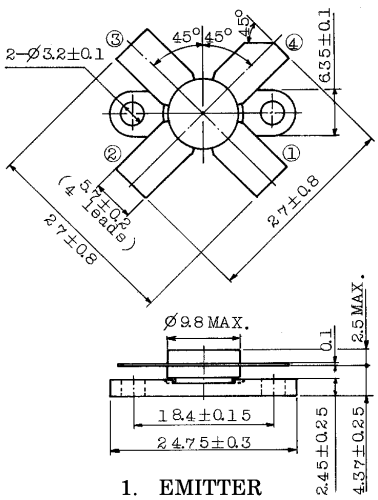
TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

# 2SC2099

2~30MHz SSB LINEAR POWER AMPLIFIER APPLICATIONS
(LOW SUPPLY VOLTAGE USE)

- Specified 12.5V, 28MHz Characteristics
- Output Power : $P_O = 20W_{PEP}$ (Min.)
- Power Gain : $G_p = 12dB$ (Min.)
- Collector Efficiency : $\eta_C = 35\%$ (Min.)
- Intermodulation Distortion : IMD = −30dB (Max.)

Unit in mm




| | |
|---|---|
| JEDEC | — |
| EIAJ | — |
| TOSHIBA | 2-10H1A |

Weight : 4.0g

MAXIMUM RATINGS (Tc = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | 40 | V |
| Collector-Emitter Voltage | $V_{CES}$ | 40 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | 18 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 4 | V |
| Collector Current | $I_C$ | 6 | A |
| Collector Power Dissipation | $P_C$ | 60 | W |
| Junction Temperature | $T_j$ | 175 | °C |
| Storage Temperature Range | $T_{stg}$ | −65~175 | °C |

ELECTRICAL CHARACTERISTICS (Tc = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = 50mA$, $I_B = 0$ | 18 | — | — | V |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CES}$ | $I_C = 50mA$, $V_{EB} = 0$ | 40 | — | — | V |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E = 1mA$, $I_C = 0$ | 4 | — | — | V |
| DC Current Gain | $h_{FE}$ | $V_{CE} = 5V$, $I_C = 5A$ * | 20 | — | 185 | |
| Transition Frequency | $f_T$ | $V_{CE} = 5V$, $I_C = 0.5A$ | — | 100 | — | MHz |
| Collector Output Capacitance | $C_{ob}$ | $V_{CB} = 12.5V$, $I_E = 0$, f = 1MHz | — | — | 250 | pF |
| Power Gain | $G_p$ | $V_{CC} = 12.5V$, $f_1 = 28.000$ MHz, $f_2 = 28.001MHz$, $I_{idle} = 25mA$, $P_O = 20W_{PEP}$ (Fig.) | 12.0 | — | — | dB |
| Input Power | Pi | | — | — | 1.2 | $W_{PEP}$ |
| Collector Efficiency | $\eta_C$ | | 35 | 45 | — | % |
| Intermodulation Distortion | IMD | | — | — | −30 | dB |
| Series Equivalent Input Impedance | $Z_{in}$ | $V_{CC} = 12.5V$, $f_1 = 28.000$ MHz, $f_2 = 28.001MHz$, $P_O = 20W_{PEP}$ | — | 1.1 −j0.25 | — | Ω |
| Series Equivalent Output Impedance | $Z_{out}$ | | — | 3.0 −j0.75 | — | Ω |

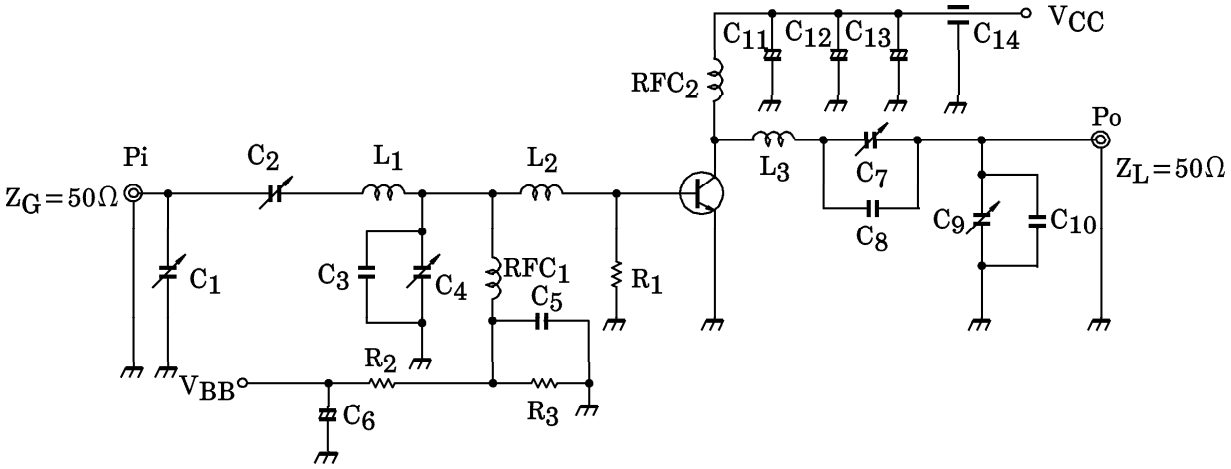
* Pulse Test: Pulse Width ≦ 100μs, Duty Cycle ≦ 3%

CAUTION

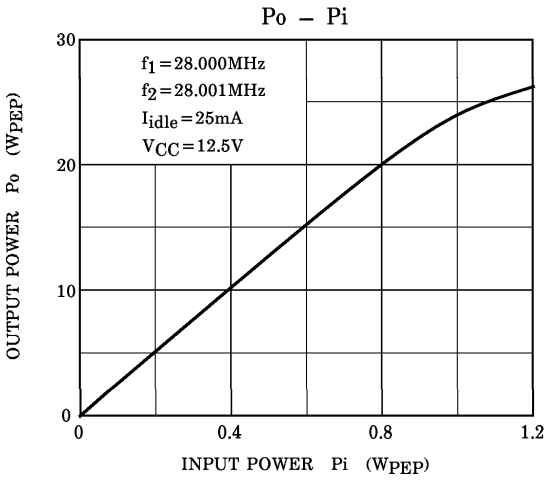
Beryllia Ceramics is used in this product. The dust or vapor can be dangerous to humans. Do not break, cut, crush or dissolve chemically. Dispose of this product properly according to law. Do not intermingle with normal industrial or domestic waste.

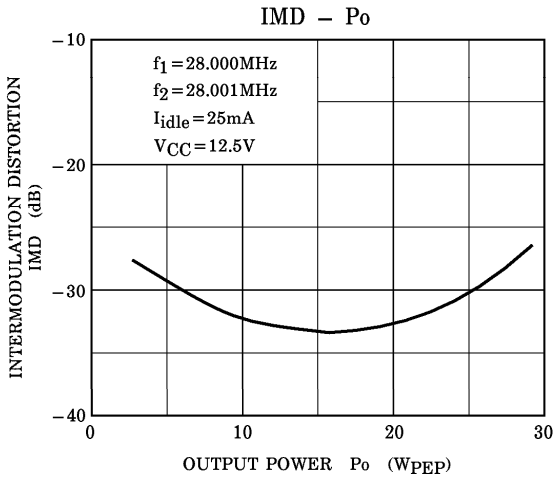
961001EAA2

Fig. Pi TEST CIRCUIT




| | | | |
|---|---|---|---|
| $C_1, C_2, C_4, C_7$ | : 7~150pF | $L_1$ | : $\phi$0.8 ENAMEL COATED COPPER WIRE, 9ID, 6T |
| $C_3$ | : 250pF | $L_2$ | : $\phi$1 SILVER PLATED COPPER WIRE, 9ID, 2T |
| $C_5$ | : 0.4$\mu$F | $L_3$ | : $\phi$1.5 ENAMEL COATED COPPER WIRE, 9ID, 5T |
| $C_6$ | : 100$\mu$F 10WV | $RFC_1$ | : $\phi$0.8 ENAMEL COATED COPPER WIRE, 9ID, 20T |
| $C_8$ | : 150pF | $RFC_2$ | : $\phi$1.5 ENAMEL COATED COPPER WIRE, 12ID, 15T |
| $C_9$ | : 10~200pF | $R_1$ | : 5.6$\Omega$ (1/2W) |
| $C_{10}$ | : 600pF | $R_2$ | : 5$\Omega$ (5W) |
| $C_{11}, C_{12}$ | : 22$\mu$F 35WV | $R_3$ | : 1.5$\Omega$ (10W) |
| $C_{13}$ | : 0.04$\mu$F | | |
| $C_{14}$ | : 1000pF (FEED THROUGH) | | |




CAUTION

These are only typical curves and devices are not necessarily guaranteed at these curves.