



EIC7785-8

UPDATED 08/21/2007

7.70-8.50GHz 8-Watt Internally-Matched Power FET

FEATURES

- 7.70–8.50GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +39.5 dBm Output Power at 1dB Compression
- 8.5 dB Power Gain at 1dB Compression
- 34% Power Added Efficiency
- -46 dBc IM3 at PO = 28.5 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 $f = 7.70\text{-}8.50\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 2200\text{mA}$	38.5	39.5		dBm
G_{1dB}	Gain at 1dB Compression $f = 7.70\text{-}8.50\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 2200\text{mA}$	7.5	8.5		dB
ΔG	Gain Flatness $f = 7.70\text{-}8.50\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 2200\text{mA}$			± 0.6	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 2200\text{mA}$ $f = 7.70\text{-}8.50\text{GHz}$		34		%
I_{d1dB}	Drain Current at 1dB Compression $f = 7.70\text{-}8.50\text{GHz}$		2200	2600	mA
IM3	Output 3rd Order Intermodulation Distortion $\Delta f = 10\text{ MHz}$ 2-Tone Test; $P_{out} = 28.5\text{ dBm S.C.L.}^2$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 65\% IDSS$ $f = 8.50\text{GHz}$	-43	-46		dBc
I_{DSS}	Saturated Drain Current $V_{DS} = 3\text{ V}$, $V_{GS} = 0\text{ V}$		4000	4500	mA
V_P	Pinch-off Voltage $V_{DS} = 3\text{ V}$, $I_{DS} = 40\text{ mA}$		-2.5	-4.0	V
R_{TH}	Thermal Resistance ³		3.5	4.0	$^\circ\text{C/W}$

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	96mA	28.8mA
Igr	Reverse Gate Current	-19.2mA	-4.8mA
Pin	Input Power	39dBm	@ 3dB Compression
Tch	Channel Temperature	175C	175C
Tstg	Storage Temperature	-65C to +175C	-65C to +175C
Pt	Total Power Dissipation	37.5W	37.5W

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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page 1 of 4

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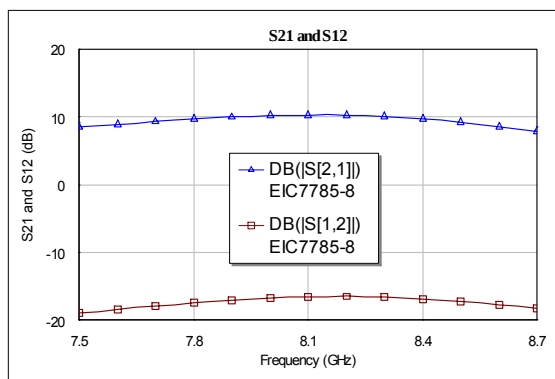
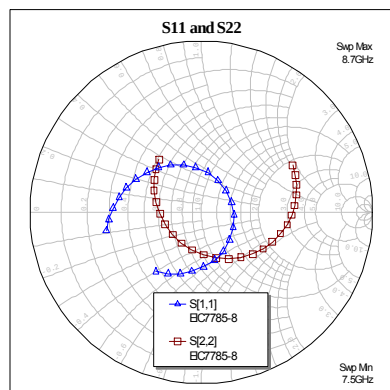
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PERFORMANCE DATA

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

$V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 2200\text{mA}$



FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
7.5	0.5659	-169.06	2.653	-99.16	0.1125	-153.47	0.5992	27.25
7.6	0.5159	177.44	2.7741	-111.83	0.1208	-165.72	0.5788	16.12
7.7	0.4615	161.8	2.9098	-125.33	0.127	-178.82	0.5468	4.26
7.8	0.3953	143.64	3.0355	-139.33	0.1344	167.39	0.5069	-8.19
7.9	0.3292	123.15	3.1442	-153.81	0.1405	153.05	0.4486	-22.61
8	0.2633	96.94	3.2247	-169.11	0.1461	138.07	0.3863	-39.28
8.1	0.2092	62.41	3.2539	174.99	0.1485	122.37	0.3151	-59.64
8.2	0.1858	17.93	3.2534	158.73	0.1502	107.25	0.2486	-87.21
8.3	0.2058	-25.56	3.1658	142.39	0.1484	91.76	0.2147	-122.78
8.4	0.2616	-60.84	3.0487	126.26	0.143	76.38	0.2226	-161.62
8.5	0.3184	-87.64	2.8796	110.62	0.1378	60.95	0.27	167.25
8.6	0.3806	-108.87	2.6767	95.4	0.1301	46.15	0.3349	145.24
8.7	0.4359	-127.56	2.4875	81.13	0.1224	30.86	0.3959	128.51

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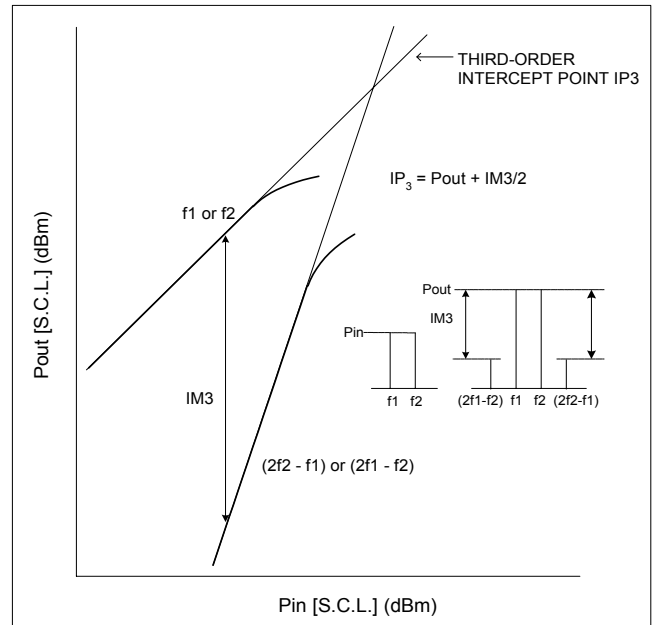
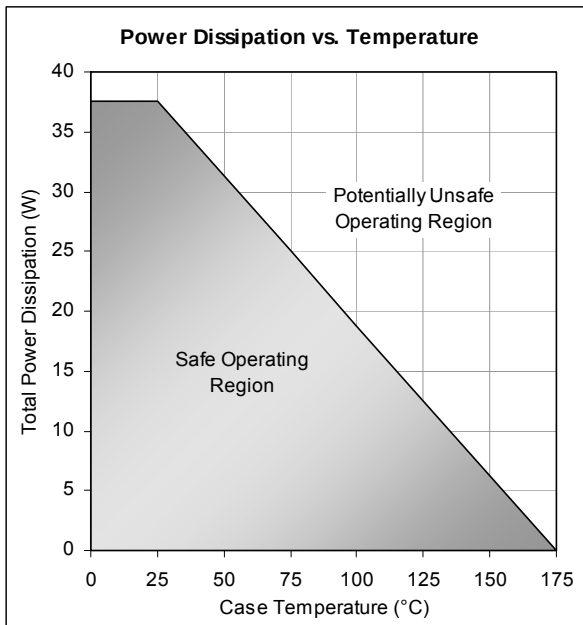
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page 2 of 4
Revised October 2007
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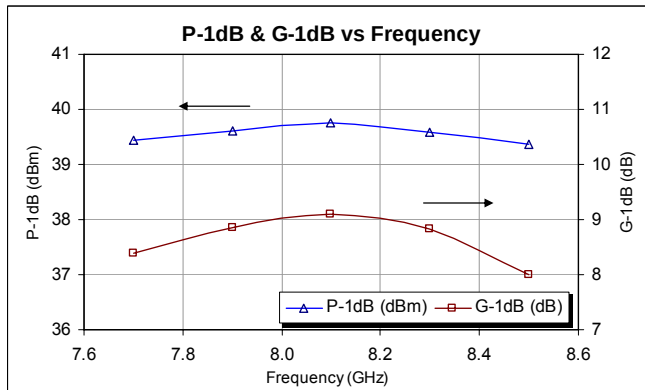
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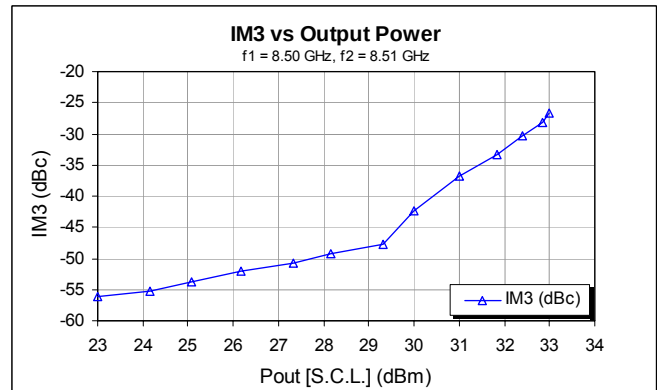
Power De-rating Curve and IM3 Definition



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



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



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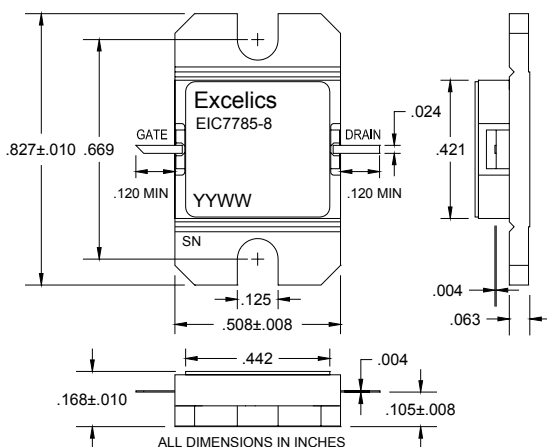
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PACKAGES OUTLINE

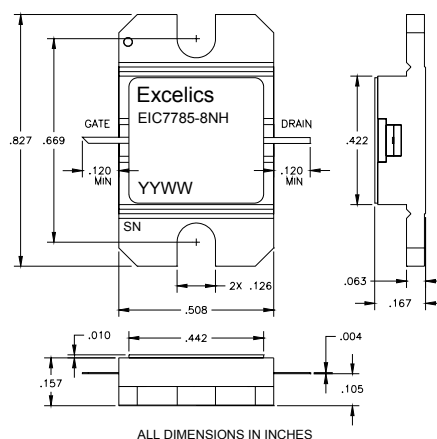
Dimensions in inches, Tolerance $\pm .005$ unless otherwise specified

EIC7785-8 (Hermetic)



Caution! ESD sensitive device.

EIC7785-8NH (Non-Hermetic)



Caution! ESD sensitive device.

ORDERING INFORMATION

Part Number	Packages	Grade ¹	f _{Test} (GHz)	P _{1dB} (min)	IM ₃ (min) ²
EIC7785-8	Hermetic	Industrial	7.70-8.50GHz	38.5	-43
EIC7785-8NH	Non-Hermetic	Industrial	7.70-8.50GHz	38.5	-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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page 4 of 4
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