BCL015-70

SUPER LOW NOISE PHEMT (0.15µm x 150µm)

The BeRex BCL015-70 is a GaAs Super Low Noise Enhancement Mode pHEMT in an industry standard, 70 mil. ceramic, Micro-X, low parasitic, surface-mountable package. It's 0.15µm by 150µm recessed gate architecture provides low noise and high associated gain over a broad frequency range of 1000 MHz to 26 GHz.

Product Features

- 70 mil. surface-mountable ceramic package
- 0.46 dB typical noise figure @12 GHz
- 11.5 dB typical associated gain @12 GHz
- 0.15 X 150 Micron Recessed Gate
- RoHS2-compliant/lead-free
- Single Positive Voltage Operation



Applications

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

Electrical Characteristics (Ta = 25 °C)

SYMBOLS	PARAMETER/TEST CONDITIONS	TEST FRE-QUENCY	MIN.	TYPICAL	Max	UNIT
NF	Noise Figure (Vds = 2V, Ids = 10mA)	12 GHz		0.46	0.60	dB
G_A	Associated Gain (Vds = 2V, Ids = 10mA)	12 GHz	10.0	11.5		dB
P1dB	Output Power @ p1dB (Vds = 2V, Ids = 10mA)	12 GHz	12	14		dBm
I_{dss}	Saturated Drain Current (Vgs = 0V, Vds = 2V)		0.15	0.25	40	uA
I_{dmax}	Maximum Drain Current (Vds = 2V)			85		mA
G_m	Transconductance			130		mS
V_p	Pinch-off Voltage (I_{ds} = 0.015mA, V_{ds} = 2V)		0.1	0.3	0.5	V
BV_{gd}	Drain Breakdown Voltage (I_g = 0.015mA, source open)			10		V
BV_{gs}	Source Breakdown Voltage (I_g = 0.015mA, drain open)			7		V
R_{th}	Thermal Resistance			280		°C/W

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MAXIMUM RATING (Ta = 25 °C)

SYMBOLS	PARAMETERS	ABSOLUTE
Vds	Drain-Source Voltage	5 V
Vgs	Gate-Source Voltage	3 V
Ids	Drain Current	I_{max}
Igsf	Forward Gate Current	20 mA
Pin	Input Power	20 dBm
Tch	Channel Temperature	150 °C
Tstg	Storage Temperature	-60 °C to 150 °C
Pt	Total Power Dissipation	200 mW

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

S-PARAMETERS (Vds = 2V, Ids = 10mA)

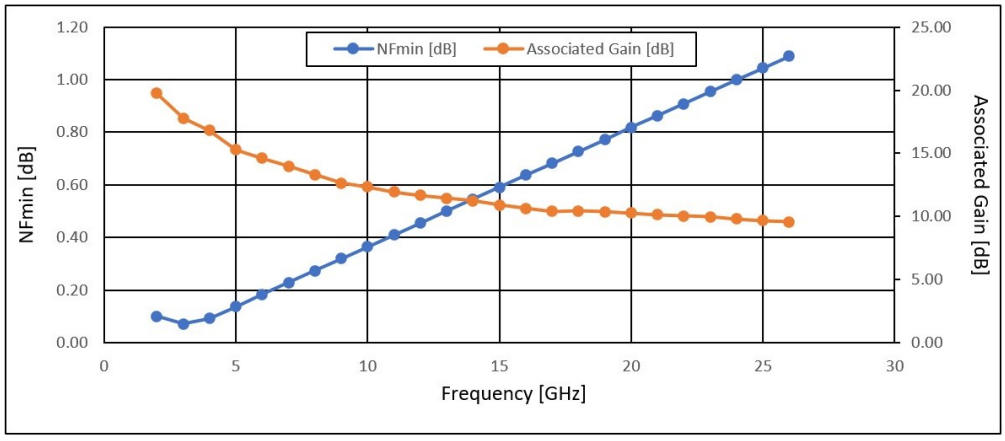
Freq. [GHz]	S11 [MAG]	S11 [Ang.]	S21 [MAG]	S21 [Ang.]	S12 [MAG]	S12 [Ang.]	S22 [MAG]	S22 [Ang.]
2	0.93	-47.62	7.66	137.36	0.043	57.40	0.71	-34.87
3	0.87	-68.07	7.02	118.99	0.058	44.03	0.67	-48.98
4	0.80	-86.32	6.39	102.37	0.070	32.47	0.63	-60.96
5	0.74	-102.83	5.85	87.31	0.079	22.49	0.59	-71.07
6	0.69	-118.90	5.41	72.87	0.087	13.12	0.56	-80.37
7	0.63	-134.75	5.06	59.05	0.093	4.36	0.53	-89.03
8	0.58	-150.85	4.75	45.55	0.099	-4.19	0.49	-97.46
9	0.53	-167.56	4.51	32.31	0.104	-12.59	0.45	-105.81
10	0.49	174.67	4.30	19.02	0.108	-21.16	0.42	-114.26
11	0.46	155.53	4.12	5.66	0.112	-29.83	0.38	-122.96
12	0.43	135.46	3.97	-7.81	0.115	-38.37	0.34	-131.88
13	0.42	113.87	3.82	-21.55	0.118	-47.34	0.31	-141.70
14	0.41	90.84	3.69	-35.48	0.120	-57.15	0.26	-151.00
15	0.44	67.16	3.57	-50.31	0.122	-67.14	0.22	-162.80
16	0.48	43.83	3.41	-65.68	0.122	-77.91	0.15	-177.83
17	0.54	22.14	3.22	-81.39	0.121	-89.51	0.08	155.13
18	0.62	2.73	3.00	-97.14	0.118	-101.86	0.05	50.70
19	0.69	-13.86	2.76	-112.64	0.112	-113.98	0.13	3.65
20	0.75	-28.08	2.50	-127.35	0.104	-126.06	0.22	-12.56
21	0.80	-40.29	2.25	-141.28	0.096	-137.43	0.30	-23.31
22	0.84	-51.06	2.04	-154.64	0.089	-148.71	0.37	-32.36
23	0.86	-61.17	1.86	-167.73	0.082	-160.03	0.43	-40.47
24	0.87	-70.85	1.70	179.11	0.077	-172.18	0.48	-47.77
25	0.87	-79.95	1.56	166.48	0.071	175.58	0.52	-54.92
26	0.87	-89.42	1.44	153.35	0.067	162.04	0.56	-62.36

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NOISE PARAMETERS (Vds = 2 V, Ids = 10 mA)

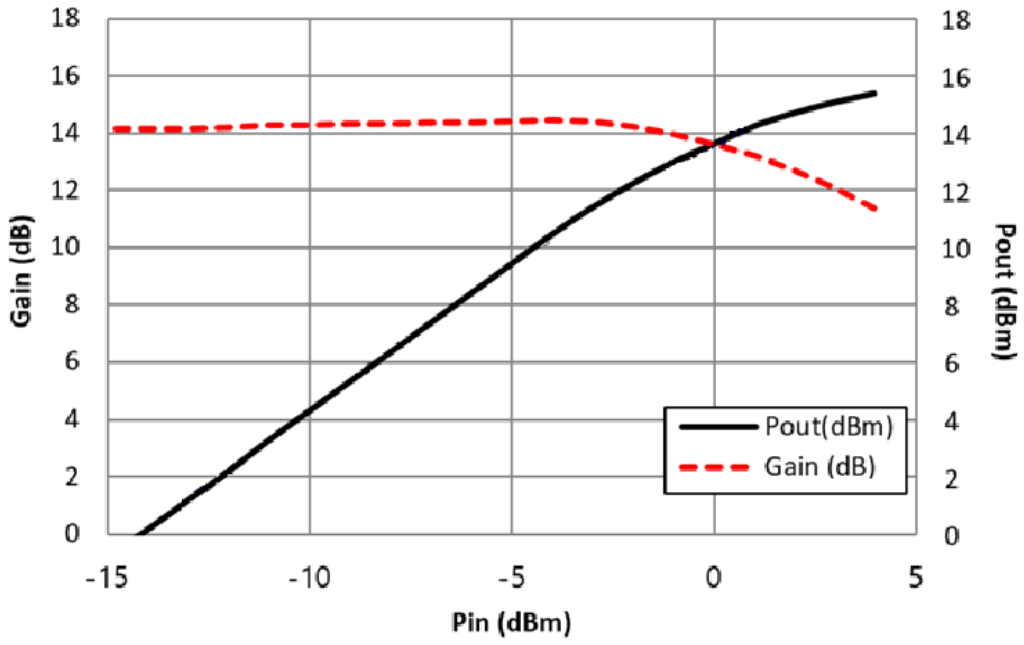
Freq. [GHz]	NF min. [dB]	Gamma opt. [Mag.]	Gamma opt. [Ang.]	Normalized Rn	Associated gain [dB]
2	0.10	0.898	27.43	0.17	19.76
3	0.07	0.847	38.46	0.15	17.77
4	0.09	0.801	50.10	0.14	16.80
5	0.14	0.756	61.84	0.12	15.29
6	0.18	0.712	75.99	0.11	14.62
7	0.23	0.668	85.12	0.09	13.98
8	0.27	0.622	96.20	0.08	13.32
9	0.32	0.572	106.73	0.07	12.64
10	0.36	0.518	116.80	0.05	12.34
11	0.41	0.457	129.41	0.05	11.93
12	0.56	0.401	143.48	0.04	11.69
13	0.50	0.335	159.77	0.03	11.44
14	0.55	0.249	173.14	0.04	11.23
15	0.59	0.168	-168.05	0.05	10.91
16	0.64	0.098	-137.43	0.06	10.66
17	0.68	0.082	-63.09	0.09	10.39
18	0.73	0.176	-7.02	0.14	10.43
19	0.77	0.276	12.86	0.18	10.37
20	0.82	0.366	24.59	0.21	10.26
21	0.86	0.446	36.44	0.24	10.15
22	0.91	0.515	45.12	0.28	10.04
23	0.95	0.574	52.07	0.34	9.98
24	1.00	0.622	62.04	0.39	9.82
25	1.04	0.660	69.32	0.41	9.68
26	1.09	0.688	77.53	0.41	9.57

ASSOCIATED GAIN / NOISE FIGURE (Vds = 2V, Ids = 10mA)

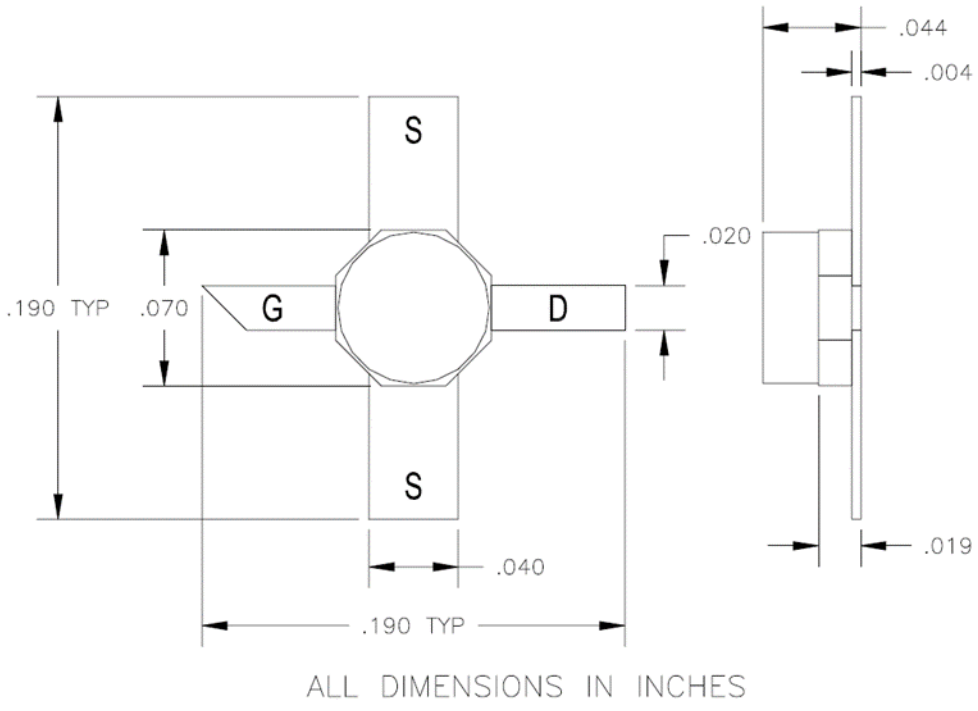


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PIN_POUT / Gain (@ 12 GHz, Vds = 2V, Ids = 10mA)

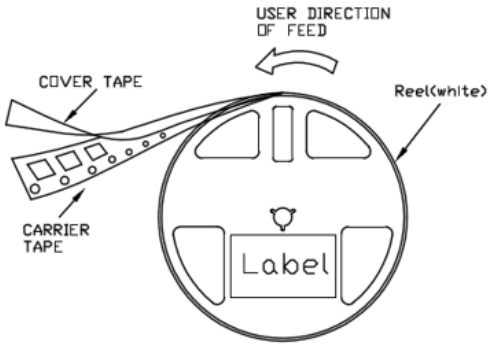


Package Outline Dimension

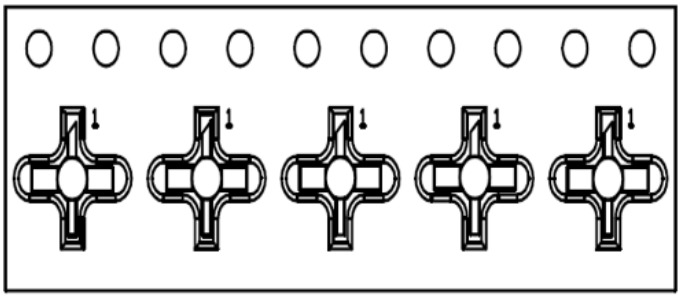


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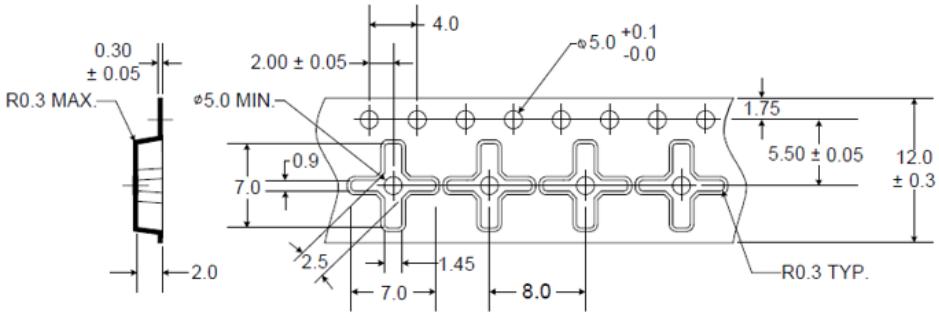
Tape and Reel Dimensions



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



User Direction of Feed



Dimensions in *mm*

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Proper ESD procedures should be followed when handling this device.

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