



EIC5964-10

5.90-6.40 GHz 10-Watt Internally-Matched Power FET

Issued Date: 06-22-04

FEATURES

- 5.90 – 6.40 GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +40.5 dBm Output Power at 1dB Compression
- 10.0 dB Power Gain at 1dB Compression
- 37% Power Added Efficiency
- -46 dBc IM3 at $P_o = 29.5$ dBm SCL
- Hermetic Metal Flange Package
- 100% Tested for DC, RF, and R_{TH}

DESCRIPTION

The EIC5964-10 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 $f = 5.90\text{-}6.40\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 3200\text{mA}$	39.5	40.5		dBm
G_{1dB}	Gain at 1dB Compression $f = 5.90\text{-}6.40\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 3200\text{mA}$	9.0	10.0		dB
ΔG	Gain Flatness $f = 5.90\text{-}6.40\text{GHz}$ $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 3200\text{mA}$			± 0.6	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 3200\text{mA}$ $f = 5.90\text{-}6.40\text{GHz}$		37		%
I_{d1dB}	Drain Current at 1dB Compression $f = 5.90\text{-}6.40\text{GHz}$		3200	3600	mA
IM3	Output 3rd Order Intermodulation Distortion $\Delta f = 10\text{ MHz}$ 2-Tone Test; $P_{out} = 29.5\text{ dBm}$ S.C.L. ² $V_{DS} = 10\text{ V}$, $I_{DSQ} \approx 65\% I_{DSS}$ $f = 6.40\text{ GHz}$	-43	-46		dBc
I_{DSS}	Saturated Drain Current $V_{DS} = 3\text{ V}$, $V_{GS} = 0\text{ V}$		5800	6400	mA
V_P	Pinch-off Voltage $V_{DS} = 3\text{ V}$, $I_{DS} = 60\text{ mA}$		-2.5	-4.0	V
R_{TH}	Thermal Resistance ³		2.5	3.0	$^\circ\text{C/W}$

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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page 1 of 4
Revised July 2004



EIC5964-10

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	120 mA
P_{IN}	Input Power	@ 3dB compression
P_T	Total Power Dissipation	42 W
T_{CH}	Channel Temperature	150°C
T_{STG}	Storage Temperature	-65/+150°C

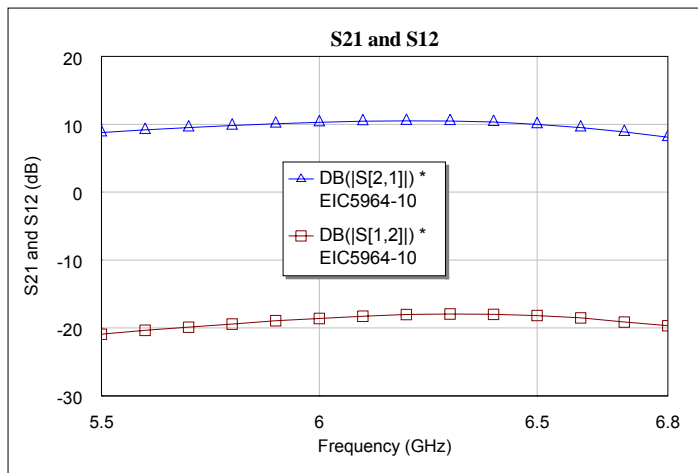
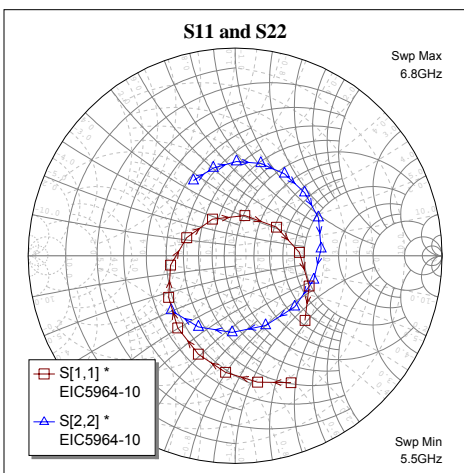
Notes:

