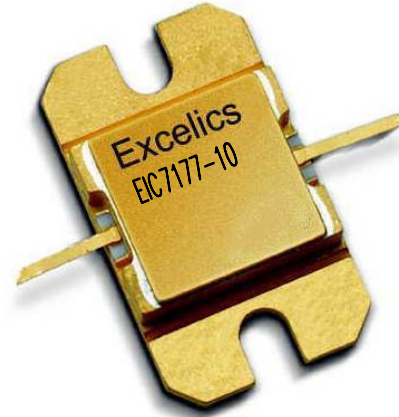


## 7.10-7.70 GHz 10-Watt Internally-Matched Power FET

### FEATURES

- 7.10 – 7.70 GHz Bandwidth
- Input/Output Impedance Matched to 50 Ohms
- +40.5 dBm Output Power at 1dB Compression
- 9 dB Power Gain at 1dB Compression
- 35% Power Added Efficiency
- -46 dBc IM3 at Po = 29.5 dBm SCL
- Hermetic Metal Flange Package
- 100% Tested for DC, RF, and R<sub>TH</sub>



### DESCRIPTION

The EIC7177-10 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<sub>a</sub> = 25°C)

SYMBOL	PARAMETERS/TEST CONDITIONS <sup>1</sup>	MIN	TYP	MAX	UNITS
<b>P<sub>1dB</sub></b>	Output Power at 1dB Compression f = 7.10-7.70GHz V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 3200mA	39.5	40.5		dBm
<b>G<sub>1dB</sub></b>	Gain at 1dB Compression f = 7.10-7.70GHz V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 3200mA	8.0	9.0		dB
<b>ΔG</b>	Gain Flatness f = 7.10-7.70GHz V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 3200mA			±0.6	dB
<b>PAE</b>	Power Added Efficiency at 1dB Compression V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 3200mA f = 7.10-7.70GHz		35		%
<b>I<sub>d1dB</sub></b>	Drain Current at 1Db Compression f = 7.10-7.70GHz		3200	3600	mA
<b>IM3</b>	Output 3rd Order Intermodulation Distortion Δf = 10 MHz 2-Tone Test; Pout = 29.5 dBm S.C.L. <sup>2</sup> V <sub>DS</sub> = 10 V, I <sub>DSQ</sub> ≈ 65% IDSS f = 7.70 GHz	-43	-46		dBc
<b>I<sub>DSS</sub></b>	Saturated Drain Current V <sub>DS</sub> = 3 V, V <sub>GS</sub> = 0 V		5800	6400	mA
<b>V<sub>P</sub></b>	Pinch-off Voltage V <sub>DS</sub> = 3 V, I <sub>DS</sub> = 60 mA		-2.5	-4.0	V
<b>R<sub>TH</sub></b>	Thermal Resistance <sup>3</sup>		2.5	3.0	°C/W

Notes:

1. Tested with 100 Ohm gate resistor.
2. S.C.L. = Single Carrier Level.
3. Overall R<sub>th</sub> depends on case mounting.



# EIC7177-10

## ABSOLUTE MAXIMUM RATINGS FOR CONTINUOUS OPERATION<sup>1,2</sup>

SYMBOL	CHARACTERISTIC	VALUE
V <sub>DS</sub>	Drain to Source Voltage	10 V
V <sub>GS</sub>	Gate to Source Voltage	-4.5 V
I <sub>DS</sub>	Drain Current	IDSS
I <sub>GSF</sub>	Forward Gate Current	120 mA
P <sub>IN</sub>	Input Power	@ 3dB compression
P <sub>T</sub>	Total Power Dissipation	42 W
T <sub>CH</sub>	Channel Temperature	150°C
T <sub>STG</sub>	Storage Temperature	-65/+150°C

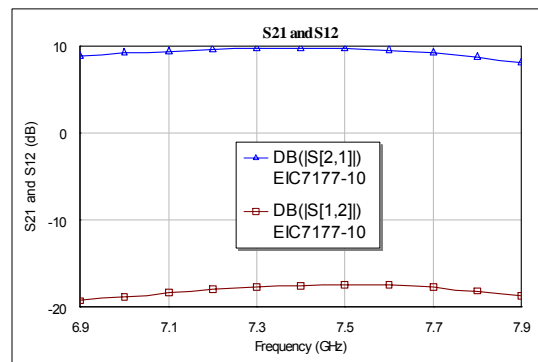
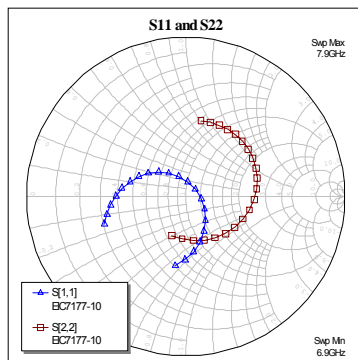
Notes:

