

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

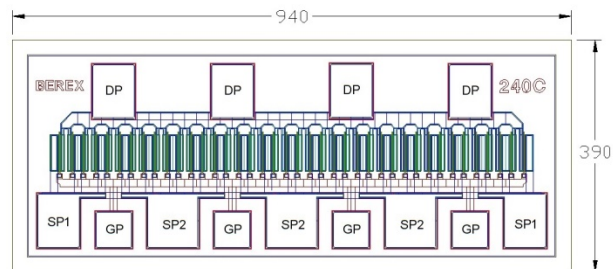
The BeRex BCP240C is a GaAs Power pHEMT with a nominal 0.25-micron by 2400-micron gate making this product ideally suited for applications where high-gain and medium power in the DC to 26.5 GHz frequency range are required. The product may be used in either wideband (6-18 GHz) or narrow-band applications. The BCP240C is produced using state of the art metallization with Si₃N₄ passivation and is screened to assure reliability.

PRODUCT FEATURES

- 33 dBm Typical Output Power
- 9 dB Typical Gain @ 12 GHz
- 0.25 X 2400 Micron Recessed Gate

APPLICATIONS

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



Chip dimensions : 940 X 390 microns
 Gate pad(GP) : 60 X 60 microns
 Drain pad(DP) : 70 X 90 microns
 Source pad1(SP1) : 70 X 90 microns
 Source pad2(SP2) : 80 X 90 microns
 Chip thickness : 75 microns

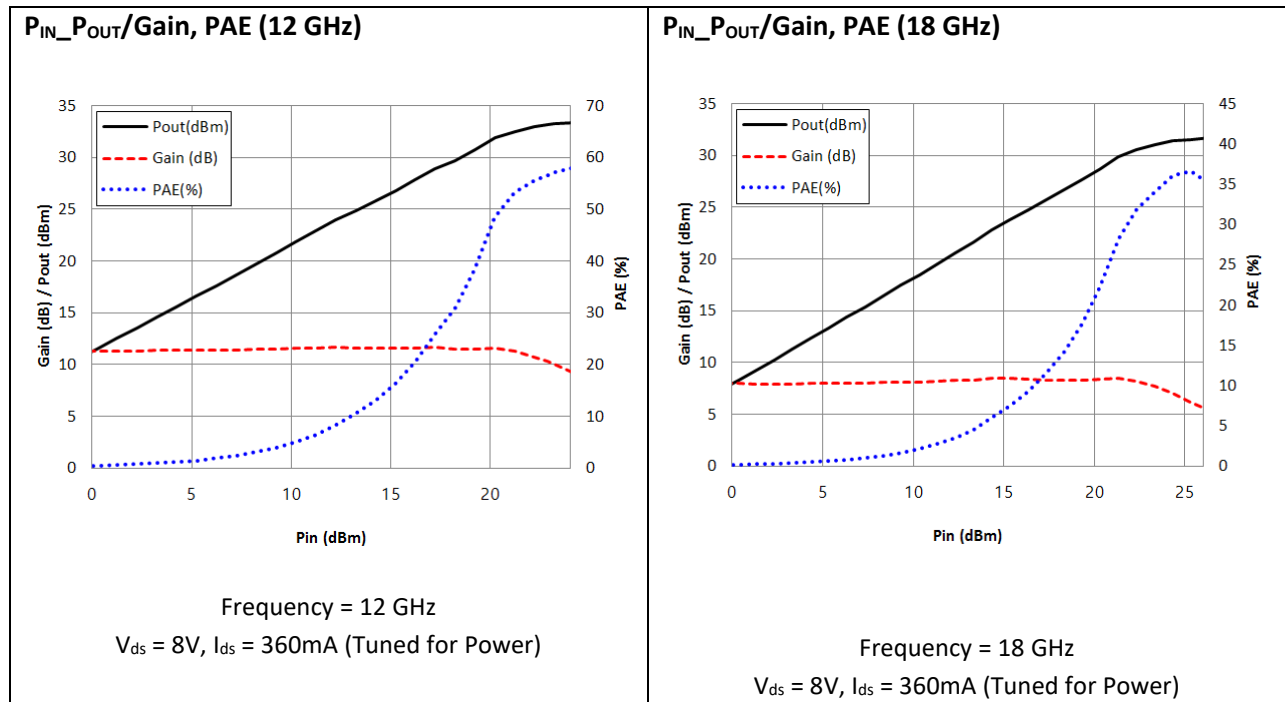
ELECTRICAL CHARACTERISTIC (TUNED FOR POWER) T_a = 25° C

PARAMETER/TEST CONDITIONS		TEST FREQ.	MIN.	TYPICAL	MAX.	UNIT
P _{1dB}	Output Power @ P _{1dB} (V _{ds} = 8V, I _d = 360mA)	12 GHZ	31.5	33.0		dBm
		18 GHZ	30.0	31.5		
G _{1dB}	Gain @ P _{1dB} (V _{ds} = 8V, I _d = 360mA)	12 GHZ	7.5	9.0		dB
		18 GHZ	5.5	7.0		
PAE	PAE @ P _{1dB} (V _{ds} = 8V, I _d = 360mA)	12 GHZ		55		%
		18 GHZ		35		
I _{dss}	Saturated Drain Current (V _{gs} = 0V, V _{ds} = 1.2V)		530	780	1030	mA
G _m	Transconductance (V _{ds} = 2V, I _d = 360mA)			930		mS
V _p	Pinch-off Voltage (I _d = 2.4mA, V _{ds} = 2V)		-2.5	-1.2		V
BV _{gd}	Drain Breakdown Voltage (I _g = -2.4mA, source open)			-15	-12	V
BV _{gs}	Source Breakdown Voltage (I _g = -2.4mA, drain open)			-13		V
R _{th}	Thermal Resistance (Au-Sn Eutectic Attach)			20		°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	120 mA	20 mA
P_{in}	Input Power	31 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	7.5 W	6.3 W

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

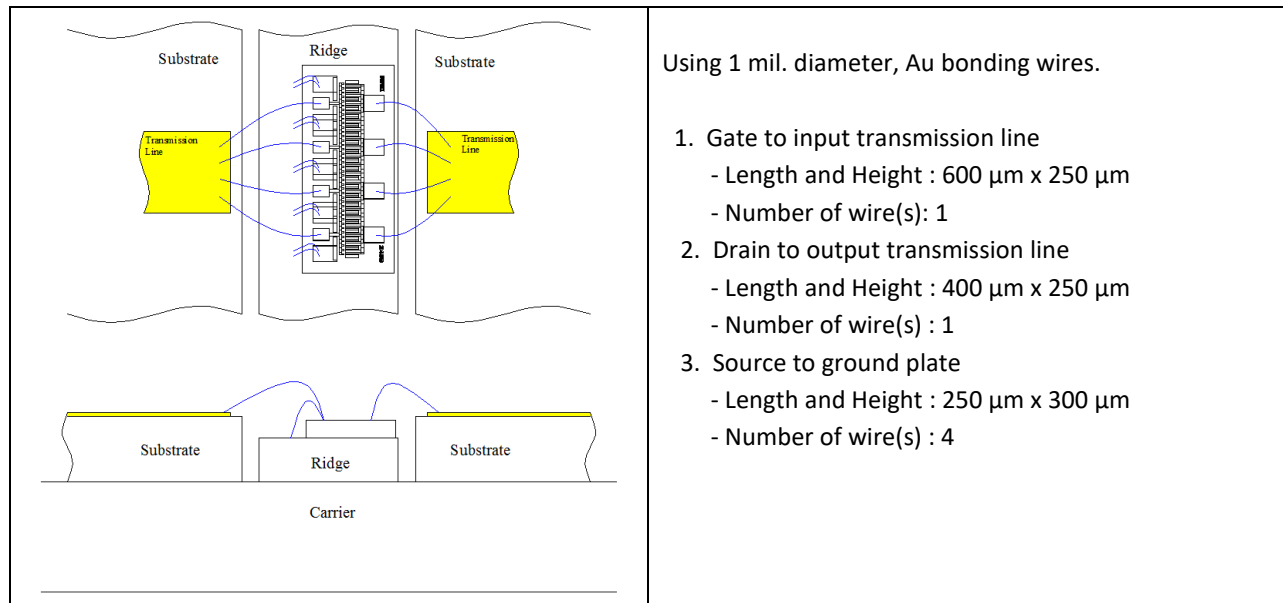


S-PARAMETERS ($V_{ds} = 8V$, $I_{ds} = 360mA$)

FREQ. [GHZ]	S11 [MAG]	S11 [ANG.]	S21 [MAG]	S21 [ANG.]	S12 [MAG]	S12 [ANG.]	S22 [MAG]	S22 [ANG.]
1.0	0.90	-141.71	11.60	103.03	0.026	22.70	0.37	-149.13
2.0	0.91	-162.67	6.10	87.03	0.027	17.84	0.39	-156.87
3.0	0.91	-171.74	4.11	76.77	0.026	23.95	0.41	-157.28
4.0	0.92	-177.53	3.07	68.30	0.026	26.13	0.44	-157.13
5.0	0.92	178.14	2.43	60.70	0.029	29.38	0.46	-156.86
6.0	0.92	174.37	1.99	53.34	0.029	34.52	0.49	-156.69
7.0	0.93	170.88	1.69	46.50	0.030	39.36	0.52	-158.15
8.0	0.93	167.72	1.46	39.93	0.031	42.60	0.55	-159.52
9.0	0.93	164.24	1.27	33.09	0.033	46.73	0.58	-161.90
10.0	0.93	160.97	1.11	26.92	0.033	47.79	0.61	-164.05
11.0	0.94	158.10	0.97	20.79	0.035	49.64	0.64	-167.07
12.0	0.94	155.51	0.84	15.19	0.037	50.01	0.67	-169.35
13.0	0.95	153.70	0.74	10.35	0.038	55.59	0.70	-171.85
14.0	0.95	152.33	0.66	6.18	0.042	47.78	0.73	-174.09
15.0	0.95	150.16	0.59	1.39	0.040	52.92	0.75	-175.32
16.0	0.95	148.78	0.52	-2.35	0.040	51.90	0.77	-176.51
17.0	0.96	147.34	0.47	-5.69	0.043	52.04	0.80	-177.53
18.0	0.96	145.07	0.43	-9.82	0.043	51.09	0.82	-177.95
19.0	0.96	143.79	0.39	-13.22	0.045	47.23	0.84	-178.32
20.0	0.96	142.11	0.35	-16.16	0.044	46.37	0.86	-178.65
21.0	0.96	141.87	0.32	-18.36	0.047	48.07	0.87	-179.41
22.0	0.95	141.13	0.30	-21.03	0.049	47.38	0.89	179.42
23.0	0.94	139.02	0.28	-24.65	0.053	45.84	0.90	177.59
24.0	0.95	137.73	0.26	-28.34	0.057	40.93	0.90	175.56
25.0	0.94	137.41	0.23	-29.87	0.056	41.14	0.89	173.60
26.0	0.94	134.60	0.21	-32.62	0.051	46.30	0.89	172.06

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.

DIE ATTACH RECOMMENDATIONS:

BeRex recommends the “Eutectic” die attach using Au-Sn (80%-20%) pre-forms. The die attach station must have accurate temperature control, and the operation should be performed with parts no hotter than 300°C for less than 60 seconds. An inert forming gas (90% N₂-10% H₂) or clean, dry N₂ should be used.

Use of conductive epoxy (gold or silver filled) may also be acceptable for die-attaching low power devices.

HANDLING PRECAUTIONS:

GaAs FETs are very sensitive to and may be damaged by Electrostatic Discharge (ESD). Therefore, proper ESD precautions must be taken whenever you are handling these devices. It is critically important that all work surfaces, and assembly equipment, as well as the operator be properly grounded when handling these devices to prevent ESD damage.

STORAGE & SHIPPING:

The BeRex standard chip device shipping package consists of an antistatic “Gel-Pak”, holding the chips, placed inside a sealed antistatic and moisture barrier bag. This packaging is designed to provide a reasonable measure of protection from both mechanical and ESD damage.

Chip devices should be stored in a clean, dry Nitrogen gas environment at room temperature until they are required for assembly. Only open the shipping package or perform die assembly in a work area with a class 10,000 or better clean room environment to prevent contamination of the exposed devices.

DISCLAIMER

BEREX RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. BEREX DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN.

LIFE SUPPORT POLICY

BEREX PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES WITHOUT THE EXPRESS WRITTEN APPROVAL OF BEREX.

1. Life support devices or systems are devices or systems which (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in labeling, can be reasonably expected to result in significant injury to the user.
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.