

FCC Radio Test Report

FCC ID: 2AB7X-WISEPOSPRO

This report concerns: Original Grant

Project No. : 1906H001
Equipment : WisePOS Pro
Test Model : WSP71
Series Model : WSP72, WSP73
Applicant : BBPOS International Limited
Address : Suite 1903-04, 19/F, Tower 2, Nina Tower, No. 8
Yeung Uk Road, Tsuen Wan, N.T. HK

Date of Receipt : Jun. 25, 2019
Date of Test : Jun. 25, 2019 ~ Aug. 28, 2019
Issued Date : Sep. 12, 2019
Tested by : BTL Inc.

Technical Manager :

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Certificate #5123.03

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 is not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	Sep. 12, 2019

1. GENERAL SUMMARY

Equipment : WisePOS Pro
Brand Name : BBPOS
Test Model : WSP71
Series Model : WSP72, WSP73
Applicant : BBPOS International Limited
Manufacturer : BBPOS International Limited
Address : Suite 1903-04, 19/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, N.T. HK
Date of Test : Jun. 25, 2019 ~ Aug. 28, 2019
Test Sample : Engineering Sample No.: SH19070367
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-3-1906H001) 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, 17 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	Summer Xu
2.1049	Occupied Bandwidth	PASS	Summer Xu
2.1051 27.53(c)(2)(4) 27.53(g) 27.53(h) 27.53(m)(4)	Conducted Spurious Emissions	PASS	Summer Xu
2.1053 27.53(c)(2) 27.53(f) 27.53(g) 27.53(h) 27.53(m)(4)	Radiated Spurious Emissions	PASS	Summer Xu
2.1051 27.53(c)(2)(4) 27.53(g) 27.53(h) 27.53(m)(4)	Band Edge Measurements	PASS	Summer Xu
-	Peak To Average Ratio	PASS	Summer Xu
2.1055 27.54	Frequency Stability	PASS	Summer Xu

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, China.

BTL's Test Firm Registration Number for FCC: 476765

BTL's Designation Number for FCC: CN1241

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)
SH-CB01 (3m)	CISPR	9KHz ~ 30MHz	V	3.79
		9KHz ~ 30MHz	H	3.57
		30MHz ~ 200MHz	V	4.12
		30MHz ~ 200MHz	H	3.20
		200MHz ~ 1,000MHz	V	3.12
		200MHz ~ 1,000MHz	H	3.18

Test Site	Method	Measurement Frequency Range	U,(dB)
SH-CB01 (3m)	CISPR	1GHz ~ 6GHz	4.40
		6GHz ~ 18GHz	4.86

Test Site	Method	Measurement Frequency Range	U,(dB)
SH-CB01 (3m)	CISPR	18 ~ 26.5 GHz	3.64
		26.5 ~ 40 GHz	3.78

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	WisePOS Pro	
Brand Name	BBPOS	
Test Model	WSP71	
Series Model	WSP72, WSP73	
Model Difference(s)	WSP71: WisePOS Pro device only; WSP72: WisePOS Pro device with hand strap; WSP73: WisePOS Pro device with pistol grip.	
Software Version	970ADGAAK2_BB_V009	
Hardware Version	7MD_V01	
Antenna Type	External Antenna	
Antenna Gain	WCDMA IV	2.2 dBi
	LTE Band 4	2.2 dBi
	LTE Band 7	2.5 dBi
	LTE Band 12	1.2 dBi
	LTE Band 13	1.2 dBi
	LTE Band 17	1.2 dBi
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
	LTE Band 17 (Channel Bandwidth: 5MHz)	706.5 MHz ~ 713.5 MHz
	LTE Band 17 (Channel Bandwidth: 10MHz)	709.0 MHz ~ 711.0 MHz

Max. EIRP Power	WCDMA Band IV (WCDMA)	QPSK	23.86	dBm
	WCDMA Band IV (HSDPA)	16QAM	22.75	dBm
	WCDMA Band IV (HSUPA)	16QAM	22.84	dBm
	LTE Band 4 (Channel Bandwidth: 1.4MHz)	QPSK	23.96	dBm
		16QAM	23.23	dBm
	LTE Band 4 (Channel Bandwidth: 3MHz)	QPSK	24.09	dBm
		16QAM	23.40	dBm
	LTE Band 4 (Channel Bandwidth: 5MHz)	QPSK	24.05	dBm
		16QAM	23.43	dBm
	LTE Band 4 (Channel Bandwidth: 10MHz)	QPSK	24.12	dBm
		16QAM	23.39	dBm
	LTE Band 4 (Channel Bandwidth: 15MHz)	QPSK	24.00	dBm
		16QAM	23.36	dBm
	LTE Band 4 (Channel Bandwidth: 20MHz)	QPSK	24.11	dBm
		16QAM	23.56	dBm
	LTE Band 7 (Channel Bandwidth: 5MHz)	QPSK	25.16	dBm
		16QAM	24.42	dBm
	LTE Band 7 (Channel Bandwidth: 10MHz)	QPSK	25.27	dBm
		16QAM	24.41	dBm
	LTE Band 7 (Channel Bandwidth: 15MHz)	QPSK	25.15	dBm
16QAM		24.35	dBm	
LTE Band 7 (Channel Bandwidth: 20MHz)	QPSK	25.21	dBm	
	16QAM	24.43	dBm	
Max. ERP Power	LTE Band 12 (Channel Bandwidth: 1.4MHz)	QPSK	21.33	dBm
		16QAM	20.59	dBm
	LTE Band 12 (Channel Bandwidth: 3MHz)	QPSK	21.39	dBm
		16QAM	20.86	dBm
	LTE Band 12 (Channel Bandwidth: 5MHz)	QPSK	21.32	dBm
		16QAM	20.85	dBm
	LTE Band 12 (Channel Bandwidth: 10MHz)	QPSK	21.39	dBm
		16QAM	20.78	dBm
	LTE Band 13 (Channel Bandwidth: 5MHz)	QPSK	21.36	dBm
		16QAM	20.92	dBm
	LTE Band 13 (Channel Bandwidth: 10MHz)	QPSK	21.25	dBm
		16QAM	20.49	dBm
LTE Band 17 (Channel Bandwidth: 5MHz)	QPSK	21.32	dBm	
	16QAM	20.71	dBm	
LTE Band 17 (Channel Bandwidth: 10MHz)	QPSK	21.35	dBm	
	16QAM	20.75	dBm	
Power Source	1. DC Voltage supplied from AC/DC adapter 2. Supplied from Li-ion battery pack			
Power Rating	1. I/P: 100-240V ~ 50/60Hz 1.0A O/P: 5V---3A/9V---3A 2. 6400mAH 3.8V			

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. WCDMA (UL:QPSK; DL: QPSK) mode was found to be the worst case and recorded.

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
Peak to Average Ratio	1312 to 1513	1312, 1413, 1513	WCDMA
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

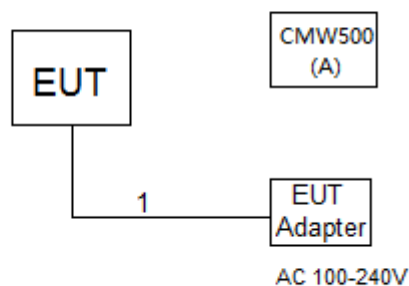
LTE BAND 13 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & ERP	23205 to 23255	23205, 23230, 23255	5MHz	QPSK, 16QAM	1RB/12RB/25RB
		23230	10MHz	QPSK, 16QAM	1RB/25RB/50RB
Occupied Bandwidth	23205 to 23255	23230	5MHz	QPSK, 16QAM	25RB
	23205 to 23255	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

LTE BAND 17 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & ER	706.5 to 713.5	23755, 23790, 23825	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	709.0 to 711.0	23780, 23790, 23775	10MHz	QPSK, 16QAM	1RB/25RB/50RB
Occupied Bandwidth	706.5 to 713.5	23755, 23790, 23825	5MHz	QPSK, 16QAM	25RB
	709.0 to 711.0	23780, 23790, 23775	10MHz	QPSK, 16QAM	50RB
Conducted Spurious Emission	706.5 to 713.5	23790	5MHz	QPSK	1 RB
	709.0 to 711.0	23790	10MHz	QPSK	1 RB
Radiated Spurious Emission	706.5 to 713.5	23755	5MHz	QPSK	1 RB
	709.0 to 711.0	23755	10MHz	QPSK	1 RB
Band Edge	706.5 to 713.5	23755	5MHz	QPSK	1RB/25RB
		23825	5MHz	QPSK	
	709.0 to 711.0	23780	10MHz	QPSK	1RB/50RB
		23775	10MHz	QPSK	
Peak To Average Ratio	706.5 to 713.5	23755, 23790, 23825	5MHz	QPSK, 16QAM	1 RB
	709.0 to 711.0	23780, 23790, 23775	10MHz	QPSK, 16QAM	1 RB
Frequency Stability	706.5 to 713.5	23790	5MHz	QPSK	1 RB
	709.0 to 711.0	23790	10MHz	QPSK	1 RB

EUT TEST CONDITIONS:

Test Item	Environmental Conditions	Test Voltage
EIRP/ERP	24.5°C, 53%RH	DC 4.0V
Output Power	24.5°C, 53%RH	DC 4.0V
Occupied Bandwidth	24.5°C, 53%RH	DC 4.0V
Conducted Emission	24.5°C, 53%RH	DC 4.0V
Radiated Emission	22°C, 55%RH	AC 120V/60Hz
Band Edge	24.5°C, 53%RH	DC 4.0V
Peak to Average Ratio	24.5°C, 53%RH	DC 4.0V
Frequency Stability	Normal and Extreme	Normal and Extreme

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.4 DESCRIPTION OF SUPPORT UNITS

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

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
A	CMW500	N/A	N/A	131463

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

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, LTE Band 17)

4.1.2 TEST PROCEDURE

EIRP/ERP:

EIRP= Conducted Power +Antenan gain

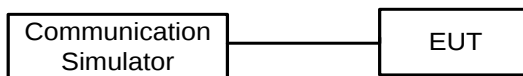
ERP power=EIPR power-2.15dBi.

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

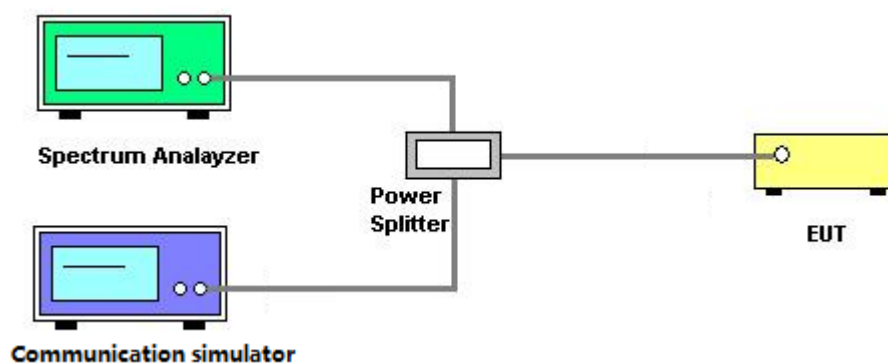
Please refer to the Appendix A.

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

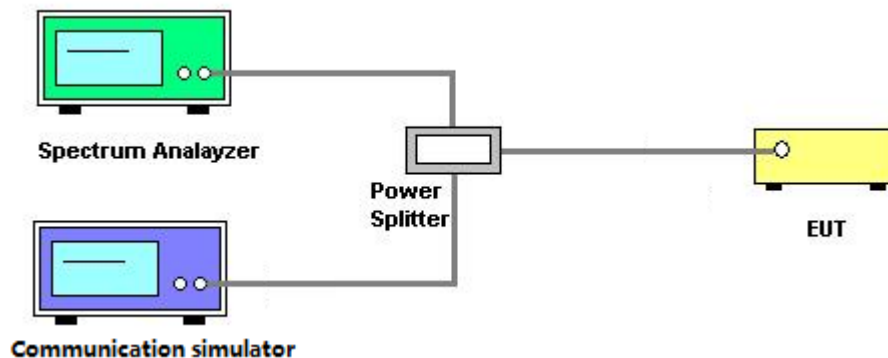
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13dBm. (WCDMA Band IV, LTE Band 4, Band 12, Band 13, Band 17)

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, Band 17)

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)

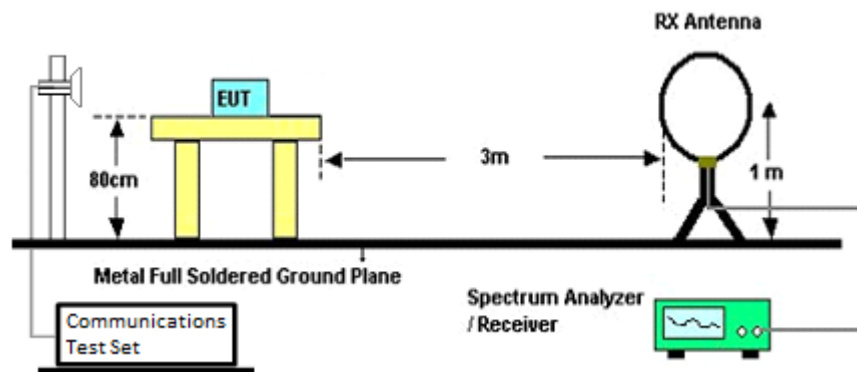
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log(P)$ dB. For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -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

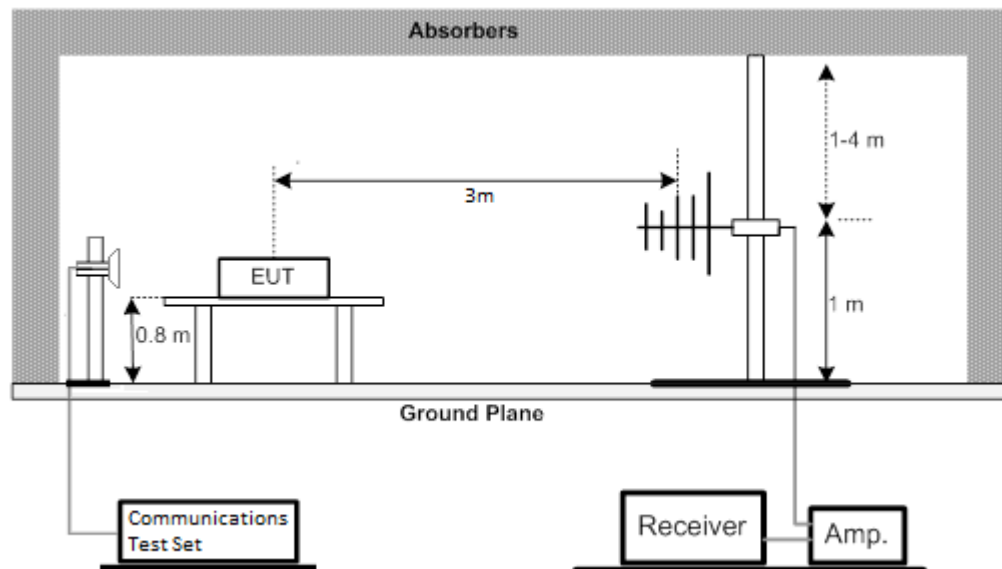
1. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. 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. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn.}$
4. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15\text{dBi.}$
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.4.3 TEST SETUP LAYOUT

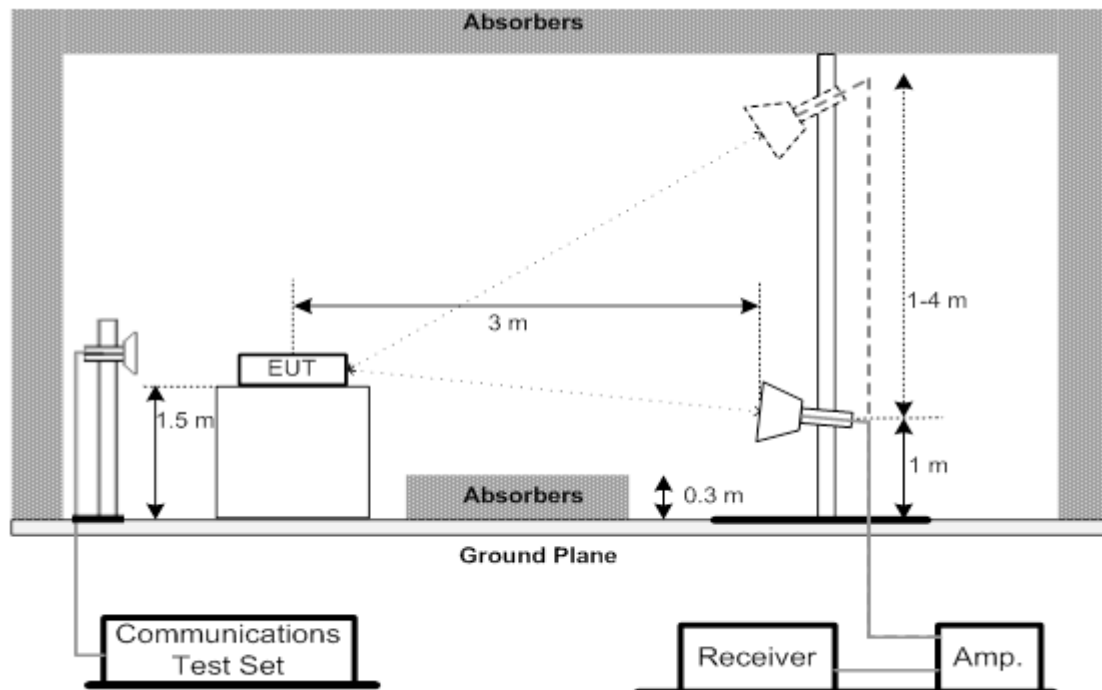
Below 30MHz



30MHz to 1GHz



Above 1GHz



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, Band 17)

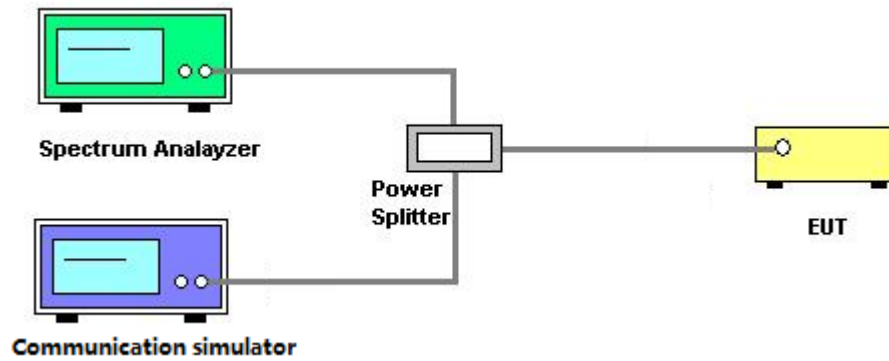
For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ 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

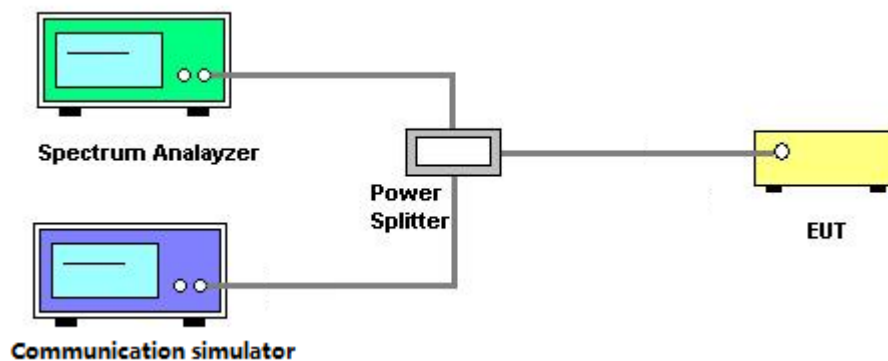
4.6.1 LIMIT

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

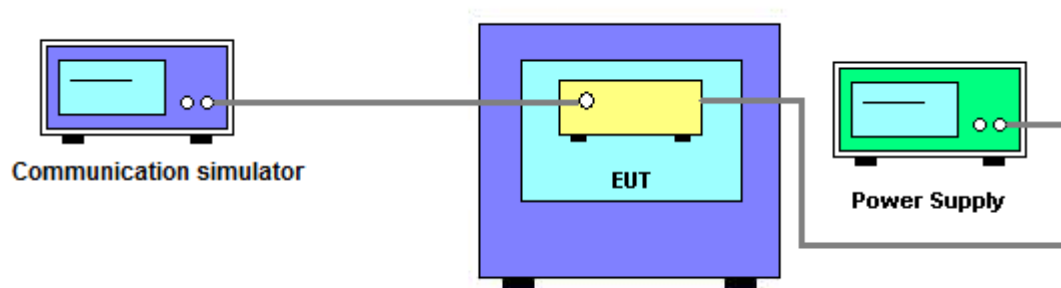
4.7.1 LIMIT

± 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(9K-30M)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Loop Antenna	EMCI	EMCI LPA600	275	Mar. 29, 2020
2	EMI Test Receiver	R&S	ESCI	100082	Mar. 29, 2020
3	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

