RF TEST REPORT

Report No.: 17070667-FCC-R5 V1

Supersede Report No.: N/A

Applicant	MOBIWIRE MOBILES (NINGBO) CO.,LTD
Product Name	4G Smartphone
Model No.	N504
Serial No.	N/A
Test Standard	FCC Part 27: 2016; ANSI/TIA-603-D: 2010
Test Date	August 11 to September 05, 2017
Issue Date	September 13, 2017
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Loren Luo	David Huang	
Loren Luo Test Engineer	David Huang Checked By	

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Test result presented in this test report is applicable to the tested sample only

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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Laboratories Introduction

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Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
17070667-FCC-R5	NONE	Original	September 06, 2017
17070667-FCC-R5 V1	V1	Updating the EUT photos	September 13, 2017

2. Customer information

Applicant Name	MOBIWIRE MOBILES (NINGBO) CO.,LTD
Applicant Add	No.999,Dacheng East Road,Fenghua,Zhejiang,China
Manufacturer	Mobiwire Mobiles (Ningbo) Co.,Ltd
Manufacturer Add	Mobiwire Mobiles,No. 999 Dacheng East Road Fenghua,Zhejiang China

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	535293
IC Test Site No.	4842E-1
Test Software	Radiated Emission Program-To Shenzhen v2.0

4. Equipment under Test (EUT) Information

Description of EUT:	4G Smartphone
Main Model:	N504
Serial Model:	N/A
Date EUT received:	August 10, 2017
Test Date(s):	August 11 to September 05, 2017
Equipment Category :	PCE
Antenna Gain:	GSM850: -3dBi PCS1900: -1dBi UMTS-FDD Band V: -3dBi UMTS-FDD Band II: -0.5dBi LTE Band IV: -1dBi WIFI: 0dBi Bluetooth/BLE: 0dBi GPS: 0dBi
Antenna Type:	PIFA antenna
Type of Modulation:	GSM / GPRS: GMSK EGPRS: GMSK,8PSK UMTS-FDD: QPSK LTE Band: QPSK, 16QAM 802.11b/g/n: DSSS, OFDM Bluetooth: GFSK, π /4DQPSK, 8DPSK BLE: GFSK GPS:BPSK

RF Operating Frequency (ies):	GSM850 TX: 824.2 ~ 848.8 MHz; RX: 869.2 ~ 893.8 MHz PCS1900 TX: 1850.2 ~ 1909.8 MHz; RX: 1930.2 ~ 1989.8 MHz UMTS-FDD Band V TX: 826.4 ~ 846.6 MHz; RX: 871.4 ~ 891.6 MHz UMTS-FDD Band II TX:1852.4 ~ 1907.6 MHz; RX: 1932.4 ~ 1987.6 MHz LTE Band IV TX: 1710.7 ~ 1754.3 MHz; RX : 2110.7 ~ 2154.3 MHz WIFI: 802.11b/g/n(20M): 2412-2462 MHz WIFI: 802.11n(40M): 2422-2452 MHz Bluetooth& BLE: 2402-2480 MHz GPS: 1575.42 MHz
Number of Channels:	GSM 850: 124CH PCS1900: 299CH UMTS-FDD Band V: 102CH UMTS-FDD Band II: 277CH WIFI :802.11b/g/n(20M): 11CH WIFI :802.11n(40M): 7CH Bluetooth: 79CH BLE: 40CH GPS:1CH
Maximum Conducted AV Power to Antenna:	LTE Band IV: 23.27 dBm
ERP/EIRP:	LTE Band IV: 22.14 dBm / EIRP
Port:	USB Port, Earphone Port
Input Power:	Adapter: Model: S005UA0500100 Input: AC100-240V~50/60Hz,150mA Output: DC 5.0V,1000mA Battery: Spec: 3.8V, 8.17Wh, 2150mAh
Trade Name :	NOBLEX
GPRS/EGPRS Multi-slot class	8/10/12

FCC ID: 2ADA4N504

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§ 1.1307; § 2.1093	RF Exposure (SAR)	Compliance
§2.1046;§ 27.50(c.10); § 27.50(d.4)	RF Output Power	Compliance
§ 27.50(d)	Peak-Average Ratio	Compliance
§ 2.1047	Modulation Characteristics	N/A
§ 2.1049; § 27.53(a.5)	99% & -26 dB Occupied Bandwidth	Compliance
§ 2.1051; § 27.53(h)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053;§ 27.53(h)	Field Strength of Spurious Radiation	Compliance
§ 27.53(h)	Out of band emission, Band Edge	Compliance
§ 27.53(m)	Band Edge 27.53(m)	N/A
§ 2.1055; § 27.5(h); § 27.54	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance

Note: Testing was performed by configuring EUT to maximum output power status, the declared output power class for different

Measurement Uncertainty

Parameter	Uncertainty
AC Power Line Conducted Emissions (150kHz~30MHz)	±3.71dB
Radiated Emission(30MHz~1GHz)	±5.12dB
Radiated Emission(1GHz~6GHz)	±5.34dB

6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

6.1 RF Exposure (SAR)

Test Result: Pass

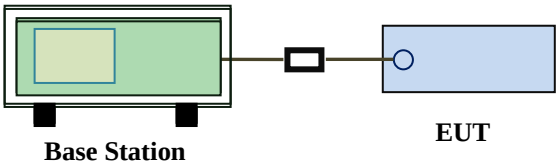
The EUT is a portable device, thus requires SAR evaluation;

Please refer to RF Exposure Evaluation Report: 17070667-FCC-H.

6.2 RF Output Power

Temperature	24℃
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	September 05, 2017
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§27.50 (c)	c)	EIRP: 30dBm	☑
Test Setup			
Test Procedure	For Conducted Power: - The transmitter output port was connected to base station. - Set EUT at maximum power through base station. - Select lowest, middle, and highest channels for each band and different test mode. For ERP/EIRP: - The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. - The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. - The frequency range up to tenth harmonic of the fundamental frequency was investigated. - Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-		

	radiating cable. The absolute levels of the spurious emissions were measured by the substitution. - Spurious emissions in dB = 10 log (TX power in Watts/0.001) – the absolute level - Spurious attenuation limit in dB = 43 + 10 Log10 (power out in Watts.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

Conducted Power

LTE Band IV:

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
20MHz	20050	1720.0	QPSK	1	0	0	23.19	23±1
				1	49	0	23.13	23±1
				1	99	0	23.14	23±1
				50	0	1	23.25	23±1
				50	24	1	23.25	23±1
				50	49	1	23.12	23±1
				100	0	1	23.27	23±1
			16QAM	1	0	1	23.00	23±1
				1	49	1	23.10	23±1
				1	99	1	23.06	23±1
				50	0	2	22.95	23±1
				50	24	2	23.05	23±1
				50	49	2	23.09	23±1
				100	0	2	22.93	23±1
	20175	1732.5	QPSK	1	0	0	23.00	22.5±1
				1	49	0	22.94	22.5±1
				1	99	0	23.02	22.5±1
				50	0	1	22.02	22.5±1
				50	24	1	22.07	22.5±1
				50	49	1	21.97	22.5±1
				100	0	1	21.98	22.5±1
			16QAM	1	0	1	22.23	21.5±1
				1	49	1	22.16	21.5±1
				1	99	1	22.29	21.5±1
				50	0	2	20.93	21.5±1
				50	24	2	20.89	21.5±1
				50	49	2	20.95	21.5±1
				100	0	2	21.01	21.5±1
	20300	1745.0	QPSK	1	0	0	22.95	22.5±1
				1	49	0	23.01	22.5±1
				1	99	0	23.02	22.5±1
				50	0	1	21.96	22.5±1
				50	24	1	22.00	22.5±1
				50	49	1	21.88	22.5±1
				100	0	1	21.94	22.5±1
			16QAM	1	0	1	22.37	21.7±1
				1	49	1	22.46	21.7±1
				1	99	1	22.46	21.7±1
				50	0	2	21.21	21.7±1
				50	24	2	21.25	21.7±1
				50	49	2	21.23	21.7±1
				100	0	2	20.97	21.7±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
15MHz	20025	1717.5	QPSK	1	0	0	23.12	23±1
				1	37	0	23.03	23±1
				1	74	0	23.10	23±1
				36	0	1	23.18	23±1
				36	16	1	23.10	23±1
				36	35	1	23.21	23±1
				75	0	1	23.06	23±1
			16QAM	1	0	1	22.95	23±1
				1	37	1	22.92	23±1
				1	74	1	23.04	23±1
				36	0	2	22.98	23±1
				36	16	2	22.90	23±1
				36	35	2	23.02	23±1
				75	0	2	23.04	23±1
	20175	1732.5	QPSK	1	0	0	22.95	22.5±1
				1	37	0	22.95	22.5±1
				1	74	0	22.86	22.5±1
				36	0	1	22.01	22.5±1
				36	16	1	21.94	22.5±1
				36	35	1	22.07	22.5±1
				75	0	1	21.97	22.5±1
			16QAM	1	0	1	22.23	21.5±1
				1	37	1	22.29	21.5±1
				1	74	1	22.13	21.5±1
				36	0	2	21.14	21.5±1
				36	16	2	21.20	21.5±1
				36	35	2	21.07	21.5±1
				75	0	2	20.96	21.5±1
	20325	1747.5	QPSK	1	0	0	22.94	23±1
				1	37	0	22.86	23±1
				1	74	0	22.89	23±1
				36	0	1	22.06	23±1
				36	16	1	22.07	23±1
				36	35	1	22.11	23±1
				75	0	1	22.09	23±1
			16QAM	1	0	1	22.44	22±1
				1	37	1	22.51	22±1
				1	74	1	22.45	22±1
				36	0	2	21.39	22±1
				36	16	2	21.48	22±1
				36	35	2	21.37	22±1
				75	0	2	21.60	22±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
10MHz	20000	1715.0	QPSK	1	0	0	22.95	23±1
				1	24	0	22.90	23±1
				1	49	0	23.00	23±1
				25	0	1	22.95	23±1
				25	12	1	22.91	23±1
				25	24	1	23.00	23±1
				50	0	1	22.98	23±1
			16QAM	1	0	1	22.89	23±1
				1	24	1	22.90	23±1
				1	49	1	22.93	23±1
				25	0	2	22.87	23±1
				25	12	2	22.80	23±1
				25	24	2	22.82	23±1
				50	0	2	22.97	23±1
	20175	1732.5	QPSK	1	0	0	22.89	22.5±1
				1	24	0	22.90	22.5±1
				1	49	0	22.81	22.5±1
				25	0	1	21.91	22.5±1
				25	12	1	21.88	22.5±1
				25	24	1	21.88	22.5±1
				50	0	1	21.96	22.5±1
			16QAM	1	0	1	21.86	21.5±1
				1	24	1	21.81	21.5±1
				1	49	1	21.80	21.5±1
				25	0	2	21.10	21.5±1
				25	12	2	21.08	21.5±1
				25	24	2	21.13	21.5±1
				50	0	2	21.00	21.5±1
	20350	1750.0	QPSK	1	0	0	22.46	22±1
				1	24	0	22.52	22±1
				1	49	0	22.40	22±1
				25	0	1	21.98	22±1
				25	12	1	22.07	22±1
				25	24	1	21.94	22±1
				50	0	1	22.03	22±1
			16QAM	1	0	1	22.22	21.5±1
				1	24	1	22.24	21.5±1
				1	49	1	22.14	21.5±1
				25	0	2	21.22	21.5±1
				25	12	2	21.16	21.5±1
				25	24	2	21.12	21.5±1
				50	0	2	21.03	21.5±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
5MHz	20000	1715.0	QPSK	1	0	0	23.00	23±1
				1	12	0	22.93	23±1
				1	24	0	23.08	23±1
				12	0	1	23.08	23±1
				12	6	1	22.96	23±1
				12	11	1	22.94	23±1
				25	0	1	22.90	23±1
			16QAM	1	0	1	22.92	23±1
				1	12	1	22.86	23±1
				1	24	1	22.92	23±1
				12	0	2	22.95	23±1
				12	6	2	22.90	23±1
				12	11	2	22.99	23±1
				25	0	2	23.02	23±1
	20175	1732.5	QPSK	1	0	0	22.92	22.5±1
				1	12	0	22.97	22.5±1
				1	24	0	22.89	22.5±1
				12	0	1	22.03	22.5±1
				12	6	1	21.94	22.5±1
				12	11	1	22.08	22.5±1
				25	0	1	21.96	22.5±1
			16QAM	1	0	1	21.96	21.5±1
				1	12	1	21.98	21.5±1
				1	24	1	22.02	21.5±1
				12	0	2	21.23	21.5±1
				12	6	2	21.21	21.5±1
				12	11	2	21.23	21.5±1
				25	0	2	21.00	21.5±1
	20350	1750.0	QPSK	1	0	0	23.07	22.5±1
				1	12	0	23.07	22.5±1
				1	24	0	22.98	22.5±1
				12	0	1	22.06	22.5±1
				12	6	1	22.13	22.5±1
				12	11	1	22.14	22.5±1
				25	0	1	21.96	22.5±1
			16QAM	1	0	1	21.96	21.5±1
				1	12	1	22.04	21.5±1
				1	24	1	22.05	21.5±1
				12	0	2	20.87	21.5±1
				12	6	2	20.79	21.5±1
				12	11	2	20.80	21.5±1
				25	0	2	21.01	21.5±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
3MHz	19965	1711.5	QPSK	1	0	0	22.96	22.5±1
				1	7	0	22.88	22.5±1
				1	14	0	23.01	22.5±1
				8	0	1	22.93	22.5±1
				8	4	1	22.98	22.5±1
				8	7	1	22.89	22.5±1
				15	0	1	22.89	22.5±1
			16QAM	1	0	1	22.94	22.5±1
				1	7	1	23.01	22.5±1
				1	14	1	22.95	22.5±1
				8	0	2	22.92	22.5±1
				8	4	2	22.94	22.5±1
				8	7	2	22.97	22.5±1
				15	0	2	22.99	22.5±1
	20175	1732.5	QPSK	1	0	0	22.94	22.5±1
				1	7	0	22.84	22.5±1
				1	14	0	22.87	22.5±1
				8	0	1	21.87	22.5±1
				8	4	1	21.86	22.5±1
				8	7	1	21.91	22.5±1
				15	0	1	21.96	22.5±1
			16QAM	1	0	1	21.90	21.5±1
				1	7	1	21.98	21.5±1
				1	14	1	21.94	21.5±1
				8	0	2	20.90	21.5±1
				8	4	2	20.88	21.5±1
				8	7	2	20.96	21.5±1
				15	0	2	20.97	21.5±1
	20385	1753.5	QPSK	1	0	0	22.89	22.5±1
				1	7	0	22.87	22.5±1
				1	14	0	22.97	22.5±1
				8	0	1	21.97	22.5±1
				8	4	1	22.01	22.5±1
				8	7	1	22.04	22.5±1
				15	0	1	21.95	22.5±1
			16QAM	1	0	1	22.33	21.5±1
				1	7	1	22.38	21.5±1
				1	14	1	22.25	21.5±1
				8	0	2	21.15	21.5±1
				8	4	2	21.18	21.5±1
				8	7	2	21.17	21.5±1
				15	0	2	21.04	21.5±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
1.4MHz	19957	1710.7	QPSK	1	0	0	21.91	22±1
				1	2	0	21.86	22±1
				1	5	0	21.90	22±1
				3	0	0	21.93	22±1
				3	1	0	21.88	22±1
				3	2	0	21.81	22±1
				6	0	1	21.89	22±1
			16QAM	1	0	1	22.90	23±1
				1	2	1	22.99	23±1
				1	5	1	22.86	23±1
				3	0	1	22.81	23±1
				3	1	1	22.90	23±1
				3	2	1	22.90	23±1
				6	0	2	22.94	23±1
	20175	1732.5	QPSK	1	0	0	22.90	22.5±1
				1	2	0	22.83	22.5±1
				1	5	0	22.80	22.5±1
				3	0	0	22.96	22.5±1
				3	1	0	22.92	22.5±1
				3	2	0	22.95	22.5±1
				6	0	1	21.85	22.5±1
			16QAM	1	0	1	21.87	21.5±1
				1	2	1	21.80	21.5±1
				1	5	1	21.89	21.5±1
				3	0	1	20.93	21.5±1
				3	1	1	20.93	21.5±1
				3	2	1	20.86	21.5±1
				6	0	2	20.76	21.5±1
	20393	1754.3	QPSK	1	0	0	22.86	22.5±1
				1	2	0	22.85	22.5±1
				1	5	0	22.90	22.5±1
				3	0	0	22.98	22.5±1
				3	1	0	22.97	22.5±1
				3	2	0	23.03	22.5±1
				6	0	1	21.82	22.5±1
			16QAM	1	0	1	21.51	22±1
				1	2	1	21.46	22±1
				1	5	1	21.45	22±1
				3	0	1	21.92	22±1
				3	1	1	22.01	22±1
				3	2	1	21.97	22±1
				6	0	2	21.85	22±1

ERP & EIRP

EIRP for LTE Band IV (Part 27)

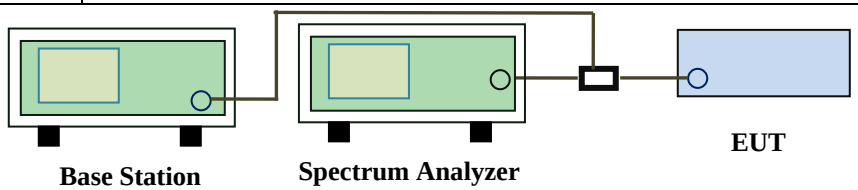
Frequency (MHz)	BW (MHz)	Modulation	RB Size/Offset	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1710.7	1.4	QPSK	1/0	13.75	V	7.95	0.79	20.91	30
1732.5	1.4	QPSK	1/0	14.74	V	7.95	0.79	21.90	30
1754.3	1.4	QPSK	1/0	14.7	V	7.95	0.79	21.86	30
1710.7	1.4	QPSK	1/0	12.2	H	7.95	0.79	19.36	30
1732.5	1.4	QPSK	1/0	13.11	H	7.95	0.79	20.27	30
1754.3	1.4	QPSK	1/0	12.77	H	7.95	0.79	19.93	30
1710.7	1.4	16-QAM	1/5	14.7	V	7.95	0.79	21.86	30
1732.5	1.4	16-QAM	1/0	13.71	V	7.95	0.79	20.87	30
1754.3	1.4	16-QAM	1/0	14.7	V	7.95	0.79	21.86	30
1710.7	1.4	16-QAM	1/5	13.4	H	7.95	0.79	20.56	30
1732.5	1.4	16-QAM	1/0	12.64	H	7.95	0.79	19.8	30
1754.3	1.4	16-QAM	1/0	13.8	H	7.95	0.79	20.96	30
1711.5	3	QPSK	1/0	14.8	V	7.95	0.79	21.96	30
1732.5	3	QPSK	1/0	14.78	V	7.95	0.79	21.94	30
1753.5	3	QPSK	1/0	14.73	V	7.95	0.79	21.89	30
1711.5	3	QPSK	1/0	13.57	H	7.95	0.79	20.73	30
1732.5	3	QPSK	1/0	13.98	H	7.95	0.79	21.14	30
1753.5	3	QPSK	1/0	13.53	H	7.95	0.79	20.69	30
1711.5	3	16-QAM	1/0	14.78	V	7.95	0.79	21.94	30
1732.5	3	16-QAM	1/0	13.74	V	7.95	0.79	20.90	30
1753.5	3	16-QAM	1/0	14.17	V	7.95	0.79	21.33	30
1711.5	3	16-QAM	1/0	13.19	H	7.95	0.79	20.35	30
1732.5	3	16-QAM	1/0	12.88	H	7.95	0.79	20.04	30
1753.5	3	16-QAM	1/0	12.5	H	7.95	0.79	19.66	30
1712.5	5	QPSK	1/0	14.84	V	7.95	0.79	22	30
1732.5	5	QPSK	1/0	14.76	V	7.95	0.79	21.92	30
1752.5	5	QPSK	1/24	14.82	V	7.95	0.79	21.98	30
1712.5	5	QPSK	1/0	13.62	H	7.95	0.79	20.78	30
1732.5	5	QPSK	1/0	13.9	H	7.95	0.79	21.06	30
1752.5	5	QPSK	1/24	12.98	H	7.95	0.79	20.14	30
1712.5	5	16-QAM	1/0	14.76	V	7.95	0.79	21.92	30
1732.5	5	16-QAM	1/0	13.8	V	7.95	0.79	20.96	30
1752.5	5	16-QAM	1/24	13.89	V	7.95	0.79	21.05	30
1712.5	5	16-QAM	1/0	14.04	H	7.95	0.79	21.20	30
1732.5	5	16-QAM	1/0	13.07	H	7.95	0.79	20.23	30
1752.5	5	16-QAM	1/24	12.39	H	7.95	0.79	19.55	30
1715	10	QPSK	1/0	14.79	V	7.95	0.79	21.95	30
1732.5	10	QPSK	1/49	14.65	V	7.95	0.79	21.81	30
1750	10	QPSK	1/0	14.3	V	7.95	0.79	21.46	30
1715	10	QPSK	1/0	13.06	H	7.95	0.79	20.22	30
1732.5	10	QPSK	1/49	13.69	H	7.95	0.79	20.85	30

1750	10	QPSK	1/0	12.68	H	7.95	0.79	19.84	30
1715	10	16-QAM	1/0	14.73	V	7.95	0.79	21.89	30
1732.5	10	16-QAM	1/49	13.64	V	7.95	0.79	20.80	30
1750	10	16-QAM	1/0	14.06	V	7.95	0.79	21.22	30
1715	10	16-QAM	1/0	13.17	H	7.95	0.79	20.33	30
1732.5	10	16-QAM	1/49	12	H	7.95	0.79	19.16	30
1750	10	16-QAM	1/0	12.35	H	7.95	0.79	19.51	30
1717.5	15	QPSK	1/0	14.96	V	7.95	0.79	22.12	30
1732.5	15	QPSK	1/74	14.7	V	7.95	0.79	21.86	30
1747.5	15	QPSK	1/0	14.78	V	7.95	0.79	21.94	30
1717.5	15	QPSK	1/0	13.84	H	7.95	0.79	21.00	30
1732.5	15	QPSK	1/74	13.9	H	7.95	0.79	21.06	30
1747.5	15	QPSK	1/0	13.97	H	7.95	0.79	21.13	30
1717.5	15	16-QAM	1/0	14.79	V	7.95	0.79	21.95	30
1732.5	15	16-QAM	1/74	13.97	V	7.95	0.79	21.13	30
1747.5	15	16-QAM	1/0	14.28	V	7.95	0.79	21.44	30
1717.5	15	16-QAM	1/0	13.46	H	7.95	0.79	20.62	30
1732.5	15	16-QAM	1/74	12.39	H	7.95	0.79	19.55	30
1747.5	15	16-QAM	1/0	13.55	H	7.95	0.79	20.71	30
1720	20	QPSK	1/99	14.98	V	7.95	0.79	22.14	30
1732.5	20	QPSK	1/99	14.86	V	7.95	0.79	22.02	30
1745	20	QPSK	1/0	14.79	V	7.95	0.79	21.95	30
1720	20	QPSK	1/99	14.01	H	7.95	0.79	21.17	30
1732.5	20	QPSK	1/99	13.42	H	7.95	0.79	20.58	30
1745	20	QPSK	1/0	13.29	H	7.95	0.79	20.45	30
1720	20	16-QAM	1/99	14.9	V	7.95	0.79	22.06	30
1732.5	20	16-QAM	1/99	14.13	V	7.95	0.79	21.29	30
1745	20	16-QAM	1/0	14.21	V	7.95	0.79	21.37	30
1720	20	16-QAM	1/99	13.3	H	7.95	0.79	20.46	30
1732.5	20	16-QAM	1/99	12.33	H	7.95	0.79	19.49	30
1745	20	16-QAM	1/0	12.66	H	7.95	0.79	19.82	30

6.3 Peak-Average Ratio

Temperature	24℃
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	September 05, 2017
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§ 27.50(d)	a)	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.	☑
Test Setup			
Test Procedure	According with KDB 971168 v02r02 5.7.2 Alternate procedure for PAPR 5.1.2 Peak power measurements with a peak power meter The total peak output power may be measured using a broadband peak RF power meter. The power meter must have a video bandwidth that is greater than or equal to the emission bandwidth and utilize a fast-responding diode detector. 5.2.3 Average power measurement with average power meter As an alternative to the use of a spectrum/signal analyzer or EMI receiver to perform a measurement of the total in-band average output power, a wideband RF average power meter with a thermocouple detector or equivalent can be used under certain conditions If the EUT can be configured to transmit continuously (i.e., the burst duty		

	cycle ≥ 98%) and at all times the EUT is transmitting at is maximum output power level, then a conventional wide-band RF power meter can be used. If the EUT cannot be configured to transmit continuously (i.e., the burst duty cycle < 98%), then there are two options for the use of an average power meter. First, a gated average power meter can be used to perform the measurement if the gating parameters can be adjusted such that the power is measured only over active transmission bursts at maximum output power levels. A conventional average power meter can also be used if the measured burst duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent) by performing the measurement over the on/off burst cycles and then correcting (increasing) the measured level by a factor equal to 10log(1/duty cycle)
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

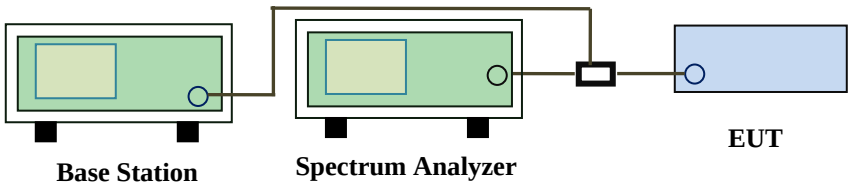
LTE Band IV (part 27)

BW(MHz)	Frequency (MHz)	Mode	Modulation	Conducted Power (dBm)		Peak-Average Ratio (PAR)
				Peak	Average	
1.4	1732.5	RB 1/0	QPSK	22.95	22.6	0.35
			16QAM	22.25	21.85	0.4
3	1732.5	RB 1/0	QPSK	23.09	22.65	0.44
			16QAM	22.03	21.6	0.43
5	1732.5	RB 1/0	QPSK	22.93	22.57	0.36
			16QAM	21.97	21.61	0.36
10	1732.5	RB 1/0	QPSK	22.8	22.43	0.37
			16QAM	21.99	21.55	0.44
15	1732.5	RB 1/0	QPSK	23.01	22.59	0.42
			16QAM	22.02	21.55	0.47
20	1732.5	RB 1/0	QPSK	23.08	22.58	0.5
			16QAM	21.94	21.63	0.31

6.4 Occupied Bandwidth

Temperature	24℃
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	September 05, 2017
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§2.1049, §27.53(a)	a)	99% Occupied Bandwidth(kHz)	☑
	b)	26 dB Bandwidth(kHz)	☑
Test Setup			
Test Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

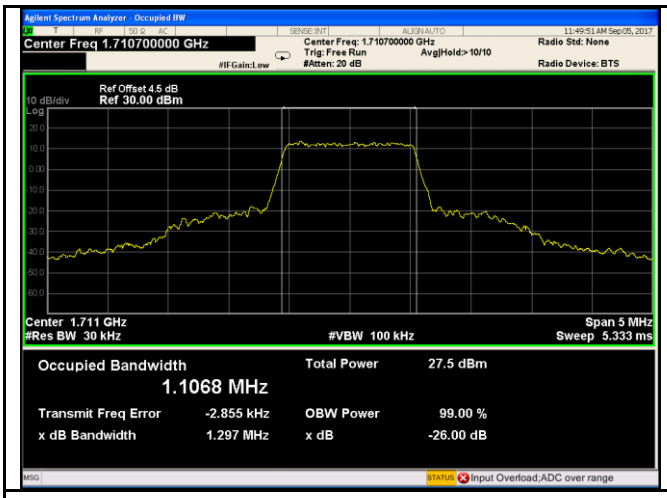
LTE Band IV (Part 27)

BW(MHz)	Channel	Frequency (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
1.4	19957	1711	16QAM	1.1071	1.292
			QPSK	1.1068	1.297
1.4	20175	1733	16QAM	1.1075	1.285
			QPSK	1.1075	1.285
1.4	20393	1754	16QAM	1.0988	1.267
			QPSK	1.0994	1.268
3	19965	1712	16QAM	2.7363	3.035
			QPSK	2.7363	3.035
3	20175	1733	16QAM	2.7269	3.036
			QPSK	2.7347	3.050
3	20385	1754	16QAM	2.7483	3.023
			QPSK	2.7486	3.019
5	19975	1713	16QAM	4.5183	5.985
			QPSK	4.5166	5.045
5	20175	1733	16QAM	4.5244	4.981
			QPSK	4.5250	4.987
5	20375	1753	16QAM	4.5315	5.050
			QPSK	4.5334	5.073
10	20000	1715	16QAM	9.0750	10.12
			QPSK	9.0750	10.12
10	20175	1733	16QAM	9.0558	10.14
			QPSK	9.0558	10.14
10	20350	1750	16QAM	9.0332	10.07
			QPSK	9.0332	10.07
15	20025	1718	16QAM	13.509	14.58
			QPSK	13.516	14.75
15	20175	1733	16QAM	13.487	14.78
			QPSK	13.491	14.79
15	20325	1748	16QAM	13.505	14.78
			QPSK	13.489	14.77

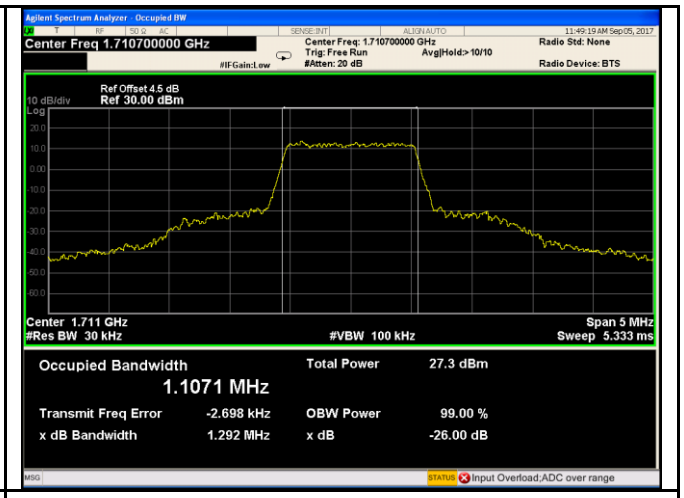
20	20050	1720	16QAM	17.942	19.32
			QPSK	17.944	19.40
20	20175	1733	16QAM	17.920	19.26
			QPSK	17.900	19.47
20	20300	1745	16QAM	17.905	19.31
			QPSK	17.937	19.20

Test Plots

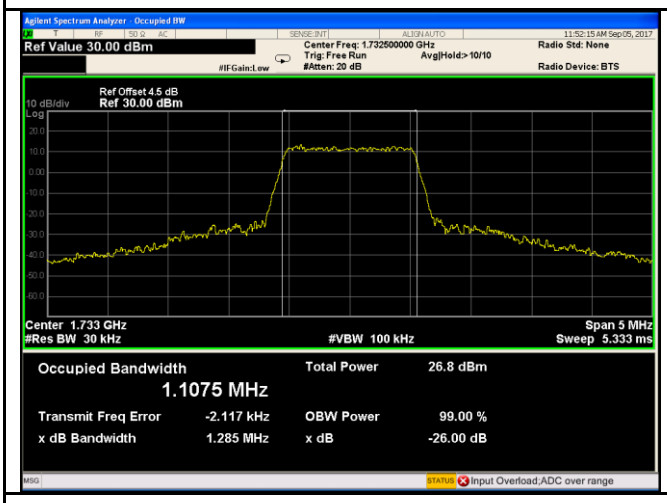
LTE Band IV (Part 27)



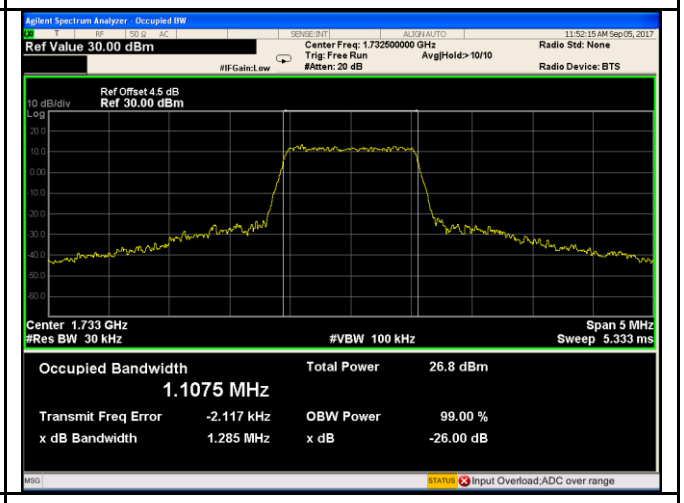
LTE band IV - Low CH QPSK-1.4



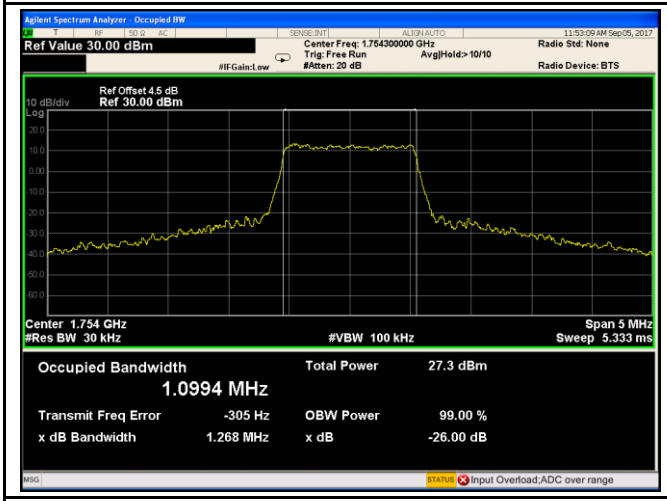
LTE band IV - Low CH 16QAM-1.4



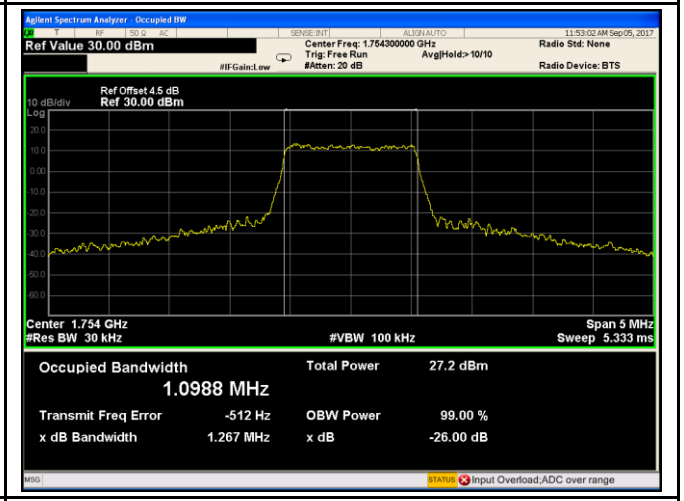
LTE band IV - Middle CH QPSK-1.4



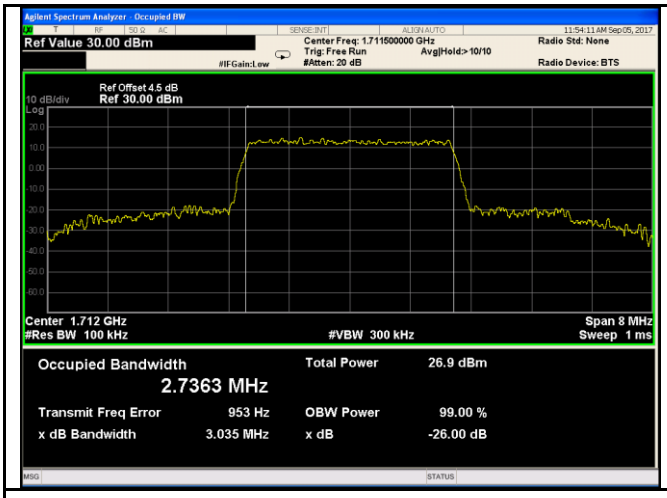
LTE band IV - Middle CH 16QAM-1.4



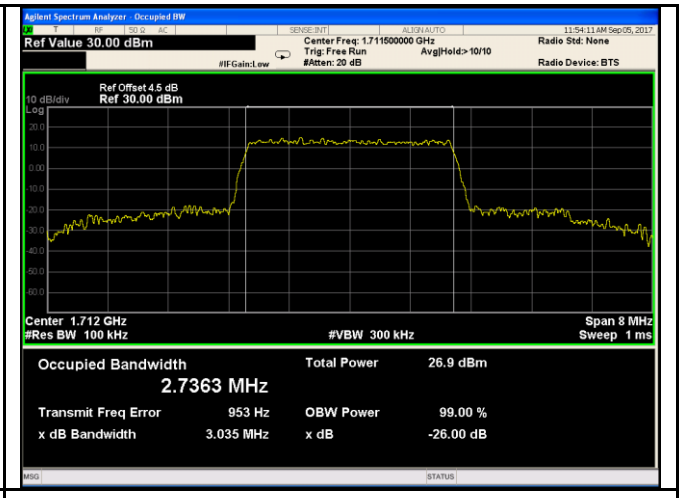
LTE band IV - High CH QPSK-1.4



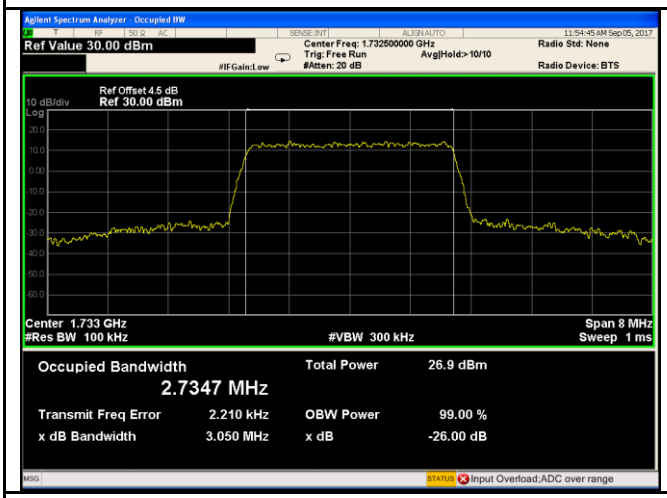
LTE band IV - High CH 16QAM-1.4



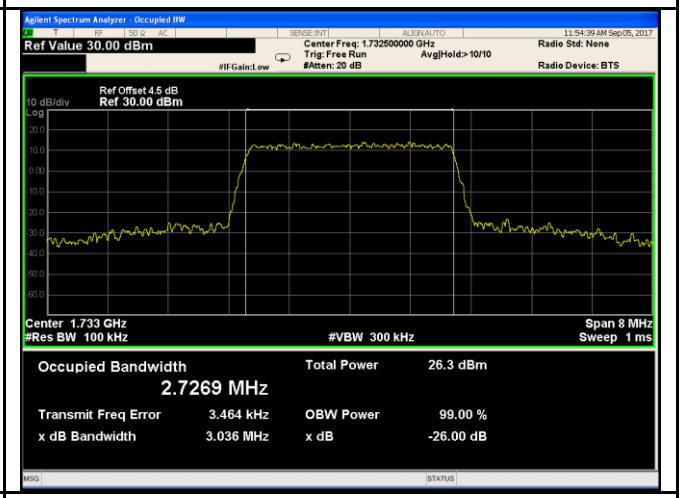
LTE band IV - Low CH QPSK-3



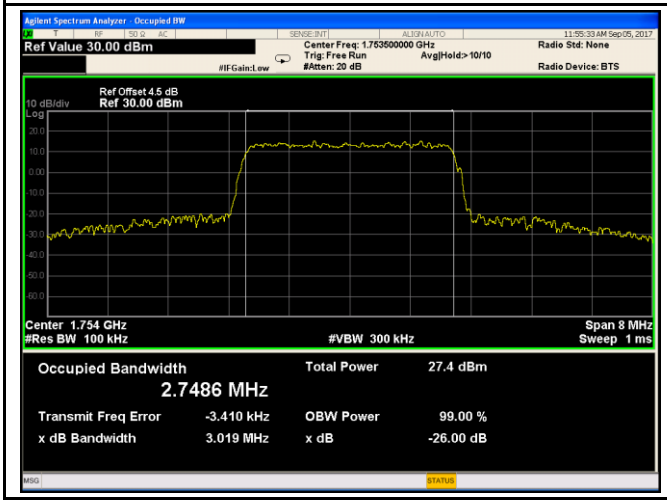
LTE band IV - Low CH 16QAM-3



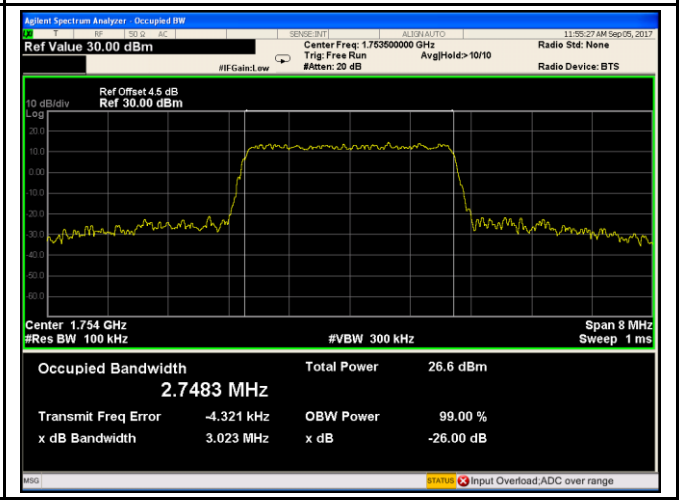
LTE band IV - Middle CH QPSK-3



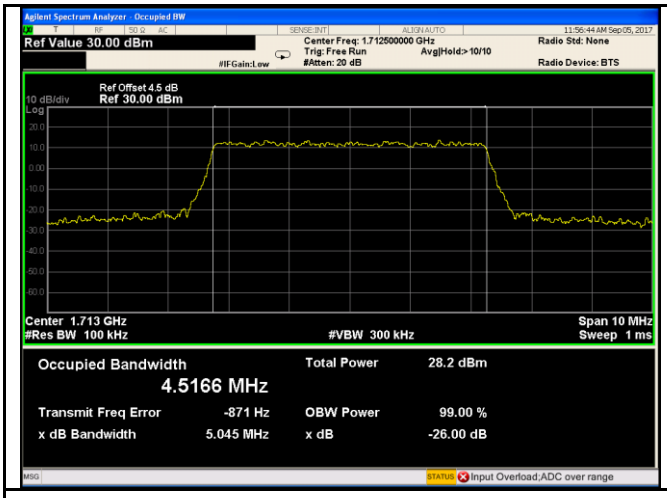
LTE band IV - Middle CH 16QAM-3



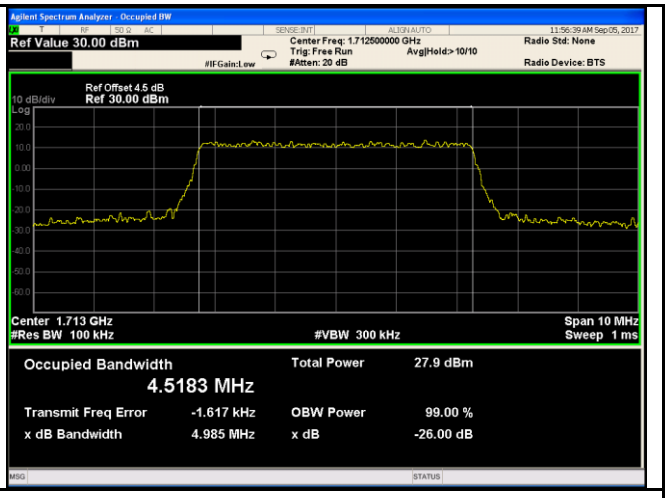
LTE band IV - High CH QPSK-3



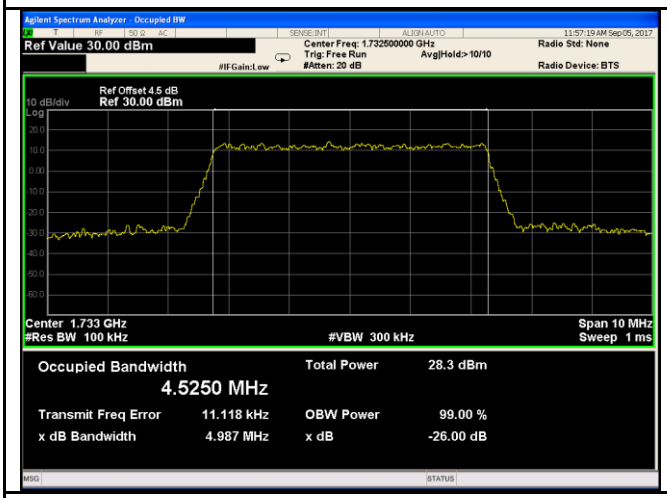
LTE band IV - High CH 16QAM-3



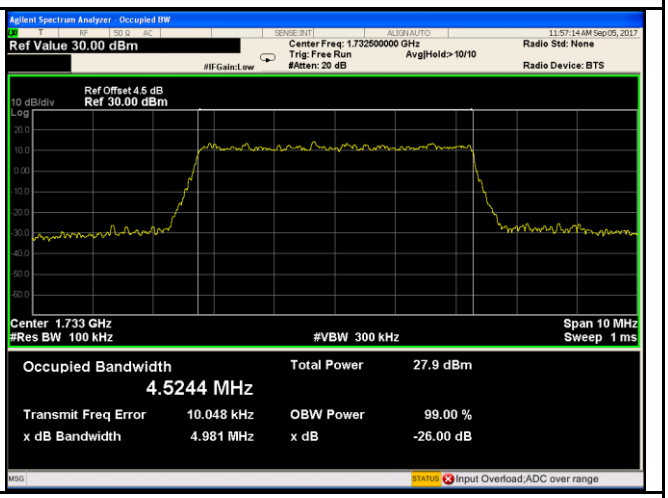
LTE band IV - Low CH QPSK-5



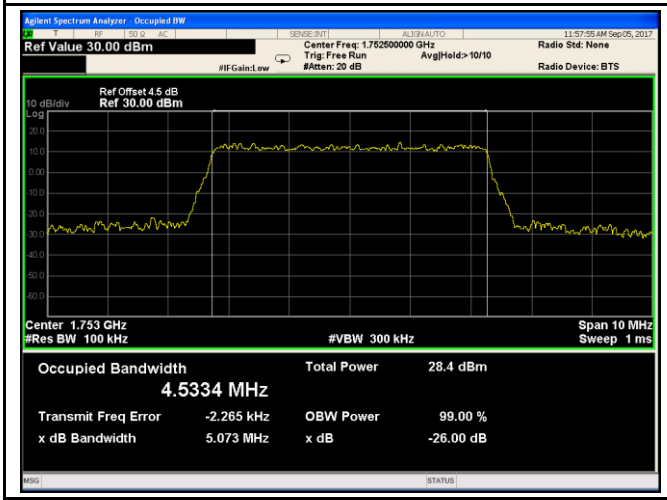
LTE band IV - Low CH 16QAM-5



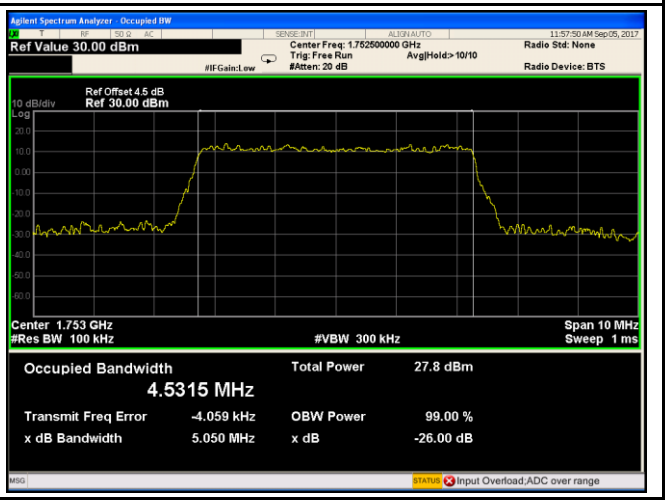
LTE band IV - Middle CH QPSK-5



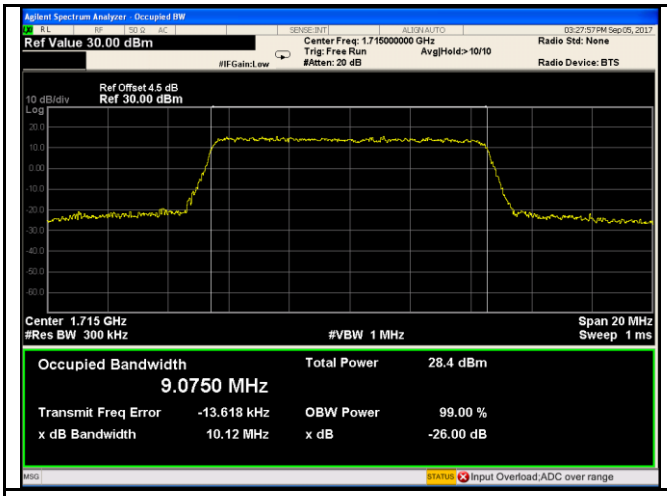
LTE band IV - Middle CH 16QAM-5



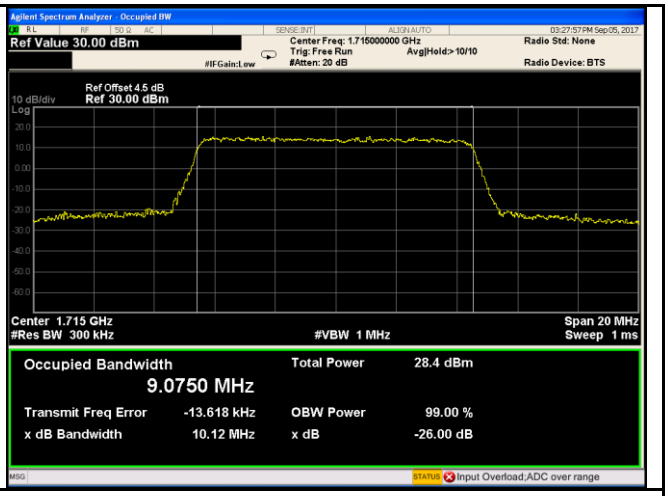
LTE band IV - High CH QPSK-5



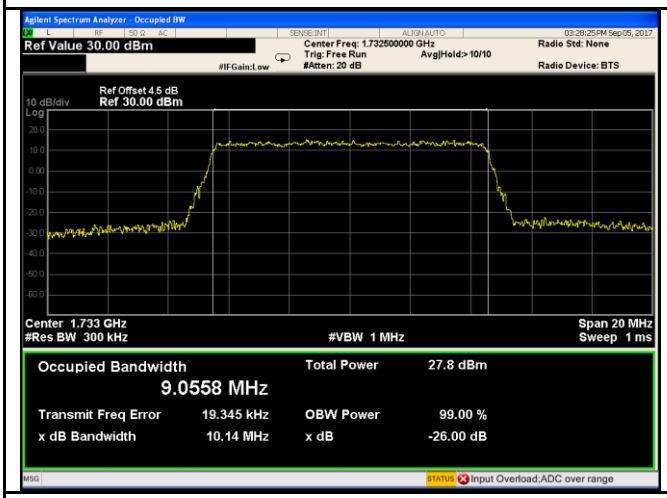
LTE band IV - High CH 16QAM-5



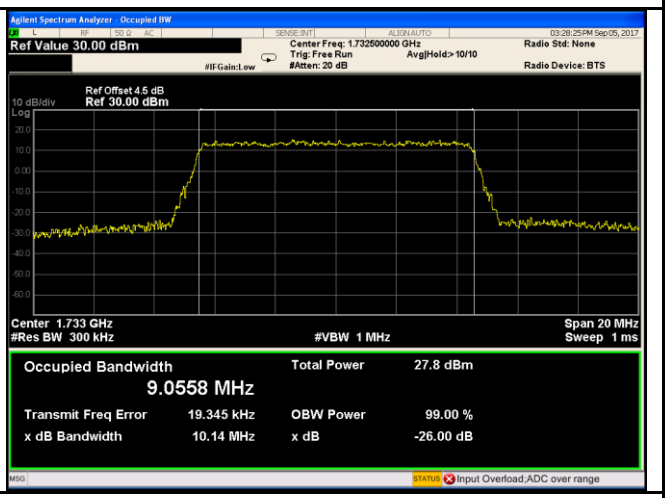
LTE band IV - Low CH QPSK-10



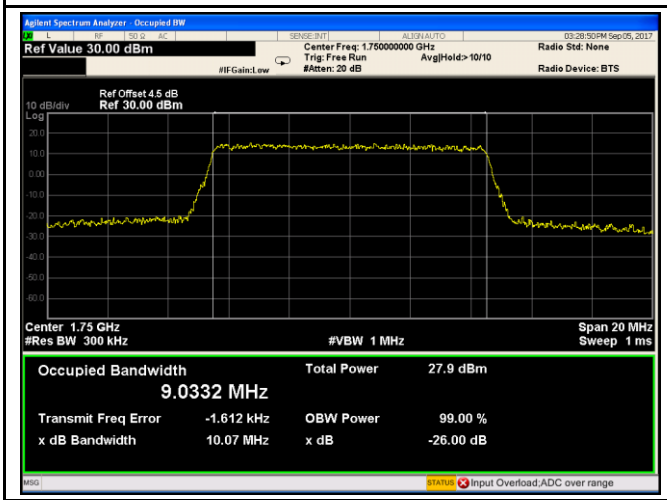
LTE band IV - Low CH 16QAM-10



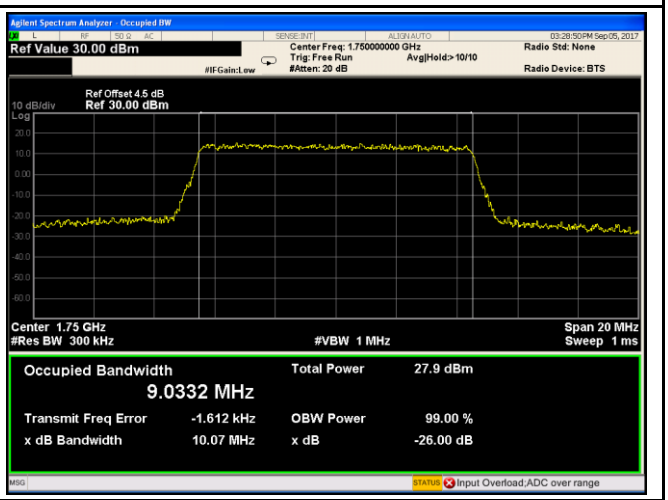
LTE band IV - Middle CH QPSK-10



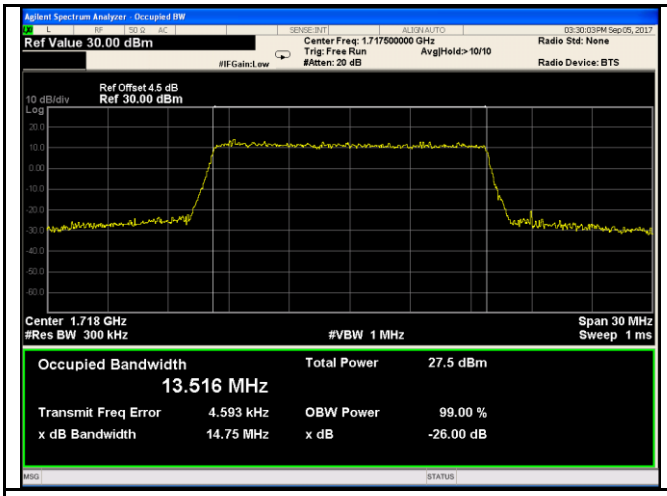
LTE band IV - Middle CH 16QAM-10



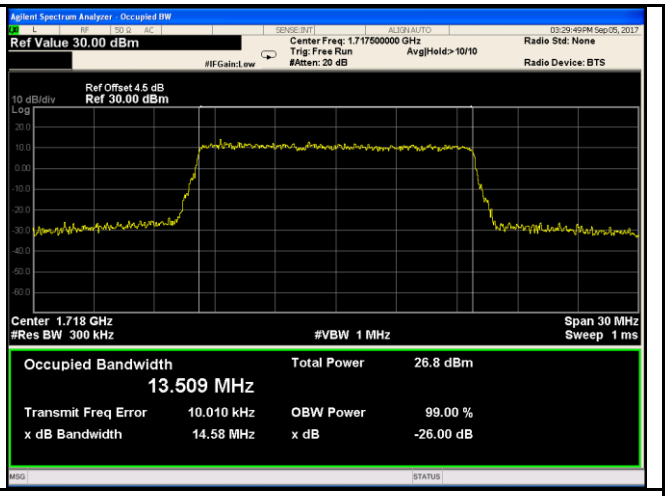
LTE band IV - High CH QPSK-10



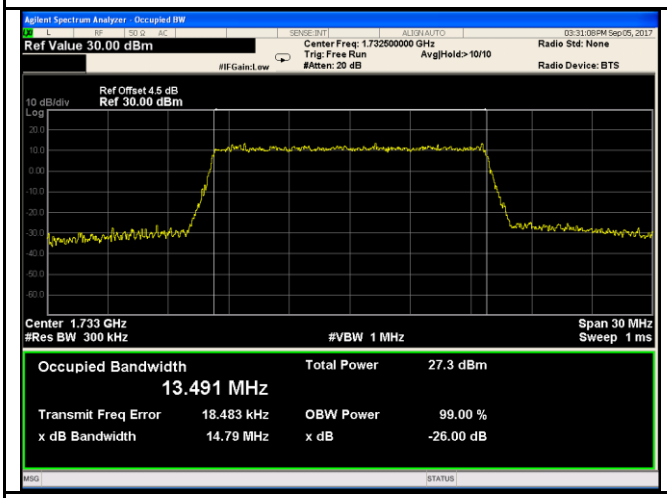
LTE band IV - High CH 16QAM-10



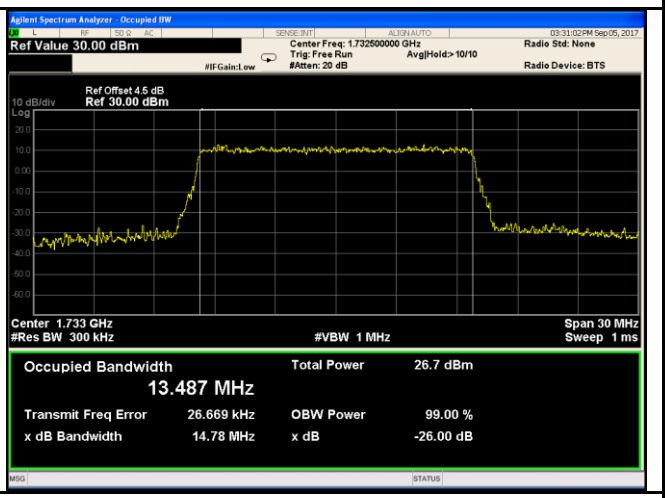
LTE band IV - Low CH QPSK-15



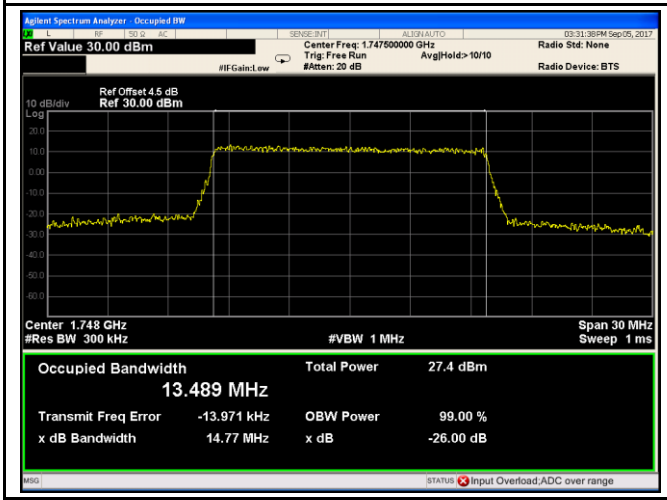
LTE band IV - Low CH 16QAM-15



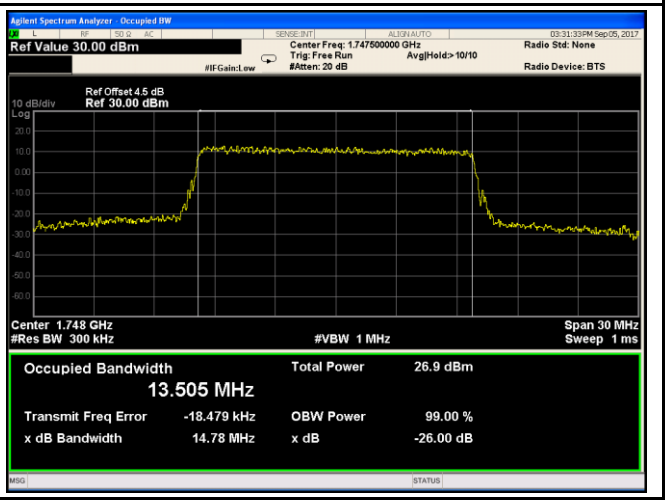
LTE band IV - Middle CH QPSK-15



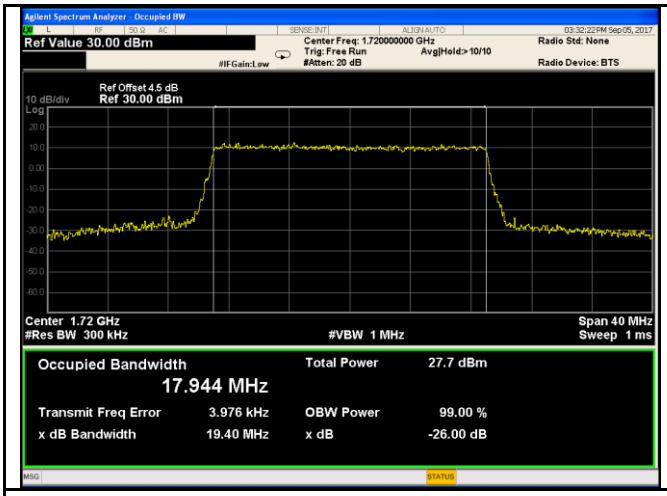
LTE band IV - Middle CH 16QAM-15



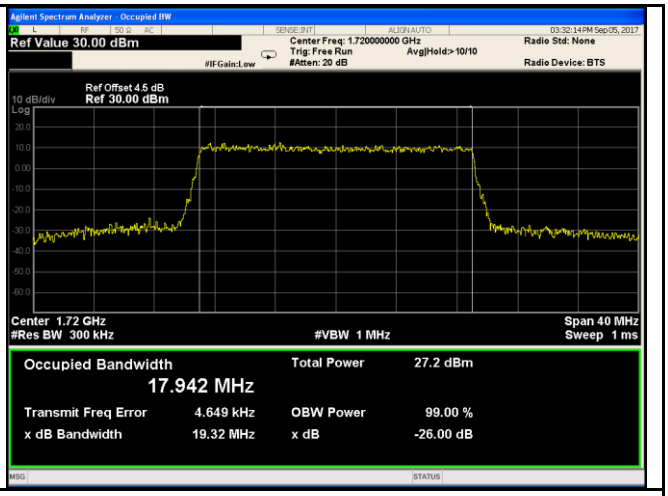
LTE band IV - High CH QPSK-15



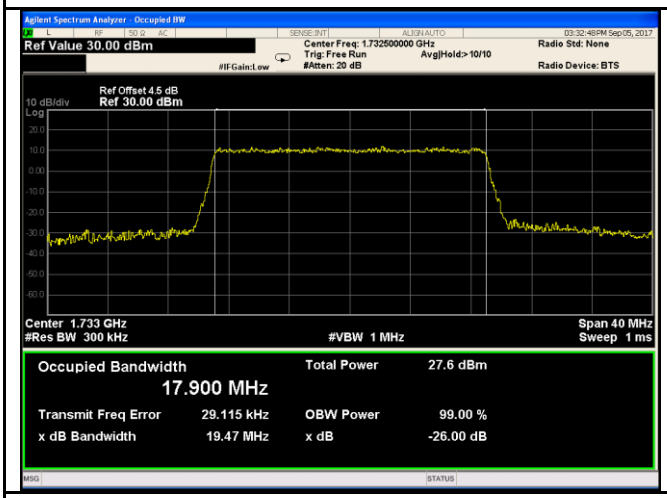
LTE band IV - High CH 16QAM-15



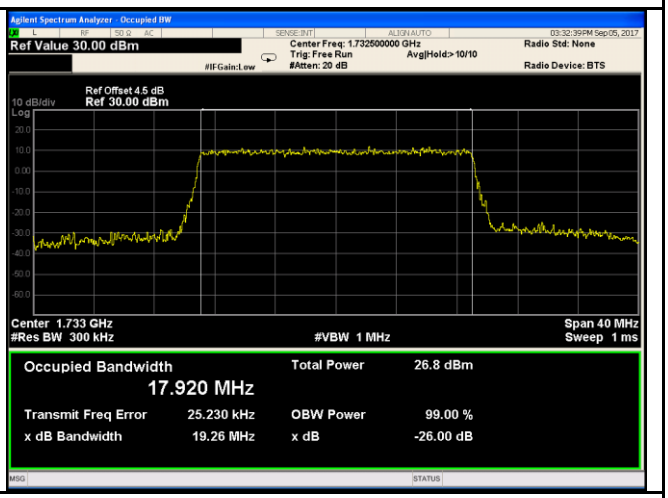
LTE band IV - Low CH QPSK-20



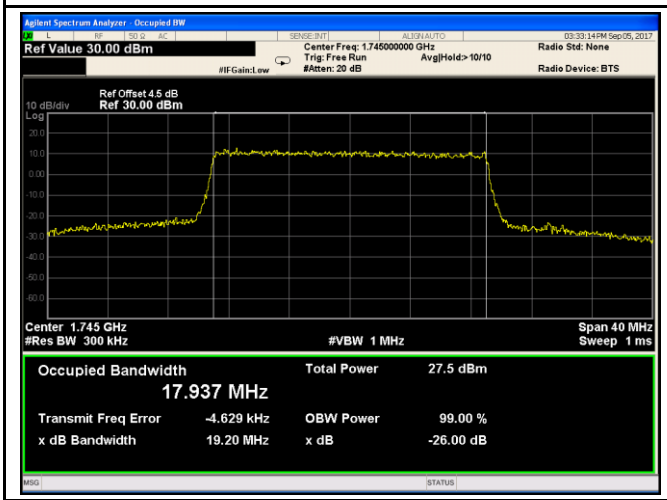
LTE band IV - Low CH 16QAM-20



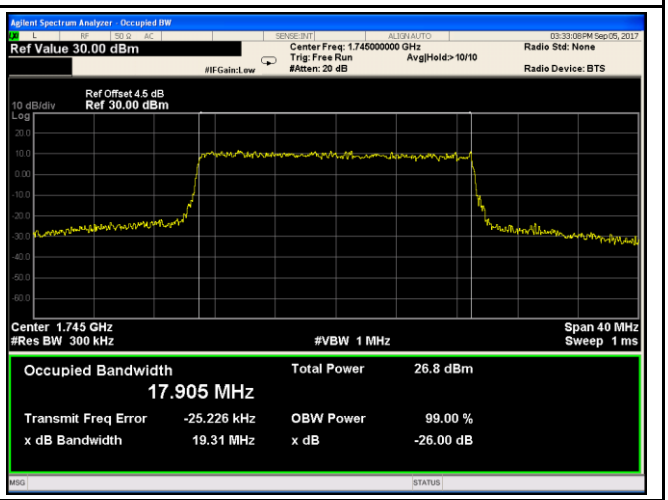
LTE band IV - Middle CH QPSK-20



LTE band IV - Middle CH 16QAM-20



LTE band IV - High CH QPSK-20

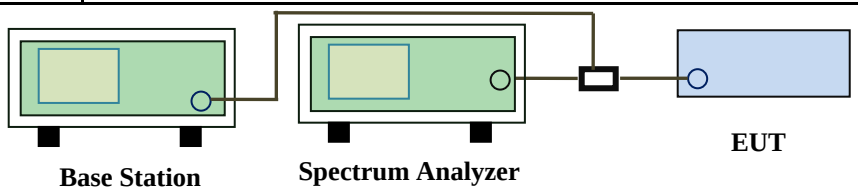


LTE band IV - High CH 16QAM-20

6.5 Spurious Emissions at Antenna Terminals

Temperature	24℃
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	September 05, 2017
Tested By :	Loren Luo

Requirement(s):

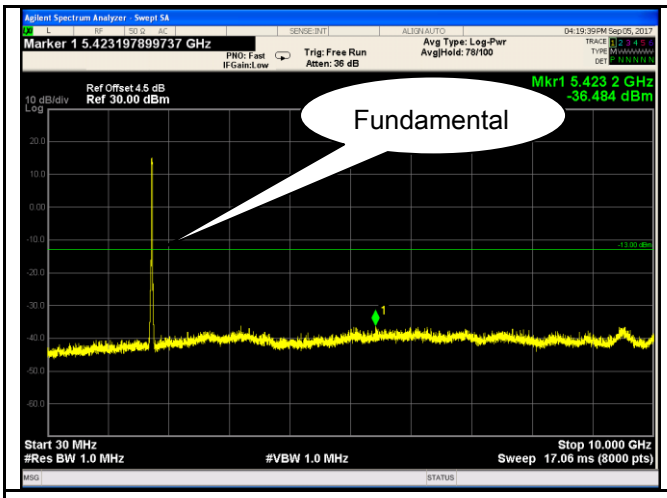
Spec	Item	Requirement	Applicable
§2.1051, § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB	☑
Test Setup			
Test Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. - Setting RBW as roughly BW/100.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

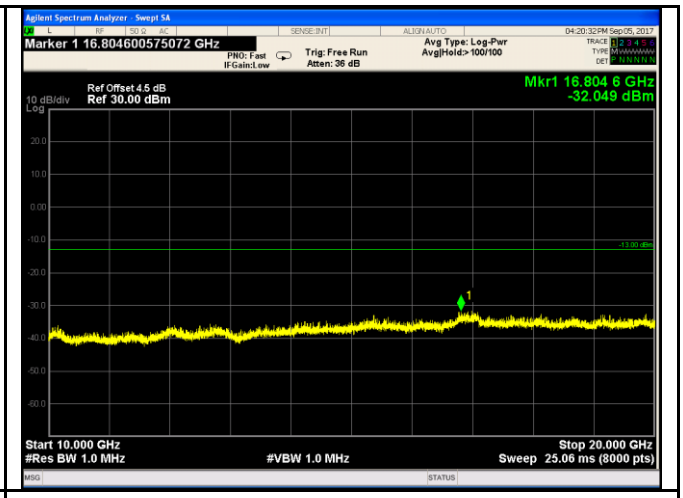
Test Plot ☑ Yes (See below) ☐ N/A

Test Plots 30MHz-20GHz

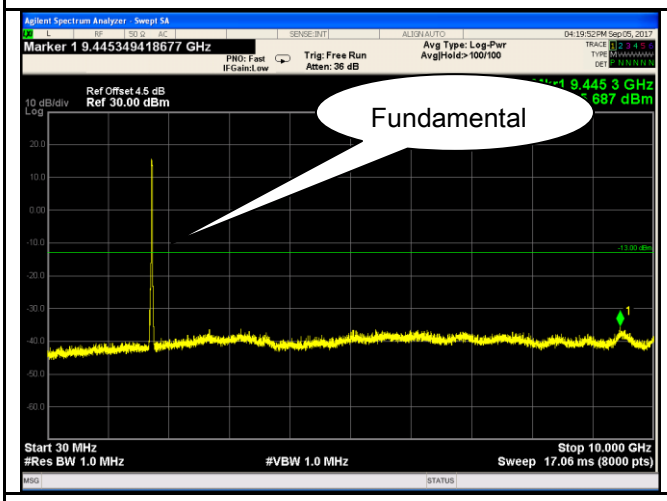
LTE Band IV (Part27) result



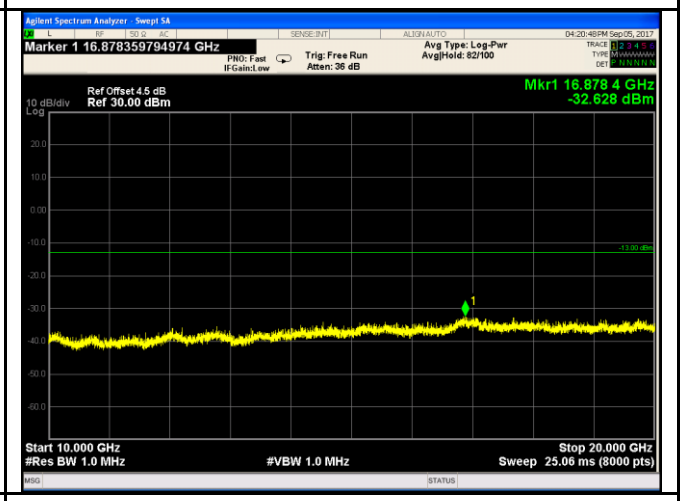
LTE Band IV - Low Channel-1



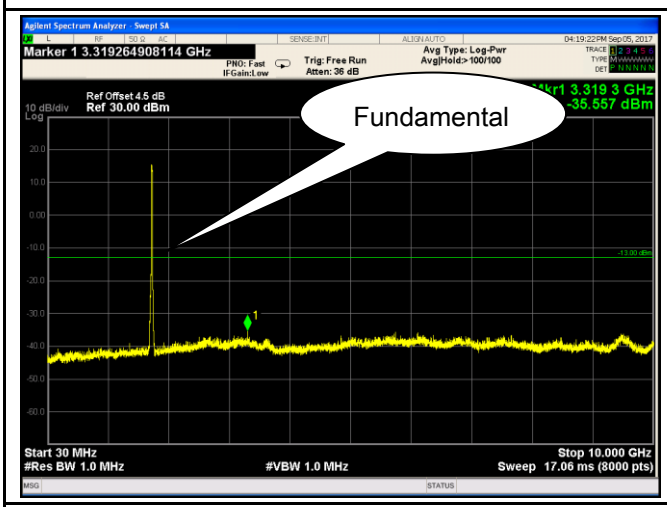
LTE Band IV - Low Channel-2



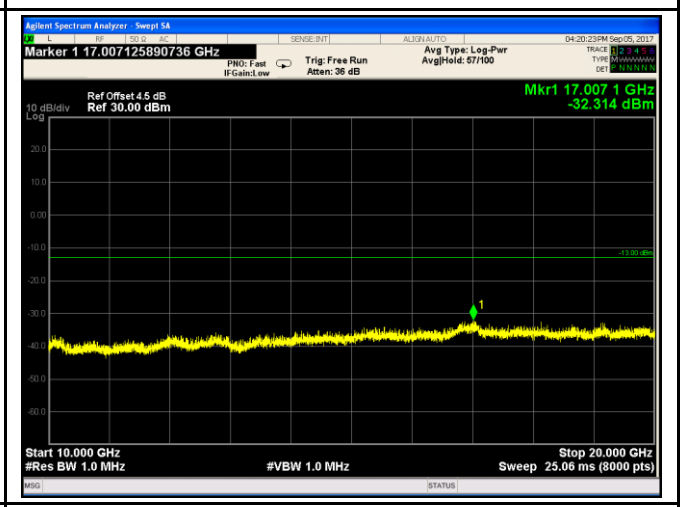
LTE Band IV - Middle Channel-1



LTE Band IV - Middle Channel-2



LTE Band IV - High Channel-1

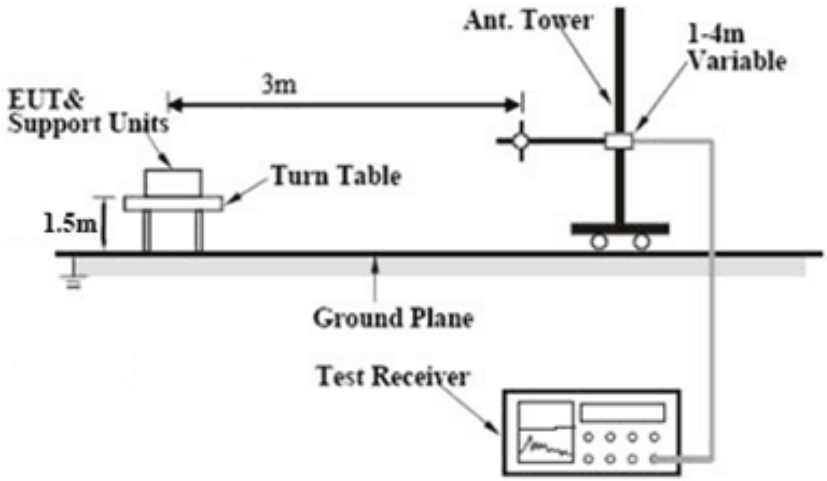


LTE Band IV - High Channel-2

6.6 Spurious Radiated Emissions

Temperature	24℃
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	September 05, 2017
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§2.1053, § 27.53(h)	a)	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. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.	☑
Test setup			
Test Procedure	1. The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. 2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. 3. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. Sample Calculation: EUT Field Strength = Raw Amplitude (dBμV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used)		

Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

LTE Band IV (Part27) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3440	-42.92	V	10.06	2.52	-35.38	-13	-22.38
3440	-44.73	H	10.06	2.52	-37.19	-13	-24.19
716.9	-53.45	V	6.3	0.4	-47.55	-13	-34.55
841.2	-52.61	H	6.1	0.44	-46.95	-13	-33.95

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3465	-42.94	V	10.09	2.52	-35.37	-13	-22.37
3465	-44.76	H	10.09	2.52	-37.19	-13	-24.19
323.9	-53.24	V	5.6	0.25	-47.89	-13	-34.89
154.2	-52.19	H	1	0.19	-51.38	-13	-38.38

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3490	-49.33	V	10.09	2.52	-41.76	-13	-28.76
3490	-50.07	H	10.09	2.52	-42.5	-13	-29.5
399.9	-53.04	V	6	0.3	-47.34	-13	-34.34
465.2	-53.65	H	6	0.29	-47.94	-13	-34.94

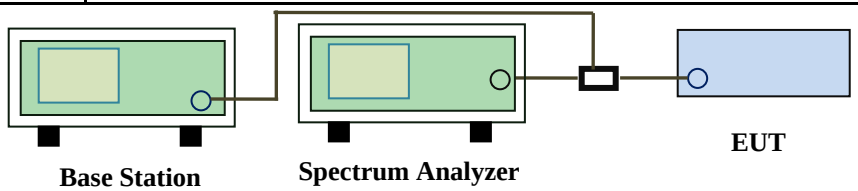
Note:

*1, The testing has been conformed to 10*1754.3MHz=17,543MHz*
2, All other emissions more than 30 dB below the limit
3, X-Axis, Y-Axis and Z–Axis were investigated. The results above show only the worst case.

6.7 Band Edge

Temperature	24℃
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	September 05, 2017
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§ 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.	☑
Test setup			
Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

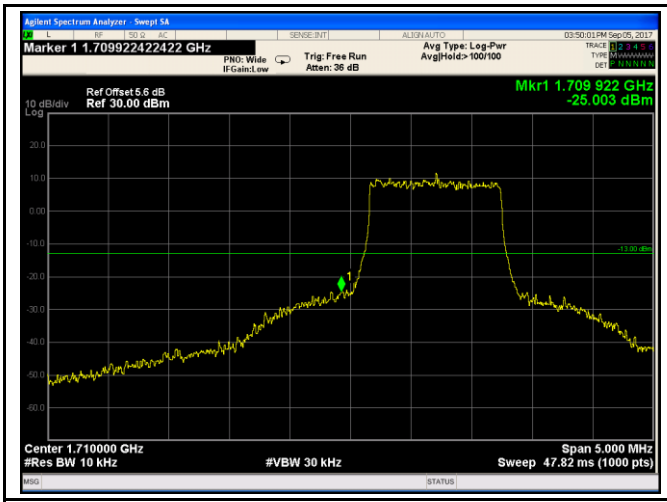
Test Plot ☑ Yes (See below) ☐ N/A

LTE Band IV (Part 27) result

BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
1.4	19957	1710	QPSK	-25.003	-13
			16QAM	-24.736	-13
1.4	20393	1755	QPSK	-29.850	-13
			16QAM	-29.742	-13
3	19965	1710	QPSK	-23.002	-13
			16QAM	-22.468	-13
3	20385	1755	QPSK	-23.162	-13
			16QAM	-23.604	-13
5	19975	1710	QPSK	-19.145	-13
			16QAM	-18.524	-13
5	20375	1755	QPSK	-21.852	-13
			16QAM	-20.833	-13
10	20000	1710	QPSK	-18.808	-13
			16QAM	-20.558	-13
10	20350	1755	QPSK	-21.125	-13
			16QAM	-19.926	-13
15	20025	1710	QPSK	-22.333	-13
			16QAM	-24.651	-13
15	20325	1755	QPSK	-21.679	-13
			16QAM	-21.679	-13
20	20050	1710	QPSK	-24.298	-13
			16QAM	-23.815	-13
20	20300	1755	QPSK	-21.855	-13
			16QAM	-26.884	-13

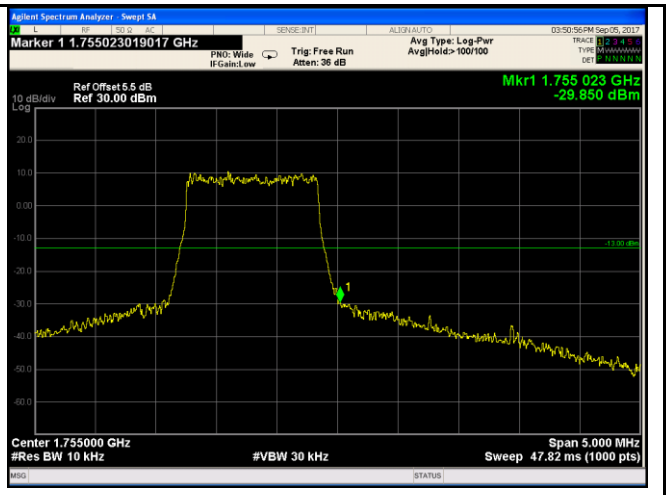
Test Plots

LTE Band IV (Part 27)



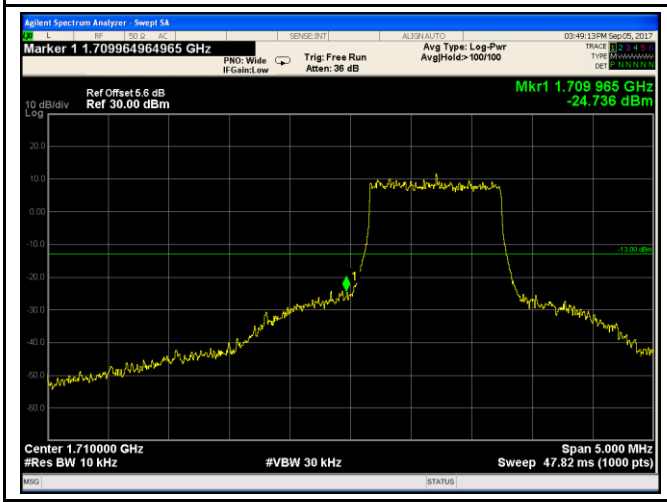
LTE Band IV - Low Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log (12.93/10)=4.5+1.1=5.6 dB



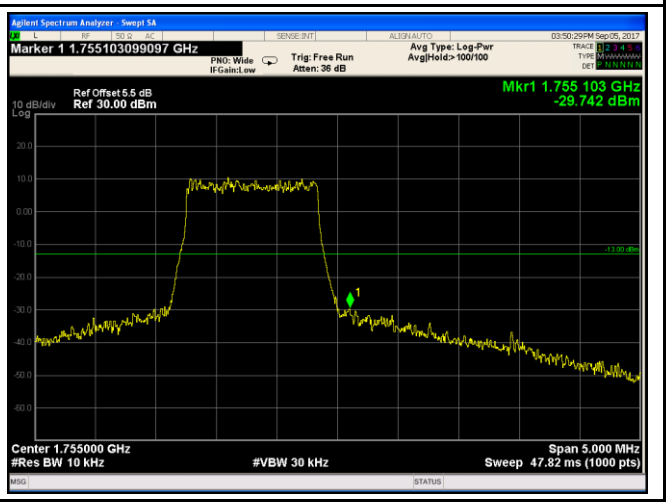
LTE Band IV - High Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log (12.87/10)=4.5+1.1=5.6 dB



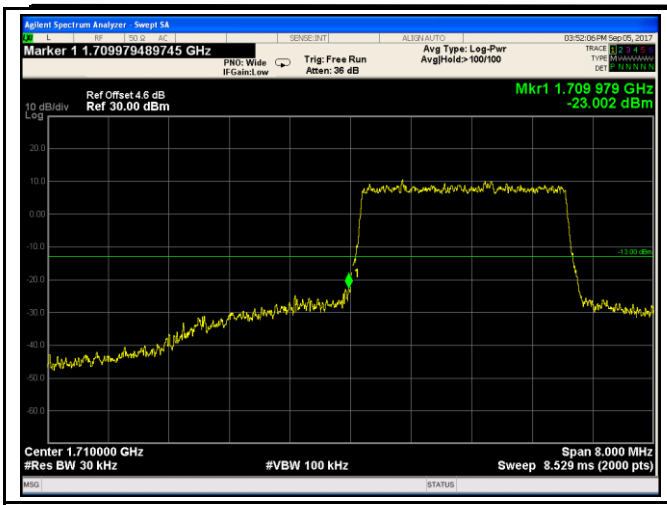
LTE Band IV - Low Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log (12.71/10)=4.5+1.0=5.5 dB



LTE Band IV - High Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log (13.02/10)=4.5+1.1=5.6 dB

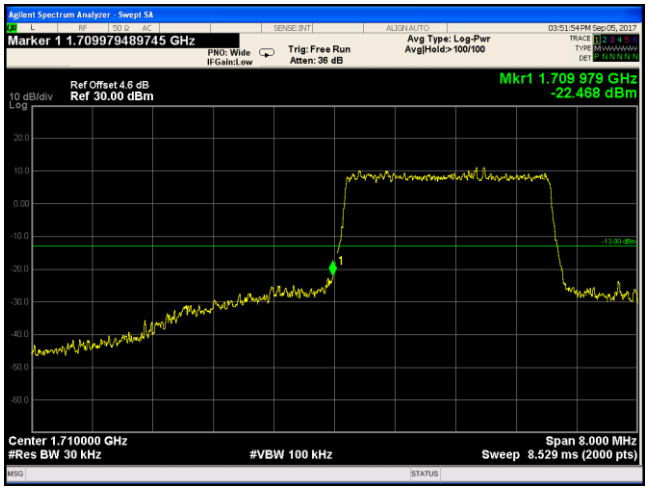


LTE Band IV - Low Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log (30.32/30)=4.5+0.0=4.5 dB

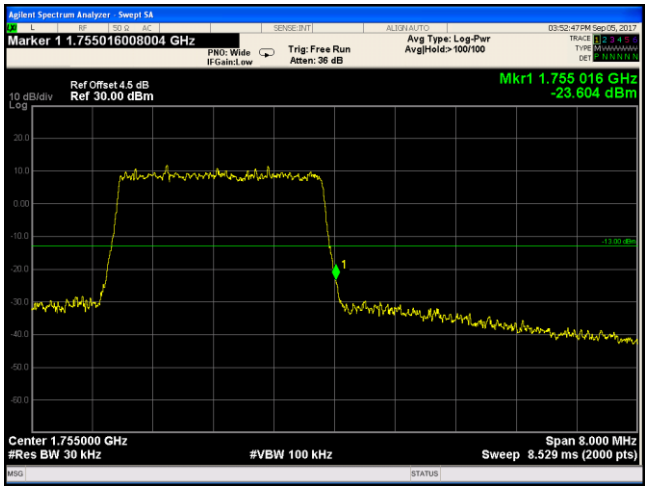
LTE Band IV - High Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log (30.54/30)=4.5+0.1=4.6 dB



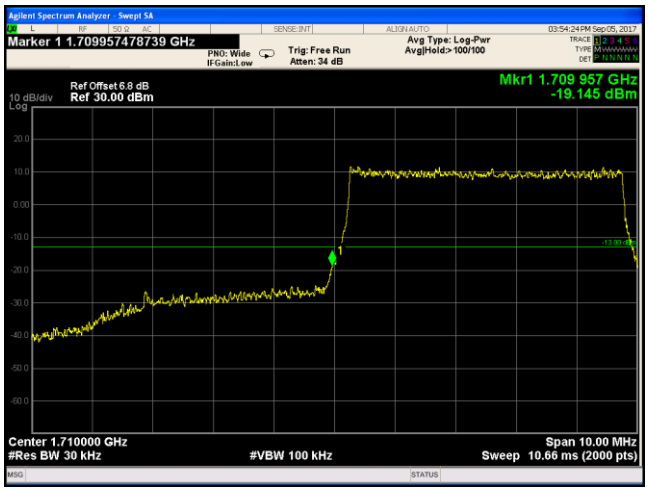
LTE Band IV - Low Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log (30.52/30)=4.5+0.1=4.6 dB



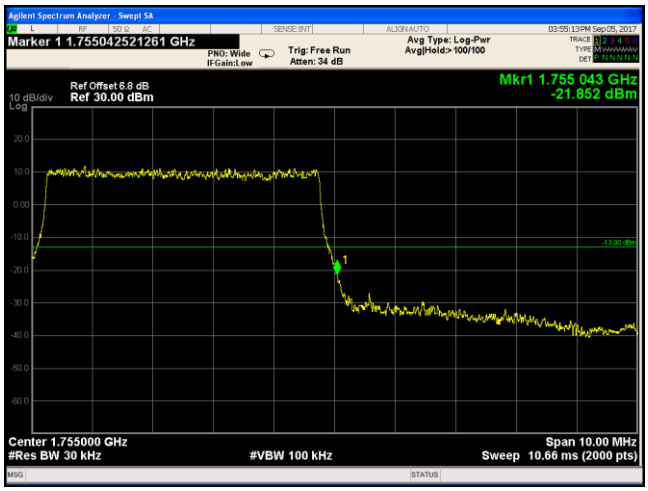
LTE Band IV - High Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log (30.70/30)=4.5+0.1=4.6 dB



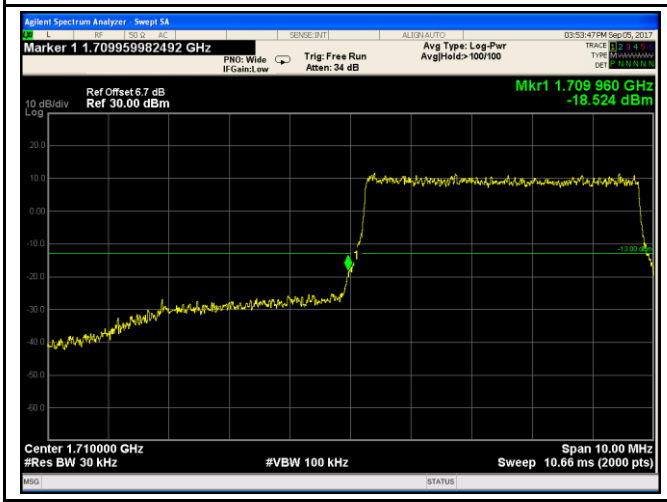
LTE Band IV - Low Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log (50.93/30)=4.5+2.3=6.8 dB



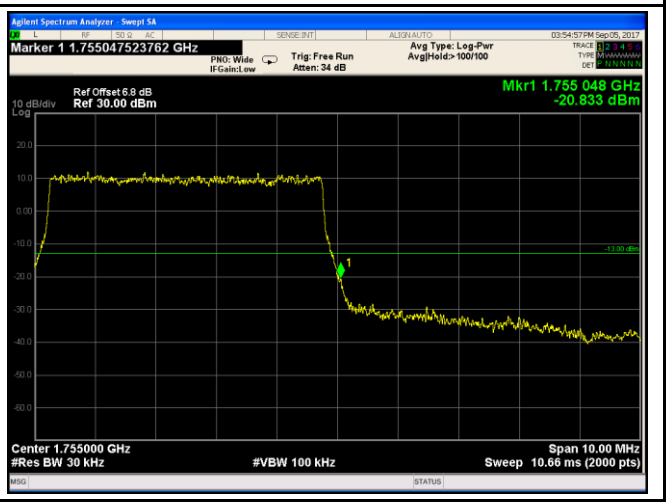
LTE Band IV - High Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log (50.62/30)=4.5+2.3=6.8 dB



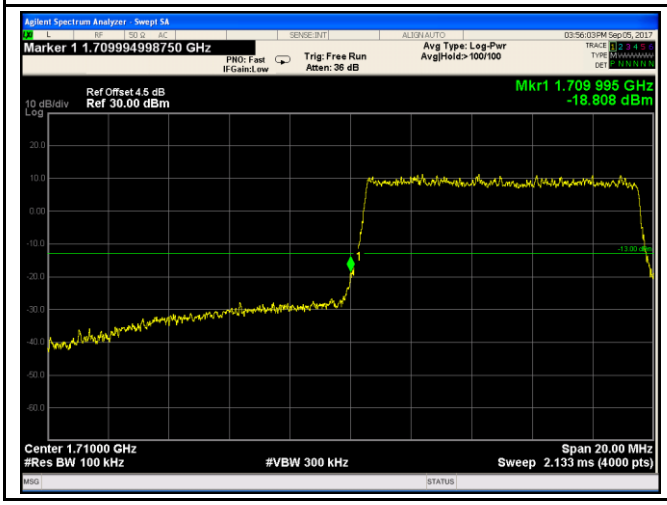
LTE Band IV - Low Channel 16QAM-5

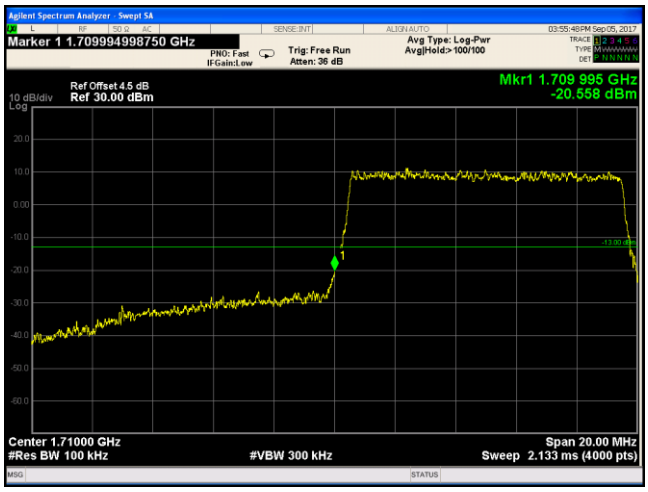
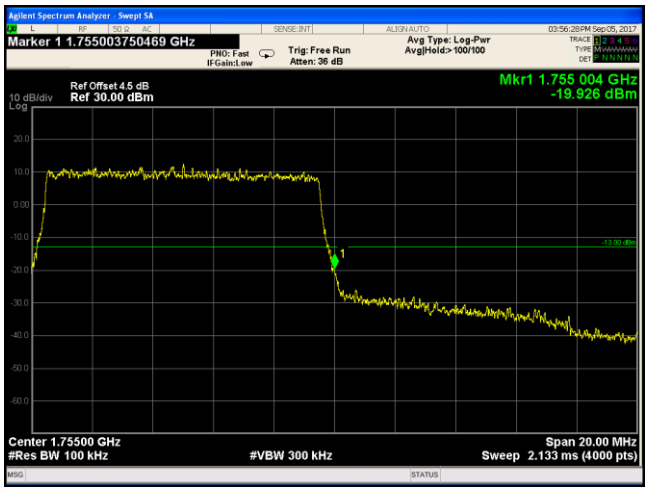
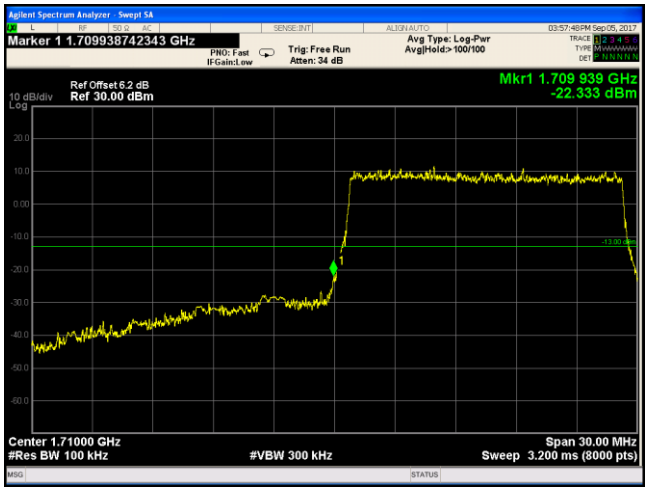
Note: Offset=Cable loss (4.5) + 10log (50.66/30)=4.5+2.3=6.8 dB

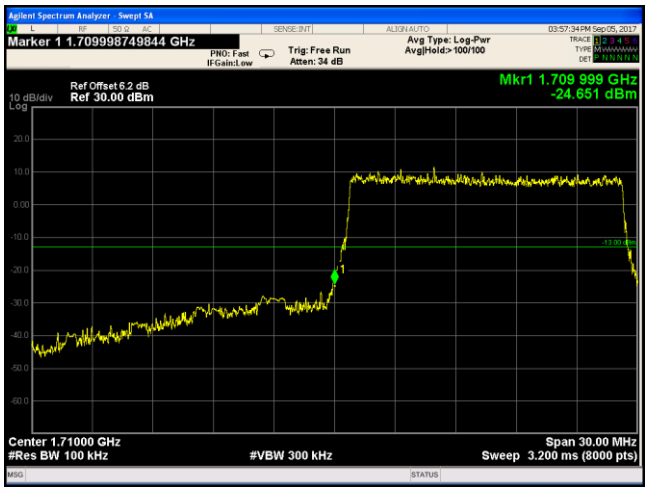


LTE Band IV - High Channel 16QAM-5

Note: Offset=Cable loss (4.5) + 10log (50.62/30)=4.5+2.3=6.8 dB



LTE Band IV - Low Channel QPSK-10	LTE Band IV - High Channel QPSK-10
	
LTE Band IV - Low Channel 16QAM-10	LTE Band IV - High Channel 16QAM-10
	
LTE Band IV - Low Channel QPSK-15	LTE Band IV - High Channel QPSK-15
Note: Offset=Cable loss (4.5) + 10log (148.5/100)=4.5+1.7=6.2 dB	Note: Offset=Cable loss (4.5) + 10log (148.8/100)=4.5+1.7=6.2 dB

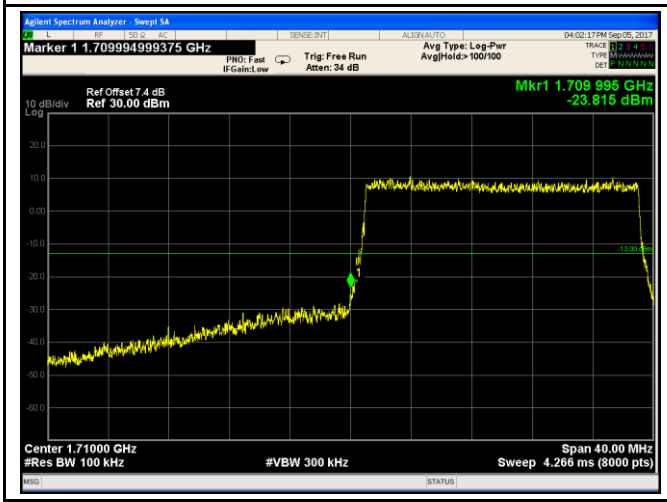


LTE Band IV - Low Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log (148.7/100)=4.5+1.7=6.2 dB

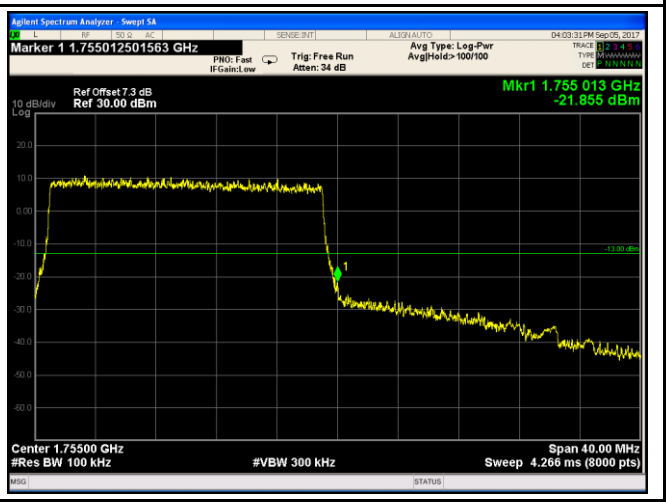
LTE Band IV - High Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log (148.3/100)=4.5+1.7=6.2 dB



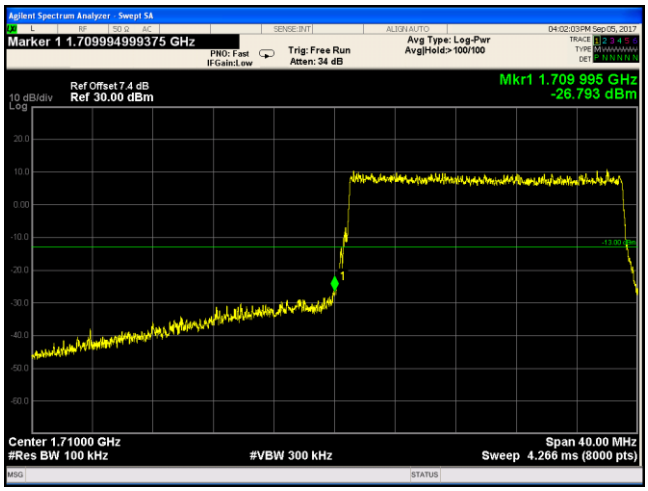
LTE Band IV - Low Channel QPSK-20

Note: Offset=Cable loss (4.5) + 10log (194.2/100)=4.5+2.9=7.4 dB



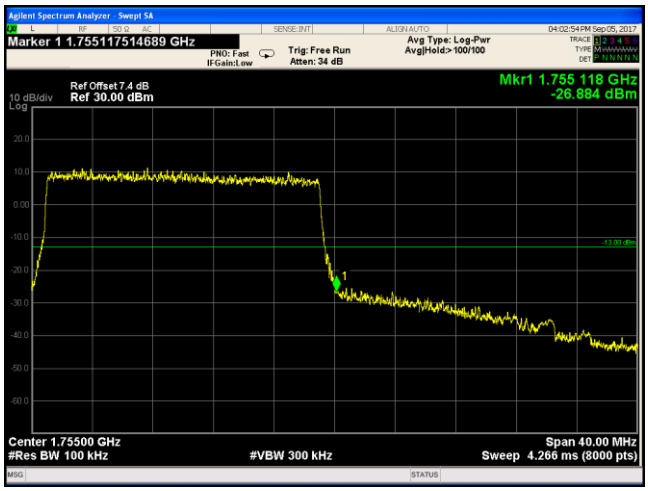
LTE Band IV - High Channel QPSK-20

Note: Offset=Cable loss (4.5) + 10log (193.6/100)=4.5+2.9=7.4 dB



LTE Band IV - Low Channel 16QAM-20

Note: Offset=Cable loss (4.5) + 10log (194.4/100)=4.5+2.9=7.4dB



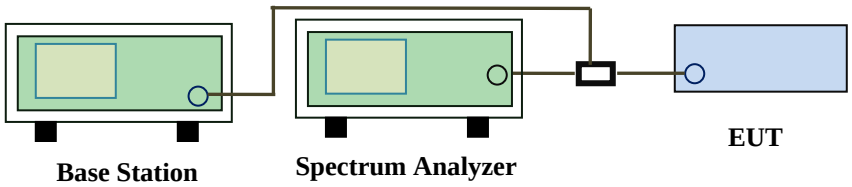
LTE Band IV - High Channel 16QAM-20

Note: Offset=Cable loss (4.5) + 10log (193.6/100)=4.5+2.9=7.4 dB

6.8 Band Edge 27.53(m)

Temperature	23℃
Relative Humidity	58%
Atmospheric Pressure	1006mbar
Test date :	----------
Tested By :	Loren Luo

Requirement(s):

Spec	Requirement	Applicable
§27.53(m)	According to FCC 27.53(m)(4) specified that power of any emmission ouutside of the channel edge must be attenuated below the transmitting power(P) by a factor shall be not less than 43+10log (P)dB at the channel edge, the limit of emission equal to -13dBm. And 55+10log (P)dB at 5.5MHz from the channel edges, the limit of emission equal to -25dBm. In the 1MHz bands immediately outside and adjacent to the frenqency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.	☐
Test Setup		
Test Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers.	
Remark		
Result	☐ Pass ☐ Fail ☑ N/A	

Test Data ☐ Yes ☑ N/A

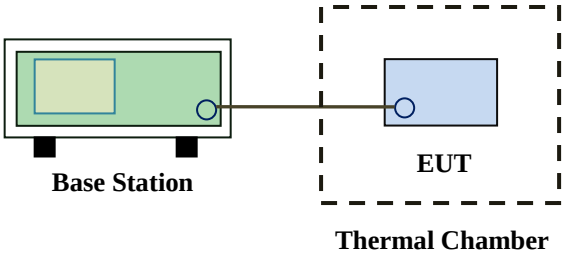
Test Plot ☐ Yes (See below) ☑ N/A

6.9 Frequency Stability

Temperature	24℃
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	September 05, 2017
Tested By :	Loren Luo

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>§2.1055,
§ 27.5(h);
§ 27.54</td><td>a)</td><td>According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:
Frequency Tolerance for Transmitters in the Public Mobile Services
<table>
<tr><th>Frequency Range (MHz)</th><th>Base, fixed (ppm)</th><th>Mobile ≤ 3 watts (□pm)</th><th>Mobile ≤ 3 watts (ppm)</th></tr>
<tr><td>25 to 50</td><td>20.0</td><td>20.0</td><td>50.0</td></tr>
<tr><td>□□to 450</td><td>5.0</td><td>5.0</td><td>50.0</td></tr>
<tr><td>450 to 512</td><td>2.5</td><td>5.0</td><td>5□0</td></tr>
<tr><td>821 to 896</td><td>1.5</td><td>2.5</td><td>2.5</td></tr>
<tr><td>928 to 9□9.</td><td>5.0</td><td>N/A</td><td>N/A</td></tr>
<tr><td>929 to 960.</td><td>1.5</td><td>N/A</td><td>N/A</td></tr>
<tr><td>2110 to 2220</td><td>10.0</td><td>N/A</td><td>N/A</td></tr>
</table>
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.
According to §27.54, The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.</td><td>☑</td></tr>
</table>

Test setup	
Procedure	A communication link was established between EUT and base station. The frequency error was monitored and measured by base station under variation of ambient temperature and variation of primary supply voltage. Limit: The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.
Remark	Frequency Stability versus Temperature: The Frequency tolerance of the carrier signal shall be maintained within 2.5ppm of the operating frequency over a temperature variation of -10ºC to +55ºC at normal supply voltage.
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

LTE Band IV (Part 27) result

Middle Channel, f_o = 1732.5 MHz				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.8	-12	0.0069	2.5
0		-12	0.0069	2.5
10		-7	0.0040	2.5
20		-14	0.0081	2.5
30		-17	0.0098	2.5
40		-17	0.0098	2.5
50		-17	0.0098	2.5
55		-14	0.0081	2.5
25	4.3	-16	0.0092	2.5
	3.3	-11	0.0063	2.5