

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

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}	$V_{DS} \times I_{DS} \times R_{th(c-c)}$	$^\circ\text{C}$	–	–	80

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

Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max.
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	$^\circ\text{C/W}$	–	1.6	2.5

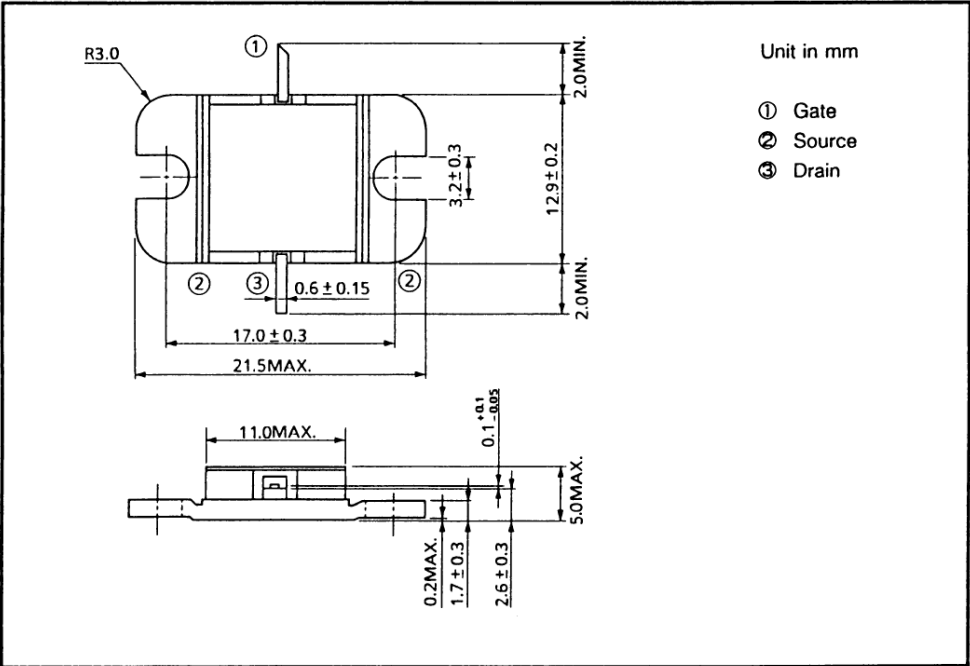
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Absolute Maximum Ratings (T_a = 25°C)

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

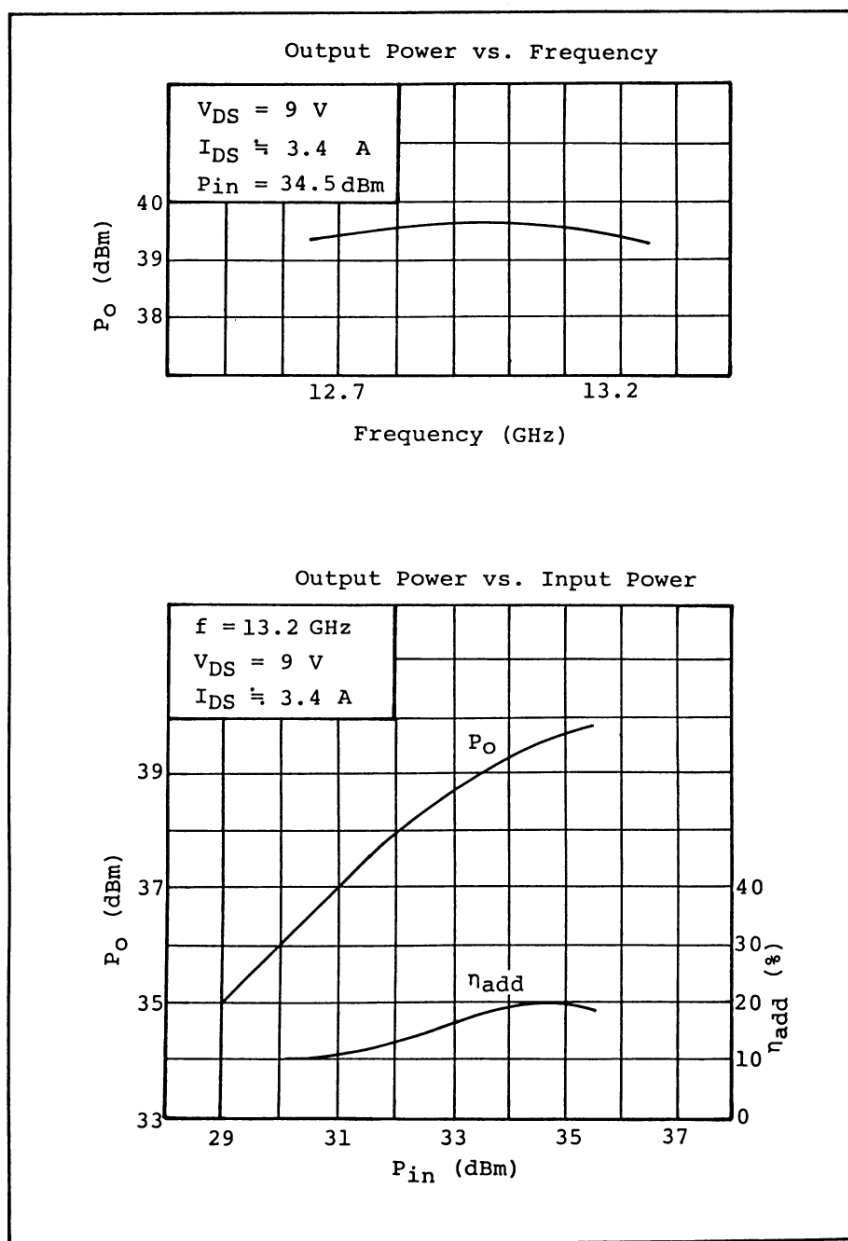
Package Outline (2-11C1B)



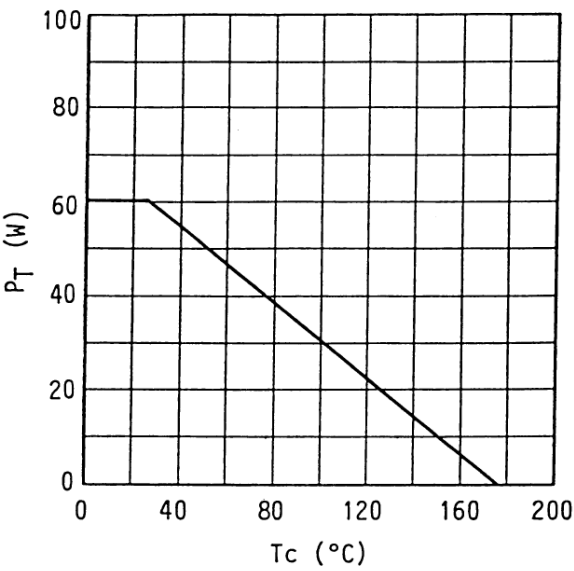
Handling Precautions for Packaged Type

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

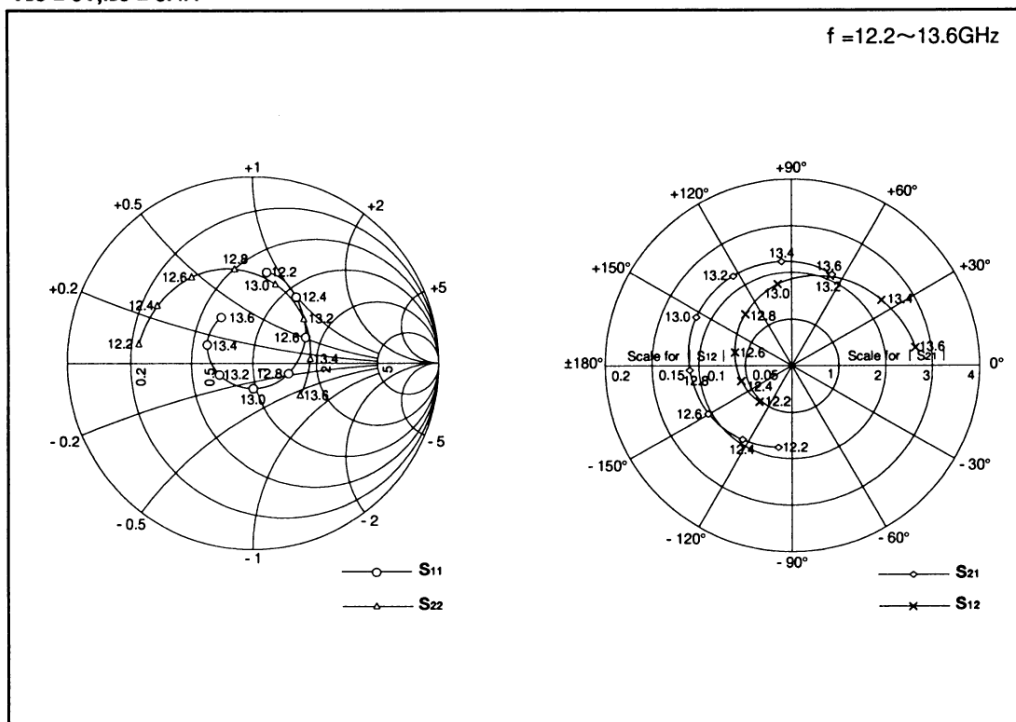
RF Performances



Power Dissipation vs. Case Temperature



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

 $V_{DS} = 9V, I_{DS} = 3.4A$ $f = 12.2 \sim 13.6GHz$ 

FREQUENCY (MHz)	S_{11}		S_{12}		S_{21}		S_{22}	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	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