FCC Radio Test Report

FCC ID: 2AVVT-CU413UCMPS1

Report No.	:	BTL-FCCP-3-2103T126B
Equipment	:	iTraMS CCU
Model Name	:	CU-41-3U-CM-PS1
Brand Name	:	Bosch
Applicant	:	Bosch Global Software Technologies Private Limited
Address	:	MS/PAC, Ban 601, Post Box No 3000 Hosur Road, Adugodi, Bengaluru, Karnataka-560030, India
Radio Function	:	WCDMA Band II + LTE Band 2
FCC Rule Part(s)	:	47 CRF FCC Part 24, Subpart E 47 CFR FCC Part 2
Measurement Procedure(s)	:	ANSI C63.26-2015 ANSI/TIA/EIA-603-E-2016 FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
Date of Receipt	:	2021/4/6
Date of Test	:	2021/4/6 ~ 2021/5/12
Issued Date	:	2022/11/22

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

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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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REVISION HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-3-2103T126	R00	Original Report.	2021/9/17	Invalid
BTL-FCCP-3-2103T126	R01	Revised Typo.	2021/9/27	Invalid
BTL-FCCP-3-2103T126	R02	Revised report to address TCB's comments.	2021/10/13	Valid
BTL-FCCP-3-2103T126B	R00	1. Added the fourth antenna. (MA173. A. LBI.001) 2. Modified applicant and address.	2022/11/22	Valid

1 SUMMARY OF TEST RESULTS

Test procedures according to the technical standards.

FCC Clause No	Description	Test Result	Judgement	Remark
15.207	AC Power Line Conducted Emissions	------	N/A	Note(3)
2.1046 24.232(c)	Equivalent Isotropically Radiated Power (EIRP)	APPENDIX A	Pass	------
2.1049	Occupied Bandwidth	APPENDIX B	Pass	------
2.1051 24.238(a)	Conducted Spurious Emissions	APPENDIX C	Pass	------
2.1053 24.238(a)	Radiated Spurious Emissions	APPENDIX D	Pass	------
24.238(a)	Band Edge Measurements	APPENDIX E	Pass	------
24.232(d)	Peak To Average Ratio	APPENDIX F	Pass	------
2.1055 24.235	Frequency Stability	APPENDIX G	Pass	------

NOTE:
(1) ”N/A” denotes test is not applicable in this Test Report.
(2) The report format version is TP.1.1.1.
(3) This is a DC input device.

1.1 TEST FACILITY

Test Firm Location: No.18, Ln. 171, Sec. 2, Jiuzong Rd., Neihu Dist., Taipei City 114, Taiwan.
TAF Accreditation Number is 0659; FCC Designation Number is TW0659.
The satellite facilities under the test firm used to collect the test data in this report are:
No. 66, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan
☒ CB15 ☐ CB16
No. 68-2, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan
☐ CB12 ☒ SR05

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 Spurious Emissions test:

Test Site	Measurement Frequency Range	U,(dB)
CB15	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

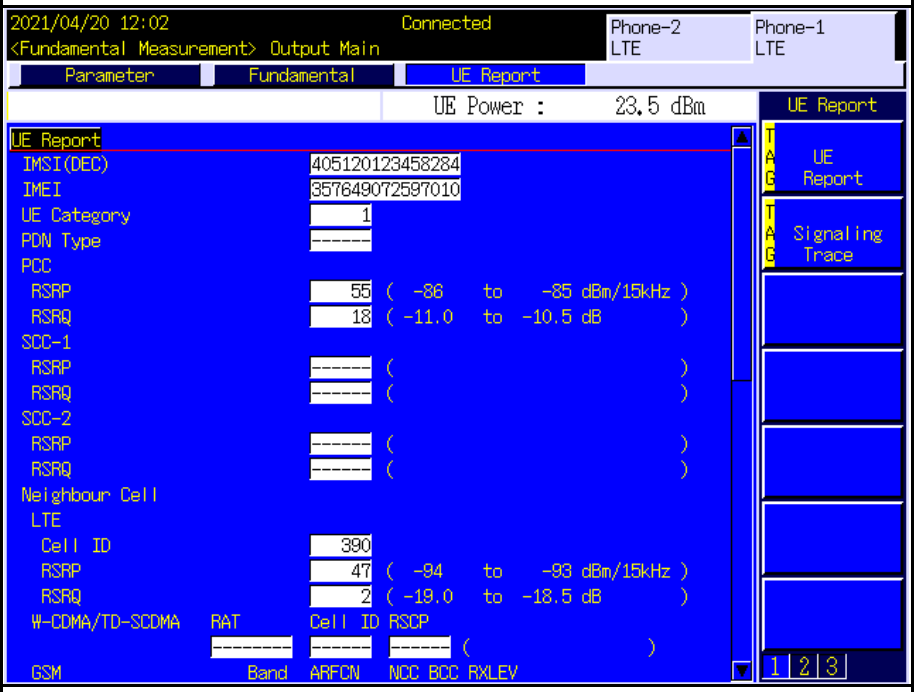
NOTE:
Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Environment Condition	Test Voltage	Tested by
EIRP (Conducted)	24.8 °C, 49 %	DC 32V	William Wei
Occupied Bandwidth	24.8 °C, 49 %	DC 32V	William Wei
Conducted Spurious Emissions	24.8 °C, 49 %	DC 32V	William Wei
Radiated Spurious Emissions and EIRP (Radiated)	Refer to data	DC 32V	Jay Kao
Band Edge	24.8 °C, 49 %	DC 32V	William Wei
Peak to Average Ratio	24.8 °C, 49 %	DC 32V	William Wei
Frequency Stability	Normal and Extreme		William Wei

2 GENERAL INFORMATION

2.1 DESCRIPTION OF EUT

Equipment	iTraMS CCU
Model Name	CU-41-3U-CM-PS1
Brand Name	Bosch
Model Difference	N/A
Power Source	DC Voltage supplied from DC Source.
Power Rating	DC 9-32V (12V or 24V)
Products Covered	N/A
Hardware Version/Test Model	AD00 A10 062
Software Version	1277401063
IEMI No.	
Test Model	CU-41-3U-CM-PS1
Sample Status	Engineering Sample
Operation Frequency	

Mode	Band	UL Frequency (MHz)	DL Frequency (MHz)
WCDMA	II	1850 ~ 1910	1930 ~ 1990
LTE	2	1850 ~ 1910	1930 ~ 1990

Maximum EIRP	WCDMA Band II: 0.682 W LTE Band 2 (1.4 MHz, QPSK): 0.776 W LTE Band 2 (1.4 MHz, 16QAM): 0.643 W LTE Band 2 (3 MHz, QPSK): 0.785 W LTE Band 2 (3 MHz, 16QAM): 0.650 W LTE Band 2 (5 MHz, QPSK): 0.794 W LTE Band 2 (5 MHz, 16QAM): 0.658 W LTE Band 2 (10 MHz, QPSK): 0.804 W LTE Band 2 (10 MHz, 16QAM): 0.665 W LTE Band 2 (15 MHz, QPSK): 0.813 W LTE Band 2 (15 MHz, 16QAM): 0.673 W LTE Band 2 (20 MHz, QPSK): 0.815 W LTE Band 2 (20 MHz, 16QAM): 0.675 W
EUT Modification(s)	N/A

NOTE:
(1) The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or 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:

Group I:

Antenna	Manufacture	Part No.	Type	Connector	Gain (dBi)	Note
External antenna	TAOGLAS.	MA250.A.LBI.001	N/A	SMA(M)ST	3.79	WCDMA Band II
					3.79	LTE Band 2
		TG.08.0723	N/A	Fakra Code D	3.55	RX only

Group II:

Antenna	Manufacture	Part No.	Type	Connector	Gain (dBi)	Note
Built-in antenna	BOSCH	N/A	N/A	Integrated (Through Hole)	5.7	WCDMA Band II
					5.7	LTE Band 2

Group III:

Antenna	Manufacture	Part No.	Type	Connector	Gain (dBi)	Note
External antenna	taoglas antenna solutions	MA240.LBI.001	N/A	SMA(M)	-0.33	WCDMA Band II
					-0.33	LTE Band 2

Group IV:

Antenna	Manufacture	Part No.	Type	Connector	Gain (dBi)	Note
External antenna	TAOGLAS.	MA173. A. LBI.001	N/A	SMA(M)ST	2.40	WCDMA Band II
					2.40	LTE Band 2

Note: The EUT includes three groups of external antennas, for Radiated test items only the worst case MA250.A.LBI.001 antenna is recorded.

(4) The above Antenna information are derived from the antenna data sheet provided by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

(5) This is a supplement report of BTL-FCCP-3-2103T126 report. The differences compared with original report are
   (1) Added the fourth antenna (MA173. A. LBI.001).
   (2) Modified applicant and address.

   After evaluated, the changes with respect to the original one, not affect the test results.

2.2 TEST MODES

WCDMA BAND II MODE			
Test Item	Available Channel	Tested Channel	Mode
EIRP	9262 to 9538	9262, 9400, 9538	WCDMA, HSDPA,HSUPA
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
EIRP (Conducted)	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 (Radiated)	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) The Radiated emissions test was verified based on the worst conducted power and Bandwidth test results reported in the original report.

(2) All X, Y and Z axes are evaluated, but only the worst case is recorded. See below table for detail.

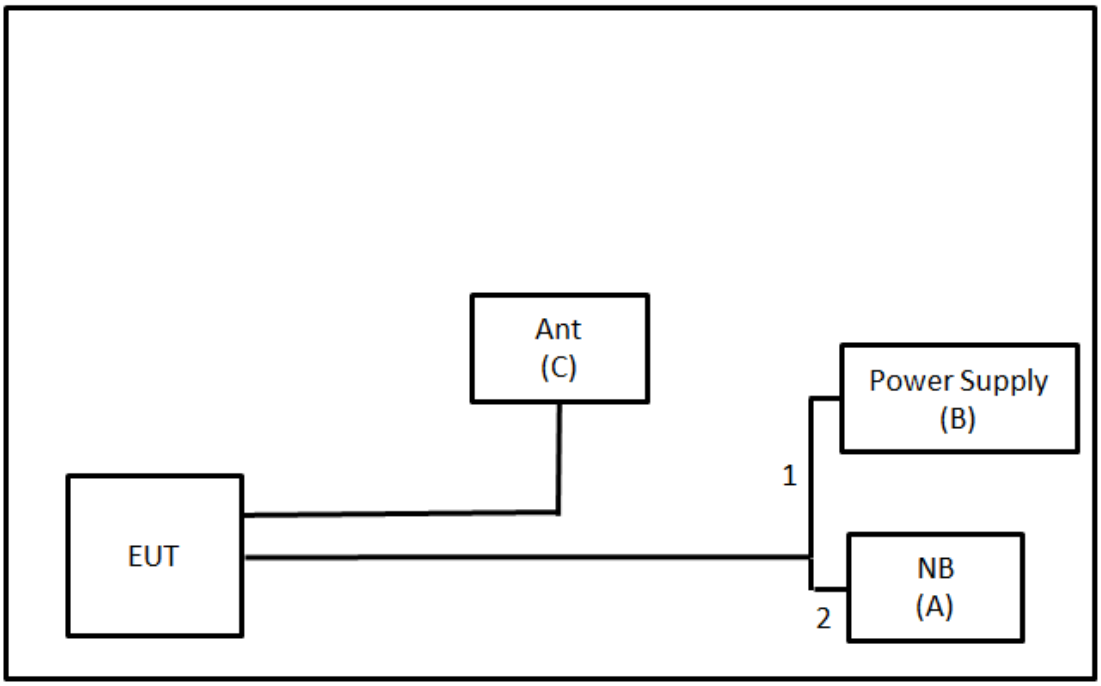
Test Item	External antenna		Built-in antenna	
	WCDMA	LTE	WCDMA	LTE
Radiated Spurious Emissions (below 1G)	Y axis	X axis	Z axis	Y axis
Radiated Spurious Emissions (above 1G)	Y axis	X axis	Z axis	Y axis

(3) For EIRP radiated part, only the worst cases are recorded.

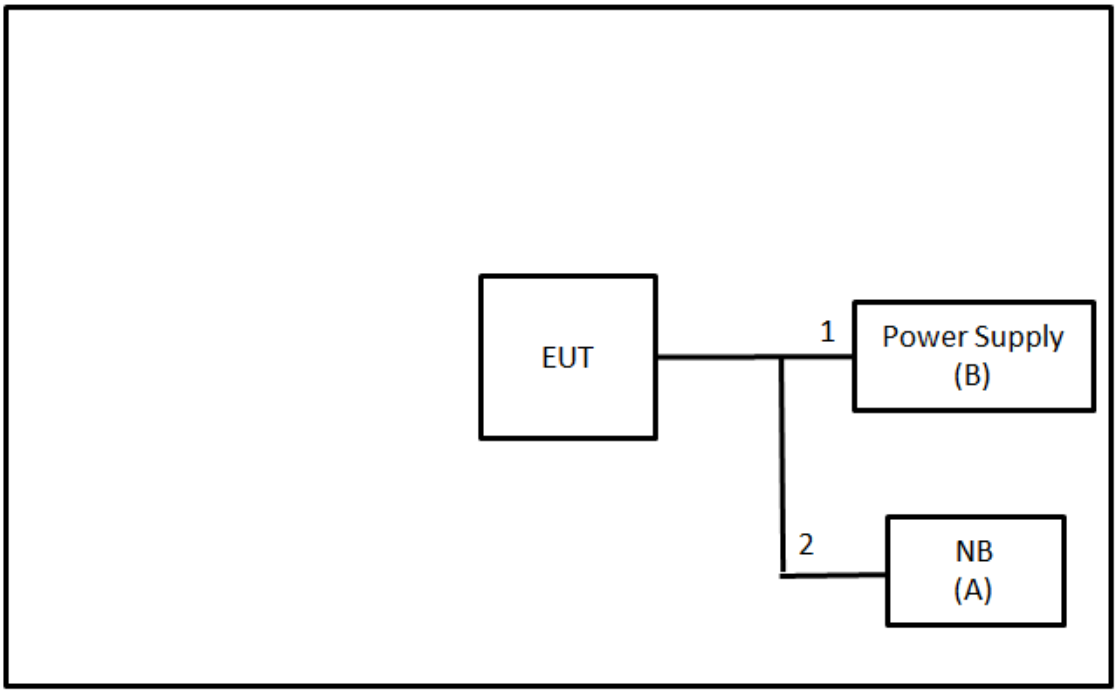
2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Equipment letters and Cable numbers refer to item numbers described in the tables of clause 2.4.

Radiated Emissions_External antenna



Radiated Emissions_Built-in antenna



2.4 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.	Remarks
A	NB	HP	TPN-I119	N/A	Furnished by test lab.
B	Power Supply	Twintex	TDS-60-15	N/A	Furnished by test lab.
C	external antenna	Taoglas	MA250.A.LBI.001	N/A	Supplied by test requester
D	Stubby antenna	Taoglas	TG.08.0723	N/A	Supplied by test requester

Item	Shielded	Ferrite Core	Length	Cable Type	Remarks
1	N/A	N/A	2m	Power Cord	Supplied by test requester
2	N/A	N/A	2.1m	RS 232 to USB	Supplied by test requester

3 EIRP TEST

3.1 LIMIT

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

NOTE:
(1) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value
Calculation example:

Reading Level		Correct Factor		Measurement Value
-29.66	+	34.26	=	4.60

Measurement Value		Limit Value		Margin Level
4.60	-	38.45	=	-33.85

3.2 TEST PROCEDURE

The testing follows FCC KDB 971168 v03r01 Section 5.

EIRP / ERP Power Measurement:
EIRP = Conducted Power + Antenna gain.
ERP power = EIPR power - 2.15 dBi.

Conducted Measurement:

The EUT was set up for the maximum power with WCDMA and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

Radiated Measurement:

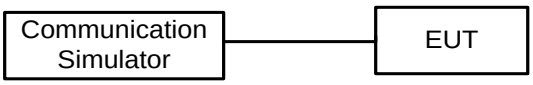
a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
b. 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
c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
d. ERP can be calculated form EIRP by subtracting the gain of dipole, ERP = EIPR - 2.15dBi..
e. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

3.3 DEVIATION FROM TEST STANDARD

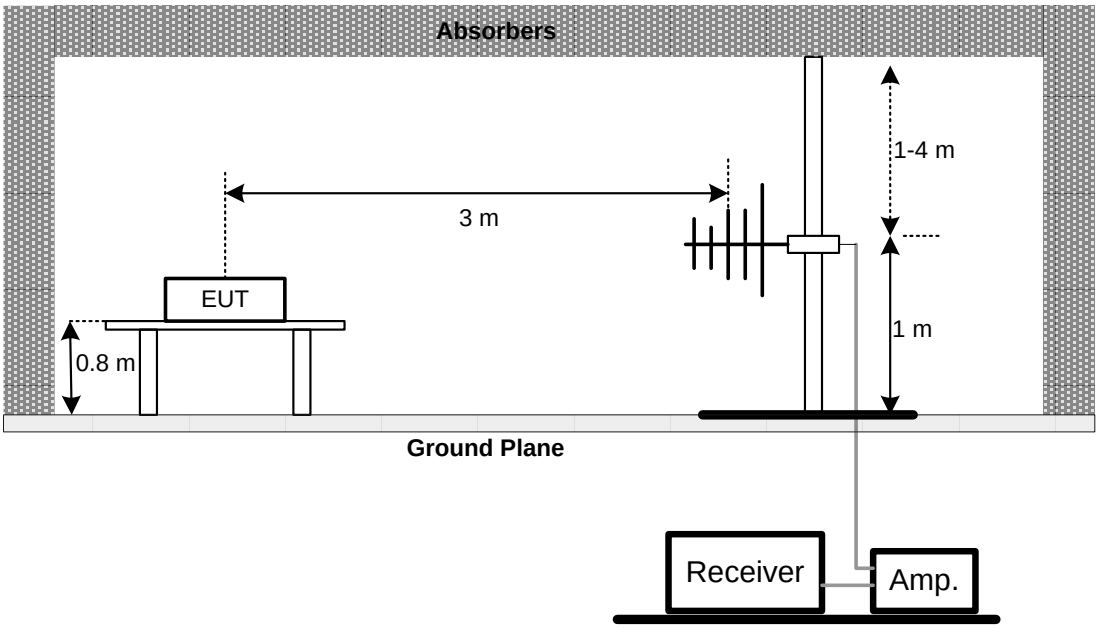
No deviation.

3.4 TEST SETUP

Conducted Measurement:



Radiated Measurement:



3.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

3.6 TEST RESULT

Please refer to the APPENDIX A.

4 OCCUPIED BANDWIDTH MEASUREMENT

4.1 TEST PROCEDURE

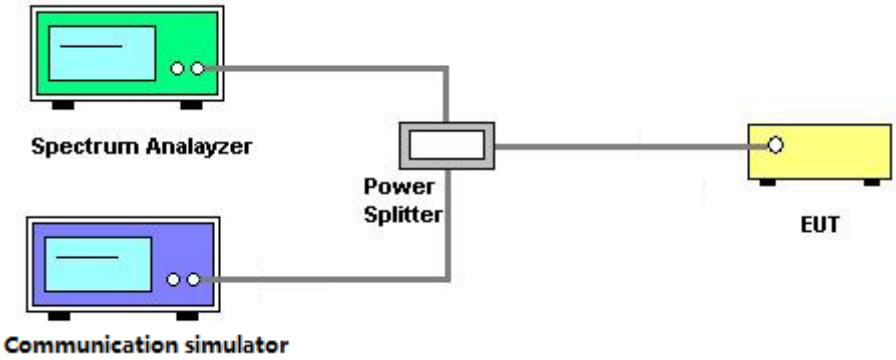
The testing follows FCC KDB 971168 v03r01 Section 4.

a. 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.
b. The EUT was connected to spectrum analyzer and system simulator via a power divider.
c. RBW=(1% ~ 5%)*EBW
   VBW⩾3* RBW.
d. Set spectrum analyzer with Peak detector.

4.2 DEVIATION FROM TEST STANDARD

No deviation.

4.3 TEST SETUP



4.4 TEST RESULT

Please refer to the APPENDIX B

5 CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

5.1 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.

5.2 TEST PROCEDURE

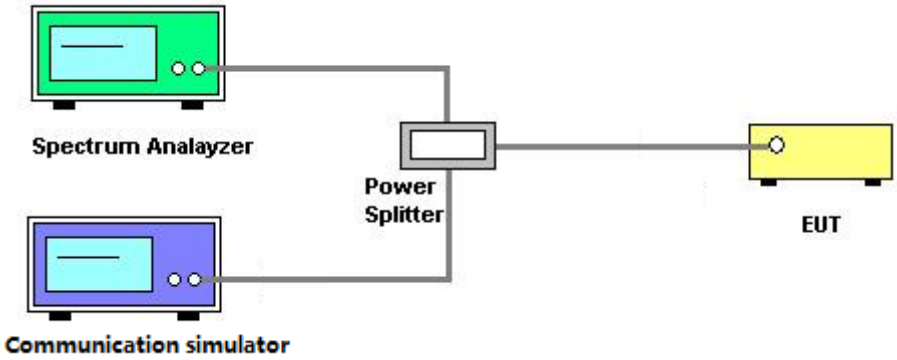
The testing follows FCC KDB 971168 v03r01 Section 6.

a. The EUT was connected to spectrum analyzer and system simulator via a power divider.
b. 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.
c. Set spectrum analyzer with Peak detector.
d. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

5.3 DEVIATION FROM TEST STANDARD

No deviation.

5.4 TEST SETUP



5.5 TEST RESULT

Please refer to the APPENDIX C.

6 RADIATED SPURIOUS EMISSIONS TEST

6.1 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.

NOTE:
(1) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value
Calculation example:

Reading Level		Correct Factor		Measurement Value
-50.43	+	-2.11	=	-52.54

Measurement Value		Limit Value		Margin Level
-52.54	-	-13	=	-39.54

6.2 TEST PROCEDURE

The testing follows FCC KDB 971168 v03r01 Section 6.2.

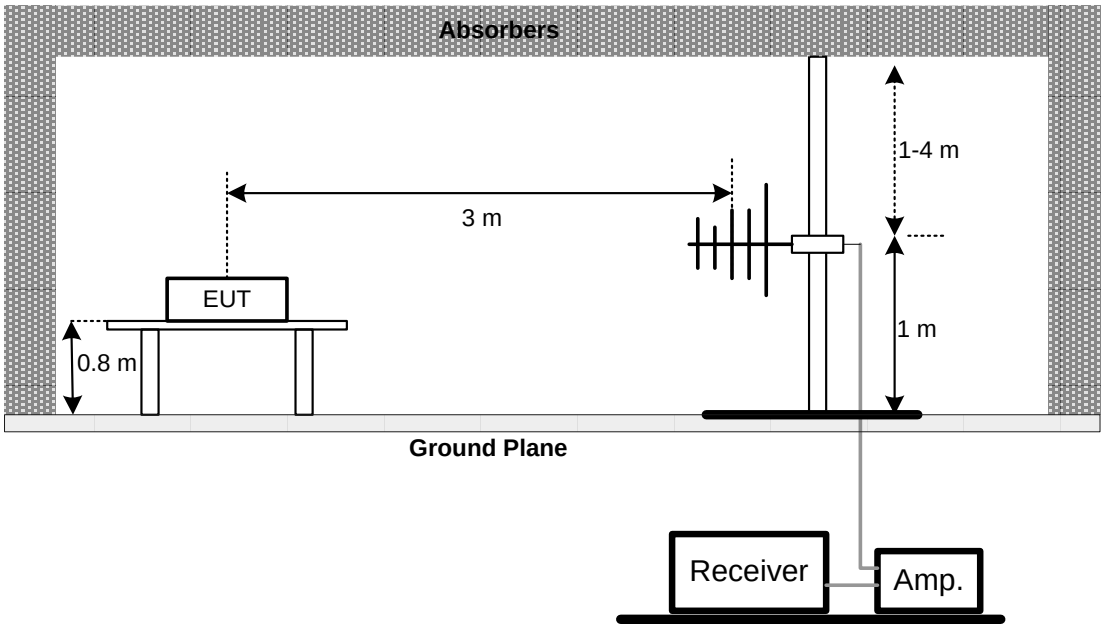
a. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
b. 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
c. EIRP = Output power level of S.G - TX cable loss + Antenna gain of substitution horn.
d. ERP can be calculated form EIRP by subtracting the gain of dipole, ERP = EIPR - 2.15dBi.
e. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

6.3 DEVIATION FROM TEST STANDARD

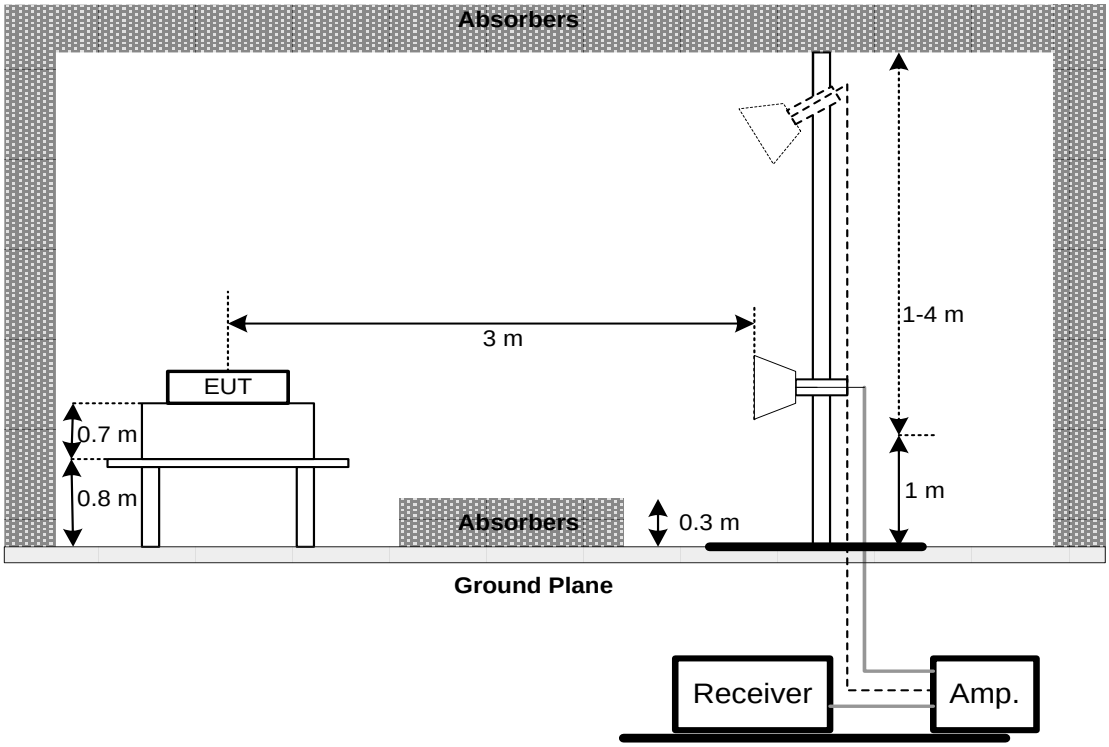
No deviation.

6.4 TEST SETUP

30 MHz to 1 GHz



Above 1 GHz



6.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

6.6 TEST RESULT

Please refer to the APPENDIX D.

7 BAND EDGE MEASUREMENT

7.1 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.

7.2 TEST PROCEDURE

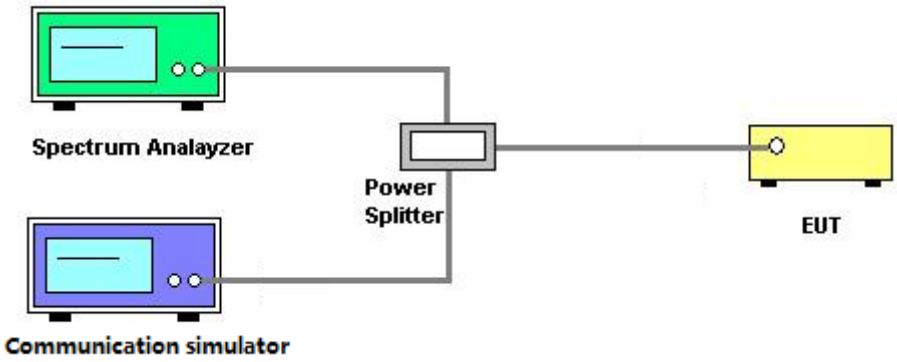
The testing follows FCC KDB 971168 v03r01 Section 6.

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

7.3 DEVIATION FROM TEST STANDARD

No deviation.

7.4 TEST SETUP



7.5 TEST RESULT

Please refer to the APPENDIX E

8 PEAK TO AVERAGE RATIO MEASUREMENT

8.1 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.

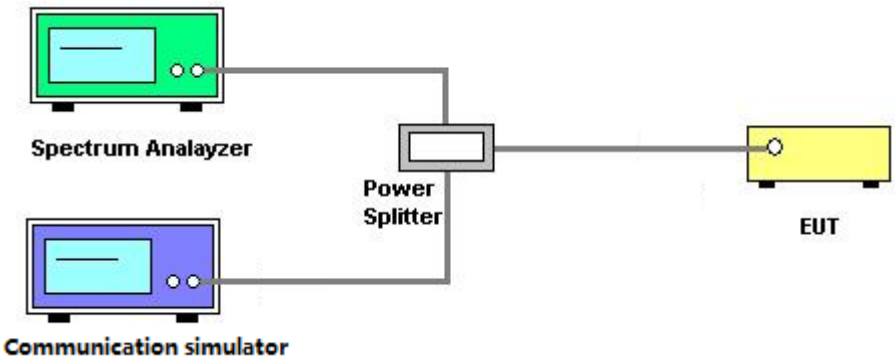
8.2 TEST PROCEDURE

The testing follows FCC KDB 971168 v03r01 Section 5.7.
a. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth.
b. Set the number of counts to a value that stabilizes the measured CCDF curve.
c. Record the maximum PAPR level associated with a probability of 0.1%.

8.3 DEVIATION FROM TEST STANDARD

No deviation.

8.4 TEST SETUP



8.5 TEST RESULT

Please refer to the APPENDIX F.

9 FREQUENCY STABILITY MEASUREMENT

9.1 LIMIT

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

9.2 TEST PROCEDURE

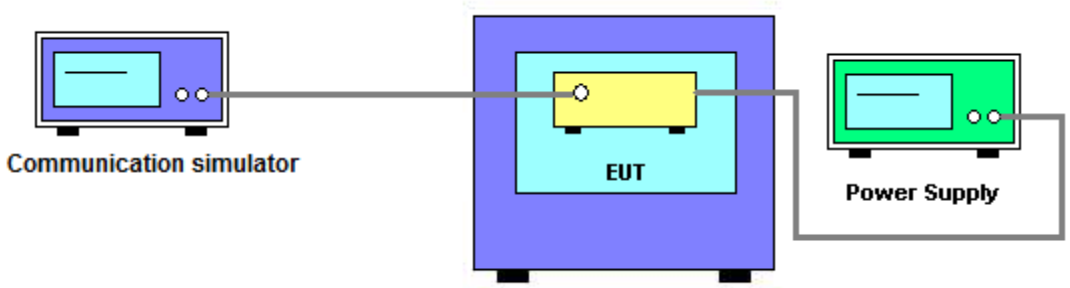
The testing follows FCC KDB 971168 v03r01 Section 9.

a. 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.
b. 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.
c. 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.
d. The frequency error was recorded frequency error from the communication simulator.

9.3 DEVIATION FROM TEST STANDARD

No deviation.

9.4 TEST SETUP



9.5 TEST RESULT

Please refer to the APPENDIX G

10 LIST OF MEASURING EQUIPMENTS

RF Power Output						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	8960 Series 10 Wireless Com Test Set	Agilent	E5515C	GB47390193	2020/6/4	2021/6/3
2	Radio Communication Analyzer	Anritsu	MT8820C	6201525878	2020/6/19	2021/6/18

Radiated Spurious Emissions						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Preamplifier	EMCI	EMC02325B	980217	2021/4/8	2022/4/7
2	Preamplifier	EMCI	EMC012645B	980267	2021/4/8	2022/4/7
3	Test Cable	EMCI	EMC-SM-SM-1000	180809	2021/4/8	2022/4/7
4	Test Cable	EMCI	EMC104-SM-SM-3000	151205	2021/4/8	2022/4/7
5	Test Cable	EMCI	EMC-SM-SM-7000	180408	2021/4/8	2022/4/7
6	MXE EMI Receiver	Agilent	N9038A	MY554200087	2020/6/10	2021/6/9
7	Signal Analyzer	Agilent	N9010A	MY56480554	2020/8/25	2021/8/24
8	Horn Ant	SCHWARZBECK	BBHA 9120D	9120D-1342	2020/6/12	2021/6/11
9	Horn Ant	Schwarzbeck	BBHA 9170	BBHA 9170340	2020/7/9	2021/7/8
10	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	VULB 9168-352	2020/7/24	2021/7/23
11	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0625	2020/7/24	2021/7/23
12	Measurement Software	EZ	EZ_EMC (Version NB-03A1-01)	N/A	N/A	N/A
13	8960 Series 10 Wireless Com Test Set	Agilent	E5515C	GB47390193	2020/6/4	2021/6/3
14	Radio Communication Analyzer (LTE)	Anritsu	MT8820C	6201525878	2020/6/3	2021/6/2

Frequency Stability Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	8960 Series 10 Wireless Com Test Set	Agilent	E5515C	GB47390193	2020/6/4	2021/6/3
2	Radio Communication Analyzer	Anritsu	MT8820C	6201525878	2020/6/19	2021/6/18

Others Conducted Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP40	100129	2020/5/22	2021/5/21

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

11 EUT TEST PHOTO

Please refer to document Appendix No.: TP-2103T126B-FCCP-2 (APPENDIX-TEST PHOTOS).

12 EUT PHOTOS

Please refer to document Appendix No.: EP-2103T126B-3 (APPENDIX-EUT PHOTOS).

APPENDIX A EIRP

EIRP (Conducted):

Band	UL/DL Channel No.	Frequency(MHz)	Average power(dBm	Gain (dBi)	EIRP (dBm)	EIRP (W)
WCDMA Band II	9262/9662	1852.4	22.59	5.70	28.29	0.675
	9400/9800	1880.0	22.64	5.70	28.34	**0.682**
	9538/9938	1907.6	22.30	5.70	28.00	0.631

Band	Sub-test	UL/DL Channel	Frequency(MHz)	Average power(dBm)	Gain (dBi)	EIRP (dBm)	EIRP (W)
HSDPA Band II	1	9262/9662	1852.4	22.54	5.70	28.24	0.667
		9400/9800	1880.0	22.59	5.70	28.29	**0.675**
		9538/9938	1907.6	22.25	5.70	27.95	0.624
	2	9262/9662	1852.4	22.06	5.70	27.76	0.597
		9400/9800	1880.0	22.11	5.70	27.81	0.604
		9538/9938	1907.6	21.77	5.70	27.47	0.558
	3	9262/9662	1852.4	21.64	5.70	27.34	0.542
		9400/9800	1880.0	21.69	5.70	27.39	0.548
		9538/9938	1907.6	21.35	5.70	27.05	0.507
	4	9262/9662	1852.4	22.45	5.70	28.15	0.653
		9400/9800	1880.0	22.50	5.70	28.20	0.661
		9538/9938	1907.6	22.16	5.70	27.86	0.611

Band	Sub-test	UL/DL Channel	Frequency(MHz)	Average power(dBm)	Gain (dBi)	EIRP (dBm)	EIRP (W)
HSUPA Band II	1	9262/9662	1852.4	22.55	5.70	28.25	0.668
		9400/9800	1880.0	22.60	5.70	28.30	**0.676**
		9538/9938	1907.6	22.26	5.70	27.96	0.625
	2	9262/9662	1852.4	20.60	5.70	26.30	0.427
		9400/9800	1880.0	20.65	5.70	26.35	0.432
		9538/9938	1907.6	20.31	5.70	26.01	0.399
	3	9262/9662	1852.4	21.69	5.70	27.39	0.548
		9400/9800	1880.0	21.74	5.70	27.44	0.555
		9538/9938	1907.6	21.40	5.70	27.10	0.513
	4	9262/9662	1852.4	20.83	5.70	26.53	0.450
		9400/9800	1880.0	20.88	5.70	26.58	0.455
		9538/9938	1907.6	20.54	5.70	26.24	0.421
	5	9262/9662	1852.4	22.48	5.70	28.18	0.658
		9400/9800	1880.0	22.53	5.70	28.23	0.665
		9538/9938	1907.6	22.19	5.70	27.89	0.615

NOTE:
(1) EIRP = Average power + Antenna gain.
(2) ERP = EIRP - 2.15.
(3) $P(W) = 1\ W \cdot 10^{(P(dBm)/10)} / 1000$
(4) The maximum antenna gain is applied.

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power	Gain (dBi)	EIRP (dBm)	EIRP (W)
2	1.4	18607	1850.7	QPSK	1	0	0	23.03	5.70	28.73	0.746
					1	2	0	22.72	5.70	28.42	0.695
					1	5	0	22.42	5.70	28.12	0.649
					3	0	0	23.03	5.70	28.73	0.746
					3	1	0	22.72	5.70	28.42	0.695
					3	2	0	22.42	5.70	28.12	0.649
					6	0	1	21.52	5.70	27.22	0.527
				16QAM	1	0	1	22.25	5.70	27.95	0.624
					1	2	1	21.90	5.70	27.60	0.575
					1	5	1	21.53	5.70	27.23	0.528
					3	0	1	22.25	5.70	27.95	0.624
					3	1	1	21.90	5.70	27.60	0.575
					3	2	1	21.53	5.70	27.23	0.528
					6	0	2	20.61	5.70	26.31	0.428
		18900	1880.0	QPSK	1	0	0	23.20	5.70	28.90	**0.776**
					1	2	0	22.69	5.70	28.39	0.690
					1	5	0	22.44	5.70	28.14	0.652
					3	0	0	23.20	5.70	28.90	**0.776**
					3	1	0	22.69	5.70	28.39	0.690
					3	2	0	22.44	5.70	28.14	0.652
					6	0	1	22.26	5.70	27.96	0.625
				16QAM	1	0	1	22.38	5.70	28.08	**0.643**
					1	2	1	22.34	5.70	28.04	0.637
					1	5	1	21.51	5.70	27.21	0.526
					3	0	1	22.38	5.70	28.08	**0.643**
					3	1	1	22.34	5.70	28.04	0.637
					3	2	1	21.51	5.70	27.21	0.526
					6	0	2	20.50	5.70	26.20	0.417
		19192	1909.2	QPSK	1	0	0	23.10	5.70	28.80	0.759
					1	2	0	22.77	5.70	28.47	0.703
					1	5	0	22.45	5.70	28.15	0.653
					3	0	0	23.10	5.70	28.80	0.759
					3	1	0	22.77	5.70	28.47	0.703
					3	2	0	22.45	5.70	28.15	0.653
					6	0	1	22.16	5.70	27.86	0.611
				16QAM	1	0	1	22.28	5.70	27.98	0.628
					1	2	1	22.24	5.70	27.94	0.622
					1	5	1	21.52	5.70	27.22	0.527
					3	0	1	22.28	5.70	27.98	0.628
					3	1	1	22.24	5.70	27.94	0.622
					3	2	1	21.52	5.70	27.22	0.527
					6	0	2	20.60	5.70	26.30	0.427

NOTE:
(1) EIRP = Average power + Antenna gain.
(2) ERP = EIRP - 2.15.
(3) $P(W) = 1\ W \cdot 10^{(P(dBm)/10)} / 1000$
(4) The maximum antenna gain is applied.

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power	Gain (dBi)	EIRP (dBm)	EIRP (W)
2	3	18615	1851.5	QPSK	1	0	0	23.08	5.70	28.78	0.755
					1	7	0	22.77	5.70	28.47	0.703
					1	14	0	22.47	5.70	28.17	0.656
					8	0	1	22.23	5.70	27.93	0.621
					8	4	1	21.85	5.70	27.55	0.569
					8	7	1	21.69	5.70	27.39	0.548
					15	0	1	21.57	5.70	27.27	0.533
				16QAM	1	0	1	22.30	5.70	28.00	0.631
					1	7	1	21.95	5.70	27.65	0.582
					1	14	1	21.58	5.70	27.28	0.535
					8	0	2	21.13	5.70	26.83	0.482
					8	4	2	20.95	5.70	26.65	0.462
					8	7	2	20.54	5.70	26.24	0.421
					15	0	2	20.66	5.70	26.36	0.433
		18900	1880.0	QPSK	1	0	0	23.25	5.70	28.95	**0.785**
					1	7	0	22.74	5.70	28.44	0.698
					1	14	0	22.49	5.70	28.19	0.659
					8	0	1	22.36	5.70	28.06	0.640
					8	4	1	21.78	5.70	27.48	0.560
					8	7	1	21.67	5.70	27.37	0.546
					15	0	1	22.31	5.70	28.01	0.632
				16QAM	1	0	1	22.43	5.70	28.13	**0.650**
					1	7	1	22.39	5.70	28.09	0.644
					1	14	1	21.56	5.70	27.26	0.532
					8	0	2	21.26	5.70	26.96	0.497
					8	4	2	20.88	5.70	26.58	0.455
					8	7	2	20.52	5.70	26.22	0.419
					15	0	2	21.30	5.70	27.00	0.501
		19184	1908.4	QPSK	1	0	0	23.15	5.70	28.85	0.767
					1	7	0	22.82	5.70	28.52	0.711
					1	14	0	22.50	5.70	28.20	0.661
					8	0	1	22.26	5.70	27.96	0.625
					8	4	1	21.86	5.70	27.56	0.570
					8	7	1	21.68	5.70	27.38	0.547
					15	0	1	22.21	5.70	27.91	0.618
				16QAM	1	0	1	22.33	5.70	28.03	0.635
					1	7	1	22.29	5.70	27.99	0.630
					1	14	1	21.57	5.70	27.27	0.533
					8	0	2	21.16	5.70	26.86	0.485
					8	4	2	20.96	5.70	26.66	0.463
					8	7	2	20.53	5.70	26.23	0.420
					15	0	2	21.10	5.70	26.80	0.479

NOTE:
(1) EIRP = Average power + Antenna gain.
(2) ERP = EIRP - 2.15.
(3) $P(W) = 1\ W \cdot 10^{(P(dBm)/10)} / 1000$
(4) The maximum antenna gain is applied.

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power	Gain (dBi)	EIRP (dBm)	EIRP (W)
2	5	18625	1852.5	QPSK	1	0	0	23.13	5.70	28.83	0.764
					1	12	0	22.82	5.70	28.52	0.711
					1	24	0	22.52	5.70	28.22	0.664
					12	0	1	22.28	5.70	27.98	0.628
					12	6	1	21.90	5.70	27.60	0.575
					12	11	1	21.74	5.70	27.44	0.555
					25	0	1	21.62	5.70	27.32	0.540
				16QAM	1	0	1	22.35	5.70	28.05	0.638
					1	12	1	22.00	5.70	27.70	0.589
					1	24	1	21.63	5.70	27.33	0.541
					12	0	2	21.18	5.70	26.88	0.488
					12	6	2	21.00	5.70	26.70	0.468
					12	11	2	20.59	5.70	26.29	0.426
					25	0	2	20.71	5.70	26.41	0.438
		18900	1880.0	QPSK	1	0	0	23.30	5.70	29.00	**0.794**
					1	12	0	22.79	5.70	28.49	0.706
					1	24	0	22.54	5.70	28.24	0.667
					12	0	1	22.41	5.70	28.11	0.647
					12	6	1	21.83	5.70	27.53	0.566
					12	11	1	21.72	5.70	27.42	0.552
					25	0	1	22.36	5.70	28.06	0.640
				16QAM	1	0	1	22.48	5.70	28.18	**0.658**
					1	12	1	22.44	5.70	28.14	0.652
					1	24	1	21.61	5.70	27.31	0.538
					12	0	2	21.31	5.70	27.01	0.502
					12	6	2	20.93	5.70	26.63	0.460
					12	11	2	20.57	5.70	26.27	0.424
					25	0	2	21.45	5.70	27.15	0.519
		19175	1907.5	QPSK	1	0	0	23.20	5.70	28.90	0.776
					1	12	0	22.87	5.70	28.57	0.719
					1	24	0	22.55	5.70	28.25	0.668
					12	0	1	22.31	5.70	28.01	0.632
					12	6	1	21.91	5.70	27.61	0.577
					12	11	1	21.73	5.70	27.43	0.553
					25	0	1	22.26	5.70	27.96	0.625
				16QAM	1	0	1	22.38	5.70	28.08	0.643
					1	12	1	22.34	5.70	28.04	0.637
					1	24	1	21.62	5.70	27.32	0.540
					12	0	2	21.21	5.70	26.91	0.491
					12	6	2	21.01	5.70	26.71	0.469
					12	11	2	20.58	5.70	26.28	0.425
					25	0	2	21.35	5.70	27.05	0.507

NOTE:
(1) EIRP = Average power + Antenna gain.
(2) ERP = EIRP - 2.15.
(3) $P(W) = 1\ W \cdot 10^{(P(dBm)/10)} / 1000$
(4) The maximum antenna gain is applied.

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power	Gain (dBi)	EIRP (dBm)	EIRP (W)
2	10	18650	1855.0	QPSK	1	0	0	23.18	5.70	28.88	0.773
					1	24	0	22.87	5.70	28.57	0.719
					1	49	0	22.57	5.70	28.27	0.671
					25	0	1	22.33	5.70	28.03	0.635
					25	12	1	21.95	5.70	27.65	0.582
					25	24	1	21.79	5.70	27.49	0.561
					50	0	1	21.67	5.70	27.37	0.546
				16QAM	1	0	1	22.40	5.70	28.10	0.646
					1	24	1	22.05	5.70	27.75	0.596
					1	49	1	21.68	5.70	27.38	0.547
					25	0	2	21.23	5.70	26.93	0.493
					25	12	2	21.05	5.70	26.75	0.473
					25	24	2	20.64	5.70	26.34	0.431
					50	0	2	20.76	5.70	26.46	0.443
		18900	1880.0	QPSK	1	0	0	23.35	5.70	29.05	**0.804**
					1	24	0	22.84	5.70	28.54	0.714
					1	49	0	22.59	5.70	28.29	0.675
					25	0	1	22.46	5.70	28.16	0.655
					25	12	1	21.88	5.70	27.58	0.573
					25	24	1	21.77	5.70	27.47	0.558
					50	0	1	22.41	5.70	28.11	0.647
				16QAM	1	0	1	22.53	5.70	28.23	**0.665**
					1	24	1	22.49	5.70	28.19	0.659
					1	49	1	21.66	5.70	27.36	0.545
					25	0	2	21.36	5.70	27.06	0.508
					25	12	2	20.98	5.70	26.68	0.466
					25	24	2	20.62	5.70	26.32	0.429
					50	0	2	21.50	5.70	27.20	0.525
		19150	1905.0	QPSK	1	0	0	23.25	5.70	28.95	0.785
					1	24	0	22.92	5.70	28.62	0.728
					1	49	0	22.60	5.70	28.30	0.676
					25	0	1	22.36	5.70	28.06	0.640
					25	12	1	21.96	5.70	27.66	0.583
					25	24	1	21.78	5.70	27.48	0.560
					50	0	1	22.31	5.70	28.01	0.632
				16QAM	1	0	1	22.43	5.70	28.13	0.650
					1	24	1	22.39	5.70	28.09	0.644
					1	49	1	21.67	5.70	27.37	0.546
					25	0	2	21.26	5.70	26.96	0.497
					25	12	2	21.06	5.70	26.76	0.474
					25	24	2	20.63	5.70	26.33	0.430
					50	0	2	21.40	5.70	27.10	0.513

NOTE:
(1) EIRP = Average power + Antenna gain.
(2) ERP = EIRP - 2.15.
(3) $P(W) = 1\ W \cdot 10^{(P(dBm)/10)} / 1000$
(4) The maximum antenna gain is applied.

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power	Gain (dBi)	EIRP (dBm)	EIRP (W)
2	15	18675	1857.5	QPSK	1	0	0	23.23	5.70	28.93	0.782
					1	37	0	22.92	5.70	28.62	0.728
					1	74	0	22.62	5.70	28.32	0.679
					36	0	1	22.38	5.70	28.08	0.643
					36	18	1	22.00	5.70	27.70	0.589
					36	35	1	21.84	5.70	27.54	0.568
					75	0	1	21.72	5.70	27.42	0.552
				16QAM	1	0	1	22.45	5.70	28.15	0.653
					1	37	1	22.10	5.70	27.80	0.603
					1	74	1	21.73	5.70	27.43	0.553
					36	0	2	21.28	5.70	26.98	0.499
					36	18	2	21.10	5.70	26.80	0.479
					36	35	2	20.69	5.70	26.39	0.436
					75	0	2	20.81	5.70	26.51	0.448
		18900	1880.0	QPSK	1	0	0	23.40	5.70	29.10	**0.813**
					1	37	0	22.89	5.70	28.59	0.723
					1	74	0	22.64	5.70	28.34	0.682
					36	0	1	22.51	5.70	28.21	0.662
					36	18	1	21.93	5.70	27.63	0.579
					36	35	1	21.82	5.70	27.52	0.565
					75	0	1	22.46	5.70	28.16	0.655
				16QAM	1	0	1	22.58	5.70	28.28	**0.673**
					1	37	1	22.54	5.70	28.24	0.667
					1	74	1	21.71	5.70	27.41	0.551
					36	0	2	21.41	5.70	27.11	0.514
					36	18	2	21.03	5.70	26.73	0.471
					36	35	2	20.67	5.70	26.37	0.434
					75	0	2	21.55	5.70	27.25	0.531
		19125	1902.5	QPSK	1	0	0	23.30	5.70	29.00	0.794
					1	37	0	22.97	5.70	28.67	0.736
					1	74	0	22.65	5.70	28.35	0.684
					36	0	1	22.41	5.70	28.11	0.647
					36	18	1	22.01	5.70	27.71	0.590
					36	35	1	21.83	5.70	27.53	0.566
					75	0	1	22.36	5.70	28.06	0.640
				16QAM	1	0	1	22.48	5.70	28.18	0.658
					1	37	1	22.44	5.70	28.14	0.652
					1	74	1	21.72	5.70	27.42	0.552
					36	0	2	21.31	5.70	27.01	0.502
					36	18	2	21.11	5.70	26.81	0.480
					36	35	2	20.68	5.70	26.38	0.435
					75	0	2	21.45	5.70	27.15	0.519

NOTE:
(1) EIRP = Average power + Antenna gain.
(2) ERP = EIRP - 2.15.
(3) $P(W) = 1\ W \cdot 10^{(P(dBm)/10)} / 1000$
(4) The maximum antenna gain is applied.

