FCC RADIO TEST REPORT

FCC ID	:	**IHDT56ZB1**
Equipment	:	**Mobile Cellular Phone**
Brand Name	:	**Motorola**
Model Name	:	**XT2071-2, XT2071-3, XT2071-5**
Applicant	:	**Motorola Mobility, LLC 222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States**
Manufacturer	:	**Motorola Mobility, LLC 222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States**
Standard	:	**FCC 47 CFR Part 2, 22(H), 24(E)**

The product was received on May 22, 2020 and testing was started from Jun. 30, 2020 and completed on Jul. 22, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The test results in this partial 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.

Louis Wu

Approved by: Louis Wu

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FG051232-02C	01	Initial issue of report	Aug. 10, 2020

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
	§22.913 (a)(2)	Effective Radiated Power (n5)	Pass	
	§24.232 (c)	Equivalent Isotropic Radiated Power (n2) (n25)		
3.3	§24.232 (d)	Peak-to-Average Ratio	Pass	-
3.4	§2.1049	Occupied Bandwidth	Reporting only	-
3.5	§2.1051 §22.917 (a) §24.238 (a)	Conducted Band Edge Measurement (n2) (n5) (n25)	Pass	-
3.6	§2.1051 §22.917 (a) §24.238 (a)	Conducted Spurious Emission (n2) (n5) (n25)	Pass	-
3.7	§2.1055 §22.355 §24.235	Frequency Stability Temperature & Voltage	Pass	-
4.2	§2.1053 §22.917 (a) §24.238 (a)	Radiated Spurious Emission (n2) (n5) (n25)	Pass	Under limit 22.18 dB at 3311.000 MHz for PT Antenna Under limit 21.68 dB at 3311.000 MHz for ASDIV Antenna

Remark: This product is electrical identical and is tested by two laboratories. The 5G NR bands n2/n5/n25 were carried out and presented in this report (Report Number :FG051232-02C, TAF 1190) and the other bands (5G NR n41/n66/n71) were performed by Sporton (Kunshan) (Report Number FG052803-01A and FG052803-01B).

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: Wii Chang

Report Producer: Ruby Zou

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature		
Equipment	Mobile Cellular Phone	
Brand Name	Motorola	
Model Name	XT2071-2, XT2071-3, XT2071-5	
FCC ID	IHDT56ZB1	
IMEI Code	**Conducted :**	IMEI 1: 353590110016238 IMEI 2: 353590110016246
	Radiation :	IMEI 1: 353590110017152 IMEI 2: 353590110017160
EUT supports Radios application	CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/LTE/5G NR/ GNSS/NFC WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE	
HW Version	DVT2	
EUT Stage	Identical Prototype	

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

Accessory List	
AC Adapter 1 (US)	Brand Name : Motorola
	Model Name : SC-51
	Manufacturer : Chenyang
AC Adapter 1 (EU)	Brand Name : Motorola
	Model Name : SC-52
	Manufacturer : Chenyang
AC Adapter 1 (UK)	Brand Name : Motorola
	Model Name : SC-53UK
	Manufacturer : Chenyang
AC Adapter 1 (AR)	Brand Name : Motorola
	Model Name : SC-56
	Manufacturer : Chenyang
AC Adapter 1 (AU)	Brand Name : Motorola
	Model Name : SC-55AU
	Manufacturer : Chenyang
AC Adapter 2 (US)	Brand Name : Motorola
	Model Name : SC-51
	Manufacturer : Acbel
AC Adapter 2 (EU)	Brand Name : Motorola
	Model Name : SC-52
	Manufacturer : Acbel
AC Adapter 2 (AR)	Brand Name : Motorola
	Model Name : SC-56
	Manufacturer : Acbel
AC Adapter 3 (IN)	Brand Name : Motorola
	Model Name : SC-54
	Manufacturer : Salom
Battery 1	Brand Name : Motorola
	Model Name : LS30
	Manufacturer : ATL
Battery 2	Brand Name : Motorola
	Model Name : LS40
	Manufacturer : ATL
Standard 3.5mm Headset 1	Brand Name : Motorola
	Model Name : SH38C37773
	Manufacturer : Lianyun
Standard 3.5mm Headset 2	Brand Name : Motorola
	Model Name : SH38C44959
	Manufacturer : Lianyun
USB-C to 3.5mm headset adaptor 1	Brand Name : Motorola
	Model Name : SC18C27844
USB-C to 3.5mm headset adaptor 2	Brand Name : Motorola
	Model Name : SC18C27845
USB Cable 1	Brand Name : Motorola
	Model Name : SC18C24367
	Manufacturer : Saibao
USB Cable 2	Brand Name : Motorola
	Model Name : SC18C24368
	Manufacturer : Luxshare

1.2 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	5G NR n2: 1852.5 MHz ~ 1907.5 MHz 5G NR n5: 826.5 MHz ~ 846.5 MHz 5G NR n25: 1852.5 MHz ~ 1912.5 MHz
Rx Frequency	5G NR n2: 1932.5 MHz ~ 1987.5 MHz 5G NR n5: 871.5 MHz ~ 891.5 MHz 5G NR n25: 1932.5 MHz ~ 1992.5 MHz
Bandwidth	5G NR n2: 5MHz / 10MHz / 15MHz / 20MHz 5G NR n5: 5MHz / 10MHz / 15MHz / 20MHz 5G NR n25: 5MHz / 10MHz / 15MHz / 20MHz
Maximum Output Power to Antenna <DFT-s-OFDM>	**<PT Antenna>** **< Ant. 2>** 5G NR n2 : 23.39 dBm 5G NR n5 : 23.65 dBm 5G NR n25 : 23.28 dBm **<ASDIV Antenna>** **<Ant. 1>** 5G NR n2 : 21.98 dBm 5G NR n5 : 22.54 dBm 5G NR n25 : 21.83 dBm
Maximum Output Power to Antenna <CP-OFDM>	**<PT Antenna>** **< Ant. 2>** 5G NR n2 : 22.07 dBm 5G NR n5 : 22.09 dBm 5G NR n25 : 21.58 dBm **<ASDIV Antenna>** **<Ant. 1>** 5G NR n2 : 20.15 dBm 5G NR n5 : 21.72 dBm 5G NR n25 : 20.19 dBm
Antenna Type	Fixed Internal Antenna
Type of Modulation	PI/2 BPSK / QPSK / 16QAM / 64QAM

1.3 Modification of EUT

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

1.4 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
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.**
	TH05-HY
Test Engineer	Richard Qiu
Temperature	23~26°C
Relative Humidity	55~58%

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
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.**
	03CH12-HY
Test Engineer	Jack Cheng, Lance Chiang, Chuan Chu
Temperature	22.8~26.2°C
Relative Humidity	56.5~68.2%

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

FCC Designation No.: TW1190 and TW0007

1.5 Applicable Standards

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

- ANSI C63.26-2015
- ANSI / TIA-603-E
- FCC 47 CFR Part 2, 22(H), 24(E)
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- FCC KDB 414788 D01 Radiated Test Site v01r01.

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.
3. The TAF code is not including all the FCC KDB listed without accreditation.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

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

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z and Accessory (Earphone or Adapter). The worst cases (Open Mode with PT Antenna: X Plane with Adapter for 5G NR n25, and Y Plane with Adapter for 5G NR n2, 5G NR n5; Open Mode with ASDIV Antenna: X Plane with Adapter for 5G NR n5 and Y Plane with Adapter for 5G NR n2, 5G NR n25) were recorded in this report.

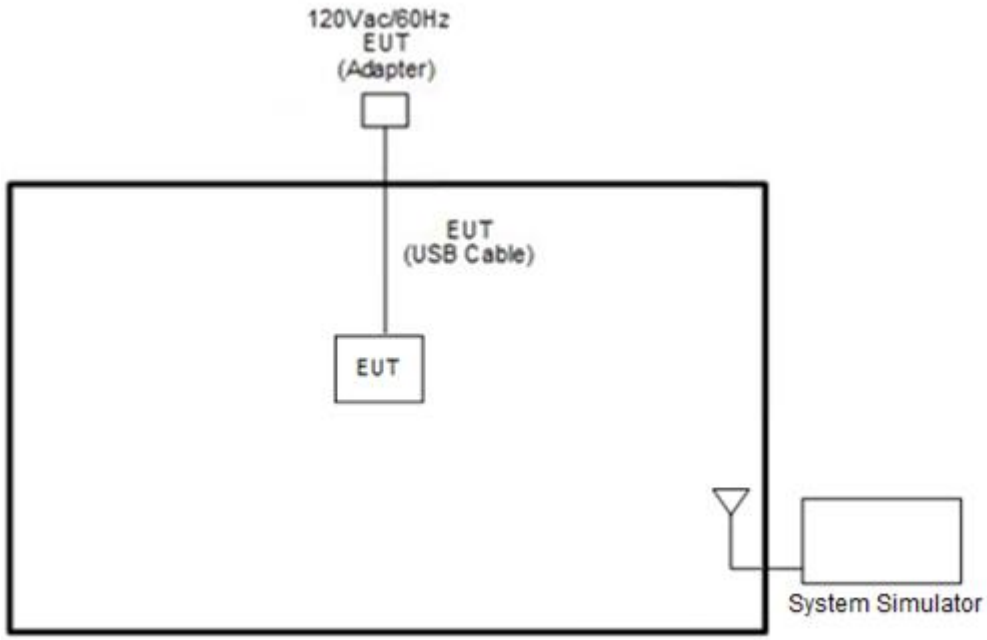
Test Items	NR Band	Bandwidth (MHz)						Modulation					RB #			Test Channel		
		5	10	15	20	40	50	PI/2 BPSK	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Max. Output Power	n2	v	v	v	v	-	-	v	v	v	v		v	v	v	v	v	v
	n5	v	v	v	v	-	-	v	v	v	v		v	v	v	v	v	v
	n25	v	v	v	v	-	-	v	v	v	v		v	v	v	v	v	v
Peak-to-Average Ratio	n2				v			v	v	v	v		v		v	v	v	v
	n5				v	-	-	v	v	v	v		v		v	v	v	v
	n25				v	-	-	v	v	v	v		v		v	v	v	v
26dB and 99% Bandwidth	n2	v	v	v	v			v	v	v	v				v	v	v	v
	n5	v	v	v	v	-	-	v	v	v	v				v	v	v	v
	n25	v	v	v	v	-	-	v	v	v	v				v	v	v	v
Conducted Band Edge	n2	v	v	v	v			v	v	v	v		v		v	v		v
	n5	v	v	v	v	-	-	v	v	v	v		v		v	v		v
	n25	v	v	v	v	-	-	v	v	v	v		v		v	v		v
Conducted Spurious Emission	n2				v			v	v	v	v		v			v	v	v
	n5				v	-	-	v	v	v	v		v			v	v	v
	n25				v	-	-	v	v	v	v		v			v	v	v
Frequency Stability	n2				v	-	-	v	v	v	v				v		v	
	n5				v	-	-	v	v	v	v				v		v	
	n25				v	-	-	v	v	v	v				v		v	

Test Items	NR Band	Bandwidth (MHz)						Modulation					RB #			Test Channel		
		5	10	15	20	40	50	PI/2 BPSK	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
E.R.P / E.I.R.P	n2	v	v	v	v	-	-	v	v	v	v		v			v	v	v
	n5	v	v	v	v	-	-	v	v	v	v		v			v	v	v
	n25	v	v	v	v	-	-	v	v	v	v		v			v	v	v
Radiated Spurious Emission	n2	Worst Case														v	v	v
	n5	Worst Case														v	v	v
	n25	Worst Case														v	v	v

Remark

1. The mark "**v** " means that this configuration is chosen for testing
2. The mark "-" means that this bandwidth is not supported.
3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.
4. Test combination is EN-DC 2A-n5A, EN-DC 7A-n5A, EN-DC 30A-n5A, EN-DC 48A-n5A, EN-DC 66A-n5A, EN-DC 5A-n2A, EN-DC 12A-n2A, EN-DC 30A-n2A, EN-DC 66A-n2A, EN-DC 2A-n25A, EN-DC 12A-n25A, EN-DC 66A-n25A.
5. For radiated measurement, pre-scanned in two modes, DFT-s OFDM and CP OFDM. The worst cases (DFT-s OFDM) were recorded in this report, and the worst modes of FR1 and LTE for simultaneous transmission were verified and compliant.
6. Wider operating range bandwidth covers narrower one when the power is higher or the same.
7. The reported ERP/EIRP are the worst power across different bandwidths, modulations, resource blocks.
8. All the radiated test cases were performed with Adapter 2.

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
2.	System Simulator	Anritsu	MT8000A	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

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

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

Offset = RF cable loss + attenuator factor.

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

Example :

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

= 4.2 + 10 = 14.2 (dB)

2.5 Frequency List of Low/Middle/High Channels

5G NR Band n2 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	372000	376000	380000
	Frequency	1860	1880	1900
15	Channel	371500	376000	380500
	Frequency	1857.5	1880	1902.5
10	Channel	371000	376000	381000
	Frequency	1855	1880	1905
5	Channel	370500	376000	381500
	Frequency	1852.5	1880	1907.5

5G NR Band n5 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	166800	167300	167800
	Frequency	834	836.5	839
15	Channel	166300	167300	168300
	Frequency	831.5	836.5	841.5
10	Channel	165800	167300	168800
	Frequency	829	836.5	844
5	Channel	165300	167300	169300
	Frequency	826.5	836.5	846.5

5G NR Band n25 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	372000	376500	381000
	Frequency	1860	1882.5	1905
15	Channel	371500	376500	381500
	Frequency	1857.5	1882.5	1907.5
10	Channel	371000	376500	382000
	Frequency	1855	1882.5	1910
5	Channel	370500	376500	382500
	Frequency	1852.5	1882.5	1912.5

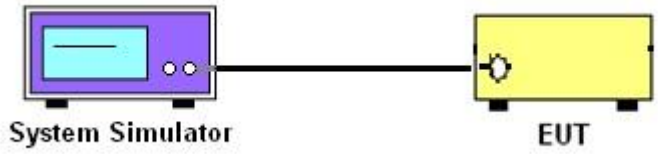
3 Conducted Test Items

3.1 Measuring Instruments

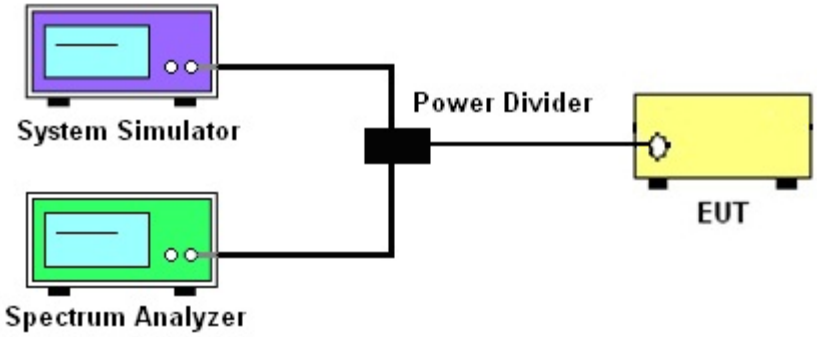
See list of measuring instruments of this test report.

3.1.1 Test Setup

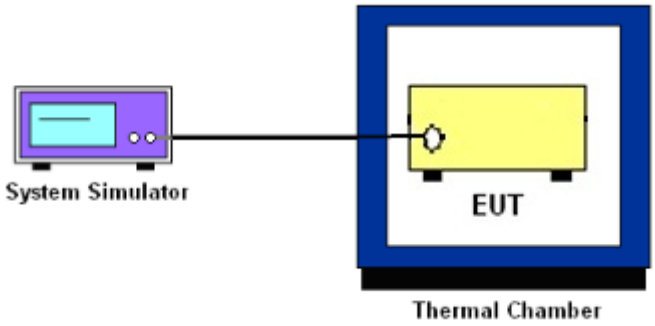
3.1.2 Conducted Output Power



3.1.3 Peak-to-Average Ratio, Occupied Bandwidth ,Conducted Band-Edge and Conducted Spurious Emission



3.1.4 Frequency Stability



3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

3.2 Conducted Output Power and ERP/EIRP

3.2.1 Description of the Conducted Output Power Measurement and ERP/EIRP Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 7 Watts for 5G NR n5

The EIRP of mobile transmitters must not exceed 2 Watts for 5G NR n2 and n25

According to KDB 412172 D01 Power Approach,

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

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

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

3.2.2 Test Procedures

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

3.3 Peak-to-Average Ratio

3.3.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.3.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.2.6

1. The EUT was connected to spectrum and system simulator via a power divider.
2. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
3. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.

3.4 Occupied Bandwidth

3.4.1 Description of Occupied Bandwidth Measurement

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

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

3.4.2 Test Procedures

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

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

3.5 Conducted Band Edge

3.5.1 Description of Conducted Band Edge Measurement

22.917(a)

For operations in the 824 – 849 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

24.238 (a)

For operations in the 1850-1910 and 1930-1990 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 1MHz bandwidth. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

3.5.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured.
3. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.
5. Set spectrum analyzer with RMS detector.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. Checked that all the results comply with the emission limit line.
   The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

3.6 Conducted Spurious Emission

3.6.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

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

3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

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

3.7 Frequency Stability

3.7.1 Description of Frequency Stability Measurement

22.355

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. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

24.235

The frequency stability shall be sufficient 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 9.0.

1. The EUT was set up in the thermal chamber and connected with the system simulator.
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 9.0.

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

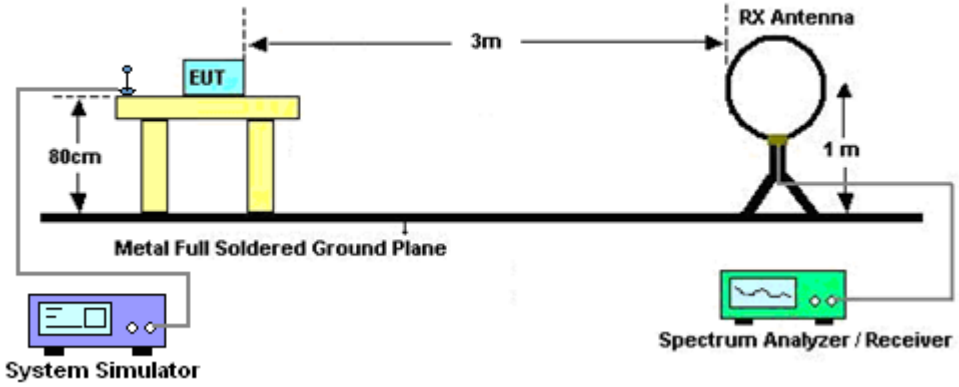
4 Radiated Test Items

4.1 Measuring Instruments

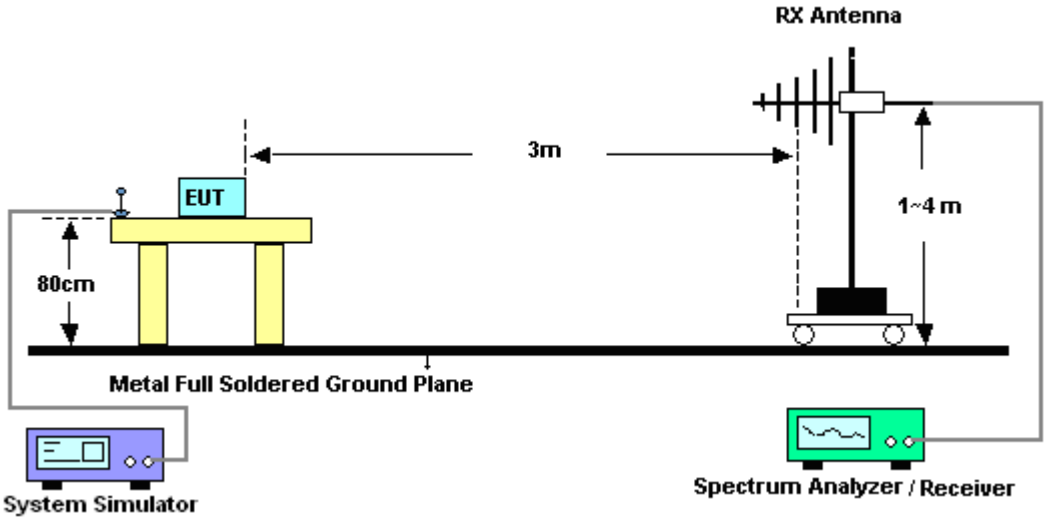
See list of measuring instruments of this test report.

4.1.1 Test Setup

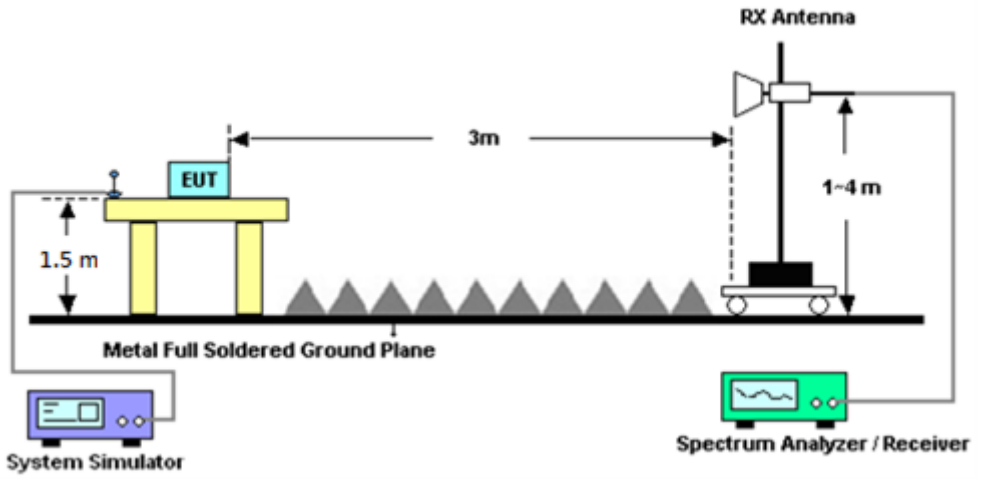
For radiated emissions below 30MHz



For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

Note:

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

4.2 Radiated Spurious Emission Measurement

4.2.1 Description of Radiated Spurious Emission Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

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

4.2.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Radio Communication Analyzer	Anritsu	MT8821C	6261849015	N/A	Jul. 09, 2019	Jun. 30, 2020~ Jul. 06, 2020	Jul. 08, 2020	Conducted (TH05-HY)
5G Wireless Test Platform	Anritsu	MT8000A	6262012917	N/A	Jan. 20, 2020	Jun 30, 2020 ~ Jul. 06, 2020	Jan. 19, 2021	Conducted (TH05-HY)
5G Wireless Test Platform	Keysight	E7515B	MY59321821	FR1	Feb. 14, 2020	Jun 30, 2020 ~ Jul. 06, 2020	Feb. 13, 2021	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV30	101749	10Hz~30GHz	Jan. 10, 2020	Jun 30, 2020 ~ Jul. 06, 2020	Jan. 09, 2021	Conducted (TH05-HY)
DC Power Supply	GW Instek	GPE-2323	GET910896	0V~64V;0A~6A	Feb. 15, 2020	Jun 30, 2020 ~ Jul. 06, 2020	Feb. 14, 2021	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-40℃~90℃	Sep. 02, 2019	Jun 30, 2020 ~ Jul. 06, 2020	Sep. 01, 2020	Conducted (TH05-HY)
Coupler	Warison	20dB 25W SMA Directional Coupler	#A	1-18GHz	Jan. 12, 2020	Jun. 30, 2020~ Jul. 06, 2020	Jan. 11, 2021	Conducted (TH05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Dec. 26, 2019	Jul. 16, 2020~ Jul. 22, 2020	Dec. 25, 2020	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	37059 & 01	30MHz~1GHz	Oct. 12, 2019	Jul. 16, 2020~ Jul. 22, 2020	Oct. 11, 2020	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1328	1GHz~18GHz	Nov. 14, 2019	Jul. 16, 2020~ Jul. 22, 2020	Nov. 13, 2020	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz~40GHz	Dec. 10, 2019	Jul. 16, 2020~ Jul. 22, 2020	Dec. 09, 2020	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 25, 2020	Jul. 16, 2020~ Jul. 22, 2020	Mar. 24, 2021	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A02375	1GHz~26.5GHz	Mar. 26, 2020	Jul. 16, 2020~ Jul. 22, 2020	Mar. 25, 2021	Radiation (03CH12-HY)
Preamplifier	Jet-Power	JPA0118-55-303K	1710001800054002	1GHz~18GHz	Aug. 06, 2019	Jul. 16, 2020~ Jul. 22, 2020	Aug. 05, 2020	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 13, 2019	Jul. 16, 2020~ Jul. 22, 2020	Dec. 12, 2020	Radiation (03CH12-HY)
Spectrum Analyzer	Agilent	N9010A	MY534701118	10Hz~44GHz	Mar. 12, 2020	Jul. 16, 2020~ Jul. 22, 2020	Mar. 11, 2021	Radiation (03CH12-HY)
Signal Generator	Rohde & Schwarz	SMB100A	101107	100kHz~40GHz	Aug. 27, 2019	Jul. 16, 2020~ Jul. 22, 2020	Aug. 26, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 12, 2019	Jul. 16, 2020~ Jul. 22, 2020	Dec. 11, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Feb. 25, 2020	Jul. 16, 2020~ Jul. 22, 2020	Feb. 24, 2021	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz~40GHz	Feb. 25, 2020	Jul. 16, 2020~ Jul. 22, 2020	Feb. 24, 2021	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP140349	N/A	Oct. 25, 2019	Jul. 16, 2020~ Jul. 22, 2020	Oct. 24, 2020	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Jul. 02, 2020~ Jul. 19, 2020	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jul. 02, 2020~ Jul. 19, 2020	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jul. 02, 2020~ Jul. 19, 2020	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Jul. 02, 2020~ Jul. 19, 2020	N/A	Radiation (03CH12-HY)

6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.24**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.62**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.06**

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

<PT Antenna>
<DFT-s-OFDM>

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	1	PI/2 BPSK	23.14	23.10	23.05
5	1	23		23.20	23.29	23.09
5	12	6		23.24	23.22	23.13
5	1	0		22.53	22.61	22.48
5	1	24		22.61	22.62	22.53
5	25	0		22.35	22.58	22.49
5	1	1	QPSK	23.06	23.04	23.01
5	1	23		23.04	23.12	23.06
5	12	6		23.15	23.17	23.07
5	1	0		22.01	22.00	22.00
5	1	24		22.09	22.12	22.00
5	25	0		22.02	22.07	22.09
5	1	1	16-QAM	21.91	21.94	21.78
5	1	1	64-QAM	20.55	20.58	20.48

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	1	PI/2 BPSK	23.30	23.19	23.15
10	1	50		23.28	23.16	23.13
10	25	12		23.39	23.30	23.20
10	1	0		22.70	22.60	22.54
10	1	51		22.71	22.63	22.47
10	50	0		22.68	22.62	22.56
10	1	1	QPSK	23.25	23.14	23.11
10	1	50		23.28	23.20	23.05
10	25	12		23.25	23.21	23.15
10	1	0		22.24	22.19	22.12
10	1	51		22.19	22.13	22.08
10	50	0		22.20	22.16	22.09
10	1	1	16-QAM	21.99	21.90	21.84
10	1	1	64-QAM	20.67	20.64	20.55

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	1	PI/2 BPSK	23.32	23.30	23.13
15	1	77		23.31	23.34	23.07
15	36	18		23.24	23.19	23.12
15	1	0		22.67	22.66	22.57
15	1	78		22.40	22.72	22.51
15	75	0		22.76	22.70	22.55
15	1	1	QPSK	23.10	23.23	23.09
15	1	77		23.27	23.19	23.09
15	36	18		23.19	23.15	23.08
15	1	0		22.19	22.06	22.00
15	1	78		22.17	22.10	22.01
15	75	0		22.23	22.16	22.07
15	1	1	16-QAM	22.03	22.06	21.88
15	1	1	64-QAM	20.69	20.65	20.55

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	1	PI/2 BPSK	23.10	23.11	23.01
20	1	104		23.02	23.03	23.06
20	50	25		23.12	23.19	23.07
20	1	0		22.54	22.53	22.44
20	1	105		22.48	22.50	22.27
20	100	0		22.57	22.54	22.43
20	1	1	QPSK	23.07	23.05	22.96
20	1	104		23.04	23.01	23.03
20	50	25		23.13	23.12	23.00
20	1	0		22.10	22.07	22.05
20	1	105		22.00	21.99	21.95
20	100	0		22.03	22.09	22.11
20	1	1	16-QAM	21.80	21.84	21.75
20	1	1	64-QAM	20.48	20.50	20.36

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	1	PI/2 BPSK	23.21	23.16	23.14
5	1	23		23.08	23.10	23.01
5	12	6		23.15	23.16	23.11
5	1	0		22.66	22.64	22.60
5	1	24		22.53	22.58	22.40
5	25	0		22.63	22.65	22.52
5	1	1	QPSK	23.14	23.10	23.07
5	1	23		23.10	23.09	22.94
5	12	6		23.16	23.18	23.03
5	1	0		22.21	22.10	22.02
5	1	24		21.99	22.01	21.91
5	25	0		22.20	22.24	22.04
5	1	1	16-QAM	21.99	21.96	21.94
5	1	1	64-QAM	20.67	20.68	20.56

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	1	PI/2 BPSK	23.13	23.08	23.10
10	1	50		23.11	23.12	23.03
10	25	12		23.27	23.22	23.12
10	1	0		22.57	22.50	22.47
10	1	51		22.49	22.59	22.36
10	50	0		22.60	21.50	22.51
10	1	1	QPSK	23.08	23.04	23.05
10	1	50		23.01	23.14	22.94
10	25	12		23.17	23.18	23.14
10	1	0		22.07	22.04	22.01
10	1	51		22.04	22.10	21.92
10	50	0		22.06	22.05	22.03
10	1	1	16-QAM	21.90	21.85	21.84
10	1	1	64-QAM	20.51	20.53	20.56

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	1	PI/2 BPSK	23.24	23.21	23.18
15	1	77		23.12	23.11	23.02
15	36	18		23.16	23.29	23.11
15	1	0		22.68	22.67	22.52
15	1	78		22.58	22.53	22.42
15	75	0		22.66	22.31	22.58
15	1	1	QPSK	23.20	23.26	23.14
15	1	77		23.17	23.10	23.01
15	36	18		23.16	23.24	23.13
15	1	0		22.15	22.18	22.05
15	1	78		22.13	22.01	21.94
15	75	0		22.19	22.23	22.07
15	1	1	16-QAM	22.00	21.99	21.90
15	1	1	64-QAM	20.67	20.68	20.57

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	1	PI/2 BPSK	23.21	23.65	23.20
20	1	104		23.10	23.12	23.00
20	50	25		23.23	23.29	22.66
20	1	0		22.55	22.70	22.62
20	1	105		22.40	22.52	22.43
20	100	0		20.78	20.90	22.62
20	1	1	QPSK	23.15	23.17	23.13
20	1	104		23.06	23.07	23.01
20	50	25		23.18	23.24	23.22
20	1	0		22.11	22.24	22.10
20	1	105		22.02	22.06	22.01
20	100	0		22.19	22.22	22.17
20	1	1	16-QAM	21.98	22.00	21.99
20	1	1	64-QAM	20.56	20.65	20.66

NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	1	PI/2 BPSK	23.11	23.09	23.08
5	1	23		23.15	23.19	23.10
5	12	6		23.09	23.20	23.07
5	1	0		22.57	22.59	22.48
5	1	24		22.56	22.55	22.35
5	25	0		22.70	22.62	22.63
5	1	1	QPSK	23.06	23.05	22.95
5	1	23		23.08	23.04	23.02
5	12	6		23.11	23.13	23.15
5	1	0		22.01	22.05	22.49
5	1	24		22.04	22.06	21.97
5	25	0		22.17	22.13	22.99
5	1	1	16-QAM	22.18	22.15	22.07
5	1	1	64-QAM	20.40	20.33	20.29

NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	1	PI/2 BPSK	23.28	23.22	23.17
10	1	50		23.14	23.20	23.08
10	25	12		23.27	23.13	23.11
10	1	0		22.60	22.51	22.49
10	1	51		22.62	22.68	22.46
10	50	0		22.71	22.64	22.58
10	1	1	QPSK	23.24	23.20	23.04
10	1	50		23.16	23.07	23.03
10	25	12		23.20	23.14	23.10
10	1	0		22.22	22.08	22.07
10	1	51		22.02	22.05	22.04
10	50	0		22.23	22.10	22.11
10	1	1	16-QAM	22.35	22.30	22.23
10	1	1	64-QAM	20.58	20.60	20.40

NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	1	PI/2 BPSK	23.23	23.14	23.12
15	1	77		23.20	23.15	23.13
15	36	18		23.25	23.06	23.13
15	1	0		22.68	22.55	22.65
15	1	78		22.59	22.55	22.47
15	75	0		22.67	22.58	22.56
15	1	1	QPSK	23.10	23.18	23.16
15	1	77		23.08	23.03	23.10
15	36	18		23.14	23.08	23.05
15	1	0		22.08	21.97	22.05
15	1	78		22.06	21.95	22.03
15	75	0		22.10	22.17	22.04
15	1	1	16-QAM	22.20	22.10	22.30
15	1	1	64-QAM	20.49	20.38	20.53

NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	1	PI/2 BPSK	23.10	23.16	23.14
20	1	104		23.02	23.01	23.00
20	50	25		23.10	23.15	23.13
20	1	0		22.60	22.58	22.53
20	1	105		22.43	22.37	22.38
20	100	0		22.56	22.55	22.49
20	1	1	QPSK	23.06	23.04	23.02
20	1	104		23.01	22.93	22.94
20	50	25		23.11	23.10	23.13
20	1	0		22.07	22.02	22.05
20	1	105		21.96	21.94	21.98
20	100	0		22.07	22.03	22.01
20	1	1	16-QAM	22.09	22.07	22.11
20	1	1	64-QAM	20.41	20.36	20.35

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NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	1	QPSK	21.98	22.02	21.94
5	1	1	16-QAM	21.02	20.98	20.87
5	1	1	64-QAM	19.60	19.61	19.51

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	1	QPSK	22.07	21.99	21.96
10	1	1	16-QAM	21.13	21.03	20.98
10	1	1	64-QAM	19.67	19.71	19.63

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	1	QPSK	22.03	22.00	21.84
15	1	1	16-QAM	21.10	21.06	20.93
15	1	1	64-QAM	19.77	19.70	19.55

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	1	QPSK	21.82	21.81	21.70
20	1	1	16-QAM	20.93	20.98	20.84
20	1	1	64-QAM	19.60	19.57	19.45

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	1	QPSK	22.09	22.02	22.04
5	1	1	16-QAM	21.11	21.06	21.09
5	1	1	64-QAM	19.79	19.72	19.69

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	1	QPSK	21.93	21.92	21.90
10	1	1	16-QAM	21.04	20.94	20.93
10	1	1	64-QAM	19.61	19.55	19.58

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	1	QPSK	22.01	22.04	21.97
15	1	1	16-QAM	21.20	21.19	21.05
15	1	1	64-QAM	19.73	19.75	19.65

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	1	QPSK	21.96	22.00	21.97
20	1	1	16-QAM	21.10	21.18	21.08
20	1	1	64-QAM	19.75	19.76	19.70

NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	1	QPSK	21.47	21.41	21.36
5	1	1	16-QAM	20.94	20.91	20.97
5	1	1	64-QAM	19.47	19.55	19.43

NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	1	QPSK	21.58	21.42	21.52
10	1	1	16-QAM	21.21	21.19	21.15
10	1	1	64-QAM	19.67	19.50	19.58

NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	1	QPSK	21.58	21.47	21.41
15	1	1	16-QAM	21.19	21.10	21.09
15	1	1	64-QAM	19.57	19.47	19.48

NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	1	QPSK	21.51	21.46	21.48
20	1	1	16-QAM	20.96	20.89	20.90
20	1	1	64-QAM	19.50	19.46	19.48

<ASDIV Antenna>
<DFT-s-OFDM>

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	1	PI/2 BPSK	21.77	21.59	21.52
5	1	23		21.89	21.71	21.58
5	12	6		21.75	21.77	21.66
5	1	0		21.22	20.96	20.90
5	1	24		21.26	21.06	21.01
5	25	0		21.21	21.13	21.11
5	1	1	QPSK	21.61	21.50	21.45
5	1	23		21.76	21.58	21.43
5	12	6		21.82	21.64	21.57
5	1	0		20.68	20.51	20.38
5	1	24		20.73	20.62	20.50
5	25	0		20.74	20.62	20.55
5	1	1	16-QAM	20.79	20.73	20.51
5	1	1	64-QAM	19.10	18.88	18.80

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	1	PI/2 BPSK	21.85	21.70	21.57
10	1	50		21.79	21.63	21.60
10	25	12		21.98	21.72	21.75
10	1	0		21.35	21.10	21.04
10	1	51		21.26	21.05	21.00
10	50	0		21.34	21.09	21.13
10	1	1	QPSK	21.77	21.58	21.53
10	1	50		21.85	21.56	21.53
10	25	12		21.84	21.62	21.65
10	1	0		20.80	20.66	20.55
10	1	51		20.83	20.61	20.50
10	50	0		20.78	20.60	20.61
10	1	1	16-QAM	20.92	20.79	20.64
10	1	1	64-QAM	19.13	18.91	18.82

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	1	PI/2 BPSK	21.95	21.74	21.52
15	1	77		21.89	21.77	21.64
15	36	18		21.63	21.71	21.58
15	1	0		21.23	21.18	21.02
15	1	78		21.27	21.11	21.03
15	75	0		21.42	21.24	21.08
15	1	1	QPSK	21.71	21.61	21.44
15	1	77		21.69	21.64	21.41
15	36	18		21.84	21.69	21.52
15	1	0		20.77	20.67	20.44
15	1	78		20.85	20.54	20.50
15	75	0		20.78	20.65	20.55
15	1	1	16-QAM	20.89	20.85	20.70
15	1	1	64-QAM	19.07	19.02	19.01

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	1	PI/2 BPSK	21.82	21.70	21.60
20	1	104		21.72	21.65	21.54
20	50	25		21.89	21.85	21.73
20	1	0		21.23	21.12	21.02
20	1	105		21.10	21.08	20.98
20	100	0		21.27	21.16	21.07
20	1	1	QPSK	21.77	21.68	21.58
20	1	104		21.69	21.56	21.51
20	50	25		21.81	21.77	21.62
20	1	0		20.81	20.72	20.58
20	1	105		20.50	20.55	20.48
20	100	0		20.78	20.66	20.56
20	1	1	16-QAM	20.86	20.83	20.67
20	1	1	64-QAM	19.14	19.36	19.16

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	1	PI/2 BPSK	22.13	22.06	22.12
5	1	23		22.03	22.09	22.00
5	12	6		22.15	22.15	22.10
5	1	0		22.12	22.04	22.08
5	1	24		21.98	22.00	21.87
5	25	0		22.07	22.09	22.01
5	1	1	QPSK	22.08	22.01	22.02
5	1	23		22.03	22.01	22.01
5	12	6		22.10	22.07	22.11
5	1	0		22.06	21.96	22.05
5	1	24		22.02	21.98	21.89
5	25	0		22.20	22.08	22.07
5	1	1	16-QAM	22.39	22.12	22.18
5	1	1	64-QAM	20.47	20.30	20.37

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	1	PI/2 BPSK	22.10	22.16	22.04
10	1	50		22.03	22.21	22.02
10	25	12		22.14	22.23	22.14
10	1	0		22.00	21.94	22.00
10	1	51		21.88	22.18	21.86
10	50	0		22.00	19.50	22.02
10	1	1	QPSK	22.02	22.07	22.05
10	1	50		22.04	22.04	22.03
10	25	12		22.07	22.22	22.08
10	1	0		22.02	21.97	22.02
10	1	51		21.90	22.13	21.87
10	50	0		22.08	22.18	22.06
10	1	1	16-QAM	22.20	22.10	22.04
10	1	1	64-QAM	20.42	20.40	20.34

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	1	PI/2 BPSK	22.37	22.29	22.25
15	1	77		22.17	22.11	22.15
15	36	18		22.12	22.23	22.16
15	1	0		22.24	22.20	22.10
15	1	78		22.13	22.09	22.02
15	75	0		19.92	22.27	22.18
15	1	1	QPSK	22.23	22.16	22.20
15	1	77		22.24	22.21	22.07
15	36	18		22.15	22.34	22.17
15	1	0		22.10	22.01	22.03
15	1	78		22.12	22.07	21.99
15	75	0		22.23	22.28	22.14
15	1	1	16-QAM	22.28	22.34	22.18
15	1	1	64-QAM	20.63	20.57	20.42

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	1	PI/2 BPSK	22.23	22.26	22.18
20	1	104		22.12	22.18	22.11
20	50	25		20.66	22.54	22.40
20	1	0		22.13	22.22	22.16
20	1	105		22.09	22.06	21.99
20	100	0		19.50	19.58	22.10
20	1	1	QPSK	22.10	22.15	22.05
20	1	104		22.08	22.17	22.09
20	50	25		22.26	22.38	22.27
20	1	0		22.07	22.24	22.05
20	1	105		21.95	22.02	21.94
20	100	0		22.19	22.24	22.03
20	1	1	16-QAM	22.16	22.28	22.25
20	1	1	64-QAM	20.60	20.62	20.55

NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	1	PI/2 BPSK	21.70	21.53	21.51
5	1	23		21.75	21.62	21.48
5	12	6		21.79	21.57	21.48
5	1	0		21.18	20.97	20.90
5	1	24		21.24	21.02	20.93
5	25	0		21.29	21.05	21.06
5	1	1	QPSK	21.66	21.37	21.34
5	1	23		21.59	21.42	21.39
5	12	6		21.74	21.45	21.52
5	1	0		20.61	20.50	20.46
5	1	24		20.63	20.44	20.45
5	25	0		20.71	20.51	20.50
5	1	1	16-QAM	20.79	20.49	20.51
5	1	1	64-QAM	19.01	18.71	18.74

NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	1	PI/2 BPSK	21.75	21.54	21.46
10	1	50		21.64	21.52	21.43
10	25	12		21.83	21.73	21.65
10	1	0		21.24	21.12	20.99
10	1	51		21.22	20.93	20.96
10	50	0		21.28	21.05	21.08
10	1	1	QPSK	21.68	21.46	21.48
10	1	50		21.72	21.46	21.44
10	25	12		21.82	21.61	21.55
10	1	0		20.78	20.53	20.49
10	1	51		20.69	20.49	20.48
10	50	0		20.78	20.61	20.53
10	1	1	16-QAM	20.83	20.63	20.54
10	1	1	64-QAM	18.99	18.82	18.70

NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	1	PI/2 BPSK	21.74	21.64	21.62
15	1	77		21.67	21.63	21.57
15	36	18		21.65	21.59	21.55
15	1	0		21.17	21.10	21.04
15	1	78		21.35	21.04	21.08
15	75	0		21.14	21.05	21.04
15	1	1	QPSK	21.58	21.57	21.46
15	1	77		21.55	21.48	21.47
15	36	18		21.59	21.53	21.49
15	1	0		20.62	20.53	20.44
15	1	78		20.53	20.47	20.44
15	75	0		20.55	20.54	20.32
15	1	1	16-QAM	20.72	20.68	20.63
15	1	1	64-QAM	19.03	18.93	18.72

NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	1	PI/2 BPSK	21.75	21.67	21.55
20	1	104		21.64	21.45	21.42
20	50	25		21.69	21.61	21.62
20	1	0		21.22	21.09	21.06
20	1	105		21.13	20.90	20.85
20	100	0		20.87	21.04	20.60
20	1	1	QPSK	21.65	21.55	21.53
20	1	104		21.60	21.44	21.39
20	50	25		21.41	21.63	21.55
20	1	0		20.72	20.65	20.52
20	1	105		20.59	20.35	20.39
20	100	0		20.75	20.55	20.51
20	1	1	16-QAM	20.79	20.69	20.47
20	1	1	64-QAM	19.02	18.87	18.79

<CP-OFDM>

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	1	QPSK	20.12	20.00	19.90
5	1	1	16-QAM	19.78	19.70	19.59
5	1	1	64-QAM	18.18	18.07	18.10

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	1	QPSK	20.10	20.01	19.94
10	1	1	16-QAM	19.75	19.87	19.68
10	1	1	64-QAM	18.34	18.33	18.15

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	1	QPSK	20.15	20.03	19.89
15	1	1	16-QAM	19.73	19.83	19.55
15	1	1	64-QAM	18.21	18.10	18.03

NR n2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	1	QPSK	20.09	20.02	20.05
20	1	1	16-QAM	19.70	19.75	19.59
20	1	1	64-QAM	18.49	18.33	18.55

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	1	QPSK	21.50	21.49	21.65
5	1	1	16-QAM	21.28	21.37	21.33
5	1	1	64-QAM	19.37	19.44	19.38

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	1	QPSK	21.35	21.24	21.30
10	1	1	16-QAM	21.07	21.02	20.89
10	1	1	64-QAM	19.42	19.35	19.51

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	1	QPSK	21.67	21.64	21.49
15	1	1	16-QAM	21.07	21.22	21.11
15	1	1	64-QAM	19.72	19.62	19.56

NR n5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	1	QPSK	21.68	21.72	21.66
20	1	1	16-QAM	21.19	21.23	21.37
20	1	1	64-QAM	19.65	19.77	19.61

NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	1	QPSK	20.03	19.92	19.86
5	1	1	16-QAM	19.78	19.71	19.53
5	1	1	64-QAM	17.97	17.88	17.76

NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	1	QPSK	20.15	19.98	19.81
10	1	1	16-QAM	19.97	19.64	19.75
10	1	1	64-QAM	18.06	17.86	17.73

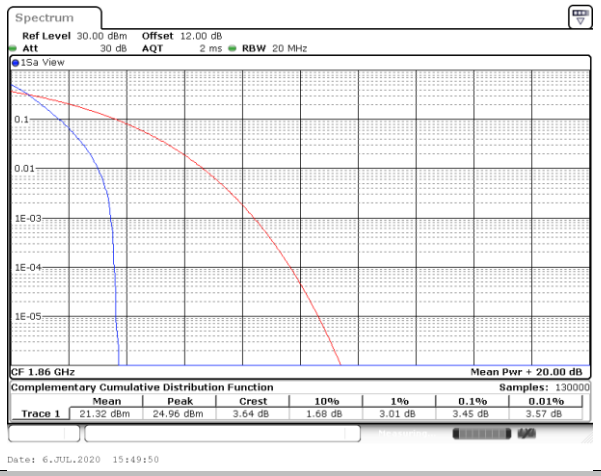
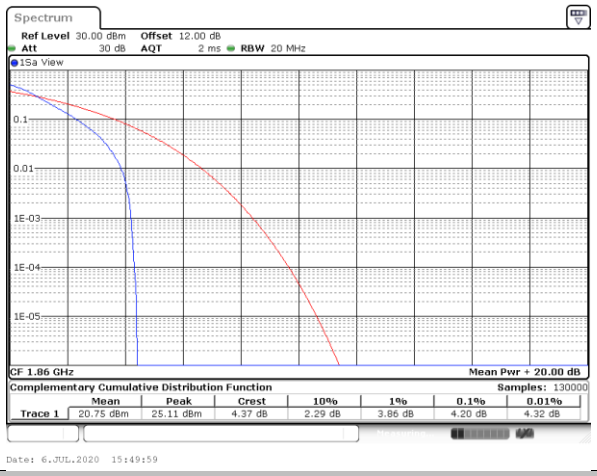
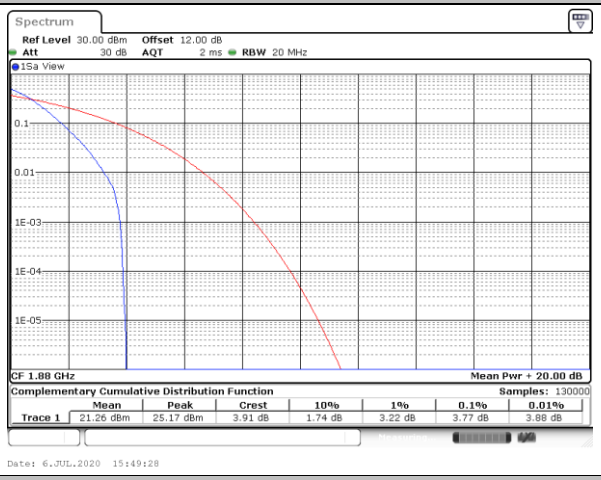
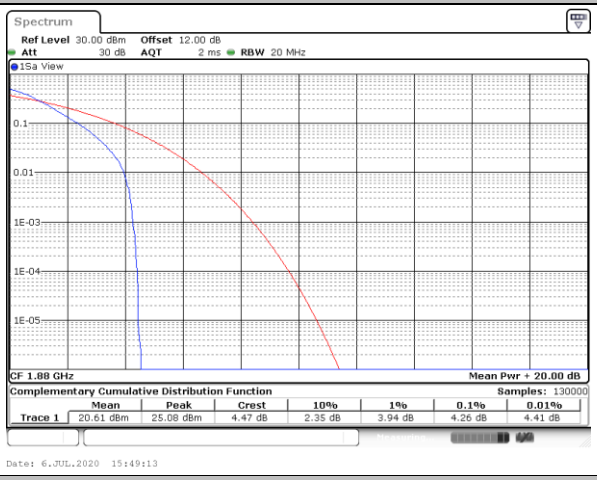
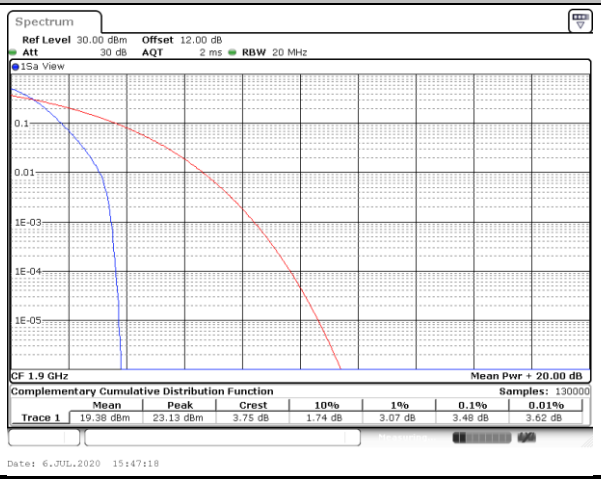
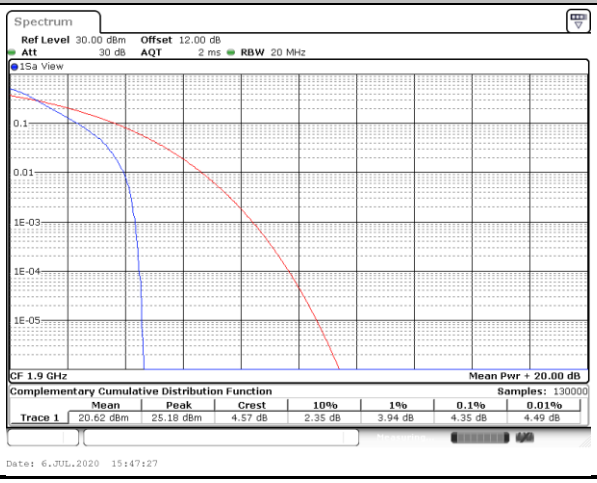
NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	1	QPSK	20.19	19.95	19.86
15	1	1	16-QAM	19.94	19.87	19.68
15	1	1	64-QAM	18.05	17.91	17.71

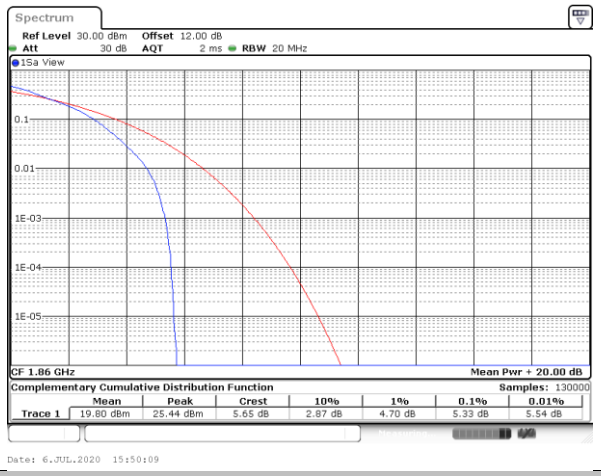
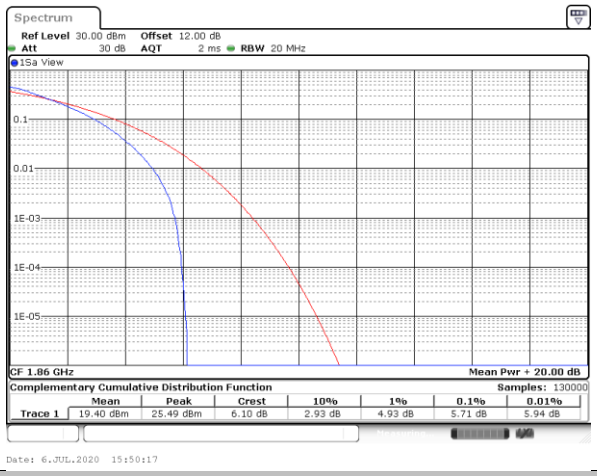
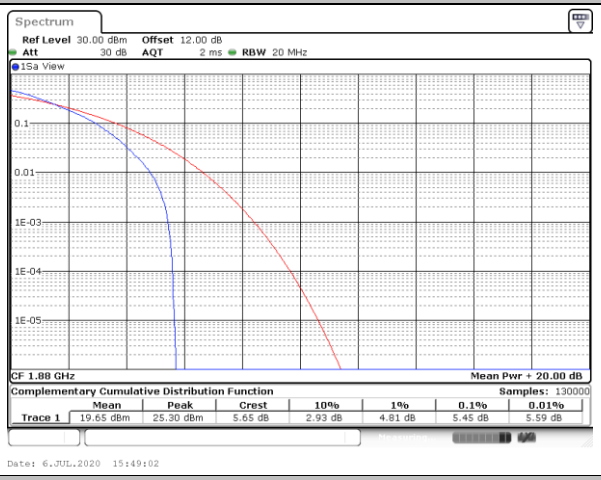
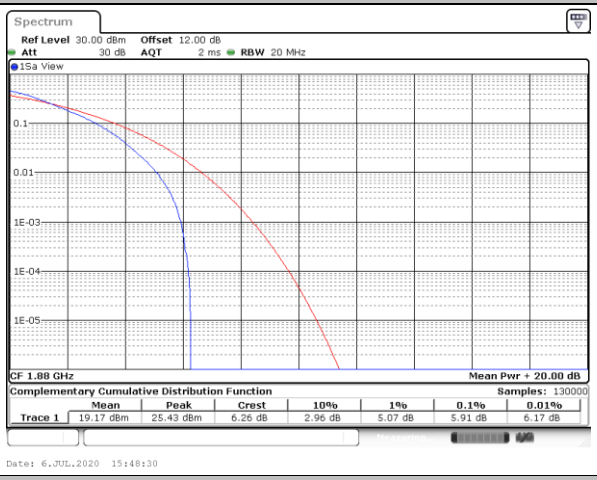
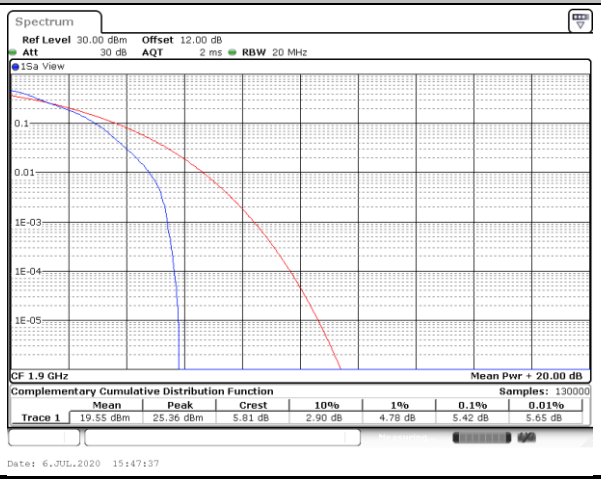
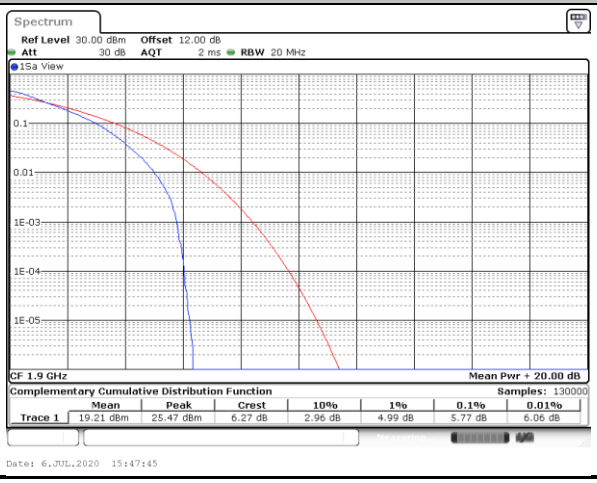
NR n25 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	1	QPSK	20.14	19.83	19.93
20	1	1	16-QAM	19.99	19.59	19.83
20	1	1	64-QAM	18.10	17.70	17.81

FR1 n2

Peak-to-Average Ratio

Mode	FR1 n2 / 20MHz / DFT-S OFDM				
Mod.	PI/2 BPSK	QPSK	16QAM	64QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Full RB	Result
Lowest CH	3.45	4.20	5.33	5.71	PASS
Middle CH	3.77	4.26	5.45	5.91	
Highest CH	3.48	4.35	5.42	5.77	

FR1 n2 / 20MHz / DFT-S OFDM	
PI/2 BPSK	**QPSK**
Lowest Channel / Full RB	**Lowest Channel / Full RB**
	
Middle Channel / Full RB	**Middle Channel / Full RB**
	
Highest Channel / Full RB	**Highest Channel / Full RB**
	

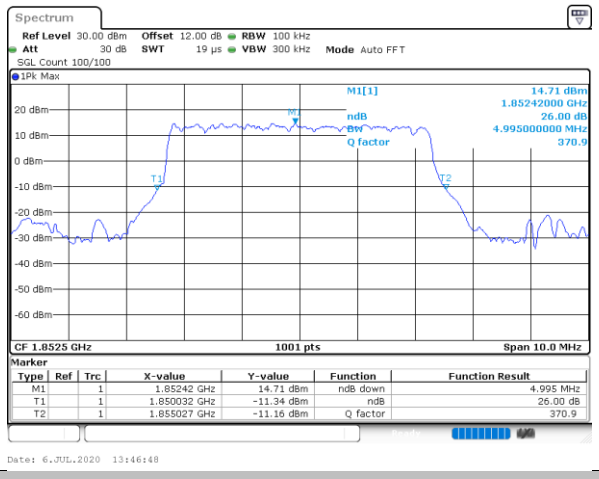
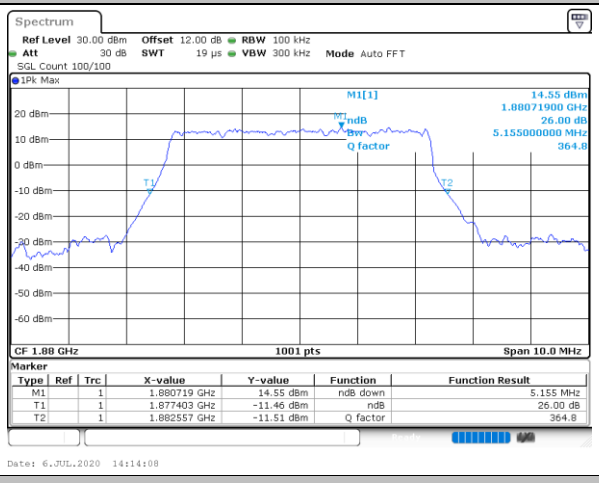
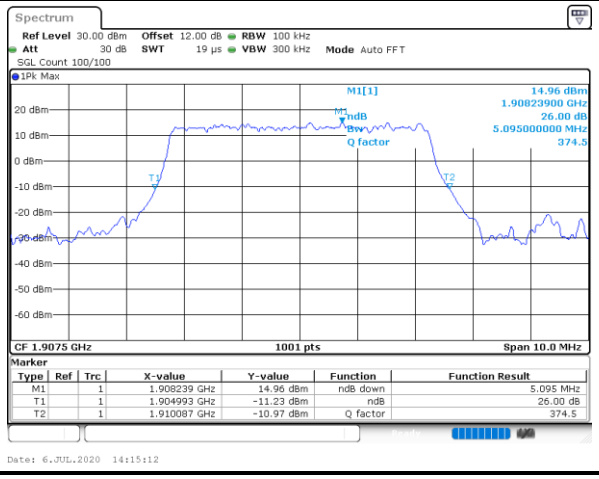
FR1 n2 / 20MHz / DFT-S OFDM	
16QAM	**64QAM**
Lowest Channel / Full RB	**Lowest Channel / Full RB**
	
Middle Channel / Full RB	**Middle Channel / Full RB**
	
Highest Channel / Full RB	**Highest Channel / Full RB**
	

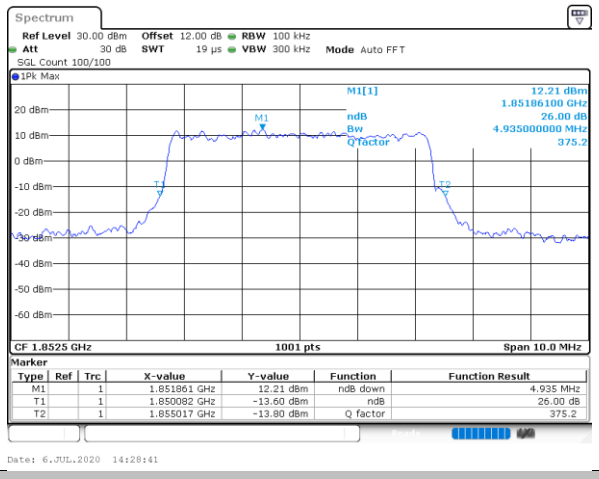
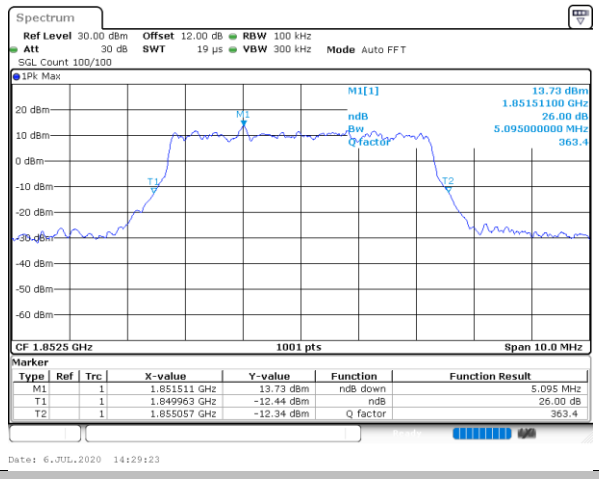
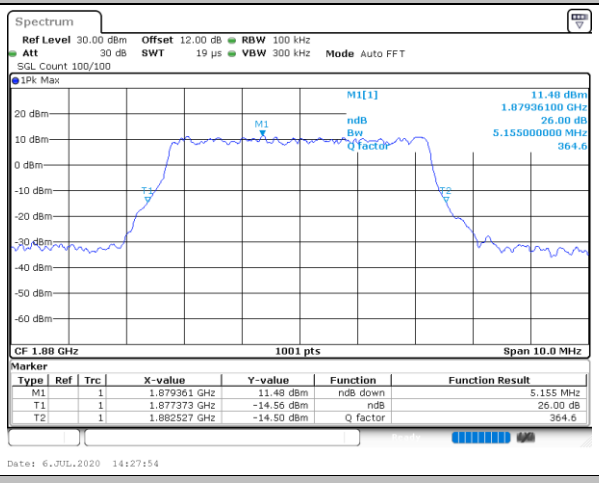
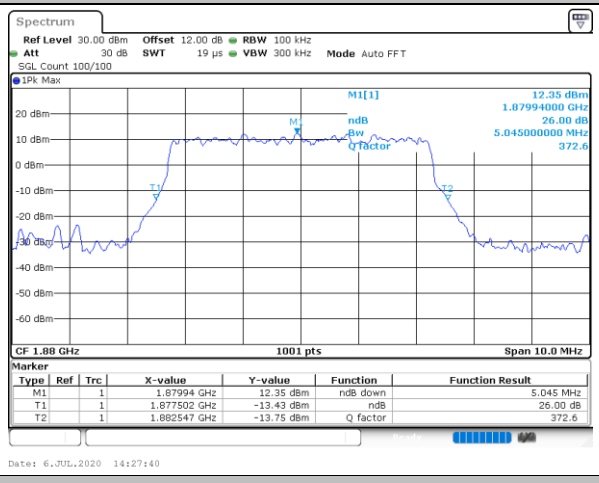
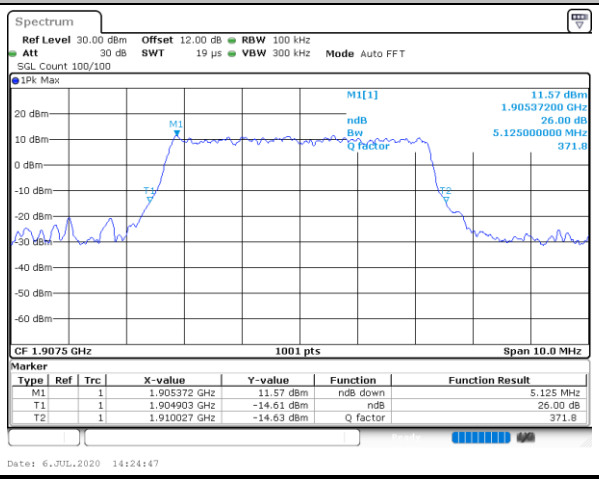
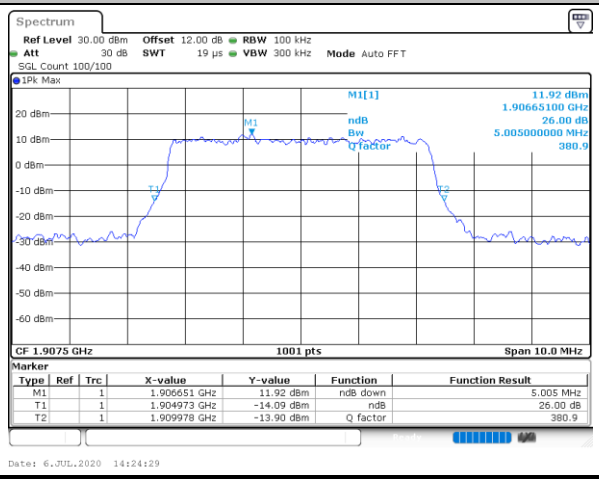
26dB Bandwidth

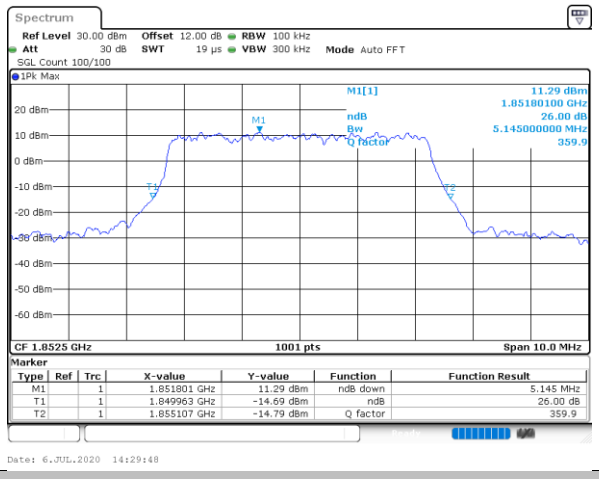
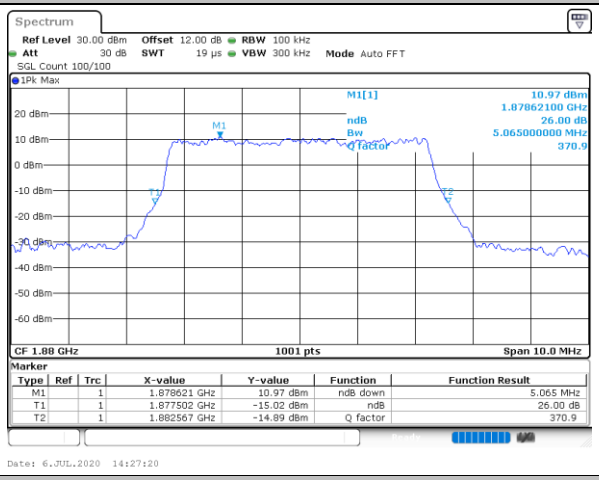
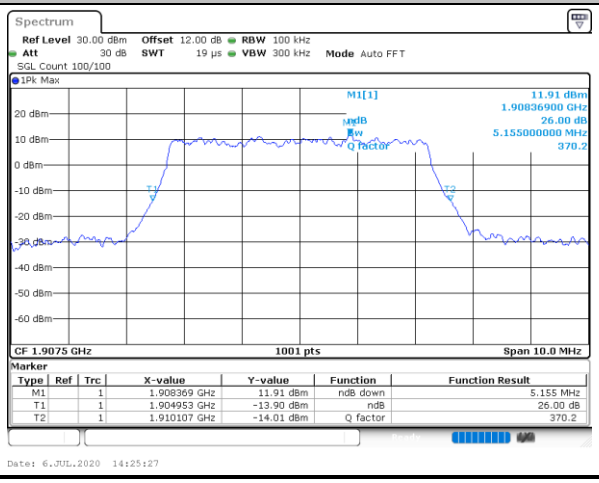
Mode	FR1 n2 : 26dB BW(MHz) / DFT-S OFDM							
BW	5MHz		10MHz		15MHz		20MHz	
Mod.	PI/2 BPSK		PI/2 BPSK		PI/2 BPSK		PI/2 BPSK	
Lowest CH	5.00		9.63		14.33		18.82	
Middle CH	5.16		9.61		14.51		18.94	
Highest CH	5.10		9.49		14.45		18.86	

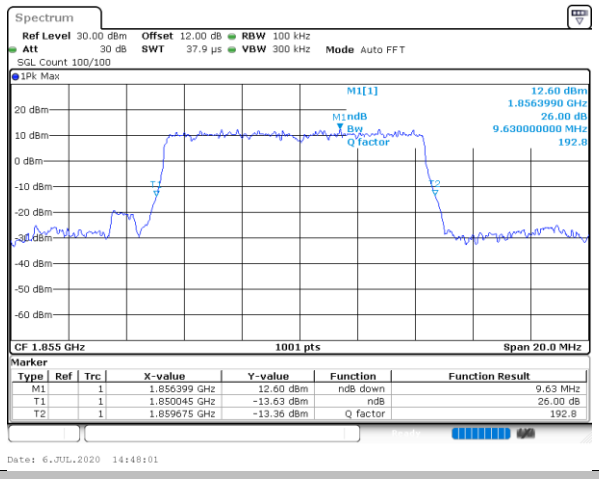
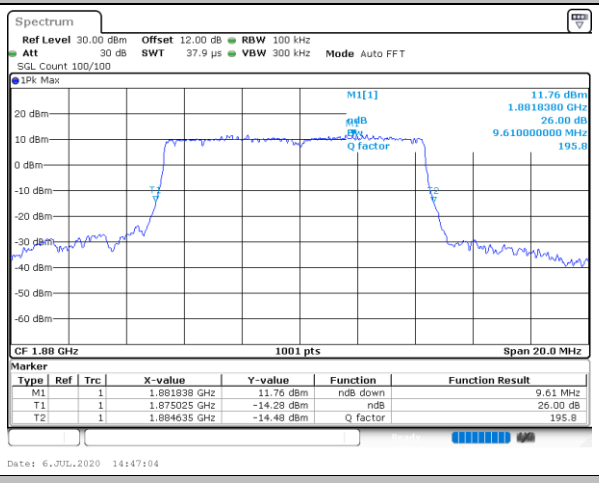
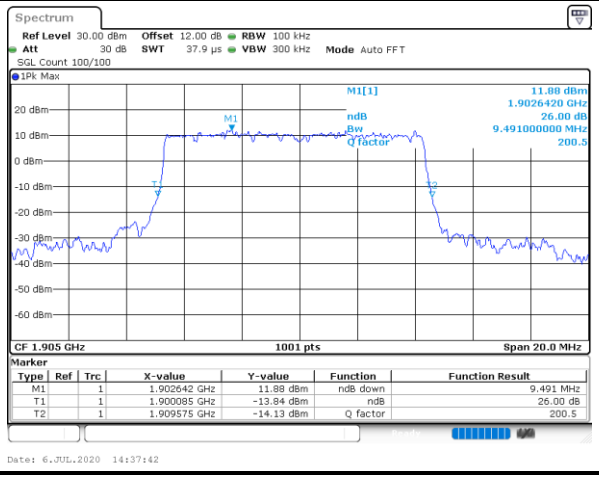
Mode	FR1 n2 : 26dB BW(MHz) / CP OFDM							
BW	5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	4.94	5.10	9.93	9.77	14.96	15.08	20.02	19.98
Middle CH	5.16	5.05	9.99	9.85	15.11	14.90	19.86	19.90
Highest CH	5.13	5.01	10.17	9.99	15.20	15.05	19.90	19.90

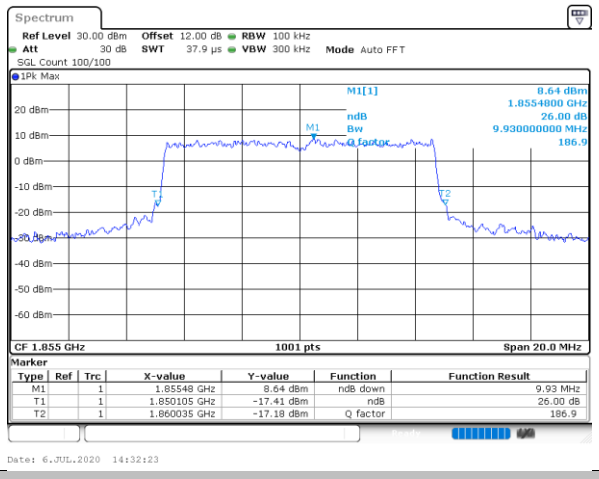
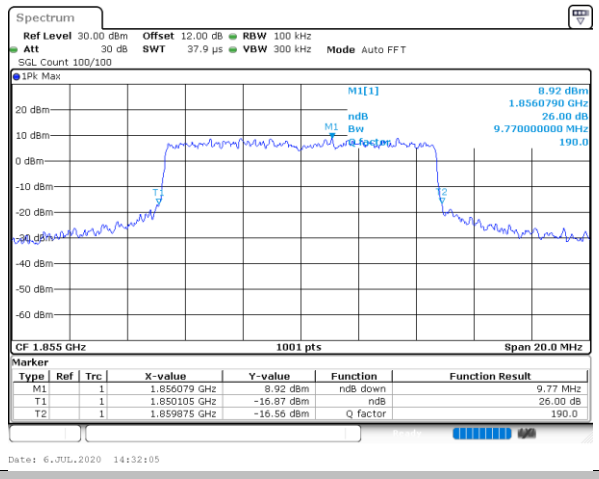
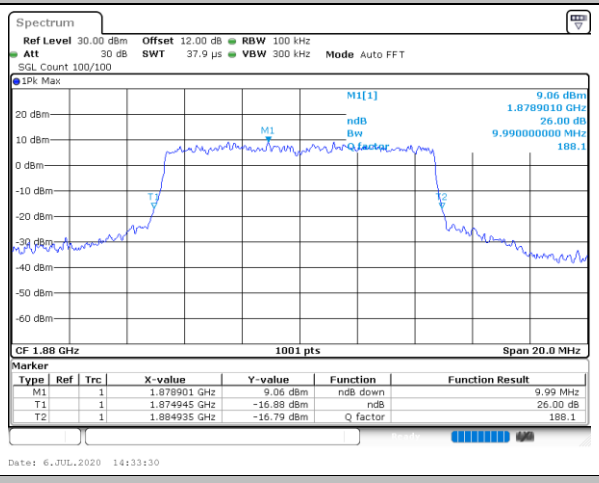
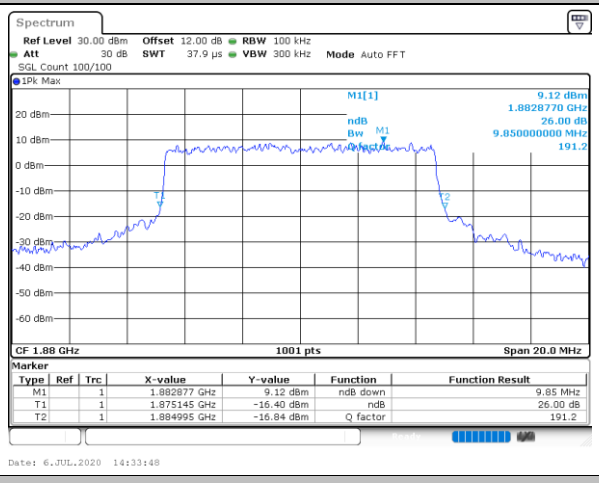
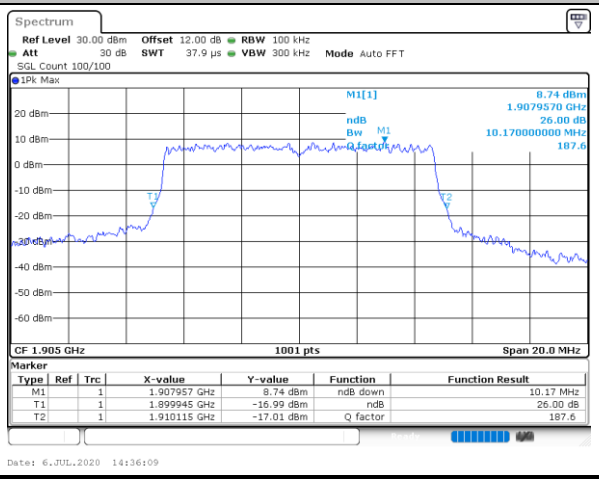
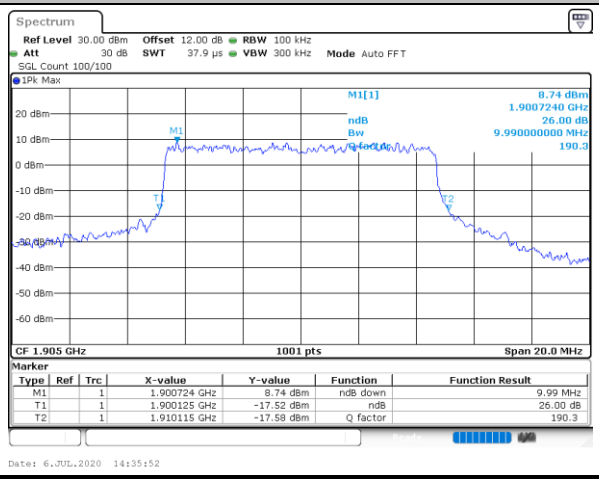
Mode	FR1 n2 : 26dB BW(MHz) / CP OFDM							
BW	5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM		64QAM		64QAM		64QAM	
Lowest CH	5.15		9.99		15.17		20.14	
Middle CH	5.07		9.99		14.99		19.90	
Highest CH	5.16		9.83		15.08		19.86	

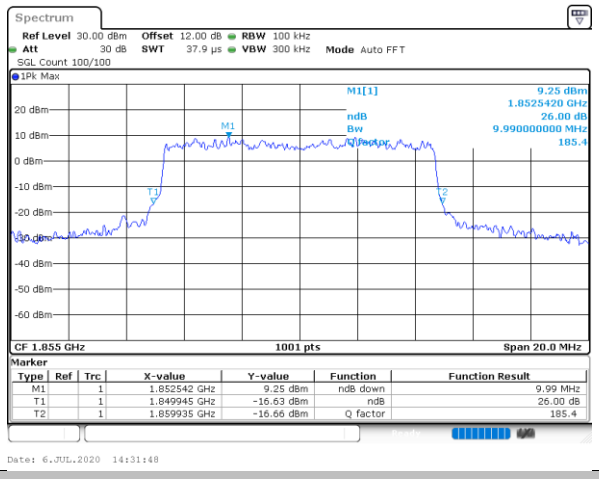
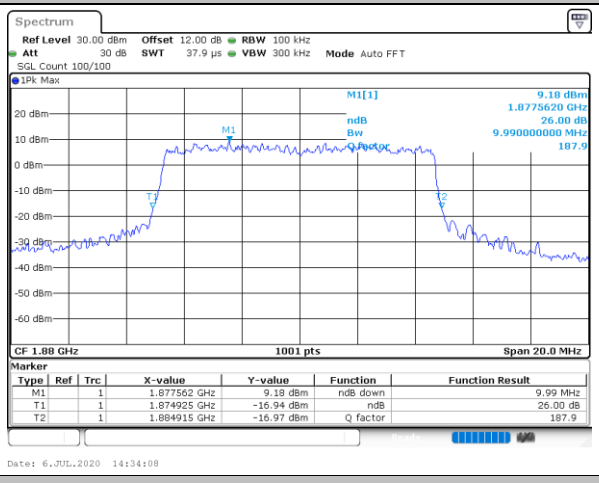
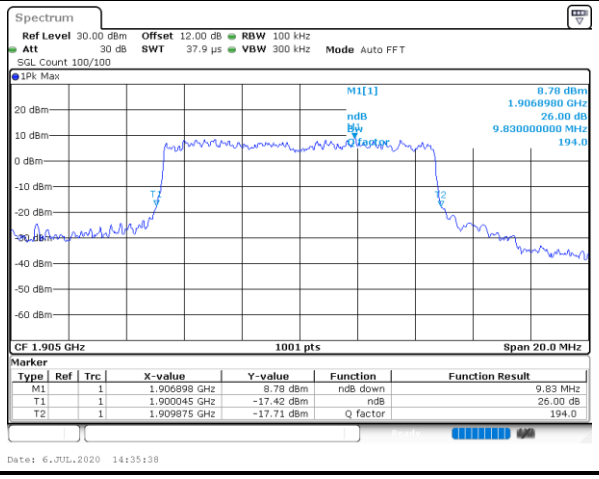
FR1 n2 / 5MHz / DFT-S OFDM	
PI/2 BPSK	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

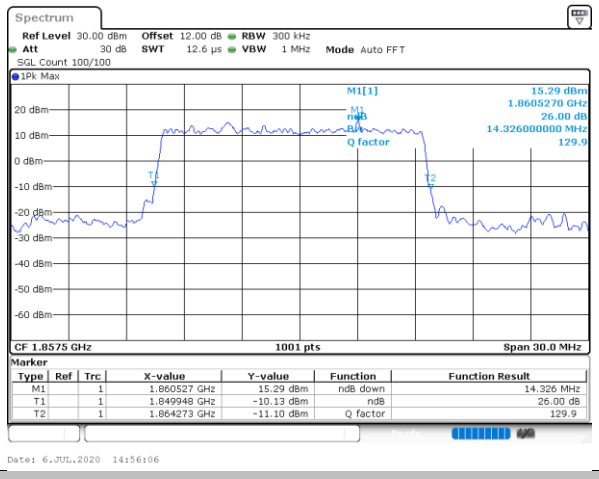
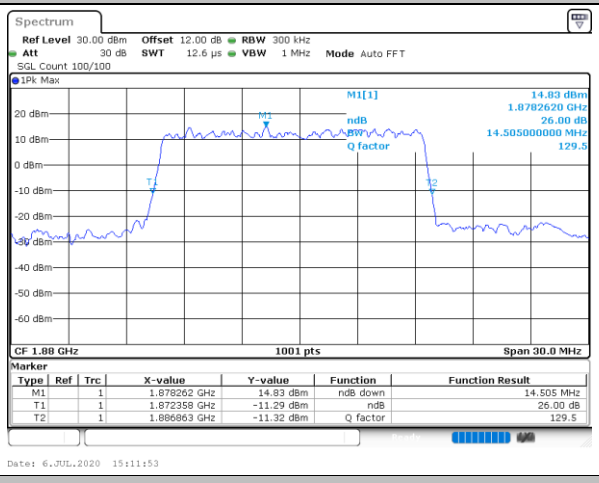
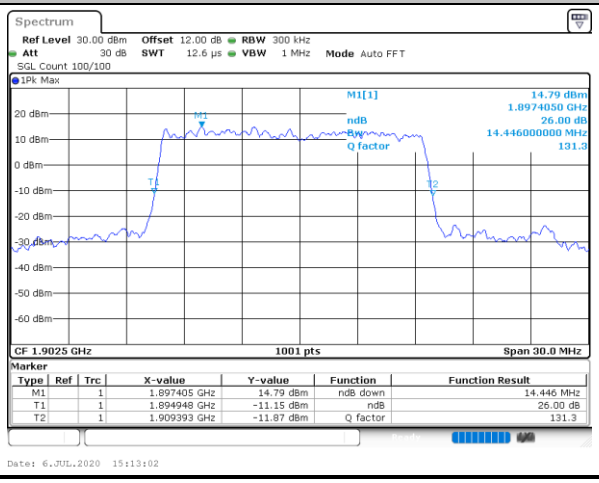
FR1 n2 / 5MHz / CP OFDM	
QPSK	**16QAM**
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

