

MILITARY SPECIFICATION
CV 7589-90
SEMICONDUCTOR DEVICE, SILICON HIGH VOLTAGE DIODE

Description: This specification covers the detail requirements for a Silicon High Voltage diode and is in accordance with K1007, except where otherwise stated.

Mechanical Dimensions and Outlines: K1007, Section 'D' Appendix 1, Dwg.9

Connections: Cathode end marked as clause 1.3.4.4

Absolute Maximum Ratings:

Device	Rating	P.R.V.	Mean Power	Recurrent Peak I_F	Rise time of Reverse Waveform	T_{op}	T_{stg}	Shock	Vibration
	Unit	k.Volts	mW	mA	V/ μ Sec	$^{\circ}C$	$^{\circ}C$	g	g
CV7589	Min	-	-	-		-55	-55	-	-
	Max	2.0	300	350		+150	+150	1500	20
CV7590	Min	-	-	-		-55	-55	-	-
	Max	3.0	300	350		+150	+150	1500	20
Notes:				A	B			C	

Notes: A. See derating curve Fig. 1.

B. The maximum rise time of a reverse voltage waveform which can be applied to the diode is defined by the empirical formula

$$\frac{dv}{dt} \text{ (max)} = \frac{5000}{I_F Pk}$$

where I_F peak is measured in milliamps and is the forward current in the diode immediately preceding the applied reverse voltage and

$$\frac{dv}{dt} \text{ (max)} \text{ is measured in volts per } \mu\text{Sec.}$$

C. Duration 0.5 milliseconds.

D. See surge rating curve Fig. 2.

E. Commercial Equivalents CV 7589 = ZHS103
 CV 7590 = ZHS106

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Primary Electrical Characteristics

Characteristic			I_R	I_R	I_R	I_R	V_F
Unit			uA	uA	uA	uA	V
CV 7589	Min		-	-	-	-	-
	Max		.10	-	10.0	-	4.5
CV 7590	Min		-	-	-	-	-
	Max		-	.10		10.0	4.5
CONDITIONS	T_{amb}	$^{\circ}C$	25	25	100	100	25
	V_R	V	2000	3000	2000	3000	
	I_F	mA					100

Reliability Assurance Requirements:- Under discussion

Requirements:

Marking The device shall be marked as K1007, Section B, 1.3.4
Essential marking, 1.3.4.1(a) and 1.3.4.1(b).

Quality Assurance Provisions:-

Destructive Tests: The tests listed in Table 2, Group B Inspection,
Sub Groups 2, 3 and 4 and in Table 3 Group C
Inspection, Sub Groups 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,
Section A 1.2.(c).

NATO Stock Number: CV7589 = 5960-99-037-3917
CV7590 = 5960-99-037-3918

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

Ministry of Aviation, Royal Radar Establishment, Malvern, Worcs. England.
2nd September 1964

TABLE 1. GROUP 'A' INSPECTION

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Sym- bol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
<u>SUB GROUP 1</u> Visual and Mechanical Inspection	5.1		.65	I				
<u>SUB GROUP 2</u> Forward Voltage Drop	8A.3.2	$I_F = 100\text{mA}, T_{\text{amb}} = 25^\circ\text{C}$.65	II	V_F	3.0	4.5	V
Reverse Current (1)	8A.2.2	CV7589 $V_R = 2\text{kV}$) $T_{\text{amb}} = 25^\circ\text{C}$ CV7590 $V_R = 3\text{kV}$)			I_R	-	0.1	μA
<u>SUB GROUP 3</u> Reverse Current (2)	8A.2.2	CV7589 $V_R = 2\text{kV}$) CV7590 $V_R = 3\text{kV}$) $T_{\text{amb}} = 100^\circ\text{C}$	2.5	I	I_R	-	10.0	μA
<u>SUB GROUP 4</u> Capacitance	8A.5.1	$V_R = -10\text{V}$ $f = 1 \text{ Mc/s}$	4.0	IA		-	3.3	pF

GROUP 'B' INSPECTION
(See Quality Assurance Provisions, Page 3)

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Sym- bol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
<u>SUB GROUP 1</u> Physical Dimensions	5.1	According to Drg.K1007/A1/D9	6.5	IC				
<u>SUB GROUP 2</u> Solderability	5.13		4.0	IA				
Temperature Cycling	5.5	-55°C to +150°C						
Moisture Resistance	5.3							
<u>SUB GROUP 3</u> Vibration Fatigue	5.15.1	Non-operating	4.0	IA				
<u>SUB GROUP 4</u> Lead Fatigue	5.10.2	2 cycles	6.5	IA				
<u>SUB GROUPS 5 & 6</u> Omitted								
<u>SUB GROUP 7</u> High Temperature Life	6.2.1 6.6.1.2.2	T _{stg} = 150°C t = 1000 hrs.	4.0	I Note 1				
<u>SUB GROUP 8</u> Operating Life	6.3 6.5 6.6 6.6.1.2.2	P.R.V. = 2kV (CV7589), 3kV (CV7590) T _{amb} between 25°C and 100°C with not less than corresponding mean rectified current given on the derating curve Fig.1 Duration 1000 hours.	4.0	IA				

TABLE II (Cont'd) GROUP 'B' INSPECTION

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Sym- bol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
<u>Post Test end Points for SUB GROUPS 2, 3, 7 and 8</u>								
Forward Voltage Drop	8A.3.2	As in Group A, Sub Group 2			V _F	-	4.5	V
Reverse Current (2)	8A.2.2	As in Group A, Sub Group 3			I _R	-	15.0	µA

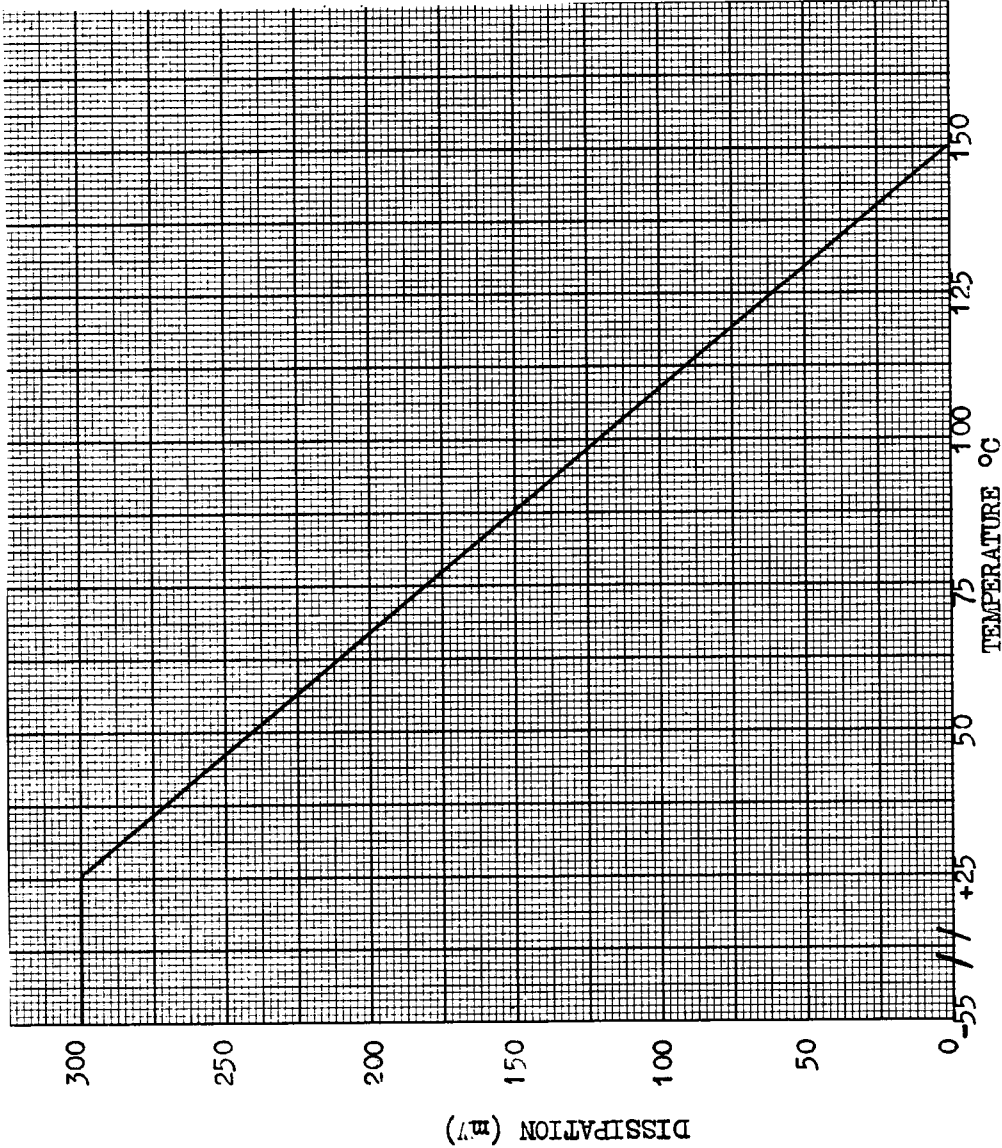
TABLE III GROUP 'C' INSPECTION
 (See Quality Assurance Provisions, Page 3, Group C Inspection)

Examination or Test	K1007/NATO Ref.	TEST CONDITIONS Specific Conditions	AQL %	Insp. Level	Sym- bol	LIMITS		Units
						Min.	Max.	
<u>SUB GROUP 1</u>								
Omitted								
<u>SUB GROUP 2</u>								
Shock	5.17.1	Non-operating. 5 blows in each of directions X1, Y1, Y2 and Z1	6.5	IA				
<u>Post Test End Points for Sub Group 2</u>								
Forward Voltage Drop	8A.3.2	As in Group A. Sub Group 2			V _F		4.5	V
Reverse Current (2)	8A.2.2	As in Group A, Sub Group 3			I _R		15.0	µA

NOTES

1. Maximum sample size 125.

FIG 1
DERATING CURVE



SURGE CURRENT RATING BASED ON A RECTANGULAR PULSE IN A FORWARD DIRECTION FULL P.R.V. IN THE REVERSE DIRECTION

