

# TOSHIBA

## MICROWAVE SEMICONDUCTOR

### TECHNICAL DATA

## MICROWAVE POWER GaAs FET

### TIM1213-15L

### FEATURES

- **LOW INTERMODULATION DISTORTION**  
IM3=-45 dBc at Pout= 30.0dBm  
Single Carrier Level
- **HIGH POWER**  
P1dB=42.0dBm at 12.7GHz to 13.2GHz
- **HIGH GAIN**  
G1dB=6.0 dB at 12.7GHz to 13.2GHz
- **BROAD BAND INTERNALLY MATCHED FET**
- **HERMETICALLY SEALED PACKAGE**

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

CHARACTERISTICS	SYMBOL	CONDITIONS	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Gain Compression Point	P1dB	VDS= 9V f= 12.7 to 13.2GHz	dBm	41.0	42.0	—
Power Gain at 1dB Gain Compression Point	G1dB		dB	5.0	6.0	—
Drain Current	IDS1		A	—	4.5	5.5
Gain Flatness	ΔG		dB	—	—	±0.8
Power Added Efficiency	ηadd		%	—	29	—
3 <sup>rd</sup> Order Intermodulation Distortion	IM3	Two-Tone Test Po=30.0 dBm	dBc	-42	-45	—
Drain Current	IDS2	(Single Carrier Level)	A	—	4.5	5.5
Channel Temperature Rise	ΔTch	(VDS X IDS + Pin - P1dB) X Rth(c-c)	°C	—	—	100

Recommended gate resistance(Rg) : Rg= 100 Ω(MAX.)

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

CHARACTERISTICS	SYMBOL	CONDITIONS	UNIT	MIN.	TYP.	MAX.
Transconductance	gm	VDS= 3V IDS= 4.8A	mS	—	3000	—
Pinch-off Voltage	VGSoff	VDS= 3V IDS= 145mA	V	-1.5	-3.0	-4.5
Saturated Drain Current	IDSS	VDS= 3V VGS= 0V	A	—	10.0	—
Gate-Source Breakdown Voltage	VGSO	IGS= -145μA	V	-5	—	—
Thermal Resistance	Rth(c-c)	Channel to Case	°C/W	—	2.0	2.5

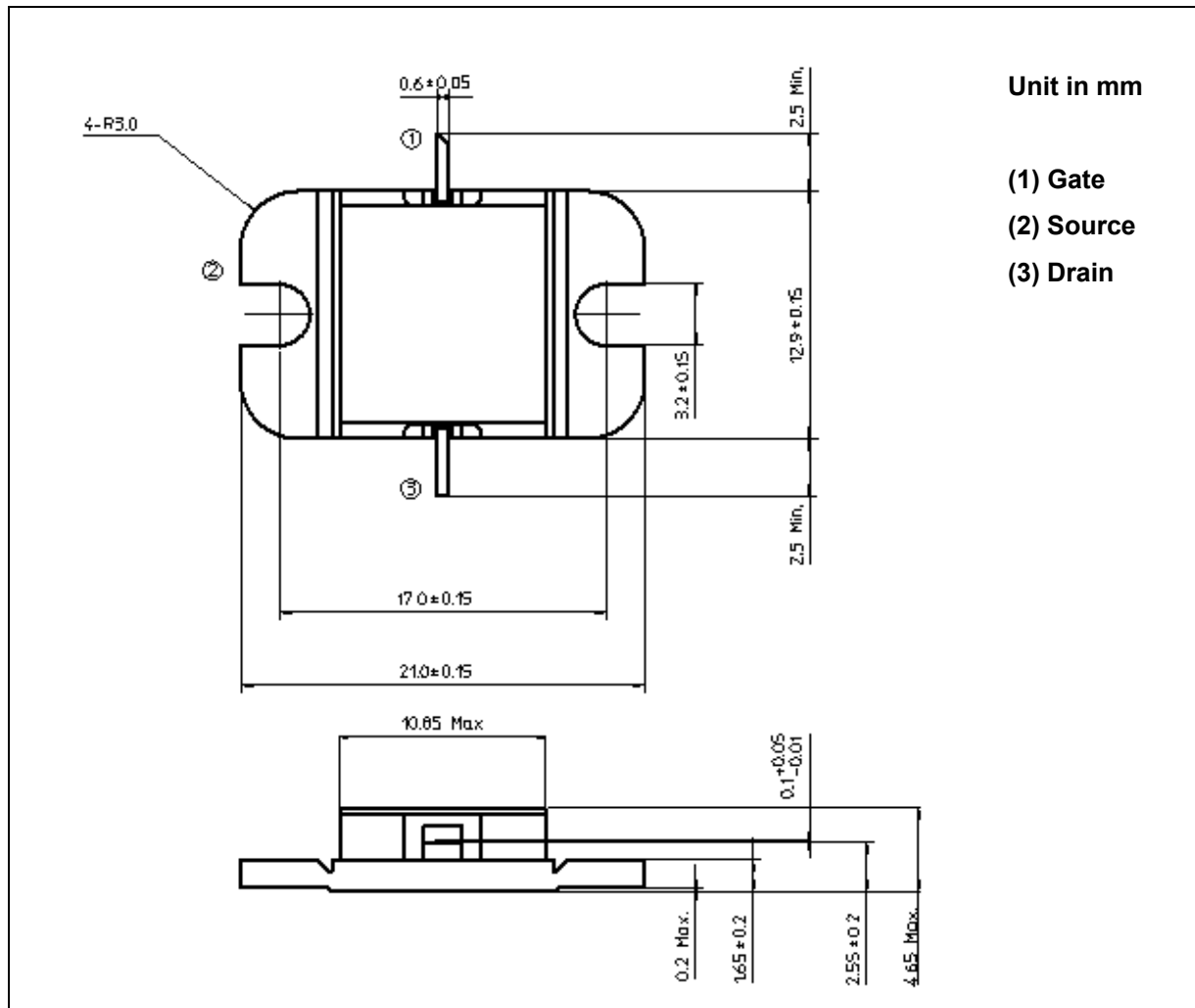
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**ABSOLUTE MAXIMUM RATINGS ( Ta= 25°C )**

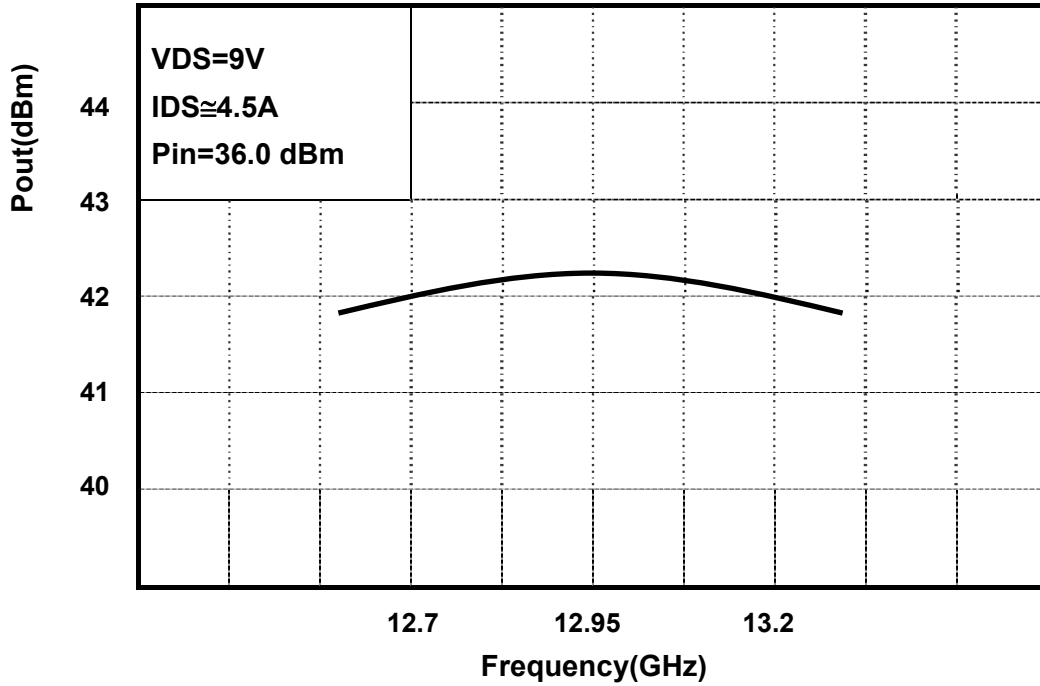
CHARACTERISTICS	SYMBOL	UNIT	RATING
Drain-Source Voltage	VDS	V	15
Gate-Source Voltage	VGS	V	-5
Drain Current	IDS	A	11.5
Total Power Dissipation (Tc= 25 °C)	PT	W	60
Channel Temperature	Tch	°C	175
Storage Temperature	Tstg	°C	-65 to +175

