

UPDATED 07/20/2005

## 10.00-10.25 GHz 8-Watt Internally Matched Power FET

### FEATURES

- 10.00– 10.25GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +39.0 dBm Output Power at 1dB Compression
- 7.0 dB Power Gain at 1dB Compression
- 31% Power Added Efficiency
- -46 dBc IM3 at  $P_o = 28$  dBm SCL
- Hermetic Metal Flange Package
- 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 $f = 10.00-10.25\text{GHz}$ $V_{DS} = 9\text{ V}, I_{DSQ} \approx 2200\text{mA}$	38.0	39.0		dBm
$G_{1dB}$	Gain at 1dB Compression $f = 10.00-10.25\text{GHz}$ $V_{DS} = 9\text{ V}, I_{DSQ} \approx 2200\text{mA}$	6.5	7.5		dB
$\Delta G$	Gain Flatness $f = 10.00-10.25\text{GHz}$ $V_{DS} = 9\text{ V}, I_{DSQ} \approx 2200\text{mA}$			$\pm 0.5$	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 9\text{ V}, I_{DSQ} \approx 2200\text{mA}$ $f = 10.00-10.25\text{GHz}$		31		%
$I_{d1dB}$	Drain Current at 1dB Compression $f = 10.00-10.25\text{GHz}$		2300	2600	mA
IM3	Output 3rd Order Intermodulation Distortion $\Delta f = 10\text{ MHz}$ 2-Tone Test; $P_{out} = 28\text{ dBm S.C.L.}^2$ $V_{DS} = 9\text{ V}, I_{DSQ} \approx 65\% \text{ IDSS}$ $f = 10.25\text{ GHz}$	-43	-46		dBc
$I_{DSS}$	Saturated Drain Current $V_{DS} = 3\text{ V}, V_{GS} = 0\text{ V}$		4000	5000	mA
$V_P$	Pinch-off Voltage $V_{DS} = 3\text{ V}, I_{DS} = 40\text{ mA}$		-2.5	-4.0	V
$R_{TH}$	Thermal Resistance <sup>3</sup>		3.5	4.0	$^\circ\text{C/W}$

 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<sup>1,2</sup>

SYMBOL	CHARACTERISTIC	VALUE
$V_{DS}$	Drain to Source Voltage	10 V
$V_{GS}$	Gate to Source Voltage	-4.5 V
$I_{DS}$	Drain Current	IDSS
$I_{GSF}$	Forward Gate Current	80 mA
$P_{IN}$	Input Power	@ 3dB compression
$P_T$	Total Power Dissipation	38 W
$T_{CH}$	Channel Temperature	175 $^\circ\text{C}$
$T_{STG}$	Storage Temperature	-65/+175 $^\circ\text{C}$

Notes: 1. Operating the device beyond any of the above ratings may result in permanent damage or reduction of MTTF.

 2. Bias conditions must also satisfy the following equation  $P_T < (T_{CH} - T_{PKG})/R_{TH}$ ; where  $T_{PKG}$  = temperature of package, and  $P_T = (V_{DS} * I_{DS}) - (P_{OUT} - P_{IN})$ .

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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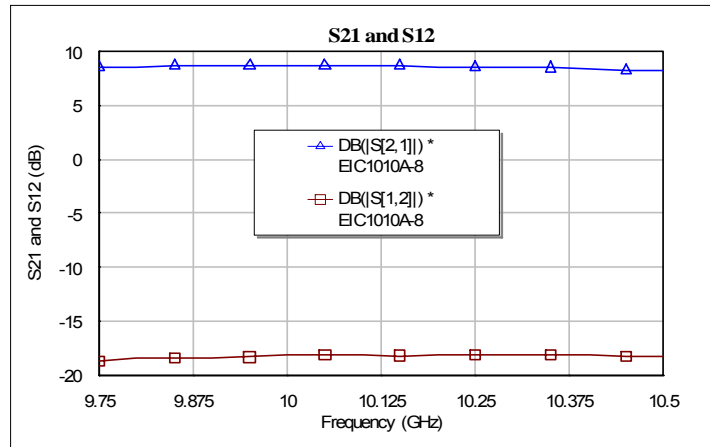
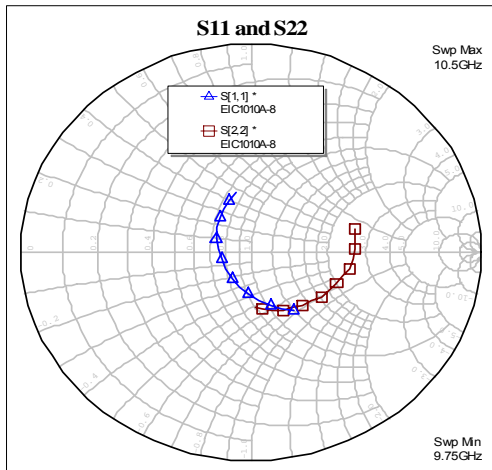
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### PERFORMANCE DATA

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

 $V_{DS} = 9\text{ V}$ ,  $I_{DSQ} \approx 2200\text{mA}$ 


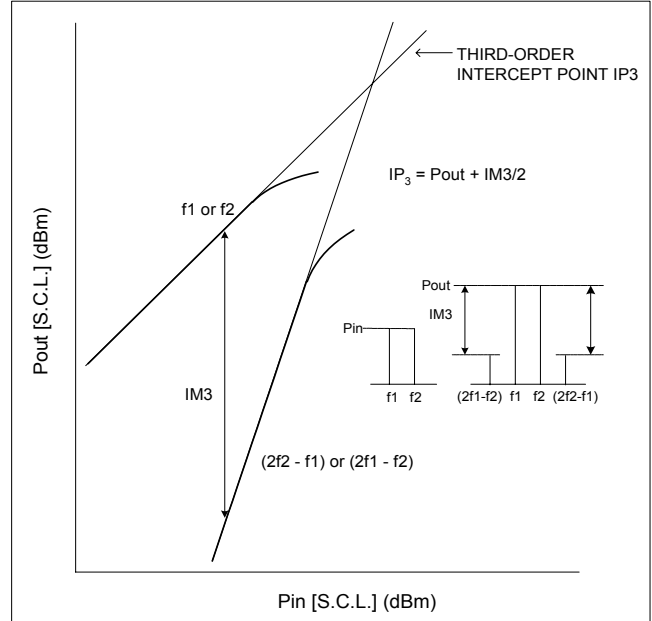
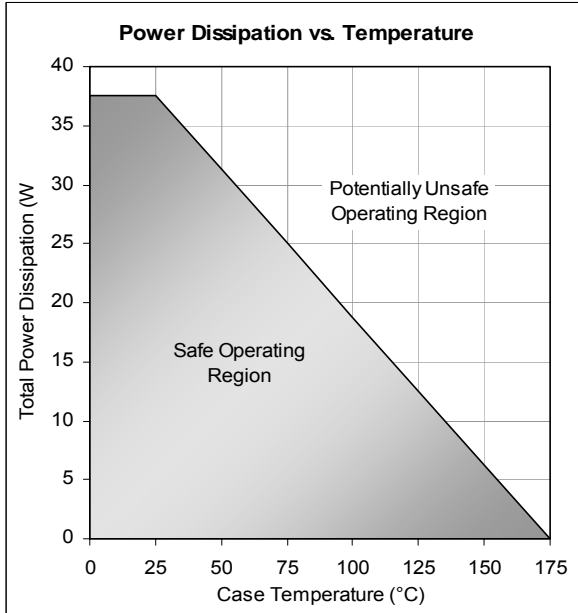
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
9.750	0.335	-56.33	2.652	129.33	0.116	84.60	0.465	13.82
9.875	0.252	-76.92	2.697	114.11	0.120	70.15	0.450	-0.78
10.000	0.171	-106.57	2.711	98.91	0.124	54.94	0.411	-15.94
10.125	0.133	-155.37	2.715	83.63	0.124	39.56	0.379	-31.58
10.250	0.166	156.13	2.679	68.11	0.123	24.26	0.339	-48.49
10.375	0.228	124.27	2.631	52.77	0.124	10.00	0.301	-67.38
10.500	0.292	103.20	2.561	38.07	0.122	-5.08	0.268	-86.62

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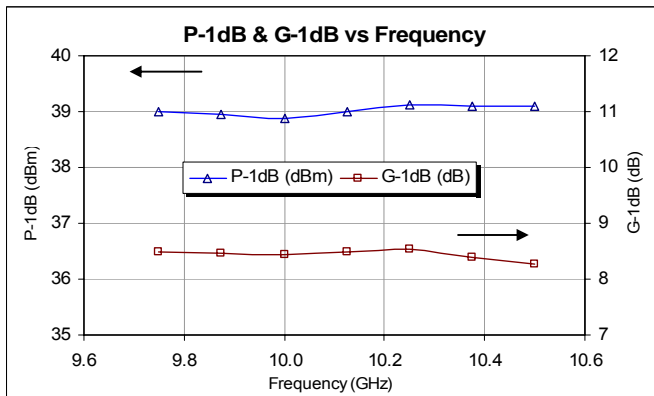
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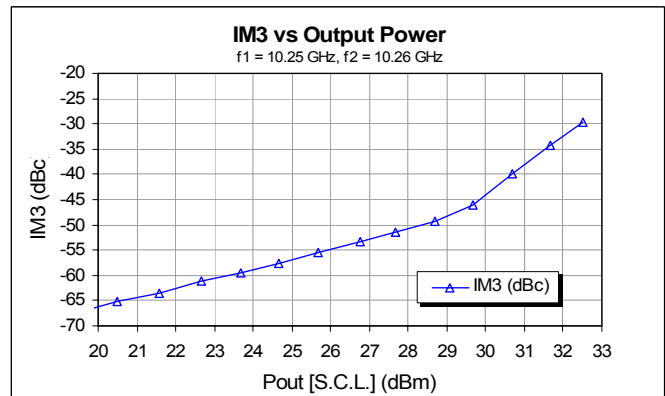
### Power De-rating Curve and IM3 Definition



### Typical Power Data ( $V_{DS} = 9\text{ V}$ , $I_{DSQ} = 2200\text{ mA}$ )



### Typical IM3 Data ( $V_{DS} = 9\text{ V}$ , $I_{DSQ} \approx 65\% IDSS$ )





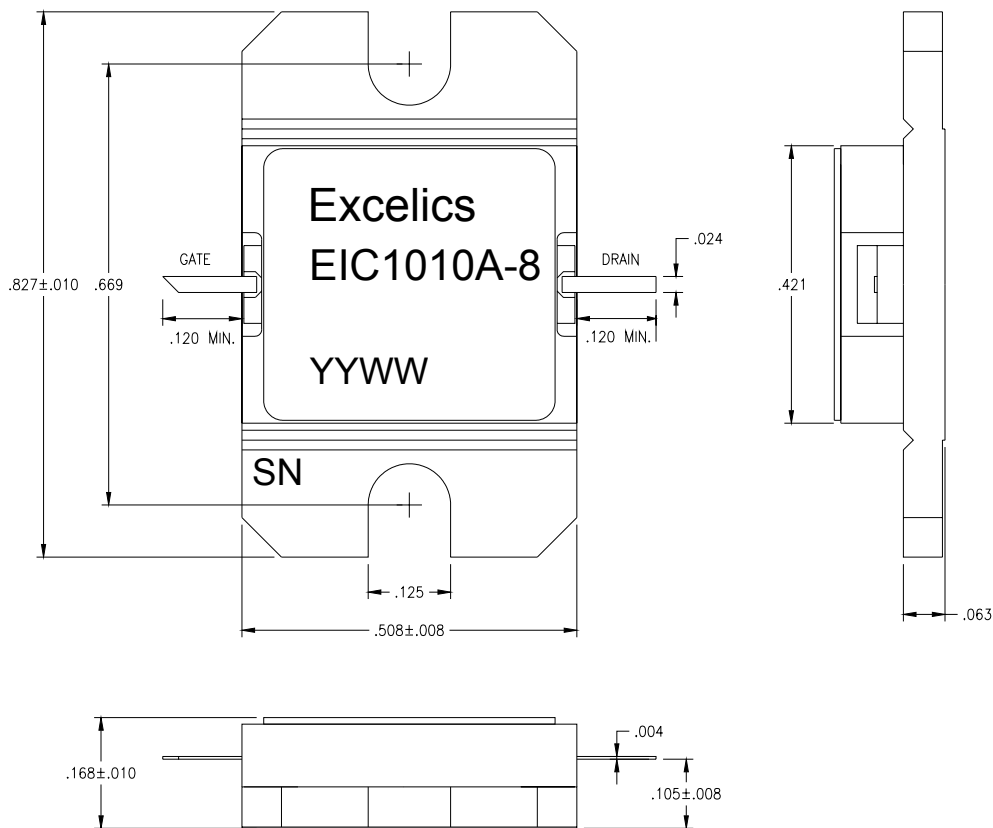
# EIC1010A-8

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### PACKAGE OUTLINE

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



### ORDERING INFORMATION

Part Number	Grade <sup>1</sup>	$f_{Test}$ (GHz)	$P_{1dB}$ (min)	$IM_3$ (min) <sup>2</sup>
EIC1010A-8	Industrial	10.00-10.25 GHz	38.0	-43

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