



# EIC4450-8

UPDATED 08/21/2007

## 4.40-5.00GHz 8-Watt Internally Matched Power FET

### FEATURES

- 4.40–5.00GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +39.5 dBm Output Power at 1dB Compression
- 10.5 dB Power Gain at 1dB Compression
- 35% Power Added Efficiency
- -46 dBc IM3 at PO = 28.5 dBm SCL
- 100% Tested for DC, RF, and R<sub>TH</sub>



### ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25°C)



Caution! ESD sensitive device.

SYMBOL	PARAMETERS/TEST CONDITIONS <sup>1</sup>	MIN	TYP	MAX	UNITS
P <sub>1dB</sub>	Output Power at 1dB Compression f = 4.4-5.0GHz V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 2200mA	38.5	39.5		dBm
G <sub>1dB</sub>	Gain at 1dB Compression f = 4.4-5.0GHz V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 2200mA	9.5	10.5		dB
ΔG	Gain Flatness f = 4.4-5.0GHz V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 2200mA			±0.6	dB
PAE	Power Added Efficiency at 1dB Compression V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 2200mA f = 4.4-5.0GHz		35		%
I <sub>d1dB</sub>	Drain Current at 1dB Compression f = 4.4-5.0GHz		2300	2600	mA
IM3	Output 3rd Order Intermodulation Distortion Δf = 10 MHz 2-Tone Test; Pout = 28.5 dBm S.C.L. <sup>2</sup> V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 65% IDSS f = 5.0GHz	-43	-46		dBc
I <sub>DSS</sub>	Saturated Drain Current V <sub>DS</sub> = 3 V, V <sub>GS</sub> = 0 V		4000	5000	mA
V <sub>P</sub>	Pinch-off Voltage V <sub>DS</sub> = 3 V, I <sub>DS</sub> = 40 mA		-2.5	-4.0	V
R <sub>TH</sub>	Thermal Resistance <sup>3</sup>		3.5	4.0	°C/W

Note: 1. Tested with 100 Ohm gate resistor.  
2. S.C.L. = Single Carrier Level.  
3. Overall R<sub>th</sub> depends on case mounting.

### ABSOLUTE MAXIMUM RATING FOR EFE

SYMBOLS	PARAMETERS	ABSOLUTE <sup>1</sup>	CONTINUOUS <sup>2</sup>
V <sub>ds</sub>	Drain-Source Voltage	15V	10V
V <sub>gs</sub>	Gate-Source Voltage	-5V	-4V
I <sub>gf</sub>	Forward Gate Current	96mA	28.8mA
I <sub>gr</sub>	Reverse Gate Current	-19.2mA	-4.8mA
P <sub>in</sub>	Input Power	39dBm	@ 3dB Compression
T <sub>ch</sub>	Channel Temperature	175C	175C
T <sub>stg</sub>	Storage Temperature	-65C to +175C	-65C to +175C
P <sub>t</sub>	Total Power Dissipation	37.5W	37.5W

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.

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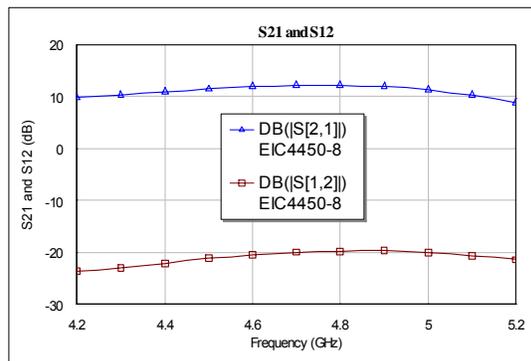
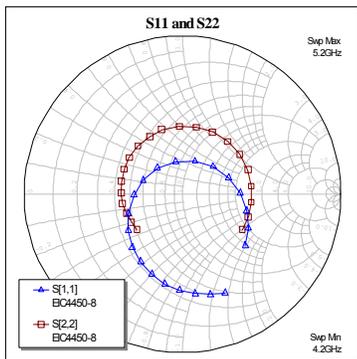
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### PERFORMANCE DATA

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

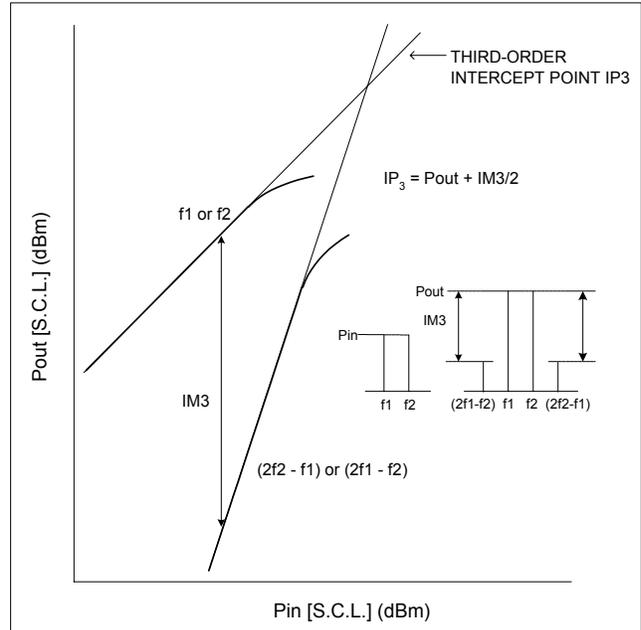
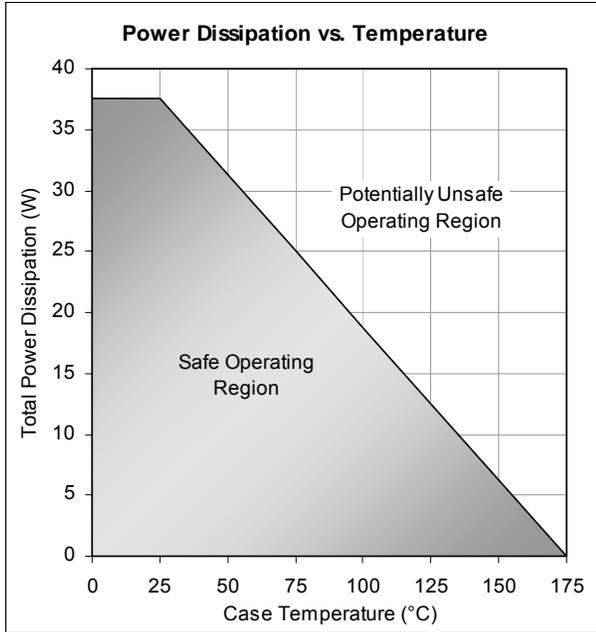
$V_{DS} = 10\text{ V}$ ,  $I_{DSQ} \approx 2200\text{mA}$



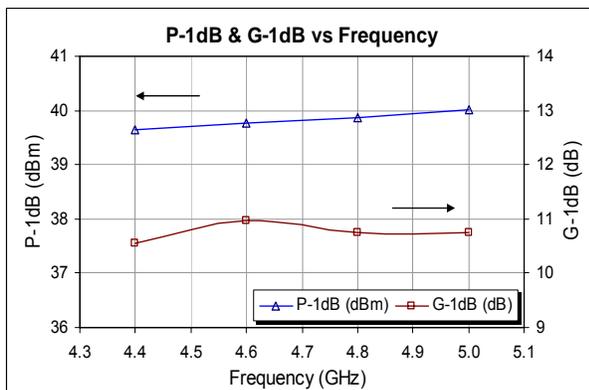
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
4.0	0.7503	-37.83	2.703	97.27	0.0555	43.87	0.3563	-105.99
4.2	0.6786	-66.68	3.0738	66.41	0.0662	11.77	0.3648	-142.14
4.4	0.5779	-101.09	3.5153	32.39	0.0788	-21.55	0.3889	178.7
4.6	0.4132	-146.28	3.9355	-6.5	0.0954	-60.58	0.4149	132.78
4.8	0.2292	134.17	4.0571	-50.3	0.1033	-105.97	0.4326	78.67
5.0	0.308	19.37	3.6482	-96.93	0.0989	-153.5	0.4399	20.6
5.2	0.5127	-39.49	2.78	-140.48	0.0854	160.93	0.4385	-30.72
5.4	0.6658	-77.6	1.9617	-177.01	0.0678	119.63	0.4493	-70.46
5.6	0.7585	-107.39	1.3733	153.13	0.0532	81.38	0.4784	-98.19
5.8	0.8058	-133.11	1.0074	126.36	0.0414	46.84	0.5605	-121.4
6.0	0.8356	-155.36	0.7453	101.98	0.0333	18.09	0.6098	-141.51

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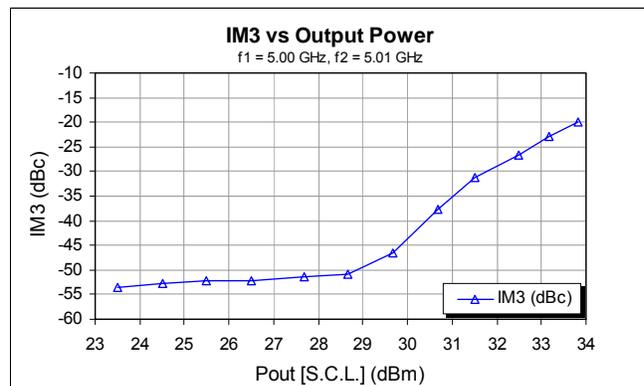
### Power De-rating Curve and IM3 Definition



### Typical Power Data ( $V_{DS} = 10\text{ V}$ , $I_{DSQ} = 2200\text{ mA}$ )



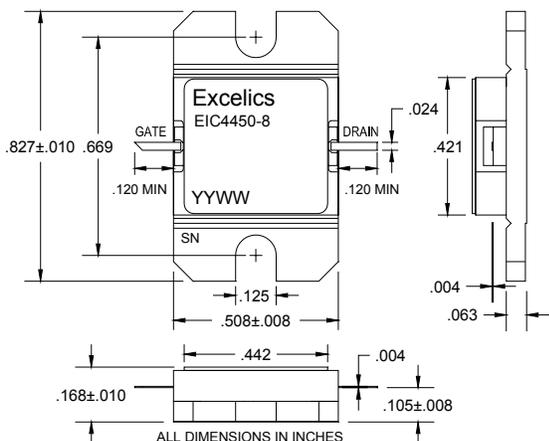
### Typical IM3 Data ( $V_{DS} = 10\text{ V}$ , $I_{DSQ} \approx 65\% IDSS$ )



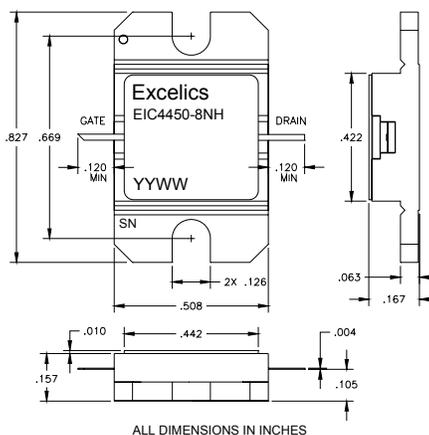
### PACKAGES OUTLINE

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

**EIC4450-8 (Hermetic)**



**EIC4450-8NH (Non-Hermetic)**



Caution! ESD sensitive device.



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>
EIC4450-8	Hermetic	Industrial	4.40-5.00GHz	38.5	-43
EIC4450-8NH	Non-Hermetic	Industrial	4.40-5.00GHz	38.5	-43

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

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