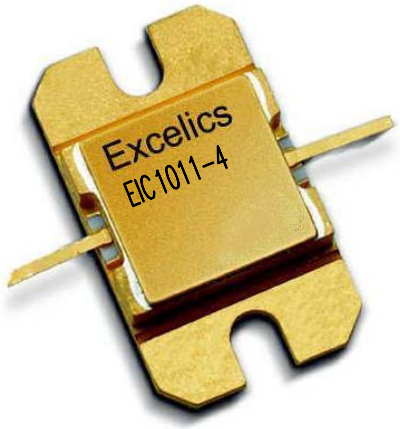
EIC1011-4

10.70-11.70 GHz 4-Watt Internally-Matched Power FET

FEATURES

- **10.70-11.70 GHz Bandwidth**
- **Input/Output Impedance Matched to 50 Ohms**
- **+36.0 dBm Output Power at 1dB Compression**
- **6.5 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 EIC1011-4 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 = 10.7-11.7GHz V_{DS} = 10 V, I_{DSQ} = 1100mA	35.5	36.0		dBm
G_{1dB}	Gain at 1dB Compression f = 10.7-11.7GHz V_{DS} = 10 V, I_{DSQ} = 1100mA	5.5	6.5		dB
ΔG	Gain Flatness f = 10.7-11.7GHz 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 = 10.7-11.7GHz		30		%
Id_{1dB}	Drain Current at 1dB Compression f = 10.7-11.7GHz		1100	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 = 11.7GHz	-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.

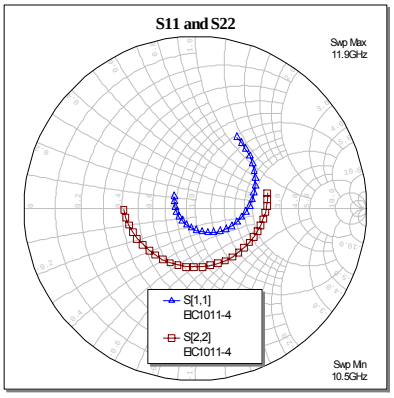
ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION[1,2]

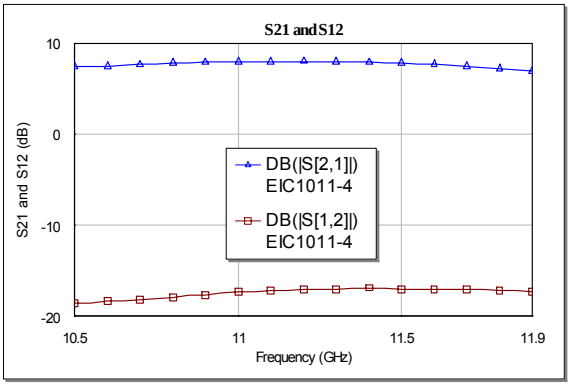
SYMBOL	CHARACTERISTIC	VALUE
V_{DS}	Drain to Source Voltage	10 V
V_{GS}	Gate to Source Voltage	-4.5 V
I_{DS}	Drain Current	IDSS
I_{GSF}	Forward Gate Current	40 mA
P_{IN}	Input Power	@ 3dB compression
P_T	Total Power Dissipation	21 W
T_{CH}	Channel Temperature	150°C
T_{STG}	Storage Temperature	-65/+150°C

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

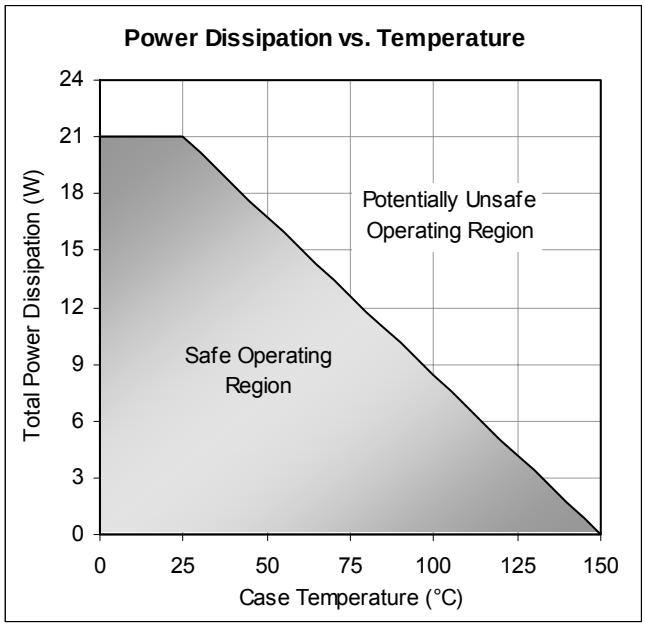
Typical S-Parameters (T= 25°C, 50Ω system, de-embedded to edge of package)
V_{DS} = 10 V, I_{DSQ} = 1100mA

