

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION CV.7151

ISSUE 1 DATED 1st FEBRUARY, 1963.

AMENDMENT NO. 1

PAGE 6

Table 2, Group B Inspection, Sub-Group 4
Specific Conditions:- ADD: 2 Cycles.

PAGE 8

Table 3, Group C Inspection, Sub-Group 2.
Shock. Specific Conditions:-
ADD: 5 Blows in each of Three Mutually
perpendicular Directions.

September, 1963.
NJ.190413

MINISTRY OF AVIATION, R.A.E.

ELECTRONIC VALVE SPECIFICATIONS

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AMENDMENT No.2

PAGE 6

TABLE 2 GROUP B INSPECTION

SUB-GROUP 2:- DELETE THERMAL SHOCK TEST.

DECEMBER, 1963
(213562)

MINISTRY OF AVIATION, R.A.E.

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION CV 7151

ISSUE No. 1

AMENDMENT NO. 3

PAGE 7 SUB-GROUP 7

High and Low Temperature Life (Non-operating)

UNDER NATO/K1007 REF. 6.2.

ADD: 6.6.1.2.2.

SUB-GROUP 8

Operating Life

UNDER NATO/K1007 REF. 6.3.

ADD: 6.6.1.2.2.

MILITARY SPECIFICATION
CV 7151.
 SEMICONDUCTOR DEVICE, TRANSISTOR

Description:- This specification covers the detail requirements for a Low Noise Silicon P.N.P. Junction Transistor and is in accordance with Specification K.1007 Issue 3 except as otherwise stated.

Mechanical Dimensions and Outline:- K1007, Section B.10.3.1, 10.3.2.2, 10.4.1 and 10.4.2.2

Connections:- 1. Emitter 2. Base 3. Collector. The body shall be insulated from all leads.

Absolute Maximum Ratings:-

Rating	V _{CB}	V _{CE}	V _{EB}	I _C (av)	I _{CM}	I _B (av)	I _{BM}	I _E (av)	I _{EM}	P	T _{amb}	Tstg	Shock	Vibration
Unit	V	V	V	mA	mA	mA	mA	mA	mA	mW	°C	°C	g	g
Min	-	-	-	-	-	-	-	-	-	-	-	-55	-	-
Max	32	32	20	50	100	15	50	65	150	250	150	150	500	20
Note	1	1	1	-	-	-	-	-	-	2	-	-	-	-

- Notes 1. d.c. or peak
 2. See derating curve, Page 9 Fig. 1
 3. Prototype BCY30 Series. 2S300 Series

CV 7151

Primary Electrical Characteristics

Characteristic		I_{CBO} (1)	I_{CBO} (2)	I_{CEX}	hfe	fT	F	V_{CE} (Sat)	V_{BE}	
Unit		μA	μA	μA	-	Mc/s	dB	mV	mV	
Min					40	0.6	-	-	-	
Max		0.1	10	20	80	3.5	6	250	600	
CONDITIONS	Tamp	$^{\circ}C$	25	100	25	25	25	25	25	
	VCB	V	-6	-6	-	-6	-6	Z Source = 500 Ohms	-	-6
	VCE	V	-	-	-32	-	-	-2	-	-
	VEB	V	-	-	-0.5	-	-	-	-	-
	IC	mA	-	-	-	-	-	-0.5	-10	-
	IE	mA	0	0	-	1	1	-	-	1
	IB	mA	-	-	-	-	-	-	-1	

Reliability Assurance Requirements:- Under discussion

Requirements

Marking. The device shall be marked first with the C.V. number and then according to K.1007, Issue 3, 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 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 3, Section A, 1.2(c)

Joint Service Catalogue Number

CV. 7151 = 5960-99-037-2414

This specification has been prepared by, and the Qualification Approval Authority is:-
Ministry of Aviation, Royal Aircraft Establishment, S. Farnborough, Hants.
England.

TABLE 1. GROUP A INSPECTION

Test	TEST CONDITIONS		LTPD	Symbol	Limits		Units
	K1007/NATO Ref.	SPECIFIC CONDITIONS			Min.	Max.	
<u>SUB-GROUP 1</u> Visual and mechanical inspection	5.1		7%				
<u>SUB-GROUP 2</u> Collector cut off current (1)	7.2.5.1	VCB = -6V, IE = 0	1% (Note 2)	I _{CBO}	-	0.1	μA
Collector cut off current (2)	7.2.5.5	VCE = -32V, VEB = 0.5V	1% (Note 2)	I _{CEX}	-	20	μA
Common Emitter, Small Signal Current Gain	7.4.2	VCE = -6V, IC = -1 mA d.c. and 0.25 mA a.c. r.m.s. max. superimposed. f = 1 kc/s.	1% (Note 2)	hfe	40	80	-
Noise Figure	7.6.3.1	Common Emitter Circuit VCE = -2V, IC = -0.5mA Z Source = 500 Ω Load = 6 K + 4 K f = 1 Kc/s.	7%	F	-	6	dB
<u>SUB-GROUP 3</u> Collector Emitter Saturation Voltage	7.3.3	IC = -10mA, IB = -1mA	7%	VCE(Sat)	-	250	mV
Base Emitter Voltage	7.3.2	VCB = -6V, IE = 1 mA	7%	VBE	-	650	mV
Emitter-base cut-off Current	7.2.6	VEB = -20V, IC = 0	7%	I _{EB0}	-	20	μA
Transition Frequency		VCB = -6V, IE = 1mA, f = 300Kc/s.	7%	FT	0.6	3.5	Mc/s.

TABLE 1. GROUP A INSPECTION (Contd.)

Test	TEST CONDITIONS		LTPD	Symbol	Limits		Units
	NATO/K1007 Ref.	SPECIFIC CONDITIONS			Min.	Max.	
<u>SUB-GROUP 4</u> Collector cut-off current(3) Common Emitter, Small Signal, Current Gain	7.2.5.1	As in Sub-group 2 Tamb = 100°C	20%	I _{CBO}	-	10	µA
	7.4.2	As in Sub-group 2 Tamb. = -55°C	20%	h _{fe}	28	-	-

TABLE 2. GROUP B INSPECTION
(See Quality Assurance Provisions Page 2)

Test	NATO/K1007 Ref.	TEST CONDITIONS		LTFD	Symbol	Limits		Units
		SPECIFIC CONDITIONS				Min.	Max.	
<u>SUB-GROUP 1</u> Physical Dimensions	5.1			20%				
<u>SUB-GROUP 2</u> Solderability	5.13			20%				
Temperature Cycling	5.5	-55°C to +100°C						
Thermal Shock	5.6.2	+100°C to 0°C						
Moisture Resistance	5.3.1.2							
<u>SUB-GROUP 3</u> Vibration Fatigue	5.15.1	Non-operating		20%				
<u>SUB-GROUP 4</u> Lead Fatigue	5.10.2			20%				
<u>SUB-GROUP 5</u> Omitted								
<u>SUB-GROUP 6</u> Omitted								

TABLE 2. GROUP B INSPECTION (Contd.)

Test	TEST CONDITIONS		LTPD	Symbol	Limits		Units
	NATO/K1007 Ref.	SPECIFIC CONDITIONS			Min.	Max.	
<u>SUB-GROUP 7</u> High and Low Temperature Life (Non-operating)	6.2						
	6.2.1	T. Storage = +100°C Min. Duration 1000 hrs.	$\lambda = 20\%$				
	6.2.2	T. Storage = -55°C Min. Duration 1000 hrs.	$\lambda = 20\%$				
<u>SUB-GROUP 8</u> Operational Life	6.3	V _{CB} = -30V P _e = 150 mW T _{amb} = 75°C. (Note 1) Duration = 1000 hrs.	$\lambda = 20\%$				
	7.2.5.5	As in Group A, Sub-group 2		I _{CEX}	-	30	μA
Collector cut-off current (2)	7.4.2	As in Group A, Sub-group 2		hfe	32	88	-
Common Emitter, Small Signal Current Gain							

TABLE 3. GROUP C INSPECTION
(See GROUP C Inspection. Quality Assurance Provisions Page 3)

Test	TEST CONDITIONS		LTPD	Symbol	Limits		Units
	NATO/K1007 Ref.	SPECIFIC CONDITIONS			Min.	Max.	
<u>SUB-GROUP 1</u>							
Omitted							
<u>SUB-GROUP 2</u>							
Shock	5.17.1	Non-operating	20%				
Vibration Variable Frequency	5.16.1	Non-operating	Q.A.				
<u>Post Test End Points for Sub-groups 1 and 2</u>							
Collector cut-off current (2)	7.2.5.5	As in Group A, Sub-group 2		I _{CEX}	30		μA
Common Emitter, Small Signal Current Gain	7.4.2	As in Group A, Sub-group 2		hfe	32	88	-

Notes 1. Alternatively the Life Test may be performed at any temperature between 45°C and 125°C given by the rating curve on page 9 Fig. 1.

2. Alternatively these tests may be performed at an Insp. Level of 100%

FIG. 1

DERATING CURVE