- 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)

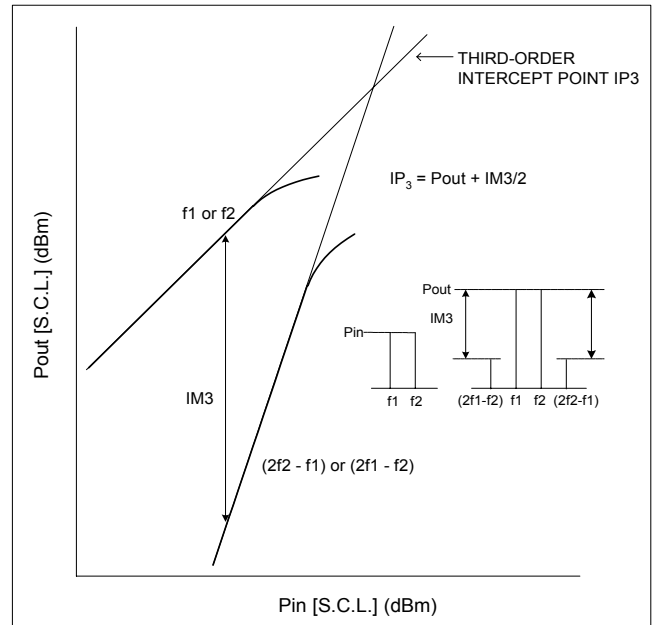
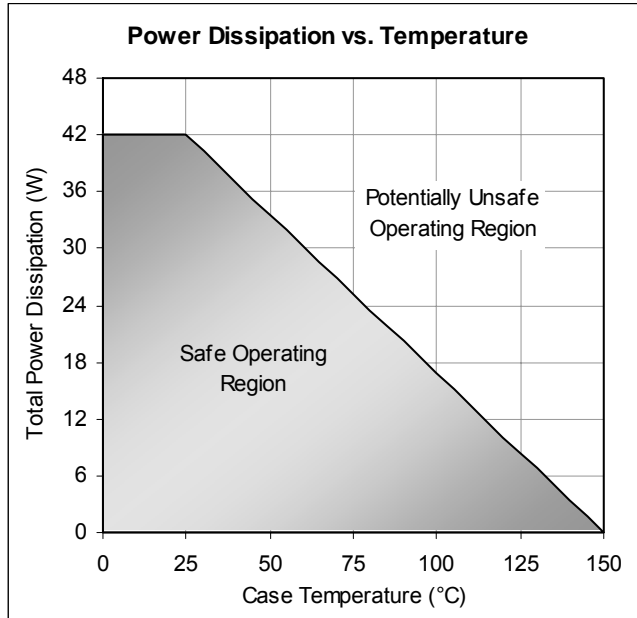
V<sub>DS</sub> = 10 V, I<sub>DSQ</sub> ≈ 3200mA



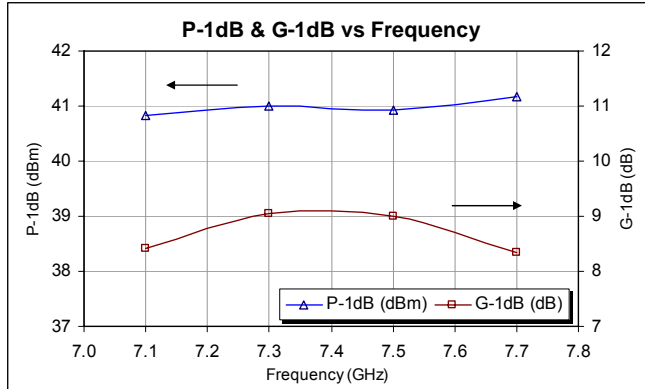
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
6.5	0.7175	-118.04	2.3853	-7.81	0.0894	-64.67	0.3979	134.6
6.7	0.6394	-138.29	2.5751	-32.99	0.0982	-88.45	0.4476	105.78
6.9	0.54	-161.16	2.7688	-59.03	0.1091	-114.52	0.4847	78.66
7.1	0.4059	172.55	2.9473	-86.83	0.1214	-141.21	0.4996	51.55
7.3	0.2293	138.08	3.0573	-116.9	0.1304	-170.74	0.4755	22.06
7.5	0.0747	37.07	3.0519	-148.09	0.135	158.19	0.4083	-11.96
7.7	0.2466	-62.75	2.8762	179.32	0.1302	126.14	0.3168	-54.79
7.9	0.4397	-98.59	2.5317	147.48	0.1164	95.19	0.261	-109.71
8.1	0.583	-126.77	2.1134	117.67	0.0983	66.91	0.2876	-160.97
8.3	0.6761	-150.57	1.7287	91.05	0.0833	40.52	0.3632	165.41
8.5	0.7392	-171.1	1.3981	66.41	0.0708	18.29	0.4355	143.08

Specifications are subject to change without notice.

