

FREQUENCY CONTROL COMPONENTS

Product Overview



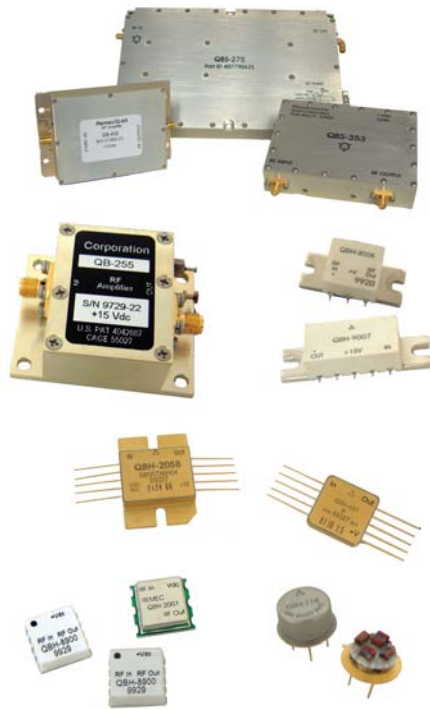


Amplifiers

Spectrum Microwave, Inc. offers high performance amplifiers from .5 MHz to 6 GHz for military, space, commercial wireless, cable TV, medical and GPS markets. Spectrum Microwave amplifiers provide wide dynamic range and very high linearity, providing users with cost-effective solutions to their most demanding signal amplification needs. Our product offering includes Low Noise Amplifiers, Driver Amplifiers, Broadband Amplifiers, and Power Amplifiers. Packaging options include drop-in, surface mount, and connectorized configurations. Our LNAs are optimized for instrumentation, preamps and receiver front-end applications. Our drive amplifiers are well suited for use in comb generators, as well as Cellular, PCS, MMDS and UMTS base stations. Our broadband amplifiers are ideal for very high dynamic range applications such as IF amplifiers in radar receivers. Spectrum Microwave amplifiers are manufactured to meet or exceed the requirements of ISO-9001 and MIL-PRF-38534, Class H and K, for military and space amplifiers. All military amplifier components can be screened to MIL-STD-883B. When you need high performance amplifiers, think Spectrum Microwave Amplifiers.

Hybrid Low Noise Amplifiers

Frequency Range (MHz)	Gain (dB)	P1dB (dBm)	Noise Figure (dB)	OIP3 (dBm)	DC Supply (Vdc/mA)	Package Style or Housing	Model Number
3 - 100	16.3	+11.0	1.9	+26	+15/21	TO-8	QBH-118
3 - 100	17.0	+16.0	1.9	+29	+15/30	TO-8	QBH-845
5 - 100	16.5	+4.5	1.5	+17	+15/11	TO-8	QBH-117
50 - 500	15.0	+1.0	1.7	+12	+15/12	TO-8	QBH-838
800 - 825	16.0	+27.0	1.1	+41	+15/150	SM	QBH-8714
800 - 960	20.0	+18.0	1.0	+30	+5/66	SM	QBH-2003
824 - 849	24.5	+23.0	1.2	+36	+15/40	SM	QBH-8720
850 - 950	14.5	+24.5	1.2	+37	+15/85	SM	QBH-8904
890 - 915	15.8	+27.0	1.0	+42	+15/150	SM	QBH-8713
1800 - 2200	13.0	+17.0	1.0	+32	+5/66	SM	QBH-2001
1850 - 1910	22.5	+20.0	1.0	+35	+15/210	SM	QBH-8756
1850 - 1910	26.8	+24.0	1.0	+37	+15/210	SM	QBH-8762
1850 - 1910	28.0	+25.0	1.2	+37	+12/190	SM	QBH-8702
1920 - 1980	17.0	+20.0	1.0	+34	+5/66	SM	QBH-2020
1930 - 1990	28.0	+25.0	1.2	+37	+12/190	SM	QBH-8701
1930 - 1990	16.0	+18.5	1.5	+30	+12/85	SM	QBH-8709
2000 - 3000	15.0	+22.0	1.5	+33	+8/85	F-PACK	QBH-5404
2000 - 6000	10.0	+12.0	3.3		+12 to +15/40	Connectorized	QBH-7012
2700 - 3300	10.0	+21.0	1.5	+8/130	+28.0	F-PACK	QBH-5107
3000 - 4000	15.0	+20.0	1.7	+8/95	+31.0	F-PACK	QBH-5403



Modular High Dynamic Range

Frequency Range (MHz)	Gain (dB)	P1dB (dBm)	Noise Figure (dB)	OIP3 (dBm)	DC Supply (Vdc/mA)	Package Style or Housing	Model Number
0.5 - 35	21.9	+31	4.0	+50	+24/420	Connectorized	QB-152
0.5 - 100	15.0	+21	3.0	+37	+15/100	Connectorized	QB-188
1 - 32	12.7	+31	7.8	+55	+24/450	Connectorized	QB-166
1 - 300	24.5	+22	3.8	+37	+20/154	Connectorized	QB-300
2 - 70	21.9	+31	4.0	+54	+24/420	Connectorized	QB-101
800 - 960	21.5	+33	2.5	+50	+14/790	Connectorized	QBS-158
800 - 870	23.0	+18	3.5	+32	+15/140	Connectorized	QB-761

Power Amplifiers

Frequency Range (MHz)	Gain (dB)	P1dB (dBm)	Output Power (Watts)	OIP3 (dBm)	DC Supply (Vdc/A)	Package Style or Housing	Model Number
800 - 960	39.0	+43	20	+53	+12.5/7	Connectorized	QBS-230
860 - 910	42.0	+39	10	+49	+24/3.5	Connectorized	QBS-227
1800 - 2000	24.0	+33	2	+47	+15/.95	Connectorized	QBS-256
2400 - 2450	32.0	+42	16	+52	+13/6.5	Connectorized	QBS-367
2400 - 2450	32.0	+46	40	+55	+15/10.5	Connectorized	QBS-368

Amplifiers



Hybrid High Dynamic Range Amplifiers

Freq. Range (MHz)	Gain (dB)	P1dB (dBm)	NF (dB)	OIP3 (dBm)	DC Supply (Vdc/mA)	Package Style or Housing	Model Number
1 - 100	15.0	+16.0	3.3	+31	+15/51	TO-8	QBH-172
1 - 200	35.5	+33.0	4.5	+48.0	+28/435	SM	QBH-2832
2 - 1000	15.5	+18.0	6.0	+30	+15/84	F-PACK	QBH-5819
5 - 100	19.8	+17.0	3.5	+30	+15/60	TO-8	QBH-124
5 - 150	15.5	+20.0	3.2	+37	+15/99	TO-8	QBH-138
5 - 150	29.0	+18.0	3.8	+31	+15/59	TO-8	QBH-180
5 - 150	29.0	+18.0	3.8	+31	+15/59	F-PACK	QBH-280
5 - 200	19.5	+8.5	3.0	+20	+15/24	TO-8	QBH-304
5 - 200	34.5	+31.0	4.7	+46	+24/300	SM	QBH-2830
5 - 300	11.3	+22.0	6.8	+37	+15/91	TO-8	QBH-103
5 - 300	12.2	+8.0	3.0	+22	+15/18	TO-8	QBH-105
5 - 300	15.0	+22.0	6.2	+37	+15/93	TO-8	QBH-155
5 - 400	12.2	+16.0	6.0	+29	+15/47	TO-8	QBH-116
5 - 400	15.0	+16.0	3.8	+30	+15/50	SM	QBH-8126
5 - 500	12.3	+21.0	7.0	+34	+15/93	TO-8	QBH-102
5 - 500	13.0	+7.0	2.4	+20	+15/18	TO-8	QBH-101
5 - 500	15.0	+9.0	3.0	+23	+15/29	TO-8	QBH-110
5 - 500	15.0	+12.0	3.0	+26	+15/33	TO-8	QBH-119
5 - 500	15.0	+16.0	3.8	+29	+15/50	TO-8	QBH-126
5 - 700	12.5	+22.0	7.0	+34	+15/95	F-PACK	QBH-204
5 - 1300	18.0	+7.0	5.0	+20	+15/41	TO-8	QBH-131
10 - 100	19.6	+23.0	4.5	+38	+15/132	TO-8	QBH-125
10 - 100	19.8	+24.0	4.0	+38	+15/82	TO-8	QBH-804
10 - 150	13.0	+19.0	5.8	+34	+15/42	TO-8	QBH-145
10 - 150	13.3	+27.0	4.2	+43	+5/175	F-PACK	QBH-261
10 - 150	13.5	+27.0	7.0	+40	+15/105	TO-8	QBH-171
10 - 150	13.5	+27.0	6.5	+39	+15/105	F-PACK	QBH-271
10 - 150	14.0	+27.0	7.5	+40	+15/105	SM	QBH-8171
10 - 150	23.0	+17.5	3.2	+29	+15/39	TO-8	QBH-149
10 - 200	7.9	+20.0	3.2	+36	+15/31	TO-8	QBH-870
10 - 200	12.5	+20.0	3.5	+38	+15/94	F-PACK	QBH-237
10 - 200	12.7	+21.0	3.5	+37	+15/94	TO-8	QBH-137
10 - 200	12.7	+21.0	4.0	+38	+15/94	SM	QBH-8137
10 - 200	20.0	+21.0	4.5	+33	+15/70	TO-8	QBH-136
10 - 200	24.4	+16.0	2.8	+25	+15/33	TO-8	QBH-181
10 - 250	13.5	+26.0	7.5	+40	+15/122	TO-8	QBH-842
10 - 300	10.0	+20.0	4.0	+38	+15/90	TO-8	QBH-851
10 - 300	11.5	+21.0	6.3	+36	+15/94	F-PACK	QBH-223
10 - 300	17.0	+18.0	3.5	+33	+15/68	SM	QBH-8152
10 - 300	20.0	+18.0	3.9	+30	+15/46	TO-8	QBH-150
10 - 300	20.0	+18.0	3.5	+30	+15/51	F-PACK	QBH-250
10 - 400	14.4	+7.0	3.0	+20	+5/25	SM	QBH-8114
10 - 500	11.5	+26.0	9.5	+35	+15/165	TO-8	QBH-115
10 - 500	12.3	+26.0	7.8	+35	+15/165	F-PACK	QBH-215
10 - 500	12.3	+26.0	7.8	+35	+15/165	SM	QBH-8115
10 - 500	17.0	+20.0	4.2	+30	+15/65	TO-8	QBH-122
10 - 500	17.0	+19.0	4.2	+30	+15/65	F-PACK	QBH-5122
10 - 1000	12.0	+20.0	7.0	+34	+15/105	F-PACK	QBH-5169
10 - 1000	16.3	+19.5	4.8	+30	+15/110	TO-8	QBH-828
10 - 1500	13.5	+20.0	5.0	+32	+15/102	SM	QBH-8817
10 - 1500	13.5	+20.0	6.5	+30	+15/105	TO-8	QBH-817
10 - 1500	13.5	+20.0	6.0	+32	+15/100	F-PACK	QBH-5817
10 - 1500	27.5	+13.5	6.0	+26	+15/85	F-PACK	QBH-5866
10 - 2000	10.0	+25.5	4.5	+39	+15/195	F-PACK	QBH-5409
10 - 2000	10.0	+25.5	4.5	+39	+15/195	TO-8	QBH-4009
10 - 2000	10.2	+20.0	8.5	+30	+15/120	TO-8	QBH-816
10 - 2000	11.0	+28.0	3.5	+40	+15/188	TO-8	QBH-4024
10 - 2500	7.5	+26.0	6.5	+36	+15/190	TO-8	QBH-4010
15 - 700	14.8	+16.0	6.5	+29	+15/44	TO-8	QBH-132
20 - 1000	13.5	+10.0	3.5	+23	+15/27	TO-8	QBH-147
20 - 1200	25.5	+13.0	4.5	+28	+15/70	F-PACK	QBH-5128
30 - 145	21.5	+25.0	2.5	+40	+15/105	SM	QBH-8719
30 - 1000	9.0	+10.0	4.8	+23	+15/27	F-PACK	QBH-5847
30 - 2000	10.0	+27.5	5.2	+41	+15/410	SM	QBH-8872
30 - 2000	10.3	+29.0	4.5	+42	+15/400	TO-8	QBH-872
30 - 3000	19.0	+15.0	3.5	+25	+15/90	TO-8	QBH-4013
50 - 600	12.5	+26.2	6.0	+36	+15/195	TO-9	QBH-4018
50 - 2000	10.0	+27.0	6.0	+38	+15/225	TO-8	QBH-4007
50 - 2000	10.0	+26.0	6.0	+38	+15/225	F-PACK	QBH-5407
50 - 2000	10.0	+28.0	4.5	+42	+15/220	SM	QBH-8407
100 - 2000	19.5	+23.0	3.2	+33	+15/190	TO-8	QBH-4012
200 - 3000	11.0	+12.0	4.0	+24	+15/75	TO-8	QBH-4002
800 - 900	8.5	+24.0	3.5	+40.5	+15/150	SM	QBH-8919
800 - 960	17.5	+29.0	2.5	+45	+9/330	SM	QBH-8920
800 - 960	22.0	+31.5	3.0	+47	+15/350	SM	QBH-8900
824 - 849	11.0	+26.0	4.2	+40	+13/130	TO-8	QBH-867
1100 - 2500	10.0	+27.0	6.0	+40	+15/225	TO-8	QBH-4008
1450 - 1500	20.6	+31.0	4.0	+47	+15/360	SM	QBH-8766
1800 - 2500	9.5	+25.0	3.7	+40	+12/215	SM	QBH-8916
2700 - 3000	8.0	+25.5	4.0	+37	+15/220	F-PACK	QBH-5858
2700 - 3300	8.0	+25.5	4.0	+37	+15/200	F-PACK	QBH-5108
3500 - 4200	26.0	+27.3	4.5	+36	+8/325	F-PACK	QBH-2638



Mixers

Spectrum Microwave offers a broad selection of mixers with RF frequencies from 0.5 MHz to 26.5 GHz. Many of these standard products are designed with broadband frequency response in both double and triple balanced configurations using lumped element and microstrip technologies. Triple balanced mixers are usually suggested for applications which require a broad band IF frequency range. Double balanced mixers are also DC coupled to the low frequency port which enables their use in phase detector applications. Various LO drive levels allow higher intercept point performance of the mixer. In addition to frequency mixers, other diode-based products are also available. Frequency doublers are offered from 5 MHz to 10 GHz (input frequency). Both mixers and doublers are available in a variety of package styles. Spectrum Microwave also offers image reject mixers and I/Q modulators which operate up to 16 GHz with various IF frequency options.

RF Mixers

Frequency (MHz) RF	Frequency (MHz) LO	Frequency (MHz) IF	LO Pwr (dBm)	CL (dB)	Package Style	Model Number
10 - 1500	10 - 1500	DC - 800	+7	7.0	TO-8	M53T
10 - 1500	10 - 1500	DC - 800	+13	6.5	TO-8	M56T
10 - 1500	10 - 1500	DC - 1000	+23	7.5	TO-8	M57T
1000 - 2000	1000 - 2000	DC - 1000	+7 to +23	8.0	TO-8	M6xT
800 - 2400	800 - 3500	DC - 1500	+7	9.0	TO-8	M73T
1 - 3400	1 - 3400	1 - 2000	+10	8.0	TO-8	M24T

Communication Band Mixers

Frequency (GHz) RF	Frequency (GHz) LO	Frequency (GHz) IF	LO Pwr (dBm)	CL (dB)	Package Style	Model Number
3.5 - 12.0	3.5 - 12.0	DC - 4.0	+7 to +18	7.0	Microstrip Carrier	MC5xMS-5&14
3.5 - 15.0	3.5 - 15.0	DC - 4.0	+7 to +18	7.5	Surface Mount	MC5xSMx-7&14
3.5 - 15.0	3.5 - 15.0	DC - 4.0	+7 to +18	7.5	Microstrip Carrier	MC5xMS-7&15
17.0 to 24.0	15.0 - 26.0	DC - 4.0	+10	8.5	Microstrip Carrier	MC134MS-3&14
17.0 to 24.0	15.0 - 26.0	DC - 4.0	+10	8.5	SMA Connect.	MC134xN-3

Octave Band Mixers



Frequency (GHz) RF	Frequency (GHz) LO	Frequency (GHz) IF	LO Pwr (dBm)	CL (dB)	Package Style	Model Number
4.0 - 8.0	3.5 - 8.5	DC - 2.0	+7 to +19	8.5	SMA Connect.	MO4xxG
4.0 - 8.0	3.5 - 8.5	DC - 2.0	+7 to +19	6.7	SMA Connect.	MO4xxN
6.0 - 12.5	5.0 - 15.0	DC - 2.5	+7 to +19	8.8	SMA Connect.	MO6xxG
6.0 - 12.5	5.0 - 15.0	DC - 2.5	+7 to +19	5.5	SMA Connect.	MO6xxN

Ultra-Broadband Mixers



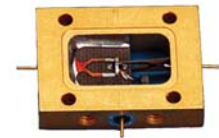
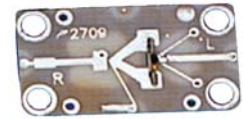
Frequency (GHz) RF	Frequency (GHz) LO	Frequency (GHz) IF	LO Pwr (dBm)	CL (dB)	Package Style	Model Number
2.0 - 18.0	2.0 - 18.0	2.0 - 5.0	+10 to +21	8.0	SMA Connect.	MM9xMS-14
0.5 - 18.0	0.5 - 18.0	DC - 0.3	+7 to +19	7.0	SMA Connect.	MM9xxG-40
2.0 - 18.0	2.0 - 18.0	DC - 0.6	+7 to +10	8.5	SMA Connect.	MM9xxG-21
2.0 - 18.0	2.0 - 18.0	.01 - 4.0	+10 to +21	7.3	SMA Connect.	MM9xxG-3
2.0 - 18.0	2.0 - 18.0	.01 - 4.0	+10 to +21	7.3	SMA Connect.	MM9xxL-1
2.0 - 18.0	2.0 - 18.0	2.0 - 8.0	+10 to +21	8.5	SMA Connect.	MM9xxL-15
2.0 - 18.0	2.0 - 18.0	1.0 - 12.0	+10 to +21	7.0	SMA Connect.	MM9xxG-2
2.0 - 19.0	2.0 - 19.0	1.0 - 9.0	+10 to +21	8.0	SMA Connect.	MM9xxN-1
2.0 - 19.0	2.0 - 19.0	1.0 - 9.0	+10 to +21	8.0	Microstrip Carrier	MM9xMS-6&-15
1.8 - 20.0	1.8 - 20.0	DC - 0.8	+7 to +18	7.2	Microstrip Carrier	MM9xMS-1&-17
1.5 - 26.5	1.5 - 26.5	DC - 1.25	+9	9.5	SMA Connect.	MM134xG-1

Mixers



Multi-Octave Band Mixers

Frequency (GHz) RF	Frequency (GHz) LO	Frequency (GHz) IF	LO Pwr (dBm)	CL (dB)	Package Style	Model Number
2.0 - 8.0	2.0 - 8.0	DC - 1.5	+7 to +19	6.7	SMA Connect.	MM4xxG-10
2.0 - 8.0	2.0 - 8.0	DC - 1.5	+7 to +19	6.7	SMA Connect.	MM4xxL-10
2.0 - 8.0	2.0 - 8.0	DC - 1.5	+7 to +18	8.0	Surface Mount	MM4xSMx-10&-14
2.0 - 8.0	2.0 - 8.0	.01 - 4.0	+10 to +21	7.3	SMA Connect.	MM4xxG-1
2.0 - 8.0	2.0 - 8.0	2.0 - 6.0	+10 to +21	7.3	SMA Connect.	MM4xxG
2.0 - 8.0	2.0 - 8.0	2.0 - 6.0	+10 to +21	7.3	SMA Connect.	MM4xxL
1.5 - 9.0	1.0 - 9.0	.01 - 4.5	+10 to +21	8.0	SMA Connect.	MM4xxN-1
1.5 - 9.0	1.5 - 9.0	.01 - 4.0	+10 to +21	6.5	Microstrip Carrier	MM4xMS &-15
2.0 - 9.0	2.0 - 9.0	DC - 1.5	+7 to +18	8.0	Microstrip Carrier	MM4xMS-10&-17
2.0 - 12.0	2.0 - 12.0	DC - 1.5	+7 to +19	7.5	SMA Connect.	MM6xxG-10
2.0 - 12.0	2.0 - 12.0	DC - 1.5	+7 to +19	7.5	SMA Connect.	MM6xxL-10
5.0 - 15.0	3.0 - 17.0	DC - 2.0	+7 to +14	8.5	Microstrip Carrier	MM8xMS-3&-14
6.0 - 18.0	6.0 - 18.0	DC - 2.5	+7 to +13	6.9	Surface Mount	MM9xSMx&-14
6.0 - 18.0	6.0 - 18.0	DC - 3.0	+7 to +19	7.0	SMA Connect.	MM9xxL
6.0 - 18.0	6.0 - 18.0	DC - 3.0	+7 to +19	7.0	SMA Connect.	MM9xxN
6.0 - 18.0	4.0 - 18.0	DC - 4.0	+7 to +19	6.5	SMA Connect.	MM9xxG-30
6.0 - 18.0	4.0 - 18.0	DC - 4.5	+7 to +19	7.0	SMA Connect.	MM9xxN-11
6.0 - 18.0	6.0 - 18.0	1.5 - 8.0	+10 to +21	7.7	SMA Connect.	MM9xxG
4.0 - 20.0	4.0 - 20.0	DC - 4.0	+7 to +18	8.5	Microstrip Carrier	MM9xMS-3&-13



I/Q Mixer/Modulators & Image Reject Mixers

Frequency (GHz) RF	Frequency (GHz) LO	Frequency (GHz) IF	LO Pwr (dBm)	CL (dB)	Package Style	Model Number
1.4 - 2.8	1.4 - 2.8	DC - 0.5	+10 to +17	6.0	Microstrip Carrier	MIQ2xMS-1
1.9 - 4.2	1.9 - 4.2	DC - 0.5	+10 to +17	6.0	Microstrip Carrier	MIQ2xMS-2
3.0 - 6.0	3.0 - 6.0	DC - 0.3	+10 to +17	6.5	Microstrip Carrier	MIQ3xMS-3
5.6 - 9.0	5.6 - 9.0	DC - 0.5	+10 to +17	5.0	Microstrip Carrier	MIQ5xMS-1
5.6 - 9.0	5.6 - 9.0	DC - 0.5	+10 to +17	5.0	Surface Mount	MIQ5xSMD-1
5.5 - 13.5	5.5 - 13.5	DC - 0.5	+10 to +17	5.3	Microstrip Carrier	MIQ6xMS-1
5.5 - 13.5	5.5 - 13.5	DC - 0.5	+10 to +17	5.3	Surface Mount	MIQ6xSMD-1
5.6 - 9.0	5.6 - 9.0	.05 - .09	+10 to +17	5.0	Microstrip Carrier	IRM5xMS-1



Frequency Doublers

Frequency (GHz) Input	Frequency (GHz) Output	LO Power (dBm)	CL (dB)	Package Style	Model Number
0.005 - 2.8	0.01 - 5.6	+11	13.0	Flatpak	FD34H-1
0.005 - 2.8	0.01 - 5.6	+11	13.0	Surface Mount	FD34SM-1
1.5 - 10.0	3.0 - 20.0	+11 to +17	12.5	SMA Connect.	FD9xxN-1
2.0 - 10.0	4.0 - 20.0	+11 to +17	13.0	Microstrip Carrier	FD9xMS-1
2.0 - 10.0	4.0 - 20.0	+11 to +17	13.0	Surface Mount	FD9xSMx-1





VCOs

Spectrum Microwave VCOs span 25 MHz to 18 GHz. Varactor tuning diodes are carefully characterized to insure excellent linearity. Eutectic substrate and die attachment and carefully controlled bonding schedules product consistent high quality, high-performance devices. Typically, tuning bandwidths of 20% to 70% are offered and a range of leaded and surface-mount packages are available. Typical applications for Spectrum VCOs include transmitters, receivers, local oscillators, synthesizers for avionics, wireless communication, satellite terminals, satellites, instruments, optical communications, and military electronics systems. Custom devices based on Spectrum's large design library are available. Spectrum Microwave VCOs are manufactured to meet or exceed the requirements of ISO-9001 and can be screened to MIL-PRF-38534, Class H and K, for military and space VCOs. All military VCOs can also be screened to MIL-STD-883B.

RF Band

*NOTE: Phase Noise at 50 kHz offset.

Frequency Range (MHz)	Power Output (dBm)	*Phase Noise (dBc/Hz)	Bias Volt. (V)	Bias Cur. (mA)	Temp Bands (°C)	Tuning Range (V)	SMV2 Model Number	TO-8 Model Number
25 - 50	+10	-121	+15	30	-55 to +100	0 to +15	HV17SM-22	HV17T-2
50 - 100	+10	-120	+15	30	-55 to +100	0 to +20	HV17SM-12	HV17T-1
75 - 150	+10	-125	+15	30	-55 to +100	0 to +20	HV27SM-62	HV27T-6
100 - 200	+10	-125	+15	25	-55 to +100	0 to +20	HV27SM-112	HV27T-11
150 - 300	+10	-110	+15	30	-55 to +100	0 to +20	HV37SM-82	HV37T-8
200 - 400	+10	-123	+15	15	-55 to +100	0 to +20	HV37SM-112	HV37T-11
300 - 600	+10	-110	+15	30	-55 to +100	0 to +25	HV37SM-72	HV37T-7
325 - 355	+10	-110	-10	50	-55 to +85	0 to -10	V31SM-112	V31T-11
400 - 800	+10	-105	+15	30	-55 to +100	0 to +25	HV47SM-12	HV47T-1
485 - 506	+4	-110	+5	20	-55 to +85	1 to 4	V31SM-72	V31T-7
500 - 1000	+10	-103	+15	30	-55 to +100	0 to +20	HV47SM-72	HV47T-7
524 - 552	-2.0	-115	+5	18	-55 to +85	1 to 4	V41SM-132	V41T-13
600 - 1200	+10	-105	+15	50	-55 to +100	0 to +20	HV47SM-82	HV47T-8
700 - 800	5.0	-100	-10	50	-55 to +85	0 to -10	V41SM-142	V41T-14
773 - 827	-2.0	-108	+5	15	-55 to +85	1 to 4	V41SM-152	V41T-15
800 - 1600	+10	-107	+15	70	-55 to +85	0 to +20	HV57SM-42	HV57T-4
950 - 1350	+10	-107	+15	30	-55 to +100	0 to +15	HV54SM-12	HV54T-1
1000 - 2000	+10	-105	+15	50	-55 to +85	0 to +20	HV67SM-12	HV67T-1
1540 - 1603	+4	-110	+5	20	-55 to +85	1 to 4	V61SM-102	V61T-10

Microwave Band

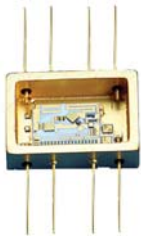
*NOTE: Phase Noise at 50 kHz offset.

Frequency Range (MHz)	Power Output (dBm)	*Phase Noise (dBc/Hz)	Bias Volt. (V)	Bias Cur. (mA)	Temp Bands (°C)	Tuning Range (V)	SMV2 Model Number	TO-8 Model Number
1500 - 2500	+10	-105	+15	50	-55 to +85	0 to +20	HV66SM-12	HV66T-1
2000 - 4000	+10	-100	+15	50	-55 to +85	0 to +20	HV87SM-42	HV87T-4
2600 - 5200	+12	-92	+15	100	-40 to +85	0 to +18	HVA87SM-32	HVA87T-3
3500 - 4500	+10	-93	+15	50	-55 to +85	0 to +20	HV83SM-12	HV83T-1
4000 - 5000	+10	-92	+15	50	-55 to +85	0 to +20	HV83SM-22	HV83T-2
4000 - 8000	+7	-90	+15	86	0 to +65	0 to +20	HVA107SM-12	HVA107T-1
4700 - 6000	+7	-90	+15	50	-55 to +85	0 to +20	HV93SM-12	HV93T-1
5500 - 7000	+10	-87	+15	75	-30 to +65	0 to +20	HVA103SM-12	HVA103T-1
6800 - 8000	+10	-87	+15	75	-30 to +65	0 to +20	HVA103SM-22	HVA103T-2
8000 - 10000	+7	-70	+15	50	-30 to +70	0 to +20	HV113SM-12	HV113T-1
9000 - 10000	+7	-75	+15	50	-30 to +70	0 to +15	V111SM-12	V111T-1

Optical Clock Recovery

*NOTE: Phase Noise at 50 kHz offset.

Frequency Range (MHz)	Power Output (dBm)	*Phase Noise (dBc/Hz)	Bias Volt. (V)	Bias Cur. (mA)	Temp Bands (°C)	Tuning Range (V)	SMV2 Model Number	TO-8 Model Number
2488	+9	-87	+12	75	0 to +85	+4 to +8	HV71SM-32	HV71T-3
2666	+8	-87	+12	75	0 to +85	+4 to +8	HV71SM-142	HV71T-14
9958	+8	-80	+15	100	0 to +85	+3 to +7	HVA121SM-12	HVA121T-1
10650	+8	-80	+15	100	0 to +85	+3 to +7	HVA121SM-22	HVA121T-2
12450	+10	-85	+15	100	0 to +85	+3 to +7	HVA131SM-52	HVA131T-5



VCOs



Broadband Microwave

*NOTE: Phase Noise at 50 kHz offset.

Frequency Range (MHz)	Power Output (dBm)	*Phase Noise (dBc/Hz)	Bias Volt. (V)	Bias Cur. (mA)	Temp Bands (°C)	Tuning Range (V)	Model Number
4000 - 8000	+10	-85	+15	300	-10 to +70	0 to -15	2263B
8000 - 12000	+10	-85	+15	300	-10 to +70	0 to -12	2264B
12000 - 18000	+10	-85	+15	300	-10 to +70	0 to +12	2265B

DROs

The Spectrum Microwave line of stabilized oscillators is designed for use in systems requiring high frequency stability with low phase noise, low microphonics, small size and low power drain. Typical applications include microwave radio links, satellite terminals, radar beacons, transponders, ECM receivers, BITE oscillators, and frequency synthesizers.

Free Running, Mechanically Tuned

Model Number	Frequency Range (GHz)	Mech Tuning BW (MHz)	Output Power (dBm)	Phase Noise @ 100kHz offset				Operating Temp (°C)
				2.5 (GHz)	6 (GHz)	12 (GHz)	20 (GHz)	
MDR2100-xxxxx	2.5 - 6.0 6.0 - 21.0	±10 ±20	+10	-130	-124	-118	-113	-20 to +65
Moisture Sealed								
MDR2560-xxxxx	4.5 - 16.0	±10	+10	-125	-122	-117	-111	-40 to +85



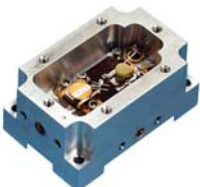
AFC Voltage Tunable

Model Number	Frequency Range (GHz)	Mech Tuning BW (MHz)	Output Power (dBm)	Phase Noise @ 100kHz offset				Operating Temp (°C)
				2.5 (GHz)	6 (GHz)	12 (GHz)	20 (GHz)	
MDR3100-xxxxx	2.5 - 6.0 6.0 - 21.0	±10 ±20	+10	-128	-122	-116	-108	-20 to +65
For Fiber Optic Clock Recovery Applications								
MDR3001-02	9.95328	±25	+11			-110		-10 to +80
MDR3001-03	10.667							



Phase Locked, Internal Reference

Model Number	Frequency Range (GHz)	Mech Tuning BW (MHz)	Output Power (dBm)	Phase Noise @ 100kHz offset				Operating Temp (°C)
				2.5 (GHz)	6 (GHz)	12 (GHz)	20 (GHz)	
MDR5100-xxxxx	3.0 - 6.0 6.0 - 21.0	±10 ±20	+13	-120	-120	-114	-105	-20 to +65
For LMDS Applications								
MDR5530-xxxxx	9.0 - 13.0		+17			-110		-40 to +85



Phase Locked, External Reference

Model Number	Frequency Range (GHz)	Mech Tuning BW (MHz)	Output Power (dBm)	Phase Noise @ 100kHz offset				Operating Temp (°C)
				2.5 (GHz)	6 (GHz)	12 (GHz)	20 (GHz)	
MDR6100-xxxxx	3.0 - 6.0 6.0 - 21.0	±10 ±20	+13	-124	-120	-114	-105	-20 to +65

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