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

Features

- Low intermodulation distortion
  - IM_3 = -45 dBc at Po = 29 dBm,
  - Single carrier level
- High power
  - P_{1dB} = 40.5 dBm at 10.7 GHz to 11.7 GHz
- High gain
  - G_{1dB} = 6.0 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	40.0	40.5	–
Power Gain at 1dB Compression Point	G_{1dB}		dB	5.0	6.0	–
Drain Current	I_{DS1}		A	–	4.0	5.0
Gain Flatness	ΔG		dB	–	–	±0.8
Power Added Efficiency	η_{add}		%	–	20	–
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	-42	-45	–
Drain Current	I_{DS2}		A	–	4.0	5.0
Channel-Temperature Rise	ΔT_{ch}	V_{DS}xI_{DS}x$R_{th(c-c)}$	°C	–	–	90

Note 1: 2 Tone Test (Pout = 29 dBm Single Carrier Level).

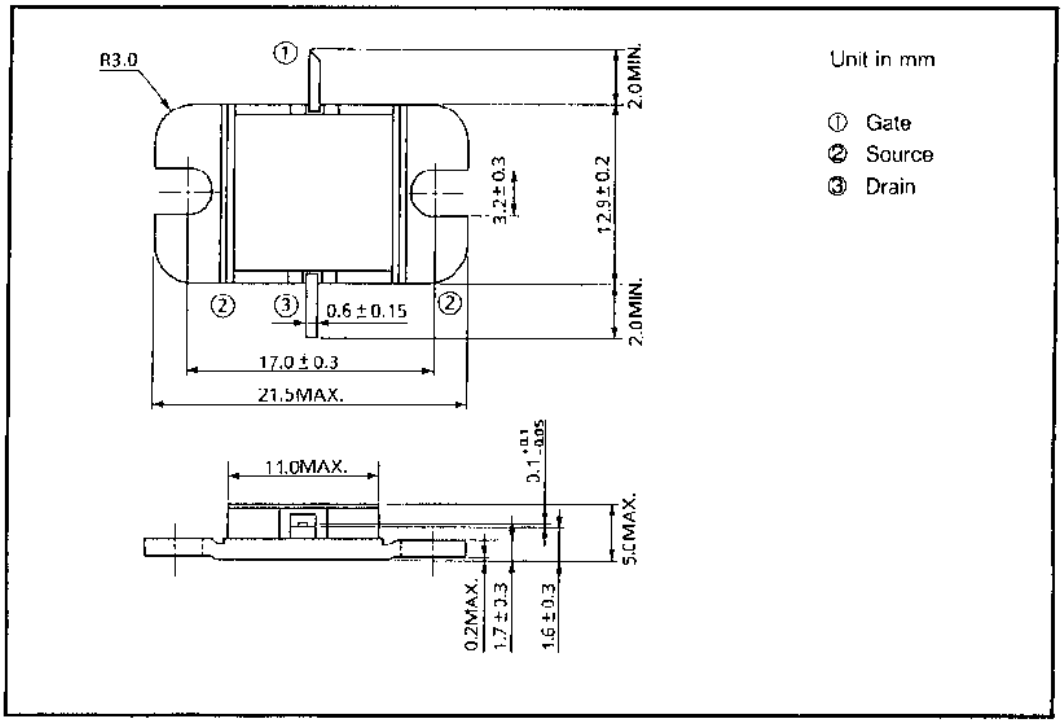
Electrical Characteristics (Ta = 25° C)

Characteristic	Symbol	Condition	Unit	Min.	Typ.	Max
Trans-conductance	gm	V_{DS} = 3V I_{DS} = 4.8A	mS	–	2800	–
Pinch-off Voltage	V_{GSoff}	V_{DS} = 3V I_{DS} = 145mA	V	-2	-3.5	-5
Saturated Drain Current	I_{DSS}	V_{DS} = 3V V_{GS} = 0V	A	–	10.0	11.5
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS} = -145μA	V	-5	–	–
Thermal Resistance	$R_{th\ (c-c)}$	Channel to case	°C/W	–	2.0	2.5

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	11.5
Total Power Dissipation (T_c = 25°C)	P_T	W	60
Channel Temperature	T_{ch}	˚C	175
Storage Temperature	T_{stg}	˚C	-65~175

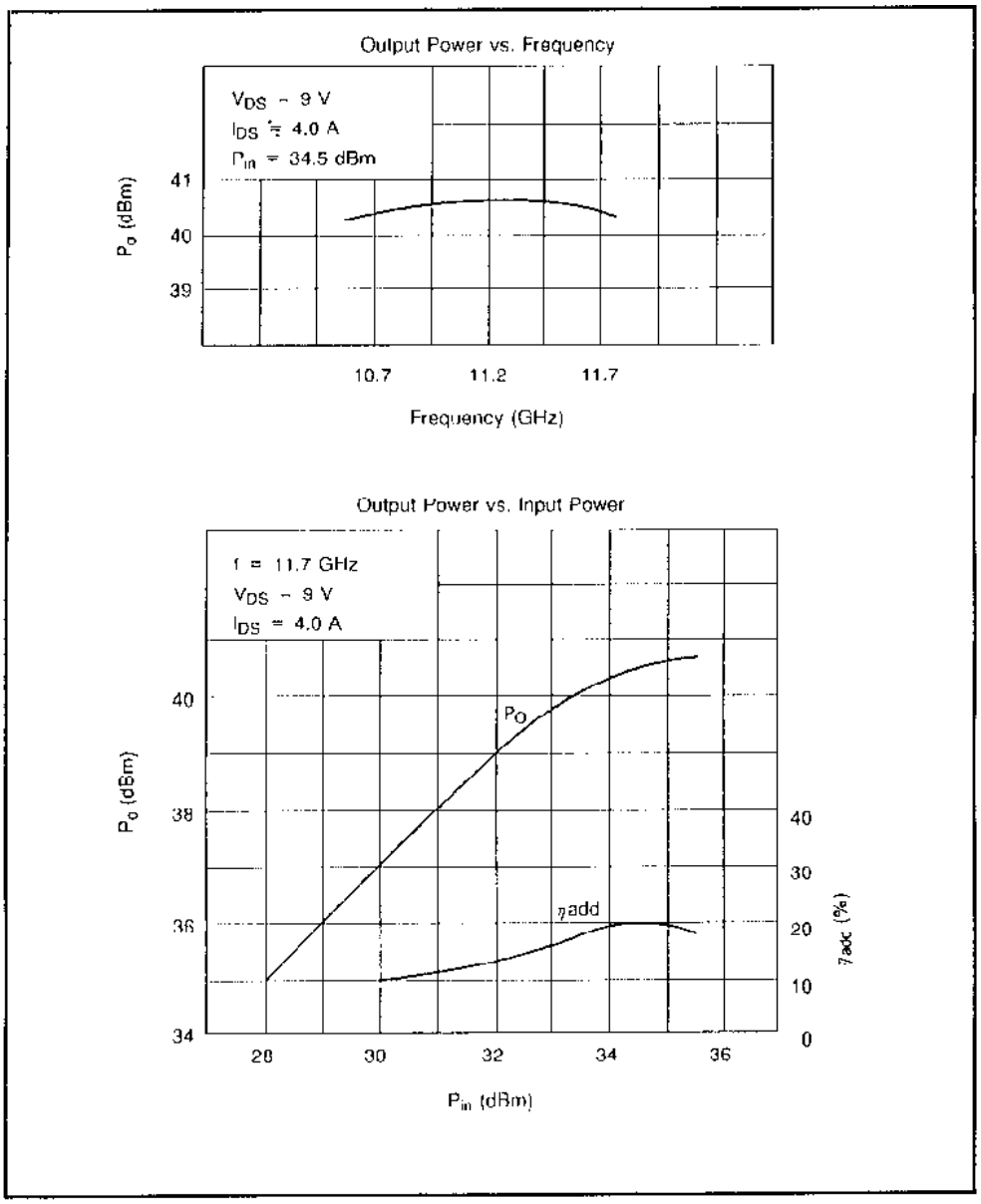
Package Outline (2-11C1B)



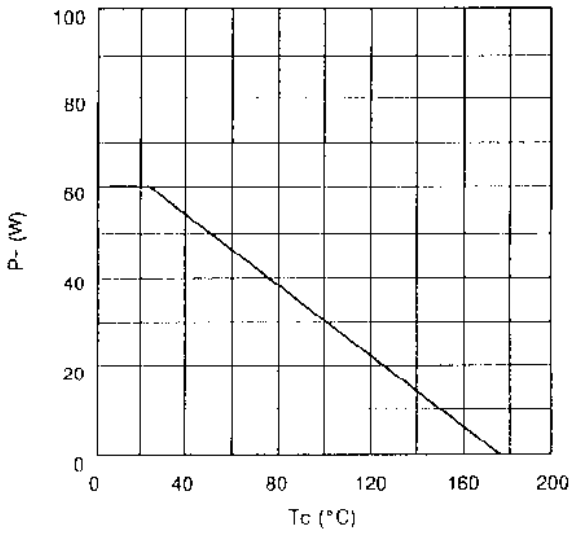
Handling Precautions for Packaged Type

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

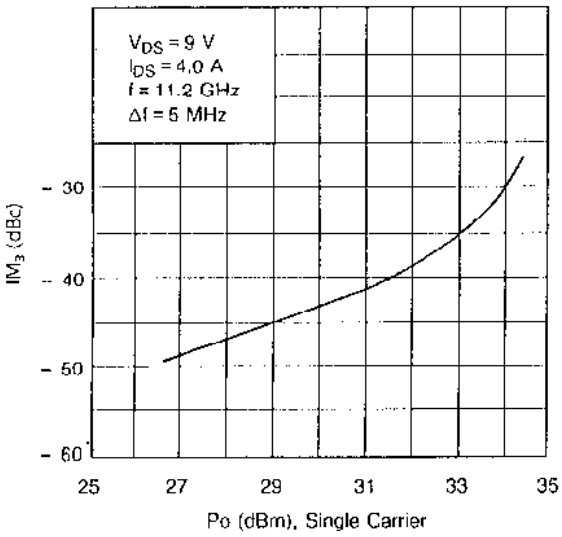
RF Performances



Power Dissipation vs. Case Temperature

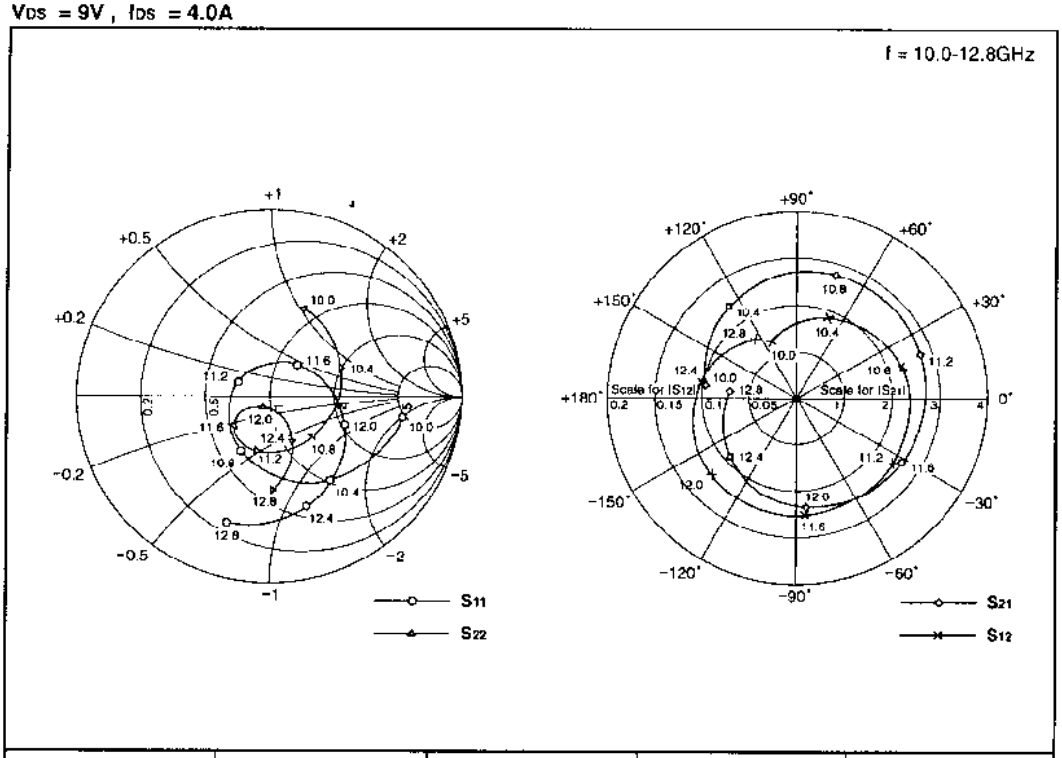


IM_3 vs. Output Power Characteristics



TIM1011-10L S-Parameters
(MAGN. and ANGLES)

V_{DS} = 9V , I_{DS} = 4.0A



FREQUENCY (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
10.0	0.70	-9	1.93	172	0.066	114	0.50	70
10.4	0.55	-55	2.44	126	0.092	69	0.40	23
10.8	0.33	-117	2.77	73	0.115	17	0.31	-43
11.2	0.18	155	2.75	20	0.123	-35	0.30	-103
11.6	0.22	50	2.61	-32	0.126	-86	0.24	-140
12.0	0.42	-21	2.36	-85	0.121	-137	0.07	-120
12.4	0.62	-72	1.89	-138	0.102	171	0.27	-64
12.8	0.71	-108	1.40	174	0.078	125	0.50	-88