TOSHIBA

MICROWAVE SEMICONDUCTOR
TECHNICAL DATA

MICROWAVE POWER GaAs FET

TIM1213-10L

FEATURES :

- HIGH POWER
  IM_3 = −45 dBc at Po = 29 dBm, Single Carrier Level
- HIGH POWER
  P_{1dB} = 40.5 dBm at 12.7 GHz to 13.2 GHz
- HIGH GAIN
  G_{1dB} = 6.0 dB at 12.7 GHz to 13.2 GHz
- BROAD BAND INTERNALLY MATCHED
- HERMETICALLY SEALED PACKAGE

RF PERFORMANCE SPECIFICATIONS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Compression Point	P_{1dB}	V_{DS} = 9 V f = 12.7 – 13.2 GHz	dBm	40.0	40.6	–
Power Gain at 1dB Compression Point	G_{1dB}		dB	5.0	6.0	–
Drain Current	I_{DS1}		A	–	4.0	5.0
Gain Flatness	ΔG		dB	–	–	±0.8
Power Added Efficiency	η_{add}		%	–	23	–
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	−42	−45	–
Drain Current	I_{DS2}		A	–	4.0	5.0
Channel-Temperature Rise	ΔT_{ch}	$V_{DS} \times I_{DS} \times R_{th(c-c)}$	°C	–	–	90

Note 1: 2 Tone Test (Pout = 29 dBm Single Carrier Level)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Transconductance	gm	V_{DS} = 3 V I_{DS} = 4.8 A	mS	–	2800	–
Pinch-off Voltage	V_{GSoff}	V_{DS} = 3 V I_{DS} = 145 mA	V	−2	−3.5	−5
Saturated Drain Current	I_{DSS}	V_{DS} = 3 V V_{GS} = 0 V	A	–	10.0	11.5
Gate-Source Leakage Voltage	V_{GSO}	I_{GS} = −146 μA	V	−5	–	–
Thermal Resistance	$R_{th\ (c-c)}$	Channel to Case	°C/W	–	2.0	2.5

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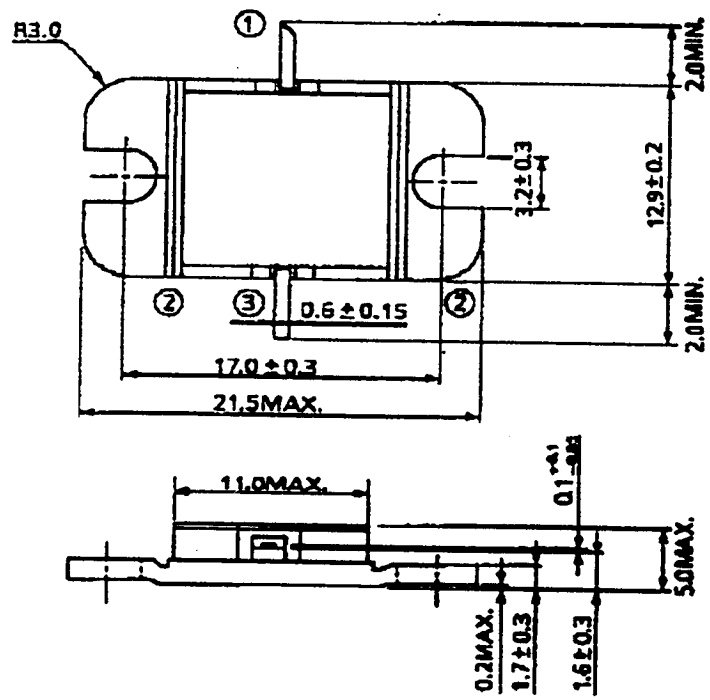
ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	UNIT	RATING
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	−5
Drain Current	I_{DS}	A	11.5
Total Power Dissipation (T_C = 25°C)	P_T	W	60
Channel Temperature	T_{ch}	°C	175
Storage Temperature	T_{stg}	°C	−65~175

PACKAGE OUTLINE (2-11C1B)



Unit in mm

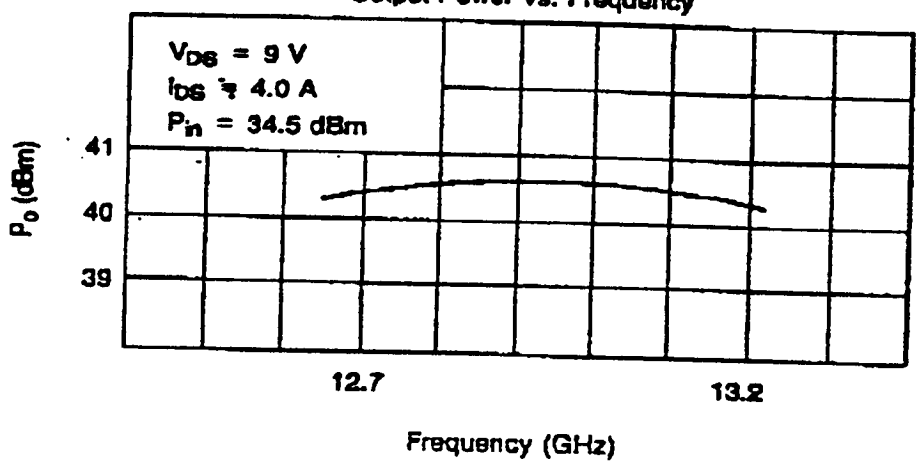
① Gate
② Source
③ Drain

HANDLING PRECAUTIONS FOR PACKAGED TYPE

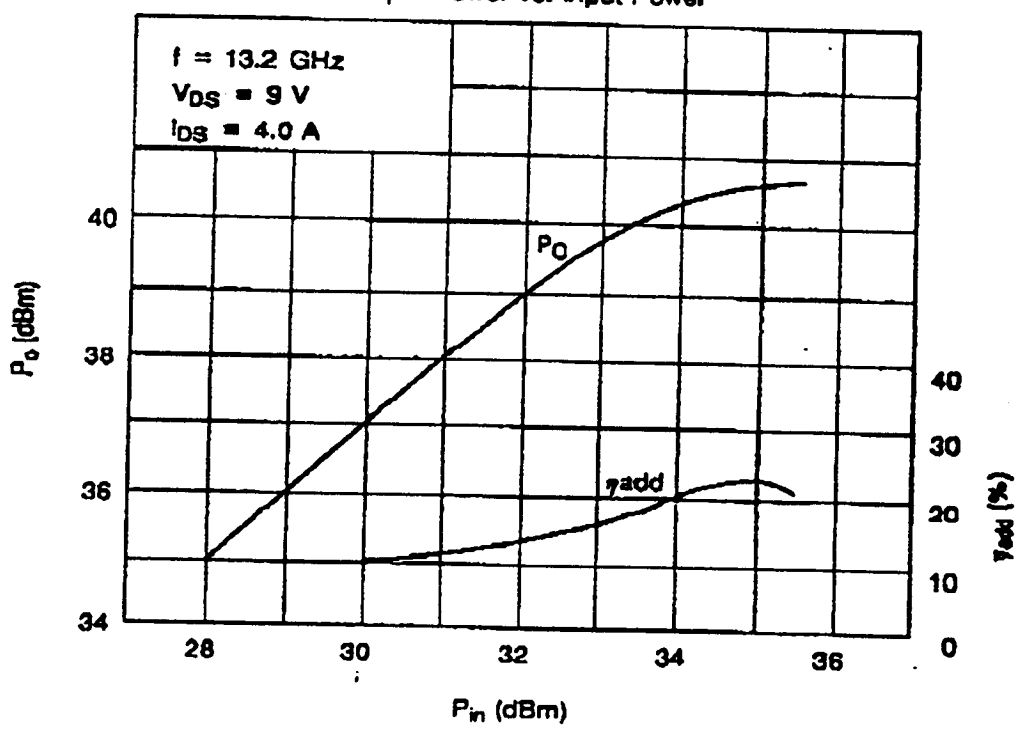
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

RF PERFORMANCES

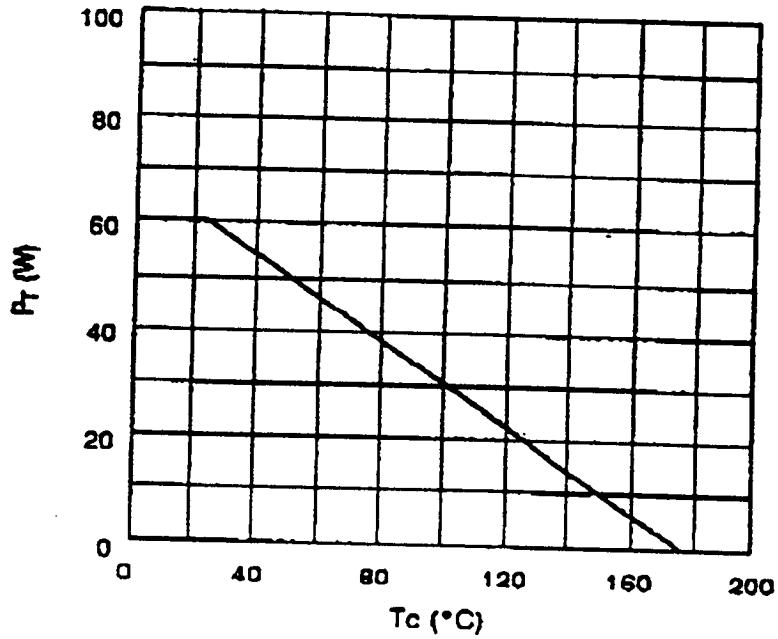
Output Power vs. Frequency



Output Power vs. Input Power



POWER DISSIPATION VS. CASE TEMPERATURE



IM_3 VS. OUTPUT POWER CHARACTERISTICS