

### FEATURES

- 14.00-14.50 GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +39.5 dBm Output Power at 1dB Compression
- 6.5 dB Power Gain at 1dB Compression
- 27% Power Added Efficiency
- Hermetic Metal Flange Package
- 100% Tested for DC, RF, and  $R_{TH}$



### DESCRIPTION

The EID1414A1-8 is a high power, highly linear, single stage MFET amplifier in a flange mount package. This amplifier features Excelics' unique PHEMT transistor technology.



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 $f = 14.00\text{-}14.50\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 2200\text{mA}$	38.5	39.5		dBm
$G_{1dB}$	Gain at 1dB Compression $f = 14.00\text{-}14.50\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 2200\text{mA}$	5.5	6.5		dB
$\Delta G$	Gain Flatness $f = 14.00\text{-}14.50\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 2200\text{mA}$			$\pm 0.6$	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 10\text{ V}, I_{DSQ} \approx 2200\text{mA}$ $f = 14.00\text{-}14.50\text{GHz}$		27		%
$I_{d1dB}$	Drain Current at 1dB Compression $f = 14.00\text{-}14.50\text{GHz}$		2800	3600	mA
$I_{DSS}$	Saturated Drain Current $V_{DS} = 3\text{ V}, V_{GS} = 0\text{ V}$		4200	5760	mA
$V_P$	Pinch-off Voltage $V_{DS} = 3\text{ V}, I_{DS} = 40\text{ mA}$		-1.2	-2.5	V
$R_{TH}$	Thermal Resistance <sup>2</sup>		3.5	4.0	$^\circ\text{C/W}$

Notes:

1. Tested with 100 Ohm gate resistor.
2. Overall  $R_{th}$  depends on case mounting.



# EID1414A1-8

UPDATED 07/12/2007

## 14.00-14.50 GHz 8-Watt Internally-Matched Power FET

### ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION<sup>1,2</sup>

SYMBOL	CHARACTERISTIC	VALUE
V <sub>DS</sub>	Drain to Source Voltage	10 V
V <sub>GS</sub>	Gate to Source Voltage	-4.5 V
I <sub>DS</sub>	Drain Current	IDSS
I <sub>GSF</sub>	Forward Gate Current	80 mA
P <sub>IN</sub>	Input Power	@ 3dB compression
P <sub>T</sub>	Total Power Dissipation	35 W
T <sub>CH</sub>	Channel Temperature	150°C
T <sub>STG</sub>	Storage Temperature	-65/+150°C

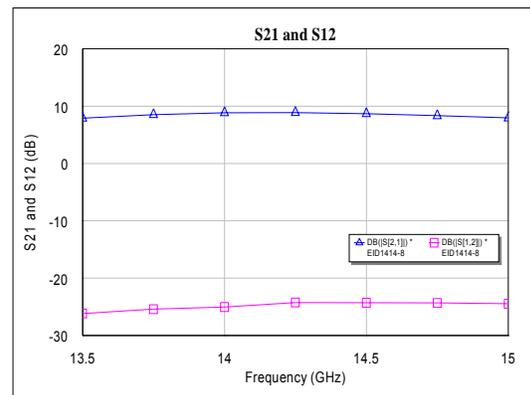
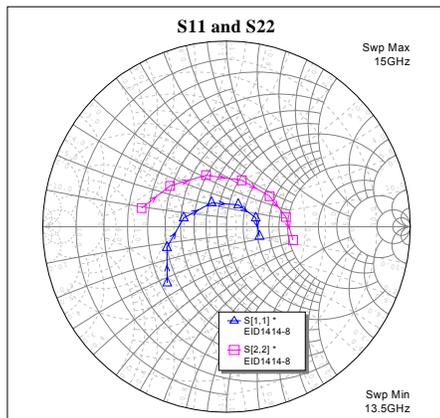
Notes:

- Operating the device beyond any of the above ratings may result in permanent damage or reduction of MTTF.
- Bias conditions must also satisfy the following equation  $P_T < (T_{CH} - T_{PKG})/R_{TH}$ ; where  $T_{PKG}$  = temperature of package, and  $P_T = (V_{DS} * I_{DS}) - (P_{OUT} - P_{IN})$ .

### PERFORMANCE DATA

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

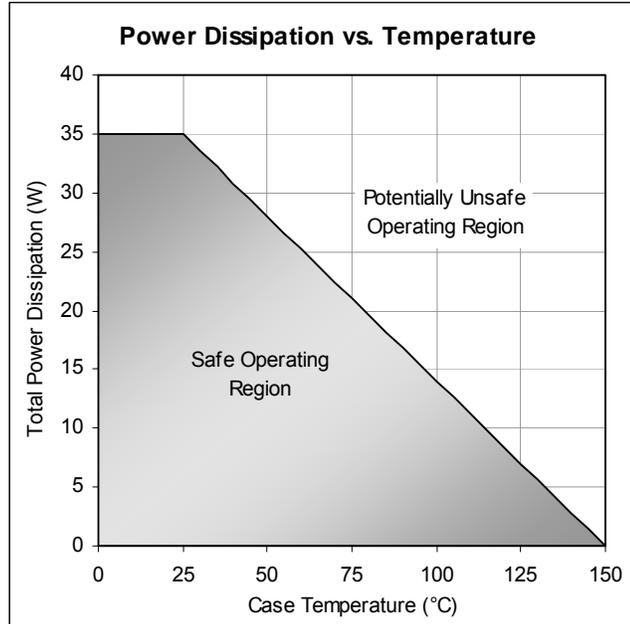
V<sub>DS</sub> = 10 V, I<sub>DSQ</sub> ≈ 2200mA



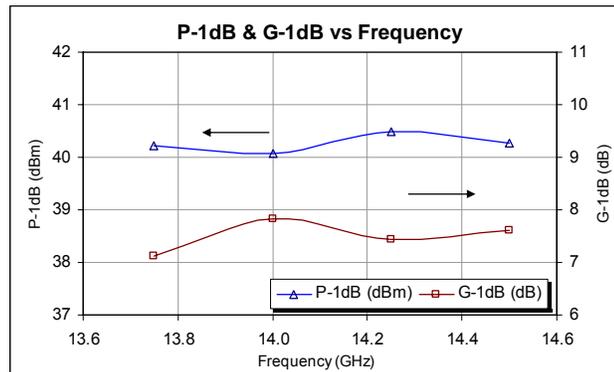
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
13.60	0.4077	-145.55	2.5516	132.84	0.0504	118.29	0.4354	159.24
13.70	0.3666	-155.39	2.6444	123.30	0.0528	105.14	0.3997	149.67
13.80	0.3254	-166.06	2.6910	114.68	0.0542	97.21	0.3624	138.73
13.90	0.2798	-178.28	2.7499	104.97	0.0560	87.14	0.3259	126.21
14.00	0.2373	168.69	2.7742	95.48	0.0561	76.29	0.2990	111.82
14.10	0.1971	152.39	2.7890	86.00	0.0580	65.56	0.2760	96.10
14.20	0.1656	132.83	2.7922	76.30	0.0610	55.52	0.2647	80.39
14.30	0.1424	109.53	2.7801	66.44	0.0601	46.74	0.2660	63.22
14.40	0.1325	86.10	2.7470	57.12	0.0615	37.32	0.2747	48.13
14.50	0.1346	61.35	2.7206	47.94	0.0610	27.10	0.2865	35.06
14.60	0.1456	41.09	2.6903	38.72	0.0610	15.70	0.3018	23.52
14.70	0.1612	23.89	2.6450	29.91	0.0606	5.80	0.3201	13.11
14.80	0.1724	9.26	2.5955	20.97	0.0602	-2.53	0.3389	4.09
14.90	0.1832	-3.80	2.5416	12.02	0.0587	-14.26	0.3527	-4.26

Specifications are subject to change without notice.

### Power De-rating Curve



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





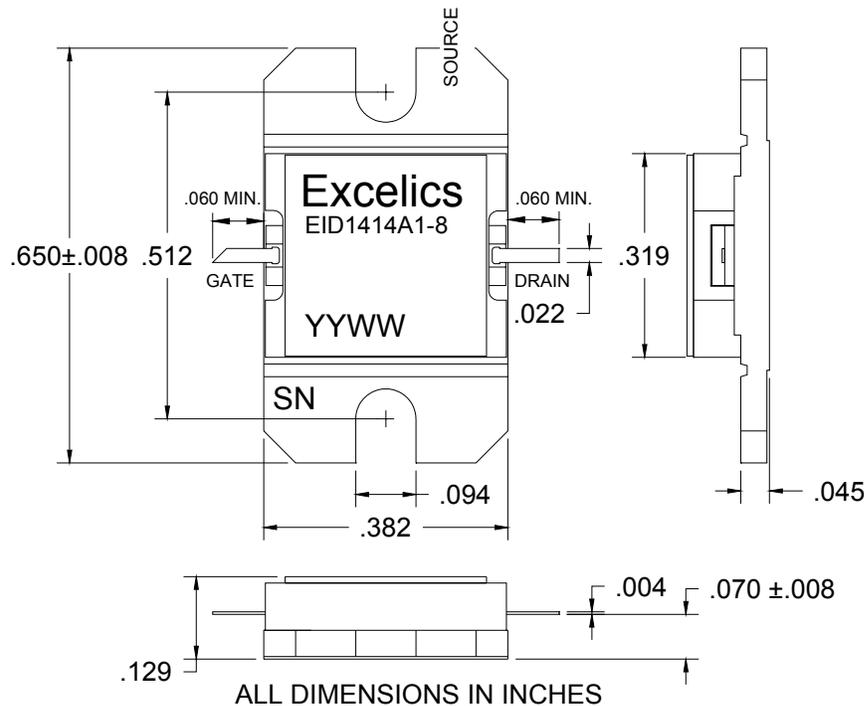
# EID1414A1-8

UPDATED 07/12/2007

## 14.00-14.50 GHz 8-Watt Internally-Matched Power FET

### PACKAGE OUTLINE

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



### ORDERING INFORMATION

Part Number	Grade <sup>1</sup>	f <sub>Test</sub> (GHz)	P <sub>1dB</sub> (min)
EID1414A1-8	Industrial	14.00-14.50 GHz	38.5

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

### DISCLAIMER

EXCELICS SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. EXCELICS DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN.

### LIFE SUPPORT POLICY

EXCELICS SEMICONDUCTOR PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF EXCELICS SEMICONDUCTOR, INC. AS HERE IN:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
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

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)

page 4 of 4  
Revised July 2007