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 Jan. 6, 2018 and testing was started from Jan. 08, 2018 and completed on Jan. 22, 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 variant 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.)

Table of Contents

History of this test report **3**

Summary of Test Result **4**

1 General Description **5**

1.1 Feature of Equipment Under Test 5
1.2 Product Specification of Equipment Under Test 6
1.3 Modification of EUT 6
1.4 Emission Designator 7
1.5 Testing Location 8
1.6 Applied Standards 8

2 Test Configuration of Equipment Under Test **9**

2.1 Test Mode 9
2.2 Connection Diagram of Test System 10
2.3 Support Unit used in test configuration 10
2.4 Measurement Results Explanation Example 11
2.5 Far Field Condition for Frequency above 18GHz 11
2.6 Frequency List of Low/Middle/High Channels 12

3 Radiated Test Items **13**

3.1 Measuring Instruments 13
3.2 Test Setup 13
3.3 Test Result of Radiated Test 15
3.4 EIRP Measurement 16
3.5 Occupied Bandwidth 17
3.6 Radiated Spurious Emission Measurement 18
3.7 Frequency Stability Measurement 19

4 List of Measuring Equipment **20**

5 Uncertainty of Evaluation **22**

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
FG890514-01A	01	Initial issue of report	Feb. 19, 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	-
Remark: This is a variant report by adding band n260. All the test cases were performed on original report which can be referred to Sporton Report Number FG890514A					

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 n260: 37GHz ~ 40GHz
Rx Frequency	NR band n260: 37GHz ~ 40GHz
Support Bandwidth	NR band n260: 50 MHz and 100 MHz
Maximum Number of contiguous CC	4
Maximum Aggregated Bandwidth	400MHz
Maximum Output Power (EIRP)	NR band n260: Module 0: 23.28 dBm Module 1: 23.28 dBm Module 2: 22.24 dBm Module 3: 24.53 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 n260 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	**37025 ~ 39975**	46M6G7D	-	0.209	46M4W7D	-	0.166	46M2W7D	-	0.127
100	**37050 ~ 39950**	95M0G7D	-	0.213	94M6W7D	-	0.162	94M4W7D	-	0.126
400	**37200 ~ 39800**	518MG7D	-	0.210	485MW7D	-	0.163	474MW7D	-	0.128

NR band n260 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	**37025 ~ 39975**	46M6G7D	-	0.213	46M5W7D	-	0.163	46M3W7D	-	0.127
100	**37050 ~ 39950**	95M2G7D	-	0.206	94M8W7D	-	0.161	94M9W7D	-	0.124
400	**37200 ~ 39800**	522MG7D	-	0.209	478MW7D	-	0.165	490MW7D	-	0.130

NR band n260 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	**37025 ~ 39975**	46M5G7D	-	0.167	46M2W7D	-	0.128	46M5W7D	-	0.101
100	**37050 ~ 39950**	95M2G7D	-	0.156	94M9W7D	-	0.119	94M7W7D	-	0.093
400	**37200 ~ 39800**	403MG7D	-	0.162	397MW7D	-	0.125	392MW7D	-	0.096

NR band n260 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	**37025 ~ 39975**	47M0G7D	-	0.264	46M4W7D	-	0.209	46M2W7D	-	0.165
100	**37050 ~ 39950**	95M6G7D	-	0.284	94M8W7D	-	0.217	94M4W7D	-	0.170
400	**37200 ~ 39800**	392MG7D	-	0.264	400MW7D	-	0.209	393MW7D	-	0.159

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.

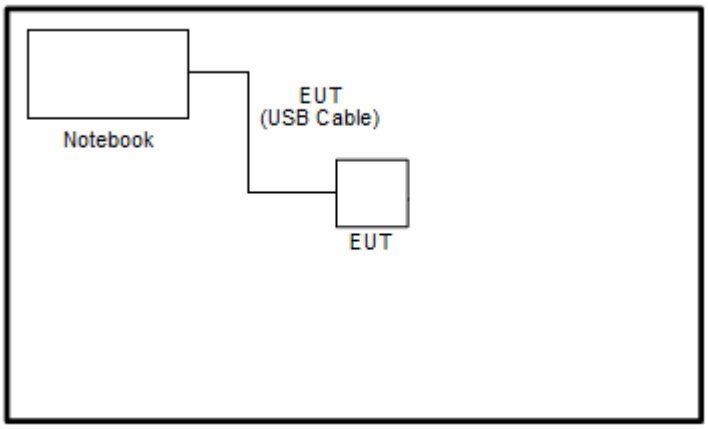
The NR radio operation is controlled via software tool QRCT v4.0.

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	n260	v	v	v	v	v	v	v		v	v	v	v
99% Occupied Bandwidth	n260	v	v	v	v	v	v			v	v	v	v
Out of Band Emission	n260	v	v	v	v	v	v			v	v		v
Spurious Emission	n260	v	v	v	v			v			v	v	v
Frequency Stability	n260	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 n260 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
50	Frequency	37025	38500	39975
100	Frequency	37050	38500	39950
400	Frequency 1	37050	38350	39650
	Frequency 2	37150	38450	39750
	Frequency 3	37250	38550	39850
	Frequency 4	37350	38650	39950

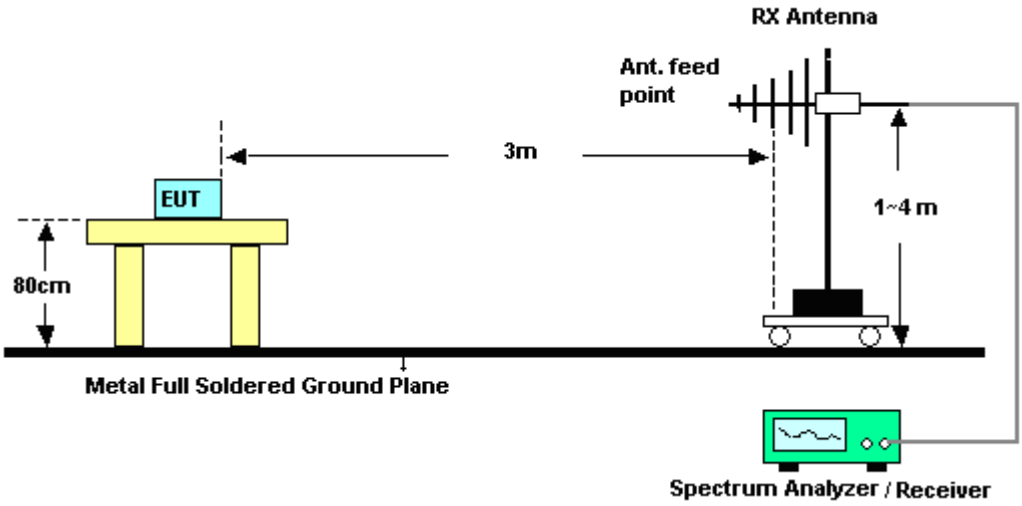
3 Radiated Test Items

3.1 Measuring Instruments

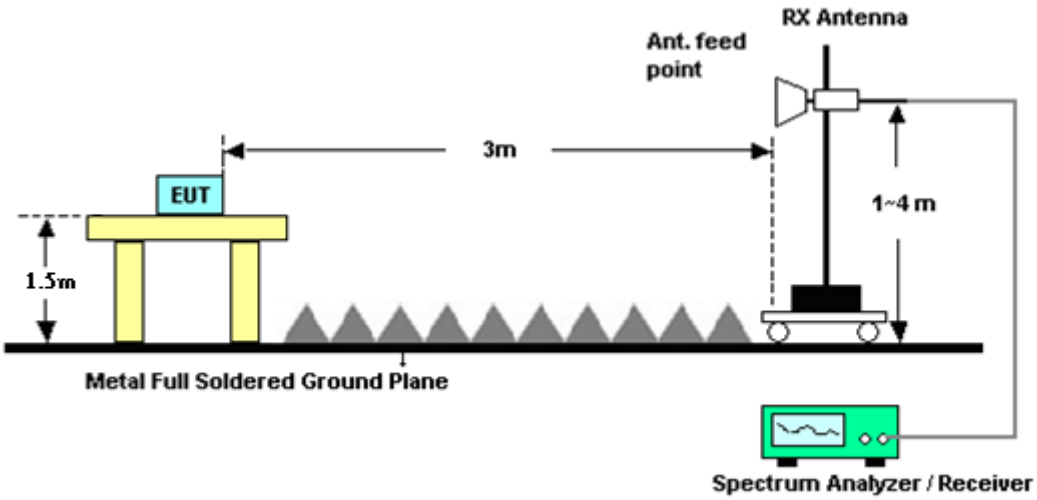
See list of measuring instruments of this test report.

