ELECTRONIC VALVE SPECIFICATIONS
SPECIFICATION CV7484-89
ISSUE 1. DATED 21st JANUARY, 1964.
AMENDMENT No. 1.

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 9. Sub Group 7 K1007/NATO Ref.
Delete: 6.6.1.2.2.
Insert: 6.6.1.2.1.

Sub Group 8 K1007/NATO Ref.
Delete: 6.6.1.2.2.
Insert: 6.6.1.2.1.

Ministry of Aviation/R.R.E.

March, 1965.

MILITARY SPECIFICATION

CV 7484-89

SEMICONDUCTOR DEVICE, TRANSISTOR

Description:- This specification covers the detail requirements for PNP Silicon, Transistors suitable for High Frequency, Medium Power applications, and is in accordance with K1007, Issue No. 3, except as otherwise stated.

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

Connections:- Collector connected to case.
Lead 1 Emitter, Lead 2 Base, Lead 3 Collector.

Absolute Maximum Ratings:-

Device	Rating	V_{CB}	V_{CE}	V_{EB}	I_C	I_E	P_{tot}	T_{stg}	T_{opn}	Shock	Vibration
	Unit	V	V	V	mA	mA	mW	°C	°C	g	g
CV 7484	Min.							- 65	- 65		
	Max.	-30	-30	-5	50	50	300	+200	+175	1500	20
CV 7485	Min.							- 65	- 65		
	Max.	-30	-30	-5	50	50	300	+200	+175	1500	20
CV 7486	Min.							- 65	- 65		
	Max.	-40	-40	-5	50	50	300	+200	+175	1500	20
CV 7487	Min.							- 65	- 65		
	Max.	-40	-40	-5	50	50	300	+200	+175	1500	20
CV 7488	Min.							-65	-65		
	Max.	-30	-30	-5	50	50	300	+200	+175	1500	20
CV 7489	Min.							- 65	- 65		
	Max.	-50	-50	-5	50	50	300	+200	+175	1500	20
	Note						A			B	

For Notes see Page 2
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Notes: A. See Derating Curve Fig. 1, Page 11,

B. 0.5 mSecs duration.

C. Commercial Equivalents 2H1254/5/6/7/8/9

Primary Electrical Characteristics:

Characteristic		I_{CBO}			V_{CE} (Sat)	h_{FE}	h_{fe}	C_{OB}	t_{on}	t_{off}	t_s	Thermal Resistance
Unit		uA			Volts			pf	nS	nS	nS	°C/mW
CV 7484	Min.					25	1.5					0.5°
	Max.	0.2			0.3	50		10	25	40		
CV 7485	Min.					40	2.5					0.5°
	Max.	0.2			0.3	80		10	25	60		
CV 7486	Min.					25	1.5					0.5°
	Max.		0.2		0.3	50		10	25	40		
CV 7487	Min.					40	2.5					0.5°
	Max.		0.2		0.3	80		10	25	60		
CV 7488	Min.					75	2.0					0.5°
	Max.	0.2			0.3	150		10	25	80		
CV 7489	Min.					25	2.0					0.5°
	Max.			0.2	0.3	100		10	25	60		
CONDITIONS: T_{case} °C		25	25	25	25	25	25	25	25	25	25	
V_{CB} V		-25	-35	-40			-10	-10	See Figure 2 Page 12	See Figure 2 Page 12		
V_{CE} V						-1.0						
I_C mA					-10	-10						
I_E mA							10					
f Mc/s							20	0.14				
I_B mA					- 2							

Reliability Assurance Requirements:- Under discussion

21st January, 1964.

Applicable Documents

Requirements

Marking: The device shall be marked according to K1007, Issue No. 3, Section B.1.3.4.1 Minimum requirements 1.3.4.1(a)(c).

Quality Assurance Provisions

Destructive Tests: The tests listed in Table 2. Group B Inspection, Sub-Group 2, 3 and 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 device shall be packed according to K1007, Issue No. 3, Section A.1.2 (c).

Joint Service Catalogue Numbers

CV7484 = 5960-99-037-3694

CV7485 = 5960-99-037-3695

CV7486 = 5960-99-037-3696

CV7487 = 5960-99-037-3697

CV7488 = 5960-99-037-3698

CV7489 = 5960-99-037-3699

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

TABLE 1 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	Excluding Physical Dimensions							
SUB-GROUP 2				0.65	II				
Collector Base Cut-off Current	7.2.5.1	V_{CB} = -25V I_E = 0	CV7484			I_{CBO}	-	0.2	µA
		V_{CB} = -25V I_E = 0	CV7485			I_{CBO}	-	0.2	µA
		V_{CB} = -35V I_E = 0	CV7486			I_{CBO}	-	0.2	µA
		V_{CB} = -35V I_E = 0	CV7487			I_{CBO}	-	0.2	µA
		V_{CB} = -25V I_E = 0	CV7488			I_{CBO}	-	0.2	µA
		V_{CB} = -40V I_E = 0	CV7489			I_{CBO}	-	0.2	µA
Static Forward Current Transfer Ratio (1)	7.3.4	V_{CE} = -1 I_C = -10mA	CV7484			h_{FE}	25	50	-
			CV7485			h_{FE}	40	80	-
			CV7486			h_{FE}	25	50	-
			CV7487			h_{FE}	40	80	-
			CV7488			h_{FE}	75	150	-
			CV7489			h_{FE}	25	100	-

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.	
SUB-GROUP 2 Cont'd									
Collector Emitter Saturation Voltage (1)	7.3.3	I_C = -10mA I_B = 2mA				V_{CE} (Sat)	-	-0.3	V
Emitter Base Cut-Off Current	7.2.5.1	V_{EB} = -3V				I_{EBO}	-	-0.2	µA
SUB-GROUP 3				4.0	I				
Base Emitter Saturation Voltage	7.3.1	I_C = -10mA I_B = -2mA				V_{BE} (Sat)	-	-1.0	V
Switching Times		V_{CC} = -15V V_{BB} = +1.5V V_P = -7.5V Pulse length = 150 nSec Figure 2 Page 12	CV7484 " CV7485 " CV7486 " CV7487 " CV7488 " CV7489 "			t_d+t_r t_s+t_f t_d+t_r t_s+t_f t_d+t_r t_s+t_f t_d+t_r t_s+t_f t_d+t_r t_s+t_f t_d+t_r t_s+t_f		25 40 25 60 25 40 25 60 25 80 25 60	nSec nSec nSec nSec nSec nSec nSec nSec nSec nSec nSec nSec

TABLE 1 GROUP A INSPECTION

Examination or Test	TEST CONDITIONS			AQL %	Insp. Level	Sym-bol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions					Min.	Max.	
SUB-GROUP 3 Cont'd									
Small Signal Forward Current Transfer Ratio	7.5.2	V_{CE} = -10V I_E = 10mA f = 20Mc/s	CV7484			h_{fe}	1.5	7.5	-
			CV7485			h_{fe}	2.5	10	-
			CV7486			h_{fe}	1.5	7.5	-
			CV7487			h_{fe}	2.5	10	-
			CV7488			h_{fe}	2.5	10	-
			CV7489			h_{fe}	2.0	10	-
Collector Base Cut-Off Current	7.2.5.1	T = 100°C V_{CB} = -25V I_E = 0	2H1254/5/6/7/8/9			I_{CBO}	-	50	µA
Static Forward Current Transfer Ratio	7.3.4	T = -55°C V_{CE} = 1V I_C = 10mA	CV7484			h_{FE}	20	50	
			CV7485			h_{FE}	30	80	
			CV7486			h_{FE}	20	50	
			CV7487			h_{FE}	30	80	
			CV7488			h_{FE}	60	150	
			CV7489			h_{FE}	20	100	

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.	
SUB-GROUP 4			4.0	1A				
Output Capacitance	7.4.8	V_{CB} = -10V I_E = 0 f = 0.14 Mc/s min.			C_{ob}	-	10	pF
Input Impedance		V_{CB} = -10V I_E = -2mA f = 1 Kc/s			h_{ib}		30	ohms

