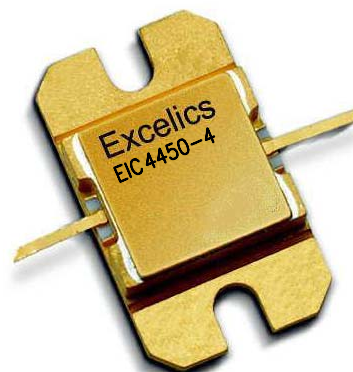


# EIC4450-4

## 4.40-5.00 GHz 4-Watt Internally Matched Power FET

### FEATURES

- 4.40–5.00GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +36.5 dBm Output Power at 1dB Compression
- 11.5 dB Power Gain at 1dB Compression
- 37% Power Added Efficiency
- -46 dBc IM3 at PO = 25.5 dBm SCL
- 100% Tested for DC, RF, and  $R_{TH}$



Caution! ESD sensitive device.

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

SYMBOL	PARAMETERS/TEST CONDITIONS <sup>1</sup>	MIN	TYP	MAX	UNITS
$P_{1dB}$	Output Power at 1dB Compression $f = 4.40\text{-}5.00\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$	35.5	36.5		dBm
$G_{1dB}$	Gain at 1dB Compression $f = 4.40\text{-}5.00\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$	10.5	11.5		dB
$\Delta G$	Gain Flatness $f = 4.40\text{-}5.00\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$			$\pm 0.6$	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$ $f = 4.40\text{-}5.00\text{GHz}$		37		%
$I_{d1dB}$	Drain Current at 1dB Compression $f = 4.40\text{-}5.00\text{GHz}$		1200	1500	mA
IM3	Output 3rd Order Intermodulation Distortion $\Delta f = 10\text{ MHz}$ 2-Tone Test; $P_{out} = 25.5\text{ dBm S.C.L.}^2$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 65\% IDSS$ $f = 5.00\text{GHz}$	-43	-46		dBc
$I_{DSS}$	Saturated Drain Current $V_{DS} = 3\text{ V}, V_{GS} = 0\text{ V}$		2000	2500	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>
Vds	Drain-Source Voltage	15V	10V
Vgs	Gate-Source Voltage	-5V	-4V
Igf	Forward Gate Current	48mA	14mA
Igr	Reverse Gate Current	-9.6mA	-2.4mA
Pin	Input Power	36dBm	@ 3dB Compression
Tch	Channel Temperature	175C	175C
Tstg	Storage Temperature	-65C to +175C	-65C to +175C
Pt	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.

Excelics Semiconductor, Inc. 310 De Guigne Drive, Sunnyvale, CA 94085

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# EIC4450-4

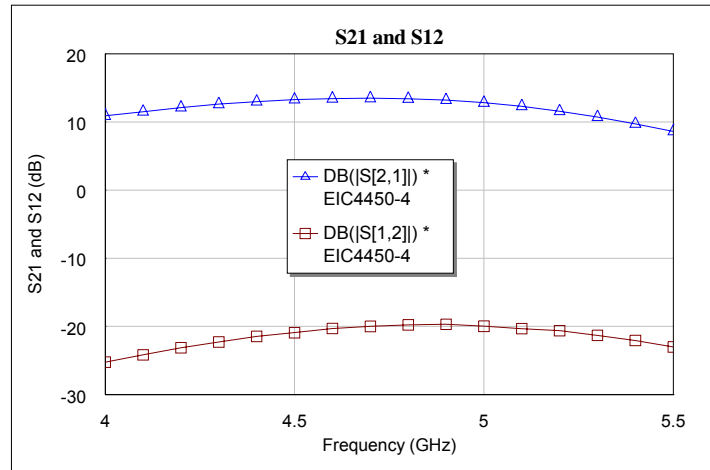
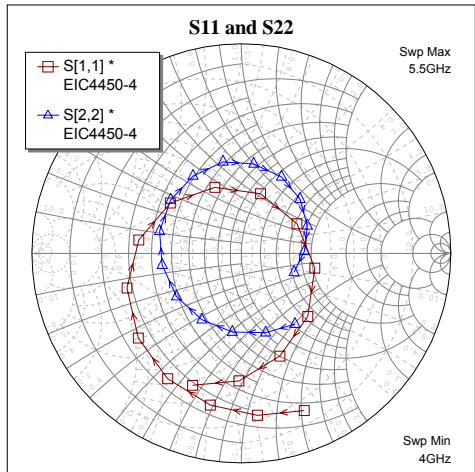
UPDATED 08/21/2007

## 4.40-5.00 GHz 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
4.00	0.808	-68.190	3.508	99.990	0.055	37.090	0.424	-52.880
4.25	0.713	-110.590	4.141	59.190	0.074	-2.750	0.368	-108.070
4.50	0.570	-163.190	4.620	13.810	0.090	-49.090	0.382	-171.490
4.75	0.383	129.460	4.719	-34.020	0.102	-96.850	0.429	132.270
5.00	0.301	28.000	4.375	-83.660	0.100	-145.990	0.431	82.100
5.25	0.481	-56.790	3.625	-132.810	0.090	165.590	0.364	33.460
5.50	0.671	-110.260	2.699	-177.940	0.071	122.650	0.268	-19.720
5.75	0.795	-149.080	1.929	141.910	0.053	84.390	0.240	-76.080
6.00	0.869	-179.020	1.365	106.080	0.040	51.160	0.290	-122.110
6.25	0.909	156.420	0.965	72.960	0.028	27.210	0.380	-155.490
6.50	0.933	135.760	0.681	42.570	0.020	0.750	0.488	178.060

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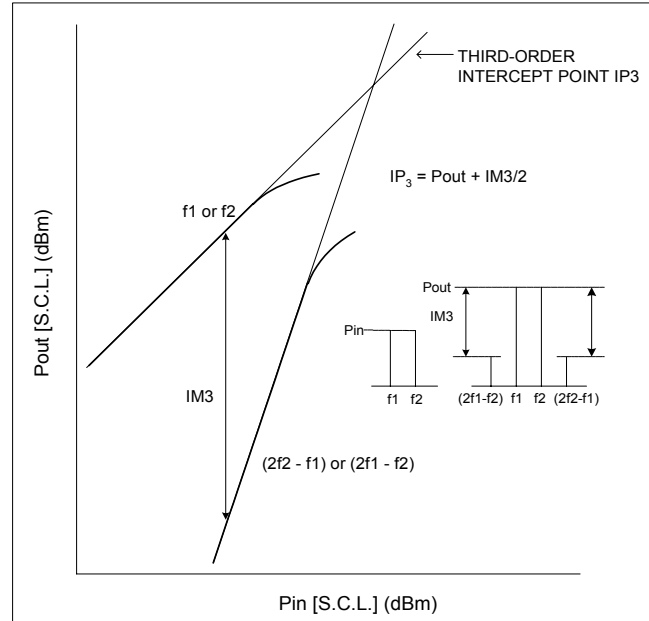
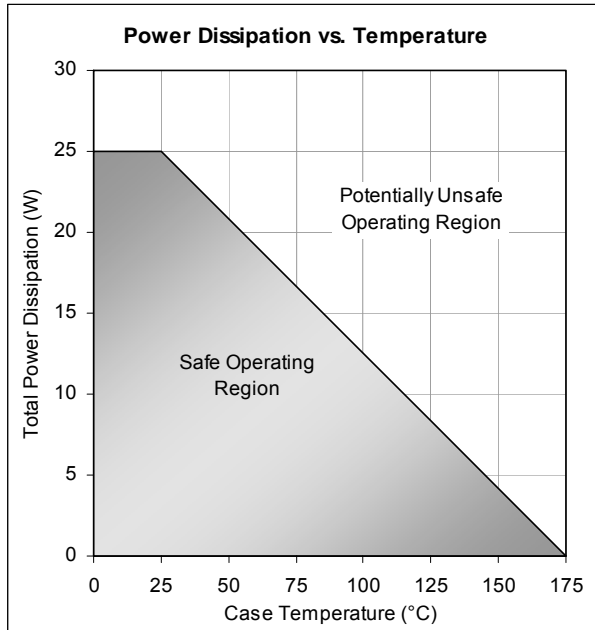
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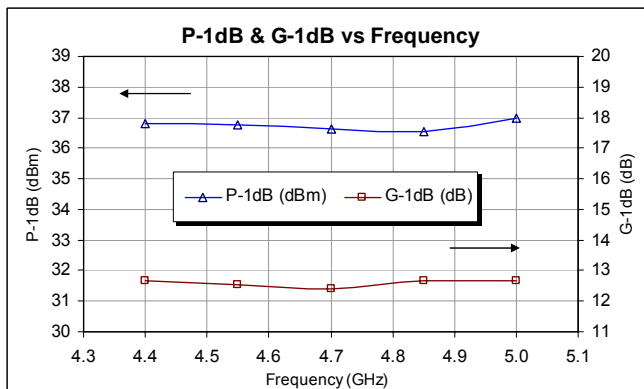
UPDATED 08/21/2007

## 4.40-5.00 GHz 4-Watt Internally Matched Power FET

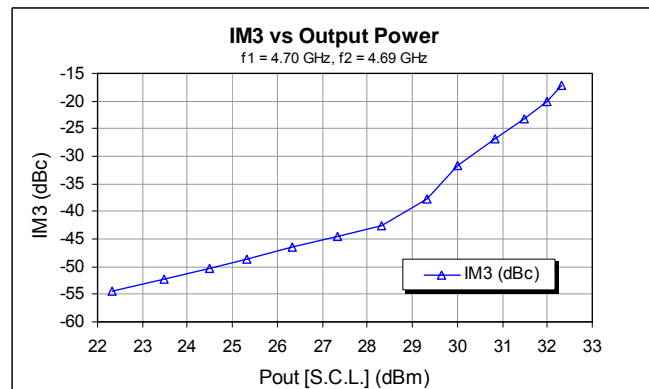
### Power De-rating Curve and IM3 Definition



### 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)



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# EIC4450-4

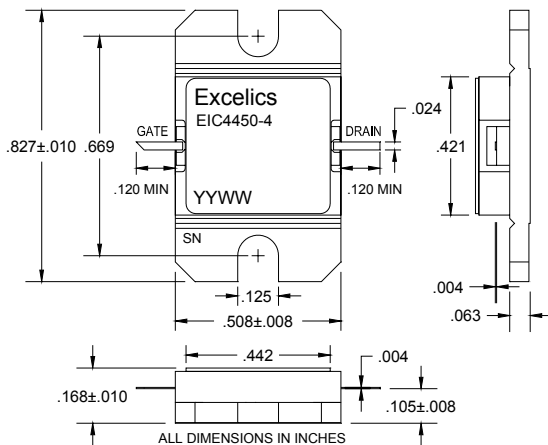
UPDATED 08/21/2007

## 4.40-5.00 GHz 4-Watt Internally Matched Power FET

### PACKAGES OUTLINE

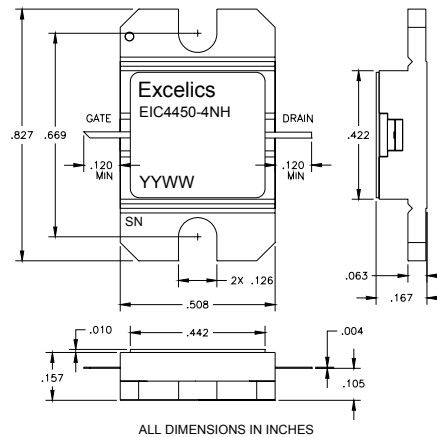
Dimensions in inches, Tolerance  $\pm .005$  unless otherwise specified

EIC4450-4 (Hermetic)



Caution! ESD sensitive device.

EIC4450-4NH (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>
EIC4450-4	Hermetic	Industrial	4.40-5.00GHz	35.5	-43
EIC4450-4NH	Non-Hermetic	Industrial	4.40-5.00GHz	35.5	-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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2. 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

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