EIC0910-4

9.50-10.50 GHz 4-Watt Internally-Matched Power FET

Issued Date: 04-27-04

FEATURES

- **9.50-10.50 GHz Bandwidth**
- **Input/Output Impedance Matched to 50 Ohms**
- **+36.5 dBm Output Power at 1dB Compression**
- **7.5 dB Power Gain at 1dB Compression**
- **30% 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 EIC0910-4 is a high power, highly linear, single stage MFET amplifier in a flange mount package. This amplifier features Excelics' unique PHEMT 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 = 9.50-10.50GHz V_{DS} = 10 V, I_{DSQ} = 1100mA	35.5	36.5		dBm
G_{1dB}	Gain at 1dB Compression f = 9.50-10.50GHz V_{DS} = 10 V, I_{DSQ} = 1100mA	6.5	7.5		dB
ΔG	Gain Flatness f = 9.50-10.50GHz 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 = 9.50-10.50GHz		30		%
Id_{1dB}	Drain Current at 1dB Compression f = 9.50-10.50GHz		1200	1300	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 = 10.50GHz	-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.

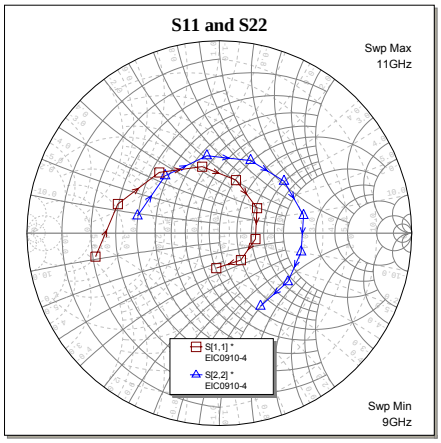
ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION[1,2]

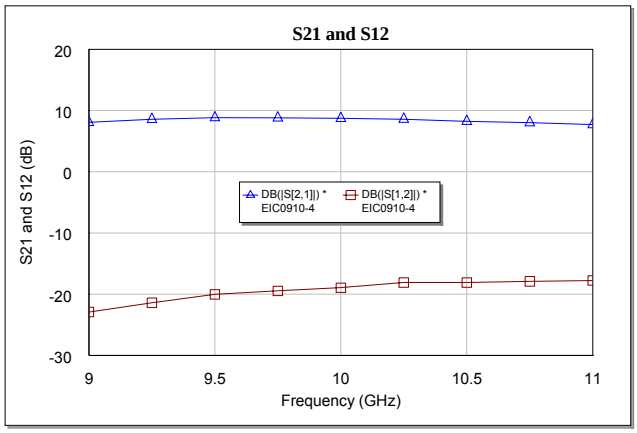
SYMBOL	CHARACTERISTIC	VALUE
V_{DS}	Drain to Source Voltage	10 V
V_{GS}	Gate to Source Voltage	-4.5 V
I_{DS}	Drain Current	IDSS
I_{GSF}	Forward Gate Current	40 mA
P_{IN}	Input Power	@ 3dB compression
P_T	Total Power Dissipation	20 W
T_{CH}	Channel Temperature	150°C
T_{STG}	Storage Temperature	-65/+150°C

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

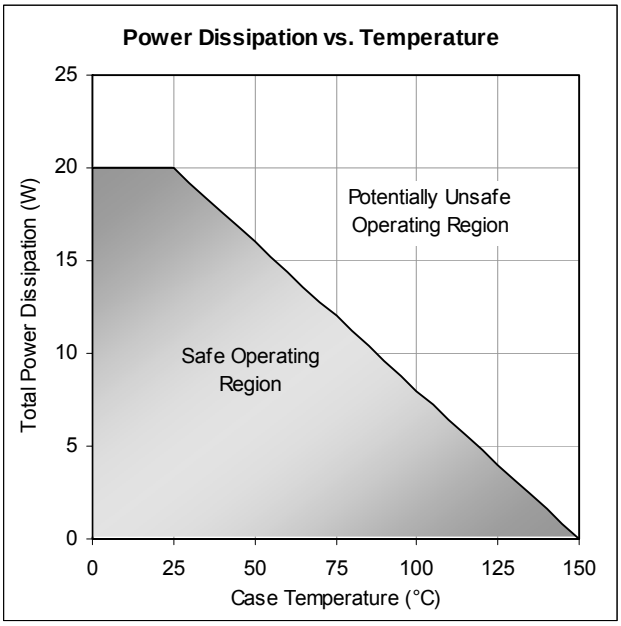
Typical S-Parameters (T= 25°C, 50Ω system, de-embedded to edge of package)
V_{DS} = 10 V, I_{DSQ} = 1100mA

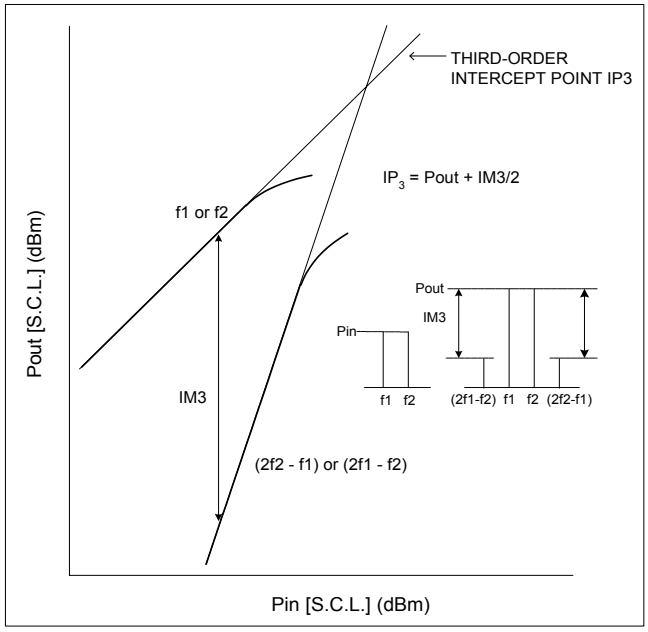




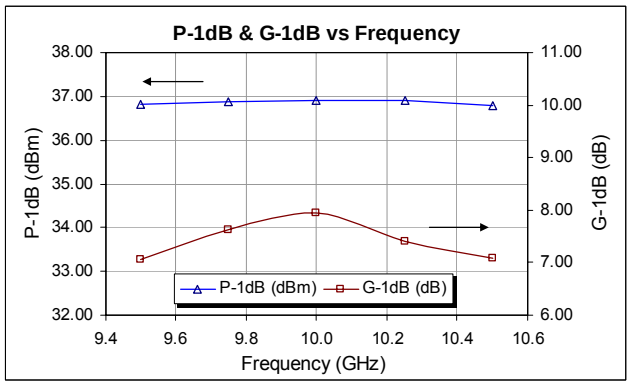
FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
8.75	0.737	-144.630	2.269	-6.970	0.057	-49.810	0.470	-160.060
9.00	0.655	-169.280	2.531	-33.010	0.071	-78.500	0.435	168.080
9.25	0.549	164.010	2.683	-59.860	0.085	-105.960	0.411	133.320
9.50	0.444	134.710	2.765	-86.790	0.100	-134.450	0.408	99.190
9.75	0.357	104.470	2.755	-112.980	0.106	-161.110	0.411	66.750
10.00	0.289	72.550	2.727	-137.970	0.113	174.650	0.431	38.790
10.25	0.235	33.570	2.687	-163.320	0.124	150.320	0.447	11.850
10.50	0.191	-9.260	2.581	172.160	0.124	124.660	0.437	-12.860
10.75	0.179	-51.300	2.519	148.030	0.127	101.940	0.436	-35.330
11.00	0.182	-94.880	2.427	123.370	0.129	78.470	0.436	-60.600
11.25	0.183	-136.850	2.332	98.400	0.131	53.300	0.431	-86.500

Power De-rating Curve and IM3 Definition

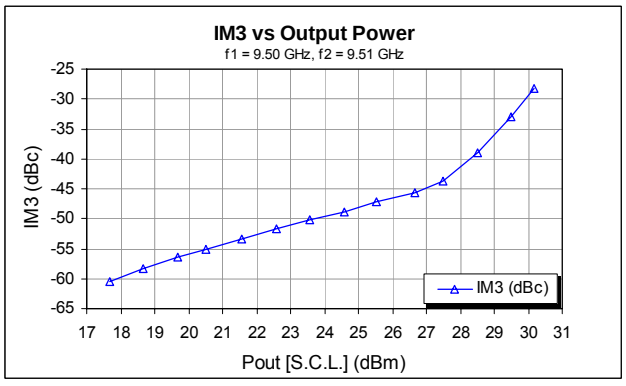




Typical Power Data (V_{DS} = 10 V, I_{DSQ} = 1100 mA)

