BCP240C

HIGH EFFICIENCY HETEROJUNCTION POWER FET CHIP (.25µm x 2400µm)

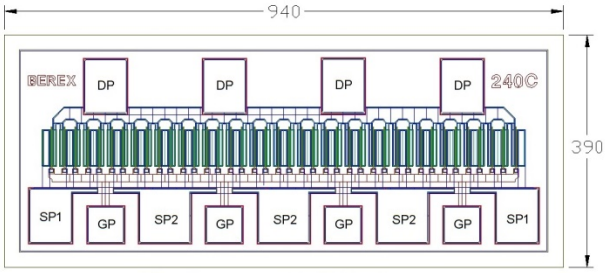
The BeRex BCP240C is a GaAs Power pHEMT with a nominal 0.25-micron by 2400-micron gate making this product ideally suited for applications where high-gain and medium power in the DC to 26.5 GHz frequency range are required. The product may be used in either wideband (6-18 GHz) or narrow-band applications. The BCP240C is produced using state of the art metallization with SI_3N_4 passivation and is screened to assure reliability.

PRODUCT FEATURES

- 33 dBm Typical Output Power
- 9 dB Typical Gain @ 12 GHz
- 0.25 X 2400 Micron Recessed Gate

APPLICATIONS

- Commercial
- Military / Hi-Rel.
- Test & Measurement



Chip dimensions : 940 X 390 microns
Gate pad(GP) : 60 X 60 microns
Drain pad(DP) : 70 X 90 microns
Source pad1(SP1) : 70 X 90 microns
Source pad2(SP2) : 80 X 90 microns
Chip thickness : 75 microns

ELECTRICAL CHARACTERISTIC (TUNED FOR POWER) T_a = 25° C

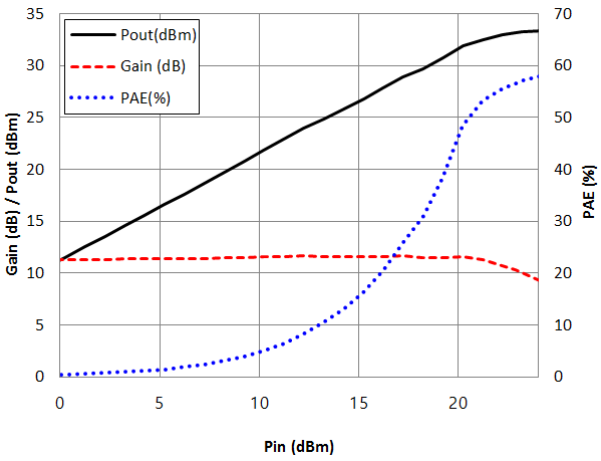
PARAMETER/TEST CONDITIONS		TEST FREQ.	MIN.	TYPICAL	MAX.	UNIT
P_{1dB}	Output Power @ P_{1dB} (V_{ds} = 8V, I_d = 360mA)	12 GHZ 18 GHz	31.5 30.0	33.0 31.5		dBm
G_{1dB}	Gain @ P_{1dB} (V_{ds} = 8V, I_d = 360mA)	12 GHZ 18 GHz	7.5 5.5	9.0 7.0		dB
PAE	PAE @ P_{1dB} (V_{ds} = 8V, I_d = 360mA)	12 GHZ 18 GHz		55 35		%
I_{dss}	Saturated Drain Current (V_{gs} = 0V, V_{ds} = 1.2V)		530	780	1030	mA
G_m	Transconductance (V_{ds} = 2V, I_d = 360mA)			930		mS
V_p	Pinch-off Voltage (I_d = 2.4mA, V_{ds} = 2V)		-2.5	-1.2		V
BV_{gd}	Drain Breakdown Voltage (I_g = -2.4mA, source open)			-15	-12	V
BV_{gs}	Source Breakdown Voltage (I_g = -2.4mA, drain open)			-13		V
R_{th}	Thermal Resistance (Au-Sn Eutectic Attach)			20		°C/W

MAXIMUM RATING (T_a = 25℃)

PARAMETERS		ABSOLUTE	CONTINUOUS
V_{ds}	Drain-Source Voltage	12V	8 V
V_{gs}	Gate-Source Voltage	-6V	-3 V
I_d	Drain Current	I_{dss}	I_{dss}
I_{gsf}	Forward Gate Current	120 mA	20 mA
P_{in}	Input Power	31 dBm	@ 3 dB compression
T_{ch}	Channel Temperature	175°C	150°C
T_{stg}	Storage Temperature	-60°C ~ 150°C	-60°C ~ 150°C
P_t	Total Power Dissipation	7.5 W	6.3 W

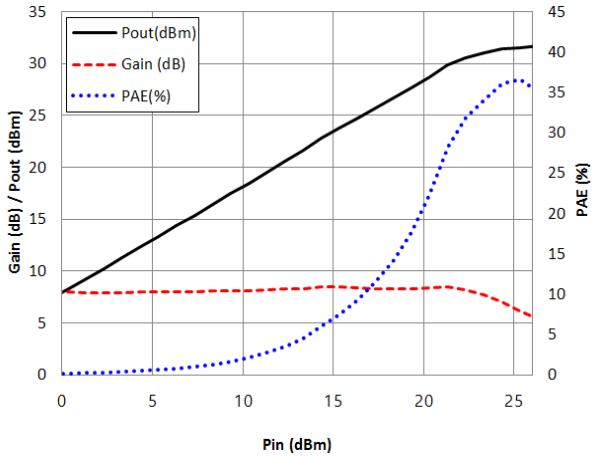
Exceeding any of the above Maximum Ratings will result in reduced MTTF and may cause permanent damage to the device.

P_{IN}_P_{OUT}/Gain, PAE (12 GHz)



Frequency = 12 GHz
V_{ds} = 8V, I_{ds} = 360mA (Tuned for Power)

P_{IN}_P_{OUT}/Gain, PAE (18 GHz)



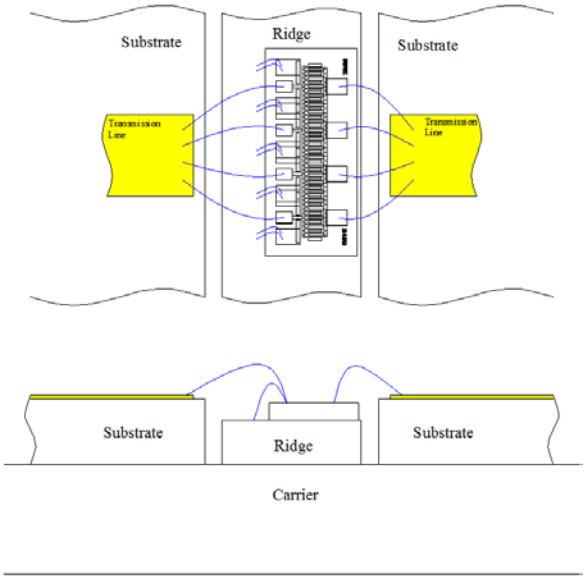
Frequency = 18 GHz
V_{ds} = 8V, I_{ds} = 360mA (Tuned for Power)

S-PARAMETERS (V_{ds} = 8V, I_{ds} = 360mA)

FREQ. [GHZ]	S11 [MAG]	S11 [ANG.]	S21 [MAG]	S21 [ANG.]	S12 [MAG]	S12 [ANG.]	S22 [MAG]	S22 [ANG.]
1.0	0.90	-141.71	11.60	103.03	0.026	22.70	0.37	-149.13
2.0	0.91	-162.67	6.10	87.03	0.027	17.84	0.39	-156.87
3.0	0.91	-171.74	4.11	76.77	0.026	23.95	0.41	-157.28
4.0	0.92	-177.53	3.07	68.30	0.026	26.13	0.44	-157.13
5.0	0.92	178.14	2.43	60.70	0.029	29.38	0.46	-156.86
6.0	0.92	174.37	1.99	53.34	0.029	34.52	0.49	-156.69
7.0	0.93	170.88	1.69	46.50	0.030	39.36	0.52	-158.15
8.0	0.93	167.72	1.46	39.93	0.031	42.60	0.55	-159.52
9.0	0.93	164.24	1.27	33.09	0.033	46.73	0.58	-161.90
10.0	0.93	160.97	1.11	26.92	0.033	47.79	0.61	-164.05
11.0	0.94	158.10	0.97	20.79	0.035	49.64	0.64	-167.07
12.0	0.94	155.51	0.84	15.19	0.037	50.01	0.67	-169.35
13.0	0.95	153.70	0.74	10.35	0.038	55.59	0.70	-171.85
14.0	0.95	152.33	0.66	6.18	0.042	47.78	0.73	-174.09
15.0	0.95	150.16	0.59	1.39	0.040	52.92	0.75	-175.32
16.0	0.95	148.78	0.52	-2.35	0.040	51.90	0.77	-176.51
17.0	0.96	147.34	0.47	-5.69	0.043	52.04	0.80	-177.53
18.0	0.96	145.07	0.43	-9.82	0.043	51.09	0.82	-177.95
19.0	0.96	143.79	0.39	-13.22	0.045	47.23	0.84	-178.32
20.0	0.96	142.11	0.35	-16.16	0.044	46.37	0.86	-178.65
21.0	0.96	141.87	0.32	-18.36	0.047	48.07	0.87	-179.41
22.0	0.95	141.13	0.30	-21.03	0.049	47.38	0.89	179.42
23.0	0.94	139.02	0.28	-24.65	0.053	45.84	0.90	177.59
24.0	0.95	137.73	0.26	-28.34	0.057	40.93	0.90	175.56
25.0	0.94	137.41	0.23	-29.87	0.056	41.14	0.89	173.60
26.0	0.94	134.60	0.21	-32.62	0.051	46.30	0.89	172.06

Note: S-parameters include bond wires. Reference planes are at edge of substrates shown on “Wire Bonding Information” figure below.

WIRE BONDING INFORMATION



Using 1 mil. diameter, Au bonding wires.

1. Gate to input transmission line
   - Length and Height : 600 µm x 250 µm
   - Number of wire(s): 1
2. Drain to output transmission line
   - Length and Height : 400 µm x 250 µm
   - Number of wire(s) : 1
3. Source to ground plate
   - Length and Height : 250 µm x 300 µm
   - Number of wire(s) : 4

Proper ESD procedures should be followed when handling this device.