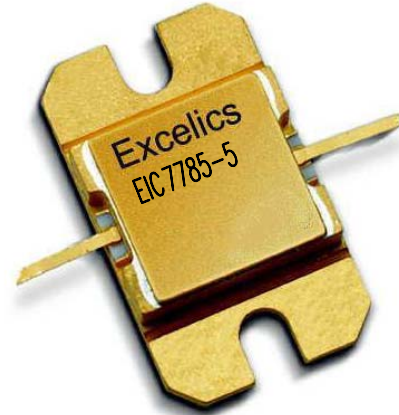


7.7-8.5 GHz 5-Watt Internally-Matched Power FET

FEATURES

- 7.7 – 8.5 GHz 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 $P_o = 26.5$ dBm SCL
- Hermetic Metal Flange Package
- 100% Tested for DC, RF, and R_{TH}



DESCRIPTION

The EIC7785-5 is a high power, highly linear, single stage MFET amplifier in a flange mount package. This amplifier features Excelics' unique MESFET transistor technology.



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 $V_{DS} = 10$ V, $I_{DSQ} \approx 1600$ mA	$f = 7.7-8.5$ GHz	36.5	37.5		dBm
G_{1dB}	Gain at 1dB Compression $V_{DS} = 10$ V, $I_{DSQ} \approx 1600$ mA	$f = 7.7-8.5$ GHz	7.5	8.5		dB
ΔG	Gain Flatness $V_{DS} = 10$ V, $I_{DSQ} \approx 1600$ mA	$f = 7.7-8.5$ GHz			± 0.6	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 10$ V, $I_{DSQ} \approx 1600$ mA	$f = 7.7-8.5$ GHz		34		%
I_{d1dB}	Drain Current at 1dB Compression	$f = 7.7-8.5$ GHz		1600	1900	mA
IM3	Output 3rd Order Intermodulation Distortion $\Delta f = 10$ MHz 2-Tone Test; $P_{out} = 26.5$ dBm S.C.L. ² $V_{DS} = 10$ V, $I_{DSQ} \approx 65\%$ IDSS	Opt-01	-42	-45		dBc
		Opt-02	-46	-49		dBc
I_{DSS}	Saturated Drain Current	$V_{DS} = 3$ V, $V_{GS} = 0$ V		2900	3500	mA
V_P	Pinch-off Voltage	$V_{DS} = 3$ V, $I_{DS} = 30$ mA		-2.5	-4.0	V
R_{TH}	Thermal Resistance ³			5.0	5.5	$^\circ\text{C/W}$

Notes:

1. Tested with 100 Ohm gate resistor.
2. S.C.L. = Single Carrier Level.
3. Overall R_{th} depends on case mounting.



EIC7785-5

ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION^{1,2}

SYMBOL	CHARACTERISTIC	VALUE
V_{DS}	Drain to Source Voltage	10 V
V_{GS}	Gate to Source Voltage	-4.5 V
I_{DS}	Drain Current	IDSS
I_{GSF}	Forward Gate Current	60 mA
P_{IN}	Input Power	@ 3dB compression
P_T	Total Power Dissipation	23 W
T_{CH}	Channel Temperature	150°C
T_{STG}	Storage Temperature	-65/+150°C

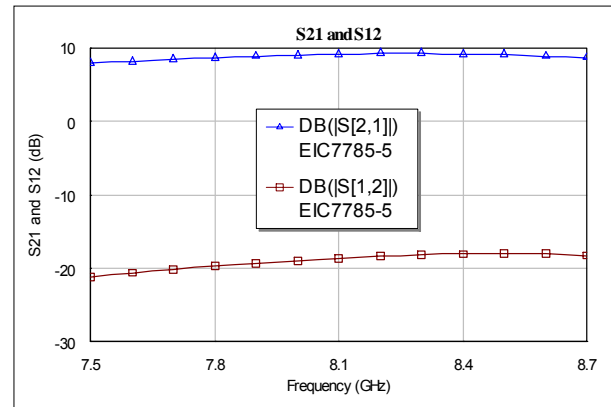
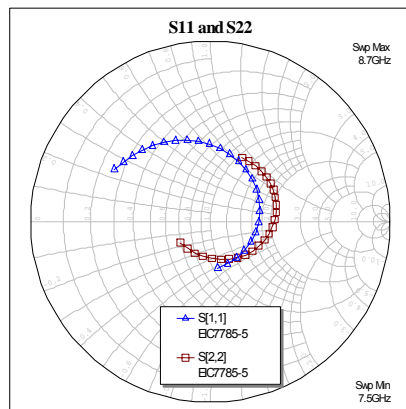
Notes:

- Operating the device beyond any of the above ratings may result in permanent damage or reduction of MTTF.
- Bias conditions must also satisfy the following equation $P_T < (T_{CH} - T_{PKG})/R_{TH}$; where T_{PKG} = temperature of package, and $P_T = (V_{DS} * I_{DS}) - (P_{OUT} - P_{IN})$.

PERFORMANCE DATA

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

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



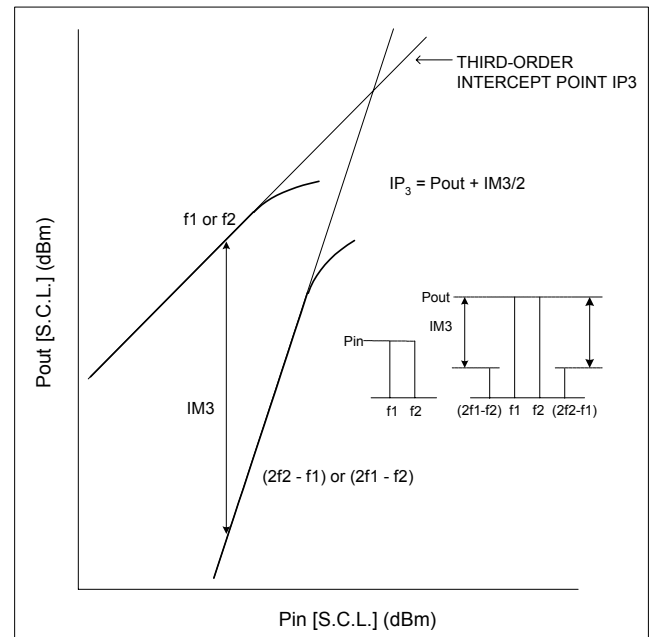
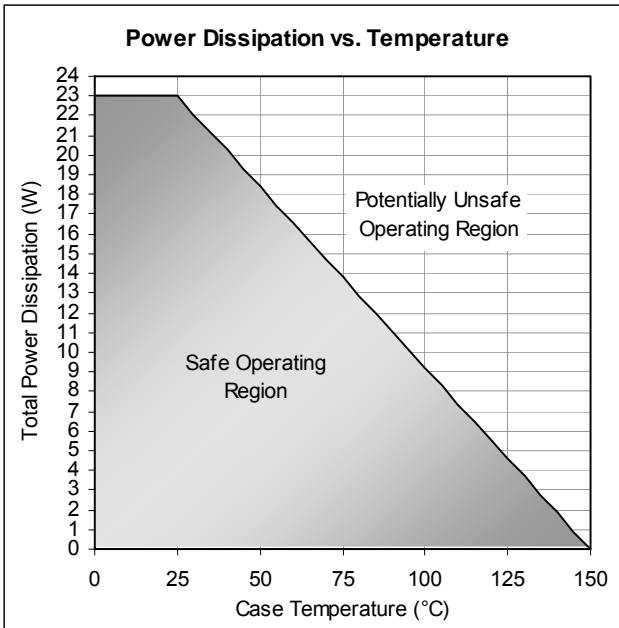
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
7.5	0.6072	151.65	2.4887	-96.64	0.0877	-140.79	0.3974	63.69
7.6	0.5668	139.93	2.5636	-108.26	0.0935	-152.21	0.399	51.15
7.7	0.5301	127.41	2.6446	-120.35	0.0984	-164.2	0.3981	38.7
7.8	0.4896	113.26	2.7096	-132.52	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.

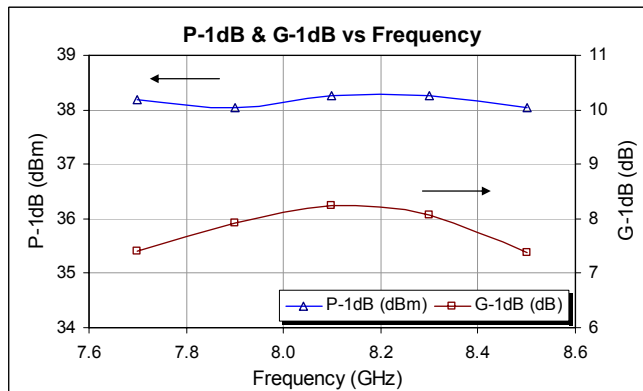
Excelics Semiconductor, Inc. 310 De Guigne Drive, Sunnyvale, CA 94085
Phone: 408-737-1711 Fax: 408-737-1868 Web: www.excelics.com

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Revised October 2003

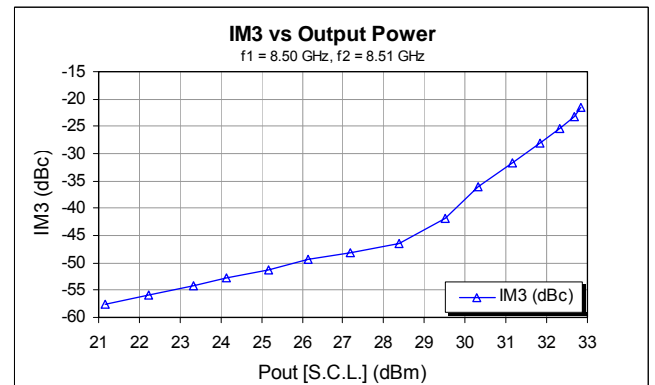
Power De-rating Curve and IM3 Definition



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

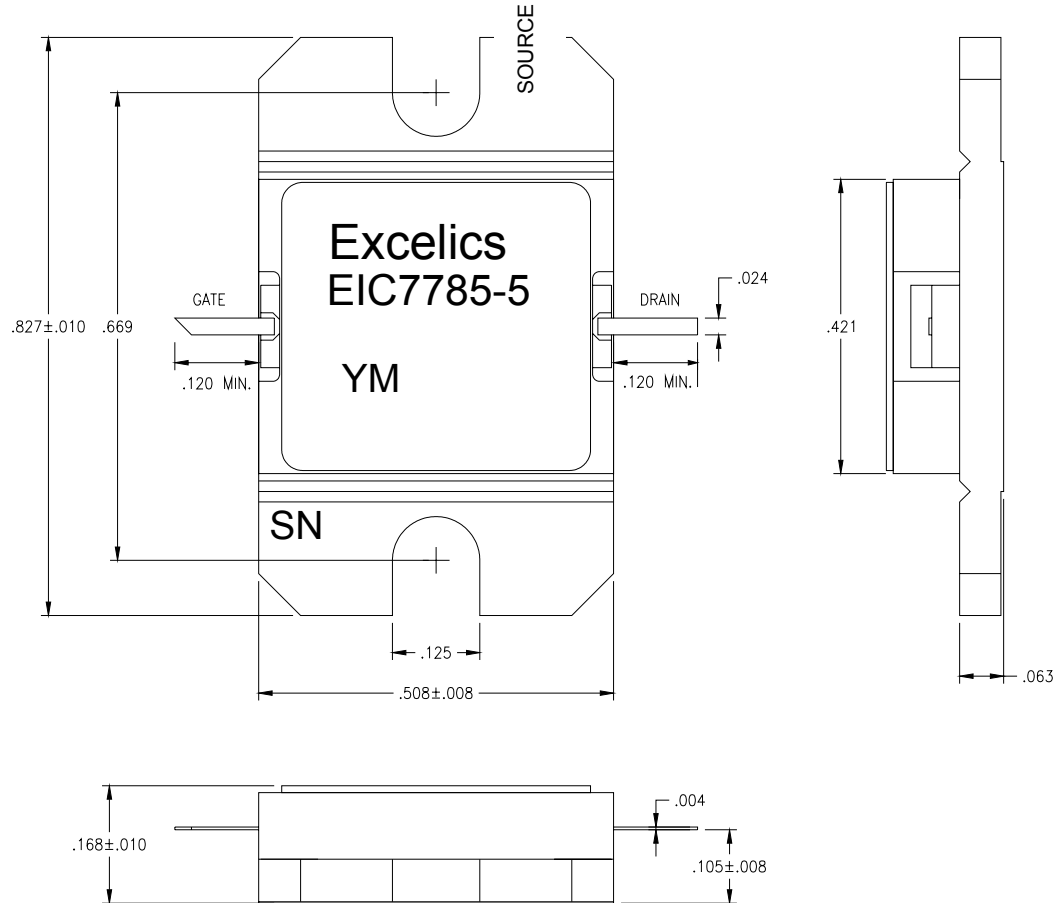


Typical IM3 Data ($V_{DS} = 10$ V, $I_{DSQ} \approx 65\%$ $IDSS$)



PACKAGE OUTLINE

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



ORDERING INFORMATION

Part Number	Grade ¹	f_{Test} (GHz)	P_{1dB} (min)	IM_3 (min) ²
EIC7785-5-01	Industrial	7.7-8.5 GHz	36.5	-42
EIC7785-5-02	Industrial	7.7-8.5 GHz	36.5	-46

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