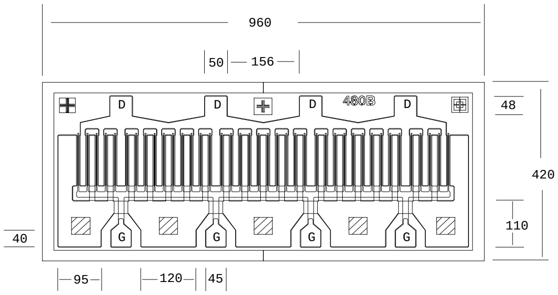
Excelics EPA480B/EPA480BV

PRELIMINARY DATA SHEET

High Efficiency Heterojunction Power FET

- **+35.5dBm TYPICAL OUTPUT POWER**
- **7.5dB TYPICAL POWER GAIN FOR EPA480B AND 12.0dB FOR EPA480BV AT 12GHz**
- **0.4X 4800 MICRON RECESSED “MUSHROOM” GATE**
- **Si_3N_4 PASSIVATION**
- **ADVANCED EPITAXIAL DOPING PROFILE PROVIDES HIGH POWER EFFICIENCY, LINEARITY AND RELIABILITY**
- **EPA480BV WITH VIA HOLE SOURCE GROUNDING**
- **Idss SORTED IN 120mA PER BIN RANGE**



Chip Thickness: 50 ± 10 microns
(with >20micons Gold Plated Heat Sink (PHS))
All Dimensions In Microns
▨ **:** Via Hole **No Via Hole For EPA480B**

ELECTRICAL CHARACTERISTICS (T_a = 25 ^{O}C)

SYMBOLS	PARAMETERS/TEST CONDITIONS	EPA480B			EPA480BV			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
P_{1dB}	Output Power at 1dB Compression f=12GHz Vds=8V, Ids=50% Idss f=18GHz	34.0	35.5		34.0	35.5 35.5		dBm
G_{1dB}	Gain at 1dB Compression f=12GHz Vds=8V, Ids=50% Idss f=18GHz	6.0	7.5		10.0	12.0 9.5		dB
PAE	Gain at 1dB Compression Vds=8V, Ids=50% Idss f=12GHz		40			45		%
Idss	Saturated Drain Current Vds=3V, Vgs=0V	880	1440	1880	880	1440	1880	mA
Gm	Transconductance Vds=3V, Vgs=0V	960	1520		960	1520		mS
Vp	Pinch-off Voltage Vds=3V, Ids=14mA		-1.0	-2.5		-1.0	-2.5	V
BVgd	Drain Breakdown Voltage Igd=4.8mA	-11	-15		-11	-15		V
BVgs	Source Breakdown Voltage Igs=4.8mA	-7	-14		-7	-14		V
Rth	Thermal Resistance (Au-Sn Eutectic Attach)		10			8		°C/W

MAXIMUM RATINGS AT 25^{O}C

SYMBOLS	PARAMETERS	EPA480B		EPA480BV	
		ABSOLUTE[1]	CONTINUOUS[2]	ABSOLUTE[1]	CONTINUOUS[2]
Vds	Drain-Source Voltage	12V	8V	12V	8V
Vgs	Gate-Source Voltage	-8V	-3V	-8V	-3V
Ids	Drain Current	Idss	1.4A	Idss	1.75A
Igsf	Forward Gate Current	240mA	40mA	240mA	40mA
Pin	Input Power	33dBm	@ 3dB Compression	33dBm	@ 3dB Compression
Tch	Channel Temperature	175°C	150°C	175°C	150°C
Tstg	Storage Temperature	-65/175°C	-65/150°C	-65/175°C	-65/150°C
Pt	Total Power Dissipation	14W	11W	17W	14W

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.

Excelics Semiconductor, Inc., 2908 Scott Blvd., Santa Clara, CA 95054
Phone: (408) 970-8664 Fax: (408) 970-8998 Web Site: www.excelics.com

S-PARAMETERS

EPA480B 8V, 1/2 Idss

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.500	0.923	-153.6	13.123	99.4	0.019	17.3	0.557	-165.5
1.000	0.920	-167.7	6.682	89.5	0.019	15.1	0.570	-170.6
2.000	0.919	-176.1	3.342	79.1	0.020	20.4	0.581	-171.4
3.000	0.920	-179.8	2.214	71.0	0.020	27.7	0.594	-170.2
4.000	0.922	177.5	1.644	63.7	0.022	35.3	0.611	-168.8
5.000	0.923	175.3	1.298	56.8	0.023	42.5	0.631	-167.6
6.000	0.925	173.3	1.065	50.2	0.025	49.0	0.653	-166.7
7.000	0.927	171.4	0.896	44.0	0.028	54.6	0.675	-166.1
8.000	0.930	169.6	0.768	38.2	0.031	59.3	0.698	-165.8
9.000	0.932	167.9	0.667	32.7	0.035	63.0	0.721	-165.7
10.000	0.934	166.1	0.585	27.6	0.038	65.8	0.742	-165.8

S-PARAMETERS

EPA480BV 8V, 1/2 Idss

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.941	-156.9	8.989	96.7	0.013	18.0	0.666	-174.6
2.0	0.948	-170.0	4.575	84.1	0.014	15.0	0.675	-176.9
3.0	0.952	-176.1	3.030	75.8	0.013	14.9	0.686	-176.2
4.0	0.951	-179.7	2.237	68.8	0.013	18.3	0.699	-175.1
5.0	0.956	176.7	1.718	63.1	0.013	22.1	0.722	-172.7
6.0	0.962	175.6	1.390	57.8	0.012	27.2	0.736	-171.5
7.0	0.965	176.1	1.163	53.3	0.012	31.5	0.755	-171.0
8.0	0.966	177.9	0.992	49.3	0.012	37.6	0.772	-171.9
9.0	0.972	179.6	0.863	45.6	0.012	41.0	0.789	-172.3
10.0	0.967	-179.0	0.760	42.0	0.011	45.2	0.805	-172.8
11.0	0.969	-177.8	0.682	38.8	0.012	47.5	0.816	-173.1
12.0	0.969	-177.3	0.613	35.3	0.012	51.2	0.818	-173.6
14.0	0.965	178.4	0.511	27.6	0.014	52.8	0.827	-172.3
16.0	0.970	169.2	0.438	18.0	0.014	46.9	0.854	-170.5
18.0	0.972	158.8	0.367	7.9	0.013	37.8	0.870	-170.6
20.0	0.979	152.1	0.299	-1.2	0.013	41.1	0.877	-172.8
22.0	0.969	163.2	0.233	-6.9	0.014	32.2	0.922	171.4
24.0	0.978	158.9	0.192	-10.9	0.015	39.3	0.923	175.7
26.0	0.977	158.9	0.169	-11.6	0.018	44.7	0.934	180.0

Note: The data included 0.7 mils diameter Au bonding wires; 4 gate wires, 15 mils each; 4 drain wires, 20 mils each; 10 source wires, 7 mils each; no source wires for EPA480BV.