For WCDMA

Radiated Emission Measurement(30M-1G)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	719	Mar. 29, 2020
2	Pre-Amplifier	emci	EMC9135	980400	Mar. 29, 2020
3	MXE EMI Receiver	Keysight	N9038A	MY57150106	Mar. 29, 2020
4	Test Cable	emci	EMC104-SM-SM-7000	170330	Apr. 17, 2020
5	Test Cable	emci	EMC104-SM-SM-1000	170331	Apr. 17, 2020
6	Test Cable	emci	EMC104-SM-NM-3500	170621	Apr. 17, 2020
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	8960 SERIES 10 WIRELESS COMMUNICATIONS TEST SET	Agilent	E5515C	GB45070942	Nov. 20, 2019

Radiated Emission Measurement(1G-18G)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Pre-Amplifier	emci	EMC184045SE	980409	Mar. 29, 2020
2	Pre-Amplifier	emci	EMC012645SE	980421	Mar. 29, 2020
3	Pre-Amplifier	emci	EMC9135	980400	Mar. 29, 2020
4	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1787	Mar. 29, 2020
5	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	3116C	00203919	Mar. 29, 2020
6	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	719	Mar. 29, 2020
7	Cable	N/A	EMC102-SM-SM-6000	170336	Apr. 17, 2020
8	8960 SERIES 10 WIRELESS COMMUNICATIONS TEST SET	Agilent	E5515C	GB45070942	Nov. 20, 2019

For LTE

Radiated Emission Measurement(30M-1G)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	719	Mar. 29, 2020
2	Pre-Amplifier	emci	EMC9135	980400	Mar. 29, 2020
3	MXE EMI Receiver	Keysight	N9038A	MY57150106	Mar. 29, 2020
4	Test Cable	emci	EMC104-SM-SM-7000	170330	Apr. 17, 2020
5	Test Cable	emci	EMC104-SM-SM-1000	170331	Apr. 17, 2020
6	Test Cable	emci	EMC104-SM-NM-3500	170621	Apr. 17, 2020
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	Wideband Radio Communication Test	R&S	CMW500	131463	Nov. 20, 2019

Radiated Emission Measurement(1G-18G)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Pre-Amplifier	emci	EMC184045SE	980409	Mar. 29, 2020
2	Pre-Amplifier	emci	EMC012645SE	980421	Mar. 29, 2020
3	Pre-Amplifier	emci	EMC9135	980400	Mar. 29, 2020
4	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1787	Mar. 29, 2020
5	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	3116C	00203919	Mar. 29, 2020
6	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	719	Mar. 29, 2020
7	Cable	N/A	EMC102-SM-SM-6000	170336	Apr. 17, 2020
8	Wideband Radio Communication Test	R&S	CMW500	131463	Nov. 20, 2019

For WCDMA

Conducted Emission & Band Edge & Occupied Bandwidth Measurement					
	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	8960 SERIES 10 WIRELESS COMMUNICATIONS TEST SET	Agilent	E5515C	GB45070942	Nov. 20, 2019
2	Spectrum Analyzer	R&S	FSP40	100626	Mar. 29, 2020
3	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 29, 2020
4	Power Divider	JUK	PD-2SF-2060	N/A	N/A

Frequency Stability Measurement					
	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	8960 SERIES 10 WIRELESS COMMUNICATIONS TEST SET	Agilent	E5515C	GB45070942	Nov. 20, 2019
2*	Spectrum Analyzer	R&S	FSP40	100626	Mar. 29, 2020
3	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 29, 2020
4	Power Divider	JUK	PD-2SF-2060	N/A	N/A
5	Temperature And Humidity Box	Blue pand	BPHS-120B	170616454	Nov. 20, 2019

For LTE

Conducted Emission & Band Edge & Occupied Bandwidth Measurement					
	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 29, 2020
2	Power Divider	JUK	PD-4SF-2060	N/A	N/A
3	Wideband Radio Communication Test	R&S	CMW500	131463	Nov. 20, 2019
4	Spectrum Analyzer	R&S	FSP40	100626	Mar. 29, 2020

Frequency Stability Measurement					
	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 29, 2020
2*	Power Divider	JUK	PD-4SF-2060	N/A	N/A
3	Wideband Radio Communication Test	R&S	CMW500	131463	Nov. 20, 2019
4	Spectrum Analyzer	R&S	FSP40	100626	Mar. 29, 2020
5	Temperature And Humidity Box	Blue pand	BPHS-120B	170616454	Nov. 20, 2019

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	22.50	21.59	21.40
16QAM	HSDPA Subtest-1	21.50	20.55	20.30
	HSDPA Subtest-2	21.50	20.04	19.81
	HSDPA Subtest-3	21.00	19.41	19.47
	HSDPA Subtest-4	20.50	19.44	18.83
16QAM	HSUPA Subtest-1	21.50	20.42	20.29
	HSUPA Subtest-2	21.50	20.64	20.40
	HSUPA Subtest-3	21.00	19.58	19.58
	HSUPA Subtest-4	21.50	20.64	20.52
	HSUPA Subtest-5	21.00	20.09	20.07

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	21.61	21.68	21.65
		1	2	21.69	21.73	21.76
		1	5	21.60	21.63	21.67
		3	0	21.66	21.67	21.68
		3	1	21.70	21.72	21.72
		3	2	21.72	21.69	21.70
	16QAM	6	0	20.73	20.68	20.70
		1	0	20.63	20.73	20.94
		1	2	20.69	20.80	21.03
		1	5	20.61	20.71	20.94
		3	0	20.79	20.71	20.82
		3	1	20.84	20.73	20.84
		3	2	20.85	20.70	20.80
		6	0	19.89	19.86	19.63

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	21.68	21.74	21.70
		1	7	21.84	21.89	21.82
		1	14	21.73	21.73	21.66
		8	0	20.71	20.70	20.70
		8	4	20.75	20.75	20.74
		8	7	20.70	20.69	20.70
		15	0	20.71	20.68	20.69
	16QAM	1	0	20.60	21.05	20.69
		1	7	20.73	21.20	20.86
		1	14	20.59	21.06	20.62
		8	0	19.87	19.86	19.80
		8	4	19.90	19.88	19.84
		8	7	19.85	19.80	19.76
		15	0	19.75	19.79	19.71

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	21.73	21.62	21.65
		1	13	21.85	21.78	21.79
		1	24	21.72	21.62	21.63
		12	0	20.71	20.70	20.72
		12	6	20.74	20.76	20.75
		12	11	20.72	20.73	20.73
		25	0	20.69	20.70	20.68
	16QAM	1	0	20.77	21.08	20.71
		1	13	20.88	21.23	20.80
		1	24	20.76	21.07	20.66
		12	0	19.82	19.85	19.80
		12	6	19.85	19.91	19.84
		12	11	19.83	19.91	19.80
		25	0	19.77	19.83	19.69

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	21.71	21.68	21.66
		1	25	21.92	21.86	21.86
		1	49	21.72	21.66	21.64
		25	0	20.74	20.74	20.73
		25	13	20.75	20.74	20.69
		25	25	20.74	20.73	20.67
		50	0	20.74	20.76	20.71
	16QAM	1	0	21.00	20.70	20.59
		1	25	21.19	20.88	20.75
		1	49	21.01	20.65	20.52
		25	0	19.84	19.93	19.83
		25	13	19.85	19.91	19.78
		25	25	19.85	19.89	19.73
		50	0	19.83	19.85	19.77

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	21.71	21.74	21.72
		1	38	21.76	21.80	21.76
		1	74	21.62	21.67	21.69
		36	0	20.83	20.64	20.80
		36	18	20.80	20.80	20.79
		36	39	20.78	20.76	20.71
		75	0	20.78	20.77	20.78
	16QAM	1	0	21.01	21.09	20.60
		1	38	21.10	21.16	20.62
		1	74	21.00	21.03	20.49
		36	0	19.87	20.09	19.83
		36	18	19.86	19.77	19.80
		36	39	19.84	19.75	19.73
		75	0	19.84	19.80	19.78

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	21.63	21.66	21.65
		1	50	21.87	20.69	21.89
		1	99	21.89	21.71	21.91
		50	0	20.76	20.74	20.76
		50	25	20.74	20.75	20.74
		50	50	20.71	20.70	20.79
		100	0	20.77	20.75	20.71
	16QAM	1	0	21.08	21.03	20.95
		1	50	21.36	19.77	21.19
		1	99	21.09	20.99	20.89
		50	0	19.80	19.81	19.80
		50	25	19.84	19.83	19.77
		50	50	19.77	19.77	19.63
		100	0	19.84	19.79	19.78

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	22.34	22.56	22.45
		1	13	22.47	22.66	22.64
		1	24	22.32	22.53	22.53
		12	0	21.40	21.56	21.58
		12	6	21.45	21.58	21.64
		12	11	21.45	21.54	21.64
		25	0	21.39	21.54	21.57
	16QAM	1	0	21.36	21.56	21.86
		1	13	21.48	21.68	21.92
		1	24	21.34	21.55	21.90
		12	0	20.34	20.61	20.65
		12	6	20.43	20.63	20.72
		12	11	20.41	20.63	20.74
		25	0	20.31	20.56	20.67

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	22.37	22.57	22.51
		1	25	22.56	22.77	22.77
		1	49	22.42	22.49	22.58
		25	0	21.37	21.57	21.59
		25	13	21.42	21.57	21.61
		25	25	21.46	21.58	21.61
		50	0	21.40	21.58	21.59
	16QAM	1	0	21.26	21.80	21.46
		1	25	21.41	21.91	21.61
		1	49	21.28	21.75	21.42
		25	0	20.34	20.63	20.73
		25	13	20.42	20.63	20.73
		25	25	20.43	20.65	20.71
		50	0	20.37	20.64	20.66

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	22.36	22.54	22.47
		1	38	22.48	22.65	22.65
		1	74	22.38	22.42	22.51
		36	0	21.40	21.64	21.72
		36	18	21.52	21.64	21.71
		36	39	21.51	21.66	21.70
		75	0	21.45	21.64	21.70
	16QAM	1	0	21.59	21.73	21.34
		1	38	21.69	21.85	21.45
		1	74	21.65	21.74	21.32
		36	0	20.38	20.52	20.61
		36	18	20.45	20.57	20.62
		36	39	20.44	20.54	20.65
		75	0	20.41	20.61	20.63

