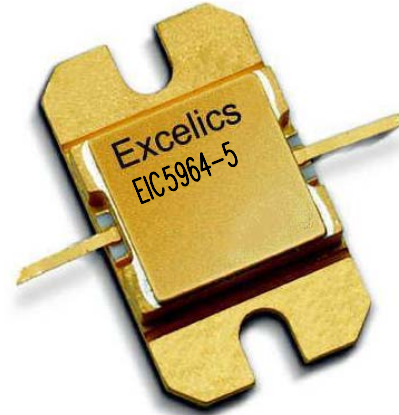


## 5.90-6.40 GHz 5-Watt Internally-Matched Power FET

### FEATURES

- 5.90 – 6.40 GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +37.5 dBm Output Power at 1dB Compression
- 10.0 dB Power Gain at 1dB Compression
- 37% Power Added Efficiency
- -46 dBc IM3 at  $P_o = 26.5$  dBm SCL
- Hermetic Metal Flange Package
- 100% Tested for DC, RF, and  $R_{TH}$



### DESCRIPTION

The EIC5964-5 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 $f = 5.90\text{-}6.40\text{GHz}$ $V_{DS} = 10\text{ V}$ , $I_{DSQ} \approx 1600\text{mA}$	36.5	37.5		dBm
$G_{1dB}$	Gain at 1dB Compression $f = 5.90\text{-}6.40\text{GHz}$ $V_{DS} = 10\text{ V}$ , $I_{DSQ} \approx 1600\text{mA}$	9	10		dB
$\Delta G$	Gain Flatness $f = 5.90\text{-}6.40\text{GHz}$ $V_{DS} = 10\text{ V}$ , $I_{DSQ} \approx 1600\text{mA}$			$\pm 0.6$	dB
PAE	Power Added Efficiency at 1dB Compression $V_{DS} = 10\text{ V}$ , $I_{DSQ} \approx 1600\text{mA}$ $f = 5.90\text{-}6.40\text{GHz}$		37		%
$I_{d1dB}$	Drain Current at 1dB Compression $f = 5.90\text{-}6.40\text{GHz}$		1600	1900	mA
IM3	Output 3rd Order Intermodulation Distortion $\Delta f = 10\text{ MHz}$ 2-Tone Test; $P_{out} = 26.5\text{ dBm}$ S.C.L. <sup>2</sup> $V_{DS} = 10\text{ V}$ , $I_{DSQ} \approx 65\%$ IDSS $f = 6.40\text{ GHz}$	-43	-46		dBc
$I_{DSS}$	Saturated Drain Current $V_{DS} = 3\text{ V}$ , $V_{GS} = 0\text{ V}$		2900	3500	mA
$V_P$	Pinch-off Voltage $V_{DS} = 3\text{ V}$ , $I_{DS} = 30\text{ mA}$		-2.5	-4.0	V
$R_{TH}$	Thermal Resistance <sup>3</sup>		5.0	5.5	$^\circ\text{C/W}$

Notes:

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



# EIC5964-5

## 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	60 mA
$P_{IN}$	Input Power	@ 3dB compression
$P_T$	Total Power Dissipation	23 W
$T_{CH}$	Channel Temperature	150°C
$T_{STG}$	Storage Temperature	-65/+150°C

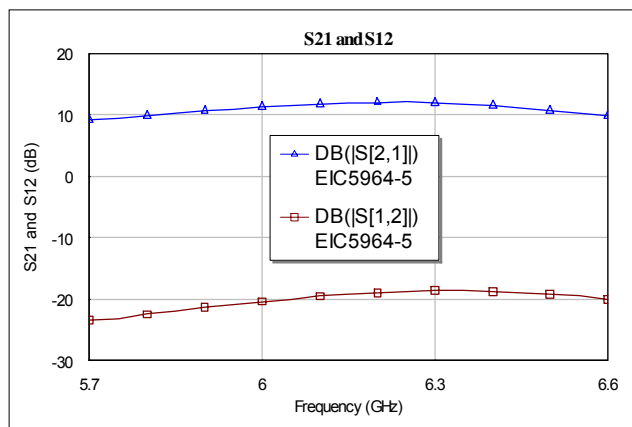
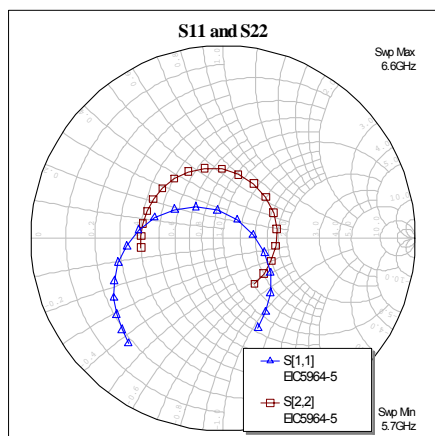
Notes:

