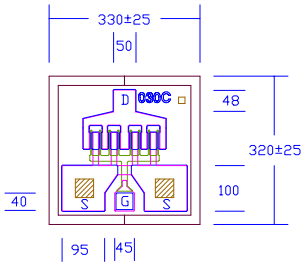
EPA030C/EPA030CV

High Efficiency Heterojunction Power FET

UPDATED 10/24/2006

FEATURES

- +23dBm TYPICAL OUTPUT POWER
- 11dB TYPICAL POWER GAIN FOR EPA030C AND 12.0dB FOR EPA030CV AT 18GHz
- 0.3 X 300 MICRON RECESSED "MUSHROOM" GATE
- Si_3N_4 PASSIVATION AND PLATED HEAT SINK
- ADVANCED EPITAXIAL DOPING PROFILE PROVIDES HIGH POWER EFFICIENCY AND RELIABILITY
- EPA030CV WITH VIA HOLE SOURCE GROUNDING
- Idss SORTED IN 10mA PER BIN RANGE



Chip Thickness: 75 ± 13 microns (EPA030C)
Chip Thickness: 85 ± 15 microns (EPA030CV)
▨ : Via Hole
No Via Hole For EPA030C
ALL DIMENSIONS IN MICRONS

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

Caution! ESD sensitive device.

SYMBOLS	PARAMETERS/TEST CONDITIONS	EPA030C			EPA030CV			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
P_{1dB}	Output Power at 1dB Compression f = 12GHz V_{DS} = 8V, I_{DS} ≈ 50% I_{DSS} f = 18GHz	21.0	23.0 23.0		21.0	23.0 23.0		dBm
G_{1dB}	Gain at 1dB Compression f = 12GHz V_{DS} = 8V, I_{DS} ≈ 50% I_{DSS} f = 18GHz	12.0	13.5 11.0		12.5	14.0 12.0		dB
PAE	Power Added Efficiency 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	50	90	130	50	90	130	mA
G_M	Transconductance V_{DS} = 3V, V_{GS} = 0V	60	95		60	95		mS
V_P	Pinch-off Voltage V_{DS} = 3 V, I_{DS} = 1.0 mA		-1.0	-2.5		-1.0	-2.5	V
BV_{GD}	Drain Breakdown Voltage I_{GD} = 1.0mA	-13	-15		-13	-15		V
BV_{GS}	Source Breakdown Voltage I_{GS} = 1.0mA	-7	-14		-7	-14		V
R_{th}	Thermal Resistance(Au-Sn Eutectic Attach)		125			95		°C/W

MAXIMUM RATINGS AT 25°C

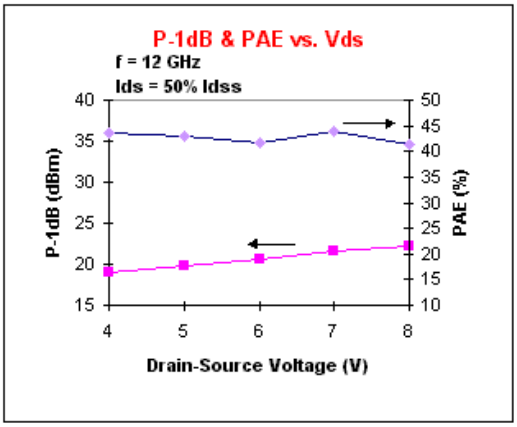
SYMBOLS	PARAMETERS	EPA030C		EPA030CV	
		ABSOLUTE[1]	CONTINUOUS[2]	ABSOLUTE[1]	CONTINUOUS[2]
V_{DS}	Drain-Source Voltage	10V	8V	10V	8V
V_{GS}	Gate-Source Voltage	-5V	-3V	-5V	-3V
Igf	Forward Gate Current	1.4mA	0.5mA	1.4mA	0.5mA
Igr	Reverse Gate Current	-0.2mA	-0.1mA	-0.2mA	-0.1mA
Pin	Input Power	20dBm	@ 3dB Compression	20dBm	@ 3dB Compression
Tch	Channel Temperature	175°C	175°C	175°C	175°C
Tstg	Storage Temperature	-65/175°C	-65/175°C	-65/175°C	-65/175°C
Pt	Total Power Dissipation	1.1W	1.1W	1.5W	1.5W

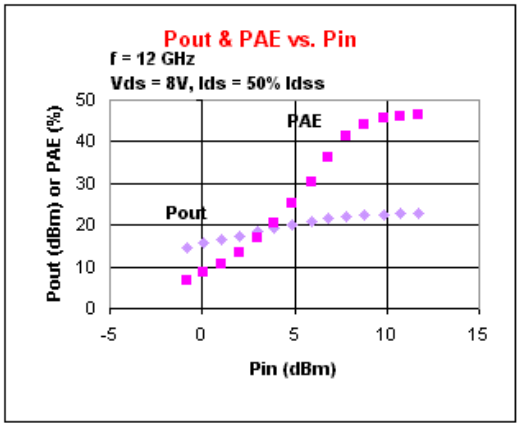
Note: 1. Exceeding any of the above ratings may result in permanent damage.
2. Exceeding any of the above ratings may reduce MTTF below design goals.

