MILITARY SPECIFICATION

CV7193- 7276

SEMICONDUCTOR DEVICE

Description:- This specification covers the detail requirements for Silicon Voltage - regulator Diodes, and is in accordance with K1007, except as otherwise specified.

Mechanical Dimensions and Outlines:- K1007, Section B, 10.3.3.2 (10-32 UNF 2A thread).

Connections:- CV7193-7234, Stud Anode
CV7235-7276, Stud Cathode

Absolute Maximum Ratings:-

Rating	P_{tot}	T_{stud}	T_{opr}	T_{stg}	Shock	Vibration	
Unit	W	°C	°C	°C	g	g	
Min.	-	-	-55	-55	-	-	
Max.	10	150	150	150	1500	20	
Note	1				2		

NOTES:- 1. See derating curve Fig. 1 page 11.

2. Duration 0.5 mS.

CV7193 - 7276

Primary Electrical Characteristics

1	2	3	4	5	6	7	8
		$V_{(BR)}$ nominal	$V_{(BR)}$ min.	$V_{(BR)}$ max.	I_R test	$Z_{(BR)}$ max.	$Z_{(BR)}$ max.
Stud Anode	Stud Cathode	V	V	V	mA	Ω	Ω
CV7193	CV7235	3.9	3.7	4.1	500	12	-
CV7194	CV7236	4.3	4.0	4.5	500	12	-
CV7195	CV7237	4.7	4.4	5.0	500	12	-
CV7196	CV7238	5.1	4.8	5.4	500	8	-
CV7197	CV7239	5.6	5.3	6.0	500	8	-
CV7198	CV7240	6.2	5.8	6.6	500	4	800
CV7199	CV7241	6.8	6.4	7.2	200	4	500
CV7200	CV7242	7.5	7.1	7.9	200	2.5	250
CV7201	CV7243	8.2	7.7	8.7	200	2.5	250
CV7202	CV7244	9.1	8.6	9.6	200	2.5	250
CV7203	CV7245	10.0	9.4	10.6	200	2.5	250
CV7204	CV7246	11.0	10.4	11.6	200	2.5	250
CV7205	CV7247	12.0	11.4	12.6	200	2.5	250
CV7206	CV7248	13.0	12.4	14.1	200	2.5	250
CV7207	CV7249	15.0	13.9	15.6	100	5.0	250
CV7208	CV7250	16.0	15.4	17.1	100	5	250
CV7209	CV7251	18.0	16.9	19.1	100	5	250
CV7210	CV7252	20.0	18.9	21.2	100	5	250
CV7211	CV7253	22.0	20.8	23.3	100	5	250
CV7212	CV7254	24.0	22.7	25.9	100	5	250
CV7213	CV7255	27.0	25.1	28.9	100	5	250
CV7214	CV7256	30.0	28.0	32.0	100	8	300
CV7215	CV7257	33.0	31.0	35.0	50	8	300
CV7216	CV7258	36.0	34.0	38.0	50	8	300
CV7217	CV7259	39.0	37.0	41.0	50	8	300
CV7218	CV7260	43.0	40.0	45.0	50	10	400
CV7219	CV7261	47.0	44.0	50.0	50	10	400
CV7220	CV7262	51.0	48.0	54.0	50	10	500
CV7221	CV7263	56.0	53.0	60.0	50	10	500
CV7222	CV7264	62.0	58.0	66.0	50	15	600
CV7223	CV7265	68.0	64.0	72.0	20	50	600
CV7224	CV7266	75.0	71.0	79.0	20	50	600
CV7225	CV7267	82.0	77.0	87.0	20	50	700
CV7226	CV7268	91.0	86.0	96.0	20	60	800
CV7227	CV7269	100.0	94.0	106.0	20	60	900
CV7228	CV7270	110.0	104.0	116.0	20	60	1100
CV7229	CV7271	120.0	114.0	126.0	20	80	1200
CV7230	CV7272	130.0	124.0	141.0	20	80	1300
CV7231	CV7273	150.0	139.0	156.0	10	180	1500
CV7232	CV7274	160.0	154.0	171.0	10	200	1600
CV7233	CV7275	180.0	169.0	191.0	10	250	1850
CV7234	CV7276	200.0	189.0	212.0	10	300	2000
Conditions	I_R mA	See Col. 6 Page 2				See Col. 6 page 2	1.0
	T_{stud} °C	100				25	25

