



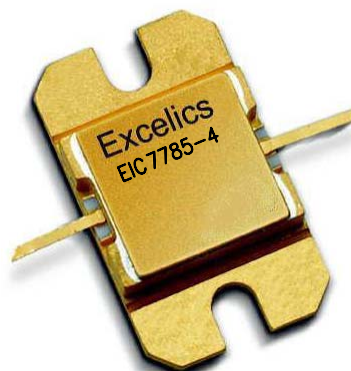
EIC7785-4

UPDATED 08/21/2007

7.70-8.50GHz 4-Watt Internally-Matched Power FET

FEATURES

- 7.70–8.50GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +36.5 dBm Output Power at 1dB Compression
- 8.5 dB Power Gain at 1dB Compression
- 34% Power Added Efficiency
- -46 dBc IM3 at PO = 25.5 dBm SCL
- 100% Tested for DC, RF, and R_{TH}



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 $f = 7.70\text{-}8.50\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 1100\text{mA}$	35.5	36.5		dBm
G_{1dB}	Gain at 1dB Compression $f = 7.70\text{-}8.50\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 1100\text{mA}$	7.5	8.5		dB
ΔG	Gain Flatness $f = 7.70\text{-}8.50\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 1100\text{mA}$			± 0.6	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 1100\text{mA}$ $f = 7.70\text{-}8.50\text{GHz}$		34		%
I_{d1dB}	Drain Current at 1dB Compression $f = 7.70\text{-}8.50\text{GHz}$		1100	1300	mA
IM3	Output 3rd Order Intermodulation Distortion $\Delta f = 10\text{ MHz}$ 2-Tone Test; $P_{out} = 25.5\text{ dBm S.C.L.}^2$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 65\% IDSS$ $f = 8.50\text{GHz}$	-43	-46		dBc
I_{DSS}	Saturated Drain Current $V_{DS} = 3\text{ V}$, $V_{GS} = 0\text{ V}$		2000	2500	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	$^\circ\text{C/W}$

Note: 1. Tested with 100 Ohm gate resistor.

2. S.C.L. = Single Carrier Level.

3. Overall R_{th} 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	36dBm	@ 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.

Specifications are subject to change without notice.

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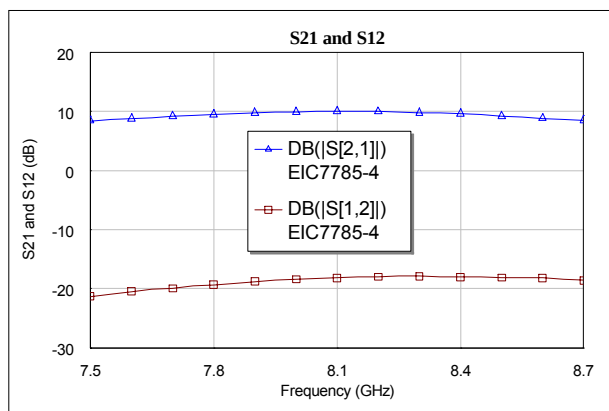
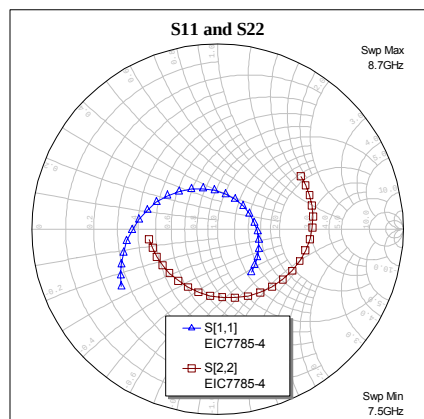
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PERFORMANCE DATA

Typical S-Parameters (T= 25°C, 50Ω system, de-embedded to edge of package)

$V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 1100\text{mA}$



FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
7.5	0.6034	-149.14	2.6409	-81.54	0.0862	-138.31	0.5314	32.49
7.6	0.5516	-159.75	2.7534	-93.4	0.0948	-149.69	0.5287	20.36
7.7	0.4935	-172.49	2.8842	-105.71	0.1006	-161.26	0.5183	7.57
7.8	0.4264	173.09	2.9901	-118.6	0.1076	-174.38	0.5005	-6.22
7.9	0.3594	156.04	3.0911	-132.17	0.1154	172.85	0.4752	-21.19
8	0.29	135.54	3.152	-146.09	0.1203	159.84	0.4444	-37.73
8.1	0.2323	109.56	3.1785	-159.96	0.1233	146.34	0.4117	-56.07
8.2	0.1942	77.04	3.1614	-174.31	0.1262	132.54	0.3812	-75.72
8.3	0.1858	42.24	3.0973	171.66	0.1277	118.21	0.3633	-96.19
8.4	0.2013	9.94	3.0181	157.94	0.1256	105.29	0.3511	-117.08
8.5	0.2311	-14.73	2.9014	144.33	0.1242	92.6	0.3517	-137.38
8.6	0.2635	-35.41	2.7724	131.4	0.1232	79.73	0.3594	-155.44
8.7	0.2953	-51.98	2.6626	119.31	0.1178	66.75	0.3726	-171.45

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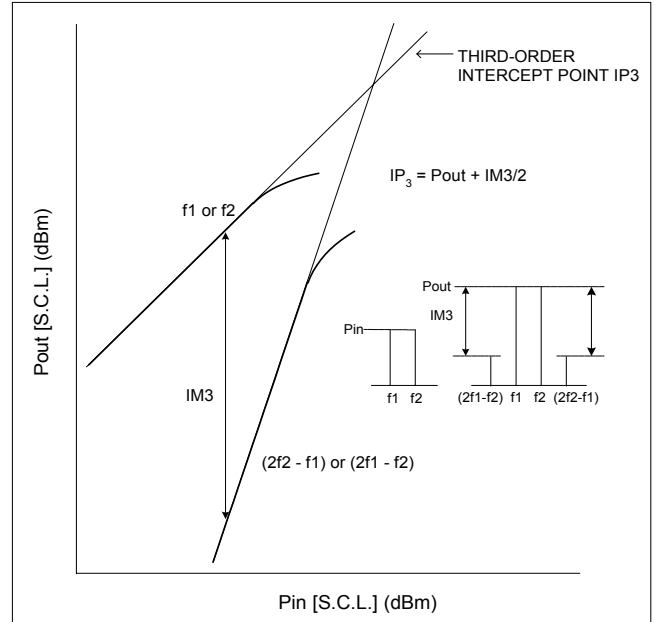
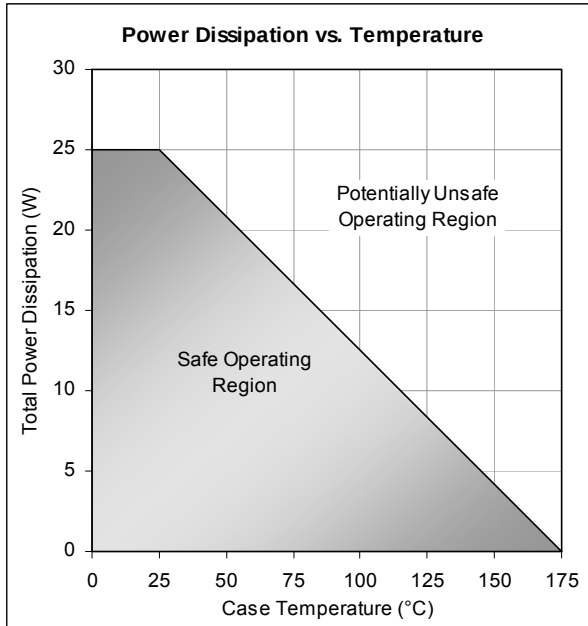
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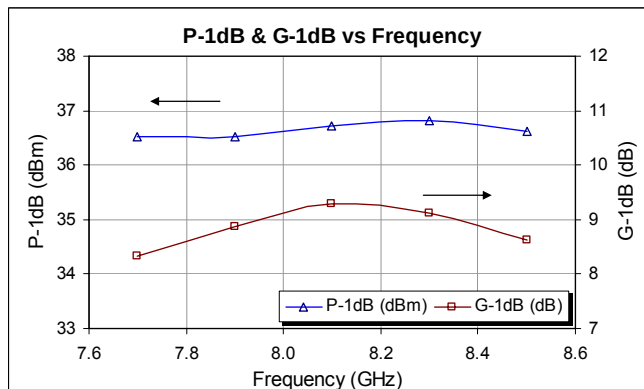
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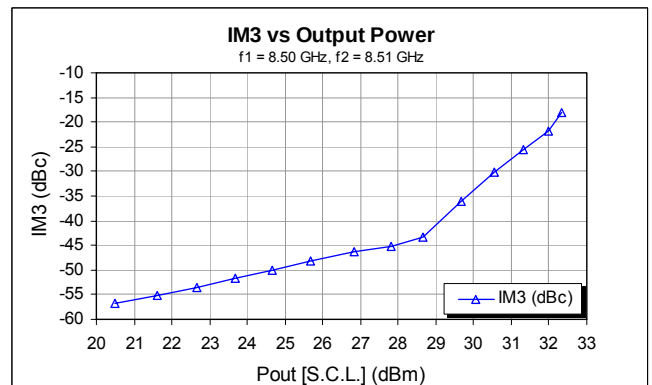
Power De-rating Curve and IM3 Definition



