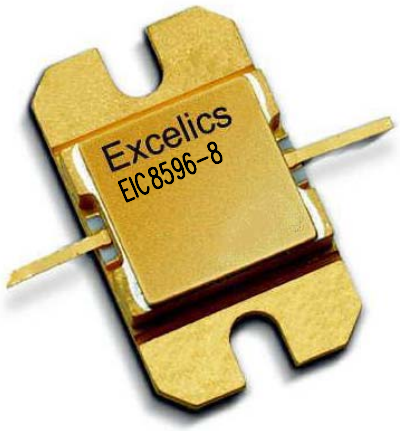
EIC8596-8

8.50-9.60 GHz 8-Watt Internally-Matched Power FET

Issued Date: 06-07-04

FEATURES

- **8.50 – 9.60 GHz Bandwidth**
- **Input/Output Impedance Matched to 50 Ohms**
- **+39.5 dBm Output Power at 1dB Compression**
- **7.5 dB Power Gain at 1dB Compression**
- **30% Power Added Efficiency**
- **-43 dBc IM3 at Po = 28.5 dBm SCL**
- **Hermetic Metal Flange Package**
- **100% Tested for DC, RF, and R_{TH}**



Caution! ESD sensitive device.

DESCRIPTION

The EIC8596-8 is a high power, highly linear, single stage MFET amplifier in a flange mount package. This amplifier features Excelics' unique MESFET transistor technology.

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

SYMBOL	PARAMETERS/TEST CONDITIONS[1]	MIN	TYP	MAX	UNITS
P_{1dB}	Output Power at 1dB Compression f = 8.50-9.60GHz V_{DS} = 10 V, I_{DSQ} ≈ 2200mA	38.5	39.5		dBm
G_{1dB}	Gain at 1dB Compression f = 8.50-9.60GHz V_{DS} = 10 V, I_{DSQ} ≈ 2200mA	6.5	7.5		dB
ΔG	Gain Flatness f = 8.50-9.60GHz 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 = 8.50-9.60GHz		30		%
Id_{1dB}	Drain Current at 1dB Compression f = 8.50-9.60GHz		2200	2600	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 = 9.60 GHz	-40	-43		dBc
I_{DSS}	Saturated Drain Current V_{DS} = 3 V, V_{GS} = 0 V		3700	4300	mA
V_P	Pinch-off Voltage V_{DS} = 3 V, I_{DS} = 40 mA		-2.5	-4.0	V
R_{TH}	Thermal Resistance[3]		2.5	3.5	°C/W

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

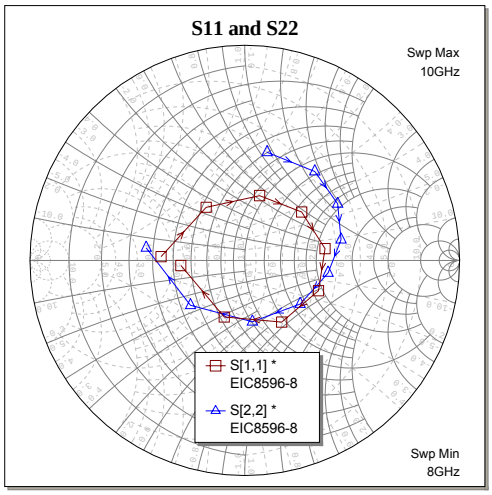
ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION[1,2]

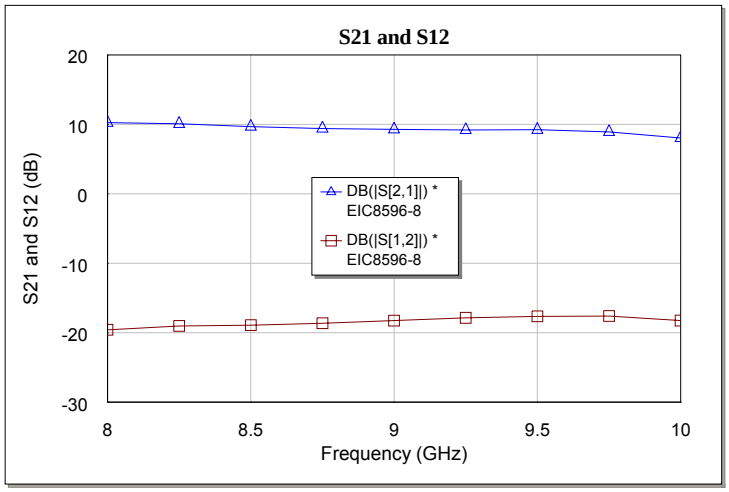
SYMBOL	CHARACTERISTIC	VALUE
V_{DS}	Drain to Source Voltage	10 V
V_{GS}	Gate to Source Voltage	-4.5 V
I_{DS}	Drain Current	IDSS
I_{GSF}	Forward Gate Current	80 mA
P_{IN}	Input Power	@ 3dB compression
P_T	Total Power Dissipation	35 W
T_{CH}	Channel Temperature	150°C
T_{STG}	Storage Temperature	-65/+150°C

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

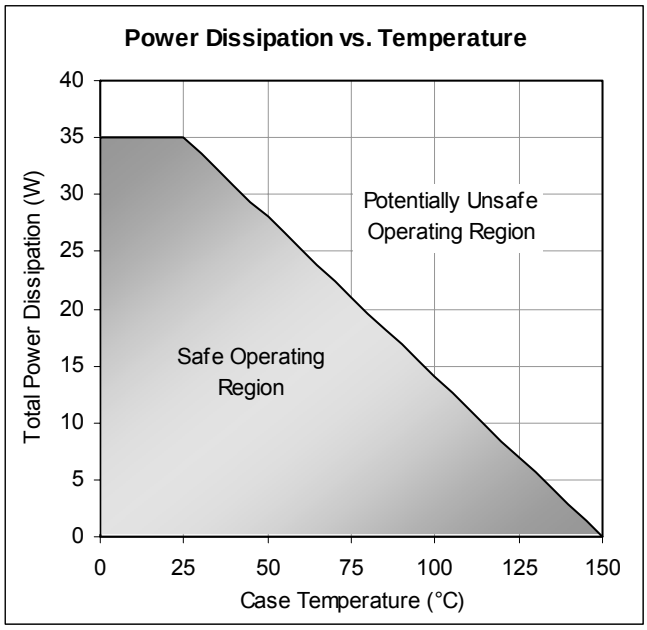
Typical S-Parameters (T= 25°C, 50Ω system, de-embedded to edge of package)
V_{DS} = 10 V, I_{DSQ} ≈ 2200mA

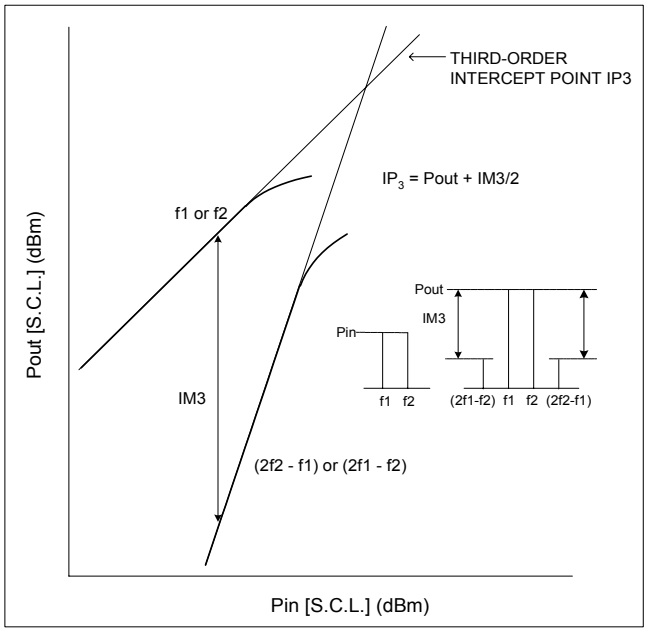




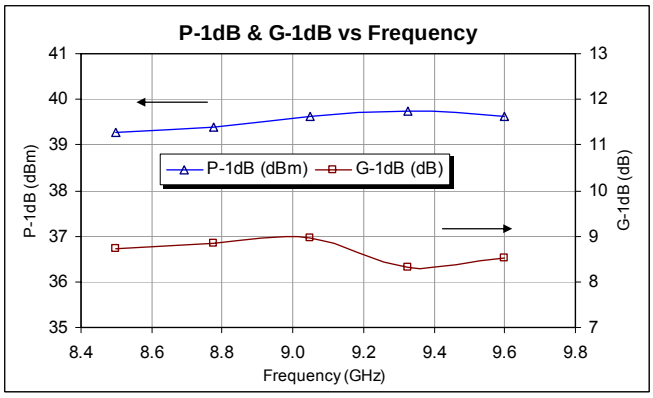
FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
8.00	0.390	177.400	3.255	-57.380	0.105	-114.220	0.514	78.300
8.25	0.306	125.970	3.195	-88.570	0.112	-145.020	0.527	51.750
8.50	0.309	77.020	3.052	-116.850	0.113	-173.180	0.507	31.300
8.75	0.348	40.380	2.957	-144.300	0.117	161.600	0.459	12.160
9.00	0.378	8.330	2.917	-170.590	0.122	135.400	0.393	-8.460
9.25	0.371	-22.220	2.884	161.430	0.128	108.950	0.328	-38.080
9.50	0.334	-59.000	2.897	132.320	0.131	81.650	0.287	-82.820
9.75	0.280	-109.930	2.793	100.510	0.132	49.430	0.327	-140.430
10.00	0.299	-175.540	2.528	66.690	0.122	16.320	0.462	172.730
10.25	0.387	132.770	2.112	34.290	0.103	-16.260	0.614	140.720
10.50	0.490	98.340	1.672	5.950	0.081	-45.080	0.713	117.810