EPA030C/EPA030CV

UPDATED 10/24/2006

High Efficiency Heterojunction Power FET





S-PARAMETERS
EPA030C 8V, ½ Idss

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---		FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.975	-23.9	7.888	162.4	0.017	76.0	0.750	-9.3	21.0	0.850	130.8	1.761	-0.7	0.069	-18.3	0.404	-121.6
2.0	0.951	-46.7	7.419	147.5	0.032	63.5	0.726	-18.3	22.0	0.854	128.3	1.647	-5.9	0.068	-18.6	0.416	-129.4
4.0	0.883	-85.5	6.169	121.3	0.053	44.0	0.643	-32.0	24.0	0.858	123.8	1.466	-16.0	0.067	-19.4	0.449	-142.5
6.0	0.840	-114.7	4.993	100.9	0.063	30.0	0.577	-41.6	26.0	0.857	120.7	1.336	-25.3	0.067	-16.9	0.489	-153.1
8.0	0.814	-136.9	4.125	84.2	0.067	19.6	0.535	-49.6	28.0	0.860	116.0	1.241	-34.9	0.070	-17.2	0.515	-162.6
10.0	0.801	-154.1	3.495	70.1	0.068	11.2	0.504	-57.1	30.0	0.861	108.2	1.160	-45.6	0.073	-19.5	0.533	-173.0
12.0	0.797	-169.5	3.041	56.7	0.067	4.5	0.479	-65.6	32.0	0.871	98.2	1.071	-56.8	0.072	-23.7	0.552	175.1
14.0	0.791	175.9	2.700	43.7	0.068	-1.9	0.453	-75.2	34.0	0.895	88.7	0.959	-68.0	0.068	-28.5	0.579	161.5
16.0	0.800	160.9	2.425	30.4	0.069	-7.5	0.434	-86.1	36.0	0.952	81.3	0.858	-79.0	0.072	-36.4	0.642	146.1
18.0	0.816	146.4	2.155	17.0	0.070	-12.1	0.411	-98.4	38.0	1.015	74.8	0.765	-91.0	0.073	-51.4	0.702	130.2
20.0	0.832	133.9	1.913	4.3	0.071	-17.8	0.400	-111.3	40.0	1.002	70.1	0.650	-103.1	0.072	-70.2	0.725	119.1

S-PARAMETERS
EPA030CV 8V, ½ Idss

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---		FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.988	-25.7	7.512	161.8	0.018	75.1	0.778	-9.1	21.0	0.869	130.7	1.524	-5.5	0.069	-26.1	0.425	-115.0
2.0	0.959	-49.8	7.041	146.0	0.034	62.8	0.748	-17.5	22.0	0.875	127.1	1.428	-11.3	0.069	-27.6	0.430	-122.2
4.0	0.888	-91.2	5.765	118.4	0.054	40.8	0.666	-30.0	24.0	0.891	120.3	1.260	-22.6	0.066	-30.9	0.444	-137.9
6.0	0.837	-125.9	4.662	96.0	0.064	25.3	0.599	-38.2	26.0	0.899	114.0	1.103	-33.8	0.063	-34.5	0.470	-153.9
8.0	0.834	-145.7	3.804	80.1	0.067	15.8	0.545	-43.7	28.0	0.905	109.4	0.955	-44.4	0.061	-35.8	0.505	-169.2
10.0	0.829	-162.2	3.181	65.7	0.068	6.8	0.496	-50.1	30.0	0.906	104.4	0.841	-55.7	0.057	-42.1	0.534	175.4
12.0	0.834	176.4	2.692	50.1	0.068	-2.3	0.466	-58.5	32.0	0.909	100.5	0.735	-66.9	0.054	-50.6	0.569	161.2
14.0	0.847	162.9	2.305	36.9	0.065	-8.7	0.436	-69.7	34.0	0.929	96.5	0.647	-77.2	0.051	-54.3	0.612	149.5
16.0	0.861	150.4	1.987	23.9	0.065	-14.2	0.432	-82.3	36.0	0.967	93.1	0.604	-85.6	0.051	-61.8	0.684	140.0
18.0	0.869	146.0	1.782	12.9	0.068	-18.3	0.418	-98.3	38.0	0.985	88.7	0.559	-96.0	0.063	-75.7	0.726	130.9
20.0	0.867	136.7	1.590	1.0	0.069	-23.3	0.426	-110.4	40.0	0.986	85.8	0.506	-106.2	0.072	-93.8	0.757	123.9

Note: The data included 0.7 mil diameter Au bonding wires; 1gate wire, 15 mils each; 1 drain wire, 20 mils each; 4 source wires, 7 mils each; no source wires for EPA030CV.