

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

Features

- Low intermodulation distortion
 - $IM_3 = -45$ dBc at $P_o = 29.0$ dBm,
 - Single carrier level
- High power
 - $P_{1dB} = 40.5$ dBm at 14.0 GHz to 14.5 GHz
- High gain
 - $G_{1dB} = 5.0$ dB at 14.0 GHz to 14.5 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}	$V_{DS} = 9V$ $f = 14.0 \sim 14.5 \text{ GHz}$	dBm	40.0	40.5	—
Power Gain at 1dB Compression Point	G_{1dB}		dB	4.0	5.0	—
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}	$V_{DS} \times I_{DS} \times R_{th(c-c)}$	$^\circ\text{C}$	—	—	90

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

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}	$I_{GS} = -145\mu A$	V	-5	—	—
Thermal Resistance	$R_{th(c-c)}$	Channel to case	$^\circ\text{C/W}$	—	2.0	2.5

Note 1: 2 Tone Test $P_{out} = 29$ dBm Single Carrier Level.

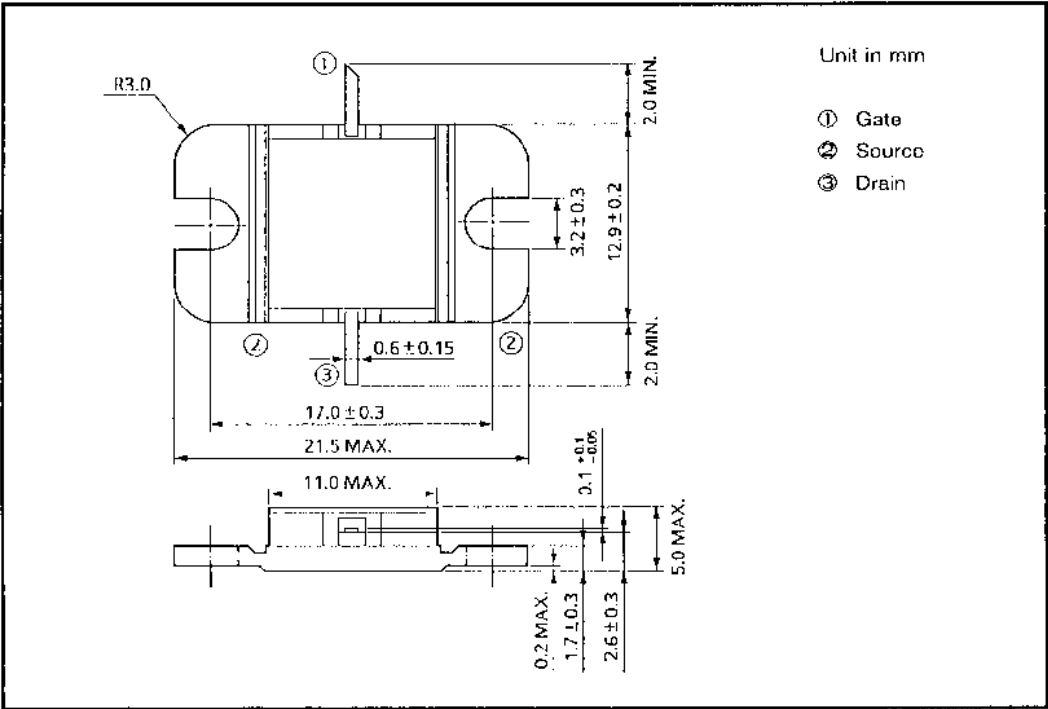
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Absolute Maximum Ratings (Ta = 25° C)

Characteristic	Symbol	Unit	Rating
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	-5
Drain Current	I_{DS}	A	11.5
Total Power Dissipation (Tc = 25°C)	P_T	W	60
Channel Temperature	T_{ch}	°C	175
Storage Temperature	T_{stg}	°C	-65~175

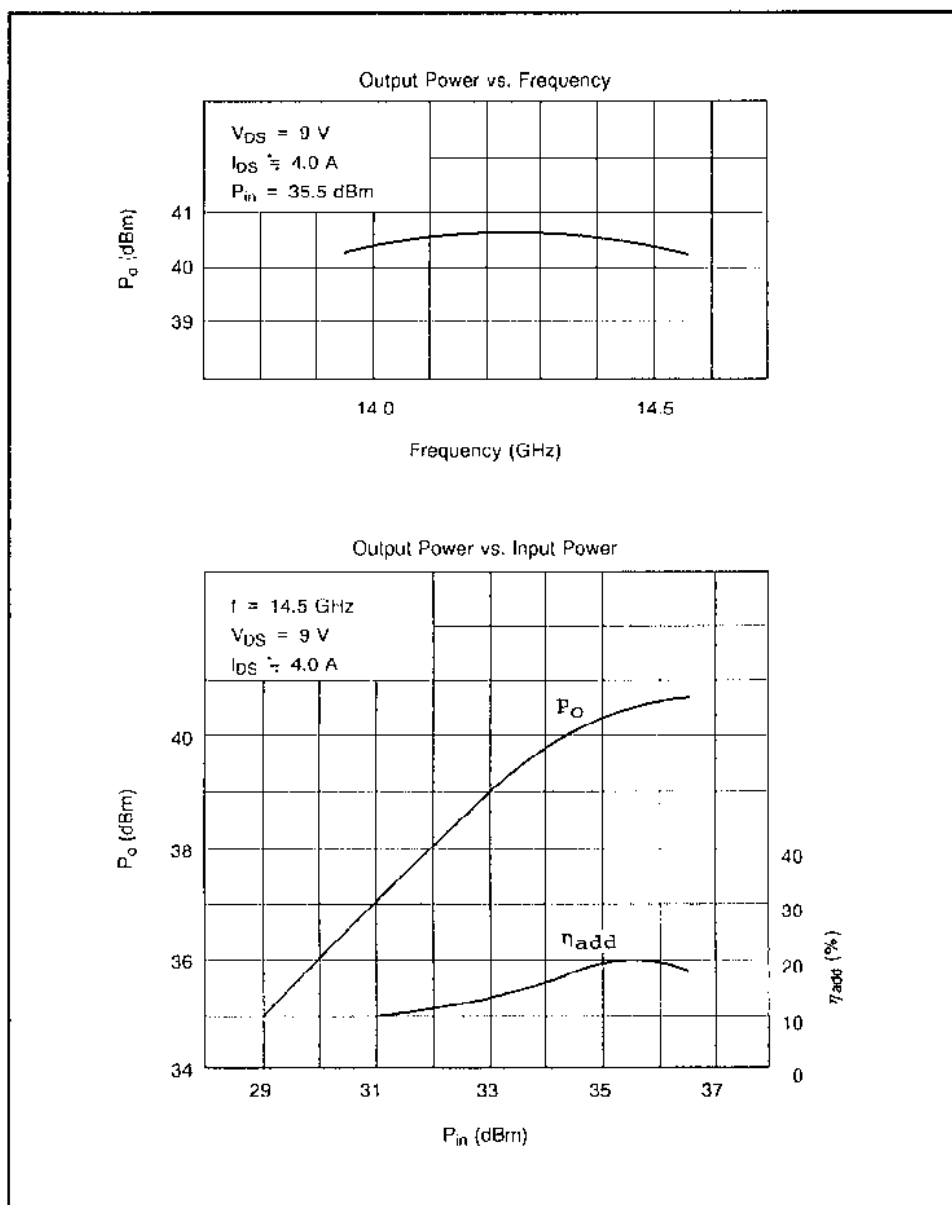
Package Outline (2-11C1B)



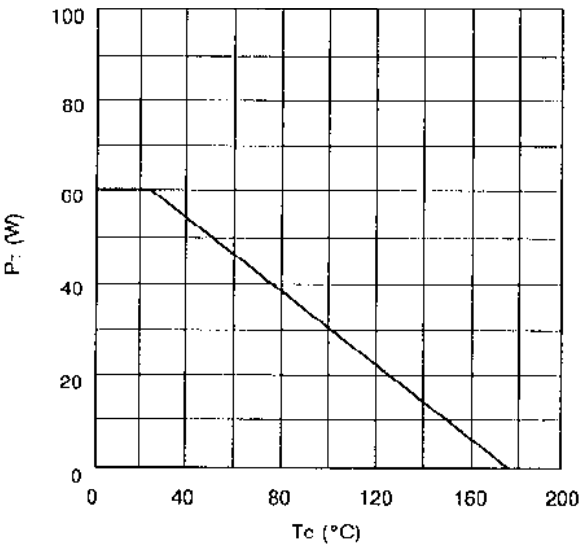
Handling Precautions for Packaged Type

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

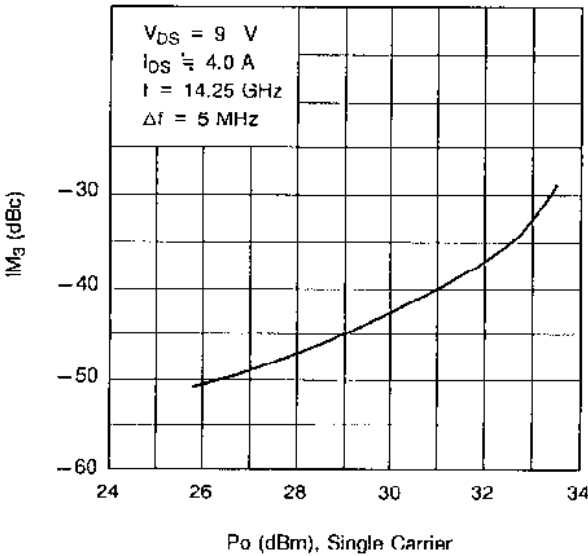
RF Performances



Power Dissipation vs. Case Temperature

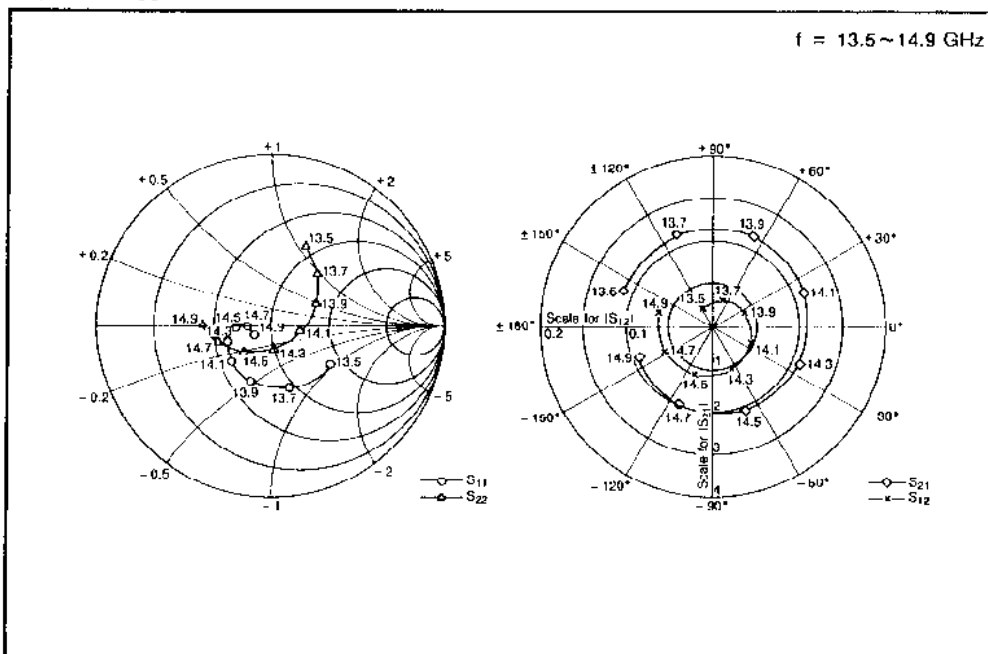


IM_3 vs. Output Power Characteristics



TIM1414-10L S-Parameters
(MAGN. and ANGLES)

$V_{DS} = 9\text{ V}$, $I_{DS} = 4.0\text{ A}$



FREQUENCY (MHz)	S_{11}		S_{21}		S_{12}		S_{22}	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
13.50	0.48	-30	2.12	159	0.039	118	0.43	70
13.60	0.46	-48	2.16	136	0.046	95	0.39	59
13.70	0.44	-65	2.16	113	0.052	71	0.33	48
13.80	0.43	-80	2.16	91	0.059	48	0.28	34
13.90	0.42	-94	2.13	68	0.066	26	0.23	17
14.00	0.41	-106	2.10	46	0.073	4	0.19	-7
14.10	0.40	-118	2.08	25	0.079	-18	0.17	-38
14.20	0.39	-128	2.06	3	0.086	-39	0.16	-70
14.30	0.38	-139	2.01	-19	0.091	-61	0.22	-95
14.40	0.36	-147	1.97	-40	0.097	-82	0.27	-114
14.50	0.35	-155	1.93	-62	0.101	-103	0.32	-129
14.60	0.33	-161	1.88	-83	0.105	-124	0.37	-140
14.70	0.32	-166	1.83	-104	0.108	-144	0.41	-150
14.80	0.30	-171	1.79	-125	0.112	-165	0.45	-158
14.90	0.28	-174	1.75	-146	0.114	-175	0.48	-166