



HIGH EFFICIENCY HETEROJUNCTION POWER FET CHIP (.25μm x 400μm)

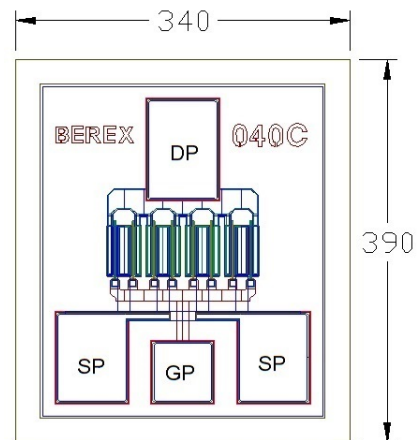
The BeRex BCP040C is a GaAs Power pHEMT with a nominal 0.25-micron by 400-micron gate making this product ideally suited for applications where high-gain and medium power in the DC to 26.5 GHz frequency range are required. The product may be used in either wideband (6-18 GHz) or narrow-band applications. The BCP040C is produced using state of the art metallization with Si₃N₄ passivation and is screened to assure reliability.

PRODUCT FEATURES

- 25.5 dBm Typical Output Power
- 13.5 dB Typical Gain @ 12 GHz
- 0.25 X 400 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

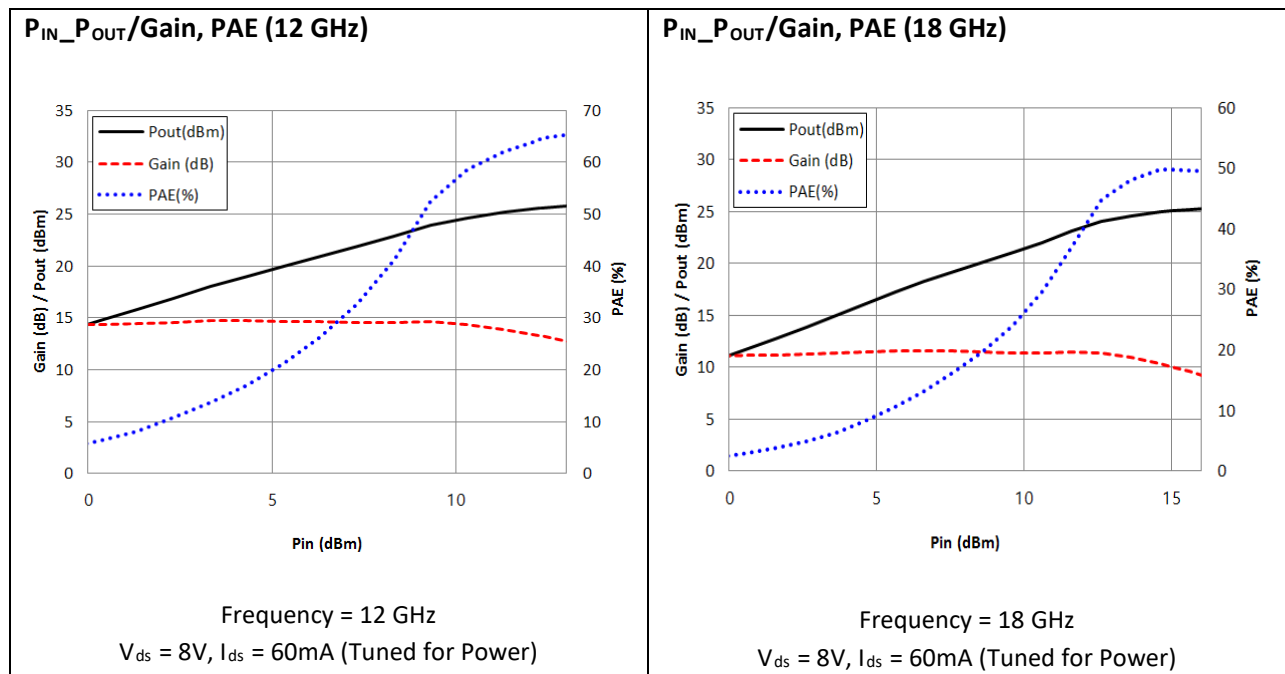
ELECTRICAL CHARACTERISTIC (TUNED FOR POWER) T_a = 25° C

PARAMETER/TEST CONDITIONS		TEST FREQ.	MIN.	TYPICAL	MAX.	UNIT
P _{1dB}	Output Power @ P _{1dB} (V _{ds} = 8V, I _{ds} = 60mA)	12 GHZ 18 GHZ	24.0 23.5	25.5 25.0		dBm
G _{1dB}	Gain @ P _{1dB} (V _{ds} = 8V, I _d = 60mA)	12 GHZ 18 GHZ	12.0 8.5	13.5 10		dB
PAE	PAE @ P _{1dB} (V _{ds} = 8V, I _d = 60mA)	12 GHZ 18 GHZ		60 50		%
NF	Noise figure (V _{ds} = 2V, I _d = 20 mA)	12 GHZ		1.05		dB
I _{dss}	Saturated Drain Current (V _{gs} = 0V, V _{ds} = 2.0V)		70	110	150	mA
G _m	Transconductance (V _{ds} = 2V, I _d = 60mA)			155		mS
V _p	Pinch-off Voltage (I _{ds} = 0.4mA, V _{ds} = 2V)		-2.5	-1.2		V
BV _{gd}	Drain Breakdown Voltage (I _g = -0.4mA, source open)			-15	-12	V
BV _{gs}	Source Breakdown Voltage (I _g = -0.4mA, drain open)			-13		V
R _{th}	Thermal Resistance (Au-Sn Eutectic Attach)			104		°C/W

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

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	20 mA	4 mA
P_{in}	Input Power	21 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	1.4 W	1.2 W

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

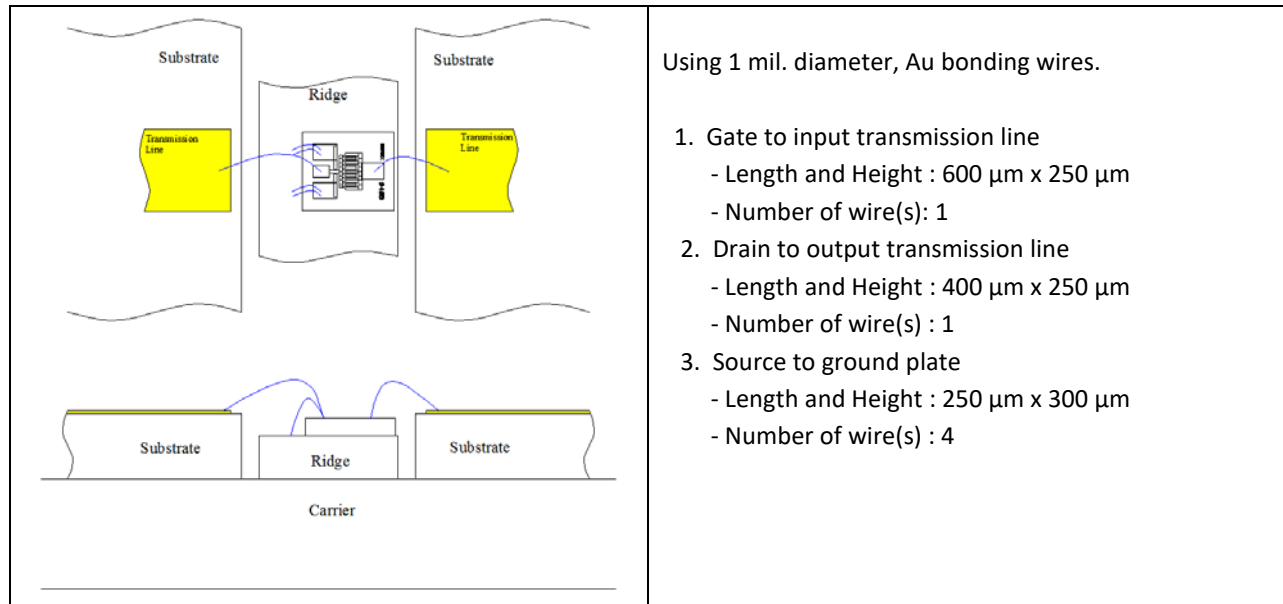


S-PARAMETERS ($V_{ds} = 8V$, $I_{ds} = 60mA$)

FREQ. [GHZ]	S11 [MAG]	S11 [ANG.]	S21 [MAG]	S21 [ANG.]	S12 [MAG]	S12 [ANG.]	S22 [MAG]	S22 [ANG.]
1.0	0.96	-32.77	9.22	157.08	0.019	74.39	0.75	-10.91
2.0	0.91	-62.35	8.30	137.43	0.033	58.12	0.70	-20.57
3.0	0.85	-89.11	7.32	120.10	0.044	46.81	0.65	-28.37
4.0	0.80	-113.74	6.38	105.13	0.050	37.96	0.60	-33.06
5.0	0.77	-135.76	5.56	91.69	0.054	29.52	0.56	-37.20
6.0	0.75	-155.44	4.86	79.41	0.056	23.50	0.52	-41.51
7.0	0.75	-173.01	4.28	68.68	0.056	18.04	0.49	-45.00
8.0	0.76	172.05	3.76	58.61	0.055	15.33	0.47	-47.88
9.0	0.77	158.74	3.32	48.98	0.051	10.95	0.46	-52.71
10.0	0.79	147.46	2.94	40.38	0.050	8.65	0.44	-56.78
11.0	0.81	138.51	2.61	32.53	0.049	8.67	0.42	-62.62
12.0	0.83	130.46	2.34	24.50	0.047	8.83	0.40	-68.79
13.0	0.85	123.26	2.12	17.44	0.045	4.84	0.39	-75.41
14.0	0.86	117.71	1.91	10.71	0.047	8.38	0.37	-83.12
15.0	0.88	111.89	1.73	3.69	0.047	6.82	0.36	-91.10
16.0	0.89	107.81	1.57	-2.51	0.048	5.16	0.36	-100.53
17.0	0.91	104.38	1.45	-8.61	0.050	5.99	0.36	-112.60
18.0	0.91	99.79	1.33	-15.34	0.050	5.85	0.37	-122.80
19.0	0.91	97.32	1.19	-21.75	0.053	5.47	0.39	-133.49
20.0	0.92	94.84	1.09	-27.79	0.052	3.02	0.42	-145.15
21.0	0.92	93.48	0.98	-33.30	0.055	3.69	0.45	-154.23
22.0	0.91	92.03	0.90	-38.62	0.055	3.83	0.49	-162.65
23.0	0.90	90.59	0.81	-44.51	0.058	2.69	0.53	-171.11
24.0	0.90	89.92	0.73	-49.47	0.061	0.24	0.56	-178.63
25.0	0.90	89.62	0.66	-53.64	0.057	-0.17	0.59	174.88
26.0	0.93	87.29	0.59	-58.58	0.062	6.04	0.62	168.70

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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