EIC1213-4

UPDATED 08/21/2007

12.70-13.20GHz 4-Watt Internally-Matched Power FET

FEATURES

- **12.70 –13.20GHz Bandwidth**
- **Input/Output Impedance Matched to 50 Ohms**
- **+36.0 dBm Output Power at 1dB Compression**
- **6.5 dB Power Gain at 1dB Compression**
- **28% Power Added Efficiency**
- **-44 dBc IM3 at Po = 25.5 dBm SCL**
- **100% Tested for DC, RF, and R_{TH}**

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

Caution! ESD sensitive device.

SYMBOL	PARAMETERS/TEST CONDITIONS[1]	MIN	TYP	MAX	UNITS
P_{1dB}	Output Power at 1dB Compression f = 12.7-13.2GHz V_{DS} = 10 V, I_{DSQ} ≈ 1100mA	35.5	36.0		dBm
G_{1dB}	Gain at 1dB Compression f = 12.7-13.2GHz V_{DS} = 10 V, I_{DSQ} ≈ 1100mA	5.5	6.5		dB
ΔG	Gain Flatness f = 12.7-13.2GHz 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 = 12.7-13.2GHz		28		%
Id_{1dB}	Drain Current at 1dB Compression f = 12.7-13.2GHz		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 = 13.2GHz	-42	-44		dBc
I_{DSS}	Saturated Drain Current V_{DS} = 3 V, V_{GS} = 0 V	1280	2080	2880	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

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

ABSOLUTE MAXIMUM RATING FOR EFE

SYMBOLS	PARAMETERS	ABSOLUTE[1]	CONTINUOUS[2]
Vds	Drain-Source Voltage	15V	10V
Vgs	Gate-Source Voltage	-5V	-4V
Igf	Forward Gate Current	48mA	14.4mA
Igr	Reverse Gate Current	-9.6mA	-2.4mA
Pin	Input Power	35.5dBm	@ 3dB Compression
Tch	Channel Temperature	175C	175C
Tstg	Storage Temperature	-65C to +175C	-65C to +175C
Pt	Total Power Dissipation	25W	25W

Note: 1. Exceeding any of the above ratings may result in permanent damage.
2. Exceeding any of the above ratings may reduce MTTF below design goals.

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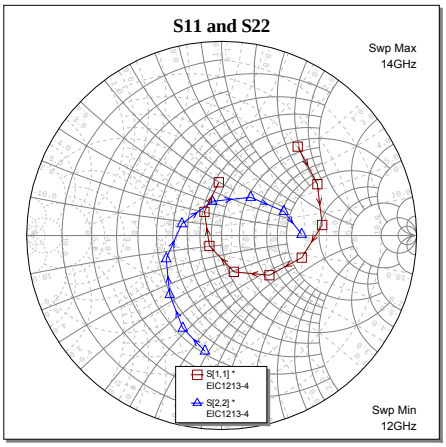
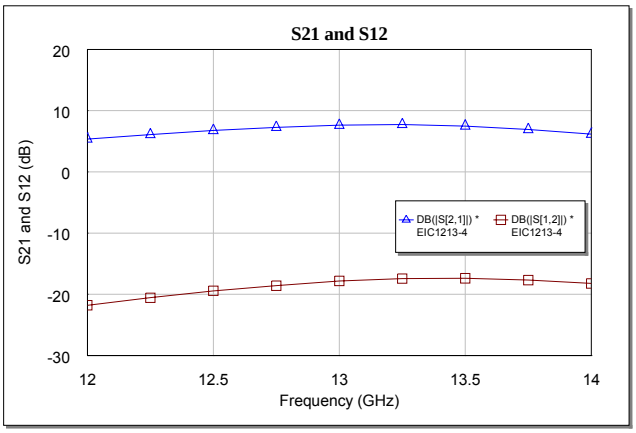
PERFORMANCE DATA

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
12.0	0.6013	49.54	1.8523	-73.04	0.0813	-101.01	0.602	-98.17
12.2	0.5629	32.76	1.9838	-88.24	0.0911	-116.63	0.5402	-109.62
12.4	0.5404	14.98	2.1132	-104.28	0.1011	-132.11	0.4471	-123.24
12.6	0.4871	-2.5	2.234	-121.18	0.1114	-148.78	0.3645	-140.48
12.8	0.4055	-19.9	2.3293	-138.38	0.1196	-166.24	0.2874	-163.34
13.0	0.3196	-39.9	2.4047	-156.51	0.1284	176.28	0.2125	163.54
13.2	0.2249	-63.97	2.4359	-175.14	0.1342	158.11	0.179	117.02
13.4	0.118	-101.47	2.4042	166.07	0.1355	139.57	0.2111	71.43
13.6	0.0879	170.88	2.322	147.76	0.1342	121.8	0.2843	38.35
13.8	0.1766	117.33	2.1849	129.28	0.1288	104.29	0.3574	16.48
14.0	0.2745	92.92	2.0299	112.36	0.1226	87.32	0.4104	0.75

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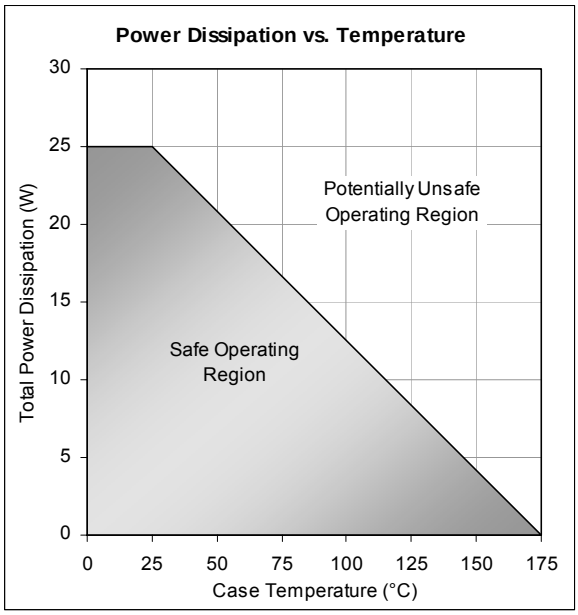
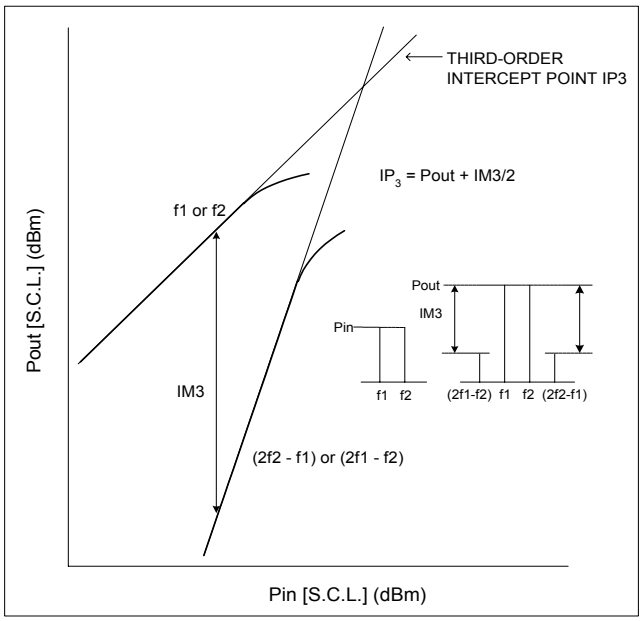
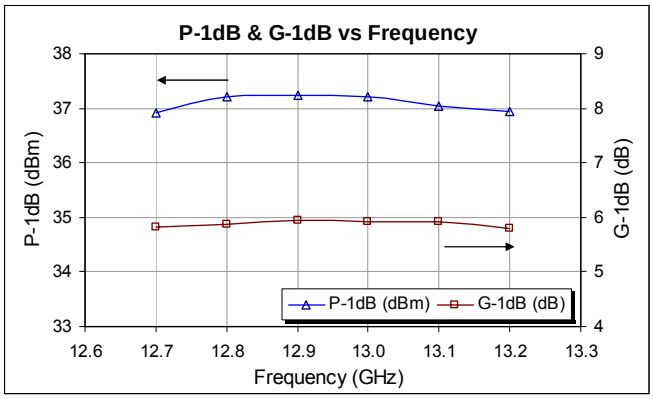
Power De-rating Curve and IM3 Definition

