MITSUBISHI RF POWER TRANSISTOR

# 2SC4240

## NPN EPITAXIAL PLANAR TYPE

## DESCRIPTION

2SC4240 is a silicon NPN epitaxial planar type transistor specifically designed for VHF power amplifier applications.

## FEATURES

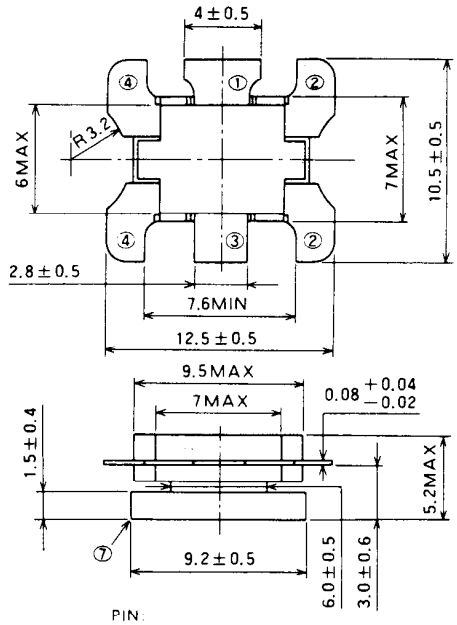
- High power gain: $G_{pe} \geqq 13$dB.
  @$V_{CC}$ = 7.2V, f = 175MHz, $P_{in}$ = 0.3W.
- Emitter ballasted construction.
- High ruggedness: Ability to withstand more than 20:1 load VSWR when operated at $V_{CC}$ = 9V, f = 175MHz, $P_O$ = 6.0W.
- Flange type ceramic package.
- $Z_{in} = 1.5 - j1.3\Omega$, $Z_{out} = 5.0 - j1.2\Omega$
  @$V_{CC}$ = 7.2V, f = 175MHz, $P_O$ = 6.0W.

## APPLICATION

For output stage of 5W power amplifiers in VHF band portable type radio sets.

## OUTLINE DRAWING

Dimensions in mm




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

T-47

## ABSOLUTE MAXIMUM RATINGS ($T_C$ = 25°C)

| Symbol | Parmeter | 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 | | 3 | A |
| $P_C$ | Collector dissipation | $T_C$ = 25°C | 20 | W |
| $T_j$ | Junction temperature | | 175 | °C |
| Tstg | Storage temperature | | −55 to 175 | °C |

Note. Above parameters are guaranteed independently.

## ELECTRICAL CHARACTERISTICS ($T_C$ = 25°C)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | |
| $V_{(BR)EBO}$ | Emitter to base breakdown voltage | $I_E$ = 5mA, $I_C$ = 0 | 3.5 | | | V |
| $V_{(BR)CBO}$ | Collector to base breakdown voltage | $I_C$ = 10mA, $I_E$ = 0 | 20 | | | V |
| $V_{(BR)CEO}$ | Collector to emitter breakdown voltage | $I_C$ = 50mA, $R_{BE} = \infty$ | 9 | | | V |
| $I_{CBO}$ | Collector cut-off current | $V_{CB}$ = 10V, $I_E$ = 0 | | | 500 | μA |
| $I_{EBO}$ | Emitter cut-off current | $V_{EB}$ = 2V, $I_C$ = 0 | | | 500 | μA |
| $h_{FE}$ | DC forward current gain * | $V_{CE}$ = 5V, $I_C$ = 0.1A | 20 | 50 | 180 | — |
| $P_O$ | Power Output | $V_{CC}$ = 7.2V, Pin = 0.3W, f = 175MHz | 6 | 7 | | W |
| $\eta_C$ | Collector efficiency | | 60 | 65 | | % |

