# MICROWAVE POWER GaAs FET

# Low Distortion Internally Matched Power GaAs FETs (C-Band)

#### Features

- Low intermodulation distortion
- $IM_3 = -42 \, dBc \, at \, Po = 31.5 \, dBm$ ,
- Single carrier level
- High power
- P<sub>1dB</sub> = 42.0 dBm at 6.4 GHz to 7.2 GHz
- High gain
  - $G_{1dB} = 7.5 \text{ dB}$  at 6.4 GHz to 7.2 GHz
- Broad band internally matched
- Hermetically sealed package

#### **RF** Performance Specifications (Ta = $25^{\circ}$ C)

Characteristics	Symbol	Condition	Unit	Min.	Тур.	Мах
Output Power at 1dB Compression Point	P <sub>1dB</sub>		dBm	41.0	42.0	-
Power Gain at 1dB Compression Point	G <sub>1dB</sub>	V <sub>DS</sub> = 10V	dB	6.5	7.5	-
Drain Current	I <sub>DS1</sub>	f = 6.4 ~ 7.2 GHz	А	_	4.2	5.0
Gain Flatness	ΔG		dB	_	-	±0.6
Power Added Efficiency	η <sub>add</sub>		%	_	31	_
3rd Order Intermodulation Distortion	IM <sub>3</sub>	Note 1	dBc	-42	-45	-
Drain Current	I <sub>DS2</sub>		А	_	4.2	5.0
Channel-Temperature Rise	$\Delta T_{ch}$	V <sub>DS</sub> xI <sub>DS</sub> xR <sub>th</sub> (c-c)	°C	_	_	80

#### **Electrical Characteristics (Ta = 25° C)**

Characteristic	Symbol	Condition	Unit	Min.	Тур.	Мах
Trans-conductance	gm	V <sub>DS</sub> = 3V I <sub>DS</sub> = 5.2A	mS	_	3200	_
Pinch-off Voltage	V <sub>GSoff</sub>	V <sub>DS</sub> = 3V I <sub>DS</sub> = 70mA	V	-2	-3.5	-5.0
Saturated Drain Current	I <sub>DSS</sub>	$V_{DS} = 3V$ $V_{GS} = 0V$	А	_	10.0	13.0
Gate-Source Breakdown Voltage	V <sub>GSO</sub>	I <sub>GS</sub> = -210μA	V	-5	_	_
Thermal Resistance	R <sub>th (c-c)</sub>	Channel to case	°C/W	-	1.9	2.5

Note 1: 2 tone Test Pout = 31.5dBm Single Carrier Level.

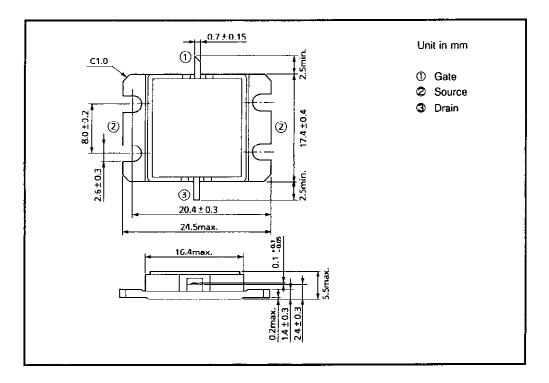
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# Absolute Maximum Ratings (Ta = 25° C)

Characteristic	Symbol	Unit	Rating
Drain-Source Voltage	V <sub>DS</sub>	V	15
Gate-Source Voltage	V <sub>GS</sub>	V	-5
Drain Current	I <sub>DS</sub>	А	13
Total Power Dissipation ( $T_c = 25^{\circ}C$ )	P <sub>T</sub>	W	60
Channel Temperature	T <sub>ch</sub>	°C	175
Storage Temperature	T <sub>stg</sub>	°C	-65~175

#### Package Outline (2-16G1B)

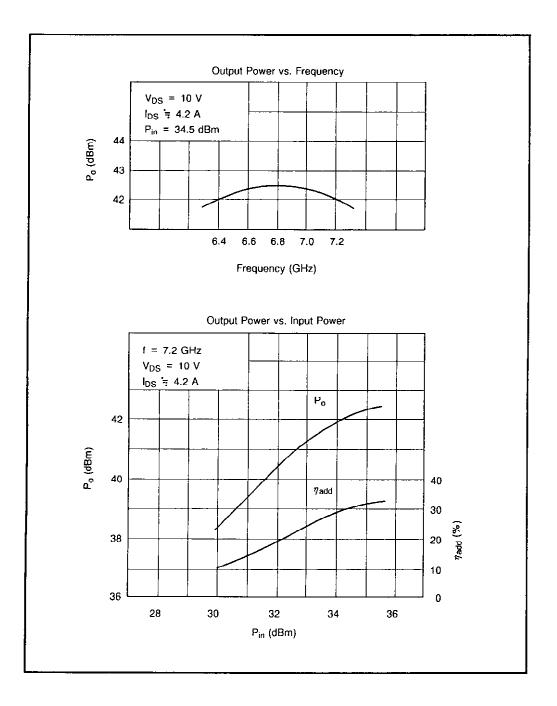


## Handling Precautions for Packaged Type

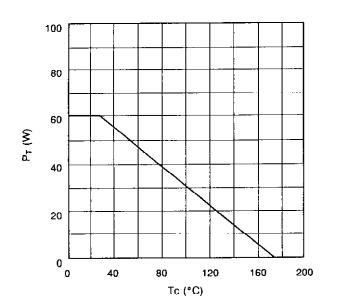
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

2/5

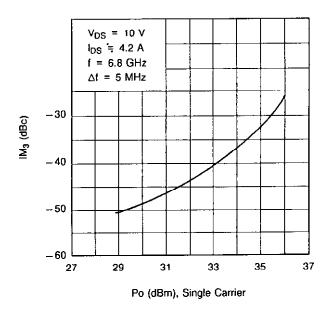
## **RF Performances**



## Power Dissipation vs. Case Temperature



IM<sub>3</sub> vs. Output Power Characteristics



# TIM6472-14L S-Parameters (MAGN. and ANGLES)

	A							
+0.5		+2 	+5	+150	7.20 7.00 5685 Scale for   512	+90° 7.6 72 7.8	f =6.0~7 +60° 7.6 Scale or I Sc	+30°
-0.2	20072 7.0 200	60 -2	<b>-</b> 5	- 150°	6.80		2 3	y 6.0 <sup>4</sup> y − 30°
	-1	 	S11 S#		- 120*	- 90°	4 ← 60° ← ★	— S21 — S12
FREQUENCY (MHz)	T	  S11 ANG	Ser	S12 ANG	. 120' <		 	
	MAG	511 ANG	See MAG	ANG	MAG	- 90°	MAG	— \$12 \$22 ANG
(MHz)		 511	Ser I		. 120' <	<u>- 90°</u>		- \$12 522
(MHz) 6.0	MAG 0.529	511 ANG 157.2	S≃ MAG 0.048	ANG -56.3	MAG 3.350	521 ANG -7.0	MAG 0.558	- \$12 522 ANG -113.8
(MHz) 6.0 6.2	MAG 0.529 0.442	S11 ANG 157.2 110.8	Sz: MAG 0.048 0.063	ANG -56.3 -94.8 -129.5	. 120 MAG 3.350 3.549	521 ANG -7.0 -41.8	MAG 0.558 0.500	- \$12 522 ANG -113.8 -149.5
(MHz) 6.0 6.2 6.4	MAG 0.529 0.442 0.372	511 ANG 157.2 110.8 61.6	Ser MAG 0.048 0.063 0.078	ANG -56.3 -94.8	MAG 3.350 3.549 3.565	- 90° - 90° - - 90 - 90° - 90° - 90° - 90° - 90° - 90	MAG 0.558 0.500 0.473	<b>S</b> <sup>22</sup> <b>ANG</b> -113.8 -149.5 175.2
(MHz) 6.0 6.2 6.4 6.6	MAG 0.529 0.442 0.372 0.334	S11 ANG 157.2 110.8 61.6 12.1	See MAG 0.048 0.063 0.078 0.089	ANG -56.3 -94.8 -129.5 -162.2	MAG 3.350 3.549 3.565 3.478	- 30° - 30° - 7.0 - 41.8 - 75.6 - 108.1 - 139.4	MAG 0.558 0.500 0.473 0.462	- \$12 522 ANG -113.8 -149.5 175.2 143.6 114.6
(MHz) 6.0 6.2 6.4 6.6 6.8	MAG 0.529 0.442 0.372 0.334 0.315	511 ANG 157.2 110.8 61.6 12.1 -35.9	Sz: MAG 0.048 0.063 0.078 0.089 0.098	ANG -56.3 -94.8 -129.5 -162.2 167.0	MAG 3.350 3.549 3.565 3.478 3.386	- 90° - 90° - - 90 - 90° - 90° - 90° - 90° - 90° - 90	MAG 0.558 0.500 0.473 0.462 0.441	<b>S22</b> ANG -113.8 -149.5 175.2 143.6
(MHz) 6.0 6.2 6.4 6.6 6.8 7.0	MAG 0.529 0.442 0.372 0.334 0.315 0.289	511 ANG 157.2 110.8 61.6 12.1 -35.9 -83.0	Szz MAG 0.048 0.063 0.078 0.089 0.098 0.105	ANG -56.3 -94.8 -129.5 -162.2 167.0 135.6	MAG 3.350 3.549 3.565 3.478 3.386 3.292	- 90° - 90° - 90° - 7.0 - 41.8 - 75.6 - 108.1 - 139.4 - 170.8	MAG 0.558 0.500 0.473 0.462 0.441 0.416	<b>S22</b> <b>ANG</b> -113.8 -149.5 175.2 143.6 114.6 83.1