



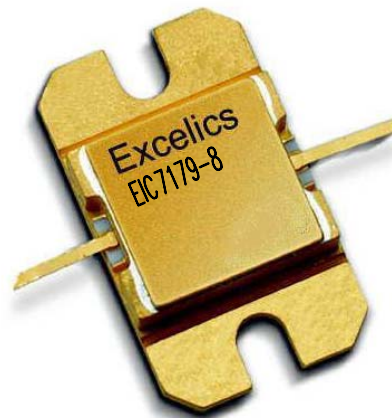
# EIC7179-8

## 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  $P_o = 28.5$  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 ( $T_a = 25^\circ\text{C}$ )

SYMBOL	PARAMETERS/TEST CONDITIONS <sup>1</sup>	MIN	TYP	MAX	UNITS
$P_{1dB}$	Output Power at 1dB Compression $f = 7.10\text{-}7.90\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 2200\text{mA}$	38.5	39.5		dBm
$G_{1dB}$	Gain at 1dB Compression $f = 7.10\text{-}7.90\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 2200\text{mA}$	7.5	8.5		dB
$\Delta G$	Gain Flatness $f = 7.10\text{-}7.90\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 2200\text{mA}$			$\pm 0.6$	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 10\text{ V}, I_{DSQ} \approx 2200\text{mA}$ $f = 7.10\text{-}7.90\text{GHz}$		30		%
$I_{d1dB}$	Drain Current at 1dB Compression $f = 7.10\text{-}7.90\text{GHz}$		2400	2800	mA
IM3	Output 3rd Order Intermodulation Distortion $\Delta f = 10\text{ MHz}$ 2-Tone Test; $P_{out} = 28.5\text{ dBm S.C.L.}^2$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 65\% I_{DSS}$ $f = 7.90\text{ GHz}$	-43	-46		dBc
$I_{DSS}$	Saturated Drain Current $V_{DS} = 3\text{ V}, V_{GS} = 0\text{ V}$		4000	4500	mA
$V_P$	Pinch-off Voltage $V_{DS} = 3\text{ V}, I_{DS} = 40\text{ mA}$		-2.5	-4.0	V
$R_{TH}$	Thermal Resistance <sup>3</sup>		3.5	4.0	$^\circ\text{C/W}$

Notes:

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

Specifications are subject to change without notice.

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## ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION<sup>1,2</sup>

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

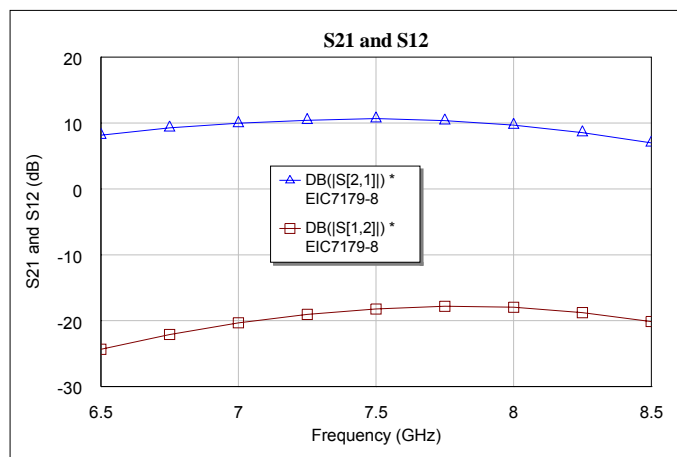
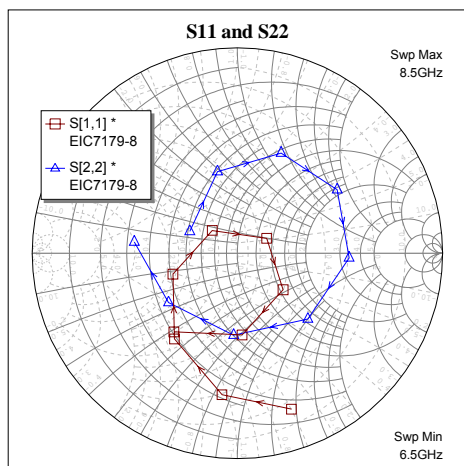
### Notes:

- 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)

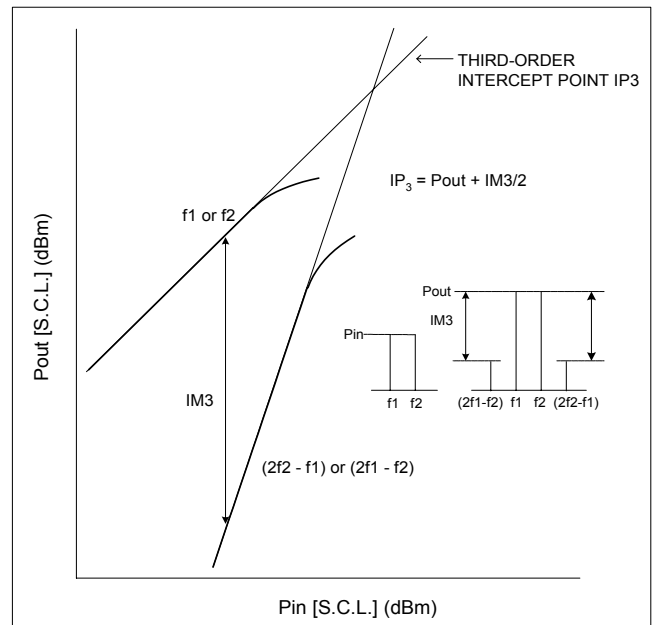
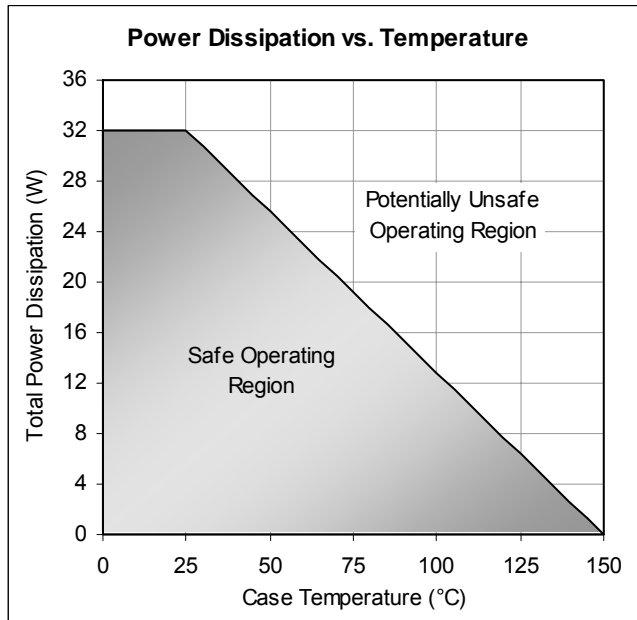
$V_{DS} = 10\text{ V}$ ,  $I_{DSQ} \approx 2200\text{mA}$



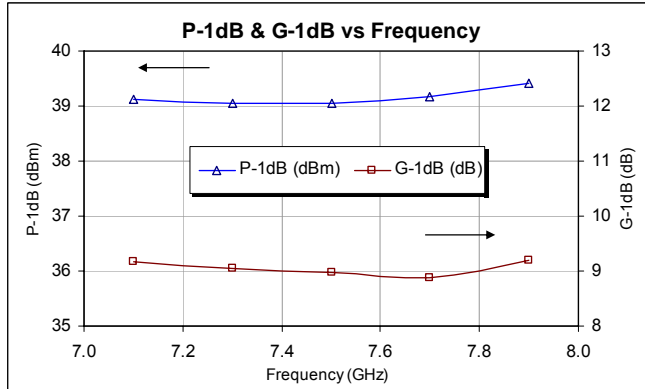
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
6.25	0.880	-49.670	2.147	58.460	0.045	1.160	0.220	-119.050
6.50	0.803	-70.860	2.561	25.780	0.061	-30.980	0.255	155.400
6.75	0.693	-96.200	2.913	-8.850	0.078	-66.370	0.409	103.720
7.00	0.517	-126.330	3.150	-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

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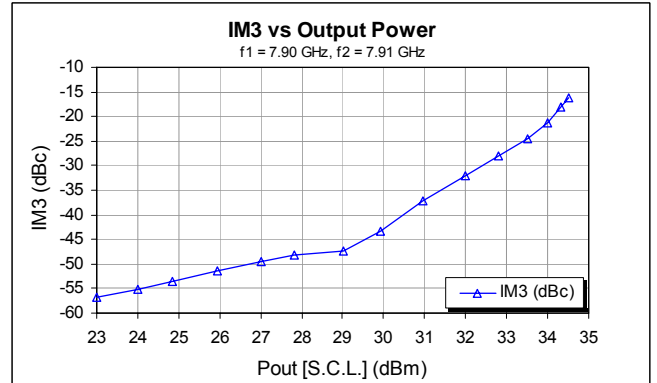
## Power De-rating Curve and IM3 Definition



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



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



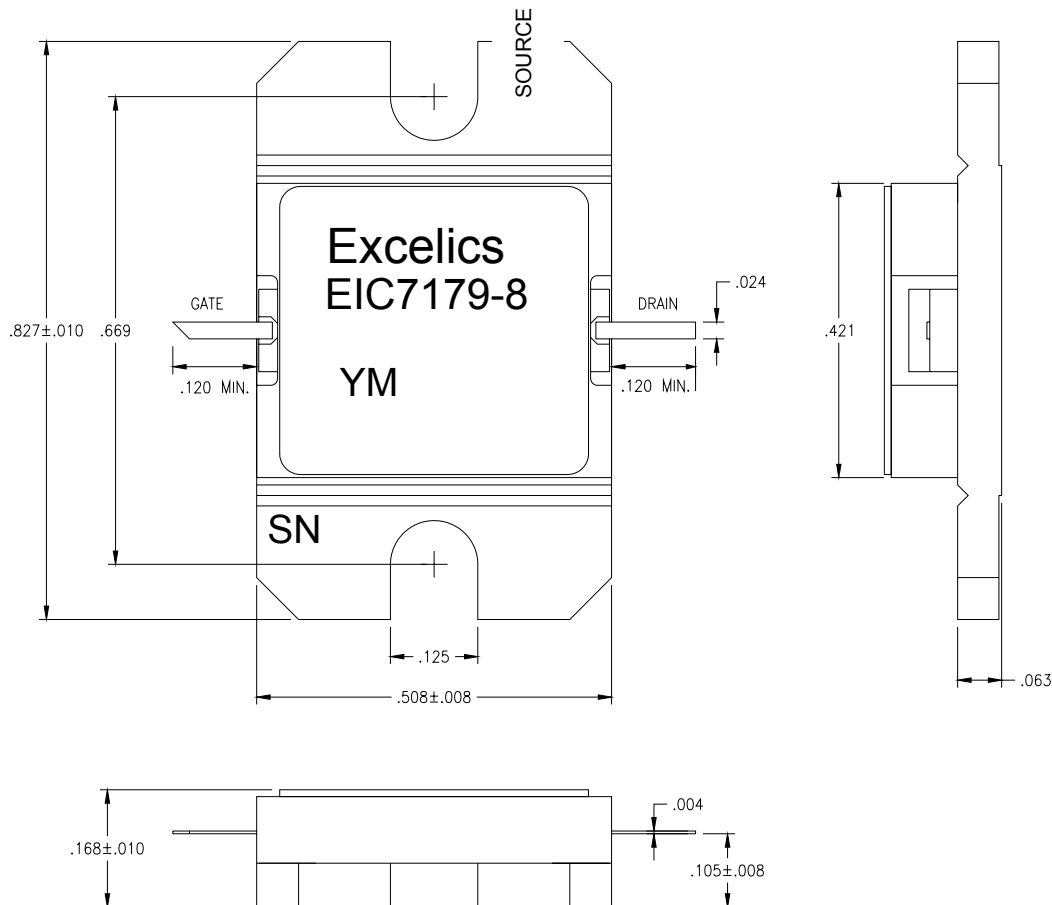
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# EIC7179-8

## PACKAGE OUTLINE

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



## ORDERING INFORMATION

Part Number	Grade <sup>1</sup>	f <sub>Test</sub> (GHz)	P <sub>1dB</sub> (min)	IM <sub>3</sub> (min) <sup>2</sup>
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.

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