**PACKAGE OUTLINE (2-11C1B)****HANDLING PRECAUTIONS FOR PACKAGE MODEL**

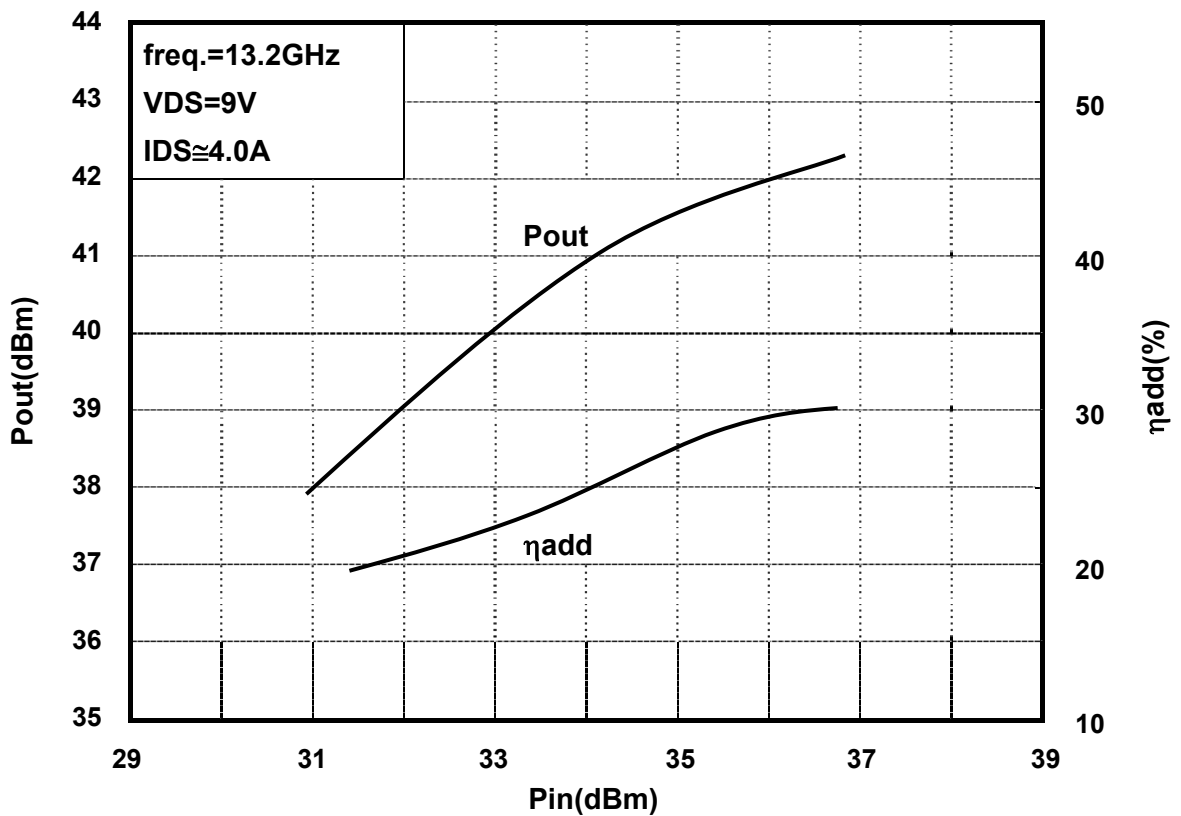
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

**RF PERFORMANCE**

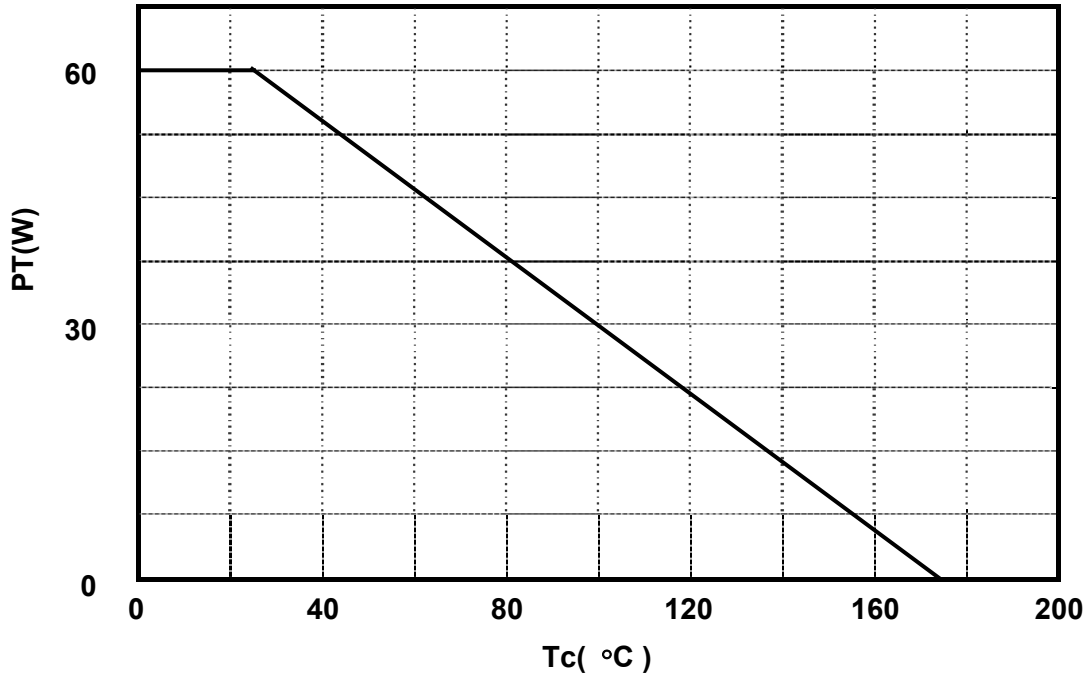
**Output Power (Pout) vs. Frequency**



**Output Power(Pout) vs. Input Power(Pin)**



Power Dissipation(PT) vs. Case Temperature(Tc)



IM3 vs. Output Power Characteristics

