TOSHIBA RF POWER AMPLIFIER MODULE

S-AV34

○RF POWER AMPLIFIER MODULE for VHF BAND

· for digital use

ABSOLUTE MAXIMUM RATINGS (T_c = 25℃, Z_G = Z_L = 50Ω)

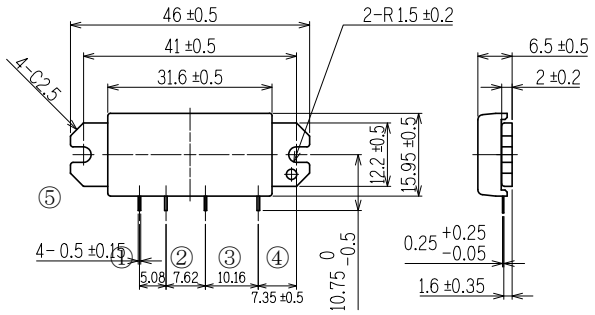
CHARACTERISTIC	SYMBOL	TEST CONDITION	RATING	UNIT
DC Supply Voltage	V_{DD}	V_{GG} =0V, Pi =0mW	20	V
DC Supply Voltage	V_{GG}	V_{DD}≦10.8V, Pi =0mW	8	V
Input Power	P_i	V_{DD}≦10.8V	20	dBmW
Junction Temperature	$T_{j\ MAX}$		150	℃
Storage Temperature Range	T_{stg}		-40~110	℃

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 and the operating ranges.
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).

Caution: This absolute maximum rating given in a sheet guarantees each item independently. When two items or more of maximum rated items joins a device at once. It becomes the outside of a guarantee.
Please design in circuit to make it always operate within this regulation also on the worst condition.

PACKAGE OUTLINE

Unit in mm



① RF Input ② V_{GG} ③ V_{DD}
④ RF Output ⑤ GROUND(FRANGE)

JEDEC	—
JEITA	—
TOSHIBA	5-32F

Weight: 11.8g

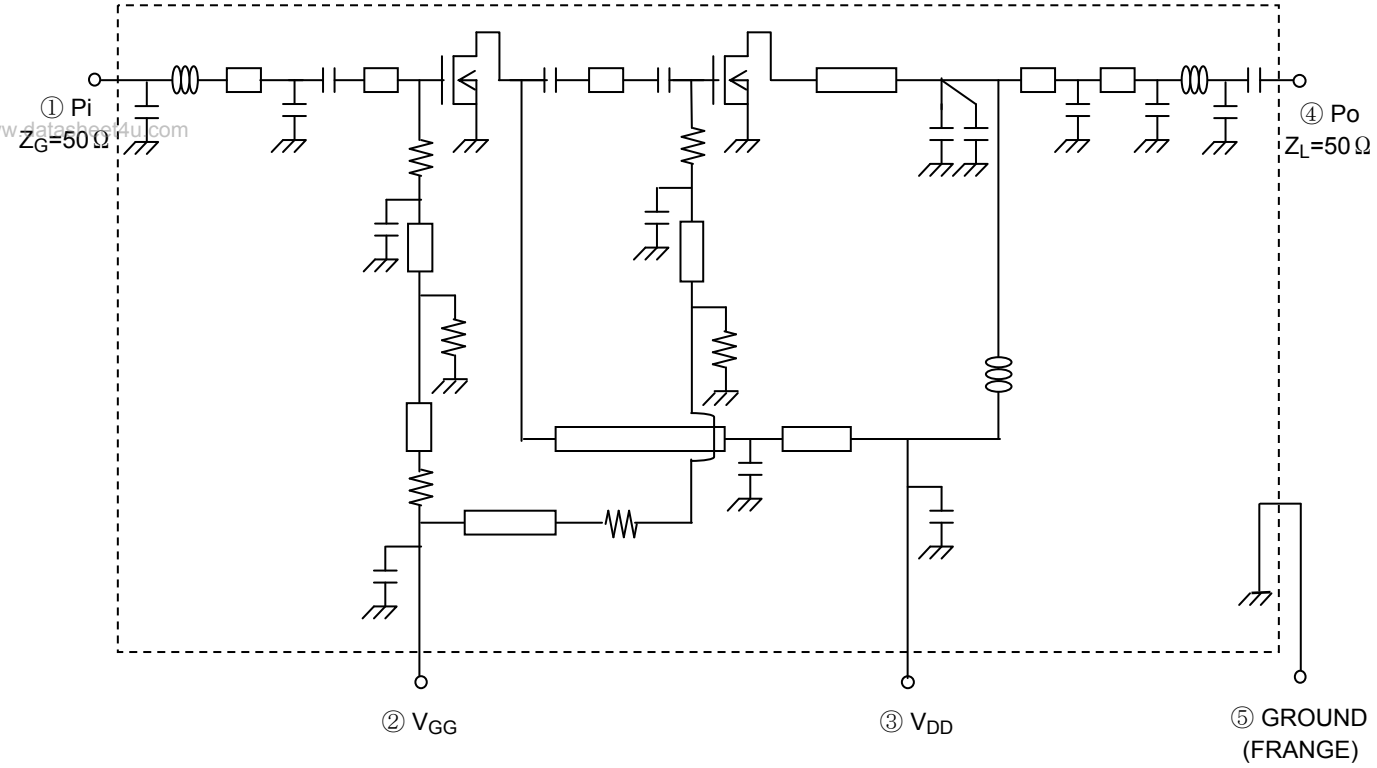
ELECTRICAL CHARACTERISTICS (Tc = 25°C, Z_G = 50Ω)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Frequency Range	f_{range}	—	150	—	165	MHz
Input Power	Pi	V_{DD} = 10.8V, I_{DD} = 2.8A (V_{GG} = adjust) Po = 39dBmW, Z_L = 50Ω	—	—	6	dBmW
Output Power 1	Po1	V_{DD} = 10.8V, V_{GG} = 5V, Pi = 12dBmW Z_L = 50Ω	43	—	—	dBmW
Total Efficiency	η_T	V_{DD} = 10.8V, Po = 39dBmW (Pi= adjust) Z_L = 50Ω	23	—	—	%
Drain Current	I_{DD}		—	—	3	A
Second Harmonic	2nd HRM	V_{DD} = 10.8V, I_{DD} = 2.8A (V_{GG} = adjust) Po = 39dBmW (Pi= adjust), Z_L = 50Ω	—	—	-30	dB
Harmonic	HRM		—	—	-30	dB
Adjacent-Channel Power Ratio	ACP	V_{DD} = 10.8V, I_{DD} = 2.8A (V_{GG} = adjust) Po = 39dBmW (Pi= adjust), Z_L = 50Ω Modulated Wave : π/4·DQPSK (α=0.5, 32kbps) Band Width : 16kHz Frequency Offset : 25kHz	—	—	-34	dB
Rate of Adjustment for Input Load	VSWRin	Input VSWR (When RF output pin connects 50Ω Load)	—	—	3	—
Gate Bias Current	I_{GGBias}	V_{DD} = 10.8V, I_{DD} = 2.8A (V_{GG} = adjust) Po = 39dBmW (Pi= adjust), Z_L = 50Ω After that Pi OFF	—	—	5	mA
Output Power 2	Po2	V_{DD} = 8.7V, V_{GG} = 5V, Pi = 5dBmW Z_L = 50Ω	36	—	—	dBmW
Ralative Phase Variation	—	V_{DD}= 10.8V, I_{DD} = 2.8A (V_{GG} = adjust) Po = 39dBmW (Pi= adjust), Z_L = 50Ω 0° (@Po = 28dBmW) Po = 28 to 41.5dBmW	—	—	20	°
Load Mismatch	—	V_{DD} = 10.8V, I_{DD} = 2.8A (V_{GG} = adjust) Po = 39dBmW (Pi= adjust, Z_L = 50Ω) VSWR LOAD 20: 1 ALL PHASE	No Degradation			—
Stability	—	V_{DD} = 8.7 to 13.0V, V_{GG} = 0 to 5V Pi = -40 to 39 dBmW VSWR LOAD 2.5: 1 ALL PHASE	All spurious output than 60dB below desired signal			—

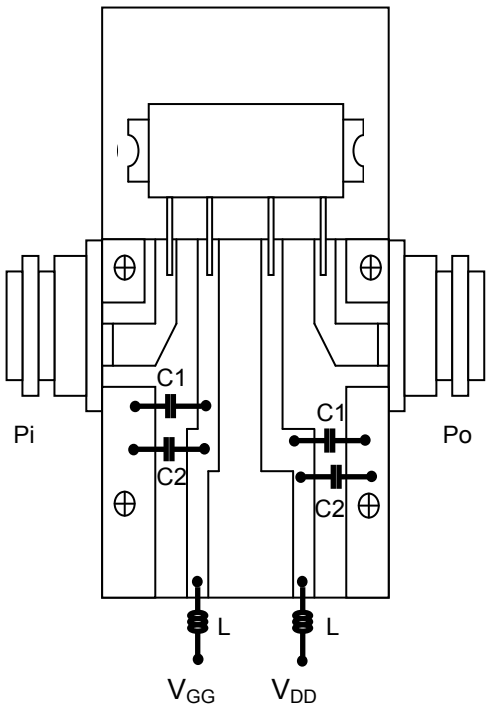
Caution

- This product has intersetting cap. Please pay attention for exceeding stress and foreign matter in your application. And not to take away the cap.
- 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.
- This product is electrostatic sensitivity, please handle with caution.

SCHEMATIC



TEST FIXTURE



C1:10000pF
C2:10 μ F
L: ϕ 0.5 ENAMEL WIRE、4T、3ID

RESTRICTIONS ON PRODUCT USE

20070701-EN GENERAL

- The information contained herein is subject to change without notice.
- TOSHIBA is continually working to improve the quality and 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 comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products 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 TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the “Handling Guide for Semiconductor Devices,” or “TOSHIBA Semiconductor Reliability Handbook” etc.
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.).These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury (“Unintended Usage”). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in his document shall be made at the customer’s own risk.
- The products described in this document shall not be used or embedded to any downstream products of which manufacture, use and/or sale are prohibited under any applicable laws and regulations.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patents or other rights of TOSHIBA or the third parties.
- Please contact your sales representative for product-by-product details in this document regarding RoHS compatibility. Please use these products in this document in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances. Toshiba assumes no liability for damage or losses occurring as a result of noncompliance with applicable laws and regulations.