ELECTRONIC VALVE SPECIFICATIONS
SPECIFICATION CV7580
ISSUE 1. DATED 15th JUNE, 1964.
AMENDMENT NO. 1.

Page 5 Under "Specific Conditions" against 7.5.2.
Add: V_{CE} = 10V, f = 20 Mc/s.

Page 10 At the end of Inspection Schedule add the following:

Notes

1. Maximum Sample Size 125.

January, 1965. Ministry of Aviation/R.R.E.
NJ.253568

MILITARY SPECIFICATION

CV 7580

SEMICONDUCTOR DEVICE, TRANSISTOR

2N1131

Description:- This specification covers the detail requirements for a PNP Silicon Planar Transistor and is in accordance with K1007 Issue 3, except as otherwise stated.

Mechanical Dimensions and Outlines:- K1007 Section B. 10.3.2.2 and 10.4.2.2

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

Absolute Maximum Ratings:-

Rating	V_{CB}	V_{EB}	V_{CER}	V_{CEO}	P_{tot}	P_{tot}	P_{tot}	T_{stg}	T_{op}	Shock	Vibration
Unit	V	V	V	V	W	W	W	°C	°C	g	g
Min.	-	-	-	-	-	-	-	-55	-55	-	-
Max.	50	5	50	35	2	1.0	0.6	200	175	1500	20
Notes			A		B	C	D			E	

Notes A. R_{BE} 10 ohms

B. Case temperature 25°C

C. Case temperature 100°C

D. Ambient temperature 25°C

E. Duration 0.5 mS

15th June, 1964
(229065)

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Primary Electrical Characteristics

Characteristic		I_{CBO}	I_{CBO}	h_{FE}	h_{FE}	h_{FE}	h_{fe}	h_{fe}	f_T	C_{ob}	$t_{on} + t_{off}$
Unit		nA	µA						Mc/s	pF	nS
CV7580	Min.	-	-	20	15	15	15	30	50	-	
	Max.	75	50	45	-	-	50	-	-	45	50
CONDITIONS V_{CB} V		30	30	-	-	-	-	-	-	10	See Fig. 2 Page 11
V_{CE} V		-	-	10	10	10	5	10	10	-	
I_C mA		-	-	150	5	150	1	5	50	-	
I_E mA		0	0	-	-	-	-	-	-	0	
f Mc/s		-	-	-	-	-	-	-	20	-	
T_{amb} °C		25	150	25	25	-55	25	25	25	25	

Characteristics		V_{CE} (sat)	V_{BE} (sat)	C_{ib}
Unit		V	V	pF
CV7580	Min.	-	-	-
	Max.	1.5	1.3	80
CONDITIONS V_{EB} V		-	-	0.5
I_C mA		150	150	0
I_B mA		15	15	-
T_{amb} °C		25	25	25

Reliability Assurance Provisions:- Under discussion.

Requirements:-

Marking: The device shall be marked as K1007 Section B 1.3.4.1 (a), (c), (d) and (f) as space permits, any other marking shall be on the packing.

Quality Assurance Provisions:-

Destructive Tests: The tests listed in Table 2 Group B Inspection, Sub Groups 2 and 3 and Group C Inspection, Sub Group 2 is 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 3, Section A. 1.2.(c).

Joint Service Catalogue Number:- 5960-99-037-3845

This specification has been prepared by, and the Qualification Approval 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			1.0	II				
Collector-emitter sustaining Voltage	7.2.2.2	R_{BE} 10 ohm I_C = 100 mA Pulse width ≤300 µsec ≤2% duty cycle I_C = 100 mA I_B = 0			V_{CER} (sust)	50	-	V
Collector-emitter sustaining Voltage	7.2.2.2.1	Pulse width ≤300 µsec ≤2% duty cycle			V_{CEO} (sust)	35	-	V
Collector Voltage	7.2.1	I_E = 0 I_C = 10 µA			BV_{CBO}	50	-	V
Collector Base Cut-off current	7.2.5.1	V_{CB} = 30V I_E = 0			I_{CBO}	-	75	nA
Emitter-Base Cut-off current		V_{EB} = 5V I_C = 0			I_{EBO}	-	10	µA

TABLE 1 GROUP A INSPECTION (Cont'd)

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Sym-bol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
Static Forward Current Transfer Ratio	7.3.4	I_C = 150 mA V_{CE} = 10V Pulse width ≤300 µS ≤2% duty cycle			h_{FE}	20	45	
Collector-Emitter Saturation Voltage	7.3.5	I_C = 150 mA I_B = 15 mA			V_{CE} (sat)	-	1.5	V
SUB GROUP 3								
Small Signal Forward Current Transfer Ratio	7.4.2	I_C = 1mA V_C = 5V f = 1Kc	4.0	I	h_{fe}	15	50	
	7.4.2	I_C = 5 mA V_C = 10V f = 1Kc			h_{fe}	20		
Transition Frequency	7.5.2	I_C = 50 mA			f_T	50	-	Mc/s
Static Forward Current Transfer Ratio	7.3.4	I_C = 5 mA V_{CE} = 10V			h_{FE}	15	-	

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			6.5	IA				
Collector-Base Cut-off Current	7.2.5.1	T_{amb} = 150°C ± 3°C V_{CB} = 30V I_E = 0			I_{CBO}	-	50	µA
Static Forward Current Transfer Ratio	7.3.4	T_{amb} = 55°C V_{CE} = 10V I_C = 150 mA			h_{FE}	10	-	
Switching Time		See Fig. 2 Page 11			t_{on} + t_{off}	-	50	nS
Output Capacitance	7.4.8	V_{CB} = 10V I_E = 0			C_{ob}	-	45	pF
Input Capacitance		V_{EB} = 0.5V I_C = 0			C_{ib}	-	80	pF

TABLE 2 GROUP B INSPECTION

See Page 3 Quality Assurance Provisions

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Symbol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
SUB GROUP 1			6.5	IC				
Physical Dimensions	5.1	According to drawings 10.3.2.2 and 10.4.2.2						
SUB GROUP 2			4.0	IA				
Solderability	5.13							
Temperature Cycling	5.5	3 cycles - 55°C to + 200°C						
Moisture Resistance	5.3							
SUB GROUP 3			4.0	IA				
Vibration Fatigue	5.15	Non operating						
Constant Acceleration	5.14.1	20000g						
SUB GROUP 4			6.5	IA				
Lead Fatigue	5.10.2	2 cycles						
SUB GROUP 5								
Omitted								
SUB GROUP 6								
Omitted								

TABLE 2 GROUP B INSPECTION (Cont'd)

See Page 3 Quality Assurance Provisions

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Symbol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
SUB GROUP 7			4.0	I				
High Temperature Storage	6.2.1 6.6.1.2.2	T_{stg} = +200°C Duration 1000 hours		Note 1				
SUB GROUP 8			4.0	IA				
Operating life	6.3 6.6.1.2.2	V_{CB} = 30V minimum T_{amb} = any temperature between 25°C and 175°C P_{tot} according to that shown on the derating curve, Fig. 1 Page 11 against the chosen temperature Duration = 1000 hours						
Post test end points for Sub Groups 2 and 3								
Collector-Base Cut-off Current	7.2.5.1	V_{CB} = -30V I_E = 0			I_{CBO}	-	100	nA

TABLE 2 GROUP B INSPECTION (Cont'd)

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Symbol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
Collector-Emitter Saturation Voltage	7.3.5	I_C = 150 mA I_B = 15 mA			V_{CE} (sat)	-	1.65	V
Base-Emitter Saturation Voltage	7.3.1	I_C = 150 mA I_B = 15 mA			V_{BE} (sat)	-	1.45	V
Post test end points for Sub Groups 7 and 8								
Collector Base Cut-off Current	7.2.5.1	V_{CB} = 30V I_E = 0			I_{CBO}	-	75	nA
Static Forward Current Transfer Ratio	7.3.4	I_C = 150 mA V_{CE} = 10V Pulse width ≤ 300 µS duty cycle ≤ 2%			h_{FE}	15	50	

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TABLE 3 GROUP C INSPECTION

See Page 3 Quality Assurance Provisions

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	IA				
Shock	5.17.1	Non operating 5 blows in each of three mutually perpendicular directions						
Post Test End Points								
Collector-Base Cut-off Current	7.2.5.1	V_{CB} = 30V I_E = 0			I_{CBO}	-	100	nA
Static Forward Current Transfer Ratio	7.3.4	I_C = 150 mA V_{CE} = 10V Pulse width ≤300 µS duty cycle ≤2%			h_{FE}	22.5	100	

FIG 2

SWITCHING TIME CIRCUIT

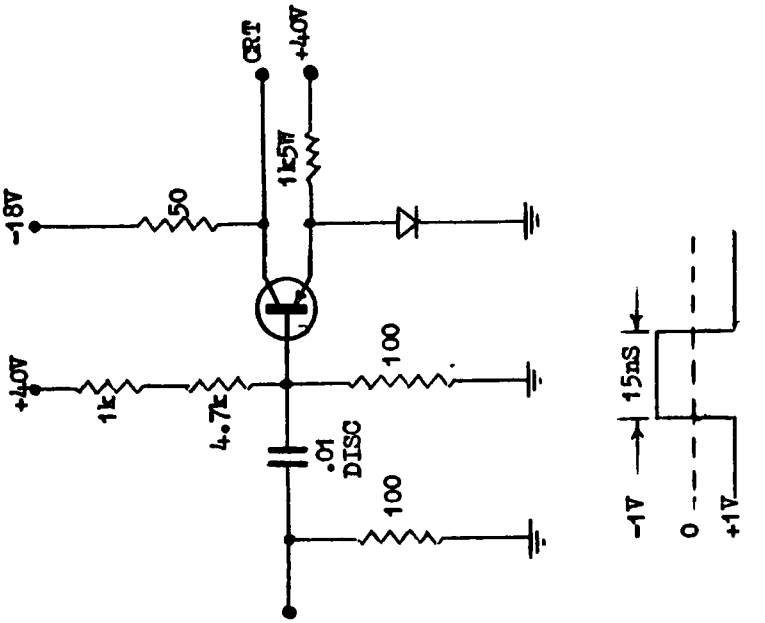

FIG 1