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

Features

- Low intermodulation distortion
  - IM_3 = -45 dBc at Po = 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 (Ta = 25° C)

Characteristics	Symbol	Condition	Unit	Min.	Typ.	Max
Output Power at 1dB Compression Point	P_{1dB}	V_{DS} = 9V f = 10.7 ~ 11.7 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}	$V_{DS}xI_{DS}xR_{th(c-c)}$	°C	–	–	70

Note 1: 2 Tone Test (Pout = 25 dBm Single Carrier Level).

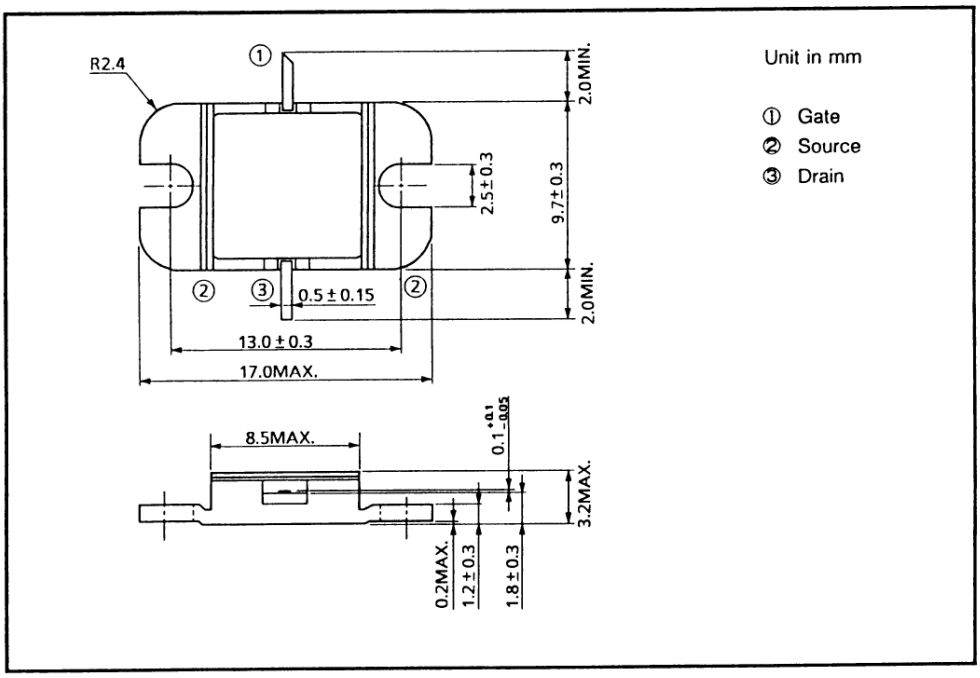
Electrical Characteristics (Ta = 25° C)

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} = -60μA	V	-5	–	–
Thermal Resistance	$R_{th\ (c-c)}$	Channel to case	°C/W	–	2.9	3.5

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°C)	P_T	W	30
Channel Temperature	T_{ch}	˚C	175
Storage Temperature	T_{stg}	˚C	-65~175

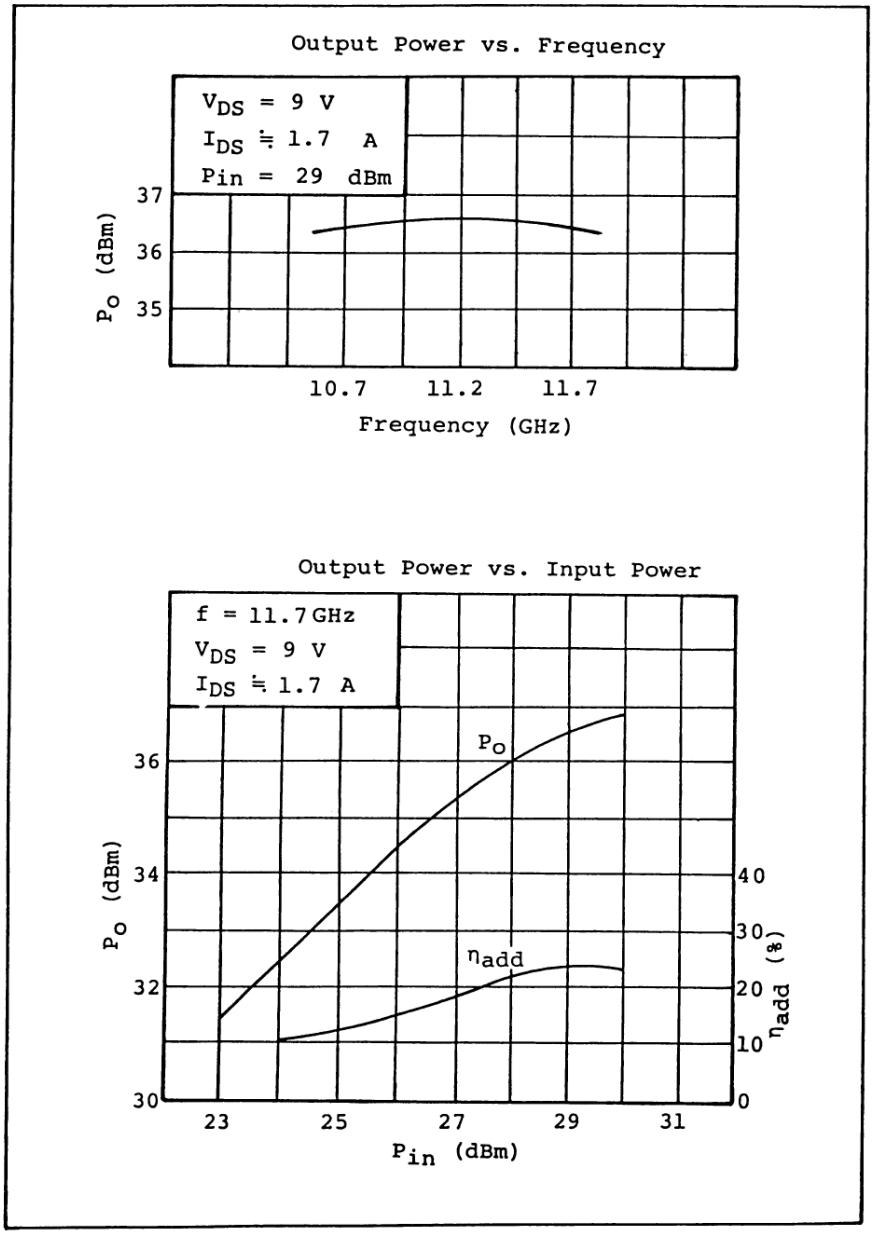
Package Outline (2-9D1B)



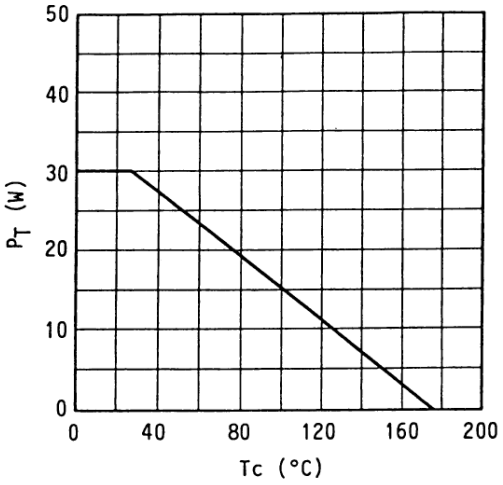
Handling Precautions for Packaged Type

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

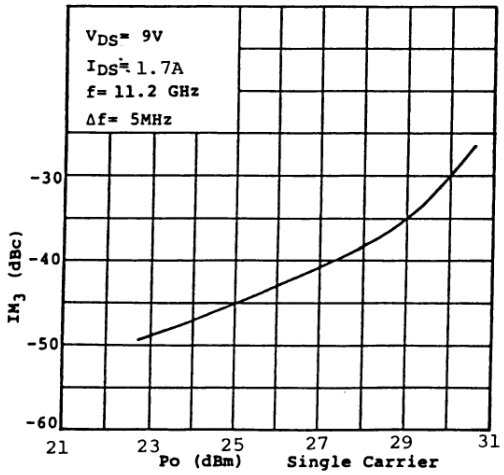
RF Performances



Power Dissipation vs. Case Temperature



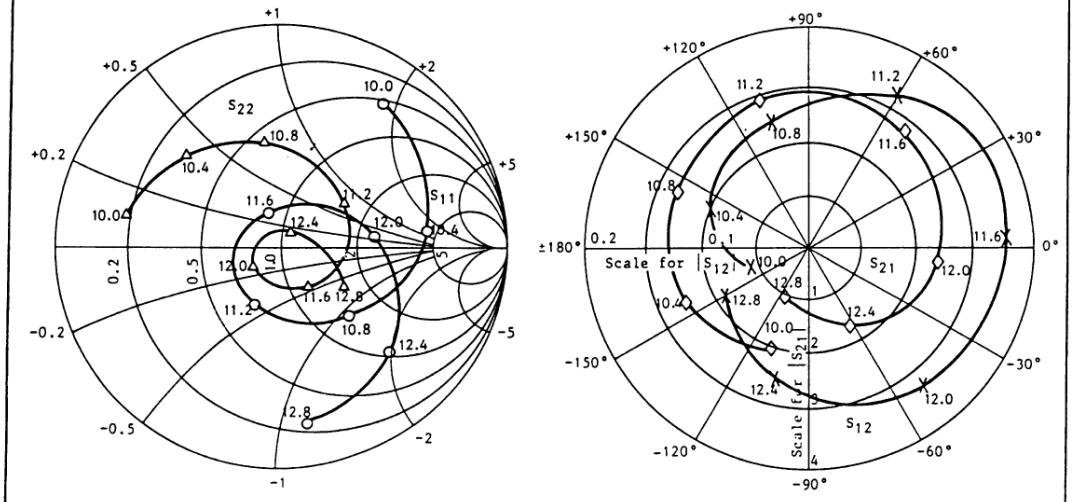
IM_3 vs. Output Power Characteristics



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

V_{DS} = 9 V, I_{DS} = 2.0 A

f = 10.0 - 12.8 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