Internally Matched Power GaAs FETs (X, Ku-Band)

Features

- High power
  - P_{1dB} = 39.5 dBm at 12.7 GHz to 13.2 GHz
- High gain
  - G_{1dB} = 5.0 dB at 12.7 GHz to 13.2 GHz
- Broadband internally matched
- Hermetically sealed package

RF Performance Specifications (T_a = 25°C)

Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max
Output Power at 1dB Compression Point	P_{1dB}	V_{DS} = 9V f = 12.7 - 13.2 GHz	dBm	38.5	39.5	–
Power Gain at 1dB Compression Point	G_{1dB}		dB	4.0	5.0	–
Drain Current	I_{DS}		A	–	3.4	4.4
Power Added Efficiency	η_{add}		%	–	20	–
Channel-Temperature Rise	ΔT_{ch}	V_{DS} x I_{DS} x $R_{th\ (c-c)}$	°C	–	–	80

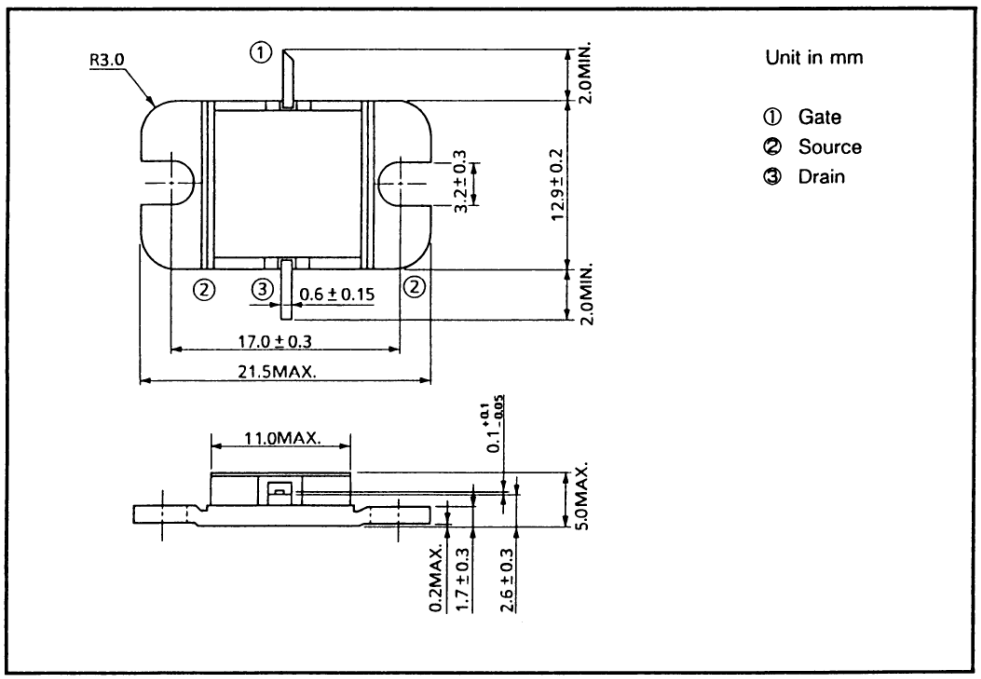
Electrical Characteristics (T_a = 25°C)

Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max.
Transconductance	gm	V_{DS} = 3V I_{DS} = 4.0A	mS	–	2400	–
Pinch-off Voltage	V_{GSoff}	V_{DS} = 3V I_{DS} = 120 mA	V	-2	-3.5	-5
Saturated Drain Current	I_{DSS}	V_{DS} = 3V V_{GS} = 0V	A	–	8.0	10.4
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS} = -120 μA	V	-5	–	–
Thermal Resistance	$R_{th\ (c-c)}$	Channel to Case	°C/W	–	1.6	2.5

Absolute Maximum Ratings (T_a = 25°C)

Characteristic	Symbol	Unit	Rating
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	-5
Drain Current	I_D	A	10.4
Total Power Dissipation (T_c = 25°C)	P_T	W	60
Channel Temperature	T_{ch}	°C	175
Storage Temperature	T_{stg}	°C	-65 ~ 175

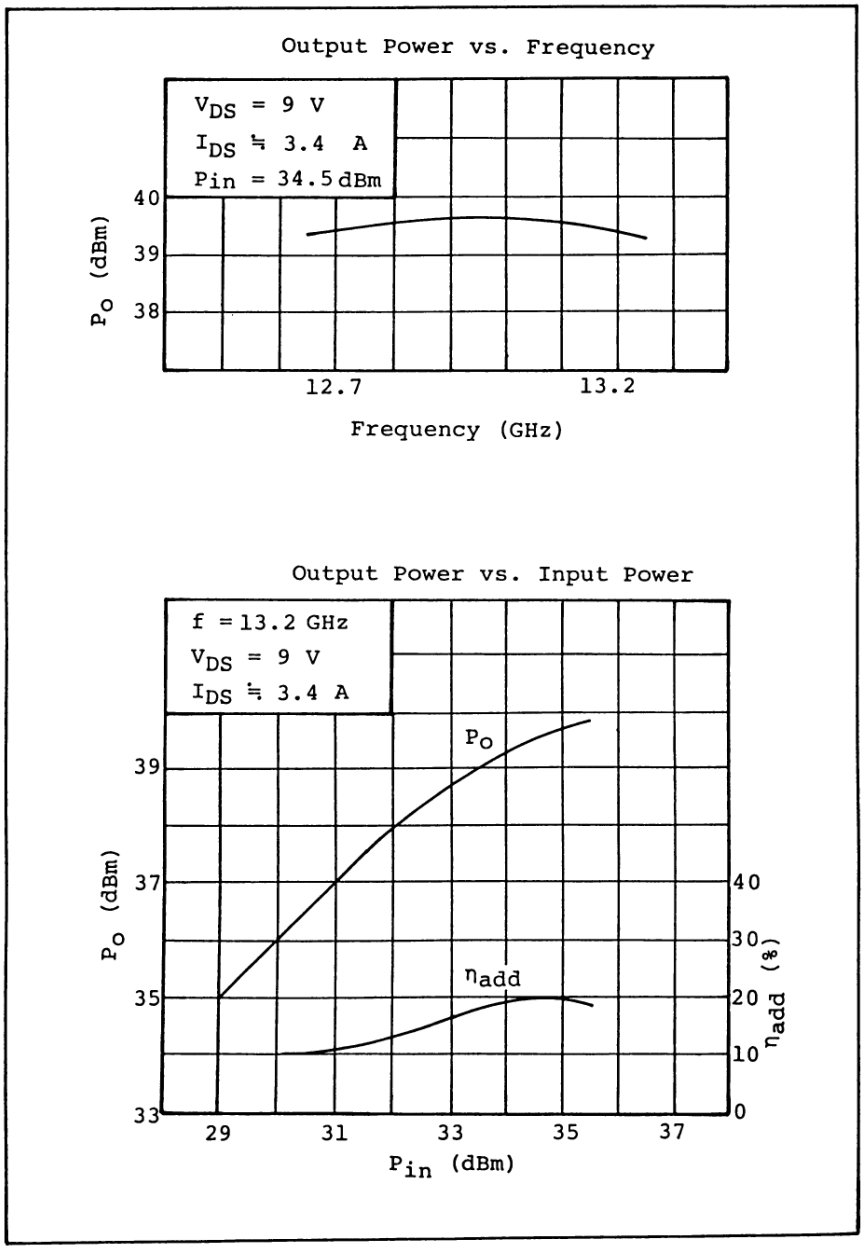
Package Outline (2-11C1B)



