

MITSUBISHI RF POWER TRANSISTOR
2SC3017

NPN EPITAXIAL PLANAR TYPE

DESCRIPTION

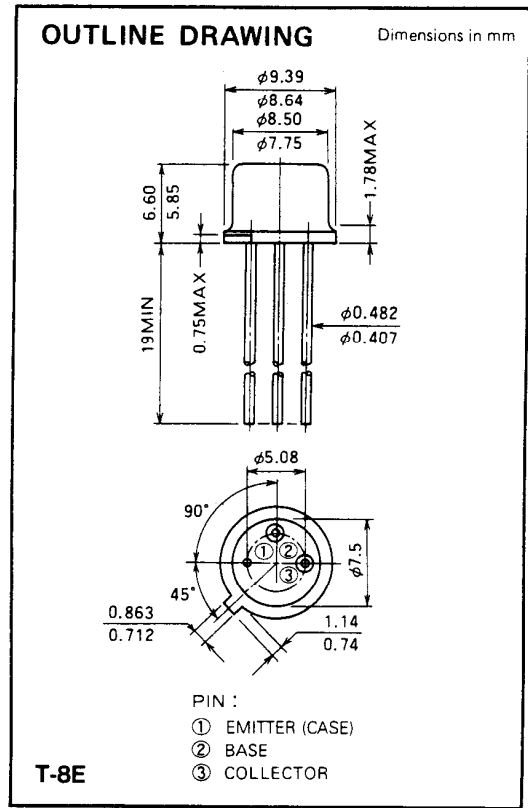
2SC3017 is a silicon NPN epitaxial planar type transistor specifically designed for VHF power amplifiers applications.

FEATURES

- High power gain: $G_{pe} \geq 11 \text{ dB}$
@ $V_{CC} = 7.2 \text{ V}$, $f = 175 \text{ MHz}$, $P_{in} = 0.1 \text{ W}$
- Emitter ballasted construction.
- Emitter case type TO-39 package.
(connected internally to emitter)
- $Z_{in} = 8 - j12 \Omega$, $Z_{out} = 11 - j1 \Omega$
@ $V_{CC} = 7.2 \text{ V}$, $f = 175 \text{ MHz}$, $P_O = 1.5 \text{ W}$.

APPLICATION

For drive stage and output stage of power amplifiers in VHF band portable radio sets.



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

| Symbol | Parameter | Conditions | Ratings | Unit |
|-----------|------------------------------|---------------------------|------------|-------------------|
| V_{CBO} | Collector to base voltage | | 20 | V |
| V_{EBO} | Emitter to base voltage | | 3.5 | V |
| V_{CEO} | Collector to emitter voltage | $R_{BE} = \infty$ | 9 | V |
| I_C | Collector current | | 1 | A |
| P_C | Collector dissipation | $T_C = 25^\circ \text{C}$ | 4 | W |
| T_J | Junction temperature | | 175 | $^\circ \text{C}$ |
| T_{stg} | Storage temperature | | -55 to 175 | $^\circ \text{C}$ |

Note: Above parameters are guaranteed independently.

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

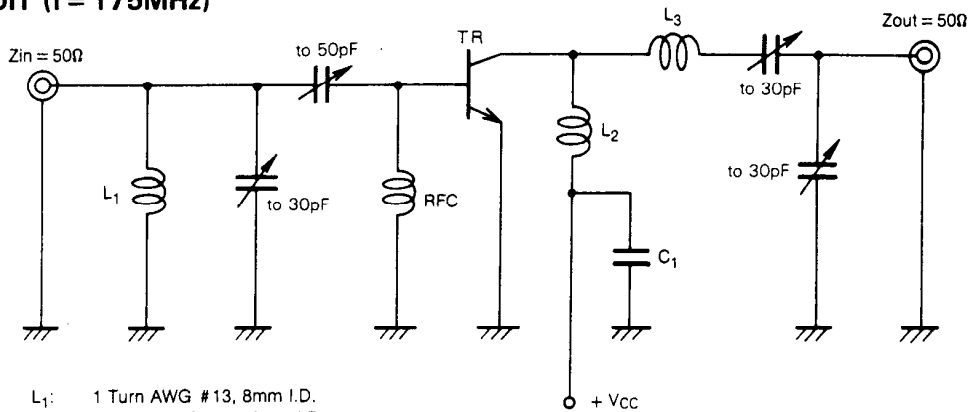
| Symbol | Parameter | Test conditions | Limits | | | Unit |
|---------------|--|---|--------|-----|-----|-----------------|
| | | | Min | Typ | Max | |
| $V_{(BR)EBO}$ | Emitter to base breakdown voltage | $I_E = 1 \text{ mA}$, $I_C = 0$ | 3.5 | | | V |
| $V_{(BR)CBO}$ | Collector to base breakdown voltage | $I_C = 10 \text{ mA}$, $I_E = 0$ | 20 | | | V |
| $V_{(BR)CEO}$ | Collector to emitter breakdown voltage | $I_C = 10 \text{ mA}$, $R_{BE} = \infty$ | 9 | | | V |
| I_{CBO} | Collector cut off current | $V_{CB} = 10 \text{ V}$, $I_E = 0$ | | | 200 | $\mu \text{ A}$ |
| I_{EBO} | Emitter cut off current | $V_{EB} = 2 \text{ V}$, $I_C = 0$ | | | 200 | $\mu \text{ A}$ |
| h_{FE} | DC forward current gain * | $V_{CE} = 5 \text{ V}$, $I_C = 0.1 \text{ A}$ | 20 | 50 | 180 | — |
| P_O | Power Output | $V_{CC} = 7.2 \text{ V}$, $P_{in} = 0.1 \text{ W}$, $f = 175 \text{ MHz}$ | 1.5 | 2.0 | | W |
| η_C | Collector efficiency | | 55 | 60 | | % |

