

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

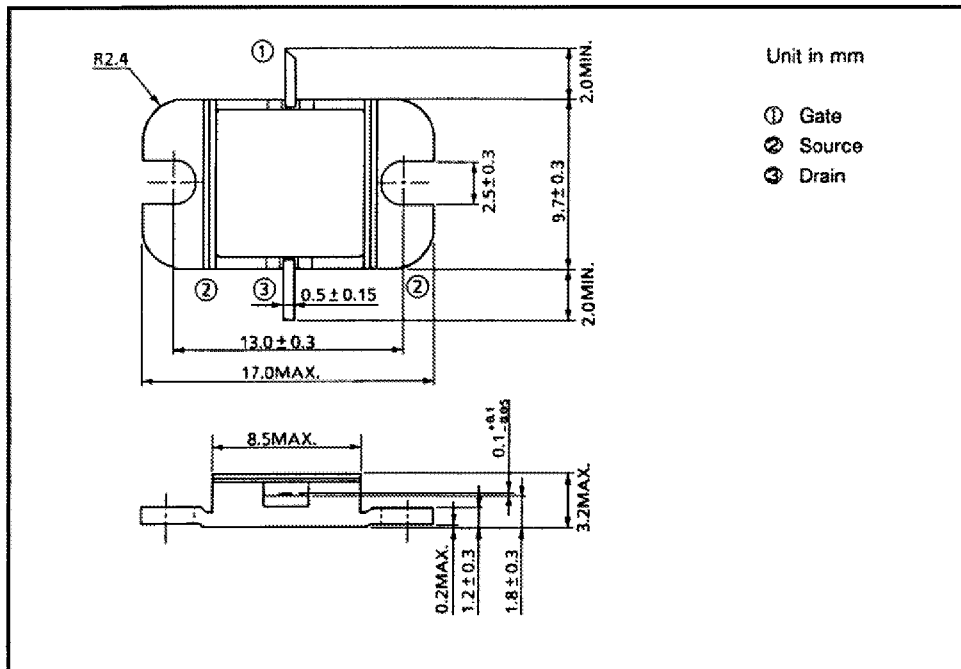
The information contained here is subject to change without notice.

The information contained herein is presented only as guide for the applications of our products. No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of TOSHIBA or others. These TOSHIBA products are intended for usage in general electronic equipments (office equipment, communication equipment, measuring equipment, domestic electrification, etc.) Please make sure that you consult with us before you use these TOSHIBA products in equipments which require high quality and/or reliability, and in equipments which could have major impact to the welfare of human life (atomic energy control, spaceship, traffic signal, combustion control, all types of safety devices, etc.). TOSHIBA cannot accept liability to any damage which may occur in case these TOSHIBA products were used in the mentioned equipments without prior consultation with TOSHIBA.

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	2.6
Total Power Dissipation ($T_c = 25^\circ\text{C}$)	P_T	W	15
Channel Temperature	T_{ch}	$^\circ\text{C}$	175
Storage Temperature	T_{stg}	$^\circ\text{C}$	-65 ~ 175

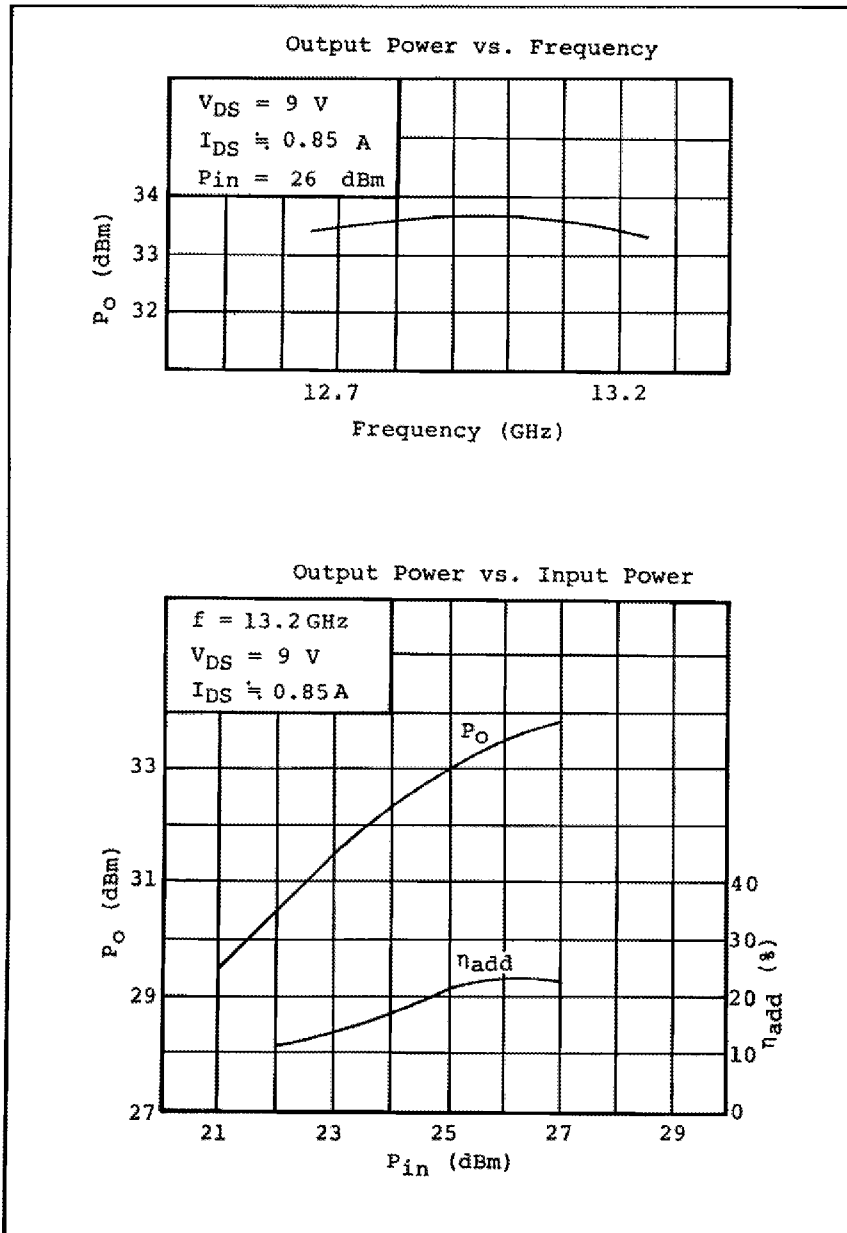
Package Outline (2-9D1B)



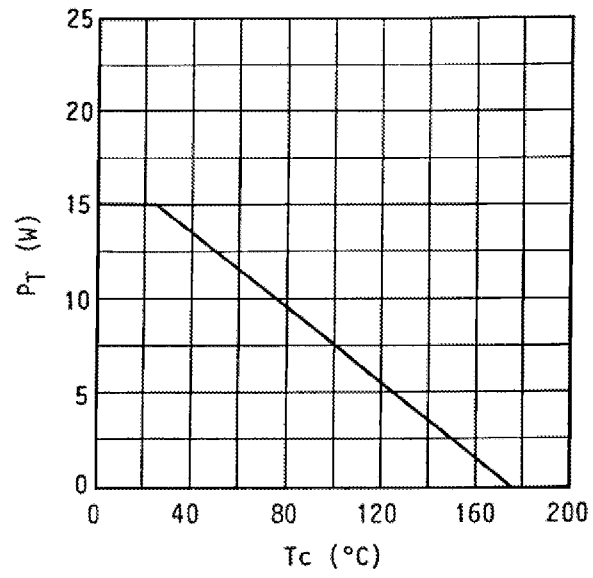
Handling Precautions for Packaged Type

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

RF Performances



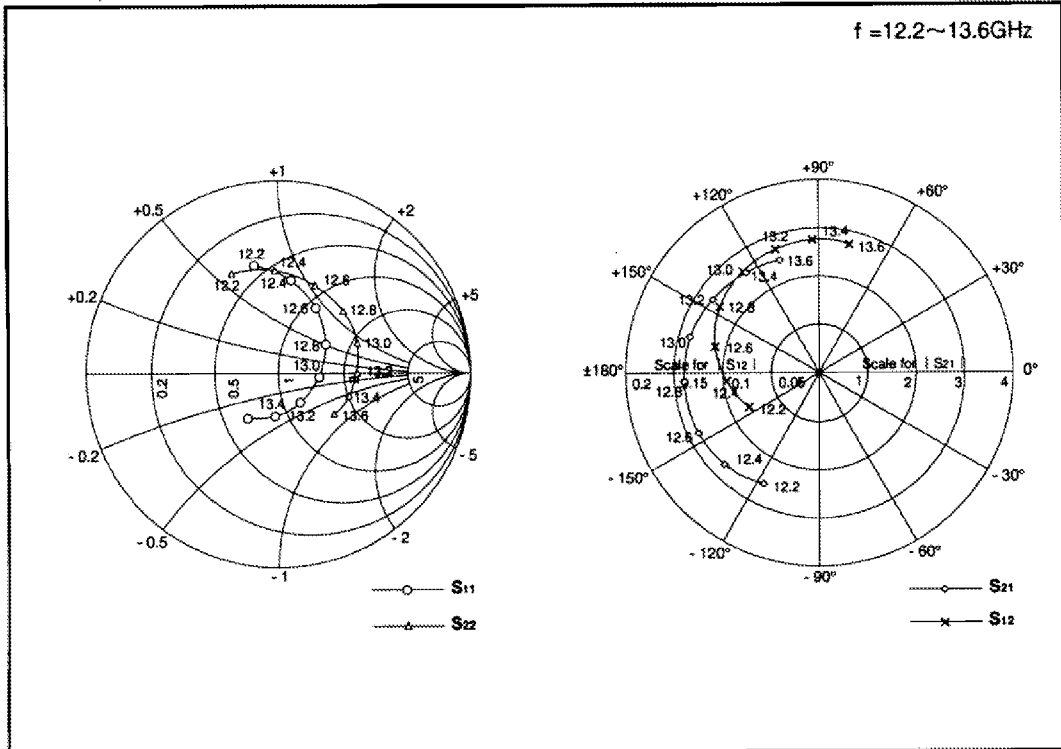
Power Dissipation vs. Case Temperature



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