VECTRON INTERNATIONAL
A DOVER COMPANY

Application Note
VCC1, CMOS XO
Typical Phase Noise and Jitter Measurements

Jitter Results

Jitter measurements were performed on a Lecroy Wavemaster 8600A oscilloscope. The measurements were recorded by testing the devices on an evaluation board with an AC coupled output. The evaluation board was connected to the 8600A with an SMA bullet and 90k samples were taken. The values in the table represent typical values and are in the units of pS.

Period Jitter: Period jitter compares the length of each cycle to the average period of an ideal clock using the long term averaging frequency.

Cycle to Cycle Jitter: Cycle to cycle jitter compares the difference in the cycle length of adjacent cycles.

Time Interval Error Jitter: TIE Jitter is the variation in the clock's transition from its ideal position over many cycles.

Also included is the intgrated jitter for the 12 kHz to 20 MHz offset band, using an Agilent E5052A.

							Measured on
Output	**Period**		**Cycle to Cycle**		**TIE**		**Agilent E5052A**
MHz	**RMS ps**	**P/P Ps**	**RMS ps**	**P/P ps**	**RMS ps**	**P/P ps**	**RMS 12kHz - 20MHz[1]** (fs)
10.000	1.8	17	3.0	31	3.1	22	578
16.384	2.8	21	4.5	31	2.3	16	242
24.576	2.6	18	4.6	31	1.9	15	260
34.368	2.2	19	4.0	32	2.1	14	242
44.736	2.3	17	3.5	27	2.5	16	126
51.840	2.5	18	3.7	29	2.3	15	138
65.536	2.8	19	4.2	29	2.6	18	115
77.760	3	20	4.5	32	2.4	16	104
90.000	3.2	19	5.2	34	2.6	15	94
106.250	2.7	19	4.0	29	2.5	16	73
125.000	1.4	13	2.4	25	3.4	23	66
155.520	2.5	15	4.4	27	2.0	14	117
166.000	2.3	14	4.2	25	1.6	12	90
189.000	2.3	17	3.4	29	2.4	16	139

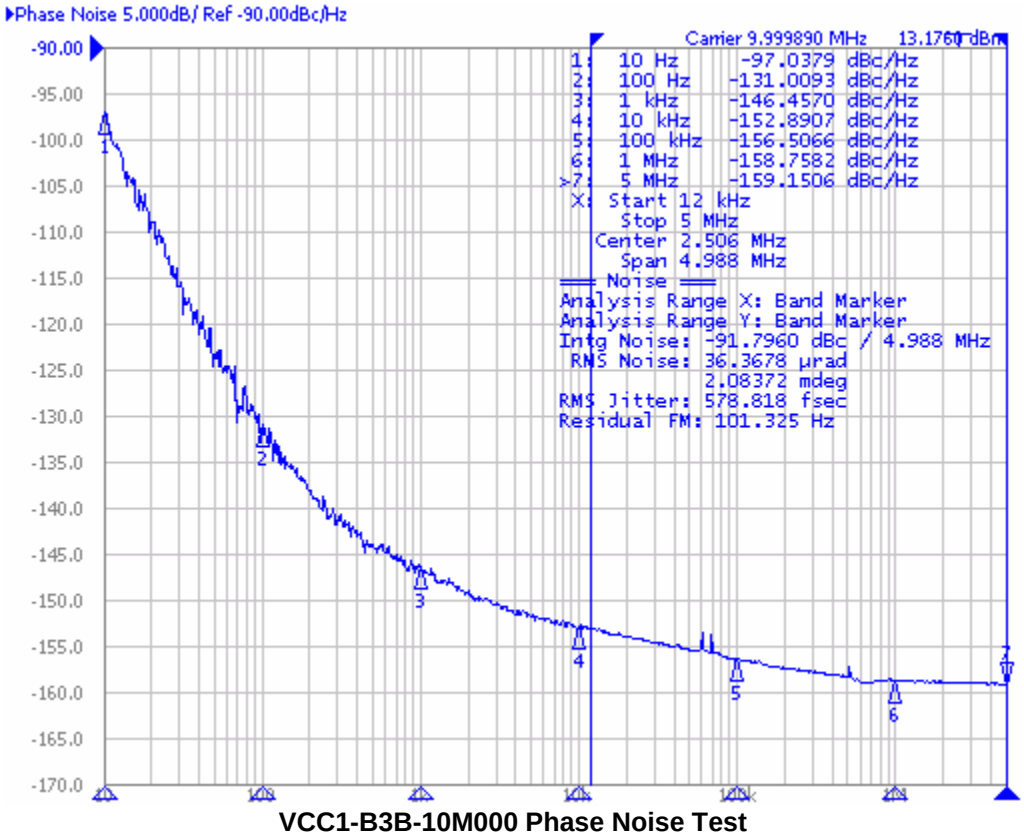
1. Data is based on 12kHz-5MHz for output frequencies < 44.736MHz

Table of typical jitter values for the VCC1 series of oscillators

Typical Phase Noise for the VCC1 Series

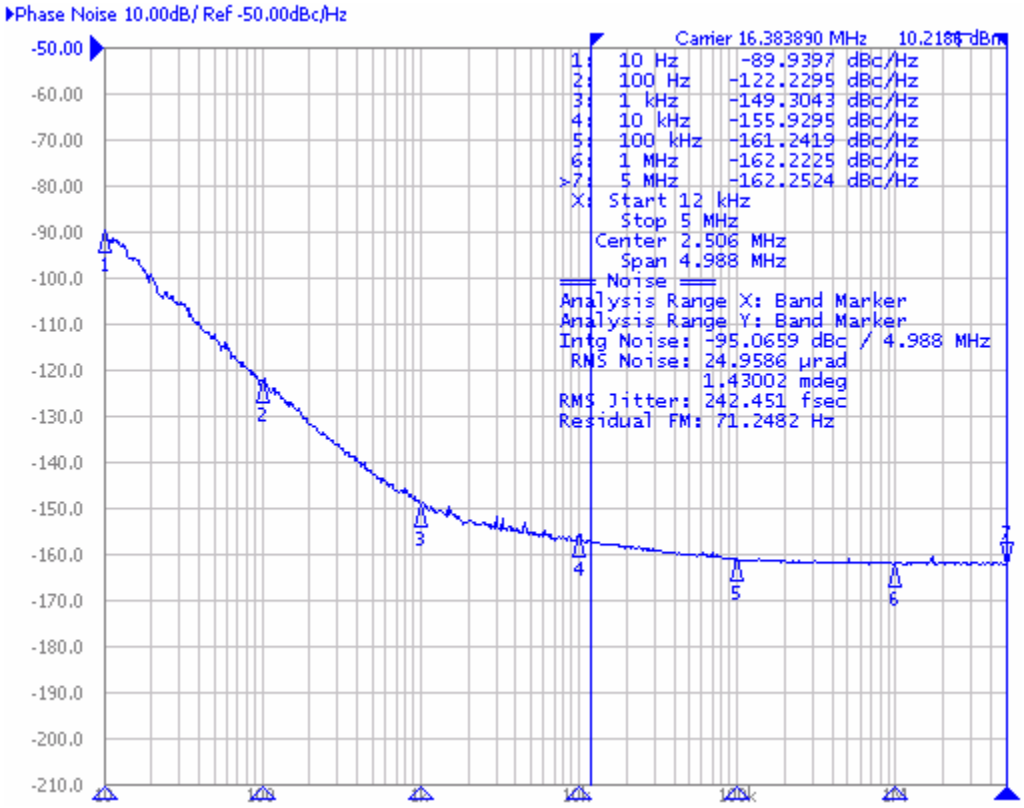
Phase Noise Results

Phase noise measurements were performed on an Agilent E5052A signal source analyzer (SSA). The E5052A has a phase noise to jitter integration calculation feature and devices were characterized in the 12kHz-20MHz band (except for the lower frequencies where the equipment limitations prevented measurement to 20 MHz – see graphs for frequency band). Please contact Vectron for other offset integration bands.

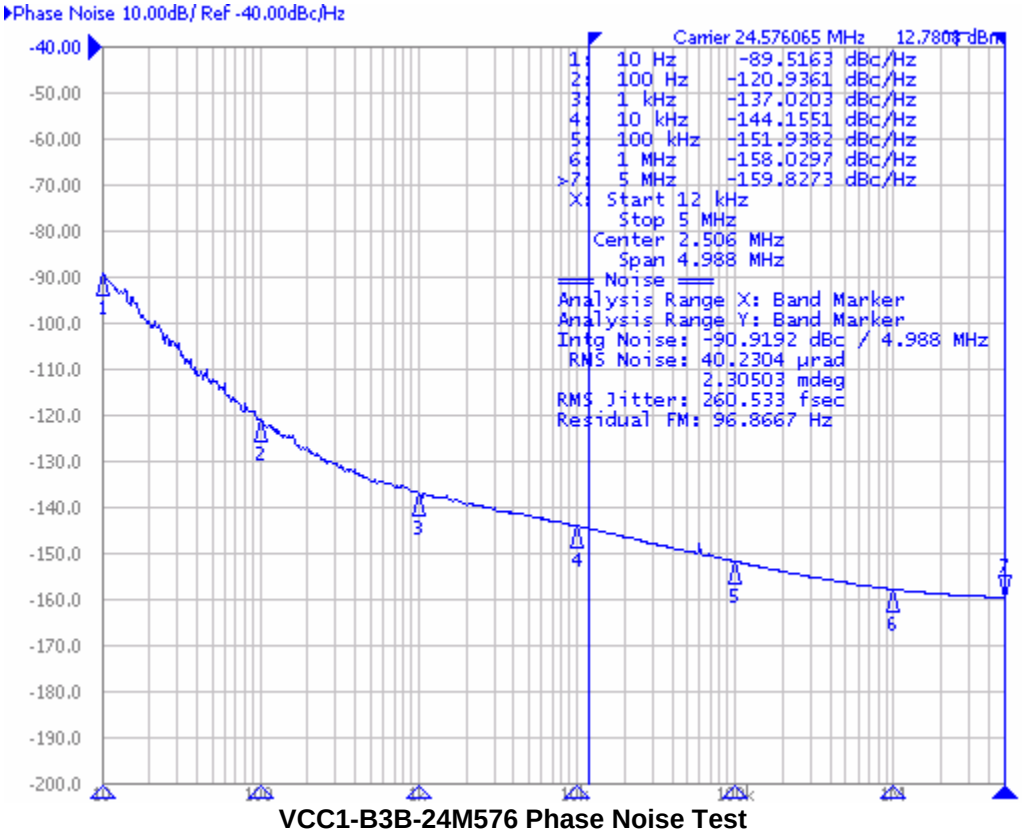


VCC1-B3B-10M000 Phase Noise Test

Typical Phase Noise for the VCC1 Series

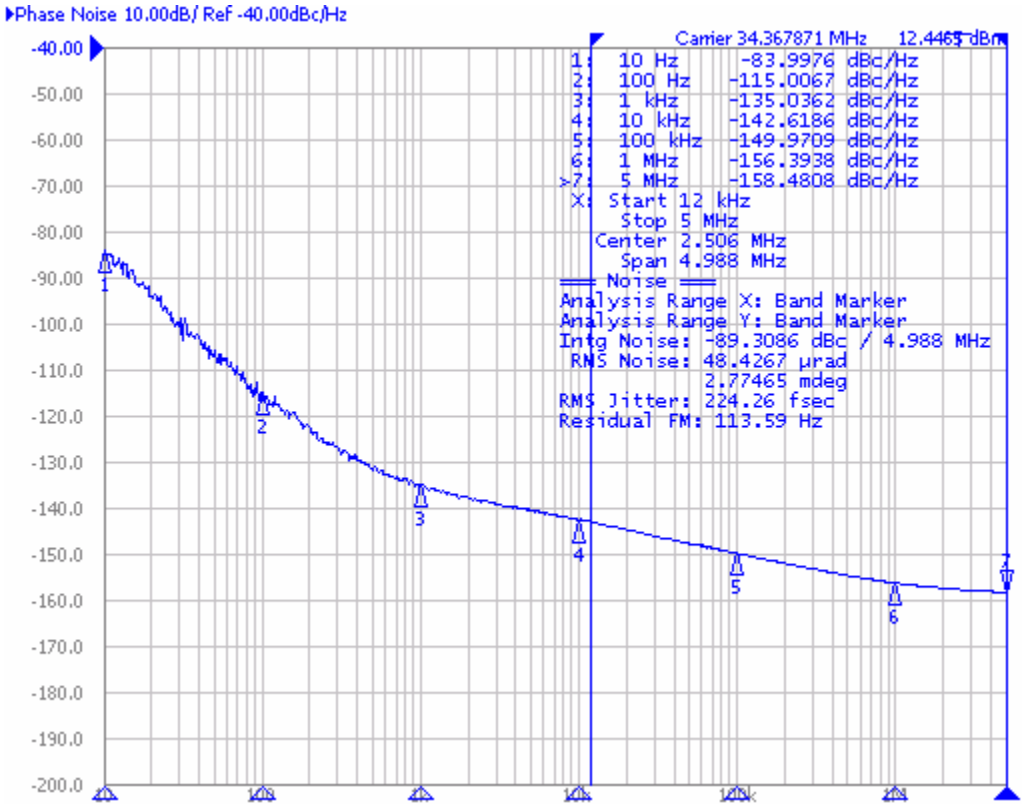


VCC1-B3B-16M384 Phase Noise Test

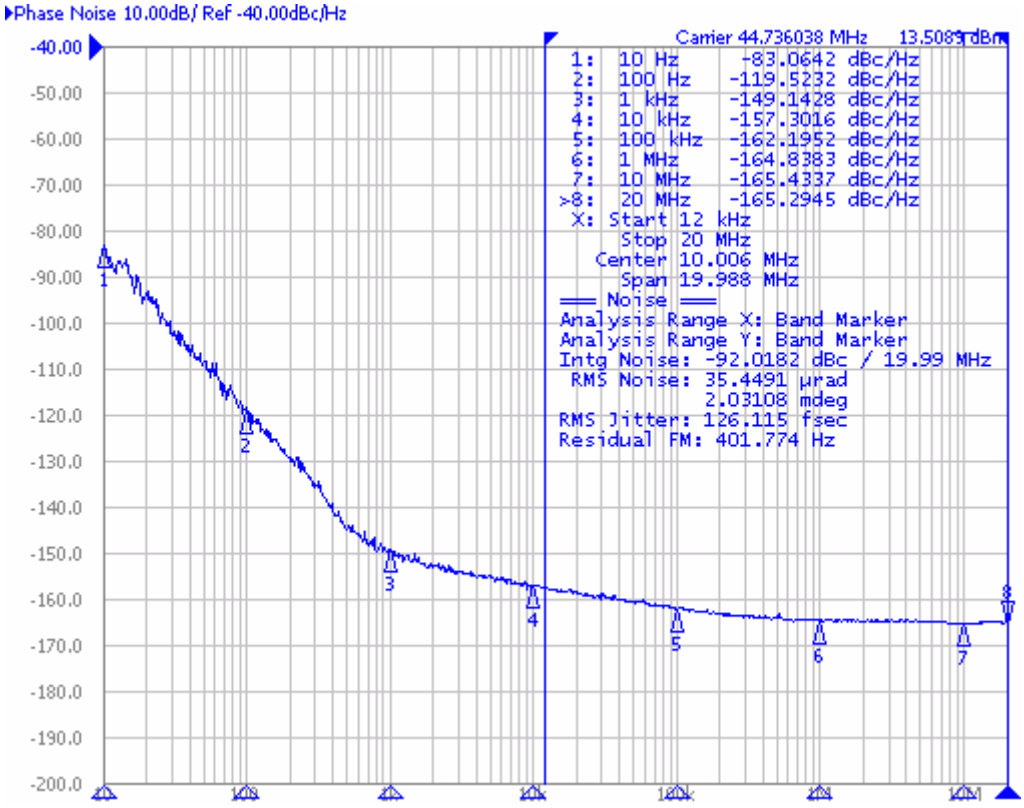


VCC1-B3B-24M576 Phase Noise Test

Typical Phase Noise for the VCC1 Series

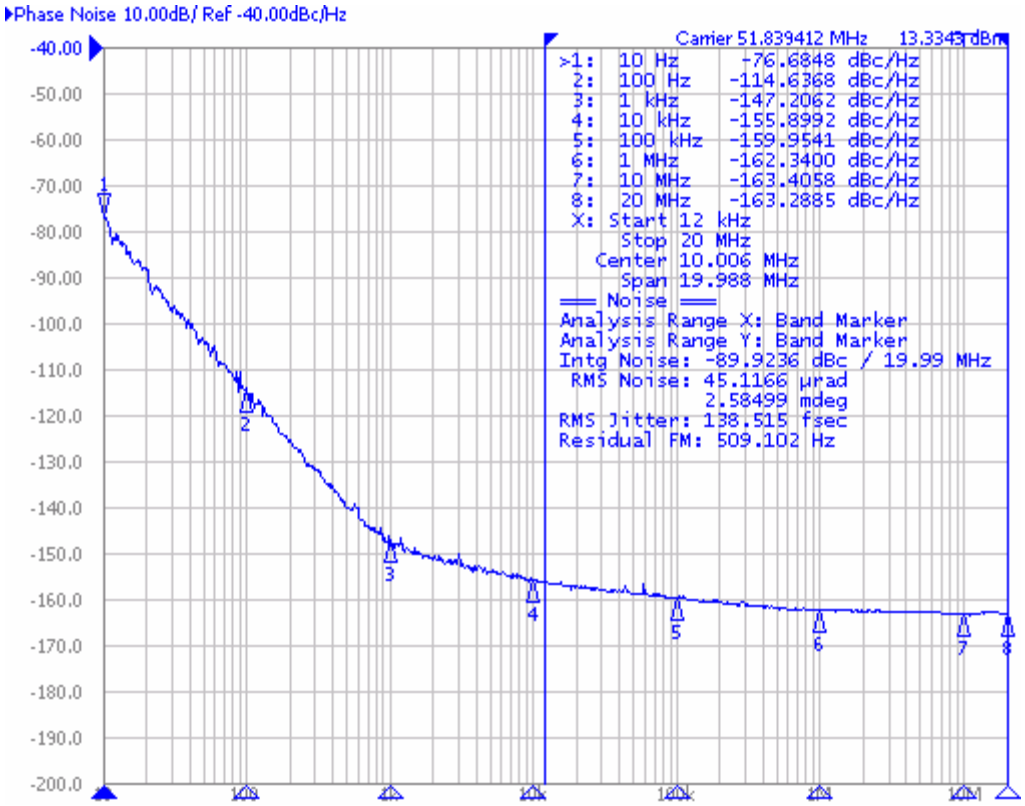


VCC1-B3B-34M368 Phase Noise Test

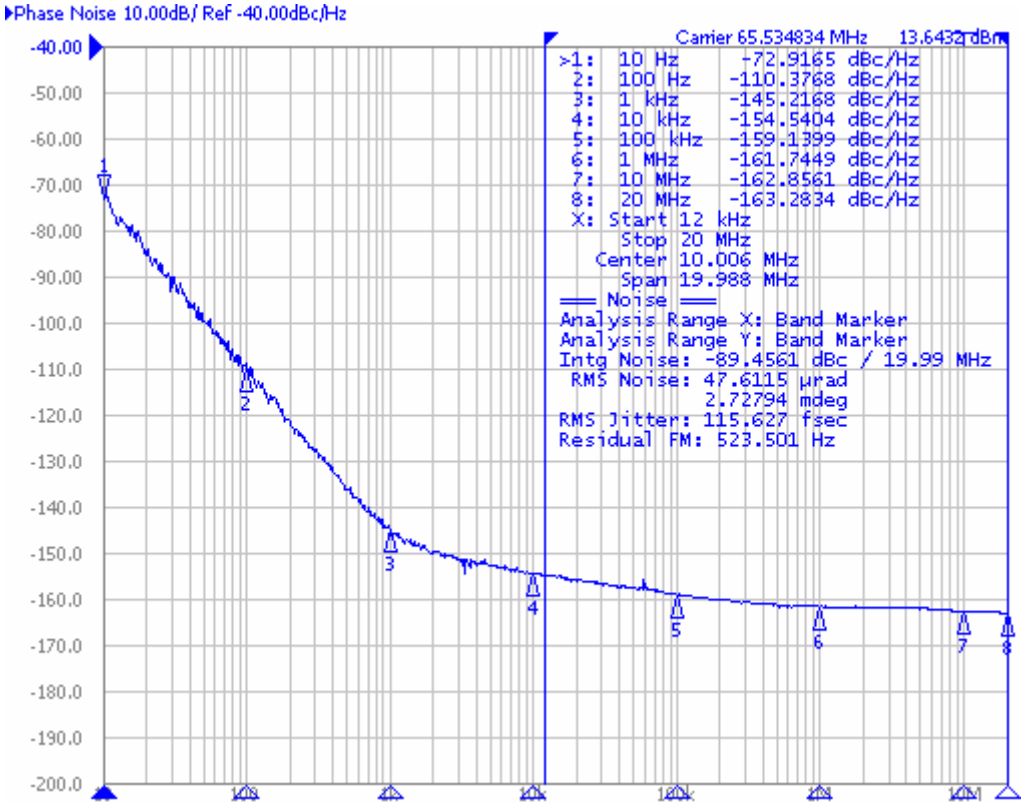


VCC1-B3B-44M736 Phase Noise Test

Typical Phase Noise for the VCC1 Series

