ELECTRONIC VALVE SPECIFICATIONS
SPECIFICATION FOR CV7591-2
ISSUE NO. 1 DATED 1ST OCTOBER, 1964
AMENDMENT NO. 1

Page 2.

Amend S_F max. to read -3 mV/°C for both CV7591 and CV7592.

Page 4.

Amend max. limit for S_F to read -3 mV/°C.

December 1964. Admiralty Surface Weapons Establishment.
N.253569

MILITARY SPECIFICATION

CV7591-2

SEMICONDUCTOR DEVICE

Description:- This specification covers the detail requirements for Silicon forward conductance diodes and is in accordance with K1007, Issue 3, except as otherwise stated.

Mechanical Dimensions and Outlines:- K1007, Section D A1/D9.

Connections:- K1007, Section B, 1.3.4.4.

Absolute Maximum Ratings:-

Device	Rating	V_R	I_o	I_{FSM}	I_{FRM}	T_{opr}	T_{stg}	Shock	Vibration
	Unit	V	mA	A	A	°C	°C	g	g
CV7591	Min.	-	-	-	-	-55	-55	-	-
	Max.	10	250	1.5	1.0	150	150	1500	20
CV7592	Min.	-	-	-	-	-55	-55	-	-
	Max.	6	150	0.5	0.5	150	150	1500	20
	Note		A	B				C	

Notes:- A. See derating curve Fig. 1.

B. Max. duration = 1 sec.

C. Duration = 0.5 ms.

D. Commercial equivalents:- CV7591 - G129
CV7592 - G130

CV7591-2

Primary Electrical Characteristics

Characteristics			I_R	I_R	V_F	V_F	Z_F	S_F
Unit			µA	µA	V	V	Ω	mV/°C
CV7591		Min.	-	-	0.50		-	
		Max.	0.1	100	0.62	1.0	60	-2
CV7592		Min.	-	-	0.57		-	
		Max.	0.1	100	0.71	1.0	60	-2
Conditions	V_R	V	2	Max. Rated				
	I_F	mA			1.0	100	1.0	1.0
	T_{amb}	°C	25	25	25	25	25	

Reliability Assurance Requirements:- Under discussion.

REQUIREMENTS:-

Marking 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 II, Group B Inspection, Sub-groups 2, 3 and 4 and in Table III, Group C Inspection, Sub-group 2 are considered destructive.

Group C Inspection 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 NUMBERS:-

CV7591 5960-99-037-3923
CV7592 5960-99-037-3924

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.	
SUB-GROUP 1			0.65	I				
Visual and Mechanical Inspection	5.1.1.							
SUB-GROUP 2			0.65	II				
Forward Voltage (1)	8A.3.2.	I_F = 1 mA						
		CV7591			V_F	0.50	0.62	V
		CV7592			V_F	0.57	0.71	V
Reverse Current (1)	8A.2.2.	V_R = 2V			I_R		0.1	µA
SUB-GROUP 3			2.5	I				
Forward Voltage (2)	8A.3.2.	I_F = 100 mA			V_F		1.0	V
SUB-GROUP 4			4.0	IA				
Reverse Current (2)	8A.2.2.	V_R = 10V (CV7591)					100	µA
		V_R = 6V (CV7592)					100	µA
Temp. Coeff of Forward Voltage		I_F = 1 mA, Temp. range +25°C to +60°C			S_F	-1	-2	mV/°C
Small-signal Forward Impedance	8A.4.2.	I_F = 1 mA			Z_F	-	60	Ω

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.	
SUB-GROUP 1			6.5	IC				
Physical Dimensions	5.1.2.	According to K1007/A1/D9						
SUB-GROUP 2			4.0	IA				
Solderability	5.13.							
Temperature Cycling	5.5.	$-55^{\circ}C$ to $+100^{\circ}C$						
Moisture Resistance	5.3.							
SUB-GROUP 3			4.0	IA				
Vibration Fatigue	5.15.	Non-operating						
SUB-GROUP 4			6.5	IA				
Lead Fatigue	5.10.2.	1 cycle						
SUB-GROUP 5		Omitted						
SUB-GROUP 6		Omitted						
SUB-GROUP 7			4.0	I				
High Temperature Life	6.2.1. 6.6.1.2.2.	$T_{amb} = 150^{\circ}C$ $t = 1000$ hours						

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Table II

GROUP B INSPECTION

Examination or Test	Test Conditions		AQL %	Insp. Level	Symbol	Limits		Units
	K1007/ NATO Ref.	Specific Conditions				Min.	Max.	
SUB-GROUP 8			4.0	IA				
Operating Life (d.c. or rectified a.c.)	6.3. 6.5. 6.6.1. 6.6.1.2.2.	T_{amb} between 25°C and 120°C I_F = max. value given by derating curve Fig. 1 corresponding to the chosen T_{amb}						
Post Test End Points Sub-groups 2, 3, 7 and 8								
Forward Voltage	8A.3.2.	As in Group A, Sub-group 2			V_F			
		CV7591				0.48	0.64	V
		CV7592				0.55	0.73	V
Reverse Current	8A.2.2.	As in Group A, Sub-group 2			I_R		0.50	µA

