

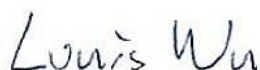


FCC RADIO TEST REPORT

FCC ID : 2ABZ2-EF136
Equipment : Smart Phone
Brand Name : ONEPLUS
Model Name : LE2117
Applicant : OnePlus Technology (Shenzhen) Co., Ltd.
18C02, 18C03, 18C04 and 18C05, Shum Yip
Terra Building, Binhe Avenue North, Futian
District, Shenzhen
Manufacturer : OnePlus Technology (Shenzhen) Co., Ltd.
18C02, 18C03, 18C04 and 18C05, Shum Yip
Terra Building, Binhe Avenue North, Futian
District, Shenzhen
Standard : FCC 47 CFR Part 2, Part 27(D)

The product was received on Dec. 15, 2020 and testing was started from Dec. 20, 2020 and completed on Jan. 05, 2021. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The test results in this partial report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Louis Wu

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



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Appendix A. Test Results of Conducted and EIRPTest	



History of this test report

Report No.	Version	Description	Issued Date
FG002626-02C	01	Initial issue of report	Feb. 04, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power and Effective Isotropic Radiated Power	Reporting only	-
3.3	-	Peak-to-Average Ratio	Reporting only	-
3.4	§2.1049	Occupied Bandwidth	Reporting only	-
3.5	§2.1051 §27.53 (a)(4)	Conducted Band Edge Measurement	Pass	-
3.6	§2.1051 §27.53 (a)(4)	Conducted Spurious Emission	Pass	-
3.7	§2.1055 §27.54	Frequency Stability Temperature & Voltage	Pass	-

Declaration of Conformity:

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

Comments and Explanations:

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

Reviewed by: Wii Chang

Report Producer: Tina Chuang

1 General Description

1.1 Product Feature of Equipment Under Test

GSM/CDMA/WCDMA/LTE/5G NR, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ac/ax, Wi-Fi 5GHz 802.11a/n/ac/ax, NFC, GNSS, ANT+, and WPC/WPT

Product Specification subjective to this standard	
Antenna Type	WWAN: <Down Antenna>: Coupling type (LDS) Antenna <Upper Antenna>: Coupling type (LDS) Antenna Bluetooth: PIFA Antenna WLAN: <Ant. 4>: PIFA Antenna <Ant. 6>: PIFA Antenna NFC: Loop Antenna BDS/Galileo/GLONASS/GPS/SBAS: PIFA Antenna ANT+: PIFA Antenna WPC/WPT: Loop Antenna
Antenna Gain	<Upper Antenna>: -3.0 dBi <Down Antenna >: -2.0 dBi

1.2 Modification of EUT

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



1.3 Testing Site

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No. TH05-HY
Test Engineer	Bryant Liu
Temperature	22~24°C
Relative Humidity	55~56%

FCC Designation No. TW1190

1.4 Applied Standards

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

- ♦ ANSI C63.26-2015
- ♦ FCC 47 CFR Part 2, Part 27(D)
- ♦ ANSI / TIA-603-E
- ♦ FCC KDB 971168 Power Meas License Digital Systems D01 v03r01
- ♦ 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.
3. The TAF code is not including all the FCC KDB listed without accreditation.

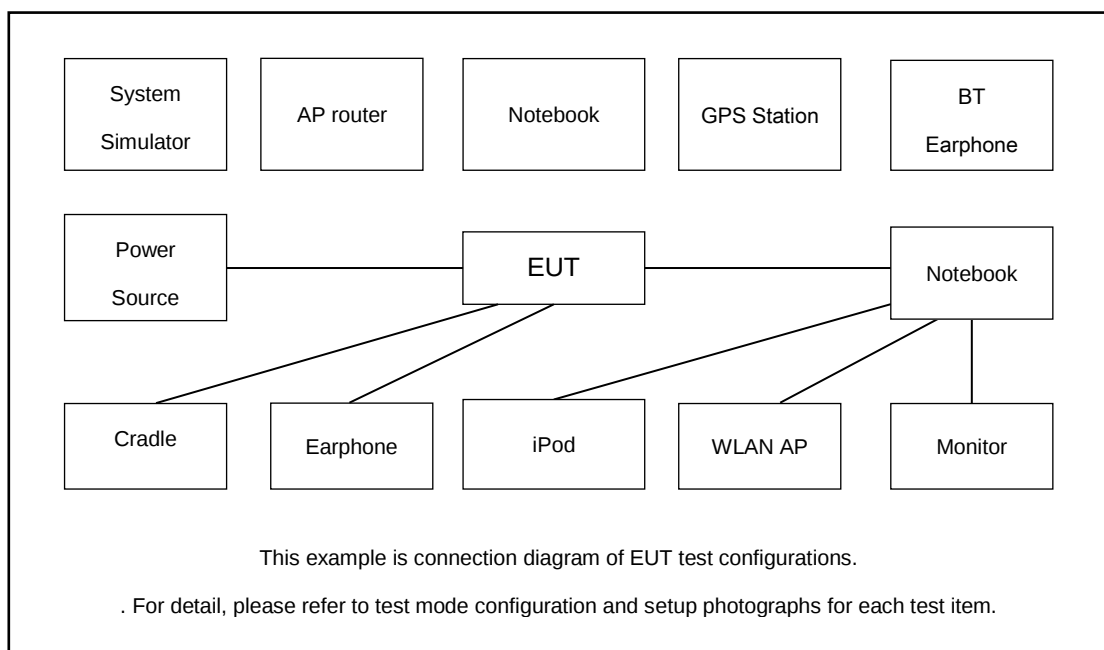
2 Test Configuration of Equipment Under Test

2.1 Test Mode

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

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	30	-	-	v	v	-	-	v	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	30	-	-	v	v	-	-	v	v	v	v		v	v	v	v
26dB and 99% Bandwidth	30	-	-	v	v	-	-	v	v	v			v	v	v	v
Conducted Band Edge	30	-	-	v	v	-	-	v	v	v	v		v	v		v
Conducted Spurious Emission	30	-	-	v	v	-	-	v	v	v	v			v	v	v
Frequency Stability	30	-	-	v	v	-	-	v	v	v			v		v	
Remark	1. The mark "v " means that this configuration is chosen for testing 2. The mark "- " means that this bandwidth is not supported. 3. All test items were performed with Down Antenna.															

2.2 Connection Diagram of Test System



2.3 Measurement Results Explanation Example

For all conducted test items:

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

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

Offset = RF cable loss + attenuator factor.

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

Example :

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

$$= 4.2 + 10 = 14.2 \text{ (dB)}$$

2.4 Frequency List of Low/Middle/High Channels

LTE Band 30 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	-	27710	-
	Frequency	-	2310	-
5	Channel	27685	27710	27735
	Frequency	2307.5	2310	2312.5

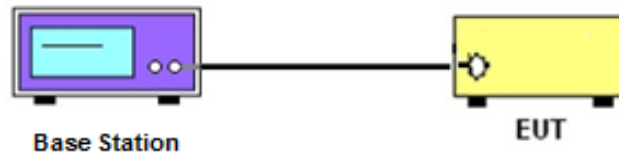
3 Conducted Test Items

3.1 Measuring Instruments

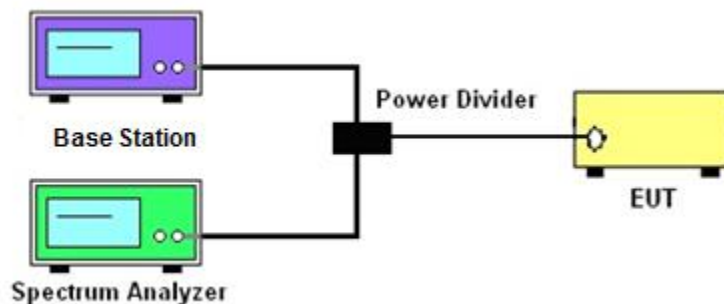
See list of measuring instruments of this test report.

3.1.1 Test Setup

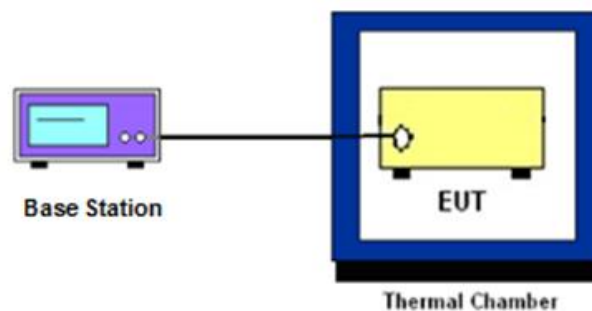
3.1.2 Conducted Output Power



3.1.3 Peak-to-Average Ratio, Occupied Bandwidth, 26dB Bandwidth ,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 Measurement

3.2.1 Description of the Conducted Output Power Measurement

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

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

3.2.2 Test Procedures

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

3.3 Peak-to-Average Ratio

3.3.1 Description of the PAR Measurement

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

3.3.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.2.6

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

3.4 Occupied Bandwidth

3.4.1 Description of Occupied Bandwidth Measurement

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

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

3.4.2 Test Procedures

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

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

3.5 Conducted Band Edge

3.5.1 Description of Conducted Band Edge Measurement

27.53 (a)(4)

For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

- (i) By a factor of not less than: $43 + 10 \log (P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log (P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log (P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log (P)$ dB on all frequencies between 2328 and 2337 MHz.
- (ii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log (P)$ dB on all frequencies between 2296 and 2300 MHz, $61 + 10 \log (P)$ dB on all frequencies between 2292 and 2296 MHz, $67 + 10 \log (P)$ dB on all frequencies between 2288 and 2292 MHz, and $70 + 10 \log (P)$ dB below 2288 MHz.
- (iii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log (P)$ dB above 2365 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 $\geq 1\%$ 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. Set spectrum analyzer with RMS detector.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. Checked that all the results comply with the emission limit line.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

3.6 Conducted Spurious Emission

3.6.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $70 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 9 kHz up to a frequency including its 10th harmonic.

3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
The path loss was compensated to the results for each measurement.
3. The 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 derived from $70 + 10\log(P)$ dB below the transmitter power P(Watts)

3.7 Frequency Stability

3.7.1 Description of Frequency Stability Measurement

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

3.7.2 Test Procedures for Temperature Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.7.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

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



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Nov. 27, 2020	Dec. 20, 2020~ Jan. 05, 2021	Nov. 26, 2021	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SU-241	92003713	-30℃~95℃	May 15, 2020	Dec. 20, 2020~ Jan. 05, 2021	May 14, 2021	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890089	1V~20V 0.5A~5A	Feb. 21, 2020	Dec. 20, 2020~ Jan. 05, 2021	Feb. 20, 2021	Conducted (TH05-HY)
Coupler	Warison	20dB 25W SMA Directional Coupler	#A	1-18GHz	Jan. 13, 2020	Dec. 20, 2020~ Jan. 05, 2021	Jan. 12, 2021	Conducted (TH05-HY)



Appendix A. Test Results of Conducted and EIRP Test

Conducted Output Power(Average power and EIRP)

<Down Antenna>

LTE Band 30 Maximum Average Power [dBm] (GT - LC = -2 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
10	1	0	QPSK		24.08		22.08	0.1614
10	1	25			23.83			
10	1	49			24.01			
10	25	0			23.01			
10	25	12			22.99			
10	25	25			23.03			
10	50	0			21.00			
10	1	0	16-QAM		23.24		21.24	0.1330
10	1	25			23.10			
10	1	49			23.17			
10	25	0			21.98			
10	25	12			22.10			
10	25	25			22.13			
10	50	0			20.99			
10	1	0	64-QAM		22.16		20.16	0.1038
10	1	25			21.93			
10	1	49			22.09			
10	25	0			20.91			
10	25	12			20.77			
10	25	25			20.46			
10	50	0			20.64			
10	1	0	256-QAM		19.03		17.11	0.0514
10	1	25			19.11			
10	1	49			19.05			
10	25	0			18.93			
10	25	12			19.05			
10	25	25			19.08			
10	50	0			19.02			



