

TOSHIBA

2SC2099

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

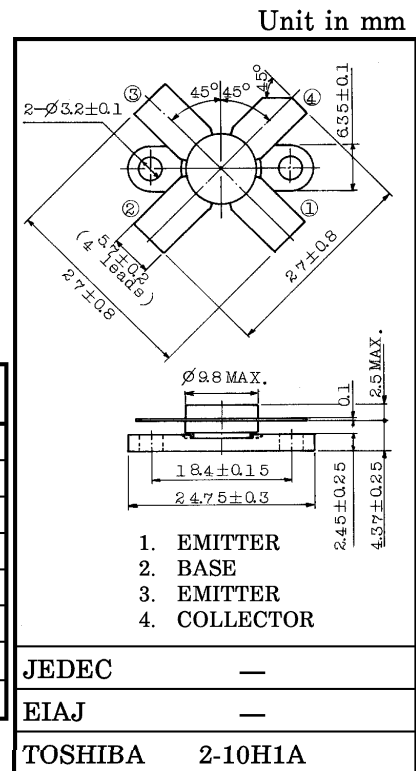
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2~30MHz SSB LINEAR POWER AMPLIFIER APPLICATIONS (LOW SUPPLY VOLTAGE USE)

- 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.)

MAXIMUM RATINGS (T_c = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CB0}	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 ($T_c = 25^\circ\text{C}$)

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	$V_{CC}=12.5V, f_1=28.000$ MHz, $f_2=28.001MHz$ $I_{idle}=25mA$ $P_o=20W_{PEP}$ (Fig.)	12.0	—	—	dB
Input Power	P_i		—	—	1.2	W_{PEP}
Collector Efficiency	η_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 $\leq 100\mu s$, 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.

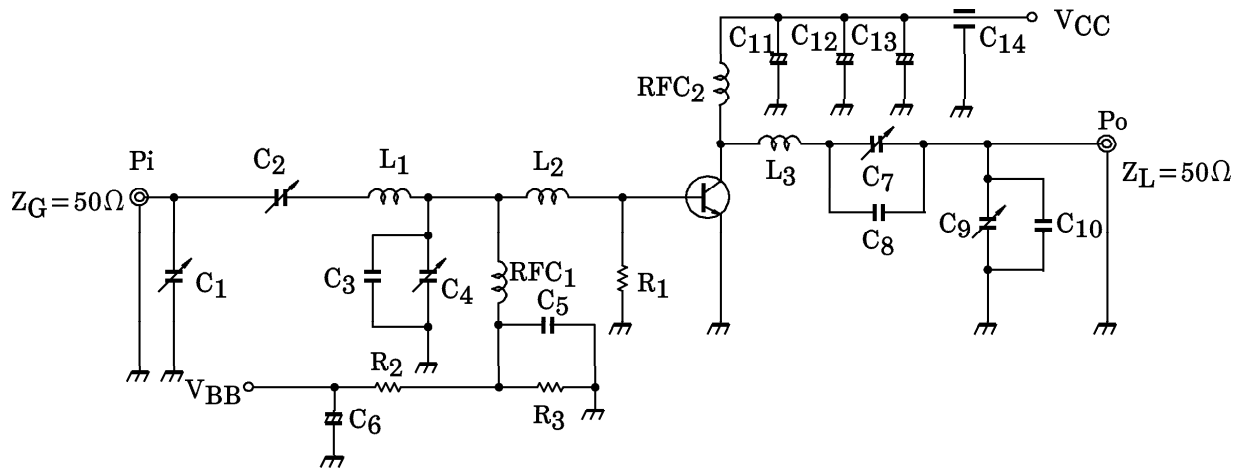
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- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

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Fig. Pi TEST CIRCUIT



C_1, C_2, C_4, C_7 : 7~150pF

C_3 : 250pF

C_5 : 0.4 μ F

C_6 : 100 μ F 10WV

C_8 : 150pF

C_9 : 10~200pF

C_{10} : 600pF

C_{11}, C_{12} : 22 μ F 35WV

C_{13} : 0.04 μ F

C_{14} : 1000pF

(FEED THROUGH)

L_1 : ϕ 0.8 ENAMEL COATED COPPER WIRE, 9ID, 6T

L_2 : ϕ 1 SILVER PLATED COPPER WIRE, 9ID, 2T

L_3 : ϕ 1.5 ENAMEL COATED COPPER WIRE, 9ID, 5T

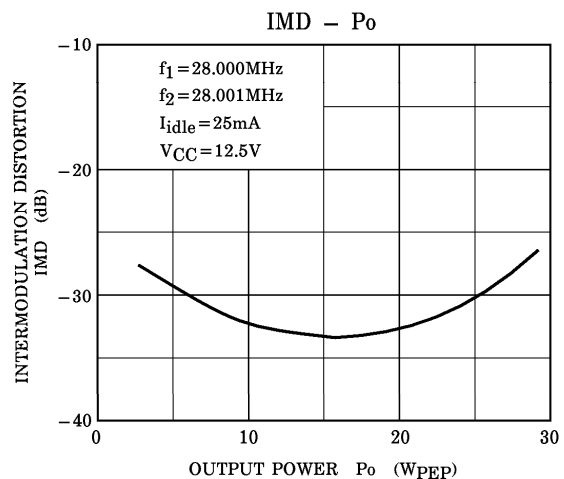
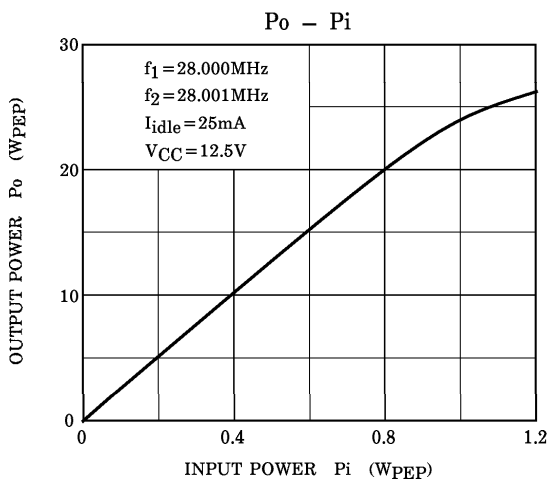
RFC_1 : ϕ 0.8 ENAMEL COATED COPPER WIRE, 9ID, 20T

RFC_2 : ϕ 1.5 ENAMEL COATED COPPER WIRE, 12ID, 15T

R_1 : 5.6 Ω (1/2W)

R_2 : 5 Ω (5W)

R_3 : 1.5 Ω (10W)



CAUTION

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

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