

ELECTRONIC VALVE SPECIFICATIONS
SPECIFICATION CV.7451
ISSUE NO.1 DATED 6.11.1963
AMENDMENT NO.1

Pages 7 and 8, Table 2. Group B Inspection (contd.) amend to read :-

Examination or Test	Test Conditions		AQL %	Insp. Level	Sym- bol	Limits		Units
	K1007/ NATO Ref.	Specific Conditions				Min.	Max.	
<u>SUB GROUP 8</u> Operating Life(1)	6.3	T _{amb} at any single temperature between 25°C and 125°C with the corresponding P _{tot} given by the derating curve on page 10. VCE = 30V (min) Duration 72 hrs min.		III				
<u>Post Operating Life(1) Test End Point</u>								
Collector Base Cut-off Current	7.2.5.1	As in Group A, S.G.2	0.65		I _{CBO}	-	12	μA
Small Signal Short Circuit Forward Current Transfer Ratio	7.4.2	As in Group A, S.G.2	0.65		h _{fe}	32	120	-

Amend "Post Test End Points for Sub Groups 2, 3, 7 and 8" by deleting "and 8".

P.T.O.

Examination or Test	Test Conditions		AQL %	Insp. Level	Sym- bbl	Limits		Units
	K1007/ NATO Ref.	Specific Conditions				Min.	Max.	
<u>SUB GROUP 3</u> Operating Life(2) See Note 2	6.3 6.6 4.5.2.1.1.1	As for Operating Life(1) Duration 1000 hours min.	4.0	IA				
<u>Post Operat- ing Life(2)</u> <u>Test End Point</u> Collector Base Cut-off Current	7.2.5.1	As in Group A, S.G.2			I _{CBO}	-	12	μA
Small Signal Short Circuit Forward Current Transfer Ratio	7.4.2	As in Group A, S.G.2			h _{fe}	32	120	-

Add to Notes

2. K1007, Section B, Clause 4.5.3.3 will not apply, however the inspectorate will inform the Qualification Approval Authority if and when the requirements of Operation Life(P) have not been met.

N.213591

ELECTRONIC VALVE SPECIFICATIONS
SPECIFICATION CV7461
ISSUE 1. DATED 6th NOVEMBER, 1963.
AMENDMENT No. 2.

Page 1. Mechanical Dimensions and Outlines K1007/NATO Ref.

Delete: 10.3.2.4. Insert 10.3.2.3.
Delete: 10.4.2.4. Insert 10.4.2.3.

Page 7. Sub Group 7. K1007/NATO Ref.

Delete: 6.6.1.2.2.
Insert: 6.6.1.2.1.

Ministry of Aviation/RRE

March, 1965.

(269185)

MILITARY SPECIFICATION

CV 7461

SEMICONDUCTOR DEVICE, TRANSISTOR

Description:- This specification covers the detail requirements for a Silicon NPN High Frequency Transistor and is in accordance with K1007 except as otherwise stated.

Mechanical Dimensions and Outlines:- K1007, Section B, 10.3.1., 10.3.2.4., 10.4.1. and 10.4.2.4.

Connections:- Lead 1 Emitter, Lead 2 Base,
Lead 3 Collector and Case

Absolute Maximum Ratings:-

Rating	V_{CB}	V_{CE}	V_{EB}	I_C	I_B	I_E	P_{tot}	T_{opr}	T_{stg}	Shook	Vib
Unit	V	V	V	mA	mA	mA	mW	°C	°C	g	g
Min.	-	-	-	-	-	-	-	-55	-55	-	-
Max.	60	45	6	50	15	65	400	175	175	1500	20
Note	1	1	1	1	1	1	2				

- Notes:-
1. d.c. or peak
 2. See derating curve - Fig. 1 Page 10.
 3. Prototype ~~2~~ 103

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Primary Electrical Characteristics:-

Characteristics		I_{CBO} (1)	I_{CBO} (2)	I_{EBO}	V_{CE} (sat)	h_{fe} (1)	h_{fe} (2)	f_T	C_{ob}	
Unit		μA	μA	μA	V	-	-	Mc/s	pF	
Min.		-	-	-	-	40	20	60	-	
Max.		10	30	10	1.0	100	-	220	10	
Conditions	T_{amb}	$^{\circ}C$	25	100	25	25	25	-55	25	25
	V_{CB}	V	60	60	-	-	-	-	-	5
	V_{CE}	V	-	-	-	-	5	5	5	-
	V_{EB}	V	-	-	6	-	-	-	-	-
	I_C	mA	-	-	0	10	-	-	-	-
	I_E	mA	0	0	-	-	5	5	5	-
	I_B	mA	-	-	-	2	-	-	-	-
	f	Mc/s	-	-	-	-	10^{-3}	10^{-3}	30	1.0

Reliability Assurance Requirements:-

Under discussion

Requirements

Marking:

The device shall be marked first with the CV number and then according to K1007 Section B, 1.3.4.

Quality Assurance Provisions

Destructive Tests:

The tests listed in Table 2, Group B Inspection, Sub-Groups 2, 3 and 4, and Table 3, Group C Inspection Sub-Group 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 devices shall be packed according to K1007, Section A, 1.2(c).

Joint Service Catalogue Number 5960-99-037-3598

This specification has been prepared by, and the Qualification Approval Authority is:- Ministry of Aviation, Royal Radar Establishment, Malvern, Worcestershire.

6th November, 1963.

CV7461

TABLE 1 GROUP A INSPECTION

Examination or Test	Test Conditions		ANL %	Insp. level	Sym-bol	Limits		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
<u>SUB GROUP 1</u> Visual and Mechanical Inspection	5.1	Excluding Physical Dimensions	0.65	I				
<u>SUB GROUP 2</u> Collector-Base Cut-Off Current	7.2.5.1	$V_{CB} = 60V$ $I_E = 0$	0.65	II	I_{CBO}	-	10	μA
Small Signal Short Circuit Forward Current Transfer Ratio	7.4.2	$V_{CE} = 5V$ $I_B = 5mA$ $f = 1 Kc/s$			h_{fe}	40	100	
Transition Frequency	7.5.2.	$V_{CE} = 5V$ $I_E = 5mA$ $f = 30Mc/s$			FT	60	300	Mc/s
<u>SUB GROUP 3</u> Collector-Emitter Saturation Voltage	7.3.3	$I_C = 10mA$ $I_B = 2mA$	2.5	I	$V_{CE} (Sat)$	-	1.0	V
Emitter-Base Cut-Off Current	7.2.6	$V_{EB} = 6V$ $I_C = 0$			I_{EBO}	-	10	μA

TABLE 1 GROUP A INSPECTION (Cont'd)

Examination or Test	Test Conditions		AQL %	Insp. Level	Symbol	Limits		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
<u>SUB GROUP 4</u>			4.0	IA				
Output Capacitance	7.4.8	$V_{CB} = 5V$ $I_E = 0$ $f = 1Mc/s$	-	-	C_{ob}	-	10	pF
Collector-Base Cut-Off Current (2)	7.2.5.1	$T_{amb} = 100^{\circ}C$ $V_{CB} = 60V$ $I_E = 0$	-	-	I_{CBO}	-	30	μA
Small Signal Short Circuit Forward Current Transfer Ratio (2)	7.4.2	$T_{amb} = -55^{\circ}C$ $V_{CE} = 5V$ $I_E = 5mA$ $f = 1 Kc/s$	-	-	h_{fe}	20	-	-

TABLE 2 GROUP B 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> Physical Dimensions	5.1	According to 10.3 and 10.4, drawings 10.3.2.4 and 10.4.2.4	6.5	IC	-	-	-	-
<u>SUB GROUP 2</u> Solderability	5.13	-55°C to + 150°C	4	IA	-	-	-	-
Temperature Cycling	5.5							
Moisture Resistance	5.3							
<u>SUB GROUP 3</u> Vibration Fatigue	5.15.1		4.0	I Note 1				
<u>SUB GROUP 4</u> Lead Fatigue	5.10.2	3 cycles	6.5	IA				
<u>SUB GROUP 5</u> Omitted								

TABLE 2 GROUP B INSPECTION (Cont'd)

Examination or Test	Test Conditions		AQL %	Insp. Level	Sym- bol	Limits		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
<u>SUB GROUP 6</u> Omitted								
<u>SUB GROUP 7</u> High Temperature Life (non-operating)	6.2.1 6.6.1.2.2	T _{stg} = + 150°C Duration = 1,000 hours	4.0	I Note 1				
<u>SUB GROUP 8</u> Operating Life	6.3 6.6.1.2.2.	T _{amb} at any single temperature between 25°C and 125°C with the corresponding P _{tot} given on the derating curve Page 10 V _{CE} = 30V (min.) Duration = 1,000 hours	4.0	IA				

TABLE 2 GROUP B INSPECTION (Cont'd)

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> Collector-Base Out-off Current	7.2.5.1	As in Group A, Sub-Group 2	-	-	I_{CBO}	-	12	μA
Small-Signal Short- Circuit Forward Current Transfer Ratio	7.4.2	As in Group A, Sub-Group 2	-	-	h_{fe}	32	120	-

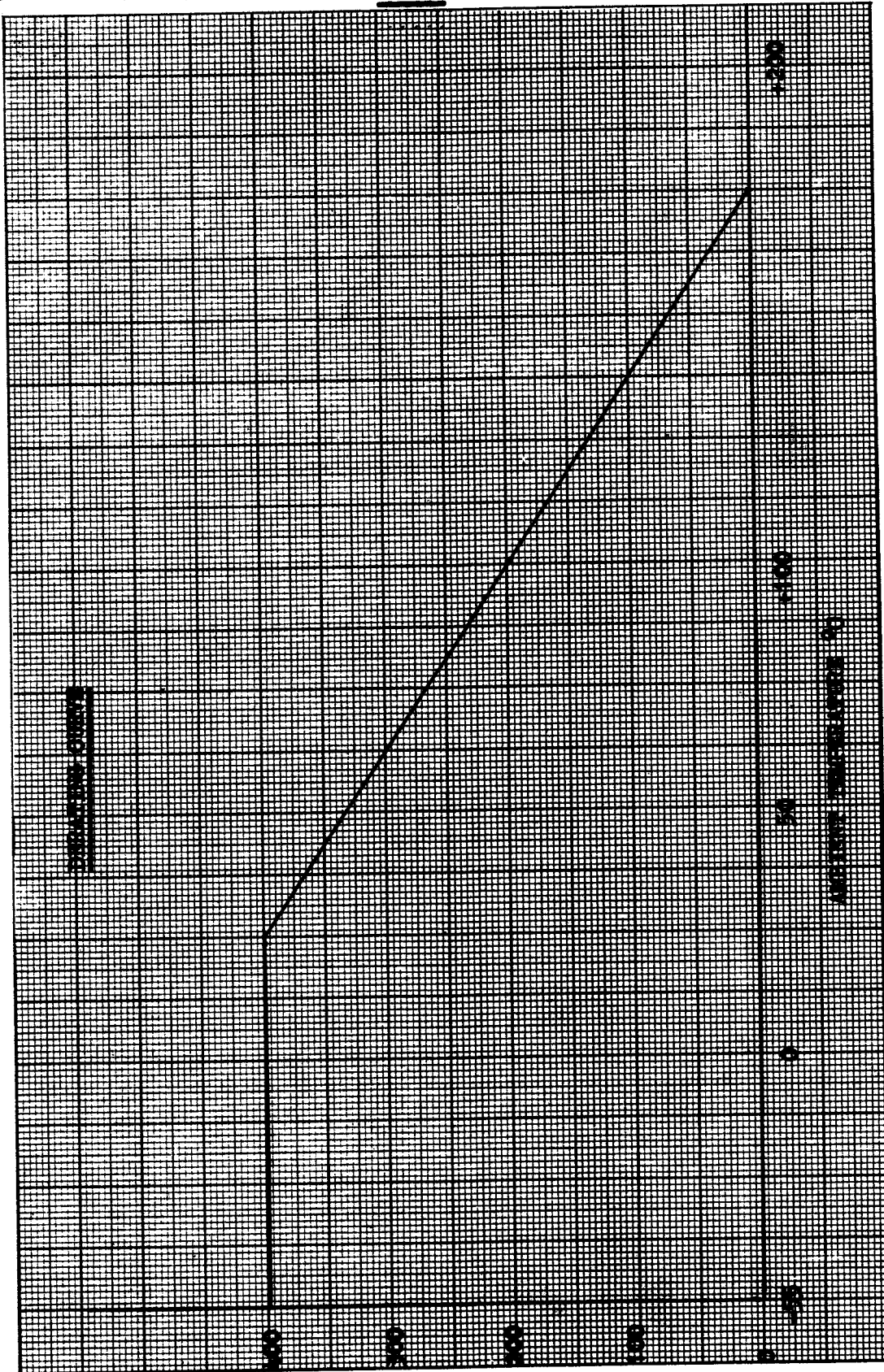
TABLE 3 GROUP C INSPECTION

Examination or Test	Test Conditions		AQL %	Insp. Level	Sym-bol	Limits		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
<u>SUB GROUP 1</u>								
Omitted								
<u>SUB GROUP 2</u>			6.5	IA				
Shock	5.17.1	Non-operating. 5 blows in each of four directions, three of which shall be mutually perpendicular. Two shall be opposite, namely toward the base and away from the base.						
<u>Post Test End Points</u>								
Collector-Base Cut-off Current	7.2.5.1	As in Group A Sub-Group 2			I _{CBO}	-	12	µA
Small-Signal Short Circuit Forward Current Transfer Ratio	7.4.2	As in Group A Sub-Group 2			h _{fe}	32	120	-

NOTES

(1) Maximum Sample Size 125

FIG 1



DISSIPATION