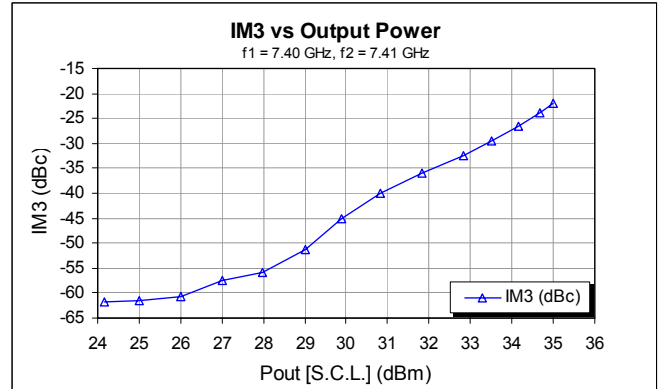
## Power De-rating Curve and IM3 Definition



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



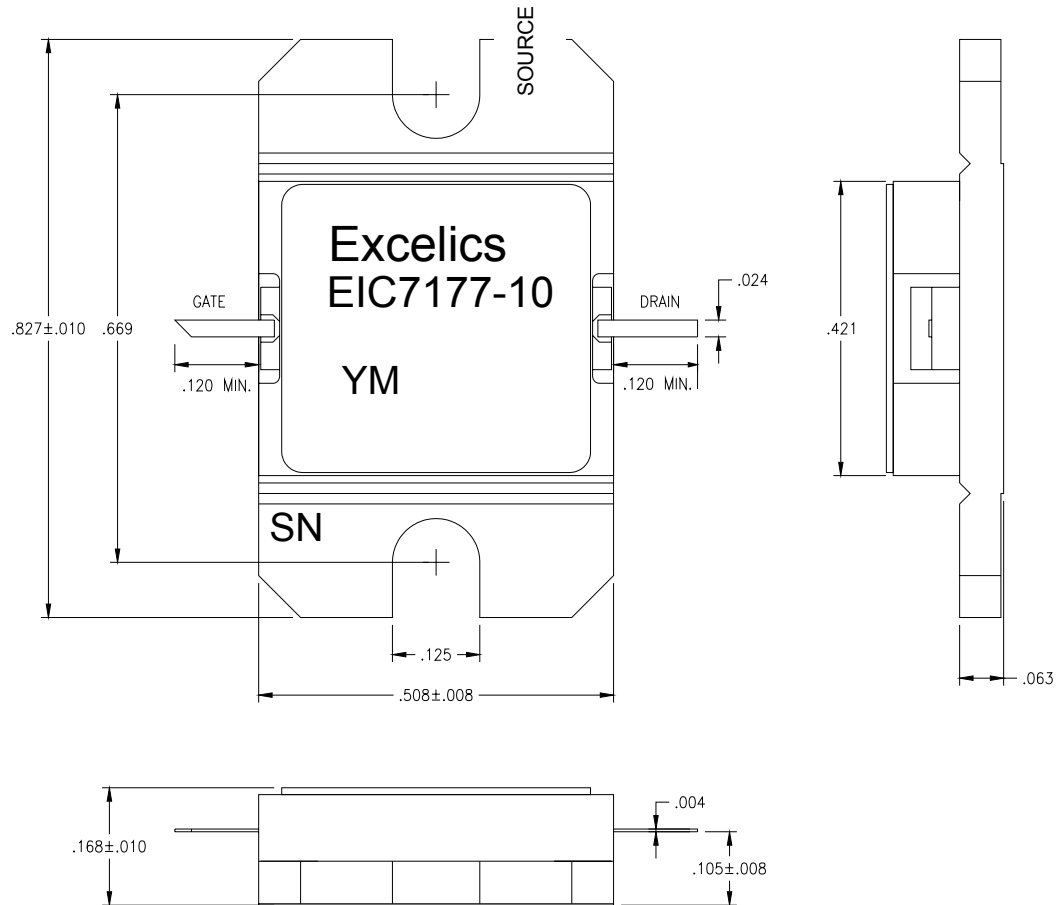
## Typical IM3 Data ( $V_{DS} = 10$ V, $I_{DSQ} \approx 65\%$ IDSS)



Specifications are subject to change without notice.

## 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>
EIC7177-10	Industrial	7.1-7.7 GHz	39.5	-43

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