

# TOSHIBA

MICROWAVE SEMICONDUCTOR

## TECHNICAL DATA

MICROWAVE POWER GaAs FET

TIM5964-4A

### FEATURES:

- HIGH POWER  
P<sub>1dB</sub> = 36.5 dBm at 5.9 GHz to 6.4 GHz
- BROAD BAND INTERNALLY MATCHED
- HIGH GAIN  
G<sub>1dB</sub> = 8.5 dB at 5.9 GHz to 6.4 GHz
- HERMETICALLY SEALED PACKAGE

### RF PERFORMANCE SPECIFICATIONS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1 dB Compression Point	P <sub>1dB</sub>	V <sub>DS</sub> = 10V f = 5.9~6.4GHz	dBm	36.0	36.5	-
Power Gain at 1 dB Compression Point	G <sub>1dB</sub>		dB	8.0	8.5	-
Drain Current	I <sub>DS</sub>		A	-	1.1	1.5
Power Added Efficiency	η <sub>add</sub>		%	-	35	-
Channel Temperature Rise	ΔT <sub>ch</sub>	V <sub>DS</sub> × I <sub>DS</sub> × R <sub>th(c-c)</sub>	°C	-	-	80

### ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Trans-conductance	g <sub>m</sub>	V <sub>DS</sub> = 3V I <sub>DS</sub> = 1.5A	ms	-	900	-
Pinch-off Voltage	V <sub>GSoff</sub>	V <sub>DS</sub> = 3V I <sub>DS</sub> = 20mA	V	-2.0	-3.5	-5.0
Saturated Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 3V V <sub>GS</sub> = 0V	A	-	2.9	3.8
Gate-Source Breakdown Voltage	V <sub>GS0</sub>	I <sub>GS</sub> = -60 μA	V	-5	-	-
Thermal Resistance	R <sub>th(c-c)</sub>	Channel to Case	°C/W	-	4.0	6.0

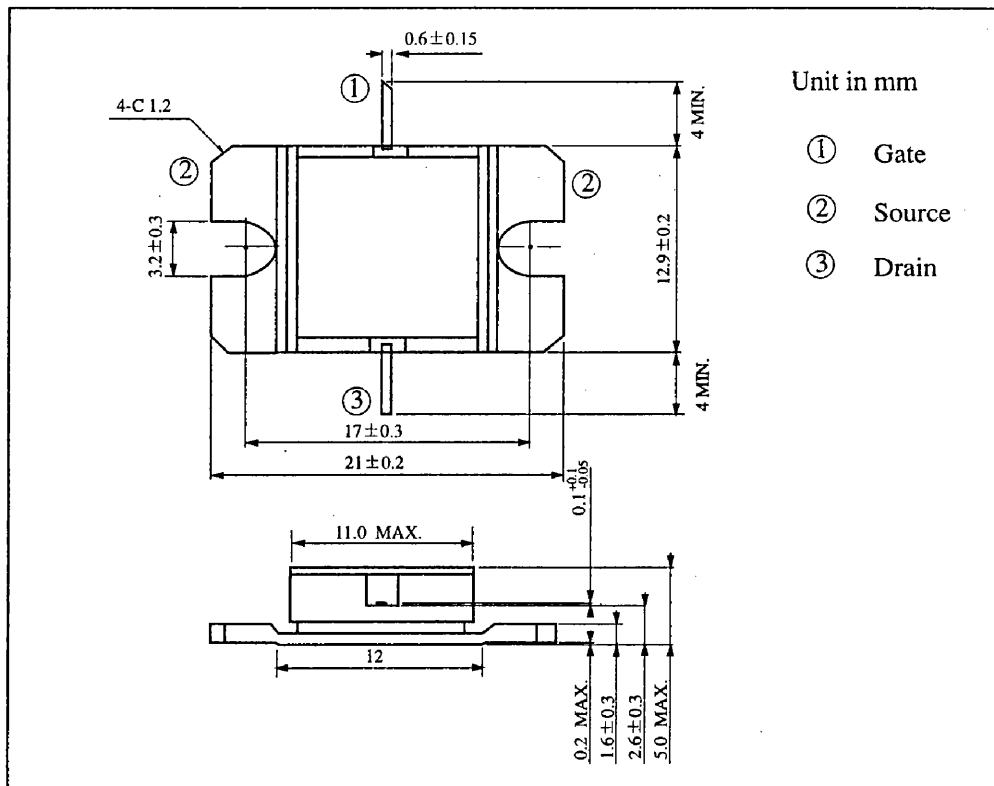
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## ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	UNIT	RATING
Drain=Source Voltage	V <sub>DS</sub>	V	15
Gate=Source Voltage	V <sub>GS</sub>	V	-5
Drain Current	I <sub>DS</sub>	A	4
Total Power Dissipation (T <sub>c</sub> =25°C)	P <sub>T</sub>	W	20
Channel Temperature	T <sub>ch</sub>	°C	175
Storage Temperature	T <sub>stg</sub>	°C	-65~175

## PACKAGE OUTLINE (2-11D1B)



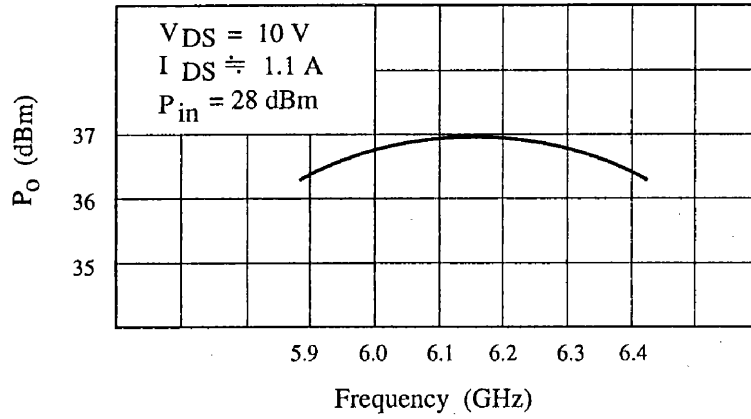
## HANDLING PRECAUTIONS FOR PACKAGED TYPE

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

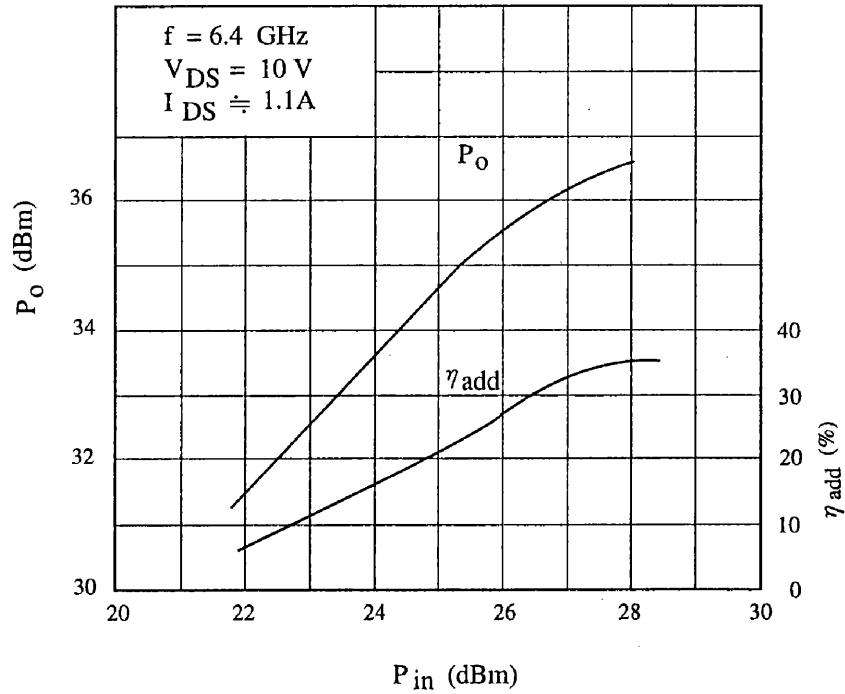
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## RF PERFORMANCES

