# Application Note
# VVC1/VVC2, CMOS VCXO
# Typical Phase Noise and Jitter Measurements

**Jitter Results**

Jitter measurements were performed on a Wavecrest SIA-3300C signal integrity analyzer. The measurements were recorded by testing the devices on an evaluation board with an AC coupled output. The evaluation board was connected to the SIA-3300C with an SMA bullet and 90k samples were taken. The values in the table represent typical values with Vc = Vdd/2.

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

**Random Jitter:** Unbounded and unpredictable jitter.

**Deterministic Jitter:** Bounded and predictable jitter.

**Total Jitter:** The sum of all of the jitter, measured to a $1x10^{-12}$ BER or confidence level.

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

| | | | | | | Measured on |
|---|---|---|---|---|---|---|
| Output | Period | | Random | Deterministic | Total | Agilent E5052A |
| MHz | RMS ps | P/P ps | P/P ps | P/P fs | P/P ps | RMS 12kHz - 20MHz[1] fs |
| **10.000** | 3.0 | 25.8 | 3.1 | 0 | 42.6 | 468 |
| **16.000** | 3.1 | 27.4 | 3.1 | 30 | 44.1 | 337 |
| **20.000** | 2.4 | 20.6 | 2.4 | 30 | 34.2 | 403 |
| **27.000** | 2.8 | 24.7 | 2.8 | 0 | 41.0 | 235 |
| **35.328** | 2.8 | 24.6 | 2.8 | 20 | 40.4 | 136 |
| **44.736** | 2.8 | 24.5 | 2.8 | 20 | 38.9 | 195 |
| **54.000** | 2.2 | 18.8 | 2.2 | 30 | 31.2 | 135 |
| **65.536** | 2.0 | 17.0 | 2.0 | 0 | 28.7 | 134 |

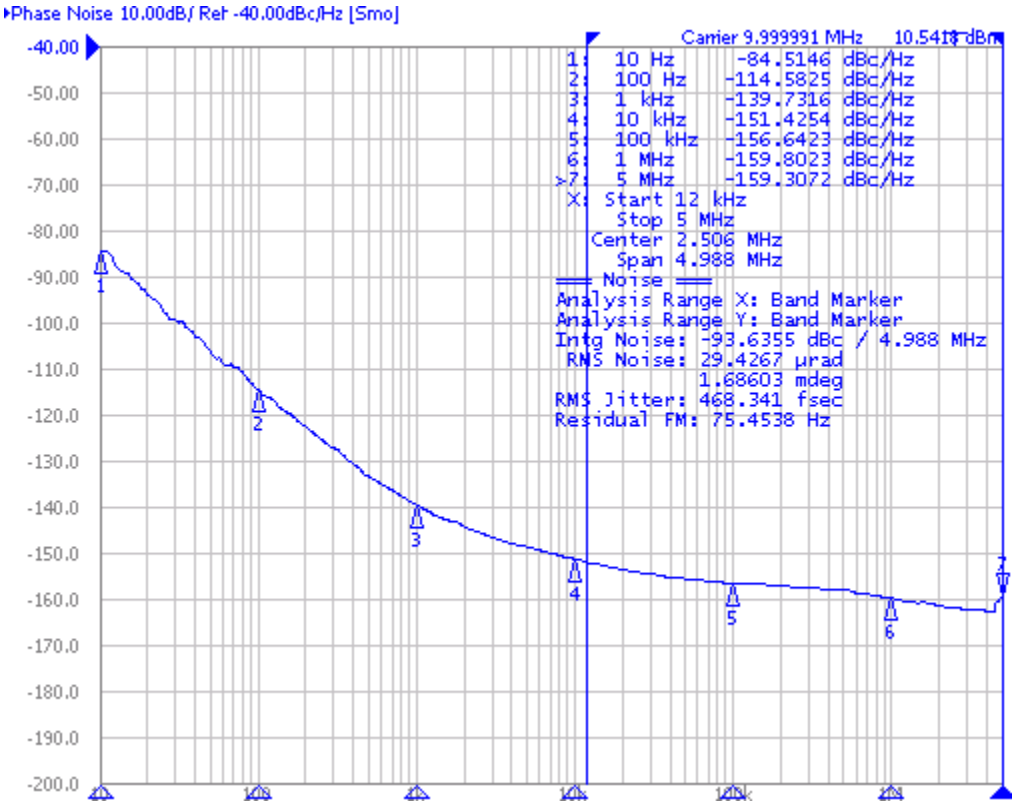
1. Data is based on 12kHz-5MHz for output frequencies < 44.736MHz

**Table of typical jitter values for the VVC1/VVC2 series of oscillators**

# Typical Phase Noise for the VVC1/VVC2 Series

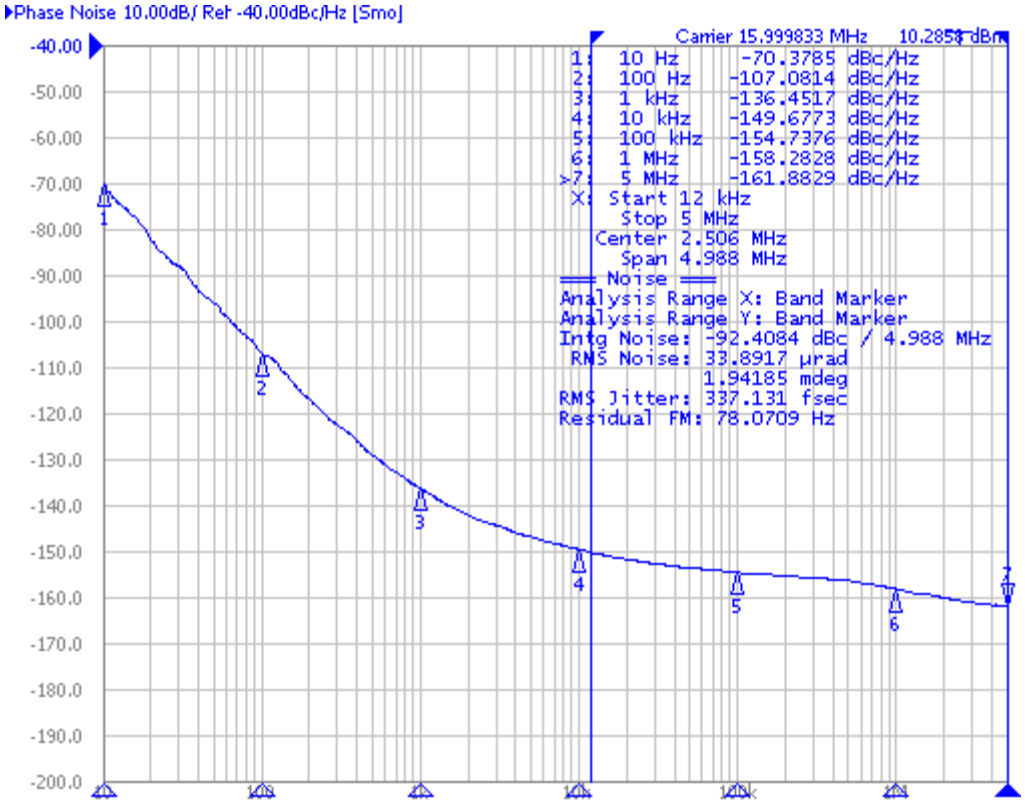
## Phase Noise Results

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.

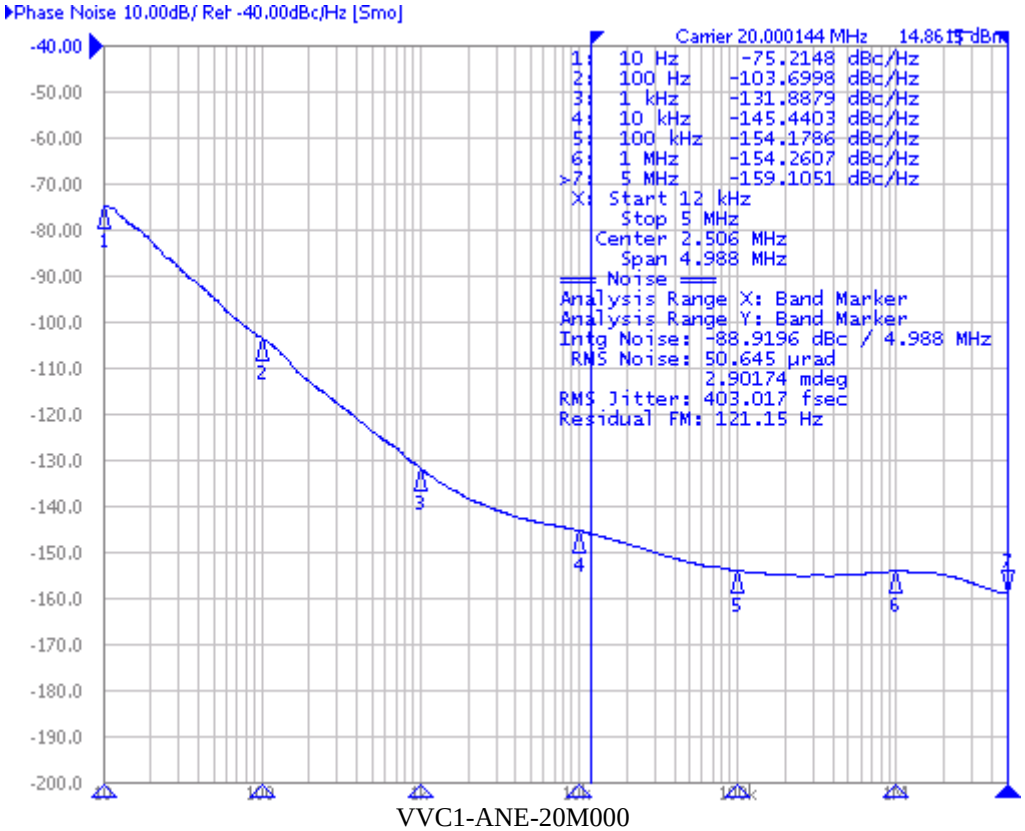



VVC1-F2F-10M000

## Typical Phase Noise for the VVC1/VVC2 Series

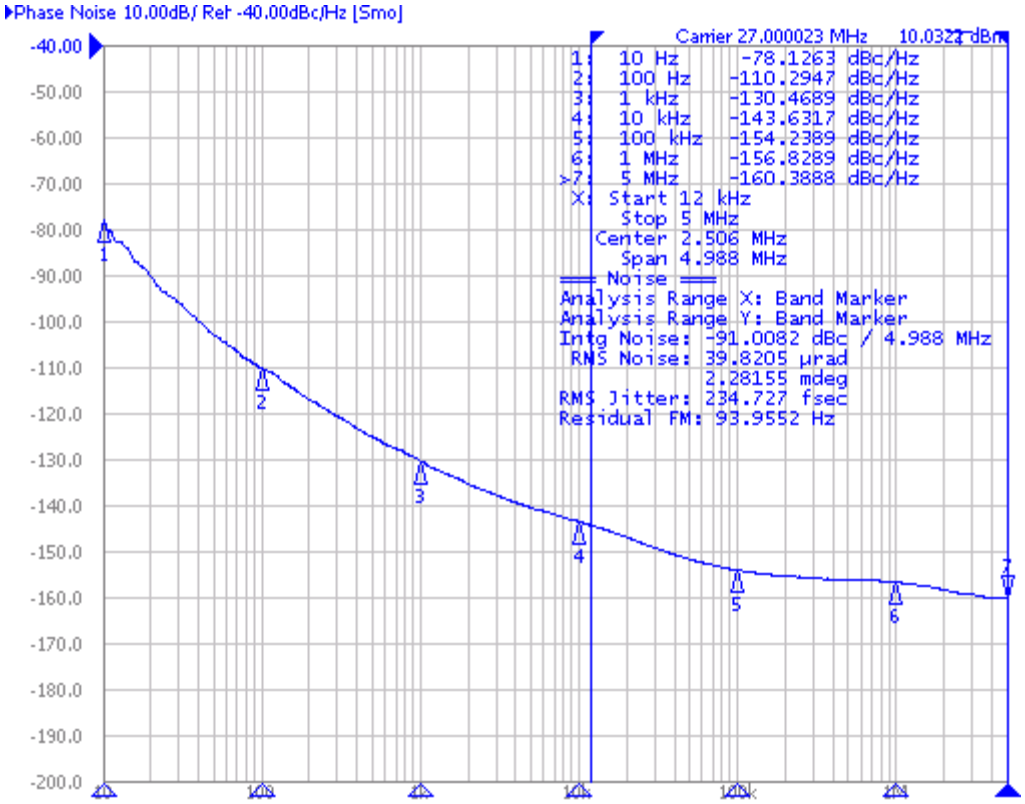



VVC1-F2F-16M000

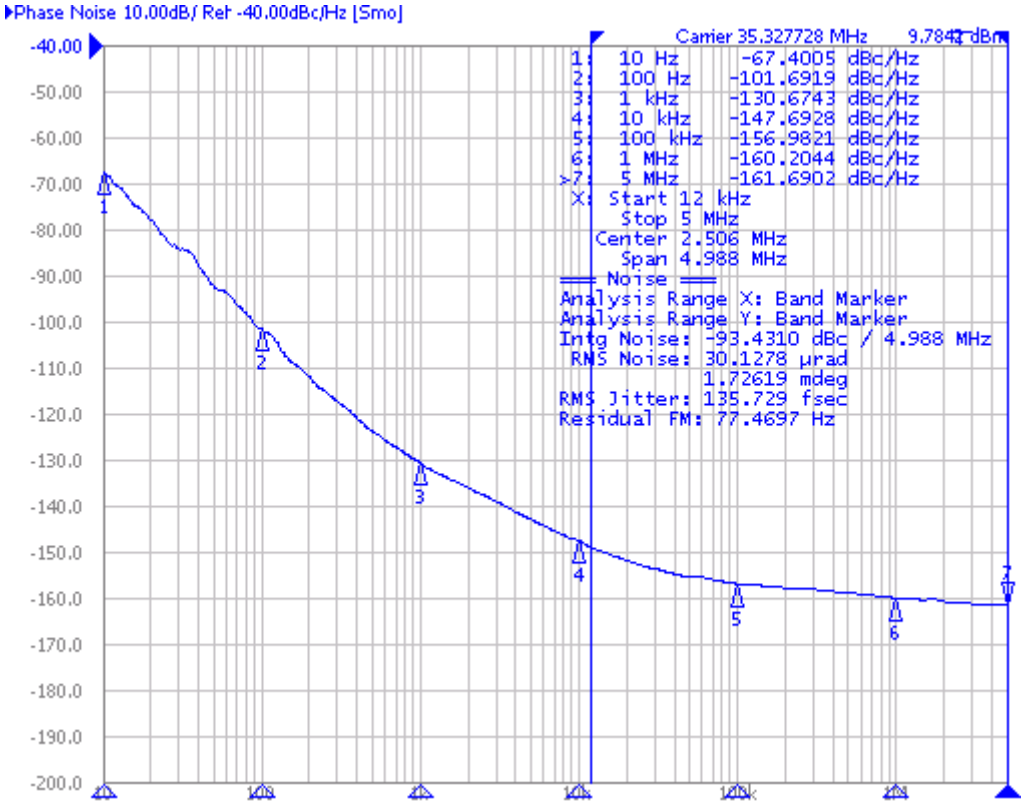



VVC1-ANE-20M000

## Typical Phase Noise for the VVC1/VVC2 Series

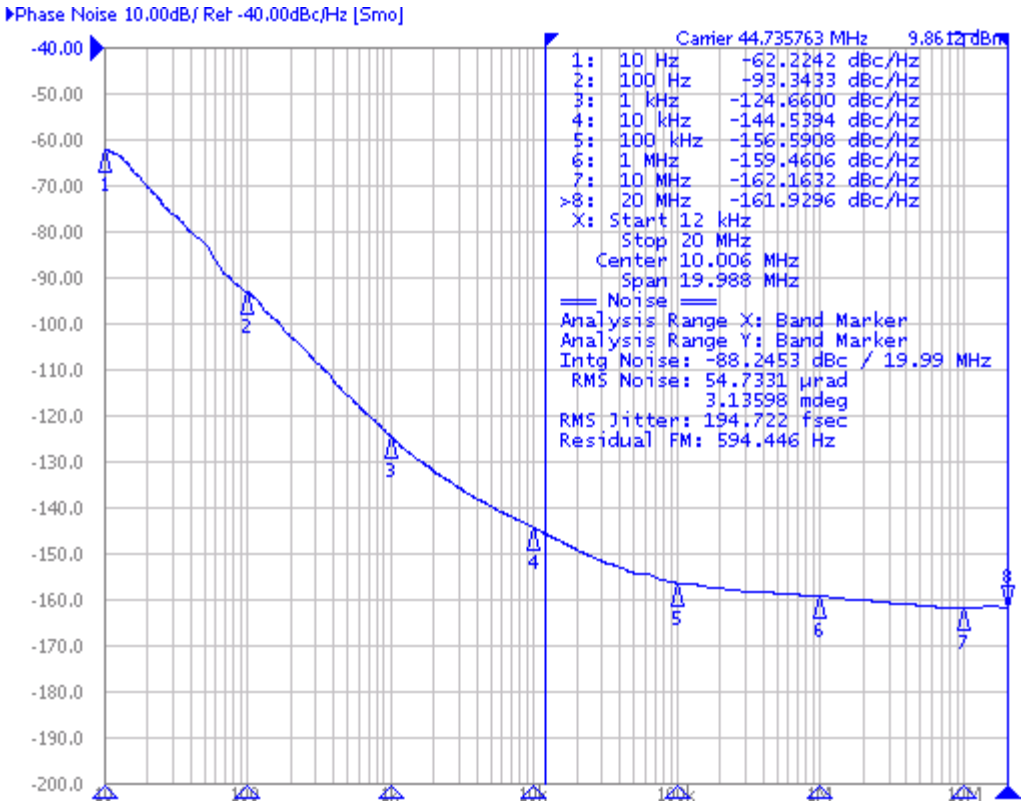



VVC2-FHE-27M000

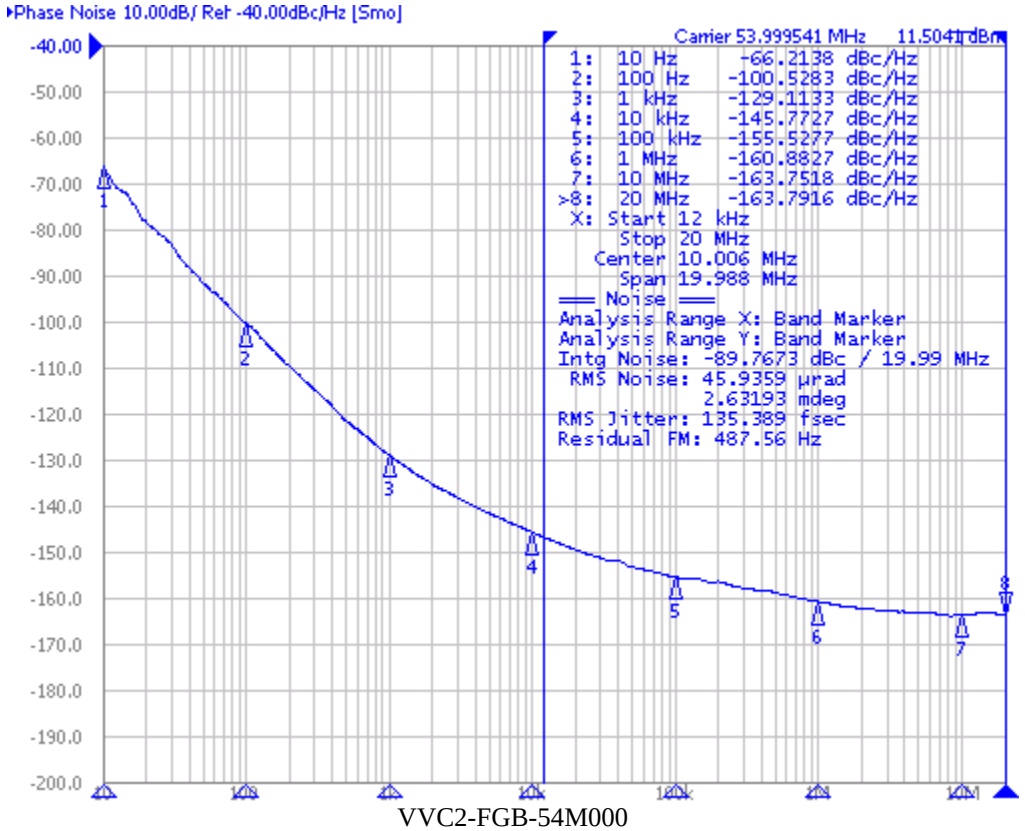



VVC1-FHF-35M328

## Typical Phase Noise for the VVC1/VVC2 Series

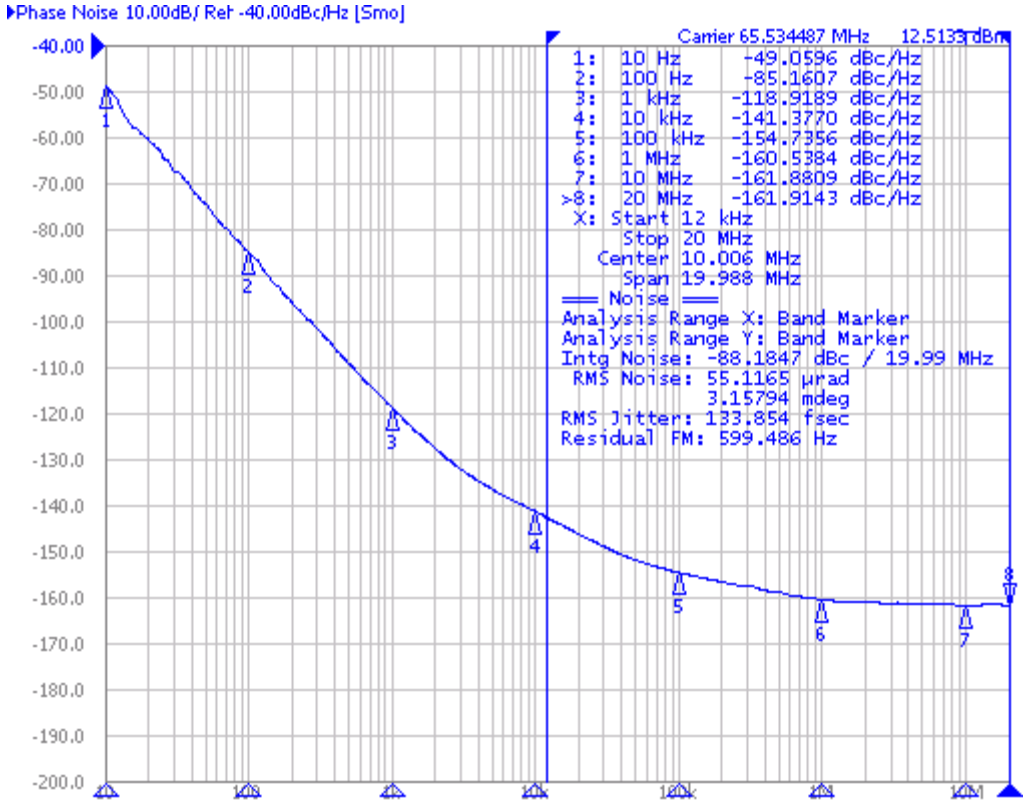



VVC2-FGE-44M736




VVC2-FGB-54M000

## Typical Phase Noise for the VVC1/VVC2 Series




VVC2-BGE-65M536

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

**For Additional Information Please Contact:**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