

# ELM1414-30F

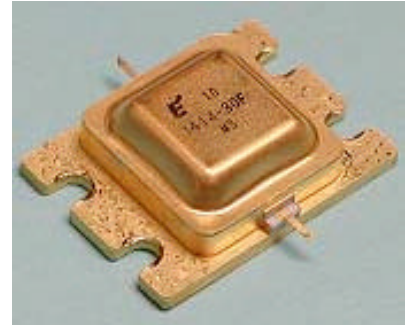
## Ku-Band Internally Matched FET

### FEATURES

- †High Output Power: P<sub>1dB</sub>=45.0dBm(Typ.)
- †High Gain: G<sub>1dB</sub>=5.5dB(Typ.)
- †High PAE: η<sub>add</sub>=24%(Typ.)
- †Broad Band: 14.0 ~ 14.5GHz
- †Impedance Matched Z<sub>in</sub>/Z<sub>out</sub> = 50Ω
- †Hermetically Sealed Package

### DESCRIPTION

The ELM1414-30F 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 (Case Temperature T<sub>c</sub>=25°C)

Item	Symbol	Rating	Unit
Drain-Source Voltage	V <sub>DS</sub>	15	V
Gate-Source Voltage	V <sub>GS</sub>	-5	V
Total Power Dissipation	P <sub>T</sub>	115.3	W
Storage Temperature	T <sub>stg</sub>	-55 to +125	°C
Channel Temperature	T <sub>ch</sub>	175	°C

### RECOMMENDED OPERATING CONDITION (Case Temperature T<sub>c</sub>=25°C)

Item	Symbol	Condition	Limit	Unit
DC Input Voltage	V <sub>DS</sub>		10	V
Forward Gate Current	I <sub>GF</sub>	R <sub>G</sub> =24 ohm	78.0	mA
Reverse Gate Current	I <sub>GR</sub>	R <sub>G</sub> =24 ohm	-16.9	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	-	16.4	-	A
Trans conductance	g <sub>m</sub>	V <sub>DS</sub> =5V, I <sub>DS</sub> =8A	-	11.6	-	S
Pinch-off Voltage	V <sub>p</sub>	V <sub>DS</sub> =5V, I <sub>DS</sub> =700mA	-0.5	-1.5	-3.0	V
Gate-Source Breakdown Voltage	V <sub>GSO</sub>	I <sub>GS</sub> =-700uA	-5.0	-	-	V
Output Power at 1dB G.C.P.	P <sub>1dB</sub>	V <sub>DS</sub> =10V	44.0	45.0	-	dBm
Power Gain at 1dB G.C.P.	G <sub>1dB</sub>	f= 14.0 ~ 14.5 GHz	4.5	5.5	-	dB
Drain Current	I <sub>DSR</sub>	I <sub>DS</sub> DC=7.0A (typ.)	-	9.0	10.4	A
Power-added Efficiency	η <sub>add</sub>	Z <sub>S</sub> =Z <sub>L</sub> =50 ohm	-	24	-	%
Gain Flatness	ΔG		-	-	1.2	dB
3rd Order Intermodulation Distortion	IM <sub>3</sub>	f=14.5 GHz Δf=10MHz, 2-tone Test P <sub>out</sub> =37.5dBm (S.C.L.)	-25	-30	-	dBc
Thermal Resistance	R <sub>th</sub>	Channel to Case	-	1.0	1.3	°C/W
Channel Temperature Rise	ΔT <sub>ch</sub>	10V x I <sub>DSR</sub> X R <sub>th</sub>	-	-	100	°C

