

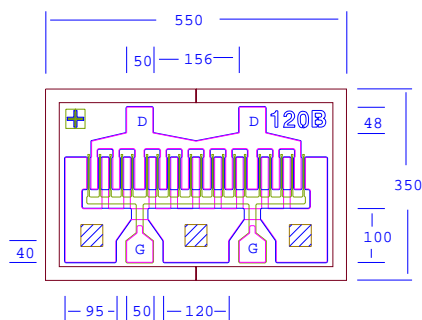


EPA120B/EPA120BV

High Efficiency Heterojunction Power FET

UPDATED 08/07/2009

- +29.5dBm TYPICAL OUTPUT POWER
- 9.0dB TYPICAL POWER GAIN FOR EPA120B AND 10.5dB FOR EPA120BV AT 18GHz
- 0.3 X 1200 MICRON RECESSED “MUSHROOM” GATE
- Si₃N₄ PASSIVATION
- ADVANCED EPITAXIAL DOPING PROFILE PROVIDES HIGH POWER EFFICIENCY, LINEARITY AND RELIABILITY
- EPA120BV WITH VIA HOLE SOURCE GROUNDING



Chip Thickness: 75 ± 20 microns

All Dimensions In Microns

☒ : Via Hole

No Via Hole For EPA120B

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

SYMBOLS	PARAMETERS/TEST CONDITIONS	EPA120B			EPA120BV			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
P_{1dB}	Output Power at 1dB Compression V _{ds} =8V, I _{ds} =50% I _{dss}	28.0	29.5 29.5		28.0	29.5 29.5		dBm
G_{1dB}	Gain at 1dB Compression V _{ds} =8V, I _{ds} =50% I _{dss}	10.0	11.5 9.0		11.5	13.0 10.5		dB
PAE	Gain at 1dB Compression V _{ds} =8V, I _{ds} =50% I _{dss}		45		46			%
I_{dss}	Saturated Drain Current V _{ds} =3V, V _{gs} =0V		360 500		360 500			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} =3.0mA		-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)		40		30			°C/W

MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	EPA120B	EPA120BV
		ABSOLUTE ¹	ABSOLUTE ¹
V_{ds}	Drain-Source Voltage	12V	12V
V_{gs}	Gate-Source Voltage	-8V	-8V
I_{ds}	Drain Current	I _{dss}	I _{dss}
I_{gsf}	Forward Gate Current	60mA	60mA
P_{in}	Input Power	27dBm	27dBm
T_{ch}	Channel Temperature	175°C	175°C
T_{stg}	Storage Temperature	-65/175°C	-65/175°C
P_t	Total Power Dissipation	3.4W	4.5W

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

Recommended conditions for reliable operation is V_{ds} of 8V maximum, channel temperature below 150 °C, and input power lower than 3dB gain compression point.

Specifications are subject to change without notice.

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EPA120B/EPA120BV

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S-PARAMETERS

EPA120B 8V, 1/2 Idss

FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.873	-97.8	14.614	124.8	0.030	40.1	0.245	-89.7
2.0	0.866	-133.3	8.974	103.2	0.035	27.0	0.239	-119.4
4.0	0.865	-159.6	4.841	81.9	0.038	19.8	0.258	-137.9
6.0	0.864	-170.9	3.287	67.7	0.037	21.8	0.296	-142.5
8.0	0.872	-177.9	2.476	55.8	0.037	23.5	0.344	-145.9
10.0	0.877	176.9	1.974	45.6	0.035	27.7	0.385	-149.2
12.0	0.890	171.7	1.633	35.0	0.036	30.8	0.429	-154.4
14.0	0.899	166.4	1.367	24.3	0.039	30.5	0.472	-161.9
16.0	0.901	161.5	1.148	13.5	0.041	29.9	0.519	-171.5
18.0	0.917	156.9	0.980	2.7	0.045	27.3	0.575	178.6
20.0	0.908	152.3	0.819	-7.9	0.051	26.1	0.635	169.2
22.0	0.896	149.4	0.698	-16.0	0.058	26.3	0.686	162.5
24.0	0.903	145.8	0.616	-23.4	0.069	26.7	0.734	157.7
26.0	0.886	143.8	0.552	-28.0	0.084	27.1	0.750	155.7

EPA120BV 8V, 1/2 Idss

FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.887	-88.4	15.05	130.0	0.029	41.8	0.272	-73.8
2.0	0.879	-127.4	9.715	107.1	0.036	25.4	0.256	-107.7
4.0	0.887	-157.2	5.309	84.0	0.038	11.4	0.274	-129.7
6.0	0.899	-168.8	3.554	69.5	0.036	6.6	0.316	-137.2
8.0	0.905	-175.1	2.651	58.1	0.035	3.3	0.372	-140.3
10.0	0.909	-179.4	2.091	48.2	0.032	1.0	0.430	-143.1
12.0	0.913	176.6	1.726	38.2	0.030	-0.8	0.484	-147.7
14.0	0.916	171.5	1.462	27.9	0.030	-2.9	0.528	-154.0
16.0	0.925	165.2	1.263	16.8	0.030	-6.7	0.570	-162.0
18.0	0.930	157.9	1.088	4.6	0.030	-10.1	0.611	-171.8
20.0	0.939	151.1	0.936	-7.4	0.031	-14.1	0.654	178.3

FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
21.0	0.946	149.8	0.824	-11.5	0.029	-15.2	0.700	174.9
22.0	0.956	148.9	0.752	-16.0	0.030	-13.2	0.720	170.6
24.0	0.967	148.0	0.636	-24.1	0.029	-11.8	0.769	164.6
26.0	0.967	148.0	0.554	-30.0	0.029	-4.9	0.799	162.4
28.0	0.956	148.0	0.503	-34.2	0.033	0.1	0.828	161.4
30.0	0.951	146.2	0.473	-39.5	0.034	-3.5	0.850	161.0
32.0	0.937	141.5	0.443	-47.2	0.033	-11.3	0.854	158.1
34.0	0.931	134.2	0.403	-57.4	0.029	-15.4	0.858	151.4
36.0	0.949	125.4	0.363	-69.3	0.029	-29.0	0.881	140.4
38.0	0.969	117.5	0.316	-81.0	0.038	-56.8	0.910	127.9
40.0	0.981	113.5	0.284	-92.8	0.050	-85.1	0.930	119.2

Note: The data included 0.7 mils diameter Au bonding wires; 2 gate wires, 15 mils each; 2 drain wires, 20 mils each; 6 source wires, 7 mils each; no source wires for EPA120BV.



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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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