



BCP080T

HIGH EFFICIENCY HETEROJUNCTION POWER FET CHIP (.25 μ m x 800 μ m)

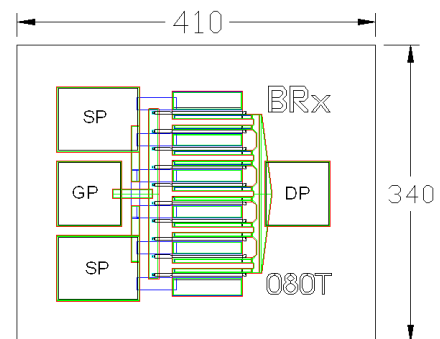
The BeRex BCP080T is a GaAs Power pHEMT with a nominal 0.25 micron gate length and 800 micron gate width making the product ideally suited for amplifier applications where high-gain and medium power in the S to K bands is required. The product may be used in either wideband (6-18 GHz) or narrow-band applications. The BCP020T is produced using state of the art metallization with Si₃N₄ passivation and is screened to assure reliability.

PRODUCT FEATURES

- 30 dBm Typical Output Power
- 10.5 dB Typical Gain @ 12 GHz
- 60% PAE Typical @12 GHz
- 0.25 X 800 μ m Recessed Gate

APPLICATIONS

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



Chip dimensions : 410 X 340 microns
 Gate pad(GP) : 75 X 75 microns
 Drain pad(DP) : 75 X 75 microns
 Source pad(SP) : 95 X 75 microns
 Chip thickness : 100 microns

DC CHARACTERISTICS $T_a = 25^\circ \text{C}$

SYMBOL	PARAMETER/TEST CONDITIONS	MIN.	TYPICAL	MAX.	UNIT
I_{dss}	Saturated Drain Current ($V_{gs} = 0V, V_{ds} = 1.0V$)	160	240	320	mA
G_m	Transconductance ($V_{ds} = 3V, V_{gs} = 50\% I_{dss}$)		320		mS
V_p	Pinch-off Voltage ($I_{ds} = 800 \mu A, V_{ds} = 2V$)	-2.5	-1.1	-0.5	V
BV_{gd}	Drain Breakdown Voltage ($I_{gd} = 0.8 \text{ mA}, \text{source open}$)		-15	-12.0	V
BV_{gs}	Source Breakdown Voltage ($I_g = 0.8 \text{ mA}, \text{drain open}$)		-13		V
R_{th}	Thermal Resistance (Au-Sn Eutectic Attach)		61		$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTIC (TUNED FOR POWER) $T_a = 25^\circ \text{C}$

SYMBOL	PARAMETER/TEST CONDITIONS	TEST FREQ.	MIN.	TYPICAL	MAX.	UNIT
P_{1dB}	Output Power @ P_{1dB} ($V_{ds} = 8V, I_{ds} = 50\% I_{dss}$)	12 GHz 18 GHz	29.0	30.0 30.0		dBm
G_{1dB}	Gain @ P_{1dB} ($V_{ds} = 8V, I_{ds} = 50\% I_{dss}$)	12 GHz 18 GHz	9.5	10.5 7.5		dB
PAE	PAE @ P_{1dB} ($V_{ds} = 8V, I_{ds} = 50\% I_{dss}$)	12 GHz 18 GHz		60 55		%

ELECTRICAL CHARACTERISTIC (TUNED FOR GAIN) $T_a = 25^\circ\text{C}$

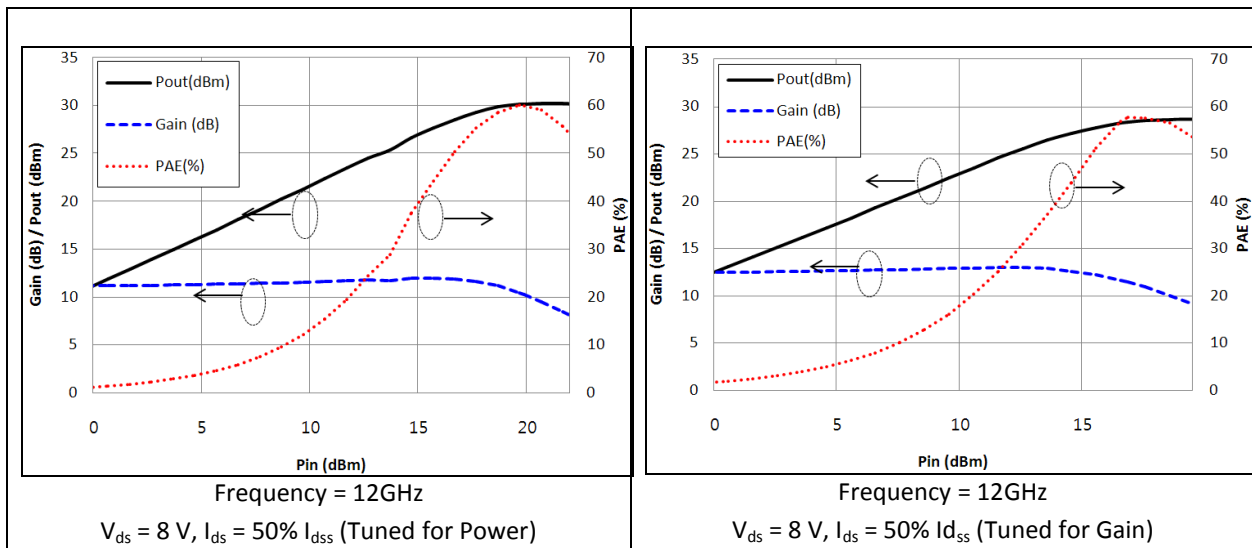
SYMBOL	PARAMETER/TEST CONDITIONS	TEST FREQ.	MIN.	TYPICAL	MAX.	UNIT
P_{1dB}	Output Power @ P_{1dB} ($V_{ds} = 8\text{V}$, $I_{ds} = 50\% I_{dss}$)	12 GHz 18 GHz	27.5	28.5 28.0		dBm
G_{1dB}	Gain @ P_{1dB} ($V_{ds} = 8\text{V}$, $I_{ds} = 50\% I_{dss}$)	12 GHz 18 GHz	10.5	11.5 8.0		dB
PAE	PAE @ P_{1dB} ($V_{ds} = 8\text{V}$, $I_{ds} = 50\% I_{dss}$)	12 GHz 18 GHz		58 45		%

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

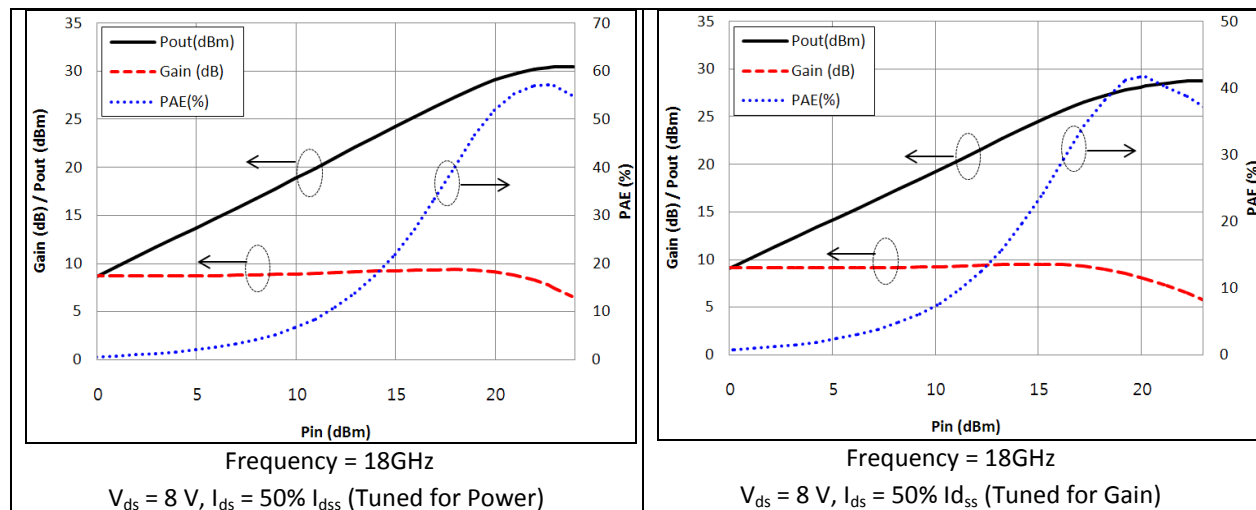
SYMBOLS	PARAMETERS	ABSOLUTE	CONTINUOUS
V_{ds}	Drain-Source Voltage	12 V	8 V
V_{gs}	Gate-Source Voltage	-6 V	-3 V
I_{ds}	Drain Current	I_{dss}	I_{dss}
I_{gsf}	Forward Gate Current	40 mA	7 mA
P_{in}	Input Power	27 dBm	@ 3dB compression
T_{ch}	Channel Temperature	175° C	150° C
T_{stg}	Storage Temperature	-60° C - 150° C	-60° C - 150° C
P_t	Total Power Dissipation	3.0 W	2.5 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)



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

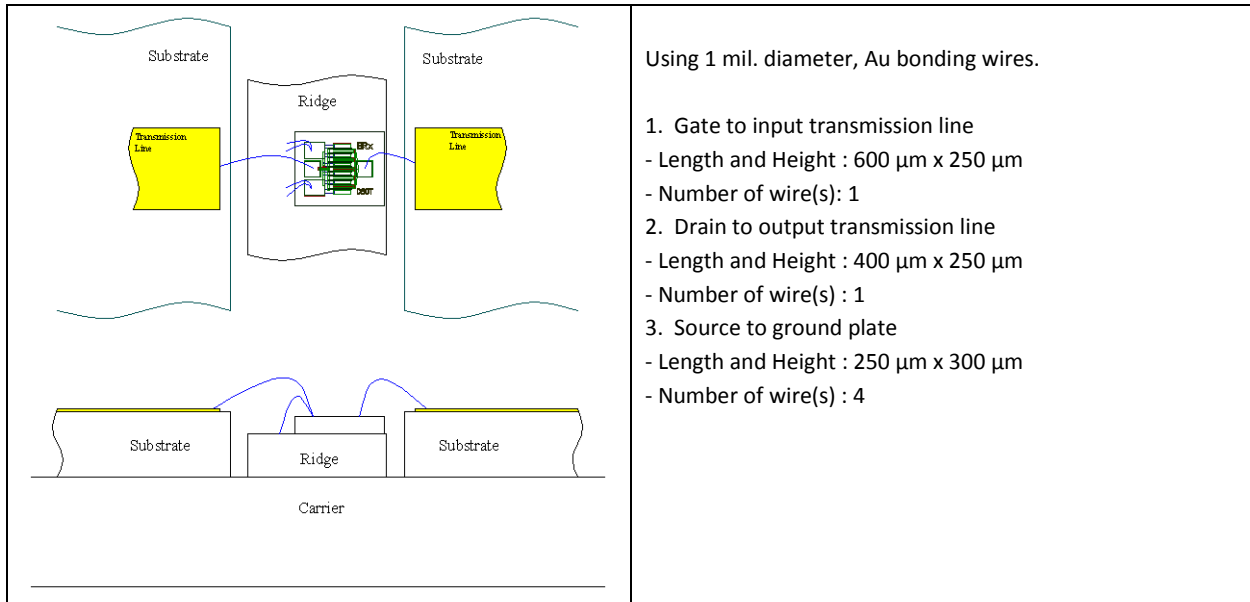


S-PARAMETER (V_{ds} = 8V, I_{ds} = 50% I_{dss})

FREQ. [GHZ]	S11 [MAG]	S11 [ANG.]	S21 [MAG]	S21 [ANG.]	S12 [MAG]	S12 [ANG.]	S22 [MAG]	S22 [ANG.]
1	0.88	-76.19	15.20	133.42	0.024	52.92	0.33	-48.85
2	0.80	-122.05	10.28	107.10	0.026	39.88	0.23	-79.11
3	0.78	-150.41	7.46	90.51	0.028	32.53	0.18	-100.71
4	0.78	-169.11	5.73	78.17	0.032	27.33	0.15	-118.62
5	0.78	177.02	4.62	67.37	0.033	26.98	0.15	-135.40
6	0.79	165.27	3.82	57.85	0.037	26.66	0.16	-148.85
7	0.81	156.52	3.20	49.39	0.039	26.35	0.18	-160.17
8	0.82	147.81	2.79	41.06	0.040	27.57	0.20	-167.44
9	0.84	140.62	2.44	33.85	0.045	26.68	0.22	-176.73
10	0.84	134.26	2.17	26.58	0.048	26.40	0.24	177.83
11	0.86	126.33	1.94	18.60	0.052	24.32	0.26	171.10
12	0.87	119.77	1.73	10.95	0.054	22.92	0.29	165.39
13	0.89	114.17	1.56	4.42	0.056	20.74	0.32	158.94
14	0.89	107.48	1.41	-3.40	0.058	17.25	0.35	152.81
15	0.90	102.39	1.24	-10.36	0.061	15.12	0.39	146.64
16	0.92	98.18	1.12	-16.82	0.062	12.32	0.44	140.53
17	0.93	93.38	0.99	-24.48	0.063	7.68	0.48	135.58
18	0.93	92.33	0.86	-28.98	0.065	8.39	0.52	130.41
19	0.93	90.25	0.76	-34.74	0.064	6.46	0.56	125.87
20	0.94	86.43	0.67	-40.26	0.063	6.69	0.61	122.41
21	0.95	87.08	0.57	-43.33	0.064	4.00	0.64	119.62
22	0.94	88.18	0.51	-46.45	0.063	3.40	0.66	117.23
23	0.94	87.44	0.44	-49.43	0.064	2.63	0.70	115.29
24	0.94	90.11	0.39	-50.10	0.064	1.51	0.73	114.62
25	0.94	91.60	0.35	-52.21	0.061	4.83	0.75	113.64
26	0.95	90.36	0.31	-52.11	0.058	10.58	0.76	114.36

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.

CAUTION

THIS PRODUCT USES GALLIUM ARSENIDE (GaAs). GaAs VAPOR AND POWDER ARE HAZARDOUS TO HUMAN HEALTH IF INHALED OR INGESTED. DO NOT BURN, DESTROY, CUT, CRUSH OR CHEMICALLY DISSOLVE THE PRODUCT. DO NOT LICK THE PRODUCT OR IN ANY WAY ALLOW IT TO ENTER THE MOUTH. EXCLUDE THE PRODUCT FROM GENERAL INDUSTRIAL WASTE OR GARBAGE AND DISPOSE OF ONLY IN ACCORDANCE TO APPLICABLE LAWS AND/OR ORDINANCES.

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