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

Features

- Low intermodulation distortion
  - IM_3 = -45 dBc at Po = 31.5 dBm,
  - Single carrier level
- High power
  - P_{1dB} = 42.5 dBm at 5.9 GHz to 6.4 GHz
- High gain
  - G_{1dB} = 7.0 dB at 5.9 GHz to 6.4 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 = 5.9 ~ 6.4 GHz	dBm	41.5	42.5	–
Power Gain at 1dB Compression Point	G_{1dB}		dB	6.0	7.0	–
Drain Current	I_{DS1}		A	–	4.8	5.5
Gain Flatness	ΔG		dB	–	–	±0.8
Power Added Efficiency	η_{add}		%	–	30	–
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	-42	-45	–
Drain Current	I_{DS2}		A	–	4.8	5.5
Channel-Temperature Rise	ΔT_{ch}	V_{DS}xI_{DS}xR_{th}(c-c)	°C	–	–	80

Electrical Characteristics (Ta = 25° C)

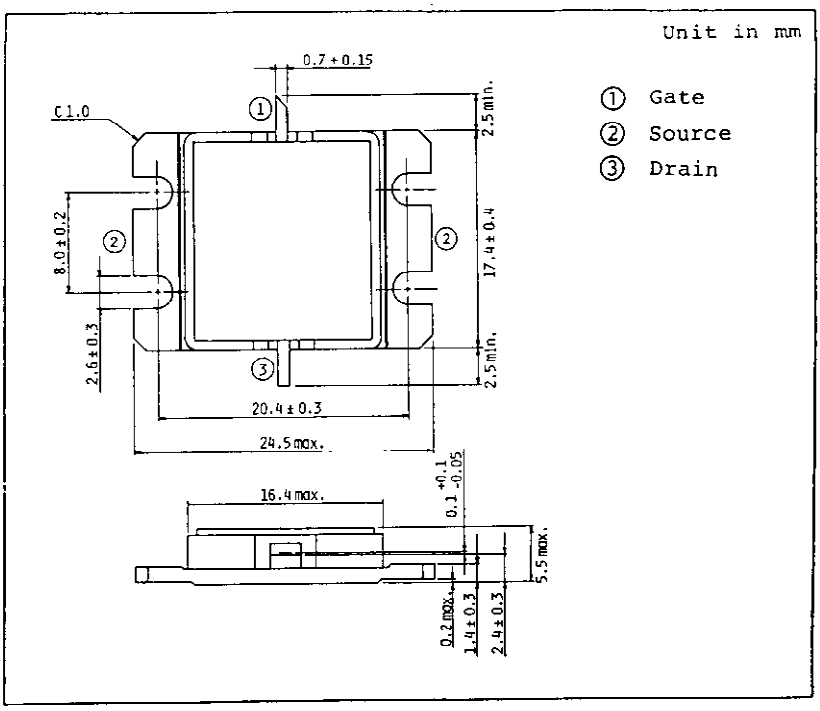
Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max
Trans-conductance	gm	V_{DS} = 3V I_{DS} = 6.0A	mS	–	3600	–
Pinch-off Voltage	V_{GSoff}	V_{DS} = 3V I_{DS} = 80mA	V	-2.0	-3.5	-5.0
Saturated Drain Current	I_{DSS}	V_{DS} = 3V V_{GS} = 0V	A	–	11.6	15.0
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS} = -240μA	V	-5	–	–
Thermal Resistance	$R_{th\ (c-c)}$	Channel to Case	°C/W	–	1.4	1.8

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	16
Total Power Dissipation (T_c = 25°C)	P_T	W	70
Channel Temperature	T_{ch}	˚C	175
Storage Temperature	T_{stg}	˚C	-65~175