3.2 Test Setup

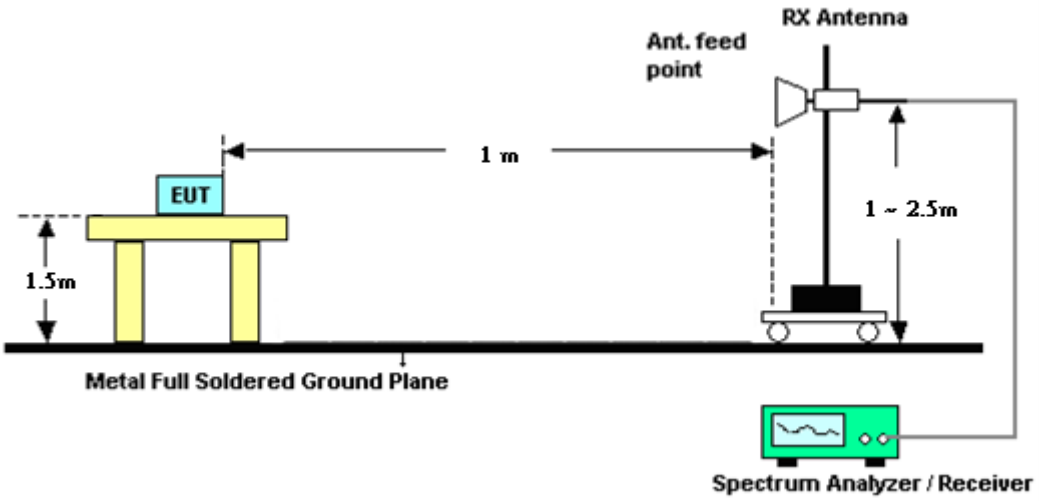
For radiated emissions from 30MHz to 1GHz



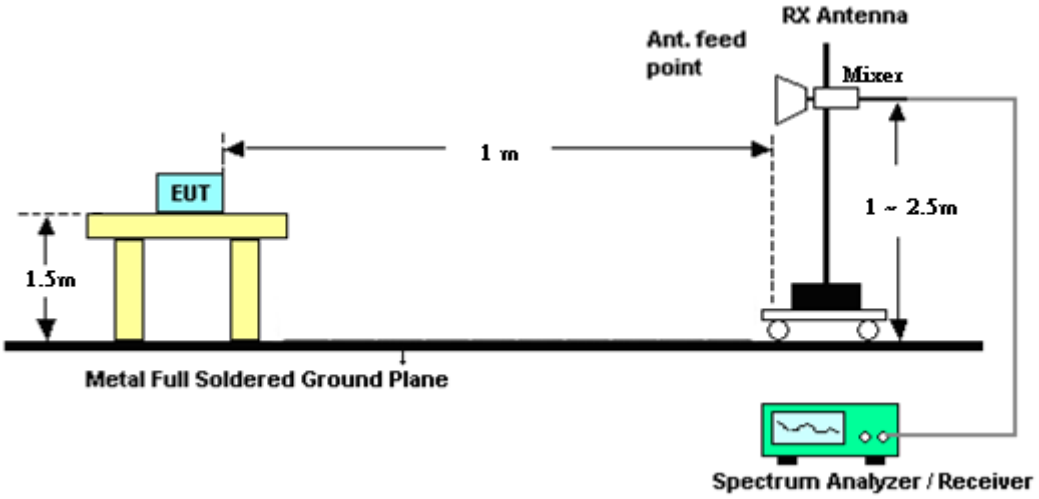
For radiated emissions 1GHz to 18GHz



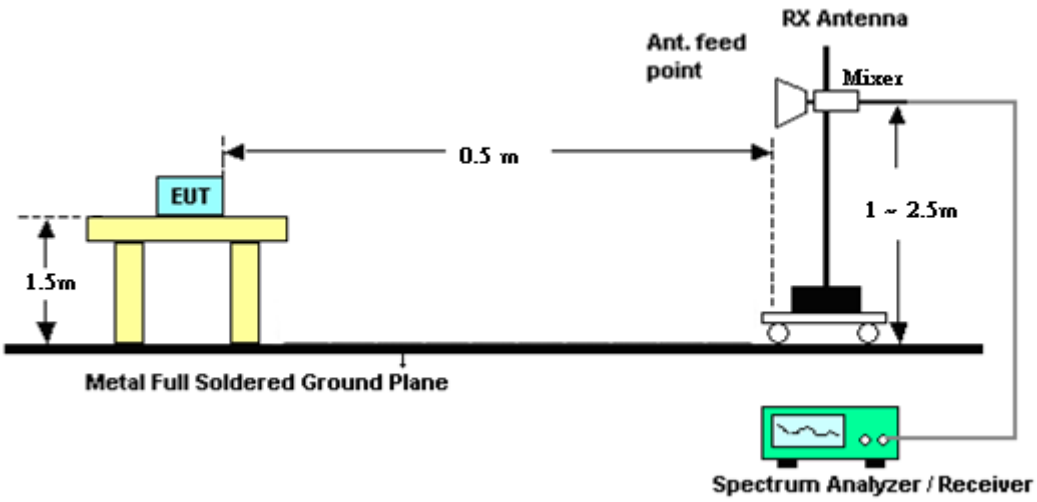
For radiated emissions above 18GHz



For radiated emissions above 40GHz up to 140GHz



For radiated emissions above 140GHz up to 200GHz



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 200GHz.

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	Jan. 08, 2018~ Jan. 22, 2018	Oct. 22, 2019	Radiation (03CH10-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Jan. 08, 2018~ Jan. 22, 2018	Nov. 22, 2019	Radiation (03CH10-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	37059&01	30MHz~1GHz	Oct. 13, 2018	Jan. 08, 2018~ Jan. 22, 2018	Oct. 12, 2019	Radiation (03CH10-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1325	1GHz ~ 18GHz	Oct. 02, 2018	Jan. 08, 2018~ Jan. 22, 2018	Oct. 01, 2019	Radiation (03CH10-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz ~ 40GHz	Nov. 20, 2018	Jan. 08, 2018~ Jan. 22, 2018	Nov. 19, 2019	Radiation (03CH10-HY)
Hygrometer	TECPEL	DTM-303B	TP140320	N/A	Nov. 05, 2018	Jan. 08, 2018~ Jan. 22, 2018	Nov. 04, 2019	Radiation (03CH10-HY)
Preamplifier	Keysight	83017A	MY53270078	1GHz~26.5GHz	Oct. 28, 2018	Jan. 08, 2018~ Jan. 22, 2018	Oct. 27, 2019	Radiation (03CH10-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz ~ 44GHz	Nov. 02, 2018	Jan. 08, 2018~ Jan. 22, 2018	Nov. 01, 2019	Radiation (03CH10-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV30	103738	9kHz~30GHz	May 22, 2018	Jan. 08, 2018~ Jan. 22, 2018	May 21, 2019	Radiation (03CH10-HY)
Software	Audix	E3 6.2009-8-24	RK-001042	N/A	N/A	Jan. 08, 2018~ Jan. 22, 2018	N/A	Radiation (03CH10-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Jan. 08, 2018~ Jan. 22, 2018	N/A	Radiation (03CH10-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Jan. 08, 2018~ Jan. 22, 2018	N/A	Radiation (03CH10-HY)
Turn Table	EMEC	TT 2200	N/A	0~360 Degree	N/A	Jan. 08, 2018~ Jan. 22, 2018	N/A	Radiation (03CH10-HY)
*Mixer	Rohde & Schwarz	FS-Z60	100986	40 ~ 60 GHz	Oct. 31, 2018	Jan. 08, 2018~ Jan. 22, 2018	Oct. 30, 2021	Radiation (03CH10-HY)
*Mixer	Rohde & Schwarz	FS-Z90	101811	60 ~ 90 GHz	Jul. 16, 2018	Jan. 08, 2018~ Jan. 22, 2018	Jul. 16, 2021	Radiation (03CH10-HY)
*Mixer	Rohde & Schwarz	FS-Z140	101128	90 ~ 140 GHz	Sep. 03, 2018	Jan. 08, 2018~ Jan. 22, 2018	Sep. 02, 2021	Radiation (03CH10-HY)
*Mixer	Rohde & Schwarz	FS-Z220	101014	140 ~ 220 GHz	Aug. 28, 2018	Jan. 08, 2018~ Jan. 22, 2018	Aug. 27, 2021	Radiation (03CH10-HY)
Standard Horn Antenna	Quinstar	QWH-UPRR00	923600007	40 ~ 60 GHz	Aug. 17, 2018	Jan. 08, 2018~ Jan. 22, 2018	Aug. 16, 2021	Radiation (03CH10-HY)
Standard Horn Antenna	Quinstar	QWH-EPRR00	784600034	60 ~ 90 GHz	Aug. 17, 2018	Jan. 08, 2018~ Jan. 22, 2018	Aug. 16, 2021	Radiation (03CH10-HY)
Standard Horn Antenna	Quinstar	QWH-FPRR00	923800008	90 ~ 140 GHz	Aug. 17, 2018	Jan. 08, 2018~ Jan. 22, 2018	Aug. 16, 2021	Radiation (03CH10-HY)
Standard Horn Antenna	Quinstar	QWH-GPRR00	923900001	140 ~ 220 GHz	Aug. 17, 2018	Jan. 08, 2018~ Jan. 22, 2018	Aug. 16, 2021	Radiation (03CH10-HY)

Note:

(*) Equipment manufacturer's Calibration Certificate.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 14, 2018	Jan. 08, 2018~ Jan. 22, 2018	Jun. 13, 2019	Thermal (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D3SP	TBN-930701	N/A	Jul. 19, 2018	Jan. 08, 2018~ Jan. 22, 2018	Jul. 18, 2019	Thermal (TH02-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890094	1V~20V 0.5A~5A	Oct. 02, 2018	Jan. 08, 2018~ Jan. 22, 2018	Oct. 01, 2019	Thermal (TH02-HY)

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 ~ 140 GHz)

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

Uncertainty of Radiated Emission Measurement (140 GHz ~ 200 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	7.60

Appendix A. Test Results of EIRP and Radiated Test

EIRP Power(Average power)

NR Band n260 Module 0						
Maximum Average EIRP [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
50	1	0	QPSK	22.76	23.20	23.03
50	32	0		22.82	23.18	23.12
50	1	0	16-QAM	21.75	22.20	21.90
50	32	0		21.78	21.99	22.05
50	1	0	64-QAM	20.59	21.03	20.77
50	32	0		20.70	20.92	20.85
100	1	0	QPSK	22.71	23.19	22.96
100	66	0		22.72	23.28	22.90
100	1	0	16-QAM	21.54	22.01	21.79
100	66	0		21.63	22.09	21.89
100	1	0	64-QAM	20.47	20.99	20.62
100	66	0		20.56	20.94	20.72
400	66	0	QPSK	22.75	23.23	22.96
400	66	0	16-QAM	21.60	22.13	21.93
400	66	0	64-QAM	20.48	21.06	20.77

NR Band n260 Module 1						
Maximum Average EIRP [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
50	1	0	QPSK	22.82	23.23	23.10
50	32	0		22.88	23.28	23.09
50	1	0	16-QAM	21.77	22.09	22.08
50	32	0		21.78	22.12	22.07
50	1	0	64-QAM	20.76	21.03	20.90
50	32	0		20.66	20.98	21.00
100	1	0	QPSK	22.66	23.13	22.96
100	66	0		22.65	23.06	22.98
100	1	0	16-QAM	21.48	22.01	21.85
100	66	0		21.63	22.06	21.85
100	1	0	64-QAM	20.45	20.86	20.71
100	66	0		20.54	20.92	20.84
400	66	0	QPSK	22.89	23.19	23.20
400	66	0	16-QAM	21.80	22.18	22.03
400	66	0	64-QAM	20.69	21.15	21.02

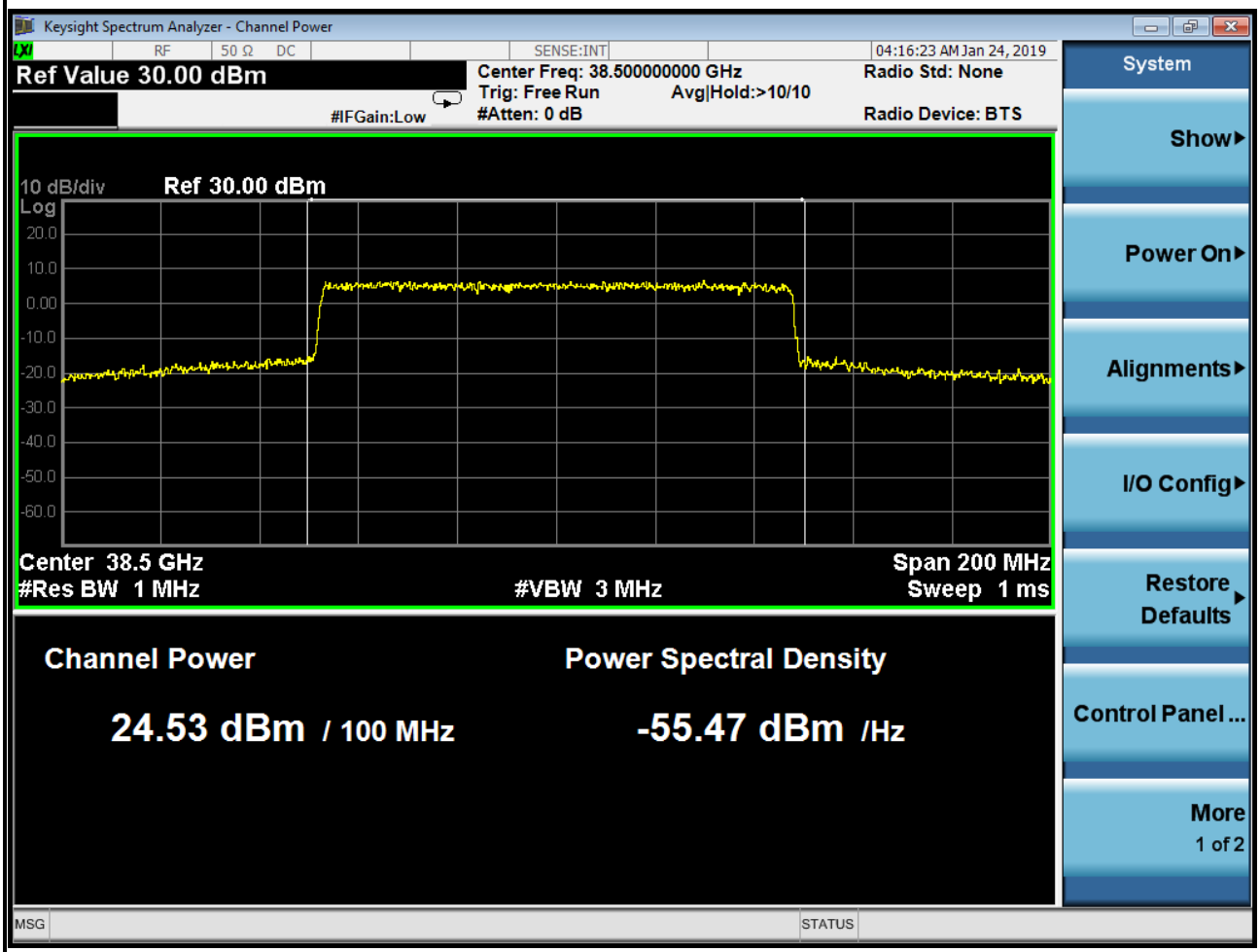
NR Band n260 Module 2						
Maximum Average EIRP [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
50	1	0	QPSK	21.69	22.14	21.93
50	32	0		21.76	22.24	21.98
50	1	0	16-QAM	20.57	21.07	20.89
50	32	0		20.62	21.05	20.88
50	1	0	64-QAM	19.50	20.05	19.76
50	32	0		19.57	19.98	19.79
100	1	0	QPSK	21.56	21.94	21.79
100	66	0		21.64	21.87	21.73
100	1	0	16-QAM	20.44	20.74	20.72
100	66	0		20.45	20.68	20.61
100	1	0	64-QAM	19.43	19.68	19.63
100	66	0		19.30	19.50	19.54
400	66	0	QPSK	21.72	22.04	22.10
400	66	0	16-QAM	20.60	20.89	20.96
400	66	0	64-QAM	19.43	19.83	19.82

NR Band n260 Module 3 Maximum Average EIRP [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
50	1	0	QPSK	23.82	24.21	24.05
50	32	0		23.75	24.21	24.06
50	1	0	16-QAM	22.70	23.20	22.94
50	32	0		22.58	23.17	22.99
50	1	0	64-QAM	21.55	22.18	21.85
50	32	0		21.48	22.07	21.84
100	1	0	QPSK	24.02	24.45	24.22
100	66	0		24.06	24.53	24.14
100	1	0	16-QAM	22.89	23.28	23.06
100	66	0		23.02	23.36	22.98
100	1	0	64-QAM	21.80	22.22	22.00
100	66	0		22.01	22.30	21.85
400	66	0	QPSK	24.01	24.21	24.08
400	66	0	16-QAM	23.00	23.20	22.90
400	66	0	64-QAM	21.93	22.02	21.87

NR Band n260

EIRP Worst Case Plot

Middle Channel / 100MHz / QPSK / 66RB0 (Module 3)



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 n260

Occupied Bandwidth

Mode	Module 0 NR Band n260 : 99%OBW(MHz)								
BW	50MHz			100MHz			400MHz		
Mod.	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Lowest CH	46.588	46.312	46.154	94.949	94.620	94.416	509.83	459.10	473.64
Middle CH	46.287	46.124	46.0	94.973	94.593	94.335	517.97	485.48	463.06
Highest CH	46.359	46.397	46.146	95.098	94.568	94.299	501.57	434.8	434.29

Mode	Module 1 NR Band n260 : 99%OBW(MHz)								
BW	50MHz			100MHz			400MHz		
Mod.	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Lowest CH	46.406	46.371	46.346	94.842	94.676	94.697	457.87	435.79	489.93
Middle CH	46.556	46.302	46.125	94.835	94.734	94.949	522.09	477.47	476.55
Highest CH	46.325	46.457	45.979	95.188	94.801	94.54	502.68	432.69	421.58

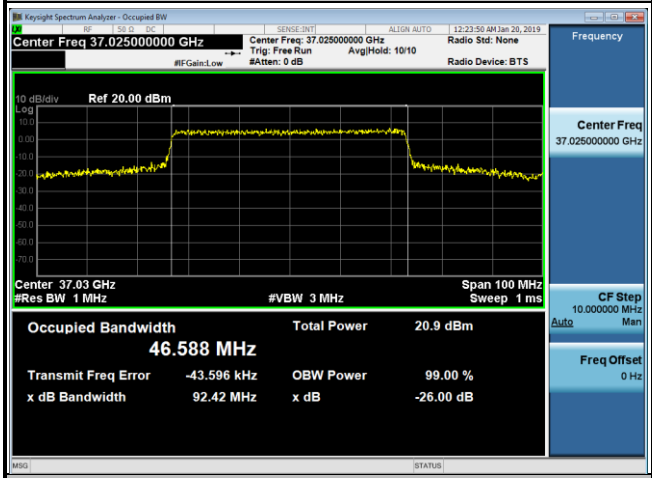
Mode	Module 2 NR Band n260 : 99%OBW(MHz)								
BW	50MHz			100MHz			400MHz		
Mod.	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Lowest CH	46.46	46.148	46.145	95.226	94.872	94.376	399.99	396.53	391.71
Middle CH	46.24	46.225	46.491	94.524	94.642	94.387	397.61	395.11	392.17
Highest CH	46.372	46.125	46.049	94.846	94.848	94.711	403.32	395.61	391.03

Mode	Module 3 NR Band n260 : 99%OBW(MHz)								
BW	50MHz			100MHz			400MHz		
Mod.	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Lowest CH	46.320	46.253	46.119	94.607	94.504	94.356	391.49	391.08	391.06
Middle CH	46.729	46.085	46.217	95.027	94.645	94.283	392.39	392.29	392.56
Highest CH	46.955	46.434	46.103	95.641	94.787	94.417	389.07	399.66	391.07

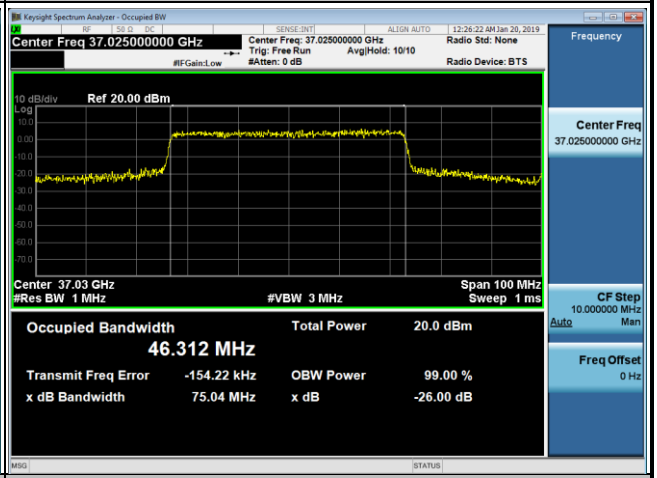
Module 0

NR Band n260

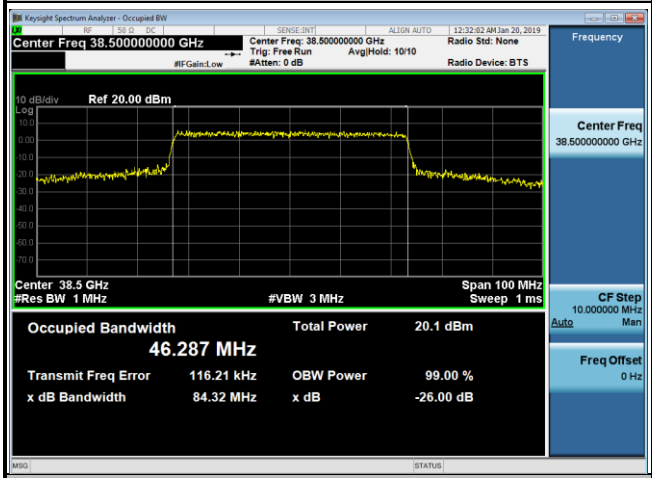
Lowest Channel / 50MHz / QPSK



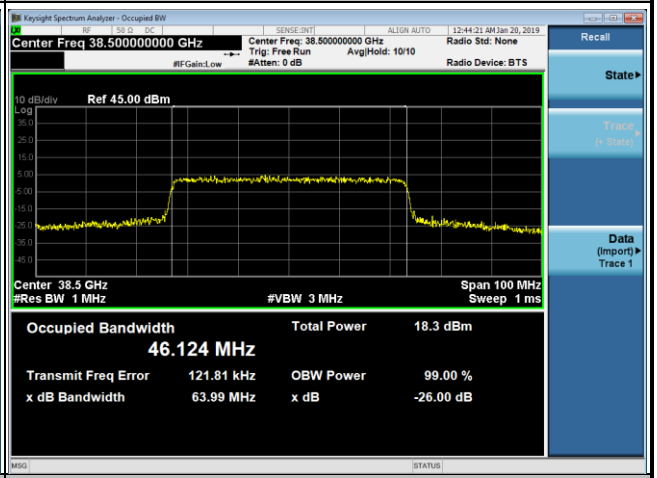
Lowest Channel / 50MHz / 16QAM



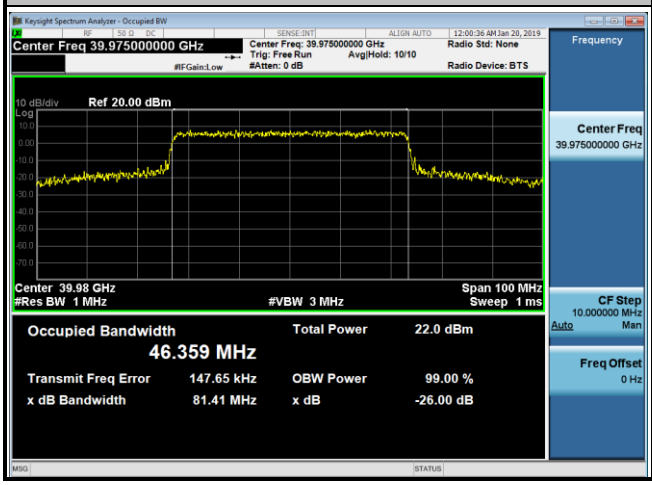
Middle Channel / 50MHz / QPSK



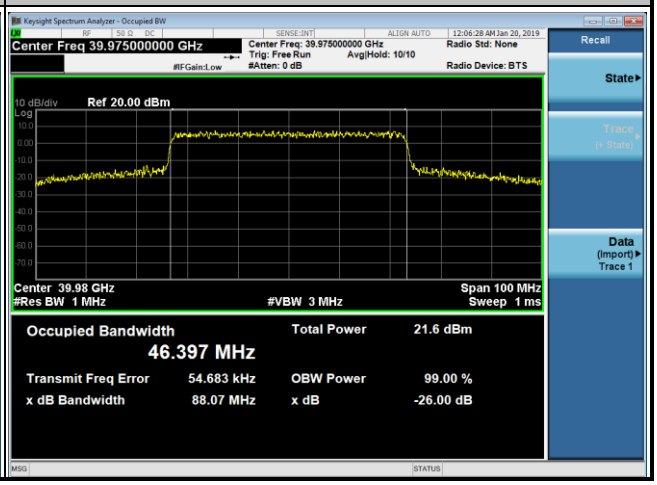
Middle Channel / 50MHz / 16QAM



Highest Channel / 50MHz / QPSK



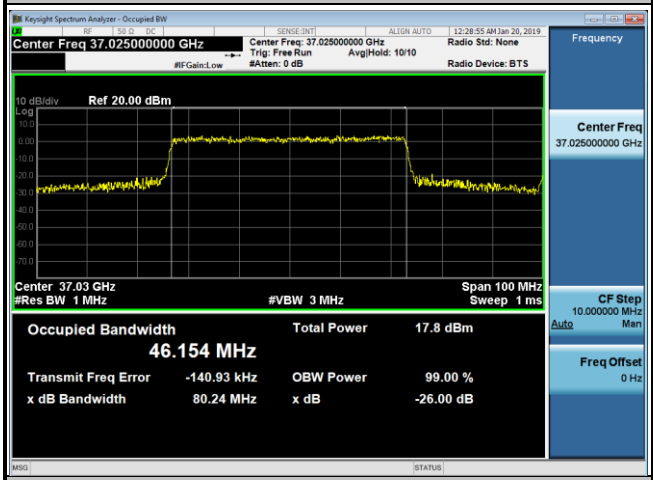
Highest Channel / 50MHz / 16QAM



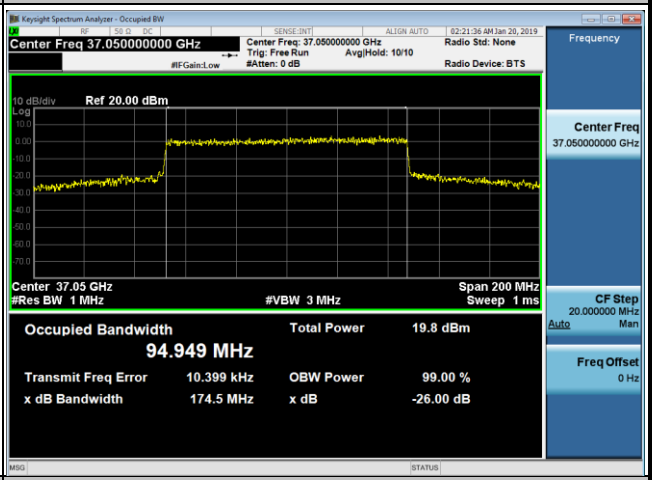
Module 0

NR Band n260

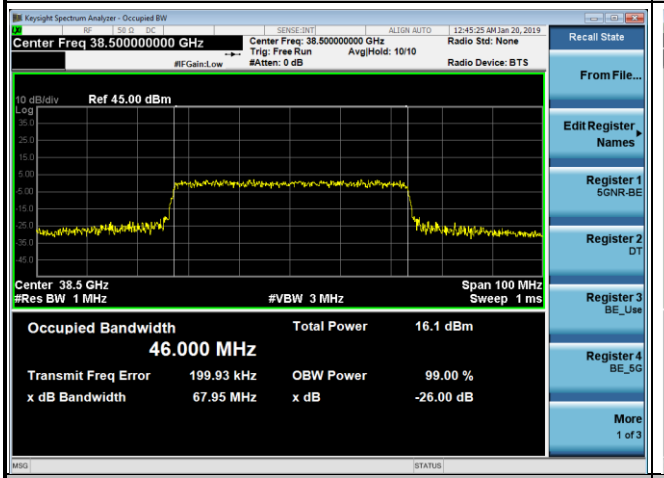
Lowest Channel / 50MHz / 64QAM



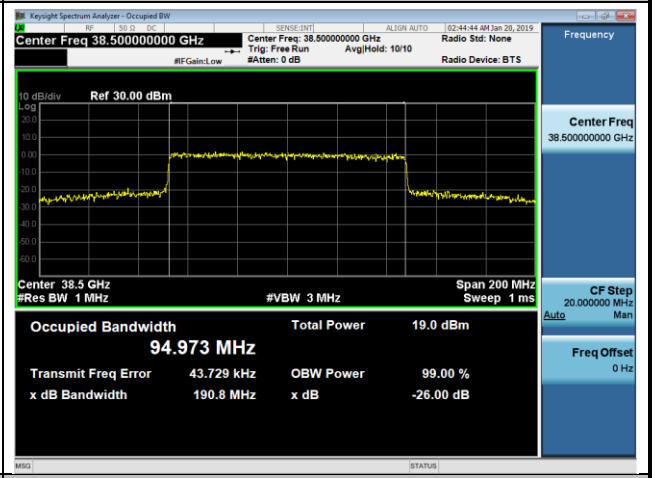
Lowest Channel / 100MHz / QPSK



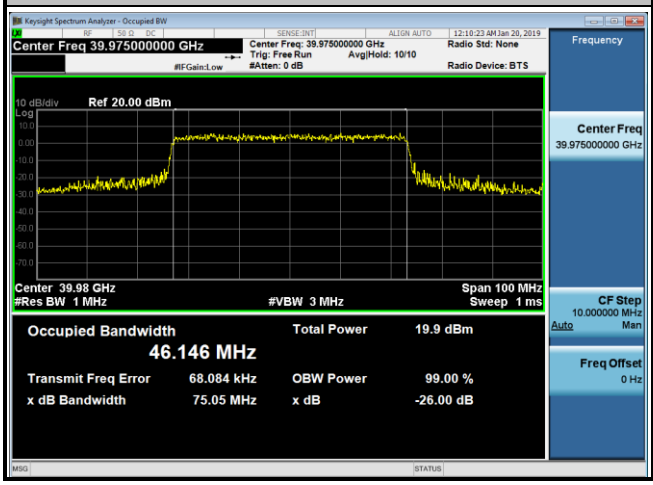