### Output Power vs. Frequency

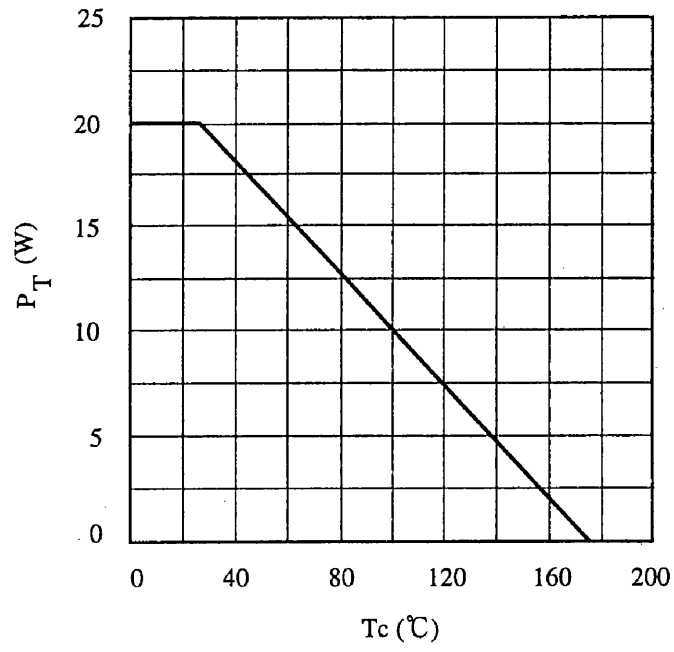


### Output Power vs. Input Power



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## POWER DISSIPATION VS. CASE TEMPERATURE

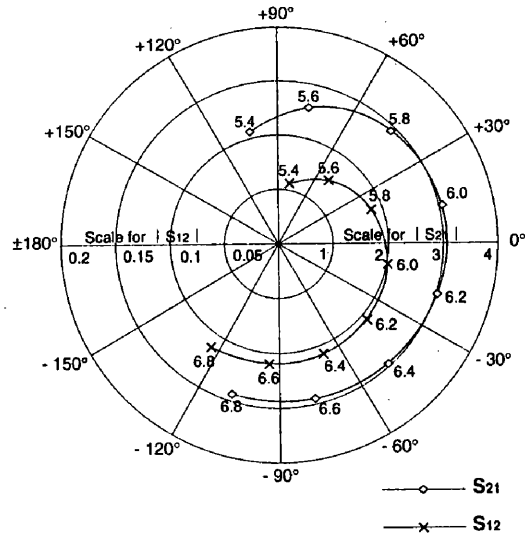
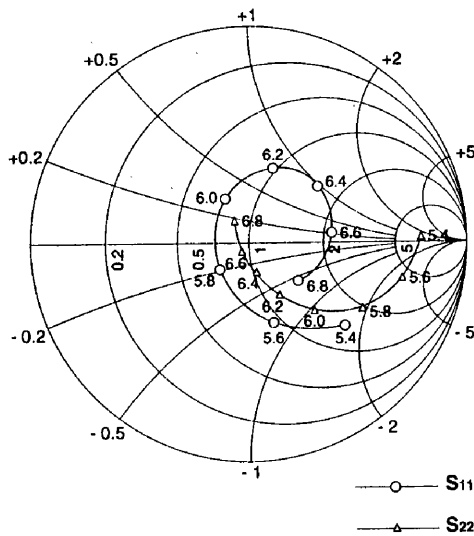


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## TIM5964-4A S-PARAMETERS (MAGN.and ANGLES)

V<sub>DS</sub> = 10V, I<sub>DS</sub> = 1.1A

f = 5.4~6.8GHz



FREQUENCY (GHz)	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
5.4	0.58	-41	2.12	104	0.056	79	0.79	2
5.6	0.38	-73	2.56	77	0.074	51	0.72	-13
5.8	0.18	-138	2.91	45	0.090	20	0.60	-30
6.0	0.23	118	3.06	13	0.101	-11	0.43	-46
6.2	0.36	72	3.03	-18	0.106	-41	0.28	-60
6.4	0.41	39	2.95	-48	0.108	-68	0.14	-76
6.6	0.38	7	2.89	-77	0.110	-95	0.05	-129
6.8	0.28	-38	2.87	-108	0.113	-124	0.12	123