FCC RADIO TEST REPORT

FCC ID	:	**NM82Q6U100**
Equipment	:	**Smart Hub**
Model Name	:	**2Q6U100**
Applicant	:	**HTC Corporation** **No. 88, Sec. 3, Zhongxing Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)**
Manufacturer	:	**HTC Corporation** **No. 88, Sec. 3, Zhongxing Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)**
Standard	:	**47 CFR Part 2, 27**

The product was received on Dec. 20, 2018 and testing was started from Jan. 02, 2019 and completed on Mar. 13, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Jones Tsai

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG8D2018C	01	Initial issue of report	Mar. 14, 2019

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.4	§2.1046	Conducted Output Power	PASS	-
	§27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 41)	PASS	-
3.5	§2.1049	Occupied Bandwidth	PASS	-
3.6	§2.1051 §27.53(m)(4)	Conducted Band Edge Measurement (Band 41)	PASS	-
3.7	§2.1051 §27.53(m)(4)	Conducted Spurious Emission (Band 41)	PASS	-
3.8	§2.1055 §27.54	Frequency Stability Temperature & Voltage	PASS	-
4.4	§2.1053 §27.53(m)(4)	Radiated Spurious Emission (Band 41)	PASS	Under limit 6.06 dB at 5088.000 MHz

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: William Chen
Report Producer: Dara Chiu

1 General Description

1.1 Product Feature of Equipment Under Test

LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ac, Wi-Fi 5GHz 802.11a/n/ac, WiGig, and 5G NR.

Product Specification subjective to this standard	
Antenna Type	WWAN: <Ant. 1>: Fixed Internal PIFA Antenna <Ant. 2>: Fixed Internal Dipole Antenna <Ant. 3>: Fixed Internal PCB Antenna WLAN: <Ant. 1>: Fixed Internal PCB Antenna <Ant. 2>: Fixed Internal PIFA Antenna Bluetooth: Fixed Internal PCB Antenna WiGig: Fixed Internal Array Antenna 5G NR: Fixed Internal PCB Antenna

1.2 Modification of EUT

No modifications are made to the EUT during all test items.

1.3 Testing Location

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No.**
	TH02-HY
Temperature	23~25℃
Relative Humidity	53~55%
Test Engineer	Chester Chen

Note: The test site complies with ANSI C63.4 2014 requirement.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH10-HY
Temperature	23~25℃
Relative Humidity	53~56%
Test Engineer	Yu Wang

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW1190 and TW0007

1.4 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2, 27
- ANSI/TIA-603-E
- ANSI C63.26-2015
- FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items are performed according to KDB 971168 D01 Power Meas License Digital Systems v03r01 with maximum output power.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.

	X Plane	Y Plane	Z Plane
Orthogonal Planes of EUT			

2.2 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m

2.3 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Example :

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

2.4 Frequency List of Low/Middle/High Channels

EN-DC Band 41 Channel and Frequency List				
NR Bandwidth [MHz]	LTE Bandwidth [MHz]	Channel	NR Frequncy [MHz]	LTE Frequncy [MHz]
40	20	Low	2516.01	2546.1
		Mid.	2592.99	2623
		High	2670	2640
60	20	Low	2526	2566
		Mid.	2592.99	2633
		High	2659.98	2619.9
80	20	Low	2536.02	2586.1
		Mid.	2592.99	2643
		High	2649.99	2599.9
100	20	Low	2546.01	2606.1
		Mid.	2592.99	2653
		High	2640	2580

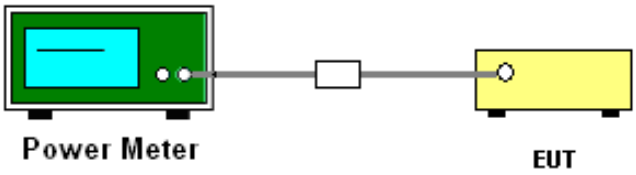
3 Conducted Test Items

3.1 Measuring Instruments

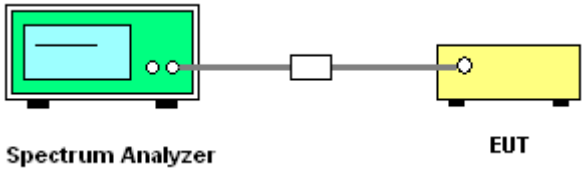
See list of measuring instruments of this test report.

3.2 Test Setup

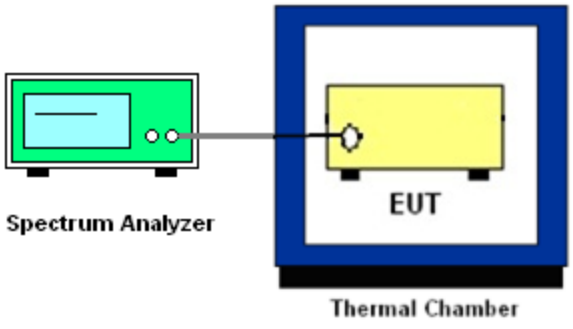
3.2.1 Conducted Output Power



3.2.2 Occupied Bandwidth ,Conducted Band-Edge and Conducted Spurious Emission



3.2.3 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power and EIRP

3.4.1 Description of the Conducted Output Power Measurement and EIRP Measurement

The Test Tool enables the EUT transmition in FTM test mode. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The EIRP of mobile transmitters must not exceed 2 Watts for Band 41.

According to KDB 412172 D01 Power Approach,

EIRP = $P_T + G_T – L_C$, ERP = EIRP -2.15, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.4.2 Test Procedures

1. The transmitter output port was connected to the power meter and set EUT at maximum power.
2. Select lowest, middle, and highest channels for each band and different modulation.
3. Measure and record the power level from the power meter.

3.5 Occupied Bandwidth

3.5.1 Description of Occupied Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

3.5.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.4.3 (26dB) and Section 5.4.4 (99OB)

1. The EUT was connected to spectrum analyzer.
2. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
3. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
4. Set the detection mode to peak, and the trace mode to max hold.
5. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace. (this is the reference value)
6. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
7. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “–X dB down amplitude” determined in step 6. If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.
8. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.6 Conducted Band Edge

3.6.1 Description of Conducted Band Edge Measurement

27.53(m)(4)

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.

3.6.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.7.

1. The EUT was connected to spectrum analyzer.
2. The band edges of low and high channels for the highest RF powers were measured.
3. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Beyond the 1 MHz band from the band edge, RBW=1MHz was used or a narrower RBW was used and the measured power was integrated over the full required measurement bandwidth.
5. Set spectrum analyzer with RMS detector.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. Checked that all the results comply with the emission limit line.
   Example:
   The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB) = -13dBm.
8. For Band 41, the 40+ 10log(P) dB, and 55+ 10log(P) dB have the same calculation as above.

3.7 Conducted Spurious Emission

3.7.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10^{th} harmonic.

3.7.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.7.

1. The EUT was connected to spectrum analyzer.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
6. Set spectrum analyzer with RMS detector.
7. Taking the record of maximum spurious emission.
8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
9. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.
10. For Band 41
    The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [55+ 10log(P)] (dB)
    = [30+ 10log(P)] (dBm) - [55+ 10log(P)] (dB)
    = -25dBm.

3.8 Frequency Stability

3.8.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block.

3.8.2 Test Procedures for Temperature Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.

1. The EUT was set up in the thermal chamber.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.8.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.

1. The EUT was placed in a temperature chamber at 20±5° C and connected with the system simulator.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

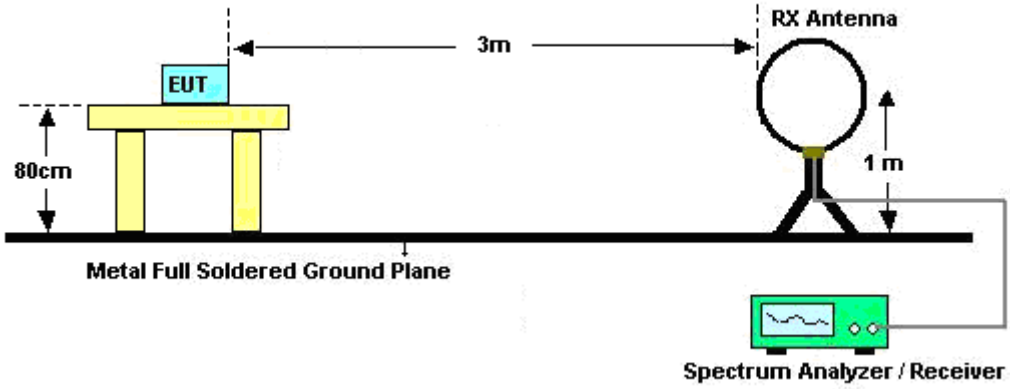
4 Radiated Test Items

4.1 Measuring Instruments

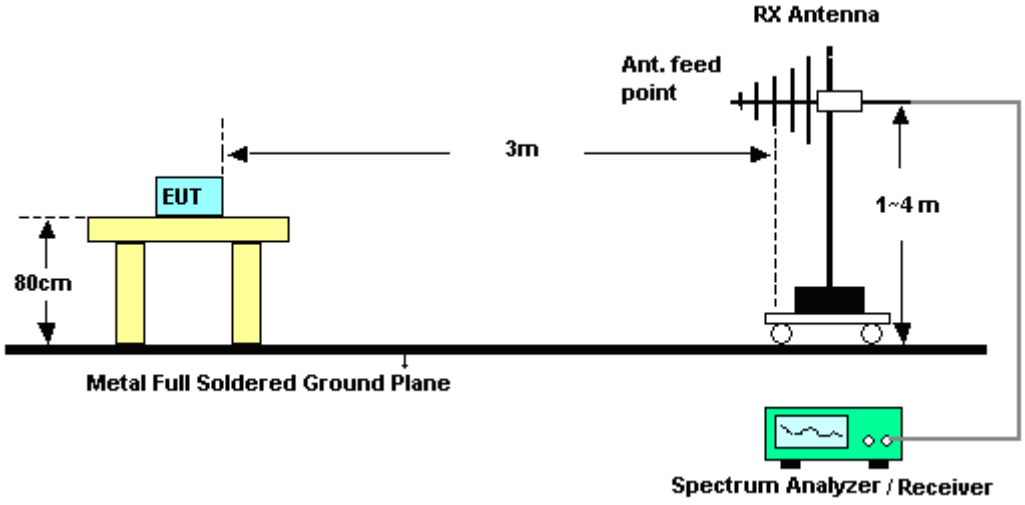
See list of measuring instruments of this test report.

4.2 Test Setup

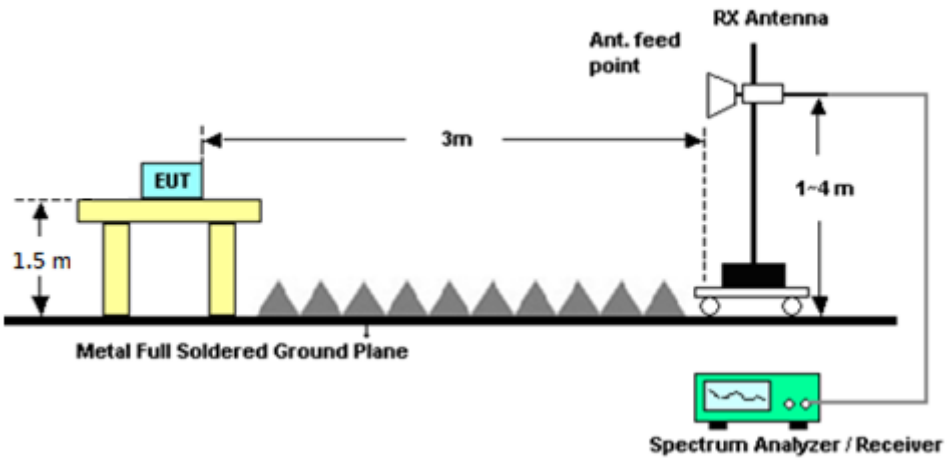
4.2.1 For radiated emissions below 30MHz



4.2.2 For radiated test from 30MHz to 1GHz



4.2.3 For radiated test above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI/TIA-603-E.

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.4.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI/TIA-603-E Section 2.2.12.

1. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
5. During the measurement, it were set to force the EUT transmitting at maximum output power.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
10. ERP (dBm) = EIRP - 2.15
11. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)
    EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
    ERP (dBm) = EIRP - 2.15

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Agilent	E4416A	GB41292344	N/A	Dec. 27, 2018	Jan. 02, 2019~ Mar. 13, 2019	Dec. 26, 2019	Conducted (TH05-HY)
Power Sensor	Agilent	E9327A	US40441548	50MHz~18GHz	Dec. 27, 2018	Jan. 02, 2019~ Mar. 13, 2019	Dec. 26, 2019	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Nov. 13, 2018	Jan. 02, 2019~ Mar. 13, 2019	Nov. 12, 2019	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-40℃~90℃	Aug. 29, 2018	Jan. 02, 2019~ Mar. 13, 2019	Aug. 28, 2019	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890094	1V~20V 0.5A~5A	Oct. 02, 2018	Jan. 02, 2019~ Mar. 13, 2019	Oct. 01, 2019	Conducted (TH05-HY)
Coupler	Woken	0.5-18G 10dB 30W	DOM5CIW3A1	0.5-18GHz	Feb. 21, 2018	Jan. 02, 2019~ Feb. 08, 2019	Feb. 20, 2019	Conducted (TH05-HY)
Coupler	Warison	20dB 25W SMA Directional Coupler	#A	1-18GHz	Jan. 14, 2019	Feb. 11, 2019~ Mar. 13, 2019	Jan. 13, 2020	Conducted (TH05-HY)
Amplifier	SONOMA	310N	187311	9kHz~1GHz	Oct. 23, 2018	Jan. 04, 2019~ Mar. 13, 2019	Oct. 22, 2019	Radiation (03CH10-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1325	1GHz ~ 18GHz	Oct. 02, 2018	Jan. 04, 2019~ Mar. 13, 2019	Oct. 01, 2019	Radiation (03CH10-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Dec. 05, 2018	Jan. 04, 2019~ Mar. 13, 2019	Dec. 04, 2019	Radiation (03CH10-HY)
Hygrometer	TECPEL	DTM-303B	TP140320	N/A	Nov. 05, 2018	Jan. 04, 2019~ Mar. 13, 2019	Nov. 04, 2019	Radiation (03CH10-HY)
Preamplifier	Keysight	83017A	MY53270078	1GHz~26.5GHz	Oct. 28, 2018	Jan. 04, 2019~ Mar. 13, 2019	Oct. 27, 2019	Radiation (03CH10-HY)
Preamplifier	Jet-Power	JAP00101800-30-10P	160118550004	1GHz~18GHz	Apr. 17, 2018	Jan. 04, 2019~ Mar. 13, 2019	Apr. 16, 2019	Radiation (03CH10-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz ~ 44GHz	Nov. 02, 2018	Jan. 04, 2019~ Mar. 13, 2019	Nov. 01, 2019	Radiation (03CH10-HY)
Filter	Woken	100-12750MHz SMA	0100V1H010001G	1GHz High Pass	N/A	Jan. 04, 2019~ Mar. 13, 2019	N/A	Radiation (03CH10-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Jan. 04, 2019~ Mar. 13, 2019	N/A	Radiation (03CH10-HY)
Turn Table	EMEC	TT 2200	N/A	0~360 Degree	N/A	Jan. 04, 2019~ Mar. 13, 2019	N/A	Radiation (03CH10-HY)
Software	Audix	E3 6.2009-8-24	RK-001042	N/A	N/A	Jan. 04, 2019~ Mar. 13, 2019	N/A	Radiation (03CH10-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jan. 07, 2019	Jan. 08, 2019~ Mar. 13, 2019	Jan. 06, 2020	Radiation (03CH10-HY)
Bilog Antenna	TESEQ	CBL 6111D&N-6-06	35414&AT-N0602	30MHz to 1GHz	Oct. 13, 2018	Jan. 04, 2019~ Mar. 13, 2019	Oct. 12, 2019	Radiation (03CH10-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY54130085	20Hz ~ 8.4GHz	Nov. 01, 2018	Jan. 04, 2019~ Mar. 13, 2019	Oct. 31, 2019	Radiation (03CH10-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 06, 2018	Jan. 04, 2019~ Mar. 13, 2019	Dec. 05, 2019	Radiation (03CH10-HY)
Filter	Wainwright	WHKX12-1080-1200-1500-60SS	SN2	1.2GHz High Pass	Sep. 16, 2018	Jan. 04, 2019~ Mar. 13, 2019	Sep. 15, 2019	Radiation (03CH10-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN4	3 GHz Highpass	Sep. 17, 2018	Jan. 04, 2019~ Mar. 13, 2019	Sep. 16, 2019	Radiation (03CH10-HY)

6 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.17**

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.48**

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.00**

Appendix A. Test Results of Conducted Test

<Conducted Output Power>

EN-DC n41 Combination 100MHz+20MHz									
NR Frequncey	LTE Frequncey	Modulation	NR		LTE		NR	LTE	Total Measured Power (dBm)
			RB Size	RB offset	RB Size	RB offset	Measured Power	Measured Power	
2546.01	2606.1	QPSK	1	0	1	0	23.91	23.98	26.96
			1	272	1	99	23.55	23.91	26.74
			273	0	100	0	22.6	22.69	25.66
		16QAM	1	0	1	0	23.7	23.38	26.55
			1	272	1	99	23.54	23.85	26.71
			273	0	100	0	22.55	22.44	25.51
		64QAM	1	0	1	0	23.69	22.31	26.06
			1	272	1	99	23.51	22.48	26.04
			273	0	100	0	22.53	21.29	24.96
2592.99	2653	QPSK	1	0	1	0	23.88	23.53	26.72
			1	272	1	99	23.59	23.55	26.58
			273	0	100	0	23.91	22.59	26.31
		16QAM	1	0	1	0	23.75	23.77	26.77
			1	272	1	99	23.55	23.45	26.51
			273	0	100	0	23.88	22.49	26.25
		64QAM	1	0	1	0	23.76	22.65	26.25
			1	272	1	99	23.51	22.66	26.12
			273	0	100	0	23.85	21.31	25.77
2640	2580	QPSK	1	0	1	0	23.58	23.66	26.63
			1	272	1	99	23.86	23.51	26.70
			273	0	100	0	23.72	22.55	26.18
		16QAM	1	0	1	0	23.55	23.38	26.48
			1	272	1	99	23.77	23.88	26.84
			273	0	100	0	23.7	22.18	26.02
		64QAM	1	0	1	0	23.54	22.25	25.95
			1	272	1	99	23.75	22.35	26.12
			273	0	100	0	23.69	21.37	25.69

EN-DC n41 Combination 80MHz+20MHz									
NR Frequncey	LTE Frequncey	Modulation	NR		LTE		NR	LTE	Total Measured Power (dBm)
			RB Size	RB offset	RB Size	RB offset	Measured Power	Measured Power	
2536.02	2586.1	QPSK	1	0	1	0	23.85	23.97	26.92
			1	216	1	99	23.67	23.96	26.83
			217	0	100	0	22.35	22.84	25.61
		16QAM	1	0	1	0	23.88	23.44	26.68
			1	216	1	99	23.7	23.86	26.79
			217	0	100	0	22.3	22.29	25.31
		64QAM	1	0	1	0	23.82	22.35	26.16
			1	216	1	99	23.55	22.37	26.01
			217	0	100	0	22.22	21.44	24.86
2592.99	2633	QPSK	1	0	1	0	23.95	23.38	26.68
			1	216	1	99	23.85	23.28	26.58
			217	0	100	0	23.88	22.79	26.38
		16QAM	1	0	1	0	23.92	23.21	26.59
			1	216	1	99	23.75	23.43	26.60
			217	0	100	0	23.75	22.41	26.14
		64QAM	1	0	1	0	23.91	22.12	26.12
			1	216	1	99	23.77	22.55	26.21
			217	0	100	0	23.8	21.33	25.75
2649.99	2599.9	QPSK	1	0	1	0	23.55	23.76	26.67
			1	216	1	99	23.65	23.77	26.72
			217	0	100	0	23.6	22.69	26.18
		16QAM	1	0	1	0	23.53	23.36	26.46
			1	216	1	99	23.55	23.64	26.61
			217	0	100	0	23.55	22.12	25.90
		64QAM	1	0	1	0	23.52	22.34	25.98
			1	216	1	99	23.58	22.33	26.01
			217	0	100	0	23.52	21.23	25.53

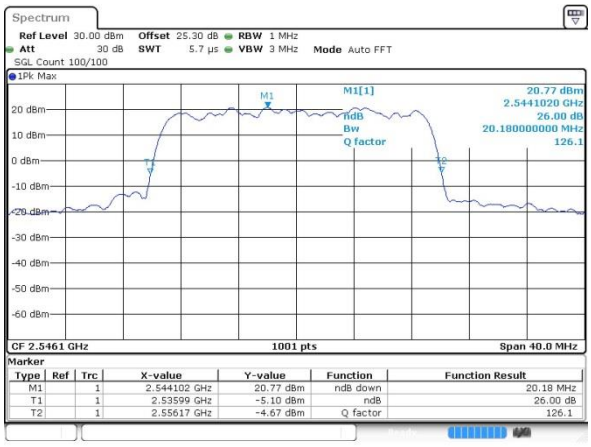
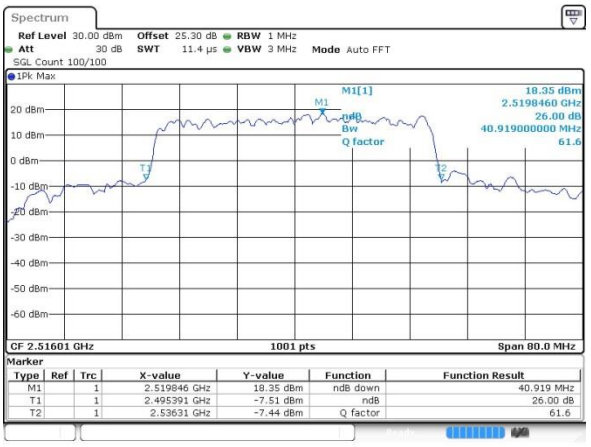
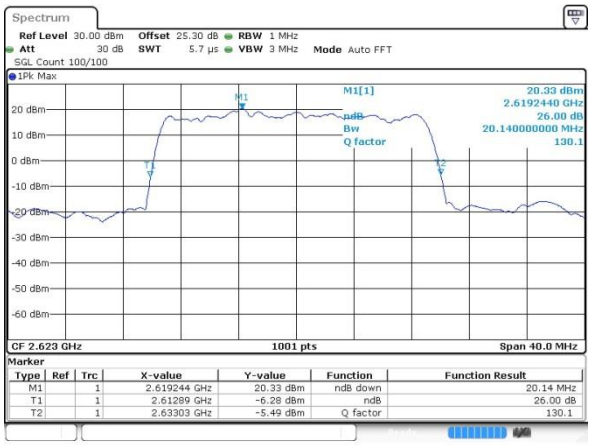
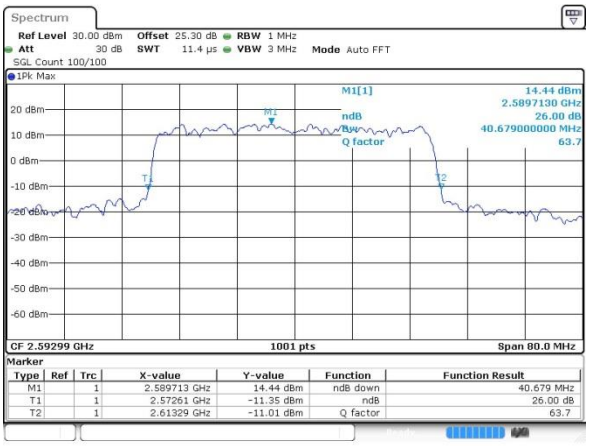
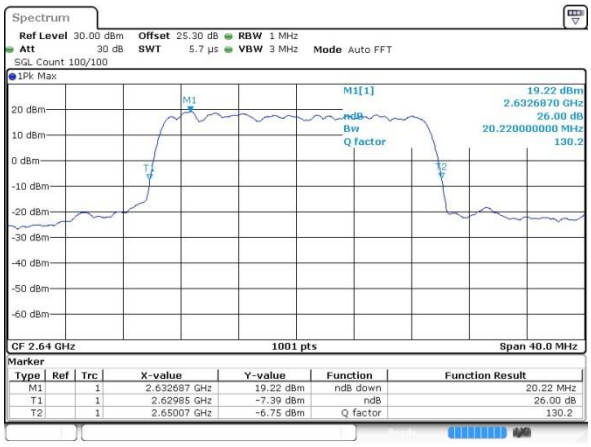
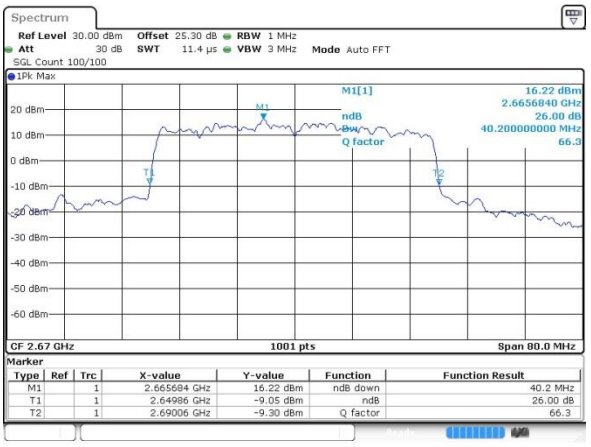
Combination 60MHz+20MHz									
NR Frequncey	LTE Frequncey	Modulation	NR		LTE		NR	LTE	Total Measured Power (dBm)
			RB Size	RB offset	RB Size	RB offset	Measured Power	Measured Power	
2526	2566	QPSK	1	0	1	0	23.83	23.48	26.67
			1	161	1	99	23.88	23.29	26.61
			162	0	100	0	22.2	22.18	25.20
		16QAM	1	0	1	0	23.53	23.44	26.50
			1	161	1	99	23.99	23.36	26.70
			162	0	100	0	22.15	22.12	25.15
		64QAM	1	0	1	0	23.69	22.56	26.17
			1	161	1	99	23.65	22.12	25.96
			162	0	100	0	22.13	21.15	24.68
2592.99	2633	QPSK	1	0	1	0	23.99	23.2	26.62
			1	161	1	99	23.88	23.92	26.91
			162	0	100	0	23.96	22.67	26.37
		16QAM	1	0	1	0	23.98	23.65	26.83
			1	161	1	99	23.91	23.21	26.58
			162	0	100	0	23.98	22.66	26.38
		64QAM	1	0	1	0	23.95	22.45	26.27
			1	161	1	99	23.85	22.25	26.13
			162	0	100	0	23.88	21.79	25.97
2659.98	2619.9	QPSK	1	0	1	0	23.55	23.72	26.65
			1	161	1	99	23.86	23.05	26.48
			162	0	100	0	23.88	22.72	26.35
		16QAM	1	0	1	0	23.52	23.05	26.30
			1	161	1	99	23.84	23.47	26.67
			162	0	100	0	23.85	22.42	26.20
		64QAM	1	0	1	0	23.51	22.43	26.01
			1	161	1	99	23.85	22.55	26.26
			162	0	100	0	23.87	21.22	25.75
Combination 40MHz+20MHz									
NR Frequncey	LTE Frequncey	Modulation	NR		LTE		NR	LTE	Total Measured Power (dBm)
			RB Size	RB offset	RB Size	RB offset	Measured Power	Measured Power	
2516.01	2546.1	QPSK	1	0	1	0	23.9	23.2	26.57
			1	105	1	99	23.93	23.3	26.64
			106	0	100	0	22.49	22.16	25.34
		16QAM	1	0	1	0	23.8	23.21	26.53
			1	105	1	99	23.98	23.22	26.63
			106	0	100	0	22.43	22.48	25.47
		64QAM	1	0	1	0	23.66	22.51	26.13
			1	105	1	99	23.61	22.66	26.17
			106	0	100	0	22.45	21.15	24.86
2592.99	2623	QPSK	1	0	1	0	23.95	23.3	26.65
			1	105	1	99	23.8	23.2	26.52
			106	0	100	0	23.75	22.77	26.30
		16QAM	1	0	1	0	23.58	23.56	26.58
			1	105	1	99	23.98	23.44	26.73
			106	0	100	0	23.66	22.78	26.25
		64QAM	1	0	1	0	23.56	22.68	26.15
			1	105	1	99	23.58	22.35	26.02
			106	0	100	0	23.38	21.7	25.63
2670	2640	QPSK	1	0	1	0	23.95	23.85	26.91
			1	105	1	99	23.85	23.18	26.54
			106	0	100	0	23.92	22.98	26.49
		16QAM	1	0	1	0	23.92	23.31	26.64
			1	105	1	99	23.82	23.33	26.59
			106	0	100	0	23.9	22.32	26.19
		64QAM	1	0	1	0	23.83	22.5	26.23
			1	105	1	99	23.85	22.65	26.30
			106	0	100	0	23.87	21.44	25.83

EN-DC LTE + NR

26dB Bandwidth

Mode		EN-DC LTE + NR : 26dB BW(MHz)					
LTE BW		20MHz			20MHz		
NR BW		40MHz			60MHz		
Mod.		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Lowest CH	LTE	20.18	20.14	20.30	20.14	20.26	20.18
	NR	40.92	42.04	41.72	60.54	60.66	60.42
	LTE + NR	61.10	62.18	62.02	80.68	80.92	80.60
Middle CH	LTE	20.14	20.10	20.30	20.14	20.22	20.14
	NR	40.68	40.68	40.36	60.90	60.90	60.54
	LTE + NR	60.82	60.78	60.66	81.04	81.12	80.68
Highest CH	LTE	20.22	20.06	20.18	20.14	20.14	20.14
	NR	40.20	40.52	40.28	60.54	61.50	60.54
	LTE + NR	60.42	60.52	60.46	80.68	81.64	80.68

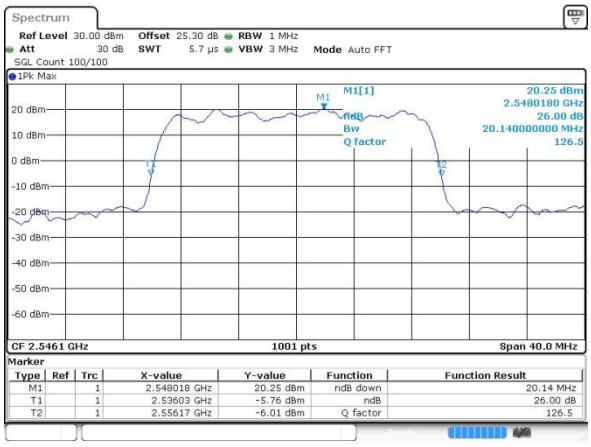
Mode		EN-DC LTE + NR : 26dB BW(MHz)					
LTE BW		20MHz			20MHz		
NR BW		80MHz			100MHz		
Mod.		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Lowest CH	LTE	20.18	20.18	20.22	20.30	20.18	20.22
	NR	80.08	80.24	80.08	100.50	100.90	100.50
	LTE + NR	100.26	100.42	100.30	120.80	121.08	120.72
Middle CH	LTE	20.14	20.18	20.02	20.22	20.14	20.02
	NR	80.40	80.24	80.56	100.70	100.50	100.70
	LTE + NR	100.54	100.42	100.58	120.92	120.64	120.72
Highest CH	LTE	20.18	20.30	20.22	20.14	20.10	20.26
	NR	80.08	80.08	80.40	100.50	100.70	100.70
	LTE + NR	100.26	100.38	100.62	120.64	120.80	120.96

EN-DC LTE 20MHz + NR 40MHz (QPSK)	
Lowest Channel LTE	**Lowest Channel NR**
	
Middle Channel LTE	**Middle Channel NR**
	
Highest Channel LTE	**Highest Channel NR**
	

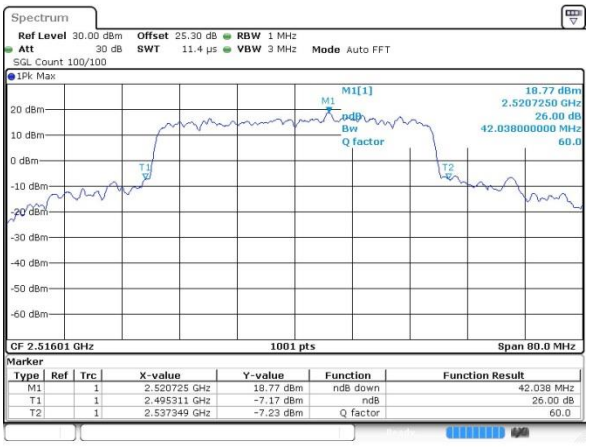
EN-DC

LTE 20MHz + NR 40MHz (16QAM)

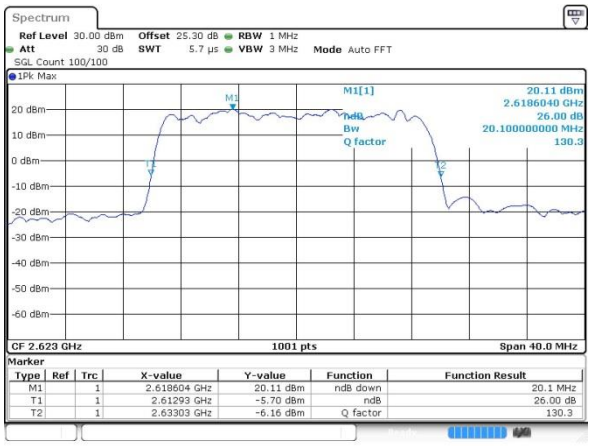
Lowest Channel LTE



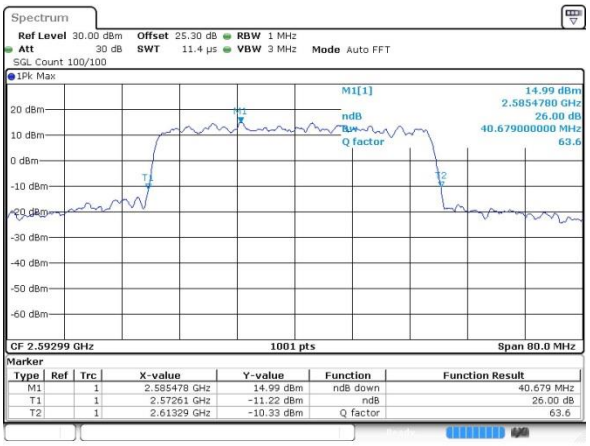
Lowest Channel NR



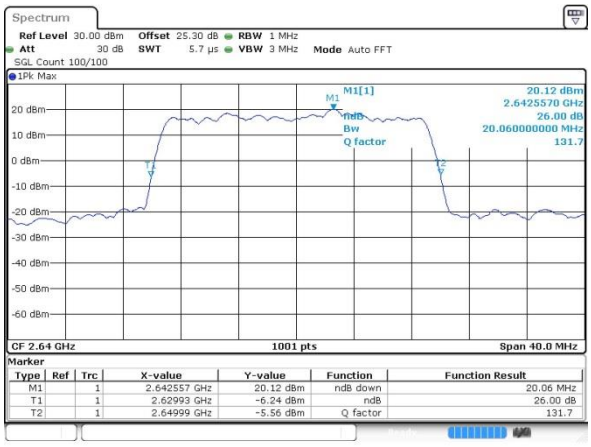
Middle Channel LTE



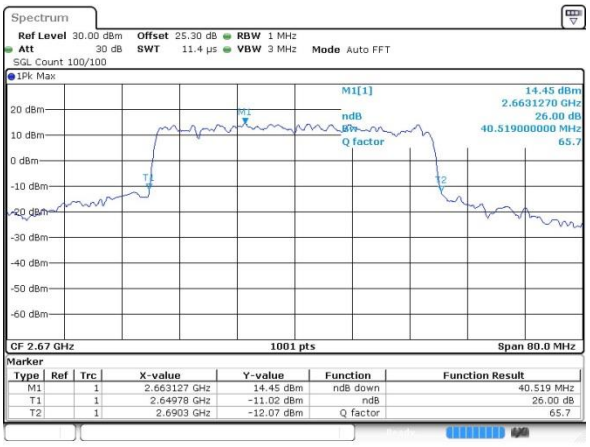
Middle Channel NR

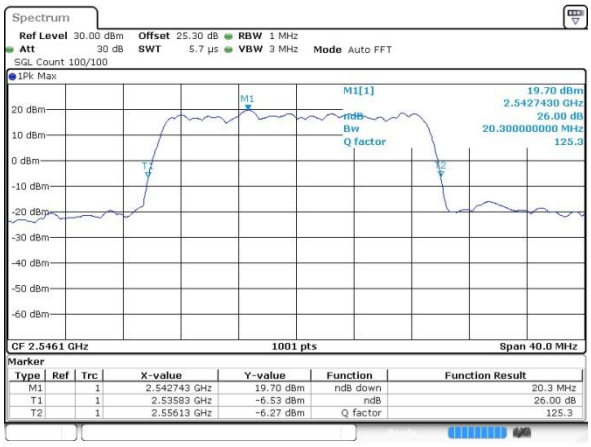
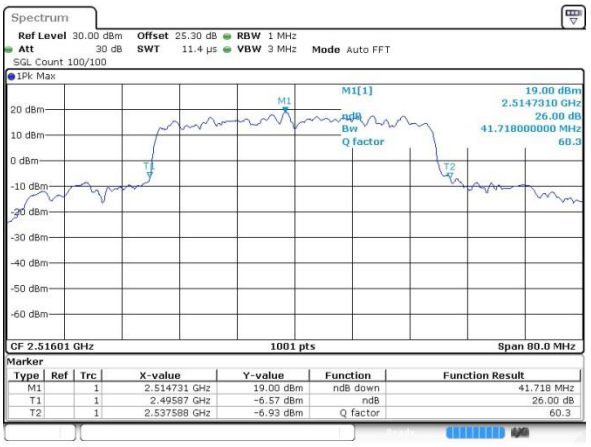
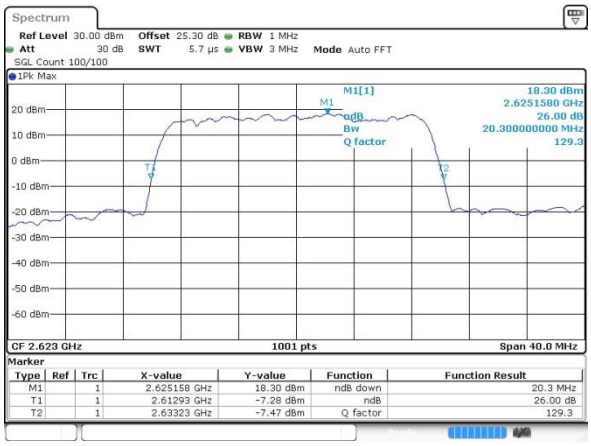
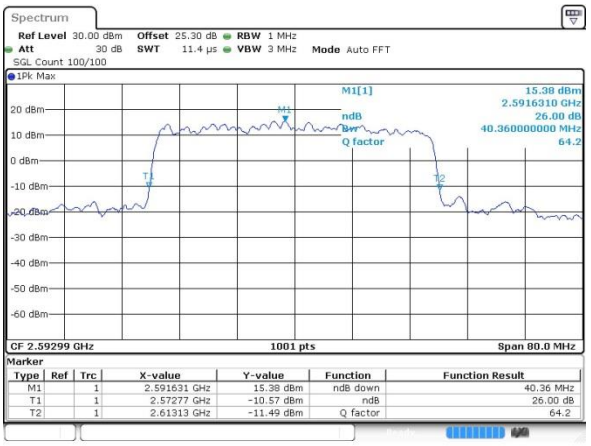
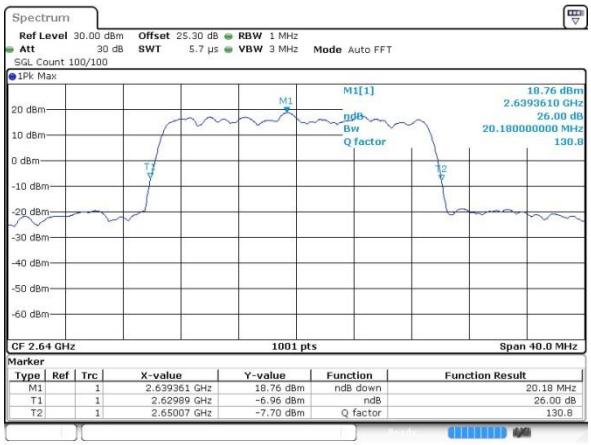
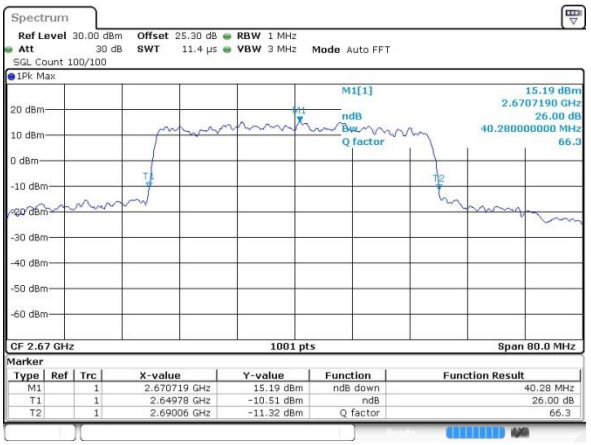


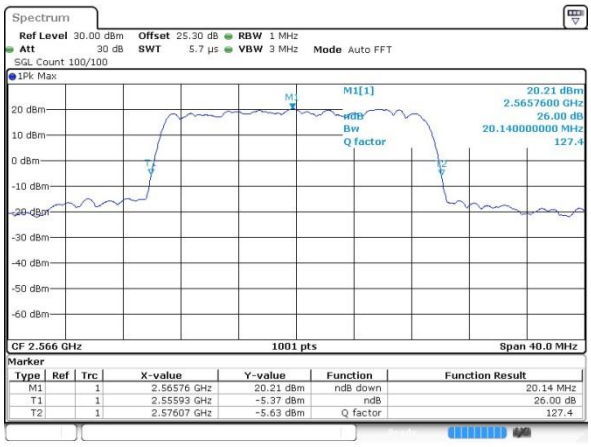
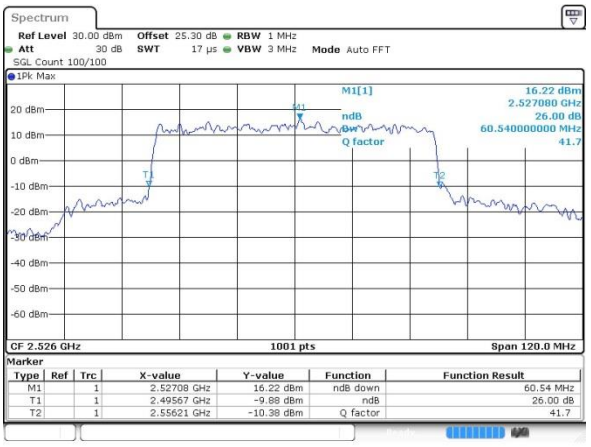
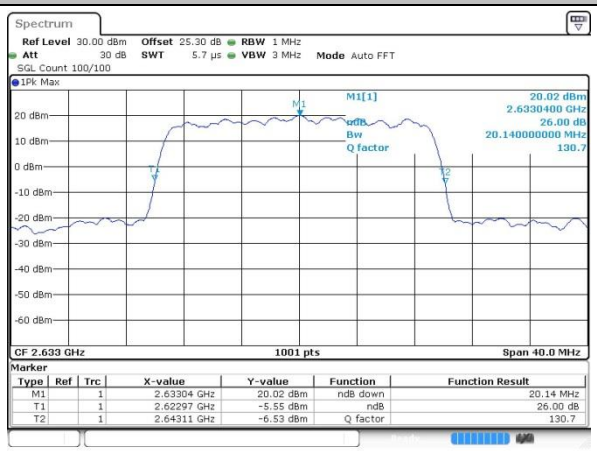
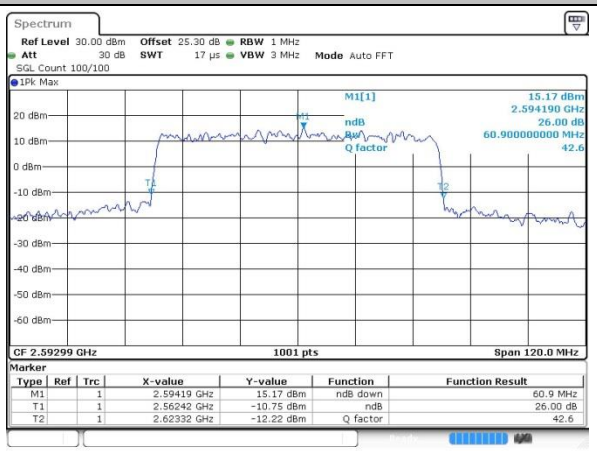
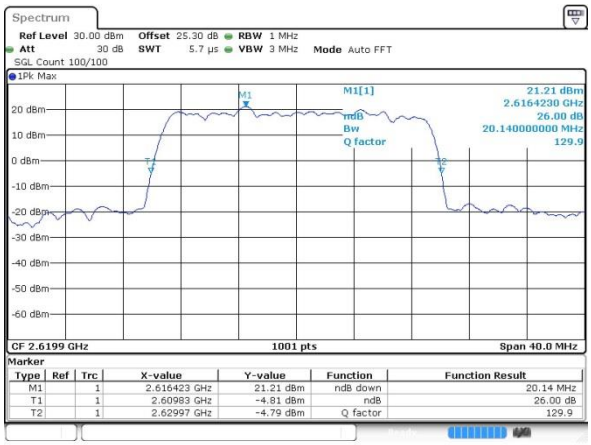
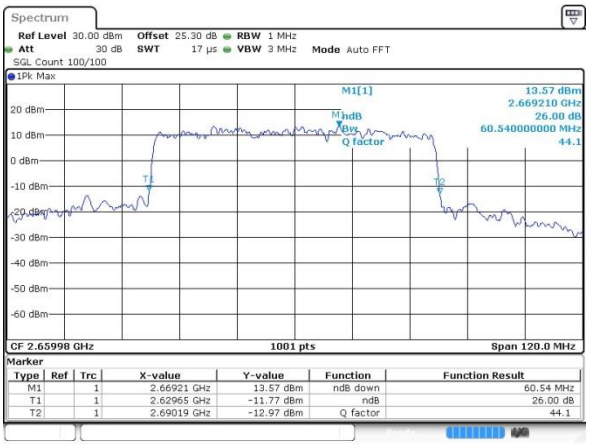
Highest Channel LTE

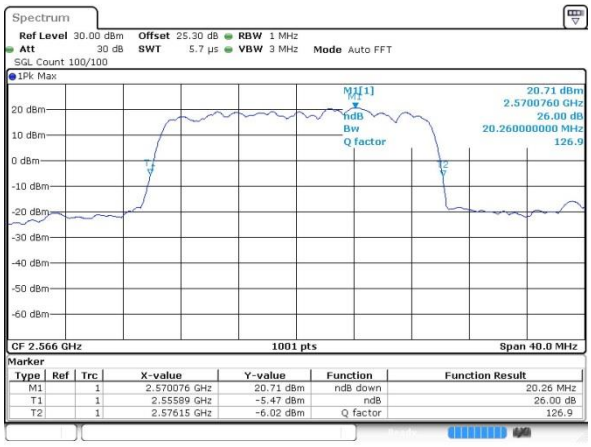
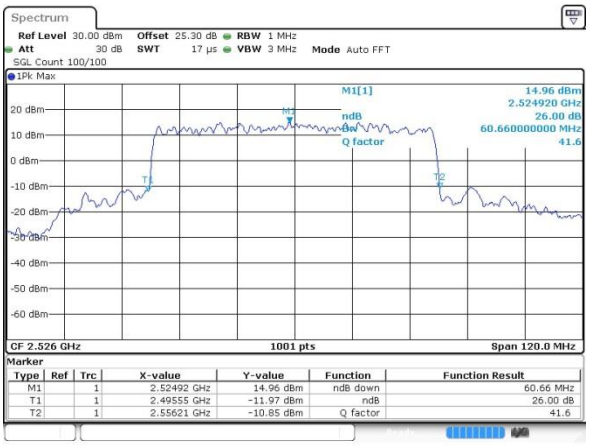
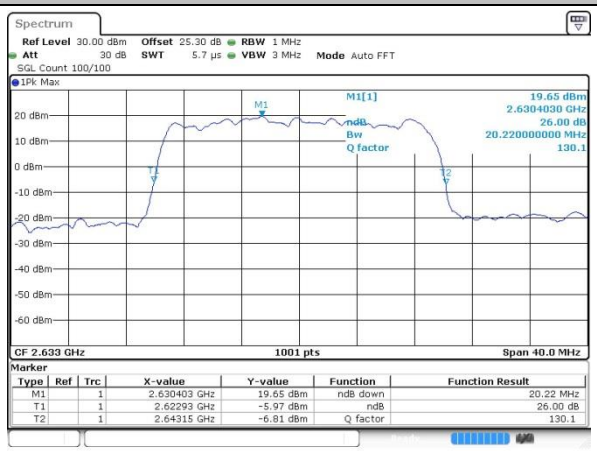
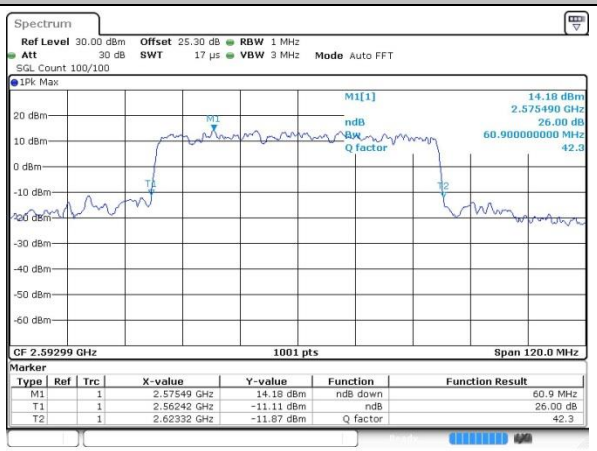
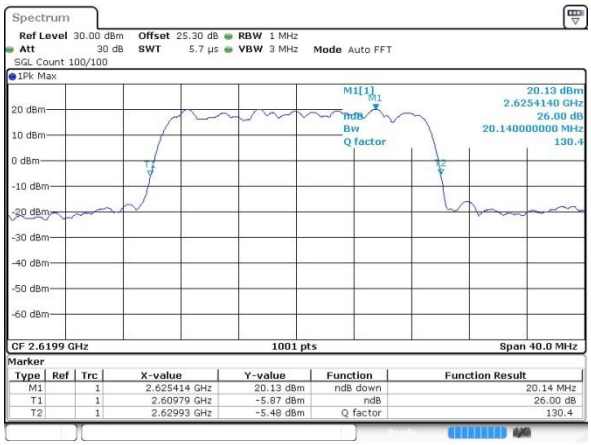
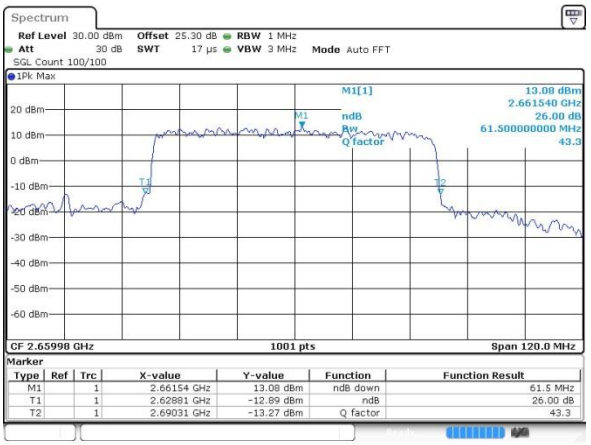


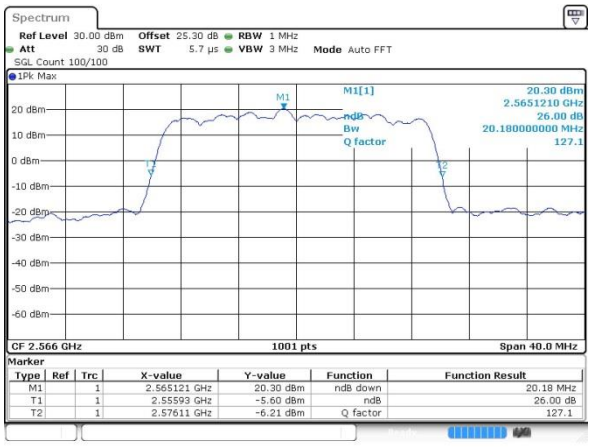
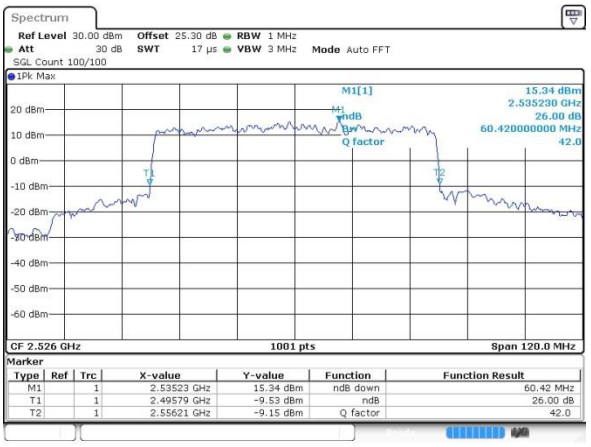
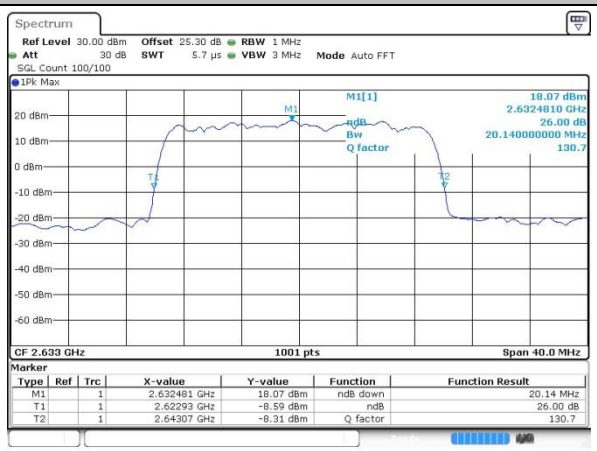
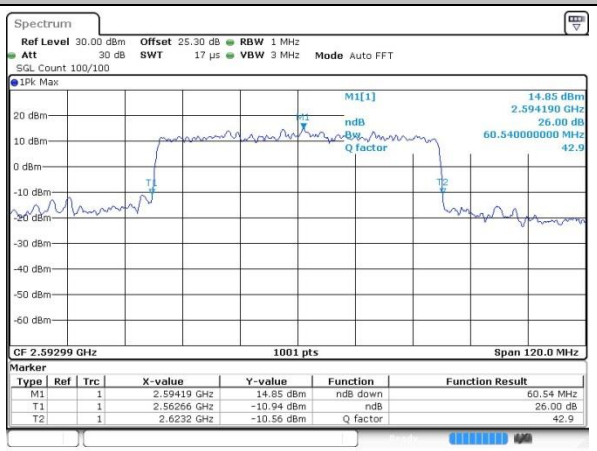
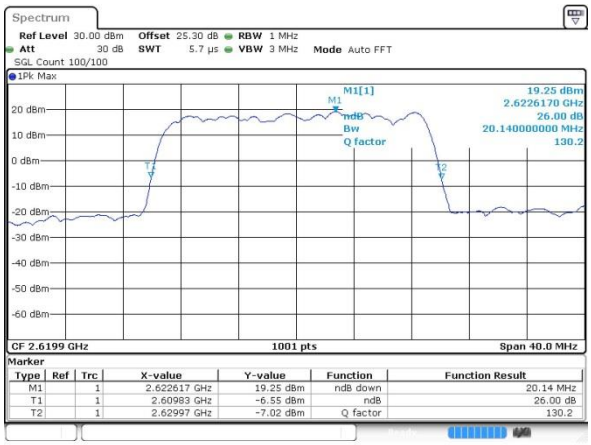
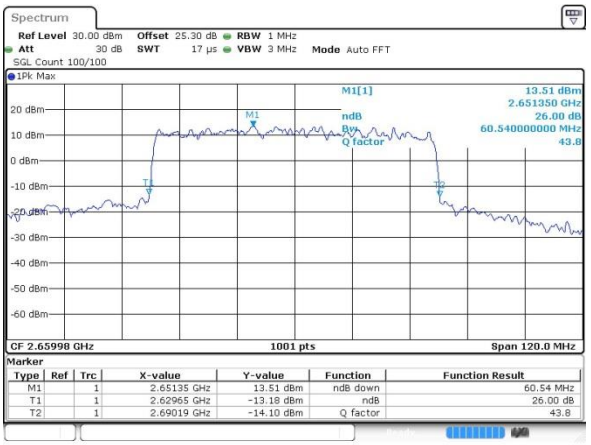
Highest Channel NR

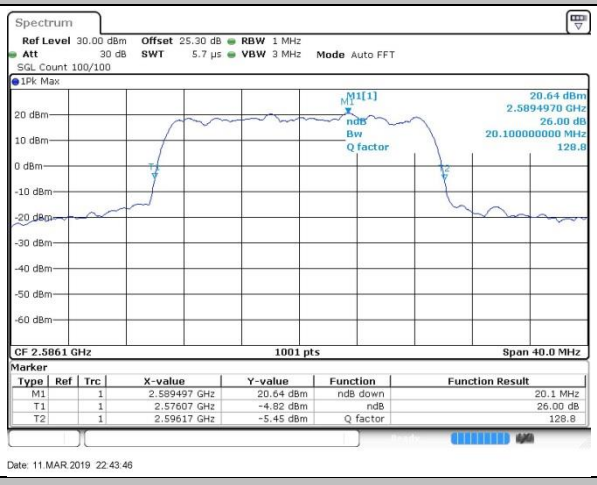
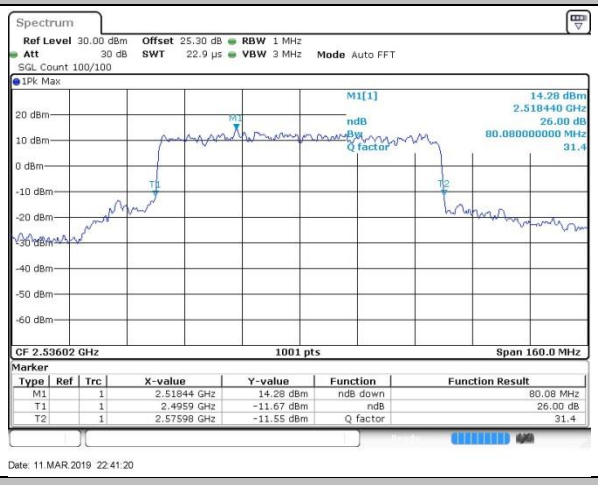
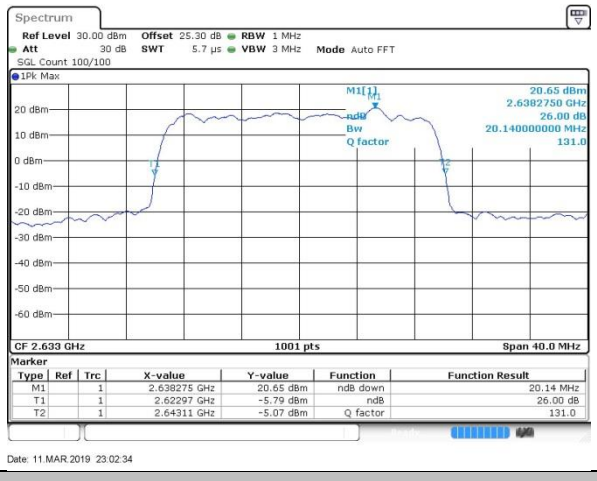
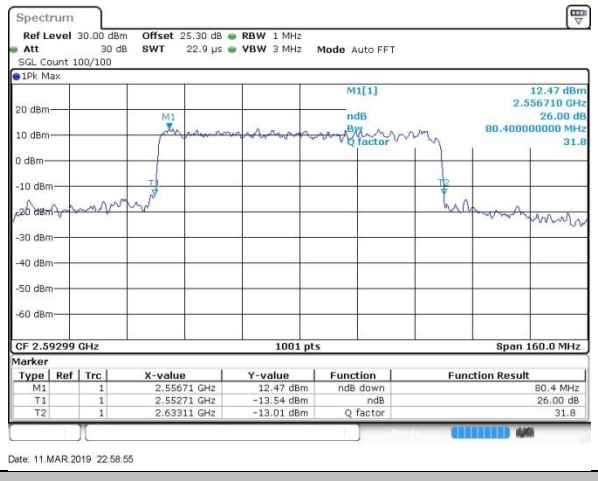
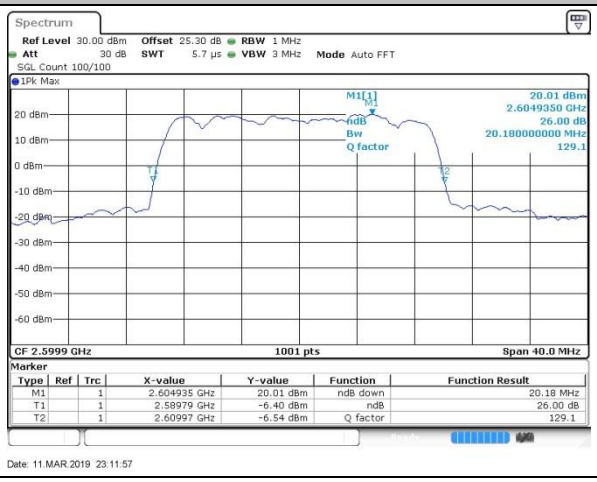
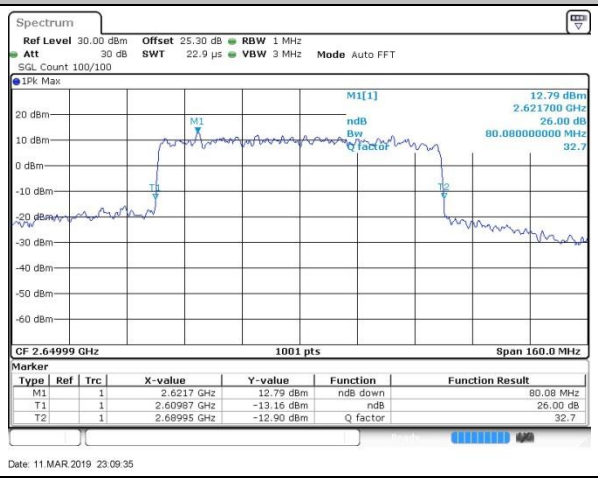


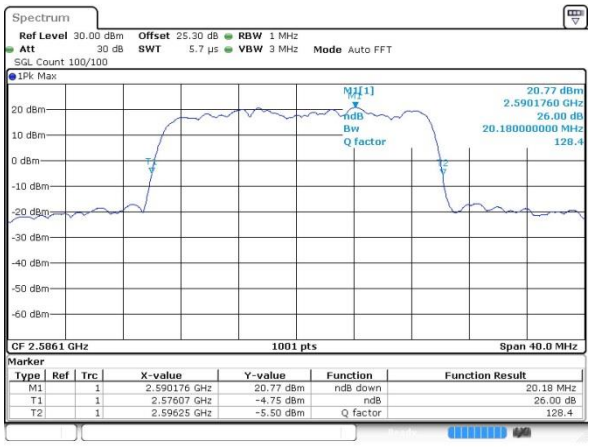
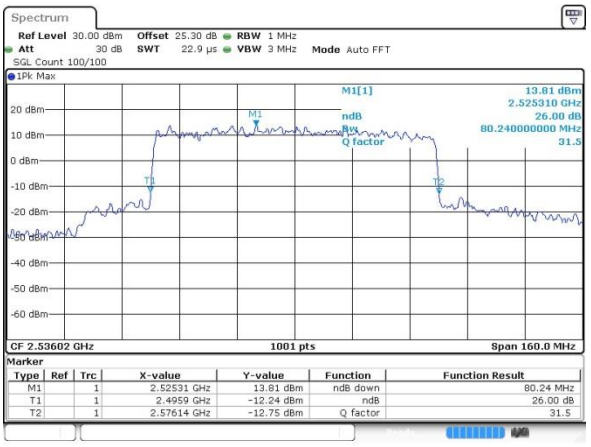
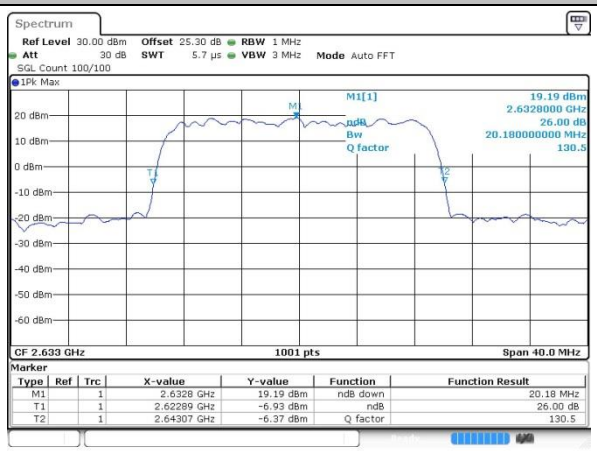
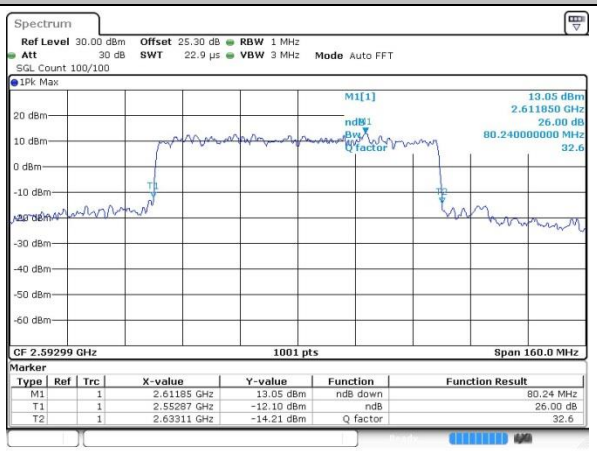
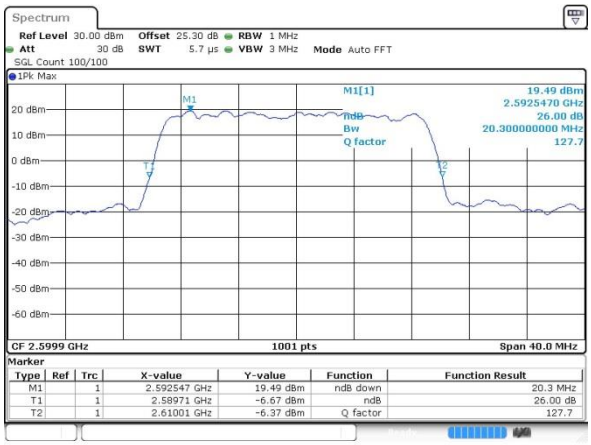
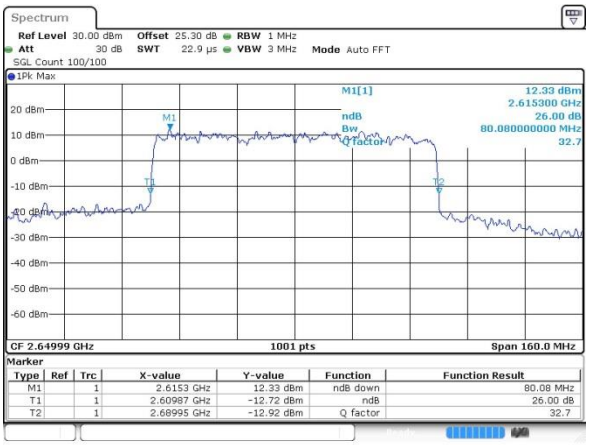
EN-DC LTE 20MHz + NR 40MHz (64QAM)	
Lowest Channel LTE	**Lowest Channel NR**
	
Middle Channel LTE	**Middle Channel NR**
	
Highest Channel LTE	**Highest Channel NR**
	

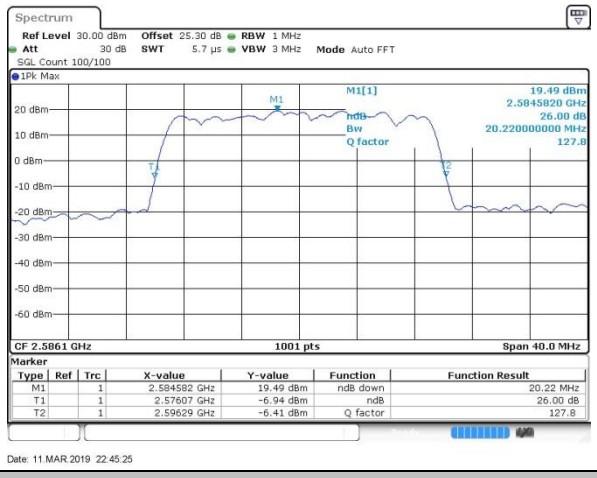
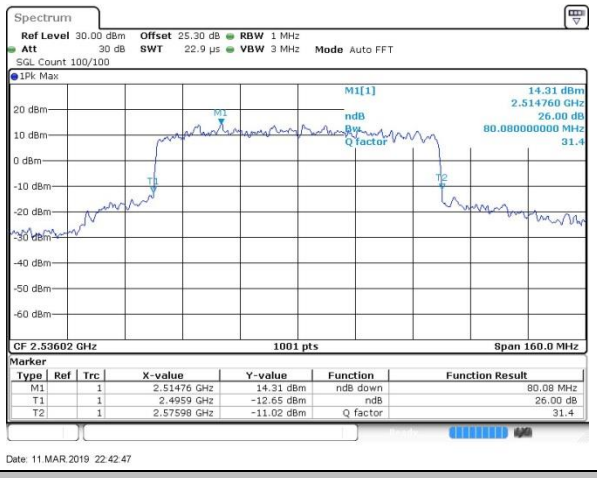
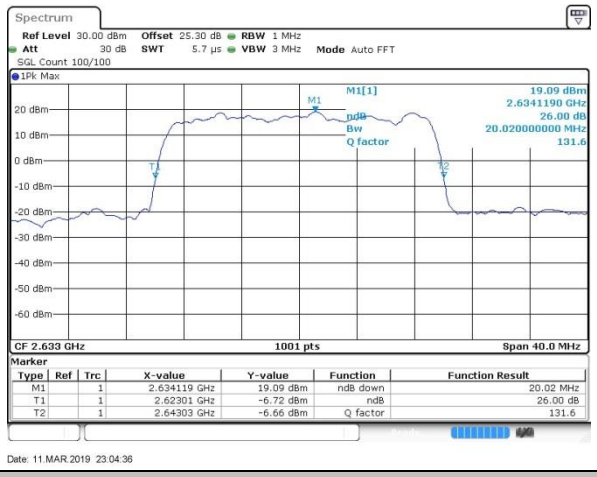
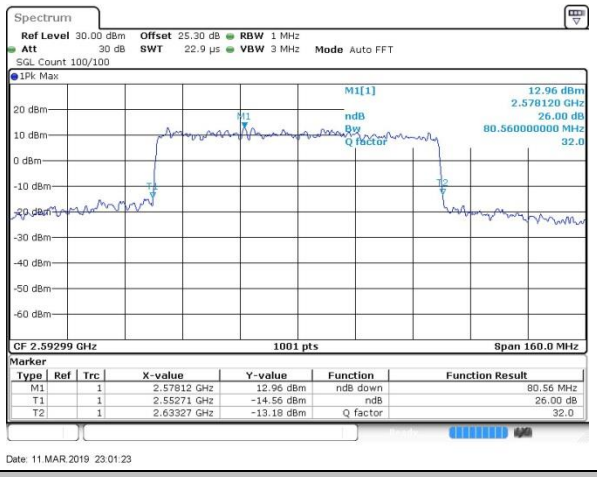
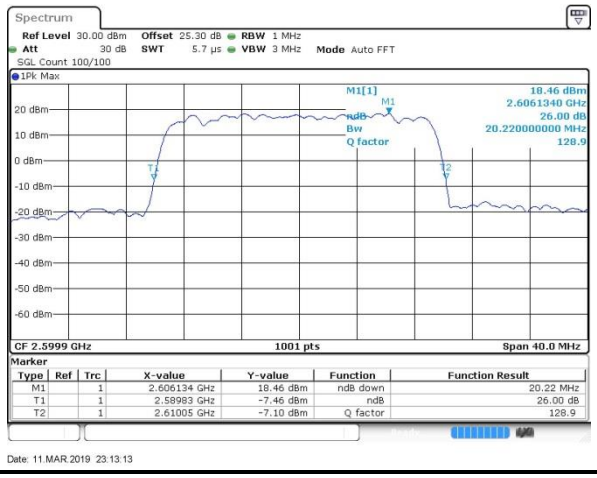
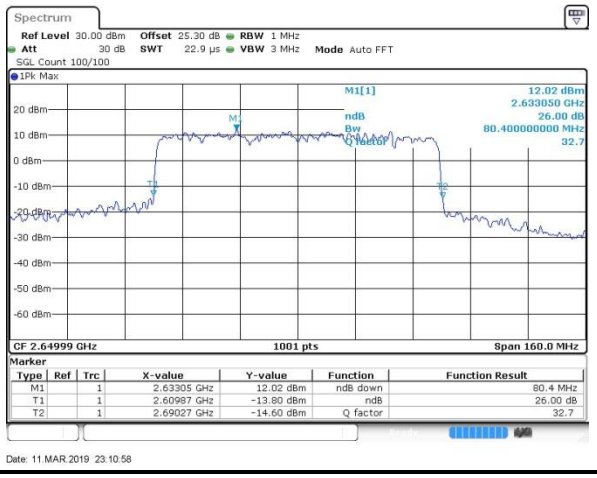
EN-DC LTE 20MHz + NR 60MHz (QPSK)	
Lowest Channel LTE	**Lowest Channel NR**
	
Middle Channel LTE	**Middle Channel NR**
	
Highest Channel LTE	**Highest Channel NR**
	

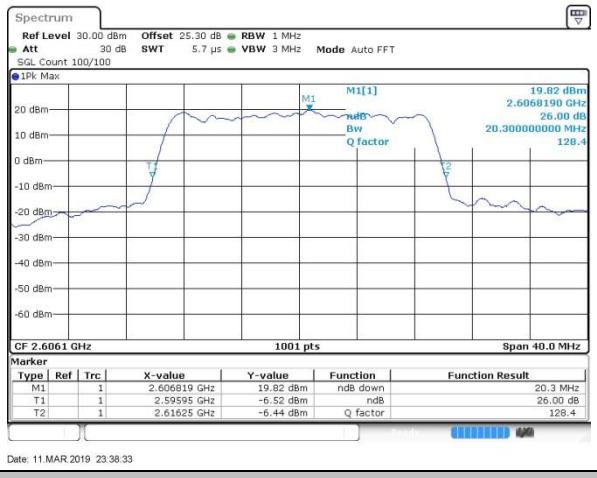
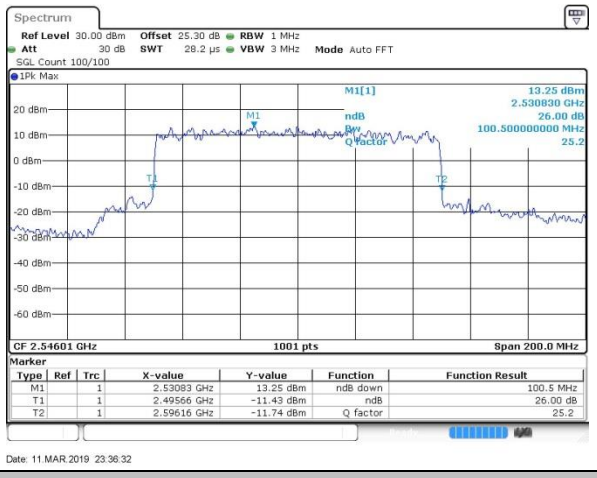
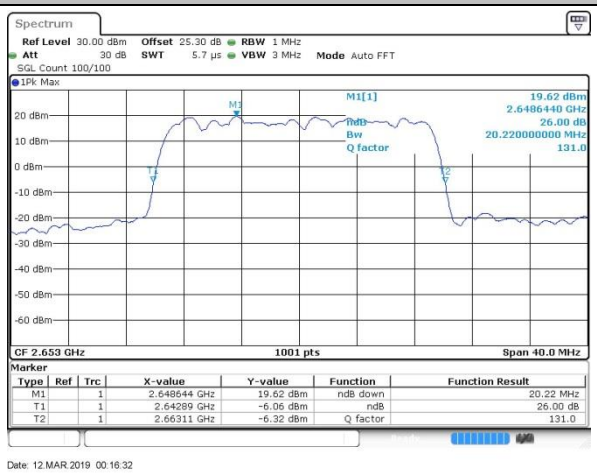
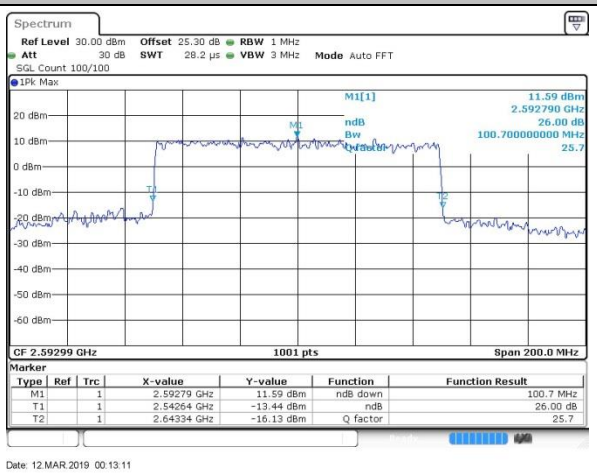
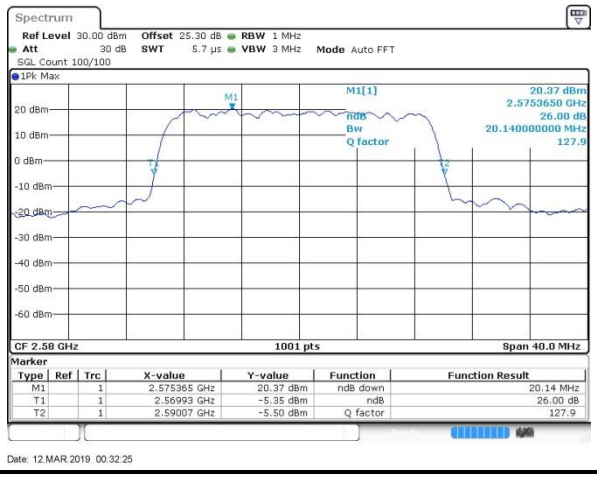
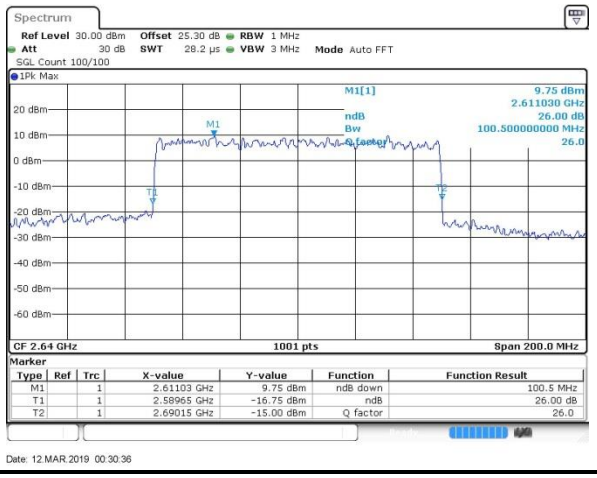
EN-DC LTE 20MHz + NR 60MHz (16QAM)	
Lowest Channel LTE	**Lowest Channel NR**
	
Middle Channel LTE	**Middle Channel NR**
	
Highest Channel LTE	**Highest Channel NR**
	

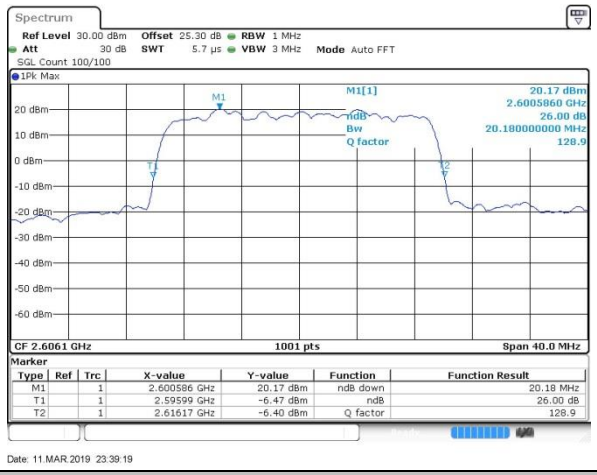
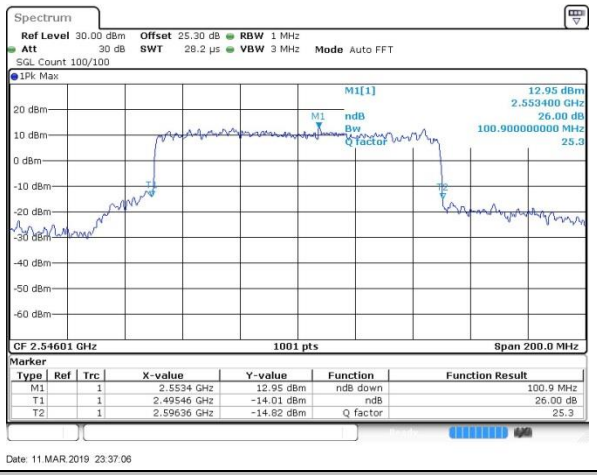
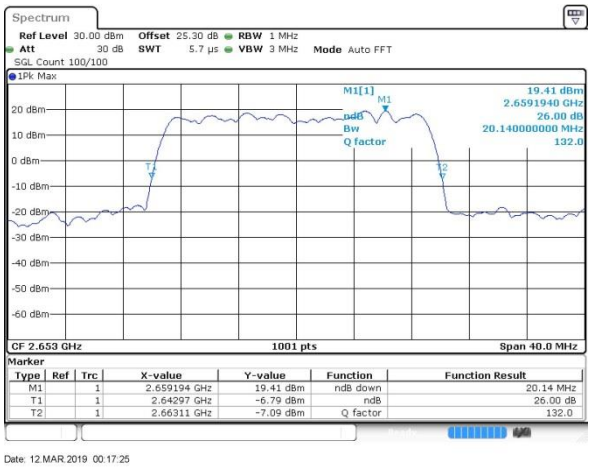
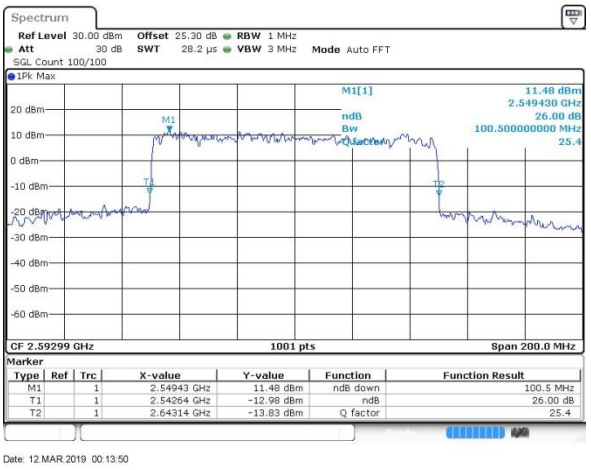
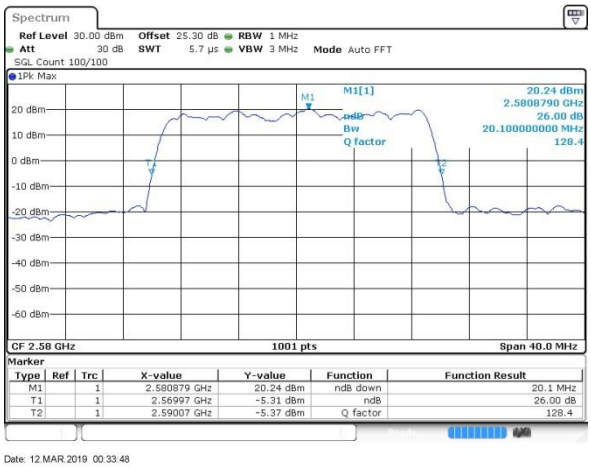
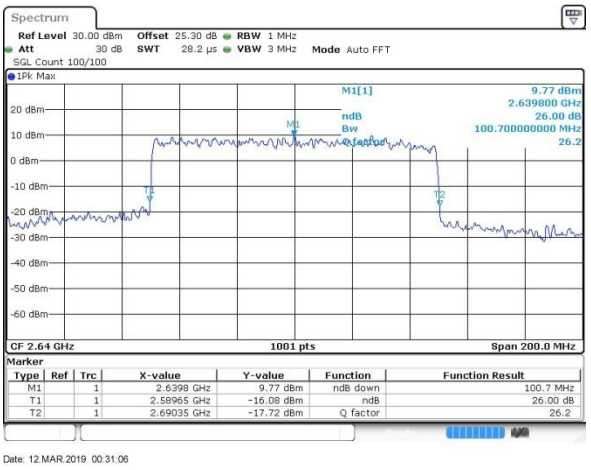
EN-DC LTE 20MHz + NR 60MHz (64QAM)	
Lowest Channel LTE	**Lowest Channel NR**
	
Middle Channel LTE	**Middle Channel NR**
	
Highest Channel LTE	**Highest Channel NR**
	

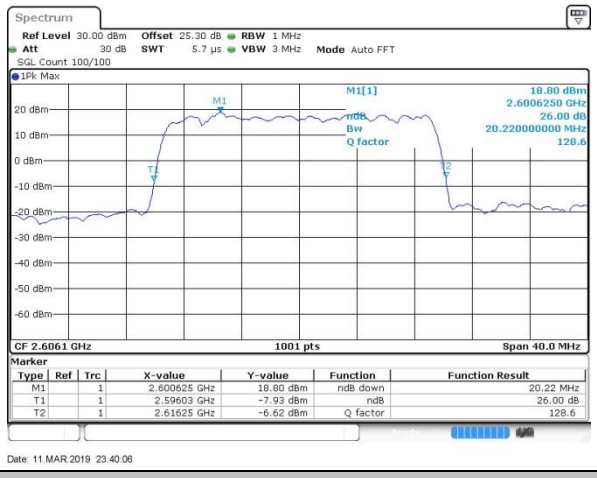
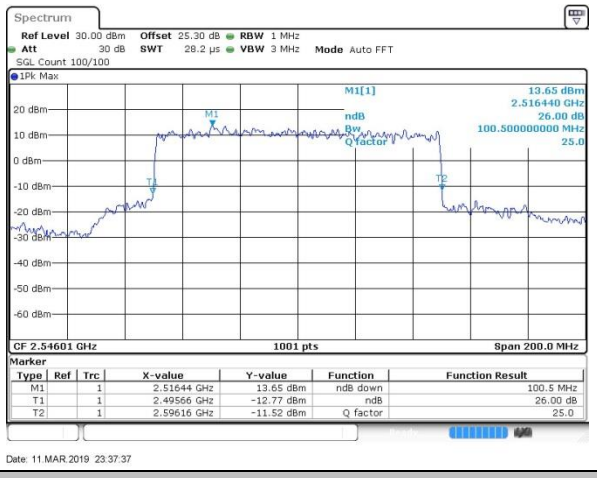
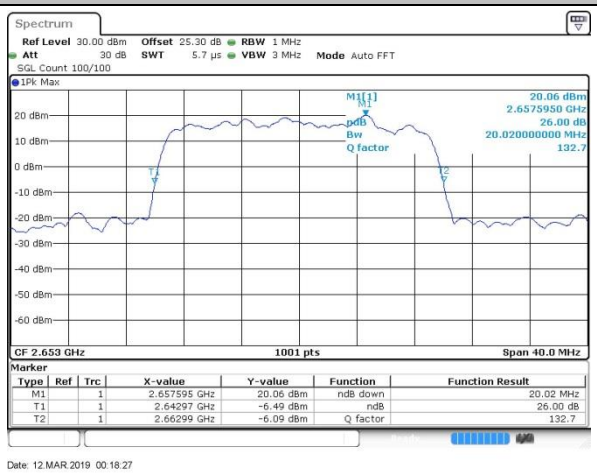
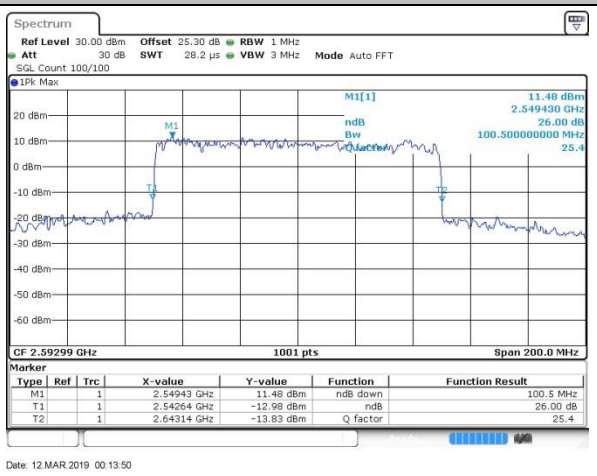
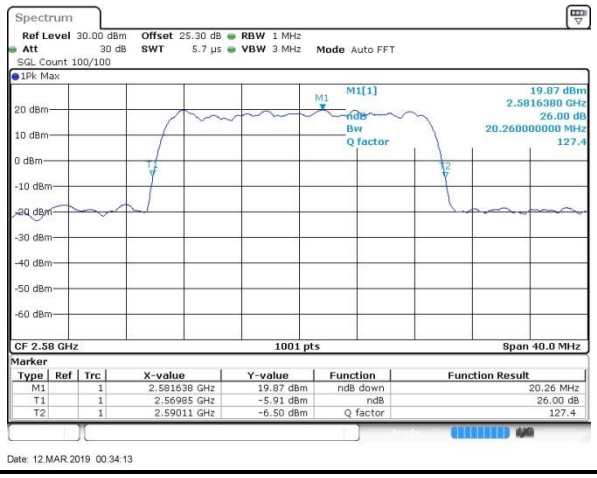
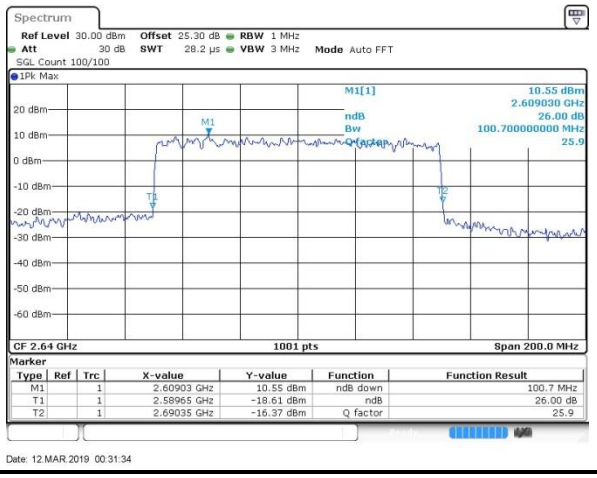
EN-DC LTE 20MHz + NR 80MHz (QPSK)	
Lowest Channel LTE	**Lowest Channel NR**
	
Middle Channel LTE	**Middle Channel NR**
	
Highest Channel LTE	**Highest Channel NR**
	

EN-DC LTE 20MHz + NR 80MHz (16QAM)	
Lowest Channel LTE	**Lowest Channel NR**
	
Middle Channel LTE	**Middle Channel NR**
	
Highest Channel LTE	**Highest Channel NR**
	

EN-DC LTE 20MHz + NR 80MHz (64QAM)	
Lowest Channel LTE	**Lowest Channel NR**
	
Middle Channel LTE	**Middle Channel NR**
	
Highest Channel LTE	**Highest Channel NR**
	

EN-DC LTE 20MHz + NR 100MHz (QPSK)	
Lowest Channel LTE	**Lowest Channel NR**
	
Middle Channel LTE	**Middle Channel NR**
	
Highest Channel LTE	**Highest Channel NR**
	

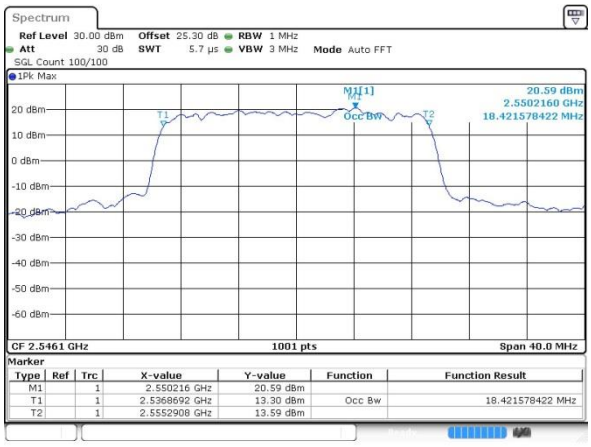
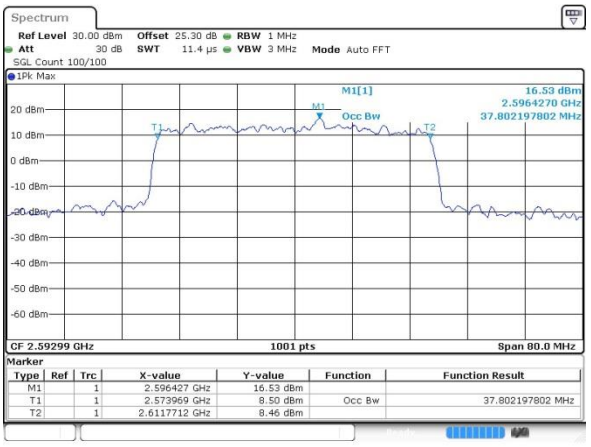
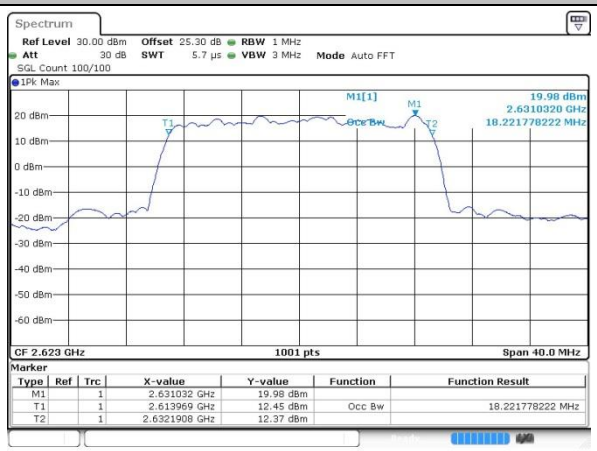
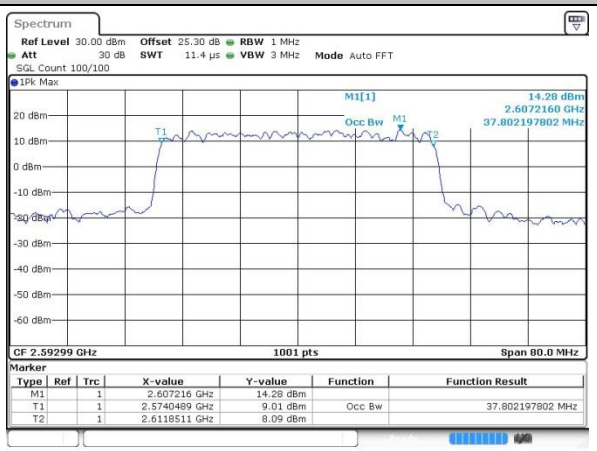
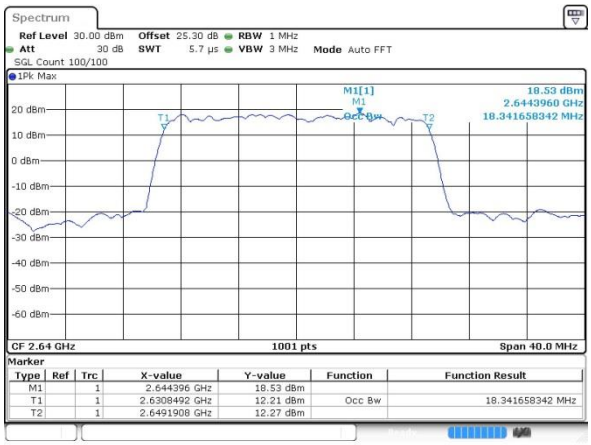
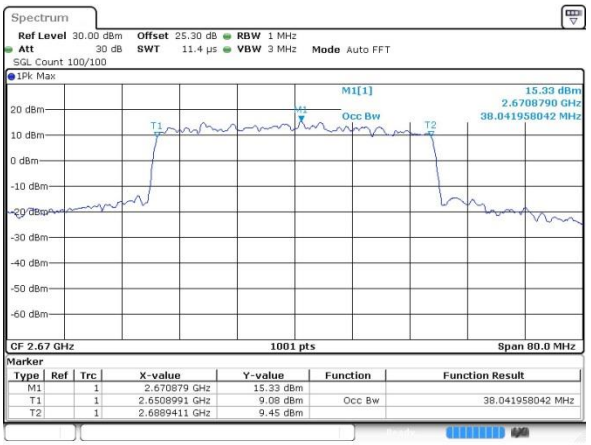
EN-DC LTE 20MHz + NR 100MHz (16QAM)	
Lowest Channel LTE	**Lowest Channel NR**
	
Middle Channel LTE	**Middle Channel NR**
	
Highest Channel LTE	**Highest Channel NR**
	

EN-DC LTE 20MHz + NR 100MHz (64QAM)	
Lowest Channel LTE	**Lowest Channel NR**
	
Middle Channel LTE	**Middle Channel NR**
	
Highest Channel LTE	**Highest Channel NR**
	

Occupied Bandwidth

Mode		LTE + NR : 99% BW(MHz)					
LTE BW		20MHz			20MHz		
NR BW		40MHz			60MHz		
Mod.		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Lowest CH	LTE	18.42	18.38	18.26	18.30	18.50	18.38
	NR	38.20	37.96	38.04	57.66	57.78	57.90
	LTE + NR	56.62	56.34	56.30	75.96	76.28	76.28
Middle CH	LTE	18.22	18.38	18.42	18.30	18.30	18.26
	NR	37.80	37.80	37.96	57.90	58.14	57.90
	LTE + NR	56.02	56.18	56.38	76.20	76.44	76.16
Highest CH	LTE	18.34	18.22	18.38	18.42	18.34	18.54
	NR	38.04	37.96	37.88	58.02	57.90	57.78
	LTE + NR	56.38	56.18	56.26	76.44	76.24	76.32

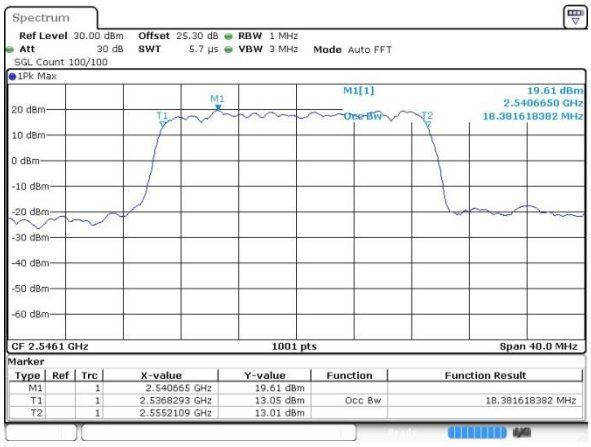
Mode		LTE + NR : 99% BW(MHz)					
LTE BW		20MHz			20MHz		
NR BW		80MHz			100MHz		
Mod.		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Lowest CH	LTE	18.38	18.42	18.38	18.42	18.34	18.26
	NR	77.36	77.04	77.04	96.70	97.30	97.30
	LTE + NR	95.74	95.46	95.42	115.12	115.64	115.56
Middle CH	LTE	18.38	18.30	18.42	18.46	18.34	18.26
	NR	77.52	77.20	77.36	97.30	97.50	97.50
	LTE + NR	95.90	95.50	95.78	115.76	115.84	115.76
Highest CH	LTE	18.50	18.38	18.34	18.34	18.22	18.22
	NR	77.20	77.36	77.36	97.30	97.10	97.50
	LTE + NR	95.70	95.74	95.70	115.64	115.32	115.72

EN-DC LTE 20MHz + NR 40MHz (QPSK)	
Lowest Channel LTE	**Lowest Channel NR**
	
Middle Channel LTE	**Middle Channel NR**
	
Highest Channel LTE	**Highest Channel NR**
	

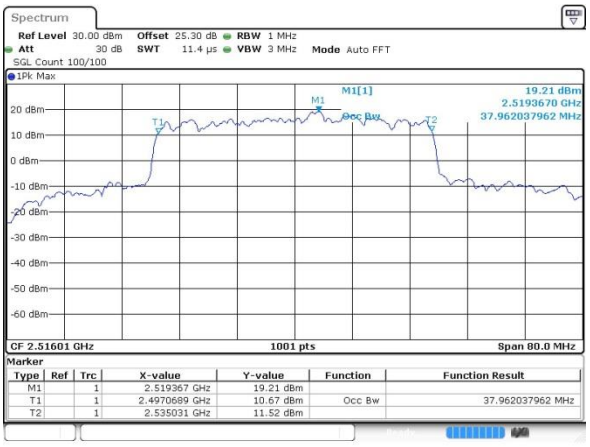
EN-DC

LTE 20MHz + NR 40MHz (16QAM)

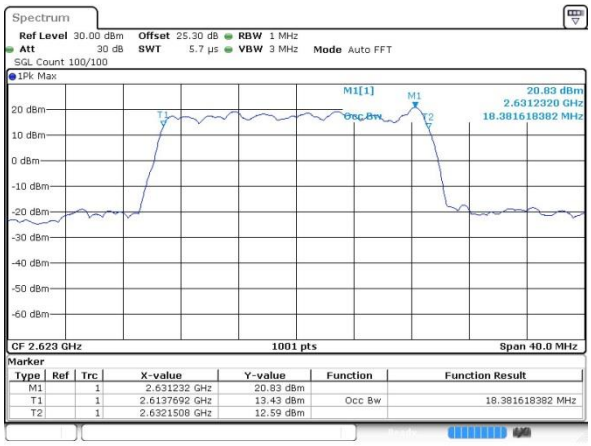
Lowest Channel LTE



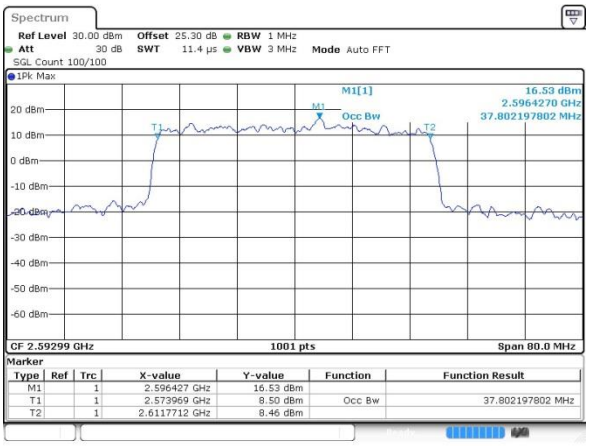
Lowest Channel NR



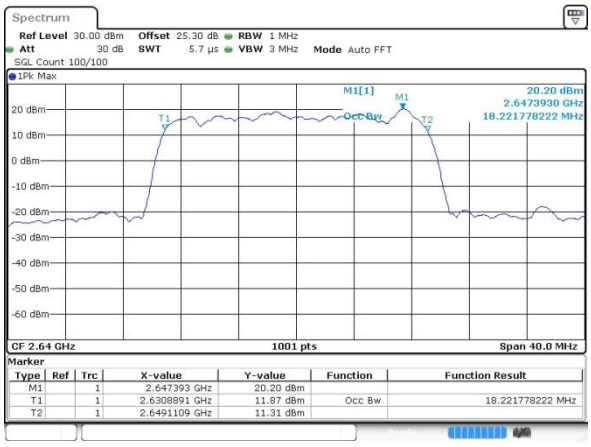
Middle Channel LTE



Middle Channel NR



Highest Channel LTE



Highest Channel NR