

DISCRIPTION

2SC3133 is a silicon NPN epitaxial planar type transistor designed for RF power amplifiers in HF band mobile radio applications.

FEATURES

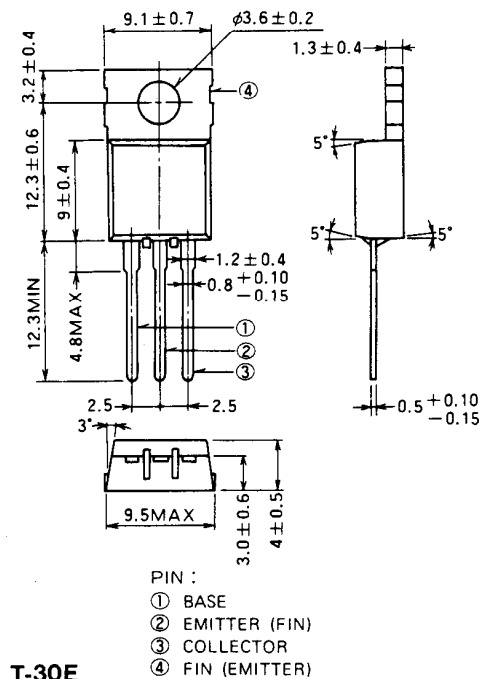
- High power gain: $G_{pe} \geq 14\text{dB}$
@ $f = 27\text{MHz}$, $V_{CC} = 12\text{V}$, $P_O = 13\text{W}$
- Emitter ballasted construction for high reliability and good performances.
- High ruggedness: The ability withstand infinite VSWR when operated at $f = 27\text{MHz}$, $P_O = 16\text{W}$, $V_{CC} = 16\text{V}$.
- Intermodulation distortion: $\text{IMD} \leq -25\text{dB}$
@ $f = 27\text{MHz}$, $V_{CC} = 12\text{V}$, $P_O = 13\text{W}$ (PEP)
- Input/output impedance:
 $Z_{in} = 1.8 - j2.5(\Omega)$, $Z_{out} = 7.0 - j3.5(\Omega)$
@ $f = 27\text{MHz}$, $V_{CC} = 12\text{V}$, $P_O = 13\text{W}$

APPLICATION

10 watts output power amplifiers in HF band SSB mobile radio application.

OUTLINE DRAWING

Dimensions in mm



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

Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector to base voltage		60	V
V_{EBO}	Emitter to base voltage		5	V
V_{CEO}	Collector to emitter voltage	$R_{BE} = \infty$	25	V
I_C	Collector current		6	A
P_C	Collector dissipation	$T_a = 25^\circ\text{C}$	1.5	W
		$T_C = 25^\circ\text{C}$	20	W
T_j	Junction temperature		150	$^\circ\text{C}$
T_{stg}	Storage temperature		-55 to 150	$^\circ\text{C}$
R_{th-a}	Thermal resistance	Junction to ambient	83.3	$^\circ\text{C/W}$
R_{th-c}		Junction to case	6.25	$^\circ\text{C/W}$

Note. Above parameters are guaranteed independently.

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

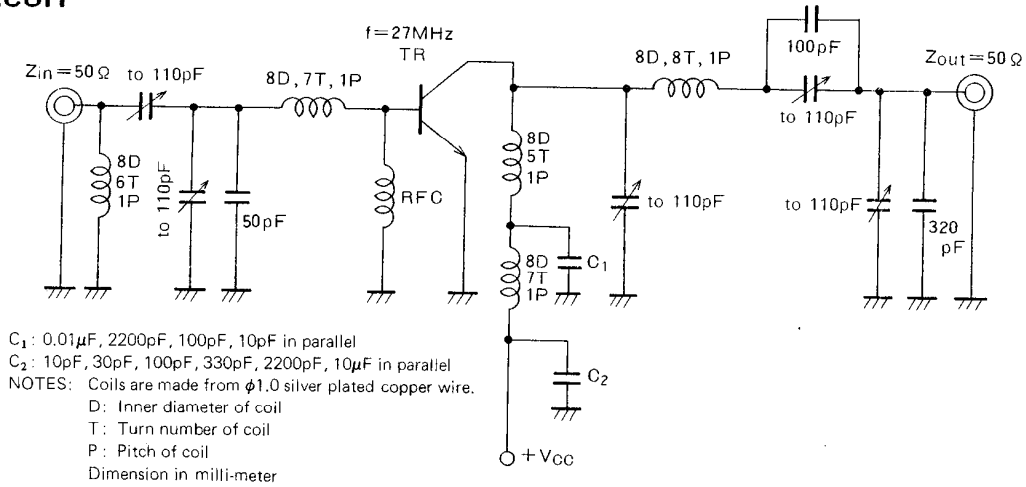
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	$I_E = 1\text{mA}$, $I_C = 0$	5			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	$I_C = 5\text{mA}$, $I_E = 0$	60			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	$I_C = 10\text{mA}$, $R_{BE} = \infty$	25			V
I_{CBO}	Collector cutoff current	$V_{CB} = 30\text{V}$, $I_E = 0$			500	μA
I_{EBO}	Emitter cutoff current	$V_{EB} = 4\text{V}$, $I_C = 0$			500	μA
h_{FE}	DC current gain *	$V_{CE} = 12\text{V}$, $I_C = 10\text{mA}$	10	50	180	—
P_O	Output power	$f = 27\text{MHz}$, $V_{CC} = 12\text{V}$, $P_{in} = 0.5\text{W}$	13	16		W
η_C	Collector efficiency		60	70		%

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

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

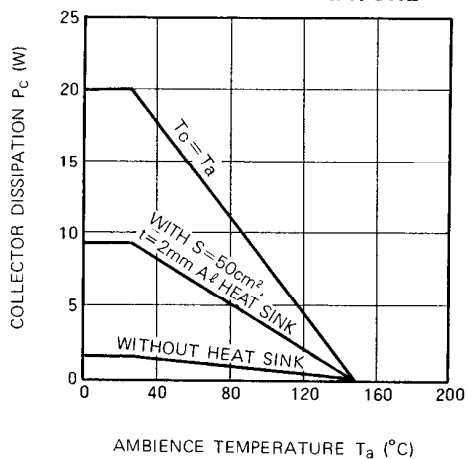
NPN EPITAXIAL PLANAR TYPE

TEST CIRCUIT

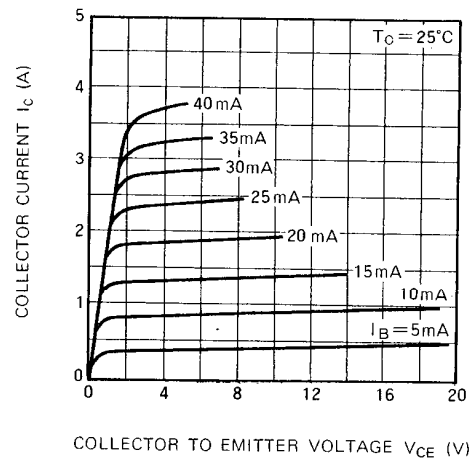


TYPICAL PERFORMANCE DATE

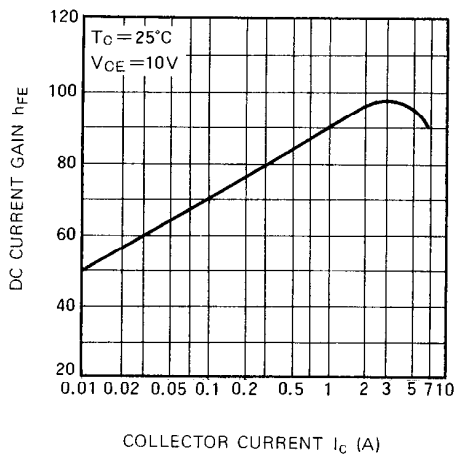
**COLLECTOR DISSIPATION VS.
AMBIENT TEMPERATURE**



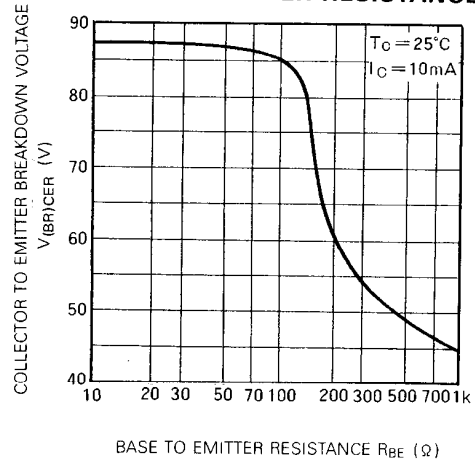
**COLLECTOR CURRENT VS.
COLLECTOR TO EMITTER VOLTAGE**



**DC CURRENT GAIN VS.
COLLECTOR CURRENT**

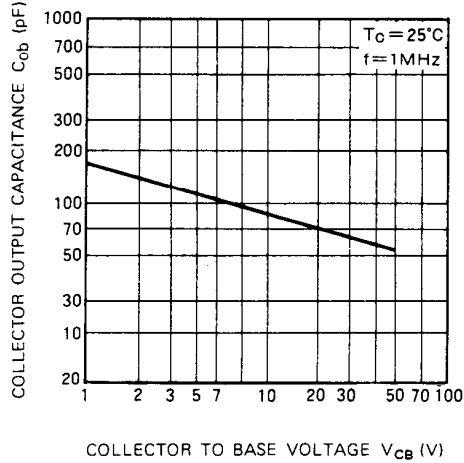


**COLLECTOR TO EMITTER BREAKDOWN
VOLTAGE VS.
BASE TO EMITTER RESISTANCE**

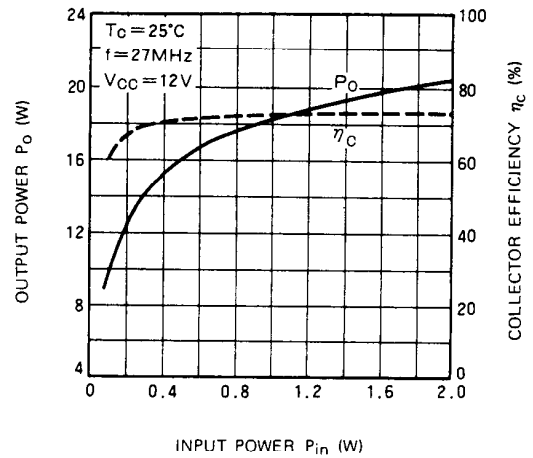


NPN EPITAXIAL PLANAR TYPE

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



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



**OUTPUT POWER VS. COLLECTOR
SUPPLY VOLTAGE**

