EIC7179-8

7.10-7.90 GHz 8-Watt Internally-Matched Power FET

Issued Date: 06-22-04

FEATURES

- **7.10 – 7.90 GHz Bandwidth**
- **Input/Output Impedance Matched to 50 Ohms**
- **+39.5 dBm Output Power at 1dB Compression**
- **9 dB Power Gain at 1dB Compression**
- **30% Power Added Efficiency**
- **-46 dBc IM3 at Po = 28.5 dBm SCL**
- **Hermetic Metal Flange Package**
- **100% Tested for DC, RF, and R_{TH}**

DESCRIPTION

The EIC7179-8 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°C)

SYMBOL	PARAMETERS/TEST CONDITIONS[1]	MIN	TYP	MAX	UNITS
P_{1dB}	Output Power at 1dB Compression f = 7.10-7.90GHz V_{DS} = 10 V, I_{DSQ} ≈ 2200mA	38.5	39.5		dBm
G_{1dB}	Gain at 1dB Compression f = 7.10-7.90GHz V_{DS} = 10 V, I_{DSQ} ≈ 2200mA	7.5	8.5		dB
ΔG	Gain Flatness f = 7.10-7.90GHz V_{DS} = 10 V, I_{DSQ} ≈ 2200mA			±0.6	dB
PAE	Power Added Efficiency at 1dB Compression V_{DS} = 10 V, I_{DSQ} ≈ 2200mA f = 7.10-7.90GHz		30		%
Id_{1dB}	Drain Current at 1dB Compression f = 7.10-7.90GHz		2400	2800	mA
IM3	Output 3rd Order Intermodulation Distortion Δf = 10 MHz 2-Tone Test; Pout = 28.5 dBm S.C.L[2] V_{DS} = 10 V, I_{DSQ} ≈ 65% IDSS f = 7.90 GHz	-43	-46		dBc
I_{DSS}	Saturated Drain Current V_{DS} = 3 V, V_{GS} = 0 V		4000	4500	mA
V_P	Pinch-off Voltage V_{DS} = 3 V, I_{DS} = 40 mA		-2.5	-4.0	V
R_{TH}	Thermal Resistance[3]		3.5	4.0	°C/W

Notes:
1. Tested with 100 Ohm gate resistor.
2. S.C.L. = Single Carrier Level.
3. Overall Rth depends on case mounting.

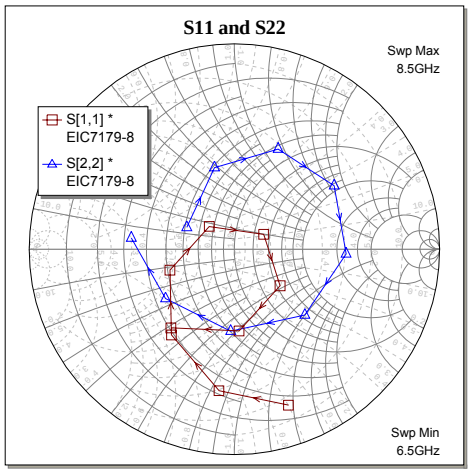
ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION[1,2]

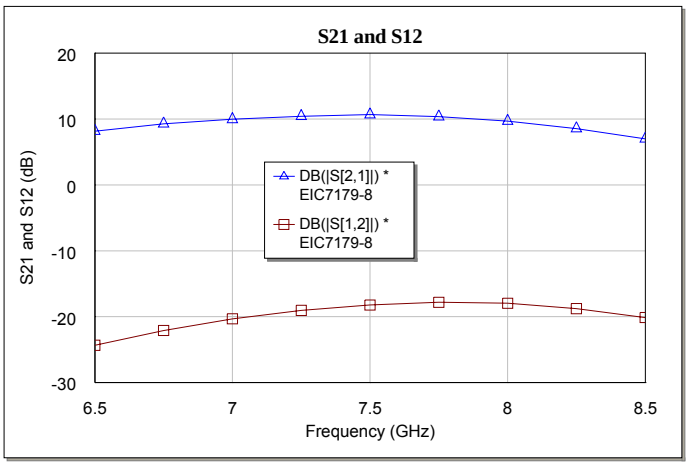
SYMBOL	CHARACTERISTIC	VALUE
V_{DS}	Drain to Source Voltage	10 V
V_{GS}	Gate to Source Voltage	-4.5 V
I_{DS}	Drain Current	IDSS
I_{GSF}	Forward Gate Current	80 mA
P_{IN}	Input Power	@ 3dB compression
P_T	Total Power Dissipation	32 W
T_{CH}	Channel Temperature	150°C
T_{STG}	Storage Temperature	-65/+150°C

Notes:
1. Operating the device beyond any of the above ratings may result in permanent damage or reduction of MTTF.
2. 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

