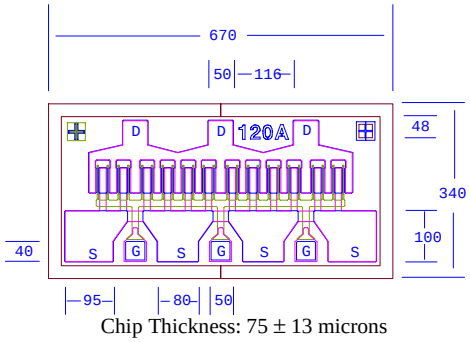
Excelics EPA120A

DATA SHEET
High Efficiency Heterojunction Power FET

- **+29.5dBm TYPICAL OUTPUT POWER**
- **9.5dB TYPICAL POWER GAIN AT 18GHz**
- **0.3 X 1200 MICRON RECESSED "MUSHROOM" GATE**
- **Si_3N_4 PASSIVATION**
- **ADVANCED EPITAXIAL HETEROJUNCTION PROFILE PROVIDES EXTRA HIGH POWER EFFICIENCY, AND HIGH RELIABILITY**
- **Idss SORTED IN 30mA PER BIN RANGE**



Chip Thickness: 75 ± 13 microns
All Dimensions In Microns

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

SYMBOLS	PARAMETERS/TEST CONDITIONS		MIN	TYP	MAX	UNIT
P_{1dB}	Output Power at 1dB Compression Vds=8V, Ids=50% Idss	f=12GHz f=18GHz	28.0	29.5 29.5		dBm
G_{1dB}	Gain at 1dB Compression Vds=8V, Ids=50% Idss	f=12GHz f=18GHz	10.0	12.0 9.5		dB
PAE	Power Added Efficiency at 1dB Compression Vds=8V, Ids=50% Idss	f=12GHz		45		%
Idss	Saturated Drain Current Vds=3V, Vgs=0V		220	360	500	mA
Gm	Transconductance Vds=3V, Vgs=0V		240	380		mS
Vp	Pinch-off Voltage Vds=3V, Ids=3.5mA			-1.0	-2.5	V
BVgd	Drain Breakdown Voltage Igd=1.2mA		-12	-15		V
BVgs	Source Breakdown Voltage Igs=1.2mA		-7	-14		V
Rth	Thermal Resistance (Au-Sn Eutectic Attach)			37		°C/W

MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	ABSOLUTE[1]	CONTINUOUS[2]
Vds	Drain-Source Voltage	12V	8V
Vgs	Gate-Source Voltage	-8V	-3V
Ids	Drain Current	Idss	385mA
Igsf	Forward Gate Current	60mA	10mA
Pin	Input Power	27dBm	@3dB Compression
Tch	Channel Temperature	175°C	150°C
Tstg	Storage Temperature	-65/175°C	-65/150°C
Pt	Total Power Dissipation	3.7W	3.1 W

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.

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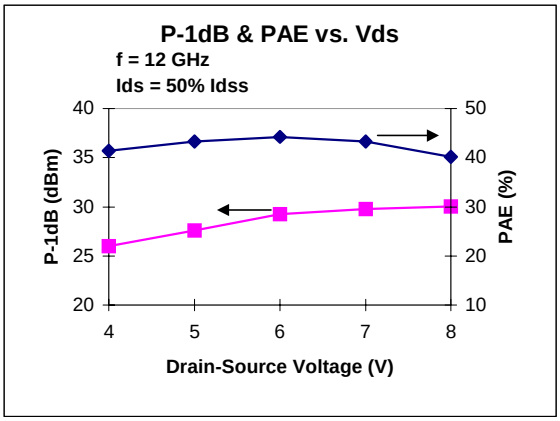

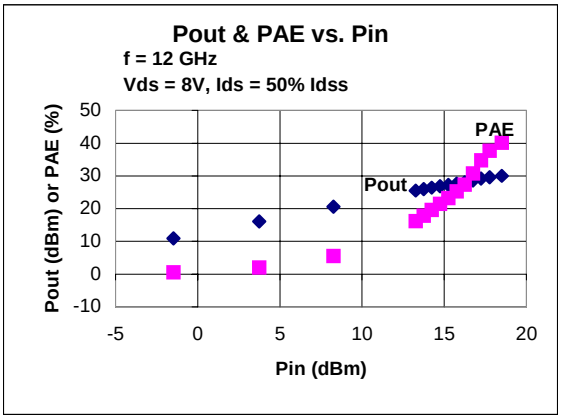

S-PARAMETERS
8V, 1/2 Idss

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.890	-98.0	15.016	124.1	0.029	40.0	0.262	-100.0
2.0	0.878	-132.7	9.107	103.0	0.036	26.8	0.278	-127.9
3.0	0.871	-148.6	6.343	91.3	0.037	20.5	0.290	-138.9
4.0	0.871	-157.2	4.875	82.8	0.037	19.1	0.307	-142.9
5.0	0.865	-163.0	3.927	75.8	0.036	18.9	0.325	-145.1
6.0	0.870	-167.0	3.304	69.5	0.036	20.4	0.345	-146.0
7.0	0.873	-169.9	2.838	64.1	0.036	21.0	0.367	-147.1
8.0	0.878	-173.0	2.483	58.4	0.035	21.0	0.391	-148.0
9.0	0.876	-175.1	2.192	53.7	0.034	21.1	0.407	-149.2
10.0	0.879	-177.1	1.960	49.0	0.032	24.3	0.428	-150.3
11.0	0.885	-178.9	1.774	44.4	0.032	25.5	0.450	-152.0
12.0	0.896	179.2	1.616	39.8	0.032	27.6	0.469	-154.4
13.0	0.904	177.4	1.474	34.9	0.032	27.3	0.490	-157.4
14.0	0.905	175.7	1.343	30.3	0.033	27.3	0.507	-160.9
15.0	0.911	174.5	1.235	25.5	0.033	28.1	0.526	-165.2
16.0	0.906	173.3	1.126	20.7	0.034	27.9	0.551	-169.8
17.0	0.913	172.6	1.044	16.4	0.035	25.9	0.576	-174.1
18.0	0.922	171.3	0.971	11.5	0.036	23.3	0.604	-178.8
19.0	0.925	169.9	0.899	6.6	0.037	25.8	0.637	176.8
20.0	0.920	168.6	0.827	1.8	0.039	24.4	0.663	172.6
21.0	0.910	168.0	0.760	-2.2	0.042	25.1	0.686	169.6
22.0	0.907	166.8	0.715	-5.9	0.045	26.2	0.711	167.1
23.0	0.910	165.7	0.676	-9.1	0.049	27.8	0.736	165.3
24.0	0.911	164.1	0.642	-12.8	0.056	28.2	0.758	163.7
25.0	0.893	161.9	0.600	-15.8	0.060	31.5	0.766	162.5
26.0	0.883	161.5	0.573	-17.2	0.065	31.4	0.763	163.6

Note: The data included 0.7 mils diameter Au bonding wires:
3 gate wires, 15 mils each; 3 drain wires, 20 mils each; 8 source wires, 7 mils each.