

TOSHIBA

MICROWAVE POWER GaAs FET

TIM1213-4L

Low Distortion Internally Matched Power GaAs FETs (X, Ku-Band)

Features

- Low intermodulation distortion
 - $IM_3 = -45$ dBc at $P_o = 25$ dBm,
 - Single carrier level
- High power
 - $P_{1dB} = 36.5$ dBm at 12.7 GHz to 13.2 GHz
- High gain
 - $G_{1dB} = 7.5$ dB at 12.7 GHz to 13.2 GHz
- Broad band internally matched
- Hermetically sealed package

RF Performance Specifications (Ta = 25° C)

Characteristics	Symbol	Condition	Unit	Min.	Typ.	Max
Output Power at 1dB Compression Point	P_{1dB}	$V_{DS} = 9V$ $f = 12.7 \sim 13.2$ GHz	dBm	35.5	36.5	-
Power Gain at 1dB Compression Point	G_{1dB}		dB	6.5	7.5	-
Drain Current	I_{DS1}		A	-	1.7	2.2
Gain Flatness	ΔG		dB	-	-	± 0.8
Power Added Efficiency	η_{add}		%	-	24	-
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	-42	-45	-
Drain Current	I_{DS2}		A	-	1.7	2.2
Channel-Temperature Rise	ΔT_{ch}	$V_{DS} \times I_{DS} \times R_{th(c-c)}$	°C	-	-	70

Note 1: 2 Tone Test (Pout = 25 dBm Single Carrier Level).

Electrical Characteristics (Ta = 25° C)

Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max
Trans-conductance	gm	$V_{DS} = 3V$ $I_{DS} = 2.0A$	mS	-	1200	-
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3V$ $I_{DS} = 60mA$	V	-2	-3.5	-5
Saturated Drain Current	I_{DSS}	$V_{DS} = 3V$ $V_{GS} = 0V$	A	-	4.0	5.2
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS} = -60\mu A$	V	-5	-	-
Thermal Resistance	$R_{th(c-c)}$	Channel to case	°C/W	-	2.9	3.5

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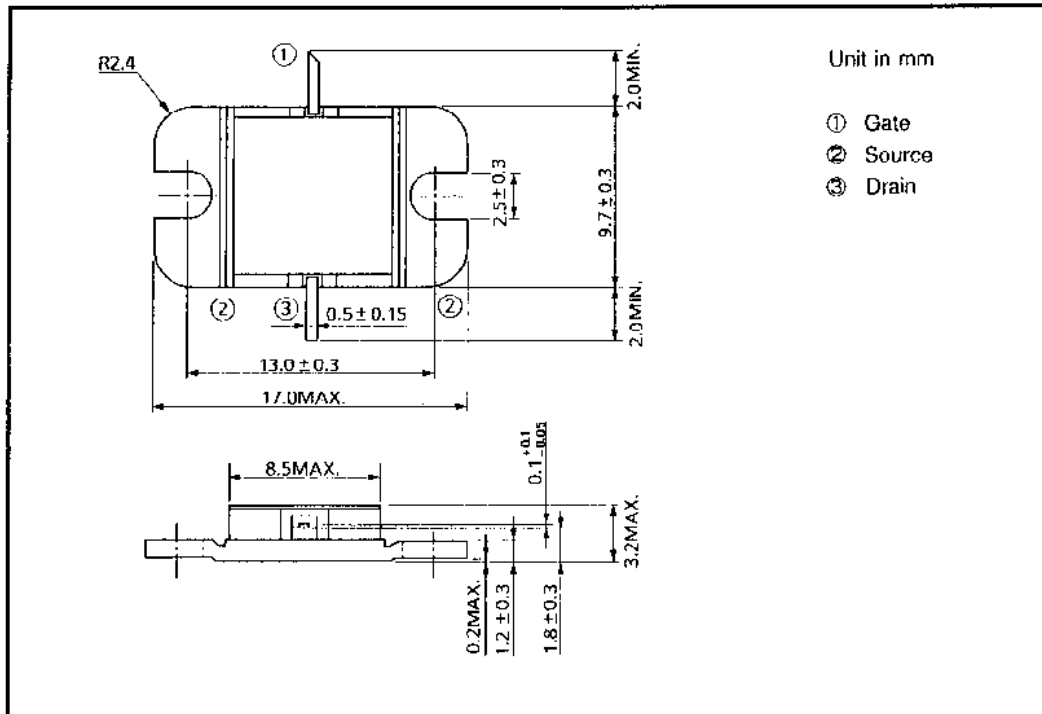


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Absolute Maximum Ratings (Ta = 25° C)

Characteristic	Symbol	Unit	Rating
Drain-Source Voltage	V _{DS}	V	15
Gate-Source Voltage	V _{GS}	V	-5
Drain Current	I _{DS}	A	5.2
Total Power Dissipation (T _c = 25°C)	P _T	W	30
Channel Temperature	T _{ch}	°C	175
Storage Temperature	T _{stg}	°C	-65~175

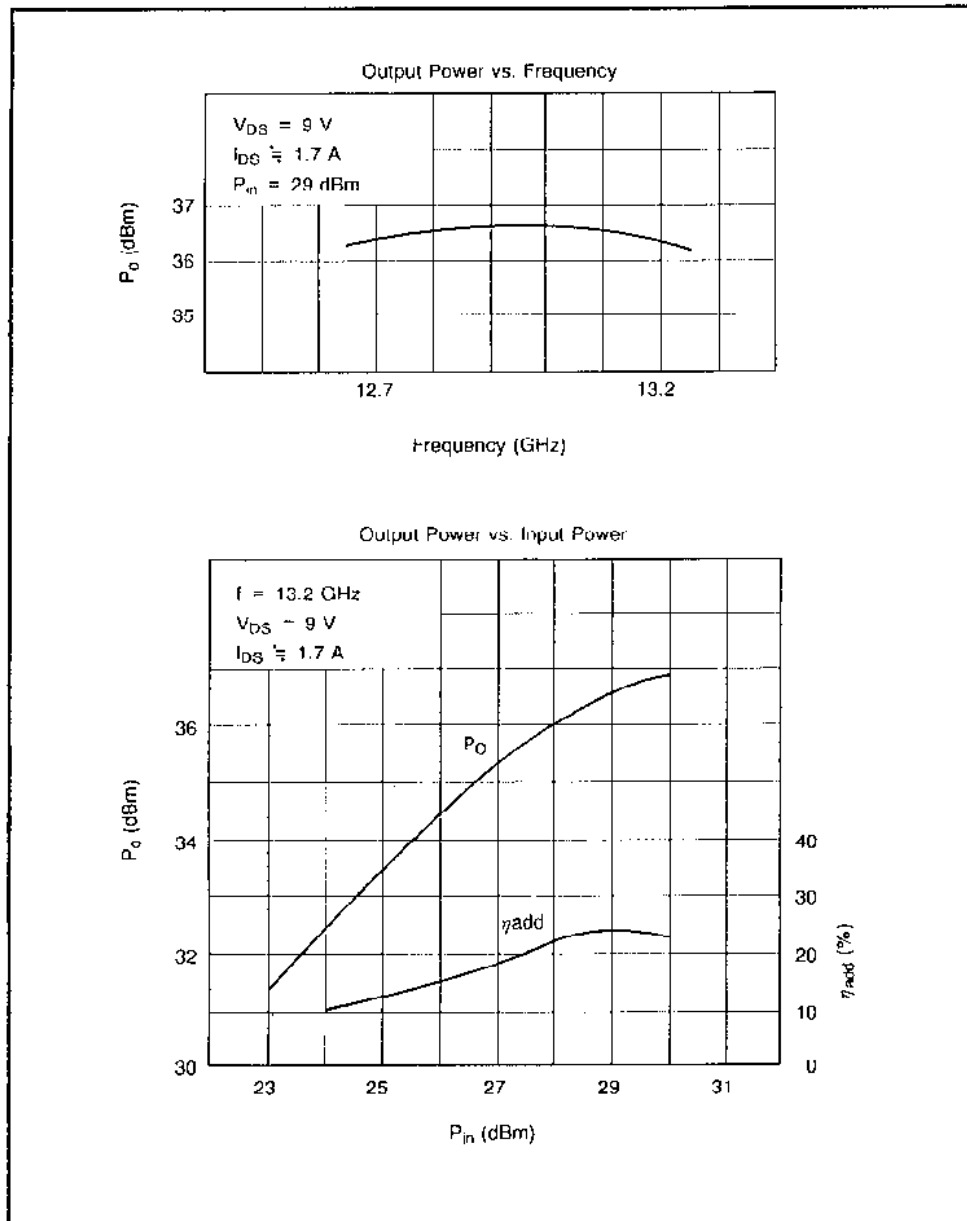
Package Outline (2-9D1A)



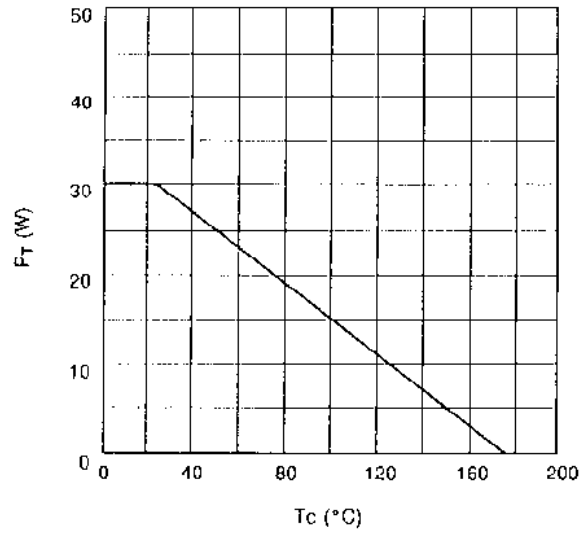
Handling Precautions for Packaged Type

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

RF Performances



Power Dissipation vs. Case Temperature



IM₃ vs. Output Power Characteristics