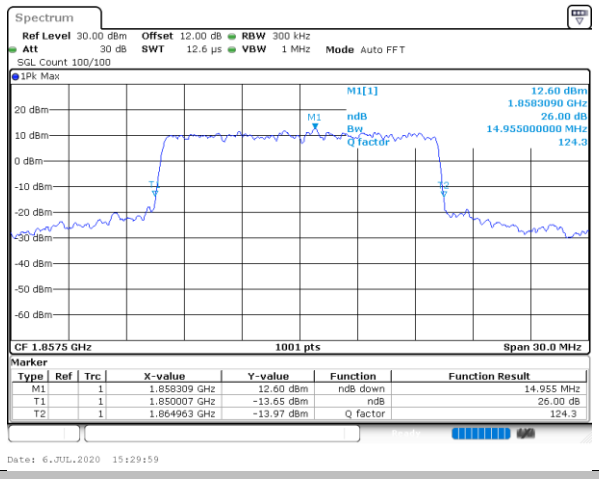
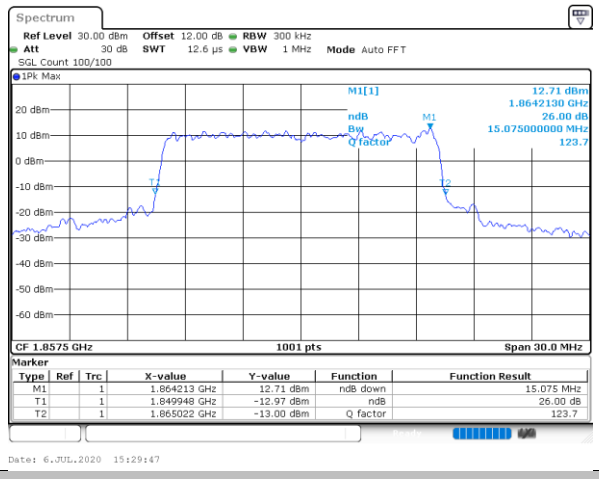
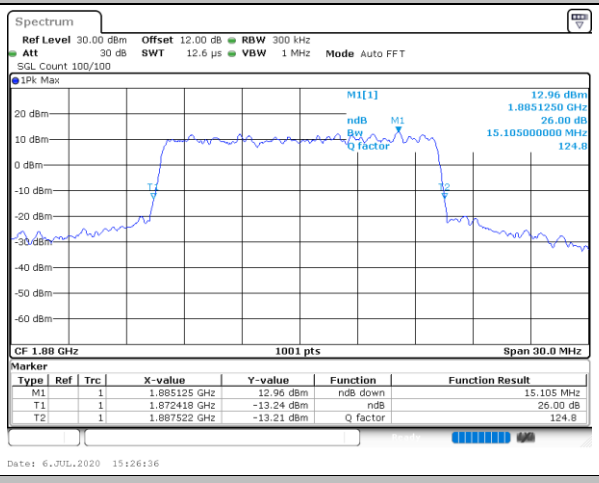
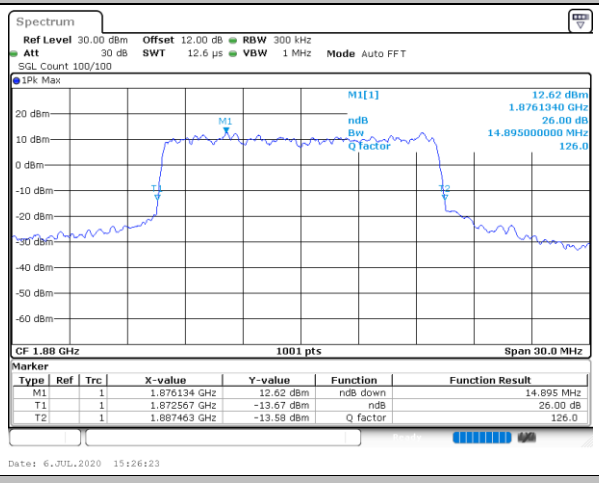
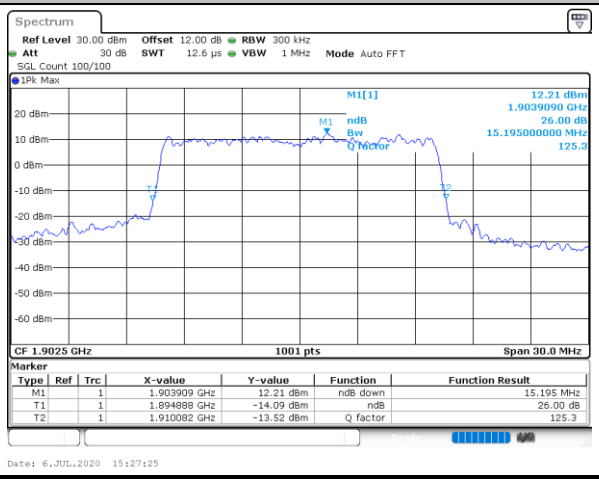
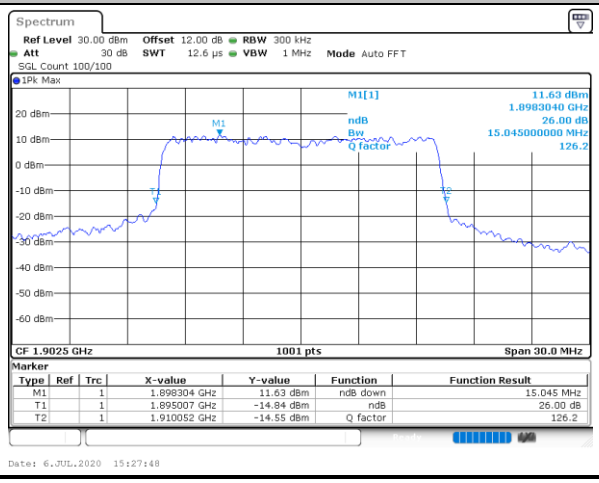
FR1 n2 / 5MHz / CP OFDM	
64QAM	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

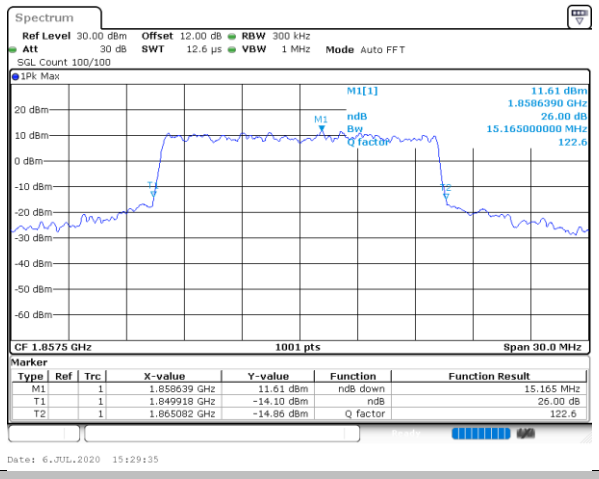
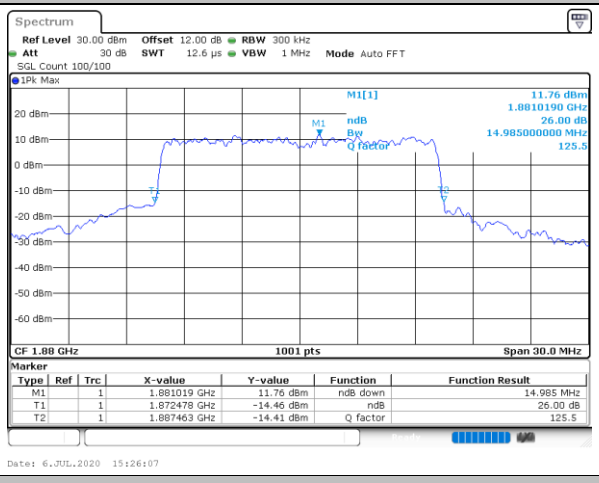
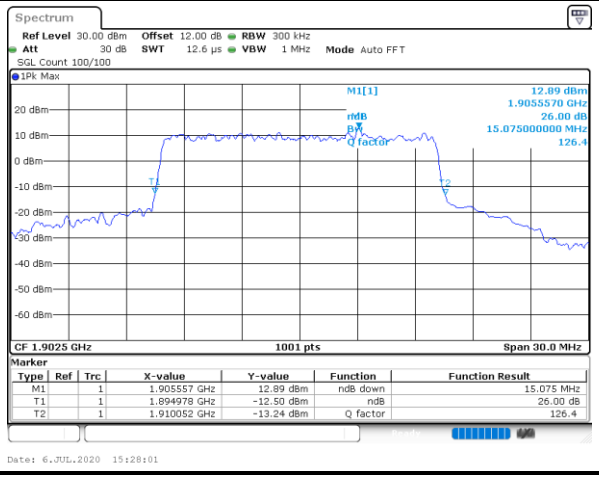
FR1 n2 / 10MHz / DFT-S OFDM	
PI/2 BPSK	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

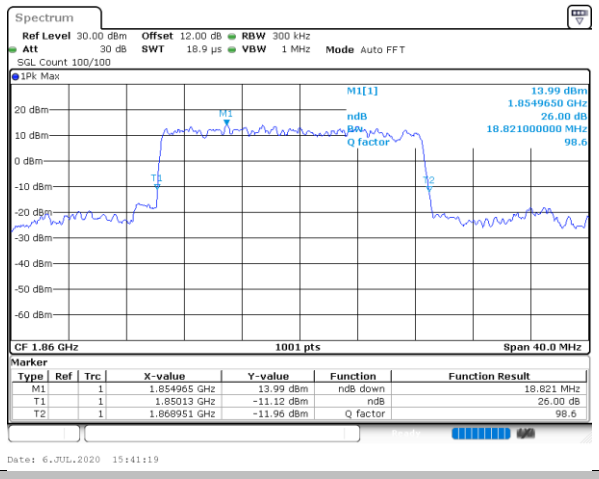
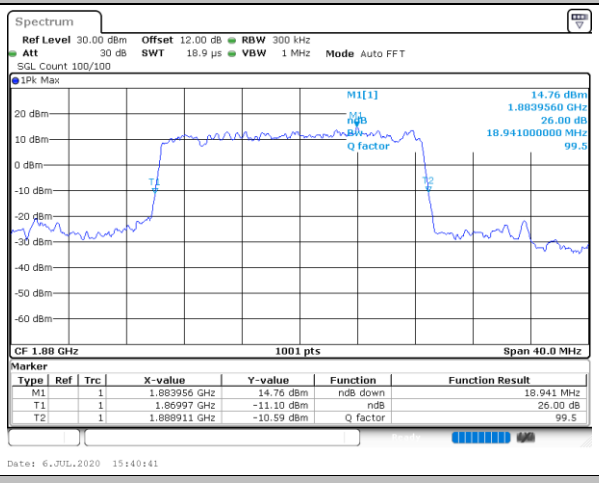
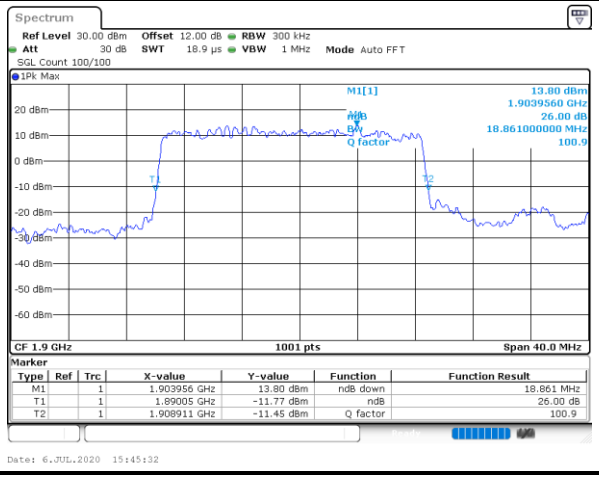
FR1 n2 / 10MHz / CP OFDM	
QPSK	**16QAM**
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

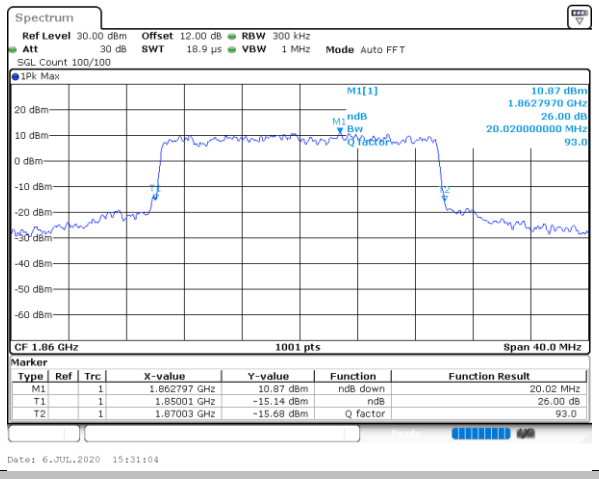
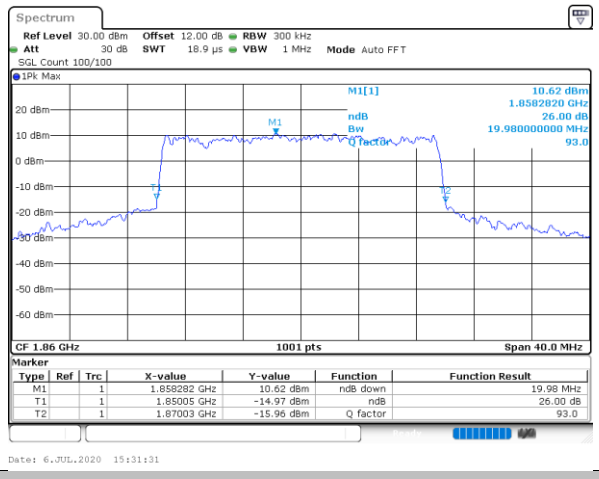
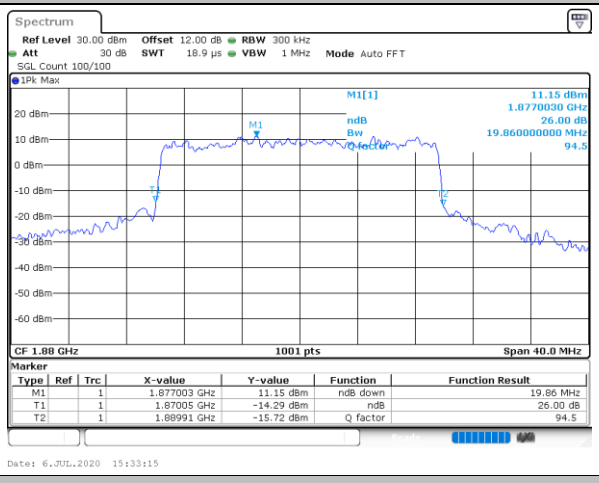
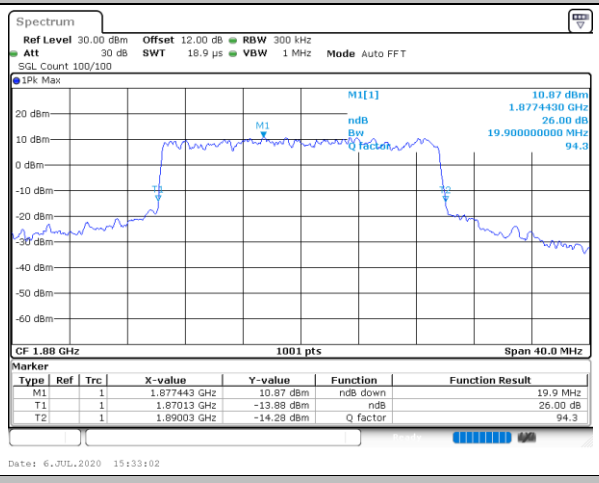
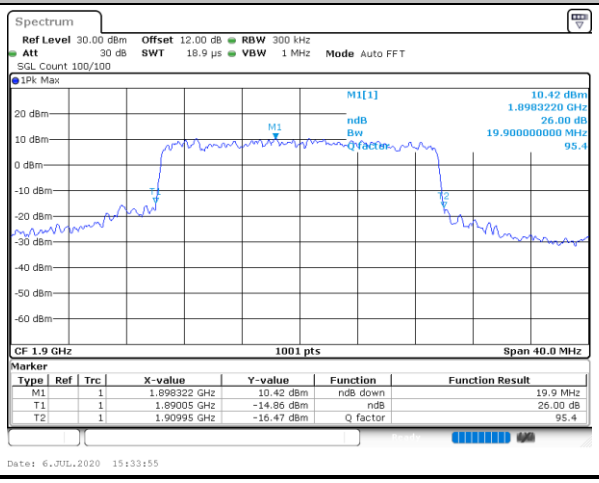
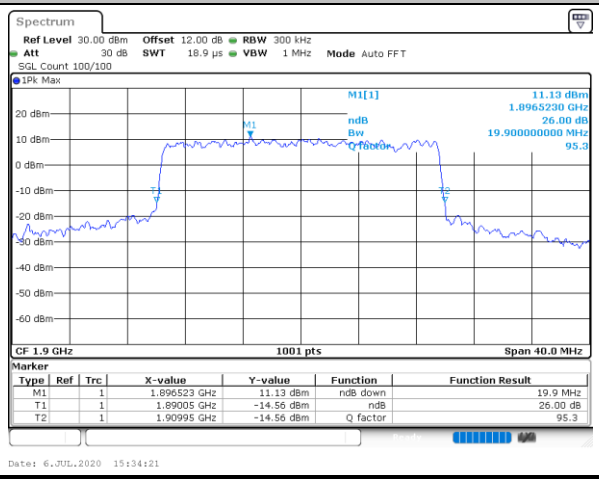
FR1 n2 / 10MHz / CP OFDM	
64QAM	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

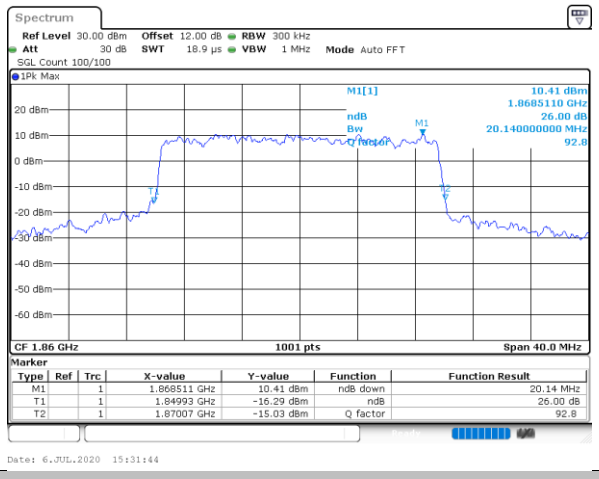
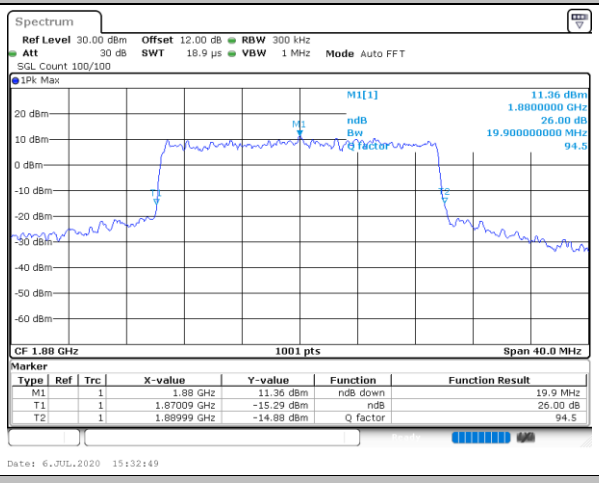
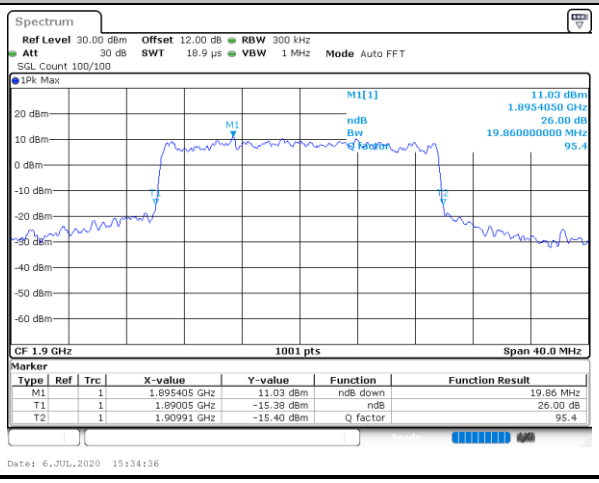
FR1 n2 / 15MHz / DFT-S OFDM	
PI/2 BPSK	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

FR1 n2 / 15MHz / CP OFDM	
QPSK	**16QAM**
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

FR1 n2 / 15MHz / CP OFDM	
64QAM	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

FR1 n2 / 20MHz / DFT-S OFDM	
PI/2 BPSK	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

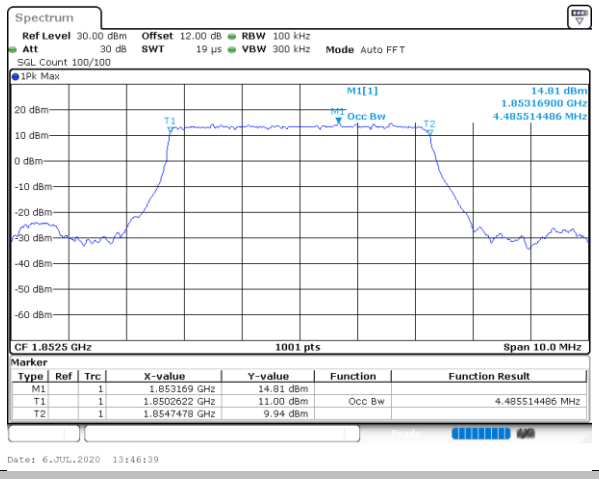
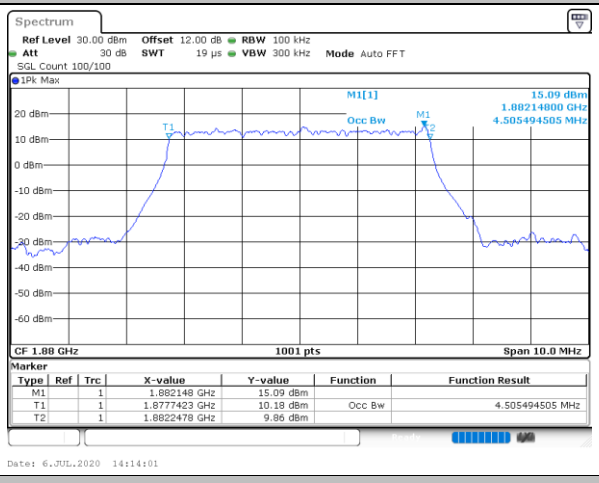
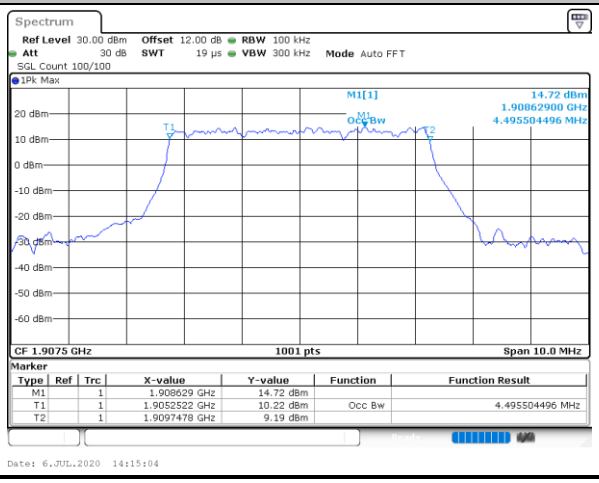
FR1 n2 / 20MHz / CP OFDM	
QPSK	**16QAM**
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

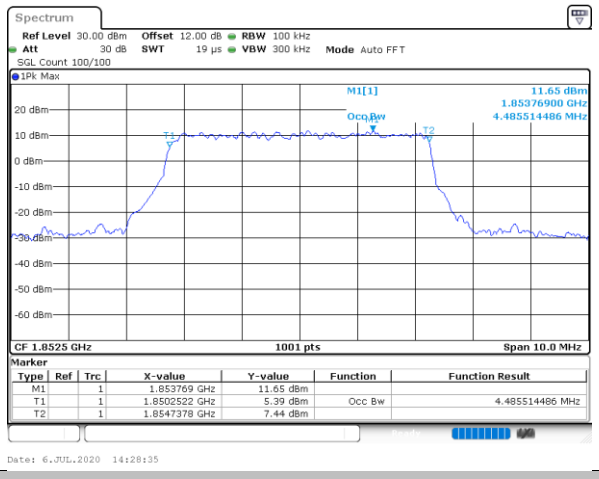
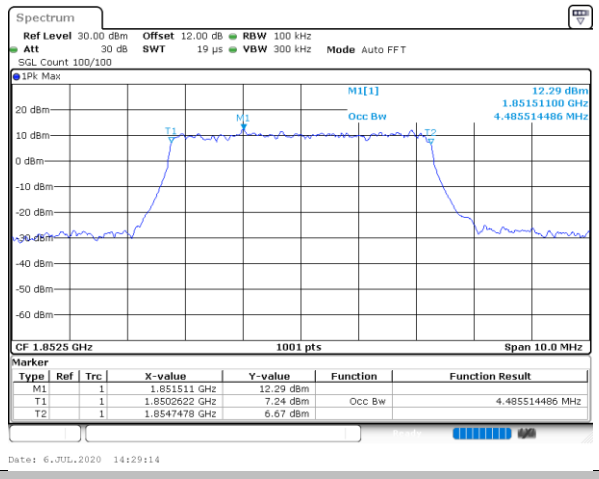
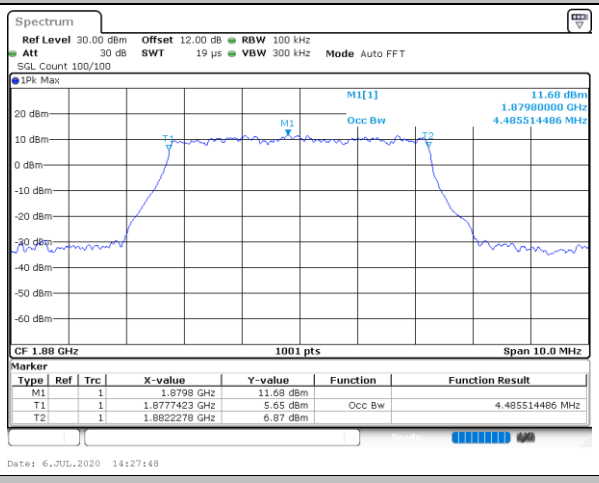
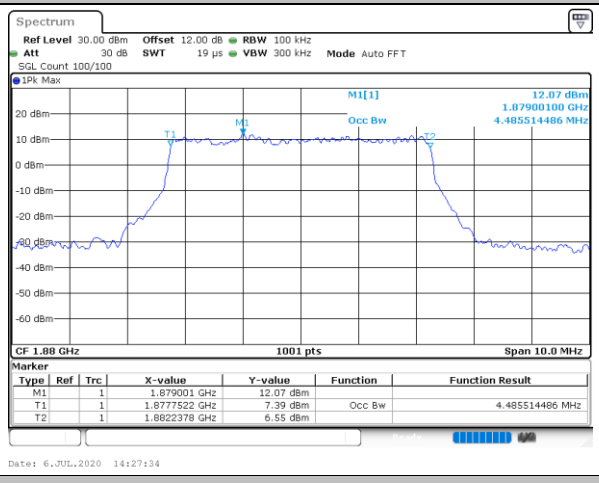
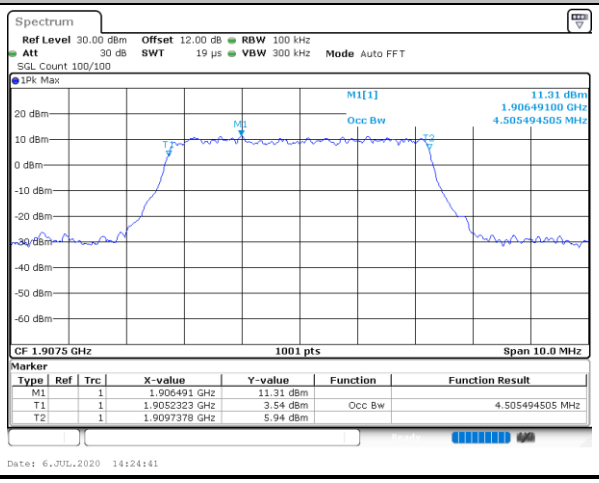
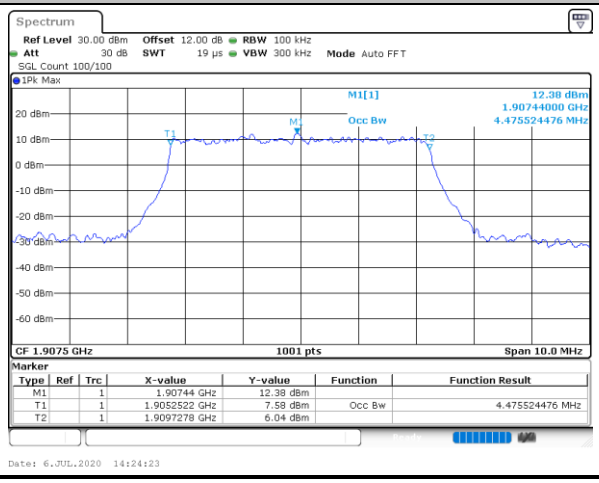
FR1 n2 / 20MHz / CP OFDM	
64QAM	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

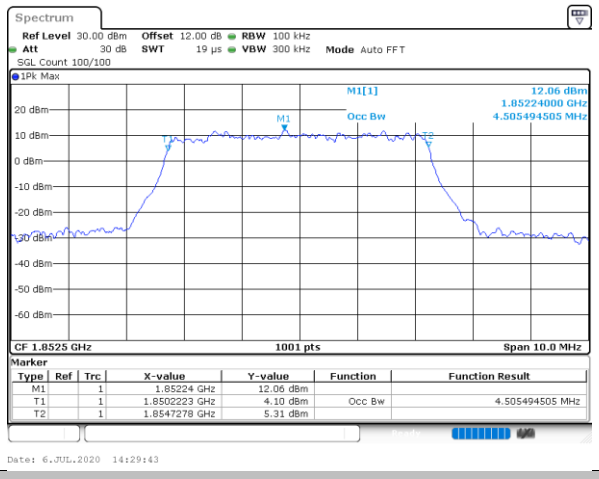
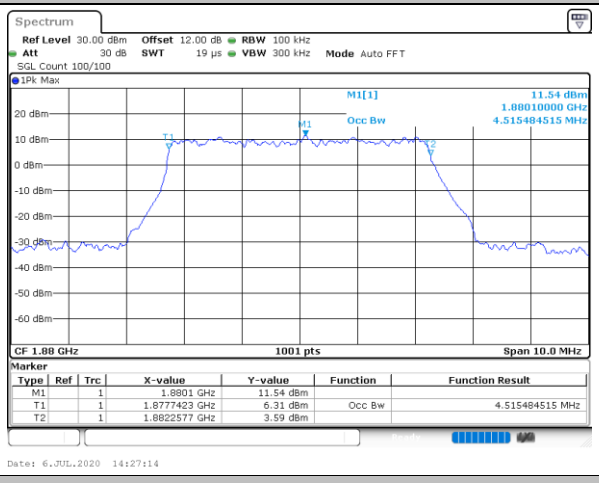
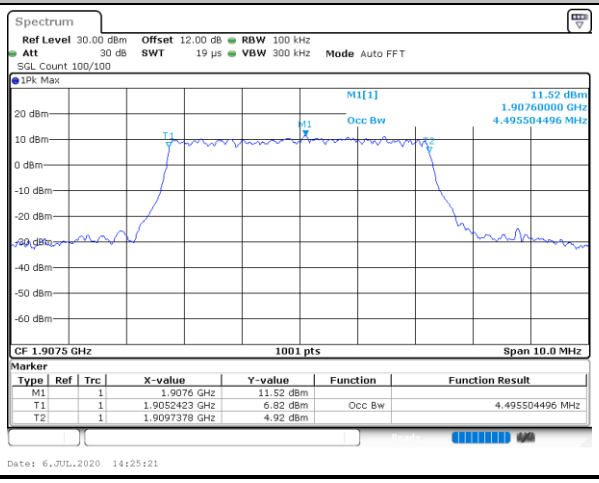
Occupied Bandwidth

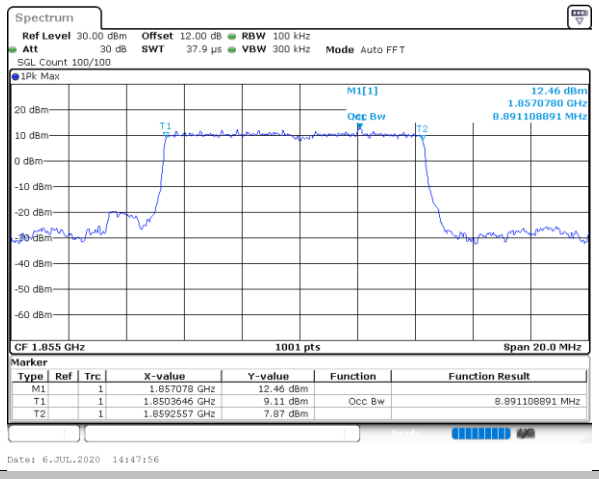
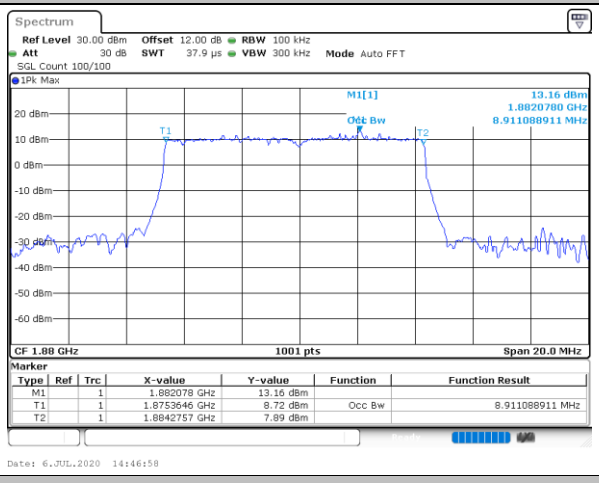
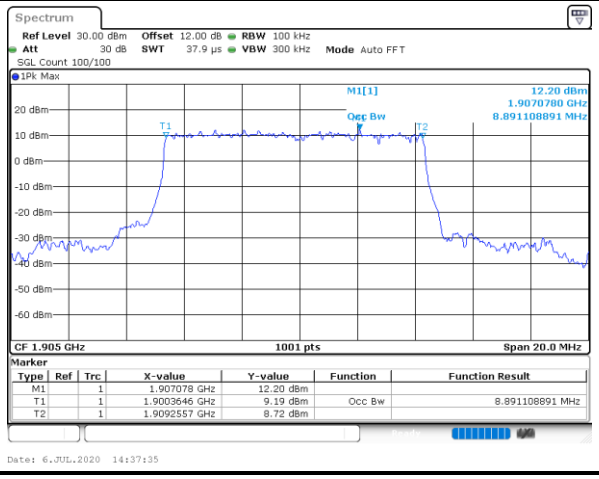
Mode	FR1 n2 : 99%OBW(MHz) / DFT-S OFDM							
BW	5MHz		10MHz		15MHz		20MHz	
Mod.	PI/2 BPSK		PI/2 BPSK		PI/2 BPSK		PI/2 BPSK	
Lowest CH	4.49		8.89		13.46		17.90	
Middle CH	4.51		8.91		13.49		17.86	
Highest CH	4.50		8.89		13.52		17.90	

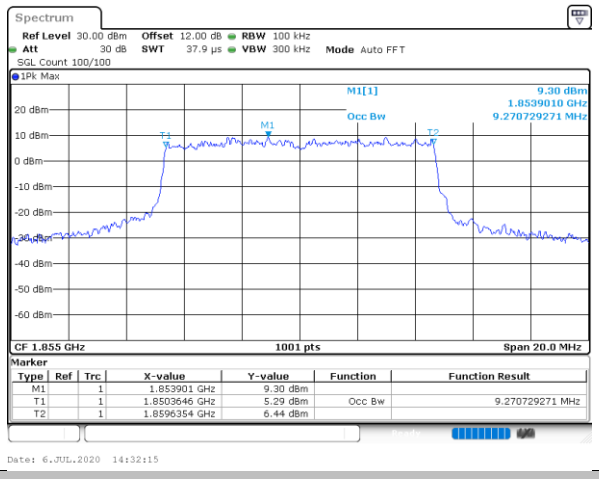
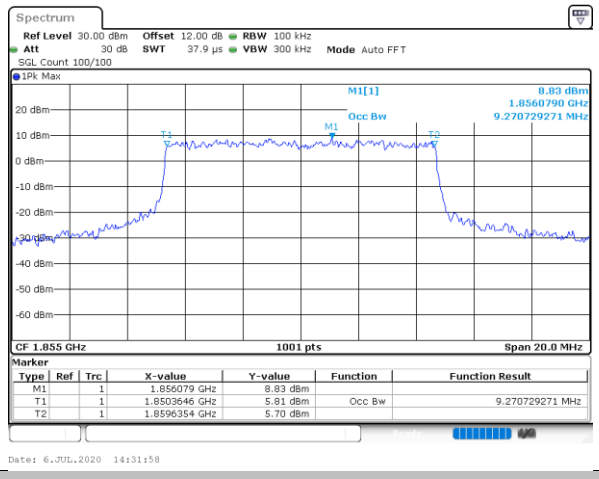
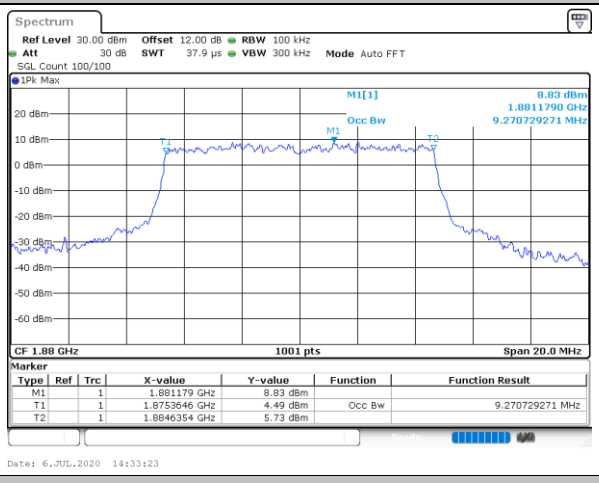
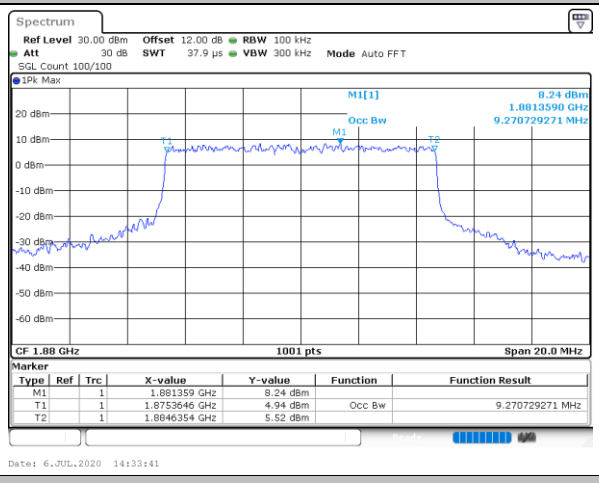
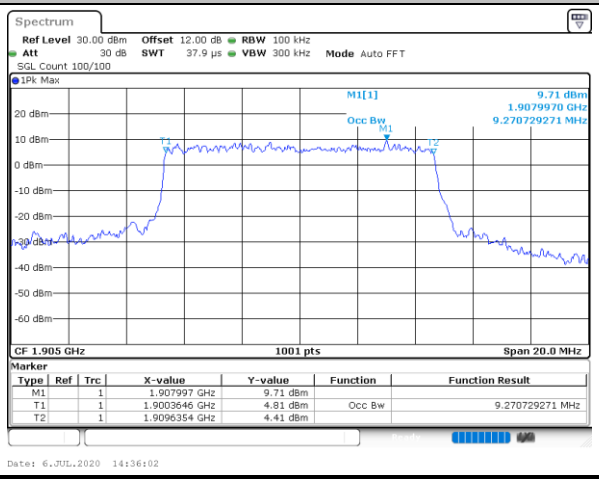
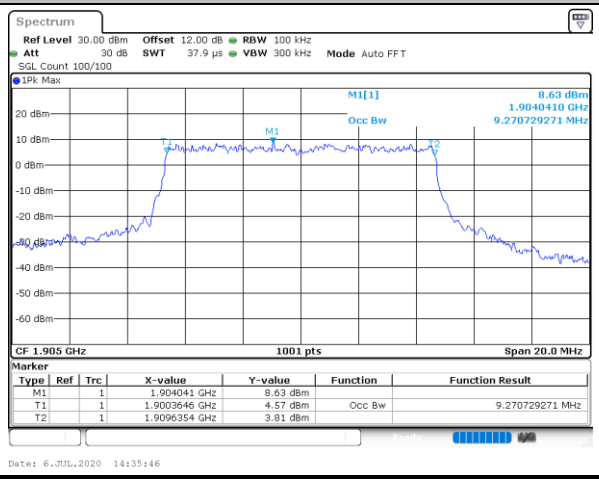
Mode	FR1 n2 : 99%OBW (MHz) / CP OFDM							
BW	5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	4.49	4.49	9.27	9.27	14.21	14.06	18.94	18.94
Middle CH	4.49	4.49	9.27	9.27	14.18	14.09	18.90	19.02
Highest CH	4.51	4.48	9.27	9.27	14.15	14.15	18.94	18.90
Mode	FR1 n2 : 99%OBW (MHz) / CP OFDM							
BW	5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM		64QAM		64QAM		64QAM	
Lowest CH	4.51		9.27		14.21		18.90	
Middle CH	4.52		9.29		14.21		18.90	
Highest CH	4.50		9.29		14.21		18.98	

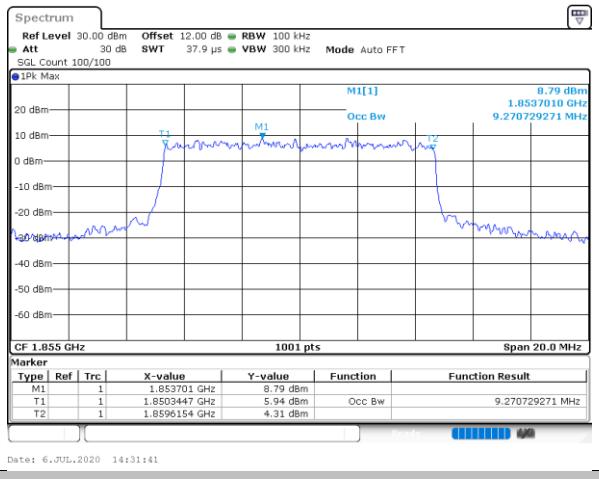
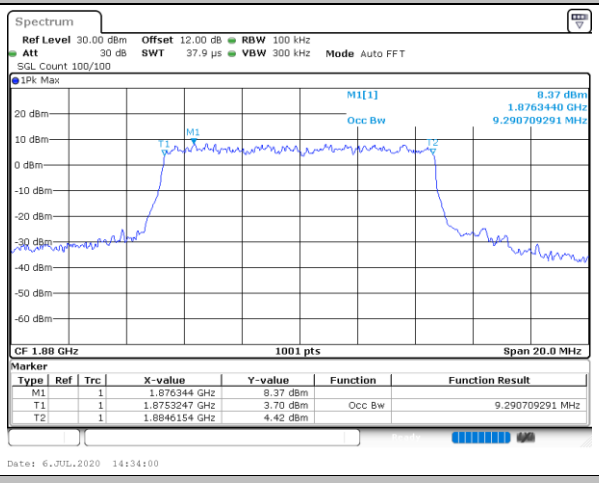
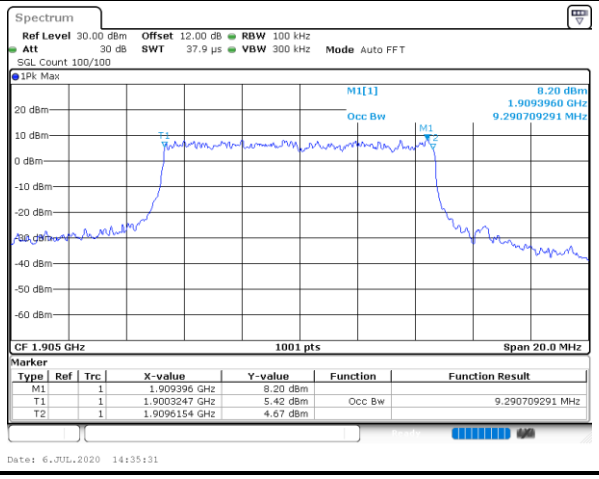
FR1 n2 / 5MHz / DFT-S OFDM	
PI/2 BPSK	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

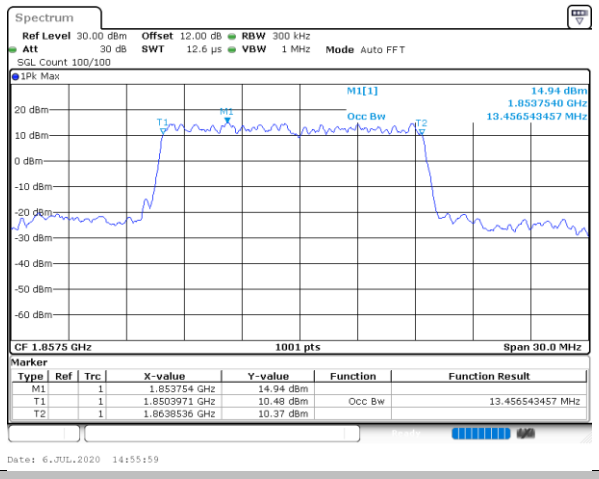
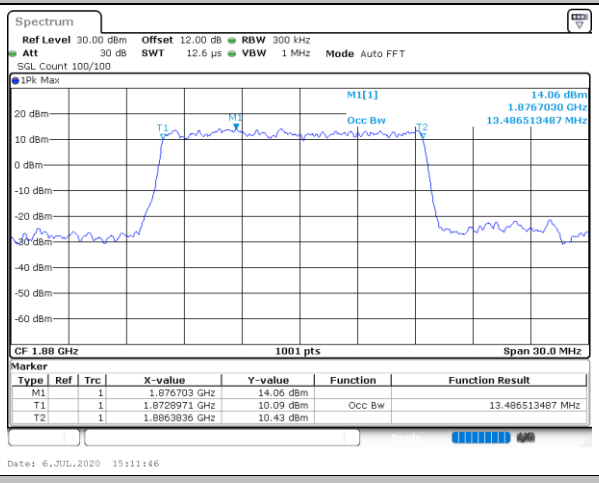
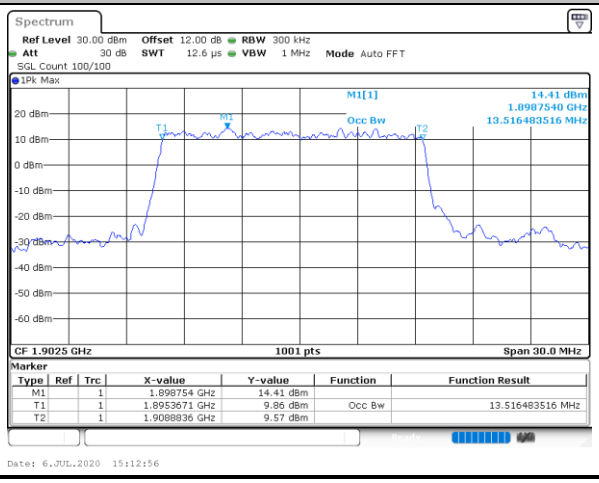
FR1 n2 / 5MHz / CP OFDM	
QPSK	**16QAM**
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

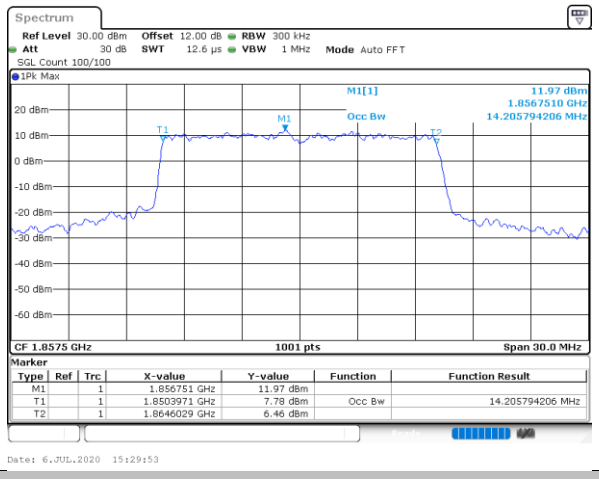
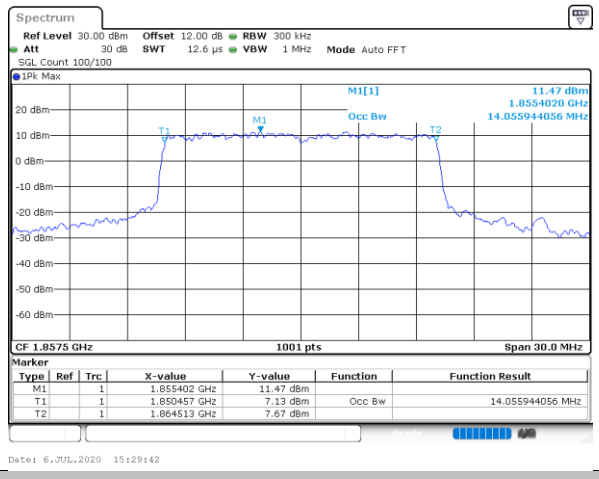
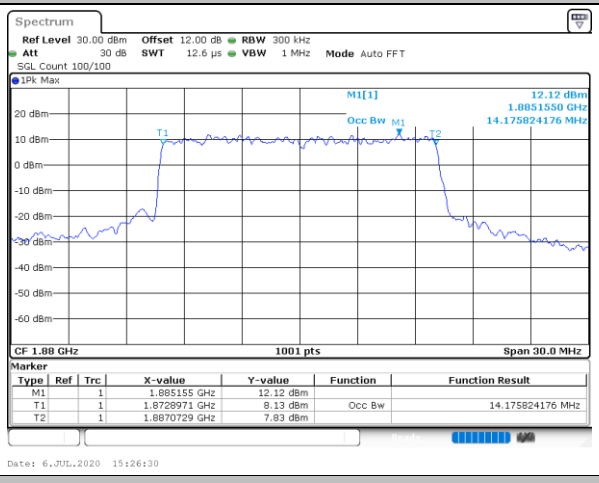
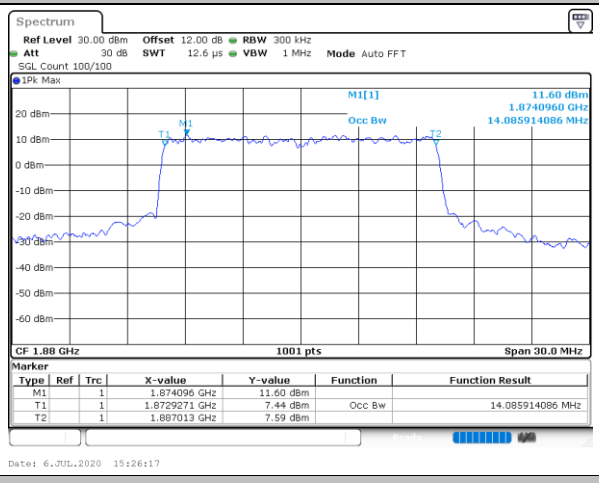
FR1 n2 / 5MHz / CP OFDM	
64QAM	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

FR1 n2 / 10MHz / DFT-S OFDM	
PI/2 BPSK	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

FR1 n2 / 10MHz / CP OFDM	
QPSK	**16QAM**
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

FR1 n2 / 10MHz / CP OFDM	
64QAM	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

FR1 n2 / 15MHz / DFT-S OFDM	
PI/2 BPSK	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

FR1 n2 / 15MHz / CP OFDM	
QPSK	**16QAM**
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**