EIC4450-8

4.4-5.0 GHz 8-Watt Internally-Matched Power FET

FEATURES

- **4.4 – 5.0 GHz Bandwidth**
- **Input/Output Impedance Matched to 50 Ohms**
- **+39.5 dBm Output Power at 1dB Compression**
- **10.5 dB Power Gain at 1dB Compression**
- **36% Power Added Efficiency**
- **-46 dBc IM3 at Po = 28.5 dBm SCL**
- **Hermetic Metal Flange Package**
- **100% Tested for DC, RF, and R_{TH}**

DESCRIPTION

The EIC4450-8 is a high power, highly linear, single stage MFET amplifier in a flange mount package. This amplifier features Excelics' unique MESFET transistor technology.

Caution! ESD sensitive device.

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

SYMBOL	PARAMETERS/TEST CONDITIONS[1]	MIN	TYP	MAX	UNITS
P_{1dB}	Output Power at 1dB Compression f = 4.4-5.0 GHz V_{DS} = 10 V, I_{DSQ} ≈ 2200 mA	38.5	39.5		dBm
G_{1dB}	Gain at 1dB Compression f = 4.4-5.0 GHz V_{DS} = 10 V, I_{DSQ} ≈ 2200 mA	9.5	10.5		dB
ΔG	Gain Flatness f = 4.4-5.0 GHz V_{DS} = 10 V, I_{DSQ} ≈ 2200 mA			±0.6	dB
PAE	Power Added Efficiency at 1dB Compression V_{DS} = 10 V, I_{DSQ} ≈ 2200 mA f = 4.4-5.0 GHz		36		%
Id_{1dB}	Drain Current at 1dB Compression f = 4.4-5.0 GHz		2200	2600	mA
IM3	Output 3rd Order Intermodulation Distortion Δf = 10 MHz 2-Tone Test; Pout = 28.5 dBm S.C.L[2] V_{DS} = 10 V, I_{DSQ} ≈ 65% IDSS f = 5.0 GHz	-43	-46		dBc
I_{DSS}	Saturated Drain Current V_{DS} = 3 V, V_{GS} = 0 V		4000	4500	mA
V_P	Pinch-off Voltage V_{DS} = 3 V, I_{DS} = 40 mA		-2.5	-4.0	V
R_{TH}	Thermal Resistance[3]		3.5	4.0	°C/W

Notes:
1. Tested with 100 Ohm gate resistor.
2. S.C.L. = Single Carrier Level.
3. Overall Rth depends on case mounting.

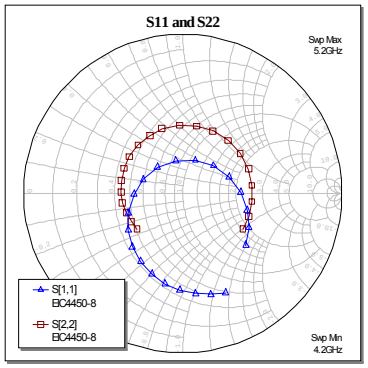
ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION[1,2]

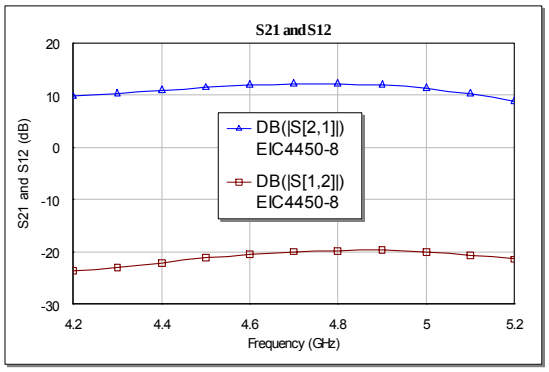
SYMBOL	CHARACTERISTIC	VALUE
V_{DS}	Drain to Source Voltage	10 V
V_{GS}	Gate to Source Voltage	-4.5 V
I_{DS}	Drain Current	IDSS
I_{GSF}	Forward Gate Current	80 mA
P_{IN}	Input Power	@ 3dB compression
P_T	Total Power Dissipation	32 W
T_{CH}	Channel Temperature	150°C
T_{STG}	Storage Temperature	-65/+150°C

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 $P_T = (V_{DS} * I_{DS}) - (P_{OUT} - P_{IN})$.

PERFORMANCE DATA

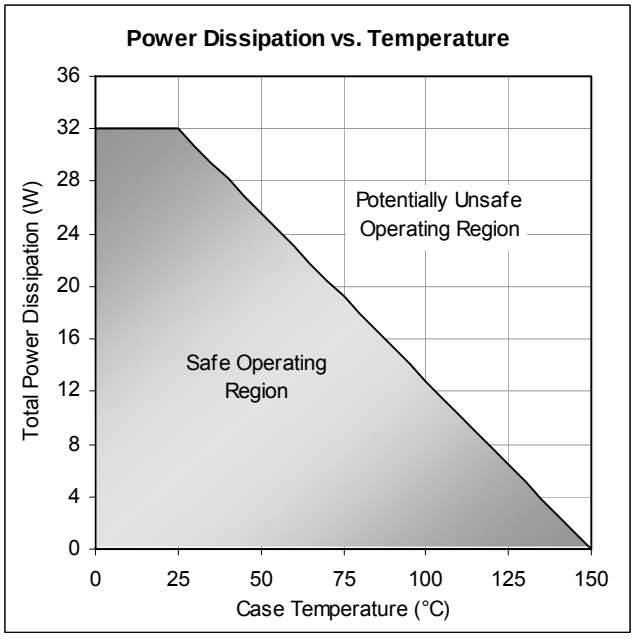
Typical S-Parameters (T= 25°C, 50Ω system, de-embedded to edge of package)
V_{DS} = 10 V, I_{DSQ} ≈ 2200mA

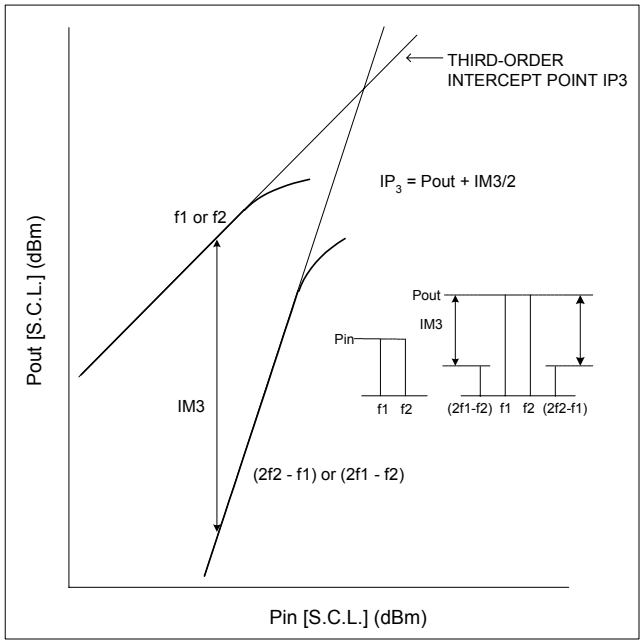




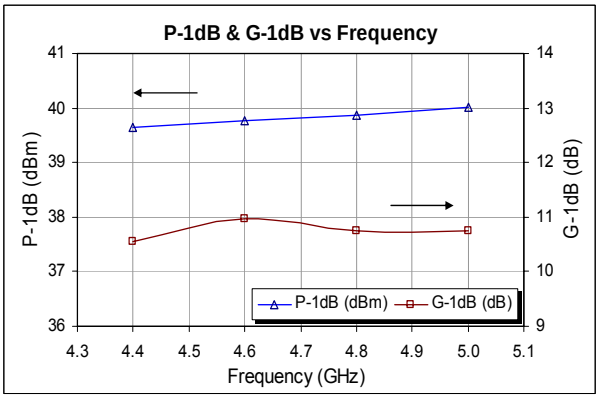
FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
4.0	0.7503	-37.83	2.703	97.27	0.0555	43.87	0.3563	-105.99
4.2	0.6786	-66.68	3.0738	66.41	0.0662	11.77	0.3648	-142.14
4.4	0.5779	-101.09	3.5153	32.39	0.0788	-21.55	0.3889	178.7
4.6	0.4132	-146.28	3.9355	-6.5	0.0954	-60.58	0.4149	132.78
4.8	0.2292	134.17	4.0571	-50.3	0.1033	-105.97	0.4326	78.67
5.0	0.308	19.37	3.6482	-96.93	0.0989	-153.5	0.4399	20.6
5.2	0.5127	-39.49	2.78	-140.48	0.0854	160.93	0.4385	-30.72
5.4	0.6658	-77.6	1.9617	-177.01	0.0678	119.63	0.4493	-70.46
5.6	0.7585	-107.39	1.3733	153.13	0.0532	81.38	0.4784	-98.19
5.8	0.8058	-133.11	1.0074	126.36	0.0414	46.84	0.5605	-121.4
6.0	0.8356	-155.36	0.7453	101.98	0.0333	18.09	0.6098	-141.51

Power De-rating Curve and IM3 Definition

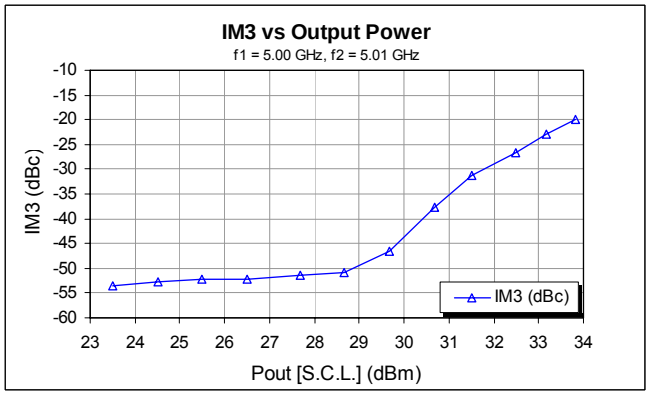




Typical Power Data (V_{DS} = 10 V, I_{DSQ} = 2200 mA)

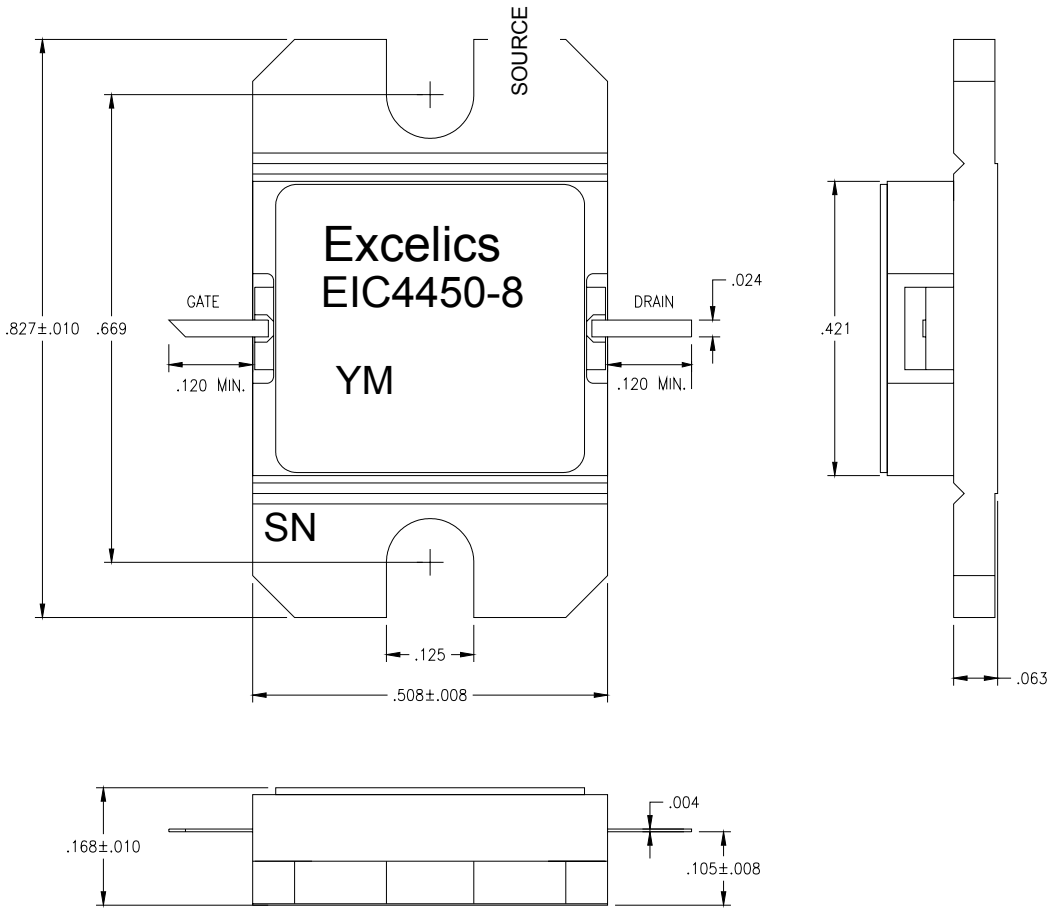


Typical IM3 Data (V_{DS} = 10 V, I_{DSQ} ≈ 65% IDSS)



PACKAGE OUTLINE

Dimensions in inches, Tolerance ± .005 unless otherwise specified



ORDERING INFORMATION

Part Number	Grade[1]	f_{Test} (GHz)	P_{1dB} (min)	IM_3 (min)[2]
EIC4450-8	Industrial	4.4-5.0 GHz	38.5	-43

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