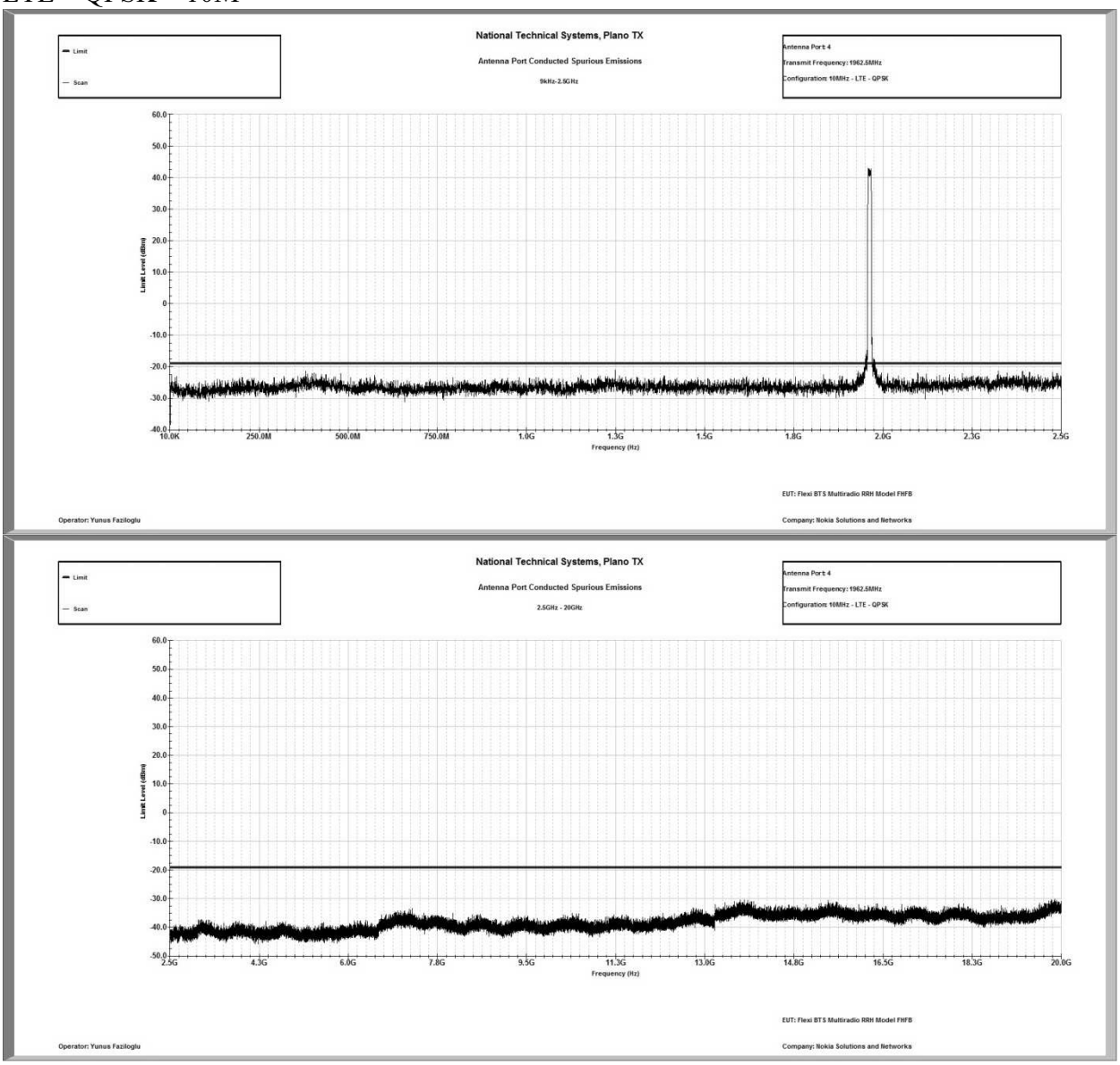
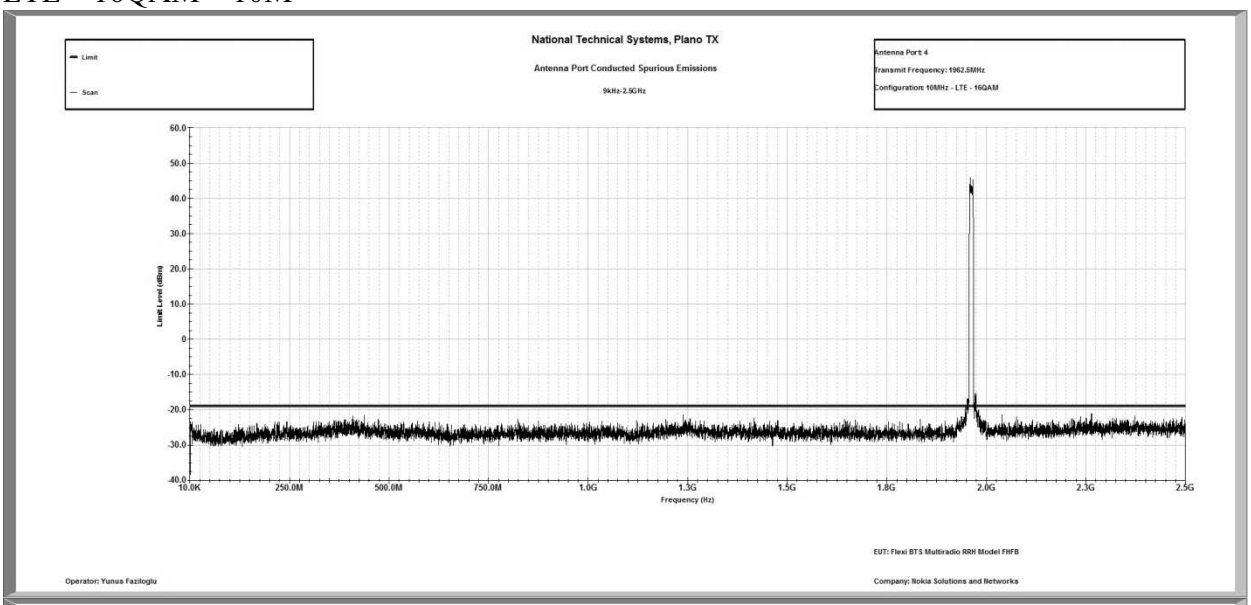
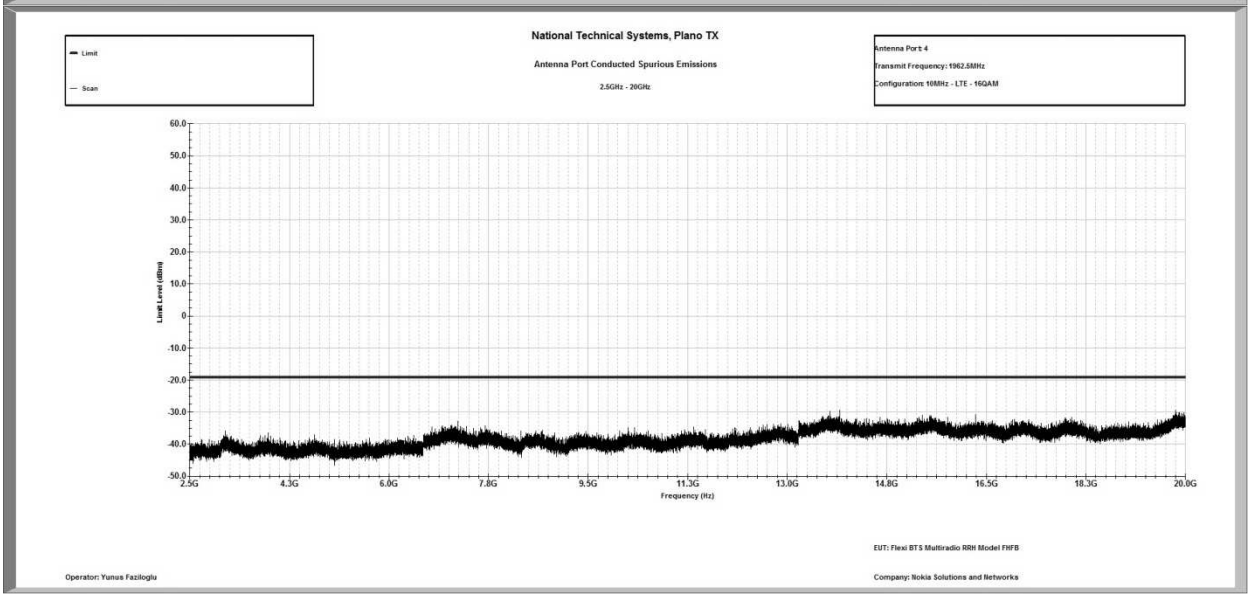
LTE – QPSK – 10M

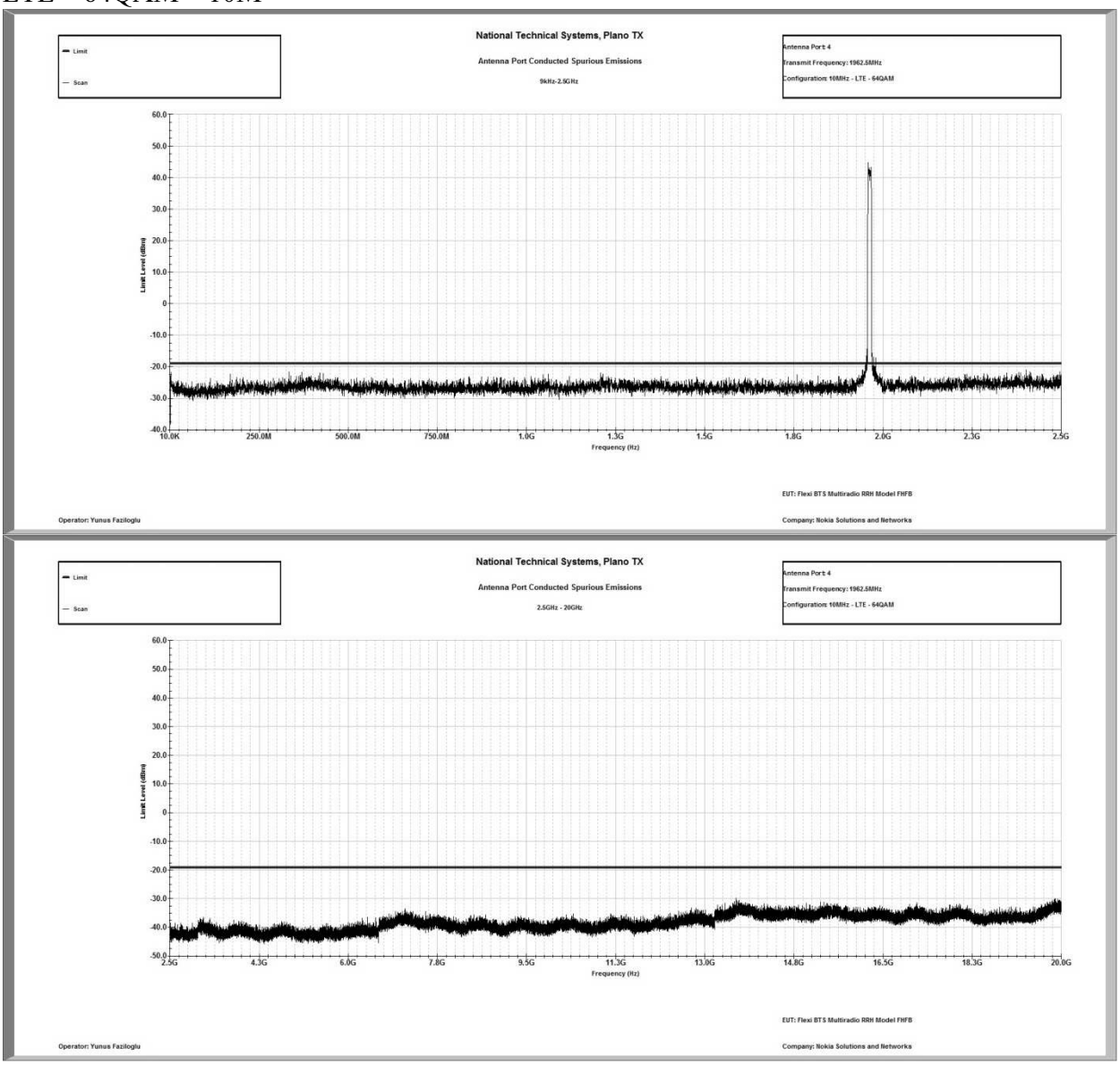

National Technical Systems, Plano TX
Antenna Port Conducted Spurious Emissions
9kHz-2.5GHz
Limit
Scan
Antenna Port: 4
Transmit Frequency: 1962.5MHz
Configuration: 10MHz - LTE - QPSK
Limit Level (dBm)
Frequency (Hz)
EUT: Flexi BTS Multiradio RRH Model FHFB
Operator: Yunus Fazilioglu
Company: Nokia Solutions and Networks
National Technical Systems, Plano TX
Antenna Port Conducted Spurious Emissions
2.5GHz - 20GHz
Limit
Scan
Antenna Port: 4
Transmit Frequency: 1962.5MHz
Configuration: 10MHz - LTE - QPSK
Limit Level (dBm)
Frequency (Hz)
EUT: Flexi BTS Multiradio RRH Model FHFB
Operator: Yunus Fazilioglu
Company: Nokia Solutions and Networks

LTE – 16QAM – 10M

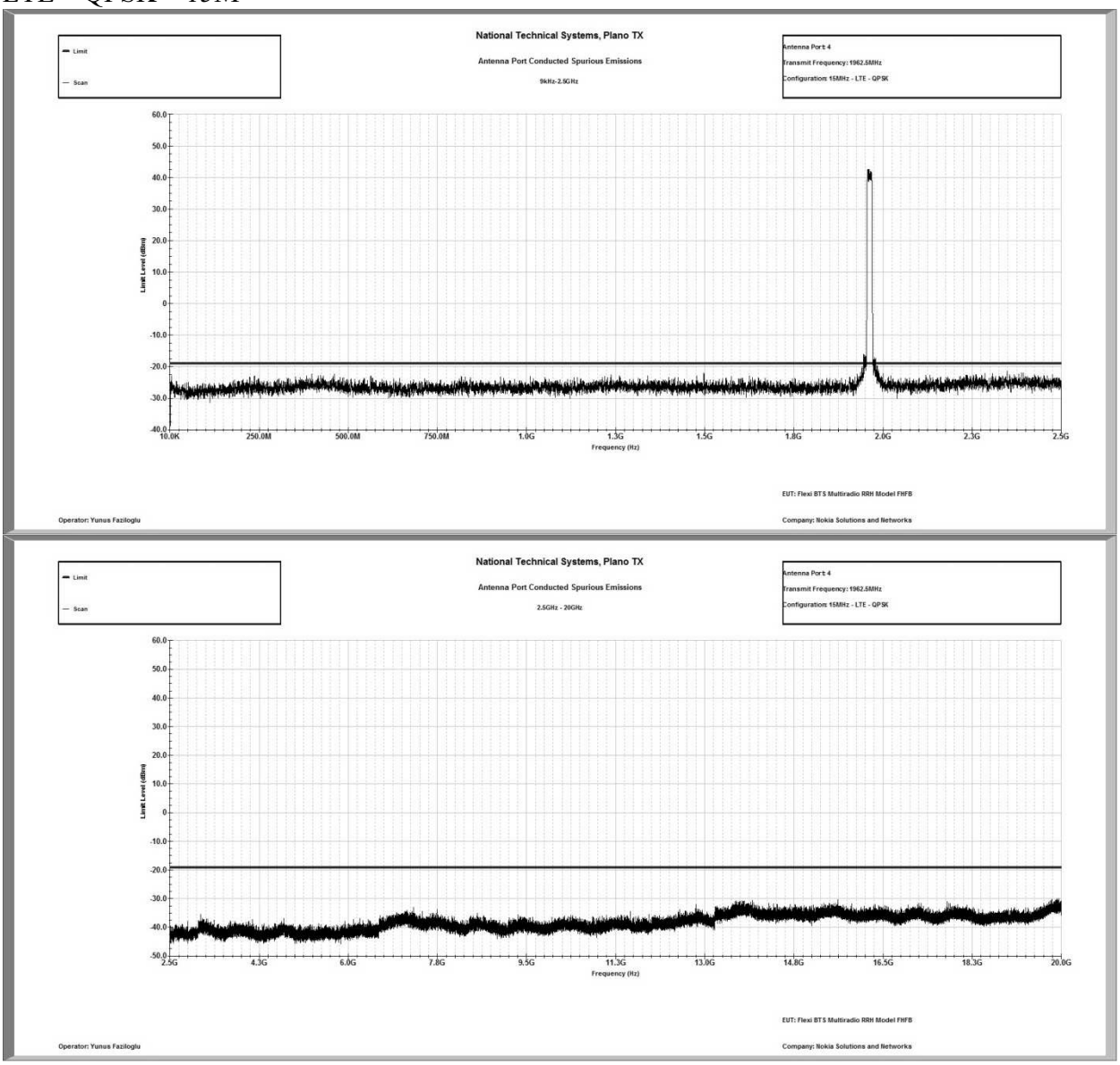




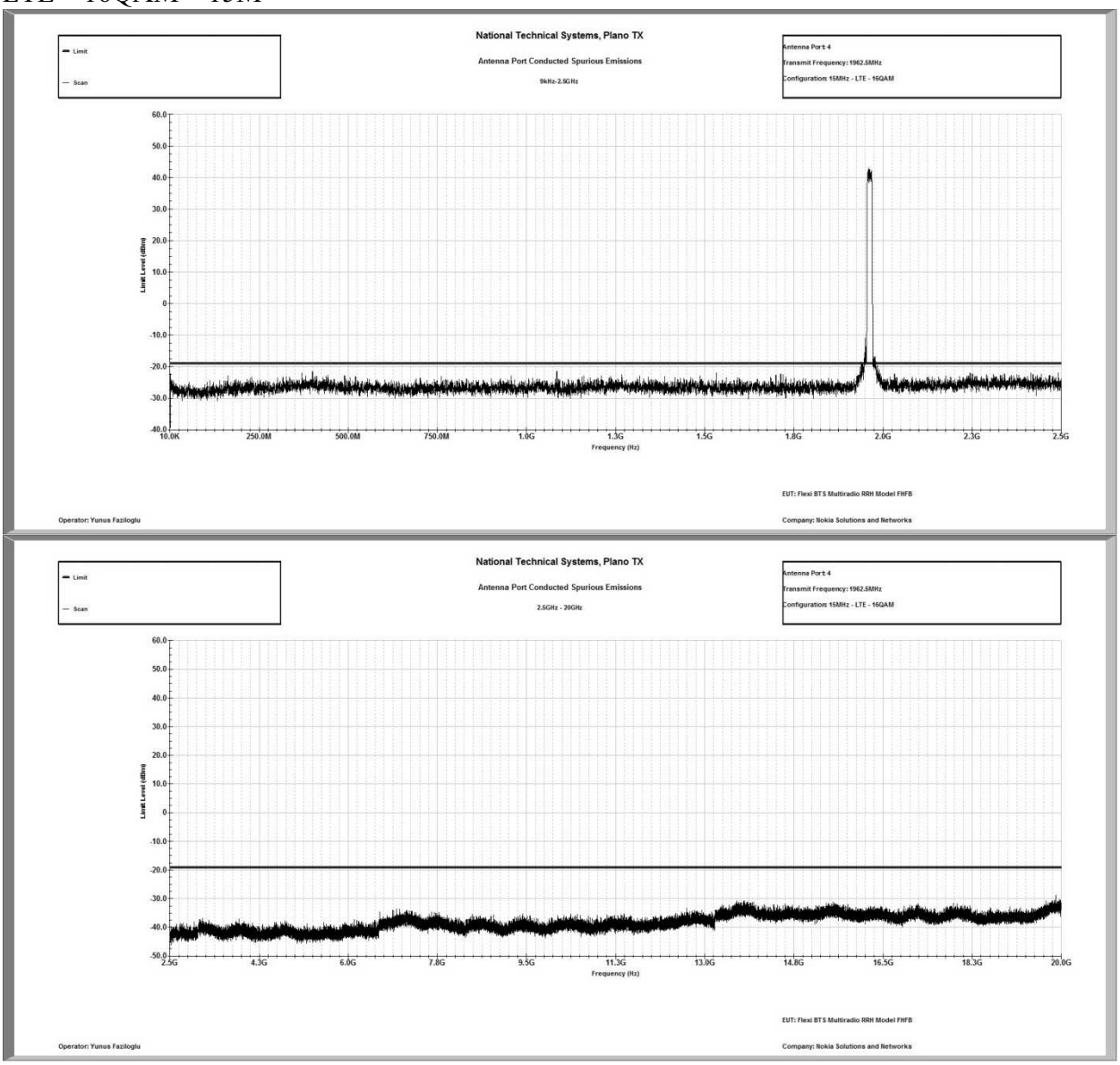
LTE – 64QAM – 10M



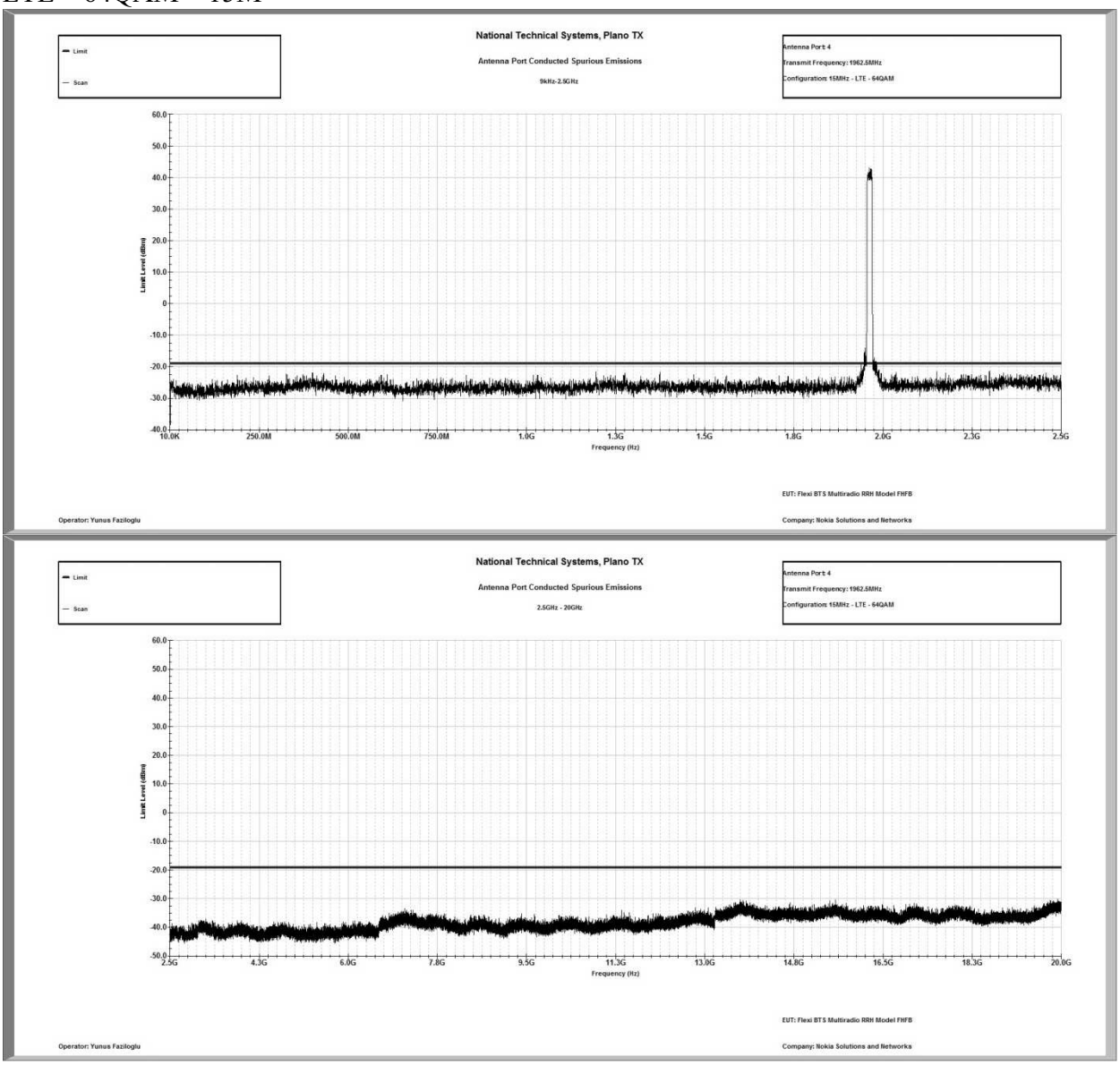
LTE – QPSK – 15M


National Technical Systems, Plano TX
Antenna Port Conducted Spurious Emissions
9kHz-2.5GHz
Limit
Scan
Antenna Port 4
Transmit Frequency: 1962.5MHz
Configuration: 15MHz - LTE - QPSK
Limit Level (dBm)
Frequency (Hz)
EUT: Flexi BTS Multiradio RRH Model FHFB
Operator: Yunus Fazilioglu
Company: Nokia Solutions and Networks
National Technical Systems, Plano TX
Antenna Port Conducted Spurious Emissions
2.5GHz - 20GHz
Limit
Scan
Antenna Port 4
Transmit Frequency: 1962.5MHz
Configuration: 15MHz - LTE - QPSK
Limit Level (dBm)
Frequency (Hz)
EUT: Flexi BTS Multiradio RRH Model FHFB
Operator: Yunus Fazilioglu
Company: Nokia Solutions and Networks

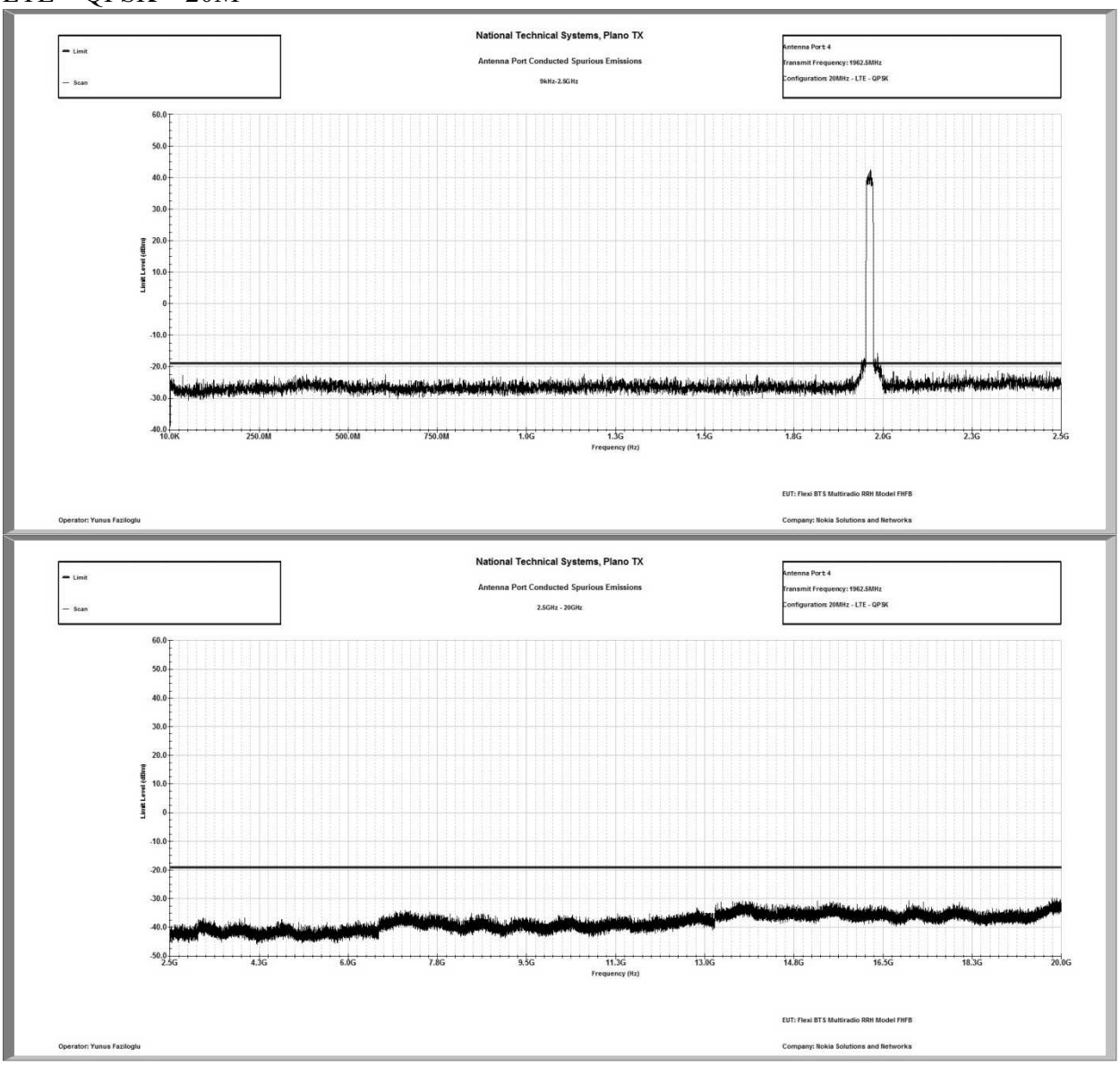
LTE – 16QAM – 15M



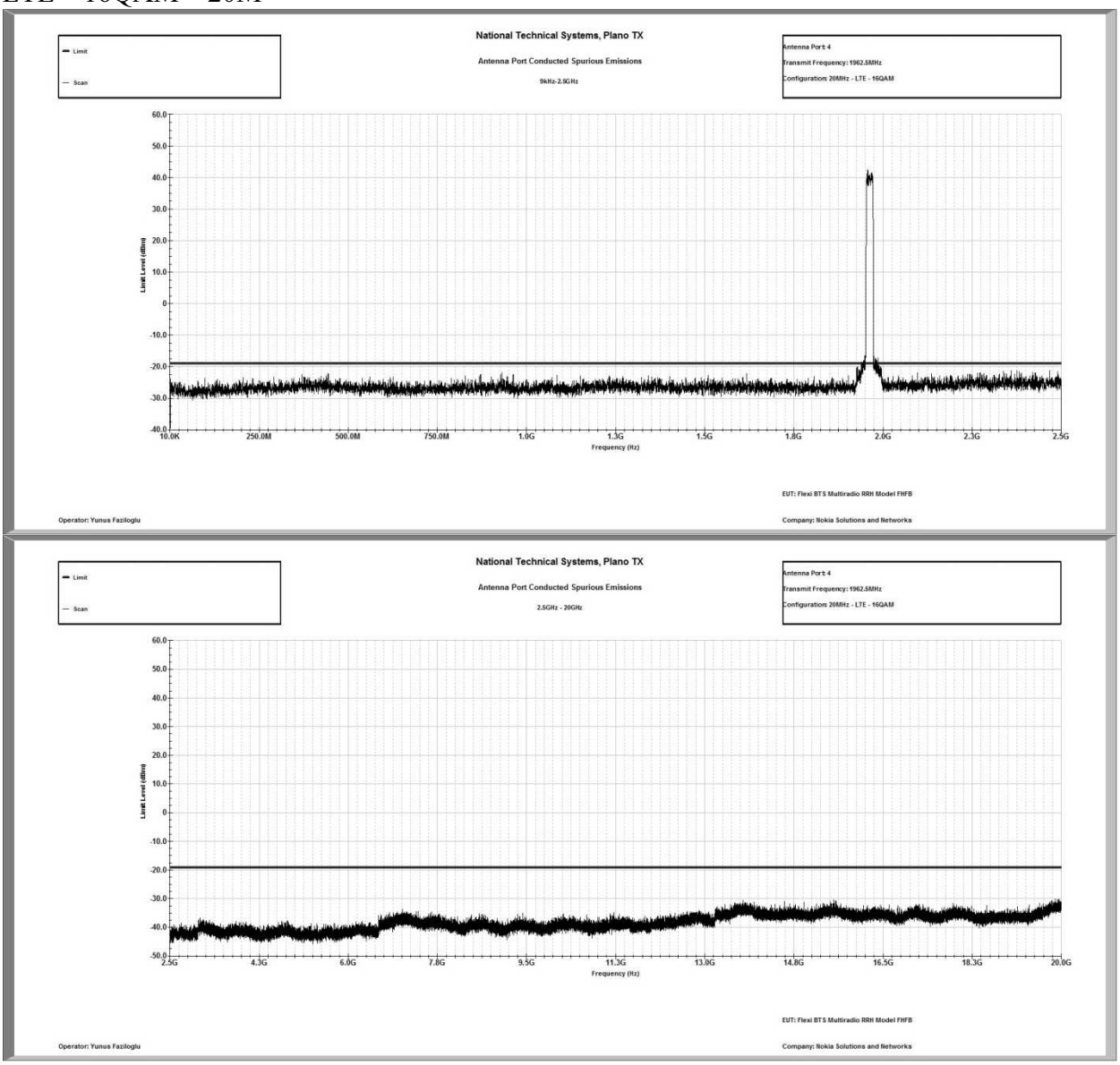
LTE – 64QAM – 15M



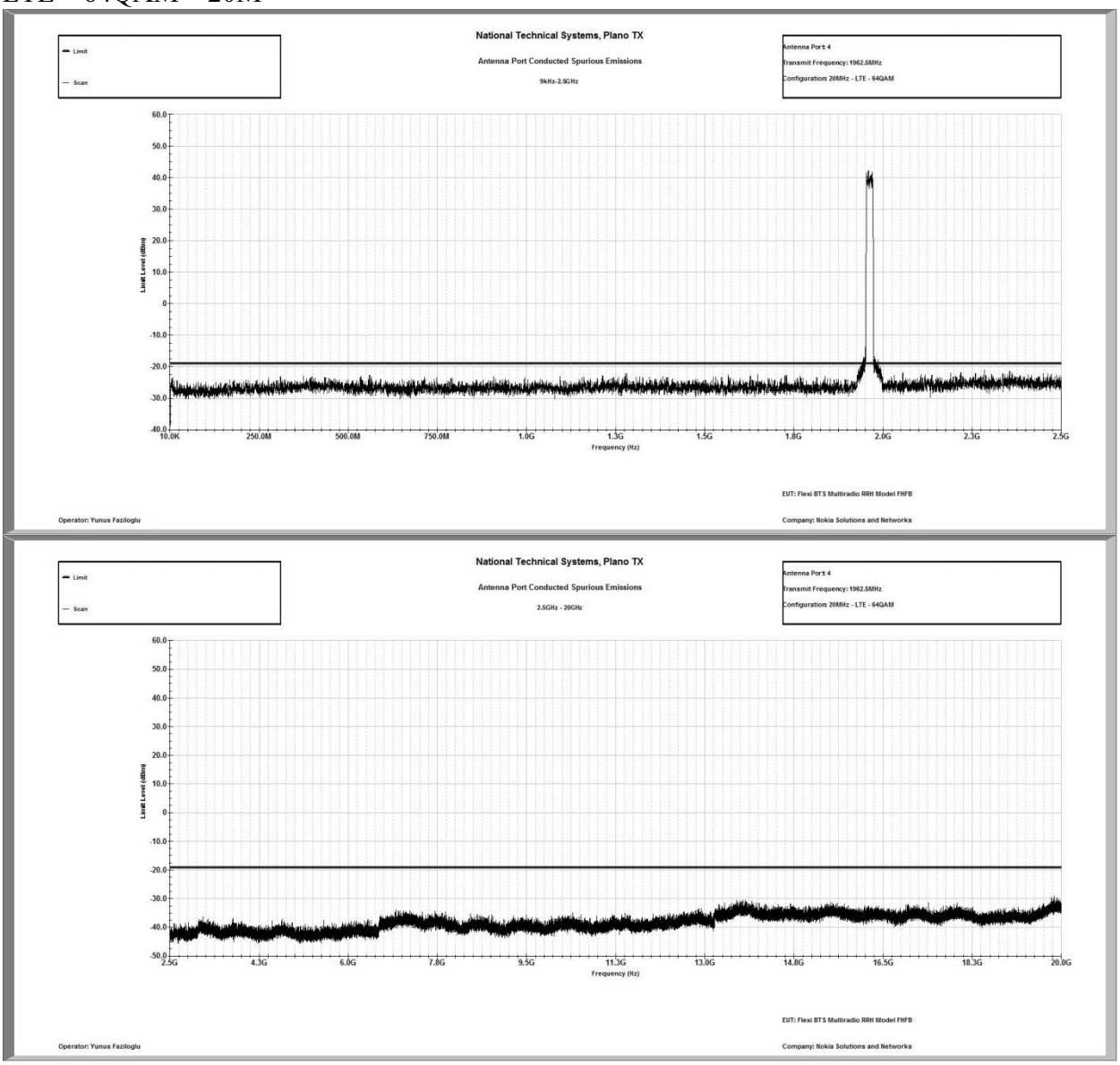
LTE – QPSK – 20M


National Technical Systems, Plano TX
Antenna Port Conducted Spurious Emissions
9kHz-2.5GHz
Limit
Scan
Antenna Port: 4
Transmit Frequency: 1962.5MHz
Configuration: 20MHz - LTE - QPSK
Limit Level (dBm)
Frequency (Hz)
EUT: Flexi BTS Multiradio RRH Model FHFB
Operator: Yunus Fazilioglu
Company: Nokia Solutions and Networks
National Technical Systems, Plano TX
Antenna Port Conducted Spurious Emissions
2.5GHz - 20GHz
Limit
Scan
Antenna Port: 4
Transmit Frequency: 1962.5MHz
Configuration: 20MHz - LTE - QPSK
Limit Level (dBm)
Frequency (Hz)
EUT: Flexi BTS Multiradio RRH Model FHFB
Operator: Yunus Fazilioglu
Company: Nokia Solutions and Networks

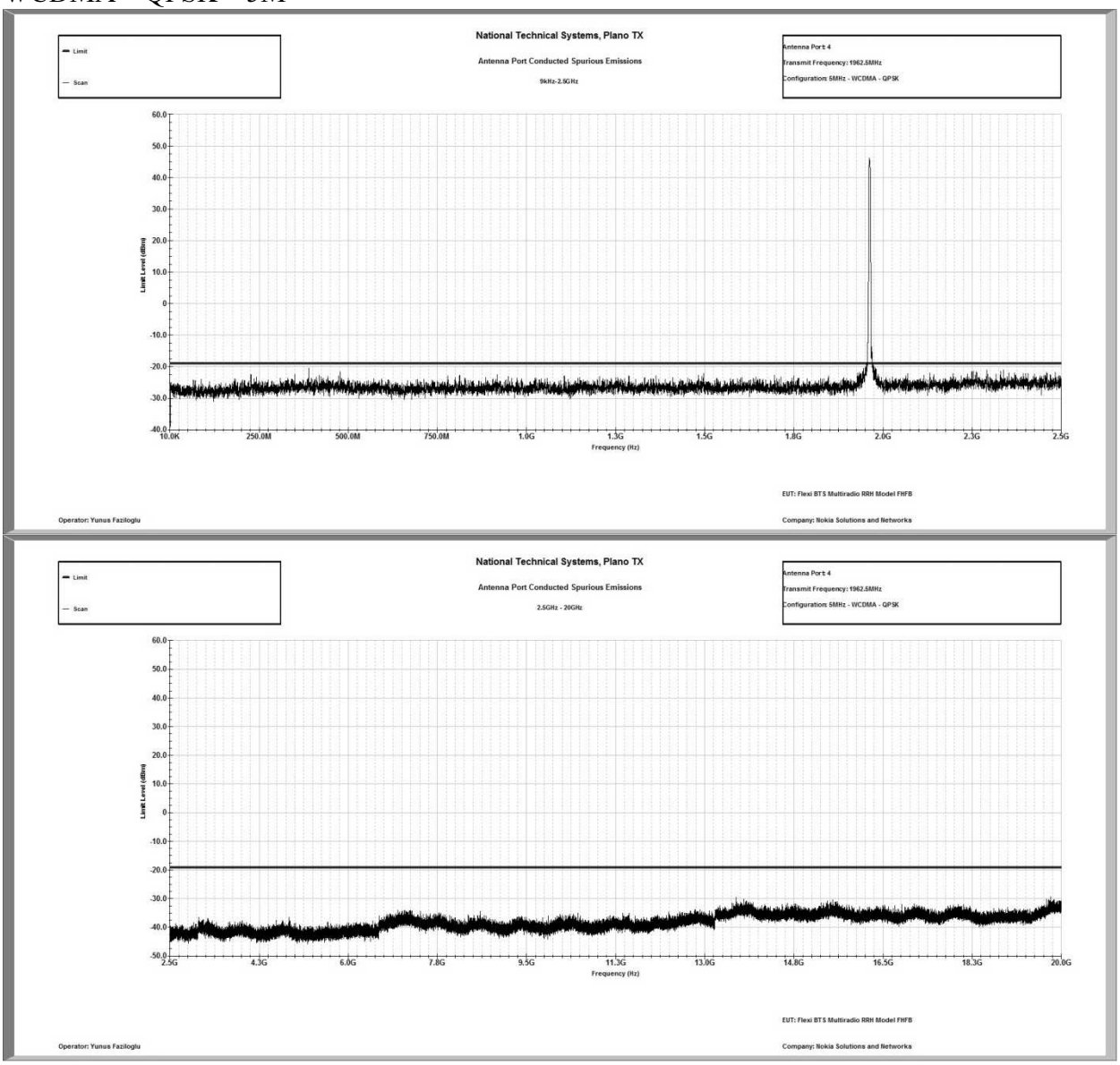
LTE – 16QAM – 20M



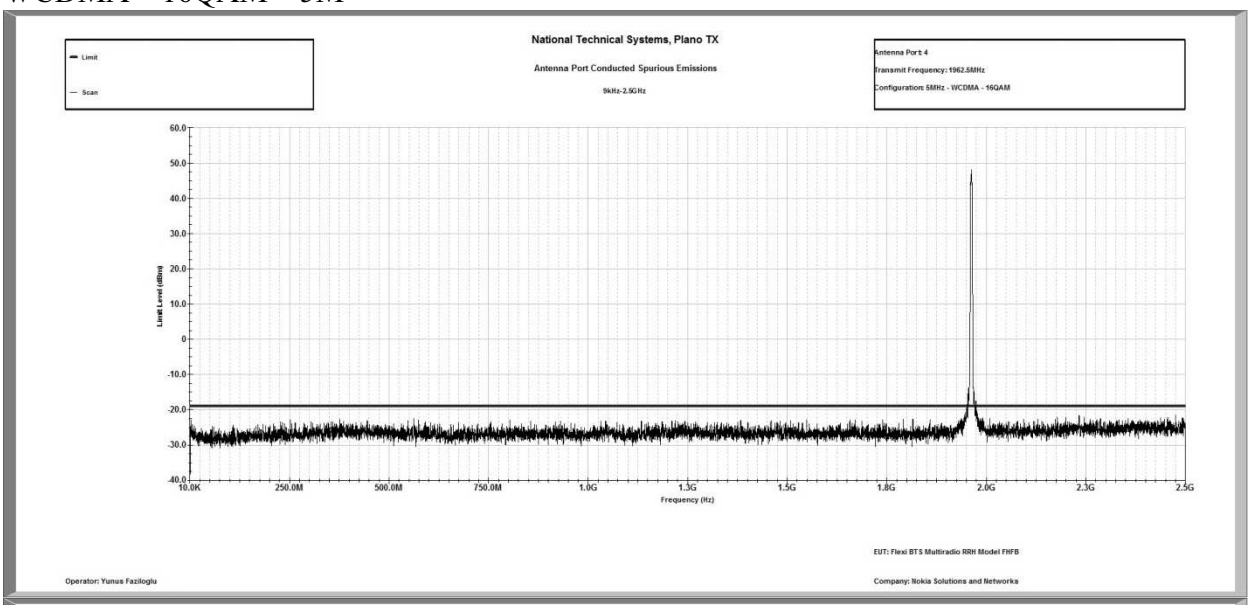
LTE – 64QAM – 20M

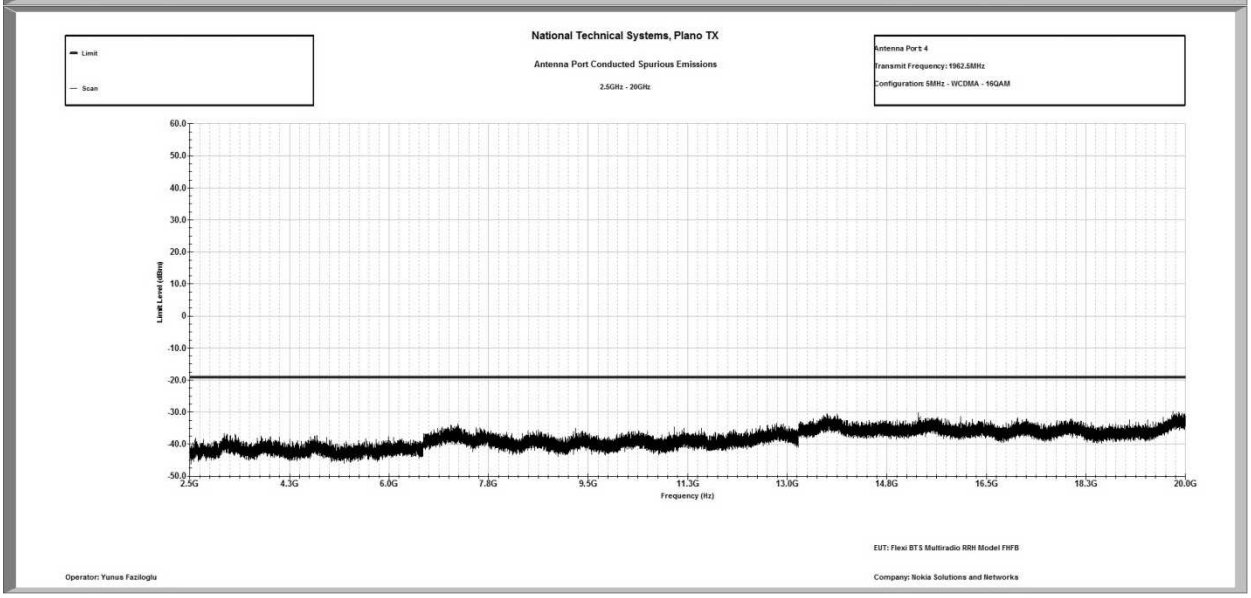


WCDMA – QPSK – 5M

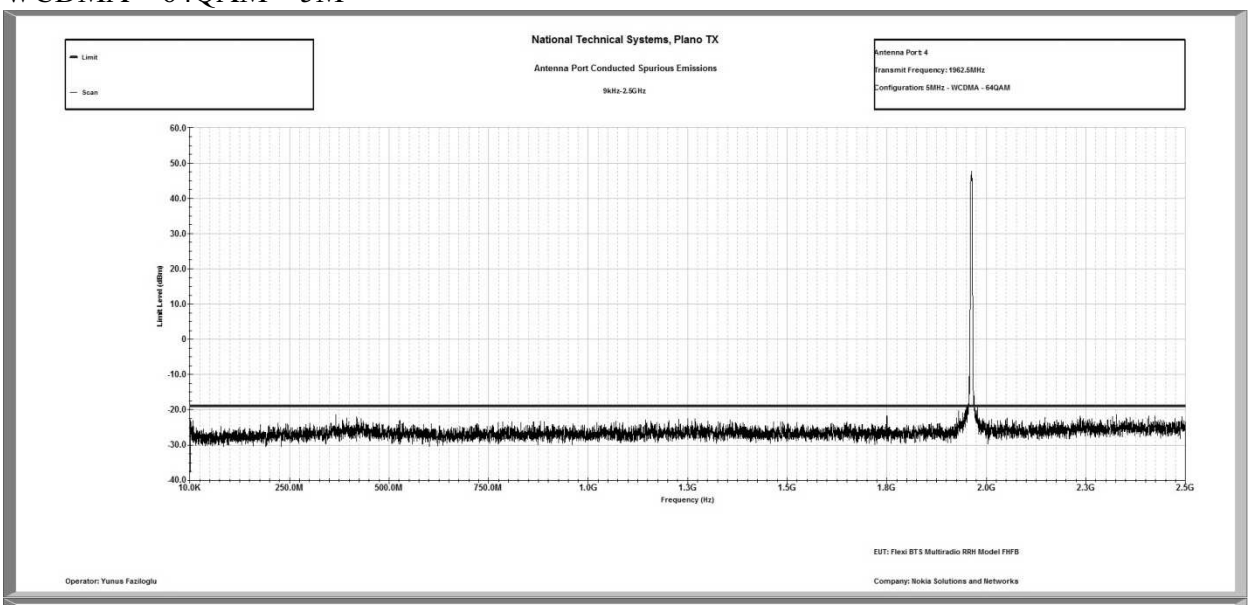


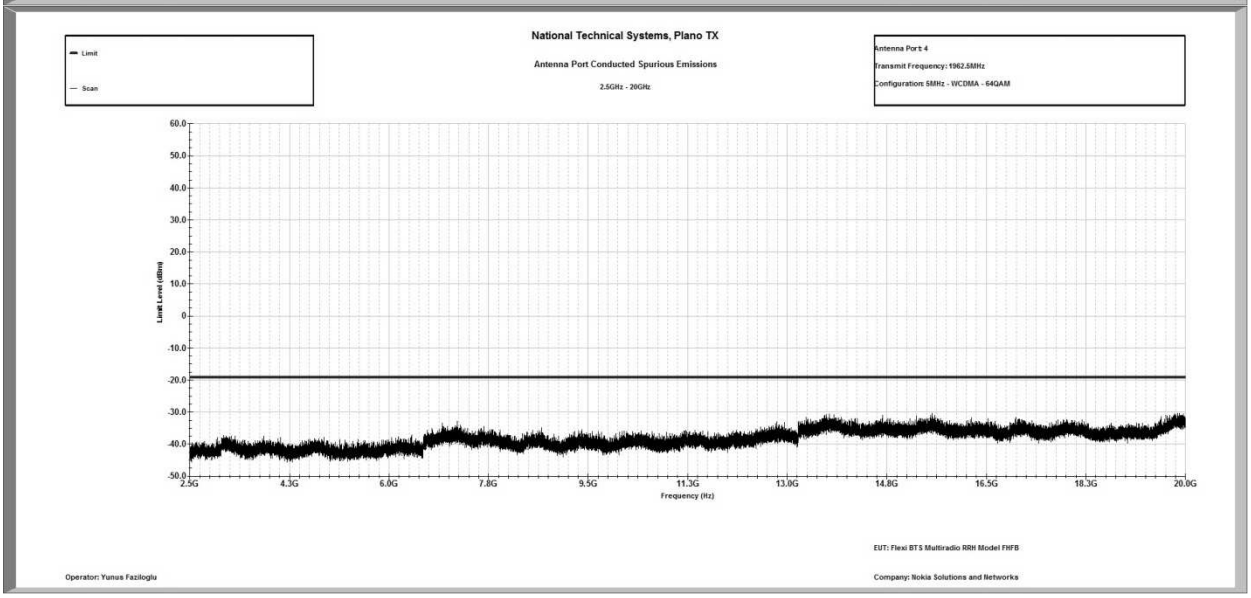
WCDMA – 16QAM – 5M





WCDMA – 64QAM – 5M





Transmitter Radiated Spurious Emissions

Antenna port conducted spurious emissions results for all modulations and channel bandwidth modes produced similar results around instrumentation noise floor. Prescans have been performed in the 30MHz – 20GHz frequency range when the unit was transmitting on its center channel at 1962.5MHz in 5MHz – 16QAM mode for LTE and 5MHz – QPSK mode for WCDMA. Final maximized peak radiated emissions were measured in these modes.

During testing all 4 antenna ports of the base station were terminated with 50ohm termination blocks. Unit was transmitting on its antenna ports 3 and 4 at full power during all testing.

LTE - 5M - 16QAM								
Frequency (MHz)	Polarity (H/V)	Raw Reading at 3m (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Field Strength at 3m (dBuV/m)	Limit at 3m (dBuV/m)	Margin (dB)
921.6	V	49.5	-39.8	24.55	2.84	37.09	76.2	-39.11
921.6	H	47.2	-39.8	24.55	2.84	34.79	76.2	-41.41
2457.6	V	65.1	-48.2	28.6	2.1	47.6	76.2	-28.6
2457.6	H	63.5	-48.2	28.6	2.1	46	76.2	-30.2
3925	H	62	-47	32.7	2.9	50.6	76.2	-25.6
3925	V	58.4	-47	32.7	2.9	47	76.2	-29.2
Corrected Field Strength = Raw Reading + Amplifier Gain + Antenna Factor + Cable Loss								
Negative margin indicates a passing result.								
Detector: Peak, RBW=1MHz, VBW=3MHz, Max-hold								

WCDMA - 5M - QPSK								
Frequency (MHz)	Polarity (H/V)	Raw Reading at 3m (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Field Strength at 3m (dBuV/m)	Limit at 3m (dBuV/m)	Margin (dB)
921.6	H	48.9	-39.8	24.55	2.84	36.49	76.2	-39.71
921.6	V	50	-39.8	24.55	2.84	37.59	76.2	-38.61
2457.6	V	63.2	-48.2	28.6	2.1	45.7	76.2	-30.5
2457.6	H	58.7	-48.2	28.6	2.1	41.2	76.2	-35
3925	H	56.9	-47	32.7	2.9	45.5	76.2	-30.7
3925	V	57.8	-47	32.7	2.9	46.4	76.2	-29.8
Corrected Field Strength = Raw Reading + Amplifier Gain + Antenna Factor + Cable Loss								
Negative margin indicates a passing result.								
Detector: Peak, RBW=1MHz, VBW=3MHz, Max-hold								

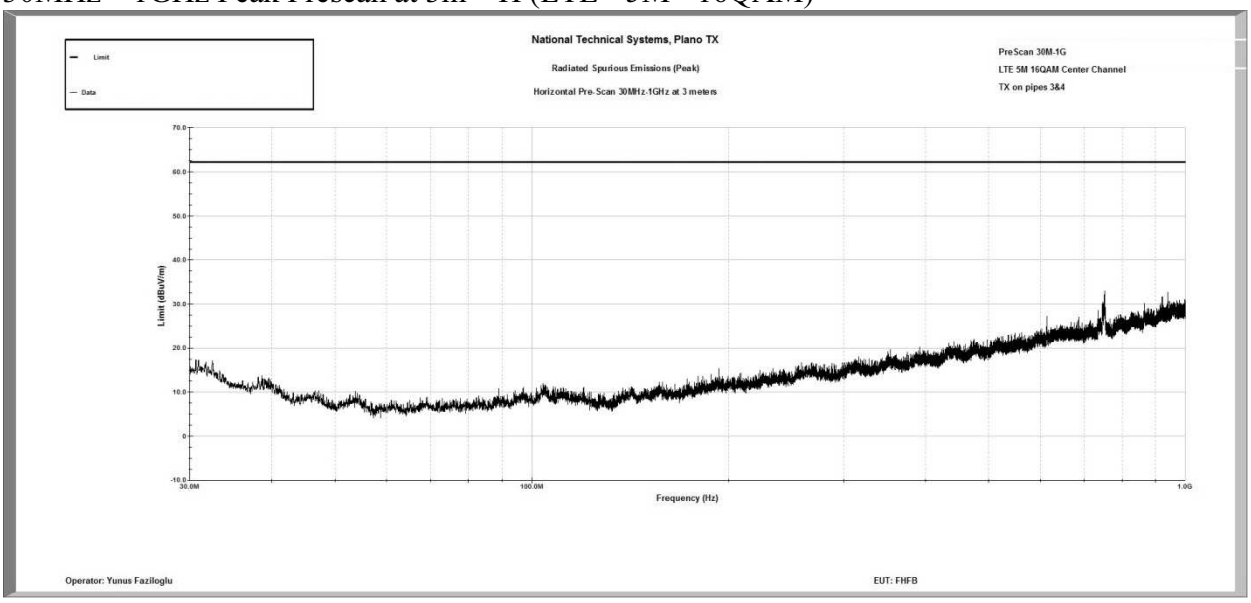
In the 30M-1GHz range emissions recorded were from the unintentional circuitry of the EUT. Harmonics of the fundamental, except for the 2nd harmonic, were below the instrumentation noise floor. All other spurious emissions were below the instrumentation noise floor as well.

Highest noise floor of the measurement instrumentation was more than 20dB below the 82.2dBuV/m at 3m limit (equivalent to –13dBm EIRP).

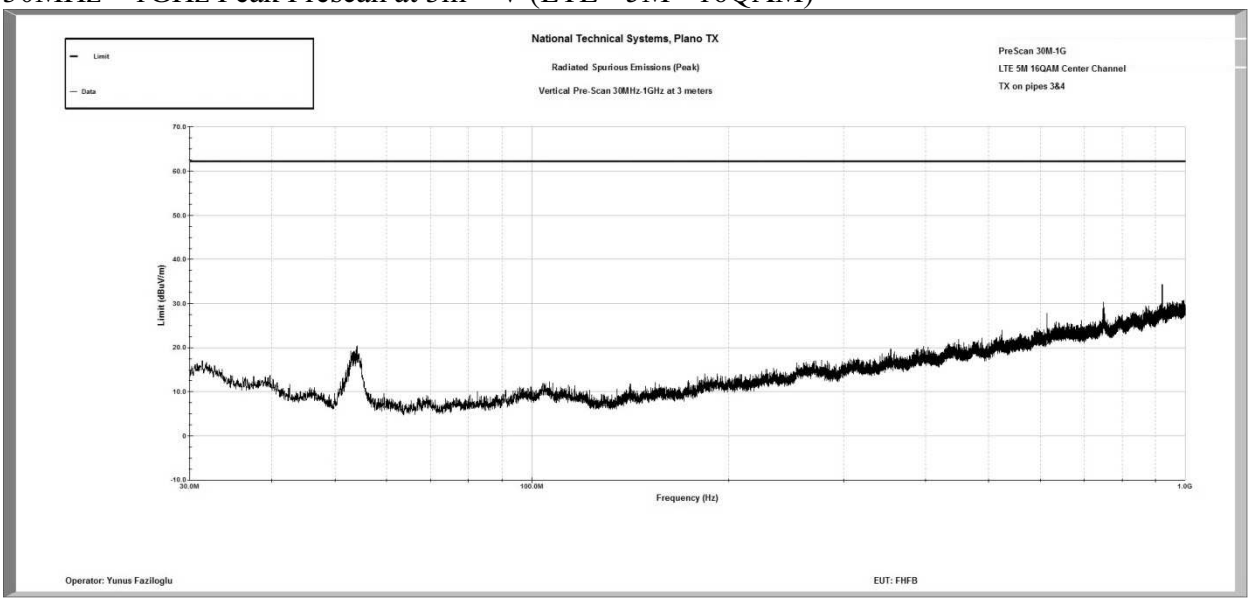
Since all maximized readings were more than 20dB below the 82.2dBuV/m at 3m limit (equivalent to -13dBm EIRP), substitution measurements were not performed. It should be noted that on the data tables above a more conservative limit corresponding to -19dBm has been applied.

TILE software was used for all prescans and plots included on the following pages. The limit shown on the plots is 20dB below the 82.2dBuV/m at 3m limit (equivalent to –13dBm EIRP).

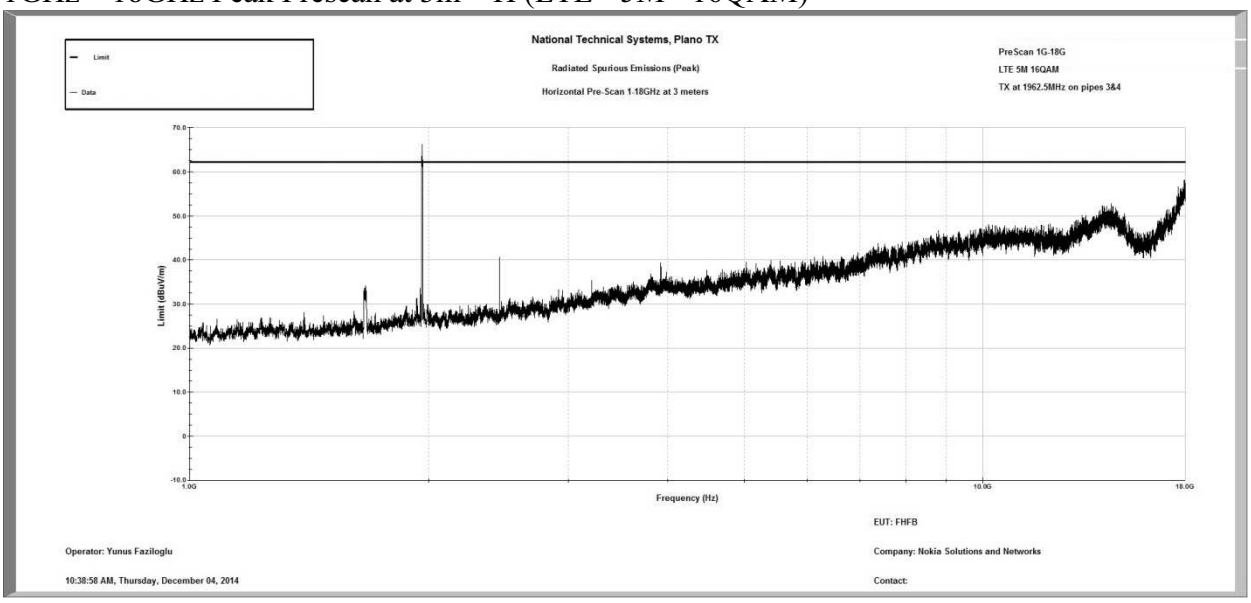
30MHz – 1GHz Peak Prescan at 3m – H (LTE - 5M - 16QAM)



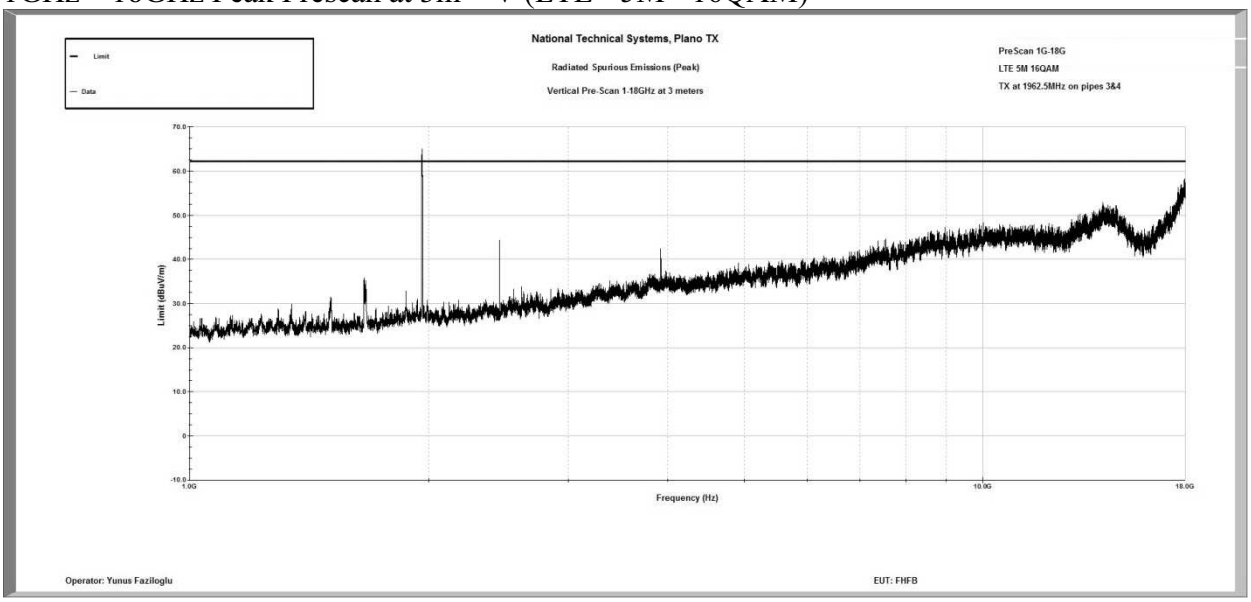
30MHz – 1GHz Peak Prescan at 3m – V (LTE - 5M - 16QAM)



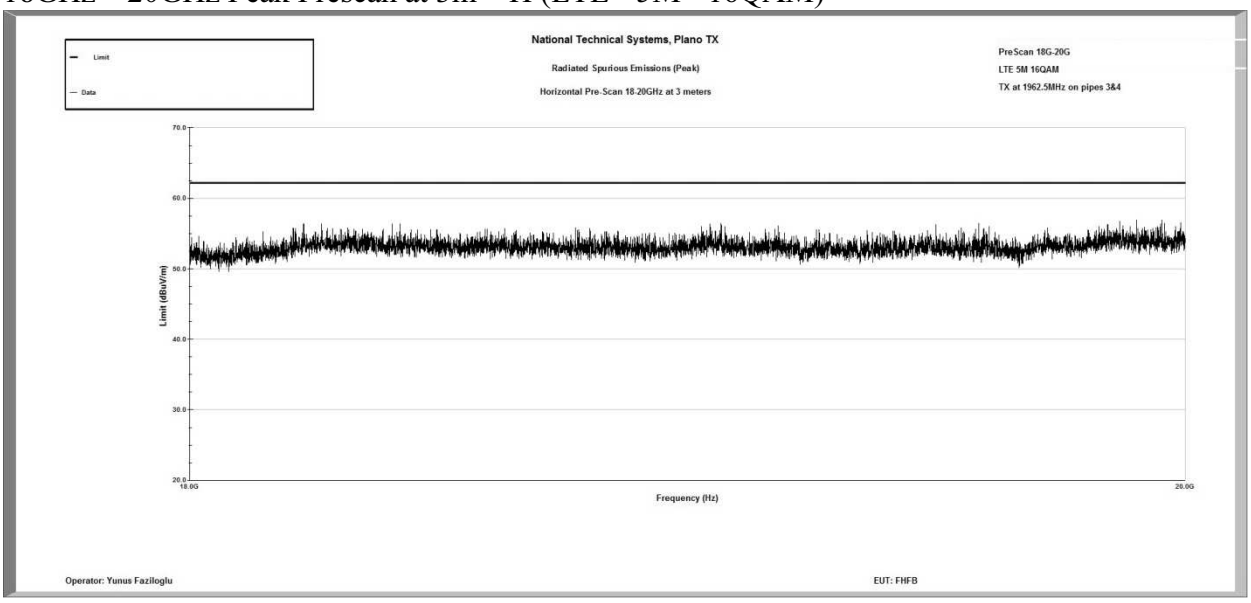
1GHz – 18GHz Peak Prescan at 3m – H (LTE - 5M - 16QAM)



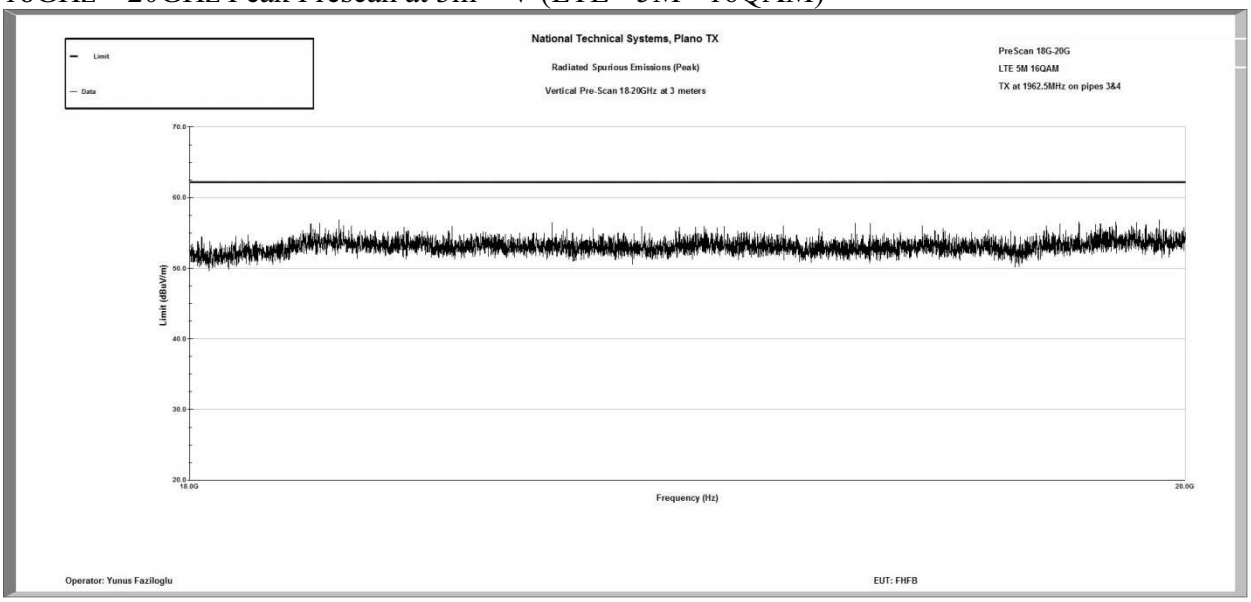
1GHz – 18GHz Peak Prescan at 3m – V (LTE - 5M - 16QAM)



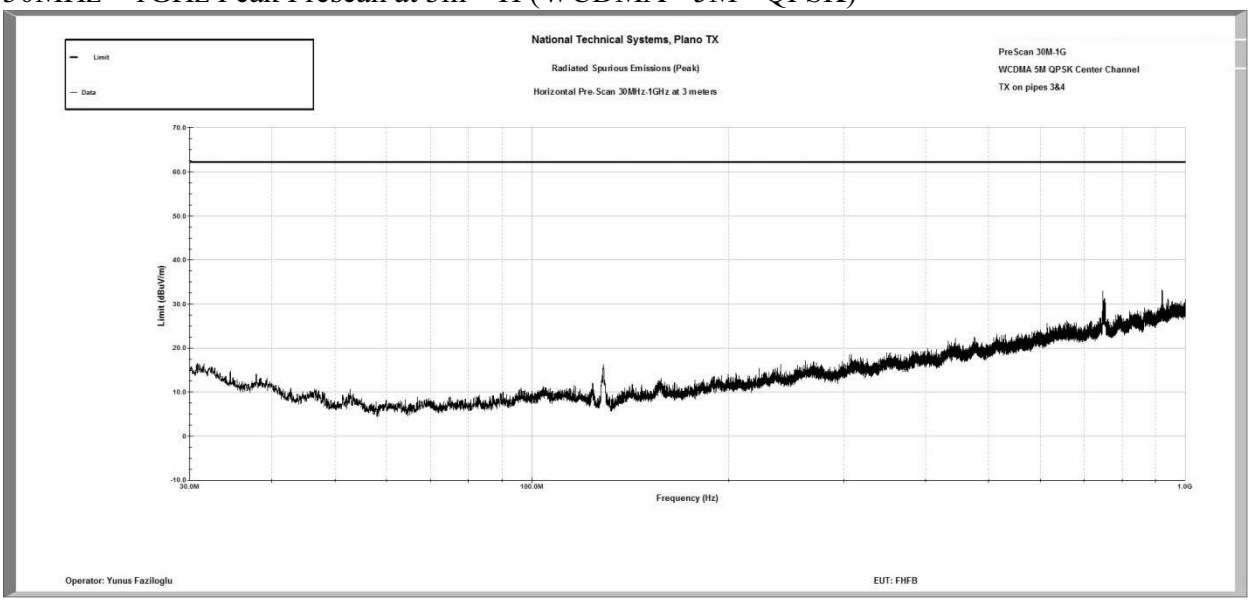
18GHz – 20GHz Peak Prescan at 3m – H (LTE - 5M - 16QAM)



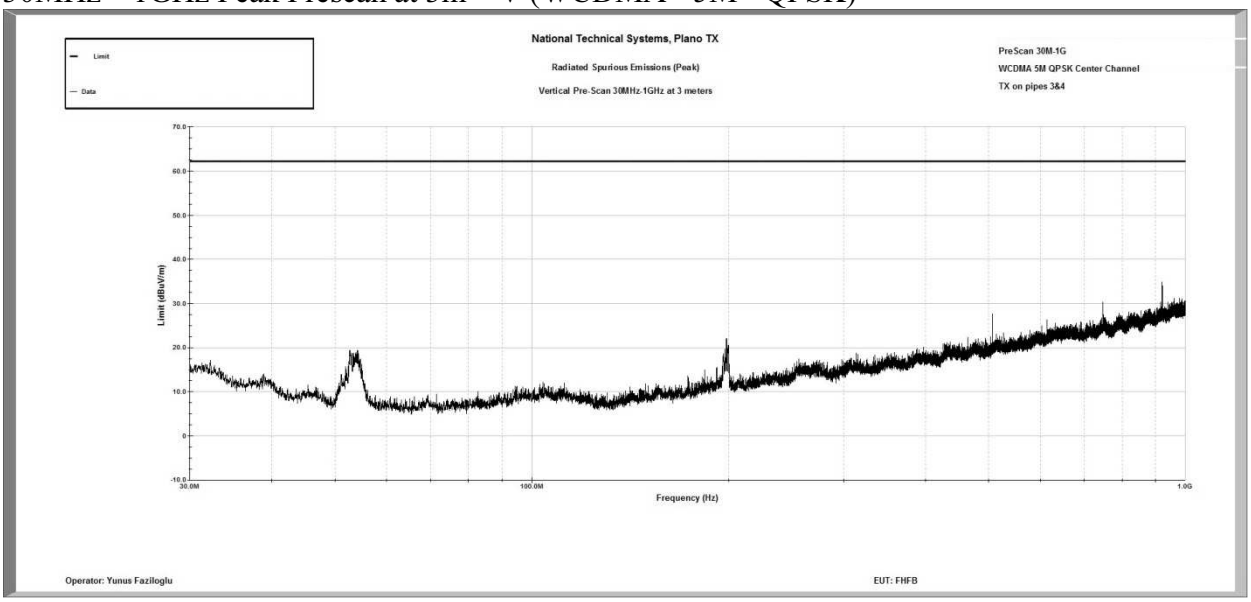
18GHz – 20GHz Peak Prescan at 3m – V (LTE - 5M - 16QAM)



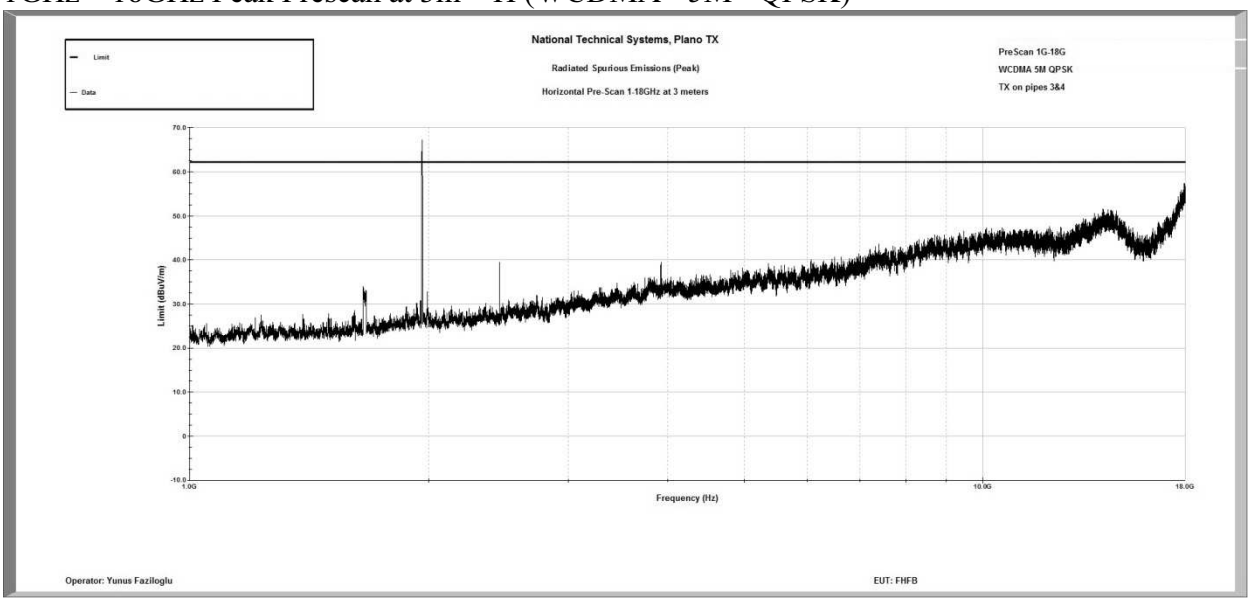
30MHz – 1GHz Peak Prescan at 3m – H (WCDMA - 5M - QPSK)



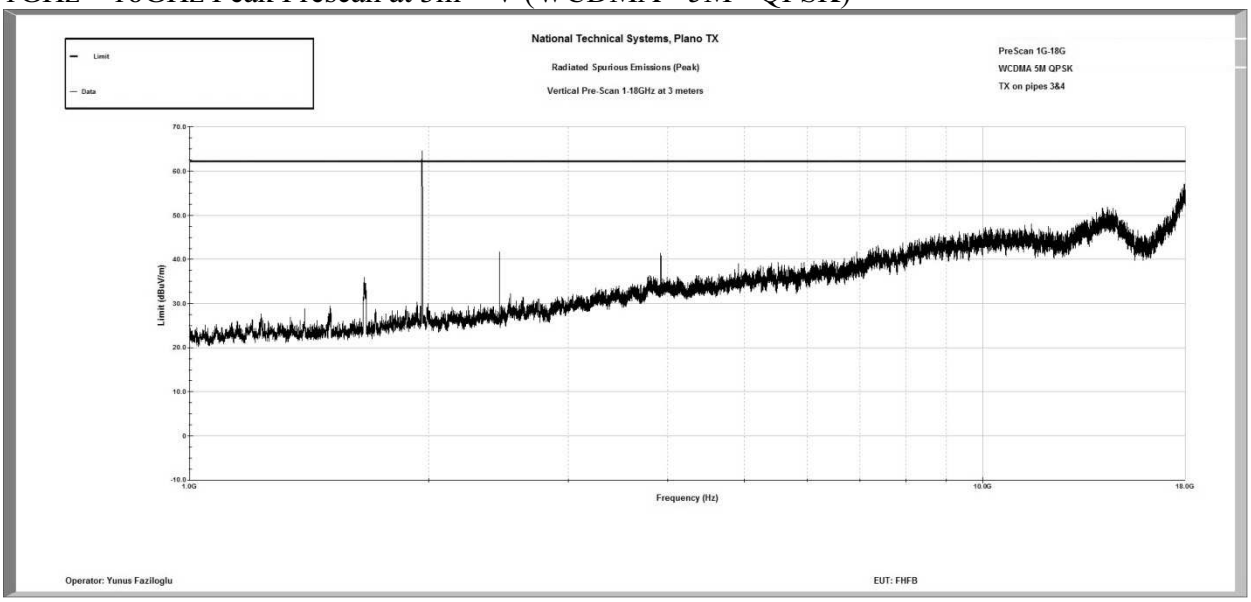
30MHz – 1GHz Peak Prescan at 3m – V (WCDMA - 5M - QPSK)



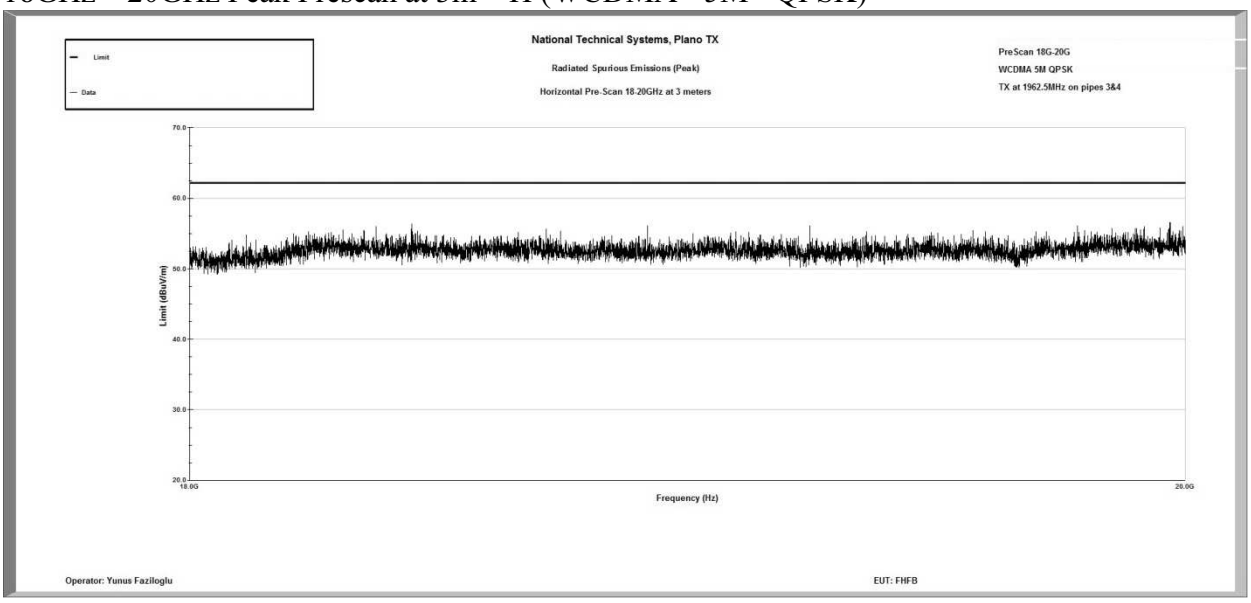
1GHz – 18GHz Peak Prescan at 3m – H (WCDMA - 5M - QPSK)



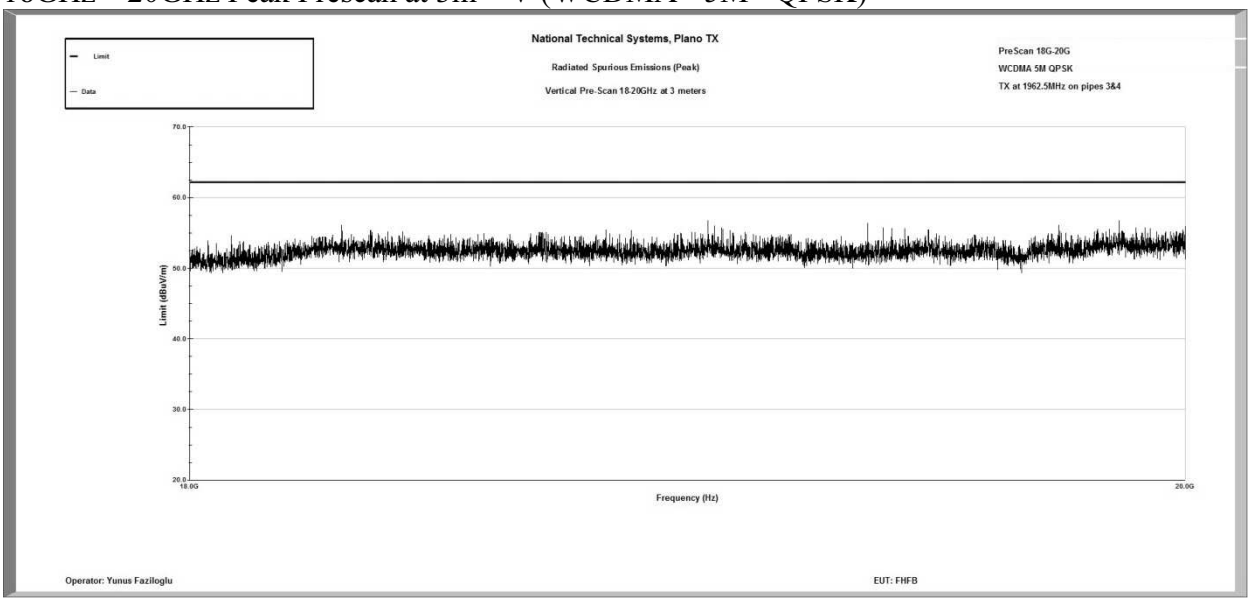
1GHz – 18GHz Peak Prescan at 3m – V (WCDMA - 5M - QPSK)



18GHz – 20GHz Peak Prescan at 3m – H (WCDMA - 5M - QPSK)



18GHz – 20GHz Peak Prescan at 3m – V (WCDMA - 5M - QPSK)



Frequency Stability

In order to demonstrate carrier frequency stability at extreme temperatures and voltages, bandedge compliance was verified at Port 4 on lowest and highest channels in WCDMA 5MHz 64QAM mode. This mode was selected since it had the highest readings at 1930MHz and 1995MHz block edges during previous bandedge tests.

Nominal operating voltage of the product is declared as 48VDC.

Bandedge reading results are listed below for extreme voltages and temperatures. The limit for compliance is same as the limit applied during previous bandedge tests, i.e. -19.03dBm.

Extreme Voltages

20C	Low	High
40.8VDC	-19.68	-19.59
55.2VDC	-20.14	-20.03

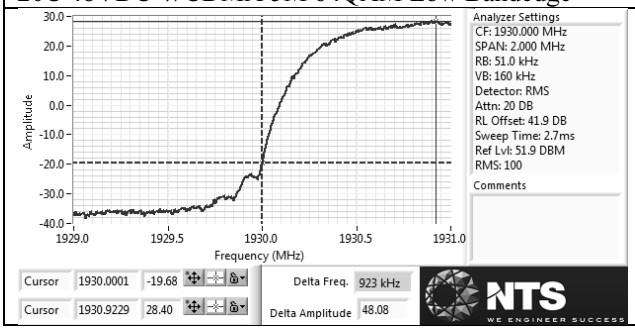
Extreme Temperatures

48VDC	Low	High
-30	-19.64	-19.55
-20	-19.62	-19.39
-10	-19.81	-19.65
0	-19.74	-19.76
10	-19.58	-19.58
20	-19.68	-19.51
30	-19.99	-19.8
40	-19.59	-19.5
50	-19.94	-19.35

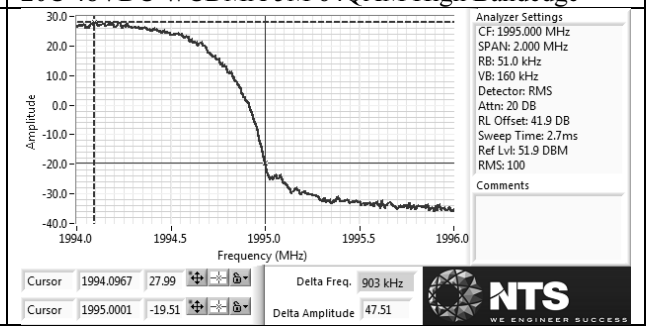
Results above are deemed sufficient to demonstrate carrier frequency stability for all other channel bandwidth modes and modulations as well as the LTE mode since all carriers are controlled by the same frequency stabilization circuitry that was subjected to the extreme conditions under this test.

All corresponding plots are included on the following pages.

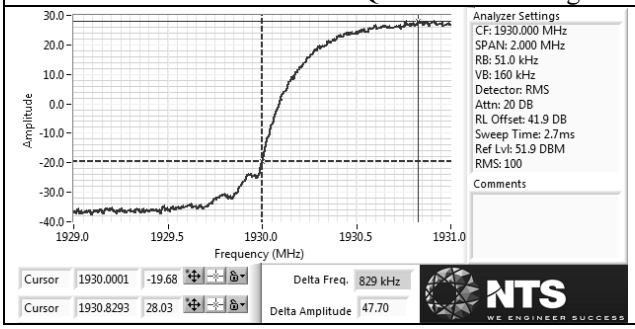
20C 48VDC WCDMA 5M 64QAM Low Bandedge



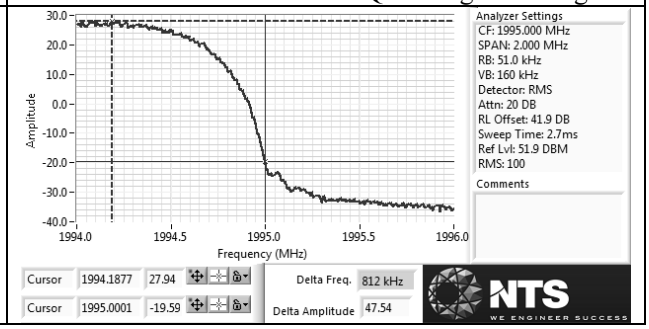
20C 48VDC WCDMA 5M 64QAM High Bandedge



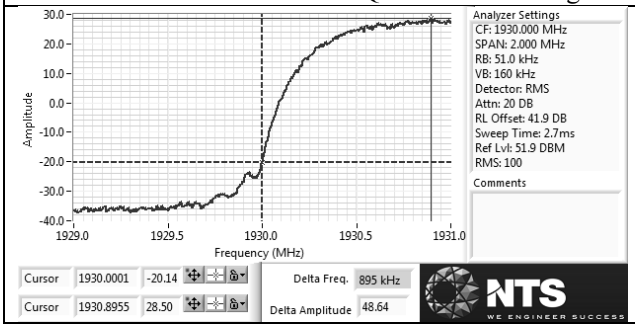
20C 40.8VDC WCDMA 5M 64QAM Low Bandedge



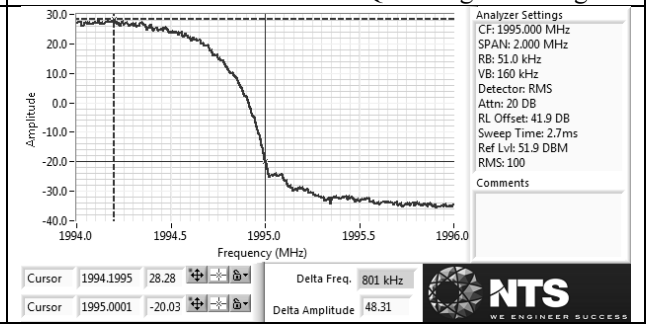
20C 40.8VDC WCDMA 5M 64QAM High Bandedge



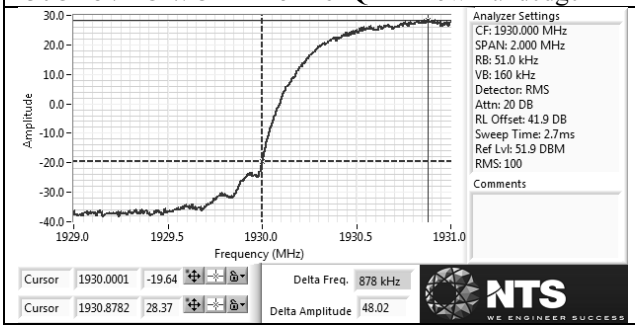
20C 55.2VDC WCDMA 5M 64QAM Low Bandedge



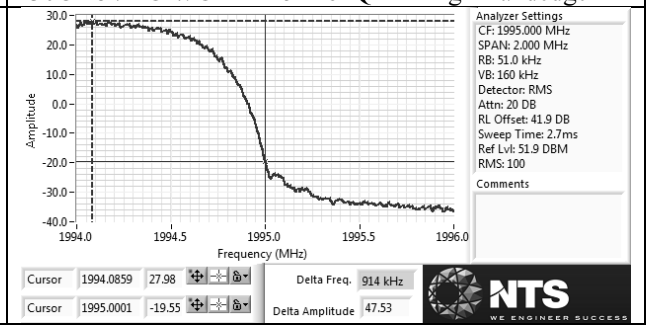
20C 55.2VDC WCDMA 5M 64QAM High Bandedge



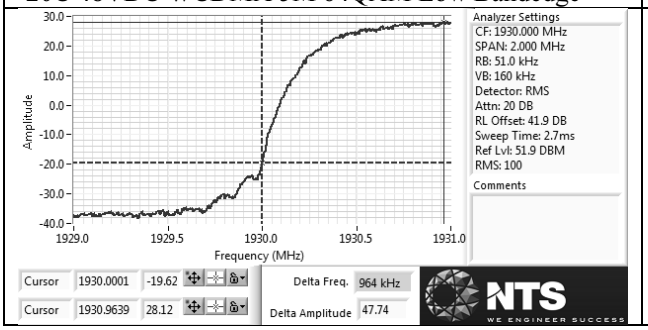
-30C 48VDC WCDMA 5M 64QAM Low Bandedge



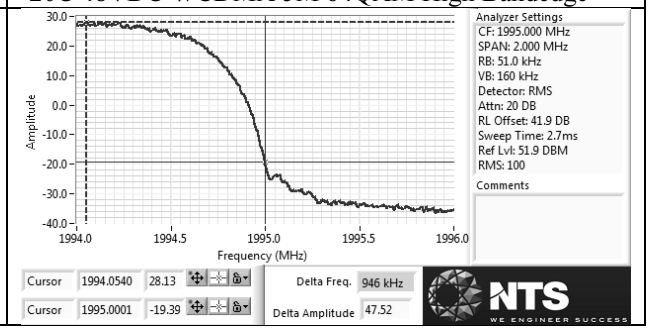
-30C 48VDC WCDMA 5M 64QAM High Bandedge



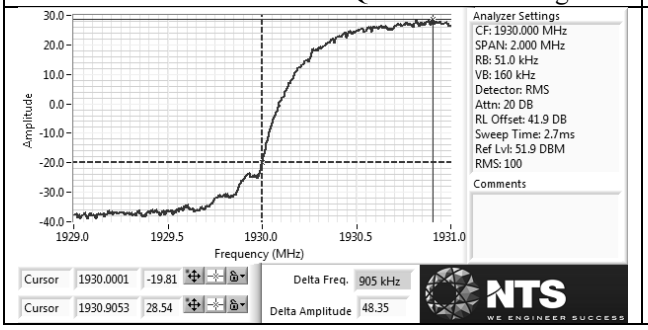
-20C 48VDC WCDMA 5M 64QAM Low Bandedge



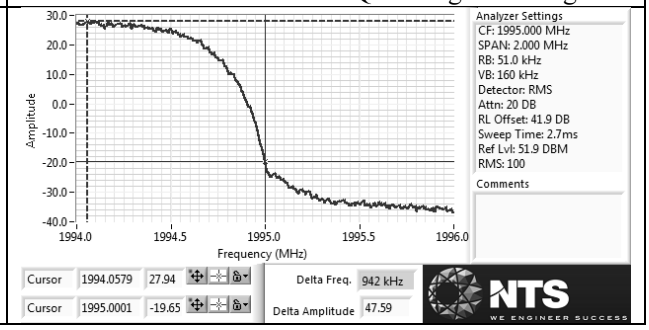
-20C 48VDC WCDMA 5M 64QAM High Bandedge



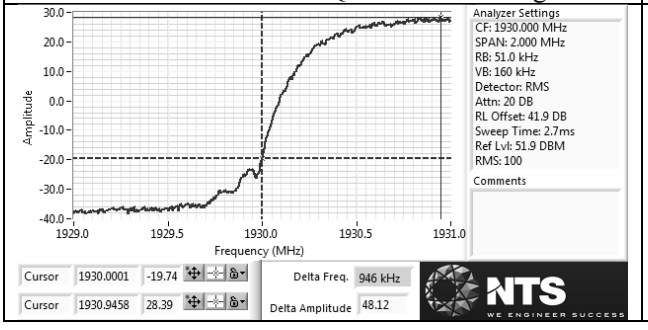
-10C 48VDC WCDMA 5M 64QAM Low Bandedge



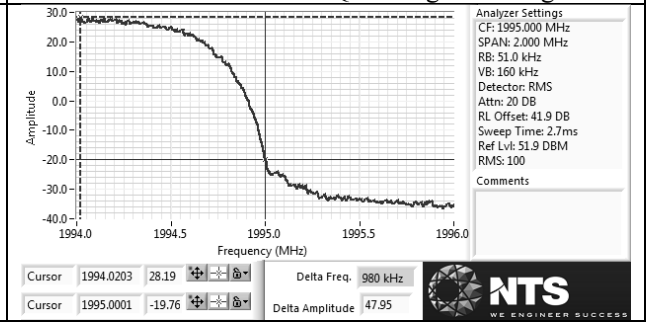
-10C 48VDC WCDMA 5M 64QAM High Bandedge



0C 48VDC WCDMA 5M 64QAM Low Bandedge



0C 48VDC WCDMA 5M 64QAM High Bandedge



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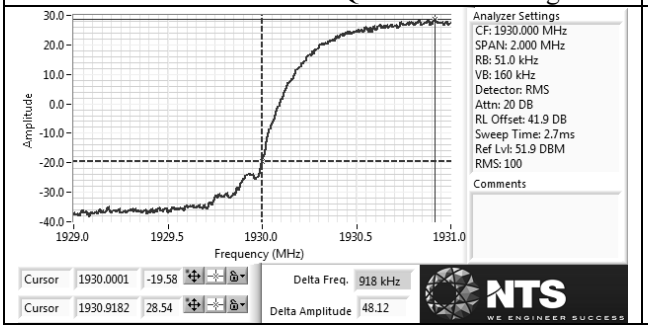

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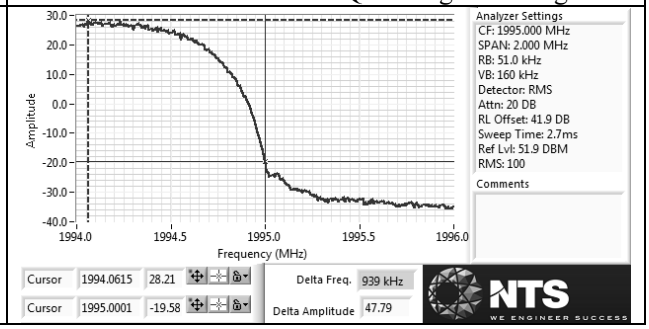

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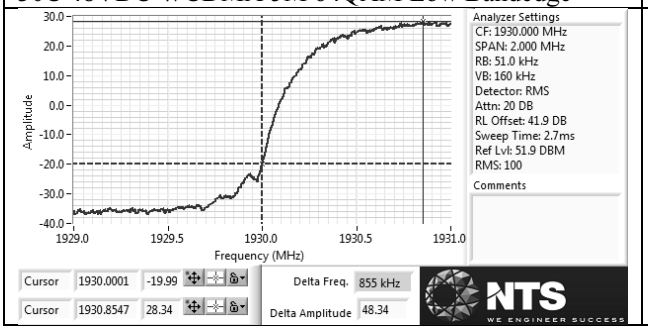

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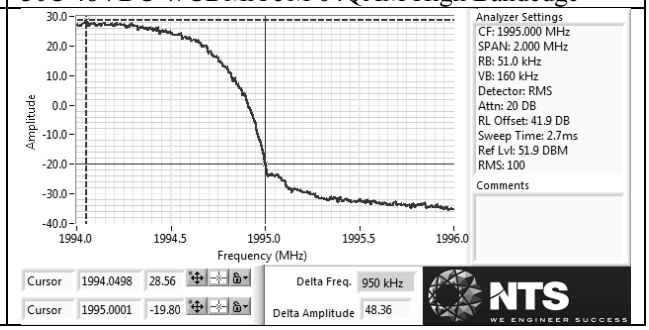

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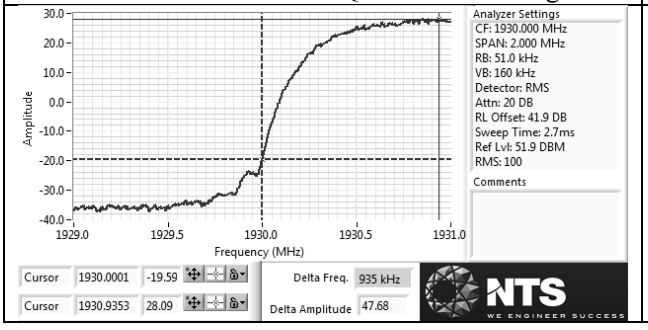

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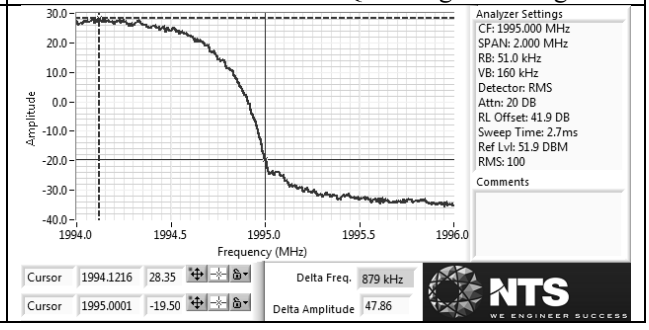

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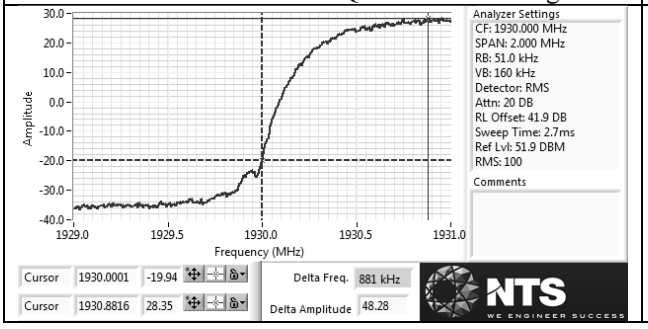

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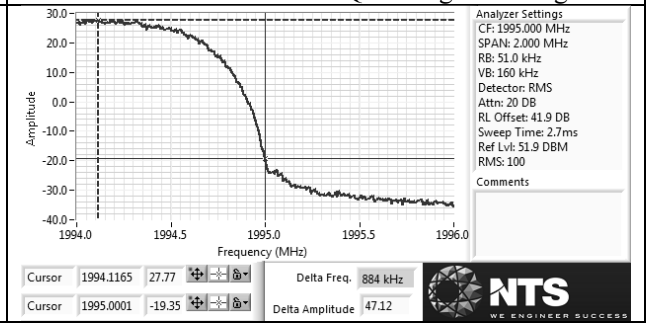

End of Report

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