BCP030C-70

HIGH EFFICIENCY HETEROJUNCTION POWER FET (0.25µm x 300µm gate)

The BeRex BCP030T-70 is a GaAs Power pHEMT in an industry standard, 70 mils. ceramic, Micro-X, low parasitic, surface-mountable package. It's 0.25µm by 300µm recessed gate architecture provides low noise, high gain and excellent PAE over a broad frequency range of 1000 MHz to 26 GHz.

PRODUCT FEATURES

- 70 mil. surface-mountable ceramic package
- 23.0 dBm P1dB @ 12 GHz (*typical*)
- 11.5 dB Power Gain @12 GHz (*typical*)
- 0.25µm X 300µm recessed gate
- RoHS-compliant/lead-free

APPLICATIONS

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



A indicates the lot tracking code

3 indicates this is a BCP030T-70

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

SYMBOLS	PARAMETER/TEST CONDITIONS	TEST FREQUENCY	MIN.	TYPICAL	Max	UNIT
P_{1dB}	Output Power @ P_{1dB} (V_{ds} = 6V, I_{ds} = 50% I_{dss})	12 GHz 18 GHz	21.5 21.0	23.0 22.5		dBm
G_{1dB}	Gain @ P_{1dB} (V_{ds} = 6V, I_{ds} = 50% I_{dss})	12 GHz 18 GHz	10.5 8.5	11.5 9.5		dB
PAE	PAE @ P_{1dB} (V_{ds} = 6V, I_{ds} = 50% I_{dss})	12 GHz 18 GHz		55 55		%
I_{dss}	Saturated Drain Current (V_{gs} = 0V, V_{ds} = 2.0V)		60	90	120	mA
G_m	Transconductance (V_{ds} = 3V, Vgs = 50% I_{dss})			120		mS
V_p	Pinch-off Voltage (I_{ds} = 0.3 mA, V_{ds} = 2V)		-2.5	-1.1	-0.5	V
BV_{gd}	Drain Breakdown Voltage (I_g = 0.3 mA, source open)			-15		V
BV_{gs}	Source Breakdown Voltage (I_g = 0.3 mA, drain open)			-13		V
R_{th}	Thermal Resistance			320		° C/W

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

SYMBOLS	PARAMETER/TEST CONDITIONS	TEST FREQUENCY	MIN.	TYPICAL	MAX.	UNIT
P_{1dB}	Output Power @ P_{1dB} (V_{ds} = 6V, I_{ds} = 50% I_{dss})	12 GHz 18 GHz	17.5 15.5	19.0 17.0		dBm
G_{1dB}	Gain @ P_{1dB} (V_{ds} = 6V, I_{ds} = 50% I_{dss})	12 GHz 18 GHz	13.0 11.0	14.0 12.0		dB
PAE	PAE @ P_{1dB} (V_{ds} = 6V, I_{ds} = 50% I_{dss})	12 GHz 18 GHz		35 20		%
I_{dss}	Saturated Drain Current (V_{gs} = 0V, V_{ds} = 2.0V)		60	90	120	mA
G_m	Transconductance (V_{ds} = 3V, Vgs = 50% I_{dss})			120		mS
V_p	Pinch-off Voltage (I_{ds} = 0.3 mA, V_{ds} = 2V)		-2.5	-1.1	-0.5	V
BV_{gd}	Drain Breakdown Voltage (I_g = 0.3 mA, source open)			-15		V
BV_{gs}	Source Breakdown Voltage (I_g = 0.3 mA, drain open)			-13		V
R_{th}	Thermal Resistance			320		° C/W

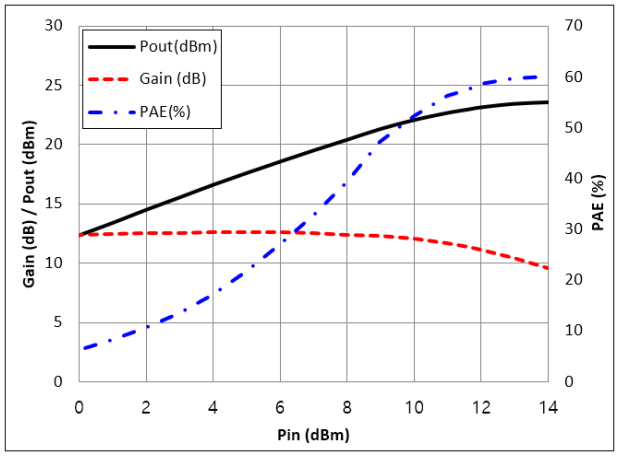
MAXIMUM RATING (T_a = 25° C)

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	18 mA	3 mA
P_{in}	Input Power	22 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	420 mW	350 mW

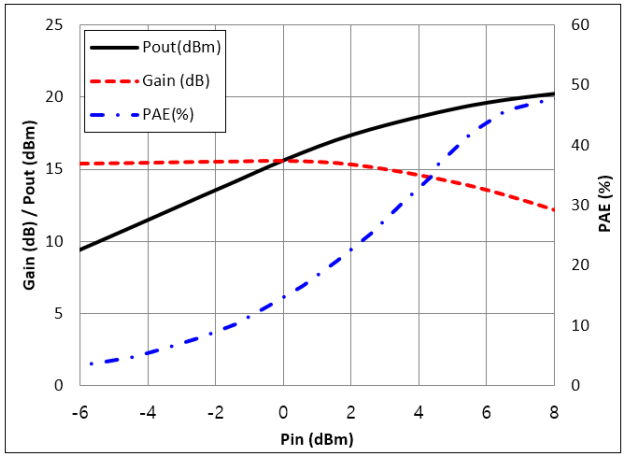
Exceeding any of the above Maximum Ratings will result in reduced MTTF and may cause permanent damage to the device.

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P_{IN}_P_{OUT}/Gain, PAE (12 GHz)

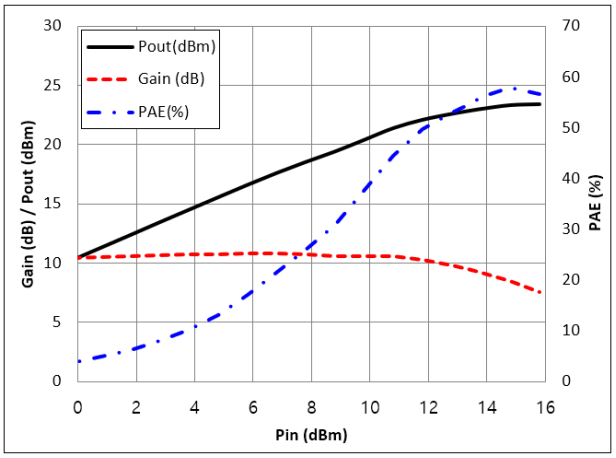


Frequency = 12GHz
V_{ds} = 6 V, I_{ds} = 50% I_{dss} (Power Tune)

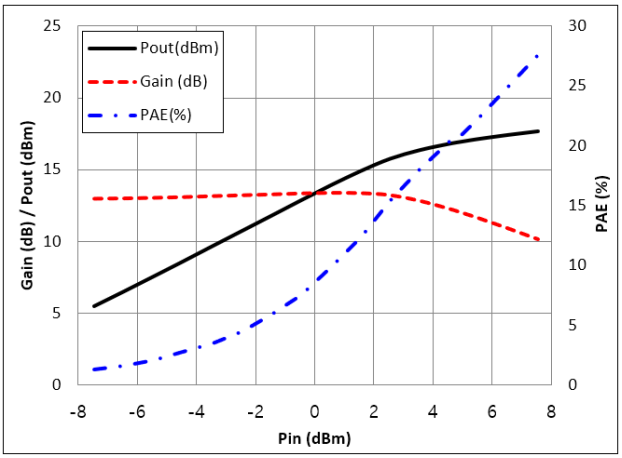


Frequency = 12GHz
V_{ds} = 6 V, I_{ds} = 50% I_{dss} (Gain Tune)

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



Frequency = 18GHz
V_{ds} = 6 V, I_{ds} = 50% I_{dss} (Tuned for Power)



Frequency = 18GHz
V_{ds} = 6 V, I_{ds} = 50% I_{dss} (Tuned for Gain)

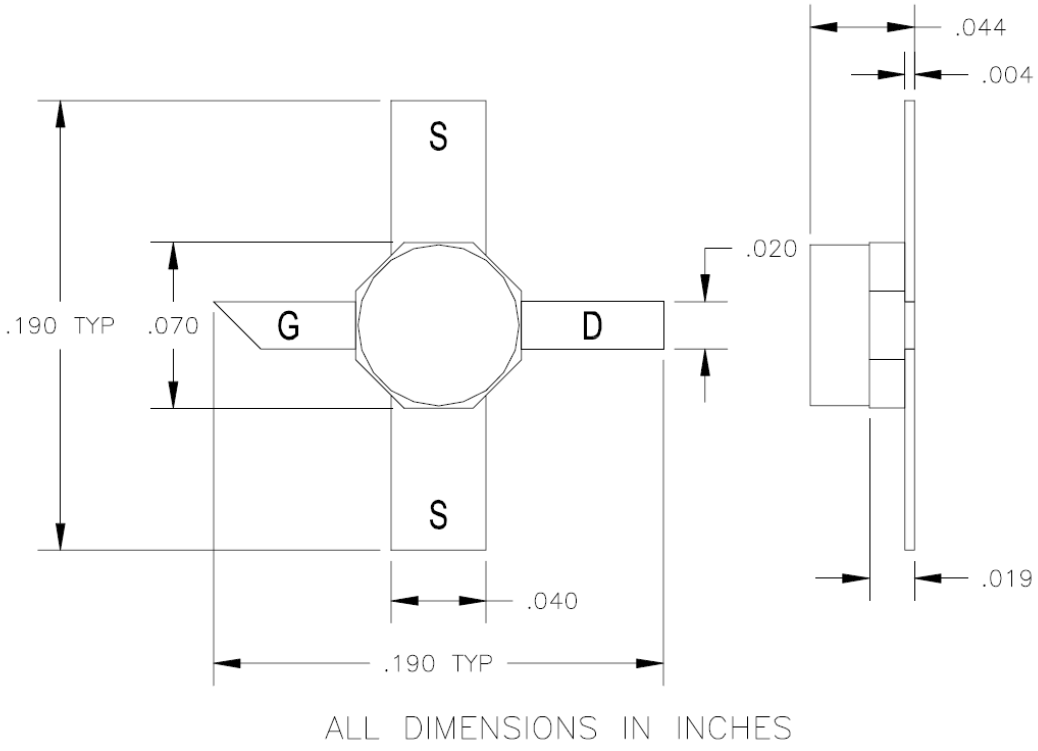
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S-PARAMETER (V_{ds} = 6V, I_{ds} = 50% I_{dss})

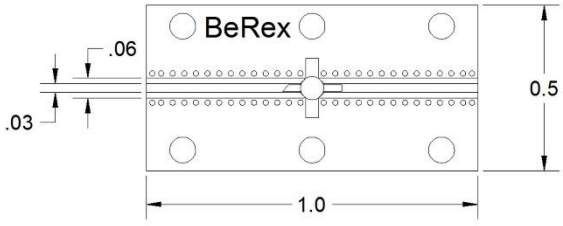
FREQ. [GHZ]	S11 [MAG]	S11 [ANG.]	S21 [MAG]	S21 [ANG.]	S12 [MAG]	S12 [ANG.]	S22 [MAG]	S22 [ANG.]
1	1.08	-36.92	6.48	154.61	0.013	73.86	0.82	-13.43
2	0.91	-65.58	5.94	123.71	0.027	48.05	0.80	-31.74
3	0.83	-104.10	5.75	93.21	0.038	23.25	0.74	-55.08
4	0.76	-133.01	5.00	68.10	0.042	5.99	0.70	-73.00
5	0.70	-156.91	4.49	47.56	0.043	-5.50	0.69	-86.86
6	0.67	-178.07	4.10	29.49	0.046	-11.62	0.66	-97.24
7	0.61	156.51	4.05	12.37	0.051	-16.61	0.65	-100.89
8	0.59	128.72	3.48	-8.22	0.049	-28.70	0.66	-113.87
9	0.57	106.53	3.11	-25.56	0.053	-32.52	0.68	-124.87
10	0.53	85.60	2.96	-44.41	0.057	-37.79	0.68	-138.81
11	0.51	60.76	2.85	-63.20	0.066	-44.76	0.65	-156.15
12	0.54	35.75	2.75	-83.61	0.077	-53.58	0.63	-176.24
13	0.57	11.09	2.56	-103.85	0.090	-67.90	0.60	166.89
14	0.62	-5.85	2.42	-121.03	0.098	-75.14	0.60	153.42
15	0.63	-26.48	2.36	-138.61	0.114	-84.31	0.58	144.80
16	0.68	-55.99	2.40	-160.62	0.135	-99.25	0.58	128.40
17	0.75	-75.32	2.10	176.63	0.140	-117.23	0.50	102.49
18	0.76	-90.81	1.85	158.29	0.138	-130.97	0.46	73.04
19	0.78	-110.97	1.65	137.85	0.144	-143.83	0.41	43.97
20	0.87	-111.50	1.59	120.26	0.176	-164.86	0.41	11.42
21	0.93	-127.08	1.47	97.36	0.156	176.34	0.40	-28.97
22	0.98	-147.31	1.34	74.08	0.151	154.76	0.51	-71.82
23	0.99	-163.07	1.06	51.05	0.129	134.94	0.64	-101.65
24	0.95	-177.21	0.83	31.33	0.105	116.30	0.71	-122.23
25	0.97	171.58	0.73	14.77	0.098	100.33	0.73	-132.34
26	0.96	155.74	0.71	-4.13	0.094	83.42	0.65	-147.88

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Package Outline Dimension



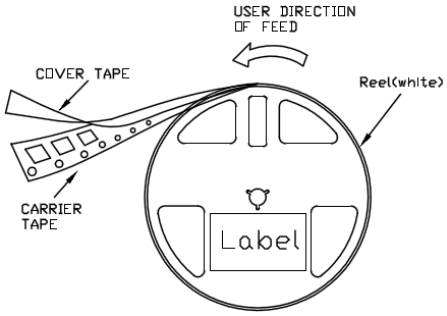
Suggested PCB Layout



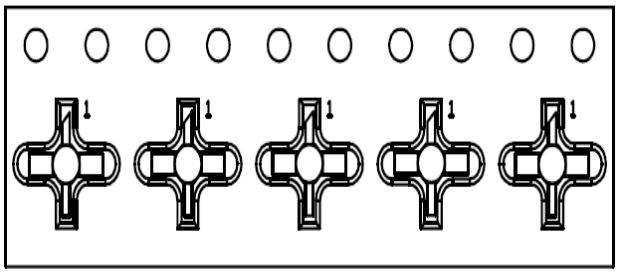
All dimensions in Inches

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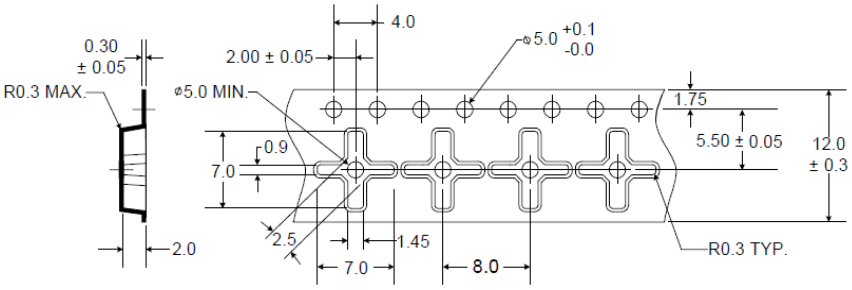
Tape and Reel Dimensions



PKG TYPE	Tape Width (mm)	Reel Size	Devices Per Reel
Ceramic 70mils	12	7"	1000



User Direction of Feed



Dimensions in *mm*

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

Proper ESD procedures should be followed when handling this device.

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Proper ESD procedures should be followed when handling this device.

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