MILITARY SPECIFICATION

CV 7455-58

SEMICONDUCTOR DEVICE, TRANSISTOR
2N1483, 2N1484, 2N1485, 2N14186

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.

(152613)

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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.

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 1			0.65	I				
Visual and Mechanical Inspection	5.1	Excluding Physical Dimensions						
SUB GROUP 2			0.65	II				
Collector-Base cut-off Current (1)	7.2.5.1	V_{CB} = 30V I_E = 0			I_{CBO}	-	15	µA
Collector-Emitter Sustaining Voltage	7.2.2.2.1	I_C = 100mA I_B = 0			V_{CEO} (sust)			
		CV7455, CV7457				40	-	V
		CV7456, CV7458				55	-	V
		I_C = 0.25mA V_{EB} = 1.5V			V_{CEX}			
		CV7455, CV7457				60	-	V
		CV7456, CV7458				100	-	V
Emitter Base Cut off Current	7.2.6	V_{EB} = 12V I_C = 0			I_{EBO}	-	15	µA
SUB GROUP 3			2.5	I				
Static Forward Current Transfer Ratio (1)	7.3.4	I_C = 750mA V_{CE} = 4.0V			h_{FE}			
		CV7455, CV7457				20	60	
		CV7456, CV7458				35	100	

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.	
Collector-Emitter Saturation Voltage	7.3.3	I_C = 750mA I_B = CV7455, CV7456 = 75mA CV7457, CV7458 = 45mA			V_{CE} (sat)	- -	2.0 0.75	V V
Base-Emitter Voltage	7.3.2	I_C = 750 mA V_{CE} = 4.0V			V_{BE}	-	3.0	V
SUB GROUP 4			4.0	1A				
Small-Signal Forward Current Transfer Ratio,	7.5. 2	V_{CB} = 28V I_C = 5 mA			f_T	600	-	kc/s
Collector-Base Cut-off	7.2.5.1	T_{amb} = 175°C V_{CB} = 30V I_E = 0			I_{CBO}	-		/uA
Static Forward Current Transfer Ratio (2)	7.3.4	T_{amb} = -55°C I_C = 750mA V_{CE} = 4.0V CV7455, CV7456 CV7457, CV7458			h_{FE}	 15 25	 - -	

TABLE 2 GROUP B INSPECTION

See Page 3, Quality Assurance Provisions, 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	IC				
Physical Dimensions	5.1	According to drawing Page 13						
SUB GROUP 2			4.0	IA				
Solderability	5.13							
Temperature Cycling	5.5	-55°C to +200°C						
Moisture Resistance	5.3.1							
SUB GROUP 3			4.0	I Note 1				
Vibration Fatigue	5.15	Non operating						
SUB GROUP 4								
Omitted								
SUB GROUP 5								
Omitted								
SUB GROUP 6								
Omitted								
SUB GROUP 7			4.0	I Note 1				
High Temperature Life (non-operating)	6.2.1 6.6.1.2.2	T_{stg} = +200°C						

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.	
SUB GROUP 8			4.0	IA				
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						
Post Test End Points for Sub Groups 2 and 3								
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		
Post Test End Points for Sub Groups 7 and 8								
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	TEST CONDITIONS		AQL %	Insp. Level	Symbol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
Static Forward Transfer Ratio	7.3.4	V_{CB} = 4.0V I_C = 750mA CV7455 CV7456 CV7457 CV7458			h_{FE}	 15 25		

TABLE 3 GROUP C INSPECTION

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

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 blows in each of three mutually perpendicular directions.						
POST TEST END POINTS for SUB GROUP 2								
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 CV7455 CV7456 CV7457 CV7458			h_{FE}	 15 25		

NOTES

1. Maximum Sample size will be 125

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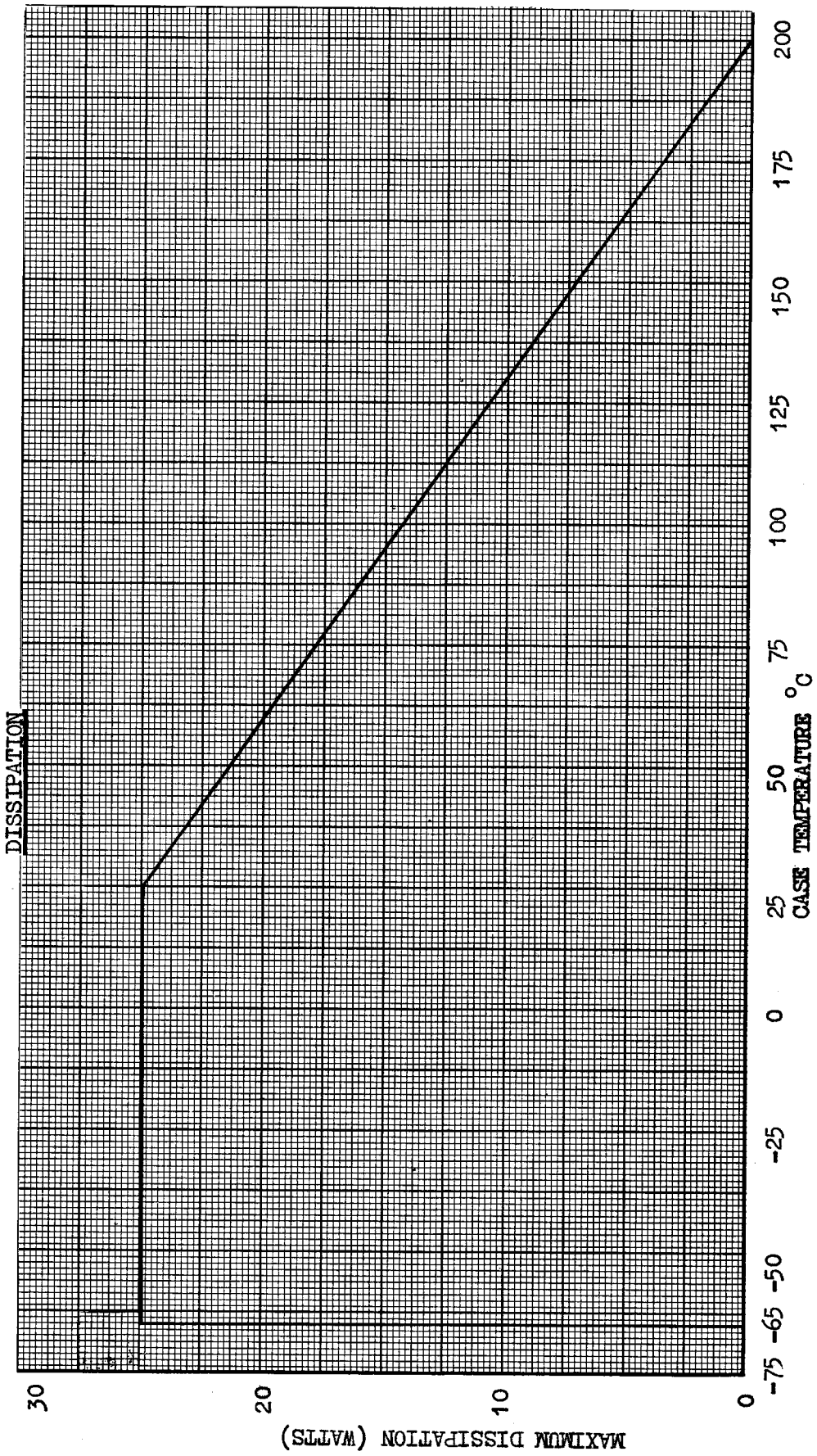
FIG 1



