

7.10-7.90 GHz 5-Watt Internally-Matched Power FET

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FEATURES

- 7.10 – 7.90 GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +37.5 dBm Output Power at 1dB Compression
- 9.0 dB Power Gain at 1dB Compression
- 35% Power Added Efficiency
- -46 dBc IM3 at $P_o = 25.5$ dBm SCL
- Hermetic Metal Flange Package
- 100% Tested for DC, RF, and R_{TH}



DESCRIPTION

The EIC7179-5 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 $f = 7.10\text{-}7.90\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 1600\text{mA}$	36.5	37.5		dBm
G_{1dB}	Gain at 1dB Compression $f = 7.10\text{-}7.90\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 1600\text{mA}$	7.5	8.5		dB
ΔG	Gain Flatness $f = 7.10\text{-}7.90\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 1600\text{mA}$			± 0.6	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 1600\text{mA}$ $f = 7.10\text{-}7.90\text{GHz}$		35		%
I_{d1dB}	Drain Current at 1dB Compression $f = 7.10\text{-}7.90\text{GHz}$		1600	2000	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 $f = 7.90\text{GHz}$	-43	-46		dBc
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	$^\circ\text{C/W}$

Notes:

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



EIC7179-5

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

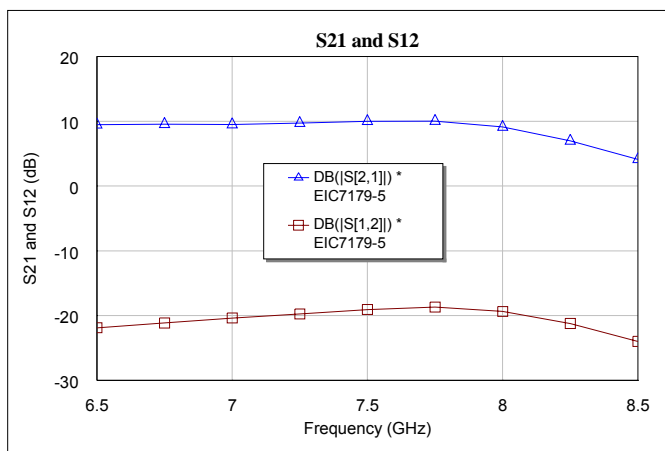
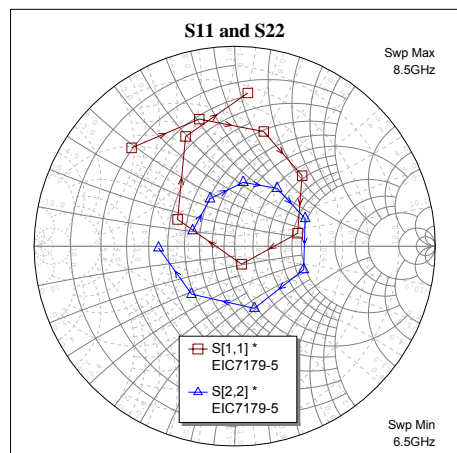
Notes:

- 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



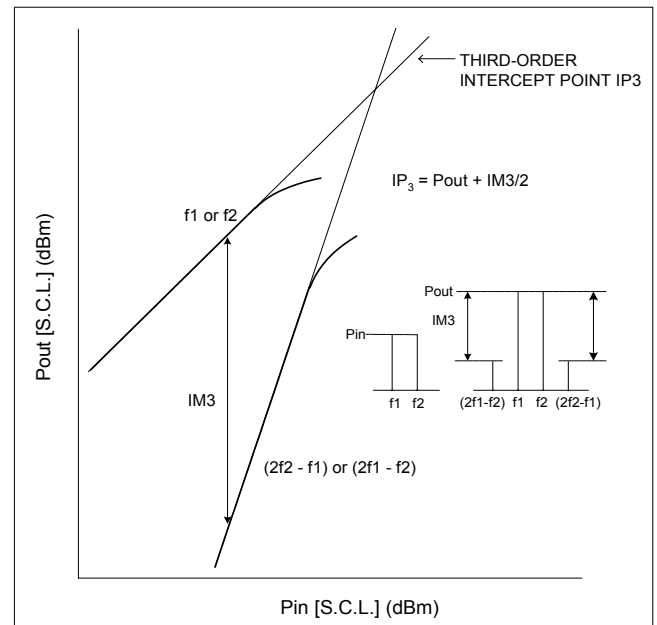
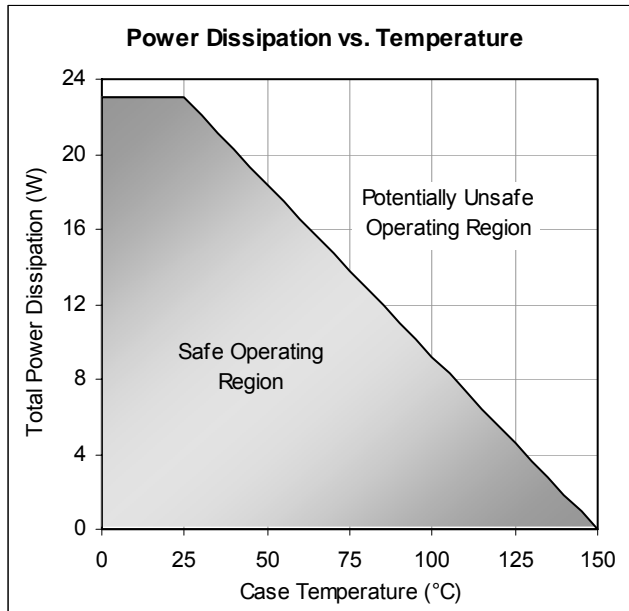
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
6.25	0.752	168.140	2.901	-7.820	0.073	-64.840	0.232	-147.530
6.50	0.711	136.260	2.974	-39.130	0.081	-97.090	0.224	159.760
6.75	0.659	105.510	3.004	-70.350	0.088	-127.140	0.267	117.460
7.00	0.591	75.820	2.986	-100.630	0.096	-156.850	0.322	82.450
7.25	0.487	46.300	3.063	-131.620	0.103	172.760	0.358	53.770
7.50	0.320	11.650	3.161	-165.600	0.111	140.350	0.377	21.450
7.75	0.097	-69.360	3.168	156.190	0.116	103.520	0.364	-18.780
8.00	0.315	154.860	2.860	113.990	0.108	62.710	0.326	-72.420
8.25	0.600	114.000	2.233	73.400	0.087	23.160	0.323	-131.860
8.50	0.769	85.120	1.607	38.360	0.063	-9.110	0.379	-178.690
8.75	0.843	64.260	1.123	9.490	0.046	-36.130	0.455	151.440

Specifications are subject to change without notice.

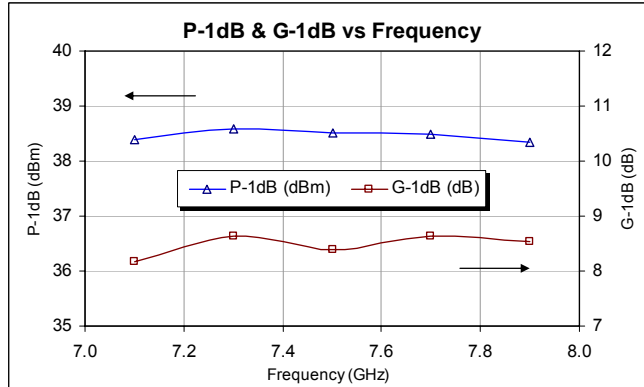
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page 2 of 4
Revised July 2004

