

TOSHIBA

MICROWAVE SEMICONDUCTOR TECHNICAL DATA

MICROWAVE POWER GaAs FET

TIM1414-7

PRELIMINARY

FEATURES :

■ HIGH POWER

$P_{1dB} = 38.5 \text{ dBm}$ at 14.0 GHz to 14.5 GHz

■ BROAD BAND INTERNALLY MATCHED

■ HIGH GAIN

$G_{1dB} = 5.5 \text{ dB}$ at 14.0 GHz to 14.5 GHz

■ HERMETICALLY SEALED PACKAGE

RF PERFORMANCE SPECIFICATIONS ($T_a = 25^\circ\text{C}$)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Compression Point	P_{1dB}	$V_{DS} = 9 \text{ V}$ $f = 14.0 \sim 14.5 \text{ GHz}$	dBm	37.5	38.5	—
Power Gain at 1dB Compression Point	G_{1dB}		dB	5.5	6.5	—
Drain Current	I_{DS}		A	—	2.25	2.75
Power Added Efficiency	η_{add}		%	—	27	—
Channel-Temperature Rise	ΔT_{ch}	$V_{DS} \times I_{DS} \times R_{th(c-c)}$	$^\circ\text{C}$	—	—	80

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

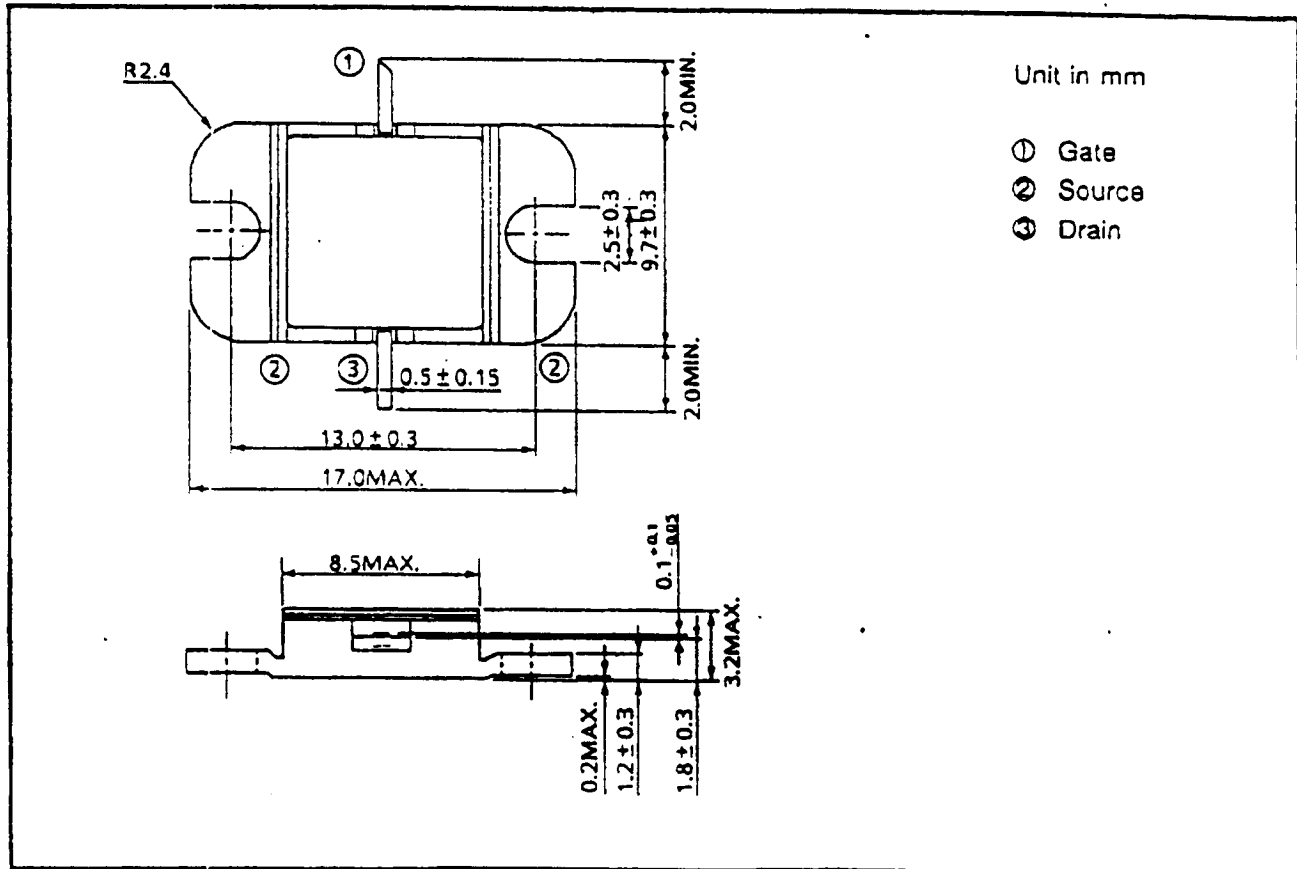
CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Transconductance	g_m	$V_{DS} = 3 \text{ V}$ $I_{DS} = 2.4 \text{ A}$	mS	—	1500	—
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3 \text{ V}$ $I_{DS} = 72 \text{ mA}$	V	-1.5	-3.0	-4.5
Saturated Drain Current	I_{DSS}	$V_{DS} = 3 \text{ V}$ $V_{GS} = 0 \text{ V}$	A	—	5.0	5.7
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS} = -72 \mu\text{A}$	V	-5	—	—
Thermal Resistance	$R_{th(c-c)}$	Channel to Case	$^\circ\text{C/W}$	—	3.0	3.7

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ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

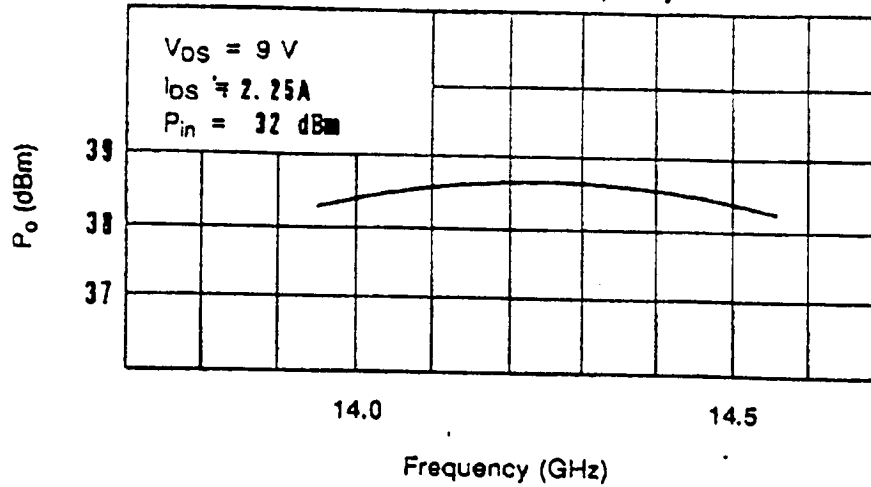
CHARACTERISTICS	SYMBOL	UNIT	RATING
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	-5
Drain Current	I_{DS}	A	5.7
Total Power Dissipation ($T_C = 25^\circ\text{C}$)	P_T	W	30
Channel Temperature	T_{ch}	$^\circ\text{C}$	175
Storage Temperature	T_{stg}	$^\circ\text{C}$	-65 ~ 175

PACKAGE OUTLINE (2-9D1B)**HANDLING PRECAUTIONS FOR PACKAGED TYPE**

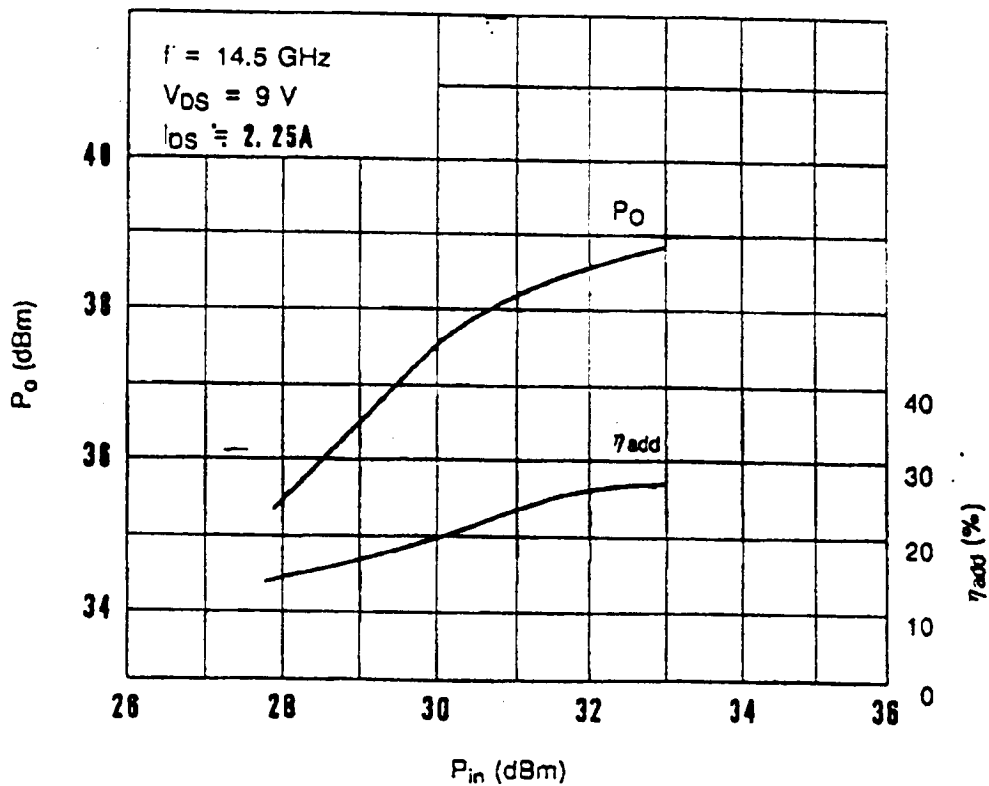
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C .

RF PERFORMANCES

Output Power vs. Frequency



Output Power vs. Input Power



POWER DISSIPATION VS. CASE TEMPERATURE