

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

#### Features

- Low intermodulation distortion
  - $IM_3 = -45$  dBc at  $P_o = 34.5$  dBm,
  - Single carrier level
- High power
  - $P_{1dB} = 45$  dBm at 5.9 GHz to 6.4 GHz
- High gain
  - $G_{1dB} = 8.0$  dB at 5.9 GHz to 6.4 GHz
- Broad band internally matched
- 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	$P_{1dB}$	$V_{DS} = 10V$ $f = 5.9 \sim 6.4$ GHz	dBm	44.0	45.0	–
Power Gain at 1dB Compression Point	$G_{1dB}$		dB	7.0	8.0	–
Drain Current	$I_{DS1}$		A	–	8.0	9.0
Gain Flatness	$\Delta G$		dB	–	–	$\pm 0.8$
Power Added Efficiency	$\eta_{add}$		%	–	33	–
3rd Order Intermodulation Distortion	$IM_3$	Note 1	dBc	-42	-45	–
Drain Current	$I_{DS2}$		A	–	8.0	9.0
Channel-Temperature Rise	$\Delta T_{ch}$	$V_{DS} \times I_{DS} \times R_{th}(c-c)$	$^\circ\text{C}$	–	–	80

#### Electrical Characteristics ( $T_a = 25^\circ\text{C}$ )

Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max
Trans-conductance	gm	$V_{DS} = 3V$ $I_{DS} = 10.5A$	mS	–	6300	–
Pinch-off Voltage	$V_{GSoff}$	$V_{DS} = 3V$ $I_{DS} = 140mA$	V	-2	-3.5	-5.0
Saturated Drain Current	$I_{DSS}$	$V_{DS} = 3V$ $V_{GS} = 0V$	A	–	20	26
Gate-Source Breakdown Voltage	$V_{GSO}$	$I_{GS} = -420\mu A$	V	-5	–	–
Thermal Resistance	$R_{th}(c-c)$	Channel to case	$^\circ\text{C}/W$	–	0.8	1.0

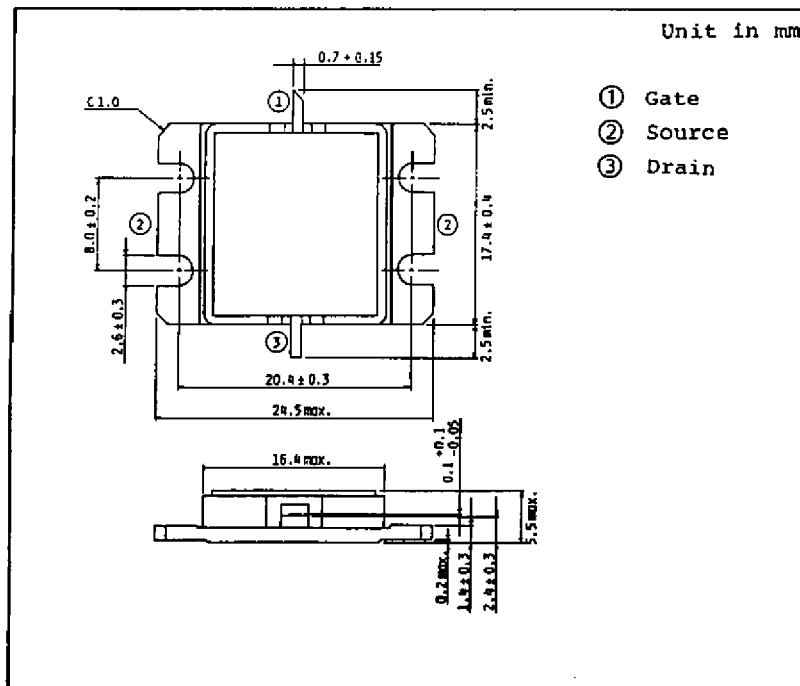
Note 1: 2 tone Test Pout = 34.5dBm Single Carrier Level.

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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>	A	26
Total Power Dissipation (T <sub>c</sub> = 25°C)	P <sub>T</sub>	W	120
Channel Temperature	T <sub>ch</sub>	°C	175
Storage Temperature	T <sub>stg</sub>	°C	-65~175

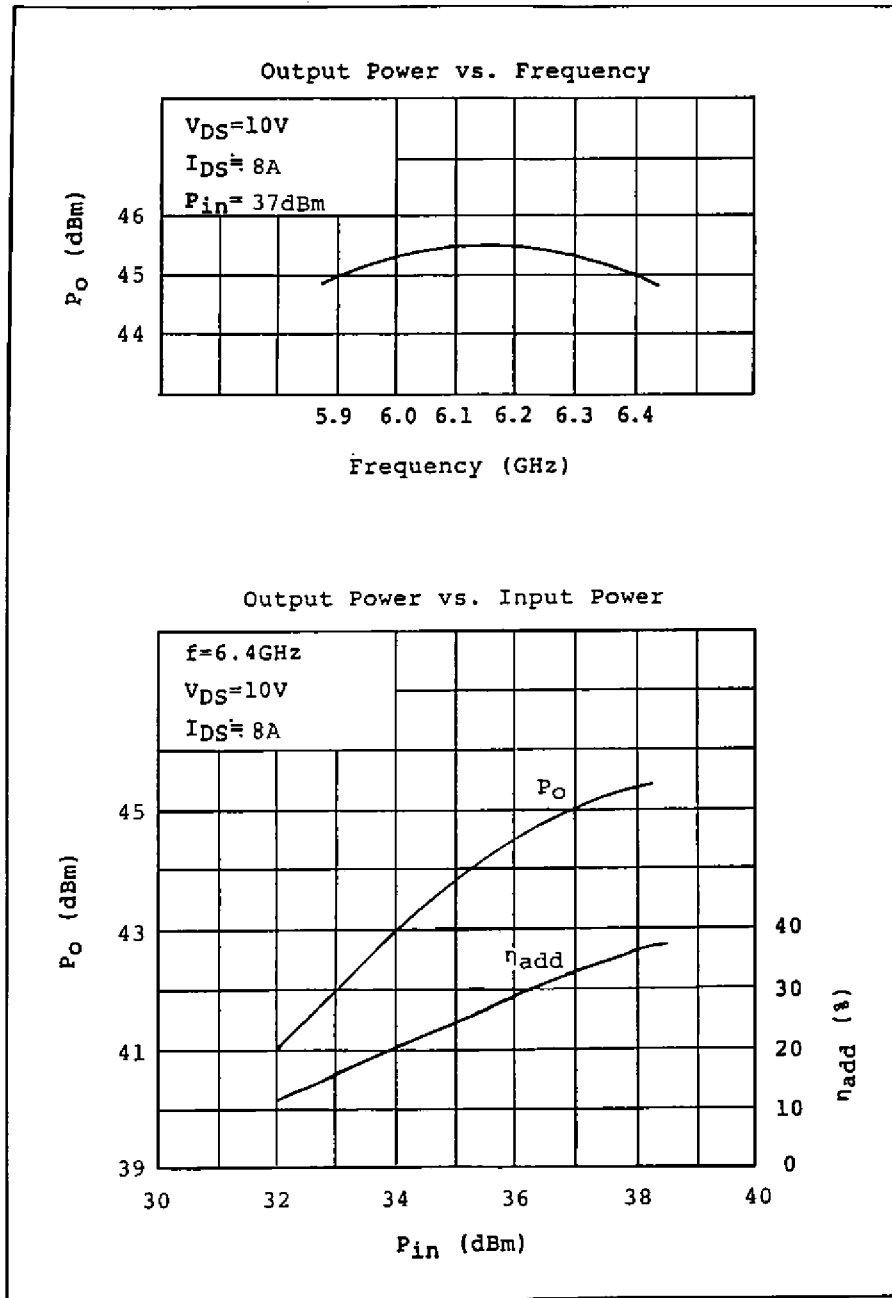
**Package Outline (2-16G1B)**



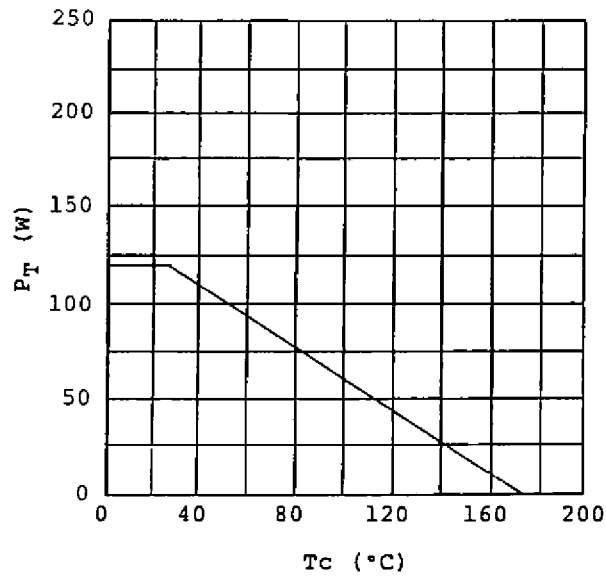
**Handling Precautions for Packaged Type**

