

### 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	$\eta_{add}$		%	-	20	-
Channel-Temperature Rise	$\Delta T_{ch}$	$V_{DS} \times I_{DS} \times R_{th(c-c)}$	$^\circ\text{C}$	-	-	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	$V_{GSO}$	$I_{GS} = -120$ $\mu\text{A}$	V	-5	-	-
Thermal Resistance	$R_{th(c-c)}$	Channel to Case	$^\circ\text{C/W}$	-	1.6	2.5

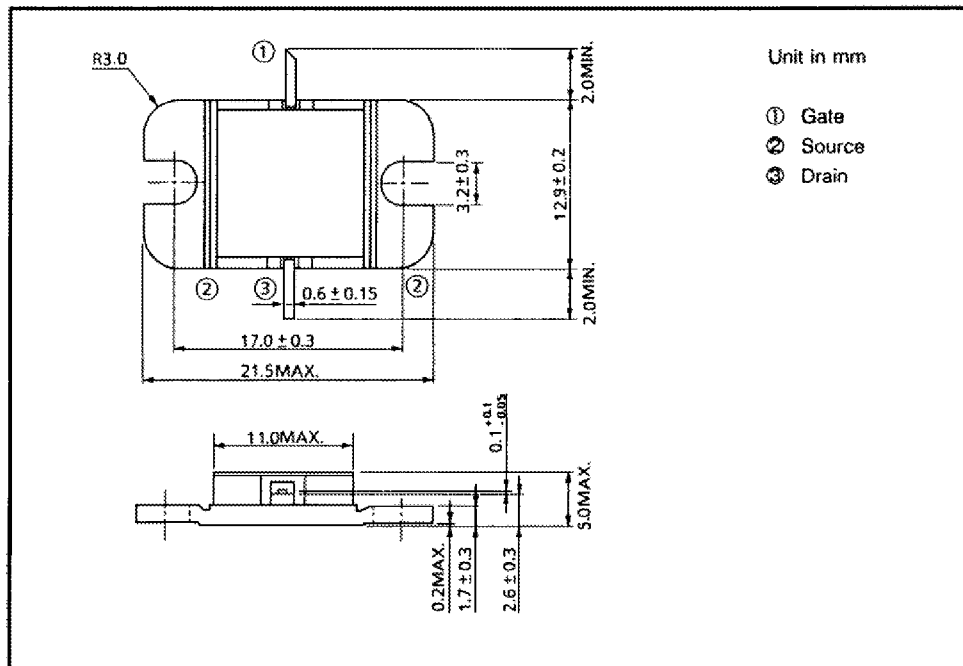
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**Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )**

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 ( $T_c = 25^\circ\text{C}$ )	$P_T$	W	60
Channel Temperature	$T_{ch}$	$^\circ\text{C}$	175
Storage Temperature	$T_{stg}$	$^\circ\text{C}$	-65 ~ 175