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.	
SUB-GROUP 1		Omitted						
SUB-GROUP 2			6.5	IA				
Shock	5.17.1.	Five blows in each of three mutually perpendicular directions						
Post Test End Points		As for Group B, Sub-groups 2, 3, 7 and 8						

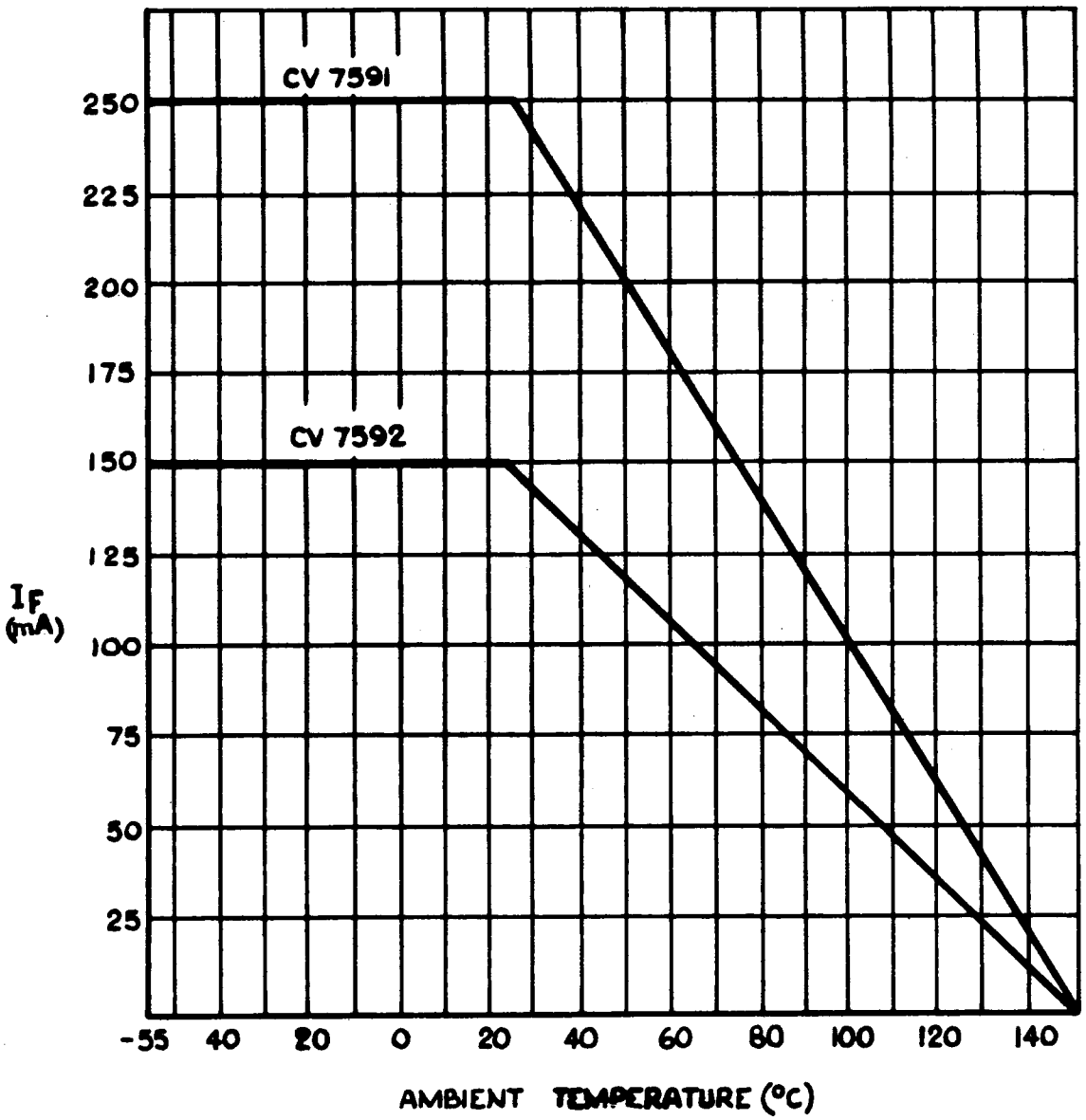
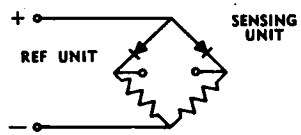


FIG. 1. DERATING CURVE

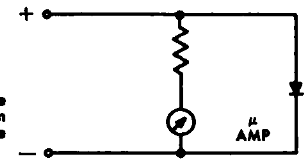
TEMPERATURE SENSING BRIDGE

The temperature coefficient of the *stabistor* makes it well suited to bridge circuit sensing applications.



