:- 1. Averaged over any 50 mS period or D.C. component. See derating curve Page 10.

2. Pulse duration < 5 mS.

3. 0.5 mS duration.

4. Commercial equivalent AAZ13.

(39972)

Primary Electrical Characteristics

Characteristic		I_R	I_R	V_F	Q_S	V_{fr}	R.E.	C
Unit		/uA	/uA	V	pC	V	%	pF
Minimum		-	-	-	-	-	70	
Typical		30	30	0.5	20	0.7		
Maximum		150	85	0.6	30	1.5	-	2.0
Conditions	V_R V	8	3		5			3
	I_F mA			10	10	20		
	f Mc/s						30	0.5
	$T_{amb.}$ °C	25	55	25	25	25	25	25

REQUIREMENTS:-

Marking: K1007, Section B 1.3.4.

QUALITY ASSURANCE PROVISIONS:-

Destructive Tests. The tests listed in Table II Group B Inspection, Subgroups 2, 3 and 4 and in Table III, Group C Inspection, Subgroup 2 are considered destructive.

Group C Inspection. Inspection shall be conducted on the initial lot and thereafter every 90 days or every fifth lot whichever occurs first.

PREPARATION FOR DELIVERY

Packaging. The device shall be packed according to K1007, Section A 1.2.(c).

JOINT SERVICE CATALOGUE NUMBER 5960-99-037-3359

This specification has been prepared by and the Qualification Approval authority is :-

Admiralty Surface Weapons Establishment,
Portsdown, Cosham,
Portsmouth, Hants, England.

Table I

GROUP A INSPECTION

Examination or Test	Test Conditions		AQL %	Insp. Level	Symbol	Limits		Units
	K1007/ NATO Ref.	Specific Conditions				Min.	Max.	
SUBGROUP 1			0.65	I				
Visual and Mechanical Inspection	5.1	Excluding Physical Dimensions						
SUBGROUP 2			0.65	II				
Forward Voltage	8A.3.2.	I_F = 10 mA			V_F	-	0.6	V
Reverse Current (1)	8A.2.2.	V_R = 8V			I_R	-	150	/uA
SUBGROUP 3			2.5	I				
Reverse Current (2)	8A.2.2.	$T_{amb.}$ = 55°C V_R = 3V			I_R	-	85	/uA
Stored Charge		I_F = 10 mA V_R = 5V See Fig. 1 page 10			Q_S	-	30	pC
Forward Recovery Voltage		I_f = 20 mA I_f rise time = 5nS See Fig. 2 page 11			V_{fr}	-	1.5	V

Table I

GROUP A INSPECTION (Cont'd.)

Examination or Test	Test Conditions		AQL %	Insp. Level	Symbol	Limits		Units
	K1007/ NATO Ref.	Specific Conditions				Min.	Max.	
SUBGROUP 4			4.0	IA				
Capacitance	8A.5.1	V_R = 3V f = 0.5 Mc/s			C		2.0	pF
Rectification Efficiency	8A.6.3.1	f = 30 Mc/s Vg = 2V peak C_1 = 100 pF ± 5% R_L = 4.7K ± 5%			R.E.	70		%

Table II

GROUP B INSPECTION

See Page 3, Quality Assurance Provisions

Examination or Test	Test Conditions		AQL %	Insp. Level	Symbol	Limits		Units
	K1007/ NATO REF.	Specific Conditions				Min.	Max.	
SUBGROUP 1			6.5	IC				
Physical Dimensions	5.1	According to Drawing 10.3.3.4						
SUBGROUP 2			4.0	IA				
Solderability	5.13							
Temperature Cycling	5.5	-55°C to +70°C						
Moisture Resistance	5.3							
SUBGROUP 3			4.0	IA				
Vibration Fatigue	5.15	Non-operating						
SUBGROUP 4			6.5	IA				
Lead Fatigue	5.10.2	1 cycle						
SUBGROUP 5								
Omitted								
SUBGROUP 6								
Omitted								

Table II

GROUP B INSPECTION (Cont'd.)

Examination or Test	Test Conditions: K1007/ NATO Ref.	Test Conditions: Specific Conditions	AQL %	Insp. Level	Symbol	Limits: Min.	Limits: Max.	Units
SUBGROUP 7			4.0	I				
High Temperature Life (Non-operating)	6.2.1. 6. 6.1.2.2	$T_{amb.}$ = 75°C t = 1000 hours						
SUBGROUP 8			4.0	IA				
Operating Life	6.3	$T_{amb.}$ between 25°C and 65°C						
	6.5	V_m = 8V						
	6.6.1. 1. 6.6.1.2.2.	I_F = Max. value given by the derating curve on page 10 corresponding to the chosen $T_{amb.}$						
		t = 1000 hrs.						
or alternatively:-								
Intermittent Life.		V_m = 8V I_m = 88 mA I_o = 28 mA R_L = 91 ohm $T_{amb.}$ = 25°C Intermittent Operation 2½ hours ON ½ hour OFF Total ON time = 1000 hrs.						

Table II

GROUP B INSPECTION (Cont'd)

Examination or Test	Test Conditions		AQL %	Insp. Level	Symbol	Limits		Units
	K1007/ NATO Ref.	Specific Conditions				Min.	Max.	
Post Test End Points for Subgroups 2, 3, 7, and 8.								
Forward Voltage	8A.3.2.	As in Group A Inspection, Subgroup 2.			V_F	-	0.67	V
Reverse Current (1)	8A.2.2.	As in Group A Inspection, Subgroup 2.			I_R	-	165	/uA

Table III

GROUP C INSPECTION

See Page 3 Quality Assurance Provisions.

Examination or Test	Test Conditions		AQL %	Insp. Level	Symbol	Limits		Units
	K1007/ NATO Ref.	Specific Conditions				Min.	Max.	
SUBGROUP 1								
Omitted.								
SUBGROUP 2			6.5	IA				
Shock	5.17	Non-operating. Five blows each orientation, Y1, Y2, X and Z						
Post Test End Points for Subgroup 2								
Forward Voltage	8A.3.2.	As in Group A Inspection, Subgroup 2.			V_F		0.67	V
Reverse Current (1)	8A.2.2.	As in Group A Inspection, Subgroup 2.			I_R		165	/uA

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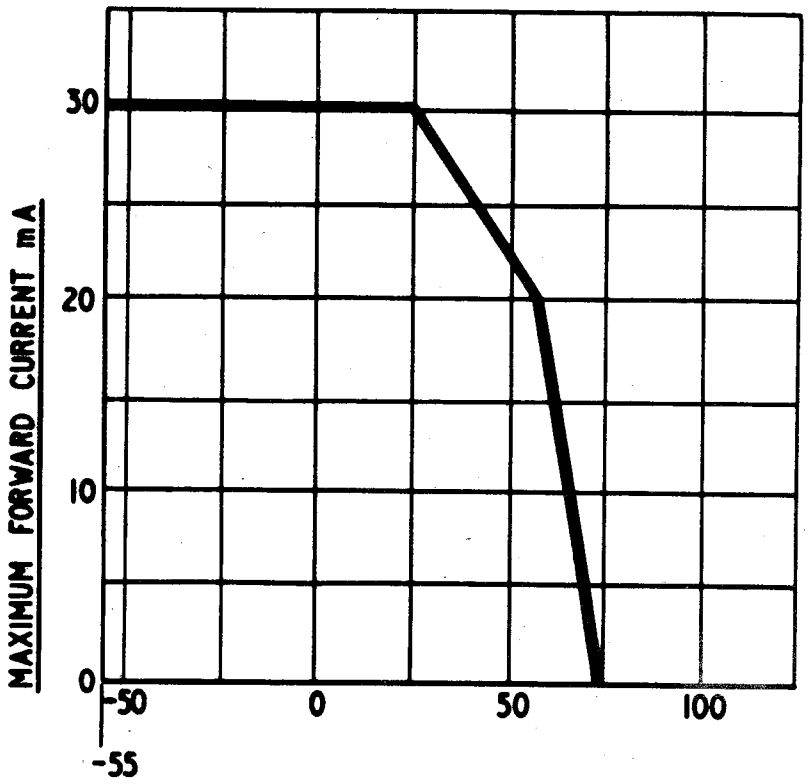
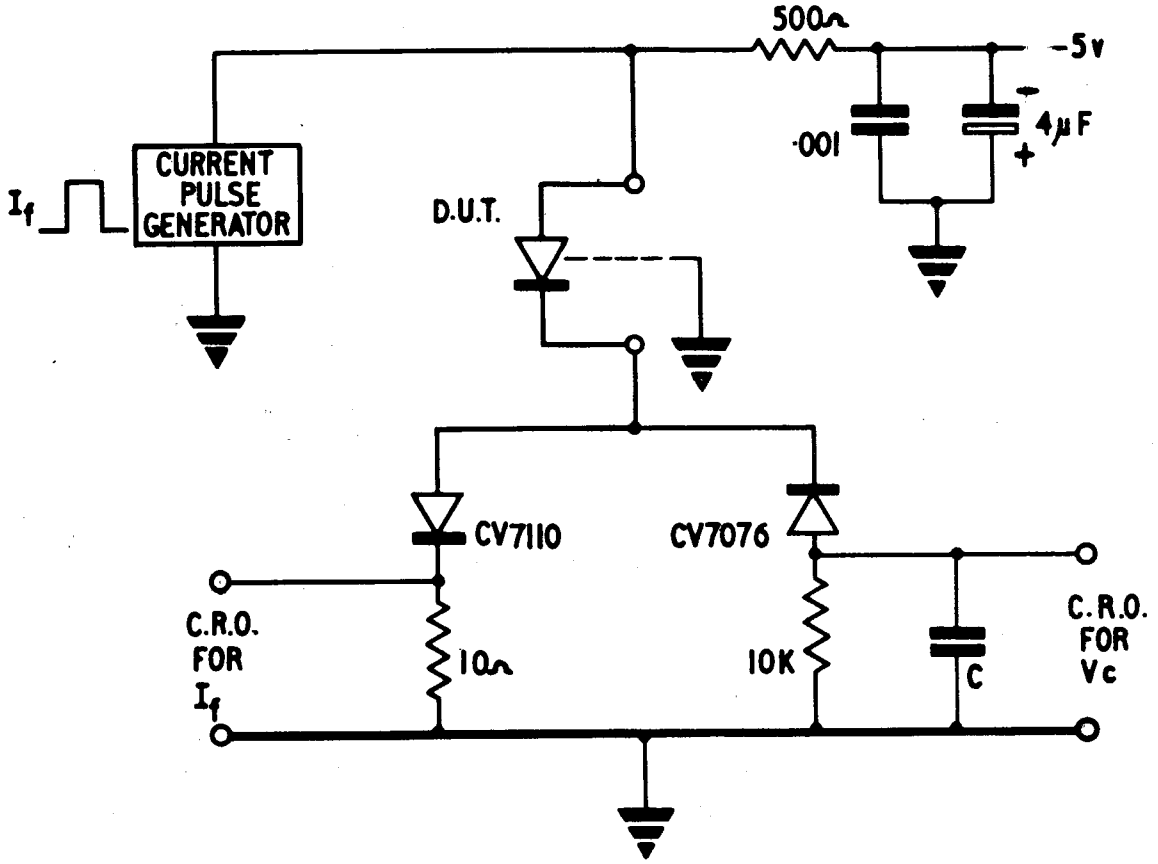
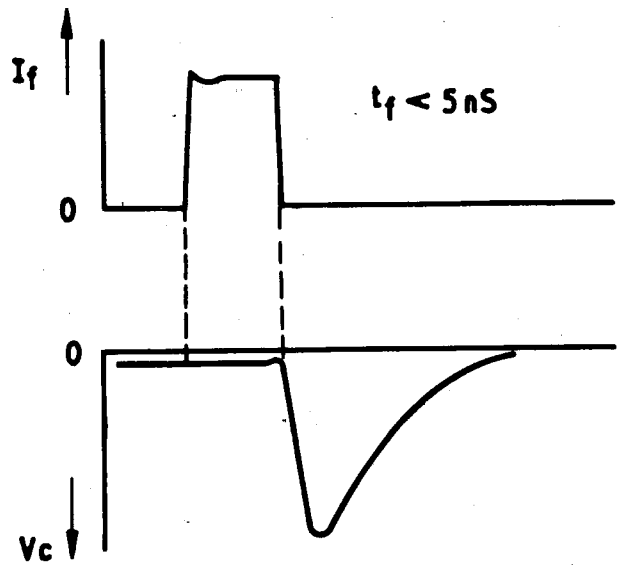

MAXIMUM FORWARD CURRENT mA
30
20
10
0
-50
0
50
100
-55
AMBIENT TEMPERATURE °C



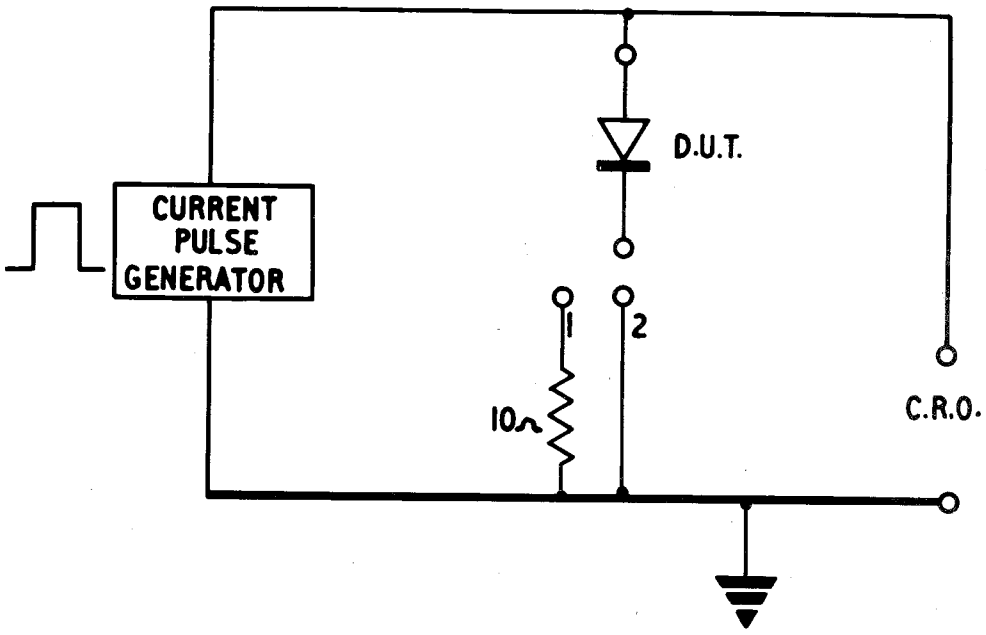


C = 100pF (INCLUDING STRAYS AND C.R.O.)

$Q_s = Vc \times C$

FIG. 1.

STORED CHARGE TEST CIRCUIT



1. CONNECT DIODE UNDER TEST TO 1. SET I_f BY MONITORING ACROSS 10Ω RESISTOR WITH C.R.O.
2. CONNECT DIODE TO 2 AND MEASURE V_{fr}.

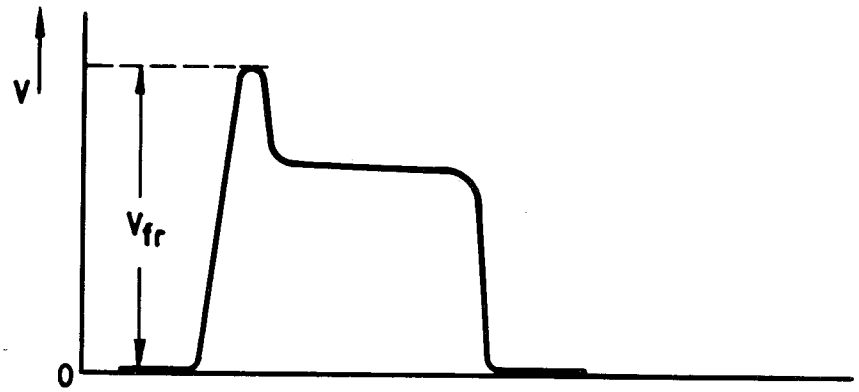
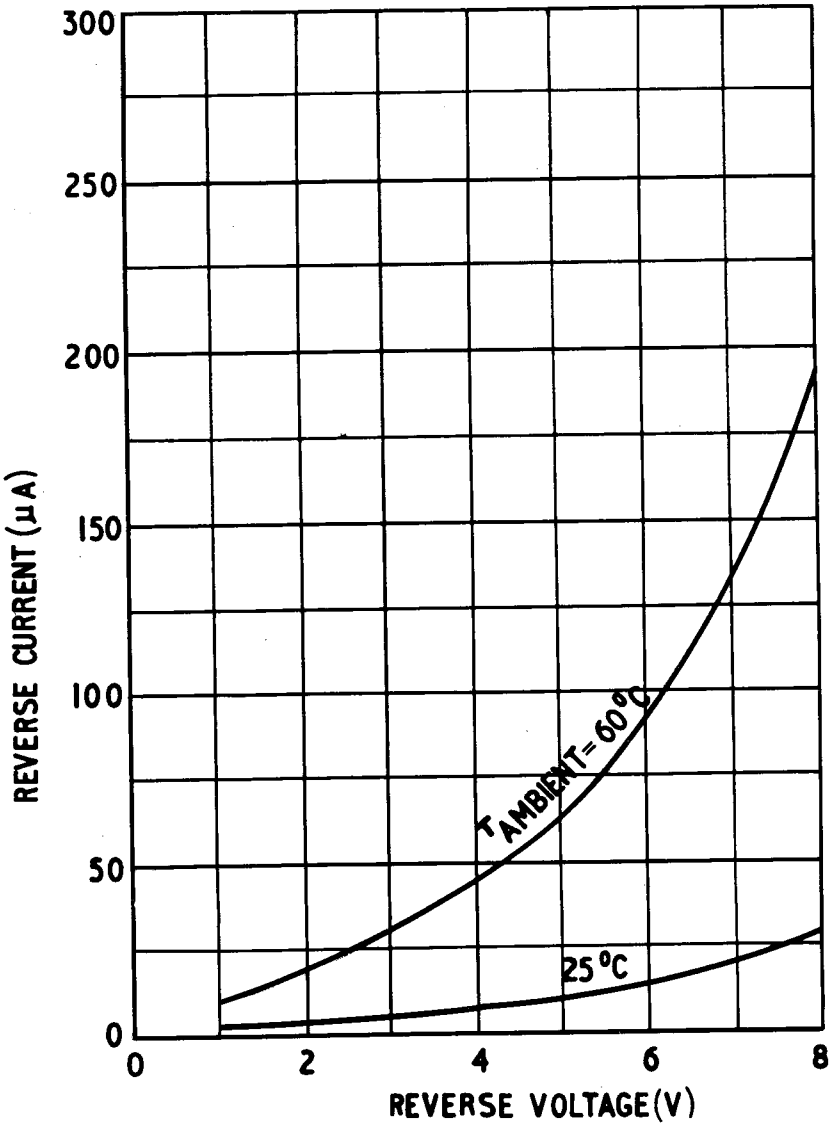
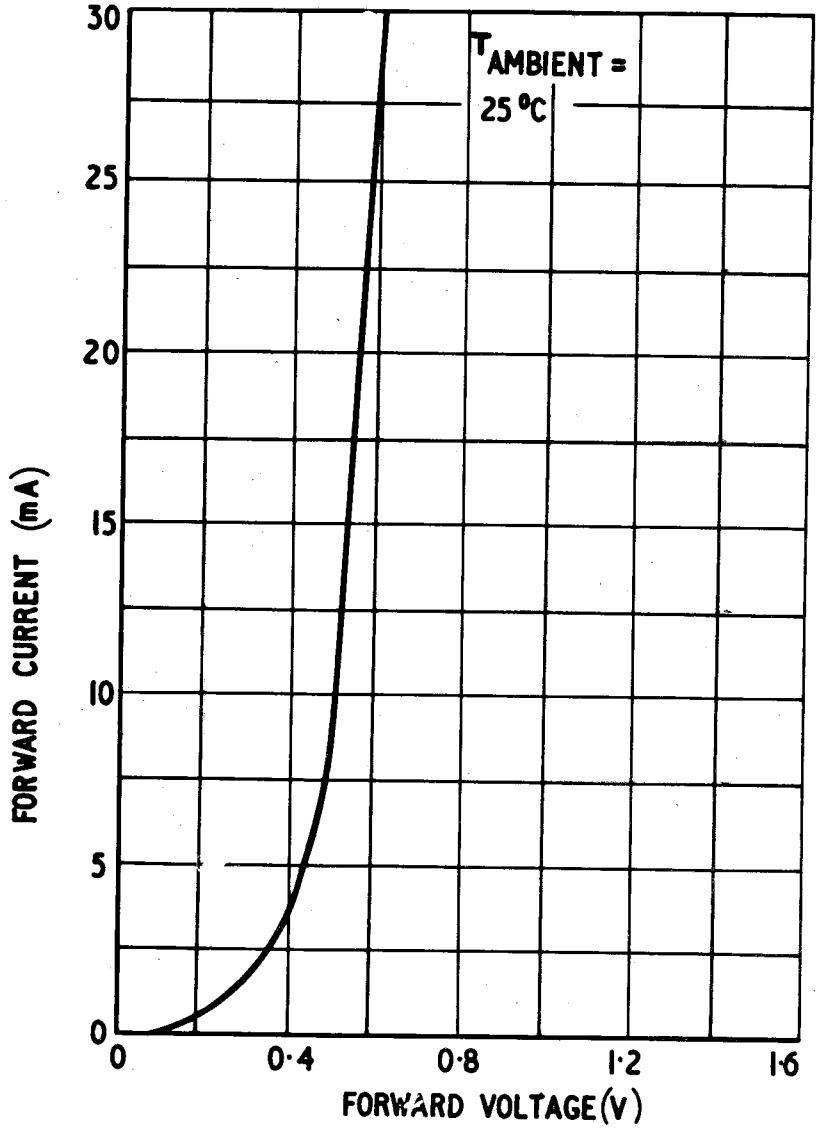


FIG.2.

FORWARD RECOVERY VOLTAGE TEST CIRCUIT



TYPICAL REVERSE CHARACTERISTICS



TYPICAL FORWARD CHARACTERISTIC