



BCP240T

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

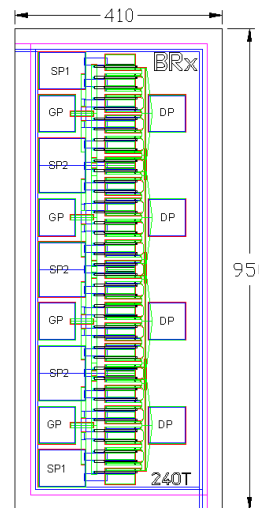
The BeRex BCP240T is a GaAs Power pHEMT with a nominal 0.25 micron gate length and 2400 micron gate width making the product ideally suited for amplifier applications where high-gain and medium power in the S to K bands is required. The product may be used in either wideband (6-18 GHz) or narrow-band applications. The BCP020T is produced using state of the art metallization with Si₃N₄ passivation and is screened to assure reliability.

PRODUCT FEATURES

- 34 dBm Typical Output Power
- 10 dB Typical Gain @12 GHz
- 58% PAE Typical @12 GHz
- 0.25 X 2400 μm Recessed Gate

APPLICATIONS

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



Chip dimensions : 410 X 950 microns
 Gate pad(GP) : 75 X 75 microns
 Drain pad(DP) : 75 X 75 microns
 Source pad1(SP1) : 95 X 75 microns
 Source pad2(SP2) : 95 X 110 microns
 Chip thickness : 100 microns

DC CHARACTERISTICS T_a = 25° C

SYMBOL	PARAMETER/TEST CONDITIONS	MIN.	TYPICAL	MAX.	UNIT
I _{dss}	Saturated Drain Current (V _{gs} = 0V, V _{ds} = 1.2V)	480	720	960	mA
G _m	Transconductance (V _{ds} = 2V, V _{gs} = 50% I _{dss})		960		mS
V _p	Pinch-off Voltage (I _{ds} = 2.4 mA, V _{ds} = 2V)	-2.5	-1.1	-0.5	V
BV _{gd}	Drain Breakdown Voltage (I _g = 2.4 mA, source open)		-15	-12	V
BV _{gs}	Source Breakdown Voltage (I _g = 2.4 mA, drain open)		-13		V
R _{th}	Thermal Resistance (Au-Sn Eutectic Attach)		23		° C/W

ELECTRICAL CHARACTERISTICS (TUNED FOR POWER) T_a = 25° 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	33.5	34.8 33.7		dBm
G _{1dB}	Gain @ P _{1dB} (V _{ds} = 8V, I _{ds} = 50% I _{dss})	12 GHz 18 GHz	9.0	10.2 7.7		dB
PAE	PAE @ P _{1dB} (V _{ds} = 8V, I _{ds} = 50% I _{dss})	12 GHz 18 GHz		58 42		%

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

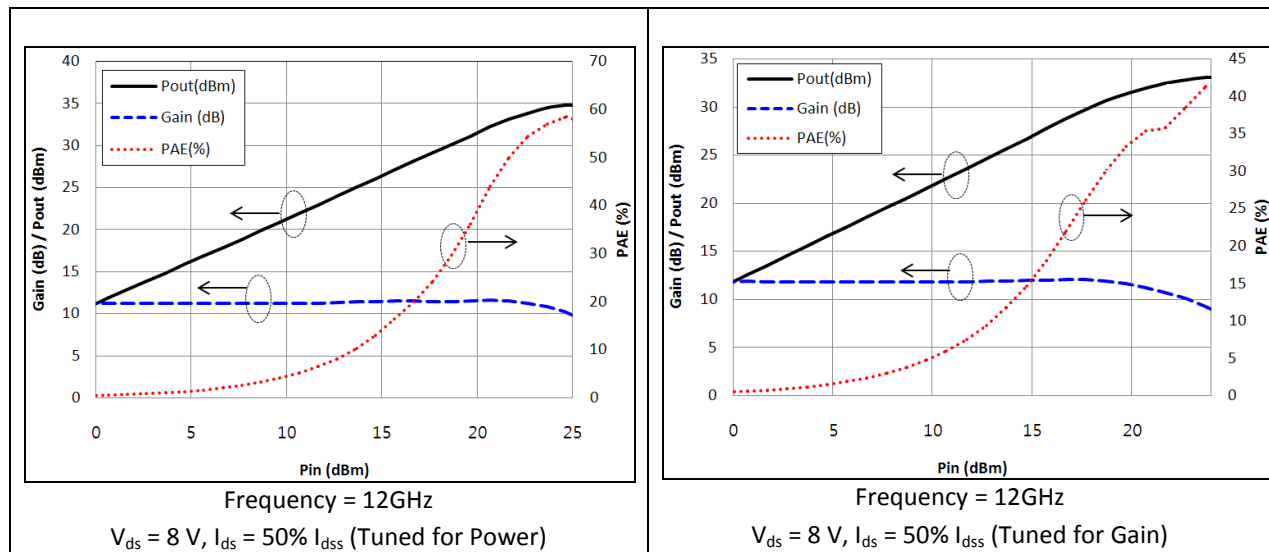
SYMBOL	PARAMETER/TEST CONDITIONS	TEST FREQ.	MIN.	TYPICAL	MAX.	UNIT
P_{1dB}	Output Power @ P_{1dB} ($V_{ds} = 8\text{V}$, $I_{ds} = 50\% I_{dss}$)	12 GHz 18 GHz	31.0	32.5 31.2		dBm
G_{1dB}	Gain @ P_{1dB} ($V_{ds} = 8\text{V}$, $I_{ds} = 50\% I_{dss}$)	12 GHz 18 GHz	9.5	11.0 8.7		dB
PAE	PAE @ P_{1dB} ($V_{ds} = 8\text{V}$, $I_{ds} = 50\% I_{dss}$)	12 GHz 18 GHz		36 27		%

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

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}	690 mA
I_{gsf}	Forward Gate Current	120 mA	20 mA
P_{in}	Input Power	31 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	8.4 W	6.9 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)

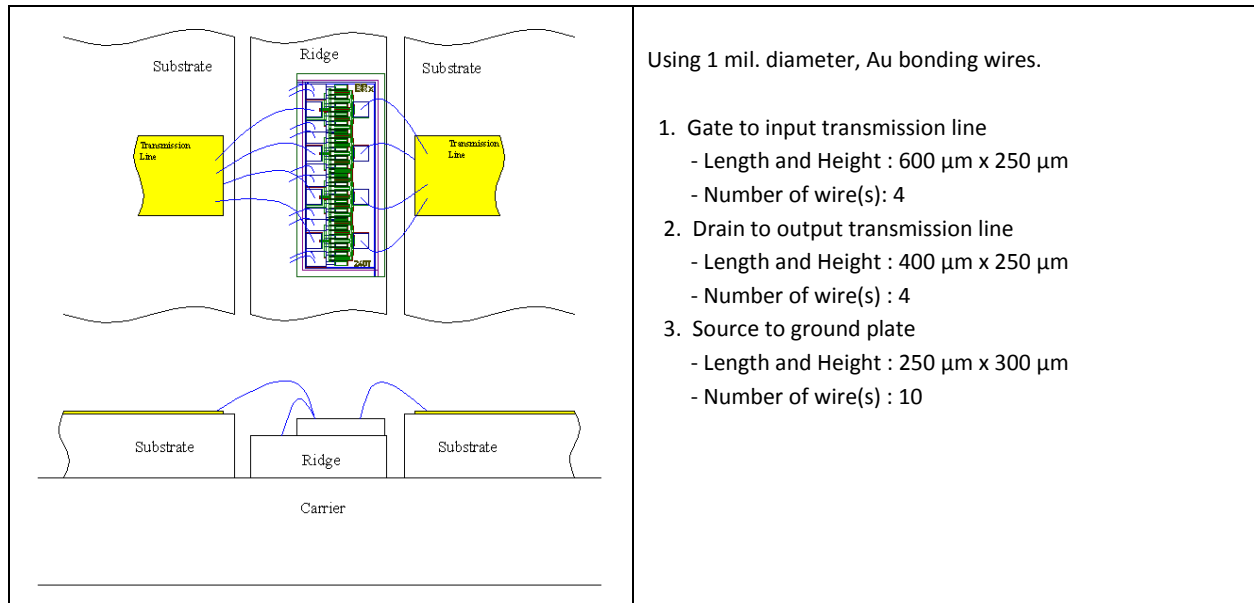


S-PARAMETER ($V_{ds} = 8V$, $I_{ds} = 50\% I_{dss}$)

FREQ. [GHZ]	S11 [MAG]	S11 [ANG.]	S21 [MAG]	S21 [ANG.]	S12 [MAG]	S12 [ANG.]	S22 [MAG]	S22 [ANG.]
1	0.90	-147.20	10.68	101.84	0.024	26.83	0.54	-166.95
2	0.90	-166.80	5.52	87.86	0.026	31.25	0.56	-173.49
3	0.91	-175.23	3.72	79.48	0.028	32.71	0.57	-175.76
4	0.92	179.32	2.80	72.74	0.032	38.68	0.58	-176.62
5	0.92	175.65	2.22	66.25	0.033	42.56	0.59	-177.49
6	0.92	172.96	1.84	60.88	0.037	47.19	0.60	-178.08
7	0.92	170.17	1.54	55.39	0.039	49.21	0.61	-178.49
8	0.93	167.87	1.35	50.23	0.040	52.94	0.62	-178.60
9	0.93	165.98	1.21	46.31	0.045	50.65	0.63	-179.68
10	0.92	163.50	1.09	41.28	0.048	53.68	0.64	179.89
11	0.93	161.40	0.99	36.84	0.052	54.32	0.65	179.02
12	0.93	158.76	0.91	32.10	0.054	53.07	0.66	178.15
13	0.93	154.63	0.85	27.43	0.056	53.42	0.67	177.02
14	0.94	151.80	0.78	22.74	0.058	51.40	0.68	175.57
15	0.93	148.54	0.72	17.87	0.061	50.66	0.69	173.37
16	0.94	143.75	0.67	12.61	0.062	47.94	0.71	171.14
17	0.94	140.71	0.62	7.15	0.063	44.66	0.72	168.48
18	0.94	136.72	0.56	2.33	0.065	40.30	0.74	166.01
19	0.95	132.10	0.51	-3.25	0.064	41.04	0.76	163.20
20	0.96	131.00	0.46	-7.07	0.063	37.85	0.77	161.05
21	0.96	128.78	0.41	-10.67	0.064	35.99	0.78	158.85
22	0.96	126.73	0.37	-13.78	0.063	35.56	0.79	157.27
23	0.95	127.90	0.33	-15.97	0.064	32.67	0.80	154.94
24	0.95	126.96	0.30	-17.87	0.064	27.92	0.82	154.34
25	0.96	127.60	0.27	-19.52	0.061	28.05	0.82	153.29
26	0.95	130.57	0.25	-18.60	0.058	37.30	0.83	153.31

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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