

# MITSUBISHI RF POWER TRANSISTOR 2SC2086

## NPN EPITAXIAL PLANAR TYPE

### DESCRIPTION

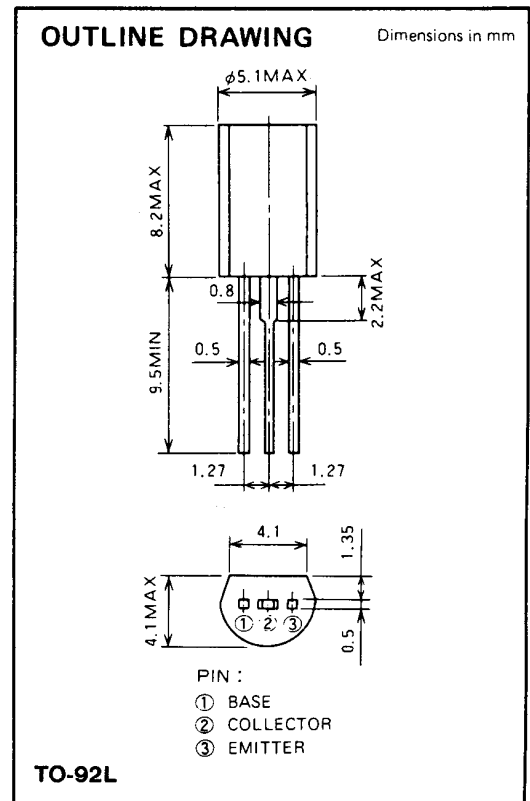
2SC2086 is a silicon NPN epitaxial planar type transistor designed for RF power amplifiers in HF band mobile radio applications.

### FEATURES

- High power gain:  $G_{pe} \geq 13\text{dB}$   
@  $V_{CC} = 12\text{V}$ ,  $P_o = 0.3\text{W}$ ,  $f = 27\text{MHz}$
- Emitter ballasted construction, gold metallization for good performances.
- TO-92 similar package with low thermal resistance.

### APPLICATION

Driver amplifiers in general in HF band mobile radio applications.



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

| Symbol     | Parameter                    | Conditions               | Ratings    | Unit               |
|------------|------------------------------|--------------------------|------------|--------------------|
| $V_{CBO}$  | Collector to base voltage    |                          | 75         | V                  |
| $V_{EBO}$  | Emitter to base voltage      |                          | 4          | V                  |
| $V_{CEO}$  | Collector to emitter voltage | $R_{BE} = \infty$        | 35         | V                  |
| $I_C$      | Collector current            |                          | 1          | A                  |
| $P_C$      | Collector dissipation        | $T_a = 25^\circ\text{C}$ | 0.8        | W                  |
| $T_j$      | Junction temperature         |                          | 135        | $^\circ\text{C}$   |
| $T_{stg}$  | Storage temperature          |                          | -55 to 135 | $^\circ\text{C}$   |
| $R_{th-a}$ | Thermal resistance           | Junction to ambient      | 137.5      | $^\circ\text{C/W}$ |

Note. Above parameters are guaranteed independently.

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

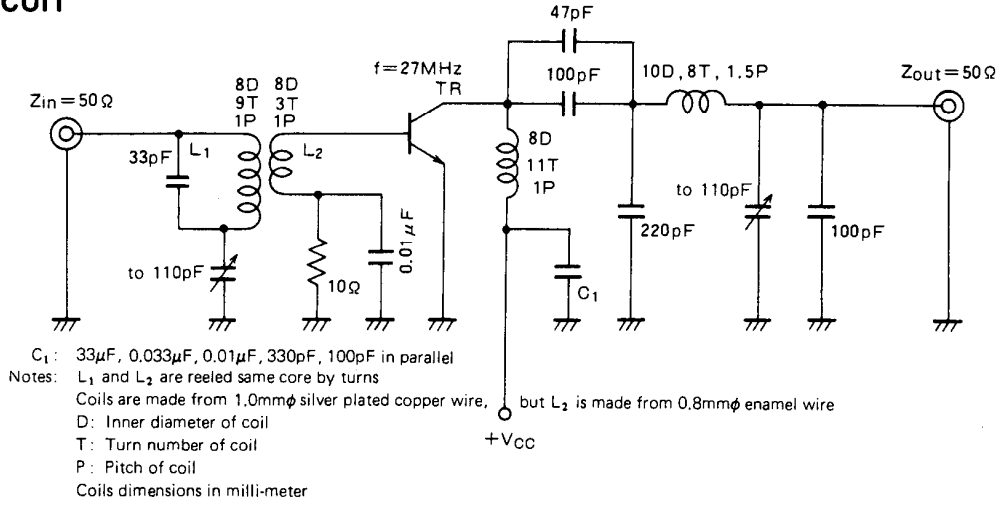
| Symbol        | Parameter                              | Test conditions   | Limits |      |     | Unit          |
|---------------|--|---|--------|------|-----|---------------|
|               |  |   | Min    | Typ  | Max |               |
| $V_{(BR)EBO}$ | Emitter to base breakdown voltage      | $I_E = 1\text{mA}$ , $I_C = 0$                                      | 4      |      |     | V             |
| $V_{(BR)CBO}$ | Collector to base breakdown voltage    | $I_C = 1\text{mA}$ , $I_E = 0$                                      | 75     |      |     | V             |
| $V_{(BR)CEO}$ | Collector to emitter breakdown voltage | $I_C = 10\text{mA}$ , $R_{BE} = \infty$                             | 35     |      |     | V             |
| $I_{CBO}$     | Collector cutoff current               | $V_{CB} = 30\text{V}$ , $I_E = 0$                                   |        |      | 10  | $\mu\text{A}$ |
| $I_{EBO}$     | Emitter cutoff current                 | $V_{EB} = 3\text{V}$ , $I_C = 0$                                    |        |      | 100 | $\mu\text{A}$ |
| $h_{FE}$      | DC forward current gain*               | $V_{CE} = 10\text{V}$ , $I_C = 0.1\text{A}$                         | 35     | 70   | 300 | —             |
| $P_o$         | Output power                           | $V_{CC} = 12\text{V}$ , $P_{in} = 15\text{mW}$ , $f = 27\text{MHz}$ | 0.3    | 0.45 |     | W             |
| $\eta_C$      | Collector efficiency                   |   | 50     | 60   |     | %             |

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

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

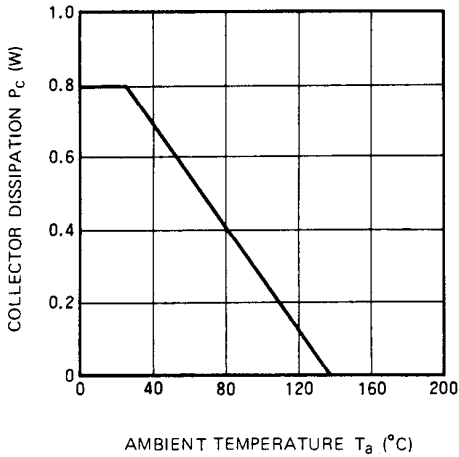
NOV. '97

**TEST CIRCUIT**

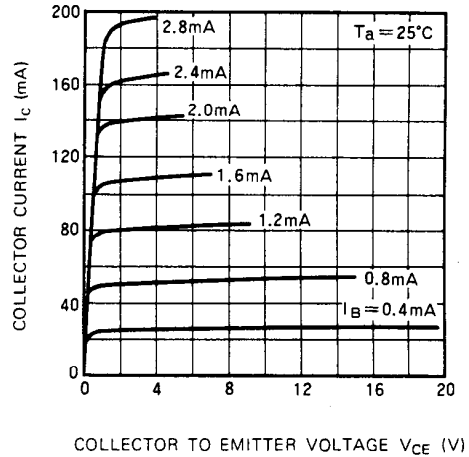


**TYPICAL PERFORMANCE DATA**

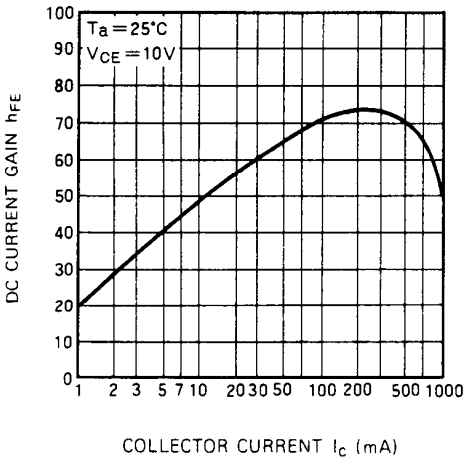
**COLLECTOR DISSIPATION VS. AMBIENT TEMPERATURE**



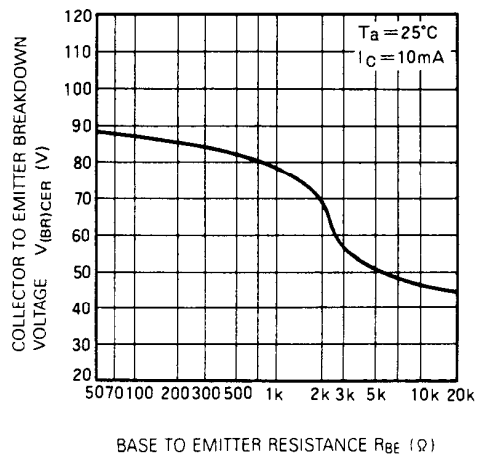
**COLLECTOR CURRENT VS. COLLECTOR TO EMITTER VOLTAGE**



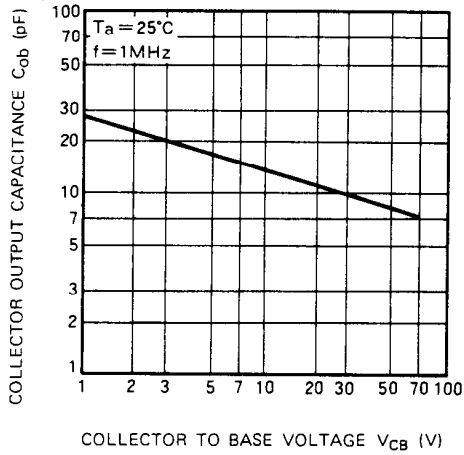
**DC CURRENT GAIN VS. COLLECTOR CURRENT**



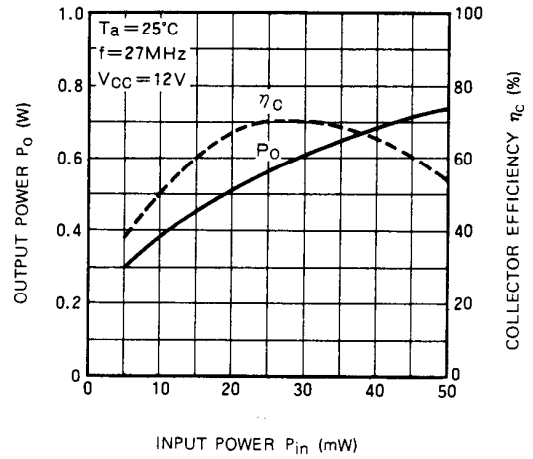
**COLLECTOR TO EMITTER BREAKDOWN VOLTAGE VS. BASE TO EMITTER RESISTANCE**



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



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



**OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE**

