2SC1971

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

2SC1971 is a silicon NPN epitaxial planar type transistor designed for RF power amplifiers on VHF band mobile radio applications.

FEATURES

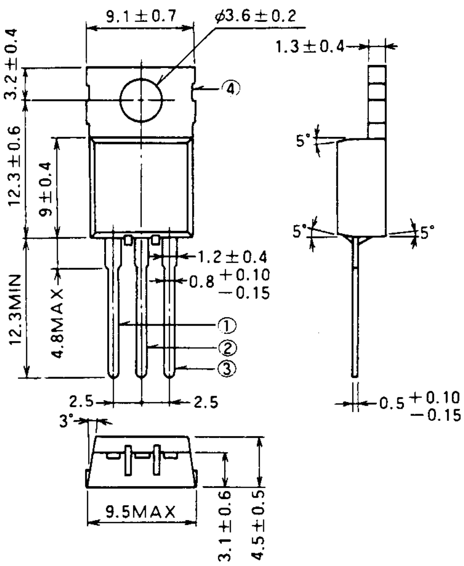
- High power gain: $G_{pe} \geqq 10dB$
  @V_{CC} = 13.5V, P_O = 6W, f = 175MHz
- Emitter ballasted construction, gold metallization for high reliability and good performances.
- TO-220 package similar is combinient for mounting.
- Ability of withstanding more than 20:1 load VSWR when operated at V_{CC} = 15.2V, P_O = 6W, f = 175MHz.

APPLICATION

4 to 5 watts output power amplifiers in VHF band applications.

OUTLINE DRAWING

Dimensions in mm



PIN :
① BASE
② EMITTER (FIN)
③ COLLECTOR
④ FIN (EMITTER)

T-30E

ABSOLUTE MAXIMUM RATINGS (T_C = 25°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		2	A
P_C	Collector dissipation	Ta = 25°C	1.5	W
		T_C = 25°C	12.5	W
T_j	Junction temperature		150	°C
T_{stg}	Storage temperature		−55 to 150	°C
Rth-a	Thermal resistance	Junction to ambient	83	°C/W
Rth-c		Junction to case	10	°C/W

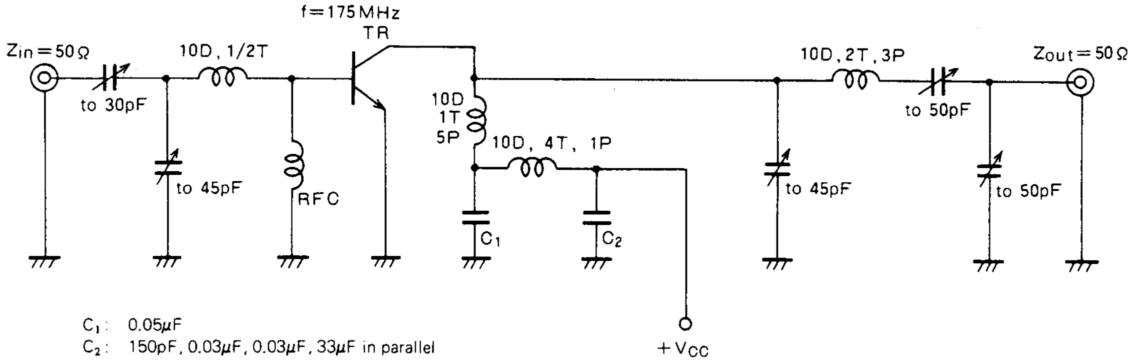
Note. Above parameters are guaranteed independently.

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	I_E = 5mA, I_C = 0	4			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	I_C = 10mA, I_E = 0	35			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	I_C = 50mA, $R_{BE} = \infty$	17			V
I_{CBO}	Collector cutoff current	V_{CB} = 25V, I_E = 0			500	μA
I_{EBO}	Emitter cutoff current	V_{EB} = 3V, I_C = 0			500	μA
h_{FE}	DC forward current gain *	V_{CE} = 10V, I_C = 0.1A	10	50	180	—
P_O	Output power	V_{CC} = 13.5V, P_{in} = 0.6W, f = 175MHz	6	7		W
η_C	Collector efficiency		60	70		%

Note. * Pulse test, Pw = 150μs, duty = 5%.
Above parameters, ratings, limits and conditions are subject to change.

