

## 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 P<sub>1dB</sub> @ 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<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	21.5 21.0	23.0 22.5		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 8.5	11.5 9.5		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		55 55		%
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> = 0.3 mA, V <sub>ds</sub> = 2V)		-2.5	-1.1	-0.5	V
BV <sub>gd</sub>	Drain Breakdown Voltage (I <sub>g</sub> = 0.3 mA, source open)			-15		V
BV <sub>gs</sub>	Source Breakdown Voltage (I <sub>g</sub> = 0.3 mA, drain open)			-13		V
R <sub>th</sub>	Thermal Resistance			320		° C/W

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

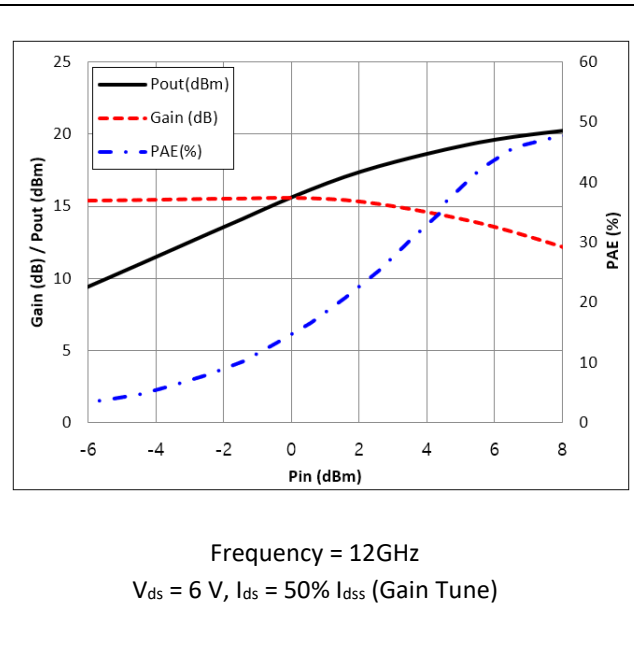
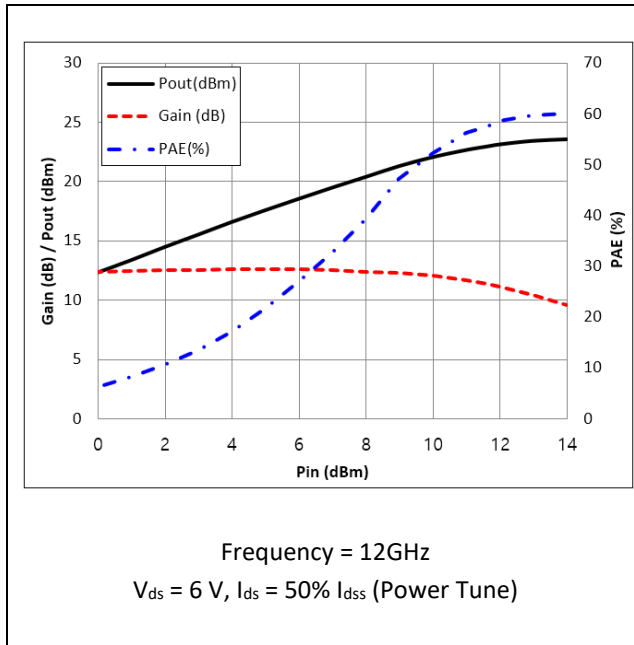
SYMBOLS	PARAMETER/TEST CONDITIONS	TEST FREQUENCY	MIN.	TYPICAL	MAX.	UNIT
$P_{1dB}$	Output Power @ $P_{1dB}$ ( $V_{ds} = 6V$ , $I_{ds} = 50\% I_{dss}$ )	12 GHz 18 GHz	17.5 15.5	19.0 17.0		dBm
$G_{1dB}$	Gain @ $P_{1dB}$ ( $V_{ds} = 6V$ , $I_{ds} = 50\% I_{dss}$ )	12 GHz 18 GHz	13.0 11.0	14.0 12.0		dB
PAE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

