FCC RF Test Report

APPLICANT	:	Motorola Solutions Inc.
EQUIPMENT	:	MSLB-MKZ900 400-512 4W LTE CBRS GNSS BT WiFi
BRAND NAME	:	Motorola Solutions
MODEL NAME	:	MSLB-MKZ900
MODEL NUMBER	:	AAH90ZDU9RH1AN
FCC ID	:	AZ489FT7133
STANDARD	:	47 CFR Part 2, 96
CLASSIFICATION	:	Citizens Band End User Devices (CBE)
EQUIPMENT TYPE	:	End User Equipment

The product was received on Aug. 28, 2020 and completely tested on Sep. 28, 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 C63.26-2015 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.

Jason Jia

Reviewed by: Jason Jia / Supervisor

James Huang

Approved by: James Huang / Manager

ACCREDITED
Cert #5145.02

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
FG082805A	01	Initial issue of report	Oct. 14, 2020
FG082805A	02	Revise the typo in Appendix A of page A3	Nov. 12, 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	-
-	§96.41	Peak-to-Average Ratio	Not Required	Not applicable for End User Devices
3.3	§96.41	Maximum E.I.R.P	Pass	-
		Maximum Power Spectral Density	Not Required	Not applicable for End User Devices
3.4	§2.1049 §96.41	Occupied Bandwidth	Reporting only	-
3.5	§2.1051 §96.41	Conducted Band Edge Measurement Adjacent Channel Leakage Ratio	Pass	-
3.6	§2.1051 §96.41	Conducted Spurious Emission	Pass	
3.7	§2.1055	Frequency Stability for Temperature & Voltage	Pass	-
4.4	§2.1051 §96.41	Radiated Spurious Emission	Pass	Under limit 13.07 dB at 14466.00 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

Motorola Solutions Inc.
8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322

1.2 Manufacturer

Motorola Solutions Malaysia Sdn. Bhd.
No. 2A, Medan Bayan Lepas, Mukim 12, S.W.D., 11900 Bayan Lepas Penang, Malaysia

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	MSLB-MKZ900 400-512 4W LTE CBRS GNSS BT WiFi
Brand Name	Motorola Solutions
Model Name	MSLB-MKZ900
Model Number:	AAH90ZDU9RH1AN
FCC ID	AZ489FT7133
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
Maximum Output Power to Antenna	21.03 dBm
Antenna Type	FPC Antenna
Type of Modulation	QPSK / 16QAM
IMEI Code	Conducted: 352511260016845/352511260016852 Radiation: 353139110020384
HW Version	P2B
SW Version	I02.21.01.0029 (BP), D00.00.65 (AP)
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	-	0.1774	4M51W7D	-	0.1489
10	**3555~3695**	9M09G7D	0.0019	0.1791	9M03W7D	-	0.1503
15	**3557.5~3692.5**	13M5G7D	-	0.1791	13M5W7D	-	0.1521
20	**3560~3690**	18M5G7D	-	0.1786	18M6W7D	-	0.1507

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

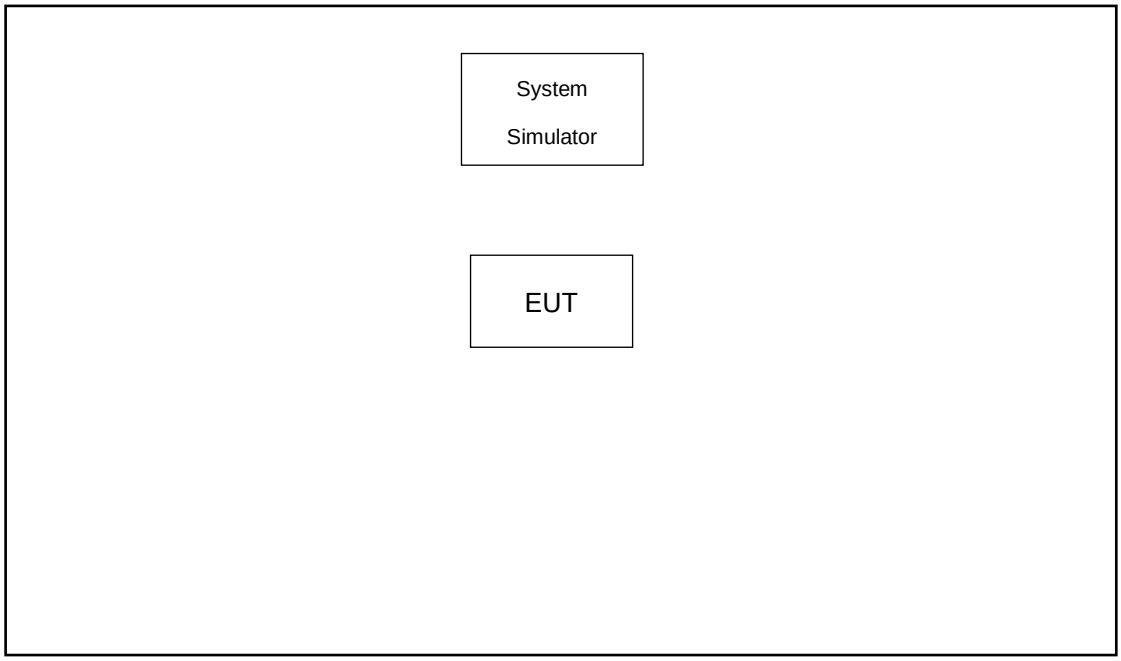
2.1 Test Mode

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	64QAM	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
Conducted Band Edge	48	-	-	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
Frequency Stability	48	-	-		v			v	v	-	v			v	v	v
Radiated Spurious Emission	48	Worst Case													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.															

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.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8821C	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 5.7 dB and 10dB attenuator.

Example :

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

= 5.7 + 10 = 15.7 (dB)

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

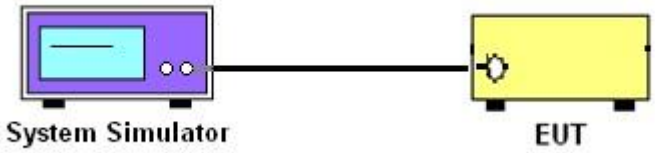
3 Conducted Test Items

3.1 Measuring Instruments

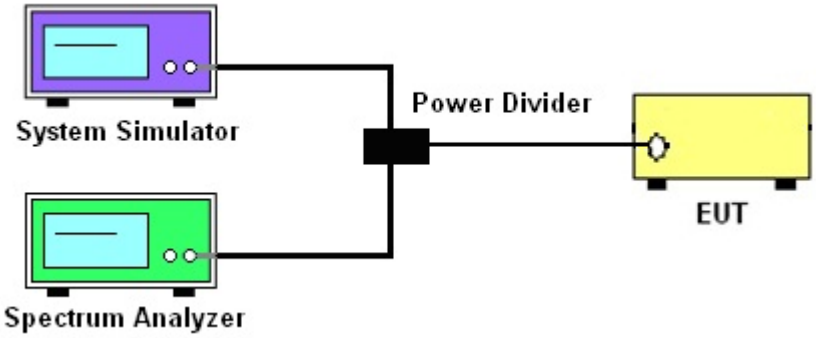
See list of measuring instruments of this test report.

3.1.1 Test Setup

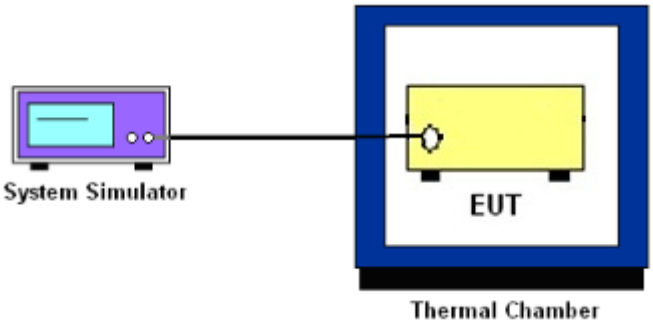
3.1.2 Conducted Output Power



3.1.3 PSD , 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

3.2.1 Description of the Conducted Output Power 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.

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 EIRP and PSD

3.3.1 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)
☒	**End User Device**	23	n/a
☐	**Category A CBSD**	30	20
☐	**Category B CBSD**	47	37

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

3.3.2 Test Procedures for EIRP

1. Establishing a communications link with the call box (Base station) to measure the Maximum conducted power, the parameters were set to force the EUT transmitting at maximum output power level. Use the average power measurement function to measure total channel power of each channel bandwidth (per ANSI C63.26-2015 Section 5.2.1)

2. Determining ERP and/or EIRP from conducted RF output power measurements (Per ANSI C63.26-2015 Section 5.2.5.5)

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

   P_T = transmitter output power in dBm

   G_T = gain of the transmitting antenna in dBi

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

3.4 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

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.

Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

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 −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 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. 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.

3.6 Conducted Spurious Emission

3.6.1 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.

3.6.2 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 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. Offset has included the duty factor for LTE Band 48. Duty factor =10 log (1/x), where x is the measured duty cycle.
8. Taking the record of maximum spurious emission.
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
10. The limit line is −40dBm/MHz.

3.7 Frequency Stability

3.7.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency

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 25±5° C and connected with the system simulator.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

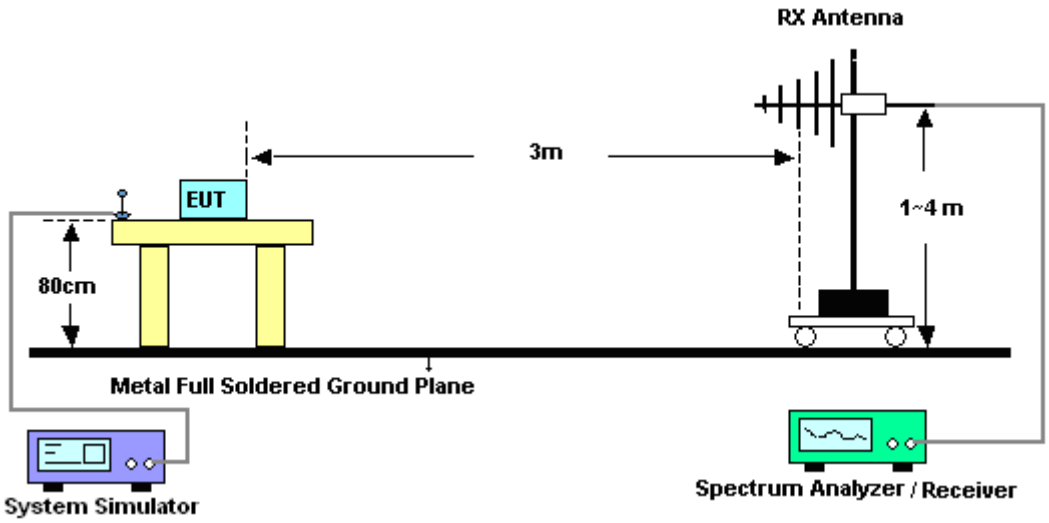
4 Radiated Test Items

4.1 Measuring Instruments

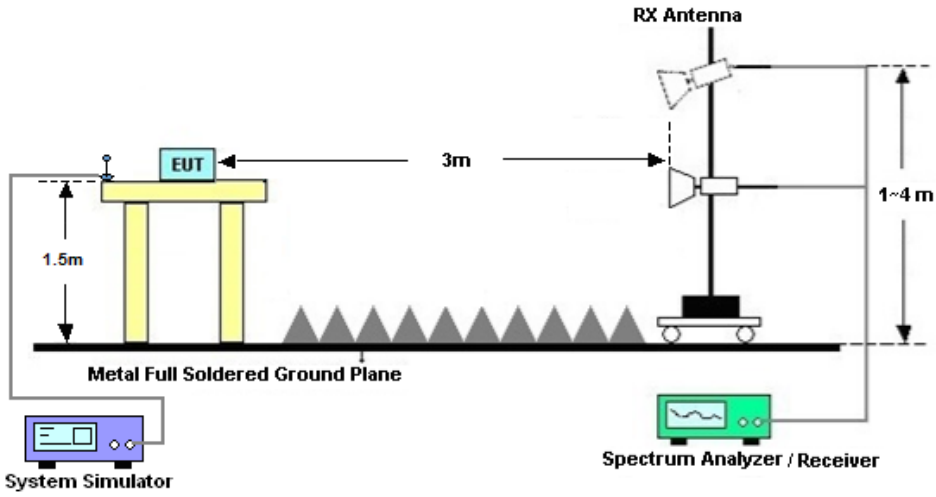
See list of measuring instruments of this test report.

4.2 Test Setup

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.
   EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
   ERP (dBm) = 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	Sep. 17, 2020~ Sep. 23, 2020	Nov. 01, 2020	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Nov. 18, 2019	Sep. 17, 2020~ Sep. 23, 2020	Nov. 17, 2020	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Apr. 15, 2020	Sep. 28, 2020	Apr. 14, 2021	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Jan. 03, 2020	Sep. 28, 2020	Jan. 02, 2021	Radiation (03CH04-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Nov. 10, 2019	Sep. 28, 2020	Nov. 09, 2020	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Nov. 10, 2019	Sep. 28, 2020	Nov. 09, 2020	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 03, 2020	Sep. 28, 2020	Jan. 02, 2021	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 08, 2020	Sep. 28, 2020	Jan. 07, 2021	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2025788	1Ghz-18Ghz	Jan. 03, 2020	Sep. 28, 2020	Jan. 02, 2021	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY57280106	500MHz~26.5GHz	Oct. 15, 2019	Sep. 28, 2020	Oct. 14, 2020	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Sep. 28, 2020	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Sep. 28, 2020	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Sep. 28, 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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.8dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.8dB

Uncertainty of Conducted Measurement

Occupied Channel Bandwidth	0.414ppm
Conducted Power	0.56dB
Conducted Power spectral density	0.54dB
Conducted emission	0.92dB
Frequency stability	0.414ppm

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

LTE Band 48 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	0	QPSK	20.85	20.74	20.25
20	1	49		20.91	20.76	20.15
20	1	99		20.89	20.59	20.18
20	50	0		20.95	20.65	20.35
20	50	24		20.96	20.76	20.32
20	50	50		21.02	20.71	20.23
20	100	0		20.95	20.74	20.34
20	1	0	16-QAM	20.15	20.06	19.57
20	1	49		20.13	20.01	19.42
20	1	99		20.28	19.99	19.52
20	50	0		20.03	19.87	19.38
20	50	24		20.08	19.86	19.42
20	50	50		20.09	19.92	19.36
20	100	0		20.11	19.88	19.37
15	1	0	QPSK	20.87	20.68	20.18
15	1	37		20.81	20.62	20.08
15	1	74		20.95	20.73	20.18
15	36	0		20.97	20.78	20.25
15	36	20		21.03	20.79	20.26
15	36	39		21.01	20.73	20.19
15	75	0		20.93	20.72	20.22
15	1	0	16-QAM	20.19	20.01	19.51
15	1	37		20.17	19.99	19.48
15	1	74		20.32	20.02	19.50
15	36	0		20.04	19.82	19.36
15	36	20		20.03	19.83	19.30
15	36	39		20.05	19.79	19.34
15	75	0		20.11	19.88	19.39

LTE Band 48 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	20.88	20.73	20.25
10	1	25		20.94	20.71	20.17
10	1	49		20.98	20.64	20.27
10	25	0		21.01	20.75	20.29
10	25	12		21.03	20.81	20.24
10	25	25		20.96	20.70	20.22
10	50	0		21.00	20.79	20.26
10	1	0	16-QAM	20.16	20.08	19.52
10	1	25		20.22	20.05	19.44
10	1	49		20.27	19.96	19.49
10	25	0		20.06	19.86	19.39
10	25	12		20.15	19.92	19.37
10	25	25		20.10	19.80	19.35
10	50	0		20.11	19.87	19.37
5	1	0	QPSK	20.95	20.78	20.18
5	1	12		20.97	20.72	20.21
5	1	24		20.99	20.71	20.16
5	12	0		20.96	20.73	20.21
5	12	7		20.97	20.78	20.22
5	12	13		20.92	20.71	20.19
5	25	0		20.97	20.68	20.17
5	1	0	16-QAM	20.20	20.03	19.46
5	1	12		20.23	19.96	19.40
5	1	24		20.19	20.05	19.50
5	12	0		20.03	19.88	19.38
5	12	7		20.09	19.87	19.36
5	12	13		20.03	19.82	19.31
5	25	0		20.09	19.83	19.29

EIRP

The worst case EIRP shown in this section is found with LTE operating only using 1RB. As such, the EIRP/10MHz and full channel EIRP values will be identical since 1RB is fully contained within all available channel bandwidths for LTE Band 48 (i.e. 5, 10, 15, 20MHz)

LTE Band 48 (GT - LC = 1.50 dB) QPSK									
Bandwidth	**5M**			**10M**			**15M**		
Channel	**(Low)**	**(Mid)**	**(High)**	**(Low)**	**(Mid)**	**(High)**	**(Low)**	**(Mid)**	**(High)**
Conducted Power (dBm/10MHz)	20.99	20.71	20.16	21.03	20.81	20.24	21.03	20.79	20.26
Conducted Power (Watts/10MHz)	0.1256	0.1178	0.1038	0.1268	0.1205	0.1057	0.1268	0.1199	0.1062
EIRP (dBm/10MHz)	22.49	22.21	21.66	22.53	22.31	21.74	22.53	22.29	21.76
EIRP (Watts/10MHz)	0.1774	0.1663	0.1466	0.1791	0.1702	0.1493	0.1791	0.1694	0.1500

LTE Band 48 (GT - LC = 1.50 dB) QPSK			
Bandwidth	**20M**		
Channel	**(Low)**	**(Mid)**	**(High)**
Conducted Power (dBm/10MHz)	21.02	20.71	20.23
Conducted Power (Watts/10MHz)	0.1265	0.1178	0.1054
EIRP (dBm/10MHz)	22.52	22.21	21.73
EIRP (Watts/10MHz)	0.1786	0.1663	0.1489

LTE Band 48 (GT - LC = 1.50 dB) 16QAM									
Bandwidth	5M			10M			15M		
Channel	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Conducted Power (dBm/10MHz)	20.23	19.96	19.40	20.27	19.96	19.49	20.32	20.02	19.50
Conducted Power (Watts/10MHz)	0.1054	0.0991	0.0871	0.1064	0.0991	0.0889	0.1076	0.1005	0.0891
EIRP (dBm/10MHz)	21.73	21.46	20.90	21.77	21.46	20.99	21.82	21.52	21.00
EIRP (Watts/10MHz)	0.1489	0.1400	0.1230	0.1503	0.1400	0.1256	0.1521	0.1419	0.1259

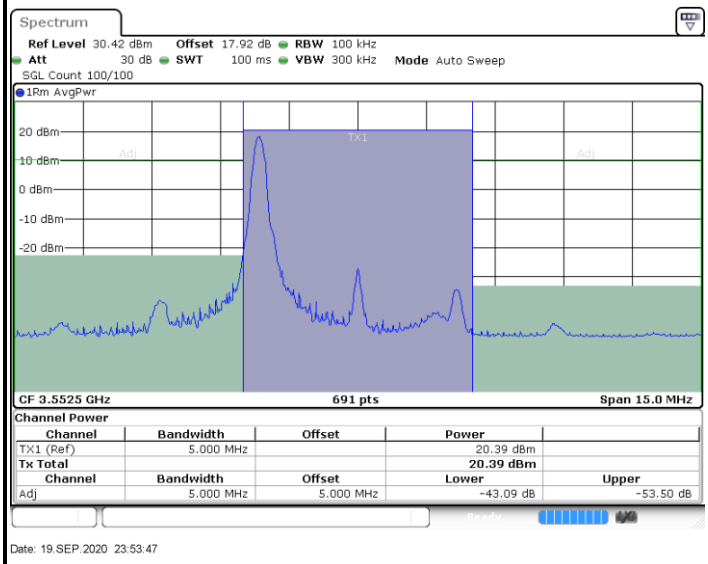
LTE Band 48 (GT - LC = 1.50 dB) 16QAM			
Bandwidth	20M		
Channel	(Low)	(Mid)	(High)
Conducted Power (dBm/10MHz)	20.28	19.99	19.52
Conducted Power (Watts/10MHz)	0.1067	0.0998	0.0895
ERP (dBm/10MHz)	21.78	21.49	21.02
ERP (Watts/10MHz)	0.1507	0.1409	0.1265

