MITSUBISHI RF POWER TRANSISTOR

2SC2904

NPN EPITAXIAL PLANAR TYPE

DISCRIPTION

2SC2904 is a silicon NPN epitaxial planar type transistor specifically designed for high power amplifiers in HF band.

FEATURES

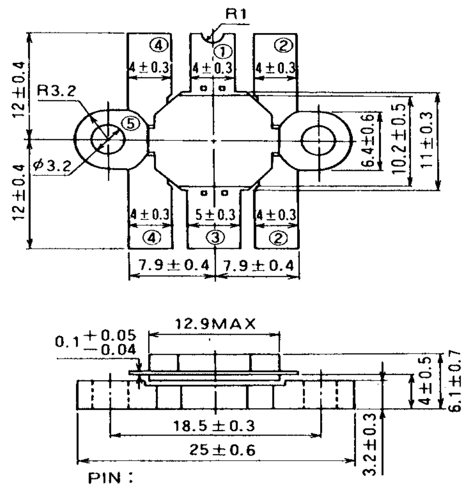
- High gain: $G_{pe} \geqq 11.5dB$ @V_{CC} = 12.5V, Po=100W, f=30MHz
- High ruggedness: Ability to withstand 20:1 load VSWR when operated at f = 30MHz P_O = 100W, V_{CC} = 15.2V
- Emitter ballansted construction
- Low thermal resistance ceramic package with flange.

APPLICATION

Output stage of transmitter in HF band SSB mobile radio sets.

OUTLINE DRAWING

Dimensions in mm



PIN :
① COLLECTOR
② EMITTER
③ BASE
④ EMITTER
⑤ FIN

NOTE: ALL ELECTRODES ARE ISOLATED FROM FLANGE.

T-40

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

Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector to base voltage		50	V
V_{EBO}	Emitter to base voltage		5	V
V_{CEO}	Collector to emitter voltage	$R_{BE}=\infty$	20	V
I_C	Collector current		22	A
P_C	Collector dissipation	Ta=25°C	7.8	W
		T_C=25°C	200	W
T_j	Junction temperature		175	°C
Tstg	Storage temperature		−55 to 175	°C
Rth-c	Thermal resistance		0.75	°C/W

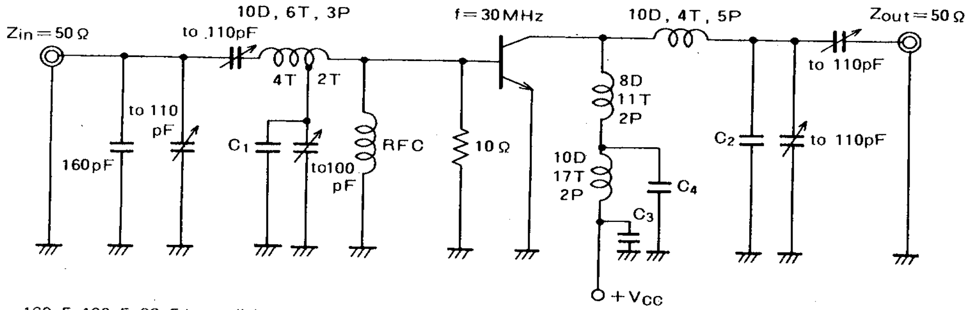
Note. Above parameters are guaranteed independently.

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

Symbol	Parameter	Test conditions	Limits Min	Limits Typ	Limits Max	Unit
$V_{(BR)EBO}$	Emitter to base breakdown voltage	I_E=20mA, I_C=0	5			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	I_C=20mA, I_E=0	50			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	I_C=100mA, $R_{BE}=\infty$	20			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}=10V, I_C=1A	10	50	180	—
P_O	Output power	f=30MHz, V_{CC}=12.5V, P_{in}=7W	100	110		W
η_C	Collector efficiency		55	60		%

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

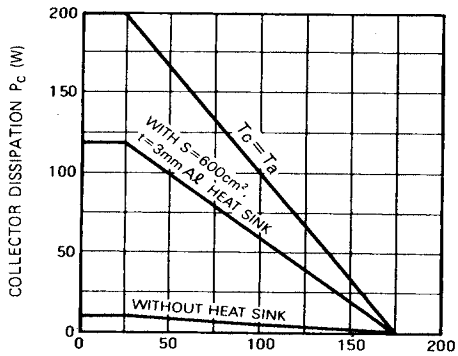
TEST CIRCUIT



C_1: 160pF, 160pF, 82pF in parallel
C_2: 82pF, 82pF, 82pF in parallel
C_3: 100pF, 4700pF, 4700pF, 0.22μF, 0.22μF, 33μF, 330μF in parallel
C_4: 100pF, 220pF, 4700pF, 0.1μF, 330μF in parallel
NOTES: All coils but L_1 are made from 1.5ϕmm silver plated copper wire, L_1 is made from 2.3ϕmm copper wire.
D: Inner diameter of coil P: Pitch of coil
T: Turn number of coil Dimension is milli-meter

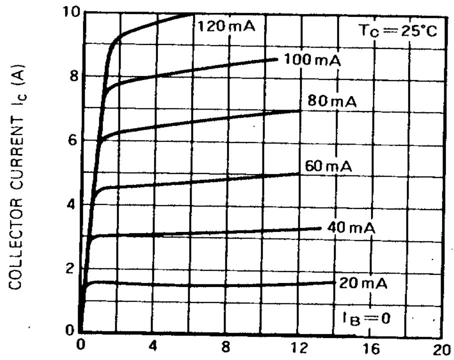
TYPICAL PERFORMANCE DATE

COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



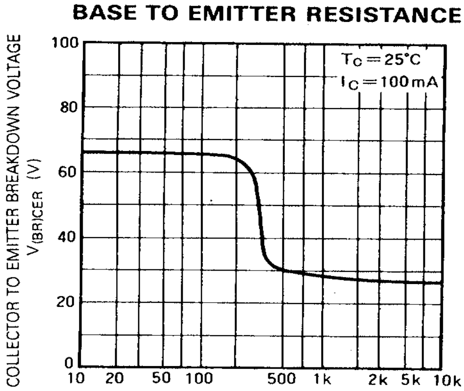
AMBIENT TEMPERATURE T_a (°C)

COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



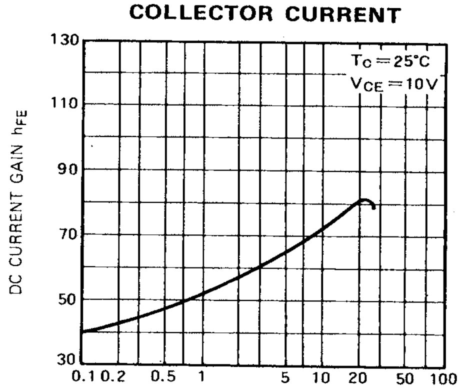
COLLECTOR TO EMITTER VOLTAGE V_{CE} (V)

COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE



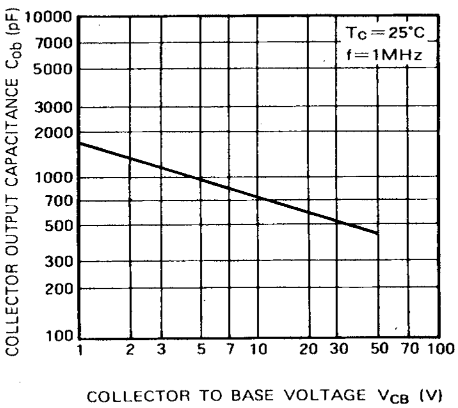
BASE TO EMITTER RESISTANCE R_{BE} (Ω)

DC CURRENT GAIN VS. COLLECTOR CURRENT

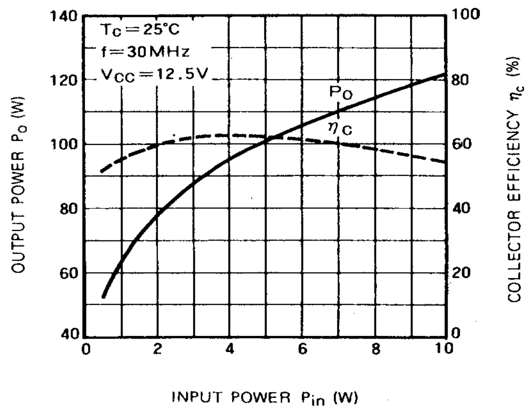


COLLECTOR CURRENT I_C (A)

COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE