VALVE ELECTRONIC
SEMICONDUCTOR DEVICE

CV7154

Specification MOA/CV7154
Issue 1 dated 8.8.61.
To be used in conjunction with K1007

SECURITY	
Specification	Valve
Unclassified	Unclassified

indicates a change

TYPE OF DEVICE - Silicon high frequency transistor npn.
CONSTRUCTION - Metal Body
PROTOTYPE - ZT43

MARKING
See K1007/4
CV Number, Factory Code and Date Code.

RATING AND CHARACTERISTICS

All limiting values are absolute

			Note
Max. collector dissipation at 25°C amb:	(mW)	300	A
Max. collector-base voltage	(V)	45	
Max. collector-emitter voltage	(V)	45	
Max. base-emitter reverse voltage	(V)	6	
Max. collector current	(mA)	50	
Max. operating and storage ambient temperature range	(°C)	-65 +150	
Min. gain bandwidth product f_t	(Mc/s)	70	B
Common emitter D.C. gain h_{FE} (At Ic = 10mA, V_{CE} = 6v)		40/80	
Typical Intrinsic Base Resistance	(ohms)	150	
Max. capacitance (V_{CE} = 6V)	(pF)	8	

DIMENSIONS
See K1007/A1/D14A
K1007/A1/D14C

MOUNTING POSITION
Any

PACKAGING
See K1007/14

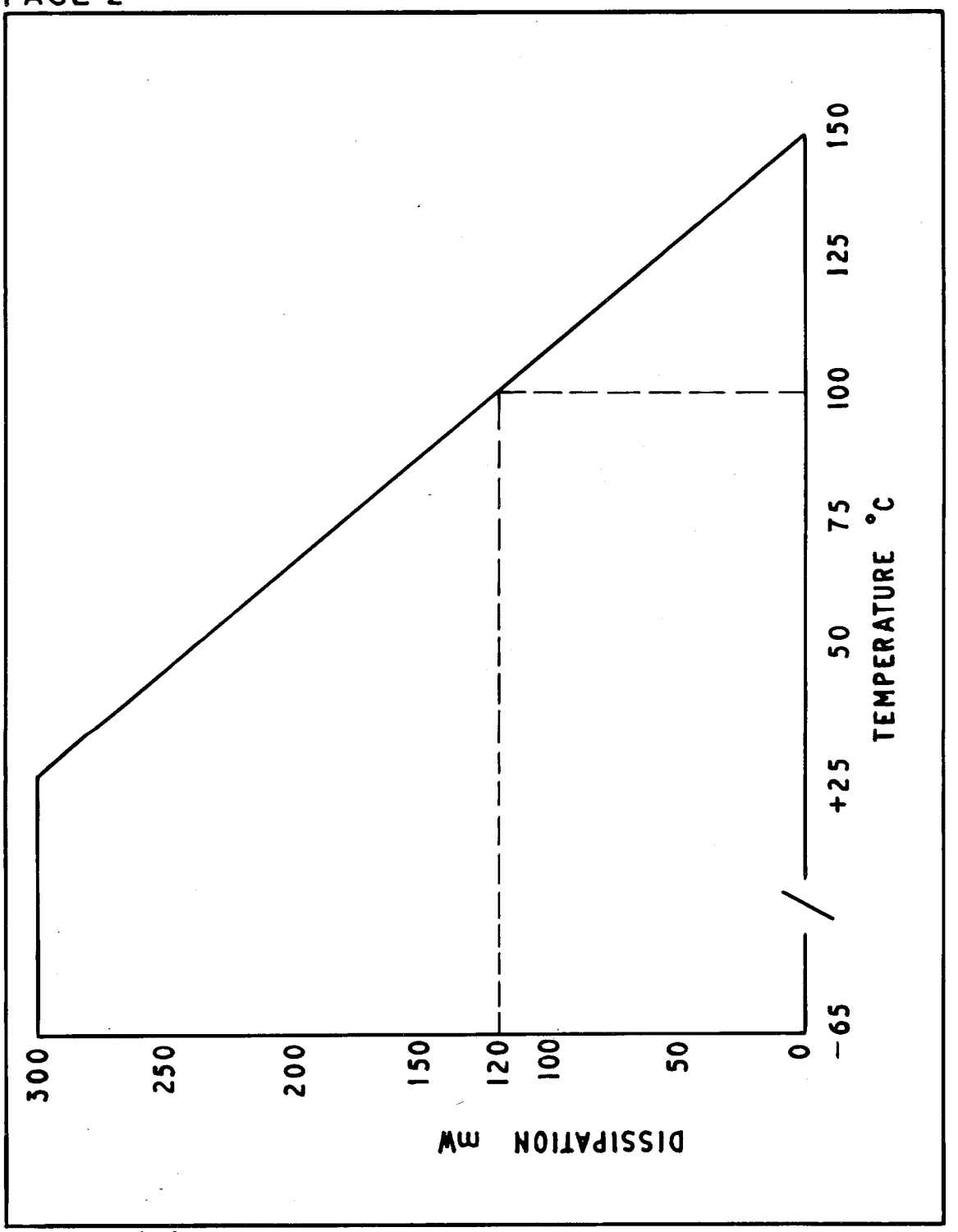
CONNECTIONS
Collector connected to can.

NOTES

A. See derating curve on Page 2

B. f_t is obtained by measuring (h_{fe}) gain at 10 Mc/s in the common emitter configuration and extrapolating at 6db per octave to deduce a frequency at which the gain is unity.

C. JOINT SERVICE CATALOGUE NUMBER: 5960-99-037-2443


DISSIPATION mW
300
250
200
150
120
100
50
0
−65
+25
50
75
100
125
150
TEMPERATURE °C

TESTS

K1007	TEST	TEST CONDITIONS	AQL %	Insp. Level	Symbol	LIMITS Min.	LIMITS Max.	Units
	GROUP A							
5D.2	Collector-base leakage current (1)	V_{CB} = 45v I_e = 0		100%	I_{cbo}	-	0.2	uA
	Collector-emitter saturation voltage	I_c = 10mA I_B = 2mA		100%	V_{CE} sat.	-	0.6	v
	GROUP B							
5D.4.1	Large signal Common emitter current gain	V_{CE} = 6V Ic = 10mA	0.65		h_{FE}	40	80	
	Switching Times Note 3	Ic = 20mA IB_1 = IB = 2mA V_{CC} = 12V V_{BB} = -20 Note 3	0.65		td tr ts+tf	- - -	70 100 ~~250~~ 400	musec. musec. musec.
	GROUP C							
	Gain Bandwidth Product Voltage Rating (h_{FB})	V_{CE} = 6V Ic = 10mA Note 5	2.5 2.5	IA IA	f_t	70	180	Mc/s
	Base-emitter saturation voltage	Ic = 10mA I_B = 2mA	2.5	IA	V_{BE} Sat		1.4	V
	Emitter-base reverse leakage current	V_{EB} = +6V Ic = 0 T = 25°C	2.5	I_{EBO}			10 uA	

TESTS (Cont'd)

K1007 Ref.	TEST	TEST CONDITIONS	AQL %	Insp.	Symbol	LIMITS Min.	LIMITS Max.	Units
	GROUP D							
	Capacitance (1)	f = 1Mc/s V_{CB} = -6V	6.5	IA	C_{OB}		8	pF
	Capacitance (2)	f = 1Mc/s V_{CE} = -6V	6.5	IA	C_{EC}		8	pF
5D.5	Noise	V_{CE} = 6V IC = 1mA f = 465 Kc/s R_L = 1K ohm R_S = 200 ohms Bandwidth = 12 Kc/s	6.5	IA			12	db
	Collector-base leakage current (2)	V_{CB} = 45V Ie = 0 T_{amb} = 100°C	6.5	IA	I_{cbo}		2.0	uA
	GROUP E							
10.2	Temperature Cycling	Three cycles - 55°C to + 150°C Note 1		IC				
10.3	Climatic Cycling Post Temperature and Climatic Cycling Tests			IC				
8	Inoperatives		6.5					
5D.2	Collector-base leakage current (1)	As in Group A	6.5		I_{cbo}		0.5	uA

TESTS CONT'D

K1007	TEST	TEST CONDITIONS	AQL %	Insp. Level	Symbol	LIMITS Min.	LIMITS Max.	Units
11.3	Fatigue			IC				
11.4	Shock Post Fatigue and Shock Tests	Hammer Angle = 60° Combined AQL for each group	10.0	IC				
8	Inoperatives		6.5					
5D.2	Collector-base leakage current (1)	As in Group A	6.5		I_{cbo}		0.5	uA
5D.4.1.	Large signal common emitter current gain	As in Group B	6.5		h_{FE}	38	90	
11.5	Soldering		6.5	IC				
10.1	Lead Fragility Note 2		6.5	IC				
	GROUP F							
13	Life Life Test End Point 1000 hours and 240 hrs	P_c = 120mW T_{amb} 100°C V_{CE} = 45V Note 4		IA				
8	Inoperatives		6.5					
5D.2	Collector-base leakage current (1)	As in Group A	6.5		I_{cbo}		0.5	uA
5D.4.1.	Large signal common Emitter current gain	As in Group B	6.5		h_{FE}	38	90	

TESTS CONTINUED

K1007	TEST	TEST CONDITIONS	AQL %	Insp.	Symbol	LIMITS Min.	LIMITS Max.	Units
13.4	Storage Life (1)	t = 150 hours T_{amb}= 150°C min.		I				
13.5	Storage Life (2)	t = 150 hours T_{amb} = -55°C max.		I				
	Post Storage Life Tests 1 and 2	Combined AQL for each groups	4.0					
8	Inoperatives							
5D.2	Collector base leakage current (1)	As in Group A			I_{cbo}	-	0.5	uA
5D.4.1	Large signal Common Emitter current gain	As in Group B			h_{FE}	38	90	
	GROUP G							
	Retest after 28 days holding			100%				
8	Inoperatives		0.5					
5D.2	Collector-base leakage current (1)	As in Group A	2.0		I_{cbo}	-	0.2	uA
5D.4.1.	Large signal emitter current gain.	As in Group B	2.0		h_{FE}	40	80	

NOTES

1. The sample of transistors shall be subjected to conditioning in accordance with K1007/10.1 and shall then be subjected to temperature cycling and climatic cycling in sequence and shall then pass the post temperature and climatic cycling tests.

2. Transistors used for this test must have undergone at least 28 cycles of the climatic test in accordance with K1007 Section 10.3.1. or 10.3.2. or 6 cycles in accordance with Section 10.3.3.

