MITSUBISHI RF POWER TRANSISTOR

2SC2695

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

2SC2695 is a silicon NPN epitaxial planar type transistor designed for RF power amplifiers in UHF band mobile radio applications.

FEATURES

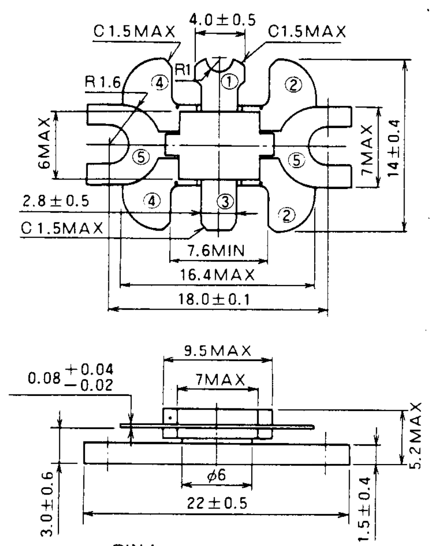
- High power gain: $G_{pe} \geq 4.9dB$
  $@V_{CC} = 13.5V, P_{in} = 9W, f = 520MHz$
- Emitter ballasted construction and gold metallization for high reliability and good performances.
- Low thermal resistance ceramic package with flange.
- Ability of withstanding more than 20:1 load VSWR all phase when operated at $V_{CC} = 15.2V, P_O = 30W, f = 520MHz$.
- Series equivalent input/output impedance:
  $Z_{in} = 1.5 + j2\Omega$ $@P_O = 30W, V_{CC} = 13.5V, f = 520$ MHz
  $Z_{out} = 2.5 + j1\Omega$

APPLICATION

25 to 28 watts output power amplifiers in UHF band mobile radio applications.

OUTLINE DRAWING

Dimensions in mm



PIN :
① COLLECTOR
② EMITTER (FLANGE)
③ BASE
④ EMITTER (FLANGE)
⑤ FIN (EMITTER)

T-31E

ABSOLUTE MAXIMUM RATINGS ($T_C = 25°C$ unless otherwise specified)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector to base voltage		35	V
V_{EBO}	Emitter to base voltage		4	V
V_{CEO}	Collector to emitter voltage	$R_{BE} = \infty$	17	V
I_C	Collector current		10	A
P_C	Collector dissipation	$Ta = 25°C$	3	W
		$T_C = 25°C$	75	W
T_j	Junction temperature		175	°C
Tstg	Storage temperature		−55 to 175	°C
Rth-a	Thermal resistance	Junction to ambient	50	°C/W
Rth-c		Junction to case	2	°C/W

Note. Above parameters are guaranteed independently.

ELECTRICAL CHARACTERISTICS ($T_C = 25°C$ unless otherwise specified)

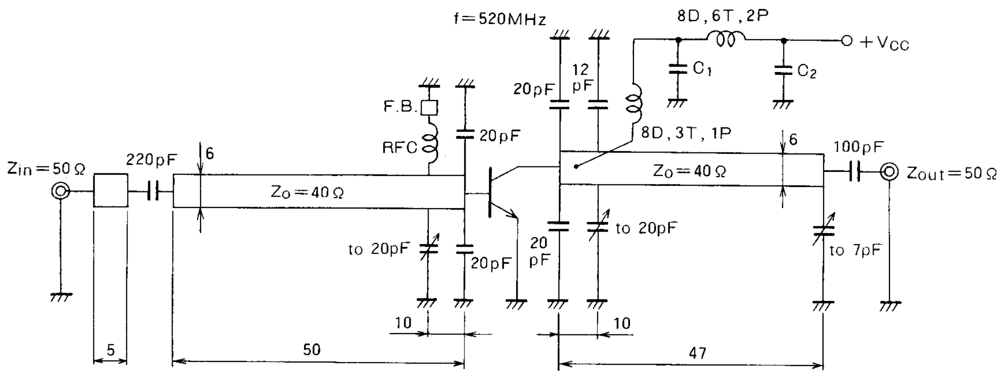
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	$I_E = 10mA, I_C = 0$	4			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	$I_C = 10mA, I_E = 0$	35			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	$I_C = 0.1A, R_{BE} = \infty$	17			V
I_{CBO}	Collector cutoff current	$V_{CB} = 15V, I_E = 0$			2	mA
I_{EBO}	Emitter cutoff current	$V_{EB} = 3V, I_C = 0$			3	mA
h_{FE}	DC forward current gain *	$V_{CC} = 10V, I_C = 1A$	20	50	180	—
P_O	Output power	$V_{CC} = 13.5V, P_{in} = 9W, f = 520MHz$	28	32		W
η_C	Collector efficiency		55	60		%

Note. * Pulse test, $P_W = 150\mu s$, duty = 5%.
Above parameters, ratings, limits and conditions are subject to change.

NOV. '97

MITSUBISHI ELECTRIC

TEST CIRCUIT

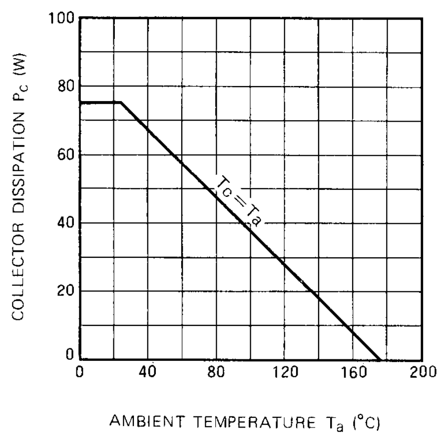


RFC: 0.4mmφ enameled wire 8T on D = 4mm, L = 13mm Bakelite
F.B.: Ferrite bead
C1: 68pF, 3300pF, 4700pF, 33μF in parallel
C2: 3300pF, 4700pF, 33μF in parallel

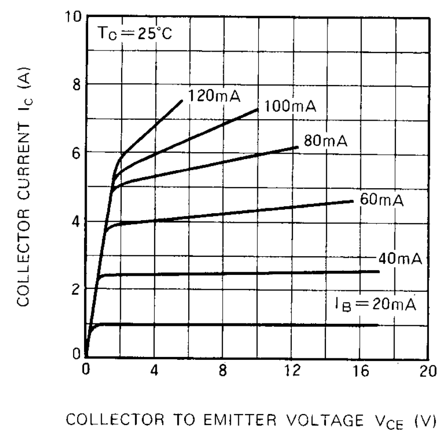
NOTES: Coil dimensions in milli-meter
D: Inner diameter of coil
T: Turn number of coil
P: Pitch of coil
Material of microstrip line: H = 1.6mm Teflon glass (ϵ_s = 2.7)

TYPICAL PERFORMANCE DATA

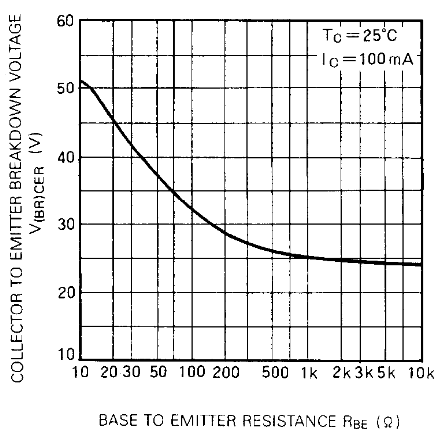
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



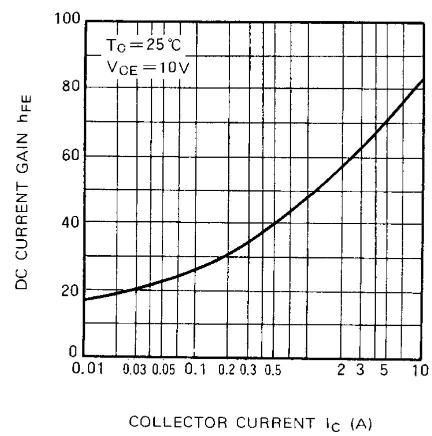
COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE



DC CURRENT GAIN VS. COLLECTOR CURRENT



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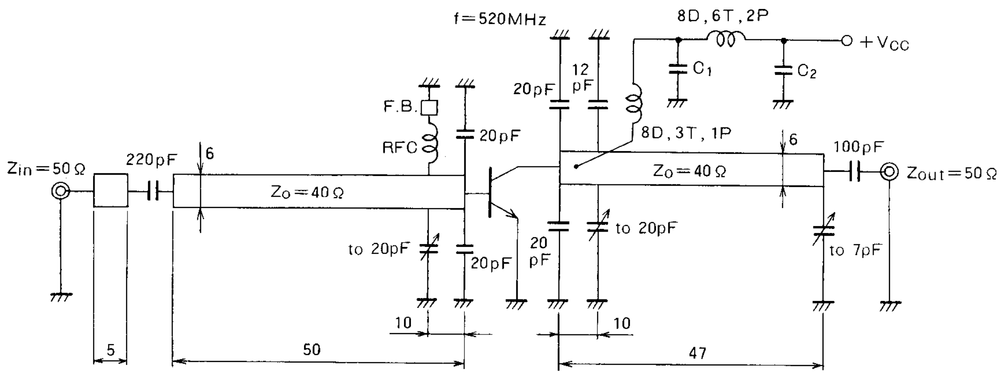

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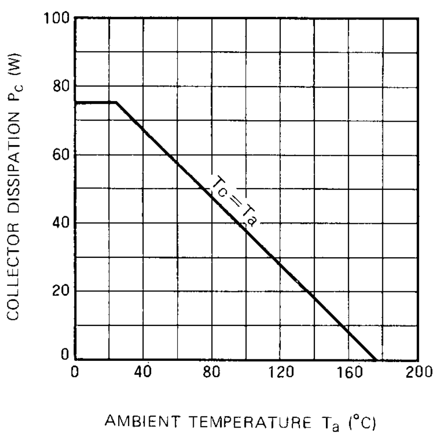
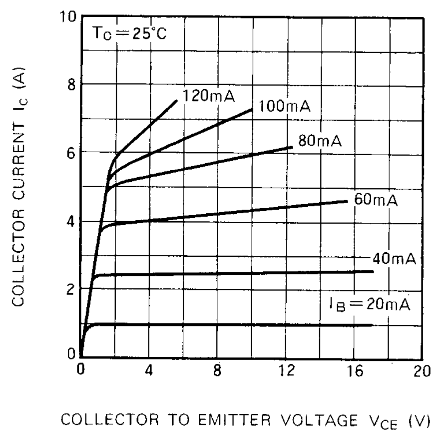


COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



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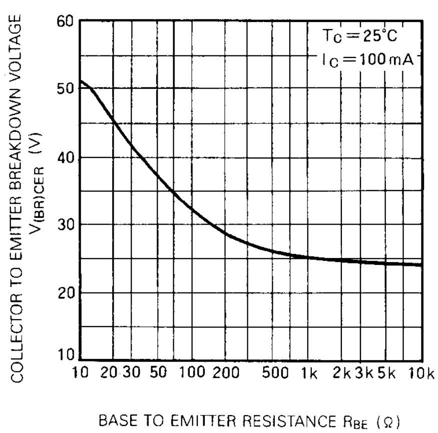

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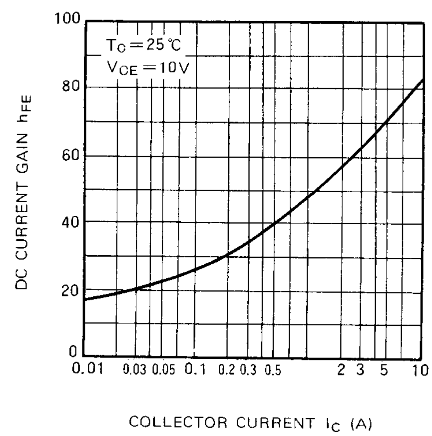
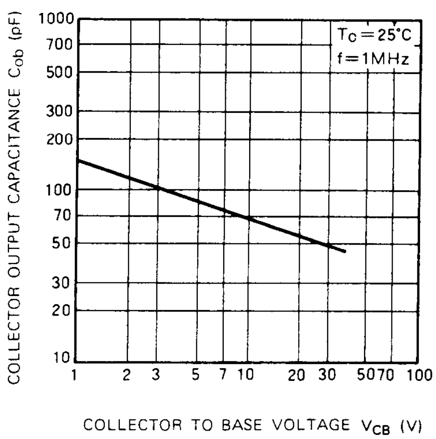
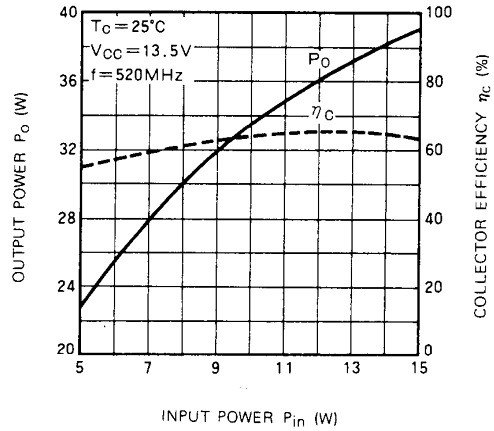


COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE