



BCP060T

HIGH EFFICIENCY pHEMT POWER FET CHIP (.25μm x 600μm)

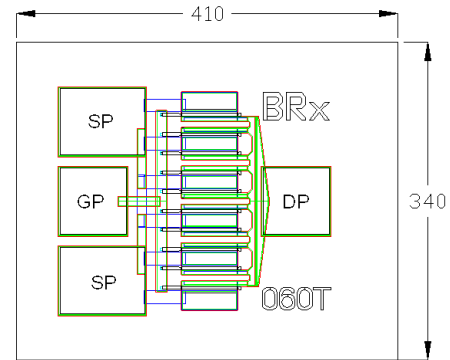
The BeRex BCP060T is a GaAs Power pHEMT with a nominal 0.25 micron gate length and 600 micron gate width making the product ideally suited for amplifier applications where high-gain and medium power in the S to K bands is required. The product may be used in either wideband (6-18 GHz) or narrow-band applications. The BCP020T is produced using state of the art metallization with Si₃N₄ passivation and is screened to assure reliability.

PRODUCT FEATURES

- 28 dBm Typical Output Power
- 12 dB Typical Gain @ 12 GHz
- 55% PAE Typical @12 GHz
- 0.25 X 600 μm 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° C

SYMBOL	PARAMETER/TEST CONDITIONS	MIN.	TYPICAL	MAX.	UNIT
I _{dss}	Saturated Drain Current (V _{gs} = 0V, V _{ds} = 2V)	120	180	240	mA
G _m	Transconductance (V _{ds} = 3V, V _{gs} = 50% I _{dss})		240		mS
V _p	Pinch-off Voltage (I _{ds} = 0.6 mA, V _{ds} = 2V)	- 2.5	-1.1	- 0.5	V
BV _{gd}	Drain Breakdown Voltage (I _g = 0.6 mA, source open)		-15	-12	V
BV _{gs}	Source Breakdown Voltage (I _g = 0.6 mA, drain open)		-13		V
R _{th}	Thermal Resistance (Au-Sn Eutectic Attach)		75		°C/W

ELECTRICAL CHARACTERISTIC (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	27.0	28.0 28.5		dBm
G _{1dB}	Gain @ P _{1dB} (V _{ds} = 8V, I _{ds} = 50% I _{dss})	12 GHz 18 GHz	11.0	12.0 9.0		dB
PAE	PAE @ P _{1dB} (V _{ds} = 8V, I _{ds} = 50% I _{dss})	12 GHz 18 GHz		55 55		%
NF	50 Ohm Noise Figure (V _{ds} =2V, I _{dss} =15 mA)	12 GHz		1.34		dB

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

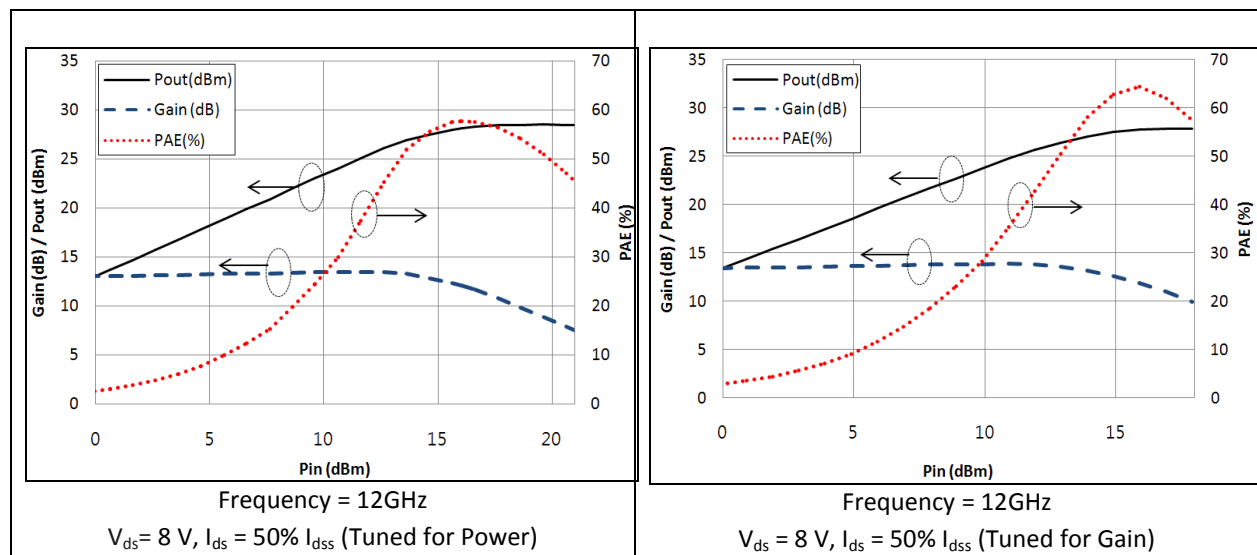
SYMBOL	PARAMETER/TEST CONDITIONS	TEST FREQ.	MIN.	TYPICAL	MAX.	UNIT
P_{1dB}	Output Power @ P_{1dB} ($V_{ds} = 8\text{V}$, $I_{ds} = 50\% I_{dss}$)	12 GHz 18 GHz		27.5 27.0		dBm
G_{1dB}	Gain @ P_{1dB} ($V_{ds} = 8\text{V}$, $I_{ds} = 50\% I_{dss}$)	12 GHz 18 GHz	11.0	12.5 9.5		dB
PAE	PAE @ P_{1dB} ($V_{ds} = 8\text{V}$, $I_{ds} = 50\% I_{dss}$)	12 GHz 18 GHz		55 50		%
NF	50 Ohm Noise Figure ($V_{ds}=2\text{V}$, $I_{dss}=15\text{ mA}$)	12 GHz		1.34		dB

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

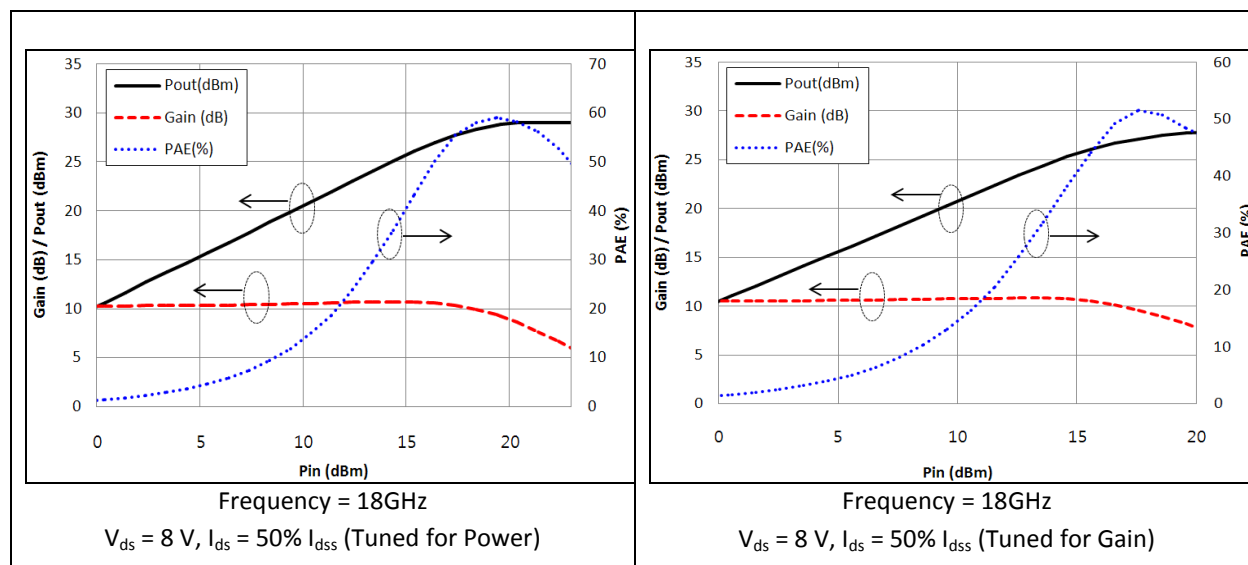
SYMBOLS	PARAMETERS	ABSOLUTE	CONTINUOUS
V_{ds}	Drain-Source Voltage	12 V	8 V
V_{gs}	Gate-Source Voltage	-6 V	-3 V
I_{ds}	Drain Current	I_{dss}	I_{dss}
I_{gsf}	Forward Gate Current	30 mA	10 mA
P_{in}	Input Power	25 dBm	@3dB Compression
T_{ch}	Channel Temperature	175° C	150° C
T_{stg}	Storage Temperature	-60° C - 150° C	-60° C - 150° C
P_t	Total Power Dissipation	2.6 W	2.2 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)

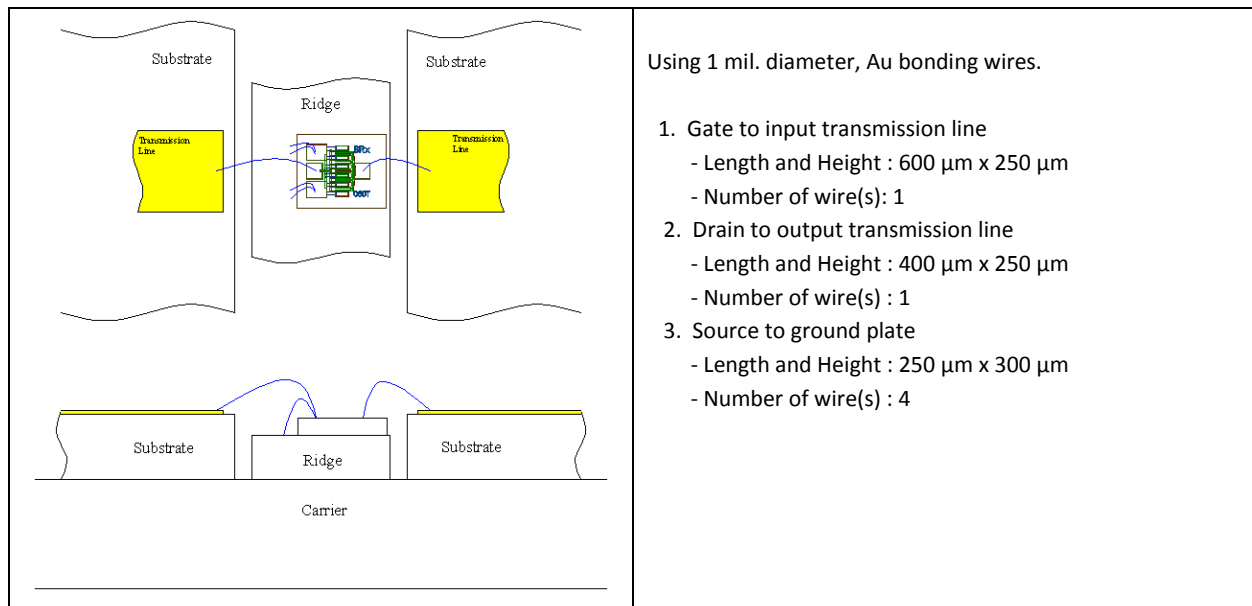


S-PARAMETER (V_{ds} = 8V, I_{ds} = 50% I_{dss})

FREQ. [GHZ]	S11 [MAG]	S11 [ANG.]	S21 [MAG]	S21 [ANG.]	S12 [MAG]	S12 [ANG.]	S22 [MAG]	S22 [ANG.]
1	0.92	-57.91	13.83	142.64	0.017	62.75	0.45	-30.63
2	0.83	-100.13	10.45	117.12	0.032	43.42	0.34	-49.55
3	0.79	-129.58	7.98	99.76	0.047	34.74	0.25	-62.90
4	0.77	-150.61	6.32	86.33	0.061	28.79	0.19	-72.26
5	0.77	-165.65	5.18	75.24	0.073	27.32	0.15	-86.36
6	0.77	-178.11	4.35	65.56	0.084	26.36	0.13	-101.81
7	0.78	172.13	3.69	56.72	0.094	25.99	0.12	-123.94
8	0.79	163.81	3.25	48.59	0.103	25.03	0.12	-137.66
9	0.80	156.81	2.88	41.33	0.108	23.59	0.12	-155.22
10	0.81	150.09	2.58	34.01	0.114	24.54	0.14	-169.25
11	0.82	143.11	2.34	26.33	0.120	23.14	0.16	178.07
12	0.83	136.61	2.12	18.59	0.124	22.92	0.19	168.01
13	0.85	130.15	1.94	11.44	0.130	19.85	0.22	157.74
14	0.86	123.54	1.77	3.60	0.134	16.06	0.25	148.31
15	0.88	117.87	1.60	-4.01	0.139	14.39	0.30	140.13
16	0.89	112.39	1.45	-11.27	0.144	10.53	0.35	132.31
17	0.90	106.79	1.29	-19.37	0.148	7.58	0.41	126.29
18	0.91	103.05	1.13	-26.14	0.153	6.07	0.46	120.85
19	0.92	100.04	1.00	-32.93	0.155	3.45	0.51	115.68
20	0.92	97.13	0.88	-38.54	0.156	0.94	0.57	111.97
21	0.93	96.22	0.76	-43.13	0.150	0.17	0.61	109.56
22	0.93	96.46	0.66	-46.19	0.149	0.71	0.65	107.33
23	0.92	96.55	0.57	-49.34	0.147	-0.34	0.68	106.11
24	0.92	97.66	0.51	-51.56	0.145	-0.02	0.71	106.08
25	0.94	98.95	0.46	-53.03	0.144	2.76	0.74	105.60
26	0.93	99.53	0.41	-54.01	0.145	3.92	0.76	106.41

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

Wire Bonding Information



Caution: ESD Sensitive
Appropriate precautions in handling, packaging
and testing devices must be observed.

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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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.