LTE Band 30 Maximum Average Power [dBm] (GT - LC = -2 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
5	1	0	QPSK	23.82	23.77	23.72	21.98	0.1578
5	1	12		23.92	23.86	23.91		
5	1	24		23.91	23.98	23.90		
5	12	0		22.95	22.90	22.94		
5	12	7		23.05	23.01	22.99		
5	12	13		23.03	22.98	23.04		
5	25	0		22.48	22.52	22.44		
5	1	0	16-QAM	23.02	22.91	22.99	21.29	0.1346
5	1	12		23.23	23.08	23.18		
5	1	24		23.19	23.16	23.29		
5	12	0		21.96	21.91	21.94		
5	12	7		22.05	22.06	22.09		
5	12	13		22.04	22.07	22.13		
5	25	0		22.04	22.01	22.05		
5	1	0	64-QAM	22.04	21.74	21.34	20.10	0.1023
5	1	12		22.10	21.70	21.68		
5	1	24		22.08	21.69	21.82		
5	12	0		21.03	20.84	20.40		
5	12	7		21.08	20.66	20.43		
5	12	13		21.04	20.48	20.43		
5	25	0		21.05	20.60	20.35		
5	1	0	256-QAM	19.03	19.05	19.07	17.84	0.0608
5	1	12		19.12	19.12	19.11		
5	1	24		19.10	19.13	19.20		
5	12	0		18.91	19.84	18.96		
5	12	7		19.03	19.04	19.07		
5	12	13		19.04	19.06	19.04		
5	25	0		19.01	19.00	19.03		



<Upper Antenna>

LTE Band 30 Maximum Average Power [dBm] (GT - LC = -3 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
10	1	0	QPSK	-	23.58	-	20.73	0.1183
10	1	25			23.73			
10	1	49			23.67			
10	25	0			22.68			
10	25	12			22.84			
10	25	25			22.77			
10	50	0			20.84			
10	1	0	16-QAM		23.03	-	20.06	0.1014
10	1	25			23.02			
10	1	49			23.06			
10	25	0			21.80			
10	25	12			21.83			
10	25	25			21.85			
10	50	0			20.81			
10	1	0	64-QAM		21.91		19.09	0.0811
10	1	25			21.88			
10	1	49			22.09			
10	25	0			20.76			
10	25	12			20.89			
10	25	25			20.80			
10	50	0			20.85			
10	1	0	256-QAM		18.78		15.85	0.0385
10	1	25			18.81			
10	1	49			18.85			
10	25	0			18.68			
10	25	12			18.74			
10	25	25			18.81			
10	50	0			18.75			



LTE Band 30 Maximum Average Power [dBm] (GT - LC = -3 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
5	1	0	QPSK	23.60	23.59	23.68	20.80	0.1202
5	1	12		23.80	23.75	23.74		
5	1	24		23.72	23.75	23.75		
5	12	0		22.69	22.70	22.72		
5	12	7		22.83	22.79	22.86		
5	12	13		22.77	22.84	22.76		
5	25	0		22.29	22.30	22.29		
5	1	0	16-QAM	22.87	22.88	23.03	20.05	0.1012
5	1	12		23.05	22.95	22.98		
5	1	24		22.88	23.03	23.05		
5	12	0		21.69	21.75	21.71		
5	12	7		21.86	21.89	21.81		
5	12	13		21.81	21.78	21.81		
5	25	0		21.80	21.74	21.84		
5	1	0	64-QAM	21.84	21.83	21.69	19.04	0.0802
5	1	12		21.83	21.84	21.77		
5	1	24		22.04	21.89	21.94		
5	12	0		20.70	20.71	20.78		
5	12	7		20.88	20.82	20.82		
5	12	13		20.86	20.85	20.75		
5	25	0		20.87	20.81	20.64		
5	1	0	256-QAM	18.74	18.81	18.77	15.95	0.0394
5	1	12		18.91	18.90	18.92		
5	1	24		18.85	18.95	18.95		
5	12	0		18.71	18.68	18.71		
5	12	7		18.80	18.84	18.83		
5	12	13		18.77	18.81	18.77		
5	25	0		18.79	18.76	18.80		



LTE Band 30

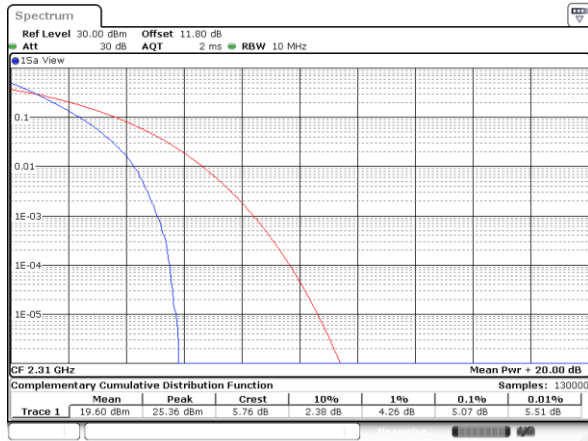
Peak-to-Average Ratio

Mode	LTE Band 30 / 10MHz				
Mod.	QPSK	16QAM	64QAM	256QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Full RB	Result
Middle CH	5.07	5.86	6.46	6.49	PASS



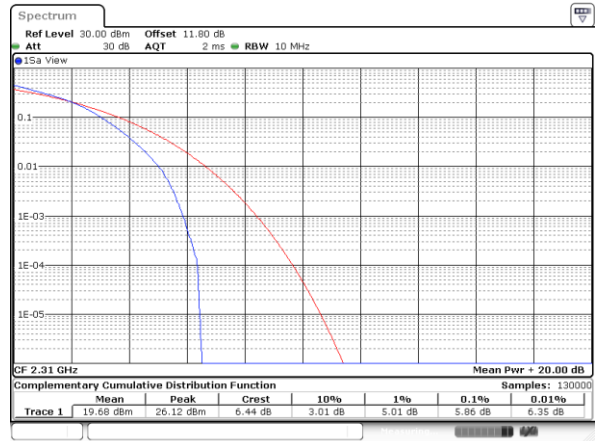
LTE Band 30 / 10MHz / QPSK

Middle Channel / Full RB



LTE Band 30 / 10MHz / 16QAM

Middle Channel / Full RB



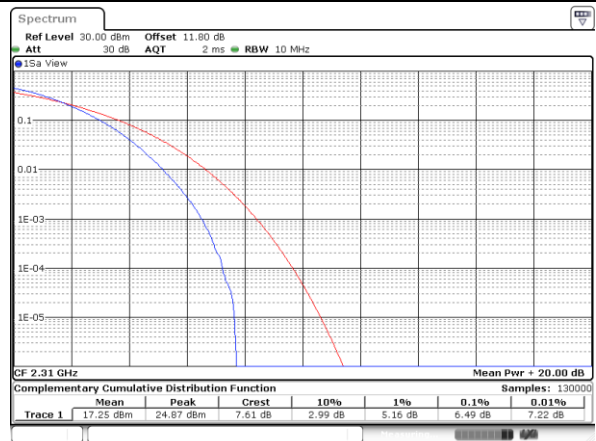
LTE Band 30 / 10MHz / 64QAM

Middle Channel / Full RB



LTE Band 30 / 10MHz / 256QAM

Middle Channel / Full RB



**EIRP Power Density**

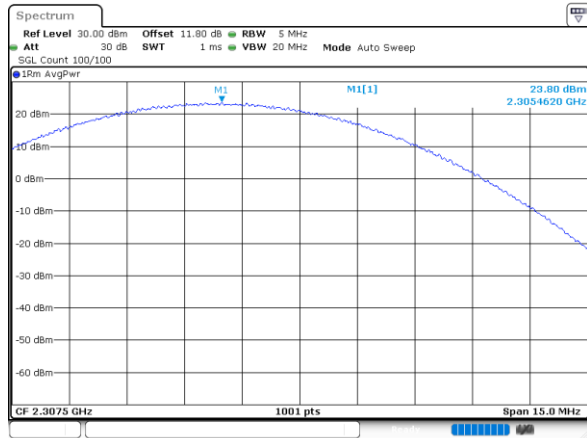
Mode	LTE Band 30 : Conducted Power Density (dBm/5MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	23.80	22.55	-	-	-	-	-	-
Middle CH	-	-	-	-	23.21	22.51	23.50	22.87	-	-	-	-
Highest CH	-	-	-	-	23.05	22.41	-	-	-	-	-	-
Mode	LTE Band 30 : Conducted Power Density (dBm/5MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM
Lowest CH	-	-	-	-	21.09	18.39	-	-	-	-	-	-
Middle CH	-	-	-	-	20.76	18.72	22.02	18.30	-	-	-	-
Highest CH	-	-	-	-	20.70	18.79	-	-	-	-	-	-

Mode	LTE Band 30 : EIRP Power Density (dBm/5MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	21.80	20.55			-	-	-	-
Middle CH	-	-	-	-	21.21	20.51	21.50	20.87	-	-	-	-
Highest CH	-	-	-	-	21.05	20.41			-	-	-	-
Mode	LTE Band 30 : EIRP Power Density (dBm/5MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM
Lowest CH	-	-	-	-	19.09	16.39	-	-	-	-	-	-
Middle CH	-	-	-	-	18.76	16.72	20.02	16.30-	-	-	-	-
Highest CH	-	-	-	-	18.70	16.79	-	-	-	-	-	-
Antenna Gain	-2 dBi											
Limit	250mW / 5MHz = 24dBm / 5MHz											
Result	Pass											



