

FCC Radio Test Report

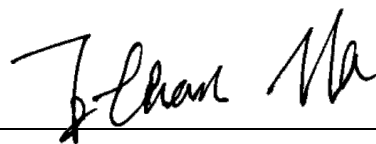
FCC ID: QISME919BS-567BNB

This report concerns: Original Grant

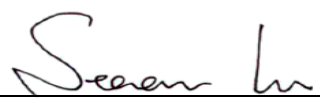
Project No. : 1907C062
Equipment : LTE Module
Test Model : ME919Bs-567bNb
Series Model : N/A
Applicant : Huawei Technologies Co., Ltd.
Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, China

Date of Receipt : Jul. 08, 2019
Date of Test : Jul. 09, 2019 ~ Jul. 22, 2019
Issued Date : Jul. 23, 2019
Tested by : BTL Inc.

Technical Manager :


(Ethan Ma)

Authorized Signatory :


(Steven Lu)

B T L I N C .

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Certificate #5123.02

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.

The report must not be used by the client to claim product certification, approval, or endorsement by NIST, A2LA, or any agency of the U.S. Government.

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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 is not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	Jul. 23, 2019

1. GENERAL SUMMARY

Equipment : LTE Module
Brand Name : HUAWEI
Test Model : ME919Bs-567bNb
Series Model : N/A
Applicant : Huawei Technologies Co., Ltd.
Manufacturer : Huawei Technologies Co., Ltd.
Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
Bantian, Longgang District, Shenzhen, 518129, China
Factory : Huawei Technologies Co., Ltd.
Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
Bantian, Longgang District, Shenzhen, 518129, China
Date of Test : Jul. 09, 2019 ~ Jul. 22, 2019
Test Sample : Engineering Sample No.: DG190708164 for conducted, DG190708163 for
radiated.
Standard(s) : 47 CFR FCC Part 27 Subpart L
47 CFR FCC Part 27 Subpart M
47 CFR FCC Part 27 Subpart H
47 CFR FCC Part 27 Subpart F
47 CFR FCC Part 2 & ANSI/TIA/EIA-603-E-2016
KDB 971168 D01 Power Meas License Digital Systems v03r01

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

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-3-1907C062) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of A2LA according to the ISO/IEC 17025 quality assessment standard and technical standard(s).

Test results included in this report are only for the WCDMA Band IV, LTE Band 4, 7, 12, 13 parts.

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part 27 Subpart L,M,H,F & Part 2			
Standard(s) Section	Test Item	Verdict	Tested By
2.1046 27.50(d)(4) 27.50(h)(2) 27.50(b)(10) 27.50(c)(10)	Effective Radiated Power & Equivalent Isotropic Radiated Power	PASS	Paul Li
2.1049	Occupied Bandwidth	PASS	Paul Li
2.1051 27.53(c)(2)(4) 27.53(g) 27.53(h) 27.53(m)(4)	Conducted Spurious Emissions	PASS	Paul Li
2.1053 27.53(c)(2) 27.53(f) 27.53(g) 27.53(h) 27.53(m)(4)	Radiated Spurious Emissions	PASS	Paul Li
2.1051 27.53(c)(2)(4) 27.53(g) 27.53(h) 27.53(m)(4)	Band Edge Measurements	PASS	Paul Li
-	Peak To Average Ratio	PASS	Paul Li
2.1055 27.54	Frequency Stability	PASS	Paul Li

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

BTL's Test Firm Registration Number for FCC: 357015

BTL's Designation Number for FCC: CN1240

2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty figures shall be calculated according the methods described in the ETSI TR 100 028 and shall correspond to an expansion factor (coverage factor) $k=1.96$ or $k=2$ (which provide confidence levels of respectively 90% and 95.45% in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)). Measurement Uncertainty for a Level of Confidence of 95 %, $U=2 \times U_c(y)$.

The BTL measurement uncertainty as below table:

A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03 (3m)	CISPR	9KHz ~ 30MHz	V	3.79
		9KHz ~ 30MHz	H	3.57
		30MHz ~ 200MHz	V	4.88
		30MHz ~ 200MHz	H	4.14
		200MHz ~ 1,000MHz	V	4.62
		200MHz ~ 1,000MHz	H	4.80

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB03 (3m)	CISPR	1GHz ~ 6GHz	4.58
		6GHz ~ 18GHz	5.18

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB03 (1m)	CISPR	18 ~ 26.5 GHz	3.80
		26.5 ~ 40 GHz	4.30

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	LTE Module	
Brand Name	HUAWEI	
Test Model	ME919Bs-567bNb	
Series Model	N/A	
Model Difference(s)	N/A	
Hardware Version	RM3ME919BSM34	
Software Version	11.789.07.05.1400	
Antenna Type	Internal Antenna	
Antenna Gain	WCDMA IV	2.5 dBi
	LTE Band 4	
	LTE Band 7	
	LTE Band 12	
	LTE Band 13	
Modulation Type	WCDMA	UL: QPSK DL: QPSK, 16QAM
	WCDMA(HSDPA/HSUPA)	16QAM
	LTE	UL: QPSK, 16QAM DL: QPSK, 16QAM, 64QAM
Operation Frequency	WCDMA Band IV	1712.4MHz ~ 1752.6MHz
	LTE Band 4 (Channel Bandwidth: 1.4MHz)	1710.7MHz ~ 1754.3MHz
	LTE Band 4 (Channel Bandwidth: 3MHz)	1711.5MHz ~ 1753.5MHz
	LTE Band 4 (Channel Bandwidth: 5MHz)	1712.5MHz ~ 1752.5MHz
	LTE Band 4 (Channel Bandwidth: 10MHz)	1715.0MHz ~ 1750.0MHz
	LTE Band 4 (Channel Bandwidth: 15MHz)	1717.5MHz ~ 1747.5MHz
	LTE Band 4 (Channel Bandwidth: 20MHz)	1720.0MHz ~ 1745.0MHz
	LTE Band 7 (Channel Bandwidth: 5MHz)	2502.5MHz ~ 2567.5MHz
	LTE Band 7 (Channel Bandwidth: 10MHz)	2505.0MHz ~ 2565.0MHz
	LTE Band 7 (Channel Bandwidth: 15MHz)	2507.5MHz ~ 2562.5MHz
	LTE Band 7 (Channel Bandwidth: 20MHz)	2510.0MHz ~ 2560.0MHz
	LTE Band 12 (Channel Bandwidth: 1.4MHz)	699.7MHz ~ 715.3MHz
	LTE Band 12 (Channel Bandwidth: 3MHz)	700.5MHz ~ 714.5MHz
	LTE Band 12 (Channel Bandwidth: 5MHz)	701.5MHz ~ 713.5MHz
	LTE Band 12 (Channel Bandwidth: 10MHz)	704.0MHz ~ 711.0MHz
	LTE Band 13 (Channel Bandwidth: 5MHz)	779.5MHz ~ 784.5MHz
	LTE Band 13 (Channel Bandwidth: 10MHz)	782.0MHz

Max. EIRP Power	WCDMA Band IV (WCDMA)	QPSK	25.45	dBm
	WCDMA Band IV (HSDPA)	16QAM	25.49	dBm
	WCDMA Band IV (HSUPA)	16QAM	25.49	dBm
	LTE Band 4 (Channel Bandwidth: 1.4MHz)	QPSK	25.29	dBm
		16QAM	24.35	dBm
	LTE Band 4 (Channel Bandwidth: 3MHz)	QPSK	25.36	dBm
		16QAM	24.50	dBm
	LTE Band 4 (Channel Bandwidth: 5MHz)	QPSK	25.23	dBm
		16QAM	24.44	dBm
	LTE Band 4 (Channel Bandwidth: 10MHz)	QPSK	25.31	dBm
		16QAM	24.46	dBm
	LTE Band 4 (Channel Bandwidth: 15MHz)	QPSK	25.19	dBm
		16QAM	24.30	dBm
	LTE Band 4 (Channel Bandwidth: 20MHz)	QPSK	24.74	dBm
		16QAM	23.80	dBm
	LTE Band 7 (Channel Bandwidth: 5MHz)	QPSK	25.36	dBm
		16QAM	24.78	dBm
	LTE Band 7 (Channel Bandwidth: 10MHz)	QPSK	25.52	dBm
		16QAM	24.68	dBm
Max. ERP Power	LTE Band 7 (Channel Bandwidth: 15MHz)	QPSK	25.47	dBm
		16QAM	24.55	dBm
	LTE Band 7 (Channel Bandwidth: 20MHz)	QPSK	25.20	dBm
		16QAM	24.42	dBm
	LTE Band 12 (Channel Bandwidth: 1.4MHz)	QPSK	22.90	dBm
		16QAM	22.20	dBm
	LTE Band 12 (Channel Bandwidth: 3MHz)	QPSK	22.98	dBm
		16QAM	22.32	dBm
	LTE Band 12 (Channel Bandwidth: 5MHz)	QPSK	23.11	dBm
		16QAM	22.62	dBm
	LTE Band 12 (Channel Bandwidth: 10MHz)	QPSK	23.10	dBm
		16QAM	22.26	dBm
	LTE Band 13 (Channel Bandwidth: 5MHz)	QPSK	23.23	dBm
		16QAM	22.09	dBm
	LTE Band 13 (Channel Bandwidth: 10MHz)	QPSK	22.78	dBm
		16QAM	21.65	dBm
Power Source	DC Voltage supplied from AC/DC adapter (support unit).			
Power Rating	I/P: 100-240V ~50/60Hz O/P: 12V 1.5A EUT: 4V			

Note:

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

3.2 DESCRIPTION OF TEST MODES AND TEST CONDITION

Following channel(s) was (were) selected for the final test as listed below:

WCDMA MODE			
Test Item	Available Channel	Tested Channel	Mode
EIRP	1312 to 1513	1312, 1413, 1513	WCDMA,HSDPA, HSUPA
Output Power	1312 to 1513	1312, 1413, 1513	WCDMA,HSDPA, HSUPA
Occupied Bandwidth	1312 to 1513	1312, 1413, 1513	WCDMA,HSDPA, HSUPA
Conducted Emission	1312 to 1513	1413	WCDMA
Radiated Emission	1312 to 1513	1413	WCDMA
Band Edge	1312 to 1513	1312, 1513	WCDMA,HSDPA, HSUPA
Peak to Average Ratio	1312 to 1513	1312, 1413, 1513	WCDMA,HSDPA, HSUPA
Frequency Stability	1312 to 1513	1413	WCDMA

LTE BAND 4 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & EIRP	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	1RB/3RB/6RB
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	1RB/8RB/15RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1RB/25RB/50RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1RB/36RB/75RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1RB/50RB/100RB
Occupied Bandwidth	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	6RB
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	15RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	25RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	50RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	75 RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	100RB
Conducted Spurious Emission	19957 to 20393	20175	1.4MHz	QPSK	1RB
	19975 to 20375	20175	5MHz	QPSK	1RB
	20050 to 20300	20175	20MHz	QPSK	1RB
Radiated Spurious Emission	19957 to 20393	20175	1.4MHz	QPSK	1RB
	19975 to 20375	20175	5MHz	QPSK	1RB
	20050 to 20300	20175	20MHz	QPSK	1RB