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

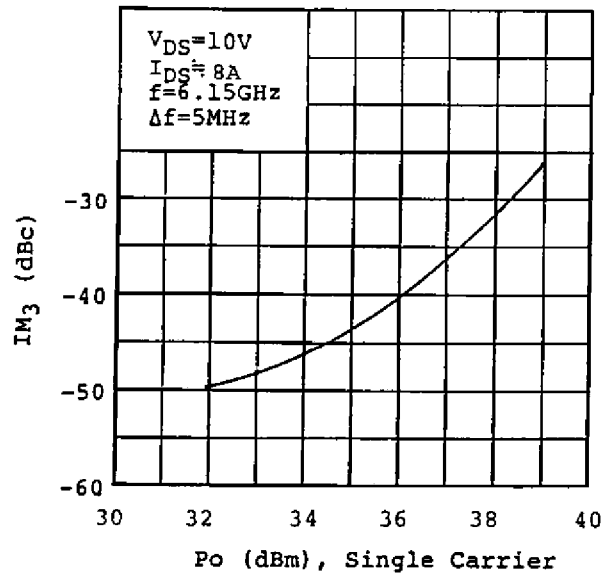
RF Performances



Power Dissipation vs. Case Temperature

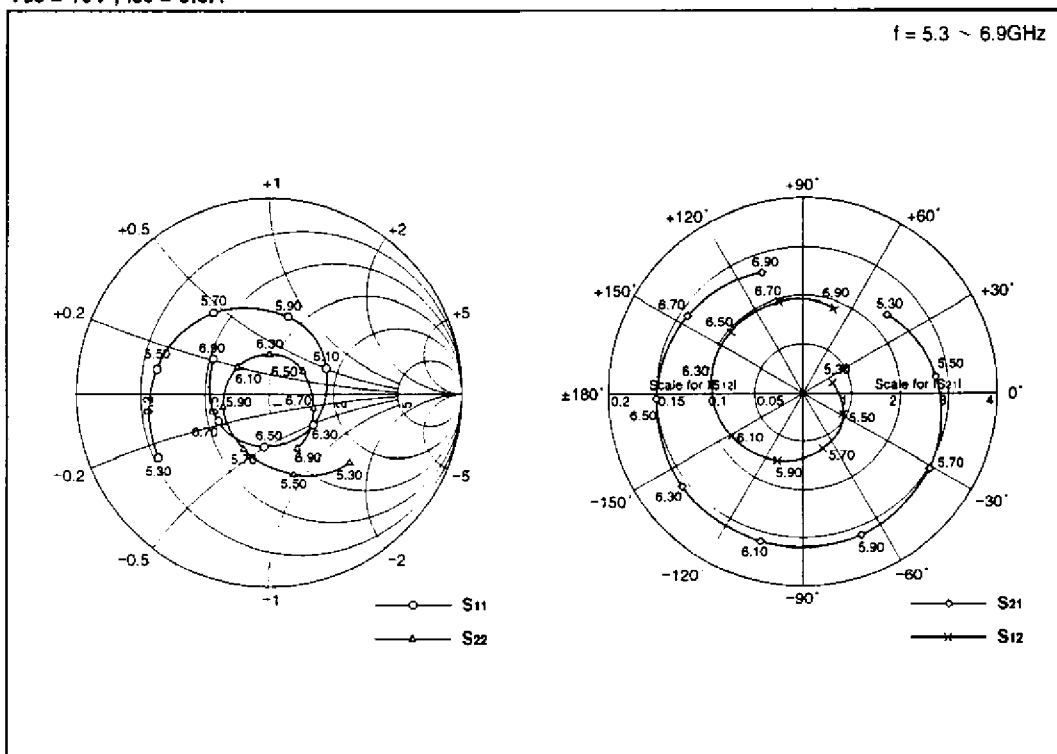


IM<sub>3</sub> vs. Output Power Characteristics



TIM5964-30L S-Parameters  
(MAGN. and ANGLES)

$V_{DS} = 10V, I_{DS} = 8.0A$



FREQUENCY (GHz)	$S_{11}$		$S_{21}$		$S_{12}$		$S_{22}$	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
5.30	0.665	-150	2.353	43	0.032	19	0.542	-40
5.50	0.598	168	2.745	7	0.046	-28	0.427	-73
5.70	0.512	125	3.030	-31	0.061	-71	0.316	-114
5.90	0.410	77	3.179	-68	0.075	-111	0.240	-164
6.10	0.322	24	3.200	-106	0.086	-149	0.209	141
6.30	0.279	-35	3.133	-142	0.094	175	0.198	87
6.50	0.279	-95	3.009	-178	0.097	140	0.200	34
6.70	0.301	-152	2.846	146	0.097	105	0.239	-18
6.90	0.344	149	2.609	109	0.092	70	0.318	-62