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

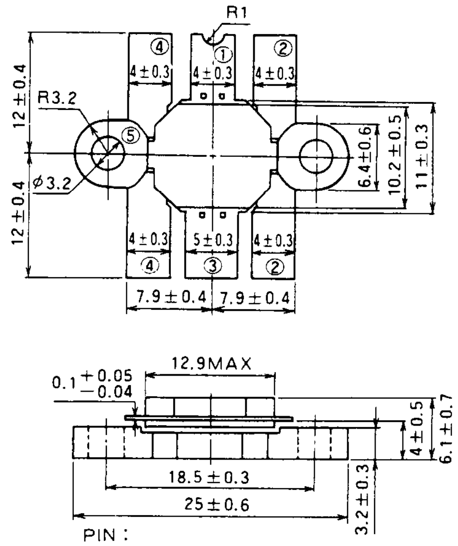
- High gain: $G_{pe} \geqq 11.5dB$
  @V_{CC} = 12.5V, Po=100W, f=30MHz
- High ruggedness: Ability to withstand 20:1 load VSWR when operated at f = 30MHz
  P_O = 100W, V_{CC} = 15.2V
- Emitter ballansted construction
- Low thermal resistance ceramic package with flange.

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	T_a=25°C	7.8	W
		T_C=25°C	200	W
T_j	Junction temperature		175	°C
T_{stg}	Storage temperature		−55 to 175	°C
$R_{th\text{-}c}$	Thermal resistance		0.75	°C/W

Note. Above parameters are guaranteed independently.

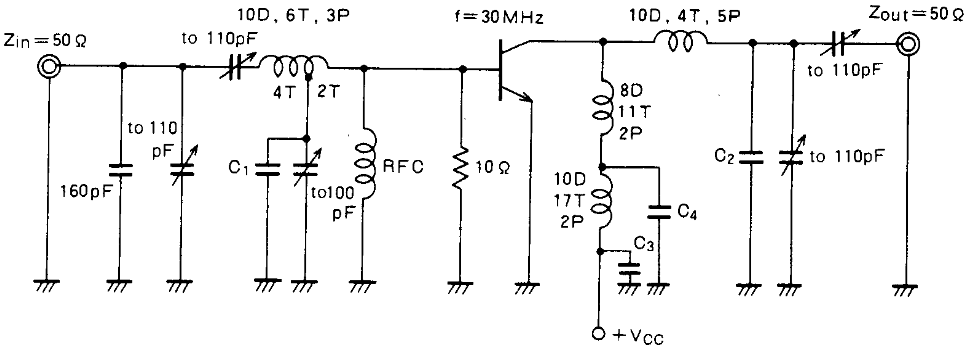
ELECTRICAL CHARACTERISTICS (T_C=25°C unless otherwise specified)

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.

NOV. '97

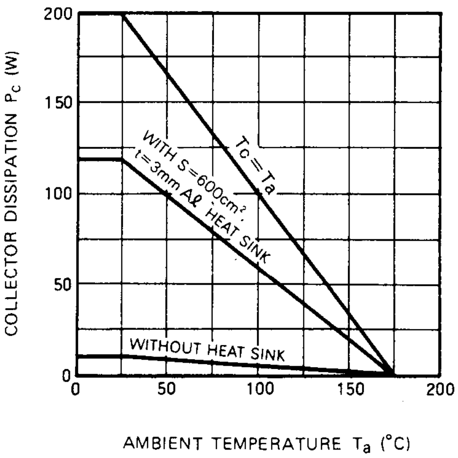
TEST CIRCUIT



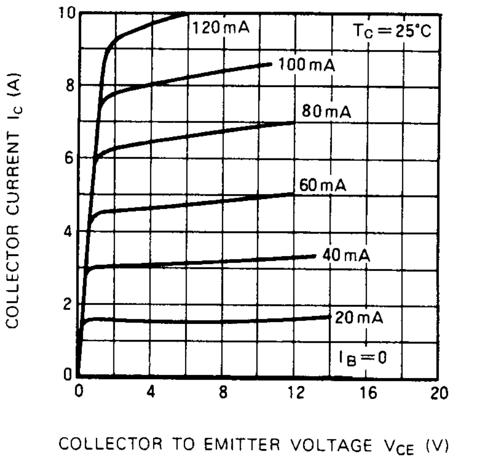
C_1: 160pF, 160pF, 82pF in parallel
C_2: 82pF, 82pF, 82pF in parallel
C_3: 100pF, 4700pF, 4700pF, 0.22μF, 0.22μF, 33μF, 330μF in parallel
C_4: 100pF, 220pF, 4700pF, 0.1μF, 330μF in parallel
NOTES: All coils but L_1 are made from 1.5ϕmm silver plated copper wire, L_1 is made from 2.3ϕmm copper wire.
D: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

TYPICAL PERFORMANCE DATE

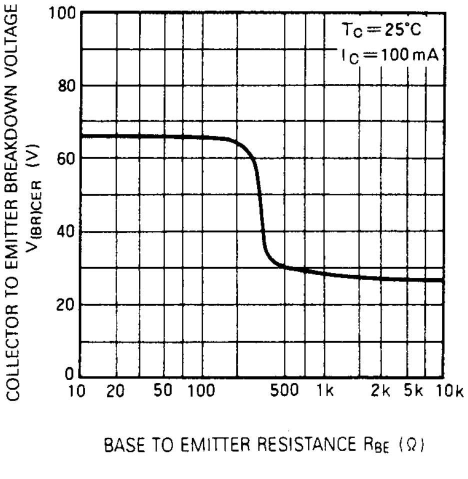
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



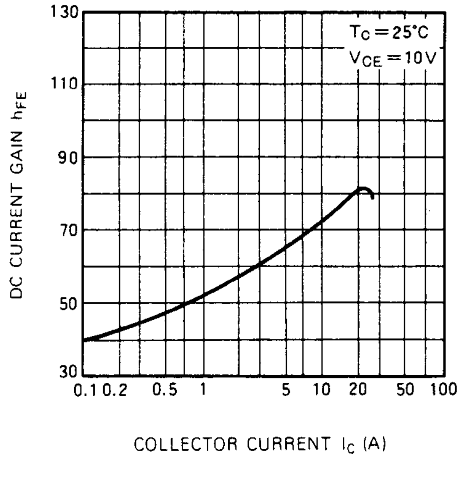
COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



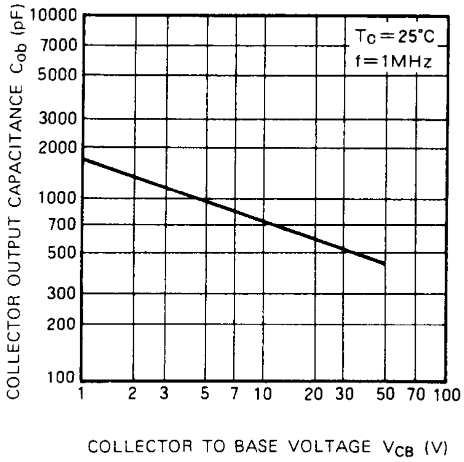
COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE



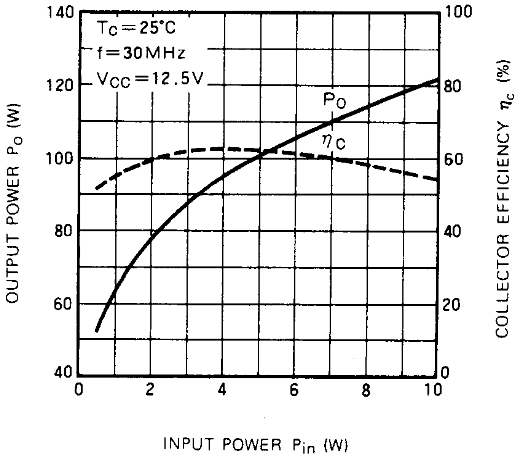
DC CURRENT GAIN VS. COLLECTOR CURRENT



COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE