

Ministry of Aviation - D.L.R.D./S.R.D.E.

SPECIFICATION: M.O.A./CV7031/32/33/34/35 Issue 2 dated June 6th 1961. To be read in conjunction with K.1007.		<u>SECURITY</u> <u>SPECIFICATION</u> Unclassified		<u>DEVICE</u> Unclassified	
—> indicates a change					
<u>TYPE OF DEVICE:</u> Silicon Power Rectifier <u>PROTOTYPE:</u> -			<u>MARKING</u> CV Number, Polarity, and if possible Factory Code and Date Code. See K.1007/4		
<u>RATINGS, CHARACTERISTICS & TYPICAL OPERATION.</u> (Not for Inspection purposes) <u>ALL LIMITING VALUES ARE ABSOLUTE</u>			<u>POLARITY</u> The stud is positive.		
<u>RATINGS</u>		NOTE		<u>DIMENSIONS</u> K.1007/A1/DL5 The flexible lead is mandatory.	
Max. peak inverse voltage -55°C to +125°C. stud temperature.	CV7031 (V) CV7032 (V) CV7033 (V) CV7034 (V) CV7035 (V)	100 200 400 600 800	A A A A A	<u>MOUNTING POSITION</u> ANY Device intended for conduction cooling.	
Max. mean forward current Max. surge current (see curve on page 2) Max. stud temperature Min. ambient temperature	(A) (°C) (°C)	2.6 125 -55	B, D C, D	<u>PACKAGING</u> See K.1007/L4	
<u>CHARACTERISTICS</u>		20 300		<u>NOTE E</u> Joint Services Catalogue Numbers CV7031, 5960-99-037-2102 CV7032, 5960-99-037-2103 CV7033, 5960-99-037-2104 CV7034, 5960-99-037-2105 CV7035, 5960-99-037-2106	
<u>TYPICAL OPERATION</u>		2.0 1.0		B B	
Max. mean forward current at 55°C ambient and at normal pressure with fin 2" x 2" x 1/16" aluminium (A)		2.0		B	
Max. mean forward current at 55°C ambient and at normal pressure with no fin (A)		1.0		B	
<u>NOTES</u>					
A. This rating applies to all waveforms including very short transients. B. Some derating may be needed at frequencies above 2.5 Kc/s. C. For method of measurement of stud temperature see T.V.C. Information Sheet No. 10. (The maximum total loss is given in figure 1 on page 2.) D. Designers should note that even at lower stud temperatures a higher current is not permitted.					

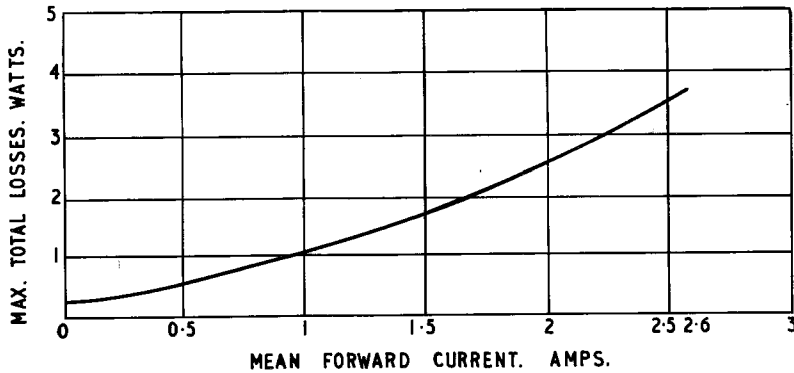


FIG. 1. MAXIMUM TOTAL LOSS CURVE

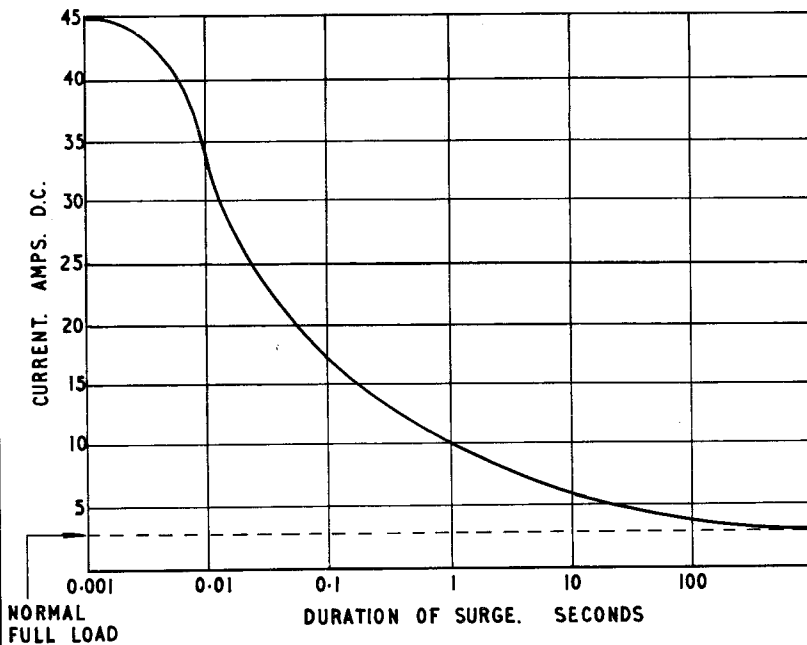


FIG. 2. SURGE CURRENT RATING FOR DIRECT CURRENT SURGES

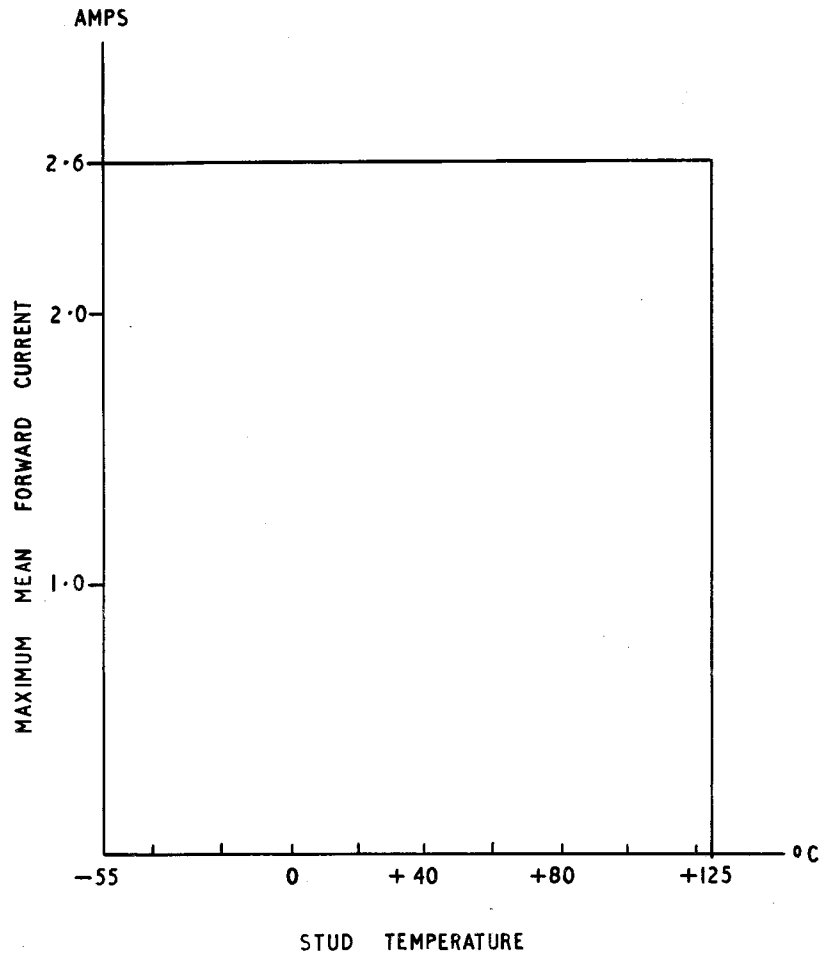


FIG 3 DERATING CURVE

TESTS

To be performed in addition to those in K.1007 Sections 5.2 and 5.3

K.1007	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits		Units
						Min.	Max.	
	<u>GROUP A</u>							
5C.4	Forward Voltage Drop	$I_F = 2.6 \text{ A d.c.}$ $T_{amb} = 15^\circ\text{C}-30^\circ\text{C}$		100%	V_F	-	1.5	V
5C.2	Reverse Current (1)	$T_{amb} = 15^\circ\text{C}-30^\circ\text{C}$ CV7031, $V_R = 100\text{V}$ CV7032, $V_R = 200\text{V}$ CV7033, $V_R = 400\text{V}$ CV7034, $V_R = 600\text{V}$ CV7035, $V_R = 800\text{V}$		100%	I_R	-		
						-	20	μA
						-	20	μA
						-	20	μA
						-	20	μA
						-	20	μA
	<u>GROUP B</u>	Omitted						
	<u>GROUP C</u>							
5C.2	Reverse Current (2)	$T_{amb} = 100^\circ\text{C min.}$ CV7031, $V_R = 100\text{V}$ CV7032, $V_R = 200\text{V}$ CV7033, $V_R = 400\text{V}$ CV7034, $V_R = 600\text{V}$ CV7035, $V_R = 800\text{V}$	2.5	I	I_R	-		
						-	300	μA
						-	300	μA
						-	300	μA
						-	300	μA
						-	300	μA
	<u>GROUP D</u>	Omitted						
	<u>GROUP E</u>							
11.5	Soldering		6.5	IC				
10.2	Temperature cycling	Three cycles -55°C to $+100^\circ\text{C}$		IC				
10.3	Climatic	Note 2						
11.3	Fatigue			IC				
11.4	Shock	Hammer angle = 60°		TA				
	<u>Post Temperature Cycling, Climatic, Fatigue and Shock Tests</u>							
8	Inoperatives		6.5					
5C.4	Forward Voltage Drop	$I_F = 2.6 \text{ A d.c.}$ $T_{amb} = 15^\circ\text{C}-30^\circ\text{C}$	6.5		V_F	-	1.6	V
5C.2	Reverse Current (2)	$T_{amb} = 100^\circ\text{C min.}$ CV7031, $V_R = 100\text{V}$ CV7032, $V_R = 200\text{V}$ CV7033, $V_R = 400\text{V}$ CV7034, $V_R = 600\text{V}$ CV7035, $V_R = 800\text{V}$	6.5		I_R	-		
						-	500	μA
						-	500	μA
						-	500	μA
						-	500	μA
						-	500	μA

K.1007	Test	Test Conditions	AQL %	Insp. Level	Sym bol	Limits		Units
						Min.	Max.	
13.3	<u>GROUP F</u> Life	Max. P.I.V. Half wave circuit with resistive load, frequency 50 c/s, stud temperature not less than 125°C, I_f not less than 2.6 amps. Note 1.		Note 3				
13.4	Storage Life (1)	$T_{amb} = -55^\circ\text{C}$ $t = 150$ hours		I				
13.5	Storage Life (2)	$T_{amb} = +125^\circ\text{C}$ $t = 150$ hours		I				
	<u>Post Storage Life Tests (1) & (2)</u>	Combined AQL for each group of tests	6.5					
5C.4	Forward Voltage Drop	$I_f = 2.6$ A d.c. $T_{amb} = 15^\circ\text{C} - 30^\circ\text{C}$	4.0		V_f	-	1.6	V
5C.2	Reverse Current (2)	$T_{amb} = 100^\circ\text{C}$ min. CV7031, $V_r = 100\text{V}$ CV7032, $V_r = 200\text{V}$ CV7033, $V_r = 400\text{V}$ CV7034, $V_r = 600\text{V}$ CV7035, $V_r = 800\text{V}$	4.0		I_r	-	500	μA
	<u>GROUP G</u>							
	Re-test after 28 days holding period.			100%				
8	Inoperatives	No voltages	0.5					
5C.4	Forward Voltage Drop	As in Group A	1.0		V_f	-	1.5	V
5C.2	Reverse Current (1)	As in Group A	1.0		I_r	-	20	μA

NOTES

- See T.V.C. Information Sheet No. 9. Design of Simple Heat Sinks. Stud Temperature should be measured in accordance with the method given in T.V.C. Information Sheet No. 10.
- The Samples used for this test shall have undergone the temperature cycling test.
- The inspection levels, sampling plans, acceptance and rejection conditions shall be in accordance with Appendix A.

APPENDIX AInspection Level

For lot sizes up to 200, at least one rectifier shall be taken from each lot and life tested for 1000 hours. For lot sizes 201 and over, at least two rectifiers shall be taken from each lot and life tested for 1000 hours.

Merit Life

Merit Life is defined as the ratio of the actual life hours for one or more rectifiers to the total life hours that would have occurred had there been no failures, expressed as a percentage:-

$$\text{Merit Life} = \frac{\text{Actual hours run}}{\text{Total possible hours}} \times 100\%$$

Classification of failures

Electrical inoperatives shall be the only criterion of failures, and the life test positions shall be so arranged as to indicate a failure when it occurs. If a failure occurs, the number of hours run when the rectifier was last recorded as operating shall be taken as the actual life.

Procedure for continuous production

When 1000 hours have elapsed since the sample drawn from the first lot was placed on life test, there should be at least four additional samples undergoing life test, with various numbers of hours on test. The Merit Life shall be computed for the first five lots. If the Merit Life exceed 90%, the first lot is acceptable. When 1000 hours have elapsed since the sample from the second lot was placed on life test, the merit life shall be computed using the test results from the first five lots. If this exceeds 90% the second lot is acceptable. The acceptability of the third, fourth and fifth lots is determined from the first five lots.

If when the sample from one of the first five lots have been life tested for 1000 hours, the computed Merit Life is 90% or less, the lot from which the sample was drawn shall be held in store. If when the sample from the subsequent lot has been life tested for 1000 hours, the computed Merit Life exceeds 90%, both lots shall be accepted. If the Merit Life is 90% or less both lots shall be held. When the sample from the fifth lot has been life tested for 1000 hours, if the computed Merit Life for all five samples exceeds 90% all lots being held shall be accepted. If the Merit Life is 90% or less, all lots being held shall be rejected.

When the sample from the sixth lot has been life tested for 1000 hours, the Merit Life shall be computed for the samples from lots 2 to 6. If this exceeds 90%, lot 6 shall be accepted: if it is 90% or less, lot 6 shall be rejected. A similar procedure shall apply for subsequent lots, the Merit Life being computed on the combined results of the completed life test of the lot under consideration and the previous four consecutive lots.

When any sample has passed the prescribed life test period or has failed it shall be removed from test.

Reduced Duration

When five consecutive lots have been accepted without any of them having been held due to failure to meet the 90% merit life requirement, reduced duration life testing is applicable, and the Merit Life shall then be computed after the sample from a lot has been life tested for 240 hours. If when a sample from a given lot has been life tested for 240 hours the computed Merit

Life is 90% or less, the lot shall be held in store and the life test of that sample and subsequent samples shall continue to 1000 hours, the Merit Life being computed after 1000 hours for each sample. Reduced duration testing shall be again applicable after five consecutive lots have been accepted.

Single Lot or non-continuous production

If production is not continuous (see section 6.6) the above procedure cannot be used. In this case, the manufacturer shall place at least five rectifiers on life test from a given lot. After 1000 hours the Merit Life for the sample shall be computed and if this exceeds 90% the lot shall be accepted. If it is 90% or less the lot shall be rejected.

If production is continuous, (section 6.6), but an interval of more than one week occurs between any two lots at the start of a production run, either the manufacturer shall place additional rectifiers on life test from one or more lots, or lots shall be held in store for a period after the sample has completed 1000 hours of life test, so that the Merit Life is computed from the results of life tests on not less than five rectifiers before a determination of acceptability is made.

Additional samples

The manufacturer may place on life test any number of additional samples from each lot, provided the minimum requirement of 1, 2 or 5 (as the case may be) is met. In addition, after the life test has started for any lot, the manufacturer may add an additional quantity to the initial life test sample, but this may be done only for any life test lot.