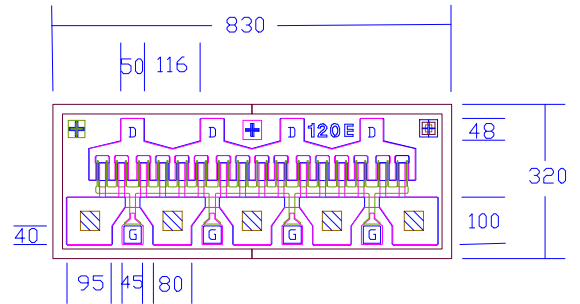



DATA SHEET
High Efficiency Heterojunction Power FET

- +29.5dBm TYPICAL OUTPUT POWER
- 9.5dB TYPICAL POWER GAIN FOR EPA120E AND 10.5dB FOR EPA120EV AT 18GHz
- 0.3 X 1200 MICRON RECESSED “MUSHROOM” GATE
- Si₃N₄ PASSIVATION
- ADVANCED EPITAXIAL DOPING PROFILE PROVIDES HIGH POWER EFFICIENCY, LINEARITY AND RELIABILITY
- EPA120EV WITH VIA HOLE SOURCE GROUNDING
- Idss SORTED IN 30mA PER BIN RANGE



Chip Thickness: 75 ± 20 microns
 All Dimensions In Microns
 : Via Hole
No Via Hole For EPA120E

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

SYMBOLS	PARAMETERS/TEST CONDITIONS	EPA120E			EPA120EV			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
P _{1dB}	Output Power at 1dB Compression f=12GHz	28.0	29.5		28.0	29.5		dBm
	V _{ds} =8V, I _{ds} =50% I _{dss} f=18GHz		29.5			29.5		
G _{1dB}	Gain at 1dB Compression f=12GHz	10.0	12.0		10.5	12.5		dB
	V _{ds} =8V, I _{ds} =50% I _{dss} f=18GHz		9.5			10.5		
PAE	Gain at 1dB Compression V _{ds} =8V, I _{ds} =50% I _{dss} f=12GHz		45			46		%
I _{dss}	Saturated Drain Current V _{ds} =3V, V _{gs} =0V	210	360	510	210	360	510	mA
G _m	Transconductance V _{ds} =3V, V _{gs} =0V	240	380		240	380		mS
V _p	Pinch-off Voltage V _{ds} =3V, I _{ds} =3.5mA		-1.0	-2.5		-1.0	-2.5	V
BV _{gd}	Drain Breakdown Voltage I _{gd} =1.2mA	-11	-15		-11	-15		V
BV _{gs}	Source Breakdown Voltage I _{gs} =1.2mA	-7	-14		-7	-14		V
R _{th}	Thermal Resistance (Au-Sn Eutectic Attach)		35			25		°C/W

MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	EPA120E		EPA120EV	
		ABSOLUTE ¹	CONTINUOUS ²	ABSOLUTE ¹	CONTINUOUS ²
V _{ds}	Drain-Source Voltage	12V	8V	12V	8V
V _{gs}	Gate-Source Voltage	-8V	-3V	-8V	-3V
I _{ds}	Drain Current	I _{dss}	405mA	I _{dss}	I _{dss}
I _{gsf}	Forward Gate Current	60mA	10mA	60mA	10mA
P _{in}	Input Power	27dBm	@ 3dB Compression	27dBm	@ 3dB Compression
T _{ch}	Channel Temperature	175°C	150°C	175°C	150°C
T _{stg}	Storage Temperature	-65/175°C	-65/150°C	-65/175°C	-65/150°C
P _t	Total Power Dissipation	3.9W	3.2W	5.4W	4.5W

Note: 1. Exceeding any of the above ratings may result in permanent damage.

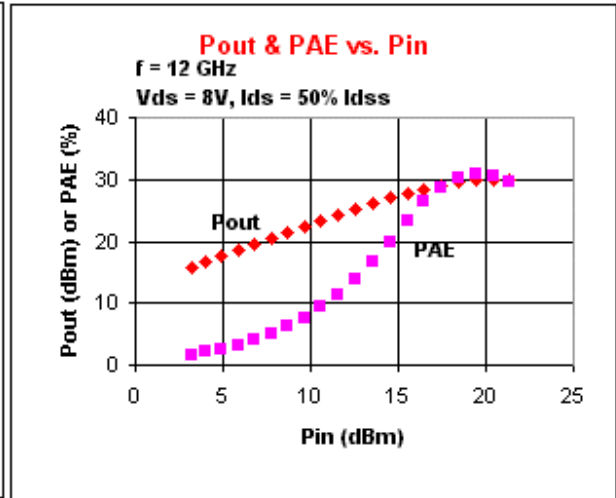
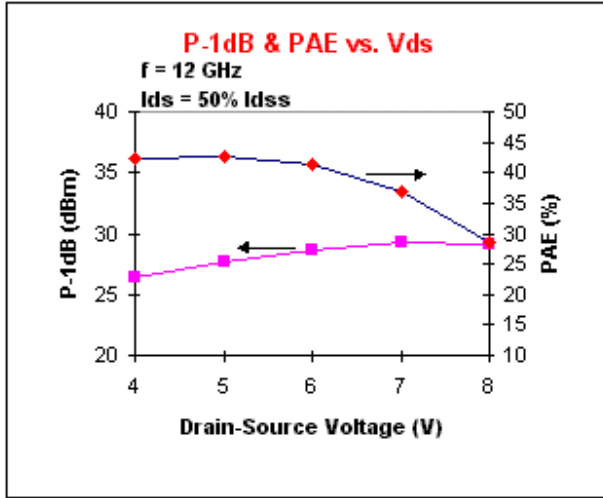
2. Exceeding any of the above ratings may reduce MTTF below design goals.

