FCC RADIO TEST REPORT

FCC ID	:	**IHDT56XL1**
Equipment	:	**Mobile 5G MOD**
Brand Name	:	**Motorola**
Model Name	:	**MD1005G**
Applicant	:	**Motorola Mobility LLC** **222 W,Merchandise Mart Plaza, Chicago IL 60654 USA**
Manufacturer	:	**Motorola Mobility LLC** **222 W,Merchandise Mart Plaza, Chicago IL 60654 USA**
Standard	:	**FCC 47 CFR Part 2, and 30**

The product was received on Sep. 05, 2018 and testing was started from Dec. 10, 2018 and completed on Dec. 25, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures ANSI C63.26-2015 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.

Jones Tsai

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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Appendix A. Test Results of EIRP and Radiated Test

Appendix B. R&S Mixer Certificate

History of this test report

Report No.	Version	Description	Issued Date
FG890514A	01	Initial issue of report	Dec. 26, 2018
FG890514A	02	Add summary table of Radiated Out of Band Emissions in page 22 of appendix A2	Jan. 03, 2019
FG890514A	03	1. Add the mixer calibration certificates showing the conversion loss in appendix B 2. Add the Far Field Condition for frequency above 18GHz in section 2.5 3. Add test setup photos for measurement frequency above 18GHz 4. Modify the beam pair configuration description in section 2	Feb. 01, 2019

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Limit	Result (PASS/FAIL)	Remark
3.4	§2.1046 §30.202	EIRP Measurement	+43dBm	Pass	-
3.5	§2.1049	Occupied Bandwidth	Not Applicable	Reporting only	-
3.6	§2.1053 §30.203	Radiated Spurious Emission	-5dBm/MHz -13dBm/MHz	Pass	-
3.7	§2.1055	Frequency Stability for Temperature & Voltage	Within the band	Pass	-

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: Yung Hsu

1 General Description

1.1 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Mobile 5G MOD
Brand Name	Motorola
Model Name	MD1005G
FCC ID	IHDT56XL1
EUT supports Radios application	LTE/5G NR
HW Version	DVT2
SW Version	PPZ29.67
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer.

Specification of Accessories		
USB Cable 1	Brand Name :	Motorola
	Model Name :	SC18C46623

Supported Unit Used in Test Configuration and System		
AC Adapter 1	Brand Name :	Motorola
	Model Name :	SC-22
	Manufacturer :	Chenyang
AC Adapter 2	Brand Name :	Motorola
	Model Name :	SC-51
	Manufacturer :	Salom
Mobile Phone	Brand Name :	Motorola
	FCC ID :	IHDT56XJ1

1.2 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Device Category in Part 30	Mobile station
Tx Frequency	NR band n261: 27.5GHz ~ 28.35GHz
Rx Frequency	NR band n261: 27.5GHz ~ 28.35GHz
Support Bandwidth	NR band n261: 50 MHz and 100 MHz
Maximum Number of contiguous CC	4
Maximum Aggregated Bandwidth	400MHz
Maximum Output Power (EIRP)	NR band n261: Module 0: 24.18 dBm Module 1: 23.18 dBm Module 2: 21.31 dBm Module 3: 23.14 dBm
Antenna Info	NR 1x4 patch array antenna for each module
Type of Modulation	CP-OFDM: QPSK / 16QAM / 64QAM DFT-s-OFDM: Not supported

1.3 Modification of EUT

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

1.4 Emission Designator

NR band n261 Module 0		QPSK			16QAM			64QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
50	27500 ~ 28350	49M9G7D	-	0.262	49M3W7D	-	0.220	48M2W7D	-	0.142
100	27500 ~ 28350	94M4G7D	-	0.301	94M6W7D	-	0.221	94M9W7D	-	0.159
400	27500 ~ 28350	418MG7D	-	0.261	440MW7D	-	0.200	399MW7D	-	0.111

NR band n261 Module 1		QPSK			16QAM			64QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
50	27500 ~ 28350	49M8G7D	-	0.208	47M8W7D	-	0.178	49M9W7D	-	0.105
100	27500 ~ 28350	94M6G7D	-	0.183	94M6W7D	-	0.172	94M6W7D	-	0.099
400	27500 ~ 28350	399MG7D	-	0.124	398MW7D	-	0.099	398MW7D	-	0.058

NR band n261 Module 2		QPSK			16QAM			64QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
50	27500 ~ 28350	49M8G7D	-	0.104	48M2W7D	-	0.098	49M4W7D	-	0.060
100	27500 ~ 28350	94M6G7D	-	0.108	94M4W7D	-	0.095	94M6W7D	-	0.057
400	27500 ~ 28350	398MG7D	-	0.135	397MW7D	-	0.100	399MW7D	-	0.097

NR band n261 Module 3		QPSK			16QAM			64QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
50	27500 ~ 28350	49M8G7D	-	0.183	47M8W7D	-	0.159	49M1W7D	-	0.098
100	27500 ~ 28350	94M6G7D	-	0.151	94M6W7D	-	0.133	94M9W7D	-	0.081
400	27500 ~ 28350	399MG7D	-	0.206	398MW7D	-	0.163	399MW7D	-	0.079

1.5 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

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

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

FCC designation No. : TW1190 / TW0007

1.6 Applied Standards

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

- FCC 47 CFR Part 2, 30
- ANSI C63.26-2015
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01

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

EUT has total 4 millimeter wave antenna modules and up to 2 beams operation for each module.

EUT is configured to radiate at rated maximum EIRP with both 2 beams ON mode at the same time.

Any antenna module cannot transmit simultaneously with the other antenna modules.

Preliminary EIRP test was performed for all beam configurations in the anechoic chamber at the manufacturer's facility, the all preliminary test results and test details are illustrated in "IHDT56XL1_OpDes_detailed reference for the simulation report", and the worst beam-pairs were identified.

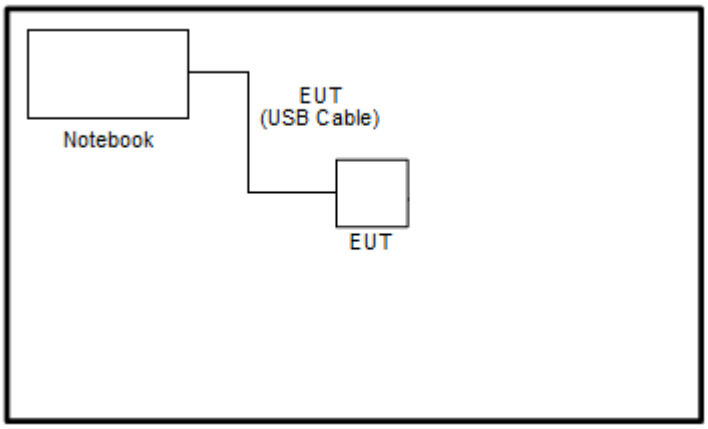
The NR radio operation is controlled via software tool QRCT v4.0.

2.1 Test Mode

For radiated measurement, the pre-scan is performed to find the worst cases EUT position.

Test Items	Band	Bandwidth (MHz)			Modulation			RB #			Test Channel		
		50	100	400	QPSK	16QAM	64QAM	1	-	Full	L	M	H
EIRP	n261	v	v	v	v	v	v	v		v	v	v	v
99% Occupied Bandwidth	n261	v	v	v	v	v	v			v	v	v	v
Out of Band Emission	n261	v	v	v	v	v	v			v	v		v
Spurious Emission	n261	v	v	v	v			v			v	v	v
Frequency Stability	n261	CW tone										v	
Remark	1. The mark "**v** " means that this configuration is chosen for testing 2. The device is investigated from 30MHz to 100GHz of fundamental signal for radiated spurious emission test under different RB size and modulations in exploratory test. Subsequently, only the worst case emissions are reported. 3. All the radiated test cases were performed with built-in battery.												

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Notebook	Lenovo	N/A	N/A	N/A	N/A

2.4 Measurement Results Explanation Example

According to ANSI C63.26-2015 Section 5.2.7

EIRP (dBm) = E(dBuV/m) + 20log (D) -104.8.

where D is the measurement distance (in the far field region) in m.

E (dBuV/m) = Spectrum Reading Level (dBm) + Antenna Factor (dB/m) + Cable Loss (dB) + 107

Hence, the spectrum analyzer *Offset* is derived including RF cable loss and antenna factor.

Offset = Antenna Factor (dB/m) + Cable Loss (dB) + 107 + 20log (D) – 104.8

The conversion loss of RF mixer is also included by the mixer table of spectrum analyzer when measurement frequency is above 40GHz.

Example :

Offset = Antenna Factor (dB/m) + Cable Loss (dB) + 107 + 20log (D) – 104.8

= 40.1 + 2.2 + 107 + 20log(1) – 104.8

= 44.5 (dB)

2.5 Far Field Condition for Frequency above 18GHz

Horn Antenna	Frequency (GHz)	Antenna Dimension A (mm)	Wavelength (λ) (m)	Far field R (m) >= $2A^2/\lambda$	Measurement Distance (D) (m)	Distance Factor 20log(D) (dB)
BBHA 9170	18	60	0.0167	0.43	1	0.00
	40	60	0.0075	0.96		
QWH-UPRR00	40	48	0.0075	0.61	1	0.00
	60	48	0.0050	0.92		
QWH-EPRR00	60	31	0.0050	0.38	1	0.00
	90	31	0.0033	0.58		
QWH-FPRR00	90	21	0.0033	0.26	1	0.00
	140	21	0.0021	0.41		

2.6 Frequency List of Low/Middle/High Channels

NR Band n261 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
50	Frequency	27525	27925	28325
100	Frequency	27550	27925	28300
400	Frequency 1	27550	27775	28000
	Frequency 2	27650	27875	28100
	Frequency 3	27750	27975	28200
	Frequency 4	27850	28075	28300

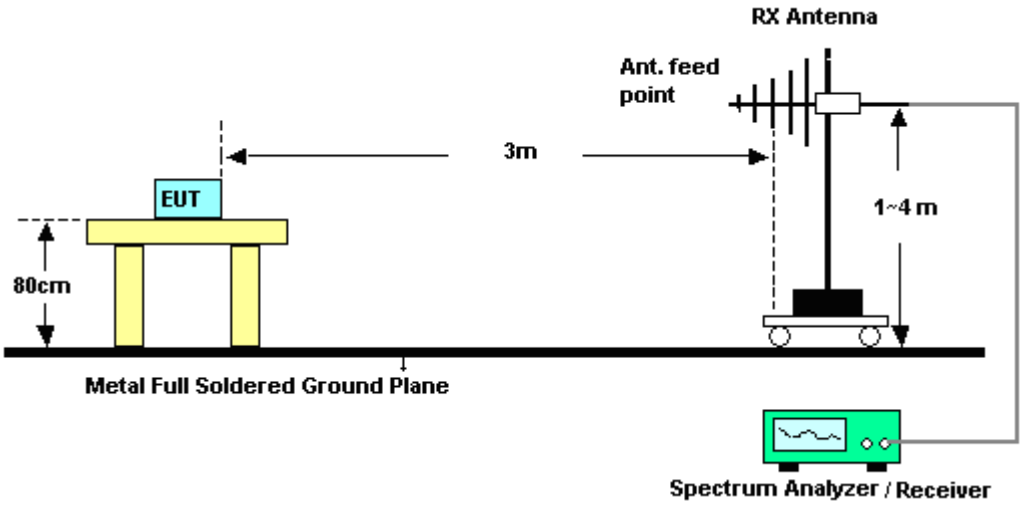
3 Radiated Test Items

3.1 Measuring Instruments

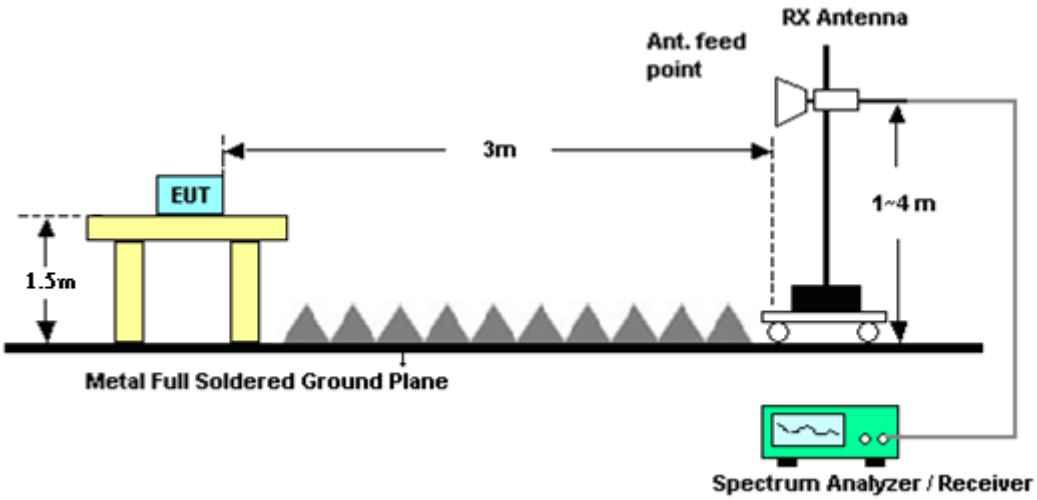
See list of measuring instruments of this test report.

3.2 Test Setup

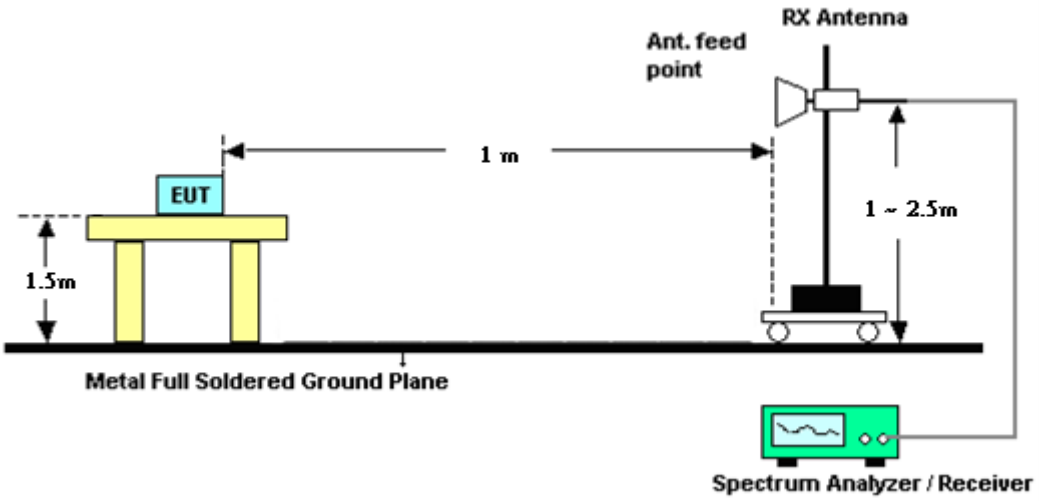
For radiated emissions from 30MHz to 1GHz



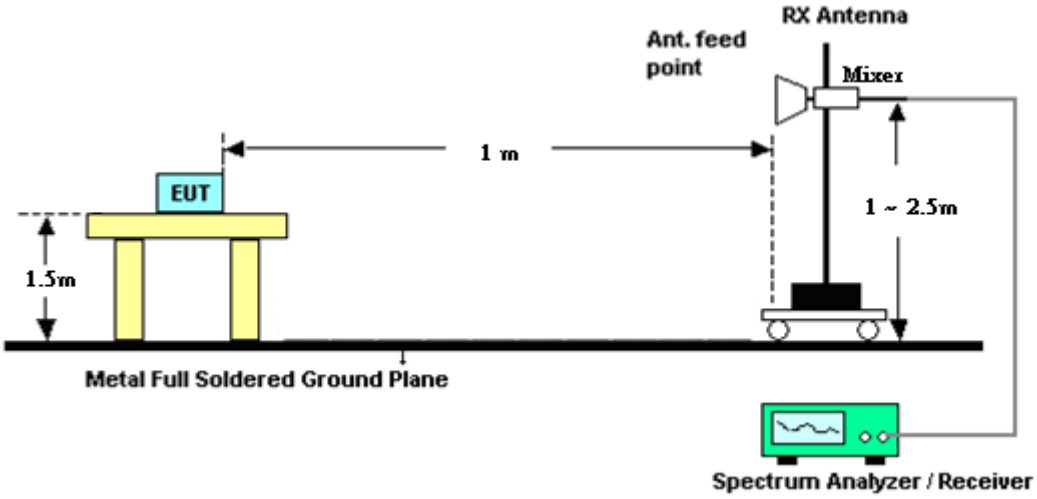
For radiated emissions 1GHz to 18GHz



For radiated emissions above 18GHz



For radiated emissions above 40GHz



3.3 Test Result of Radiated Test

Please refer to Appendix A.

3.4 EIRP Measurement

3.4.1 Description of EIRP Measurement

For mobile stations, the average power of the sum of all antenna elements is limited to a maximum EIRP of +43 dBm.

3.4.2 Test Procedures

1. Set EUT at maximum output power.
2. Select lowest, middle, and highest channels for each band and different modulation.
3. Enable channel power function of spectrum analyzer
4. Set frequency would like to be investigated.
5. Set Detector = RMS
6. Set Trace mode = trace average
7. Set Sweep time = auto couple
8. Set sweep points ≥ 2 x Span/RBW
9. Set sweep count 100 and wait until the trace to be stabilized
10. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
11. Measure and record the power level from the spectrum analyzer.
12. The test result is calculated according to
    ANSI C63.26-2015 Section 5.2.7
    EIRP (dBm) = E(dBuV/m) + 20log (D) -104.8.
    where D is the measurement distance (in the far field region) in m.
    E (dBuV/m) = Spectrum Level (dBm) + Antenna Factor (dB/m) + Cable Loss (dB) + 107
    That is, set the spectrum offset including sum of
    Antenna Factor (dB/m) + Cable Loss (dB) + 107 + 20log (D) – 104.8

3.5 Occupied Bandwidth

3.5.1 Description of Occupied Bandwidth Measurement

This is for reporting only.

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.

3.5.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.4.4

1. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be at least 1.5 times the anticipated OBW.
2. 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.
3. Set the detection mode to peak, and the trace mode to max hold.
4. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.6 Radiated Spurious Emission Measurement

3.6.1 Description of Radiated Spurious Emission Measurement

The spectrum is scanned from 30 MHz up to 100GHz.

The conductive power or the total radiated power of any emission outside a licensee's frequency block shall be −13 dBm/MHz or lower. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be −5 dBm/MHz or lower.

3.6.2 Test Procedures

1. Set EUT at maximum output power..
2. Select lowest, middle, and highest channels for each band and different modulation.
3. Measure and record the power level from the spectrum analyzer.
4. Set frequency would like to be investigated.
5. Set Detector = RMS
6. Set Trace mode = trace average
7. Set Sweep time = auto couple
8. Set sweep points ≥ 2 x Span/RBW
9. Set sweep count 100 and wait until the trace to be stabilized
10. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
11. For measurement from 30MHz to 18GHz,

    An antenna was substituted in place of the EUT and was driven by a signal generator.
    Tune the output power of signal generator to the same emission level with EUT maximum spurious emission. Take record of output power and repeat for another polarization.
12. For measurement above 18GHz, the test result is calculated according to

    ANSI C63.26-2015 Section 5.2.7 and 5.7.3 and 5.7.4

    EIRP (dBm) = E(dBuV/m) + 20log (D) -104.8.

    where D is the measurement distance (in the far field region) in m.

    E (dBuV/m) = Spectrum Level (dBm) + Antenna Factor (dB/m) + Cable Loss (dB) + 107

    That is, set the spectrum offset including sum of

    Antenna Factor (dB/m) + Cable Loss (dB) + 107 + 20log (D) – 104.8
13. The conversion loss of RF mixer is also included in conversion loss table of the spectrum analyzer when measurement frequency is above 40GHz.

3.7 Frequency Stability Measurement

3.7.1 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.

3.7.2 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.

3.7.3 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° C.
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 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Amplifier	SONOMA	310N	187311	9kHz~1GHz	Oct. 23, 2018	Dec. 10, 2018~ Dec. 25, 2018	Oct. 22, 2019	Radiation (03CH10-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	37059&01	30MHz~1GHz	Oct. 13, 2018	Dec. 10, 2018~ Dec. 25, 2018	Oct. 12, 2019	Radiation (03CH10-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1325	1GHz ~ 18GHz	Oct. 02, 2018	Dec. 10, 2018~ Dec. 25, 2018	Oct. 01, 2019	Radiation (03CH10-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz ~ 40GHz	Nov. 20, 2018	Dec. 10, 2018~ Dec. 25, 2018	Nov. 19, 2019	Radiation (03CH10-HY)
Hygrometer	TECPEL	DTM-303B	TP140320	N/A	Nov. 05, 2018	Dec. 10, 2018~ Dec. 25, 2018	Nov. 04, 2019	Radiation (03CH10-HY)
Preamplifier	Keysight	83017A	MY53270078	1GHz~26.5GHz	Oct. 28, 2018	Dec. 10, 2018~ Dec. 25, 2018	Oct. 27, 2019	Radiation (03CH10-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz ~ 44GHz	Nov. 02, 2018	Dec. 10, 2018~ Dec. 25, 2018	Nov. 01, 2019	Radiation (03CH10-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV30	103738	9kHz~30GHz	May 22, 2018	Dec. 10, 2018~ Dec. 25, 2018	May 21, 2019	Thermal (TH02-HY)
Software	Audix	E3 6.2009-8-24	RK-001042	N/A	N/A	Dec. 10, 2018~ Dec. 25, 2018	N/A	Radiation (03CH10-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Dec. 10, 2018~ Dec. 25, 2018	N/A	Radiation (03CH10-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Dec. 10, 2018~ Dec. 25, 2018	N/A	Radiation (03CH10-HY)
Turn Table	EMEC	TT 2200	N/A	0~360 Degree	N/A	Dec. 10, 2018~ Dec. 25, 2018	N/A	Radiation (03CH10-HY)
*Mixer	Rohde & Schwarz	FS-Z60	100986	40 ~ 60 GHz	Oct. 31, 2018	Dec. 10, 2018~ Dec. 25, 2018	Oct. 30, 2021	Radiation (03CH10-HY)
*Mixer	Rohde & Schwarz	FS-Z90	101811	60 ~ 90 GHz	Jul. 16, 2018	Dec. 10, 2018~ Dec. 25, 2018	Jul. 16, 2021	Radiation (03CH10-HY)
*Mixer	Rohde & Schwarz	FS-Z140	101128	90 ~ 140 GHz	Sep. 03, 2018	Dec. 10, 2018~ Dec. 25, 2018	Sep. 02, 2021	Radiation (03CH10-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 14, 2018	Dec. 10, 2018~ Dec. 25, 2018	Jun. 13, 2019	Thermal (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D3SP	TBN-930701	N/A	Jul. 19, 2018	Dec. 10, 2018~ Dec. 25, 2018	Jul. 18, 2019	Thermal (TH02-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890094	1V~20V 0.5A~5A	Oct. 02, 2018	Dec. 10, 2018~ Dec. 25, 2018	Oct. 01, 2019	Thermal (TH02-HY)
Standard Horn Antenna	Quinstar	QWH-UPRR00	923600007	40 ~ 60 GHz	Aug. 17, 2018	Dec. 10, 2018~ Dec. 25, 2018	Aug. 16, 2021	Radiation (03CH10-HY)
Standard Horn Antenna	Quinstar	QWH-EPRR00	784600034	60 ~ 90 GHz	Aug. 17, 2018	Dec. 10, 2018~ Dec. 25, 2018	Aug. 16, 2021	Radiation (03CH10-HY)
Standard Horn Antenna	Quinstar	QWH-FPRR00	923800008	90 ~ 140 GHz	Aug. 17, 2018	Dec. 10, 2018~ Dec. 25, 2018	Aug. 16, 2021	Radiation (03CH10-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Dec. 10, 2018~ Dec. 25, 2018	Nov. 22, 2019	Radiation (03CH10-HY)

Note:

(*) Equipment manufacturer's Calibration Certificate.

5 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

Uncertainty of Radiated Emission Measurement (40 GHz ~ 100 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.80

Appendix A. Test Results of EIRP and Radiated Test

EIRP Power(Average power)

NR Band n261 Module 0 Maximum Average EIRP [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
50	1	0	QPSK	24.05	23.51	23.62
50	32	0		24.18	23.66	24.07
50	1	0	16-QAM	23.12	22.29	22.02
50	32	0		23.42	22.81	22.68
50	1	0	64-QAM	21.53	21.03	20.10
50	32	0		21.27	20.91	21.28
100	1	0	QPSK	24.78	23.54	23.44
100	66	0		24.36	23.88	23.46
100	1	0	16-QAM	23.45	22.20	22.40
100	66	0		23.24	22.90	22.23
100	1	0	64-QAM	22.02	20.51	20.26
100	66	0		21.29	20.96	20.37
400	66	0	QPSK	24.16	22.98	22.62
400	66	0	16-QAM	23.02	22.01	21.91
400	66	0	64-QAM	20.44	19.77	19.07

NR Band n261 Module 1 Maximum Average EIRP [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
50	1	0	QPSK	23.18	21.92	20.16
50	32	0		22.96	21.86	20.50
50	1	0	16-QAM	22.50	21.25	19.53
50	32	0		21.75	20.87	19.27
50	1	0	64-QAM	20.20	19.00	17.29
50	32	0		19.79	18.87	17.39
100	1	0	QPSK	22.62	22.42	21.30
100	66	0		22.37	22.43	20.96
100	1	0	16-QAM	22.36	21.43	20.71
100	66	0		21.56	21.20	20.25
100	1	0	64-QAM	19.97	18.97	18.44
100	66	0		19.46	19.18	18.26
400	66	0	QPSK	20.92	20.34	20.21
400	66	0	16-QAM	19.96	19.29	19.25
400	66	0	64-QAM	17.64	16.87	16.87

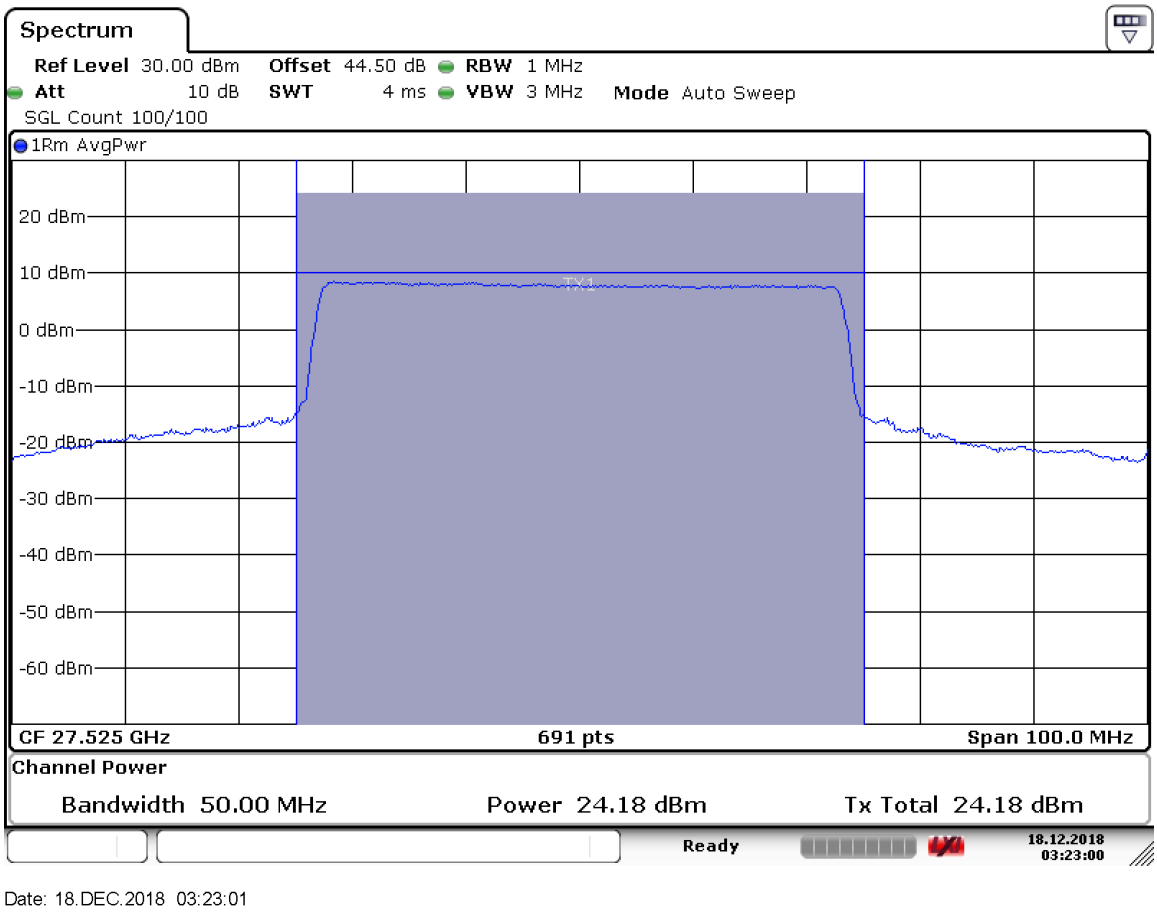
NR Band n261 Module 2 Maximum Average EIRP [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
50	1	0	QPSK	20.17	19.31	16.20
50	32	0		20.06	19.13	16.37
50	1	0	16-QAM	19.90	18.73	15.73
50	32	0		19.37	18.17	15.33
50	1	0	64-QAM	17.79	16.43	13.48
50	32	0		17.71	16.22	13.58
100	1	0	QPSK	**20.34**	19.09	16.54
100	66	0		19.90	19.03	16.46
100	1	0	16-QAM	19.79	18.71	15.92
100	66	0		19.10	17.93	15.52
100	1	0	64-QAM	17.58	16.41	13.67
100	66	0		17.10	16.12	13.56
400	66	0	QPSK	**21.31**	19.35	18.63
400	66	0	16-QAM	19.98	18.40	17.56
400	66	0	64-QAM	19.87	15.84	15.27

NR Band n261 Module 3 Maximum Average EIRP [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
50	1	0	QPSK	22.55	21.41	18.59
50	32	0		22.63	21.09	18.09
50	1	0	16-QAM	22.01	20.92	17.98
50	32	0		21.72	20.08	16.99
50	1	0	64-QAM	19.92	18.65	15.72
50	32	0		19.89	18.25	15.06
100	1	0	QPSK	21.79	19.72	17.16
100	66	0		21.76	20.19	17.65
100	1	0	16-QAM	21.25	19.09	16.66
100	66	0		20.83	19.06	16.75
100	1	0	64-QAM	19.11	16.80	14.24
100	66	0		18.94	17.12	14.84
400	66	0	QPSK	23.14	21.69	20.16
400	66	0	16-QAM	22.11	20.66	19.43
400	66	0	64-QAM	18.99	18.00	17.69

NR Band n261

EIRP Worst Case Plot

Lowest Channel / 50MHz / QPSK / 32RB0 (Module 0)



Offset = Antenna Factor (dB/m) + Cable Loss (dB) + 107 + 20log (D) – 104.8

= 40.1 + 2.2 + 107 + 20log(1) – 104.8

= 44.5 (dB)

NR Band n261

Occupied Bandwidth

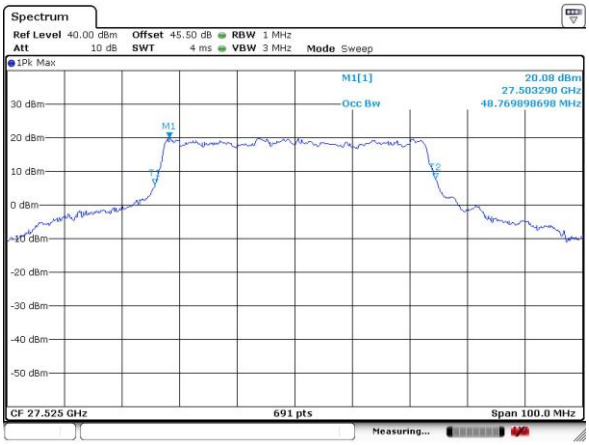
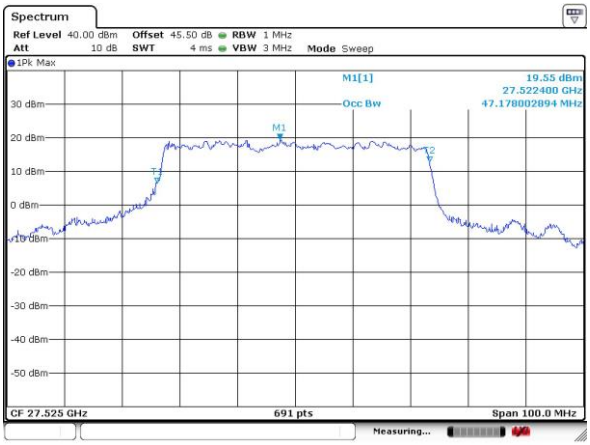
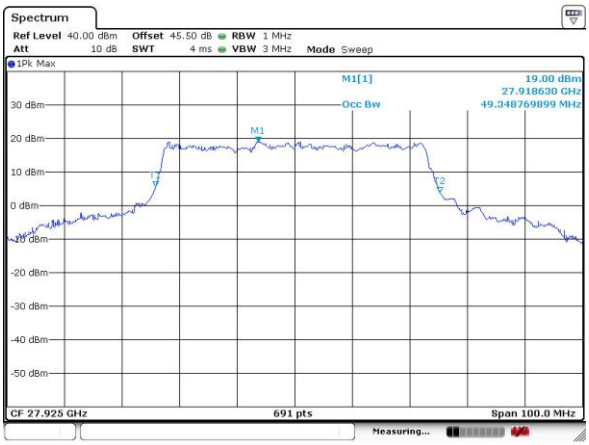
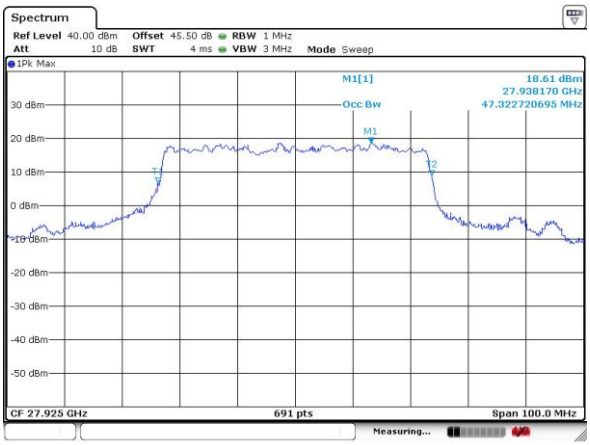
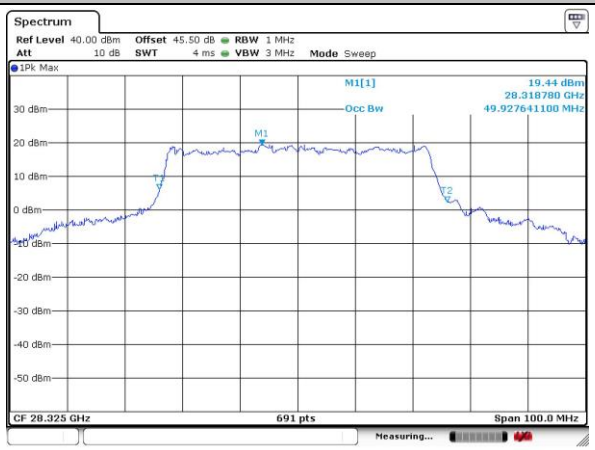
Mode	Module 0 NR Band n261 : 99%OBW(MHz)								
BW	50MHz			100MHz			400MHz		
Mod.	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Lowest CH	48.77	47.18	47.76	94.64	94.36	94.36	417.95	398.26	394.79
Middle CH	49.34	49.32	48.05	94.64	94.64	94.93	405.21	400.58	399.42
Highest CH	49.93	47.32	48.19	94.64	94.35	94.35	496.67	439.94	394.79

Mode	Module 1 NR Band n261 : 99%OBW(MHz)								
BW	50MHz			100MHz			400MHz		
Mod.	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Lowest CH	48.77	47.18	48.05	94.93	94.64	94.64	395.95	393.63	394.79
Middle CH	47.32	47.03	49.93	94.64	94.36	94.36	399.42	398.26	398.26
Highest CH	49.78	47.76	49.20	94.64	94.36	94.64	394.79	393.63	393.63

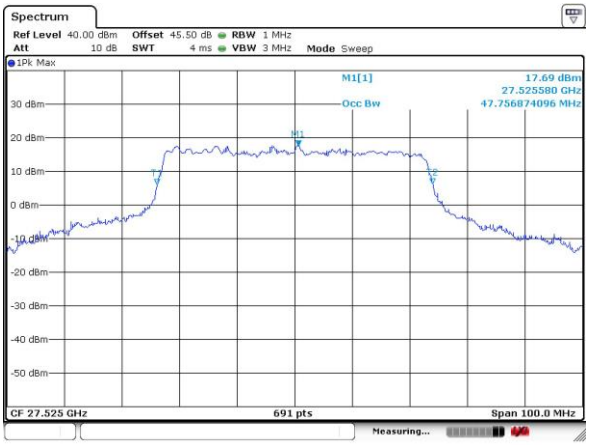
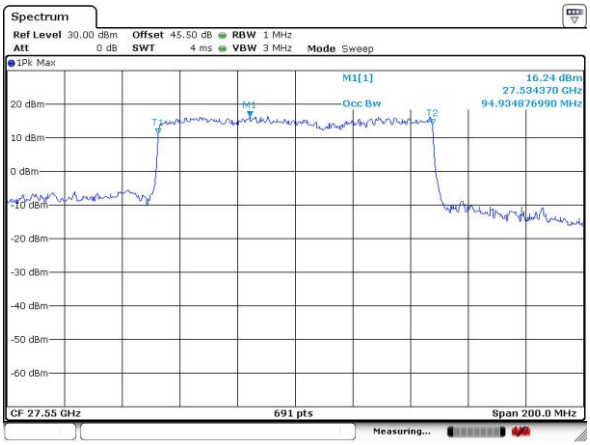
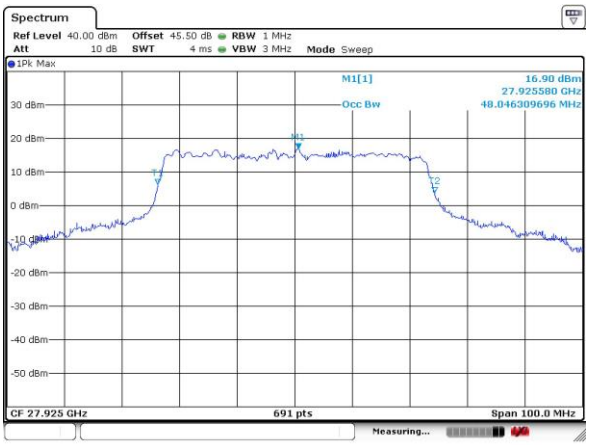
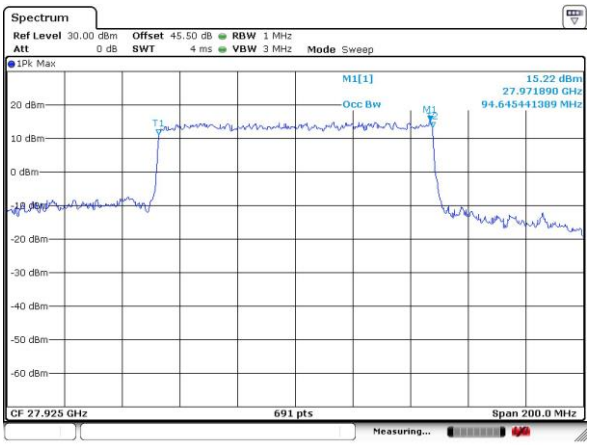
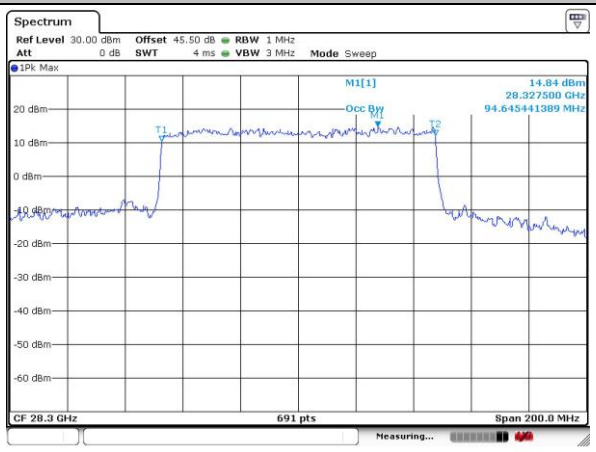
Mode	Module 2 NR Band n261 : 99%OBW(MHz)								
BW	50MHz			100MHz			400MHz		
Mod.	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Lowest CH	48.63	47.03	47.90	94.35	94.35	94.35	395.95	393.63	394.79
Middle CH	47.90	47.03	48.48	94.35	94.35	94.35	398.26	397.11	399.42
Highest CH	49.78	48.19	49.35	94.64	94.35	94.64	394.79	392.47	394.79

Mode	Module 3 NR Band n261 : 99%OBW(MHz)								
BW	50MHz			100MHz			400MHz		
Mod.	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Lowest CH	48.63	46.89	47.76	94.64	94.64	94.93	397.11	394.79	394.79
Middle CH	48.77	46.89	48.19	94.64	94.35	94.35	399.42	398.26	399.42
Highest CH	49.78	47.76	49.06	94.64	94.35	94.35	393.63	392.47	392.74

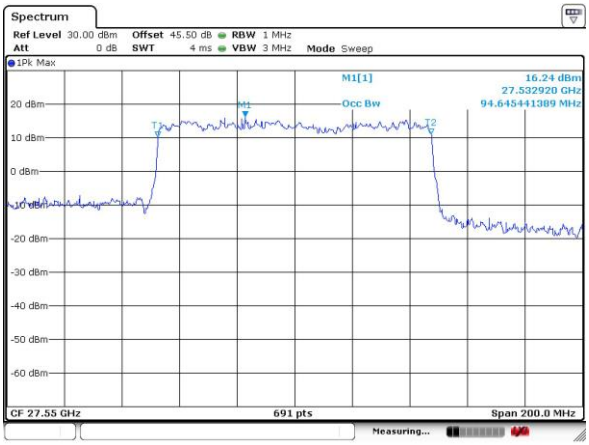
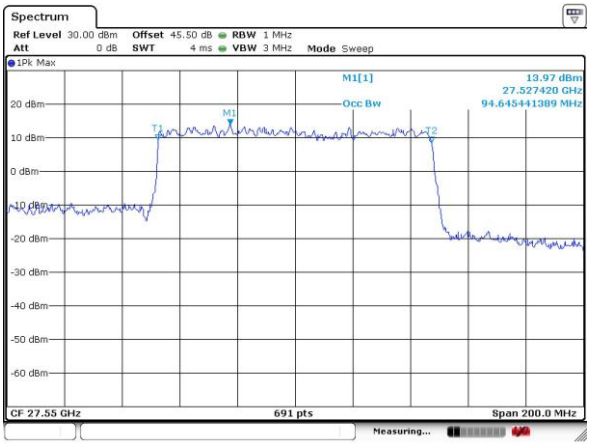
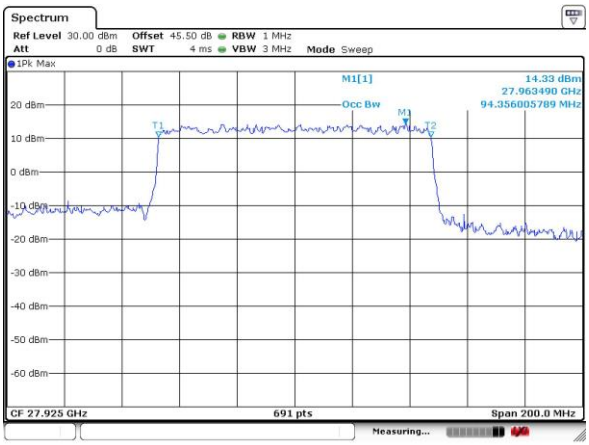
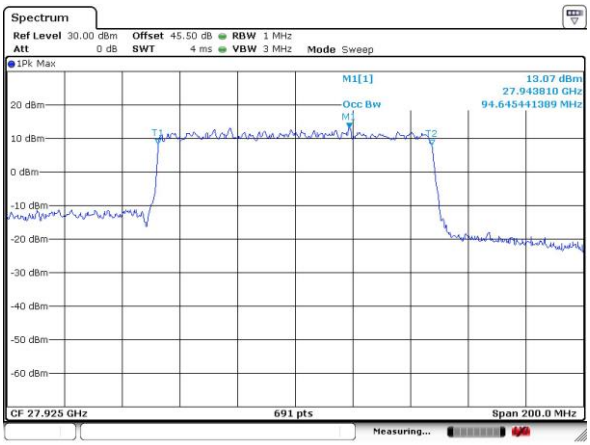
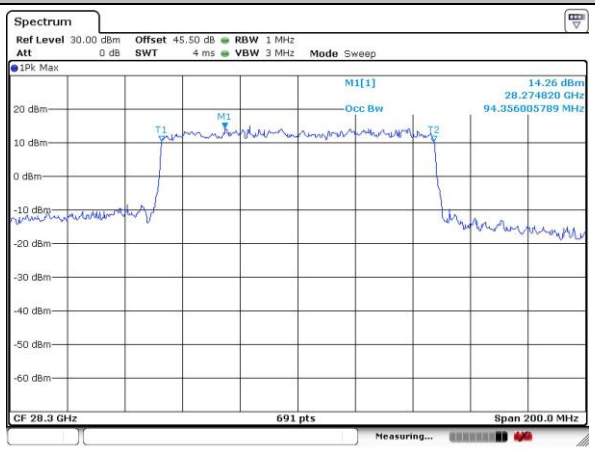
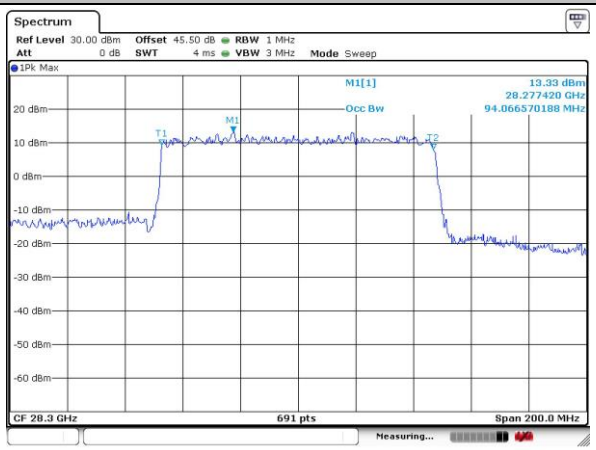
Module 0

NR Band n261	
Lowest Channel / 50MHz / QPSK	Lowest Channel / 50MHz / 16QAM
	
Middle Channel / 50MHz / QPSK	Middle Channel / 50MHz / 16QAM
	
Highest Channel / 50MHz / QPSK	Highest Channel / 50MHz / 16QAM
	

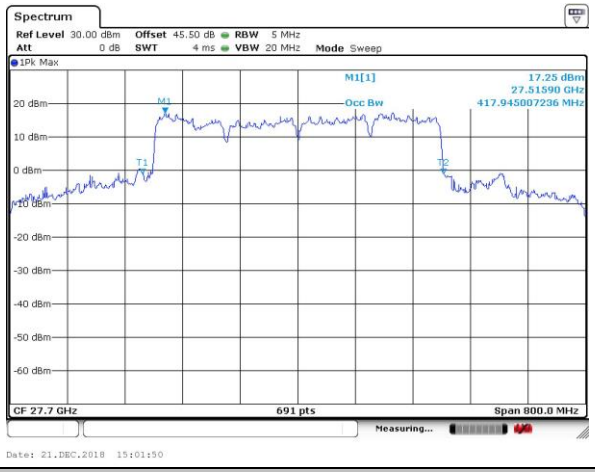
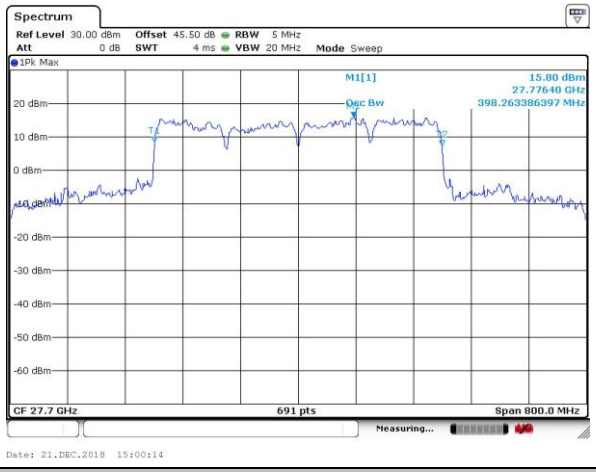
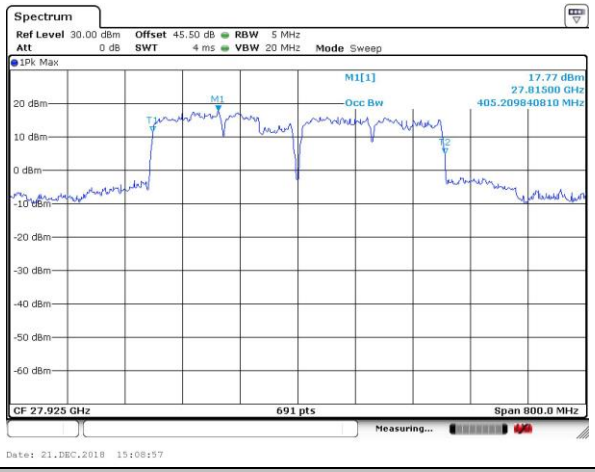
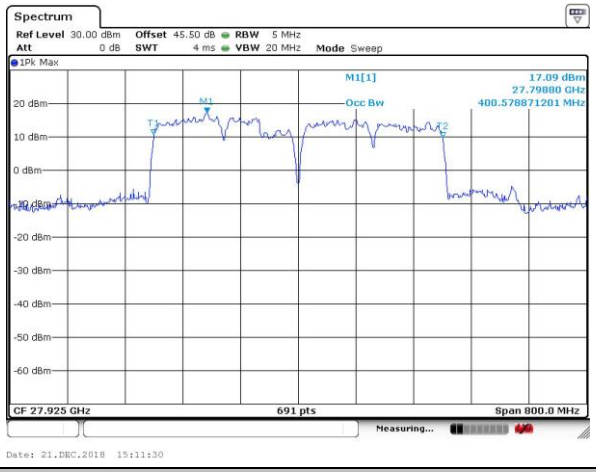
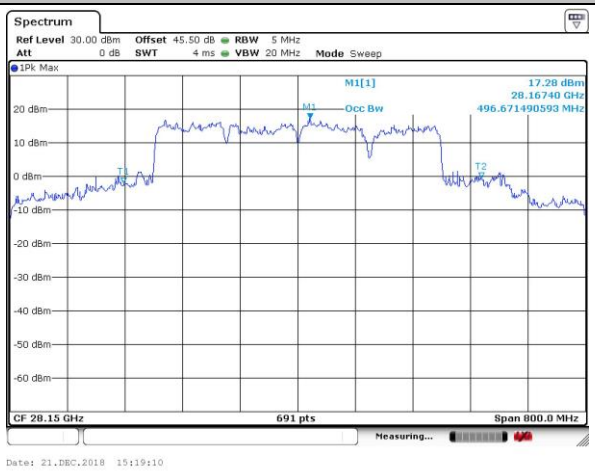
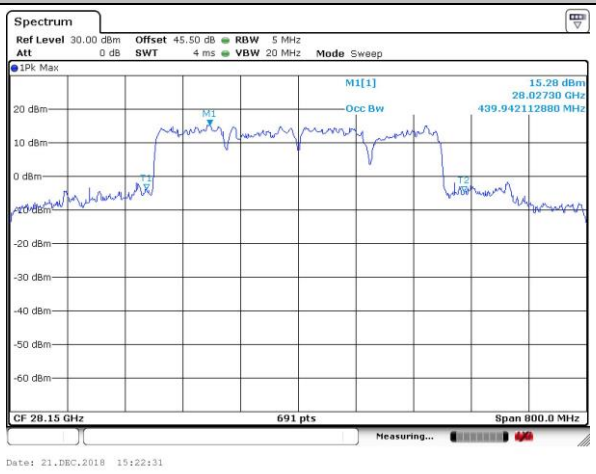
Module 0

NR Band n261	
Lowest Channel / 50MHz / 64QAM	Lowest Channel / 100MHz / QPSK
	
Middle Channel / 50MHz / 64QAM	Middle Channel / 100MHz / QPSK
	
Highest Channel / 50MHz / 64QAM	Highest Channel / 100MHz / QPSK
	

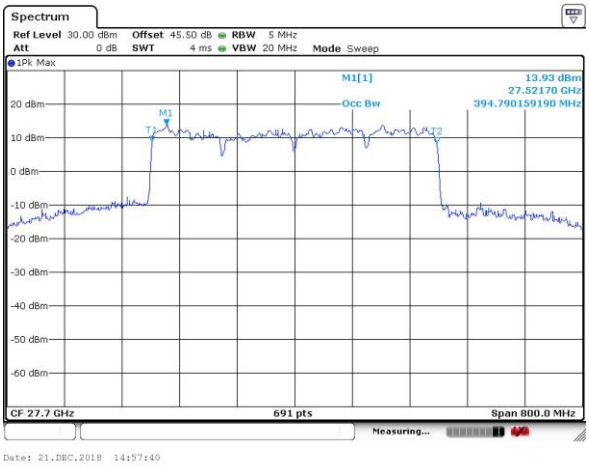
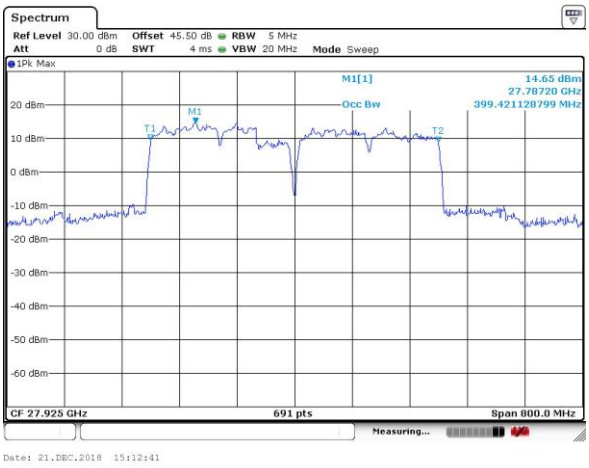
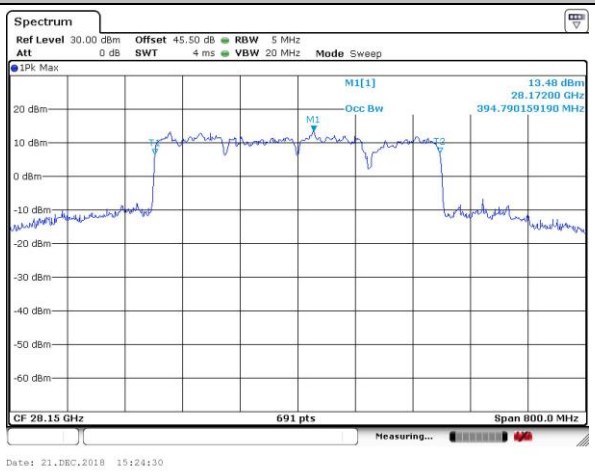
Module 0

NR Band n261	
Lowest Channel / 100MHz / 16QAM	**Lowest Channel / 100MHz / 64QAM**
	
Middle Channel / 100MHz / 16QAM	**Middle Channel / 100MHz / 64QAM**
	
Highest Channel / 100MHz / 16QAM	**Highest Channel / 100MHz / 64QAM**
	

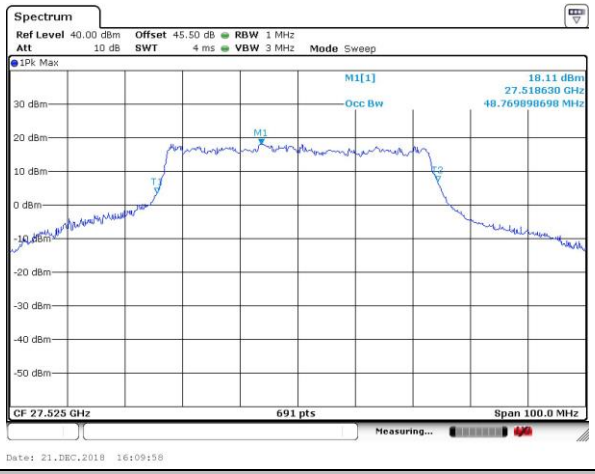
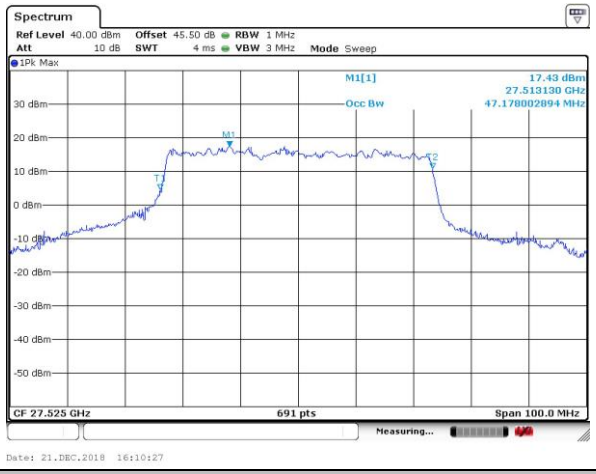
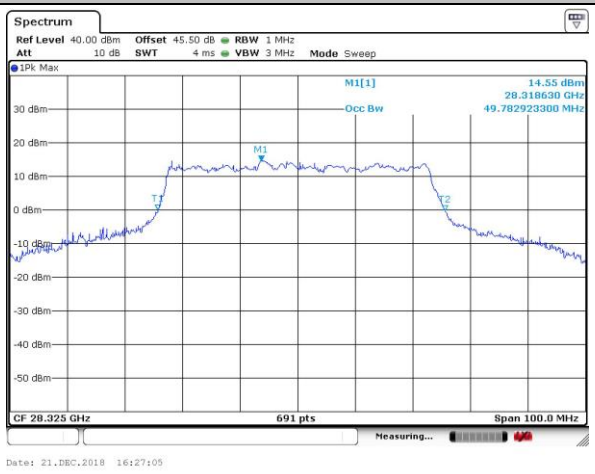
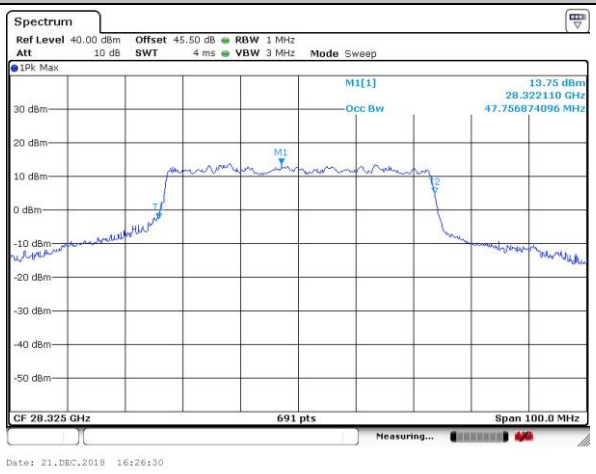
Module 0

NR Band n261	
Lowest Channel / 400MHz / QPSK	Lowest Channel / 400MHz / 16QAM
	
Middle Channel / 400MHz / QPSK	Middle Channel / 400MHz /16QAM
	
Highest Channel / 400MHz / QPSK	Highest Channel / 400MHz /16QAM
	

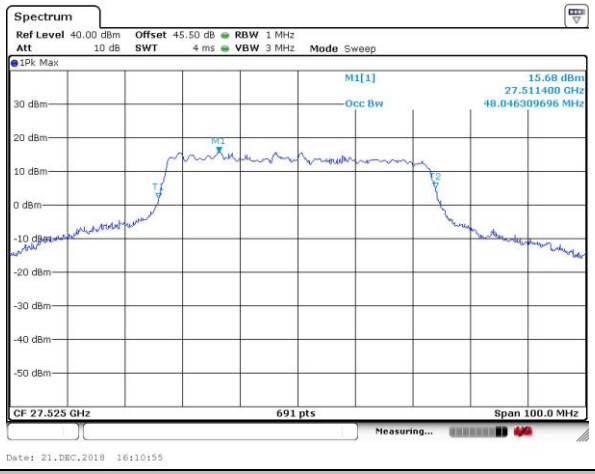
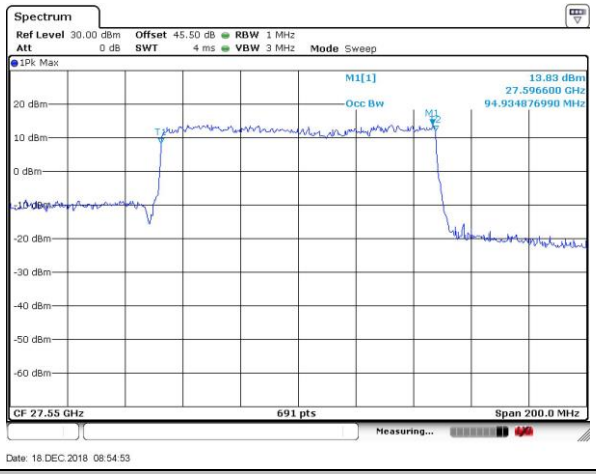
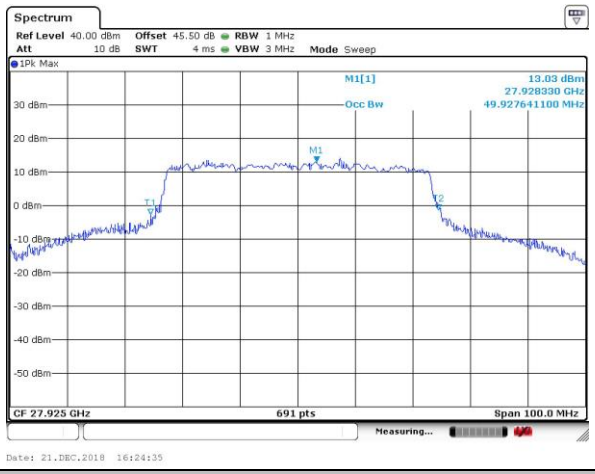
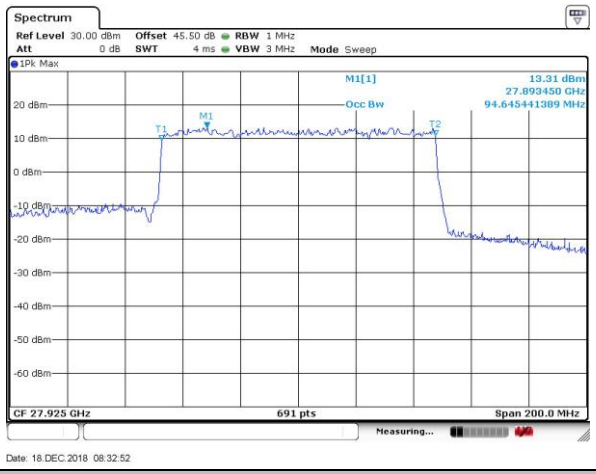
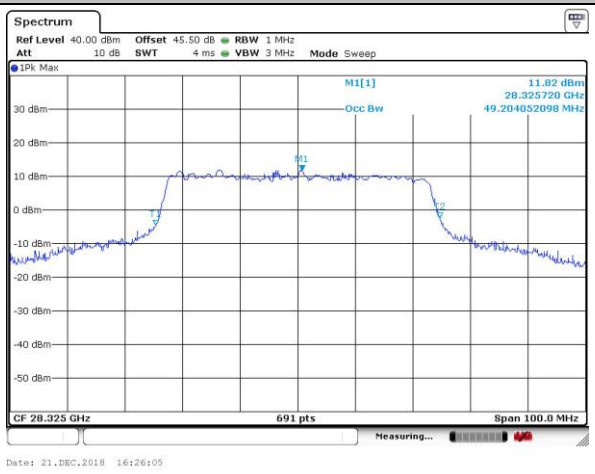
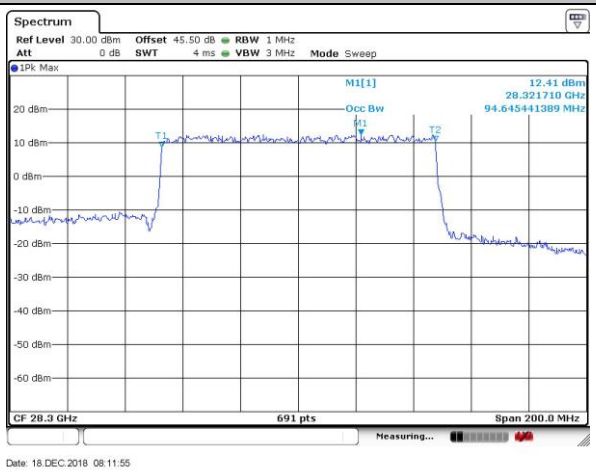
Module 0

NR Band n261	
Lowest Channel / 400MHz / 64QAM	
	intentionally blank
Middle Channel / 400MHz / 64QAM	
	intentionally blank
Highest Channel / 400MHz / 64QAM	
	intentionally blank

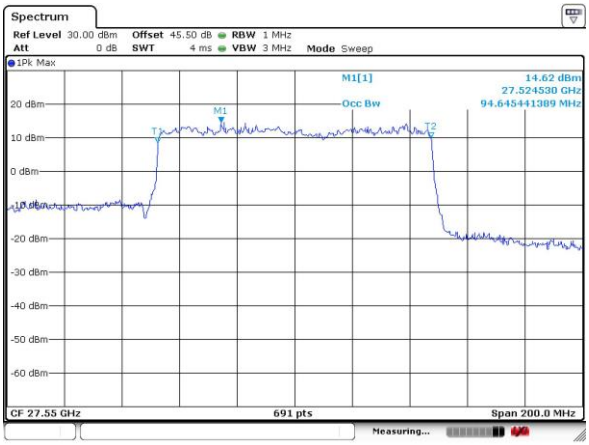
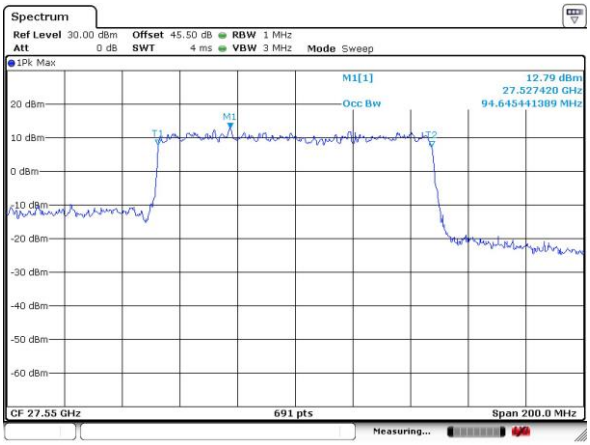
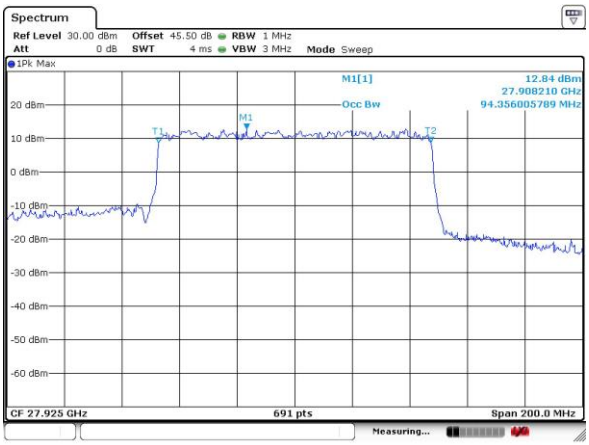
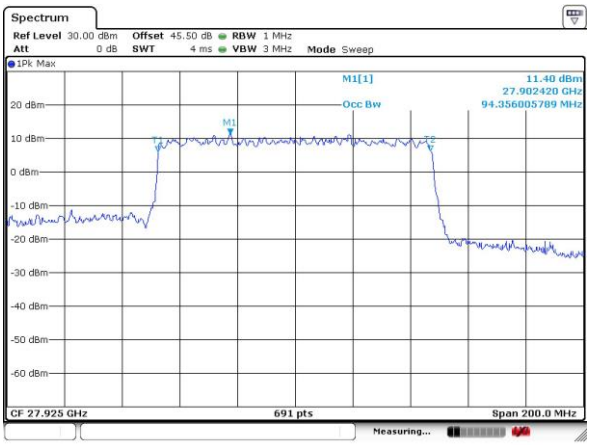
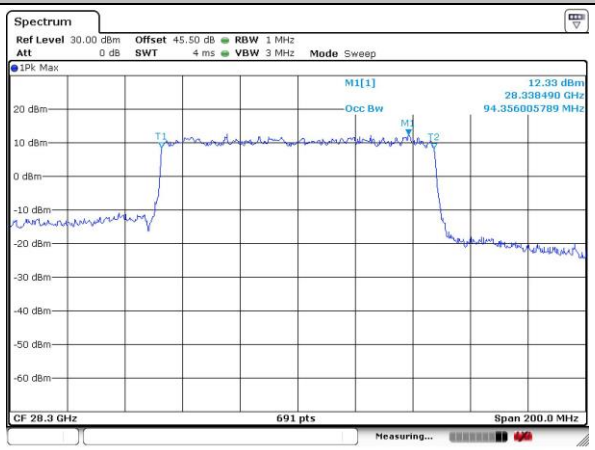
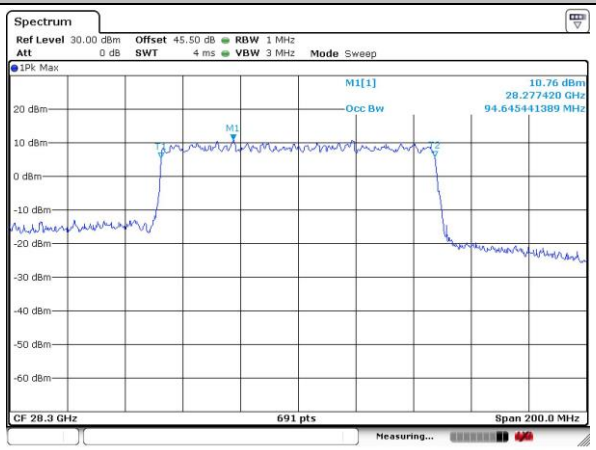
Module 1

NR Band n261	
Lowest Channel / 50MHz / QPSK	Lowest Channel / 50MHz / 16QAM
	
Middle Channel / 50MHz / QPSK	Middle Channel / 50MHz / 16QAM
Highest Channel / 50MHz / QPSK	Highest Channel / 50MHz / 16QAM
	

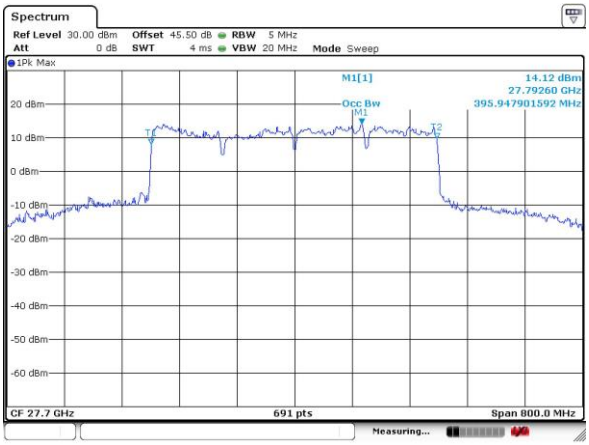
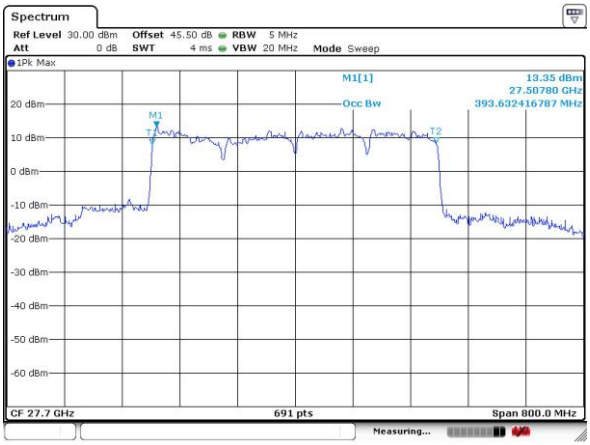
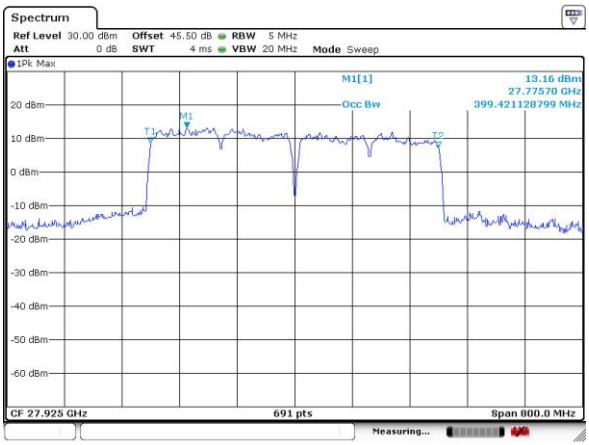
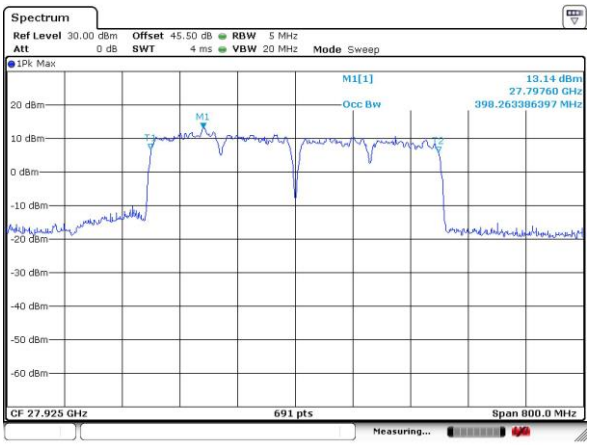
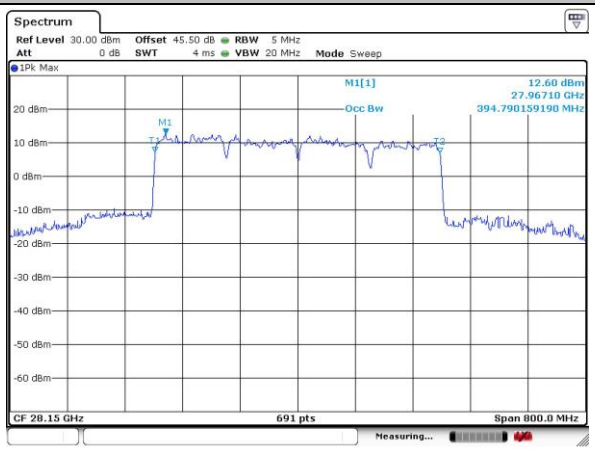
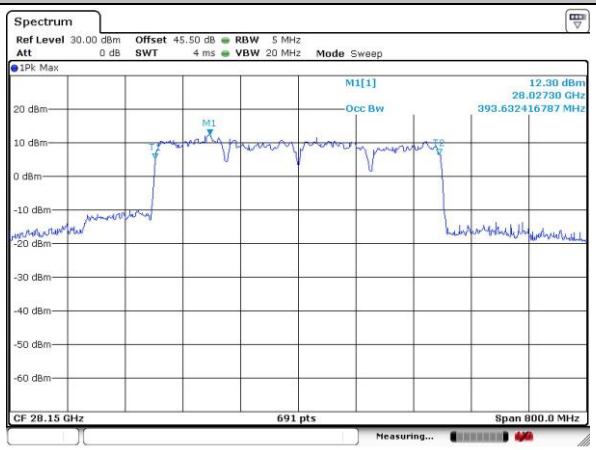
Module 1

NR Band n261	
Lowest Channel / 50MHz / 64QAM	Lowest Channel / 100MHz / QPSK
	
Middle Channel / 50MHz / 64QAM	Middle Channel / 100MHz / QPSK
	
Highest Channel / 50MHz / 64QAM	Highest Channel / 100MHz / QPSK
	

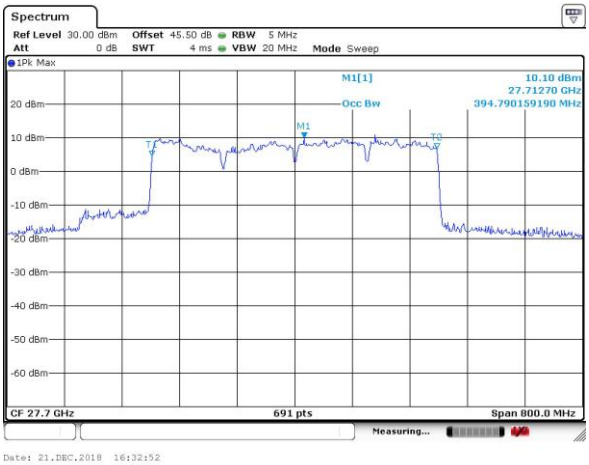
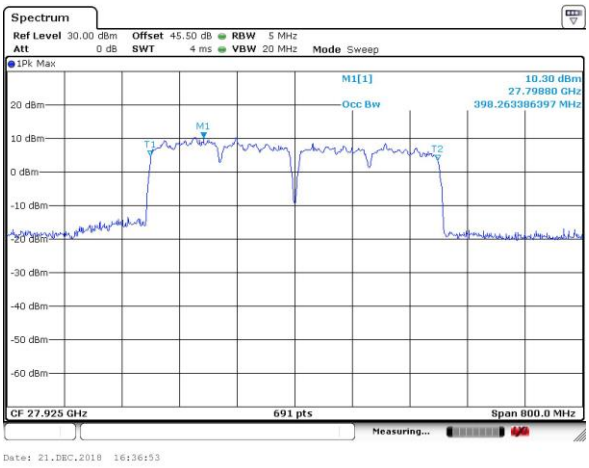
Module 1

NR Band n261	
Lowest Channel / 100MHz / 16QAM	**Lowest Channel / 100MHz / 64QAM**
	
Middle Channel / 100MHz / 16QAM	**Middle Channel / 100MHz / 64QAM**
	
Highest Channel / 100MHz / 16QAM	**Highest Channel / 100MHz / 64QAM**
	

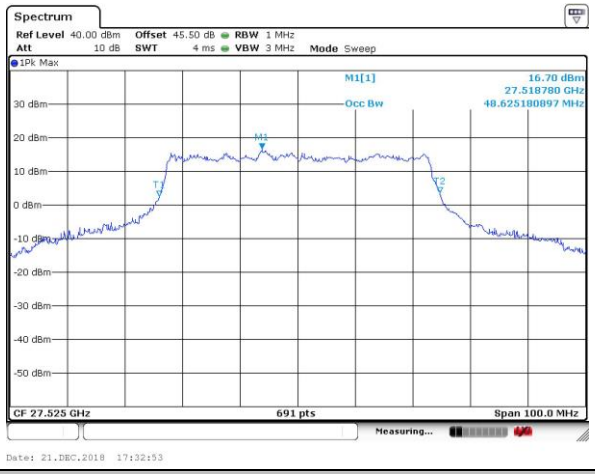
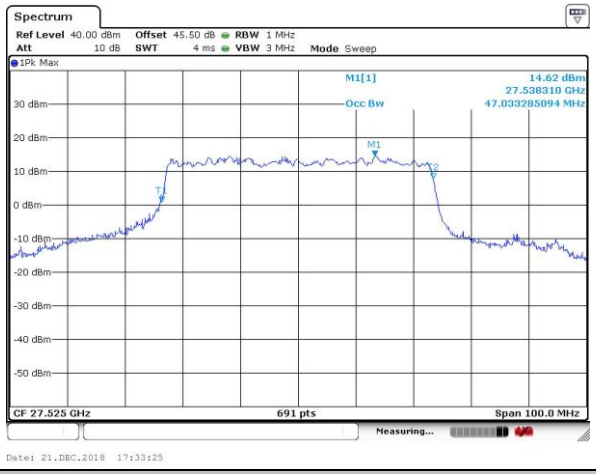
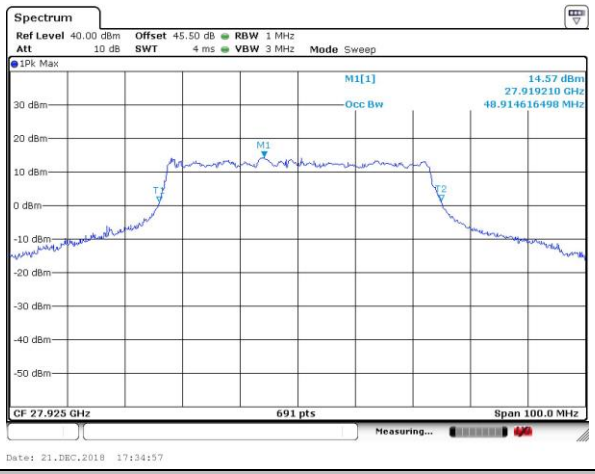
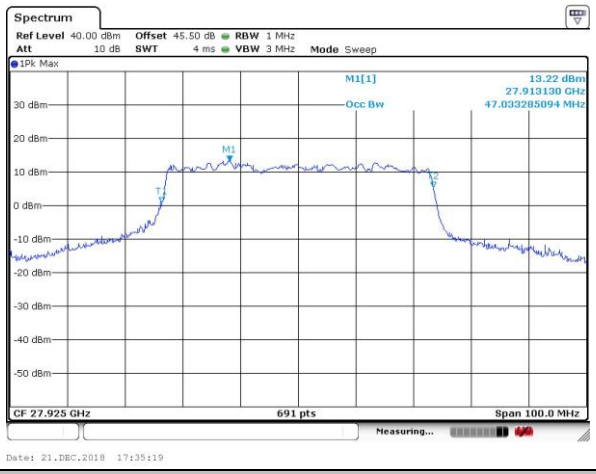
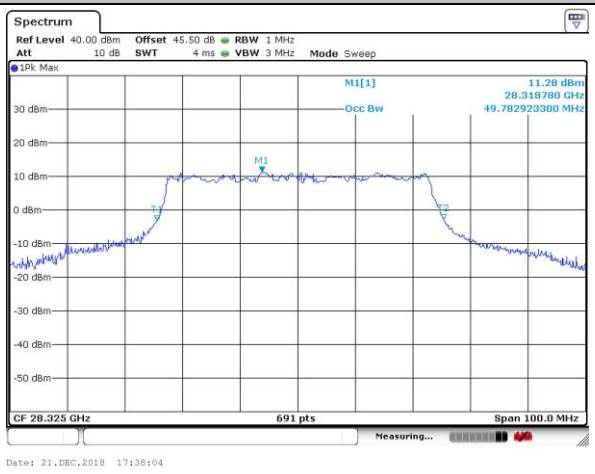
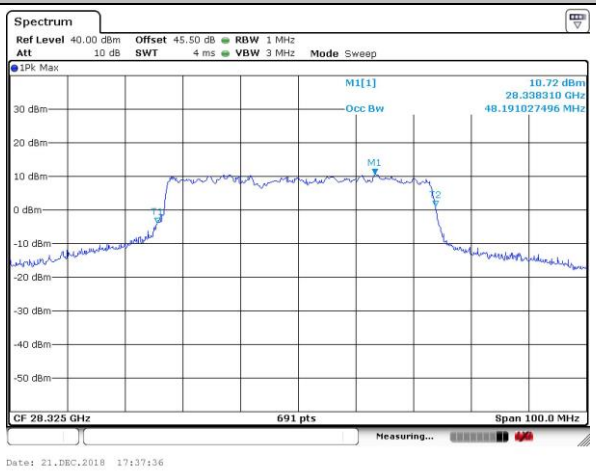
Module 1

NR Band n261	
Lowest Channel / 400MHz / QPSK	**Lowest Channel / 400MHz / 16QAM**
	
Middle Channel / 400MHz / QPSK	**Middle Channel / 400MHz /16QAM**
	
Highest Channel / 400MHz / QPSK	**Highest Channel / 400MHz /16QAM**
	

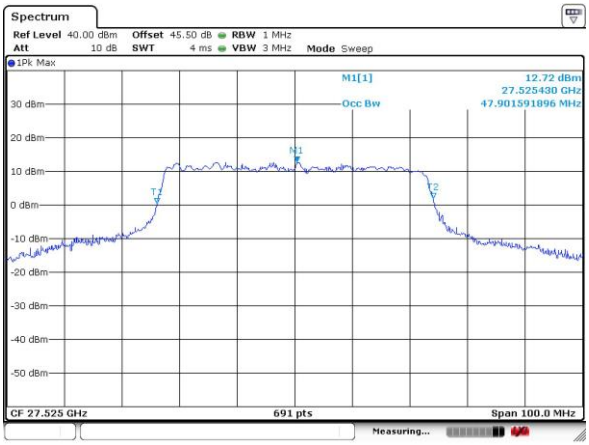
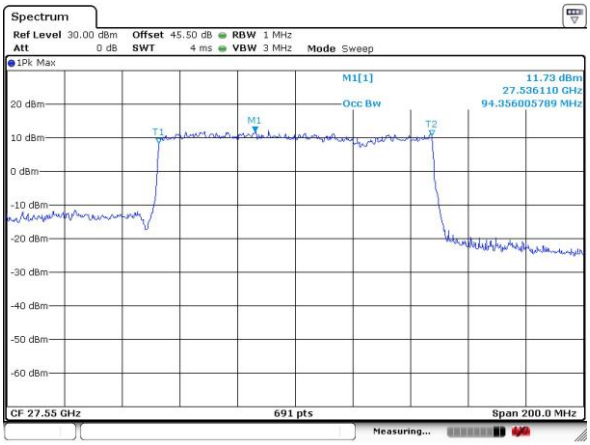
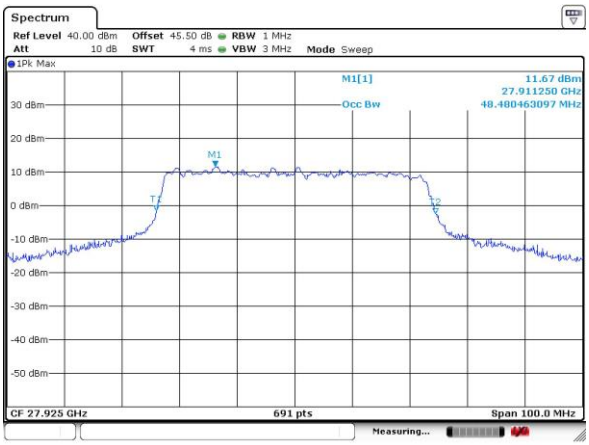
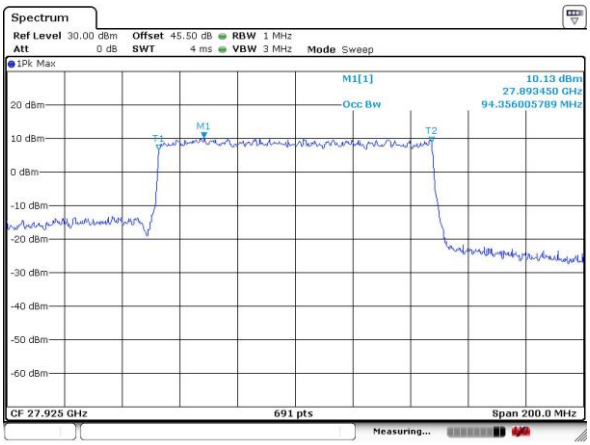
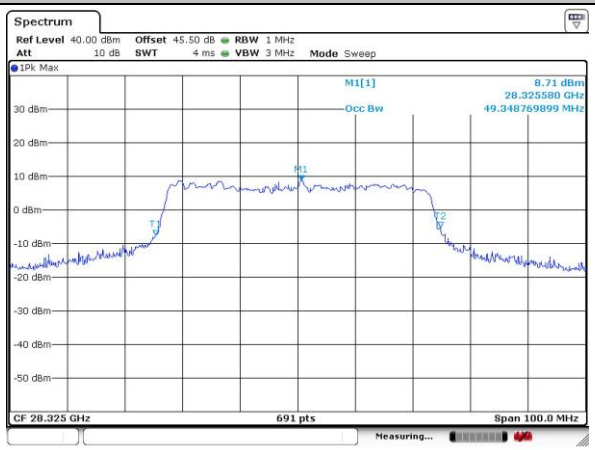
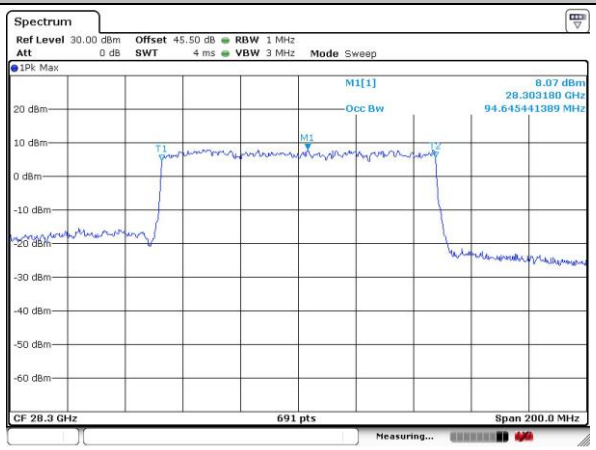
Module 1

NR Band n261	
Lowest Channel / 400MHz / 64QAM	
	**intentionally blank**
Middle Channel / 400MHz / 64QAM	
	**intentionally blank**
Highest Channel / 400MHz / 64QAM	
	intentionally blank

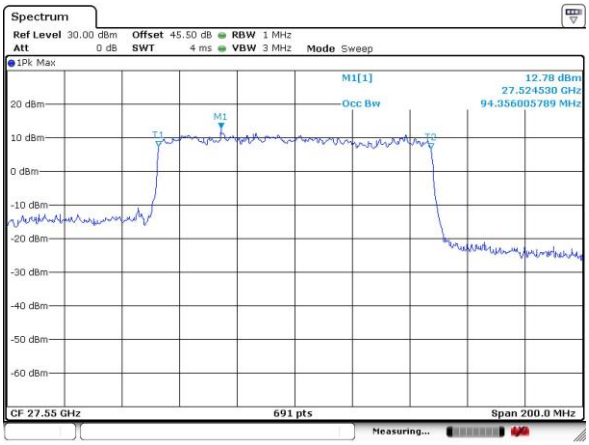
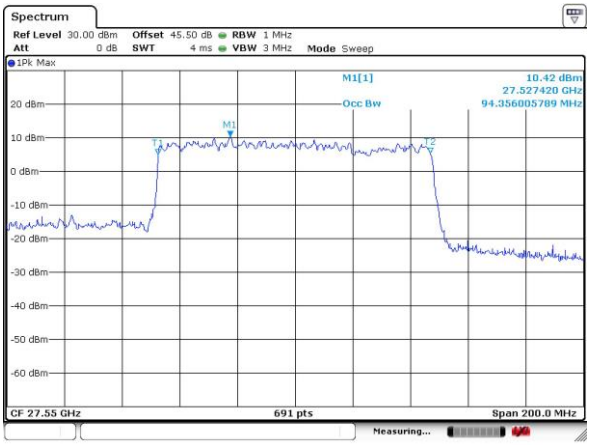
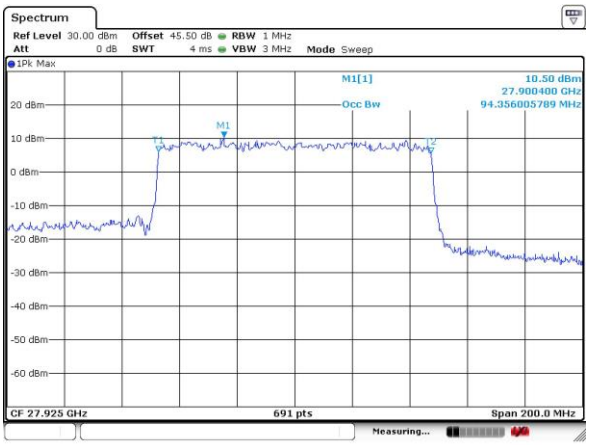
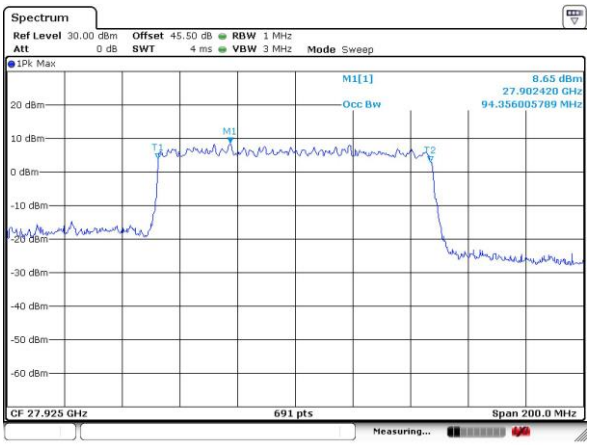
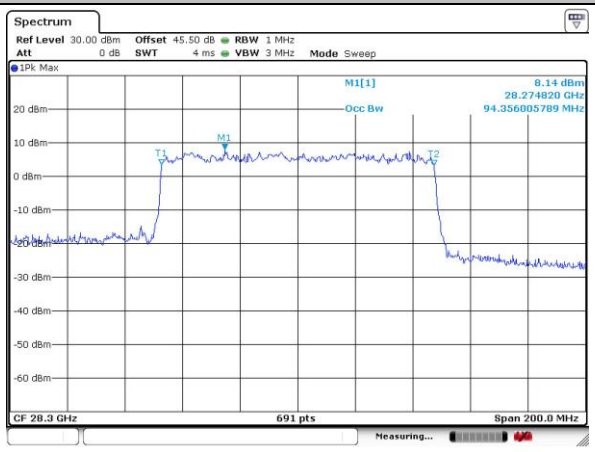
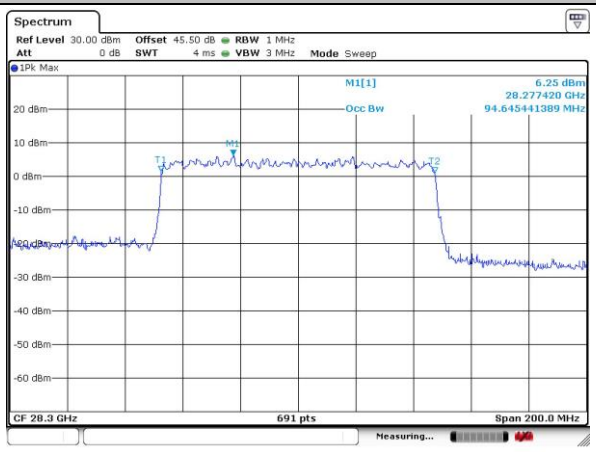
Module 2

NR Band n261	
Lowest Channel / 50MHz / QPSK	Lowest Channel / 50MHz / 16QAM
	
Middle Channel / 50MHz / QPSK	Middle Channel / 50MHz / 16QAM
	
Highest Channel / 50MHz / QPSK	Highest Channel / 50MHz / 16QAM
	

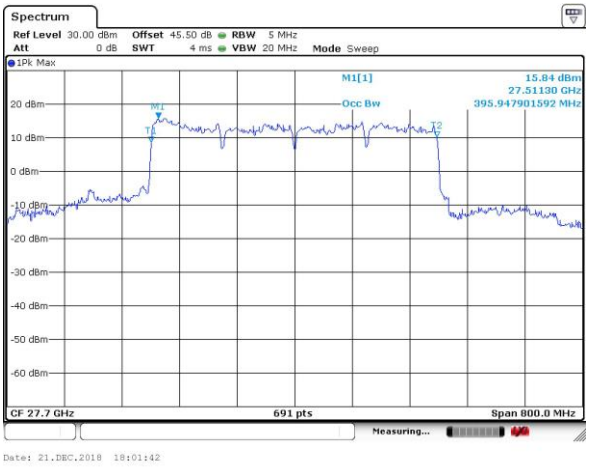
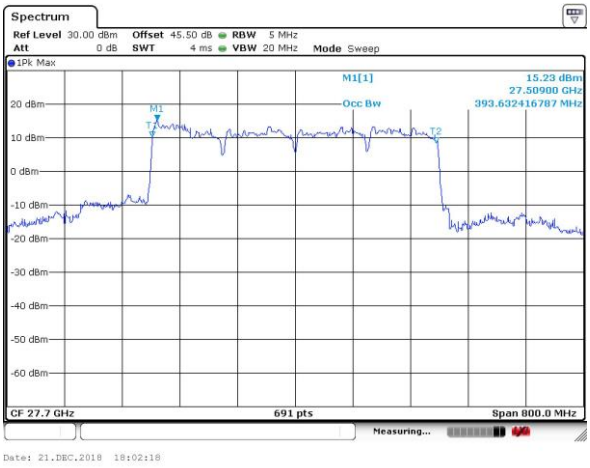
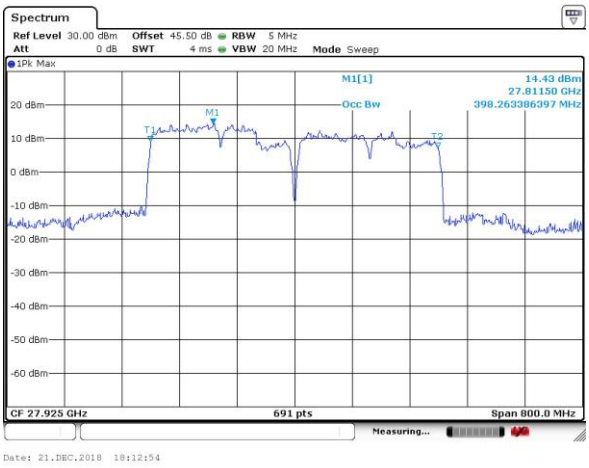
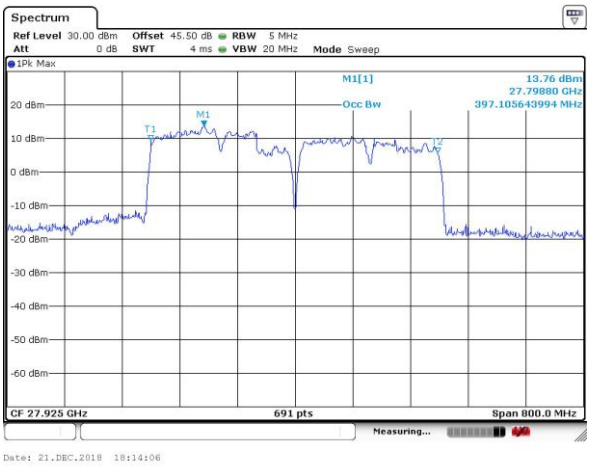
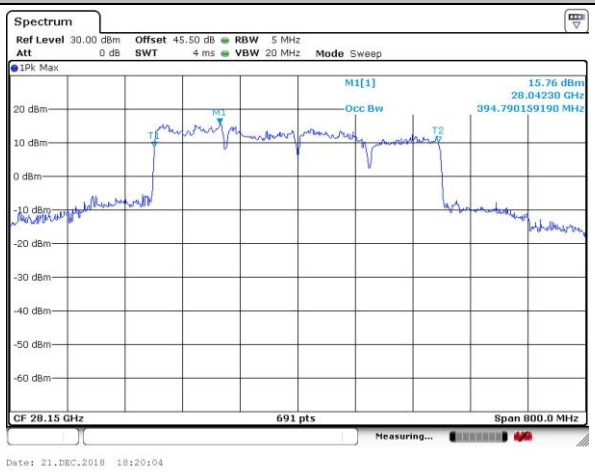
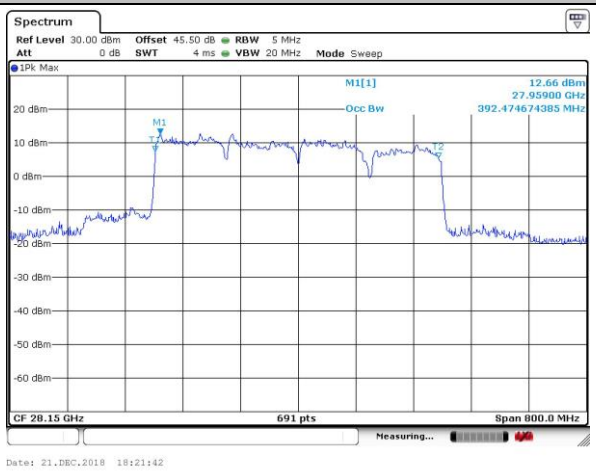
Module 2

NR Band n261	
Lowest Channel / 50MHz / 64QAM	Lowest Channel / 100MHz / QPSK
	
Middle Channel / 50MHz / 64QAM	Middle Channel / 100MHz / QPSK
	
Highest Channel / 50MHz / 64QAM	Highest Channel / 100MHz / QPSK
	

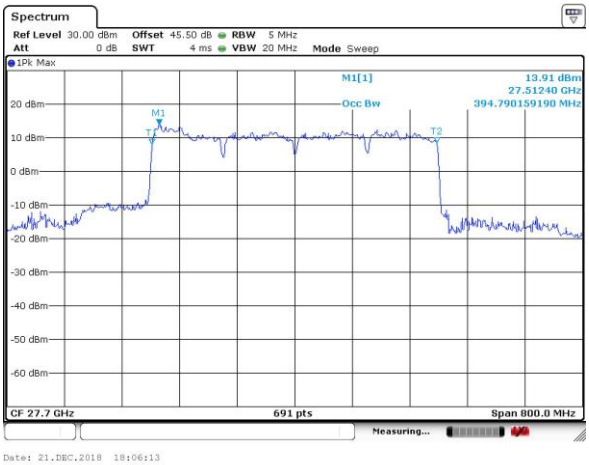
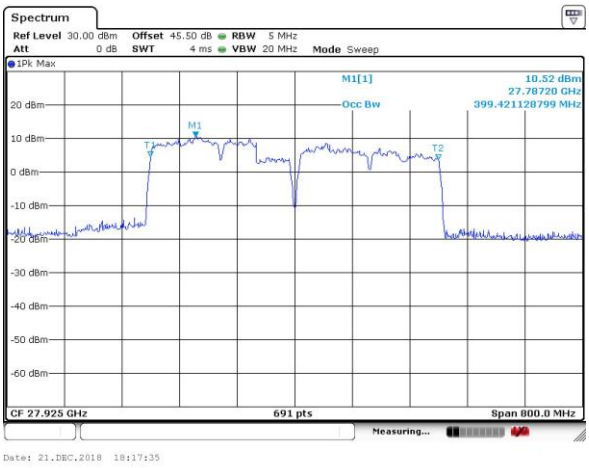
Module 2

NR Band n261	
Lowest Channel / 100MHz / 16QAM	**Lowest Channel / 100MHz / 64QAM**
	
Middle Channel / 100MHz / 16QAM	**Middle Channel / 100MHz / 64QAM**
	
Highest Channel / 100MHz / 16QAM	**Highest Channel / 100MHz / 64QAM**
	

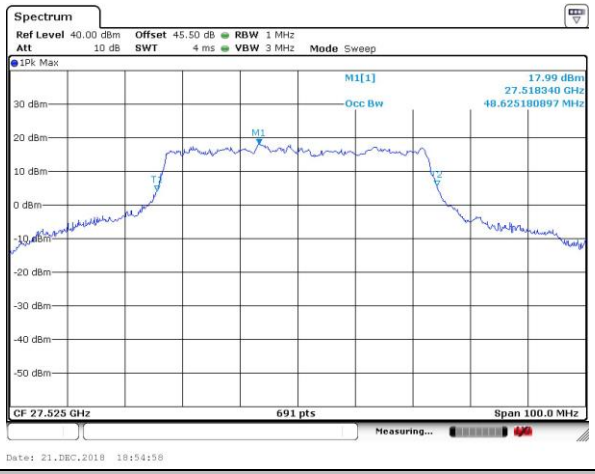
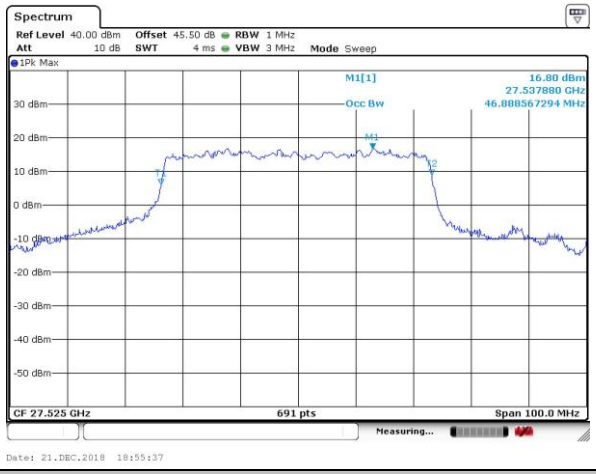
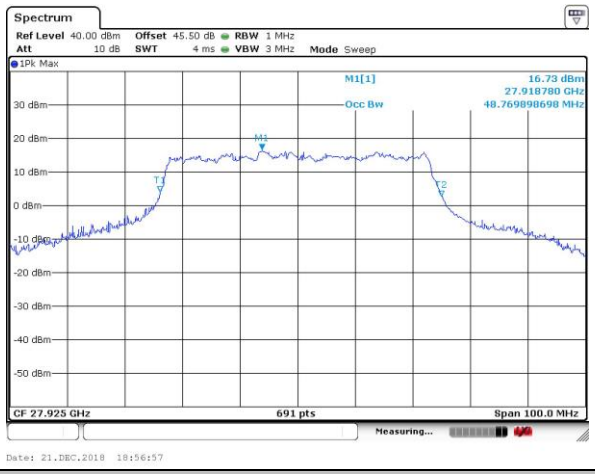
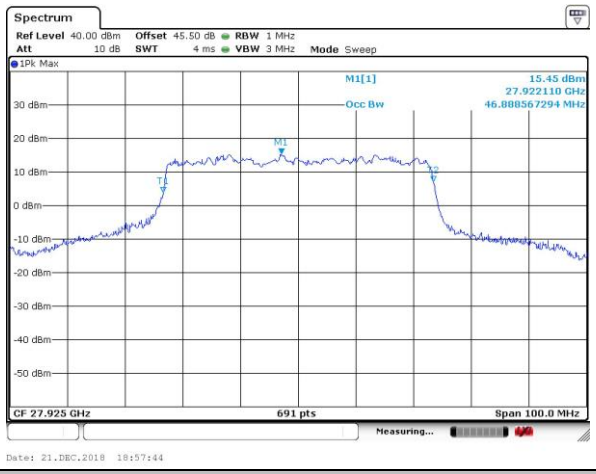
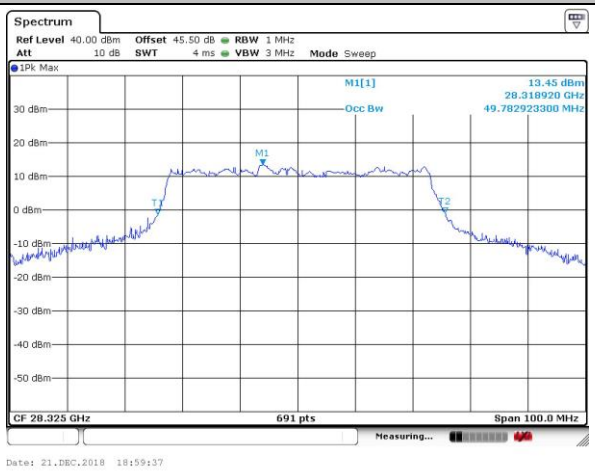
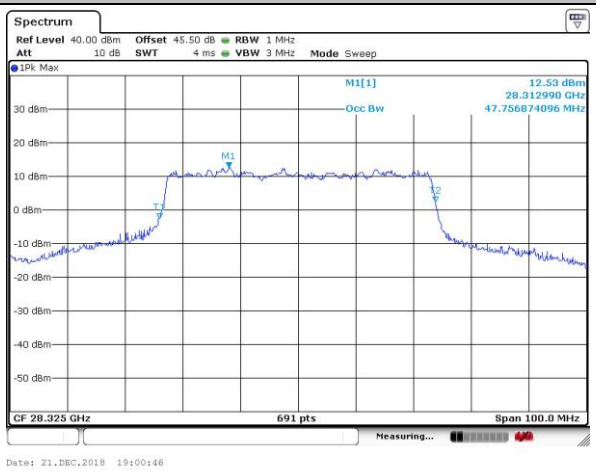
Module 2

NR Band n261	
Lowest Channel / 400MHz / QPSK	Lowest Channel / 400MHz / 16QAM
	
Middle Channel / 400MHz / QPSK	Middle Channel / 400MHz /16QAM
	
Highest Channel / 400MHz / QPSK	Highest Channel / 400MHz /16QAM
	

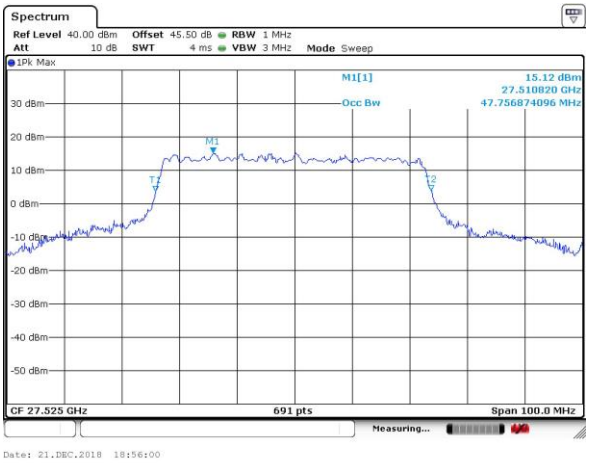
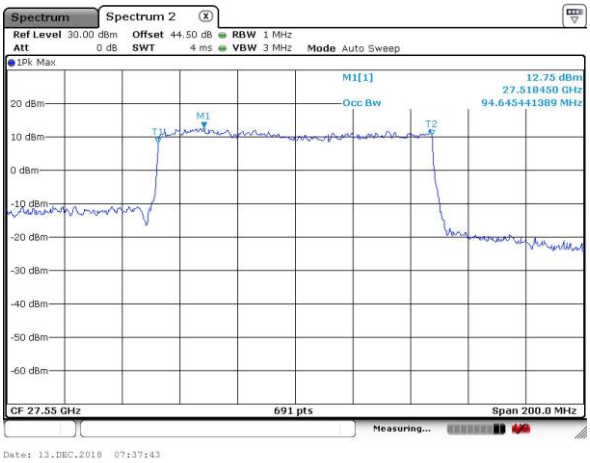
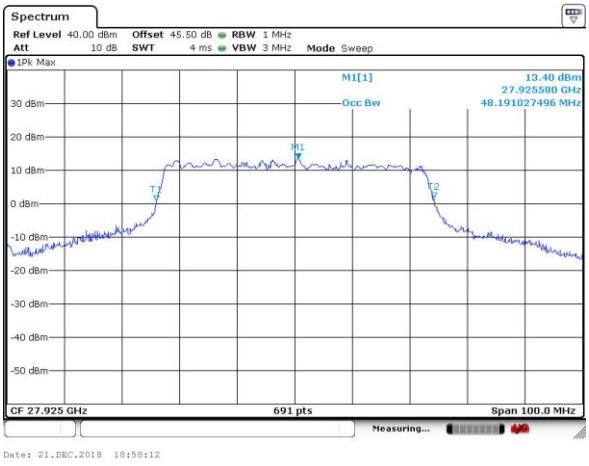
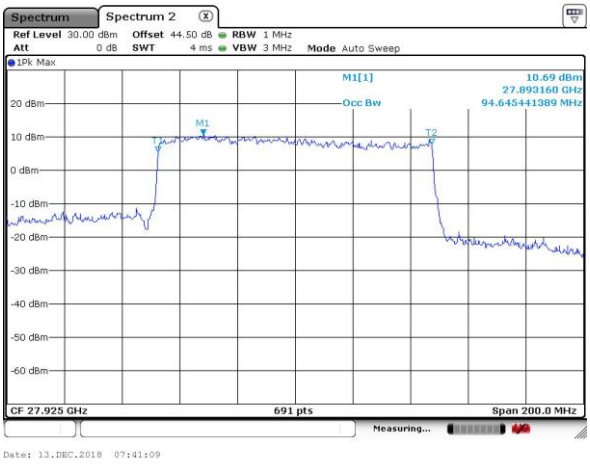
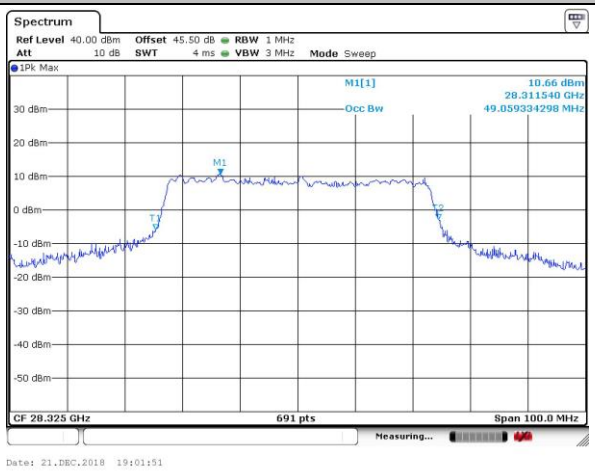
Module 2

NR Band n261	
Lowest Channel / 400MHz / 64QAM	
	
Middle Channel / 400MHz / 64QAM	
	
Highest Channel / 400MHz / 64QAM	

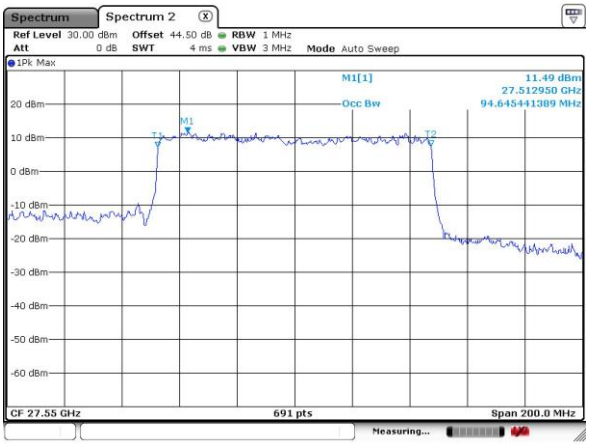
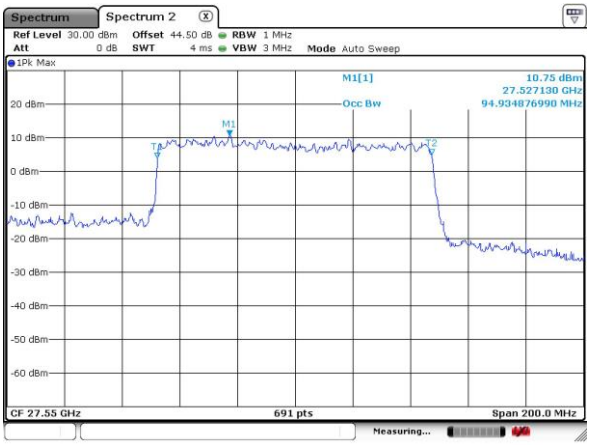
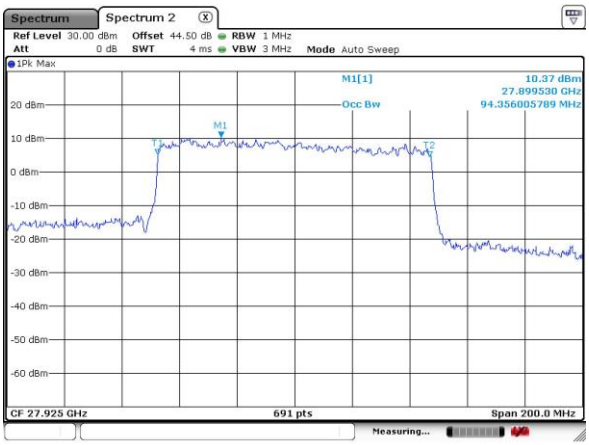
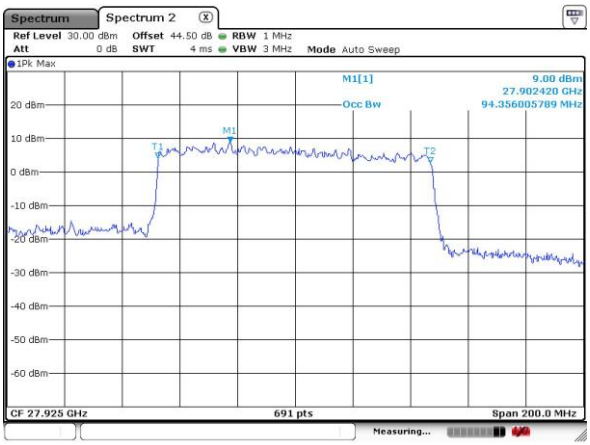
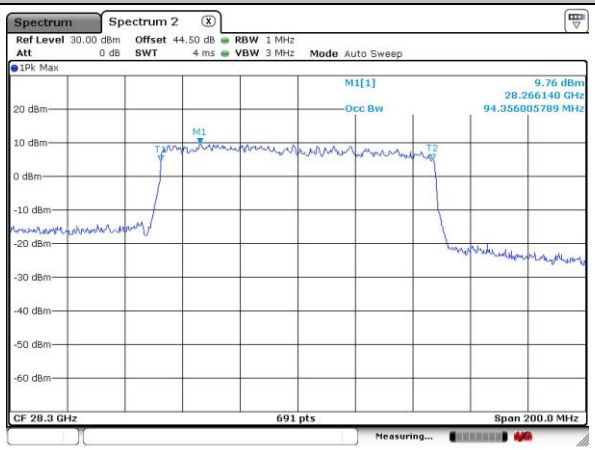
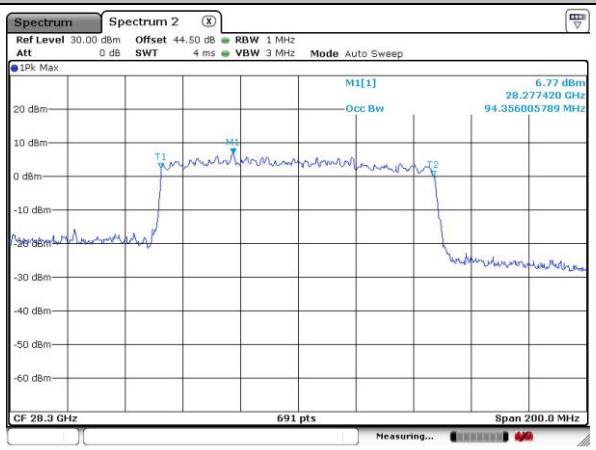
Module 3

NR Band n261	
Lowest Channel / 50MHz / QPSK	Lowest Channel / 50MHz / 16QAM
	
Middle Channel / 50MHz / QPSK	Middle Channel / 50MHz / 16QAM
	
Highest Channel / 50MHz / QPSK	Highest Channel / 50MHz / 16QAM
	

Module 3

NR Band n261	
Lowest Channel / 50MHz / 64QAM	Lowest Channel / 100MHz / QPSK
	
Middle Channel / 50MHz / 64QAM	Middle Channel / 100MHz / QPSK
	
Highest Channel / 50MHz / 64QAM	Highest Channel / 100MHz / QPSK
	

Module 3

NR Band n261	
Lowest Channel / 100MHz / 16QAM	Lowest Channel / 100MHz / 64QAM
	
Middle Channel / 100MHz / 16QAM	Middle Channel / 100MHz / 64QAM
	
Highest Channel / 100MHz / 16QAM	Highest Channel / 100MHz / 64QAM