- 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,  $I_{DSQ} \approx 1600$ mA



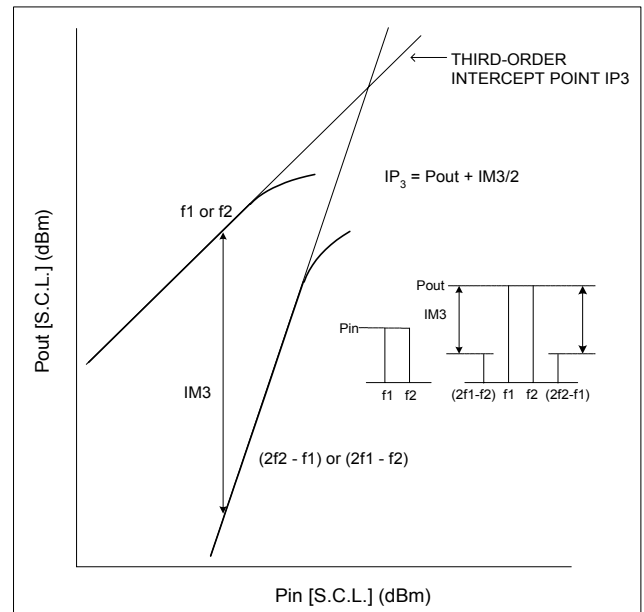
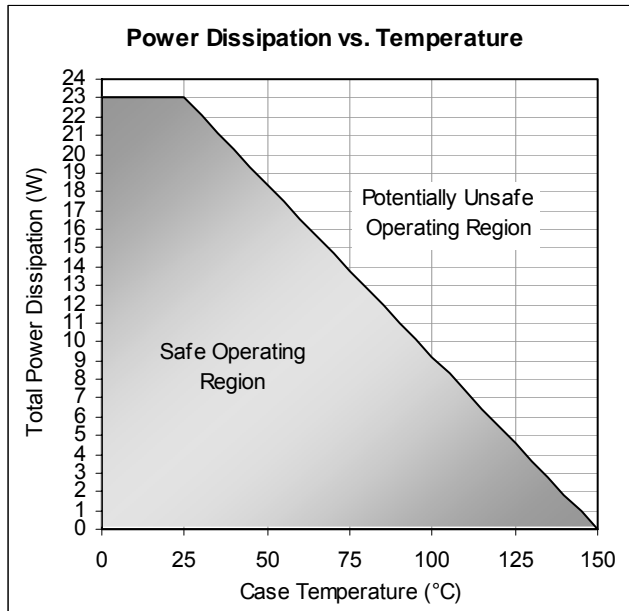
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
5.0	0.8762	-68.84	1.7994	80.39	0.0328	29.57	0.4953	-79.67
5.2	0.8635	-84.6	2.007	59.65	0.038	8.76	0.4698	-103
5.4	0.8302	-101.78	2.2788	37.21	0.0467	-14.33	0.4494	-128.88
5.6	0.7786	-121	2.6401	12.91	0.0578	-41.76	0.436	-157.76
5.8	0.6819	-144.4	3.1226	-14.08	0.0756	-70.41	0.4251	169.64
6.0	0.5026	-175.32	3.6773	-46.63	0.0962	-102.08	0.4017	129.34
6.2	0.2156	131.27	4.0039	-85.29	0.1122	-140.56	0.3411	76.64
6.4	0.2277	-19.28	3.7685	-126.36	0.1151	177.65	0.2831	9.5
6.6	0.5	-68.73	3.096	-163.58	0.1006	142.35	0.2871	-55.38
6.8	0.6636	-97.49	2.4237	165.14	0.0842	112.7	0.3252	-99.88
7.0	0.7514	-119.49	1.8902	138.45	0.068	87.64	0.3686	-130.68

Specifications are subject to change without notice.

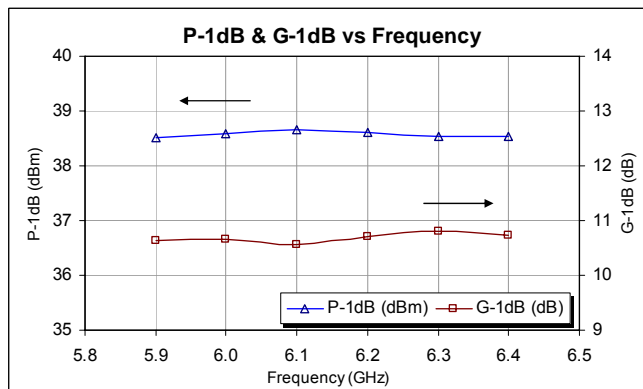
Excelics Semiconductor, Inc. 310 De Guigne Drive, Sunnyvale, CA 94085  
Phone: 408-737-1711 Fax: 408-737-1868 Web: [www.excelics.com](http://www.excelics.com)

