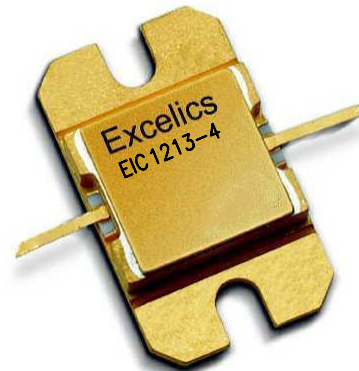


### FEATURES

- 12.70 –13.20GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +36.0 dBm Output Power at 1dB Compression
- 6.5 dB Power Gain at 1dB Compression
- 28% Power Added Efficiency
- -44 dBc IM3 at  $P_o = 25.5$  dBm SCL
- 100% Tested for DC, RF, and  $R_{TH}$



### ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )



Caution! ESD sensitive device.

SYMBOL	PARAMETERS/TEST CONDITIONS <sup>1</sup>	MIN	TYP	MAX	UNITS
$P_{1dB}$	Output Power at 1dB Compression $f = 12.7\text{-}13.2\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$	35.5	36.0		dBm
$G_{1dB}$	Gain at 1dB Compression $f = 12.7\text{-}13.2\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$	5.5	6.5		dB
$\Delta G$	Gain Flatness $f = 12.7\text{-}13.2\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$			$\pm 0.6$	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$ $f = 12.7\text{-}13.2\text{GHz}$		28		%
$I_{d1dB}$	Drain Current at 1dB Compression $f = 12.7\text{-}13.2\text{GHz}$		1100	1300	mA
IM3	Output 3rd Order Intermodulation Distortion $\Delta f = 10\text{ MHz}$ 2-Tone Test; $P_{out} = 25.5\text{ dBm S.C.L.}^2$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 65\% IDSS$ $f = 13.2\text{GHz}$	-42	-44		dBc
$I_{DSS}$	Saturated Drain Current $V_{DS} = 3\text{ V}, V_{GS} = 0\text{ V}$	1280	2080	2880	mA
$V_P$	Pinch-off Voltage $V_{DS} = 3\text{ V}, I_{DS} = 20\text{ mA}$		-2.5	-4.0	V
$R_{TH}$	Thermal Resistance <sup>3</sup>		5.5	6.0	$^\circ\text{C/W}$

Note: 1. Tested with 100 Ohm gate resistor.  
2. S.C.L. = Single Carrier Level.  
3. Overall  $R_{th}$  depends on case mounting.

### ABSOLUTE MAXIMUM RATING FOR EFE

SYMBOLS	PARAMETERS	ABSOLUTE <sup>1</sup>	CONTINUOUS <sup>2</sup>
$V_{ds}$	Drain-Source Voltage	15V	10V
$V_{gs}$	Gate-Source Voltage	-5V	-4V
$I_{gf}$	Forward Gate Current	48mA	14.4mA
$I_{gr}$	Reverse Gate Current	-9.6mA	-2.4mA
$P_{in}$	Input Power	35.5dBm	@ 3dB Compression
$T_{ch}$	Channel Temperature	175C	175C
$T_{stg}$	Storage Temperature	-65C to +175C	-65C to +175C
$P_t$	Total Power Dissipation	25W	25W

Note: 1. Exceeding any of the above ratings may result in permanent damage.  
2. Exceeding any of the above ratings may reduce MTTF below design goals.

Specifications are subject to change without notice.



# EIC1213-4

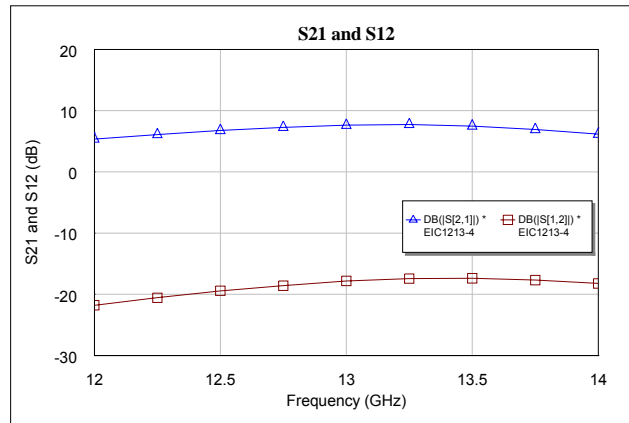
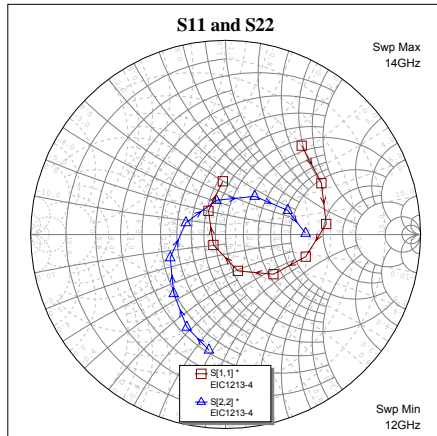
UPDATED 08/21/2007

## 12.70-13.20GHz 4-Watt Internally-Matched Power FET

### PERFORMANCE DATA

Typical S-Parameters (T= 25°C, 50Ω system, de-embedded to edge of package)

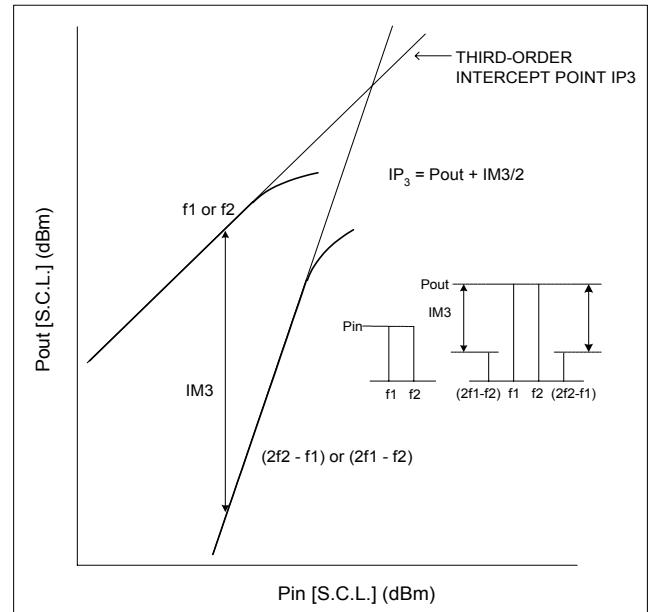
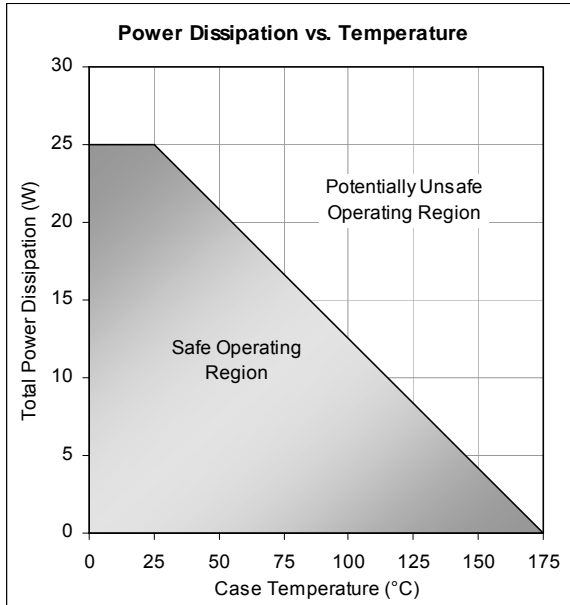
$V_{DS} = 10\text{ V}$ ,  $I_{DSQ} \approx 1100\text{ mA}$



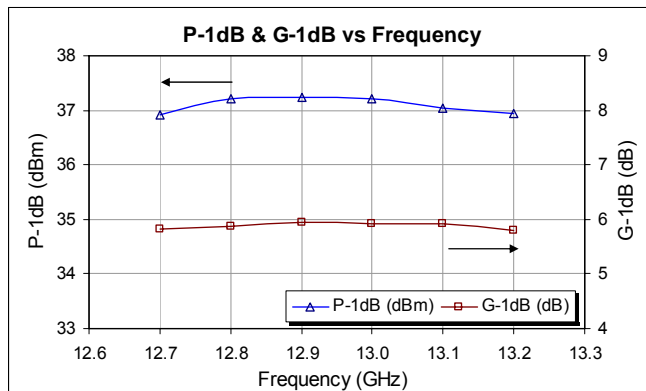
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
12.0	0.6013	49.54	1.8523	-73.04	0.0813	-101.01	0.602	-98.17
12.2	0.5629	32.76	1.9838	-88.24	0.0911	-116.63	0.5402	-109.62
12.4	0.5404	14.98	2.1132	-104.28	0.1011	-132.11	0.4471	-123.24
12.6	0.4871	-2.5	2.234	-121.18	0.1114	-148.78	0.3645	-140.48
12.8	0.4055	-19.9	2.3293	-138.38	0.1196	-166.24	0.2874	-163.34
13.0	0.3196	-39.9	2.4047	-156.51	0.1284	176.28	0.2125	163.54
13.2	0.2249	-63.97	2.4359	-175.14	0.1342	158.11	0.179	117.02
13.4	0.118	-101.47	2.4042	166.07	0.1355	139.57	0.2111	71.43
13.6	0.0879	170.88	2.322	147.76	0.1342	121.8	0.2843	38.35
13.8	0.1766	117.33	2.1849	129.28	0.1288	104.29	0.3574	16.48
14.0	0.2745	92.92	2.0299	112.36	0.1226	87.32	0.4104	0.75

Specifications are subject to change without notice.

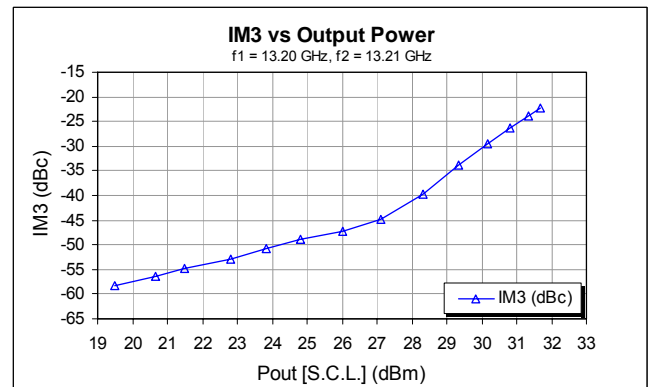
### Power De-rating Curve and IM3 Definition



### Typical Power Data (V<sub>DS</sub> = 10 V, I<sub>DSQ</sub> = 1100 mA)



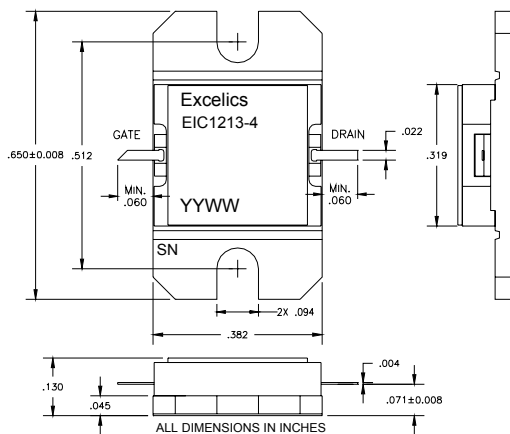
### Typical IM3 Data (V<sub>DS</sub> = 10 V, I<sub>DSQ</sub> ≈ 65% IDSS)



### PACKAGES OUTLINE

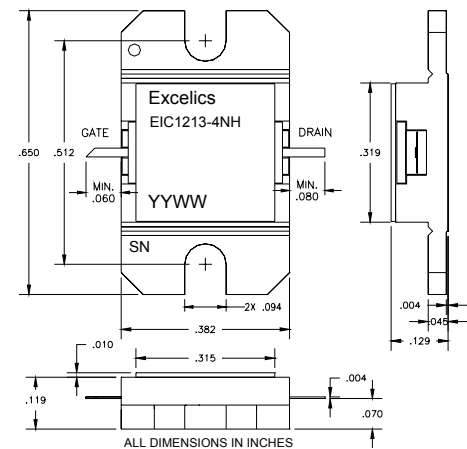
Dimensions in inches, Tolerance  $\pm .005$  unless otherwise specified

**EIC1213-4 (Hermetic)**



**Caution! ESD sensitive device.**

**EIC1213-4NH (Non-Hermetic)**



**Caution! ESD sensitive device.**

### ORDERING INFORMATION

Part Number	Packages	Grade <sup>1</sup>	f <sub>Test</sub> (GHz)	P <sub>1dB</sub> (min)	IM <sub>3</sub> (min) <sup>2</sup>
EIC1213-4	Hermetic	Industrial	12.70-13.20GHz	35.5	-42
EIC1213-4NH	Non-Hermetic	Industrial	12.70-13.20GHz	35.5	-42

- Notes: 1. Contact factory for military and hi-rel grades.  
2. Exact test conditions are specified in "Electrical Characteristics" table.

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- A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness