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

Features

- Low intermodulation distortion
  - IM_3 = -45 dBc at Po = 34.5 dBm,
  - Single carrier level
- High power
  - P_{1dB} = 45 dBm at 5.3 GHz to 5.9 GHz
- High gain
  - G_{1dB} = 8.5 dB at 5.3 GHz to 5.9 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 = 5.3 ~ 5.9 GHz	dBm	44.0	45.0	–
Power Gain at 1dB Compression Point	G_{1dB}		dB	7.5	8.5	–
Drain Current	I_{DS1}		A	–	8.0	9.0
Gain Flatness	ΔG		dB	–	–	±0.8
Power Added Efficiency	η_{add}		%	–	34	–
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	-42	-45	–
Drain Current	I_{DS2}		A	–	8.0	9.0
Channel-Temperature Rise	ΔT_{ch}	V_{DS}xI_{DS}xR_{th}(c-c)	°C	–	–	80

Electrical Characteristics (Ta = 25° C)

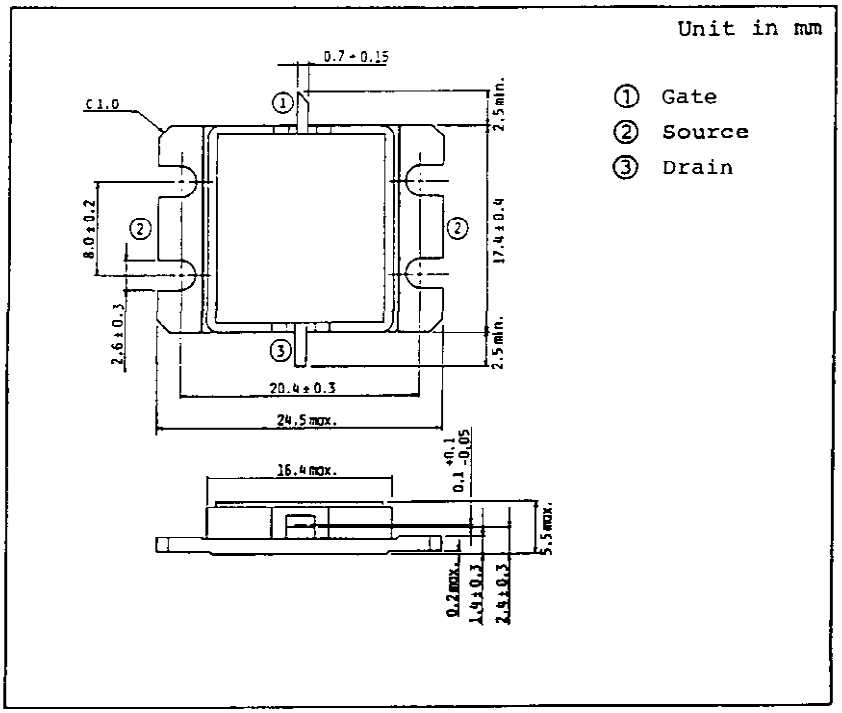
Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max
Trans-conductance	gm	V_{DS} = 3V I_{DS} = 10.5A	mS	–	6300	–
Pinch-off Voltage	V_{GSoff}	V_{DS} = 3V I_{DS} = 140mA	V	-2	-3.5	-5.0
Saturated Drain Current	I_{DSS}	V_{DS} = 3V V_{GS} = 0V	A	–	20	26
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS} = -420μA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

Note 1: 2 tone Test Pout = 34.5dBm 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	26
Total Power Dissipation (T_c = 25°C)	P_T	W	120
Channel Temperature	T_{ch}	°C	175
Storage Temperature	T_{stg}	°C	-65~175

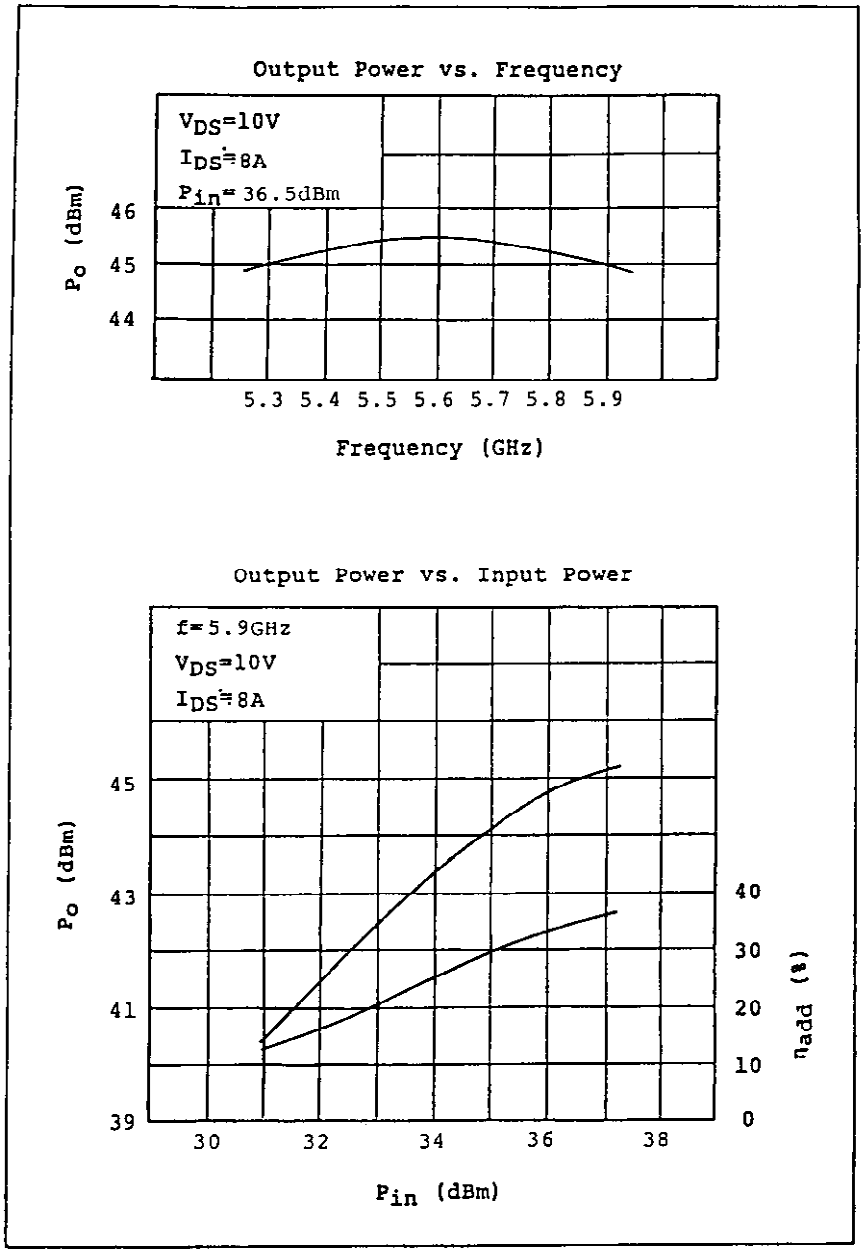
Package Outline (2-16G1B)



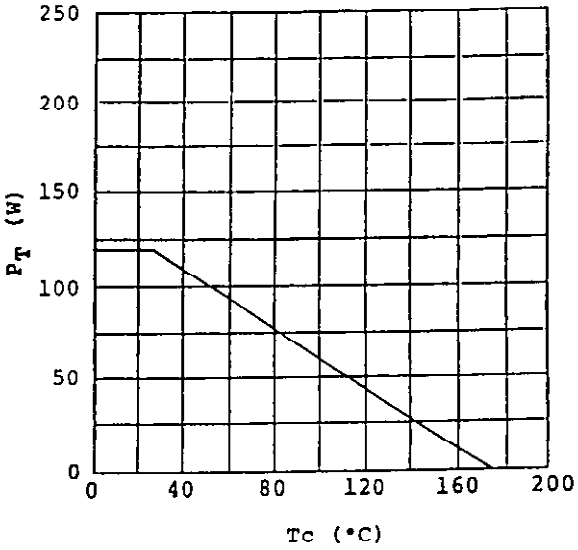
Handling Precautions for Packaged Type

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

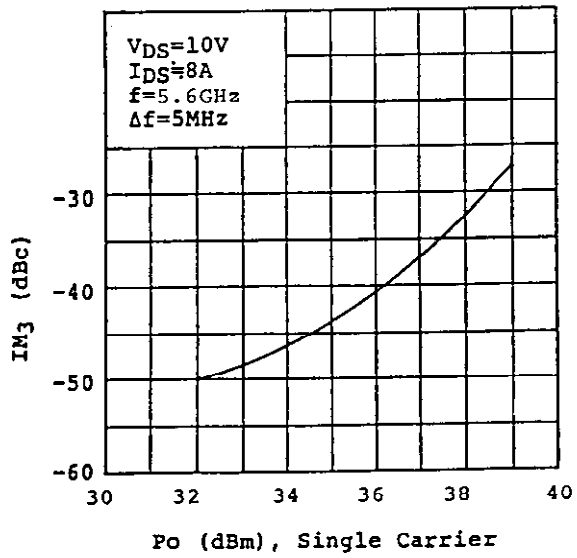
RF Performances



Power Dissipation vs. Case Temperature

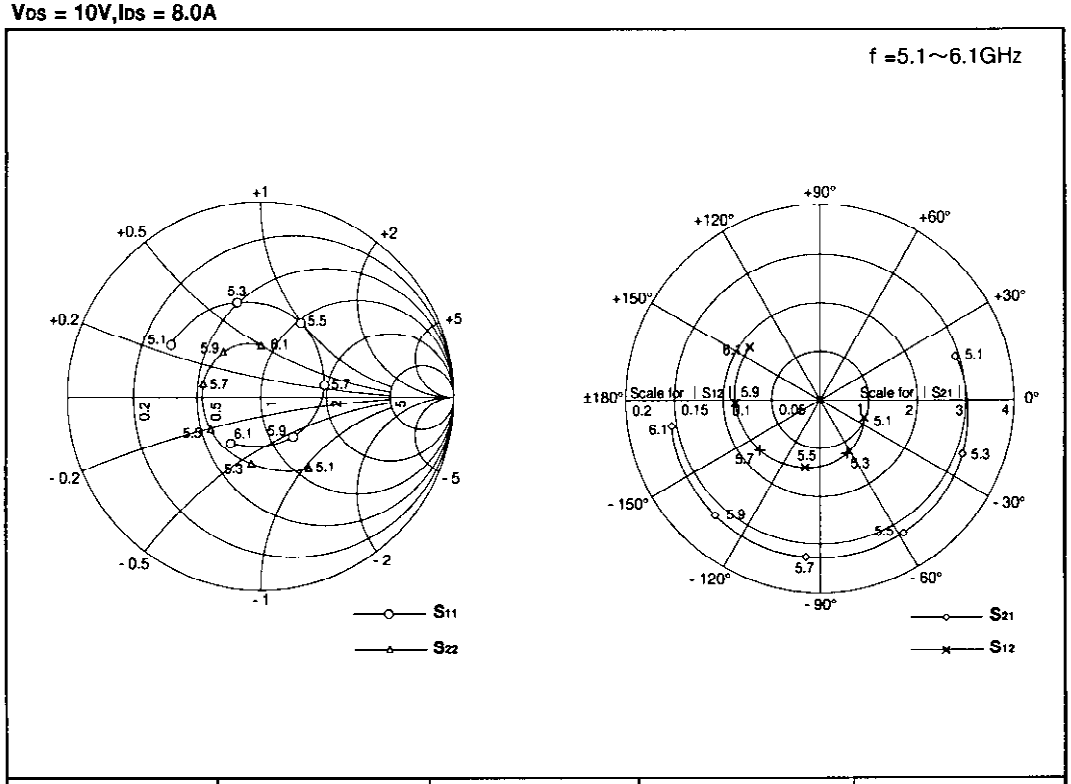


IM_3 vs. Output Power Characteristics



TIM5359-30L S-Parameters
(MAGN. and ANGLES)

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



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
5.1	0.537	149.9	0.048	-21.2	2.971	18.3	0.446	-55.3
5.3	0.503	104.0	0.061	-64.2	3.164	-20.1	0.347	-98.3
5.5	0.436	59.9	0.072	-103.9	3.250	-57.8	0.307	-147.3
5.7	0.346	11.8	0.082	-141.7	3.260	-95.0	0.310	167.5
5.9	0.273	-48.4	0.090	-178.8	3.223	-132.3	0.305	128.8
6.1	0.275	-121.1	0.093	143.8	3.125	-170.4	0.264	89.8