

TOSHIBA

MICROWAVE SEMICONDUCTOR TECHNICAL DATA

MICROWAVE POWER GaAs FET S9G07A

FEATURES :

■ LOW DISTORTION

$P_{adj} = -74 \text{ dBc@ } P_o = 29 \text{ dBm}$

■ NON-MATCHED TYPE

■ HIGH GAIN

$G_{1\text{dB}} = 14 \text{ dB}$

■ HERMETICALLY SEALED PACKAGE

RF PERFORMANCE SPECIFICATIONS ($T_a = 25^\circ\text{C}$)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Compression Point	$P_{1\text{dB}}$	$V_{DS} = 10\text{V}$ $f = 1.9 \text{ GHz}$	dBm	32.5	33.5	-
Power Gain at 1dB Compression Point	$G_{1\text{dB}}$		dB	13	14	-
Drain Current	I_{DS}		A	-	0.5	0.8
Power Added Efficiency	η_{add}		%	-	43	-
Channel-Temperature Rise	ΔT_{ch}	NOTE 1	$^\circ\text{C}$	-	-	80
Adjacent Channel Leakage Power	P_{adj}	$V_{DS} = 10\text{V}, f = 1.9\text{GHz}$ $P_o = 29\text{dBm}, I_{DS} = 0.5\text{A}$ $\pi/4\text{-QPSK Modulation}$ 600kHz Offset	dBc	-	-74	-

NOTE 1: $\Delta T_{ch} = (V_{DS} \times I_{DS} + P_{in} - P_{1\text{dB}}) \times R_{th(c-c)}$

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Transconductance	g_m	$V_{DS} = 3 \text{ V}$ $I_{DS} = 0.5 \text{ A}$	mS	-	500	-
Pinch-off Voltage	$V_{GS\text{off}}$	$V_{DS} = 3 \text{ V}$ $I_{DS} = 10 \text{ mA}$	V	-1.0	-1.9	-4.0
Saturated Drain Current	I_{DSS}	$V_{DS} = 2 \text{ V}$ $V_{GS} = 0 \text{ V}$	A	-	1.0	1.5
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS} = -20 \mu\text{A}$	V	-5	-	-
Thermal Resistance	$R_{th(c-c)}$	Channel to case	$^\circ\text{C/W}$	-	10	14

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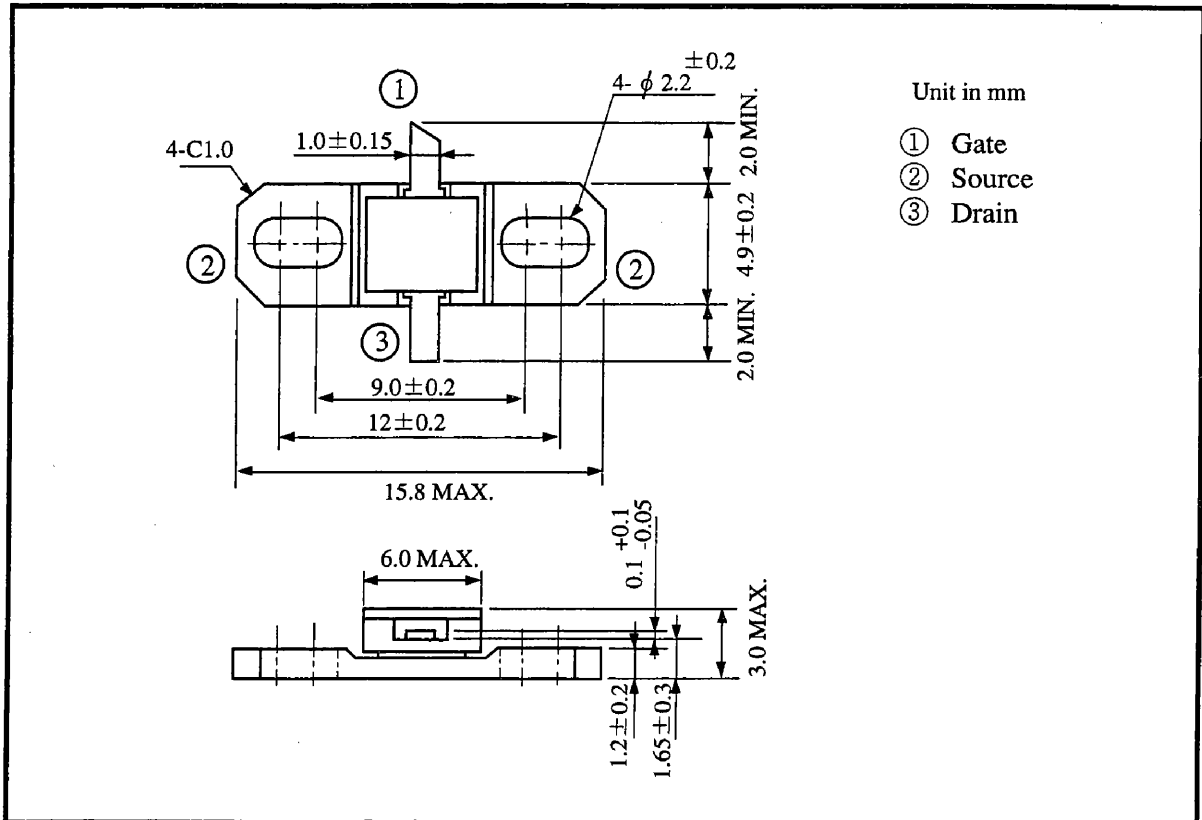
* The information contained herein may be changed without prior notice. It is therefore advisable to contact TOSHIBA before proceeding with the design of equipment incorporating this product.

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ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	UNIT	RATING
Drain-Source Voltage	V _{DS}	V	15
Gate-Source Voltage	V _{GS}	V	-5
Drain Current	I _{DS}	A	1.5
Total Power Dissipation(Tc = 25°C)	P _T	W	10.7
Channel Temperature	T _{ch}	°C	175
Storage Temperature	T _{stg}	°C	-65~175

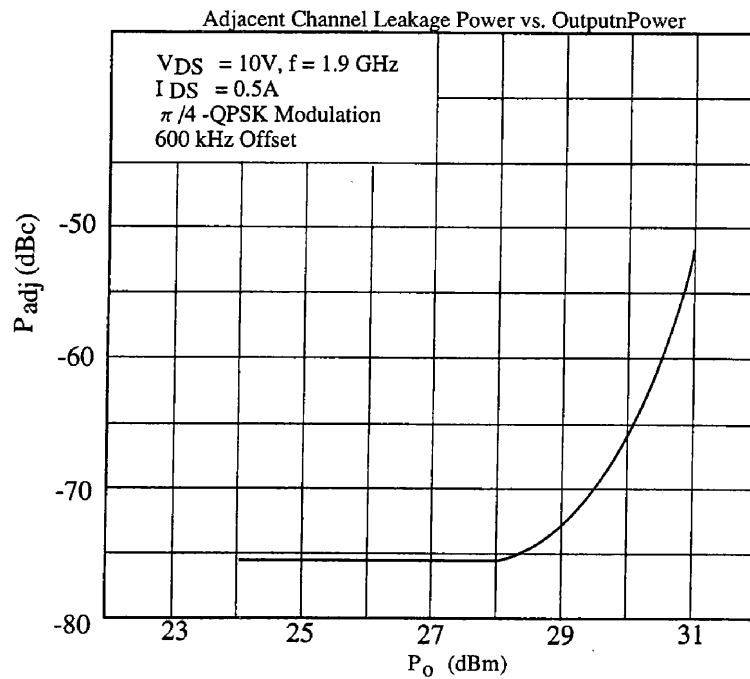
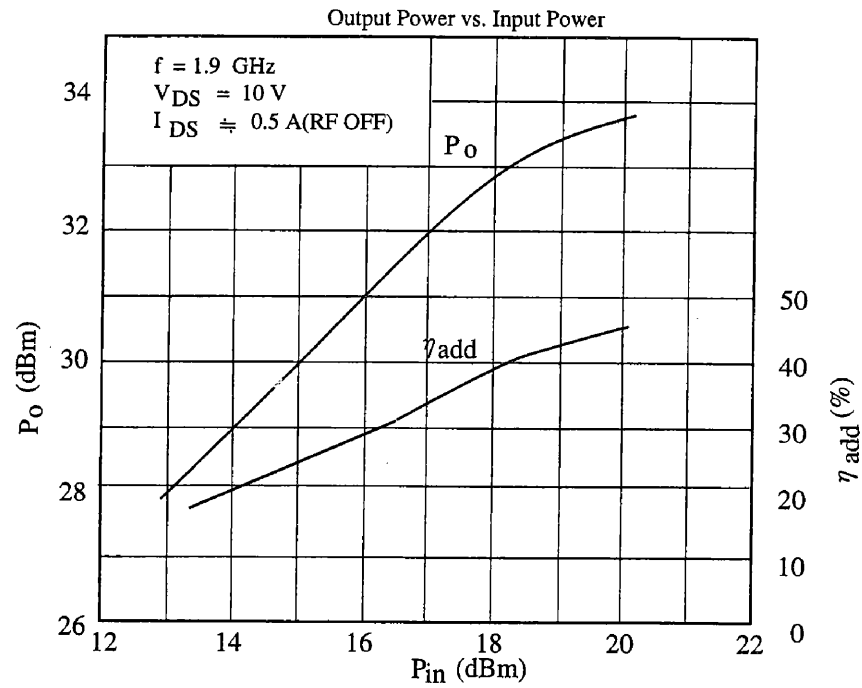
PACKAGE OUTLINE (2-5M1A)



HANDLING PRECAUTIONS FOR PACKAGED TYPE

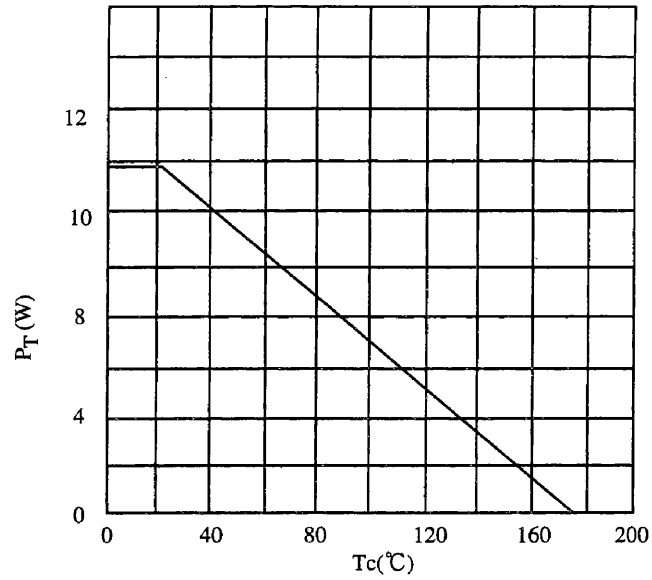
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

RF PERFORMANCES

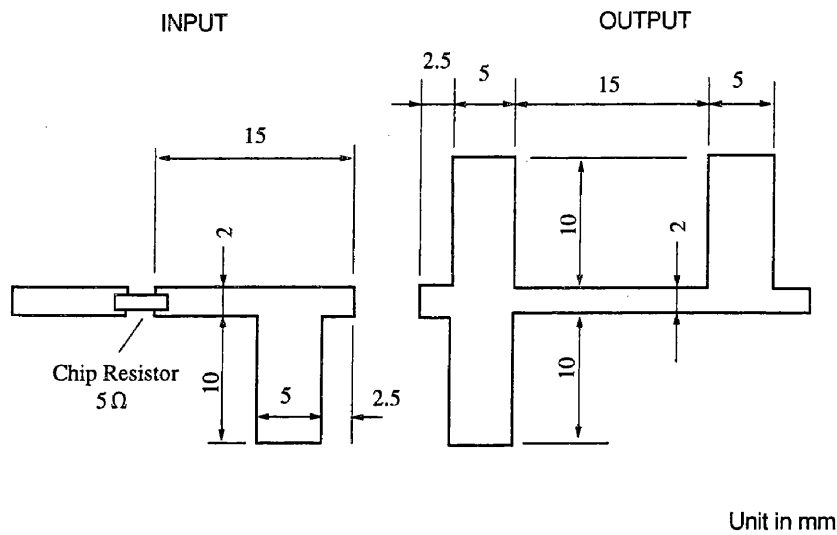


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POWER DISSIPATION VS. CASE TEMPERATURE



DRAWING OF RECOMMENDED MATCHING NETWORK



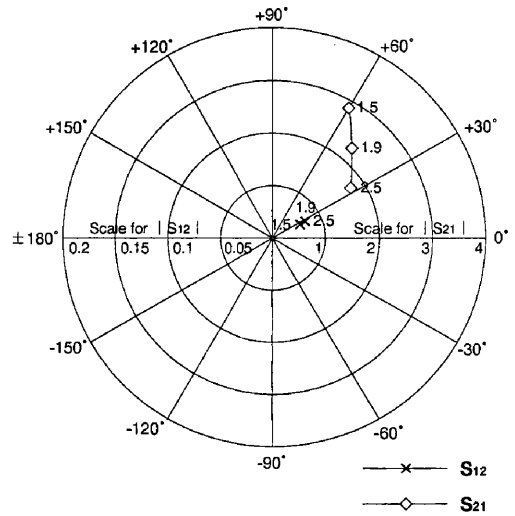
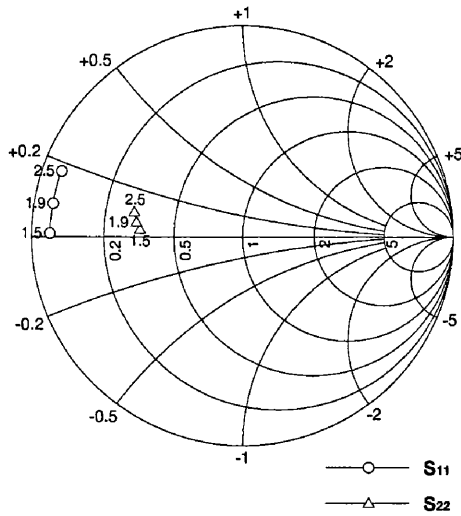
Substrate Material : Teflon ($\epsilon r = 2.8$)
Thickness : 0.76 mm

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S9G07A S-PARAMETERS (MAGN.and ANGLES)

$V_{DS} = 10V, I_{DS} = 0.5A$

$f = 1.5 \sim 2.5GHz$



FREQUENCY (GHz)	S_{11}		S_{12}		S_{21}		S_{22}	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.50	0.91	179	0.027	26	2.86	60	0.49	176
1.60	0.91	176	0.028	26	2.69	57	0.49	175
1.70	0.91	174	0.029	26	2.53	55	0.50	174
1.80	0.91	172	0.029	27	2.40	52	0.50	173
1.90	0.91	170	0.030	27	2.28	49	0.51	172
2.00	0.91	169	0.031	27	2.17	46	0.51	171
2.10	0.91	167	0.032	27	2.07	44	0.52	170
2.20	0.91	165	0.033	27	1.98	41	0.52	169
2.30	0.91	163	0.033	27	1.90	39	0.52	169
2.40	0.91	162	0.034	27	1.82	36	0.53	168
2.50	0.91	160	0.035	27	1.75	33	0.53	167