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

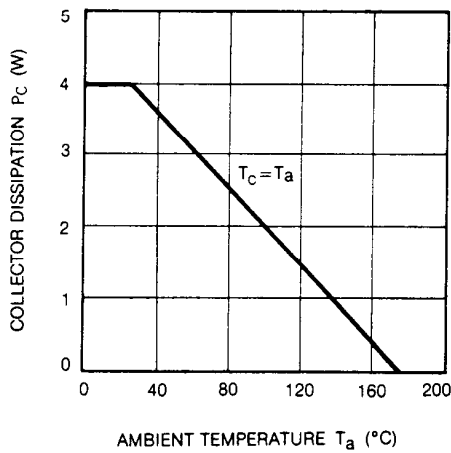
TEST CIRCUIT (f = 175MHz)



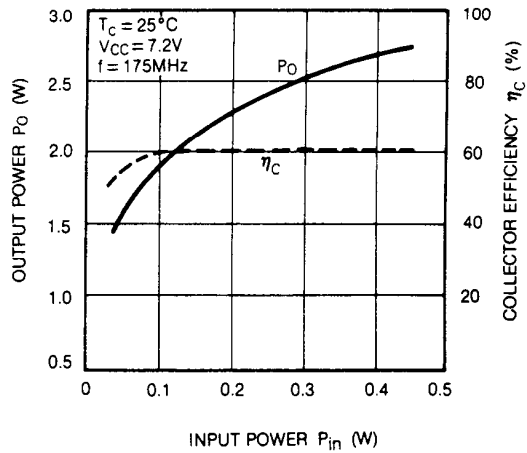
- L₁: 1 Turn AWG #13, 8mm I.D.
- L₂: 4 Turns AWG #13, 8mm I.D.
- L₃: 2 Turns AWG #13, 8mm I.D.
- RFC: 20 Turns AWG #26 Enameled wire Close Wound on 4mm O.D., 14mm Length Bakelite.
- C₁: 0.022μF, 0.047μF, 0.1μF in parallel.

TYPICAL PERFORMANCE DATA

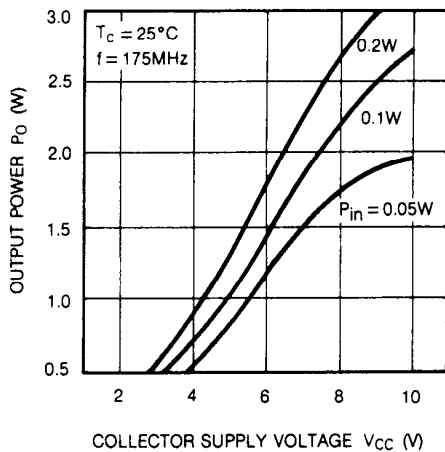
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE CHARACTERISTICS.



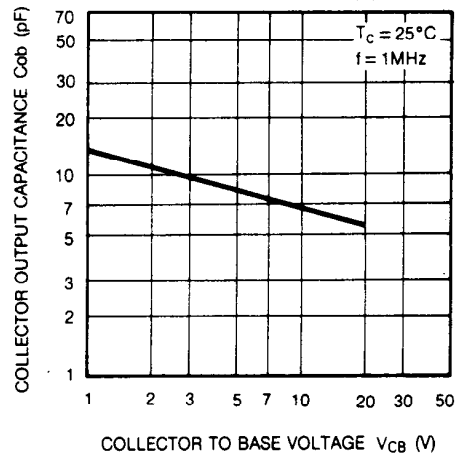
OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER CHARACTERISTICS.



OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE CHARACTERISTICS



COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE CHARACTERISTICS.



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