page 2 of 4  
Revised October 2003

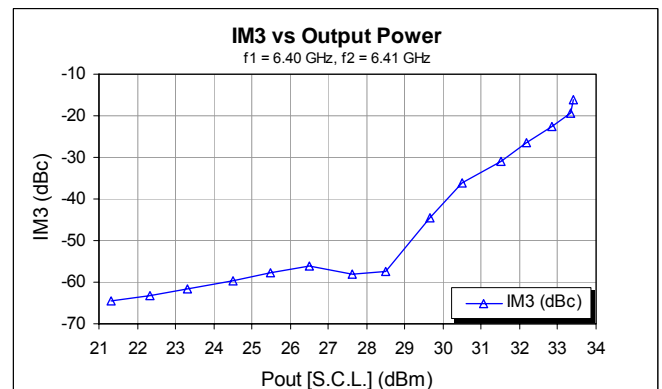
## Power De-rating Curve and IM3 Definition



## Typical Power Data ( $V_{DS} = 10$ V, $I_{DSQ} = 1600$ mA)

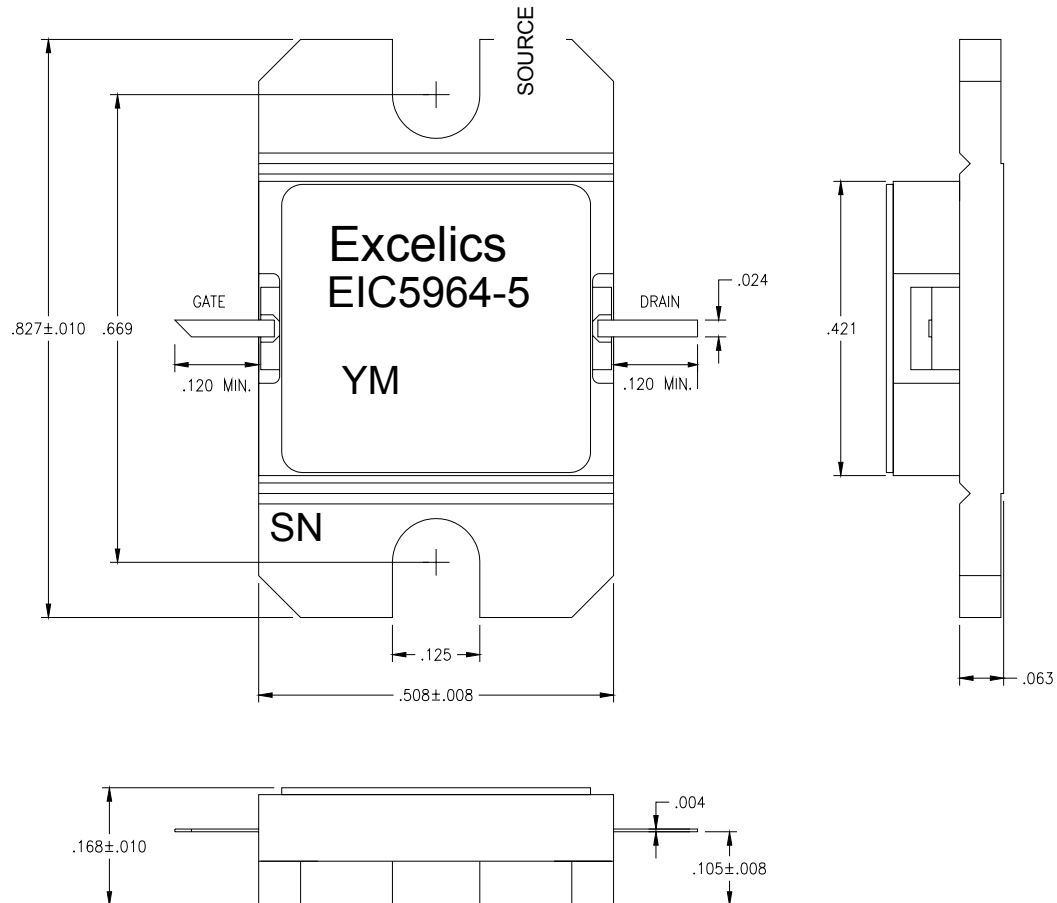


## Typical IM3 Data ( $V_{DS} = 10$ V, $I_{DSQ} \approx 65\%$ IDSS)



## PACKAGE OUTLINE

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



## ORDERING INFORMATION

Part Number	Grade <sup>1</sup>	f <sub>Test</sub> (GHz)	P <sub>1dB</sub> (min)	IM <sub>3</sub> (min) <sup>2</sup>
EIC5964-5	Industrial	5.9-6.4 GHz	36.5	-43

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