EIC8596-4

UPDATED 08/21/2007

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

FEATURES

- **8.50 –9.60GHz 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 Po = 25.5 dBm SCL**
- **100% Tested for DC, RF, and R_{TH}**

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

Caution! ESD sensitive device.

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} ≈ 1100mA	35.5	36.5		dBm
G_{1dB}	Gain at 1dB Compression f = 8.50-9.60GHz V_{DS} = 10 V, I_{DSQ} ≈ 1100mA	6.5	7.5		dB
ΔG	Gain Flatness f = 8.50-9.60GHz V_{DS} = 10 V, I_{DSQ} ≈ 1100mA			±0.6	dB
PAE	Power Added Efficiency at 1dB Compression V_{DS} = 10 V, I_{DSQ} ≈ 1100mA f = 8.50-9.60GHz		30		%
Id_{1dB}	Drain Current at 1dB Compression f = 8.50-9.60GHz		1100	1300	mA
IM3	Output 3rd Order Intermodulation Distortion Δf = 10 MHz 2-Tone Test; Pout = 25.5 dBm S.C.L[2] V_{DS} = 10 V, I_{DSQ} ≈ 65% IDSS f = 9.60GHz	-40	-43		dBc
I_{DSS}	Saturated Drain Current V_{DS} = 3 V, V_{GS} = 0 V		1800	2200	mA
V_P	Pinch-off Voltage V_{DS} = 3 V, I_{DS} = 20 mA		-2.5	-4.0	V
R_{TH}	Thermal Resistance[3]		5.0	6.0	°C/W

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

ABSOLUTE MAXIMUM RATING FOR EFE

SYMBOLS	PARAMETERS	ABSOLUTE[1]	CONTINUOUS[2]
Vds	Drain-Source Voltage	15V	10V
Vgs	Gate-Source Voltage	-5V	-4V
Igf	Forward Gate Current	48mA	14.4mA
Igr	Reverse Gate Current	-9.6mA	-2.4mA
Pin	Input Power	36.0dBm	@ 3dB Compression
Tch	Channel Temperature	175C	175C
Tstg	Storage Temperature	-65C to +175C	-65C to +175C
Pt	Total Power Dissipation	25W	25W

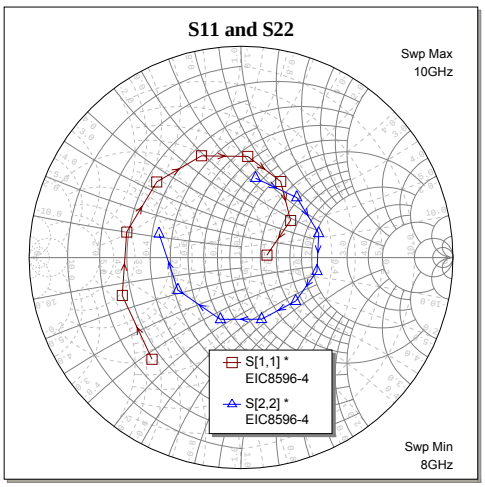
Note: 1. Exceeding any of the above ratings may result in permanent damage.
2. Exceeding any of the above ratings may reduce MTTF below design goals.

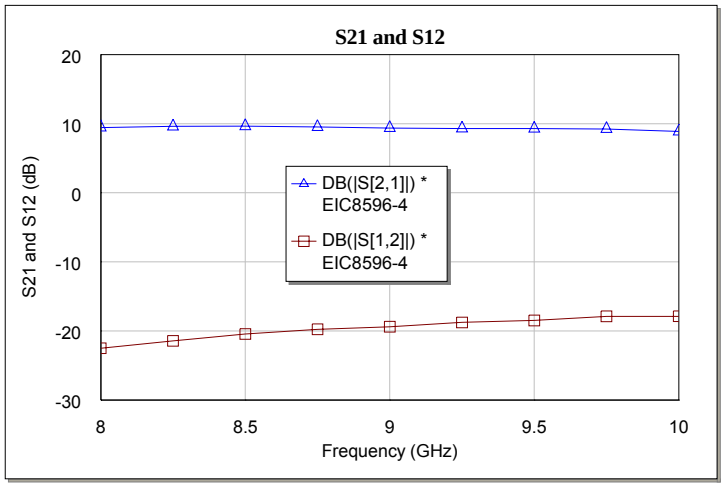
UPDATED 08/21/2007

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

PERFORMANCE DATA

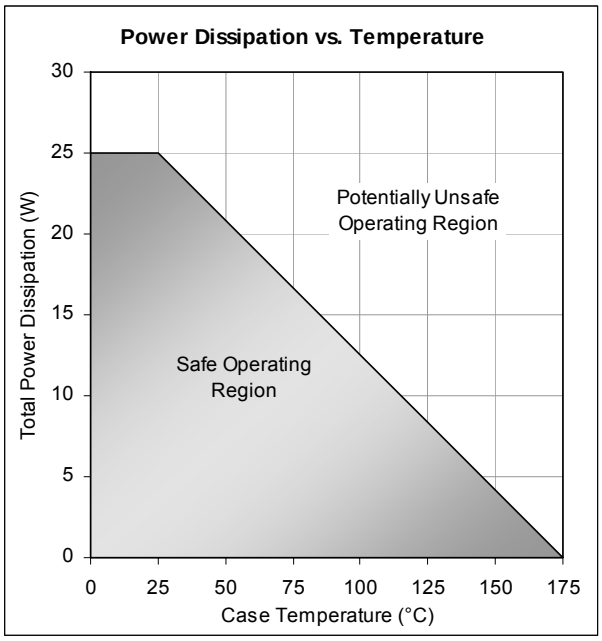
Typical S-Parameters (T= 25°C, 50Ω system, de-embedded to edge of package)
V_{DS} = 10 V, I_{DSQ} ≈ 1100mA

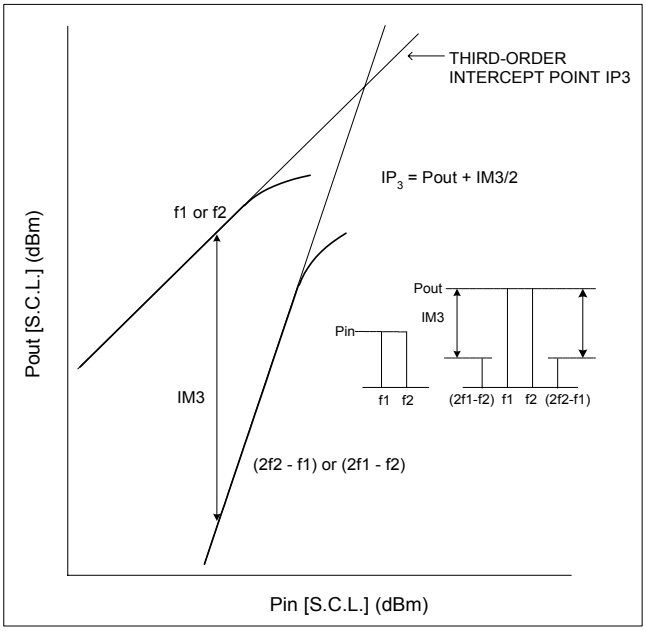




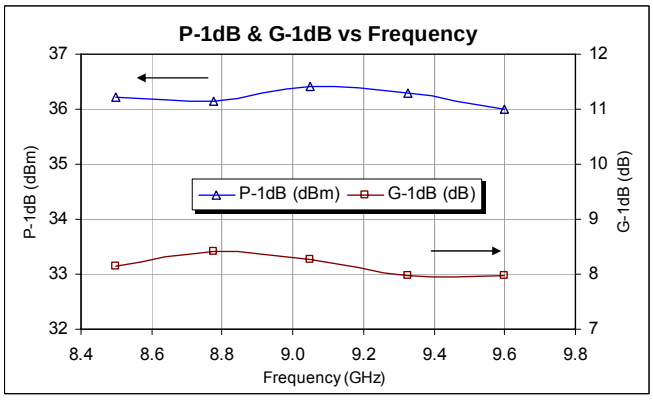
FREQ (GHz)	--- S11 --- MAG	ANG	--- S21 --- MAG	ANG	--- S12 --- MAG	ANG	--- S22 --- MAG	ANG
8.00	0.639	-131.090	2.971	-43.850	0.075	-95.770	0.381	79.650
8.25	0.589	-162.210	3.029	-71.870	0.085	-125.560	0.387	47.150
8.50	0.553	167.390	3.042	-98.890	0.095	-152.800	0.384	17.300
8.75	0.535	138.050	2.997	-125.900	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

Power De-rating Curve and IM3 Definition

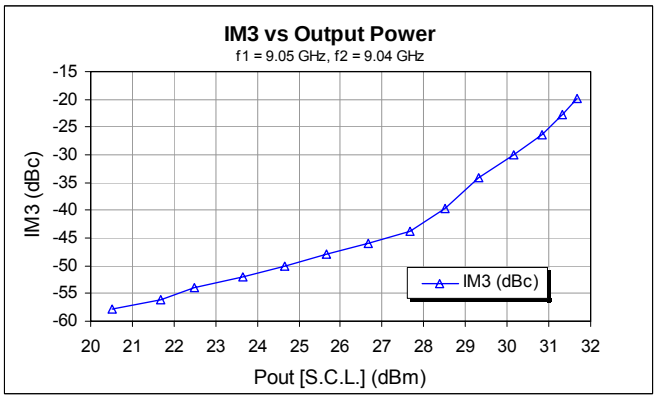




Typical Power Data (V_{DS} = 10 V, I_{DSQ} = 1100 mA)



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



EIC8596-4

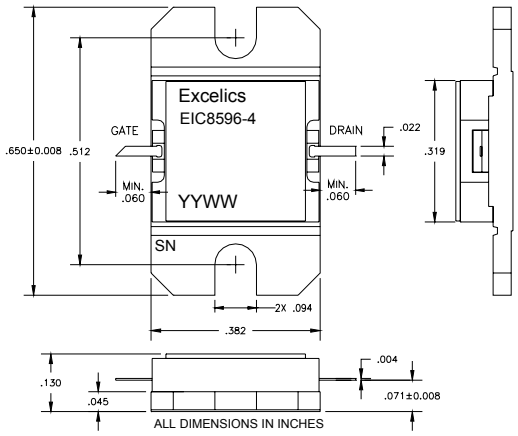
UPDATED 08/21/2007

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

PACKAGES OUTLINE

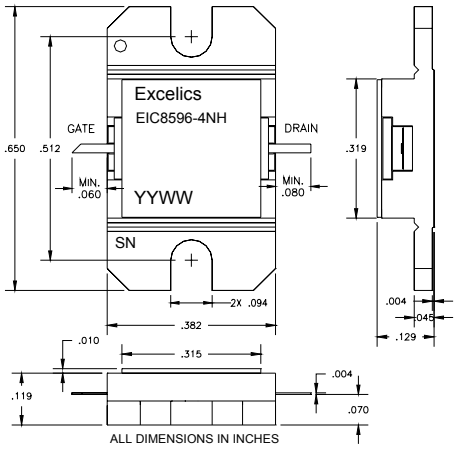
Dimensions in inches, Tolerance ± .005 unless otherwise specified

EIC8596-4 (Hermetic)



Caution! ESD sensitive device.

EIC8596-4NH (Non-Hermetic)



Caution! ESD sensitive device.

ORDERING INFORMATION

Part Number	Packages	Grade[1]	f_{Test} (GHz)	P_{1dB} (min)	IM_3 (min)[2]
EIC8596-4	Hermetic	Industrial	8.50-9.60GHz	35.5	-40
EIC8596-4NH	Non-Hermetic	Industrial	8.50-9.60GHz	35.5	-40

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

DISCLAIMER

EXCELICS SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. EXCELICS DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN.

LIFE SUPPORT POLICY

EXCELICS SEMICONDUCTOR PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF EXCELICS SEMICONDUCTOR, INC. AS HERE IN:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness