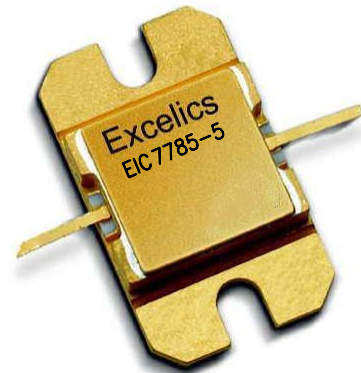


### FEATURES

- 7.70–8.50GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +37.5 dBm Output Power at 1dB Compression
- 8.5 dB Power Gain at 1dB Compression
- 34% Power Added Efficiency
- -49 dBc IM3 at PO = 26.5 dBm SCL
- 100% Tested for DC, RF, and R<sub>TH</sub>



Caution! ESD sensitive device.

### ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25°C)

SYMBOL	PARAMETERS/TEST CONDITIONS <sup>1</sup>	MIN	TYP	MAX	UNITS
<b>P<sub>1dB</sub></b>	Output Power at 1dB Compression V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 1600mA f = 7.70-8.50GHz	36.5	37.5		dBm
<b>G<sub>1dB</sub></b>	Gain at 1dB Compression V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 1600mA f = 7.70-8.50GHz	7.5	8.5		dB
<b>ΔG</b>	Gain Flatness V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 1600mA f = 7.70-8.50GHz			±0.6	dB
<b>PAE</b>	Power Added Efficiency at 1dB Compression V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 1600mA f = 7.70-8.50GHz		34		%
<b>I<sub>d1dB</sub></b>	Drain Current at 1dB Compression f = 7.70-8.50GHz		1600	1900	mA
<b>IM3</b>	Output 3rd Order Intermodulation Distortion Δf = 10 MHz 2-Tone Test; P <sub>out</sub> = 26.5 dBm S.C.L. <sup>2</sup> V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 65% IDSS f = 8.50GHz	Opt-01	-42	-45	dBc
		Opt-02	-46	-49	
<b>I<sub>DSS</sub></b>	Saturated Drain Current V <sub>DS</sub> = 3 V, V <sub>GS</sub> = 0 V		2900	3500	mA
<b>V<sub>P</sub></b>	Pinch-off Voltage V <sub>DS</sub> = 3 V, I <sub>DS</sub> = 30 mA		-2.5	-4.0	V
<b>R<sub>TH</sub></b>	Thermal Resistance <sup>3</sup>		5.0	5.5	°C/W

Note: 1. Tested with 100 Ohm gate resistor.

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

3. Overall R<sub>th</sub> depends on case mounting.

### ABSOLUTE MAXIMUM RATING FOR EFE

SYMBOLS	PARAMETERS	ABSOLUTE <sup>1</sup>	CONTINUOUS <sup>2</sup>
<b>V<sub>ds</sub></b>	Drain-Source Voltage	15V	10V
<b>V<sub>gs</sub></b>	Gate-Source Voltage	-5V	-4V
<b>I<sub>gf</sub></b>	Forward Gate Current	68mA	20.4mA
<b>I<sub>gr</sub></b>	Reverse Gate Current	-13.6mA	-3.4mA
<b>P<sub>in</sub></b>	Input Power	37dBm	@ 3dB Compression
<b>T<sub>ch</sub></b>	Channel Temperature	175C	175C
<b>T<sub>stg</sub></b>	Storage Temperature	-65C to +175C	-65C to +175C
<b>P<sub>t</sub></b>	Total Power Dissipation	27W	27W

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.



# EIC7785-5

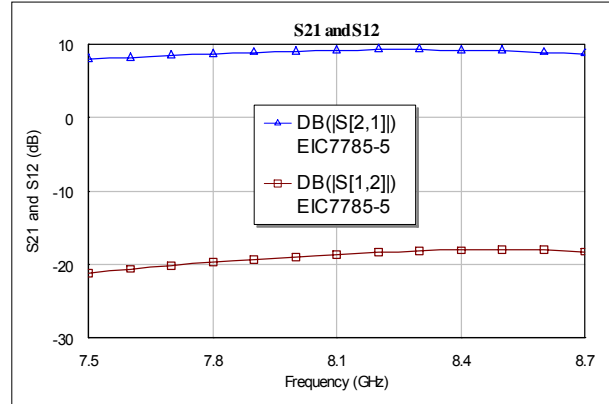
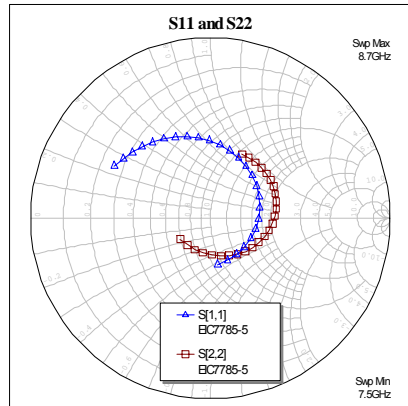
UPDATED 08/21/2007

