TOSHIBA

MICROWAVE SEMICONDUCTOR

TECHNICAL DATA

MICROWAVE POWER GaAs FET

TIM5964-16SL

FEATURES :

- LOW INTERMODULATION DISTORTION
  IM_3 = −45 dBc at Po = 31.5 dBm, Single Carrier Level
- HIGH POWER
  P_{1dB} = 42.5 dBm at 5.9 GHz to 6.4 GHz
- HIGH GAIN
  G_{1dB} = 8.0 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	41.5	42.5	–
Power Gain at 1 dB Compression Point	G_{1dB}		dB	7.0	8.0	–
Drain Current	I_{DS}		A	–	4.4	5.0
Gain Flatness	ΔG		dB	–	–	±0.8
Power Added Efficiency	η_{add}		%	–	34	–
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	–	–	80

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

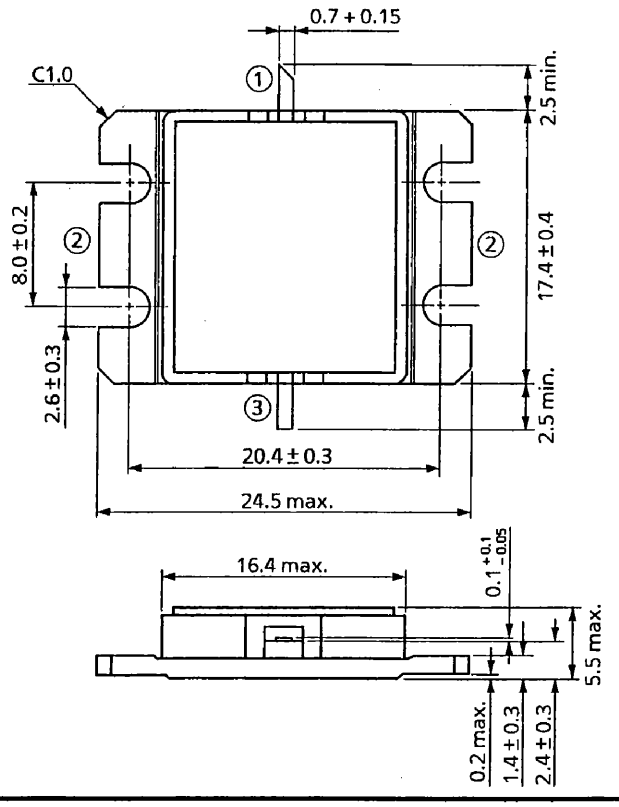
CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Transconductance	gm	V_{DS} = 3 V I_{DS} = 6.0 A	mS	–	3600	–
Pinch-off Voltage	V_{GSoff}	V_{DS} = 3 V I_{DS} = 60 mA	V	−1	−2.5	−4.0
Saturated Drain Current	I_{DSS}	V_{DS} = 3 V V_{GS} = 0 V	A	–	10.5	14.0
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS} = − 200 μA	V	−5	–	–
Thermal Resistance	$R_{th\ (c-c)}$	Channel to Case	°C/W	–	1.5	2.0

Note 1 : 2 tone Test Pout = 31.5 dBm Single Carrier Level.

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	14
Total Power Dissipation (T_C = 25°C)	P_T	W	75
Channel Temperature	T_{ch}	°C	175
Storage Temperature	T_{stg}	°C	−65~175

PACKAGE OUTLINE (2-16G1B)



