

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

Features

- High power
 - $P_{1dB} = 33.5$ dBm at 12.7 GHz to 13.2 GHz
- High gain
 - $G_{1dB} = 7.5$ 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	32.5	33.5	–
Power Gain at 1dB Compression Point	G_{1dB}		dB	6.5	7.5	–
Drain Current	I_{DS}		A	–	0.85	1.1
Power Added Efficiency	η_{add}		%	–	24	–
Channel-Temperature Rise	ΔT_{ch}	$V_{DS} \times I_{DS} \times R_{th(c-c)}$	$^\circ\text{C}$	–	–	60

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

Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max.
Transconductance	gm	$V_{DS} = 3V$ $I_{DS} = 1.0A$	mS	–	600	–
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3V$ $I_{DS} = 30$ mA	V	-2	-3.5	-5
Saturated Drain Current	I_{DSS}	$V_{DS} = 3V$ $V_{GS} = 0V$	A	–	2.0	2.6
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS} = -30$ μA	V	-5	–	–
Thermal Resistance	$R_{th(c-c)}$	Channel to Case	$^\circ\text{C/W}$	–	5	6

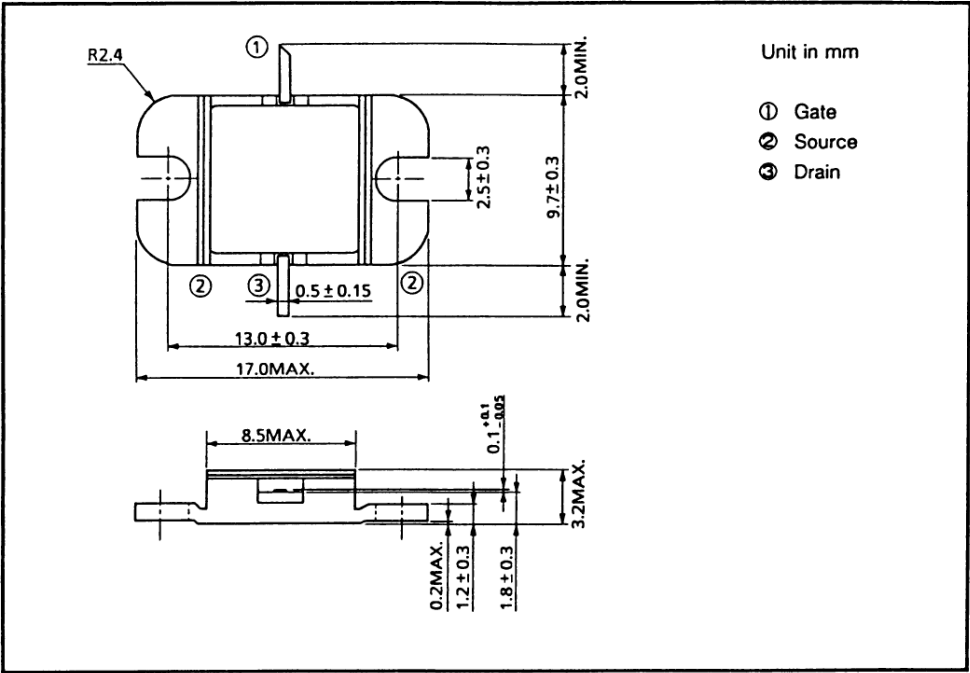
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Absolute Maximum Ratings (T_a = 25°C)

Characteristic	Symbol	Unit	Rating
Drain-Source Voltage	V _{DS}	V	15
Gate-Source Voltage	V _{GS}	V	-5
Drain Current	I _D	A	2.6
Total Power Dissipation (T _c = 25°C)	P _T	W	15
Channel Temperature	T _{ch}	°C	175
Storage Temperature	T _{stg}	°C	-65 ~ 175

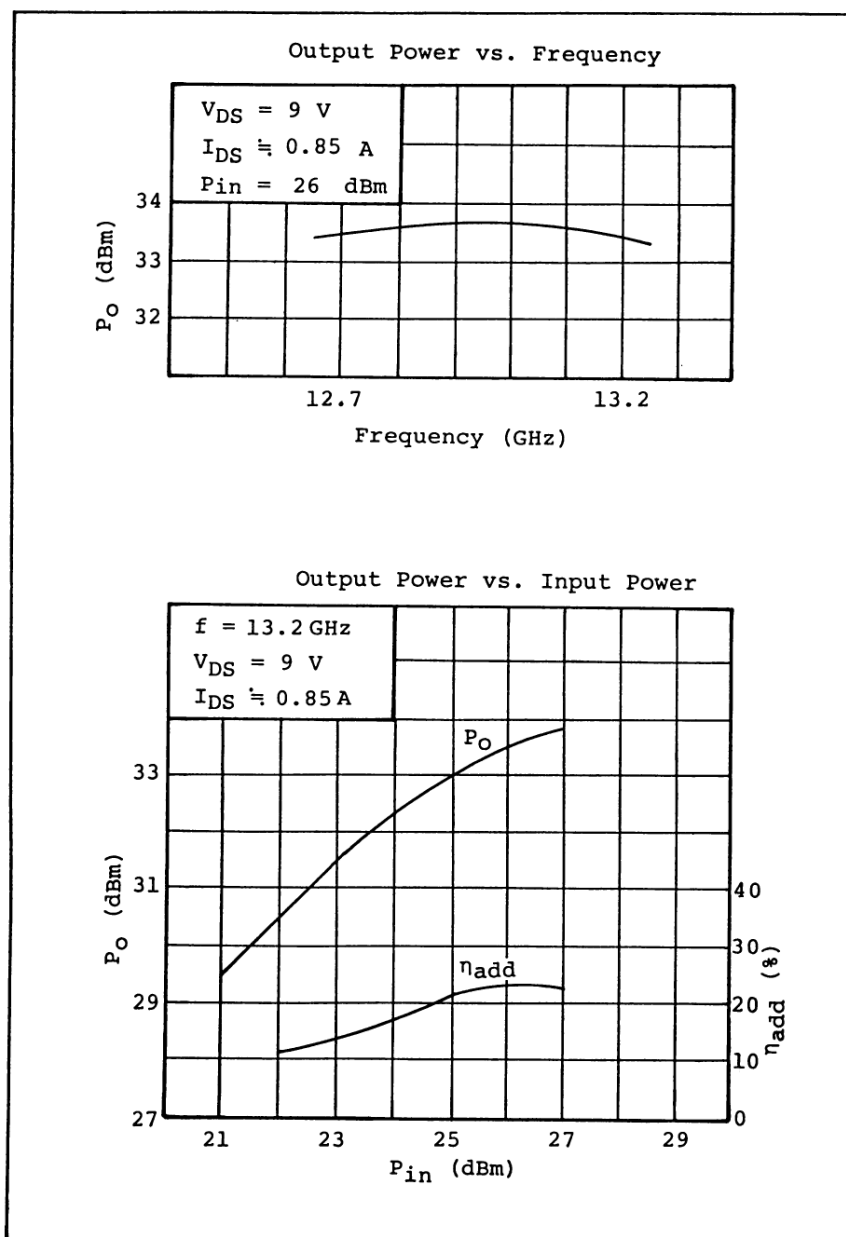
Package Outline (2-9D1B)



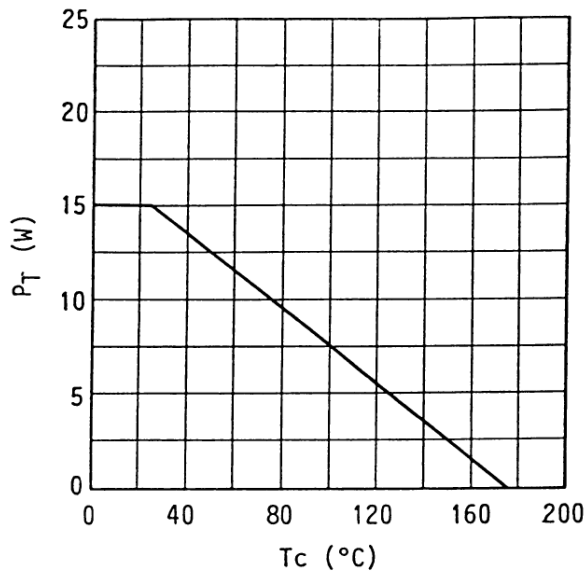
Handling Precautions for Packaged Type

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

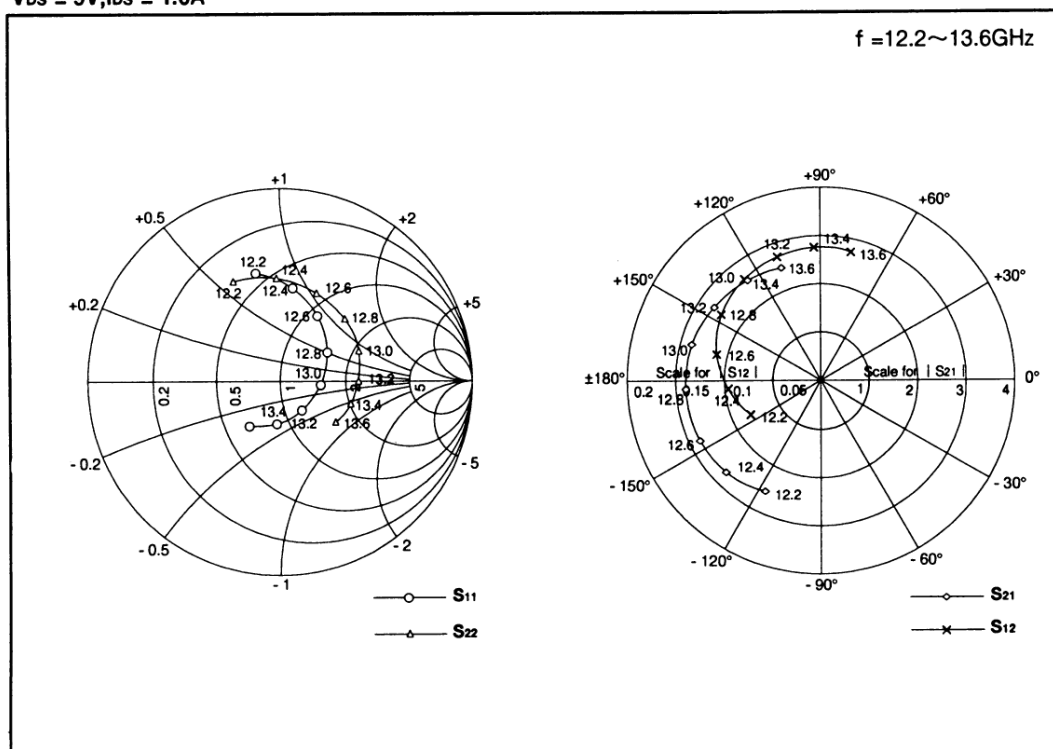
RF Performances



Power Dissipation vs. Case Temperature



TIM1213-2 S-Parameters (Magn. and Angles)

 $V_{DS} = 9V, I_{DS} = 1.0A$ $f = 12.2 \sim 13.6GHz$ 

FREQUENCY (MHz)	S_{11}		S_{12}		S_{21}		S_{22}	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
12.2	0.566	102.7	0.081	-154.8	2.549	-117.1	0.566	115.2
12.4	0.481	82.0	0.097	-174.8	2.707	-136.5	0.525	91.2
12.6	0.385	58.6	0.111	165.6	2.788	-156.5	0.492	66.5
12.8	0.291	30.3	0.123	146.3	2.809	-176.4	0.465	42.7
13.0	0.220	-5.8	0.130	127.7	2.774	164.1	0.440	20.5
13.2	0.190	-51.4	0.135	109.9	2.692	145.1	0.415	-0.2
13.4	0.219	-94.6	0.137	92.6	2.580	126.8	0.390	-18.8
13.6	0.279	-125.1	0.136	76.2	2.452	109.4	0.364	-35.7