



FCC RF Test Report

APPLICANT : TCL Communication Ltd
EQUIPMENT : 5G NR/ LTE/WCDMA/GSM Mobile Phone
BRAND NAME : TCL
MODEL NAME : T790S
FCC ID : 2ACCJN042
STANDARD : 47 CFR Part 2, 96
CLASSIFICATION : Citizens Band End User Devices (CBE)
EQUIPMENT TYPE : End User Equipment

The product was received on May 19, 2020 and completely tested on Aug. 12, 2020. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.

Reviewed by: Jason Jia / Supervisor

Approved by: James Huang / Manager



Sporton International (Kunshan) Inc.

**No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China**



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History of this test report

Report No.	Version	Description	Issued Date
FG051926C	Rev. 01	Initial issue of report	Aug. 13, 2020



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	§96.41	Peak-to-Average Ratio	Not Required	Not applicable for End User Devices
3.2	§96.41	Maximum E.I.R.P	Pass	-
		Maximum Power Spectral Density	Not Required	Not applicable for End User Devices
3.3	§2.1049 §96.41	Occupied Bandwidth	Reporting only	-
3.4	§2.1051 §96.41	Conducted Band Edge Measurement	Pass	-
3.5	§2.1051 §96.41	Conducted Spurious Emission	Pass	-
3.6	§2.1055	Frequency Stability for Temperature & Voltage	Pass	-
4.4	§2.1051 §96.41	Radiated Spurious Emission	Pass	Under limit 10.96 dB at 10848.000 MHz

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.



1 General Description

1.1 Applicant

TCL Communication Ltd

5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong

1.2 Manufacturer

TCL Communication Ltd

5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	5G NR/ LTE/WCDMA/GSM Mobile Phone
Brand Name	TCL
Model Name	T790S
FCC ID	2ACCJN042
Tx Frequency	LTE Band 48: 3552.5 MHz ~ 3697.5 MHz
Rx Frequency	LTE Band 48: 3552.5 MHz ~ 3697.5 MHz
Bandwidth	5MHz / 10MHz / 15MHz / 20MHz
Uplink CA Band(s)	48C
Antenna Gain	-1.1 dBi
Type of Modulation	QPSK / 16QAM / 64QAM
IMEI Code	Conducted: NA Radiation: 015749000013685
HW Version	03
SW Version	1B6GTWG0
EUT Stage	Identical Prototype

Remark:

The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Maximum EIRP Power, Frequency Tolerance, and Emission Designator

LTE Band 48		QPSK			16QAM		
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)
5	3552.5~3697.5	4M52G7D	-	0.1660	4M51W7D	-	0.1393
10	3555~3695	9M07G7D	0.0054	0.1545	9M03W7D	-	0.1291
15	3557.5~3692.5	13M5G7D	-	0.1607	13M5W7D	-	0.1340
20	3560~3690	17M9G7D	-	0.1581	17M9W7D	-	0.1282
LTE Band 48		64QAM					
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)		Frequency Tolerance (ppm)	Maximum EIRP (W)		
5	3552.5~3697.5	4M52W7D		-	0.0841		
10	3555~3695	9M05W7D		-	0.0916		
15	3557.5~3692.5	13M5W7D		-	0.0891		
20	3560~3690	17M9W7D		-	0.0845		

LTE Band 48C		QPSK			16QAM		
BW (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	
20MHz+20MHz	37M8G7D	-	0.0713	37M7W7D	-	0.0540	
LTE Band 48C		64QAM					
BW (MHz)		Emission Designator (99%OBW)		Frequency Tolerance (ppm)	Maximum EIRP(W)		
20MHz+20MHz		37M7W7D		-	0.0516		



1.5 Testing Site

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International (Kunshan) Inc.		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH04-KS TH01-KS	CN1257	314309

1.6 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-KS	AUDIX	E3	6.2009-8-24a

1.7 Applied 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
- ♦ 47 CFR Part 2, 96
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 940660 D01 Part 96 CBRS v02
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

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



2 Test Configuration of Equipment Under Test

2.1 Test Mode

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

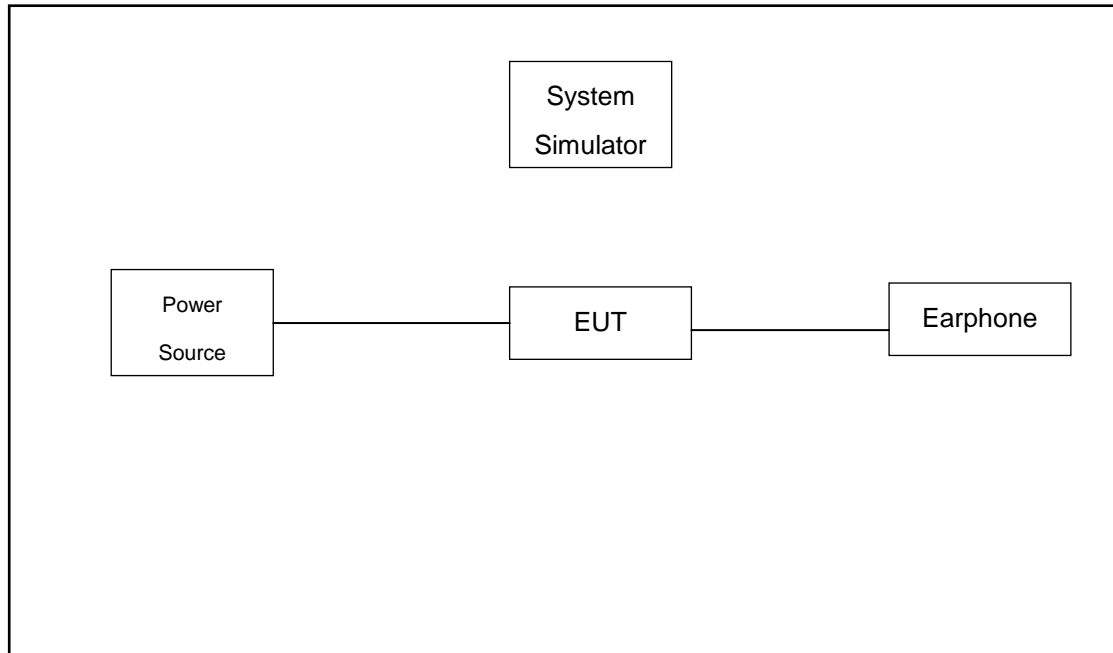
For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

Test Items	Band	Bandwidth (MHz)						Modulation				RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64 QAM	256 QAM	1	Half	Full	L	M	H
Max. Output Power	48	-	-	v	v	v	v	v	v	v		v		v	v	v	v
26dB and 99% Bandwidth	48	-	-	v	v	v	v	v	v	v				v	v	v	v
Conducted Band Edge	48	-	-	v	v	v	v	v	v	v		v		v	v		v
Conducted Spurious Emission	48	-	-	v	v	v	v	v	v	v		v			v	v	v
E.R.P / E.I.R.P	48	-	-	v	v	v	v	v	v	v		v			v	v	v
Frequency Stability	48	-	-		v			v				v				v	
Radiated Spurious Emission	48	Worst Case														v	
Remark	1.	2. The mark "v" means that this configuration is chosen for testing 3. The mark "-" means that this bandwidth is not supported. 4. 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. 5. All the radiated test cases were performed with Adapter.															



Test Items	Band	Bandwidth (MHz)							Modulation				RB #			Test Channel		
		20+20	20+15	15+20	20+10	10+20	20+5	5+20	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Max. Output Power	48C	v	v	v	v	v	v	v	v	v	v		v		v	v	v	
26dB and 99% Bandwidth	48C	v	v	v	v	v	v	v	v	v	v				v	v	v	
Conducted Band Edge	48C	v	v	v	v	v	v	v	v	v	v		v		v	v	v	
Conducted Spurious Emission	48C	v	v	v	v	v	v	v	v	v	v		v			v	v	
E.R.P / E.I.R.P	48C	v	v	v	v	v	v	v	v	v	v		v			v	v	
Radiated Spurious Emission	48C	Worst Case														v		
Note	<ol style="list-style-type: none"> The mark "v" means that this configuration is chosen for testing The mark "-" means that this bandwidth is not supported. 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. All the radiated test cases were performed with Adapter. Frequency stability only shows the worst case of LTE band 48/48C. LTE band48C only show the maximum power and maximum bandwidth combination in the report. 																	

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.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GW INSTEK	GPS-3030D	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 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.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 6.0 dB.

Example :

$$\begin{aligned}
 \text{Offset(dB)} &= \text{RF cable loss(dB)}. \\
 &= 6.0 \text{ (dB)}
 \end{aligned}$$



2.5 Frequency List of Low/Middle/High Channels

LTE Band 48 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	55340	55990	56640
	Frequency	3560.0	3625.0	3690.0
15	Channel	55315	55990	56665
	Frequency	3557.5	3625.0	3692.5
10	Channel	55290	55990	56690
	Frequency	3555.0	3625.0	3695.0
5	Channel	55265	55990	56715
	Frequency	3552.5	3625.0	3697.5



LTE Band 48C_CA Channel and Frequency List					
BW [MHz]	Channel/Frequency(MHz)		Lowest	Middle	Highest
5 + 20	PCC	Channel	55273	55898	56523
		Frequency	3553.3	3615.8	3678.3
	SCC	Channel	55390	56015	56640
		Frequency	3565	3627.5	3690
20 + 5	PCC	Channel	55340	55965	56590
		Frequency	3560	3622.5	3685
	SCC	Channel	55457	56082	56707
		Frequency	3571.7	3634.2	3696.7
10 + 20	PCC	Channel	55295	55896	56496
		Frequency	3555.5	3615.6	3675.6
	SCC	Channel	55439	56040	56640
		Frequency	3569.9	3630	3690
20 + 10	PCC	Channel	55340	55941	56541
		Frequency	3560	3620.1	3680.1
	SCC	Channel	55484	56085	56685
		Frequency	3574.4	3634.5	3694.5
15 + 20	PCC	Channel	55318	55893	56469
		Frequency	3557.8	3615.3	3672.9
	SCC	Channel	55489	56064	56640
		Frequency	3574.9	3632.4	3690
20 + 15	PCC	Channel	55340	55916	56491
		Frequency	3560	3617.6	3675.1
	SCC	Channel	55511	56087	56662
		Frequency	3577.1	3634.7	3692.2
20 + 20	PCC	Channel	55340	55891	56442
		Frequency	3560	3615.1	3670.2
	SCC	Channel	55538	56089	56640
		Frequency	3579.8	3634.9	3690

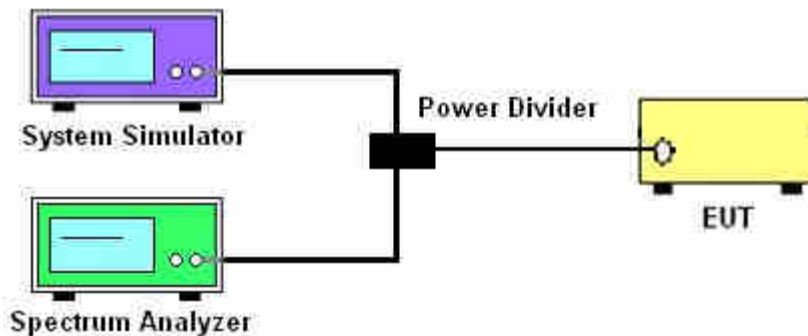
3 Conducted Test Items

3.1 Measuring Instruments

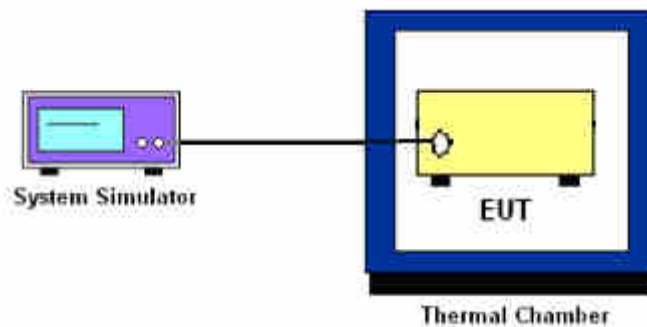
See list of measuring instruments of this test report.

3.1.1 Test Setup

3.1.2 EIRP, Occupied Bandwidth, Conducted Band-Edge and Conducted Spurious Emission



3.1.3 Frequency Stability



3.1.4 Test Result of Conducted Test

Please refer to Appendix A.

3.2 EIRP

3.2.1 Description of the EIRP Measurement

EIRP and PSD limits for CBRS equipment as below table:

Device		Maximum EIRP (dBm/10 MHz)	Maximum PSD (dBm/MHz)
<input checked="" type="checkbox"/>	End User Device	23	n/a
<input type="checkbox"/>	Category A CBSD	30	20
<input type="checkbox"/>	Category B CBSD	47	37

Remark: Maximum PSD values are radiated. Measurements can be done conducted and add antenna gain back in.

1. Set instrument center frequency to OBW center frequency.
2. Set span to at least 2 times the OBW.
3. Set the RBW to the specified reference bandwidth (often 1 MHz).
4. Set VBW $\geq 3 \times$ RBW.
5. Detector = RMS (power averaging).
6. Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW.
7. Sweep time = auto couple.
8. Employ trace averaging (RMS) mode over a minimum of 100 traces.
9. Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).
10. Determine the EIRP by adding the effective antenna gain to the adjusted power level.
11. Add $10 \log(1/\text{duty cycle})$ to the measured power level to compute the average power during continuous transmission.

The testing follows ANSI C63.26-2015 Section 5.2.5.5

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, 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



3.3 Occupied Bandwidth

3.3.1 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.

3.3.2 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.

3.4 Conducted Band Edge

3.4.1 Description of Conducted Band Edge Measurement

Part 96.41 (e) (1) (i)

For CBSD the emission limits outside the fundamental are as follows:

Within 0 MHz to 10 MHz above and below the assigned channel ≤ -13 dBm/MHz

Greater than 10 MHz above and below the assigned channel ≤ -25 dBm/MHz

Part 96.41 (e) (1) (ii)

For End User Devices the emission limits outside the fundamental are as follows:

Within 0 MHz to B MHz above and below the assigned channel ≤ -13 dBm/MHz

Greater than B MHz above and below the assigned channel ≤ -25 dBm/MHz

where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device.

Part 96.41 (e) (2)

For CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz

3.4.2 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 $\geq 1\%$ 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. Offset has included the duty factor for LTE Band 48. Duty factor $=10 \log (1/x)$, where x is the measured duty cycle.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.



3.5 Conducted Spurious Emission

3.5.1 Description of Conducted Spurious Emission Measurement

96.41 (e)(2)

The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

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 RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
6. Set spectrum analyzer with RMS detector.
7. Taking the record of maximum spurious emission.
8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
9. The limit line is -40dBm/MHz.



3.6 Frequency Stability

3.6.1 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. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency

3.6.2 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.

3.6.3 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 $25\pm 5^{\circ}\text{C}$ and connected with the system simulator.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

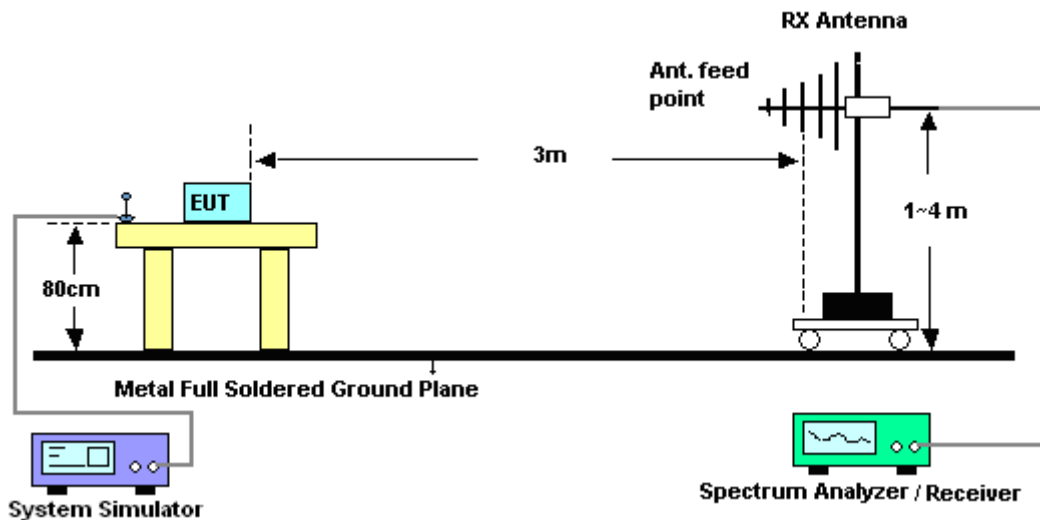
4 Radiated Test Items

4.1 Measuring Instruments

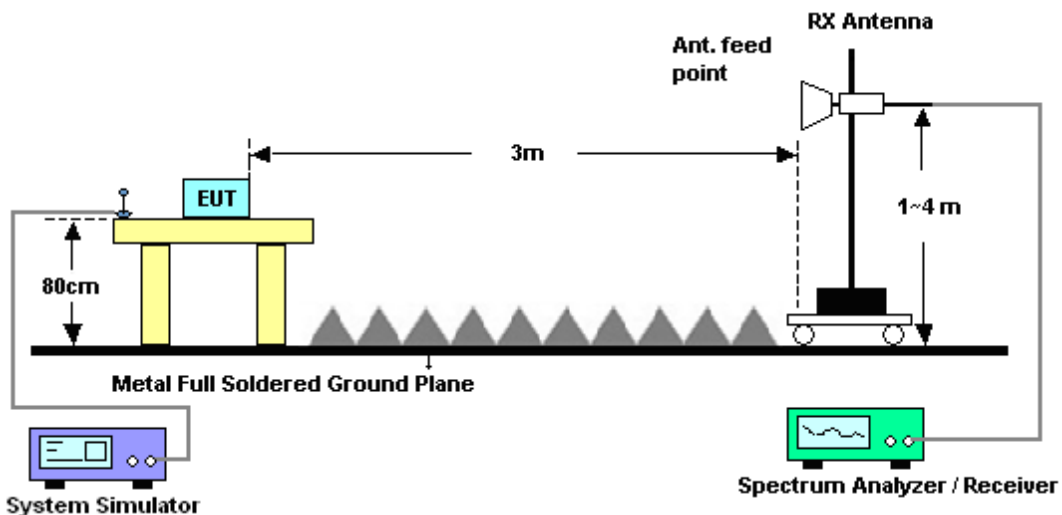
See list of measuring instruments of this test report.

4.2 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.



4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission 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 -40dBm / MHz. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.4.2 Test Procedures

1. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
5. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
$$\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$$
$$\text{ERP (dBm)} = \text{EIRP} - 2.15$$
8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
The limit line is -40dBm/MHz



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Nov. 02, 2019	Jul. 31, 2020~ Aug. 12, 2020	Nov. 01, 2020	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Nov. 18, 2019	Jul. 31, 2020~ Aug. 12, 2020	Nov. 17, 2020	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Apr. 15, 2020	Jul. 27, 2020	Apr. 14, 2021	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Jan. 02, 2020	Jul. 27, 2020	Jan. 03, 2021	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1356	1GHz~18GHz	Apr. 20, 2020	Jul. 27, 2020	Apr. 19, 2021	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Nov. 10, 2019	Jul. 27, 2020	Nov. 09, 2020	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 02, 2020	Jul. 27, 2020	Jan. 01, 2021	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 08, 2020	Jul. 27, 2020	Jan. 07, 2021	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-00 101800-30-1 0P	2025788	1Ghz-18Ghz	Jan. 02, 2020	Jul. 27, 2020	Jan. 01, 2021	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY57280106	500MHz~26.5GHz	Oct. 15, 2019	Jul. 27, 2020	Oct. 14, 2020	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jul. 27, 2020	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jul. 27, 2020	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jul. 27, 2020	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required



6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.3dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.8dB
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Appendix A. Test Results of Conducted Test

Band 48						
BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	for EMC Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				55340	55990	56640
Frequency (MHz)				3560	3625	3690
20	QPSK	1	0	22.74	23.09	22.87
20	QPSK	1	49	22.90	23.03	22.79
20	QPSK	1	99	22.98	22.99	22.76
20	QPSK	50	0	21.87	22.06	21.96
20	QPSK	50	24	21.99	22.07	21.94
20	QPSK	50	50	22.00	22.06	21.92
20	QPSK	100	0	21.89	21.87	21.90
20	16QAM	1	0	21.94	22.18	22.01
20	16QAM	1	49	21.98	21.96	21.97
20	16QAM	1	99	22.06	22.02	21.86
20	16QAM	50	0	21.01	21.22	21.12
20	16QAM	50	24	21.03	21.28	21.03
20	16QAM	50	50	21.13	21.26	21.02
20	16QAM	100	0	20.90	21.22	20.96
20	64QAM	1	0	20.33	20.24	19.85
20	64QAM	1	49	20.37	19.89	19.75
20	64QAM	1	99	20.33	19.75	19.35
20	64QAM	50	0	19.87	19.42	19.20
20	64QAM	50	24	19.95	19.43	19.11
20	64QAM	50	50	19.96	19.39	19.01
20	64QAM	100	0	19.73	19.32	19.12
Channel				55315	55990	56665
Frequency (MHz)				3557.5	3625	3692.5
15	QPSK	1	0	22.57	23.07	22.93
15	QPSK	1	37	22.77	23.01	22.57
15	QPSK	1	74	22.89	23.16	22.69
15	QPSK	36	0	22.35	22.33	21.97



15	QPSK	36	20	21.85	22.36	21.91
15	QPSK	36	39	21.91	22.34	22.03
15	QPSK	75	0	21.83	22.18	21.92
15	16QAM	1	0	21.71	22.23	21.96
15	16QAM	1	37	21.75	22.28	21.67
15	16QAM	1	74	22.04	22.37	21.60
15	16QAM	36	0	20.81	21.34	21.05
15	16QAM	36	20	20.77	21.43	20.97
15	16QAM	36	39	20.81	21.34	20.92
15	16QAM	75	0	20.83	21.35	20.96
15	64QAM	1	0	20.38	20.10	19.82
15	64QAM	1	37	20.48	20.07	19.48
15	64QAM	1	74	20.60	20.12	19.31
15	64QAM	36	0	19.91	19.35	19.08
15	64QAM	36	20	19.87	19.40	18.98
15	64QAM	36	39	19.94	19.36	18.98
15	64QAM	75	0	19.78	19.28	19.00
Channel				55290	55990	56690
Frequency (MHz)				3555	3625	3695
10	QPSK	1	0	22.59	23.07	22.79
10	QPSK	1	25	22.66	22.99	22.53
10	QPSK	1	49	22.78	22.66	22.56
10	QPSK	25	0	21.80	22.06	21.76
10	QPSK	25	12	21.81	22.04	21.77
10	QPSK	25	25	21.85	21.92	21.76
10	QPSK	50	0	21.80	21.97	21.57
10	16QAM	1	0	21.75	22.21	21.88
10	16QAM	1	25	21.83	22.17	21.66
10	16QAM	1	49	21.96	21.86	21.72
10	16QAM	25	0	20.77	21.32	20.92
10	16QAM	25	12	20.80	21.23	20.98
10	16QAM	25	25	20.80	21.22	20.96
10	16QAM	50	0	20.86	21.16	20.92
10	64QAM	1	0	20.35	20.05	19.93
10	64QAM	1	25	20.43	19.95	19.60
10	64QAM	1	49	20.72	19.55	19.45



10	64QAM	25	0	19.78	19.40	18.97
10	64QAM	25	12	19.77	19.31	19.03
10	64QAM	25	25	19.84	19.21	18.99
10	64QAM	50	0	19.80	19.32	18.99
Channel				55265	55990	56715
Frequency (MHz)				3552.5	3625	3697.5
5	QPSK	1	0	22.64	23.07	22.69
5	QPSK	1	12	22.58	23.27	22.66
5	QPSK	1	24	22.59	23.30	22.69
5	QPSK	12	0	21.73	22.85	21.85
5	QPSK	12	7	21.81	22.35	21.88
5	QPSK	12	13	21.85	22.41	21.89
5	QPSK	25	0	21.79	22.33	21.71
5	16QAM	1	0	21.82	22.21	21.76
5	16QAM	1	12	21.87	22.25	21.76
5	16QAM	1	24	21.96	22.54	21.86
5	16QAM	12	0	20.75	21.31	20.87
5	16QAM	12	7	20.77	21.27	20.97
5	16QAM	12	13	20.79	21.31	20.91
5	16QAM	25	0	20.81	21.33	20.87
5	64QAM	1	0	20.35	19.99	19.63
5	64QAM	1	12	20.26	19.92	19.63
5	64QAM	1	24	20.35	19.88	19.70
5	64QAM	12	0	19.72	19.35	18.94
5	64QAM	12	7	19.74	19.33	18.97
5	64QAM	12	13	19.80	19.40	18.96
5	64QAM	25	0	19.75	19.35	18.85



CA_48C							
Combination 20MHz+20MHz (100RB+100RB)							
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)
			RB Size	RB offset	RB Size	RB offset	
55340	55538	QPSK	100	0	100	0	19.42
55891	56089	QPSK	100	0	100	0	19.63
56442	56640	QPSK	100	0	100	0	19.50
55340	55538	16QAM	100	0	100	0	18.34
55891	56089	16QAM	100	0	100	0	18.42
56442	56640	16QAM	100	0	100	0	18.19
55340	55538	64QAM	100	0	100	0	18.09
55891	56089	64QAM	100	0	100	0	18.23
56442	56640	64QAM	100	0	100	0	18.11



EIRP

LTE Band 48 (GT - LC = -1.1 dB) QPSK									
Bandwidth	5M			10M			15M		
Channel	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Conducted Power (dBm)	22.59	23.30	22.69	22.66	22.99	22.53	22.89	23.16	22.69
Conducted Power (Watts)	0.1816	0.2138	0.1858	0.1845	0.1991	0.1791	0.1945	0.2070	0.1858
EIRP (dBm)	21.49	22.20	21.59	21.56	21.89	21.43	21.79	22.06	21.59
EIRP (Watts)	0.1409	0.1660	0.1442	0.1432	0.1545	0.1390	0.1510	0.1607	0.1442

LTE Band 48 (GT - LC = -1.1 dB) QPSK			
Bandwidth	20M		
Channel	(Low)	(Mid)	(High)
Conducted Power (dBm)	22.74	23.09	22.87
Conducted Power (Watts)	0.1879	0.2037	0.1936
EIRP (dBm)	21.64	21.99	21.77
EIRP (Watts)	0.1459	0.1581	0.1503



LTE Band 48 (GT - LC = -1.1 dB) 16QAM									
Bandwidth	5M			10M			15M		
Channel	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Conducted Power (dBm)	21.96	22.54	21.86	21.75	22.21	21.88	22.04	22.37	21.60
Conducted Power (Watts)	0.1570	0.1795	0.1535	0.1496	0.1663	0.1542	0.1600	0.1726	0.1445
EIRP (dBm)	20.86	21.44	20.76	20.65	21.11	20.78	20.94	21.27	20.50
EIRP (Watts)	0.1219	0.1393	0.1191	0.1161	0.1291	0.1197	0.1242	0.1340	0.1122

LTE Band 48 (GT - LC = -1.1 dB) 16QAM			
Bandwidth	20M		
Channel	(Low)	(Mid)	(High)
Conducted Power (dBm)	21.94	22.18	22.01
Conducted Power (Watts)	0.1563	0.1652	0.1589
EIRP (dBm)	20.84	21.08	20.91
EIRP (Watts)	0.1213	0.1282	0.1233



LTE Band 48 (GT - LC = -1.1 dB) 64QAM									
Bandwidth	5M			10M			15M		
Channel	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Conducted Power (dBm)	20.35	19.99	19.63	20.72	19.55	19.45	20.60	20.12	19.31
Conducted Power (Watts)	0.1084	0.0998	0.0918	0.1180	0.0902	0.0881	0.1148	0.1028	0.0853
EIRP (dBm)	19.25	18.89	18.53	19.62	18.45	18.35	19.50	19.02	18.21
EIRP (Watts)	0.0841	0.0774	0.0713	0.0916	0.0700	0.0684	0.0891	0.0798	0.0662

LTE Band 48 (GT - LC = -1.1 dB) 64QAM			
Bandwidth	20M		
Channel	(Low)	(Mid)	(High)
Conducted Power (dBm)	20.37	19.89	19.75
Conducted Power (Watts)	0.1089	0.0975	0.0944
EIRP (dBm)	19.27	18.79	18.65
EIRP (Watts)	0.0845	0.0757	0.0733



LTE Band 48C (GT - LC = -1.1 dB) QPSK			
Bandwidth	20M		
Channel	(Low)	(Mid)	(High)
Conducted Power (dBm)	19.42	19.63	19.50
Conducted Power (Watts)	0.0875	0.0918	0.0891
EIRP (dBm)	18.32	18.53	18.40
EIRP (Watts)	0.0679	0.0713	0.0692

LTE Band 48C (GT - LC = -1.1 dB) 16QAM			
Bandwidth	20M		
Channel	(Low)	(Mid)	(High)
Conducted Power (dBm)	18.34	18.42	18.19
Conducted Power (Watts)	0.0682	0.0695	0.0659
EIRP (dBm)	17.24	17.32	17.09
EIRP (Watts)	0.0530	0.0540	0.0512

LTE Band 48C (GT - LC = -1.1 dB) 64QAM			
Bandwidth	20M		
Channel	(Low)	(Mid)	(High)
Conducted Power (dBm)	18.09	18.23	18.11
Conducted Power (Watts)	0.0644	0.0665	0.0647
EIRP (dBm)	16.99	17.13	17.01
EIRP (Watts)	0.0500	0.0516	0.0502



LTE Band 48

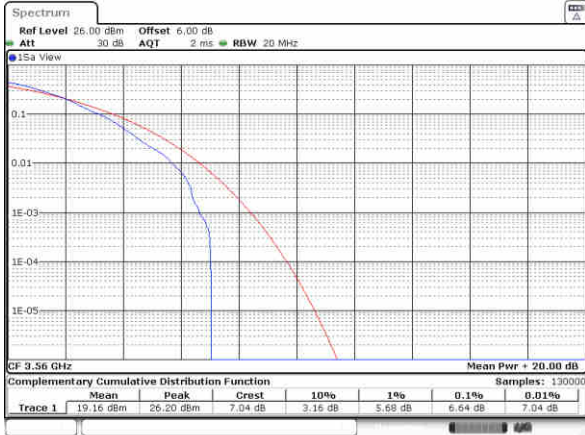
Peak-to-Average Ratio

Mode	LTE Band 48 / 20MHz				
Mod.	QPSK		16QAM		Limit: 13dB
RB Size	1RB	Full RB	1RB	Full RB	Result
Lowest CH	6.64	6.32	6.81	6.90	PASS
Middle CH	5.45	5.19	5.77	6.96	
Highest CH	5.51	5.13	6.55	6.38	
Mode	LTE Band 48 / 20MHz				
Mod.	64QAM				Limit: 13dB
RB Size	1RB	Full RB			Result
Lowest CH	6.93	6.96	-	-	PASS
Middle CH	6.96	6.87	-	-	
Highest CH	6.78	6.87	-	-	



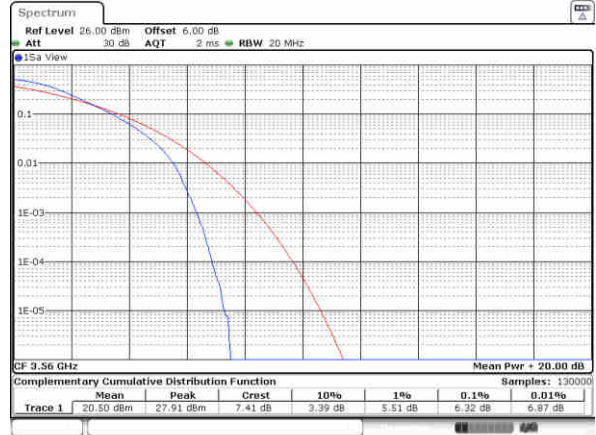
LTE Band 48 / 20MHz / QPSK

Lowest Channel / 1RB



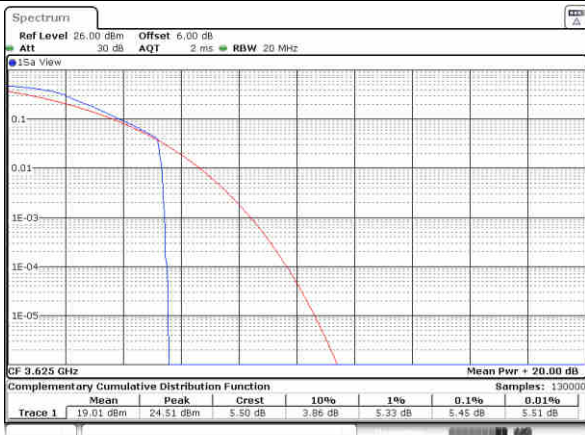
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Lowest Channel / Full RB



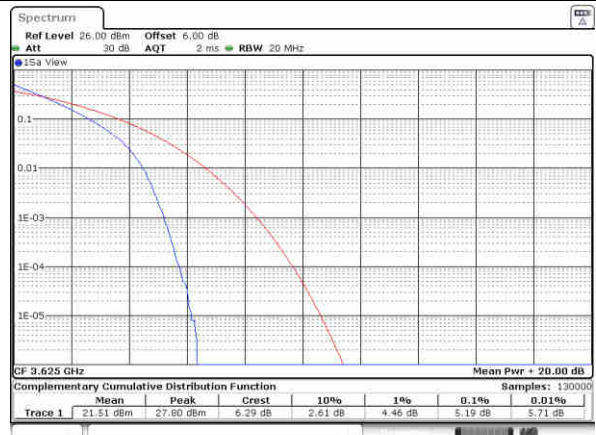
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Middle Channel / 1RB



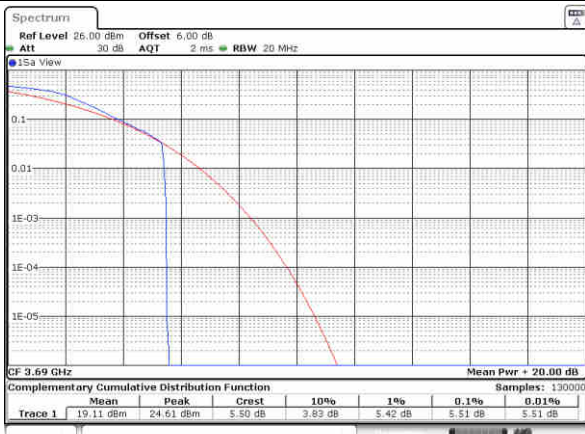
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Middle Channel / Full RB



Date: 31.JUL.2020 14:15:05

Highest Channel / 1RB



Date: 31.JUL.2020 14:18:34

Highest Channel / Full RB

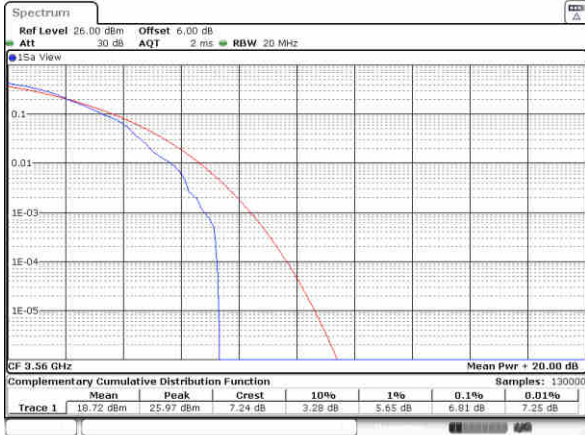


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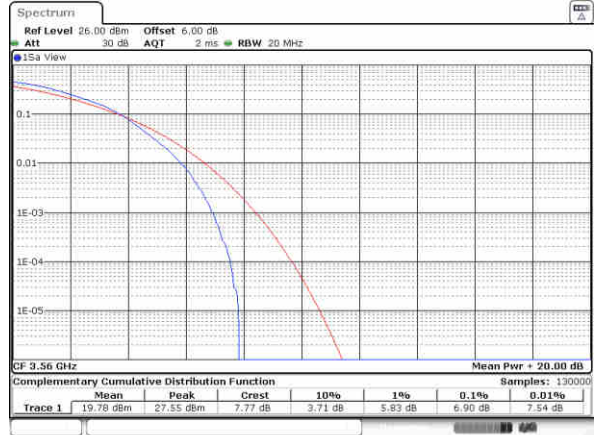
LTE Band 48 / 20MHz / 16QAM

Lowest Channel / 1RB



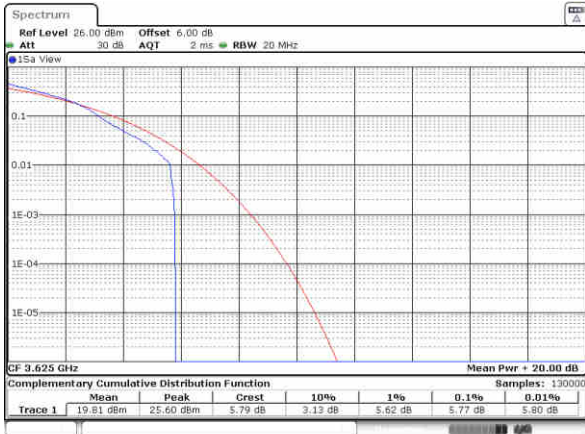
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Lowest Channel / Full RB



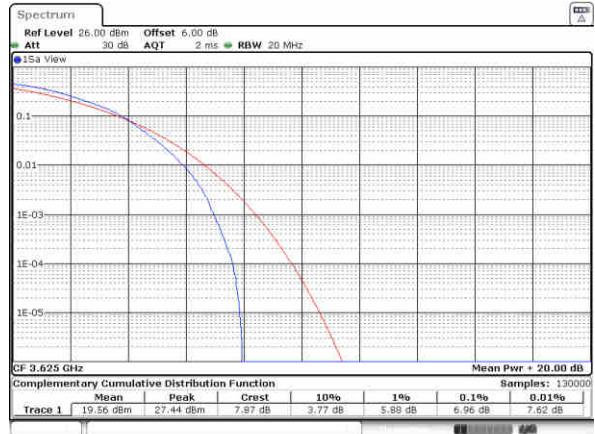
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Middle Channel / 1RB



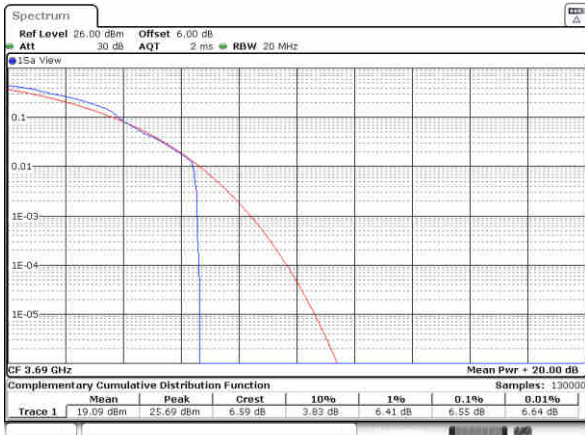
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Middle Channel / Full RB



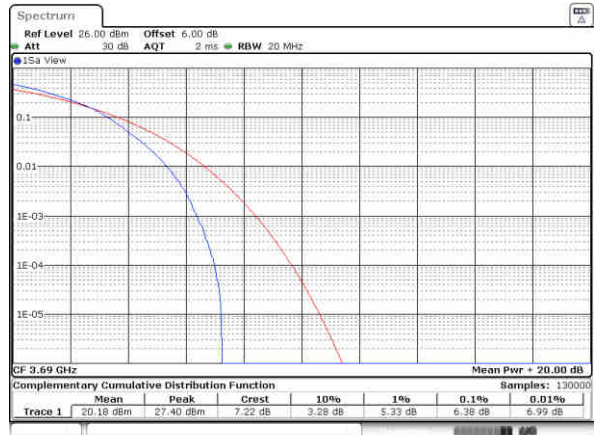
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Highest Channel / 1RB



Date: 31.JUL.2020 14:19:46

Highest Channel / Full RB

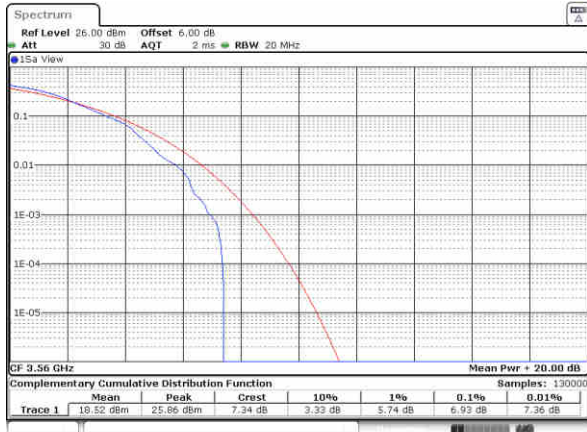


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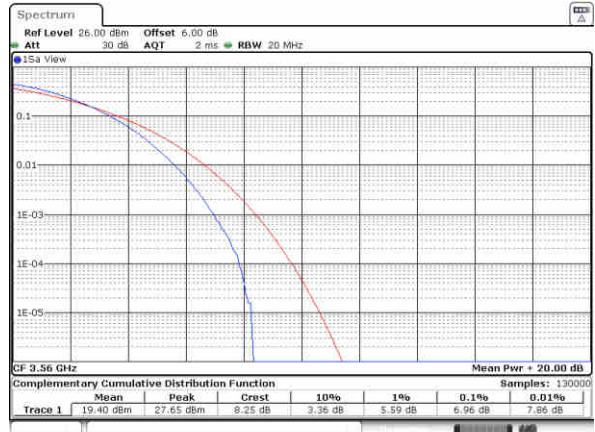
LTE Band 48 / 20MHz / 64QAM

Lowest Channel / 1RB



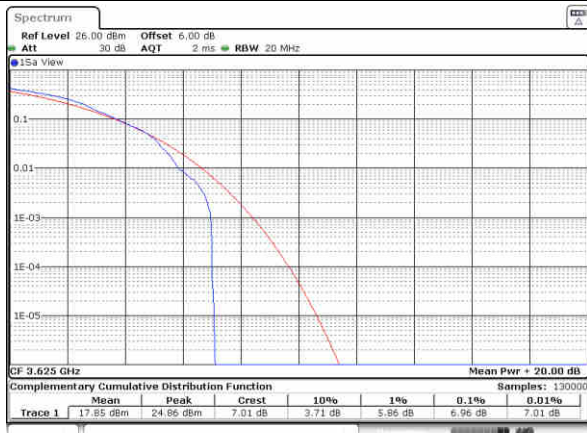
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Lowest Channel / Full RB



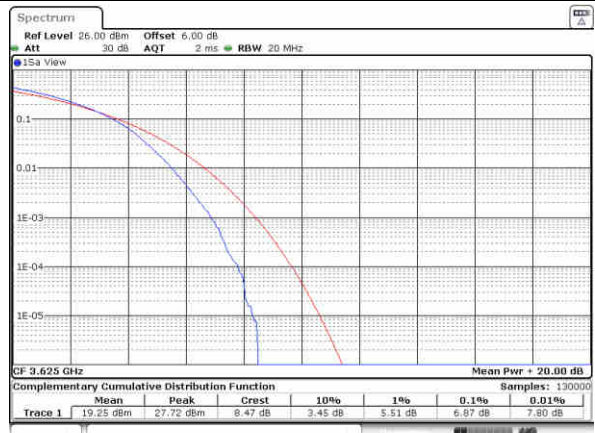
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Middle Channel / 1RB



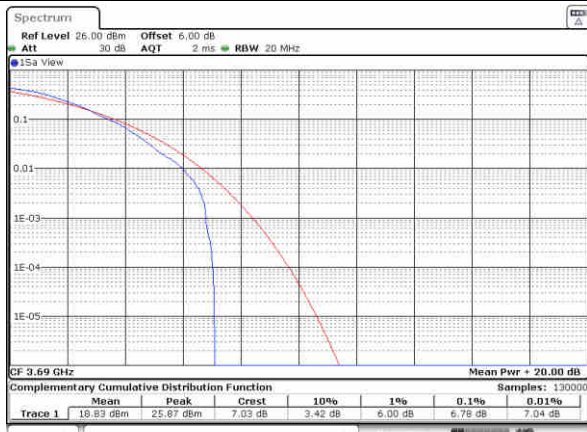
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Middle Channel / Full RB



Date: 31.JUL.2020 14:16:14

Highest Channel / 1RB



Date: 31.JUL.2020 14:29:07

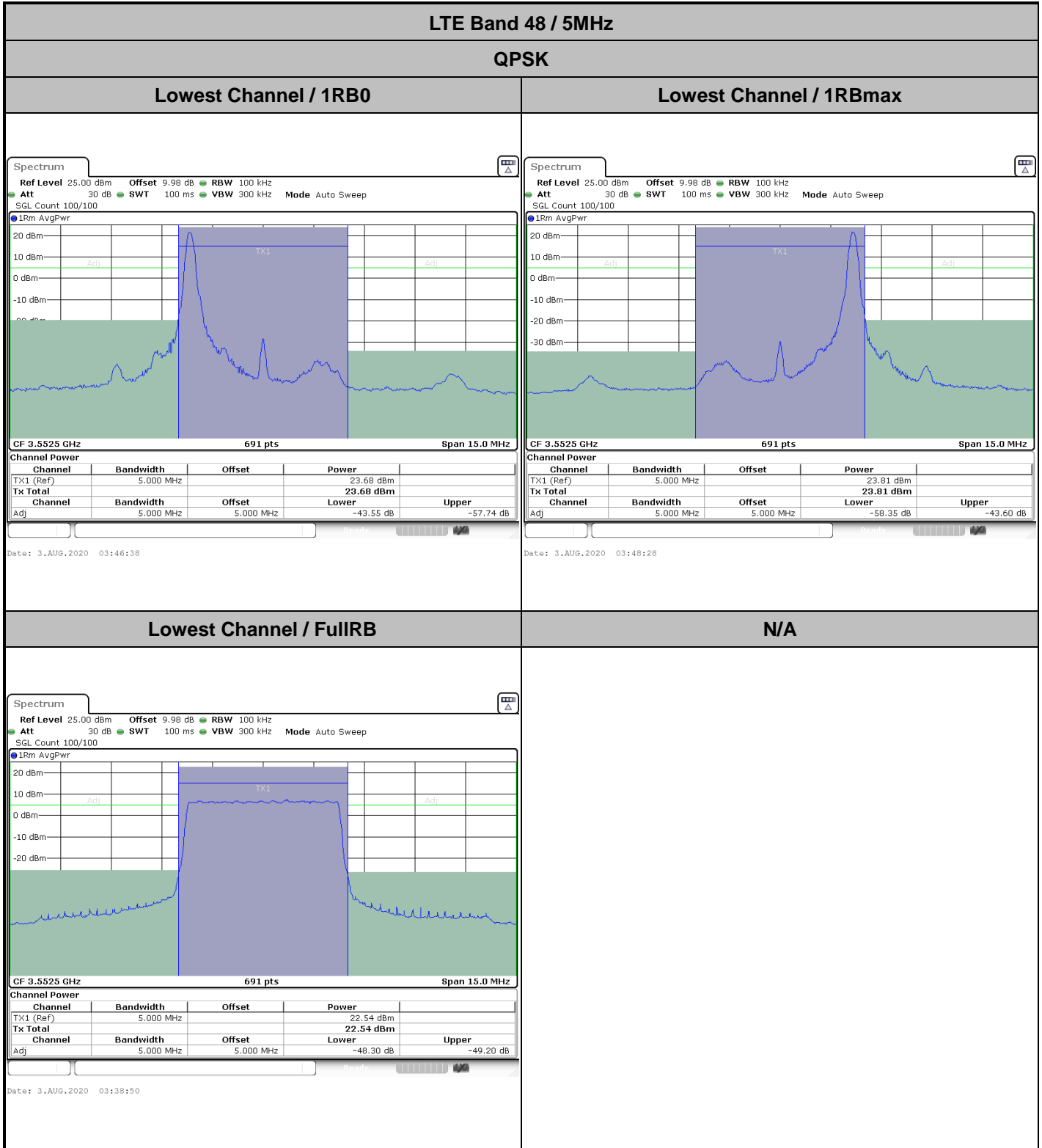
Highest Channel / Full RB



Date: 31.JUL.2020 14:29:27



ACLR

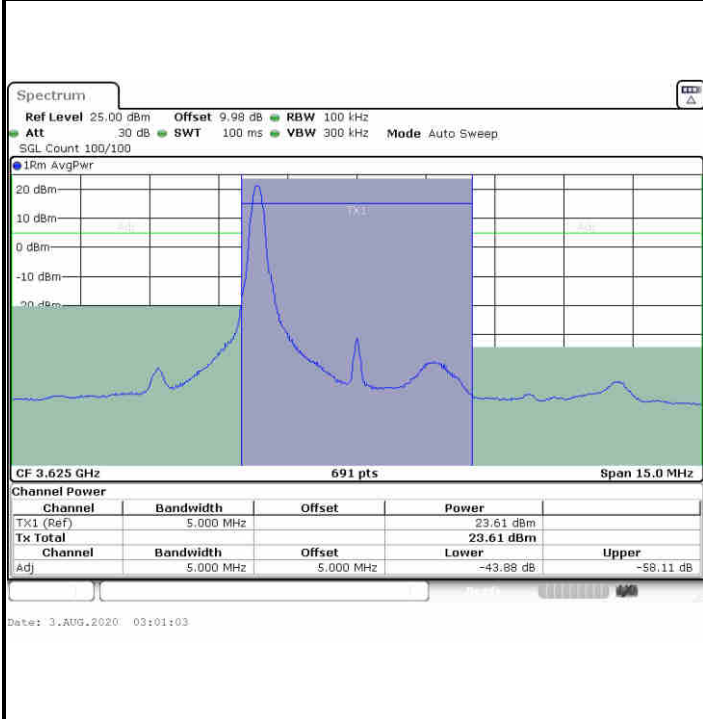




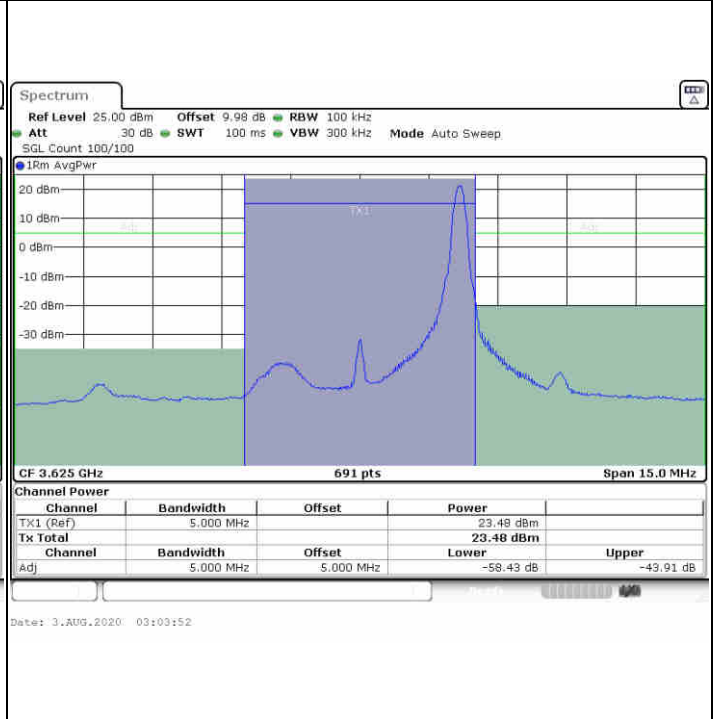
LTE Band 48 / 5MHz

QPSK

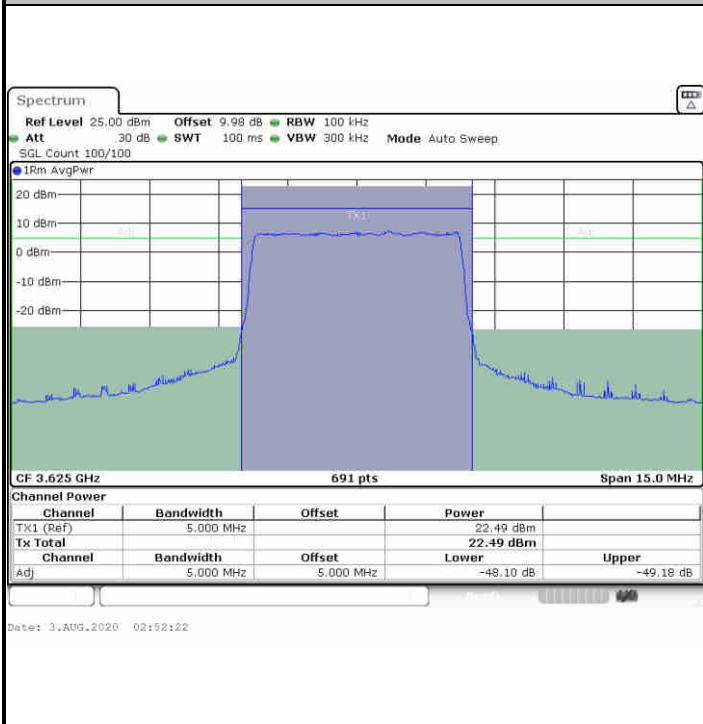
Middle Channel / 1RB0



Middle Channel / 1RBmax



Middle Channel / FullRB



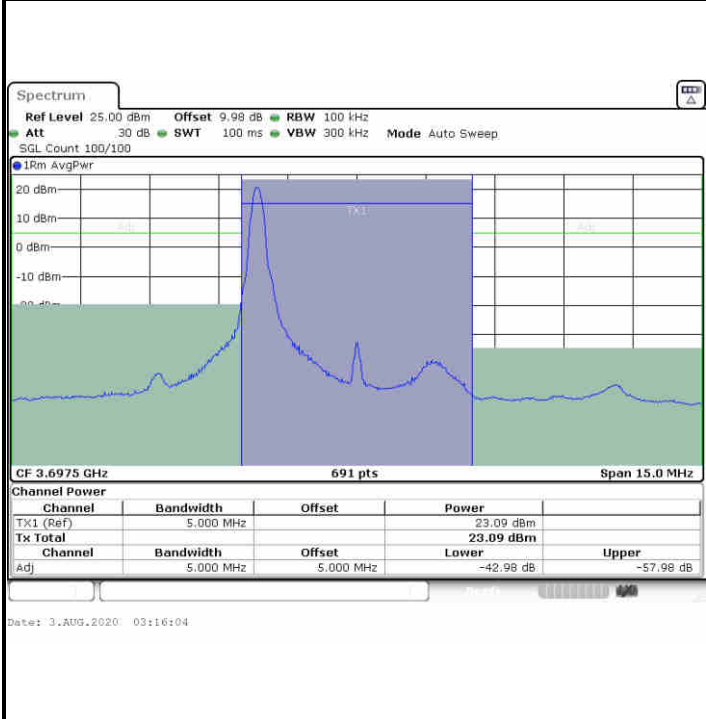
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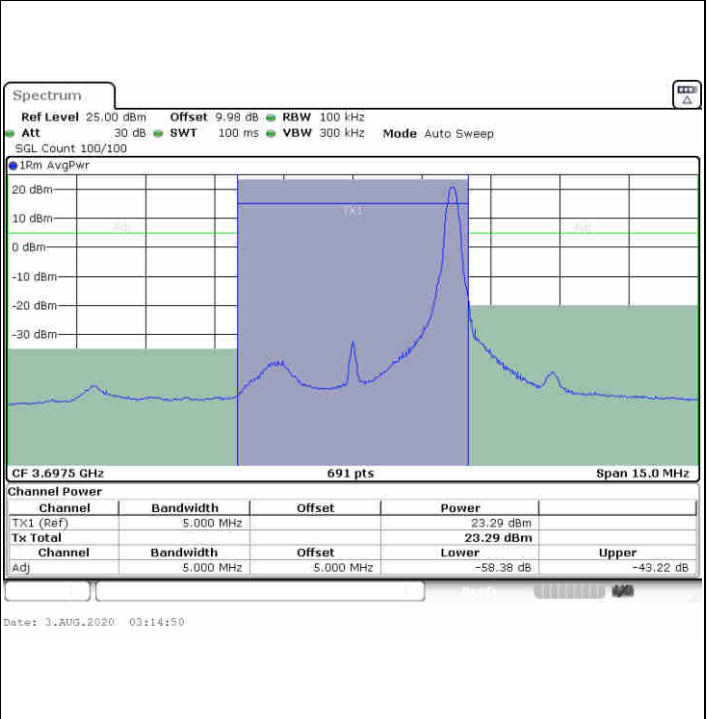
LTE Band 48 / 5MHz

QPSK

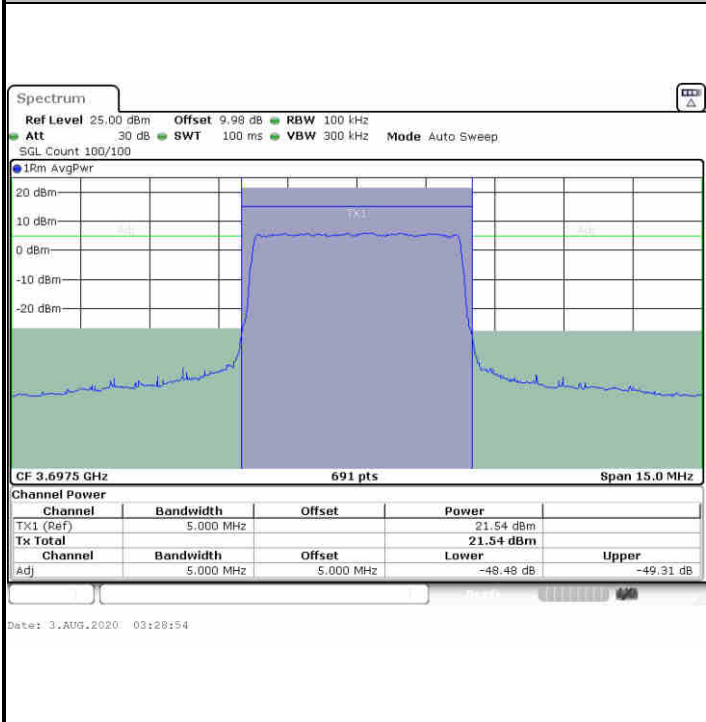
Highest Channel / 1RB0



Highest Channel / 1RBmax



Highest Channel / FullIRB



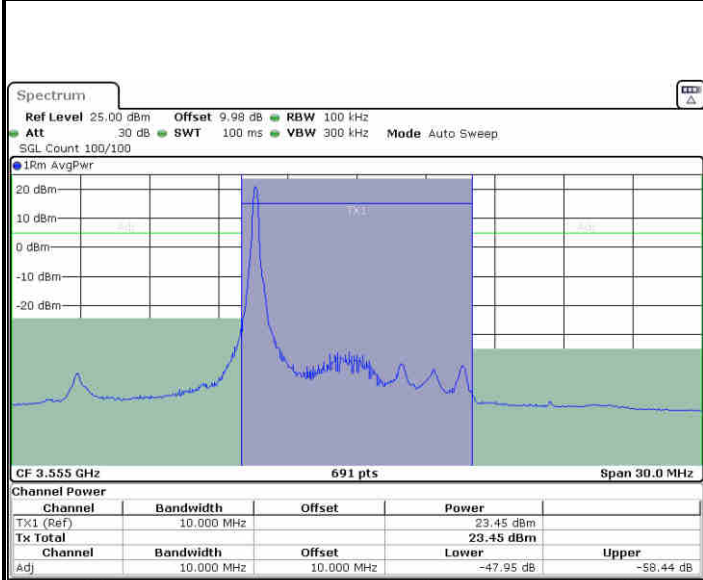
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LTE Band 48 / 10MHz

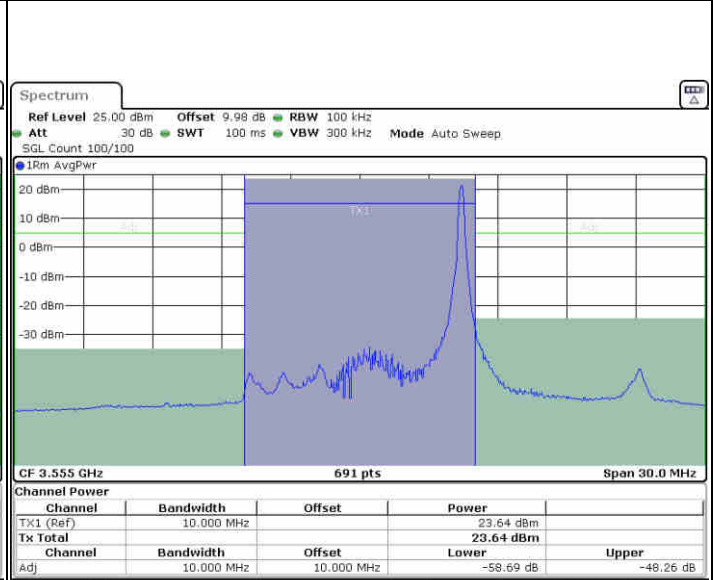
QPSK

Lowest Channel / 1RB0



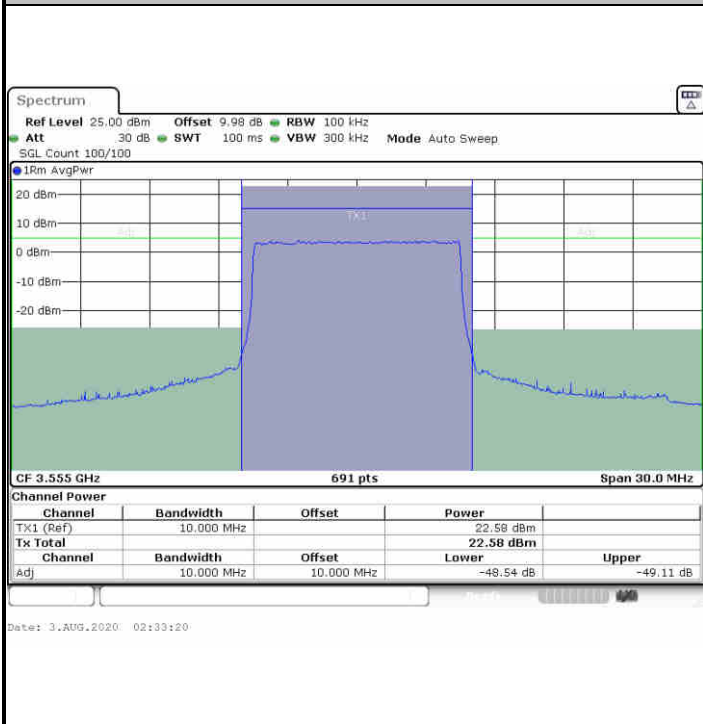
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Lowest Channel / 1RBmax



Date: 3.AUG.2020 02:44:12

Lowest Channel / FullRB



Date: 3.AUG.2020 02:33:20

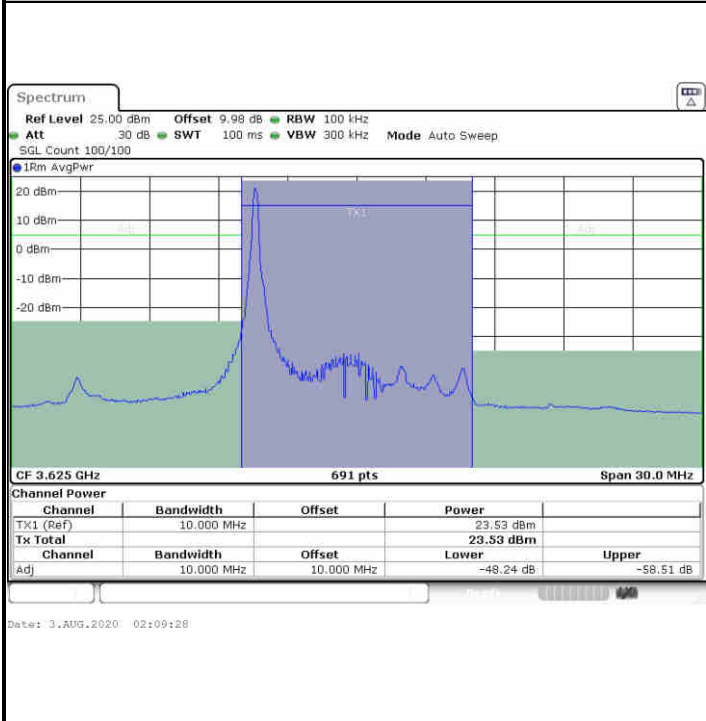
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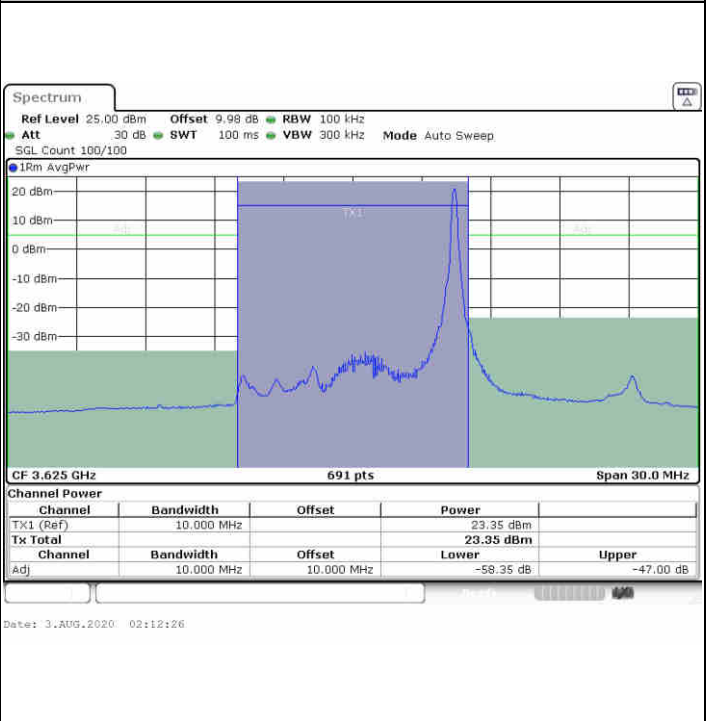
LTE Band 48 / 10MHz

QPSK

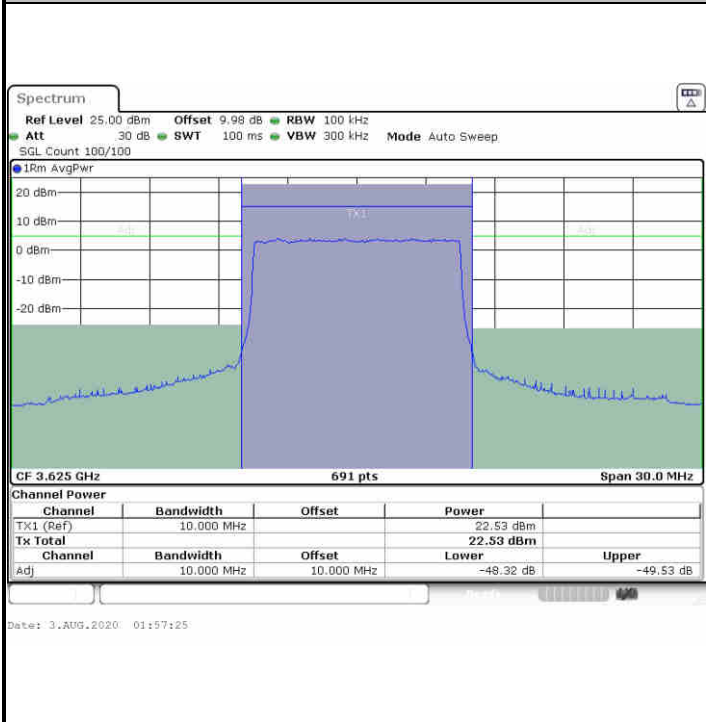
MiddleChannel / 1RB0



Middle Channel / 1RBmax



Middle Channel / FullRB



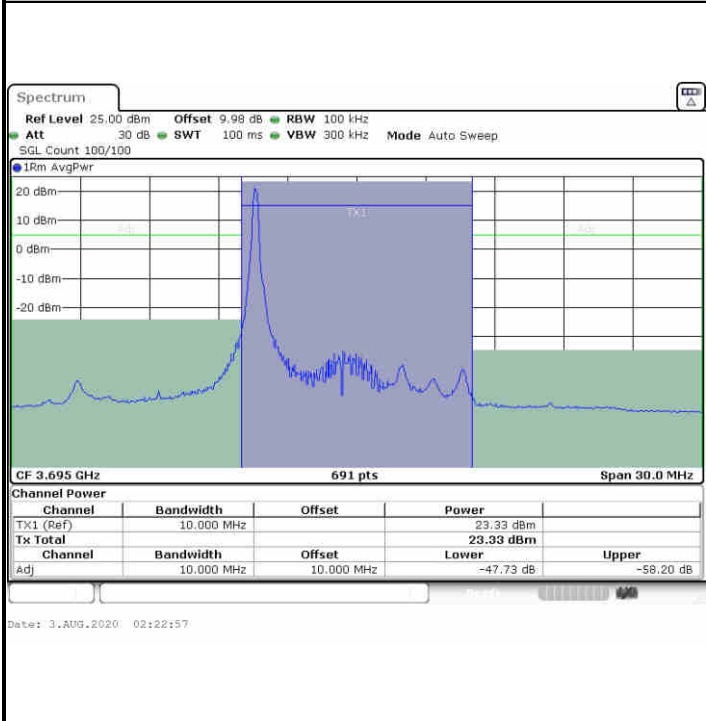
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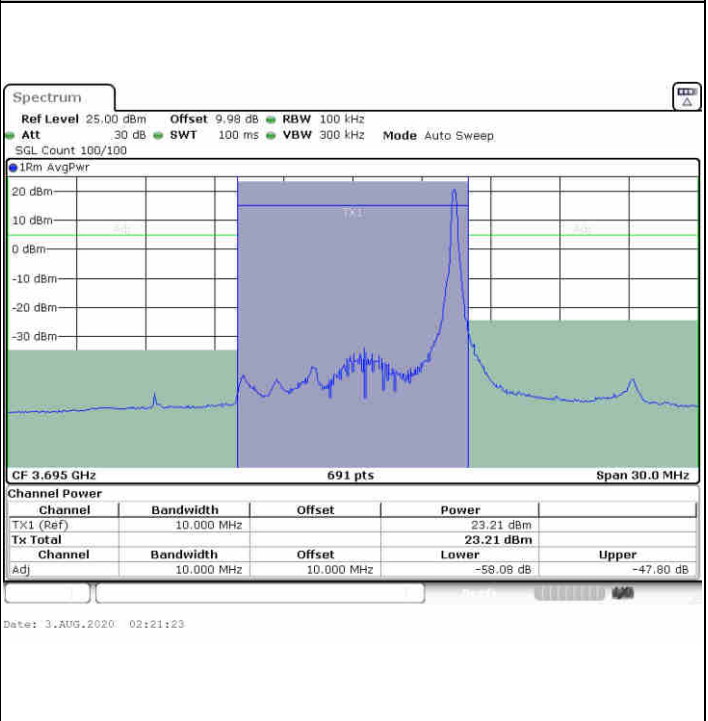
LTE Band 48 / 10MHz

QPSK

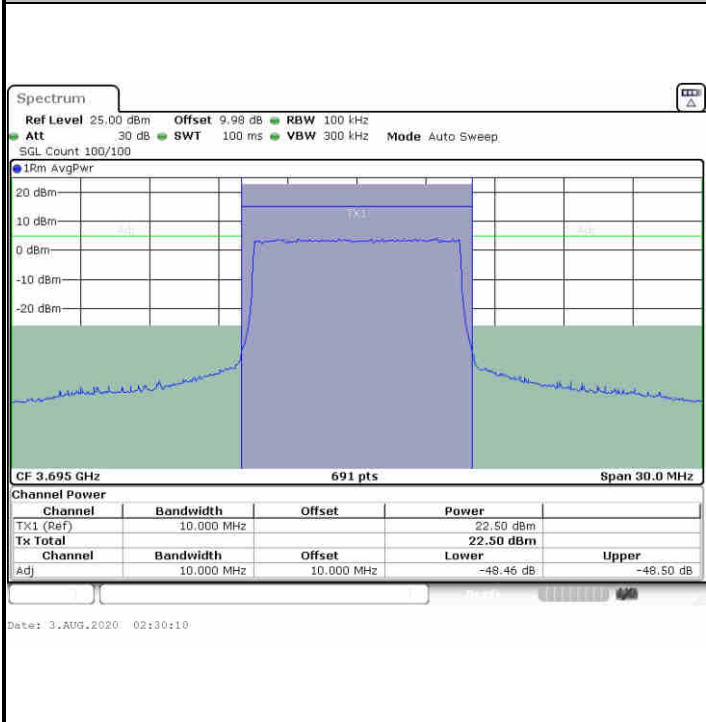
Highest Channel / 1RB0



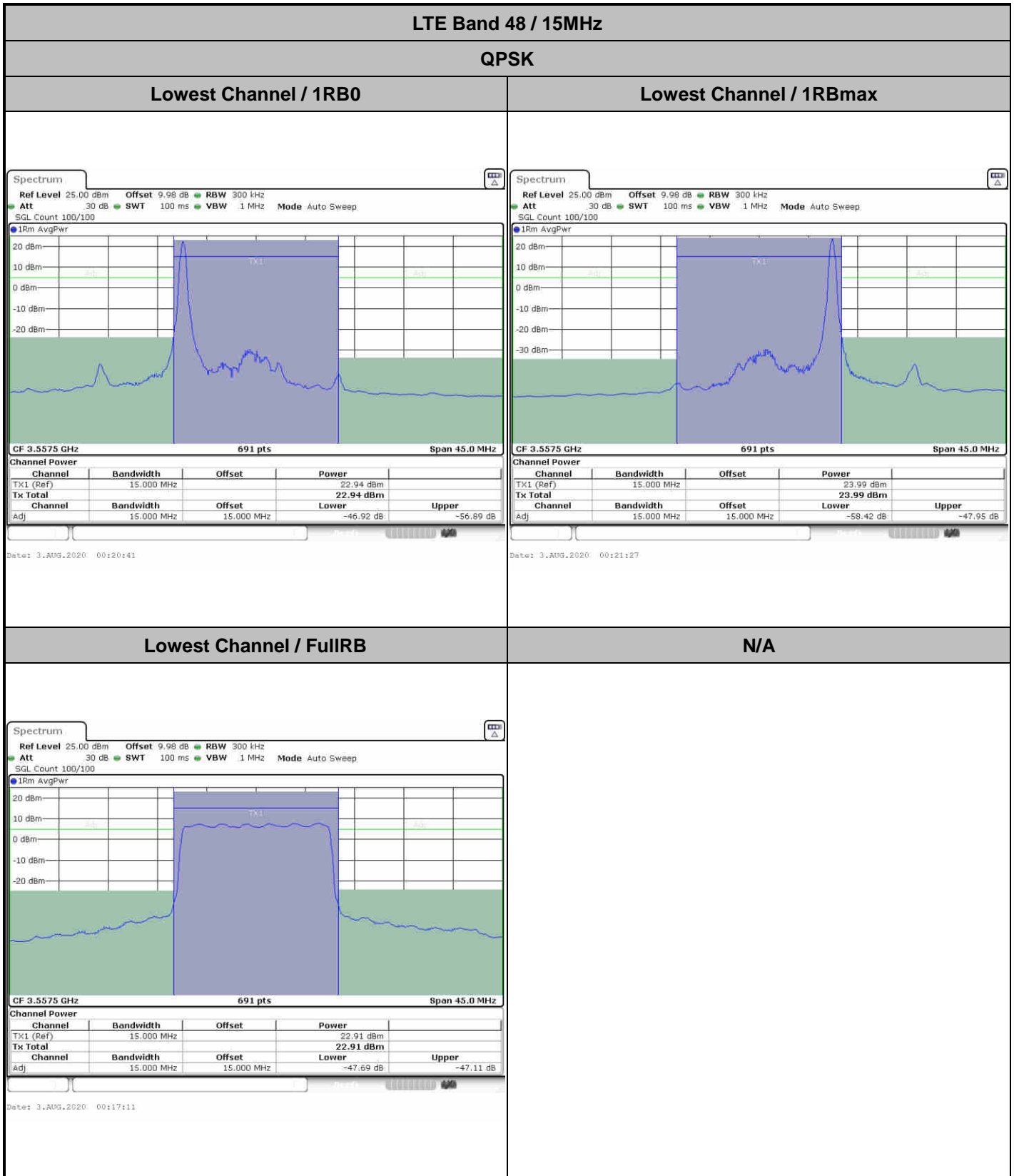
Highest Channel / 1RBmax

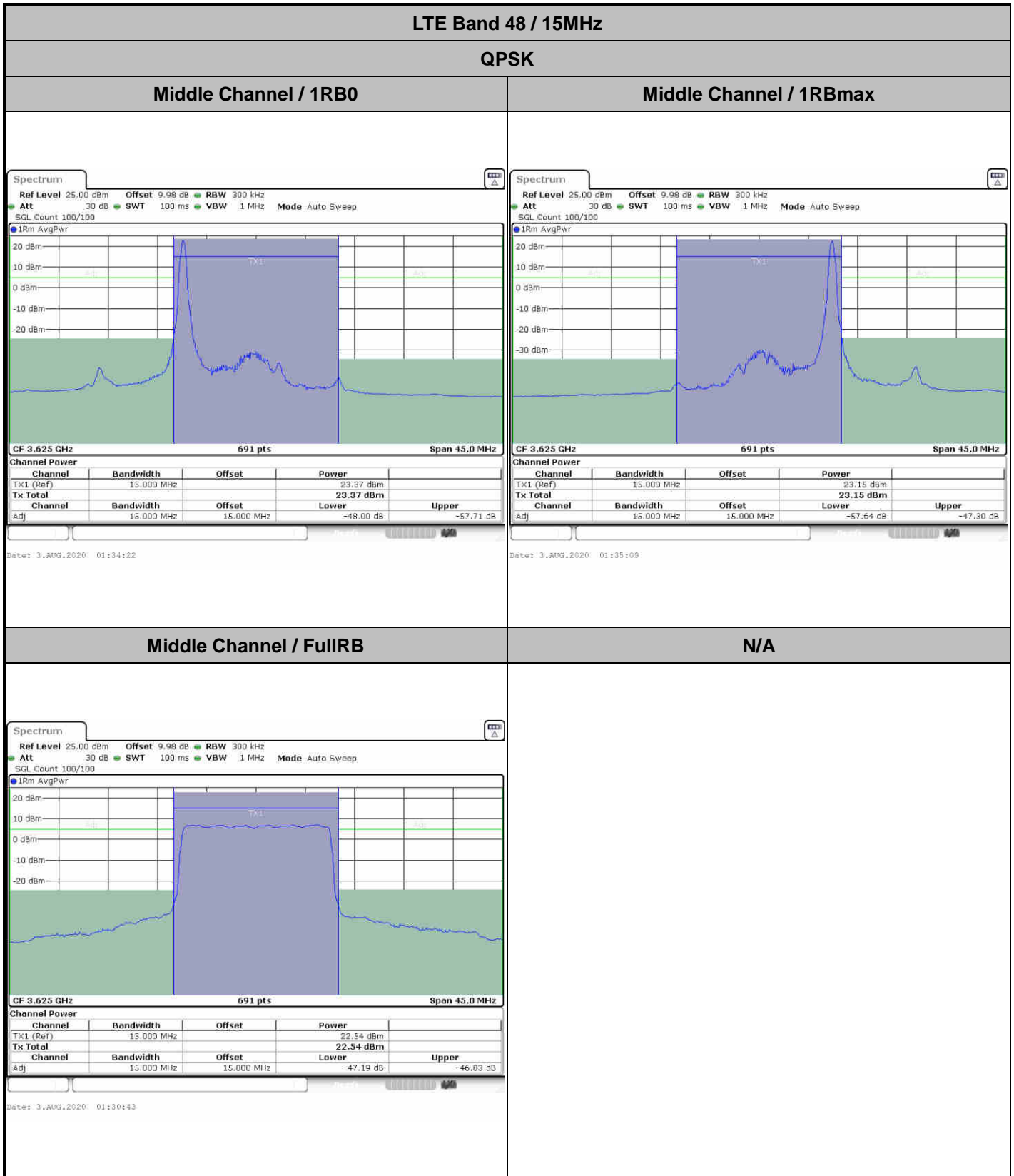


Highest Channel / FullIRB



N/A



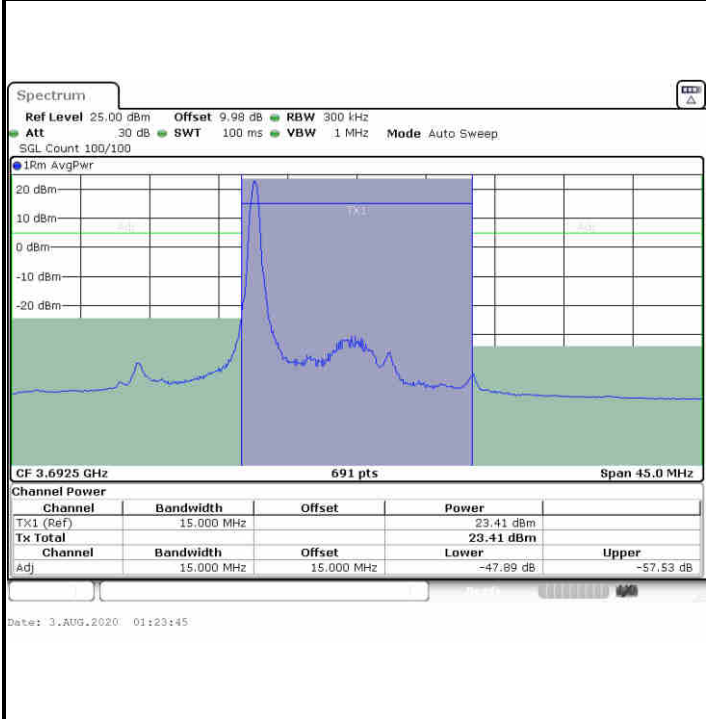




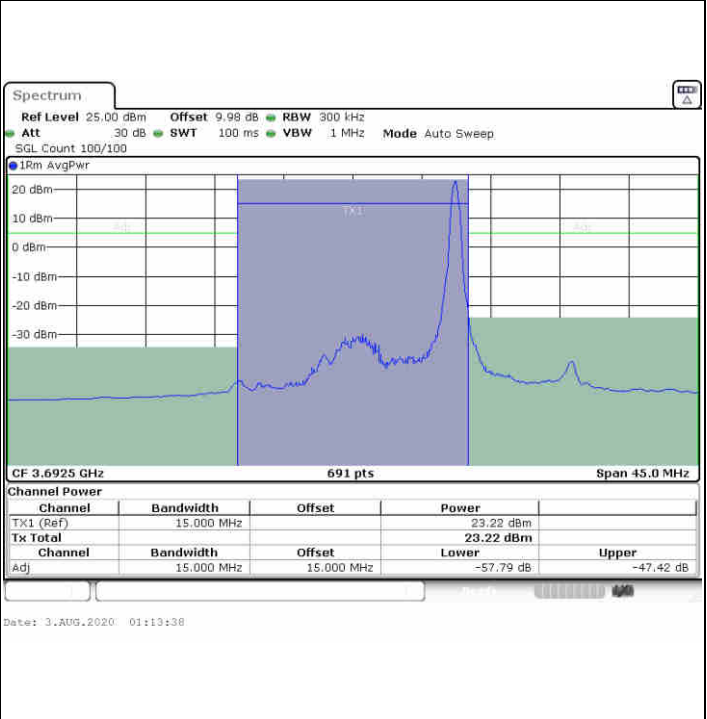
LTE Band 48 / 15MHz

QPSK

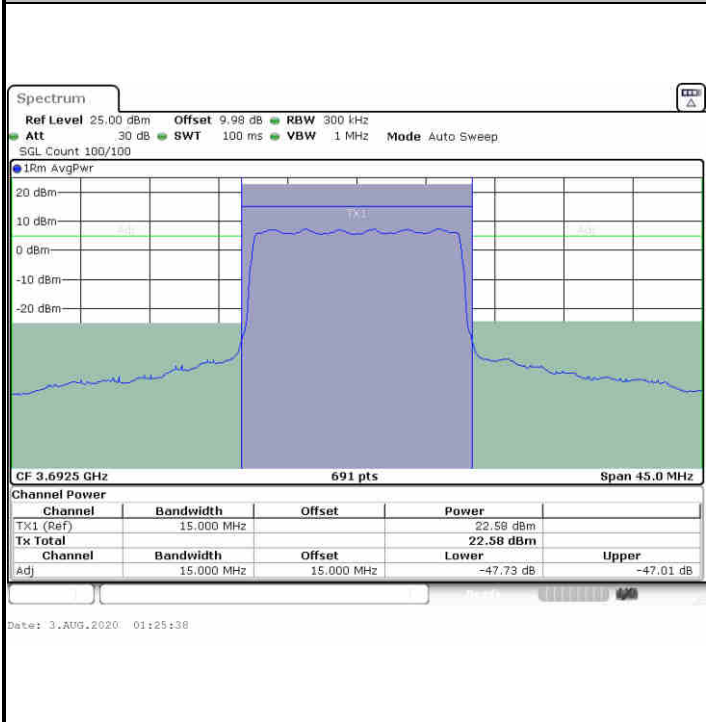
Highest Channel / 1RB0



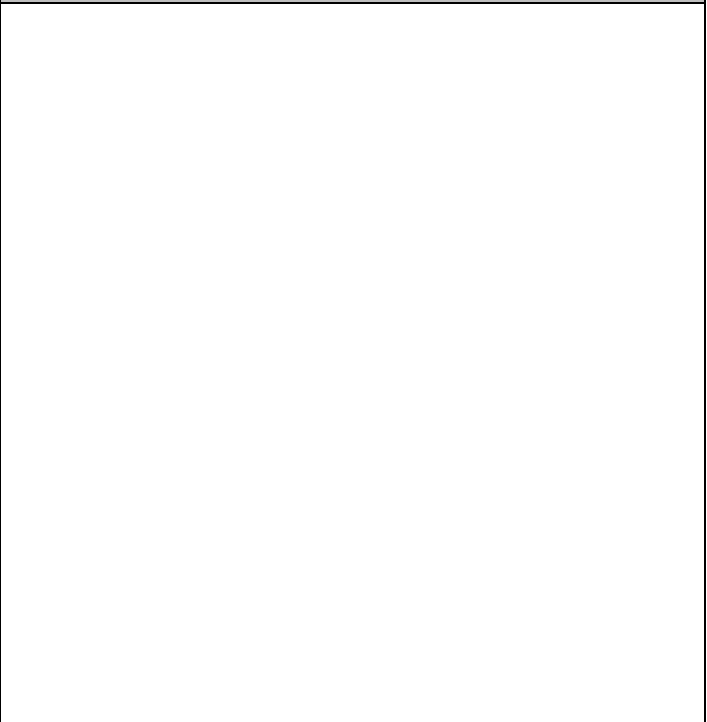
Highest Channel / 1RBmax



Highest Channel / FullIRB



N/A

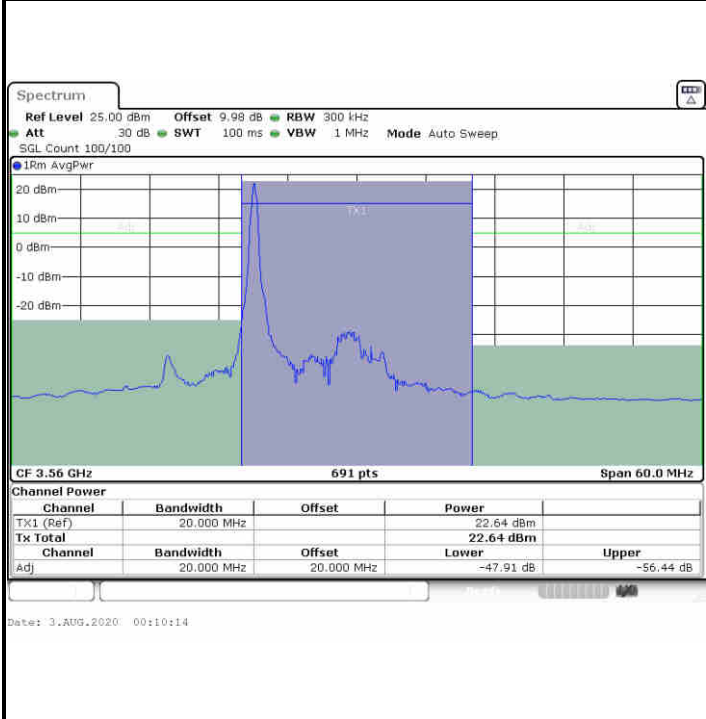




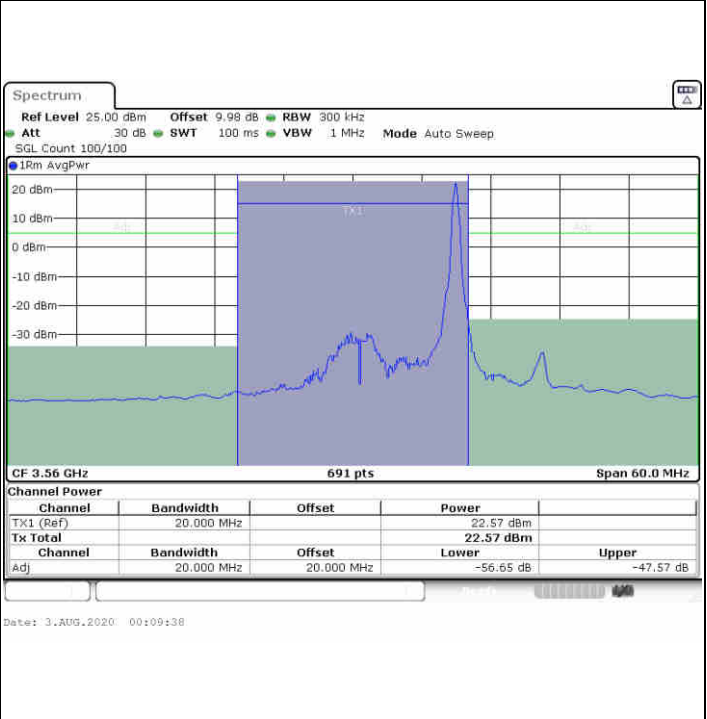
LTE Band 48 / 20MHz

QPSK

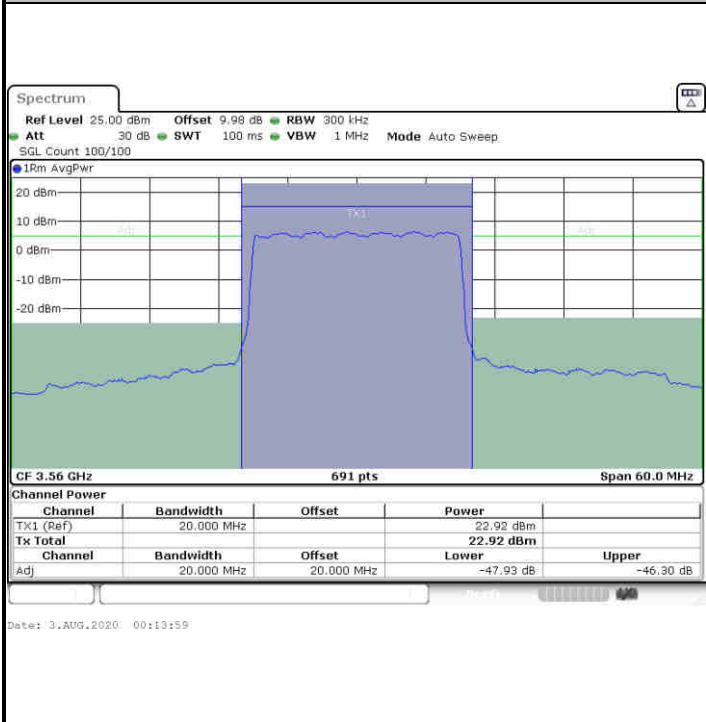
Lowest Channel / 1RB0



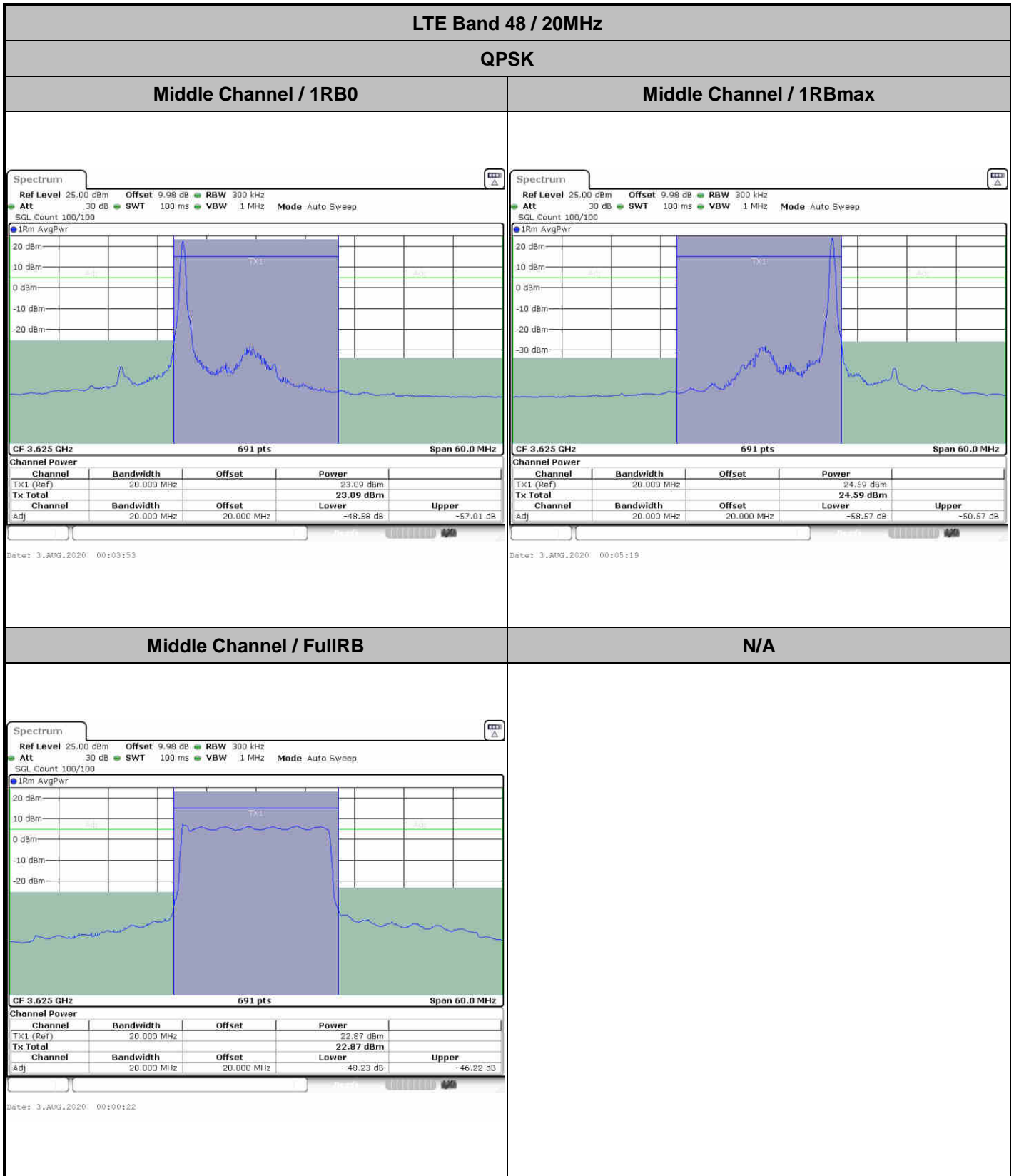
Lowest Channel / 1RBmax



Lowest Channel / FullRB



N/A

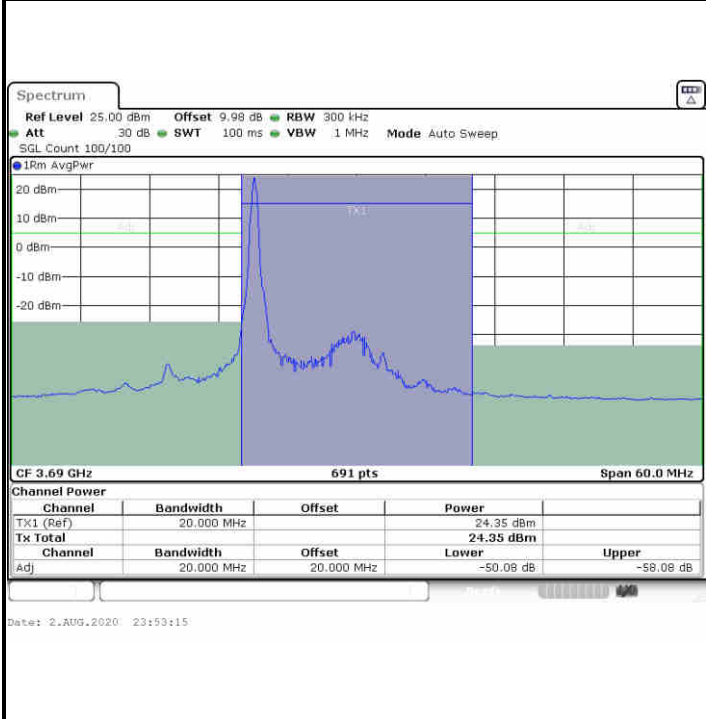




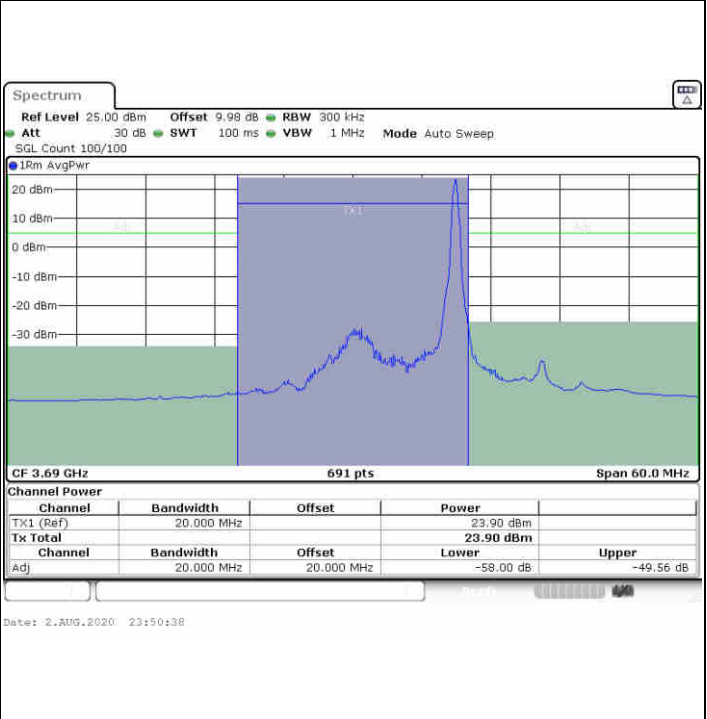
LTE Band 48 / 20MHz

QPSK

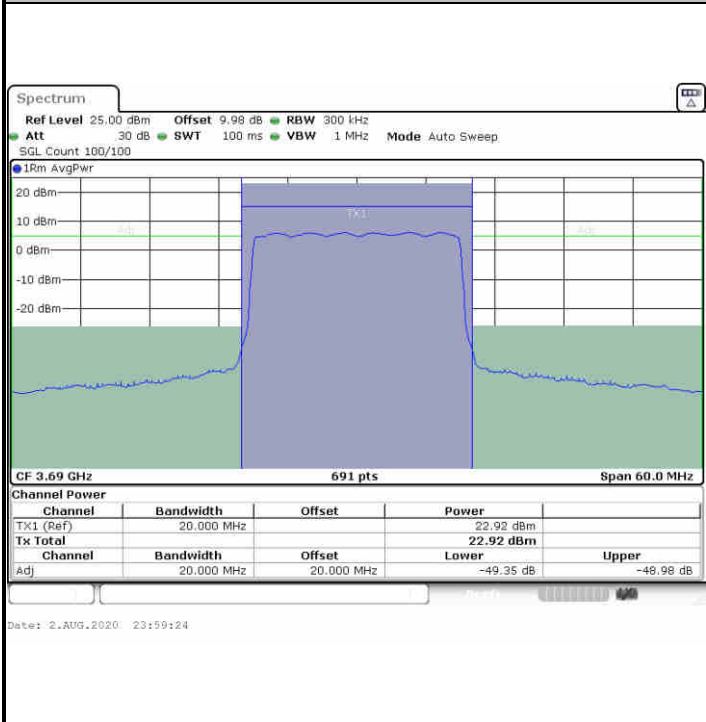
Highest Channel / 1RB0



Highest Channel / 1RBmax



Highest Channel / FullIRB



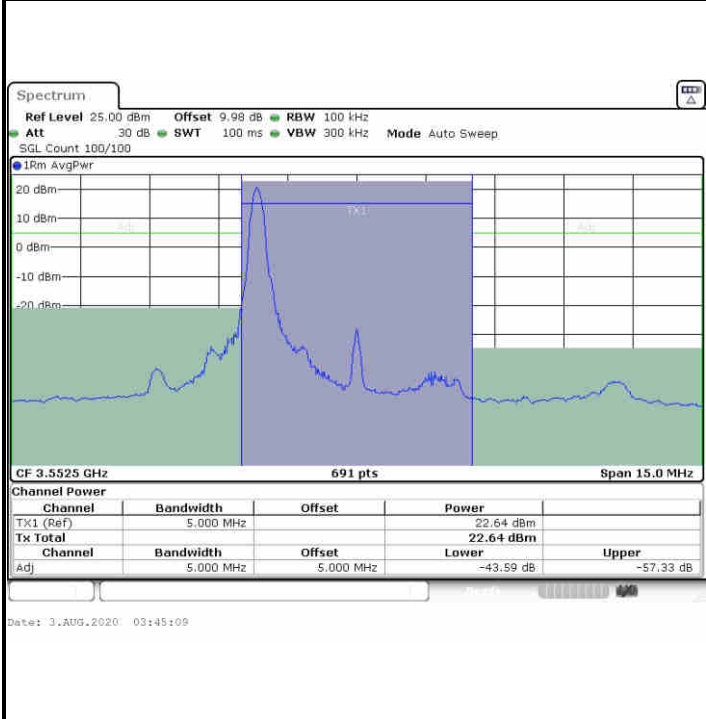
N/A



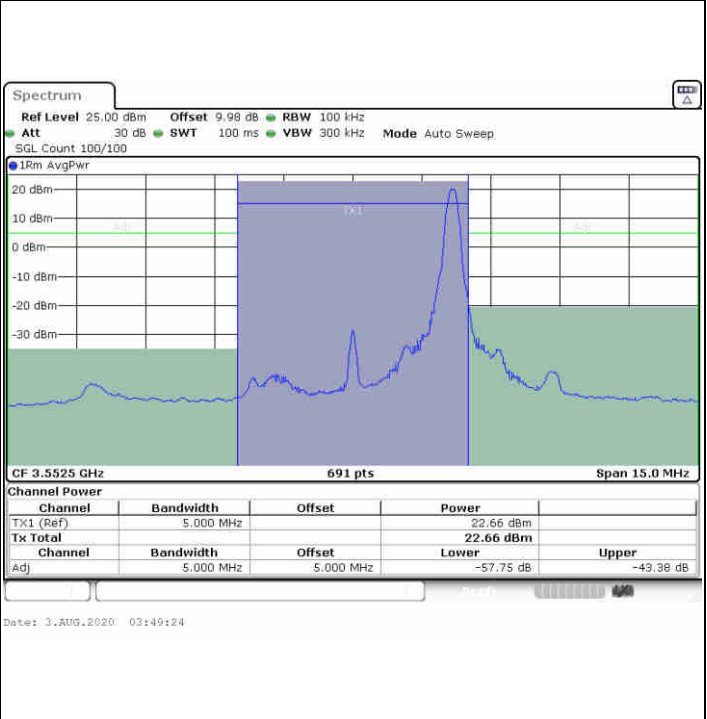
LTE Band 48 / 5MHz

16QAM

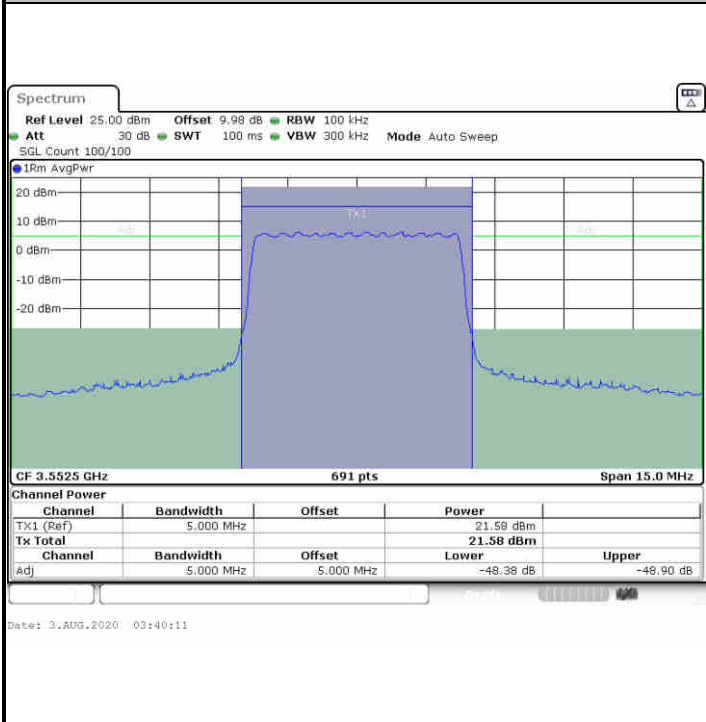
Lowest Channel / 1RB0



Lowest Channel / 1RBmax



Lowest Channel / FullRB



N/A

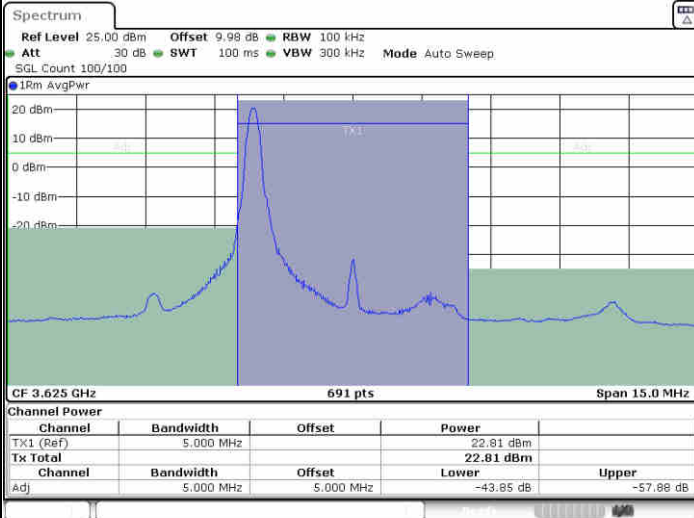


LTE Band 48 / 5MHz

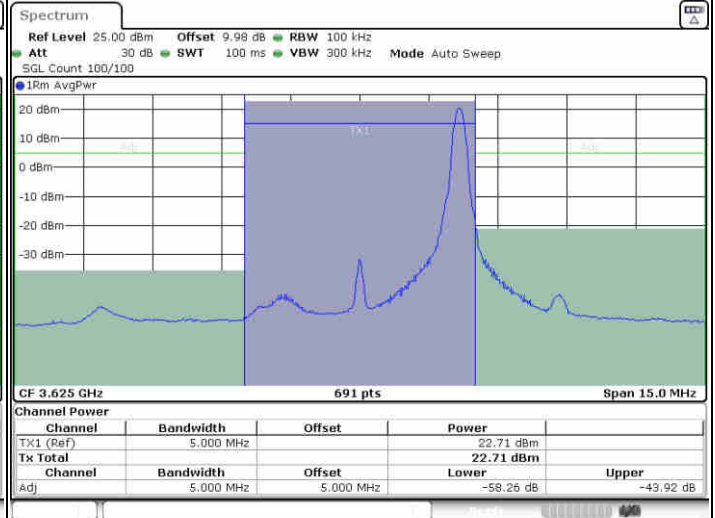
16QAM

Middle Channel / 1RB0

Middle Channel / 1RBmax



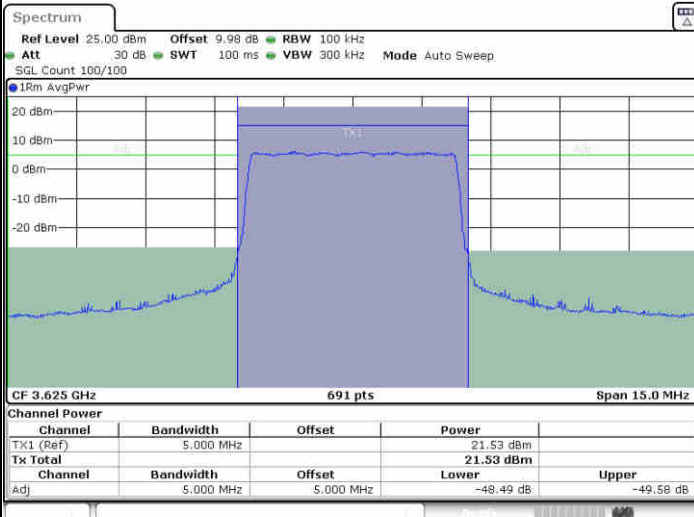
Date: 3.AUG.2020 02:57:20



Date: 3.AUG.2020 03:04:32

Middle Channel / FullRB

N/A



Date: 3.AUG.2020 02:53:11

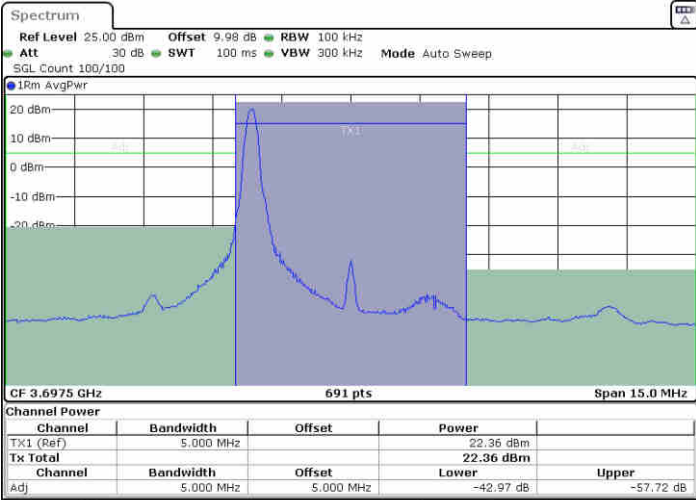


LTE Band 48 / 5MHz

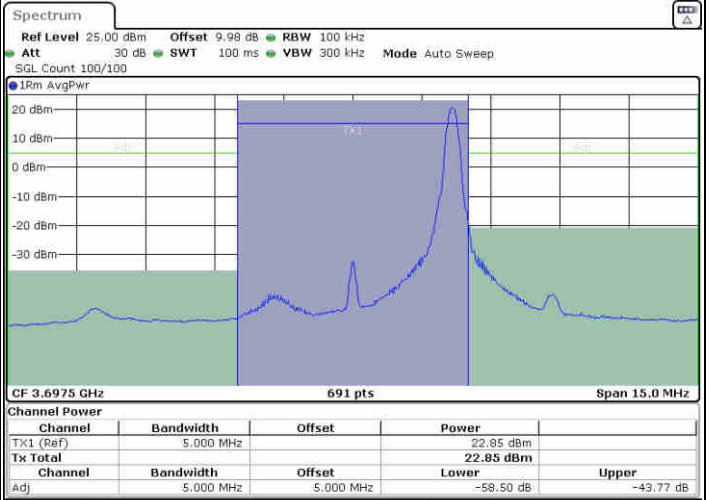
16QAM

Highest Channel / 1RB0

Highest Channel / 1RBmax



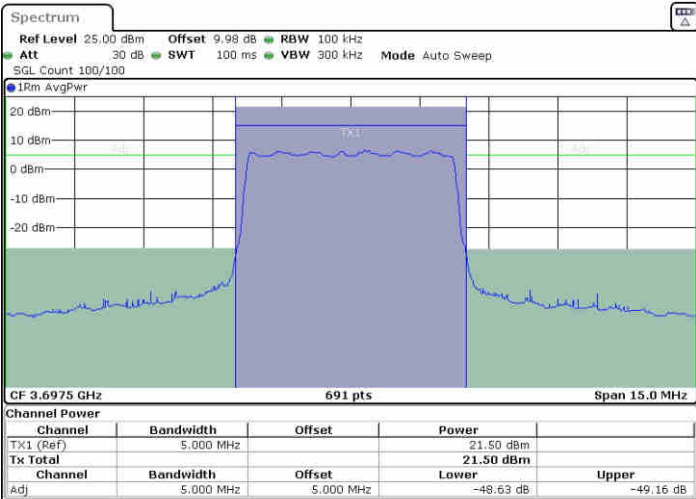
Date: 3.AUG.2020 03:18:39



Date: 3.AUG.2020 03:12:40

Highest Channel / FullIRB

N/A



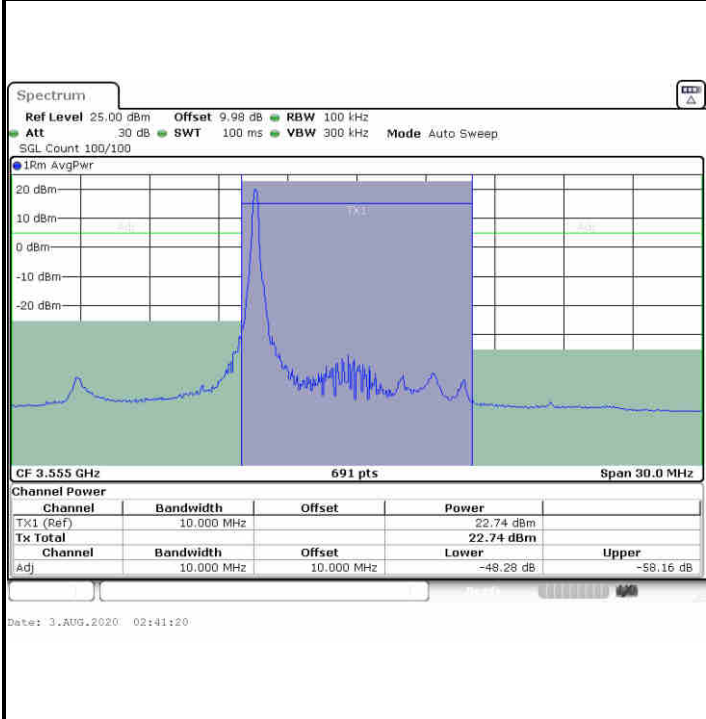
Date: 3.AUG.2020 03:24:35



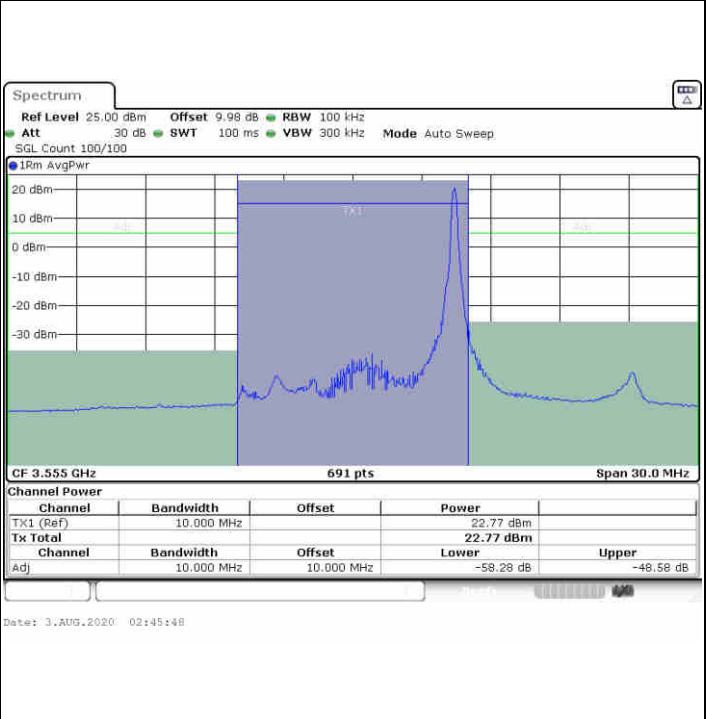
LTE Band 48 / 10MHz

16QAM

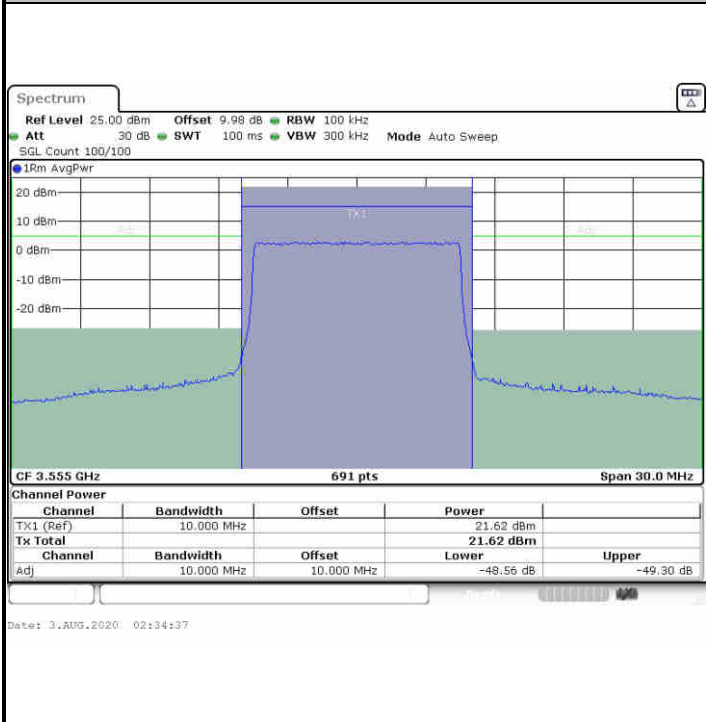
Lowest Channel / 1RB0



Lowest Channel / 1RBmax



Lowest Channel / FullRB



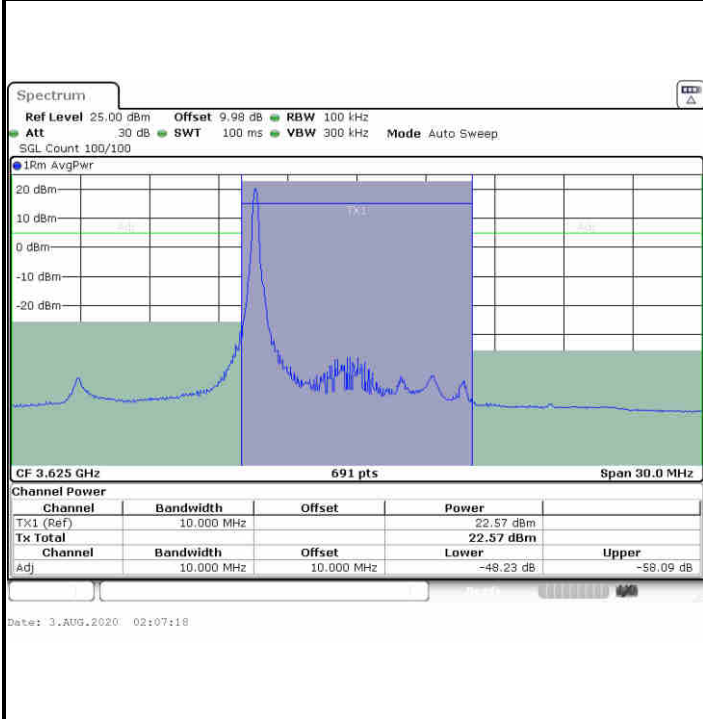
N/A



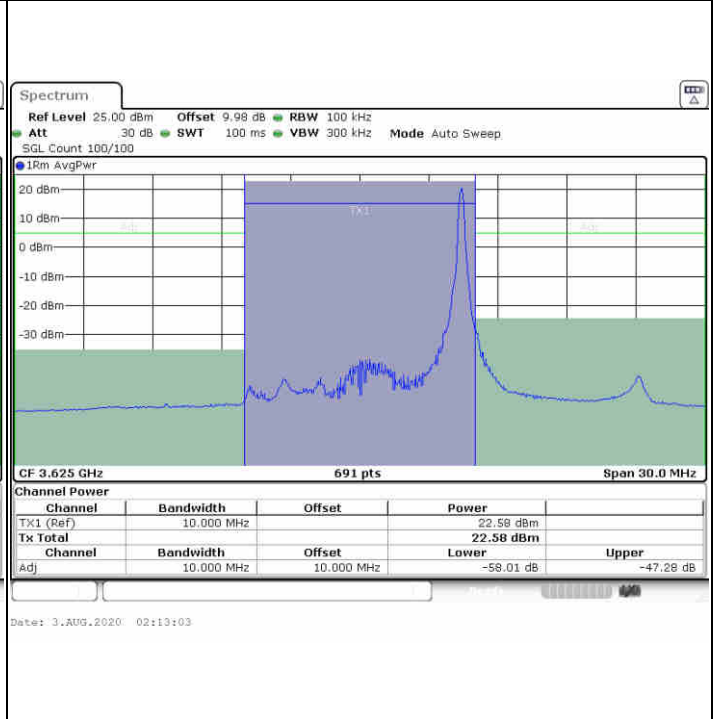
LTE Band 48 / 10MHz

16QAM

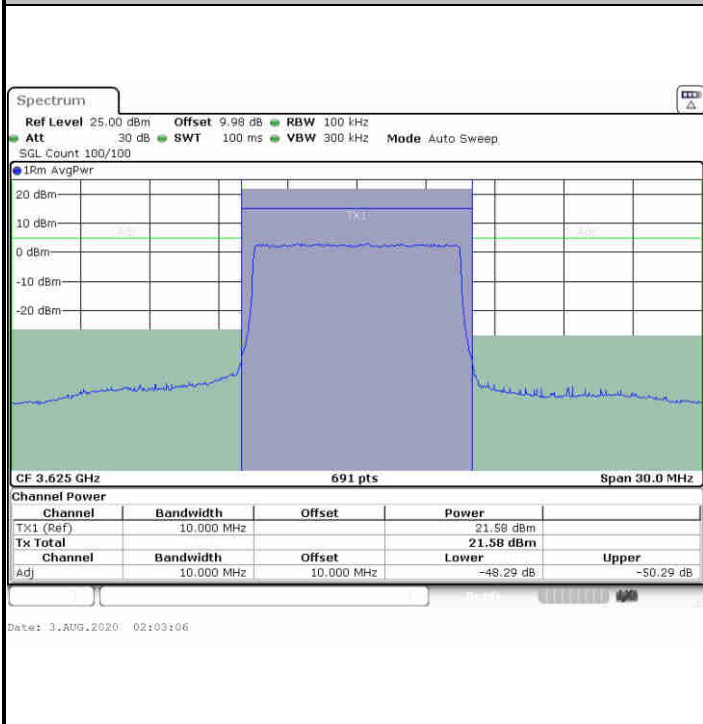
MiddleChannel / 1RB0



Middle Channel / 1RBmax



Middle Channel / FullIRB



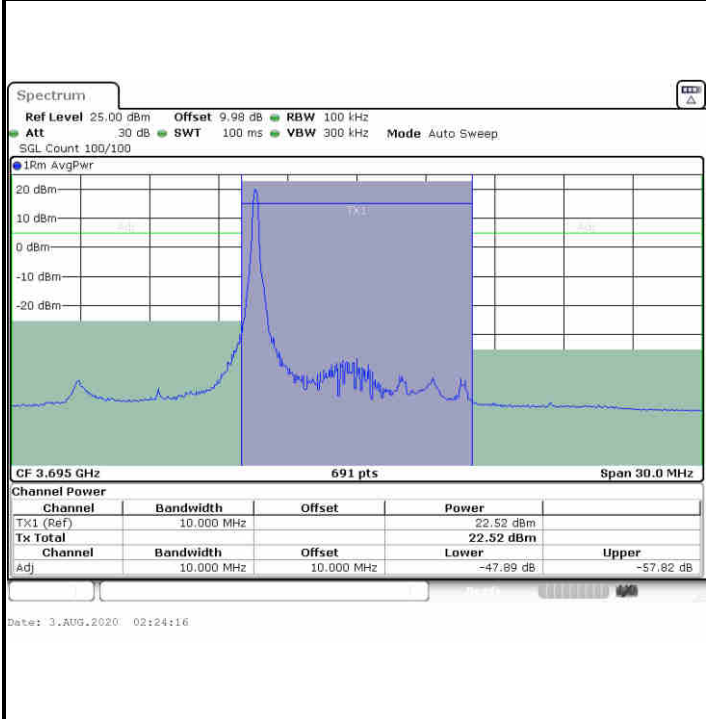
N/A



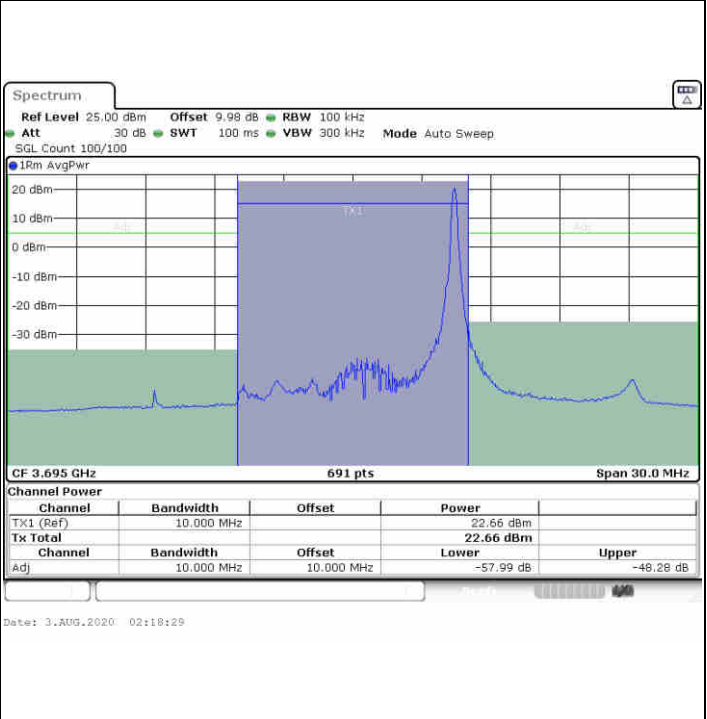
LTE Band 48 / 10MHz

16QAM

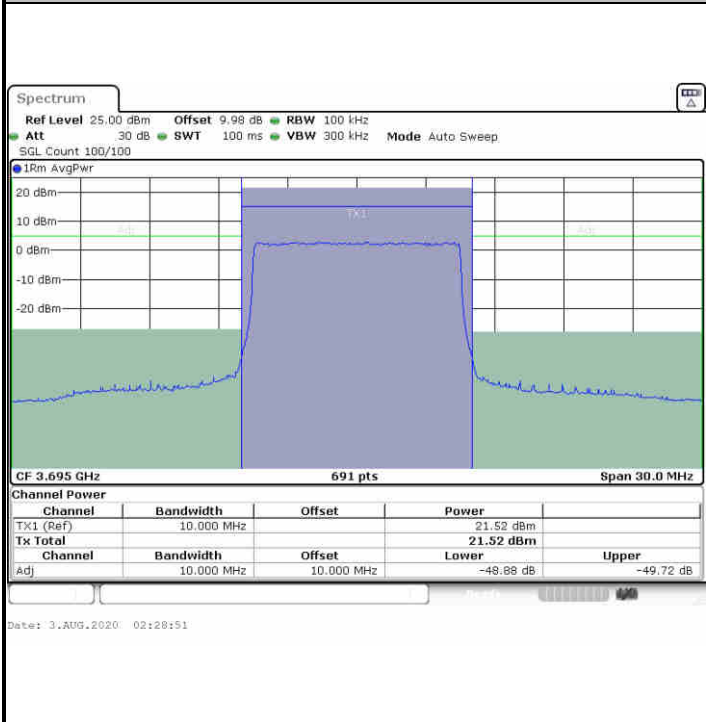
Highest Channel / 1RB0



Highest Channel / 1RBmax



Highest Channel / FullIRB



N/A

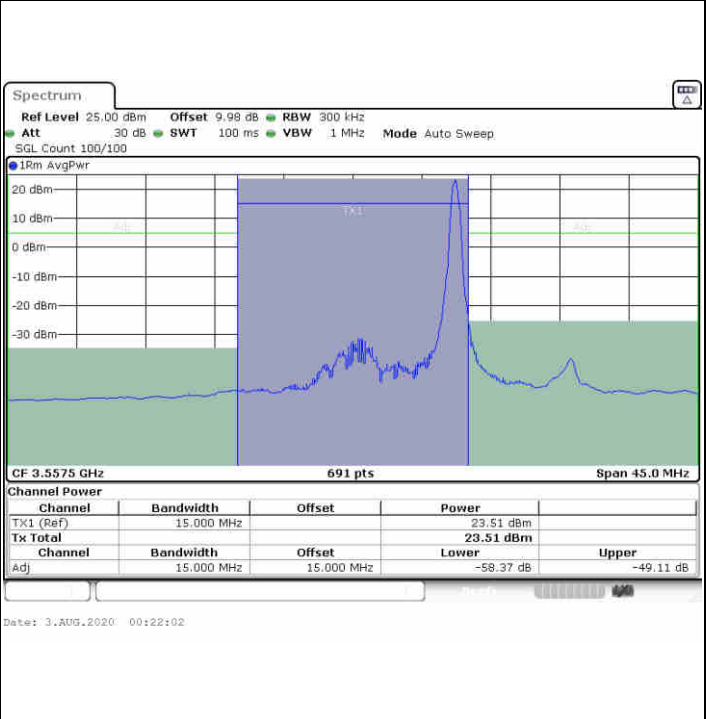
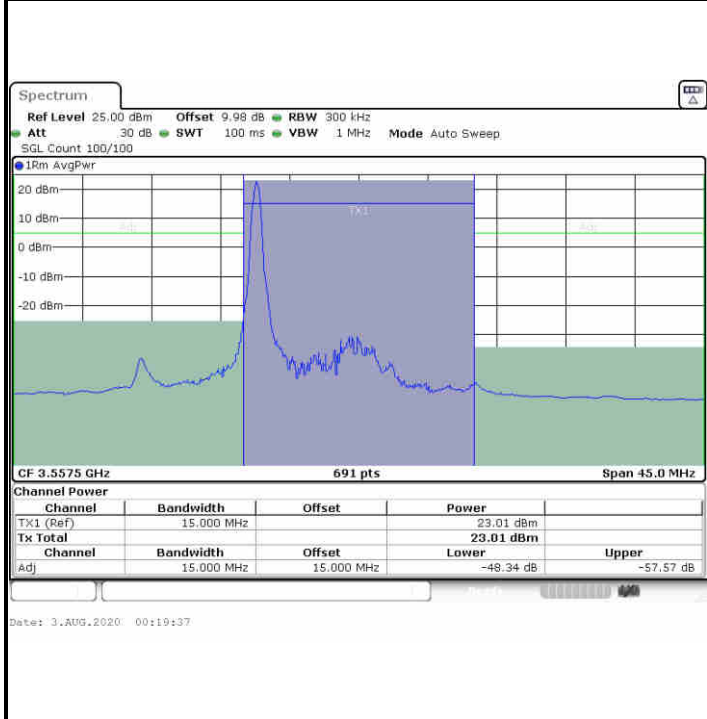


LTE Band 48 / 15MHz

16QAM

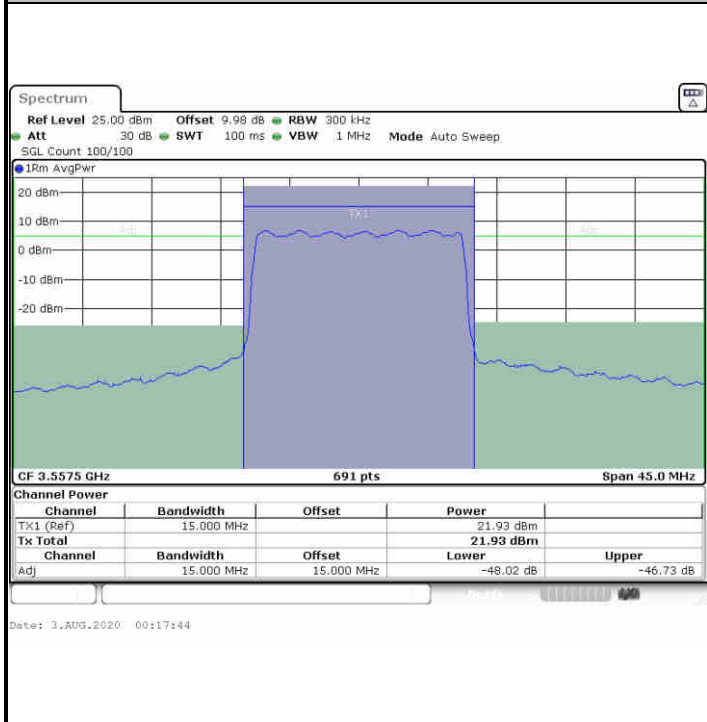
Lowest Channel / 1RB0

Lowest Channel / 1RBmax



Lowest Channel / FullRB

N/A

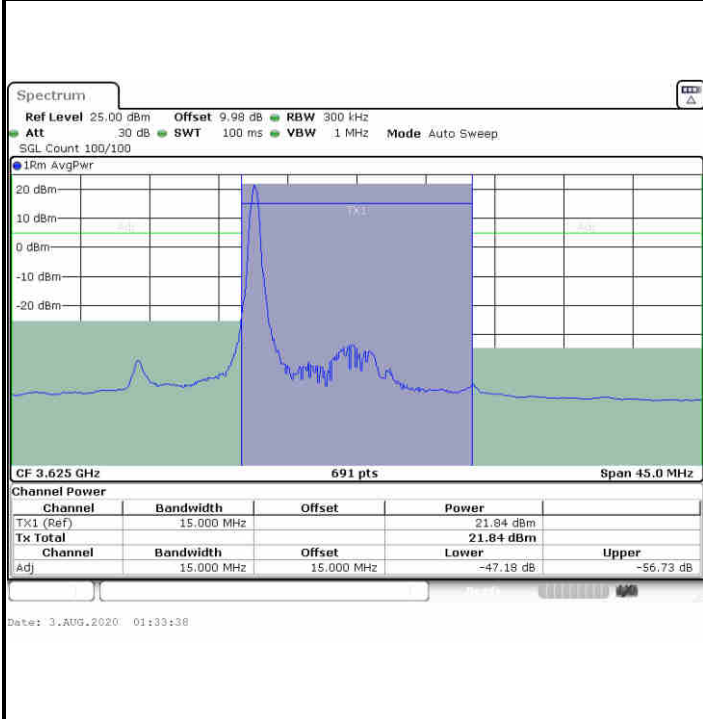




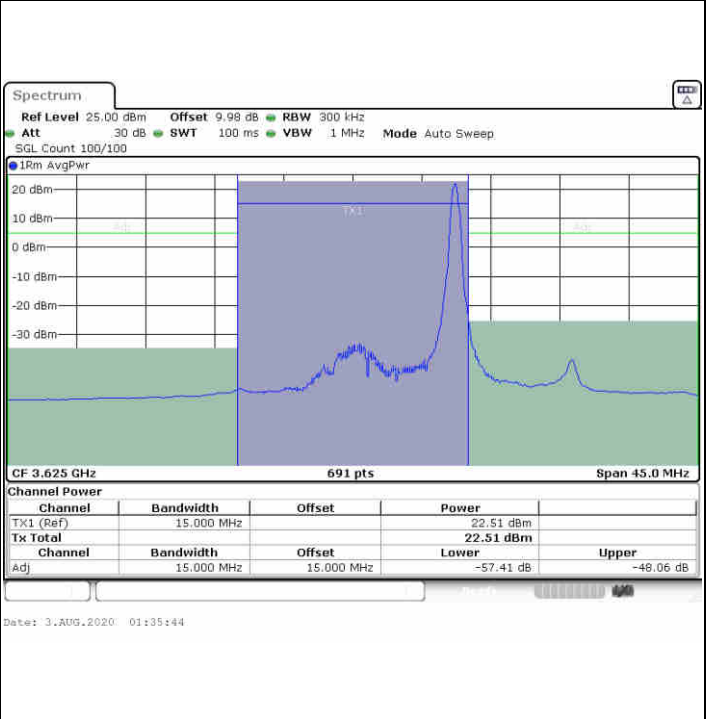
LTE Band 48 / 15MHz

16QAM

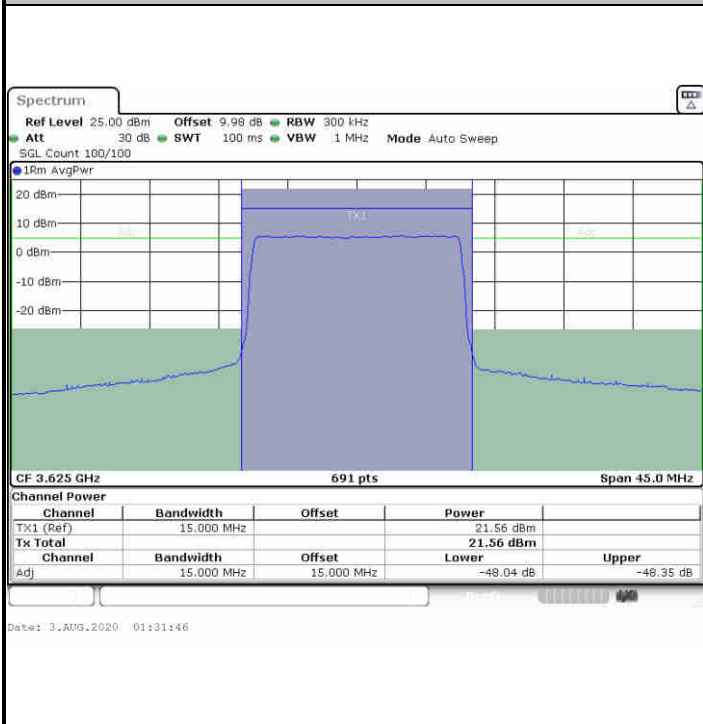
Middle Channel / 1RB0



Middle Channel / 1RBmax



Middle Channel / FullRB



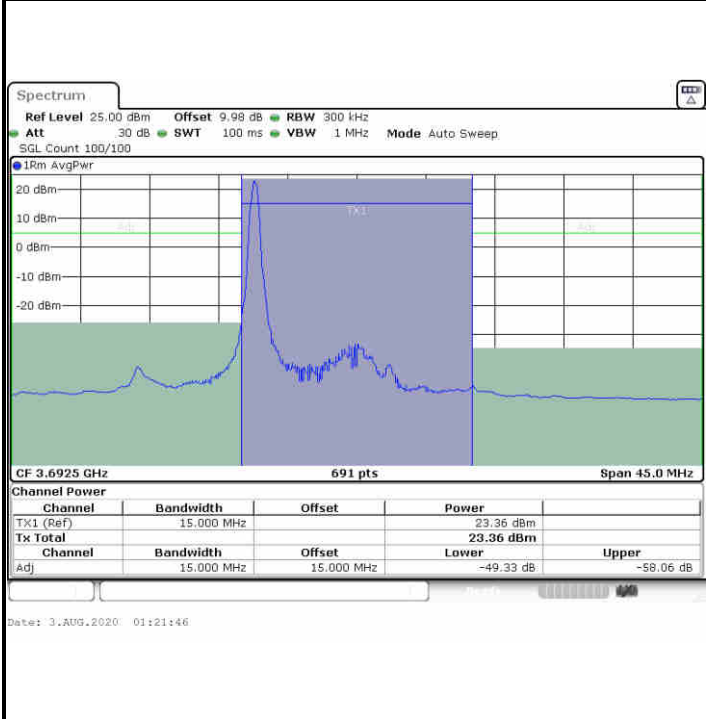
N/A



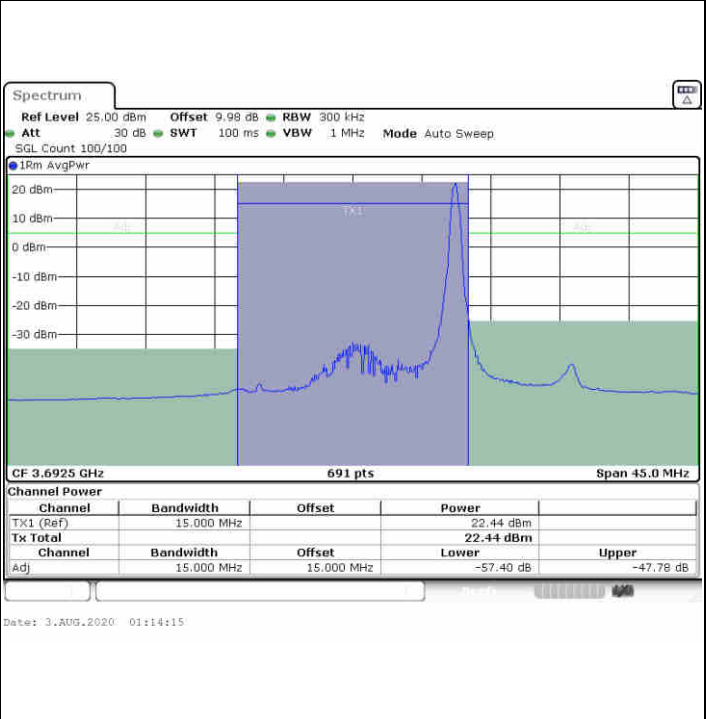
LTE Band 48 / 15MHz

16QAM

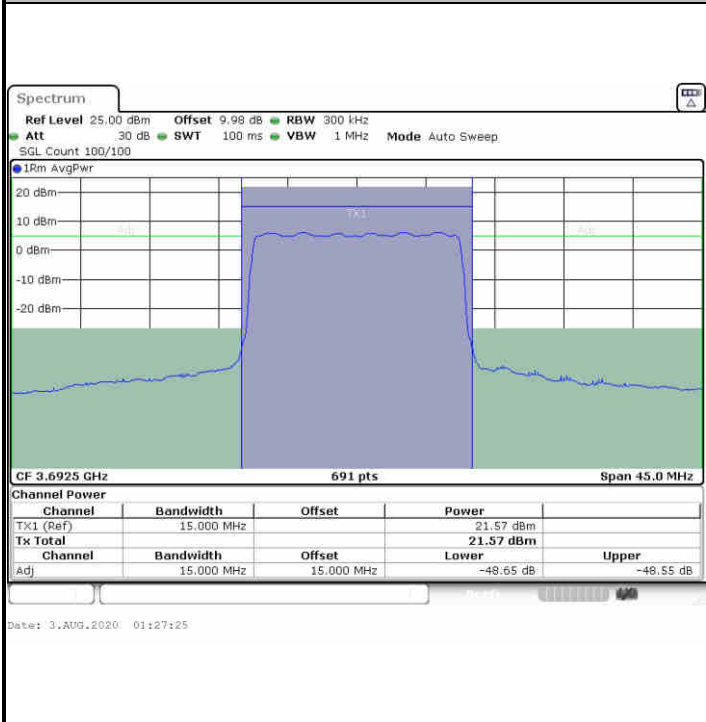
Highest Channel / 1RB0



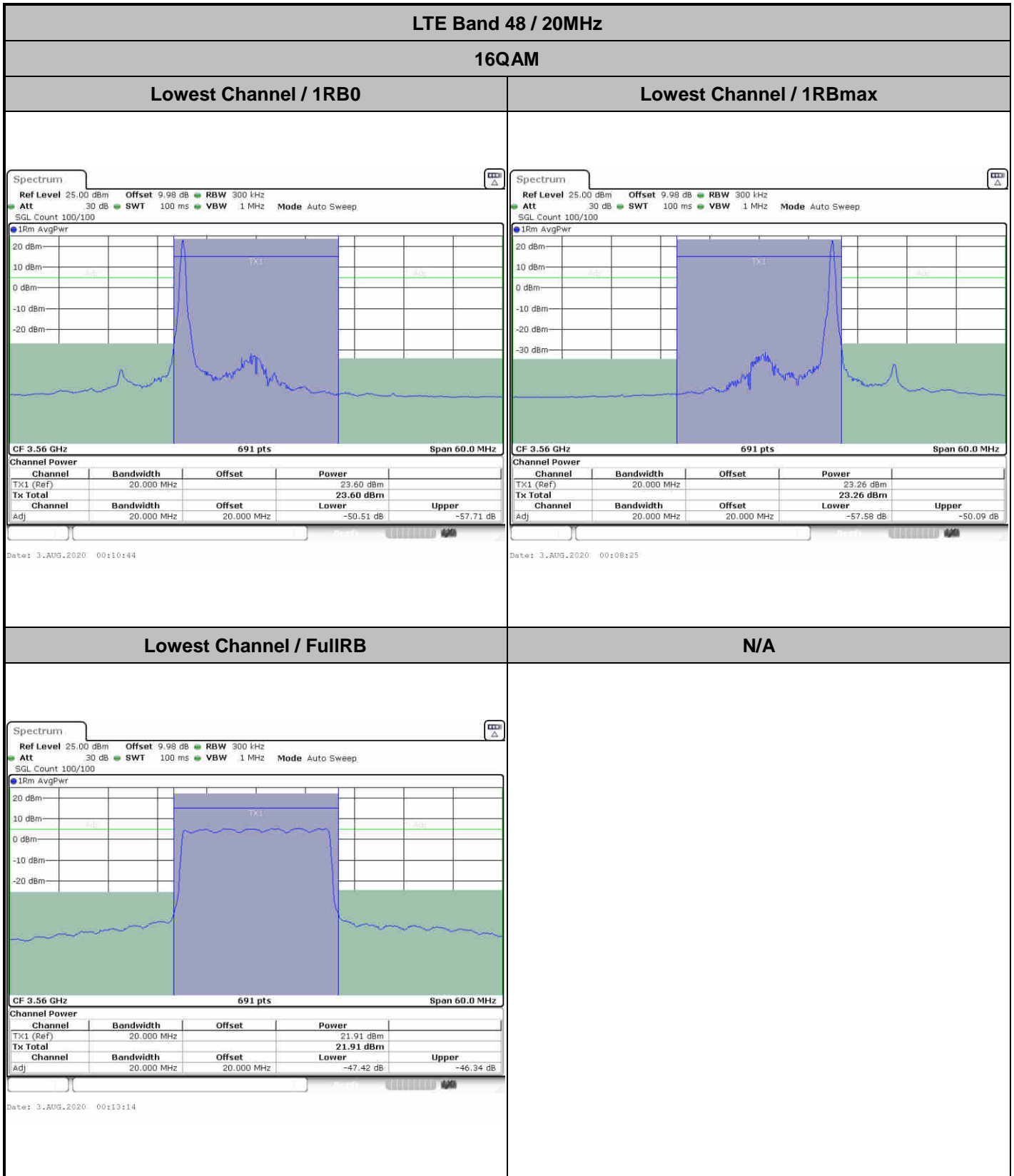
Highest Channel / 1RBmax



Highest Channel / FullIRB



N/A

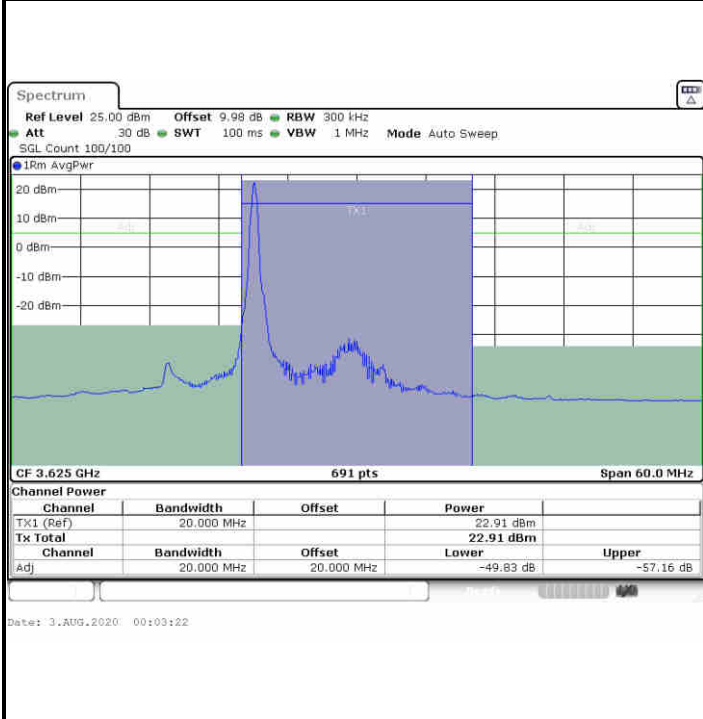




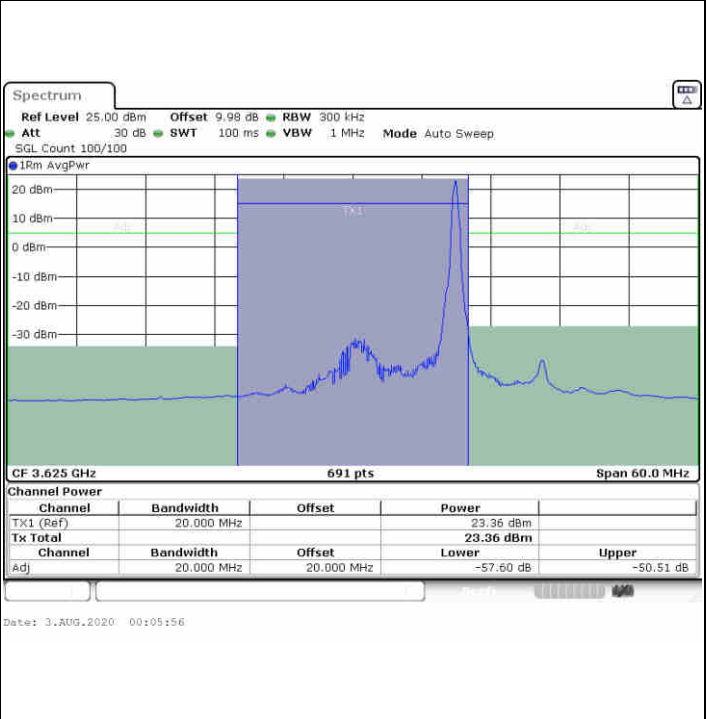
LTE Band 48 / 20MHz

16QAM

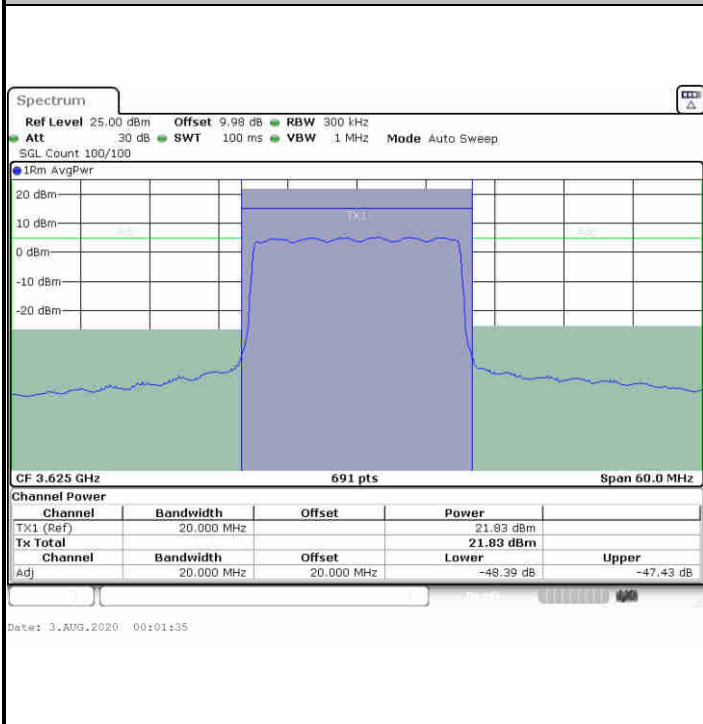
Middle Channel / 1RB0



Middle Channel / 1RBmax



Middle Channel / FullRB



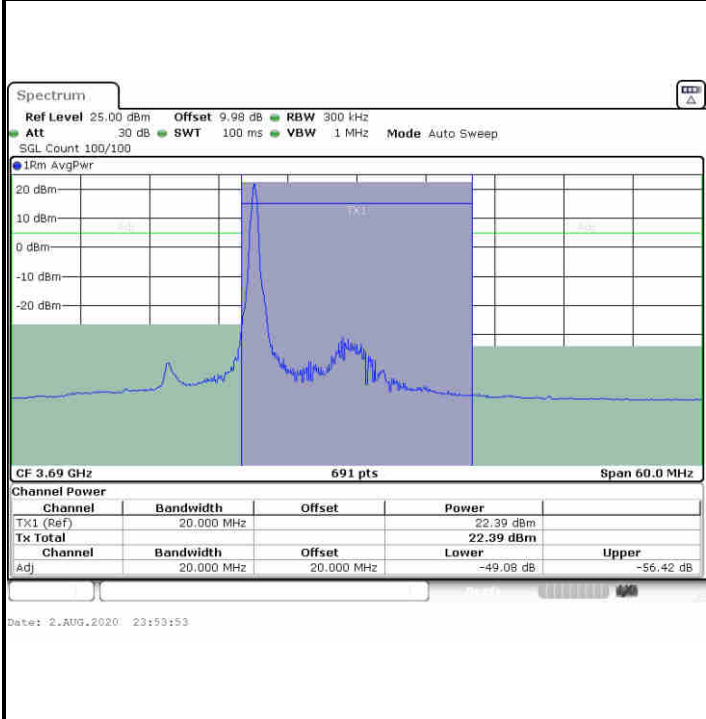
N/A



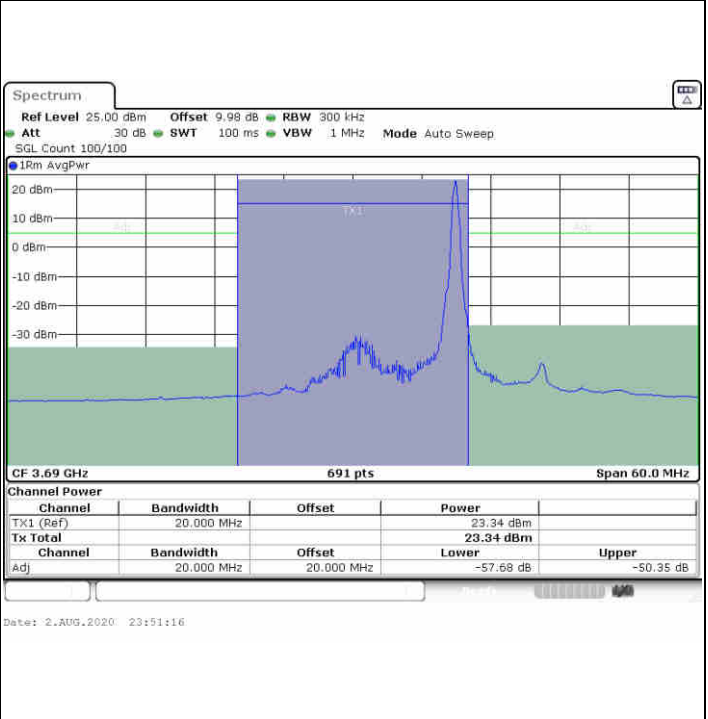
LTE Band 48 / 20MHz

16QAM

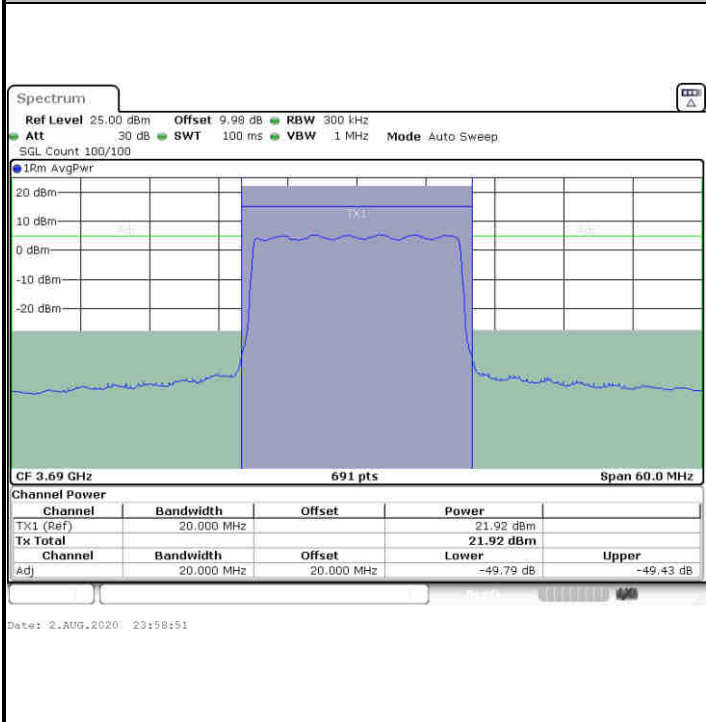
Highest Channel / 1RB0



Highest Channel / 1RBmax



Highest Channel / FullIRB



N/A

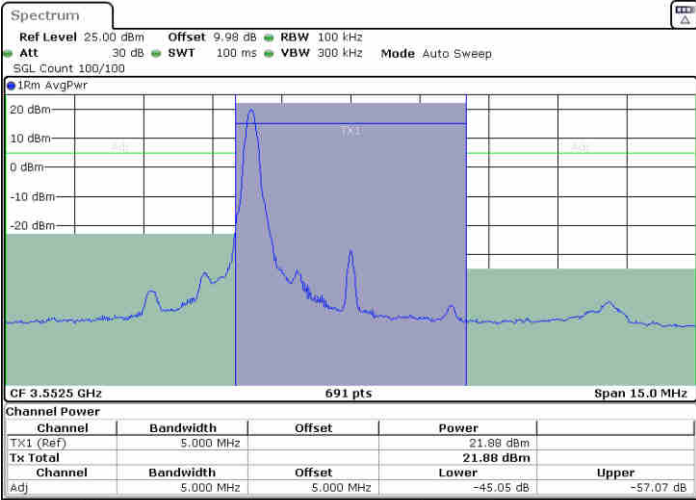


LTE Band 48 / 5MHz

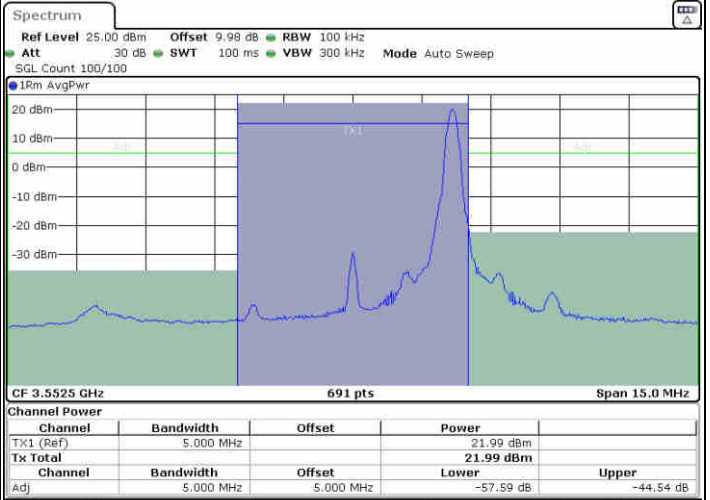
64QAM

Lowest Channel / 1RB0

Lowest Channel / 1RBmax



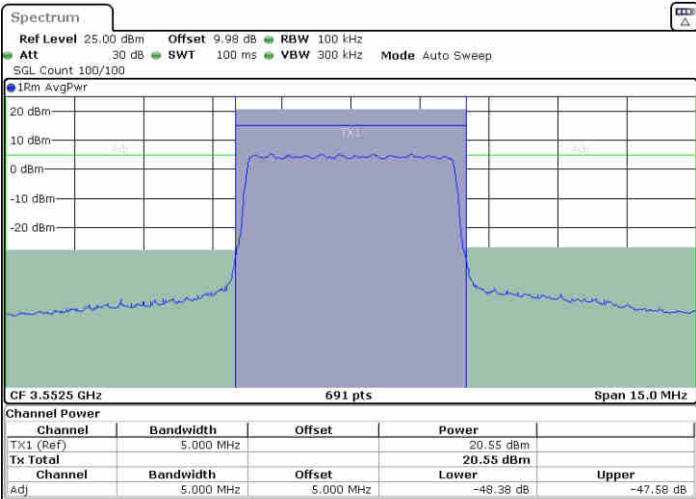
Date: 3.AUG.2020 03:43:51



Date: 3.AUG.2020 03:51:55

Lowest Channel / FullRB

N/A



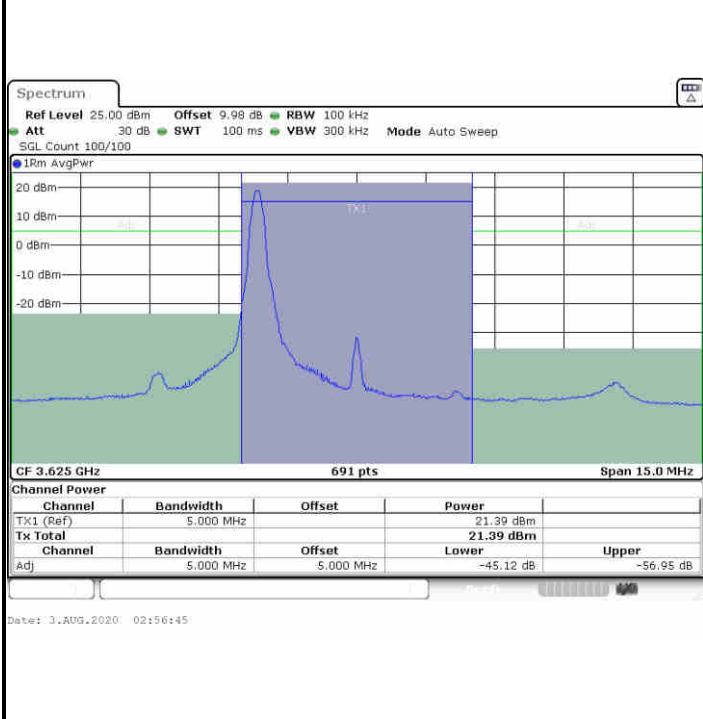
Date: 3.AUG.2020 03:41:57



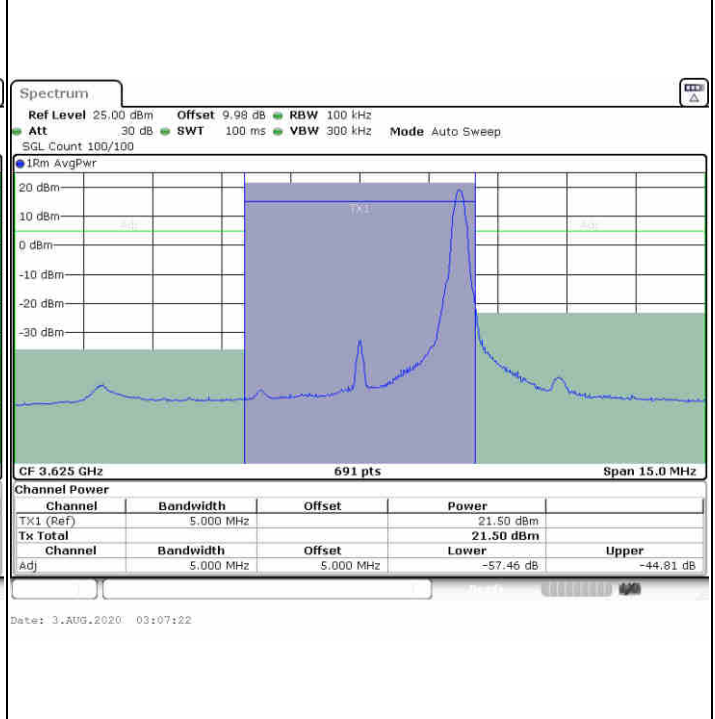
LTE Band 48 / 5MHz

64QAM

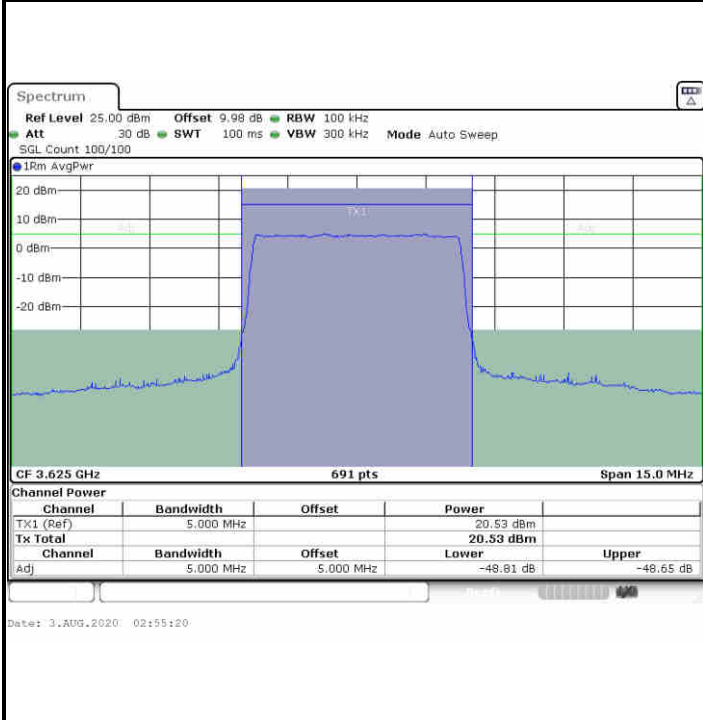
Middle Channel / 1RB0



Middle Channel / 1RBmax



Middle Channel / FullRB



N/A

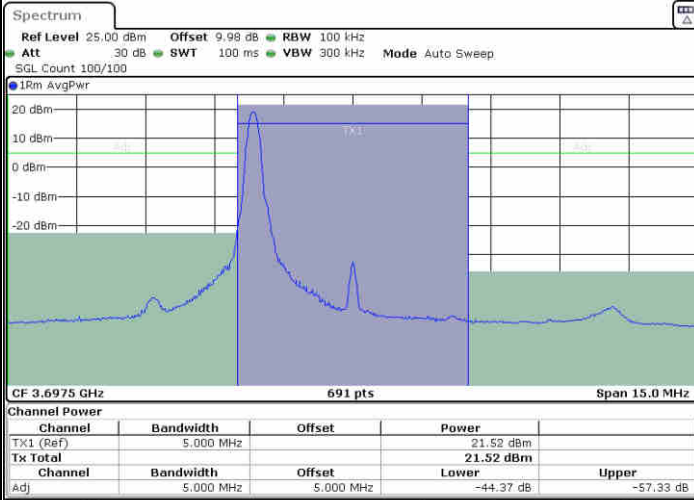


LTE Band 48 / 5MHz

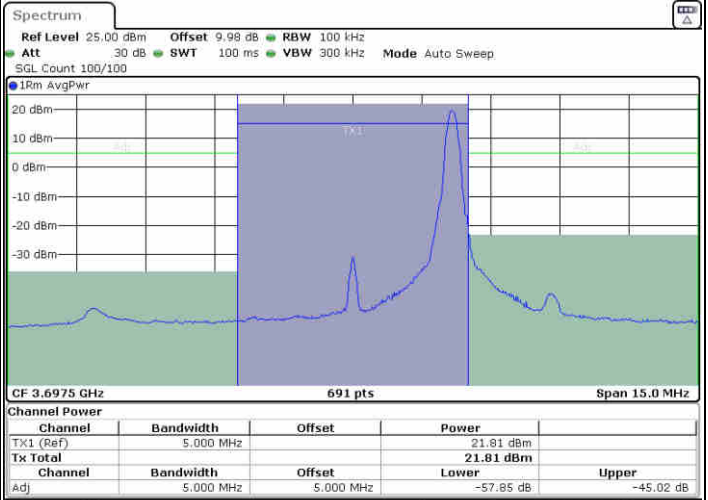
64QAM

Highest Channel / 1RB0

Highest Channel / 1RBmax



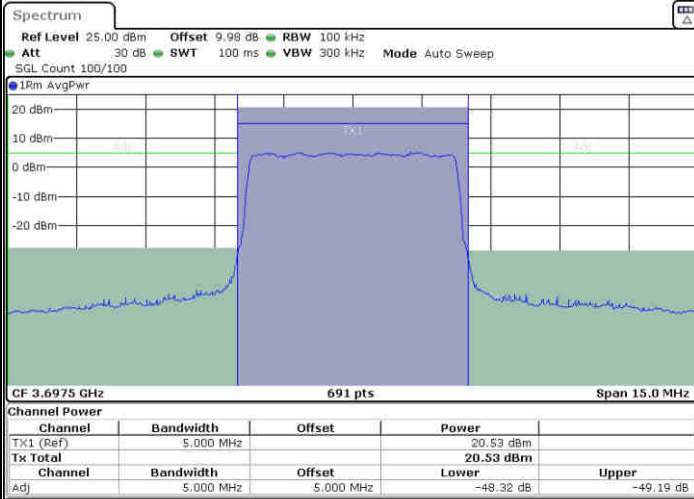
Date: 3.AUG.2020 03:19:34



Date: 3.AUG.2020 03:12:06

Highest Channel / FullIRB

N/A



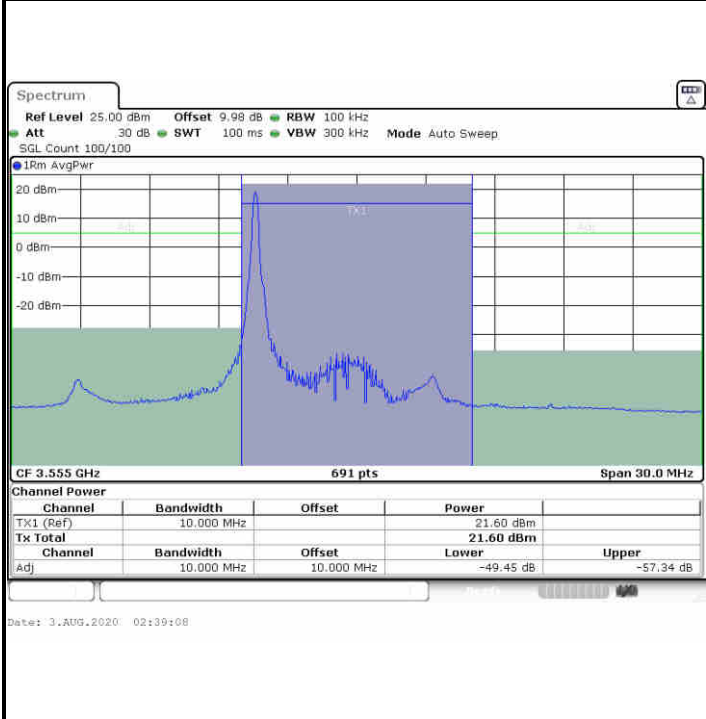
Date: 3.AUG.2020 03:22:10



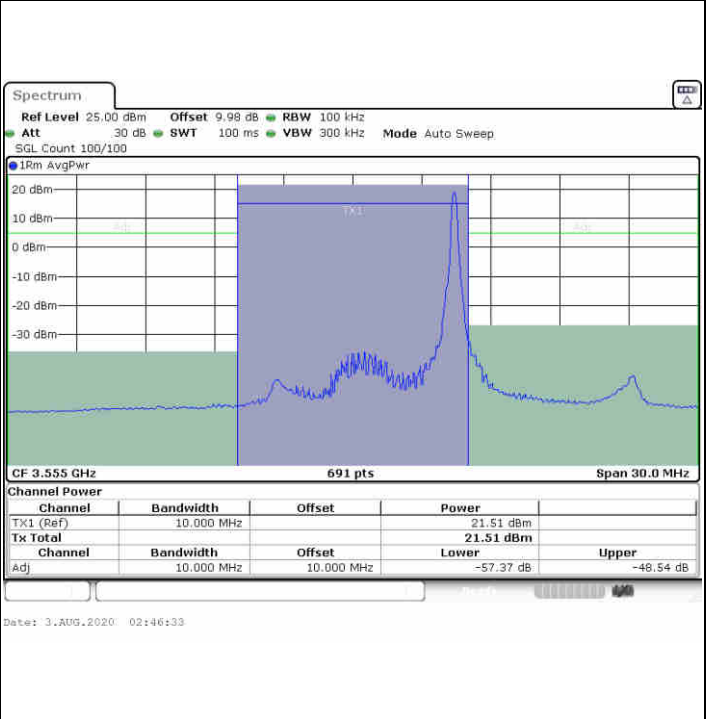
LTE Band 48 / 10MHz

64QAM

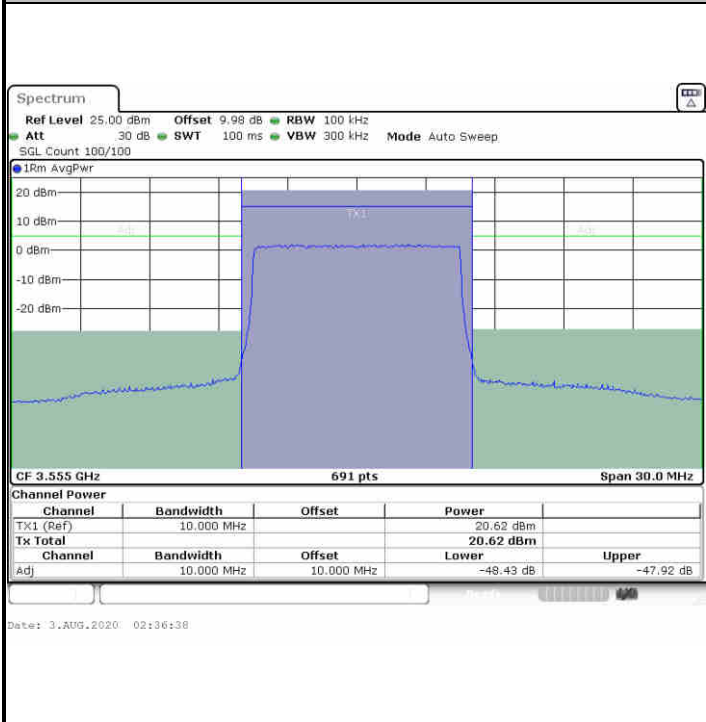
Lowest Channel / 1RB0



Lowest Channel / 1RBmax



Lowest Channel / FullRB



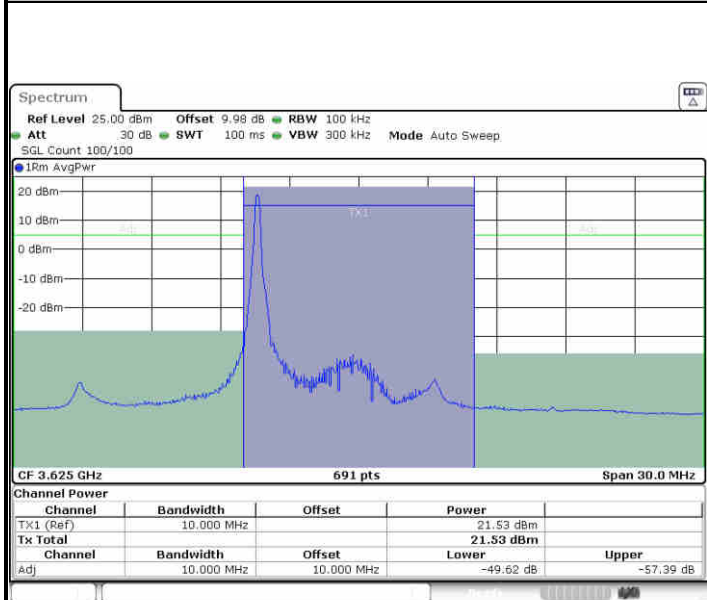
N/A



LTE Band 48 / 10MHz

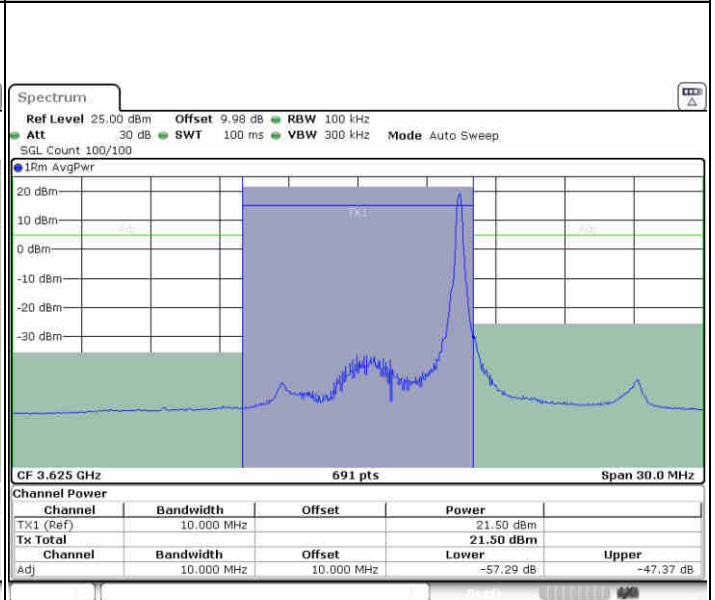
64QAM

MiddleChannel / 1RB0



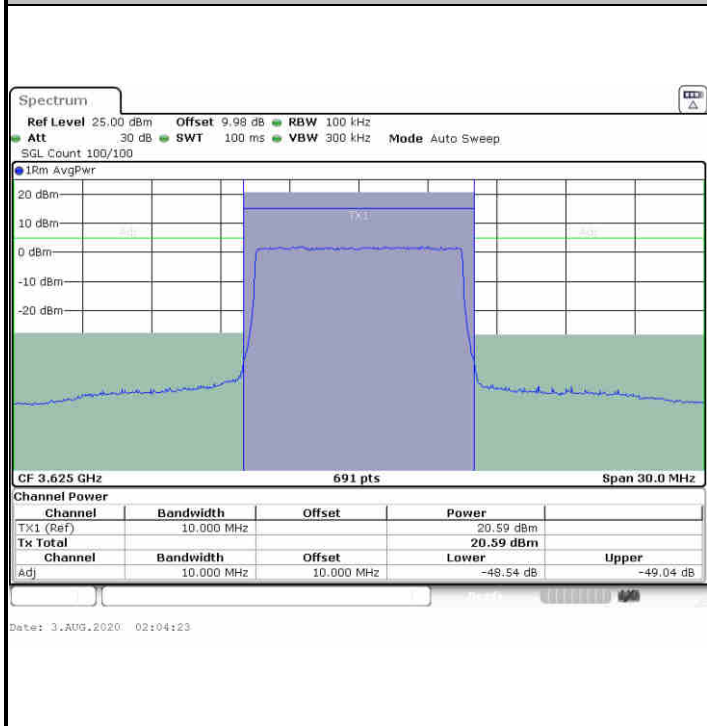
Date: 3.AUG.2020 02:05:14

Middle Channel / 1RBmax



Date: 3.AUG.2020 02:15:18

Middle Channel / FullRB



Date: 3.AUG.2020 02:04:23

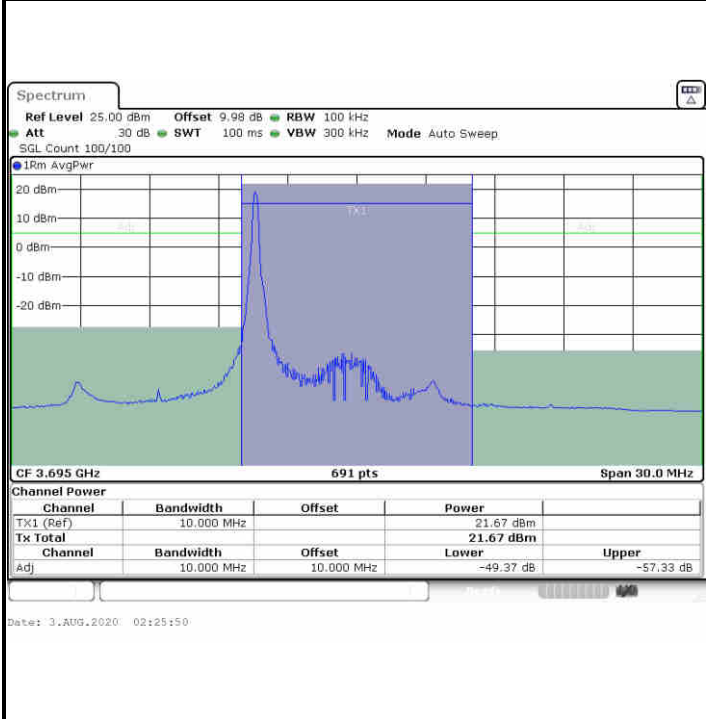
N/A



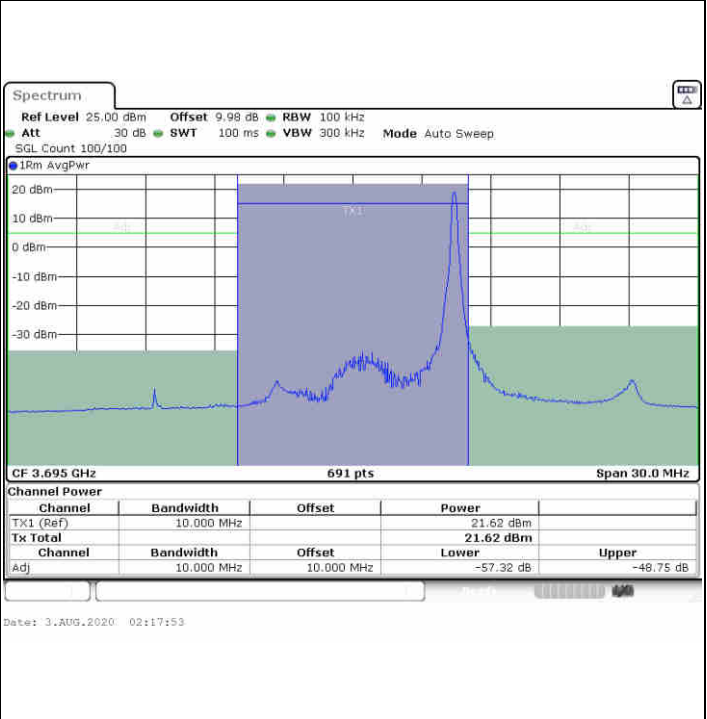
LTE Band 48 / 10MHz

64QAM

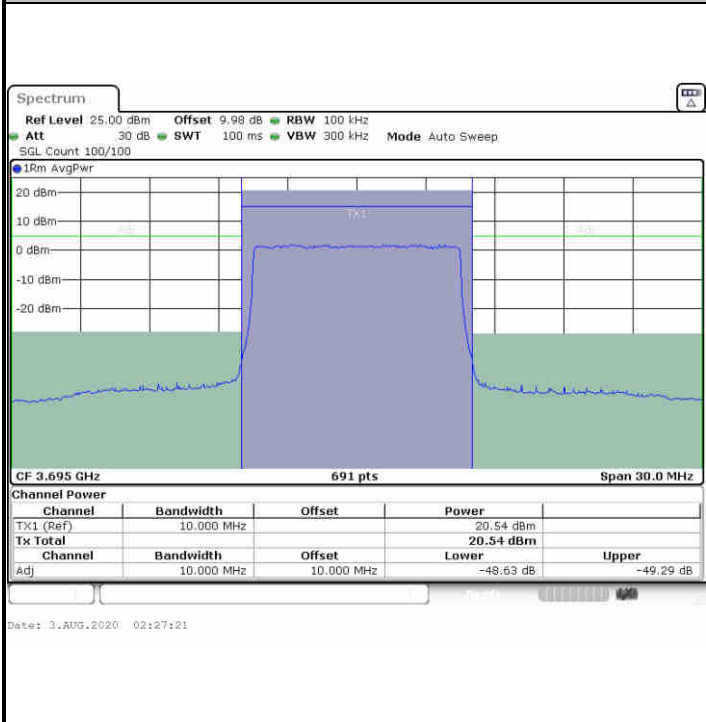
Highest Channel / 1RB0



Highest Channel / 1RBmax



Highest Channel / FullIRB



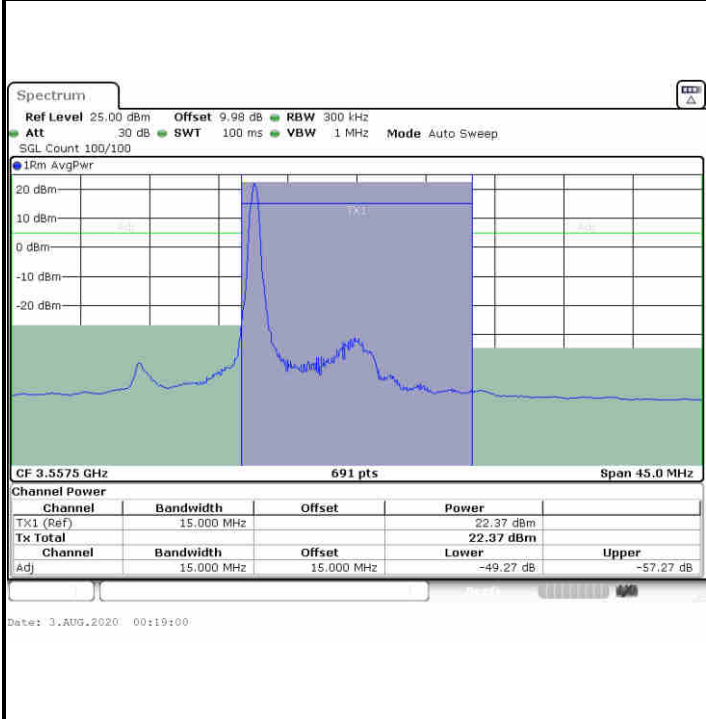
N/A



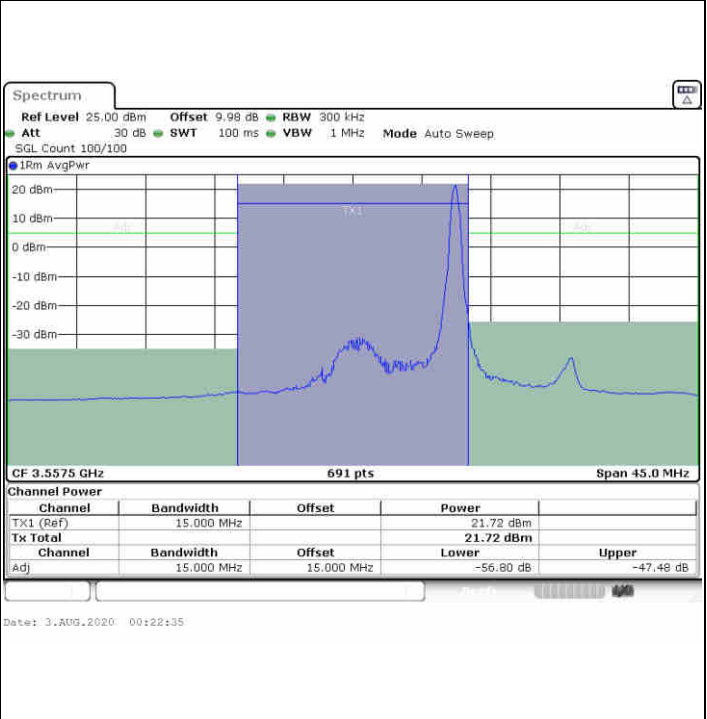
LTE Band 48 / 15MHz

64QAM

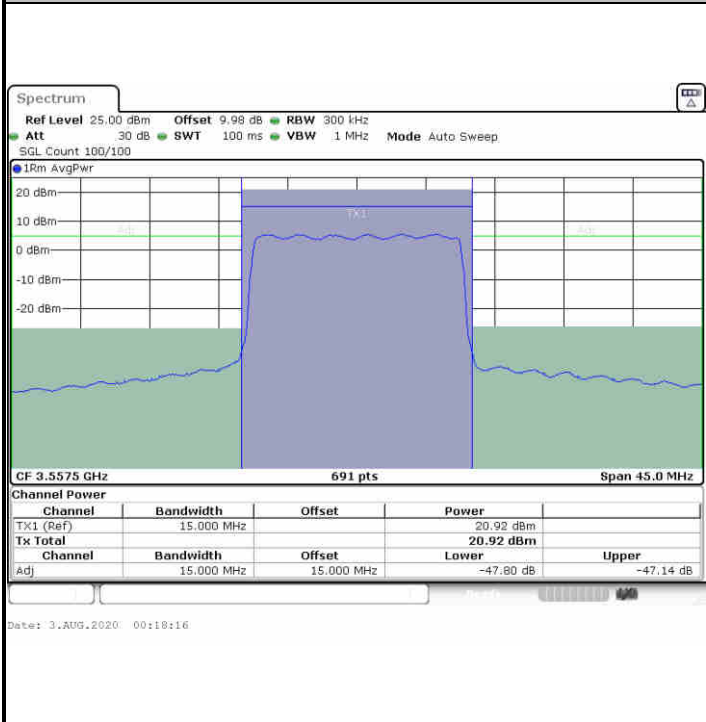
Lowest Channel / 1RB0



Lowest Channel / 1RBmax



Lowest Channel / FullRB



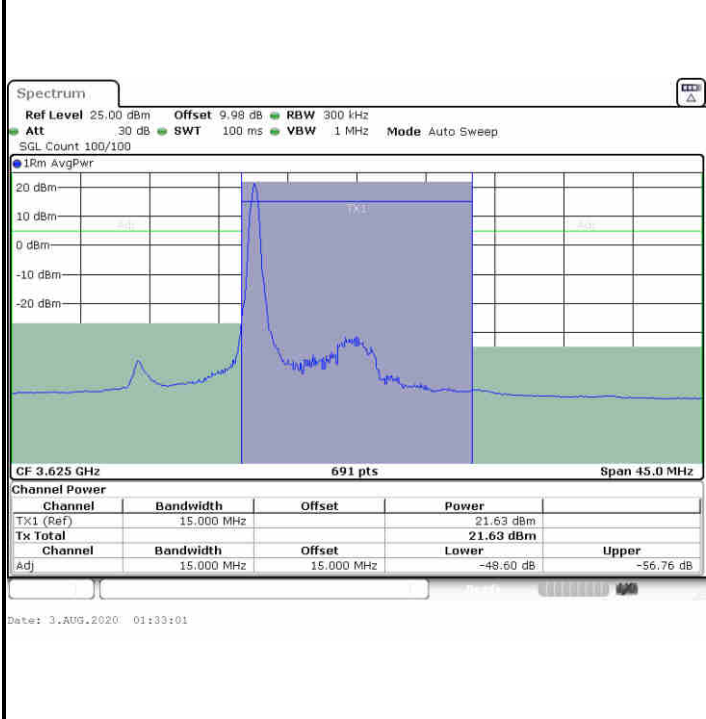
N/A



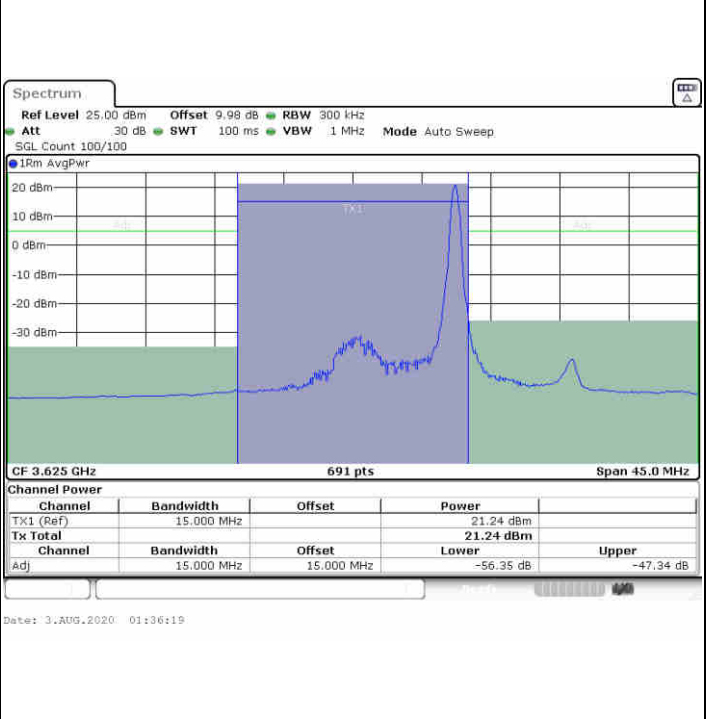
LTE Band 48 / 15MHz

64QAM

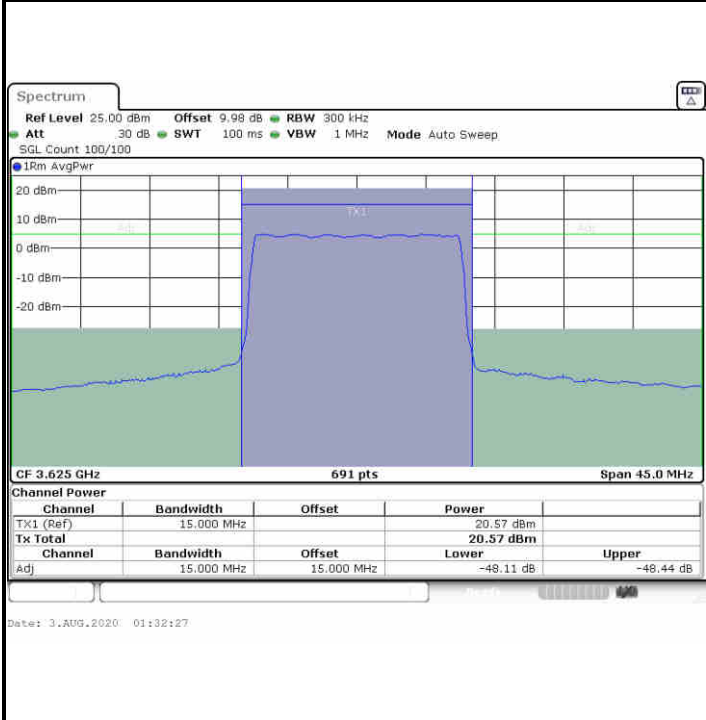
Middle Channel / 1RB0



Middle Channel / 1RBmax



Middle Channel / FullRB



N/A

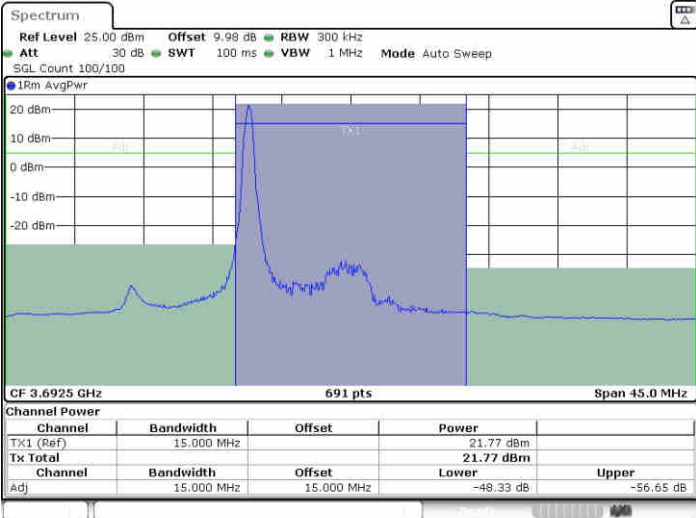


LTE Band 48 / 15MHz

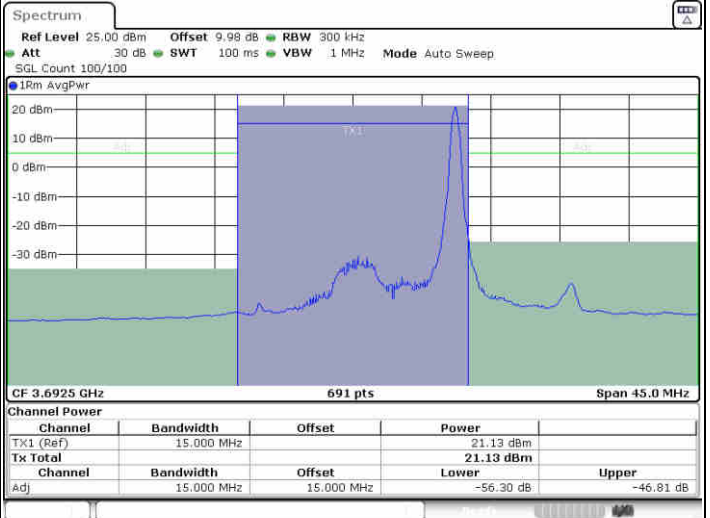
64QAM

Highest Channel / 1RB0

Highest Channel / 1RBmax



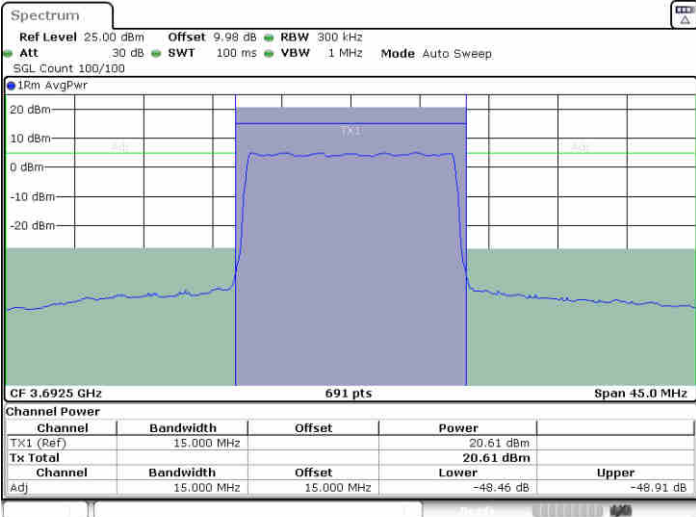
Date: 3.AUG.2020 01:19:46



Date: 3.AUG.2020 01:17:30

Highest Channel / FullIRB

N/A



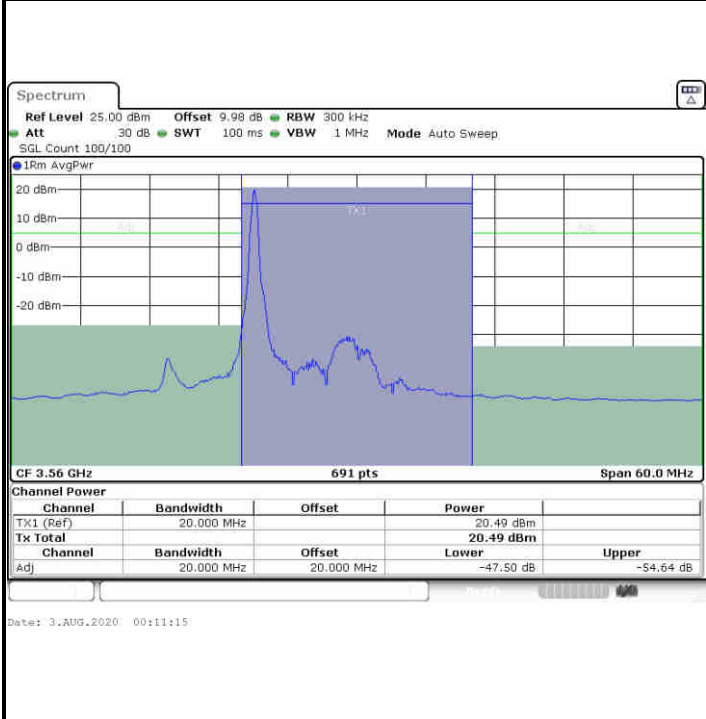
Date: 3.AUG.2020 01:29:18



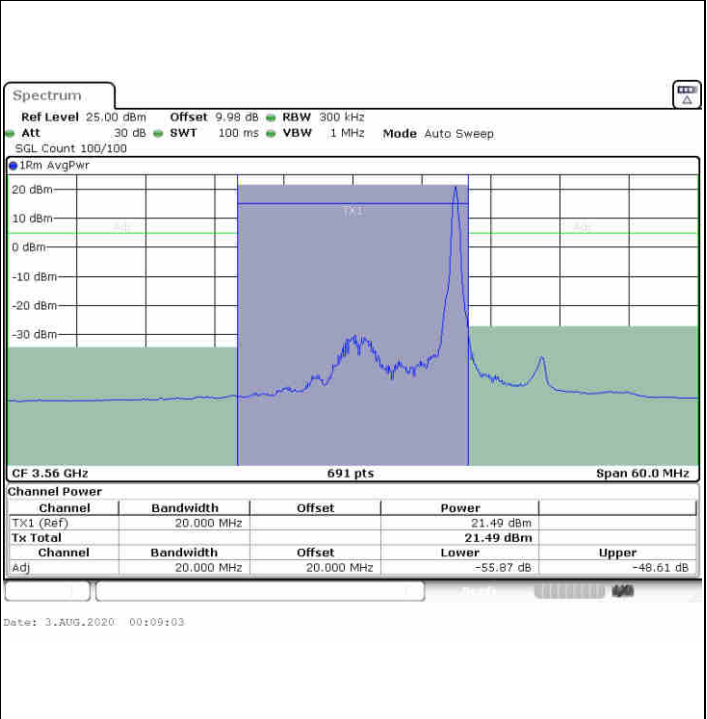
LTE Band 48 / 20MHz

64QAM

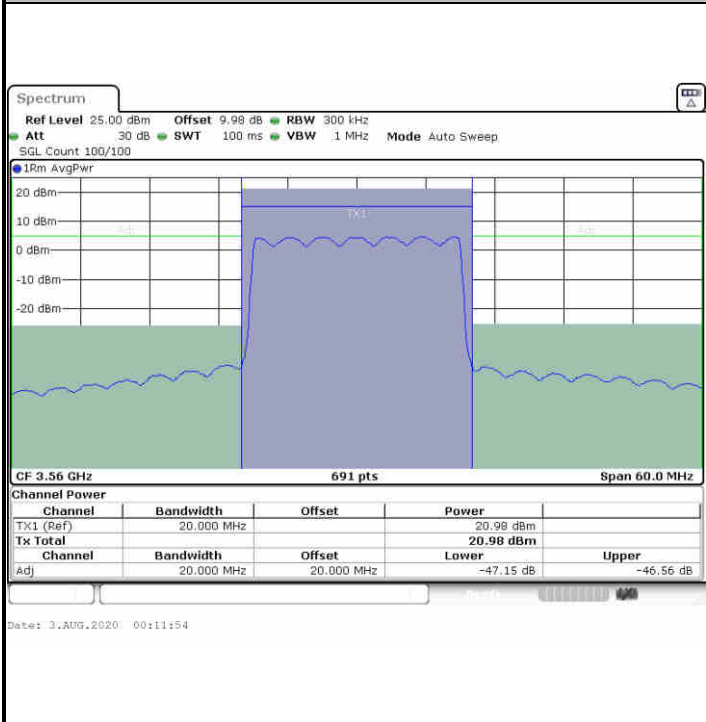
Lowest Channel / 1RB0



Lowest Channel / 1RBmax



Lowest Channel / FullRB



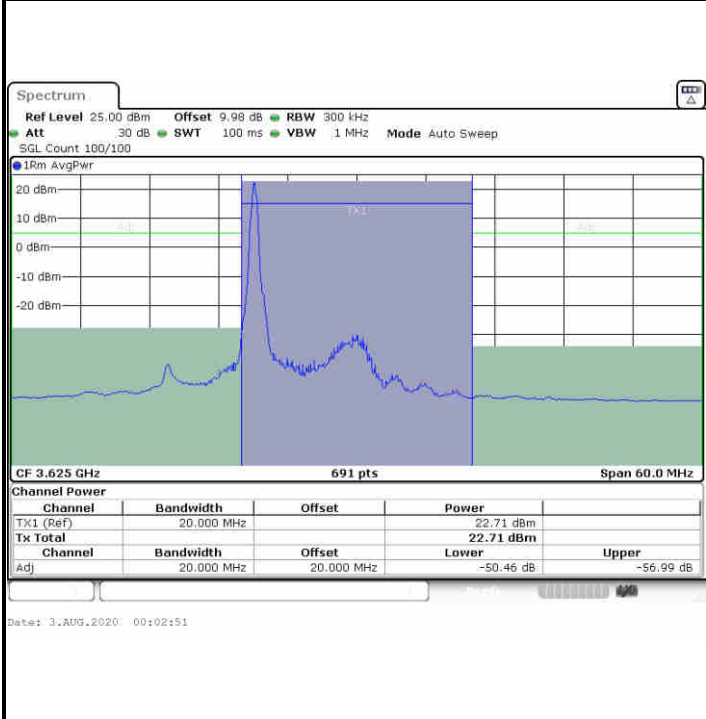
N/A



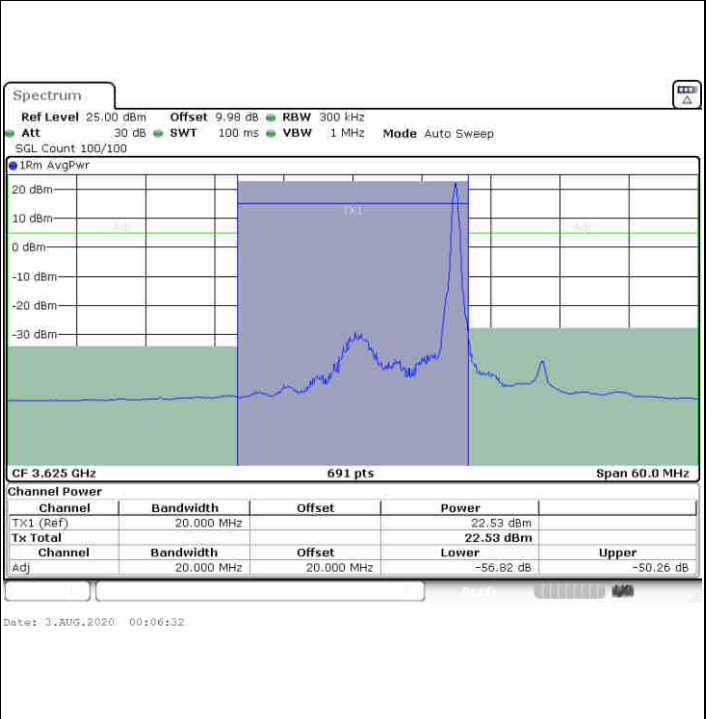
LTE Band 48 / 20MHz

64QAM

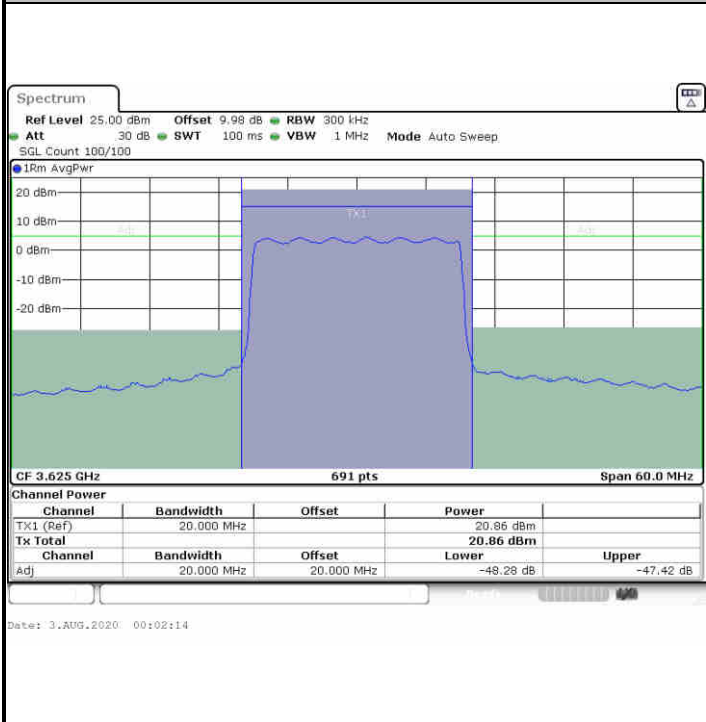
Middle Channel / 1RB0



Middle Channel / 1RBmax



Middle Channel / FullRB



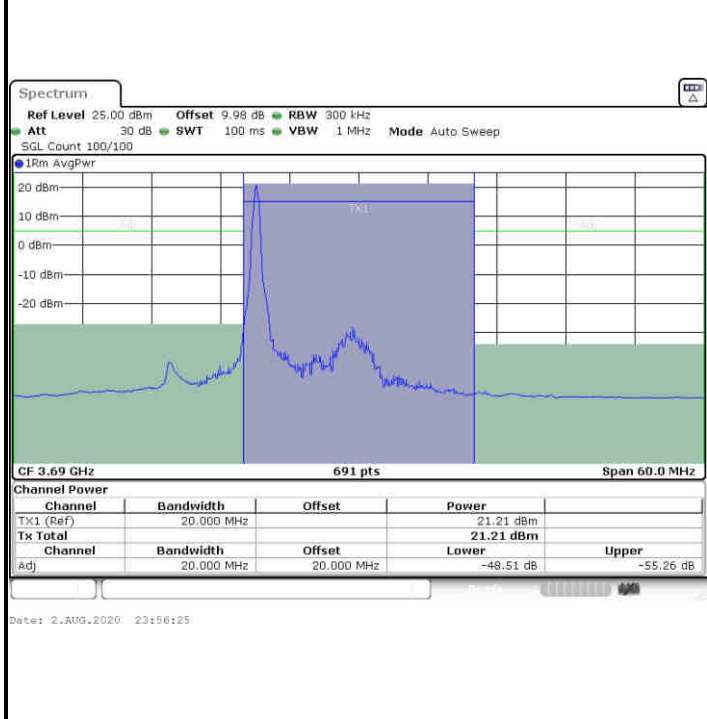
N/A



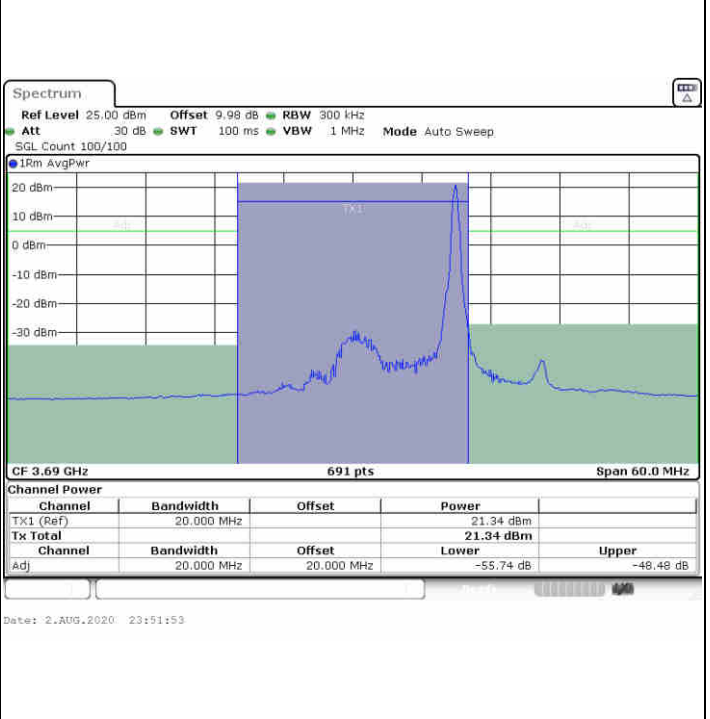
LTE Band 48 / 20MHz

64QAM

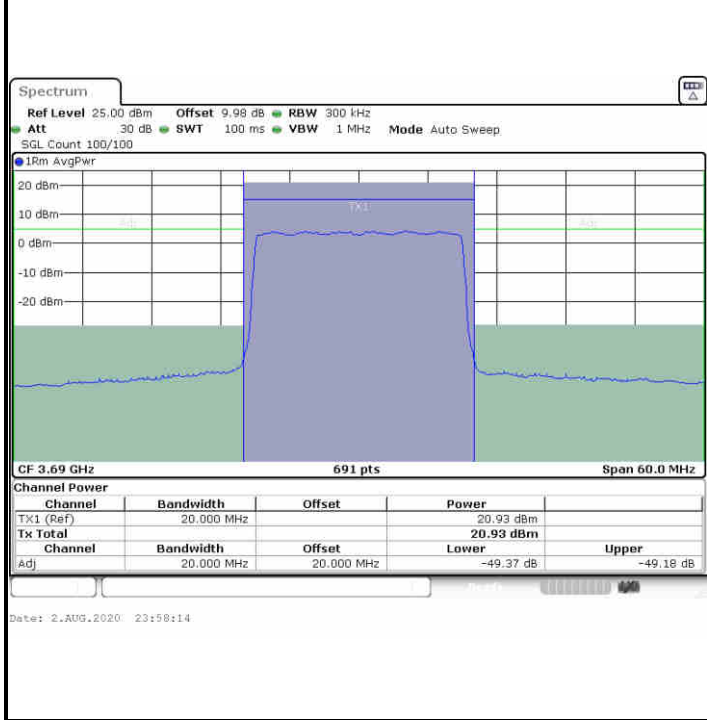
Highest Channel / 1RB0



Highest Channel / 1RBmax



Highest Channel / FullIRB



N/A



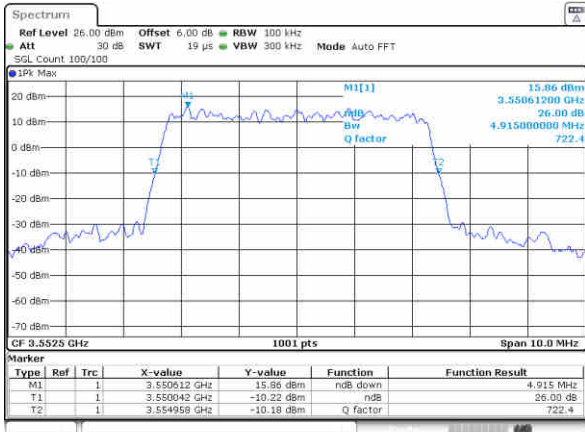
26dB Bandwidth

Mode	LTE Band 48 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	4.92	4.86	9.63	9.71	14.18	14.09	18.94	18.82
Middle CH	-	-	-	-	4.78	4.97	9.69	9.61	14.09	14.15	18.82	18.82
Highest CH	-	-	-	-	4.90	4.97	9.63	9.77	14.27	14.12	19.06	18.74
Mode	LTE Band 48 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM		64QAM		64QAM		64QAM		64QAM		64QAM	
Lowest CH	-	-	-	-	4.75	-	9.85	-	14.30	-	19.14	-
Middle CH	-	-	-	-	4.89	-	9.63	-	14.51	-	18.94	-
Highest CH	-	-	-	-	4.90	-	9.73	-	14.27	-	19.02	-

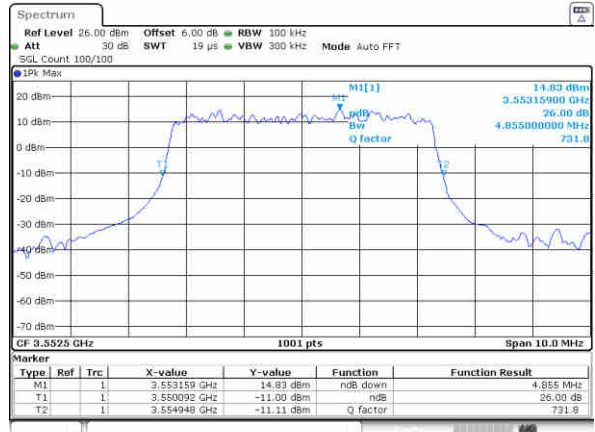


LTE Band 48

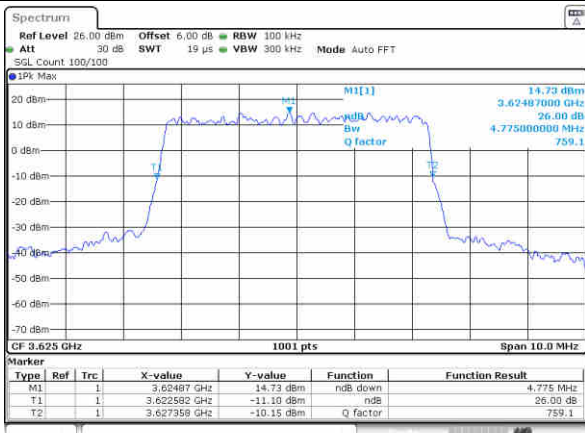
Lowest Channel / 5MHz / QPSK



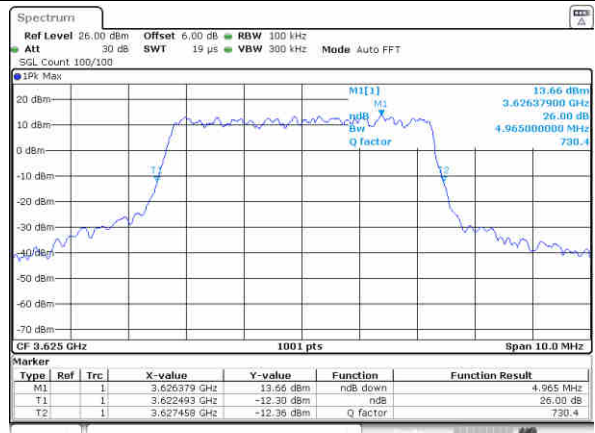
Lowest Channel / 5MHz / 16QAM



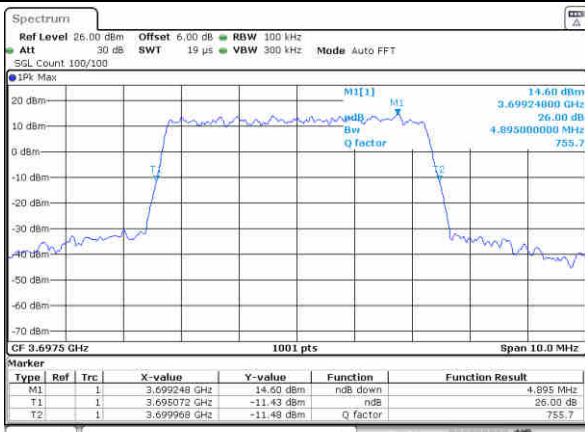
Middle Channel / 5MHz / QPSK



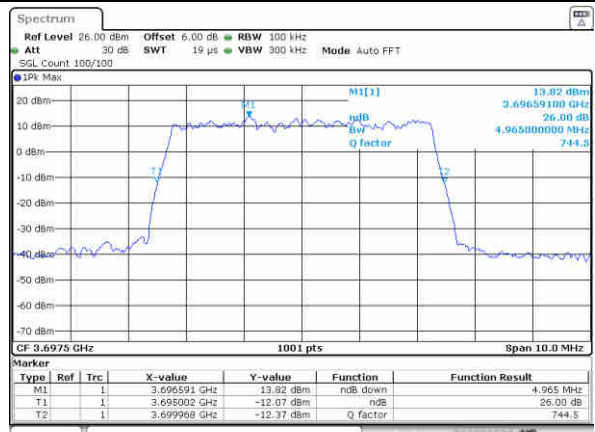
Middle Channel / 5MHz / 16QAM



Highest Channel / 5MHz / QPSK



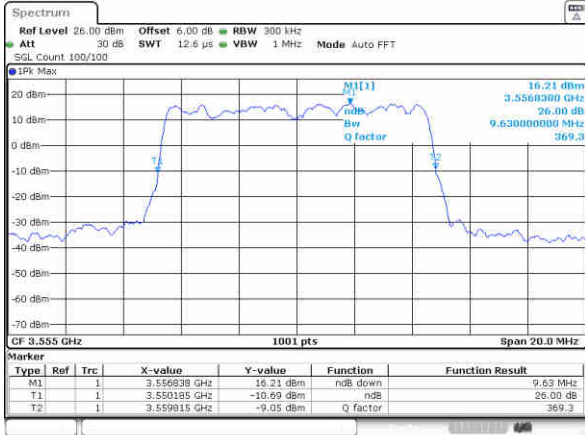
Highest Channel / 5MHz / 16QAM





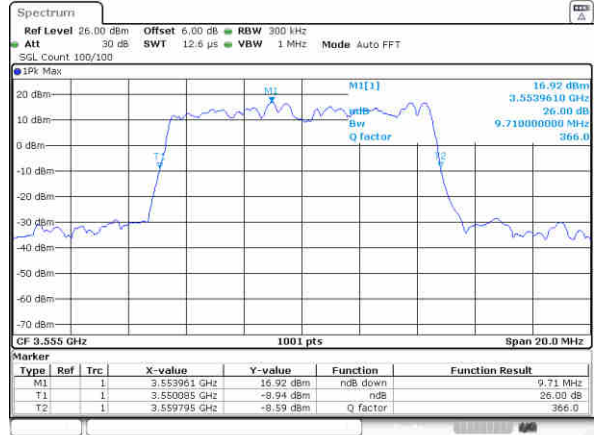
LTE Band 48

Lowest Channel / 10MHz / QPSK



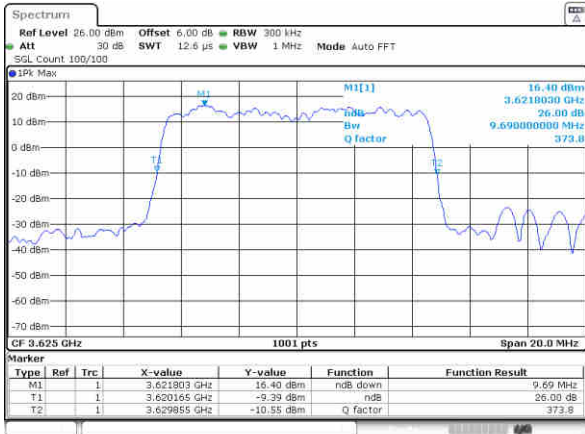
Date: 31.JUL.2020 14:01:17

Lowest Channel / 10MHz / 16QAM



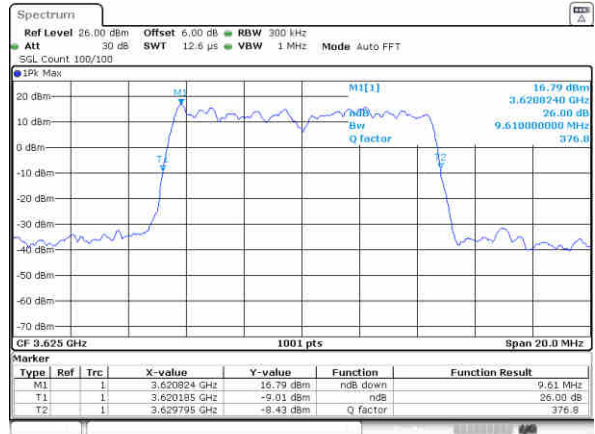
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Middle Channel / 10MHz / QPSK



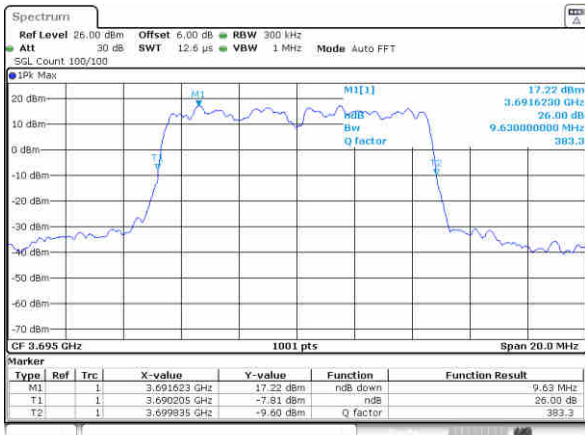
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Middle Channel / 10MHz / 16QAM



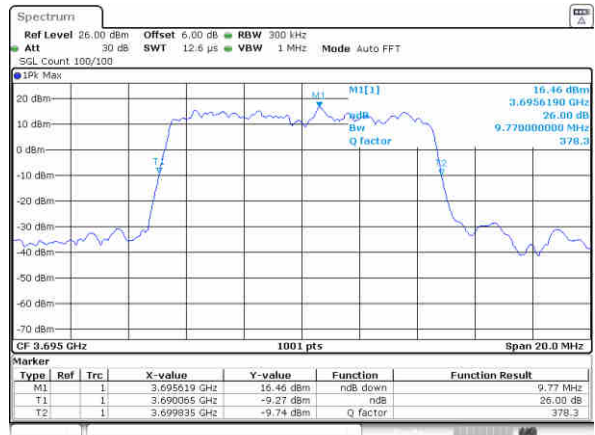
Date: 31.JUL.2020 13:59:25

Highest Channel / 10MHz / QPSK



Date: 31.JUL.2020 14:02:06

Highest Channel / 10MHz / 16QAM



Date: 31.JUL.2020 14:02:24