

MILITARY SPECIFICATION

CV 7455 - 58

SEMICONDUCTOR DEVICE, TRANSISTOR
 2N1483, 2N1484, 2N1485, 2N1486

Description: This specification covers the detail requirements for Silicon NPN medium power transistors and is in accordance with K1007 Issue 3 except where otherwise stated.

Mechanical Dimensions and Outlines: K1007 Section B 10.3.2.5 and 10.4.2.5.
 Retaining Clamp. Fig.5 Page 14.

Connections: Collector connected to Case.
 Pin 1. Emitter, Pin 2. Base, Pin 3. Collector.

Absolute Maximum Ratings

Device	Rating	V _{CBO}	V _{EBO}	V _{CEO}	V _{CEX}	I _C	I _B	T _{stg}	θ _{j-c}	T _{opr}	P _c
	Unit	V	V	V	V	A	A	°C	°C/W	°C	W
CV7455	Min	-	-	-	-	-	-	-55	-	-	-
& CV7457	Max	60	12	40	60	3.0	1.5	+200	7	+200	25
CV7456	Min	-	-	-	-	-	-	-55	-	-	-
& CV7458	Max	100	12	55	100	3.0	1.5	+200		+200	25

Device	Rating	Shock	Vibration
	Unit	g	g
All	Max	1500	20
	Notes	A	

Note A: Duration 0.5 mSec.
 B: Commercial equivalents ZT1483-1486
 CV numbers run consecutively.

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CV7455-58

Primary Electrical Characteristics:

Characteristic		I_{CBO}	I_{EBO}	V_{CE} (sat)	V_{BE}	h_{FE}	I_{CBO}	f_{hfb}
Unit		μA	μA	V	V		mA	kc/s
CV7455 & CV7456	Min	-	-	-	-	20	-	600
	Max	15	15	2.0	3.0	60		-
CV7457 & CV7458	Min	-	-	-	-	35	-	600
	Max	15	15	0.75	2.0	100		-
CONDITIONS	T_{case} °C	25	25	25	25	25	175	25
	V_{CB} V	30	-	-	-	-	30	28
	V_{CE} V	-	-	-	4.0	4.0	-	-
	V_{EB} V	-	12	-	-	-	-	-
	I_C mA	-	0	750	750	750	-	5
	I_E mA	0	-	-	-	-	0	-
	I_B mA	-	-	Note 1	-	-	-	-

Note 1 CV7455 & 7456 $I_B = 75mA$, CV7457 & 7458 $I_B = 40mA$

Reliability Assurance Requirements:-

Under discussion

Requirements:-

Marking: The device shall be marked as K1007 Section B 1.3.4., as space permits, any other marking shall be on the pack.

Quality Assurance Provisions

Destructive Tests The tests listed in Table 2, Group B Inspection, Sub Groups 2 and 3 and Group C 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, Section A. 1.2(c). Insulating washers and retaining clamp will be packed with each device.

Joint Service Catalogue Numbers:-

CV7455	=	5960-99-037-3578
CV7456	=	5960-99-037-3579
CV7457	=	5960-99-037-3580
CV7458	=	5960-99-037-3581

This specification has been prepared by, and the Qualification Approval Authority is:-

Ministry of Aviation, Royal Radar Establishment, Malvern, Worcs. England.

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TABLE 1 GROUP A INSPECTION

Examination or Test	K1007/NATO Ref.	TEST CONDITIONS		AQL %	Insp. Level	Sym-bol	LIMITS		Units
		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 (1)	7.2.5.1	$V_{CB} = 30V$ $I_E = 0$		0.65	II	I_{CBO}	-	15	μA
Collector-Emitter Sustaining Voltage	7.2.2.2.1	$I_C = 100mA$ $I_B = 0$	CV74-55, CV74-57 CV74-56, CV74-58			V_{CEO} (sust.)	40 55	-	V V
Emitter Base Cut off Current	7.2.6	$I_C = 0.25mA$ $V_{EB} = 1.5V$	CV74-55, CV74-57 CV74-56, CV74-58			V_{CEX}	60 100	-	V V
<u>SUB GROUP 3</u> Static Forward Current Transfer Ratio (1)	7.3.4	$I_C = 750mA$ $V_{CE} = 4.0V$	CV74-55, CV74-57 CV74-56, CV74-58	2.5	I	I_{EBO}	-	15	μA

TABLE 1 GROUP A INSPECTION (Cont'd)

Examination or Test	K1007/NATO Ref.	TEST CONDITIONS		AQL %	Insp. Level	Sym-bol	LIMITS		Units
		Specific Conditions					Min.	Max.	
Collector-Emitter Saturation Voltage	7.3.3	$I_C = 750\text{mA}$ $I_B = \text{CV74-55, CV74-56} = 75\text{mA}$ $\text{CV74-57, CV74-58} = 45\text{mA}$				V_{CE} (sat)	-	2.0 0.75	V V
Base-Emitter Voltage	7.3.2	$I_C = 750\text{ mA}$ $V_{CE} = 4.0\text{V}$				V_{BE}	-	3.0	V
<u>SUB GROUP 4</u> Small-Signal Forward Current Transfer Ratio,	7.5.2	$V_{CB} = 28\text{V}$ $I_C = 5\text{ mA}$		4.0	1A	f_T	600	-	kc/s
Collector-Base Cut-off	7.2.5.1	$T_{amb} = 175^\circ\text{C}$ $V_{CB} = 30\text{V}$ $I_E = 0$				I_{CBO}	-		μA
Static Forward Current Transfer Ratio (2)	7.3.4	$T_{amb} = -55^\circ\text{C}$ $I_C = 750\text{mA}$ $V_{CE} = 4.0\text{V}$				h_{FE}	15 25	- -	

CV74-55, CV74-56
CV74-57, CV74-58

TABLE 2 GROUP B INSPECTION

See Page 3, Quality Assurance Provisions, Destructive Tests

Examination or Test	K1007/NATO Ref.	TEST CONDITIONS		AQL %	Insp. Level	Sym- bol	LIMITS		Units
		Specific Conditions					Min.	Max.	
<u>SUB GROUP 1</u> Physical Dimensions	5.1	According to drawing Page 13		6.5	IC				
<u>SUB GROUP 2</u> Solderability	5.13			4.0	IA				
Temperature Cycling	5.5	-55°C to +200°C							
Moisture Resistance	5.3.1								
<u>SUB GROUP 3</u> Vibration Fatigue	5.15	Non operating		4.0	I Note 1				
<u>SUB GROUP 4</u> Omitted									
<u>SUB GROUP 5</u> Omitted									
<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} = +200°C		4.0	I Note 1				

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 8</u> Operating Life	6.3 6.6.1.2.2	T _{amb} at any temperature between +100°C and +160°C V _{CB} = max for devices. P _c = to wattage shown on Derating curve for chosen temperature Fig.1	4.0	IA				
<u>Post Test End Points for Sub Groups 2 and 3</u>								
Collector-Base Cut-off Current (1)	7.2.5.1	V _{CB} = 30V I _E = 0			I _{CBO}	-	45	μA
Static Forward Current Transfer Ratio	7.3.4	V _{CB} = 4.0V I _C = 750mA CV7455 CV7456 CV7457 CV7458			h _{FE}	10 25		
<u>Post Test End Points for Sub Groups 7 and 8</u>								
Collector Base Cut-off Current (1)	7.2.5.1	V _{CB} = 30V I _E = 0			I _{CBO}	-	45	μA

TABLE 2 GROUP B INSPECTION (Cont'd)

Examination or Test	K1007/NATO Ref.	TEST CONDITIONS		AQL %	Insp. Level	Sym- bol	LIMITS		Units
		Specific Conditions					Min.	Max.	
Static Forward Transfer Ratio	7.3.4	$V_{CB} = 4.0V$	CV7455 CV7456			h_{FE}	15		
		$I_C = 750mA$	CV7457 CV7458				25		

TABLE 3 GROUP C INSPECTION
See Page 3. Quality Assurance Provisions. Destructive Tests and Gp. C.

Examination or Test	K1007/NATO Ref.	TEST CONDITIONS		AQL Insp. Level %	Sym- bol	LIMITS		Units
		Specific Conditions				Min.	Max.	
<u>SUB GROUP 1</u> Omitted								
<u>SUB GROUP 2</u> Shock		5 blows in each of three mutually perpendicular directions.		6.5 IA				
<u>POST TEST END POINTS for SUB GROUP 2</u>								
Collector Base Cut-off Current (1)	7.2.5.1	V _{CB} = 30V I _E = 0			I _{CBO}	-	45	μA
Static Forward Current Transfer Ratio	7.3.4	V _{CB} = 4.0V I _C = 750 mA CV74-55 CV74-56 CV74-57 CV74-58			h _{FE}		15 25	

NOTES

1. Maximum Sample size will be 125

FIG 1

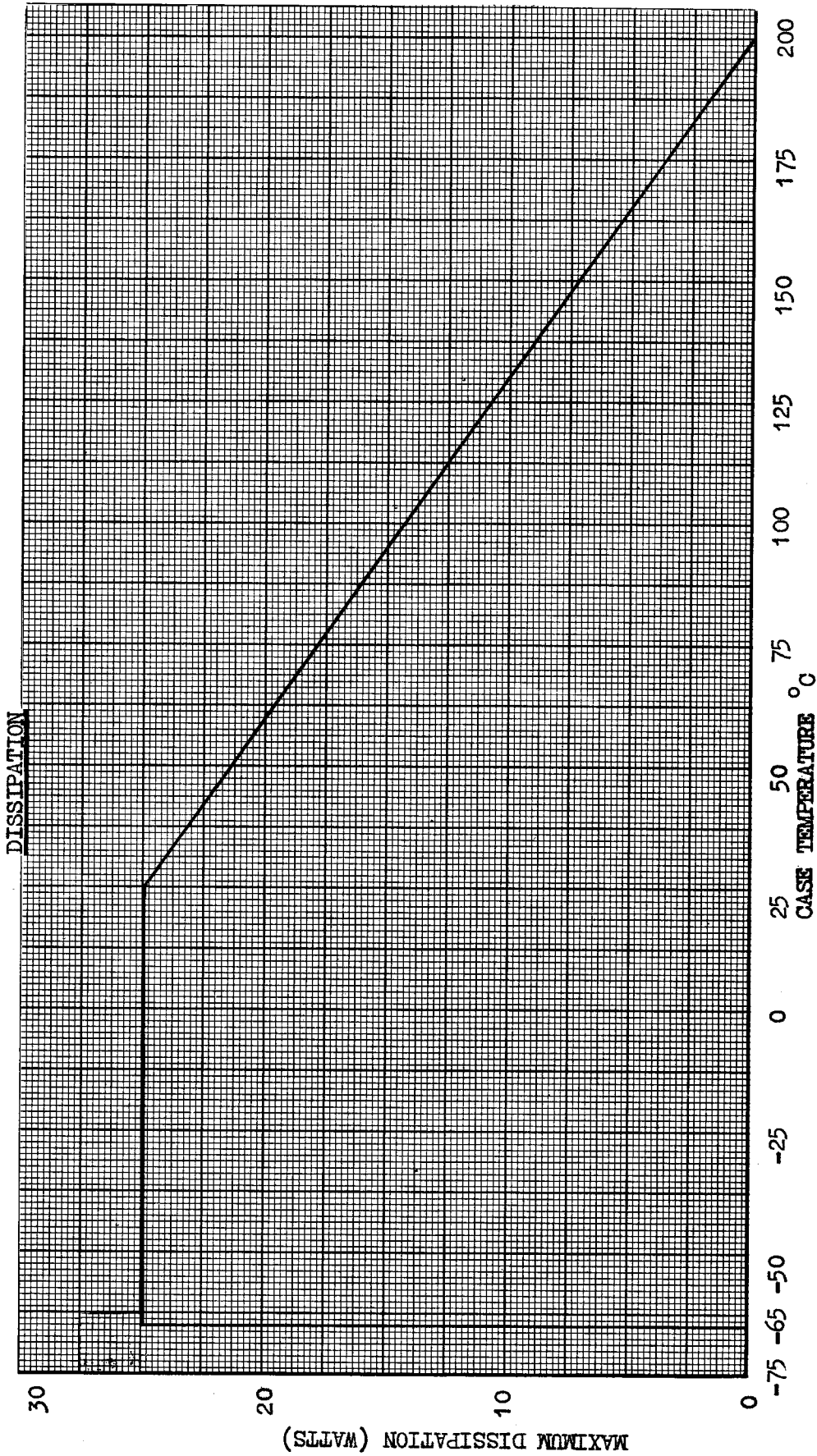
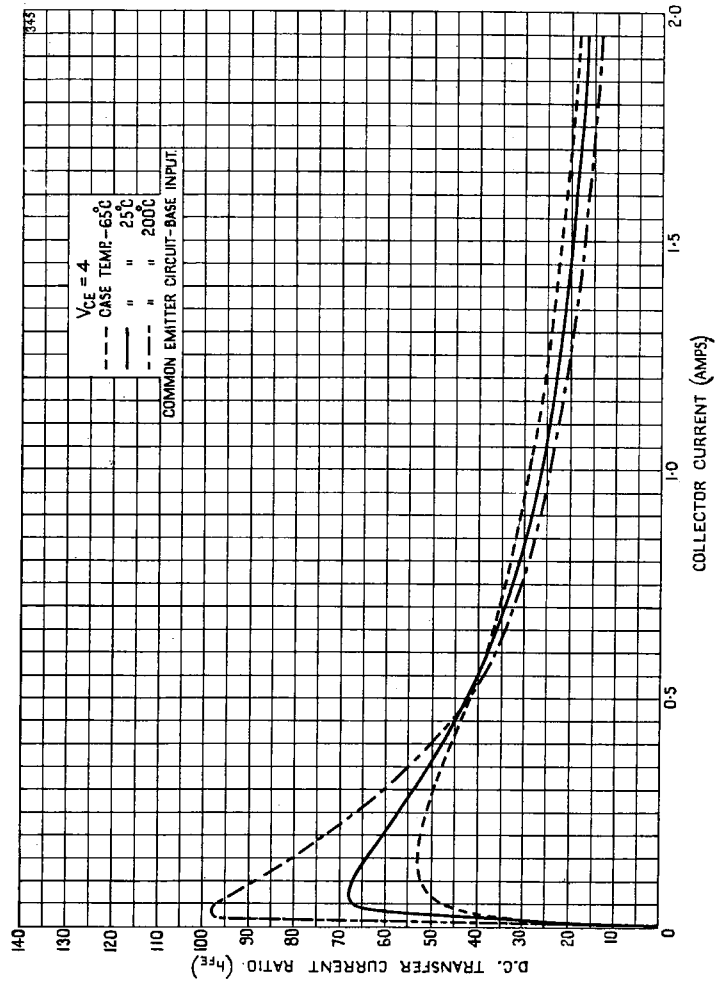