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	22.27	22.34	22.40
		1	50	22.50	22.65	22.68
		1	99	22.51	22.70	22.71
		50	0	21.30	21.55	21.61
		50	25	21.38	21.55	21.59
		50	50	21.33	21.59	21.62
		100	0	21.30	21.54	21.57
	16QAM	1	0	21.58	21.64	21.85
		1	50	21.89	21.92	21.93
		1	99	21.63	21.68	21.86
		50	0	20.31	20.52	20.60
		50	25	20.35	20.54	20.59
		50	50	20.29	20.56	20.57
		100	0	20.27	20.56	20.62

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	22.08	22.11	22.11
		1	2	22.15	22.18	22.23
		1	5	22.07	22.11	22.14
		3	0	22.18	22.22	22.19
		3	1	22.24	22.27	22.26
		3	2	22.20	22.28	22.24
		6	0	21.14	21.17	21.16
	16QAM	1	0	21.26	21.33	21.45
		1	2	21.30	21.45	21.54
		1	5	21.23	21.36	21.48
		3	0	21.44	21.36	21.34
		3	1	21.53	21.38	21.36
		3	2	21.45	21.35	21.36
		6	0	20.40	20.43	20.10

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	22.12	22.20	22.14
		1	7	22.28	22.34	22.26
		1	14	22.14	22.22	22.13
		8	0	21.13	21.16	21.17
		8	4	21.22	21.22	21.21
		8	7	21.16	21.15	21.15
		15	0	21.21	21.23	21.16
	16QAM	1	0	21.23	21.63	21.21
		1	7	21.28	21.81	21.30
		1	14	21.12	21.70	21.16
		8	0	20.34	20.42	20.25
		8	4	20.37	20.46	20.28
		8	7	20.34	20.39	20.20
		15	0	20.26	20.35	20.15

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	22.14	22.17	22.07
		1	13	22.27	22.26	22.20
		1	24	22.14	22.15	22.10
		12	0	21.05	21.30	21.09
		12	6	21.23	21.30	21.21
		12	11	21.20	21.28	21.13
		25	0	21.11	21.34	21.07
	16QAM	1	0	21.38	21.67	21.22
		1	13	21.41	21.80	21.28
		1	24	21.29	21.70	21.17
		12	0	20.15	20.49	20.15
		12	6	20.33	20.52	20.27
		12	11	20.32	20.52	20.19
		25	0	20.18	20.47	20.06

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	22.05	22.18	22.10
		1	25	22.23	22.30	22.27
		1	49	22.27	22.31	22.34
		25	0	21.17	21.48	21.21
		25	13	21.21	21.33	21.29
		25	25	21.11	21.54	21.31
		50	0	21.17	21.54	21.26
	16QAM	1	0	21.60	21.17	21.18
		1	25	21.73	21.44	21.31
		1	49	21.65	21.20	21.04
		25	0	20.22	20.61	20.33
		25	13	20.32	20.50	20.38
		25	25	20.24	20.73	20.29
		50	0	20.26	20.62	20.27

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	22.23	22.22	22.07
		1	13	22.31	22.29	22.23
		1	24	22.20	22.23	22.08
		12	0	21.32	21.28	21.23
		12	6	21.38	21.30	21.32
		12	11	21.41	21.32	21.27
		25	0	21.37	21.34	21.22
	16QAM	1	0	21.41	21.77	21.34
		1	13	21.53	21.87	21.44
		1	24	21.45	21.74	21.32
		12	0	20.49	20.50	20.31
		12	6	20.53	20.53	20.42
		12	11	20.56	20.55	20.38
		25	0	20.48	20.48	20.27

LTE Band / BW	Modulation	RB Size	RB Offset	Mid CH
				23230CH
				782MHz
13 / 10M	QPSK	1	0	22.19
		1	25	22.17
		1	49	22.20
		25	0	21.32
		25	13	21.34
		25	25	21.35
		50	0	21.33
	16QAM	1	0	21.26
		1	25	21.44
		1	49	21.22
		25	0	20.48
		25	13	20.50
		25	25	20.45
		50	0	20.44

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23755CH	23790CH	23825CH
				706.5MHz	710MHz	713.5MHz
17 / 5M	QPSK	1	0	22.08	22.13	22.07
		1	13	22.24	22.27	22.18
		1	24	22.13	22.09	22.03
		12	0	21.32	21.13	21.05
		12	6	21.25	21.22	21.22
		12	11	21.20	21.30	21.12
		25	0	21.26	21.25	21.07
	16QAM	1	0	21.14	21.34	21.60
		1	13	21.38	21.42	21.66
		1	24	21.26	21.21	21.51
		12	0	20.34	20.26	20.20
		12	6	20.32	20.33	20.33
		12	11	20.27	20.41	20.22
		25	0	20.23	20.34	20.14

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23780CH	23790CH	23800CH
				709MHz	710MHz	711MHz
17 / 10M	QPSK	1	0	22.05	22.20	22.10
		1	25	22.24	22.29	22.19
		1	49	22.25	22.30	22.20
		25	0	21.35	21.32	21.20
		25	13	21.26	21.26	21.24
		25	25	21.53	21.34	21.20
		50	0	21.46	21.36	21.20
	16QAM	1	0	21.01	21.55	21.22
		1	25	21.37	21.70	21.39
		1	49	21.04	21.38	21.08
		25	0	20.45	20.40	20.34
		25	13	20.34	20.35	20.36
		25	25	20.57	20.43	20.32
		50	0	20.47	20.43	20.27

EIRP Power (dBm):

Modulation	Band	WCDMA IV		
	Tx Channel	1312CH	1413CH	1513CH
	Frequency	1712.4MHz	1732.6MHz	1752.6MHz
BPSK	RMC 12.2K	23.79	23.60	23.57
16QAM	HSDPA Subtest-1	22.75	22.50	22.68
	HSDPA Subtest-2	22.24	22.01	21.90
	HSDPA Subtest-3	21.61	21.67	21.70
	HSDPA Subtest-4	21.64	21.03	21.55
16QAM	HSUPA Subtest-1	22.62	22.49	22.69
	HSUPA Subtest-2	22.84	22.60	22.74
	HSUPA Subtest-3	21.78	21.78	21.60
	HSUPA Subtest-4	22.84	22.72	22.82
	HSUPA Subtest-5	22.29	22.27	22.45

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	23.81	23.88	23.85
		1	2	23.89	23.93	23.96
		1	5	23.80	23.83	23.87
		3	0	23.86	23.87	23.88
		3	1	23.90	23.92	23.92
		3	2	23.92	23.89	23.90
		6	0	22.93	22.88	22.90
	16QAM	1	0	22.83	22.93	23.14
		1	2	22.89	23.00	23.23
		1	5	22.81	22.91	23.14
		3	0	22.99	22.91	23.02
		3	1	23.04	22.93	23.04
		3	2	23.05	22.90	23.00
		6	0	22.09	22.06	21.83

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	23.88	23.94	23.90
		1	7	24.04	24.09	24.02
		1	14	23.93	23.93	23.86
		8	0	22.91	22.90	22.90
		8	4	22.95	22.95	22.94
		8	7	22.90	22.89	22.90
		15	0	22.91	22.88	22.89
	16QAM	1	0	22.80	23.25	22.89
		1	7	22.93	23.40	23.06
		1	14	22.79	23.26	22.82
		8	0	22.07	22.06	22.00
		8	4	22.10	22.08	22.04
		8	7	22.05	22.00	21.96
		15	0	21.95	21.99	21.91

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	23.93	23.82	23.85
		1	13	24.05	23.98	23.99
		1	24	23.92	23.82	23.83
		12	0	22.91	22.90	22.92
		12	6	22.94	22.96	22.95
		12	11	22.92	22.93	22.93
		25	0	22.89	22.90	22.88
	16QAM	1	0	22.97	23.28	22.91
		1	13	23.08	23.43	23.00
		1	24	22.96	23.27	22.86
		12	0	22.02	22.05	22.00
		12	6	22.05	22.11	22.04
		12	11	22.03	22.11	22.00
		25	0	21.97	22.03	21.89

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	23.91	23.88	23.86
		1	25	24.12	24.06	24.06
		1	49	23.92	23.86	23.84
		25	0	22.94	22.94	22.93
		25	13	22.95	22.94	22.89
		25	25	22.94	22.93	22.87
		50	0	22.94	22.96	22.91
	16QAM	1	0	23.20	22.90	22.79
		1	25	23.39	23.08	22.95
		1	49	23.21	22.85	22.72
		25	0	22.04	22.13	22.03
		25	13	22.05	22.11	21.98
		25	25	22.05	22.09	21.93
		50	0	22.03	22.05	21.97

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	23.91	23.94	23.92
		1	38	23.96	24.00	23.96
		1	74	23.82	23.87	23.89
		36	0	23.03	22.84	23.00
		36	18	23.00	23.00	22.99
		36	39	22.98	22.96	22.91
		75	0	22.98	22.97	22.98
	16QAM	1	0	23.21	23.29	22.80
		1	38	23.30	23.36	22.82
		1	74	23.20	23.23	22.69
		36	0	22.07	22.29	22.03
		36	18	22.06	21.97	22.00
		36	39	22.04	21.95	21.93
		75	0	22.04	22.00	21.98

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	23.83	23.86	23.85
		1	50	24.07	22.89	24.09
		1	99	24.09	23.91	24.11
		50	0	22.96	22.94	22.96
		50	25	22.94	22.95	22.94
		50	50	22.91	22.90	22.99
		100	0	22.97	22.95	22.91
	16QAM	1	0	23.28	23.23	23.15
		1	50	23.56	21.97	23.39
		1	99	23.29	23.19	23.09
		50	0	22.00	22.01	22.00
		50	25	22.04	22.03	21.97
		50	50	21.97	21.97	21.83
		100	0	22.04	21.99	21.98

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	24.84	25.06	24.95
		1	13	24.97	25.16	25.14
		1	24	24.82	25.03	25.03
		12	0	23.90	24.06	24.08
		12	6	23.95	24.08	24.14
		12	11	23.95	24.04	24.14
		25	0	23.89	24.04	24.07
	16QAM	1	0	23.86	24.06	24.36
		1	13	23.98	24.18	24.42
		1	24	23.84	24.05	24.40
		12	0	22.84	23.11	23.15
		12	6	22.93	23.13	23.22
		12	11	22.91	23.13	23.24
		25	0	22.81	23.06	23.17

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	24.87	25.07	25.01
		1	25	25.06	25.27	25.27
		1	49	24.92	24.99	25.08
		25	0	23.87	24.07	24.09
		25	13	23.92	24.07	24.11
		25	25	23.96	24.08	24.11
		50	0	23.90	24.08	24.09
	16QAM	1	0	23.76	24.30	23.96
		1	25	23.91	24.41	24.11
		1	49	23.78	24.25	23.92
		25	0	22.84	23.13	23.23
		25	13	22.92	23.13	23.23
		25	25	22.93	23.15	23.21
		50	0	22.87	23.14	23.16