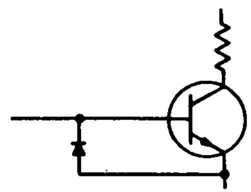
METER PROTECTION

The low saturation voltage of the *stabistor* will allow normal operation of a sensitive microammeter, while protecting it from overvoltage.



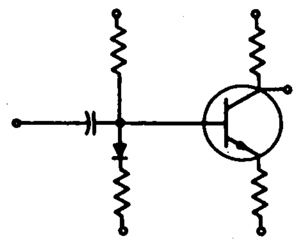
BASE CLAMPING DIODE

The *stabistor* in this circuit provides protection for transistors having low BV_{EBO}, by clamping the reverse base voltage. This type of protection allows high collector currents and does not require additional base bias.



STABILIZED TRANSISTOR BIAS

The *stabistor* provides temperature compensation equal to the temperature coefficient of the base-emitter diode of the transistor.



LOGARITHMIC ATTENUATORS

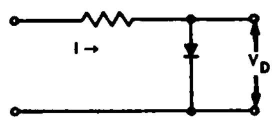
The characteristic of the *stabistor* approximates a log function according to the equation:

$$V_D \cong \frac{AKT}{q} \ln \frac{I}{I_S}$$

where: K = Boltzmann's Constant
T = Ambient Temperature in °Kelvin
q = Charge on an Electron
I = Forward Diode Current
I_S = Diode Saturation Current ($\approx 10^{-12}$ amps)

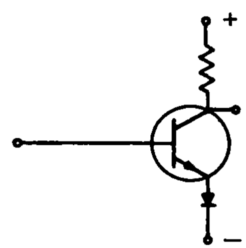
for $V > \frac{KT}{q}$

and $\frac{KT}{q} \approx$ 25.8 mv at room temperature

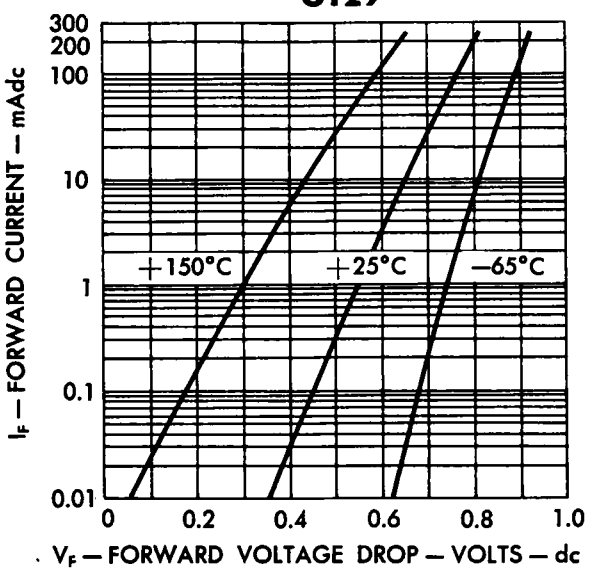


TRANSISTOR EMITTER VARISTOR

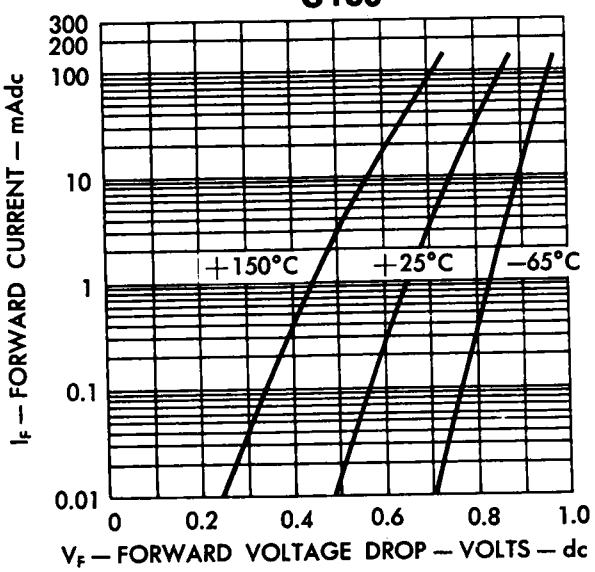
The *stabistor*, acting as a variable emitter resistor for switching applications, presents a high impedance for no signal and low impedance for on signal. This circuit should be used only in applications where the transistor is held firmly off because of the effect of temperature on the emitter voltage with the *stabistor* in the circuit.



G129


300
200
100
10
1
0.1
0.01
+150°C
+25°C
−65°C
0
0.2
0.4
0.6
0.8
1.0
I_F — FORWARD CURRENT — mAdc
V_F — FORWARD VOLTAGE DROP — VOLTS — dc

G130


300
200
100
10
1
0.1
0.01
+150°C
+25°C
−65°C
0
0.2
0.4
0.6
0.8
1.0
I_F — FORWARD CURRENT — mAdc
V_F — FORWARD VOLTAGE DROP — VOLTS — dc