15th October, 1963

FIG 2

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

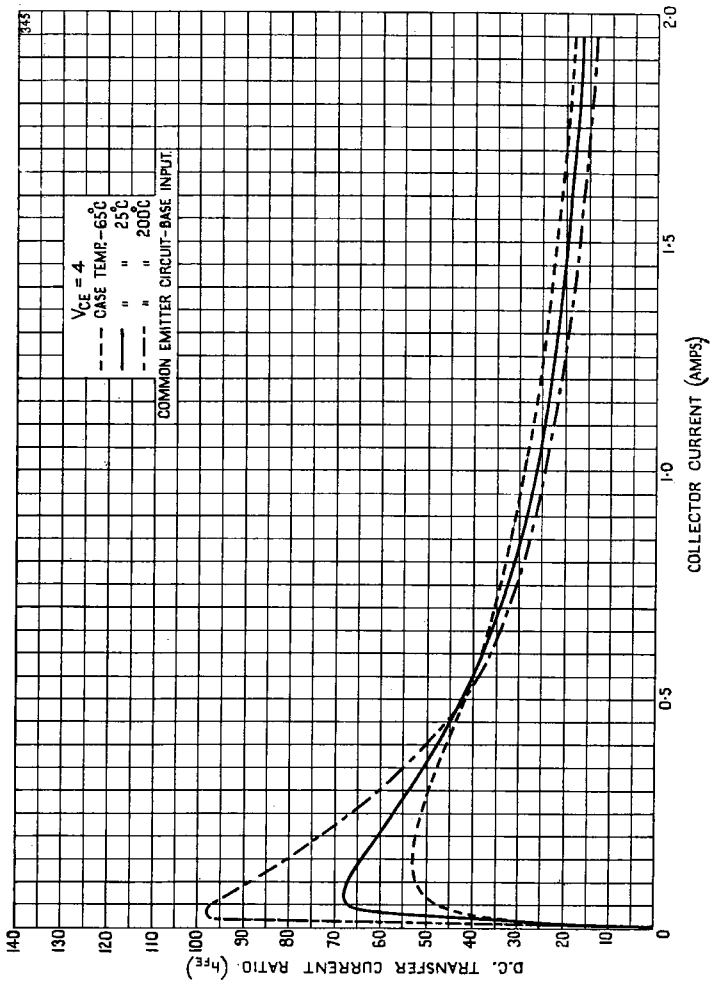
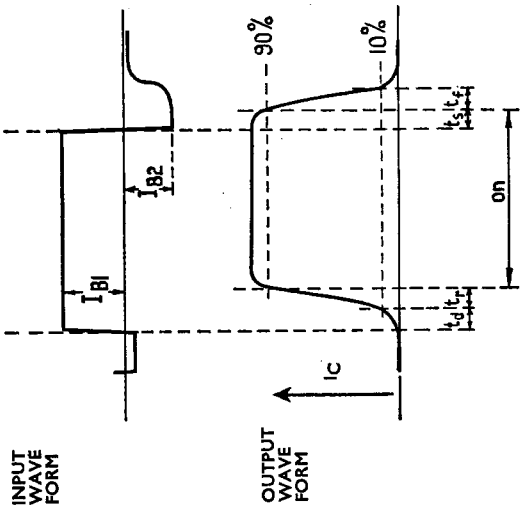


FIG 3

TYPICAL POWER-SWITCHING PERFORMANCE



TYPICALLY.

$t_{on} = t_d + t_r = 200 + 1000 = 1200$ mμSec.

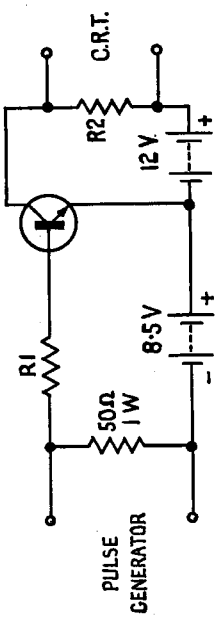
$t_{off} = t_s + t_f = 800 + 1100 = 1900$ mμSec.

'On' DC Collector current ... = 750 mA.

'Turn on' Base current (I_{B1}) ... = 65 mA.

'Turn off' Base current (I_{B2}) ... = −35 mA.

TEST CIRCUIT



R_1 ... ... 220Ω 1W.

R_2 ... ... 15·9Ω 2W.

FIG. 4

RETAINING CLAMP