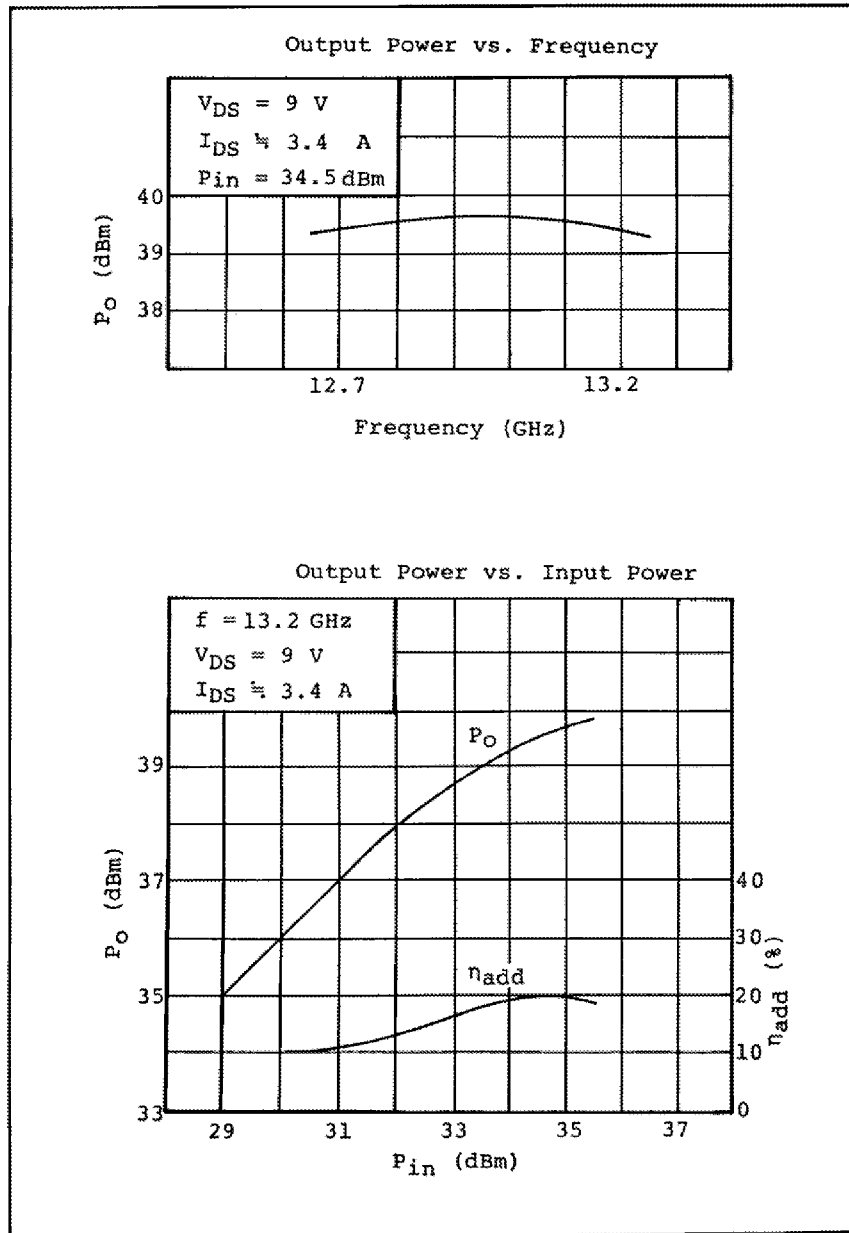
**Package Outline (2-11C1B)**



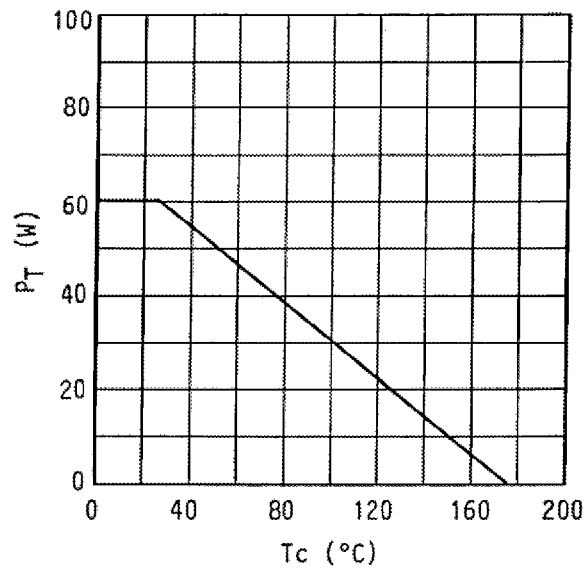
**Handling Precautions for Packaged Type**

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

RF Performances

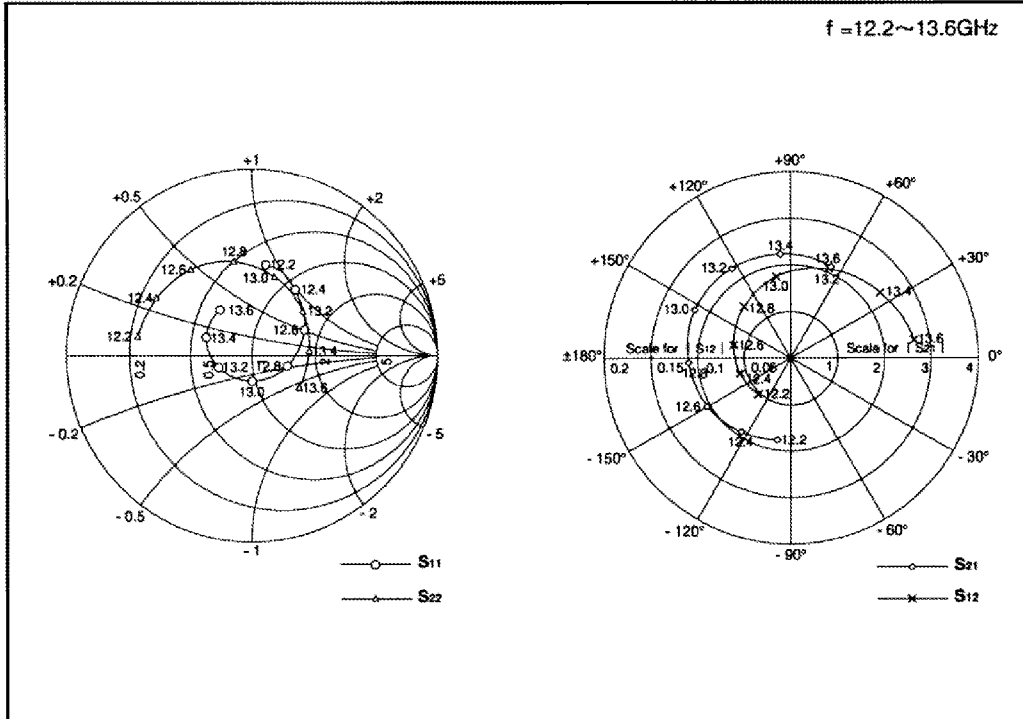


Power Dissipation vs. Case Temperature



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

V<sub>DS</sub> = 9V, I<sub>CS</sub> = 3.4A



FREQUENCY (MHz)	S <sub>11</sub>		S <sub>12</sub>		S <sub>21</sub>		S <sub>22</sub>	
	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