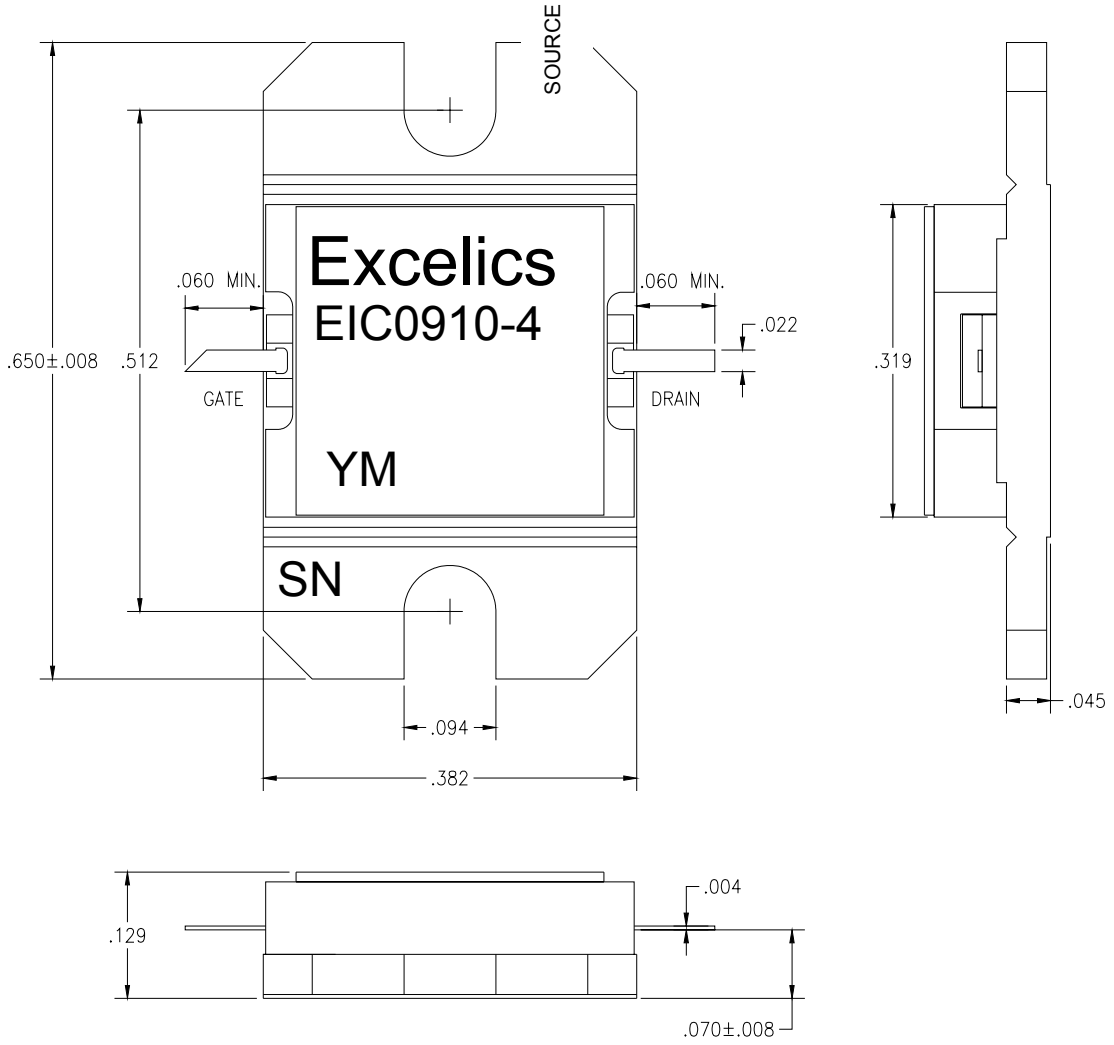


Typical IM3 Data (V_{DS} = 10 V, I_{DSQ} ≈ 65% IDSS)



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]
EIC0910-4	Industrial	9.50-10.50 GHz	35.5	-43.0

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