FCC Radio Test Report

FCC ID: 2AMHM-AD00A10055

Report No.	:	BTL-FCCP-6-1911T165
Equipment	:	iTraMS Gen2A
Model Name	:	CU-303-0403
Brand Name	:	Bosch
Applicant	:	Robert Bosch Engineering & Business Solution Pvt. Ltd.
Address	:	123, Industrial Layout, Hosur Road, Koramangala, Bengaluru, 560095 Bengaluru India
Radio Function	:	WCDMA Band II, LTE Band 2
FCC Rule Part(s)	:	47 CFR FCC Part 24 Subpart E 47 CFR FCC Part 2 ANSI/TIA/EIA-603-E-2016 KDB 971168 D01 Power Meas License Digital Systems v03r01
Measurement Procedure(s)	:	ANSI C63.10-2013
Date of Receipt	:	2019/11/27
Date of Test	:	2019/11/27 ~ 2020/1/7
Issued Date	:	2020/3/16

The above equipment has been tested and found in compliance with the requirement of the above standards by BTL Inc.

Prepared by : Peter Chen, Engineer

Approved by : Scott Hsu , Manager

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

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BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	2020/3/3
R01	Revised report to address TCB's comments.	2020/3/16

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part 24 Subpart E & Part 2			
Standard(s) Section	**Test Item**	**Judgment**	**Remark**
2.1046 24.232(c)	Equivalent Isotropic Radiated Power	PASS	------
2.1049	Occupied Bandwidth	PASS	------
2.1051 24.238(a)	Conducted Spurious Emissions	PASS	------
2.1053 24.238(a)	Radiated Spurious Emissions	PASS	------
24.238(a)	Band Edge Measurements	PASS	------
24.232(d)	Peak To Average Ratio	PASS	------
2.1055 24.235	Frequency Stability	PASS	------

Note:

(1) “N/A” denotes test is not applicable in this test report.

(2) The report format version is TP.1.1.1.

1.1 TEST FACILITY

The test facilities used to collect the test data in this report:

No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan
The test sites and facilities are covered under FCC RN: 355421 and DN: TW1099.

☐ C05 ☐ CB08 ☐ CB11 ☐ CB15 ☐ CB16
☒ SR06

No.18, Ln. 171, Sec. 2, Jiuzong Rd., Neihu Dist., Taipei City 114, Taiwan
The test sites and facilities are covered under FCC RN: 325517 and DN: TW1115.

☐ C03 ☒ CB18 ☐ CB19

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**, where expanded uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k = 2**, providing a level of confidence of approximately **95 %**. The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{cispr} requirement.

A. Radiated emissions test :

Test Site	Measurement Frequency Range	U,(dB)
CB18	0.03 GHz ~ 0.2 GHz	4.17
	0.2 GHz ~ 1 GHz	4.72
	1 GHz ~ 6 GHz	5.21
	6 GHz ~ 18 GHz	5.51
	18 GHz ~ 26 GHz	3.69
	26 GHz ~ 40 GHz	4.23

NOTE:
Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Environment Condition	Test Voltage	Tested By
Output Power & EIRP	24.6 °C, 54.3 %	DC 32V	Eric Lee
Occupied Bandwidth	24.6 °C, 54.3 %	DC 32V	Eric Lee
Conducted Spurious Emissions	24.6 °C, 54.3 %	DC 32V	Eric Lee
Radiated Spurious Emissions	23 °C, 65 %	DC 32V	Hunter Chiang
Band Edge	24.6 °C, 54.3 %	DC 32V	Eric Lee
Peak to Average Ratio	24.6 °C, 54.3 %	DC 32V	Eric Lee
Frequency Stability	Normal and Extreme		Eric Lee

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	iTraMS Gen2A	
Brand Name	Bosch	
Test Model	CU-303-0403	
Series Model	N/A	
Model Difference(s)	N/A	
Hardware Version	B2	
Software Version	MS8	
Power Source	Supplied from Battery.	
Power Rating	DC 9-32V	
Modulation Type	WCDMA/HSDPA/HSUPA	UL: QPSK DL: QPSK
	LTE	UL: QPSK,16QAM DL: QPSK,16QAM

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

WCDMA Band II				
Test Frequency ID	UARFCN	Frequency of Uplink (MHz)	UARFCN	Frequency of Downlink (MHz)
Low Range	9262	1852.4	9662	1932.4
Mid Range	9400	1880.0	9800	1960.0
High Range	9538	1907.6	9938	1987.6

LTE Band 2					
Test Frequency ID	Bandwidth (MHz)	N_{UL}	Frequency of Uplink (MHz)	N_{DL}	Frequency of Downlink (MHz)
Low Range	1.4	18607	1850.7	607	1930.7
	3	18615	1851.5	615	1931.5
	5	18625	1852.5	625	1932.5
	10	18650	1855	650	1935
	15	18675	1857.5	675	1937.5
	20	18700	1860	700	1940
Mid Range	1.4/3/5/10/15/20	18900	1880	900	1960
High Range	1.4	19193	1909.3	1193	1989.3
	3	19185	1908.5	1185	1988.5
	5	19175	1907.5	1175	1987.5
	10	19150	1905	1150	1985
	15	19125	1902.5	1125	1982.5
	20	19100	1900	1100	1980

3. Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
CH0	BOSCH	N/A	PCB	N/A	4	-

2.2 DESCRIPTION OF TEST MODES

Following mode(s) is (were) found to be the worst case(s) and selected for the final test.

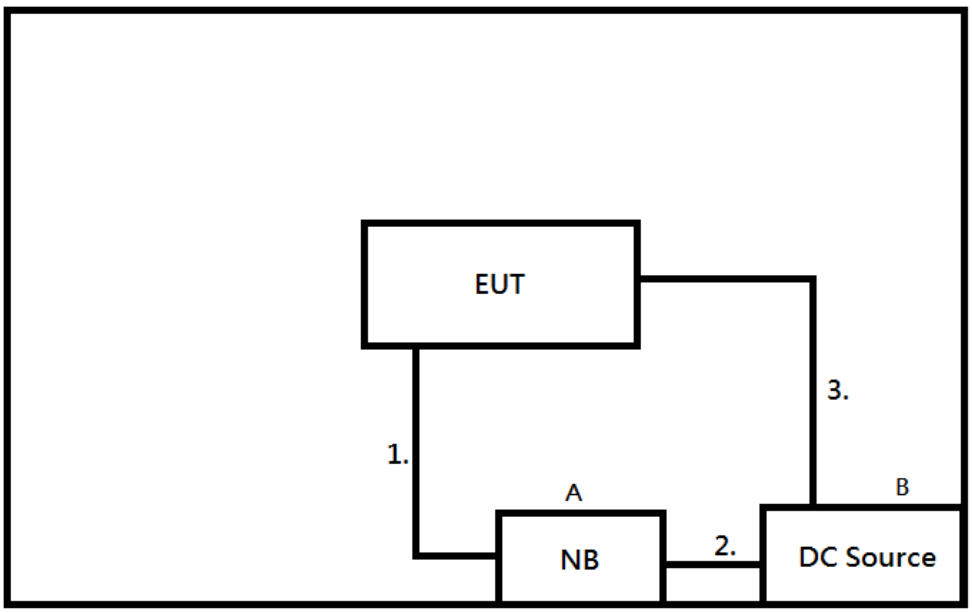
WCDMA BAND II MODE			
Test Item	Available Channel	Tested Channel	Mode
Output Power	9262 to 9538	9262, 9400, 9538	WCDMA, HSDPA,HSUPA
EIRP	9262 to 9538	9262, 9400, 9538	WCDMA
Occupied Bandwidth	9262 to 9538	9262, 9400, 9538	WCDMA
Conducted Spurious Emissions	9262 to 9538	9400	WCDMA
Radiated Spurious Emissions	9262 to 9538	9400	WCDMA
Band Edge	9262 to 9538	9262, 9538	WCDMA
Peak to Average Ratio	9262 to 9538	9262, 9400, 9538	WCDMA
Frequency Stability	9262 to 9538	9400	WCDMA

LTE BAND 2 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM	1RB/3RB/6RB
	18615 to 19185	18615 , 18900, 19185	3MHz	QPSK, 16QAM	1RB/8RB/15RB
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	1RB/25RB/50RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	1RB/36RB/75RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	1RB/50RB/100RB
EIRP	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	1RB/50RB/100RB
Occupied Bandwidth	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM	6RB
	18615 to 19185	18615 , 18900, 19185	3MHz	QPSK, 16QAM	15RB
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	25RB
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	50RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	75 RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	100RB

LTE BAND 2 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Conducted Spurious Emissions	18607 to 19193	18900	1.4MHz	QPSK	1RB
	18615 to 19185	18900	3MHz	QPSK	1RB
	18625 to 19175	18900	5MHz	QPSK	1RB
	18650 to 19150	18900	10MHz	QPSK	1RB
	18675 to 19125	18900	15MHz	QPSK	1RB
	18700 to 19100	18900	20MHz	QPSK	1RB
Radiated Spurious Emissions	18700 to 19100	18900	20MHz	QPSK	1RB
Band Edge	18607 to 19193	18607, 19193	1.4MHz	QPSK	1RB/6RB
	18615 to 19185	18615, 19185	3MHz	QPSK	1RB/15RB
	18625 to 19175	18625, 19175	5MHz	QPSK	1RB/25RB
	18650 to 19150	18650, 19150	10MHz	QPSK	1RB/50RB
	18675 to 19125	18675, 19125	15MHz	QPSK	1RB/75RB
	18700 to 19100	18700, 19100	20MHz	QPSK	1RB/100RB
Peak To Average Ratio	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM	1RB
	18615 to 19185	18615 , 18900, 19185	3MHz	QPSK, 16QAM	1RB
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	1RB
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	1RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	1RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	1RB
Frequency Stability	18607 to 19193	18900	1.4MHz	QPSK	1RB
	18615 to 19185	18900	3MHz	QPSK	1RB
	18625 to 19175	18900	5MHz	QPSK	1RB
	18650 to 19150	18900	10MHz	QPSK	1RB
	18675 to 19125	18900	15MHz	QPSK	1RB
	18700 to 19100	18900	20MHz	QPSK	1RB

NOTE:
(1) All X, Y and Z axes are evaluated, but only the worst case (Y axis) is recorded.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model No.	Series No.	Remarks
A	notebook	hp	TPN-1119	NA	-
B	DC Source	twintex	TP-6010	1616AP051502100	-
-	2*LTE MIMO & GNSS Antenna	TAOGLAS	MA250.A.LBI.001	-	External Antenna Supplied by test requester. For evaluation only.

Item	Shielded	Ferrite Core	Length	Cable Type	Remarks
1	NO	NO	1m	Lan to USB	-
2	YES	NO	0.5m	RS232 to USB	-
3	NO	NO	1.5m	Power cable	-

3. TEST RESULT

3.1 RADIATED POWER MEASUREMENT

3.1.1 LIMIT

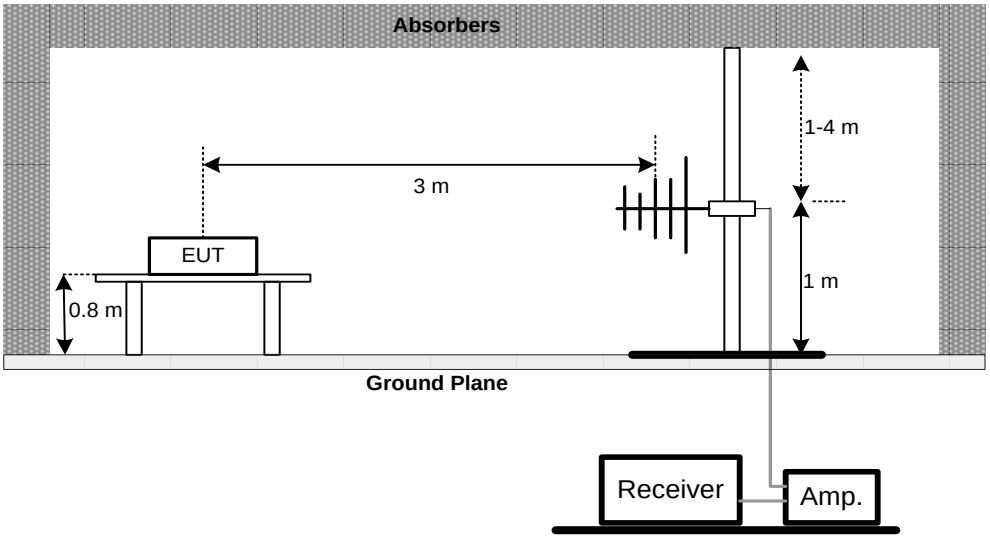
Mobile / Portable station are limited to 2 watts e.i.r.p.

3.1.2 TEST PROCEDURES

1. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
2. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value “ of step a. Record the power level of S.G
3. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
4. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

3.1.3 TEST SETUP LAYOUT

Radiated Power Measurement



3.1.4 TEST DEVIATION

No deviation

3.1.5 TEST RESULTS

Please refer to the APPENDIX A.

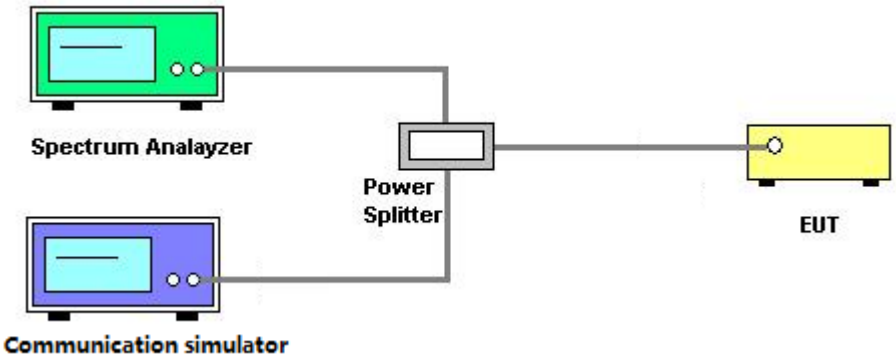
3.2 OCCUPIED BANDWIDTH MEASUREMENT

3.2.1 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 4.

1. The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth and 26dB bandwidth.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. RBW=(1% ~ 5%)*EBW
   VBW≥3* RBW
4. Set spectrum analyzer with Peak detector.

3.2.2 TEST SETUP LAYOUT



3.2.3 TEST DEVIATION

No deviation

3.2.4 TEST RESULTS

Please refer to the APPENDIX B.

3.3 CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

3.3.1 LIMIT

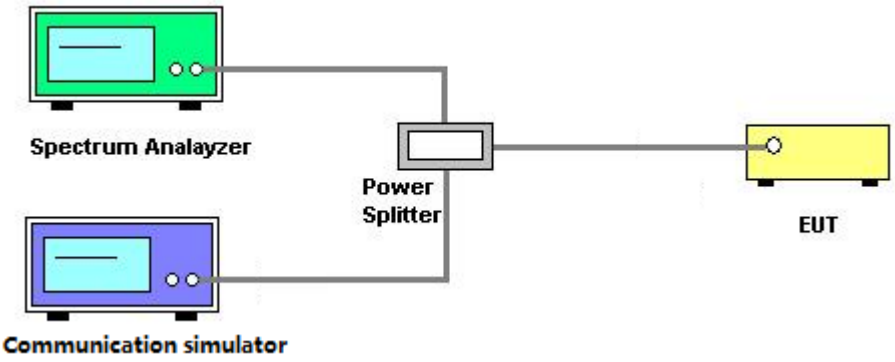
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to -13dBm.

3.3.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 6.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Set RBW>=1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
3. Set spectrum analyzer with Peak detector.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.3.3 TEST SETUP LAYOUT



3.3.4 TEST DEVIATION

No deviation

3.3.5 TEST RESULTS

Please refer to the APPENDIX C.

3.4 RADIATED SPURIOUS EMISSIONS MEASUREMENT

3.4.1 LIMIT

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. The emission limit equal to -13dBm.

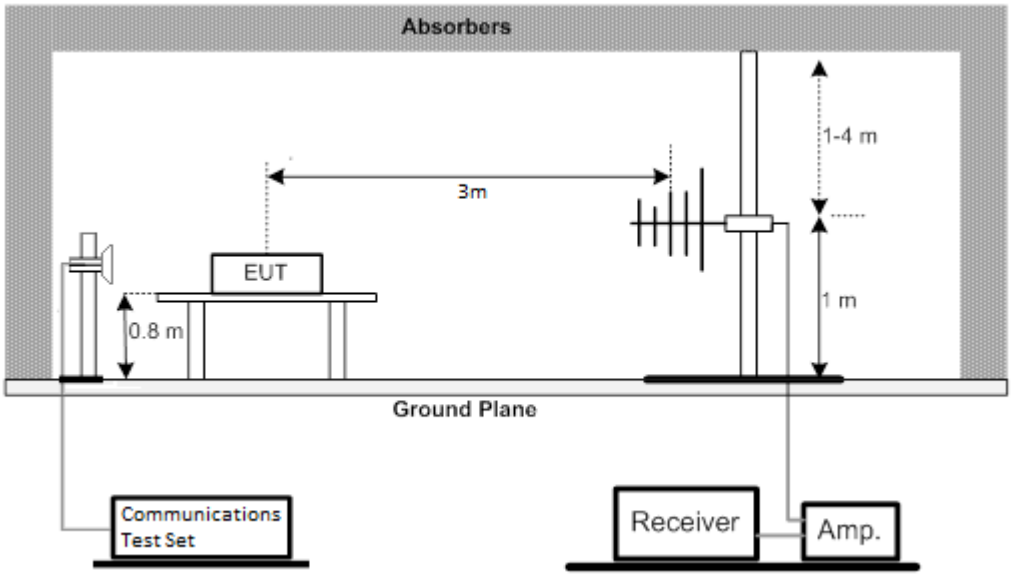
3.4.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 6.2.

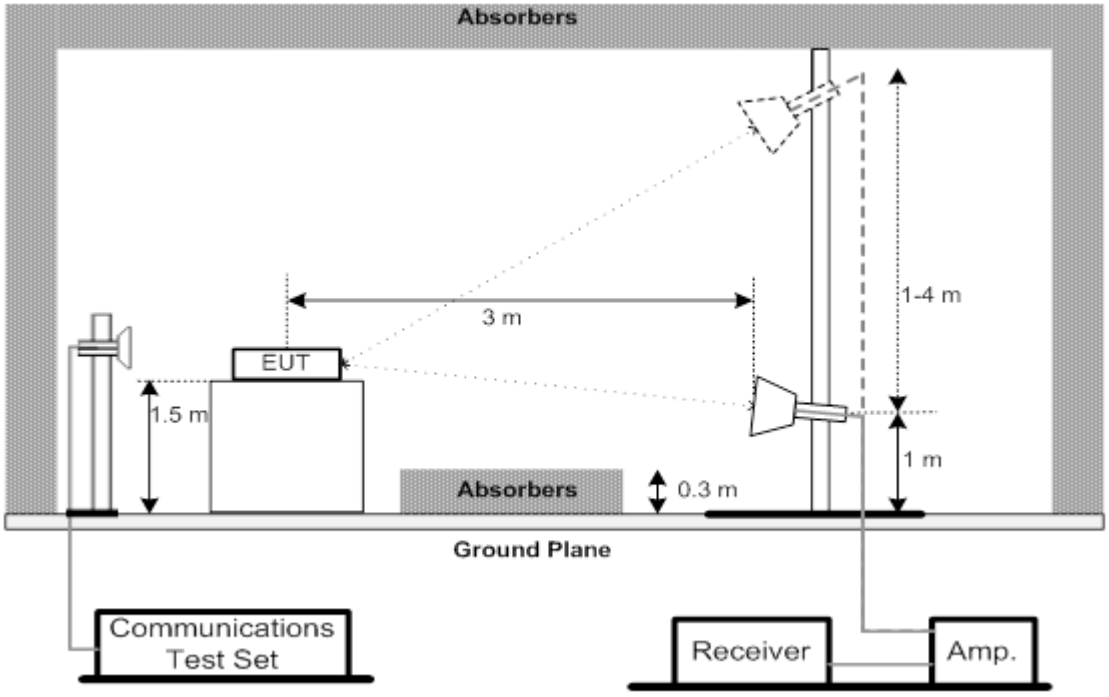
1. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
2. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value “ of step a. Record the power level of S.G
3. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
4. ERP can be calculated form EIRP by subtracting the gain of dipole, ERP = EIPR - 2.15dBi.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

3.4.3 TEST SETUP LAYOUT

30MHz to 1000MHz



Above 1GHz



3.4.4 TEST DEVIATION

No deviation

3.4.5 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the APPENDIX D.

3.4.6 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the APPENDIX E.

3.5 BAND EDGE MEASUREMENT

3.5.1 LIMIT

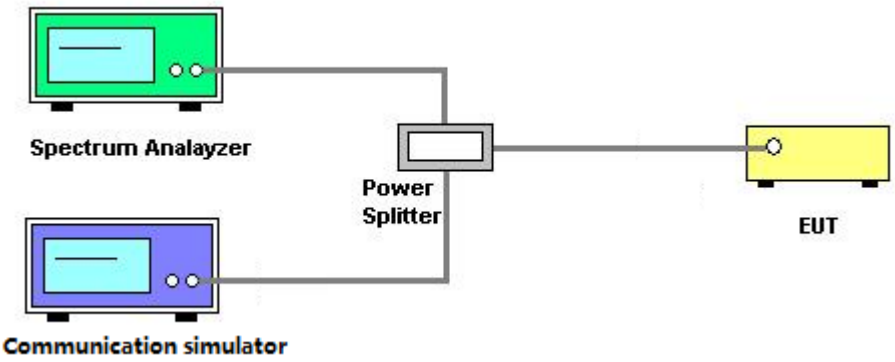
A Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

3.5.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 6.

1. All measurements were done at low and high operational frequency range.
2. Record the max trace plot into the test report.

3.5.3 TEST SETUP LAYOUT



3.5.4 TEST DEVIATION

No deviation

3.5.5 TEST RESULTS

Please refer to the APPENDIX F.

3.6 PEAK TO AVERAGE RATIO MEASUREMENT

3.6.1 LIMIT

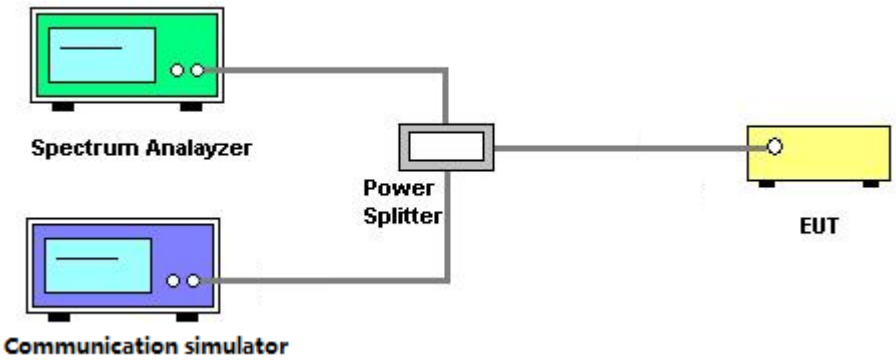
In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.6.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 5.7.

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

3.6.3 TEST SETUP LAYOUT



3.6.4 TEST DEVIATION

No deviation

3.6.5 TEST RESULTS

Please refer to the APPENDIX G.

3.7 FREQUENCY STABILITY MEASUREMENT

3.7.1 LIMIT

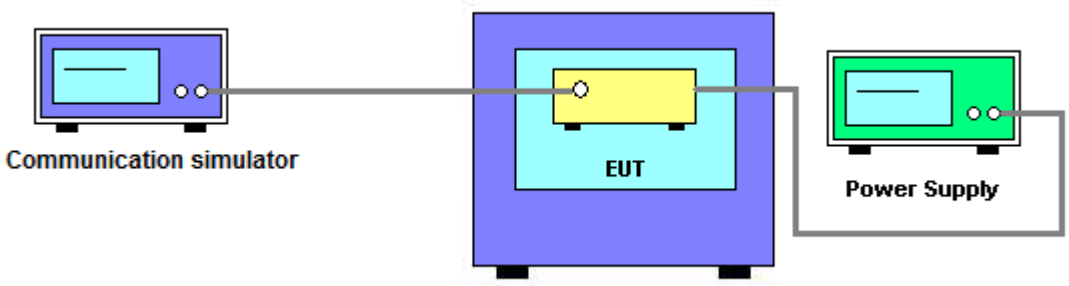
±1.5 ppm is for base and fixed station. ±2.5 ppm is for mobile station.

3.7.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 9.

1. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
2. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
3. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5°C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.
4. The frequency error was recorded frequency error from the communication simulator.

3.7.3 TEST SETUP LAYOUT



3.7.4 TEST DEVIATION

No deviation

3.7.5 TEST RESULTS

Please refer to the APPENDIX H.

4. LIST OF MEASUREMENT EQUIPMENTS

Radiated Emissions Measurement & ERP Power Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Preamplifier	EMCI	EMC02325B	980217	2019/4/12	2020/4/11
2	Preamplifier	EMCI	EMC012645B	980267	2019/4/12	2020/4/11
3	Test Cable	EMCI	EMC104-SM-SM-800	150207	2019/4/12	2020/4/11
4	Test Cable	EMCI	EMC104-SM-SM-3000	151205	2019/4/12	2020/4/11
5	Test Cable	EMCI	EMC-SM-SM-7000	180408	2019/4/12	2020/4/11
6	MXE EMI Receiver	Agilent	N9038A	MY55420127	2019/3/26	2020/3/25
7	Signal Analyzer	Agilent	N9010A	MY56480554	2019/6/6	2020/6/5
8	Horm Ant	SCHWARZBECK	BBHA 9120D	9120D-1342	2019/6/10	2020/6/9
9	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	000992	2019/5/29	2020/5/28
10	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0508	2019/5/29	2020/5/28
11	8960 Series 10 Wireless Com Test Set	Agilent	E5515C	GB47390193	2019/7/5	2020/7/4
12	Radio Communication Analyzer (LTE)	Anritsu	MT8820C	6201525878	2019/6/5	2020/6/4

Frequency Stability Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP40	100129	2019/5/23	2020/5/22

Others Conducted Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP40	100129	2019/5/23	2020/5/22

Remark: "N/A" denotes no model name, no serial no. or no calibration specified.
All calibration period of equipment list is one year.

5. EUT TEST PHOTOS

Please refer to document Appendix No.: TP-1911T165-FCCP-1 (APPENDIX-TEST PHOTOS).

6. EUT PHOTOS

Please refer to document Appendix No.: EP-1911T165-1 (APPENDIX-EUT PHOTOS).

APPENDIX A - RADIATED POWER

Output Power (dBm):

Modulation	Band	WCDMA Band II		
	Tx Channel	9262CH	9400CH	9538CH
	Frequency	1852.4MHz	1880MHz	1907.6MHz
QPSK	RMC 12.2K	22.7	22.7	22.8
	HSDPA Subtest-1	22.7	22.8	22.8
	HSDPA Subtest-2	22.3	22.4	22.4
	HSDPA Subtest-3	21.8	22.0	21.9
	HSDPA Subtest-4	21.8	21.9	21.9
	HSUPA Subtest-1	22.7	22.8	22.8
	HSUPA Subtest-2	20.8	20.9	21.0
	HSUPA Subtest-3	21.8	22.0	21.9
	HSUPA Subtest-4	20.9	21.0	20.9
	HSUPA Subtest-5	22.7	22.8	22.8

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18607CH	18900CH	19193CH
				1850.7MHz	1880MHz	1909.3MHz
2 / 1.4M	QPSK	1	0	24.4	24.4	24.3
		1	2	23.7	23.9	23.9
		1	5	23.5	23.8	23.7
		3	0	24.4	24.4	24.3
		3	1	23.7	23.9	23.9
		3	2	23.5	23.8	23.7
		6	0	22.6	22.9	22.9
	16QAM	1	0	23.6	23.5	23.5
		1	2	22.8	23.0	23.0
		1	5	22.7	23.0	22.8
		3	0	23.6	23.5	23.5
		3	1	22.8	23.0	23.0
		3	2	22.7	23.0	22.8
		6	0	21.6	20.5	20.6

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18615CH	18900CH	19185CH
				1851.5MHz	1880MHz	1908.4MHz
2 / 3M	QPSK	1	0	24.4	24.4	24.3
		1	7	23.7	23.9	23.9
		1	14	23.5	23.8	23.7
		8	0	23.5	23.6	23.4
		8	4	22.9	23.1	23.1
		8	7	22.6	22.9	22.8
		15	0	22.6	22.9	22.9
	16QAM	1	0	23.6	23.5	23.5
		1	7	22.8	23.0	23.0
		1	14	22.7	23.0	22.8
		8	0	22.5	22.6	22.5
		8	4	21.9	22.1	22.1
		8	7	21.6	21.9	21.8
		15	0	21.6	21.3	21.1

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18625CH	18900CH	19175CH
				1852.5MHz	1880MHz	1907.5MHz
2 / 5M	QPSK	1	0	24.5	24.5	24.4
		1	12	23.8	24.0	24.0
		1	24	23.6	23.9	23.8
		12	0	23.6	23.7	23.5
		12	6	23.0	23.2	23.2
		12	11	22.7	23.0	22.9
		25	0	22.7	23.0	23.0
	16QAM	1	0	23.7	23.6	23.6
		1	12	22.9	23.1	23.1
		1	24	22.8	23.1	22.9
		12	0	22.6	22.7	22.6
		12	6	22.0	22.2	22.2
		12	11	21.7	22.0	21.9
		25	0	21.7	22.0	21.9

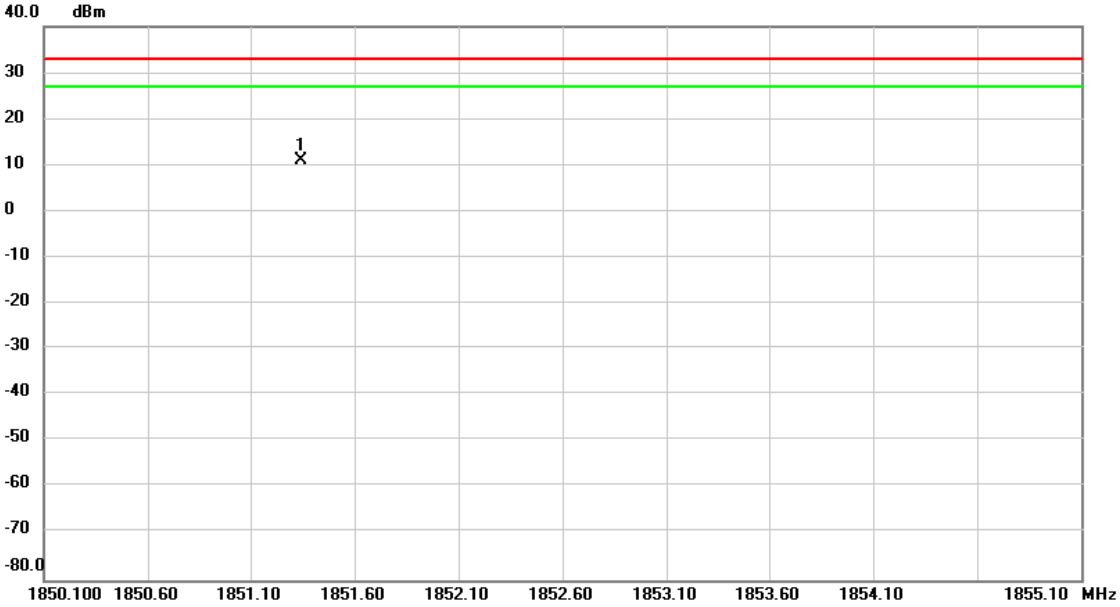
LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18650CH	18900CH	19150CH
				1855MHz	1880MHz	1905MHz
2 / 10M	QPSK	1	0	24.5	24.5	24.4
		1	24	23.8	24.0	24.0
		1	49	23.6	23.9	23.8
		25	0	23.6	23.7	23.5
		25	12	23.0	23.2	23.2
		25	24	22.7	23.0	22.9
		50	0	22.7	23.0	23.0
	16QAM	1	0	23.7	23.6	23.6
		1	24	22.9	23.1	23.1
		1	49	22.8	23.1	22.9
		25	0	22.6	22.7	22.6
		25	12	22.0	22.2	22.2
		25	24	21.7	22.0	21.9
		50	0	21.7	22.0	21.9

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18675CH	18900CH	19125CH
				1857.5MHz	1880MHz	1902.5MHz
2 / 15M	QPSK	1	0	24.6	24.6	24.5
		1	37	23.9	24.1	24.1
		1	74	23.7	24.0	23.9
		36	0	23.7	23.8	23.6
		36	18	23.1	23.3	23.3
		36	35	22.8	23.1	23.0
		75	0	22.8	23.1	23.1
	16QAM	1	0	23.8	23.7	23.7
		1	37	23.0	23.2	23.2
		1	74	22.9	23.2	23.0
		36	0	22.7	22.8	22.7
		36	18	22.1	22.3	22.3
		36	35	21.8	22.1	22.0
		75	0	21.8	22.1	22.0

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				18700CH	18900CH	19100CH
				1860MHz	1880MHz	1900MHz
2 / 20M	QPSK	1	0	24.6	24.6	24.5
		1	49	23.9	24.1	24.1
		1	99	23.7	24.0	23.9
		50	0	23.7	23.8	23.6
		50	24	23.1	23.3	23.3
		50	49	22.8	23.1	23.0
		100	0	22.8	23.1	23.1
	16QAM	1	0	23.8	23.7	23.7
		1	49	23.0	23.2	23.2
		1	99	22.9	23.2	23.0
		50	0	22.7	22.8	22.7
		50	24	22.1	22.3	22.3
		50	49	21.8	22.1	22.0
		100	0	21.8	22.1	22.0

EIRP (dBm):

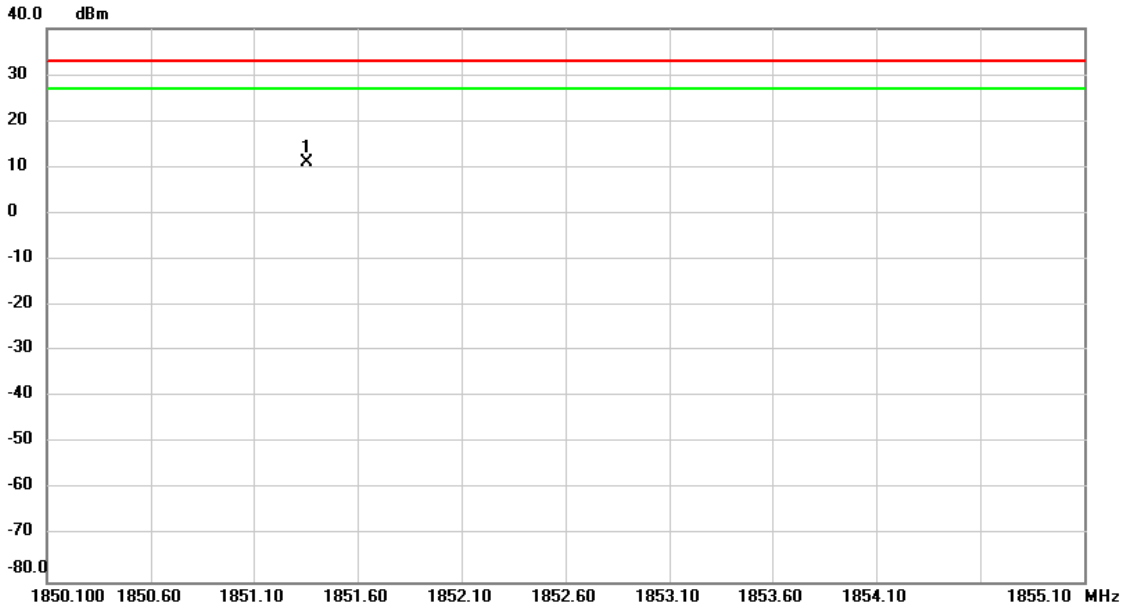
Test Mode	WCDMA Band II_Link CH9662_Internal Antenna	Tested Date	2019/12/22~26
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1851.340	16.83	-5.79	11.04	33.01	-21.97	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

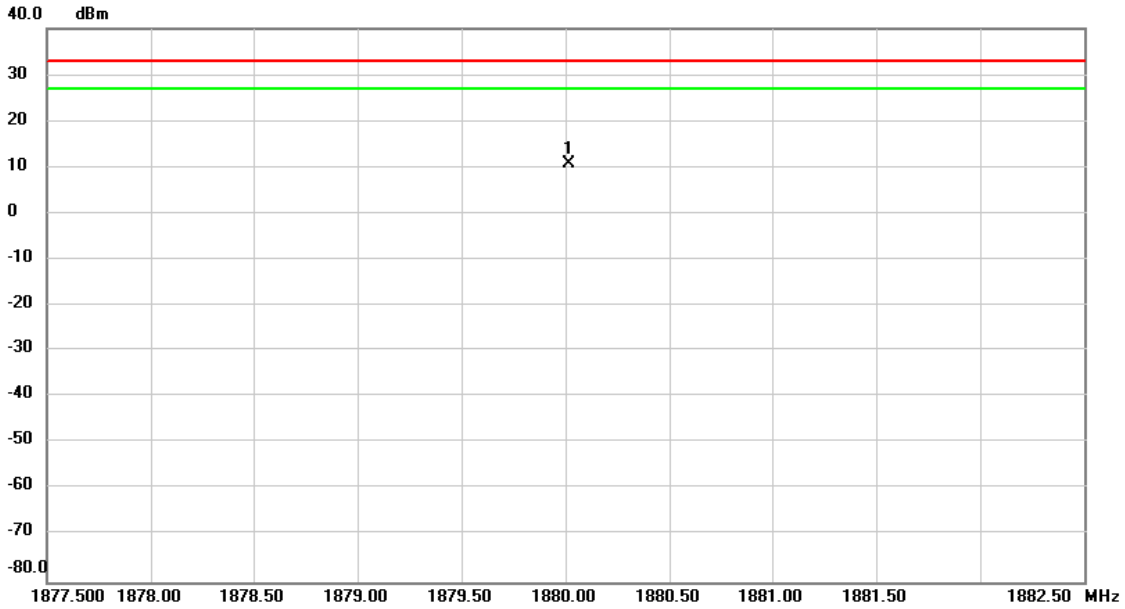
Test Mode	WCDMA Band II_Link CH9662_Internal Antenna	Tested Date	2019/12/22~26
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1851.360	16.93	-5.79	11.14	33.01	-21.87	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

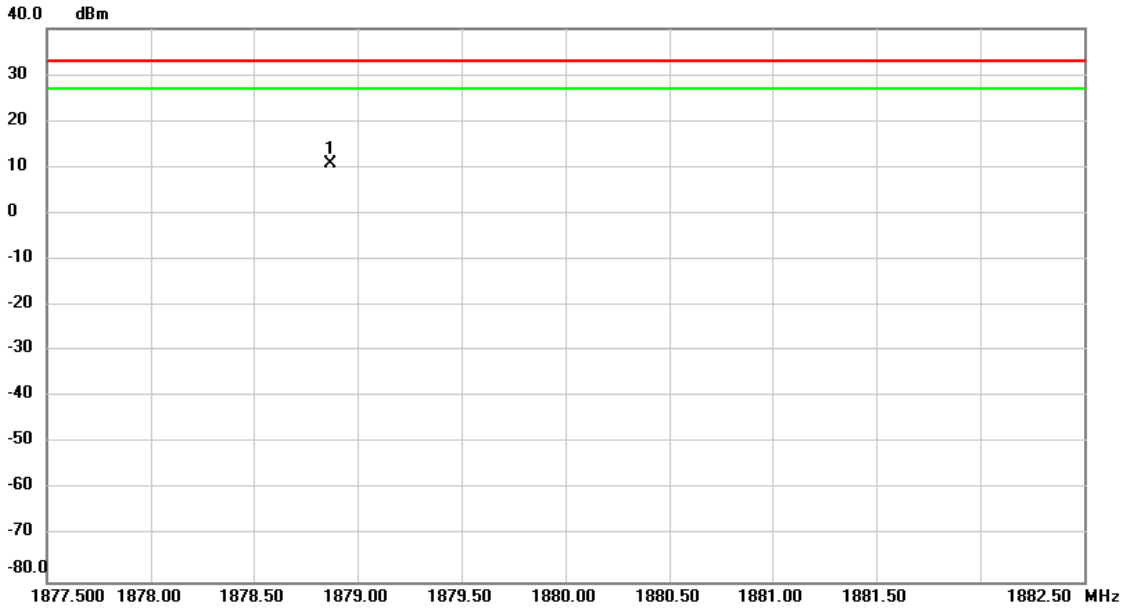
Test Mode	WCDMA Band II_Link CH9800_Internal Antenna	Tested Date	2019/12/22~26
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1880.015	16.86	-6.04	10.82	33.01	-22.19	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

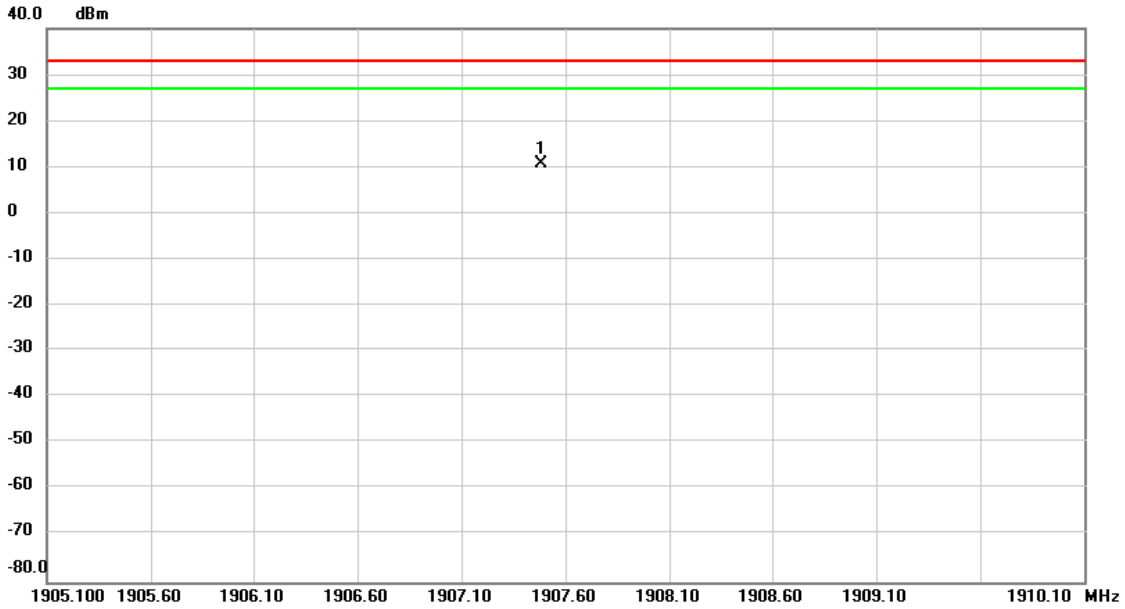
Test Mode	WCDMA Band II_Link CH9800_Internal Antenna	Tested Date	2019/12/22~26
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1878.870	16.74	-6.03	10.71	33.01	-22.30	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

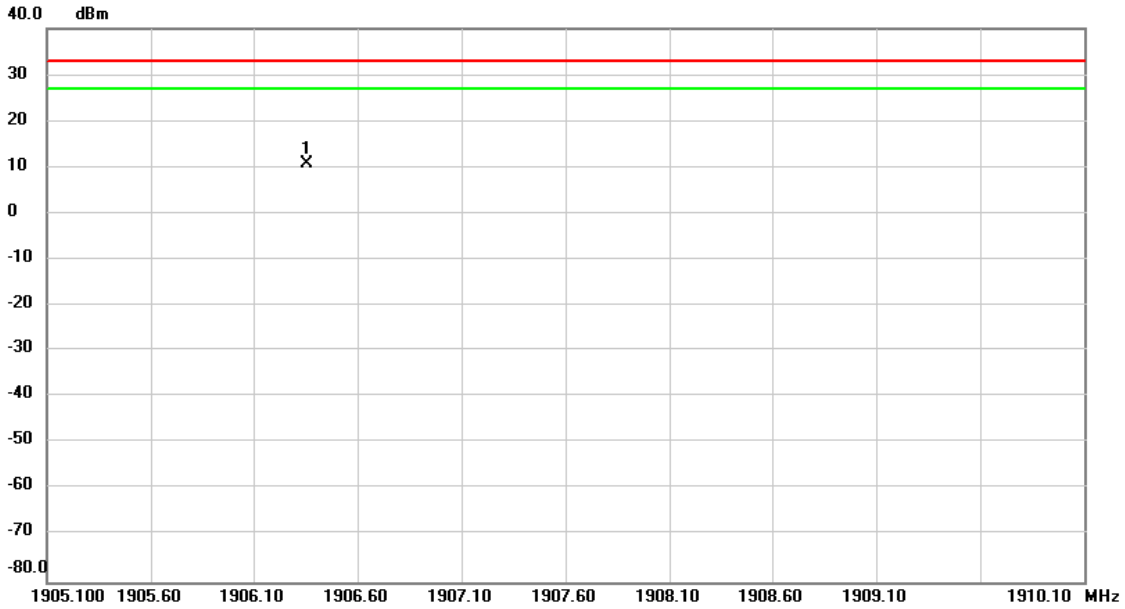
Test Mode	WCDMA Band II_Link CH9938_Internal Antenna	Tested Date	2019/12/22~26
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1907.485	16.91	-6.13	10.78	33.01	-22.23	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

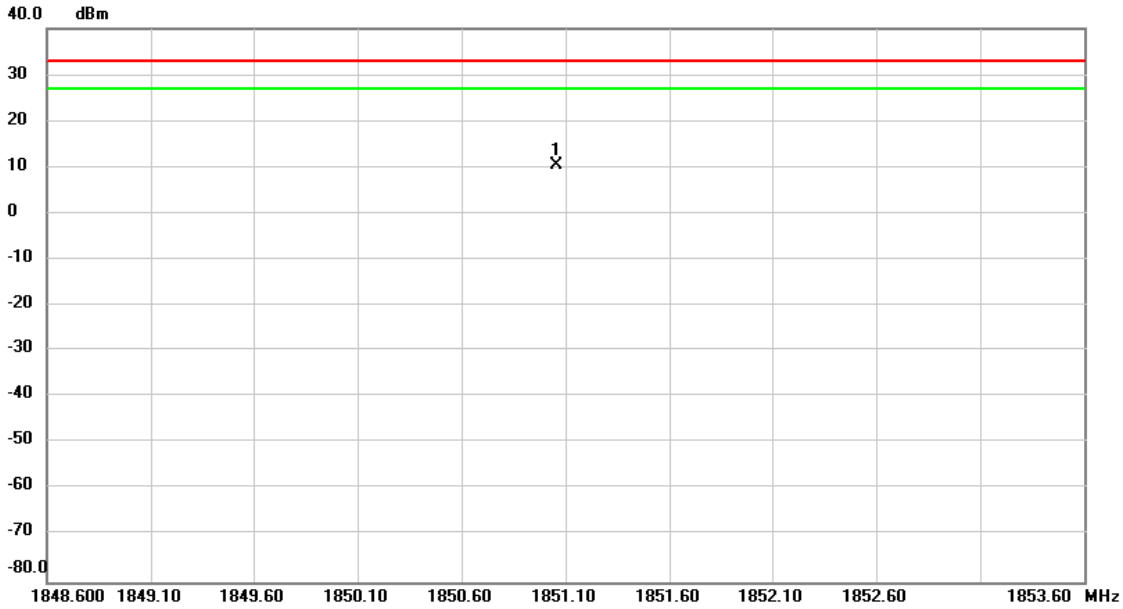
Test Mode	WCDMA Band II_Link CH9938_Internal Antenna	Tested Date	2019/12/22~26
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1906.360	16.79	-6.14	10.65	33.01	-22.36	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

