



# FCC RF Test Report

**APPLICANT** : HMD Global Oy  
**EQUIPMENT** : GSM/WCDMA/LTE Mobile Phone  
**BRAND NAME** : NOKIA  
**MODEL NAME** : TA-1395  
**FCC ID** : 2AJOTTA-1395  
**STANDARD** : 47 CFR Part 2, 22(H), 24(E), 27(L), 27(M)  
**CLASSIFICATION** : PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Jan. 21, 2021 and completely tested on Mar. 06, 2021. 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

Alex Wang

Approved by: Alex Wang / Manager



**Sporton International (Kunshan) Inc.**

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



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### REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG112111B	Rev. 01	Initial issue of report	Mar. 30, 2021



### SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
	§22.913(a)(5)	Effective Radiated Power (Band 5)	ERP < 7 Watt	PASS	
	§24.232(c) §27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 2)(Band 7)	EIRP < 2Watt	PASS	
	§27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4)	EIRP < 1Watt	PASS	
3.5	§24.232(d)	Peak-to-Average Ratio	<13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §22.917(a) §24.238(a) §27.53(h)	Conducted Band Edge Measurement (Band 2) (Band 4) (Band 5)	< 43+10log <sub>10</sub> (P[Watts])	PASS	-
	§27.53(m)(4)	Conducted Band Edge Measurement (Band 7)	§27.53(m)(4)		
3.8	§2.1051 §22.917(a) §24.238(a) §27.53(h)	Conducted Spurious Emission (Band 2) (Band 4) (Band 5)	< 43+10log <sub>10</sub> (P[Watts])	PASS	-
	§2.1051 §27.53(m)(4)	Conducted Spurious Emission (Band 7)	< 55+10log <sub>10</sub> (P[Watts])		
3.9	§2.1055 §22.355	Frequency Stability Temperature & Voltage	< 2.5 ppm for Part 22	PASS	-
	§2.1055 §24.235 §27.54		Within Authorized Band		



Report Section	FCC Rule	Description	Limit	Result	Remark
4.4	§2.1053 §22.917(a) §24.238(a) §27.53(h)	Radiated Spurious Emission (Band 2) (Band 4) (Band 5)	$< 43+10\log_{10}(P[\text{Watts}])$	PASS	Under limit 20.02 dB at 7580.000 MHz
	§2.1053 §27.53(m)(4)	Radiated Spurious Emission (Band 7)	$< 55+10\log_{10}(P[\text{Watts}])$		

**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

HMD Global Oy  
Bertel Jungin aukio 9, 02600 Espoo, Finland

## 1.2 Manufacturer

HMD Global Oy  
Bertel Jungin aukio 9, 02600 Espoo, Finland

## 1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	GSM/WCDMA/LTE Mobile Phone
Brand Name	NOKIA
Model Name	TA-1395
FCC ID	2AJOTTA-1395
EUT supports Radios application	GSM/WCDMA/LTE FM Receiver
IMEI Code	Conducted: N/A Radiation: N/A
HW Version	HW0141
SW Version	0.2105.11.10
EUT Stage	Identical Prototype

## 1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	LTE Band 2 : 1850 MHz ~ 1910 MHz LTE Band 4 : 1710 MHz ~ 1755 MHz LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 7 : 2500 MHz ~ 2570 MHz
Rx Frequency	LTE Band 2 : 1930 MHz ~ 1990 MHz LTE Band 4 : 2110 MHz ~ 2155 MHz LTE Band 5 : 869 MHz ~ 894 MHz LTE Band 7 : 2620 MHz ~ 2690 MHz
Bandwidth	LTE Band 2 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 4 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 5 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 7 : 5MHz / 10MHz / 15MHz / 20MHz
Maximum Output Power to Antenna	LTE Band 2 : 22.84 dBm LTE Band 4 : 22.97 dBm LTE Band 5 : 22.90 dBm LTE Band 7 : 22.78 dBm



Antenna Gain	LTE Band 2 : -2.71 dBi LTE Band 4 : -3.14 dBi LTE Band 5 : -3.85 dBi LTE Band 7 : -2.91 dBi
Type of Modulation	QPSK / 16QAM / 64QAM (Downlink only)

### 1.5 Modification of EUT

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

### 1.6 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

LTE Band 2		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)
20	1860.0 ~ 1900.0	18M5G7D	0.0024	0.1030	18M4W7D	-	0.0889
LTE Band 4		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)
20	1720.0 ~ 1745.0	18M4G7D	0.0022	0.0962	18M3W7D	-	0.0778
LTE Band 5		QPSK			16QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
10	829.0 ~ 844.0	9M07G7D	0.0022	0.0490	9M05W7D	-	0.0406
LTE Band 7		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)
20	2510.0 ~ 2560.0	18M4G7D	0.0023	0.0971	18M4W7D	-	0.0655



### 1.7 Testing Location

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

<b>Test Firm</b>	Sporton International (Kunshan) Inc.		
<b>Test Site Location</b>	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		
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Designation No.</b>	<b>FCC Test Firm Registration No.</b>
	03CH04-KS TH01-KS	CN1257	314309

### 1.8 Test Software

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

### 1.9 Applicable Standards

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

- ♦ 47 CFR Part 2, 22(H), 24(E), 27(L), 27(M)
- ♦ ANSI C63.26-2015
- ♦ FCC KDB 971168 D01 Power Meas License Digital Systems 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.





## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

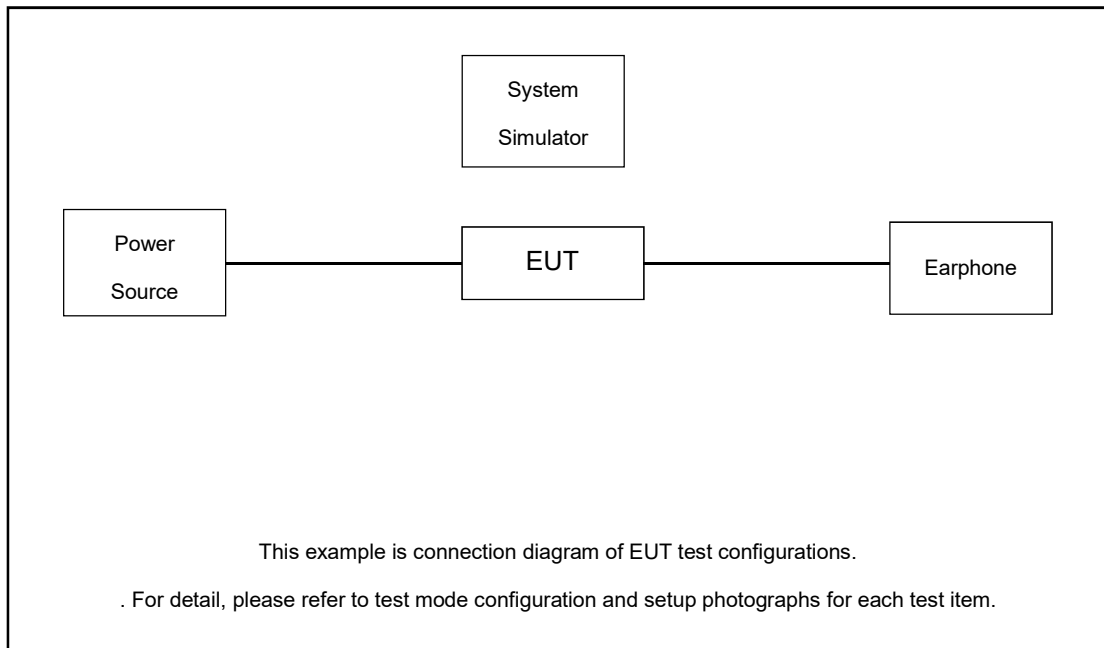
Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas License Digital Systems v03r01 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

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	2	v	v	v	v	v	v	v	v	-	v	v	v	v	v	v
	4	v	v	v	v	v	v	v	v	-	v	v	v	v	v	v
	5	v	v	v	v	-	-	v	v	-	v	v	v	v	v	v
	7	-	-	v	v	v	v	v	v	-	v	v	v	v	v	v
Peak-to-Average Ratio	2	-	-	-	-	-	v	v	v	-	v	-	v	v	v	v
	4	-	-	-	-	-	v	v	v	-	v	-	v	v	v	v
	5	-	-	-	v	-	-	v	v	-	v	-	v	v	v	v
	7	-	-	-	-	-	v	v	v	-	v	-	v	v	v	v
26dB and 99% Bandwidth	2	v	v	v	v	v	v	v	v	-	-	-	v	v	v	v
	4	v	v	v	v	v	v	v	v	-	-	-	v	v	v	v
	5	v	v	v	v	-	-	v	v	-	-	-	v	v	v	v
	7	-	-	v	v	v	v	v	v	-	-	-	v	v	v	v
Conducted Band Edge	2	v	v	v	v	v	v	v	v	-	v	-	v	v	-	v
	4	v	v	v	v	v	v	v	v	-	v	-	v	v	-	v
	5	v	v	v	v	-	-	v	v	-	v	-	v	v	-	v
	7	-	-	v	v	v	v	v	v	-	v	-	v	v	-	v
Conducted Spurious Emission	2	v	v	v	v	v	v	v	v	-	v	-	-	v	v	v
	4	v	v	v	v	v	v	v	v	-	v	-	-	v	v	v
	5	v	v	v	v	-	-	v	v	-	v	-	-	v	v	v
	7	-	-	v	v	v	v	v	v	-	v	-	-	v	v	v
Frequency Stability	2	-	-	-			v	v	-	-	-	-	v	-	v	-
	4	-	-	-			v	v	-	-	-	-	v	-	v	-
	5	-	-	-	v	-	-	v	-	-	-	-	v	-	v	-
	7	-	-	-			v	v	-	-	-	-	v	-	v	-

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
E.R.P / E.I.R.P	2	v	v	v	v	v	v	v	v	-	v	-	-	v	v	v
	4	v	v	v	v	v	v	v	v	-	v	-	-	v	v	v
	5	v	v	v	v	-	-	v	v	-	v	-	-	v	v	v
	7	-	-	v	v	v	v	v	v	-	v	-	-	v	v	v
Radiated Spurious Emission	2	Worst Case											-	v	-	
	4	Worst Case											-	v	-	
	5	Worst Case											-	v	-	
	7	Worst Case											-	v	-	
Note	<ol style="list-style-type: none"> <li>The mark "v" means that this configuration is chosen for testing</li> <li>The mark "-" means that this bandwidth is not supported.</li> <li>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.</li> </ol>															

## 2.2 Connection Diagram of Test System





### 2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
2.	Power Source	Chroma	61601	N/A	N/A	Unshielded, 1.8 m
3.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
4.	Earphone	NOKIA	WH-108/RTF	N/A	N/A	N/A

### 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 5.9dB

$$\begin{aligned} \text{Example : } \text{Offset(dB)} &= \text{RF cable loss(dB)} \\ &= 5.9 \text{ (dB)} \end{aligned}$$

### 2.5 Frequency List of Low/Middle/High Channels

LTE Band 2 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	18700	18900	19100
	Frequency	1860	1880	1900
15	Channel	18675	18900	19125
	Frequency	1857.5	1880	1902.5
10	Channel	18650	18900	19150
	Frequency	1855	1880	1905
5	Channel	18625	18900	19175
	Frequency	1852.5	1880	1907.5
3	Channel	18615	18900	19185
	Frequency	1851.5	1880	1908.5
1.4	Channel	18607	18900	19193
	Frequency	1850.7	1880	1909.3



LTE Band 4 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	20050	20175	20300
	Frequency	1720	1732.5	1745
15	Channel	20025	20175	20325
	Frequency	1717.5	1732.5	1747.5
10	Channel	20000	20175	20350
	Frequency	1715	1732.5	1750
5	Channel	19975	20175	20375
	Frequency	1712.5	1732.5	1752.5
3	Channel	19965	20175	20385
	Frequency	1711.5	1732.5	1753.5
1.4	Channel	19957	20175	20393
	Frequency	1710.7	1732.5	1754.3

LTE Band 5 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	20450	20525	20600
	Frequency	829	836.5	844
5	Channel	20425	20525	20625
	Frequency	826.5	836.5	846.5
3	Channel	20415	20525	20635
	Frequency	825.5	836.5	847.5
1.4	Channel	20407	20525	20643
	Frequency	824.7	836.5	848.3

LTE Band 7 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	20850	21100	21350
	Frequency	2510	2535	2560
15	Channel	20825	21100	21375
	Frequency	2507.5	2535	2562.5
10	Channel	20800	21100	21400
	Frequency	2505	2535	2565
5	Channel	20775	21100	21425
	Frequency	2502.5	2535	2567.5

### 3 Conducted Test Items

#### 3.1 Measuring Instruments

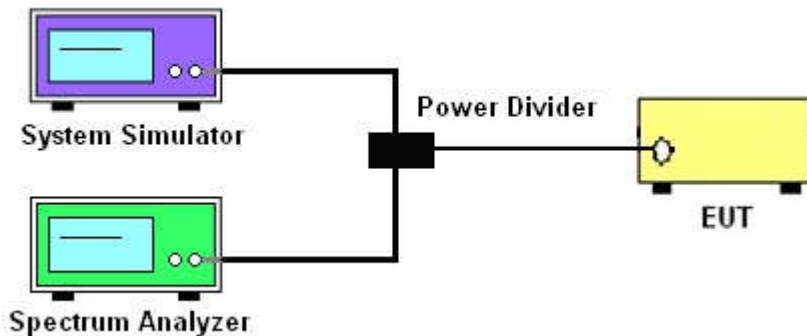
See list of measuring instruments of this test report.

#### 3.2 Test Setup

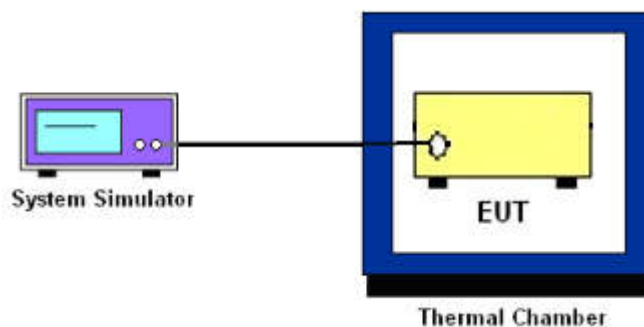
##### 3.2.1 Conducted Output Power



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



##### 3.2.3 Frequency Stability



### 3.3 Test Result of Conducted Test

Please refer to Appendix A.



### 3.4 Conducted Output Power and ERP/EIRP

#### 3.4.1 Description of the Conducted Output Power Measurement and ERP/EIRP Measurement

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

The ERP of mobile transmitters must not exceed 7 Watts for LTE Band 5

The EIRP of mobile transmitters must not exceed 2 Watts for LTE Band 2 and Band 7

The EIRP of mobile transmitters must not exceed 1 Watts for LTE Band 4

According to KDB 412172 D01 Power Approach,

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

$P_T$  = transmitter output power in dBm

$G_T$  = gain of the transmitting antenna in dBi

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

#### 3.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.



## **3.5 Peak-to-Average Ratio**

### **3.5.1 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.

### **3.5.2 Test Procedures**

1. The testing follows ANSI C63.26 Section 5.2.3.4 (CCDF).
2. The EUT was connected to spectrum and system simulator via a power divider.
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
4. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
5. Record the deviation as Peak to Average Ratio.



## 3.6 Occupied Bandwidth

### 3.6.1 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.

### 3.6.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.4
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. 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.
4. 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.
5. Set the detection mode to peak, and the trace mode to max hold.
6. 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)
7. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
8. 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.
9. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.





### 3.7 Conducted Band Edge

#### 3.7.1 Description of Conducted Band Edge Measurement

22.917(a)

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

24.238 (a)

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

27.53 (h)

For operations in the 1710 – 1755 MHz band, the FCC limit is  $43 + 10\log_{10}(P[\text{Watts}])$  dB below the transmitter power  $P(\text{Watts})$  in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

27.53(m)(4)

For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that  $43 + 10 \log (P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log (P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.



### 3.7.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set RBW  $\geq$  1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz band from the band edge, RBW=1MHz was used or a narrower RBW was used and the measured power was integrated over the full required measurement bandwidth of 1 MHz.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.

Example:

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

$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)} = -13\text{dBm}.$$

9. For LTE Band 7, the other 40 dB, and 55 dB have additionally applied same calculation above.



### 3.8 Conducted Spurious Emission

#### 3.8.1 Description of Conducted Spurious Emission Measurement

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

For Band 7:

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  $55 + 10 \log (P)$  dB.

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

#### 3.8.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. 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.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
7. Set spectrum analyzer with RMS detector.
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 derived from  $43 + 10\log(P)$ dB below the transmitter power P(Watts)  
=  $P(W) - [43 + 10\log(P)]$  (dB)  
=  $[30 + 10\log(P)]$  (dBm) -  $[43 + 10\log(P)]$  (dB)  
= -13dBm.
11. For Band 7  
The limit line is derived from  $55 + 10\log(P)$ dB below the transmitter power P(Watts)  
=  $P(W) - [55 + 10\log(P)]$  (dB)  
=  $[30 + 10\log(P)]$  (dBm) -  $[55 + 10\log(P)]$  (dB)  
= -25dBm.



## 3.9 Frequency Stability

### 3.9.1 Description of Frequency Stability Measurement

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

### 3.9.2 Test Procedures for Temperature Variation

1. The testing follows ANSI C63.26 section 5.6.4
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to  $-30^{\circ}\text{C}$  and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in  $10^{\circ}\text{C}$  step up to  $50^{\circ}\text{C}$ . 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.

### 3.9.3 Test Procedures for Voltage Variation

1. The testing follows ANSI C63.26 section 5.6.5
2. The EUT was placed in a temperature chamber at  $20\pm 5^{\circ}\text{C}$  and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value for other than hand carried battery equipment.
4. For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.
5. The variation in frequency was measured for the worst case.

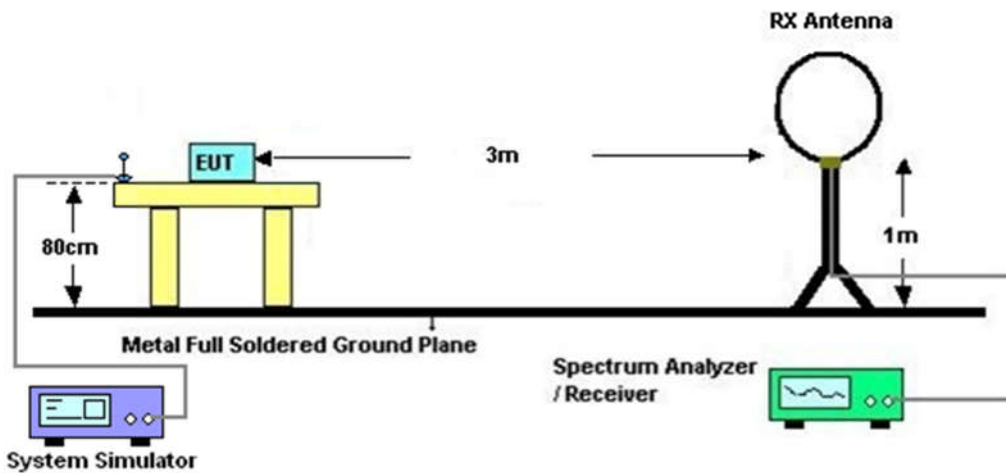
## 4 Radiated Test Items

### 4.1 Measuring Instruments

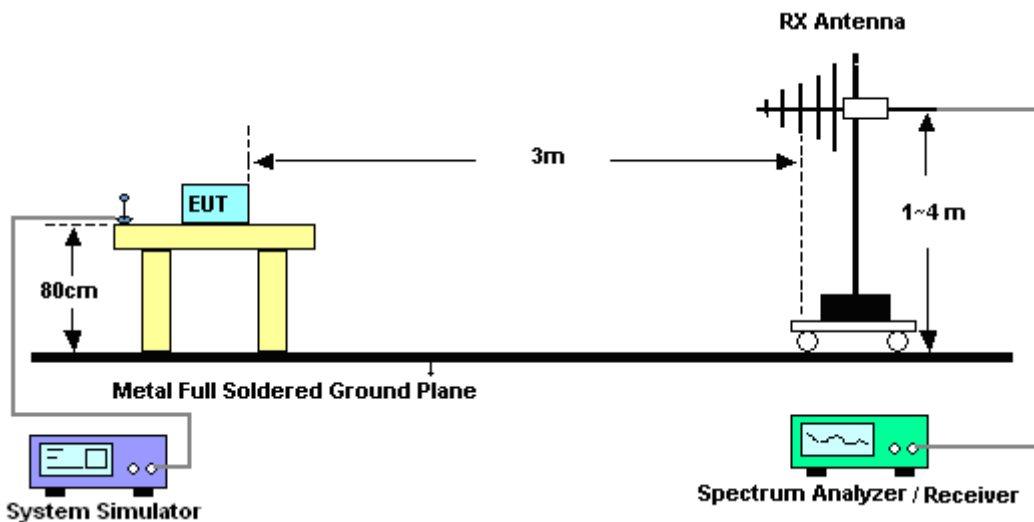
See list of measuring instruments of this test report.

### 4.2 Test Setup

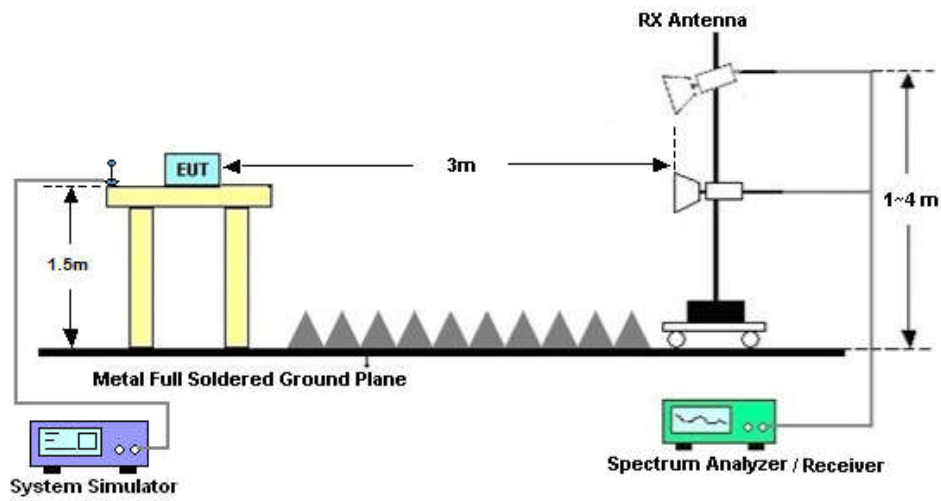
#### 4.2.1 For radiated test below 30MHz



#### 4.2.2 For radiated test from 30MHz to 1GHz



### 4.2.3 For radiated test above 1GHz



### 4.3 Test Result of Radiated Test

According to engineering evaluation, Conducted Spurious Emission test Low/Middle/High channels, Radiated Spurious Emissions test the middle channel (because the middle channel test data margin > 6 dB).

Please refer to Appendix B.



## 4.4 Radiated Spurious Emission

### 4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

For Band 7

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  $55 + 10 \log (P)$  dB.

The spectrum is scanned from 9 kHz up to the 10th harmonic of the fundamental frequency, the worst-case emissions are reported.

### 4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. 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.
3. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10.  $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11.  $ERP \text{ (dBm)} = EIRP - 2.15$
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from  $43 + 10\log(P)$ dB below the transmitter power P(Watts)  
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$   
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$   
 $= -13\text{dBm}.$

13. For Band 7:

The limit line is derived from  $55 + 10\log(P)$ dB below the transmitter power P(Watts)



## 5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Nov. 01, 2020	Mar. 06, 2021	Oct. 31, 2021	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	Aug. 27, 2020	Mar. 06, 2021	Aug. 26, 2021	Conducted (TH01-KS)
Temperature & humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 03, 2020	Mar. 06, 2021	Jul. 02, 2021	Conducted (TH01-KS)
Thermometer & hygrometer	SHENTUO	HTC-1	KS100807JC GS05	HTC-105	Apr. 14, 2020	Mar. 06, 2021	Apr. 13, 2021	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz~44G,MAX 30dB	Apr. 15, 2020	Feb. 19, 2021	Apr. 14, 2021	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 01, 2020	Feb. 19, 2021	Oct. 31, 2021	Radiation (03CH04-KS)
Vector Signal Generator	R&S	SMBV100A	258305	9KHz~6GHz	Jan. 06, 2021	Feb. 19, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Signal Generator	R&S	SMR40	100455	10MHz~40GHz	Jan. 06, 2021	Feb. 19, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Jun. 08, 2020	Feb. 19, 2021	Jun. 07, 2021	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1356	1GHz~18GHz	Apr. 20, 2020	Feb. 19, 2021	Apr. 19, 2021	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Jan. 06, 2021	Feb. 19, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 06, 2021	Feb. 19, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 07, 2021	Feb. 19, 2021	Jan. 06, 2022	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-00 101800-30-1 AP	2025788	1Ghz-18Ghz	Jan. 06, 2021	Feb. 19, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY57280106	500MHz~26.5GHz	Oct. 14, 2020	Feb. 19, 2021	Oct. 13, 2021	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Feb. 19, 2021	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Feb. 19, 2021	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Feb. 19, 2021	NCR	Radiation (03CH04-KS)
Thermometer & hygrometer	SHENTUO	HTC-1	KS150428JC GS02	HTC-108	Apr. 14, 2020	Feb. 19, 2021	Apr. 13, 2021	Radiation (03CH04-KS)

NCR: No Calibration Required





## 6 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

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

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

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

### Conducted Output Power(Average power) and REP/EIRP

#### LTE Band 2

BW [MHz]	Modulation	RB Size	RB Offset	Power	Power	Power	EIRP		
				Low Ch. / Freq.	Middle Ch. / Freq.	High Ch. / Freq.			
Channel				18700	18900	19100			
Frequency (MHz)				1860	1880	1900	L	M	H
20	QPSK	1	0	22.76	22.84	22.58	0.1012	0.1030	0.0971
20	QPSK	1	49	22.78	22.69	22.65	0.1016	0.0995	0.0986
20	QPSK	1	99	22.71	22.65	22.73	0.1000	0.0986	0.1005
20	QPSK	50	0	21.54	21.68	21.67	0.0764	0.0789	0.0787
20	QPSK	50	24	21.54	21.56	21.54	0.0764	0.0767	0.0764
20	QPSK	50	50	21.52	21.57	21.62	0.0760	0.0769	0.0778
20	QPSK	100	0	21.53	21.70	21.65	0.0762	0.0793	0.0783
20	16QAM	1	0	21.71	21.72	22.20	0.0794	0.0796	0.0889
Channel				18675	18900	19125	EIRP		
Frequency (MHz)				1857.5	1880	1902.5	L	M	H
15	QPSK	1	0	22.78	22.59	22.64	0.1016	0.0973	0.0984
15	16QAM	1	0	21.85	21.62	21.68	0.0820	0.0778	0.0789
Channel				18650	18900	19150	EIRP		
Frequency (MHz)				1855	1880	1905	L	M	H
10	QPSK	1	0	22.78	22.58	22.63	0.1016	0.0971	0.0982
10	16QAM	1	0	21.87	21.86	22.07	0.0824	0.0822	0.0863
Channel				18625	18900	19175	EIRP		
Frequency (MHz)				1852.5	1880	1907.5	L	M	H
5	QPSK	1	0	22.78	22.63	22.67	0.1016	0.0982	0.0991
5	16QAM	1	0	21.82	21.96	22.13	0.0815	0.0841	0.0875
Channel				18615	18900	19185	EIRP		
Frequency (MHz)				1851.5	1880	1908.5	L	M	H
3	QPSK	1	0	22.77	22.67	22.57	0.1014	0.0991	0.0968
3	16QAM	1	0	21.82	21.99	22.19	0.0815	0.0847	0.0887
Channel				18607	18900	19193	EIRP		



Frequency (MHz)				1850.7	1880	1909.3	L	M	H
1.4	QPSK	1	0	22.76	22.81	22.76	0.1012	0.1023	0.1012
1.4	16QAM	1	0	21.82	21.73	21.99	0.0815	0.0798	0.0847

**LTE Band 4**

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	EIRP		
Channel				20050	20175	20300			
Frequency (MHz)				1720	1732.5	1745	L	M	H
20	QPSK	1	0	22.88	22.97	22.69	0.0942	0.0962	0.0902
20	QPSK	1	49	22.74	22.77	22.58	0.0912	0.0918	0.0879
20	QPSK	1	99	22.70	22.60	22.53	0.0904	0.0883	0.0869
20	QPSK	50	0	21.80	21.83	21.57	0.0735	0.0740	0.0697
20	QPSK	50	24	21.70	21.68	21.50	0.0718	0.0714	0.0685
20	QPSK	50	50	21.75	21.64	21.59	0.0726	0.0708	0.0700
20	QPSK	100	0	21.73	21.88	21.86	0.0723	0.0748	0.0745
20	16QAM	1	0	22.05	21.65	21.79	0.0778	0.0710	0.0733
Channel				20025	20175	20325	EIRP		
Frequency (MHz)				1717.5	1732.5	1747.5	L	M	H
15	QPSK	1	0	22.90	22.87	22.53	0.0946	0.0940	0.0869
15	16QAM	1	0	21.88	21.92	21.96	0.0748	0.0755	0.0762
Channel				20000	20175	20350	EIRP		
Frequency (MHz)				1715	1732.5	1750	L	M	H
10	QPSK	1	0	22.87	22.75	22.72	0.0940	0.0914	0.0908
10	16QAM	1	0	21.99	21.83	21.96	0.0767	0.0740	0.0762
Channel				19975	20175	20375	EIRP		
Frequency (MHz)				1712.5	1732.5	1752.5	L	M	H
5	QPSK	1	0	22.86	22.75	22.79	0.0938	0.0914	0.0923
5	16QAM	1	0	21.88	21.67	21.73	0.0748	0.0713	0.0723
Channel				19965	20175	20385	EIRP		
Frequency (MHz)				1711.5	1732.5	1753.5	L	M	H
3	QPSK	1	0	22.85	22.78	22.76	0.0935	0.0920	0.0916
3	16QAM	1	0	21.95	21.71	21.79	0.0760	0.0719	0.0733
Channel				19950	20175	20393	EIRP		



Frequency (MHz)				1710	1732.5	1754.3	L	M	H
1.4	QPSK	1	0	22.89	22.76	22.76	0.0944	0.0916	0.0916
1.4	16QAM	1	0	22.00	21.93	21.80	0.0769	0.0757	0.0735

**LTE Band 5**

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP		
Channel				20450	20525	20600	ERP		
Frequency (MHz)				829	836.5	844	L	M	H
10	QPSK	1	0	22.80	22.90	22.87	0.0479	0.0490	0.0486
10	QPSK	1	25	22.65	22.73	22.78	0.0462	0.0471	0.0476
10	QPSK	1	49	22.79	22.64	22.78	0.0478	0.0461	0.0476
10	QPSK	25	0	21.98	22.06	21.95	0.0396	0.0404	0.0394
10	QPSK	25	12	21.64	22.05	21.72	0.0366	0.0403	0.0373
10	QPSK	25	25	21.83	21.66	21.74	0.0383	0.0368	0.0375
10	QPSK	50	0	21.89	22.09	21.99	0.0388	0.0406	0.0397
10	16QAM	1	0	21.93	22.06	22.08	0.0392	0.0404	0.0406
Channel				20425	20525	20625	ERP		
Frequency (MHz)				826.5	836.5	846.5	L	M	H
5	QPSK	1	0	22.59	22.81	22.70	0.0456	0.0480	0.0468
5	16QAM	1	0	21.82	21.87	21.89	0.0382	0.0386	0.0388
Channel				20415	20525	20635	ERP		
Frequency (MHz)				825.5	836.5	847.5	L	M	H
3	QPSK	1	0	22.65	22.77	22.67	0.0462	0.0475	0.0465
3	16QAM	1	0	21.81	21.87	21.89	0.0381	0.0386	0.0388
Channel				20407	20525	20643	ERP		
Frequency (MHz)				824.7	836.5	848.3	L	M	H
1.4	QPSK	1	0	22.83	22.86	22.80	0.0482	0.0485	0.0479
1.4	16QAM	1	0	21.70	22.03	21.95	0.0372	0.0401	0.0394



LTE Band 7

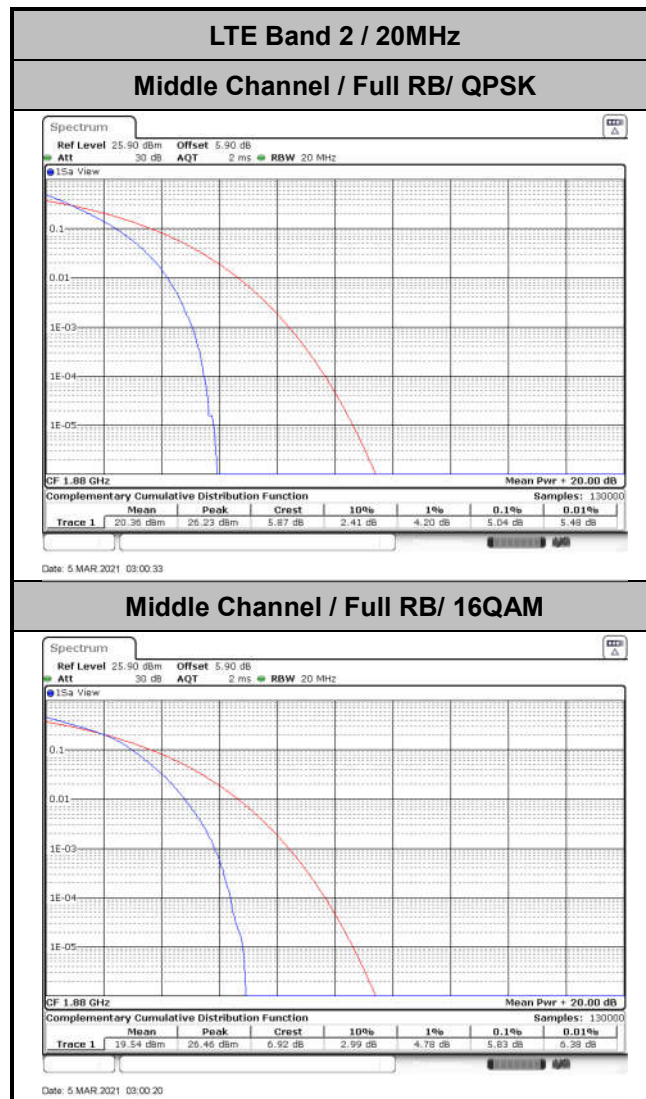
BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	EIRP		
Channel				20850	20850	21350	EIRP		
Frequency (MHz)				2510	2535	2560	L	M	H
20	QPSK	1	0	22.58	22.78	22.57	0.0927	0.0971	0.0925
20	QPSK	1	49	22.51	22.60	22.54	0.0912	0.0931	0.0918
20	QPSK	1	99	22.55	22.54	22.60	0.0920	0.0918	0.0931
20	QPSK	50	0	20.74	21.00	20.86	0.0607	0.0644	0.0624
20	QPSK	50	24	20.88	20.80	20.95	0.0627	0.0615	0.0637
20	QPSK	50	50	20.93	20.88	20.89	0.0634	0.0627	0.0628
20	QPSK	100	0	20.87	20.94	20.84	0.0625	0.0635	0.0621
20	16QAM	1	0	20.99	21.07	21.04	0.0643	0.0655	0.0650
Channel				20825	21100	21375	EIRP		
Frequency (MHz)				2507.5	2535	2562.5	L	M	H
15	QPSK	1	0	22.65	22.74	22.68	0.0942	0.0962	0.0948
15	16QAM	1	0	20.91	20.91	20.97	0.0631	0.0631	0.0640
Channel				20800	21100	21400	EIRP		
Frequency (MHz)				2505	2535	2565	L	M	H
10	QPSK	1	0	22.54	22.76	22.53	0.0918	0.0966	0.0916
10	16QAM	1	0	20.92	20.90	20.89	0.0632	0.0630	0.0628
Channel				20775	21100	21425	EIRP		
Frequency (MHz)				2502.5	2535	2567.5	L	M	H
5	QPSK	1	0	22.52	22.70	22.57	0.0914	0.0953	0.0925
5	16QAM	1	0	20.85	20.81	20.71	0.0622	0.0617	0.0603



# LTE Band 2

## Peak-to-Average Ratio

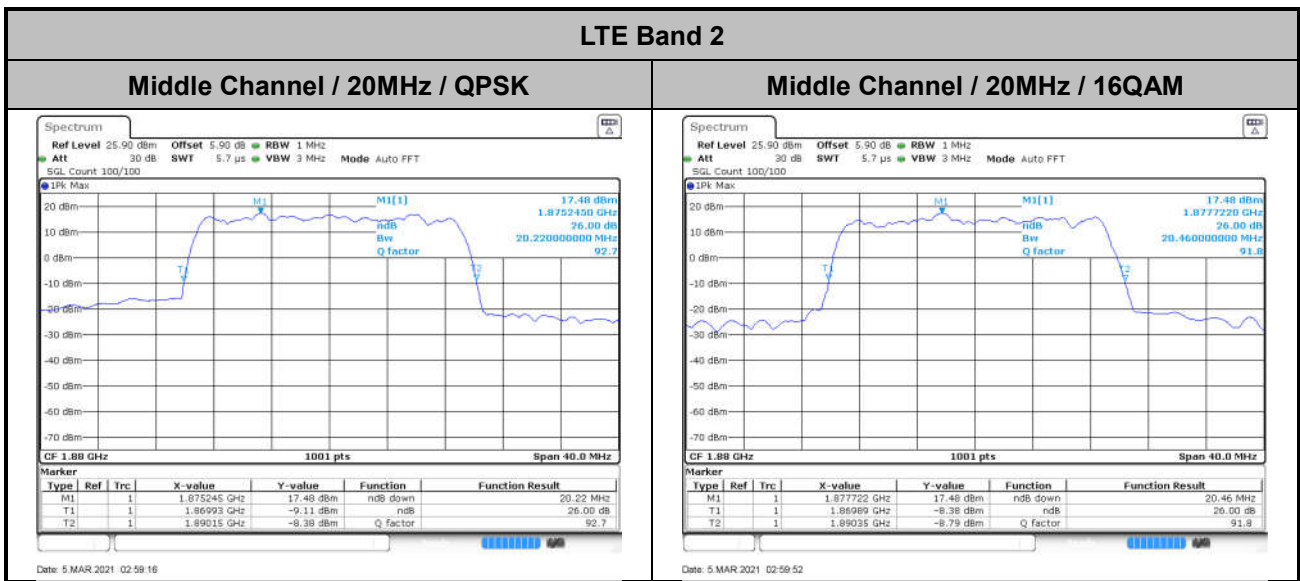
Mode	LTE Band 2 / 20MHz			
Mod.	QPSK	16QAM		Limit: 13dB
RB Size	Full RB	Full RB		Result
Middle CH	5.04	5.83		PASS





**26dB Bandwidth**

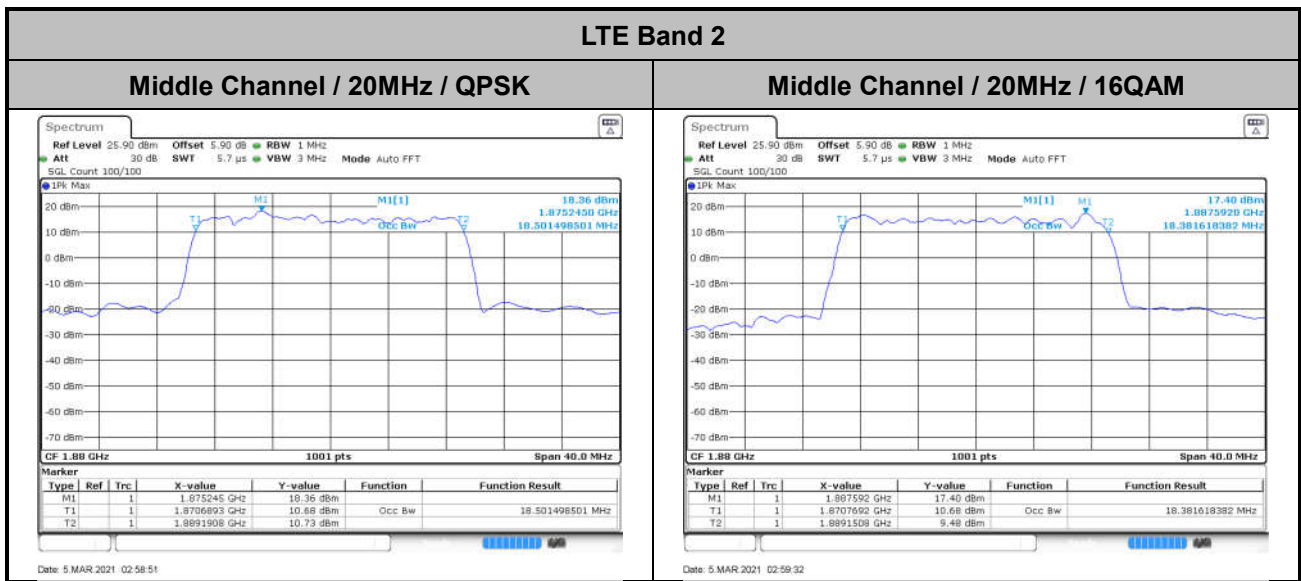
Mode	LTE Band 2 : 26dB BW(MHz)	
BW	20MHz	
Mod.	QPSK	16QAM
Middle CH	20.22	20.46





## Occupied Bandwidth

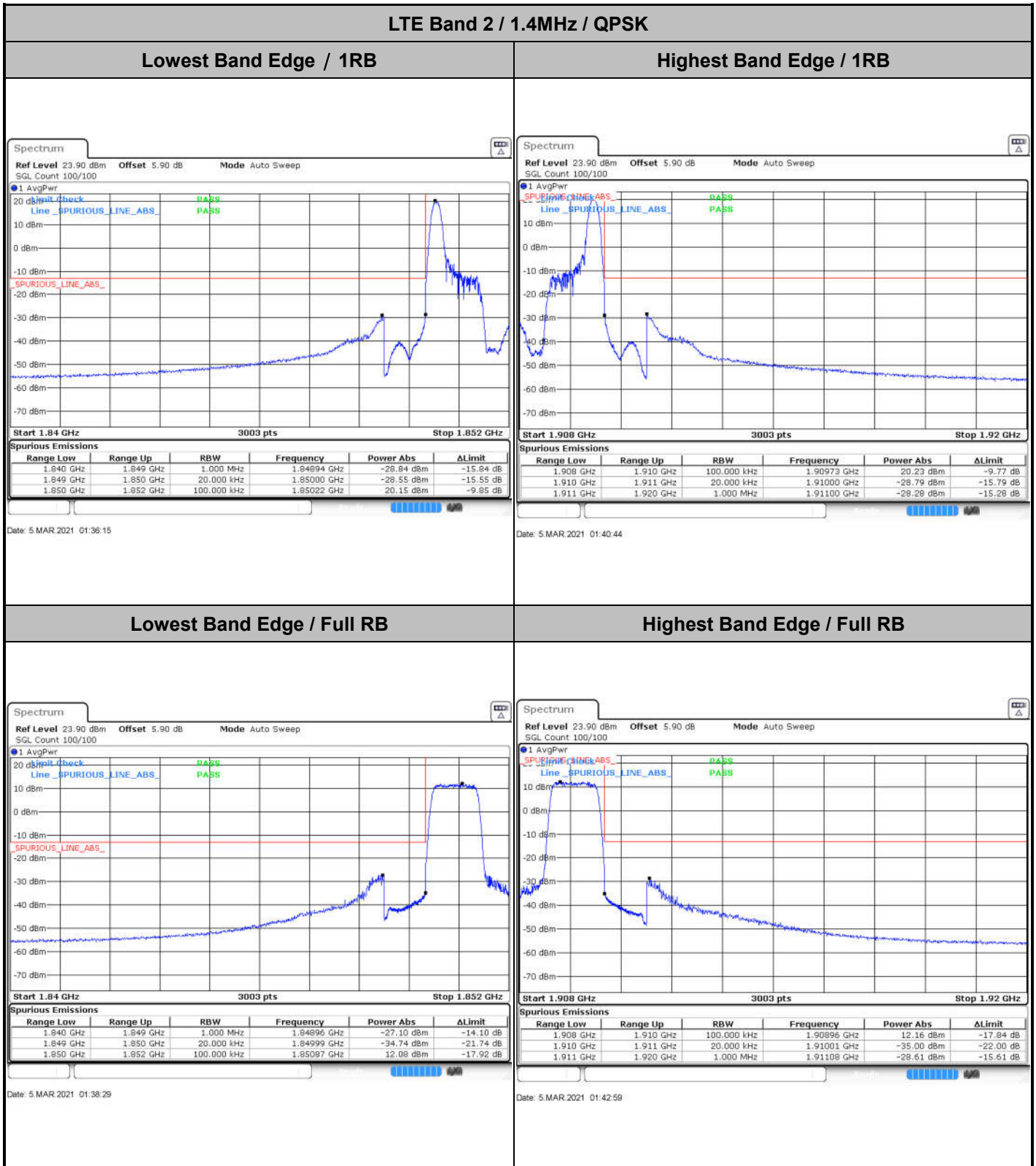
<b>Mode</b>	<b>LTE Band 2 : 99%OBW(MHz)</b>	
<b>BW</b>	<b>20MHz</b>	
<b>Mod.</b>	<b>QPSK</b>	<b>16QAM</b>
<b>Middle CH</b>	18.50	18.38







