TOSHIBA

MICROWAVE SEMICONDUCTOR

TECHNICAL DATA

MICROWAVE POWER GaAs FET

TIM5964-45SL

FEATURES :

- LOW INTERMODULATION DISTORTION
  IM_3 = −45 dBc at Po = 35.5 dBm, Single Carrier Level
- HIGH POWER
  P_{1dB} = 46.5 dBm at 5.9 GHz to 6.4 GHz
- HIGH GAIN
  G_{1dB} = 9.0 dB at 5.9 GHz to 6.4 GHz
- BROAD BAND INTERNALLY MATCHED
- HERMETICALLY SEALED PACKAGE

RF PERFORMANCE SPECIFICATIONS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1 dB Compression Point	P_{1dB}	V_{DS} = 10 V f = 5.9 ~ 6.4 GHz	dBm	46.0	46.5	–
Power Gain at 1 dB Compression Point	G_{1dB}		dB	8.0	9.0	–
Drain Current	I_{DS}		A	–	9.6	10.8
Gain Flatness	ΔG		dB	–	–	±0.8
Power Added Efficiency	ηadd		%	–	41	–
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	−42	−45	–
Channel-Temperature Rise	ΔTch	$V_{DS} \times I_{DS} \times R_{th}$ (c−c)	°C	–	–	100

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Transconductance	gm	V_{DS} = 3 V I_{DS} = 11.0 A	mS	–	8000	–
Pinch-off Voltage	V_{GSoff}	V_{DS} = 3 V I_{DS} = 170 mA	V	-1.0	-2.5	-4.0
Saturated Drain Current	I_{DSS}	V_{DS} = 3 V V_{GS} = 0 V	A	–	24	31
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS} = −500 μA	V	−5	–	–
Thermal Resistance	$R_{th\ (c-c)}$	Channel to Case	°C/W	–	0.8	1.2

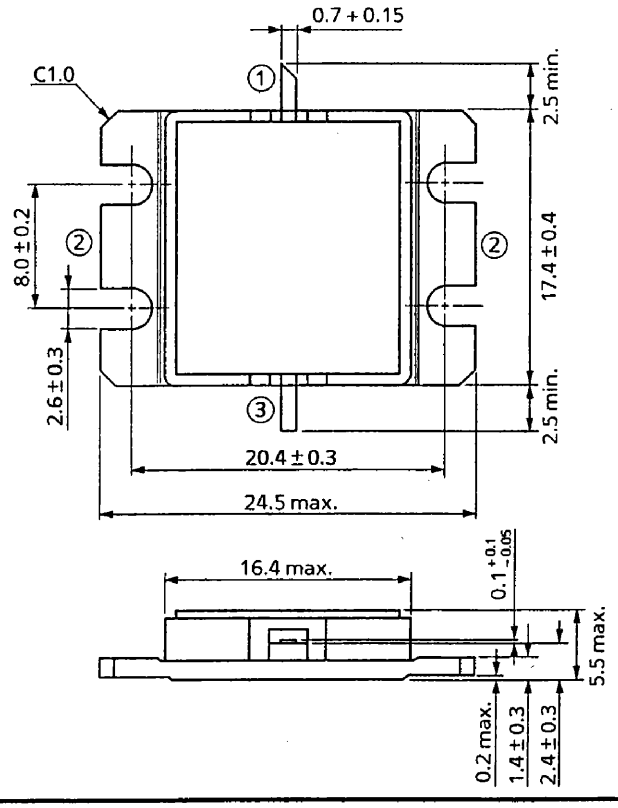
Note 1 : 2 tone Test Pout = 35.5 dBm Single Carrier Level.

Recommended gate resistace (Rg) : Rg=Rg1 (10 Ω) + Rg2 (18 Ω) = 28 Ω (MAX.)

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	UNIT	RATING
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	−5
Drain Current	I_{DS}	A	31
Total Power Dissipation (T_C = 25°C)	P_T	W	125
Channel Temperature	T_{ch}	°C	175
Storage Temperature	T_{stg}	°C	−65~175

PACKAGE OUTLINE (2-16G1B)