CASE STYLE : M2A

S.C.L. : Single Carrier Level

G.C.P.: Gain Compression Point

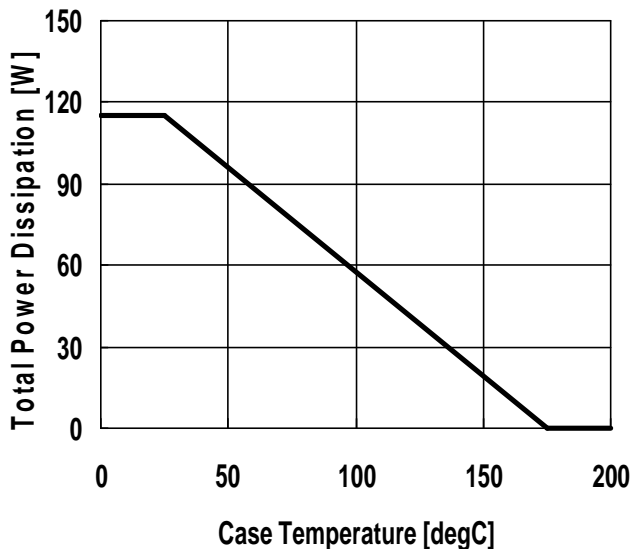
ESD	Class III	2000V ~
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Note : Based on EIAJ ED-4701 C-111A (C=100pF, R=1.5kΩ)

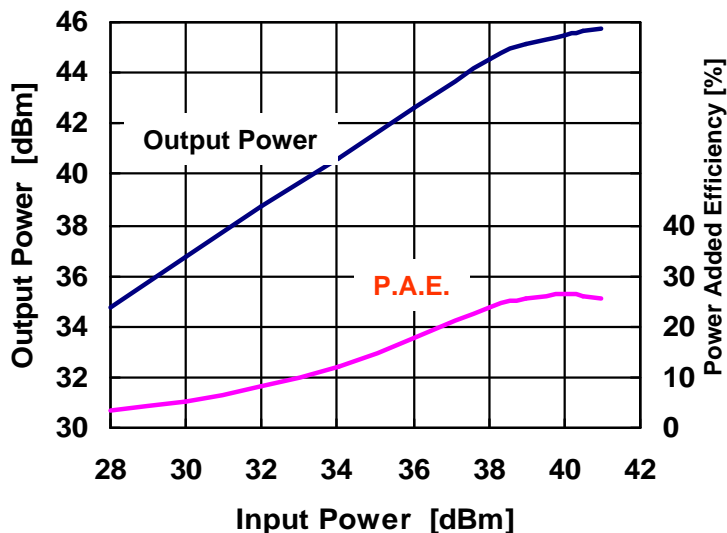
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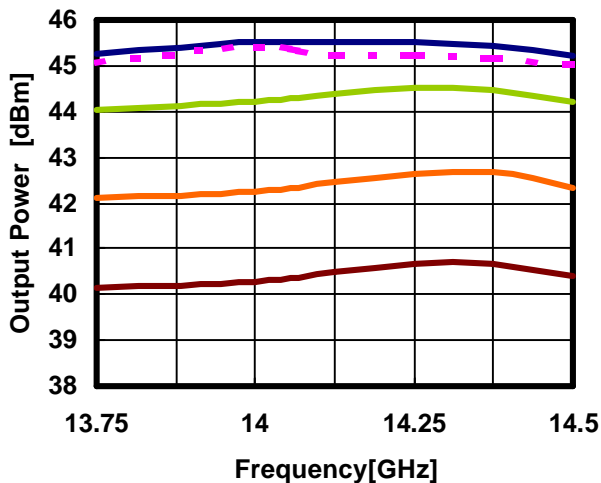
POWER DERATING CURVE



Output Power & P.A.E. vs . Input Power  
VDS=10V, IDS(DC)=7A, f = 14.25GHz

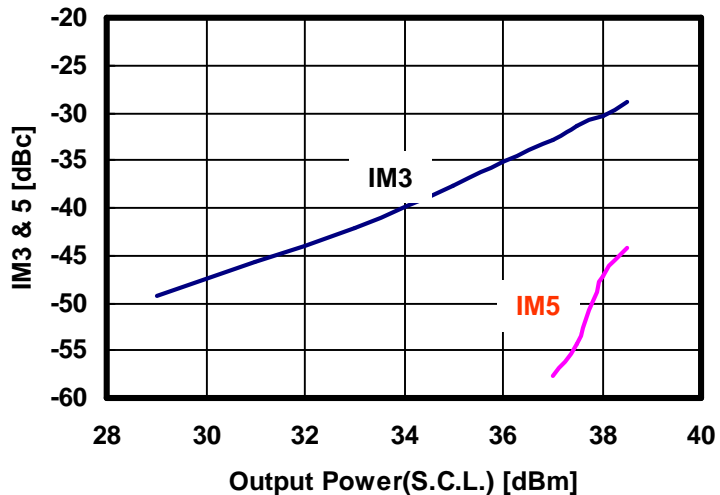


Output Power vs. frequency  
VDS=10V, IDS(DC)=7A



- 34dBm      — 36dBm      — 38dBm
- 40dBm      - - - P1dB

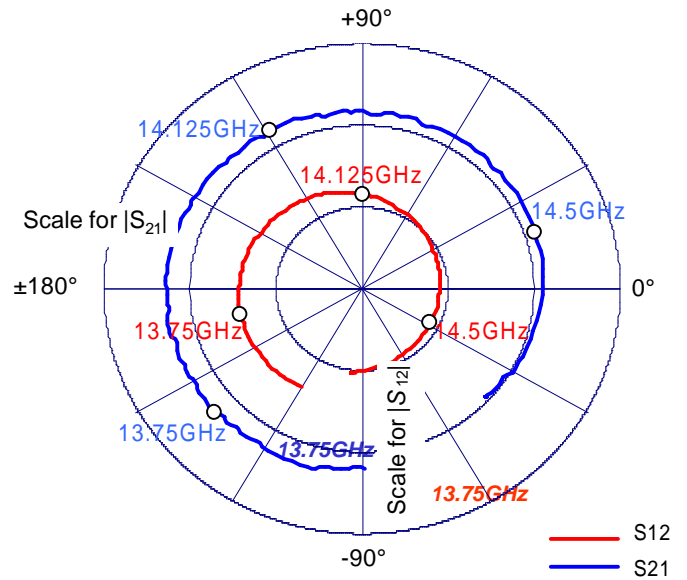
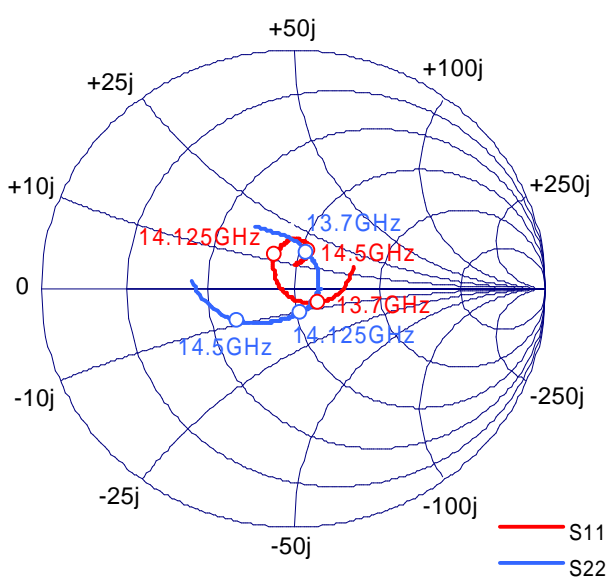
IMD vs. Output Power  
VDS=10V, IDS(DC)=7A  
f1=14.5GHz, f2=14.51GHz



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## S-PARAMETER



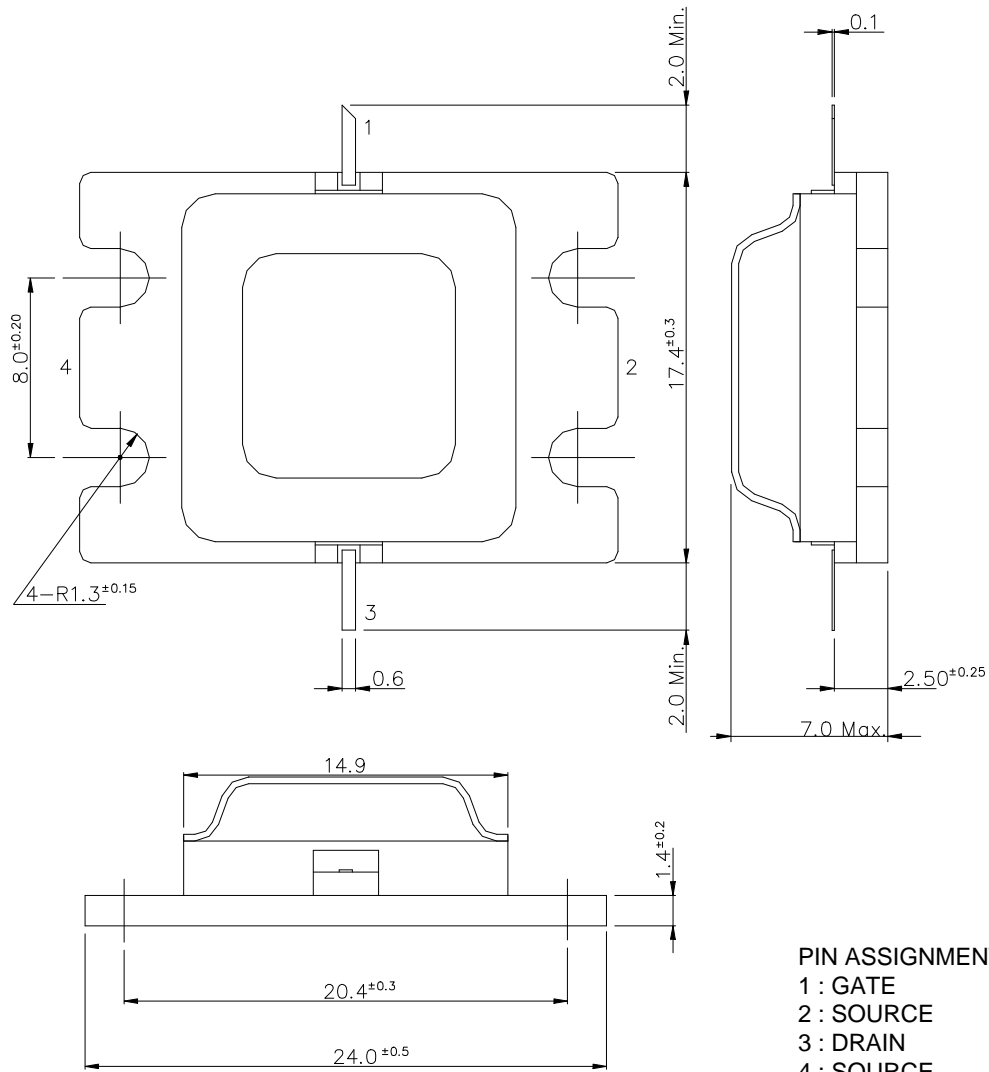
VDS=10.0V , IDS=7.0A

freq(GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
13.5	0.257	21.0	2.198	-89.4	0.138	-120.6	0.299	120.5
13.6	0.182	-4.3	2.268	-113.7	0.143	-144.0	0.222	98.0
13.7	0.114	-29.1	2.284	-138.4	0.144	-167.7	0.163	70.6
13.8	0.052	-76.5	2.255	-162.6	0.141	168.7	0.124	37.4
13.9	0.047	-175.9	2.273	172.6	0.135	144.5	0.102	-1.6
14.0	0.099	141.0	2.227	147.9	0.128	119.9	0.093	-41.3
14.1	0.152	120.3	2.212	123.3	0.117	94.7	0.100	-69.7
14.2	0.188	103.0	2.184	98.3	0.107	67.8	0.120	-94.7
14.3	0.209	90.1	2.166	72.8	0.098	38.9	0.147	-115.0
14.4	0.204	77.1	2.138	46.6	0.092	7.0	0.194	-131.5
14.5	0.170	70.7	2.122	18.5	0.089	-27.2	0.259	-148.7
14.6	0.130	70.2	2.079	-11.1	0.094	-63.0	0.333	-166.7
14.7	0.097	86.7	1.951	-42.7	0.104	-97.5	0.403	175.5

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Package Out Line  
Case Style : M2A



### PIN ASSIGNMENT

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

Unit : mm

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# **ELM1414-30F**

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

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#### **CAUTION**

Eudyna Devices Compound Semiconductor Products contain **gallium arsenide (GaAs)** which can be hazardous to the human body and the environment.

For safety, observe the following procedures:

·Do not put these products into the mouth.

·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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