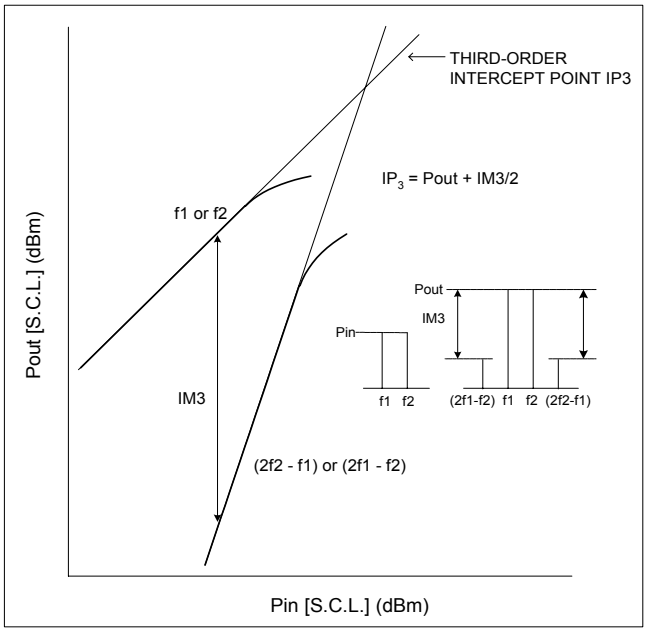




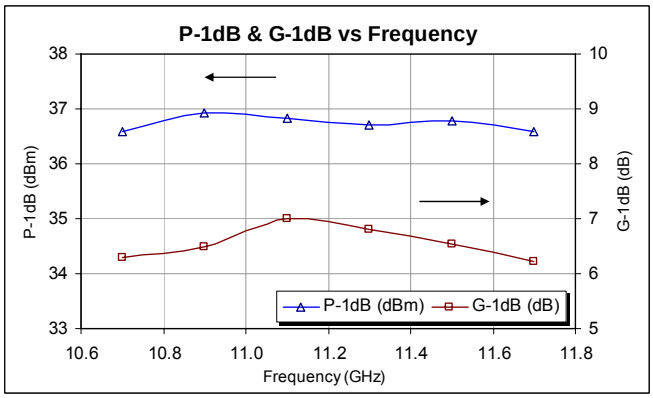
FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
10.0	0.5739	108.35	2.1901	-123.52	0.1038	-170.96	0.4584	55.24
10.2	0.5419	89.44	2.2517	-141.43	0.1081	171.77	0.4527	38.81
10.4	0.5027	69.8	2.3146	-159.96	0.1142	153.91	0.4397	21.79
10.6	0.454	49.43	2.3701	-178.6	0.1209	135.5	0.4186	2.16
10.8	0.3919	26.75	2.4477	162.08	0.1272	116.3	0.3848	-20.15
11.0	0.3168	2.48	2.5075	141.24	0.1368	95.69	0.359	-45.27
11.2	0.2355	-25.9	2.5133	119.63	0.1399	74.8	0.342	-75.08
11.4	0.1589	-62.62	2.4807	97.75	0.1436	52.35	0.3447	-107.19
11.6	0.1084	-118.22	2.4142	76.04	0.141	30.62	0.3633	-137.98
11.8	0.1171	176.36	2.2904	53.87	0.1378	9.3	0.4005	-166.15
12.0	0.1688	130.2	2.157	32.3	0.1337	-13.09	0.4409	169.07

Power De-rating Curve and IM3 Definition

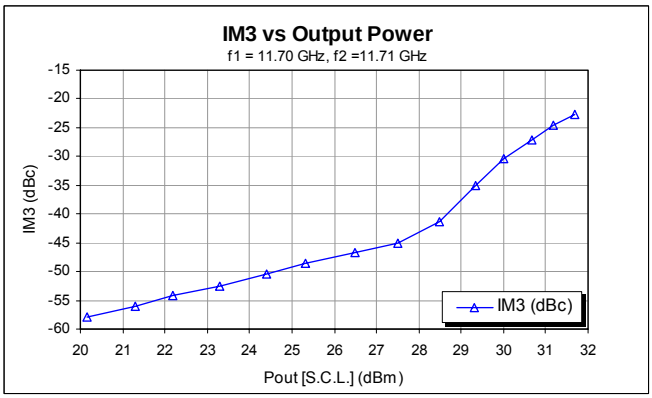




Typical Power Data (V_{DS} = 10 V, I_{DSQ} = 1100 mA)

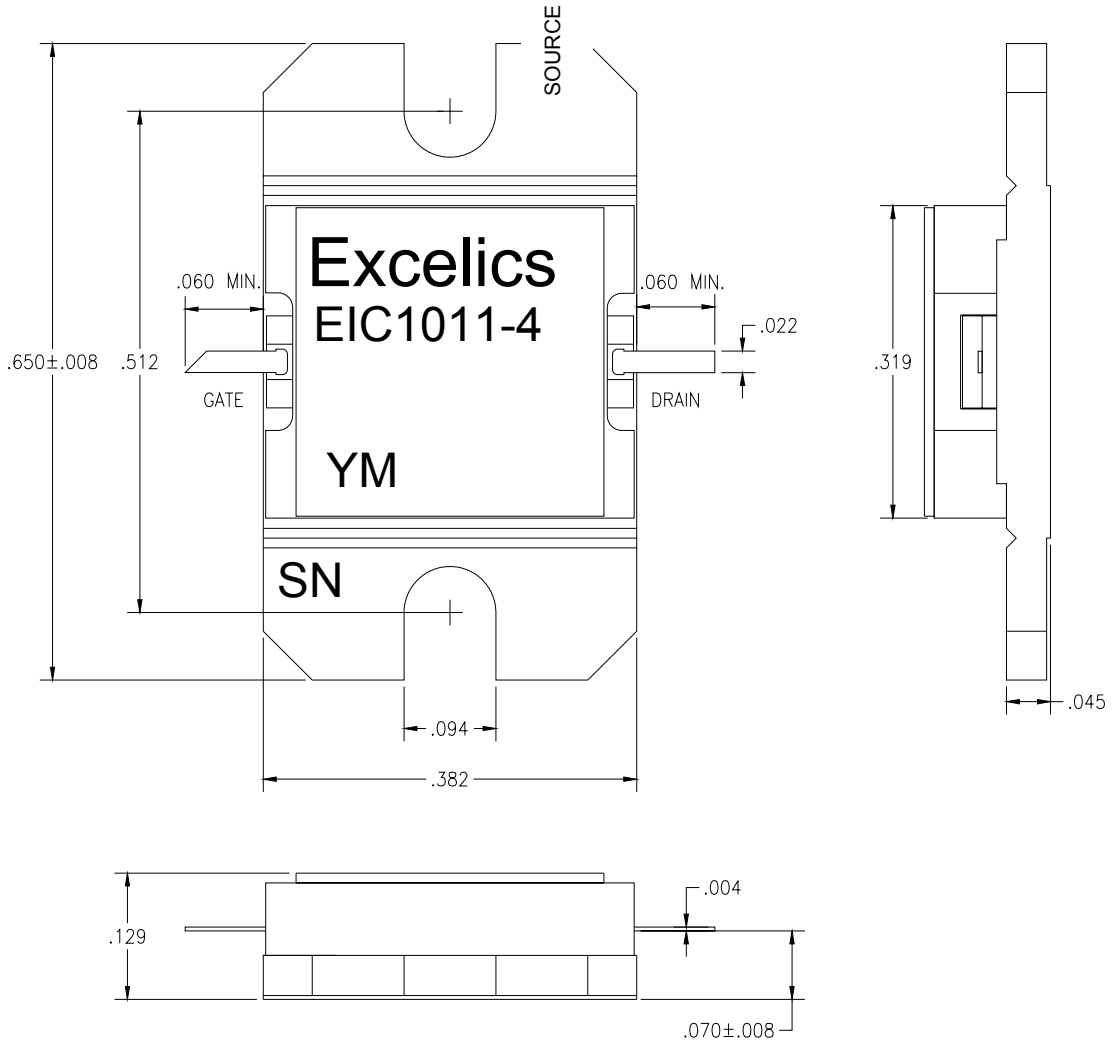


Typical IM3 Data (V_{DS} = 10 V, I_{DSQ} ≈ 65% IDSS)



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]
EIC1011-4	Industrial	10.70-11.70 GHz	35.5	-43

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