- 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)

$V_{DS} = 10$ V, $I_{DSQ} \approx 3200$ mA



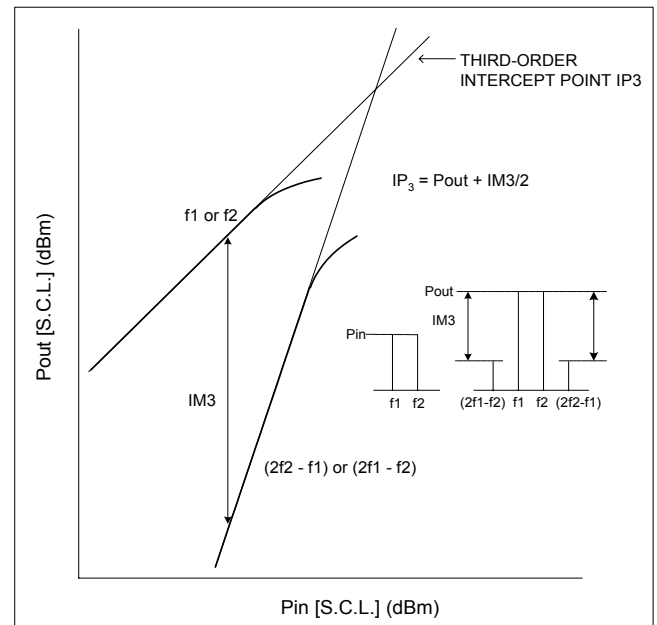
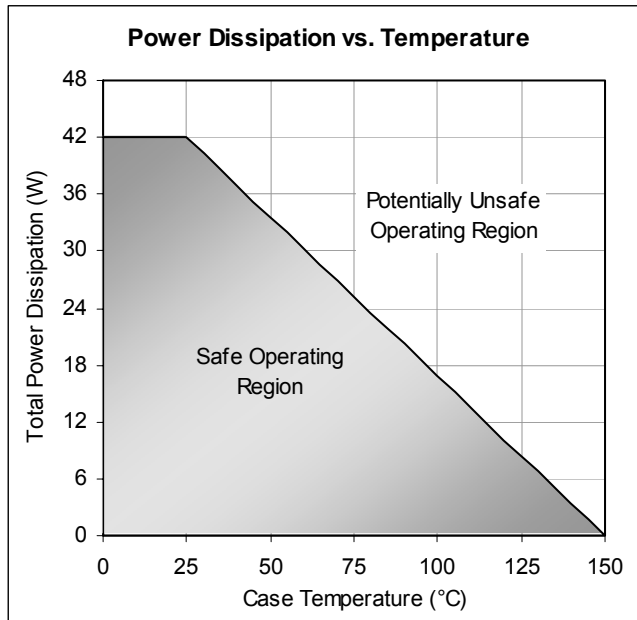
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
5.00	0.842	-10.380	2.138	85.680	0.066	23.190	0.279	-146.210
5.25	0.770	-36.270	2.452	52.620	0.075	-8.650	0.338	160.980
5.50	0.668	-66.150	2.749	17.860	0.090	-42.660	0.414	119.050
5.75	0.535	-102.210	3.044	-18.590	0.104	-77.630	0.459	82.070
6.00	0.378	-148.060	3.268	-57.830	0.118	-116.340	0.453	42.110
6.25	0.226	142.100	3.354	-99.660	0.126	-157.830	0.407	-5.740
6.50	0.243	34.670	3.165	-144.200	0.123	159.460	0.366	-66.250
6.75	0.423	-32.680	2.662	171.730	0.107	116.550	0.395	-128.840
7.00	0.573	-76.790	2.037	131.380	0.084	77.710	0.470	-176.150
7.25	0.675	-110.330	1.498	95.780	0.066	45.490	0.549	151.630
7.50	0.750	-137.290	1.090	64.300	0.050	12.690	0.624	128.540

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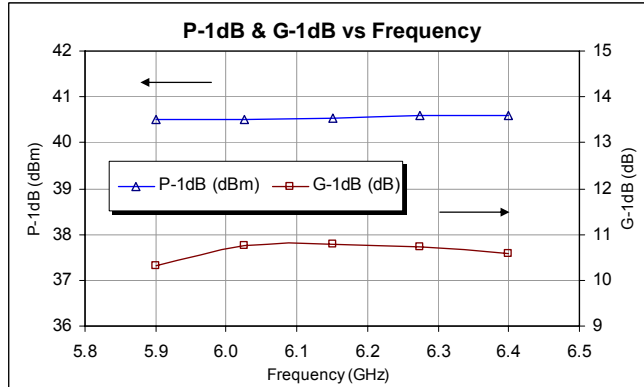
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page 2 of 4
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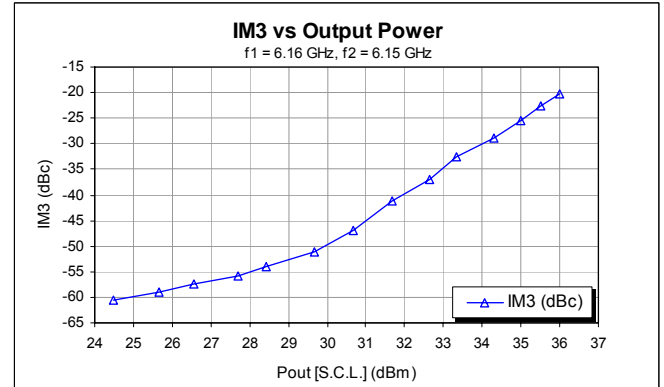
Power De-rating Curve and IM3 Definition



Typical Power Data ($V_{DS} = 10$ V, $I_{DSQ} = 3200$ mA)

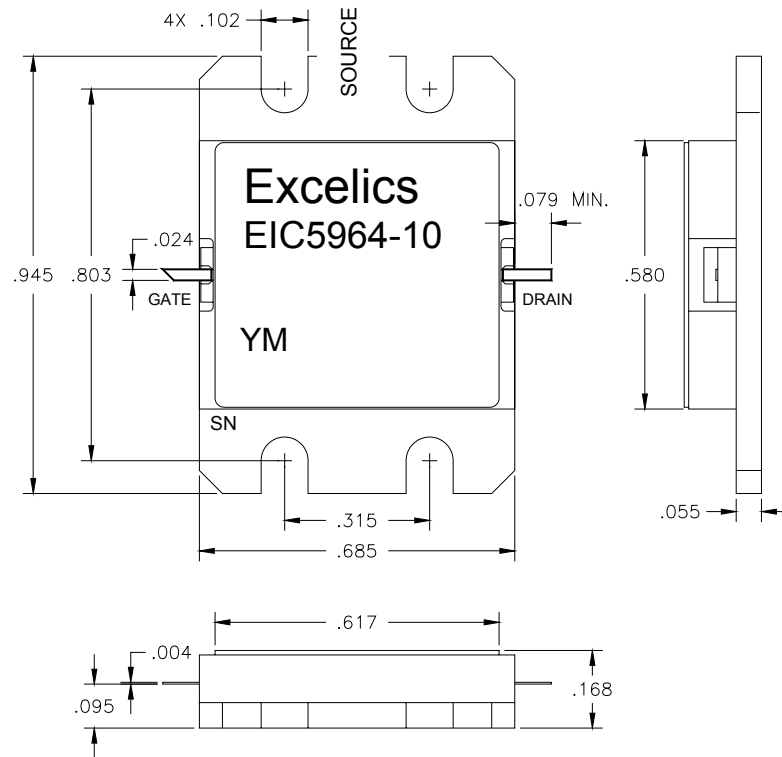


Typical IM3 Data ($V_{DS} = 10$ V, $I_{DSQ} \approx 65\%$ IDSS)



PACKAGE OUTLINE

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



ORDERING INFORMATION

Part Number	Grade ¹	f _{Test} (GHz)	P _{1dB} (min)	IM ₃ (min) ²
EIC5964-10	Industrial	5.90-6.40 GHz	39.5	-43

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