



# 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, 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 P<sub>1dB</sub> @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

### ELECTRICAL CHARACTERISTIC (TUNED FOR POWER) T<sub>a</sub> = 25° C

SYMBOLS	PARAMETER/TEST CONDITIONS	TEST FREQUENCY	MIN.	TYPICAL	Max	UNIT
P <sub>1dB</sub>	Output Power @ P <sub>1dB</sub> (V <sub>ds</sub> = 6V, I <sub>ds</sub> = 50% I <sub>dss</sub> )	12 GHz 18 GHz	23.0 22.5	24 23.5		dBm
G <sub>1dB</sub>	Gain @ P <sub>1dB</sub> (V <sub>ds</sub> = 6V, I <sub>ds</sub> = 50% I <sub>dss</sub> )	12 GHz 18 GHz	10.5 7.0	12.0 8.5		dB
PAE	PAE @ P <sub>1dB</sub> (V <sub>ds</sub> = 6V, I <sub>ds</sub> = 50% I <sub>dss</sub> )	12 GHz 18 GHz		70 60		%
I <sub>dss</sub>	Saturated Drain Current (V <sub>gs</sub> = 0V, V <sub>ds</sub> = 2.0V)		60	90	120	mA
G <sub>m</sub>	Transconductance (V <sub>ds</sub> = 3V, V <sub>gs</sub> = 50% I <sub>dss</sub> )			120		mS
V <sub>p</sub>	Pinch-off Voltage (I <sub>ds</sub> = 0.2 mA, V <sub>ds</sub> = 2V)		-2.5	-1.1	-0.5	V
BV <sub>gd</sub>	Drain Breakdown Voltage (I <sub>g</sub> = 0.2 mA, source open)			-15		V
BV <sub>gs</sub>	Source Breakdown Voltage (I <sub>g</sub> = 0.2 mA, drain open)			-13		V
R <sub>th</sub>	Thermal Resistance			320		° C/W

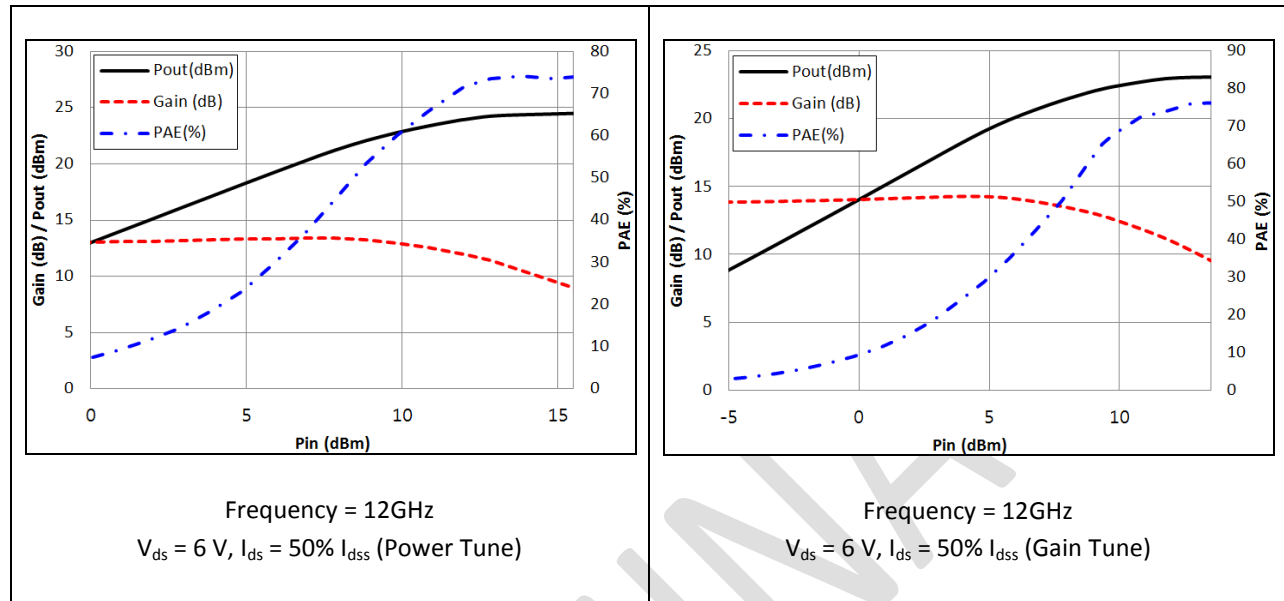
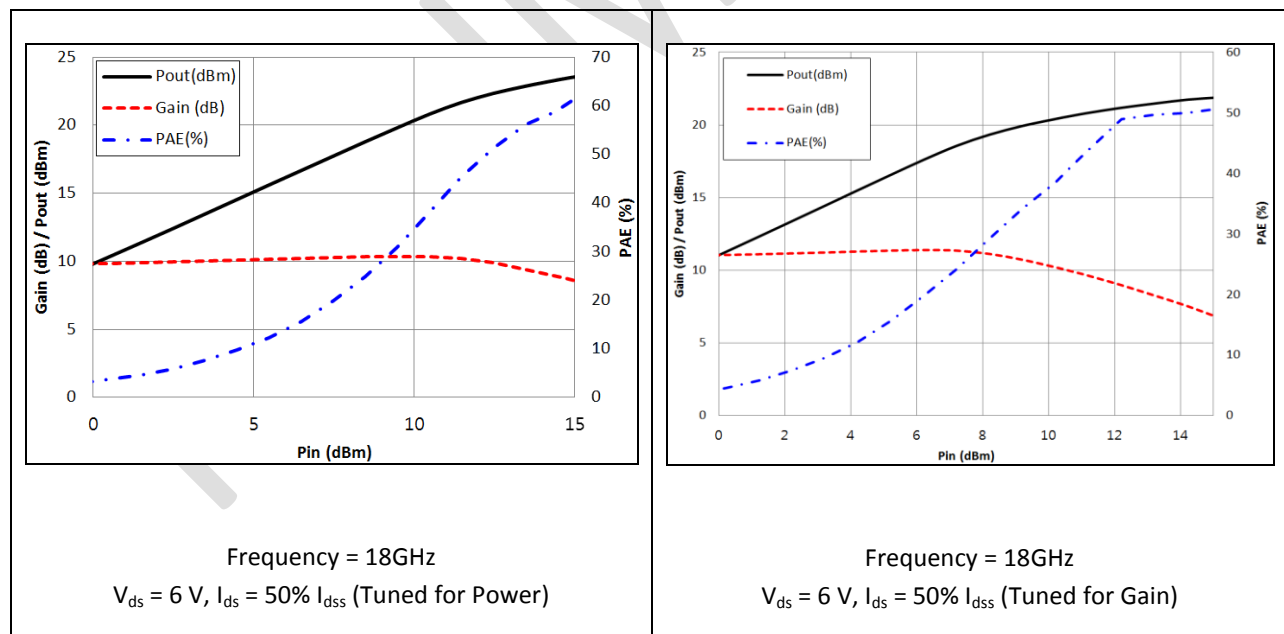
ELECTRICAL CHARACTERISTIC (TUNED FOR GAIN)  $T_a = 25^\circ \text{C}$ 

SYMBOLS	PARAMETER/TEST CONDITIONS	TEST FREQUENCY	MIN.	TYPICAL	MAX.	UNIT
$P_{1dB}$	Output Power @ $P_{1dB}$ ( $V_{ds} = 8V$ , $I_{ds} = 50\% I_{dss}$ )	12 GHz 18 GHz	21.0 19.5	22.0 20.5		dBm
$G_{1dB}$	Gain @ $P_{1dB}$ ( $V_{ds} = 8V$ , $I_{ds} = 50\% I_{dss}$ )	12 GHz 18 GHz	11.5 8.5	13.0 10.0		dB
PAE	PAE @ $P_{1dB}$ ( $V_{ds} = 8V$ , $I_{ds} = 50\% I_{dss}$ )	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 ( $V_{ds} = 3V$ , $V_{gs} = 50\% I_{dss}$ )			120		mS
$V_p$	Pinch-off Voltage ( $I_{ds} = 0.2 \text{ mA}$ , $V_{ds} = 2V$ )		-2.5	-1.1	-0.5	V
$BV_{gd}$	Drain Breakdown Voltage ( $I_g = 0.2\text{mA}$ , source open)			-15		V
$BV_{gs}$	Source Breakdown Voltage ( $I_g = 0.2\text{mA}$ , drain open)			-13		V
$R_{th}$	Thermal Resistance			320		$^\circ \text{C/W}$

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	18 mA	3 mA
$P_{in}$	Input Power	22 dBm	@ 3dB compression
$T_{ch}$	Channel Temperature	175 $^\circ \text{C}$	150 $^\circ \text{C}$
$T_{stg}$	Storage Temperature	-60 $^\circ \text{C}$ - 150 $^\circ \text{C}$	-60 $^\circ \text{C}$ - 150 $^\circ \text{C}$
$P_t$	Total Power Dissipation	420 mW	350 mW

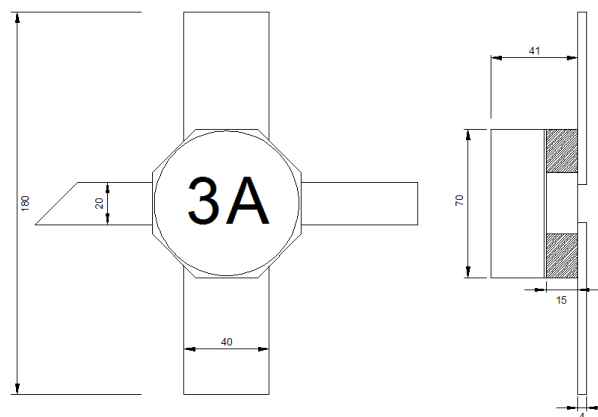
Exceeding any of the above Maximum Ratings will result in reduced MTTF and may cause permanent damage to the device.

P<sub>IN</sub>\_P<sub>OUT</sub>/Gain, PAE (12 GHz)P<sub>IN</sub>\_P<sub>OUT</sub>/Gain, PAE (18 GHz)

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

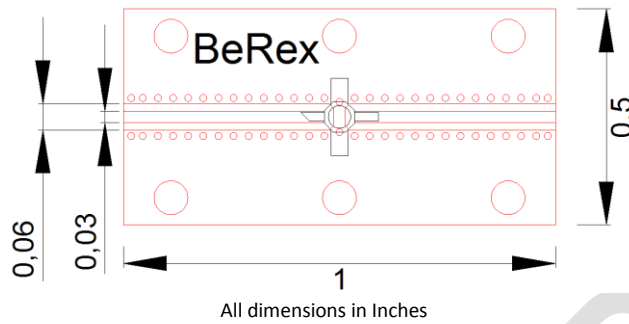
FREQ. [GHZ]	S11 [MAG]	S11 [ANG.]	S21 [MAG]	S21 [ANG.]	S12 [MAG]	S12 [ANG.]	S22 [MAG]	S22 [ANG.]
1	0.97	-36.44	7.62	148.34	0.019	63.96	0.71	-21.45
2	0.90	-67.46	6.84	121.35	0.034	45.01	0.68	-39.50
3	0.82	-95.78	6.15	96.63	0.045	27.50	0.65	-54.83
4	0.74	-125.41	5.56	72.34	0.054	10.39	0.60	-69.56
5	0.68	-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

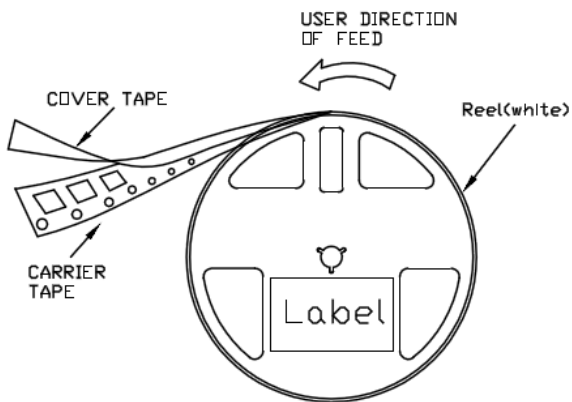


All dimensions in mils.

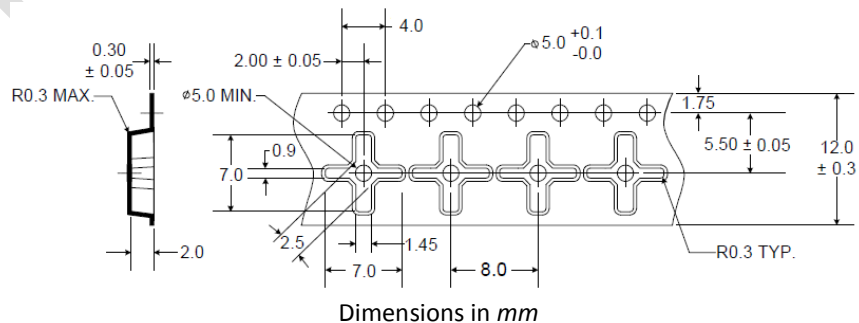
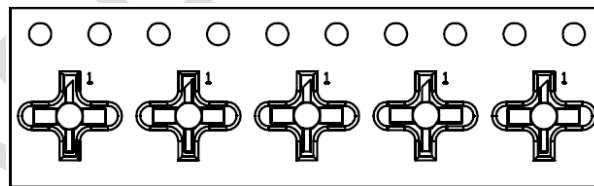
Suggested PCB layout



Tape and Reel Dimensions



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





Proper ESD procedures should be followed when handling this device.

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PRELIMINARY