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	24.86	25.04	24.97
		1	38	24.98	25.15	25.15
		1	74	24.88	24.92	25.01
		36	0	23.90	24.14	24.22
		36	18	24.02	24.14	24.21
		36	39	24.01	24.16	24.20
		75	0	23.95	24.14	24.20
	16QAM	1	0	24.09	24.23	23.84
		1	38	24.19	24.35	23.95
		1	74	24.15	24.24	23.82
		36	0	22.88	23.02	23.11
		36	18	22.95	23.07	23.12
		36	39	22.94	23.04	23.15
		75	0	22.91	23.11	23.13

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	24.77	24.84	24.90
		1	50	25.00	25.15	25.18
		1	99	25.01	25.20	25.21
		50	0	23.80	24.05	24.11
		50	25	23.88	24.05	24.09
		50	50	23.83	24.09	24.12
		100	0	23.80	24.04	24.07
	16QAM	1	0	24.08	24.14	24.35
		1	50	24.39	24.42	24.43
		1	99	24.13	24.18	24.36
		50	0	22.81	23.02	23.10
		50	25	22.85	23.04	23.09
		50	50	22.79	23.06	23.07
		100	0	22.77	23.06	23.12

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	21.13	21.16	21.16
		1	2	21.20	21.23	21.28
		1	5	21.12	21.16	21.19
		3	0	21.23	21.27	21.24
		3	1	21.29	21.32	21.31
		3	2	21.25	21.33	21.29
		6	0	20.19	20.22	20.21
	16QAM	1	0	20.31	20.38	20.50
		1	2	20.35	20.50	20.59
		1	5	20.28	20.41	20.53
		3	0	20.49	20.41	20.39
		3	1	20.58	20.43	20.41
		3	2	20.50	20.40	20.41
		6	0	19.45	19.48	19.15

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	21.17	21.25	21.19
		1	7	21.33	21.39	21.31
		1	14	21.19	21.27	21.18
		8	0	20.18	20.21	20.22
		8	4	20.27	20.27	20.26
		8	7	20.21	20.20	20.20
		15	0	20.26	20.28	20.21
	16QAM	1	0	20.28	20.68	20.26
		1	7	20.33	20.86	20.35
		1	14	20.17	20.75	20.21
		8	0	19.39	19.47	19.30
		8	4	19.42	19.51	19.33
		8	7	19.39	19.44	19.25
		15	0	19.31	19.40	19.20

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	21.19	21.22	21.12
		1	13	21.32	21.31	21.25
		1	24	21.19	21.20	21.15
		12	0	20.10	20.35	20.14
		12	6	20.28	20.35	20.26
		12	11	20.25	20.33	20.18
		25	0	20.16	20.39	20.12
	16QAM	1	0	20.43	20.72	20.27
		1	13	20.46	20.85	20.33
		1	24	20.34	20.75	20.22
		12	0	19.20	19.54	19.20
		12	6	19.38	19.57	19.32
		12	11	19.37	19.57	19.24
		25	0	19.23	19.52	19.11

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	21.10	21.23	21.15
		1	25	21.28	21.35	21.32
		1	49	21.32	21.36	21.39
		25	0	20.22	20.53	20.26
		25	13	20.26	20.38	20.34
		25	25	20.16	20.59	20.36
		50	0	20.22	20.59	20.31
	16QAM	1	0	20.65	20.22	20.23
		1	25	20.78	20.49	20.36
		1	49	20.70	20.25	20.09
		25	0	19.27	19.66	19.38
		25	13	19.37	19.55	19.43
		25	25	19.29	19.78	19.34
		50	0	19.31	19.67	19.32

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	21.28	21.27	21.12
		1	13	21.36	21.34	21.28
		1	24	21.25	21.28	21.13
		12	0	20.37	20.33	20.28
		12	6	20.43	20.35	20.37
		12	11	20.46	20.37	20.32
		25	0	20.42	20.39	20.27
	16QAM	1	0	20.46	20.82	20.39
		1	13	20.58	20.92	20.49
		1	24	20.50	20.79	20.37
		12	0	19.54	19.55	19.36
		12	6	19.58	19.58	19.47
		12	11	19.61	19.60	19.43
		25	0	19.53	19.53	19.32

LTE Band / BW	Modulation	RB Size	RB Offset	Mid CH
				23230CH
				782MHz
13 / 10M	QPSK	1	0	21.24
		1	25	21.22
		1	49	21.25
		25	0	20.37
		25	13	20.39
		25	25	20.40
		50	0	20.38
	16QAM	1	0	20.31
		1	25	20.49
		1	49	20.27
		25	0	19.53
		25	13	19.55
		25	25	19.50
		50	0	19.49

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23755CH	23790CH	23825CH
				706.5MHz	710MHz	713.5MHz
17 / 5M	QPSK	1	0	21.13	21.18	21.12
		1	13	21.29	21.32	21.23
		1	24	21.18	21.14	21.08
		12	0	20.37	20.18	20.10
		12	6	20.30	20.27	20.27
		12	11	20.25	20.35	20.17
		25	0	20.31	20.30	20.12
	16QAM	1	0	20.19	20.39	20.65
		1	13	20.43	20.47	20.71
		1	24	20.31	20.26	20.56
		12	0	19.39	19.31	19.25
		12	6	19.37	19.38	19.38
		12	11	19.32	19.46	19.27
		25	0	19.28	19.39	19.19

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23780CH	23790CH	23800CH
				709MHz	710MHz	711MHz
17 / 10M	QPSK	1	0	21.10	21.25	21.15
		1	25	21.29	21.34	21.24
		1	49	21.30	21.35	21.25
		25	0	20.40	20.37	20.25
		25	13	20.31	20.31	20.29
		25	25	20.58	20.39	20.25
		50	0	20.51	20.41	20.25
	16QAM	1	0	20.06	20.60	20.27
		1	25	20.42	20.75	20.44
		1	49	20.09	20.43	20.13
		25	0	19.50	19.45	19.39
		25	13	19.39	19.40	19.41
		25	25	19.62	19.48	19.37
		50	0	19.52	19.48	19.32

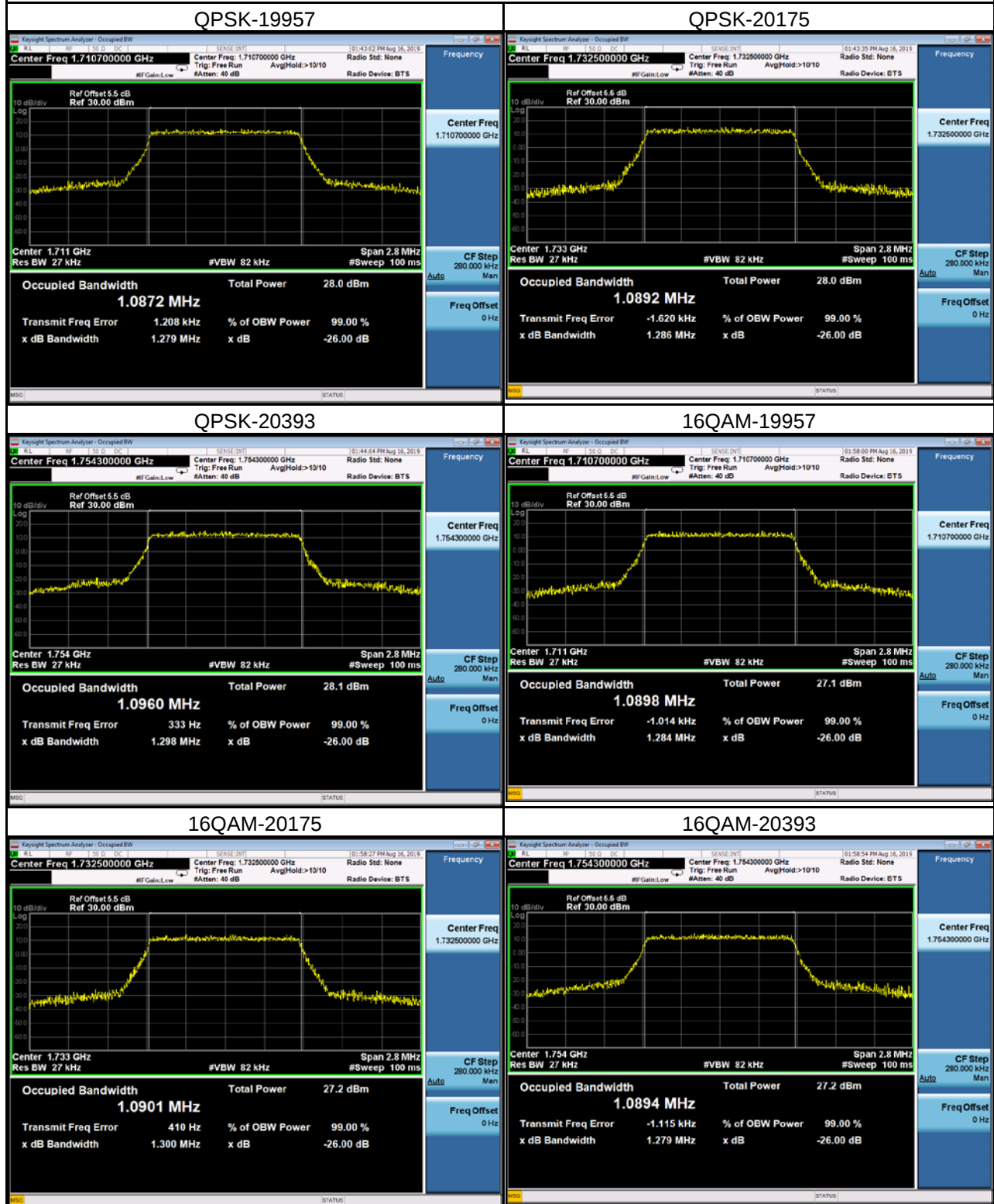
APPENDIX B - OCCUPIED BANDWIDTH

WCDMA Band IV_WCDMA					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
1312	1712.4	4.1775	1312	1712.4	4.7200
1413	1732.6	4.1813	1413	1732.6	4.7120
1513	1752.6	4.1832	1513	1752.6	4.7130