LTE BAND 4 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Band Edge	19957 to 20393	19957	1.4MHz	QPSK	1RB/6RB
		20393	1.4MHz	QPSK	
	19965 to 20385	19965	3MHz	QPSK	1RB/15RB
		20385	3MHz	QPSK	
	19975 to 20375	19975	5MHz	QPSK	1RB/25RB
		20375	5MHz	QPSK	
	20000 to 20350	20000	10MHz	QPSK	1RB/50RB
		20350	10MHz	QPSK	
	20025 to 20325	20025	15MHz	QPSK	1RB/75RB
		20325	15MHz	QPSK	
	20050 to 20300	20050	20MHz	QPSK	1RB/100RB
		20300	20MHz	QPSK	
Peak To Average Ratio	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	1RB
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	1RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1RB
Frequency Stability	19957 to 20393	20175	1.4MHz	QPSK	1RB
	19965 to 20385	20175	3MHz	QPSK	1RB
	19975 to 20375	20175	5MHz	QPSK	1RB
	20000 to 20350	20175	10MHz	QPSK	1RB
	20025 to 20325	20175	15MHz	QPSK	1RB
	20050 to 20300	20175	20MHz	QPSK	1RB

LTE BAND 7 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & EIRP	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM	1RB/25RB/50RB
	20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM	1RB/36RB/75RB
	20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM	1RB/50RB/100RB
Occupied Bandwidth	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM	25RB
	20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM	50RB
	20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM	75RB
	20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM	100RB
Conducted Spurious Emission	20775 to 21425	21100	5MHz	QPSK	1 RB
	20850 to 21350	21100	20MHz	QPSK	1 RB
Radiated Spurious Emission	20775 to 21425	21100	5MHz	QPSK	1 RB
	20850 to 21350	21100	20MHz	QPSK	1 RB
Band Edge	20775 to 21425	20775	5MHz	QPSK	1RB/25RB
		21425	5MHz	QPSK	
	20800 to 21400	20800	10MHz	QPSK	1RB/50RB
		21400	10MHz	QPSK	
	20825 to 21375	20825	15MHz	QPSK	1RB/75RB
		21375	15MHz	QPSK	
	20850 to 21350	20850	20MHz	QPSK	1RB/100RB
		21350	20MHz	QPSK	
Peak To Average Ratio	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM	1RB
	20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM	1RB
	20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM	1RB
	20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM	1RB
Frequency Stability	20775 to 21425	21100	5MHz	QPSK	1RB
	20800 to 21400	21100	10MHz	QPSK	1RB
	20825 to 21375	21100	15MHz	QPSK	1RB
	20850 to 21350	21100	20MHz	QPSK	1RB

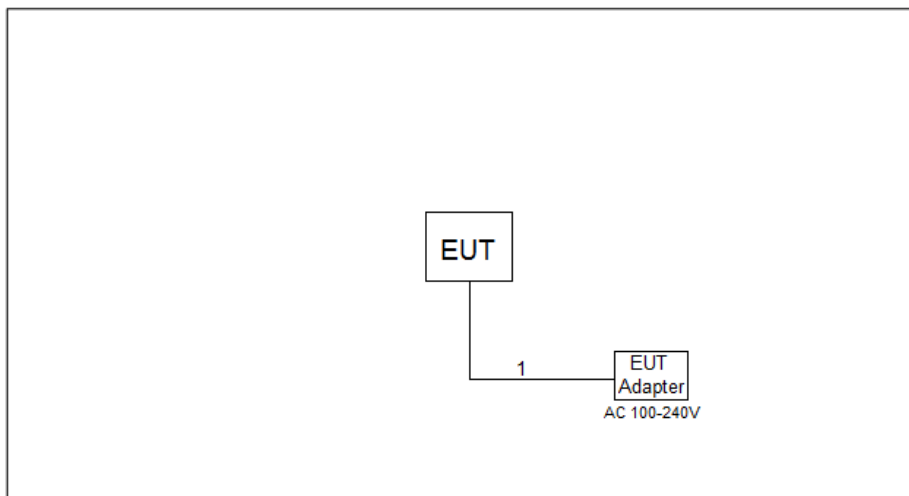
LTE BAND 12 MODE					
Test Item	Available Channel	Tested Channel	Channel	Modulation	Mode
Output Power & ERP	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM	1RB/3RB/6RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM	1RB/8RB/15RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	1RB/25RB/50RB
Occupied Bandwidth	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM	6RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM	15RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	25RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	50RB
Conducted Spurious Emission	23017 to 23173	23095	1.4MHz	QPSK	1 RB
	23035 to 23155	23095	5MHz	QPSK	1 RB
	23060 to 23130	23095	10MHz	QPSK	1 RB
Radiated Spurious Emission	23017 to 23173	23095	1.4MHz	QPSK	1 RB
	23035 to 23155	23095	5MHz	QPSK	1 RB
	23060 to 23130	23095	10MHz	QPSK	1 RB
Band Edge	23017 to 23173	23017	1.4MHz	QPSK	1RB/6RB
		23173	1.4MHz	QPSK	
	23025 to 23165	23025	3MHz	QPSK	1RB/15RB
		23165	3MHz	QPSK	
	23035 to 23155	23035	5MHz	QPSK	1RB/25RB
		23155	5MHz	QPSK	
	23060 to 23130	23060	10MHz	QPSK	1RB/50RB
		23130	10MHz	QPSK	
Peak to Average Ratio	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM	1 RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM	1 RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	1 RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	1 RB
Frequency Stability	23017 to 23173	23095	1.4MHz	QPSK	1 RB
	23025 to 23165	23095	3MHz	QPSK	1 RB
	23035 to 23155	23095	5MHz	QPSK	1 RB
	23060 to 23130	23095	10MHz	QPSK	1 RB

LTE BAND 13 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & ERP	23205 to 23255	23205, 23230, 23255	5MHz	QPSK, 16QAM	1RB/12RB/25RB
		23230	10MHz	QPSK, 16QAM	1RB/25RB/50RB
Occupied Bandwidth	23205 to 23255	23230	5MHz	QPSK, 16QAM	25RB
	23205 to 23255	23230	10MHz	QPSK, 16QAM	50RB
Conducted Spurious Emission	23205 to 23255	23230	5MHz	QPSK	1 RB
		23230	10MHz	QPSK	1 RB
Radiated Spurious Emission	23205 to 23255	23230	5MHz	QPSK	1 RB
	23205 to 23255	23230	10MHz	QPSK	1 RB
Band Edge	23205 to 23255	23205, 23255	5MHz	QPSK	1RB/25RB
	23205 to 23255	23230	10MHz	QPSK	1RB/50RB
Peak To Average Ratio	23205 to 23255	23205, 23230, 23255	5MHz	QPSK, 16QAM	1RB
	23205 to 23255	23230	10MHz	QPSK, 16QAM	1RB
Frequency Stability	23205 to 23255	23230	5MHz	QPSK	1RB
	23205 to 23255	23230	10MHz	QPSK	1RB

EUT TEST CONDITIONS:

Test Item	Environmental Conditions	Test Voltage
EIRP/ERP	24.5°C, 49.5%RH	DC 4.0V
Output Power	24.5°C, 49.5%RH	DC 4.0V
Occupied Bandwidth	24.5°C, 49.5%RH	DC 4.0V
Conducted Emission	24.5°C, 49.5%RH	DC 4.0V
Radiated Emission	24°C, 68%RH	AC 120V/60Hz
Band Edge	24.5°C, 49.5%RH	DC 4.0V
Peak to Average Ratio	24.5°C, 49.5%RH	DC 4.0V
Frequency Stability	Normal and Extreme	Normal and Extreme

3.3 BLOCK DIGRAM SHOWING THECONFIGURATIONOFSYSTEMTESTED



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	Mfr/Brand	Model/Type No.	Series No.
-	-	-	-	-

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	DC Cable	NO	NO	1.2m

4. TEST RESULT

4.1 OUTPUT POWER MEASUREMENT

4.1.1 LIMIT

Mobile / Portable station are limited to 1 watts e.i.r.p. (WCDMA Band IV, LTE Band 4)

Mobile / Portable station are limited to 2 watts e.i.r.p. (LTE Band 7)

Mobile / Portable station are limited to 3 watts e.i.r.p. (LTE Band 12, LTE Band 13)

4.1.2 TEST PROCEDURE

EIRP/ERP:

EIRP= Conducted Power +Antenan gain

ERP power=EIPR power-2.15dBi.

Output Power:

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.

4.1.3 TEST SETUP LAYOUT

Conducted Power Measurement



4.1.4 TEST DEVIATION

No deviation

4.1.5 TEST RESULTS

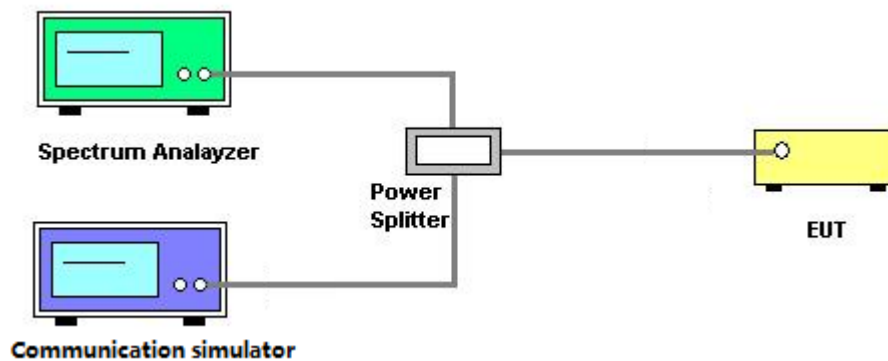
Please refer to the Appendix A.

4.2 OCCUPIED BANDWIDTH MEASUREMENT

4.2.1 TEST PROCEDURE

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.

4.2.2 TEST SETUP LAYOUT



4.2.3 TEST DEVIATION

No deviation

4.2.4 TEST RESULTS

Please refer to the Appendix B.

4.3 CONDUCTED EMISSIONS MEASUREMENT

4.3.1 LIMIT

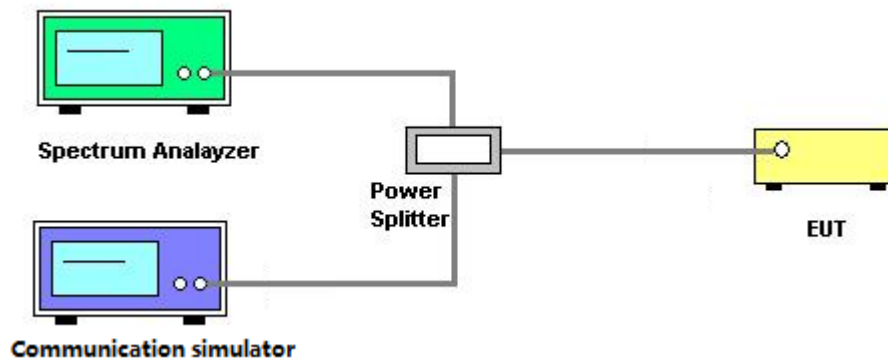
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13dBm. (WCDMA Band IV, LTE Band 4, Band 12, Band 13)

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

4.3.2 TEST PROCEDURES

1. The testing follows FCC KDB 971168 v03r01 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured. Set $RBW \geq 1\%$ EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

4.3.3 TEST SETUP LAYOUT



4.3.4 TEST DEVIATION

No deviation

4.3.5 TEST RESULTS

Please refer to the Appendix C.

4.4 RADIATED EMISSIONS MEASUREMENT

4.4.1 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. (WCDMA Band IV, LTE Band 4, Band 12)

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

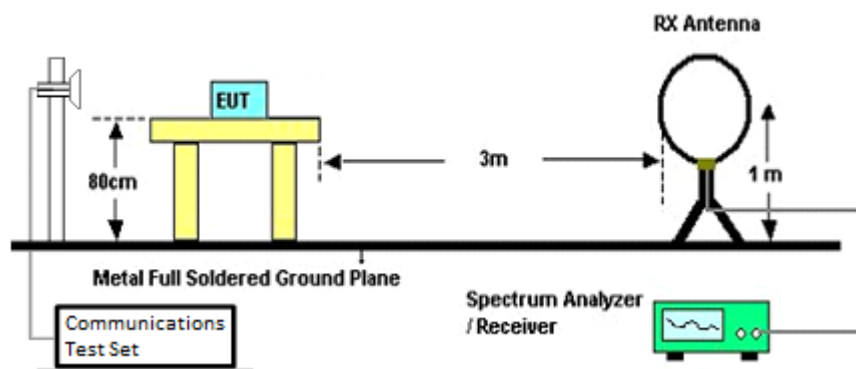
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log(P)$ dB. For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. (LTE Band 13)

4.4.2 TEST PROCEDURES

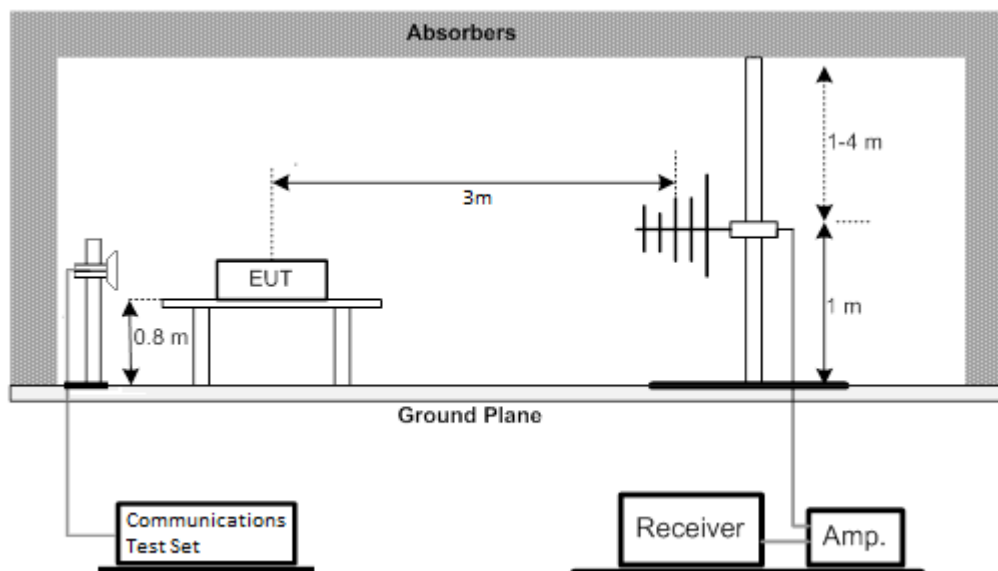
1. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. 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. 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.P.R power - 2.15dBi.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.4.3 TEST SETUP LAYOUT

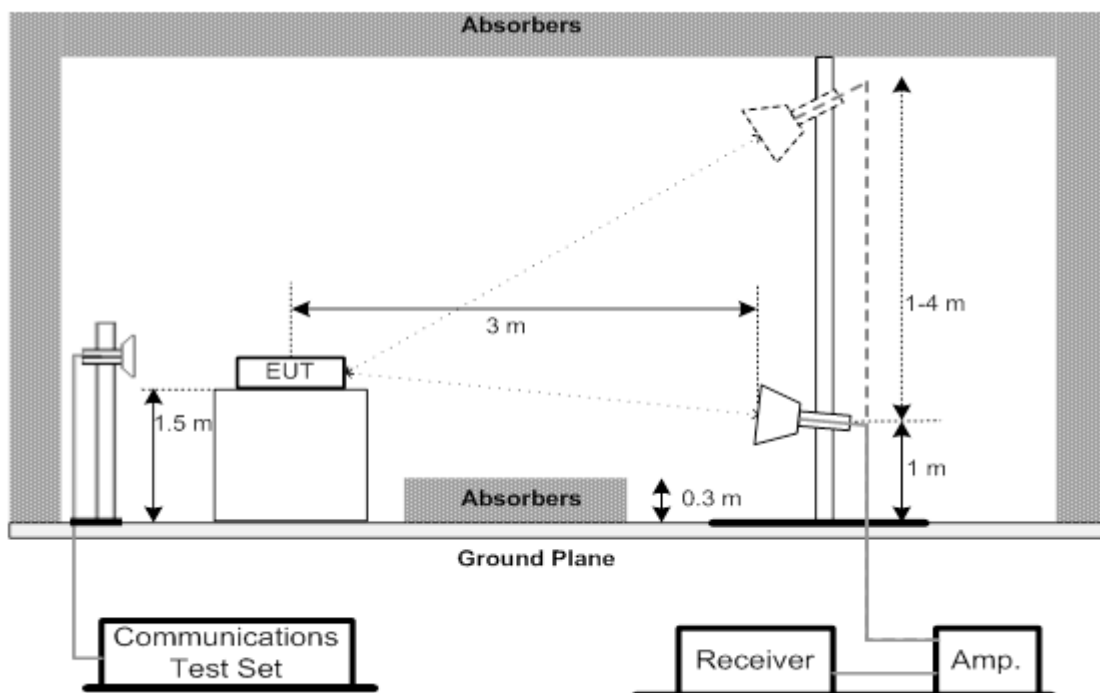
Below 30MHz



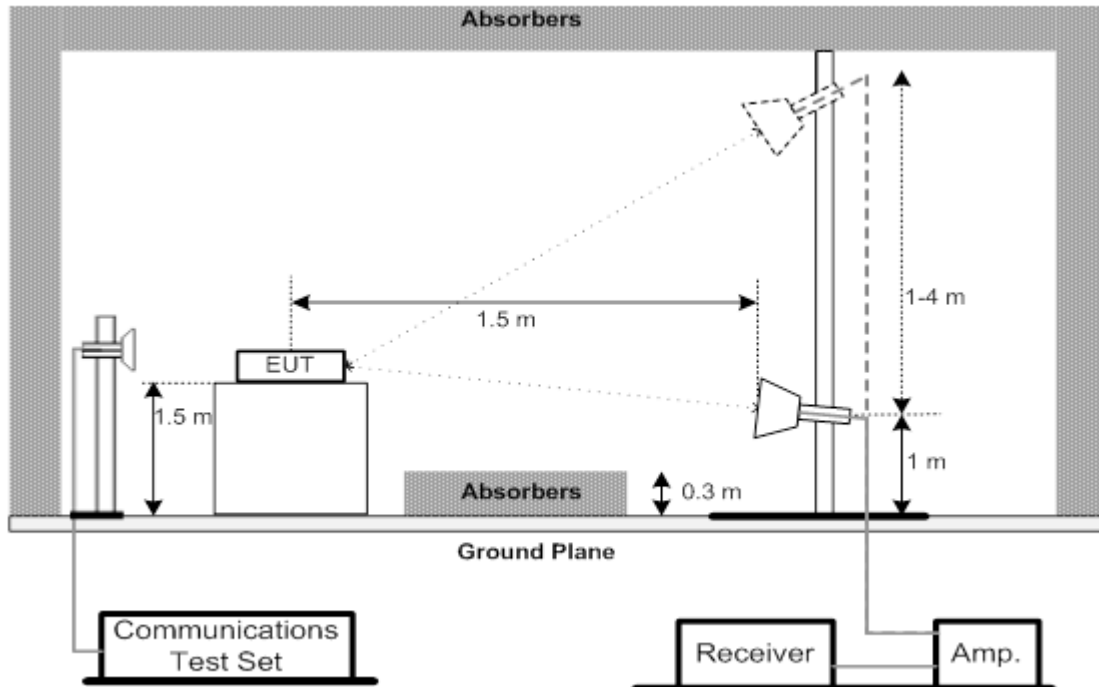
30MHz to 1GHz



1GHz to 18GHz



Above 18GHz



4.4.4 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Appendix D.

4.4.5 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the Appendix E.

4.4.6 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the Appendix F.

4.5 BAND EDGE MEASUREMENT

4.5.1 LIMIT

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed. (WCDMA Band IV, LTE Band 4, Band 12)

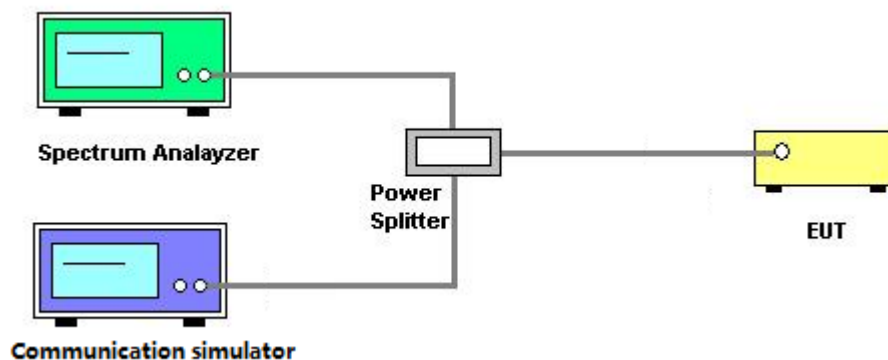
For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. (LTE Band 7)

For operations in the 776-788 MHz band, the FCC limit is $43 + 10 \log_{10}(P[\text{Watts}])$ dB below the transmitter power P(Watts) in a 100 kHz bandwidth. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed. In addition, the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment. (LTE Band 13)

4.5.2 TEST PROCEDURES

1. All measurements were done at low and high operational frequency range.
2. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 15kHz and VB of the spectrum is 43kHz (LTE Bandwidth 1.4MHz).
3. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 30kHz and VB of the spectrum is 91kHz (LTE Bandwidth 3MHz).
4. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 51kHz and VB of the spectrum is 150kHz (LTE Bandwidth 5MHz).
5. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Bandwidth 10MHz).
6. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Bandwidth 15MHz).
7. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 200kHz and VB of the spectrum is 620kHz (LTE Bandwidth 20MHz).
8. Record the max trace plot into the test report.

4.5.3 TEST SETUP LAYOUT



4.5.4 TEST DEVIATION

No deviation

4.5.5 TEST RESULTS

Please refer to the Appendix G.

4.6 PEAK TO AVERAGE RATIO MEASUREMENT

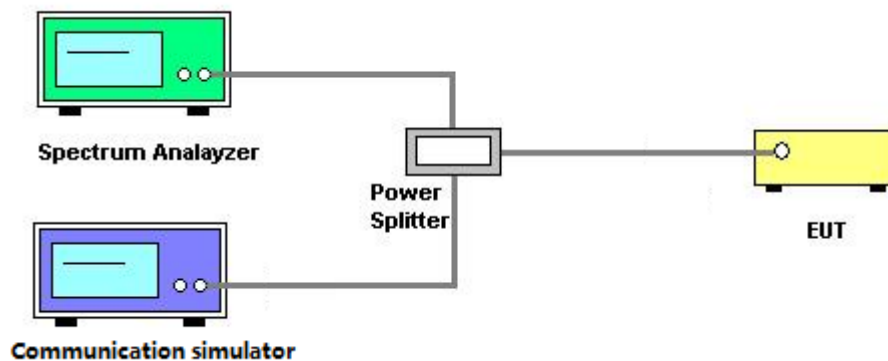
4.6.1 LIMIT

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.

