BCP030T-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 mil. ceramic, Micro-X, low parasitic, surface-mountable package. It's ideally suited for applications requiring low noise with high gain and excellent PAE over a broad frequency range of 1000 MHz to 26 GHz.

PRODUCT FEATURES

- 70 mil. surface-mountable ceramic package
- 24 dBm P1dB @12 GHz (*typical*)
- 12 dB 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	23.0 22.5	24.0 23.5		dBm
G_{1dB}	Gain @ P_{1dB} (V_{ds} = 6V, I_{ds} = 50% I_{dss})	12 GHz 18 GHz	10.5 7.0	12.0 8.5		dB
PAE	PAE @ P_{1dB} (V_{ds} = 6V, I_{ds} = 50% I_{dss})	12 GHz 18 GHz		70 60		%
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} = 0.2 mA, V_{ds} = 2V)		-2.5	-1.1	-0.5	V
BV_{gd}	Drain Breakdown Voltage (I_g = 0.2 mA, source open)			-15		V
BV_{gs}	Source Breakdown Voltage (I_g = 0.2 mA, drain open)			-13		V
R_{th}	Thermal Resistance			320		° C/W

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

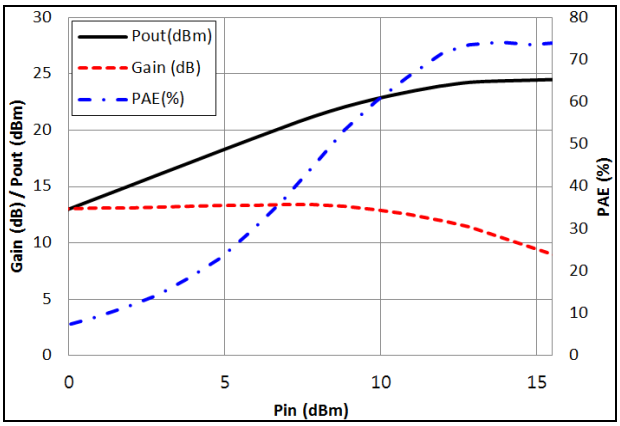
SYMBOLS	PARAMETER/TEST CONDITIONS	TEST FREQUENCY	MIN.	TYPICAL	MAX.	UNIT
P_{1dB}	Output Power @ P_{1dB} (V_{ds} = 6V, I_{ds} = 50% I_{dss})	12 GHz 18 GHz	21.0 19.5	22.0 20.5		dBm
G_{1dB}	Gain @ P_{1dB} (V_{ds} = 6V, I_{ds} = 50% I_{dss})	12 GHz 18 GHz	11.5 8.5	13.0 10.0		dB
PAE	PAE @ P_{1dB} (V_{ds} = 6V, I_{ds} = 50% I_{dss})	12 GHz 18 GHz		65 40		%
I_{dss}	Saturated Drain Current (V_{gs} = 0V, V_{ds} = 1.0V)		60	90	120	mA
G_m	Transconductance (V_{ds} = 3V, Vgs = 50% I_{dss})			120		mS
V_p	Pinch-off Voltage (I_{ds} = 0.2 mA, V_{ds} = 2V)		-2.5	-1.1	-0.5	V
BV_{gd}	Drain Breakdown Voltage (I_g = 0.2mA, source open)			-15		V
BV_{gs}	Source Breakdown Voltage (I_g = 0.2mA, drain open)			-13		V
R_{th}	Thermal Resistance			320		° C/W

MAXIMUM RATING (T_a = 25° C)

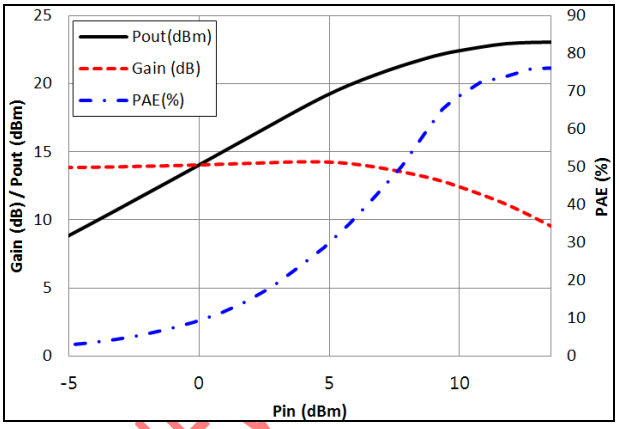
SYMBOLS	PARAMETERS	ABSOLUTE	CONTINUOUS
V_{ds}	Drain-Source Voltage	12 V	8 V
V_{gs}	Gate-Source Voltage	-6 V	-3 V
I_{ds}	Drain Current	I_{dss}	I_{dss}
I_{gsf}	Forward Gate Current	18 mA	3 mA
P_{in}	Input Power	22 dBm	@ 3dB compression
T_{ch}	Channel Temperature	175° C	150° C
T_{stg}	Storage Temperature	-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.

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

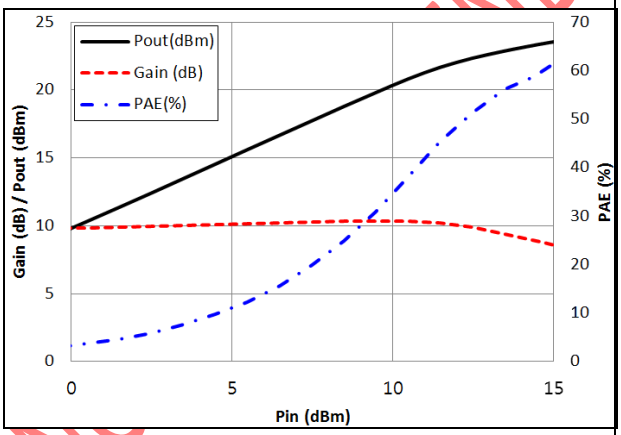


Frequency = 12GHz
V_{ds} = 6 V, I_{ds} = 50% I_{dss} (Power Tune)

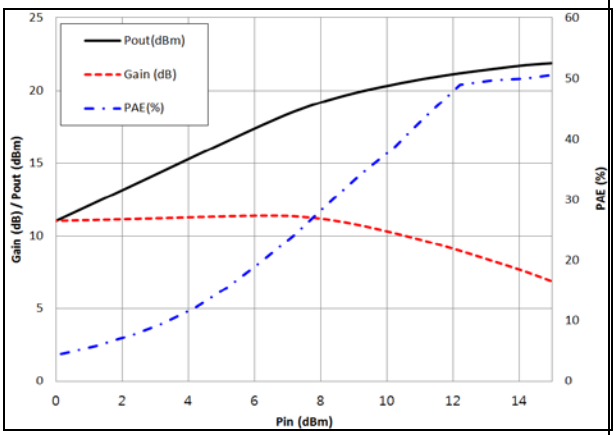


Frequency = 12GHz
V_{ds} = 6 V, I_{ds} = 50% I_{dss} (Gain Tune)

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



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

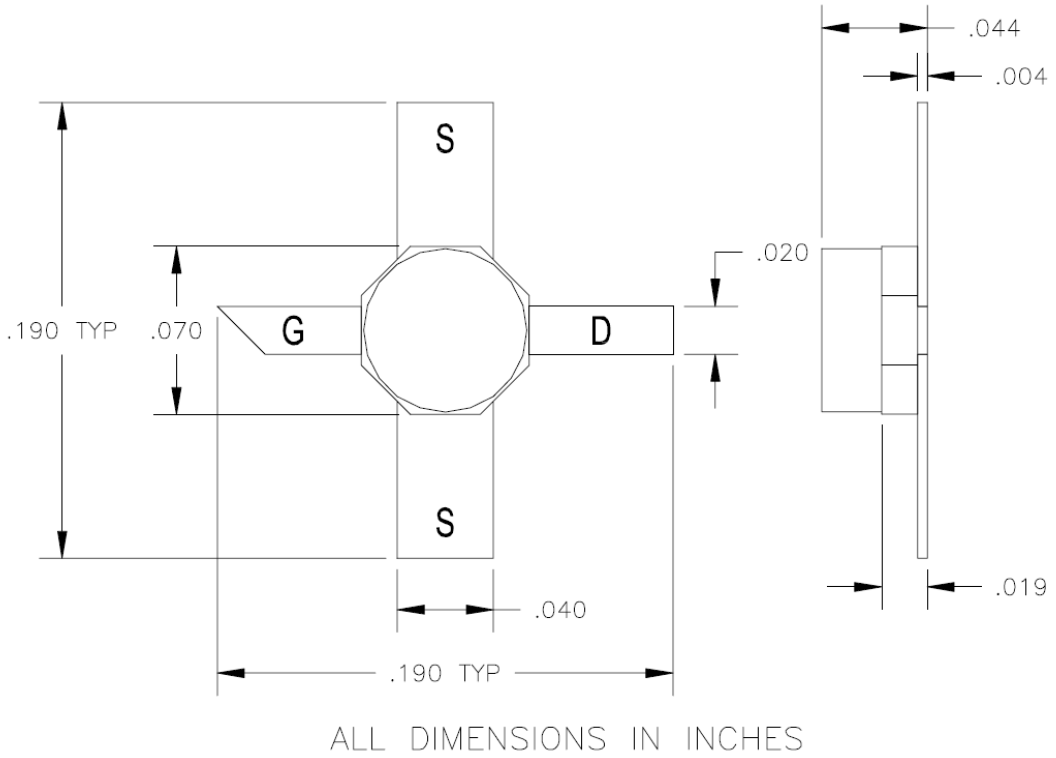


Frequency = 18GHz
V_{ds} = 6 V, I_{ds} = 50% I_{dss} (Tuned for Gain)

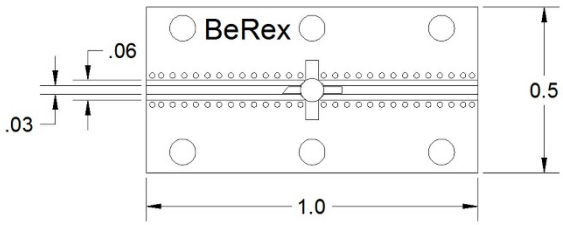
S-PARAMETER (V_{ds} = 6V, I_{ds} = 50% I_{dss})

FREQ. [GHZ]	S11 [MAG]	S11 [ANG.]	S21 [MAG]	S21 [ANG.]	S12 [MAG]	S12 [ANG.]	S22 [MAG]	S22 [ANG.]
1	0.97	-36.44	7.62	148.34	0.019	63.96	0.71	-21.45
2	0.90	-67.46	6.84	121.35	0.034	45.01	0.68	-39.50
3	0.82	-95.78	6.15	96.63	0.045	27.50	0.65	-54.83
4	0.74	-125.41	5.56	72.34	0.054	10.39	0.60	-69.56
5	0.68	-154.85	4.97	48.89	0.059	-4.58	0.56	-85.10
6	0.63	178.26	4.38	26.69	0.062	-18.02	0.54	-101.36
7	0.58	154.89	3.96	6.77	0.065	-29.24	0.54	-114.44
8	0.55	127.75	3.61	-12.25	0.068	-38.65	0.54	-120.05
9	0.53	104.20	3.39	-30.48	0.073	-48.20	0.52	-127.27
10	0.51	78.00	3.32	-49.64	0.081	-58.64	0.45	-138.50
11	0.52	48.90	3.19	-70.35	0.089	-70.65	0.37	-157.17
12	0.54	22.14	2.97	-91.64	0.095	-83.55	0.33	176.26
13	0.57	-1.26	2.73	-111.58	0.100	-95.31	0.34	157.26
14	0.58	-24.01	2.53	-130.78	0.107	-107.75	0.36	150.45
15	0.62	-47.46	2.38	-150.22	0.112	-121.53	0.32	148.96
16	0.69	-70.66	2.28	-170.04	0.120	-135.53	0.20	152.45
17	0.76	-93.74	2.18	169.98	0.129	-151.58	0.03	167.92
18	0.82	-111.56	2.00	149.41	0.130	-167.71	0.13	-23.66
19	0.84	-119.05	1.78	131.52	0.123	177.97	0.21	-33.71
20	0.89	-123.28	1.57	112.15	0.119	163.47	0.17	-62.80
21	0.92	-128.87	1.33	91.48	0.110	145.63	0.19	-143.94
22	0.92	-151.02	1.10	69.08	0.099	126.72	0.41	-163.08
23	0.91	169.76	0.94	47.99	0.092	107.48	0.59	-145.80
24	0.93	131.71	0.82	29.94	0.086	91.39	0.66	-126.41
25	0.98	109.36	0.81	12.15	0.091	76.80	0.62	-125.11
26	1.03	107.39	0.84	-10.05	0.104	56.98	0.50	-162.86

Package Outline Dimension

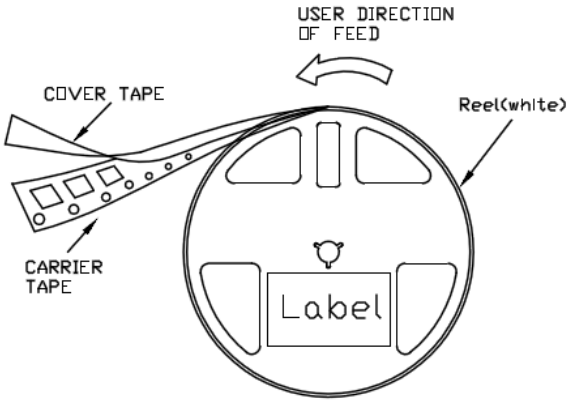


Suggested PCB layout

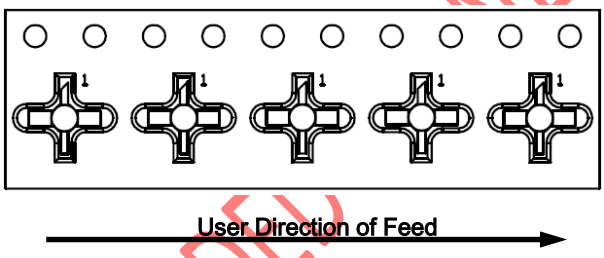


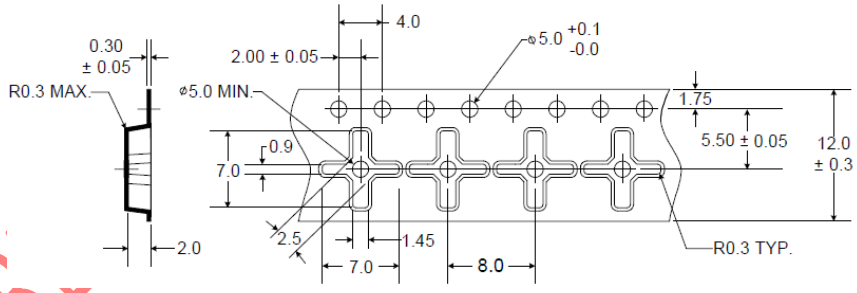
All dimensions in Inches

Tape and Reel Dimensions



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





Dimensions in *mm*

DISCLAIMER

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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.

Proper ESD procedures should be followed when handling this device.