



EIC7785-5

UPDATED 08/21/2007

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

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_{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 $f = 7.70\text{-}8.50\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 1600\text{mA}$	36.5	37.5		dBm
G_{1dB}	Gain at 1dB Compression $f = 7.70\text{-}8.50\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 1600\text{mA}$	7.5	8.5		dB
ΔG	Gain Flatness $f = 7.70\text{-}8.50\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 1600\text{mA}$			± 0.6	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 1600\text{mA}$ $f = 7.70\text{-}8.50\text{GHz}$		34		%
I_{d1dB}	Drain Current at 1dB Compression $f = 7.70\text{-}8.50\text{GHz}$		1600	1900	mA
IM3	Output 3rd Order Intermodulation Distortion $\Delta f = 10\text{ MHz}$ 2-Tone Test; $P_{out} = 26.5\text{ dBm S.C.L.}^2$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 65\% IDSS$ $f = 8.50\text{GHz}$	Opt-01	-42	-45	dBc
		Opt-02	-46	-49	
I_{DSS}	Saturated Drain Current $V_{DS} = 3\text{ V}$, $V_{GS} = 0\text{ V}$		2900	3500	mA
V_P	Pinch-off Voltage $V_{DS} = 3\text{ V}$, $I_{DS} = 30\text{ mA}$		-2.5	-4.0	V
R_{TH}	Thermal Resistance ³		5.0	5.5	$^\circ\text{C/W}$

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	68mA	20.4mA
Igr	Reverse Gate Current	-13.6mA	-3.4mA
Pin	Input Power	37dBm	@ 3dB Compression
Tch	Channel Temperature	175C	175C
Tstg	Storage Temperature	-65C to +175C	-65C to +175C
Pt	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.

Excelics Semiconductor, Inc. 310 De Guigne Drive, Sunnyvale, CA 94085

Phone: 408-737-1711 Fax: 408-737-1868 Web: www.excelics.com

page 1 of 4

Revised October 2007
www.DataSheet4U.com



EIC7785-5

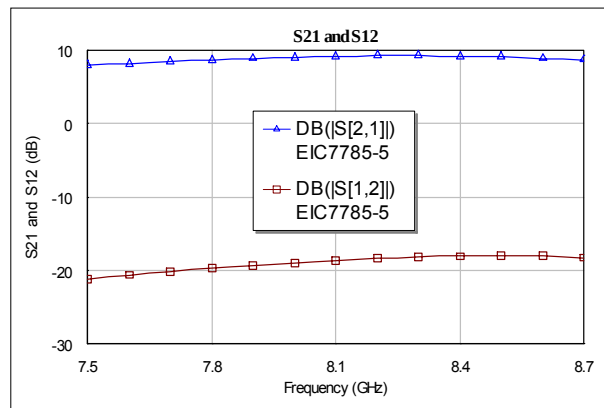
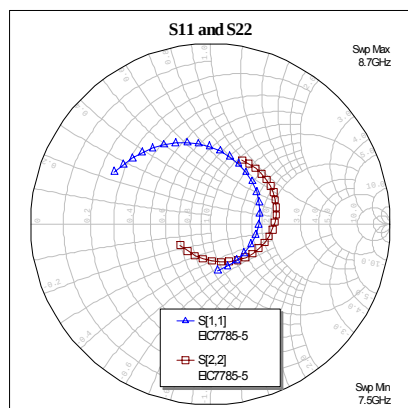
UPDATED 08/21/2007

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.

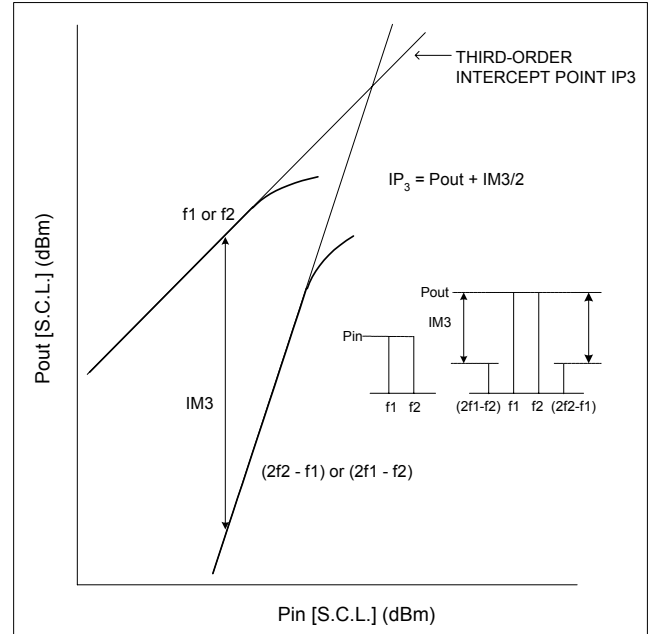
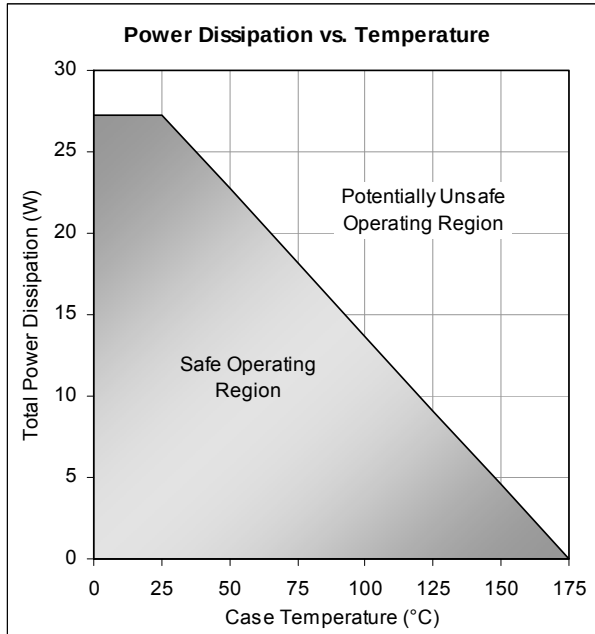
Excelics Semiconductor, Inc. 310 De Guigne Drive, Sunnyvale, CA 94085
Phone: 408-737-1711 Fax: 408-737-1868 Web: www.excelics.com

page 2 of 4
Revised October 2007
www.DataSheet4U.com

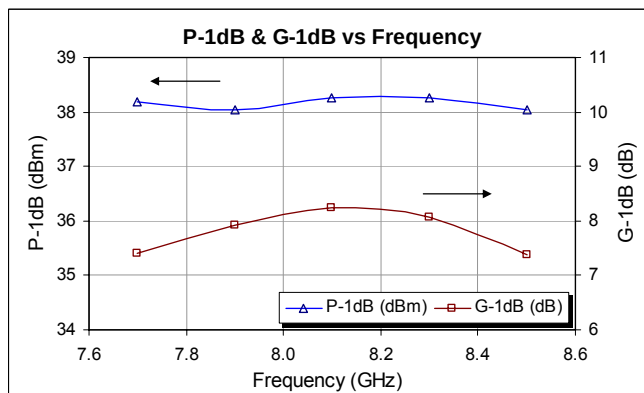
UPDATED 08/21/2007

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

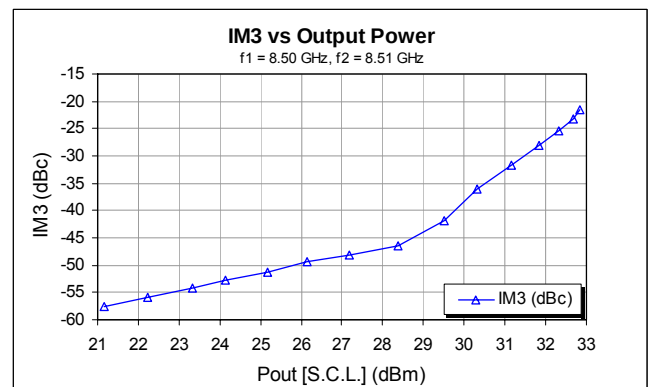
Power De-rating Curve and IM3 Definition



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.



EIC7785-5

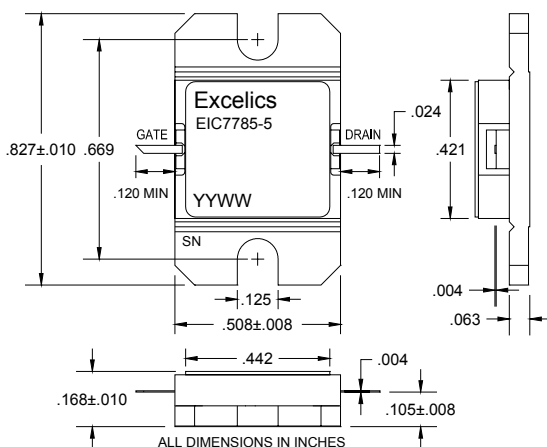
UPDATED 08/21/2007

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

PACKAGES OUTLINE

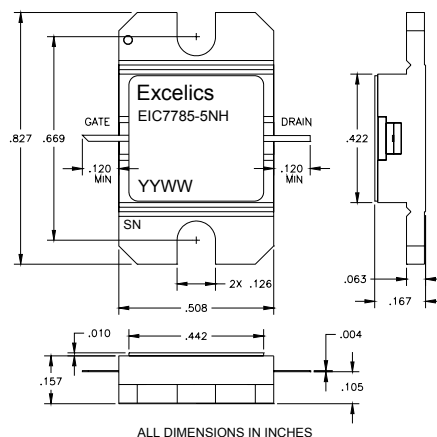
Dimensions in inches, Tolerance $\pm .005$ unless otherwise specified

EIC7785-5 (Hermetic)



Caution! ESD sensitive device.

EIC7785-5NH (Non-Hermetic)



Caution! ESD sensitive device.

ORDERING INFORMATION

Part Number	Packages	Grade ¹	f _{Test} (GHz)	P _{1dB} (min)	IM ₃ (min) ²
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: 1. Contact factory for military and hi-rel grades.
2. 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:

1. 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.
2. 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

Specifications are subject to change without notice.

Excelics Semiconductor, Inc. 310 De Guigne Drive, Sunnyvale, CA 94085
Phone: 408-737-1711 Fax: 408-737-1868 Web: www.excelics.com

page 4 of 4
Revised October 2007
www.DataSheet4U.com