

DISCRIPTION

2SC3240 is a silicon NPN epitaxial planar type transistor specifically designed for high power amplifiers in HF band.

FEATURES

- High gain: $G_{pe} \geq 11.5\text{dB}$, $P_o \geq 100\text{W}$
@f = 30MHz, $V_{CC} = 12.5\text{V}$, $P_{in} = 7\text{W}$
- High ruggedness: Ability to withstand 20:1 load VSWR when operated at f = 30MHz, $P_o = 100\text{W}$, $V_{CC} = 15.2\text{V}$.
- Emitter ballasted construction
- Low thermal resistance ceramic package with flange.

Input-output impedance

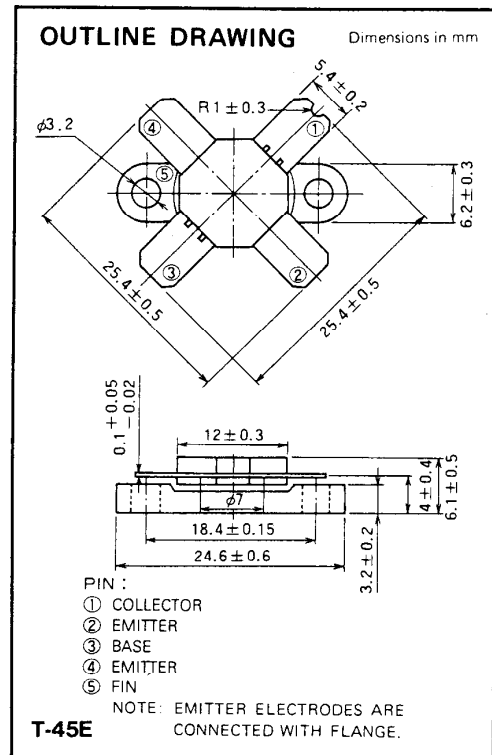
$Z_{in} = 0.4 - j0.8 (\Omega)$

$Z_{out} = 1.0 - j1.1 (\Omega)$

@f = 30MHz, $V_{CC} = 12.5\text{V}$, $P_o = 100\text{W}$

APPLICATION

Output stage of transmitter in HF band SSB mobile radio sets.



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

| Symbol | Parameter | Conditions | Ratings | Unit |
|------------|------------------------------|--------------------------|------------|--------------------|
| V_{CB0} | Collector to base voltage | | 50 | V |
| V_{EB0} | Emitter to base voltage | | 5 | V |
| V_{CE0} | Collector to emitter voltage | $R_{BE} = \infty$ | 20 | V |
| I_C | Collector current | | 25 | A |
| P_C | Collector dissipation | $T_a = 25^\circ\text{C}$ | 8 | W |
| | | $T_C = 25^\circ\text{C}$ | 270 | W |
| T_j | Junction temperature | | 175 | $^\circ\text{C}$ |
| T_{stg} | Storage temperature | | -55 to 175 | $^\circ\text{C}$ |
| R_{th-a} | Thermal resistance | Junction to ambient | 18.7 | $^\circ\text{C/W}$ |
| R_{th-c} | | Junction to case | 0.556 | $^\circ\text{C/W}$ |

Note. Above parameters are guaranteed independently.

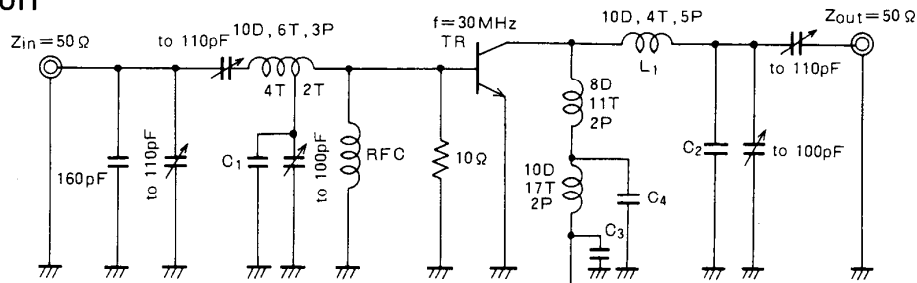
ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise specified)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|---------------|--|---|--------|-----|-----|------|
| | | | Min | Typ | Max | |
| $V_{(BR)EB0}$ | Emitter to base breakdown voltage | $I_E = 20\text{mA}$, $I_C = 0$ | 5 | | | V |
| $V_{(BR)CB0}$ | Collector to base breakdown voltage | $I_C = 20\text{mA}$, $I_E = 0$ | 50 | | | V |
| $V_{(BR)CE0}$ | Collector to emitter breakdown voltage | $I_C = 100\text{mA}$, $R_{BE} = \infty$ | 20 | | | V |
| I_{CB0} | Collector cutoff current | $V_{CB} = 15\text{V}$, $I_E = 0$ | | | 5 | mA |
| I_{EB0} | Emitter cutoff current | $V_{EB} = 3\text{V}$, $I_C = 0$ | | | 5 | mA |
| h_{FE} | DC forward current gain* | $V_{CE} = 10\text{V}$, $I_C = 1\text{A}$ | 10 | 50 | 180 | — |
| P_o | Output power | $f = 30\text{MHz}$, $V_{CC} = 12.5\text{V}$, $P_{in} = 7\text{W}$ | 100 | 110 | | W |
| η_C | Collector efficiency | | 55 | 60 | | % |

