MITSUBISHI RF POWER TRANSISTOR

2SC2540

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

2SC2540 is a silicon NPN epitaxial planar type transistor designed for RF power amplifiers in VHF band mobile radio applications.

FEATURES

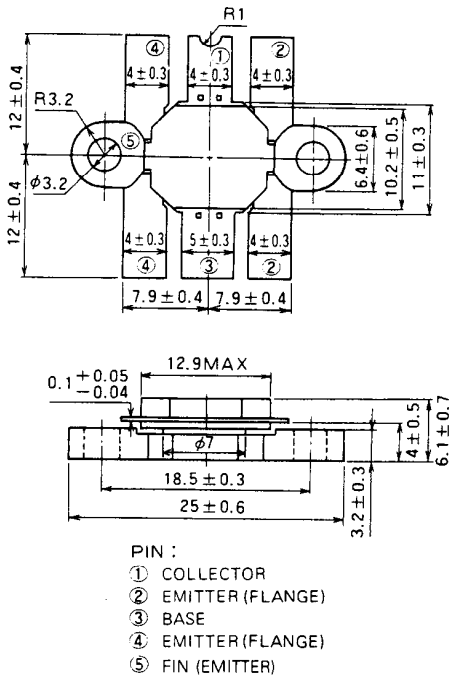
- High power gain: $G_{pe} \geqq 8.2$dB
  @V_{CC} = 13.5V, P_O = 40W, f = 175MHz
- Emitter ballasted construction and gold metallization for high reliability and good performances.
- Low thermal resistance ceramic package with flange.
- Ability of withstanding more than 20:1 load VSWR when operated at V_{CC} = 15.2V, P_O = 40W, f = 175MHz, T_C = 25°C.

APPLICATION

30 to 35 watts output power amplifiers in VHF band mobile radio applications.

OUTLINE DRAWING

Dimensions in mm



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

T-40E

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} = ∞	17	V
I_C	Collector current		10	A
P_C	Collector dissipation	T_a = 25°C	4.5	W
		T_C = 25°C	80	W
T_j	Junction temperature		175	°C
Tstg	Storage temperature		−55 to 175	°C
Rth-a	Thermal resistance	Junction to ambient	33.3	°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} = ∞	17			V
I_{CBO}	Collector cutoff current	V_{CB} = 15V, I_E = 0			2.5	mA
I_{EBO}	Emitter cutoff current	V_{EB} = 3V, I_C = 0			2	mA
h_{FE}	DC forward current gain*	V_{CE} = 10V, I_C = 0.2A	10	60	180	—
P_O	Output power	V_{CC} = 13.5V, P_{in} = 6W, f = 175MHz	40	45		W
η_C	Collector efficiency		60	70		%

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

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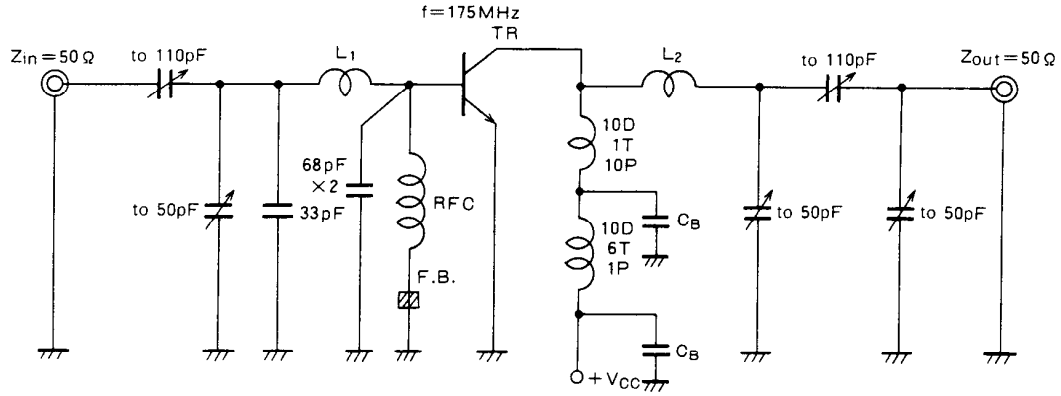
TEST CIRCUIT

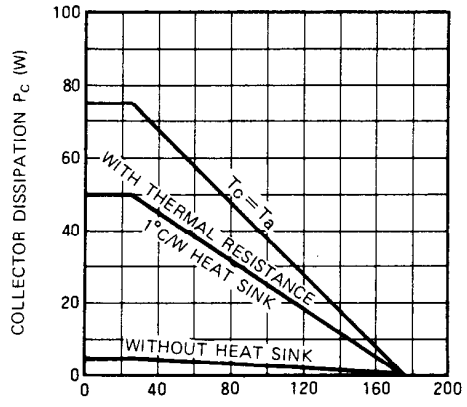


L1: Length = 10mm, width = 6mm, thickness = 0.3mm copper plate
L2: Length = 10mm, width = 3mm, thickness = 0.3mm copper plate
F.B.: Ferrite bead
RFC: 0.4mmφ enameled copper wire 17 turn
C_B: 10μF, 1000pF, 150pF in parallel

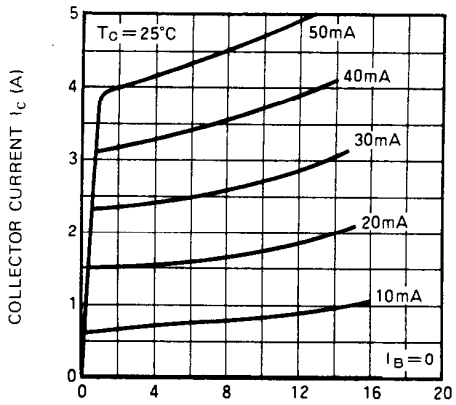
NOTES: Coils are made from 1.5mmφ silver plated copper wire except L1 & L2
D: Inner diameter of coil
T: Turn number of coil
P: Pitch of coil
Dimension in milli-meter

TYPICAL PERFORMANCE DATA

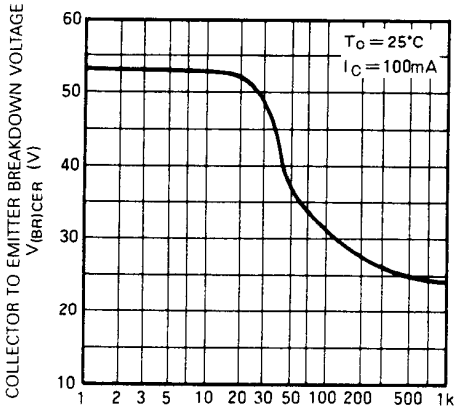
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



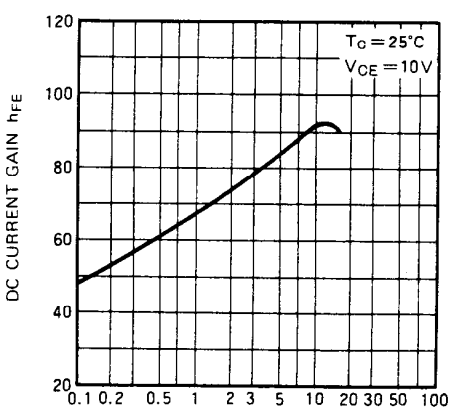
COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE



DC CURRENT GAIN VS. COLLECTOR CURRENT



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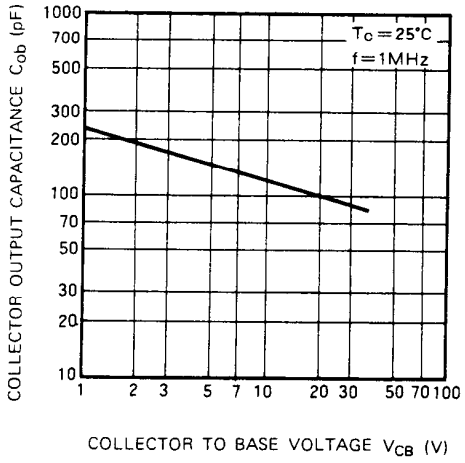
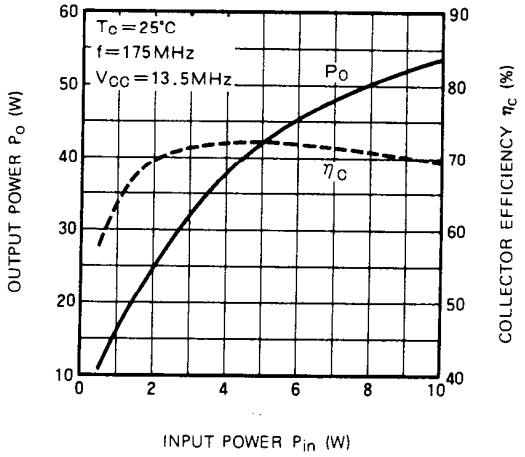
COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE