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_{1dB} = 42.0 dBm at 6.4 GHz to 7.2 GHz
- High gain
  - G_{1dB} = 7.5 dB at 6.4 GHz to 7.2 GHz
- Broad band internally matched
- Hermetically sealed package

RF Performance Specifications (Ta = 25° C)

Characteristics	Symbol	Condition	Unit	Min.	Typ.	Max
Output Power at 1dB Compression Point	P_{1dB}	V_{DS} = 10V f = 6.4 ~ 7.2 GHz	dBm	41.0	42.0	–
Power Gain at 1dB Compression Point	G_{1dB}		dB	6.5	7.5	–
Drain Current	I_{DS1}		A	–	4.2	5.0
Gain Flatness	ΔG		dB	–	–	±0.6
Power Added Efficiency	η_{add}		%	–	31	–
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	-42	-45	–
Drain Current	I_{DS2}		A	–	4.2	5.0
Channel-Temperature Rise	ΔT_{ch}	V_{DS}xI_{DS}xR_{th}(c-c)	°C	–	–	80

Electrical Characteristics (Ta = 25° C)

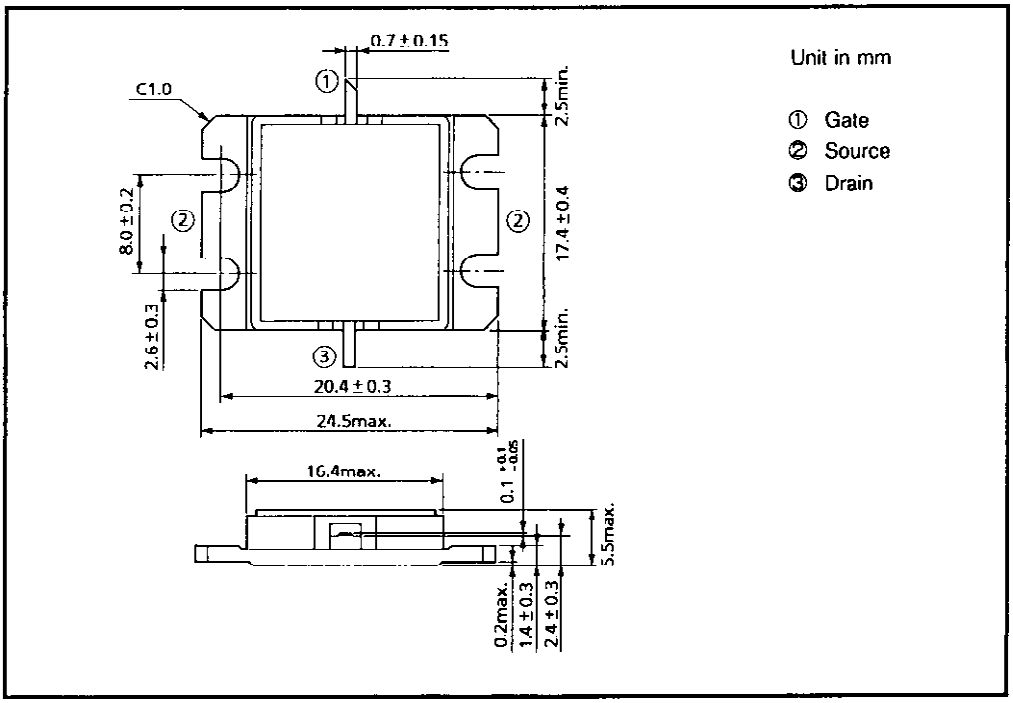
Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max
Trans-conductance	gm	V_{DS} = 3V I_{DS} = 5.2A	mS	–	3200	–
Pinch-off Voltage	V_{GSoff}	V_{DS} = 3V I_{DS} = 70mA	V	-2	-3.5	-5.0
Saturated Drain Current	I_{DSS}	V_{DS} = 3V V_{GS} = 0V	A	–	10.0	13.0
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS} = -210μA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

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

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	13
Total Power Dissipation (T_c = 25°C)	P_T	W	60
Channel Temperature	T_{ch}	˚C	175
Storage Temperature	T_{stg}	˚C	-65~175

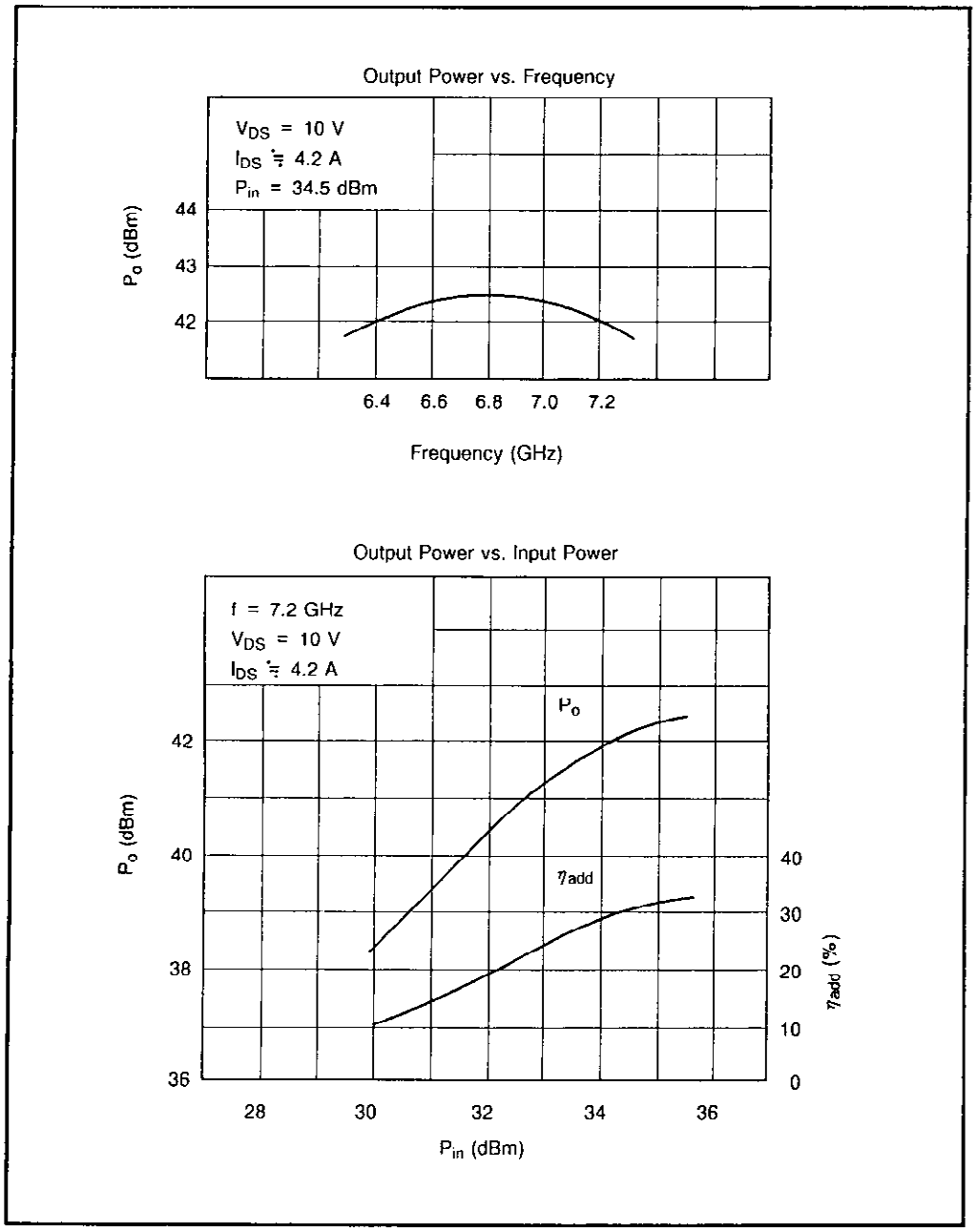
Package Outline (2-16G1B)