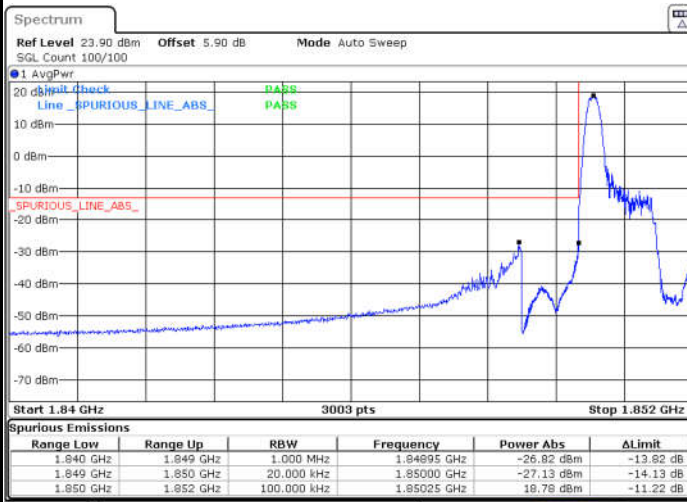
# Conducted Band Edge





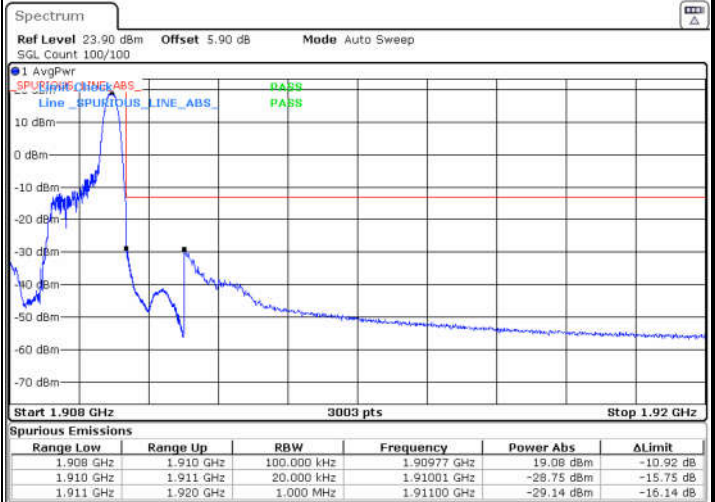
LTE Band 2 / 1.4MHz / 16QAM

Lowest Band Edge / 1 RB



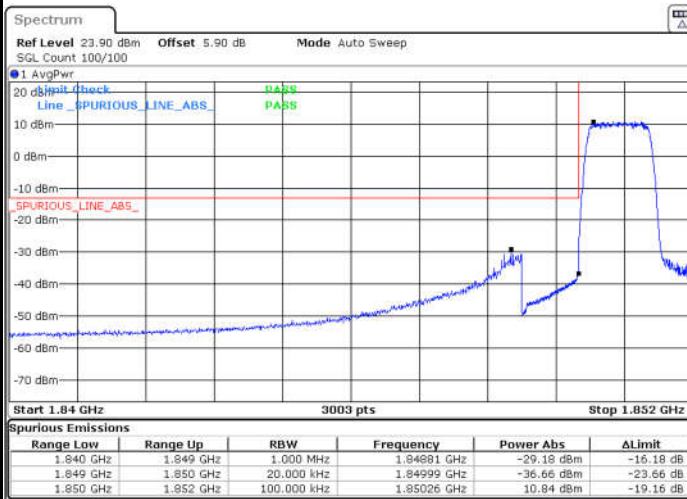
Date: 5 MAR 2021 01:37:22

Highest Band Edge / 1 RB



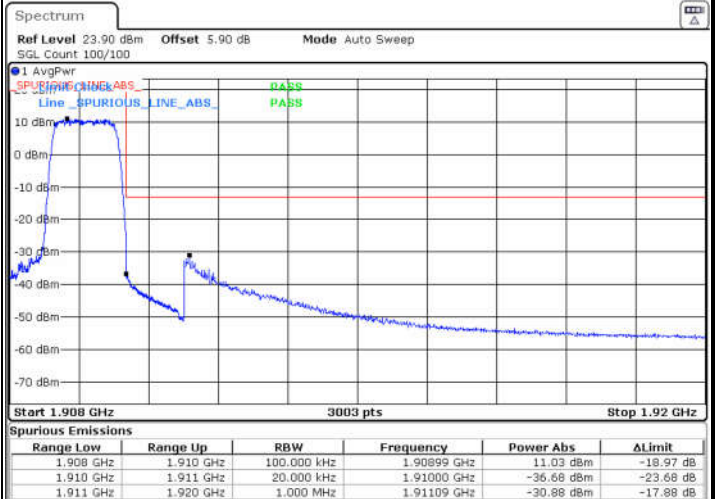
Date: 5 MAR 2021 01:41:52

Lowest Band Edge / Full RB



Date: 5 MAR 2021 01:39:37

Highest Band Edge / Full RB

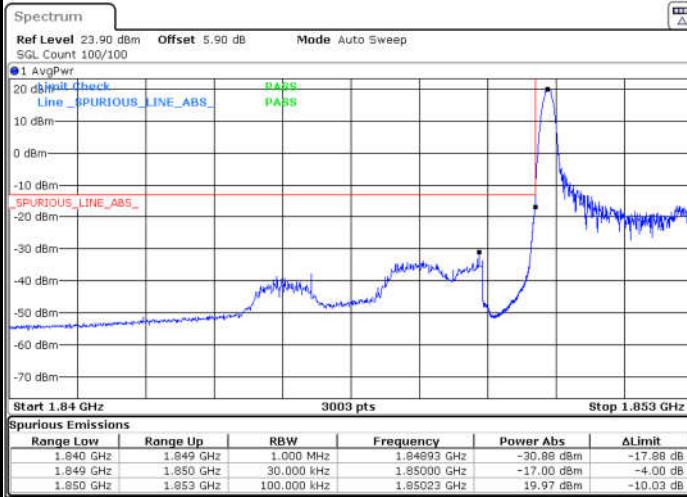


Date: 5 MAR 2021 01:44:06



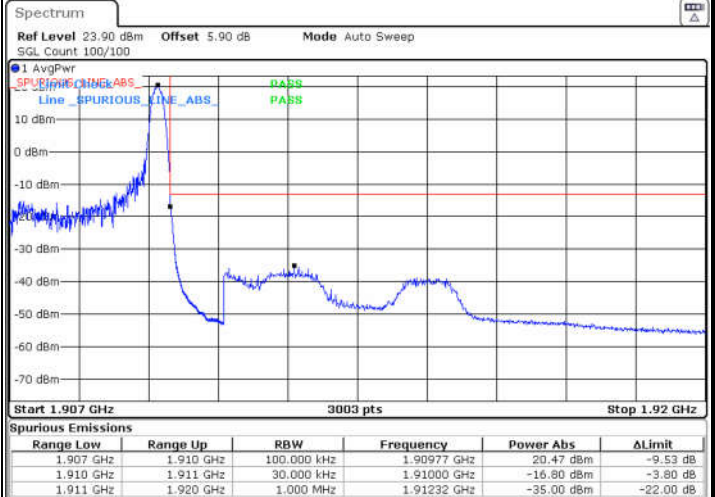
LTE Band 2 / 3MHz / QPSK

Lowest Band Edge / 1RB



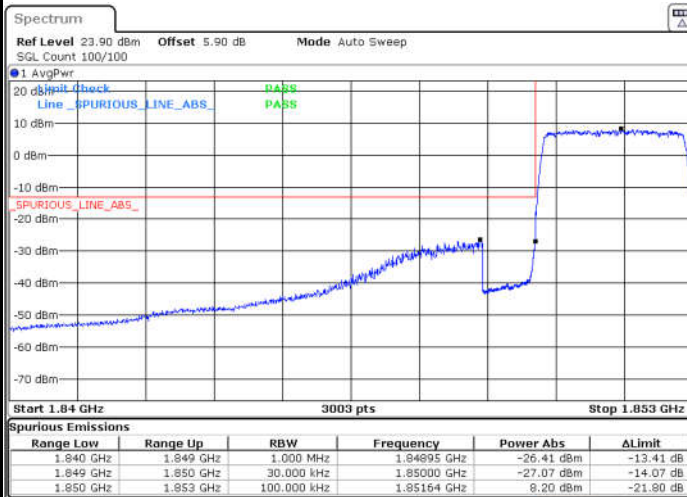
Date: 5 MAR 2021 01:45:14

Highest Band Edge / 1 RB



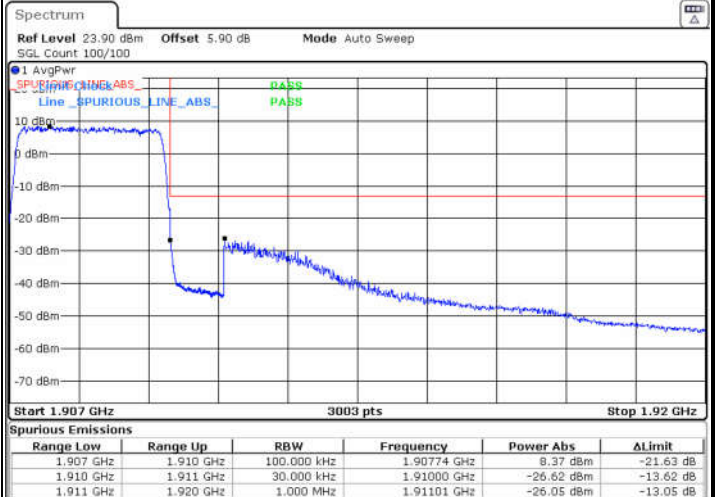
Date: 5 MAR 2021 01:49:43

Lowest Band Edge / Full RB



Date: 5 MAR 2021 01:47:29

Highest Band Edge / Full RB

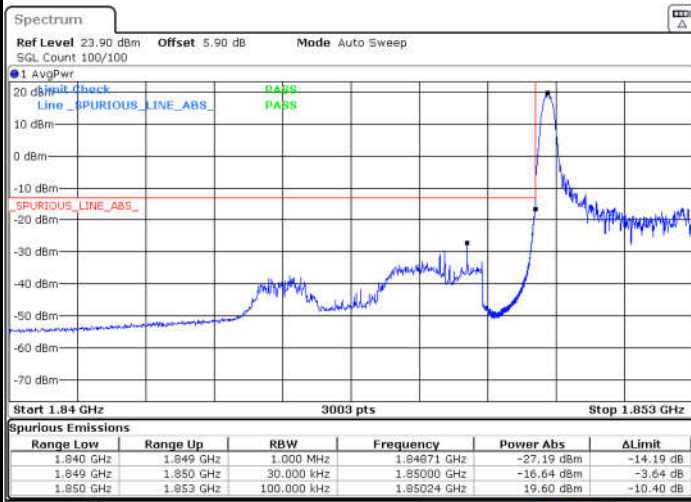


Date: 5 MAR 2021 01:51:58



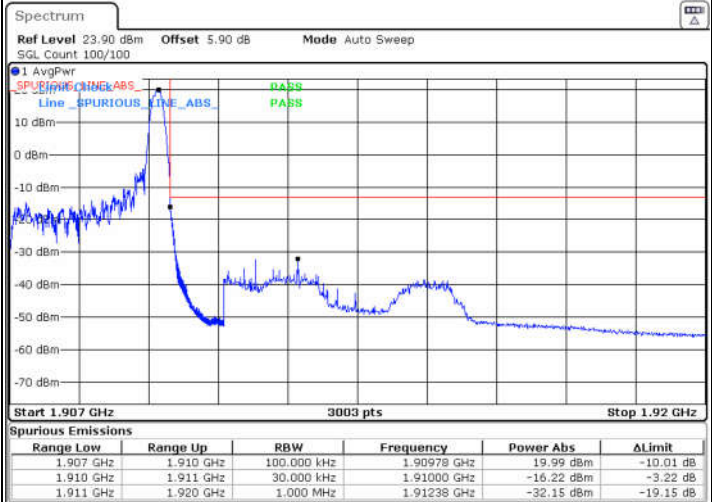
LTE Band 2 / 3MHz / 16QAM

Lowest Band Edge / 1 RB



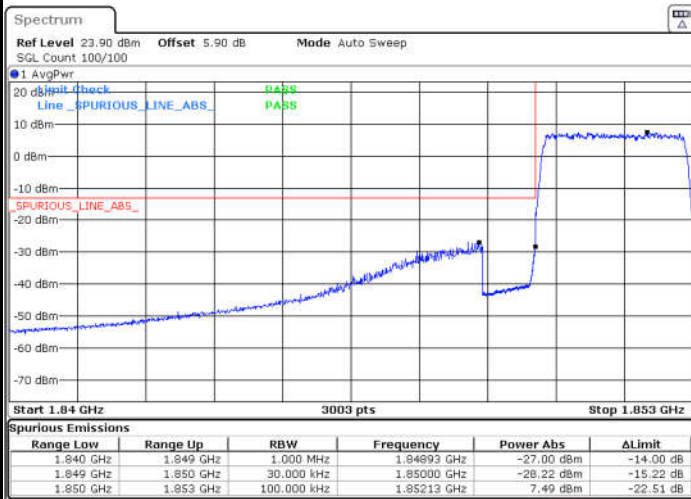
Date: 5 MAR 2021 01:46:21

Highest Band Edge / 1 RB



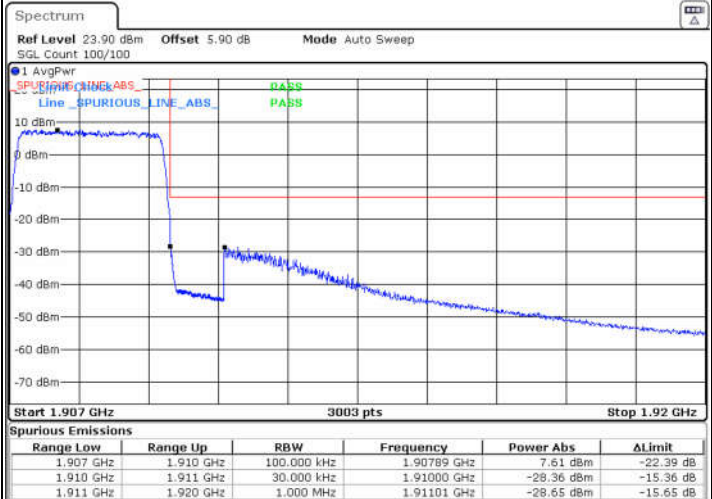
Date: 5 MAR 2021 01:50:51

Lowest Band Edge / Full RB



Date: 5 MAR 2021 01:48:36

Highest Band Edge / Full RB

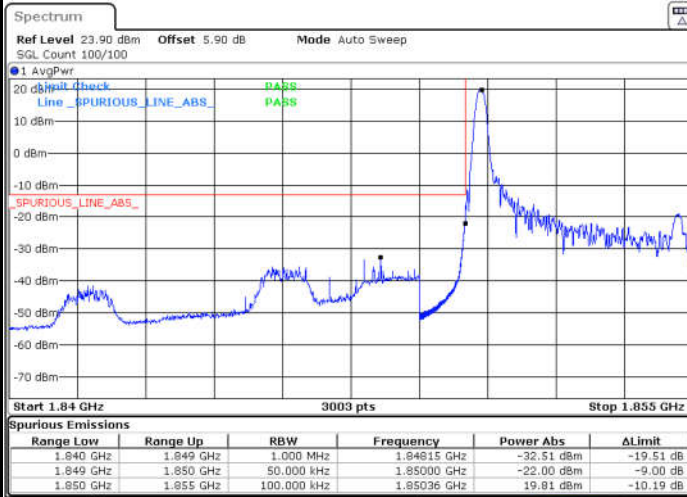


Date: 5 MAR 2021 01:53:06



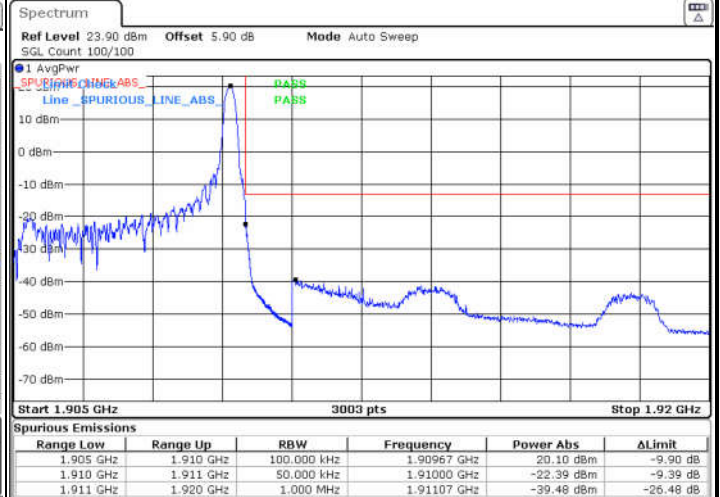
LTE Band 2 / 5MHz / QPSK

Lowest Band Edge / 1 RB



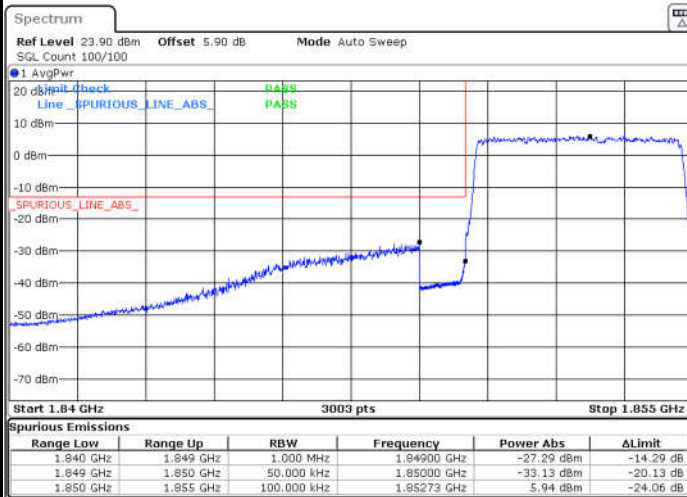
Date: 5 MAR 2021 01:54:13

Highest Band Edge / 1 RB



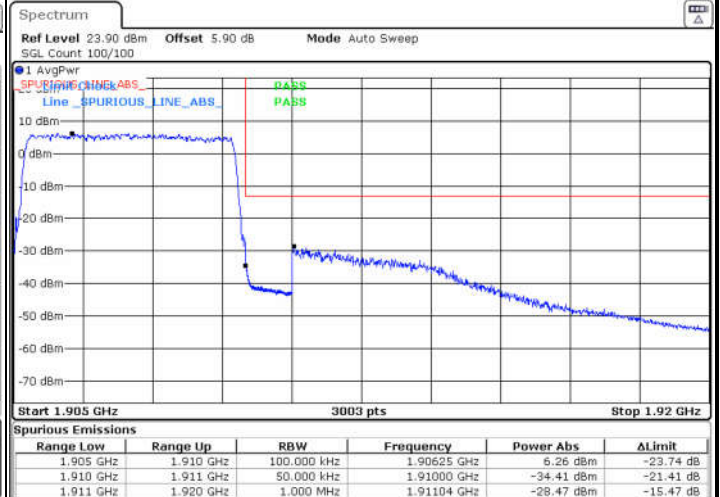
Date: 5 MAR 2021 01:58:43

Lowest Band Edge / Full RB



Date: 5 MAR 2021 01:56:28

Highest Band Edge / Full RB

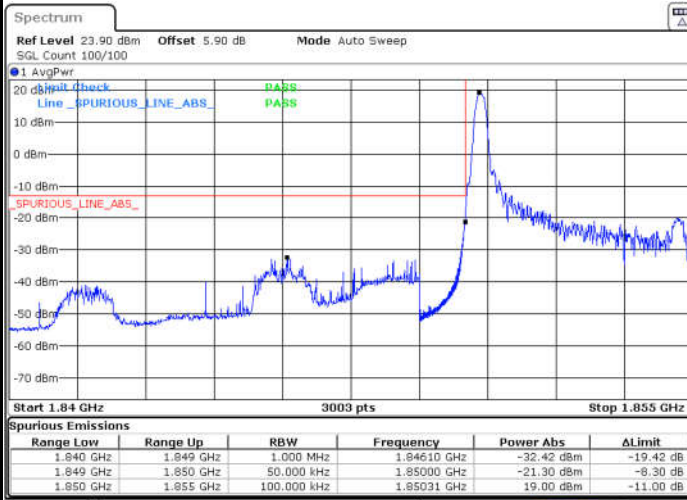


Date: 5 MAR 2021 02:00:57



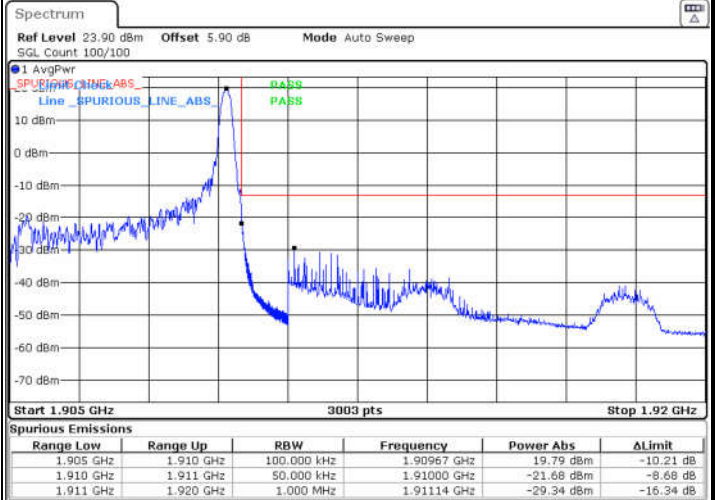
LTE Band 2 / 5MHz / 16QAM

Lowest Band Edge / 1RB



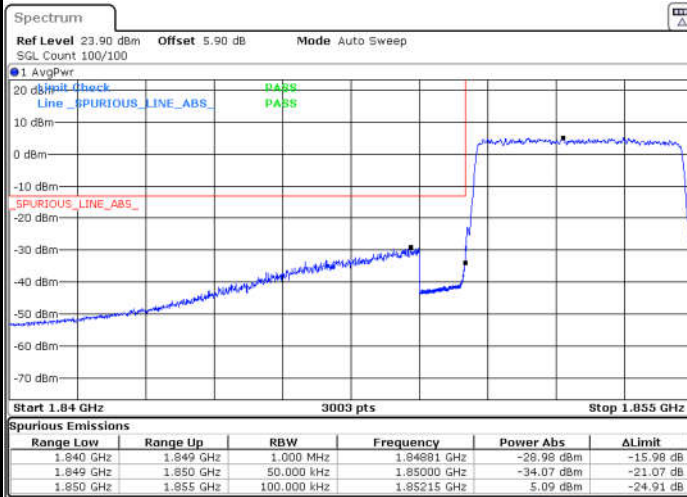
Date: 5 MAR 2021 01:55:20

Highest Band Edge / 1 RB



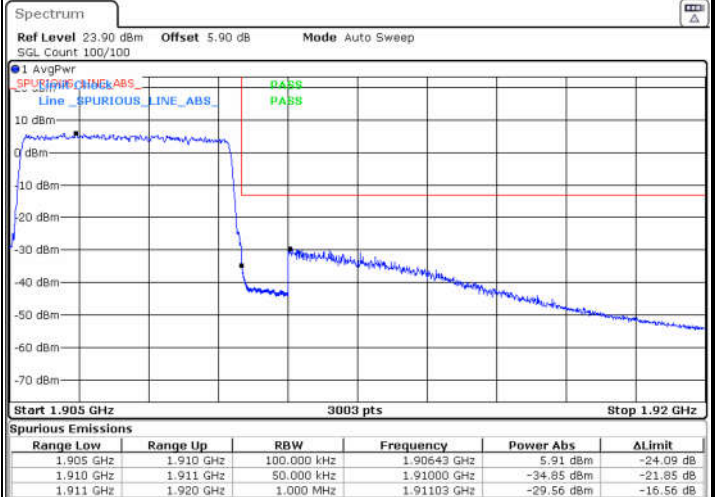
Date: 5 MAR 2021 01:59:50

Lowest Band Edge / Full RB



Date: 5 MAR 2021 01:57:35

Highest Band Edge / Full RB

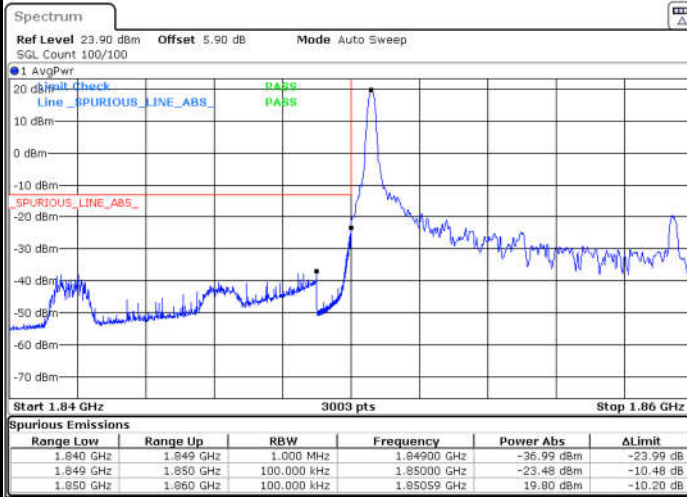


Date: 5 MAR 2021 02:02:05



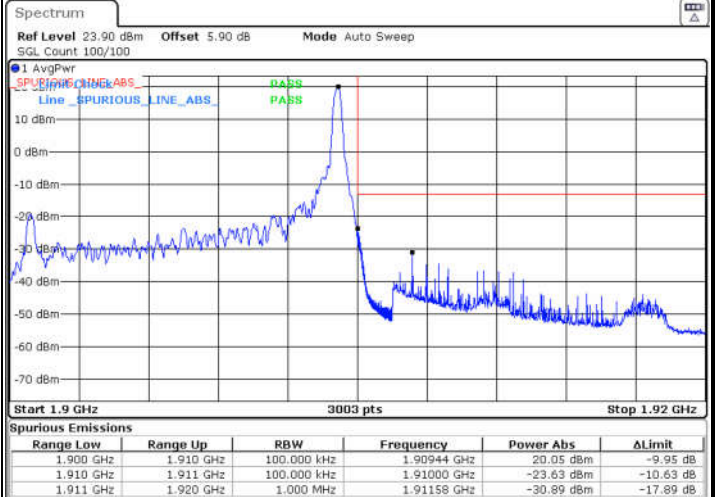
LTE Band 2 / 10MHz / QPSK

Lowest Band Edge / 1 RB



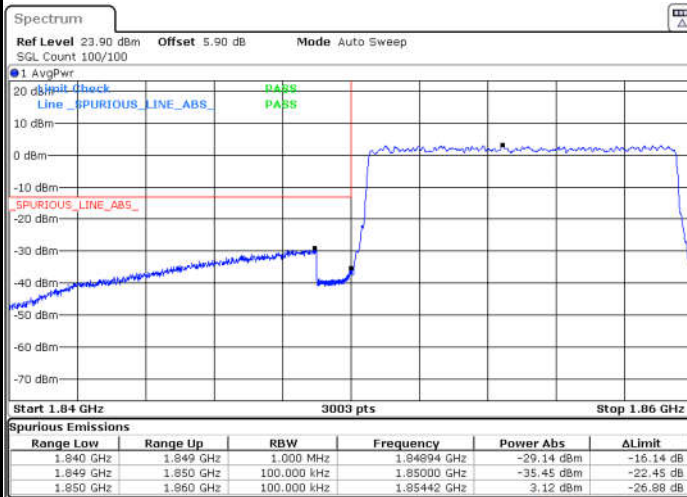
Date: 5 MAR 2021 02:03:12

Highest Band Edge / 1 RB



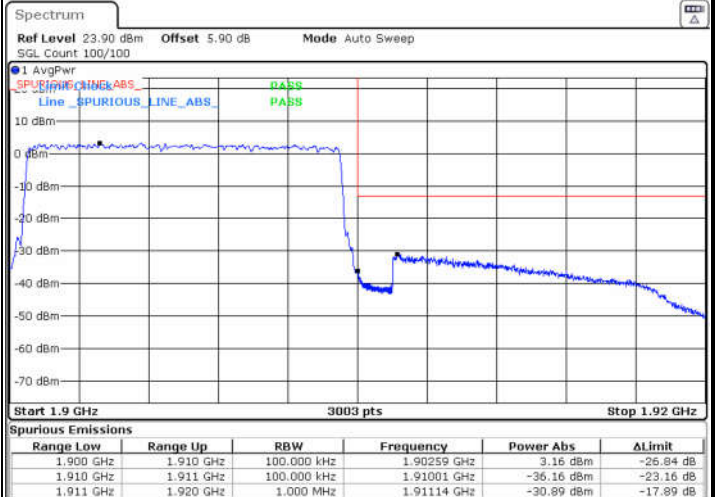
Date: 5 MAR 2021 02:07:42

Lowest Band Edge / Full RB



Date: 5 MAR 2021 02:05:27

Highest Band Edge / Full RB

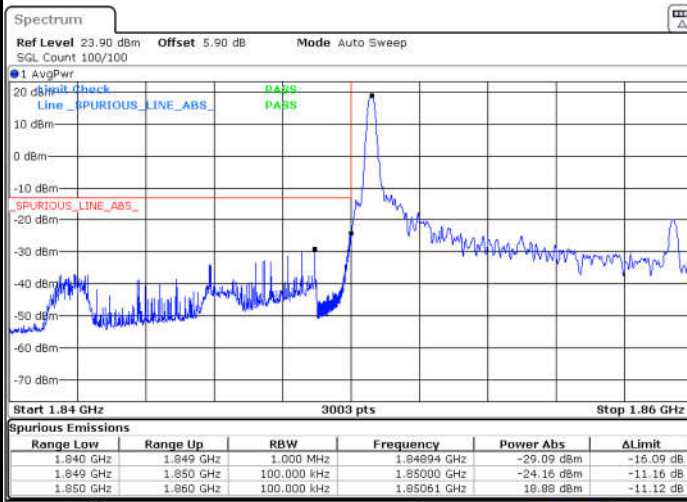


Date: 5 MAR 2021 02:09:57



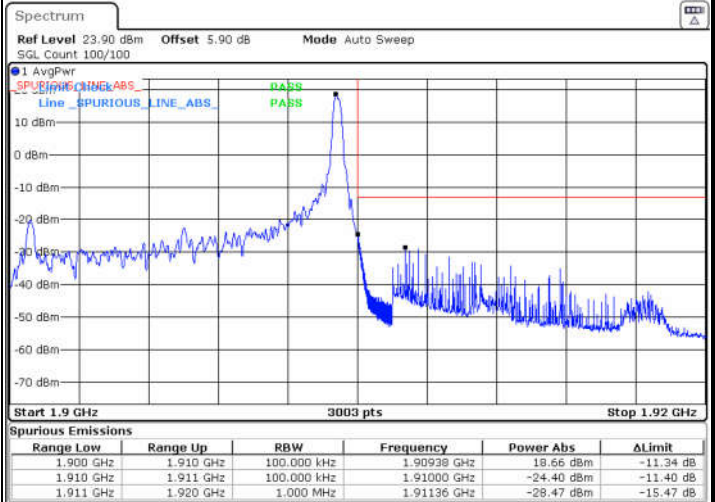
LTE Band 2 / 10MHz / 16QAM

Lowest Band Edge / 1 RB



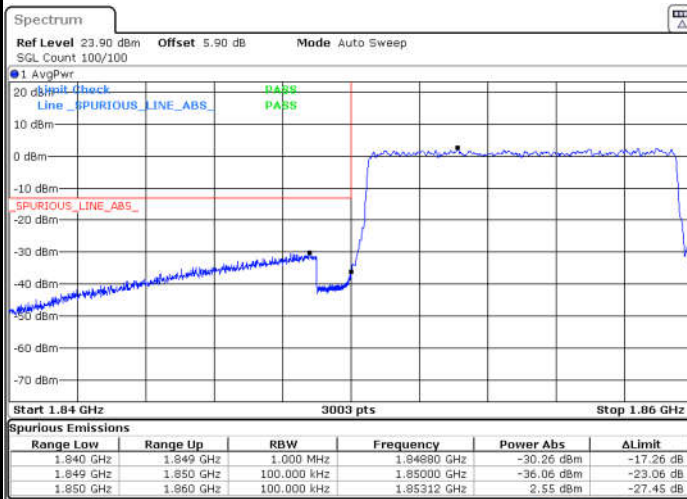
Date: 5 MAR 2021 02:04:20

Highest Band Edge / 1 RB



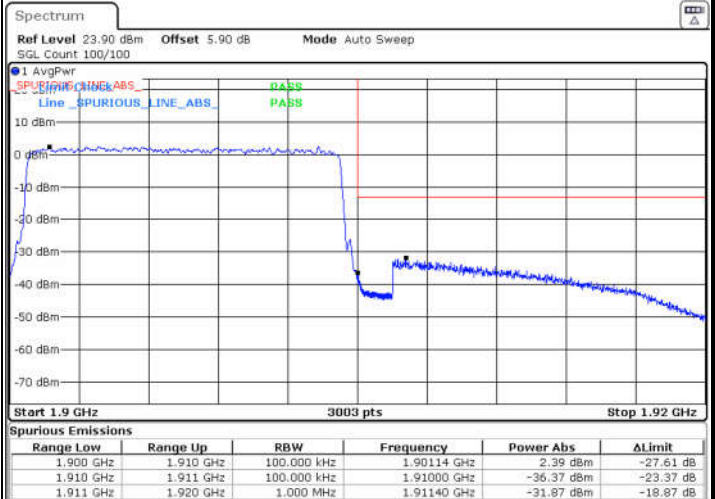
Date: 5 MAR 2021 02:08:49

Lowest Band Edge / Full RB



Date: 5 MAR 2021 02:06:34

Highest Band Edge / Full RB



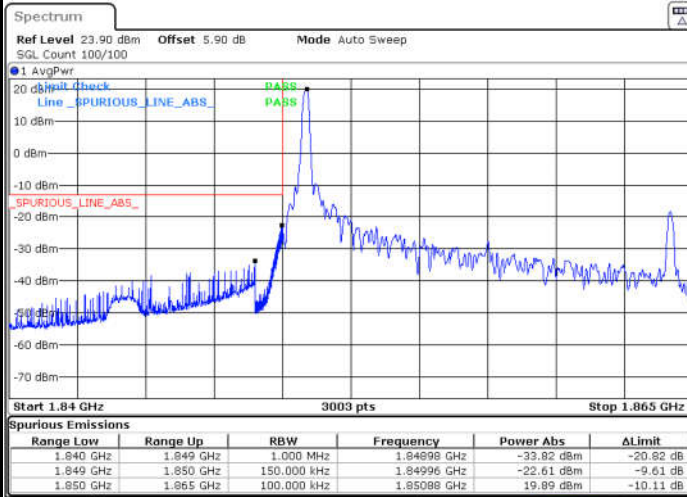
Date: 5 MAR 2021 02:11:04





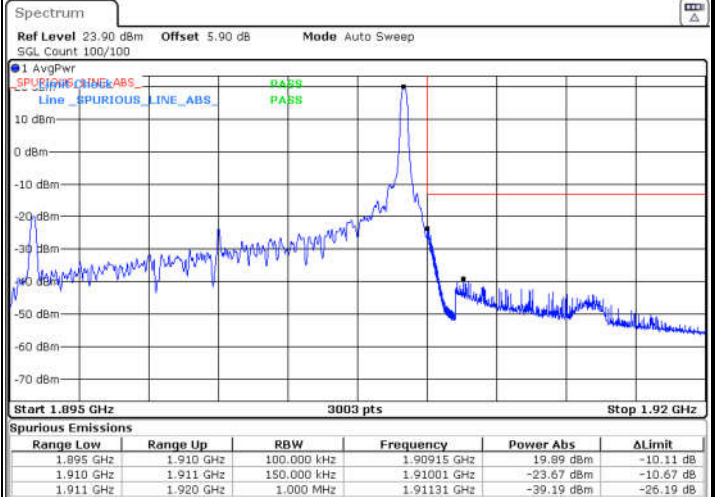
LTE Band 2 / 15MHz / QPSK

Lowest Band Edge / 1 RB



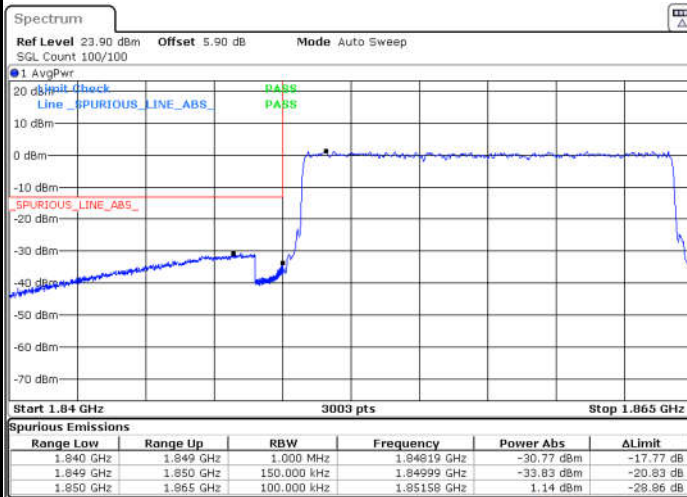
Date: 5 MAR 2021 02:12:11

Highest Band Edge / 1 RB



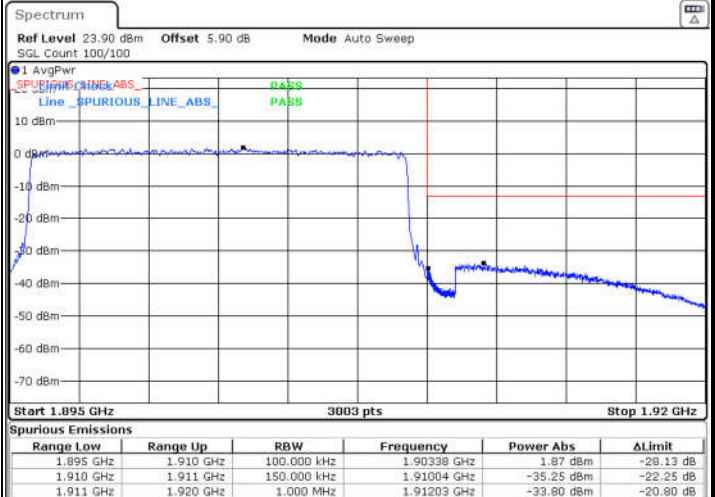
Date: 5 MAR 2021 02:16:41

Lowest Band Edge / Full RB



Date: 5 MAR 2021 02:14:26

Highest Band Edge / Full RB

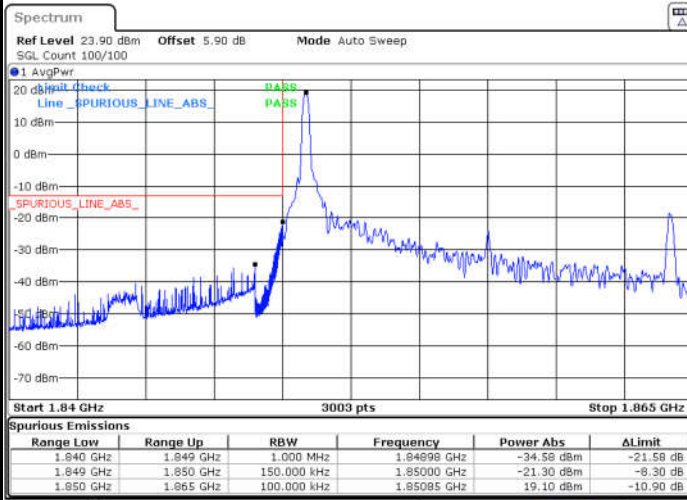


Date: 5 MAR 2021 02:18:56



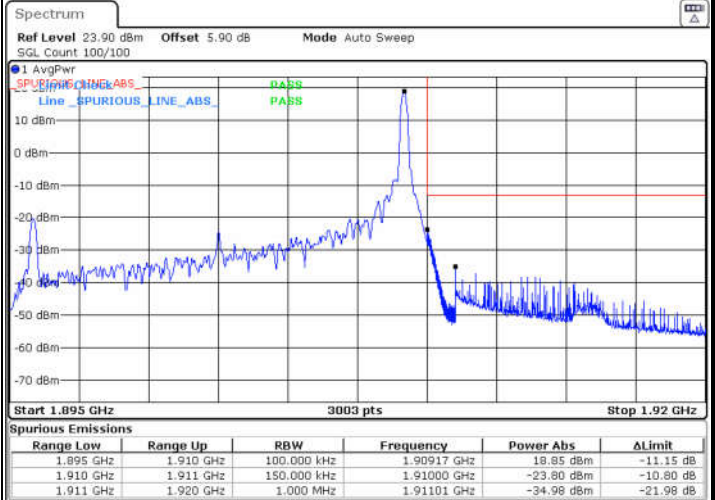
LTE Band 2 / 15MHz / 16QAM

Lowest Band Edge / 1 RB



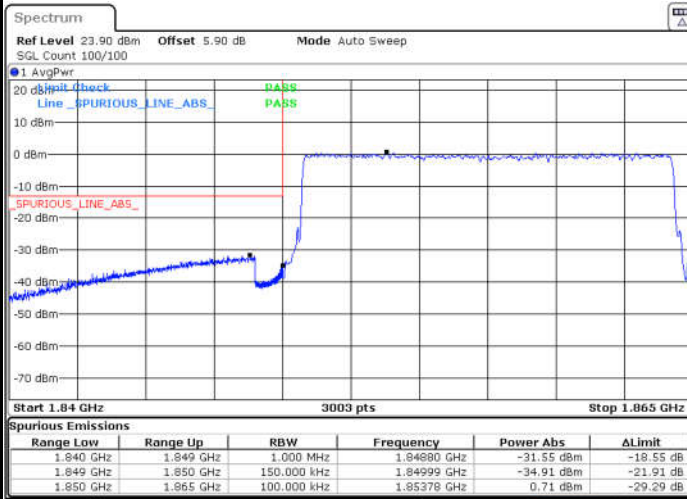
Date: 5 MAR 2021 02:13:19

Highest Band Edge / 1 RB



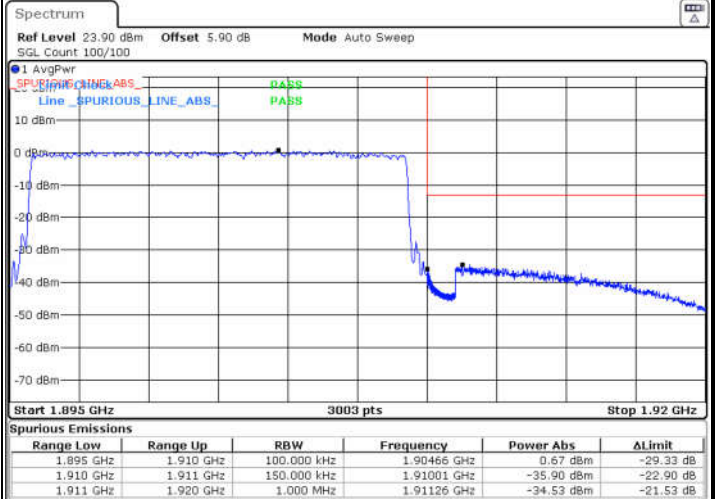
Date: 5 MAR 2021 02:17:49

Lowest Band Edge / Full RB



Date: 5 MAR 2021 02:15:34

Highest Band Edge / Full RB



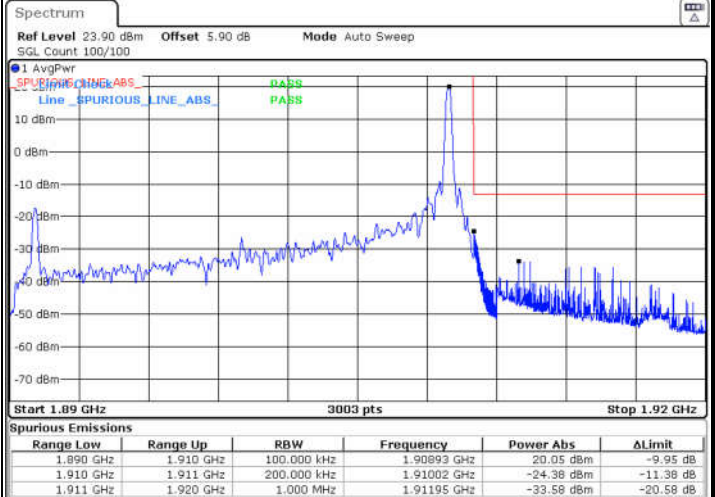
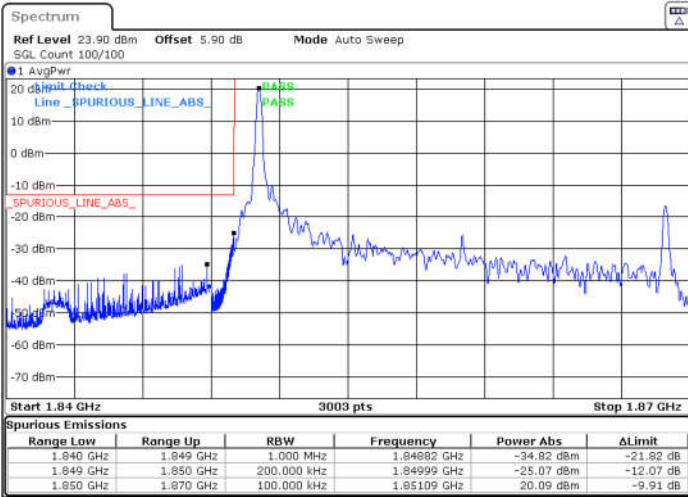
Date: 5 MAR 2021 02:20:03



LTE Band 2 / 20MHz / QPSK

Lowest Band Edge / 1 RB

Highest Band Edge / 1 RB

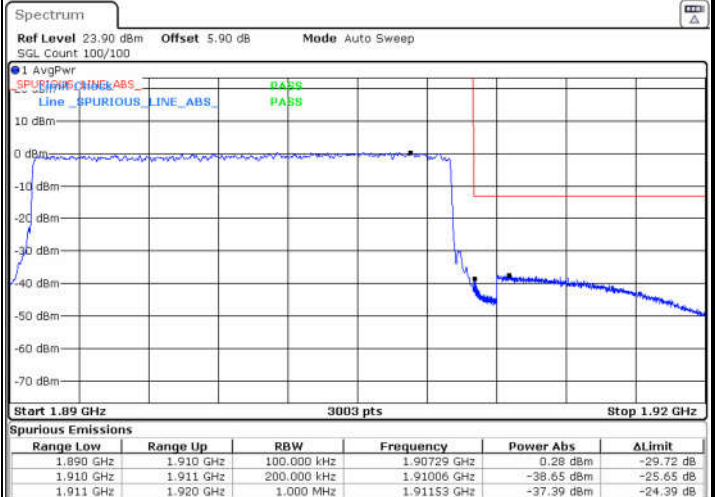
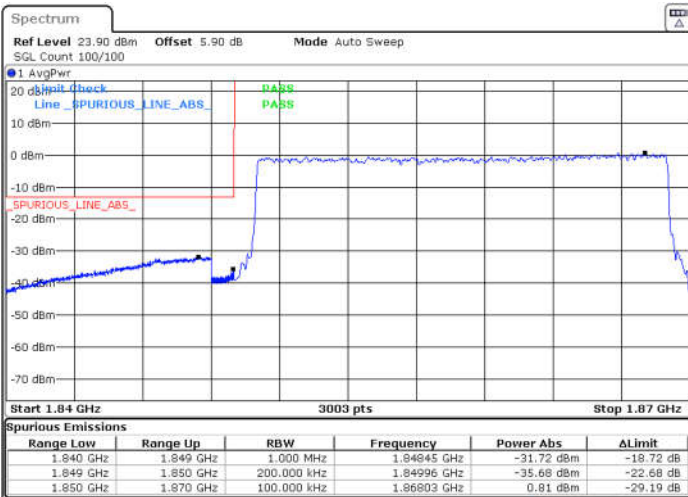


Date: 5 MAR 2021 02:21:11

Date: 5 MAR 2021 02:25:40

Lowest Band Edge / Full RB

Highest Band Edge / Full RB



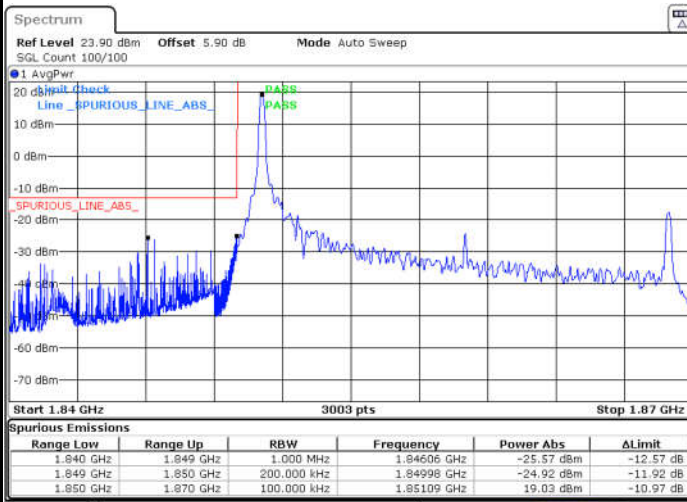
Date: 5 MAR 2021 02:23:28

Date: 5 MAR 2021 02:27:55



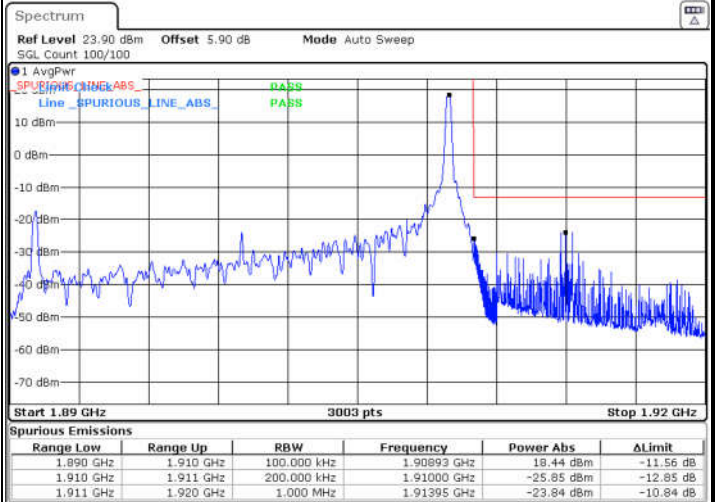
LTE Band 2 / 20MHz / 16QAM

Lowest Band Edge / 1 RB



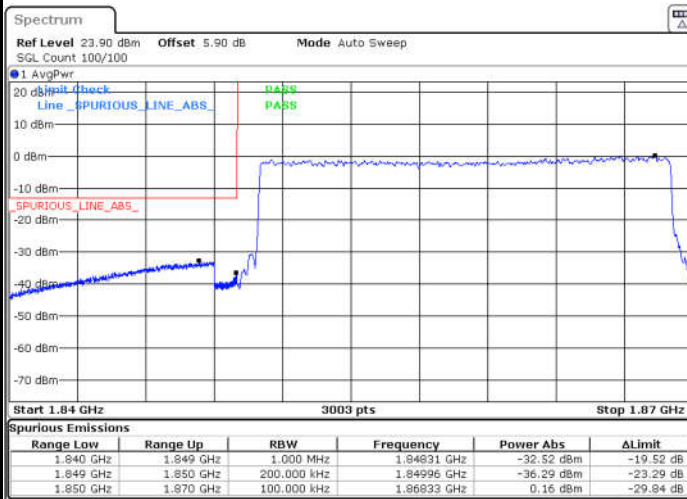
Date: 5 MAR 2021 02:22:18

Highest Band Edge / 1 RB



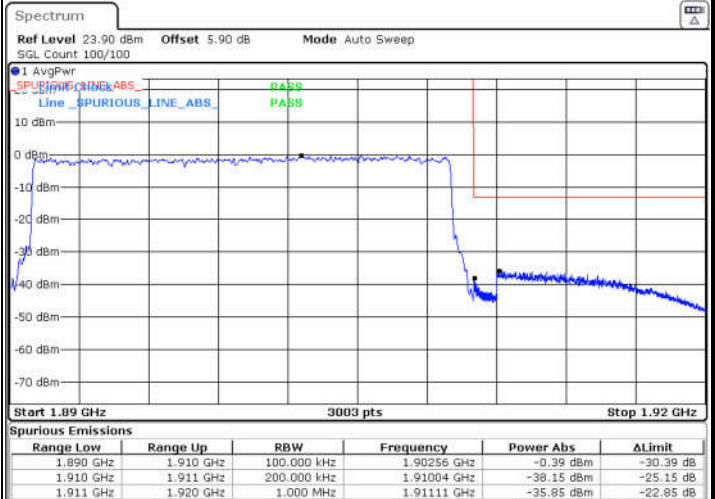
Date: 5 MAR 2021 02:26:48

Lowest Band Edge / Full RB



Date: 5 MAR 2021 02:24:33

Highest Band Edge / Full RB



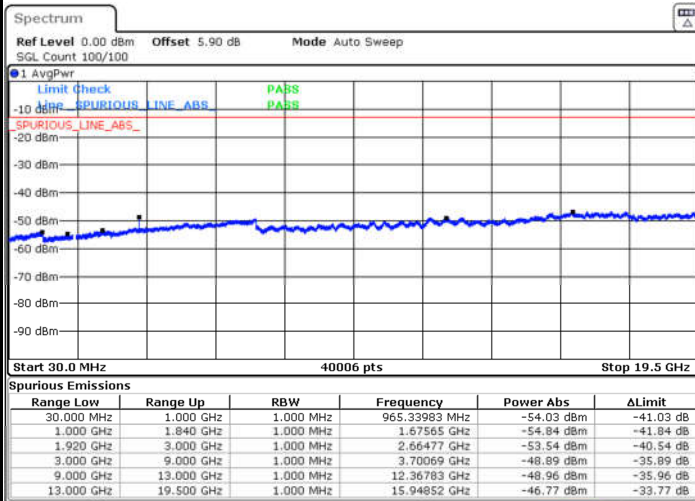
Date: 5 MAR 2021 02:29:03



# Conducted Spurious Emission

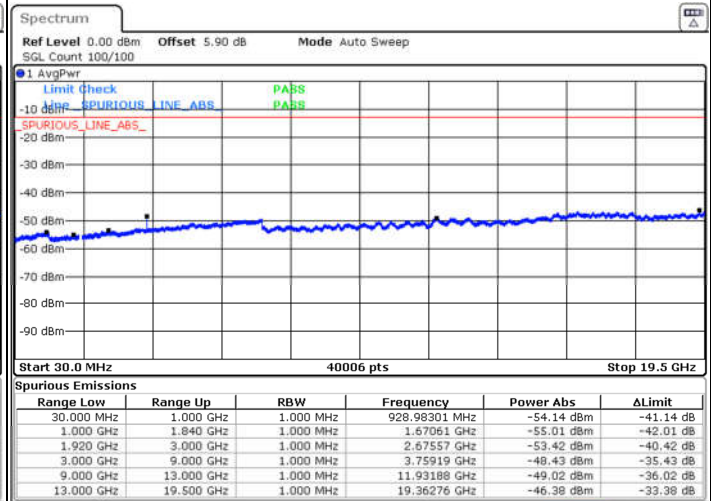
## LTE Band 2 / 1.4MHz

### Lowest Channel / QPSK



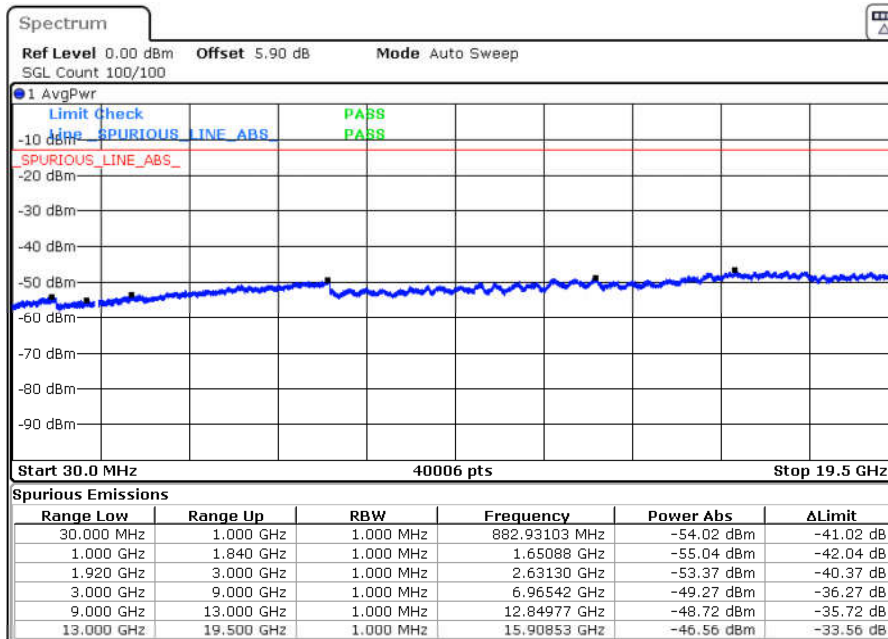
Date: 5 MAR 2021 03:07:34

### Middle Channel / QPSK



Date: 5 MAR 2021 03:06:18

### Highest Channel / QPSK

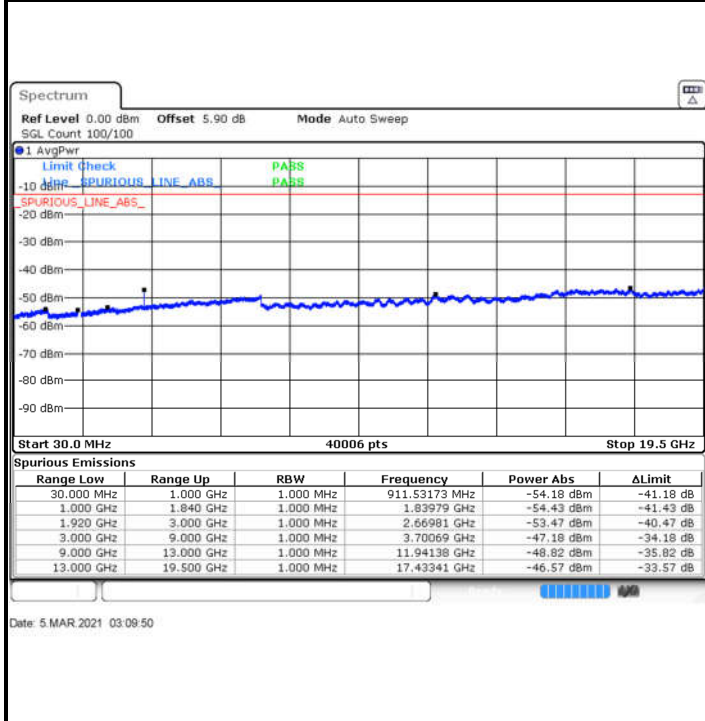


Date: 5 MAR 2021 03:08:18

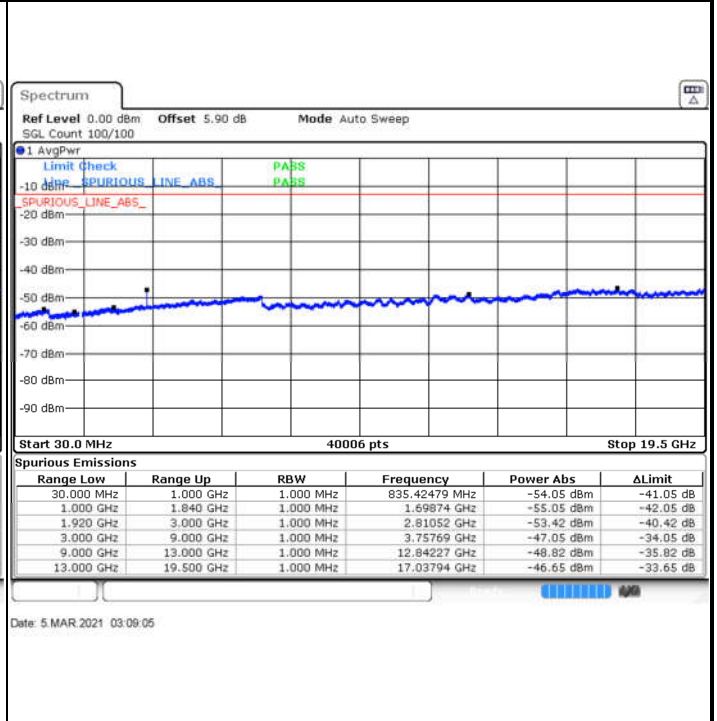


**LTE Band 2 / 3MHz**

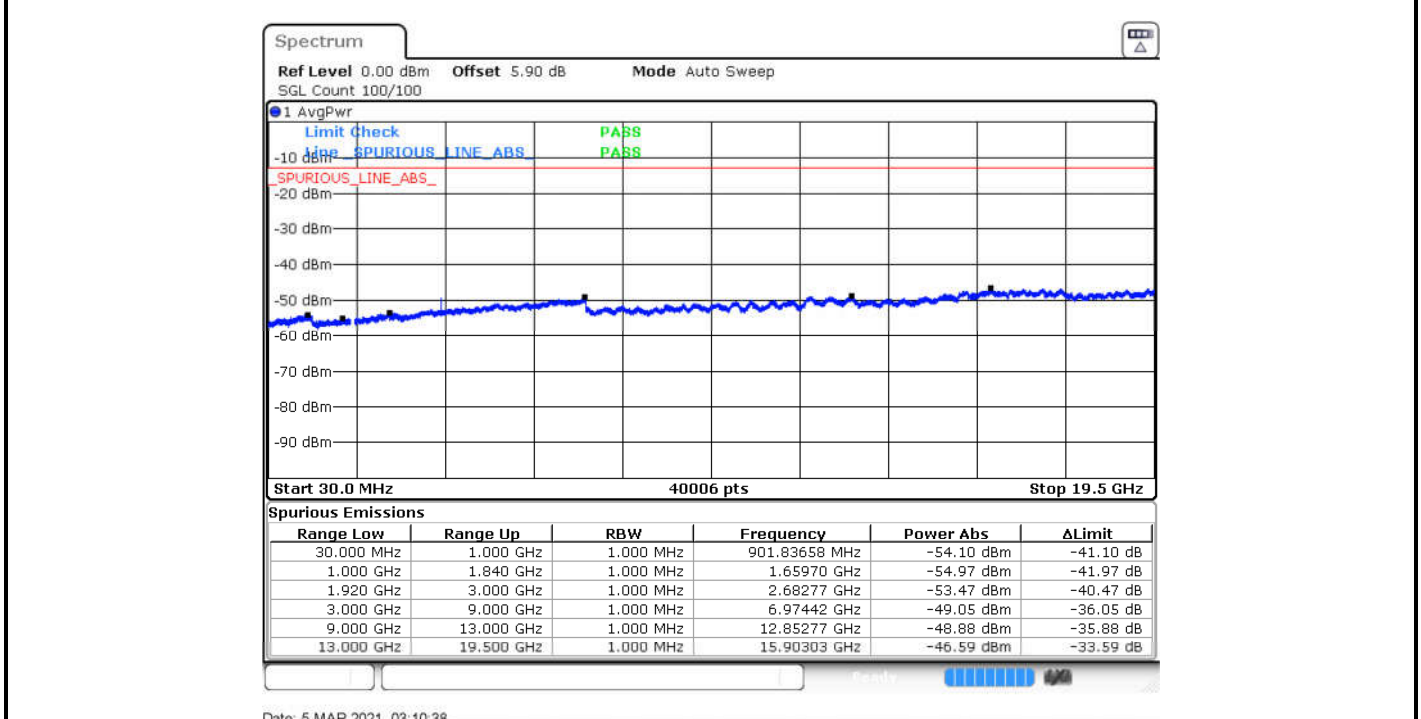
**Lowest Channel / QPSK**



**Middle Channel / QPSK**



**Highest Channel / QPSK**

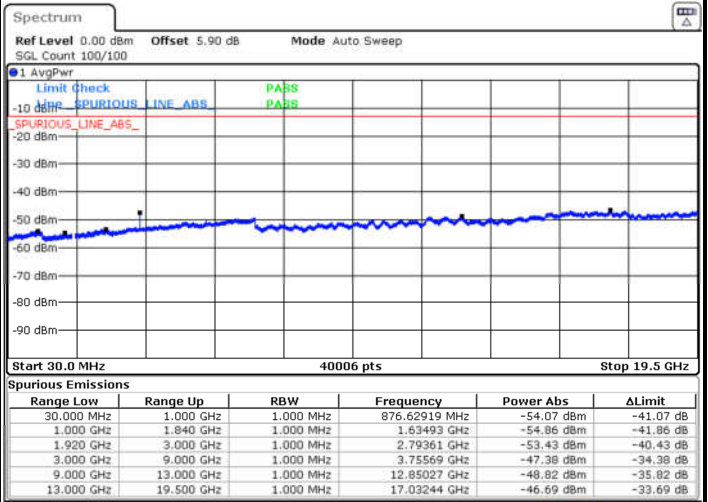
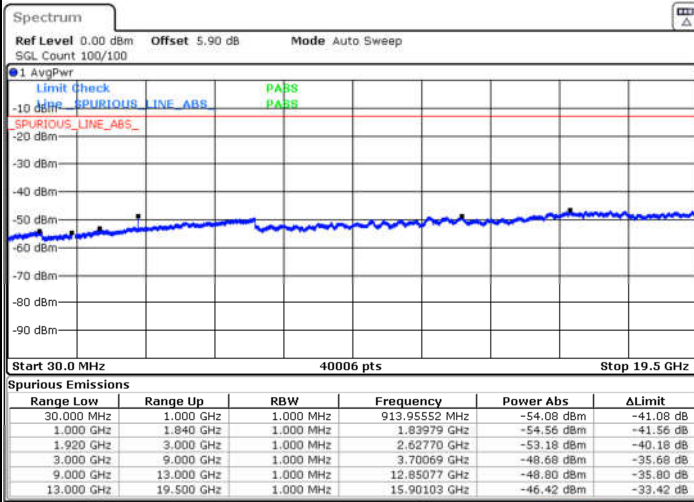




LTE Band 2 / 5MHz

Lowest Channel / QPSK

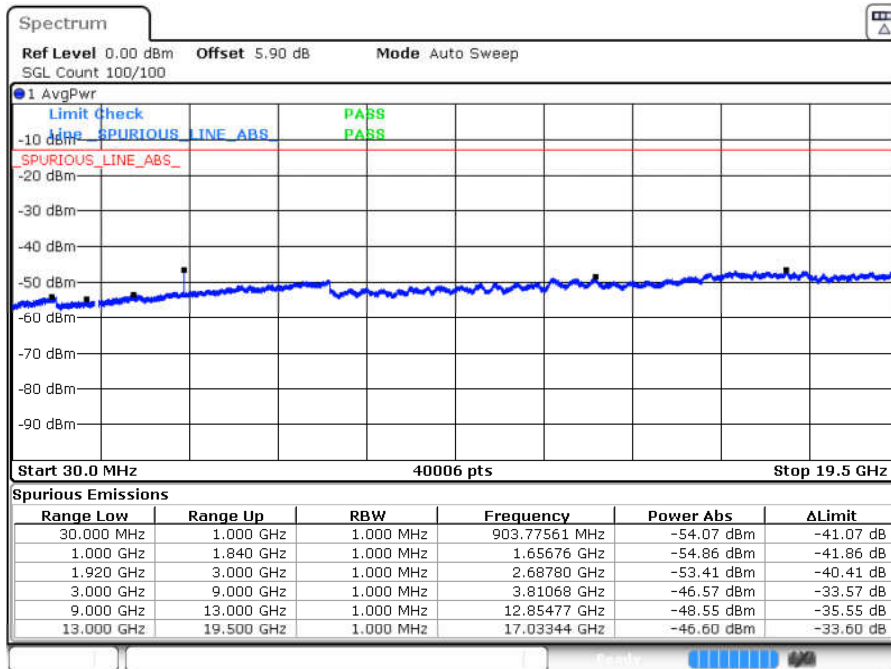
Middle Channel / QPSK



Date: 5 MAR 2021 03:12:15

Date: 5 MAR 2021 03:11:33

Highest Channel / QPSK

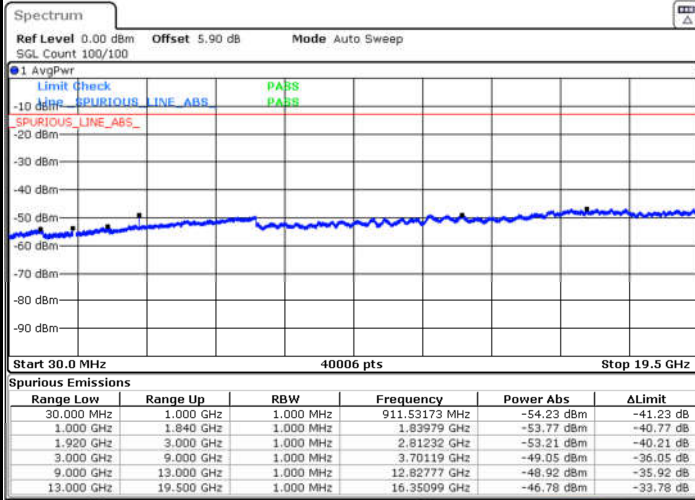


Date: 5 MAR 2021 03:12:59



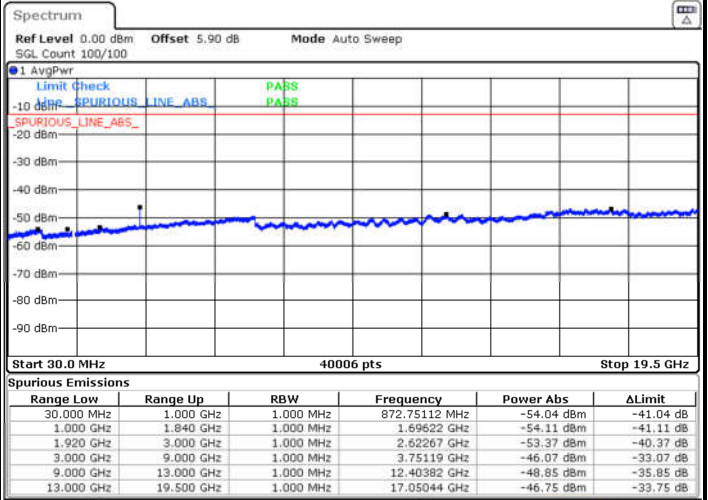
LTE Band 2 / 10MHz

Lowest Channel / QPSK



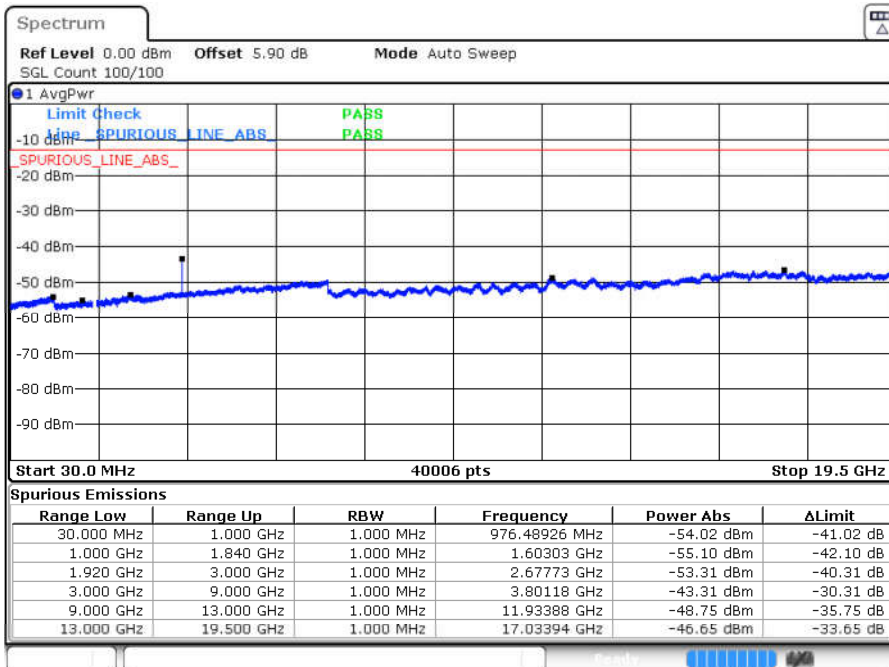
Date: 5 MAR 2021 03:15:18

Middle Channel / QPSK



Date: 5 MAR 2021 03:13:53

Highest Channel / QPSK



Date: 5 MAR 2021 03:16:22

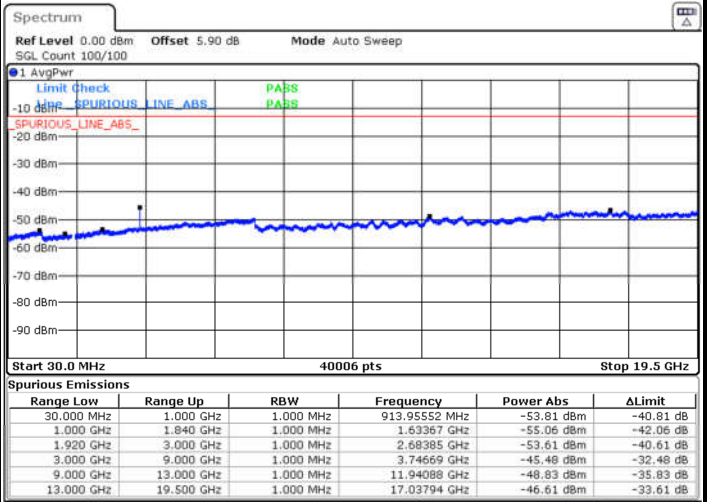
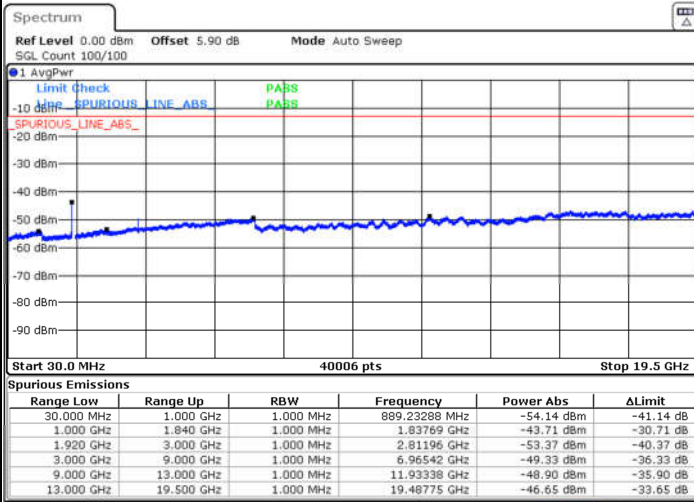




LTE Band 2 / 15MHz

Lowest Channel / QPSK

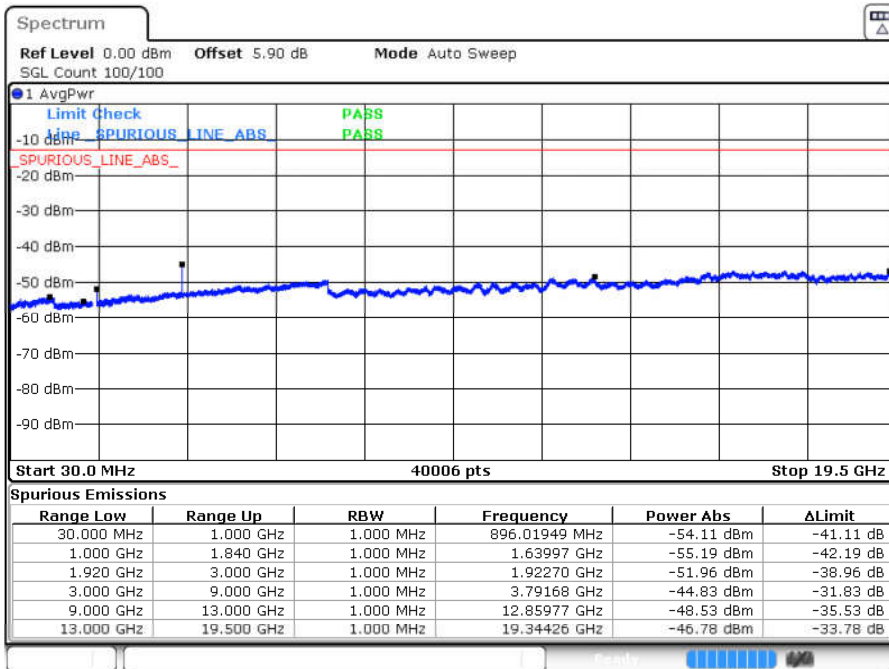
Middle Channel / QPSK



Date: 5 MAR 2021 03:17:54

Date: 5 MAR 2021 03:17:09

Highest Channel / QPSK



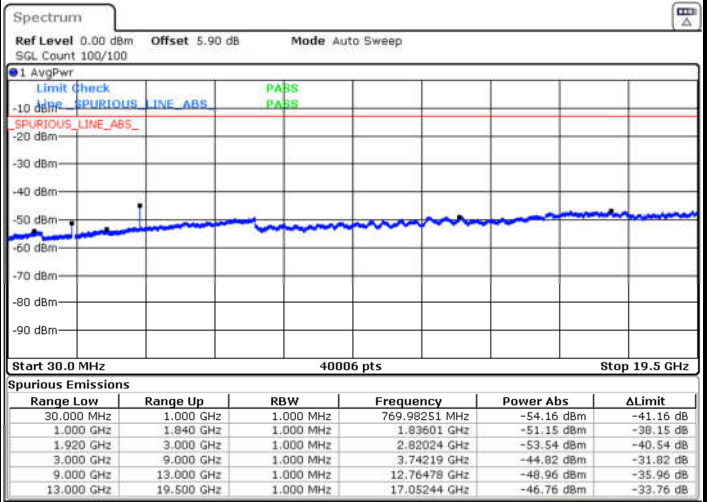
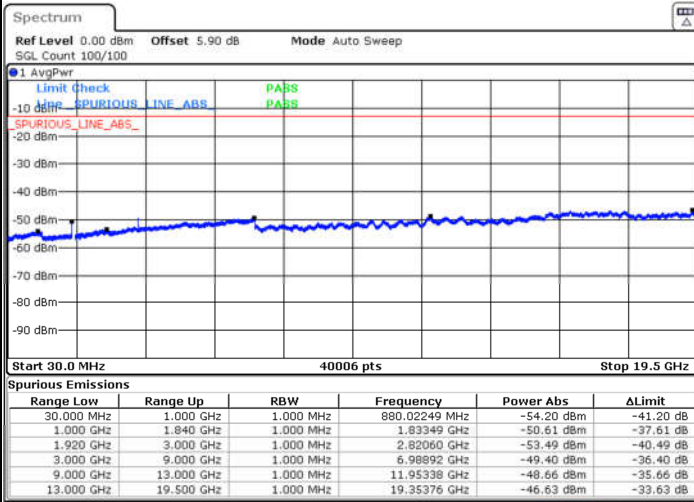
Date: 5 MAR 2021 03:21:37



LTE Band 2 / 20MHz

Lowest Channel / QPSK

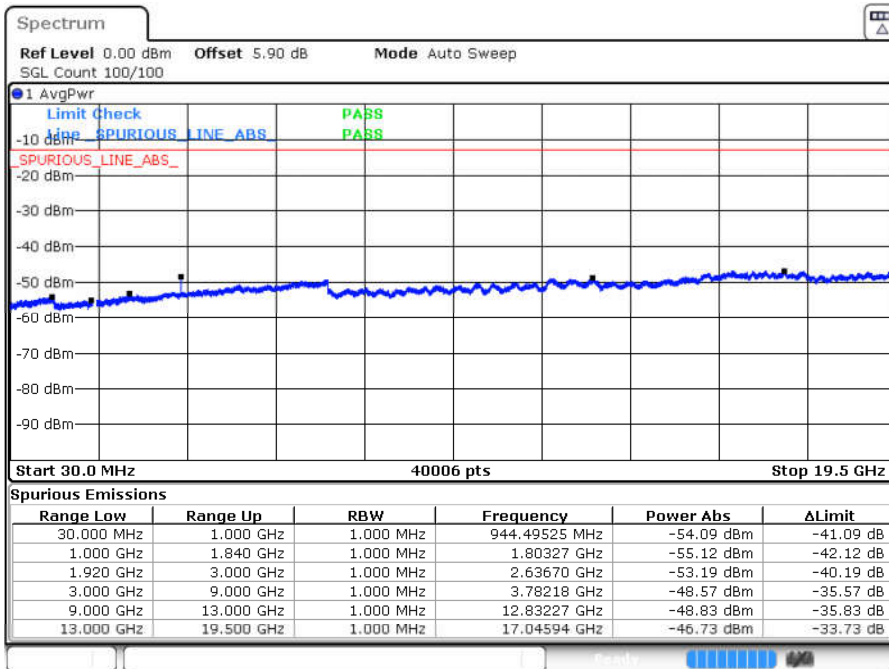
Middle Channel / QPSK



Date: 5 MAR 2021 03:04:18

Date: 5 MAR 2021 03:02:17

Highest Channel / QPSK



Date: 5 MAR 2021 03:05:21



### Frequency Stability

Test Conditions		LTE Band 2 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 20MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0006	PASS
40	Normal Voltage	0.0005	
30	Normal Voltage	0.0013	
20(Ref.)	Normal Voltage	0.0002	
10	Normal Voltage	0.0004	
0	Normal Voltage	0.0002	
-10	Normal Voltage	0.0017	
-20	Normal Voltage	0.0024	
-30	Normal Voltage	0.0018	
20	Maximum Voltage	0.0006	
20	Normal Voltage	0.0011	
20	Battery End Point	0.0001	

**Note:**

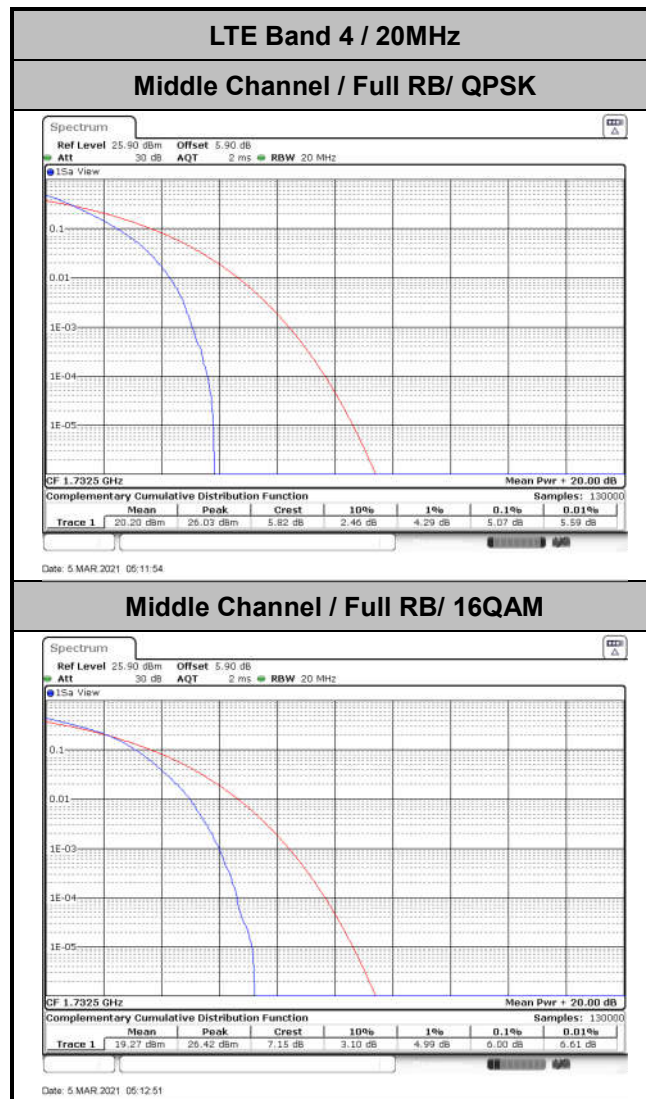
1. Normal Voltage =3.9 V. ; Battery End Point (BEP) =3.6 V. ; Maximum Voltage =4.2 V.
2. Note: The frequency fundamental emissions stay within the authorized frequency block.



# LTE Band 4

## Peak-to-Average Ratio

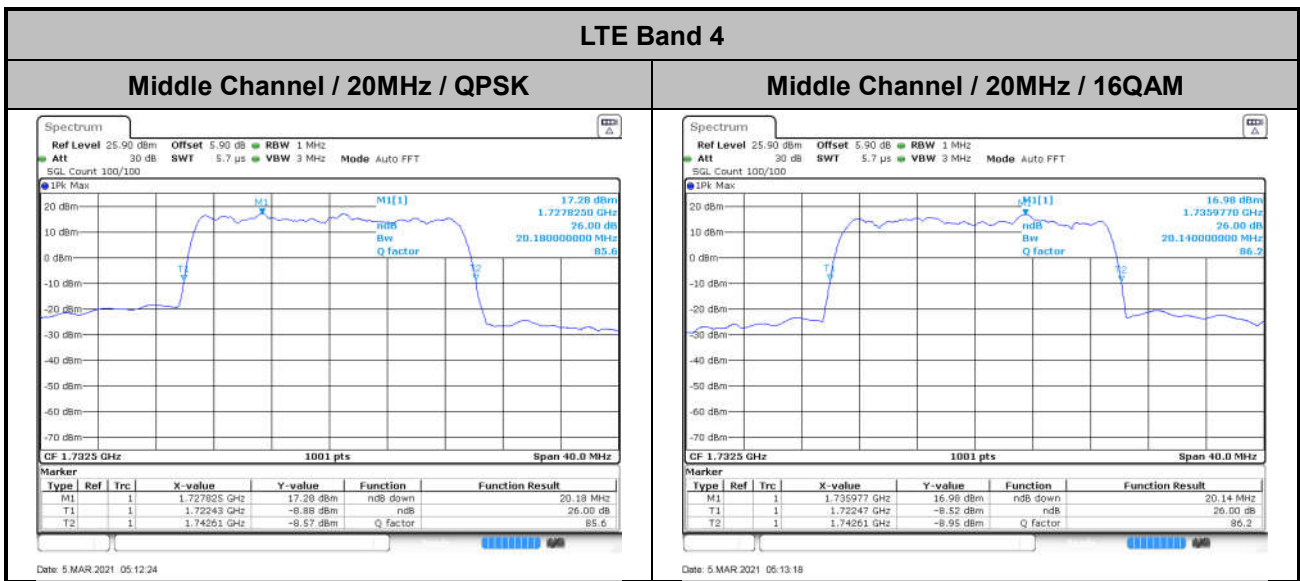
Mode	LTE Band 4 / 20MHz			
Mod.	QPSK	16QAM		Limit: 13dB
RB Size	Full RB	Full RB		Result
Middle CH	5.07	6.00		<b>PASS</b>





## 26dB Bandwidth

Mode	LTE Band 4 : 26dB BW(MHz)	
BW	20MHz	
Mod.	QPSK	16QAM
Middle CH	20.18	20.14





# Occupied Bandwidth

Mode	LTE Band 4 : 99%OBW(MHz)	
BW	20MHz	
Mod.	QPSK	16QAM
Middle CH	18.42	18.30