EPA120E/EPA120EV

DATA SHEET

High Efficiency Heterojunction Power FET

EPA120E



S-PARAMETERS

EPA120E 8V, 1/2 Idss

FREQ (GHz)	S11		S21		S12		S22		FREQ (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.898	-97.8	14.488	124.9	0.034	39.3	0.300	-95.1	21.0	0.938	162.3	0.751	-2.6	0.036	7.9	0.725	179.6
2.0	0.885	-134.7	8.805	103.0	0.041	22.6	0.313	-125.6	22.0	0.938	161.2	0.701	-6.4	0.036	6.4	0.743	177.5
4.0	0.887	-159.7	4.668	81.9	0.042	10.9	0.338	-140.7	24.0	0.939	159.3	0.622	-14.1	0.039	10.6	0.769	173.4
6.0	0.898	-168.8	3.128	68.6	0.040	8.5	0.366	-145.2	26.0	0.946	158.7	0.559	-21.2	0.041	12.6	0.783	168.3
8.0	0.904	-174.2	2.329	57.5	0.039	6.7	0.411	-148.1	28.0	0.946	158.0	0.513	-27.1	0.046	16.3	0.791	164.0
10.0	0.912	-177.2	1.842	47.7	0.037	5.6	0.458	-152.2	30.0	0.948	156.9	0.472	-33.6	0.050	11.6	0.799	158.5
12.0	0.917	-179.9	1.501	38.2	0.035	6.4	0.511	-157.7	32.0	0.955	154.5	0.430	-40.1	0.049	10.4	0.813	152.9
14.0	0.922	-177.5	1.256	28.9	0.033	6.5	0.564	-163.1	34.0	0.959	151.2	0.388	-46.3	0.048	11.3	0.836	147.6
16.0	0.927	-173.8	1.077	19.4	0.033	5.8	0.616	-168.7	36.0	0.967	147.5	0.348	-51.4	0.050	9.7	0.875	141.4
18.0	0.934	-169.1	0.934	9.9	0.034	6.0	0.658	-173.5	38.0	0.993	143.3	0.325	-58.0	0.055	0.1	0.891	134.7
20.0	0.936	-164.2	0.827	0.5	0.035	4.2	0.692	-178.4	40.0	0.994	137.0	0.312	-67.9	0.058	-21.3	0.876	130.0

EPA120EV 8V, 1/2 Idss

FREQ (GHz)	S11		S21		S12		S22		FREQ (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.926	-100.1	13.872	123.9	0.034	39.1	0.290	-87.9	21.0	0.952	160.1	0.699	-7.0	0.031	-12.0	0.701	-175.6
2.0	0.910	-135.7	8.326	102.2	0.040	20.9	0.283	-117.5	22.0	0.959	159.1	0.647	-11.1	0.031	-11.8	0.718	-177.3
4.0	0.907	-159.8	4.431	81.8	0.042	10.1	0.305	-132.6	24.0	0.965	156.0	0.560	-18.7	0.030	-9.4	0.751	177.9
6.0	0.911	-173.3	2.988	67.4	0.040	3.9	0.355	-134.0	26.0	0.967	151.5	0.483	-26.6	0.032	-5.6	0.778	173.2
8.0	0.919	-174.7	2.273	56.1	0.040	1.7	0.381	-143.2	28.0	0.964	147.7	0.427	-34.3	0.031	-5.0	0.800	168.1
10.0	0.920	-177.4	1.805	44.9	0.037	-2.0	0.425	-152.3	30.0	0.954	143.1	0.374	-43.3	0.032	-8.5	0.811	162.5
12.0	0.927	-172.0	1.449	33.1	0.034	-6.4	0.492	-153.2	32.0	0.955	139.5	0.337	-52.2	0.032	-15.8	0.820	156.1
14.0	0.937	-167.1	1.175	22.7	0.032	-7.6	0.550	-158.5	34.0	0.961	136.3	0.299	-60.2	0.027	-21.0	0.831	151.4
16.0	0.945	-161.8	0.967	13.4	0.030	-9.2	0.611	-160.7	36.0	0.974	135.2	0.276	-64.6	0.029	-19.6	0.867	147.5
18.0	0.953	-164.4	0.825	5.4	0.030	-9.5	0.653	-169.8	38.0	0.981	134.3	0.261	-70.0	0.034	-34.5	0.876	144.0
20.0	0.951	-162.0	0.725	-2.5	0.030	-11.7	0.692	-173.6	40.0	0.979	134.0	0.243	-75.5	0.044	-55.2	0.877	141.6

Note: The data included 0.7 mils diameter Au bonding wires; 4gate wires, 15 mils each; 4 drain wires, 20 mils each; 10 source wires, 7 mils each; no source wires for EPA120EV.