



REPORT No.: SZ18050027W06

TEST REPORT

APPLICANT : Wiko SAS

PRODUCT NAME : Smartphone

MODEL NAME : W_C200SN

BRAND NAME : Wiko

FCC ID : 2AM86WC200SN

STANDARD(S) : 47 CFR Part 27, Subpart M

TEST DATE : 2018-05-17 to 2018-05-31

ISSUE DATE : 2018-05-31

Tested by:

Su Hang
Su Hang (Test Engineer)

Approved by:

Andy Yeh
Andy Yeh (Technical Director)

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MORLAB

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REPORT No.: SZ18050027W06

Change History		
Issue	Date	Reason for change
1.0	2018-05-25	First edition
2.0	2018-05-31	Second edition



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Wiko SAS
Applicant Address:	1, rue Capitaine Dessemond 13007 - Marseille - France.
Manufacturer:	Shenzhen Tinnno Mobile Technology Corp.
Manufacturer Address:	4/F, H-3 Building, OCT Eastern industrial Park, No.1 XiangShan East Road., Nan Shan District, Shenzhen, P.R. China

1.2. Equipment Under Test (EUT) Description

Product Name:	Smartphone	
Serial No:	(N/A, marked #1 by test site)	
Hardware Version:	V1.1	
Software Version:	W_C200SN-V02	
Modulation Type:	QPSK, 16QAM	
Operation Band:	Band 7 Channel Bandwidth	
Frequency Range:	LTE Band 7	Tx: 2500MHz - 2570MHz
		Rx: 2500MHz - 2570MHz
Channel Bandwidth:	LTE Band 7	5 MHz, 10MHz, 15 MHz, 20 MHz
Emission Designator:	4M49G7D (LTE Band 7, QPSK, BW 5MHz) 4M49W7D (LTE Band 7, 16QAM, BW 5MHz) 8M96G7D (LTE Band 7, QPSK, BW 10MHz) 8M98W7D (LTE Band 7, 16QAM, BW 10MHz) 13M47G7D (LTE Band 7, QPSK, BW 15MHz) 13M46W7D (LTE Band 7, 16QAM, BW 15MHz) 17M91G7D (LTE Band 7, QPSK, BW 20MHz) 17M94W7D (LTE Band 7, 16QAM, BW 20MHz)	
Antenna Type:	PIFA Antenna	
Antenna Gain:	-1.1 dBi	
Operating voltage:	Normal(NV):	3.8V
	Lowest(LV):	3.5V
	Highest(HV):	4.35V



Note 1: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.3. Test Standards and Results

The objective of the report is to perform testing according to Part 2 and Part 27 for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
3	47 CFR Part 27	Miscellaneous Wireless Communications Services

Test detailed items/section required by FCC rules and results are as below:

Section	Description	Test Date	Test Engineer	Result
2.1046	Transmitter Conducted Output Power	May 23, 2018	Su Hang	PASS
2.1049	Occupied Bandwidth	May 17, 2018	Su Hang	PASS
2.1055, 27.54	Frequency Stability	May 17, 2018	Su Hang	PASS
27.50(d)(5)	Peak to Average Ratio	May 17, 2018	Su Hang	PASS
2.1051, 27.53(m)(4)	Conducted Spurious Emissions	May 31, 2018	Su Hang	PASS
2.1051, 27.53(m)(4)	Band Edge	May 24, 2018	Su Hang	PASS
27.50(c)(10), 27.50(h)(2)	Equivalent Isotropic Radiated Power	May 25, 2018	Wu Zhongwen	PASS
2.1051, 27.53(m)(4)	Radiated Spurious Emissions	May 23, 2018	Wu Zhongwen	PASS

Note: The tests were performed according to the method of measurements prescribed in KDB971168 D01 v03 (Oct 27, 2017) and ANSI/TIA-603-E-2016.

1.4. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106

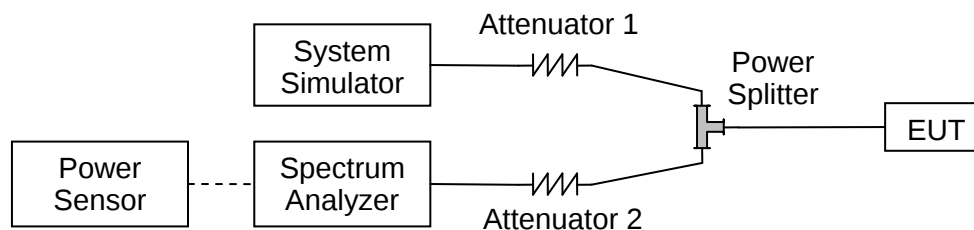
2. 47 CFR Part 2, 27 Requirements

2.1. Transmitter Conducted Output Power

2.1.1. Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

2.1.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2.1.3. Test procedure

KDB 971168 D01v03 Section 5.2 and ANSI/TIA-603-E-2016.

2.1.4. Result



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 7	20MHz	L 20850	2510	QPSK	1	0	22.64
					1	49	22.75
					1	99	22.68
					50	0	22.31
					50	25	22.12
					50	49	22.15
					100	0	22.55
				16-QAM	1	0	20.75
					1	49	21.40
					1	99	20.26
					50	0	19.90
					50	25	19.79
					50	49	19.62
					100	0	19.76
		M 21100	2535	QPSK	1	0	22.57
					1	49	22.71
					1	99	22.81
					50	0	22.51
					50	25	22.42
					50	49	22.39
					100	0	22.44
				16-QAM	1	0	21.23
					1	49	21.63
					1	99	21.15
					50	0	20.05
					50	25	20.16
					50	49	20.18
					100	0	20.11
		H 21350	2560	QPSK	1	0	22.58
					1	49	22.37
					1	99	22.27
					50	0	22.38
					50	25	22.44
					50	49	22.61
					100	0	22.51
				16-QAM	1	0	21.86
					1	49	21.86
					1	99	21.53
					50	0	20.77
					50	25	20.58
					50	49	20.62
					100	0	20.68



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 7	15MHz	L 20825	2507.5	QPSK	1	0	21.83
					1	37	21.68
					1	74	21.24
					36	0	20.77
					36	18	20.71
					36	35	20.69
					75	0	20.62
				16-QAM	1	0	21.31
					1	37	21.53
					1	74	20.58
					36	0	19.93
					36	18	19.85
					36	35	19.80
					75	0	19.81
		M 21100	2535	QPSK	1	0	21.92
					1	37	21.72
					1	74	21.65
					36	0	20.84
					36	18	20.48
					36	35	20.41
					75	0	20.35
				16-QAM	1	0	21.30
					1	37	21.59
					1	74	20.95
					36	0	20.19
					36	18	20.21
					36	35	20.23
					75	0	20.16
		H 21375	2562.5	QPSK	1	0	22.25
					1	37	22.11
					1	74	21.85
					36	0	21.38
					36	18	21.25
					36	35	21.25
					75	0	21.10
				16-QAM	1	0	21.97
					1	37	22.08
					1	74	21.51
					36	0	20.61
					36	18	20.65
					36	35	20.55
					75	0	20.60



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 7	10MHz	L 20800	2505	QPSK	1	0	21.84
					1	24	21.61
					1	49	21.53
					25	0	20.13
					25	12	20.12
					25	24	20.11
					50	0	20.07
				16-QAM	1	0	21.00
					1	24	21.27
					1	49	21.17
					25	0	19.90
					25	12	19.81
					25	24	19.91
					50	0	19.87
		M 21100	2535	QPSK	1	0	21.54
					1	24	21.62
					1	49	21.42
					25	0	20.56
					25	12	20.47
					25	24	20.41
					50	0	20.35
				16-QAM	1	0	20.62
					1	24	21.54
					1	49	20.86
					25	0	20.06
					25	12	20.14
					25	24	20.12
					50	0	20.02
		H 21400	2565	QPSK	1	0	22.21
					1	24	22.16
					1	49	22.07
					25	0	20.88
					25	12	20.83
					25	24	20.74
					50	0	20.62
				16-QAM	1	0	21.84
					1	24	22.10
					1	49	21.86
					25	0	20.57
					25	12	20.58
					25	24	20.61
					50	0	20.53



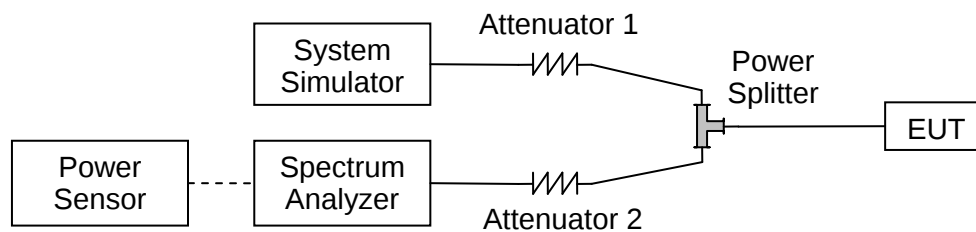
Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 7	5MHz	L 20775	2502.5	QPSK	1	0	21.73
					1	12	21.67
					1	24	21.62
					12	0	20.51
					12	6	20.48
					12	11	20.33
					25	0	20.35
				16-QAM	1	0	20.83
					1	12	21.37
					1	24	20.64
					12	0	19.94
					12	6	19.89
					12	11	19.86
					25	0	19.76
		M 21100	2535	QPSK	1	0	21.95
					1	12	21.74
					1	24	21.87
					12	0	20.92
					12	6	20.88
					12	11	20.61
					25	0	20.35
				16-QAM	1	0	20.62
					1	12	21.54
					1	24	20.86
					12	0	20.06
					12	6	20.14
					12	11	20.12
					25	0	20.02
		H 21425	2567.5	QPSK	1	0	22.29
					1	12	22.19
					1	24	22.23
					12	0	21.32
					12	6	21.25
					12	11	21.10
					25	0	20.92
				16-QAM	1	0	21.41
					1	12	22.00
					1	24	21.20
					12	0	20.58
					12	6	20.57
					12	11	20.36
					25	0	20.46

2.2. Occupied Bandwidth

2.2.1. Requirement

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission. Occupied bandwidth is also known as the 99% emission bandwidth.

2.2.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2.2.3. Test procedure

KDB 971168 D01v03 Section 4.1 and ANSI/TIA-603-E-2016.



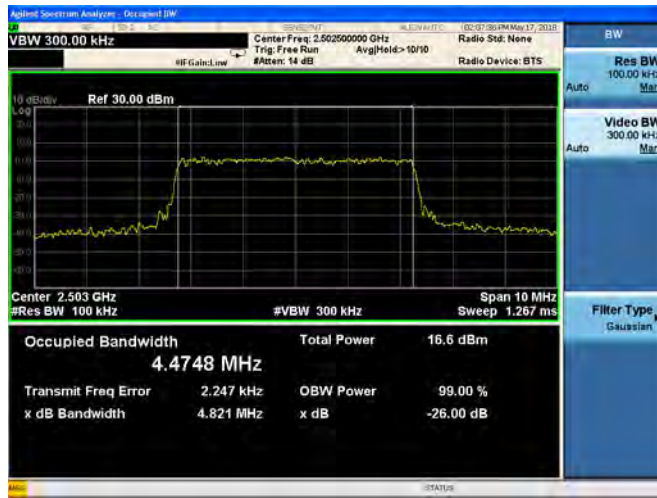
2.2.4. Test Result

LTE Band 7, BW: 5MHz					
Channel	Frequency (MHz)	QPSK		16QAM	
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)
20775	2502.5	4.4748	4.821	4.4763	4.810
21100	2535.0	4.4918	4.805	4.4711	4.765
21425	2567.5	4.4945	4.803	4.4920	4.897
LTE Band 7, BW: 10MHz					
Channel	Frequency (MHz)	QPSK		16QAM	
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)
20800	2505.0	8.9362	9.537	8.9416	9.454
21100	2535.0	8.9391	9.726	8.9751	9.487
21400	2565.0	8.9619	9.534	8.9592	9.453
LTE Band 7, BW: 15MHz					
Channel	Frequency (MHz)	QPSK		16QAM	
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)
20825	2507.5	13.468	14.21	13.459	14.18
21100	2535.0	13.445	14.29	13.455	14.24
21375	2562.5	13.397	14.16	13.443	14.15
LTE Band 7, BW: 20MHz					
Channel	Frequency (MHz)	QPSK		16QAM	
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)
20850	2510.0	17.890	18.96	17.938	18.94
21100	2535.0	17.914	18.87	17.908	18.87
21350	2560.0	17.884	18.90	17.913	18.97

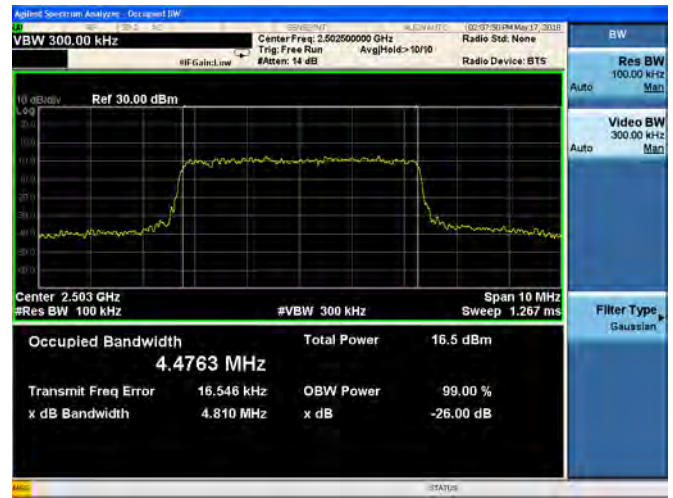


LTE Band 7 99%&26dB Bandwidth

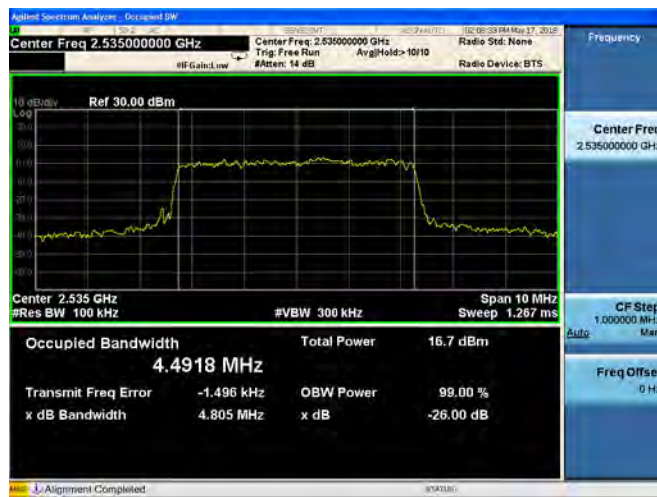
5MHz/QPSK/Low CH



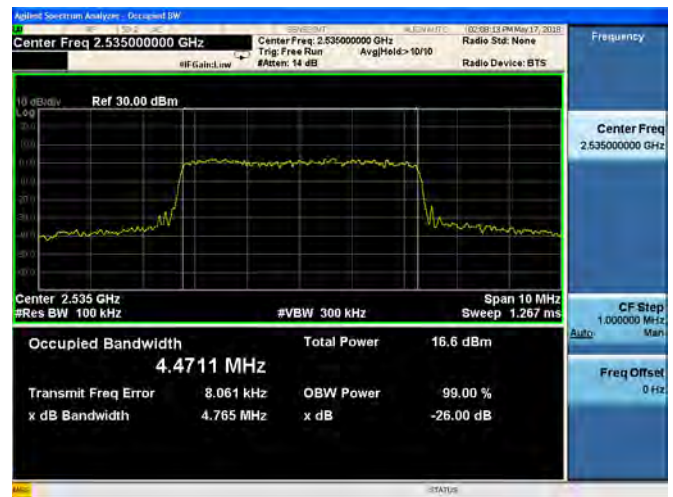
5MHz/16QAM/Low CH



5MHz/QPSK/Mid CH



5MHz/16QAM/Mid CH





5MHz/QPSK/High CH

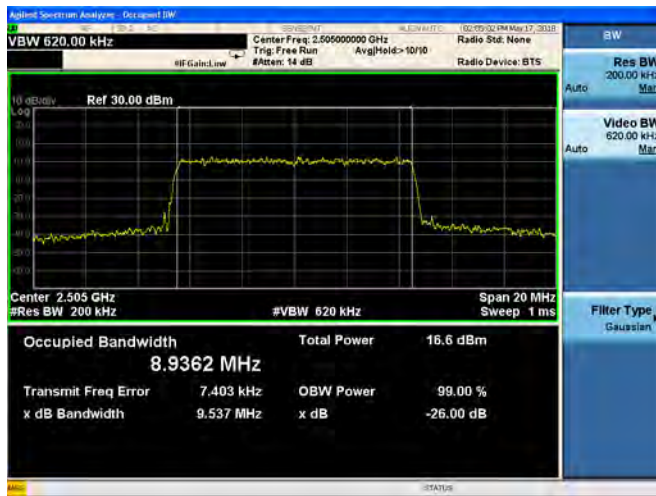


5MHz/16QAM/High CH

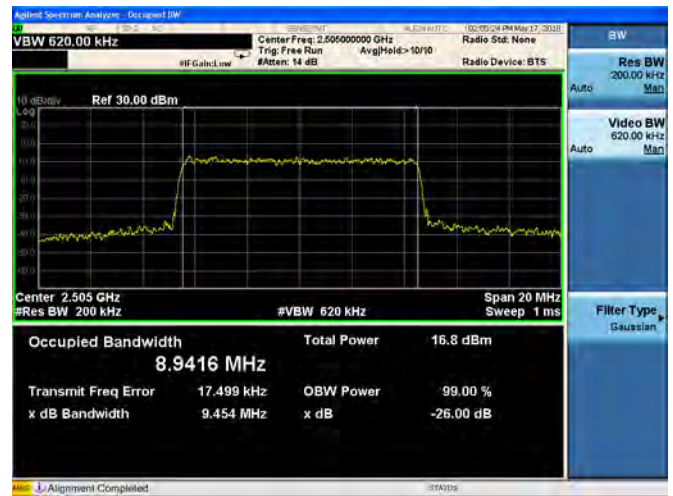




10MHz/QPSK/Low CH



10MHz/16QAM/Low CH



10MHz/QPSK/Mid CH



10MHz/16QAM/Mid CH



10MHz/QPSK/High CH

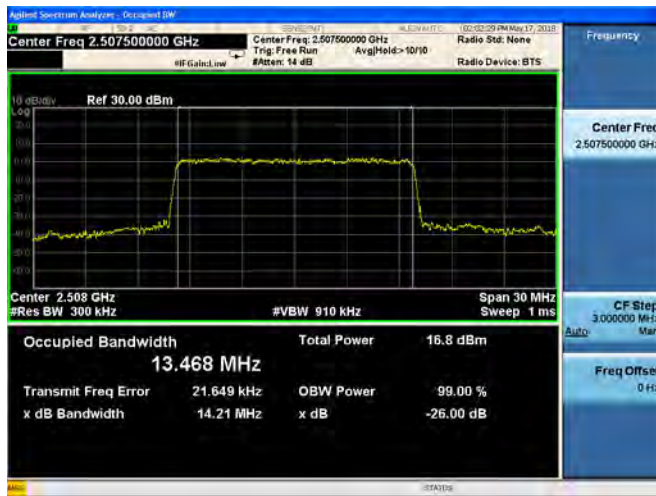


10MHz/16QAM/High CH

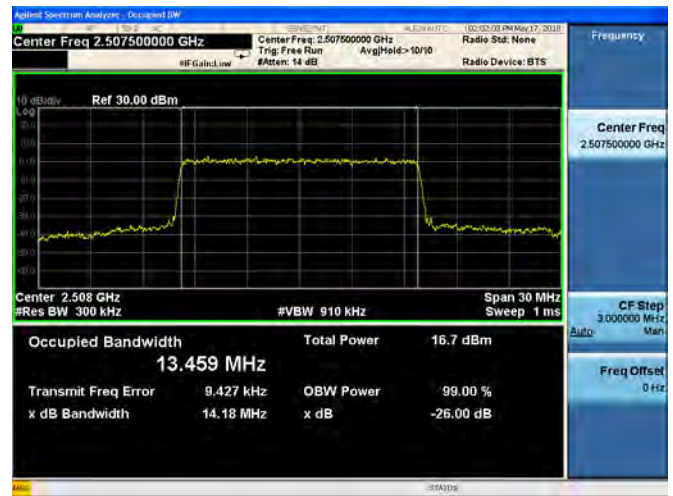




15MHz/QPSK/Low CH



15MHz/16QAM/Low CH



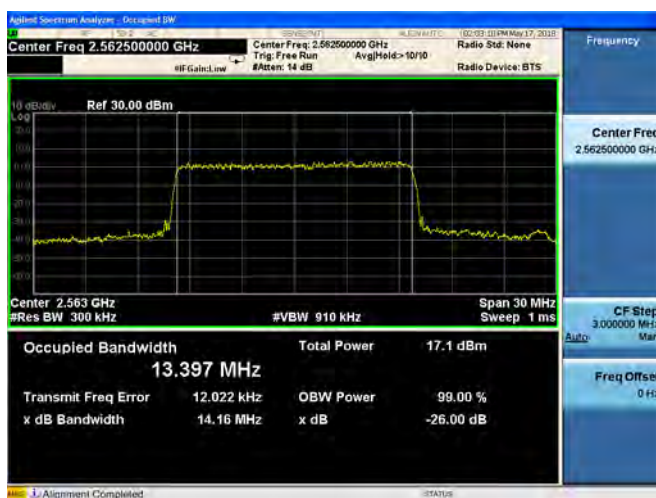
15MHz/QPSK/Mid CH



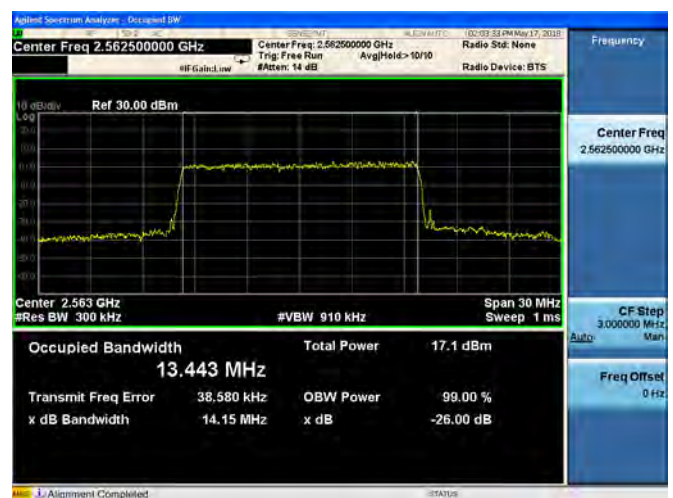
15MHz/16QAM/Mid CH



15MHz/QPSK/High CH



15MHz/16QAM/High CH

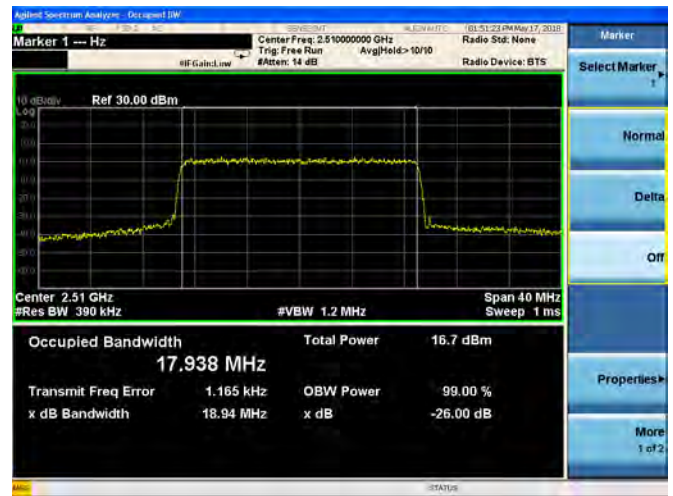




20MHz/QPSK/Low CH



20MHz/16QAM/Low CH



20MHz/QPSK/Mid CH



20MHz/16QAM/Mid CH



20MHz/QPSK/High CH



20MHz/16QAM/High CH



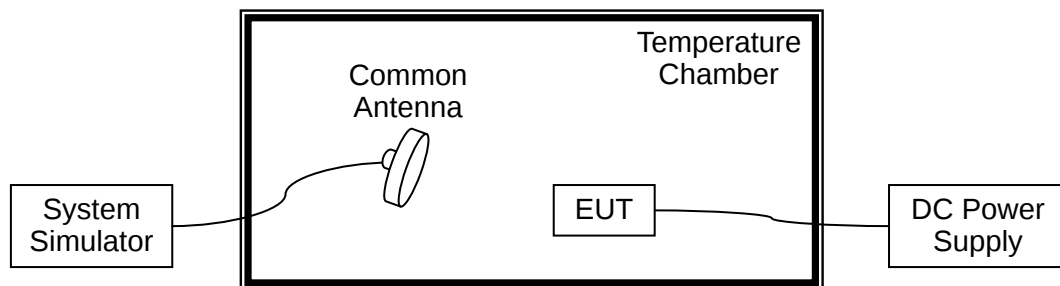
2.3. Frequency Stability

2.3.1. Requirement

According to FCC section 2.1055 & 27.54&24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

- (a) The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.
- (b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

2.3.2. Test Description



The EUT which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT is commanded by the System Simulator (SS) to operate at the maximum output power. A call is established between the EUT and the SS via a Common Antenna.

2.3.3. Test procedure

KDB 971168 D01v03 Section 9.0 and ANSI/TIA-603-E-2016.

2.3.4. Test Result

The nominal, highest and lowest extreme voltages are separately 3.8VDC, 4.35VDC and 3.5VDC, which are specified by the applicant; the normal temperature here used is 20°C. The frequency deviation limit is ± 2.5 ppm.



The testing was performed using one RB and Bandwidth setting for each band.

LTE Band 7 – QPSK - Channel 21100 – Frequency 2535MHz – RB 25/0				
Limit: 2535MHz*2.5ppm=6337.5Hz				
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Result
100	3.8V	-30	9.39	PASS
100		-20	-12.83	
100		-10	6.66	
100		0	8.57	
100		+10	7.39	
100		+20	6.31	
100		+30	-14.06	
100		+40	7.66	
100		+50	6.61	
115	4.35V	+20	-12.91	
85	3.5V	+20	9.74	

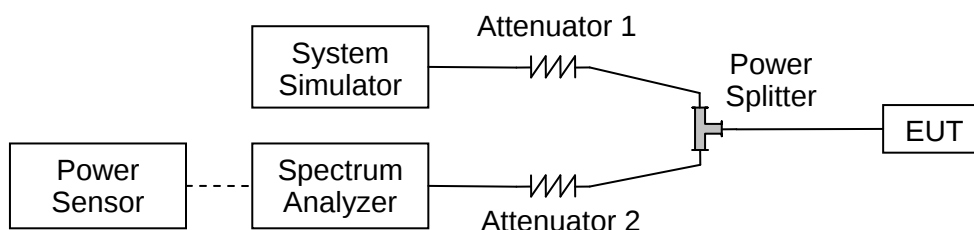
2.4. Peak to Average Ratio

2.4.1. Requirement

According to FCC section 24.232(d), the peak to average ratio (PAR) of the transmission may not exceed 13dB.

2.4.2. Test Description

A. Test Set:



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2.4.3. Test procedure

KDB 971168 D01v03 Section 5.7 and ANSI/TIA-603-E-2016.

2.4.4. Test Result

Record the maximum PAPR level associated with a probability of 0.1%.



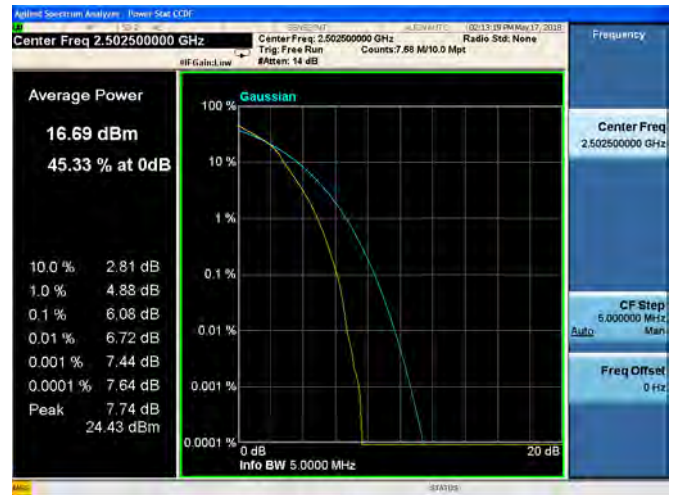
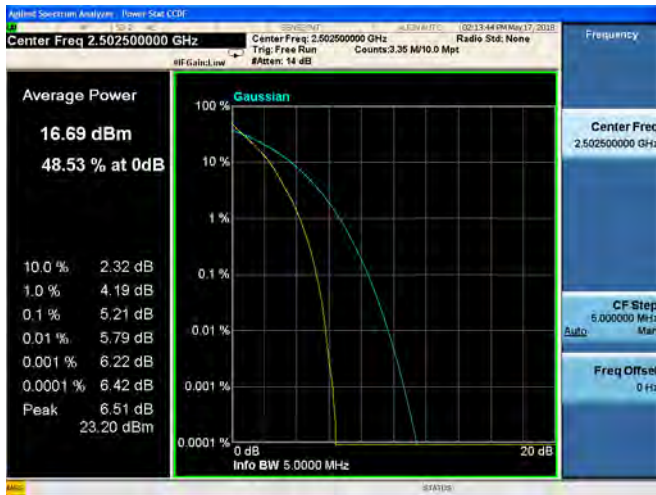
LTE Band 7, BW: 5MHz			
Channel	Frequency (MHz)	Peak to Average Ratio(dB)	
		QPSK	16QAM
20775	2502.5	5.21	6.08
21100	2535.0	8.53	5.75
21425	2567.5	5.28	6.03
LTE Band 7, BW: 10MHz			
Channel	Frequency (MHz)	Peak to Average Ratio(dB)	
		QPSK	16QAM
20800	2505.0	5.73	6.12
21100	2535.0	5.30	5.96
21400	2565.0	6.03	6.24
LTE Band 7, BW: 15MHz			
Channel	Frequency (MHz)	Peak to Average Ratio(dB)	
		QPSK	16QAM
20825	2507.5	5.61	6.26
21100	2535.0	5.47	6.12
21375	2562.5	5.76	6.39
LTE Band 7, BW: 20MHz			
Channel	Frequency (MHz)	Peak to Average Ratio(dB)	
		QPSK	16QAM
20850	2510.0	5.56	6.35
21100	2535.0	5.35	6.16
21350	2560.0	5.62	6.42



LTE Band 7 Peak to Average Radio

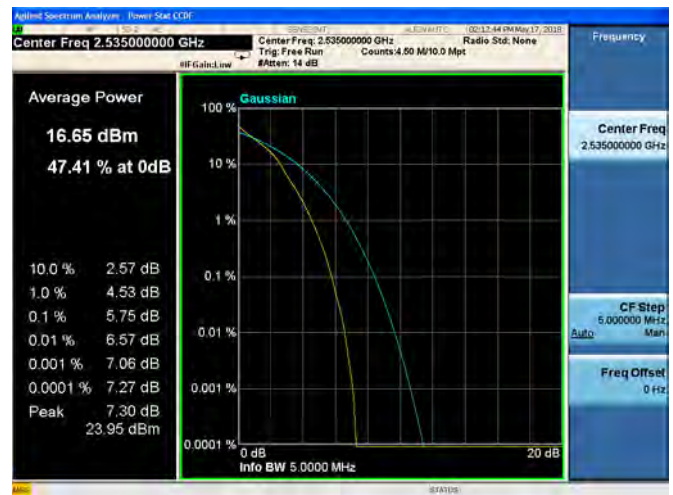
5MHz/QPSK/Low CH

5MHz/16QAM/Low CH



5MHz/QPSK/Mid CH

5MHz/16QAM/Mid CH





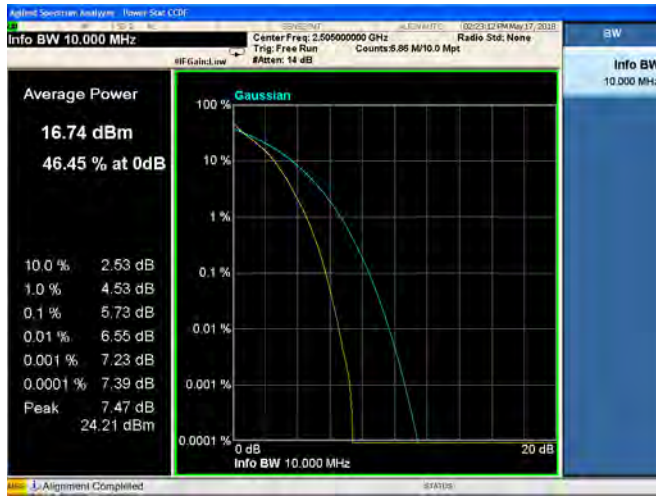
5MHz/QPSK/High CH

5MHz/16QAM/High CH





10MHz/QPSK/Low CH



10MHz/16QAM/Low CH



10MHz/QPSK/Mid CH



10MHz/16QAM/Mid CH



10MHz/QPSK/High CH



10MHz/16QAM/High CH





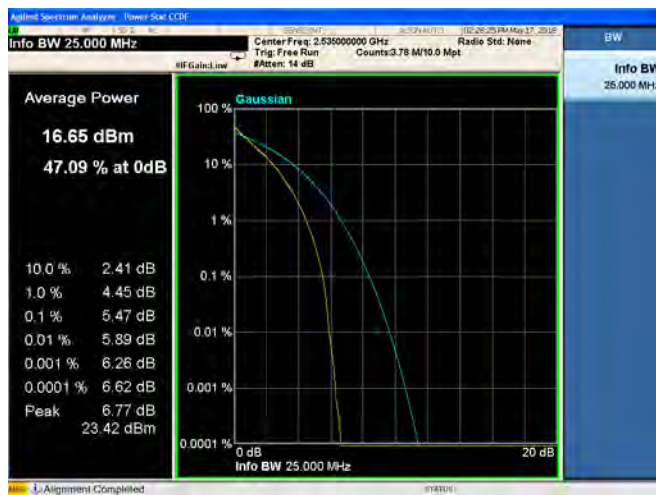
15MHz/QPSK/Low CH



15MHz/16QAM/Low CH



15MHz/QPSK/Mid CH



15MHz/16QAM/Mid CH



15MHz/QPSK/High CH



15MHz/16QAM/High CH





20MHz/QPSK/Low CH



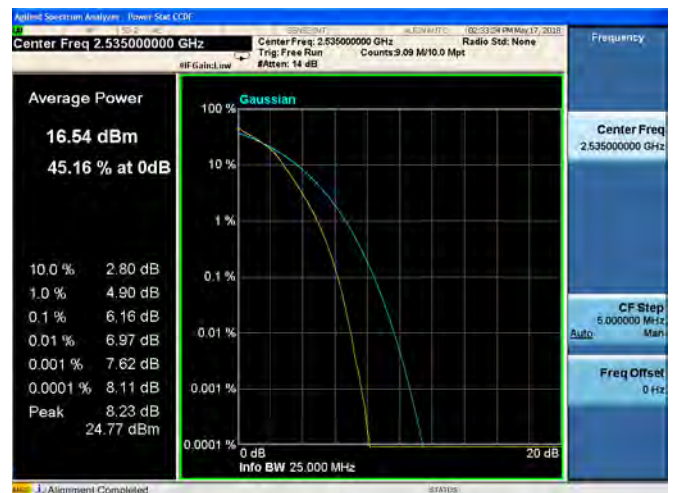
20MHz/16QAM/Low CH



20MHz/QPSK/Mid CH



20MHz/16QAM/Mid CH



20MHz/QPSK/High CH



20MHz/16QAM/High CH



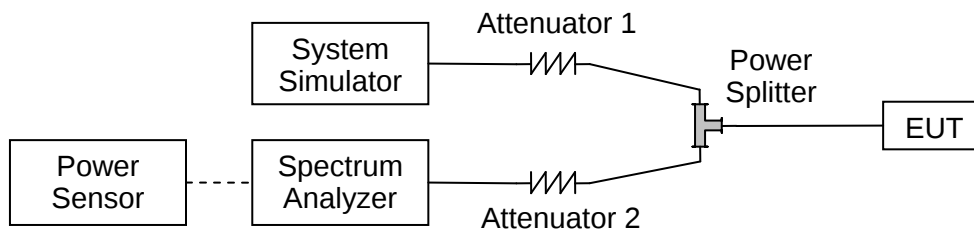
2.5. Conducted Spurious Emissions

2.5.1. Requirement

According to FCC section 2.1051, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \cdot \log(P)$ dB. This calculated to be -13dBm.

For LTE Band 7, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $55 + 10 \cdot \log(P)$ dB. This calculated to be -25dBm.

2.5.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2.5.3. Test procedure

KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.

2.5.4. Test Result



LTE Band 7 5MHz BW Low Channel

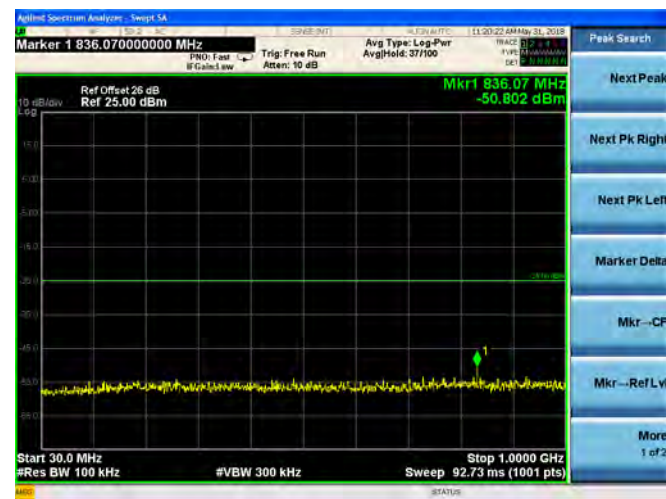
QPSK



16QAM



16QAM



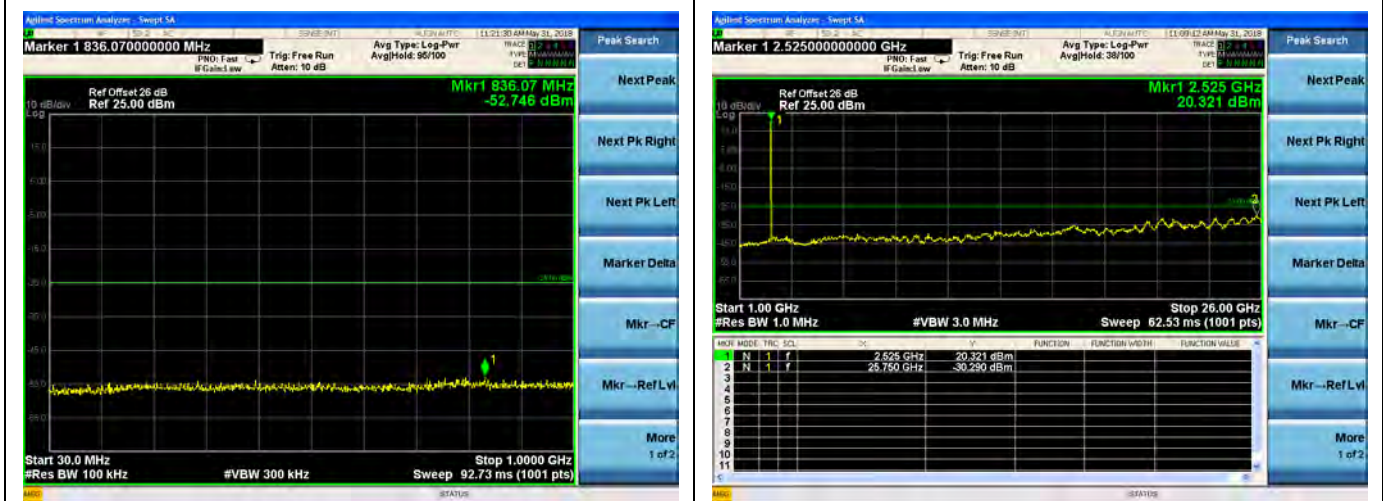


LTE Band 7 5MHz BW Mid Channel

QPSK



16QAM





REPORT No.: SZ18050027W06

LTE Band 7 5MHz BW High Channel

QPSK



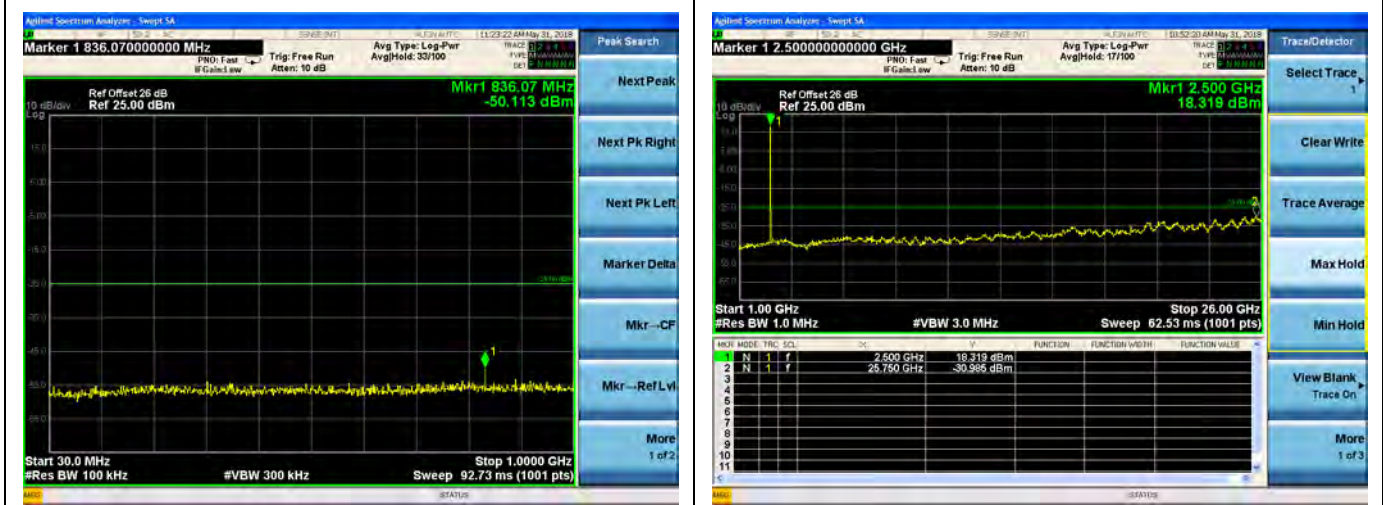
16QAM





LTE Band 7 10MHz BW Low Channel

QPSK



16QAM





LTE Band 7 10MHz BW Mid Channel

QPSK



16QAM





REPORT No.: SZ18050027W06

LTE Band 7 10MHz BW High Channel

QPSK



16QAM





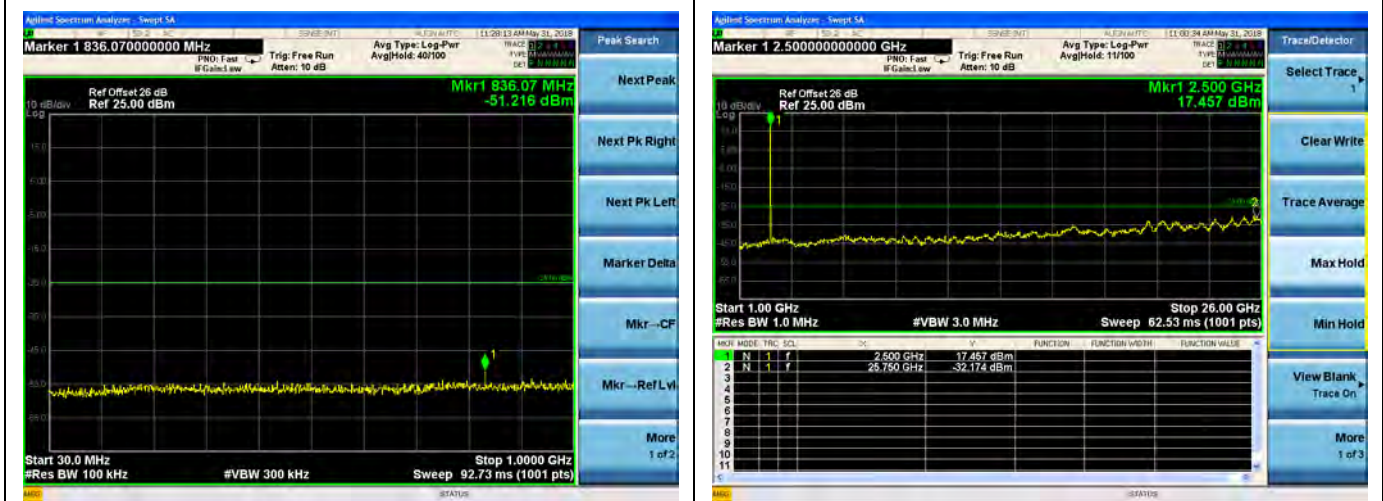
REPORT No.: SZ18050027W06

LTE Band 7 15MHz BW Low Channel

QPSK



16QAM





LTE Band 7 15MHz BW Mid Channel

QPSK



16QAM





LTE Band 7 15MHz BW High Channel

QPSK



16QAM





LTE Band 7 20MHz BW Low Channel

QPSK



16QAM





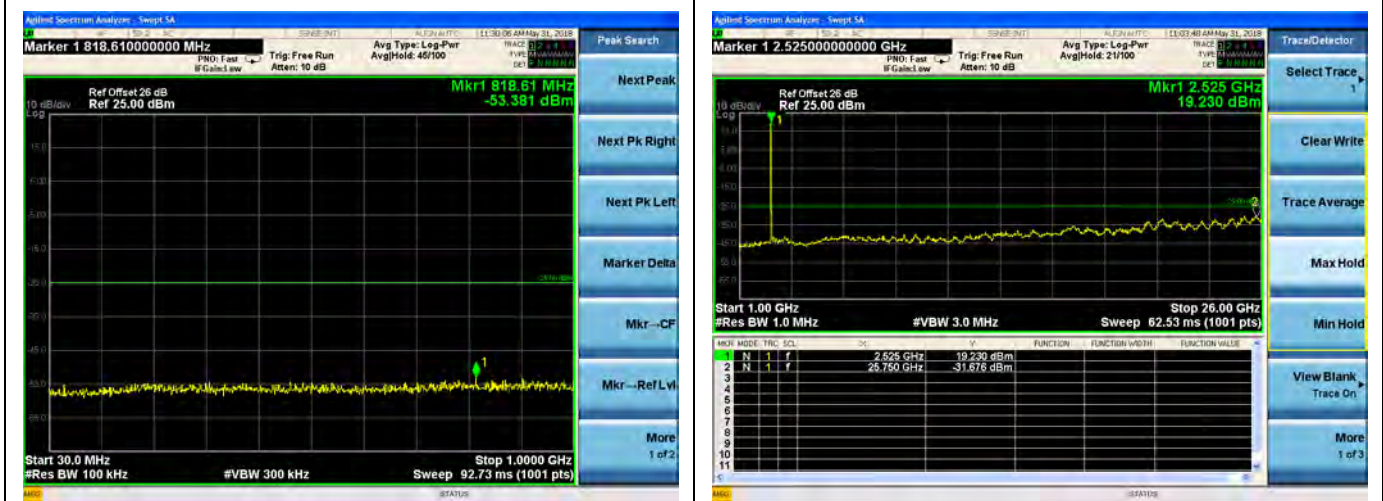
REPORT No.: SZ18050027W06

LTE Band 7 20MHz BW Mid Channel

QPSK



16QAM





LTE Band 7 20MHz BW High Channel

QPSK



16QAM





2.6. Band Edge

2.6.1. Requirement

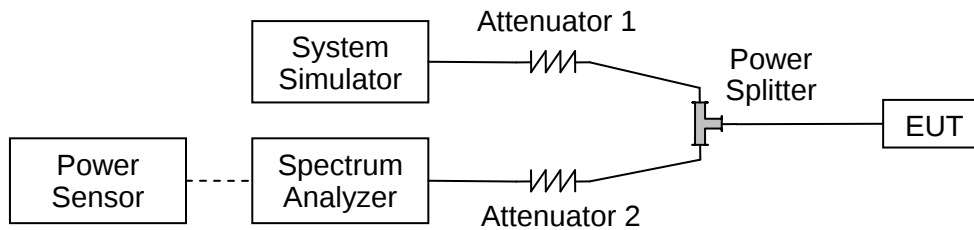
According to FCC section 24.238(a), The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to FCC section 27.53(g), For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

According to FCC section 27.53(h), For operations in the 1710–1755 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.

According to FCC section 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 than $43 + 10 \log(P)$ 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.

2.6.2. Test Description



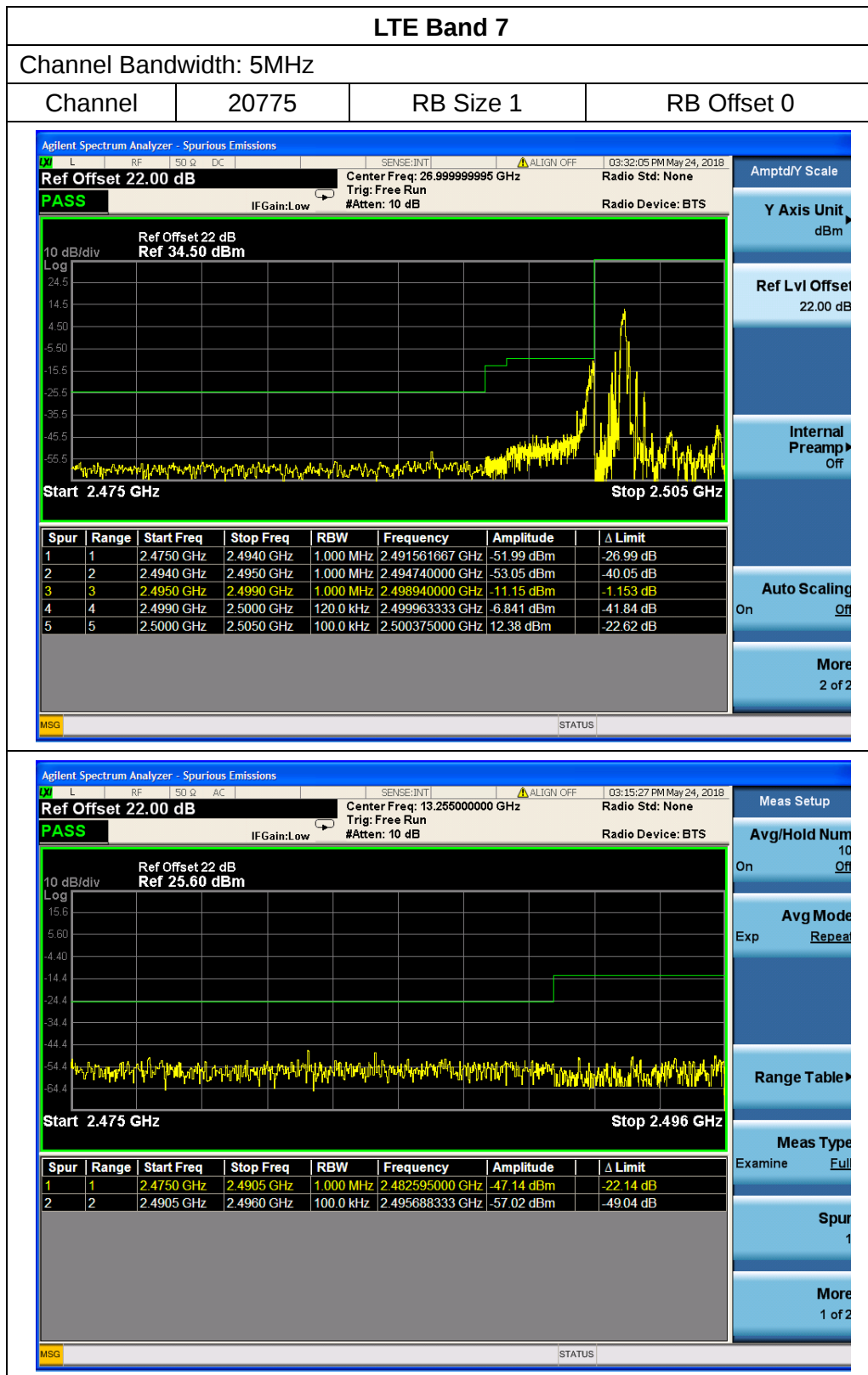
The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

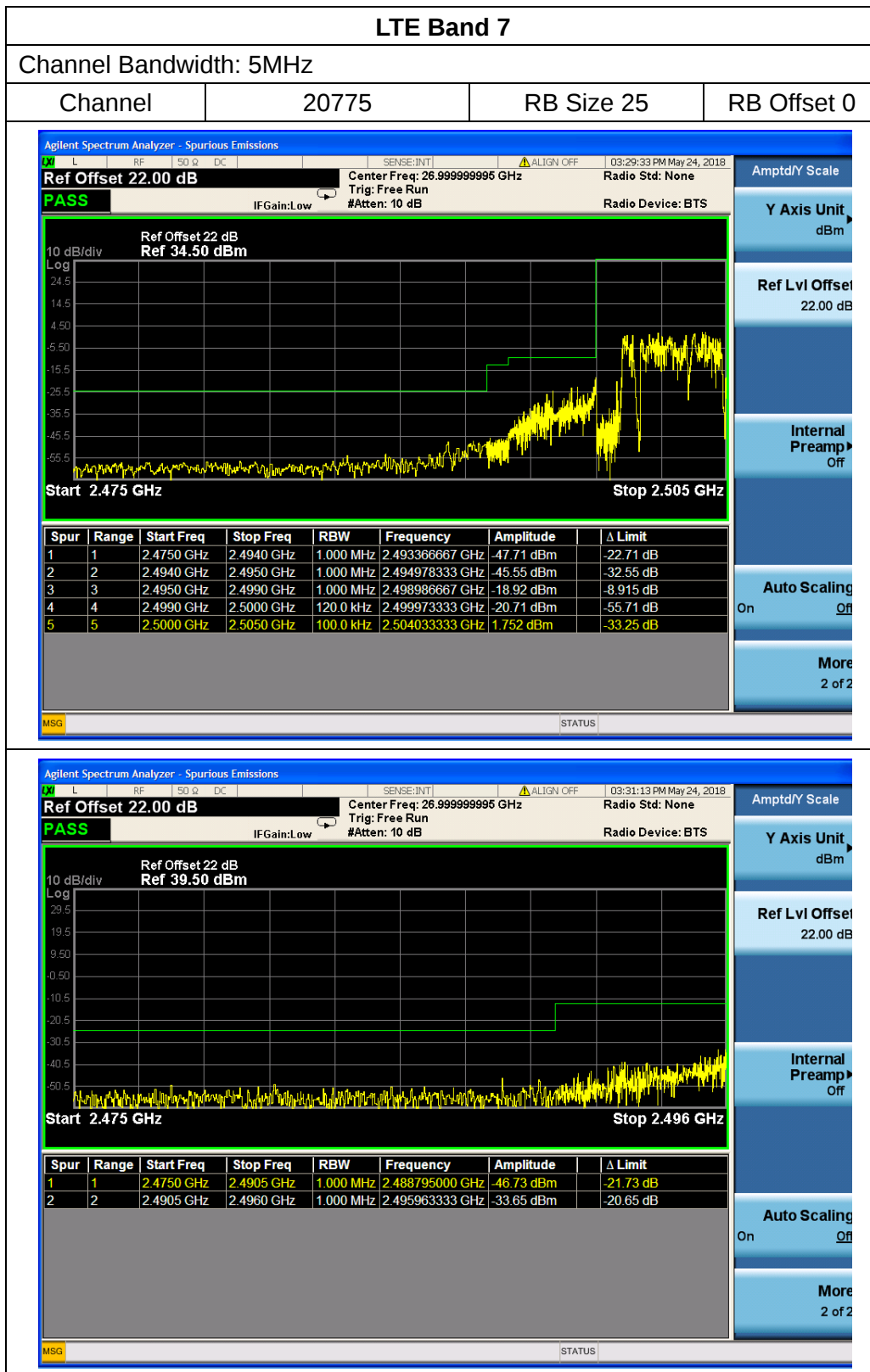
2.6.3. Test procedure

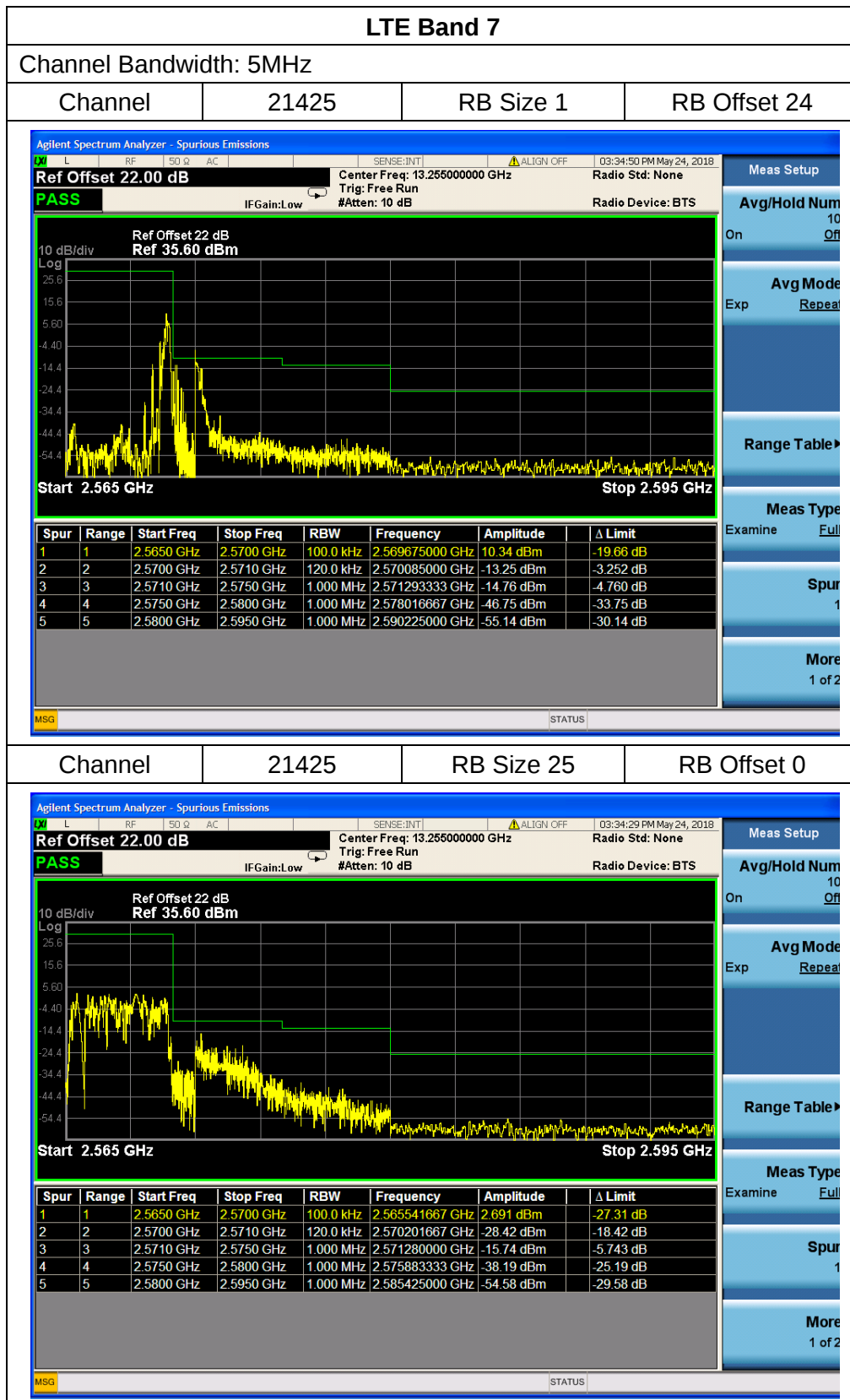
KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.