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



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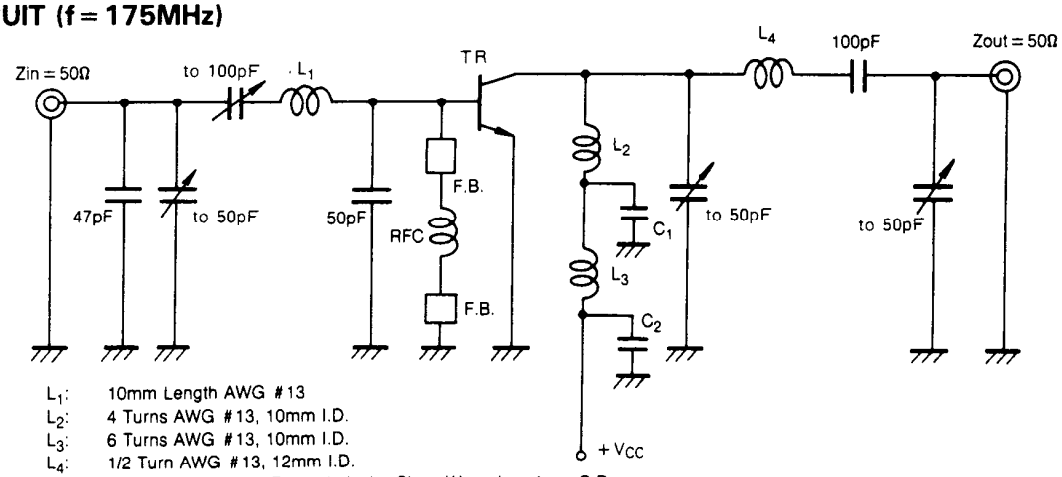
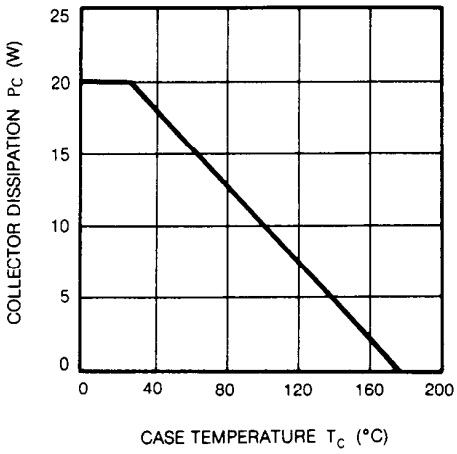
### TEST CIRCUIT (f = 175MHz)



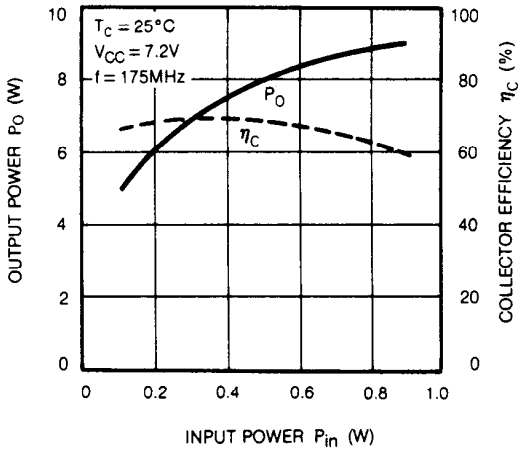

$L_1$: 10mm Length AWG #13
$L_2$: 4 Turns AWG #13, 10mm I.D.
$L_3$: 6 Turns AWG #13, 10mm I.D.
$L_4$: 1/2 Turn AWG #13, 12mm I.D.
RFC: 40 Turns AWG #32 Enameled wire Close Wound on 4mm O.D.
14mm Length Bakelite.
$C_1$: 220pF, 1000pF, 4700pF, 10μF in parallel.
$C_2$: 220pF, 1000pF, 4700pF, 10μF in parallel.

### TYPICAL PERFORMANCE DATA

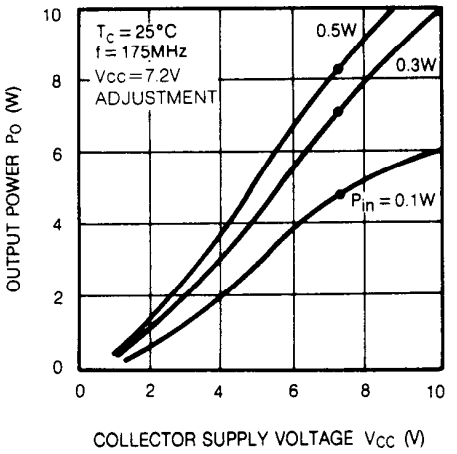
**COLLECTOR DISSIPATION VS. CASE TEMPERATURE CHARACTERISTICS**



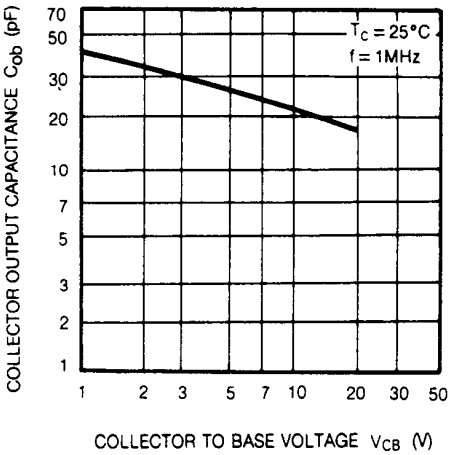

**OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER CHARACTERISTICS.**




**OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE CHARACTERISTICS**




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



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