

**TOSHIBA**MICROWAVE SEMICONDUCTOR  
TECHNICAL DATA

MICROWAVE POWER GaAs FET

TIM1414-4LA-371

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

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Compression Point	P1dB	VDS= 9V f= 14.0-14.5 GHz	dBm	36.0	36.5	—
Linear Gain	GL		dB	7.0	7.5	—
Drain Current	IDS1		A	—	1.8	2.0
Power Added Efficiency	$\eta_{add}$		%	—	23	—
3rd Order Intermodulation Distortion	IM3	NOTE 1 $\Delta f=5\text{MHz}^*$	dBc	-42	-45	—
Drain Current	IDS2		A	—	1.8	2.0
Channel-Temperature Rise	$\Delta T_{ch}$	NOTE 2	°C/W	—	—	70

Toshiba measures the RF performance of all GaAs FET devices at ambient temperature (Ta=25°C). The following table is an estimation of the RF performance at -40 to +70°C. This estimation is based on experience and GaAs material characteristics.

## RF PERFORMANCE SPECIFICATIONS ( Ta= -40 to +70°C )

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Compression Point	P1dB	VDS= 9V f= 14.0-14.5 GHz	dBm	35.3	—	—
Linear Gain	GL		dB	6.3	—	—
Drain Current	IDS1		A	—	1.8	2.0
Power Added Efficiency	$\eta_{add}$		%	—	—	—
3rd Order Intermodulation Distortion	IM3	NOTE 1 $\Delta f=5\text{MHz}^*$	dBc	-40	—	—
Drain Current	IDS2		A	—	1.8	2.0
Channel-Temperature Rise	$\Delta T_{ch}$	NOTE 2	°C/W	—	—	70

Note 1 : 2 tone test Pout=25.0dBm Single Carrier Level

\* : The IM3 of the device does not depend or change by frequency separation of either 5MHz or 30KHz.

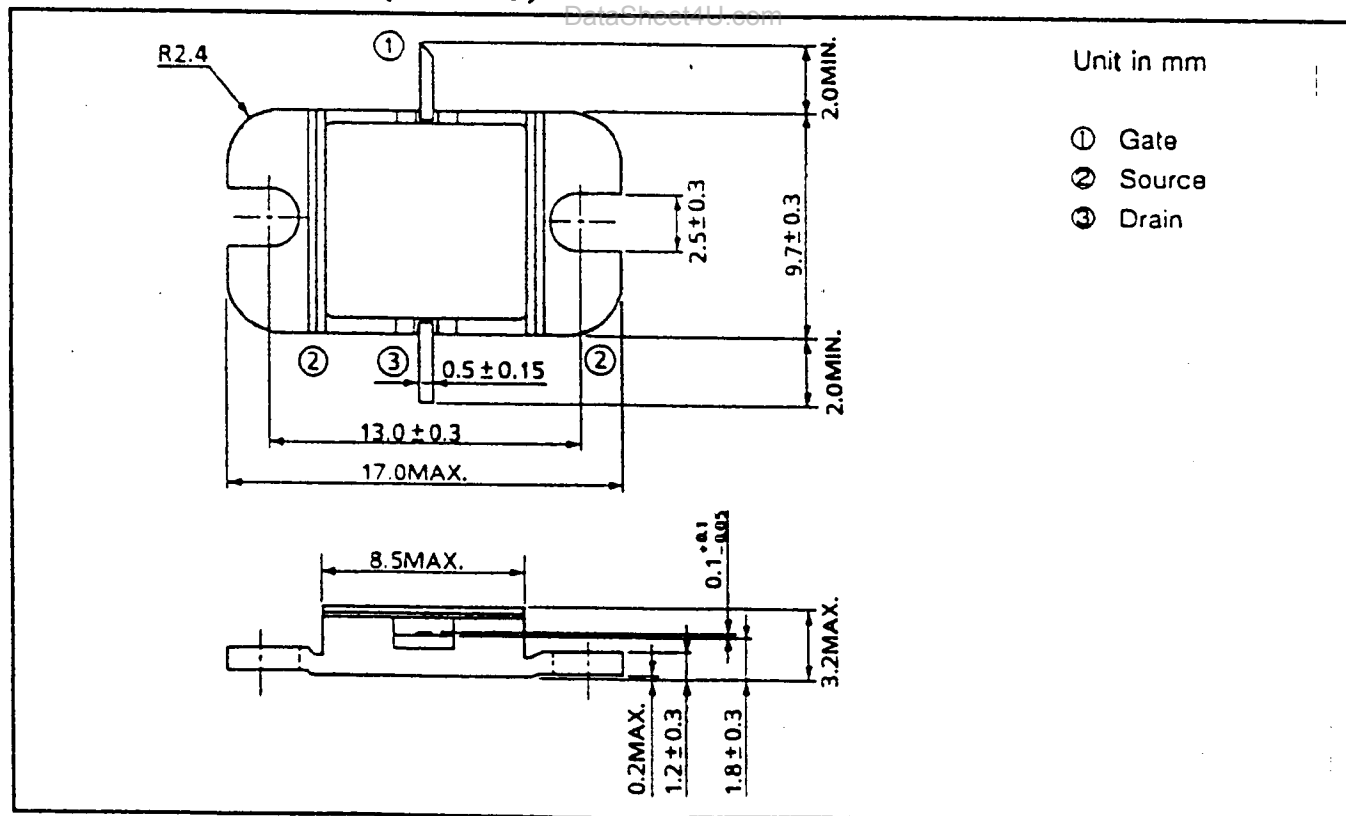
Note 2 :  $\Delta T_{ch} = (VDS \times IDS1 \times R_{th}(c-c))$

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

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Transconductance	gm	VDS= 3V IDS= 2.0A	mS	—	1200	—
Pinch-off Voltage	VGSoff	VDS= 3V IDS= 60mA	V	-2.0	-3.5	-5.0
Saturated Drain Current	IDSS	VDS= 3V VGS=0V	A	—	4.0	5.2
Gate-Source Breakdown Voltage	VGS0	IGS= -60μA	V	-5	—	—
Thermal Resistance	Rth(c-c)	Channel to Case	°C/W	—	2.9	3.5

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

CHARACTERISTICS	SYMBOL	RATING	UNIT
Drain-Source Voltage	VDS	15	V
Gate-Source Voltage	VGS	-5	V
Drain Current	IDS	5.2	A
Total Power Dissipation (Tc= 25 °C)	PT	30	W
Channel Temperature	Tch	175	°C
Storage	Tstg	-65 ~ +175	°C

**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.