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

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

TEST CIRCUIT

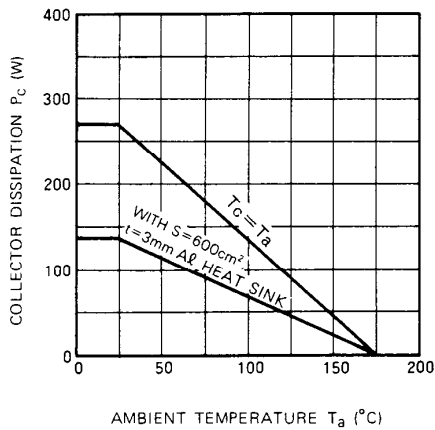


- C₁: 160pF, 160pF, 82pF in parallel
 - C₂: 82pF, 82pF, 82pF in parallel
 - C₃: 100pF, 4700pF, 4700pF, 0.22μF, 0.22μF, 33μF, 330μF in parallel
 - C₄: 100pF, 220pF, 4700pF, 0.1μF, 330μF in parallel
- RFC: 27 Turns 1φ enameled wire

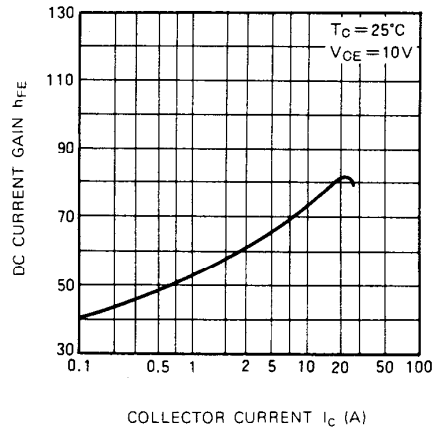
NOTES: All coils but L₁ are made from 1.5φmm silver plated copper wire, L₁ is made from 2.3φmm copper wire.
 D: Inner diameter of coil
 T: Turn number of coil
 P: Pitch of coil
 Dimension in milli-meter

TYPICAL PERFORMANCE DATE

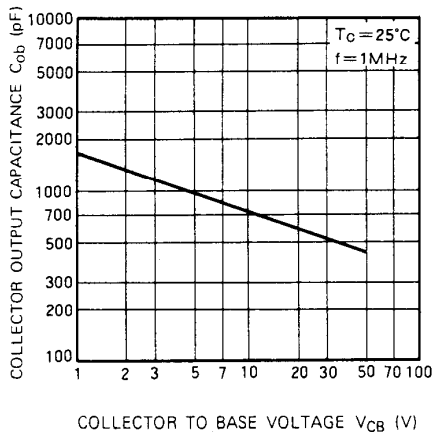
COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE



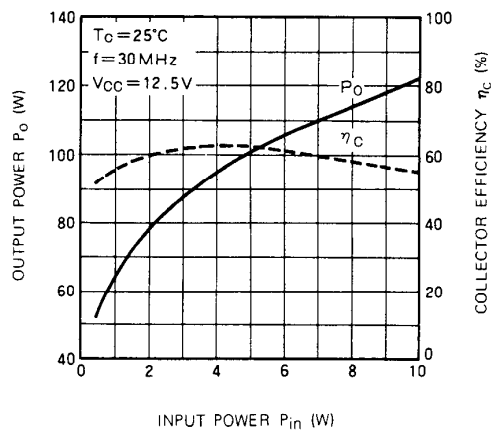
DC CURRENT GAIN VS. COLLECTOR CURRENT



COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE

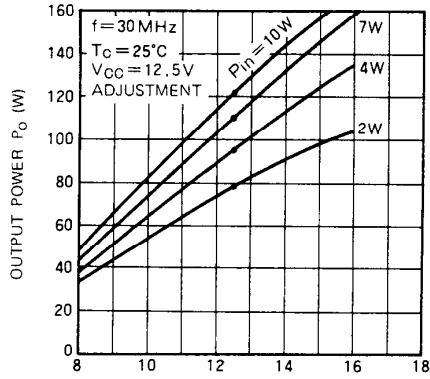


OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER



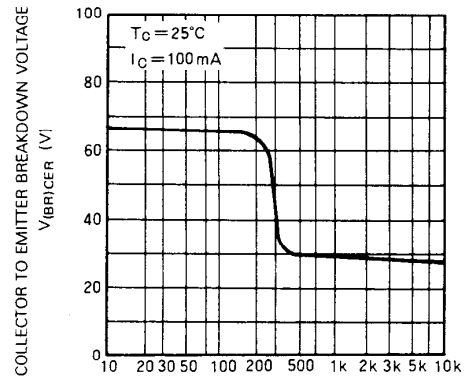
NPN EPITAXIAL PLANAR TYPE

OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE



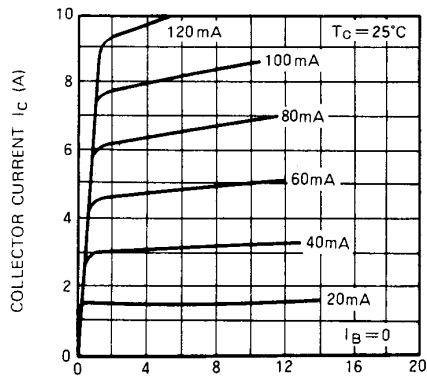
COLLECTOR SUPPLY VOLTAGE V_{cc} (V)

COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE



BASE TO EMITTER RESISTANCE R_{BE} (Ω)

COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE



COLLECTOR TO EMITTER VOLTAGE (V)