Unit in mm

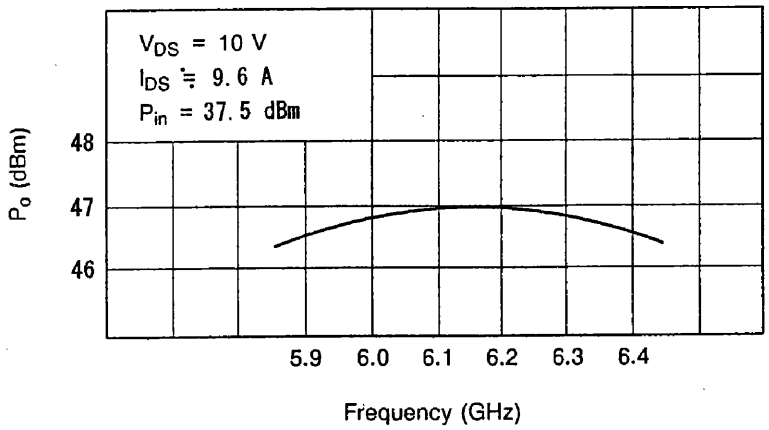
① Gate
② Source
③ Drain

HANDLING PRECAUTIONS FOR PACKAGED TYPE

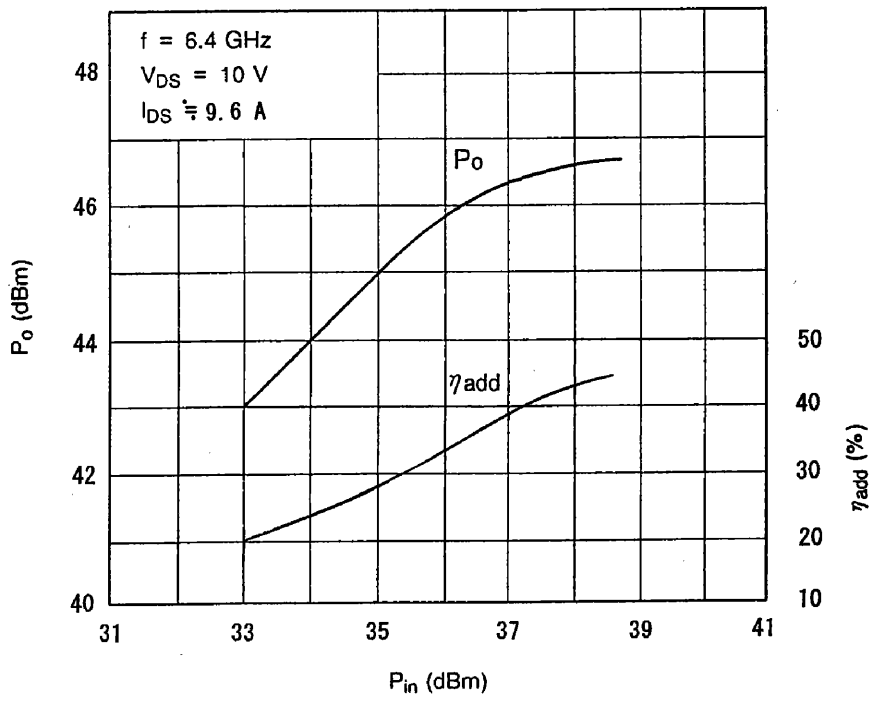
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

