

# ELM1314-9F

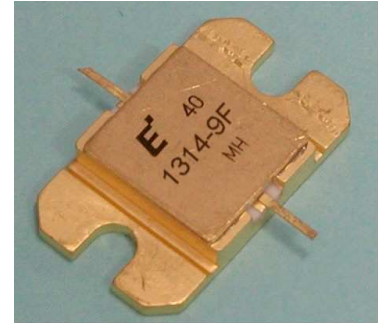
## Ku-Band Internally Matched FET

### FEATURES

- High Output Power: P<sub>1dB</sub>=39.5dBm(Typ.)
- High Gain: G<sub>1dB</sub>=6.0dB(Typ.)
- High PAE: η<sub>add</sub>=30%(Typ.)
- Broad Band: 13.75~14.5GHz
- Impedance Matched Z<sub>in</sub>/Z<sub>out</sub> = 50Ω
- Hermetically Sealed Package

### DESCRIPTION

The ELM1314-9F is a power GaAs FET that is internally matched for standard communication bands to provide optimum power and gain in a 50Ω system.



### ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Rating	Unit
Drain-Source Voltage (T <sub>c</sub> =25°C)	V <sub>DS</sub>	15	V
Gate-Source Voltage (T <sub>c</sub> =25°C)	V <sub>GS</sub>	-5	V
Total Power Dissipation	P <sub>T</sub>	35.7	W
Storage Temperature	T <sub>stg</sub>	-55 to +125	°C
Channel Temperature	T <sub>ch</sub>	+175	°C

### RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Recommend	Unit
DC Input Voltage	V <sub>DS</sub>		≤10	V
Forward Gate Current	I <sub>GF</sub>	R <sub>G</sub> =100 ohm	≤+19.5	mA
Reverse Gate Current	I <sub>GR</sub>	R <sub>G</sub> =100 ohm	≥-4.3	mA
Storage Temperature	T <sub>stg</sub>		-55 to +125	°C
Channel Temperature	T <sub>ch</sub>		≤+155	°C

### ELECTRICAL CHARACTERISTICS (Case Temperature T<sub>c</sub>=25°C)

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =5V, V <sub>GS</sub> =0V	-	4.1	6.2	A
Trans conductance	g <sub>m</sub>	V <sub>DS</sub> =5V, I <sub>DS</sub> =2A	-	2.9	-	S
Pinch-off Voltage	V <sub>p</sub>	V <sub>DS</sub> =5V, I <sub>DS</sub> =175mA	-0.5	-1.5	-3.0	V
Gate-Source Breakdown Voltage	V <sub>GSO</sub>	I <sub>GS</sub> =-175μA	-5.0	-	-	V
Output Power at 1dB G.C.P.	P <sub>1dB</sub>	V <sub>DS</sub> =10V	39.0	39.5	-	dBm
Power Gain at 1dB G.C.P.	G <sub>1dB</sub>	f= 13.75 ~ 14.5 GHz	5.0	6.0	-	dB
Drain Current	I <sub>DSR</sub>	I <sub>DS</sub> DC=1.75A (typ.)	-	2.4	2.8	A
Power-added Efficiency	η <sub>add</sub>	Z <sub>s</sub> =Z <sub>L</sub> =50 ohm	-	30	-	%
Gain Flatness	ΔG		-	-	1.2	dB
3rd Order Intermodulation Distortion	IM3	f=14.5 GHz Δf=10MHz, 2-tone Test P <sub>out</sub> =33.0dBm (S.C.L.)	-25	-30	-	dBc
Thermal Resistance	R <sub>th</sub>	Channel to Case	-	3.5	4.2	°C/W
Channel Temperature Rise	ΔT <sub>ch</sub>	10V x I <sub>DSR</sub> X R <sub>th</sub>	-	-	100	°C

CASE STYLE : IA

S.C.L. : Single Carrier Level

G.C.P.: Gain Compression Point

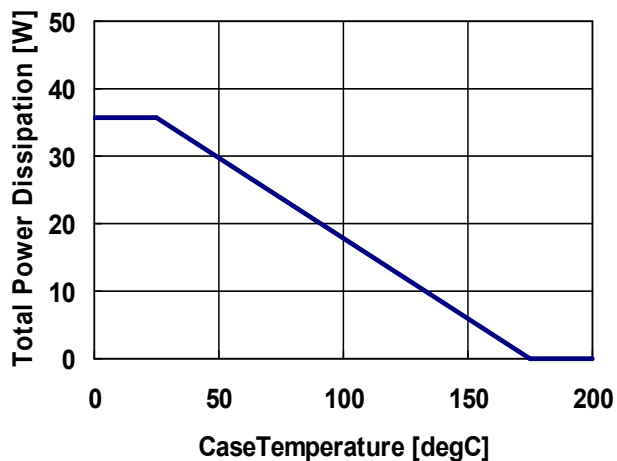
ESD	Class III	2000V ~
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Note : Based on EIAJ ED-4701 C-111A (C=100pF, R=1.5kΩ)

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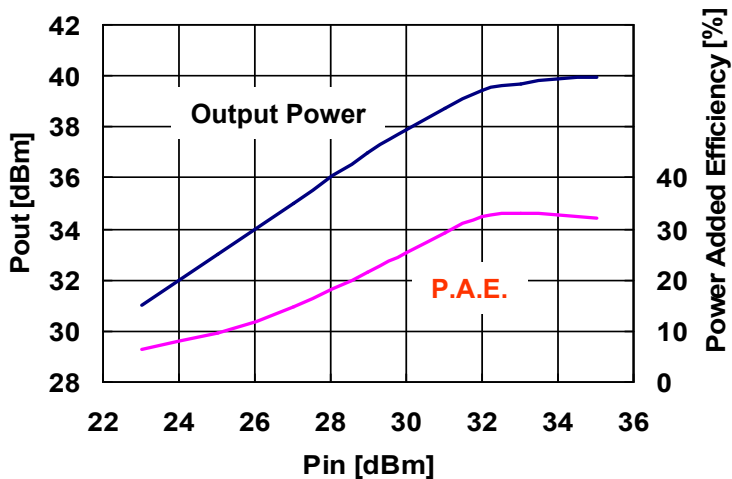
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POWER DERATING CURVE



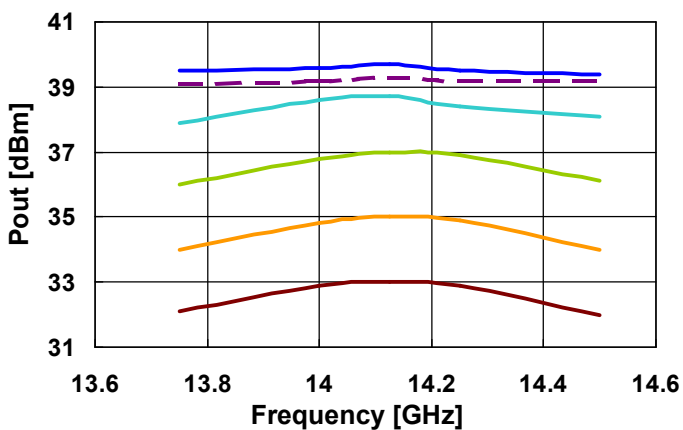
Output Power & P.A.E. vs. Input Power

VDS=10V, IDS(DC)=1.75A, f = 14.125GHz



Output Power vs. frequency

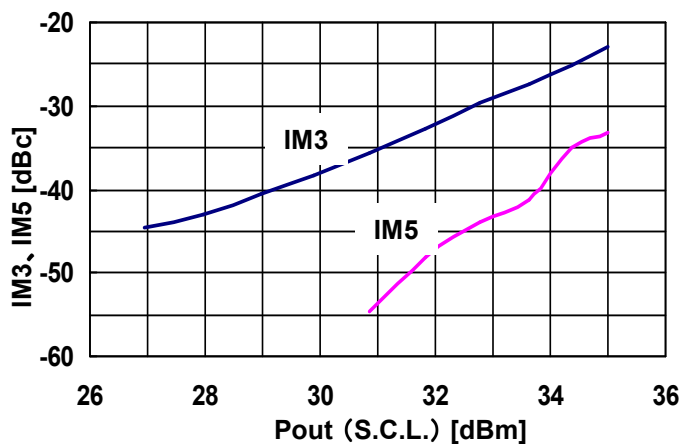
VDS=10V, IDS(DC)=1.75A



IMD vs. Output Power

VDS=10V, IDS(DC)=1.75A

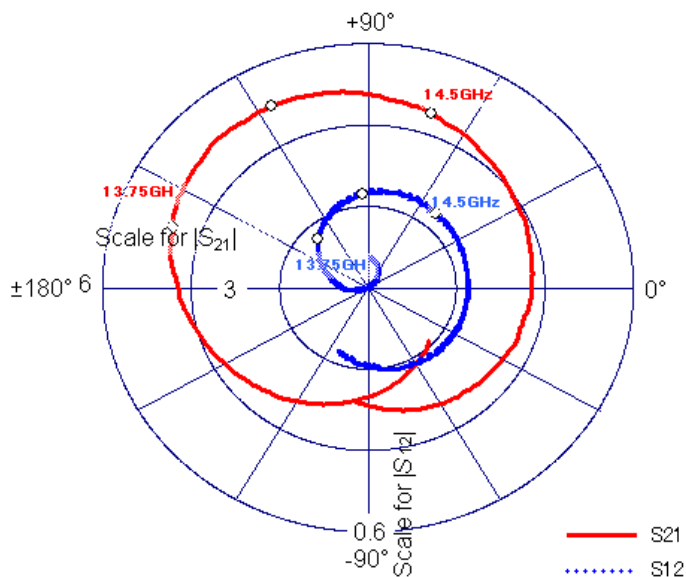
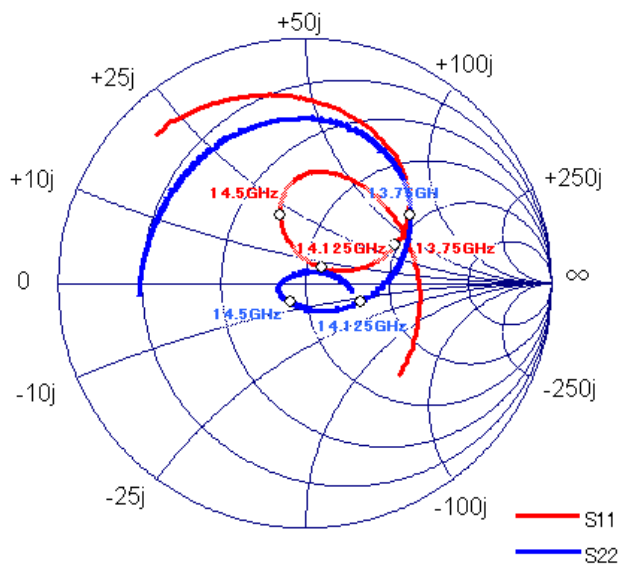
f1 = 14.50 GHz, f2=14.51 GHz



— 25dBm    — 27dBm    — 29dBm  
 — 31dBm    — 33dBm    ····· P1dB

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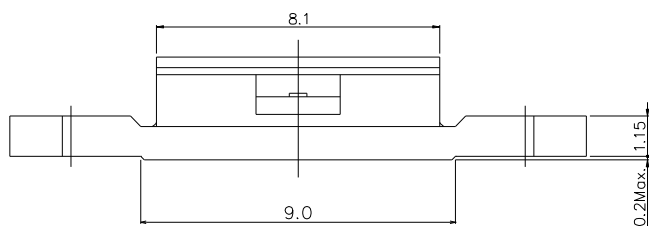
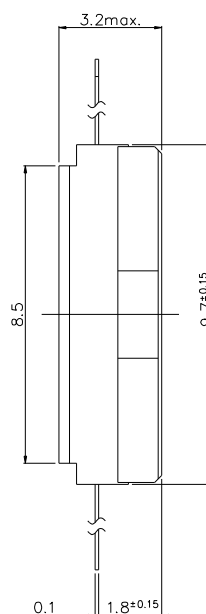
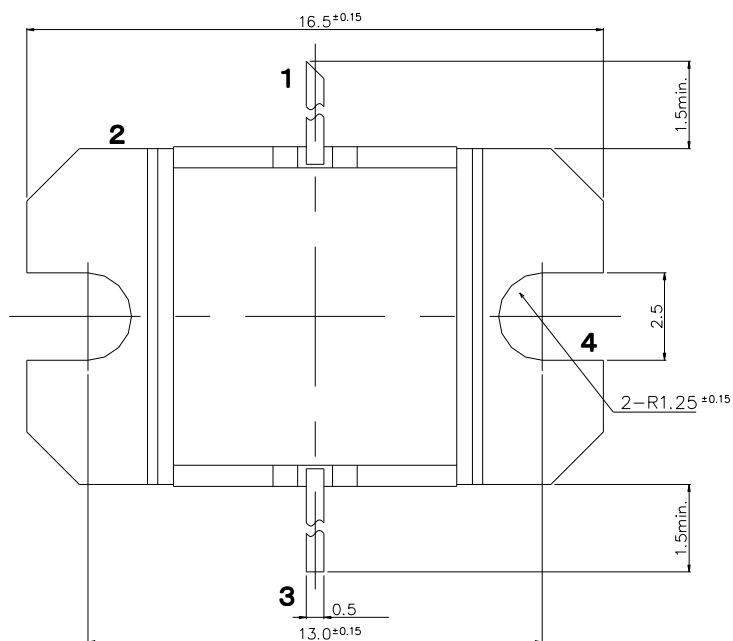


freq[GHz]	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
13.5	0.554	40.3	2.074	-171.5	0.057	154.6	0.609	54.7
13.6	0.500	33.3	2.165	178.0	0.066	146.3	0.575	46.4
13.7	0.439	26.4	2.282	166.9	0.076	137.9	0.534	37.5
13.8	0.358	20.0	2.382	155.5	0.088	128.0	0.479	27.5
13.9	0.274	15.6	2.440	143.3	0.097	118.1	0.412	15.7
14.0	0.181	17.0	2.489	130.9	0.107	106.8	0.336	2.0
14.1	0.104	35.6	2.479	118.7	0.115	95.1	0.256	-14.4
14.2	0.099	86.0	2.455	106.1	0.119	82.8	0.183	-35.4
14.3	0.163	108.6	2.407	94.2	0.121	70.9	0.129	-62.5
14.4	0.235	112.1	2.321	82.9	0.120	60.1	0.102	-96.0
14.5	0.296	109.5	2.256	71.3	0.119	50.1	0.099	-127.2
14.6	0.349	105.8	2.180	60.7	0.117	39.9	0.106	-147.3
14.7	0.391	100.9	2.089	50.6	0.116	30.6	0.112	-158.2

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■ Package Out Line  
Case Style : IA



## PIN ASSIGNMENT

- 1 : GATE
- 2 : SOURCE
- 3 : DRAIN
- 4 : SOURCE

Unit : mm

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# **ELM1314-9F**

## ***Ku-Band Internally Matched FET***

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For safety, observe the following procedures:

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- Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.
- Observe government laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures.

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