Power De-rating Curve and IM3 Definition

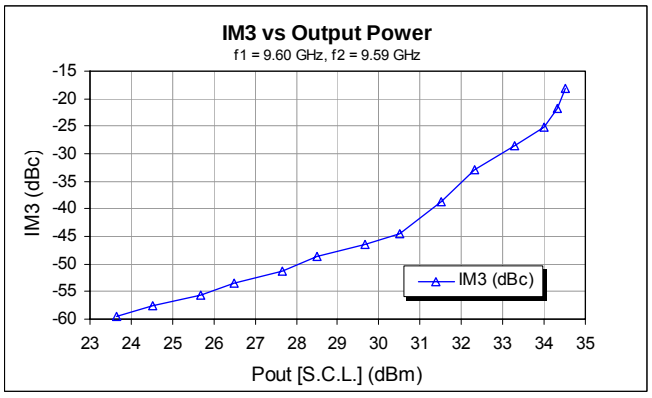




Typical Power Data (V_{DS} = 10 V, I_{DSQ} = 2200 mA)

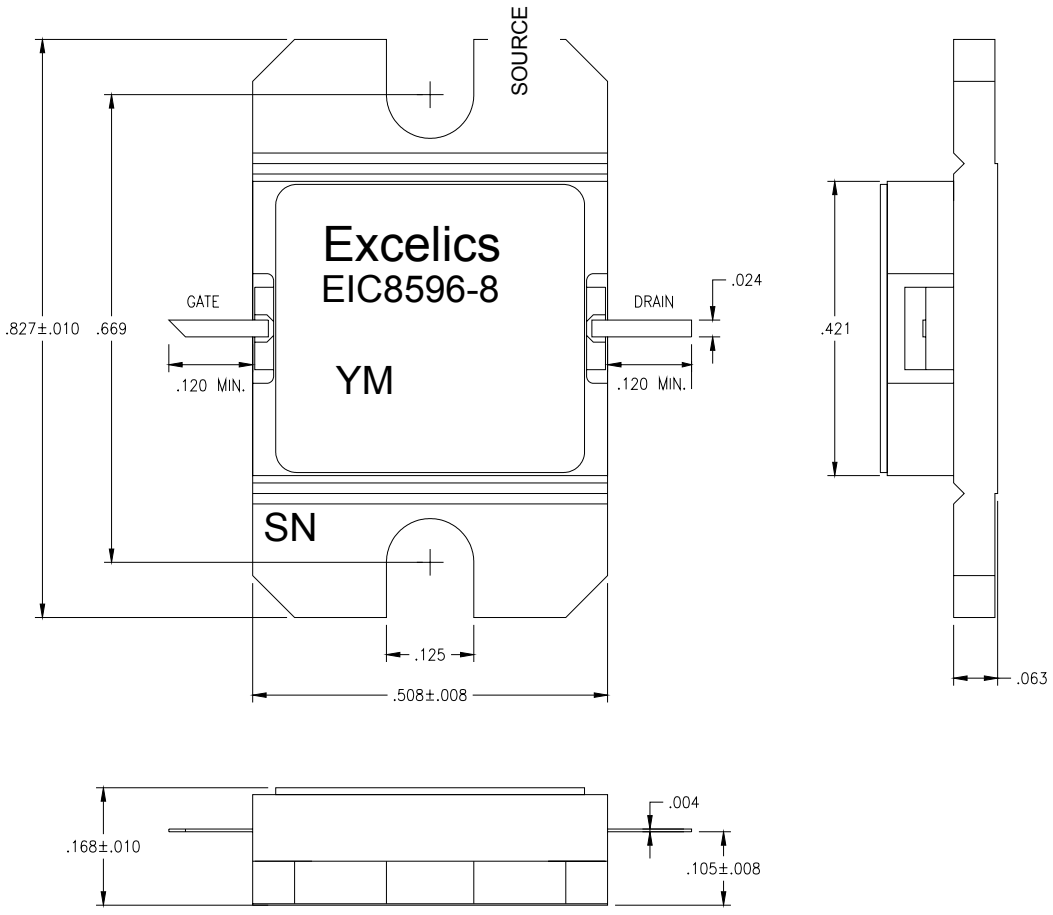


Typical IM3 Data (V_{DS} = 10 V, I_{DSQ} ≈ 65% IDSS)



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]
EIC8596-8	Industrial	8.50-9.60 GHz	38.5	-40

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