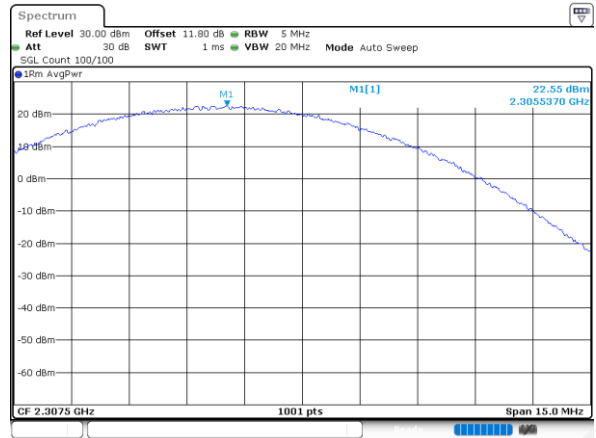
LTE Band 30 / 5MHz

Lowest Channel / 5MHz / 1RB0 / QPSK



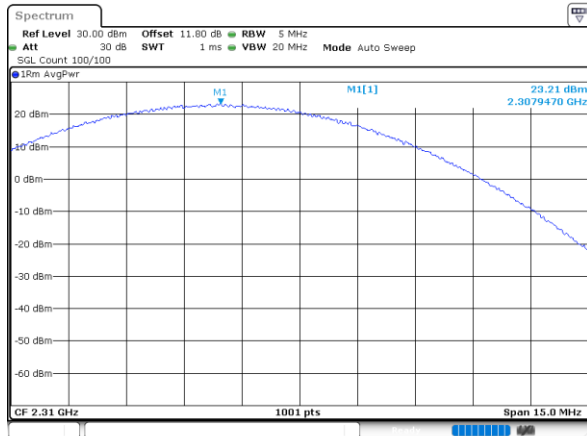
Date: 20, DEC, 2020 15:05:33

Lowest Channel / 5MHz / 1RB0 / 16QAM



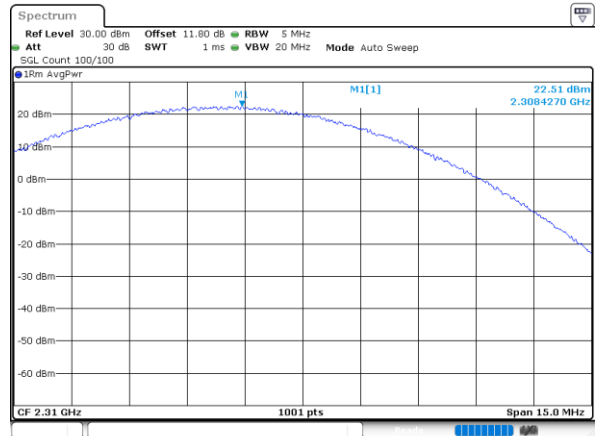
Date: 20, DEC, 2020 15:05:53

Middle Channel / 5MHz / 1RB0 / QPSK



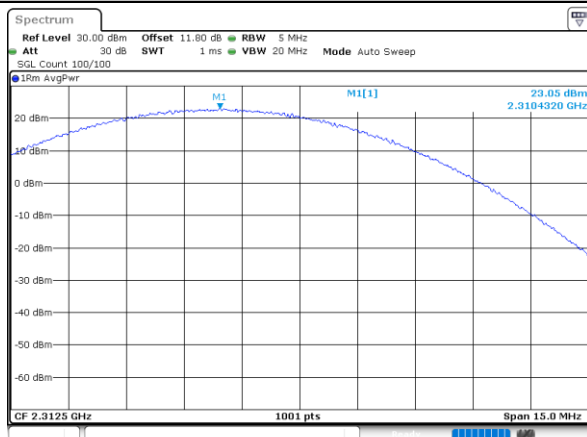
Date: 20, DEC, 2020 15:06:33

Middle Channel / 5MHz / 1RB0 / 16QAM



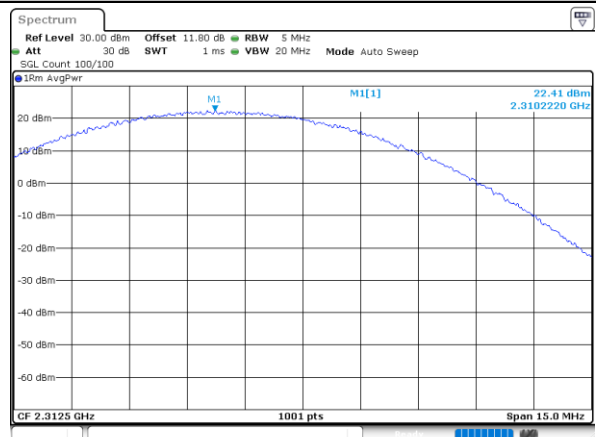
Date: 20, DEC, 2020 15:06:52

Highest Channel / 5MHz / 1RB0 / QPSK



Date: 20, DEC, 2020 15:07:32

Highest Channel / 5MHz / 1RB0 / 16QAM

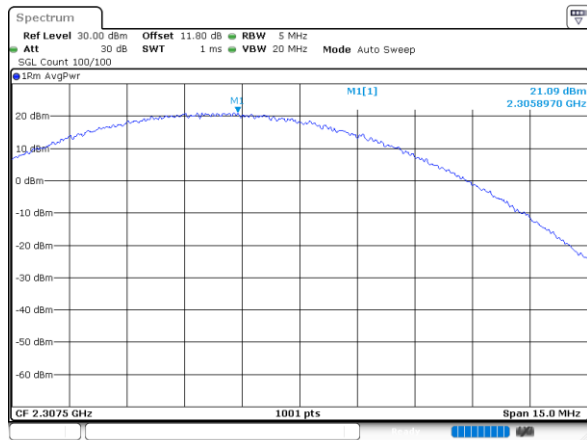


Date: 20, DEC, 2020 15:07:52



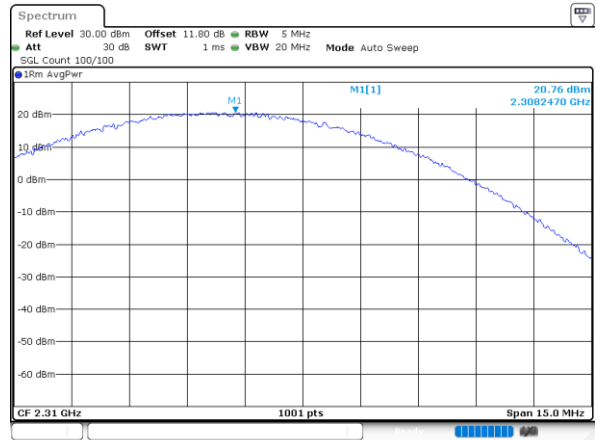
LTE Band 30 / 5MHz

Lowest Channel / 5MHz / 1RB0 / 64QAM



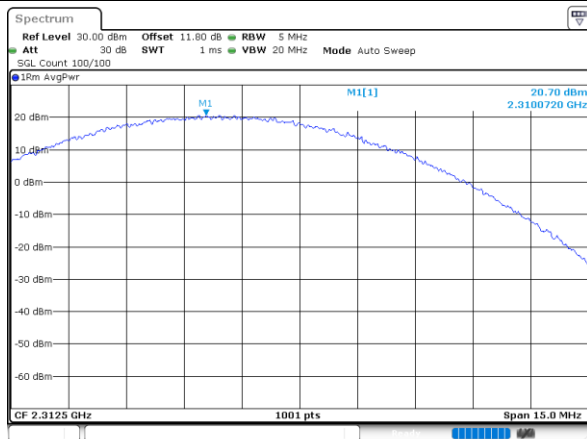
Date: 20, DEC, 2020 15:06:13

Middle Channel / 5MHz / 1RB0 / 64QAM



Date: 20, DEC, 2020 15:07:12

Highest Channel / 5MHz / 1RB0 / 64QAM

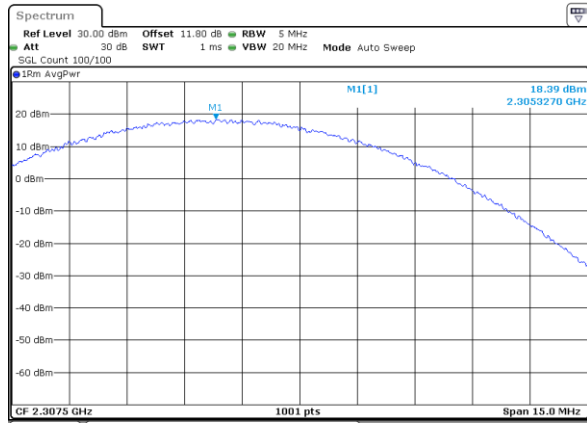


Date: 20, DEC, 2020 15:08:12



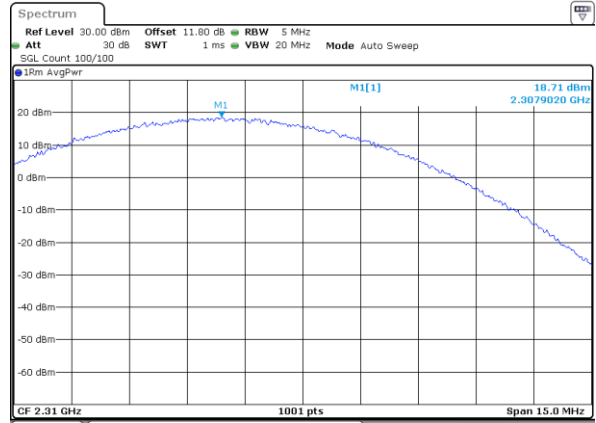
LTE Band 30 / 5MHz

Lowest Channel / 5MHz / 1RB0 / 256QAM



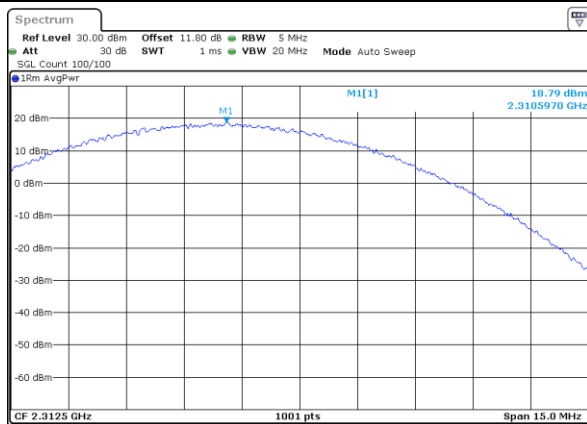
Date: 30, DEC, 2020 16:30:53

Middle Channel / 5MHz / 1RB0 / 256QAM



Date: 30, DEC, 2020 16:33:35

Highest Channel / 5MHz / 1RB0 / 256QAM

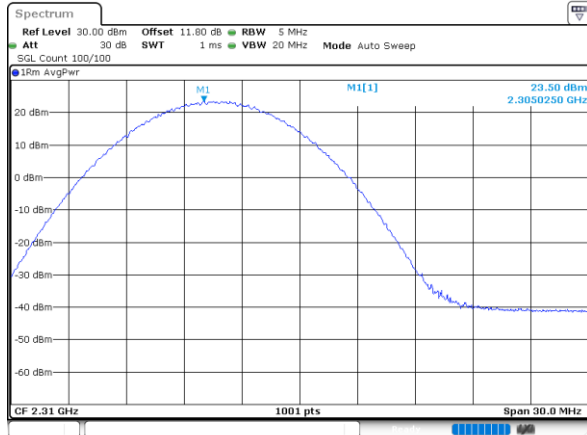


Date: 30, DEC, 2020 16:35:10

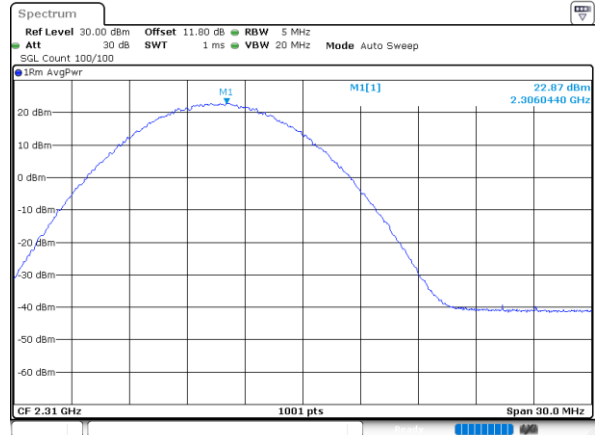


LTE Band 30 / 10MHz

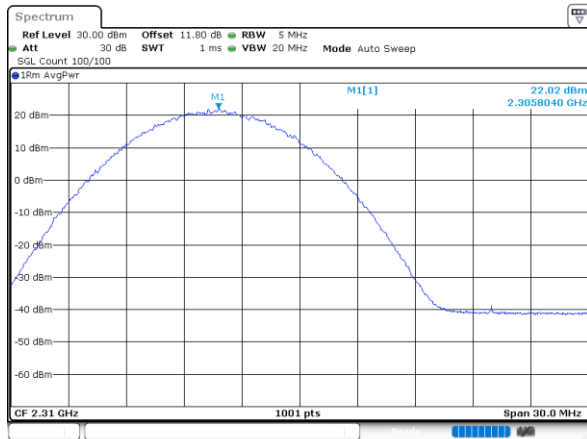
Lowest Channel / 10MHz / 1RB0 / QPSK



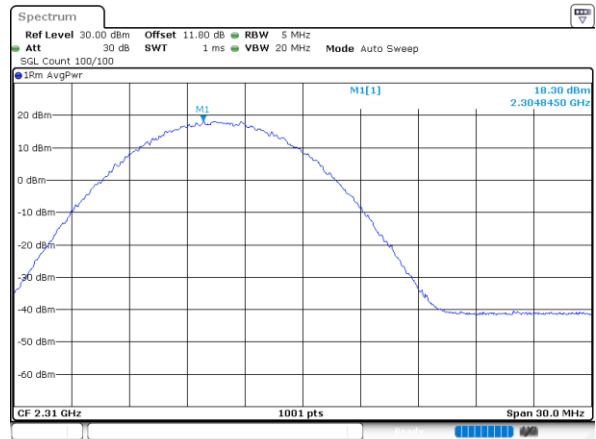
Lowest Channel / 10MHz / 1RB0 / 16QAM



Lowest Channel / 10MHz / 1RB0 / 64QAM



Lowest Channel / 10MHz / 1RB0 / 256QAM



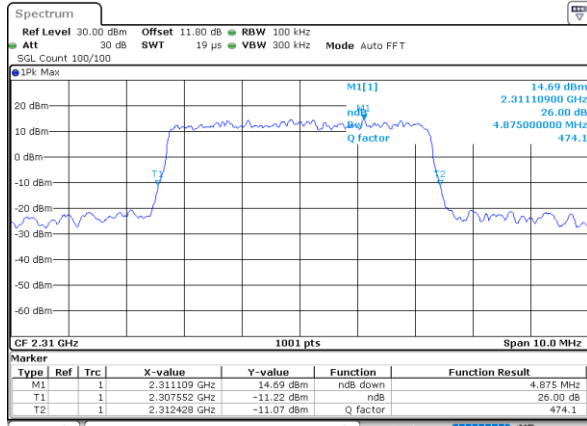
**26dB Bandwidth**

Mode	LTE Band 30 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	-	-	-	-	4.88	4.88	9.65	9.73	-	-	-	-
Mode	LTE Band 30 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM
Middle CH	-	-	-	-	4.93	4.92	9.75	9.75	-	-	-	-

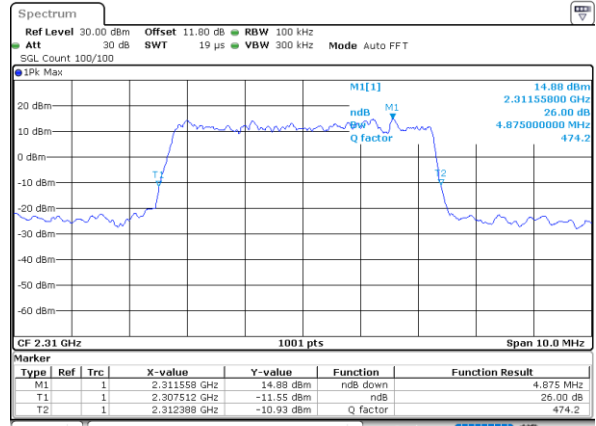


LTE Band 30

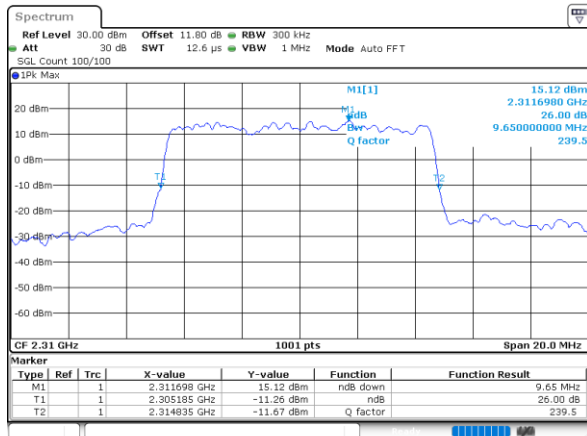
Middle Channel / 5MHz / QPSK



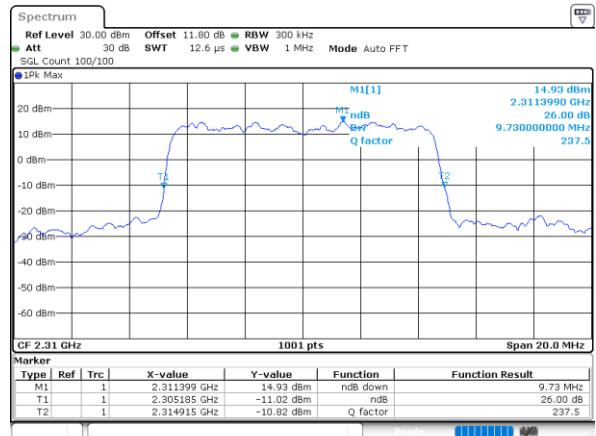
Middle Channel / 5MHz / 16QAM



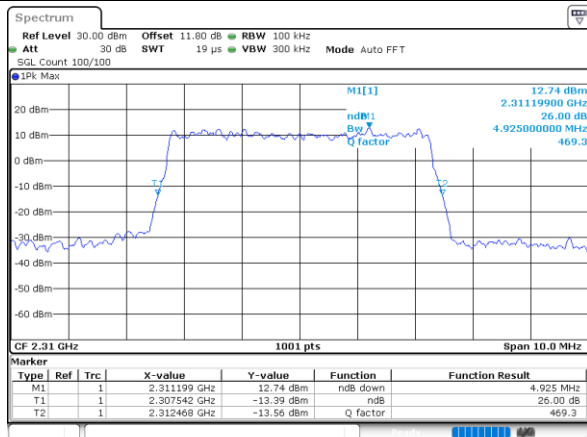
Middle Channel / 10MHz / QPSK



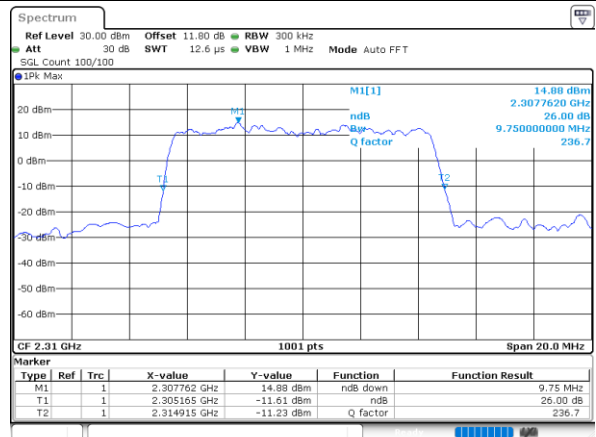
Middle Channel / 10MHz / 16QAM



Middle Channel / 5MHz / 64QAM



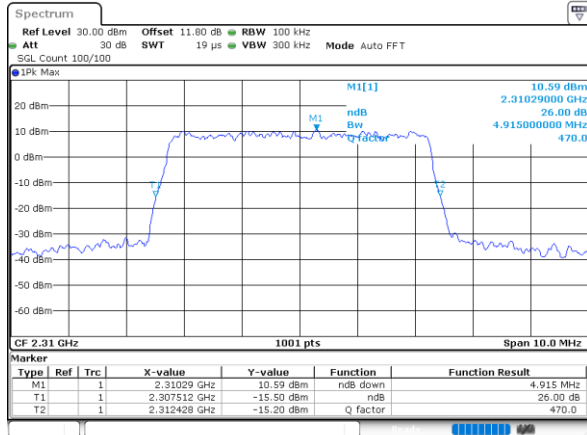
Middle Channel / 10MHz / 64QAM





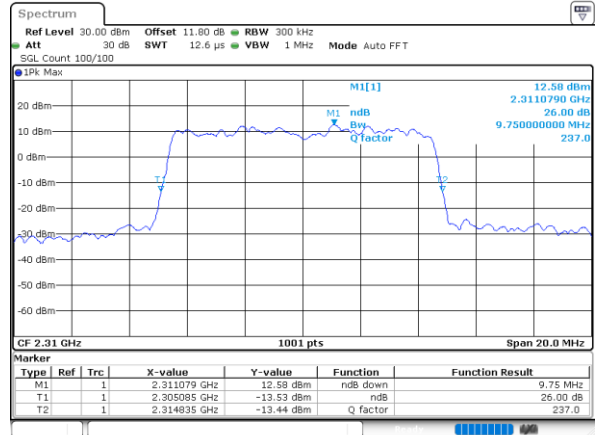
LTE Band 30

Middle Channel / 5MHz / 256QAM



Date: 30, DEC, 2020 16:32:41

Middle Channel / 10MHz / 256QAM



Date: 30, DEC, 2020 16:38:49

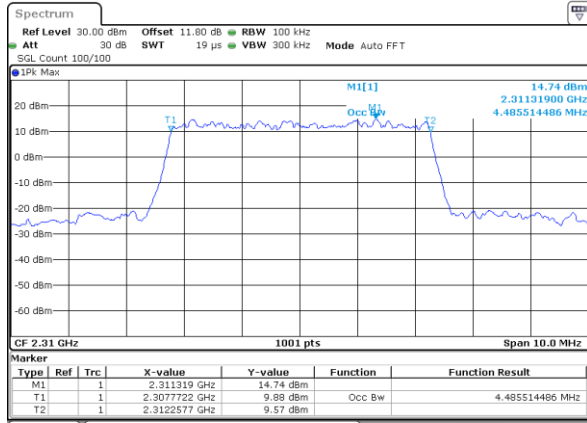
**Occupied Bandwidth**

Mode	LTE Band 30 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	-	-	-	-	4.49	4.51	8.95	9.01	-	-	-	-
Mode	LTE Band 30 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM
Middle CH	-	-	-	-	4.49	4.48	9.05	8.99	-	-	-	-



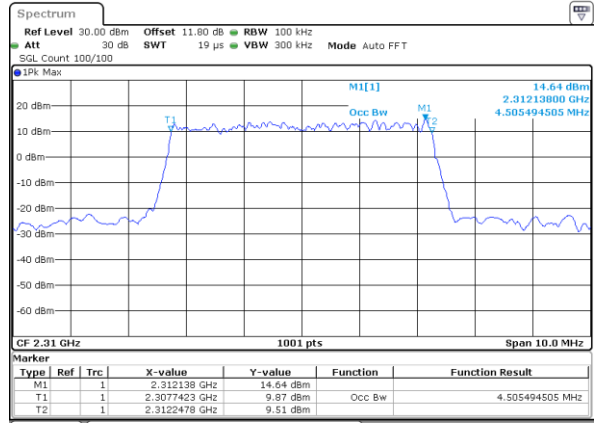
LTE Band 30

Middle Channel / 5MHz / QPSK



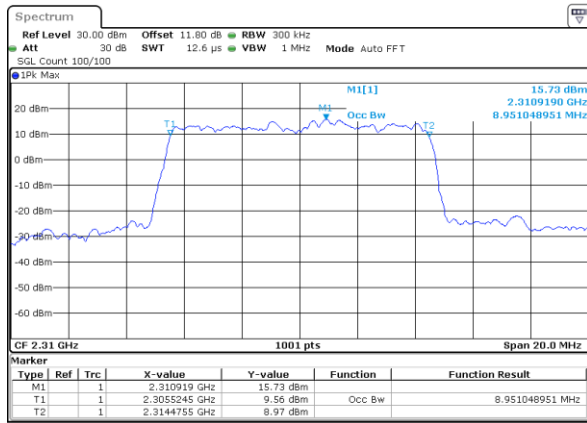
Date: 20, DEC, 2020 14:31:54

Middle Channel / 5MHz / 16QAM



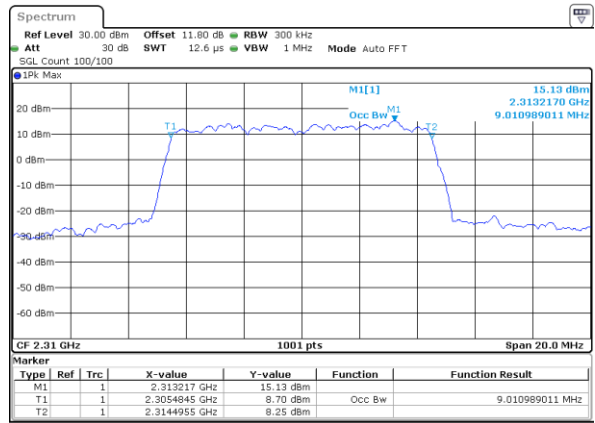
Date: 20, DEC, 2020 14:32:07

Middle Channel / 10MHz / QPSK



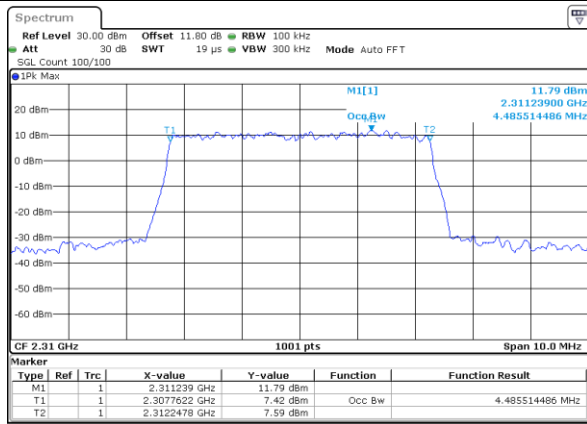
Date: 20, DEC, 2020 14:32:47

Middle Channel / 10MHz / 16QAM



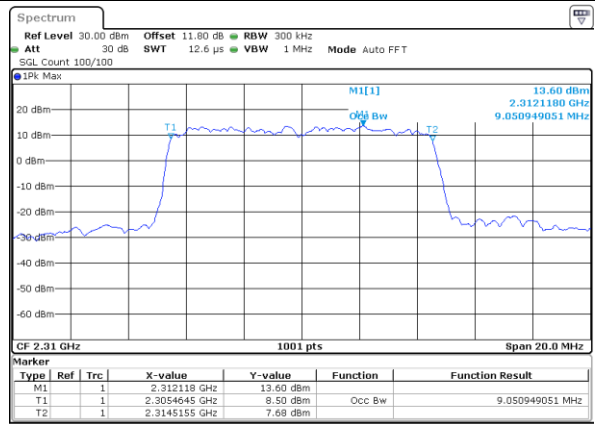
Date: 20, DEC, 2020 14:33:00

Middle Channel / 5MHz / 64QAM



Date: 20, DEC, 2020 14:33:40

Middle Channel / 10MHz / 64QAM

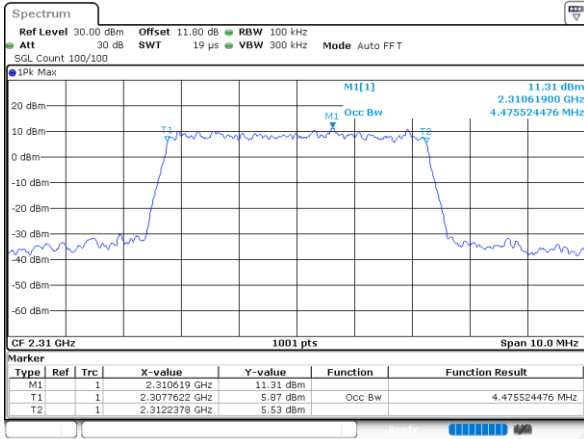


Date: 20, DEC, 2020 15:02:21



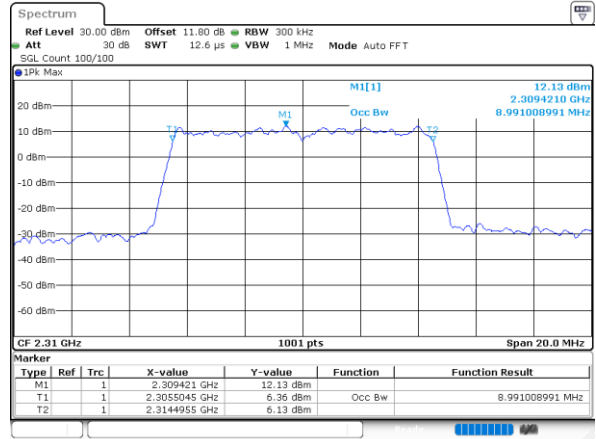
LTE Band 30

Middle Channel / 5MHz / 256QAM

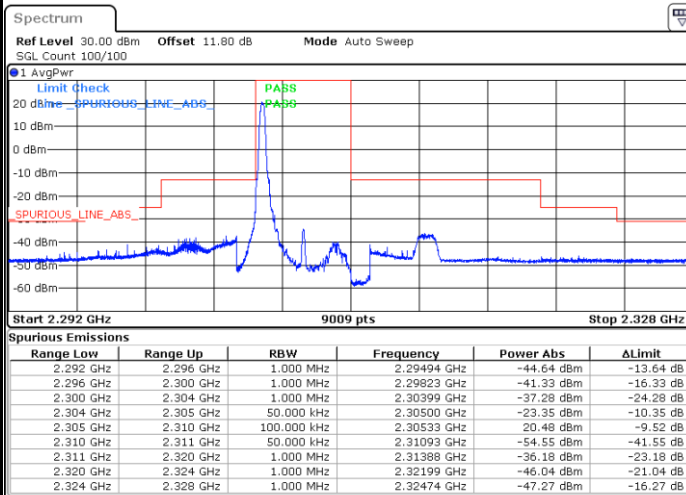
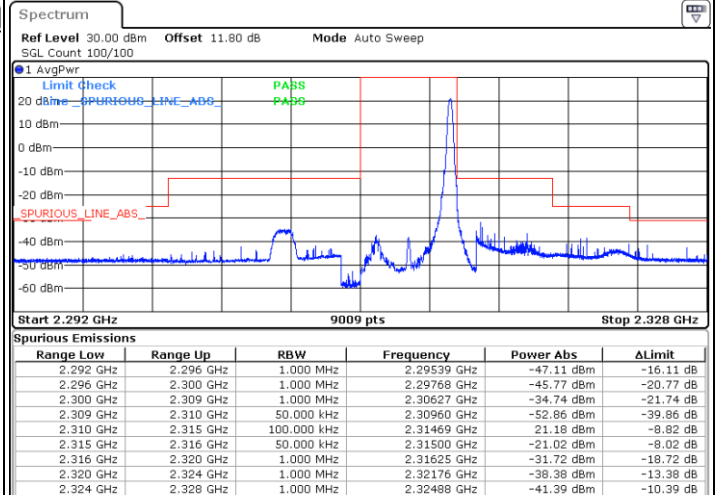
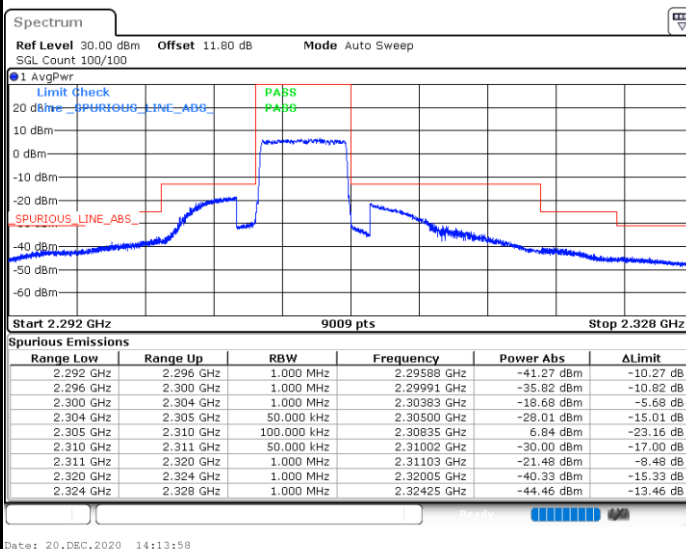
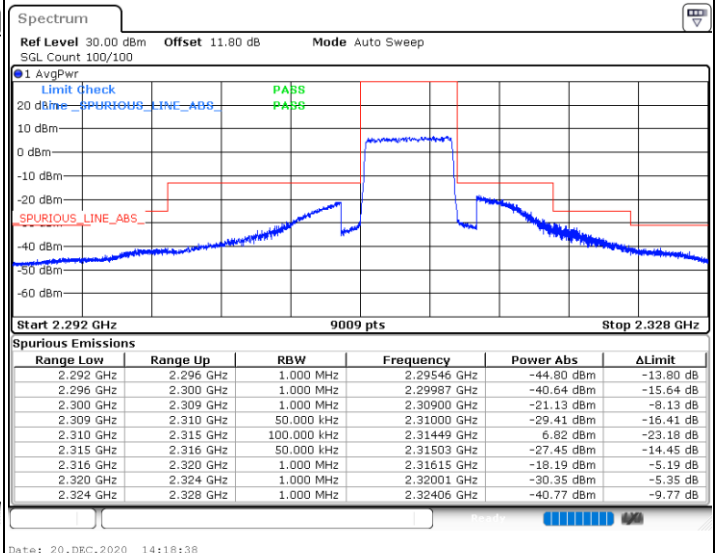


Date: 30, DEC, 2020 16:32:32

Middle Channel / 10MHz / 256QAM



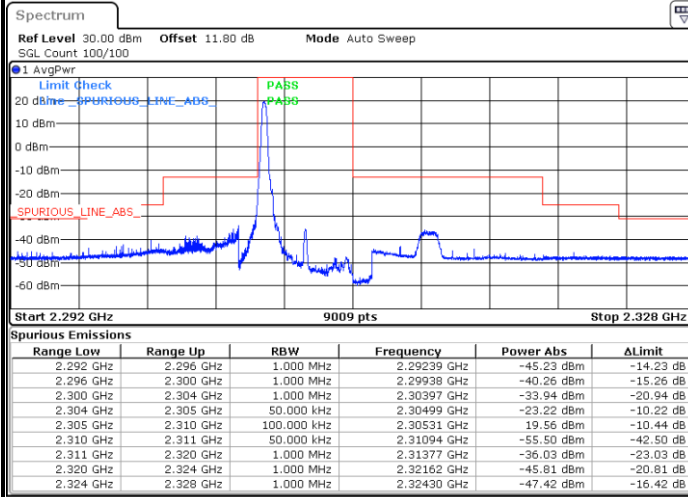
Date: 30, DEC, 2020 16:38:40

**Conducted Band Edge****LTE Band 30 / 5MHz / QPSK****Lowest Band Edge / 1 RB****Highest Band Edge / 1 RB****Lowest Band Edge / Full RB****Highest Band Edge / Full RB**



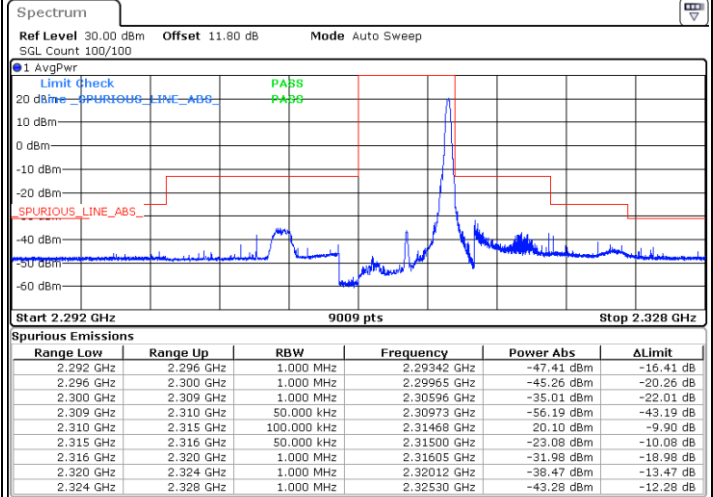
LTE Band 30 / 5MHz / 16QAM

Lowest Band Edge / 1 RB



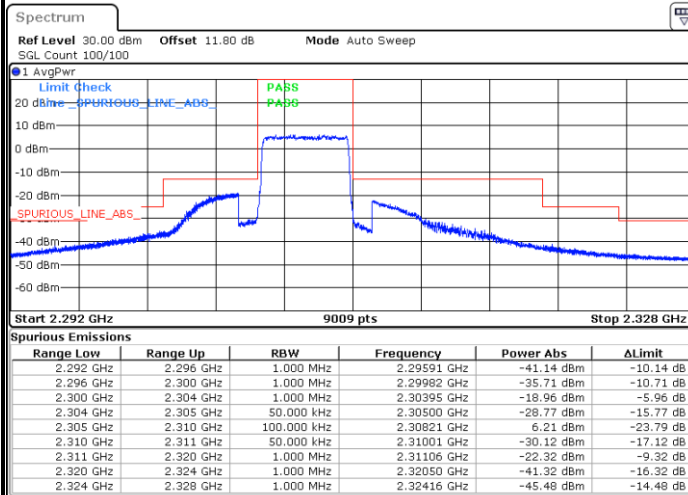
Date: 20.DEC.2020 14:12:25

Highest Band Edge / 1 RB



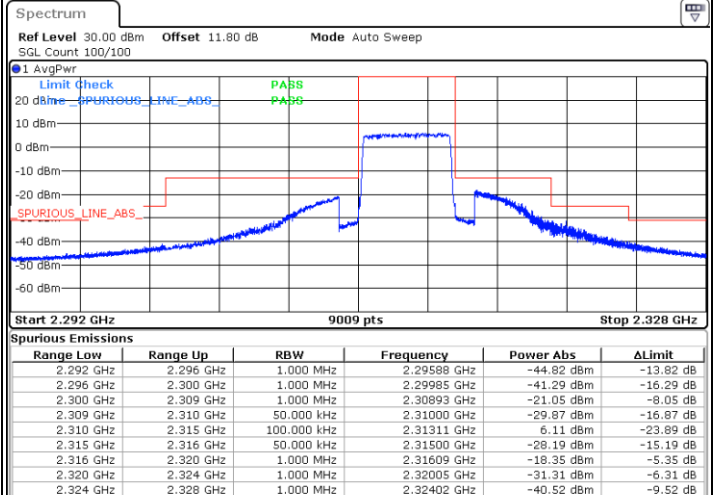
Date: 20.DEC.2020 14:17:05

Lowest Band Edge / Full RB



Date: 20.DEC.2020 14:14:45

Highest Band Edge / Full RB

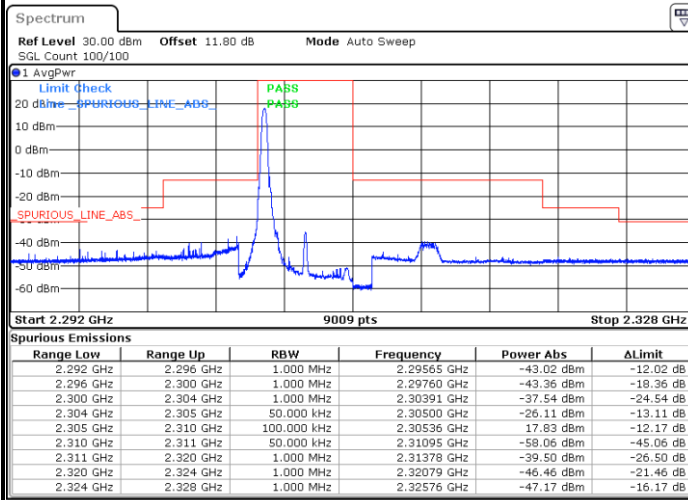


Date: 20.DEC.2020 14:19:25



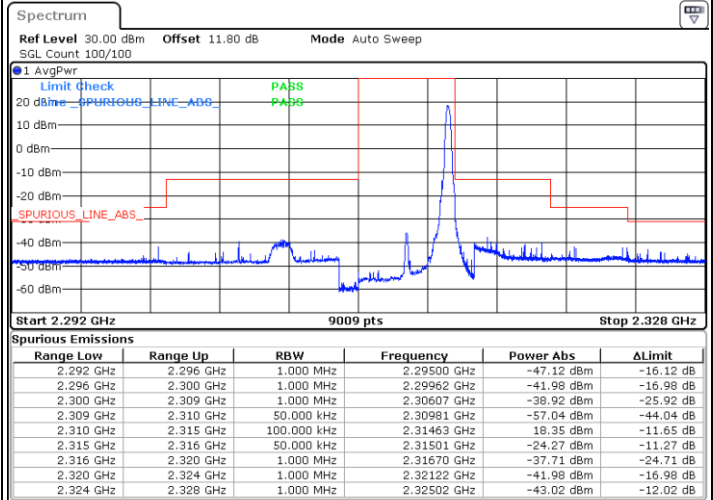
LTE Band 30 / 5MHz / 64QAM

Lowest Band Edge / 1 RB



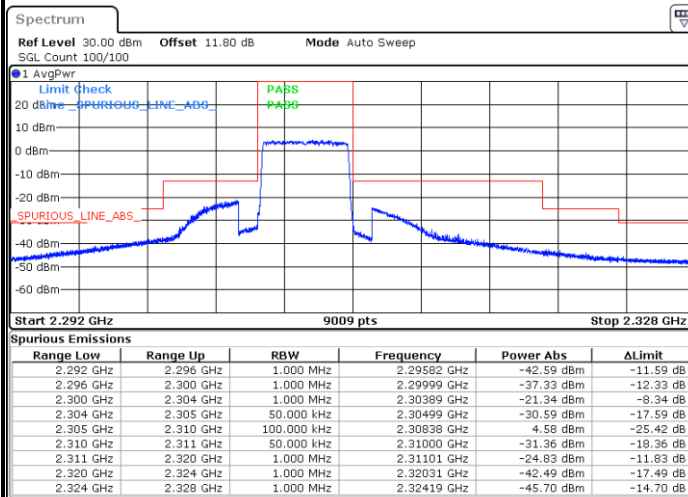
Date: 20.DEC.2020 14:13:12

Highest Band Edge / 1 RB



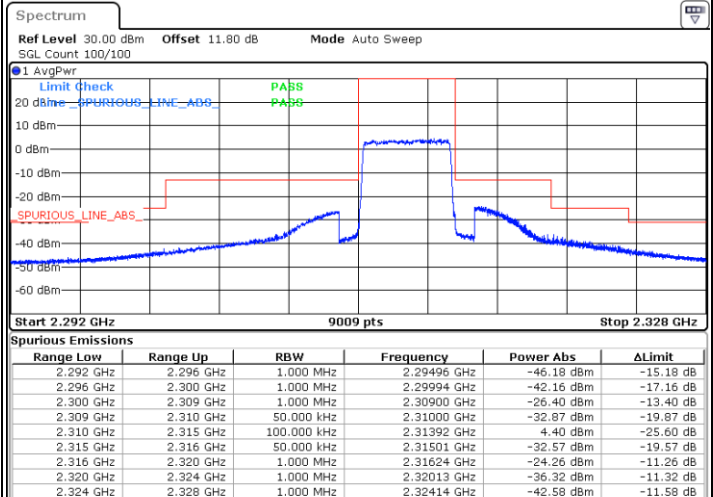
Date: 20.DEC.2020 14:17:52

Lowest Band Edge / Full RB



Date: 20.DEC.2020 14:15:32

Highest Band Edge / Full RB

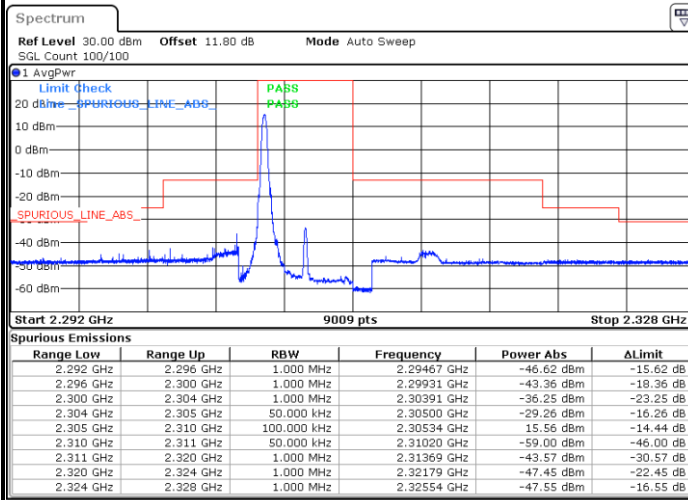


Date: 20.DEC.2020 14:20:12



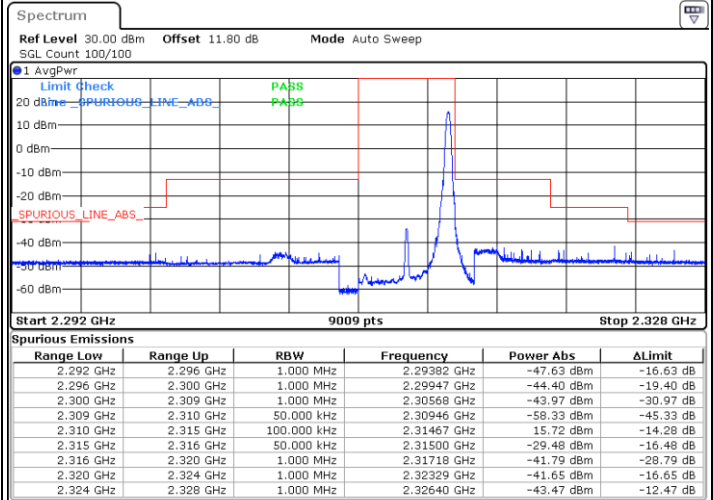
LTE Band 30 / 5MHz / 256QAM

Lowest Band Edge / 1 RB



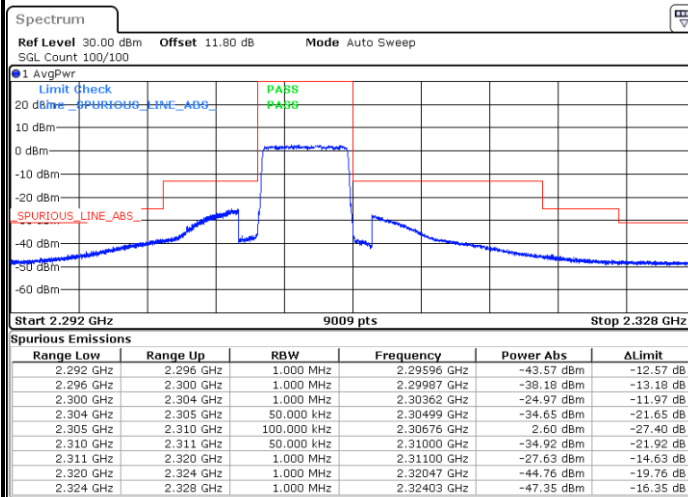
Date: 30.DEC.2020 16:30:34

Highest Band Edge / 1 RB



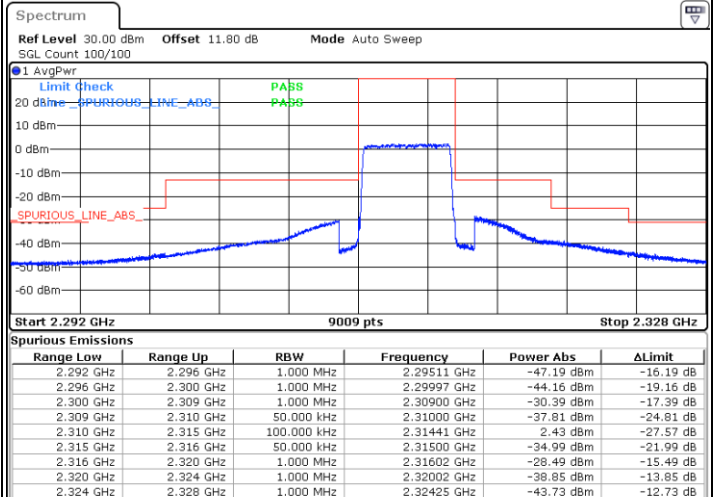
Date: 30.DEC.2020 16:35:47

Lowest Band Edge / Full RB



Date: 30.DEC.2020 16:31:20

Highest Band Edge / Full RB

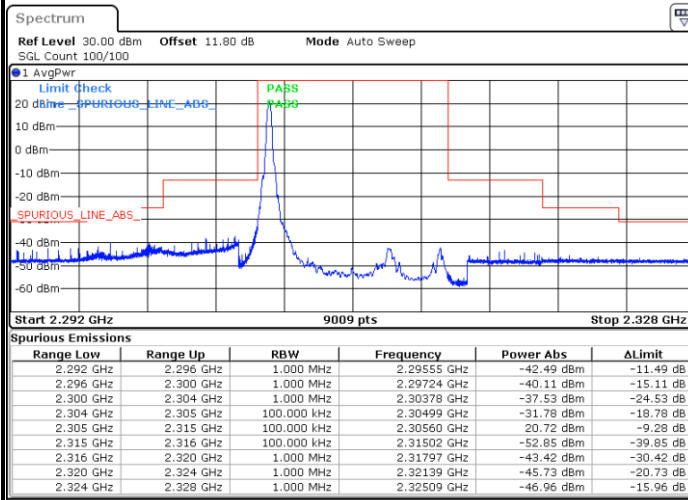


Date: 30.DEC.2020 16:34:30



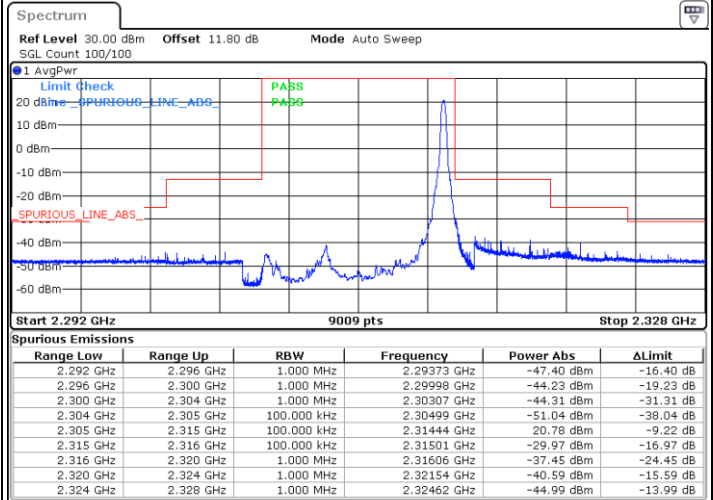
LTE Band 30 / 10MHz / QPSK

Lowest Band Edge / 1 RB



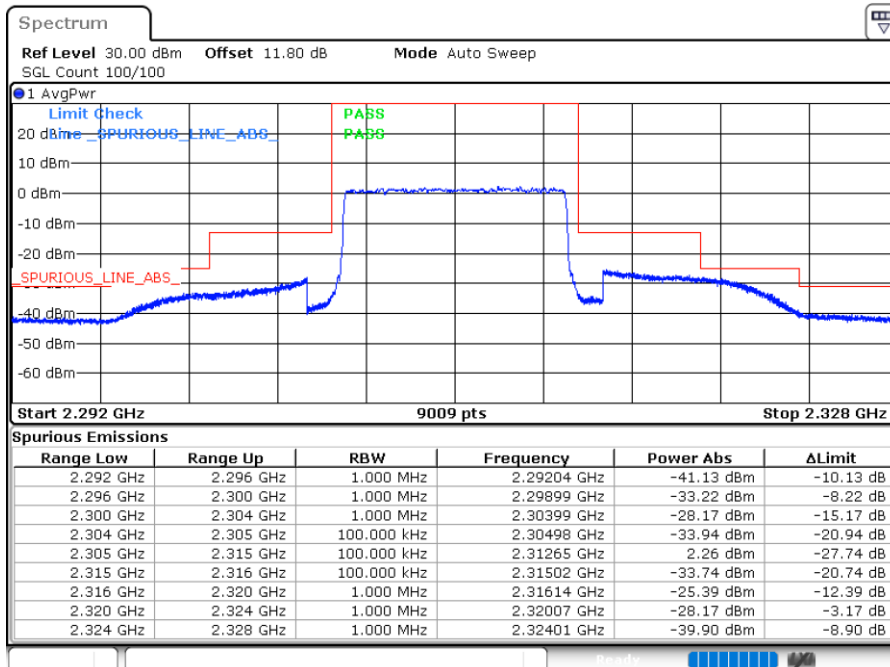
Date: 20.DEC.2020 14:21:00

Highest Band Edge / 1 RB



Date: 20.DEC.2020 14:23:18

Band Edge / Full RB

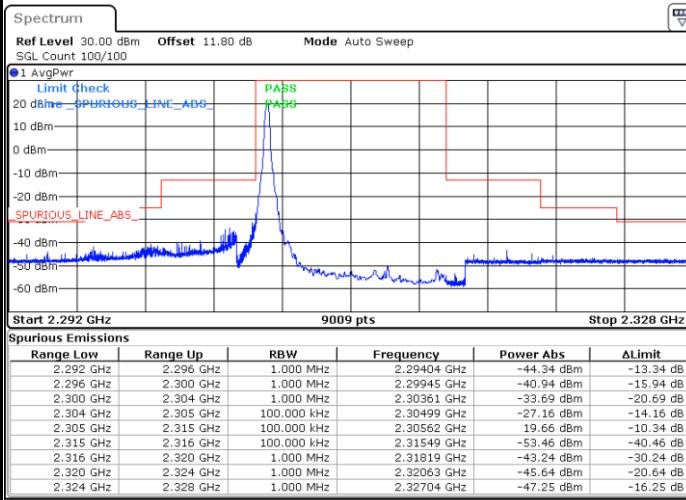


Date: 20.DEC.2020 15:14:53



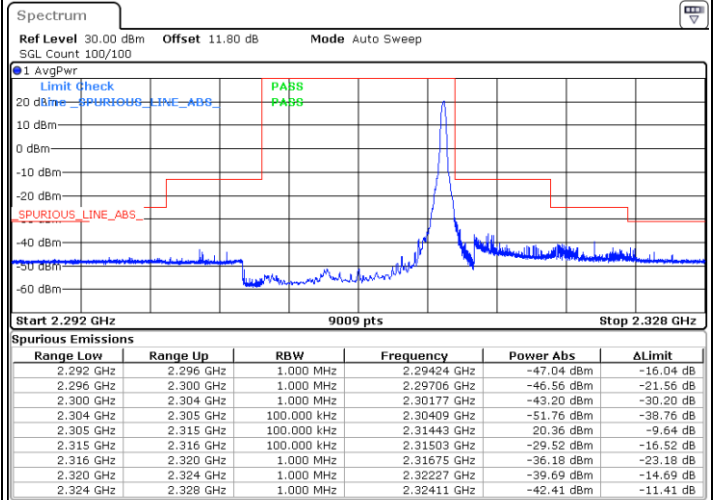
LTE Band 30 / 10MHz / 16QAM

Lowest Band Edge / 1 RB



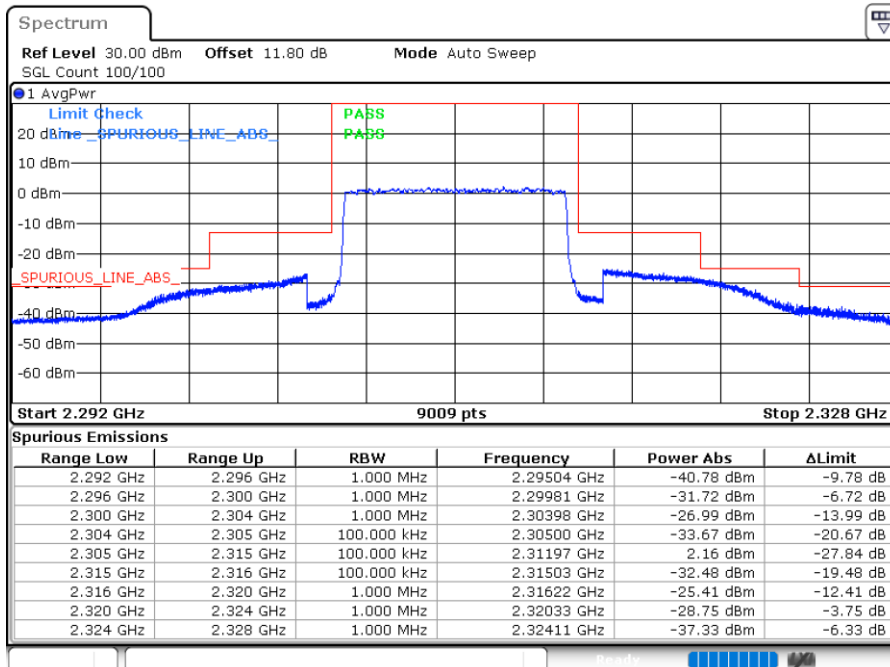
Date: 20.DEC.2020 14:21:46

Highest Band Edge / 1 RB



Date: 20.DEC.2020 14:24:04

Band Edge / Full RB

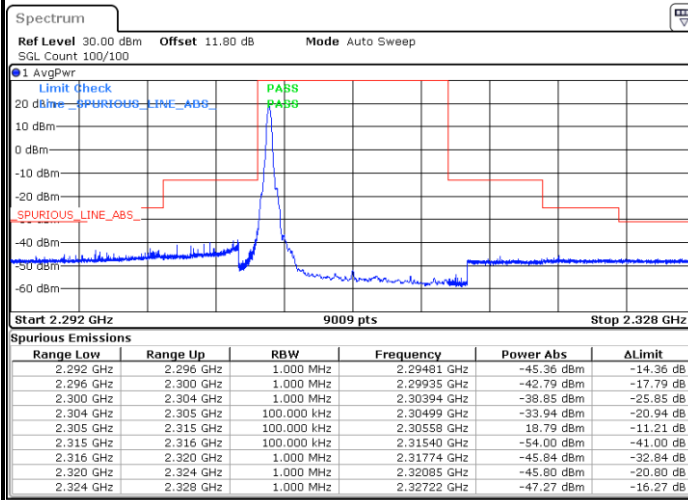


Date: 20.DEC.2020 14:26:22



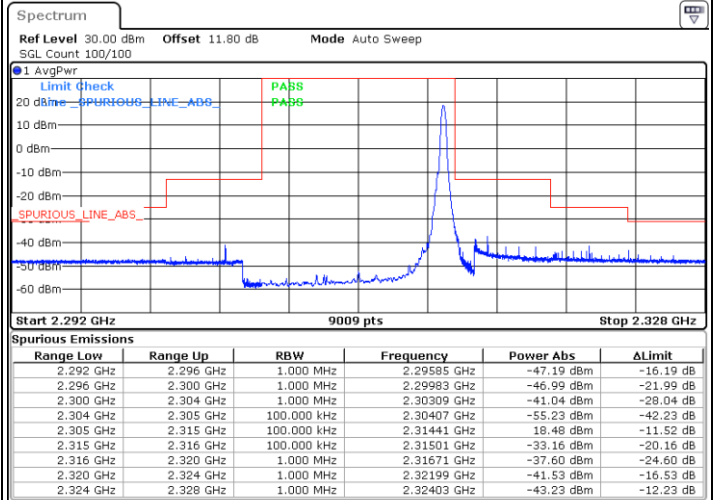
LTE Band 30 / 10MHz / 64QAM

Lowest Band Edge / 1 RB



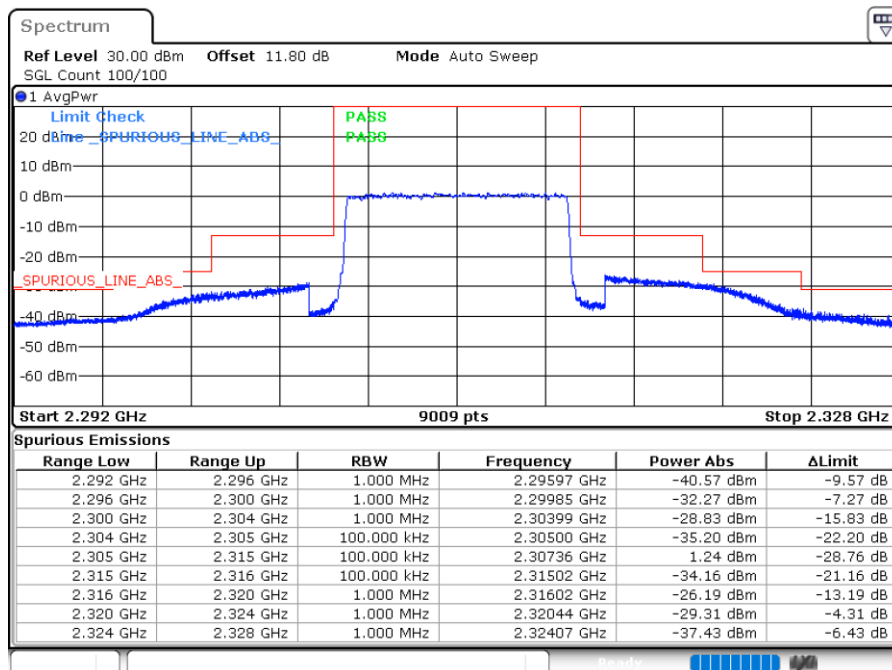
Date: 20.DEC.2020 14:22:32

Highest Band Edge / 1 RB



Date: 20.DEC.2020 14:24:50

Band Edge / Full RB

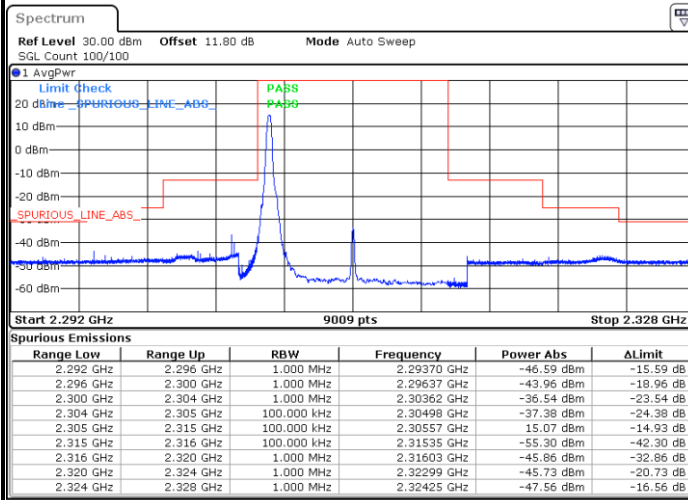


Date: 20.DEC.2020 14:27:08



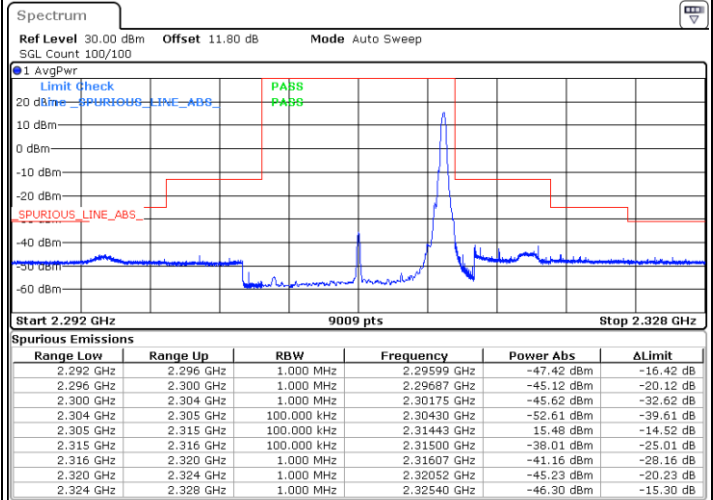
LTE Band 30 / 10MHz / 256QAM

Lowest Band Edge / 1 RB



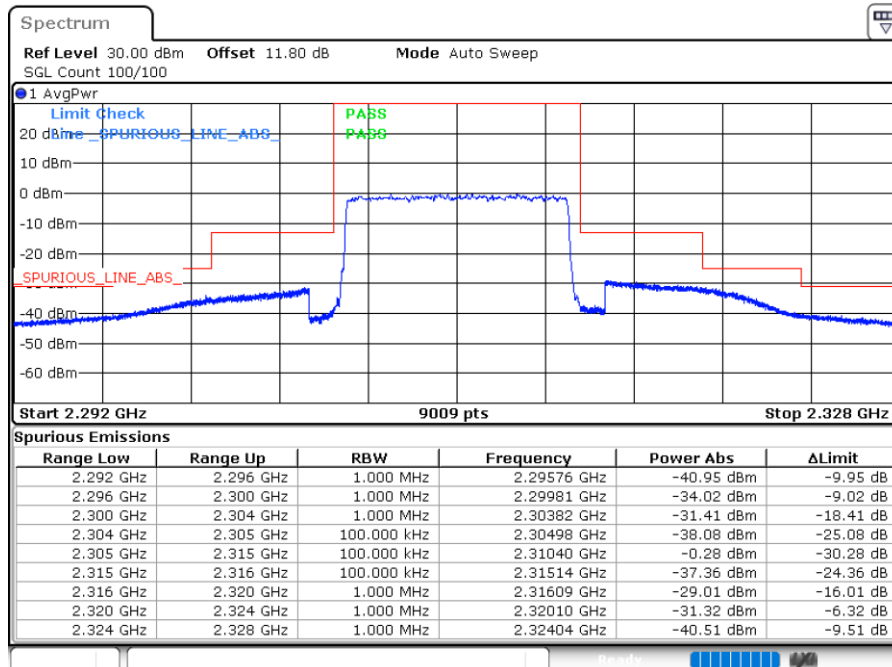
Date: 30.DEC.2020 16:39:47

Highest Band Edge / 1 RB



Date: 30.DEC.2020 16:40:28

Band Edge / Full RB



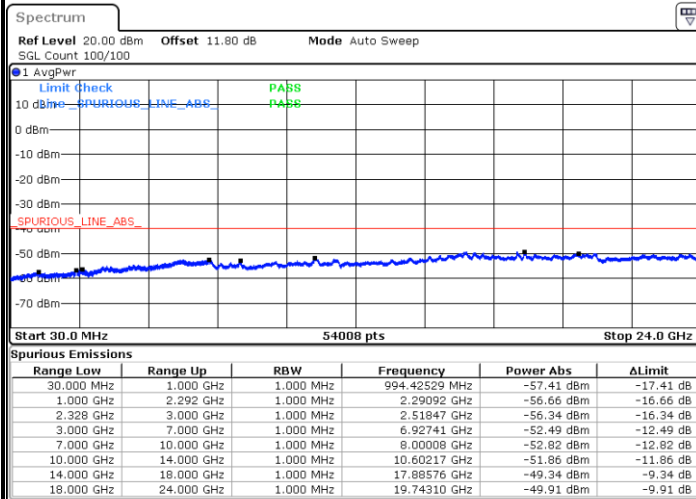
Date: 30.DEC.2020 16:39:05



Conducted Spurious Emission

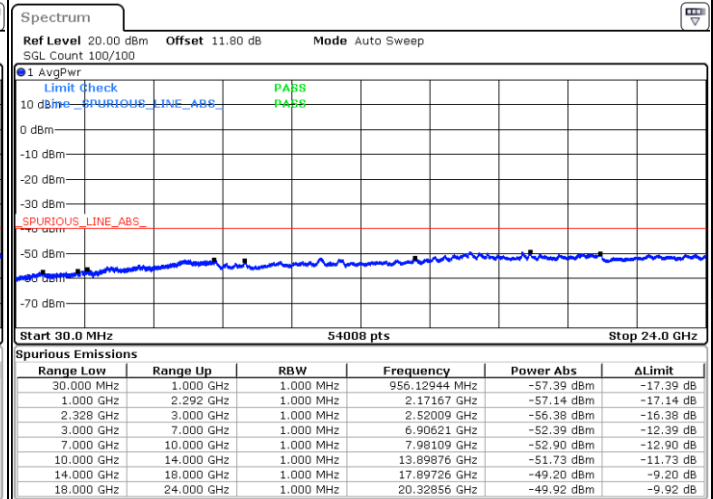
LTE Band 30 / 5MHz

Lowest Channel / QPSK



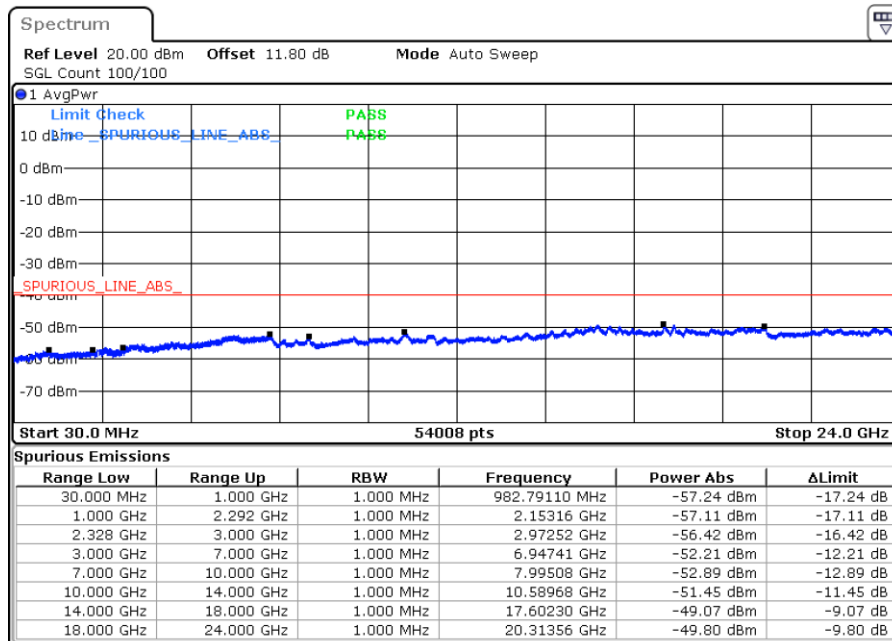
Date: 20.DEC.2020 14:29:09

Middle Channel / QPSK



Date: 20.DEC.2020 14:29:58

Highest Channel / QPSK

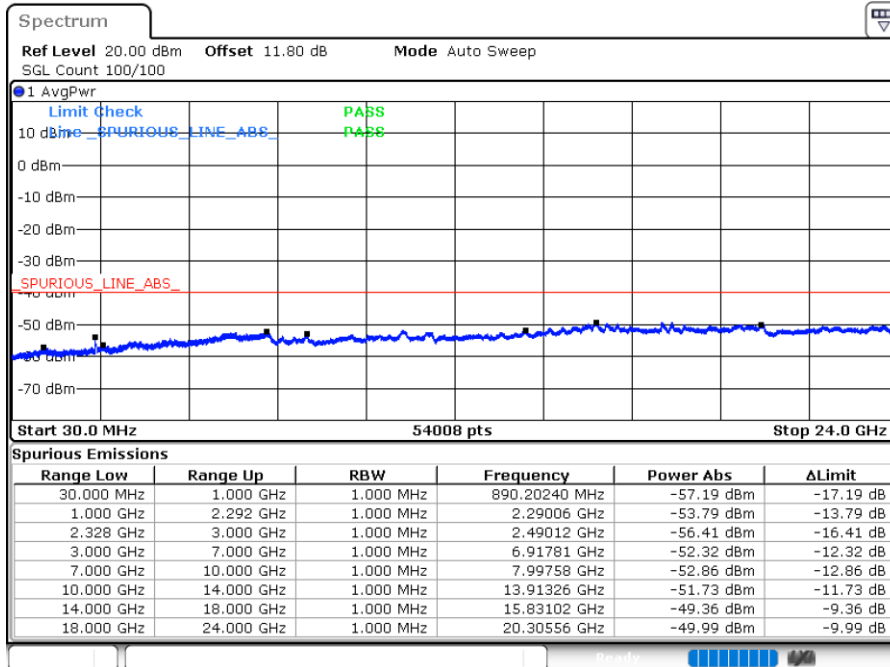


Date: 20.DEC.2020 14:30:48



LTE Band 30 / 10MHz

Middle Channel / QPSK



Date: 20 DEC 2020 14:31:39

Frequency Stability

Test Conditions		LTE Band 30 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0014	PASS
40	Normal Voltage	0.0005	
30	Normal Voltage	0.0023	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0014	
0	Normal Voltage	0.0068	
-10	Normal Voltage	0.0000	
-20	Normal Voltage	0.0008	
-30	Normal Voltage	0.0053	
20	Maximum Voltage	0.0046	
20	Normal Voltage	0.0014	
20	Battery End Point	0.0023	

Note:

1. Normal Voltage =7.74 V. ; Battery End Point (BEP) =7.2 V. ; Maximum Voltage =8.9 V.
2. Note: The frequency fundamental emissions stay within the authorized frequency block.

———THE END———