



# EIC5964-8

UPDATED 08/21/2007

## 5.90-6.40GHz 8-Watt Internally Matched Power FET

### FEATURES

- 5.90–6.40GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +39.5 dBm Output Power at 1dB Compression
- 10.0 dB Power Gain at 1dB Compression
- 37% 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 = 5.9-6.4GHz 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 = 5.9-6.4GHz V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 2200mA	9.0	10.0		dB
ΔG	Gain Flatness f = 5.9-6.4GHz 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 = 5.9-6.4GHz		37		%
I <sub>d1dB</sub>	Drain Current at 1dB Compression f = 5.9-6.4GHz		2200	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 = 6.4GHz	-43	-46		dBc
I <sub>DSS</sub>	Saturated Drain Current V <sub>DS</sub> = 3 V, V <sub>GS</sub> = 0 V		4000	4500	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.



# EIC5964-8

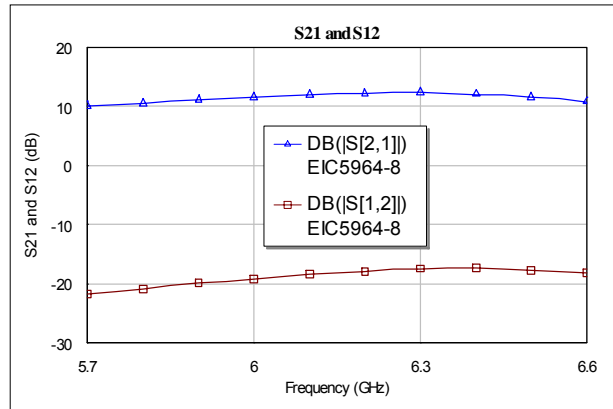
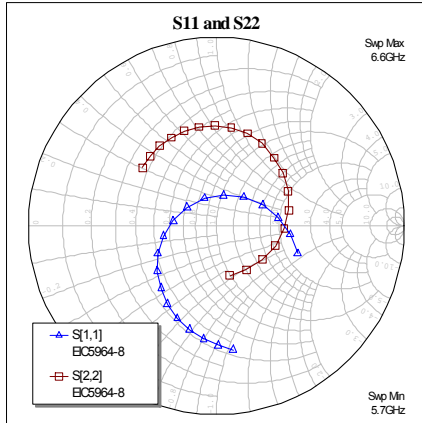
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### PERFORMANCE DATA

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

V<sub>DS</sub> = 10 V, I<sub>DSQ</sub> ≈ 2200mA



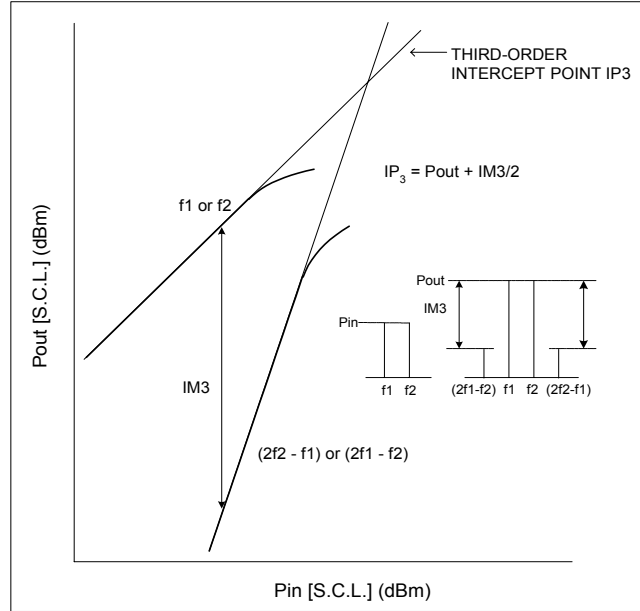
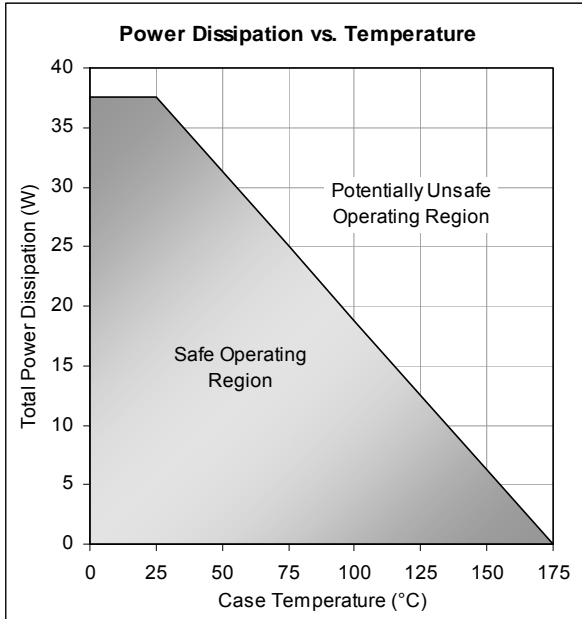
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
5.0	0.873	-7.73	1.9865	102.43	0.0385	50.45	0.4069	-90.78
5.2	0.8439	-25.93	2.285	77.92	0.0467	23.43	0.4003	-128.98
5.4	0.7893	-46.35	2.6094	51.4	0.0592	-4.16	0.4285	-166.69
5.6	0.7151	-69.29	2.9628	23.77	0.0737	-33.07	0.4765	158.39
5.8	0.6028	-96.47	3.3734	-5.88	0.0912	-62.69	0.5213	125.52
6.0	0.444	-131.54	3.7964	-39.07	0.1107	-96.25	0.5321	90.88
6.2	0.2308	173.31	4.0744	-76.09	0.1282	-133.24	0.4733	49.87
6.4	0.2091	46.37	4.0033	-116.4	0.1362	-173.52	0.3603	-2.01
6.6	0.455	-18.8	3.4617	-156.9	0.1237	147.8	0.2712	-75.07
6.8	0.6333	-56.77	2.6951	167.51	0.1009	112.66	0.3134	-142.54
7.0	0.7311	-85.42	2.035	136.97	0.0814	83.64	0.4055	176.45

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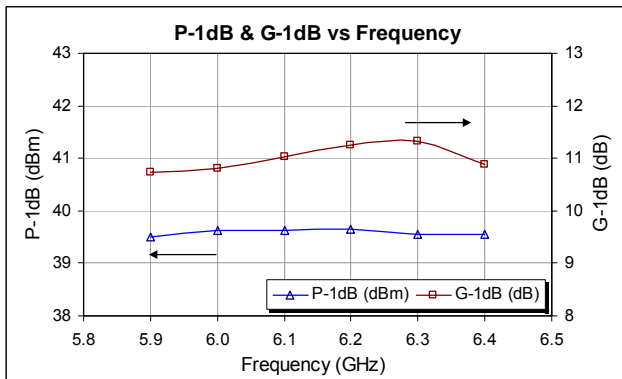
Excelics Semiconductor, Inc. 310 De Guigne Drive, Sunnyvale, CA 94085  
 Phone: 408-737-1711 Fax: 408-737-1868 Web: [www.excelics.com](http://www.excelics.com)

page 2 of 4  
 Revised October 2007

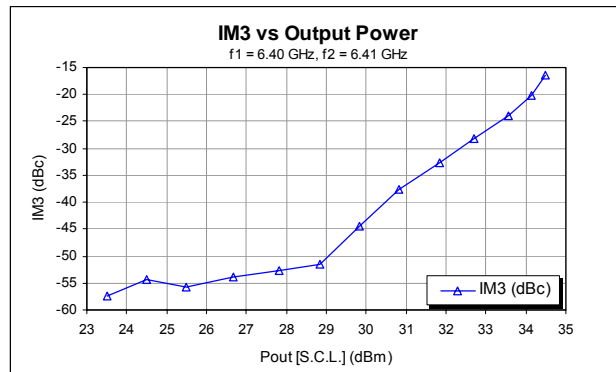
### Power De-rating Curve and IM3 Definition



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

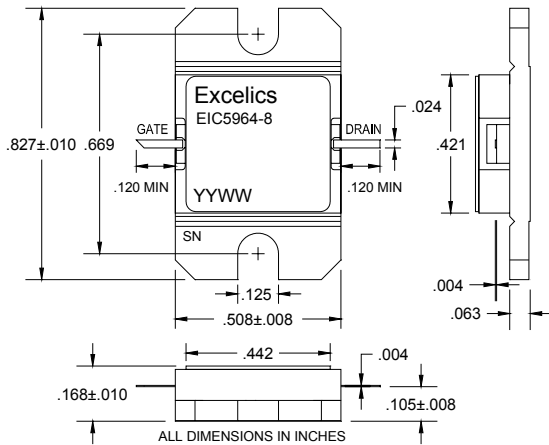
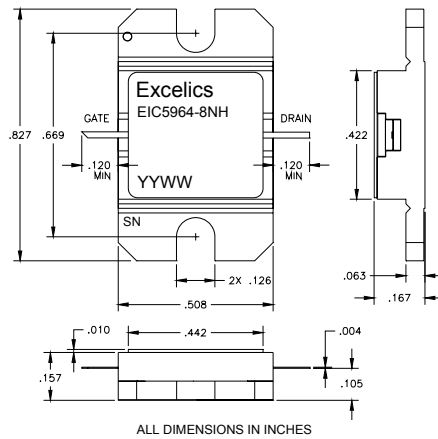


### Typical IM3 Data ( $V_{DS} = 10\text{ V}$ , $I_{DSQ} \approx 65\% IDSS$ )



### PACKAGES OUTLINE

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

**EIC5964-8 (Hermetic)**

**EIC5964-8NH (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>
EIC5964-8	Hermetic	Industrial	5.90-6.40GHz	38.5	-43
EIC5964-8NH	Non-Hermetic	Industrial	5.90-6.40GHz	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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