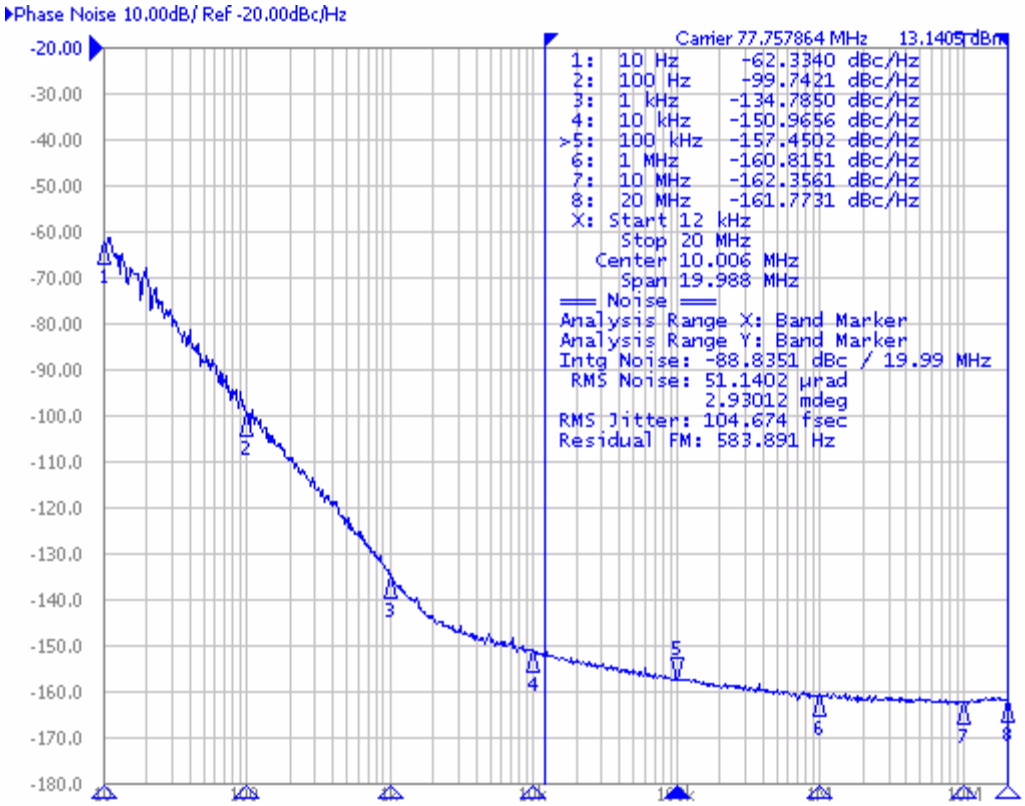


VCC1-B3B-51M840 Phase Noise Test

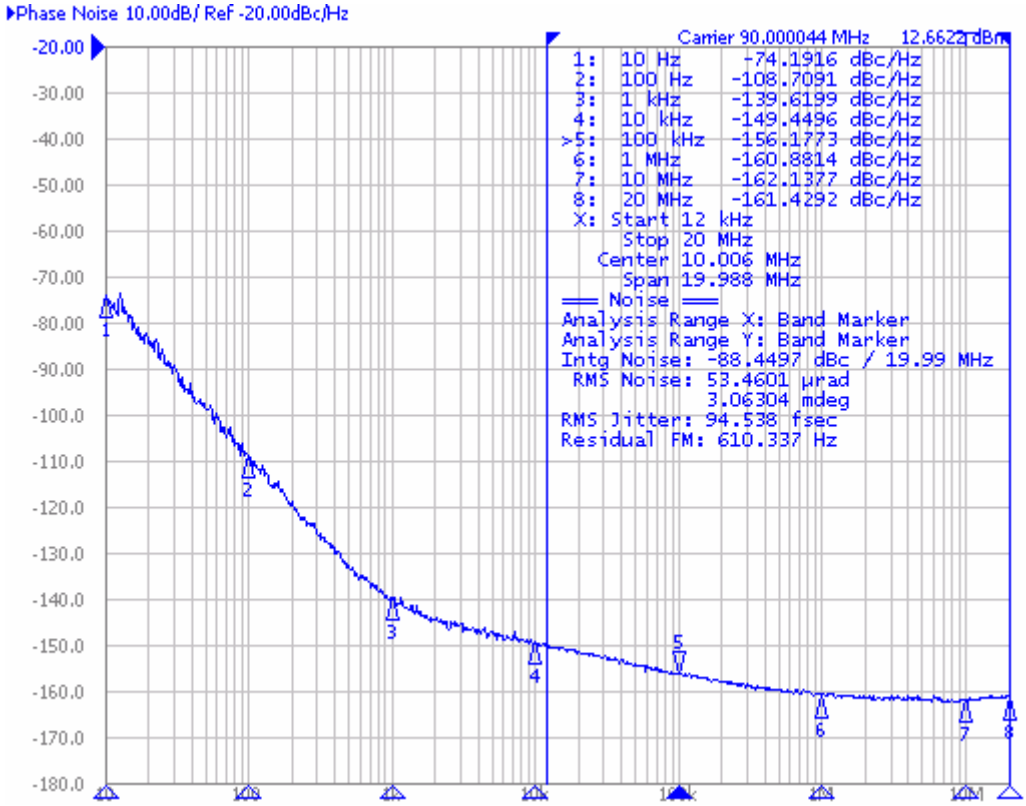


VCC1-B3D-65M536 Phase Noise Test

Typical Phase Noise for the VCC1 Series

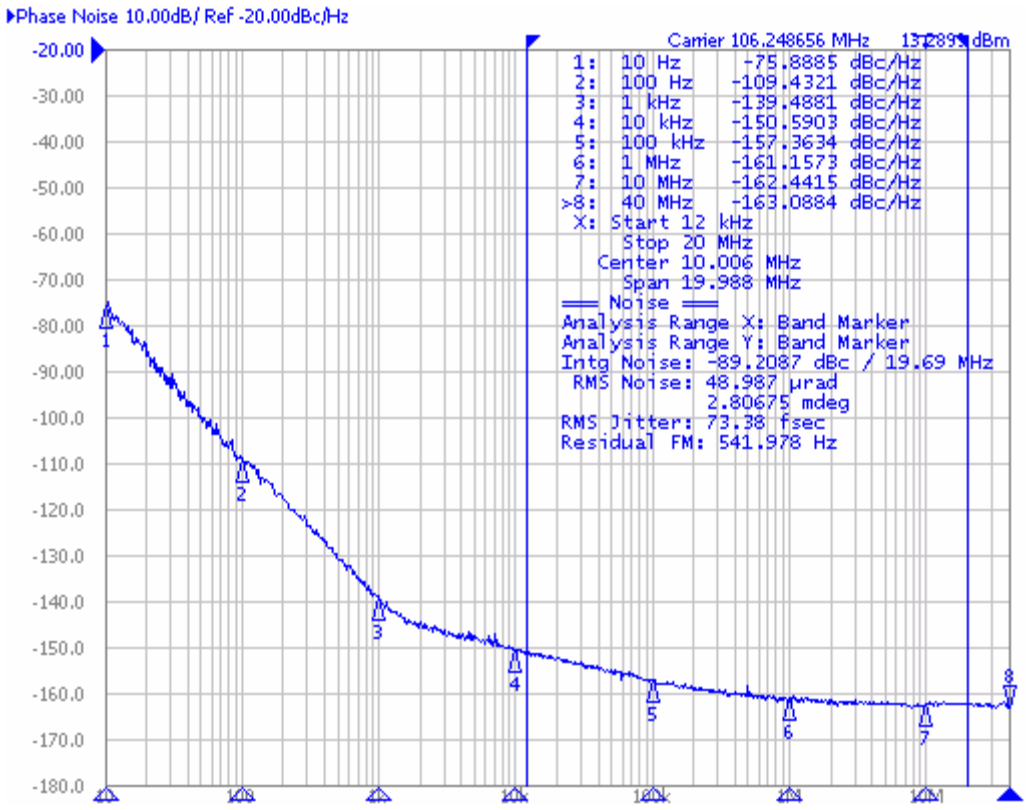


VCC1-B3B-77M760 Phase Noise Test

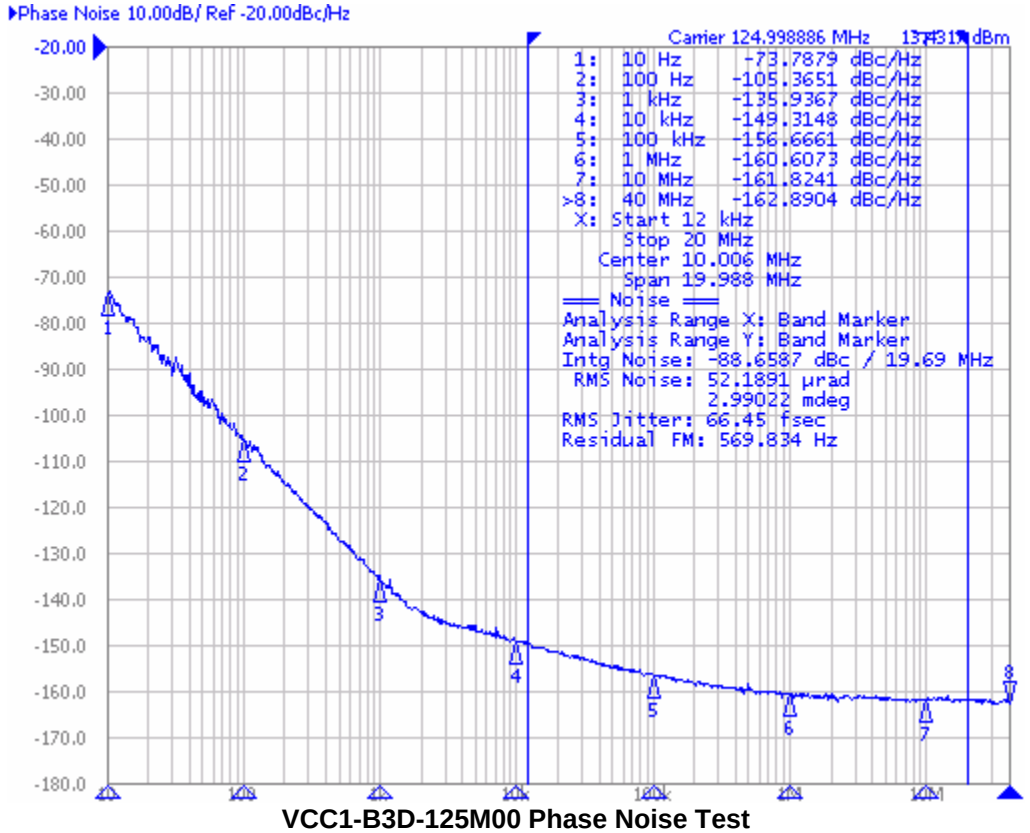


VCC1-B3B-90M000 Phase Noise Test

Typical Phase Noise for the VCC1 Series

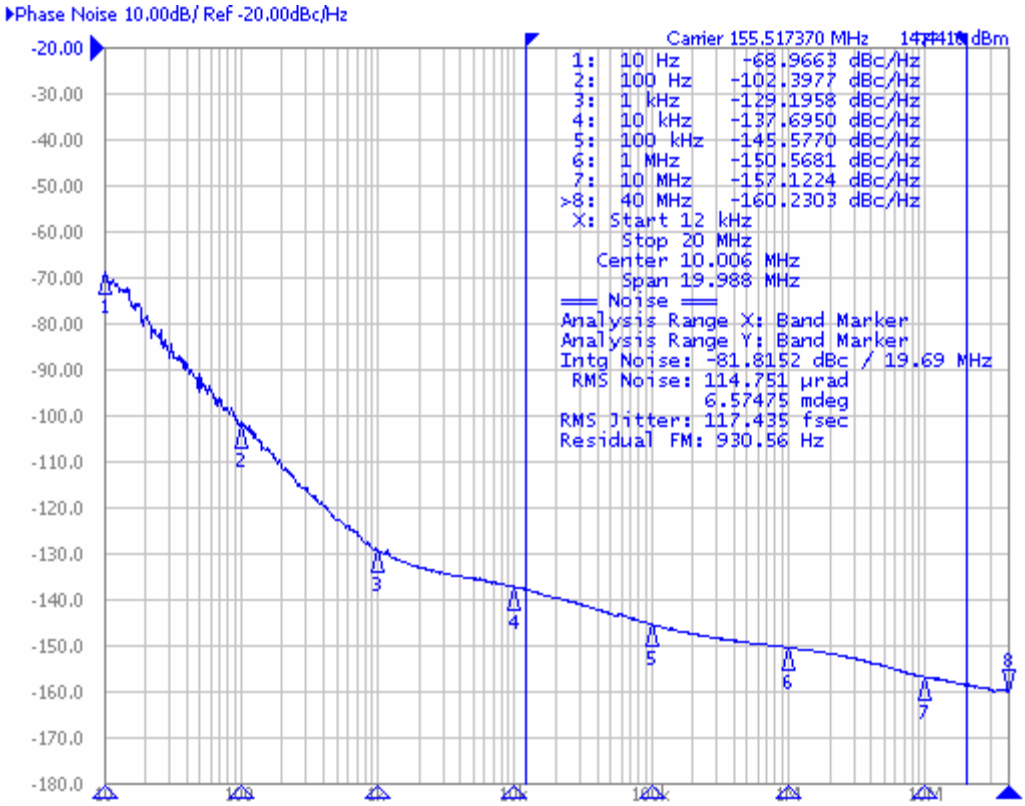


VCC1-B3B-106M25 Phase Noise Test

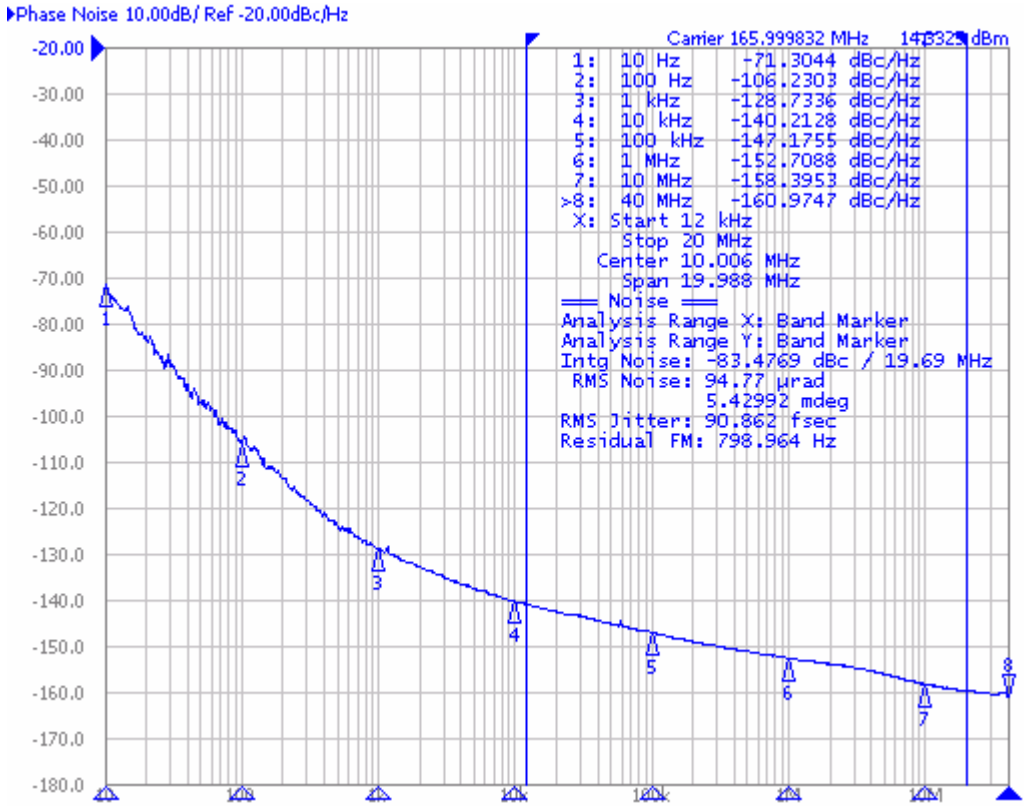


VCC1-B3D-125M00 Phase Noise Test

Typical Phase Noise for the VCC1 Series

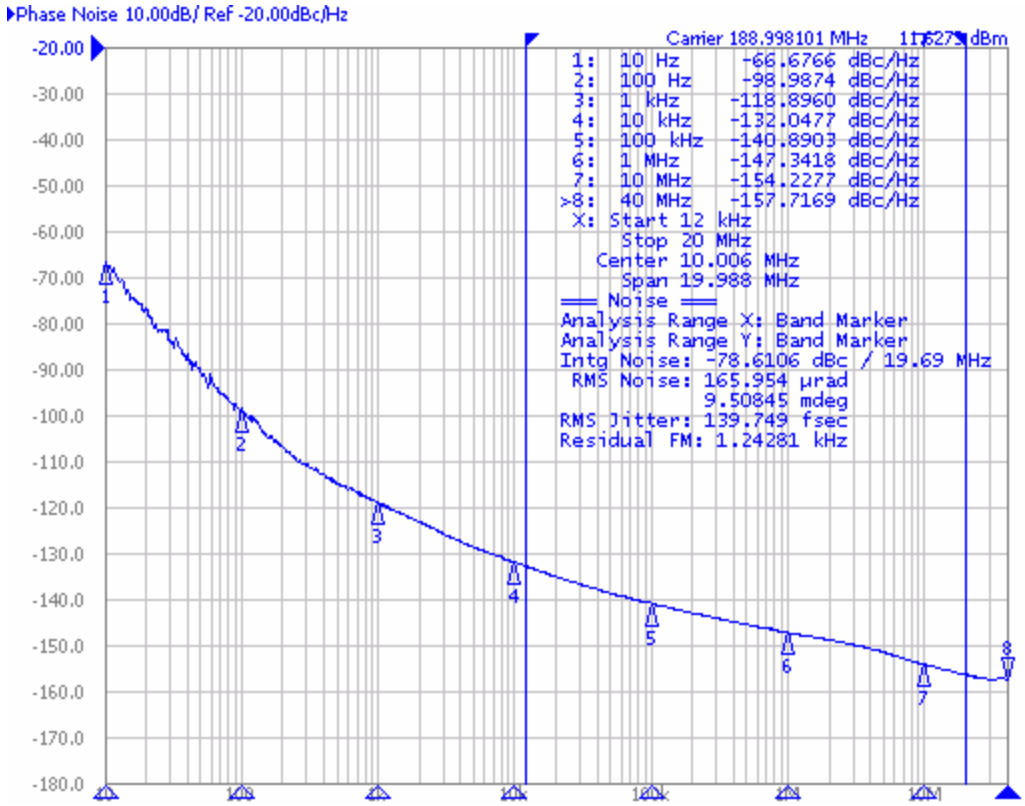


VCC1-B3D-155M52 Phase Noise Test



VCC1-B3D-166M00 Phase Noise Test

Typical Phase Noise for the VCC1 Series



VCC1-G3C-189M00 Phase Noise Test

Contact Application Engineering for any phase noise/jitter data on frequencies not listed.

For Additional Information Please Contact:

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