

Transmitter Antenna Port Conducted Spurious Emissions

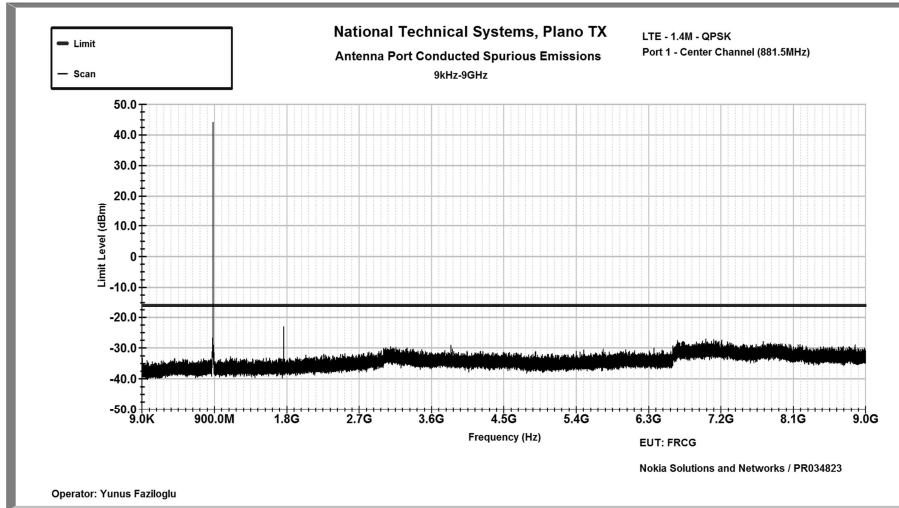
Tests performed at Port 1 on center channel for all modulations and bandwidth modes. Due to 2x2 MIMO operation, limit is -16.02dBm (-13dBm – $10 \cdot \log(2)$) per FCC KDB 662911D01 v02r01.

TILE6 measurement software was used during testing with the following settings:

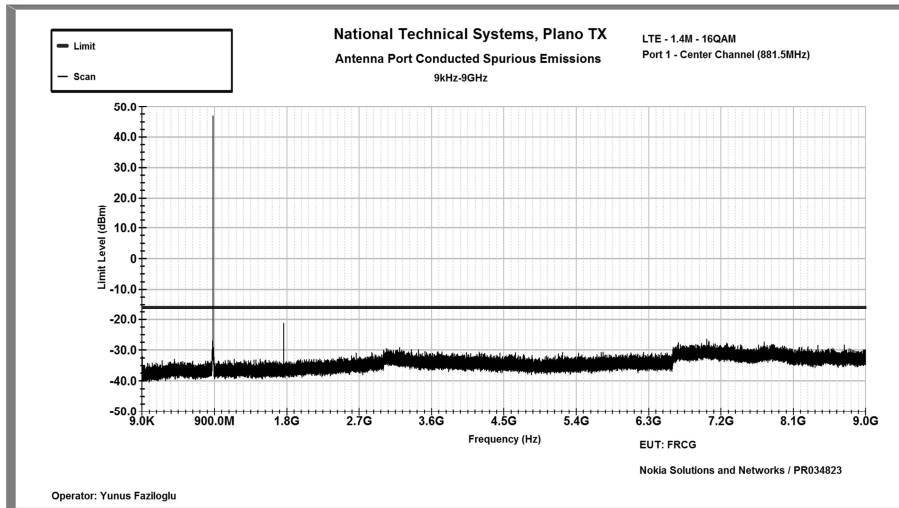
Frequency Range	RBW	VBW	Number of data points	Divided into	Detector	Sweep Time	Max hold over
9kHz-150kHz	1kHz	3kHz	8000	1 segment	Peak	Auto	50 sweeps
150kHz-9GHz	100kHz	300kHz	8000	12 segments	Peak	Auto	50 sweeps

Corresponding plots are included on the following pages.

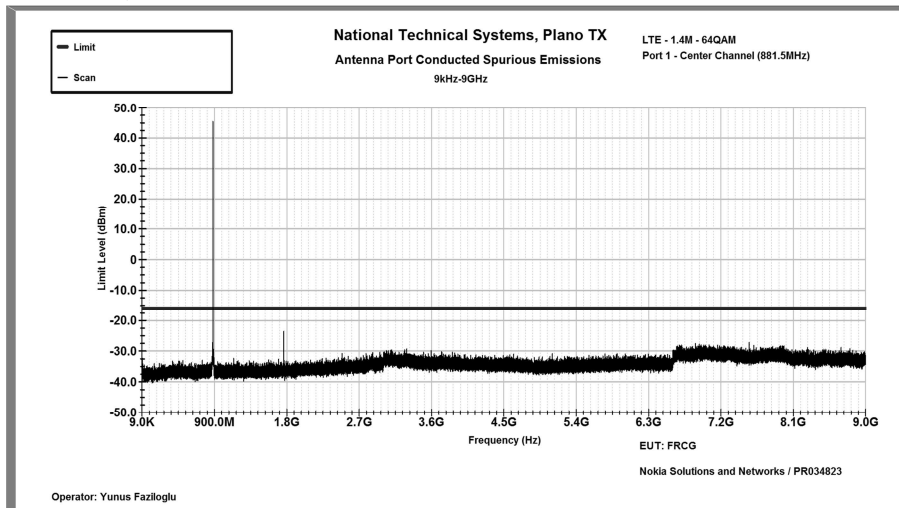
LTE – QPSK – 1.4M



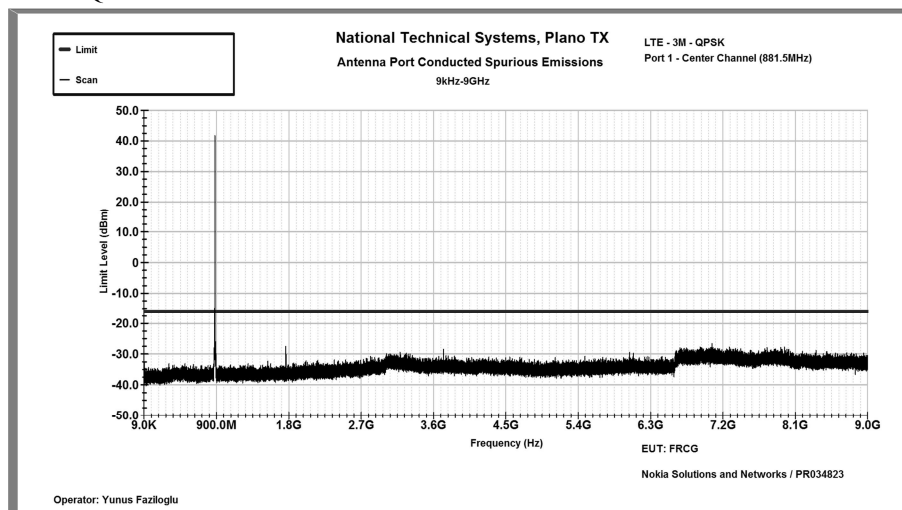
LTE – 16QAM – 1.4M



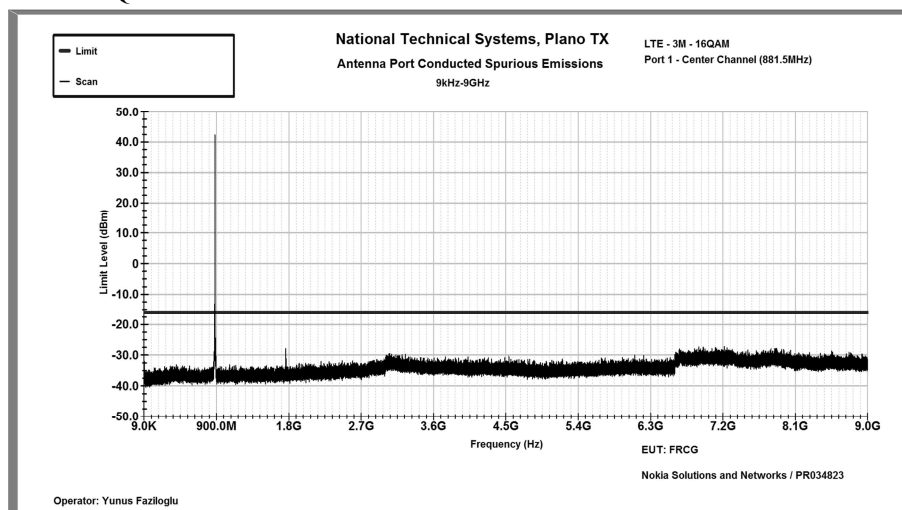
LTE – 64QAM – 1.4M



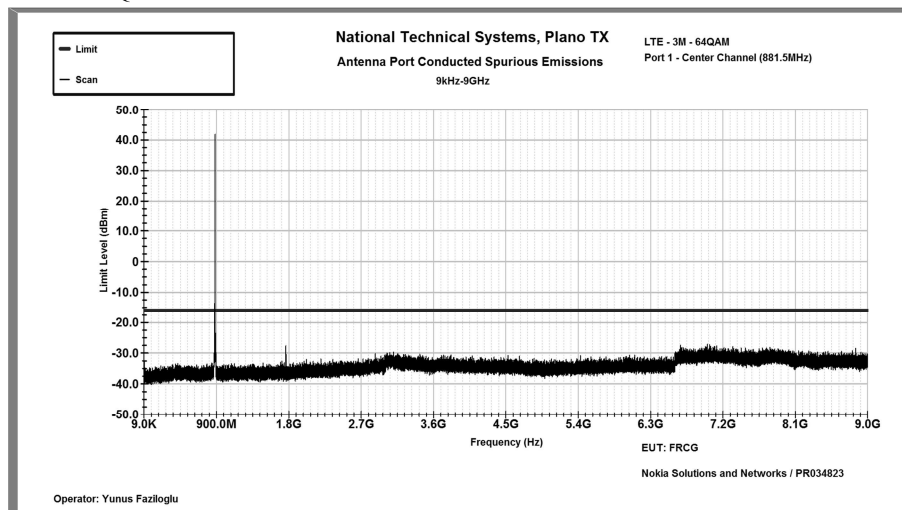
LTE – QPSK – 3M



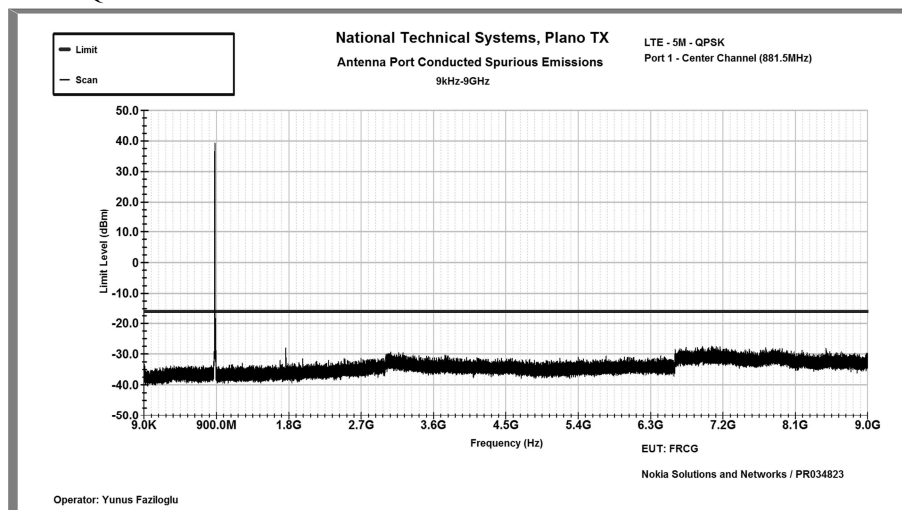
LTE – 16QAM – 3M



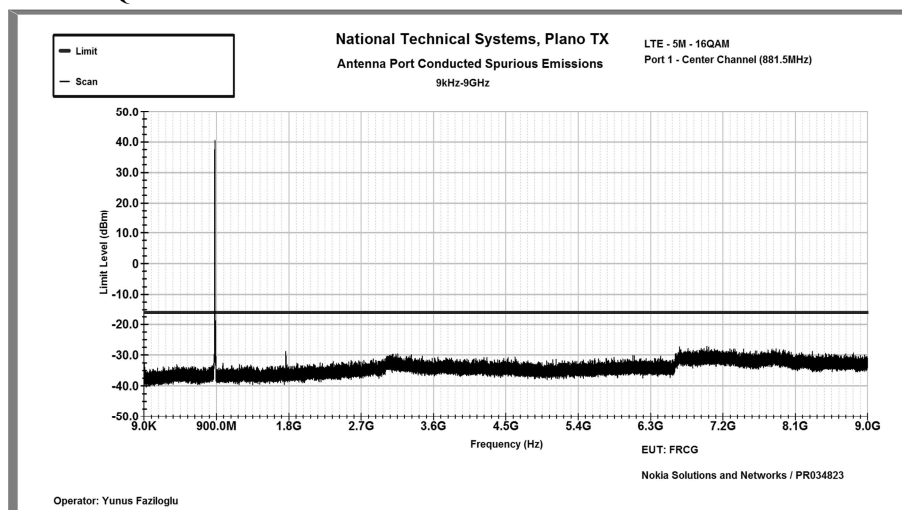
LTE – 64QAM – 3M



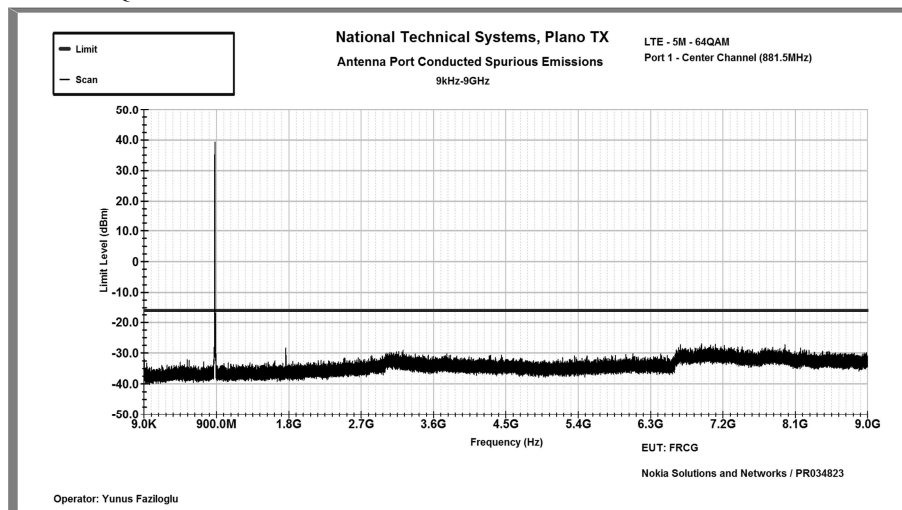
LTE – QPSK – 5M



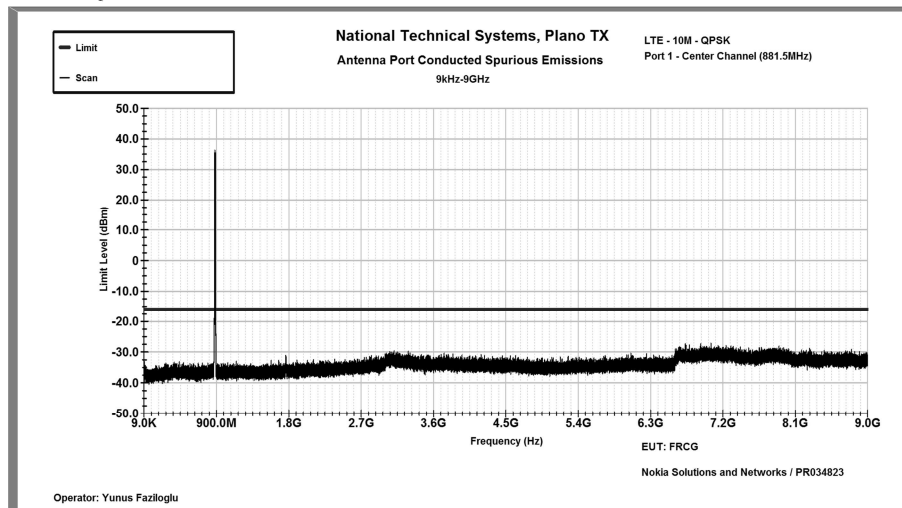
LTE – 16QAM – 5M



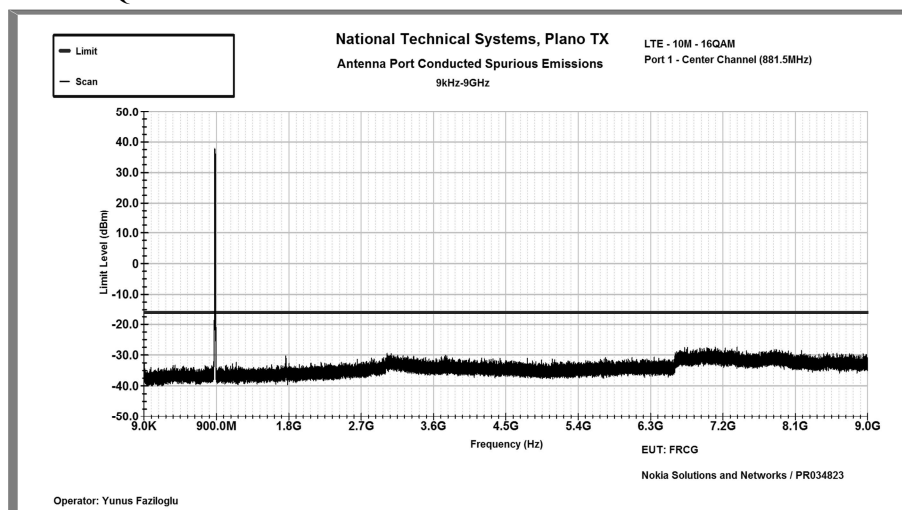
LTE – 64QAM – 5M



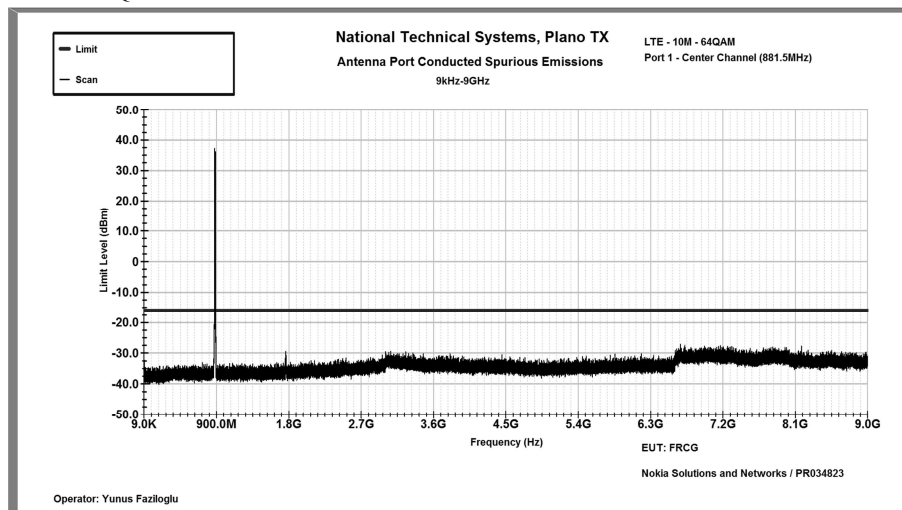
LTE – QPSK – 10M



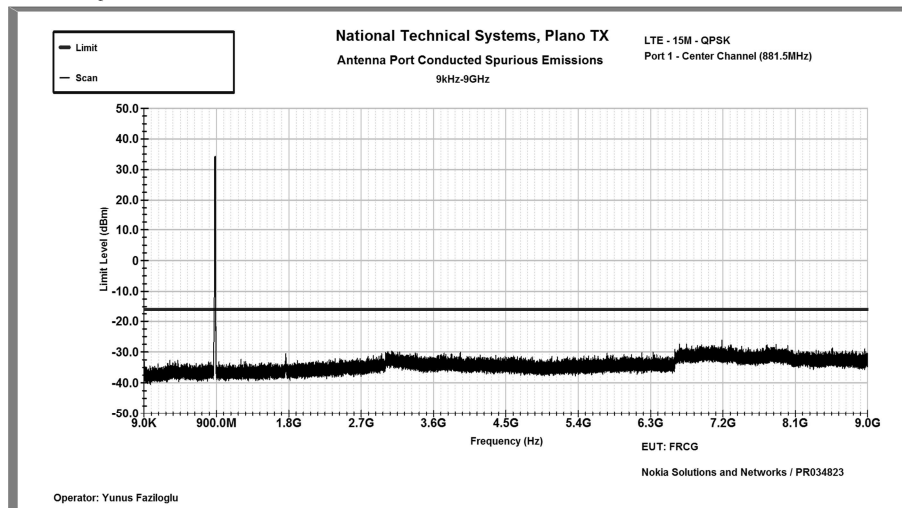
LTE – 16QAM – 10M



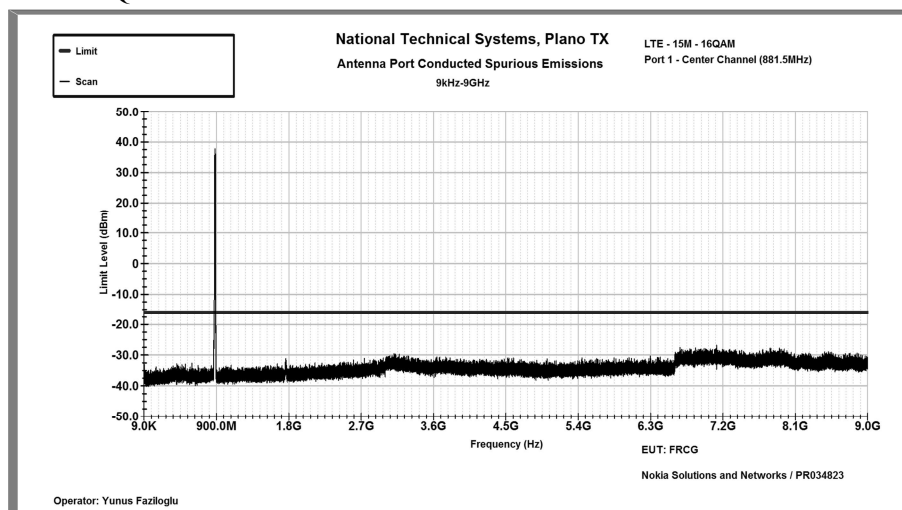
LTE – 64QAM – 10M



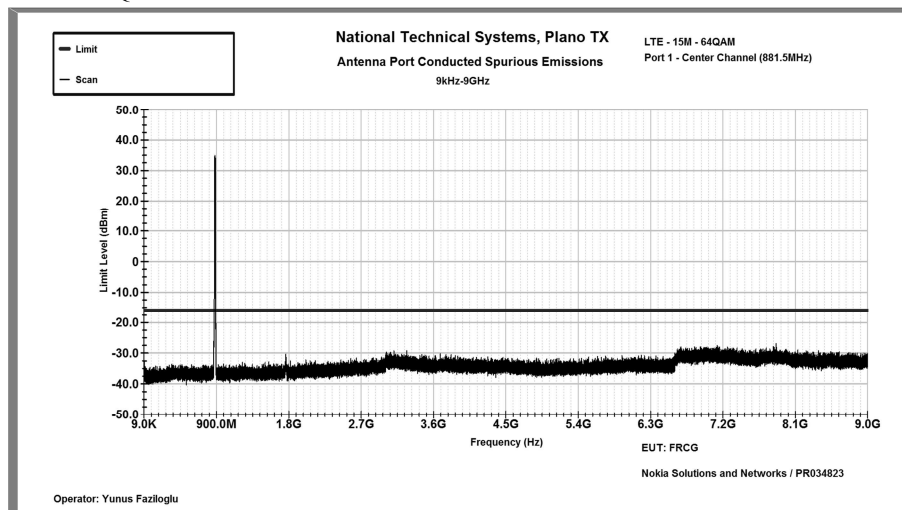
LTE – QPSK – 15M



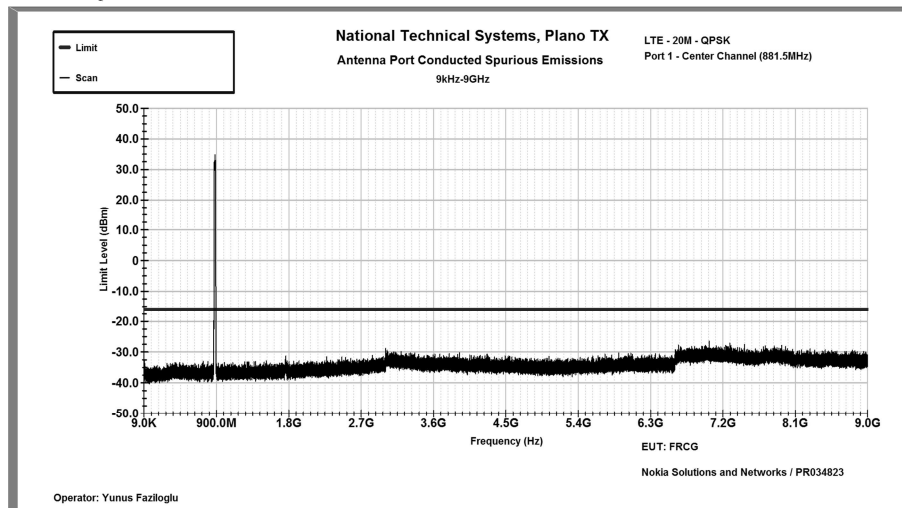
LTE – 16QAM – 15M



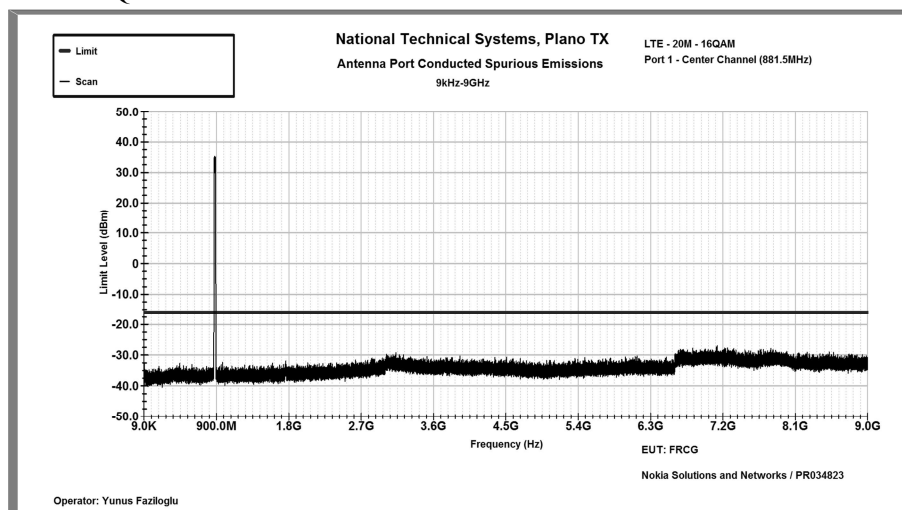
LTE – 64QAM – 15M



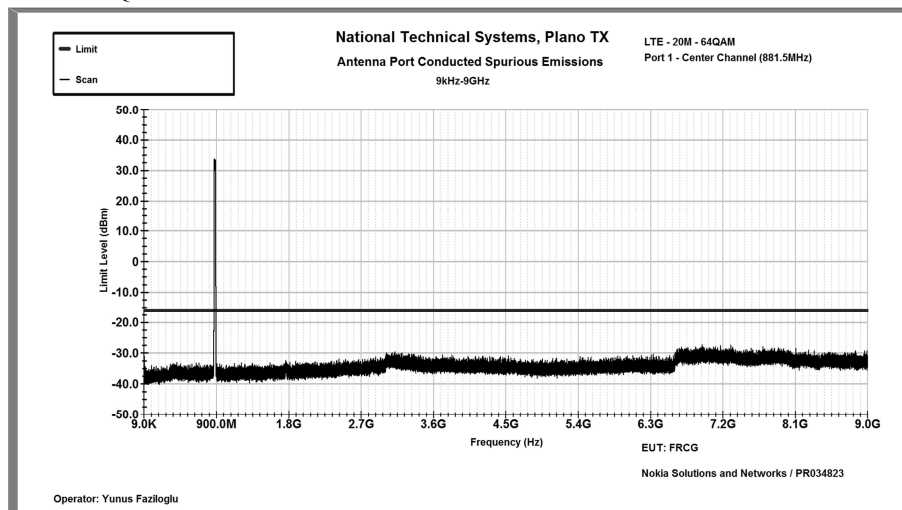
LTE – QPSK – 20M



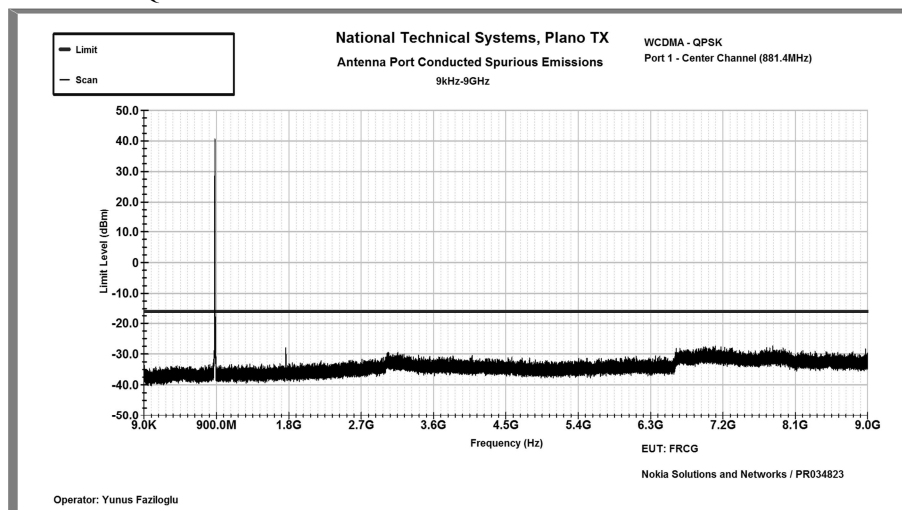
LTE – 16QAM – 20M



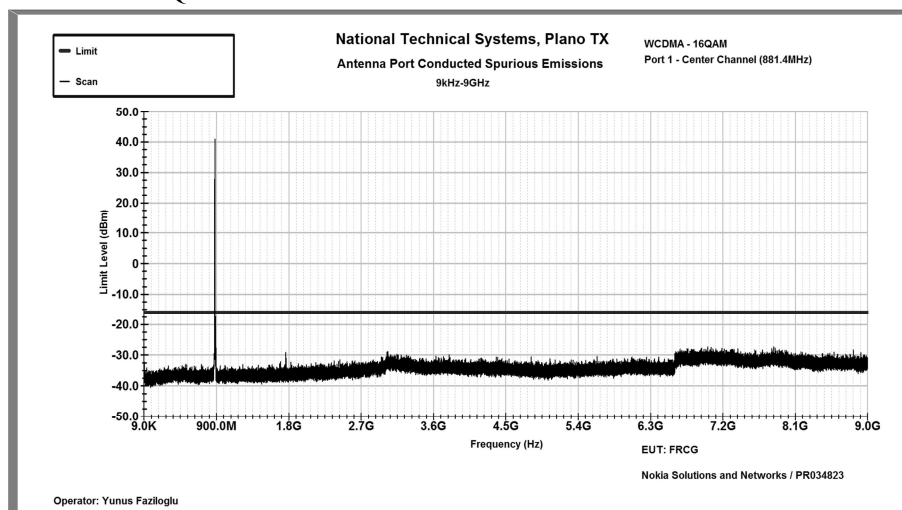
LTE – 64QAM – 20M



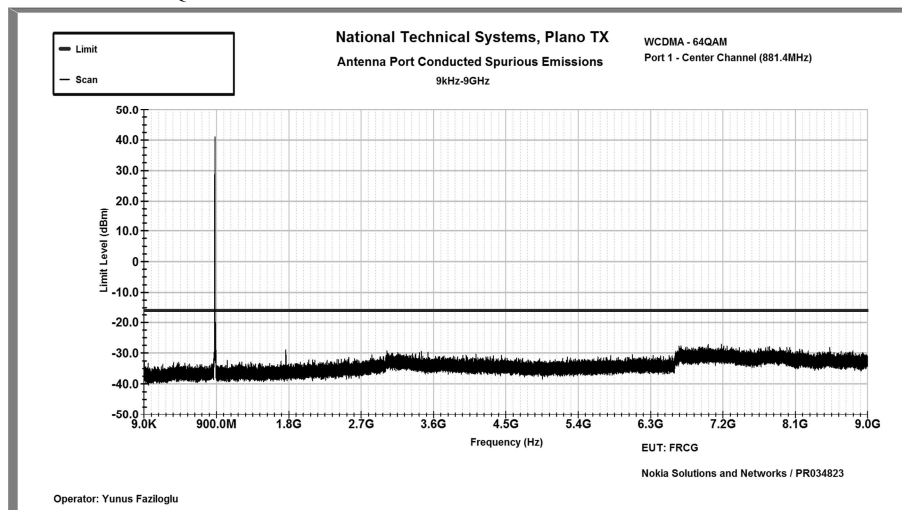
WCDMA – QPSK – 5M



WCDMA – 16QAM – 5M



WCDMA – 64QAM – 5M



Transmitter Radiated Spurious Emissions

Based on antenna port conducted spurious emissions tests results, preliminary scans for radiated spurious emissions were performed in 30MHz – 9GHz frequency range in the following configurations:

LTE: 1.4M - 16QAM transmitting at center channel (881.5MHz) on both ports.

WCDMA: 5M - QPSK transmitting at center channel (881.4MHz) on both ports.

Final maximized peak radiated emissions were measured in these modes. During testing both antenna ports of the base station were terminated with 50ohm termination blocks and unit was transmitting on both of its ports at full power as described above.

LTE Results:

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)
614.4	V	43.7	-36.3	21	1.6	30	82.2	-52.2
614.4	H	41.6	-36.3	21	1.6	27.9	82.2	-54.3
921.6	V	44.4	-36	24.5	2.9	35.8	82.2	-46.4
921.6	H	41	-36	24.5	2.9	32.4	82.2	-49.8
1228.8	V	47.3	-49.4	25.5	2.5	25.9	82.2	-56.3
1228.8	H	44.5	-49.4	25.5	2.5	23.1	82.2	-59.1
1763	V	43.1	-49	26.5	2.6	23.2	82.2	-59
1763	H	51.4	-49	26.5	2.6	31.5	82.2	-50.7
2457.5	V	39.1	-48.2	28.4	3.1	22.4	82.2	-59.8
2457.5	H	37.7	-48.2	28.4	3.1	21	82.2	-61.2
3526	V	46	-47.2	31.3	4	34.1	82.2	-48.1
3526	H	42.4	-47.2	31.3	4	30.5	82.2	-51.7
4407.5	V	48.4	-46.7	32.2	4.4	38.3	82.2	-43.9
4407.5	H	47.6	-46.7	32.2	4.4	37.5	82.2	-44.7
8450 - NF	V	41.7	-45.2	37.5	5.5	39.5	82.2	-42.7
8450 - NF	H	41.2	-45.2	37.5	5.5	39	82.2	-43.2
Corrected Field Strength = Raw Reading + Amplifier Gain + Antenna Factor + Cable Loss								
Negative margin indicates a passing result.								
Detector: Peak, RBW=100kHz, VBW=300kHz, Max-hold								
NF: Noise Floor								

WCDMA Results:

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)
614.4	V	43.9	-36.3	21	1.6	30.2	82.2	-52
614.4	H	42.2	-36.3	21	1.6	28.5	82.2	-53.7
921.6	V	44.8	-36	24.5	2.9	36.2	82.2	-46
921.6	H	40.7	-36	24.5	2.9	32.1	82.2	-50.1
1763	V	39.3	-49	26.5	2.6	19.4	82.2	-62.8
1763	H	44.3	-49	26.5	2.6	24.4	82.2	-57.8
4407.5	V	44.2	-46.7	32.2	4.4	34.1	82.2	-48.1
4407.5	H	43.4	-46.7	32.2	4.4	33.3	82.2	-48.9
8450 - NF	V	41.7	-45.2	37.5	5.5	39.5	82.2	-42.7
8450 - NF	H	41.2	-45.2	37.5	5.5	39	82.2	-43.2
Corrected Field Strength = Raw Reading + Amplifier Gain + Antenna Factor + Cable Loss								
Negative margin indicates a passing result.								
Detector: Peak, RBW=100kHz, VBW=300kHz, Max-hold								
NF: Noise Floor								

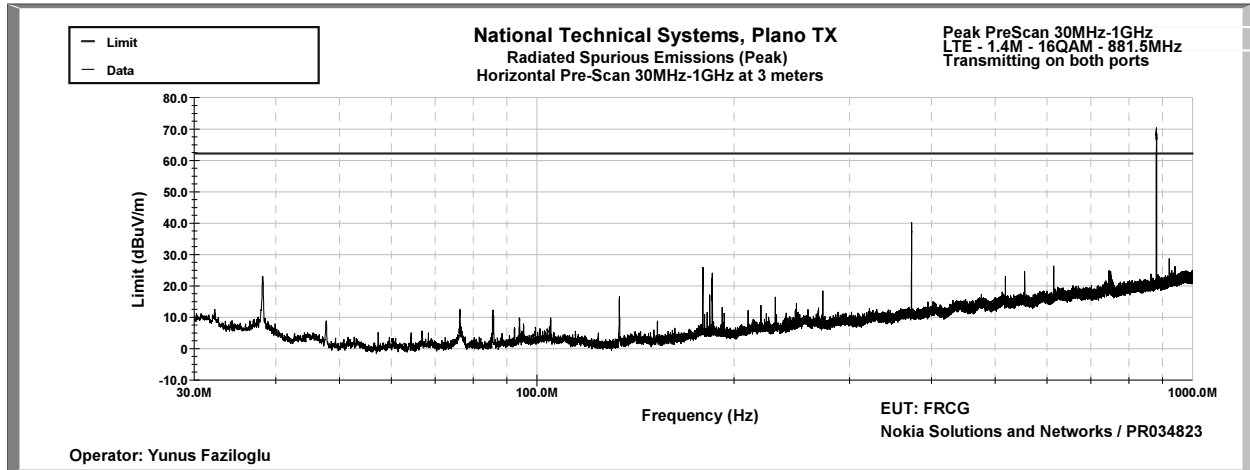
Highest noise floor of the measurement instrumentation was more than 20dB below the 82.2dBuV/m at 3m limit (equivalent to -13dBm EIRP).

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.

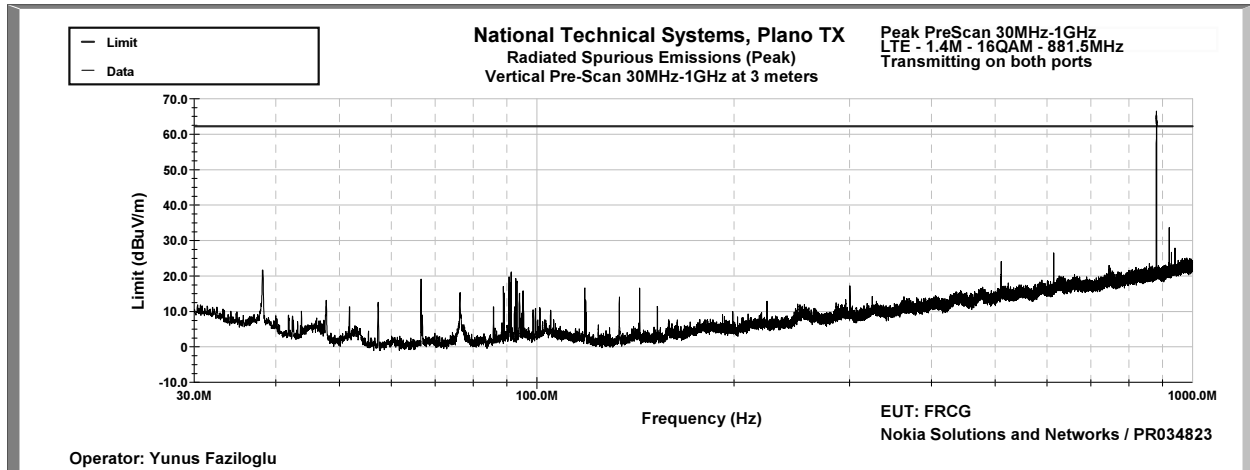
TILE software was used for all prescans and plots included on the following pages. The limit shown on the plots is 20dB below the 82.2dBuV/m at 3m limit.

LTE Plots:

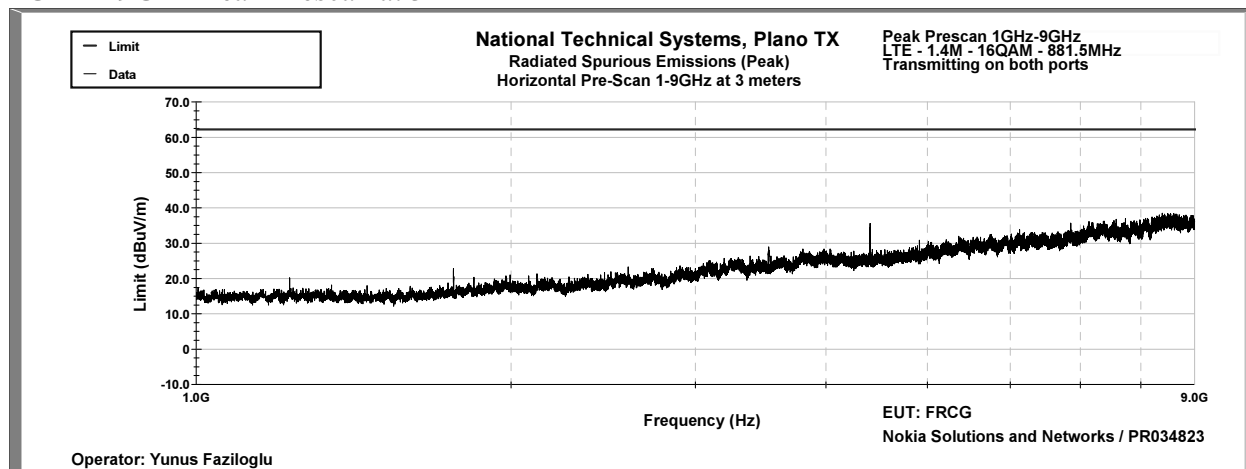
30MHz – 1GHz Peak Prescan at 3m – H



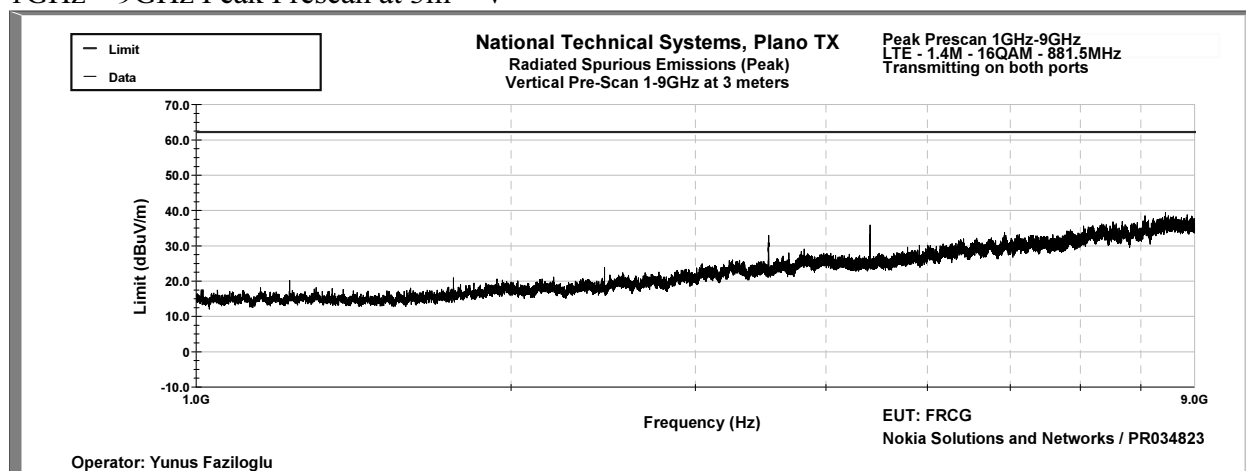
30MHz – 1GHz Peak Prescan at 3m – V



1GHz – 9GHz Peak Prescan at 3m – H

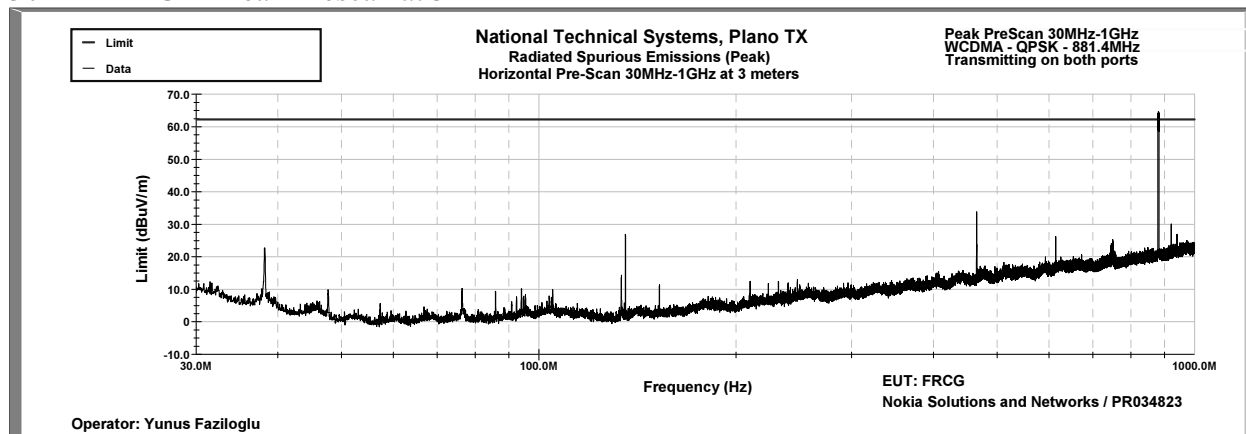


1GHz – 9GHz Peak Prescan at 3m – V

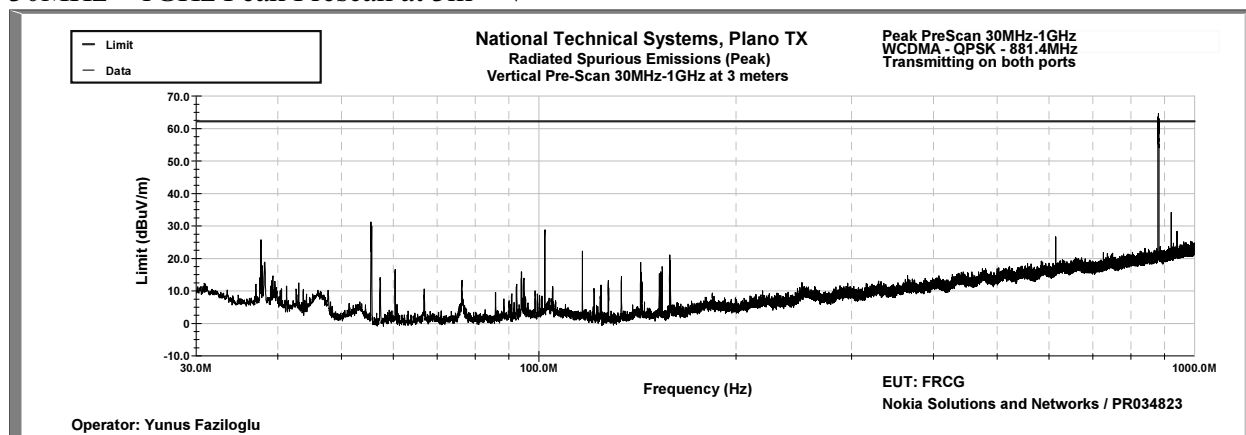


WCDMA Plots:

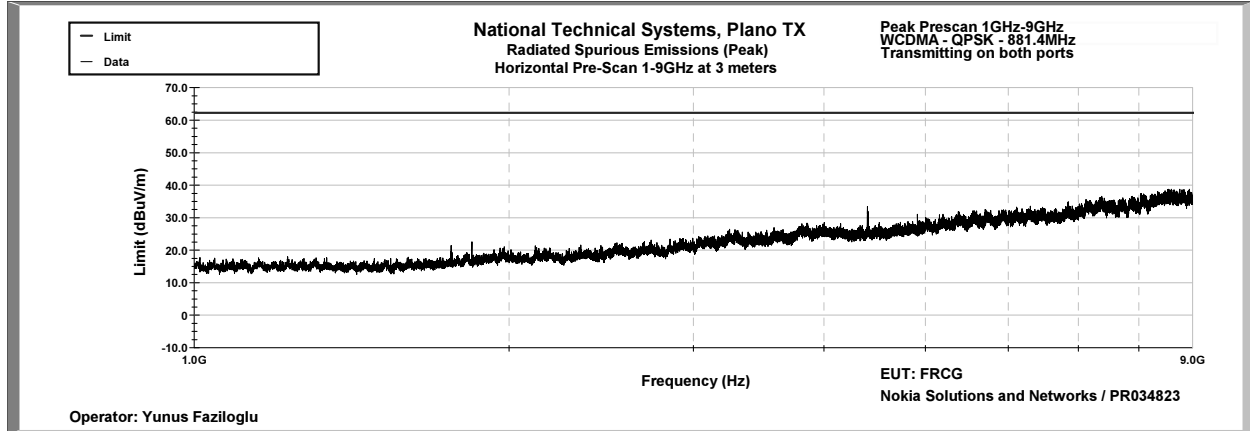
30MHz – 1GHz Peak Prescan at 3m – H



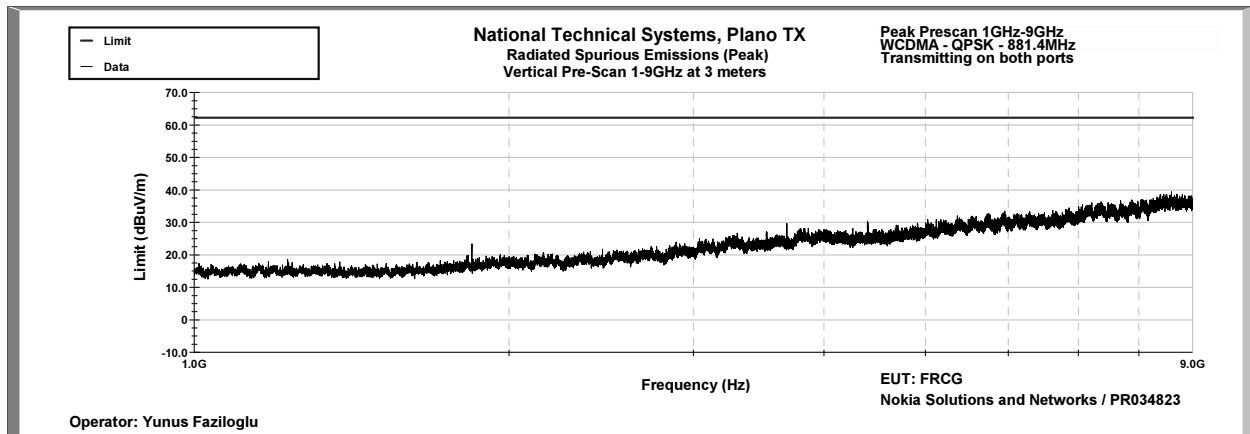
30MHz – 1GHz Peak Prescan at 3m – V



1GHz – 9GHz Peak Prescan at 3m – H



1GHz – 9GHz Peak Prescan at 3m – V



Frequency Stability

In order to demonstrate carrier frequency stability at extreme temperatures and voltages, frequency error was measured in the following configuration:

LTE: 20MHz – 64QAM transmitting at center channel (881.5MHz) on Port 1.

WCDMA: 5MHz – 64QAM transmitting at center channel (881.4MHz) on Port 1.

WCDMA mode compliance was verified only at the temperature extremes.

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

Frequency error results are listed below for extreme voltages and temperatures.

Extreme Voltages

	LTE
20C	Freq. Error (mHz)
40.8VDC	498
55.2VDC	649

Extreme Temperatures

	WCDMA	LTE
48VDC	Freq. Error (mHz)	Freq. Error (mHz)
-30	200	671
-20		637
-10		800
0		583
10		650
20		694
30		698
40		749
50	640	901

Based on the results above, highest recorded frequency error is equivalent to 0.001ppm, which is below 1.5ppm limit.

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

End of Report

This page is intentionally blank and marks the last page of this test report.