Unit in mm

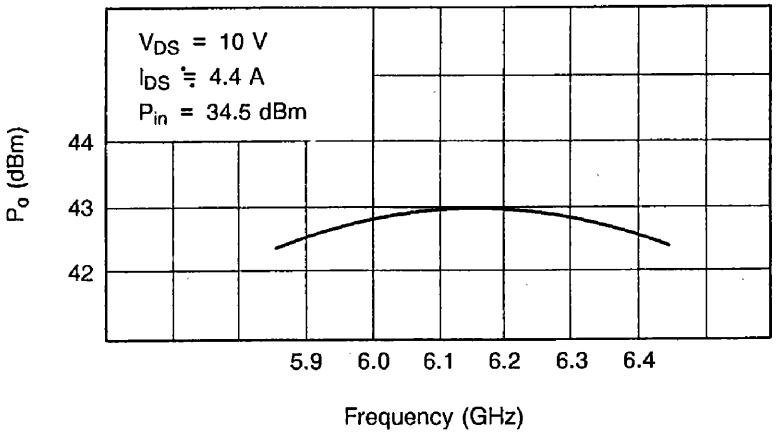
① Gate
② Source
③ Drain

HANDLING PRECAUTIONS FOR PACKAGED TYPE

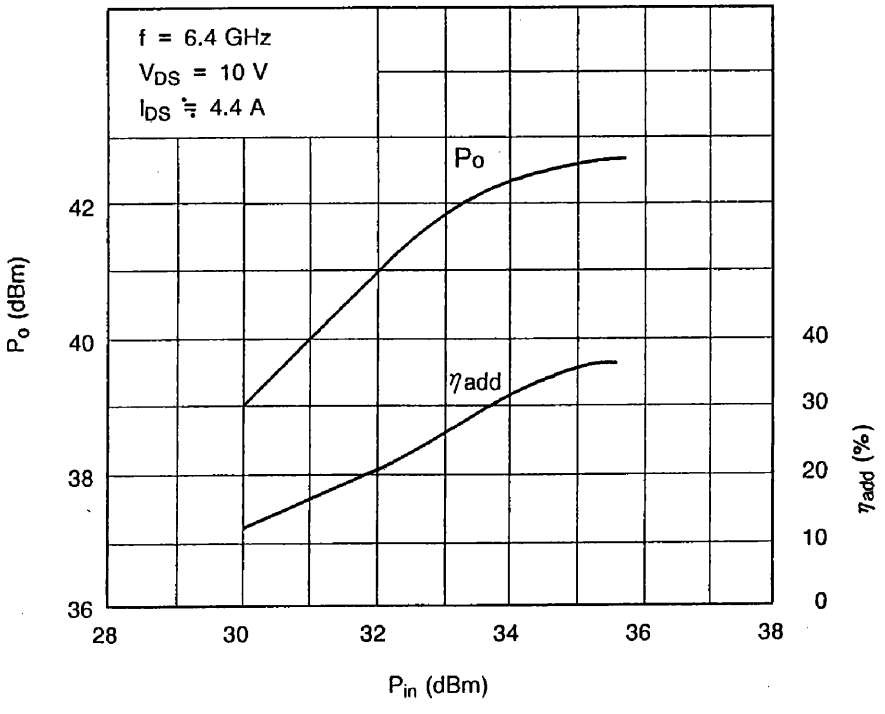
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

