EIC4450-4

4.4-5.0 GHz 4-Watt Internally-Matched Power FET

Issued Date: 06-17-04

FEATURES

- **4.4 – 5.0 GHz Bandwidth**
- **Input/Output Impedance Matched to 50 Ohms**
- **+36.5 dBm Output Power at 1dB Compression**
- **11.5 dB Power Gain at 1dB Compression**
- **37% Power Added Efficiency**
- **-46 dBc IM3 at Po = 25.5 dBm SCL**
- **Hermetic Metal Flange Package**
- **100% Tested for DC, RF, and R_{TH}**

Caution! ESD sensitive device.

DESCRIPTION

The EIC4450-4 is a high power, highly linear, single stage MFET amplifier in a flange mount package. This amplifier features Excelics' unique MESFET transistor technology.

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

SYMBOL	PARAMETERS/TEST CONDITIONS[1]	MIN	TYP	MAX	UNITS
P_{1dB}	Output Power at 1dB Compression f = 4.4-5.0GHz V_{DS} = 10 V, I_{DSQ} ≈ 1100mA	35.5	36.5		dBm
G_{1dB}	Gain at 1dB Compression f = 4.4-5.0GHz V_{DS} = 10 V, I_{DSQ} ≈ 1100mA	10.5	11.5		dB
ΔG	Gain Flatness f = 4.4-5.0GHz V_{DS} = 10 V, I_{DSQ} ≈ 1100mA			±0.6	dB
PAE	Power Added Efficiency at 1dB Compression V_{DS} = 10 V, I_{DSQ} ≈ 1100mA f = 4.4-5.0GHz		37		%
Id_{1dB}	Drain Current at 1dB Compression f = 4.4-5.0GHz		1200	1500	mA
IM3	Output 3rd Order Intermodulation Distortion Δf = 10 MHz 2-Tone Test; Pout = 25.5 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		2000	2500	mA
V_P	Pinch-off Voltage V_{DS} = 3 V, I_{DS} = 20 mA		-2.5	-4.0	V
R_{TH}	Thermal Resistance[3]		5.5	6.0	°C/W

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

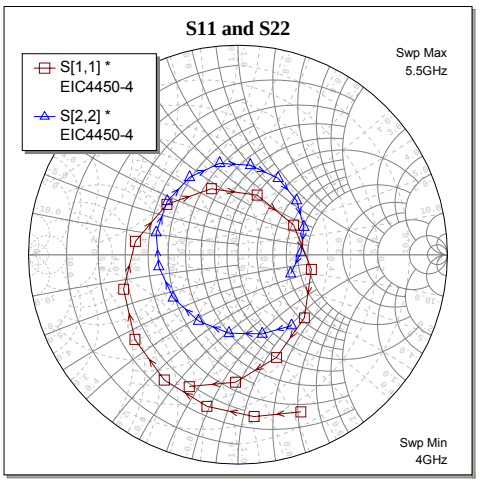
ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION[1,2]

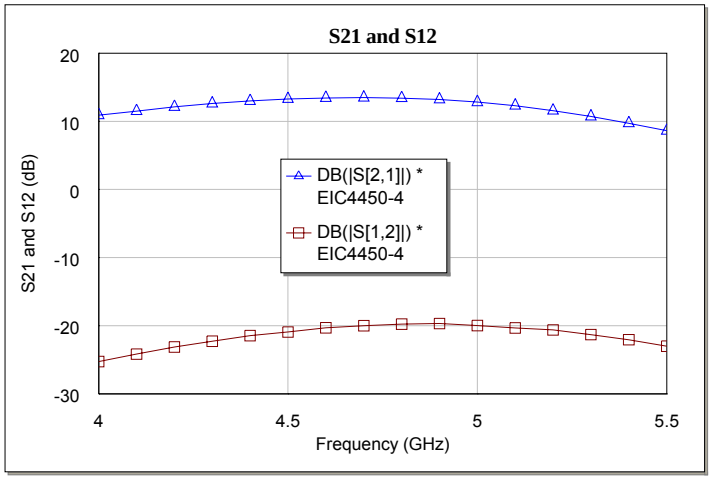
SYMBOL	CHARACTERISTIC	VALUE
V_{DS}	Drain to Source Voltage	10 V
V_{GS}	Gate to Source Voltage	-4.5 V
I_{DS}	Drain Current	IDSS
I_{GSF}	Forward Gate Current	40 mA
P_{IN}	Input Power	@ 3dB compression
P_T	Total Power Dissipation	21 W
T_{CH}	Channel Temperature	150°C
T_{STG}	Storage Temperature	-65/+150°C

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

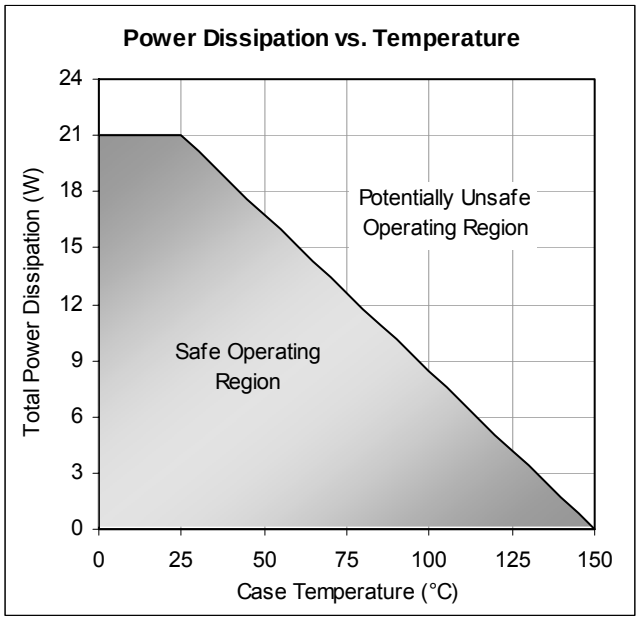
Typical S-Parameters (T= 25°C, 50Ω system, de-embedded to edge of package)
V_{DS} = 10 V, I_{DSQ} ≈ 1100mA

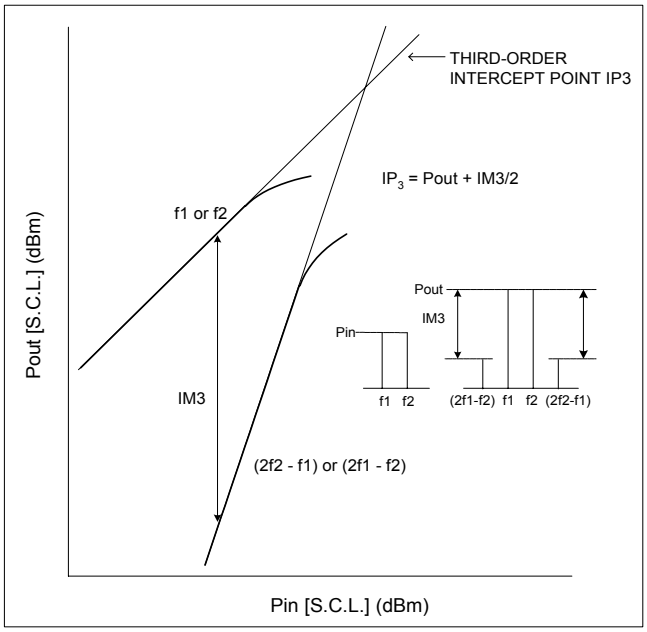




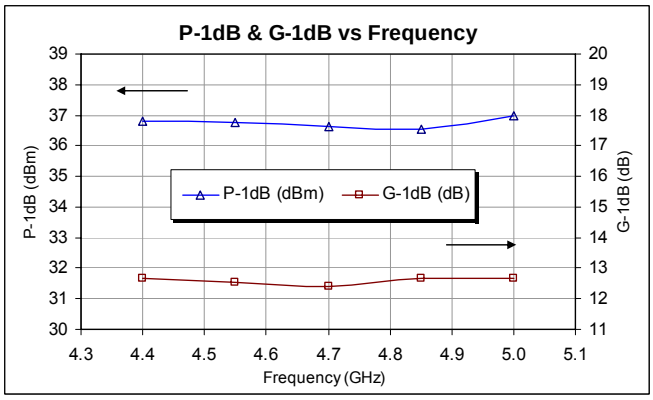
FREQ (GHz)	--- S11 --- MAG	ANG	--- S21 --- MAG	ANG	--- S12 --- MAG	ANG	--- S22 --- MAG	ANG
4.00	0.808	-68.190	3.508	99.990	0.055	37.090	0.424	-52.880
4.25	0.713	-110.590	4.141	59.190	0.074	-2.750	0.368	-108.070
4.50	0.570	-163.190	4.620	13.810	0.090	-49.090	0.382	-171.490
4.75	0.383	129.460	4.719	-34.020	0.102	-96.850	0.429	132.270
5.00	0.301	28.000	4.375	-83.660	0.100	-145.990	0.431	82.100
5.25	0.481	-56.790	3.625	-132.810	0.090	165.590	0.364	33.460
5.50	0.671	-110.260	2.699	-177.940	0.071	122.650	0.268	-19.720
5.75	0.795	-149.080	1.929	141.910	0.053	84.390	0.240	-76.080
6.00	0.869	-179.020	1.365	106.080	0.040	51.160	0.290	-122.110
6.25	0.909	156.420	0.965	72.960	0.028	27.210	0.380	-155.490
6.50	0.933	135.760	0.681	42.570	0.020	0.750	0.488	178.060

Power De-rating Curve and IM3 Definition

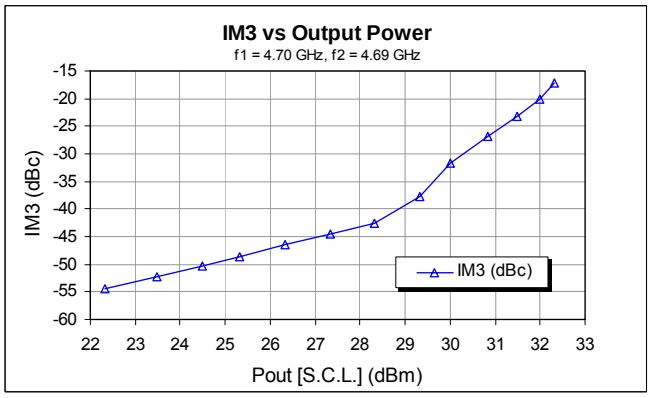




Typical Power Data (V_{DS} = 10 V, I_{DSQ} = 1100 mA)

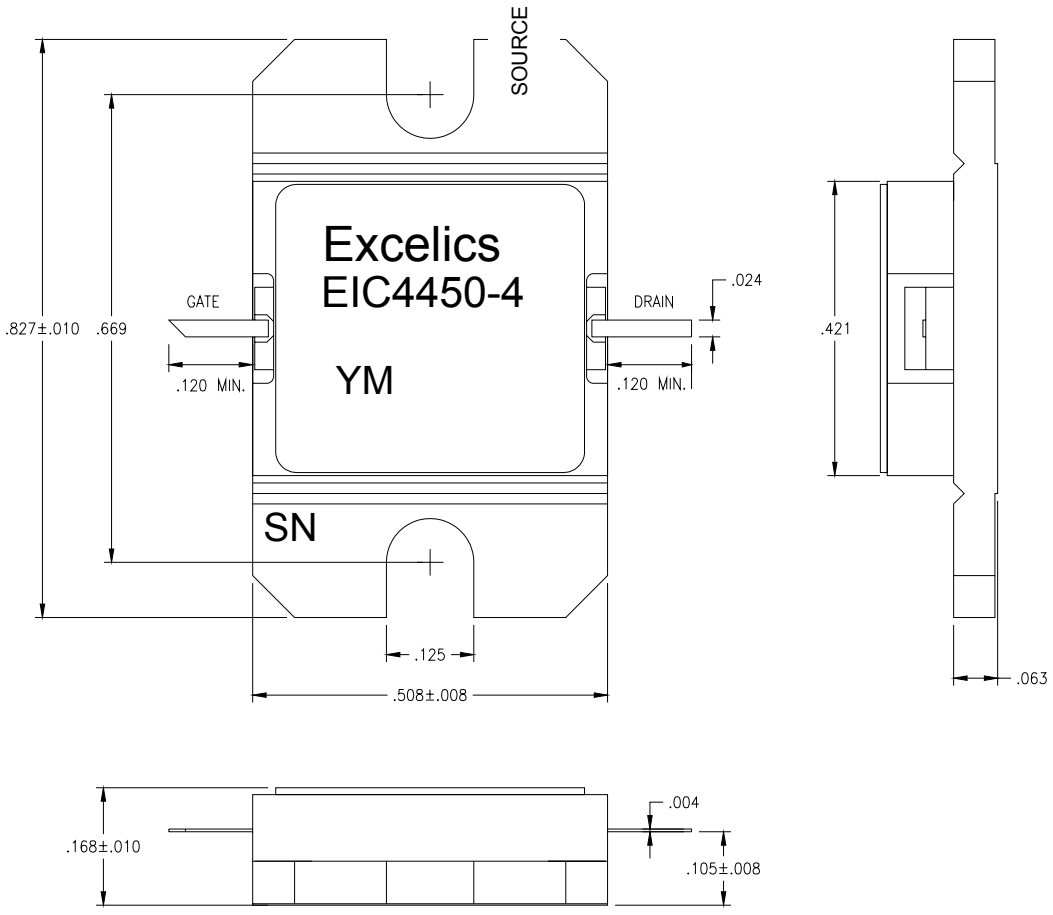


Typical IM3 Data (V_{DS} = 10 V, I_{DSQ} ≈ 65% IDSS)



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]
EIC4450-4	Industrial	4.4-5.0 GHz	35.5	-43

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