

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

# 2SC2099

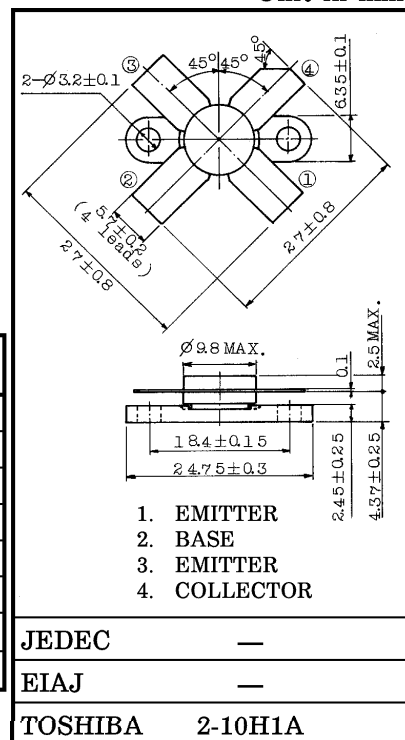
2~30MHz SSB LINEAR POWER AMPLIFIER APPLICATIONS  
(LOW SUPPLY VOLTAGE USE)

Unit in mm

- 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.)

MAXIMUM RATINGS ( $T_c = 25^\circ C$ )

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	$^\circ C$
Storage Temperature Range	$T_{stg}$	-65~175	$^\circ C$



ELECTRICAL CHARACTERISTICS ( $T_c = 25^\circ C$ )

Weight : 4.0g

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	$G_p$	$V_{CC} = 12.5V, f_1 = 28.000$	12.0	—	—	dB
Input Power	$P_i$	MHz, $f_2 = 28.001MHz$	—	—	1.2	$W_{PEP}$
Collector Efficiency	$\eta_C$	$I_{idle} = 25mA$	35	45	—	%
Intermodulation Distortion	IMD	$P_o = 20W_{PEP}$ (Fig.)	—	—	-30	dB
Series Equivalent Input Impedance	$Z_{in}$	$V_{CC} = 12.5V, f_1 = 28.000$	—	1.1 -j0.25	—	$\Omega$
Series Equivalent Output Impedance	$Z_{out}$	MHz, $f_2 = 28.001MHz$ $P_o = 20W_{PEP}$	—	3.0 -j0.75	—	$\Omega$

\* Pulse Test: Pulse Width  $\leq 100\mu s$ , Duty Cycle  $\leq 3%$

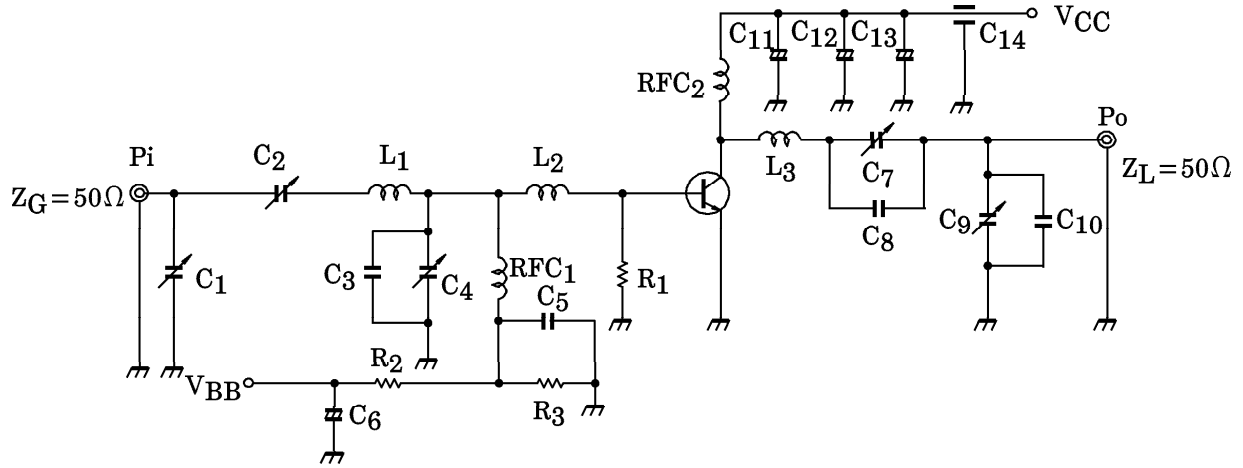
**CAUTION**

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.

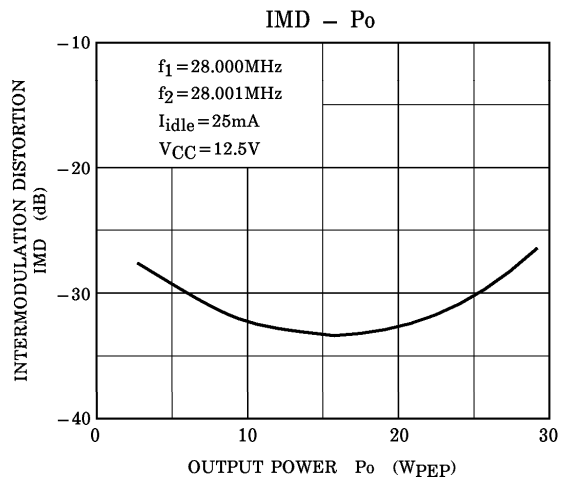
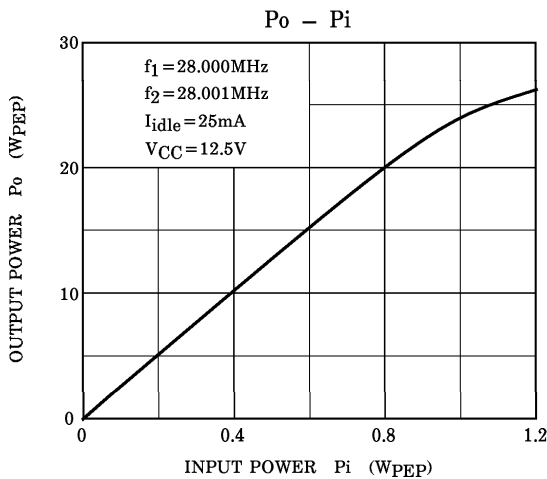
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Fig. Pi TEST CIRCUIT



- |   |  |
|---|--|
| C <sub>1</sub> , C <sub>2</sub> , C <sub>4</sub> , C <sub>7</sub> : 7~150pF | L <sub>1</sub> : φ0.8 ENAMEL COATED COPPER WIRE, 9ID, 6T     |
| C <sub>3</sub> : 250pF  | L <sub>2</sub> : φ1 SILVER PLATED COPPER WIRE, 9ID, 2T       |
| C <sub>5</sub> : 0.4μF  | L <sub>3</sub> : φ1.5 ENAMEL COATED COPPER WIRE, 9ID, 5T     |
| C <sub>6</sub> : 100μF 10WV   | RFC <sub>1</sub> : φ0.8 ENAMEL COATED COPPER WIRE, 9ID, 20T  |
| C <sub>8</sub> : 150pF  | RFC <sub>2</sub> : φ1.5 ENAMEL COATED COPPER WIRE, 12ID, 15T |
| C <sub>9</sub> : 10~200pF   | R <sub>1</sub> : 5.6Ω (1/2W)                                 |
| C <sub>10</sub> : 600pF   | R <sub>2</sub> : 5Ω (5W)                                     |
| C <sub>11</sub> , C <sub>12</sub> : 22μF 35WV                               | R <sub>3</sub> : 1.5Ω (10W)                                  |
| C <sub>13</sub> : 0.04μF  |  |
| C <sub>14</sub> : 1000pF  |  |
- (FEED THROUGH)



CAUTION

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

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