

## DESCRIPTION

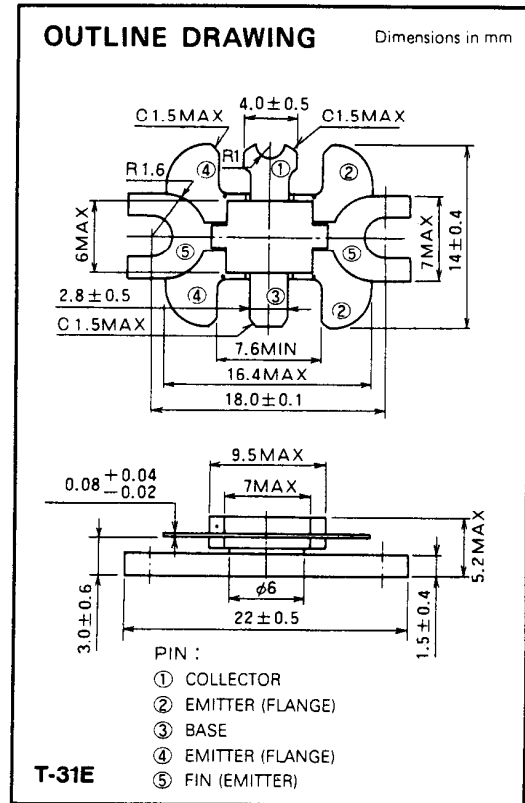
2SC2094 is a silicon NPN epitaxial planar type transistor designed for RF power amplifiers in VHF band mobile radio applications.

## FEATURES

- High power gain:  $G_{pe} \geq 8.8\text{dB}$   
@  $V_{CC} = 13.5\text{V}$ ,  $P_O = 15\text{W}$ ,  $f = 175\text{MHz}$
- 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  $V_{CC} = 15.2\text{V}$ ,  $P_O = 18\text{W}$ ,  $f = 175\text{MHz}$ .
- Low intermodulation distortion:  $\text{IMD} - 30\text{dBc}(\text{typ}) @ 15\text{WPEP}$

## APPLICATION

10 to 14 watts output linear power amplifiers in VHF band.



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

Symbol	Parameter	Conditions	Ratings	Unit
$V_{CBO}$	Collector to base voltage		40	V
$V_{EBO}$	Emitter to base voltage		4.5	V
$V_{CEO}$	Collector to emitter voltage	$R_{BE} = \infty$	17	V
$I_C$	Collector current		3.5	A
$P_C$	Collector dissipation	$T_a = 25^\circ\text{C}$	2	W
		$T_C = 25^\circ\text{C}$	30	W
$T_j$	Junction temperature		175	$^\circ\text{C}$
$T_{stg}$	Storage temperature		-55 to 175	$^\circ\text{C}$
$R_{th-a}$	Thermal resistance	Junction to ambient	75	$^\circ\text{C/W}$
$R_{th-c}$		Junction to case	5	$^\circ\text{C/W}$

Note. Above parameters are guaranteed independently.

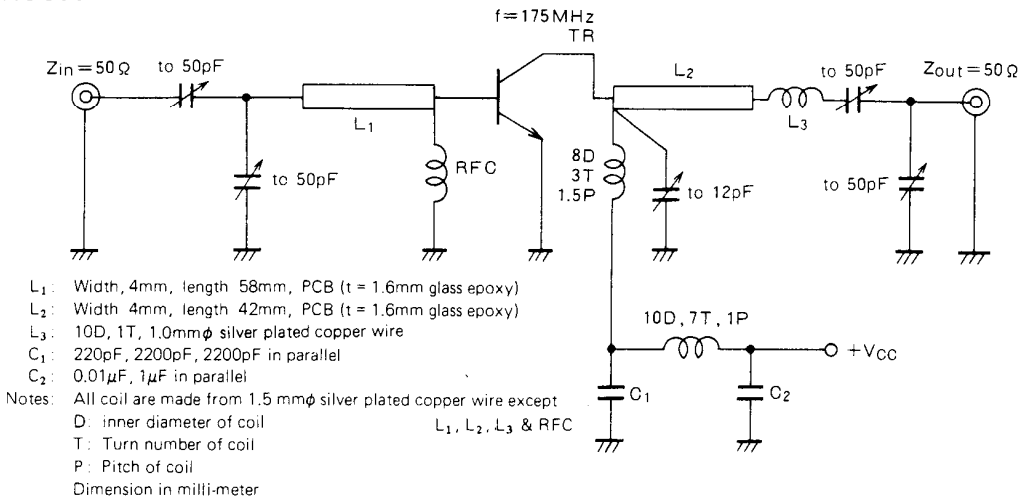
## ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	$I_E = 1\text{mA}$ , $I_C = 0$	4.5			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	$I_C = 10\text{mA}$ , $I_E = 0$	40			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	$I_C = 0.1\text{A}$ , $R_{BE} = \infty$	17			V
$I_{CBO}$	Collector cutoff current	$V_{CB} = 25\text{V}$ , $I_E = 0$			2	mA
$I_{EBO}$	Emitter cutoff current	$V_{EB} = 3\text{V}$ , $I_C = 0$			0.5	mA
$h_{FE}$	DC forward current gain*	$V_{CE} = 10\text{V}$ , $I_C = 0.1\text{A}$	10	50	180	—
* $P_O$	Output power	$V_{CC} = 13.5\text{V}$ , $P_{in} = 2\text{W}$ , $f = 175\text{MHz}$	15	16		W
$\eta_C$	Collector efficiency		60	70		%

