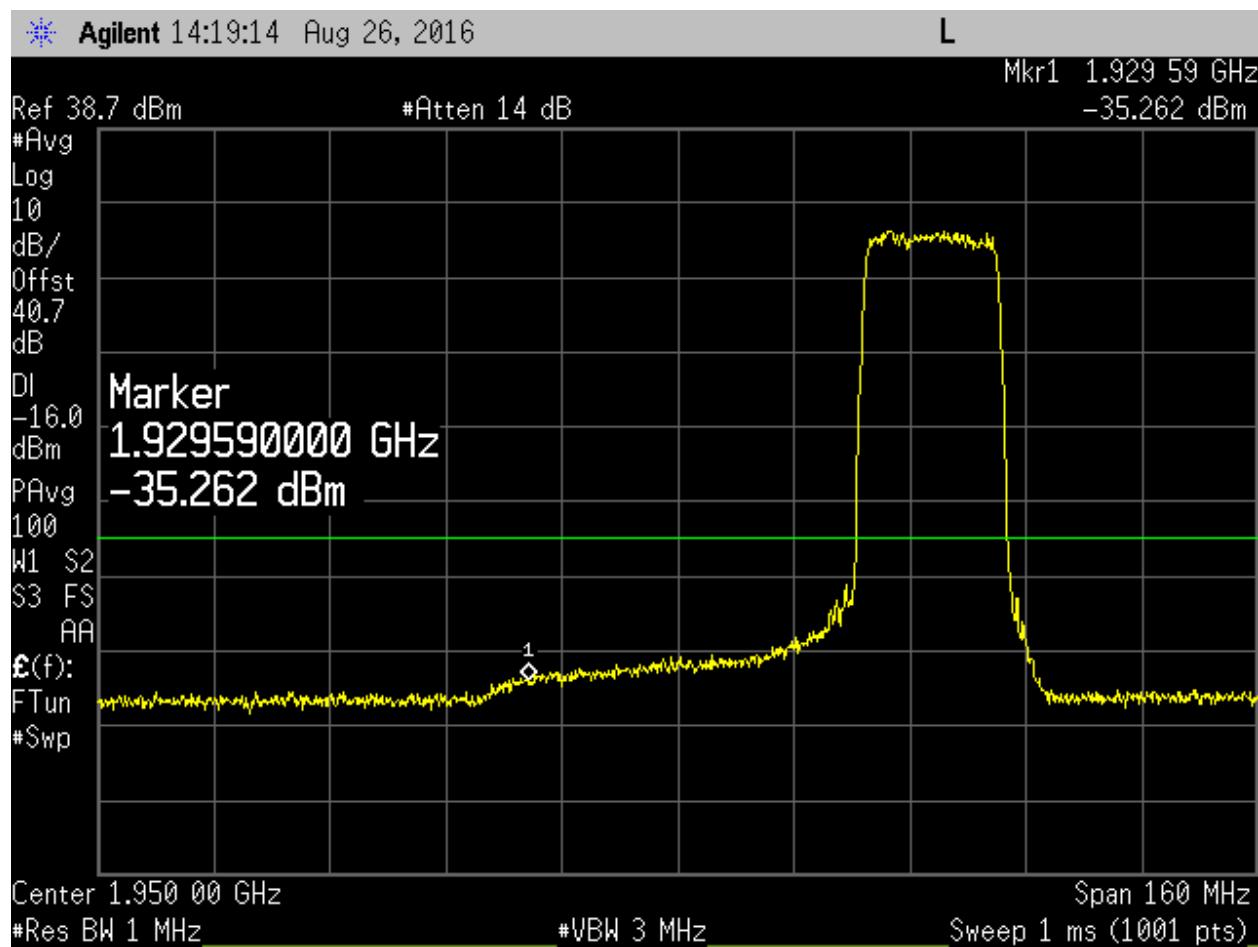
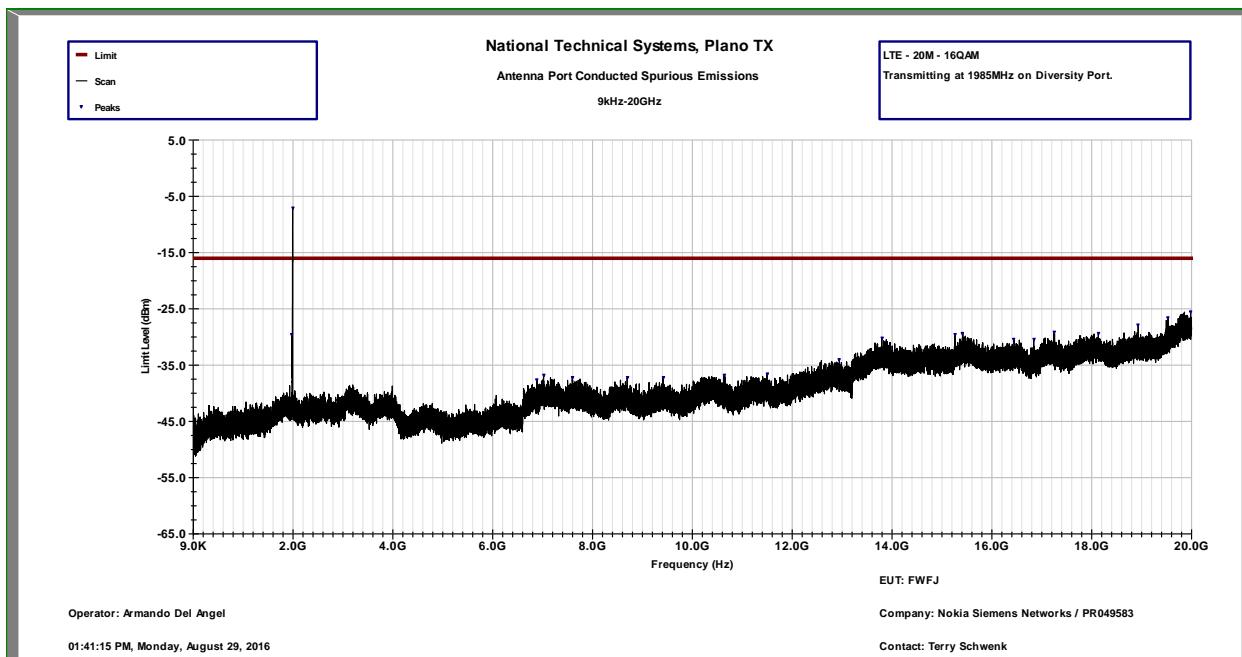
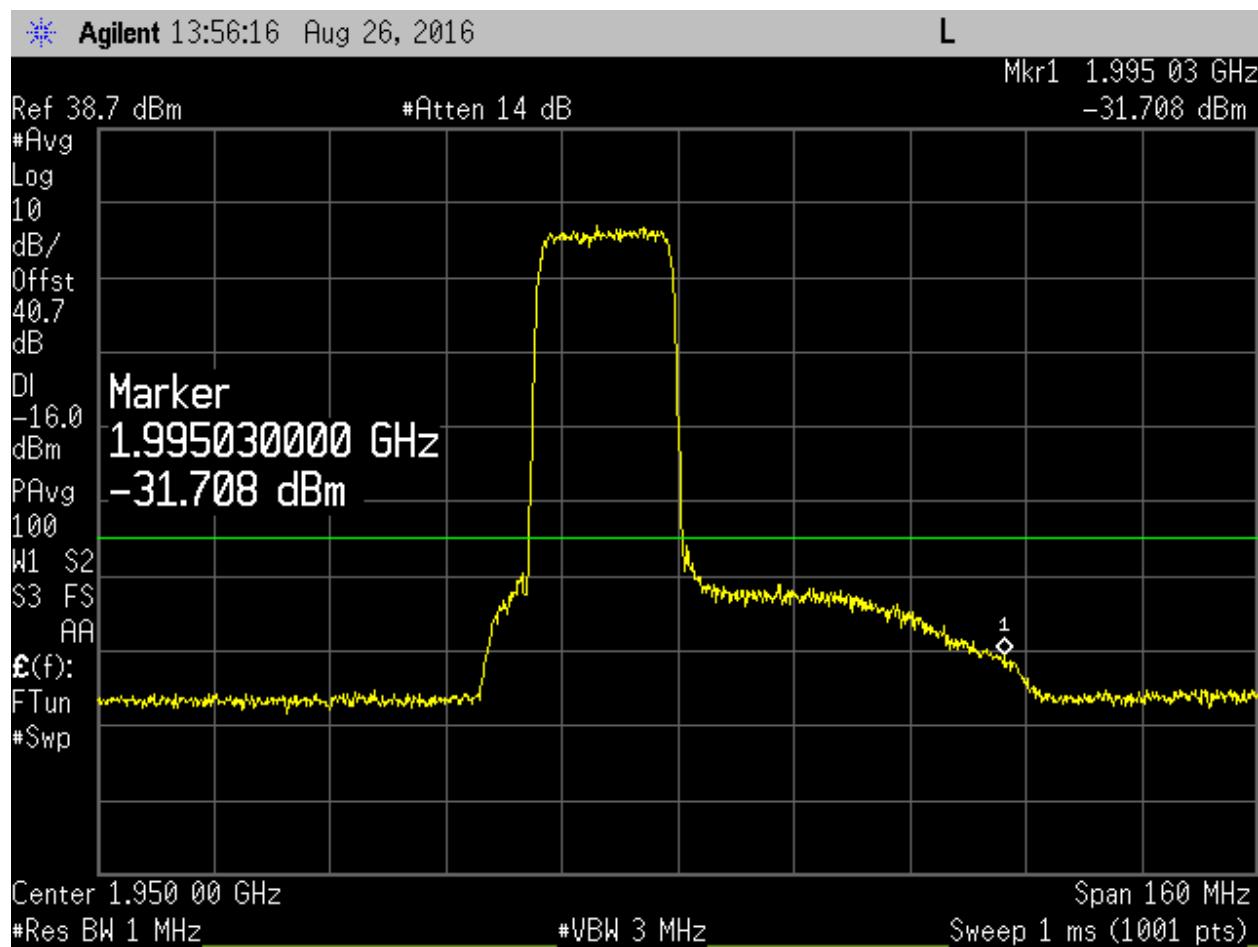
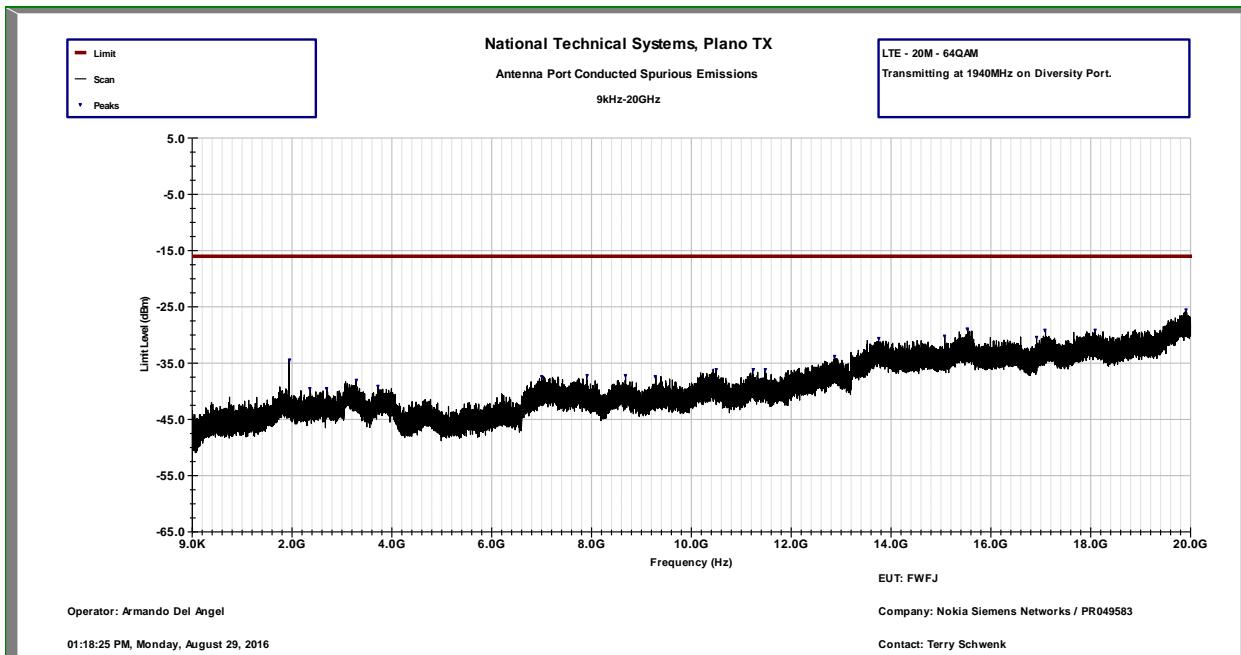


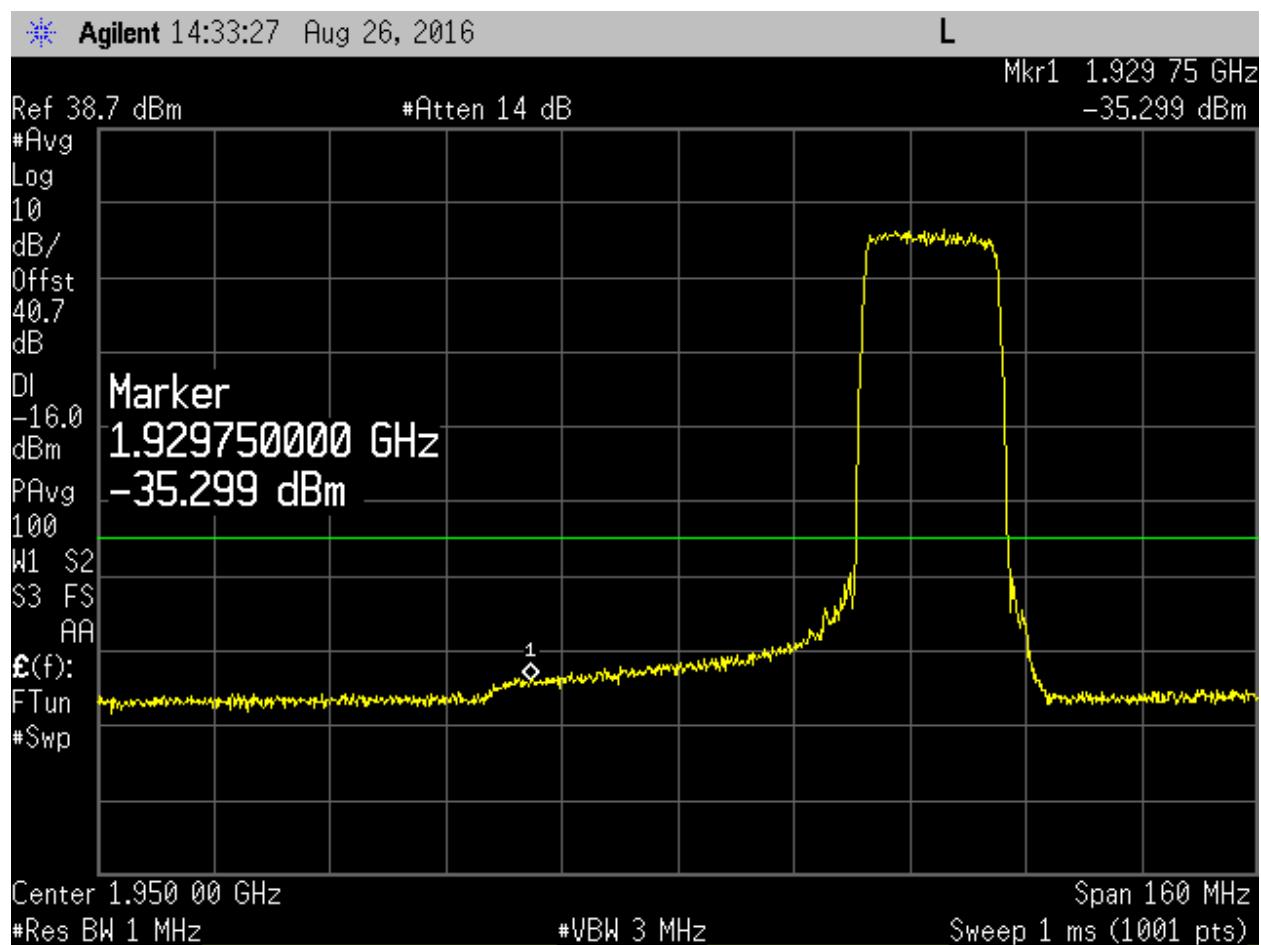
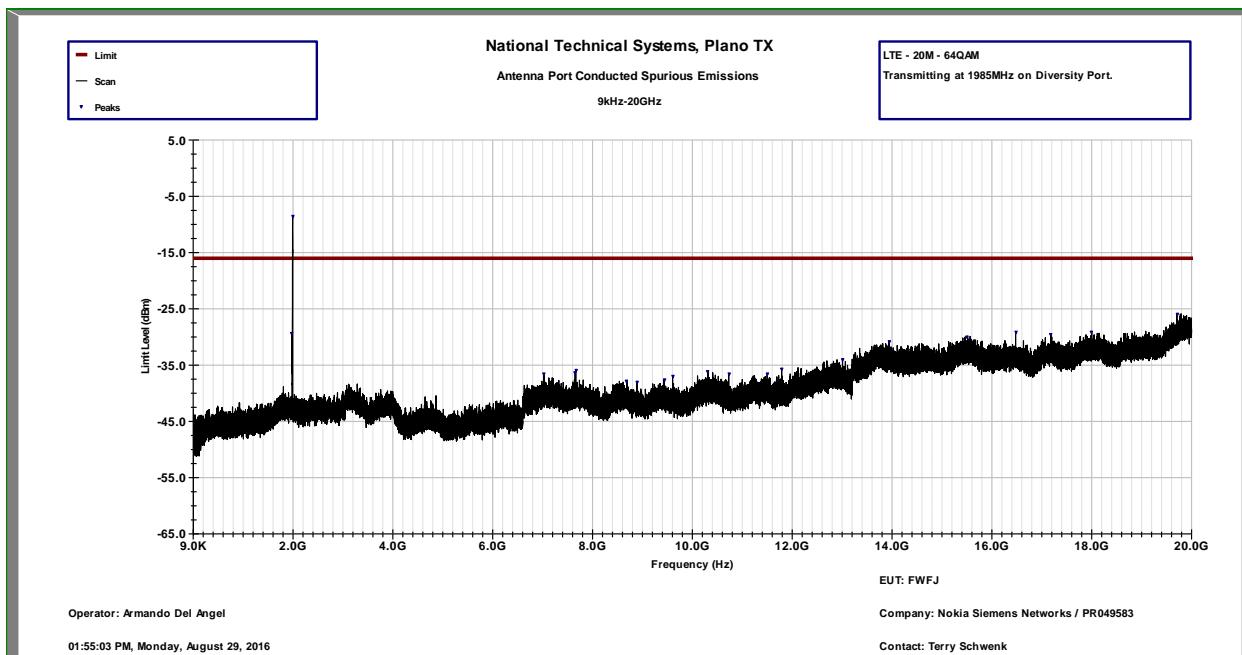
## 20M – LTE – 16QAM – High Channel



## 20M – LTE – 64QAM – Low Channel



## 20M – LTE – 64QAM – High Channel



**Transmitter Radiated Spurious Emissions**

Based on antenna port conducted spurious emissions tests results, preliminary scans for radiated spurious emissions were performed in 30MHz – 20GHz frequency range in the following configurations:

LTE: 10M – 16QAM transmitting at Low (1932.5MHz) channel on both antennas.

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

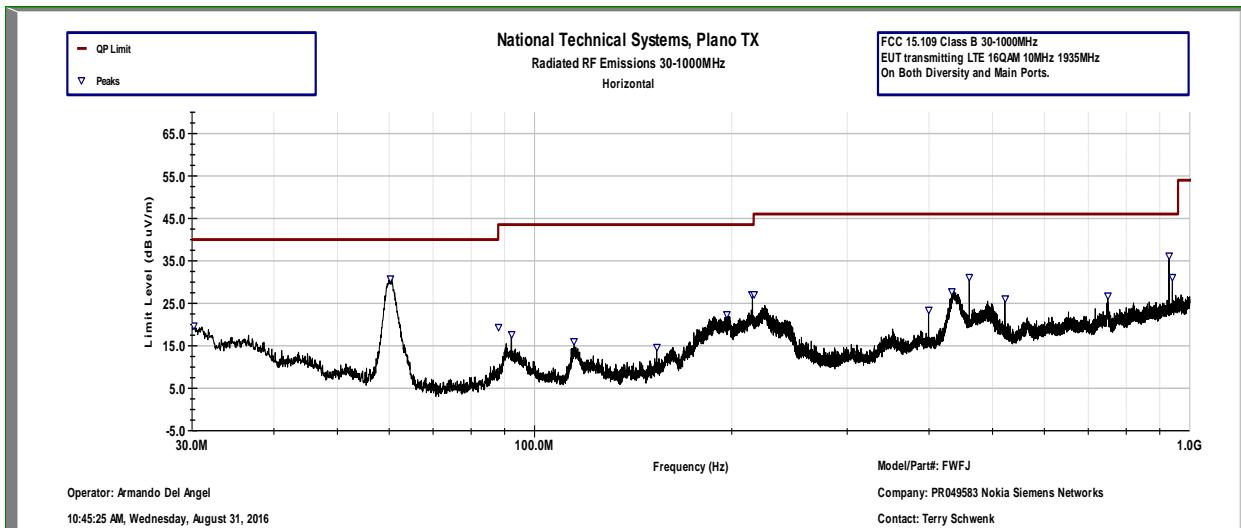
Frequency	Polarity	Antenna	Cable	Pre Amp	Raw Peak	Corrected	Limit	Margin
MHz	H/V	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dB
215.023	V	11.5	0.86	-41.861	29.356	58.857	82.2	-23.343
17999.1	V	45.963	15.218	-39.403	34.158	56.174	82.2	-26.026
17985	H	45.916	15.203	-39.445	34.246	56.096	82.2	-26.104
17953.2	V	45.811	15.168	-39.54	34.403	55.878	82.2	-26.322
17927.6	V	45.726	15.141	-39.617	34.305	55.478	82.2	-26.722
17914.4	H	45.682	15.127	-39.657	34.295	55.311	82.2	-26.889
17839.2	H	45.28	15.096	-39.639	33.839	54.386	82.2	-27.814
17747.1	H	44.652	14.966	-39.706	34.444	54.356	82.2	-27.844
17694.3	H	44.094	14.851	-39.789	34.374	53.834	82.2	-28.366
17717.4	V	44.531	14.899	-39.765	33.977	53.641	82.2	-28.559
799.98	V	23.2	2.118	-42.1	26.529	43.312	82.2	-38.888
7743.31	V	36.308	6.137	-41.061	39.83	41.215	82.2	-40.985
9978.35	H	38.132	8.369	-39.792	33.298	40.007	82.2	-42.193
9922.09	V	38.044	8.161	-39.511	33.14	39.835	82.2	-42.365
9581.98	V	37.684	7.356	-40.4	34.091	38.731	82.2	-43.469
9668.86	H	37.661	7.608	-40.124	33.514	38.658	82.2	-43.542
7733.57	V	36.313	6.168	-41.002	37.135	38.615	82.2	-43.585
8553.14	H	37.353	6.686	-40.74	34.913	38.211	82.2	-43.989
929.733	H	24.8	2.871	-42	37.541	23.212	82.2	-58.988
215.725	H	11.515	0.861	-41.875	38.799	9.3	82.2	-72.9

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

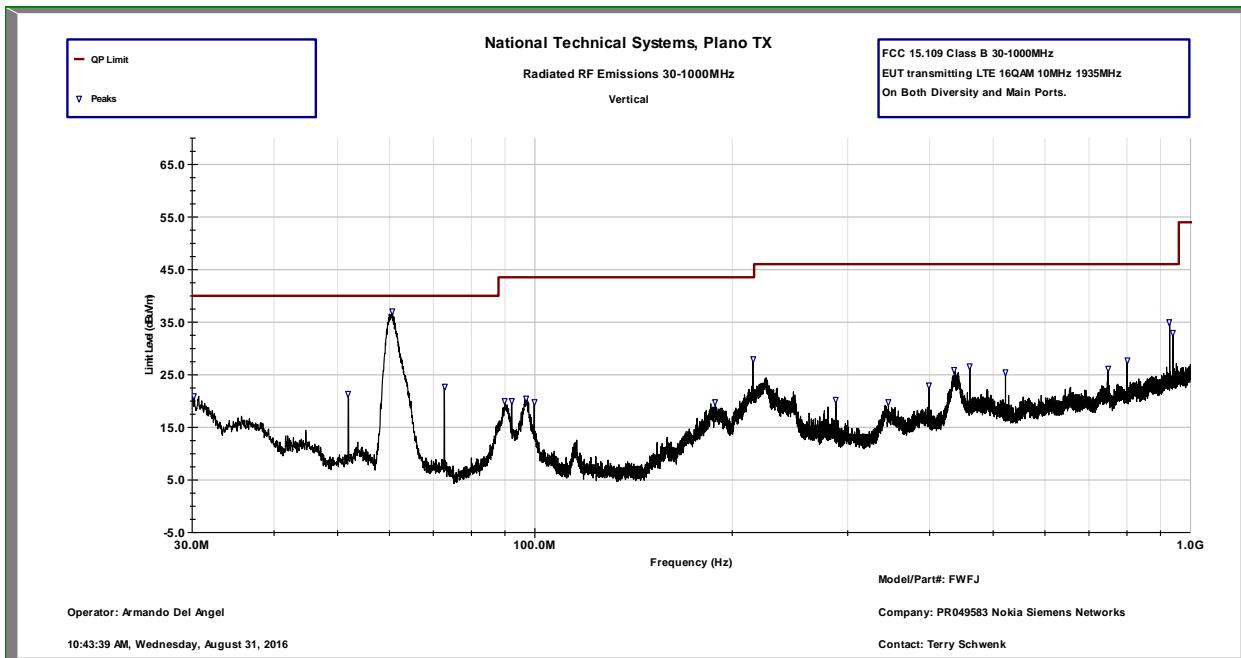
Since all maximized readings were more than 20dB below the 82.2dBuV/m at 3m limit (equivalent to -13dBm EIRP), substitution measurements were not performed.

TILE software was used for all prescans and plots included on the following pages.

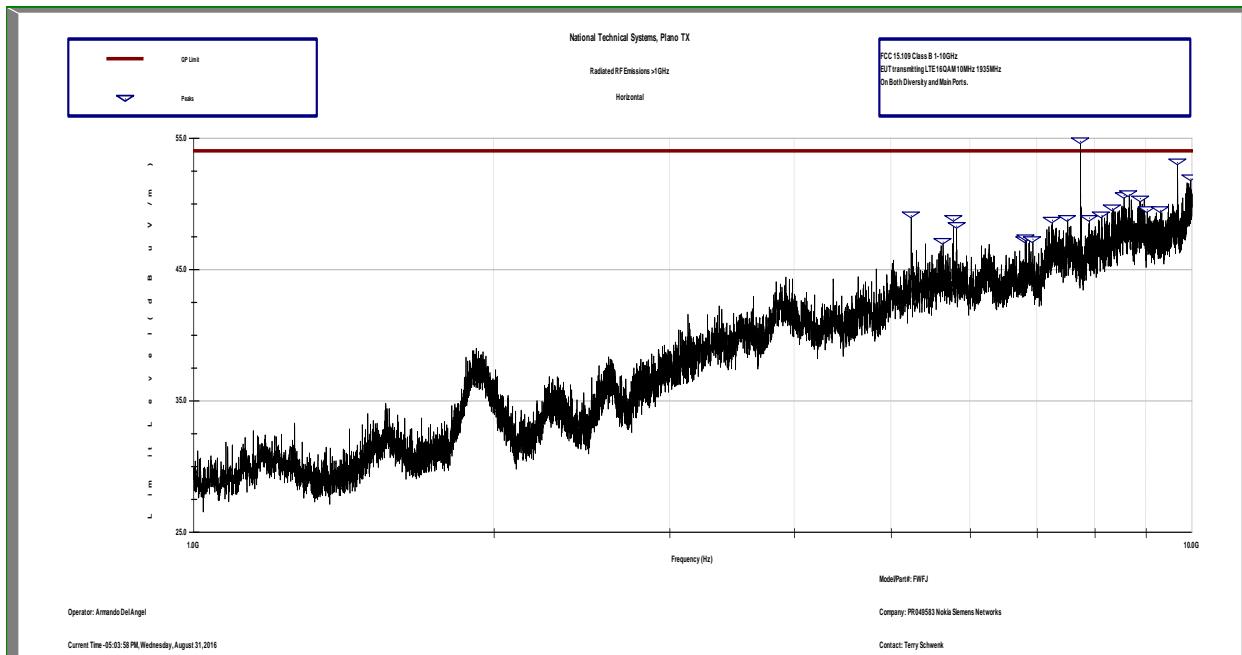
## 30MHz – 1GHz Peak Prescan at 3m – H



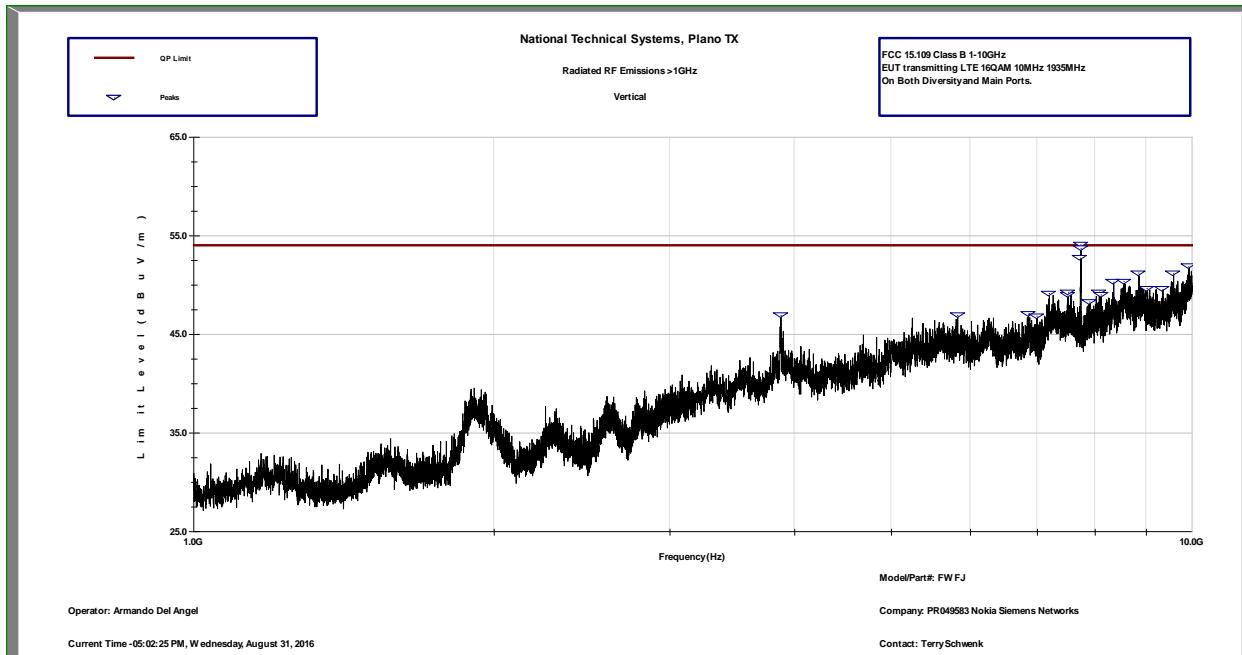
## 30MHz – 1GHz Peak Prescan at 3m – V



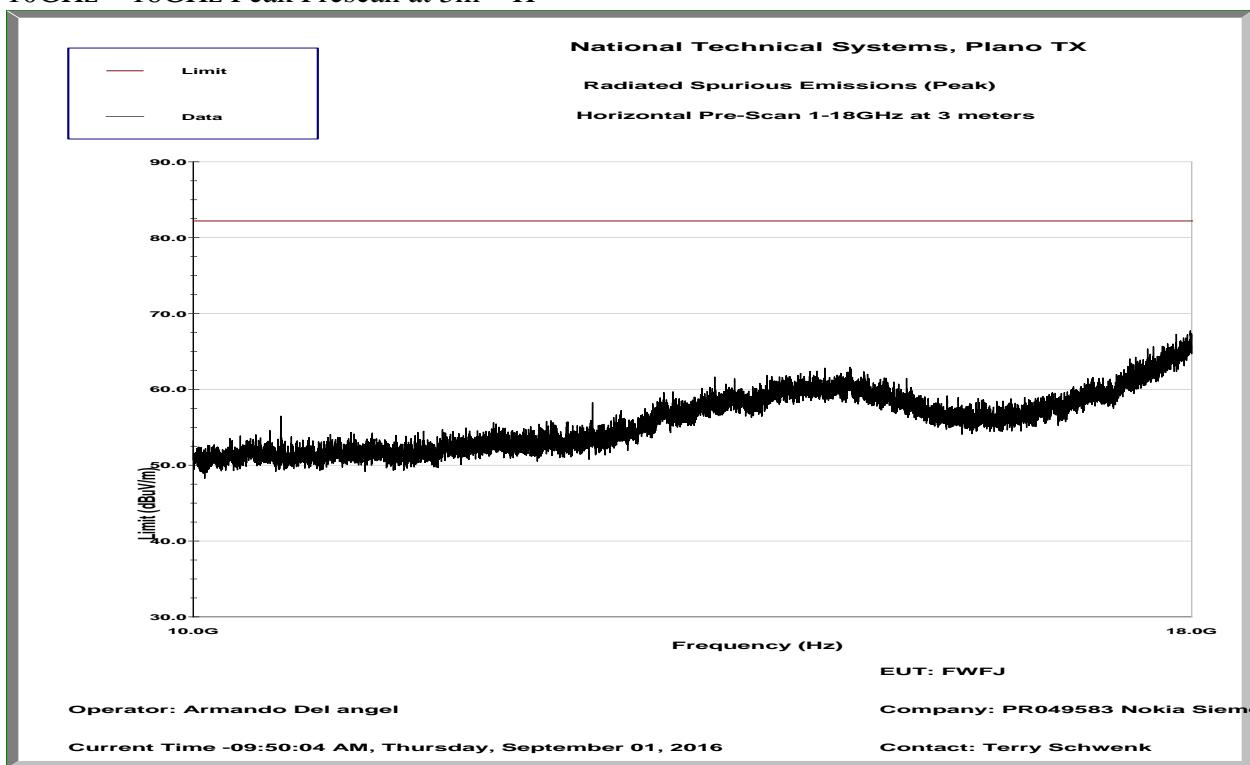
## 1GHz – 10GHz Peak Prescan at 3m – H



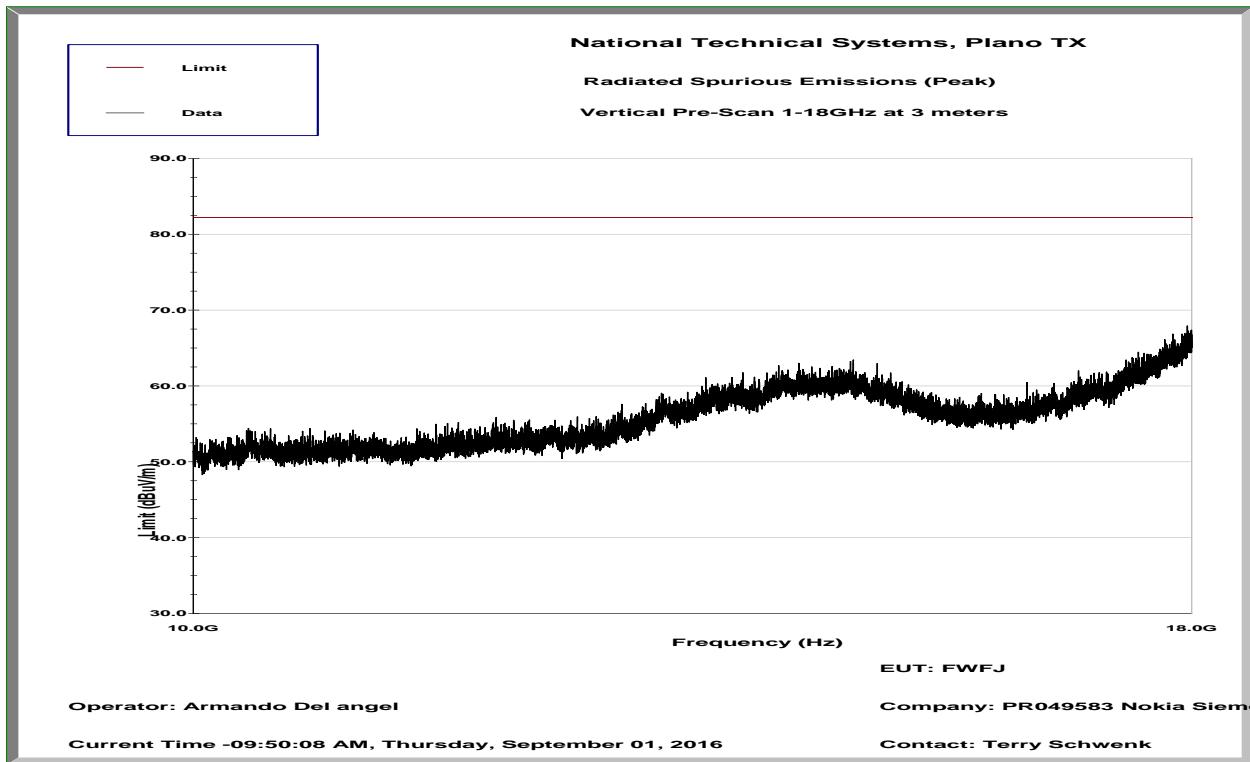
## 1GHz – 10GHz Peak Prescan at 3m – V



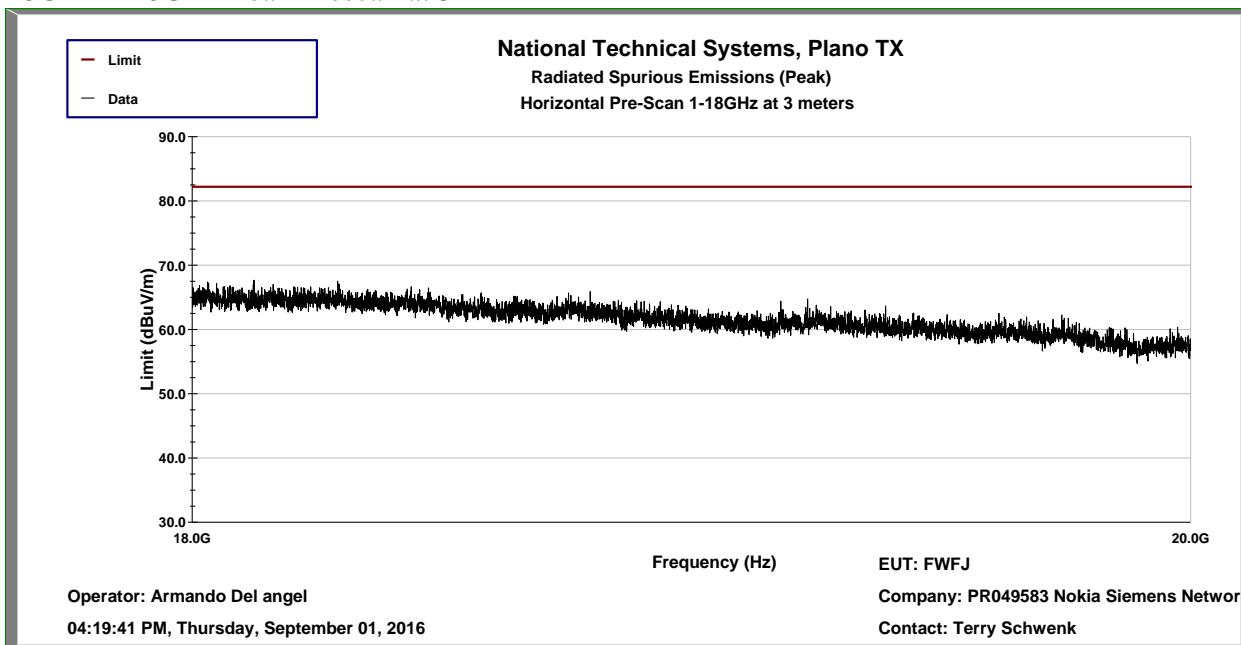
## 10GHz – 18GHz Peak Prescan at 3m – H



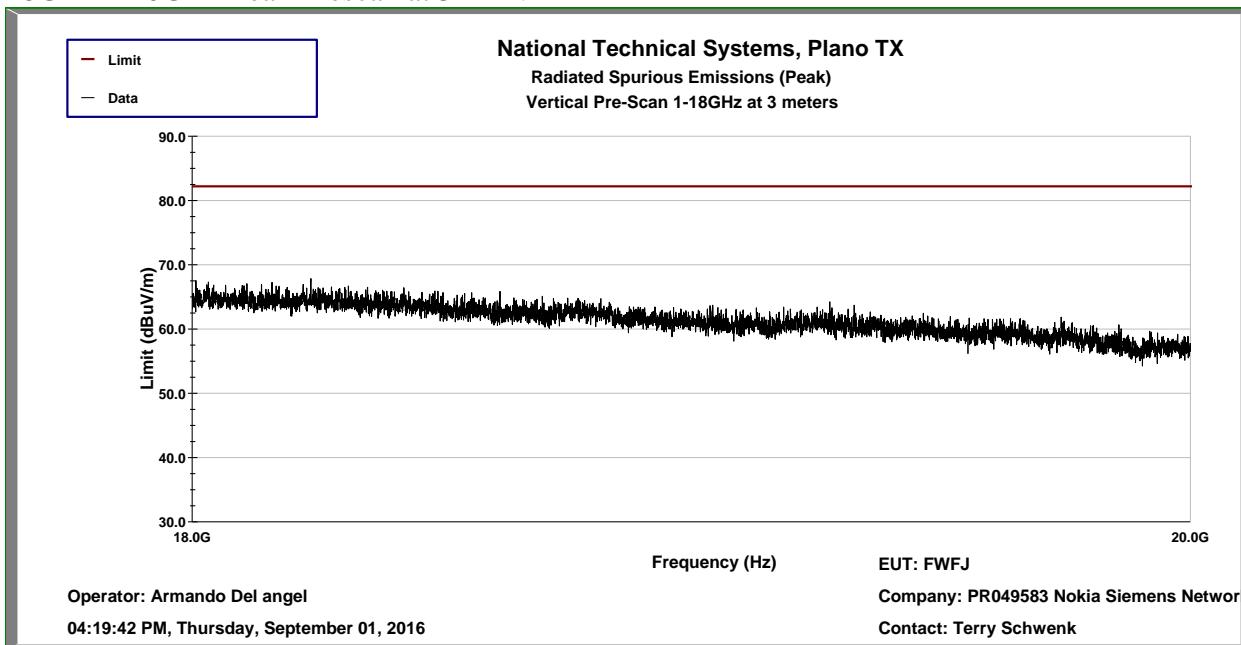
## 10GHz – 18GHz Peak Prescan at 3m – V



## 18GHz – 20GHz Peak Prescan at 3m – H



## 18GHz – 20GHz Peak Prescan at 3m – V



## **Frequency Stability**

In order to demonstrate carrier frequency stability at extreme temperatures and voltages, frequency Bandedge was measured in the following configuration (Worst case from conducted Port Bandedge measurement):

LTE: 10M – 16QAM transmitting at Low (1935MHz) and High (1990MHz) channels on Main Port.

Nominal operating voltage of the product is declared as 115VAC.

Amplitude at the bandedges are compared with the limit used during the bandedge measurement (-16.02dBm).

### Extreme Voltages

	1935MHz	1990MHz
20C	Amplitude (dBm)	Amplitude (dBm)
97.75VAC	-17.85	-19.076
132.25VAC	-18.931	-19.303

### Extreme Temperatures

	1935MHz	1990MHz
115VAC	Amplitude (dBm)	Amplitude (dBm)
-30	-19.711	-18.385
-20	-20.016	-18.341
-10	-21.61	-19.939
0	-18.592	-18.121
10	-20.42	-20.06
20	-19.16	-19.28
30	-17.75	-18.675
40	-18.477	-19.44
50	-17.826	-17.074

Based on the results above, highest amplitude at any bandedge was -17.074dBm, which ensures that the transmitted signal remains in its authorized frequency block at extreme voltages and temperatures.

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.

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***Appendix B WCDMA Test Data***

**RF Output Power**

RF output power has been measured in both Peak and RMS Average terms for each transmit chain at center channel for all modulations and bandwidth modes. Peak to average ratio (PAR) has been calculated as described in Section 5.7.2 of KDB971168 D01 v02r02 and all results are presented in tabular form below.

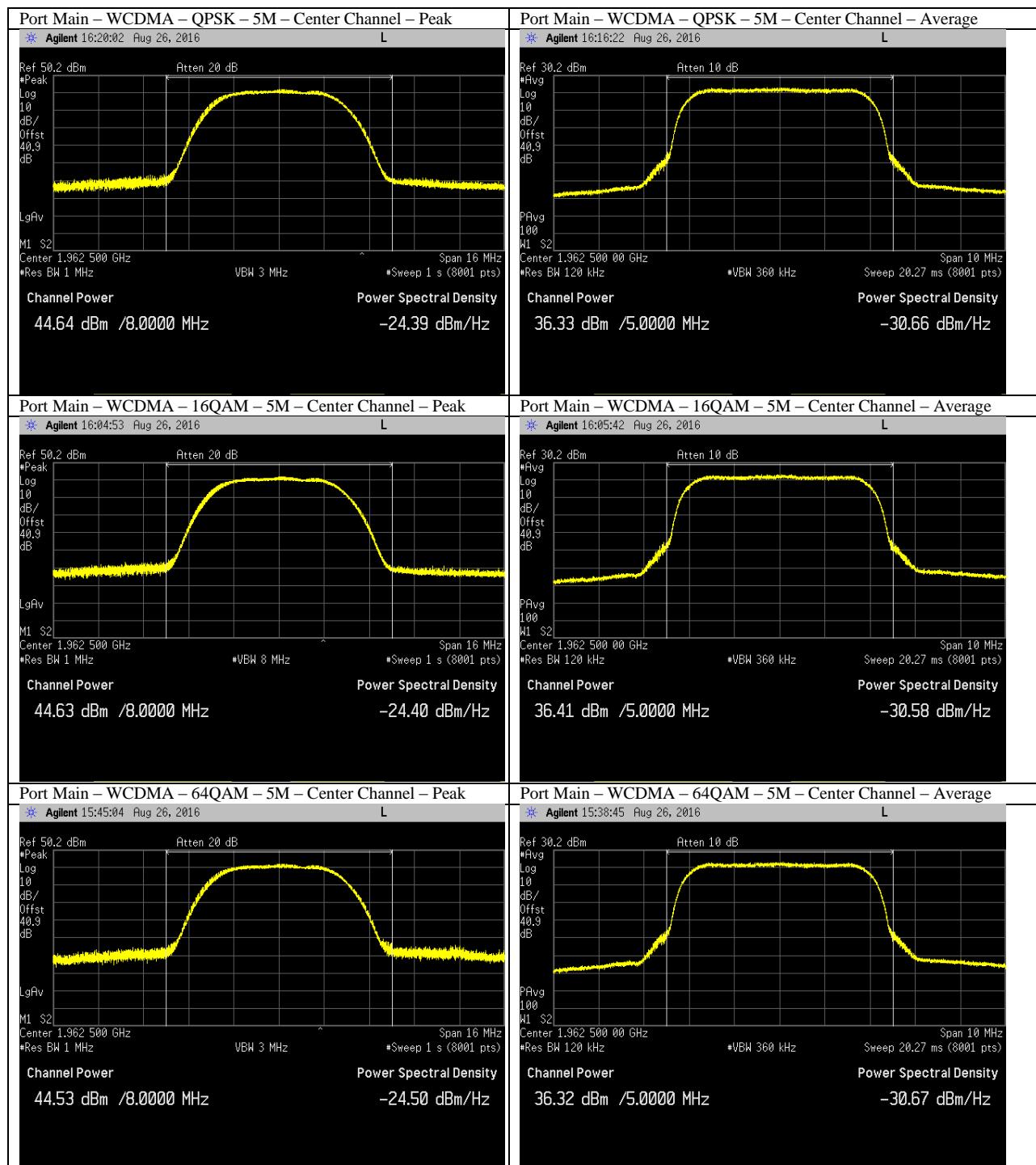
		WCDMA - QPSK			WCDMA - 16QAM			WCDMA - 64QAM		
		Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)
<b>M Port</b>	<b>5M</b>	44.64	36.33	8.31	44.63	36.41	8.22	44.53	36.32	8.21
<b>D Port</b>	<b>5M</b>	44.97	36.75	8.22	44.92	36.71	8.21	44.97	36.71	8.26
<b>Combined</b>	<b>5M</b>	47.82	39.56	11.28	47.79	39.57	11.23	47.77	39.53	11.25

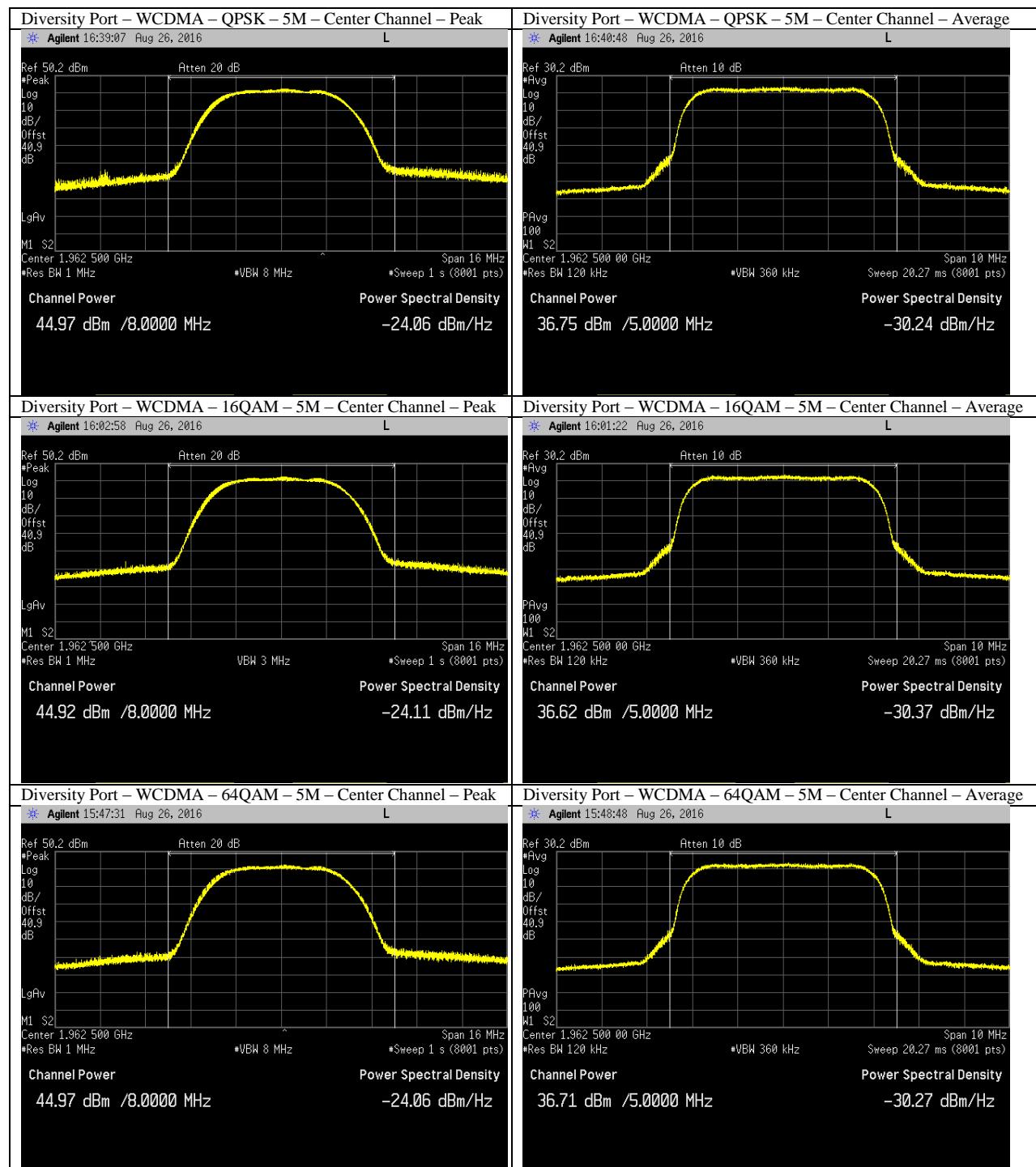
Based on the results above, Diversity Port had the highest RMS average power and therefore it was selected for all the remaining LTE mode antenna port tests on the product.

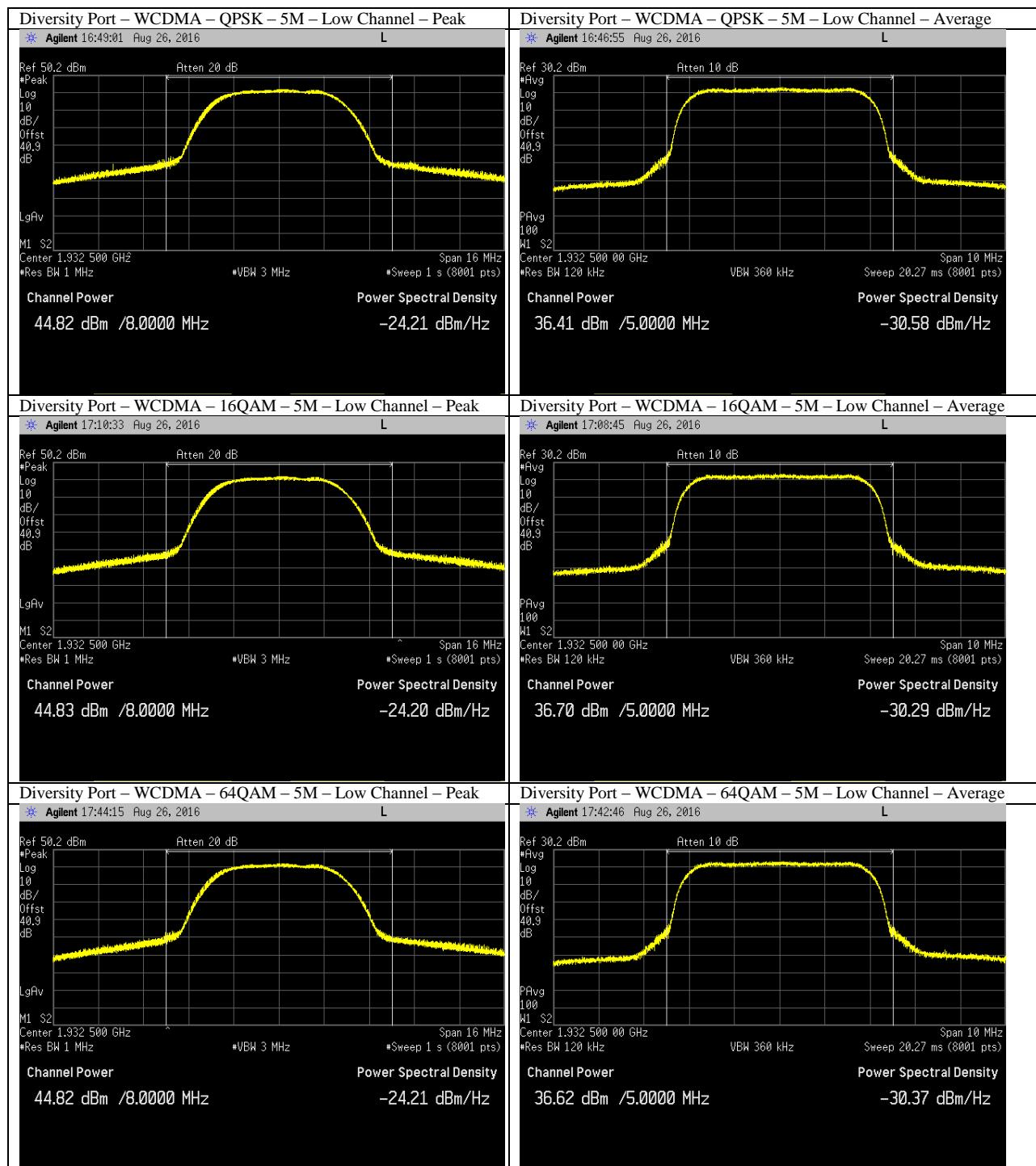
Subsequently output power levels on lowest and highest channels were tested only on Diversity Port and results presented below.

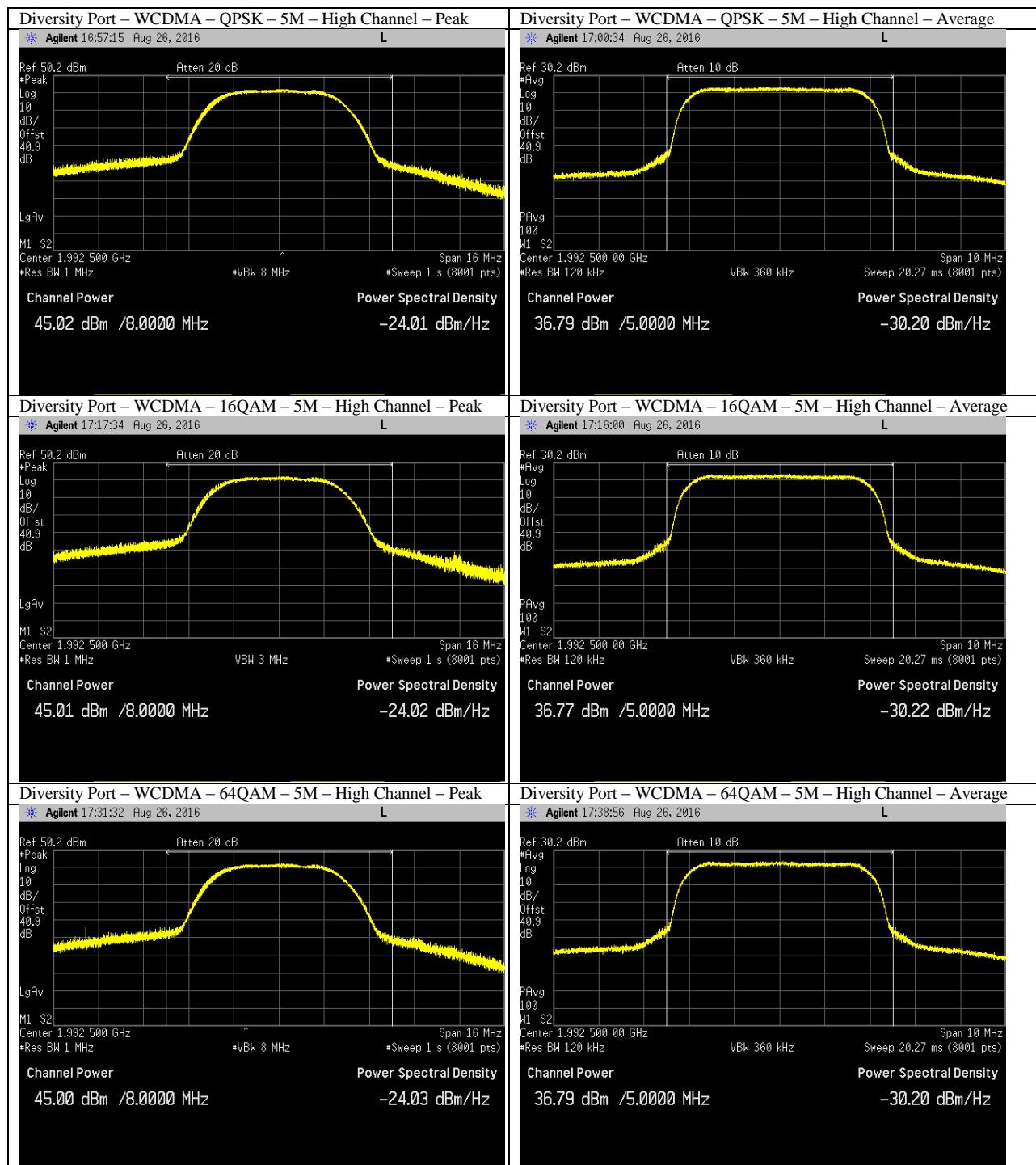
		WCDMA - QPSK			WCDMA - 16QAM			WCDMA - 64QAM			
		Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)	
<b>D Port</b>	<b>Low Channel</b>	5M	44.82	36.41	8.41	44.83	36.7	8.13	44.82	36.62	8.2
<b>D Port</b>	<b>High Channel</b>	5M	45.02	36.79	8.23	45.01	36.77	8.24	45	36.79	8.21

All corresponding plots included on the following pages. Total path loss of 40.9dB accounted in via reference level offset to the spectrum analyzer.







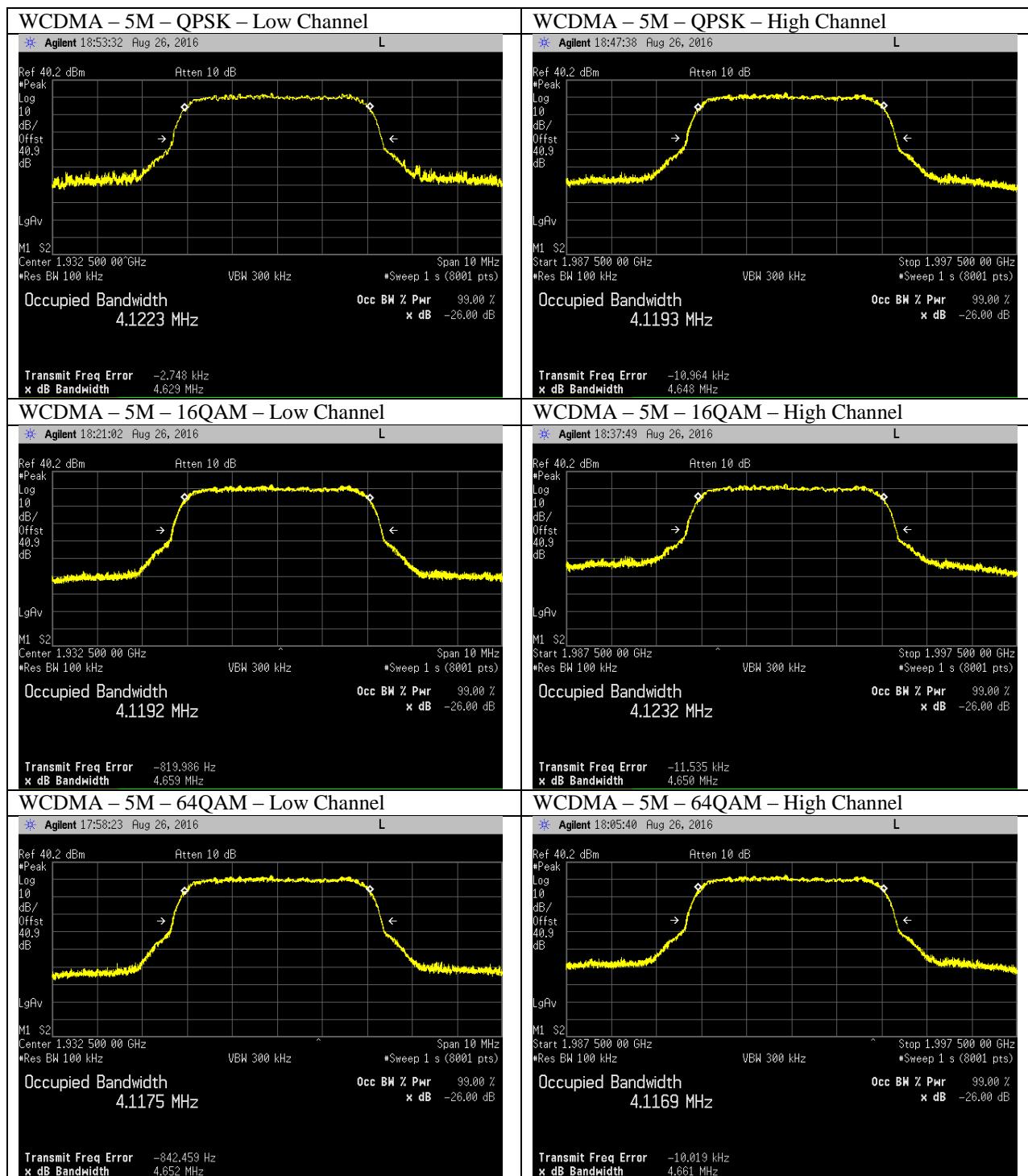


**Emission Bandwidths (26dB and 99%)**

Emissions bandwidths were measured on bottom and top channels for all modulations and bandwidth modes on Diversity Port and results presented below.

	WCDMA - QPSK				WCDMA - 16QAM				WCDMA - 64QAM			
	Low		High		Low		High		Low		High	
	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)
5M	4.629	4.1223	4.648	4.1193	4.659	4.1192	4.65	4.1232	4.652	4.1175	4.1169	4.661

Corresponding plots included on the following pages.



**Antenna Port Conducted Bandedge**

Limit is -13dBm and is further reduced by  $10 * \log(2)$  per FCC KDB 662911D01 v02r01 due to 2x2 MIMO operation, which brings it down to -16.03dBm.

Tests performed at Diversity Port on lowest and highest channels for all modulations and channel bandwidth modes.

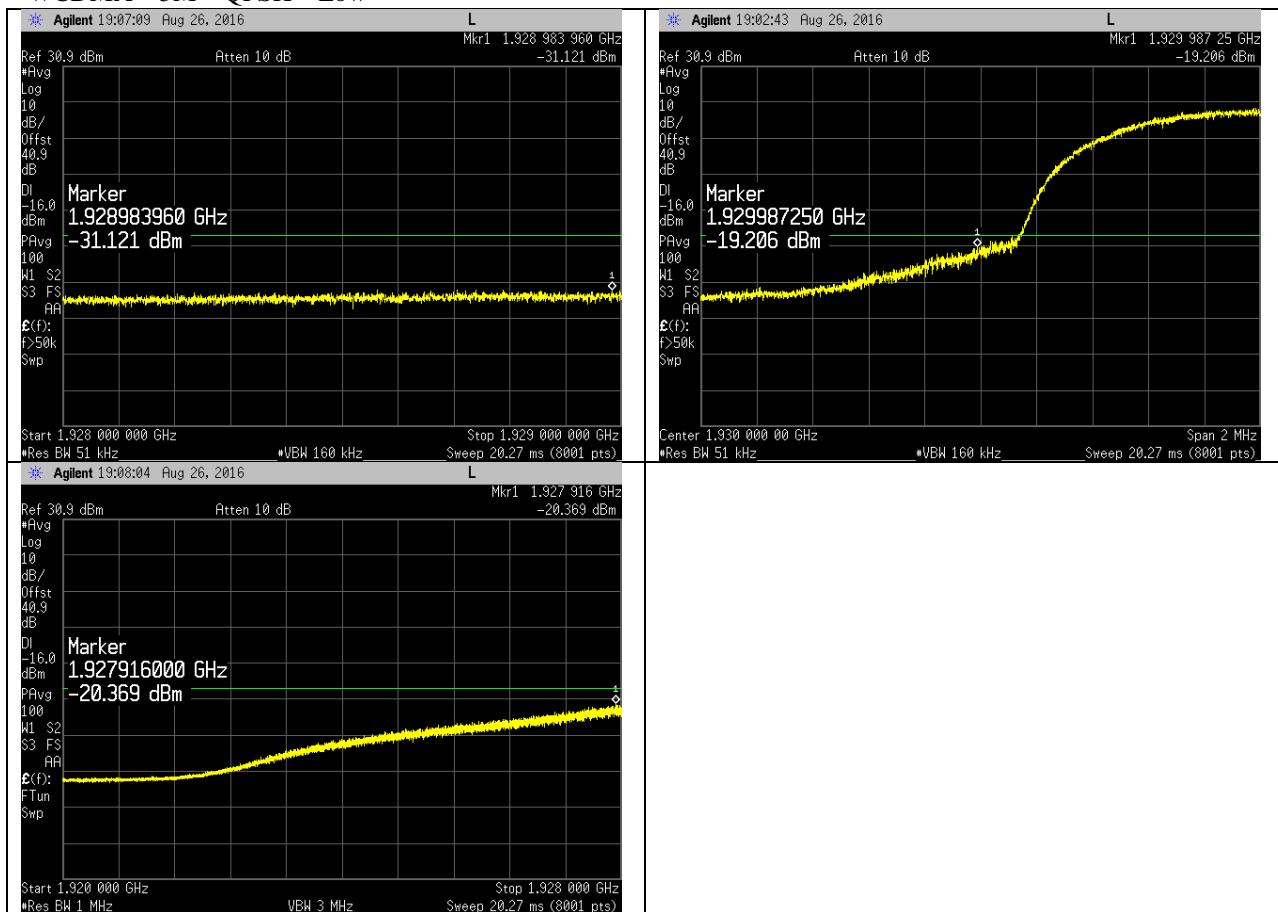
	WCDMA - QPSK		WCDMA - 16QAM		WCDMA - 64QAM	
	Low	High	Low	High	Low	High
5MHz	-19.206dBm	-17.494dBm	-19.718dBm	-17.683dBm	-19.017dBm	-17.775dBm
5MHz Dual	-20.514dBm	-20.874dBm	-20.290dBm	-21.399dBm	-19.352dBm	-21.162dBm

Measurements were performed in RMS average mode with 1MHz RBW and 3MHz VBW over 100 traces. In 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 1% of the emission bandwidth has been used.

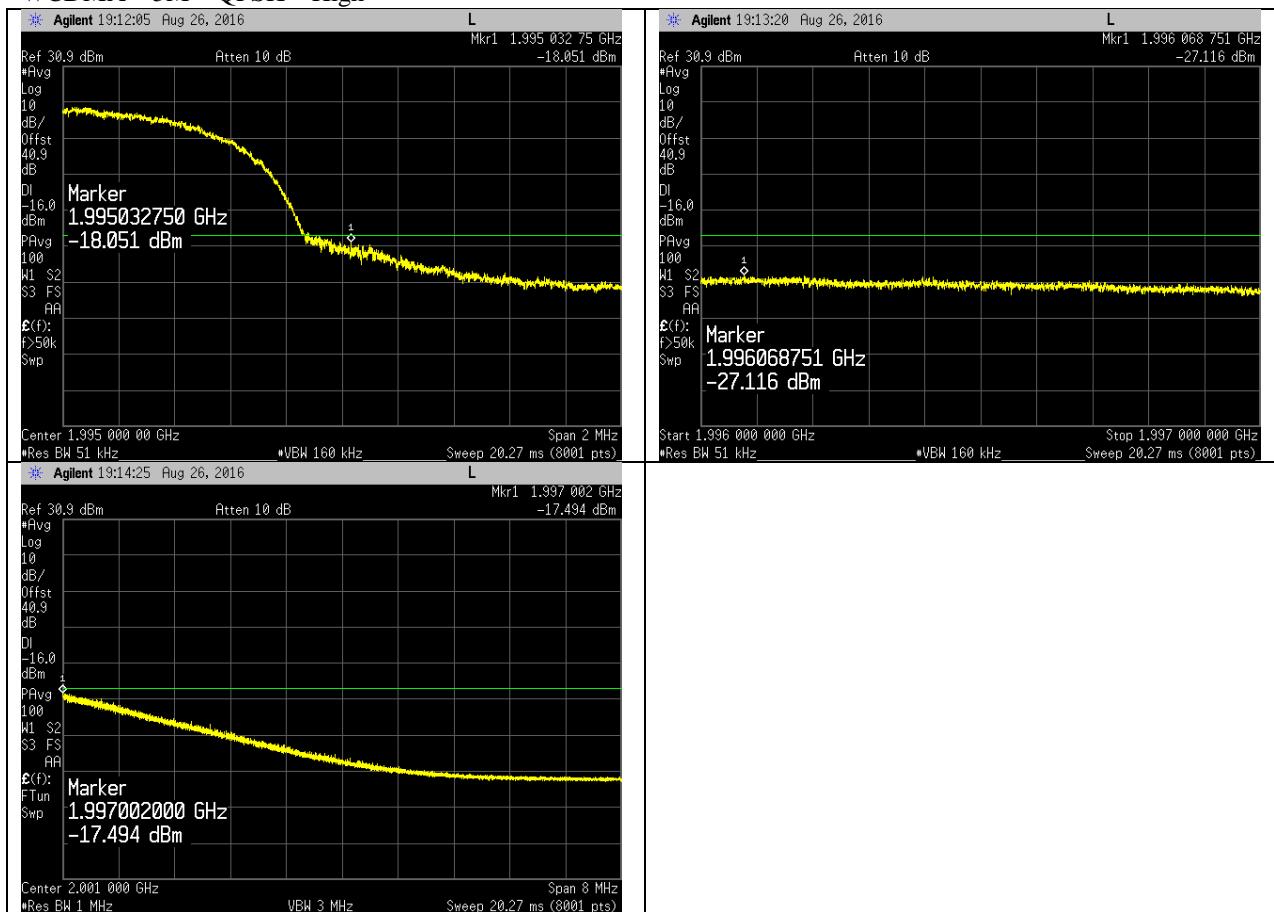
Total path loss of 40.9dB accounted in via reference level offset to the spectrum analyzer.

All corresponding plots are included on the following pages.

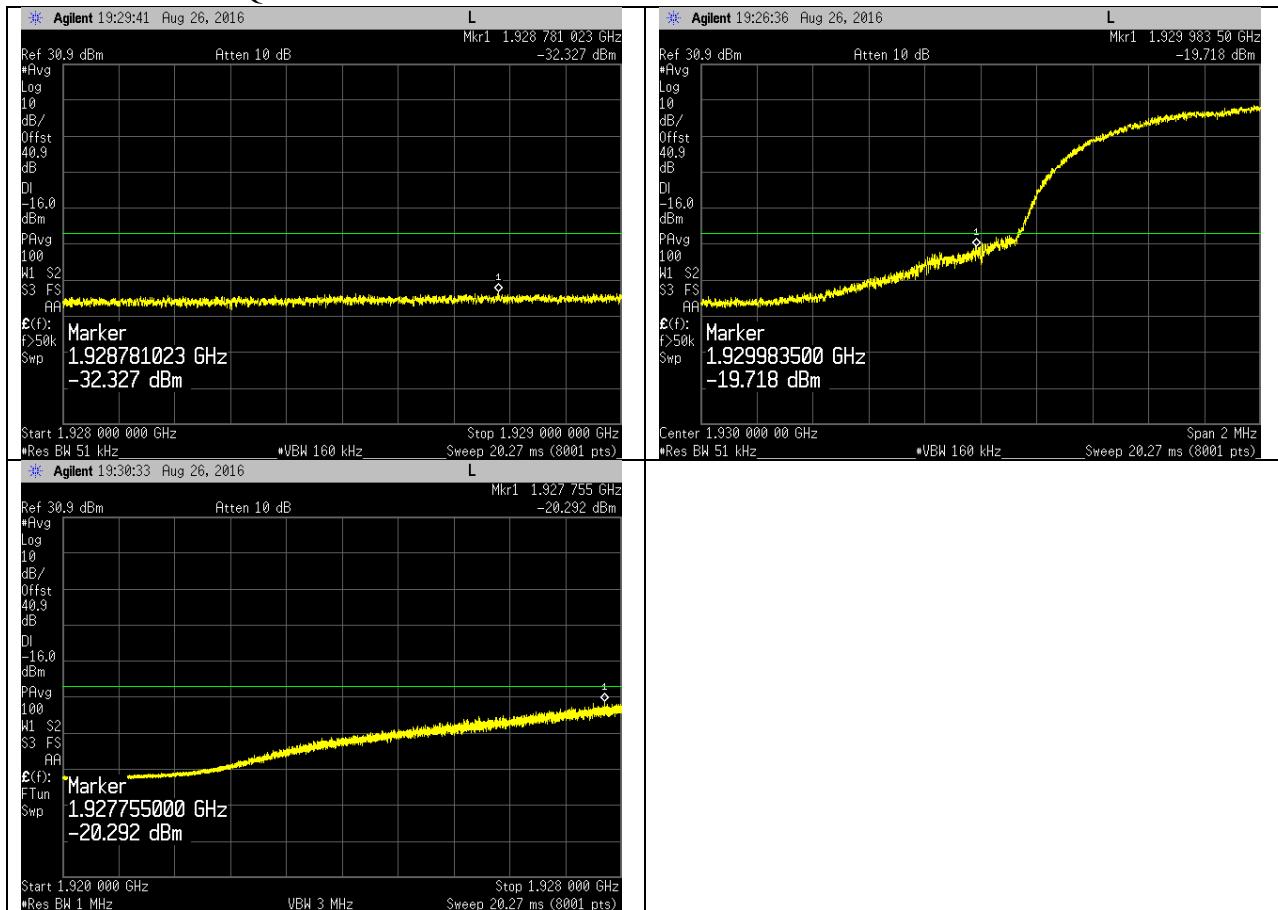
## WCDMA – 5M – QPSK – Low



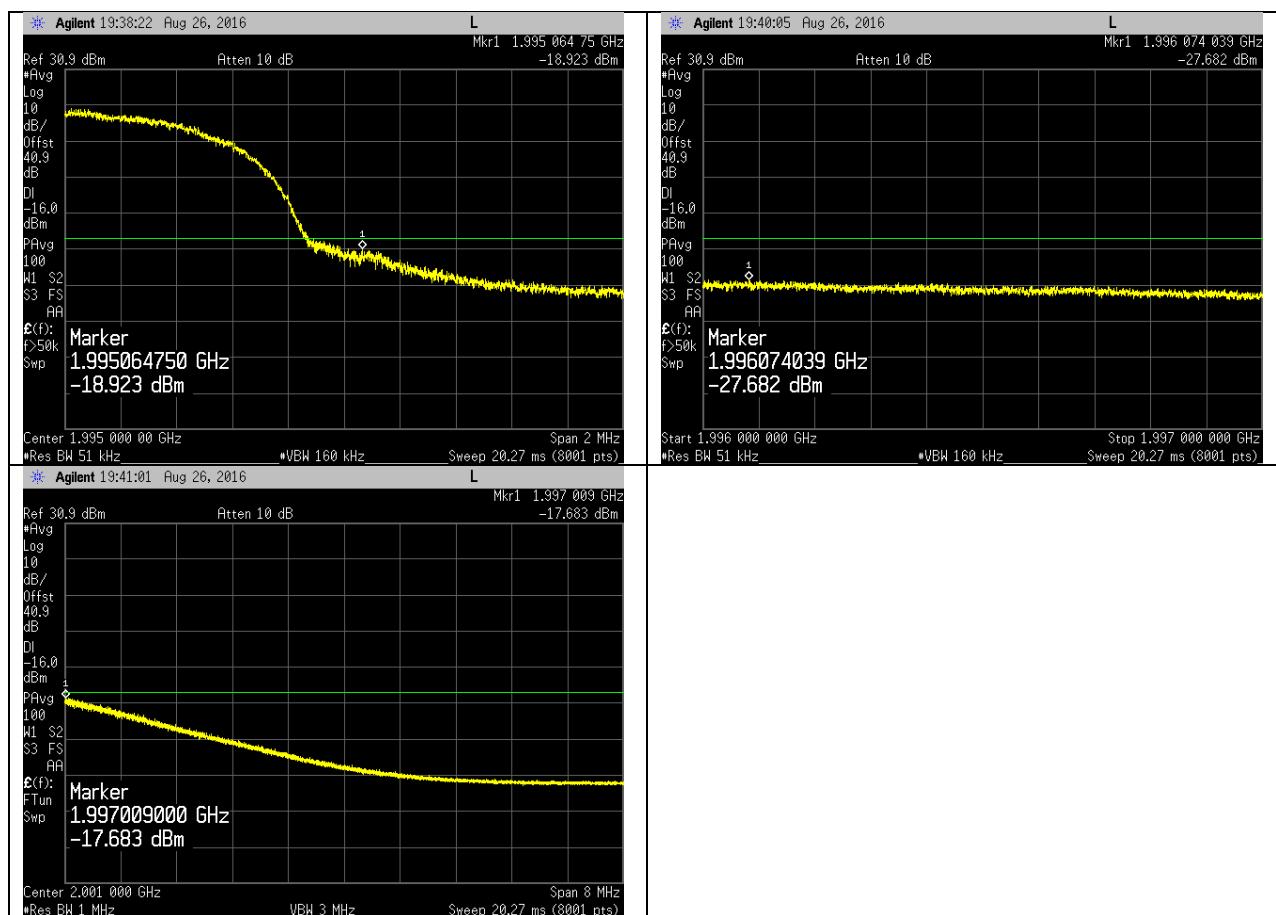
## WCDMA – 5M – QPSK – High



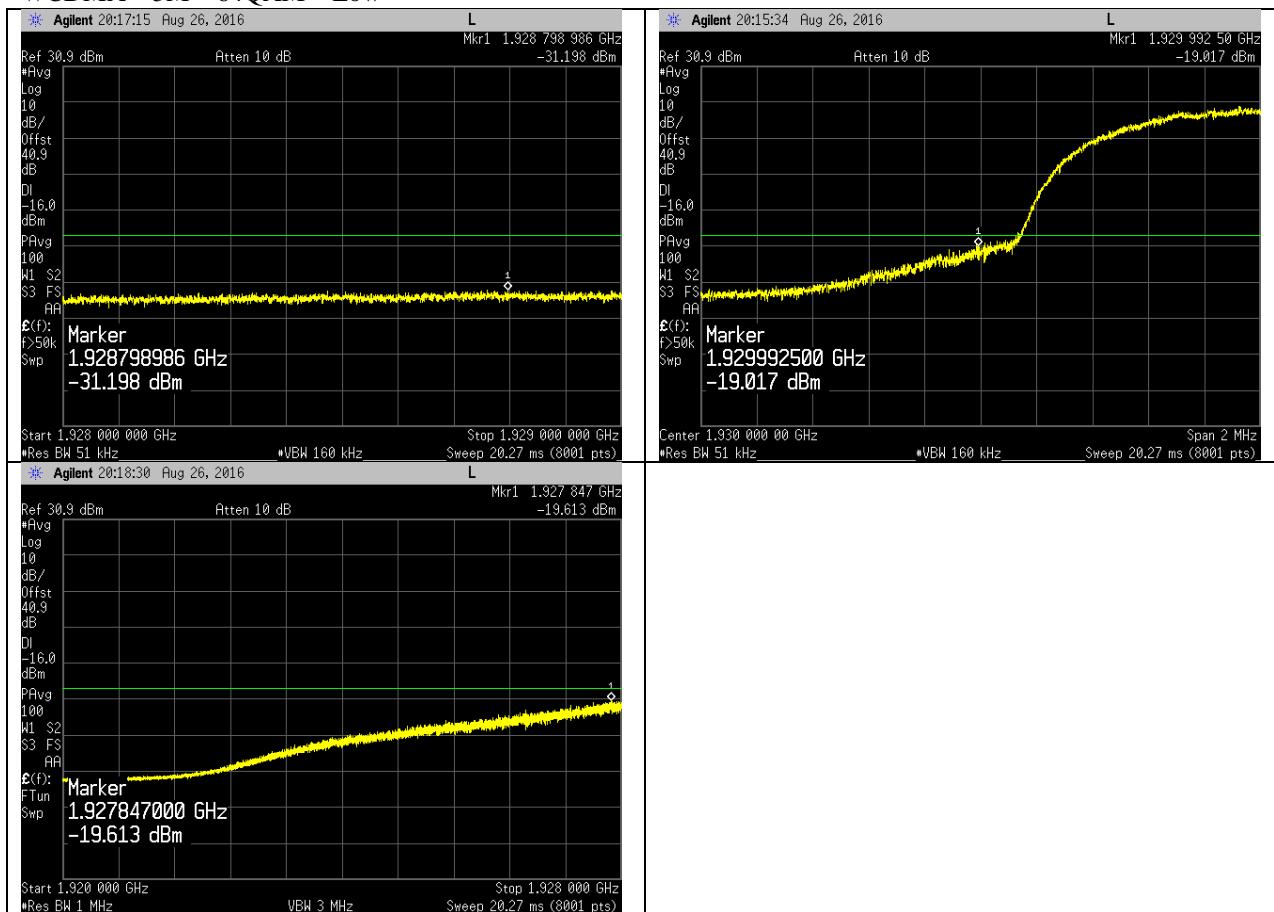
## WCDMA – 5M – 16QAM – Low



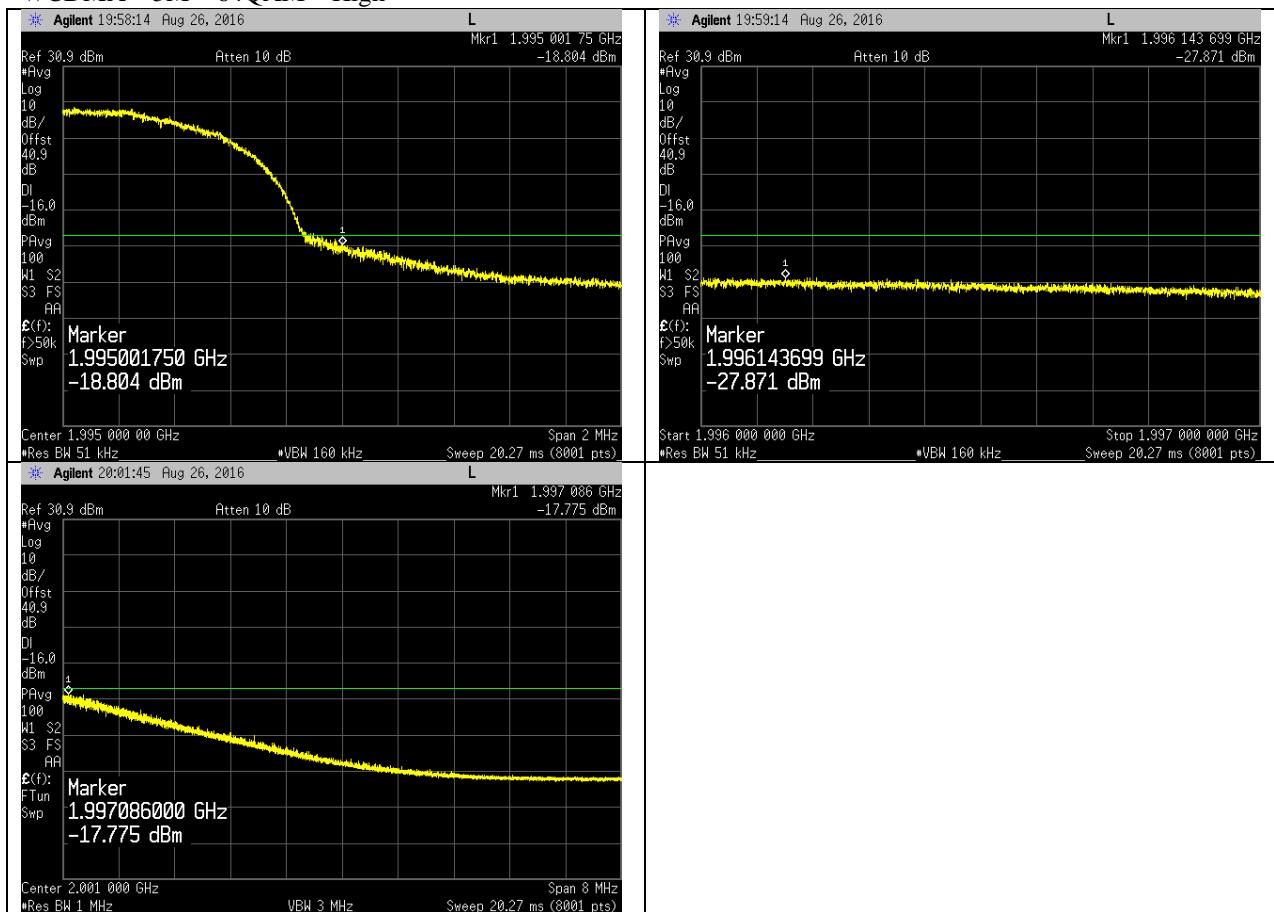
## WCDMA – 5M – 16QAM – High



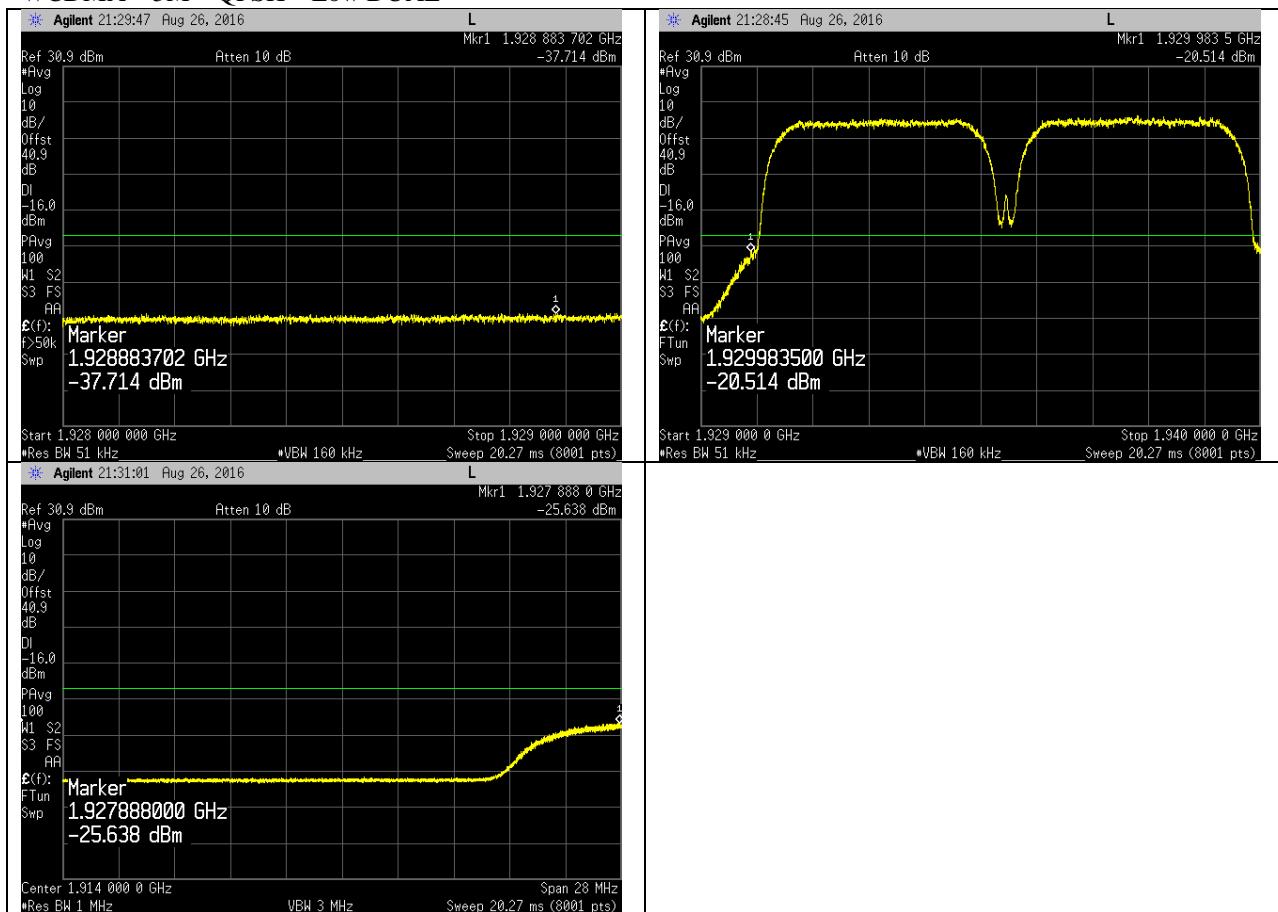
## WCDMA – 5M – 64QAM – Low



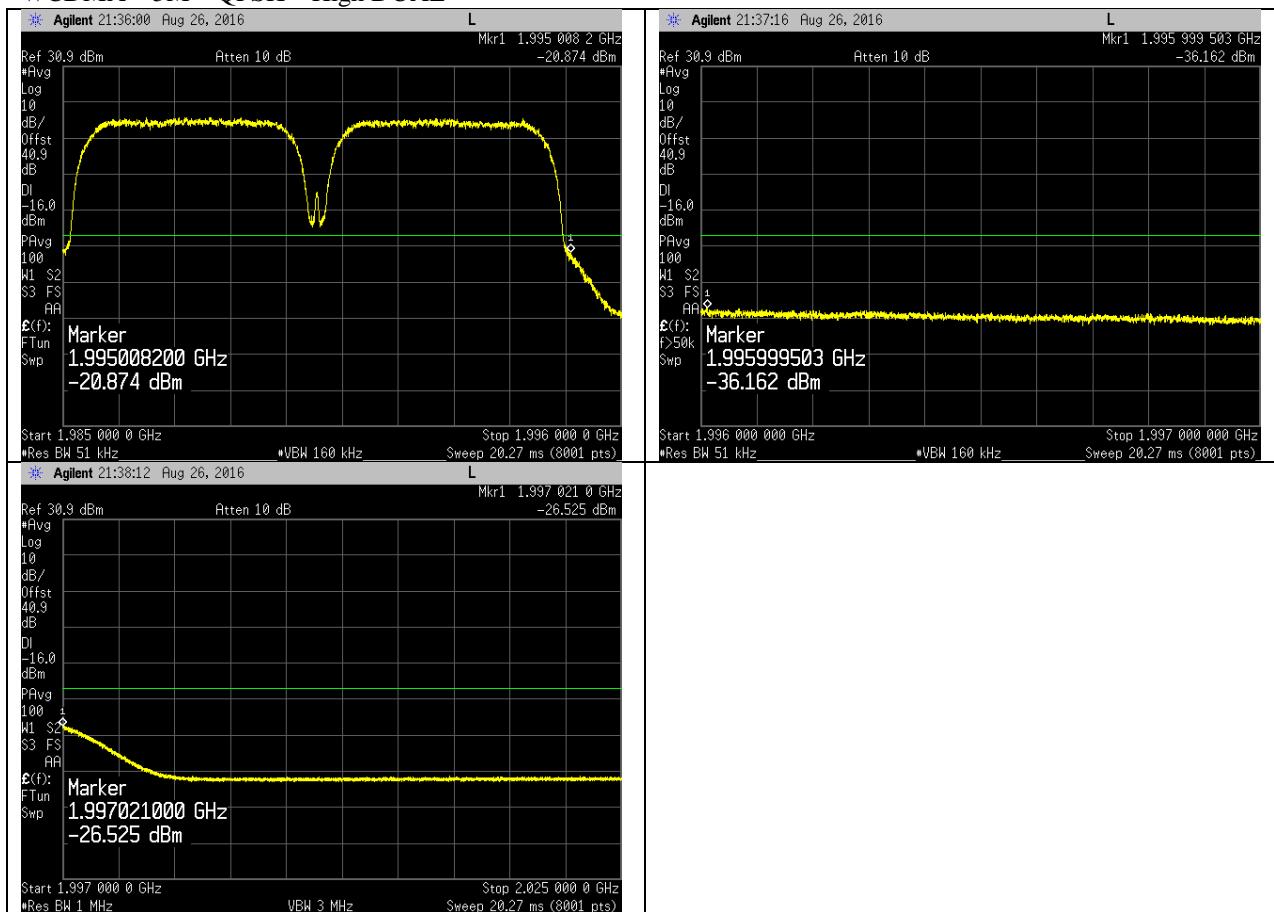
## WCDMA – 5M – 64QAM – High



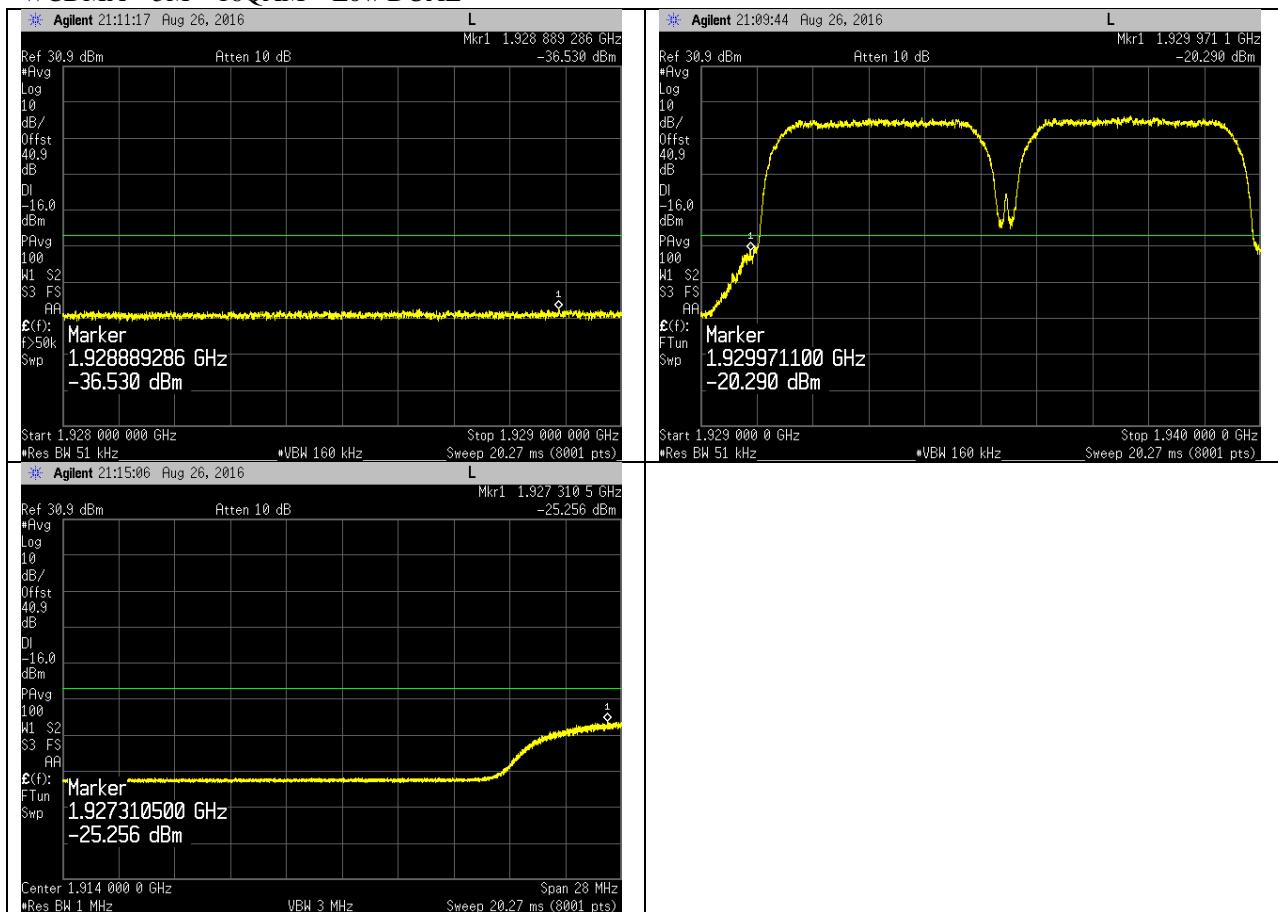
## WCDMA – 5M – QPSK – Low DUAL



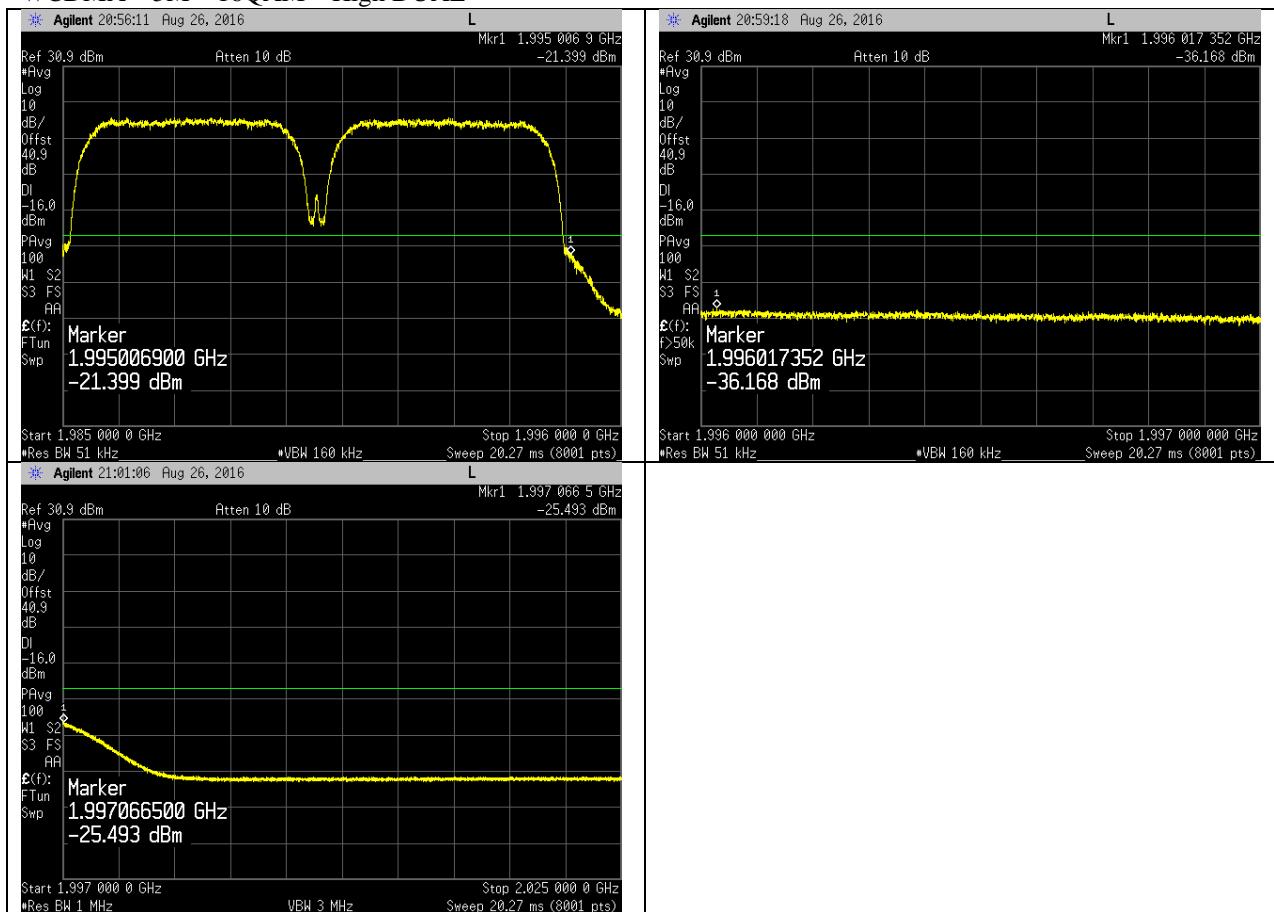
## WCDMA – 5M – QPSK – High DUAL



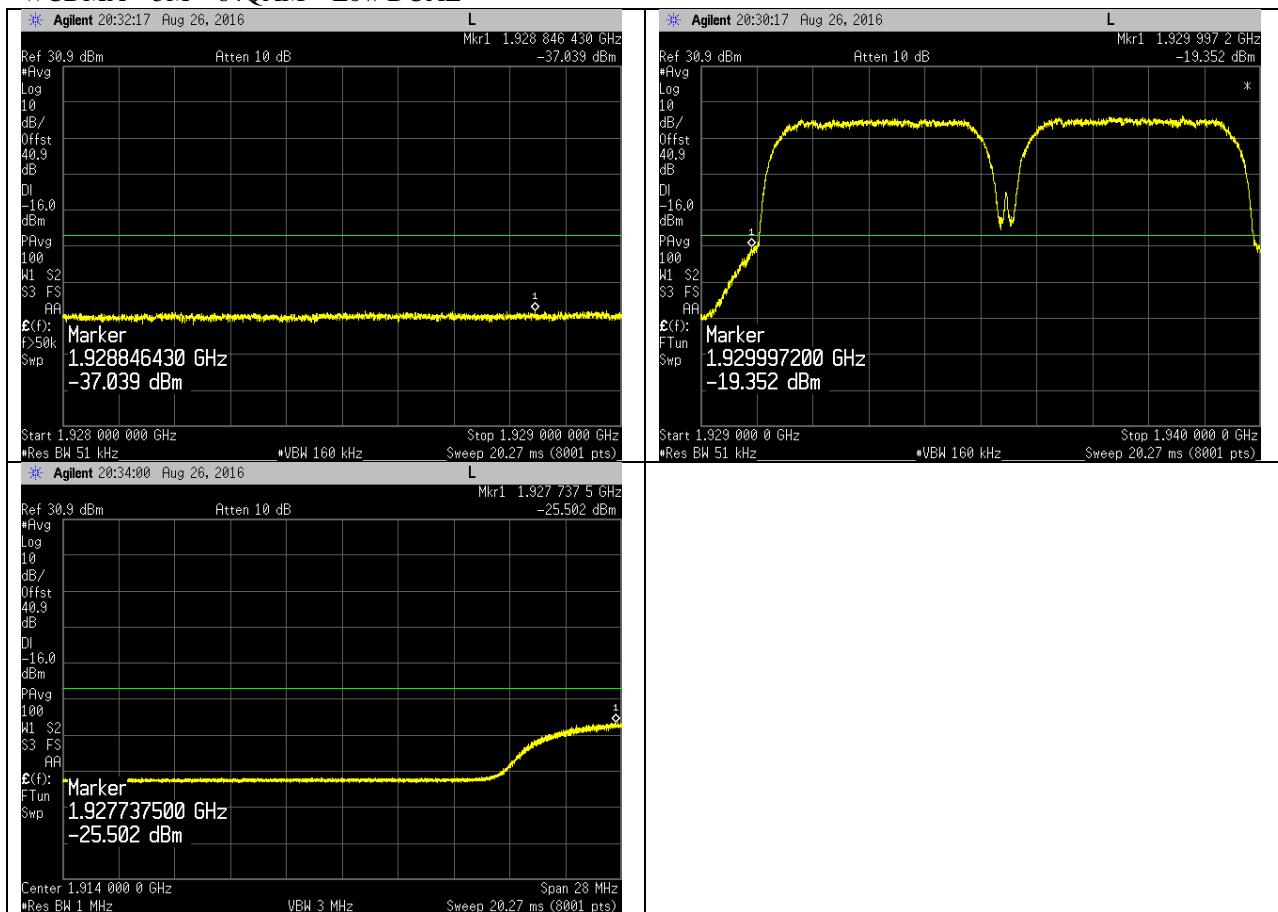
## WCDMA – 5M – 16QAM – Low DUAL



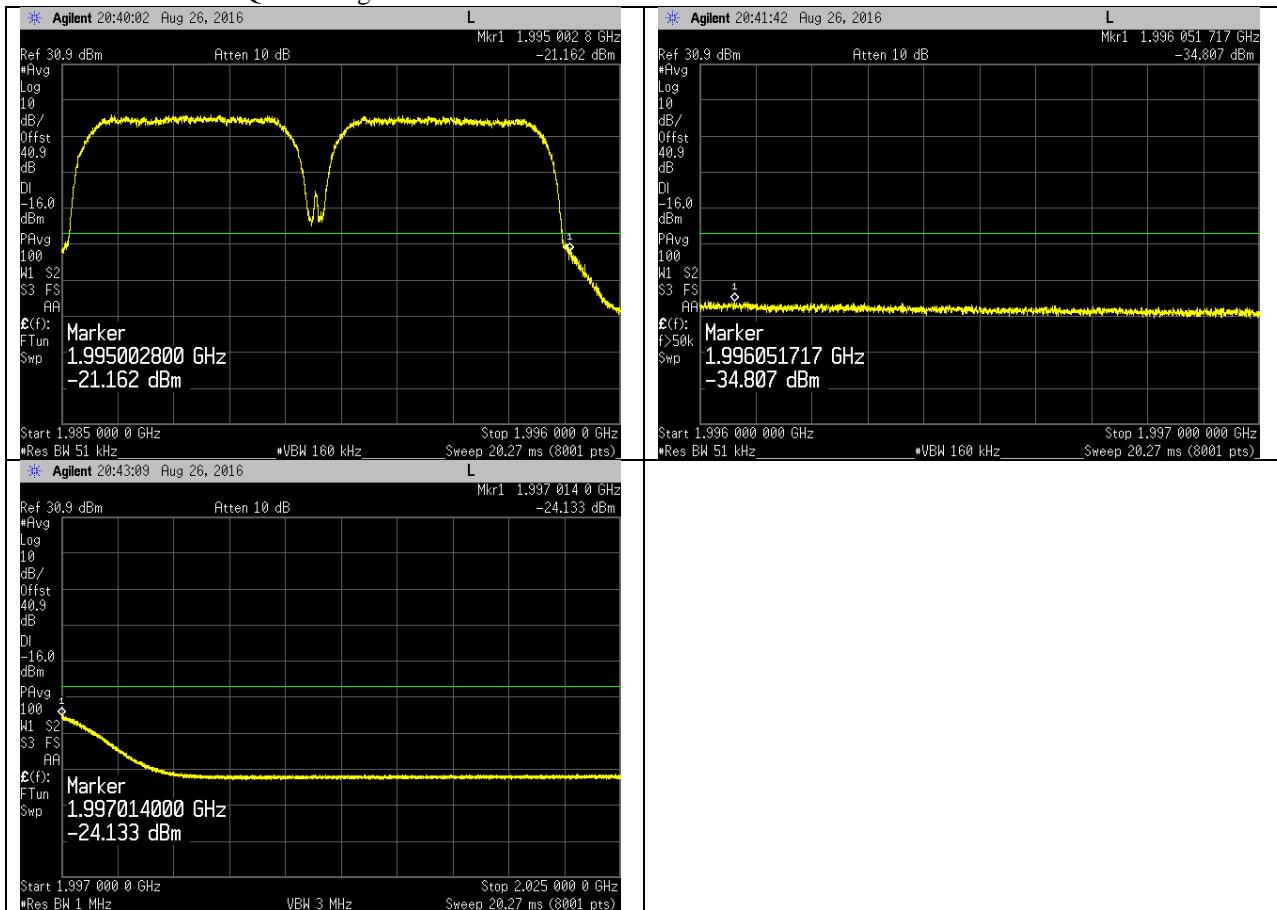
## WCDMA – 5M – 16QAM – High DUAL



## WCDMA – 5M – 64QAM – Low DUAL



## WCDMA – 5M – 64QAM – High DUAL



**Transmitter Antenna Port Conducted Spurious Emissions**

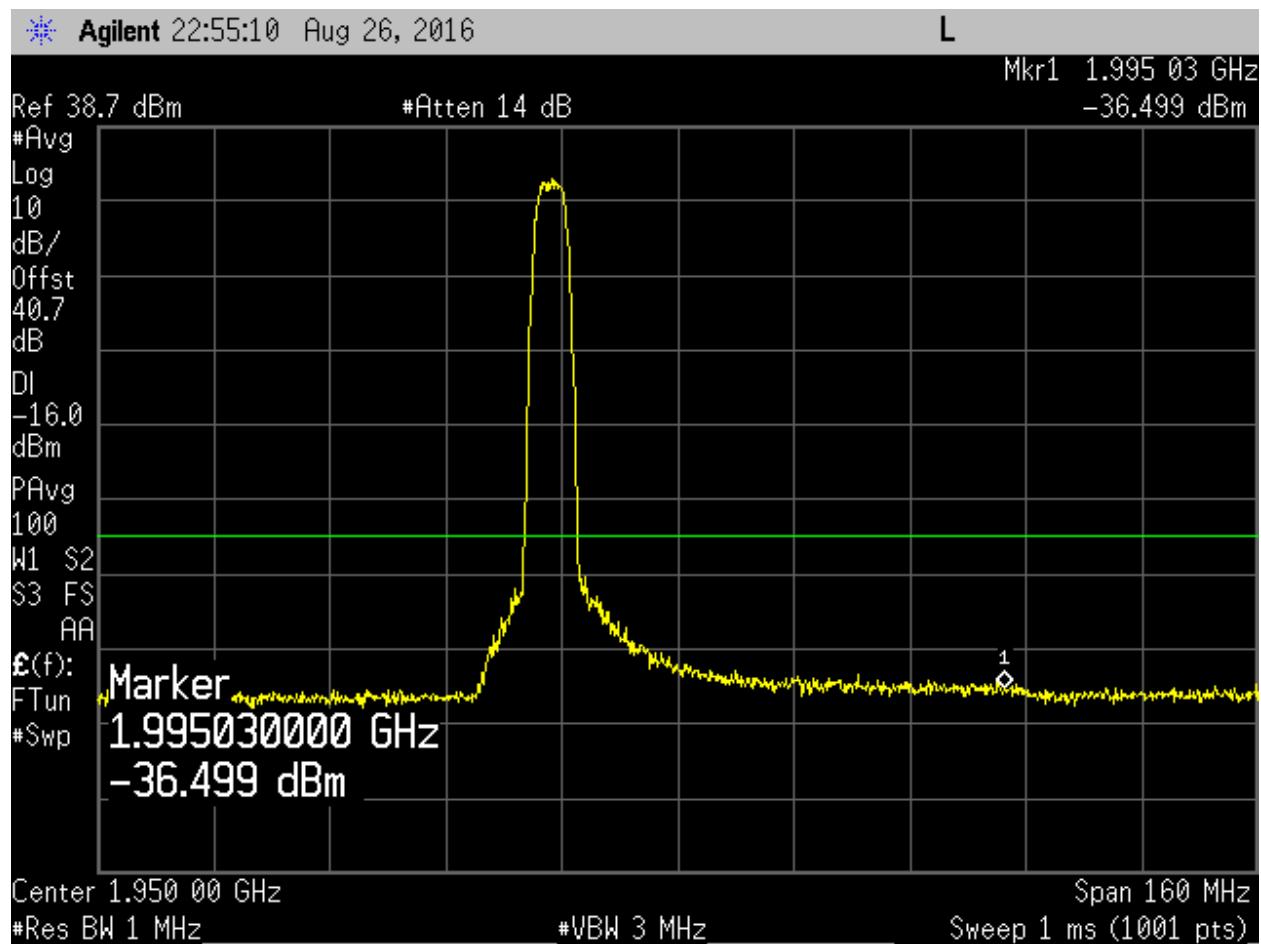
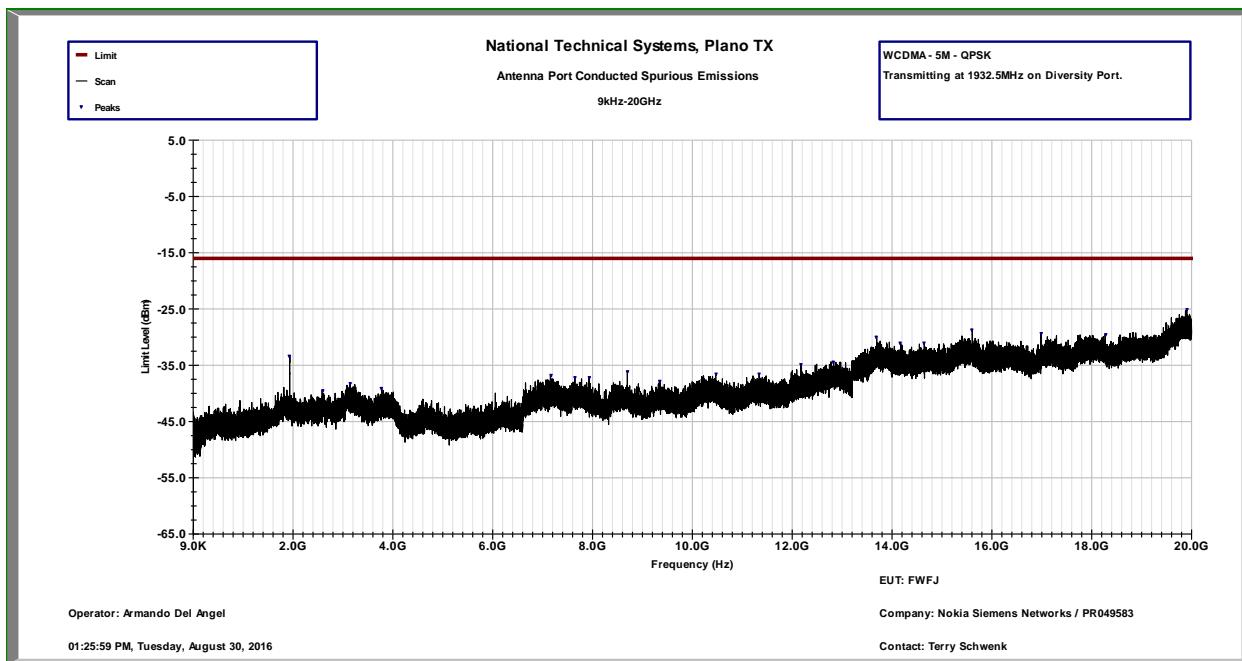
Tests performed at Diversity Port on center channel for all modulations and bandwidth modes. Due to 4x4 MIMO operation, limit is -19.03dBm (-13dBm – 10\*log(4)) per FCC KDB 662911D01 v02r01.

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

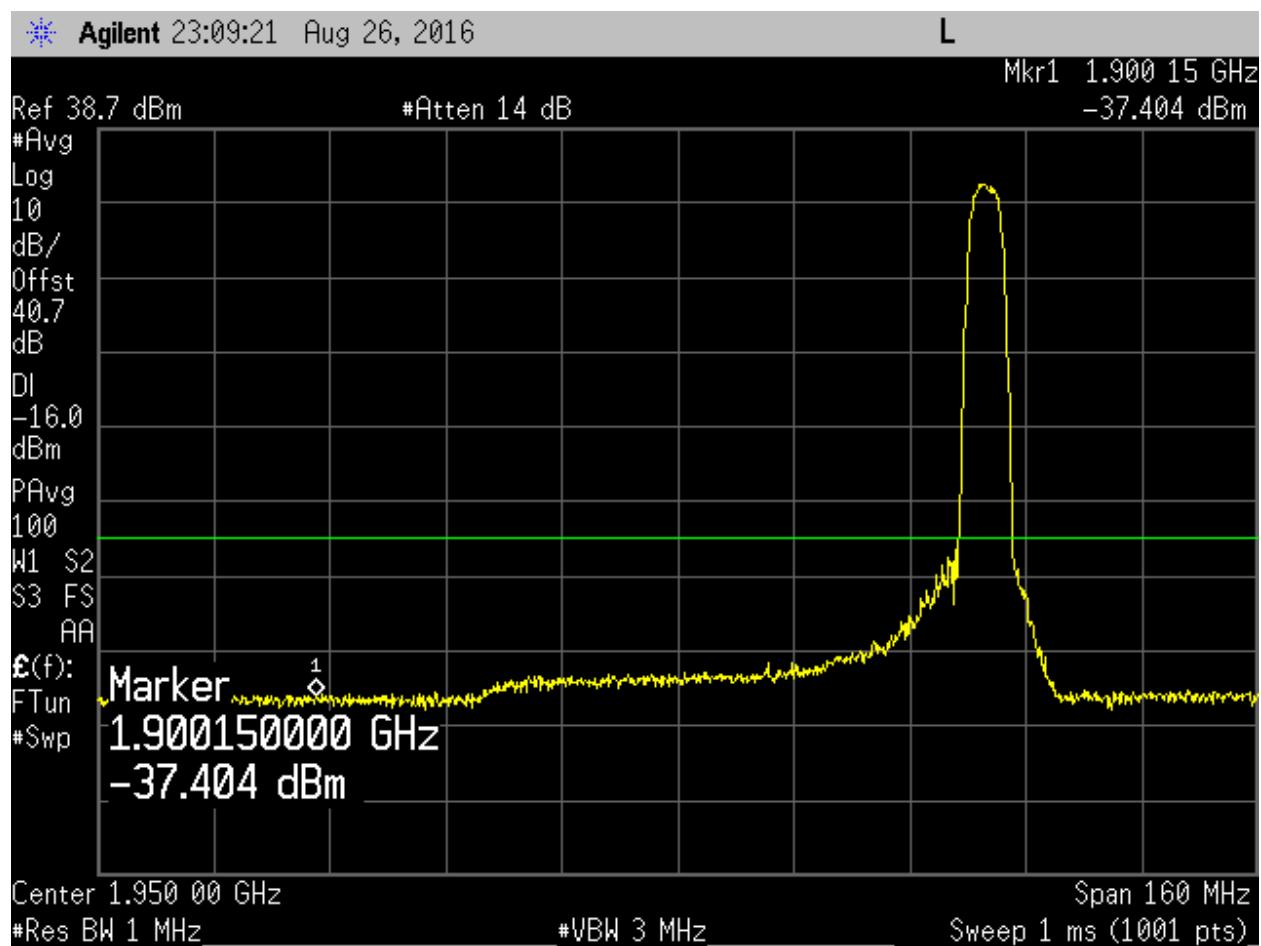
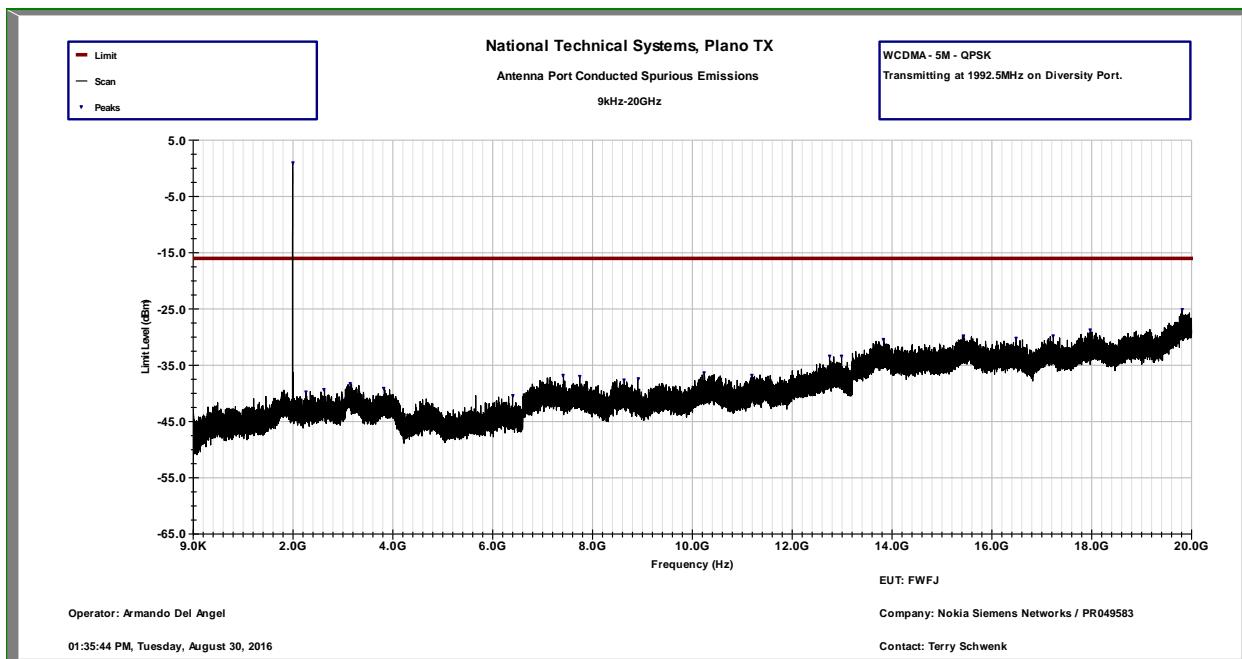
Frequency Range	RBW	VBW	Number of data points	Divided into	Detector	Sweep Time	Max hold over
9kHz-150kHz	1kHz	3kHz	8000	1 segment	Peak	Auto	50 sweeps
150kHz-1.5MHz	100kHz	300kHz	8000	1 segment	Peak	Auto	50 sweeps
1.5MHz-20GHz	1MHz	3MHz	8000	10 segments	Peak	Auto	50 sweeps

Corresponding plots are included on the following pages. 1<sup>st</sup> Plot was taken with a notch filter. The notch filter was used from 9kHz-4GHz with a stop-band of 1870-2030MHz. The 2<sup>nd</sup> plot was taken with no filter in order to measure the stop-band of the notch filter 1870-2030MHz. This was accomplished with internal and external attenuation. The external attenuation was corrected through the PSA's reference offset, attenuator + cables = 40.7dB.

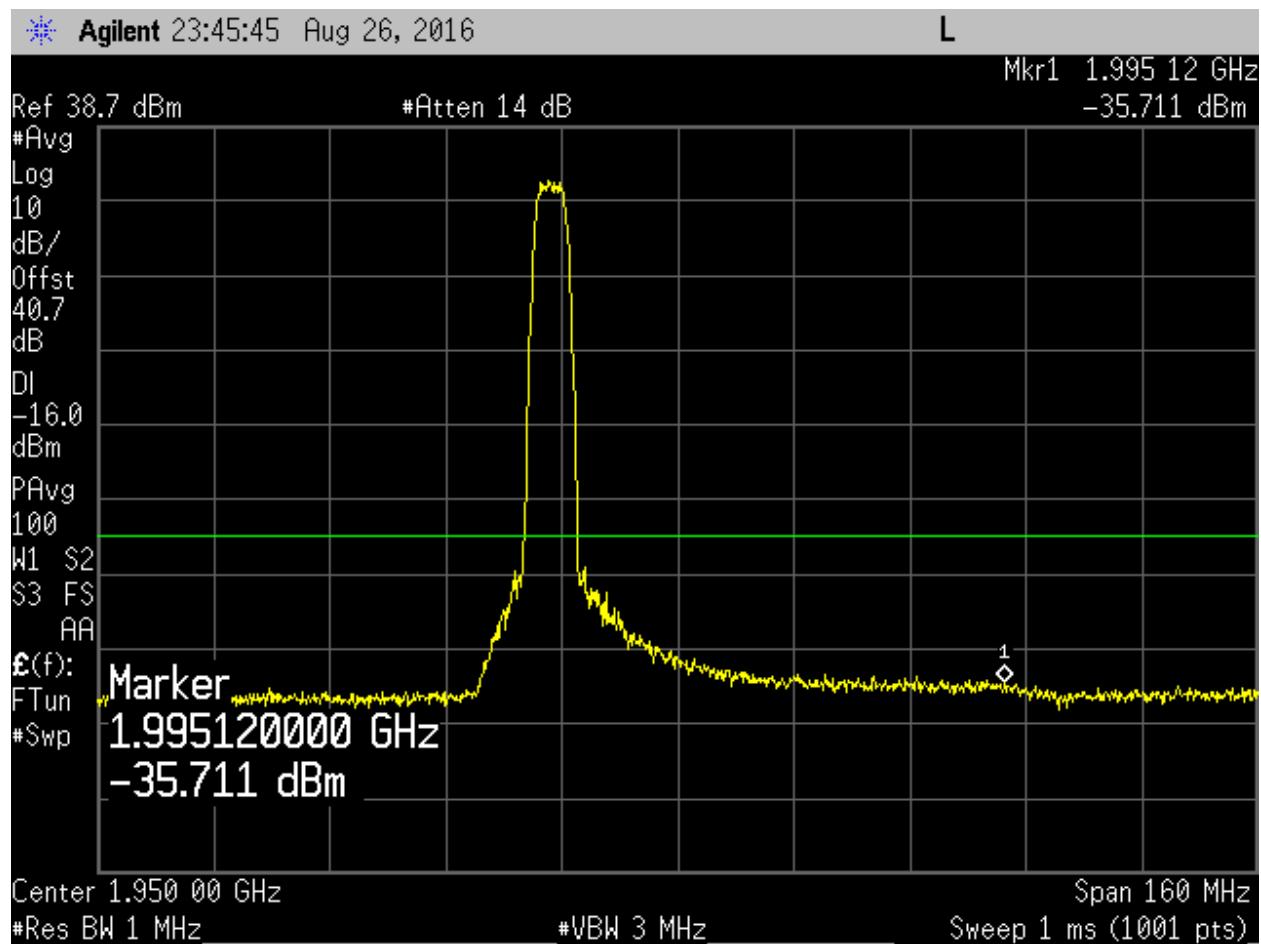
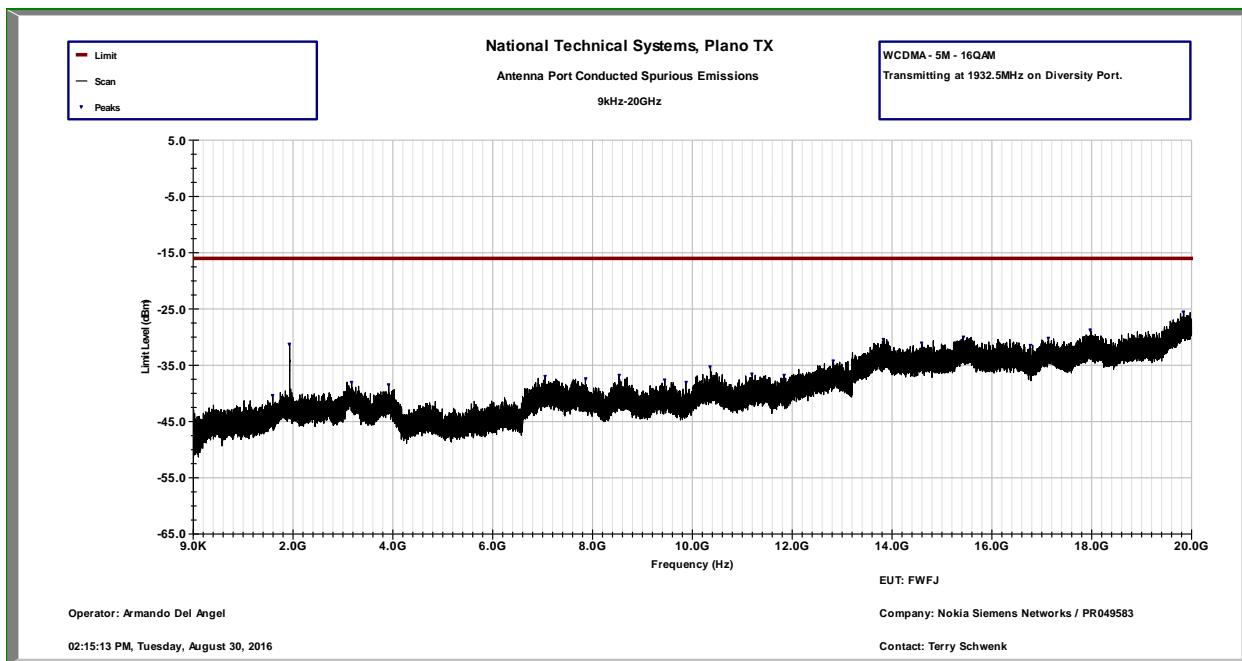
## WCDMA – QPSK – 5M Low Channel



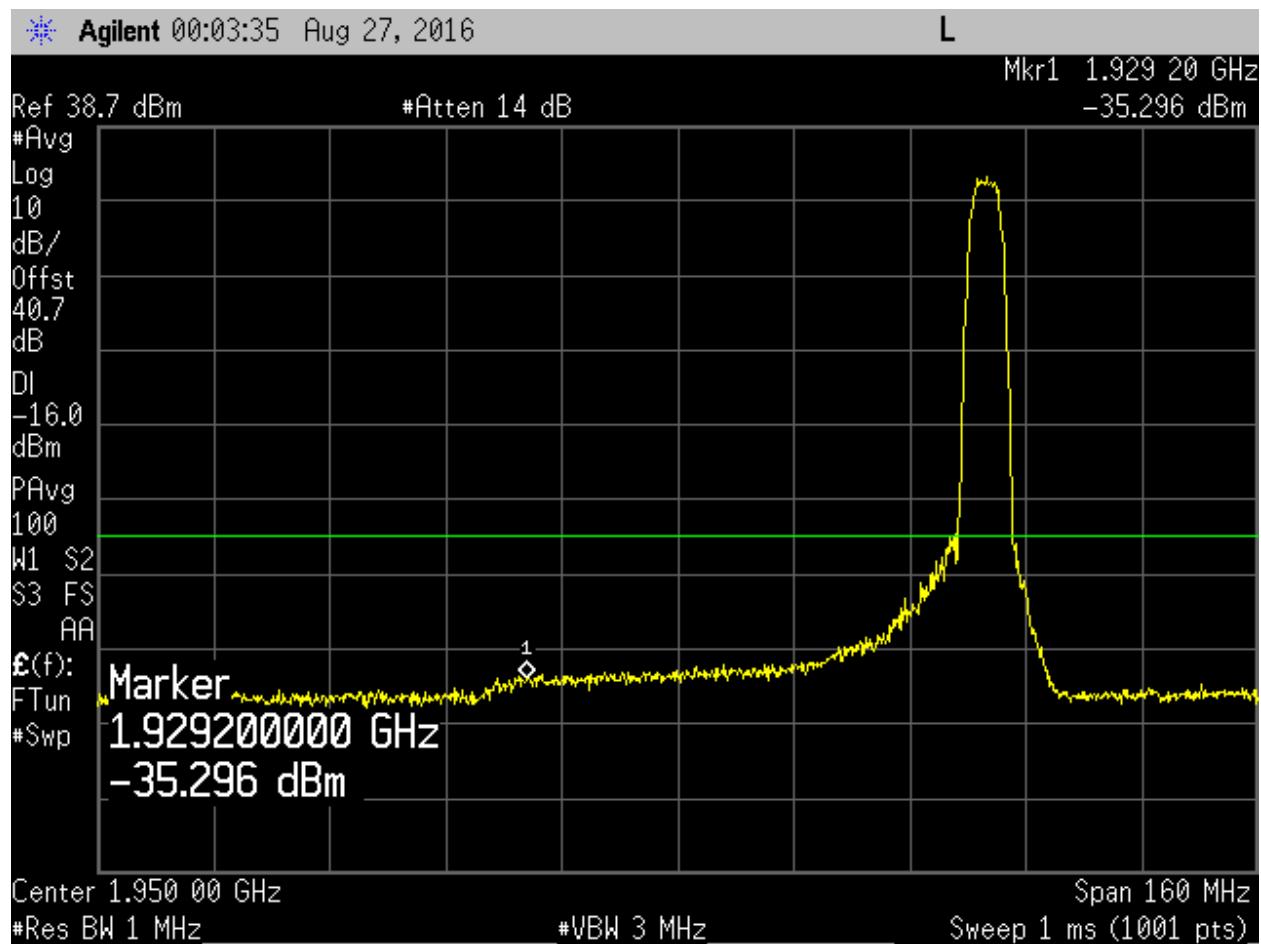
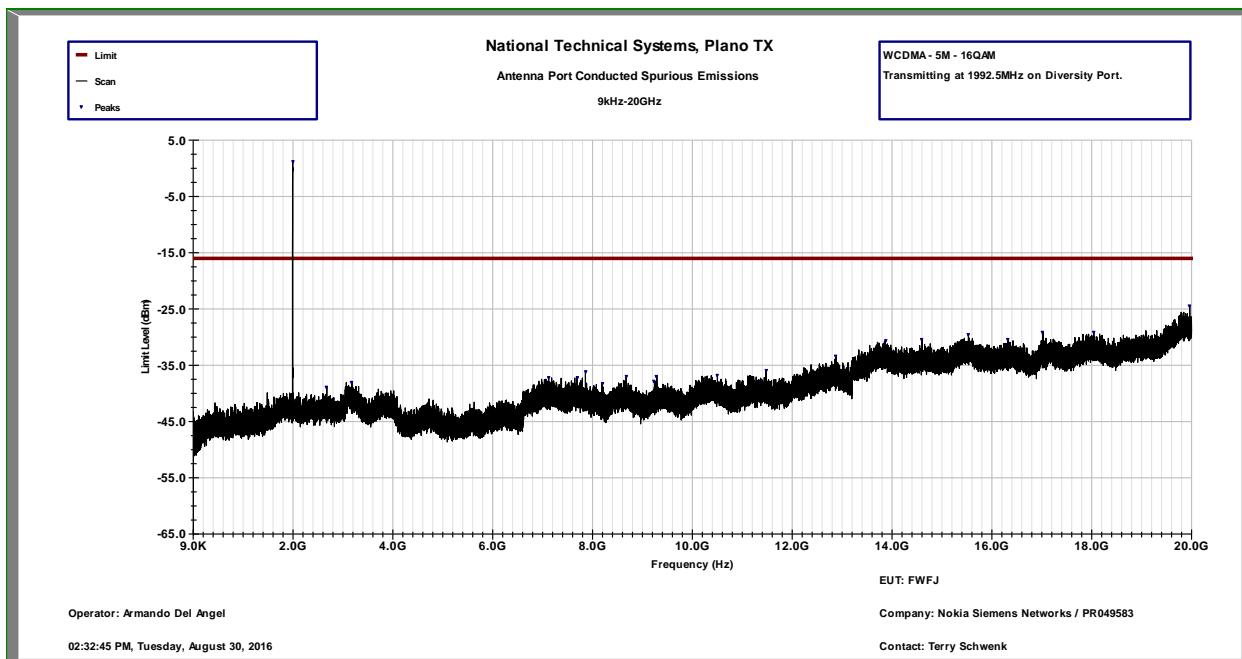
## WCDMA – QPSK – 5M High Channel



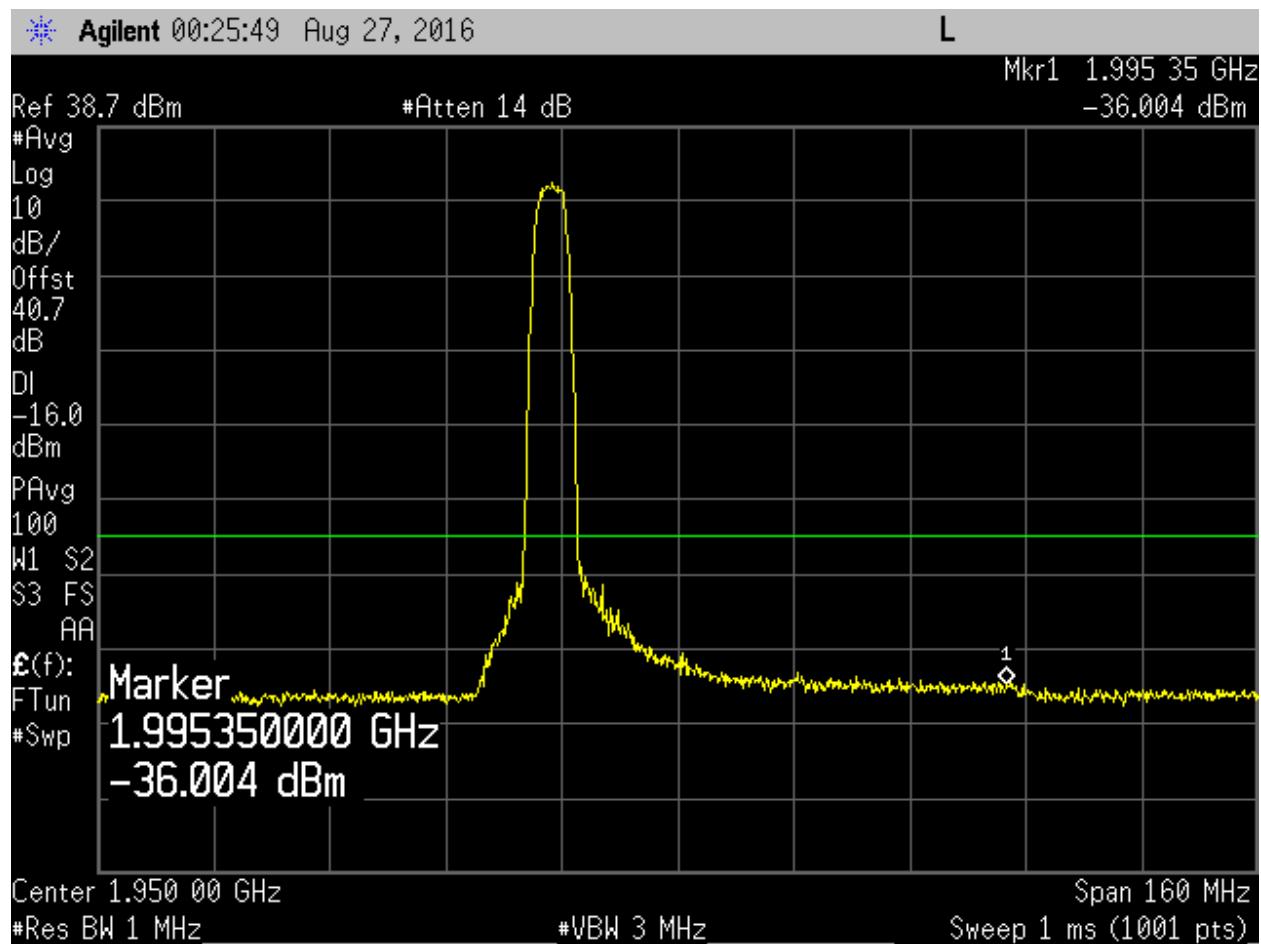
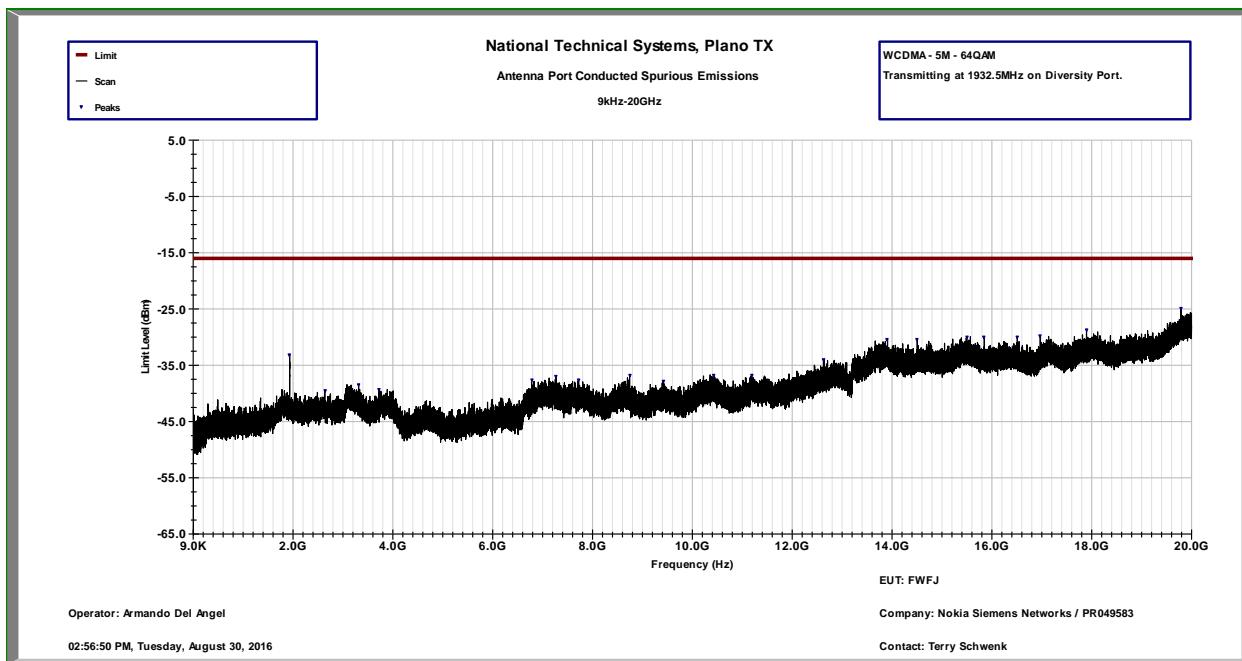
## WCDMA – 16QAM – 5M Low Channel



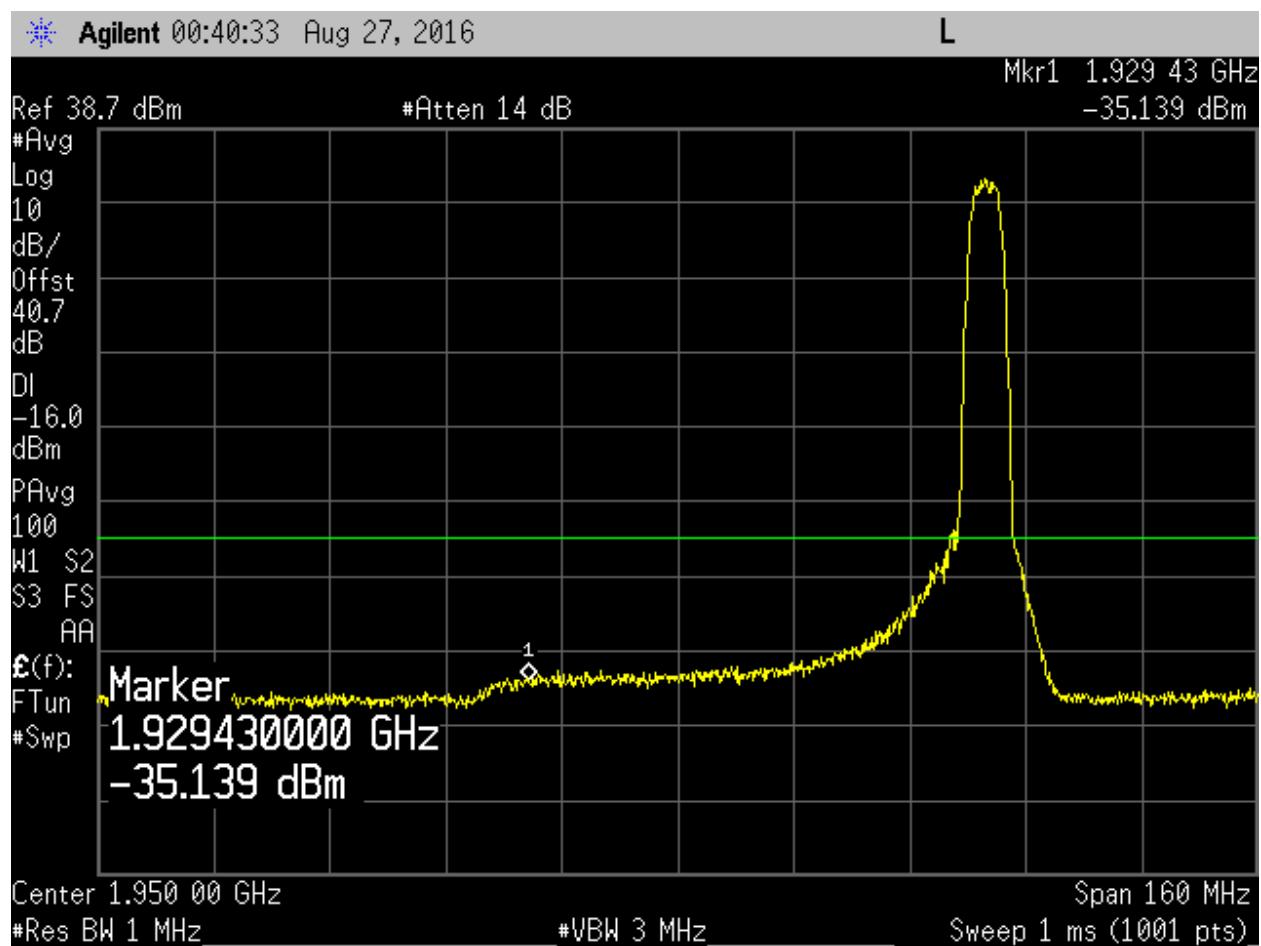
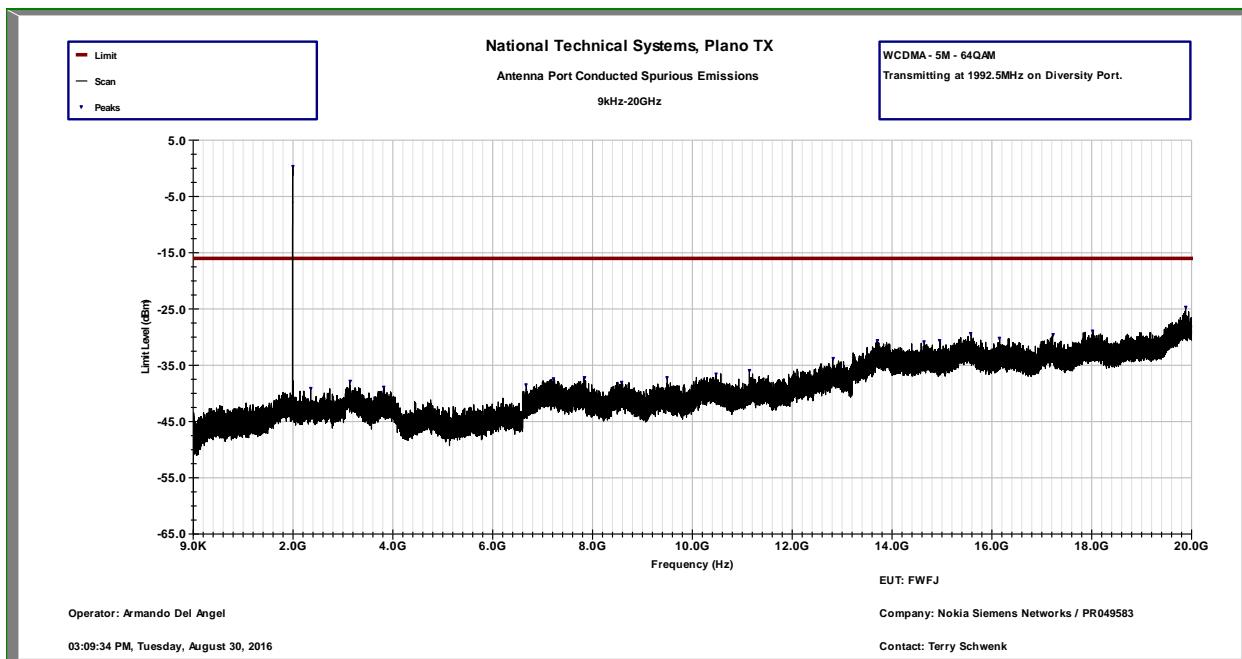
## WCDMA – 16QAM – 5M High Channel



## WCDMA – 64QAM – 5M Low Channel



## WCDMA – 64QAM – 5M High Channel



***Transmitter Radiated Spurious Emissions***

Based on antenna port conducted spurious emissions tests results, preliminary scans for radiated spurious emissions were performed in 30MHz – 20GHz frequency range in the following configurations:

WCDMA Single Carrier: 5M – QPSK transmitting at High (1992.5MHz) channel on both antennas.

WCDMA Dual Carrier: 5M – 64QAM transmitting at Low (1932.5MHz) channel on both antennas.

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

Frequency	Polarity	Antenna	Cable	Pre Amp	Raw Peak	Corrected	Limit	Margin
MHz	H/V	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dB
17998.30	V	45.96	15.217	-39.405	34.233	56.24	82.2	-25.96
17977.30	V	45.891	15.195	-39.468	34.225	55.984	82.2	-26.216
17980.00	H	45.899	15.197	-39.46	34.19	55.98	82.2	-26.22
18031.30	V	45.113	15.258	-39.402	34.82	55.79	82.2	-26.41
17963.00	H	45.843	15.179	-39.511	34.136	55.726	82.2	-26.474
18023.20	H	45.115	15.248	-39.401	34.61	55.571	82.2	-26.629
18010.80	H	45.117	15.233	-39.401	34.548	55.497	82.2	-26.703
18015.30	H	45.116	15.238	-39.401	34.324	55.278	82.2	-26.922
18015.80	V	45.116	15.239	-39.401	34.261	55.216	82.2	-26.984
9964.33	V	38.116	8.317	-39.722	33.309	40.02	82.2	-42.18
9564.82	V	37.712	7.339	-40.4	34.285	38.936	82.2	-43.264
9586.82	H	37.676	7.361	-40.4	33.993	38.629	82.2	-43.571
7967.89	V	36.734	6.098	-40.824	36.409	38.417	82.2	-43.783
8930.61	H	37.719	7.118	-40.769	34.253	38.321	82.2	-43.879
8898.81	V	37.724	7.137	-40.801	33.825	37.885	82.2	-44.315
8821.08	V	37.686	7.065	-40.879	33.543	37.415	82.2	-44.785
8704.28	H	37.525	6.856	-40.517	33.416	37.28	82.2	-44.92
8609.07	H	37.436	6.834	-40.591	33.247	36.926	82.2	-45.274
7736.16	V	36.311	6.16	-41.018	34.085	35.539	82.2	-46.661
5231.54	H	33.863	5.331	-42.4	36.717	33.51	82.2	-48.69
60.8751	V	7.446	0.427	-40.37	62.816	30.319	82.2	-51.881
61.0062	H	7.438	0.428	-40.379	60.259	27.745	82.2	-54.455
60.5365	H	7.467	0.426	-40.346	62.517	27.649	82.2	-54.551
60.87	V	7.446	0.427	-40.37	57.464	24.968	82.2	-57.232
929.61	V	24.8	2.87	-42	38.111	23.781	82.2	-58.419
460.014	V	18.101	1.355	-41.9	43.781	21.336	82.2	-60.864
30.6129	V	17.846	0.26	-38.1	36.083	16.089	82.2	-66.111
30.7973	H	17.741	0.261	-38.114	36.014	15.902	82.2	-66.298
92.1726	V	8.365	0.559	-41.175	47.412	15.161	82.2	-67.039
86.23	V	7.576	0.534	-41	41.468	8.577	82.2	-73.623
63.3214	H	7.298	0.437	-40.445	61.612	4.81	82.2	-77.39

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.

## **Frequency Stability**

In order to demonstrate carrier frequency stability at extreme temperatures and voltages, frequency Bandedge was measured in the following configuration (Worst case from conducted Port Bandedge measurement):

LTE: 10M – 16QAM transmitting at Low (1935MHz) and High (1990MHz) channels on Main Port.

Nominal operating voltage of the product is declared as 115VAC.

Amplitude at the bandedges are compared with the limit used during the bandedge measurement (-16.02dBm).

### Extreme Voltages

	1935MHz	1990MHz
20C	Amplitude (dBm)	Amplitude (dBm)
97.75VAC	-20.782	-21.606
132.25VAC	-20.955	-20.6

### Extreme Temperatures

	1932.5MHz	1992.5MHz
115VAC	Amplitude (dBm)	Amplitude (dBm)
-30	-21.435	-21.995
-20	-20.576	-21.375
-10	-20.886	-21.67
0	-20.146	-21.882
10	-24.751	-24.213
20	-21.327	-20.885
30	-20.351	-21.291
40	-20.594	-20.482
50	-20.087	-19.227

Based on the results above, highest amplitude at any bandedge was -17.074dBm, which ensures that the transmitted signal remains in its authorized frequency block at extreme voltages and temperatures.

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***

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marks the last page of this test report.