RF PERFORMANCES

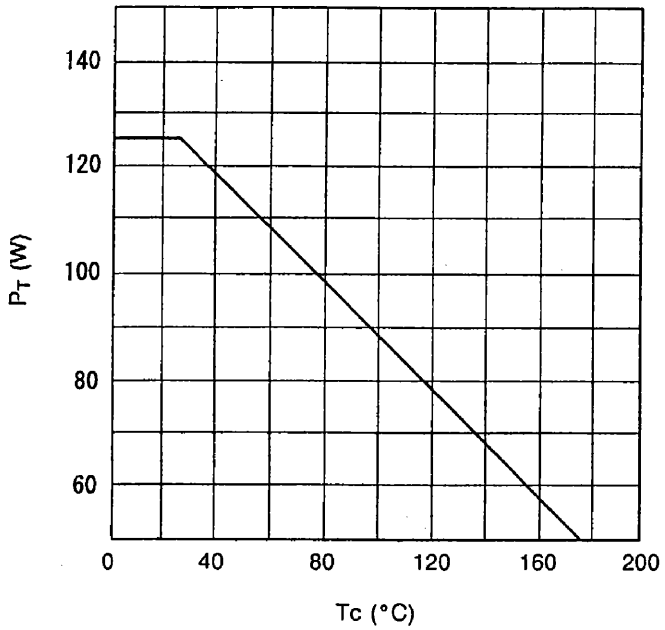
Output Power vs. Frequency



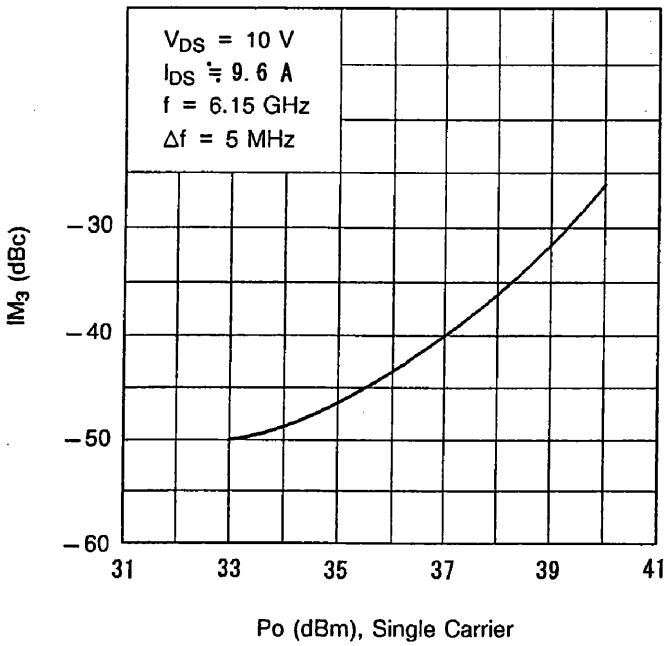
Output Power vs. Input Power



POWER DISSIPATION VS. CASE TEMPERATURE



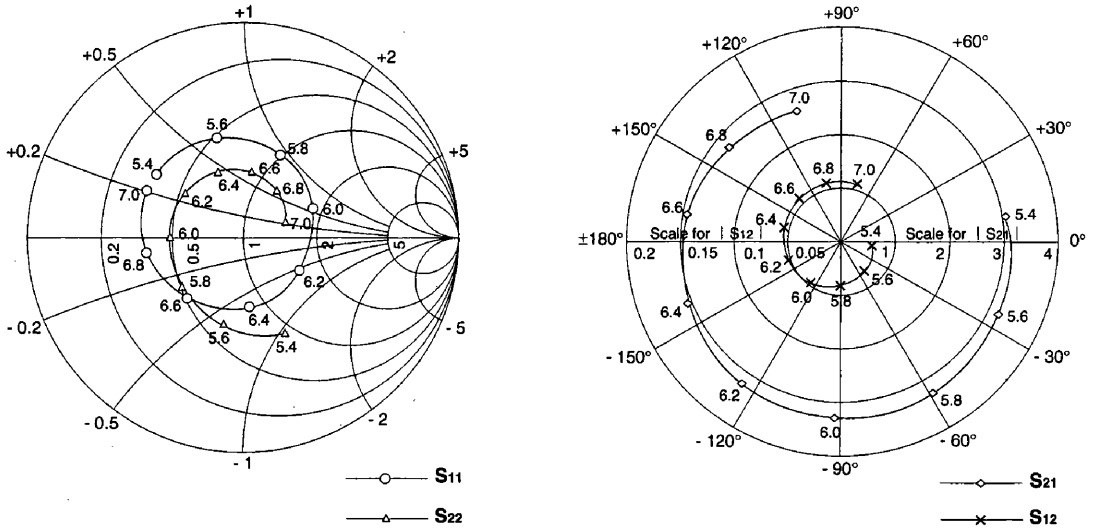
IM_3 VS. OUTPUT POWER CHARACTERISTICS



TIM5964-45SL S-PARAMETERS
(MAGN.and ANGLES)

V_{DS} = 10V,I_{DS} = 9.6A

f =5.4~7.0GHz



FREQUENCY (GHz)	S11 MAG	S11 ANG	S21 MAG	S21 ANG	S12 MAG	S12 ANG	S22 MAG	S22 ANG
5.4	0.50	144	3.06	9	0.029	-7	0.48	-66
5.6	0.48	105	3.20	-25	0.035	-51	0.41	-103
5.8	0.42	66	3.28	-59	0.041	-90	0.36	-142
6.0	0.35	23	3.29	-92	0.047	-126	0.34	179
6.2	0.30	-30	3.22	-125	0.052	-161	0.34	142
6.4	0.32	-85	3.08	-158	0.055	166	0.33	111
6.6	0.38	-133	2.91	170	0.056	134	0.31	83
6.8	0.45	-171	2.74	140	0.056	104	0.27	55
7.0	0.50	154	2.58	109	0.056	74	0.21	22