

MITSUBISHI RF POWER TRANSISTOR 2SC1971

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

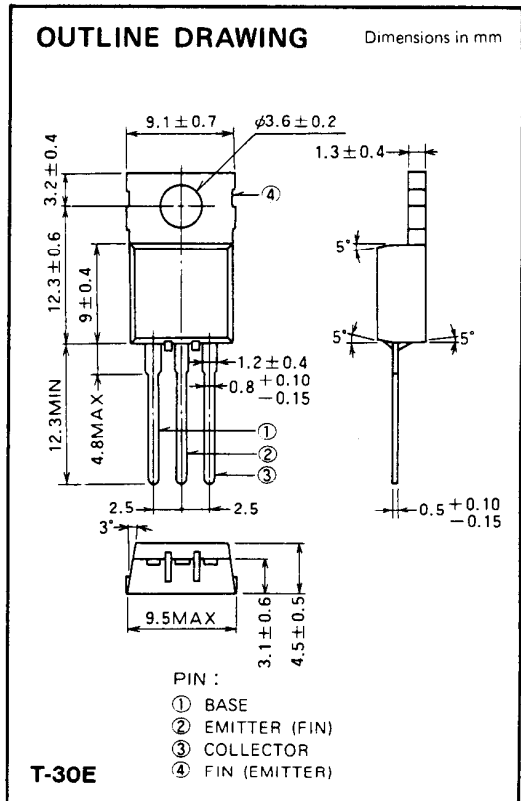
2SC1971 is a silicon NPN epitaxial planar type transistor designed for RF power amplifiers on VHF band mobile radio applications.

FEATURES

- High power gain: $G_{pe} \geq 10\text{dB}$
@ $V_{CC} = 13.5\text{V}$, $P_o = 6\text{W}$, $f = 175\text{MHz}$
- 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 $V_{CC} = 15.2\text{V}$, $P_o = 6\text{W}$, $f = 175\text{MHz}$.

APPLICATION

4 to 5 watts output power amplifiers in VHF band 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 | | 2 | A |
| P_C | Collector dissipation | $T_a = 25^\circ\text{C}$ | 1.5 | W |
| | | $T_C = 25^\circ\text{C}$ | 12.5 | 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 | $^\circ\text{C/W}$ |
| | | Junction to case | 10 | $^\circ\text{C/W}$ |

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 | $I_F = 5\text{mA}$, $I_C = 0$ | 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 | μA |
| I_{EBO} | Emitter cutoff current | $V_{EB} = 3\text{V}$, $I_C = 0$ | | | 500 | μA |
| h_{FE} | DC forward current gain* | $V_{CE} = 10\text{V}$, $I_C = 0.1\text{A}$ | 10 | 50 | 180 | — |
| * P_o | Output power | $V_{CC} = 13.5\text{V}$, $P_{in} = 0.6\text{W}$, $f = 175\text{MHz}$ | 6 | 7 | | W |
| η_C | Collector efficiency | | 60 | 70 | | % |

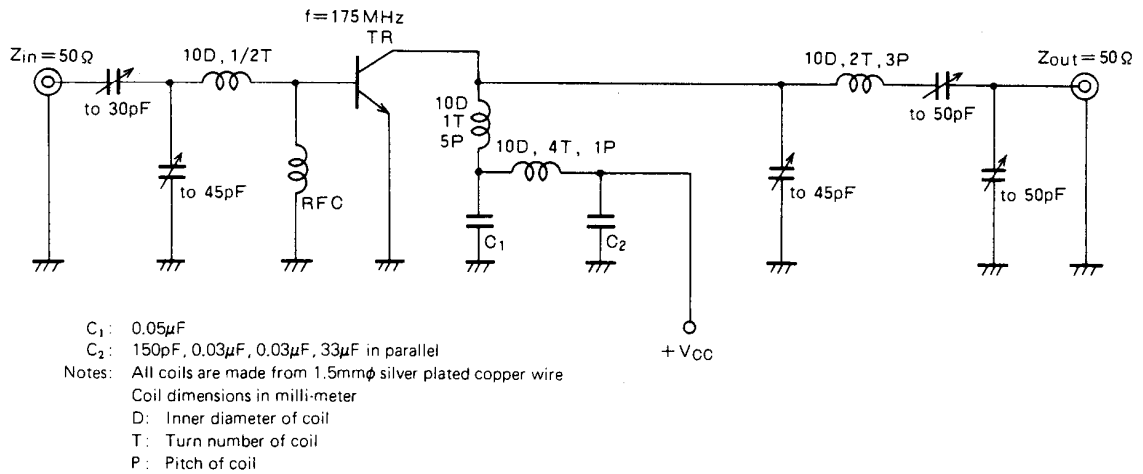
Note. * Pulse test, $P_W = 150\mu\text{s}$, duty = 5%.

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

NOV. '97

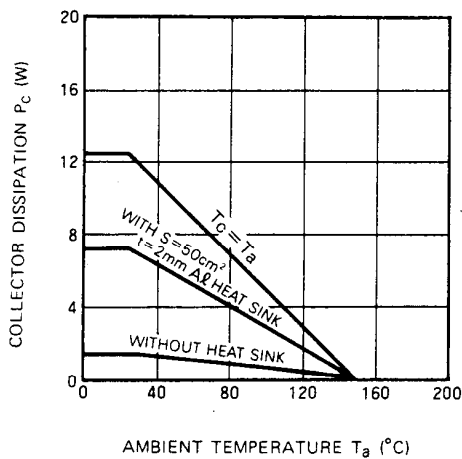
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TEST CIRCUIT

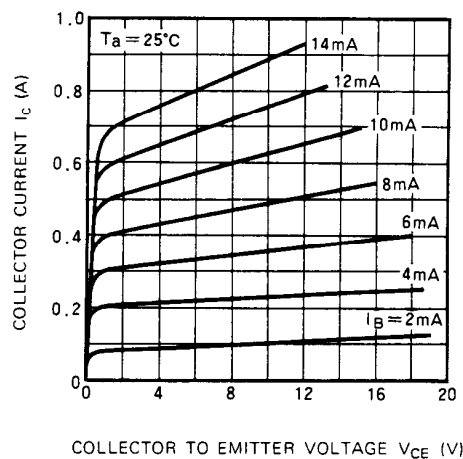


TYPICAL PERFORMANCE DATA

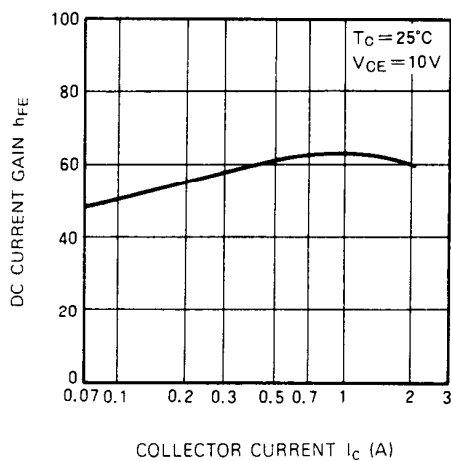
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



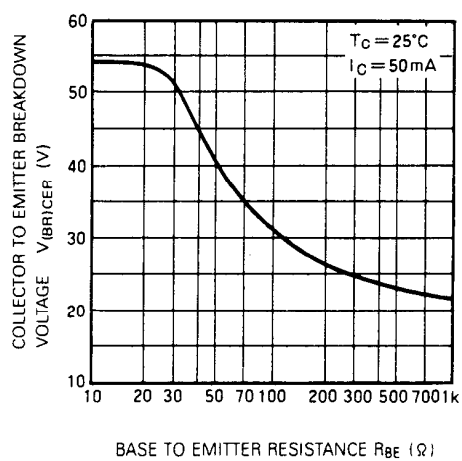
COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



DC CURRENT GAIN VS. COLLECTOR CURRENT

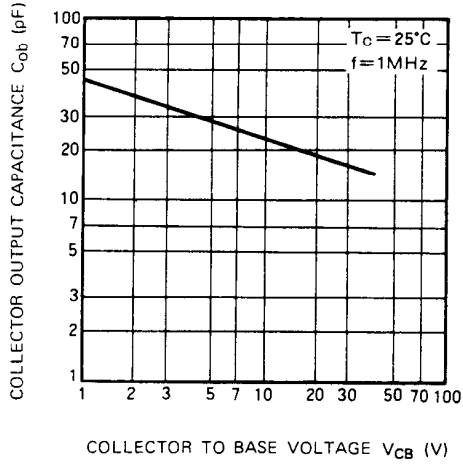


COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE

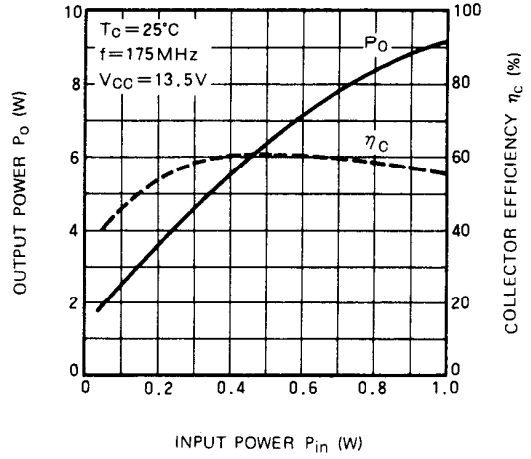


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COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE



OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE