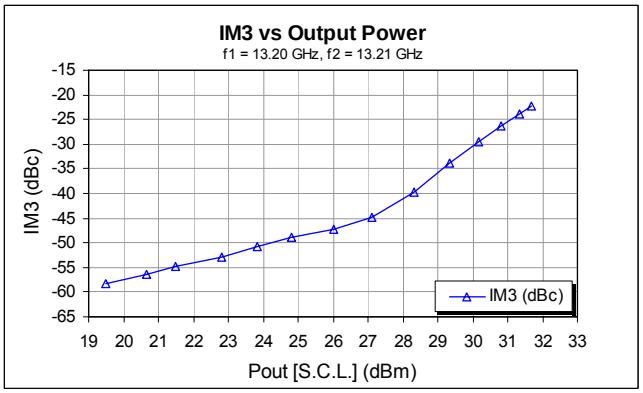




Typical Power Data (V_{DS} = 10 V, I_{DSQ} = 1100 mA)



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



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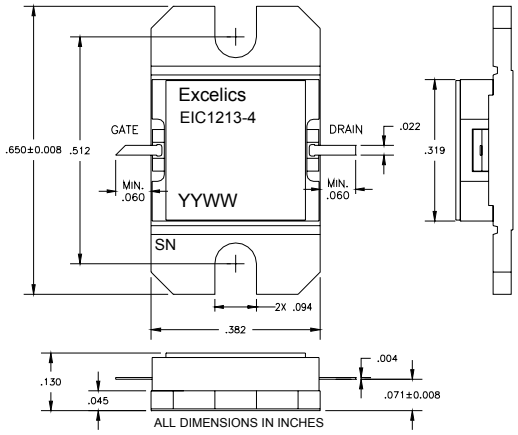
PACKAGES OUTLINE

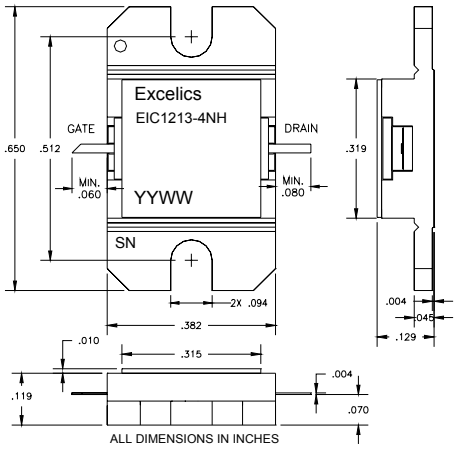
Dimensions in inches, Tolerance ± .005 unless otherwise specified

EIC1213-4 (Hermetic)



Caution! ESD sensitive device.

EIC1213-4NH (Non-Hermetic)



Caution! ESD sensitive device.

ORDERING INFORMATION

Part Number	Packages	Grade[1]	f_{Test} (GHz)	P_{1dB} (min)	IM_3 (min)[2]
EIC1213-4	Hermetic	Industrial	12.70-13.20GHz	35.5	-42
EIC1213-4NH	Non-Hermetic	Industrial	12.70-13.20GHz	35.5	-42

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

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