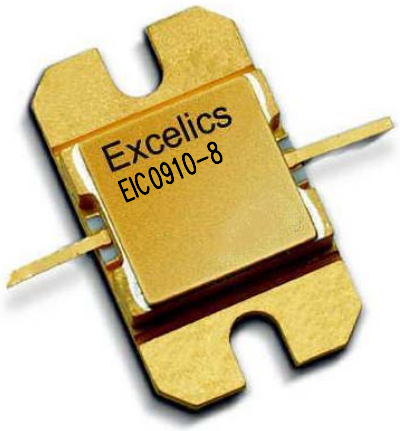
EIC0910-8

9.50-10.50 GHz 8-Watt Internally-Matched Power FET

Issued Date: 06-07-04

FEATURES

- **9.50 – 10.50 GHz Bandwidth**
- **Input/Output Impedance Matched to 50 Ohms**
- **+39.5 dBm Output Power at 1dB Compression**
- **7.5 dB Power Gain at 1dB Compression**
- **30% Power Added Efficiency**
- **-43 dBc IM3 at Po = 28.5 dBm SCL**
- **Hermetic Metal Flange Package**
- **100% Tested for DC, RF, and R_{TH}**



Caution! ESD sensitive device.

DESCRIPTION

The EIC0910-8 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 = 9.50-10.50GHz V_{DS} = 10 V, I_{DSQ} ≈ 2200mA	38.5	39.5		dBm
G_{1dB}	Gain at 1dB Compression f = 9.50-10.50GHz V_{DS} = 10 V, I_{DSQ} ≈ 2200mA	6.5	7.5		dB
ΔG	Gain Flatness f = 9.50-10.50GHz V_{DS} = 10 V, I_{DSQ} ≈ 2200mA			±0.6	dB
PAE	Power Added Efficiency at 1dB Compression V_{DS} = 10 V, I_{DSQ} ≈ 2200mA f = 9.50-10.50GHz		30		%
Id_{1dB}	Drain Current at 1dB Compression f = 9.50-10.50GHz		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 = 10.50 GHz	-40	-43		dBc
I_{DSS}	Saturated Drain Current V_{DS} = 3 V, V_{GS} = 0 V		3700	4300	mA
V_P	Pinch-off Voltage V_{DS} = 3 V, I_{DS} = 40 mA		-2.5	-4.0	V
R_{TH}	Thermal Resistance[3]		2.5	3.5	°C/W

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

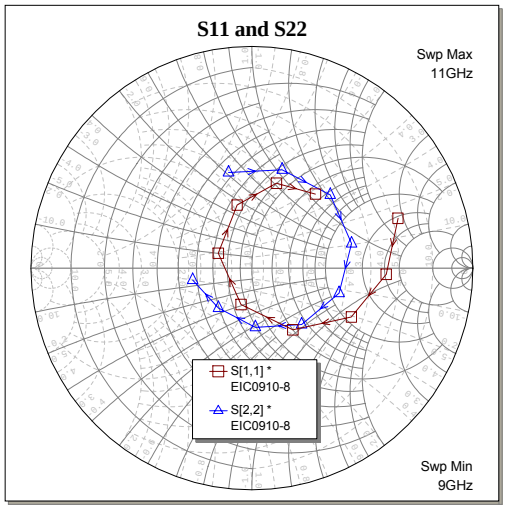
ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION[1,2]

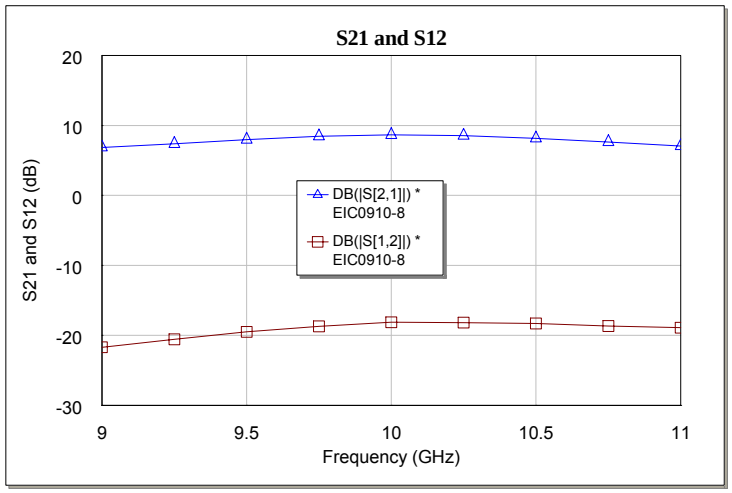
SYMBOL	CHARACTERISTIC	VALUE
V_{DS}	Drain to Source Voltage	10 V
V_{GS}	Gate to Source Voltage	-4.5 V
I_{DS}	Drain Current	IDSS
I_{GSF}	Forward Gate Current	80 mA
P_{IN}	Input Power	@ 3dB compression
P_T	Total Power Dissipation	35 W
T_{CH}	Channel Temperature	150°C
T_{STG}	Storage Temperature	-65/+150°C

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

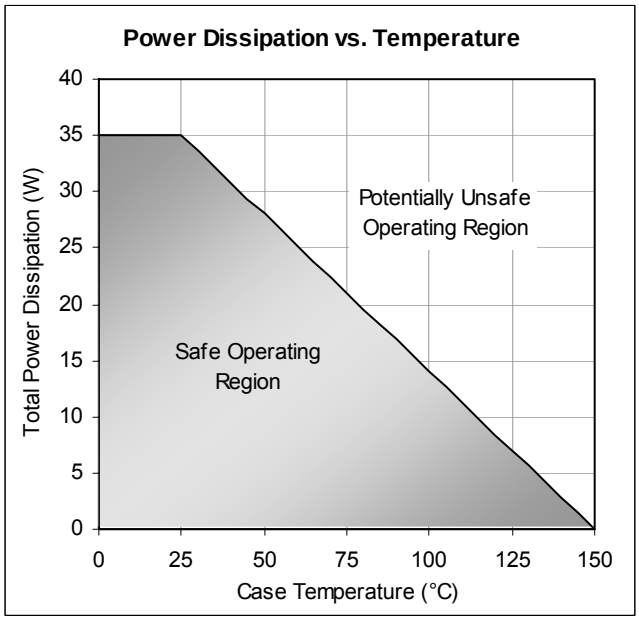
Typical S-Parameters (T= 25°C, 50Ω system, de-embedded to edge of package)
V_{DS} = 10 V, I_{DSQ} ≈ 2200mA

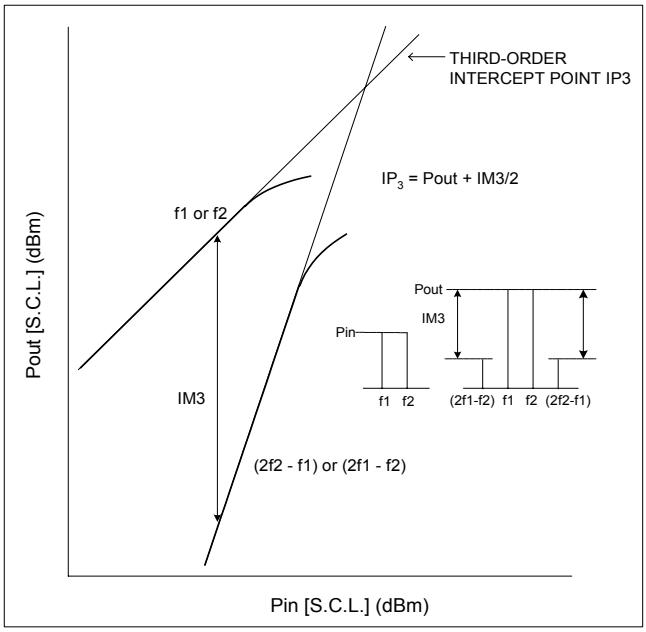




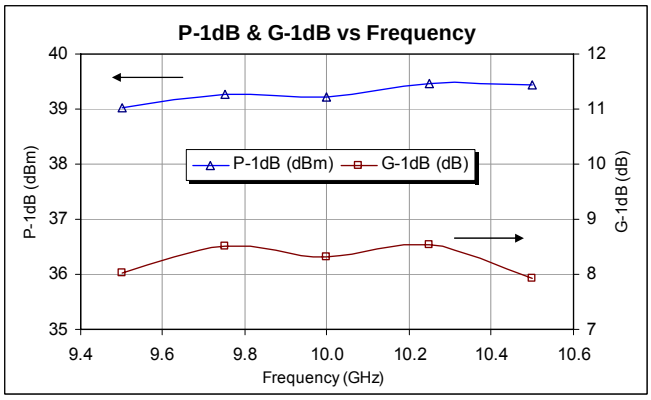
FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
8.75	0.762	39.140	2.089	-121.460	0.075	-169.770	0.429	137.700
9.00	0.698	18.780	2.205	-147.410	0.082	165.740	0.444	103.800
9.25	0.608	-2.610	2.339	-174.210	0.094	139.390	0.464	72.840
9.50	0.501	-26.030	2.511	158.700	0.106	113.610	0.484	42.960
9.75	0.335	-56.330	2.652	129.330	0.116	84.600	0.465	13.820
10.00	0.171	-106.570	2.711	98.910	0.124	54.940	0.411	-15.940
10.25	0.166	156.130	2.679	68.110	0.123	24.260	0.339	-48.490
10.50	0.292	103.200	2.561	38.070	0.122	-5.080	0.268	-86.620
10.75	0.399	73.790	2.414	9.130	0.117	-33.680	0.235	-130.070
11.00	0.441	49.230	2.258	-19.300	0.113	-61.740	0.274	-168.690
11.25	0.419	28.540	2.158	-47.480	0.113	-91.500	0.360	162.890

Power De-rating Curve and IM3 Definition

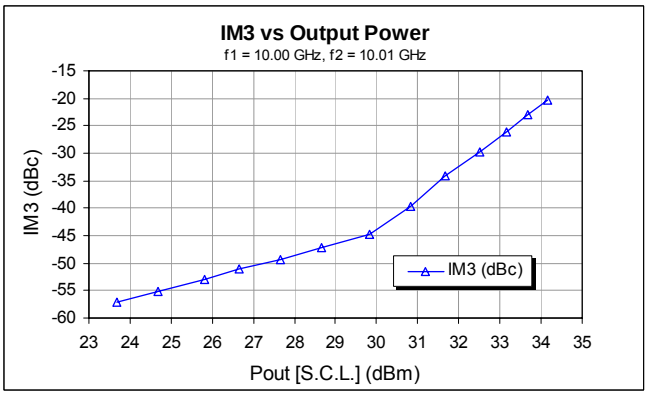




Typical Power Data (V_{DS} = 10 V, I_{DSQ} = 2200 mA)

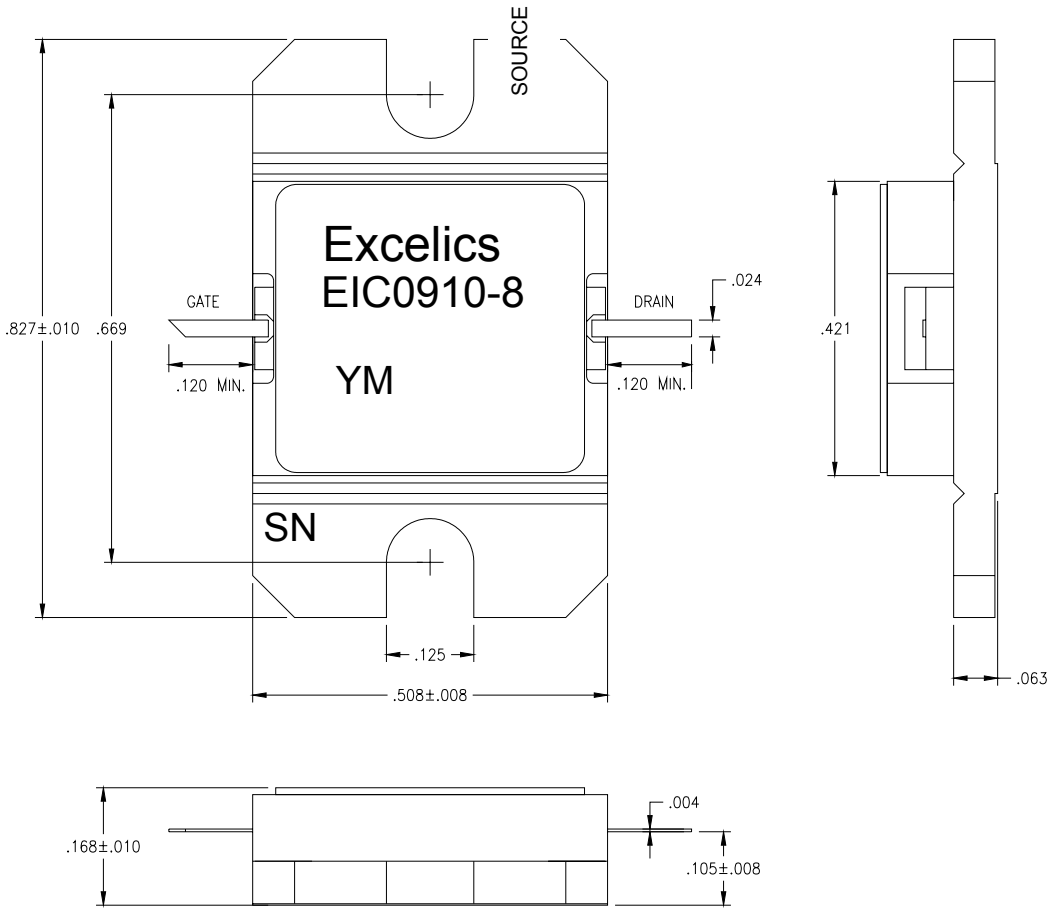


Typical IM3 Data (V_{DS} = 10 V, I_{DSQ} ≈ 65% IDSS)



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]
EIC0910-8	Industrial	9.50-10.50 GHz	38.5	-40

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