

CV7088.

VALVE ELECTRONIC
(SEMICONDUCTOR DEVICE)

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ADMIRALTY SURFACE WEAPONS ESTABLISHMENT

Specification: AD/CV7088 Issue 1 dated 1.6.61. To be read in conjunction with K1007 Mandatory sections 1, 2, 3, 4, 5.1, 5.2, 5.3, 9 and 15. Other Sections and Appendices as called up by this Specification.	SECURITY	
	<u>Specification</u> Unclassified	<u>Valve</u> Unclassified

TYPE OF VALVE: Silicon Variable Capacitance Diode PROTOTYPE: SVC 2		<u>MARKING</u> CV Number, Polarity marking and if possible, the Factory Code and Date Code - see K1007/4	
<u>RATINGS AND CHARACTERISTICS</u> (Not for Inspection purposes) (All Limiting values are absolute)		<u>DIMENSIONS</u> See K1007/A1/D6A and D6B	
		<u>MOUNTING POSITION</u> Any	
		<u>PACKAGING</u> A.1.S. 6 K1007/14	
<u>RATINGS</u> Max. Reverse Voltage (V) 30 A Max. Forward Voltage 25°C (V) 0.4 100°C (V) 0.25 Max. Operating Temperature (°C) 150 Max. Storage Temperature (°C) 100 Min. Storage Temperature (°C) -55	Note		
<u>CHARACTERISTICS</u> Capacitance at -3 V:Min. (pF) 5.5 B Max. (pF) 8.0 B Variation of Capacitance -3 V to -10 V:Min. (%) -30 B Max. (%) -45 Max. Forward Current at 0.4 V 25°C (µA) 5 at 0.25 V (100°C) (µA) 5 Max. Reverse Current at -30 V 100°C (µA) 10 Typical Series Resistance (ohms) 4 Typical Inductance (mµH) 10 Additional Inductance for Leads (mµH/cm) 10			

NOTES

- A. This rating applies over the range -55°C to +150°C.
- B. The capacitance of all diodes measured at -3 volts is between 5.5 and 8.0 pF. With increase of reverse bias the capacitance decreases by an amount between 30% and 45% of its value at -3 volt.

The capacitance of a device of value 6 pF at -3 volt will therefore reduce to between 3.3 pF (-45%) and 4.2 pF (-30%) at -10 volts.

See also Note 1 on page 3.
- C. The Joint Services Catalogue number is 5960-99-037-2189.

CV7088/1/1

K1007	Test	Test Conditions	AQL %	Insp. Level	Sym.	Limits		Units
						Min.	Max.	
	<u>GROUP A</u> Omitted							
	<u>GROUP B</u>							
	Reverse Current	$V_R = -30 \text{ V}$ $T_{amb} = 100^\circ\text{C}$	0.65	11	I_R	-	10	μA
	Capacitance	$V_R = -3 \text{ V}$ $f = 1 \text{ Mc/s}$	0.65	11	C	5.5	8.0	PF
	<u>GROUP C</u>							
	Forward Current	$V_F = 0.4 \text{ V}$ $T_{amb} = 15 - 30^\circ\text{C}$	2.5	1	I_F	-	5	μA
	Capacitance Change	$V_T = -3 \text{ V to } -10 \text{ V}$ Note 1	2.5	1	$-\Delta C$	30	45	%
	<u>GROUP D</u> Omitted							
	<u>GROUP E</u>							
10.1	LEAD FRAGILITY	Note 2	6.5	IC				
11.5	SOLDERING		6.5	IC				
10.2	TEMPERATURE CYCLING	3 cycles $-55^\circ\text{C to } +100^\circ\text{C}$ Note 3		IC				
10.3	CLIMATIC CYCLING	Note 3						
	<u>Post Temperature and Climatic Cycling Tests</u>							
8.	Inoperatives		6.5					
	Reverse Current	As in Group B	6.5		I_R	-	12	μA
	Capacitance	As in Group B	6.5		C	5.0	8.5	PF
11.3	FATIGUE	No Voltage		IC				
	<u>Post Fatigue Tests</u>							
8.	Inoperatives		6.5					
	Reverse Current	As in Group B	6.5		I_R	-	12	μA
	Capacitance	As in Group B	6.5		C	5.0	8.5	PF
11.4	SHOCK	Hammer Angle = 60°		Q.A.				
	<u>GROUP F</u>							
13	LIFE	$V_R = -30 \text{ V}$ $T_{amb} = +100^\circ\text{C}$		1A				
13.3	<u>Post Life Tests</u>							
8.	Inoperatives		4.0					
	Reverse Current	As in Group B	4.0		I_R	-	12	μA
	Capacitance	As in Group B	4.0		C	5.0	8.5	PF
13.4	STORAGE LIFE (1)	No Voltages $T_{amb} = -55^\circ\text{C } t = 150 \text{ h}$		I				
13.5	STORAGE LIFE (2)	No Voltages $T_{amb} = +100^\circ\text{C } t = 150 \text{ h}$		I				
	<u>Post Storage Tests</u>							
	Repeat Group B tests to Group B Limits	Combined AQL for (a) Storage Life (1) (b) Storage Life (2)	4.0 4.0					

