

### DESCRIPTION

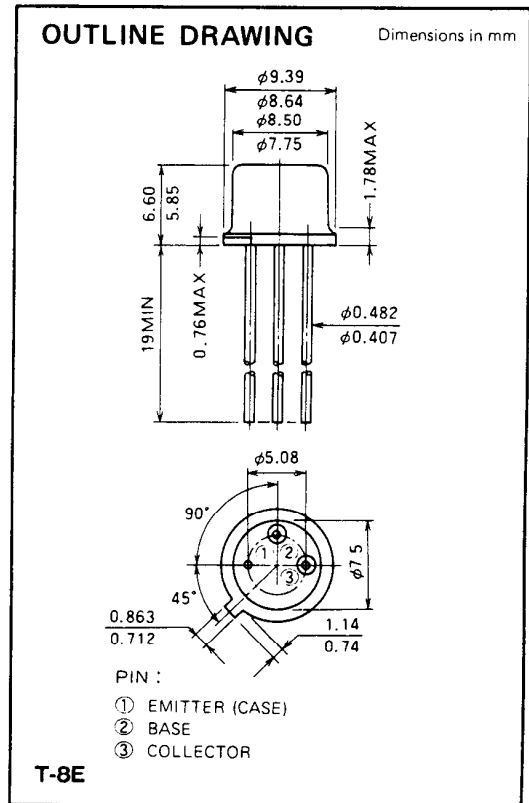
2SC1947 is a silicon NPN epitaxial planar type transistor designed for industrial use RF power amplifiers on VHF band mobile radio applications.

### FEATURES

- High power gain:  $G_{pe} \geq 10.7\text{dB}$   
@  $V_{CC} = 13.5\text{V}$ ,  $P_O = 3.5\text{W}$ ,  $f = 175\text{MHz}$
- TO-39 metal sealed package for high reliability.
- Emitter electrode is connected electrically to the case.

### APPLICATION

1 to 3 watt power amplifiers in VHF band mobile radio applications.



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

Symbol	Parameter	Conditions	Ratings	Unit
$V_{CBO}$	Collector to base voltage		35	V
$V_{EBO}$	Emitter to base voltage		4	V
$V_{CEO}$	Collector to emitter voltage	$R_{BE} = \infty$	17	V
$I_C$	Collector current		1	A
$P_C$	Collector dissipation	$T_a = 25^\circ\text{C}$	1	W
		$T_C = 25^\circ\text{C}$	10	W
$T_j$	Junction temperature		175	$^\circ\text{C}$
$T_{stg}$	Storage temperature		-65 to 175	$^\circ\text{C}$
$R_{th-a}$	Thermal resistance	Junction to ambient	150	$^\circ\text{C/W}$
$R_{th-c}$		Junction to case	15	$^\circ\text{C/W}$

Note: Above parameters are guaranteed independently.

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

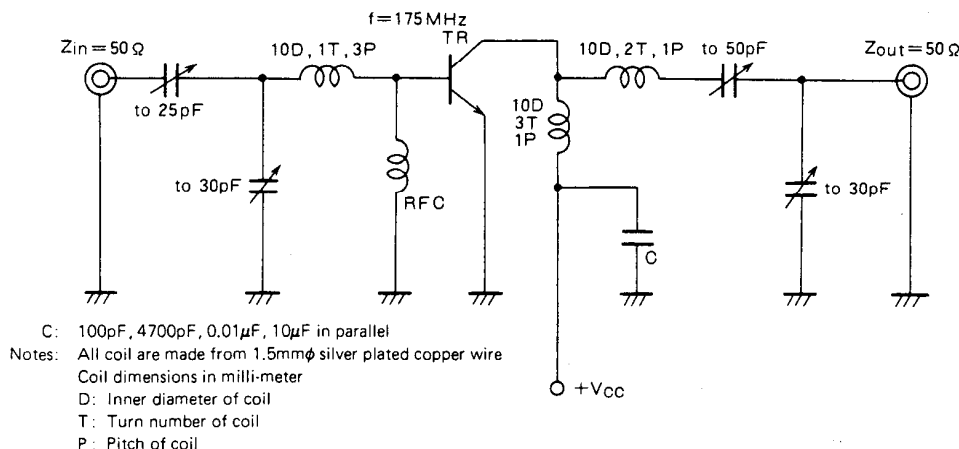
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	$I_E = 5\text{mA}$ , $I_C = 0$	4			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	$I_C = 10\text{mA}$ , $I_E = 0$	35			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	$I_C = 50\text{mA}$ , $R_{BE} = \infty$	17			V
$I_{CBO}$	Collector cutoff current	$V_{CB} = 25\text{V}$ , $I_E = 0$			500	$\mu\text{A}$
$I_{EBO}$	Emitter cutoff current	$V_{EB} = 3\text{V}$ , $I_C = 0$			500	$\mu\text{A}$
$h_{FE}$	DC forward current gain *	$V_{CE} = 10\text{V}$ , $I_C = 0.1\text{A}$	10	50	180	—
$P_O$	Output power **	$V_{CC} = 13.5\text{V}$ , $P_{in} = 0.3\text{W}$ , $f = 175\text{MHz}$	3.5	4		W
$\eta_C$	Collector efficiency		50	60		%

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

\*\* In case of the case grounded.

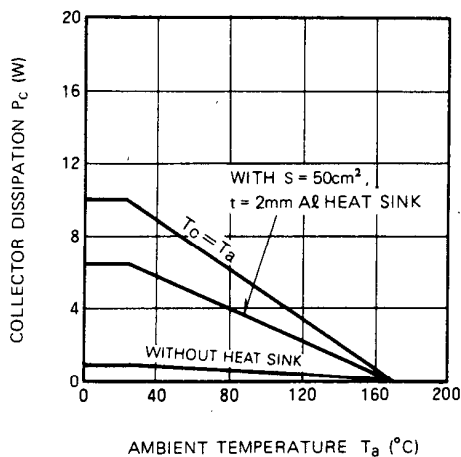
Above parameters, ratings, limits and conditions are subject to change.

**TEST CIRCUIT**

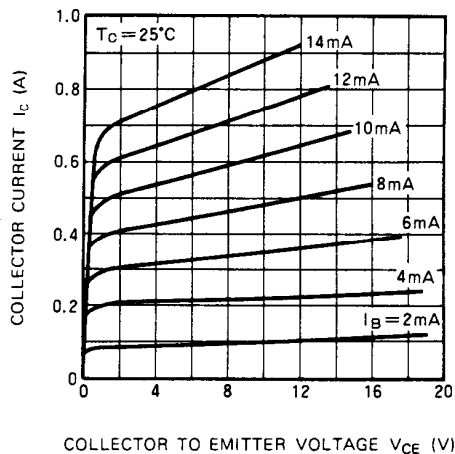


**TYPICAL PERFORMANCE DATA**

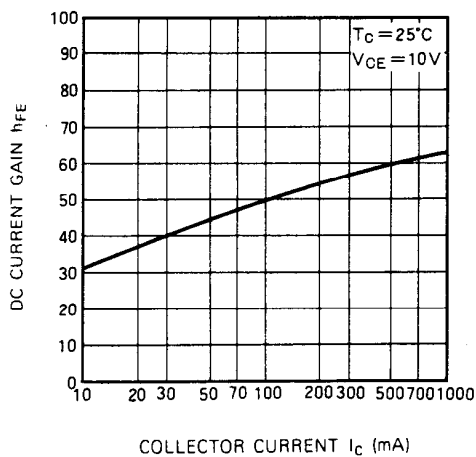
**COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE**



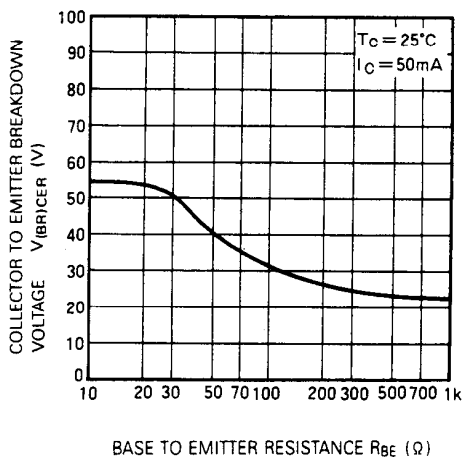
**COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE**



**DC CURRENT GAIN VS. COLLECTOR CURRENT**

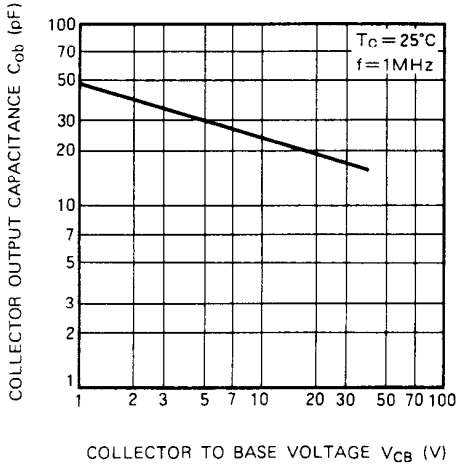


**COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE**

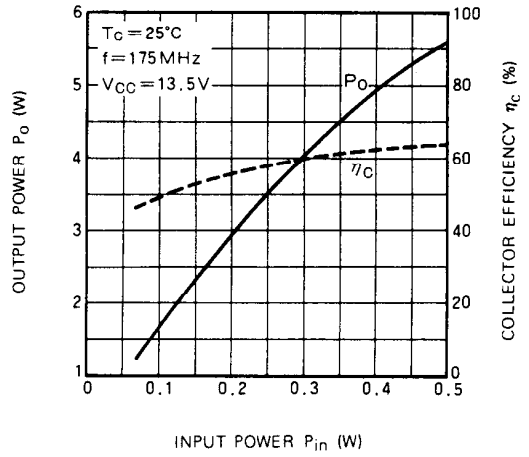


**NPN EPITAXIAL PLANAR TYPE**

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



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



**OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE**

