

MILITARY SPECIFICATION  
**CV7536-50**  
SEMICONDUCTOR DEVICE, REFERENCE DIODE

Description:- This specification covers the detail requirements for Silicon Reference Diodes, single ended and is in accordance with K1007, Issue 3. except as otherwise stated.

Mechanical Dimensions and Outlines:- See Drawing Fig. 2. Page 11

Connections:- The cathode lead will be indicated

Absolute Maximum Ratings:-

RATING	V <sub>F</sub>	P <sub>tot</sub>	T <sub>op</sub>	T <sub>stg</sub>	I <sub>R</sub>	Vibration	Shock
UNIT	V	mW	°C	°C	mA	g	g
MIN	-	-	-40	-40	-	-	-
MAX	1.2	300	+150	+150		20	100
NOTES		A			B		C

Note A. Averaged over any 20 mSec period, up to 50°C  
See Derating Curve Fig. 1. Page 10

B. Max. Peak Reverse Current (mA). See Table 1  
Page 2.

C. Duration = 6 mS.

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**TABLE 1**

Number	mA (max)	Number	mA (max)
CV 7536	110	CV 7544	45
CV 7537	110	CV 7545	42
CV 7538	90	CV 7546	40
CV 7539	80	CV 7547	35
CV 7540	75	CV 7548	30
CV 7541	65	CV 7549	27
CV 7542	60	CV 7550	25
CV 7543	50		

**Primary Electrical Characteristics**

Characteristic	$V_Z$			$r_z$	$S_Z$		C	$I_R$	$I_R$
	V			ohms	%/°C		pF	$\mu A$	$\mu A$
	Min.	Typ.	Max.	Max.	Min.	Max.		Max.	Max.
CV7536	3.135	3.3	3.465	130	-.08	-.03	90	1.0	5
CV7537	3.420	3.6	3.780	100	-.06	-.02	90	1.0	5
CV7538	3.705	3.9	4.095	90	-.06	-.02	85	1.0	5
CV7539	4.085	4.3	4.515	80	-.05	-.01	85	1.0	5
CV7540	4.465	4.7	4.935	75	-.04	0.00	80	1.0	5
CV7541	4.845	5.1	5.355	70	-.03	+0.02	80	1.0	5
CV7542	5.320	5.6	5.880	40	-.02	+0.03	60	1.0	5
CV7543	5.890	6.2	6.510	15	0.00	+0.05	60	1.0	5
CV7544	6.460	6.8	7.140	10	+0.02	+0.07	45	1.0	5
CV7545	7.125	7.5	7.875	10	+0.03	+0.07	45	0.1	5
CV7546	7.790	8.2	8.610	15	+0.04	+0.08	40	0.1	5
CV7547	8.645	9.1	9.555	18	+0.05	+0.08	40	0.1	5
CV7548	9.500	10	10.500	25	+0.05	+0.08	25	0.1	5
CV7549	10.4	11	11.6	35	.05	+0.09	25	0.1	5
CV7550	11.400	12	12.600	45	+0.05	+0.09	25	0.1	5
$I_R$ mA	5			5	5				
$V_R$ V	-			-	-		-1	Note D	
$T_1$ °C	-			-	25		-	-	
$T_2$ °C	-			-	60		-	-	
T °C	25			25	-		25	25	100

NOTE D.  $V_R$  conditions for these tests can be seen on Pages 4 and 6

Reliability Assurance Requirements

Under discussion

## Requirements:-

### Marking

The device shall be marked as K1007 Section B.  
1.3.4. Minimum requirements 1.3.4.1(a) and (b).

## Quality Assurance Provisions:-

### Destructive Tests:

The tests listed in Table 2. Group B Inspection, Sub Groups 2 and 3 and Table 3. Group C Inspection, Sub Group 2 are considered destructive.

### Group C Inspection

This inspection shall be conducted on the initial lot, and thereafter every ninety days or every fifth lot, whichever occurs first.

## Preparation for Delivery:-

### Packaging

The device shall be packed according to K1007. Issue 3. Section A. 1.2.(c).

## NATO Stock Numbers:-

CV7536 = 5960-99-037-3789  
CV7537 = 5960-99-037-3790  
CV7538 = 5960-99-037-3791  
CV7539 = 5960-99-037-3792  
CV7540 = 5960-99-037-3793  
CV7541 = 5960-99-037-3794  
CV7542 = 5960-99-037-3795  
CV7543 = 5960-99-037-3796  
CV7544 = 5960-99-037-3797  
CV7545 = 5960-99-037-3798  
CV7546 = 5960-99-037-3799  
CV7547 = 5960-99-037-3800  
CV7548 = 5960-99-037-3801  
CV7549 = 5960-99-037-3802  
CV7550 = 5960-99-037-3803

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

Ministry of Aviation, Royal Radar Establishment, Malvern, Worcs., England.

27th May, 1964

Page 3

TABLE 1. GROUP A INSPECTION

Examination or Test	K1007/NATO Ref.	TEST CONDITIONS		AQL %	Insp. Level	Sym- bol	LIMITS		Units
		Specific Conditions					Min.	Max.	
<u>SUB GROUP 1</u> Visual and Mechanical Inspection	5.1	Excluding Physical Dimensions		0.65	I				
	8A.2.4	$I_R = 5mA$	CV7536 CV7537 CV7538 CV7539 CV7540 CV7541 CV7542 CV7543 CV7544 CV7545 CV7546 CV7547 CV7548 CV7549 CV7550	0.65	II	$V_Z$	3.1 3.4 3.7 4.0 4.4 4.8 5.3 5.8 6.4 7.1 7.7 8.6 9.40 10.40 11.40	3.5 3.8 4.1 4.5 5.0 5.4 6.0 6.6 7.2 7.9 8.7 9.6 10.60 11.6 12.60	V " " " " " " " " " " " " " " " "
<u>SUB GROUP 2</u> Zener Voltage									
Reverse Current (1)	8A.2.2		$V_R = 0.5V$			$I_R$	-	1.0	$\mu A$
			$V_R = 1.0V$				-	1.0	$\mu A$
			$V_R = 3.0V$				-	0.1	$\mu A$

TABLE 1. GROUP A INSPECTION (Cont'd)

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Sym- bol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
Slope Resistance	8A.4.1	$I_R = 5 \text{ mA}$	2.5	I	$r_z$	-	130	ohms
						-	100	"
						-	90	"
						-	80	"
						-	75	"
						-	70	"
						-	40	"
						-	15	"
						-	10	"
						-	10	"
						-	15	"
						-	18	"
						-	25	"
						-	40	"
						-	45	"
SUB GROUP 3 Temperature Coefficient	8A.7.3	$I_R = 5 \text{ mA}$ $T_1 = 32.5 \text{ }^\circ\text{C}$ $T_2 = 60 \text{ }^\circ\text{C}$	2.5	I	$s_z$	-0.08	-0.03	%/°C
						-0.06	-0.02	"
						-0.06	-0.02	"
						-0.05	-0.01	"
						-0.04	0.00	"
-0.03	+0.02	"						

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TABLE 1 GROUP A INSPECTION (Cont'd)

Examination or Test	K1007/NATO Ref.	TEST CONDITIONS Specific Conditions	AQL %	Insp. Sym- Level bol	LIMITS		Units
					Min.	Max.	
SUB GROUP 3 Cont'd		CV7542			-0.02	+0.03	V
		CV7543			0.00	+0.05	V
		CV7544			+0.02	+0.07	V
		CV7545			+0.03	+0.07	V
		CV7546			+0.04	+0.08	V
		CV7547			+0.05	+0.08	V
		CV7548			+0.05	+0.08	V
		CV7549			+0.05	+0.08	V
		CV7550			+0.05	+0.09	V
					-	1.2	V
Forward Voltage Drop	8A.3.2	$I_F = 100 \text{ mA}$		$V_F$			
Reverse Current (2)	8A.2.2	$T_{amb} = 100^\circ\text{C}$		$I_R$			
SUB GROUP 4 Capacitance		CV7536 - $V_R = 1.0V$			-	5.0	$\mu\text{A}$
		CV7538 - $V_R = 3.0V$			-	5.0	$\mu\text{A}$
		$V = -1V$	CV7536 - CV7537			40	pF
		$f = 1 \text{ Mc/s.}$	CV7538 - CV7539			35	pF
			CV7540 - CV7541			30	pF
			CV7542 - CV7543			20	pF
			CV7544 - CV7545			10	pF
			CV7546 - CV7547			10	pF
			CV7548 - CV7550			8	pF
					C		

**TABLE 2. GROUP B INSPECTION**  
**See Page 3. Quality Assurance Provisions**

Examination or Test	K1007/NATO Ref.	TEST CONDITIONS Specific Conditions	AQL %	Insp. Level	Sym-bol	LIMITS		Units
						Min.	Max.	
<u>SUB GROUP 1</u> Physical Dimensions	5.1	According to drawing Fig. 2 Page 11	6.5	IC				
<u>SUB GROUP 2</u> Solderability	5.12		4.0	IA				
Temperature Cycling	5.5	-40 to + 150°C						
Moisture Resistance	5.3							
<u>SUB GROUP 3</u> Vibration Fatigue	5.15.1		4.0	IA				
<u>SUB GROUP 4</u> Lead Fatigue	5.10.2	3 cycles						
Omitted								
<u>SUB GROUP 7</u> High Temperature	6.2.1	T <sub>stg</sub> = 150°C Duration 1000 hrs.	4.0	I	Note 1			
<u>SUB GROUP 8</u> Operating Life	6.3 6.6.1.2.2	T <sub>amb</sub> Any single temperature between 50°C and 150°C P <sub>tot</sub> according to that shown on the derating curve Fig. 1. Page 10 for the chosen temperature. Duration = 1000 hours.	4.0	IA				

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**TABLE 2. GROUP B INSPECTION (Cont'd)**  
 See Page 3. Quality Assurance Provisions

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Sym- bol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
<u>Post Test End Points</u> <u>for SUB GROUPS 2</u> <u>3, 7 and 8</u> Zener Voltage	8A.2.4	$I_R = 5 \text{ mA}$  CV7536 CV7537 CV7538 CV7539 CV7540 CV7541 CV7542 CV7543 CV7544 CV7545 CV7546 CV7547 CV7548 CV7549 CV7550			$V_Z$	3.035	3.565	V
						3.320	3.880	"
						3.605	4.195	"
						3.985	4.615	"
						4.365	5.035	"
						4.745	5.455	"
						5.220	5.980	"
						5.790	6.610	"
						6.360	7.240	"
						7.025	7.975	"
						7.690	8.710	"
						8.545	9.655	"
						9.40	10.60	"
						10.30	11.65	"
						11.30	12.70	"
Reverse Current	8A.2.2	CV7536 $-CV7537 V_R = 0.5V$ CV7538 $-CV7544 V_R = 1.0V$ CV7545 $-CV7550 V_R = 3.0V$			$I_R$	-	1.5	$\mu A$
						-	1.5	$\mu A$
						-	0.15	$\mu A$



TABLE 3. GROUP C INSPECTION (Cont'd)  
See Page 3. Quality Assurance Provisions

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Sym- bol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
<u>SUB GROUP 1</u> Omitted								
<u>SUB GROUP 2</u> Shock	5.17	5 blows in each of three mutually perpendicular directions	6.5	IA				
<u>Post Shock End Points</u>								
<u>Zener Voltage</u>	8A.2.4	$I_R = 5 \text{ mA}$ CV7536 CV7537 CV7538 CV7539 CV7540 CV7541 CV7542 CV7543 CV7544 CV7545 CV7546 CV7547 CV7548 CV7549 CV7550			$V_Z$	3.035 3.320 3.605 3.985 4.365 4.745 5.220 5.790 6.360 7.025 7.690 8.345 9.40 10.30 11.30	3.565 3.880 4.195 4.615 5.035 5.455 5.980 6.610 7.240 7.975 8.710 9.655 10.60 11.65 12.70	V " " " " " " " " " " " " " " " "
<u>Reverse Current</u>	8A.2.2	$I_R = 0.5V$ CV7536 CV7538 CV7545			$I_R$	- - -	1.5 1.5 0.15	$\mu A$ $\mu A$ $\mu A$

FIG 1

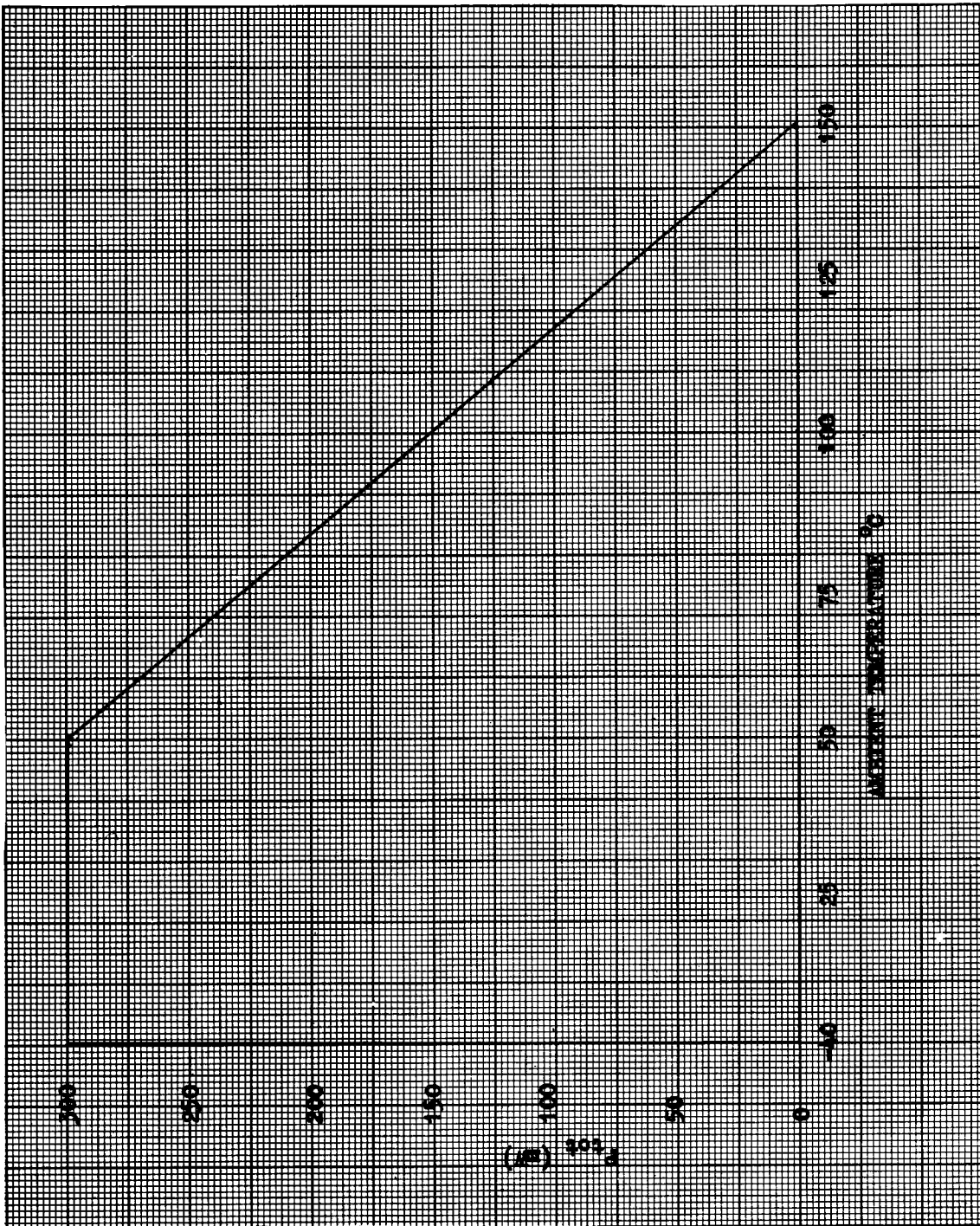
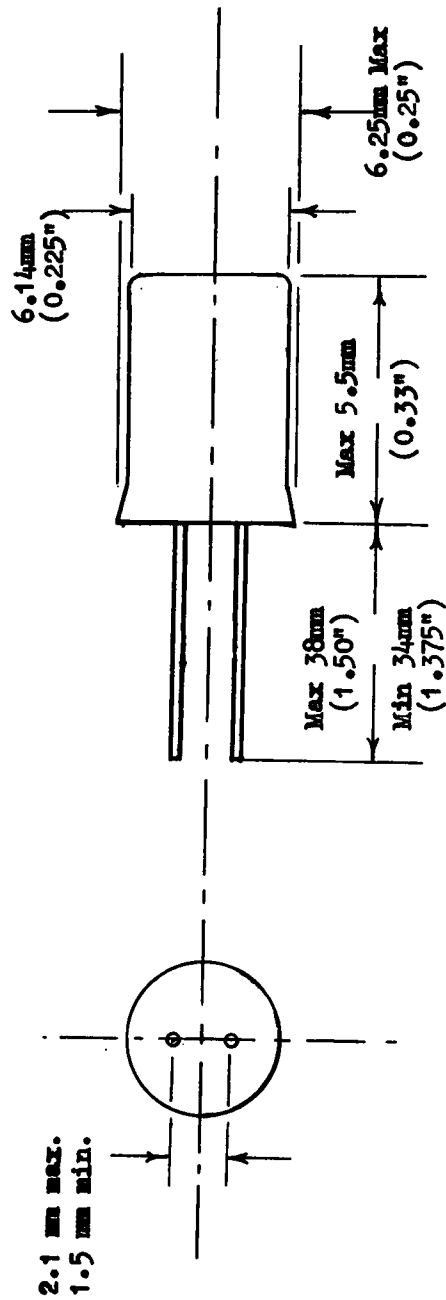


Fig 2



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