1	2	3	4	5	6
		S_z min.	S_z min.	S_z max.	$Z_{(B.R.)}$ max.
Stud Anode	Stud Cathode	%/°C	%/°C	%/°C	Ω
CV7193	CV7235	-0.10	-0.06	-0.02	-
CV7194	CV7236	-0.08	-0.04	0.00	-
CV7195	CV7237	-0.06	-0.02	0.02	-
CV7196	CV7238	-0.045	-0.005	0.035	-
CV7197	CV7239	-0.03	0.01	0.05	-
CV7198	CV7240	-0.01	0.03	0.07	1200
CV7199	CV7241	-0.01	0.03	0.07	750
CV7200	CV7242	0.00	0.04	0.08	375
CV7201	CV7243	0.00	0.04	0.08	375
CV7202	CV7244	0.01	0.05	0.09	375
CV7203	CV7245	0.01	0.05	0.09	375
CV7204	CV7246	0.01	0.05	0.09	375
CV7205	CV7247	0.015	0.055	0.095	375
CV7206	CV7248	0.015	0.055	0.095	375
CV7207	CV7249	0.02	0.06	0.10	375
CV7208	CV7250	0.02	0.06	0.10	375
CV7209	CV7251	0.02	0.06	0.10	375
CV7210	CV7252	0.02	0.06	0.10	375
CV7211	CV7253	0.02	0.06	0.10	375
CV7212	CV7254	0.02	0.06	0.10	375
CV7213	CV7255	0.02	0.06	0.10	375
CV7214	CV7256	0.02	0.06	0.10	450
CV7215	CV7257	0.02	0.06	0.10	450
CV7216	CV7258	0.03	0.07	0.11	450
CV7217	CV7259	0.03	0.07	0.11	450
CV7218	CV7260	0.03	0.07	0.11	600
CV7219	CV7261	0.03	0.07	0.11	600
CV7220	CV7262	0.04	0.08	0.12	750
CV7221	CV7263	0.04	0.08	0.12	750
CV7222	CV7264	0.04	0.08	0.12	900
CV7223	CV7265	0.04	0.08	0.12	900
CV7224	CV7266	0.05	0.09	0.13	900
CV7225	CV7267	0.05	0.09	0.13	1050
CV7226	CV7268	0.06	0.10	0.14	1200
CV7227	CV7269	0.06	0.10	0.14	1350
CV7228	CV7270	0.06	0.10	0.14	1650
CV7229	CV7271	0.06	0.10	0.14	1800
CV7230	CV7272	0.06	0.10	0.14	1950
CV7231	CV7273	0.06	0.10	0.14	2250
CV7232	CV7274	0.06	0.10	0.14	2400
CV7233	CV7275	0.06	0.10	0.14	2775
CV7234	CV7276	0.06	0.10	0.14	3000
Conditions	I_R mA	See Col. 6, page 2.			1.0
	T_{stud} °C	25 - 100			25

Applicable Documents:-

T.V.C. Information Sheets Nos. 9 and 10.

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 on Table II Group B Inspection, Subgroups 2, and 3, 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 devices shall be packed according to K1007, Section A, 1.2 (c). Items 1 to 6 inclusive shown in Fig. 2 page 12 shall be packed with each device.

Joint Service Catalogue Numbers:-

CV7193	5960-99-037-2600
CV7194	5960-99-037-2601
CV7195	5960-99-037-2602
CV7196	5960-99-037-2603
CV7197	5960-99-037-2604
CV7198	5960-99-037-2605
CV7199	5960-99-037-2606
CV7200	5960-99-037-2607
CV7201	5960-99-037-2608
CV7202	5960-99-037-2609
CV7203	5960-99-037-2610
CV7204	5960-99-037-2611
CV7205	5960-99-037-2612
CV7206	5960-99-037-2613
CV7207	5960-99-037-2614
CV7208	5960-99-037-2615
CV7209	5960-99-037-2616
CV7210	5960-99-037-2617
CV7211	5960-99-037-2618
CV7212	5960-99-037-2619
CV7213	5960-99-037-2620
CV7214	5960-99-037-2621
CV7215	5960-99-037-2622
CV7216	5960-99-037-2623
CV7217	5960-99-037-2624
CV7218	5960-99-037-2625
CV7219	5960-99-037-2626
CV7220	5960-99-037-2627
CV7221	5960-99-037-2628
CV7222	5960-99-037-2629

CV7223	5960-99-037-2630
CV7224	5960-99-037-2631
CV7225	5960-99-037-2632
CV7226	5960-99-037-2633
CV7227	5960-99-037-2634
CV7228	5960-99-037-2635
CV7229	5960-99-037-2636
CV7230	5960-99-037-2637
CV7231	5960-99-037-2638
CV7232	5960-99-037-2639
CV7233	5960-99-037-2640
CV7234	5960-99-037-2641
CV7235	5960-99-037-2642
CV7236	5960-99-037-2643
CV7237	5960-99-037-2644
CV7238	5960-99-037-2645
CV7239	5960-99-037-2646
CV7240	5960-99-037-2647
CV7241	5960-99-037-2648
CV7242	5960-99-037-2649
CV7243	5960-99-037-2650
CV7244	5960-99-037-2651
CV7245	5960-99-037-2652
CV7246	5960-99-037-2653
CV7247	5960-99-037-2654
CV7248	5960-99-037-2655
CV7249	5960-99-037-2656
CV7250	5960-99-037-2657
CV7251	5960-99-037-2658
CV7252	5960-99-037-2659
CV7253	5960-99-037-2660
CV7254	5960-99-037-2661
CV7255	5960-99-037-2662
CV7256	5960-99-037-2663
CV7257	5960-99-037-2664
CV7258	5960-99-037-2665
CV7259	5960-99-037-2666
CV7260	5960-99-037-2667
CV7261	5960-99-037-2668
CV7262	5960-99-037-2669
CV7263	5960-99-037-2670
CV7264	5960-99-037-2671
CV7265	5960-99-037-2672
CV7266	5960-99-037-2673
CV7267	5960-99-037-2674
CV7268	5960-99-037-2675
CV7269	5960-99-037-2676
CV7270	5960-99-037-2677
CV7271	5960-99-037-2678
CV7272	5960-99-037-2679
CV7273	5960-99-037-2680
CV7274	5960-99-037-2681
CV7275	5960-99-037-2682
CV7276	5960-99-037-2683

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: K1007/ NATO Ref.	Test Conditions: Specific Conditions	AQL %	Insp. Level	Symbol	Limits: Min.	Limits: Max.	Units
SUBGROUP 1			0.65	II				
Visual and Mechanical Inspection	5.1	Excluding Physical Dimensions						
SUBGROUP 2			0.65	II				
Breakdown Voltage	8A.2.4	T_{stud} = 100°C ± 2°C. I_R = Col. 6 page 2. Single shot pulse, 0.1 sec duration, max. t_r and t_f = 10 mS.			V(BR)	Col.4 page 2	Col.5 page2	V
Forward Volt Drop	8A.3.2	T_{stud} = 25°C. I_F = 2A.			V_F		1.5	V
Small Signal Breakdown Impedance (1)	8A.4.1	T_{stud} = 25°C. I_R = Col. 6 page 2. Measurement to be made between 5 and 10 secs after the application of reverse current.			Z(BR)		Col.7 page2	Ω
SUBGROUP 3			2.5	I				
Small Signal Breakdown Impedance (2)	8A.4.1	T_{stud} = 25°C I_R = 1 mA. CV7199-CV7234 and CV7241-CV7276 only.			Z(BR)		Col.8 page 2	Ω

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				
Temperature Coefficient of Operating Voltage	8A.7.3	I_R = Col. 6 page 2. T_1 = 25°C ± 5°C. T_2 = 100°C ± 5°C. Single shot pulse, 0.1 sec duration, max. t_r and t_f = 10 mS. Note:- Measured values of T_1 and T_2 to be used in calculating S_z.			S_z	Col.3 page 3	Col.5 page 3	%/°C

Table II

GROUP B INSPECTION

See Page 4 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 10.3.3.2 and Fig. 2, page 12.						
SUBGROUP 2			6.5	IC				
Solderability	5.13							
Temperature Cycling	5.5	-55°C to +150°C						
Moisture Resistance	5.3							
SUBGROUP 3								
Vibration Fatigue	5.15	Non-operating						
SUBGROUP 4								
Omitted.								
SUBGROUP 5								
Omitted.								
SUBGROUP 6								
Omitted.								
SUBGROUP 7			6.5	IC				
High Temperature Life (Non-operating)	6.2.1 6.6.1.2.2	T_{amb} = 150°C. t = 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.	
SUBGROUP 8			4.0	IA				
Operating Life	6.3 6.5 6.6.1.1 6.6.1.2.2	T_{stud} not greater than 140°C. I_R to give dissipation not less than the value corresponding to the chosen T_{stud}, according to the derating curve Fig. 1, page 11.						
Post Test End Points for Subgroups 2, 3, 7 and 8								
Breakdown Voltage	8A.2.4	As in Group A Inspection, Subgroup 2.			$V_{(BR)}$	Col.4 page 2	Col. 5 page 2	V
Small Signal Breakdown Impedance (2)	8A.4.1	As in Group A Inspection, Subgroup 3.			$Z_{(BR)}$		Col. 6 page 3	Ω

Table III

GROUP C INSPECTION

See Page 4 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 : Y_1, Y_2, X and Z						
Post Test End Points for Subgroup 2								
Breakdown Voltage	8A.2.4	As in Group A Inspection, Subgroup 2.			$V_{(BR)}$	Col.4 page 2	Col.5 page 2	V
Small Signal Breakdown Impedance (2)	8A.4.1	As in Group A Inspection, Subgroup 3.			$Z_{(BR)}$		Col.6 page 3	Ω

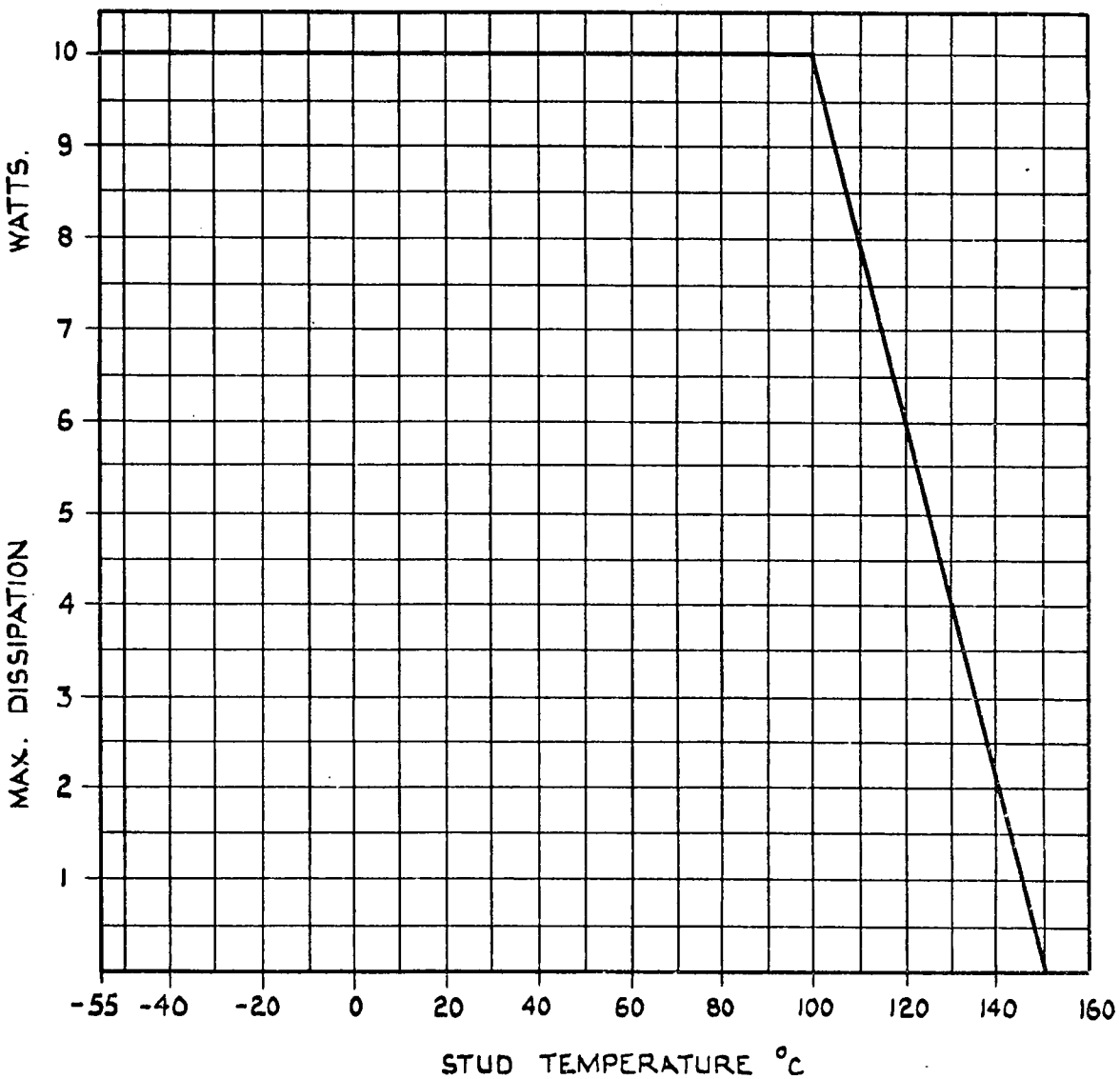
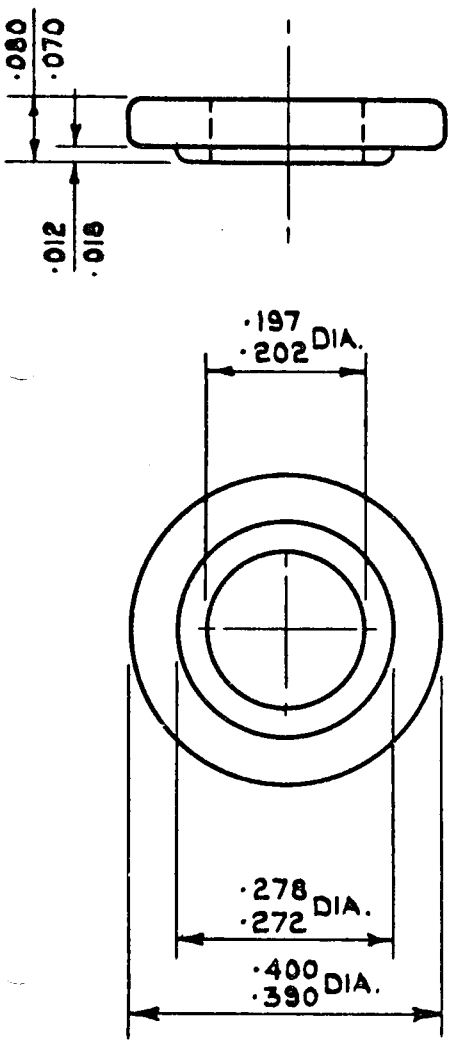