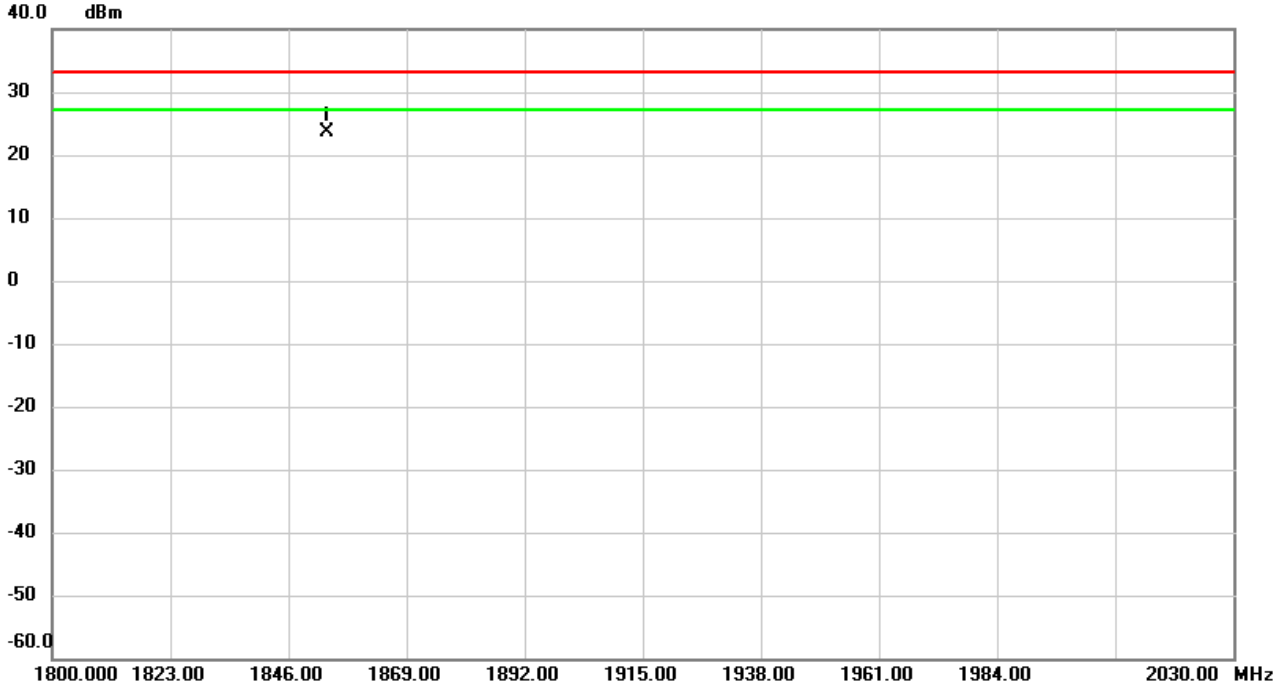
Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power	Gain (dBi)	EIRP (dBm)	EIRP (W)
2	20	18700	1860.0	QPSK	1	0	0	23.28	5.70	28.98	0.791
					1	49	0	22.97	5.70	28.67	0.736
					1	99	0	22.67	5.70	28.37	0.687
					50	0	1	22.39	5.70	28.09	0.644
					50	24	1	22.01	5.70	27.71	0.590
					50	49	1	21.85	5.70	27.55	0.569
					100	0	1	21.73	5.70	27.43	0.553
				16QAM	1	0	1	22.46	5.70	28.16	0.655
					1	49	1	22.11	5.70	27.81	0.604
					1	99	1	21.74	5.70	27.44	0.555
					50	0	2	21.29	5.70	26.99	0.500
					50	24	2	21.11	5.70	26.81	0.480
					50	49	2	20.70	5.70	26.40	0.437
					100	0	2	20.82	5.70	26.52	0.449
		18900	1880.0	QPSK	1	0	0	23.41	5.70	29.11	**0.815**
					1	49	0	22.90	5.70	28.60	0.724
					1	99	0	22.65	5.70	28.35	0.684
					50	0	1	22.52	5.70	28.22	0.664
					50	24	1	21.94	5.70	27.64	0.581
					50	49	1	21.83	5.70	27.53	0.566
					100	0	1	22.47	5.70	28.17	0.656
				16QAM	1	0	1	22.59	5.70	28.29	**0.675**
					1	49	1	22.55	5.70	28.25	0.668
					1	99	1	21.72	5.70	27.42	0.552
					50	0	2	21.42	5.70	27.12	0.515
					50	24	2	21.04	5.70	26.74	0.472
					50	49	2	20.68	5.70	26.38	0.435
					100	0	2	21.56	5.70	27.26	0.532
		19100	1900.0	QPSK	1	0	0	23.31	5.70	29.01	0.796
					1	49	0	22.98	5.70	28.68	0.738
					1	99	0	22.66	5.70	28.36	0.685
					50	0	1	22.42	5.70	28.12	0.649
					50	24	1	22.02	5.70	27.72	0.592
					50	49	1	21.84	5.70	27.54	0.568
					100	0	1	22.37	5.70	28.07	0.641
				16QAM	1	0	1	22.49	5.70	28.19	0.659
					1	49	1	22.45	5.70	28.15	0.653
					1	99	1	21.73	5.70	27.43	0.553
					50	0	2	21.32	5.70	27.02	0.504
					50	24	2	21.12	5.70	26.82	0.481
					50	49	2	20.69	5.70	26.39	0.436
					100	0	2	21.46	5.70	27.16	0.520

NOTE:
(1) EIRP = Average power + Antenna gain.
(2) ERP = EIRP - 2.15.
(3) $P(W) = 1\ W \cdot 10^{(P(dBm)/10)} / 1000$
(4) The maximum antenna gain is applied.

EIRP (Radiated):

For External antenna:

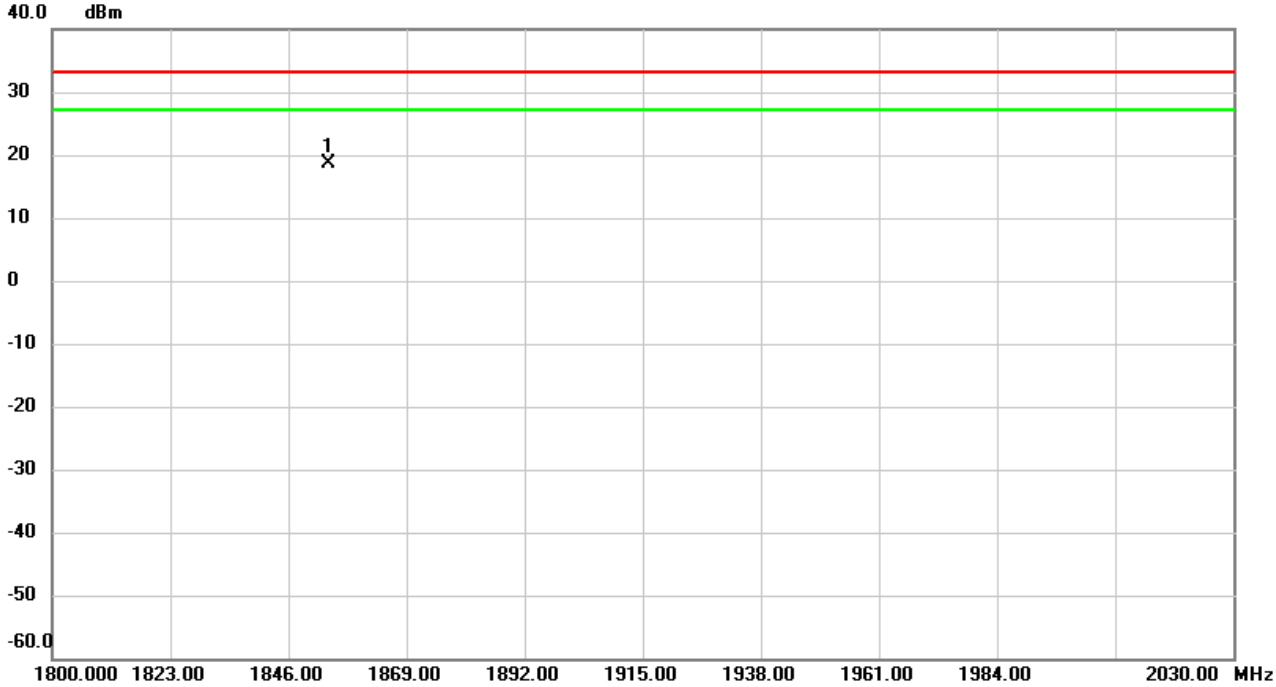
Test Mode	WCDMA Band II	Test Date	2021/4/20
Test Channel	CH 9662	Polarization	Vertical
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1853.621	-16.55	40.08	23.53	33.01	-9.48	peak	

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

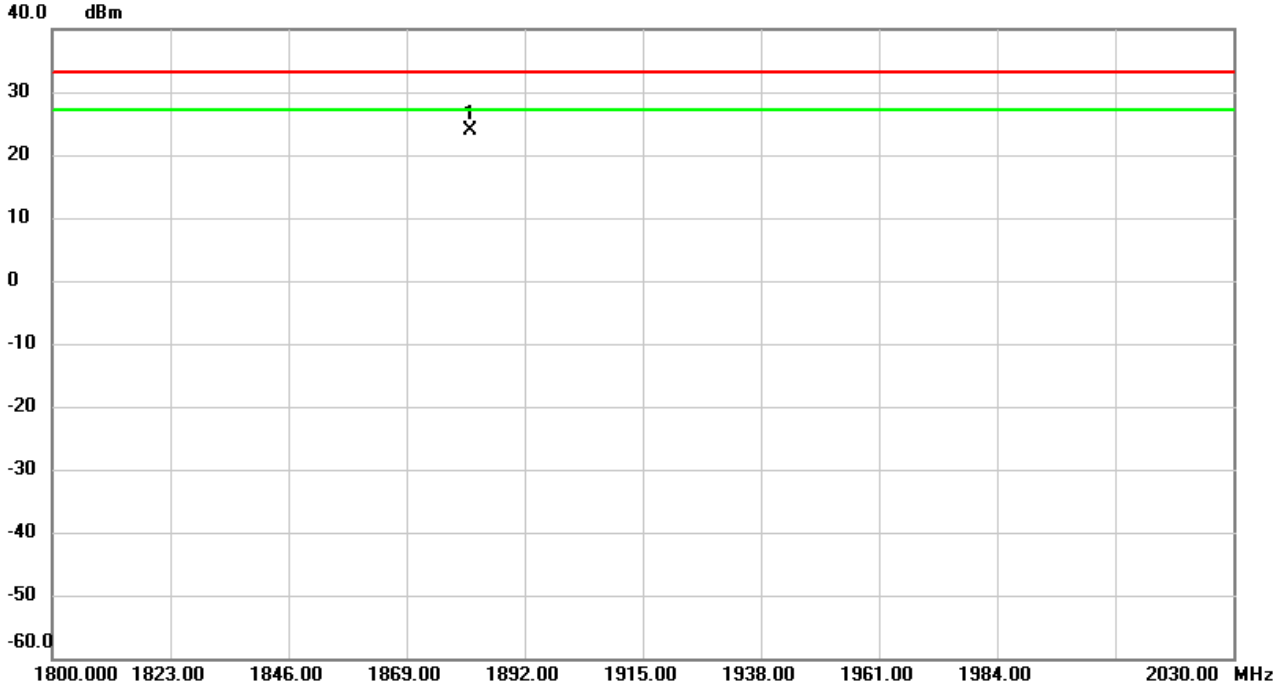
Test Mode	WCDMA Band II	Test Date	2021/4/20
Test Channel	CH 9662	Polarization	Horizontal
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1853.851	-21.99	40.63	18.64	33.01	-14.37	peak	

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

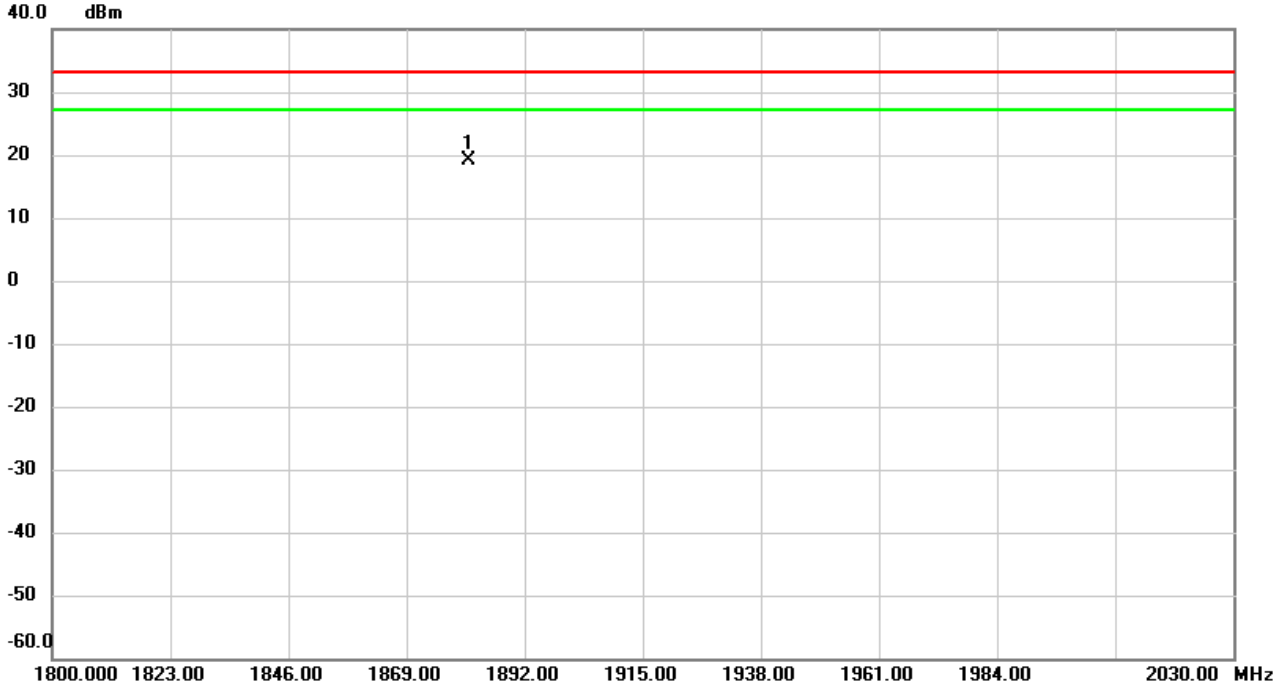
Test Mode	WCDMA Band II	Test Date	2021/4/20
Test Channel	CH 9800	Polarization	Vertical
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1881.397	-16.26	40.20	23.94	33.01	-9.07	peak	

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

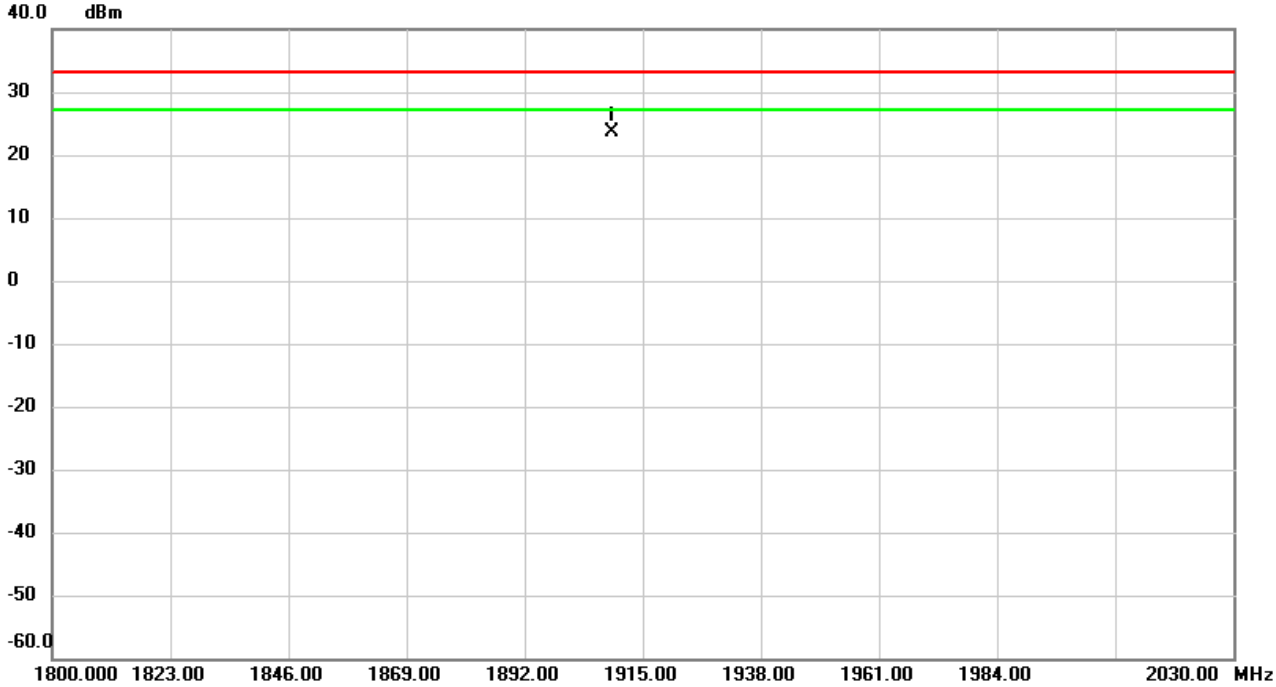
Test Mode	WCDMA Band II	Test Date	2021/4/20
Test Channel	CH 9800	Polarization	Horizontal
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1881.251	-21.66	40.73	19.07	33.01	-13.94	peak	

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

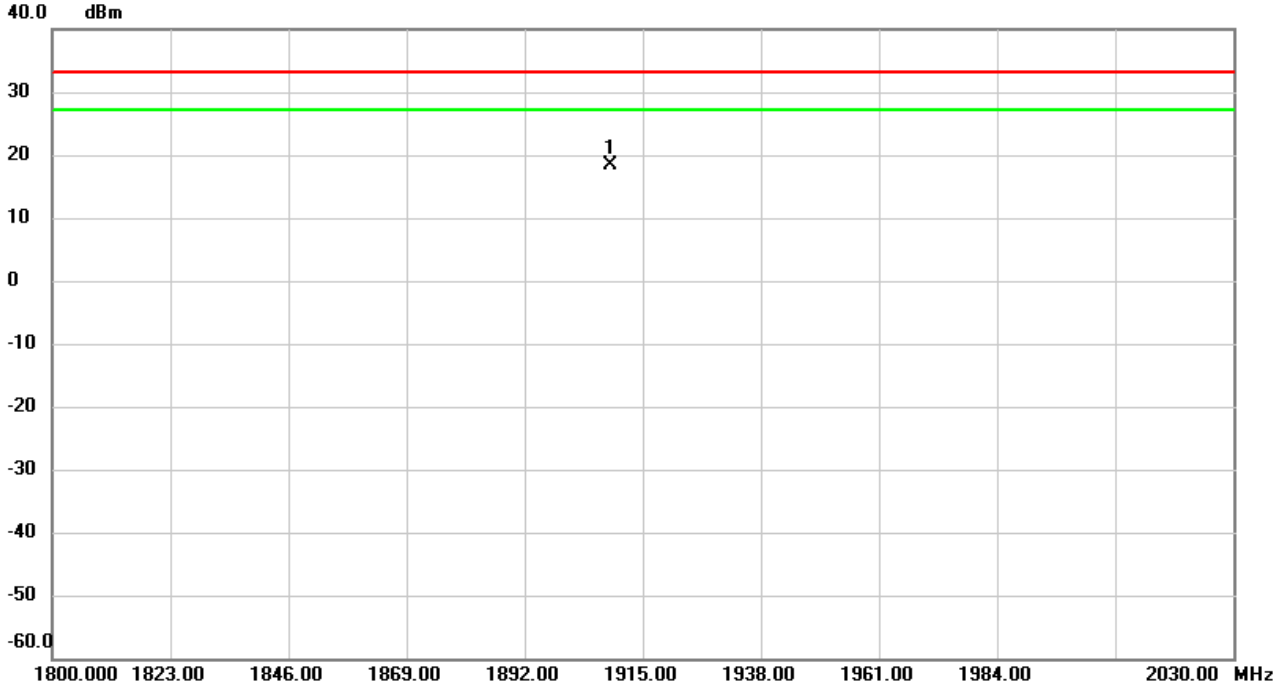
Test Mode	WCDMA Band II	Test Date	2021/4/20
Test Channel	CH 9938	Polarization	Vertical
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1908.936	-16.69	40.32	23.63	33.01	-9.38	peak	

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

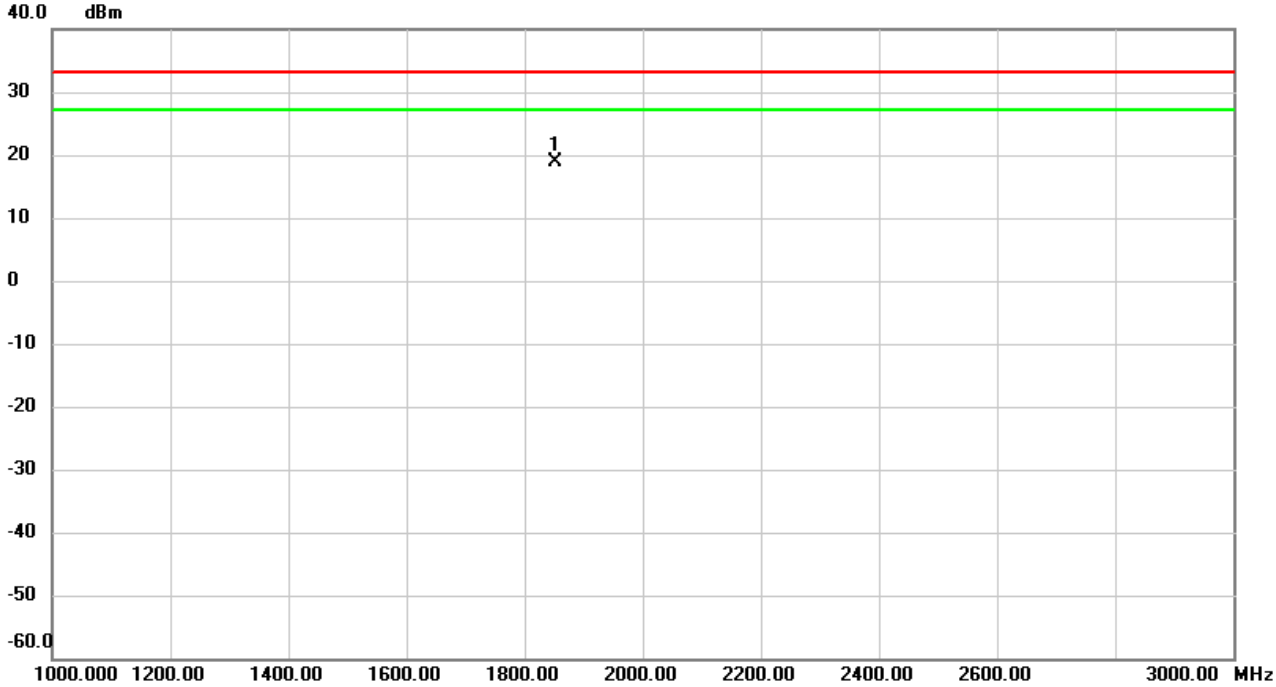
Test Mode	WCDMA Band II	Test Date	2021/4/20
Test Channel	CH 9938	Polarization	Horizontal
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1908.790	-22.47	40.83	18.36	33.01	-14.65	peak	

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

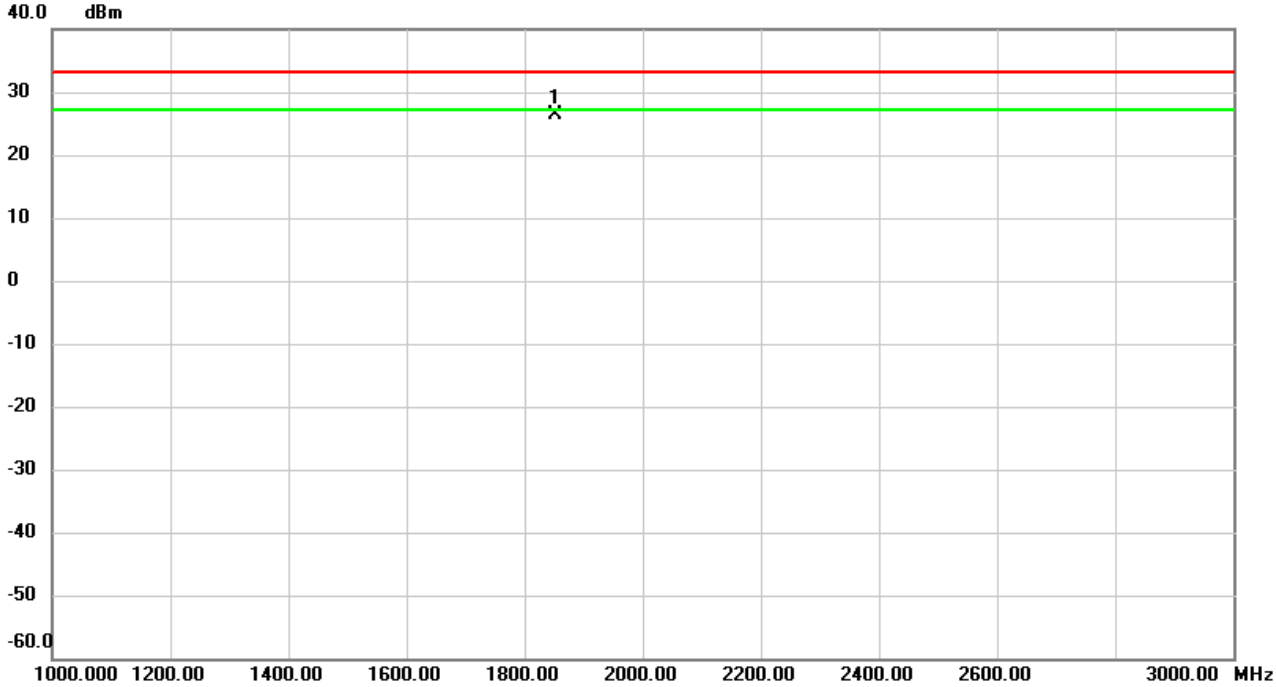
Test Mode	LTE Band 2	Test Date	2021/4/15
Test Channel	CH 18700	Polarization	Vertical
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1851.400	-21.10	40.07	18.97	33.01	-14.04	peak	

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

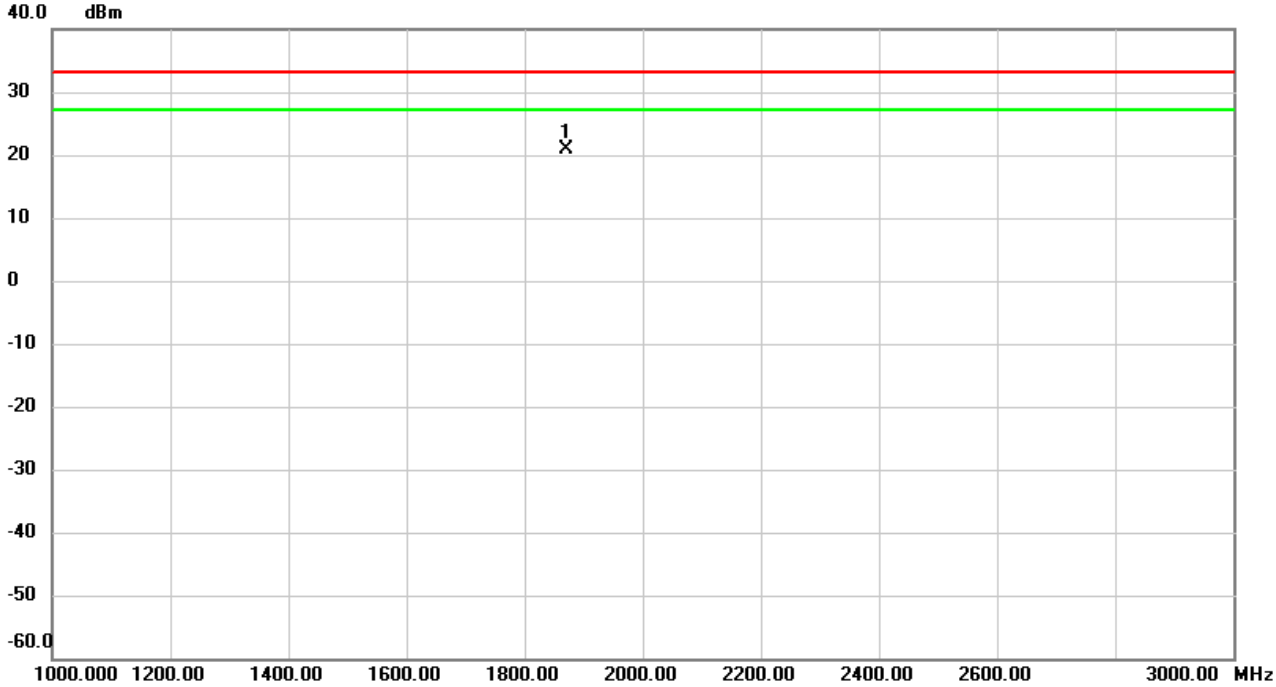
Test Mode	LTE Band 2	Test Date	2021/4/15
Test Channel	CH 18700	Polarization	Horizontal
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1851.400	-14.16	40.62	26.46	33.01	-6.55	peak	

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

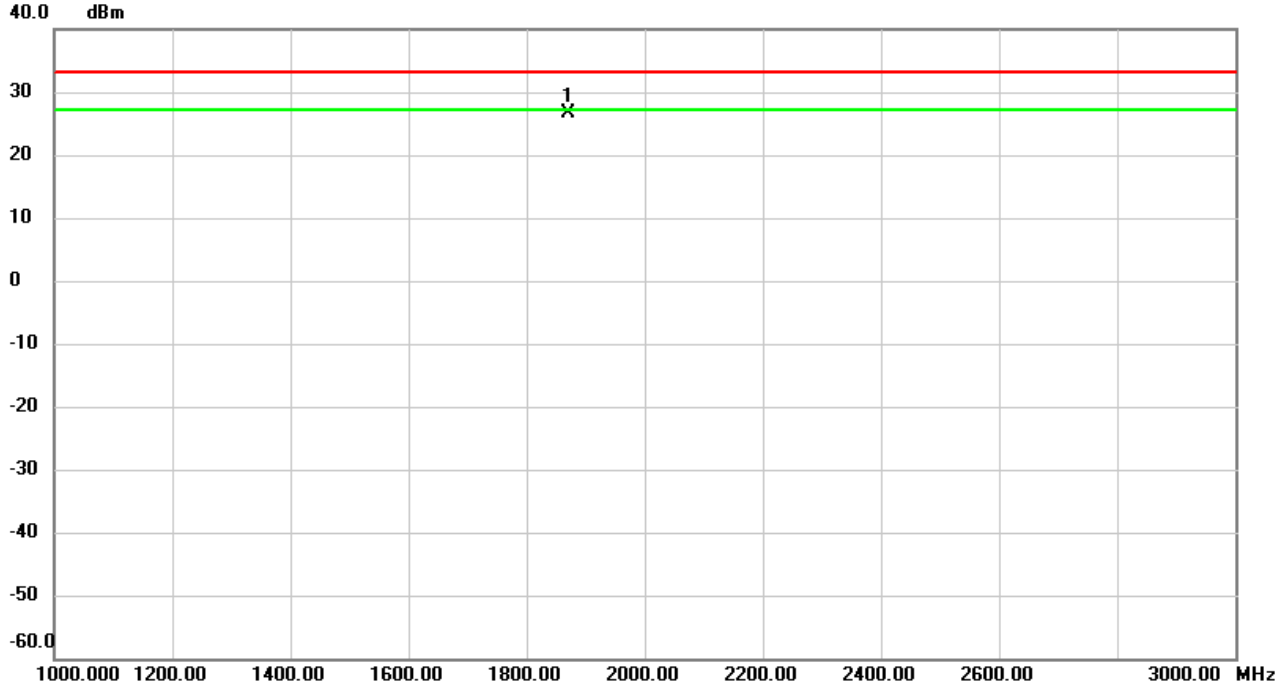
Test Mode	LTE Band 2	Test Date	2021/4/15
Test Channel	CH 18900	Polarization	Vertical
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1871.400	-19.33	40.16	20.83	33.01	-12.18	peak	

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

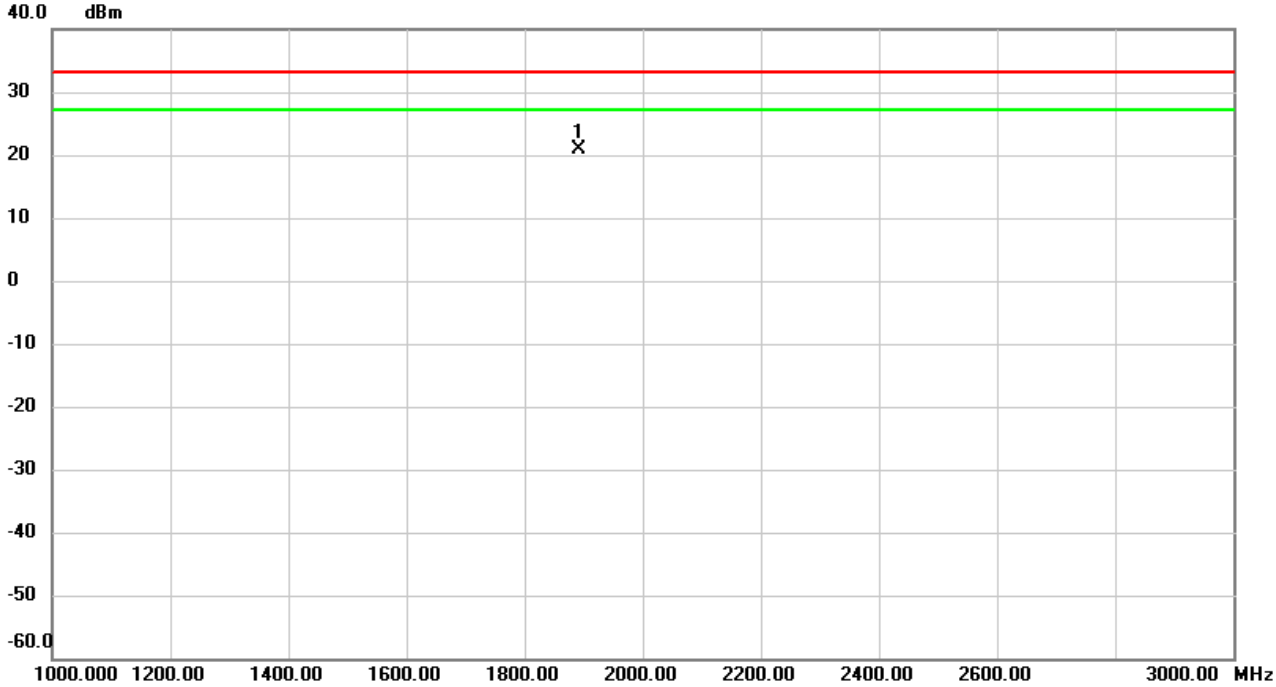
Test Mode	LTE Band 2	Test Date	2021/4/15
Test Channel	CH 18900	Polarization	Horizontal
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1871.400	-13.95	40.69	26.74	33.01	-6.27	peak	

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

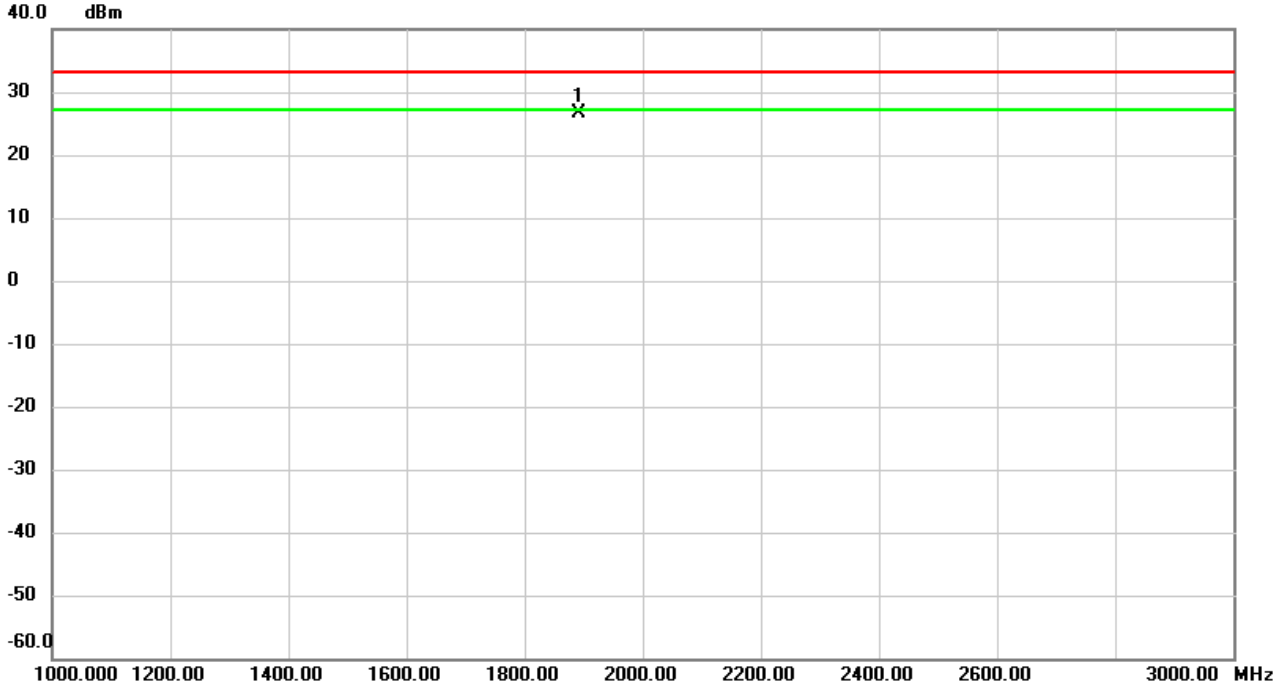
Test Mode	LTE Band 2	Test Date	2021/4/15
Test Channel	CH 19100	Polarization	Vertical
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1891.400	-19.49	40.25	20.76	33.01	-12.25	peak	

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

Test Mode	LTE Band 2	Test Date	2021/4/15
Test Channel	CH 19100	Polarization	Horizontal
Temp	22°C	Hum.	61%

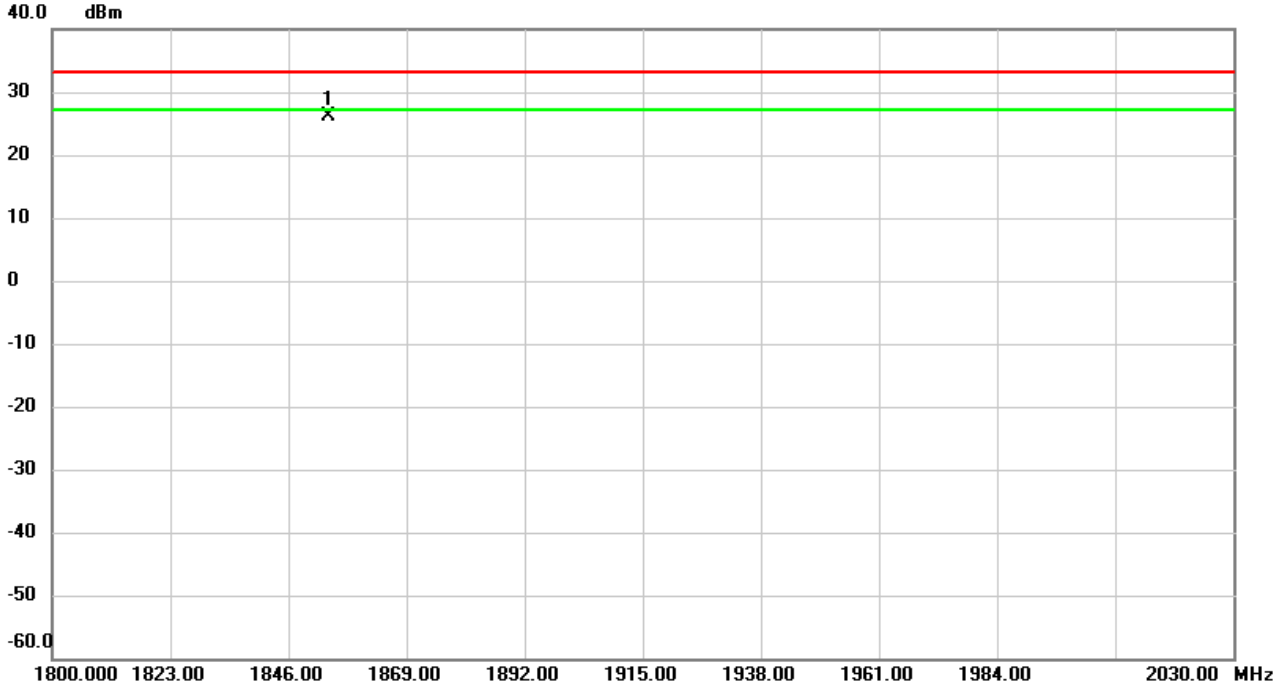


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1891.400	-14.09	40.76	26.67	33.01	-6.34	peak	

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

For Built-in antenna:

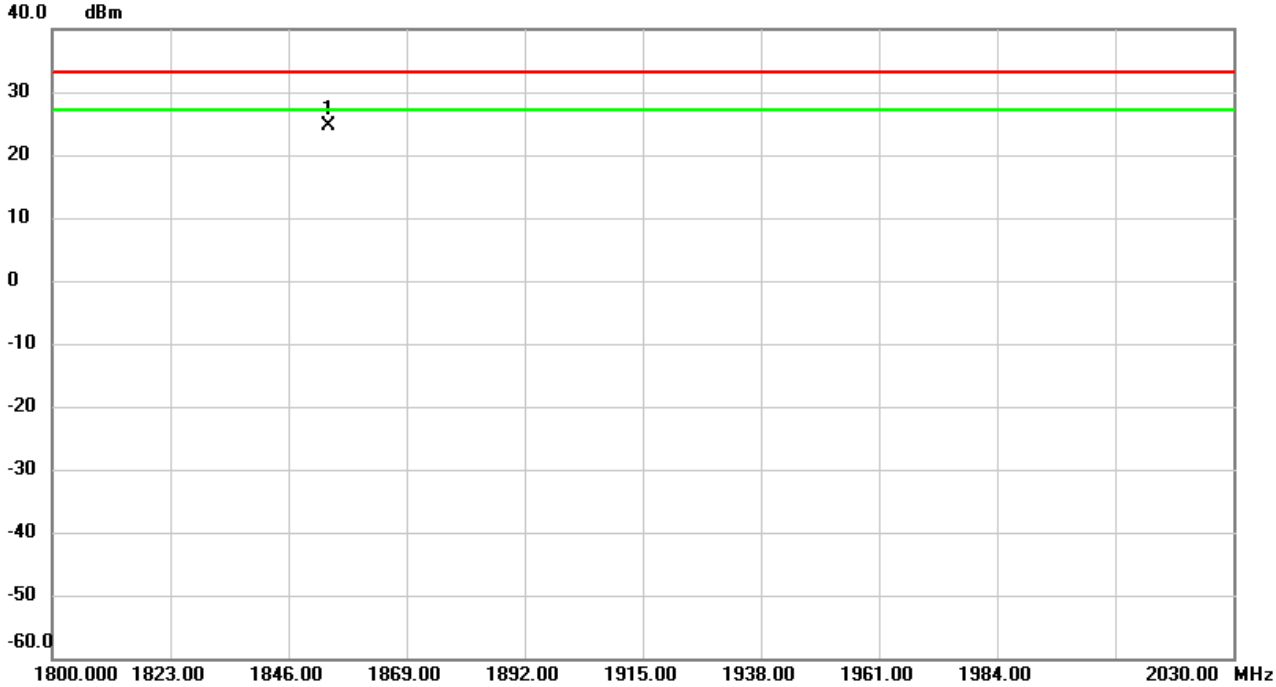
Test Mode	WCDMA Band II	Test Date	2021/5/8
Test Channel	CH 9662	Polarization	Vertical
Temp	24°C	Hum.	58%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1853.682	-14.07	40.08	26.01	33.01	-7.00	peak	

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

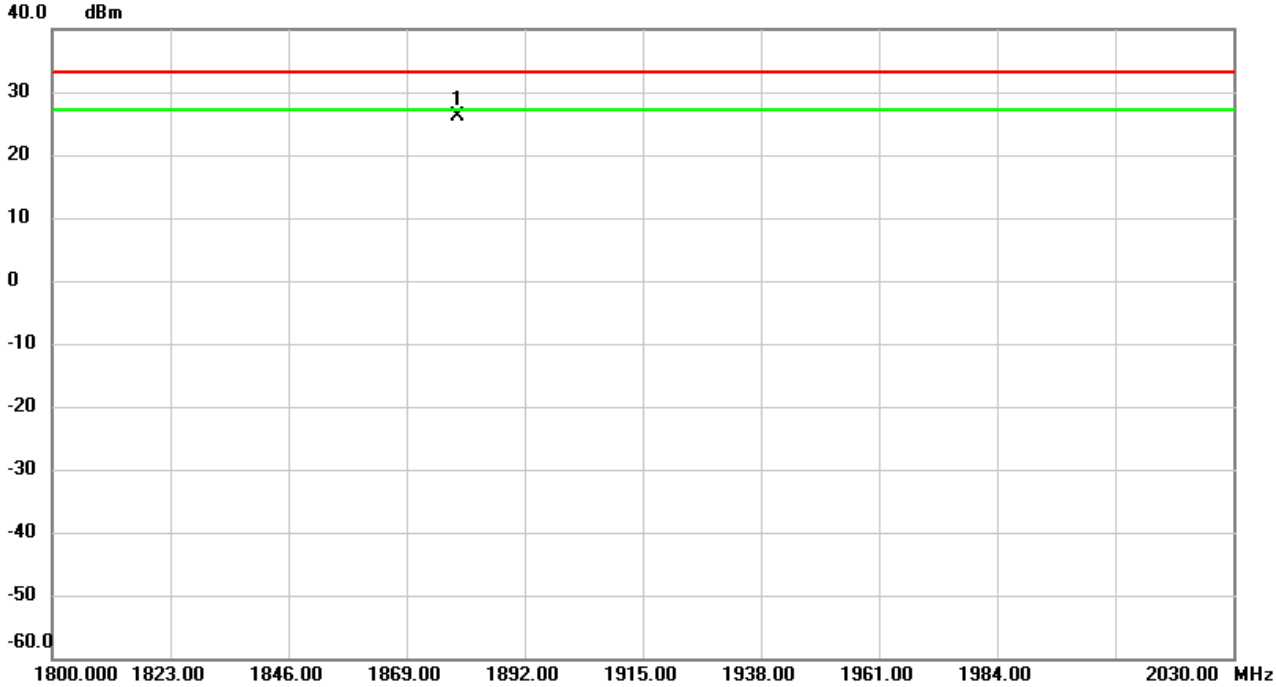
Test Mode	WCDMA Band II	Test Date	2021/5/8
Test Channel	CH 9662	Polarization	Horizontal
Temp	24°C	Hum.	58%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1853.697	-16.02	40.63	24.61	33.01	-8.40	peak	

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

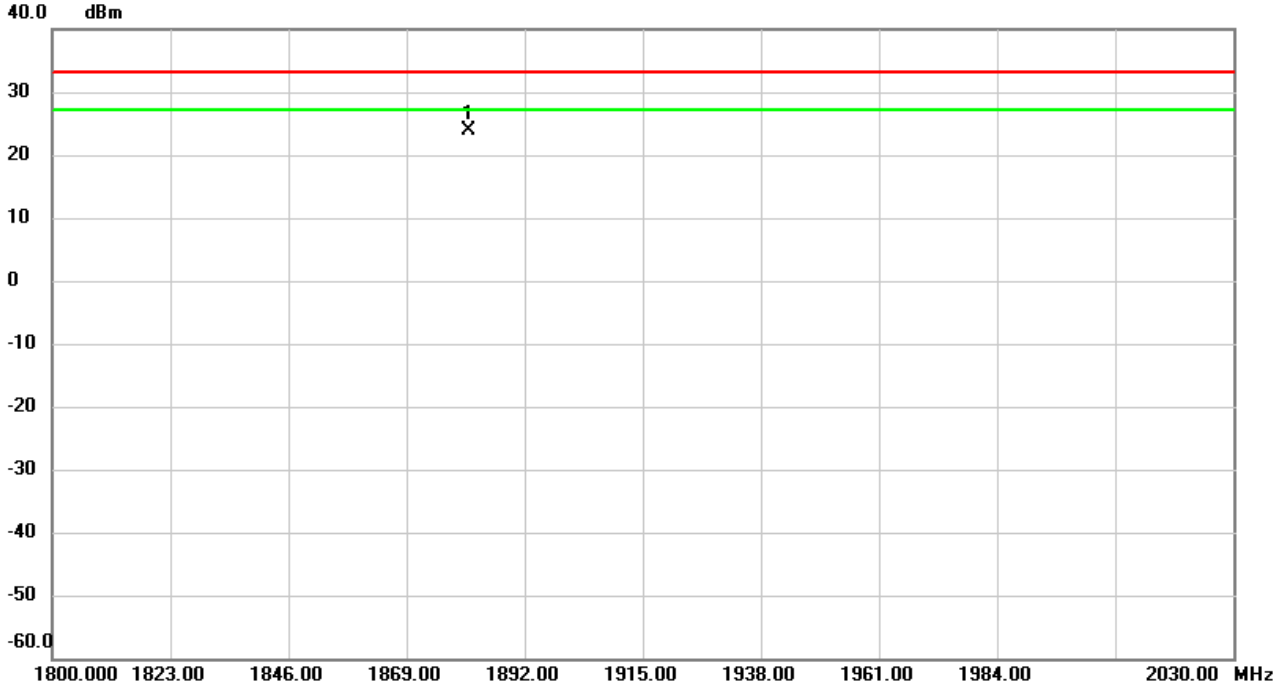
Test Mode	WCDMA Band II	Test Date	2021/5/8
Test Channel	CH 9800	Polarization	Vertical
Temp	24°C	Hum.	58%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1878.905	-13.97	40.19	26.22	33.01	-6.79	peak	

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

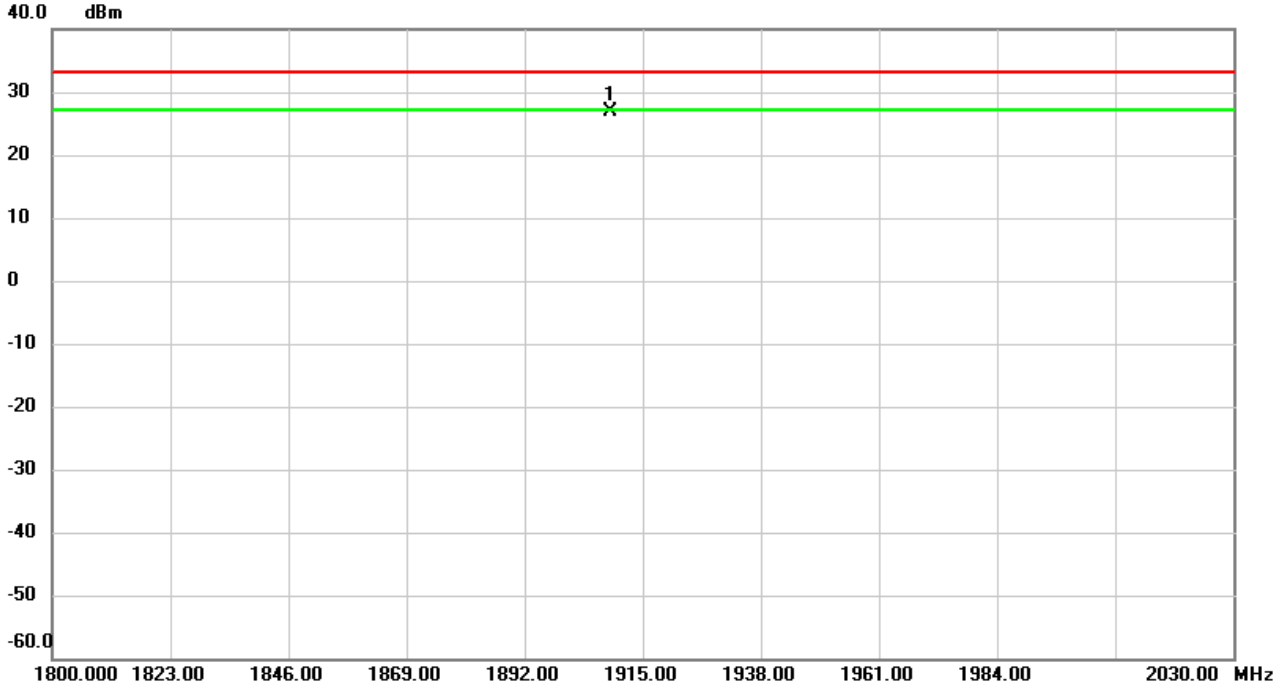
Test Mode	WCDMA Band II	Test Date	2021/5/8
Test Channel	CH 9800	Polarization	Horizontal
Temp	24°C	Hum.	58%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1881.152	-16.93	40.73	23.80	33.01	-9.21	peak	

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

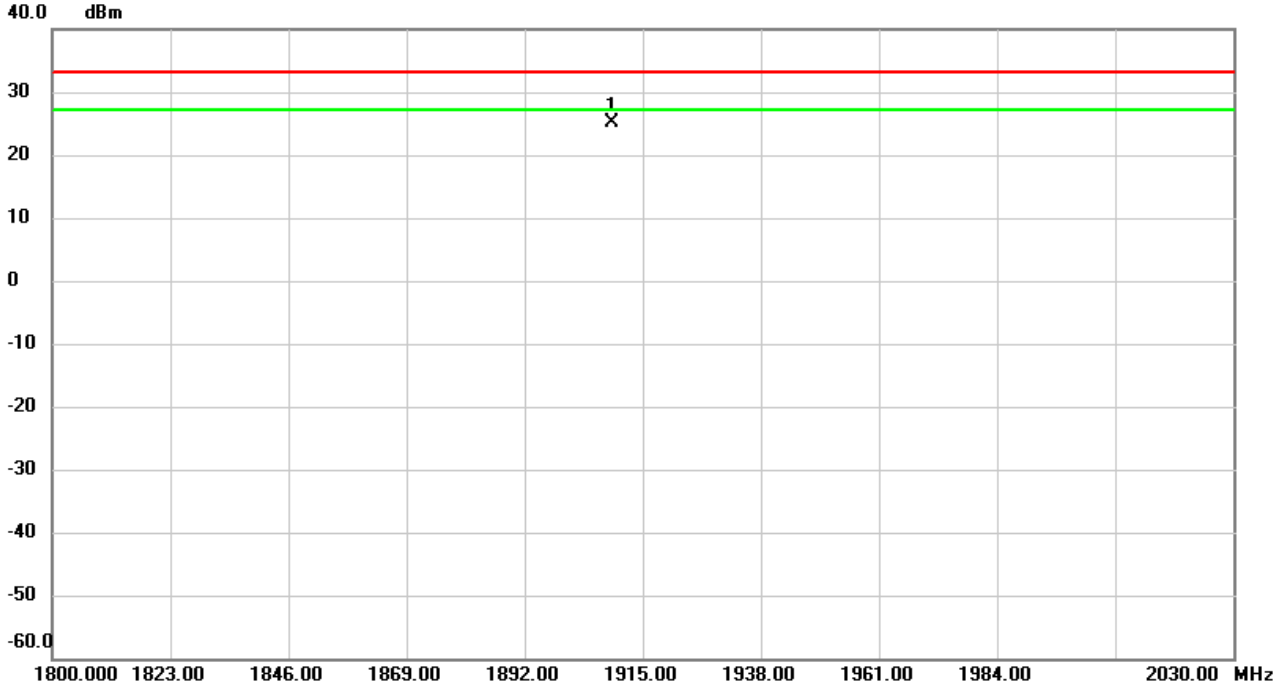
Test Mode	WCDMA Band II	Test Date	2021/5/8
Test Channel	CH 9938	Polarization	Vertical
Temp	24°C	Hum.	58%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1908.775	-13.54	40.32	26.78	33.01	-6.23	peak	

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

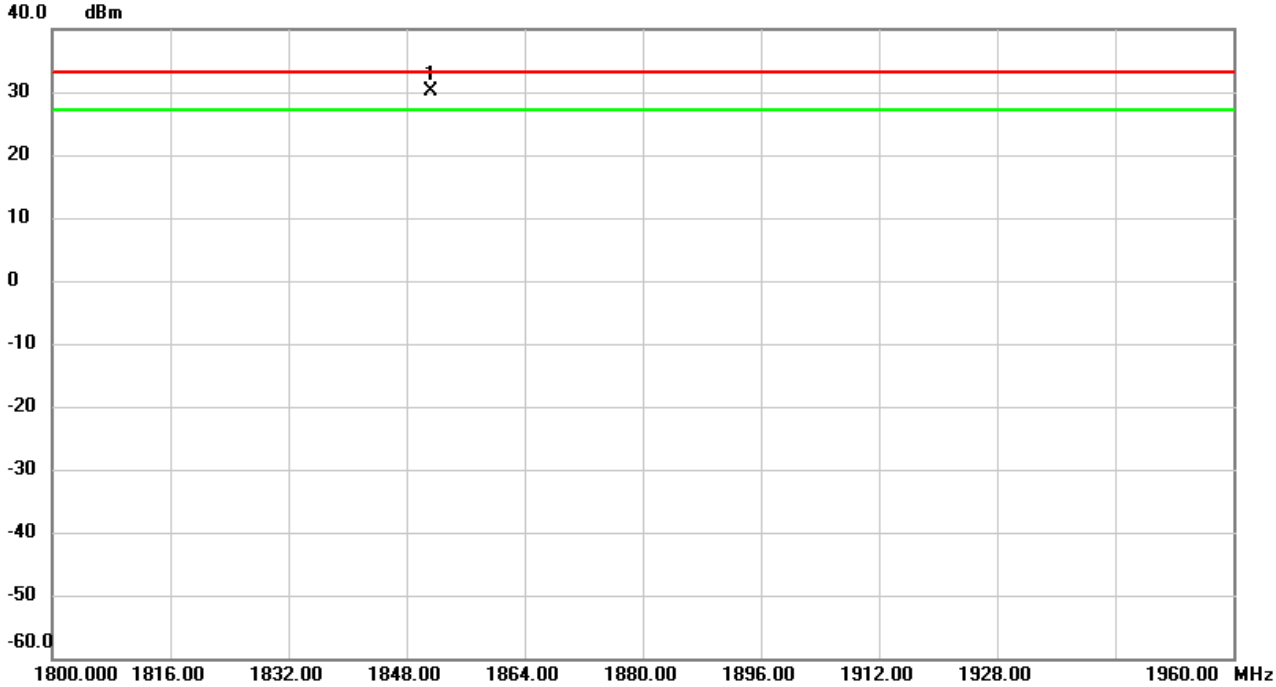
Test Mode	WCDMA Band II	Test Date	2021/5/8
Test Channel	CH 9938	Polarization	Horizontal
Temp	24°C	Hum.	58%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1908.989	-15.69	40.83	25.14	33.01	-7.87	peak	

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

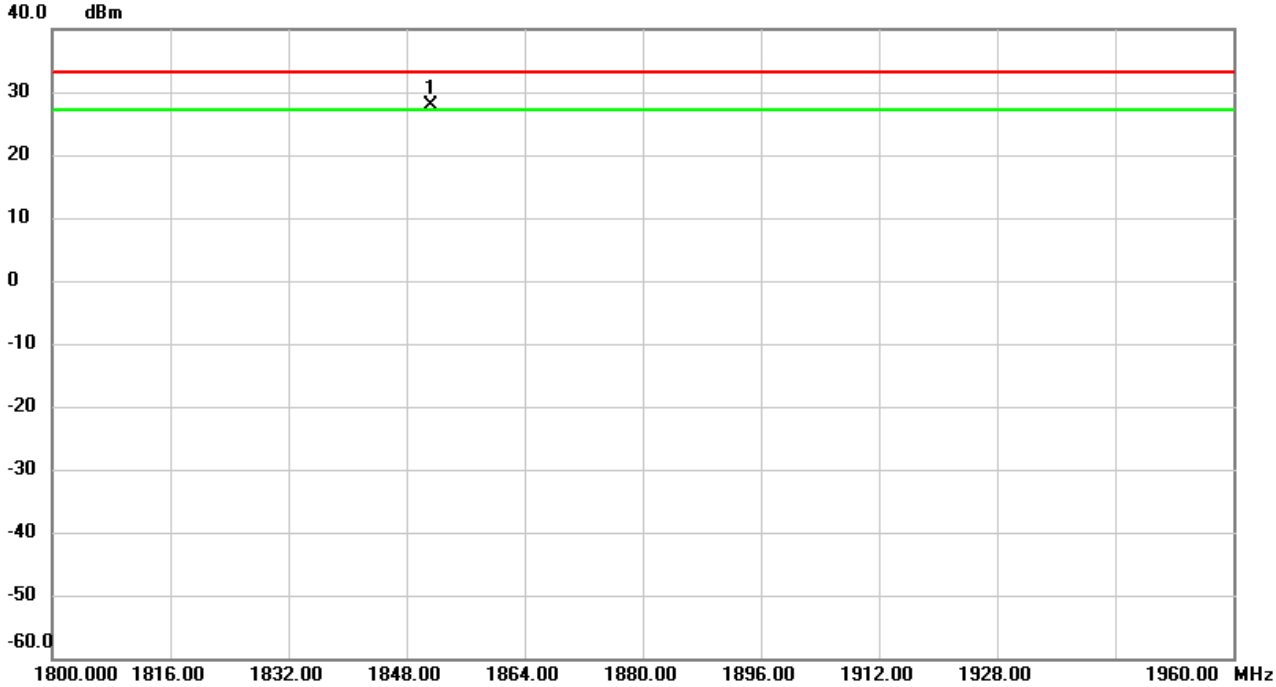
Test Mode	LTE Band 2	Test Date	2021/5/7
Test Channel	CH 18700	Polarization	Vertical
Temp	24°C	Hum.	58%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1851.253	-9.84	40.07	30.23	33.01	-2.78	peak	

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

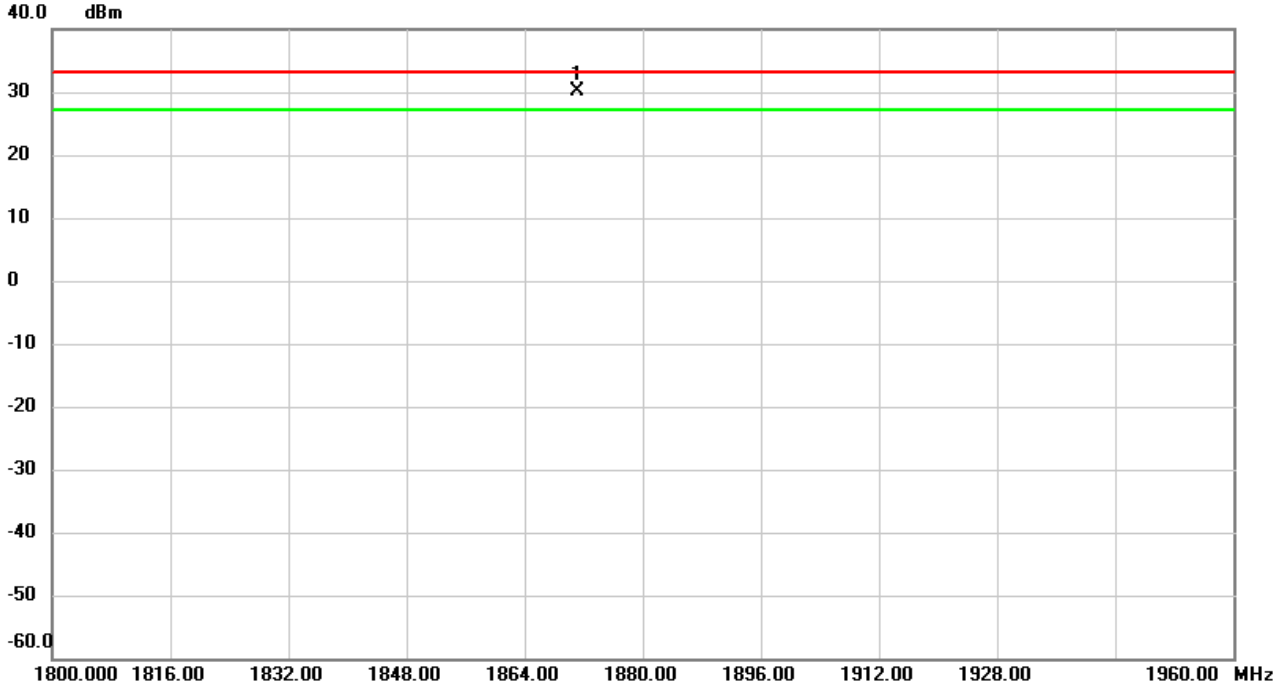
Test Mode	LTE Band 2	Test Date	2021/5/7
Test Channel	CH 18700	Polarization	Horizontal
Temp	24°C	Hum.	58%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1851.307	-12.76	40.62	27.86	33.01	-5.15	peak	

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

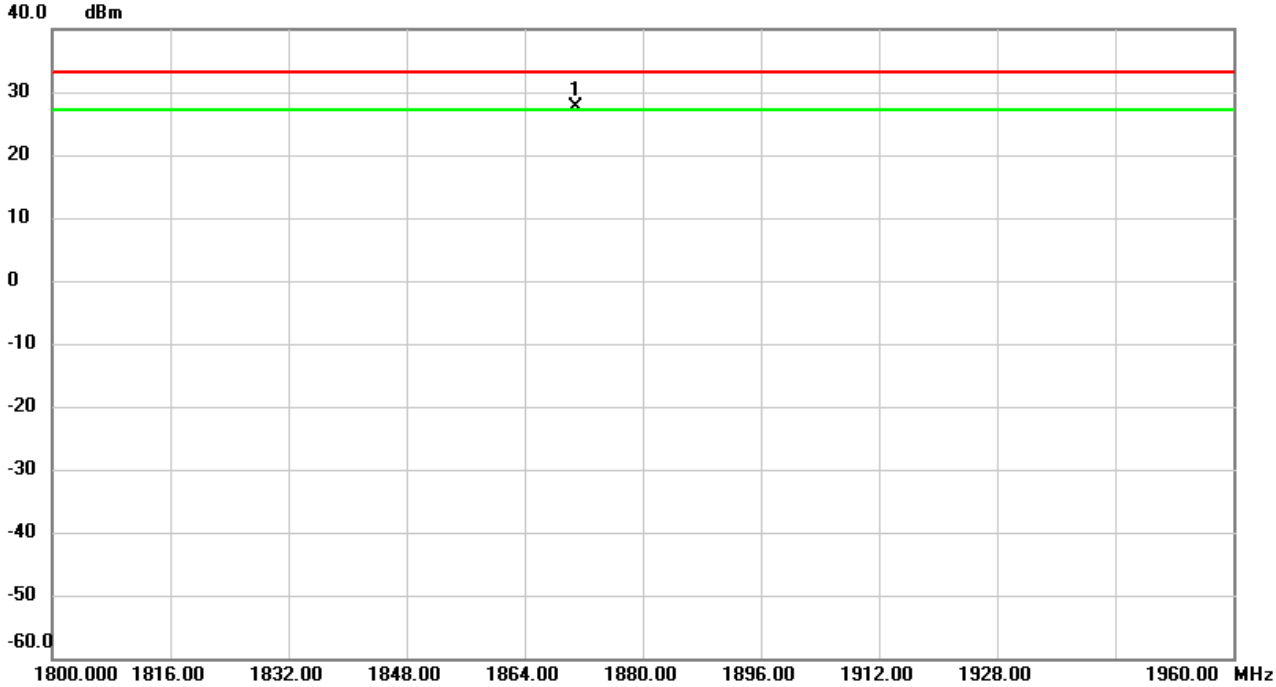
Test Mode	LTE Band 2	Test Date	2021/5/7
Test Channel	CH 18900	Polarization	Vertical
Temp	24°C	Hum.	58%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1871.061	-10.06	40.16	30.10	33.01	-2.91	peak	

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

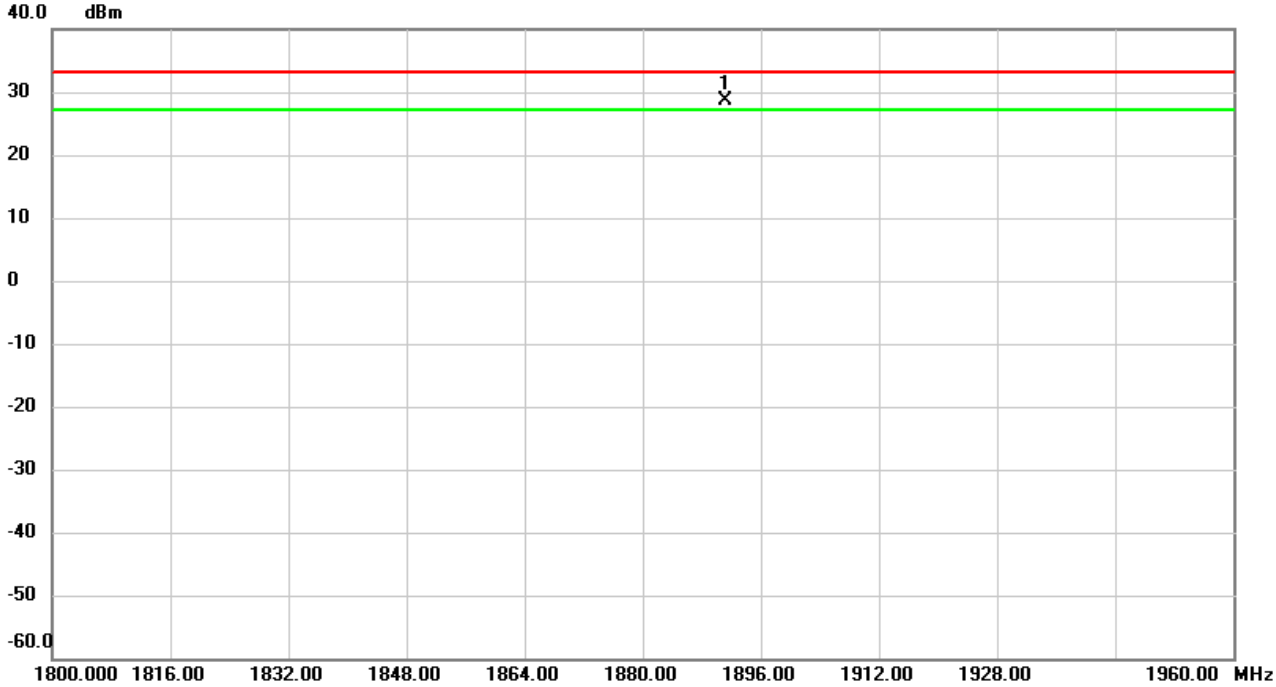
Test Mode	LTE Band 2	Test Date	2021/5/7
Test Channel	CH 18900	Polarization	Horizontal
Temp	24°C	Hum.	58%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1871.035	-13.14	40.69	27.55	33.01	-5.46	peak	

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

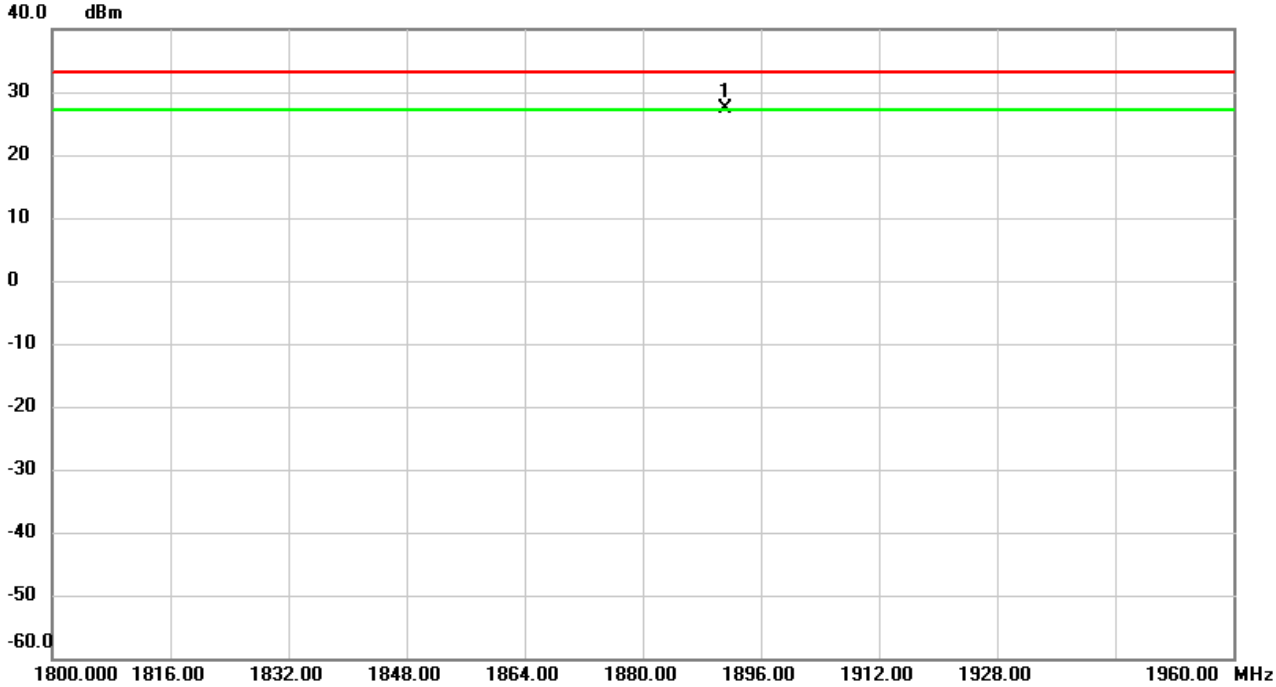
Test Mode	LTE Band 2	Test Date	2021/5/7
Test Channel	CH 19100	Polarization	Vertical
Temp	24°C	Hum.	58%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1891.125	-11.60	40.24	28.64	33.01	-4.37	peak	

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

Test Mode	LTE Band 2	Test Date	2021/5/7
Test Channel	CH 19100	Polarization	Horizontal
Temp	24°C	Hum.	58%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1891.157	-13.30	40.76	27.46	33.01	-5.55	peak	

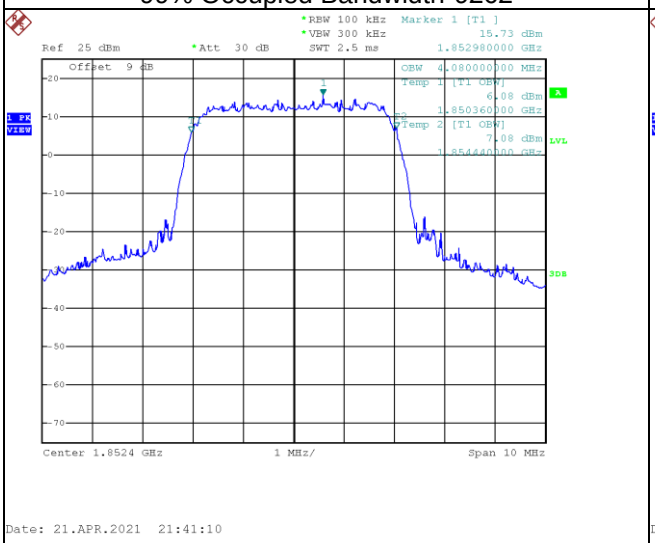
REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

APPENDIX B OCCUPIED BANDWIDTH

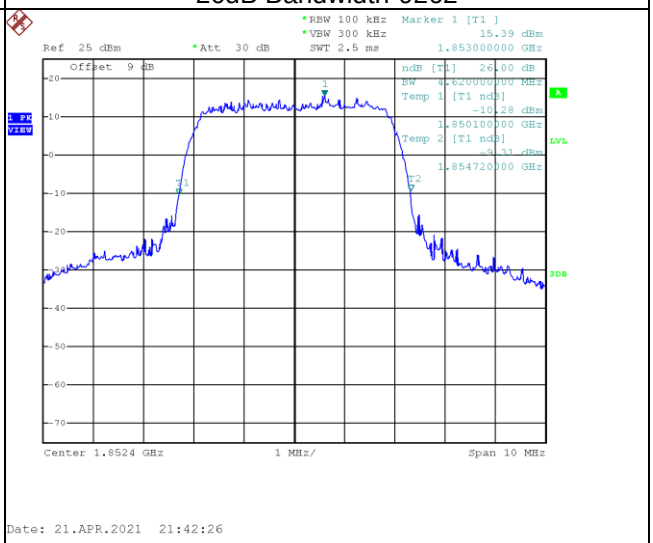
WCDMA Band II_WCDMA					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
9262	1852.4	4.08	9262	1852.4	4.62
9400	1880	4.08	9400	1880	4.66
9538	1907.6	4.08	9538	1907.6	4.68

Spectrum Plot

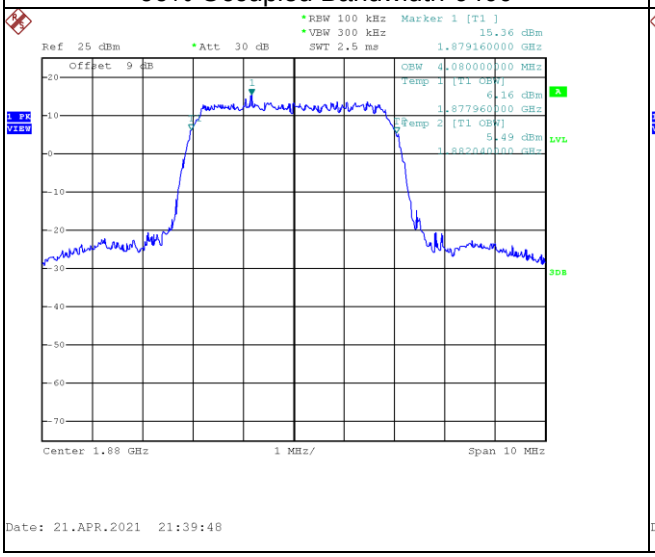
99% Occupied Bandwidth-9262



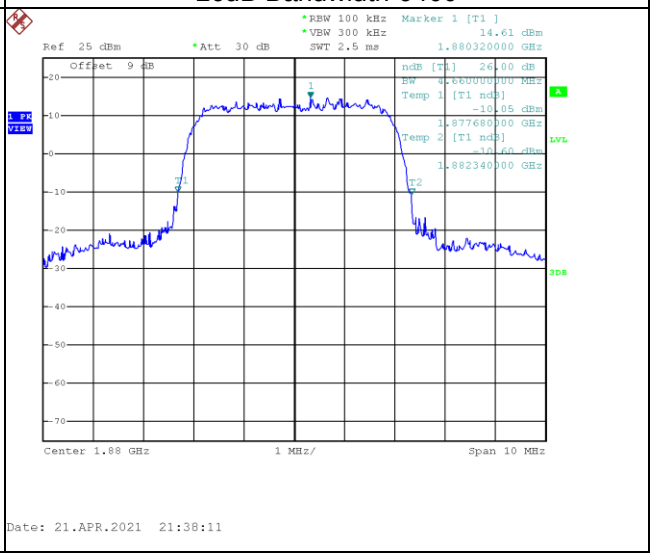
26dB Bandwidth-9262

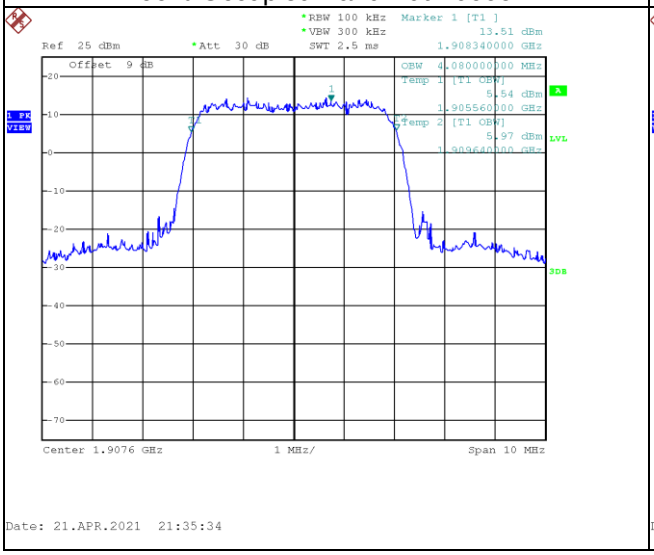
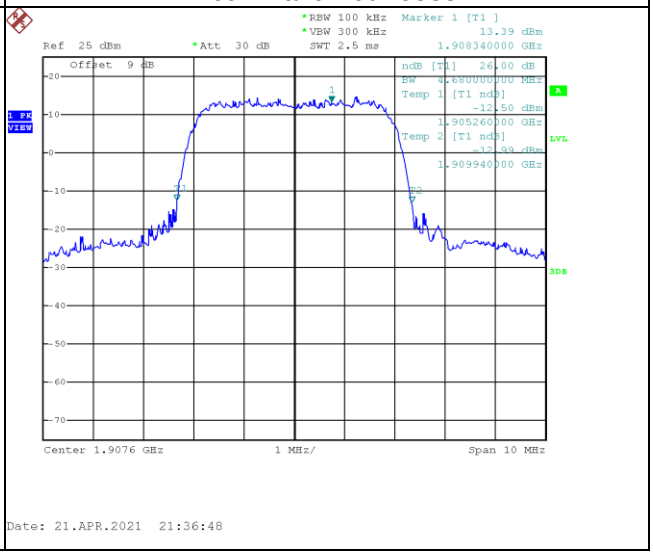


99% Occupied Bandwidth-9400



26dB Bandwidth-9400

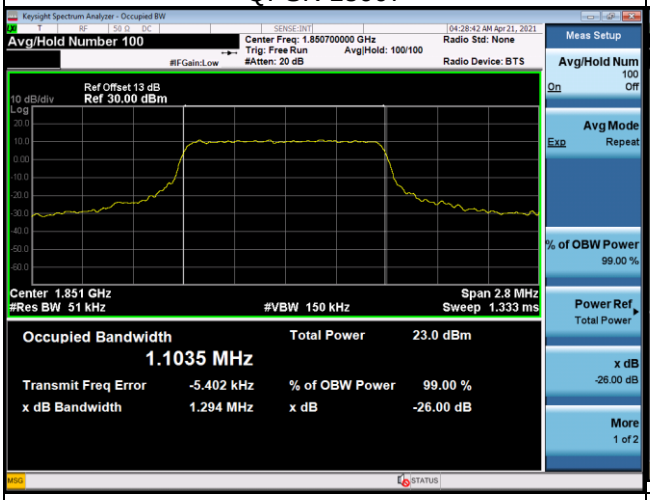


99% Occupied Bandwidth-9538	26dB Bandwidth-9538
	

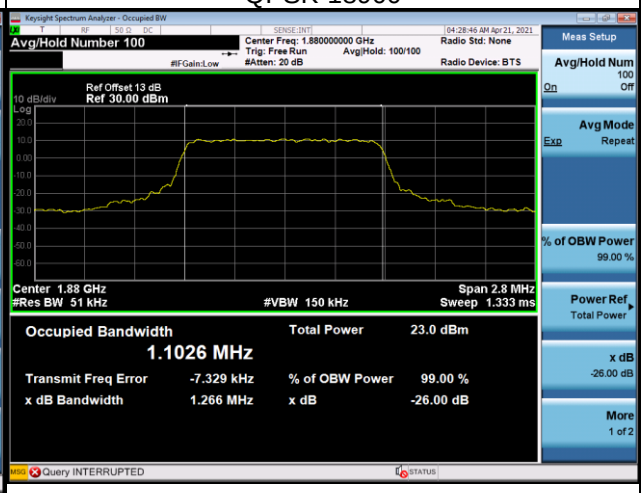
LTE Band 2_1.4M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18607	1850.7	1.1035	18607	1850.7	1.294
18900	1880	1.1026	18900	1880	1.266
19193	1909.3	1.1030	19193	1909.3	1.287
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18607	1850.7	1.1083	18607	1850.7	1.321
18900	1880	1.1054	18900	1880	1.288
19193	1909.3	1.0986	19193	1909.3	1.311

Spectrum Plot

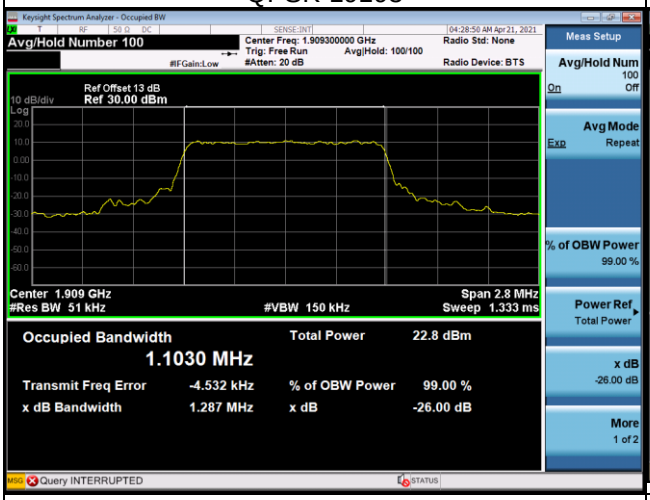
QPSK-18607



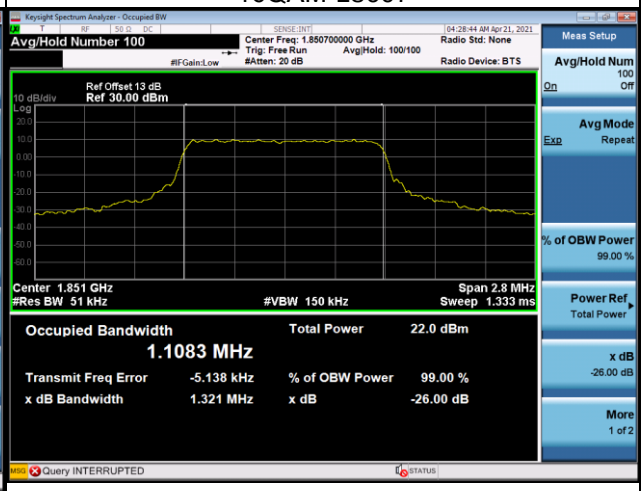
QPSK-18900



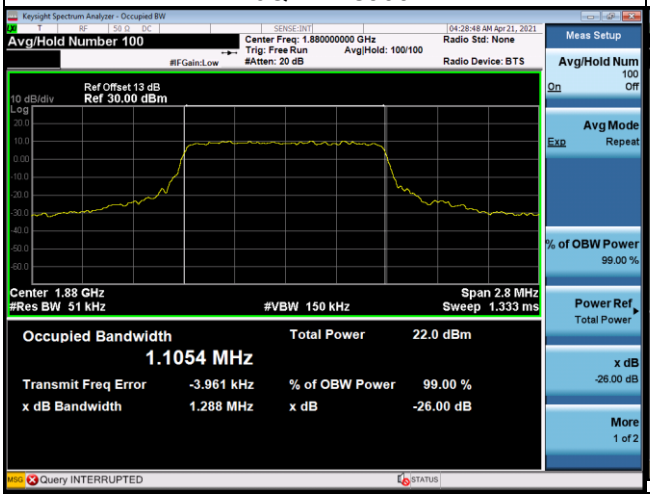
QPSK-19193



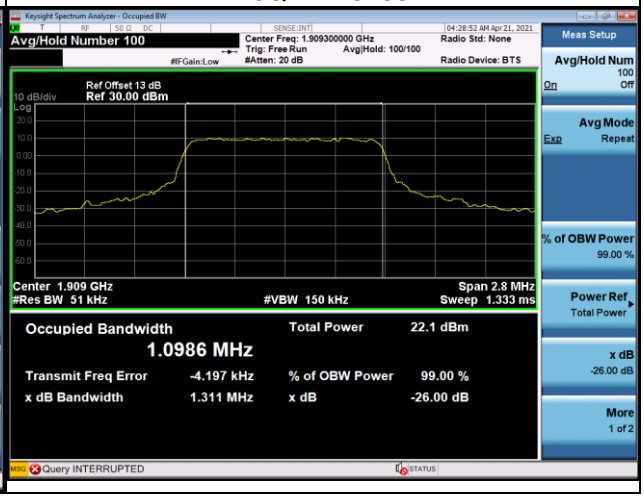
16QAM-18607



16QAM-18900



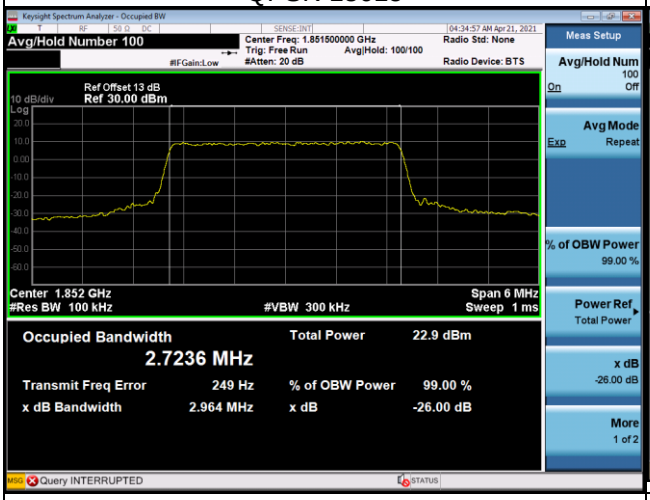
16QAM-19193



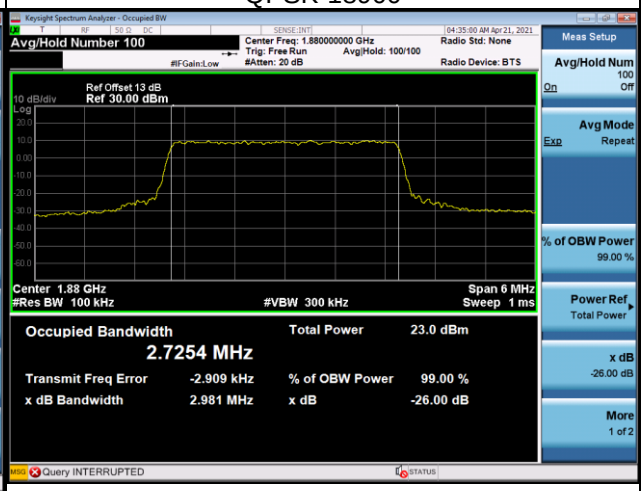
LTE Band 2_3M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18615	1851.5	2.7236	18615	1851.5	2.964
18900	1880	2.7254	18900	1880	2.981
19185	1908.5	2.7193	19185	1908.5	2.955
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18615	1851.5	2.7126	18615	1851.5	2.959
18900	1880	2.7274	18900	1880	2.951
19185	1908.5	2.7217	19185	1908.5	2.949

Spectrum Plot

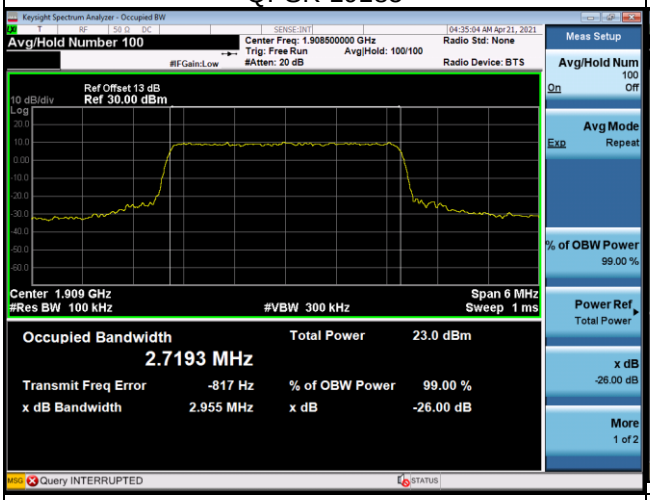
QPSK-18615



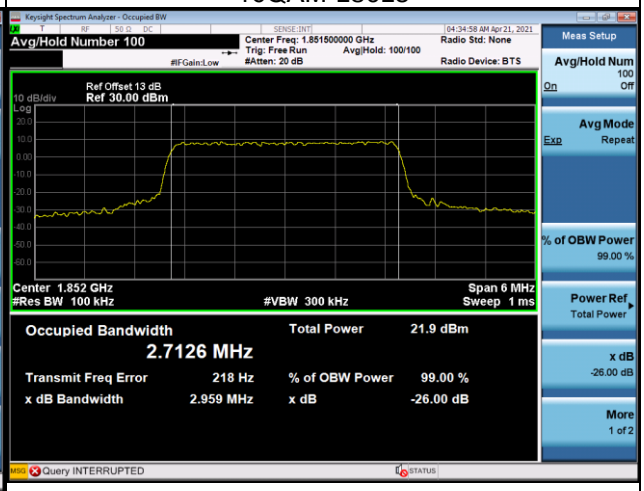
QPSK-18900



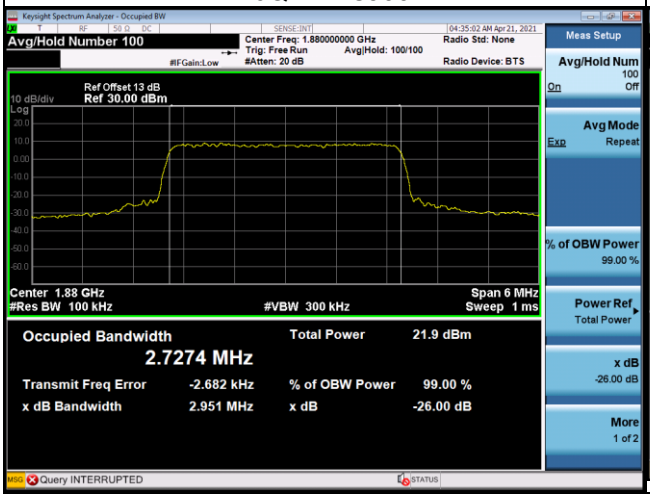
QPSK-19185



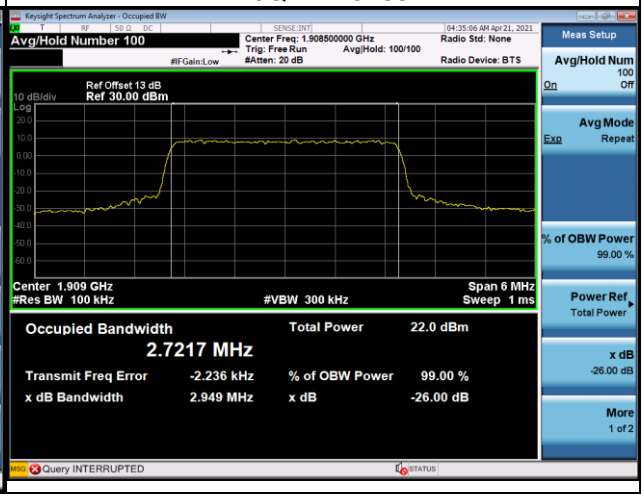
16QAM-18615



16QAM-18900



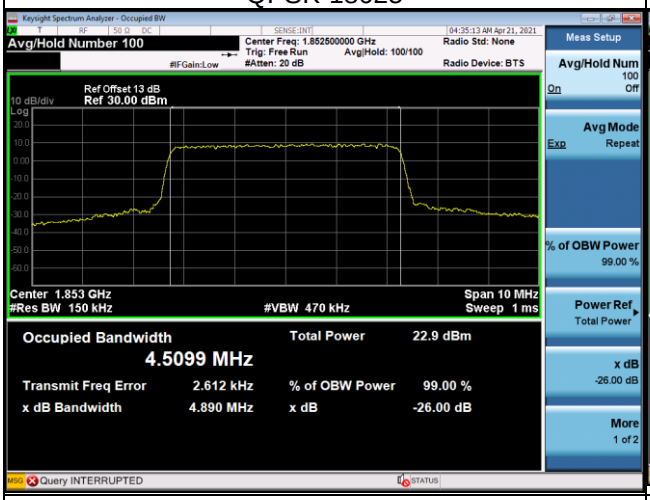
16QAM-19185



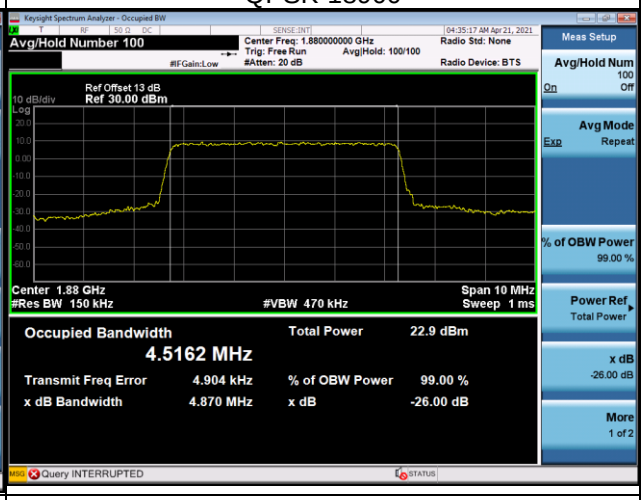
LTE Band 2_5M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18625	1852.5	4.5099	18625	1852.5	4.890
18900	1880	4.5162	18900	1880	4.870
19175	1907.5	4.5099	19175	1907.5	4.878
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18625	1852.5	4.5038	18625	1852.5	4.873
18900	1880	4.5078	18900	1880	4.871
19175	1907.5	4.5027	19175	1907.5	4.866

Spectrum Plot

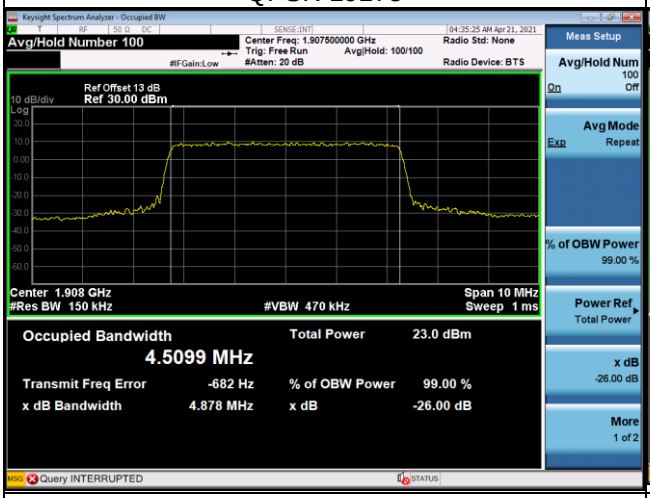
QPSK-18625



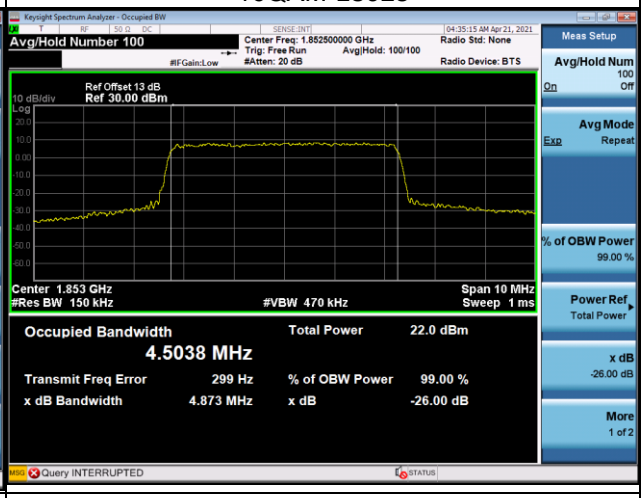
QPSK-18900



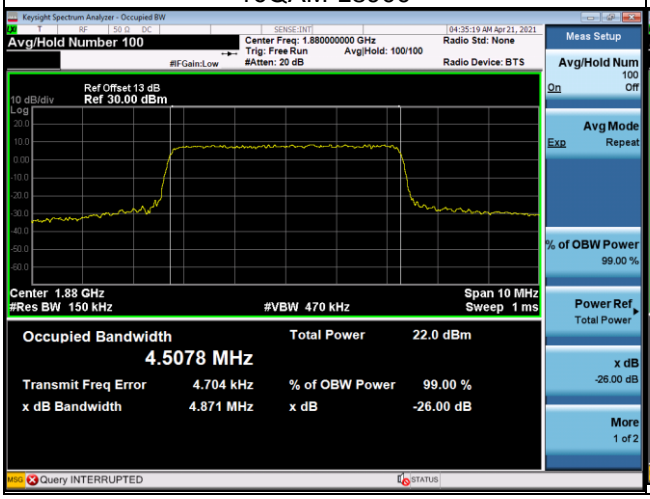
QPSK-19175



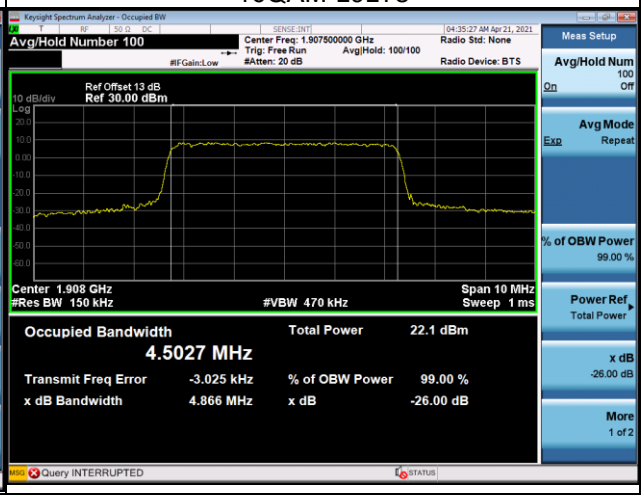
16QAM-18625



16QAM-18900



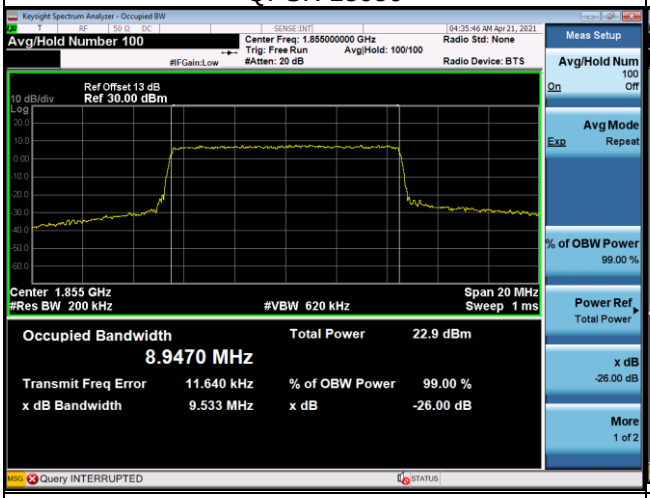
16QAM-19175



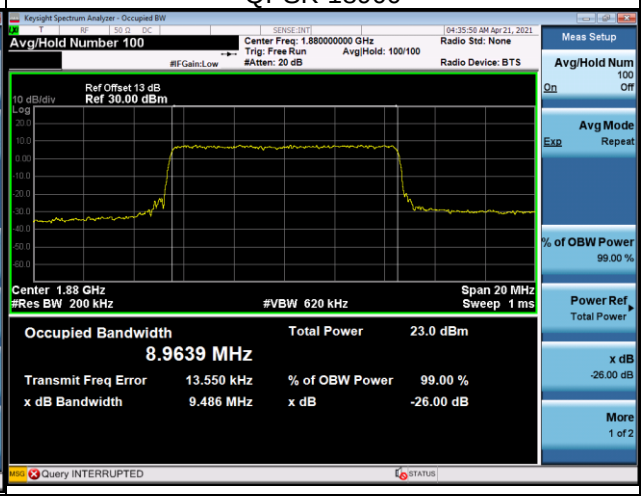
LTE Band 2_10M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18650	1855	8.9470	18650	1855	9.533
18900	1880	8.9639	18900	1880	9.486
19150	1905	8.9745	19150	1905	9.592
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18650	1855	8.9547	18650	1855	9.520
18900	1880	8.9639	18900	1880	9.580
19150	1905	8.9828	19150	1905	9.527

Spectrum Plot

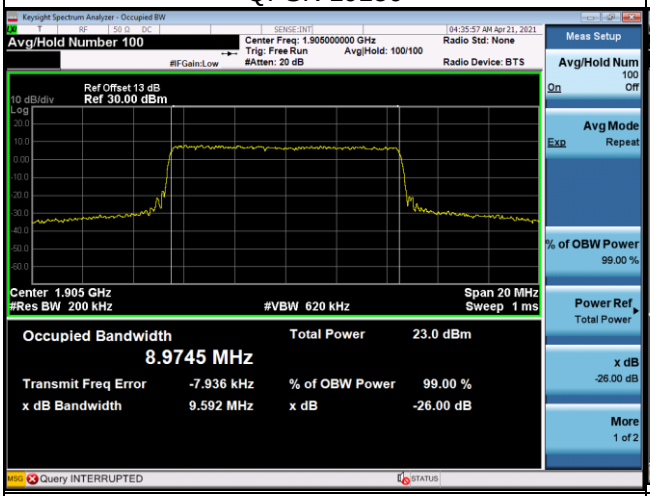
QPSK-18650



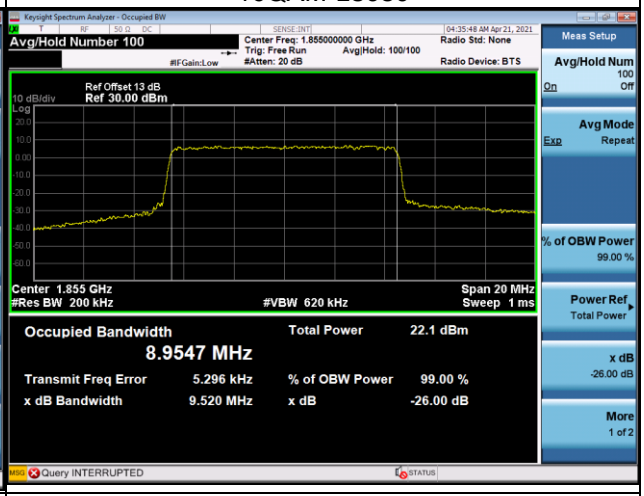
QPSK-18900



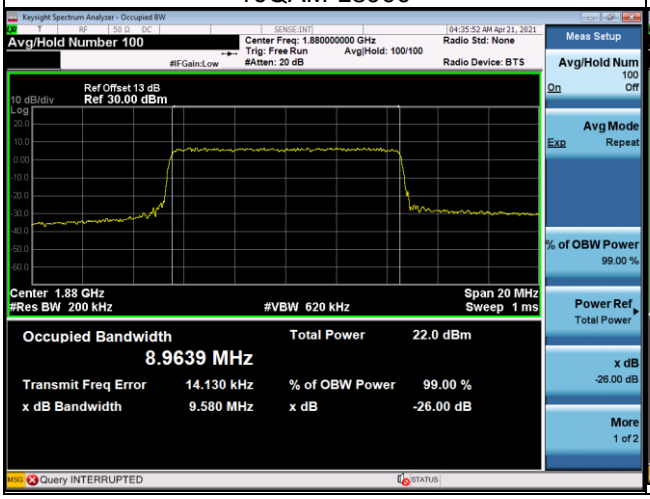
QPSK-19150



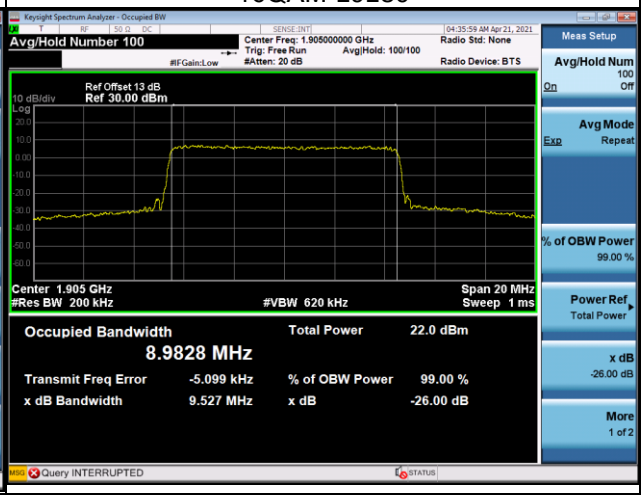
16QAM-18650



16QAM-18900



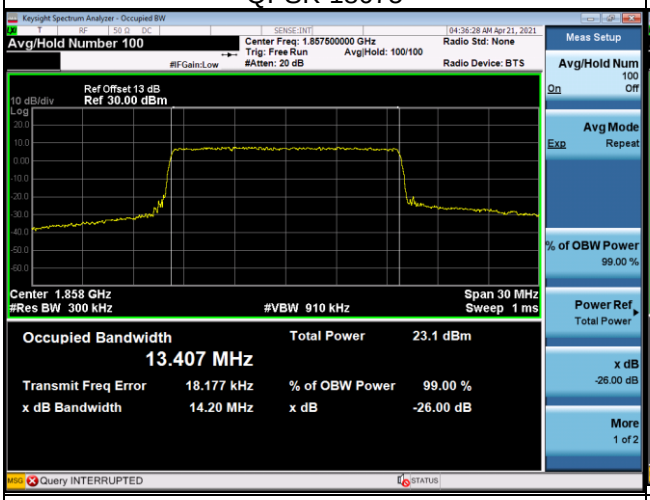
16QAM-19150



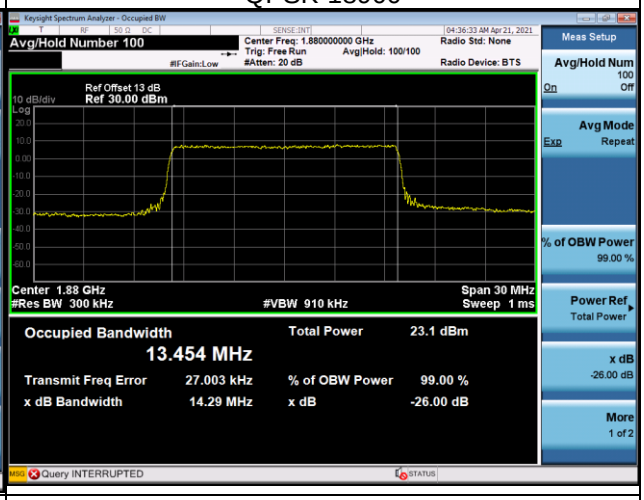
LTE Band 2_15M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18675	1857.5	13.407	18675	1857.5	14.20
18900	1880	13.454	18900	1880	14.29
19125	1902.5	13.455	19125	1902.5	14.22
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18675	1857.5	13.419	18675	1857.5	14.26
18900	1880	13.471	18900	1880	14.31
19125	1902.5	13.448	19125	1902.5	14.28

Spectrum Plot

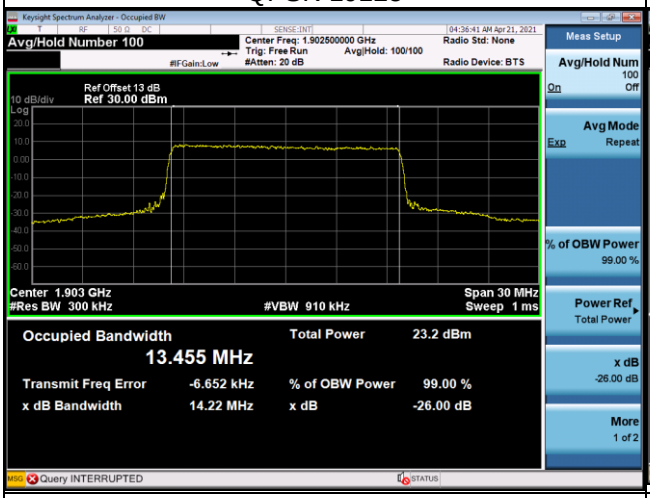
QPSK-18675



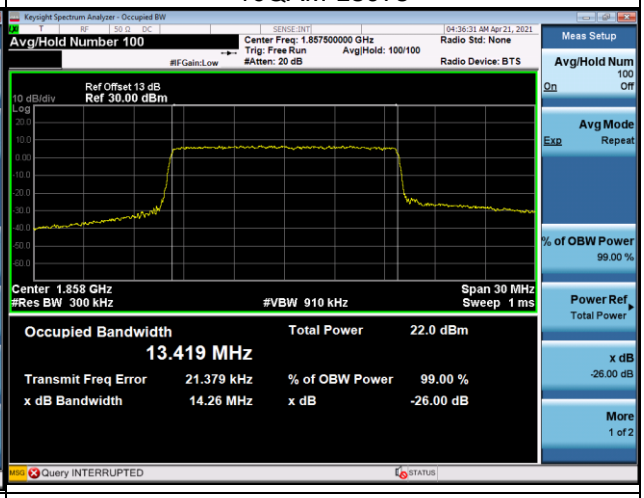
QPSK-18900



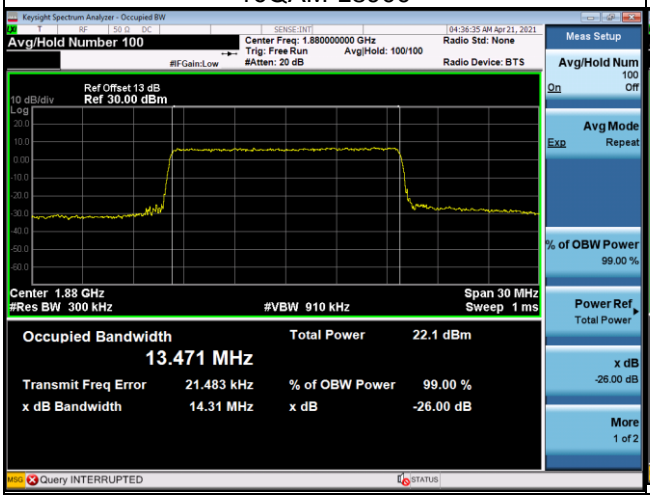
QPSK-19125



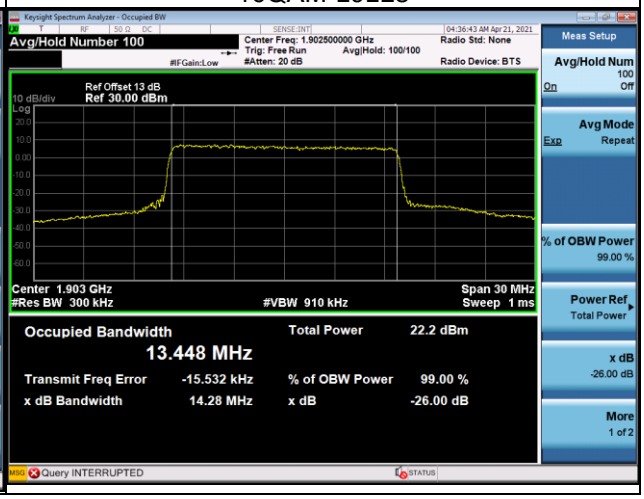
16QAM-18675



16QAM-18900



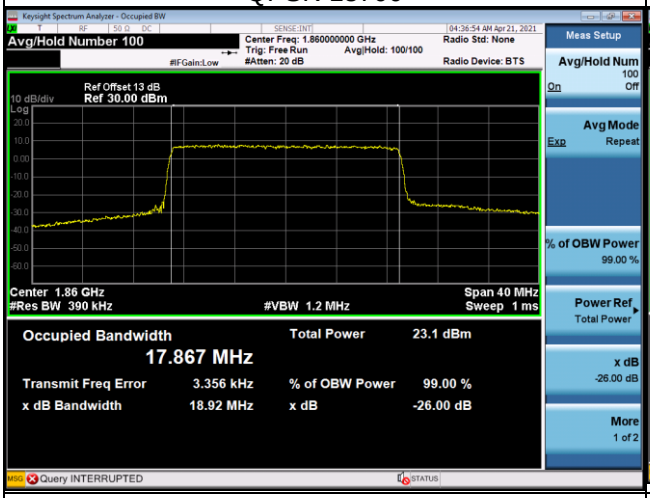
16QAM-19125



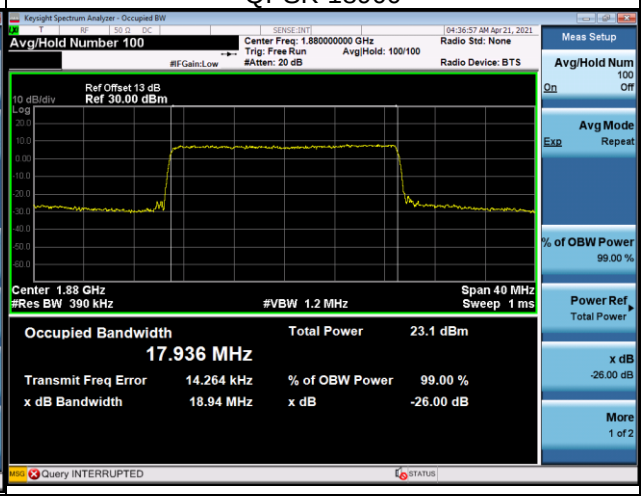
LTE Band 2_20M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18700	1860	17.867	18700	1860	18.92
18900	1880	17.936	18900	1880	18.94
19100	1900	17.942	19100	1900	18.91
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
18700	1860	17.879	18700	1860	18.90
18900	1880	17.940	18900	1880	18.96
19100	1900	17.902	19100	1900	18.91

Spectrum Plot

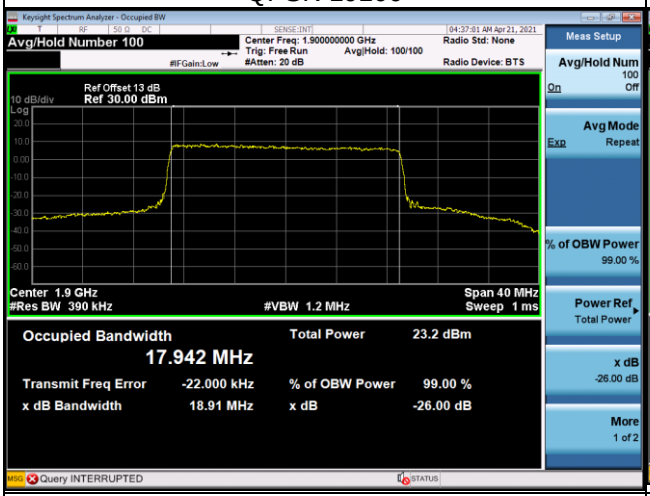
QPSK-18700



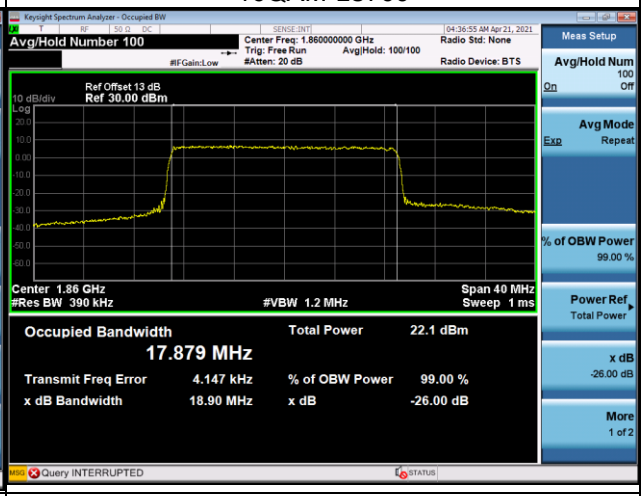
QPSK-18900



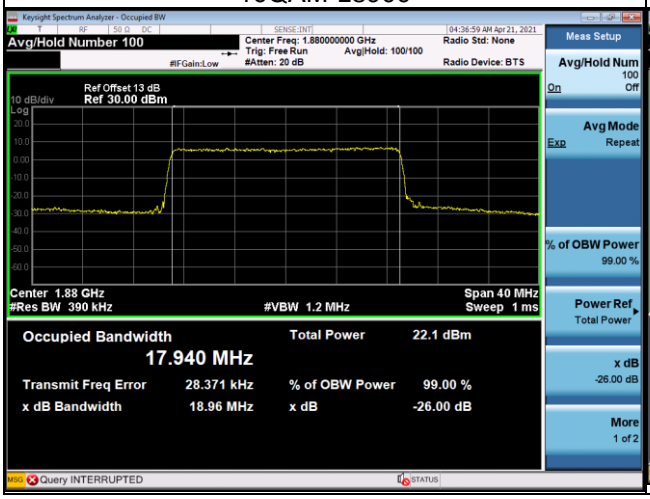
QPSK-19100



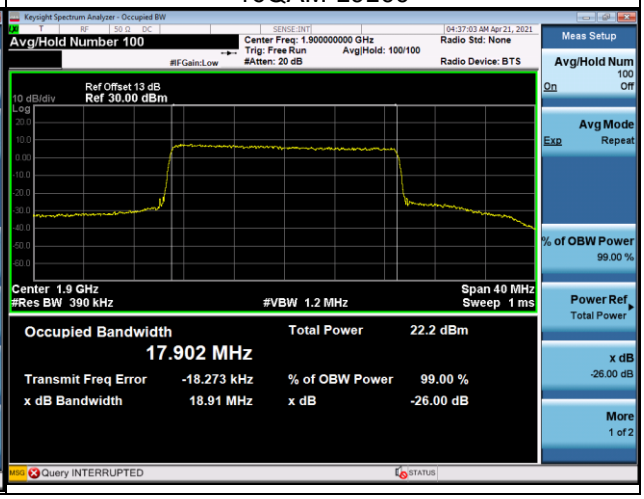
16QAM-18700



16QAM-18900

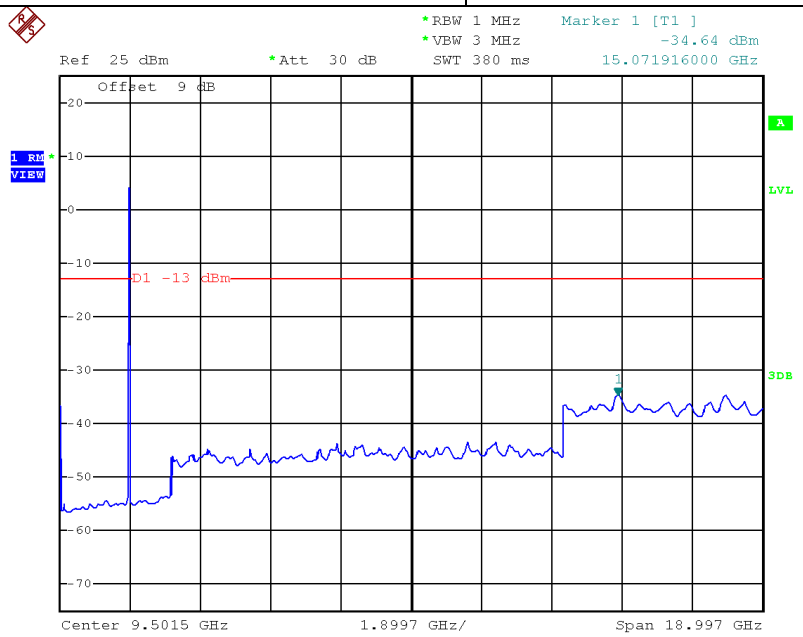


16QAM-19100



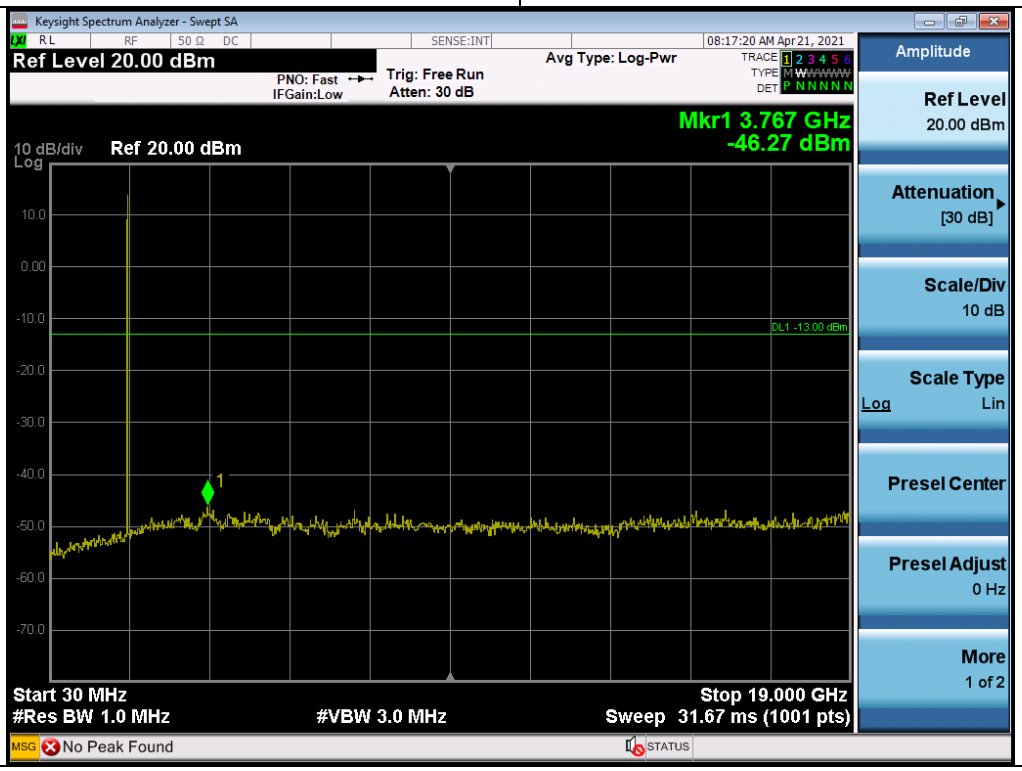
APPENDIX C CONDUCTED SPURIOUS EMISSION

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

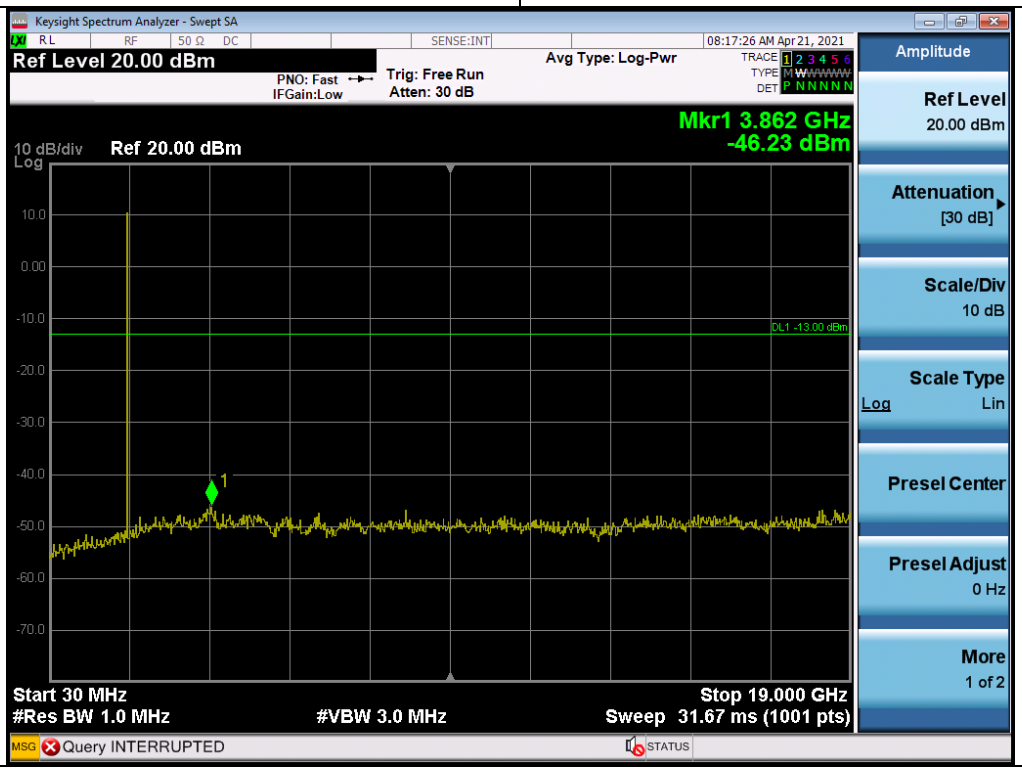


Date: 21.APR.2021 21:51:45

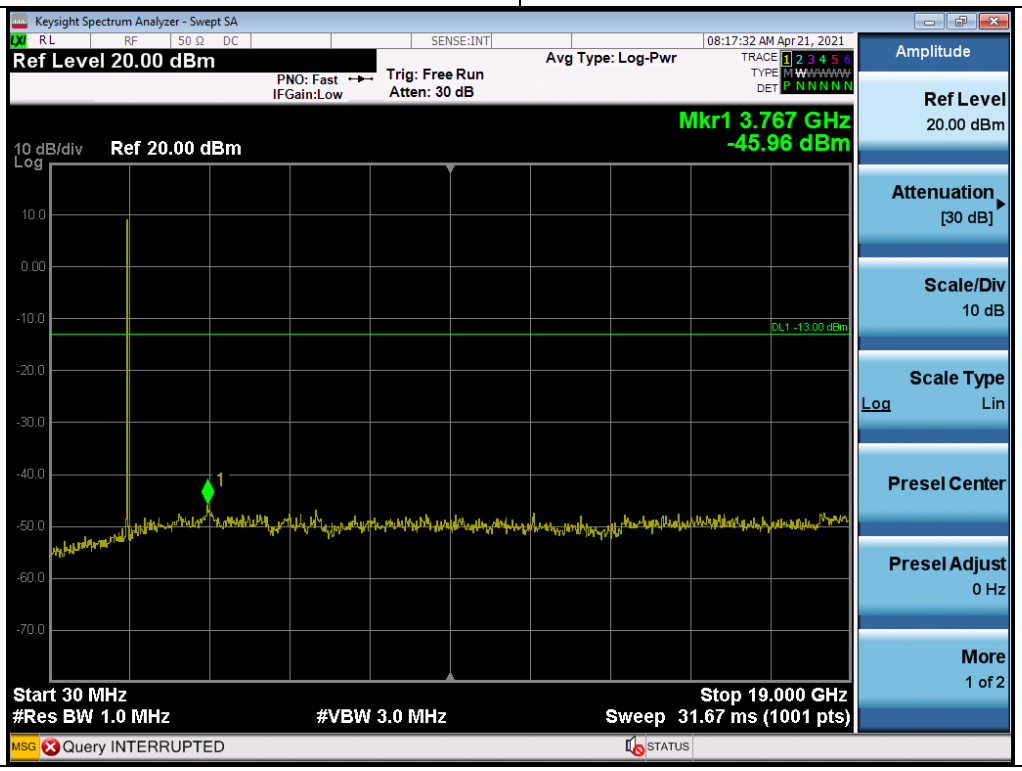
LTE Band 2_1.4M Spectrum Plot	
Channel	Frequency(MHz)
18900	1880



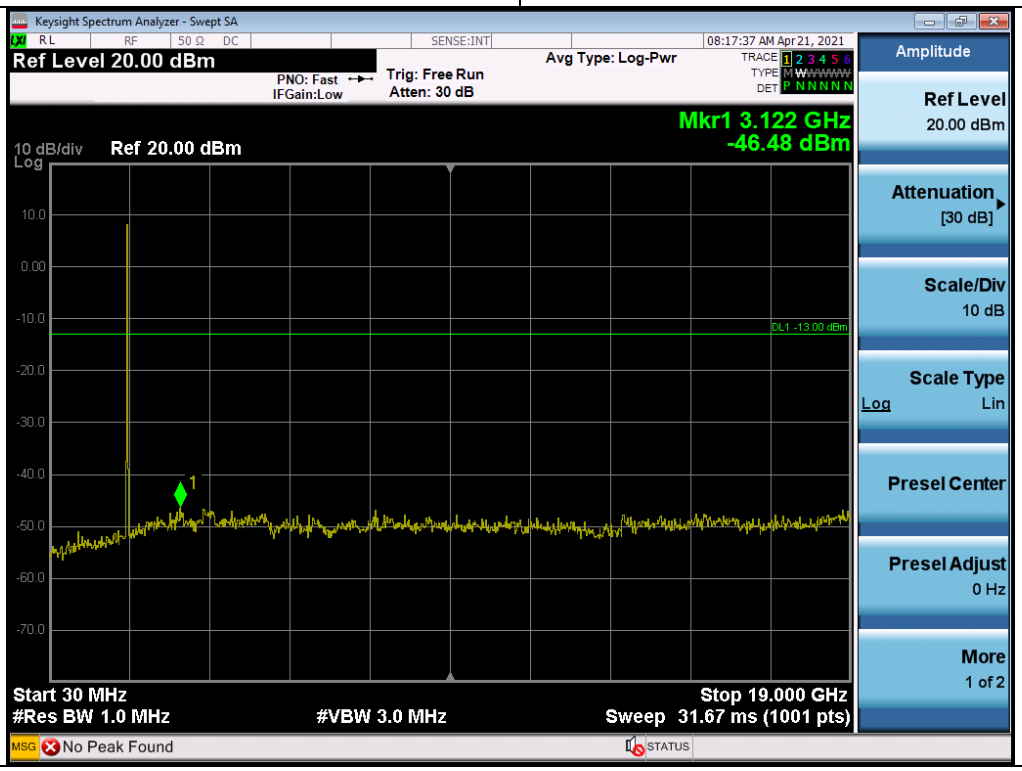
LTE Band 2_3M Spectrum Plot	
Channel	Frequency(MHz)
18900	1880



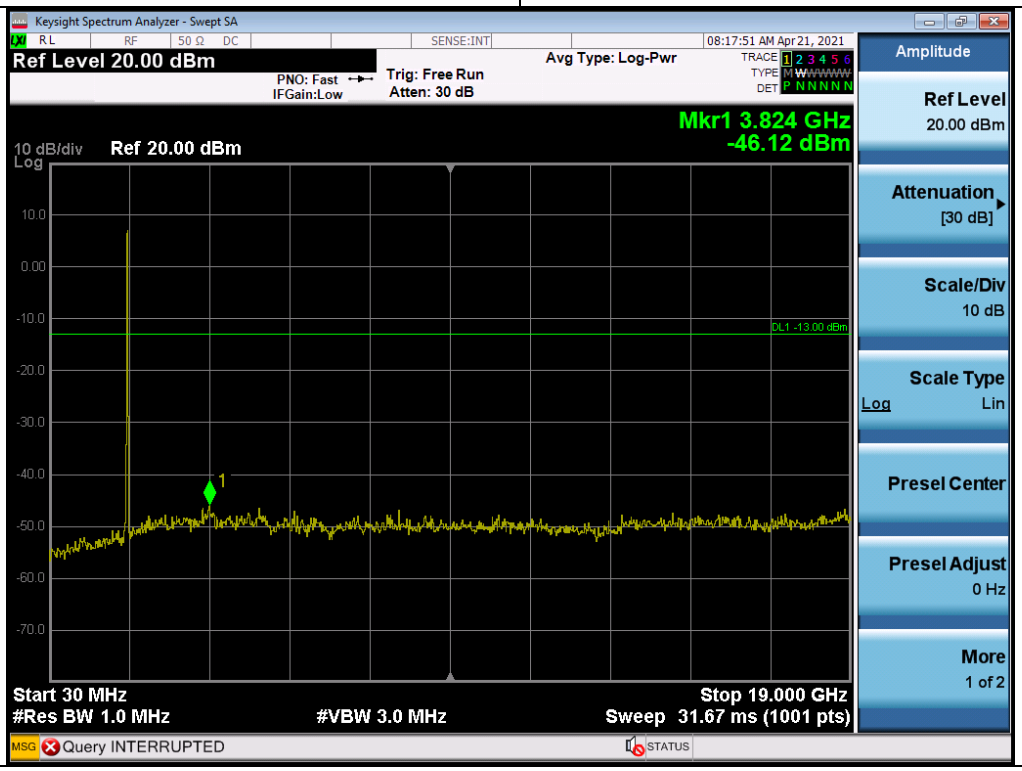
LTE Band 2_5M Spectrum Plot	
Channel	Frequency(MHz)
18900	1880



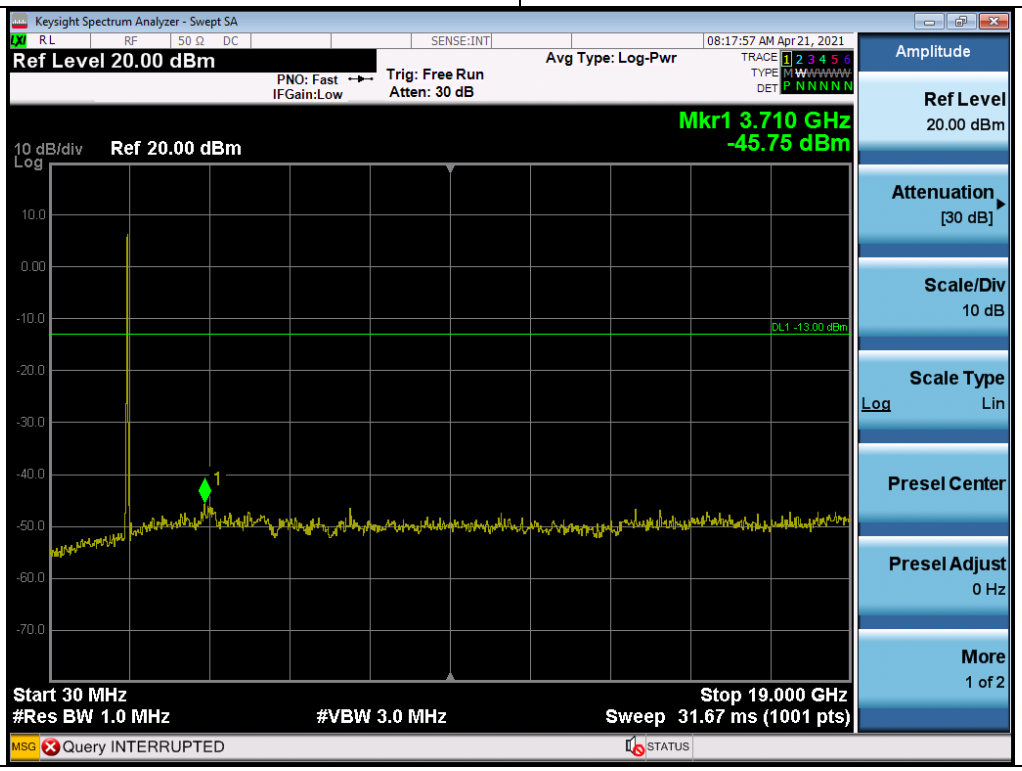
LTE Band 2_10M Spectrum Plot	
Channel	Frequency(MHz)
18900	1880



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



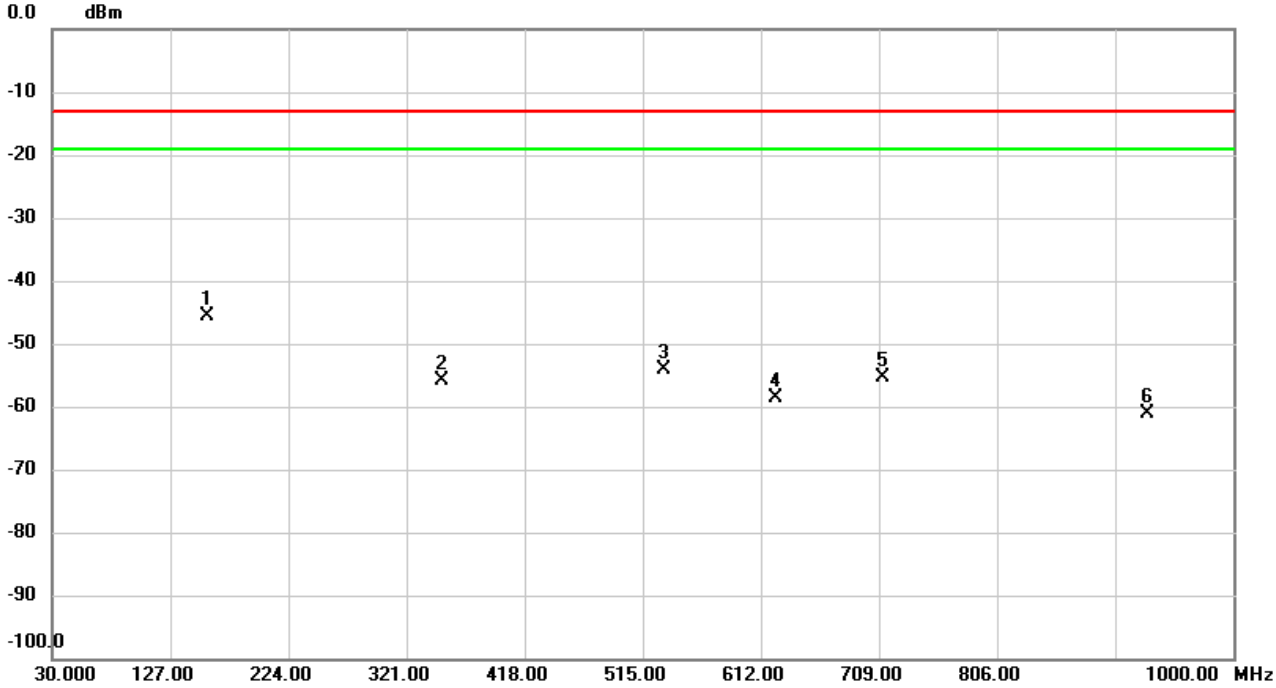
LTE Band 2_20M Spectrum Plot	
Channel	Frequency(MHz)
18900	1880



APPENDIX D RADIATED SPURIOUS EMISSIONS

For External antenna:

Test Mode	WCDMA Band II	Test Date	2021/4/20
Test Channel	CH 9800	Polarization	Vertical
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	157.5873	-49.16	3.46	-45.70	-13.00	-32.70	peak	
2		350.6172	-62.35	6.59	-55.76	-13.00	-42.76	peak	
3		532.3630	-61.29	7.20	-54.09	-13.00	-41.09	peak	
4		624.0280	-71.10	12.41	-58.69	-13.00	-45.69	peak	
5		712.7183	-67.64	12.38	-55.26	-13.00	-42.26	peak	
6		929.9337	-72.98	11.88	-61.10	-13.00	-48.10	peak	

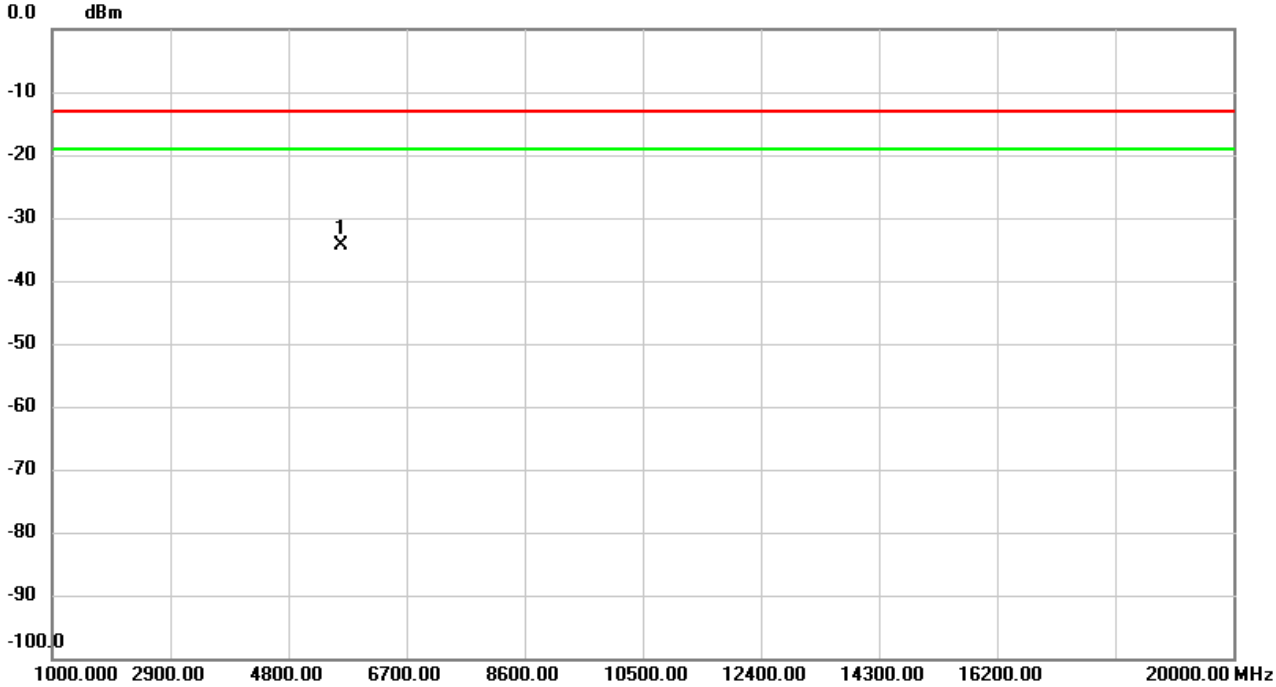
REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	WCDMA Band II	Test Date	2021/4/20
Test Channel	CH 9800	Polarization	Horizontal
Temp	22°C	Hum.	61%

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	157.6196	-42.75	2.70	-40.05	-13.00	-27.05	peak	
2		351.0053	-59.48	4.12	-55.36	-13.00	-42.36	peak	
3		456.0563	-68.18	12.40	-55.78	-13.00	-42.78	peak	
4		711.8130	-68.94	10.18	-58.76	-13.00	-45.76	peak	
5		827.5016	-75.90	15.87	-60.03	-13.00	-47.03	peak	
6		929.9336	-74.46	14.00	-60.46	-13.00	-47.46	peak	

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

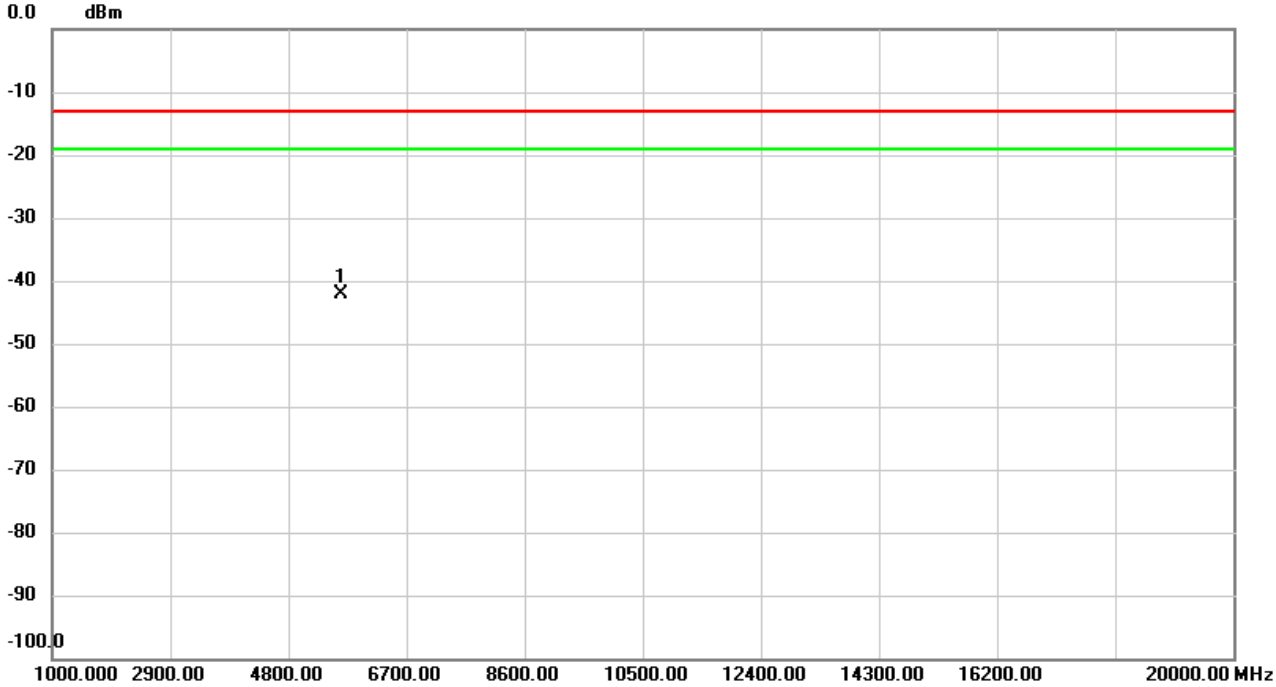
Test Mode	WCDMA Band II	Test Date	2021/4/20
Test Channel	CH 9800	Polarization	Vertical
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	5644.233	-36.66	2.37	-34.29	-13.00	-21.29	peak	

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

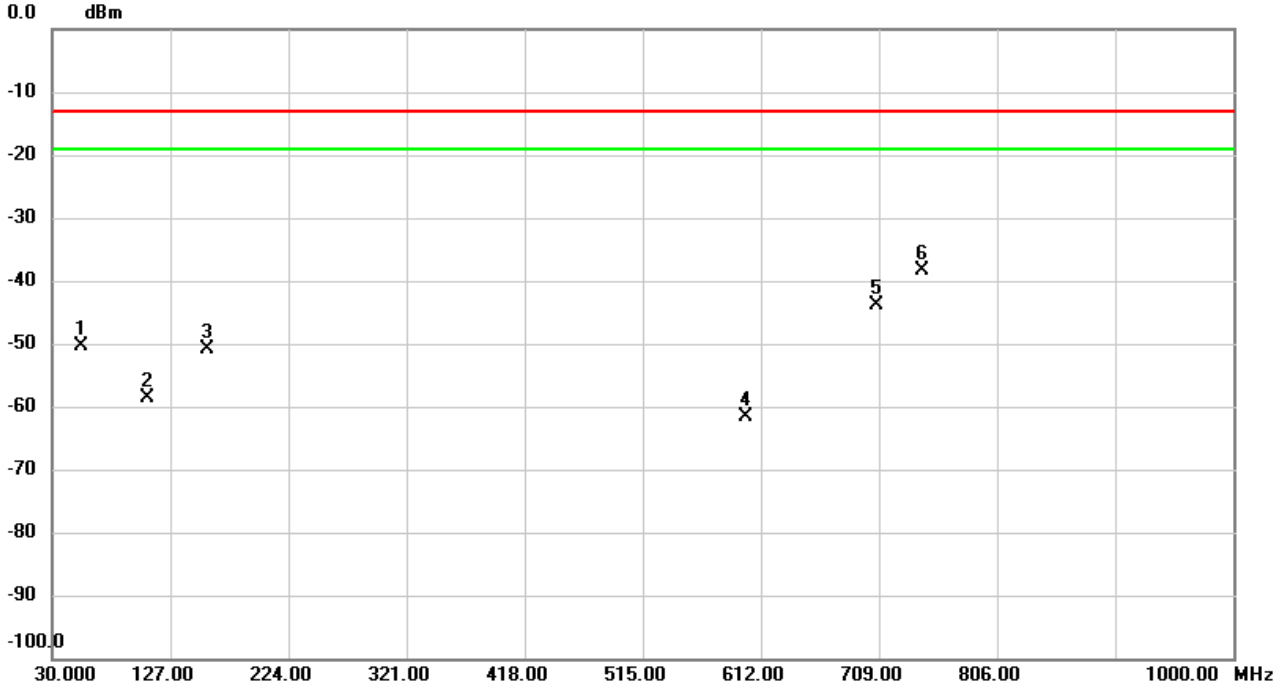
Test Mode	WCDMA Band II	Test Date	2021/4/20
Test Channel	CH 9800	Polarization	Horizontal
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	5643.600	-44.85	2.75	-42.10	-13.00	-29.10	peak	

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

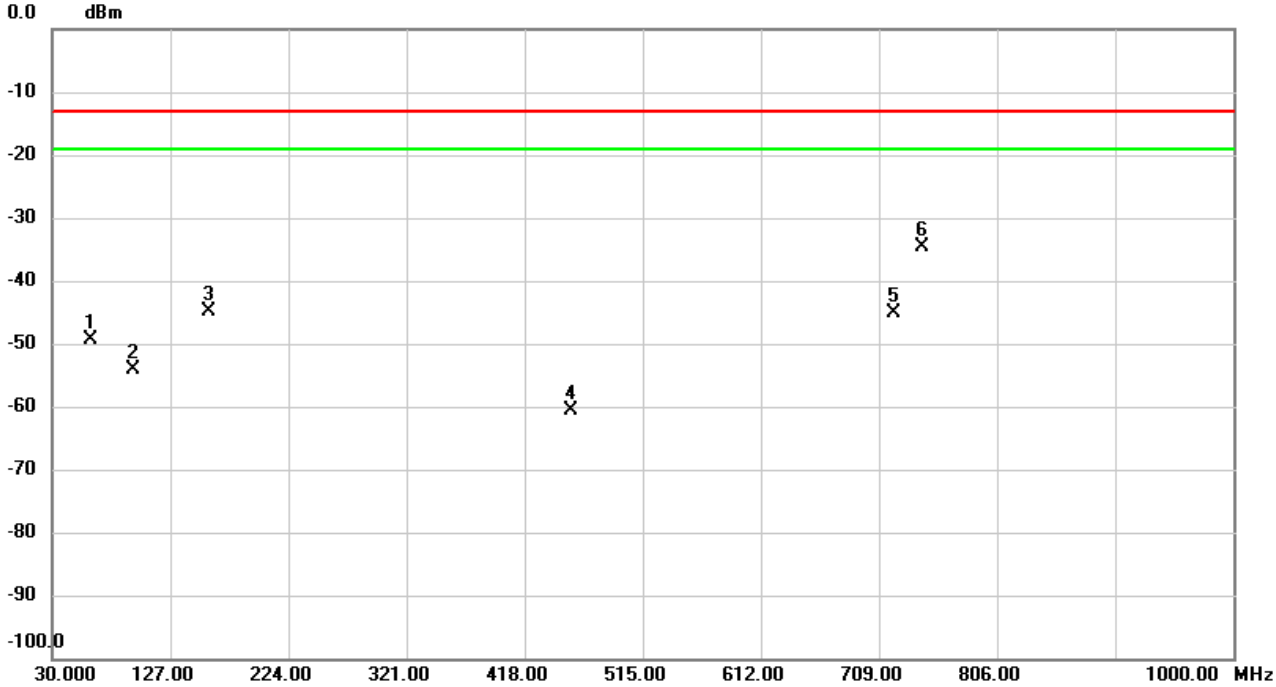
Test Mode	LTE Band 2	Test Date	2021/4/15
Test Channel	CH 18900	Polarization	Vertical
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		54.2500	-49.86	-0.49	-50.35	-13.00	-37.35	peak	
2		108.8287	-58.91	0.31	-58.60	-13.00	-45.60	peak	
3		157.6197	-54.22	3.46	-50.76	-13.00	-37.76	peak	
4		600.0367	-73.88	12.15	-61.73	-13.00	-48.73	peak	
5		706.5750	-56.47	12.52	-43.95	-13.00	-30.95	peak	
6	*	744.7283	-50.14	11.68	-38.46	-13.00	-25.46	peak	

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

Test Mode	LTE Band 2	Test Date	2021/4/15
Test Channel	CH 18900	Polarization	Horizontal
Temp	22°C	Hum.	61%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		61.8483	-55.89	6.46	-49.43	-13.00	-36.43	peak	
2		96.7360	-57.58	3.46	-54.12	-13.00	-41.12	peak	
3		158.8483	-47.49	2.67	-44.82	-13.00	-31.82	peak	
4		456.0563	-72.93	12.40	-60.53	-13.00	-47.53	peak	
5		721.9010	-55.96	10.86	-45.10	-13.00	-32.10	peak	
6	*	744.4373	-46.88	12.38	-34.50	-13.00	-21.50	peak	

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