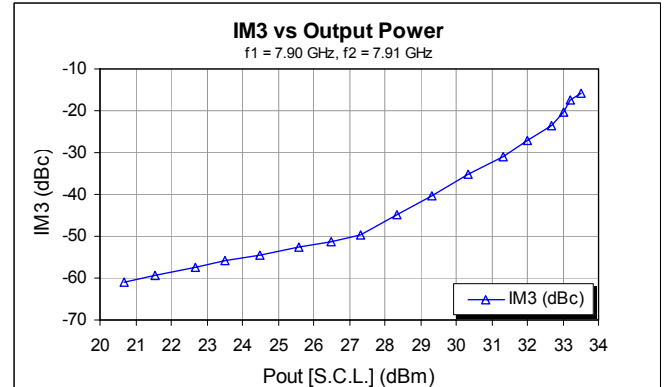
Power De-rating Curve and IM3 Definition



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

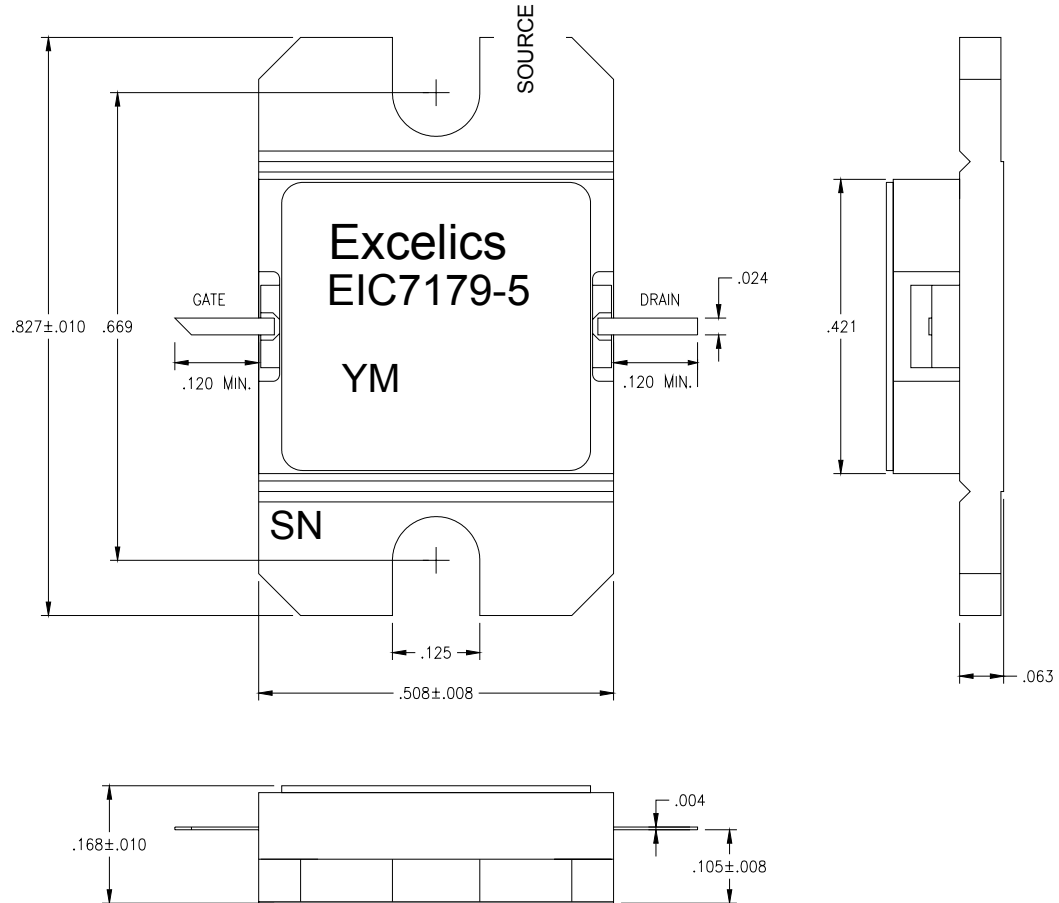


Typical IM3 Data ($V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 65\% IDSS$)



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
EIC7179-5	Industrial	7.10-7.90 GHz	36.5	-43

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