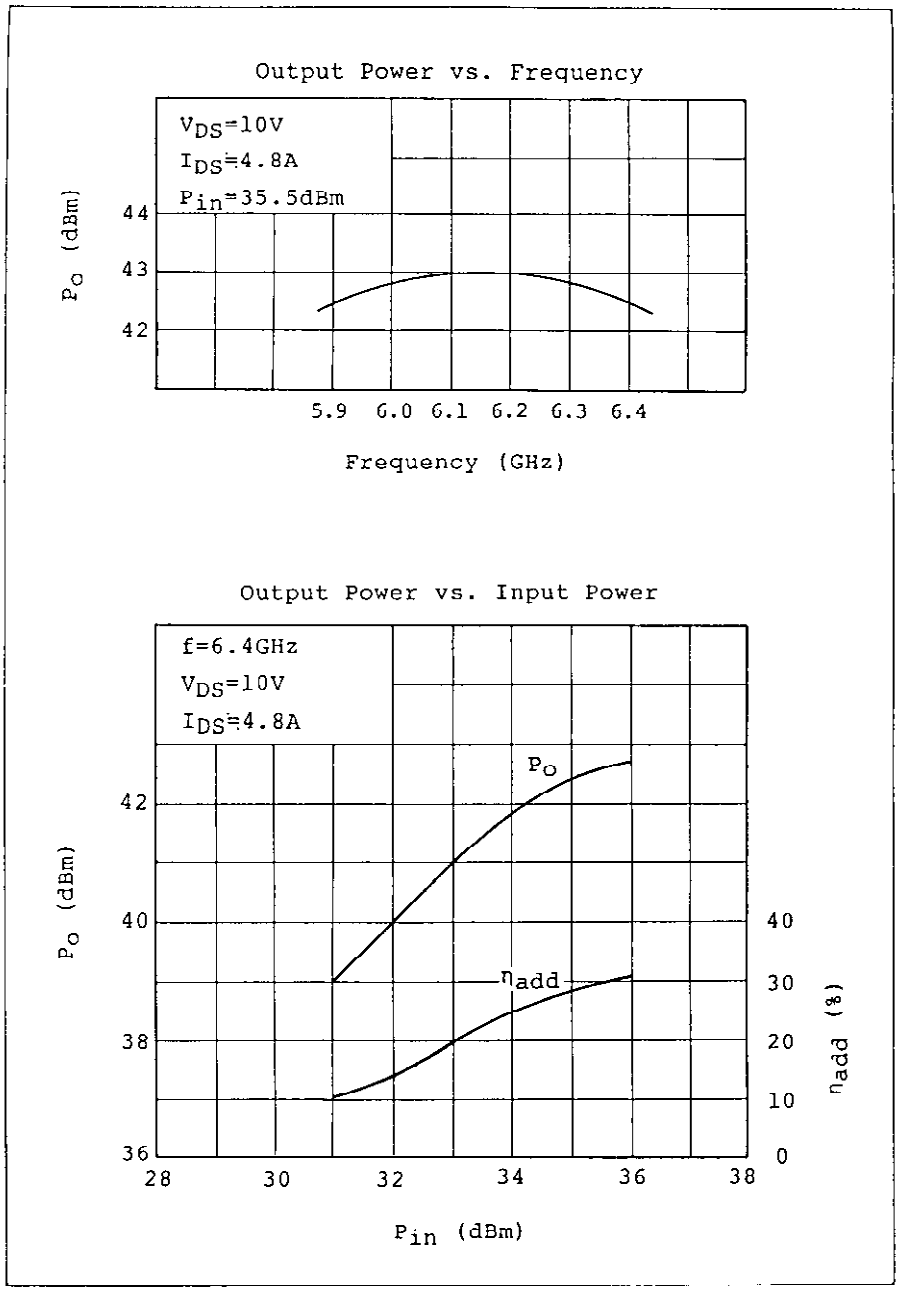
Package Outline (2-16G1B)



