MITSUBISHI RF POWER TRANSISTOR

2SC2538

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

2SC2538 is a silicon NPN epitaxial planar type transistor designed for RF amplifiers on VHF band mobile radio applications.

FEATURES

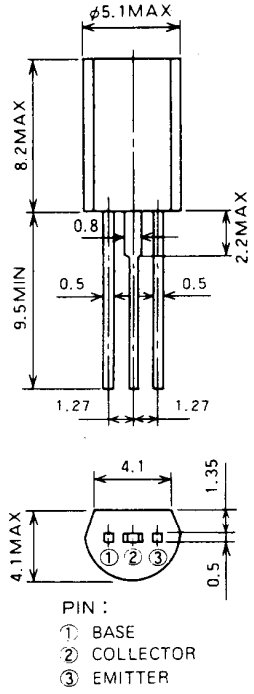
- High power gain: $G_{pe} \geqq 10$dB
  @V_{CC} = 13.5V, P_O = 0.5W, f = 175MHz
- TO-92 similar package is combinient for mounting.
- Equivalent input/output series impedance:
  Z_{in} = 5.3 – j2.9Ω @V_{CC} = 13.5V, P_O = 500mW, f = 175MHz
  Z_{out} = 29 – j63.5Ω

APPLICATION

Driver amplifiers in general VHF band mobile radio applications.

OUTLINE DRAWING

Dimensions in mm



PIN :
① BASE
② COLLECTOR
③ EMITTER

TO-92L

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

Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector to base voltage		40	V
V_{EBO}	Emitter to base voltage		4	V
V_{CEO}	Collector to emitter voltage	R_{BE} = ∞	17	V
I_C	Collector current		0.4	A
P_C	Collector dissipation	Ta = 25°C	0.7	W
		T_C = 25°C	3	W
T_j	Junction temperature		135	°C
Tstg	Storage temperature		−55 to 135	°C
Rth-a	Thermal resistance	Junction to ambient	157	°C/W
Rth-c		Junction to case	36.7	°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 = 1mA, I_C = 0	4			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	I_C = 1mA, I_E = 0	40			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	I_C = 10mA, R_{BE} = ∞	17			V
I_{CBO}	Collector cutoff current	V_{CB} = 15V, I_E = 0			100	μA
I_{EBO}	Emitter cutoff current	V_{EB} = 3V, I_C = 0			200	μA
h_{FE}	DC forward current gain *	V_{CE} = 10V, I_C = 0.1A	10	80	300	—
P_O	Output power	V_{CC} = 13.5V, P_{in} = 50mW, f = 175MHz	500	600		mW
η_C	Collector efficiency		45	55		%

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

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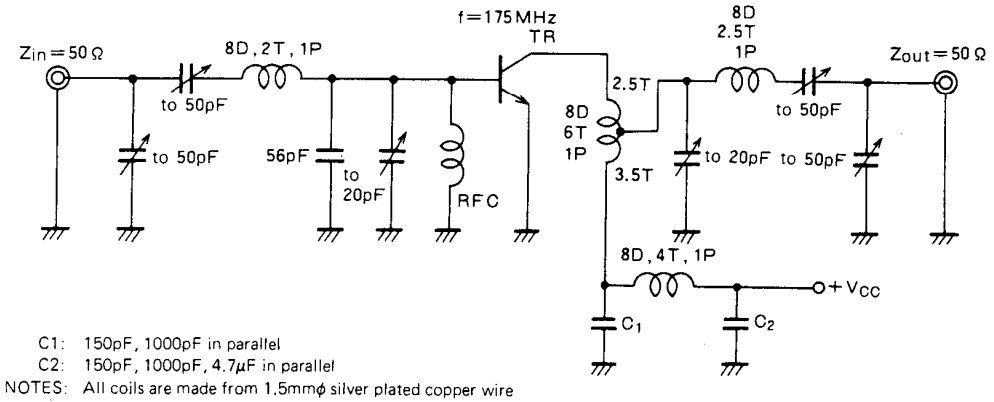
NPN EPITAXIAL PLANAR TYPE

