MITSUBISHI RF POWER TRANSISTOR

2SC4989

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

2SC4989 is a silicon NPN epitaxial planar type transistor specifically designed for high power amplifiers in UHF band.

FEATURES

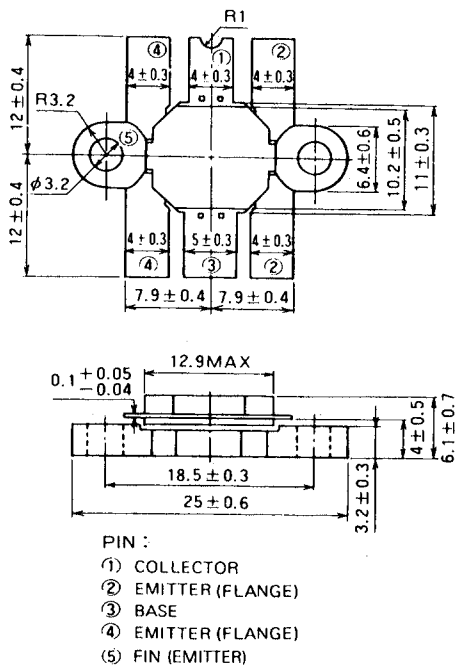
- High power output and high gain : $P_o \geqq 65W$, $G_{pe} \geqq 5.1dB$, @ V_{CC} = 12.5V, f = 520MHz, P_{in} = 20W
- Emitter ballasted construction.
- Load mismatch : Ability to withstand more than 8 : 1 load VSWR when operated at V_{CC} = 15.2V, P_o = 65W, f = 520MHz,
- High reliability due to gold metalization die.
- Flange type ceramic package.
- Equivalent input/output series impedance :
  Z_{in} = 1.01 + j4.09 Ω @P_o = 70W, V_{CC} = 12.5V, f = 520MHz
  Z_{out} = 1.04 + j2.55 Ω

APPLICATIONS

For output stage of 50W power amplifiers in UHF band.

OUTLINE DRAWING

Dimension in mm



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

T-40E

ABSOLUTE MAXIMUM RATINGS (Tc = 25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector-base voltage		35	V
V_{EBO}	Emitter-base voltage		4	V
V_{CEO}	Collector-emitter voltage	R_{BE} = ∞	17	V
I_C	Collector current		20	A
P_C	Collector dissipation		150	W
T_j	Junction temperature		175	℃
T_{stg}	Storage temperature		− 55 to 175	℃

Note. Above parameters are guaranteed independently.

ELECTRICAL CHARACTERISTICS (Tc = 25℃ unless otherwise noted)

Symbol	Parameter	Test conditions	Limits		Unit
			Min	Max	
$V_{(BR)CBO}$	Collector-base breakdown voltage	I_C = 20mA, I_E = 0	35		V
$V_{(BR)EBO}$	Emitter-base breakdown voltage	I_E = 20mA, I_C = 0	4		V
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	I_C = 100mA, R_{BE} = ∞	17		V
I_{CBO}	Collector cutoff current	V_{CB} = 15V, I_E = 0		5	mA
I_{EBO}	Emitter cutoff current	V_{EB} = 3V, I_C = 0		5	mA
h_{FE}	DC forward current gain	V_{CE} = 5V, I_C = 5A	10	180	−
P_o	Output power	V_{CC} = 12.5V, f = 520MHz, P_{in} = 20W	65		W
η_C	Collector efficiency		55		%

Note. Above parameters, ratings, limits and conditions are subject to change.

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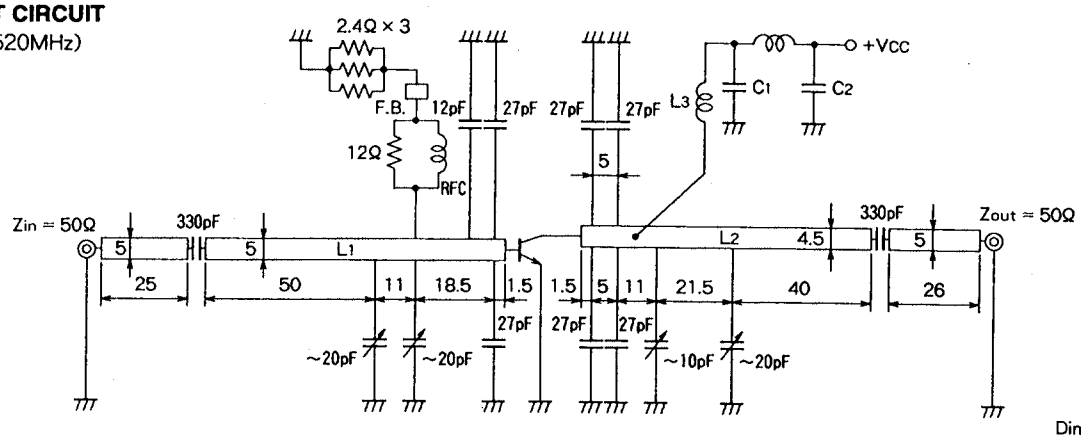
TEST CIRCUIT
(f = 520MHz)



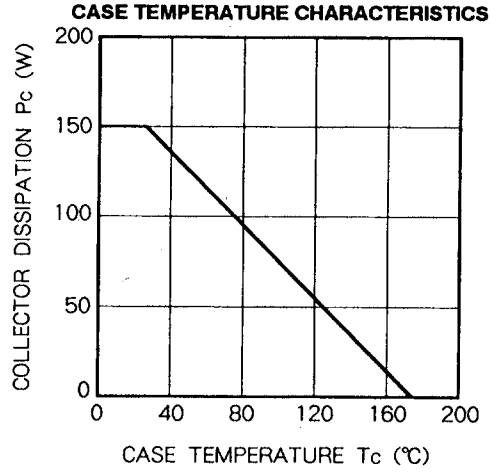
Dimensions in mm

L1, L2 : Microstrip : Board material 1.6mm thick, glass-teflon εr = 2.6
L3 : 5D, 2Turn, 1P, φ1.6mm silver plated copper wire
L4 : 5D, 5Turn, 1P, φ1.6mm silver plated copper wire
RFC : 5D, 8Turn, 1P, φ0.7mm enameled wire

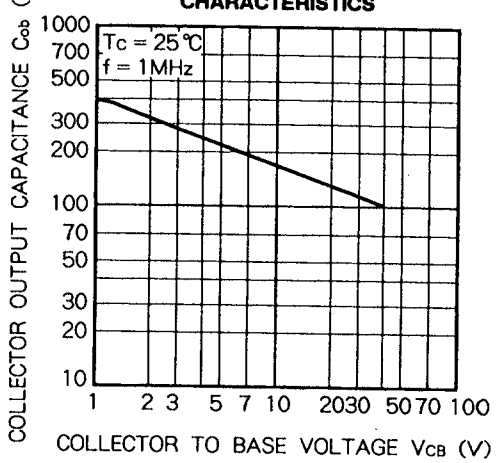
F.B : Ferrite Bead
C1 : 47pF, 2200pF, 22000pF, 2200μF in Paralleled
C2 : 47pF, 2200pF, 22000pF, 2200μF, 100μF

TYPICAL PERFORMANCE DATA

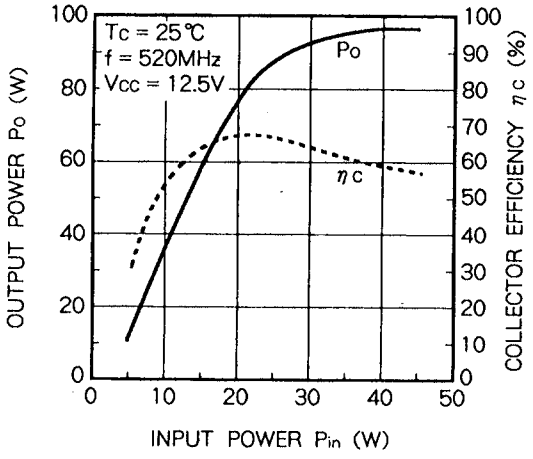
COLLECTOR DISSIPATION VS. CASE TEMPERATURE CHARACTERISTICS



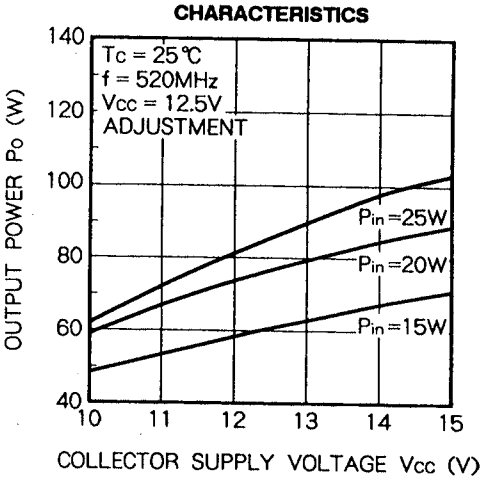
COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE CHARACTERISTICS



OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER CHARACTERISTICS



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE CHARACTERISTICS



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DC CURRENT GAIN VS.
COLLECTOR CURRENT CHARACTERISTICS