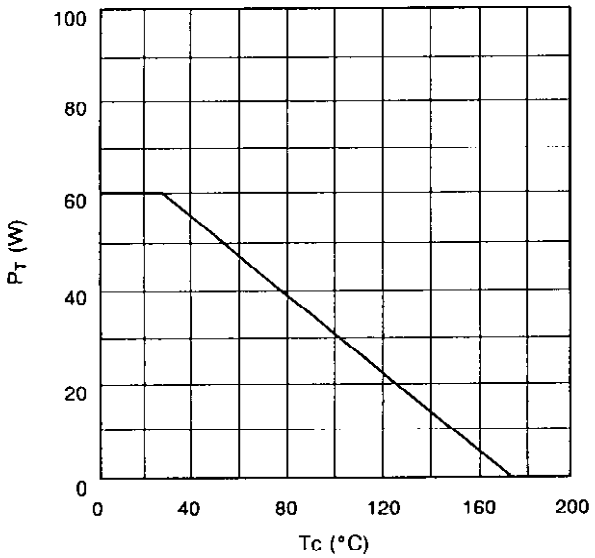
Handling Precautions for Packaged Type

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

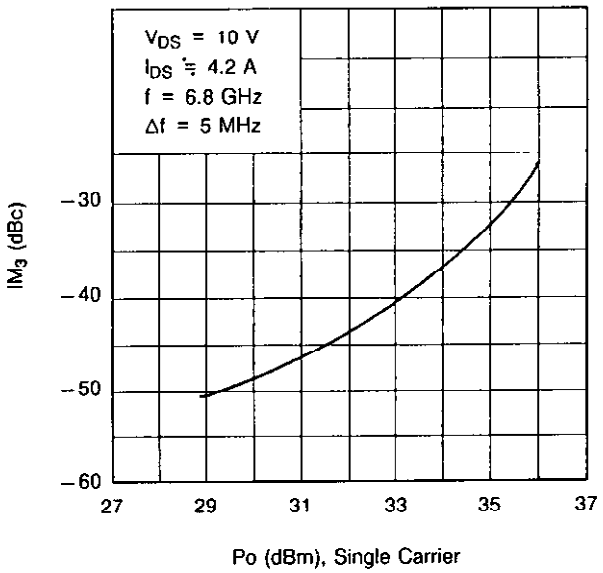
RF Performances



Power Dissipation vs. Case Temperature

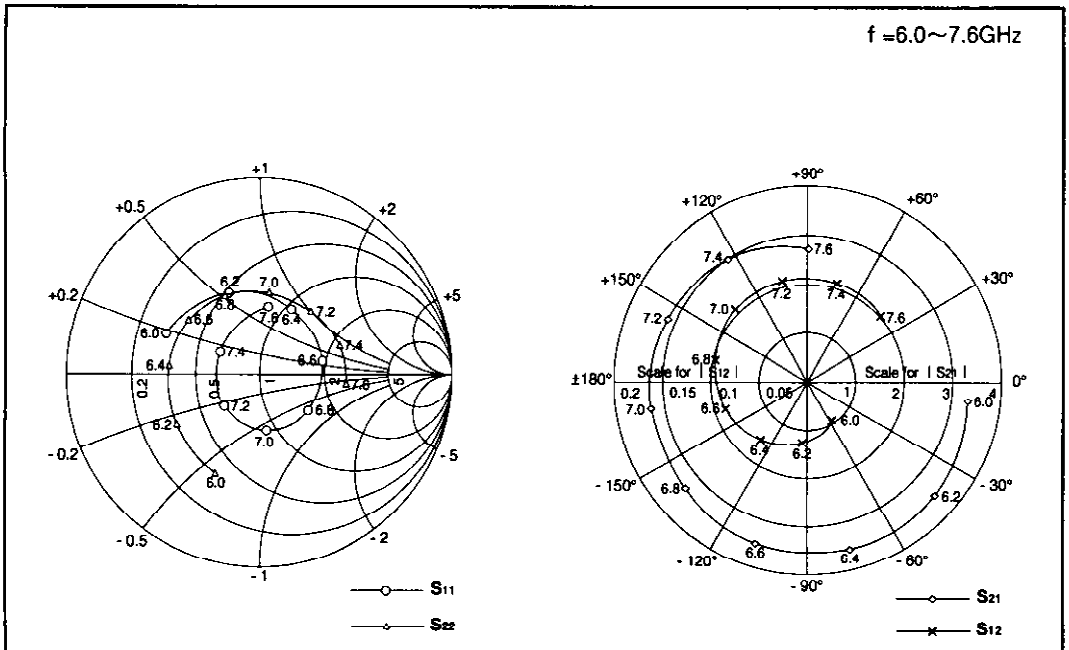


IM_3 vs. Output Power Characteristics



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

V_{DS} = 10V, I_{DS} = 4.2A



FREQUENCY (MHz)	S_{11} MAG	S_{11} ANG	S_{12} MAG	S_{12} ANG	S_{21} MAG	S_{21} ANG	S_{22} MAG	S_{22} ANG
6.0	0.529	157.2	0.048	-56.3	3.350	-7.0	0.558	-113.8
6.2	0.442	110.8	0.063	-94.8	3.549	-41.8	0.500	-149.5
6.4	0.372	61.6	0.078	-129.5	3.565	-75.6	0.473	175.2
6.6	0.334	12.1	0.089	-162.2	3.478	-108.1	0.462	143.6
6.8	0.315	-35.9	0.098	167.0	3.386	-139.4	0.441	114.6
7.0	0.289	-83.0	0.105	135.6	3.292	-170.8	0.416	83.1
7.2	0.243	-137.5	0.107	104.5	3.167	156.7	0.415	49.5
7.4	0.228	150.7	0.104	72.7	2.997	123.8	0.443	19.5
7.6	0.343	81.8	0.102	40.4	2.704	89.5	0.456	-5.7