4.6.2 TEST PROCEDURES

1. Set resolution/measurement bandwidth $\geq$ 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%.

4.6.3 TEST SETUP LAYOUT



4.6.4 TEST DEVIATION

No deviation

4.6.5 TEST RESULTS

Please refer to the Appendix H.

4.7 FREQUENCY STABILITY MEASUREMENT

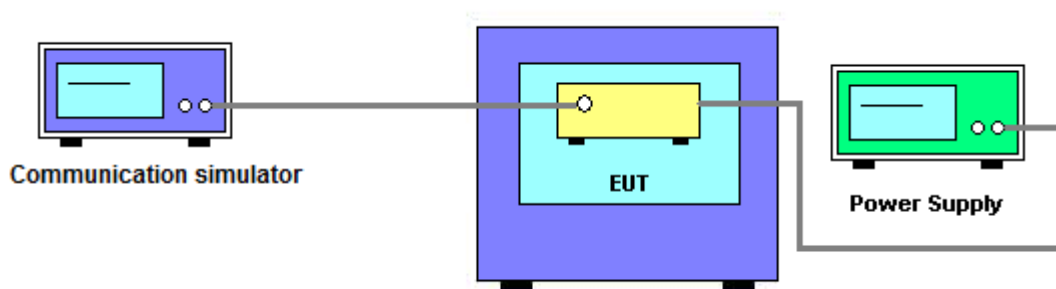
4.7.1 LIMIT

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

4.7.2 TEST PROCEDURES

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 $\pm 0.5^{\circ}\text{C}$ 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.

4.7.3 TEST SETUP LAYOUT



4.7.4 TEST DEVIATION

No deviation

4.7.5 TEST RESULTS

Please refer to the Appendix I.

5. LIST OF MEASUREMENT EQUIPMENTS

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarzbeck	VULB9160	9160-3232	Mar. 09, 2020
2	Amplifier	Agilent	8449B	3008A02274	Mar. 10, 2020
3	Amplifier	HP	8447D	2944A09673	Aug. 11, 2019
4	HighPass Filter	Wairwright Instruments Gmbh	WHK 1.5/15G-10ST	11	Mar. 10, 2020
5	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 1710/1785-1690/180 5-60/12SS	38	Mar. 10, 2020
6	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 824/849-810/863-60/ 9SS	7	Mar. 10, 2020
7	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 880/915-860/935-60/ 9SS	14	Mar. 10, 2020
8	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 1850/1910-1830/193 0-60/10SS	17	Mar. 10, 2020
9	HighPass Filter	Wairwright Instruments Gmbh	WHK3.1/18G-10SS	24	Mar. 10, 2020
10	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 10, 2020
11	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 10, 2020
12	Receiver	Agilent	N9038A	MY52130039	Aug. 11, 2019
13	wideband radio communication tester	R&S	CMW500	152372	Mar. 10, 2020
14	High pass filter	KANGMAIWEI	ZHPF-M3-12.75G-38 69	B2015073763	Feb. 12, 2020
15	High pass filter	KANGMAIWEI	ZHPF-M1000-4000-1	B2015073762	Feb. 12, 2020
16	High pass filter	KANGMAIWEI	ZHPF-M6-186-1727	B2015073764	Feb. 12, 2020
17	Cable	emci	LMR-400(30MHz-1G Hz)(8m+5m)	N/A	May 24, 2020
18	Cable	mitron	B10-01-01-12M	18072744	Jul. 30, 2019
19	Controller	ETS-Lindgren	2090	N/A	N/A
20	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
21	Loop Antenna	EM	EM-6876-1	230	Jan. 15, 2020
22	Double Ridged Guide Antenna	ETS	3115	75789	Mar. 09, 2020
23	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 23, 2020

Conducted Emission & Band Edge & Occupied Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 10, 2020
2	EXA Spectrum Analyzer	Agilent	N9010A	MY50520044	Mar. 10, 2020
3	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Mar. 10, 2020
4	wideband radio communication tester	R&S	CMW500	152372	Mar. 10, 2020
5	Spectrum Analyzer	R&S	FSP40	100185	Aug. 11, 2019

Frequency Stability Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 10, 2020
2*	Multi-output DC Power Supply	GW Instek	GPC-3030DN	EK880675	Sep. 26, 2020
3	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Mar. 10, 2020
4	wideband radio communication tester	R&S	CMW500	152372	Mar. 10, 2020
5	Const Temp,& Humidity Chamber	Bell	BTH-50C	20170306001	Mar. 10, 2020

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

* All calibration period of equipment list is three year.

APPENDIX A - OUTPUT POWER

Output Power (dBm):

Modulation	Band	WCDMA IV		
	Tx Channel	1312CH	1413CH	1513CH
	Frequency	1712.4MHz	1732.6MHz	1752.6MHz
BPSK	RMC 12.2K	22.79	22.85	22.94
	RMC 64K	22.78	22.89	22.95
	RMC 144K	22.83	22.89	22.95
	RMC 384K	22.85	22.88	22.94
16QAM	HSDPA Subtest-1	22.86	22.99	22.97
	HSDPA Subtest-2	22.83	22.93	22.96
	HSDPA Subtest-3	22.82	22.91	22.97
	HSDPA Subtest-4	22.79	22.89	22.98
16QAM	HSUPA Subtest-1	21.63	21.66	21.83
	HSUPA Subtest-2	20.86	20.89	20.91
	HSUPA Subtest-3	20.82	21.12	20.97
	HSUPA Subtest-4	20.91	20.98	21.04
	HSUPA Subtest-5	22.85	22.94	22.99

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19957CH	20175CH	20393CH
				1710.7MHz	1732.5MHz	1754.3MHz
4 / 1.4M	QPSK	1	0	21.76	22.79	22.43
		1	2	21.79	22.79	22.66
		1	5	21.64	22.65	22.79
		3	0	21.73	22.75	22.49
		3	1	21.68	22.73	22.63
		3	2	21.70	22.78	22.74
		6	0	20.62	21.66	21.56
	16QAM	1	0	20.54	21.81	21.40
		1	2	20.57	21.85	21.62
		1	5	20.49	21.73	21.75
		3	0	20.56	21.71	21.47
		3	1	20.54	21.73	21.56
		3	2	20.54	21.80	21.71
		6	0	20.10	21.08	21.09

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19965CH	20175CH	20385CH
				1711.5MHz	1732.5MHz	1753.5MHz
4 / 3M	QPSK	1	0	21.44	22.66	21.97
		1	7	21.66	22.86	22.54
		1	14	21.27	22.33	22.63
		8	0	20.54	21.61	21.11
		8	4	20.56	21.68	21.31
		8	7	20.46	21.54	21.41
		15	0	20.49	21.65	21.24
	16QAM	1	0	20.75	21.68	21.02
		1	7	20.96	22.00	21.49
		1	14	20.55	21.45	21.64
		8	0	20.18	21.16	20.65
		8	4	20.22	21.22	20.91
		8	7	20.10	21.08	21.00
		15	0	20.14	21.08	20.77

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19975CH	20175CH	20375CH
				1712.5MHz	1732.5MHz	1752.5MHz
4 / 5M	QPSK	1	0	21.42	22.65	21.73
		1	13	21.59	22.73	22.20
		1	24	21.02	21.93	22.10
		12	0	20.49	21.64	21.00
		12	6	20.49	21.61	21.15
		12	11	20.41	21.45	21.14
		25	0	20.37	21.58	21.07
	16QAM	1	0	20.51	21.74	20.87
		1	13	20.70	21.94	21.38
		1	24	20.07	21.00	21.22
		12	0	20.06	21.13	20.49
		12	6	20.10	21.08	20.58
		12	11	20.04	21.08	20.68
		25	0	19.98	21.01	20.46

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20000CH	20175CH	20350CH
				1715MHz	1732.5MHz	1750MHz
4 / 10M	QPSK	1	0	21.37	22.57	21.73
		1	25	21.60	22.81	22.09
		1	49	21.29	21.63	22.15
		25	0	20.39	21.69	20.68
		25	13	20.43	21.57	20.93
		25	25	20.60	21.28	21.04
		50	0	20.66	21.42	20.85
	16QAM	1	0	20.49	21.73	20.53
		1	25	20.84	21.96	20.98
		1	49	20.43	20.80	20.90
		25	0	19.97	21.18	20.13
		25	13	19.94	21.03	20.43
		25	25	20.09	20.84	20.47
		50	0	20.23	20.87	20.27

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20025CH	20175CH	20325CH
				1717.5MHz	1732.5MHz	1747.5MHz
4 / 15M	QPSK	1	0	21.45	22.49	21.89
		1	38	21.88	22.69	22.02
		1	74	21.95	21.56	22.00
		36	0	20.45	21.56	20.75
		36	18	20.76	21.56	20.84
		36	39	20.84	21.32	20.85
		75	0	20.98	21.55	20.92
	16QAM	1	0	20.70	21.58	20.99
		1	38	21.12	21.80	21.12
		1	74	21.19	20.67	21.08
		36	0	20.03	20.67	20.31
		36	18	20.22	21.00	20.35
		36	39	20.25	20.79	20.34
		75	0	20.44	20.94	20.40

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20050CH	20175CH	20300CH
				1720MHz	1732.5MHz	1745MHz
4 / 20M	QPSK	1	0	21.44	22.13	22.09
		1	50	22.24	21.36	21.91
		1	99	22.08	21.45	21.86
		50	0	20.54	21.67	21.04
		50	25	20.95	21.44	20.81
		50	50	21.36	21.31	20.70
		100	0	21.12	21.64	20.81
	16QAM	1	0	20.48	21.15	21.21
		1	50	21.30	20.80	21.11
		1	99	21.18	20.53	20.96
		50	0	20.03	21.14	20.49
		50	25	20.34	20.94	20.31
		50	50	20.80	20.81	20.27
		100	0	20.62	21.15	20.35

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20775CH	21100CH	21425CH
				2502.5MHz	2535MHz	2567.5MHz
7 / 5M	QPSK	1	0	21.86	22.18	22.86
		1	13	22.00	22.34	22.85
		1	24	21.48	21.86	22.17
		12	0	20.95	21.20	22.08
		12	6	21.00	21.28	22.12
		12	11	20.87	21.27	21.87
		25	0	20.84	21.18	21.91
	16QAM	1	0	20.99	21.48	22.27
		1	13	21.15	21.70	22.28
		1	24	20.60	21.22	21.58
		12	0	20.25	20.51	21.09
		12	6	20.31	20.66	21.14
		12	11	20.19	20.56	20.93
		25	0	20.14	20.46	20.93

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20800CH	21100CH	21400CH
				2505MHz	2535MHz	2565MHz
7 / 10M	QPSK	1	0	21.93	22.23	22.45
		1	25	21.95	22.51	23.02
		1	49	21.31	21.90	22.17
		25	0	20.76	21.12	21.86
		25	13	20.67	21.16	21.98
		25	25	20.54	21.05	21.84
		50	0	20.60	21.03	21.82
	16QAM	1	0	21.05	21.24	21.58
		1	25	21.06	21.48	22.18
		1	49	20.50	20.95	21.42
		25	0	19.86	20.24	21.12
		25	13	19.79	20.26	21.26
		25	25	19.62	20.12	21.07
		50	0	19.68	20.08	20.96

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20825CH	21100CH	21375CH
				2507.5MHz	2535MHz	2562.5MHz
7 / 15M	QPSK	1	0	21.67	21.90	21.78
		1	38	21.79	22.60	22.97
		1	74	21.30	21.62	21.97
		36	0	20.67	21.13	21.43
		36	18	20.66	21.24	21.87
		36	39	20.37	21.01	21.80
		75	0	20.49	21.02	21.64
	16QAM	1	0	20.74	21.02	20.93
		1	38	20.78	21.67	22.05
		1	74	20.03	20.83	21.22
		36	0	19.76	20.19	20.63
		36	18	19.77	20.32	21.05
		36	39	19.48	20.10	21.02
		75	0	19.60	20.07	20.78

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20850CH	21100CH	21350CH
				2510MHz	2535MHz	2560MHz
7 / 20M	QPSK	1	0	21.85	21.78	21.73
		1	50	21.82	22.67	22.70
		1	99	21.24	21.66	22.21
		50	0	20.75	21.02	21.46
		50	25	20.59	21.23	21.72
		50	50	20.31	21.10	21.84
		100	0	20.46	21.05	21.56
	16QAM	1	0	20.97	20.84	21.15
		1	50	20.83	21.44	21.92
		1	99	20.20	20.65	21.56
		50	0	19.86	20.03	20.52
		50	25	19.74	20.25	20.80
		50	50	19.44	20.15	20.94
		100	0	19.55	20.02	20.69

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23017CH	23095CH	23173CH
				699.7MHz	707.5MHz	715.3MHz
12 / 1.4M	QPSK	1	0	22.17	22.46	22.36
		1	2	22.12	22.54	22.48
		1	5	21.97	22.34	22.31
		3	0	22.21	22.51	22.42
		3	1	22.21	22.55	22.45
		3	2	22.15	22.50	22.47
		6	0	21.95	22.37	22.31
	16QAM	1	0	21.49	21.81	21.66
		1	2	21.49	21.85	21.77
		1	5	21.36	21.71	21.68
		3	0	21.44	21.72	21.63
		3	1	21.40	21.74	21.65
		3	2	21.37	21.76	21.70
		6	0	21.14	21.52	21.54

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23025CH	23095CH	23165CH
				700.5MHz	707.5MHz	714.5MHz
12 / 3M	QPSK	1	0	22.07	22.32	22.00
		1	7	22.19	22.63	22.55
		1	14	21.91	22.10	22.17
		8	0	21.93	22.37	22.10
		8	4	21.99	22.39	22.30
		8	7	21.96	22.26	22.28
		15	0	21.93	22.30	22.22
	16QAM	1	0	21.43	21.74	21.26
		1	7	21.56	21.97	21.85
		1	14	21.16	21.50	21.51
		8	0	21.12	21.50	21.37
		8	4	21.26	21.53	21.53
		8	7	21.14	21.40	21.48
		15	0	21.15	21.40	21.34

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23035CH	23095CH	23155CH
				701.5MHz	707.5MHz	713.5MHz
12 / 5M	QPSK	1	0	22.31	22.76	22.22
		1	13	22.18	22.48	22.17
		1	24	22.68	22.27	22.34
		12	0	21.82	22.30	21.84
		12	6	21.93	22.33	21.97
		12	11	21.82	22.19	22.06
		25	0	21.89	22.07	21.86
	16QAM	1	0	21.69	22.27	21.64
		1	13	21.48	21.94	21.72
		1	24	21.72	21.83	21.91
		12	0	21.04	21.42	21.10
		12	6	21.09	21.44	21.31
		12	11	20.99	21.36	21.34
		25	0	21.07	21.29	21.09

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23060CH	23095CH	23130CH
				704MHz	707.5MHz	711MHz
12 / 10M	QPSK	1	0	22.25	22.37	22.75
		1	25	22.36	22.57	22.20
		1	49	22.09	21.79	22.24
		25	0	21.72	22.08	22.02
		25	13	22.00	22.21	21.93
		25	25	21.94	21.79	21.79
		50	0	21.85	21.96	21.87
	16QAM	1	0	21.66	21.81	21.49
		1	25	21.73	21.91	21.41
		1	49	21.41	21.30	21.56
		25	0	20.86	21.16	21.04
		25	13	21.13	21.28	21.01
		25	25	21.05	20.91	20.85
		50	0	20.95	21.09	20.95

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23205CH	23230CH	23255CH
				779.5MHz	782MHz	784.5MHz
13 / 5M	QPSK	1	0	22.29	22.37	22.88
		1	13	21.99	22.51	22.32
		1	24	22.67	22.52	22.20
		12	0	20.83	21.09	21.24
		12	6	20.83	21.55	21.21
		12	11	20.96	21.33	20.90
		25	0	20.95	21.16	21.03
	16QAM	1	0	21.23	21.11	21.74
		1	13	20.81	21.41	21.03
		1	24	21.54	21.46	20.98
		12	0	20.73	20.98	21.07
		12	6	20.67	21.40	21.06
		12	11	20.82	21.22	20.77
		25	0	20.74	21.05	20.84

LTE Band / BW	Modulation	RB Size	RB Offset	Mid CH
				23230CH
				782MHz
13 / 10M	QPSK	1	0	22.32
		1	25	22.43
		1	49	22.09
		25	0	20.69
		25	13	21.17
		25	25	20.87
		50	0	20.88
	16QAM	1	0	21.03
		1	25	21.30
		1	49	20.73
		25	0	20.58
		25	13	20.92
		25	25	20.63
		50	0	20.62

EIRP Power (dBm):

Modulation	Band	WCDMA IV		
	Tx Channel	1312CH	1413CH	1513CH
	Frequency	1712.4MHz	1732.6MHz	1752.6MHz
BPSK	RMC 12.2K	25.29	25.35	25.44
	RMC 64K	25.28	25.39	25.45
	RMC 144K	25.33	25.39	25.45
	RMC 384K	25.35	25.38	25.44
16QAM	HSDPA Subtest-1	25.36	25.49	25.47
	HSDPA Subtest-2	25.33	25.43	25.46
	HSDPA Subtest-3	25.32	25.41	25.47
	HSDPA Subtest-4	25.29	25.39	25.48
16QAM	HSUPA Subtest-1	24.13	24.16	24.33
	HSUPA Subtest-2	23.36	23.39	23.41
	HSUPA Subtest-3	23.32	23.62	23.47
	HSUPA Subtest-4	23.41	23.48	23.54
	HSUPA Subtest-5	25.35	25.44	25.49

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19957CH	20175CH	20393CH
				1710.7MHz	1732.5MHz	1754.3MHz
4 / 1.4M	QPSK	1	0	24.26	25.29	24.93
		1	2	24.29	25.29	25.16
		1	5	24.14	25.15	25.29
		3	0	24.23	25.25	24.99
		3	1	24.18	25.23	25.13
		3	2	24.20	25.28	25.24
		6	0	23.12	24.16	24.06
	16QAM	1	0	23.04	24.31	23.90
		1	2	23.07	24.35	24.12
		1	5	22.99	24.23	24.25
		3	0	23.06	24.21	23.97
		3	1	23.04	24.23	24.06
		3	2	23.04	24.30	24.21
		6	0	22.60	23.58	23.59

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19965CH	20175CH	20385CH
				1711.5MHz	1732.5MHz	1753.5MHz
4 / 3M	QPSK	1	0	23.94	25.16	24.47
		1	7	24.16	25.36	25.04
		1	14	23.77	24.83	25.13
		8	0	23.04	24.11	23.61
		8	4	23.06	24.18	23.81
		8	7	22.96	24.04	23.91
		15	0	22.99	24.15	23.74
	16QAM	1	0	23.25	24.18	23.52
		1	7	23.46	24.50	23.99
		1	14	23.05	23.95	24.14
		8	0	22.68	23.66	23.15
		8	4	22.72	23.72	23.41
		8	7	22.60	23.58	23.50
		15	0	22.64	23.58	23.27

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19975CH	20175CH	20375CH
				1712.5MHz	1732.5MHz	1752.5MHz
4 / 5M	QPSK	1	0	23.92	25.15	24.23
		1	13	24.09	25.23	24.70
		1	24	23.52	24.43	24.60
		12	0	22.99	24.14	23.50
		12	6	22.99	24.11	23.65
		12	11	22.91	23.95	23.64
		25	0	22.87	24.08	23.57
	16QAM	1	0	23.01	24.24	23.37
		1	13	23.20	24.44	23.88
		1	24	22.57	23.50	23.72
		12	0	22.56	23.63	22.99
		12	6	22.60	23.58	23.08
		12	11	22.54	23.58	23.18
		25	0	22.48	23.51	22.96

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20000CH	20175CH	20350CH
				1715MHz	1732.5MHz	1750MHz
4 / 10M	QPSK	1	0	23.87	25.07	24.23
		1	25	24.10	25.31	24.59
		1	49	23.79	24.13	24.65
		25	0	22.89	24.19	23.18
		25	13	22.93	24.07	23.43
		25	25	23.10	23.78	23.54
		50	0	23.16	23.92	23.35
	16QAM	1	0	22.99	24.23	23.03
		1	25	23.34	24.46	23.48
		1	49	22.93	23.30	23.40
		25	0	22.47	23.68	22.63
		25	13	22.44	23.53	22.93
		25	25	22.59	23.34	22.97
		50	0	22.73	23.37	22.77

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20025CH	20175CH	20325CH
				1717.5MHz	1732.5MHz	1747.5MHz
4 / 15M	QPSK	1	0	23.95	24.99	24.39
		1	38	24.38	25.19	24.52
		1	74	24.45	24.06	24.50
		36	0	22.95	24.06	23.25
		36	18	23.26	24.06	23.34
		36	39	23.34	23.82	23.35
		75	0	23.48	24.05	23.42
	16QAM	1	0	23.20	24.08	23.49
		1	38	23.62	24.30	23.62
		1	74	23.69	23.17	23.58
		36	0	22.53	23.17	22.81
		36	18	22.72	23.50	22.85
		36	39	22.75	23.29	22.84
		75	0	22.94	23.44	22.90

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20050CH	20175CH	20300CH
				1720MHz	1732.5MHz	1745MHz
4 / 20M	QPSK	1	0	23.94	24.63	24.59
		1	50	24.74	23.86	24.41
		1	99	24.58	23.95	24.36
		50	0	23.04	24.17	23.54
		50	25	23.45	23.94	23.31
		50	50	23.86	23.81	23.20
		100	0	23.62	24.14	23.31
	16QAM	1	0	22.98	23.65	23.71
		1	50	23.80	23.30	23.61
		1	99	23.68	23.03	23.46
		50	0	22.53	23.64	22.99
		50	25	22.84	23.44	22.81
		50	50	23.30	23.31	22.77
		100	0	23.12	23.65	22.85

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20775CH	21100CH	21425CH
				2502.5MHz	2535MHz	2567.5MHz
7 / 5M	QPSK	1	0	24.36	24.68	25.36
		1	13	24.50	24.84	25.35
		1	24	23.98	24.36	24.67
		12	0	23.45	23.70	24.58
		12	6	23.50	23.78	24.62
		12	11	23.37	23.77	24.37
		25	0	23.34	23.68	24.41
	16QAM	1	0	23.49	23.98	24.77
		1	13	23.65	24.20	24.78
		1	24	23.10	23.72	24.08
		12	0	22.75	23.01	23.59
		12	6	22.81	23.16	23.64
		12	11	22.69	23.06	23.43
		25	0	22.64	22.96	23.43

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20800CH	21100CH	21400CH
				2505MHz	2535MHz	2565MHz
7 / 10M	QPSK	1	0	24.43	24.73	24.95
		1	25	24.45	25.01	25.52
		1	49	23.81	24.40	24.67
		25	0	23.26	23.62	24.36
		25	13	23.17	23.66	24.48
		25	25	23.04	23.55	24.34
		50	0	23.10	23.53	24.32
	16QAM	1	0	23.55	23.74	24.08
		1	25	23.56	23.98	24.68
		1	49	23.00	23.45	23.92
		25	0	22.36	22.74	23.62
		25	13	22.29	22.76	23.76
		25	25	22.12	22.62	23.57
		50	0	22.18	22.58	23.46

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20825CH	21100CH	21375CH
				2507.5MHz	2535MHz	2562.5MHz
7 / 15M	QPSK	1	0	24.17	24.40	24.28
		1	38	24.29	25.10	25.47
		1	74	23.80	24.12	24.47
		36	0	23.17	23.63	23.93
		36	18	23.16	23.74	24.37
		36	39	22.87	23.51	24.30
		75	0	22.99	23.52	24.14
	16QAM	1	0	23.24	23.52	23.43
		1	38	23.28	24.17	24.55
		1	74	22.53	23.33	23.72
		36	0	22.26	22.69	23.13
		36	18	22.27	22.82	23.55
		36	39	21.98	22.60	23.52
		75	0	22.10	22.57	23.28

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20850CH	21100CH	21350CH
				2510MHz	2535MHz	2560MHz
7 / 20M	QPSK	1	0	24.35	24.28	24.23
		1	50	24.32	25.17	25.20
		1	99	23.74	24.16	24.71
		50	0	23.25	23.52	23.96
		50	25	23.09	23.73	24.22
		50	50	22.81	23.60	24.34
		100	0	22.96	23.55	24.06
	16QAM	1	0	23.47	23.34	23.65
		1	50	23.33	23.94	24.42
		1	99	22.70	23.15	24.06
		50	0	22.36	22.53	23.02
		50	25	22.24	22.75	23.30
		50	50	21.94	22.65	23.44
		100	0	22.05	22.52	23.19

ERP Power (dBm):

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23017CH	23095CH	23173CH
				699.7MHz	707.5MHz	715.3MHz
12 / 1.4M	QPSK	1	0	22.52	22.81	22.71
		1	2	22.47	22.89	22.83
		1	5	22.32	22.69	22.66
		3	0	22.56	22.86	22.77
		3	1	22.56	22.90	22.80
		3	2	22.50	22.85	22.82
		6	0	22.30	22.72	22.66
	16QAM	1	0	21.84	22.16	22.01
		1	2	21.84	22.20	22.12
		1	5	21.71	22.06	22.03
		3	0	21.79	22.07	21.98
		3	1	21.75	22.09	22.00
		3	2	21.72	22.11	22.05
		6	0	21.49	21.87	21.89

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23025CH	23095CH	23165CH
				700.5MHz	707.5MHz	714.5MHz
12 / 3M	QPSK	1	0	22.42	22.67	22.35
		1	7	22.54	22.98	22.90
		1	14	22.26	22.45	22.52
		8	0	22.28	22.72	22.45
		8	4	22.34	22.74	22.65
		8	7	22.31	22.61	22.63
		15	0	22.28	22.65	22.57
	16QAM	1	0	21.78	22.09	21.61
		1	7	21.91	22.32	22.20
		1	14	21.51	21.85	21.86
		8	0	21.47	21.85	21.72
		8	4	21.61	21.88	21.88
		8	7	21.49	21.75	21.83
		15	0	21.50	21.75	21.69

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23035CH	23095CH	23155CH
				701.5MHz	707.5MHz	713.5MHz
12 / 5M	QPSK	1	0	22.66	23.11	22.57
		1	13	22.53	22.83	22.52
		1	24	23.03	22.62	22.69
		12	0	22.17	22.65	22.19
		12	6	22.28	22.68	22.32
		12	11	22.17	22.54	22.41
		25	0	22.24	22.42	22.21
	16QAM	1	0	22.04	22.62	21.99
		1	13	21.83	22.29	22.07
		1	24	22.07	22.18	22.26
		12	0	21.39	21.77	21.45
		12	6	21.44	21.79	21.66
		12	11	21.34	21.71	21.69
		25	0	21.42	21.64	21.44

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23060CH	23095CH	23130CH
				704MHz	707.5MHz	711MHz
12 / 10M	QPSK	1	0	22.60	22.72	23.10
		1	25	22.71	22.92	22.55
		1	49	22.44	22.14	22.59
		25	0	22.07	22.43	22.37
		25	13	22.35	22.56	22.28
		25	25	22.29	22.14	22.14
		50	0	22.20	22.31	22.22
	16QAM	1	0	22.01	22.16	21.84
		1	25	22.08	22.26	21.76
		1	49	21.76	21.65	21.91
		25	0	21.21	21.51	21.39
		25	13	21.48	21.63	21.36
		25	25	21.40	21.26	21.20
		50	0	21.30	21.44	21.30

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23205CH	23230CH	23255CH
				779.5MHz	782MHz	784.5MHz
13 / 5M	QPSK	1	0	22.64	22.72	23.23
		1	13	22.34	22.86	22.67
		1	24	23.02	22.87	22.55
		12	0	21.18	21.44	21.59
		12	6	21.18	21.90	21.56
		12	11	21.31	21.68	21.25
		25	0	21.30	21.51	21.38
	16QAM	1	0	21.58	21.46	22.09
		1	13	21.16	21.76	21.38
		1	24	21.89	21.81	21.33
		12	0	21.08	21.33	21.42
		12	6	21.02	21.75	21.41
		12	11	21.17	21.57	21.12
		25	0	21.09	21.40	21.19

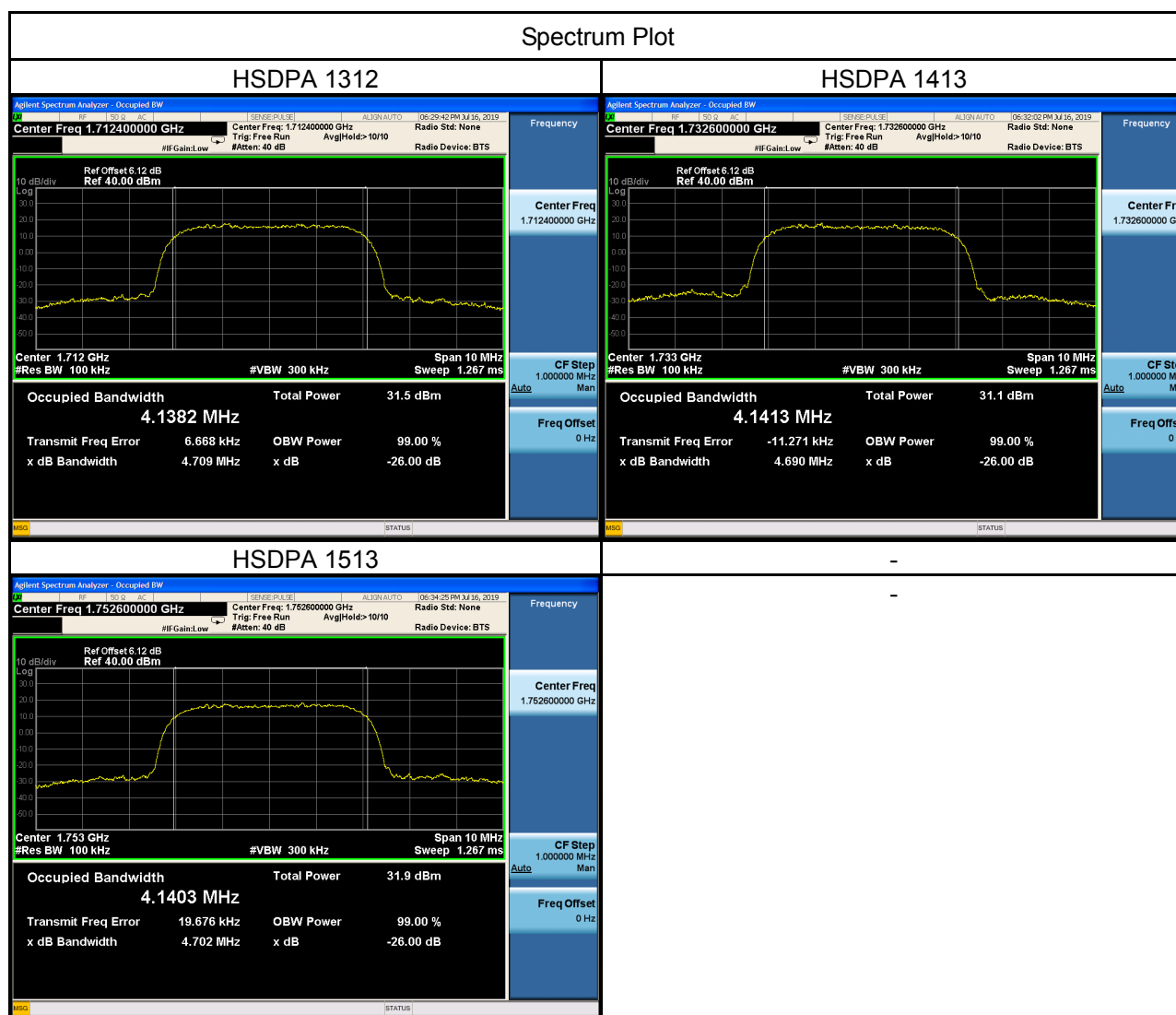
LTE Band / BW	Modulation	RB Size	RB Offset	Mid CH
				23230CH
				782MHz
13 / 10M	QPSK	1	0	22.67
		1	25	22.78
		1	49	22.44
		25	0	21.04
		25	13	21.52
		25	25	21.22
		50	0	21.23
	16QAM	1	0	21.38
		1	25	21.65
		1	49	21.08
		25	0	20.93
		25	13	21.27
		25	25	20.98
		50	0	20.97

APPENDIX B - OCCUPIED BANDWIDTH

WCDMA Band IV_WCDMA					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
1312	1712.4	4.1511	1312	1712.4	4.7060
1413	1732.6	4.1396	1413	1732.6	4.7010
1513	1752.6	4.1406	1513	1752.6	4.7080



WCDMA Band IV_HSDPA					
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
1312	1712.4	4.1382	1312	1712.4	4.7090
1413	1732.6	4.1413	1413	1732.6	4.6900
1513	1752.6	4.1403	1513	1752.6	4.7020

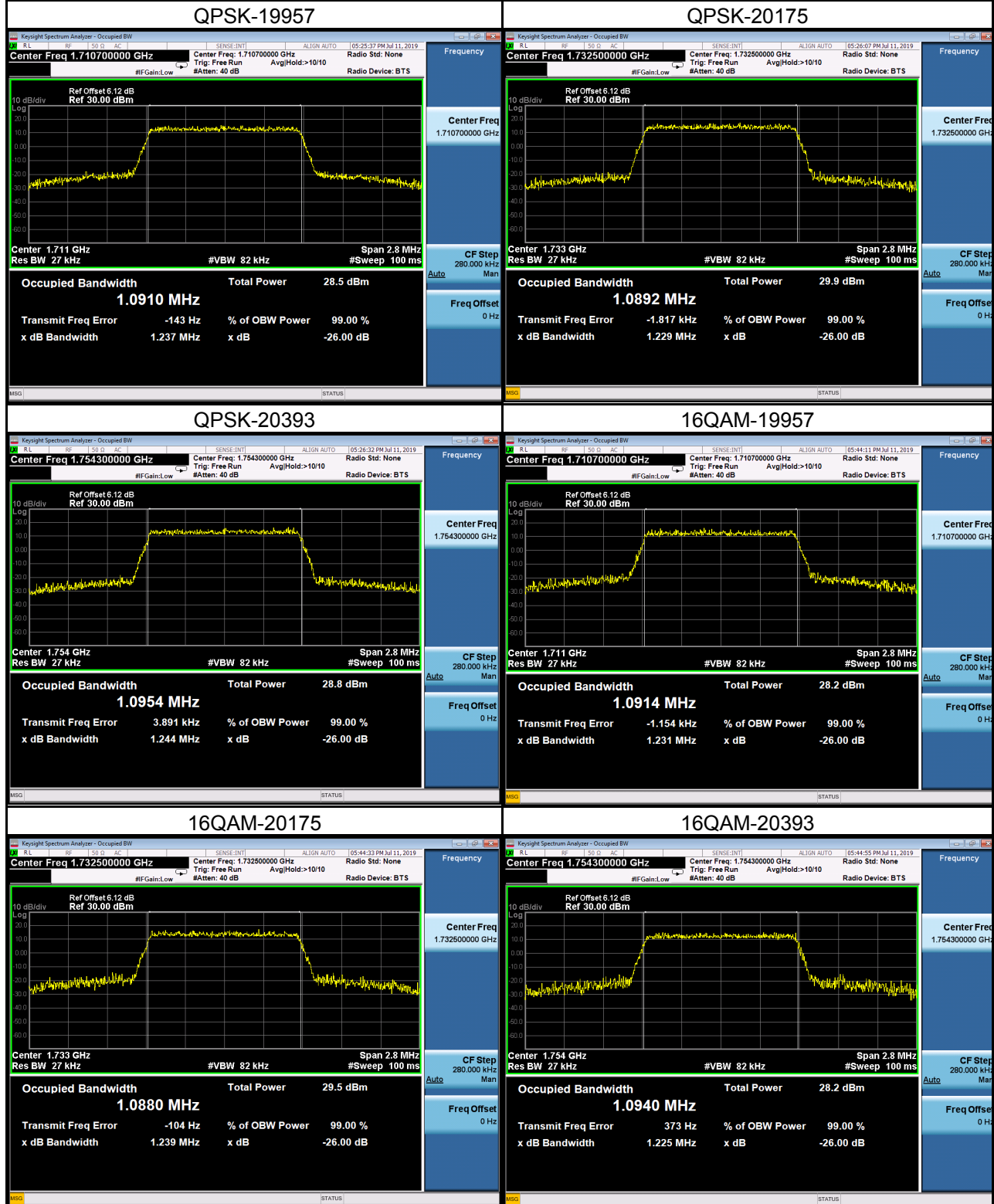


WCDMA Band IV_HSUPA					
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
1312	1712.4	4.1426	1312	1712.4	4.7180
1413	1732.6	4.1374	1413	1732.6	4.7070
1513	1752.6	4.1464	1513	1752.6	4.7080



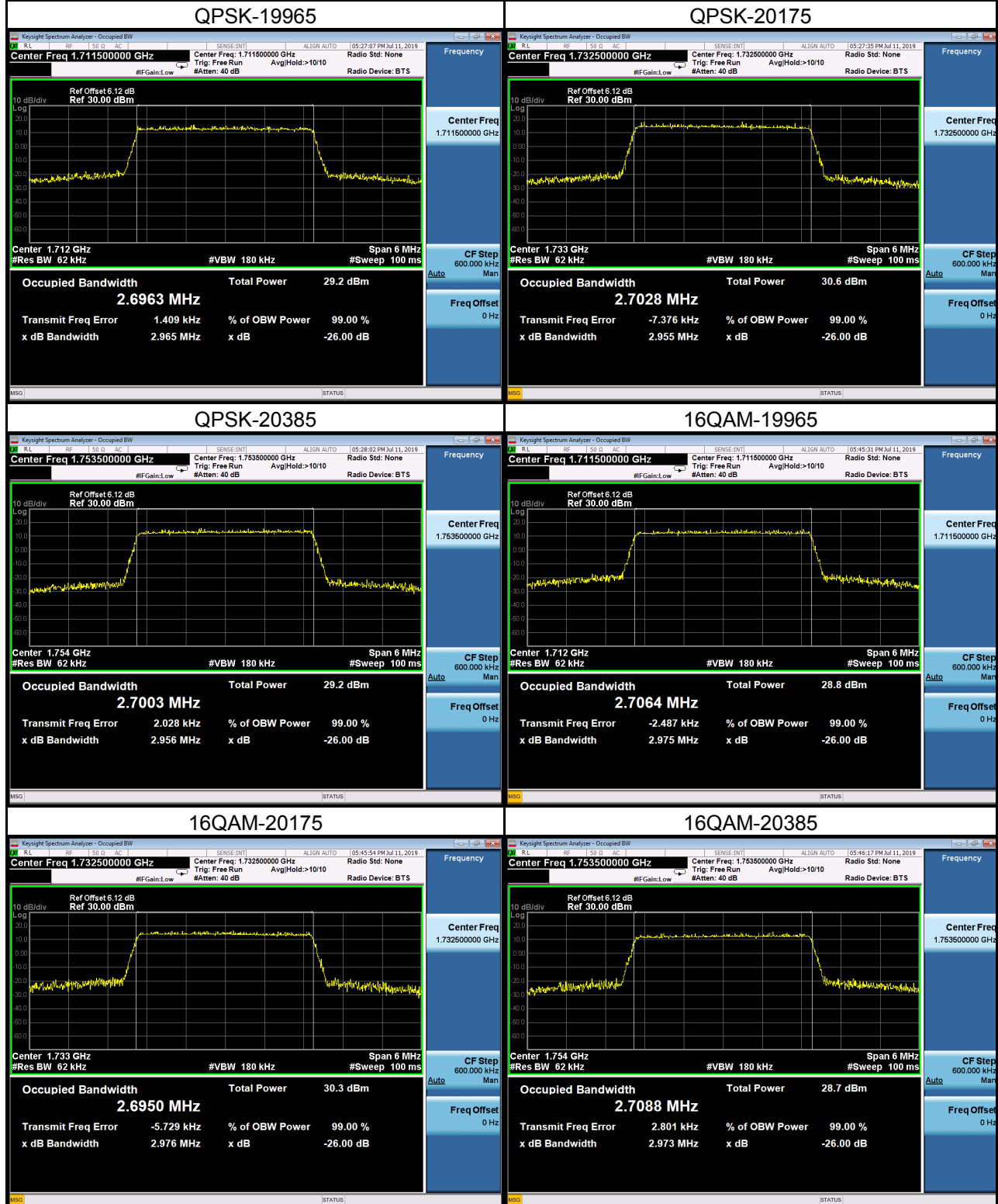
LTE Band 4_1.4M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
19957	1710.7	1.0910	19957	1710.7	1.0914
20175	1732.5	1.0892	20175	1732.5	1.0880
20393	1754.3	1.0954	20393	1754.3	1.0940
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19957	1710.7	1.2370	19957	1710.7	1.2310
20175	1732.5	1.2290	20175	1732.5	1.2390
20393	1754.3	1.2440	20393	1754.3	1.2250

Spectrum Plot



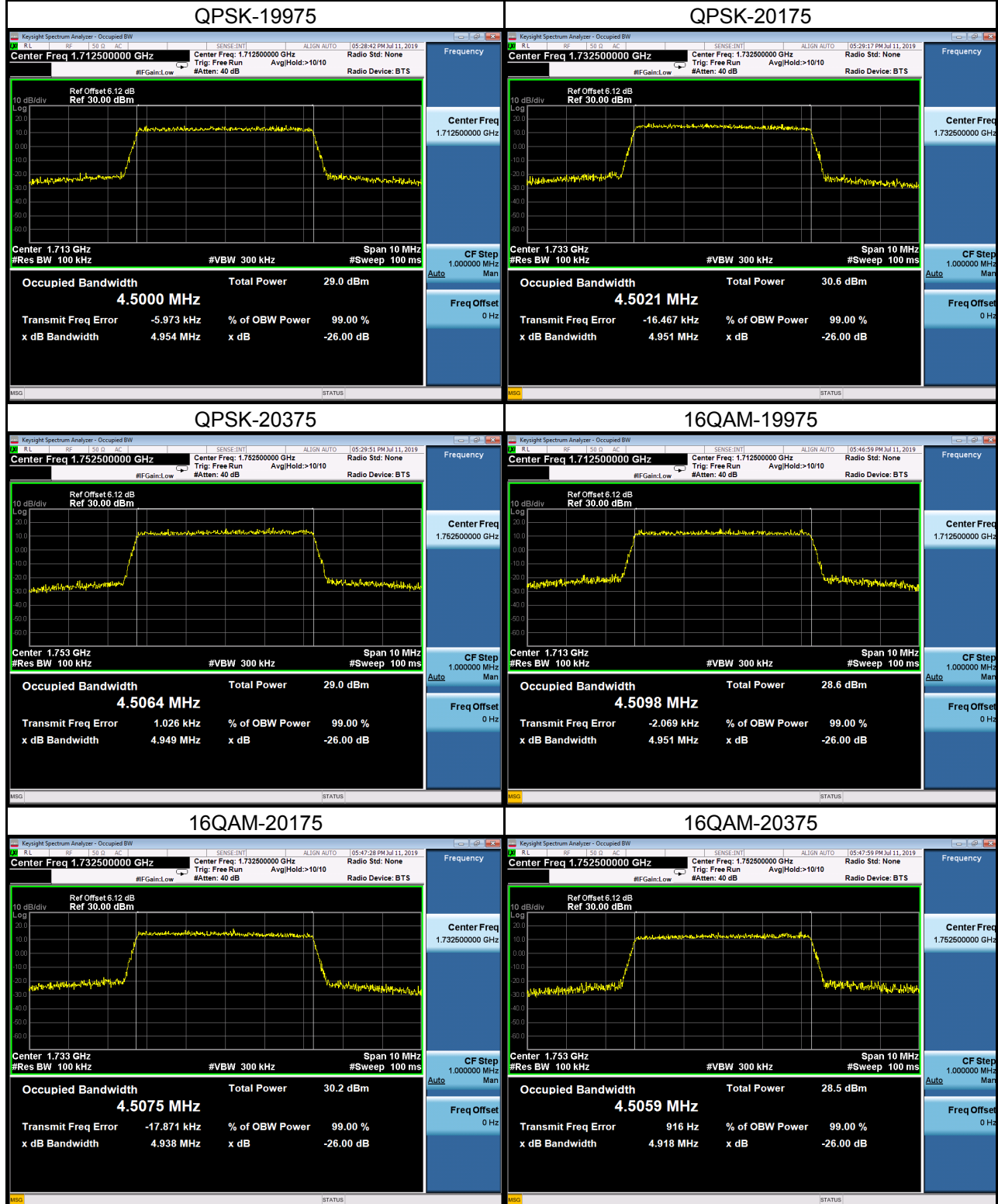
LTE Band 4_3M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
19965	1711.5	2.6963	19965	1711.5	2.7064
20175	1732.5	2.7028	20175	1732.5	2.6950
20385	1753.5	2.7003	20385	1753.5	2.7088
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19965	1711.5	2.9650	19965	1711.5	2.9750
20175	1732.5	2.9550	20175	1732.5	2.9760
20385	1753.5	2.9560	20385	1753.5	2.9730

Spectrum Plot



LTE Band 4_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
19975	1712.5	4.5000	19975	1712.5	4.5098
20175	1732.5	4.5021	20175	1732.5	4.5075
20375	1752.5	4.5064	20375	1752.5	4.5059
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19975	1712.5	4.9540	19975	1712.5	4.9510
20175	1732.5	4.9510	20175	1732.5	4.9380
20375	1752.5	4.9490	20375	1752.5	4.9180

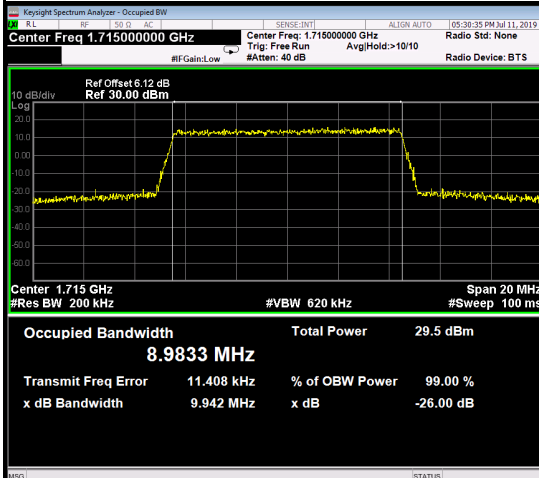
Spectrum Plot



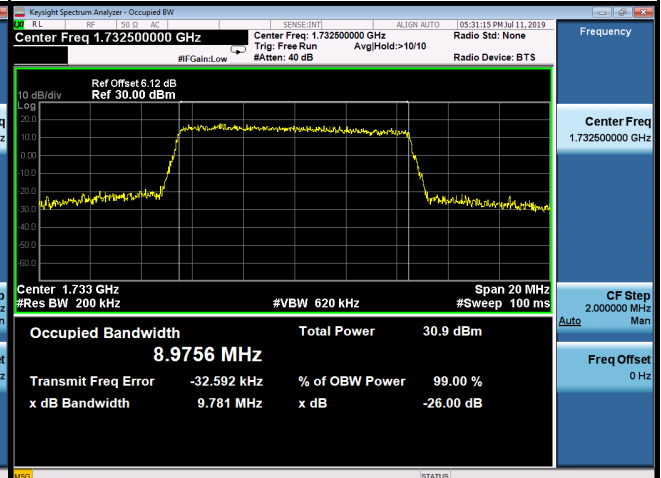
LTE Band 4_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20000	1715	8.9833	20000	1715	8.9975
20175	1732.5	8.9756	20175	1732.5	8.9705
20350	1750	8.9741	20350	1750	8.9861
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20000	1715	9.9420	20000	1715	9.9620
20175	1732.5	9.7810	20175	1732.5	9.8650
20350	1750	9.8600	20350	1750	9.7650

Spectrum Plot

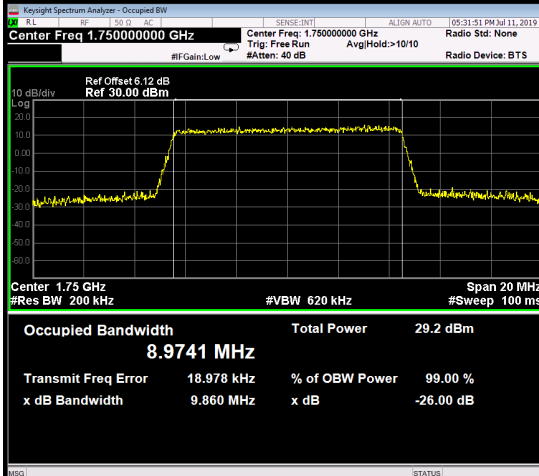
QPSK-20000



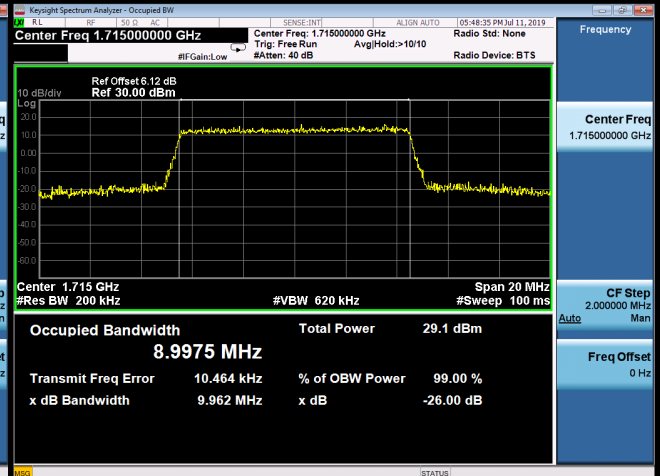
QPSK-20175



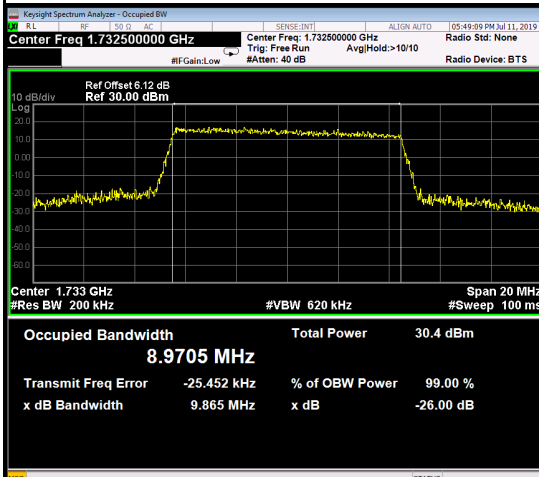
QPSK-20350



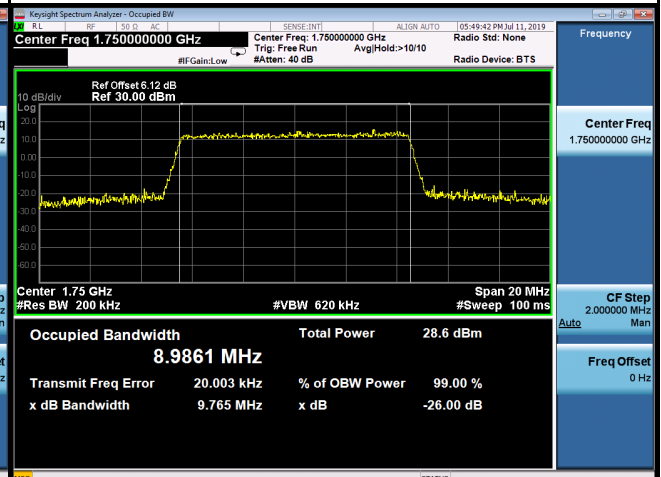
16QAM-20000



16QAM-20175

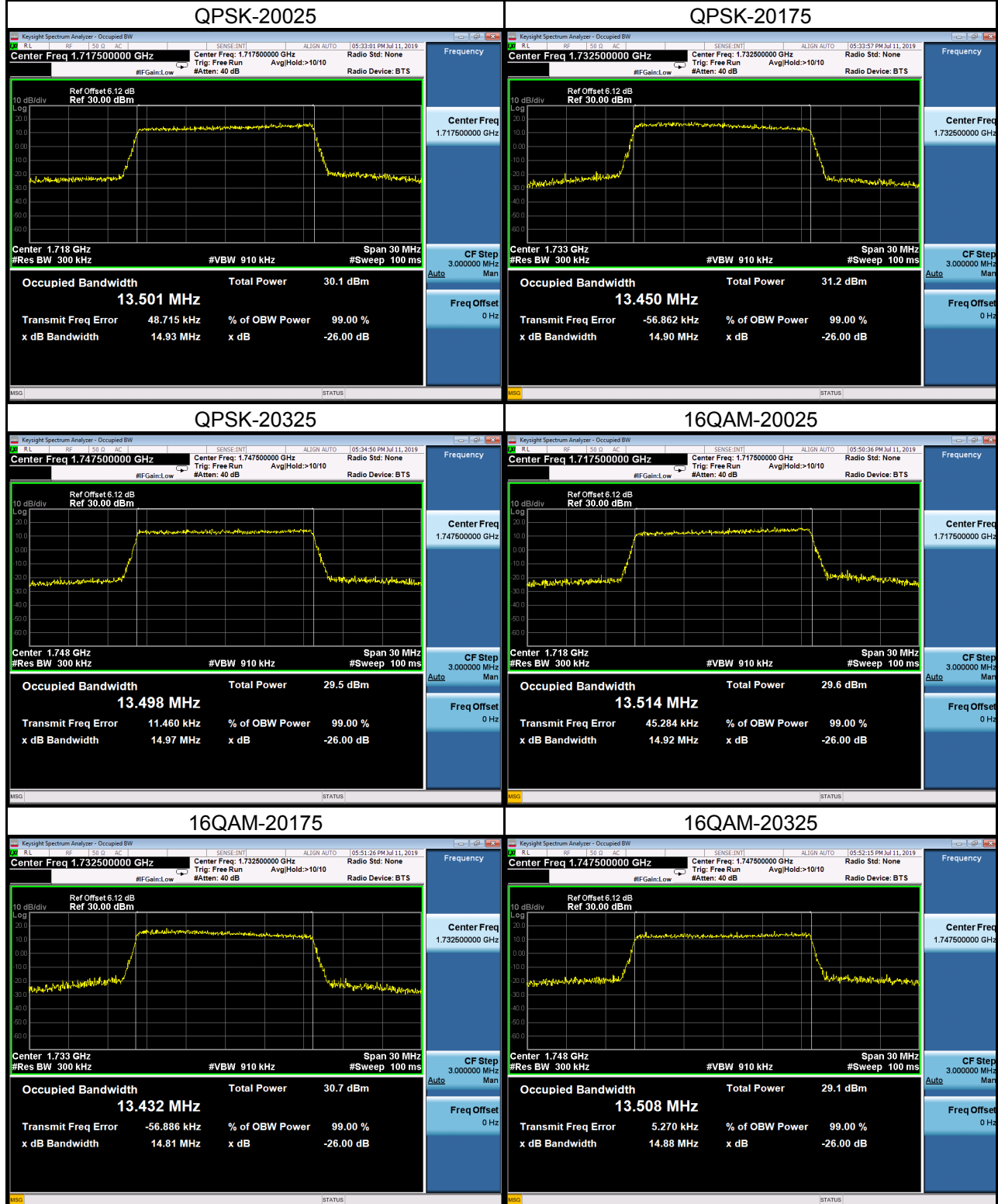


16QAM-20350



LTE Band 4_15M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20025	1717.5	13.5010	20025	1717.5	13.5140
20175	1732.5	13.4500	20175	1732.5	13.4320
20325	1747.5	13.4980	20325	1747.5	13.5080
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20025	1717.5	14.9300	20025	1717.5	14.9200
20175	1732.5	14.9000	20175	1732.5	14.8100
20325	1747.5	14.9700	20325	1747.5	14.8800

Spectrum Plot



LTE Band 4_20M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20050	1720	17.9260	20050	1720	17.9880
20175	1732.5	17.8440	20175	1732.5	17.8710
20300	1745	18.0650	20300	1745	18.0990
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20050	1720	19.6500	20050	1720	19.6400
20175	1732.5	19.6100	20175	1732.5	19.6500
20300	1745	19.7700	20300	1745	19.8700

Spectrum Plot

