

TOSHIBA

MICROWAVE POWER GaAs FET

S9G08A

PRELIMINARY

Features

- Low distortion
 - $P_{adj} = -74$ dBc at $P_o = 38$ dBm
- High gain
 - $G_{1dB} = 13$ dB
- Partially matched type
- Hermetically sealed package

RF Performance Specifications ($T_a = 25^\circ\text{C}$)

Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max.
Output Power at 1dB Compression Point	P_{1dB}	$V_{DS} = 10V$ $f = 1.9$ GHz	dBm	41.5	42.5	–
Power Gain at 1dB Compression Point	G_{1dB}		dB	12.0	13.0	–
Drain Current	I_{DS}		A	–	3.5	5.0
Power Added Efficiency	η_{add}		%	–	42	–
Channel-Temperature Rise	ΔT_{ch}	Note 1	$^\circ\text{C}$	–	–	80
Adjacent Channel Leakage Power	P_{adj}	$V_{DS} = 10V, f = 1.9$ GHz $P_o = 38$ dBm $I_{DS} \approx 3.5A$ $\pi / 4$ -QPSK Modulation 600 kHz Offset	dBc	–	-74	–

Note 1: $\Delta T_{ch} = (V_{DS} \times I_{DS} + P_{in} - P_{1dB}) \times R_{th(c-c)}$ Electrical Characteristics ($T_a = 25^\circ\text{C}$)

Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max.
Transconductance	gm	$V_{DS} = 3V$ $I_{DS} = 3.0A$	mS	–	5300	–
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3V$ $I_{DS} = 30$ mA	V	-1.0	-1.9	-4.0
Saturated Drain Current	I_{DSS}	$V_{DS} = 2V$ $V_{GS} = 0V$	A	–	9.5	13.0
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS} = -300$ μA	V	-5	–	–
Thermal Resistance	$R_{th(c-c)}$	Channel to Case	$^\circ\text{C/W}$	–	1.6	2.2

The information contained here is subject to change without notice.

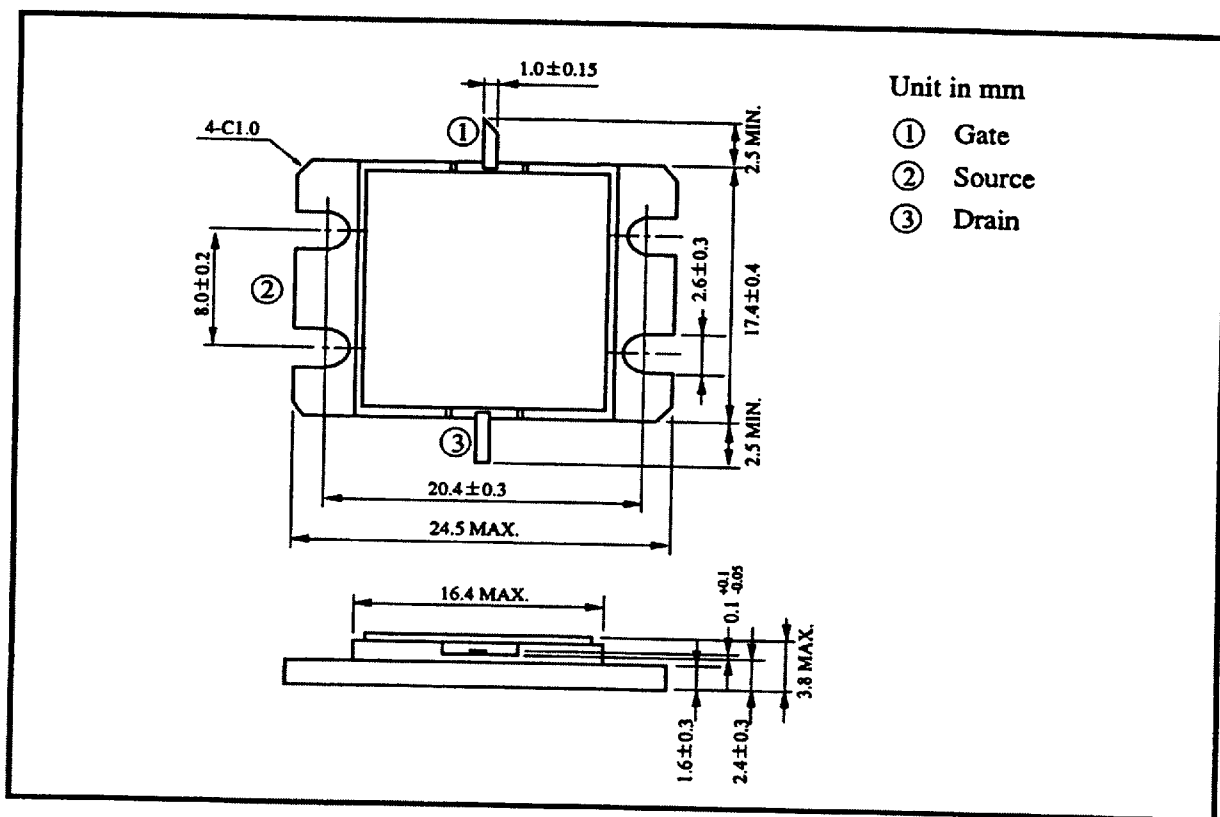
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Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristic	Symbol	Unit	Rating
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	-5
Drain Current	I_{DS}	A	13.0
Total Power Dissipation ($T_c = 25^\circ\text{C}$)	P_T	W	65
Channel Temperature	T_{ch}	$^\circ\text{C}$	175
Storage Temperature	T_{stg}	$^\circ\text{C}$	-65 ~ 175

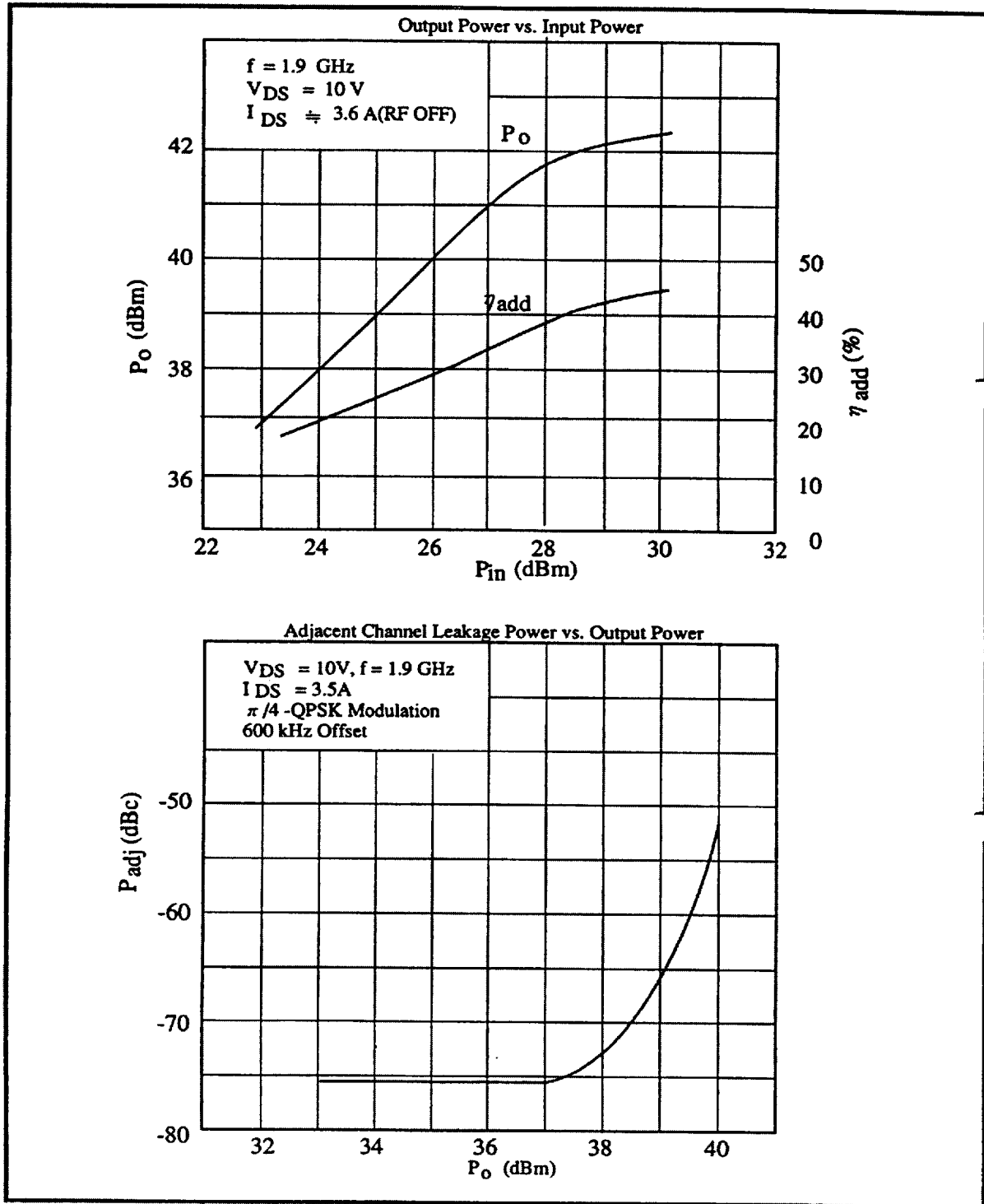
Package Outline (2-16G6A)



Handling Precautions for Packaged Type

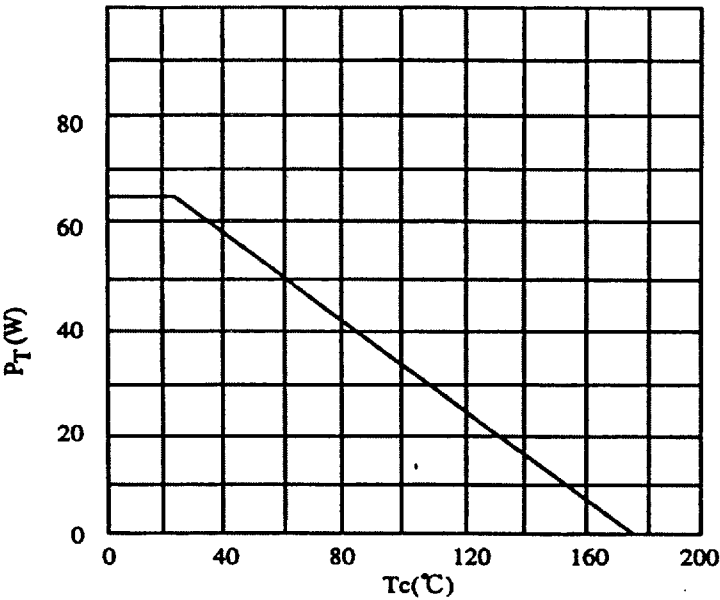
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

RF Performances

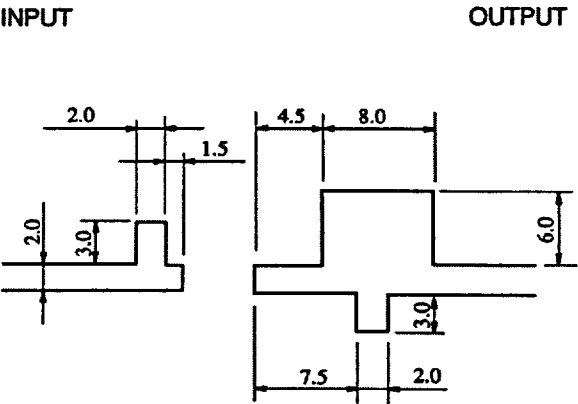


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Power Dissipation vs. Case Temperature



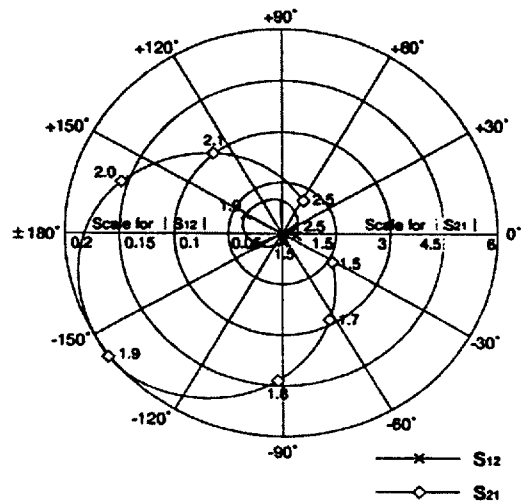
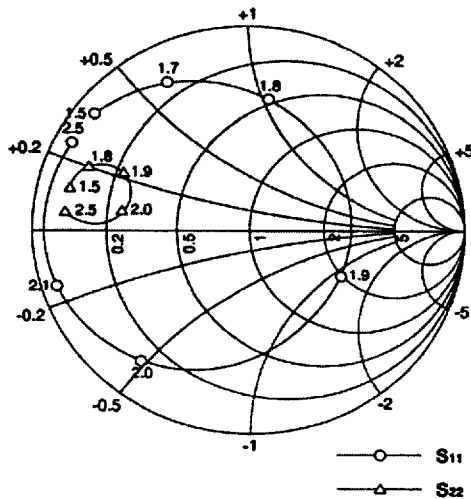
Drawing of Recommended Matching Network



Substrate Material: Teflon ($\epsilon r = 2.8$)
Thickness: 0.76mm

Unit in mm

S9G08A S-Parameters (Magn. and Angles)

 $V_{DS} = 10V, I_{DS} = 3.6A$ $f = 1.5 \sim 2.5GHz$ 

FREQUENCY (GHz)	S_{11}		S_{12}		S_{21}		S_{22}	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.50	0.91	141	0.008	-85	1.69	-31	0.85	166
1.60	0.88	132	0.011	-102	2.12	-45	0.84	164
1.70	0.81	117	0.015	-123	2.89	-63	0.84	162
1.80	0.66	82	0.025	-155	4.36	-92	0.80	157
1.90	0.48	-28	0.039	151	6.06	-143	0.64	154
2.00	0.81	-128	0.033	93	4.69	161	0.59	171
2.10	0.93	-163	0.024	59	3.04	129	0.68	176
2.20	0.95	-180	0.019	37	2.16	107	0.74	177
2.30	0.94	170	0.016	20	1.65	89	0.78	177
2.40	0.94	161	0.014	5	1.34	73	0.82	176
2.50	0.92	152	0.013	-8	1.15	58	0.85	174