ACLR

LTE Band 48 / 5MHz

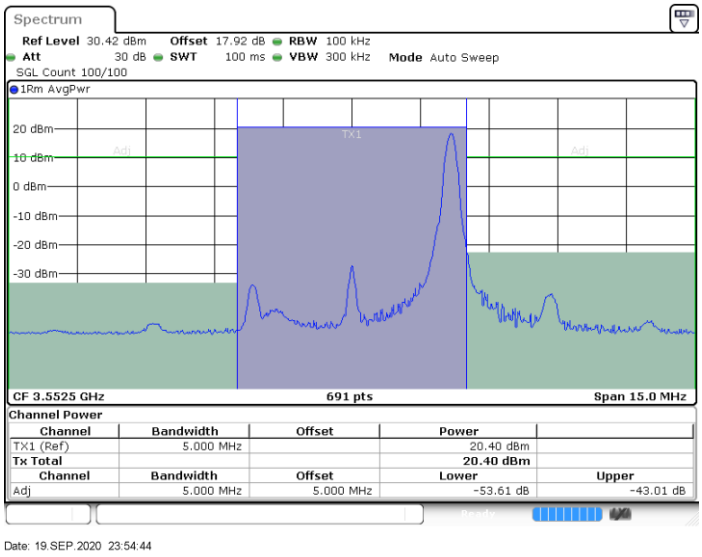
QPSK

Lowest Channel / 1RB0



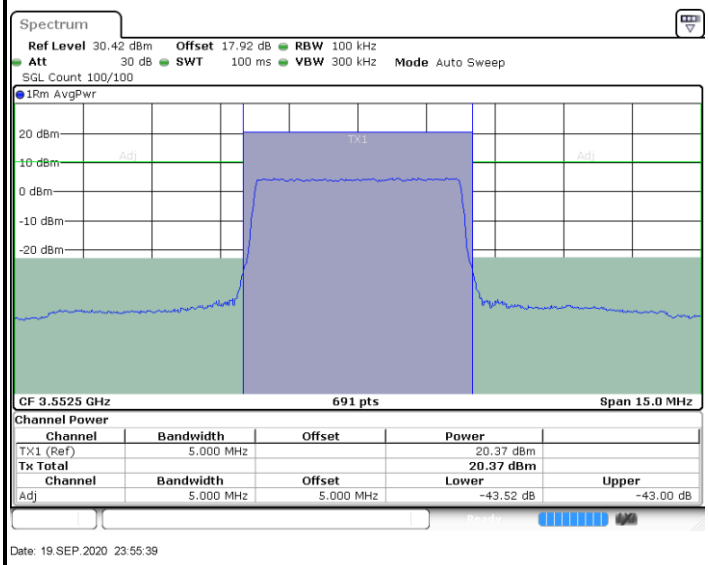
Date: 19.SEP.2020 23:53:47

Lowest Channel / 1RBmax



Date: 19.SEP.2020 23:54:44

Lowest Channel / Full RB



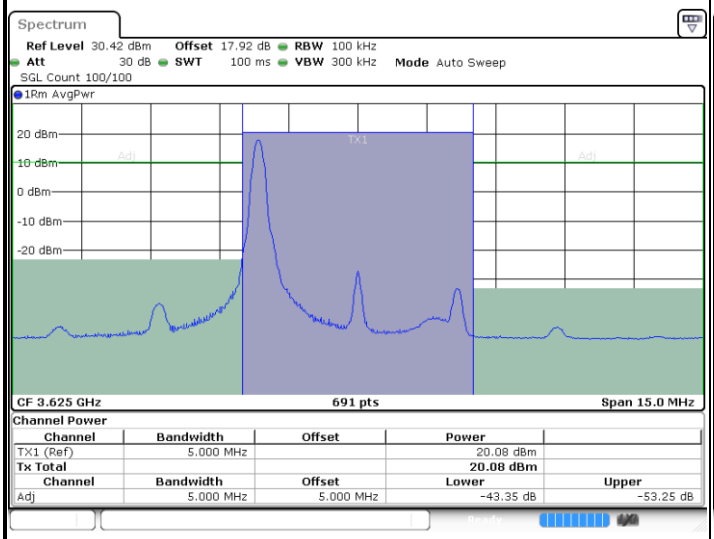
Date: 19.SEP.2020 23:55:39

N/A

LTE Band 48 / 5MHz

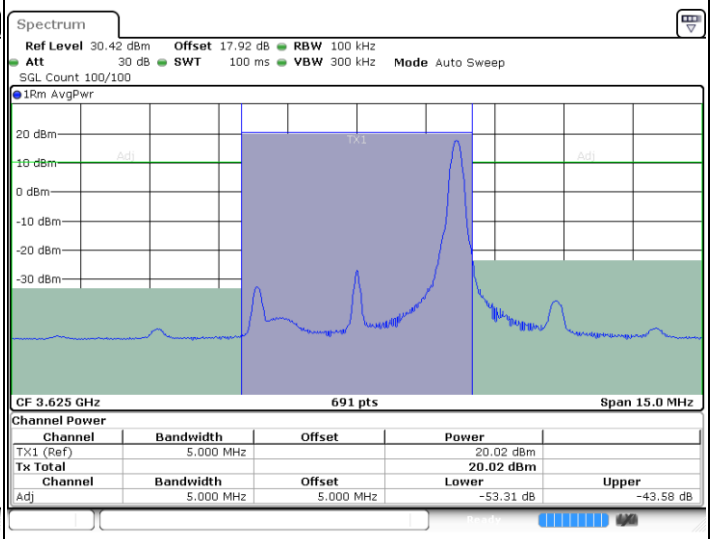
QPSK

Middle Channel / 1RB0



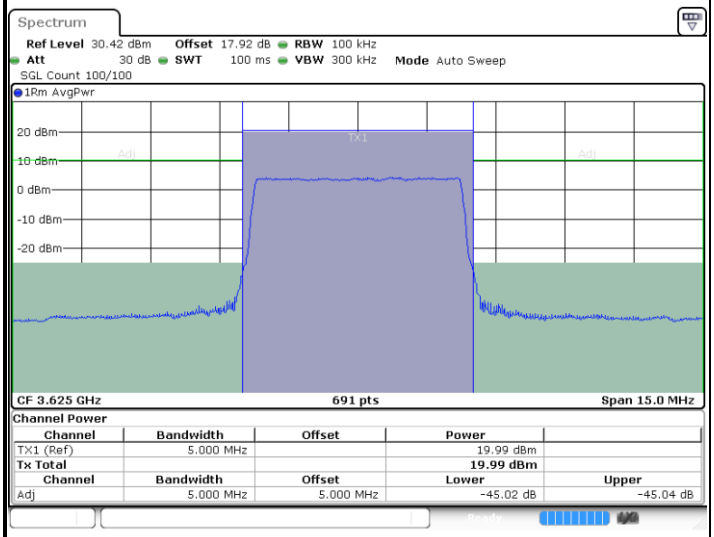
Date: 20.SEP.2020 00:00:21

Middle Channel / 1RBmax



Date: 19.SEP.2020 23:59:42

Middle Channel / Full RB



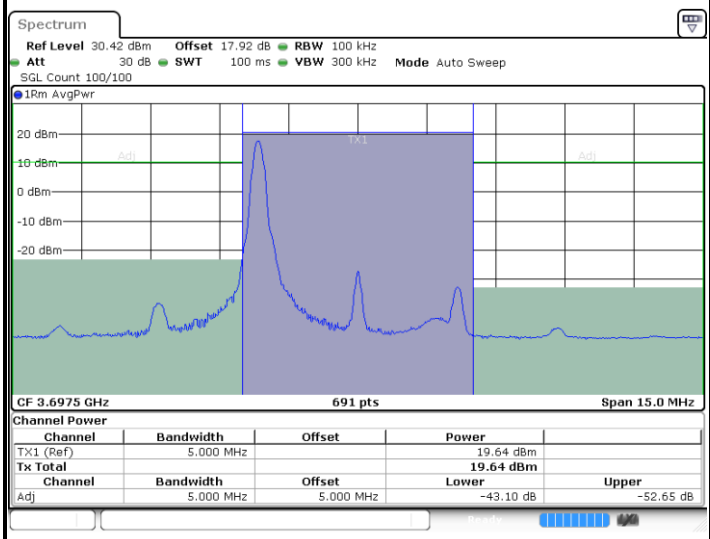
Date: 20.SEP.2020 00:01:01

N/A

LTE Band 48 / 5MHz

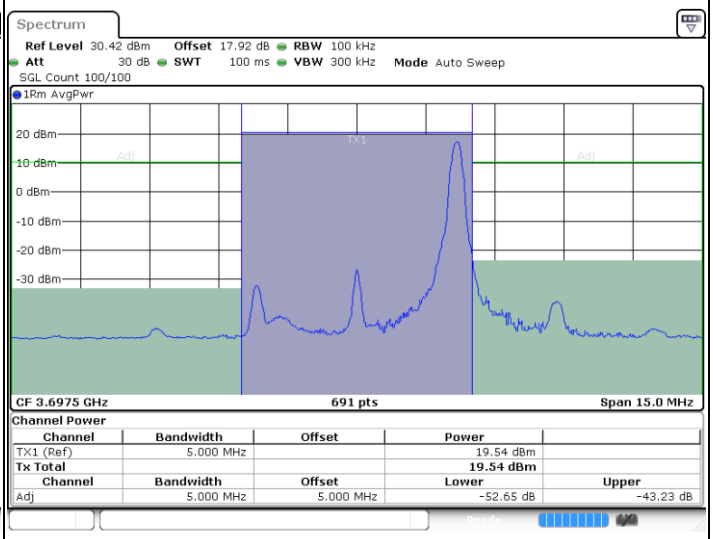
QPSK

Highest Channel / 1RB0



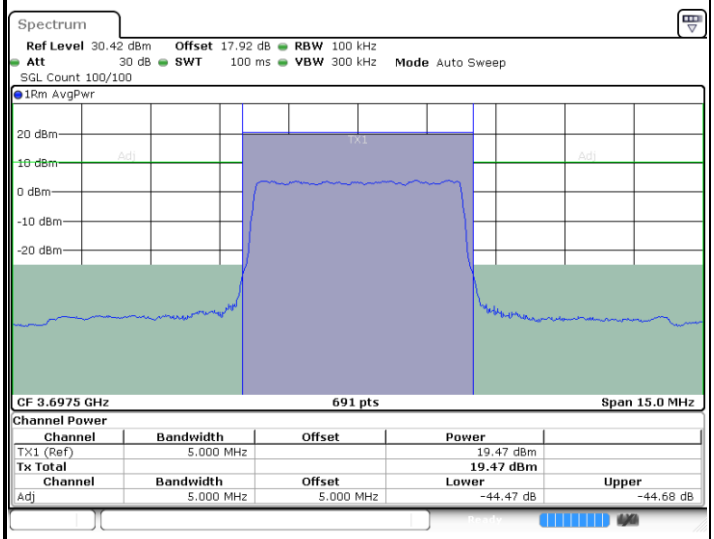
Date: 20.SEP.2020 00:05:18

Highest Channel / 1RBmax



Date: 20.SEP.2020 00:04:15

Highest Channel / Full RB



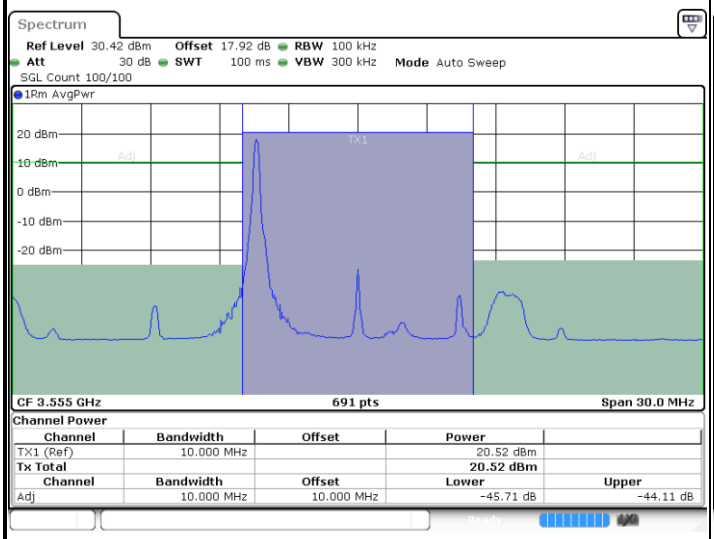
Date: 20.SEP.2020 00:05:59

N/A

LTE Band 48 / 10MHz

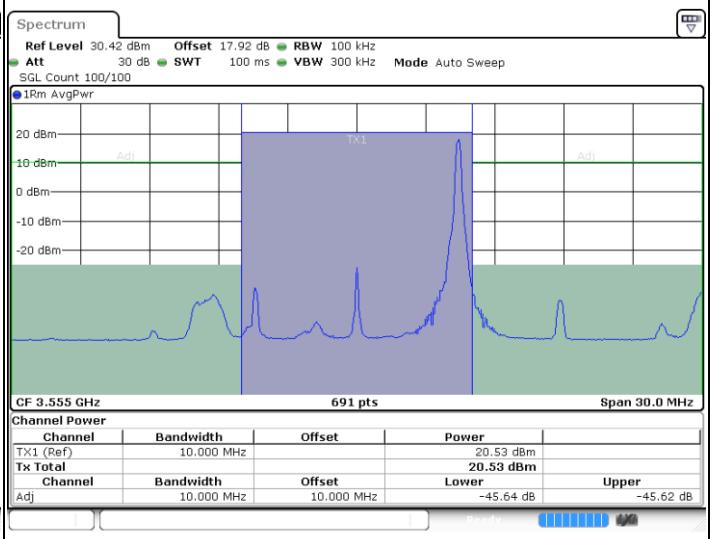
QPSK

Lowest Channel / 1RB0



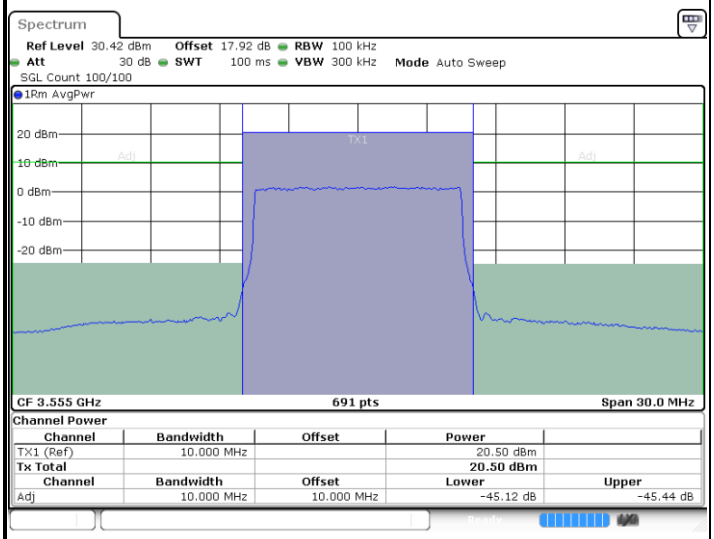
Date: 20.SEP.2020 00:24:28

Lowest Channel / 1RBmax



Date: 20.SEP.2020 00:25:04

Lowest Channel / Full RB



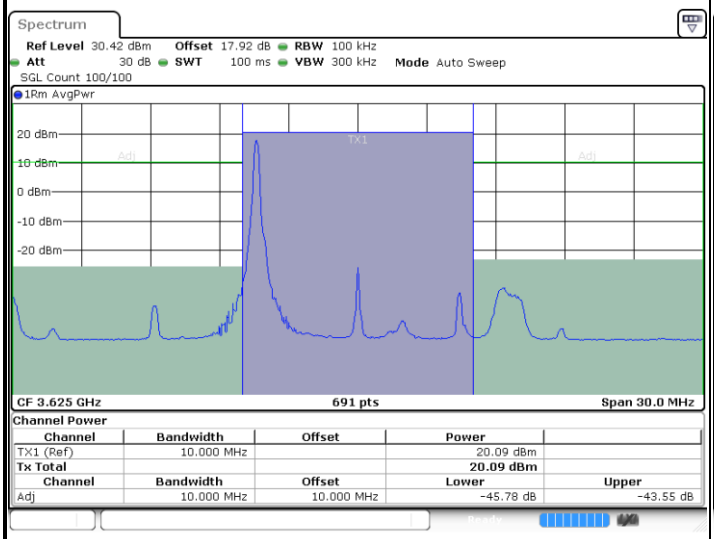
Date: 20.SEP.2020 00:23:38

N/A

LTE Band 48 / 10MHz

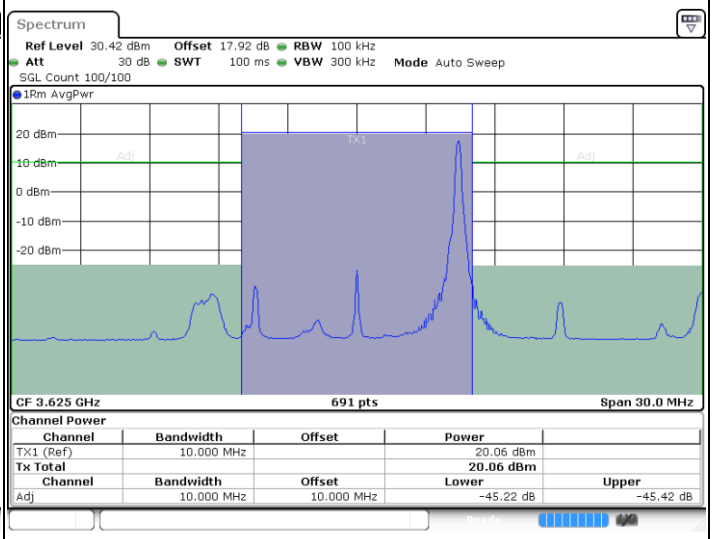
QPSK

Middle Channel / 1RB0



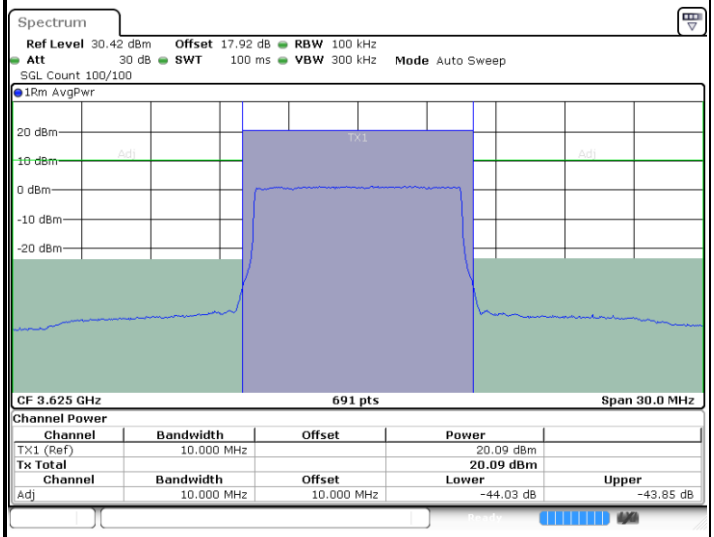
Date: 20.SEP.2020 00:28:58

Middle Channel / 1RBmax



Date: 20.SEP.2020 00:29:53

Middle Channel / Full RB



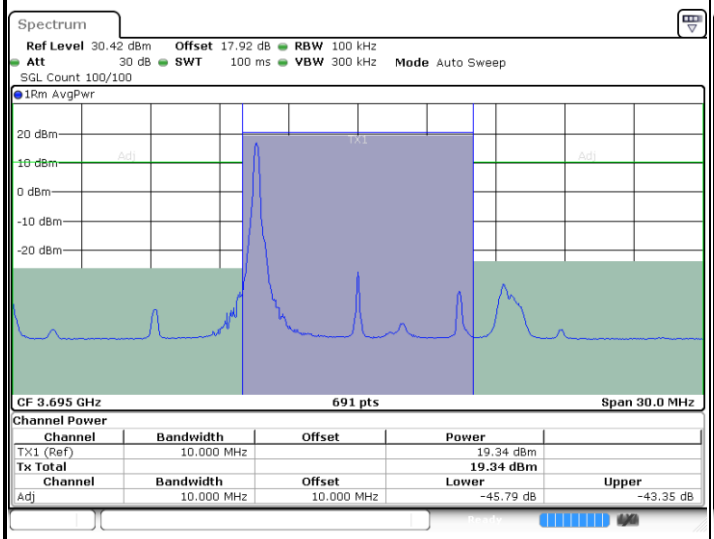
Date: 20.SEP.2020 00:28:05

N/A

LTE Band 48 / 10MHz

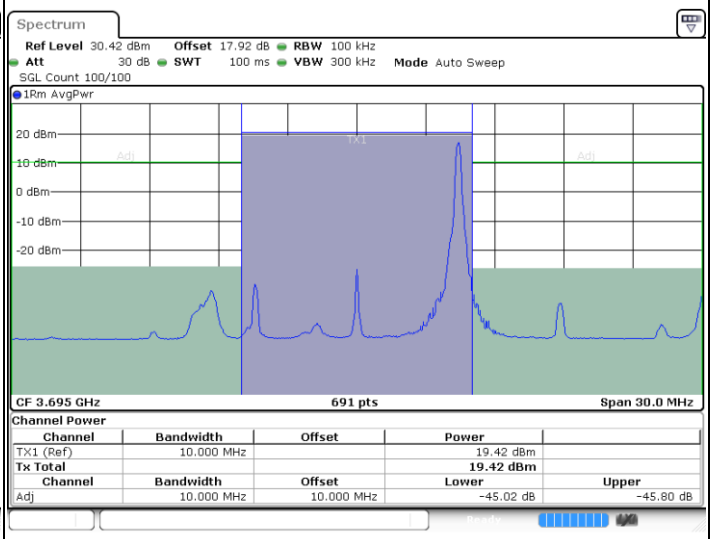
QPSK

Highest Channel / 1RB0



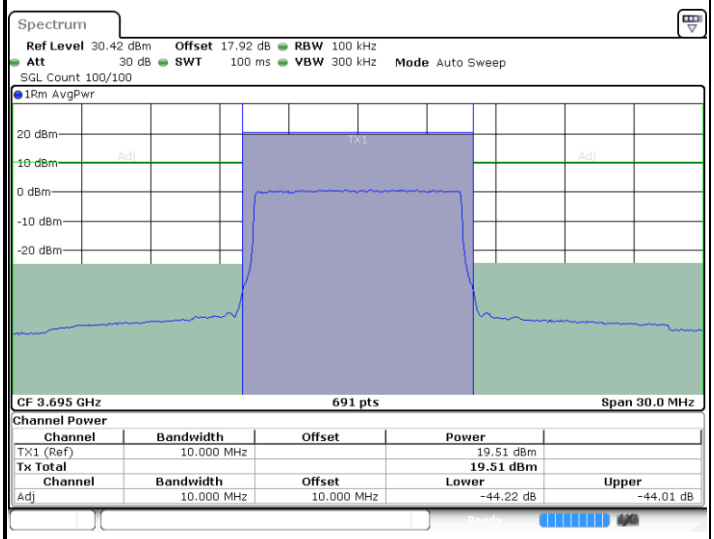
Date: 20.SEP.2020 00:35:03

Highest Channel / 1RBmax



Date: 20.SEP.2020 00:35:49

Highest Channel / Full RB



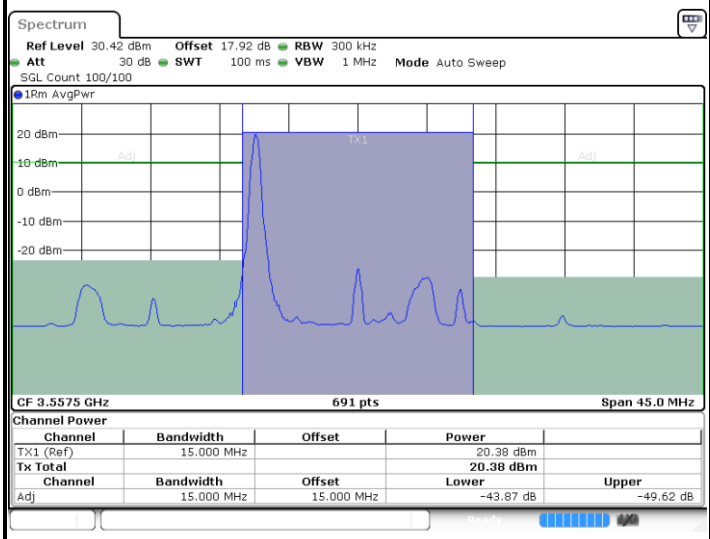
Date: 20.SEP.2020 00:34:16

N/A

LTE Band 48 / 15MHz

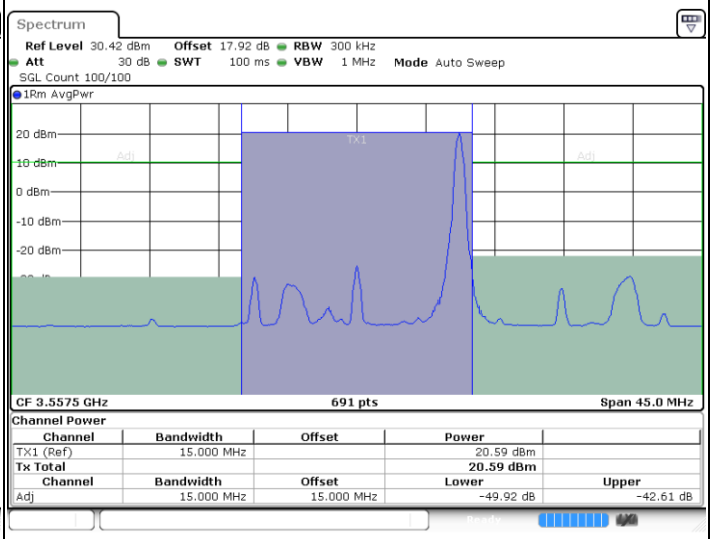
QPSK

Lowest Channel / 1RB0



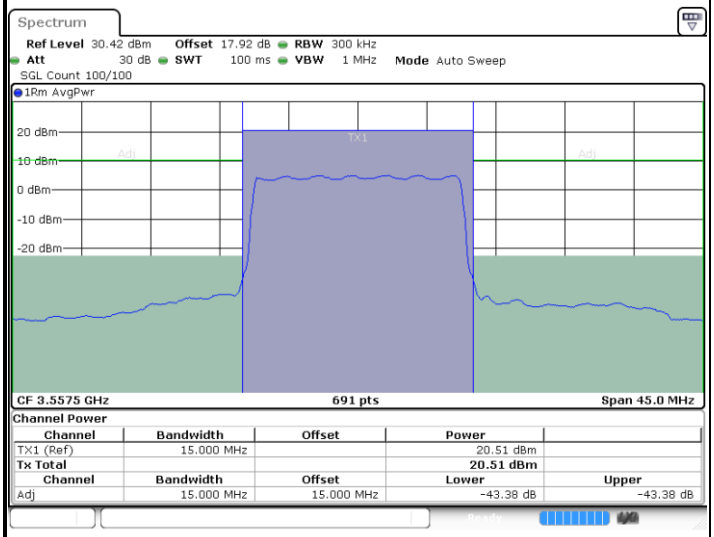
Date: 20.SEP.2020 00:42:12

Lowest Channel / 1RBmax



Date: 20.SEP.2020 00:43:15

Lowest Channel / Full RB



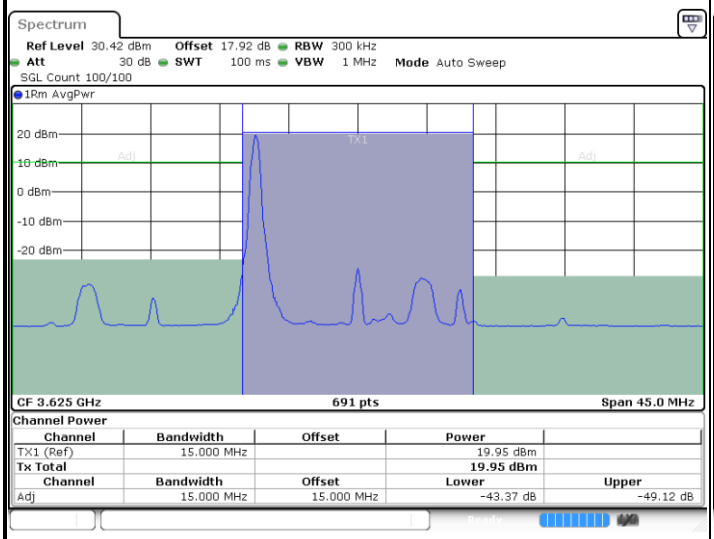
Date: 20.SEP.2020 00:43:52

N/A

LTE Band 48 / 15MHz

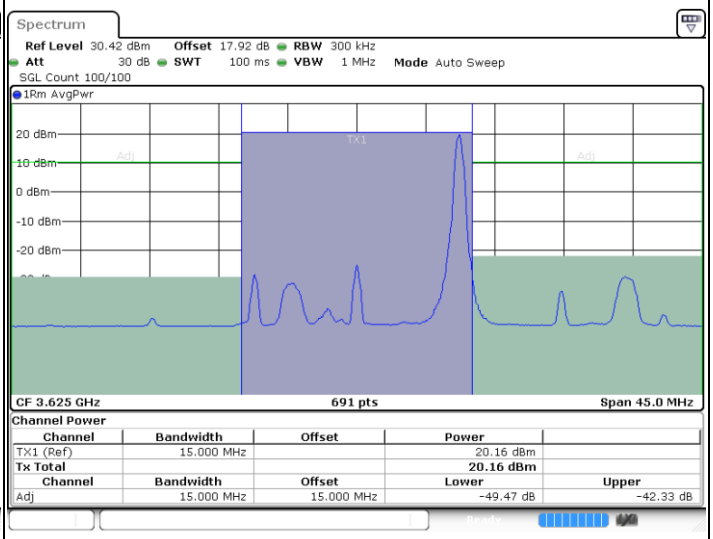
QPSK

Middle Channel / 1RB0



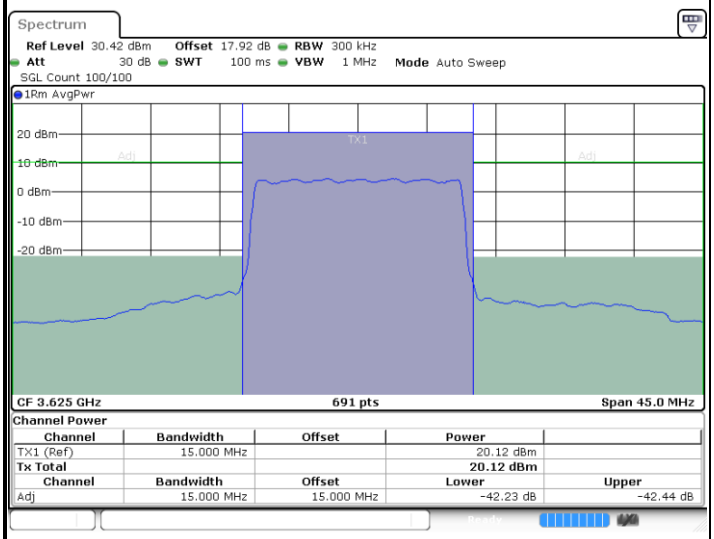
Date: 20.SEP.2020 00:48:01

Middle Channel / 1RBmax



Date: 20.SEP.2020 00:46:59

Middle Channel / Full RB



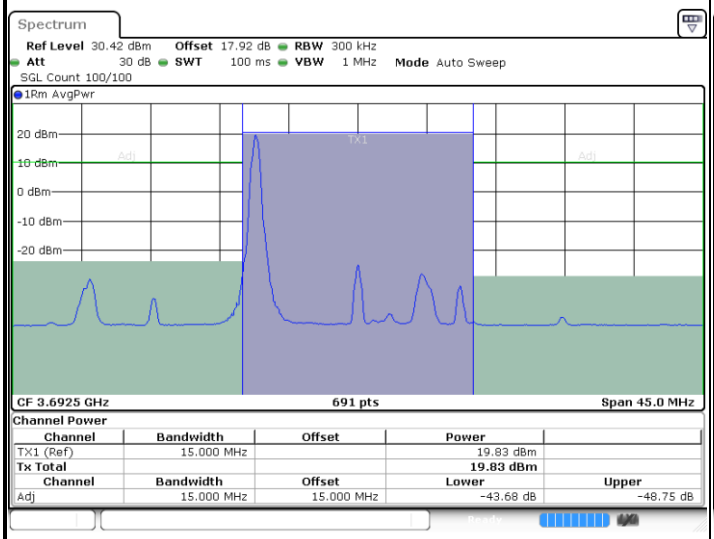
Date: 20.SEP.2020 00:48:36

N/A

LTE Band 48 / 15MHz

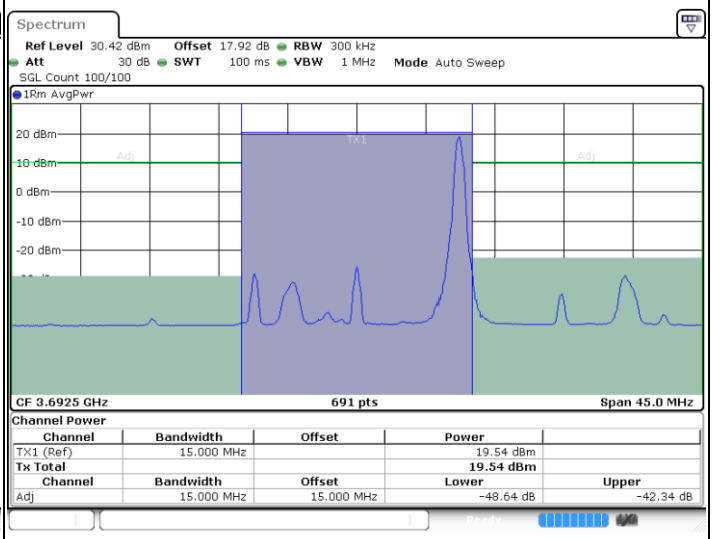
QPSK

Highest Channel / 1RB0



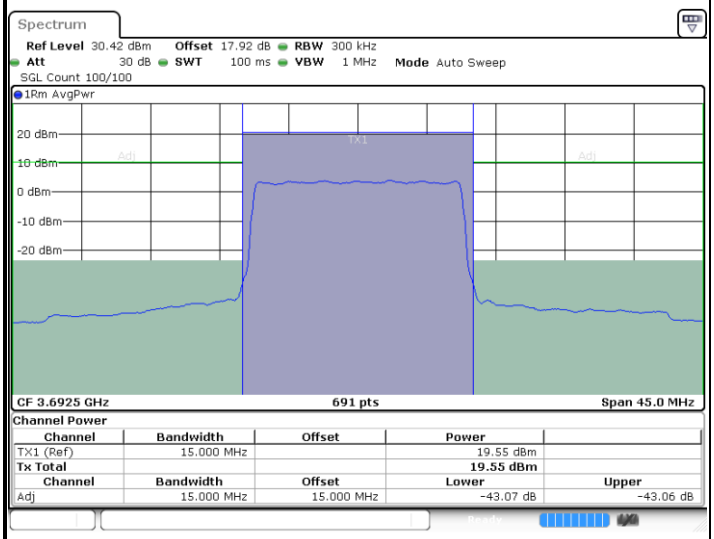
Date: 20.SEP.2020 00:53:11

Highest Channel / 1RBmax



Date: 20.SEP.2020 00:52:09

Highest Channel / Full RB



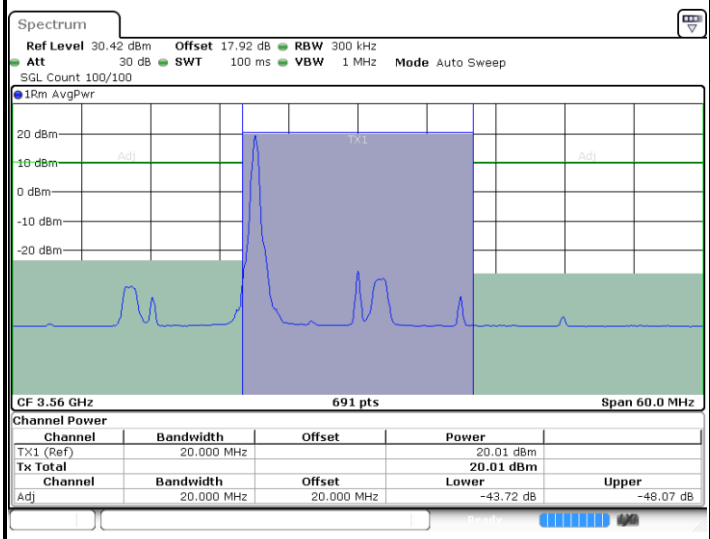
Date: 20.SEP.2020 00:54:27

N/A

LTE Band 48 / 20MHz

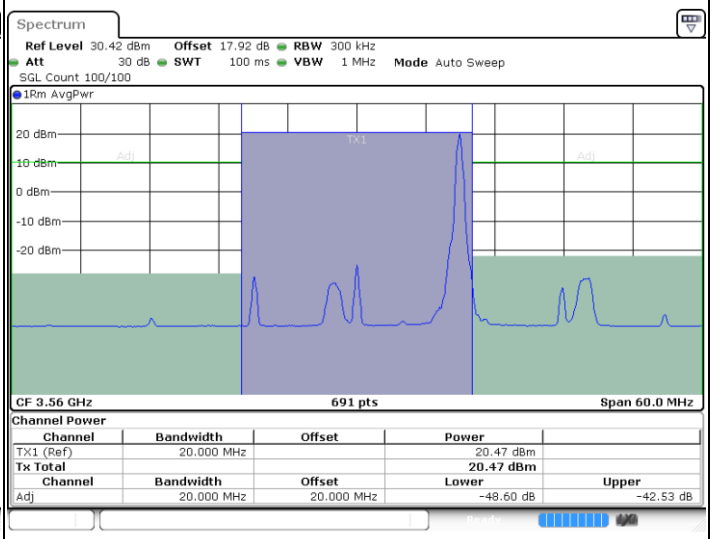
QPSK

Lowest Channel / 1RB0



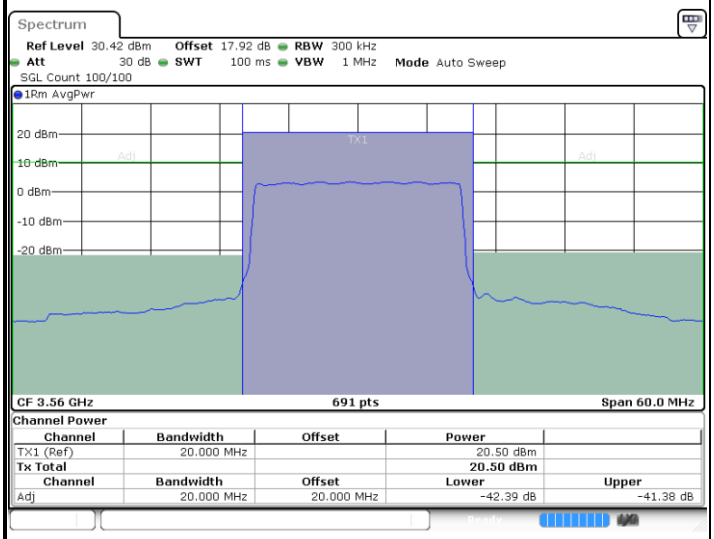
Date: 20.SEP.2020 01:01:07

Lowest Channel / 1RBmax



Date: 20.SEP.2020 01:01:51

Lowest Channel / Full RB



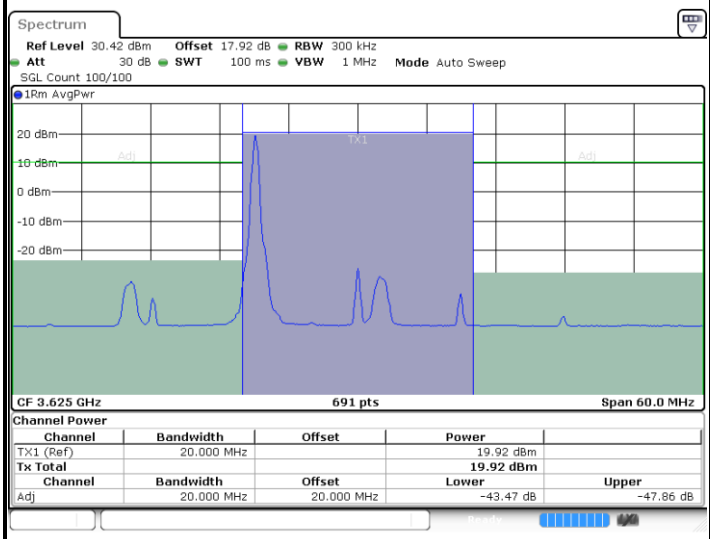
Date: 20.SEP.2020 00:59:53

N/A

LTE Band 48 / 20MHz

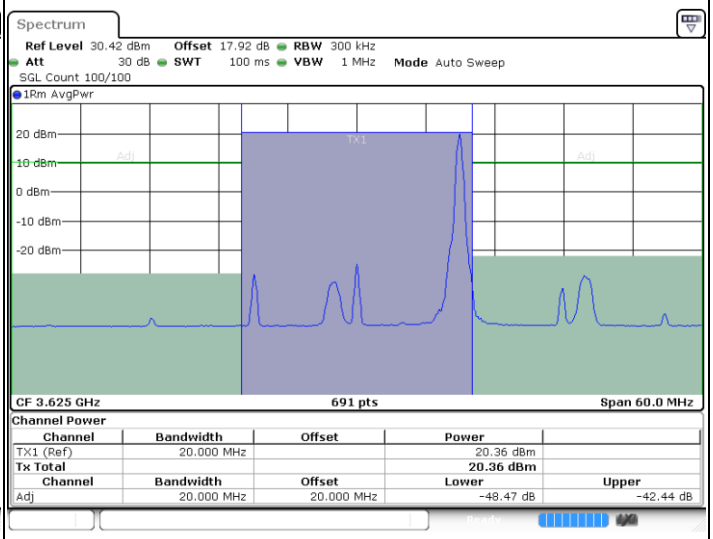
QPSK

Middle Channel / 1RB0



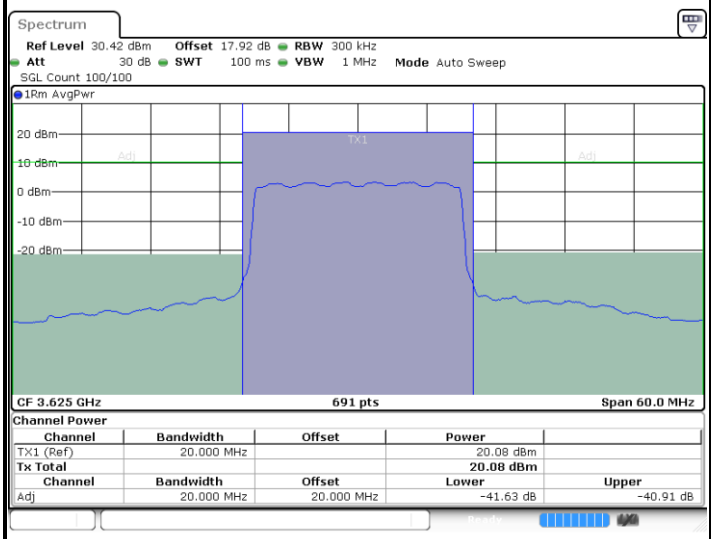
Date: 20.SEP.2020 01:08:37

Middle Channel / 1RBmax



Date: 20.SEP.2020 01:09:50

Middle Channel / Full RB



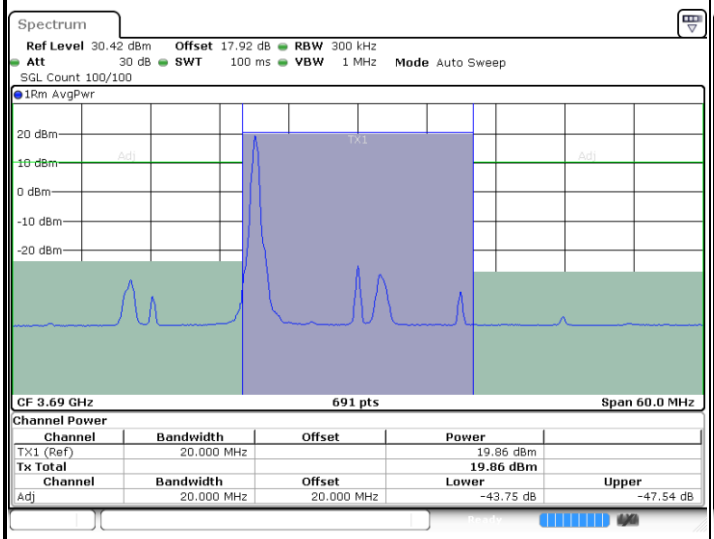
Date: 20.SEP.2020 01:10:47

N/A

LTE Band 48 / 20MHz

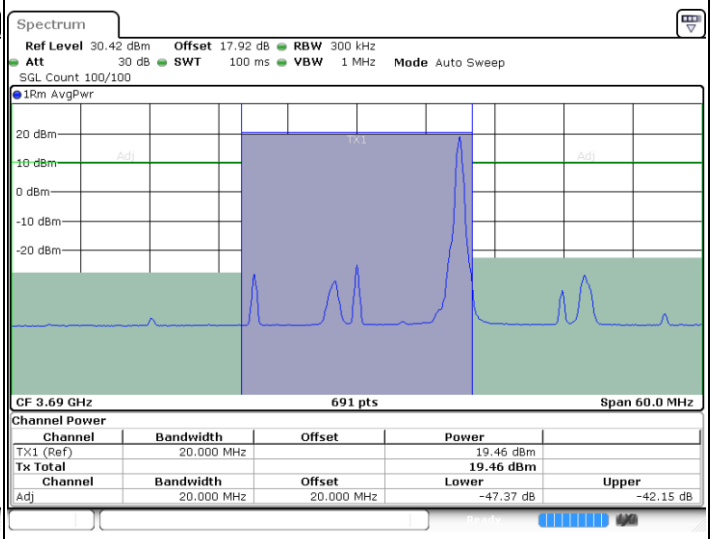
QPSK

Highest Channel / 1RB0



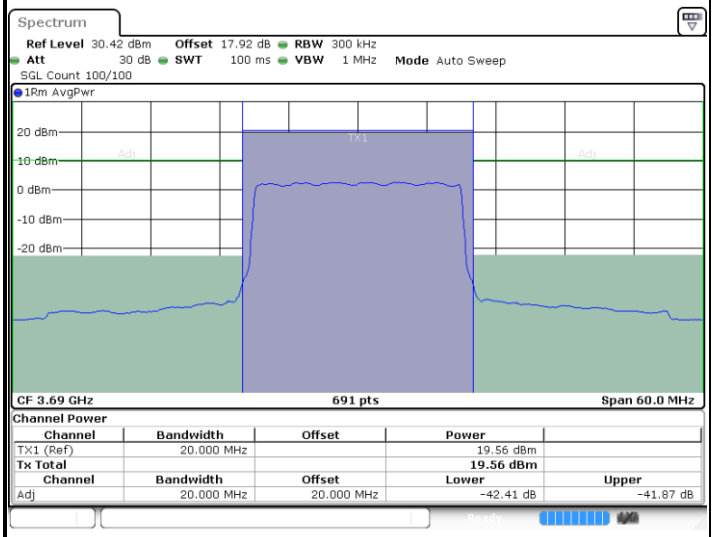
Date: 20.SEP.2020 01:13:02

Highest Channel / 1RBmax



Date: 20.SEP.2020 01:13:46

Highest Channel / Full RB



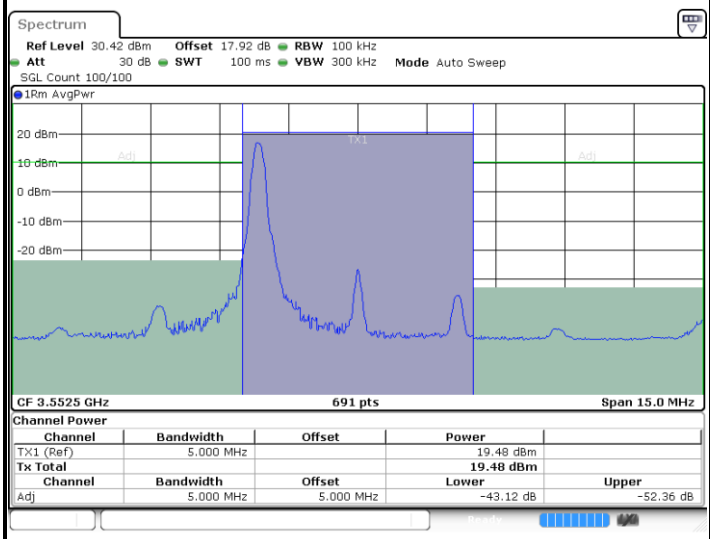
Date: 20.SEP.2020 01:12:10

N/A

LTE Band 48 / 5MHz

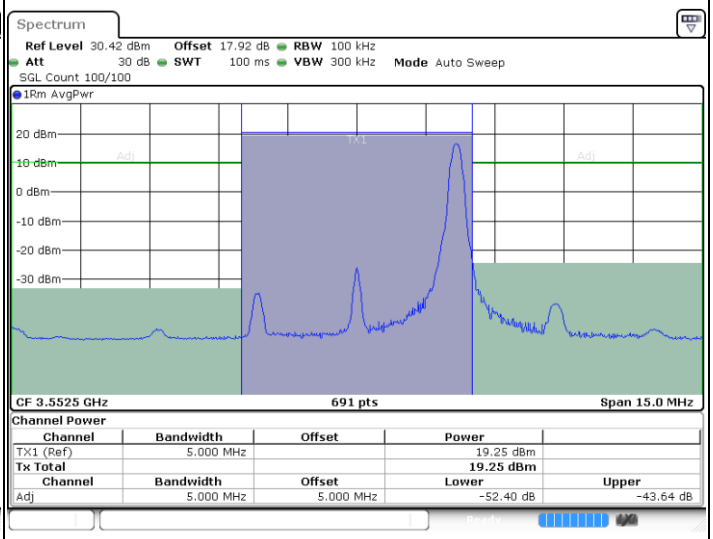
16QAM

Lowest Channel / 1RB0



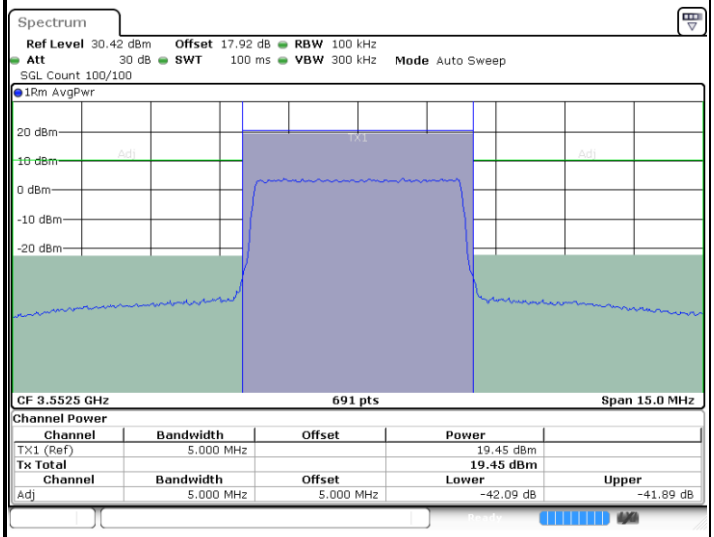
Date: 19.SEP.2020 23:57:39

Lowest Channel / 1RBmax



Date: 19.SEP.2020 23:58:32

Lowest Channel / Full RB



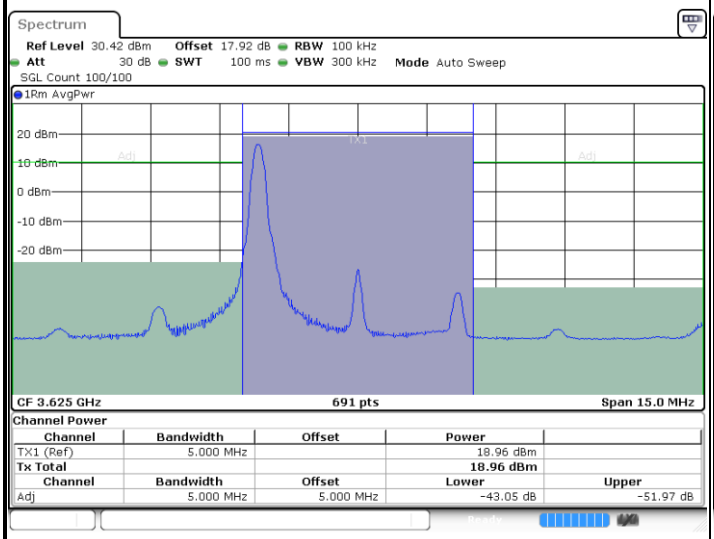
Date: 19.SEP.2020 23:56:37

N/A

LTE Band 48 / 5MHz

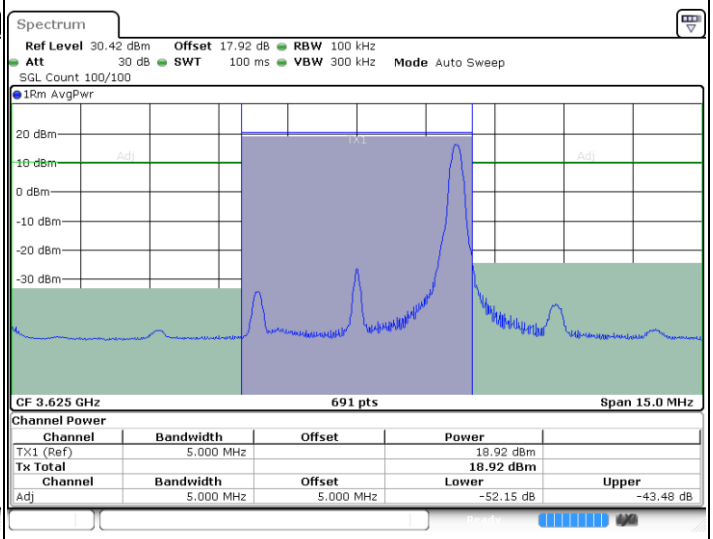
16QAM

Middle Channel / 1RB0



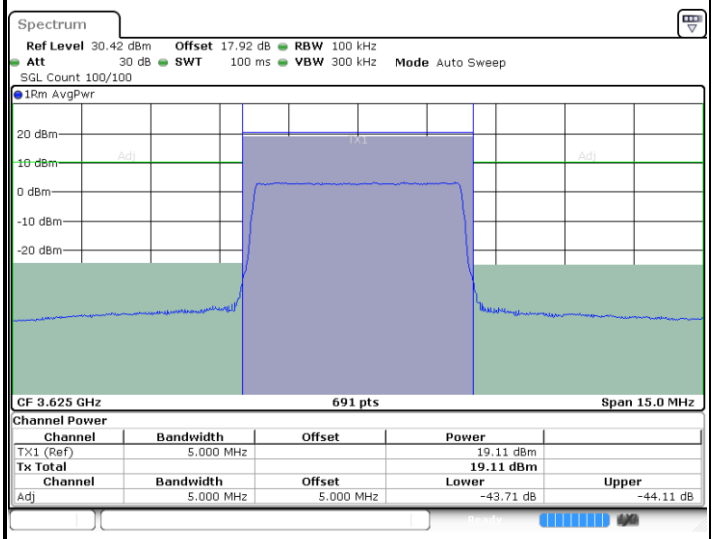
Date: 20.SEP.2020 00:02:28

Middle Channel / 1RBmax



Date: 20.SEP.2020 00:03:25

Middle Channel / Full RB



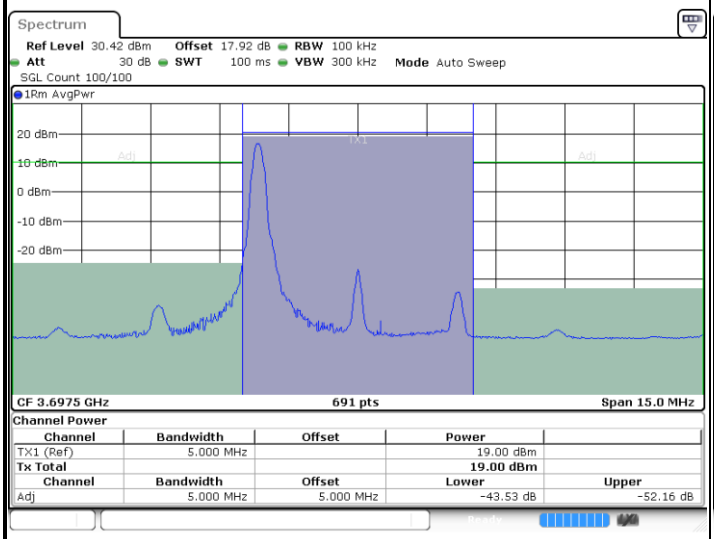
Date: 20.SEP.2020 00:01:42

N/A

LTE Band 48 / 5MHz

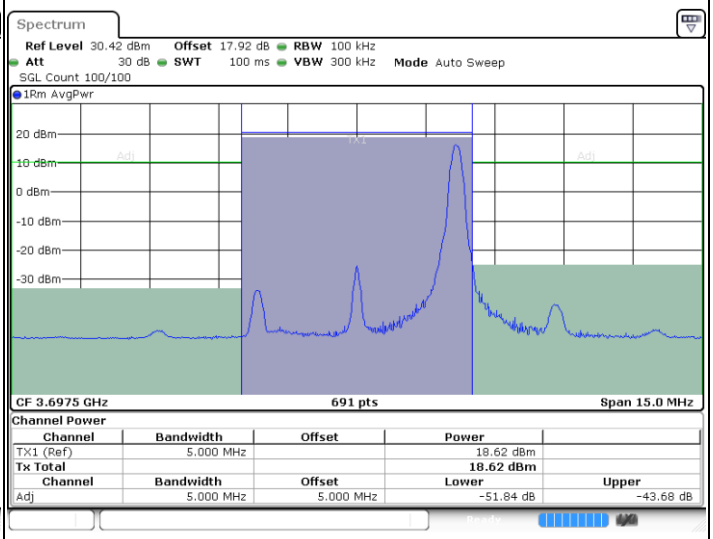
16QAM

Highest Channel / 1RB0



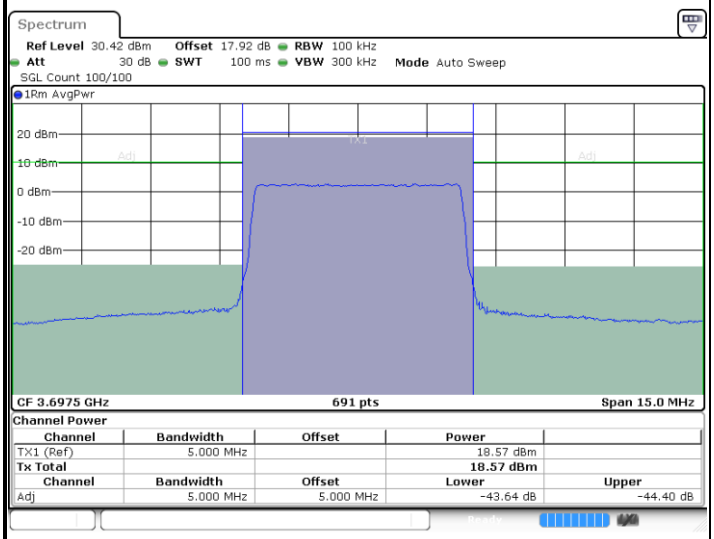
Date: 20.SEP.2020 00:07:32

Highest Channel / 1RBmax



Date: 20.SEP.2020 00:22:19

Highest Channel / Full RB



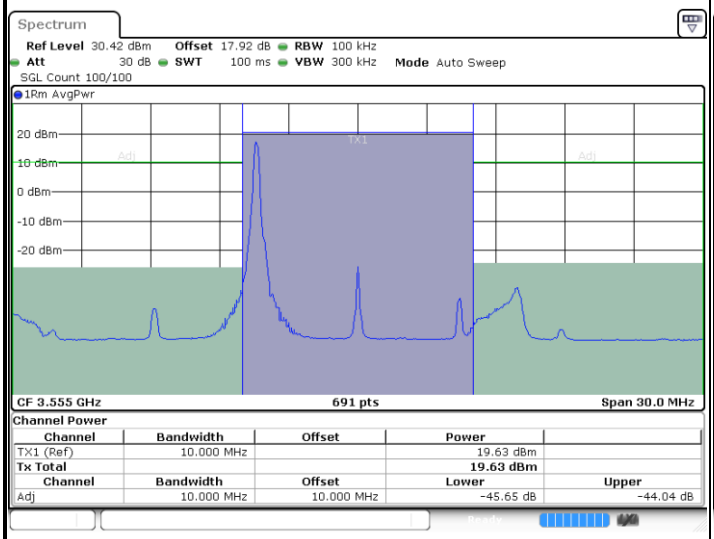
Date: 20.SEP.2020 00:06:59

N/A

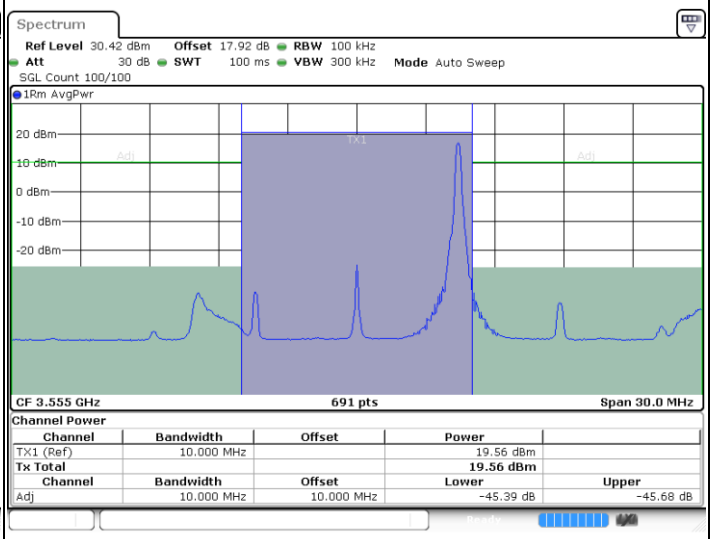
LTE Band 48 / 10MHz

16QAM

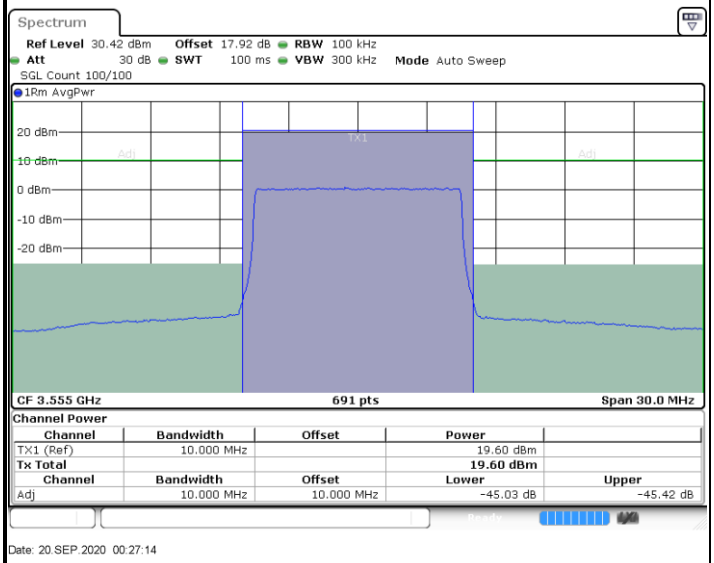
Lowest Channel / 1RB0



Lowest Channel / 1RBmax



Lowest Channel / Full RB

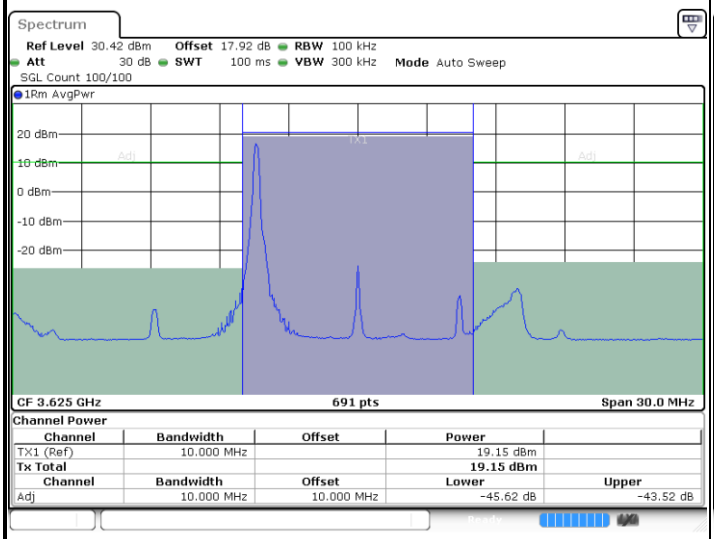


N/A

LTE Band 48 / 10MHz

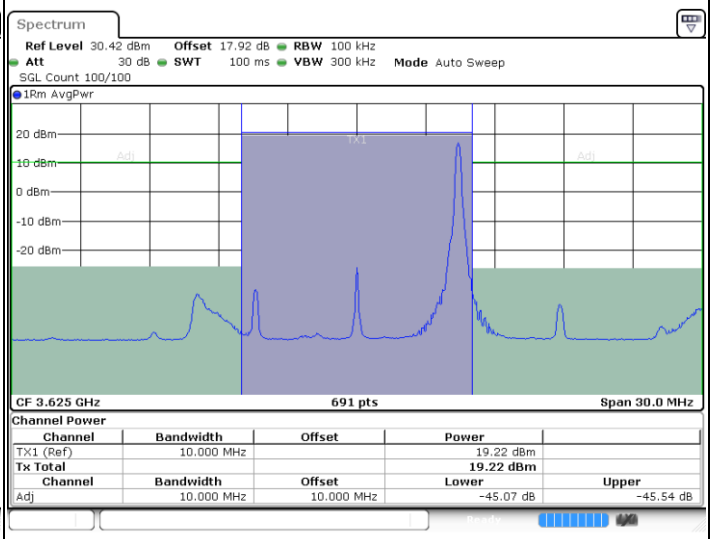
16QAM

Middle Channel / 1RB0



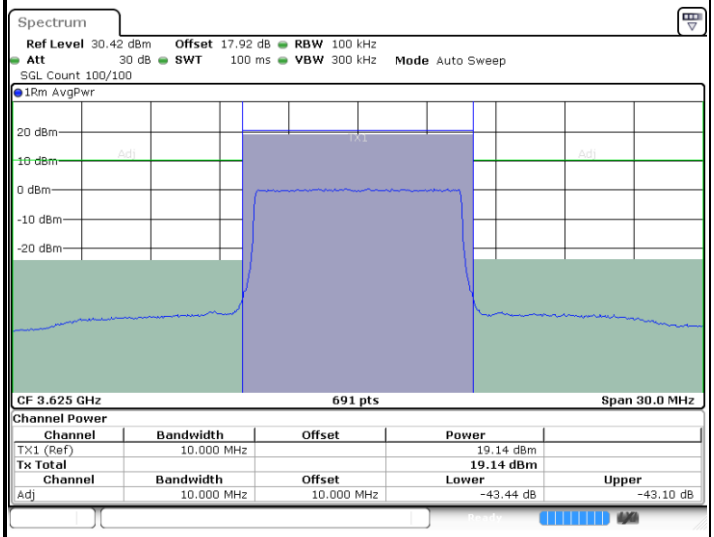
Date: 20.SEP.2020 00:32:23

Middle Channel / 1RBmax



Date: 20.SEP.2020 00:31:20

Middle Channel / Full RB



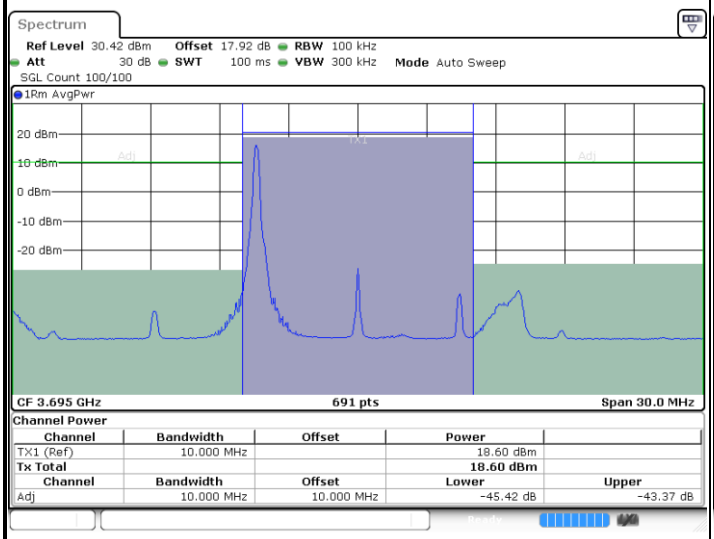
Date: 20.SEP.2020 00:33:02

N/A

LTE Band 48 / 10MHz

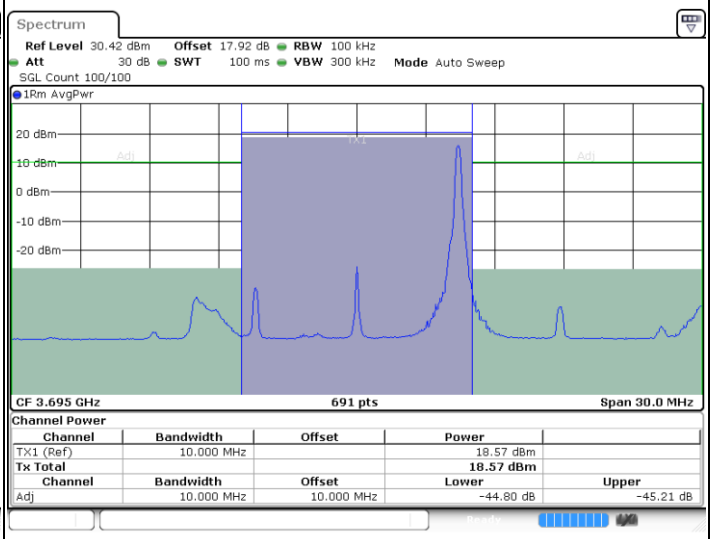
16QAM

Highest Channel / 1RB0



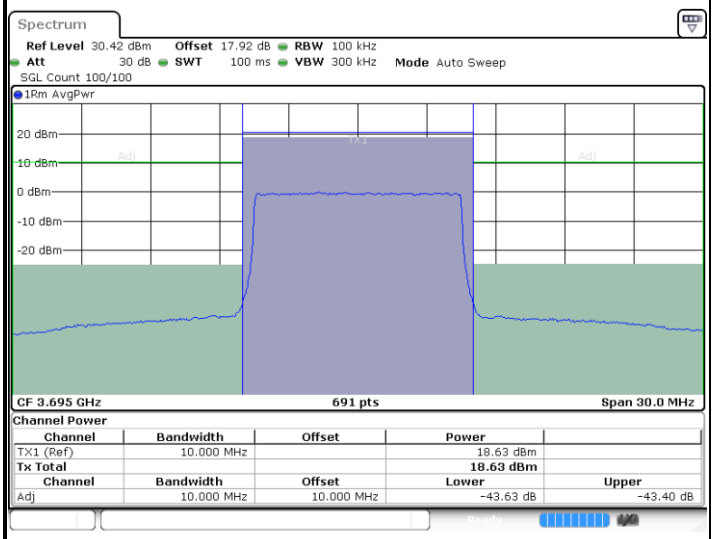
Date: 20.SEP.2020 00:39:07

Highest Channel / 1RBmax



Date: 20.SEP.2020 00:36:49

Highest Channel / Full RB



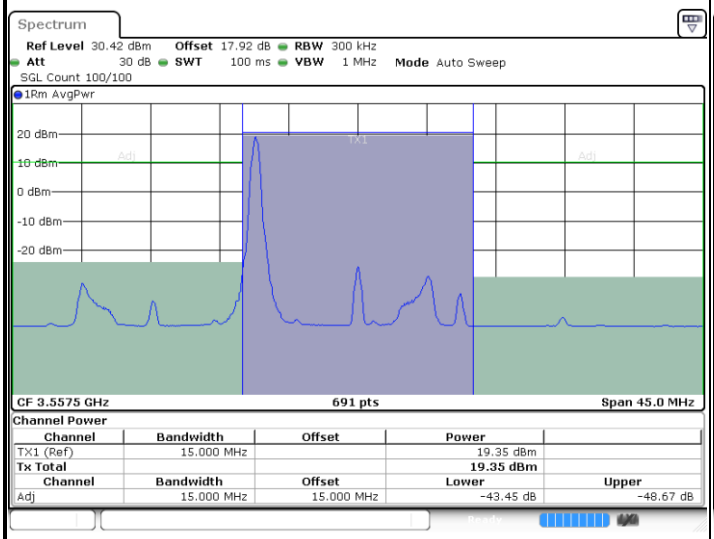
Date: 20.SEP.2020 00:37:57

N/A

LTE Band 48 / 15MHz

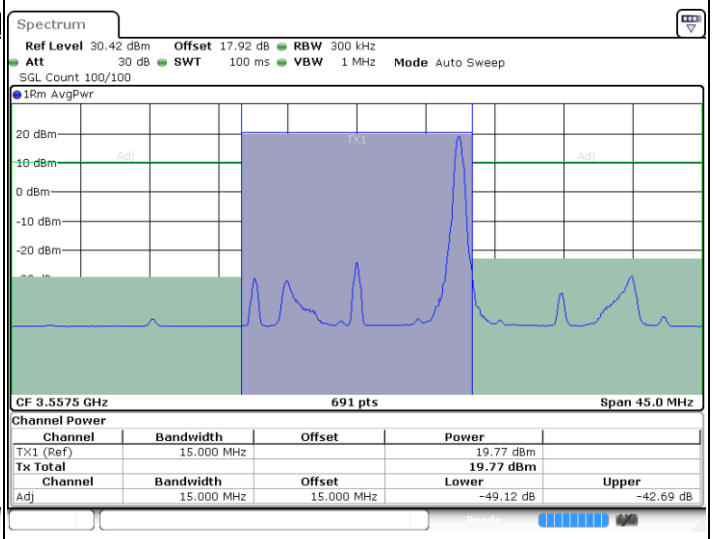
16QAM

Lowest Channel / 1RB0



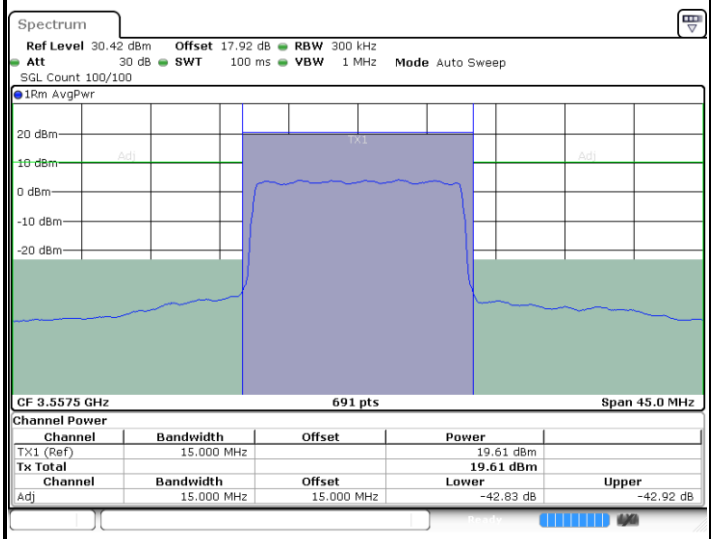
Date: 20.SEP.2020 00:45:19

Lowest Channel / 1RBmax



Date: 20.SEP.2020 00:45:54

Lowest Channel / Full RB



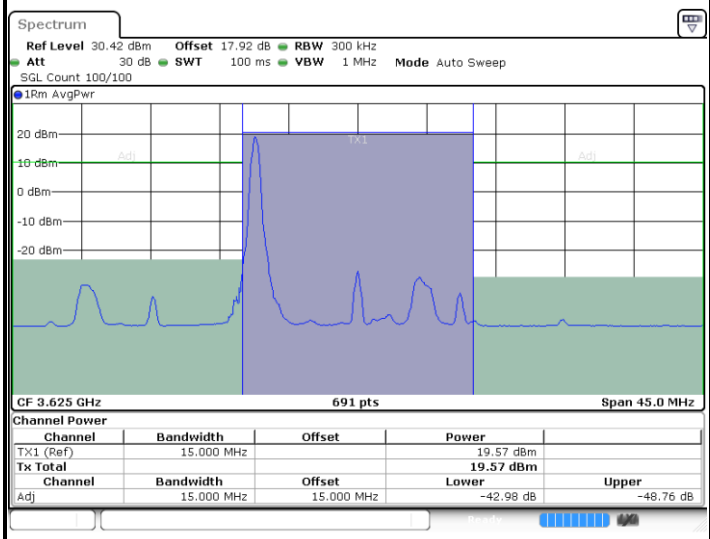
Date: 20.SEP.2020 00:44:30

N/A

LTE Band 48 / 15MHz

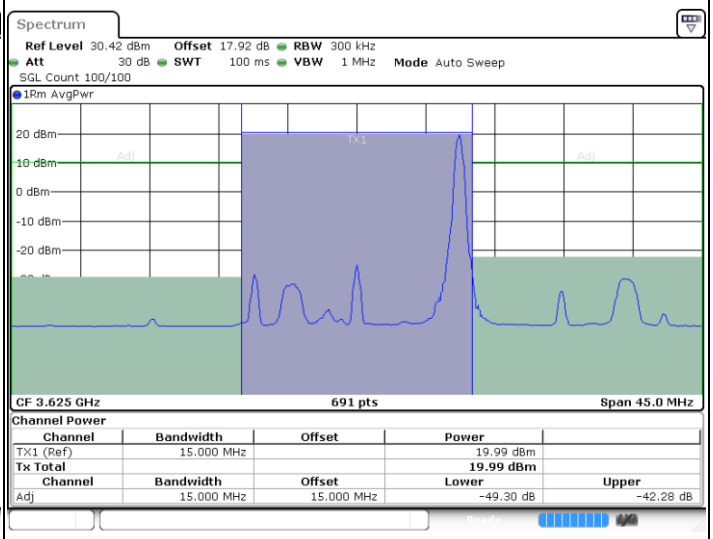
16QAM

Middle Channel / 1RB0



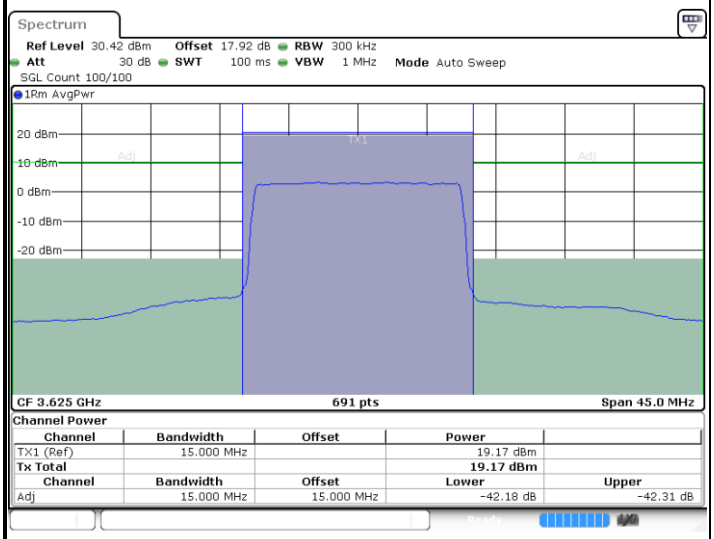
Date: 20.SEP.2020 00:50:12

Middle Channel / 1RBmax



Date: 20.SEP.2020 00:50:58

Middle Channel / Full RB



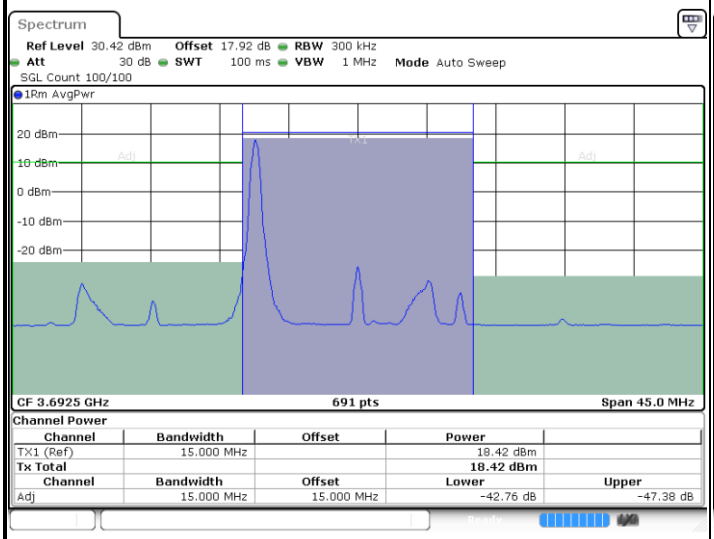
Date: 20.SEP.2020 00:49:20

N/A

LTE Band 48 / 15MHz

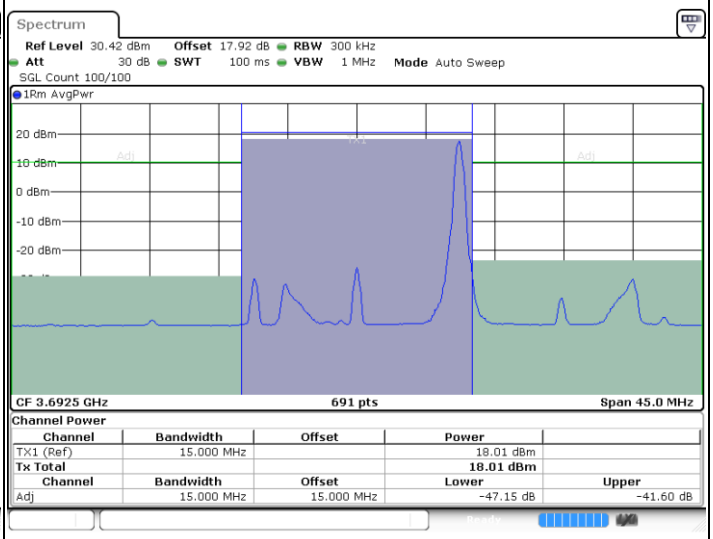
16QAM

Highest Channel / 1RB0



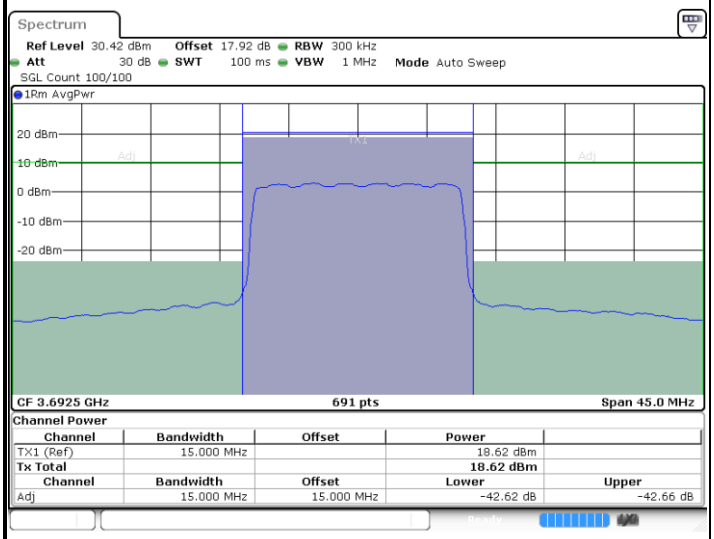
Date: 20.SEP.2020 00:56:07

Highest Channel / 1RBmax



Date: 20.SEP.2020 00:56:43

Highest Channel / Full RB



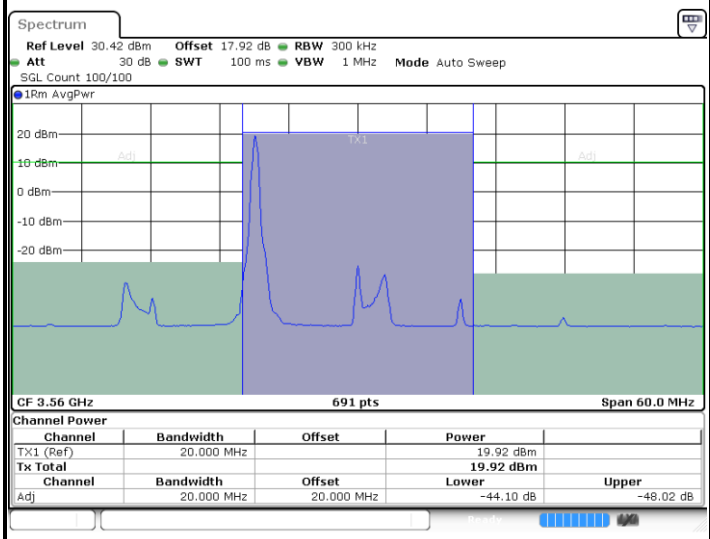
Date: 20.SEP.2020 00:55:22

N/A

LTE Band 48 / 20MHz

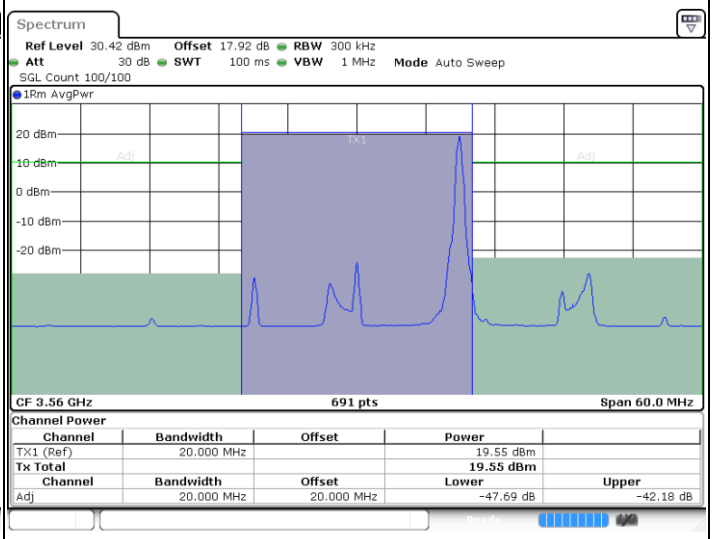
16QAM

Lowest Channel / 1RB0



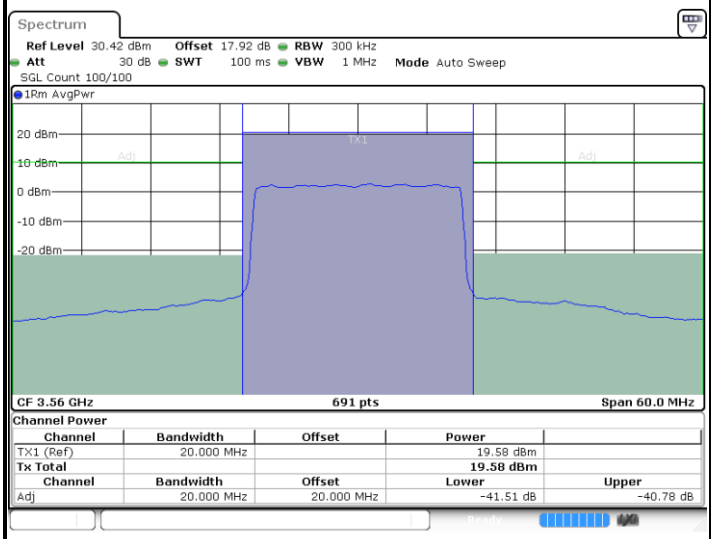
Date: 20.SEP.2020 01:03:44

Lowest Channel / 1RBmax



Date: 20.SEP.2020 01:02:34

Lowest Channel / Full RB



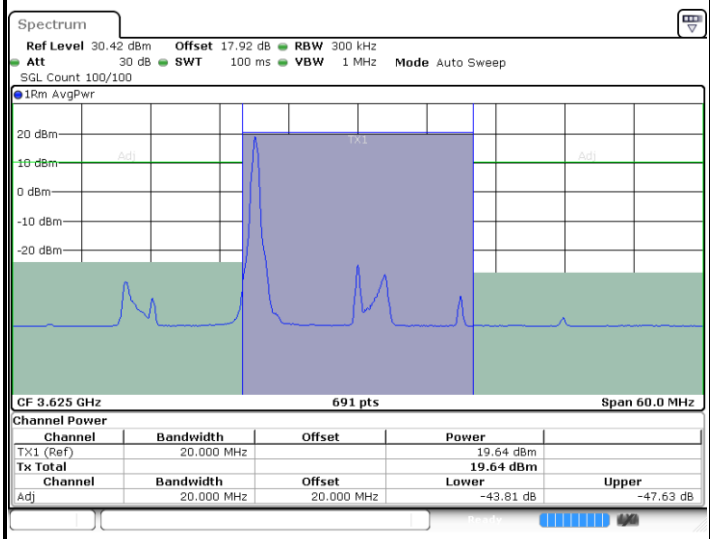
Date: 20.SEP.2020 01:04:50

N/A

LTE Band 48 / 20MHz

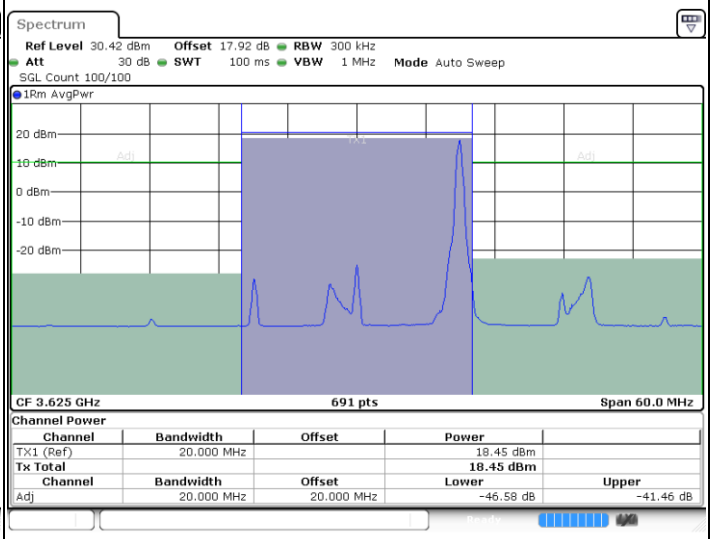
16QAM

Middle Channel / 1RB0



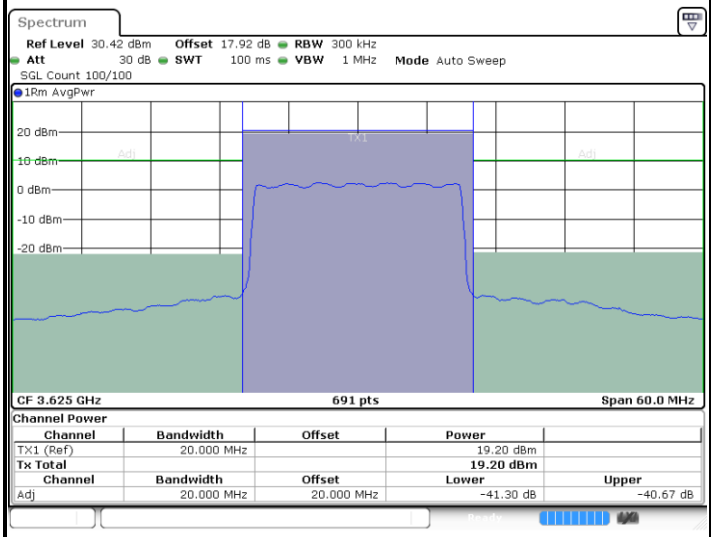
Date: 20.SEP.2020 01:06:16

Middle Channel / 1RBmax



Date: 20.SEP.2020 01:07:18

Middle Channel / Full RB



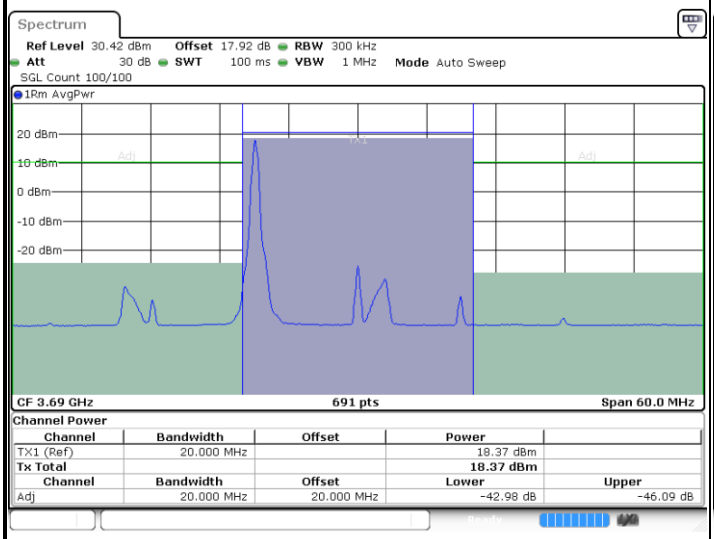
Date: 20.SEP.2020 01:05:32

N/A

LTE Band 48 / 20MHz

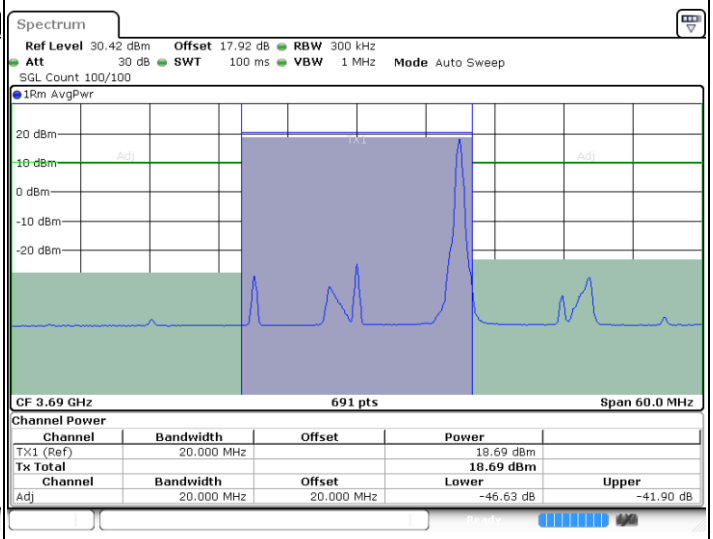
16QAM

Highest Channel / 1RB0



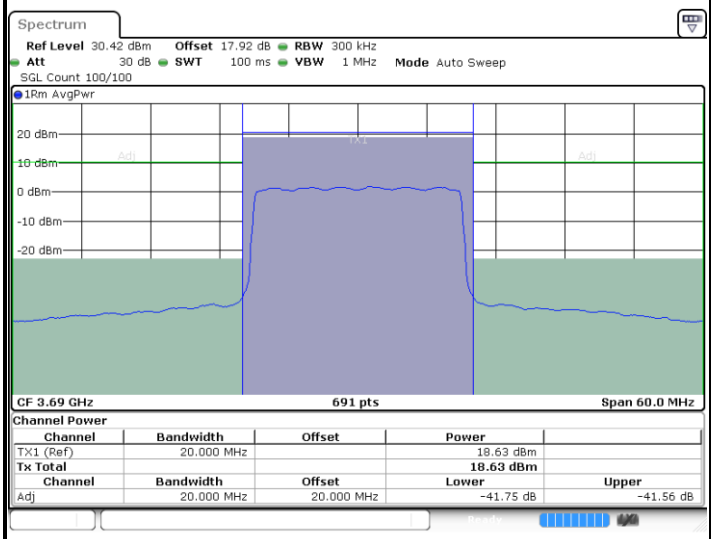
Date: 20.SEP.2020 01:15:55

Highest Channel / 1RBmax



Date: 20.SEP.2020 01:14:28

Highest Channel / Full RB



Date: 20.SEP.2020 01:15:16

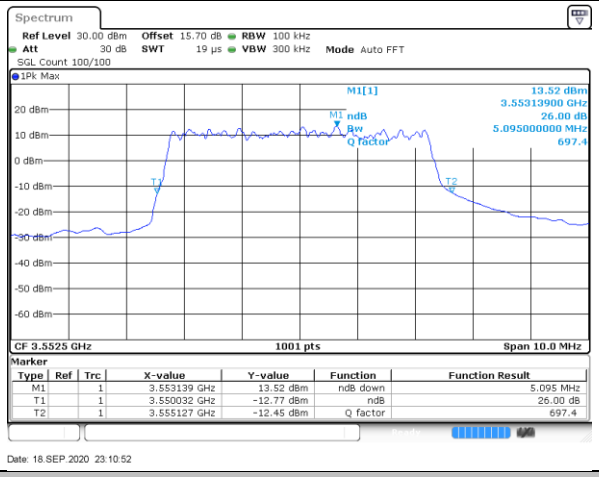
N/A

26dB Bandwidth

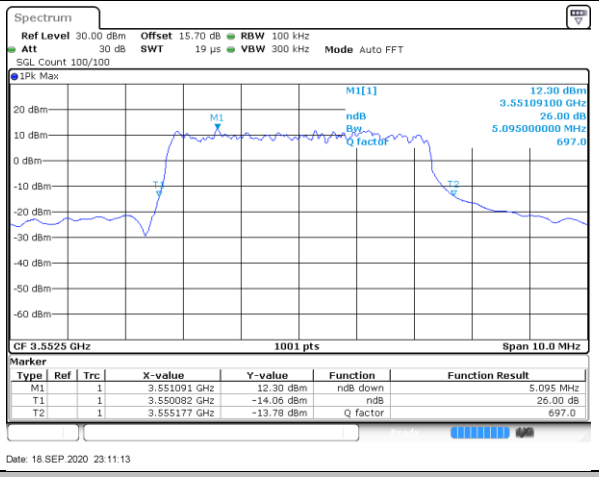
Mode	LTE Band 48 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	5.10	5.10	9.79	9.75	14.30	14.33	20.18	20.10
Middle CH	-	-	-	-	4.90	4.91	9.69	9.65	14.24	14.27	20.06	20.06
Highest CH	-	-	-	-	4.87	4.82	9.75	9.71	14.33	14.15	20.18	20.26

LTE Band 48

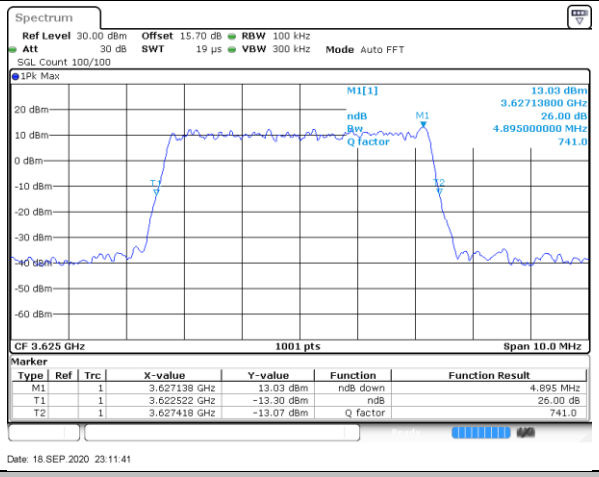
Lowest Channel / 5MHz / QPSK



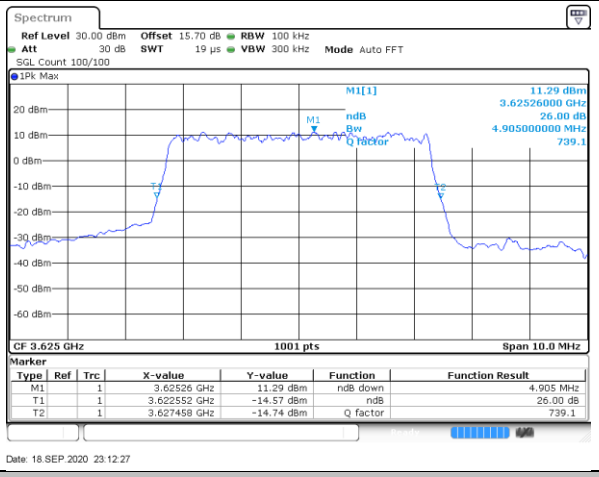
Lowest Channel / 5MHz / 16QAM



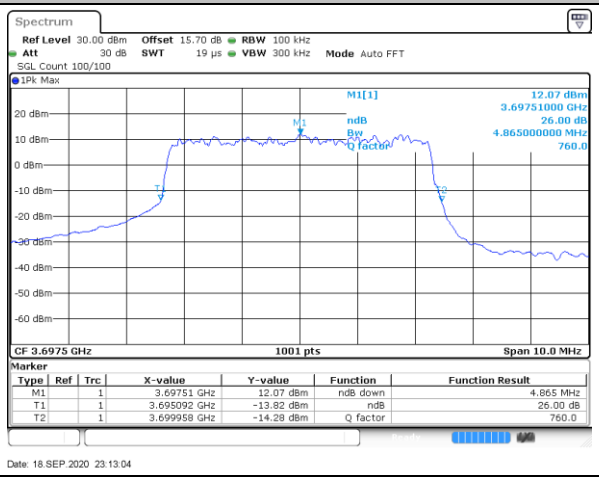
Middle Channel / 5MHz / QPSK



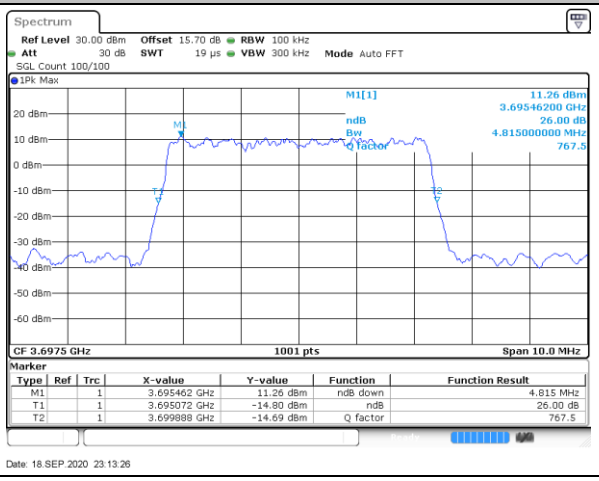
Middle Channel / 5MHz / 16QAM



Highest Channel / 5MHz / QPSK

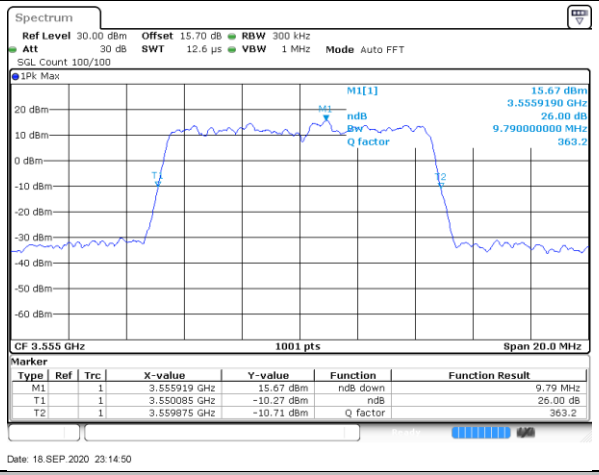


Highest Channel / 5MHz / 16QAM

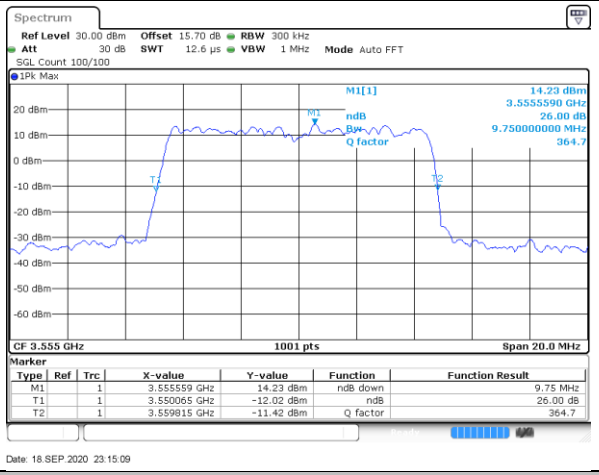


LTE Band 48

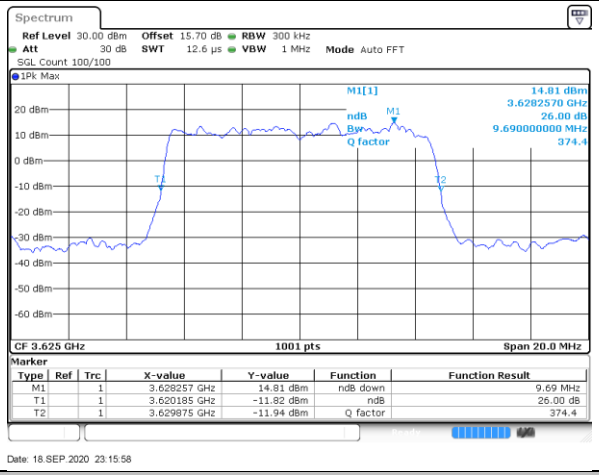
Lowest Channel / 10MHz / QPSK



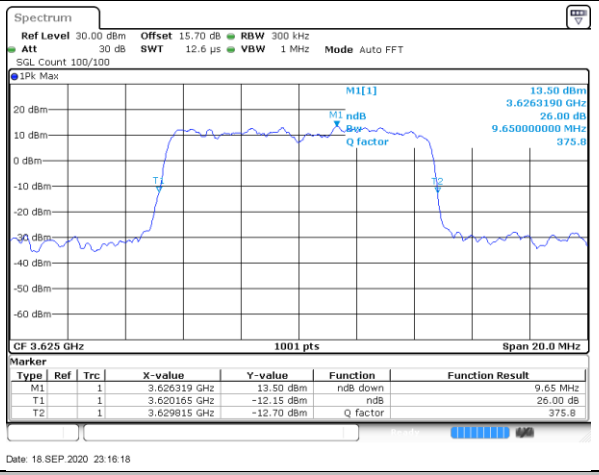
Lowest Channel / 10MHz / 16QAM



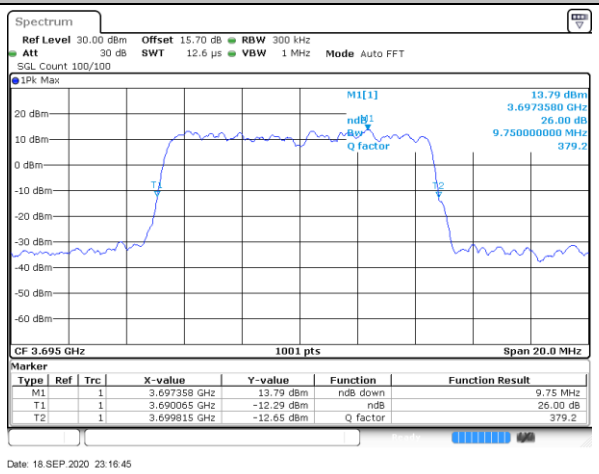
Middle Channel / 10MHz / QPSK



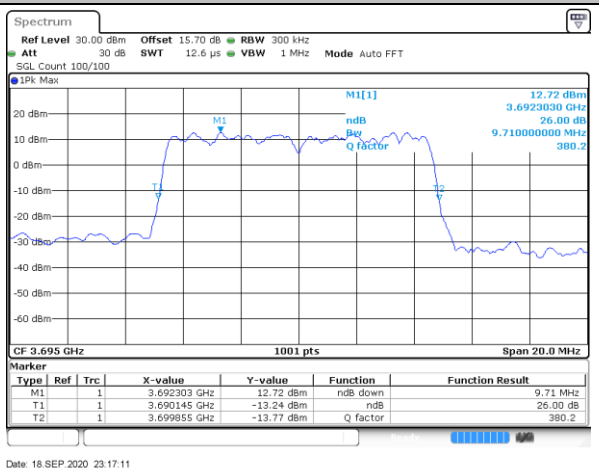
Middle Channel / 10MHz / 16QAM



Highest Channel / 10MHz / QPSK

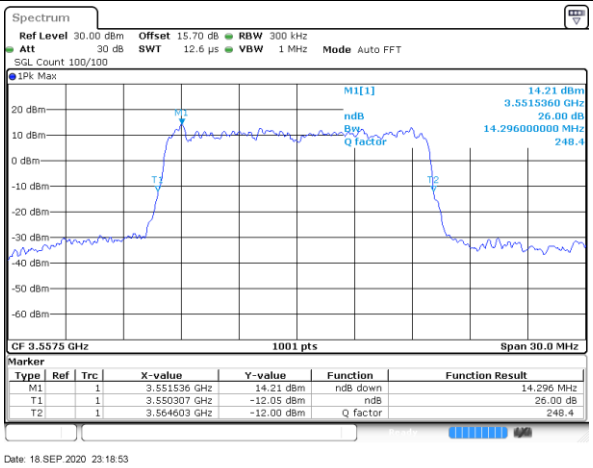


Highest Channel / 10MHz / 16QAM

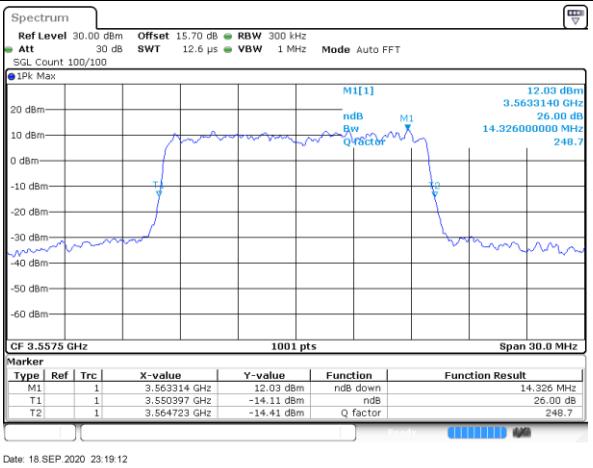


LTE Band 48

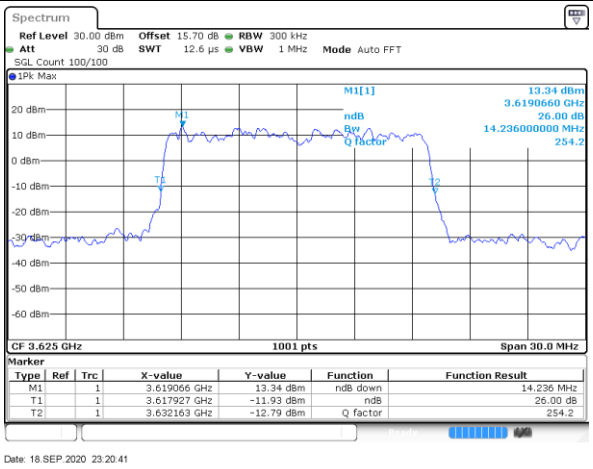
Lowest Channel / 15MHz / QPSK



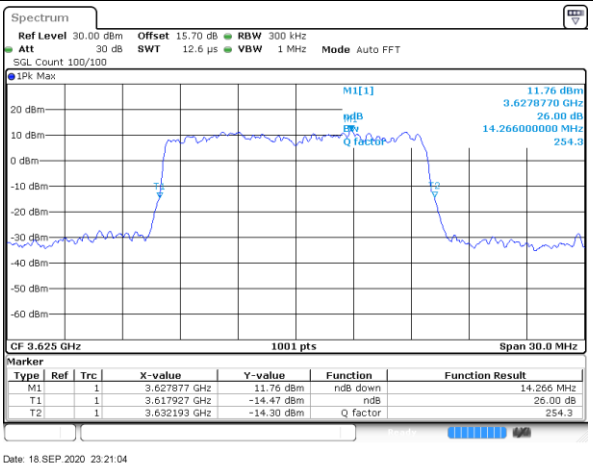
Lowest Channel / 15MHz / 16QAM



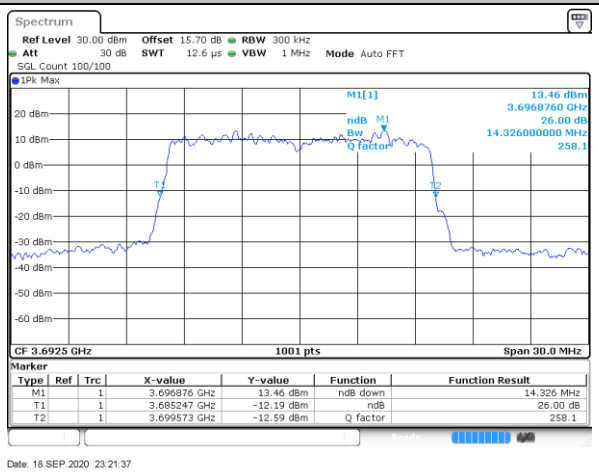
Middle Channel / 15MHz / QPSK



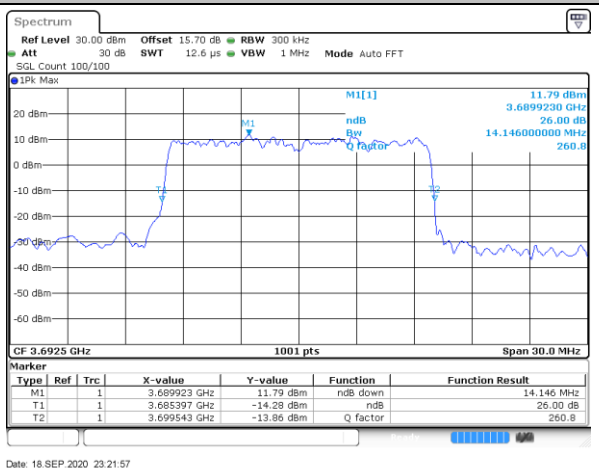
Middle Channel / 15MHz / 16QAM



Highest Channel / 15MHz / QPSK

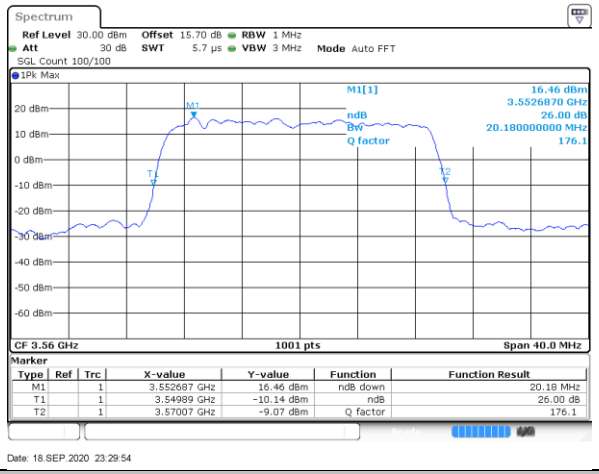


Highest Channel / 15MHz / 16QAM

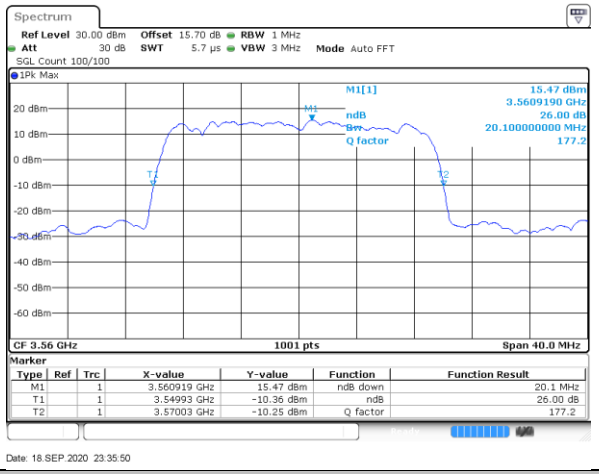


LTE Band 48

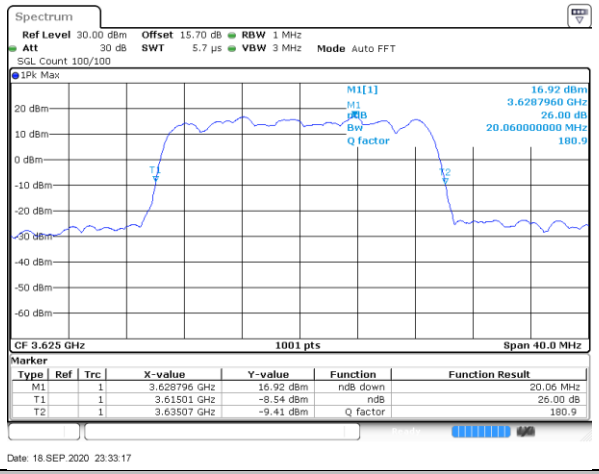
Lowest Channel / 20MHz / QPSK



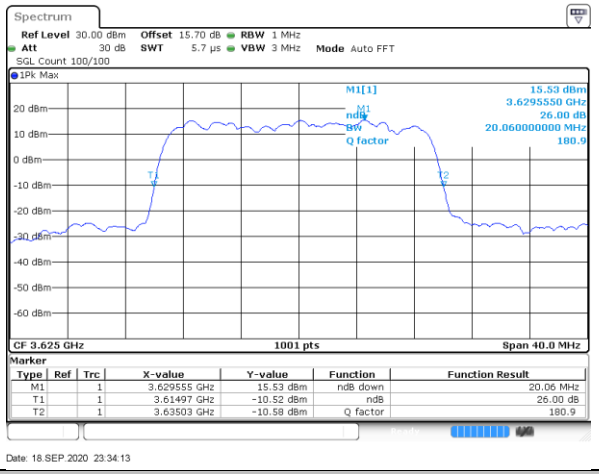
Lowest Channel / 20MHz / 16QAM



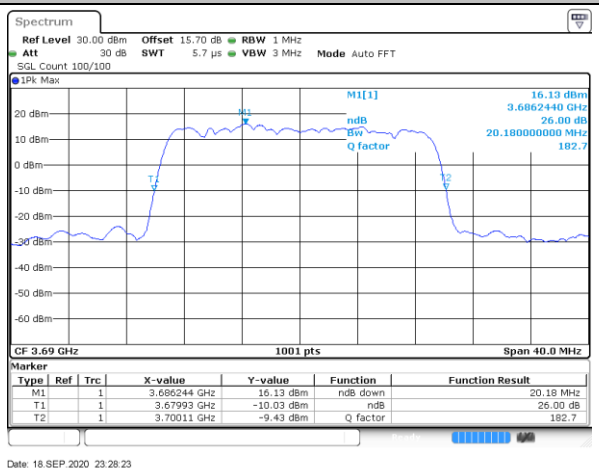
Middle Channel / 20MHz / QPSK



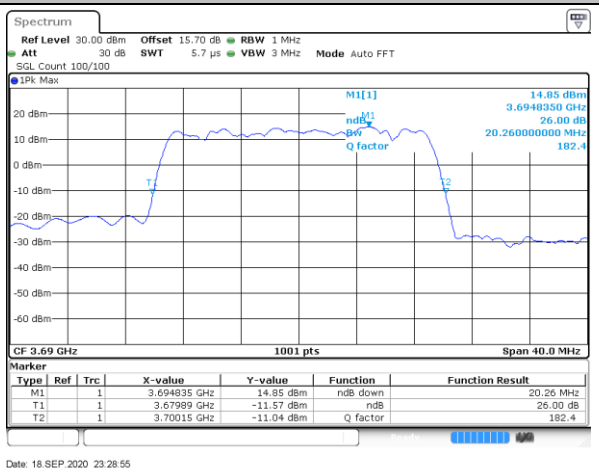
Middle Channel / 20MHz / 16QAM



Highest Channel / 20MHz / QPSK



Highest Channel / 20MHz / 16QAM

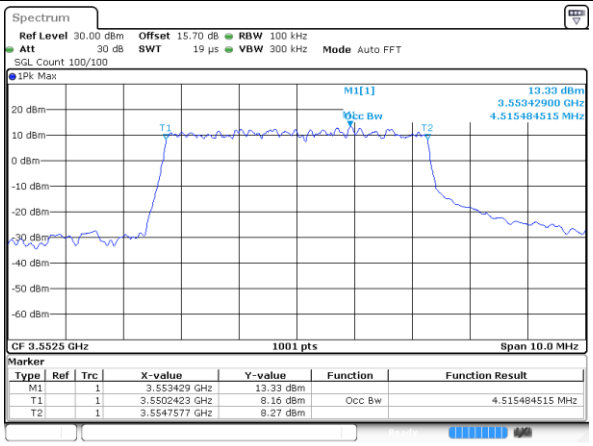


Occupied Bandwidth

Mode	LTE Band 48 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	4.52	4.51	9.01	9.03	13.46	13.37	18.46	18.58
Middle CH	-	-	-	-	4.50	4.50	9.09	8.97	13.40	13.49	18.42	18.30
Highest CH	-	-	-	-	4.50	4.50	9.09	9.01	13.40	13.43	18.38	18.42

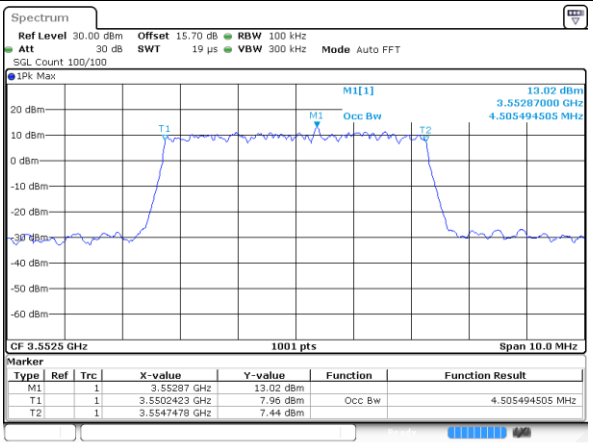
LTE Band 48

Lowest Channel / 5MHz / QPSK



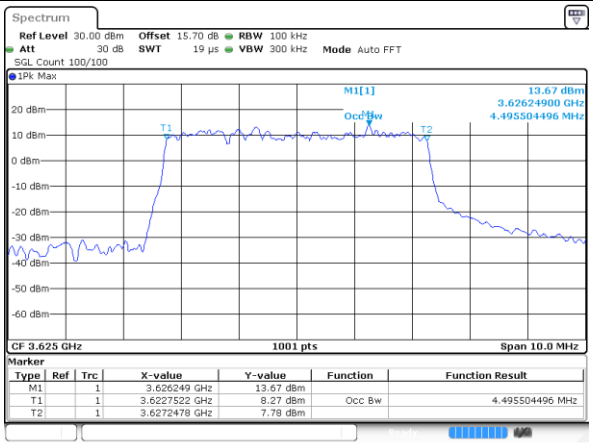
Date: 18.SEP.2020 23:10:43

Lowest Channel / 5MHz / 16QAM



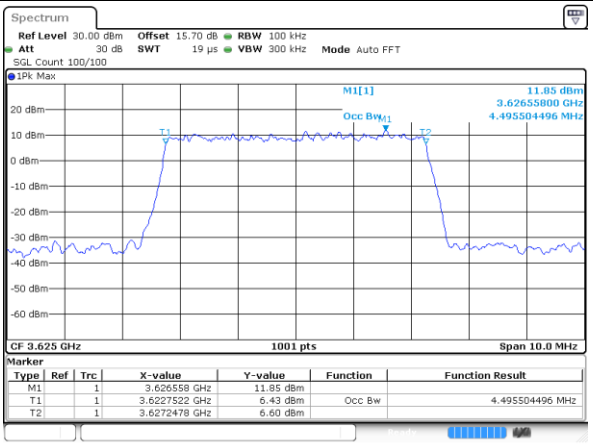
Date: 18.SEP.2020 23:11:05

Middle Channel / 5MHz / QPSK



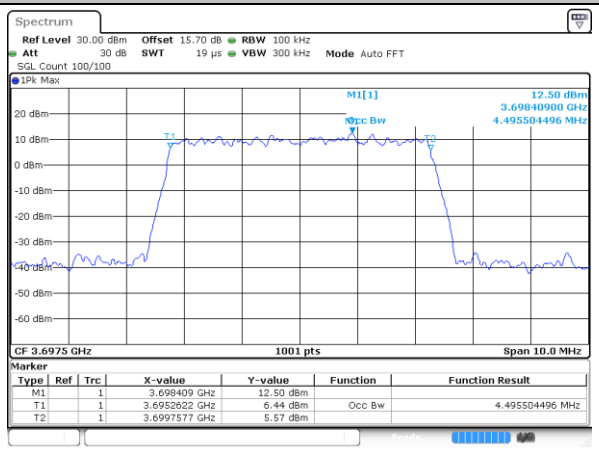
Date: 18.SEP.2020 23:11:33

Middle Channel / 5MHz / 16QAM



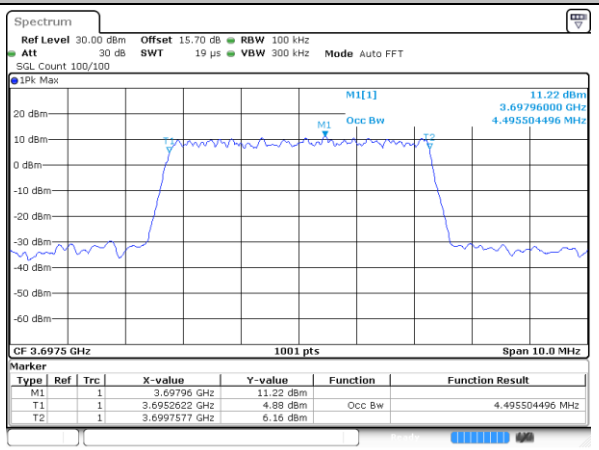
Date: 18.SEP.2020 23:12:21

Highest Channel / 5MHz / QPSK



Date: 18.SEP.2020 23:12:57

Highest Channel / 5MHz / 16QAM



Date: 18.SEP.2020 23:13:18