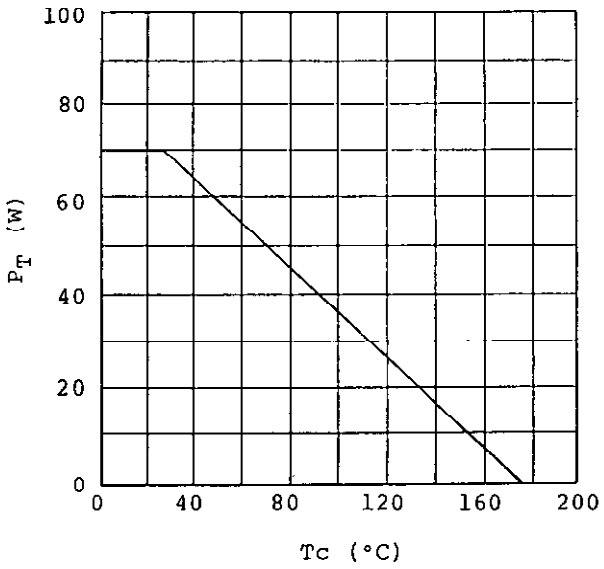
Handling Precautions for Packaged Type

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

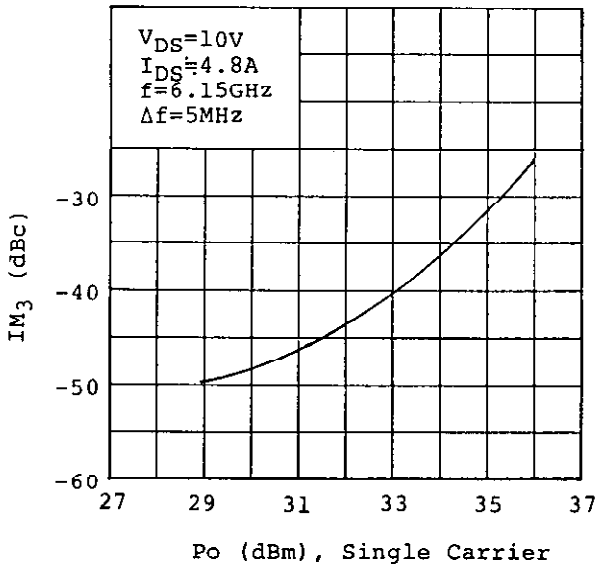
RF Performances



Power Dissipation vs. Case Temperature

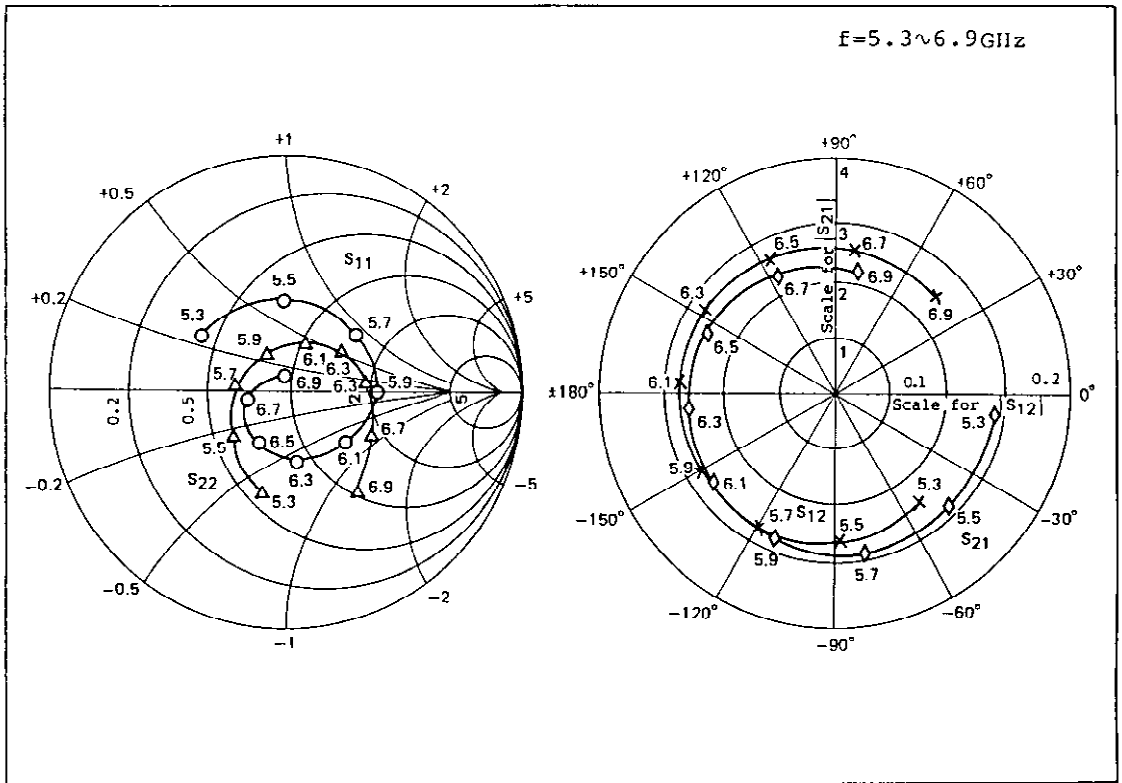


IM_3 vs. Output Power Characteristics



TIM5964-16L S-Parameters
(MAGN. and ANGLES)

V_{DS}=10V, I_{DS}=4.0A



FREQUENCY (GHz)	S_{11}		S_{12}		S_{21}		S_{22}	
5.3	0.44	147	0.120	-51	2.81	-6	0.44	-103
5.5	0.40	93	0.129	-86	2.85	-42	0.30	-139
5.7	0.38	41	0.133	-118	2.83	-77	0.22	175
5.9	0.38	1	0.131	-150	2.75	-110	0.19	121
6.1	0.33	-40	0.131	178	2.62	-142	0.22	73
6.3	0.30	-82	0.131	148	2.55	-175	0.28	39
6.5	0.25	-119	0.129	116	2.47	153	0.33	6
6.7	0.17	-171	0.128	82	2.34	118	0.41	-27
6.9	0.08	98	0.122	45	2.23	79	0.51	-56