K1007	Test	Test Conditions	AQL %	Insp. Level	Sym.	Limits		Units
						Min.	Max.	
	<u>GROUP G</u>							
5.3.2.11	Retest after 28 days holding period							
8.	Inoperatives		0.5	100%				
	Capacitance	As in Group B	2.0	100%	C	5.5	8.0	pF

NOTES

1. The total capacitance (C) consists of the junction capacitance (C_j) plus stray capacitance.

The junction capacitance (C) varies with reverse bias (V_r) according to the following approximate relationship:

$$C_j = \frac{K}{(V_r + 0.6)^{\frac{1}{2}}}$$

There is no significant change in capacitance with temperature, +

Stray capacitance depends upon the length of the diode leads used but would not substantially exceed 1 pF.

2. Devices used for this test must have undergone at least 28 cycles of the climatic test in accordance with K1007 section 10.3.1 or 10.3.2 or 6 cycles in accordance with section 10.3.3.
3. The sample shall be subjected to conditioning in accordance with K1007 section 10.1 and shall then be subjected to the temperature cycling and climatic cycling in sequence.

TYPICAL VARIATION OF CAPACITANCE WITH BIAS VOLTAGE.

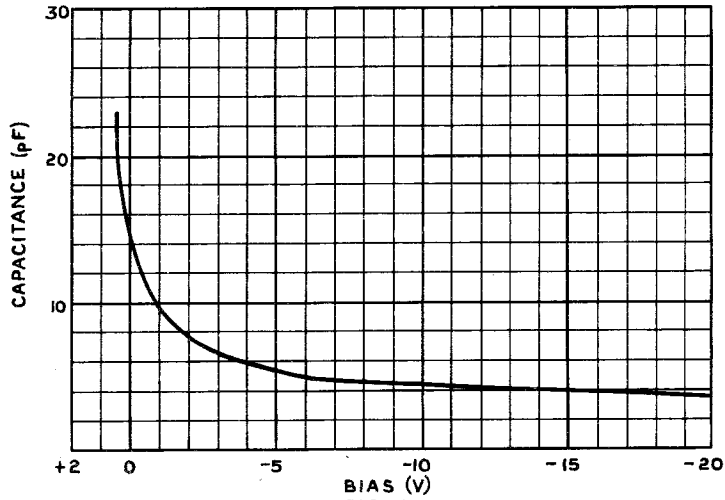


FIG. 1.

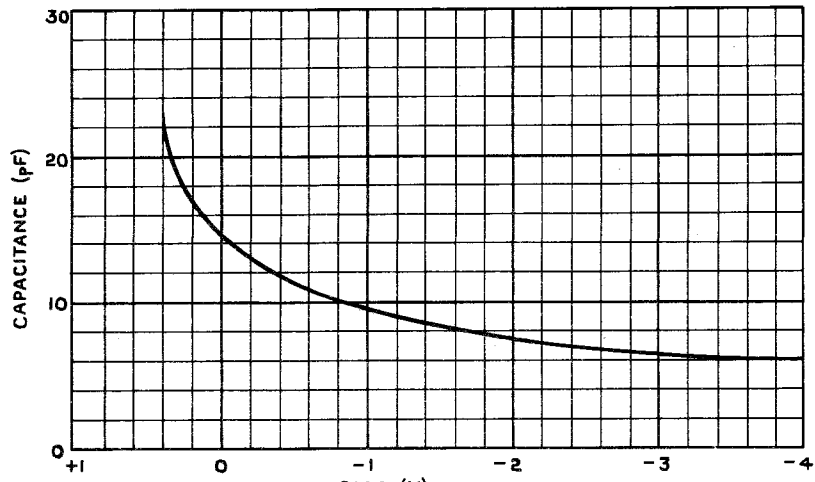


FIG. 2.