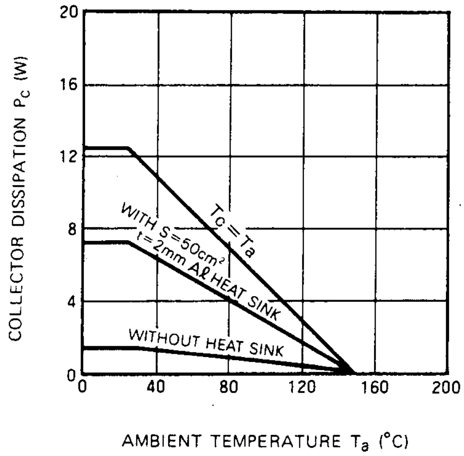
TEST CIRCUIT



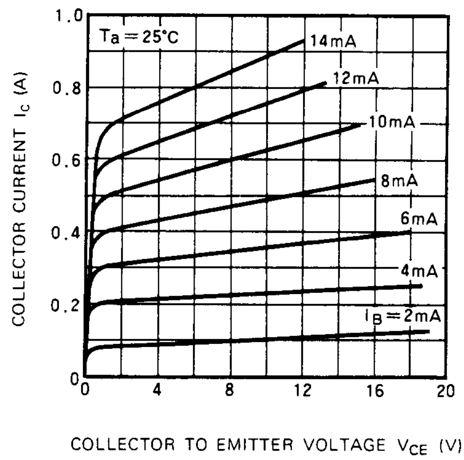
C_1: 0.05μF
C_2: 150pF, 0.03μF, 0.03μF, 33μF in parallel
Notes: All coils are made from 1.5mmϕ silver plated copper wire
Coil dimensions in milli-meter
D: Inner diameter of coil
T: Turn number of coil
P: Pitch of coil

TYPICAL PERFORMANCE DATA

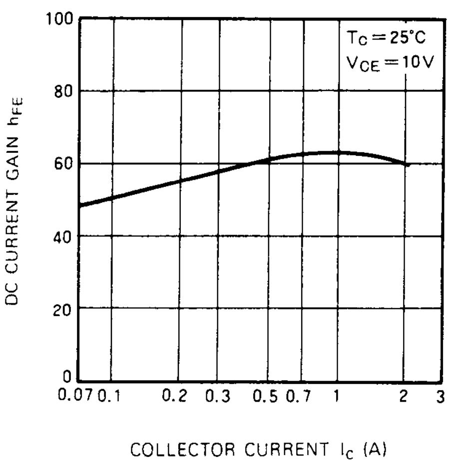
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



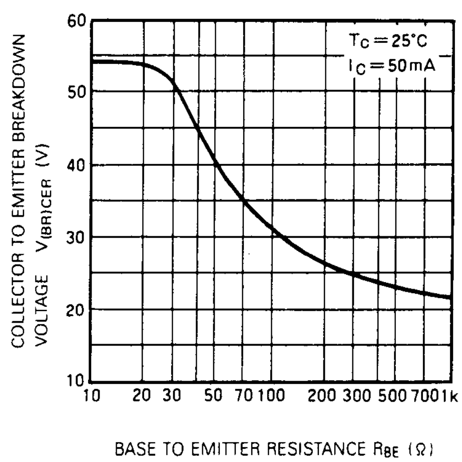
COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



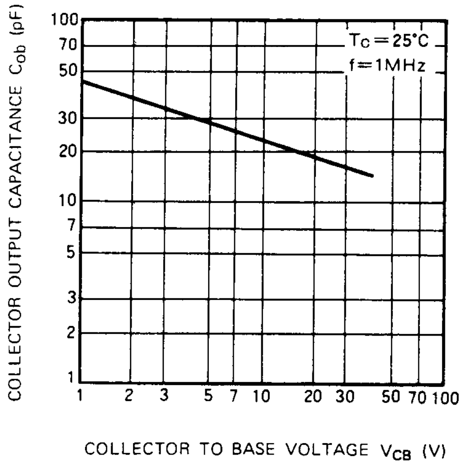
DC CURRENT GAIN VS. COLLECTOR CURRENT



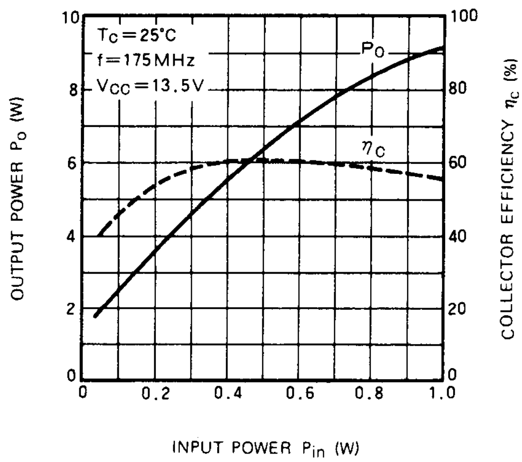
COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE



COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE