

TOSHIBA
MICROWAVE SEMICONDUCTOR
TECHNICAL DATA

MICROWAVE POWER GaAs FET
TIM1414-5L

FEATURES

■ **HIGH POWER**

P1dB=37.5dBm at 14.0GHz to 14.5GHz

■ **HIGH GAIN**

G1dB=6.0dB at 14.0GHz to 14.5GHz

■ **BROAD BAND INTERNALLY MATCHED**

■ **HERMETICALLY SEALED PACKAGE**

RF PERFORMANCE SPECIFICATIONS (Ta= 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Output Power at 1dB Compression Point	P1dB	VDS= 9V f =14.0-14.5GHz	37.0	37.5	—	dBm
Power Gain at 1dB Compression Point	G1dB		5.0	6.0	—	dB
Drain Current	IDS1		—	2.0	2.5	A
Power Added Efficiency	η_{add}		—	23	—	%
3rd Order Intermodulation Distortion	IM3	Two Tone Test P=26dBm (Single Carrier Level)	-42	-45	—	dBc
Drain Current	IDS2		—	2.0	2.5	A
Channel Temperature Rise	ΔT_{ch}	VDS X IDS X Rth(c-c)	—	—	80	°C

ELECTRICAL CHARACTERISTICS (Ta= 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Transconductance	gm	VDS= 3V IDS=2.4A	—	1400	—	mS
Pinch-off Voltage	VGSoff	VDS= 3V IDS= 72mA	-2.0	-3.5	-5.0	V
Saturated Drain Current	IDSS	VDS= 3V VGS= 0V	—	5.0	5.7	A
Gate-Source Breakdown Voltage	VGSO	IGS= -72 μ A	-5	—	—	V
Thermal Resistance	Rth(c-c)	Channel to Case	—	3.0	3.7	°C/W

◆ The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may results from its use, No license is granted by implication or otherwise under any patent or patent rights of TOSHIBA or others.

The information contained herein is subject to change without prior notice. It is therefor advisable to contact TOSHIBA before proceeding with design of equipment incorporating this product.

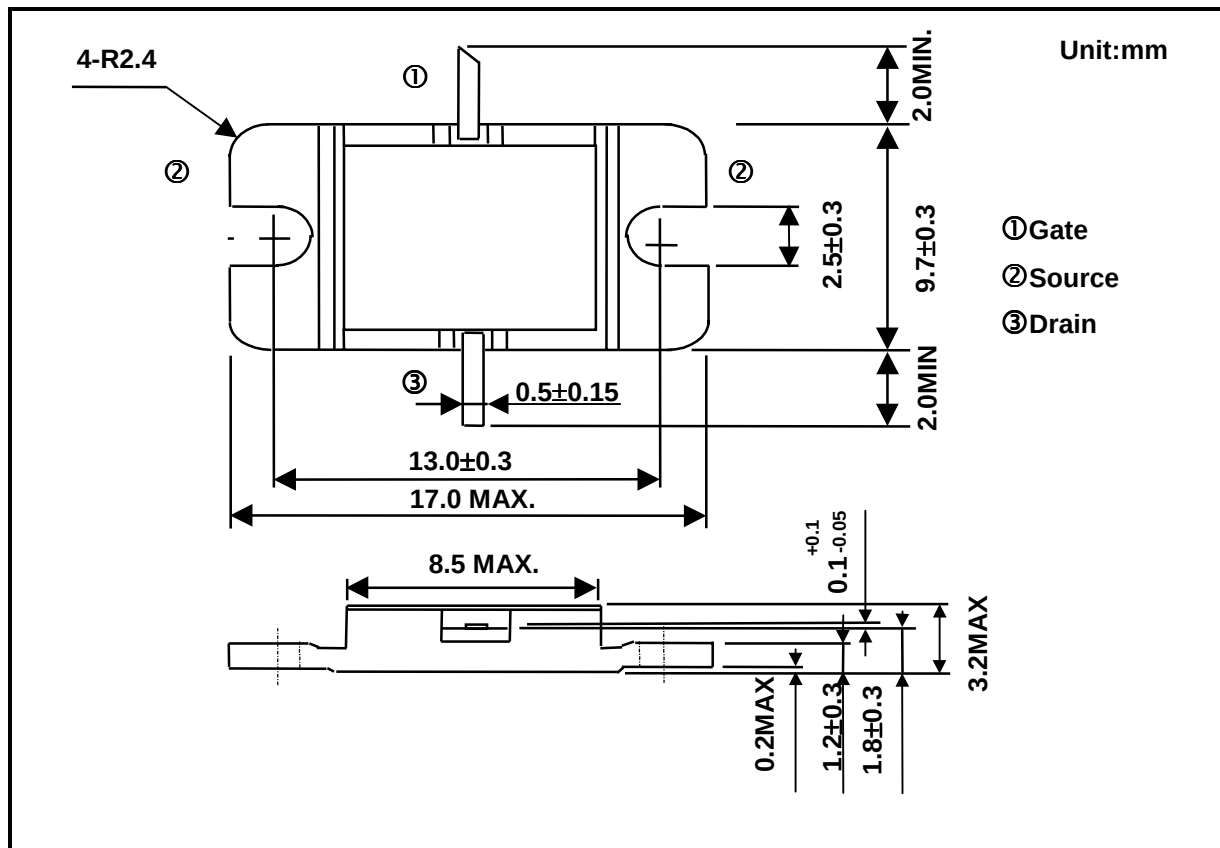
TOSHIBA CORPORATION

Jan. 2000

ABSOLUTE MAXIMUM RATINGS (Ta= 25°C)

CHARACTERISTICS	SYMBOL	RATING	UNIT
Drain-Source Voltage	VDS	15	V
Gate-Source Voltage	VGS	-5	V
Drain Current	IDS	5.7	A
Total Power Dissipation (Tc= 25 °C)	PT	30	W
Channel Temperature	Tch	175	°C
Storage	Tstg	-65 ~ +175	°C

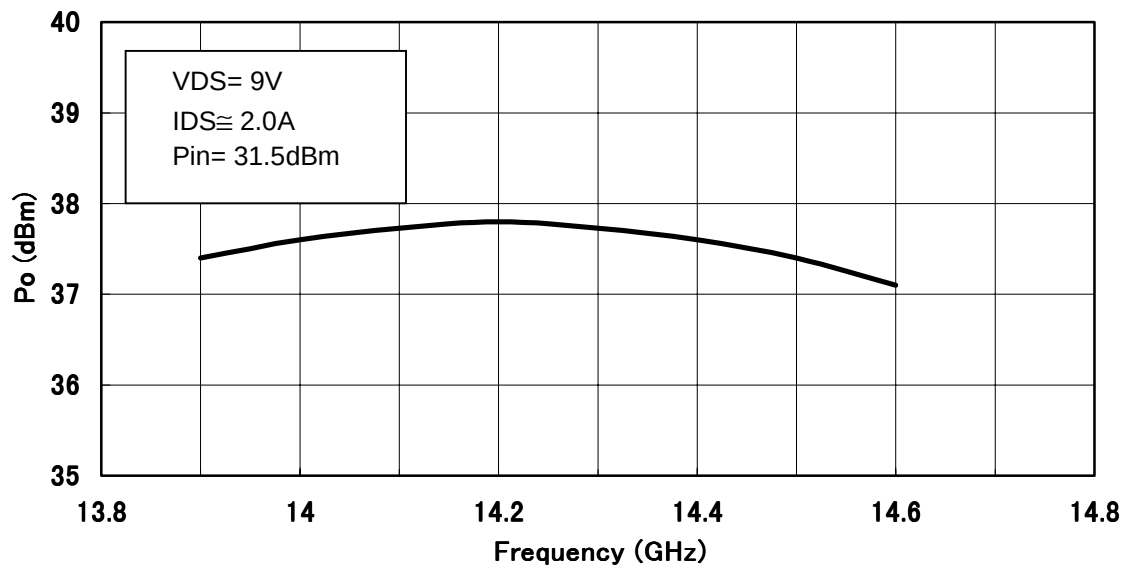
PACKAGE OUTLINE (2-9D1B)



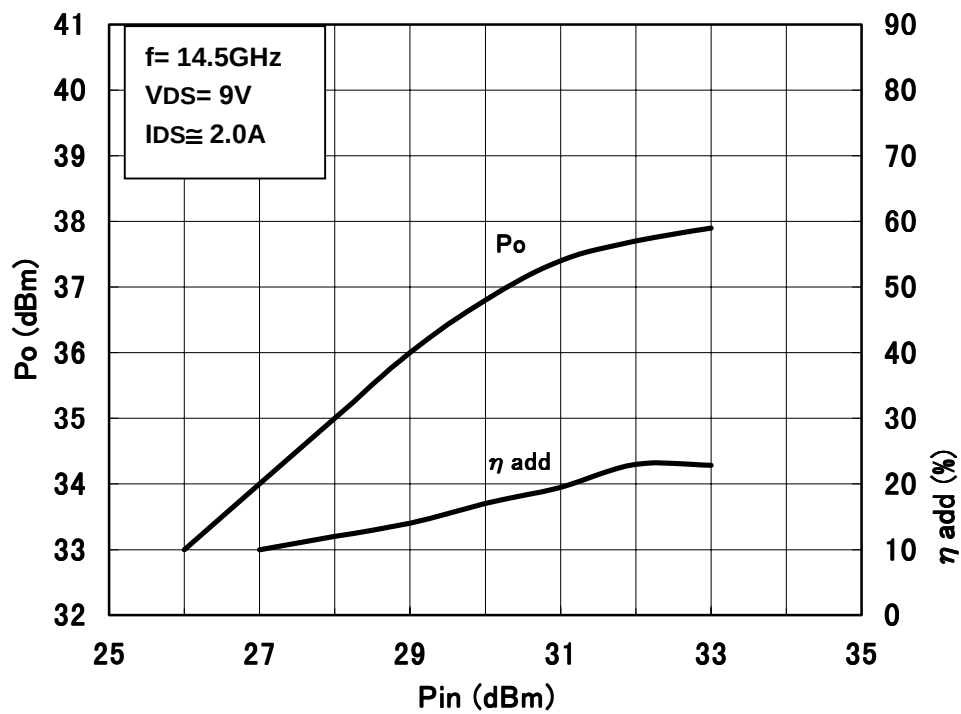
HANDLING PRECAUTIONS FOR PACKAGED TYPE

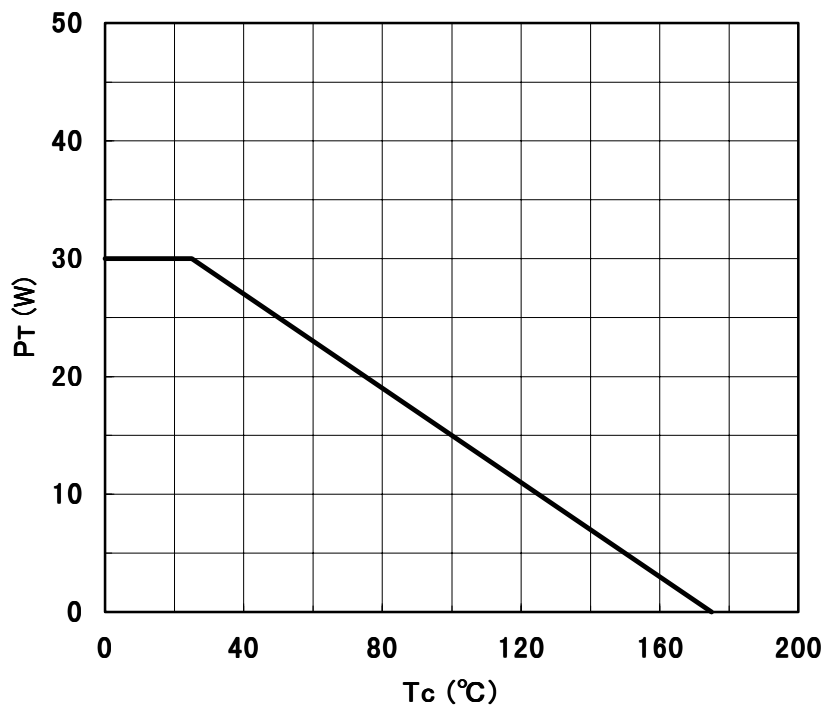
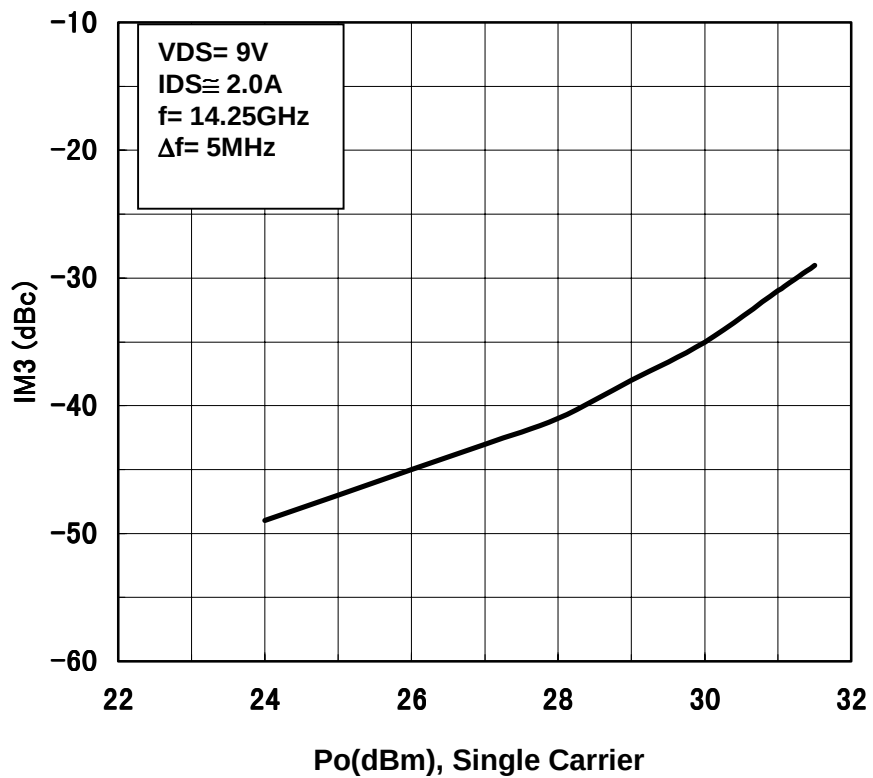
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

Output Power vs. Frequency



Output Power vs. Input Power



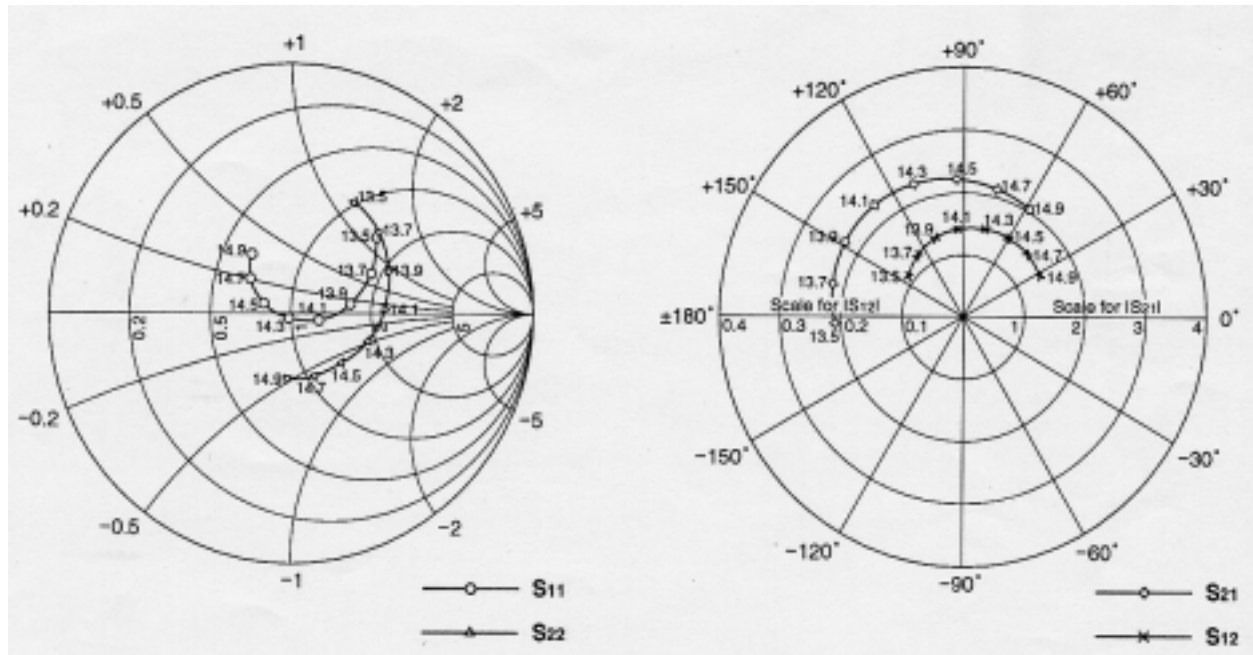
POWER DISSIPATION vs. CASE TEMPERATURE**IM3 vs. OUTPUT POWER CHARACTERISTICS**

TIM1414-5L S-PARAMETERS

(MAGN. and ANGLES)

VDS=9V, IDS=2.0A

f=13.5 – 14.9GHz



FREQUENCY (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
13.5	0.47	41	2.10	-177	0.111	144	0.52	60
13.6	0.42	34	2.16	175	0.118	136	0.51	51
13.7	0.37	26	2.20	166	0.124	127	0.49	42
13.8	0.31	18	2.25	157	0.130	119	0.47	33
13.9	0.25	9	2.28	148	0.135	110	0.44	23
14.0	0.19	-1	2.30	139	0.139	102	0.42	13
14.1	0.12	-13	2.31	129	0.142	94	0.39	3
14.2	0.06	-32	2.30	120	0.145	85	0.36	-8
14.3	0.02	-113	2.29	111	0.146	76	0.34	-19
14.4	0.07	178	2.26	102	0.148	68	0.31	-31
14.5	0.12	160	2.22	93	0.147	60	0.29	-43
14.6	0.17	149	2.18	84	0.147	51	0.28	-56
14.7	0.22	140	2.13	75	0.146	44	0.27	-68
14.8	0.26	132	2.09	66	0.144	36	0.27	-81
14.9	0.29	124	2.04	58	0.142	28	0.29	-93