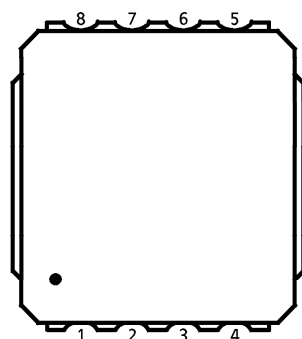


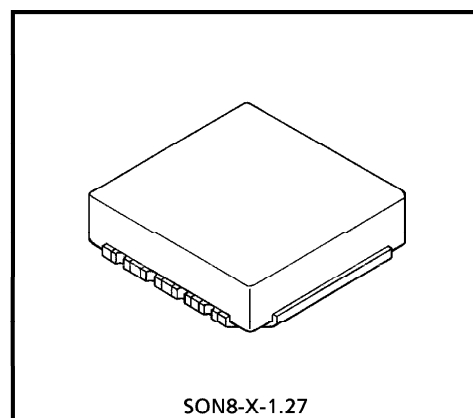
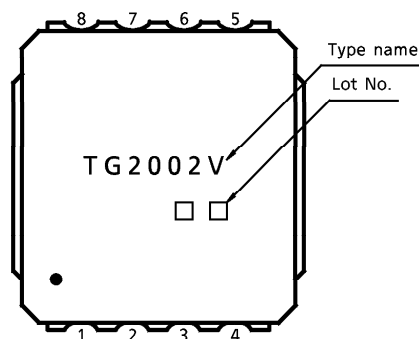
TOSHIBA HIGH FREQUENCY POWER AMPLIFIER MODULE

TG2002V**1.9GHz BAND POWER AMPLIFIER MODULE
(PHS DIGITAL CORDLESS TELEPHONE)****FEATURES**

- $V_{DD} = 3V$, $I_{DD} = 250mA$ (MAX.)
- $P_O = 22dBmW$ (MIN.), $G_p = 30dB$ (MIN.)
- GaAs MMIC MODULE
- Leadless Surface Mount Package (SON8)

PIN CONNECTION
(Top view)

- | | |
|--------------|--------------|
| 1. V_{DD1} | 5. V_{GC} |
| 2. GND | 6. Output |
| 3. Input | 7. GND |
| 4. V_{GG} | 8. V_{DD2} |

MARKING

SON8-X-1.27

Weight : 0.17g (Typ.)

961001EBC1

- 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.
- Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
- The products described in this document are subject to foreign exchange and foreign trade control laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{DD}	5	V
	V_{GG}	-4	V
Control Voltage	V_{GC}	5	V
Input Power	P_i	2	mW
Operating Temperature Range	T_{opr}	-10~60	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40~110	$^\circ\text{C}$

(Note) $V_{DD} = V_{DD1} = V_{DD2}$

CAUTION

This device is electrostatic sensitivity. Please handle with caution.

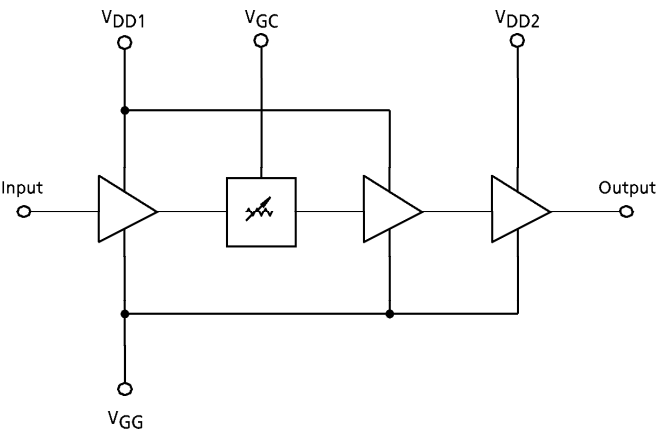
Do not use the chemical for removing flux. Please mount with no clean solder.

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

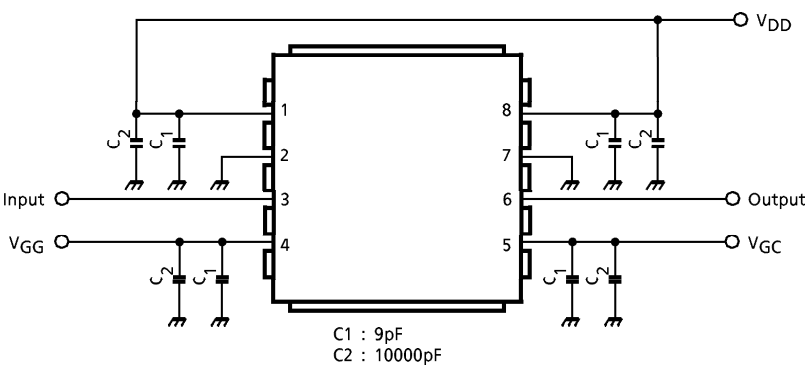
CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Frequency Range	f _{range}	—	—		1895	—	1918	MHz
Output Power	P _O	1	V _{DD} = 3V, V _{GG} = − 2V, V _{GC} = 0.5V P _i = − 8dBmW, Z _g = Z _l = 50Ω		22	24	—	dBmW
Power Gain	G _p				30	32	—	dB
Gain Control Ratio	G _c	1	P _i = − 8dBmW, V _{DD} = 3V, V _{GG} = − 2V V _{GC} = 2.5V, Z _g = Z _l = 50Ω		− 17	− 20	− 23	dB
Input VSWR	VSWR _{in}	1	V _{DD} = 3V, V _{GG} = − 2V, V _{GC} = 0.5V P _O = 22dBmW, P _i = Adjustment		—	—	2.5	—
Gate Current	IGG	—			—	—	− 5	mA
Gain Control Current	IGC				—	—	0.1	mA
Total Current	I _T				—	225	250	mA
Harmonics	2f ₀				—	—	− 30	dB
	3f ₀				—	—	− 30	dB
Adjacent Channel Leakage Power Ratio	Padj (1)	1	V _{DD} = 3V, V _{GG} = − 2V, V _{GC} = 0.5V, Z _g = Z _l = 50Ω P _O = 22dBmW, P _i = Adjustment (Note 2)	Δf = 600kHz	—	—	− 58	dB
	Padj (2)		Δf = 900kHz	—	—	− 63	dB	
Load Mismatch	—	—	V _{DD} = 4.5V, V _{GG} = − 2V, V _{GC} = 0.5V P _O = 22dBmW, P _i = Adjustment, Z _g = 50Ω VSWR Load = 20 : 1 all phase		No Degradation			—
Stability	—	—	V _{DD} = 2.5~4.5V, V _{GG} = − 2V, V _{GC} = 0.5V P _i = 0mW~ − 6dBmW, Z _g = 50Ω VSWR Load = 6 : 1 all phase		All spurious output than 60dB below desired signal			—

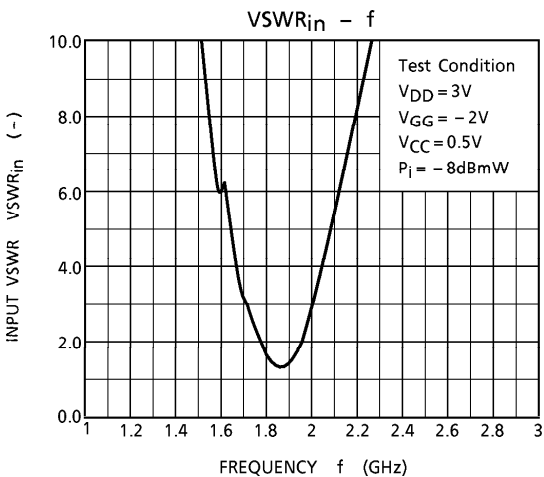
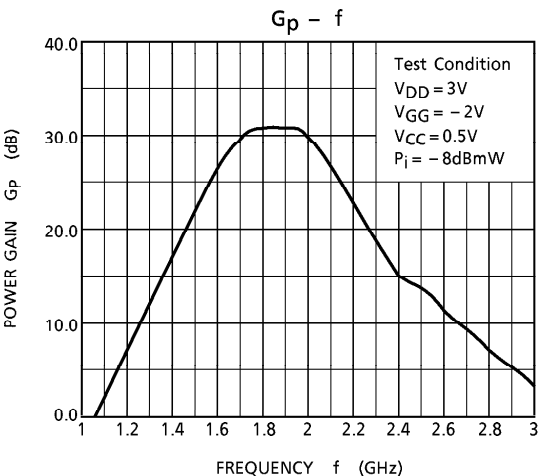
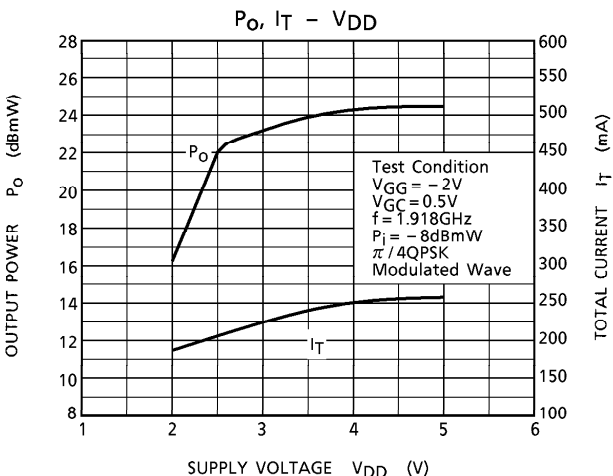
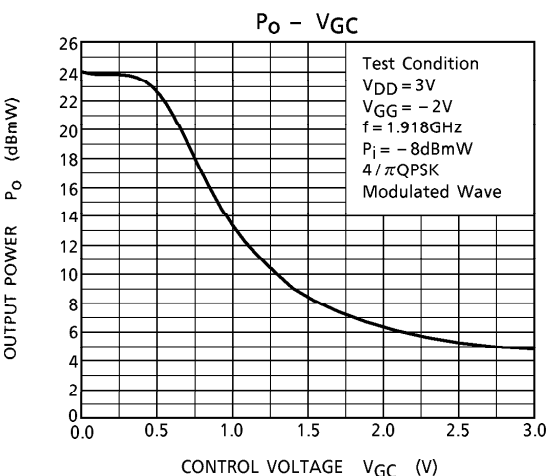
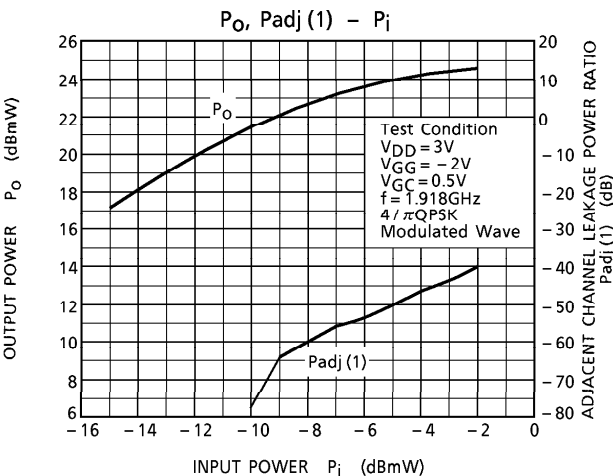
(Note 1) $V_{DD} = V_{DD1} = V_{DD2}$ (Note 2) Input signal is modulated to $\pi/4$ QPSK ($\alpha = 0.5$). Bit rate is 384kbps.

EQUIVALENT CIRCUIT

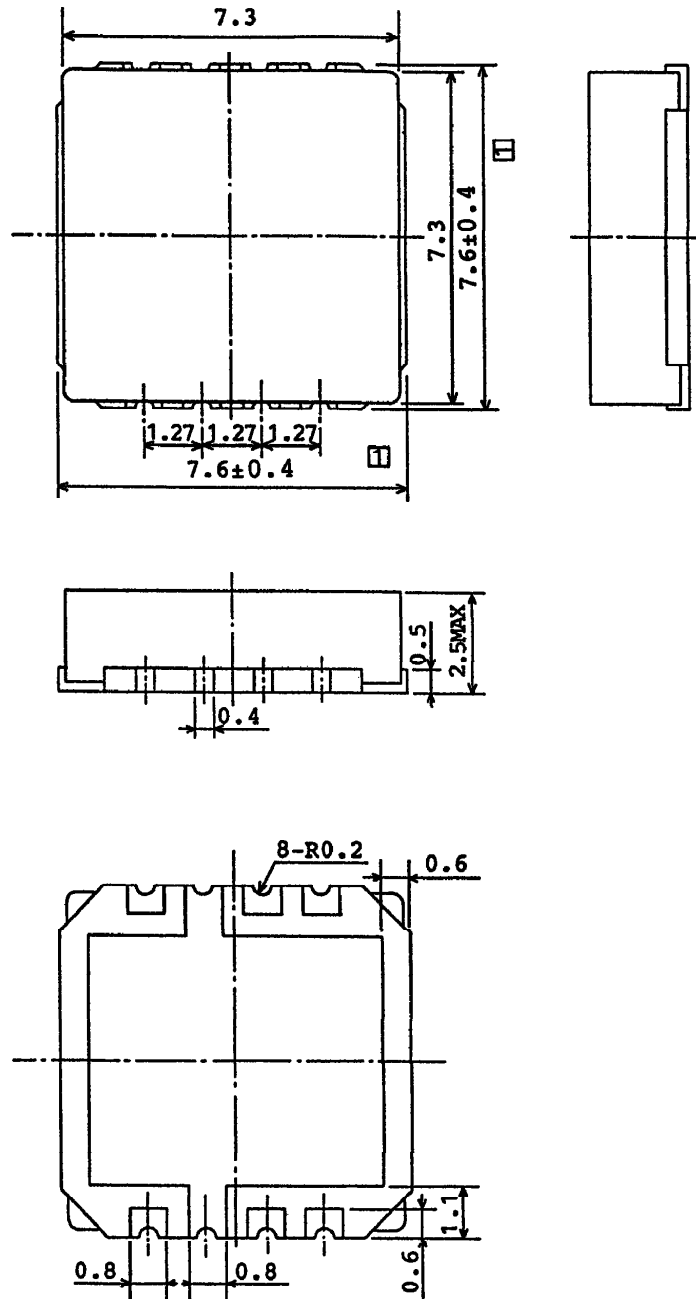


TEST CIRCUIT 1 (RF TEST CIRCUIT)





Unit : mm



Weight : 0.17g (Typ.)