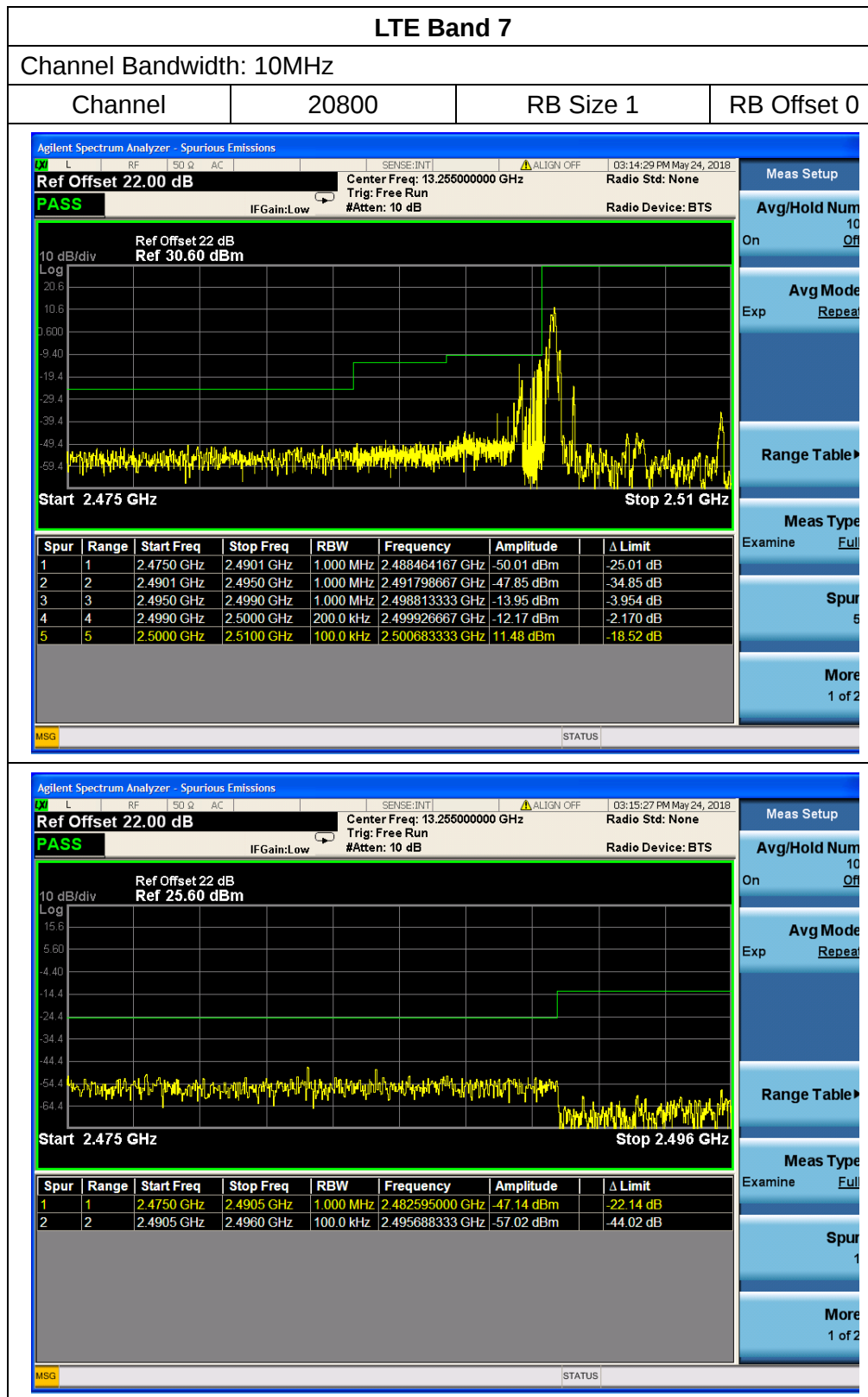
2.6.4. Test Result

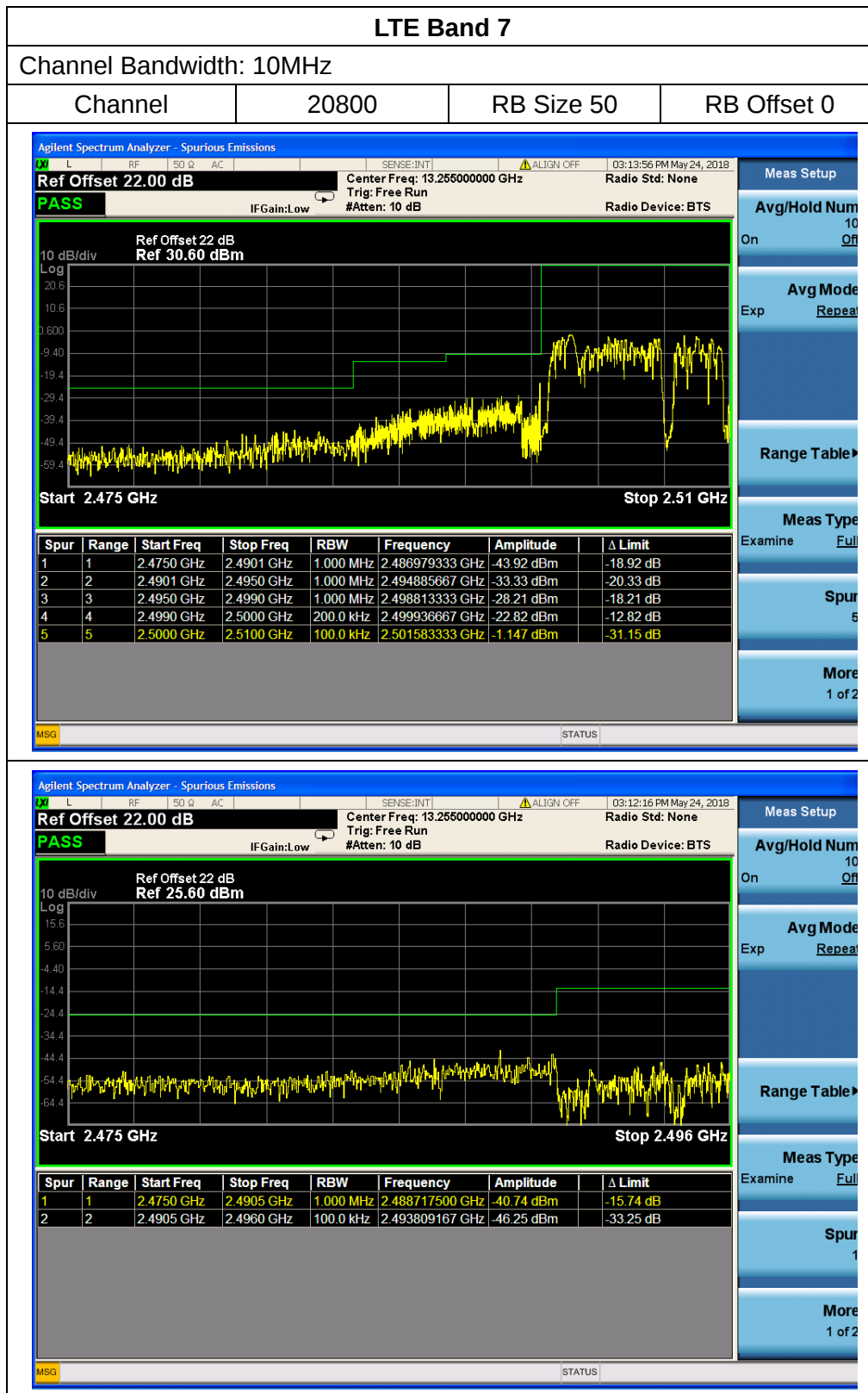
The center frequency of spectrum is the band edge frequency and span is 2MHz, Record the max trace into the test report.

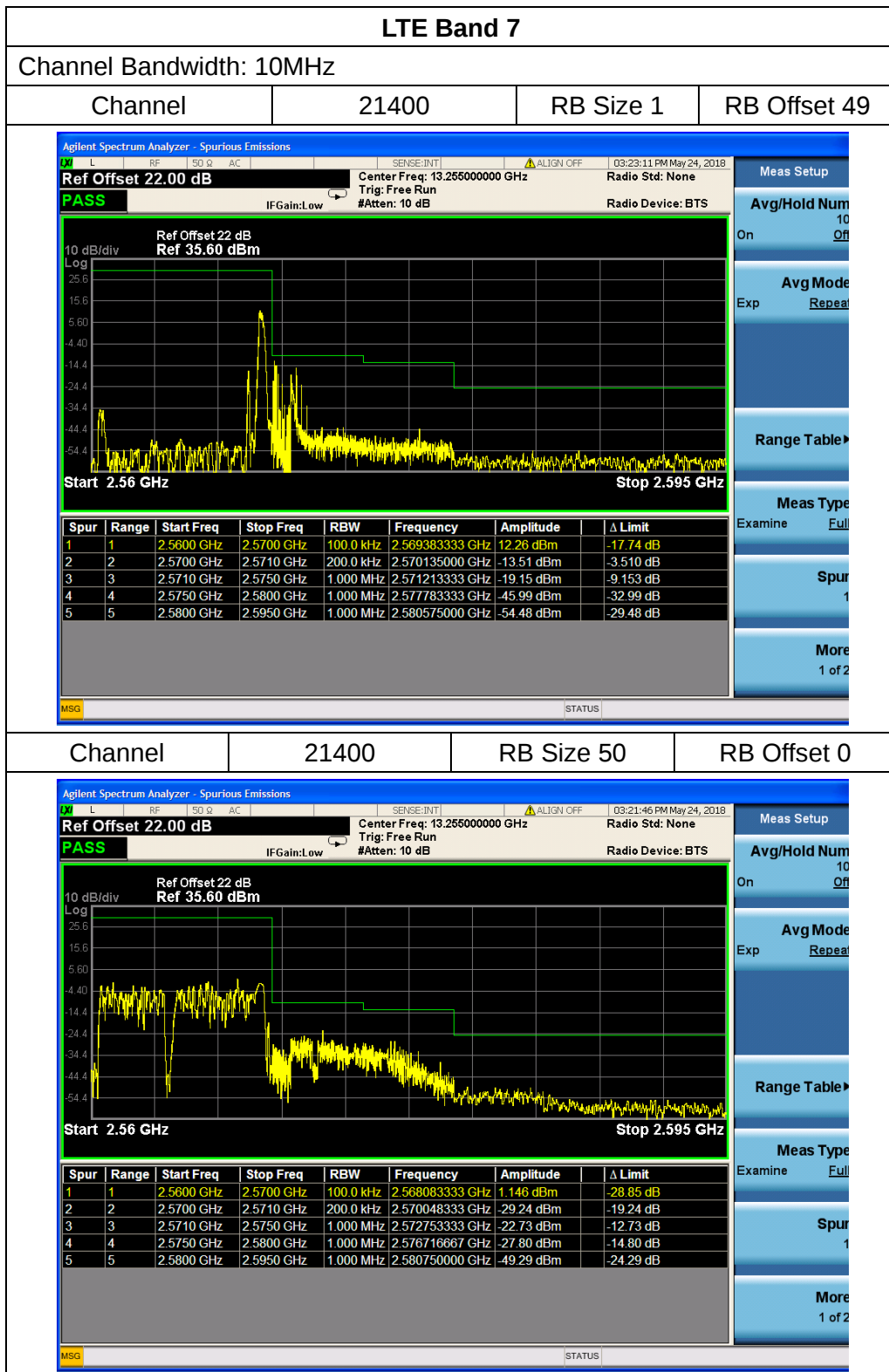


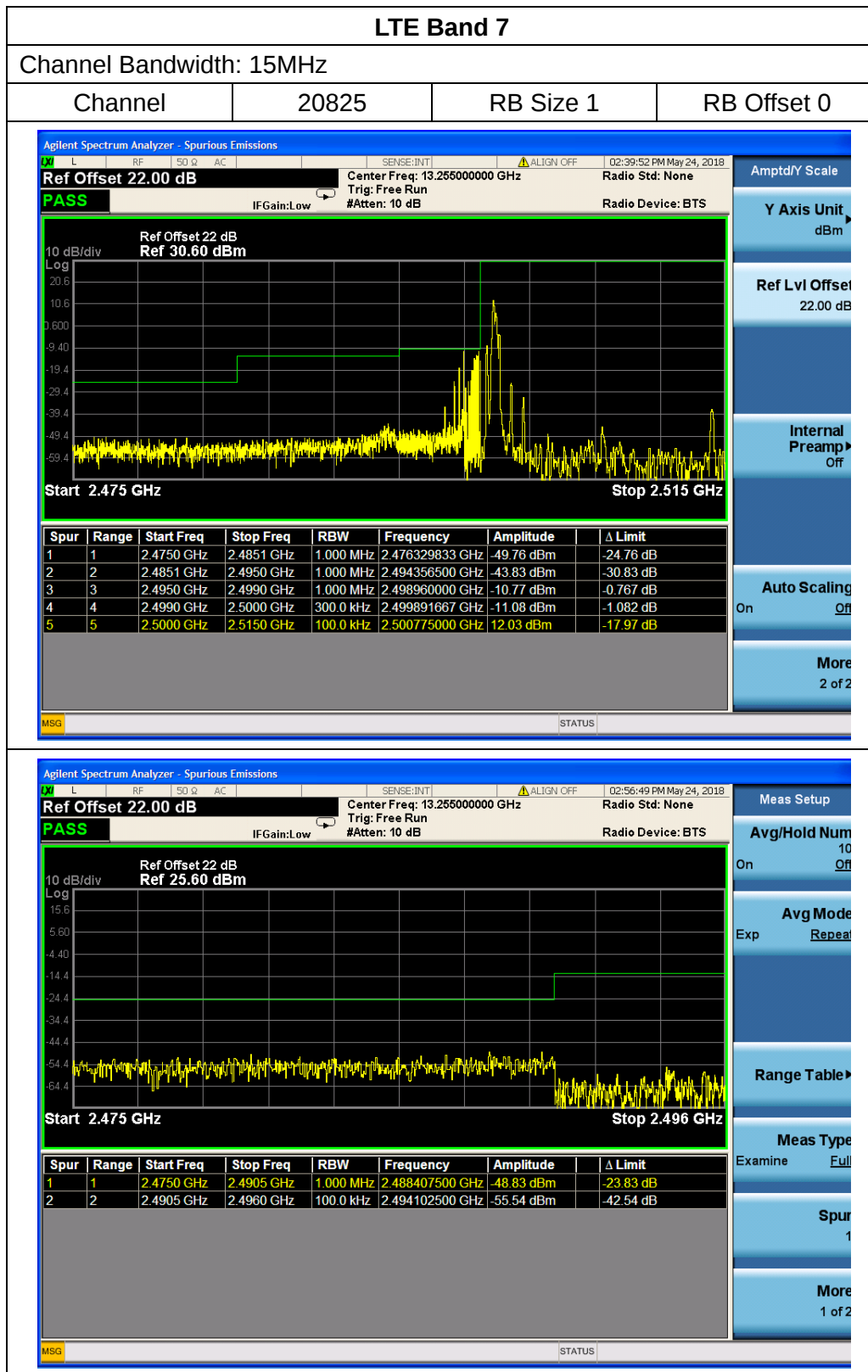


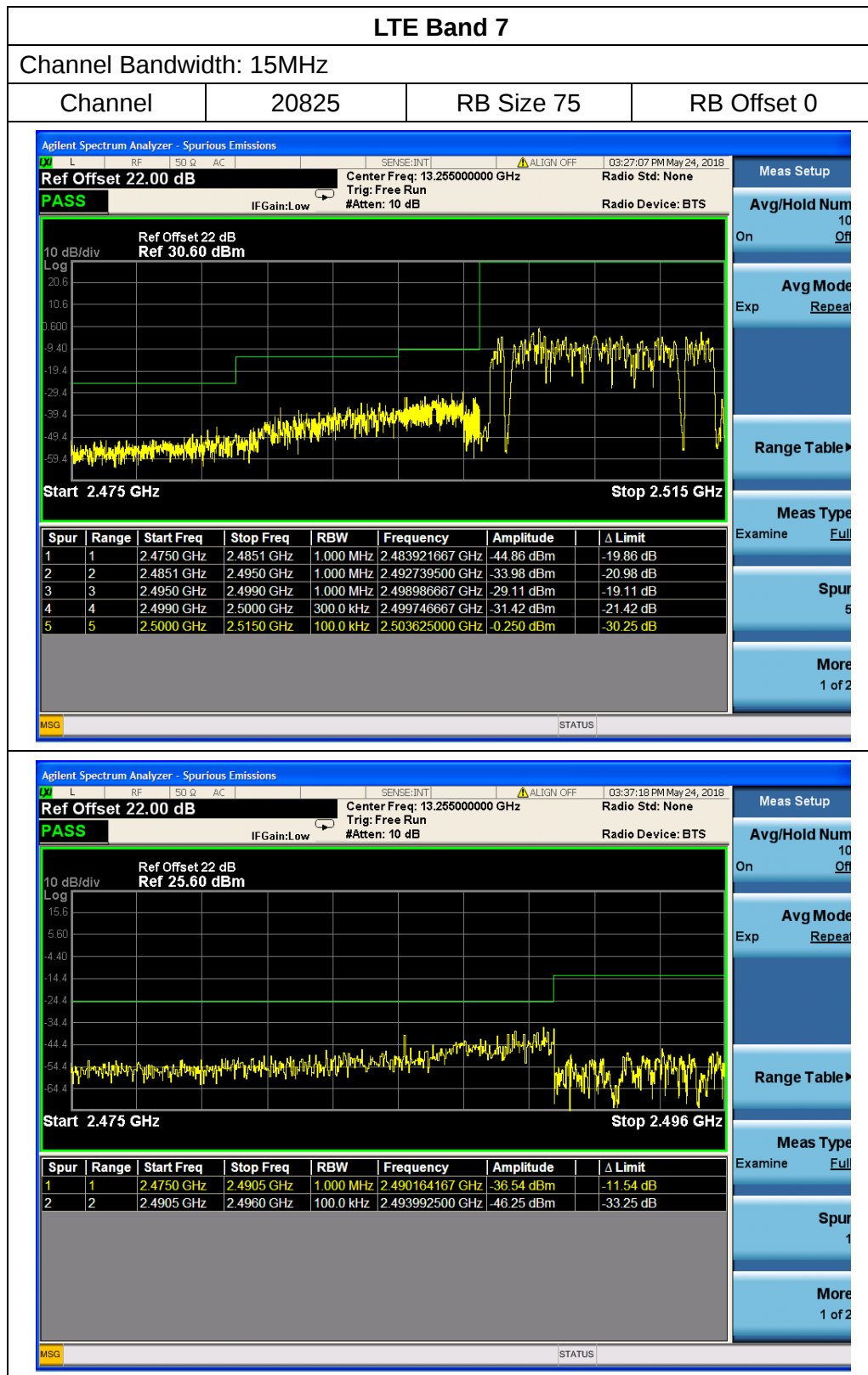


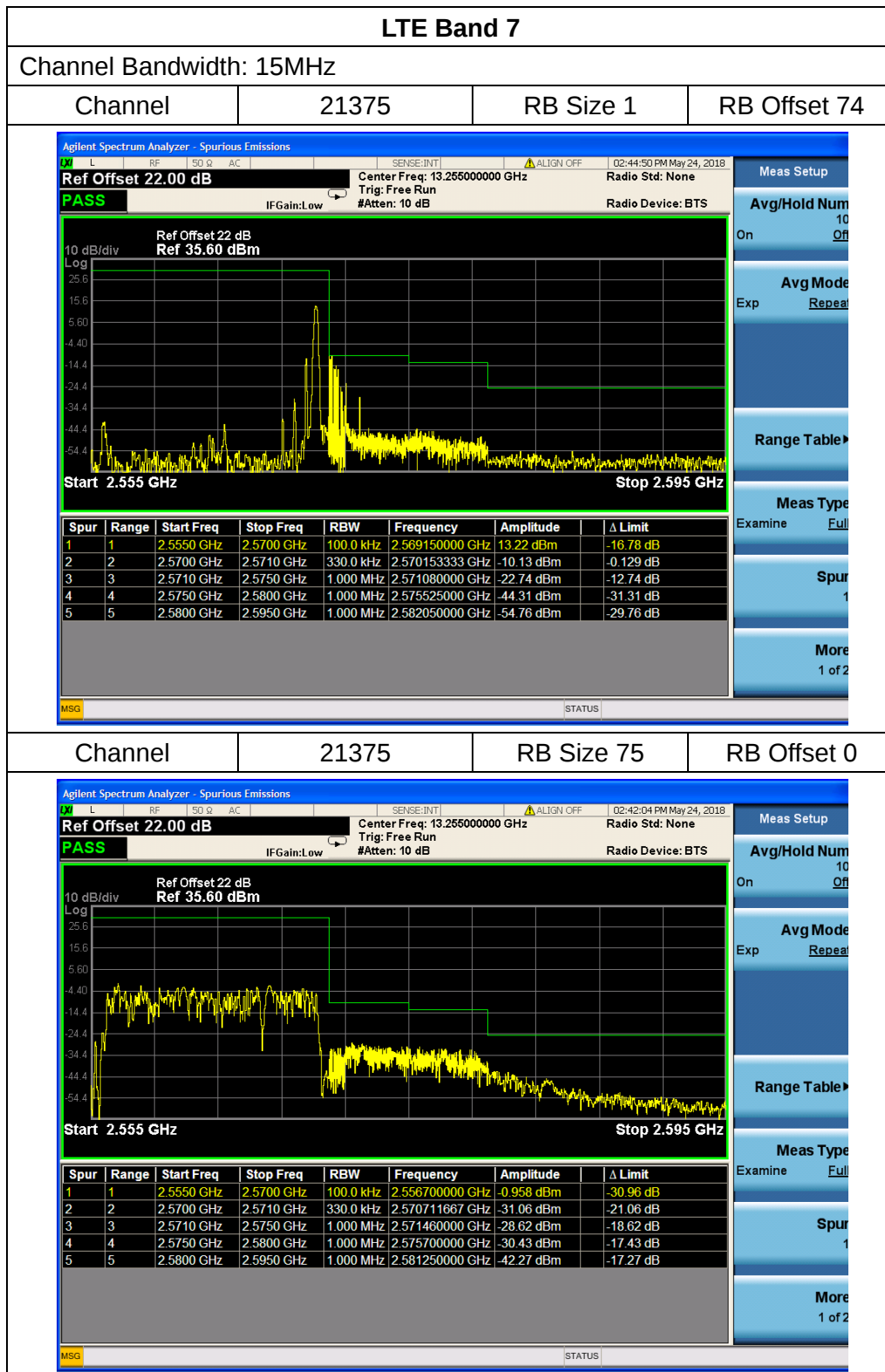


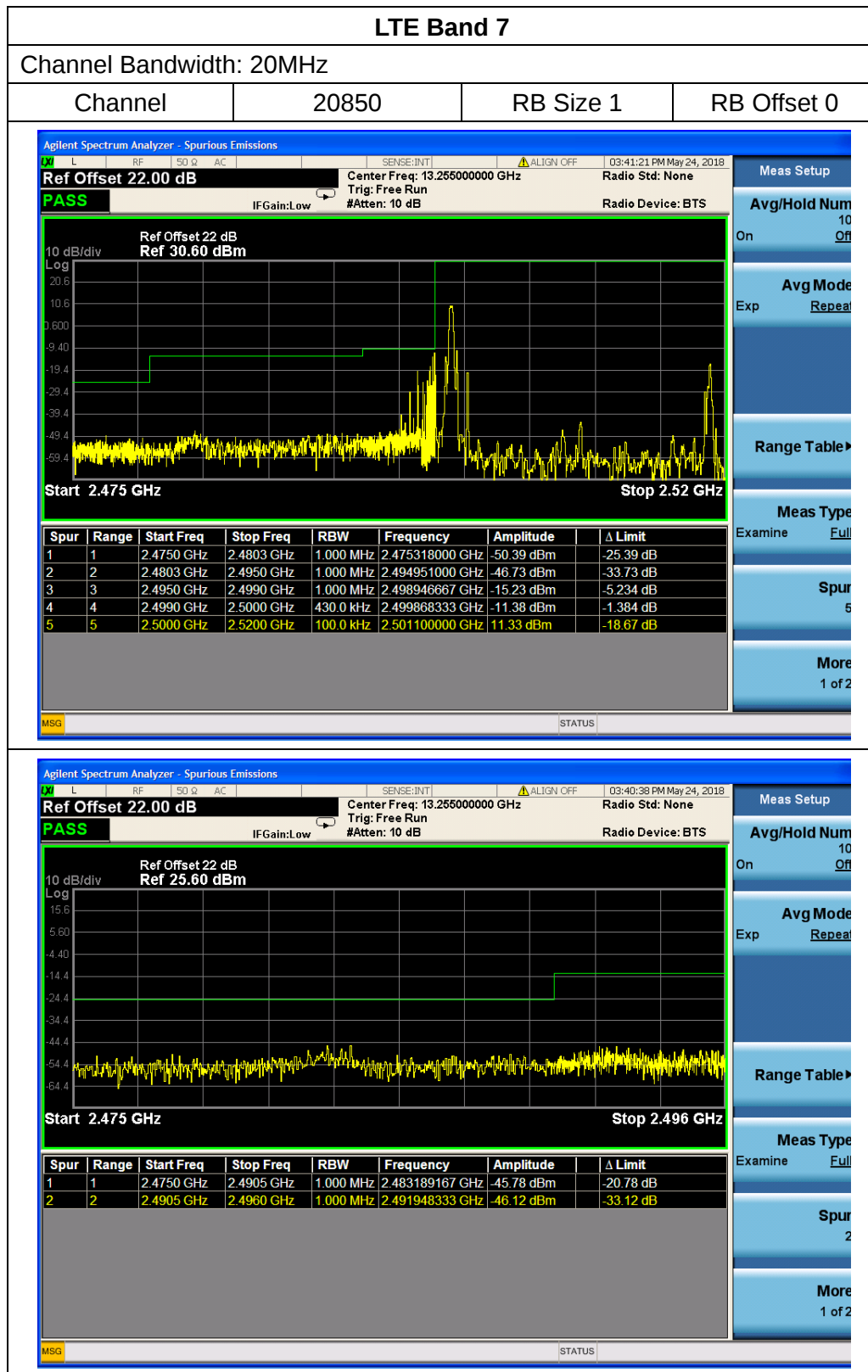


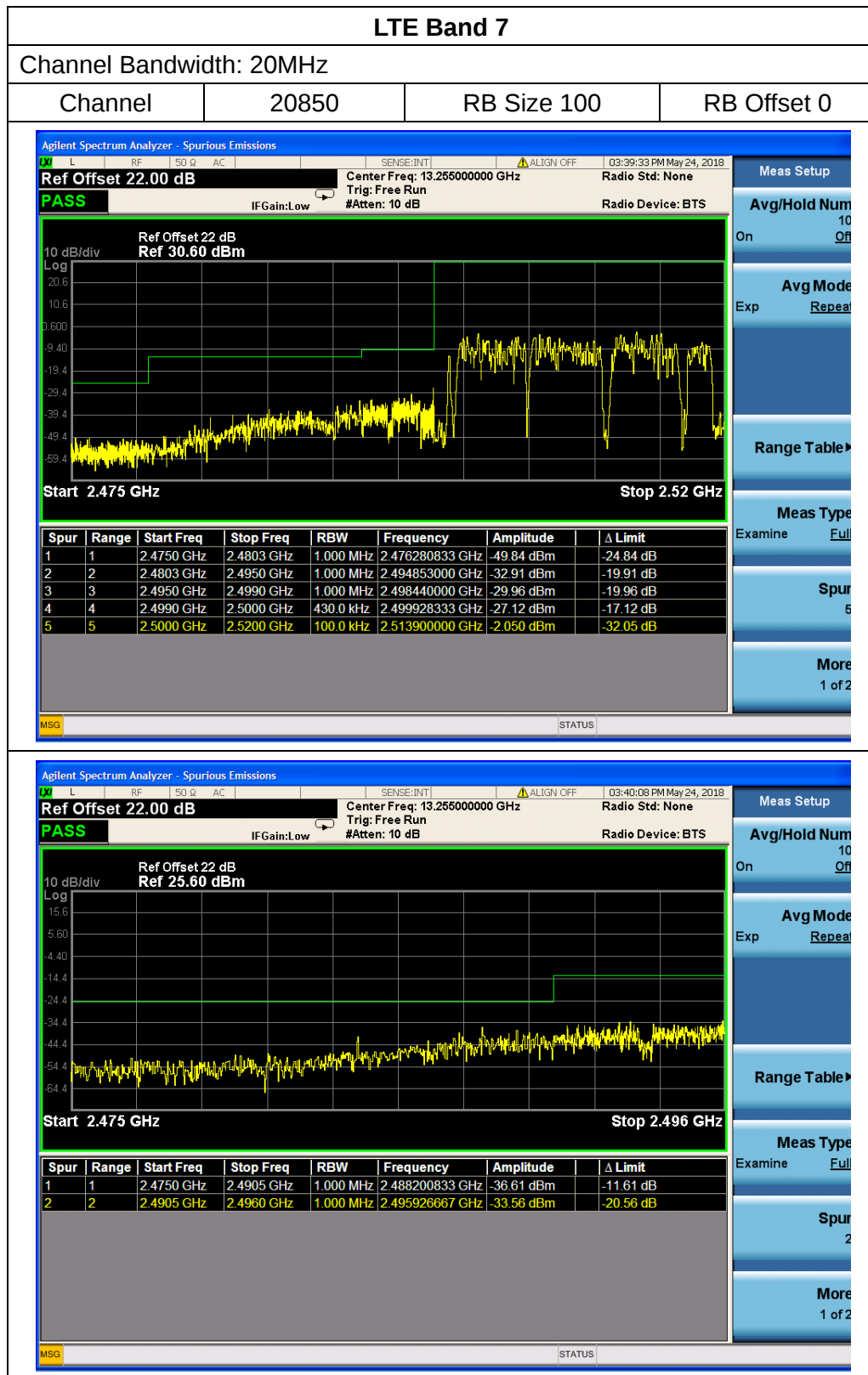


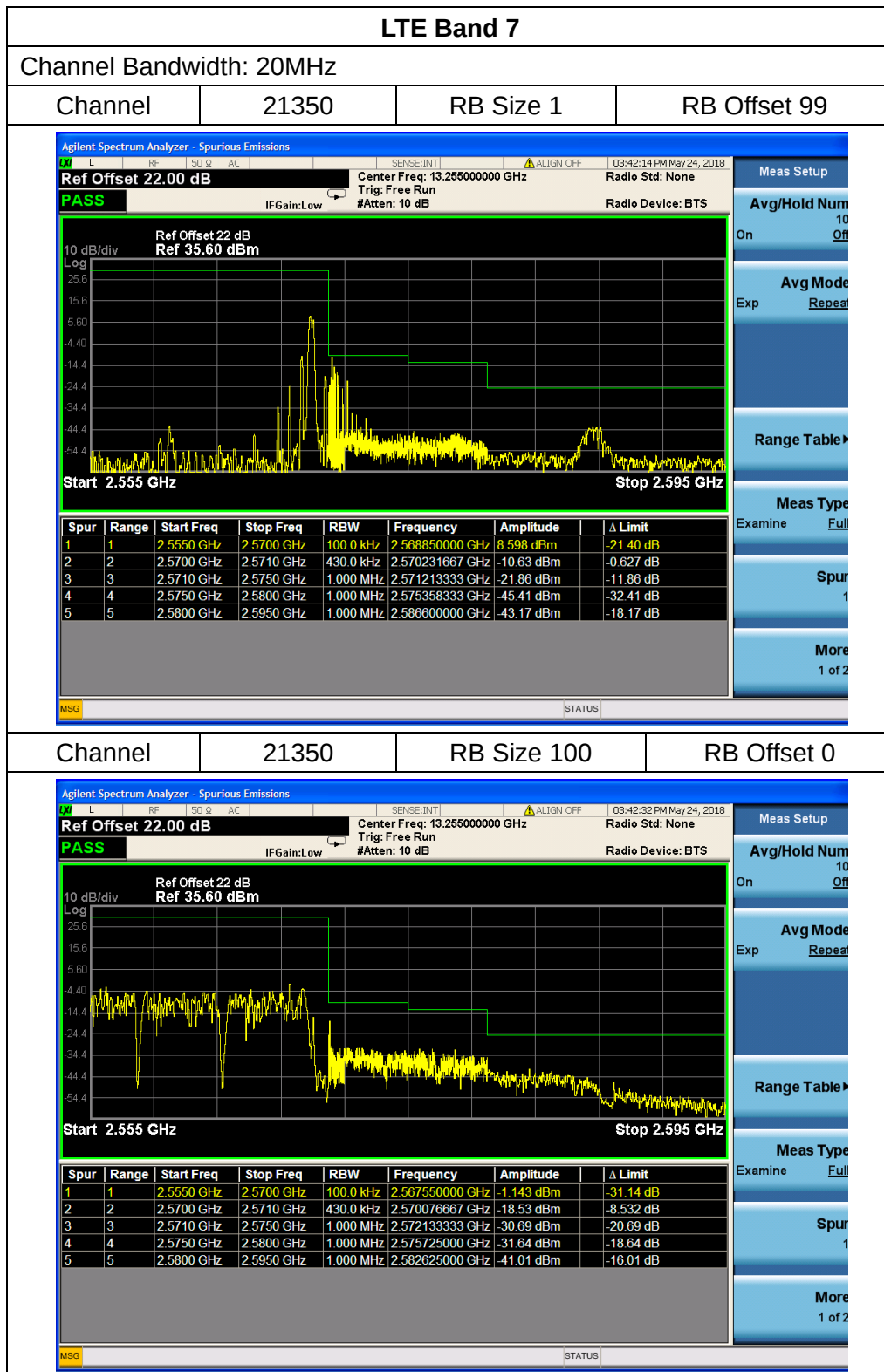












2.7. Transmitter Radiated Power (EIRP/ERP)

2.7.1. Requirement

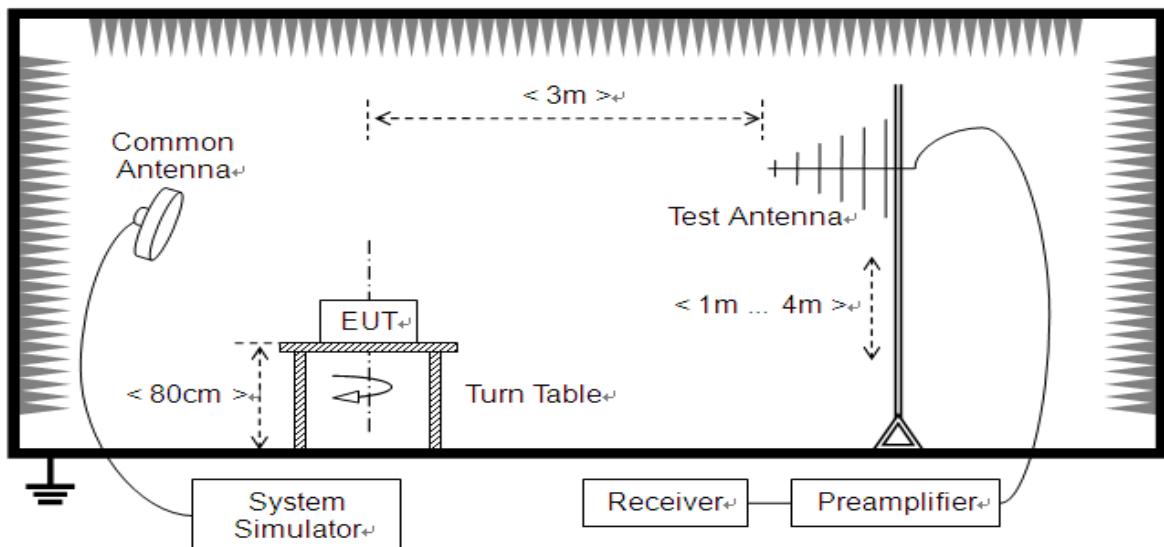
According to FCC section 24.232 (c) for LTE Band 2, Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to FCC section 27.50 (d) for LTE Band 4, fixed, mobile and portable (hand-held) stations in the 1710-1755MHz band are limited to 1wat EIRP.

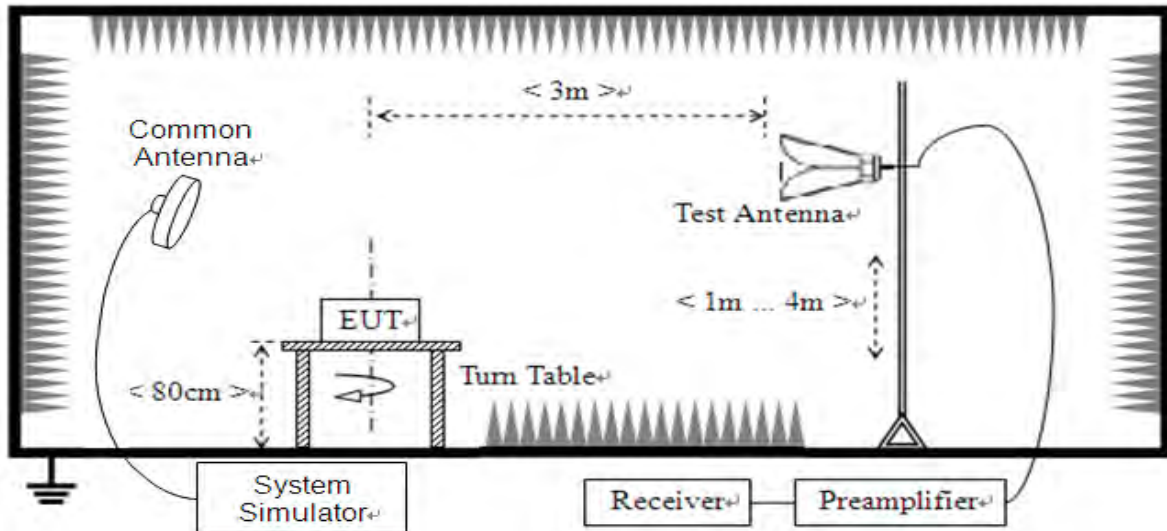
According to FCC section 27.50 (h) for LTE Band 7, Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

According to FCC section 27.50 (c) for LTE Band 12/17, Portable stations (hand-held devices) operating in the 704-716MHz band are limited to 3watts ERP.

2.7.2. Test Description



(For the test frequency from 30MHz to 1GHz)



(For the test frequency above 1GHz)

The EUT is located in a 3m Full-Anechoic Chamber, the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading.

A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power, and only the test result of the maximum output power was recorded.

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground and the Turn Table is actuated to turn from 0° to 360° to determine the maximum value of the radiated power. The emission levels at both horizontal and vertical polarizations should be tested. The Filters consists of Notch Filters and High Pass Filter.

2.7.3. Test procedure

KDB 971168 D01v03 Section 51&5.2 and ANSI/TIA-603-E-2016.



2.7.4. Test Result

The EUT was verified under all configurations (RB size and offset) and the worst case radiated power reported for each modulation/channel bandwidth.

The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested.

The substitution corrections are obtained as described below:

$$A_{\text{SUBST}} = P_{\text{SUBST_TX}} - P_{\text{SUBST_RX}} - L_{\text{SUBST_CABLES}} + G_{\text{SUBST_TX_ANT}}$$

$$A_{\text{TOT}} = L_{\text{CABLES}} + A_{\text{SUBST}}$$

Where A_{SUBST} is the final substitution correction including receive antenna gain.

$P_{\text{SUBST_TX}}$ is signal generator level,

$P_{\text{SUBST_RX}}$ is receiver level,

$L_{\text{SUBST_CABLES}}$ is cable losses including TX cable,

$G_{\text{SUBST_TX_ANT}}$ is substitution antenna gain.

A_{TOT} is total correction factor including cable loss and substitution correction

During the test, the data of A_{TOT} was added in the Test Spectrum Analyze, so Spectrum Analyze reading is the final values which contain the data of A_{TOT} .

Note: Both horizontal and vertical polarizations of the test antenna are evaluated respectively, only the worst data (horizontal) were recorded in this report.



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		EIRP (dBm)
					RB Size	RB Offset	
LTE Band 7	20MHz	L 20850	2510	QPSK	1	0	22.37
					100	0	22.69
				16-QAM	1	0	21.58
					100	0	22.67
		M 21100	2535	QPSK	1	0	24.39
					100	0	23.45
				16-QAM	1	0	23.72
					100	0	22.63
		H 21350	2560	QPSK	1	0	23.33
					100	0	22.75
				16-QAM	1	0	23.67
					100	0	22.18
Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		EIRP (dBm)
					RB Size	RB Offset	
LTE Band 7	15MHz	L 20825	2507.5	QPSK	1	0	22.18
					75	0	22.51
				16-QAM	1	0	23.57
					75	0	21.63
		M 21100	2535	QPSK	1	0	22.93
					75	0	22.58
				16-QAM	1	0	23.35
					75	0	21.54
		H 21375	2562.5	QPSK	1	0	24.63
					75	0	22.46
				16-QAM	1	0	23.65
					75	0	22.75
Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		EIRP (dBm)
					RB Size	RB Offset	
LTE Band 7	10MHz	L 20800	2505	QPSK	1	0	22.37
					50	0	22.43
				16-QAM	1	0	22.31
					50	0	22.39
		M 21100	2535	QPSK	1	0	23.75
					50	0	22.39
				16-QAM	1	0	23.67
					50	0	21.76
		H 21400	2565	QPSK	1	0	23.99
					50	0	22.83
				16-QAM	1	0	23.76
					50	0	22.39



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		EIRP (dBm)
					RB Size	RB Offset	
LTE Band 7	5MHz	L 20775	2502.5	QPSK	1	0	22.69
					25	0	21.57
				16-QAM	1	0	22.69
					25	0	21.85
		M 21100	2535	QPSK	1	0	24.63
					25	0	22.74
				16-QAM	1	0	23.12
					25	0	22.13
		H 21425	2567.5	QPSK	1	0	23.18
					25	0	22.47
				16-QAM	1	0	23.58
					25	0	21.33

2.8. Radiated Spurious Emissions

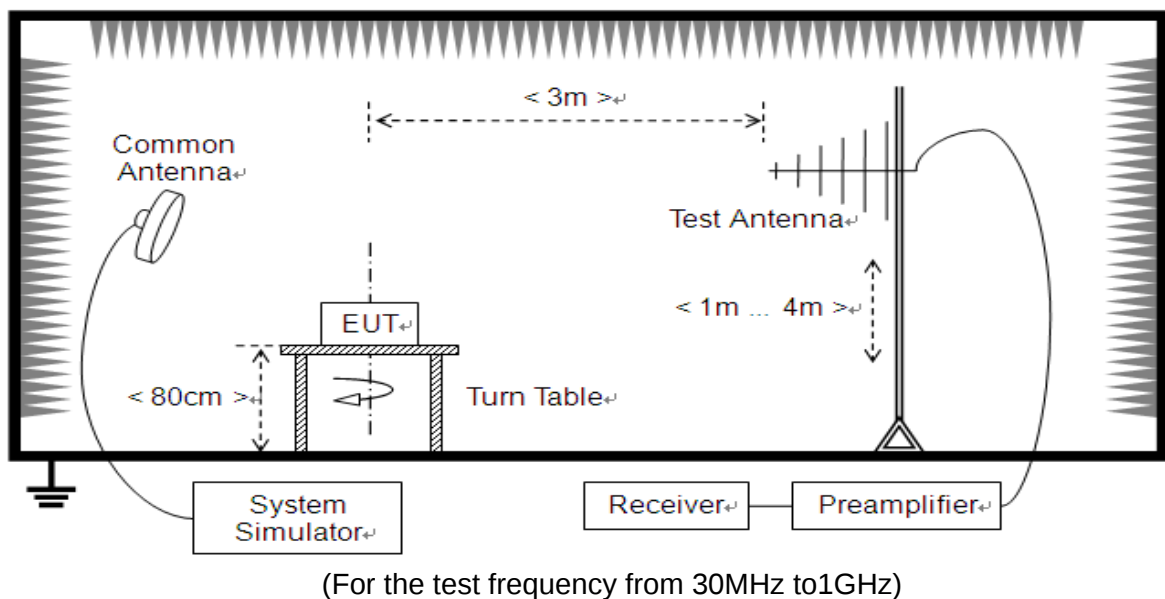
2.8.1. Requirement

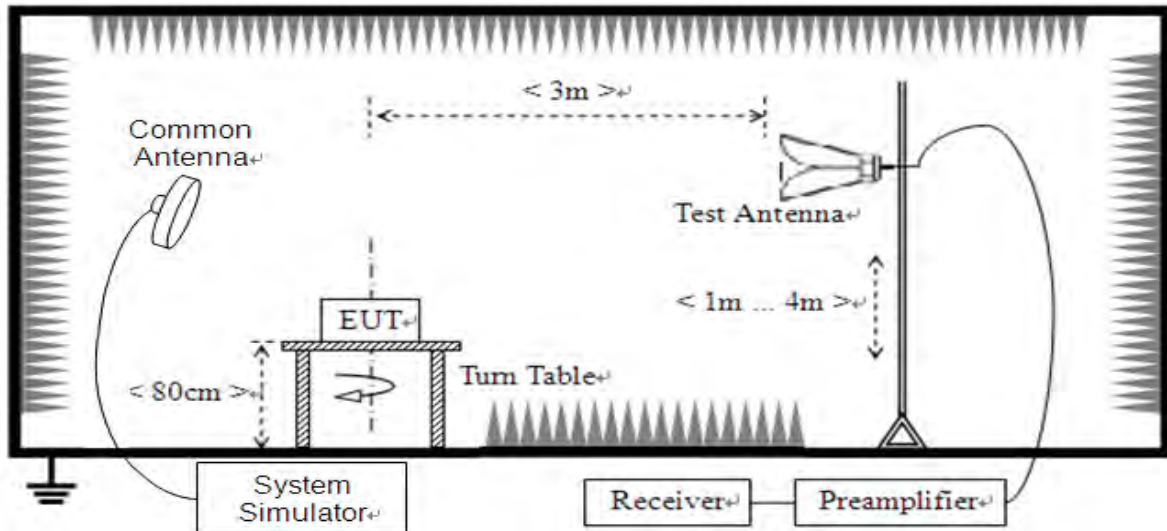
According to FCC section 2.1051, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. This calculated to be -13dBm.

Additional requirement for LTE Band 7:

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $55 + 10 \log(P)$ dB. This calculated to be -25dBm.

2.8.2. Test Description





(For the test frequency above 1GHz)

The EUT is located in a 3m Full-Anechoic Chamber, the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading. A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power, and only the test result of the maximum output power was recorded.

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground and the Turn Table is actuated to turn from 0° to 360° to determine the maximum value of the radiated power. The emission levels at both horizontal and vertical polarizations should be tested. The Filters consists of Notch Filters and High Pass Filter.

Note: when doing measurements above 1GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

2.8.3. Test procedure

KDB 971168 D01v03 Section 5.8 and ANSI/TIA-603-E-2016.



2.8.4. Test Result

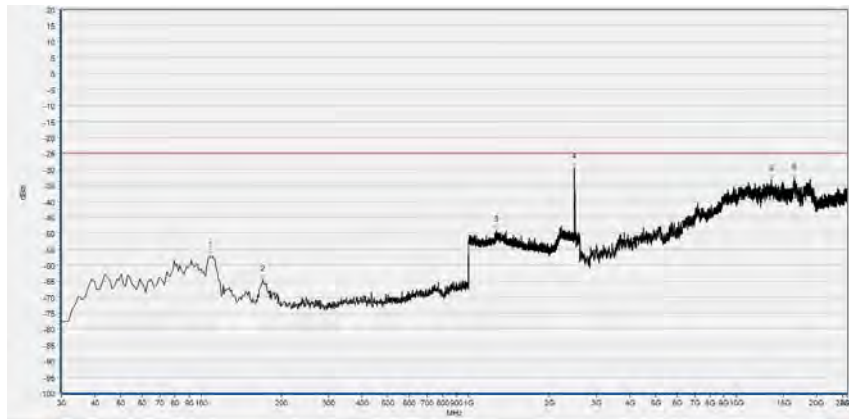
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. Test Antenna height is varied from 1m to 4m above the ground, and the Turn Table is actuated to turn from 0° to 360°, both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

Note1: The power of the EUT transmitting frequency should be ignored.

Note2: All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Note3: All bandwidth and test channel were considered and evaluated respectively by performing full test for each band, only the worst cases were recorded in this test report.

LTE Band 7 20MHz BW, Low Channel, QPSK

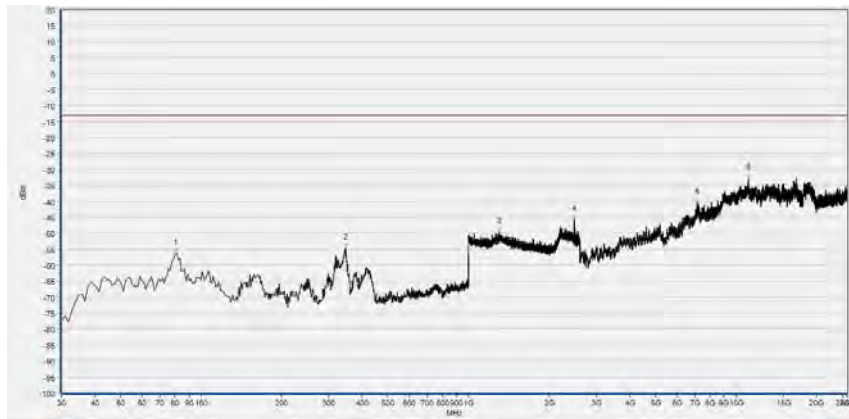


No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	108.570	-57.08	-25.00	Horizontal	PASS
2	169.680	-64.49	-25.00	Horizontal	PASS
3	1270.188	-49.00	-25.00	Horizontal	PASS
4	2484.754	-29.43	-25.00	Horizontal	N/A
5	13574.468	-33.09	-25.00	Horizontal	PASS
6	16455.319	-32.70	-25.00	Horizontal	PASS



No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	39.700	-56.76	-25.00	Vertical	PASS
2	85.290	-57.60	-25.00	Vertical	PASS
3	1279.152	-49.15	-25.00	Vertical	PASS
4	2506.000	-36.75	-25.00	Vertical	N/A
5	11280.851	-33.35	-25.00	Vertical	PASS
6	16451.064	-32.44	-25.00	Vertical	PASS

LTE Band 7 20MHz BW, Low Channel, 16QAM



No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	110.510	-57.75	-25.00	Horizontal	PASS
2	1315.646	-49.91	-25.00	Horizontal	PASS
3	2487.315	-37.44	-25.00	Horizontal	N/A
4	7217.021	-41.05	-25.00	Horizontal	PASS
5	11063.830	-34.40	-25.00	Horizontal	PASS
6	18953.191	-33.28	-25.00	Horizontal	PASS



No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	37.760	-58.39	-25.00	Vertical	PASS
2	100.810	-57.77	-25.00	Vertical	PASS
3	1271.469	-49.48	-25.00	Vertical	PASS
4	2486.675	-40.04	-25.00	Vertical	N/A
5	11136.170	-34.41	-25.00	Vertical	PASS
6	18825.532	-33.26	-25.00	Vertical	PASS

LTE Band 7 20MHz BW, Mid Channel, QPSK



No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	107.600	-61.29	-25.00	Horizontal	PASS
2	170.650	-61.65	-25.00	Horizontal	PASS
3	1347.659	-49.35	-25.00	Horizontal	PASS
4	2234.414	-47.47	-25.00	Horizontal	PASS
5	12289.362	-34.52	-25.00	Horizontal	PASS
6	16451.064	-32.64	-25.00	Horizontal	PASS

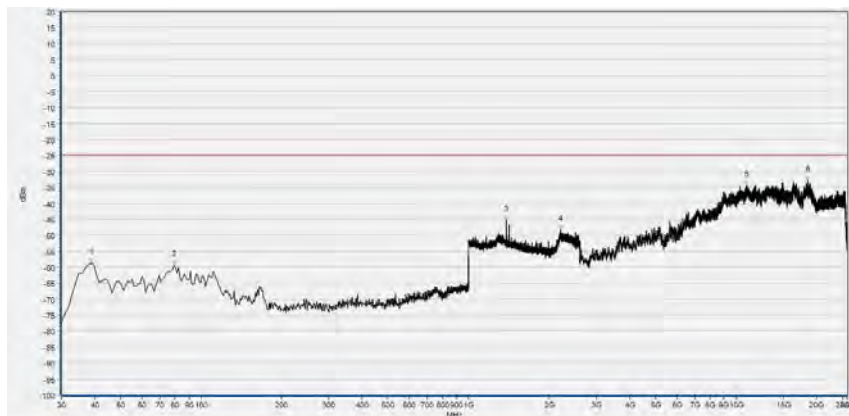


No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	37.760	-57.63	-25.00	Vertical	PASS
2	85.290	-58.27	-25.00	Vertical	PASS
3	111.480	-58.93	-25.00	Vertical	PASS
4	2459.144	-46.80	-25.00	Vertical	PASS
5	10361.702	-33.74	-25.00	Vertical	PASS
6	16544.681	-32.08	-25.00	Vertical	PASS

LTE Band 7 20MHz BW, Mid Channel, 16QAM

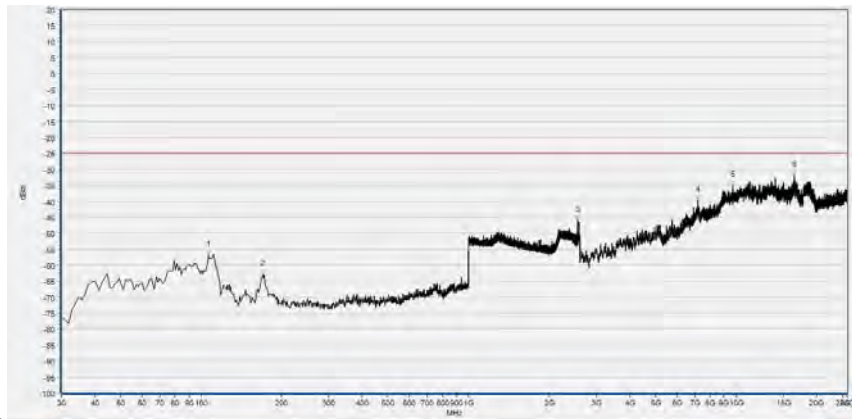


No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	110.510	-56.65	-25.00	Horizontal	PASS
2	1327.171	-49.56	-25.00	Horizontal	PASS
3	2284.354	-48.54	-25.00	Horizontal	PASS
4	7221.277	-41.44	-25.00	Horizontal	PASS
5	11025.532	-34.33	-25.00	Horizontal	PASS
6	16400.000	-32.14	-25.00	Horizontal	PASS

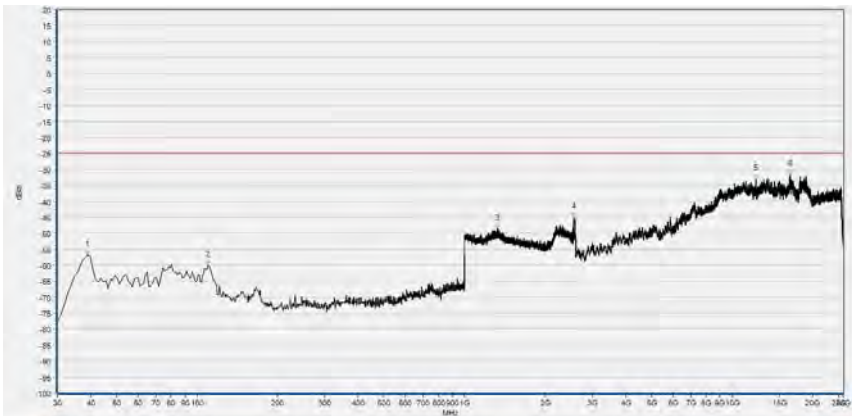


No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	38.730	-58.73	-25.00	Vertical	PASS
2	79.470	-59.23	-25.00	Vertical	PASS
3	1380.952	-45.36	-25.00	Vertical	PASS
4	2212.005	-48.27	-25.00	Vertical	PASS
5	10919.149	-34.25	-25.00	Vertical	PASS
6	18544.681	-32.63	-25.00	Vertical	PASS

LTE Band 7 20MHz BW, High Channel, QPSK

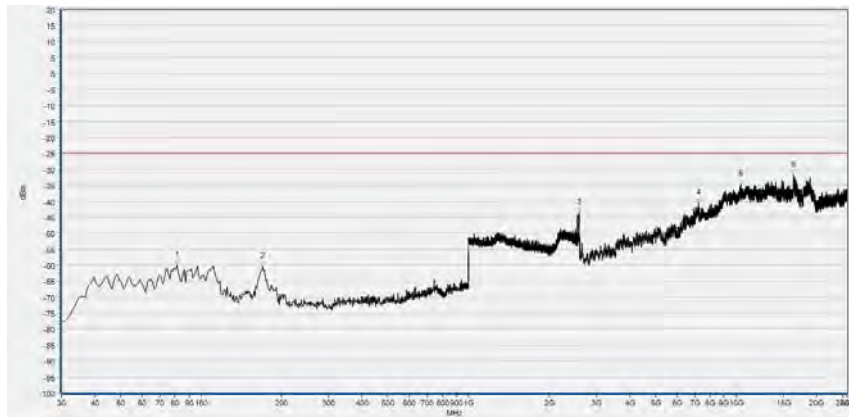


No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	106.630	-56.89	-25.00	Horizontal	PASS
2	169.680	-62.89	-25.00	Horizontal	PASS
3	2553.261	-45.86	-25.00	Horizontal	N/A
4	7182.979	-39.70	-25.00	Horizontal	PASS
5	9736.170	-34.93	-25.00	Horizontal	PASS
6	16527.660	-31.85	-25.00	Horizontal	PASS



No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	38.730	-56.81	-25.00	Vertical	PASS
2	109.540	-60.04	-25.00	Vertical	PASS
3	1328.451	-48.62	-25.00	Vertical	PASS
4	2552.621	-45.06	-25.00	Vertical	N/A
5	12268.085	-32.93	-25.00	Vertical	PASS
6	16540.426	-31.64	-25.00	Vertical	PASS

LTE Band 7 20MHz BW, High Channel, 16QAM



No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	81.410	-59.90	-25.00	Horizontal	PASS
2	169.680	-60.48	-25.00	Horizontal	PASS
3	2585.274	-43.56	-25.00	Horizontal	N/A
4	7251.064	-40.53	-25.00	Horizontal	PASS
5	10395.745	-34.84	-25.00	Horizontal	PASS
6	16408.511	-31.94	-25.00	Horizontal	PASS



No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	38.730	-56.59	-25.00	Vertical	PASS
2	79.470	-58.75	-25.00	Vertical	PASS
3	1457.143	-46.07	-25.00	Vertical	PASS
4	2553.261	-46.53	-25.00	Vertical	N/A
5	10617.021	-33.69	-25.00	Vertical	PASS
6	18876.596	-31.77	-25.00	Vertical	PASS



Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test items	Uncertainty
Output Power	± 2.22 dB
Bandwidth	$\pm 5\%$
Conducted Spurious Emission	± 2.77 dB
Band Edge	± 2.77 dB
Equivalent Isotropic Radiated Power	± 2.22 dB
Radiated Spurious Emissions	± 6 dB

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$



Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, Guangdong Province, P. R. China
Responsible Test Lab Manager:	Mr. Su Feng
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, Guangdong Province, P. R. China

3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI/TIA-603-E-2016 and CISPR Publication 22; the FCC designation number is CN1192.



4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Power Splitter	NW521	1506A	Weinschel	2018.04.17	2019.04.16
Attenuator 1	(N/A.)	10dB	Resnet	2018.04.17	2019.04.16
Attenuator 2	(N/A.)	3dB	Resnet	2018.04.17	2019.04.16
EXA Signal Analyzer	MY53470836	N9010A	Agilent	2017.12.03	2018.12.02
USB Power Sensor	MY54210011	U2021XA	Agilent	2018.04.17	2019.04.16
System Simulator	152038	CMW500	R&S	2018.05.08	2019.05.07
RF cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
Coaxial cable	CB02	RF02	Morlab	N/A	N/A
SMA connector	CN01	RF03	HUBER-SUHNER	N/A	N/A
Temperature Chamber	(N/A)	HUT705P	CHONGQING HANBA EXPERIMENTAL EQUIPMENT CO.,LTD	2018.04.17	2019.04.16

4.2 Auxiliary Test Equipment

Equipment Name	Model No.	Brand Name	Manufacturer	Cal.Date	Cal. Due
Computer	T430i	Think Pad	Lenovo	N/A	N/A

**4.3 Radiated Test Equipments**

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
System Simulator	152038	CMW500	R&S	2018.05.08	2019.05.07
Receiver	MY54130016	N9038A	Agilent	2018.05.08	2019.05.07
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2018.05.08	2019.05.07
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2017.09.13	2018.09.12
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2017.09.13	2018.09.12
Coaxial cable (N male) (9KHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
1-18GHz pre-Amplifier	MA02	TS-PR18	Rohde& Schwarz	2018.05.08	2019.05.07
18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde& Schwarz	2018.05.08	2019.05.07
Anechoic Chamber	N/A	9m*6m*6m	CRT	2017.11.19	2020.11.18

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