

DISCRIPTION

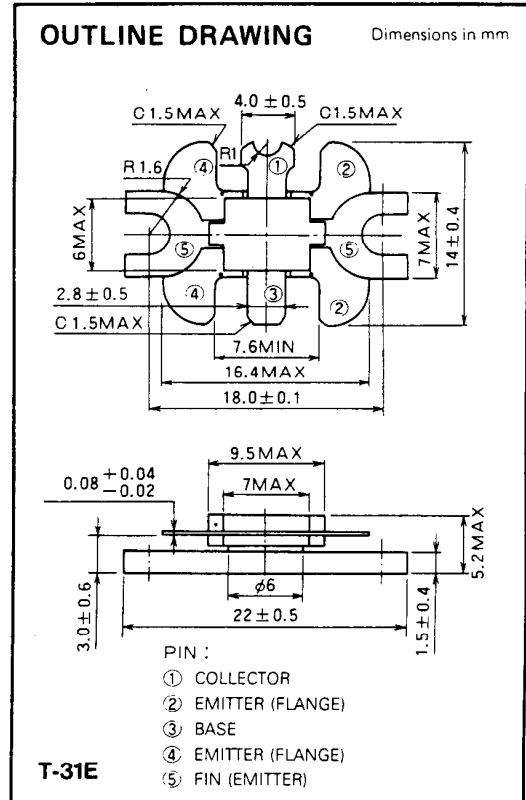
2SC1946 is a silicon NPN epitaxial planar type transistor designed for RF power amplifiers on VHF band mobile radio applications.

FEATURES

- High power gain: $G_{pe} \geq 6.7\text{dB}$
@ $V_{CC} = 13.5\text{V}$, $P_o = 28\text{W}$, $f = 175\text{MHz}$
- 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 $V_{CC} = 15.2\text{V}$, $P_o = 30\text{W}$, $f = 175\text{MHz}$.

APPLICATION

25 watts output power amplifiers applications 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		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		7	A
P_C	Collector dissipation	$T_a = 25^\circ\text{C}$	3	W
		$T_C = 25^\circ\text{C}$	50	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	50	$^\circ\text{C/W}$
R_{th-c}		Junction to case	3	$^\circ\text{C/W}$

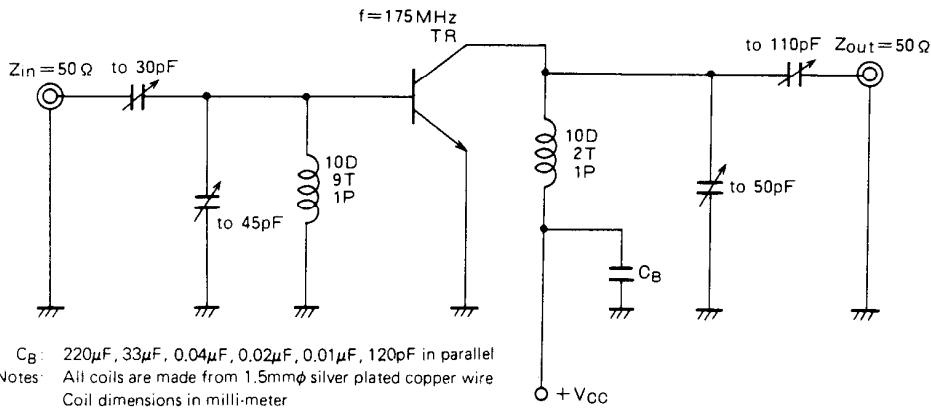
Note. Above parameters are guaranteed independently.

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	$I_E = 10\text{mA}$, $I_C = 0$	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	$I_C = 100\text{mA}$, $R_{BE} = \infty$	17			V
I_{CBO}	Collector cutoff current	$V_{CB} = 25\text{V}$, $I_E = 0$			2	mA
I_{EBO}	Emitter cutoff current	$V_{EB} = 3\text{V}$, $I_C = 0$			1	mA
h_{FE}	DC forward current gain *	$V_{CE} = 10\text{V}$, $I_C = 0.2\text{A}$	10	50	180	—
P_o	Output power	$V_{CC} = 13.5\text{V}$, $P_{in} = 6\text{W}$, $f = 175\text{MHz}$	28	32		W
η_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.

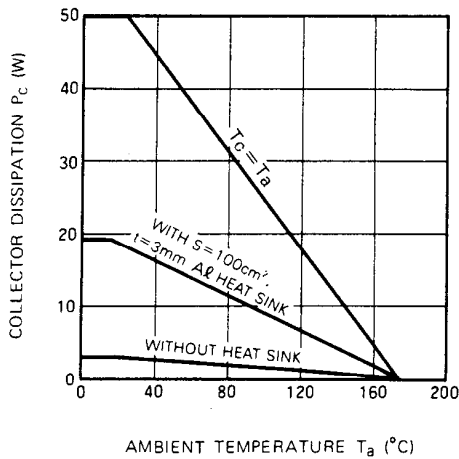
TEST CIRCUIT



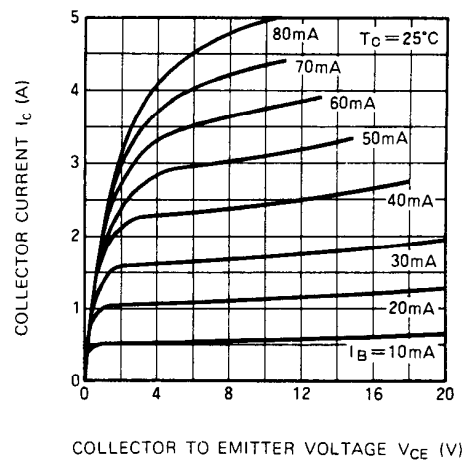
C_B : 220 μ F, 33 μ F, 0.04 μ F, 0.02 μ F, 0.01 μ F, 120pF in parallel
 Notes: All coils are made from 1.5mm ϕ silver plated copper wire
 Coil dimensions in milli-meter
 D: Inner diameter of coil
 T: Turn number of coil
 P: Pitch of coil

TYPICAL PERFORMANCE DATA

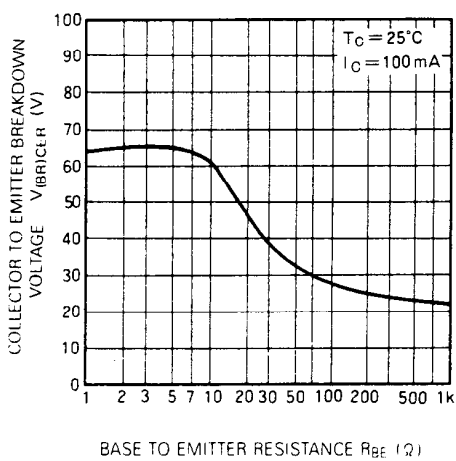
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



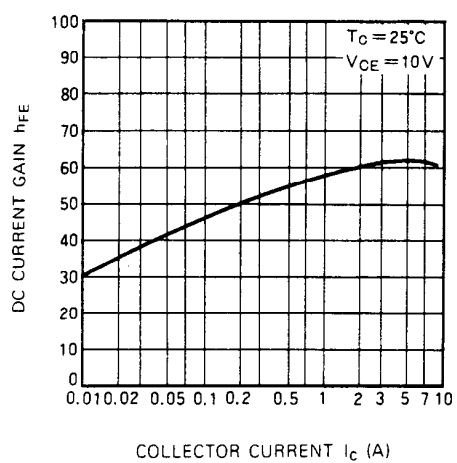
COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE

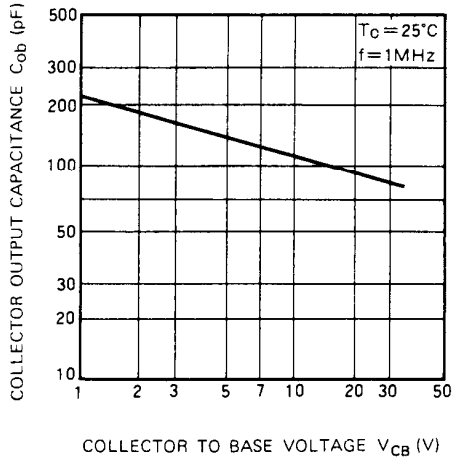


DC CURRENT GAIN VS. COLLECTOR CURRENT

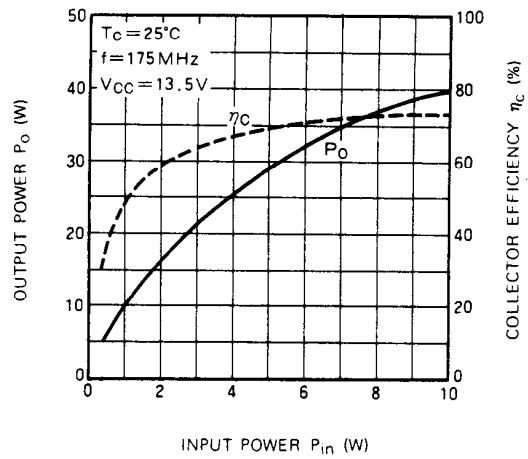


NPN EPITAXIAL PLANAR TYPE

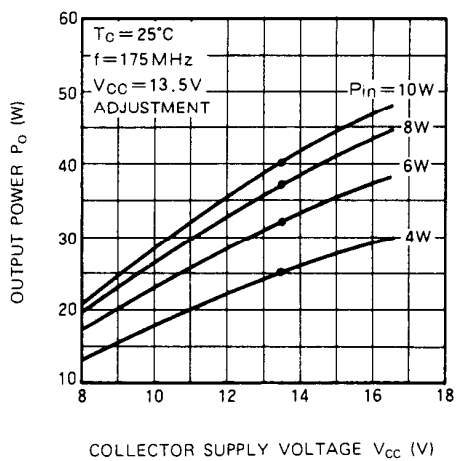
**COLLECTOR OUTPUT CAPACITANCE VS.
 COLLECTOR TO BASE VOLTAGE**



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



**OUTPUT POWER VS. COLLECTOR
 SUPPLY VOLTAGE**



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