

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION CV.7344/5/6

ISSUE 1 DATED 1st FEBRUARY 1963

AMENDMENT NO. 1

Page 4

Table 1 Group A Inspection Sub-Group 3
Collector Emitter Saturation Voltage.
Specific Conditions:-

DELETE:- I_b - 10 mA

INSERT:- I_b - 1 mA

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

(39970)

P.T.O.

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Table 2 Group B Inspection Post Test End Points
for Sub-Groups 2, 3, 4, 6 and 7

DELETE:- 6 and 7

INSERT:- 7 and 8

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Table 3 Group C Inspection Sub-Group 2

Shock Specific Conditions:-

ADD:- 5 Blows in each of Three Mutually
Perpendicular Directions.

Post Test End Points for Sub-Groups 1 and 2,
Common Emitter small signal current gain
for CV.7345 Limits Max:-

DELETE:- 73

INSERT:- 66

September 1963

MINISTRY OF AVIATION, R.A.E.

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AMENDMENT No. 2.

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TABLE 2 GROUP B INSPECTION

SUB-GROUP 2:- DELETE THERMAL SHOCK TEST

DECEMBER, 1963.

MINISTRY OF AVIATION, R.A.E.

(213565)

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION CV7344-5-6

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.

DECEMBER 1963

MINISTRY OF AVIATION, R.A.E.

MILITARY SPECIFICATION
CV 7344-5-6.
 SEMICONDUCTOR DEVICE, TRANSISTOR

Description:-

This specification covers the detail requirements for a 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, 10.4.1.4 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} (pk)	P	T _{amb}	T _{stg}	Shock	Vibration
Unit	V	V	V	mA	mA	mA	mA	mA	mA	mW	°C	°C	g	g
Min	-	-	-	-	-	-	-	-	-	-	-	-55	-	-
Max	60	60	30	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 BCY 30 Series, 2S300 Series

CV 7344-5-6

Primary Electrical Characteristics

Characteristic	I _{CBO} (1)	I _{CBO} (2)	I _{CEM}	h _{fe}			f _T			F	V _{CE} (Sat)	V _{BE}
				av. 7344	CV. 7345	CV. 7346	CV. 7344	CV. 7345	CV. 7346			
Unit	μA	μA	μA	-	-	-	Mc/s	Mc/s	Mc/s	dB	mV	mV
Min	-	-	-	15	30	60	0.3	0.6	0.7	-	-	-
Max	0.1	10	20	30	60	120	2.0	3.0	7.0	16	250	600
CONDITIONS	T _{amb} °C	25	100	25	25		25			25	25	25
	V _{CB} V	-6	-6	-	-6		-6				-	-6
	V _{CE} V	-	-	-60	-		-			-2	-	-
	V _{EB} V	-	-	-0.5	-		-			-	-	-
	I _C mA	-	-	-	-		-			0.5	-10	-
	I _E mA	0	0	-	1		1			-	-	1
I _B 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 Numbers

CV.7344 = 5960-99-037-2958

CV.7345 = 5960-99-037-2959

CV.7346 = 5960-99-037-2960

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
	KL007/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	V _{CB} = -6V, I _E = 0	1% (Note 2)	I _{CBO}	-	0.1	μA
Collector cut off current (2)	7.2.5.5	V _{CE} = -60V, V _{EB} = -0.5V	1% (Note 2)	I _{CEX}	-	20	μA
Common Emitter, Small Signal Current Gain	7.4.2	V _{CE} = -6V, I _C = -1 mA d.c. and 0.25 mA a.c. r.m.s. max, superimposed. f = 1 kc/s. CV.7344 CV.7345 CV.7346	1% (Note 2)	h _{fe}	15 30 60	33 66 120	
<u>SUB-GROUP 3</u> Collector Emitter Saturation Voltage	7.3.3	I _C = -10mA, I _B = -10mA	7%	V _{CE (Sat)}	-	250	mV
Base Emitter Voltage	7.3.2	V _{CB} = -6V, I _E = 1 mA	7%	V _{BE}	-	650	mV

TABLE 1. GROUP A INSPECTION(Contd.)

Test	TEST CONDITIONS		LTPD	Symbol	Limits		Units
	NATO/K1007 Ref.	SPECIFIC CONDITIONS			Min.	Max.	
<u>SUB-GROUP 3</u> (Contd.)							
Emitter-base cut-off Current	7.2.6	VEB = -20V, IC = 0	7%	I_{EBO}	-	20	μA
Noise Figure	7.6.3.1	Common Emitter Circuit VCE = -2V, IC = -0.5mA Z Source = 500 Ω Load = 6 k Ω + 4 k Ω f = 1 kc/s.	7%	F	-	16	dB
Transition Frequency		VCE = -6V, IE = 1mA, f = 300 Kc/s. CV.7344 CV.7345 CV.7346	7%	fT	0.3 0.3 1.0	2.0 3.0 7.0	Mc/s Mc/s Mc/s
<u>SUB-GROUP 4</u>							
Collector cut-off current (3)	7.2.5.1	As in Sub-group 2 Tamb = 100°C	20%	ICEO	-	10	μA
Common Emitter, Small Signal Current Gain	7.4.2	As in Sub-group 2 Tamb = -55°C CV.7344 CV.7345 CV.7346	20%	hfe	11 21 42	- - -	- - -

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TABLE 2. GROUP B INSPECTION
(See Quality Assurance Provisions, Page 3)

Test	NATO/K1007 Ref.	TEST CONDITIONS SPECIFIC CONDITIONS	LTPD	Symbol	Limits		Units
					Min.	Max.	
<u>SUB-GROUP 1</u> Physical Dimensions	5.1		20%				
<u>SUB-GROUP 2</u> Solderability	5.13						
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		LTFD	Symbol	Limits		Units
	NATO/K1007 Ref.	SPECIFIC CONDITIONS			Min.	Max.	
<u>SUB-GROUP 7</u>							
High and Low Temperature Life (Non-operating)	6.2						
High Temperature	6.2.1	T. storage = +100°C Min. Duration 1000 hrs.	$\lambda = 20\%$				
Low Temperature	6.2.2	T. storage = -55°C Min. Duration 1000 hrs.	$\lambda = 20\%$				
<u>SUB-GROUP 8</u>							
Operation Life	6.3	$V_{CB} = -30V, P_c = 150 \text{ mW}$ $T_{amb} = 75^\circ\text{C}$ (Note 1) Duration 1000 hrs.	$\lambda = 20\%$				
Post Test End Points for <u>Sub-groups 2, 3, 4, 6 and 7</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 CV.7344 CV.7345 CV.7346		hfe	12	36	-
					24	66	-
					48	132	-

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		h _{fe}			
		CV.7344			12	36	
		CV.7345			24	73	
		CV.7346			48	152	

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

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

FIG.1

DERATING CURVE

