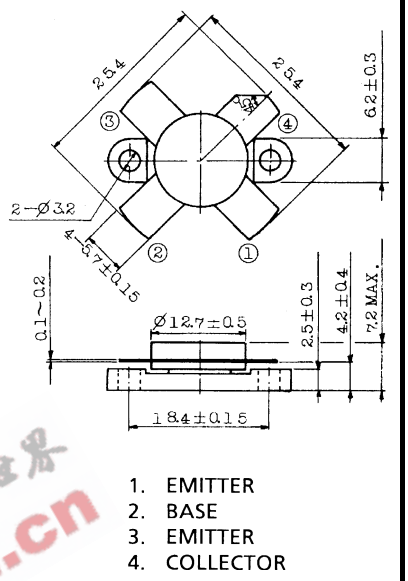
TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE

2SC2290A

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

Unit in mm

- Specified 12.5V, 28MHz Characteristics
- Output Power : P_O = 60W$_{PEP}$ (Min.)
- Power Gain : G_p = 11.8dB (Min.)
- Collector Efficiency : η_C = 35% (Min.)
- Intermodulation Distortion : IMD = −30dB (Max.)



JEDEC	—
EIAJ	—
TOSHIBA	2−13B1A

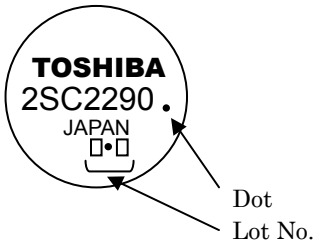
Weight: 5.2g

ABSOLUTE MAXIMUM RATINGS (Tc = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	45	V
Collector-Emitter Voltage	V_{CES}	45	V
Collector-Emitter Voltage	V_{CEO}	18	V
Emitter-Base Voltage	V_{EBO}	4	V
Collector Current	I_C	20	A
Collector Power Dissipation	P_C	175	W
Junction Temperature	T_j	175	°C
Storage Temperature Range	T_{stg}	−65~175	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

MARKING

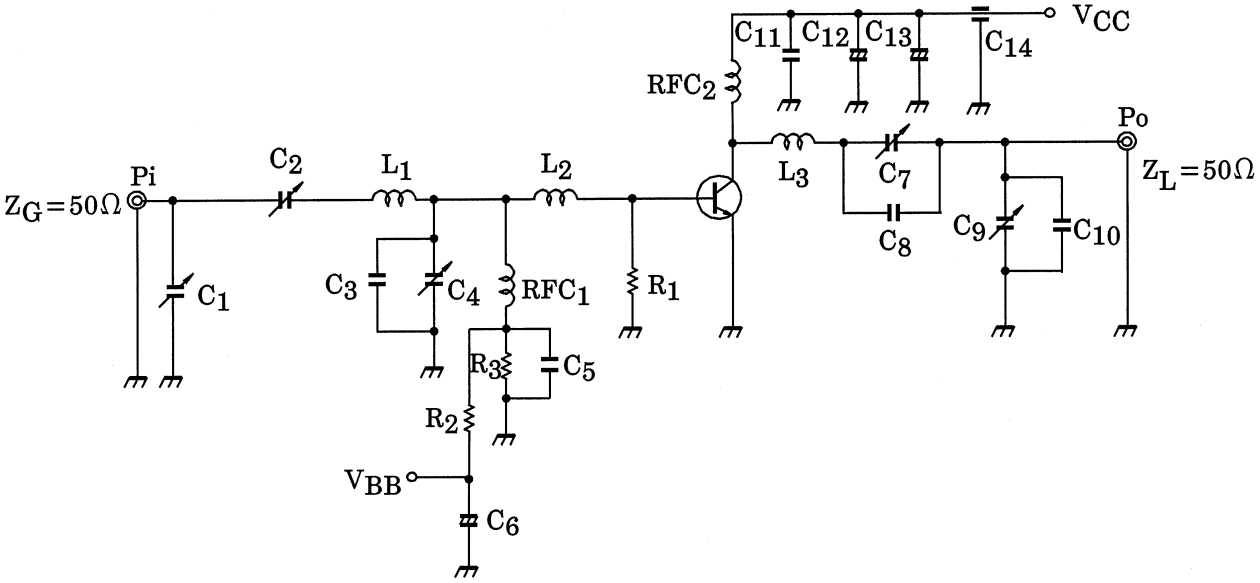


ELECTRICAL CHARACTERISTICS (Tc = 25°C)

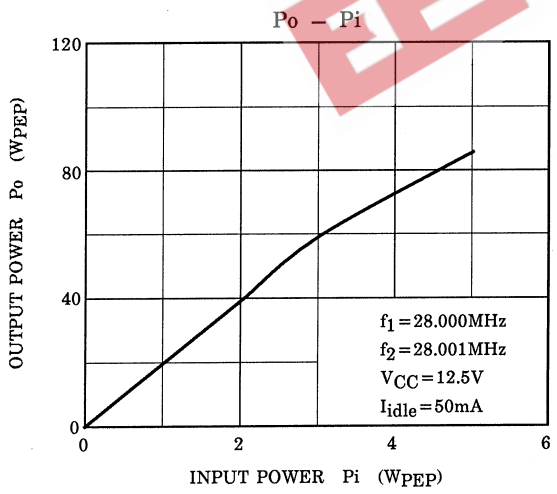
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector-Emitter Breakdown Voltage	$V_{(BR)\ CEO}$	I_C = 100mA, I_B = 0	18	—	—	V
Collector-Emitter Breakdown Voltage	$V_{(BR)\ CES}$	I_C = 100mA, V_{EB} = 0	45	—	—	V
Emitter-Base Breakdown Voltage	$V_{(BR)\ EBO}$	I_E = 1mA, I_C = 0	4	—	—	V
DC Current Gain	h_{FE}	V_{CE} = 5V, I_C = 10A *	10	—	150	—
Collector Output Capacitance	C_{ob}	V_{CB} = 12.5V, I_E = 0 f = 1MHz	—	—	500	pF
Power Gain	G_p	V_{CC} = 12.5V, f_1 = 28.000MHz, f_2 = 28.001MHz I_{idle} = 50mA Po = 60W_{PEP} (Fig.)	11.8	13.8	—	dB
Input Power	Pi		—	2.5	4	W_{PEP}
Collector Efficiency	η_C		35	—	—	%
Intermodulation Distortion	IMD		—	—	−30	dB
Series Equivalent Input Impedance	Z_{in}	V_{CC} = 12.5V, f_1 = 28.000MHz, f_2 = 28.001MHz Po = 60W_{PEP}	—	1.02 −j0.17	—	Ω
Series Equivalent Output Impedance	Z_{out}		—	0.86 −j0.21	—	Ω

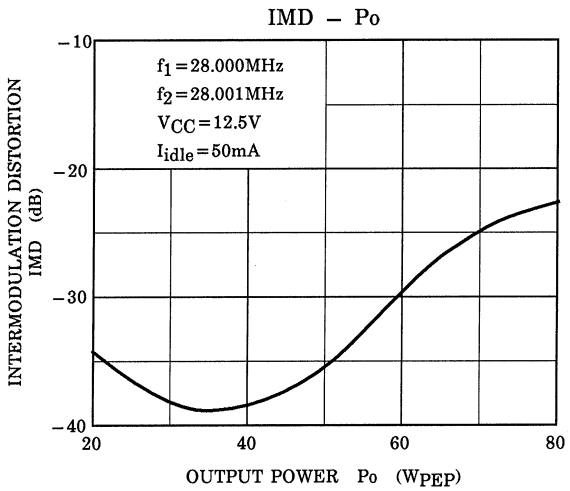
* Pulse Test: Pulse Width ≤ 100μs, Duty Cycle ≤ 3%

Fig. Pi TEST CIRCUIT



C_1, C_2, C_4, C_7	: 7~150pF		L_1	:	ϕ0.8 ENAMEL COATED COPPER WIRE, 9ID, 6T
C_3	: 250pF		L_2	:	ϕ1 SILVER PLATED COPPER WIRE, 9ID, 2T
C_5	: 0.4μF		L_3	:	ϕ1.5 ENAMEL COATED COPPER WIRE, 9ID, 5T
C_6	: 100μF 10WV		RFC$_1$	:	ϕ0.8 ENAMEL COATED COPPER WIRE, 9ID, 20T
C_8	: 150pF		RFC$_2$	:	ϕ1.5 ENAMEL COATED COPPER WIRE, 12ID, 15T
C_9	: 10~200pF		R_1	:	5.6Ω (1 / 2W)
C_{10}	: 600pF		R_2	:	5Ω (5W)
C_{11}	: 0.4μF		R_3	:	1.5Ω (10W)
C_{12}, C_{13}	: 22μF 35WV				
C_{14}	: 1000pF (FEED THROUGH)				





CAUTION

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

RESTRICTIONS ON PRODUCT USE

20070701-EN GENERAL

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