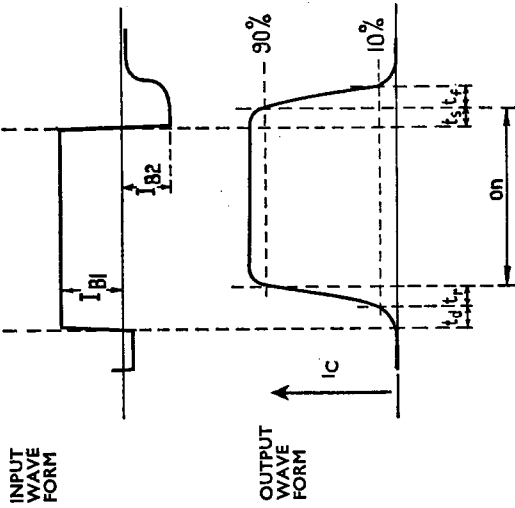
FIG 2

TYPICAL VARIATION OF DC CURRENT GAIN (h_{FE})
with Collector current and Ambient Temperature.



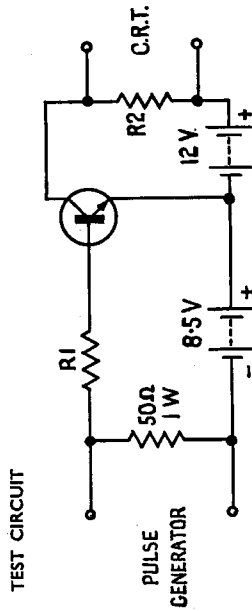
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FIG 3



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TYPICAL POWER-SWITCHING PERFORMANCE



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TYPICALLY:
 $t_{on} = t_d + t_r = 200 + 1000 = 1200 \text{ } \mu\text{s}$
 $t_{off} = t_s + t_f = 800 + 1100 = 1900 \text{ } \mu\text{s}$
 'On' DC Collector current ... = 750 mA
 'Turn on' Base current (I_{B1}) ... = 65 mA
 'Turn off' Base current (I_{B2}) ... = -35 mA

R1 220Ω 1W.
 R2 15-9Ω 2W.

FIG. 4
RETAINING CLAMP