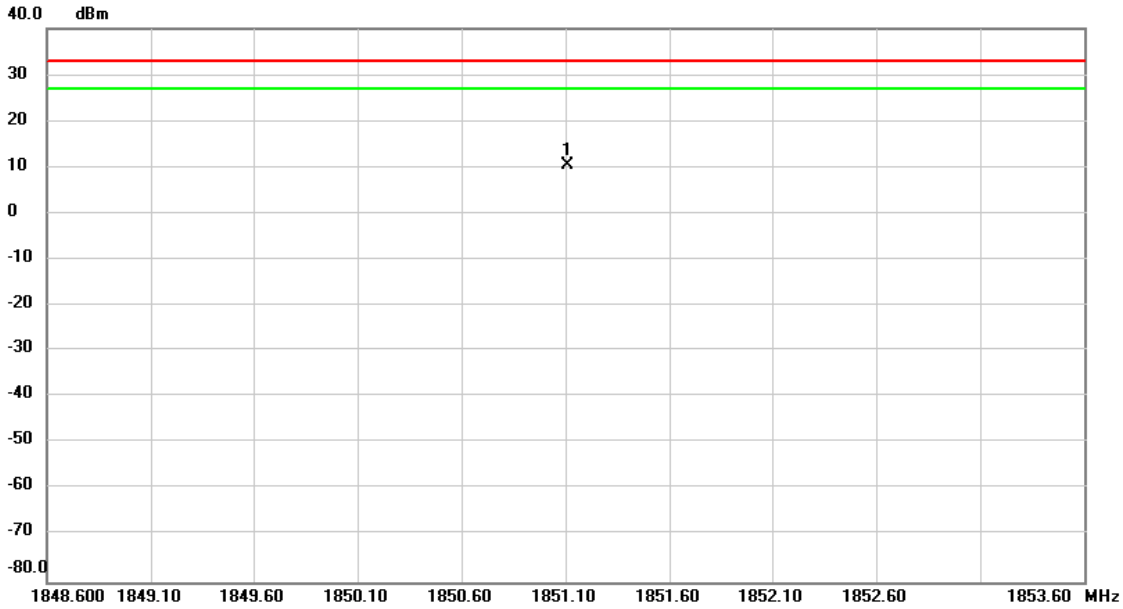
Test Mode	LTE Band 2_Link CH 18700_Internal Antenna	Tested Date	2019/12/22~26
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1851.055	16.30	-5.79	10.51	33.01	-22.50	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

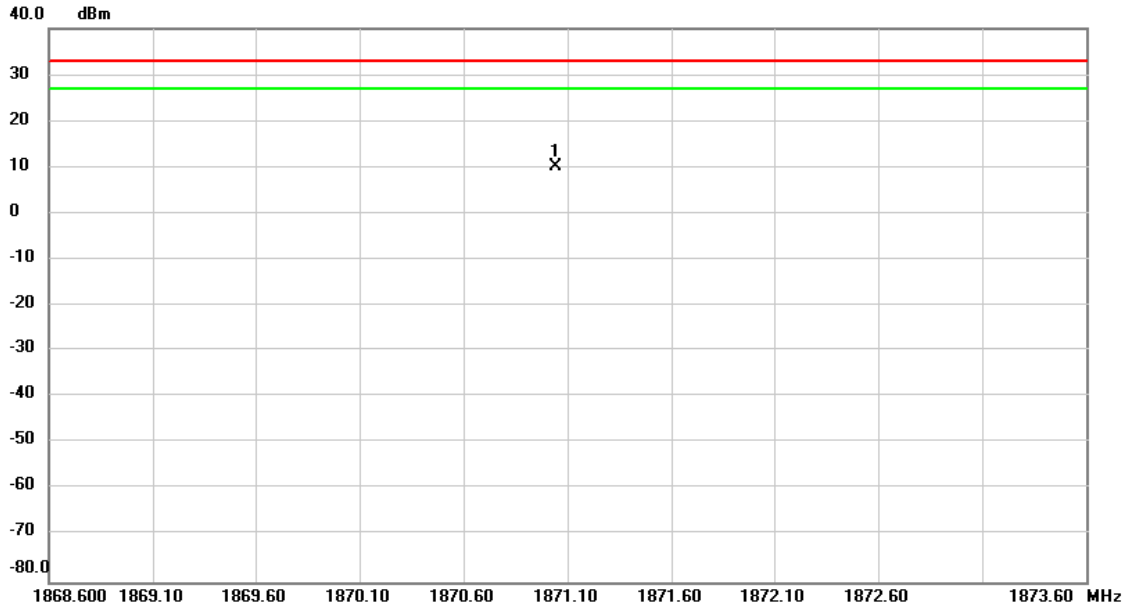
Test Mode	LTE Band 2_Link CH 18700_Internal Antenna	Tested Date	2019/12/22~26
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1851.110	16.23	-5.79	10.44	33.01	-22.57	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

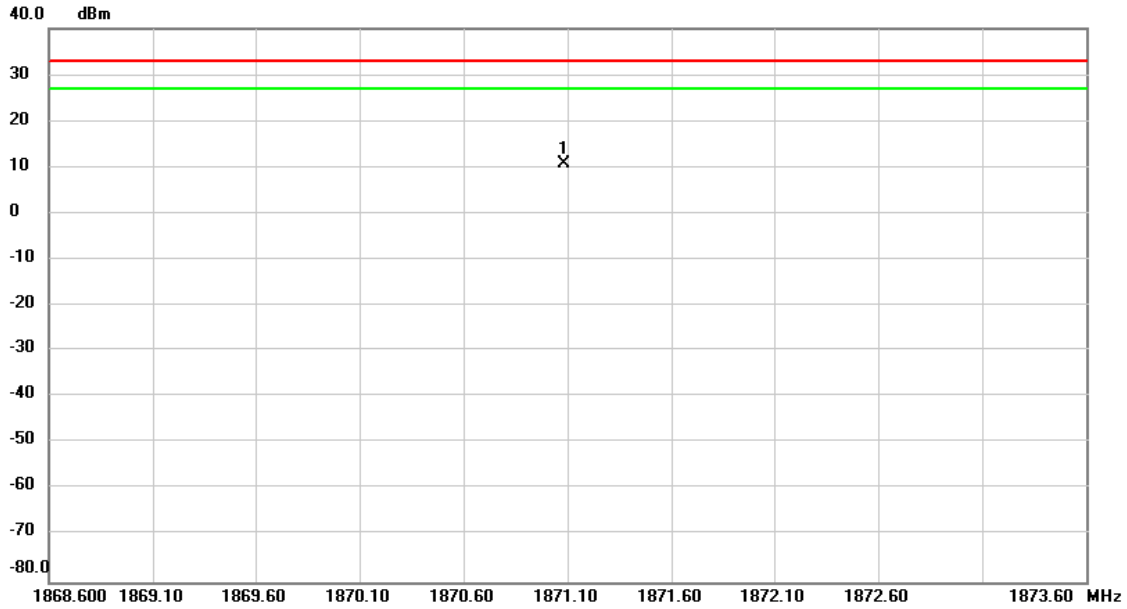
Test Mode	LTE Band 2_Link CH 18900_Internal Antenna	Tested Date	2019/12/22~26
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1871.040	16.11	-5.97	10.14	33.01	-22.87	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

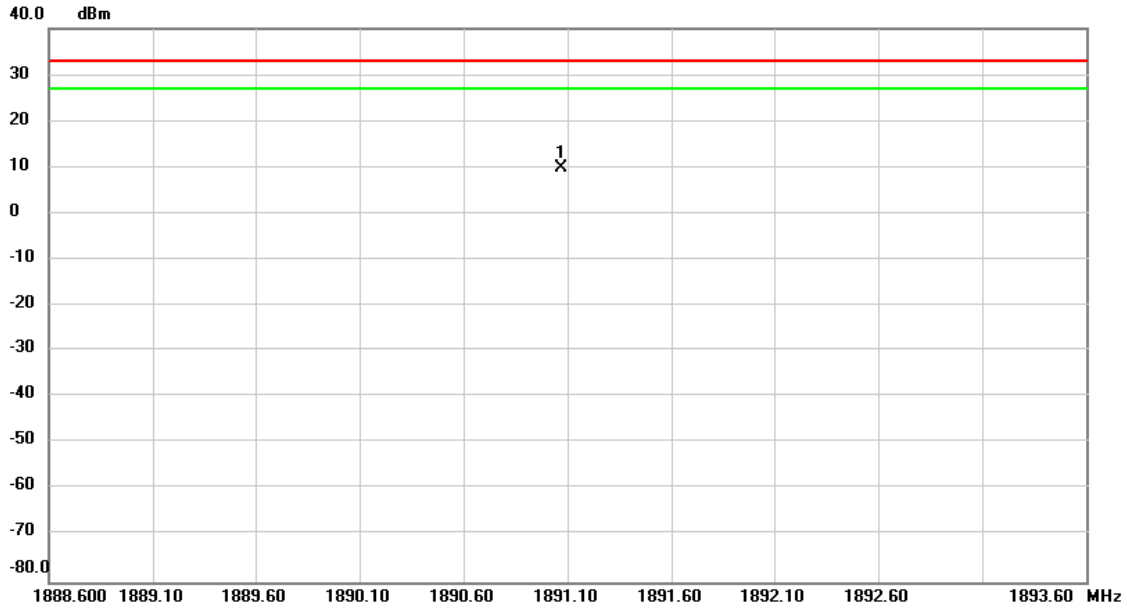
Test Mode	LTE Band 2_Link CH 18900_Internal Antenna	Tested Date	2019/12/22~26
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1871.080	16.68	-5.97	10.71	33.01	-22.30	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

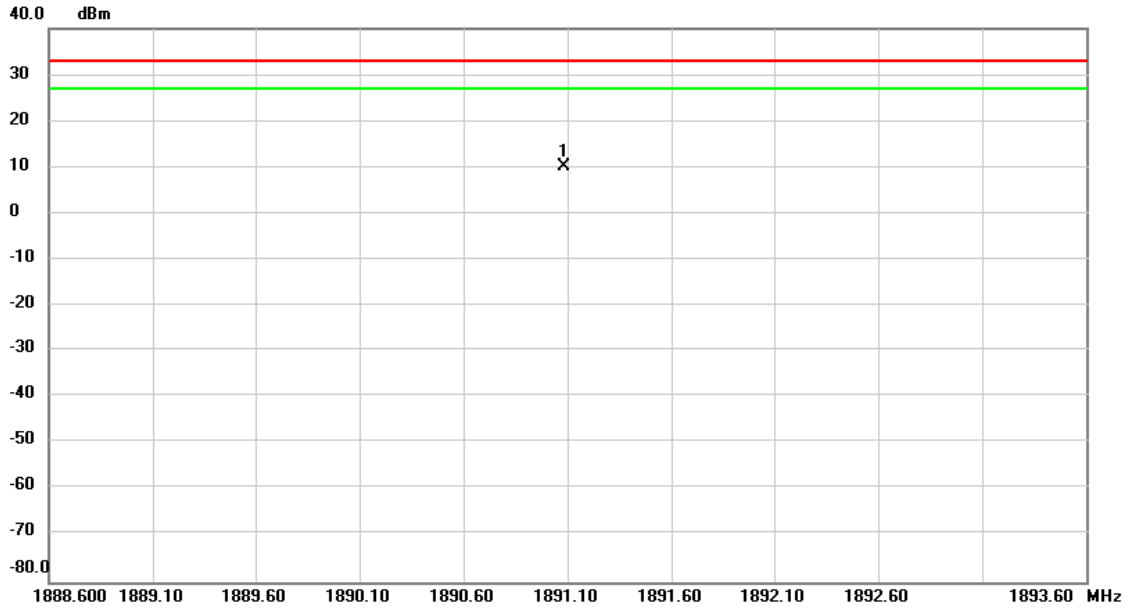
Test Mode	LTE Band 2_Link CH 19100_Internal Antenna	Tested Date	2019/12/22~26
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1891.070	16.00	-6.14	9.86	33.01	-23.15	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

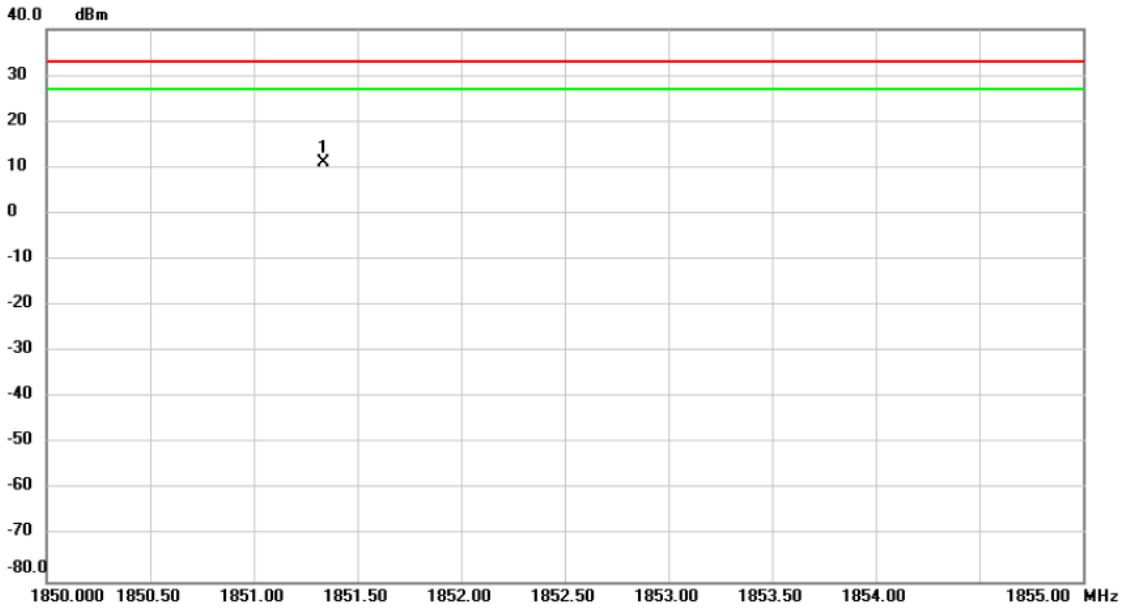
Test Mode	LTE Band 2_Link CH 19100_Internal Antenna	Tested Date	2019/12/22~26
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1891.080	16.18	-6.14	10.04	33.01	-22.97	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

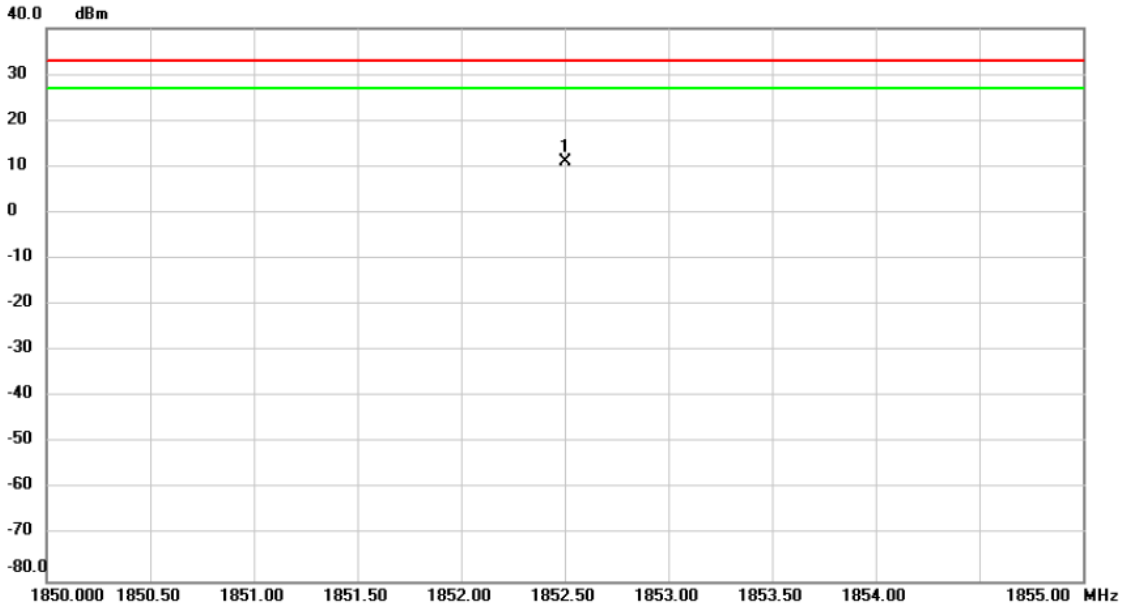
Test Mode	WCDMA Band II_Link CH9662_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1851.340	16.78	-5.79	10.99	33.01	-22.02	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

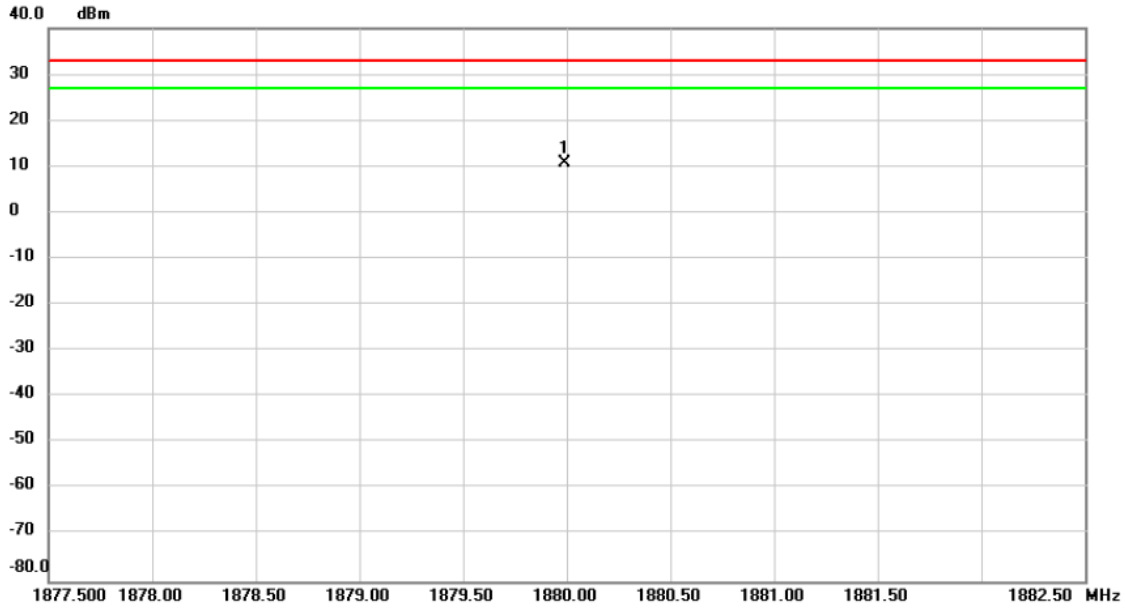
Test Mode	WCDMA Band II_Link CH9662_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1852.500	16.94	-5.80	11.14	33.01	-21.87	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

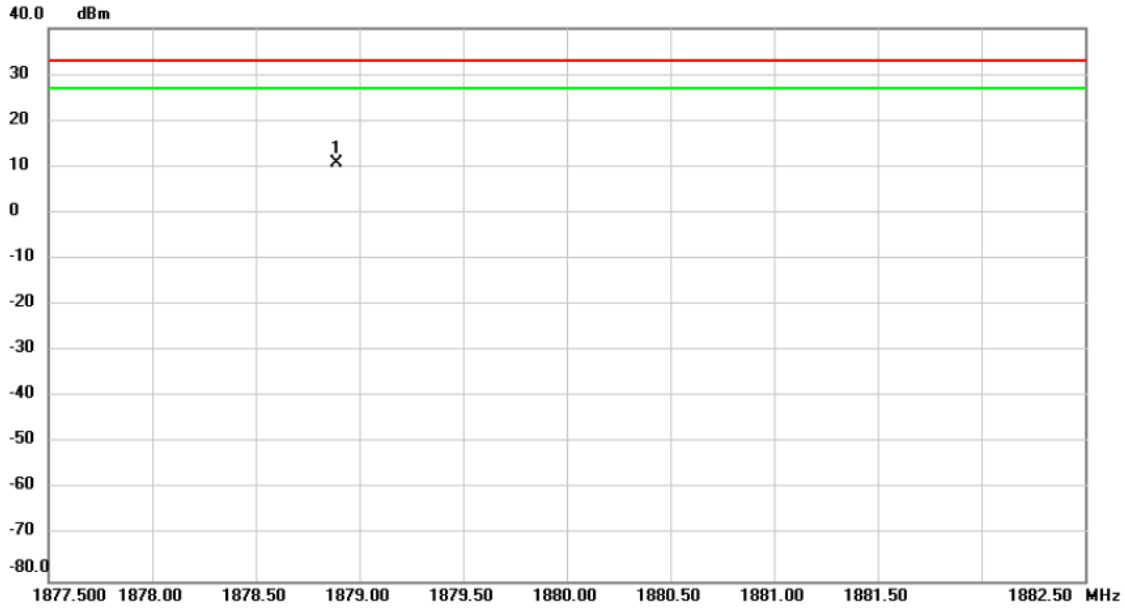
Test Mode	WCDMA Band II_Link CH9800_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1879.990	16.70	-6.04	10.66	33.01	-22.35	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

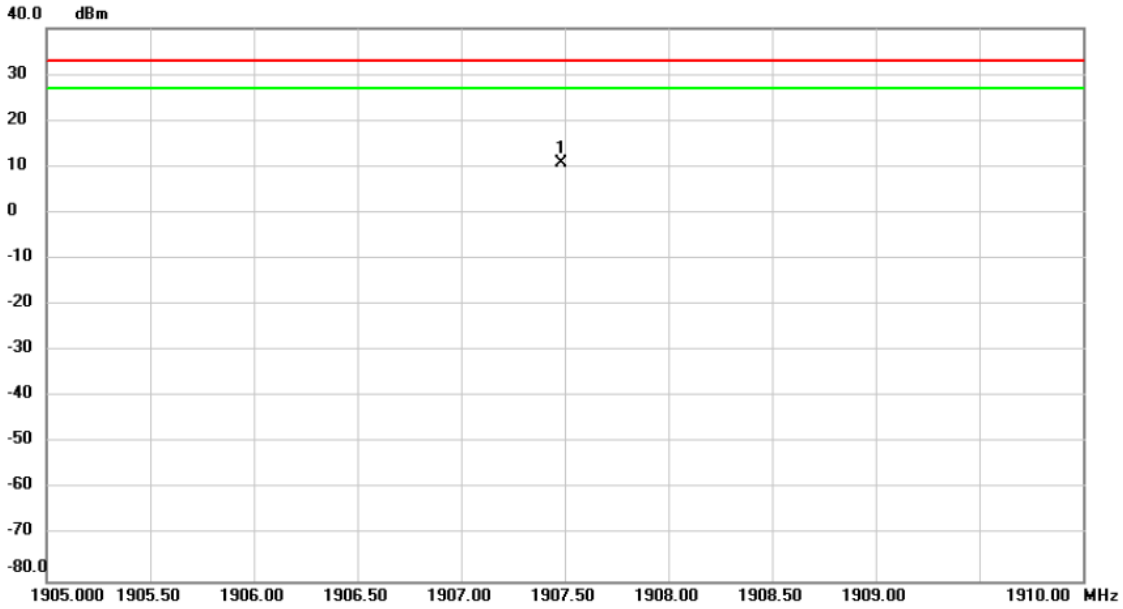
Test Mode	WCDMA Band II_Link CH9800_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1878.890	16.81	-6.03	10.78	33.01	-22.23	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

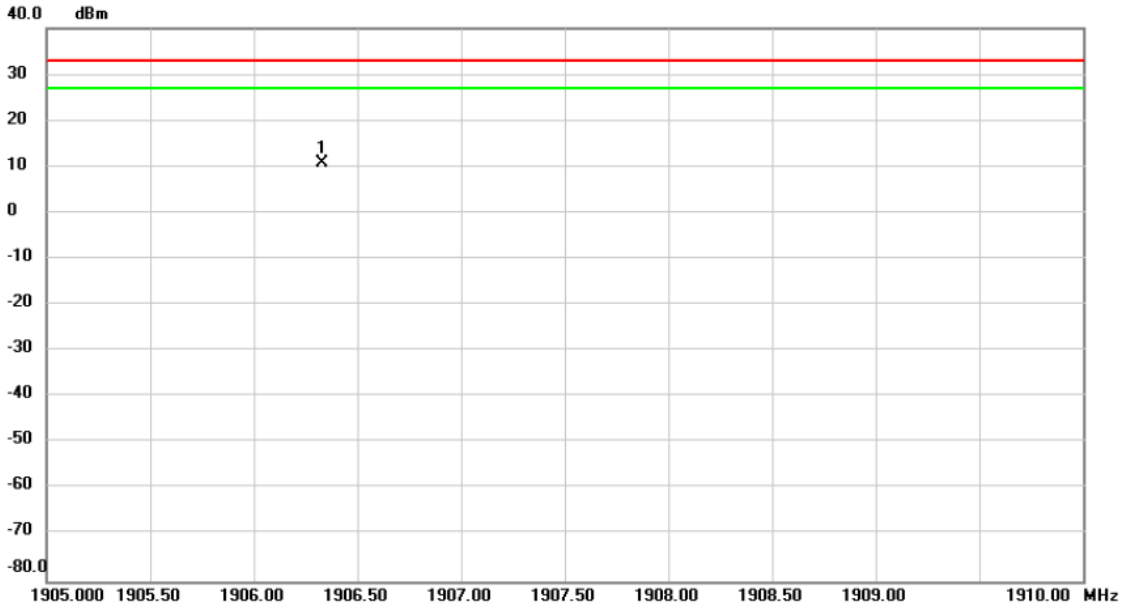
Test Mode	WCDMA Band II_Link CH9938_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1907.480	16.83	-6.13	10.70	33.01	-22.31	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

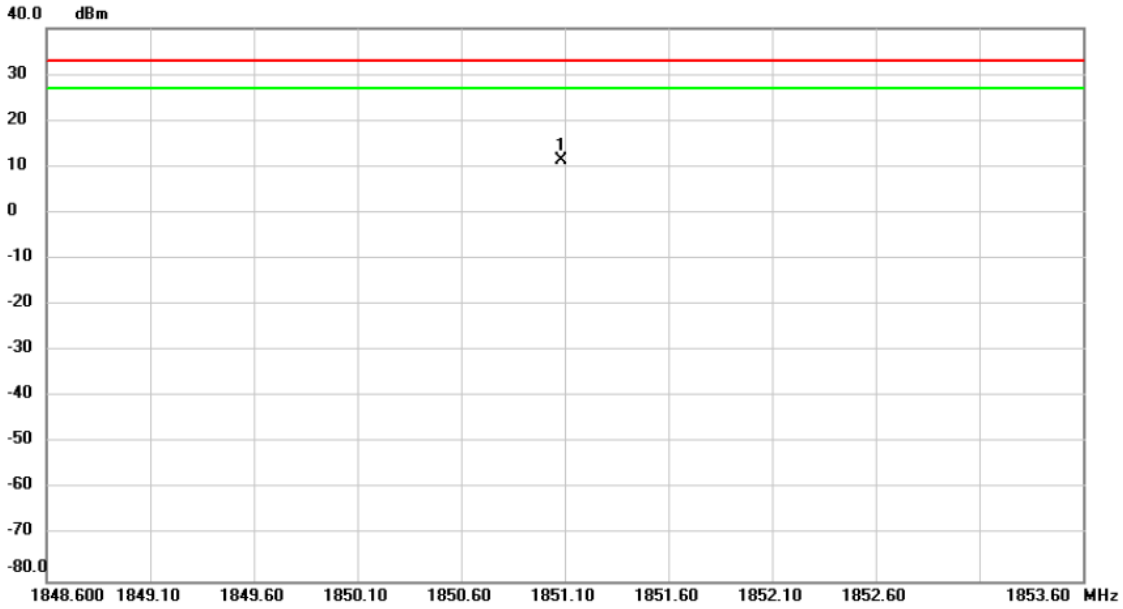
Test Mode	WCDMA Band II_Link CH9938_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1906.330	16.82	-6.14	10.68	33.01	-22.33	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

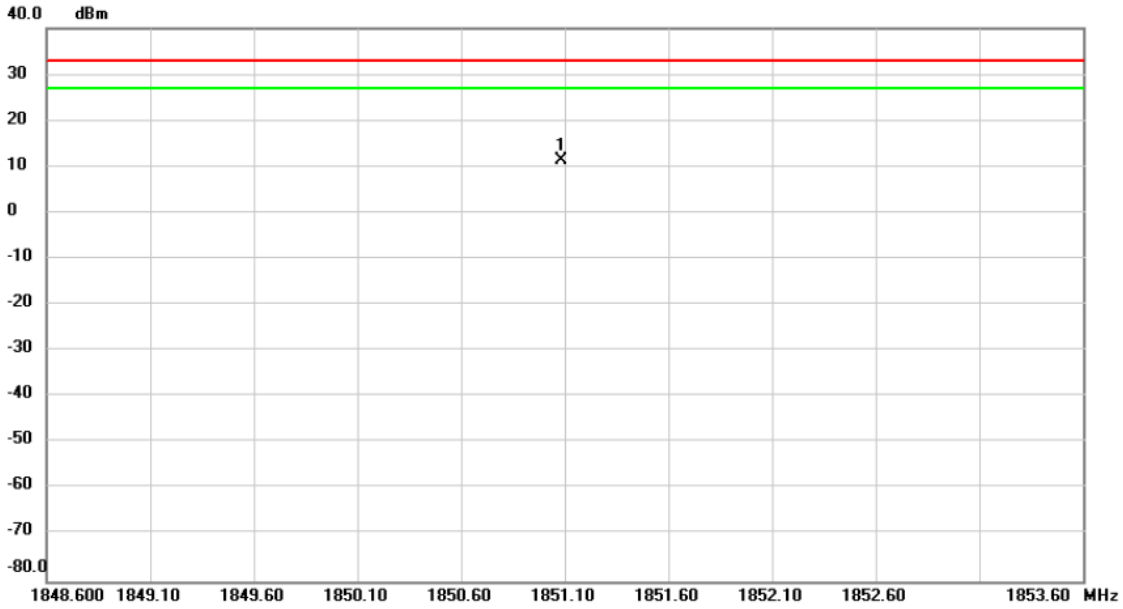
Test Mode	LTE Band 2_Link CH 18700_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1851.080	17.02	-5.79	11.23	33.01	-21.78	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

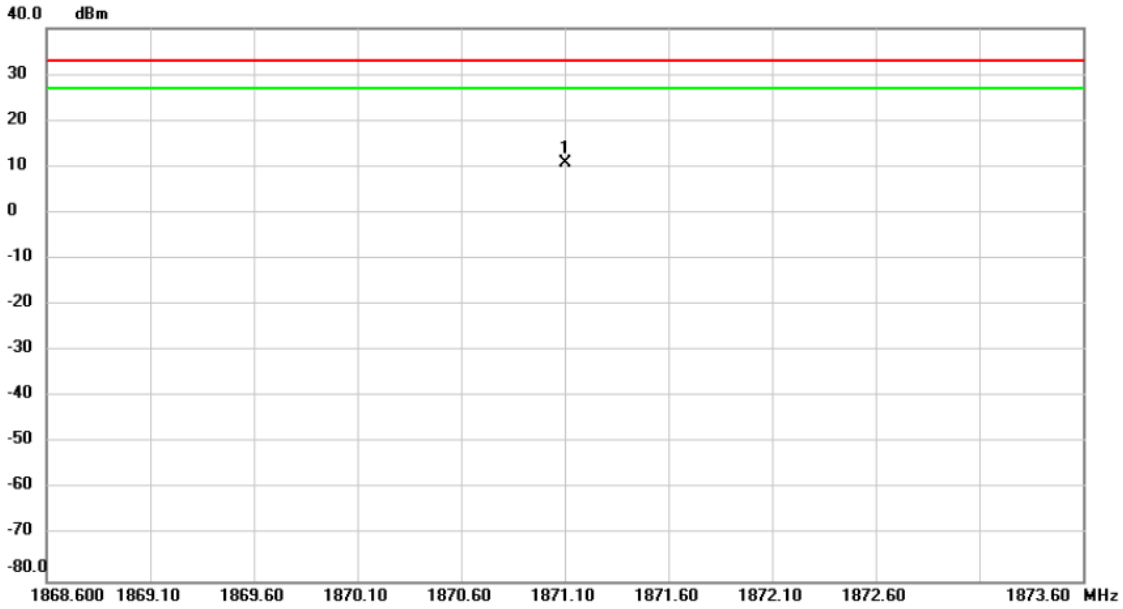
Test Mode	LTE Band 2_Link CH 18700_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1851.080	17.09	-5.79	11.30	33.01	-21.71	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

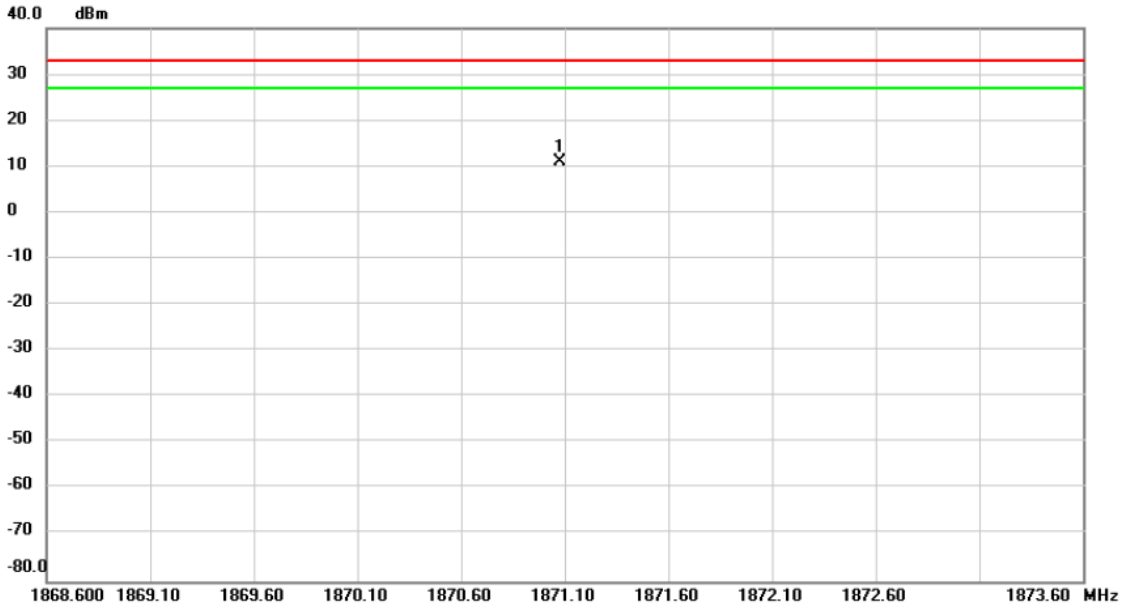
Test Mode	LTE Band 2_Link CH 18900_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1871.100	16.71	-5.97	10.74	33.01	-22.27	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

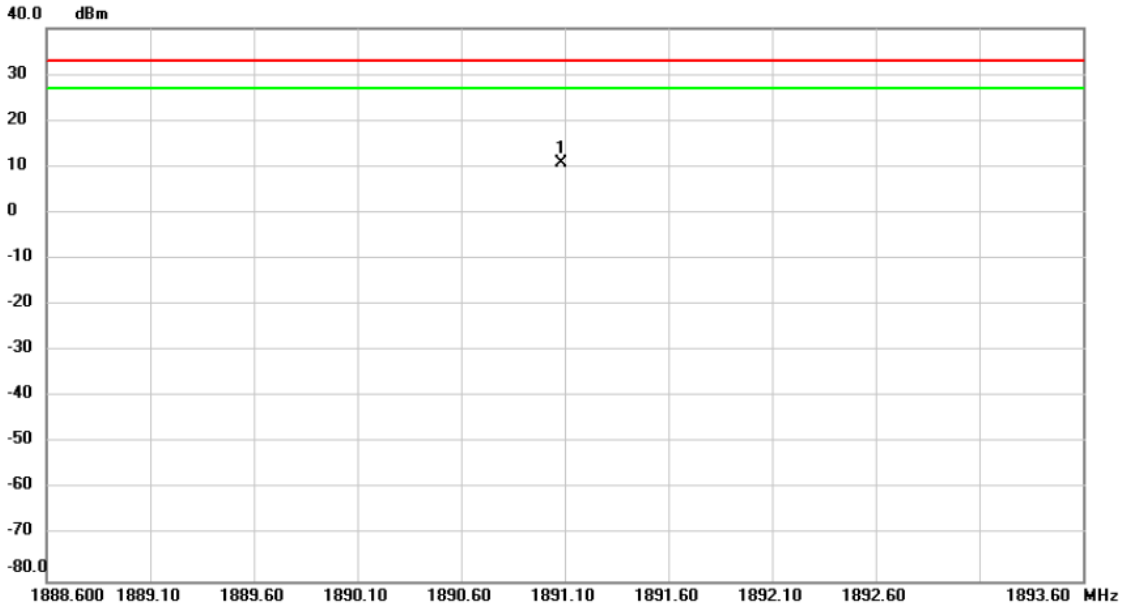
Test Mode	LTE Band 2_Link CH 18900_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1871.075	17.00	-5.97	11.03	33.01	-21.98	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

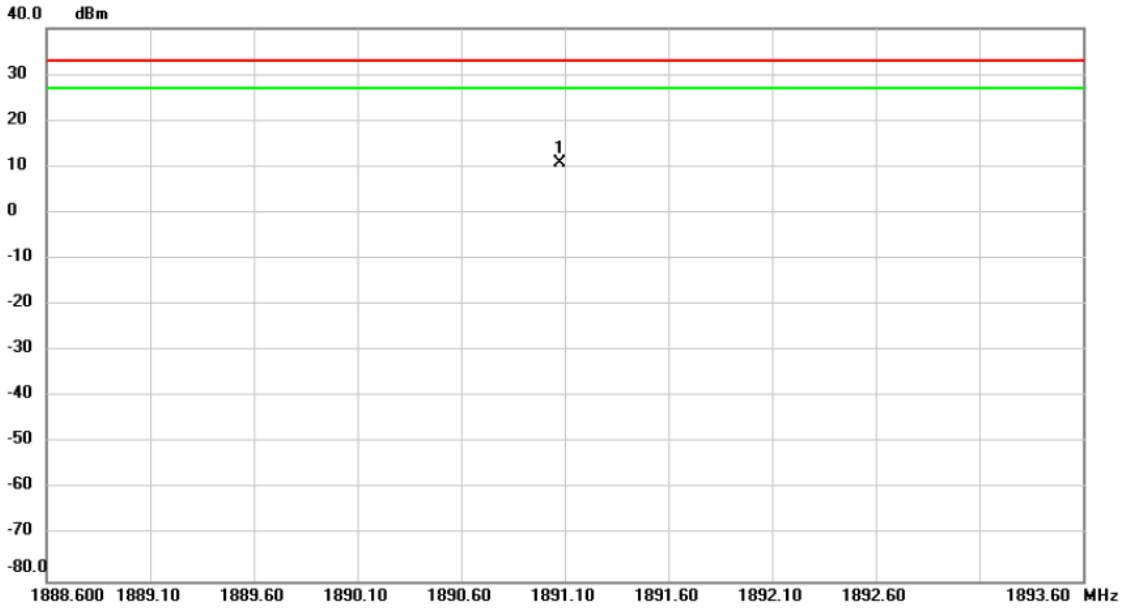
Test Mode	LTE Band 2_Link CH 19100_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1891.085	16.98	-6.14	10.84	33.01	-22.17	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	LTE Band 2_Link CH 19100_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Horizontal

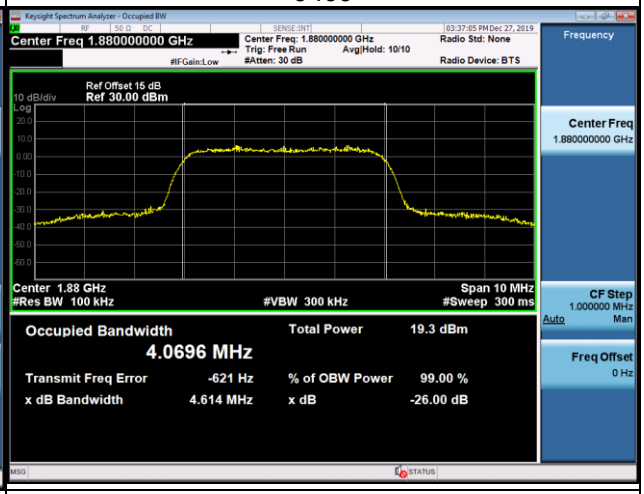
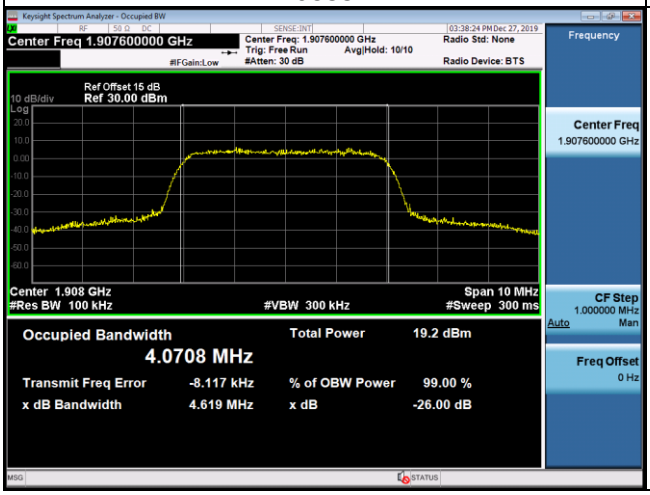


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1891.075	17.02	-6.14	10.88	33.01	-22.13	peak	

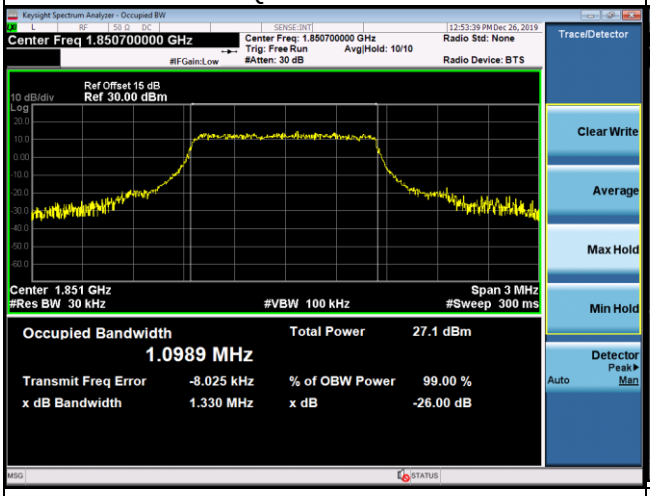
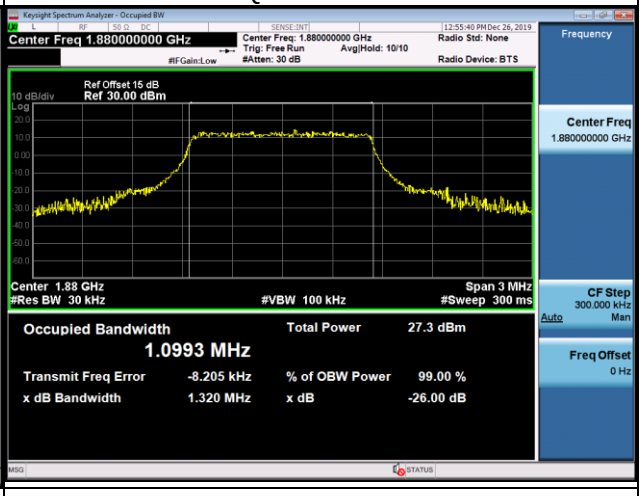
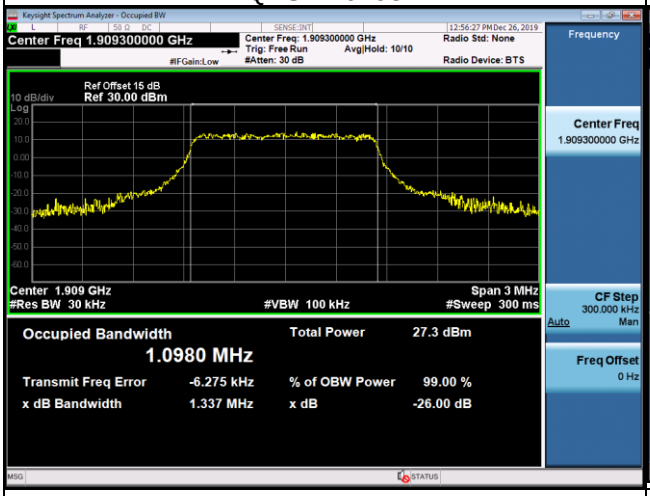
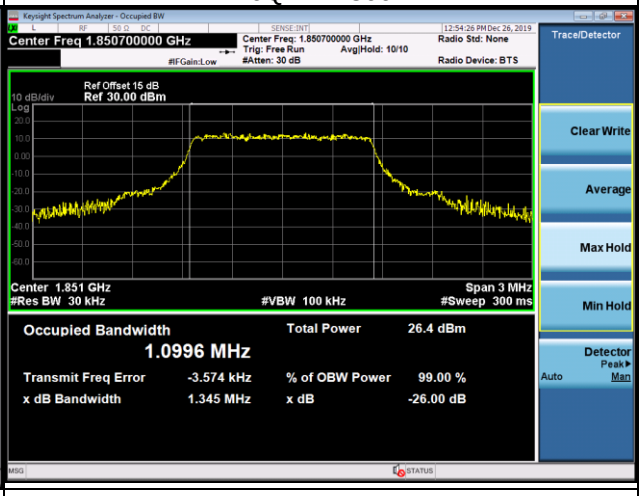
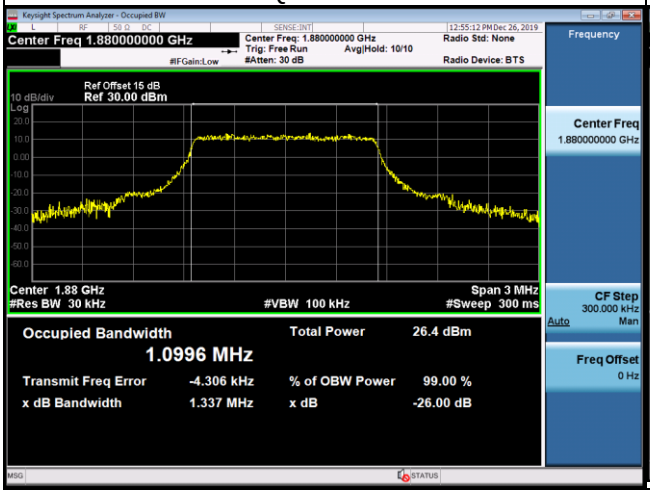
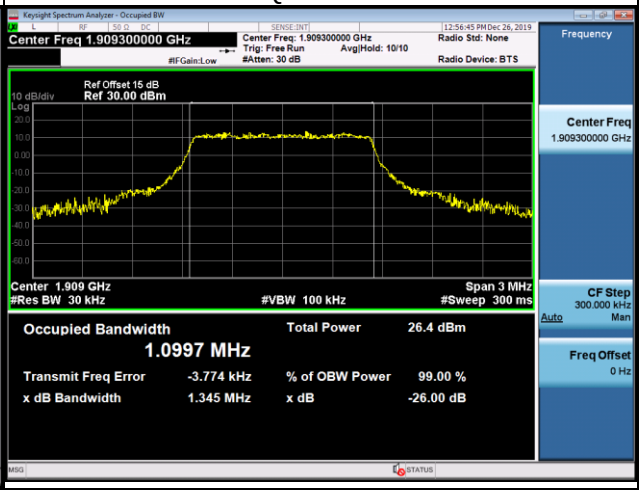
REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

APPENDIX B - OCCUPIED BANDWIDTH

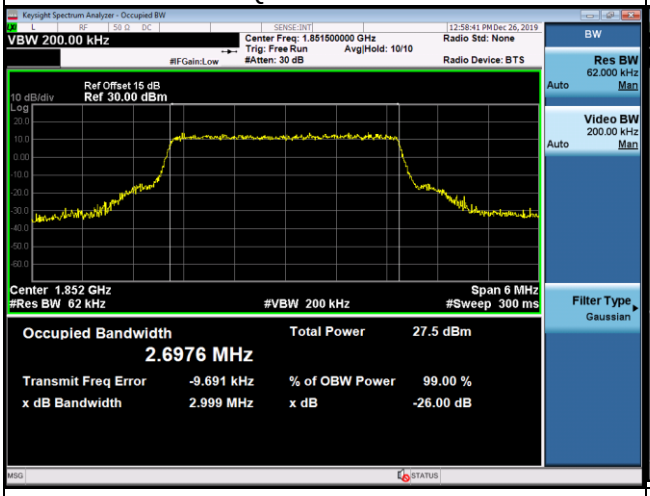
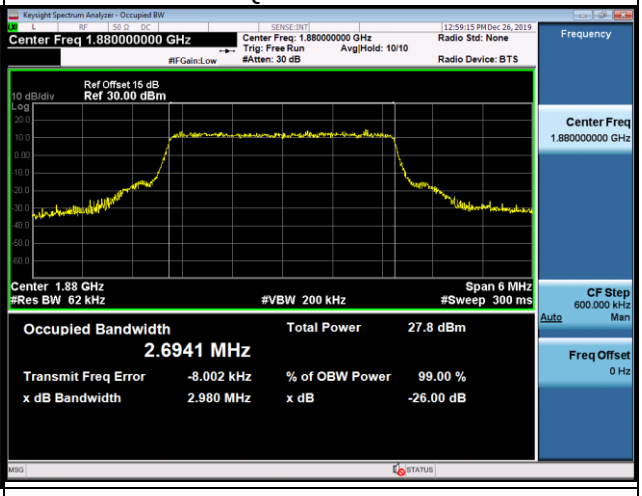
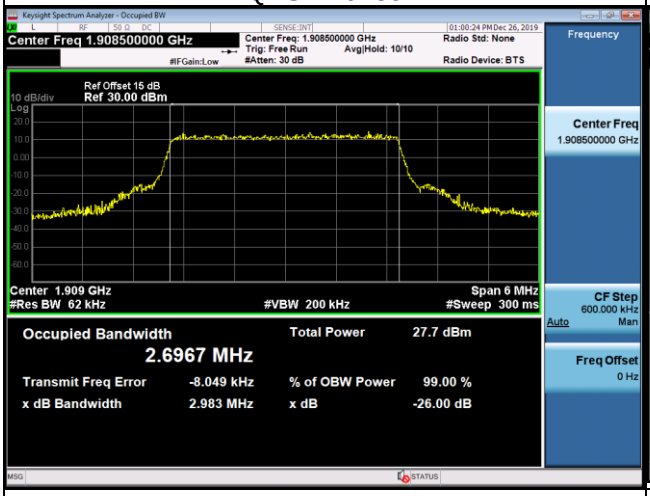
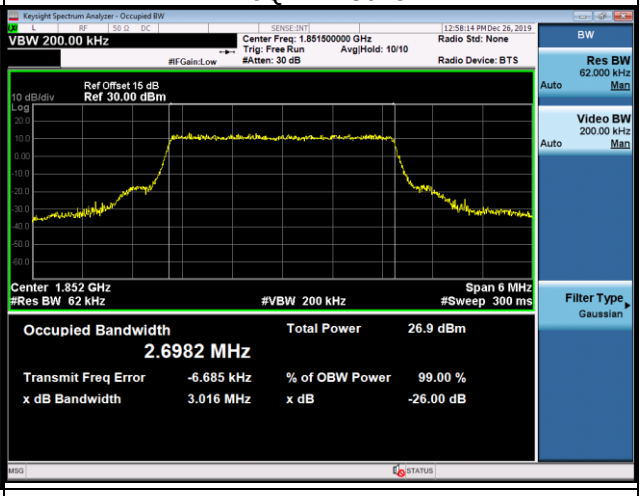
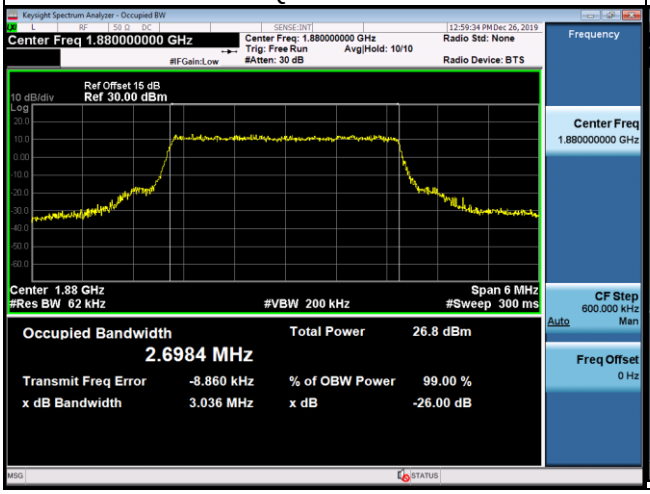
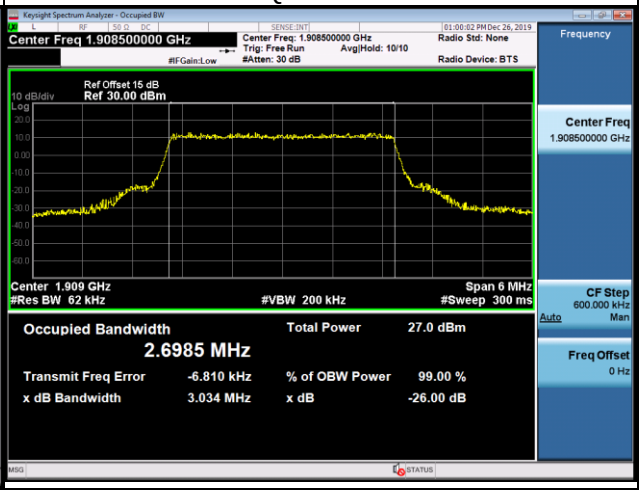
WCDMA Band II_WCDMA					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
9262	1852.4	4.0705	9262	1852.4	4.636
9400	1880	4.0696	9400	1880	4.614
9538	1907.6	4.0708	9538	1907.6	4.619

Spectrum Plot	
9262	9400
	
9538	-
	-

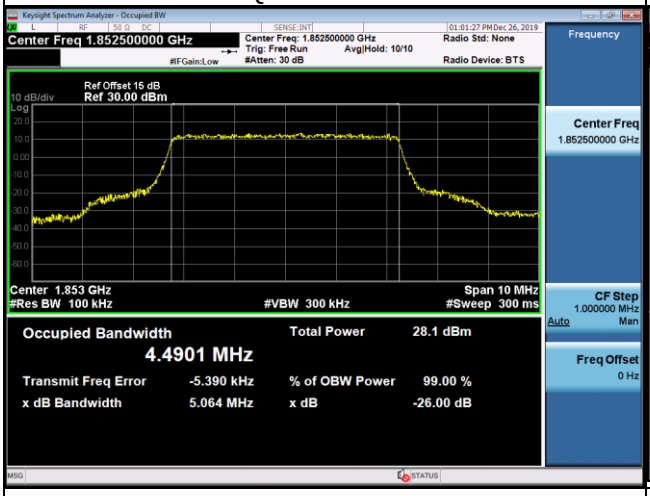
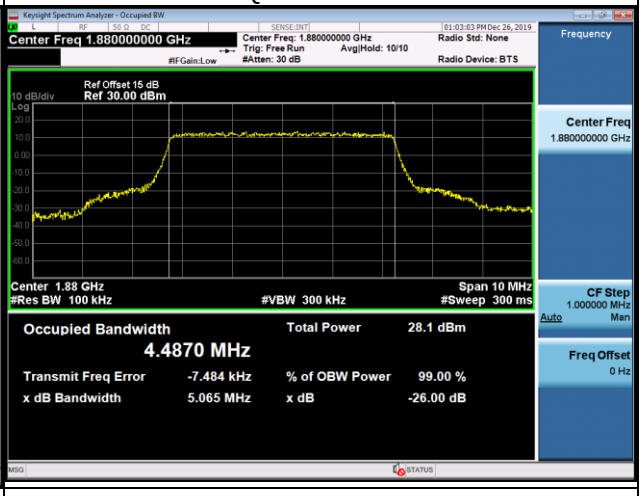
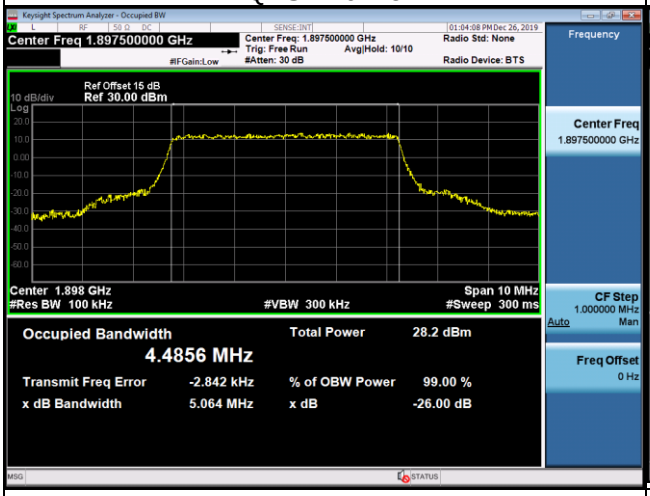
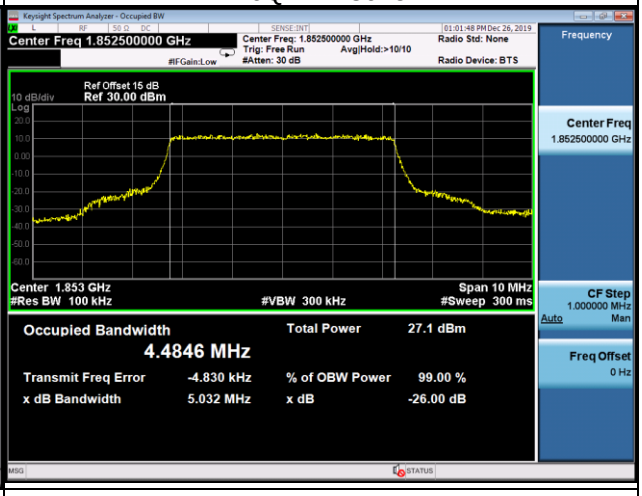
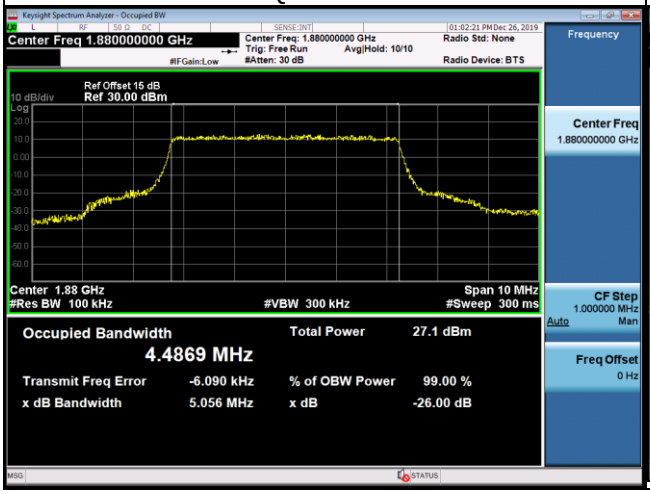
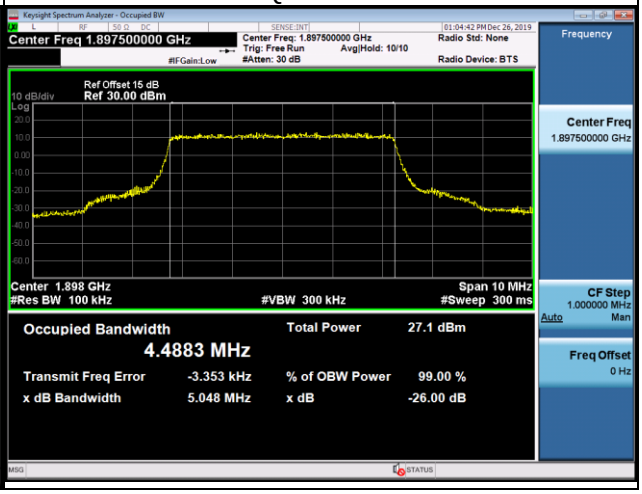
LTE Band 2_1.4M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18607	1850.7	1.0989	18607	1850.7	1.330
18900	1880	1.0993	18900	1880	1.320
19193	1909.3	1.0980	19193	1909.3	1.337
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18607	1850.7	1.0996	18607	1850.7	1.345
18900	1880	1.0996	18900	1880	1.337
19193	1909.3	1.0997	19193	1909.3	1.345

Spectrum Plot	
QPSK-18607	QPSK-18900
	
QPSK-19193	16QAM-18607
	
16QAM-18900	16QAM-19193
	

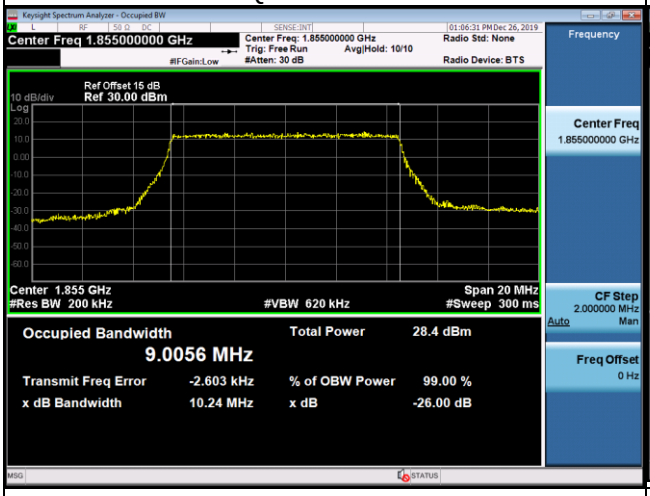
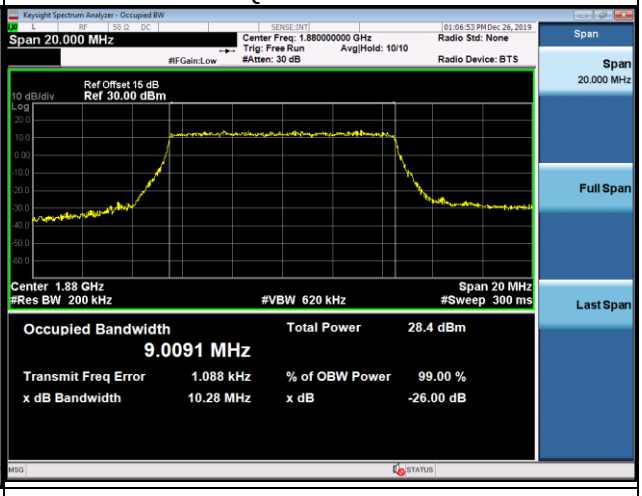
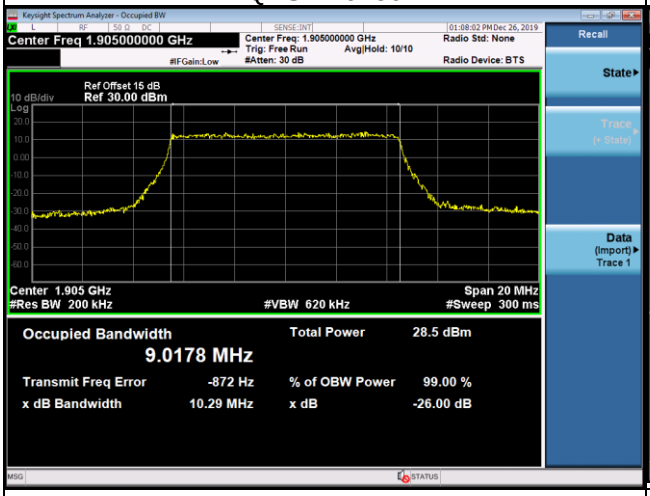
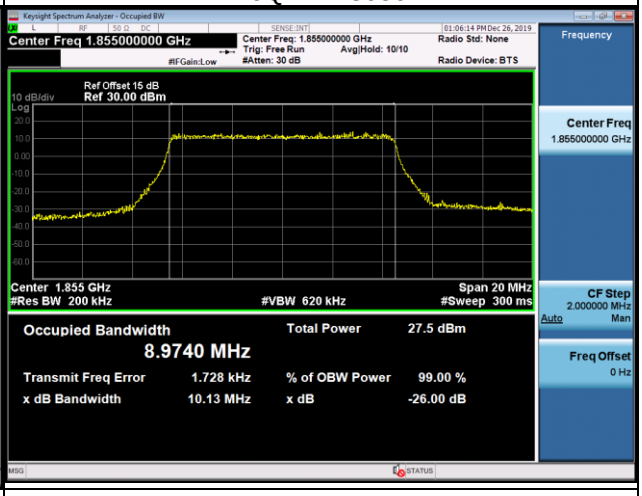
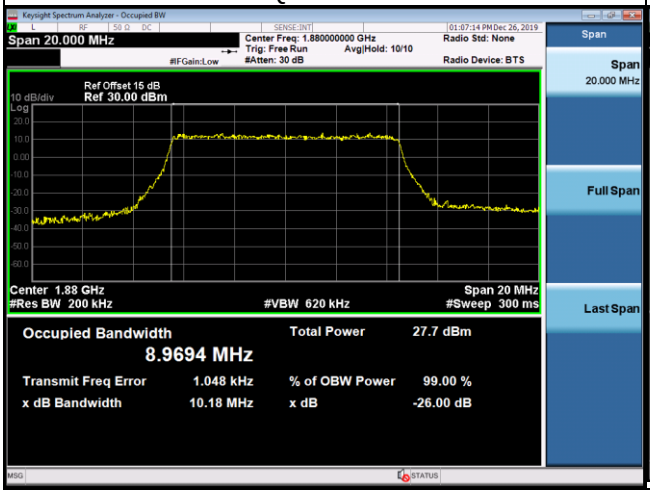
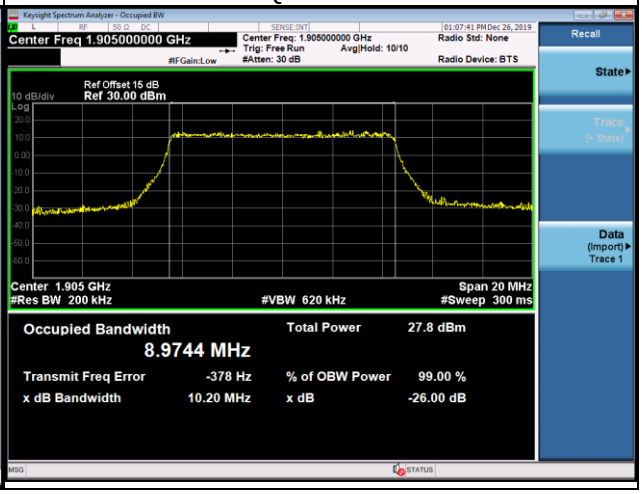
LTE Band 2_3M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18615	1851.5	2.6976	18615	1851.5	2.999
18900	1880	2.6941	18900	1880	2.980
19185	1908.5	2.6969	19185	1908.5	2.983
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18615	1851.5	2.6982	18615	1851.5	3.016
18900	1880	2.6984	18900	1880	3.036
19185	1908.5	2.6985	19185	1908.5	3.034

Spectrum Plot	
QPSK-18615	QPSK-18900
	
QPSK-19185	16QAM-18615
	
16QAM-18900	16QAM-19185
	

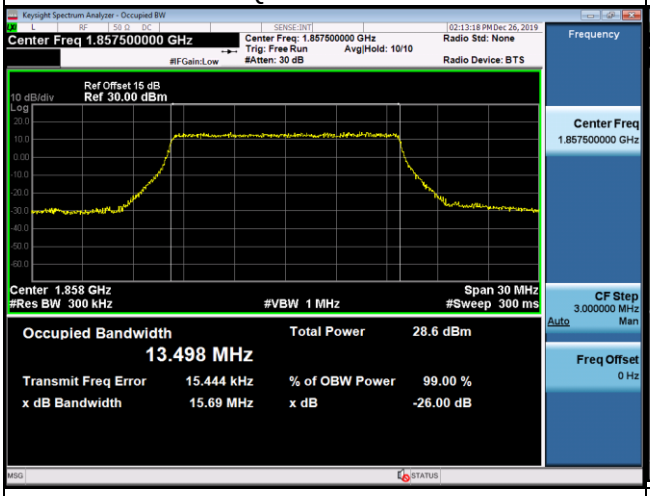
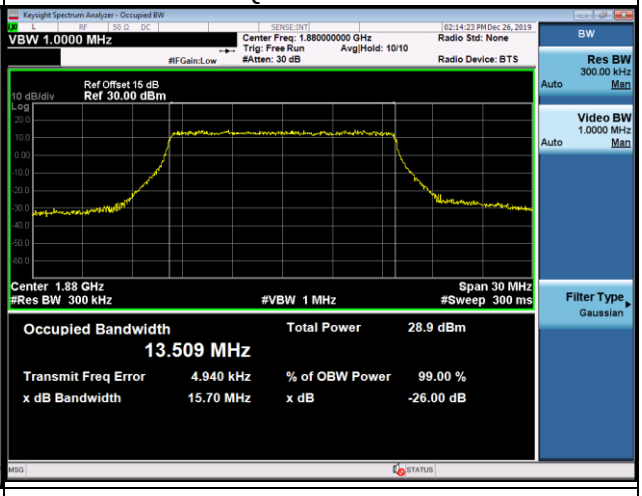
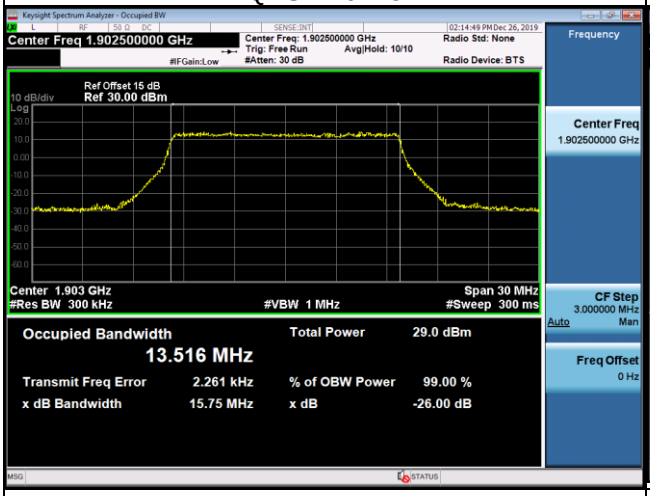
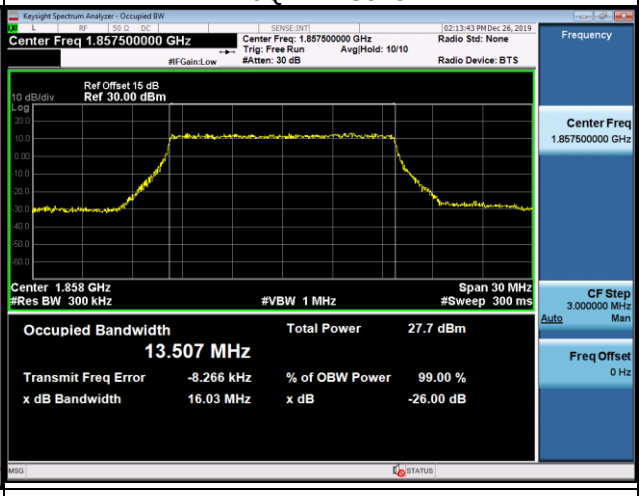
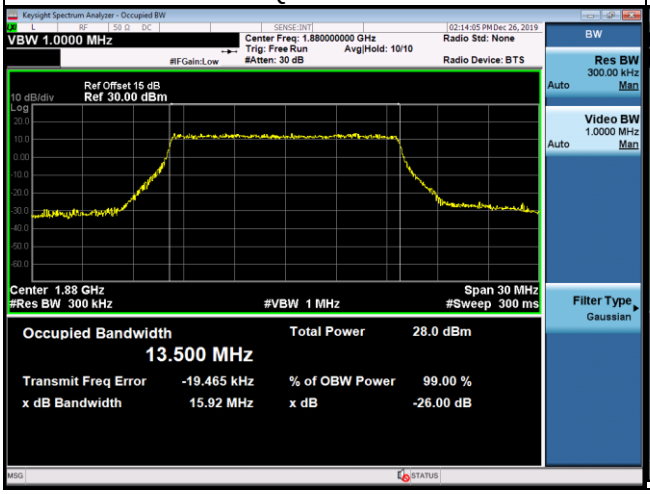
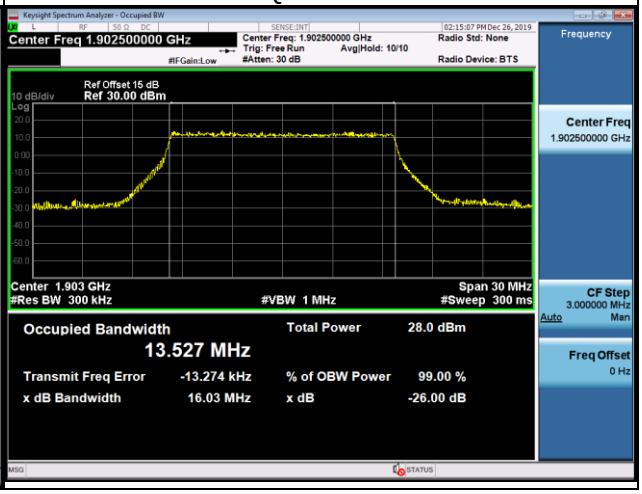
LTE Band 2_5M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18625	1852.5	4.4901	18625	1852.5	5.064
18900	1880	4.4870	18900	1880	5.065
19175	1907.5	4.4856	19175	1907.5	5.064
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18625	1852.5	4.4846	18625	1852.5	5.032
18900	1880	4.4869	18900	1880	5.056
19175	1907.5	4.4883	19175	1907.5	5.048

Spectrum Plot	
QPSK-18625	QPSK-18900
	
QPSK-19175	16QAM-18625
	
16QAM-18900	16QAM-19175
	

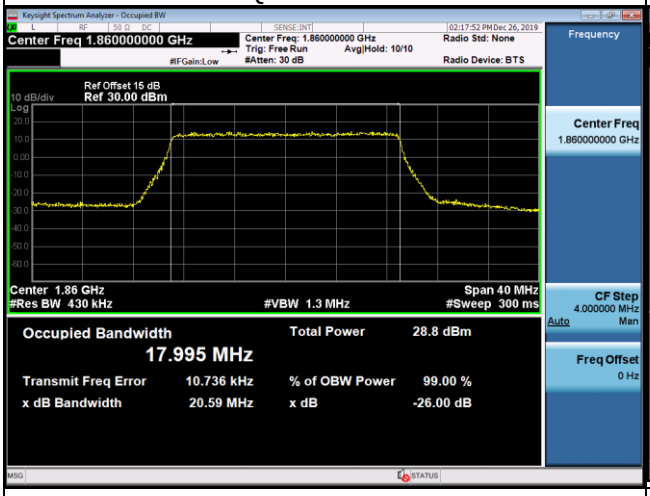
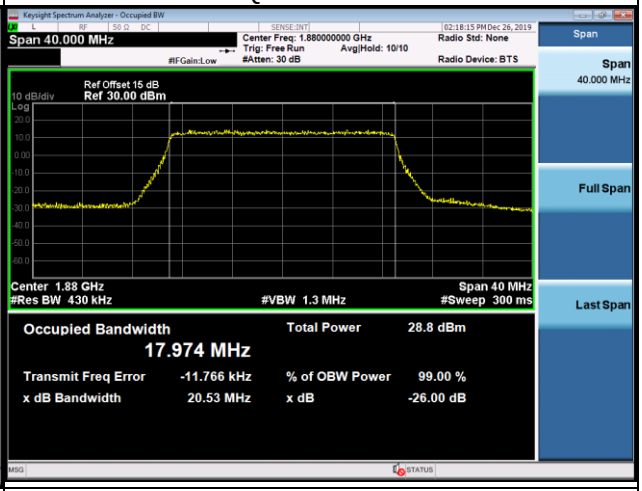
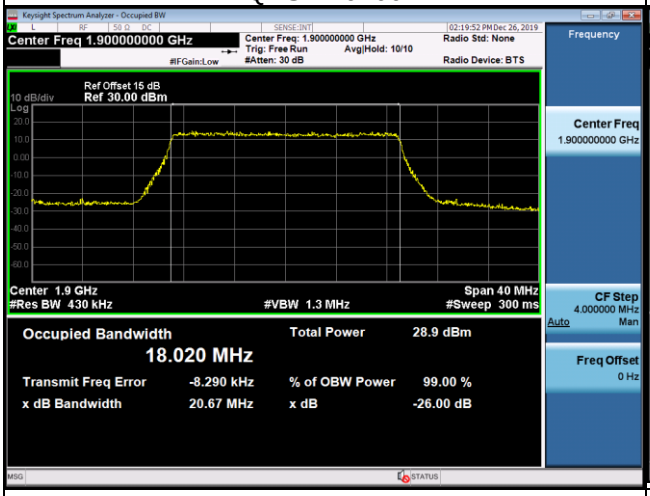
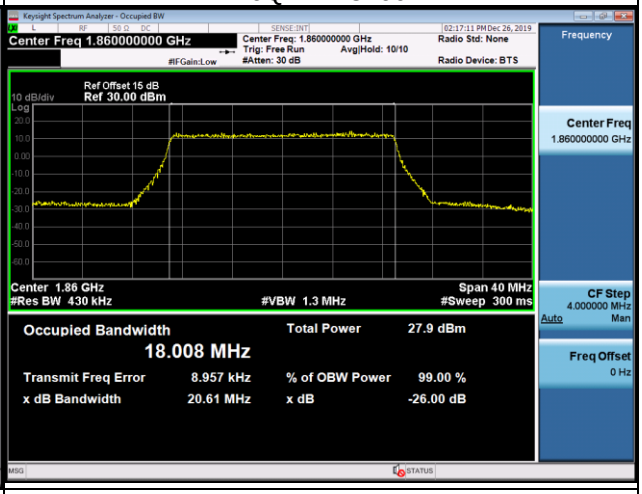
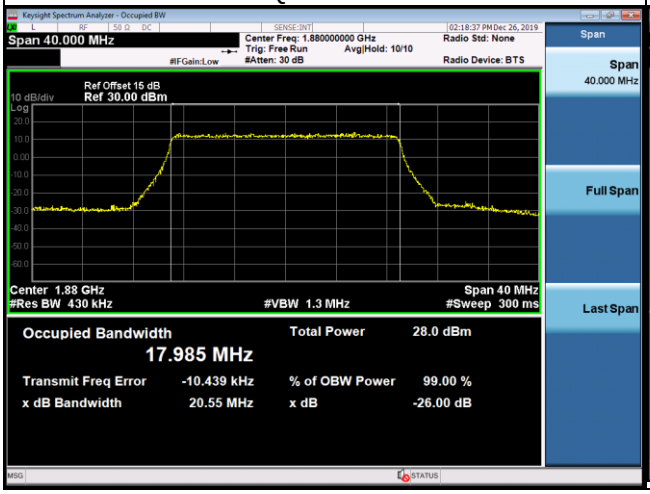
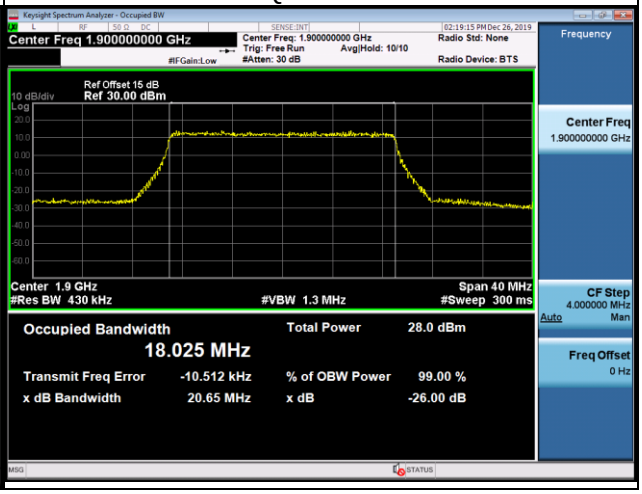
LTE Band 2_10M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18650	1855	9.0056	18650	1855	10.24
18900	1880	9.0091	18900	1880	10.28
19150	1905	9.0178	19150	1905	10.29
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18650	1855	8.9740	18650	1855	10.13
18900	1880	8.9694	18900	1880	10.18
19150	1905	8.9744	19150	1905	10.20

Spectrum Plot	
QPSK-18650	QPSK-18900
	
QPSK-19150	16QAM-18650
	
16QAM-18900	16QAM-19150
	

LTE Band 2_15M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18675	1857.5	13.498	18675	1857.5	15.69
18900	1880	13.509	18900	1880	15.70
19125	1902.5	13.516	19125	1902.5	15.75
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18675	1857.5	13.507	18675	1857.5	16.03
18900	1880	13.500	18900	1880	15.92
19125	1902.5	13.527	19125	1902.5	16.03

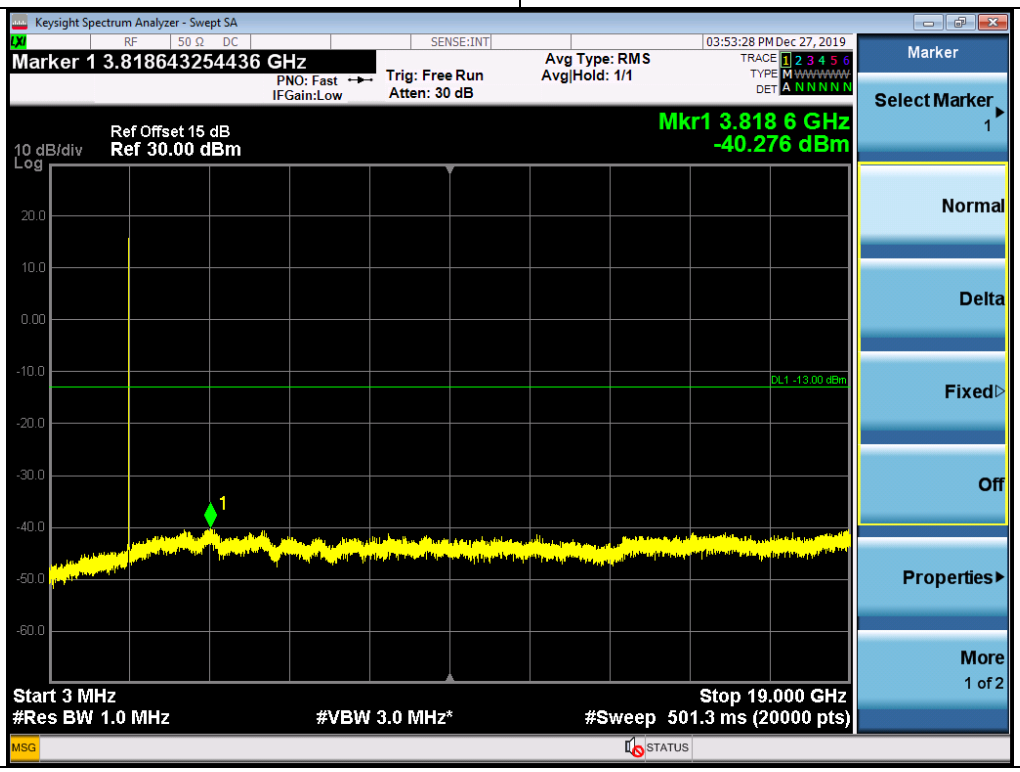
Spectrum Plot	
QPSK-18675	QPSK-18900
	
QPSK-19125	16QAM-18675
	
16QAM-18900	16QAM-19125
	

LTE Band 2_20M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18700	1860	17.995	18700	1860	20.59
18900	1880	17.974	18900	1880	20.53
19100	1900	18.020	19100	1900	20.67
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18700	1860	18.008	18700	1860	20.61
18900	1880	17.985	18900	1880	20.55
19100	1900	18.025	19100	1900	20.65

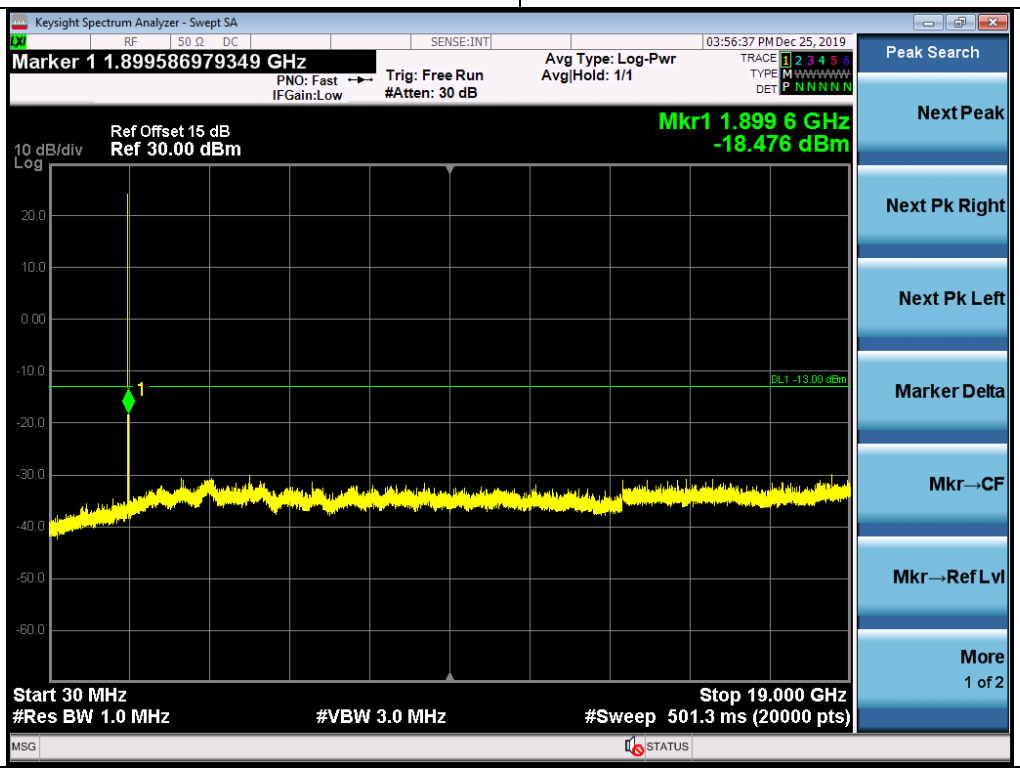
Spectrum Plot	
QPSK-18700	QPSK-18900
	
QPSK-19100	16QAM-18700
	
16QAM-18900	16QAM-19100
	

APPENDIX C - CONDUCTED SPURIOUS EMISSIONS

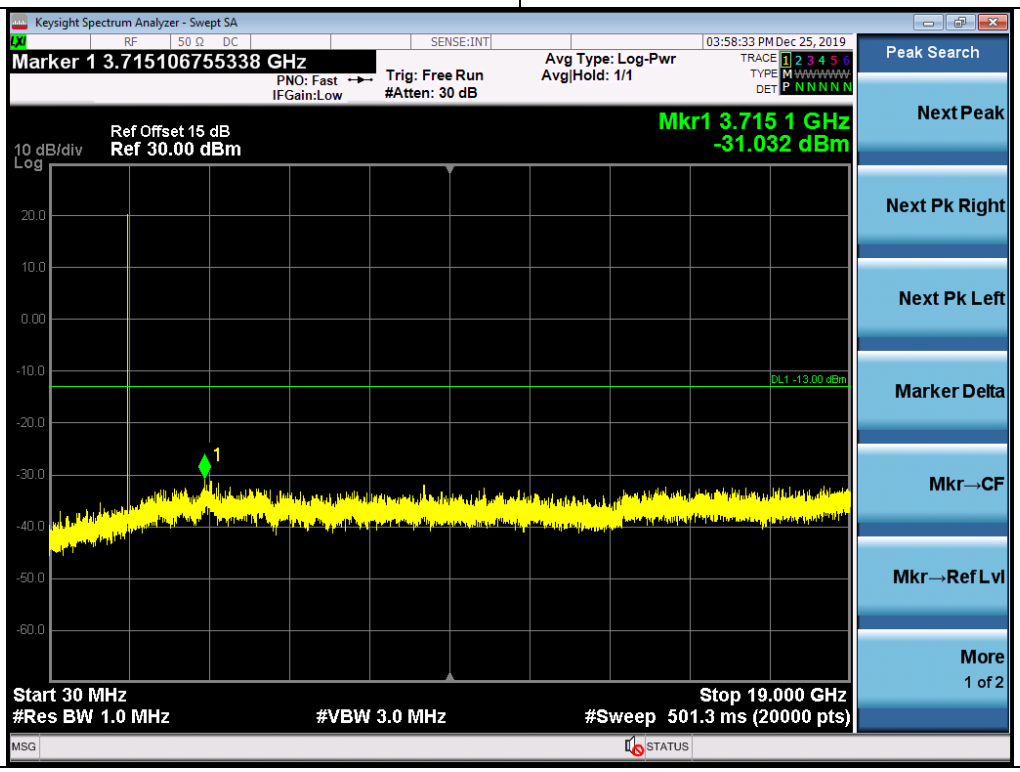
WCDMA Band II_WCDMA Spectrum Plot	
Channel	Frequency(MHz)
9400	1880



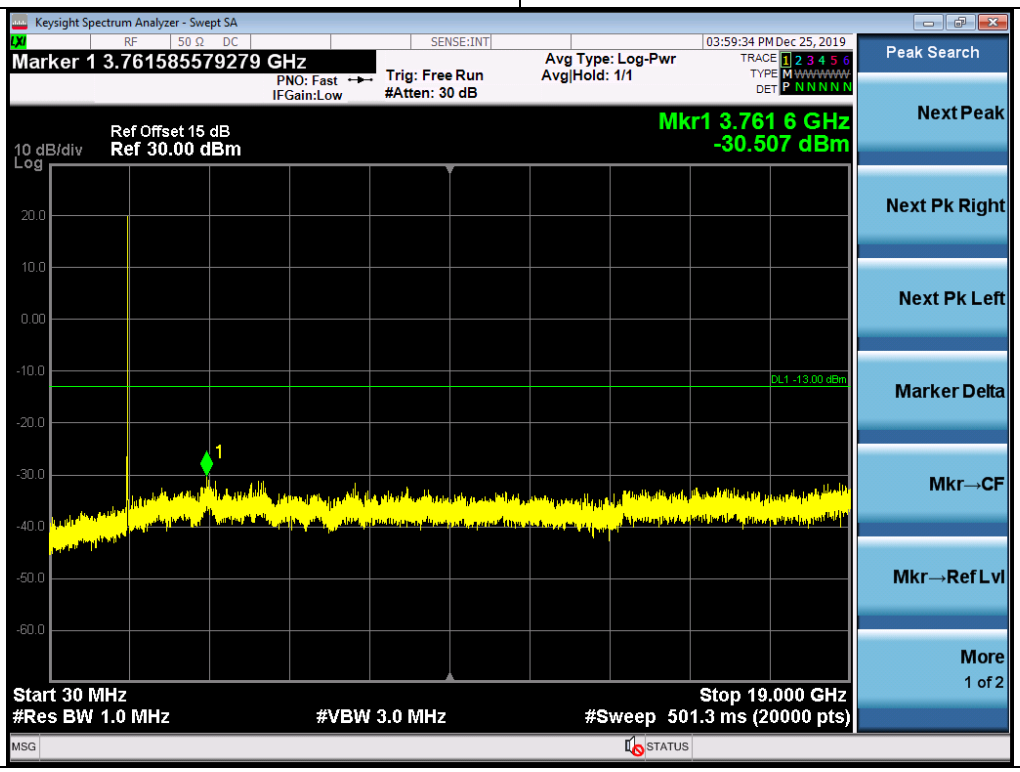
LTE Band 2_1.4M Spectrum Plot	
Channel	Frequency(MHz)
18900	1880



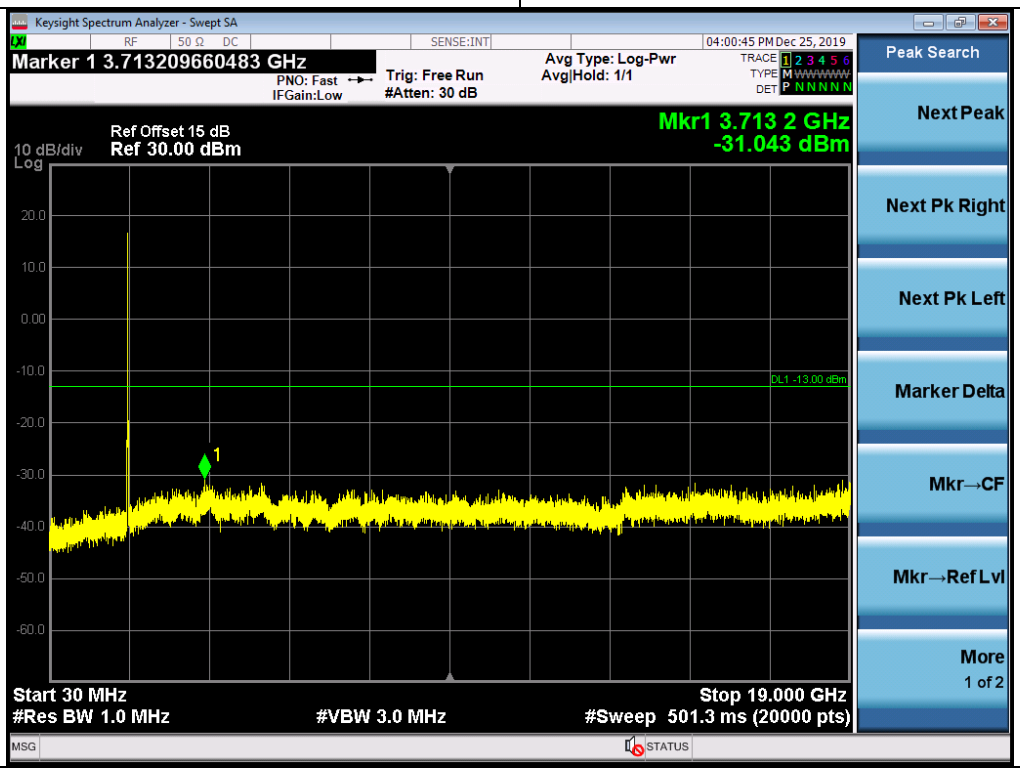
LTE Band 2_3M Spectrum Plot	
Channel	Frequency(MHz)
18900	1880



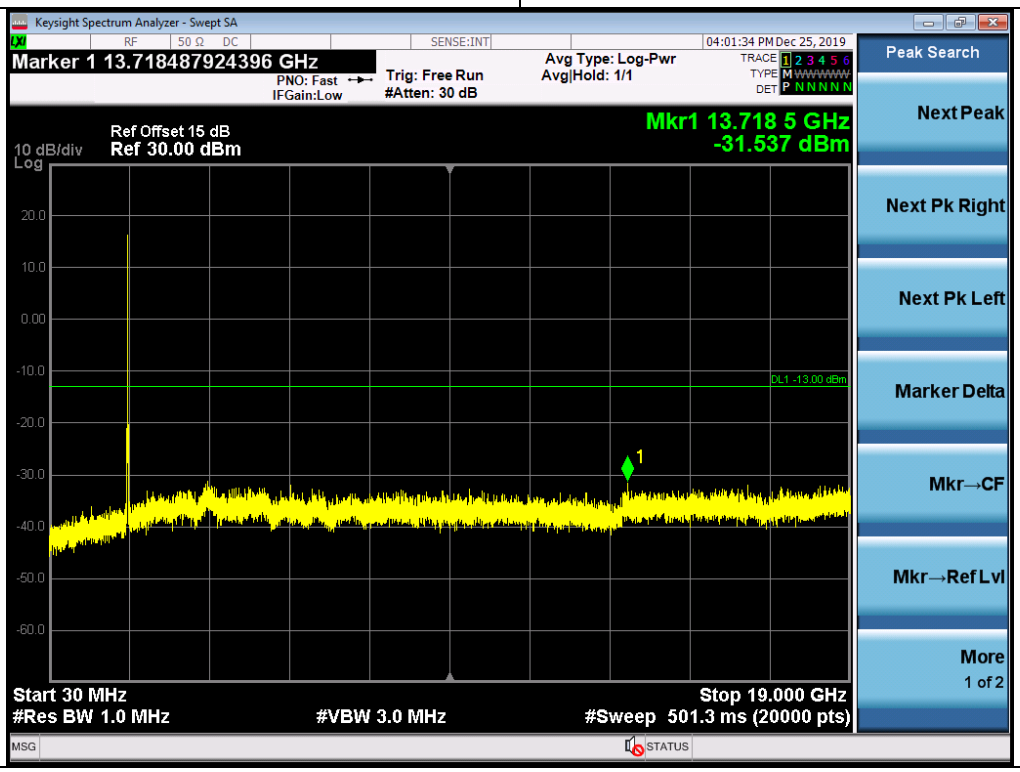
LTE Band 2_5M Spectrum Plot	
Channel	Frequency(MHz)
18900	1880



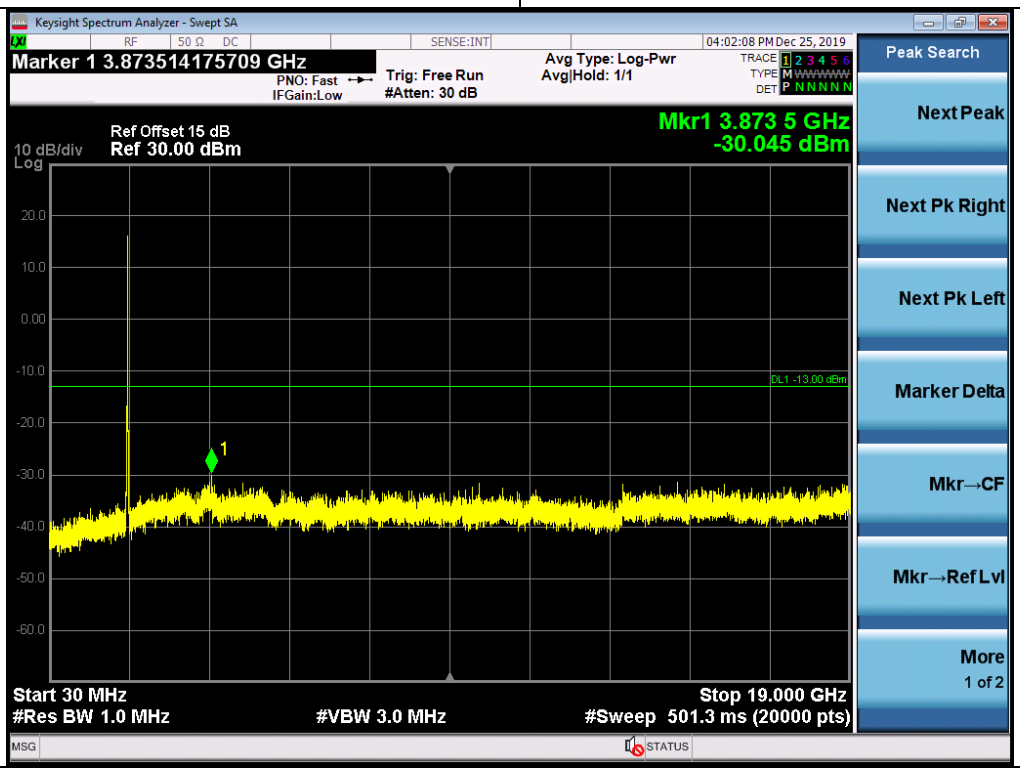
LTE Band 2_10M Spectrum Plot	
Channel	Frequency(MHz)
18900	1880



LTE Band 2_15M Spectrum Plot	
Channel	Frequency(MHz)
18900	1880

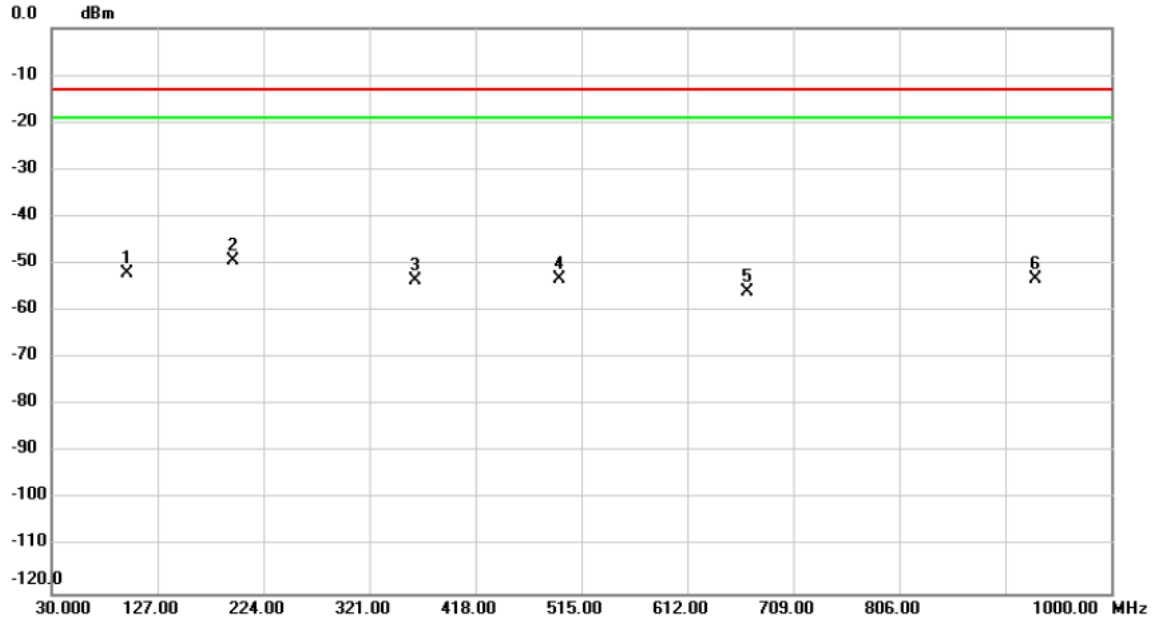


LTE Band 2_20M Spectrum Plot	
Channel	Frequency(MHz)
18900	1880



APPENDIX D - RADIATED SPURIOUS EMISSIONS (30MHZ TO 1000MHZ)

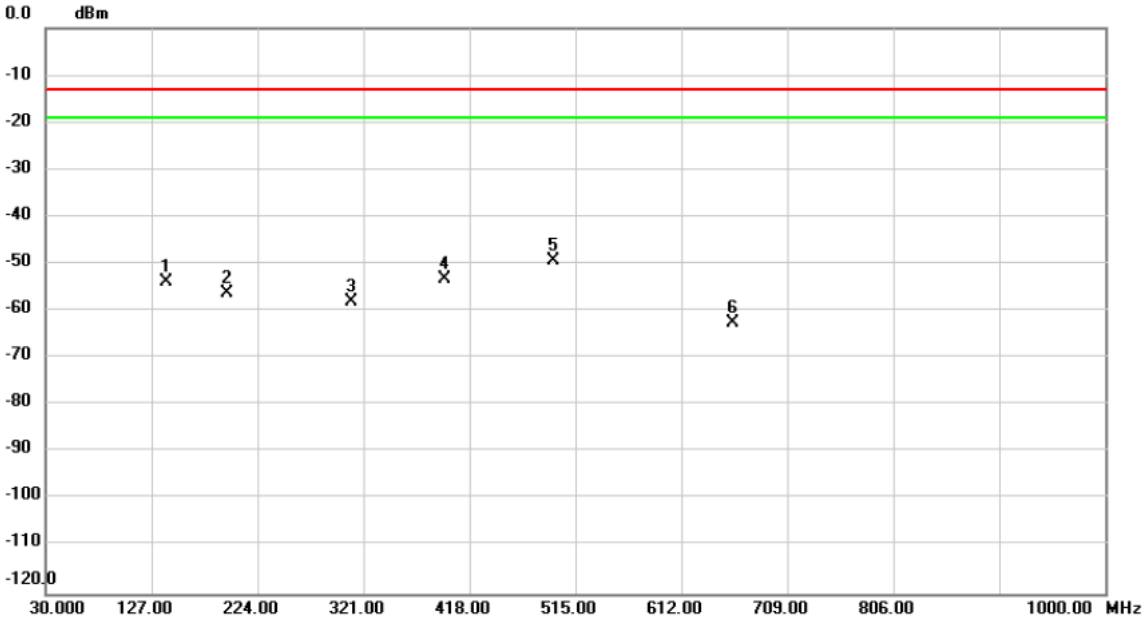
Test Mode	WCDMA Band II_TX CH9800_Internal Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		98.8700	-53.20	1.26	-51.94	-13.00	-38.94	peak	
2	*	195.8700	-53.58	4.20	-49.38	-13.00	-36.38	peak	
3		362.7100	-61.16	7.73	-53.43	-13.00	-40.43	peak	
4		494.6300	-61.72	8.54	-53.18	-13.00	-40.18	peak	
5		666.3200	-72.58	16.66	-55.92	-13.00	-42.92	peak	
6		930.1600	-69.27	16.03	-53.24	-13.00	-40.24	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

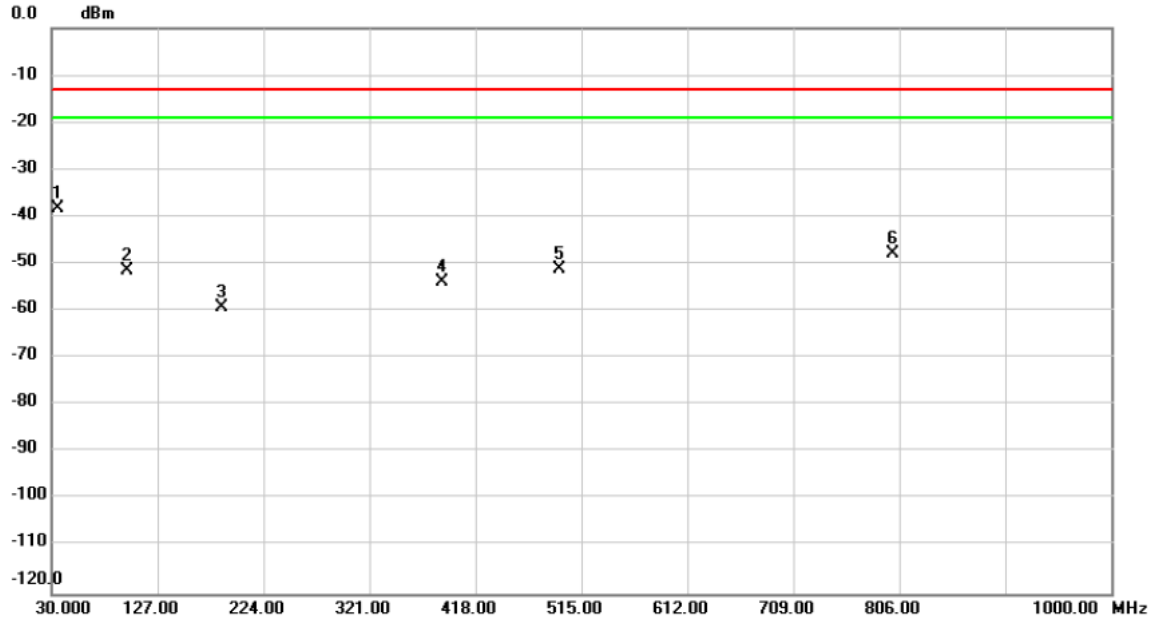
Test Mode	WCDMA Band II_TX CH9800_Internal Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		140.5800	-57.51	3.58	-53.93	-13.00	-40.93	peak	
2		195.8700	-55.69	-0.65	-56.34	-13.00	-43.34	peak	
3		310.3300	-60.98	2.82	-58.16	-13.00	-45.16	peak	
4		394.7200	-63.32	10.10	-53.22	-13.00	-40.22	peak	
5	*	494.6300	-63.87	14.39	-49.48	-13.00	-36.48	peak	
6		659.5300	-72.15	9.54	-62.61	-13.00	-49.61	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	LTE Band 2_TX CH18900_Internal Antenna	Tested Date	2019/12/22
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	35.8200	-53.45	15.22	-38.23	-13.00	-25.23	peak	
2		98.8700	-54.76	3.39	-51.37	-13.00	-38.37	peak	
3		186.1700	-59.45	0.12	-59.33	-13.00	-46.33	peak	
4		387.9300	-61.85	7.95	-53.90	-13.00	-40.90	peak	
5		494.6300	-63.96	12.73	-51.23	-13.00	-38.23	peak	
6		800.1800	-64.08	16.20	-47.88	-13.00	-34.88	peak	

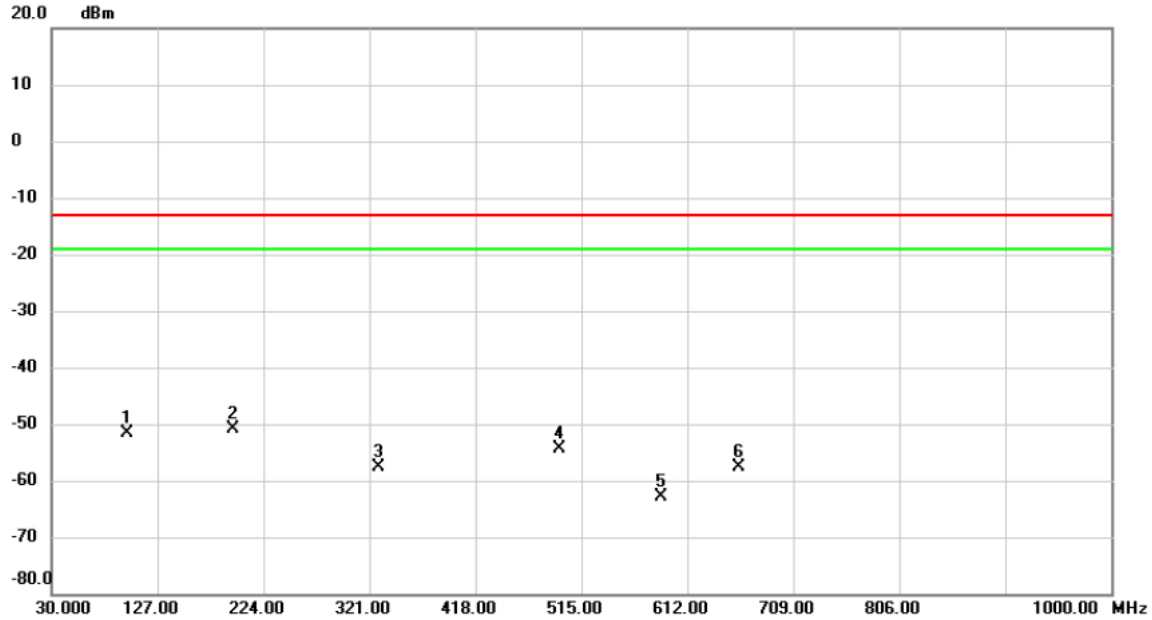
REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	LTE Band 2_TX CH18900_Internal Antenna	Tested Date	2019/12/22
Test Voltage	DC 32V	Polarization	Horizontal

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	35.8200	-56.90	15.22	-41.68	-13.00	-28.68	peak	
2		98.8700	-49.59	3.39	-46.20	-13.00	-33.20	peak	
3		184.2300	-59.84	0.54	-59.30	-13.00	-46.30	peak	
4		428.6700	-62.70	12.72	-49.98	-13.00	-36.98	peak	
5		494.6300	-62.37	12.73	-49.64	-13.00	-36.64	peak	
6		800.1800	-61.99	16.20	-45.79	-13.00	-32.79	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

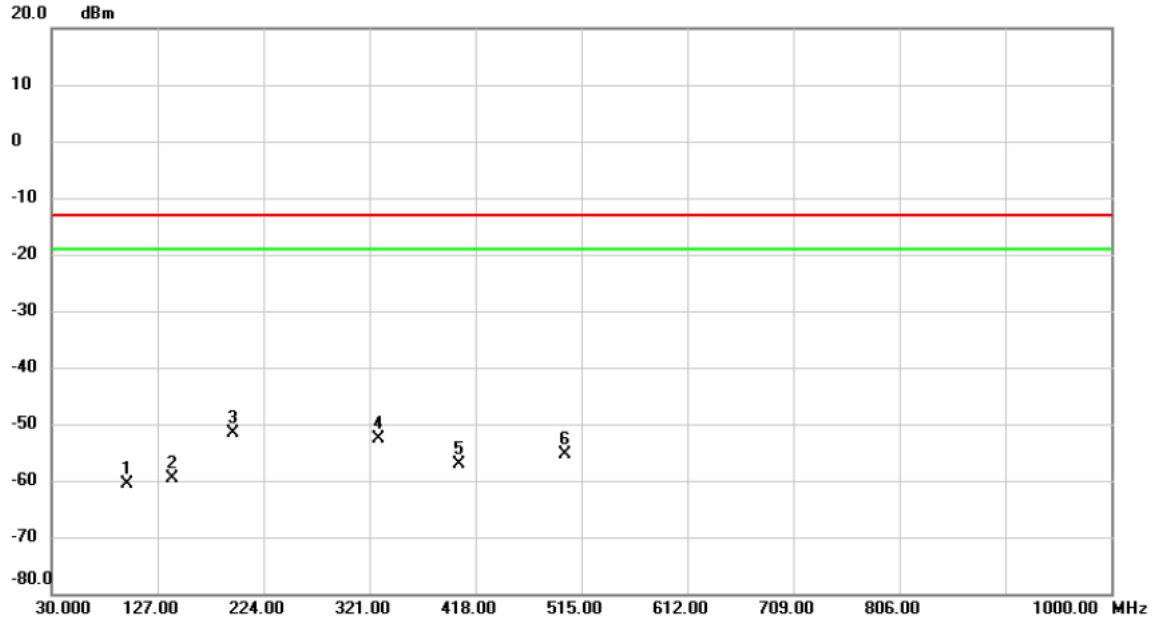
Test Mode	WCDMA Band II_TX CH9800_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		98.8700	-52.23	0.52	-51.71	-13.00	-38.71	peak	
2	*	195.8700	-54.04	3.16	-50.88	-13.00	-37.88	peak	
3		329.7300	-64.74	7.03	-57.71	-13.00	-44.71	peak	
4		494.6300	-61.33	6.88	-54.45	-13.00	-41.45	peak	
5		587.7500	-74.29	11.38	-62.91	-13.00	-49.91	peak	
6		659.5300	-72.37	14.69	-57.68	-13.00	-44.68	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

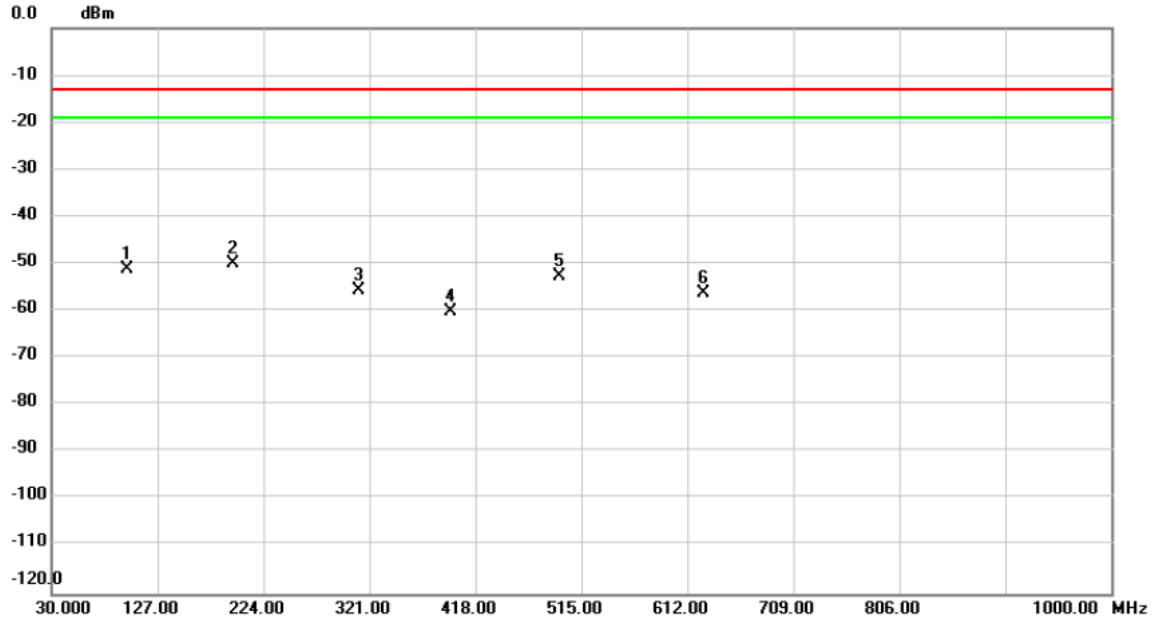
Test Mode	WCDMA Band II_TX CH9800_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		98.8700	-61.09	0.52	-60.57	-13.00	-47.57	peak	
2		140.5800	-62.29	2.78	-59.51	-13.00	-46.51	peak	
3	*	195.8700	-54.77	3.16	-51.61	-13.00	-38.61	peak	
4		329.7300	-59.53	7.03	-52.50	-13.00	-39.50	peak	
5		403.4500	-62.67	5.43	-57.24	-13.00	-44.24	peak	
6		500.4500	-62.30	7.05	-55.25	-13.00	-42.25	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

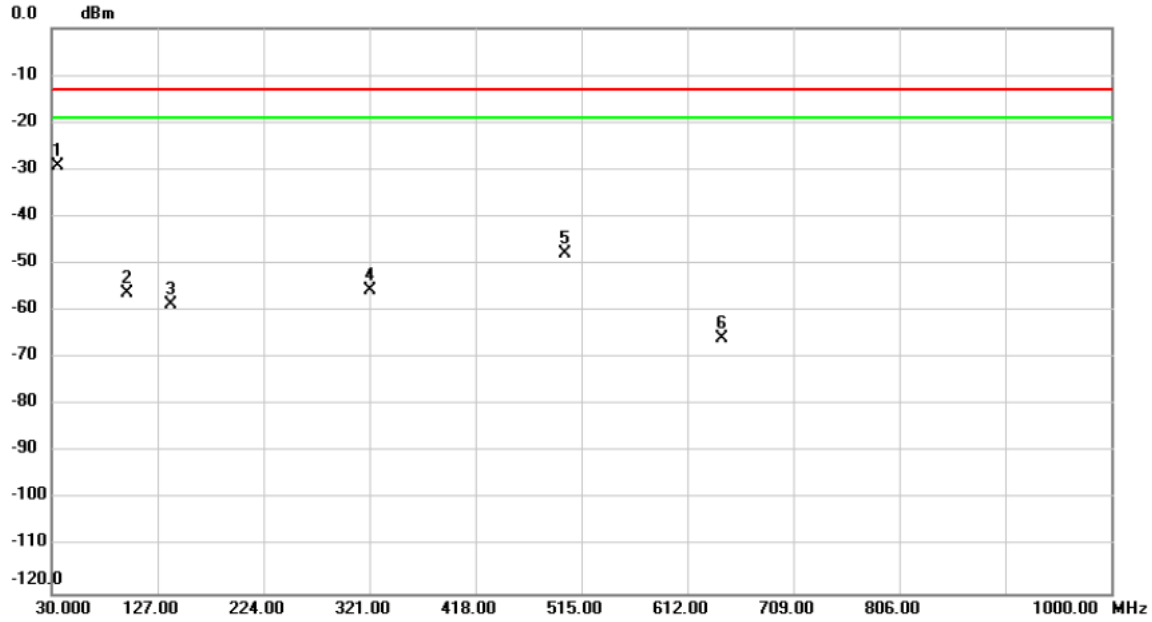
Test Mode	LTE Band 2_TX CH18900_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		98.8700	-52.33	1.26	-51.07	-13.00	-38.07	peak	
2	*	195.8700	-54.02	4.20	-49.82	-13.00	-36.82	peak	
3		311.3000	-64.26	8.68	-55.58	-13.00	-42.58	peak	
4		395.6900	-67.12	6.98	-60.14	-13.00	-47.14	peak	
5		494.6300	-61.06	8.54	-52.52	-13.00	-39.52	peak	
6		626.5500	-71.71	15.38	-56.33	-13.00	-43.33	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	LTE Band 2_TX CH18900_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Horizontal

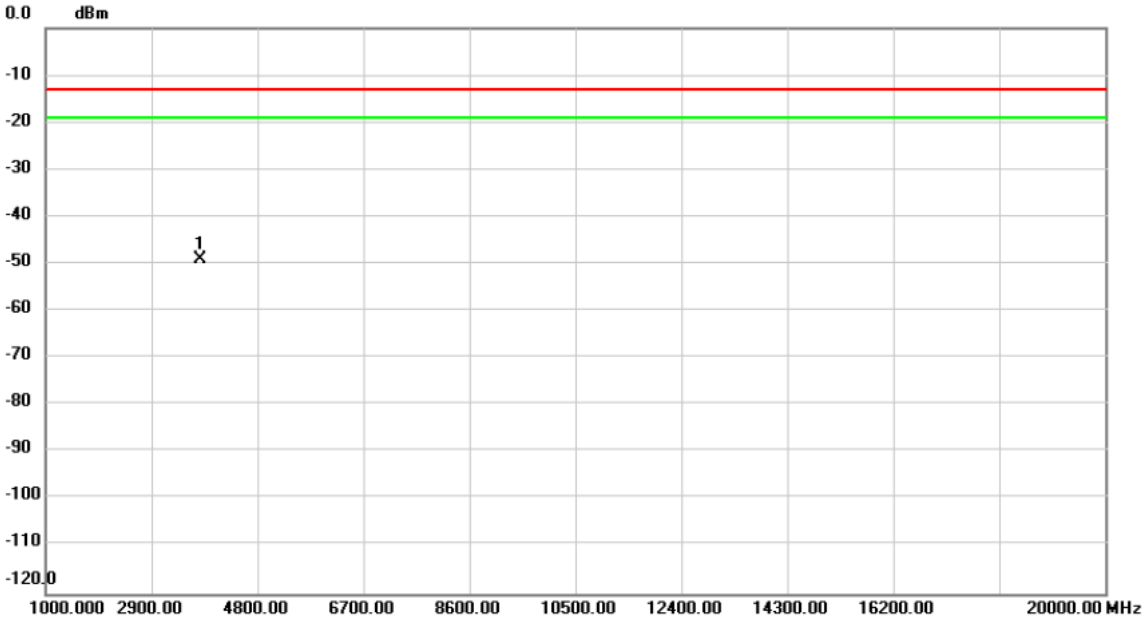


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	35.8200	-44.84	15.69	-29.15	-13.00	-16.15	peak	
2		98.8700	-60.52	4.13	-56.39	-13.00	-43.39	peak	
3		139.6100	-62.20	3.58	-58.62	-13.00	-45.62	peak	
4		321.0000	-59.24	3.52	-55.72	-13.00	-42.72	peak	
5		500.4500	-62.01	14.03	-47.98	-13.00	-34.98	peak	
6		644.0100	-75.07	9.08	-65.99	-13.00	-52.99	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

APPENDIX E - RADIATED SPURIOUS EMISSIONS (ABOVE 1000MHZ)

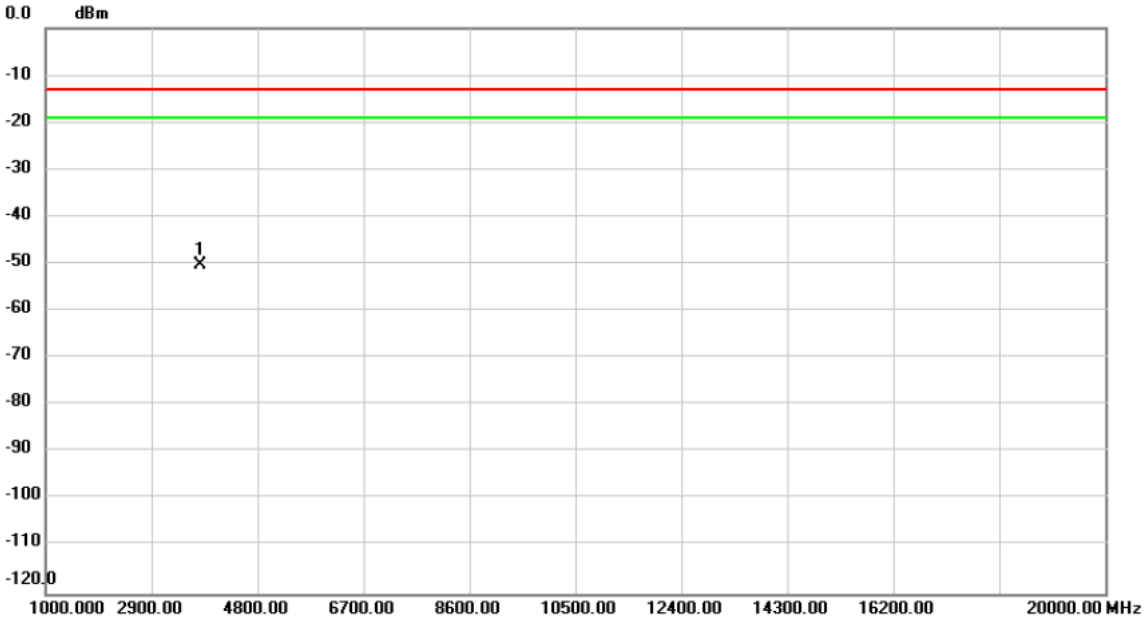
Test Mode	WCDMA Band II_TX CH9800_Internal Antenna	Tested Date	2019/12/26
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	3762.430	-49.05	-0.09	-49.14	-13.00	-36.14	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	WCDMA Band II_TX CH9800_Internal Antenna	Tested Date	2019/12/26
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	3762.980	-50.31	-0.03	-50.34	-13.00	-37.34	peak	

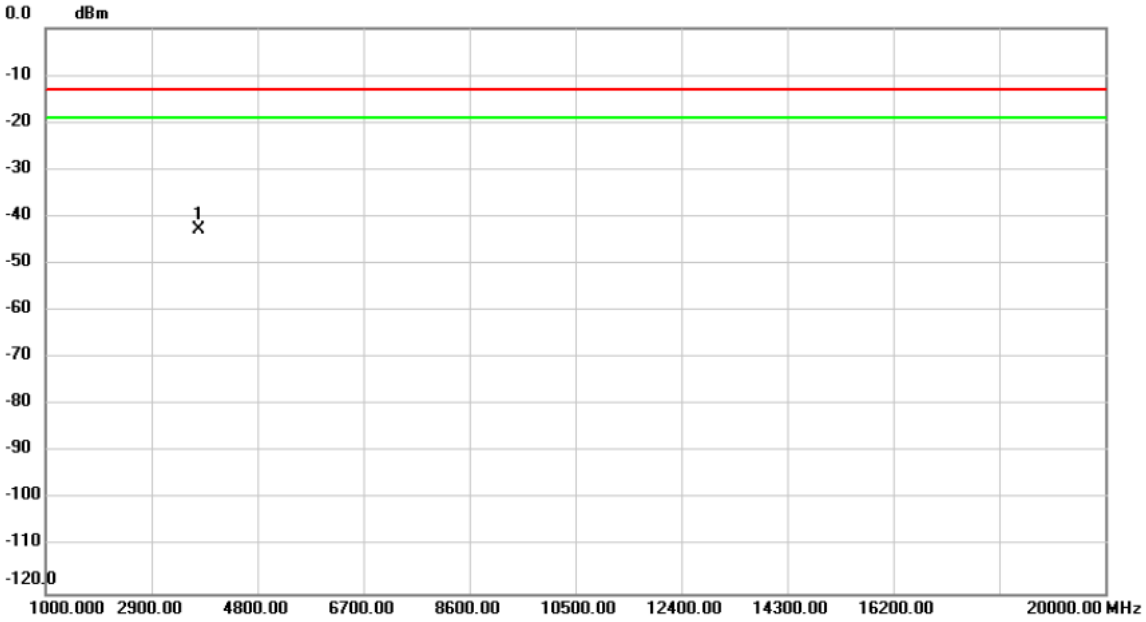
REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	LTE Band 2_TX CH18900_Internal Antenna	Tested Date	2019/12/24
Test Voltage	DC 32V	Polarization	Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	3742.175	-42.21	-0.06	-42.27	-13.00	-29.27	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

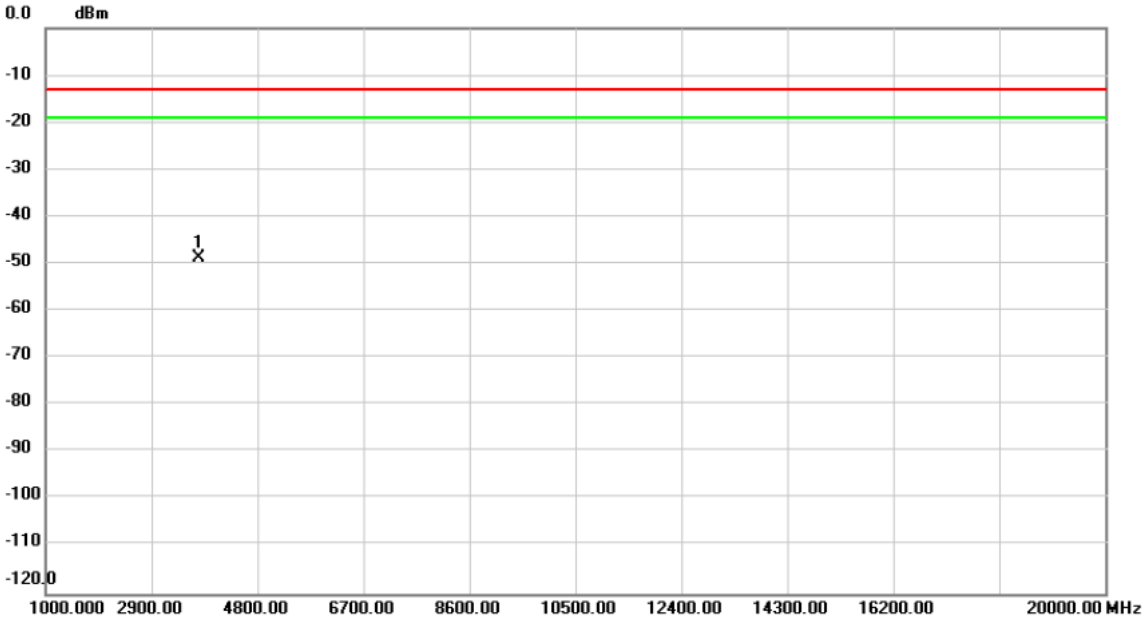
Test Mode	LTE Band 2_TX CH18900_Internal Antenna	Tested Date	2019/12/24
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	3742.150	-42.66	-0.23	-42.89	-13.00	-29.89	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

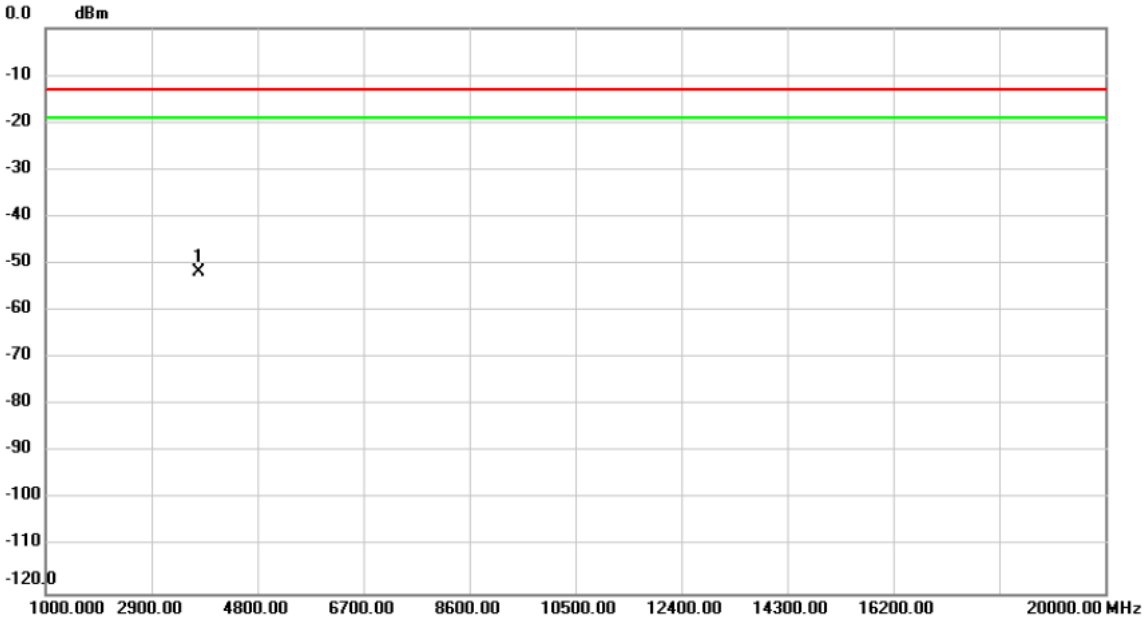
Test Mode	WCDMA Band II_TX CH9800_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	3759.820	-48.76	-0.08	-48.84	-13.00	-35.84	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

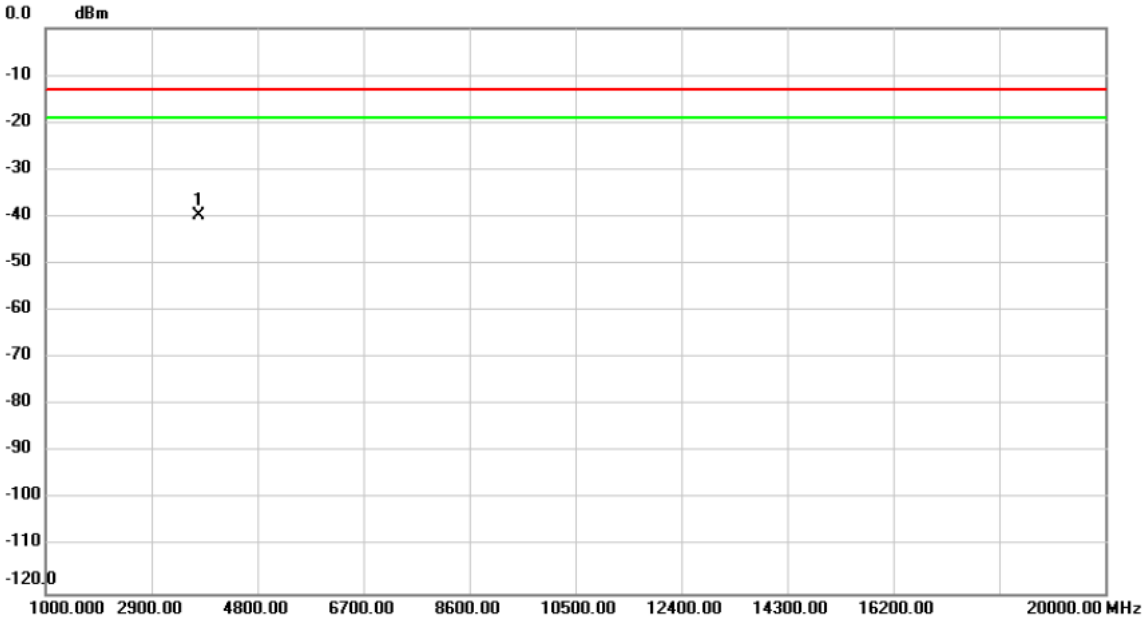
Test Mode	WCDMA Band II_TX CH9800_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	3756.580	-51.62	-0.09	-51.71	-13.00	-38.71	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

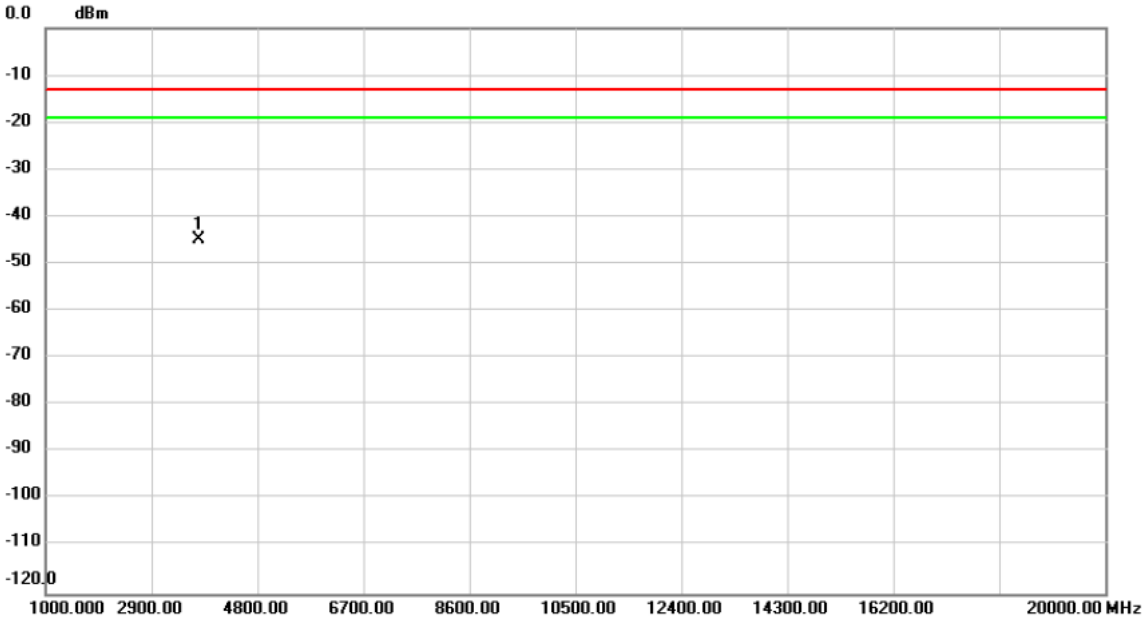
Test Mode	LTE Band 2_TX CH18900_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	3742.015	-39.63	-0.06	-39.69	-13.00	-26.69	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	LTE Band 2_TX CH18900_External Antenna	Tested Date	2019/12/25
Test Voltage	DC 32V	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	3742.025	-44.64	-0.23	-44.87	-13.00	-31.87	peak	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

APPENDIX F - BAND EDGE

WCDMA Band II_WCDMA Spectrum Plot			
Channel	9262	Channel	9538