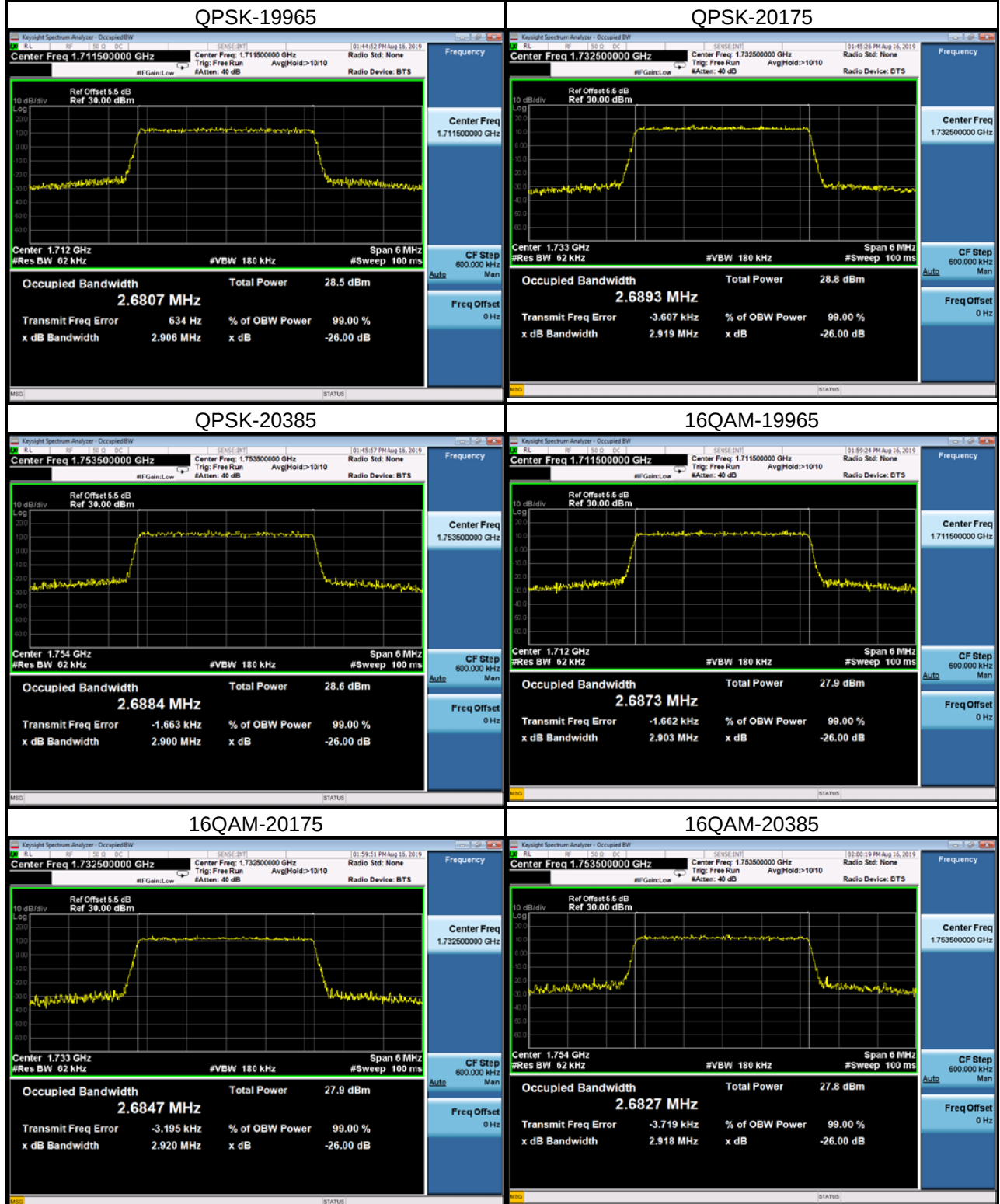
LTE Band 4_1.4M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
19957	1710.7	1.0872	19957	1710.7	1.0898
20175	1732.5	1.0892	20175	1732.5	1.0901
20393	1754.3	1.0960	20393	1754.3	1.0894
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19957	1710.7	1.2790	19957	1710.7	1.2840
20175	1732.5	1.2860	20175	1732.5	1.3000
20393	1754.3	1.2980	20393	1754.3	1.2790

Spectrum Plot



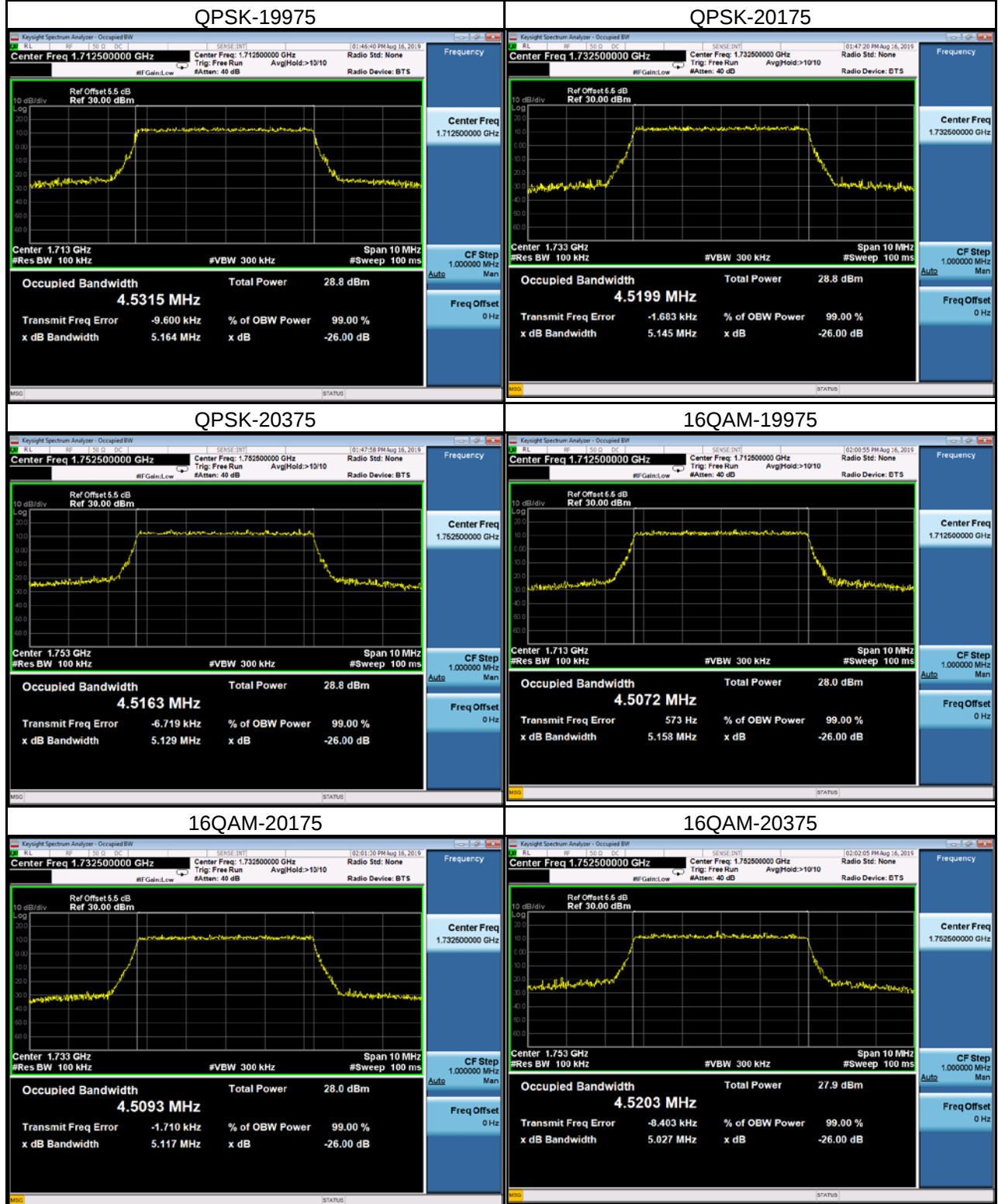
LTE Band 4_3M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
19965	1711.5	2.6807	19965	1711.5	2.6873
20175	1732.5	2.6893	20175	1732.5	2.6847
20385	1753.5	2.6884	20385	1753.5	2.6827
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19965	1711.5	2.9060	19965	1711.5	2.9030
20175	1732.5	2.9190	20175	1732.5	2.9200
20385	1753.5	2.9000	20385	1753.5	2.9180

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	4.5315	19975	1712.5	4.5072
20175	1732.5	4.5199	20175	1732.5	4.5093
20375	1752.5	4.5163	20375	1752.5	4.5203
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19975	1712.5	5.4640	19975	1712.5	5.1580
20175	1732.5	5.1450	20175	1732.5	5.1170
20375	1752.5	5.1290	20375	1752.5	5.0270

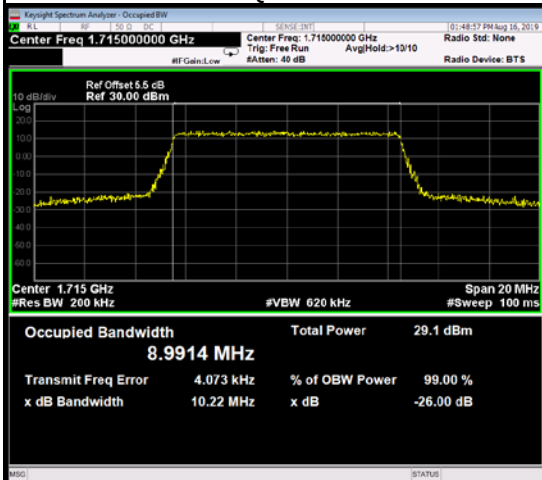
Spectrum Plot



LTE Band 4_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20000	1715	8.9914	20000	1715	8.9787
20175	1732.5	8.9820	20175	1732.5	8.9829
20350	1750	9.0037	20350	1750	8.9991
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20000	1715	10.2200	20000	1715	10.0800
20175	1732.5	10.0900	20175	1732.5	9.98400
20350	1750	10.0600	20350	1750	10.0500

Spectrum Plot

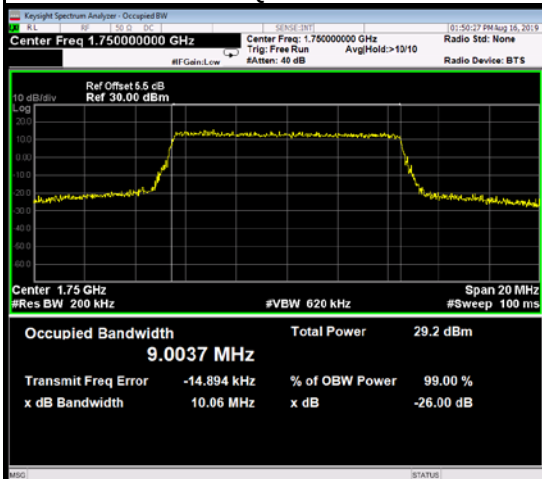
QPSK-20000



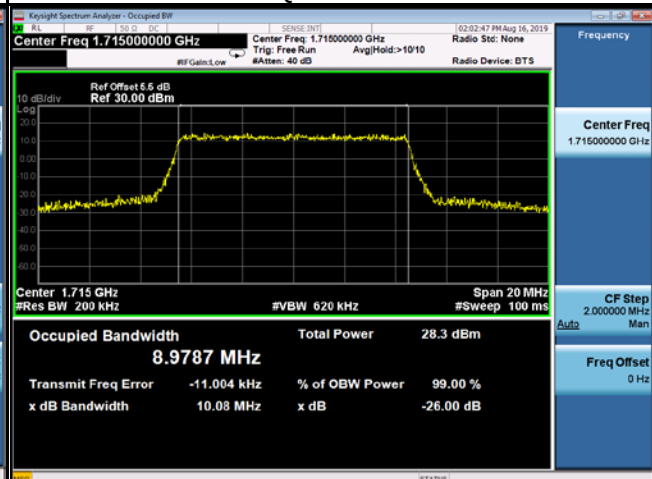
QPSK-20175



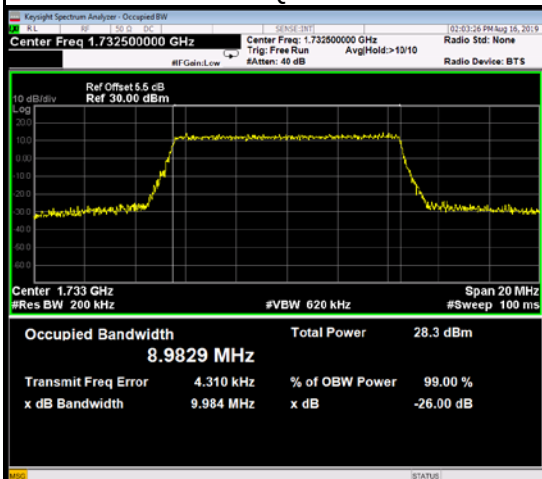
QPSK-20350



16QAM-20000



16QAM-20175

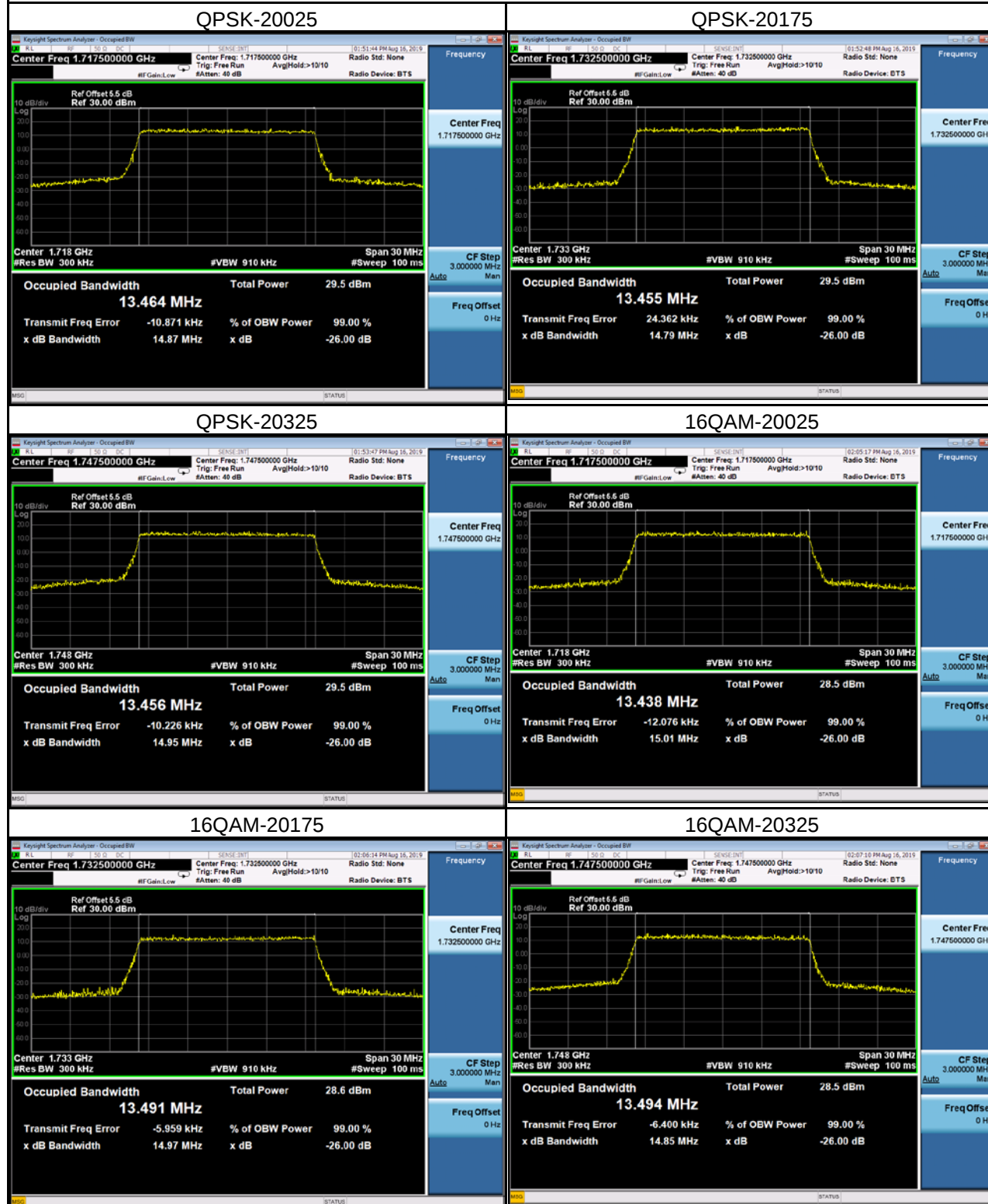


16QAM-20350



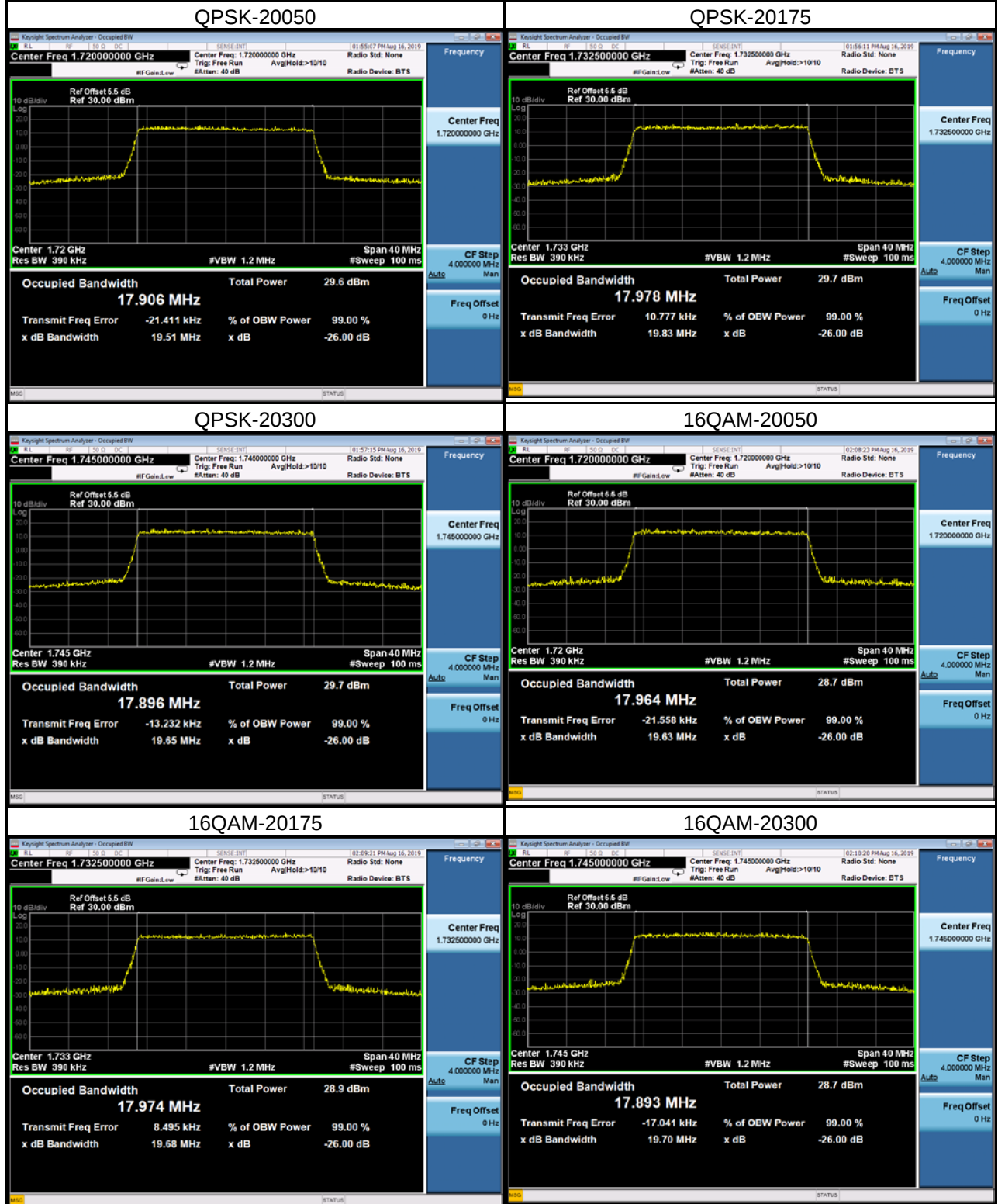
LTE Band 4_15M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20025	1717.5	13.4640	20025	1717.5	13.4380
20175	1732.5	13.4550	20175	1732.5	13.4910
20325	1747.5	13.4560	20325	1747.5	13.4940
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20025	1717.5	14.8700	20025	1717.5	15.0100
20175	1732.5	14.7900	20175	1732.5	14.9700
20325	1747.5	14.9500	20325	1747.5	14.8500

Spectrum Plot



LTE Band 4_20M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20050	1720	17.9060	20050	1720	17.9640
20175	1732.5	17.9780	20175	1732.5	17.9740
20300	1745	17.8960	20300	1745	17.8930
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20050	1720	19.5100	20050	1720	19.6300
20175	1732.5	19.8300	20175	1732.5	19.6800
20300	1745	19.6500	20300	1745	19.7000

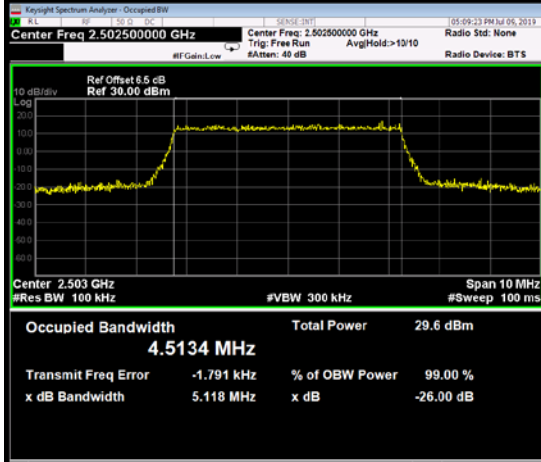
Spectrum Plot



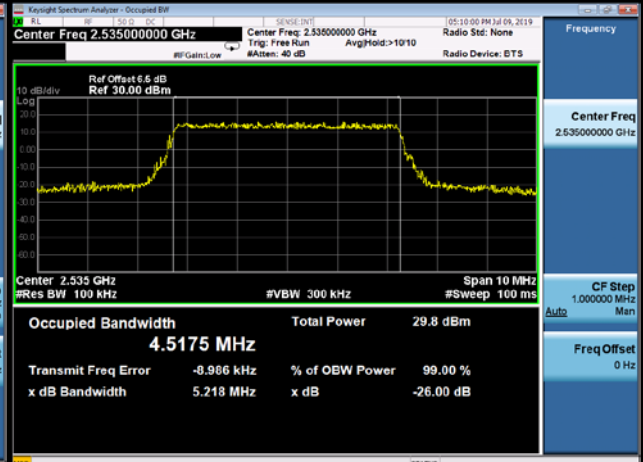
LTE Band 7_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20775	2502.5	4.5134	20775	2502.5	4.5138
21100	2535	4.5175	21100	2535	4.5091
21425	2567.5	4.5226	21425	2567.5	4.5161
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20775	2502.5	5.1180	20775	2502.5	5.1350
21100	2535	5.2180	21100	2535	5.1850
21425	2567.5	5.1150	21425	2567.5	5.1330

Spectrum Plot

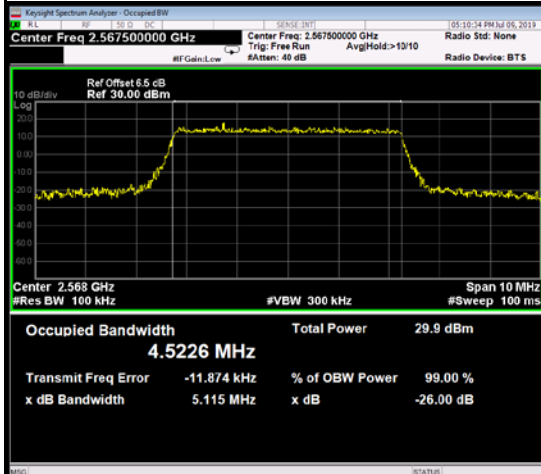
QPSK-20775



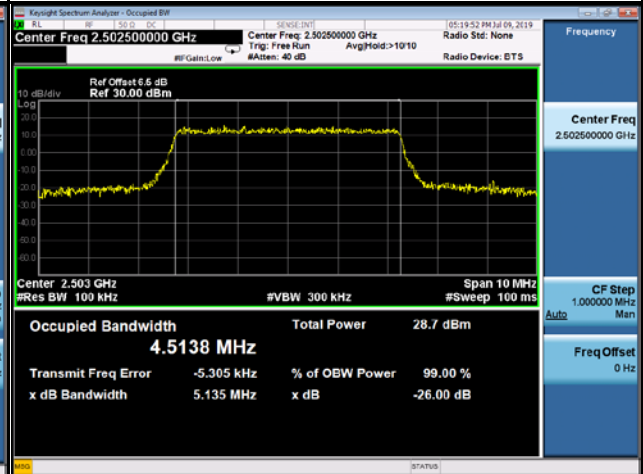
QPSK-21100



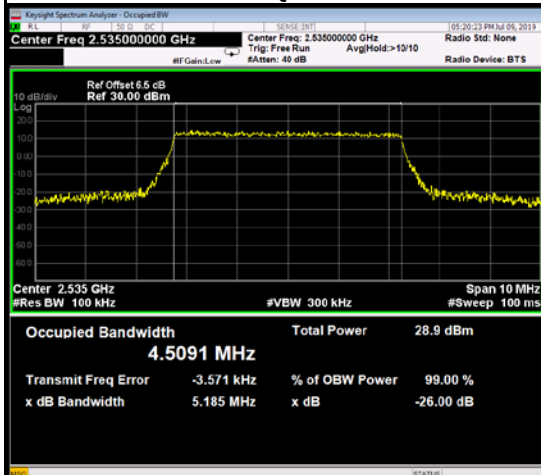
QPSK-21425



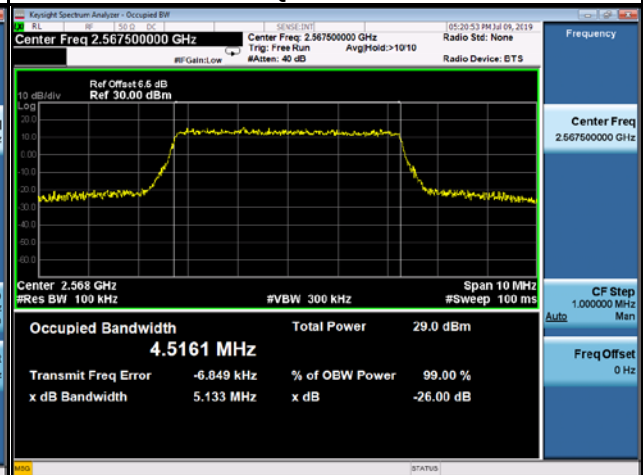
16QAM-20775



16QAM-21100

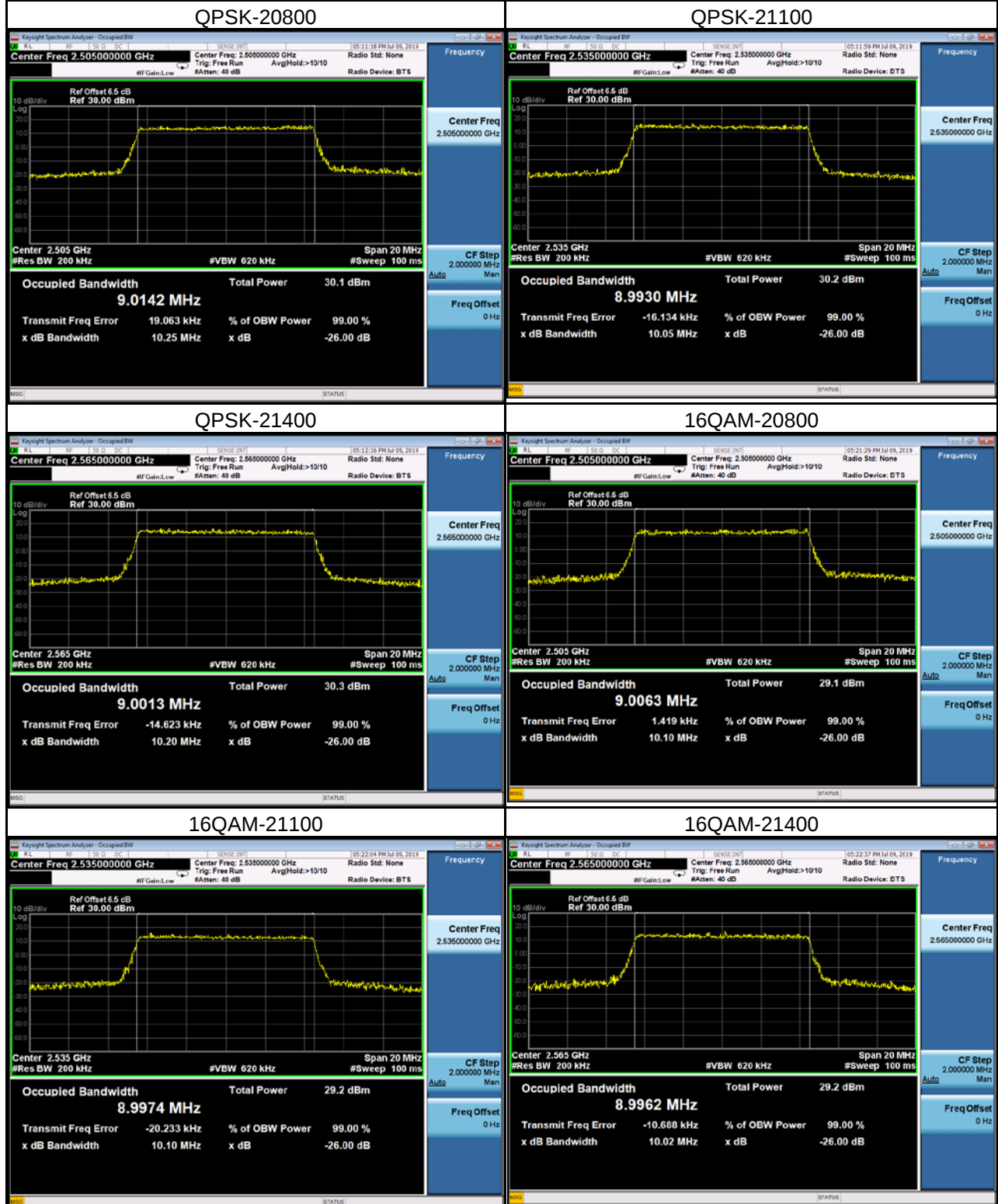


16QAM-21425



LTE Band 7_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20800	2505	9.0142	20800	2505	9.0063
21100	2535	8.9930	21100	2535	8.9974
21400	2565	9.0013	21400	2565	8.9962
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20800	2505	10.2500	20800	2505	10.1000
21100	2535	10.0500	21100	2535	10.1000
21400	2565	10.2000	21400	2565	10.0200

Spectrum Plot



LTE Band 7_15M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20825	2507.5	13.5290	20825	2507.5	13.5220
21100	2535	13.4680	21100	2535	13.5020
21375	2562.5	13.4350	21375	2562.5	13.4300
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20825	2507.5	15.2100	20825	2507.5	14.8700
21100	2535	15.0300	21100	2535	14.9500
21375	2562.5	14.8700	21375	2562.5	14.9800