



EIC8596-4

8.50-9.60 GHz 4-Watt Internally-Matched Power FET

Issued Date: 06-07-04

FEATURES

- 8.50 – 9.60 GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +36.5 dBm Output Power at 1dB Compression
- 7.5 dB Power Gain at 1dB Compression
- 30% Power Added Efficiency
- -43 dBc IM3 at $P_o = 25.5$ dBm SCL
- Hermetic Metal Flange Package
- 100% Tested for DC, RF, and R_{TH}



DESCRIPTION

The EIC8596-4 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 $f = 8.50\text{-}9.60\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$	35.5	36.5		dBm
G_{1dB}	Gain at 1dB Compression $f = 8.50\text{-}9.60\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$	6.5	7.5		dB
ΔG	Gain Flatness $f = 8.50\text{-}9.60\text{GHz}$ $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$			± 0.6	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 10\text{ V}, I_{DSQ} \approx 1100\text{mA}$ $f = 8.50\text{-}9.60\text{GHz}$		30		%
I_{d1dB}	Drain Current at 1dB Compression $f = 8.50\text{-}9.60\text{GHz}$		1100	1300	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 $V_{DS} = 10\text{ V}, I_{DSQ} \approx 65\% I_{DSS}$ $f = 9.60\text{ GHz}$	-40	-43		dBc
I_{DSS}	Saturated Drain Current $V_{DS} = 3\text{ V}, V_{GS} = 0\text{ V}$		1800	2200	mA
V_P	Pinch-off Voltage $V_{DS} = 3\text{ V}, I_{DS} = 20\text{ mA}$		-2.5	-4.0	V
R_{TH}	Thermal Resistance ³		5.0	6.0	$^\circ\text{C/W}$

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^{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	40 mA
P_{IN}	Input Power	@ 3dB compression
P_T	Total Power Dissipation	20 W
T_{CH}	Channel Temperature	150°C
T_{STG}	Storage Temperature	-65/+150°C

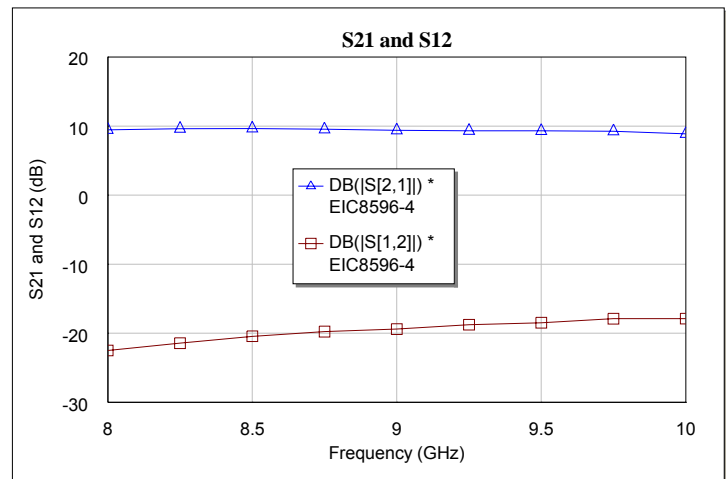
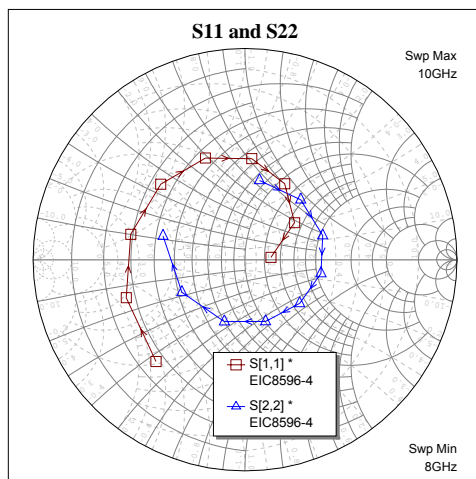
Notes:

- 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)

$V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 1100\text{mA}$



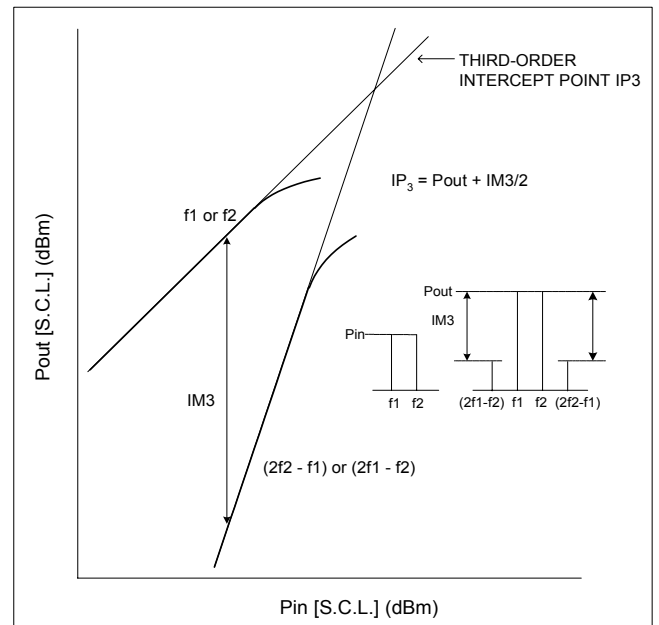
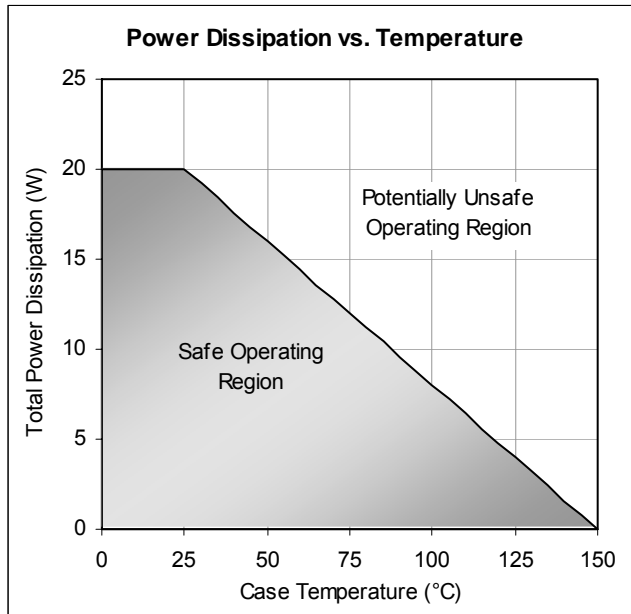
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
8.00	0.639	-131.090	2.971	-43.850	0.075	-95.770	0.381	79.650
8.25	0.589	-162.210	3.029	-71.870	0.085	-125.560	0.387	47.150
8.50	0.553	167.390	3.042	-98.890	0.095	-152.800	0.384	17.300
8.75	0.535	138.050	2.997	-125.900	0.103	-179.370	0.364	-10.280
9.00	0.516	111.210	2.947	-152.010	0.107	155.110	0.331	-38.730
9.25	0.479	86.150	2.924	-178.400	0.115	128.390	0.308	-71.620
9.50	0.406	62.550	2.918	154.530	0.119	102.590	0.309	-108.380
9.75	0.292	36.850	2.901	125.240	0.127	74.230	0.336	-152.650
10.00	0.123	5.160	2.779	94.570	0.128	44.690	0.403	163.780
10.25	0.085	-167.640	2.588	62.670	0.123	13.470	0.499	126.800
10.50	0.278	157.010	2.245	31.830	0.112	-17.580	0.564	94.870

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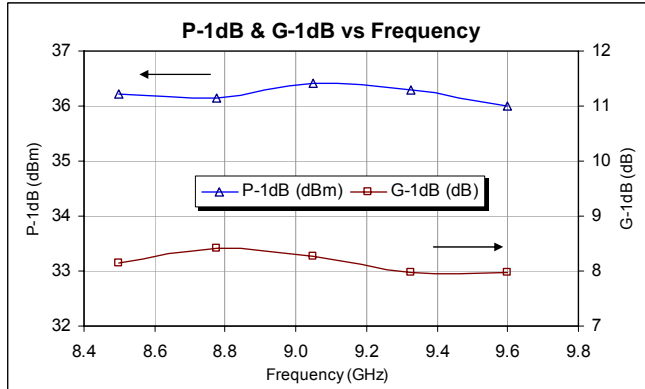


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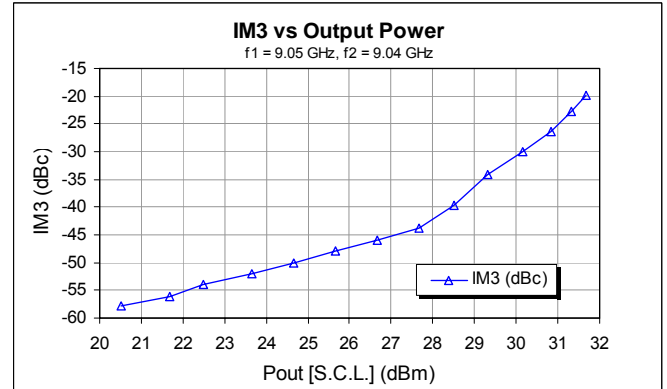
Power De-rating Curve and IM3 Definition



Typical Power Data (V_{DS} = 10 V, I_{DSQ} = 1100 mA)



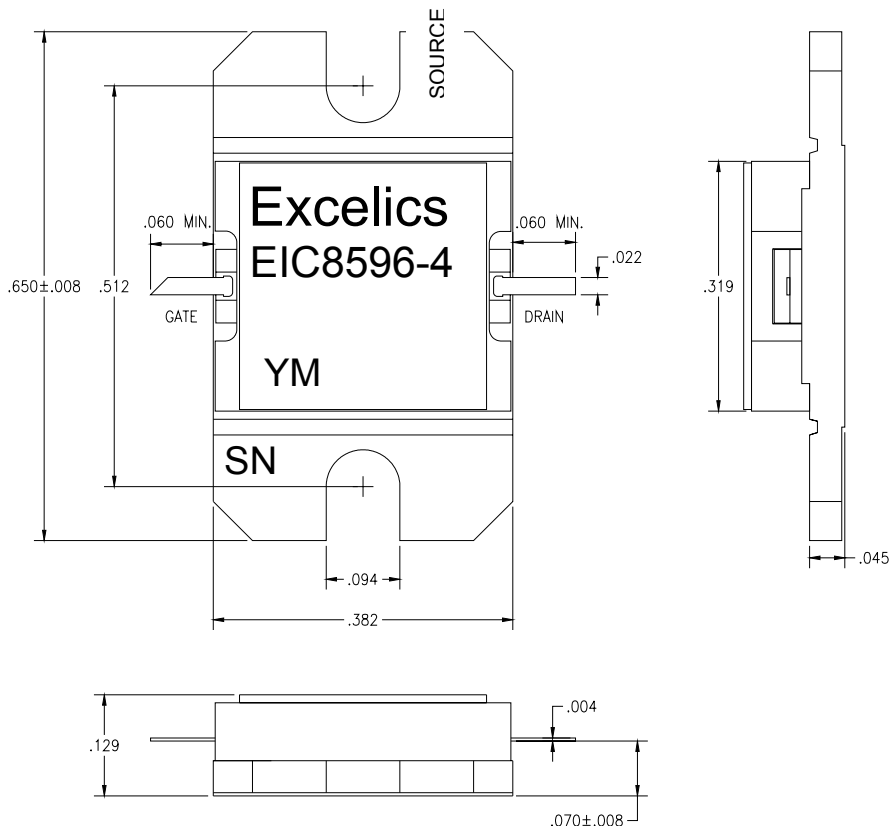
Typical IM3 Data (V_{DS} = 10 V, I_{DSQ} ≈ 65% IDSS)



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PACKAGE OUTLINE

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



ORDERING INFORMATION

Part Number	Grade ¹	f_{Test} (GHz)	$P_{1\text{dB}}$ (min)	IM_3 (min) ²
EIC8596-4	Industrial	8.50-9.60 GHz	35.5	-40

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