TOSHIBA

MICROWAVE SEMICONDUCTOR
TECHNICAL DATA

MICROWAVE POWER GaAs FET

TIM1414-4L

FEATURES :

- LOW INTERMODULATION DISTORTION
  IM_3 = −45 dBc at Po = 25 dBm,
  Single Carrier Level
- HIGH POWER
  P_{1dB} = 36.5 dBm at 14.0 GHz to 14.5 GHz
- HIGH GAIN
  G_{1dB} = 6.0 dB at 14.0 GHz to 14.5 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 = 14.0 ~ 14.5 GHz	dBm	36.5	36.5	—
Power Gain at 1dB Compression Point	G_{1dB}		dB	5.0	6.0	—
Drain Current	I_{DS1}		A	—	1.7	2.2
Gain Flatness	ΔG		dB	—	—	±0.8
Power Added Efficiency	η_{add}		%	—	22	—
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.
Transconductance	gm	V_{DS} = 3 V I_{DS} = 2.0 A	mS	—	1200	—
Pinch-off Voltage	V_{GSoff}	V_{DS} = 3 V I_{DS} = 60 mA	V	−2	−3.5	−5
Saturated Drain Current	I_{DSS}	V_{DS} = 3 V V_{GS} = 0 V	A	—	4.0	5.2
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS} = −60 μA	V	−5	—	—
Thermal Resistance	$R_{th(c-c)}$	Channel to Case	°C/W	—	2.9	3.5

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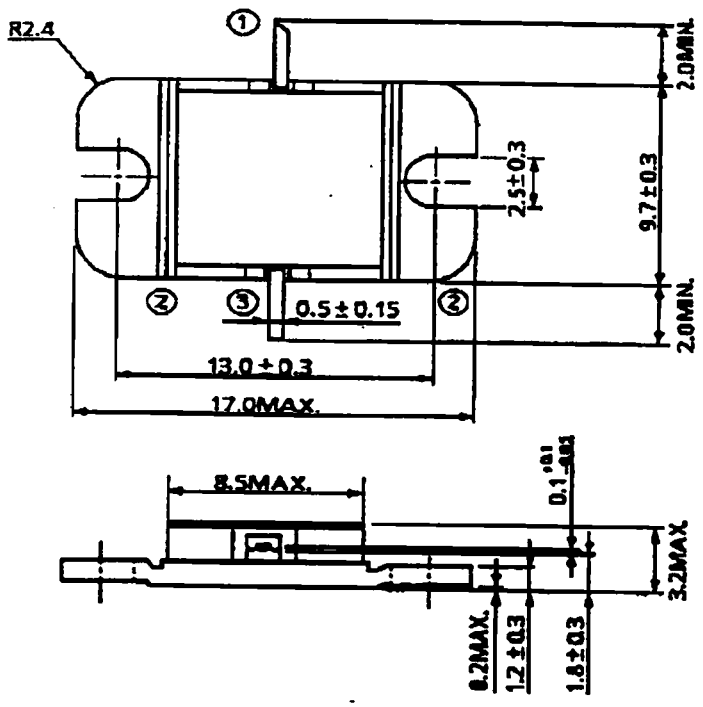
ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	UNIT	RATING
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	−5
Drain Current	I_{DS}	A	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 (2-9D1B)



Unit in mm

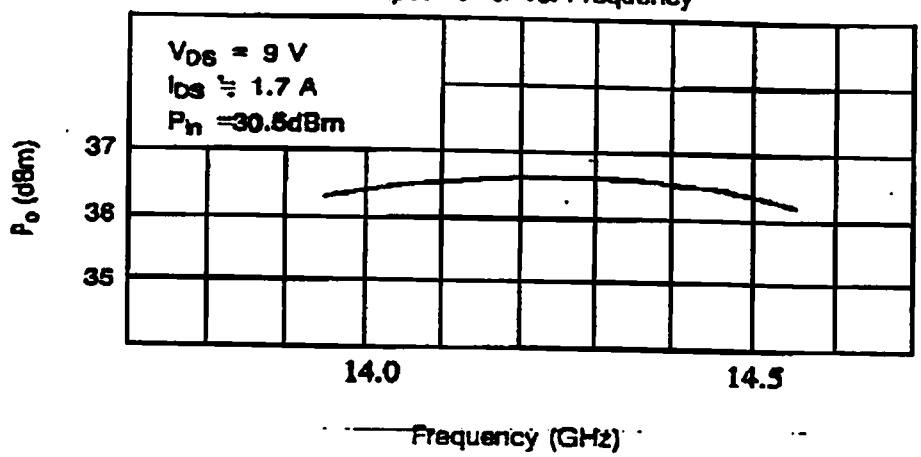
① Gate
② Source
③ Drain

HANDLING PRECAUTIONS FOR PACKAGED TYPE

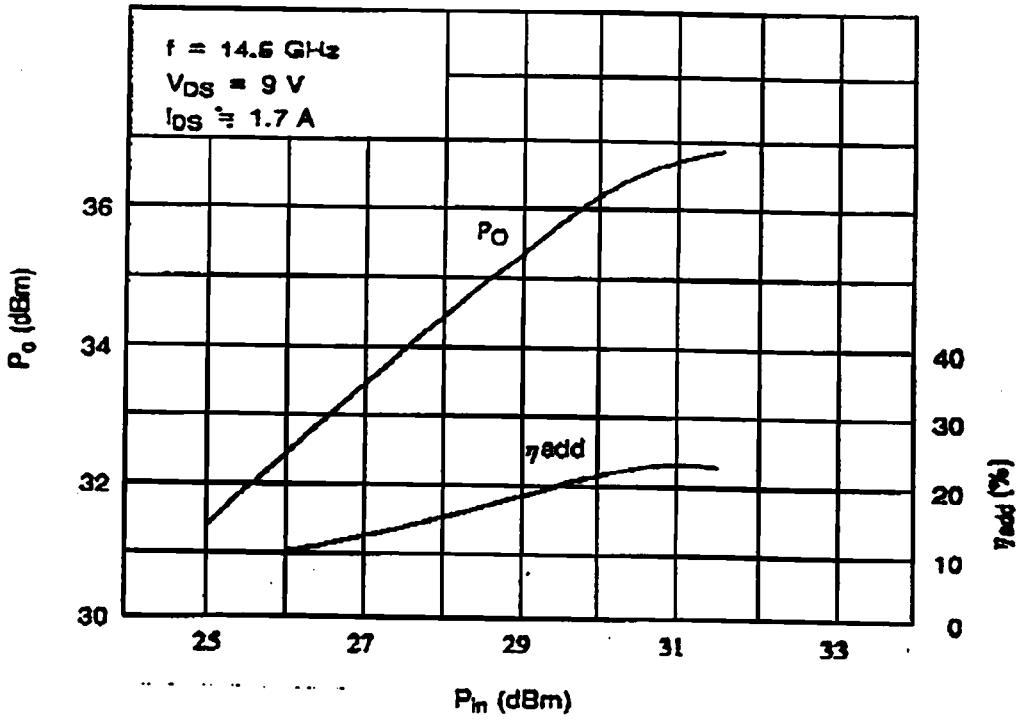
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

RF PERFORMANCES

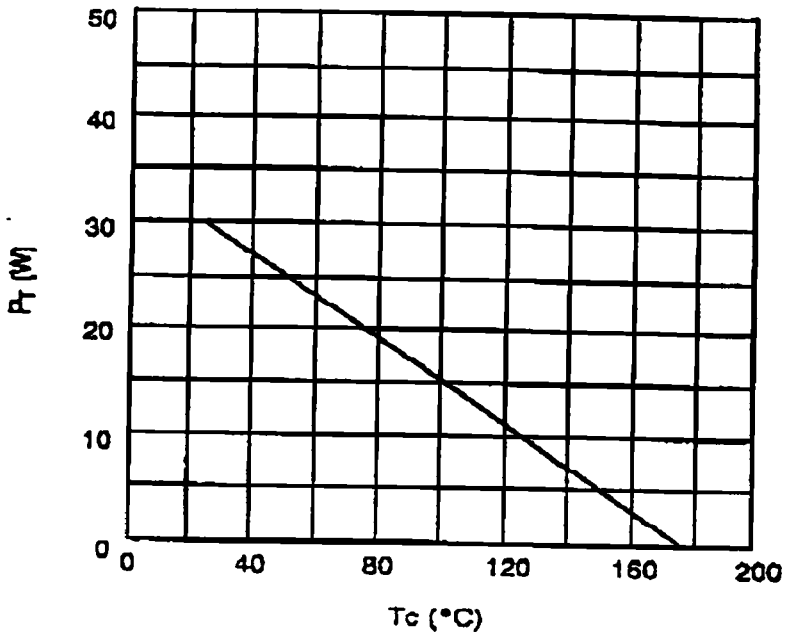
Output Power vs. Frequency



Output Power vs. Input Power



POWER DISSIPATION VS. CASE TEMPERATURE



IM_3 VS. OUTPUT POWER CHARACTERISTICS