3. The switching times are measured in the circuit on the following page.

I_{B1} is defined as

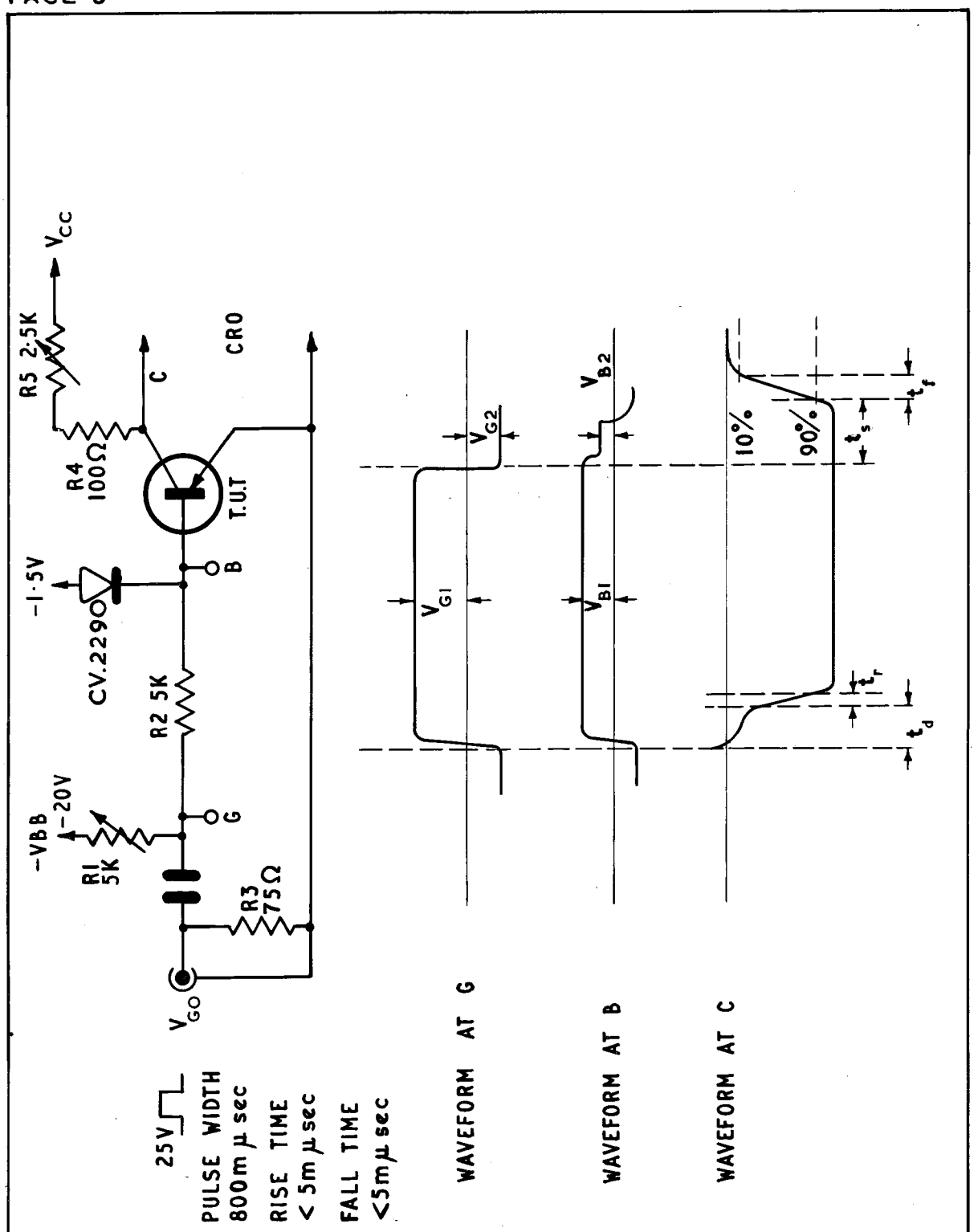
$$\frac{V_{G1} - V_{B1}}{R_2}$$

I_{B2} is defined as

$$\frac{V_{G2} + V_{B2}}{R_2}$$

4. Alternatively this test may be done at any temperature from + 25°C to 120°C provided that P_c is the rating appropiate to the temperature chosen.

5. Using a grounded base configuration apply 5 mA ± 1% to the emitter with 45 volts on the collector. The base current shall read zero or negative.


V_{CC}
R5 2·5K
R4 100Ω
C
CRO
T.U.T
B
-1·5V
CV.2290
R2 5K
-VBB
-20V
R1 5K
G
R3 75Ω
V_{GO}
25V
PULSE WIDTH 800m μ sec
RISE TIME < 5m μ sec
FALL TIME <5m μ sec
WAVEFORM AT G
V_{G2}
V_{G1}
WAVEFORM AT B
V_{B2}
V_{B1}
WAVEFORM AT C
10%
90%
t_f
t_s
t_r
t_d