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



Typical IM3 Data ($V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 65\% IDSS$)



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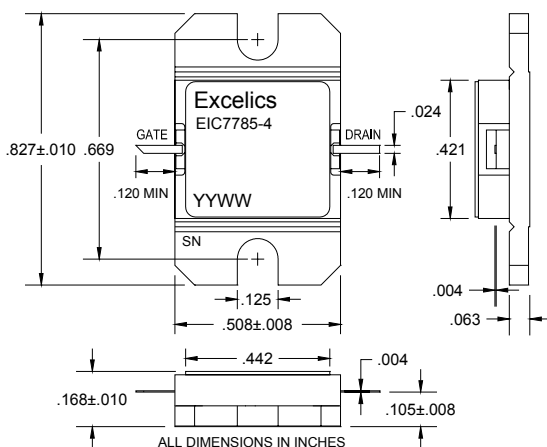
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PACKAGES OUTLINE

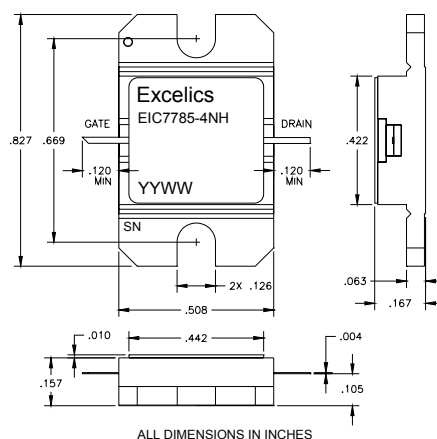
Dimensions in inches, Tolerance $\pm .005$ unless otherwise specified

EIC7785-4 (Hermetic)



Caution! ESD sensitive device.

EIC7785-4NH (Non-Hermetic)



Caution! ESD sensitive device.

ORDERING INFORMATION

Part Number	Packages	Grade ¹	f _{Test} (GHz)	P _{1dB} (min)	IM ₃ (min) ²
EIC7785-4	Hermetic	Industrial	7.70-8.50GHz	35.5	-43
EIC7785-4NH	Non-Hermetic	Industrial	7.70-8.50GHz	35.5	-43

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

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