

DISCRIPTION

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

FEATURES

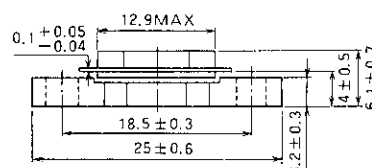
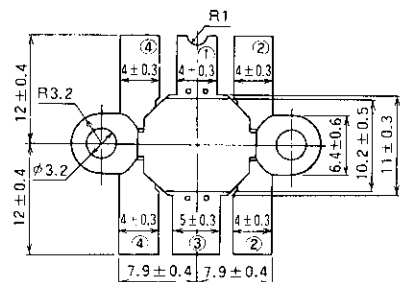
- High gain: $G_{pe} \geq 11.5\text{dB}$
@ $V_{CC} = 12.5\text{V}$, $P_o = 100\text{W}$, $f = 30\text{MHz}$
- High ruggedness: Ability to withstand 20:1 load VSWR when operated at $f = 30\text{MHz}$
 $P_o = 100\text{W}$, $V_{CC} = 15.2\text{V}$
- Emitter ballansted construction
- Low thermal resistance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

APPLICATION

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

OUTLINE DRAWING

Dimensions in mm



- ① COLLECTOR
- ② EMITTER
- ③ BASE
- ④ EMITTER

NOTE: EMITTER ELECTRODES ARE CONNECTED WITH FLANGE.

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise specified)

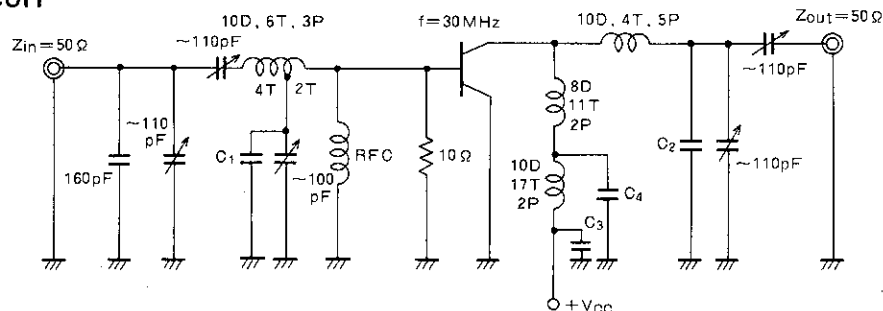
Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector to base voltage		50	V
V_{EBO}	Emitter to base voltage		5	V
V_{CEB}	Collector to emitter voltage	$R_{BE} = \infty$	20	V
I_C	Collector current		22	A
P_C	Collector dissipation	$T_a = 25^\circ\text{C}$	7.8	W
		$T_C = 25^\circ\text{C}$	200	W
T_J	Junction temperature		+175	$^\circ\text{C}$
T_{stg}	Storage temperature		-55 ~ +175	$^\circ\text{C}$
R_{th-c}	Thermal resistance		0.75	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	$I_E = 20\text{mA}$, $I_C = 0$	5			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	$I_C = 20\text{mA}$, $I_E = 0$	50			V
$V_{(BR)CEB}$	Collector to emitter breakdown voltage	$I_C = 100\text{mA}$, $R_{BE} = \infty$	20			V
I_{CBO}	Collector cutoff current	$V_{CB} = 15\text{V}$, $I_E = 0$			5	mA
I_{EBO}	Emitter cutoff current	$V_{EB} = 3\text{V}$, $I_C = 0$			5	mA
h_{FE}	DC forward current gain *	$V_{CE} = 10\text{V}$, $I_C = 1\text{A}$	10	50	180	—
P_O	Output power	$f = 30\text{MHz}$, $V_{CC} = 12.5\text{V}$, $P_{in} = 7\text{W}$	100	110		W
η_C	Collector efficiency		55	60		%

* Note: Pulse test, $P_W = 150\mu\text{s}$, duty = 5%

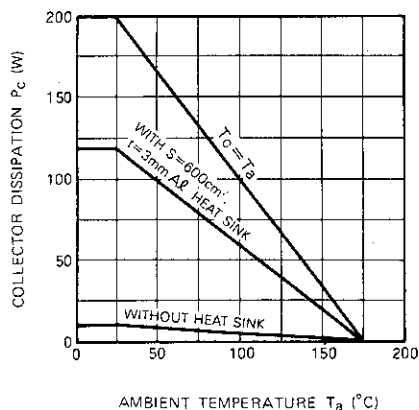
TEST CIRCUIT



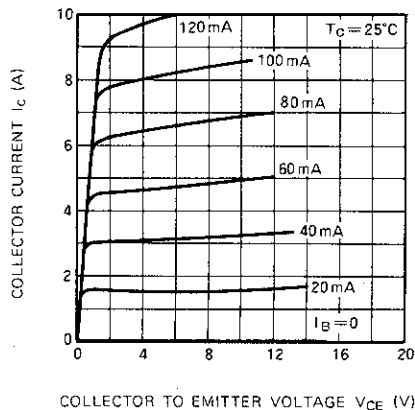
C₁: 160pF, 160pF, 82pF in parallel
C₂: 82pF, 82pF, 82pF in parallel
C₃: 100pF, 4700pF, 4700pF, 0.22μF, 0.22μF, 33μF, 330μF in parallel
C₄: 100pF, 220pF, 4700pF, 0.1μF, 330μF in parallel
NOTES: All coils but L₁ are made from 1.5φmm silver plated copper wire, L₁ is made from 2.3φmm copper wire.
D: Inner diameter of coil P: Pitch of coil
T: Turn number of coil Dimension is milli-meter

TYPICAL PERFORMANCE DATA

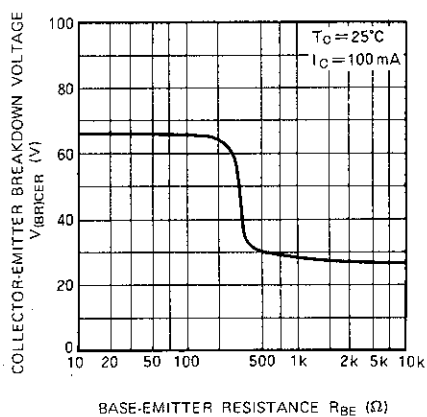
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



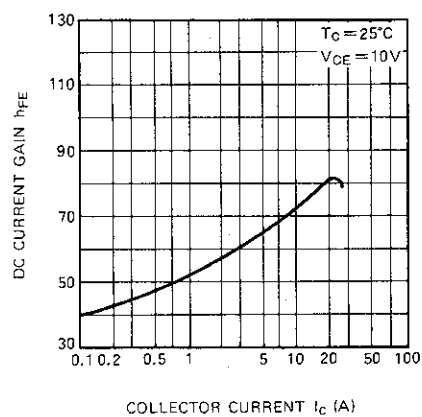
COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



COLLECTOR-EMITTER BREAKDOWN VOLTAGE VS. BASE-EMITTER RESISTANCE

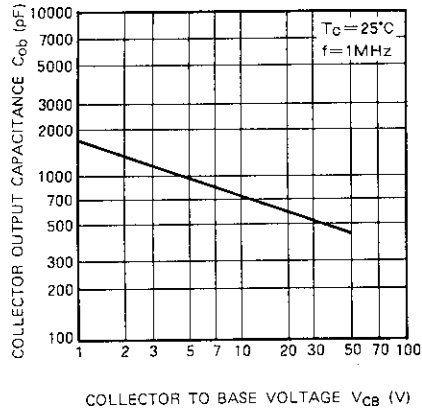


DC CURRENT GAIN VS. COLLECTOR CURRENT

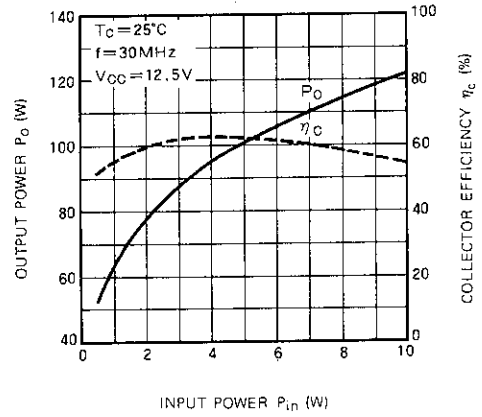


NPN EPITAXIAL PLANAR TYPE

**COLLECTOR OUTPUT CAPACITANCE
 VS. COLLECTOR TO BASE VOLTAGE**



**OUTPUT POWER, COLLECTOR
 EFFICIENCY VS. INPUT POWER**



**OUTPUT POWER VS. COLLECTOR
 SUPPLY VOLTAGE**