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

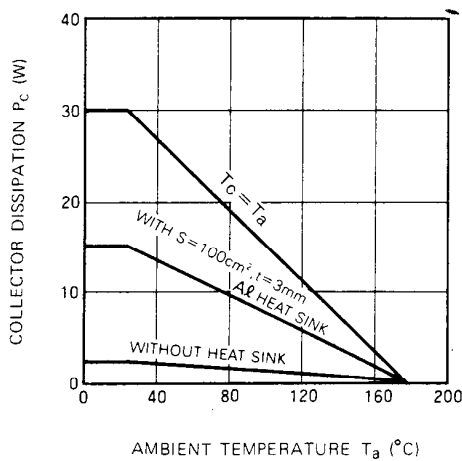
Above parameters, ratings, limits and conditions are subject to change.

**TEST CIRCUIT**

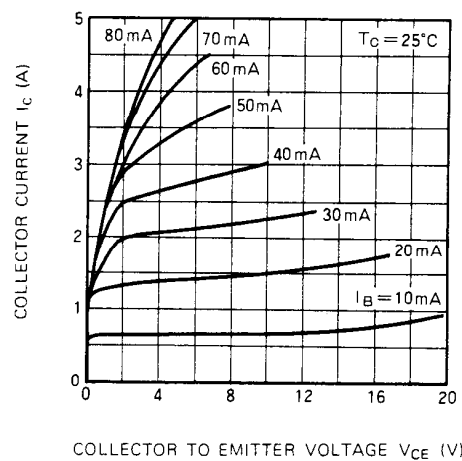


**TYPICAL PERFORMANCE DATA**

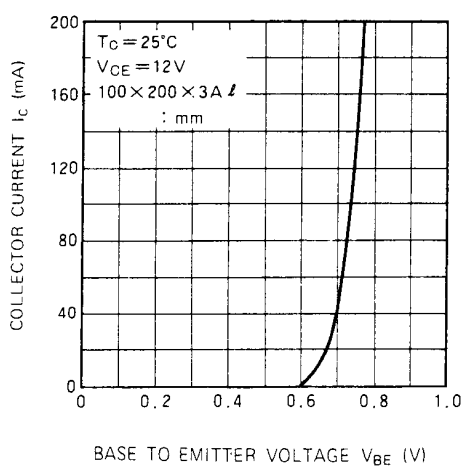
**COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE**



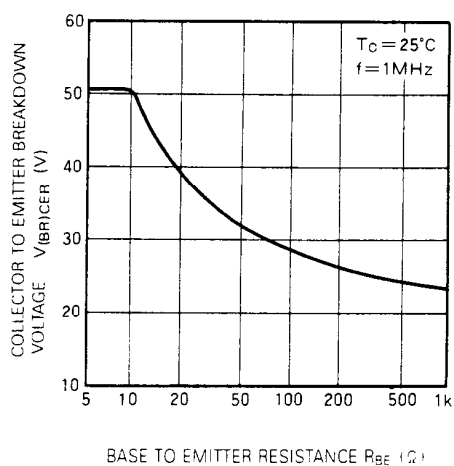
**COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE**



**COLLECTOR CURRENT VS. BASE TO EMITTER VOLTAGE**

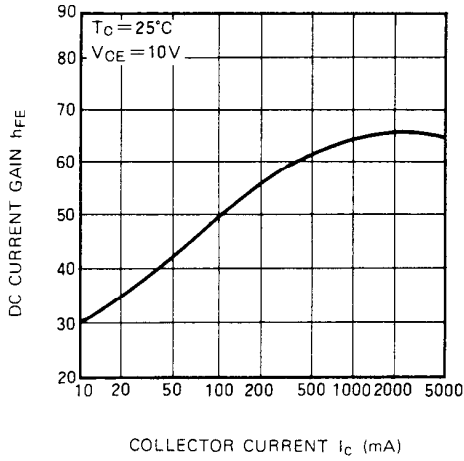


**COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE**

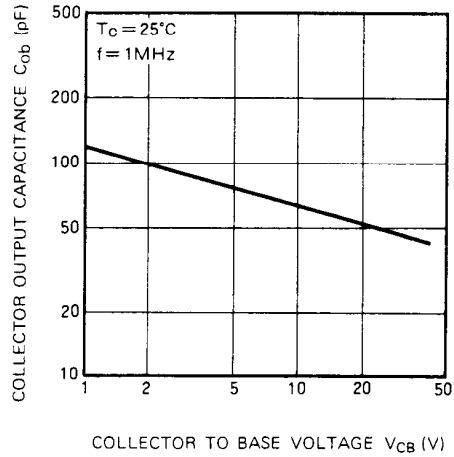


**NPN EPITAXIAL PLANAR TYPE**

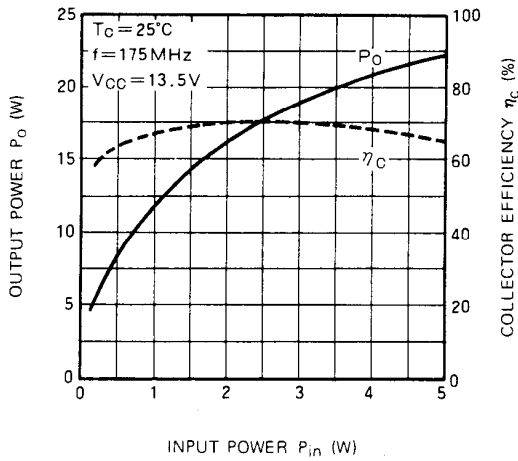
**DC CURRENT GAIN VS. COLLECTOR CURRENT**



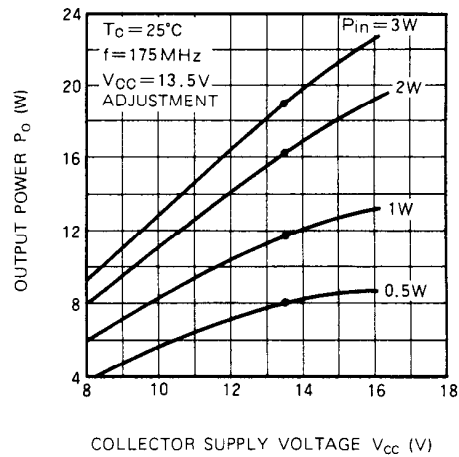
**COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE CHARACTERISTICS**



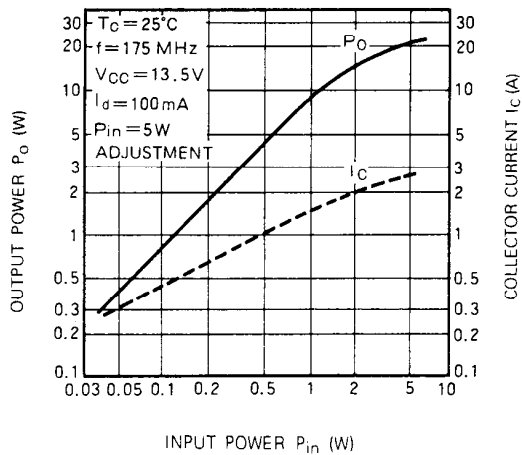
**OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER**



**OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE**



**IN CASE AB OPERATING OUTPUT POWER, COLLECTOR CURRENT VS. INPUT POWER**



**THIRD ORDER INTERMODULATION DISTORTION VS. OUTPUT POWER**

