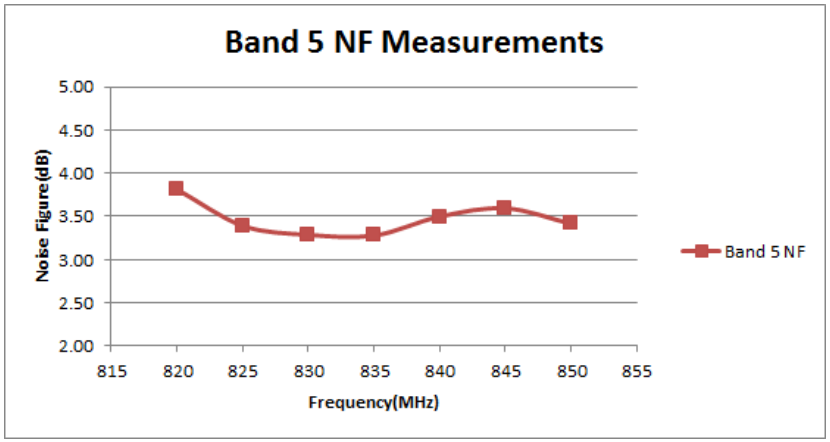
Lime Microsystems

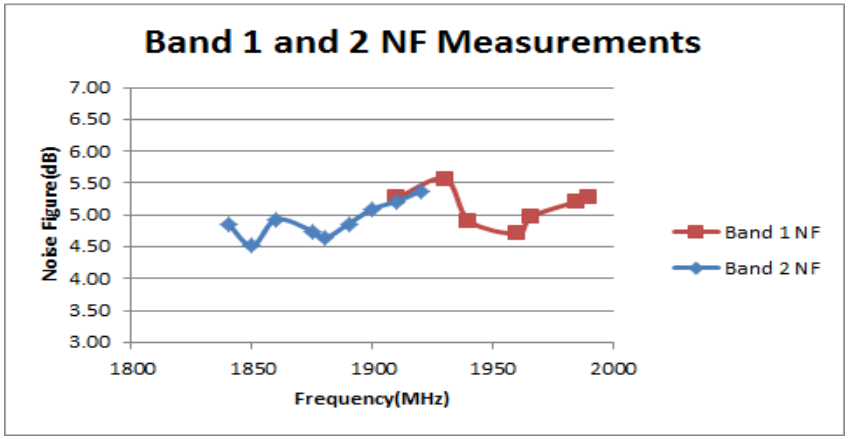
Temperature Measurements

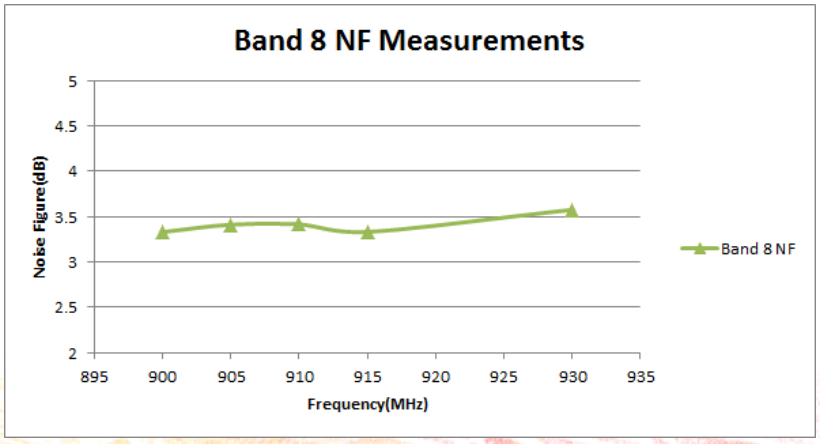
Wideband Transceiver Technology Enabling Personal Broadband

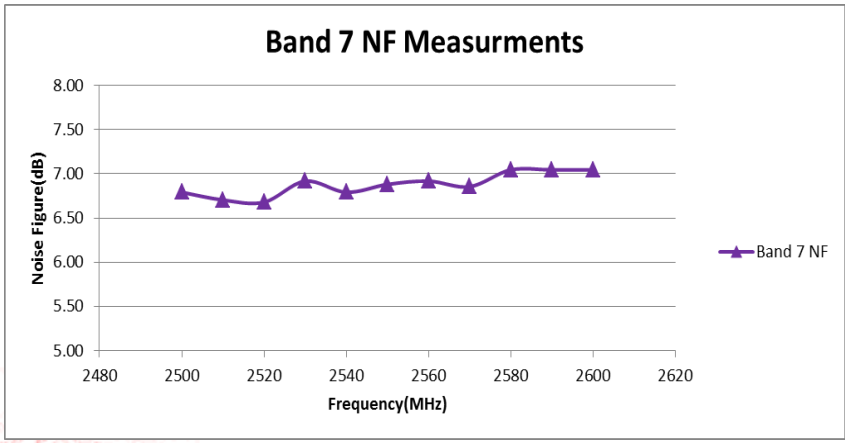
LMS6002 Performance Details

High and Low band Receive NF plots









Receive System Measurements

- **Receiver Sensitivity:**
- 3GPP 25141-930 Section 7.2.5 specification: -106.3 dBm for BER ≤ .001.
- Lime reference design receiver sensitivity measured on a baseband platform with RMC12.2 kbps.
- Band 1 and 2 measured sensitivity typically -115 dBm.
- Band 5 and 8 measured sensitivity typically -116 dBm.
- Calculated sensitivity = -116 dBm in low band assuming Eb/No=8.7 dB and NF=7.8 dB and .5 dB implementation loss.

- **Receiver Adjacent Channel Selectivity:**
- 3GPP 25141-930 Section 7.4 specification: BER ≤ .001 with -91 dBm
- desired and -28 dBm modulated blocker at +/- 5 MHz.
- Achieved -99 dBm sensitivity for BER ≤ .001 in highband.
- Achieved -102 dBm sensitivity for BER ≤ .001 in lowband

Transmitter EVM in Low band for WCDMA TM1

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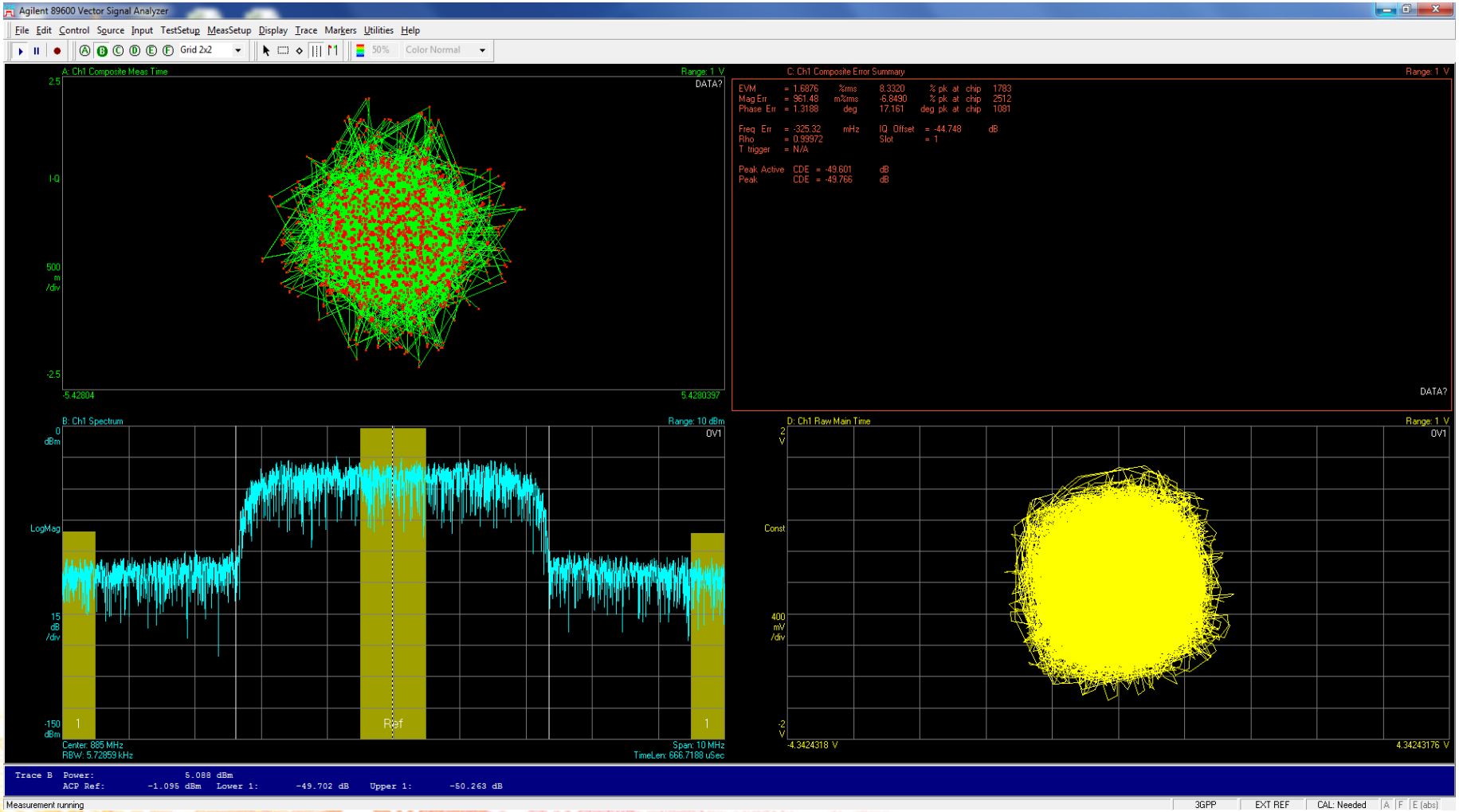
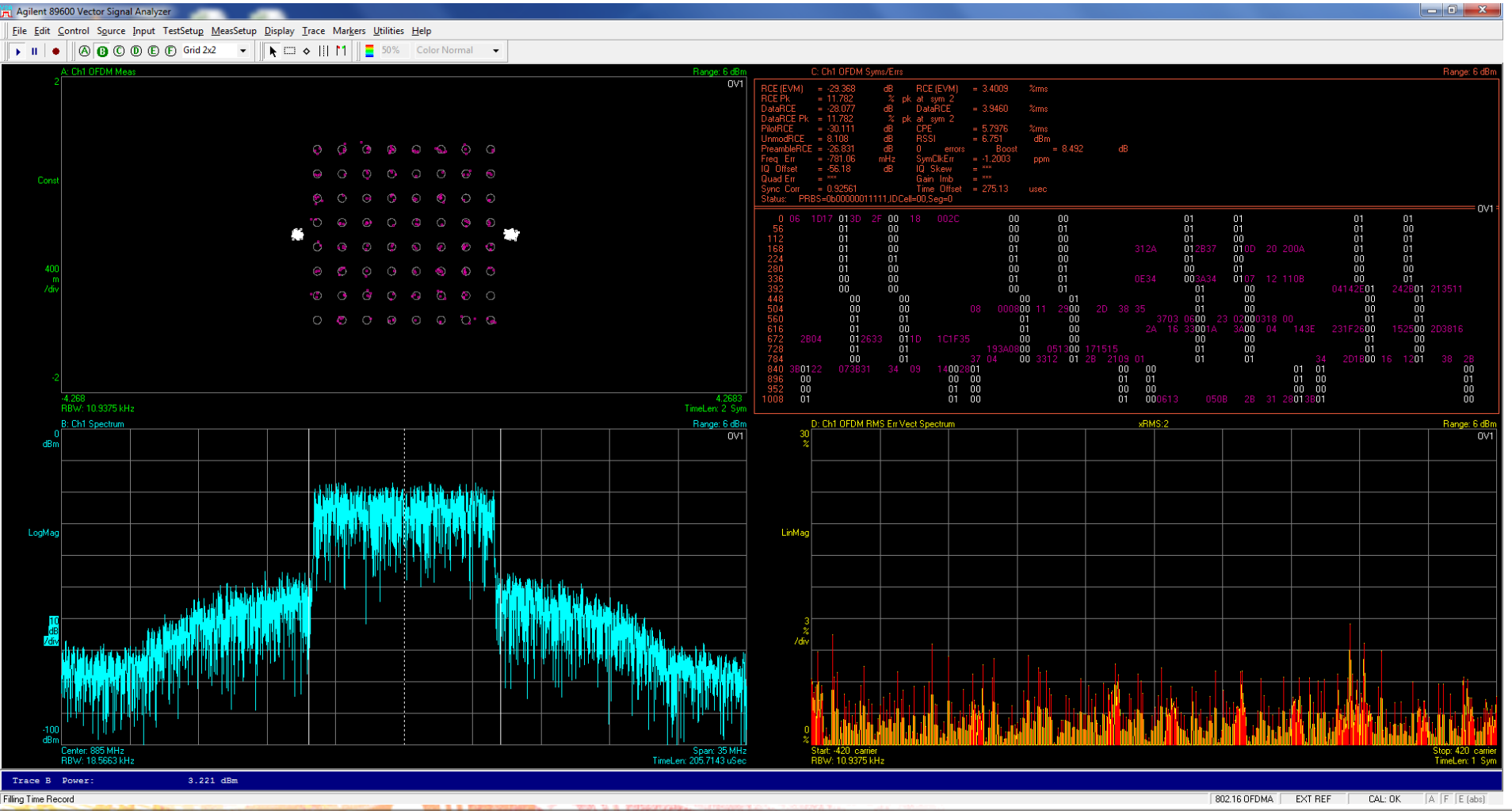
Transmitter EVM = 1.68% at 885 MHz for WCDMA TM1. Pout=5 dBm.



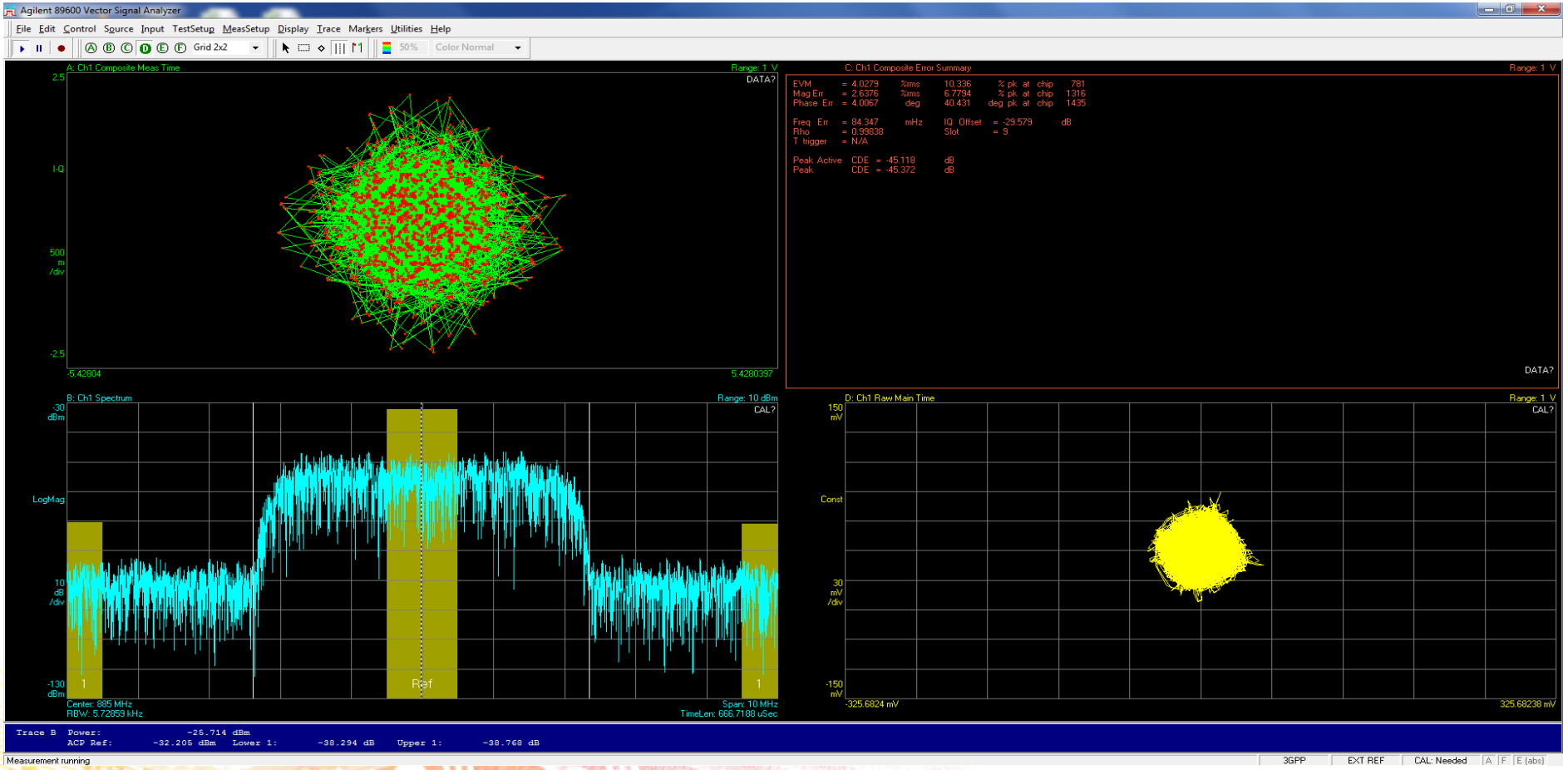
Transmitter EVM in Low band for 64-QAM OFDMA

Transmitter EVM = 3.4% at 885 MHz for 64-QAM OFDMA. Pout=4.8 dBm



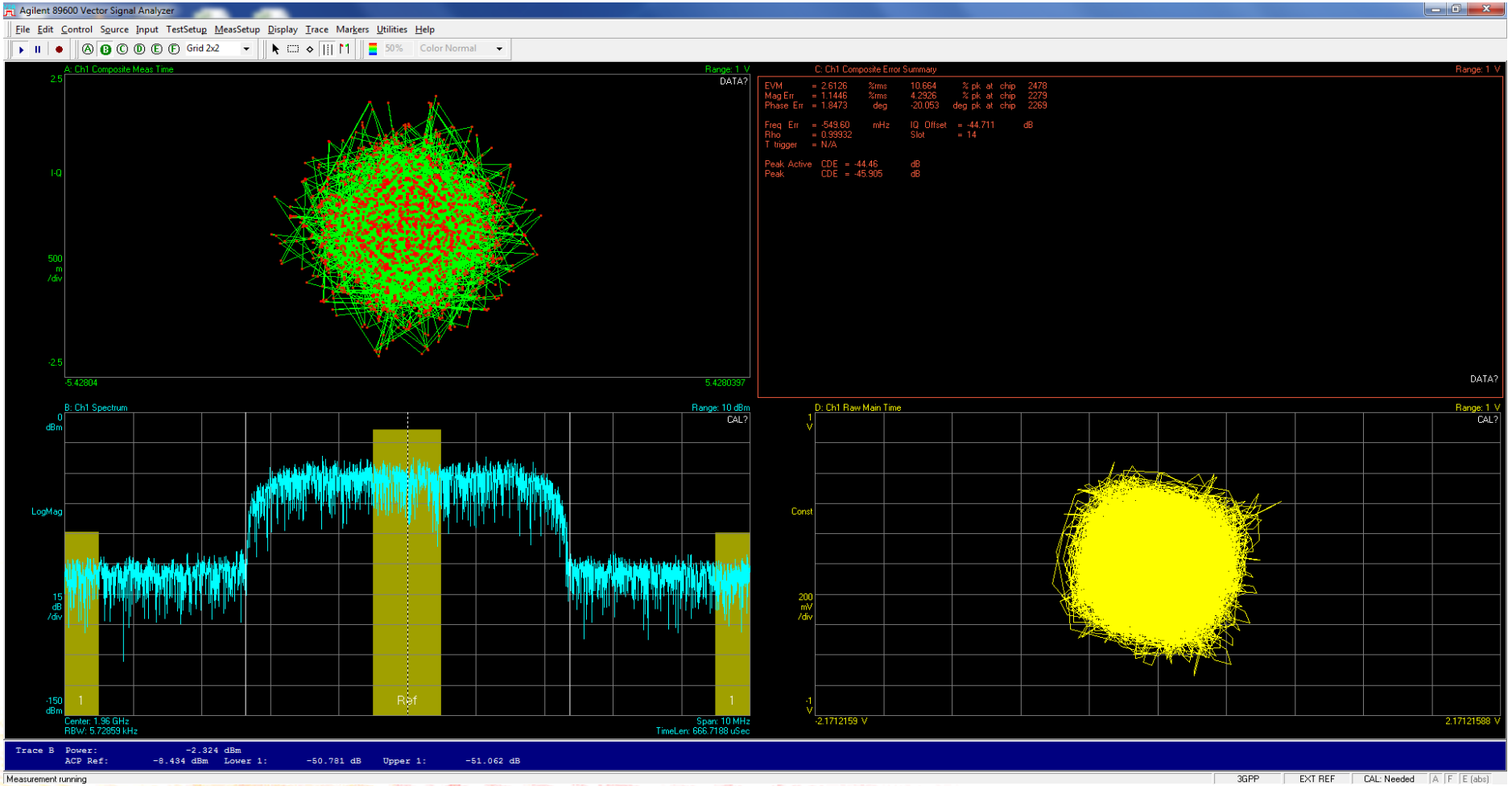
Transmitter EVM in Low band for WCDMA TM1 at Low Output Power.

Transmitter EVM = 4% at 885 MHz for TM1. Pout=-25.7 dBm.
Power control range > 30 dB.



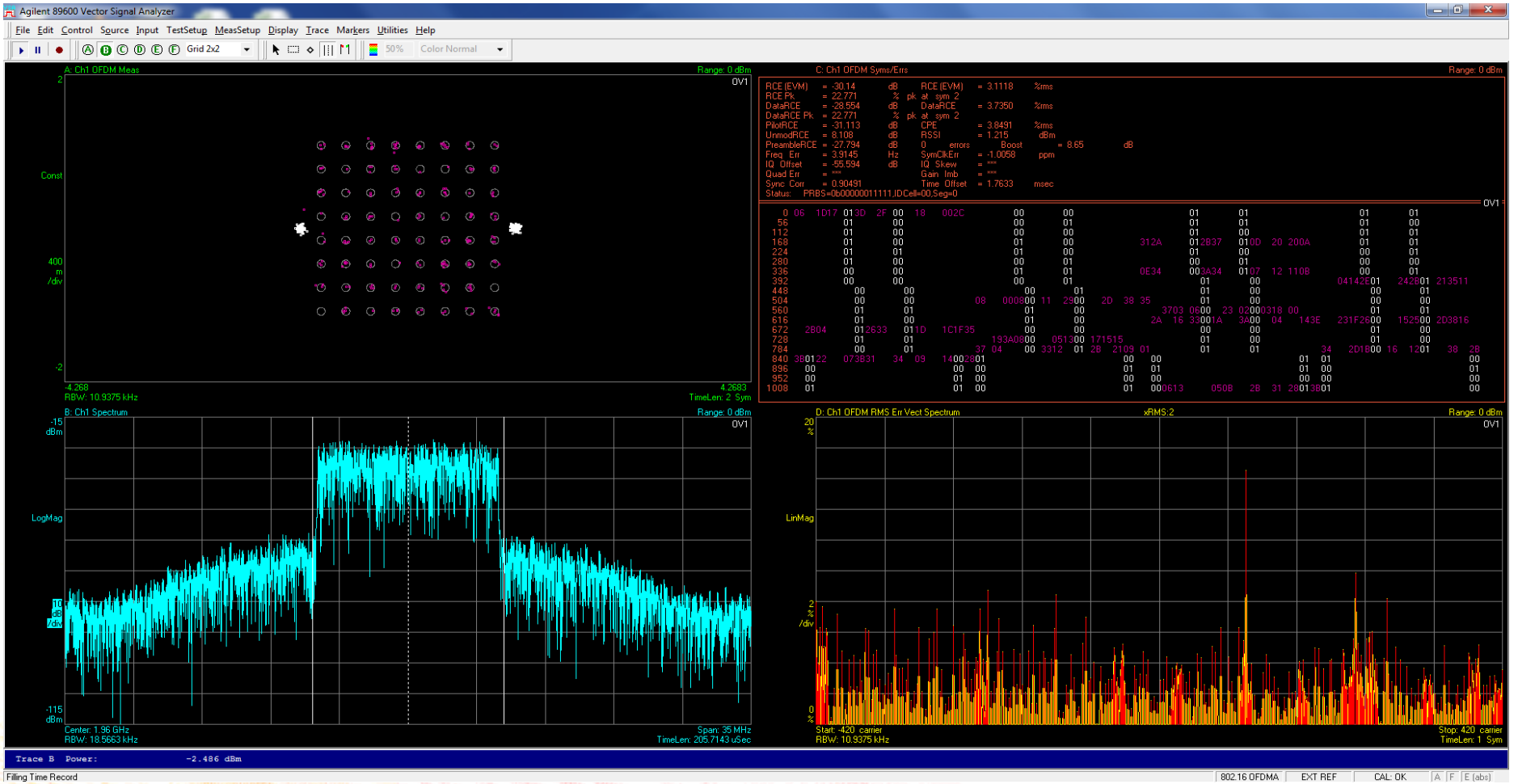
Transmitter EVM in High band for WCDMA TM1 at High Output Power.

Transmitter EVM = 2.6% at 1960 MHz for TM1. Pout=-2.3 dBm.

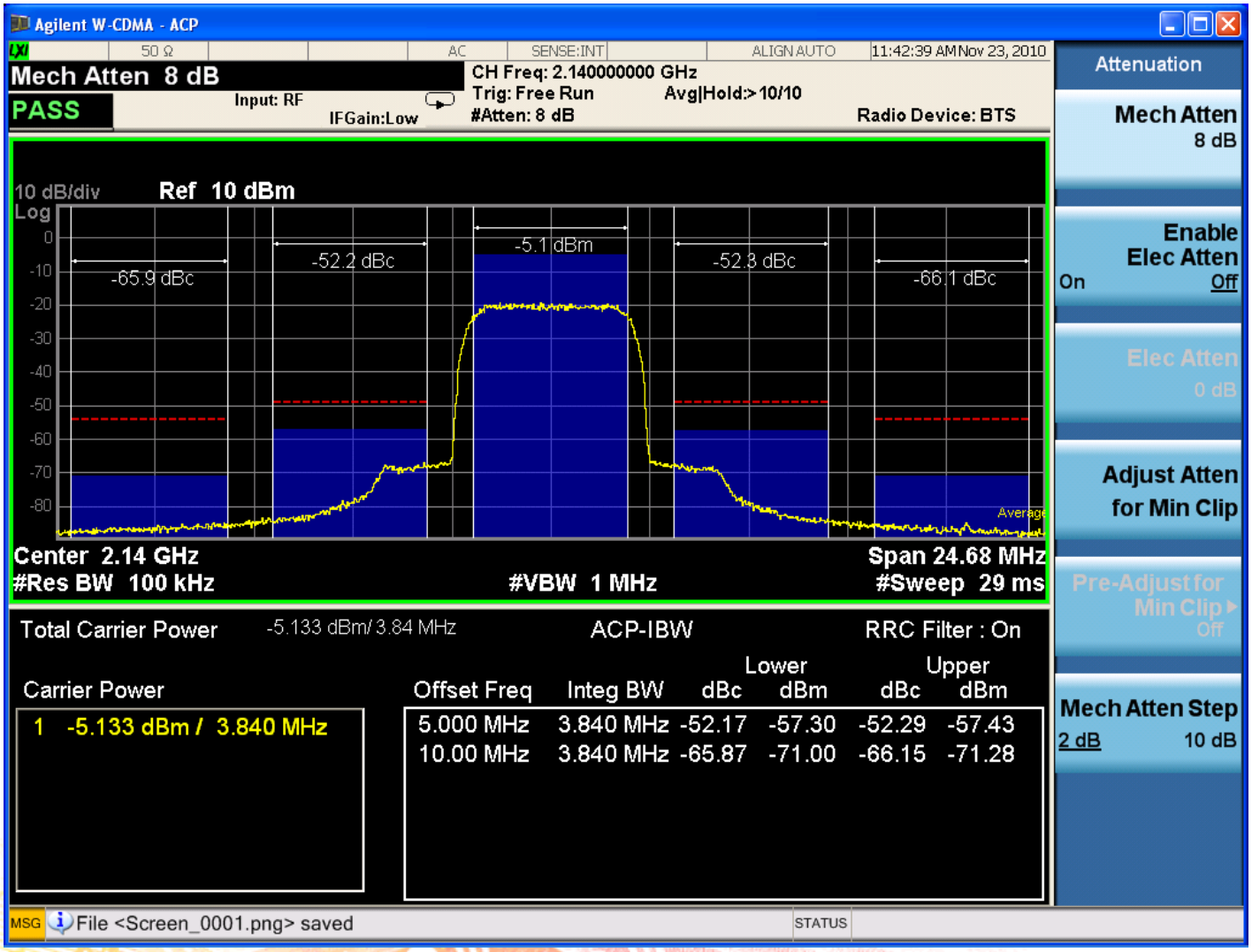


Transmitter EVM in High band for 64-QAM OFDMA at High Output Power.

Transmitter EVM = 2.6% at 1960 MHz for 64-QAM OFDMA. Pout=-2.4 dBm



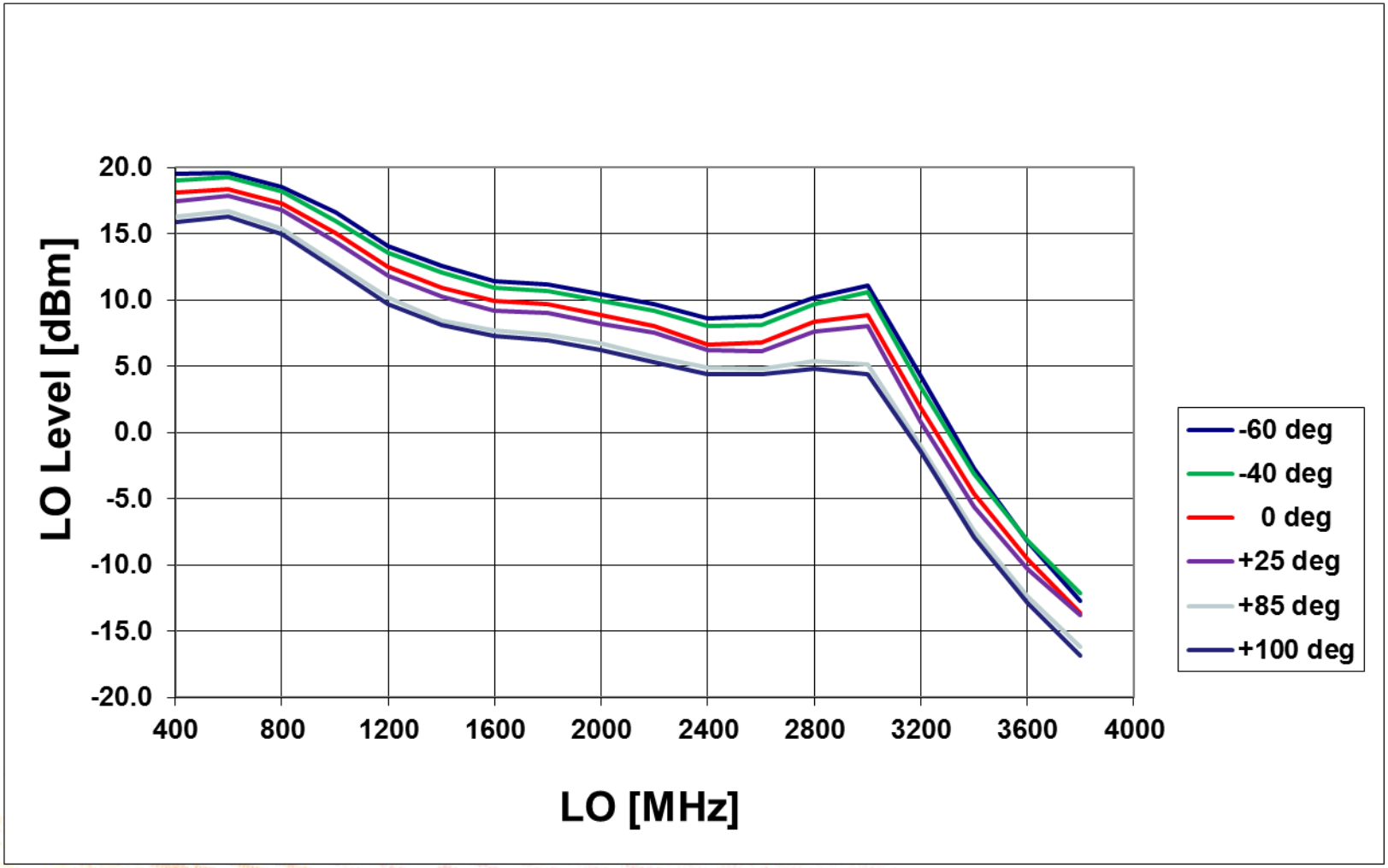
Transmitter ACLR1/ACLR2 in high band at high power for WCDMA TMA1.



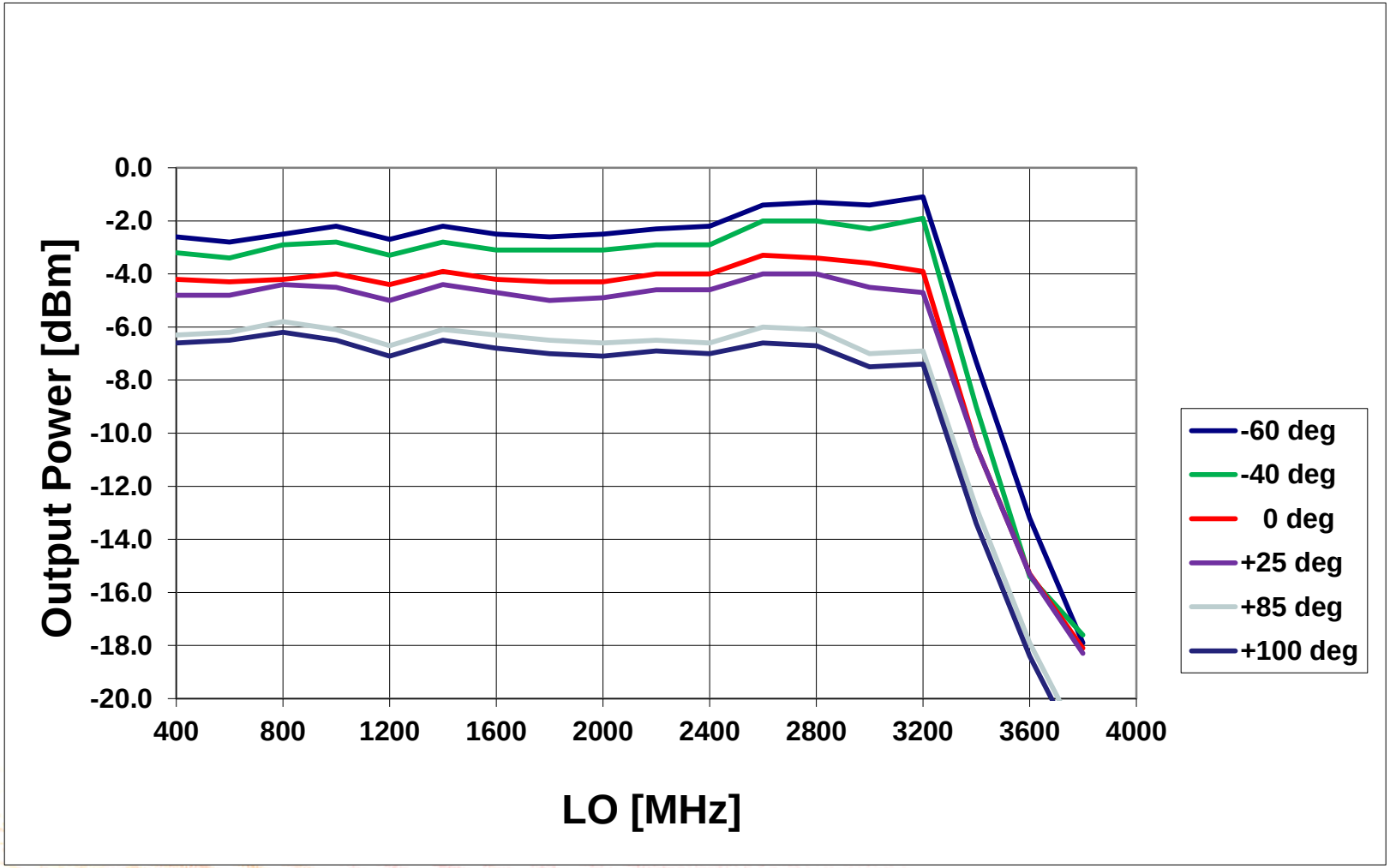
Temperature test

- Tested MS6002 over temperature (-50ºC, -40ºC, 0ºC, 25ºC, 85ºC and 100ºC).
- Transmit frequency range: 400MHz - 3800MHz
- Results presented are OFDM signal with 20 MHz modulation bandwidth, 1024 carriers, 64QAM supplied to transmit chain via analogue inputs.
- Measured results presented are Phase Noise, EVM, ACP.

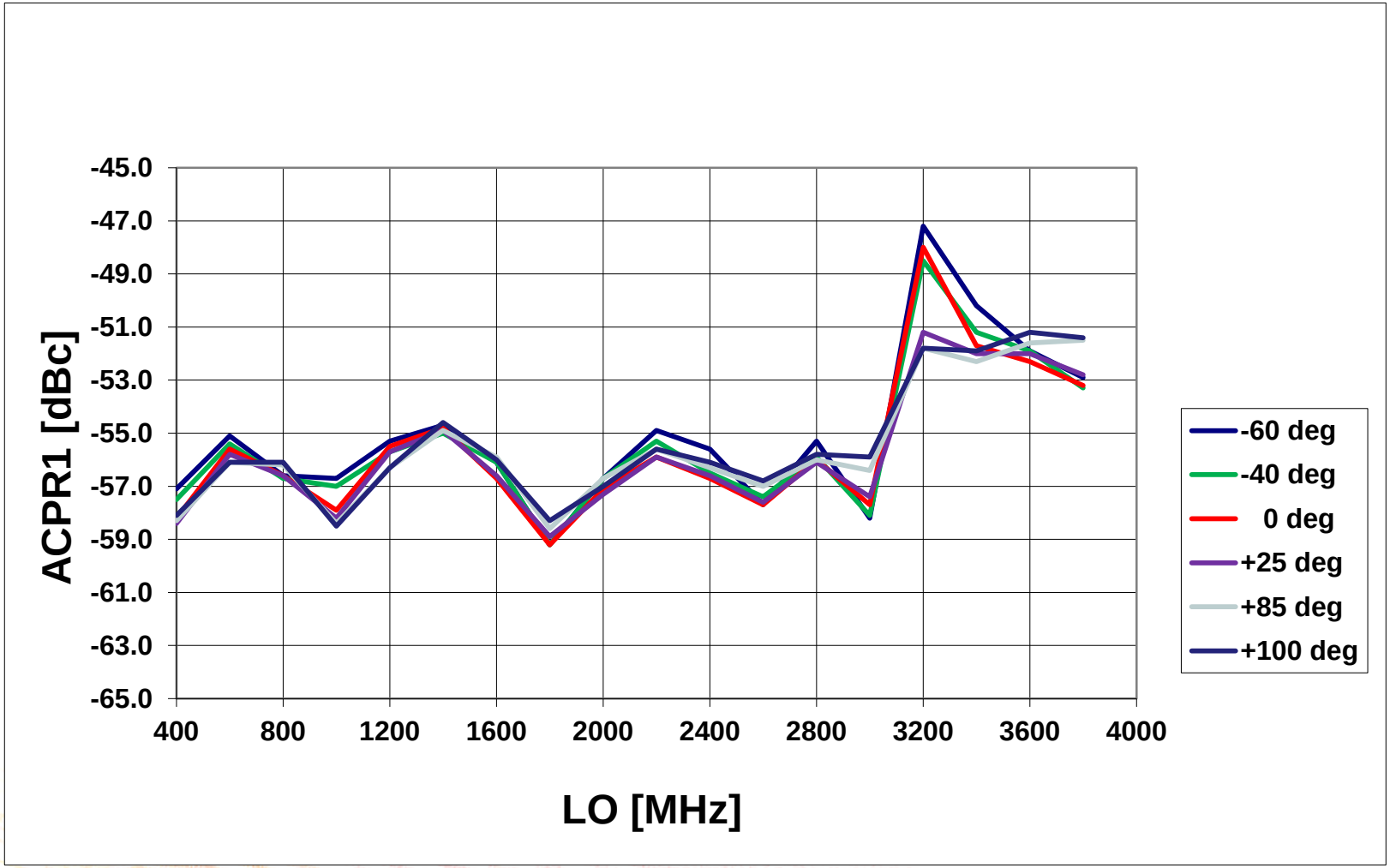
TX CW Output Power at Maximum Gain



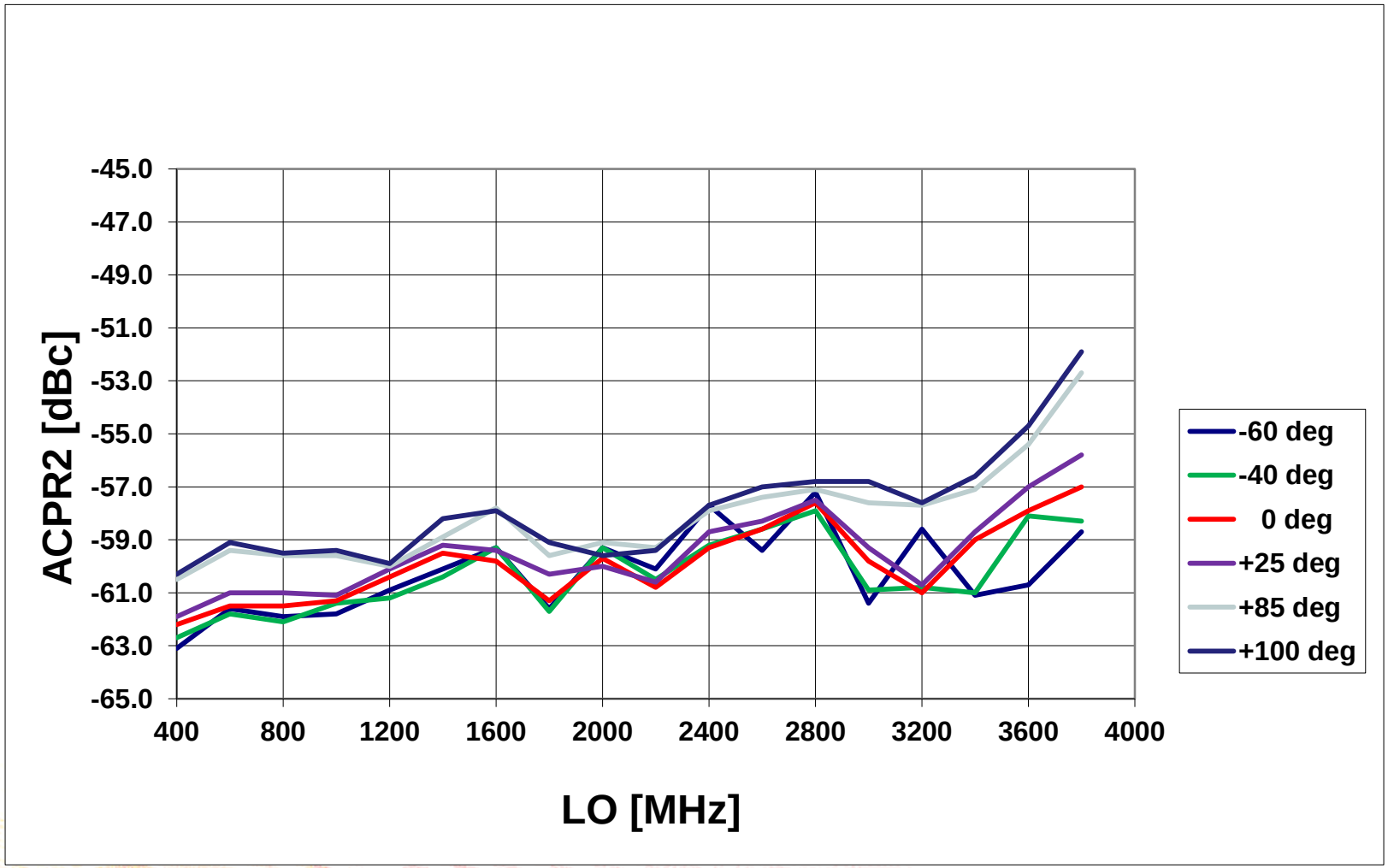
TX Output Power
OFDM modulated, AGC applied at 25deg



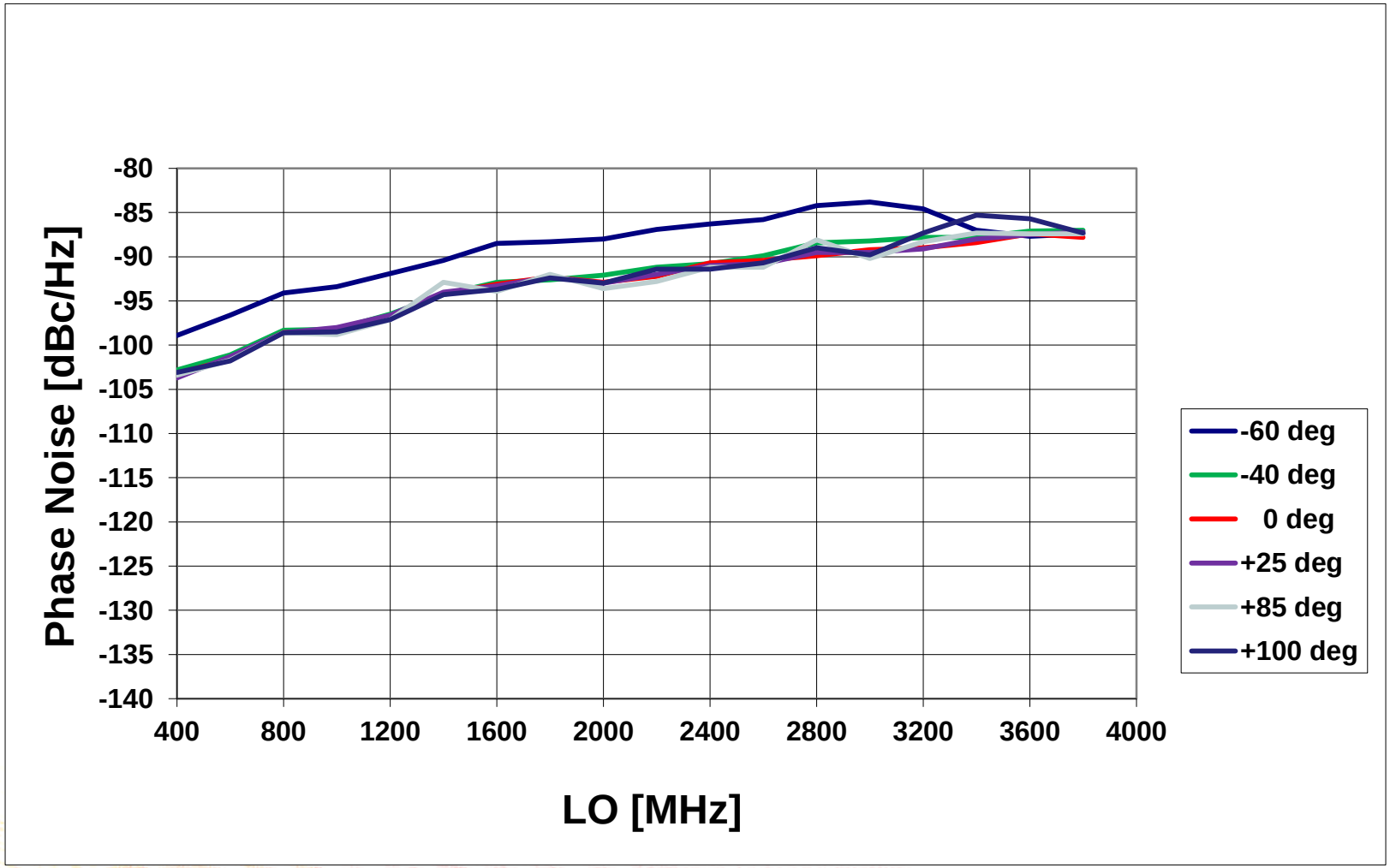
TX ACPR1


ACPR1 [dBc]
-45.0
-47.0
-49.0
-51.0
-53.0
-55.0
-57.0
-59.0
-61.0
-63.0
-65.0
400
800
1200
1600
2000
2400
2800
3200
3600
4000
LO [MHz]
-60 deg
-40 deg
0 deg
+25 deg
+85 deg
+100 deg

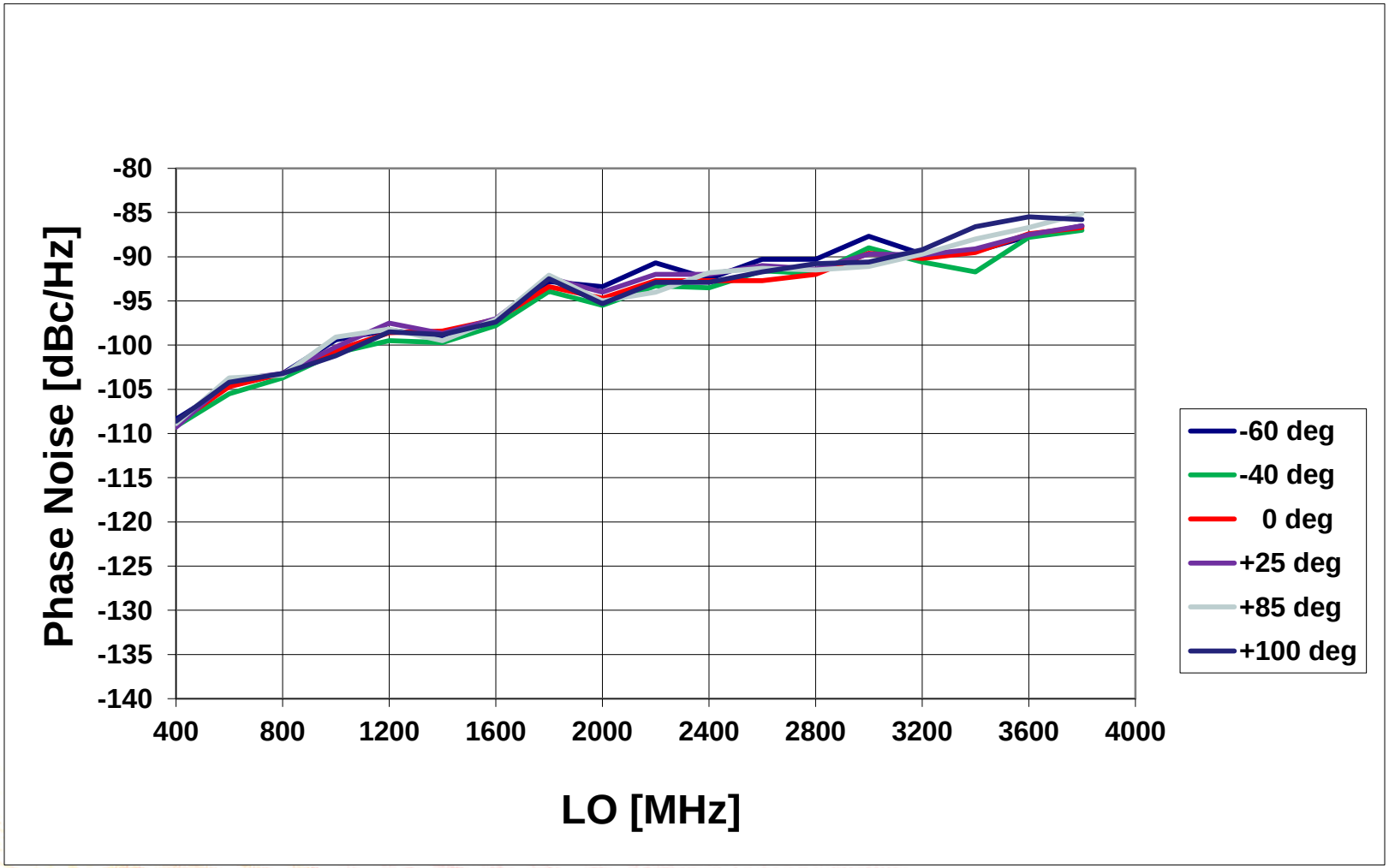
TX ACPR2


ACPR2 [dBc]
-45.0
-47.0
-49.0
-51.0
-53.0
-55.0
-57.0
-59.0
-61.0
-63.0
-65.0
400
800
1200
1600
2000
2400
2800
3200
3600
4000
LO [MHz]
-60 deg
-40 deg
0 deg
+25 deg
+85 deg
+100 deg

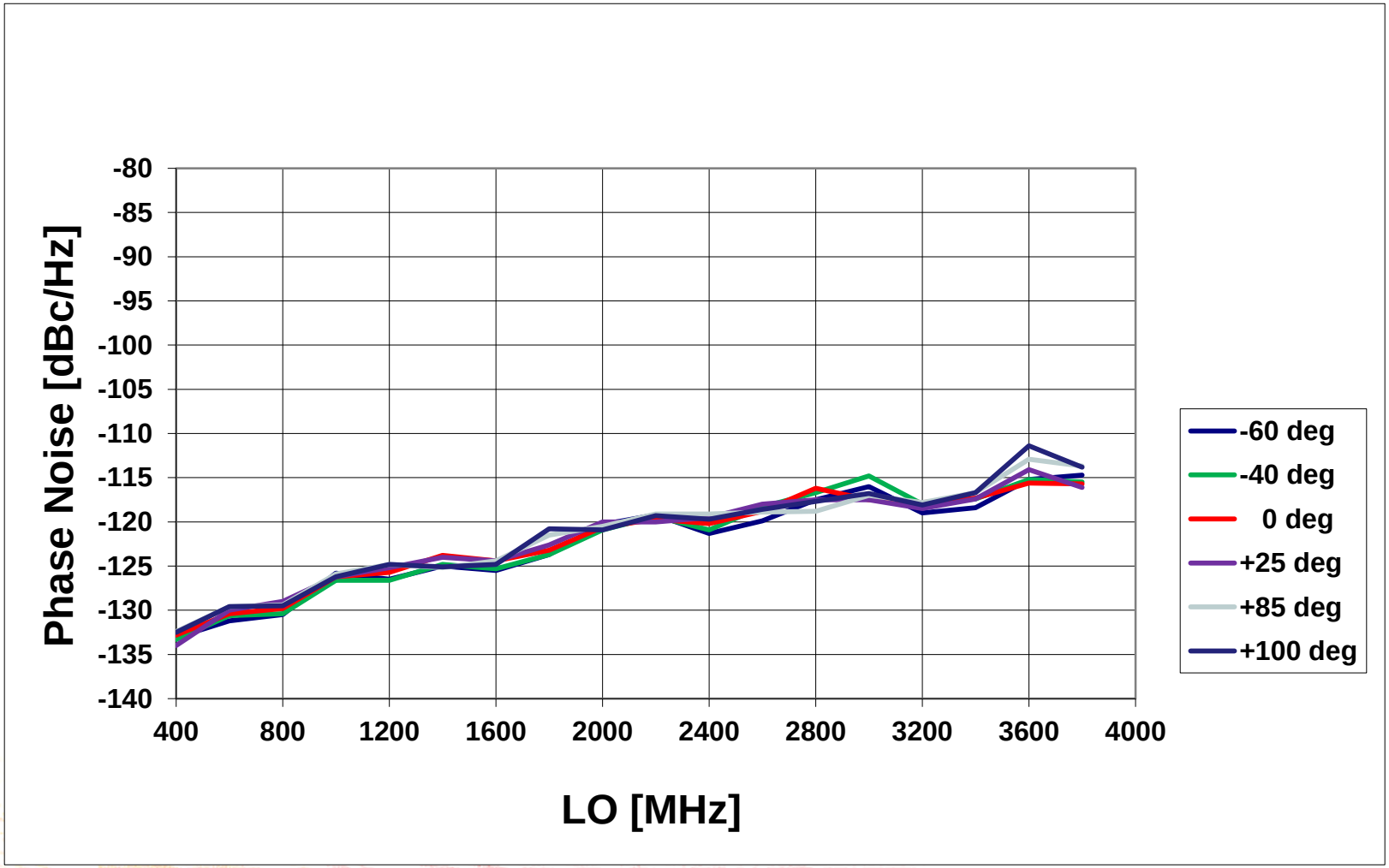
TX/RX PLL Phase Noise at 10kHz



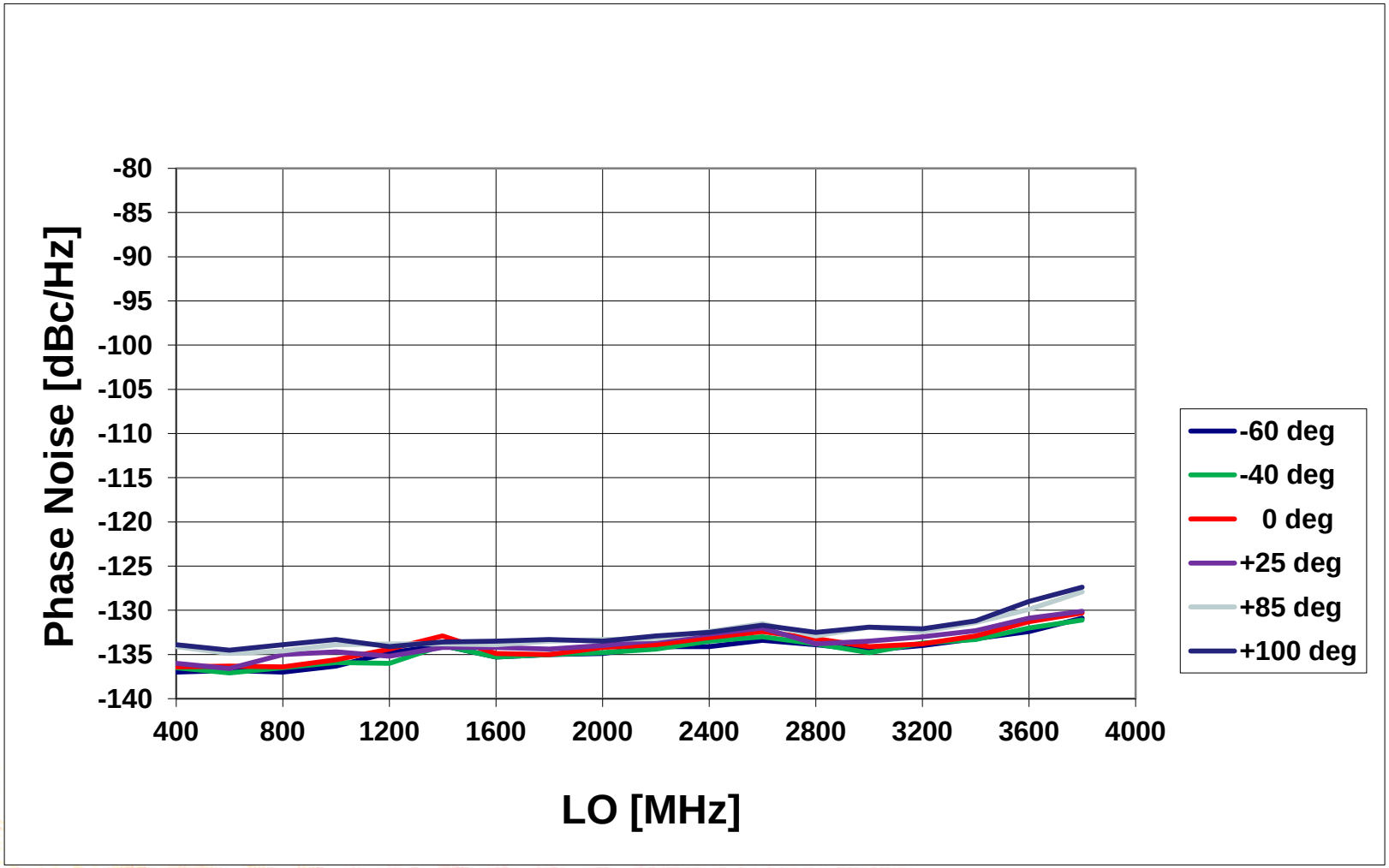
TX/RX PLL Phase Noise at 100kHz



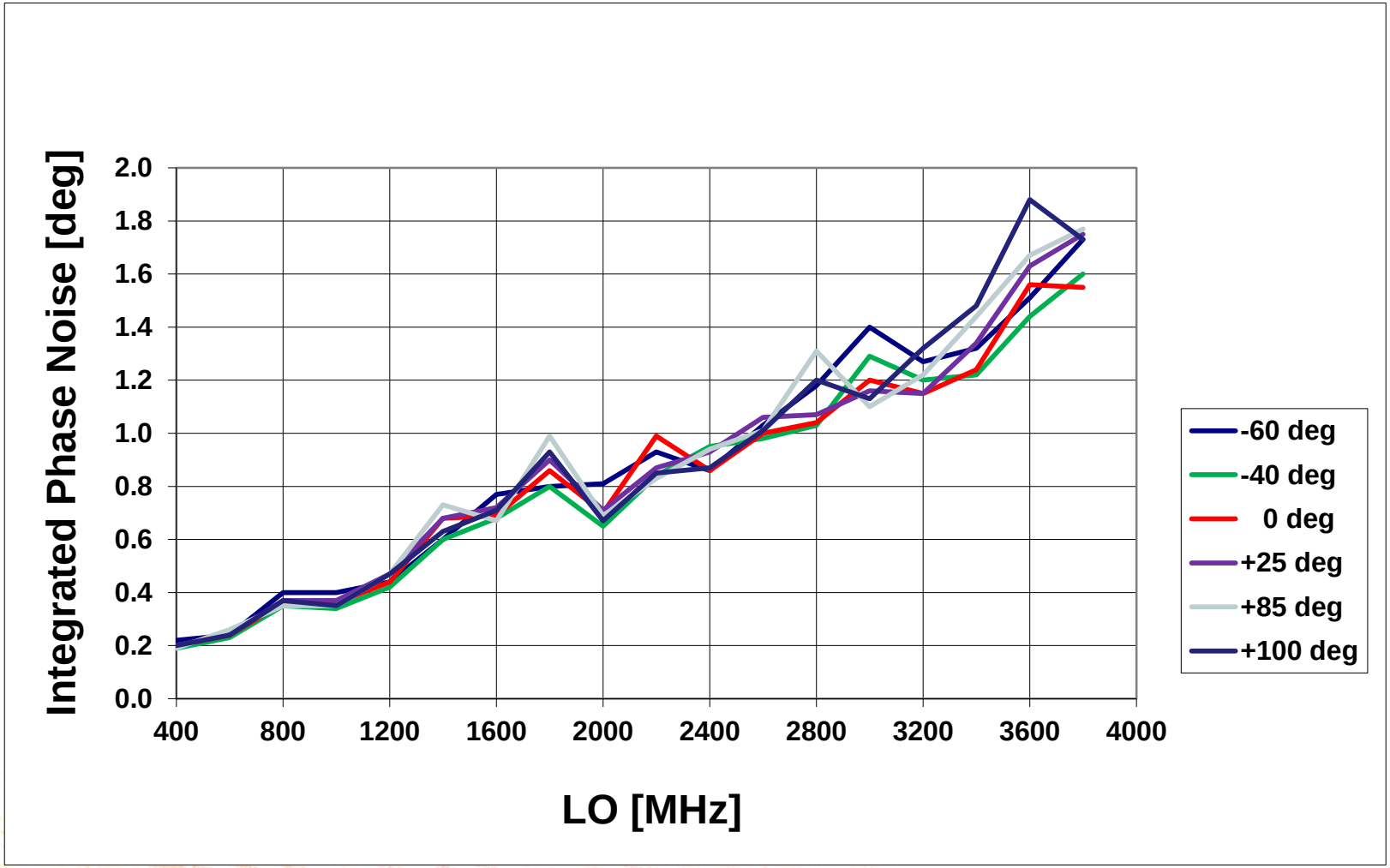
TX/RX PLL Phase Noise at 1MHz



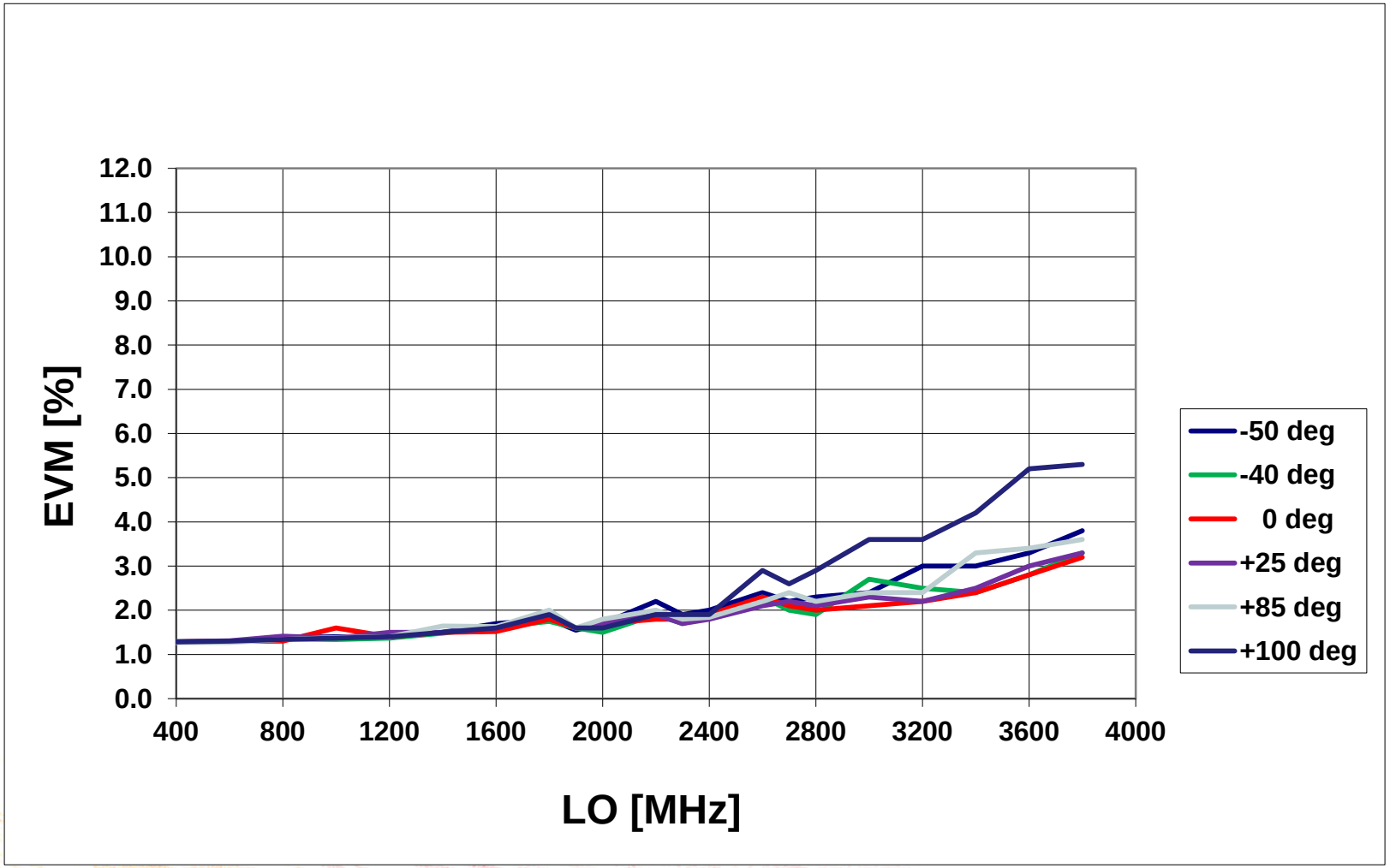
TX/RX PLL Phase Noise at 10MHz



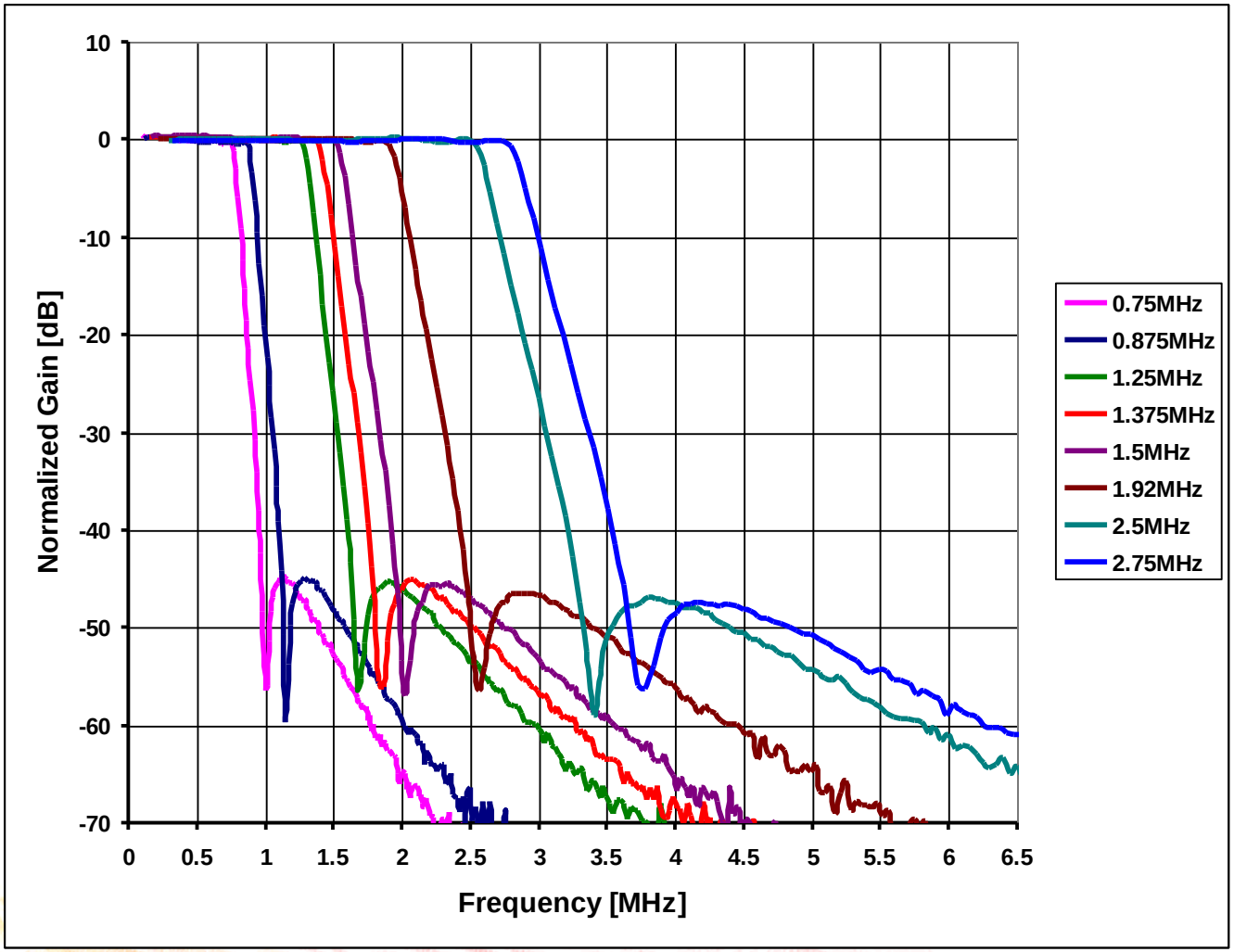
TX/RX PLL Integrated Phase Noise



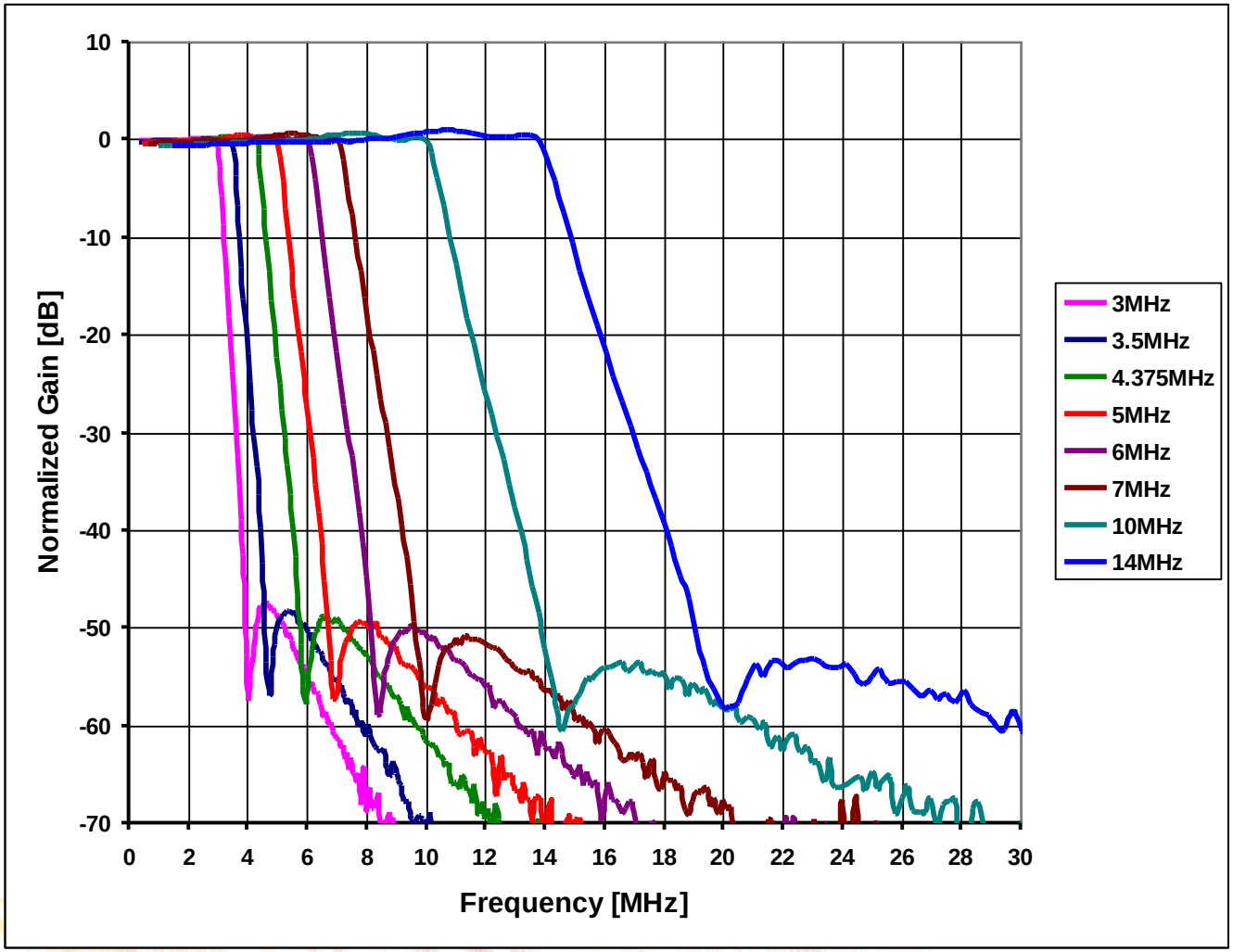
TX EVM


EVM [%]
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
400
800
1200
1600
2000
2400
2800
3200
3600
4000
LO [MHz]
-50 deg
-40 deg
0 deg
+25 deg
+85 deg
+100 deg

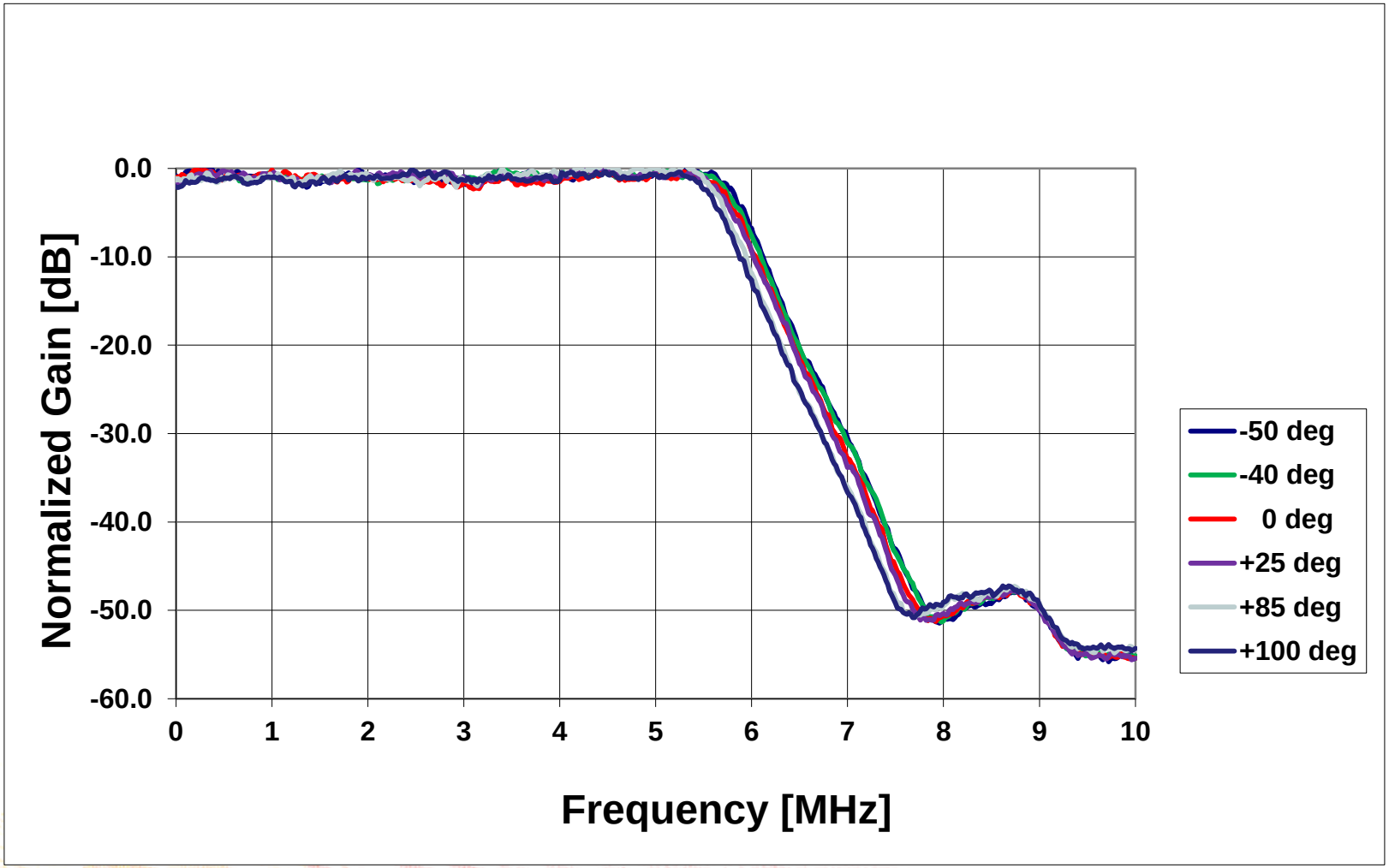
TX/RX LPF Responses at Room Temperature



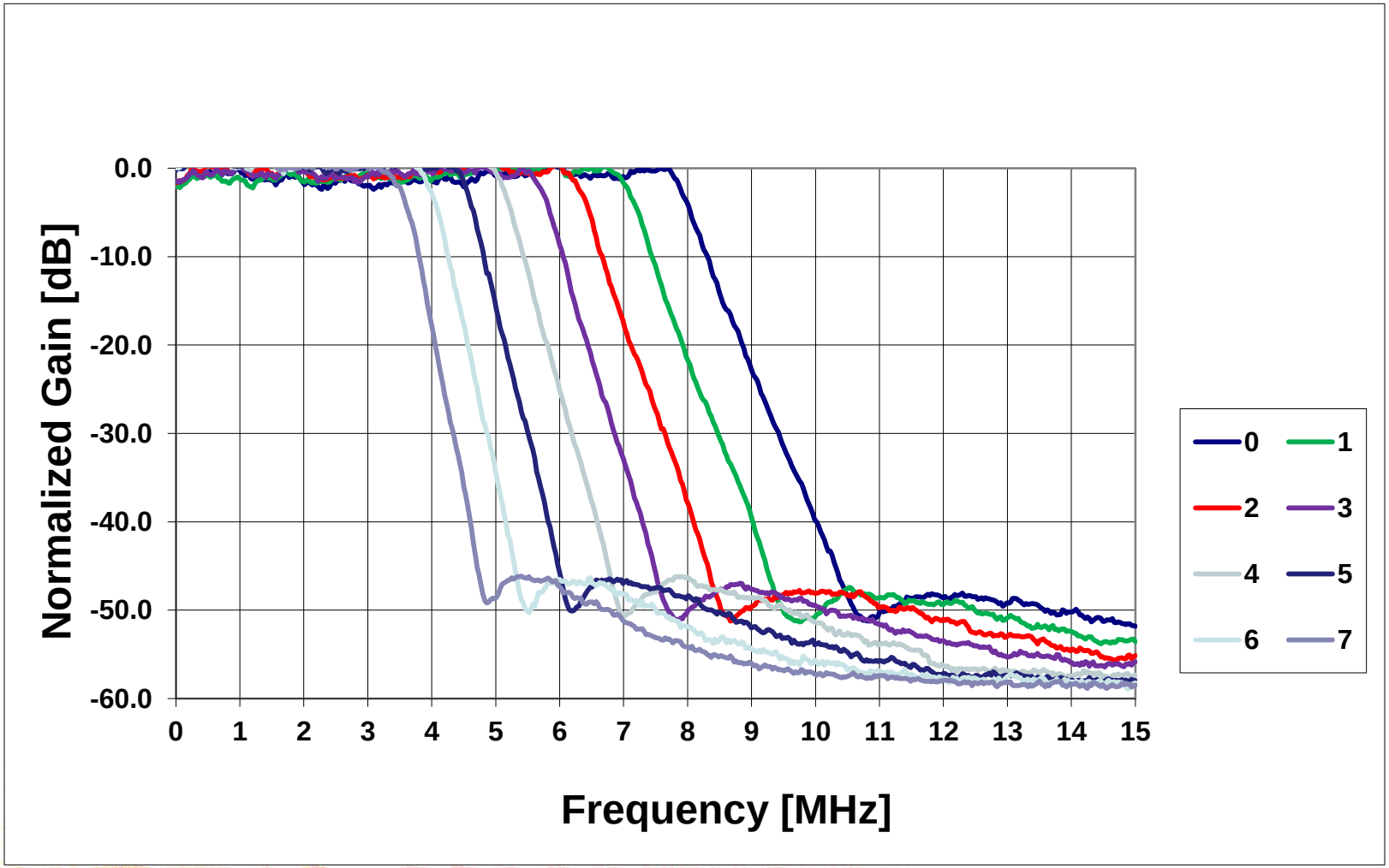
TX/RX LPF Responses at Room Temperature



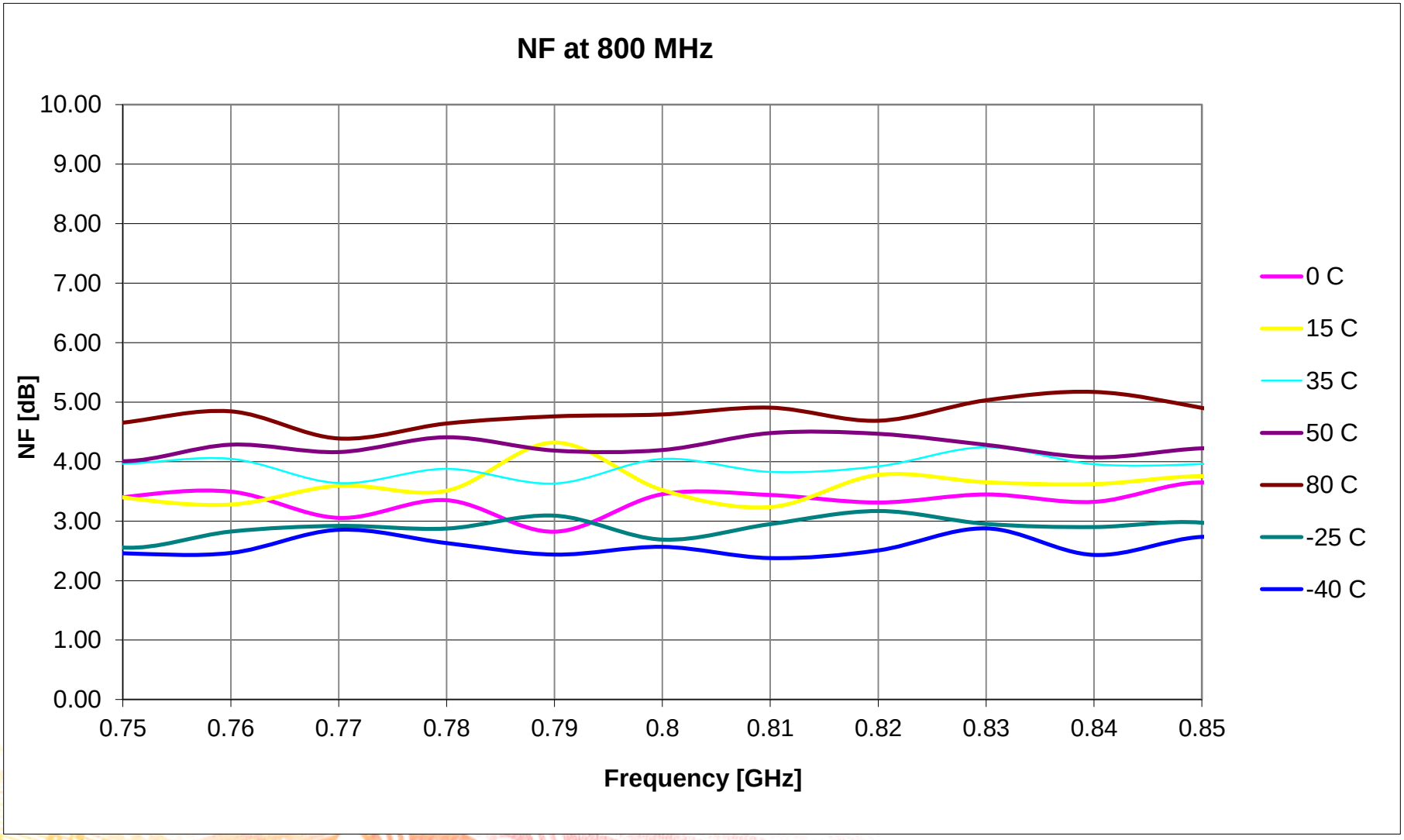
TX/RX 5MHz LPF Response vs Temperature



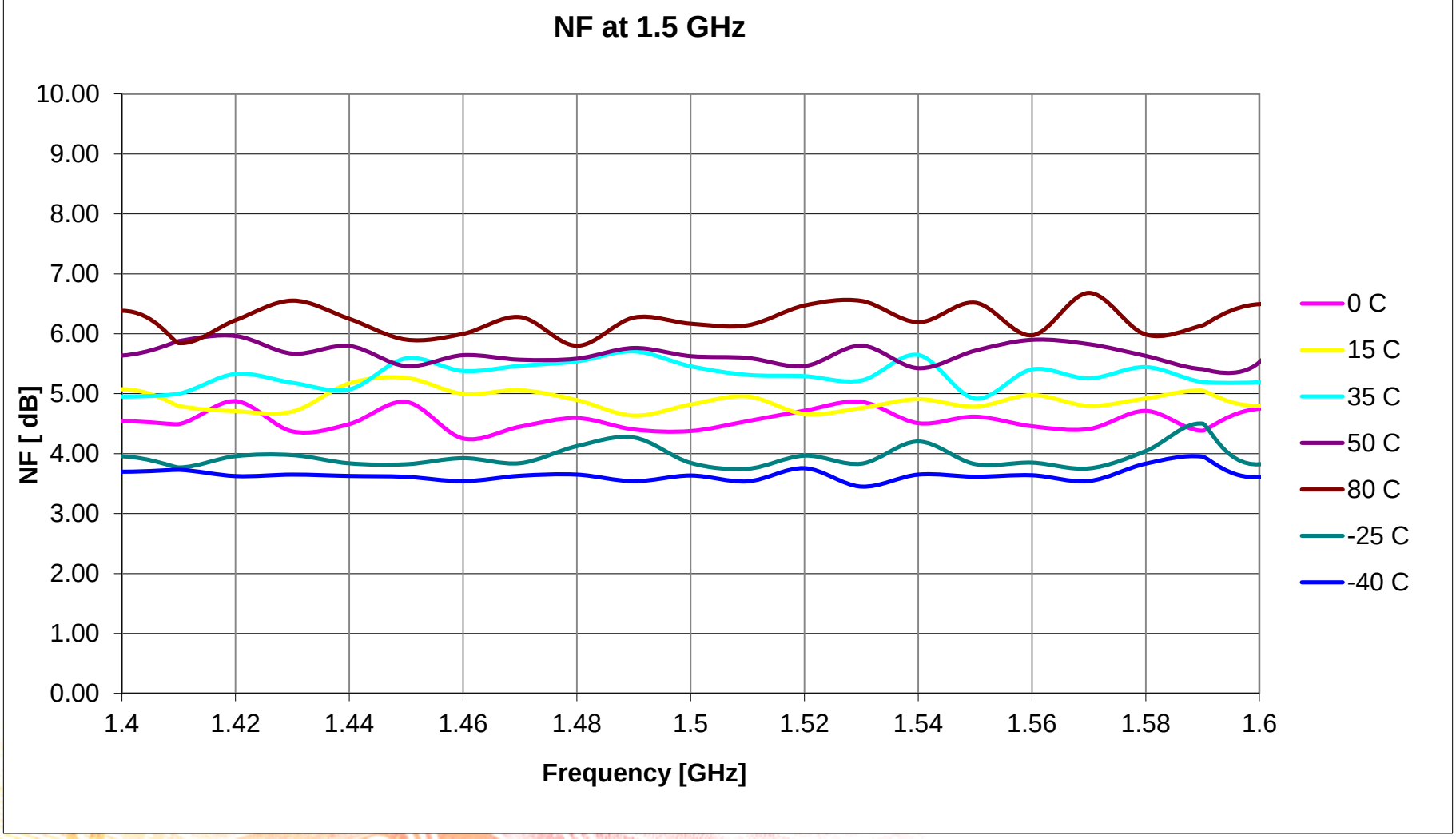
TX/RX 5MHz LPF Process Tuning Capability



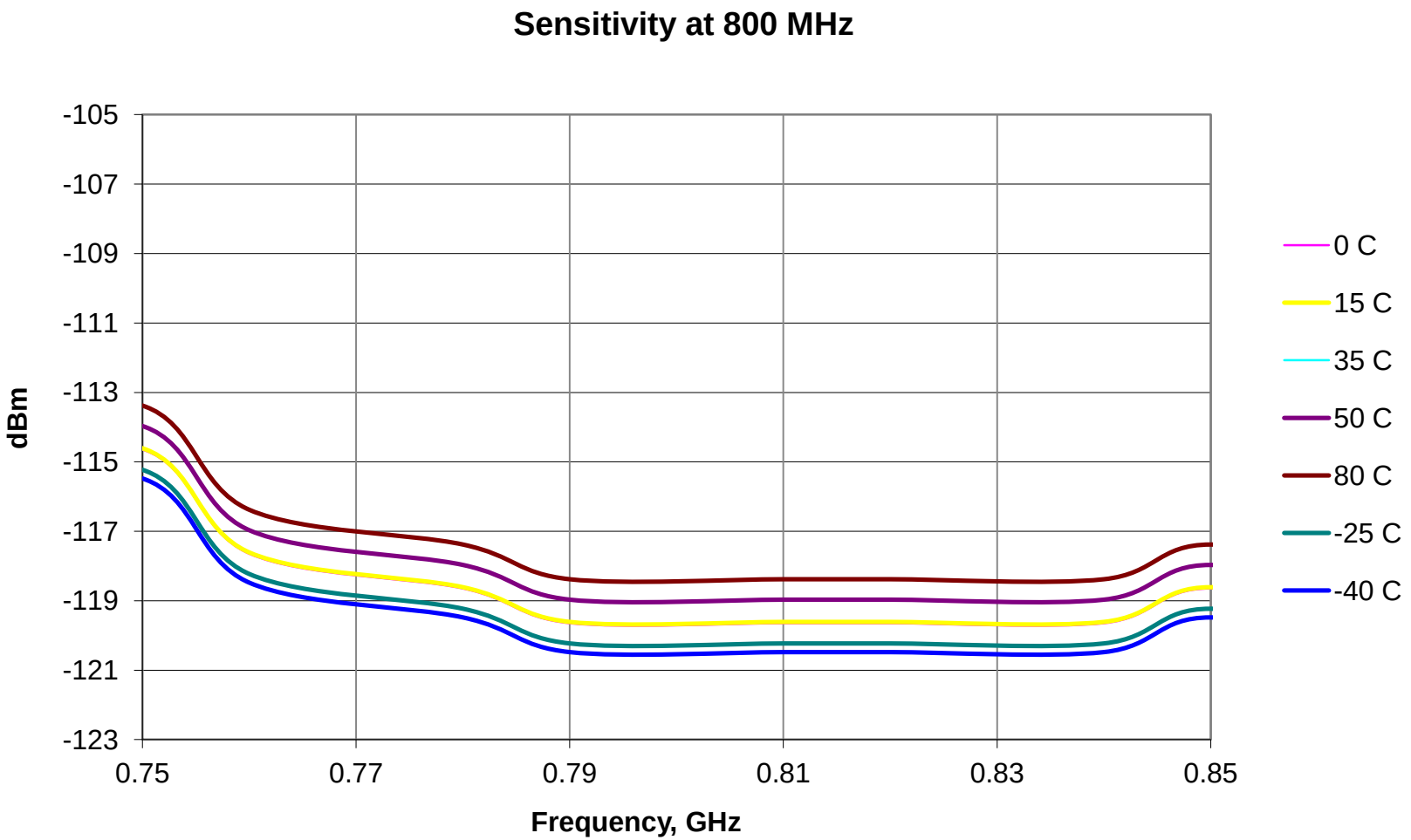
Noise Figure at 800 MHz



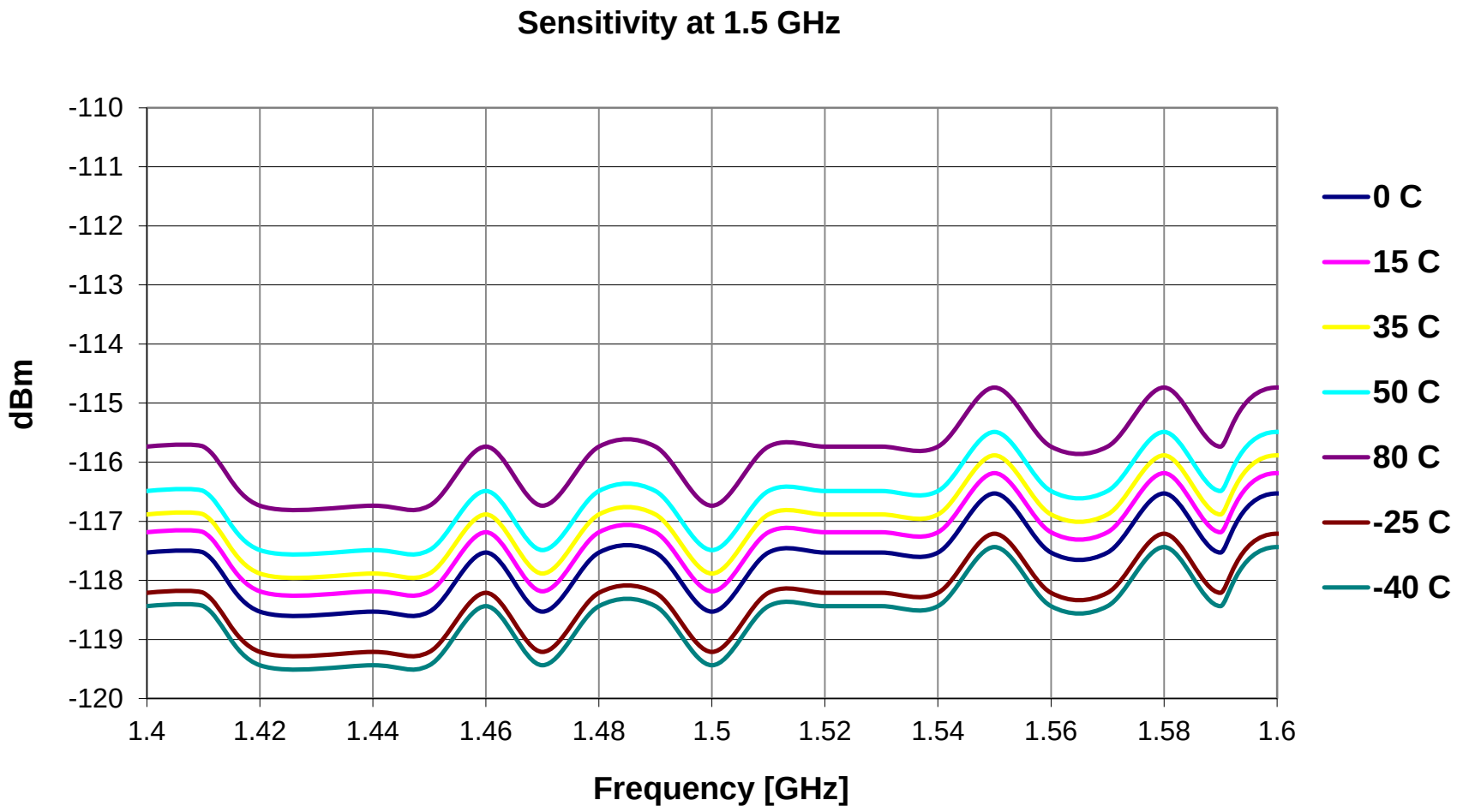
Noise Figure at 1.5 GHz



Sensitivity Measurements at 800 MHz



Sensitivity Measurements at 1.5 GHz

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