## 7.70-8.50GHz 5-Watt Internally-Matched Power FET

### PERFORMANCE DATA

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

$V_{DS} = 10\text{ V}$ ,  $I_{DSQ} \approx 1600\text{mA}$



FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
7.5	0.6072	151.65	2.4887	-96.64	0.0877	-140.79	0.3974	63.69
7.6	0.5668	139.93	2.5636	-108.26	0.0935	-152.21	0.399	51.15
7.7	0.5301	127.41	2.6446	-120.35	0.0984	-164.2	0.3981	38.7
7.8	0.4896	113.26	2.7096	-132.52	0.1039	-176.06	0.392	26.7
7.9	0.4497	98.49	2.7726	-145.04	0.1085	171.35	0.378	14.39
8	0.4085	82.47	2.8207	-157.79	0.1123	158.96	0.3592	1.76
8.1	0.3689	64.87	2.8563	-170.82	0.1168	146.5	0.3329	-11.65
8.2	0.331	45.51	2.8892	175.98	0.1211	133.84	0.3001	-26.37
8.3	0.2961	23.89	2.888	162.68	0.1237	121.11	0.2676	-43.46
8.4	0.2689	-0.24	2.8767	149.22	0.1251	107.74	0.2323	-63
8.5	0.2517	-26.44	2.8389	135.66	0.1254	94.86	0.2034	-87.46
8.6	0.2485	-54.31	2.7741	122.25	0.1254	81.38	0.1942	-116.35
8.7	0.2603	-81	2.7202	108.74	0.1226	67.75	0.2049	-145.47

Specifications are subject to change without notice.

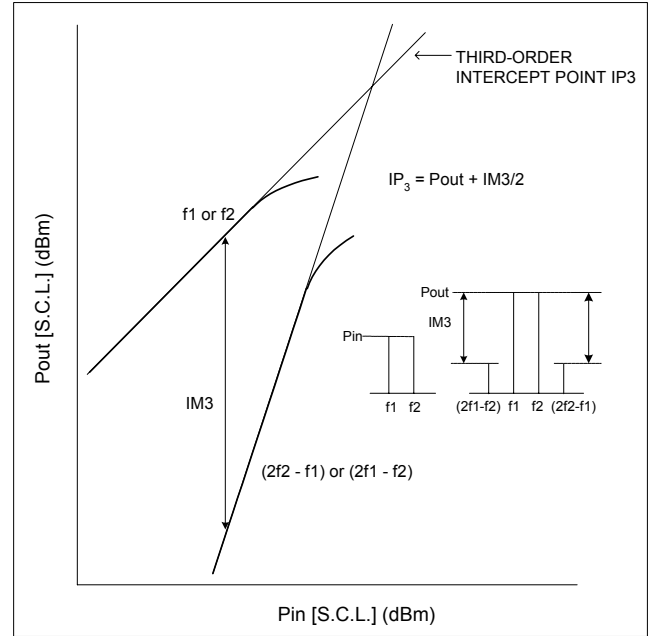
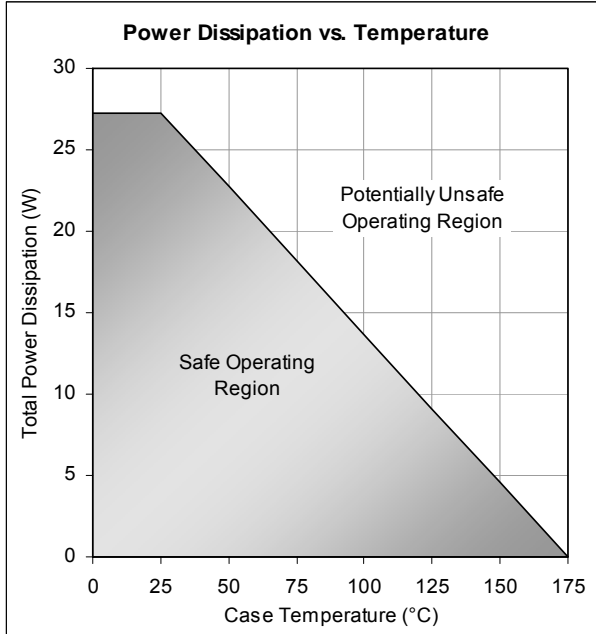


# EIC7785-5

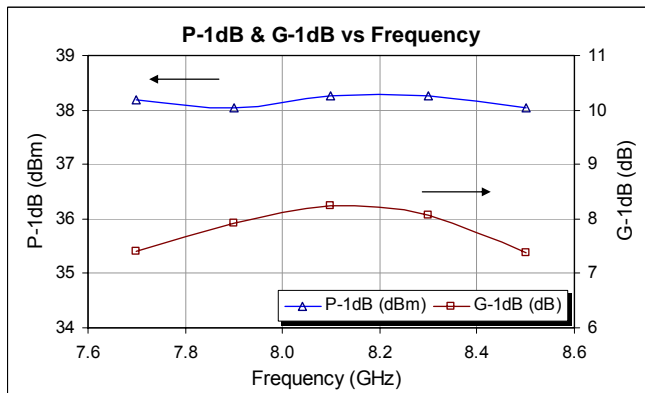
UPDATED 08/21/2007

## 7.70-8.50GHz 5-Watt Internally-Matched Power FET

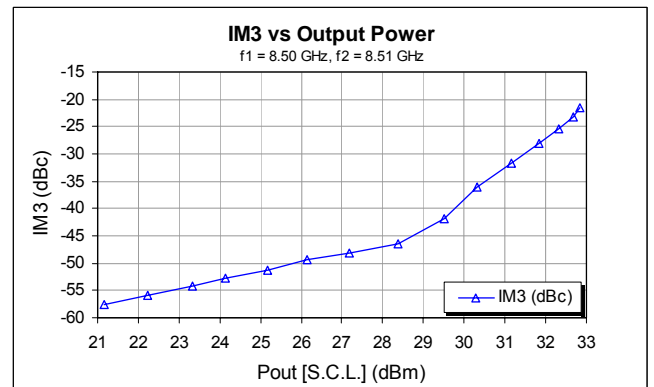
### Power De-rating Curve and IM3 Definition



### Typical Power Data ( $V_{DS} = 10\text{ V}$ , $I_{DSQ} = 1600\text{ mA}$ )



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

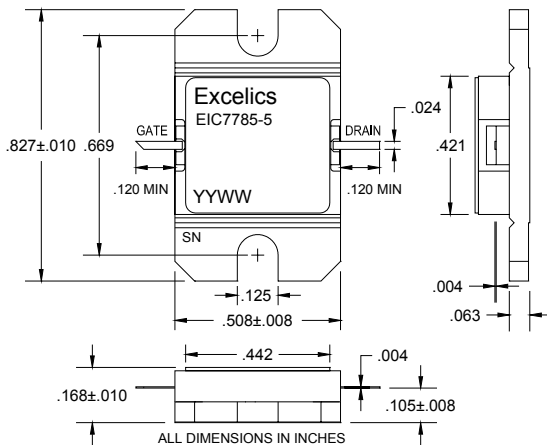


Specifications are subject to change without notice.

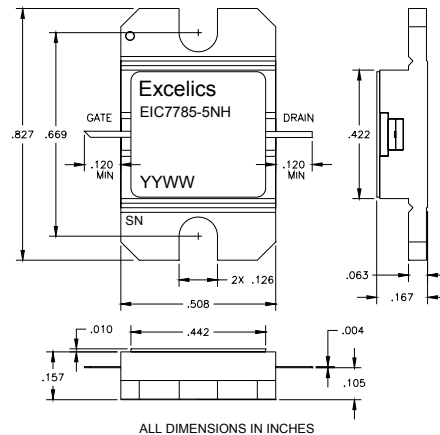
### PACKAGES OUTLINE

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

**EIC7785-5 (Hermetic)**



**EIC7785-5NH (Non-Hermetic)**



Caution! ESD sensitive device.



Caution! ESD sensitive device.

### ORDERING INFORMATION

Part Number	Packages	Grade <sup>1</sup>	f <sub>Test</sub> (GHz)	P <sub>1dB</sub> (min)	IM <sub>3</sub> (min) <sup>2</sup>
EIC7785-5-01	Hermetic	Industrial	7.70-8.50GHz	36.5	-42
EIC7785-5NH-01	Non-Hermetic	Industrial	7.70-8.50GHz	36.5	-42
EIC7785-5-02	Hermetic	Industrial	7.70-8.50GHz	36.5	-46
EIC7785-5NH-02	Non-Hermetic	Industrial	7.70-8.50GHz	36.5	-46

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

### DISCLAIMER

EXCELICS SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. EXCELICS DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN.

### LIFE SUPPORT POLICY

EXCELICS SEMICONDUCTOR PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF EXCELICS SEMICONDUCTOR, INC. AS HERE IN:

- Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
- A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness