



# BCP030C

## HIGH EFFICIENCY HETEROJUNCTION POWER FET CHIP (.25μm x 300μm)

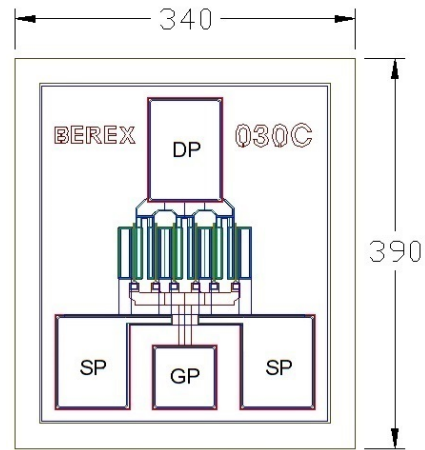
The BeRex BCP030C is a GaAs Power pHEMT with a nominal 0.25-micron by 300-micron gate making this product ideally suited for applications where high-gain and medium power in the DC to 26.5 GHz frequency range are required. The product may be used in either wideband (6-18 GHz) or narrow-band applications. The BCP030C is produced using state of the art metallization with Si<sub>3</sub>N<sub>4</sub> passivation and is screened to assure reliability.

### PRODUCT FEATURES

- 24.5 dBm Typical Output Power
- 13.5 dB Typical Gain @ 12 GHz
- 0.25 X 300 Micron Recessed Gate

### APPLICATIONS

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



Chip dimensions : 340 X 390 microns  
 Gate pad(GP) : 60 X 60 microns  
 Drain pad(DP) : 70 X 100 microns  
 Source pad(SP) : 70 X 95 microns  
 Chip thickness : 75 microns

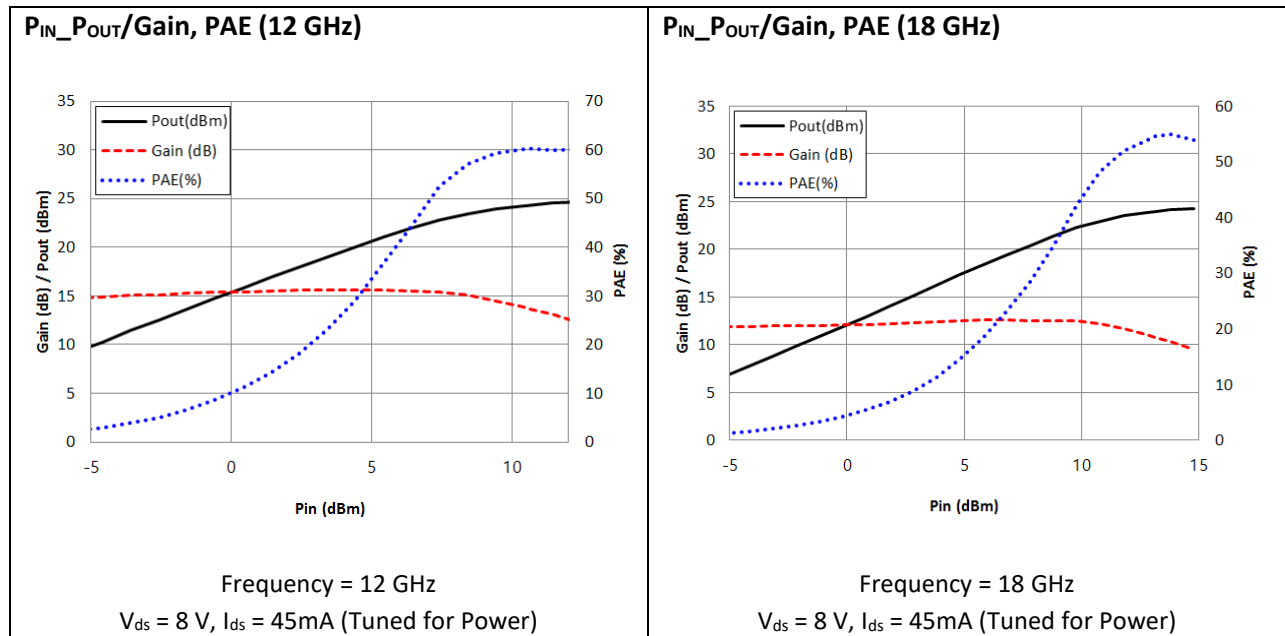
### ELECTRICAL CHARACTERISTIC (TUNED FOR POWER) T<sub>a</sub> = 25° C

PARAMETER/TEST CONDITIONS		TEST FREQ.	MIN.	TYPICAL	MAX.	UNIT
P <sub>1dB</sub>	Output Power @ P <sub>1dB</sub> (V <sub>ds</sub> = 8V, I <sub>d</sub> = 45mA)	12 GHZ 18 GHZ	23.0 23.0	24.5 24.5		dBm
G <sub>1dB</sub>	Gain @ P <sub>1dB</sub> (V <sub>ds</sub> = 8V, I <sub>d</sub> = 45mA)	12 GHZ 18 GHZ	12.0 9.0	13.5 10.5		dB
PAE	PAE @ P <sub>1dB</sub> (V <sub>ds</sub> = 8V, I <sub>d</sub> = 45mA)	12 GHZ 18 GHZ		60 55		%
NF	Noise figure (V <sub>ds</sub> = 2V, I <sub>d</sub> = 15 mA)	12 GHZ		1.1		dB
I <sub>dss</sub>	Saturated Drain Current (V <sub>gs</sub> = 0V, V <sub>ds</sub> = 2.0V)		60	90	120	mA
G <sub>m</sub>	Transconductance (V <sub>ds</sub> = 2V, I <sub>d</sub> = 45mA)			115		mS
V <sub>p</sub>	Pinch-off Voltage (I <sub>ds</sub> = 0.3mA, V <sub>ds</sub> = 2V)		-2.5	-1.2		V
BV <sub>gd</sub>	Drain Breakdown Voltage (I <sub>g</sub> = -0.3mA, source open)			-15	-12	V
BV <sub>gs</sub>	Source Breakdown Voltage (I <sub>g</sub> = -0.3mA, drain open)			-13		V
R <sub>th</sub>	Thermal Resistance (Au-Sn Eutectic Attach)			115		°C/W

MAXIMUM RATING ( $T_a = 25^\circ \text{C}$ )

PARAMETERS		ABSOLUTE	CONTINUOUS
$V_{ds}$	Drain-Source Voltage	12 V	8 V
$V_{gs}$	Gate-Source Voltage	-6 V	-3 V
$I_d$	Drain Current	$I_{dss}$	$I_{dss}$
$I_{gsf}$	Forward Gate Current	18 mA	3 mA
$P_{in}$	Input Power	22 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	1.3 W	1.1 W

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

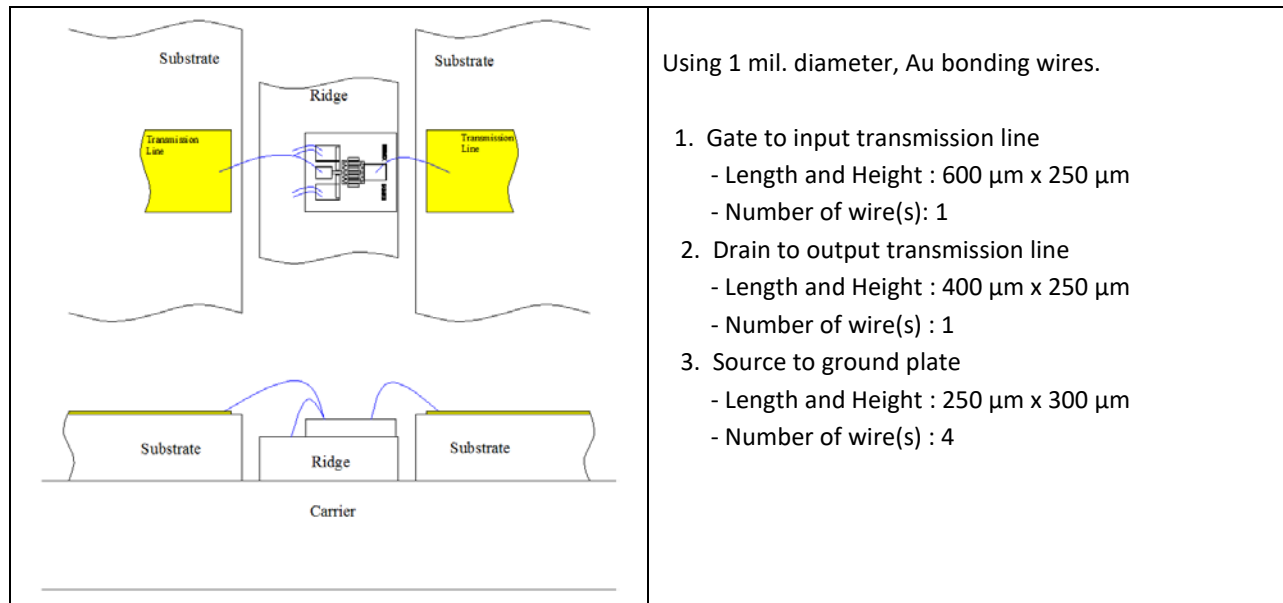


S-PARAMETERS ( $V_{ds} = 8V$ ,  $I_{ds} = 45mA$ )

FREQ. [GHZ]	S11 [MAG]	S11 [ANG.]	S21 [MAG]	S21 [ANG.]	S12 [MAG]	S12 [ANG.]	S22 [MAG]	S22 [ANG.]
1.0	0.98	-23.86	7.38	162.50	0.014	74.60	0.81	-6.76
2.0	0.94	-46.46	7.02	146.70	0.030	66.16	0.79	-13.54
3.0	0.89	-69.03	6.57	131.52	0.038	55.17	0.75	-19.74
4.0	0.84	-91.85	6.05	117.38	0.046	47.41	0.71	-23.65
5.0	0.79	-113.68	5.52	103.92	0.054	38.46	0.67	-27.78
6.0	0.76	-134.40	4.98	91.19	0.056	30.31	0.63	-31.80
7.0	0.75	-153.92	4.49	79.98	0.057	24.78	0.60	-34.64
8.0	0.74	-170.69	4.01	69.58	0.056	19.61	0.57	-37.56
9.0	0.75	174.28	3.58	59.64	0.056	14.51	0.55	-41.45
10.0	0.76	161.67	3.21	50.90	0.051	10.25	0.53	-44.56
11.0	0.77	150.68	2.88	42.68	0.050	9.53	0.52	-48.73
12.0	0.79	140.76	2.61	34.50	0.049	8.41	0.51	-53.13
13.0	0.81	131.79	2.38	27.20	0.049	6.81	0.49	-57.19
14.0	0.83	124.13	2.16	20.07	0.049	3.22	0.47	-61.62
15.0	0.85	116.58	1.97	12.99	0.046	4.27	0.46	-66.25
16.0	0.86	110.76	1.79	6.68	0.047	5.07	0.44	-71.83
17.0	0.88	106.16	1.66	0.71	0.049	3.61	0.43	-79.17
18.0	0.89	100.57	1.52	-6.23	0.051	1.39	0.42	-86.51
19.0	0.90	96.91	1.39	-12.56	0.051	2.67	0.42	-95.77
20.0	0.91	93.43	1.26	-18.91	0.051	-1.59	0.41	-107.58
21.0	0.90	91.80	1.15	-24.47	0.054	-0.89	0.42	-118.49
22.0	0.90	90.93	1.05	-29.70	0.054	-1.15	0.44	-129.50
23.0	0.89	90.40	0.95	-35.59	0.058	-2.37	0.46	-140.82
24.0	0.90	90.80	0.87	-39.96	0.056	0.12	0.48	-151.10
25.0	0.90	91.15	0.80	-44.03	0.052	-1.19	0.51	-159.63
26.0	0.92	90.01	0.72	-48.59	0.059	1.93	0.55	-168.32

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

## WIRE BONDING INFORMATION



Proper ESD procedures should be followed when handling this device.

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