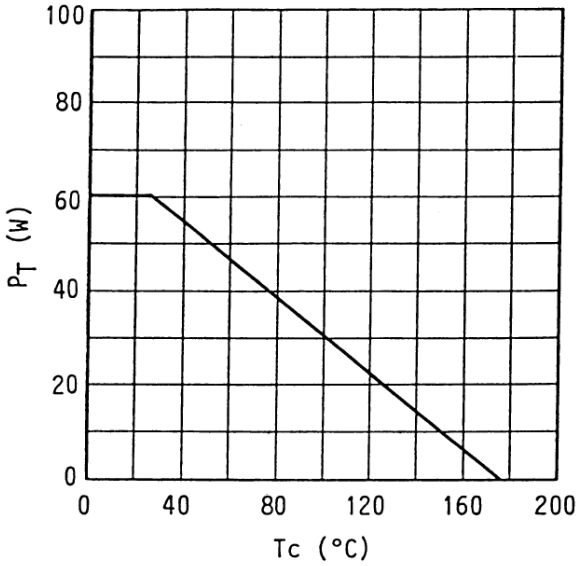
Handling Precautions for Packaged Type

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

RF Performances

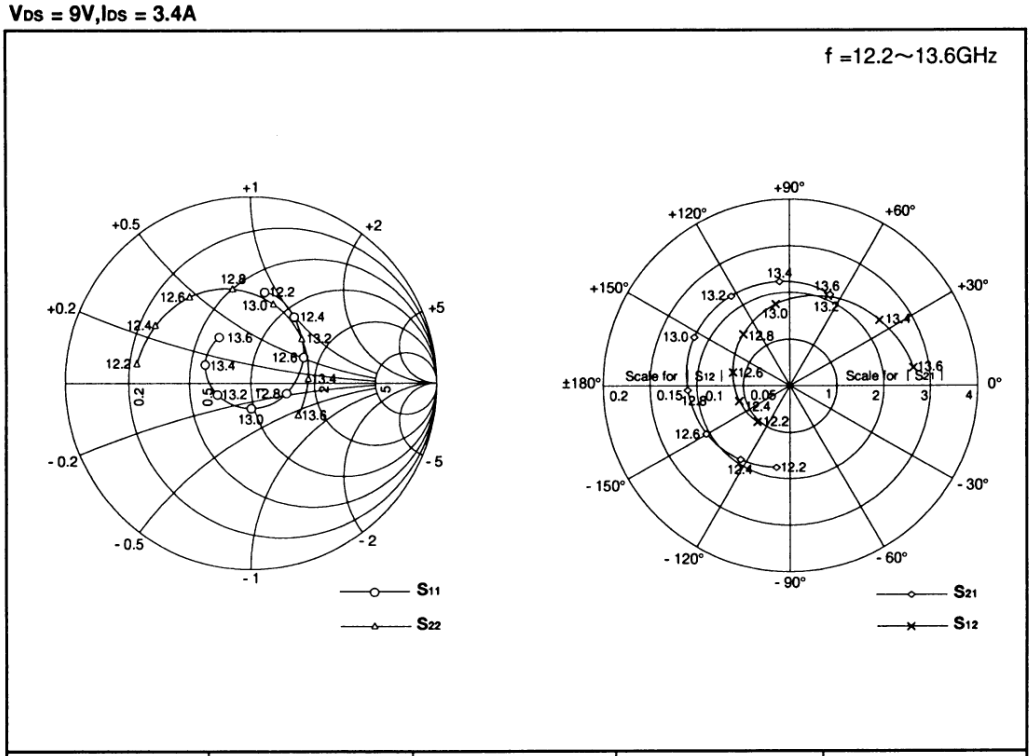


Power Dissipation vs. Case Temperature



TIM1213-8 S-Parameters (Magn. and Angles)

V_{DS} = 9V, I_{DS} = 3.4A



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
12.2	0.491	81.1	0.052	-134.9	1.796	-100.2	0.630	171.0
12.4	0.415	56.4	0.057	-163.4	1.944	-124.1	0.607	149.7
12.6	0.313	27.0	0.065	165.8	2.096	-149.6	0.568	126.7
12.8	0.198	-14.8	0.076	133.3	2.230	-177.0	0.512	102.0
13.0	0.132	-90.4	0.089	100.1	2.306	154.0	0.436	74.5
13.2	0.194	-162.3	0.103	67.8	2.294	124.0	0.360	42.5
13.4	0.268	157.2	0.118	37.2	2.194	94.3	0.308	5.0
13.6	0.300	125.3	0.133	8.5	2.054	65.3	0.304	-35.0