TABLE 2 GROUP B INSPECTION

See Quality Assurance Provisions Page 4 Destructive Tests

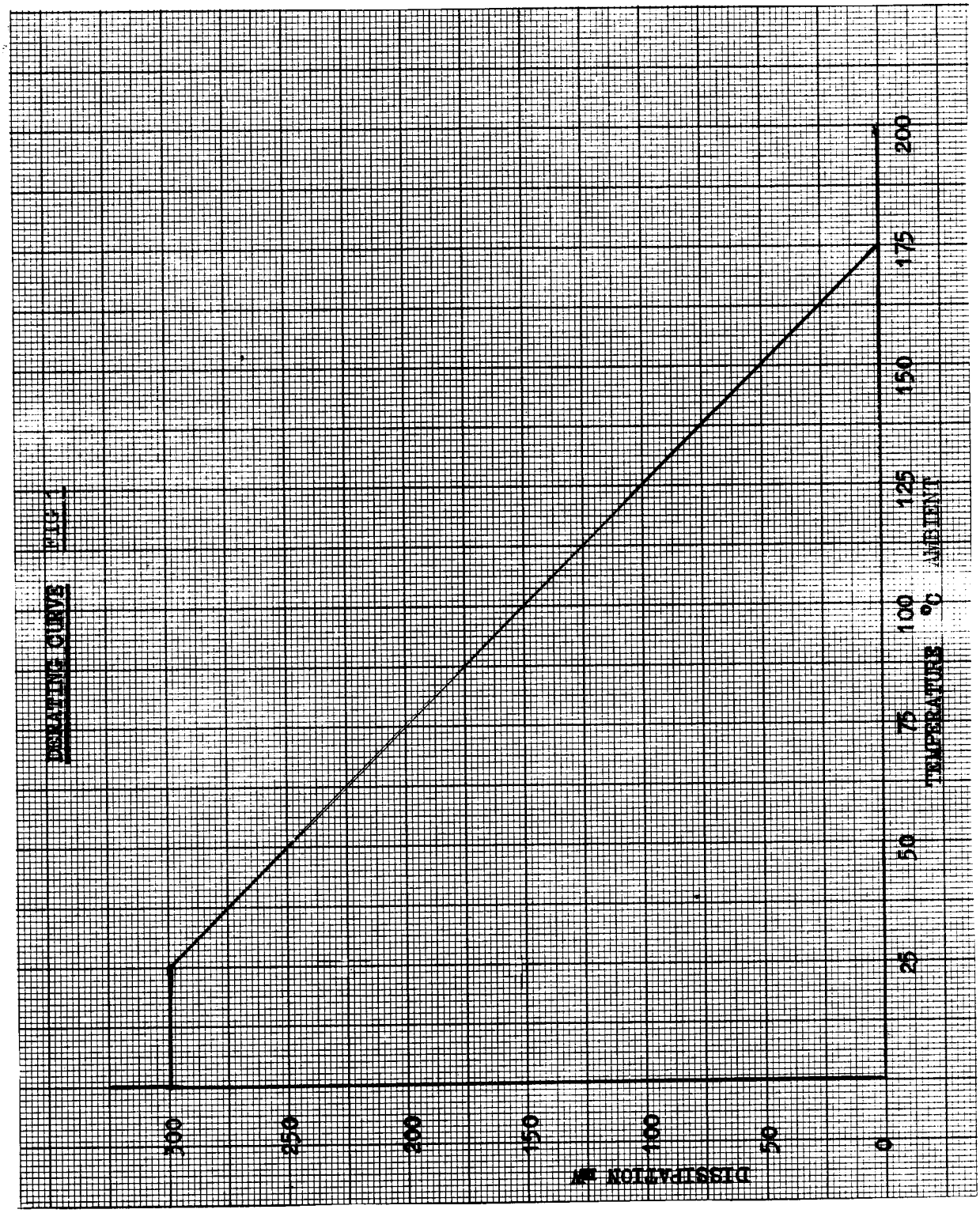
Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Sym-bol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
SUB GROUP 1			6.5	1A				
Physical	5.1	According to K1007, Section B,10.3.1., 10.3.2.4., 10.4.1., 10.4.2.4.						
SUB GROUP 2			4.0	1A				
Solderability	5.13	230° ± 5°C						
Temperature Cycling	5.5	-65° to +150°C						
Moisture Resistance	5.3							
SUB GROUP 3			4.0	1A				
Vibration Fatigue	5.15.1	20G						
SUB GROUP 4			6.5	1A				
Lead Fatigue	5.10.2	2 cycles						
SUB GROUP 5								
Omitted								
SUB GROUP 6								
Omitted								

TABLE 2 GROUP B INSPECTION (Cont'd)

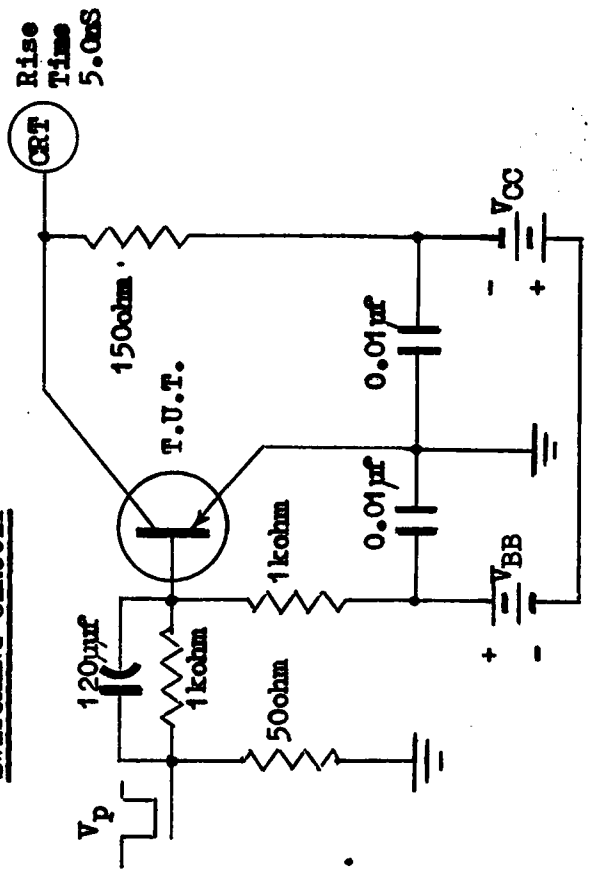
Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Sym-bol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
SUB-GROUP 7			2.5	1				
High Temperature Life (non-operating)	6.2.1 6.6.1.2.2	T_{stg} = +200°C Duration = 1000 hours						
SUB-GROUP 8			6.5	1A				
Operating Life	6.3 6.6.1.2.2	T_{amb} at any single temp. between 25°C and 150°C with the corresponding P_{tot} given on the derating curve Fig. 1, Page 11. V_{CE} max. for device Duration 1000 hours						
Post Test End Points for Sub-Group 2, 3, 7 and 8								
Collector Base Cut-off current	7.2.5.1	As in Group A, Sub-Group 2			I_{CBO}		0.5	uA
Static Forward Current Transfer Ratio	7.3.4	As in Group A, Sub-Group 2 CV7484			h_{FE}	20	55	-
		CV7485			h_{FE}	35	85	-
		CV7486			h_{FE}	20	55	-
		CV7487			h_{FE}	35	85	-
		CV7488			h_{FE}	70	155	-
		CV7489			h_{FE}	20	105	-

TABLE 3 GROUP C INSPECTION

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	1A				
Shock (Non operating)	5.17.1	5 blows in each of 3 mutually perpendicular directions						
Post Test End Points								
Collector Base Cut-off current	7.2.5.1	As in Group A, Sub-Group 2			I_{CBO}		0.5	µA
Static Forward Current Transfer Ratio	7.3.4	As in Group A, Sub-Group 2 CV7484			h_{FE}	20	55	-
		CV7485			h_{FE}	35	85	-
		CV7486			h_{FE}	20	55	-
		CV7487			h_{FE}	35	85	-
		CV7488			h_{FE}	70	155	-
		CV7489			h_{FE}	20	105	-


DERATING CURVE
FIG 1
TEMPERATURE °C AMBIENT
0
25
50
75
100
125
150
175
200
DISSIPATION W
300
250
200
150
100
50
0

SWITCHING CIRCUIT



Conditions:-

V_{CC} = -15V

V_{BB} = +1.5V

V_p = -7.5V

Pulse Length = 150nS-300nS

Rise Time = 3.0nS Max

P.R.F. ≤ 150 p.p.s

DETERMINATION OF SWITCHING TIMES FROM OSCILLOSCOPE DISPLAY