FIG. 1

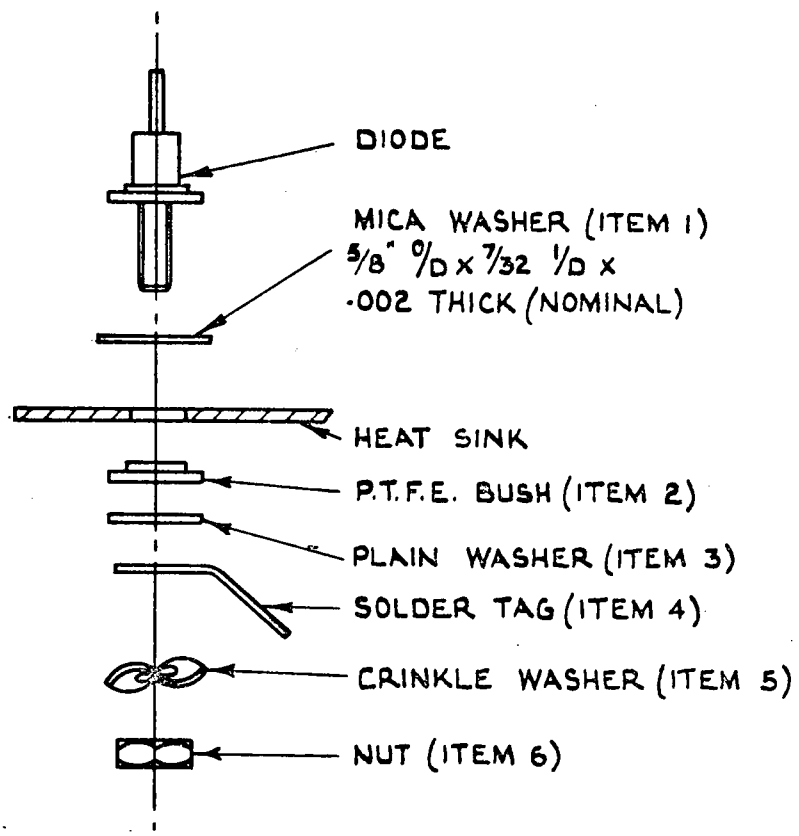
POWER DERATING



P.T.F.E. BUSH

(ITEM 2)

SCALE:- 4/1



TYPICAL ASSEMBLY

SCALE 1/1

ALL METAL PARTS TO BE TINNED

MOUNTING TORQUE, WITH DRY THREAD = 12 IN. LBS. MIN., 15 IN. LBS. MAX.

FIG. 2