

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

Features

- Low intermodulation distortion
 - $IM_3 = -45$ dBc at $P_o = 25$ dBm,
 - Single carrier level
- High power
 - $P_{1dB} = 36.5$ dBm at 10.7 GHz to 11.7 GHz
- High gain
 - $G_{1dB} = 7.5$ dB at 10.7 GHz to 11.7 GHz
- Broad band internally matched
- Hermetically sealed package

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

Characteristics	Symbol	Condition	Unit	Min.	Typ.	Max
Output Power at 1dB Compression Point	P_{1dB}	$V_{DS} = 9V$ $f = 10.7 \sim 11.7 \text{ GHz}$	dBm	35.5	36.5	—
Power Gain at 1dB Compression Point	G_{1dB}		dB	6.5	7.5	—
Drain Current	I_{DS1}		A	—	1.7	2.2
Gain Flatness	ΔG		dB	—	—	± 0.8
Power Added Efficiency	η_{add}		%	—	24	—
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	-42	-45	—
Drain Current	I_{DS2}		A	—	1.7	2.2
Channel-Temperature Rise	ΔT_{ch}	$V_{DS} \times I_{DS} \times R_{th(c-c)}$	$^\circ\text{C}$	—	—	70

Note 1: 2 Tone Test ($P_{out} = 25$ dBm Single Carrier Level).

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

Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max
Trans-conductance	gm	$V_{DS} = 3V$ $I_{DS} = 2.0A$	mS	—	1200	—
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3V$ $I_{DS} = 60mA$	V	-2	-3.5	-5
Saturated Drain Current	I_{DSS}	$V_{DS} = 3V$ $V_{GS} = 0V$	A	—	4.0	5.2
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS} = -60\mu A$	V	-5	—	—
Thermal Resistance	$R_{th(c-c)}$	Channel to case	$^\circ\text{C/W}$	—	2.9	3.5

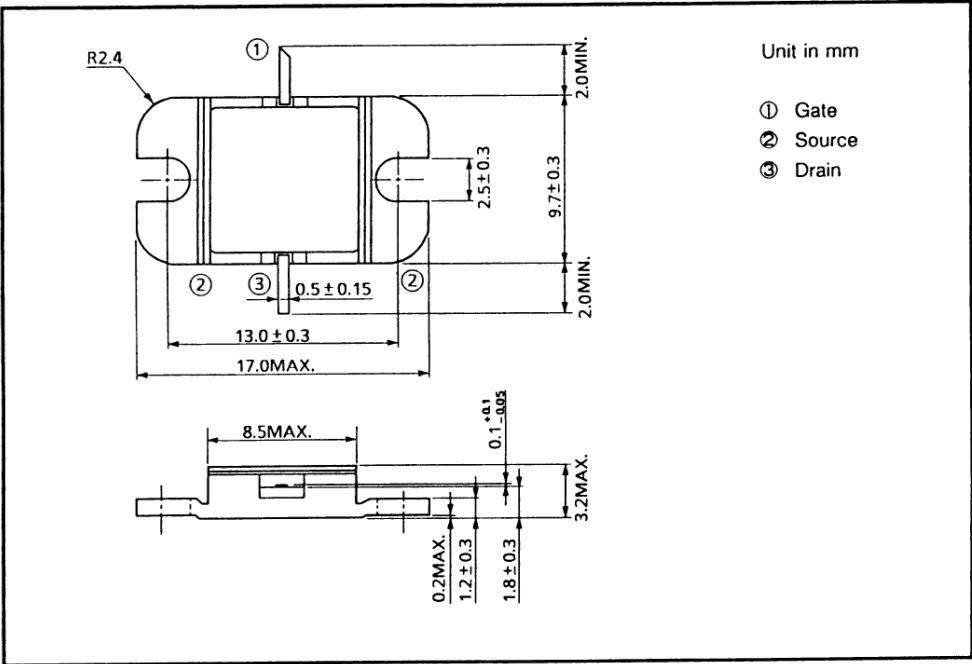
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Absolute Maximum Ratings (Ta = 25° C)

Characteristic	Symbol	Unit	Rating
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	-5
Drain Current	I_{DS}	A	5.2
Total Power Dissipation ($T_c = 25^{\circ}C$)	P_T	W	30
Channel Temperature	T_{ch}	°C	175
Storage Temperature	T_{stg}	°C	-65~175

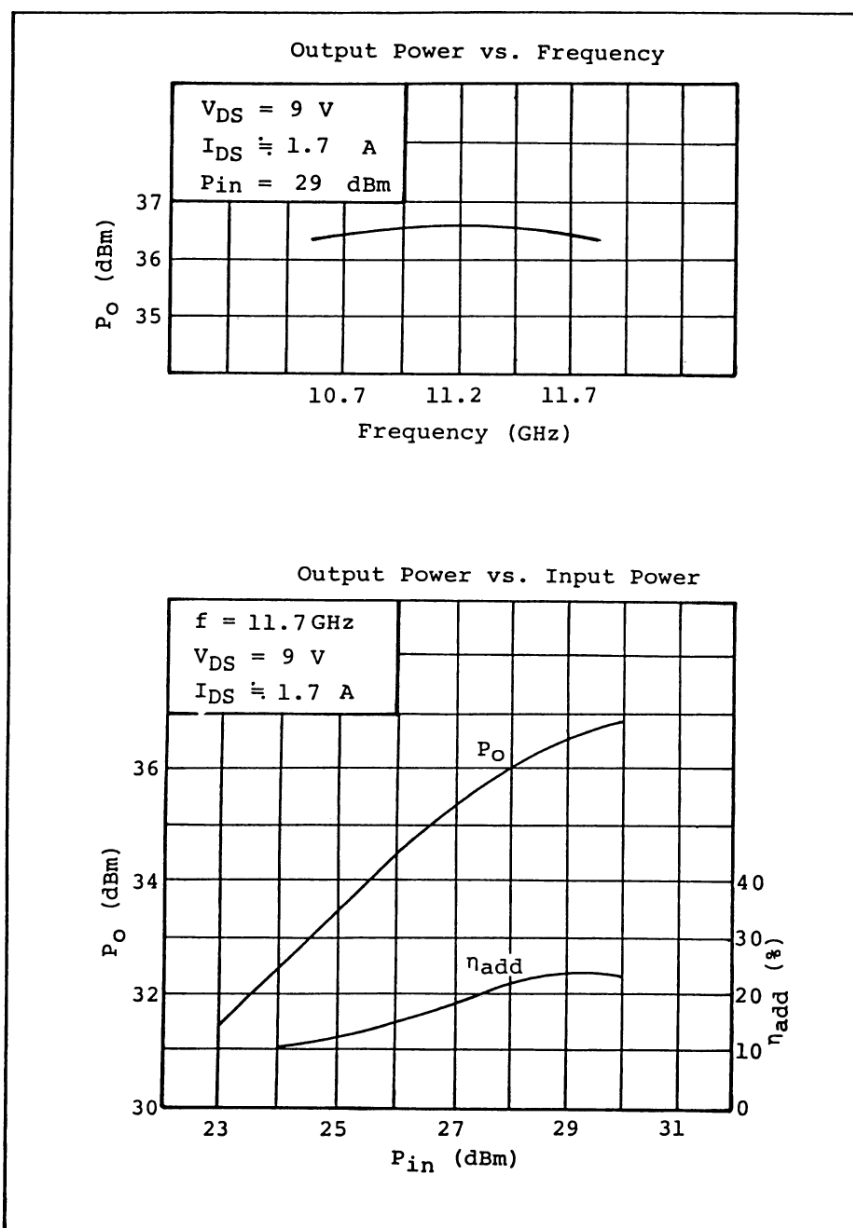
Package Outline (2-9D1B)



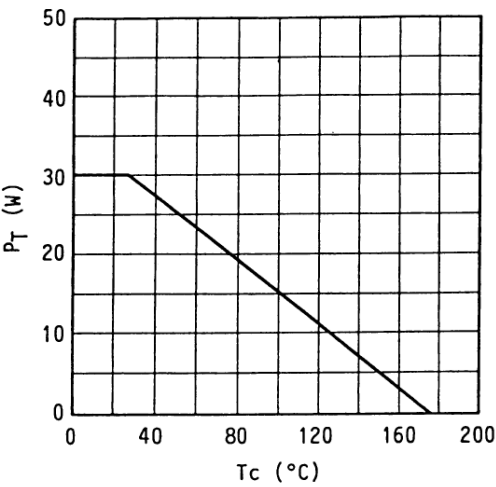
Handling Precautions for Packaged Type

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

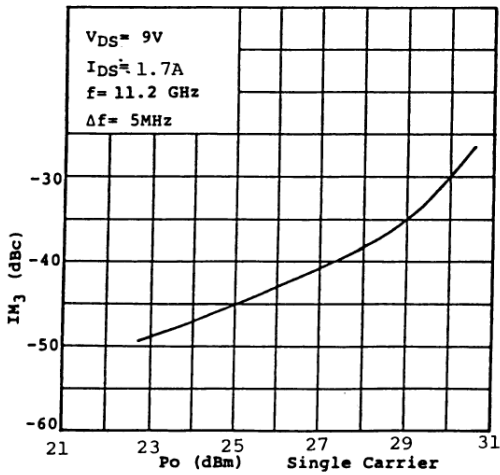
RF Performances



Power Dissipation vs. Case Temperature



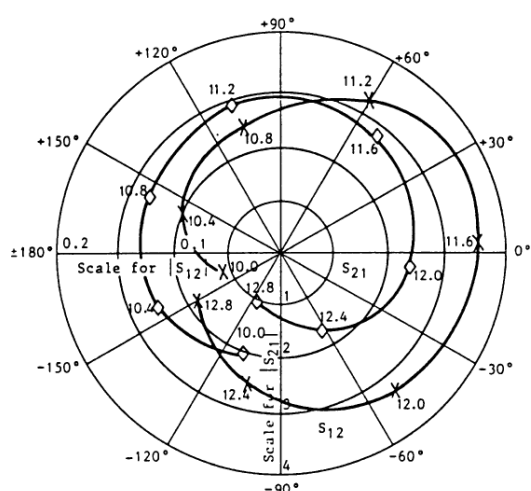
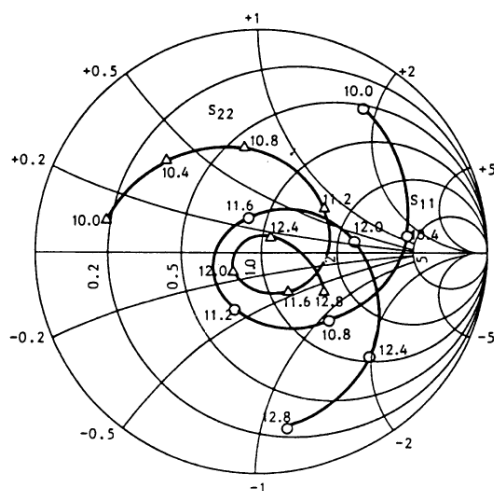
IM_3 vs. Output Power Characteristics



TIM1011-4L S-Parameters
(MAGN. and ANGLES)

$V_{DS} = 9 \text{ V}$, $I_{DS} = 2.0 \text{ A}$

$f = 10.0 - 12.8 \text{ GHz}$



FREQUENCY (GHz)	S ₁₁		S ₁₂		S ₂₁		S ₂₂	
10.0	0.78	54	0.055	-164	2.09	-110	0.71	168
10.4	0.66	6	0.099	154	2.49	-155	0.59	135
10.8	0.44	-46	0.124	106	2.57	156	0.46	99
11.2	0.29	-113	0.168	60	2.93	108	0.35	34
11.6	0.16	110	0.182	4	2.85	51	0.22	-56
12.0	0.43	7	0.166	-51	2.38	-7	0.16	-148
12.4	0.68	-45	0.128	-105	1.70	-64	0.08	60
12.8	0.82	-82	0.087	-152	1.05	-114	0.34	-32