RF PERFORMANCES

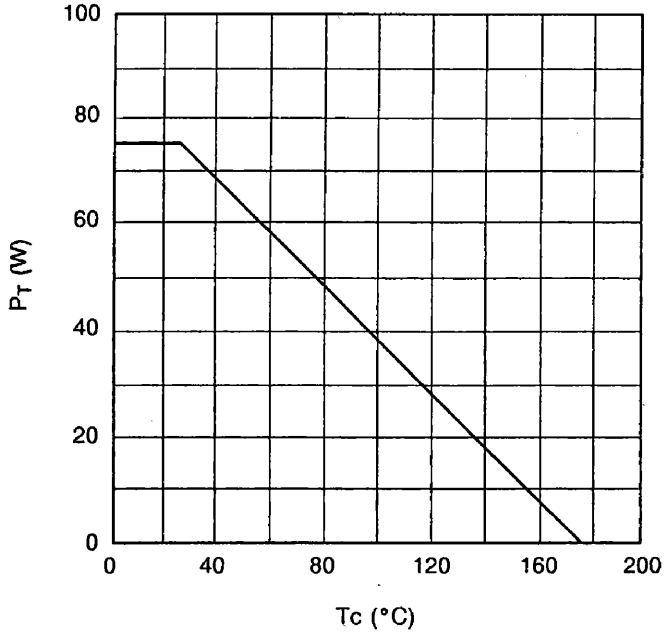
Output Power vs. Frequency



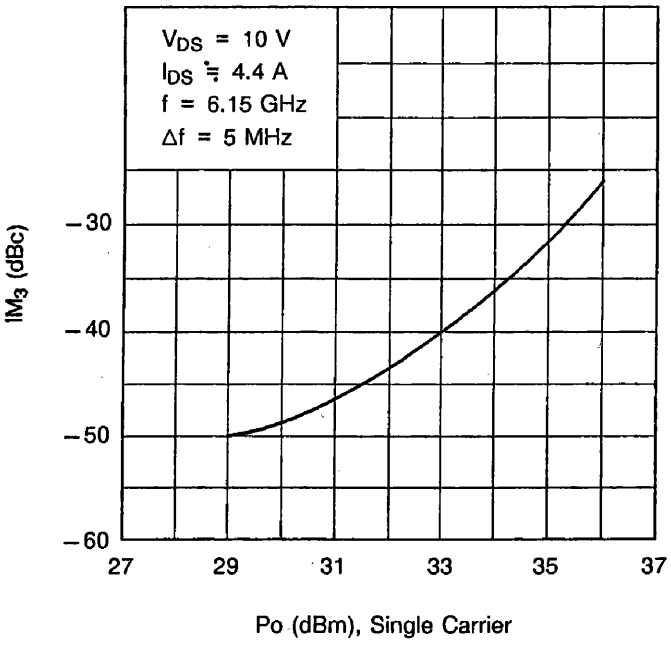
Output Power vs. Input Power



POWER DISSIPATION VS. CASE TEMPERATURE



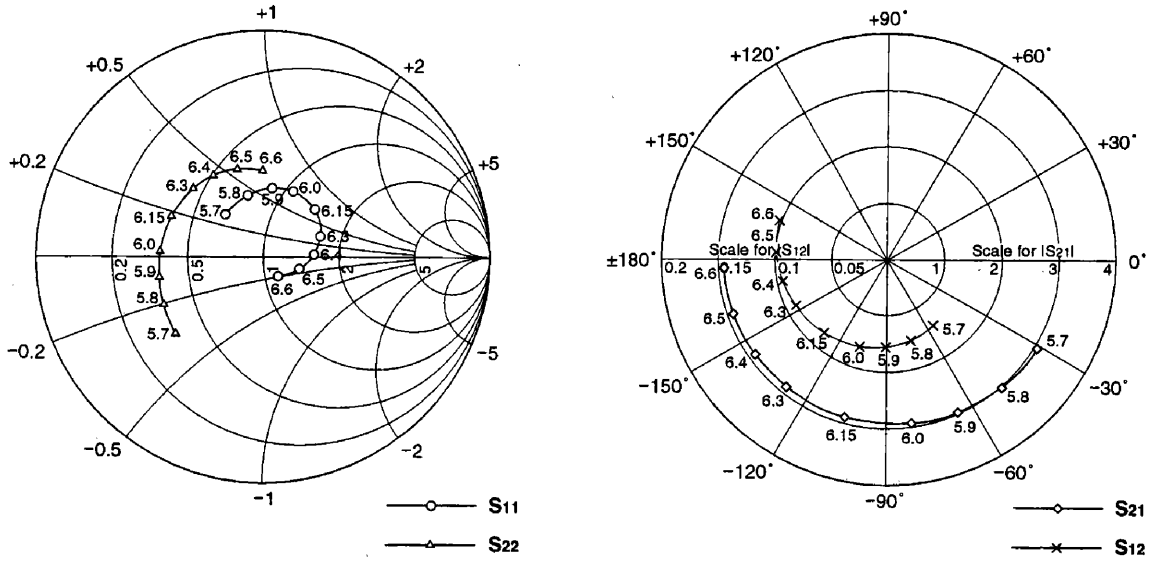
IM_3 VS. OUTPUT POWER CHARACTERISTICS



TIM5964-16SL S-PARAMETERS
(MAGN. and ANGLES)

V_{DS} = 10V , I_{DS} = 4.0A

f =5.7 ~ 6.6GHz



FREQUENCY (GHz)	S11 MAG	S11 ANG	S21 MAG	S21 ANG	S12 MAG	S12 ANG	S22 MAG	S22 ANG
5.70	0.252	131.6	3.056	-31.1	0.071	-55.6	0.515	-138.3
5.80	0.281	104.2	3.025	-48.5	0.075	-73.8	0.487	-153.9
5.90	0.306	83.0	2.974	-65.3	0.078	-90.8	0.467	-168.8
6.00	0.318	65.8	2.928	-81.4	0.081	-107.1	0.456	176.8
6.15	0.310	43.1	2.886	-104.9	0.086	-130.5	0.444	156.1
6.30	0.268	20.2	2.877	-128.3	0.091	-153.2	0.433	135.7
6.40	0.224	3.3	2.882	-144.1	0.095	-168.4	0.422	121.7
6.50	0.167	-17.8	2.893	-160.3	0.099	176.0	0.404	106.7
6.60	0.107	-52.2	2.898	-177.1	0.102	160.1	0.381	90.6