



# EIC0910-2

UPDATED 08/21/2007

## 9.50-10.50GHz 2-Watt Internally-Matched Power FET

### FEATURES

- 9.50 –10.50GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +33.5 dBm Output Power at 1dB Compression
- 8.0 dB Power Gain at 1dB Compression
- 30% Power Added Efficiency
- -46 dBc IM3 at  $P_o = 22.5$  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 $f = 9.50\text{-}10.50\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 550\text{mA}$	32.5	33.5		dBm
$G_{1dB}$	Gain at 1dB Compression $f = 9.50\text{-}10.50\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 550\text{mA}$	7.0	8.0		dB
$\Delta G$	Gain Flatness $f = 9.50\text{-}10.50\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 550\text{mA}$			$\pm 0.6$	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 10\text{ V}, I_{DSQ} \approx 550\text{mA}$ $f = 9.50\text{-}10.50\text{GHz}$		30		%
$I_{d1dB}$	Drain Current at 1dB Compression $f = 9.50\text{-}10.50\text{GHz}$		600	700	mA
IM3	Output 3rd Order Intermodulation Distortion $\Delta f = 10\text{ MHz}$ 2-Tone Test; $P_{out} = 22.5\text{ dBm S.C.L.}^2$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 65\% IDSS$ $f = 10.50\text{GHz}$	-43	-46		dBc
$I_{DSS}$	Saturated Drain Current $V_{DS} = 3\text{ V}, V_{GS} = 0\text{ V}$		1000	1250	mA
$V_P$	Pinch-off Voltage $V_{DS} = 3\text{ V}, I_{DS} = 10\text{ mA}$		-2.5	-4.0	V
$R_{TH}$	Thermal Resistance <sup>3</sup>		11	12	$^\circ\text{C/W}$

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	24mA	7.2mA
Igr	Reverse Gate Current	-4.8mA	-1.2mA
Pin	Input Power	33.0dBm	@ 3dB Compression
Tch	Channel Temperature	175C	175C
Tstg	Storage Temperature	-65C to +175C	-65C to +175C
Pt	Total Power Dissipation	12.5W	12.5W

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.

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)

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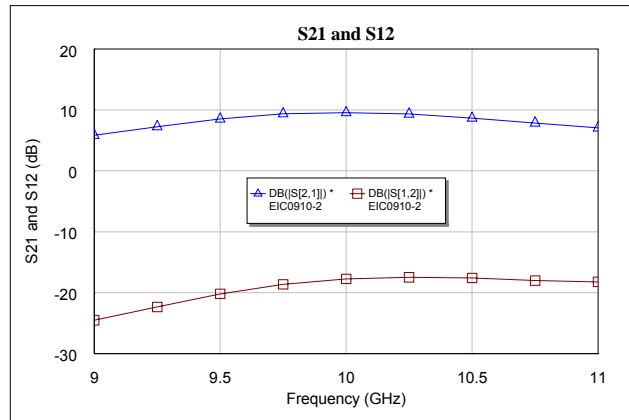
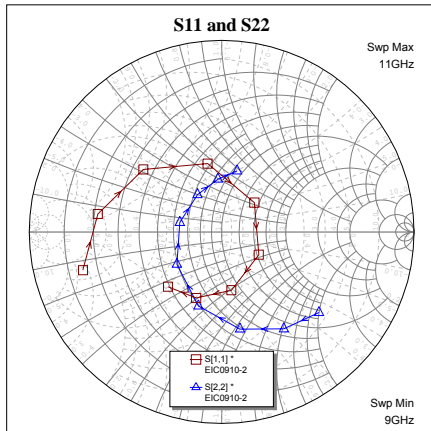
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### PERFORMANCE DATA

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

$V_{DS} = 10\text{ V}$ ,  $I_{DSQ} = 550\text{mA}$



FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
8.75	0.801	-144.750	1.666	55.890	0.045	10.590	0.698	-25.380
9.00	0.748	-164.560	1.962	36.560	0.059	-9.970	0.658	-39.760
9.25	0.650	171.690	2.305	14.740	0.076	-32.680	0.600	-57.400
9.50	0.522	141.280	2.669	-10.520	0.098	-58.510	0.516	-79.320
9.75	0.364	101.620	2.943	-38.640	0.117	-86.820	0.405	-107.410
10.00	0.229	42.070	3.009	-67.750	0.130	-115.840	0.288	-144.010
10.25	0.227	-31.690	2.929	-95.780	0.134	-143.460	0.223	167.180
10.50	0.309	-80.620	2.712	-122.110	0.132	-168.960	0.232	122.730
10.75	0.369	-111.080	2.470	-146.280	0.126	168.060	0.276	93.950
11.00	0.399	-134.340	2.254	-168.390	0.123	146.710	0.329	75.830
11.25	0.402	-154.030	2.085	170.040	0.117	126.180	0.377	62.360

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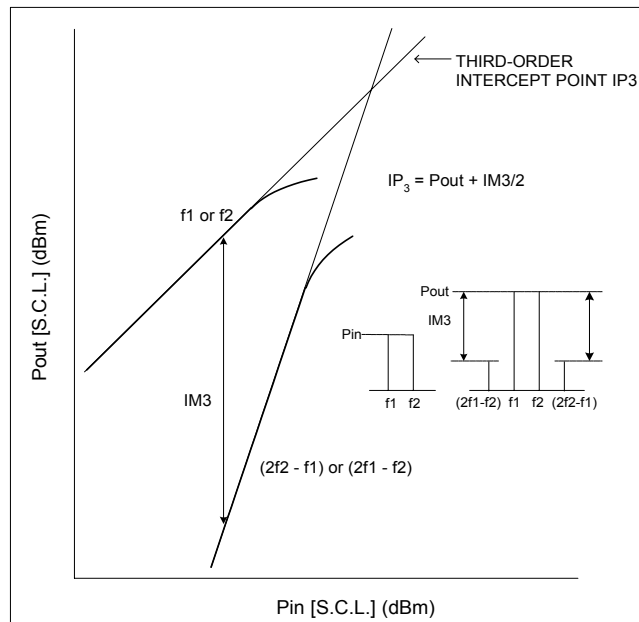
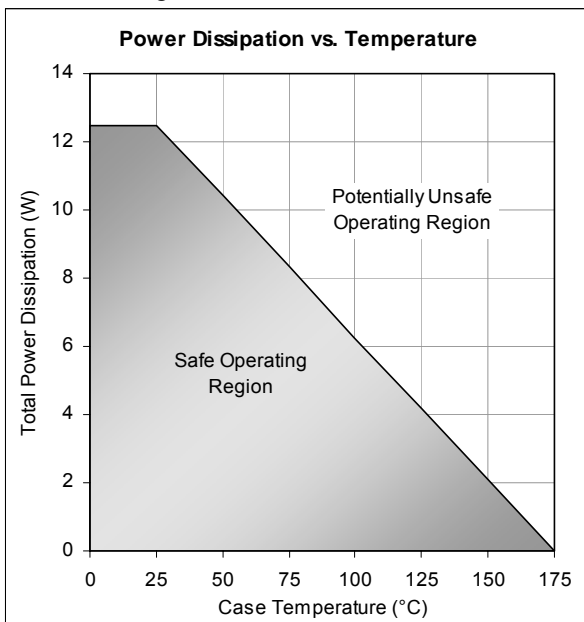


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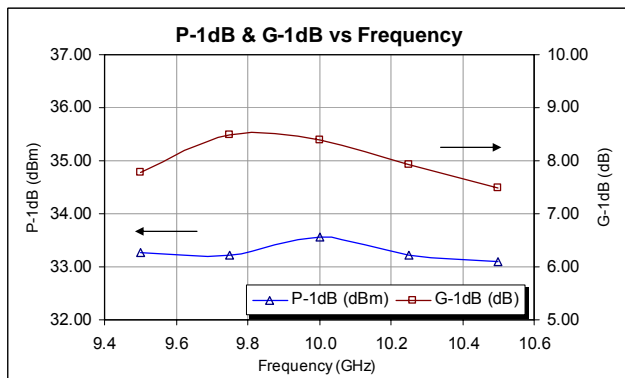
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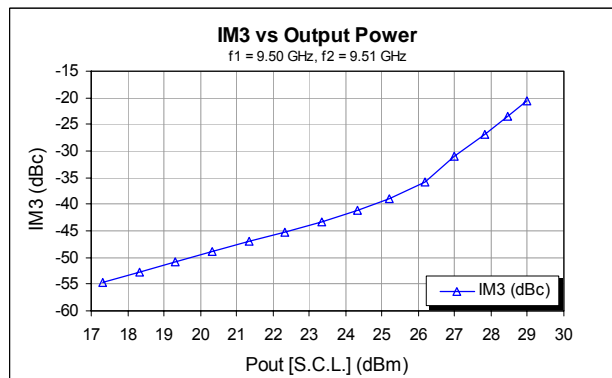
### Power De-rating Curve and IM3 Definition



### Typical Power Data ( $V_{DS} = 10\text{ V}$ , $I_{DSQ} = 550\text{ mA}$ )



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



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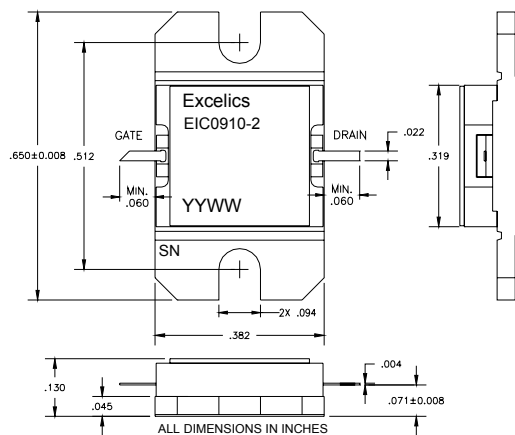
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### PACKAGES OUTLINE

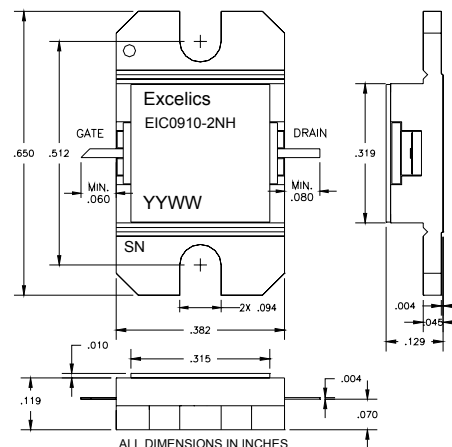
Dimensions in inches, Tolerance  $\pm .005$  unless otherwise specified

**EIC0910-2 (Hermetic)**



Caution! ESD sensitive device.

**EIC0910-2NH (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>
EIC0910-2	Hermetic	Industrial	9.50-10.50GHz	32.5	-43
EIC0910-2NH	Non-Hermetic	Industrial	9.50-10.50GHz	32.5	-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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