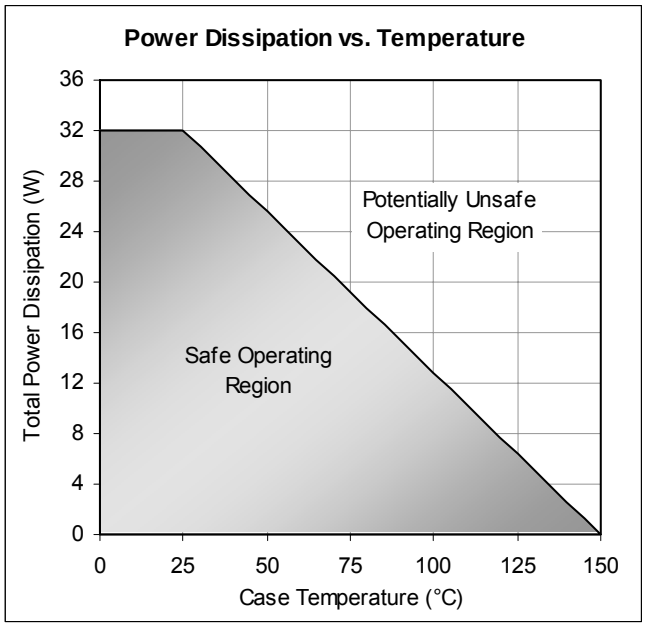
Typical S-Parameters (T= 25°C, 50Ω system, de-embedded to edge of package)
V_{DS} = 10 V, I_{DSQ} ≈ 2200mA

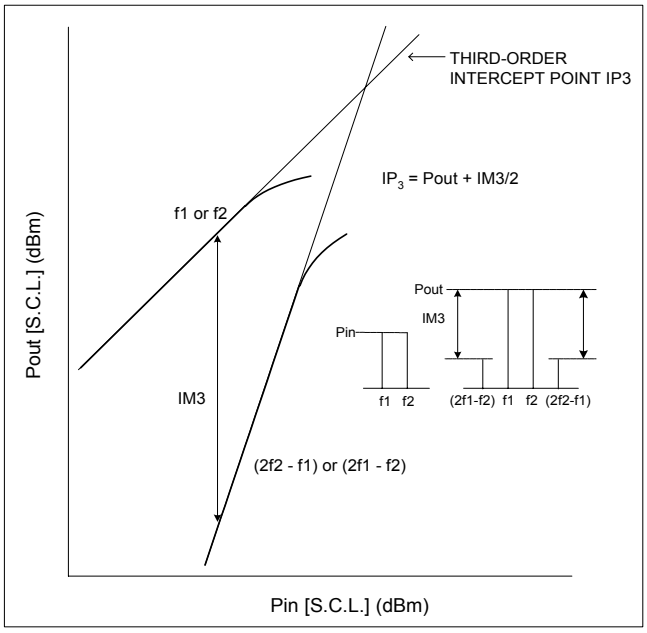




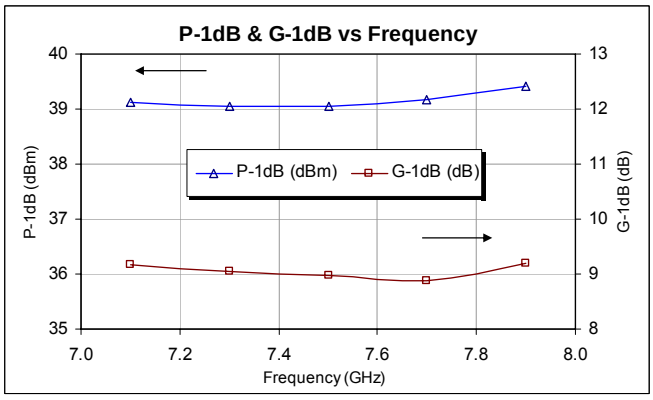
FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
6.25	0.880	-49.670	2.147	58.460	0.045	1.160	0.220	-119.050
6.50	0.803	-70.860	2.561	25.780	0.061	-30.980	0.255	155.400
6.75	0.693	-96.200	2.913	-8.850	0.078	-66.370	0.409	103.720
7.00	0.517	-126.330	3.150	-44.530	0.096	-100.870	0.533	66.370
7.25	0.330	-162.030	3.324	-79.880	0.112	-136.570	0.576	32.440
7.50	0.165	137.750	3.420	-117.150	0.122	-173.260	0.545	-2.360
7.75	0.160	26.960	3.298	-154.880	0.129	150.260	0.470	-43.000
8.00	0.285	-38.600	3.055	167.050	0.126	113.450	0.399	-92.540
8.25	0.398	-86.640	2.676	129.920	0.115	77.180	0.413	-144.320
8.50	0.492	-128.940	2.241	93.730	0.099	43.170	0.505	173.770
8.75	0.570	-165.600	1.765	59.440	0.081	10.010	0.606	143.580

Power De-rating Curve and IM3 Definition

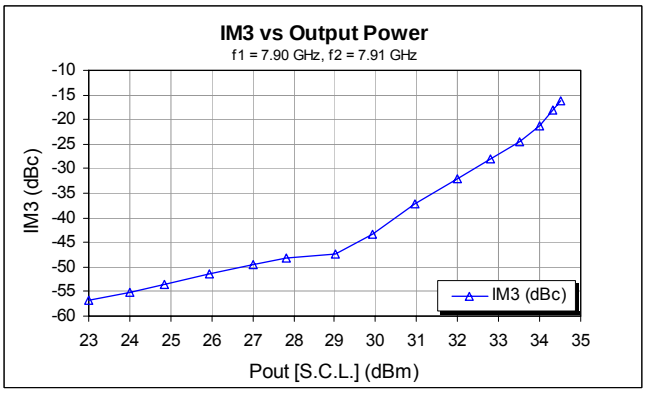




Typical Power Data (V_{DS} = 10 V, I_{DSQ} = 2200 mA)

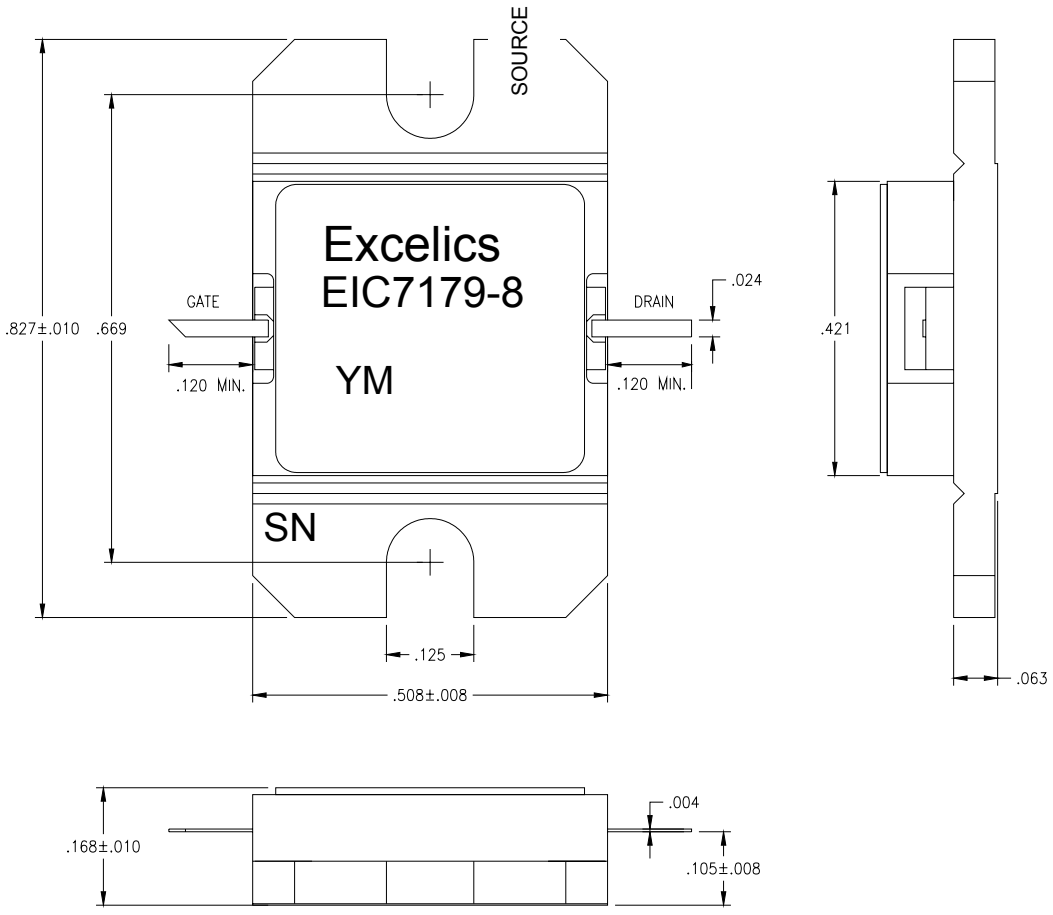


Typical IM3 Data (V_{DS} = 10 V, I_{DSQ} ≈ 65% IDSS)



PACKAGE OUTLINE

Dimensions in inches, Tolerance ± .005 unless otherwise specified



ORDERING INFORMATION

Part Number	Grade[1]	f_{Test} (GHz)	P_{1dB} (min)	IM_3 (min)[2]
EIC7179-8	Industrial	7.10-7.90 GHz	38.5	-43

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