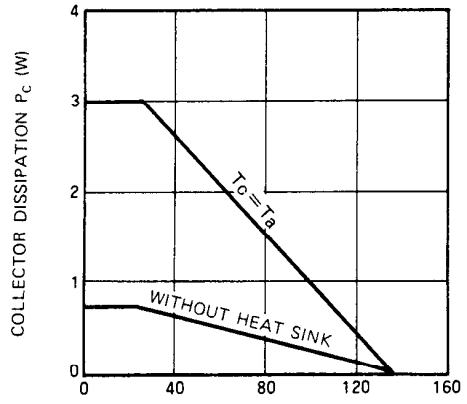
TEST CIRCUIT



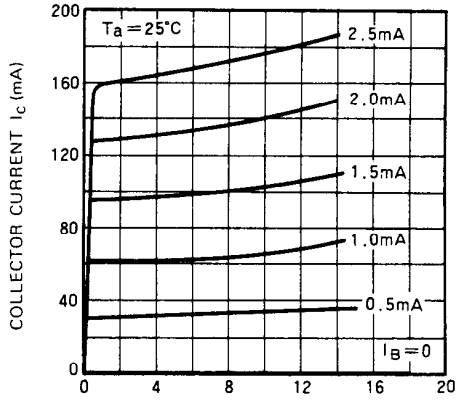
C1: 150pF, 1000pF in parallel
C2: 150pF, 1000pF, 4.7μF in parallel
NOTES: All coils are made from 1.5mmφ silver plated copper wire
Coil Dimensions in milli-meter
D: Inner diameter of coil
T: Turn number of coil
P: Pitch of coil

TYPICAL PERFORMANCE DATA

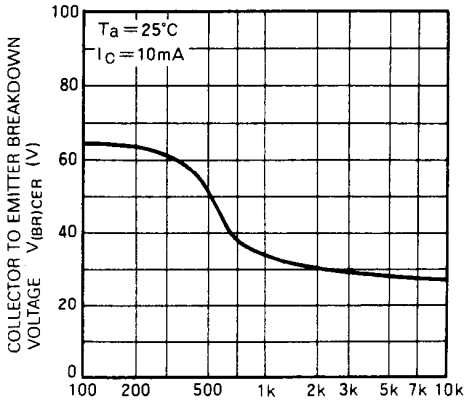
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



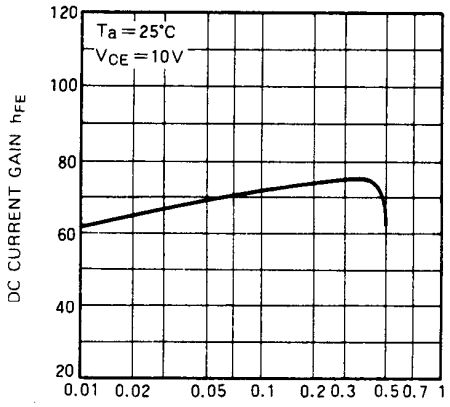
COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE



DC CURRENT GAIN VS. COLLECTOR CURRENT



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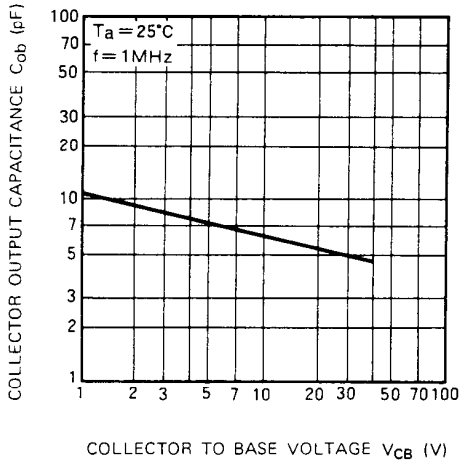
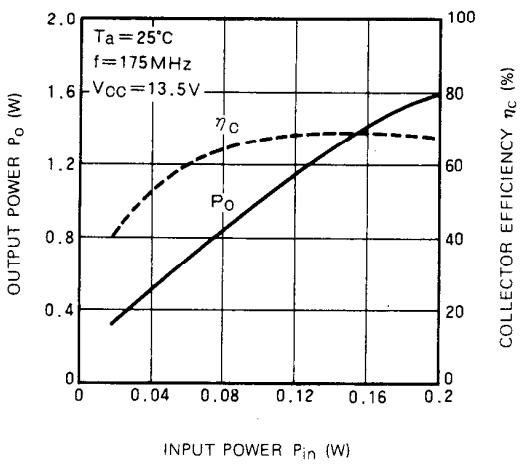
COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE