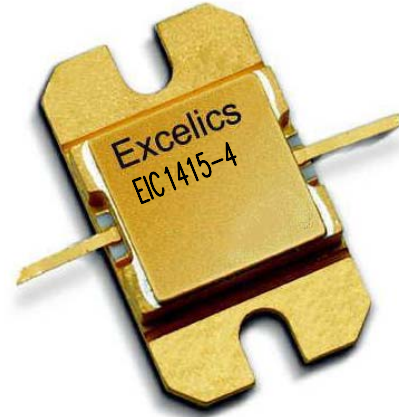


14.40-15.35 GHz 4-Watt Internally-Matched Power FET

FEATURES

- 14.40-15.35 GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +36.0 dBm Output Power at 1dB Compression
- 5.0 dB Power Gain at 1dB Compression
- 25% Power Added Efficiency
- -43 dBc IM3 at $P_o = 25.0$ dBm SCL
- Hermetic Metal Flange Package
- 100% Tested for DC, RF, and R_{TH}



DESCRIPTION

The EIC1415-4 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 ($T_a = 25^\circ\text{C}$)

SYMBOL	PARAMETERS/TEST CONDITIONS ¹	MIN	TYP	MAX	UNITS
P_{1dB}	Output Power at 1dB Compression $f = 14.40-15.35\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$	35.5	36.0		dBm
G_{1dB}	Gain at 1dB Compression $f = 14.40-15.35\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$	4.5	5.0		dB
ΔG	Gain Flatness $f = 14.40-15.35\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$			± 0.6	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$ $f = 14.40-15.35\text{GHz}$		25		%
I_{d1dB}	Drain Current at 1dB Compression $f = 14.40-15.35\text{GHz}$		1100	1300	mA
IM3	Output 3rd Order Intermodulation Distortion $\Delta f = 10\text{ MHz}$ 2-Tone Test; $P_{out} = 25.0\text{ dBm S.C.L}^2$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 65\% I_{DSS}$ $f = 15.35\text{ GHz}$	-40	-43		dBc
I_{DSS}	Saturated Drain Current $V_{DS} = 3\text{ V}, V_{GS} = 0\text{ V}$		2080	2880	mA
V_P	Pinch-off Voltage $V_{DS} = 3\text{ V}, I_{DS} = 20\text{ mA}$		-2.5	-4.0	V
R_{TH}	Thermal Resistance ³		5.5	6.0	$^\circ\text{C/W}$

Notes:

1. Tested with 100 Ohm gate resistor.
2. S.C.L. = Single Carrier Level.
3. Overall R_{th} 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	25 W
T _{CH}	Channel Temperature	150°C
T _{STG}	Storage Temperature	-65/+150°C

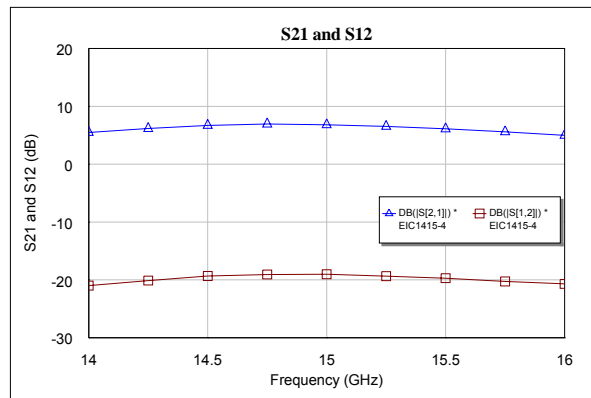
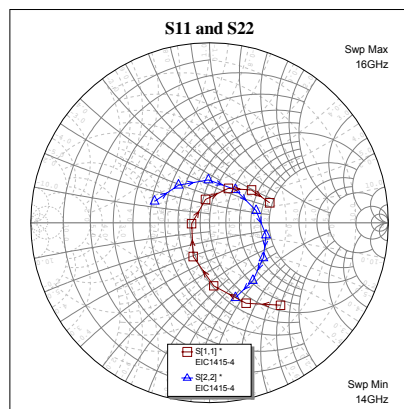
Notes:

- Operating the device beyond any of the above ratings may result in permanent damage or reduction of MTTF.
- 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)

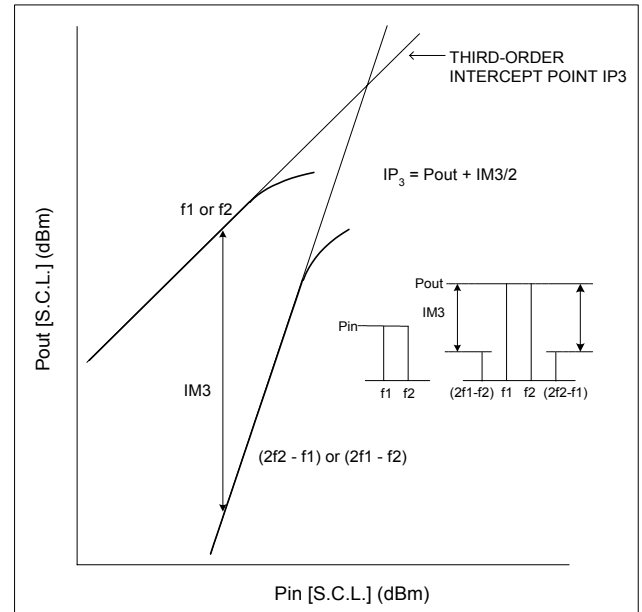
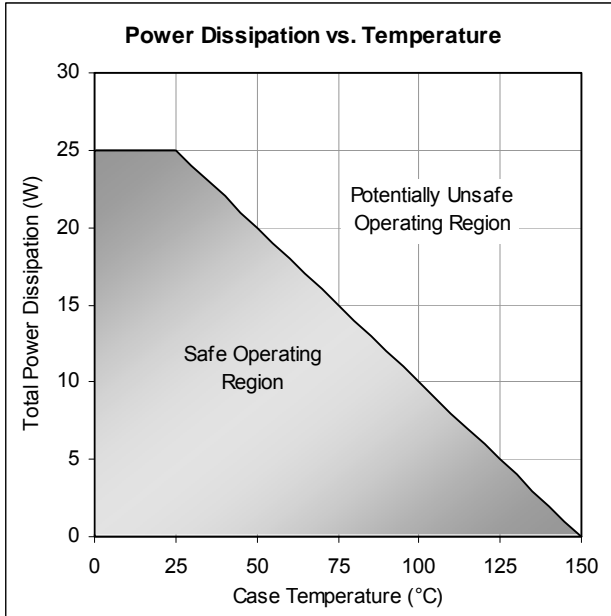
V_{DS} = 10 V, I_{DSQ} ≈ 1100mA



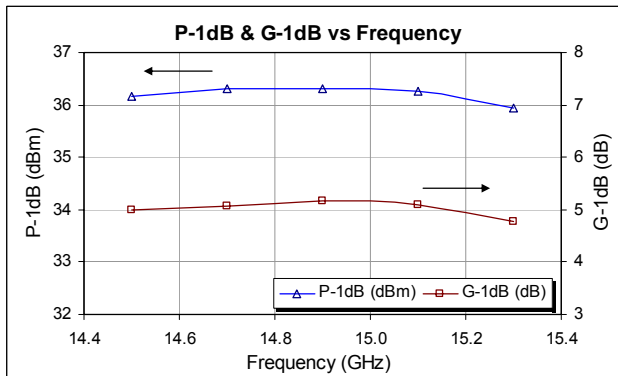
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
14.0	0.6068	-49.15	1.877	-177.59	0.0891	165.79	0.3297	158.87
14.2	0.5179	-62.08	2.0095	167.01	0.0968	151.06	0.2845	136.09
14.4	0.408	-76.91	2.1124	149.96	0.1045	134.45	0.2476	108.17
14.6	0.2953	-96.76	2.1936	132.35	0.1105	118.01	0.229	75.76
14.8	0.1842	-124.53	2.2226	114.65	0.1123	100.02	0.2344	43.28
15.0	0.1005	-176.76	2.1863	96.84	0.1117	82.9	0.2691	14.39
15.2	0.1135	111.12	2.1382	79.55	0.1076	66.18	0.3153	-8.02
15.4	0.1828	73.41	2.0646	62.7	0.106	50.07	0.3511	-25.07
15.6	0.2549	50.97	1.9841	46.37	0.1007	34	0.3776	-41.25
15.8	0.3111	33.55	1.8752	30.24	0.0959	19.23	0.4118	-56.52
16.0	0.3548	18.22	1.7781	14.56	0.0921	3.91	0.4413	-70.84

Specifications are subject to change without notice.

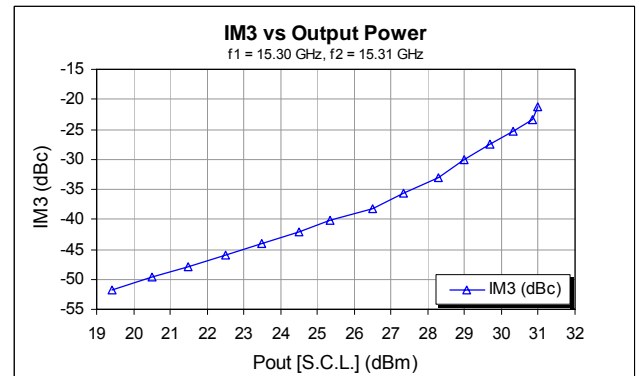
Power De-rating Curve and IM3 Definition



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

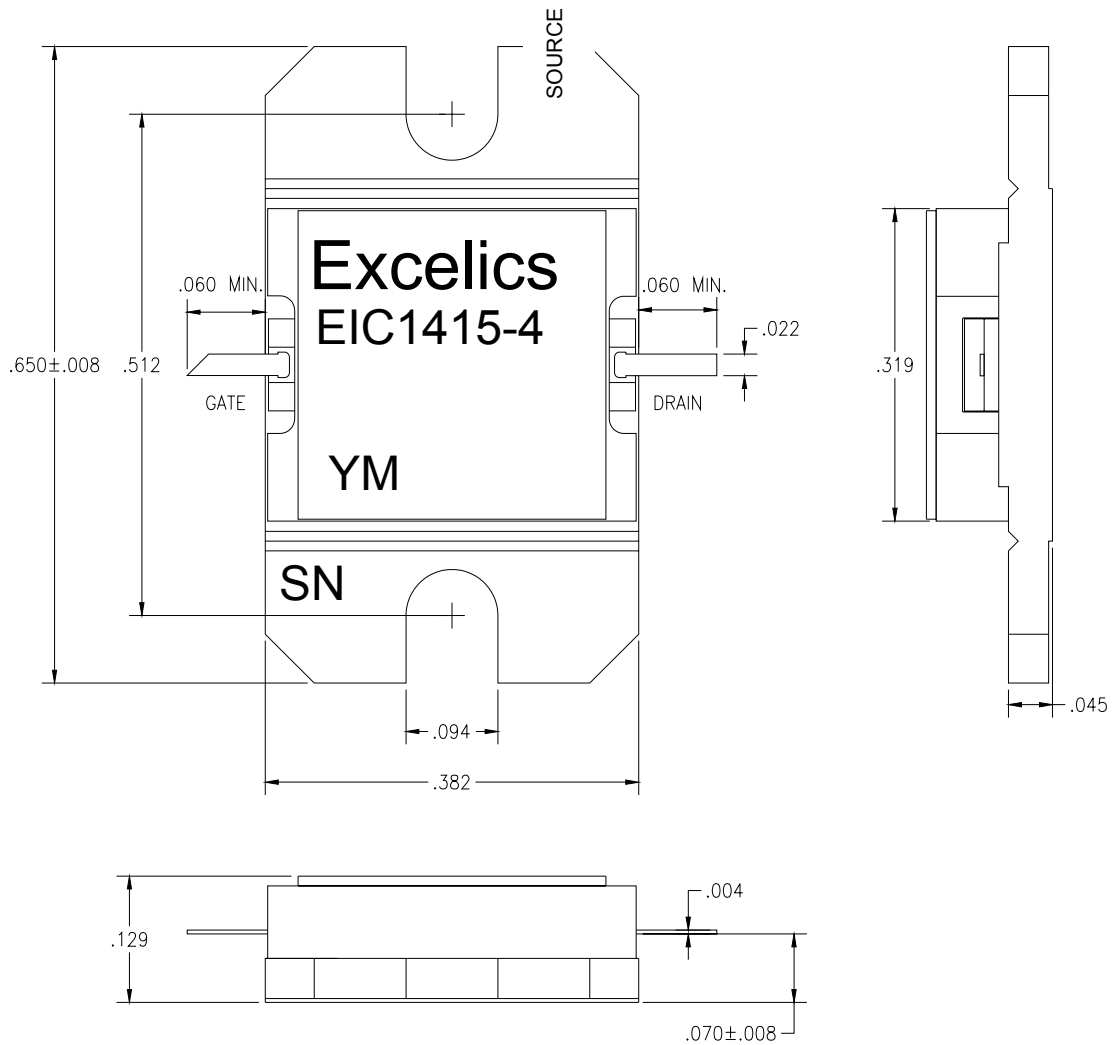


Typical IM3 Data (V_{DS} = 10 V, I_{DSQ} ≈ 65% IDSS)



PACKAGE OUTLINE

Dimensions in inches, Tolerance $\pm .005$ unless otherwise specified



ORDERING INFORMATION

Part Number	Grade ¹	f_{Test} (GHz)	$P_{1\text{dB}}$ (min)	IM_3 (min) ²
EIC1415-4	Industrial	14.40-15.35 GHz	35.5	-40.0

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