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

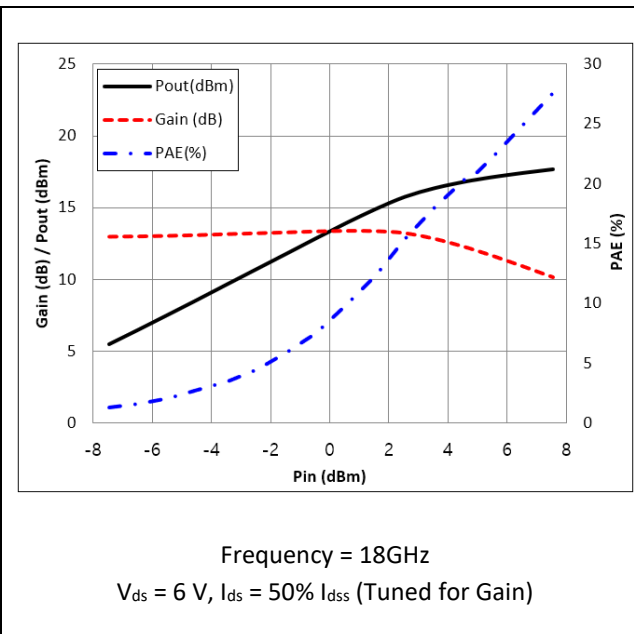
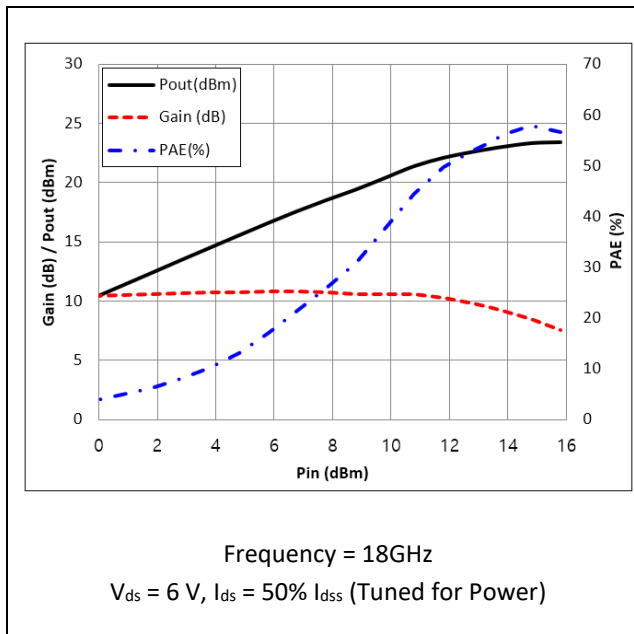
SYMBOLS	PARAMETERS	ABSOLUTE	CONTINUOUS
$V_{ds}$	Drain-Source Voltage	12 V	8 V
$V_{gs}$	Gate-Source Voltage	-6 V	-3 V
$I_{ds}$	Drain Current	$I_{dss}$	$I_{dss}$
$I_{gsf}$	Forward Gate Current	18 mA	3 mA
$P_{in}$	Input Power	22 dBm	@ 3dB compression
$T_{ch}$	Channel Temperature	175 $^\circ\text{C}$	150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



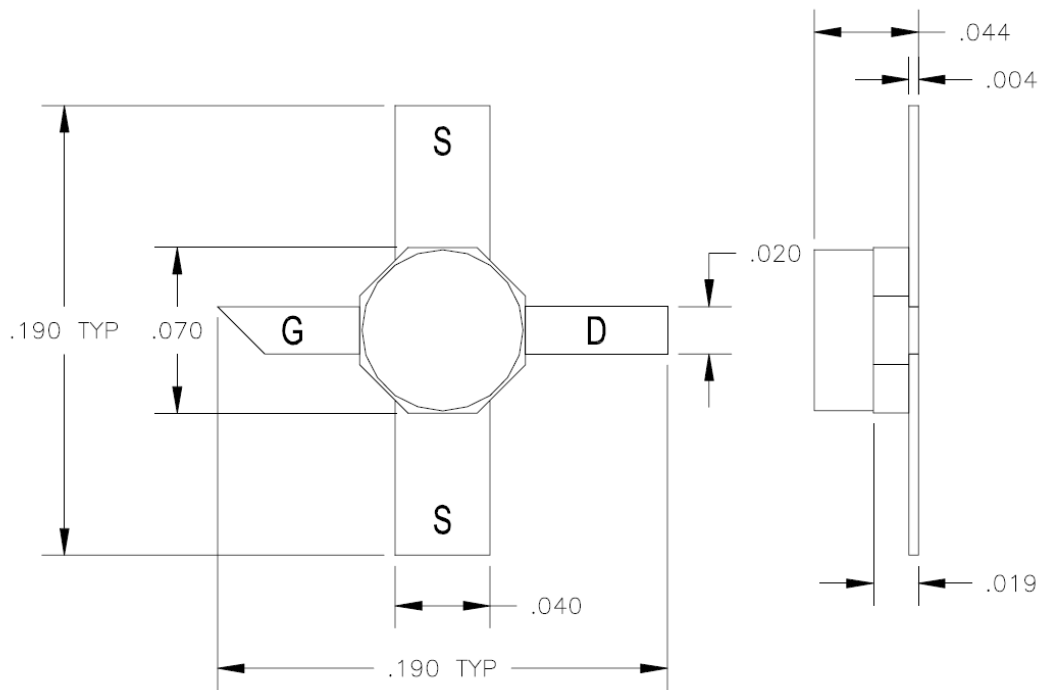
**P<sub>IN</sub>\_P<sub>OUT</sub>/Gain, PAE (18 GHz)**



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

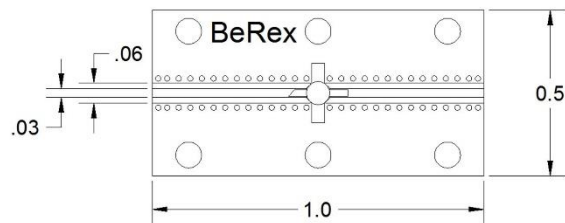
FREQ. [GHZ]	S11 [MAG]	S11 [ANG.]	S21 [MAG]	S21 [ANG.]	S12 [MAG]	S12 [ANG.]	S22 [MAG]	S22 [ANG.]
1	1.08	-36.92	6.48	154.61	0.013	73.86	0.82	-13.43
2	0.91	-65.58	5.94	123.71	0.027	48.05	0.80	-31.74
3	0.83	-104.10	5.75	93.21	0.038	23.25	0.74	-55.08
4	0.76	-133.01	5.00	68.10	0.042	5.99	0.70	-73.00
5	0.70	-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

**Package Outline Dimension**



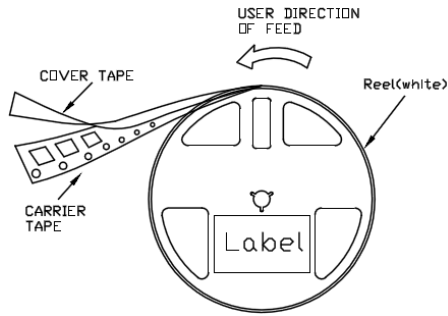
ALL DIMENSIONS IN INCHES

**Suggested PCB Layout**

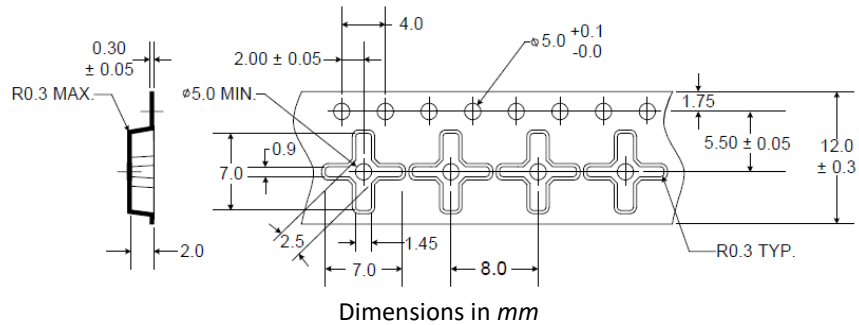
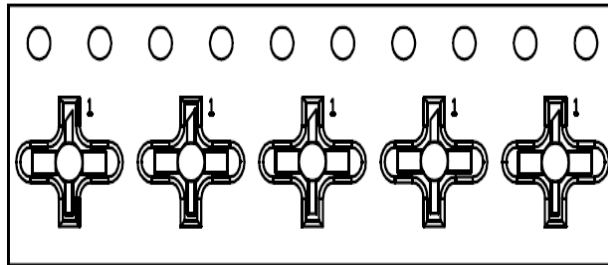


All dimensions in Inches

Tape and Reel Dimensions



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



Proper ESD procedures should be followed when handling this device.

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