Middle Channel / 50MHz / 64QAM



Middle Channel / 100MHz / QPSK



Highest Channel / 50MHz / 64QAM

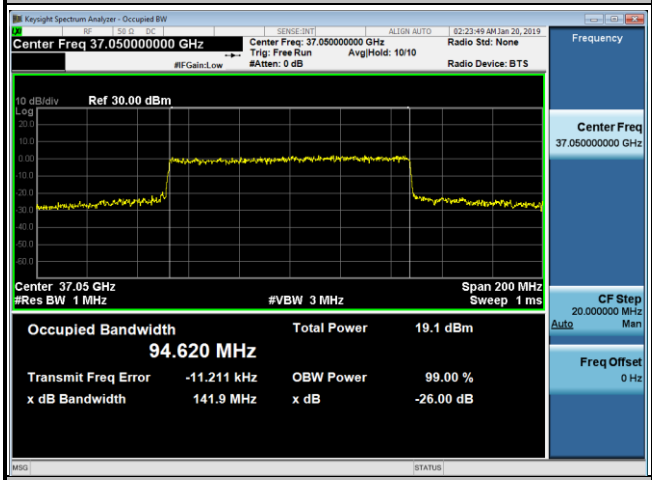


Highest Channel / 100MHz / QPSK

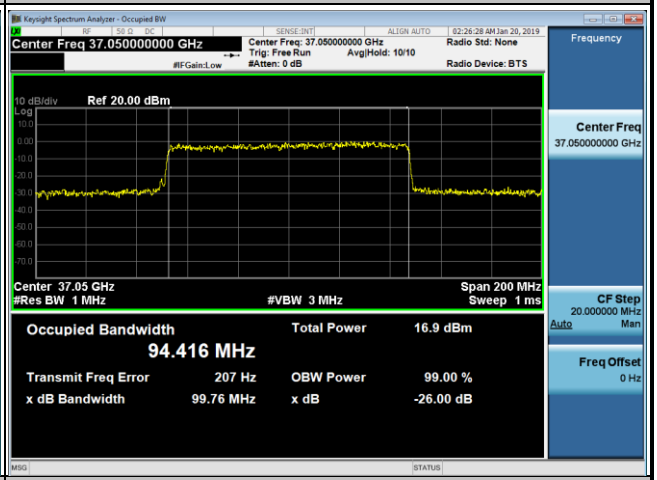
Module 0

NR Band n260

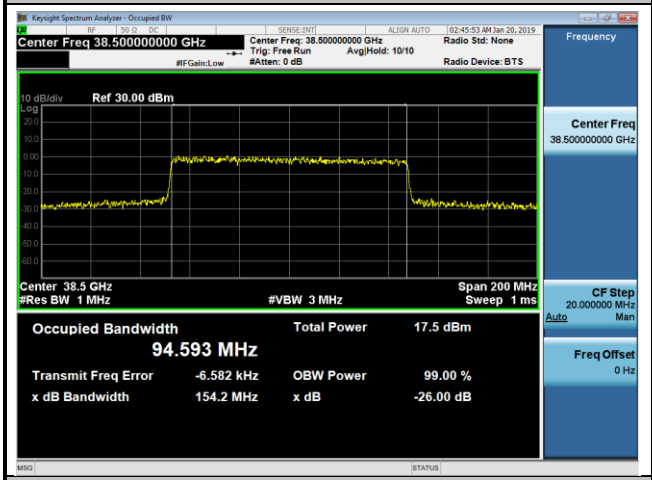
Lowest Channel / 100MHz / 16QAM



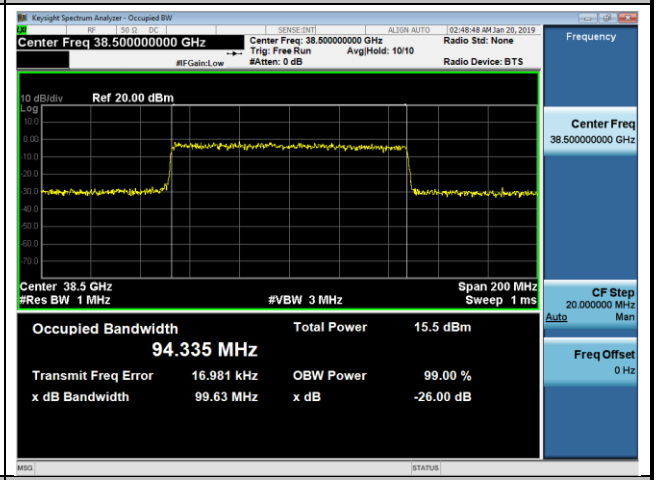
Lowest Channel / 100MHz / 64QAM



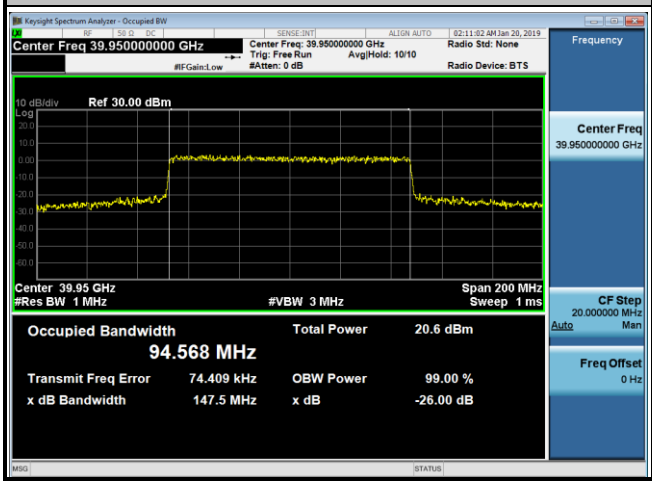
Middle Channel / 100MHz / 16QAM



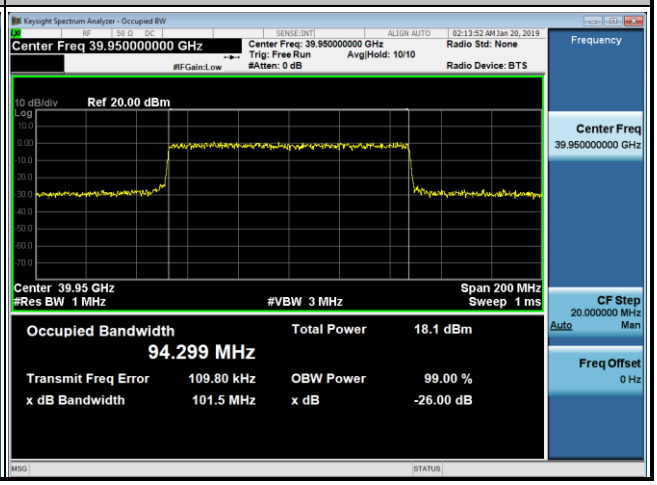
Middle Channel / 100MHz / 64QAM



Highest Channel / 100MHz / 16QAM



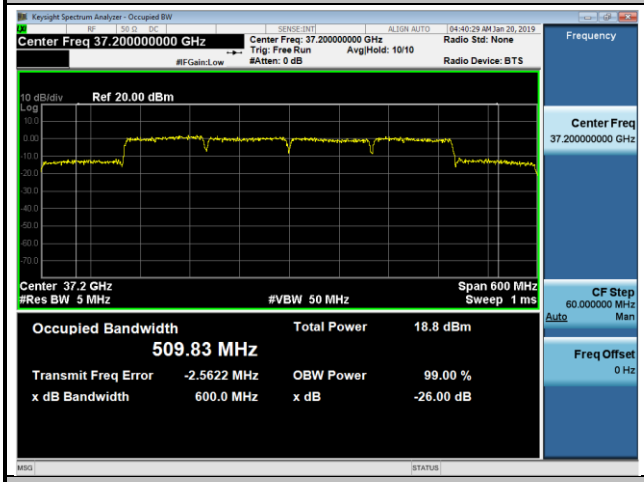
Highest Channel / 100MHz / 64QAM



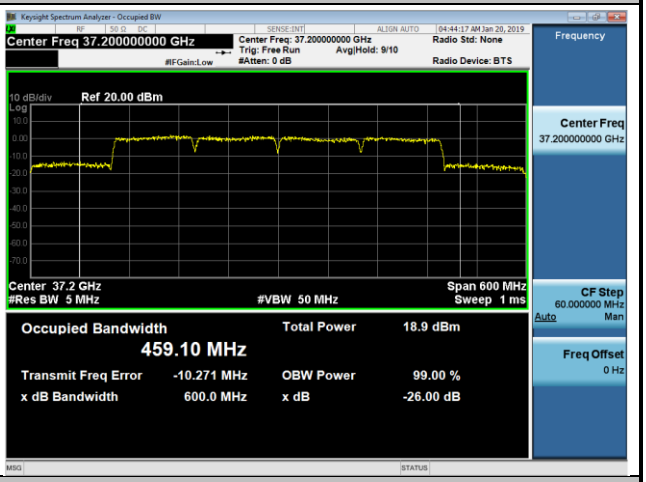
Module 0

NR Band n260

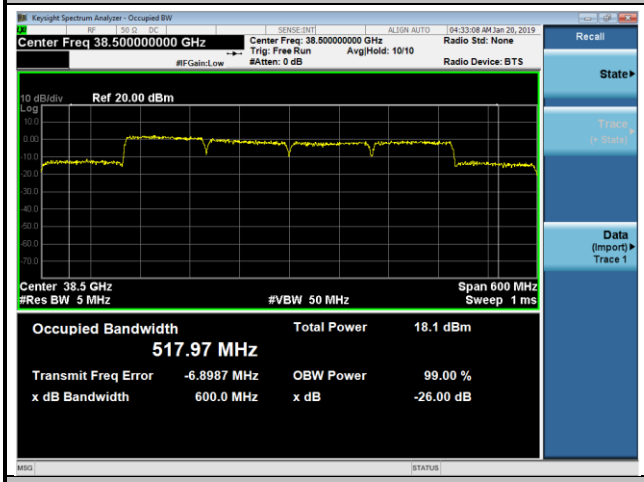
Lowest Channel / 400MHz / QPSK



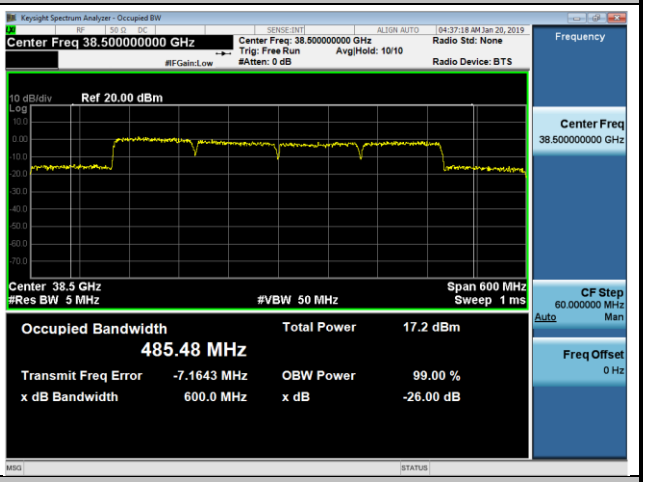
Lowest Channel / 400MHz / 16QAM



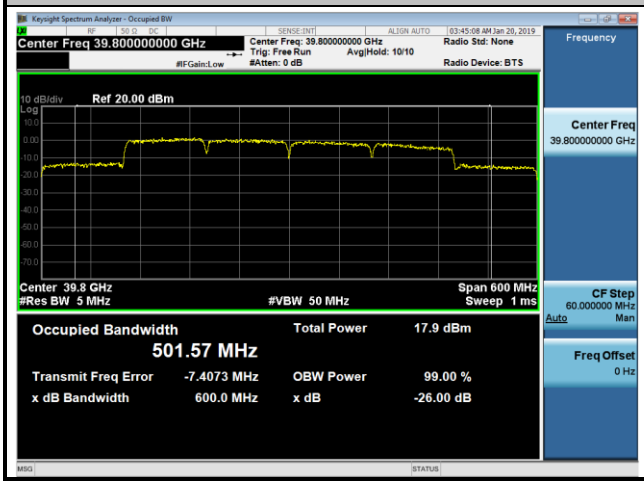
Middle Channel / 400MHz / QPSK



Middle Channel / 400MHz /16QAM

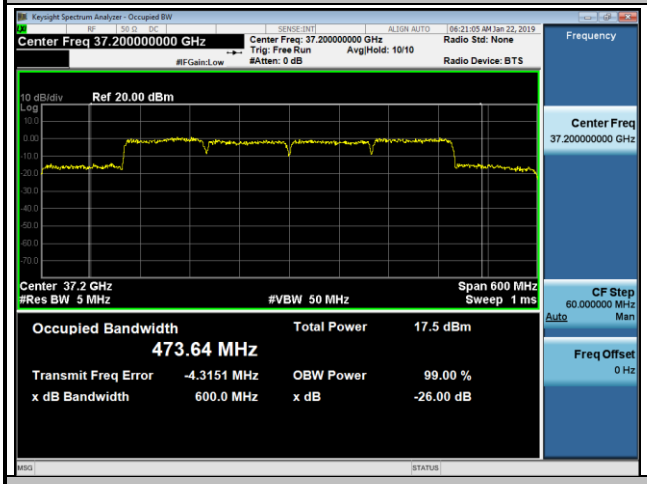
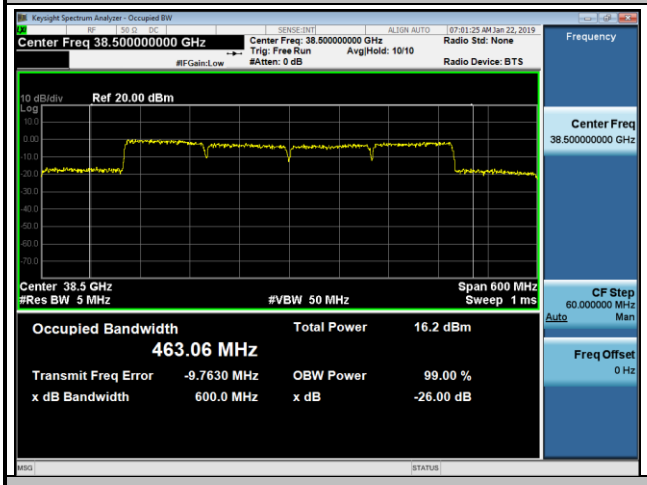
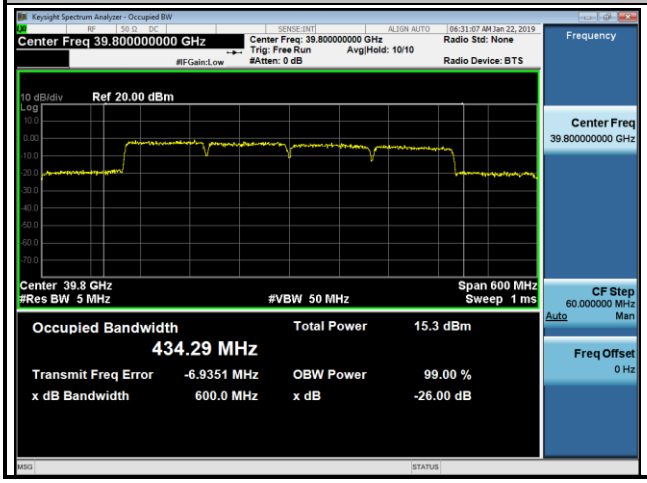


Highest Channel / 400MHz / QPSK



Highest Channel / 400MHz /16QAM

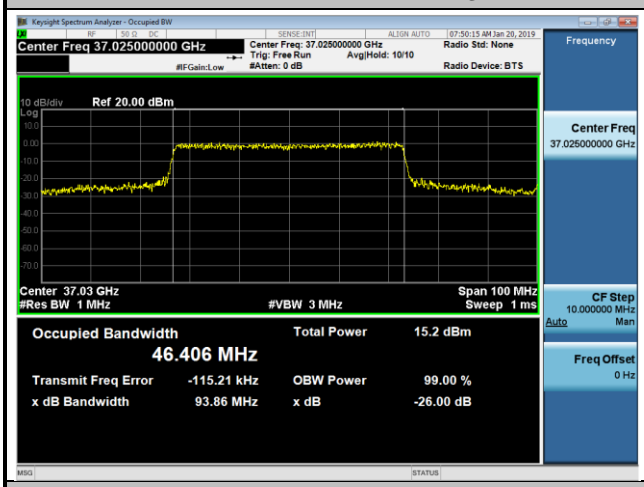
Module 0

NR Band n260	
Lowest Channel / 400MHz / 64QAM	
	**intentionally blank**
Middle Channel / 400MHz / 64QAM	
	**intentionally blank**
Highest Channel / 400MHz / 64QAM	
	**intentionally blank**

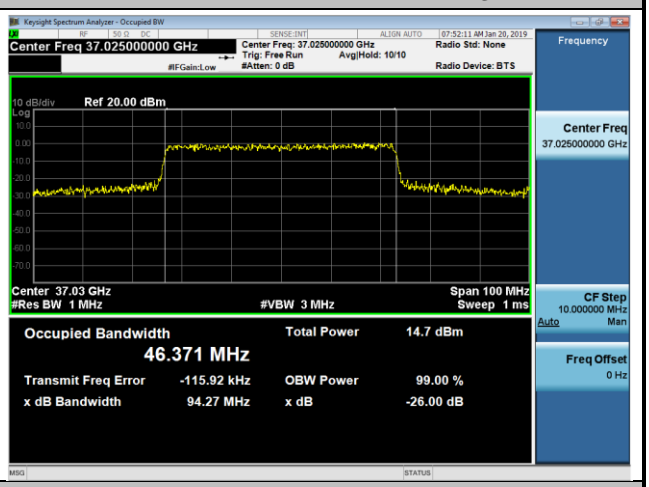
Module 1

NR Band n260

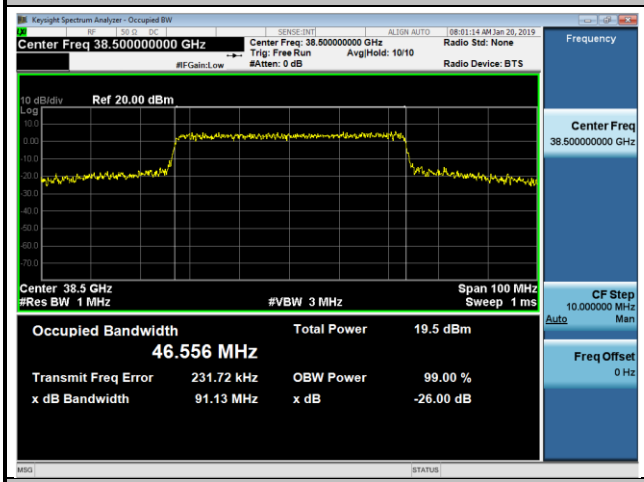
Lowest Channel / 50MHz / QPSK



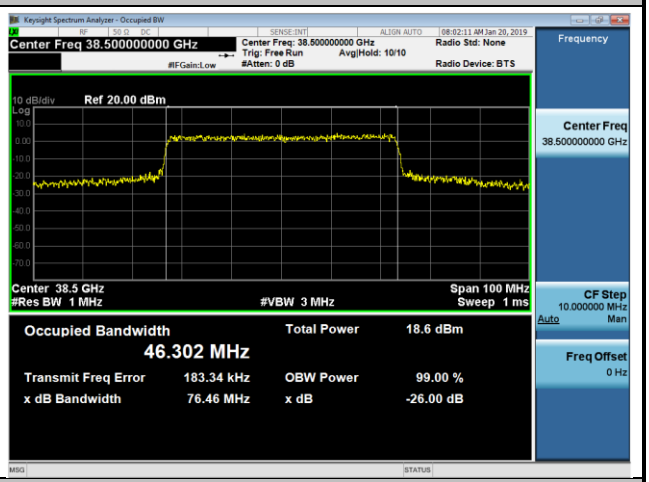
Lowest Channel / 50MHz / 16QAM



Middle Channel / 50MHz / QPSK

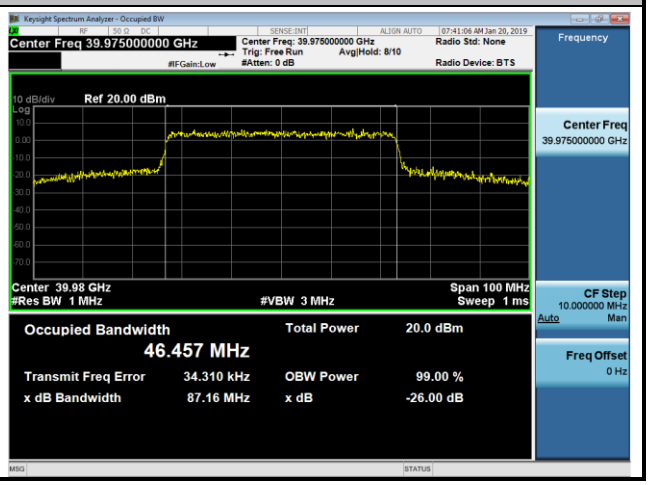


Middle Channel / 50MHz / 16QAM



Highest Channel / 50MHz / QPSK

Highest Channel / 50MHz / 16QAM

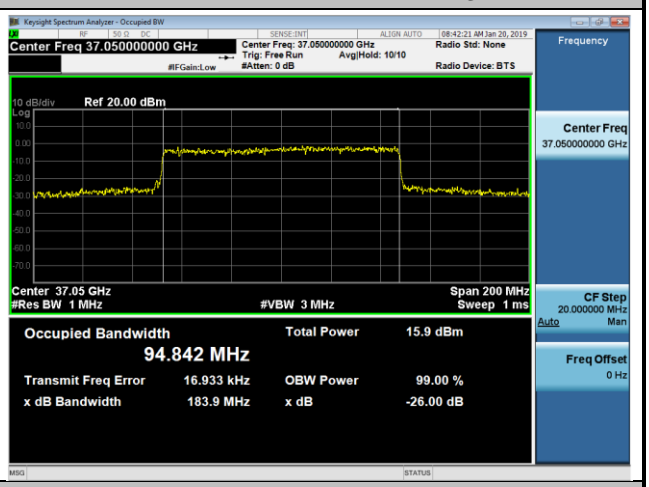


Module 1

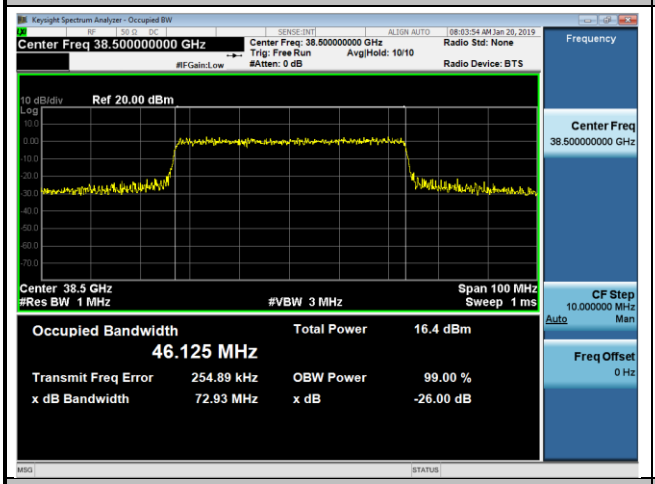
NR Band n260

Lowest Channel / 50MHz / 64QAM

Lowest Channel / 100MHz / QPSK

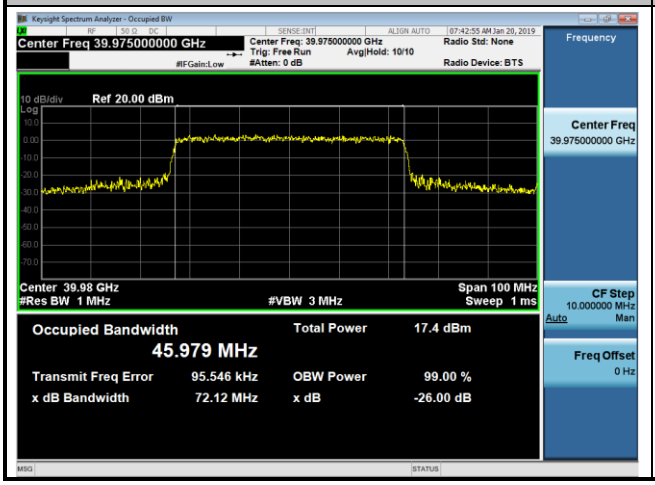


Middle Channel / 50MHz / 64QAM

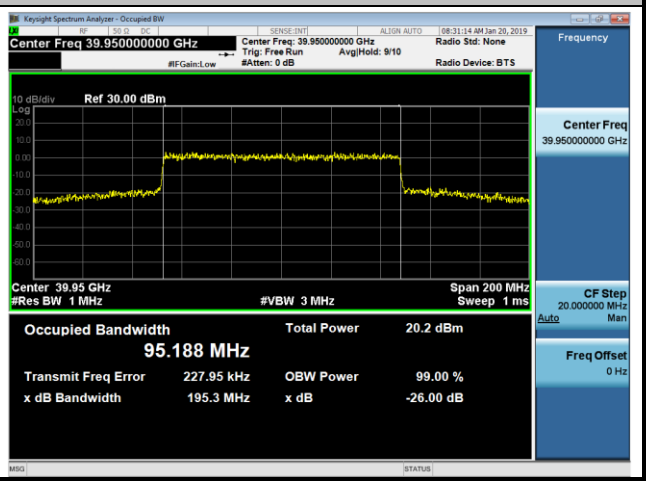


Middle Channel / 100MHz / QPSK

Highest Channel / 50MHz / 64QAM



Highest Channel / 100MHz / QPSK

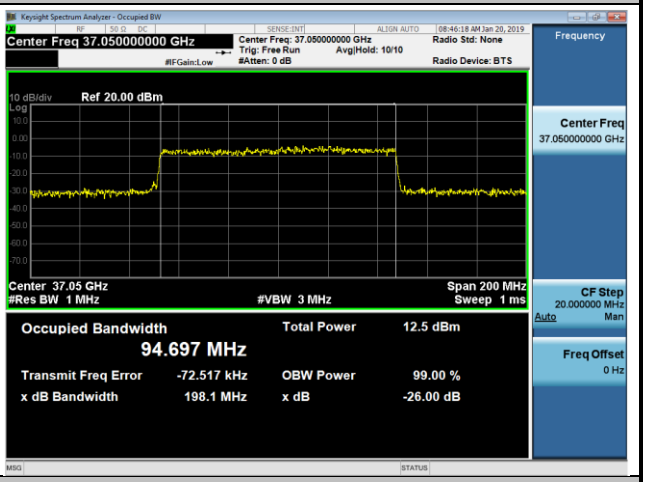


Module 1

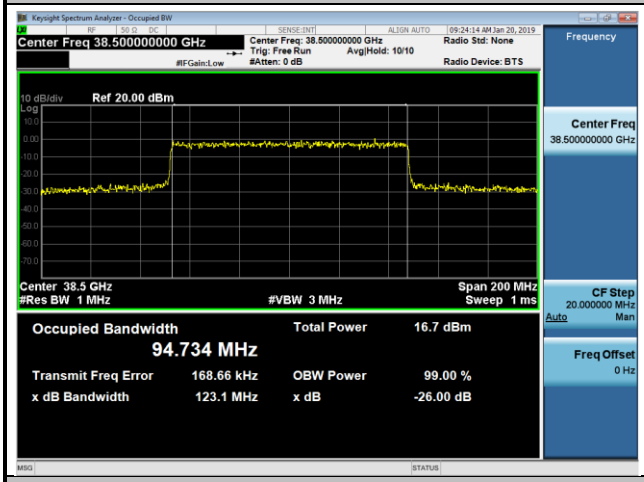
NR Band n260

Lowest Channel / 100MHz / 16QAM

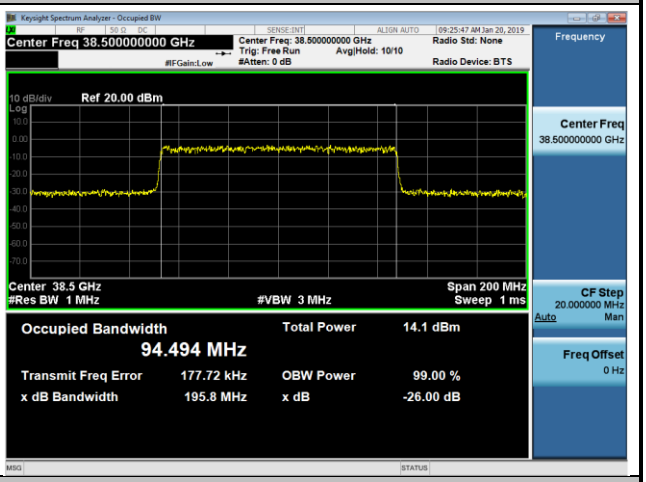
Lowest Channel / 100MHz / 64QAM



Middle Channel / 100MHz / 16QAM

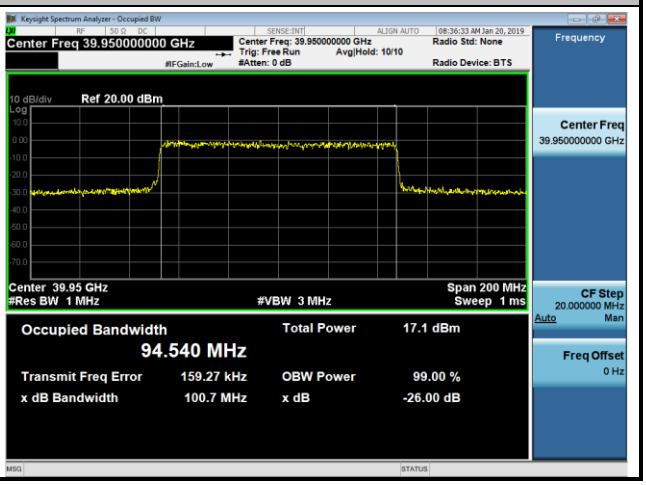


Middle Channel / 100MHz / 64QAM



Highest Channel / 100MHz / 16QAM

Highest Channel / 100MHz / 64QAM



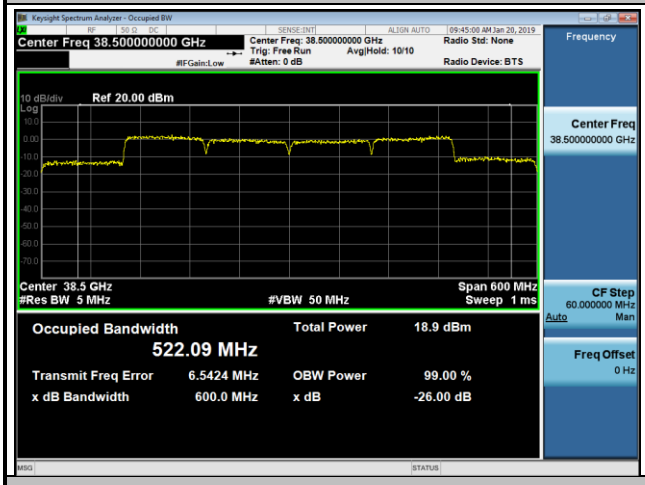
Module 1

NR Band n260

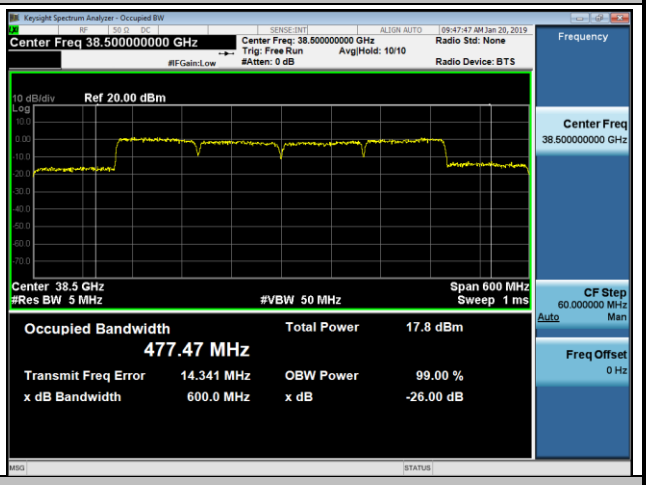
Lowest Channel / 400MHz / QPSK

Lowest Channel / 400MHz / 16QAM

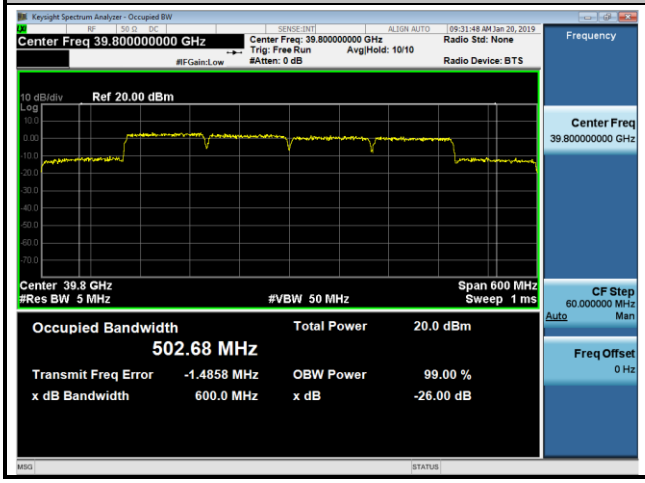
Middle Channel / 400MHz / QPSK



Middle Channel / 400MHz /16QAM

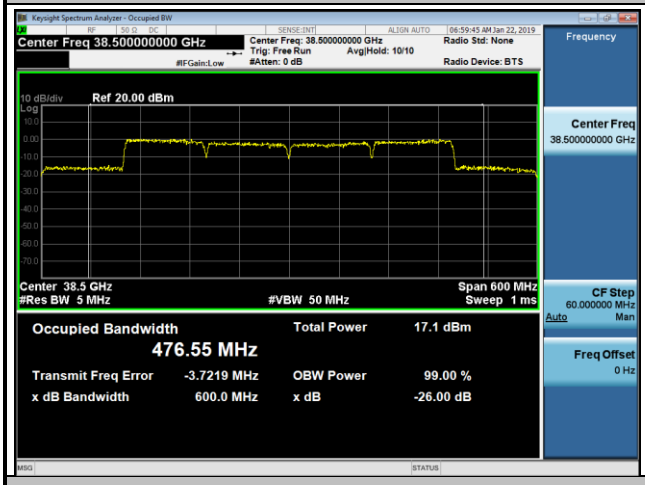
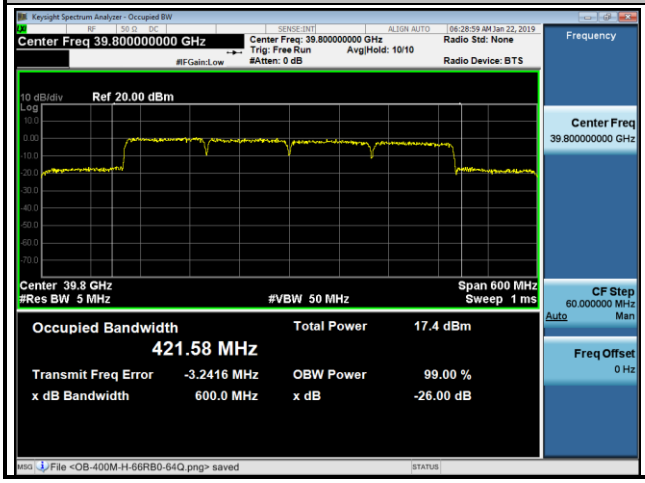


Highest Channel / 400MHz / QPSK



Highest Channel / 400MHz /16QAM

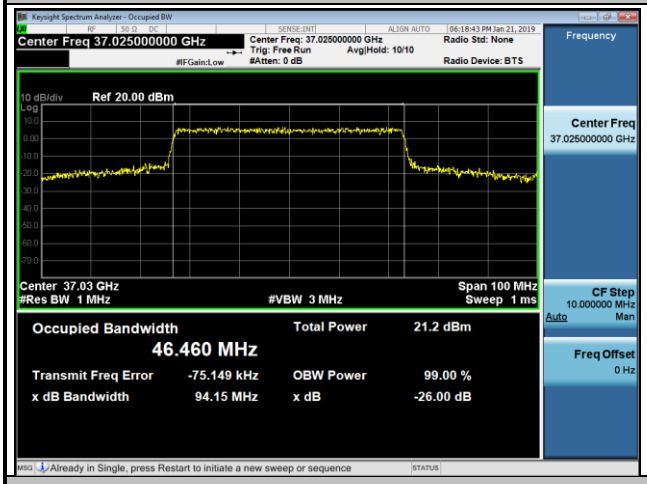
Module 1

NR Band n260	
Lowest Channel / 400MHz / 64QAM	
	intentionally blank
Middle Channel / 400MHz / 64QAM	
	**intentionally blank**
Highest Channel / 400MHz / 64QAM	
	**intentionally blank**

Module 2

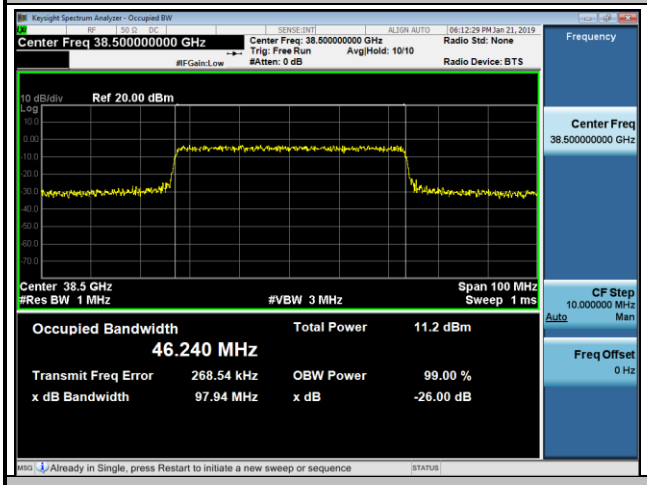
NR Band n260

Lowest Channel / 50MHz / QPSK

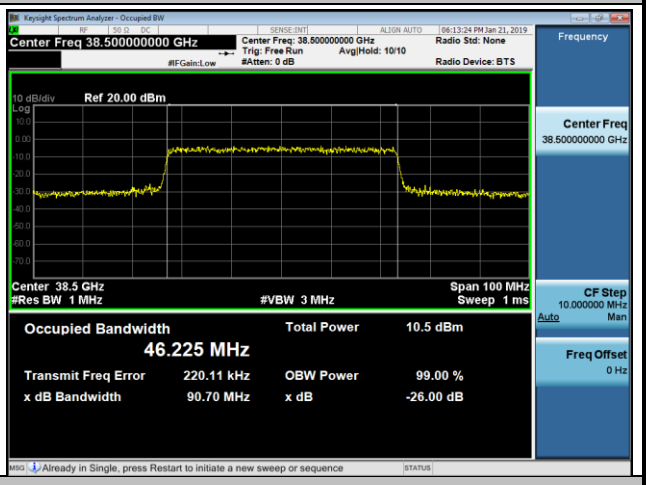


Lowest Channel / 50MHz / 16QAM

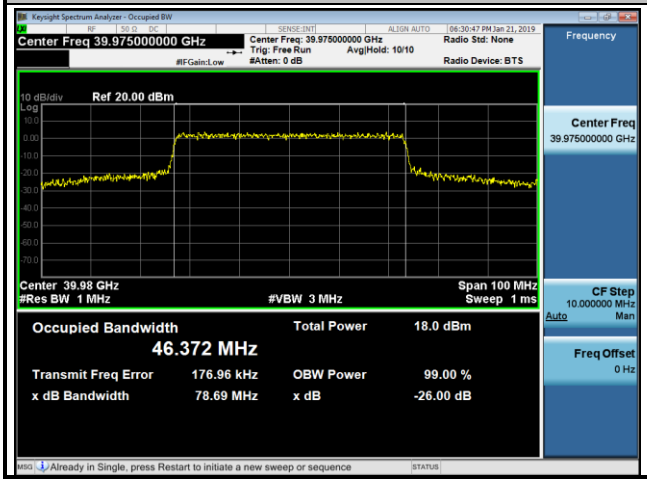
Middle Channel / 50MHz / QPSK



Middle Channel / 50MHz / 16QAM



Highest Channel / 50MHz / QPSK



Highest Channel / 50MHz / 16QAM