RF TEST REPORT

Applicant	Shanghai MobileTek Communication Ltd.
FCC ID	2AK9DL600
Product	LTE-CATM1 IOT
Brand	LYNQ
Model	L600
Report No.	RXA1706-0181RF
Issue Date	June 21, 2017

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2017)/ FCC CFR47 Part 27C (2017)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Performed by: Jiangpeng Lan	*Approved by: Kai Xu*

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Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	RF power output	2.1046	PASS
2	Effective Isotropic Radiated power	27.50(d)(4) 27.50(b)(10)	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	27.53(h) /27.53(g)	PASS
5	Peak-to-Average Power Ratio	27.50(d)/KDB971168 D01(5.7)	PASS
6	Frequency Stability	2.1055 / 27.54	PASS
7	Spurious Emissions at Antenna Terminals	2.1051 27.53(h) /27.53(g)	PASS
8	Radiates Spurious Emission	2.1053 /27.53(h) /27.53(g)	PASS
Date of Testing: June 13, 2017~ June 21, 2017			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard.			

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement by any government agencies.

1.2 Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (recognition number is 428261)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3 Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
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2 General Description of Equipment under Test

Client Information

Applicant	Shanghai MobileTek Communication Ltd.
Applicant address	Free Trade Zone No. 33, No. 17 building 6H Xiya Road
Manufacturer	Shanghai MobileTek Communication Ltd.
Manufacturer address	Free Trade Zone No. 33, No. 17 building 6H Xiya Road

General information

EUT Description			
Model:	L600		
Product IMEI:	866873022276763		
Hardware Version:	V1		
Software Version:	V1		
Power Supply:	External power supply		
Antenna Type:	The EUT don't have standard Antenna, The Antenna used for testing in this report is the after-market accessory (Rod antenna)		
Test Mode(s):	LTE Band 4; LTE Band 13		
LTE Release:	13		
LTE Category:	M1		
Maximum E.I.R.P./ E.R.P.	LTE Band 4: 22.94dBm LTE Band 13: 19.50dBm		
Rated Power Supply Voltage:	3.8V		
Extreme Voltage:	Minimum: 3.3V Maximum: 4.3V		
Extreme Temperature:	Lowest: -40°C Highest: +85°C		
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	LTE Band 4	1710 ~ 1755	2110 ~ 2155
	LTE Band 13	777 ~ 787	746 ~ 756
Note：1. The information of the EUT is declared by the manufacturer. Please refer to the specifications or user manual for details.			

Accessory equipment	
Evaluation Board	RF Cable
Adapter	Antenna: Rod antenna
Micro USB Cable	/

2.1 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards
FCC CFR47 Part 2 (2017)
FCC CFR47 Part 27C (2017)
ANSI/TIA-603-D (2010)
KDB 971168 D01 Power Meas License Digital Systems v02r02

3 Test Configuration

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (Z axis, vertical polarization) and the worst case was recorded.

All mode and data rates and positions and RB size and modulations were investigated.
Subsequently, only the worst case emissions are reported.
The following testing in LTE is set based on the maximum RF Output Power.
The following testing in different Bandwidth is set to detailin the following table:

Test modes are chosen to be reported as the worst case configuration below for LTE Band 4/13:

Test items	Modes	Bandwidth (MHz)						Modulation		RB			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	50%	100%	L	M	H
RF power output	LTE 4	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O	O	O	O	O	O	O
Effective Isotropic Radiated power	LTE 4	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O	-	-	O	O	O	O
Occupied Bandwidth	LTE 4	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O			O	O	O	O
Band Edge Compliance	LTE 4	O	O	O	O	O	O	O	O	O	-	O	O	-	O
	LTE 13	-	-	O	O	-	-	O	O	O	-	O	O	-	O
Peak-to-Average Power Ratio	LTE 4	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O	-	-	O	O	O	O
Frequency Stability	LTE 4	O	O	O	O	O	O	O	O	-	-	O	-	O	-
	LTE 13	-	-	O	O	-	-	O	O	-	-	O	-	O	-
Spurious Emissions at Antenna Terminals	LTE 4	O	O	O	O	O	O	-	O	O	-	-	O	O	O
	LTE 13	-	-	O	O	-	-	-	O	O	-	-	O	O	O
Radiates Spurious Emission	LTE 4	O	O	O	O	O	O	-	O	O	-	-	O	O	O
	LTE 13	-	-	O	O	-	-	-	O	O	-	-	O	O	O
Note	1. The mark “O” means that this configuration is chosen for testing. 2. The mark “-” means that this configuration is not testing.														

4 Test Information

4.1 RF Power Output

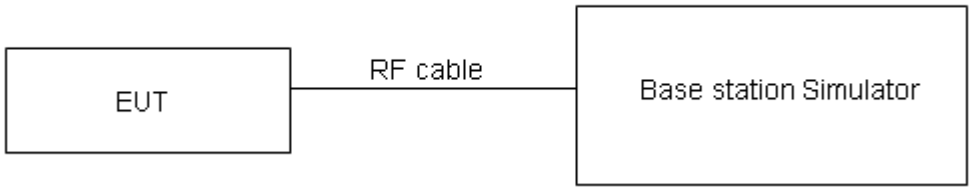
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation.

Test Setup



The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.

Limits

No specific RF power output requirements in part 2.1046.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U=0.4 dB.

Test Results

LTE TDD Band 4				AV Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19957/1710.7	20175/1732.5	20393/1754.3
1.4MHz	QPSK	1	0	22.33	21.60	22.41
		1	2	22.36	21.49	22.35
		1	5	22.32	21.50	22.45
		3	0	23.19	22.54	23.34
		3	2	23.13	22.56	23.37
		3	3	23.19	22.54	23.55
		6	0	22.13	21.81	22.52
	16QAM	1	0	22.17	22.35	23.12
		1	2	22.17	22.21	23.26
		1	5	22.11	22.23	23.26
		3	0	23.01	22.89	23.71
		3	2	23.05	22.90	23.76
		3	3	23.06	22.91	23.83
		5	0	22.55	21.86	22.59
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
3MHz	QPSK	1	0	22.35	21.64	22.44
		1	3	22.39	21.54	22.39
		1	5	22.35	21.55	22.49
		3	0	22.29	21.66	22.47
		3	2	22.25	21.66	22.49
		3	3	22.29	21.65	22.65
		6	0	22.16	21.85	22.55
	16QAM	1	0	22.20	22.37	23.15
		1	3	22.20	22.26	23.30
		1	5	22.13	22.27	23.29
		3	0	22.12	22.02	22.83
		3	2	22.16	22.03	22.88
		3	3	22.16	22.03	22.96
		5	0	22.58	21.90	22.62
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
5MHz	QPSK	1	0	22.32	21.62	22.40
		1	3	22.37	21.50	22.36
		1	5	22.32	21.50	22.45
		3	0	22.26	21.61	22.43
		3	2	22.23	21.62	22.44
		3	3	22.27	21.63	22.61
		6	0	22.14	21.84	22.53

	16QAM	1	0	22.17	22.33	23.12
		1	3	22.17	22.24	23.27
		1	5	22.10	22.25	23.25
		3	0	22.10	21.98	22.80
		3	2	22.13	21.98	22.84
		3	3	22.13	21.98	22.92
		5	0	22.56	21.86	22.57
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20000/1715	20175/1732.5	20350/1750
10MHz	QPSK	1	0	22.34	21.63	22.43
		1	3	22.40	21.55	22.40
		1	5	22.34	21.54	22.48
		3	0	22.29	21.66	22.47
		3	2	22.26	21.67	22.48
		3	3	22.29	21.67	22.66
		6	0	22.22	21.86	22.57
	16QAM	1	0	22.19	22.36	23.14
		1	3	22.20	22.28	23.30
		1	5	22.13	22.27	23.28
		3	0	22.13	22.03	22.84
		3	2	22.15	22.02	22.87
		3	3	22.16	22.03	22.96
		5	0	22.59	21.91	22.61
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
15MHz	QPSK	1	0	22.33	21.59	22.41
		1	3	22.38	21.54	22.37
		1	5	22.31	21.49	22.44
		3	0	22.27	21.62	22.44
		3	2	22.23	21.62	22.44
		3	3	22.26	21.64	22.62
		6	0	22.20	21.82	22.52
	16QAM	1	0	22.14	22.34	23.12
		1	3	22.18	22.25	23.28
		1	5	22.10	22.23	23.25
		3	0	22.10	22.01	22.81
		3	2	22.12	21.97	22.83
		3	3	22.14	21.99	22.93
		5	0	22.56	21.86	22.57
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20050/1720	20175/1732.5	20300/1745
20MHz	QPSK	1	0	22.30	21.55	22.38
		1	3	22.37	21.50	22.35

		1	5	22.29	21.48	22.41
		3	0	22.24	21.57	22.40
		3	2	22.21	21.58	22.41
		3	3	22.23	21.59	22.58
		6	0	22.17	21.77	22.48
	16QAM	1	0	22.12	22.30	23.07
		1	3	22.14	22.23	23.24
		1	5	22.08	22.20	23.23
		3	0	22.07	21.97	22.78
		3	2	22.09	21.95	22.80
		3	3	22.11	21.94	22.89
		5	0	22.54	21.82	22.54

LTE FDD Band 13				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23205/779.5	23230/782	23255/784.5
5MHz	QPSK	1	0	24.24	22.42	22.18
		1	3	24.54	22.41	22.15
		1	5	24.58	22.35	22.11
		3	0	21.52	21.49	21.47
		3	2	21.54	21.52	21.49
		3	3	21.76	21.50	21.58
		6	0	21.69	21.52	21.48
	16QAM	1	0	24.63	23.13	22.70
		1	3	24.54	23.22	22.81
		1	5	24.05	23.23	22.79
		3	0	23.62	21.84	21.68
		3	2	23.65	21.87	21.72
		3	3	23.73	21.90	21.70
		5	0	21.23	21.81	20.64
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				/	23230/782	/
10MHz	QPSK	1	0	/	24.62	/
		1	3	/	24.65	/
		1	5	/	24.47	/
		3	0	/	24.60	/
		3	2	/	24.58	/
		3	3	/	24.53	/
		6	0	/	21.97	/
	16QAM	1	0	/	23.25	/
		1	3	/	23.39	/
		1	5	/	23.31	/
		3	0	/	22.98	/
		3	2	/	23.01	/
		3	3	/	23.19	/
		5	0	/	22.05	/

4.2 Effective Isotropic Radiated Power

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

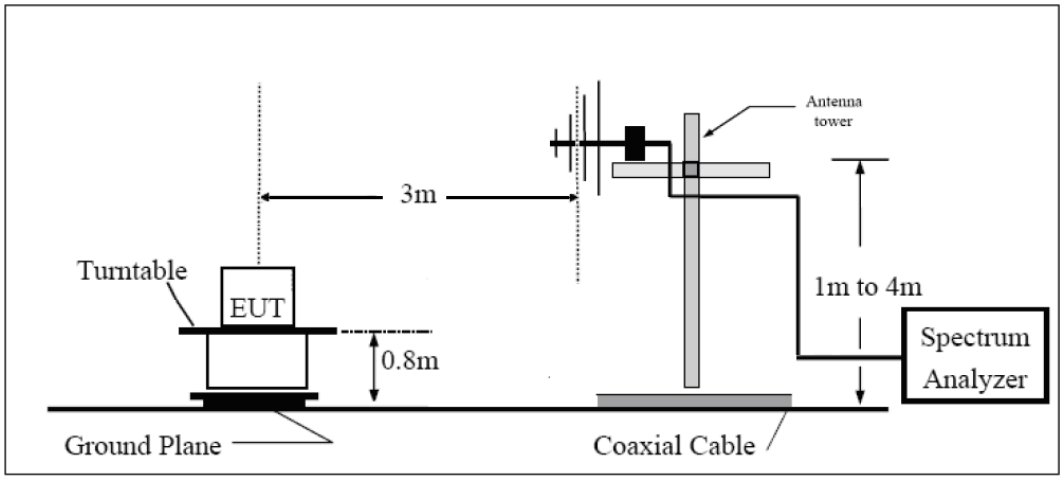
Methods of Measurement

1. The testing follows FCC KDB 971168 v02r02 Section 5.8 and ANSI / TIA-603-D-2010 Section 2.2.12.
2. Above 30MHz：The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test.Set Test Receiver or Spectrum RBW=1MHz,VBW=3MHz, And the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:
Power(EIRP)=PMea- PAg - Pcl + Ga
The measurement results are amend as described below:
Power(EIRP)=PMea- Pcl + Ga
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP

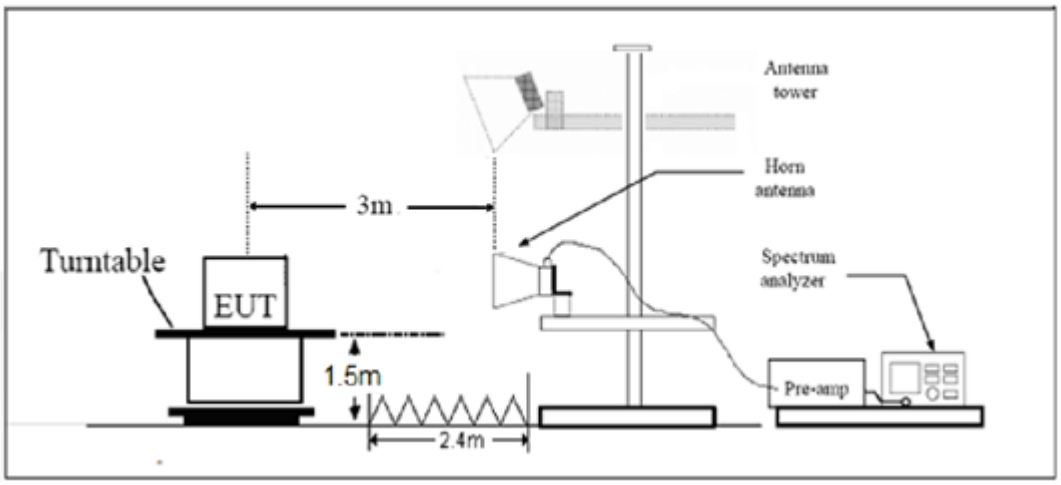
= EIRP-2.15dBi.

Test setup

30MHz~~~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

Limits

Rule Part 27.50(b) (10) specifies that “Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP”

Rule Part 27.50(d) (4) specifies that “Fixed, mobile and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP”

Part 27.50(b)(10)Limit (ERP)	≤ 3 W (34.77 dBm)
Part 27.50(d)(4)Limit (EIRP)	≤ 1 W (30 dBm)

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 1.19 dB

Test Results

LTE Band 4								
Bandwidth	Frequency (MHz)	Ant Pot (H/V)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	Conclusion
1.4MHz (QPSK)	1710.7	H	-34.12	-54.30	0.00	1.44	21.62	Pass
	1732.5	H	-33.69	-54.32	0.00	1.57	22.19	Pass
	1754.3	H	-33.62	-54.10	0.00	1.72	22.20	Pass
	1710.7	V	-33.55	-54.35	0.00	1.44	22.24	Pass
	1732.5	V	-33.52	-54.41	0.00	1.57	22.46	Pass
	1754.3	V	-33.61	-54.52	0.00	1.72	22.63	Pass
1.4MHz (16QAM)	1710.7	H	-34.44	-54.30	0.00	1.44	21.30	Pass
	1732.5	H	-34.00	-54.32	0.00	1.57	21.88	Pass
	1754.3	H	-32.92	-54.10	0.00	1.72	22.90	Pass
	1710.7	V	-32.85	-54.35	0.00	1.44	22.94	Pass
	1732.5	V	-33.83	-54.41	0.00	1.57	22.15	Pass
	1754.3	V	-33.92	-54.52	0.00	1.72	22.32	Pass
3MHz (QPSK)	1711.5	H	-35.72	-54.33	0.00	1.44	20.05	Pass
	1732.5	H	-35.55	-54.32	0.00	1.57	20.33	Pass
	1753.5	H	-33.72	-54.11	0.00	1.72	22.11	Pass
	1711.5	V	-35.76	-54.35	0.00	1.44	20.03	Pass
	1732.5	V	-36.19	-54.41	0.00	1.57	19.79	Pass
	1753.5	V	-34.73	-54.48	0.00	1.72	21.47	Pass
3MHz (16QAM)	1711.5	H	-36.02	-54.33	0.00	1.44	19.75	Pass
	1732.5	H	-35.87	-54.32	0.00	1.57	20.01	Pass
	1753.5	H	-34.03	-54.11	0.00	1.72	21.80	Pass
	1711.5	V	-36.08	-54.35	0.00	1.44	19.71	Pass
	1732.5	V	-36.48	-54.41	0.00	1.57	19.50	Pass
	1753.5	V	-35.05	-54.48	0.00	1.72	21.15	Pass
5MHz (QPSK)	1712.5	H	-35.98	-54.34	0.00	1.44	19.80	Pass
	1732.5	H	-35.76	-54.32	0.00	1.57	20.12	Pass
	1752.5	H	-34.00	-54.13	0.00	1.72	21.84	Pass
	1712.5	V	-34.92	-54.38	0.00	1.44	20.90	Pass
	1732.5	V	-36.40	-54.41	0.00	1.57	19.58	Pass
	1752.5	V	-34.98	-54.47	0.00	1.72	21.21	Pass
5MHz (16QAM)	1712.5	H	-36.28	-54.34	0.00	1.44	19.50	Pass
	1732.5	H	-36.08	-54.32	0.00	1.57	19.80	Pass
	1752.5	H	-34.32	-54.13	0.00	1.72	21.52	Pass
	1712.5	V	-35.22	-54.38	0.00	1.44	20.60	Pass
	1732.5	V	-36.73	-54.41	0.00	1.57	19.25	Pass
	1752.5	V	-35.28	-54.47	0.00	1.72	20.91	Pass
10MHz (QPSK)	1715	H	-36.95	-54.33	0.00	1.44	18.82	Pass
	1732.5	H	-36.74	-54.32	0.00	1.57	19.14	Pass
	1750	H	-35.39	-54.12	0.00	1.66	20.39	Pass

	1715	V	-34.99	-54.32	0.00	1.44	20.77	Pass
	1732.5	V	-36.35	-54.41	0.00	1.57	19.63	Pass
	1750	V	-35.06	-54.52	0.00	1.66	21.12	Pass
10MHz (16QAM)	1715	H	-37.25	-54.33	0.00	1.44	18.52	Pass
	1732.5	H	-37.07	-54.32	0.00	1.57	18.81	Pass
	1750	H	-35.73	-54.12	0.00	1.66	20.05	Pass
	1715	V	-35.34	-54.32	0.00	1.44	20.42	Pass
	1732.5	V	-36.65	-54.41	0.00	1.57	19.33	Pass
	1750	V	-35.38	-54.52	0.00	1.66	20.80	Pass
15MHz (QPSK)	1717.5	H	-37.31	-54.35	0.00	1.49	18.52	Pass
	1732.5	H	-37.74	-54.32	0.00	1.57	18.14	Pass
	1747.5	H	-36.44	-54.17	0.00	1.66	19.39	Pass
	1717.5	V	-35.71	-54.39	0.00	1.49	20.17	Pass
	1732.5	V	-36.72	-54.41	0.00	1.57	19.26	Pass
	1747.5	V	-35.96	-54.51	0.00	1.66	20.21	Pass
15MHz (16QAM)	1717.5	H	-37.61	-54.35	0.00	1.49	18.22	Pass
	1732.5	H	-38.08	-54.32	0.00	1.57	17.80	Pass
	1747.5	H	-36.78	-54.17	0.00	1.66	19.05	Pass
	1717.5	V	-36.03	-54.39	0.00	1.49	19.85	Pass
	1732.5	V	-37.07	-54.41	0.00	1.57	18.91	Pass
	1747.5	V	-36.27	-54.51	0.00	1.66	19.90	Pass
20MHz (QPSK)	1720	H	-37.74	-54.37	0.00	1.49	18.12	Pass
	1732.5	H	-38.24	-54.32	0.00	1.57	17.64	Pass
	1745	H	-37.07	-54.23	0.00	1.63	18.79	Pass
	1720	V	-36.36	-54.44	0.00	1.49	19.57	Pass
	1732.5	V	-36.80	-54.41	0.00	1.57	19.18	Pass
	1745	V	-36.96	-54.59	0.00	1.63	19.26	Pass
20MHz (16QAM)	1720	H	-38.05	-54.37	0.00	1.49	17.81	Pass
	1732.5	H	-38.56	-54.32	0.00	1.57	17.32	Pass
	1745	H	-37.41	-54.23	0.00	1.63	18.45	Pass
	1720	V	-36.68	-54.44	0.00	1.49	19.25	Pass
	1732.5	V	-37.16	-54.41	0.00	1.57	18.82	Pass
	1745	V	-37.27	-54.59	0.00	1.63	18.95	Pass

LTE Band 13								
Bandwidth	**Frequency (MHz)**	**Ant Pot (H/V)**	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**ERP (dBm)**	**Conclusion**
5MHz (QPSK)	779.5	H	-32.16	-49.17	0.00	2.04	19.06	Pass
	782	H	-34.30	-49.39	0.00	2.03	17.13	Pass
	784.5	H	-34.61	-49.72	0.00	2.01	17.11	Pass
	779.5	V	-32.93	-48.95	0.00	2.04	18.06	Pass
	782	V	-33.62	-49.12	0.00	2.03	17.53	Pass
	784.5	V	-33.75	-49.35	0.00	2.01	17.61	Pass
5MHz (16QAM)	779.5	H	-32.46	-49.17	0.00	2.04	18.76	Pass
	782	H	-34.66	-49.39	0.00	2.03	16.77	Pass
	784.5	H	-34.92	-49.72	0.00	2.01	16.80	Pass
	779.5	V	-33.23	-48.95	0.00	2.04	17.76	Pass
	782	V	-33.95	-49.12	0.00	2.03	17.20	Pass
	784.5	V	-34.09	-49.35	0.00	2.01	17.27	Pass
10MHz (QPSK)	782	H	-31.93	-49.39	0.00	2.03	19.50	Pass
	782	V	-32.73	-49.12	0.00	2.03	18.42	Pass
10MHz (16QAM)	782	H	-32.23	-49.39	0.00	2.03	19.20	Pass
	782	V	-33.04	-49.12	0.00	2.03	18.11	Pass

Note: 1. EIRP= E.R.P+2.15

4.3 Occupied Bandwidth

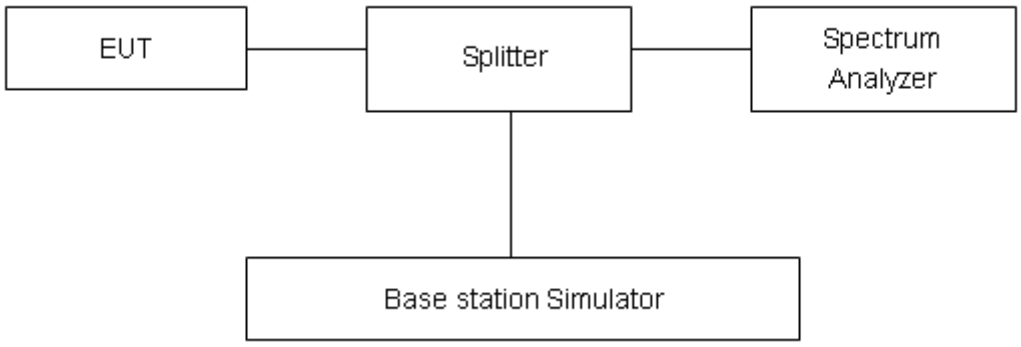
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer.
RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4/ LTE Band 13.
99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

No specific occupied bandwidth requirements in part 2.1049.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U=624Hz.

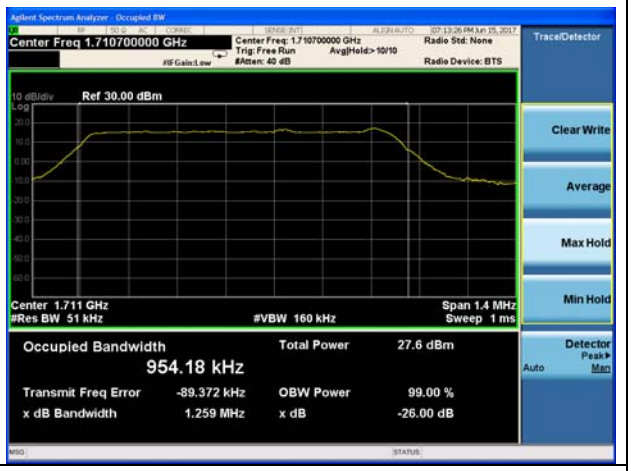
Test Result

LTE Band 4						
RB	**Modulation**	**Bandwidth (MHz)**	**Channel**	**Frequency (MHz)**	**99% Power Bandwidth(MHz)**	**-26dBc Bandwidth(MHz)**
100%	QPSK	1.4	19957	1710.7	0.946	1.160
			20175	1732.5	0.963	1.205
			20393	1754.3	0.966	1.160
		3	19965	1711.5	1.000	1.823
			20175	1732.5	0.994	1.386
			20385	1753.5	1.015	1.392
		5	19975	1712.5	1.174	2.042
			20175	1732.5	0.976	1.320
			20375	1752.5	1.036	1.393
		10	20000	1715	1.084	1.649
			20175	1732.5	1.035	1.738
			20350	1750	1.054	2.081
		15	20025	1717.5	1.186	1.177
			20175	1732.5	1.017	1.561
			20325	1747.5	1.043	1.628
		20	20050	1720	1.009	1.649
			20175	1732.5	1.062	1.747
			20300	1745	1.089	1.769
	16QAM	1.4	19957	1710.7	0.954	1.259
			20175	1732.5	0.955	1.253
			20393	1754.3	0.971	1.186
		3	19965	1711.5	0.995	1.349
			20175	1732.5	0.985	1.382
			20385	1753.5	0.986	1.329
		5	19975	1712.5	1.088	1.564
			20175	1732.5	1.091	1.742
			20375	1752.5	1.010	1.890
		10	20000	1715	1.077	1.777
			20175	1732.5	1.227	2.065
			20350	1750	1.106	1.888
		15	20025	1717.5	1.030	1.618
			20175	1732.5	1.034	1.659
			20325	1747.5	1.057	1.727
		20	20050	1720	1.073	1.889
			20175	1732.5	1.074	1.816
			20300	1745	1.061	1.817

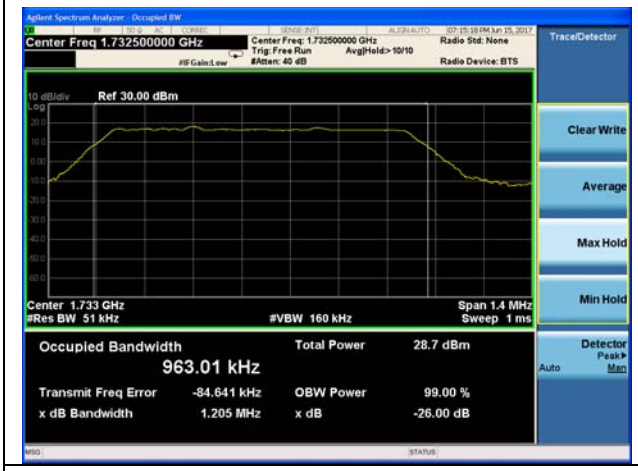
LTE Band 13						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(kHz)	-26dBc Bandwidth(kHz)
100%	QPSK	5	23205	779.5	0.974	1.317
			23230	782	0.979	1.315
			23255	784.5	0.993	1.431
		10	23230	782	1.031	1.704
	16QAM	5	23205	779.5	0.982	1.312
			23230	782	0.998	1.235
			23255	784.5	1.018	1.516
		10	23230	782	1.055	1.628

LTE Band 4 QPSK 1.4MHz CH-Low

LTE Band 4 16QAM 1.4MHz CH-Low



LTE Band 4 QPSK 1.4MHz CH-Middle



LTE Band 4 16QAM 1.4MHz CH-Middle

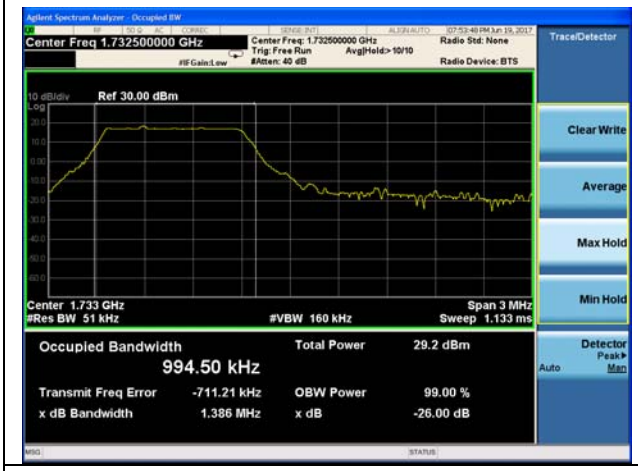
LTE Band 4 QPSK 1.4MHz CH-High

LTE Band 4 16QAM 1.4MHz CH-High

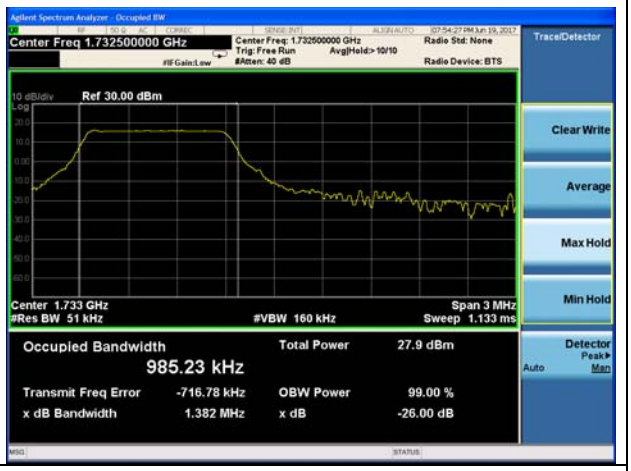
LTE Band 4 QPSK 3MHz CH-Low

LTE Band 4 16QAM 3MHz CH-Low

LTE Band 4 QPSK 3MHz CH-Middle



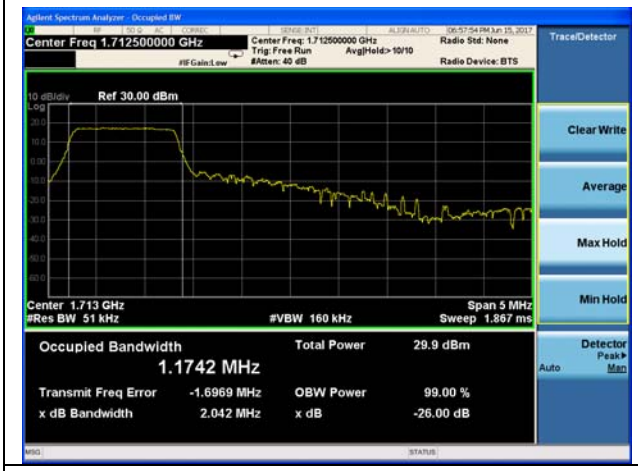
LTE Band 4 16QAM 3MHz CH-Middle



LTE Band 4 QPSK 3MHz CH-High

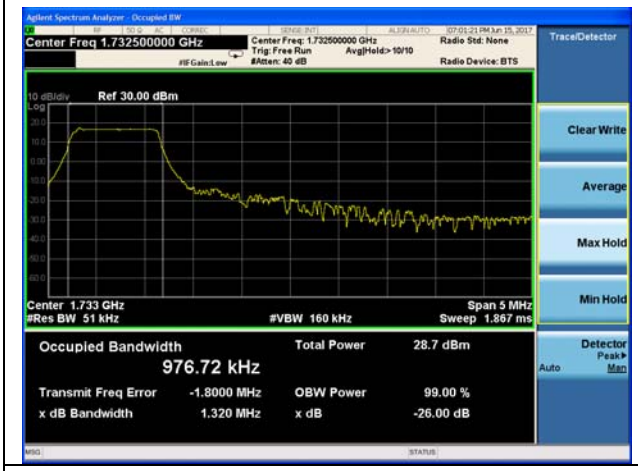
LTE Band 4 16QAM 3MHz CH-High

LTE Band 4 QPSK 5MHz CH-Low



LTE Band 4 16QAM 5MHz CH-Low

LTE Band 4 QPSK 5MHz CH-Middle



LTE Band 4 16QAM 5MHz CH-Middle

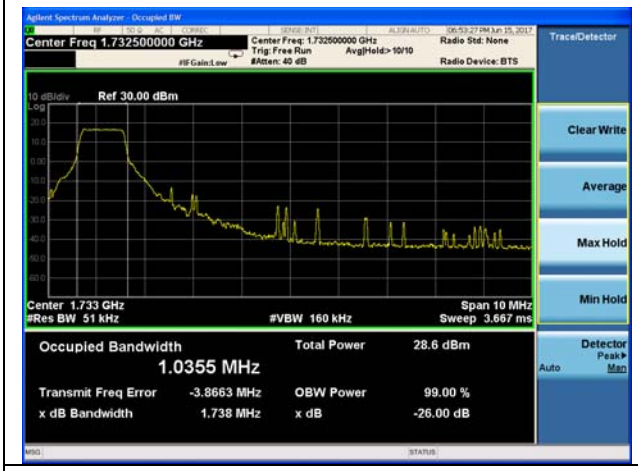
LTE Band 4 QPSK 5MHz CH-High

LTE Band 4 16QAM 5MHz CH-High

LTE Band 4 QPSK 10MHz CH-Low

LTE Band 4 16QAM 10MHz CH-Low

LTE Band 4 QPSK 10MHz CH-Middle



LTE Band 4 16QAM 10MHz CH-Middle

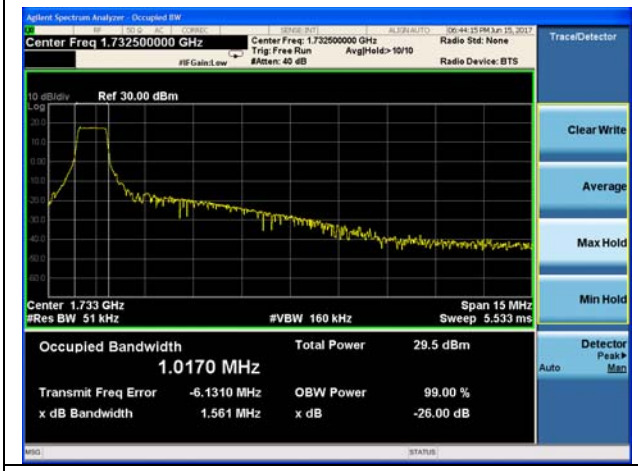
LTE Band 4 QPSK 10MHz CH-High

LTE Band 4 16QAM 10MHz CH-High

LTE Band 4 QPSK 15MHz CH-Low

LTE Band 4 16QAM 15MHz CH-Low

LTE Band 4 QPSK 15MHz CH-Middle

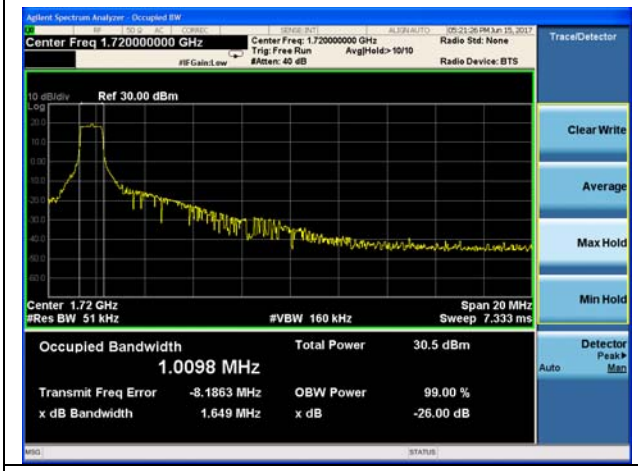


LTE Band 4 16QAM 15MHz CH-Middle

LTE Band 4 QPSK 15MHz CH-High

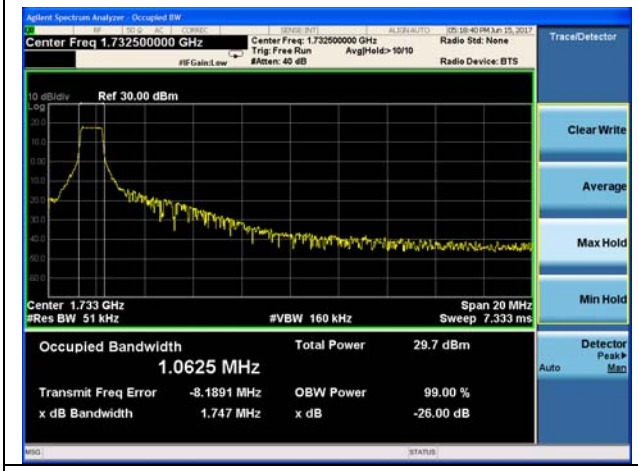
LTE Band 4 16QAM 15MHz CH-High

LTE Band 4 QPSK 20MHz CH-Low



LTE Band 4 16QAM 20MHz CH-Low

LTE Band 4 QPSK 20MHz CH-Middle

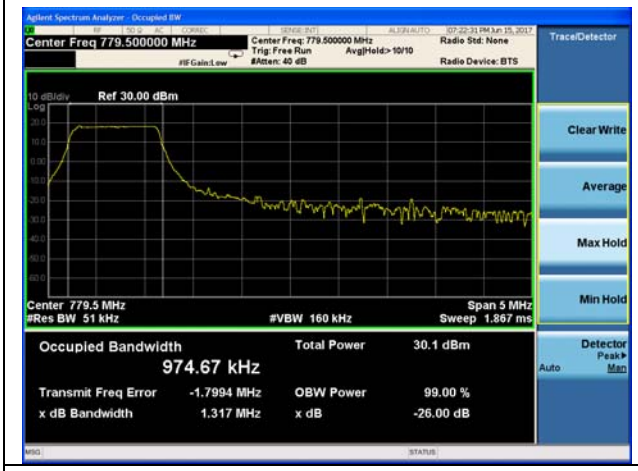


LTE Band 4 16QAM 20MHz CH-Middle

LTE Band 4 QPSK 20MHz CH-High

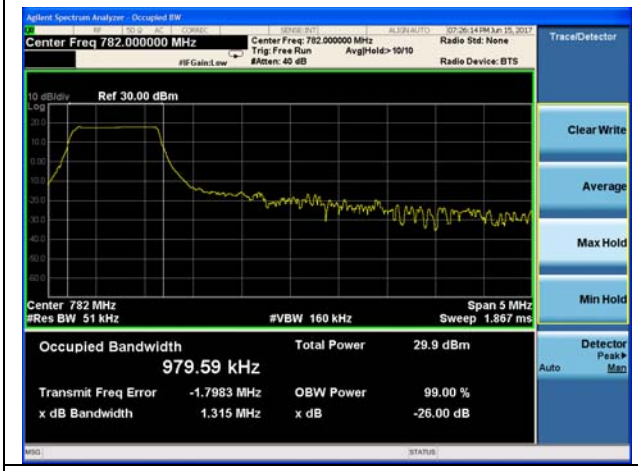
LTE Band 4 16QAM 20MHz CH-High

LTE Band 13 QPSK 5MHz CH-Low



LTE Band 13 16QAM 5MHz CH-Low

LTE Band 13 QPSK 5MHz CH-Middle



LTE Band 13 16QAM 5MHz CH-Middle

LTE Band 13 QPSK 5MHz CH-High

LTE Band 13 16QAM 5MHz CH-High

LTE Band 13 QPSK 10MHz CH-Middle	LTE Band 13 16QAM 10MHz CH-Middle
	

4.4 Band Edge Compliance

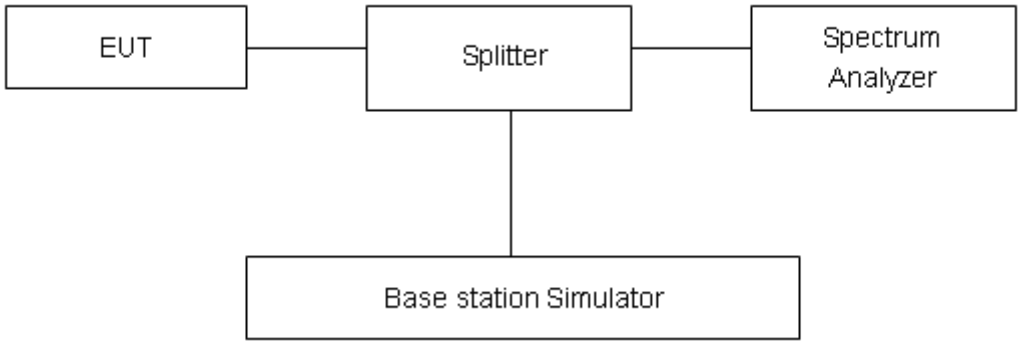
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured.
The testing follows KDB 971168 v02r02 Section 6.0
1.The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured.
3. For LTE Band 41 Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.
RBW is set to 15 kHz, VBW is set to 51 kHz for LTE Band 4/13 on spectrum analyzer.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. Checked that all the results comply with the emission limit line.

Test Setup



Limits

Rule Part 27.53(h)/ specifies that " for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$ (P) dB"

Part 27.53(g) specifies that " For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log10 (P) dB."

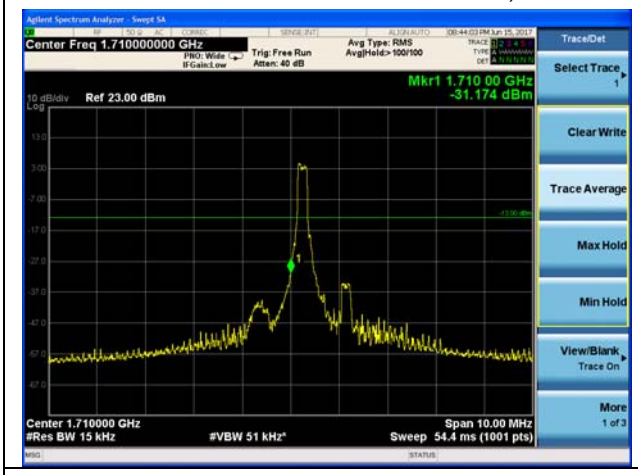
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor *k* = 1.96, *U*=0.684dB.

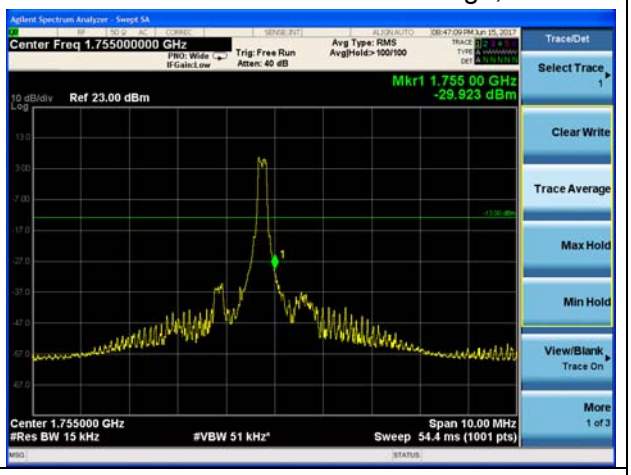
Test Result

All the test traces in the plots shows the test results clearly.

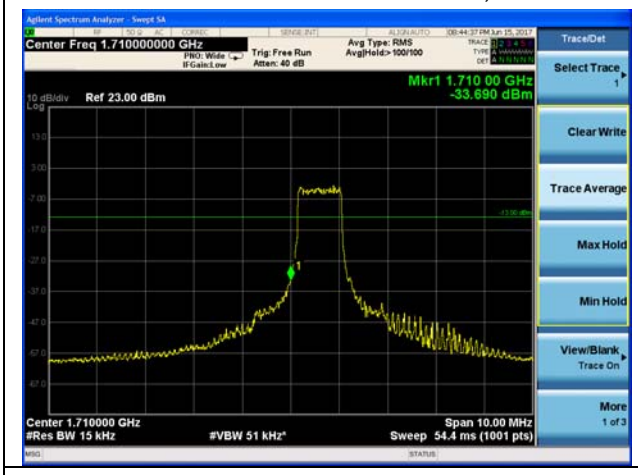
LTE Band 4 QPSK 1.4MHz CH-Low, 1 RB



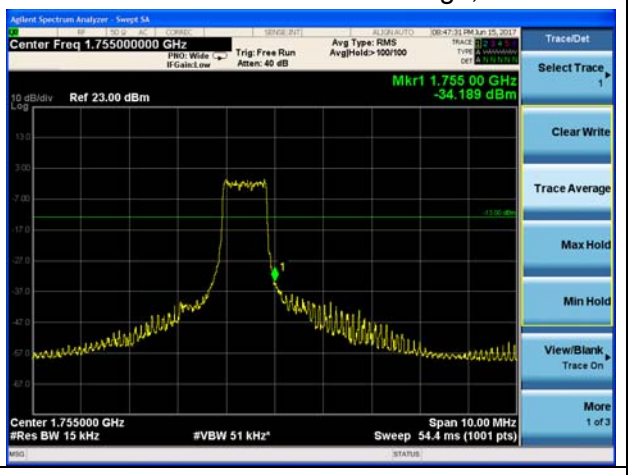
LTE Band 4 QPSK 1.4MHz CH-High, 1 RB



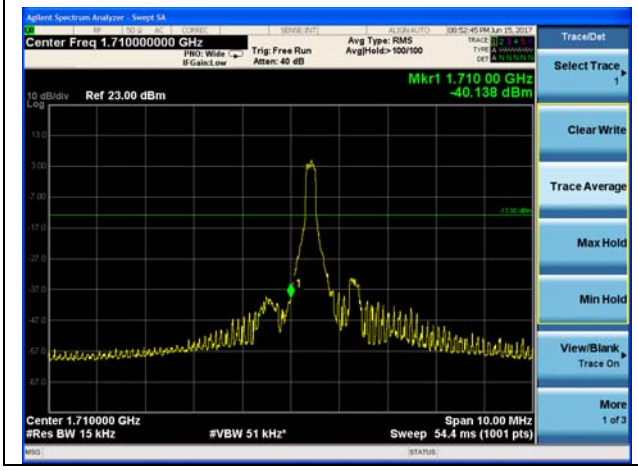
LTE Band 4 QPSK 1.4MHz CH-Low, 100%RB



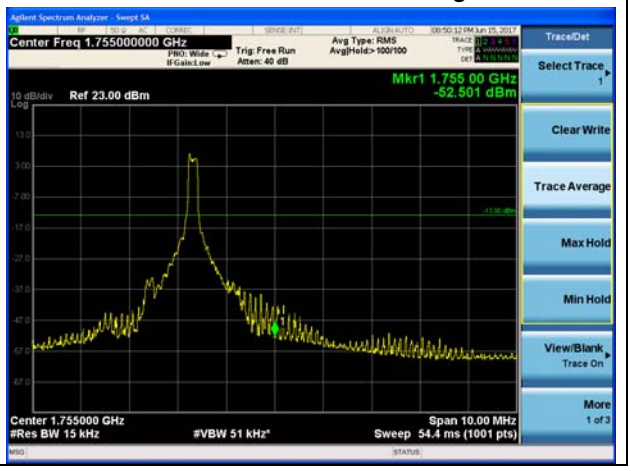
LTE Band 4 QPSK 1.4MHz CH-High, 100%RB



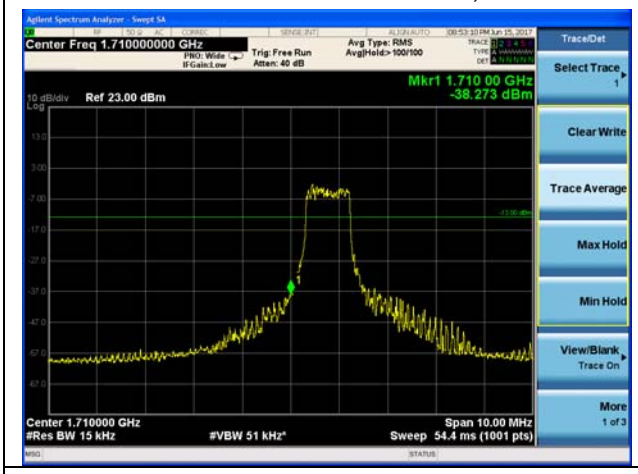
LTE Band 4 QPSK 3MHz CH-Low, 1 RB



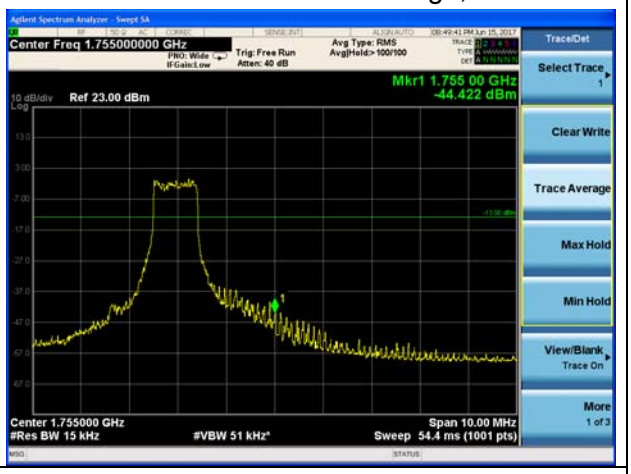
LTE Band 4 QPSK 3MHz CH-High, 1 RB



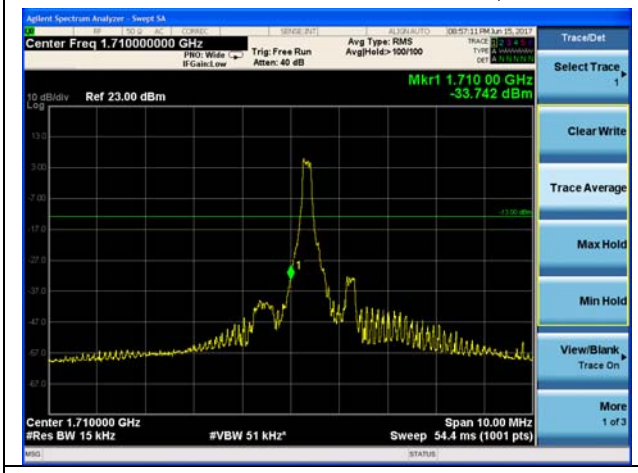
LTE Band 4 QPSK 3MHz CH-Low, 100%RB



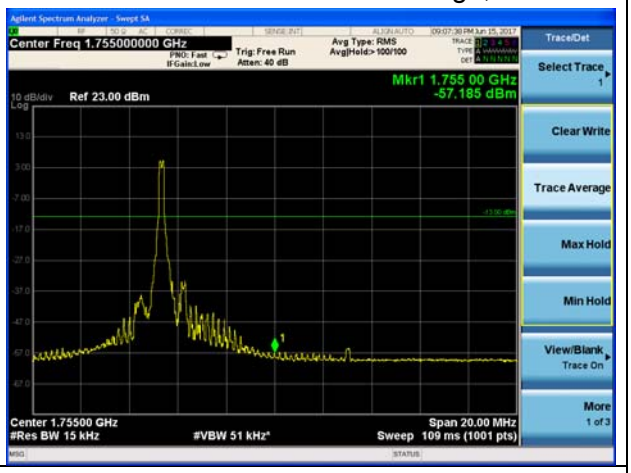
LTE Band 4 QPSK 3MHz CH-High, 100%RB



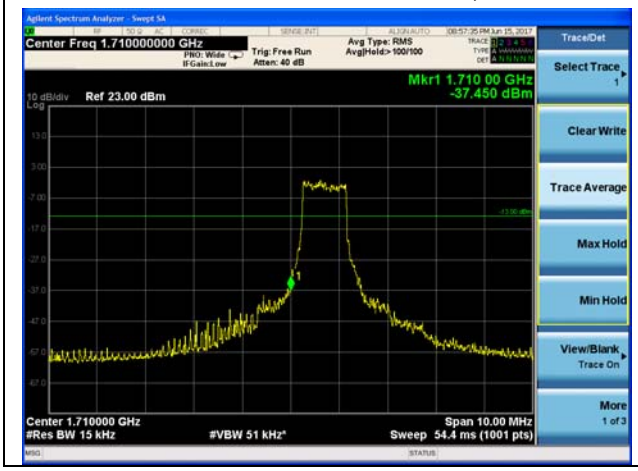
LTE Band 4 QPSK 5MHz CH-Low, 1 RB



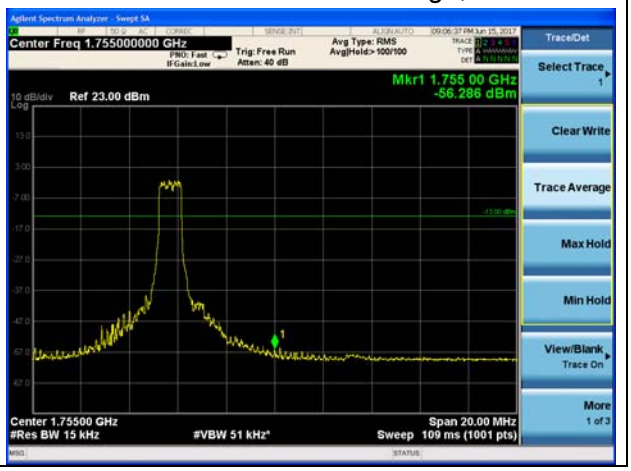
LTE Band 4 QPSK 5MHz CH-High, 1 RB



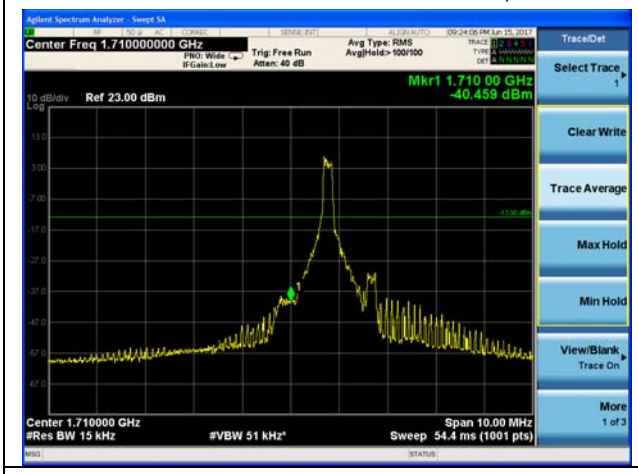
LTE Band 4 QPSK 5MHz CH-Low, 100%RB



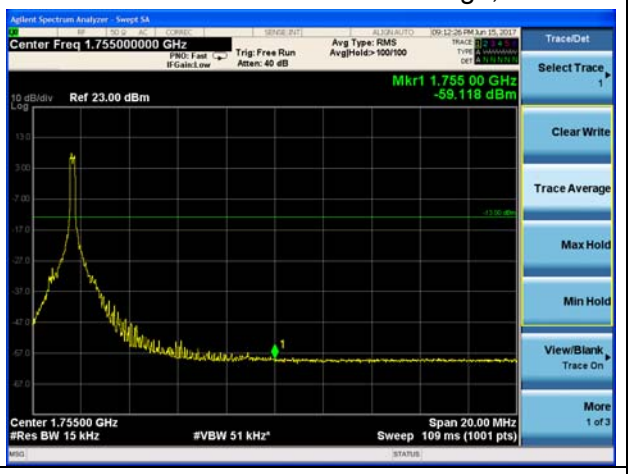
LTE Band 4 QPSK 5MHz CH-High, 100%RB



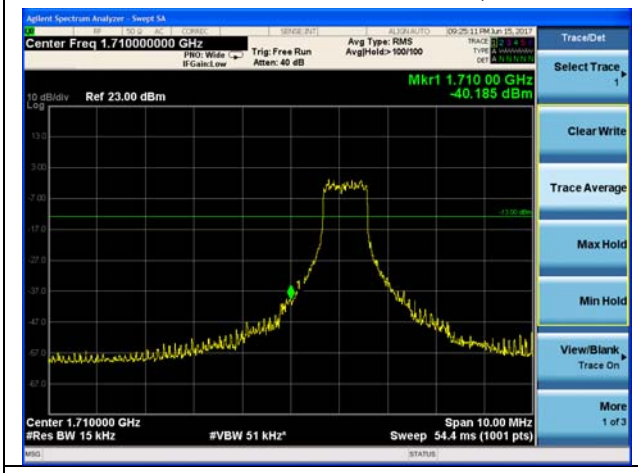
LTE Band 4 QPSK 10MHz CH-Low, 1 RB



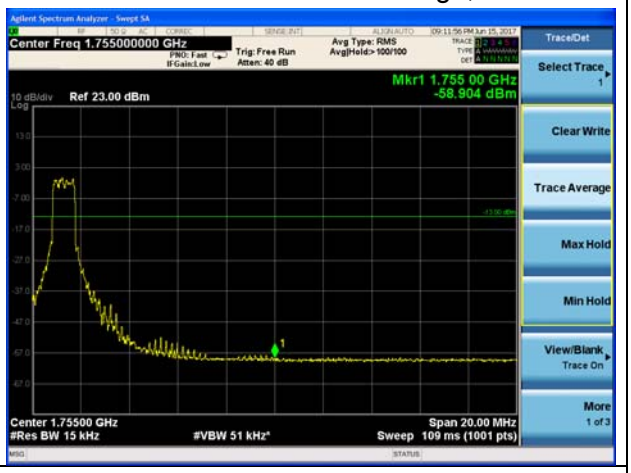
LTE Band 4 QPSK 10MHz CH-High, 1 RB



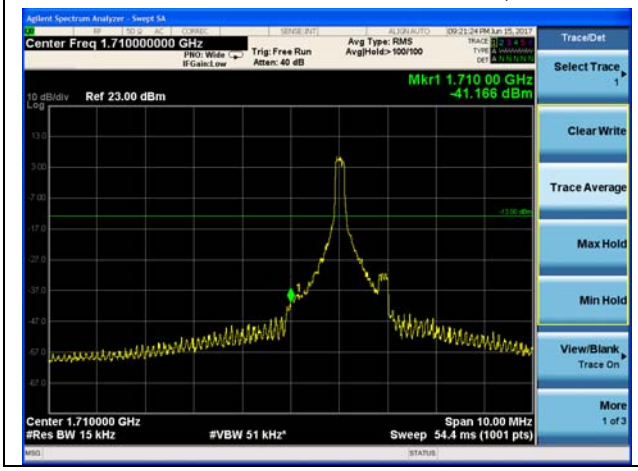
LTE Band 4 QPSK 10MHz CH-Low, 100%RB



LTE Band 4 QPSK 10MHz CH-High, 100%RB

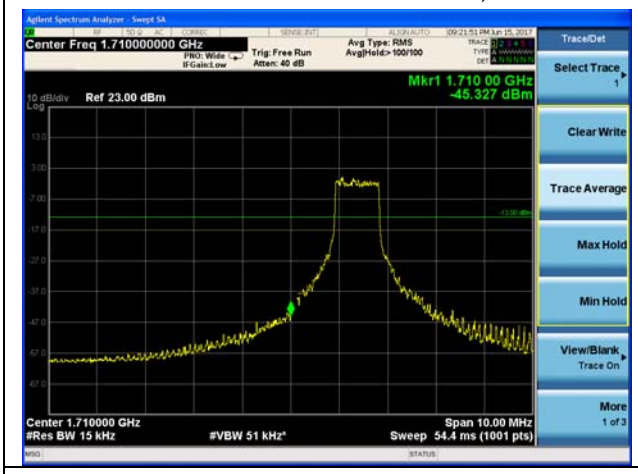


LTE Band 4 QPSK 15MHz CH-Low, 1 RB



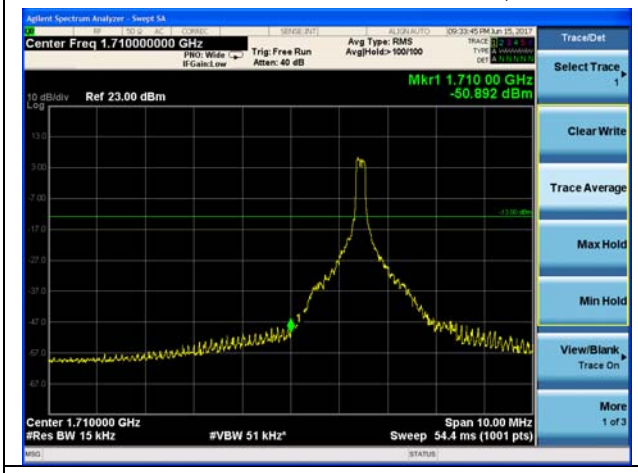
LTE Band 4 QPSK 15MHz CH-High, 1 RB

LTE Band 4 QPSK 15MHz CH-Low, 100%RB

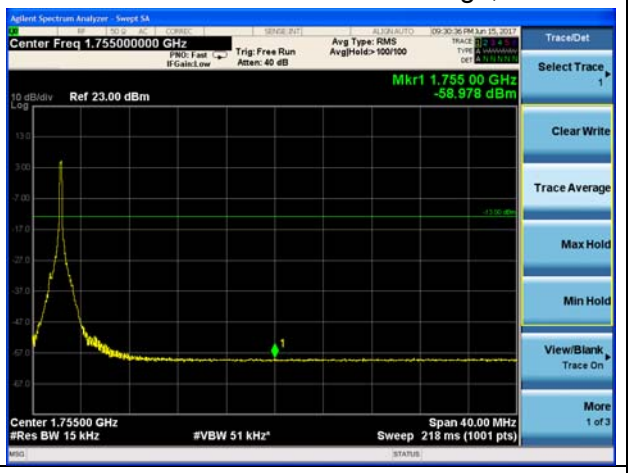


LTE Band 4 QPSK 15MHz CH-High, 100%RB

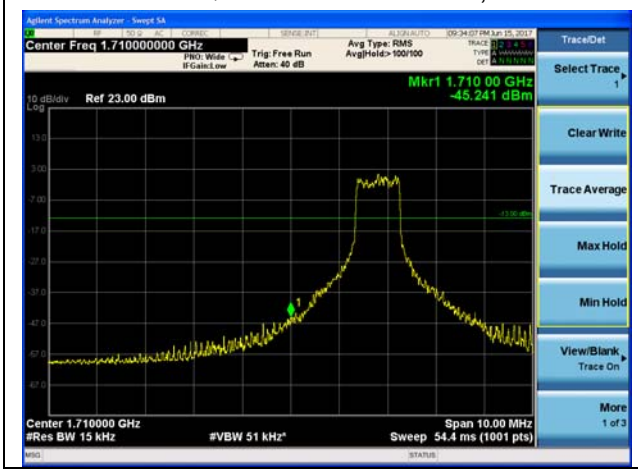
LTE Band 4 QPSK 20MHz CH-Low, 1 RB



LTE Band 4 QPSK 20MHz CH-High, 1 RB



LTE Band 4 QPSK 20MHz CH-Low, 100%RB



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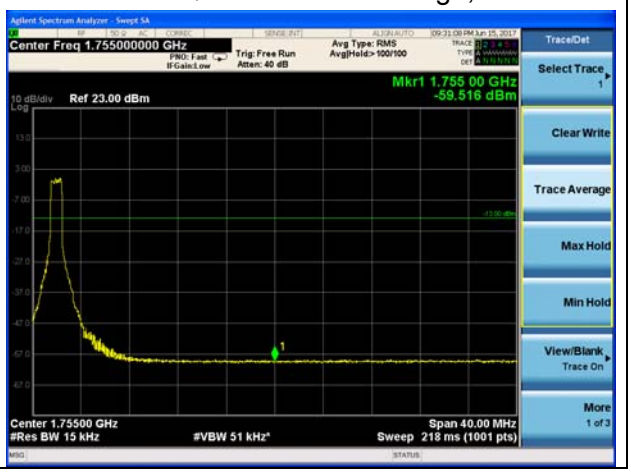
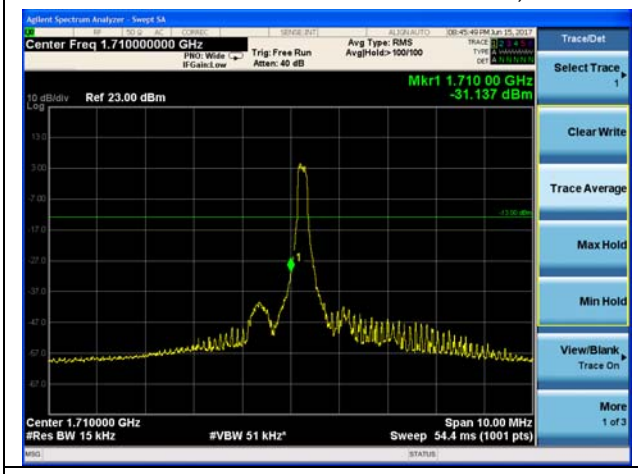
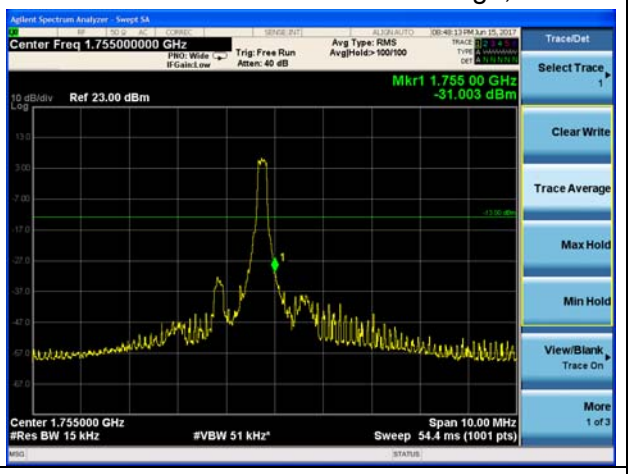


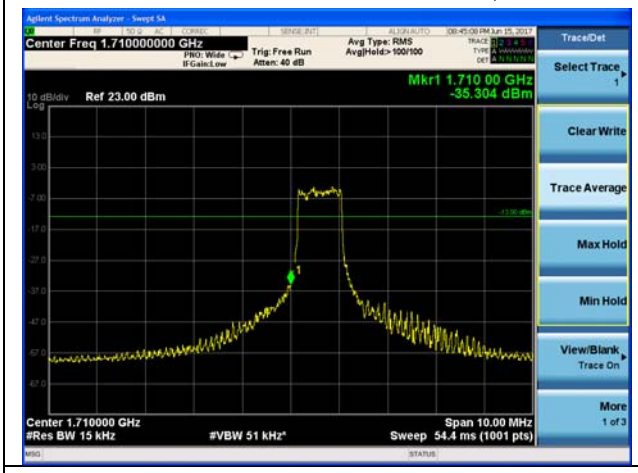
LTE Band 4 16QAM 1.4MHz CH-Low, 1 RB



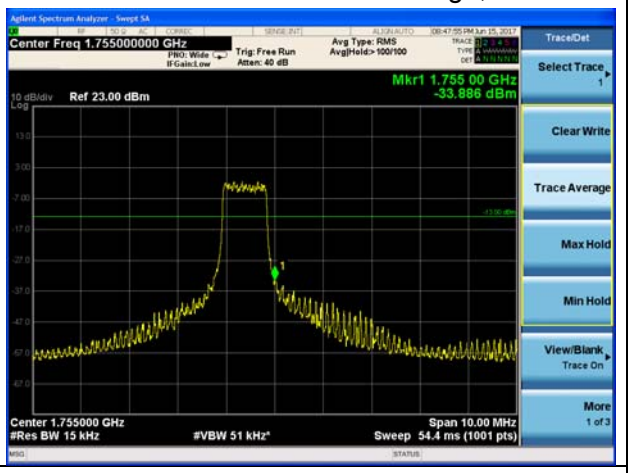
LTE Band 4 16QAM 1.4MHz CH-High, 1 RB



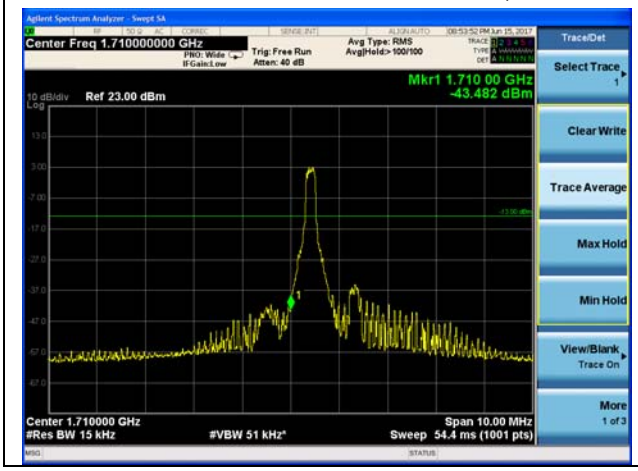
LTE Band 4 16QAM 1.4MHz CH-Low, 100%RB



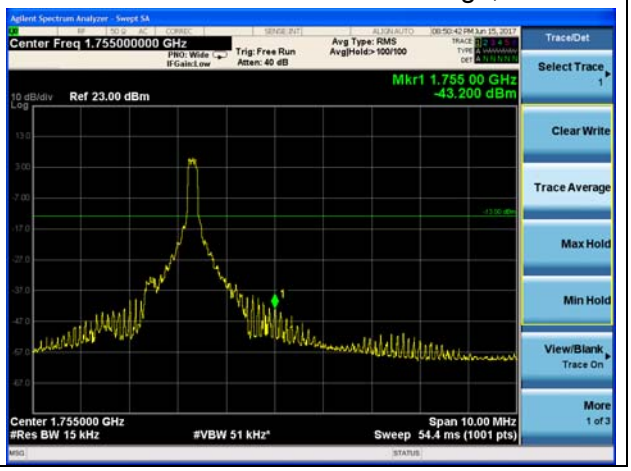
LTE Band 4 16QAM 1.4MHz CH-High, 100%RB



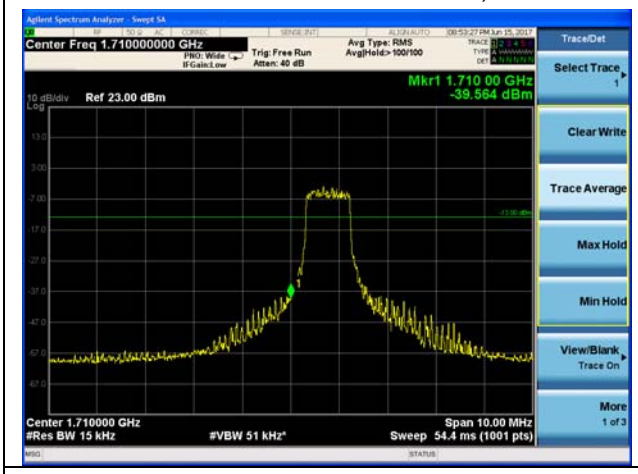
LTE Band 4 16QAM 3MHz CH-Low, 1 RB



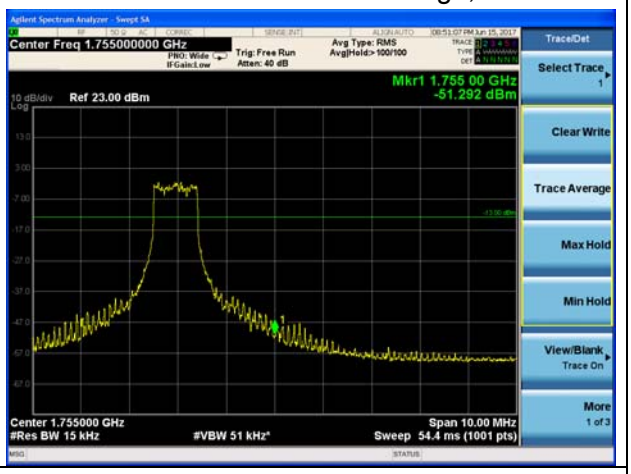
LTE Band 4 16QAM 3MHz CH-High, 1 RB



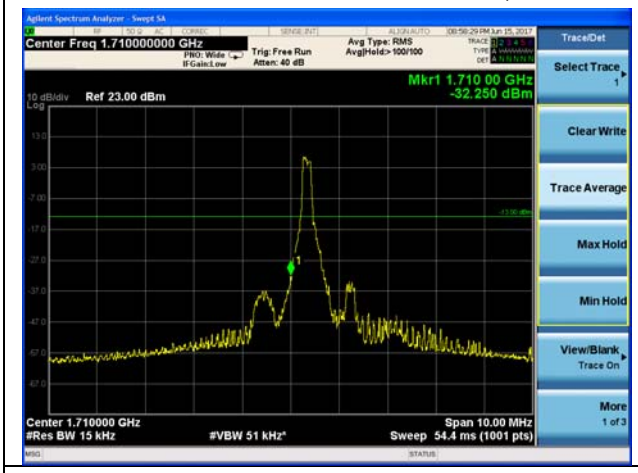
LTE Band 4 16QAM 3MHz CH-Low, 100%RB



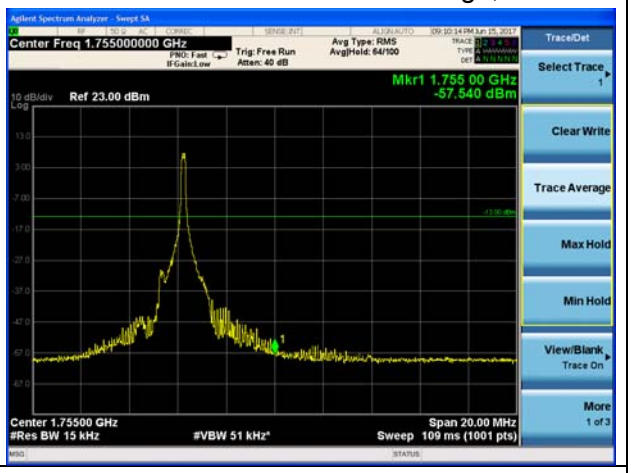
LTE Band 4 16QAM 3MHz CH-High, 100%RB



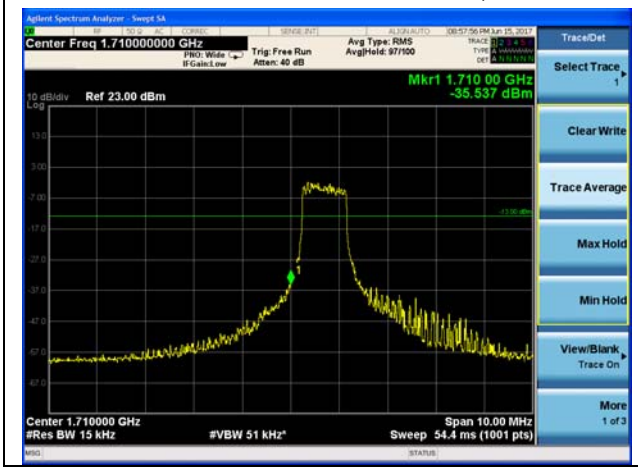
LTE Band 4 16QAM 5MHz CH-Low, 1 RB



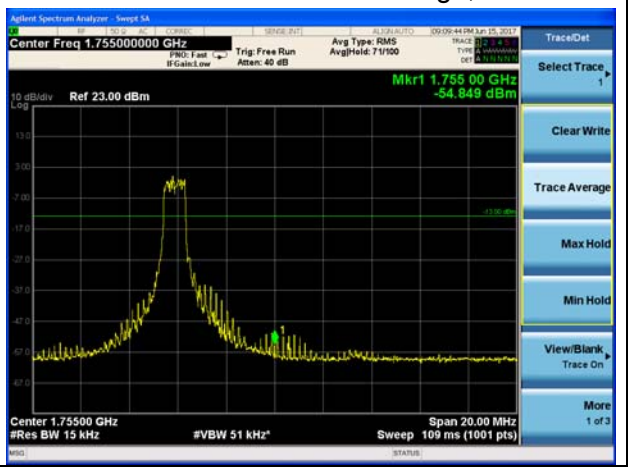
LTE Band 4 16QAM 5MHz CH-High, 1 RB



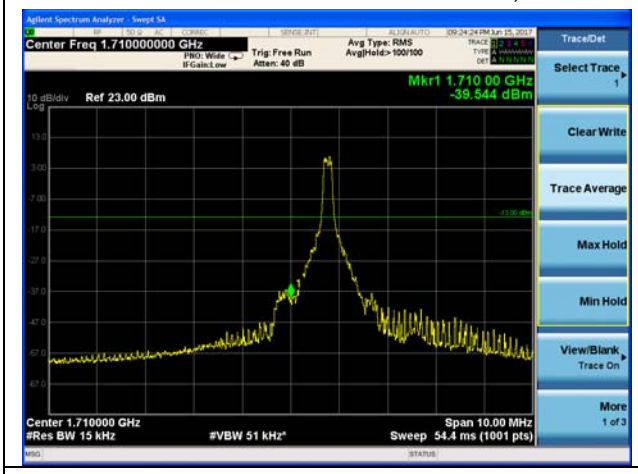
LTE Band 4 16QAM 5MHz CH-Low, 100%RB



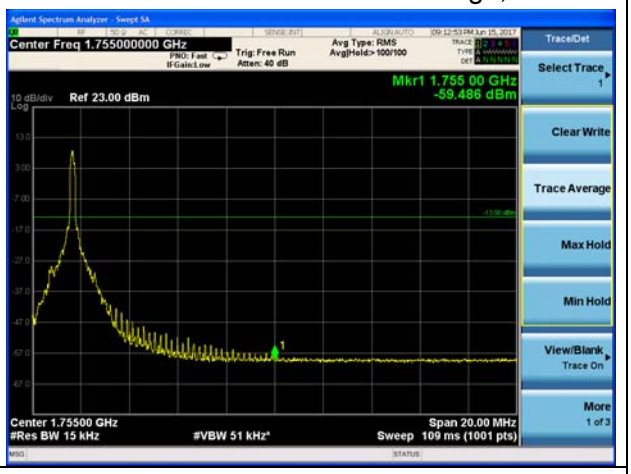
LTE Band 4 16QAM 5MHz CH-High, 100%RB



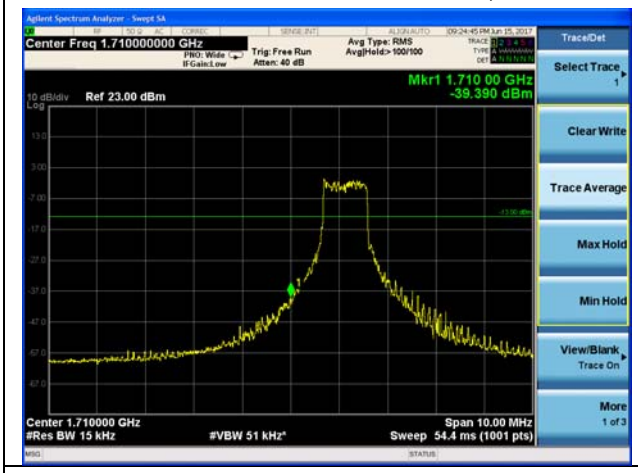
LTE Band 4 16QAM 10MHz CH-Low, 1 RB



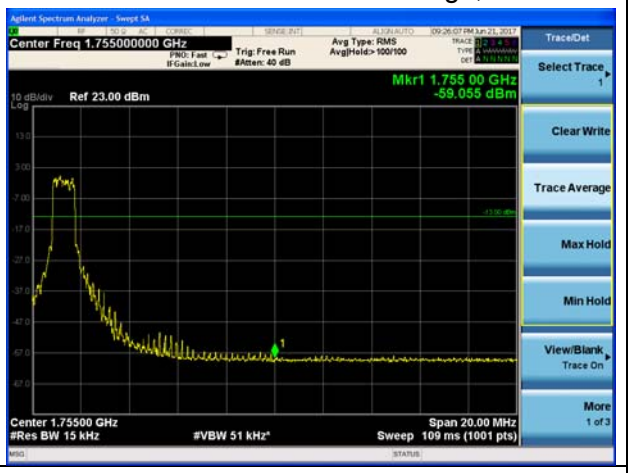
LTE Band 4 16QAM 10MHz CH-High, 1 RB



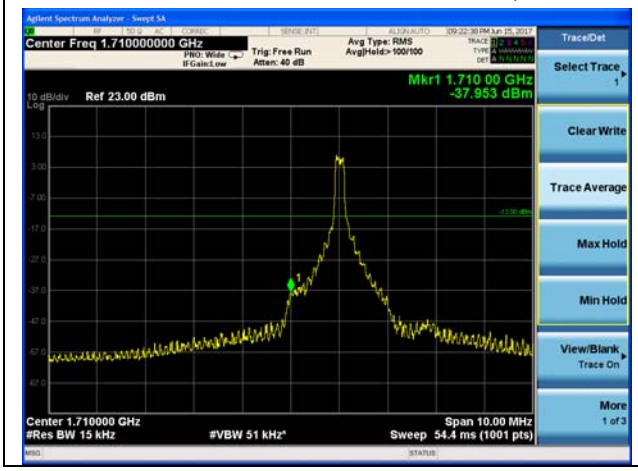
LTE Band 4 16QAM 10MHz CH-Low, 100%RB



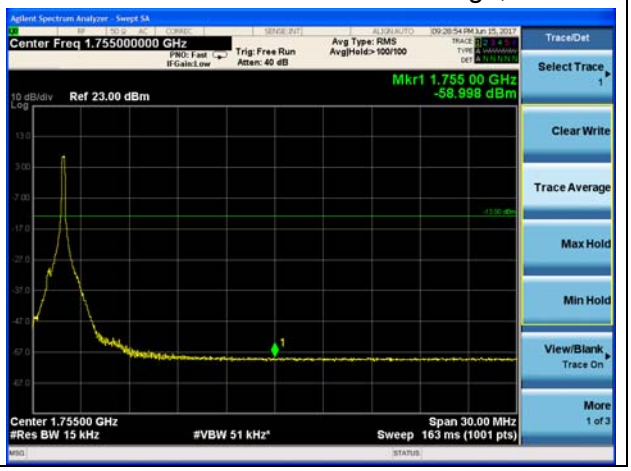
LTE Band 4 16QAM 10MHz CH-High, 100%RB



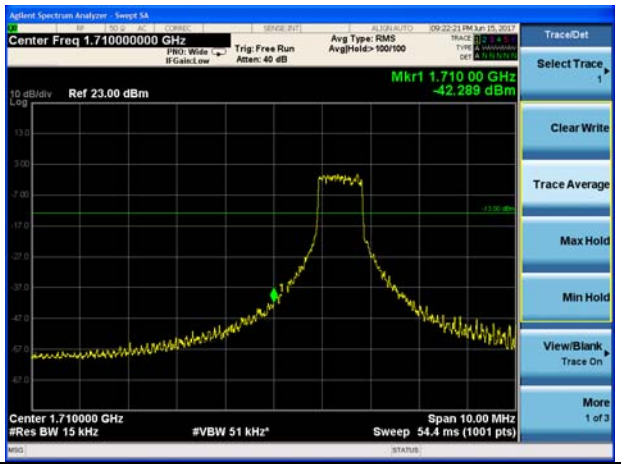
LTE Band 4 16QAM 15MHz CH-Low, 1 RB



LTE Band 4 16QAM 15MHz CH-High, 1 RB

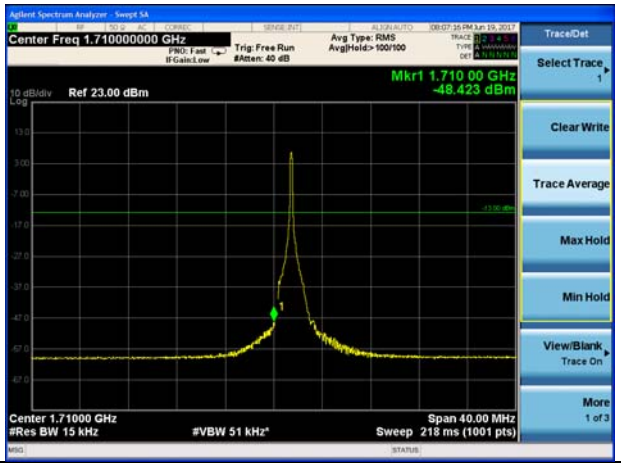


LTE Band 4 16QAM 15MHz CH-Low, 100%RB

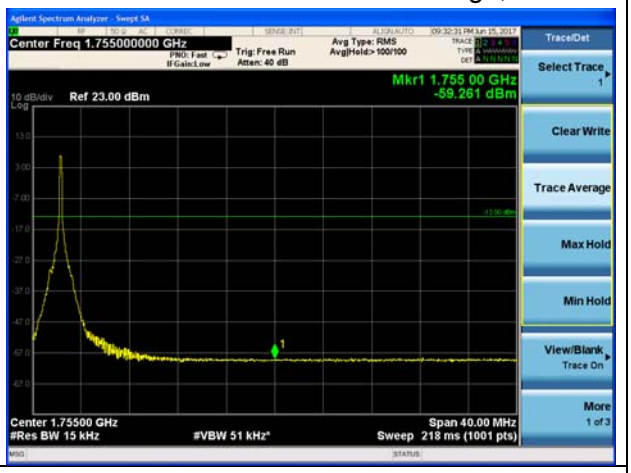


LTE Band 4 16QAM 15MHz CH-High, 100%RB

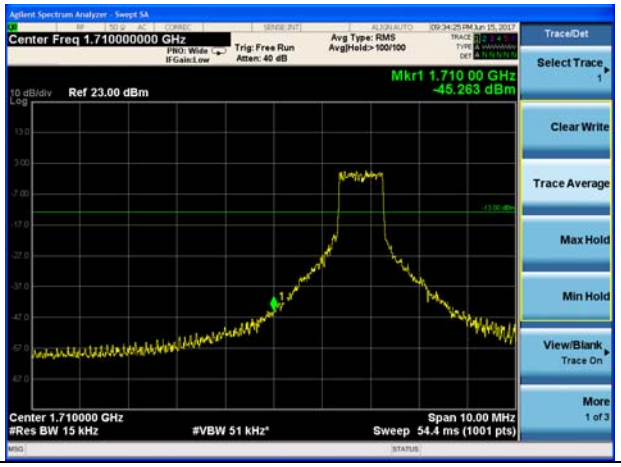
LTE Band 4 16QAM 20MHz CH-Low, 1 RB



LTE Band 4 16QAM 20MHz CH-High, 1 RB

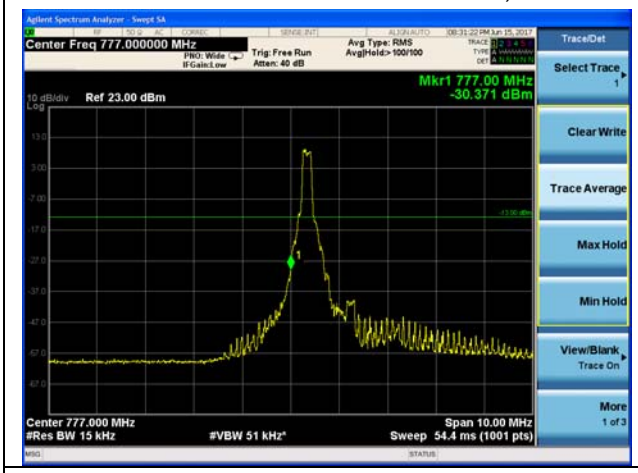


LTE Band 4 16QAM 20MHz CH-Low, 100%RB

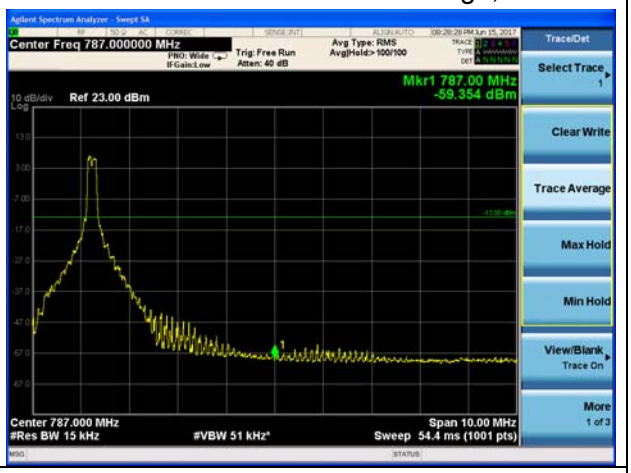


LTE Band 4 16QAM 20MHz CH-High, 100%RB

LTE Band 13 QPSK 5MHz CH-Low, 1 RB

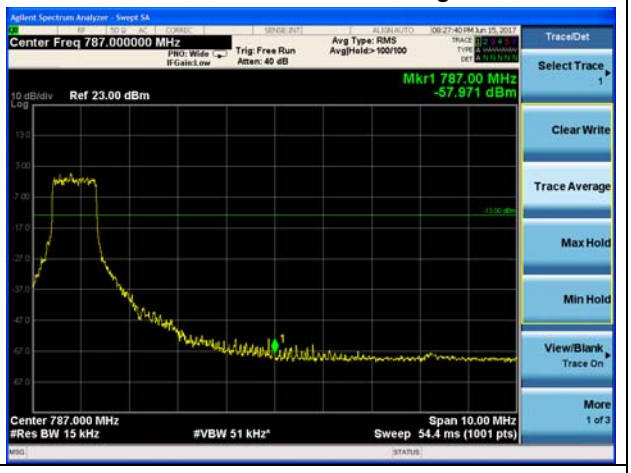


LTE Band 13 QPSK 5MHz CH-High, 1 RB



LTE Band 13 QPSK 5MHz CH-Low, 100%RB

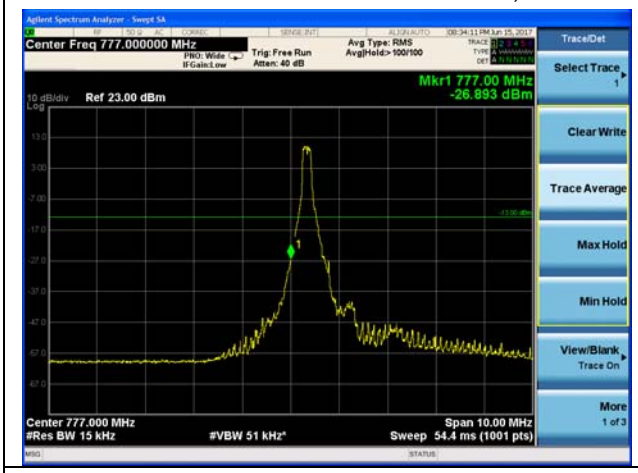
LTE Band 13 QPSK 5MHz CH-High, 100%RB



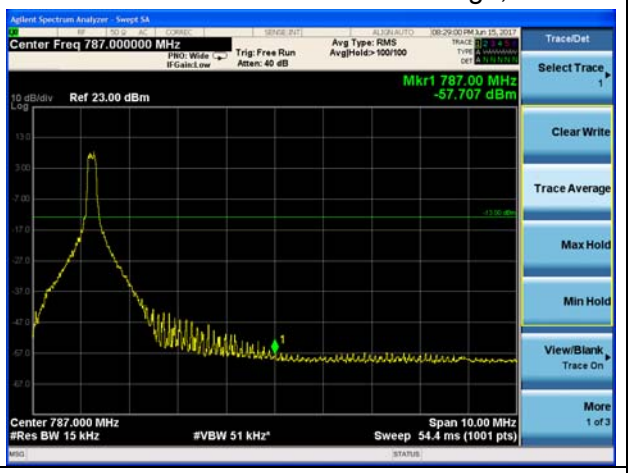
LTE Band 13 QPSK 10MHz, 1 RB

LTE Band 13 QPSK 10MHz, 100%RB

LTE Band 13 16QAM 5MHz CH-Low, 1 RB

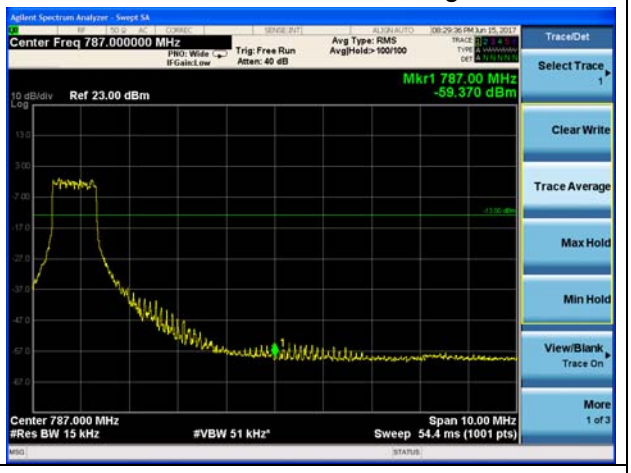


LTE Band 13 16QAM 5MHz CH-High, 1 RB



LTE Band 13 16QAM 5MHz CH-Low, 100%RB

LTE Band 13 16QAM 5MHz CH-High, 100%RB



LTE Band 13 16QAM 10MHz, 1 RB

LTE Band 13 16QAM 10MHz, 100%RB

4.5 Peak-to-Average Power Ratio (PAPR)

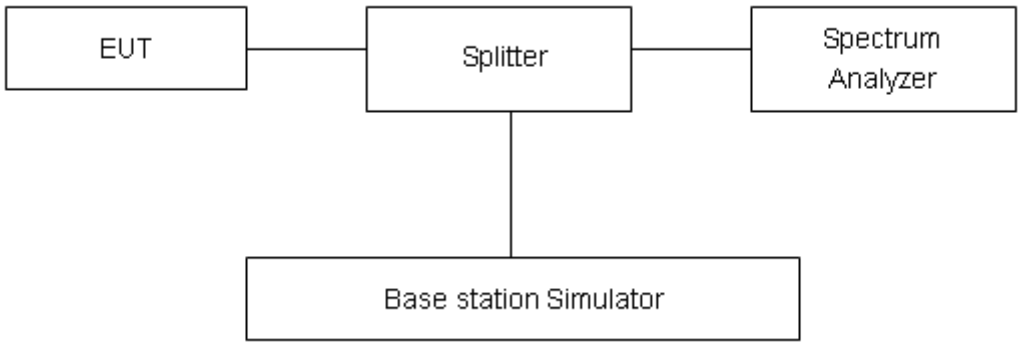
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

Measure the total peak power and record as PPk. And measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (*e.g.*, dBm). Determine the PAPR from:
PAPR (dB) = PPk (dBm) - PAvg (dBm).

Test Setup



Limits

Rule Part 27.50(d)(5) Equipment employed must be authorized in accordance with the provisions of 24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. 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.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for thenormal distribution is with the coverage factor k = 2, U= 0.4 dB.

Test Results

LTE Band 4								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	19957	1710.7	31.93	22.13	9.80	≤13	PASS
		20175	1732.5	31.26	21.81	9.45	≤13	PASS
		20393	1754.3	33.20	22.52	10.68	≤13	PASS
	3	19965	1711.5	31.52	22.16	9.36	≤13	PASS
		20175	1732.5	29.35	21.85	7.50	≤13	PASS
		20385	1753.5	32.11	22.55	9.56	≤13	PASS
	5	19975	1712.5	30.59	22.14	8.45	≤13	PASS
		20175	1732.5	30.92	21.84	9.08	≤13	PASS
		20375	1752.5	32.26	22.53	9.73	≤13	PASS
	10	20000	1715	31.59	22.22	9.37	≤13	PASS
		20175	1732.5	30.92	21.86	9.06	≤13	PASS
		20350	1750	31.65	22.57	9.08	≤13	PASS
	15	20025	1717.5	32.02	22.20	9.82	≤13	PASS
		20175	1732.5	32.12	21.82	10.30	≤13	PASS
		20325	1747.5	32.10	22.52	9.58	≤13	PASS
	20	20050	1720	32.30	22.17	10.13	≤13	PASS
		20175	1732.5	30.95	21.77	9.18	≤13	PASS
		20300	1745	31.46	22.48	8.98	≤13	PASS
16QAM	1.4	19957	1710.7	32.94	22.55	10.39	≤13	PASS
		20175	1732.5	31.83	21.86	9.97	≤13	PASS
		20393	1754.3	33.07	22.59	10.48	≤13	PASS
	3	19965	1711.5	33.44	22.58	10.86	≤13	PASS
		20175	1732.5	32.50	21.90	10.60	≤13	PASS
		20385	1753.5	33.41	22.62	10.79	≤13	PASS
	5	19975	1712.5	33.10	22.56	10.54	≤13	PASS
		20175	1732.5	31.92	21.86	10.06	≤13	PASS
		20375	1752.5	33.15	22.57	10.58	≤13	PASS
	10	20000	1715	32.38	22.59	9.79	≤13	PASS
		20175	1732.5	31.59	21.91	9.68	≤13	PASS
		20350	1750	32.48	22.61	9.87	≤13	PASS
	15	20025	1717.5	32.64	22.56	10.08	≤13	PASS
		20175	1732.5	31.42	21.86	9.56	≤13	PASS
		20325	1747.5	31.64	22.57	9.07	≤13	PASS
	20	20050	1720	32.88	22.54	10.34	≤13	PASS
		20175	1732.5	31.89	21.82	10.07	≤13	PASS
		20300	1745	31.29	22.54	8.75	≤13	PASS

LTE Band 13								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	5	23205	779.5	30.14	21.69	8.45	≤13	PASS
		23230	782	30.60	21.52	9.08	≤13	PASS
		23255	784.5	31.21	21.48	9.73	≤13	PASS
	10	23230	782	31.03	21.97	9.06	≤13	PASS
16QAM	5	23205	779.5	31.73	21.23	10.50	≤13	PASS
		23230	782	31.95	21.81	10.14	≤13	PASS
		23255	784.5	31.35	20.64	10.71	≤13	PASS
	10	23230	782	31.46	22.05	9.41	≤13	PASS

4.6 Frequency Stability

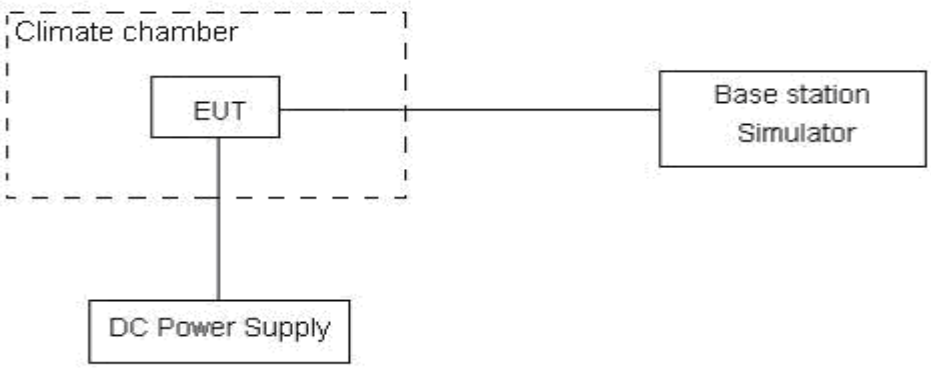
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

1. Frequency Stability (Temperature Variation)
   The temperature inside the climate chamber is varied from -40°C to +85°C in 10°C step size.
   (1)With all power removed, the temperature was decreased to -10°C and permitted to stabilize for three hours.
   (2)Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.
   (3) Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.
2. Frequency Stability (Voltage Variation)
   The frequency stability shall be measured with variation of primary supply voltage as follows:
   (1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
   (2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.
   This transceiver is specified to operate with an input voltage of between 3.3 V and 4.3 V, with a nominal voltage of 3.8V.

Test setup



Limits

No specific frequency stability requirements in part 27.54

Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor k = 3,U=0.01ppm.

Test Result

Bandwidth	Test status	LTE Band 4 Channel 20175 Test Results (ppm)	
		QPSK	16QAM
1.4MHz	-40°C/Normal Voltage	-0.00089	-0.00316
	-30°C/Normal Voltage	-0.00069	-0.00282
	-20°C/Normal Voltage	0.00021	-0.00295
	-10°C/Normal Voltage	0.00083	-0.00008
	0°C/Normal Voltage	-0.00130	-0.00186
	10°C/Normal Voltage	0.00077	0.00021
	20°C/Normal Voltage	0.00161	-0.00065
	30°C/Normal Voltage	-0.00057	-0.00216
	40°C/Normal Voltage	-0.00062	-0.00127
	50°C/Normal Voltage	-0.00203	-0.00132
	60°C/Normal Voltage	-0.00276	-0.00326
	70°C/Normal Voltage	-0.00229	-0.00072
	80°C/Normal Voltage	-0.00063	-0.00160
	85°C/Normal Voltage	0.00123	-0.00062
	20°C/Min Voltage	0.00004	0.00083
	20°C/Max Voltage	-0.00040	-0.00113
3MHz	-40°C/Normal Voltage	0.00109	0.00131
	-30°C/Normal Voltage	0.00136	0.00012
	-20°C/Normal Voltage	-0.00113	-0.00192
	-10°C/Normal Voltage	0.00175	-0.00253
	0°C/Normal Voltage	-0.00128	-0.00031
	10°C/Normal Voltage	-0.00173	0.00021
	20°C/Normal Voltage	-0.00271	-0.00130
	30°C/Normal Voltage	-0.00059	-0.00162
	40°C/Normal Voltage	0.00048	0.00098
	50°C/Normal Voltage	0.00063	-0.00042
	60°C/Normal Voltage	-0.00314	-0.00204
	70°C/Normal Voltage	-0.00148	-0.00072
	80°C/Normal Voltage	-0.00073	-0.00295
	85°C/Normal Voltage	-0.00095	-0.00391
	20°C/Min Voltage	0.00122	-0.00059
	20°C/Max Voltage	-0.00077	-0.00058
5MHz	-40°C/Normal Voltage	-0.00180	-0.00003
	-30°C/Normal Voltage	-0.00159	-0.00027
	-20°C/Normal Voltage	0.00079	-0.00104
	-10°C/Normal Voltage	-0.00072	-0.00055

	0°C/Normal Voltage	0.00121	0.00031
	10°C/Normal Voltage	0.00067	-0.00065
	20°C/Normal Voltage	-0.00070	-0.00006
	30°C/Normal Voltage	0.00135	-0.00083
	40°C/Normal Voltage	0.00071	0.00249
	50°C/Normal Voltage	-0.00074	-0.00148
	60°C/Normal Voltage	-0.00182	-0.00181
	70°C/Normal Voltage	-0.00132	-0.00068
	80°C/Normal Voltage	-0.00197	-0.00124
	85°C/Normal Voltage	-0.00063	0.00188
	20°C/Min Voltage	0.00069	0.00065
	20°C/Max Voltage	0.00190	0.00294
10MHz	-40°C/Normal Voltage	-0.00087	-0.00008
	-30°C/Normal Voltage	0.00103	-0.00152
	-20°C/Normal Voltage	0.00259	-0.00245
	-10°C/Normal Voltage	-0.00001	0.00048
	0°C/Normal Voltage	0.00085	0.00125
	10°C/Normal Voltage	-0.00031	0.00001
	20°C/Normal Voltage	0.00111	-0.00067
	30°C/Normal Voltage	0.00244	0.00057
	40°C/Normal Voltage	-0.00102	0.00184
	50°C/Normal Voltage	-0.00087	-0.00161
	60°C/Normal Voltage	-0.00195	-0.00194
	70°C/Normal Voltage	-0.00145	-0.00081
	80°C/Normal Voltage	-0.00211	-0.00137
	85°C/Normal Voltage	0.00121	0.00147
	20°C/Min Voltage	0.00004	0.00092
	20°C/Max Voltage	0.00160	0.00173
15MHz	-40°C/Normal Voltage	-0.00012	-0.00040
	-30°C/Normal Voltage	-0.00029	0.00010
	-20°C/Normal Voltage	-0.00075	0.00295
	-10°C/Normal Voltage	-0.00067	0.00244
	0°C/Normal Voltage	-0.00006	0.00056
	10°C/Normal Voltage	0.00248	0.00320
	20°C/Normal Voltage	0.00054	-0.00033
	30°C/Normal Voltage	0.00050	0.00182
	40°C/Normal Voltage	-0.00027	0.00155
	50°C/Normal Voltage	0.00145	0.00158
	60°C/Normal Voltage	0.00088	-0.00167
	70°C/Normal Voltage	0.00244	-0.00260

	80°C/Normal Voltage	-0.00016	0.00033
	85°C/Normal Voltage	0.00096	0.00008
	20°C/Min Voltage	-0.00057	0.00117
	20°C/Max Voltage	-0.00032	0.00066
20MHz	-40°C/Normal Voltage	-0.00033	-0.00124
	-30°C/Normal Voltage	0.00020	0.00140
	-20°C/Normal Voltage	0.00095	0.00040
	-10°C/Normal Voltage	0.00084	0.00211
	0°C/Normal Voltage	-0.00218	0.00087
	10°C/Normal Voltage	-0.00156	-0.00072
	20°C/Normal Voltage	0.00166	0.00130
	30°C/Normal Voltage	0.00034	0.00158
	40°C/Normal Voltage	0.00099	0.00205
	50°C/Normal Voltage	0.00229	-0.00275
	60°C/Normal Voltage	-0.00031	0.00018
	70°C/Normal Voltage	0.00081	-0.00007
	80°C/Normal Voltage	-0.00011	0.00077
	85°C/Normal Voltage	0.00122	0.00163
	20°C/Min Voltage	-0.00234	-0.00190
	20°C/Max Voltage	-0.00040	-0.00080

Bandwidth	Test status	LTE Band 13 Channel 23230 Test Results (ppm)	
		QPSK	16QAM
5MHz	-40°C/Normal Voltage	-0.00149	-0.00297
	-30°C/Normal Voltage	-0.00189	-0.00077
	-20°C/Normal Voltage	-0.00057	-0.00167
	-10°C/Normal Voltage	-0.00038	-0.00084
	0°C/Normal Voltage	-0.00073	-0.00004
	10°C/Normal Voltage	-0.00115	-0.00255
	20°C/Normal Voltage	-0.00066	-0.00188
	30°C/Normal Voltage	-0.00119	-0.00212
	40°C/Normal Voltage	-0.00046	-0.00113
	50°C/Normal Voltage	0.00053	0.00092
	60°C/Normal Voltage	-0.00063	-0.00032
	70°C/Normal Voltage	0.00079	-0.00099
	80°C/Normal Voltage	0.00211	0.00025
	85°C/Normal Voltage	-0.00006	-0.00068
	20°C/Min Voltage	0.00020	0.00021
	20°C/Max Voltage	0.00084	-0.00048
10MHz	-40°C/Normal Voltage	-0.00129	-0.00033
	-30°C/Normal Voltage	-0.00099	0.00058
	-20°C/Normal Voltage	0.00034	0.00025
	-10°C/Normal Voltage	-0.00017	-0.00044
	0°C/Normal Voltage	0.00127	-0.00103
	10°C/Normal Voltage	-0.00165	-0.00117
	20°C/Normal Voltage	-0.00062	-0.00152
	30°C/Normal Voltage	-0.00182	-0.00113
	40°C/Normal Voltage	-0.00111	-0.00060
	50°C/Normal Voltage	0.00128	0.00141
	60°C/Normal Voltage	0.00071	-0.00184
	70°C/Normal Voltage	0.00227	-0.00278
	80°C/Normal Voltage	-0.00033	0.00016
	85°C/Normal Voltage	-0.00027	0.00023
	20°C/Min Voltage	-0.00126	-0.00007
	20°C/Max Voltage	0.00005	-0.00031

4.7 Spurious Emissions at Antenna Terminals

Ambient condition

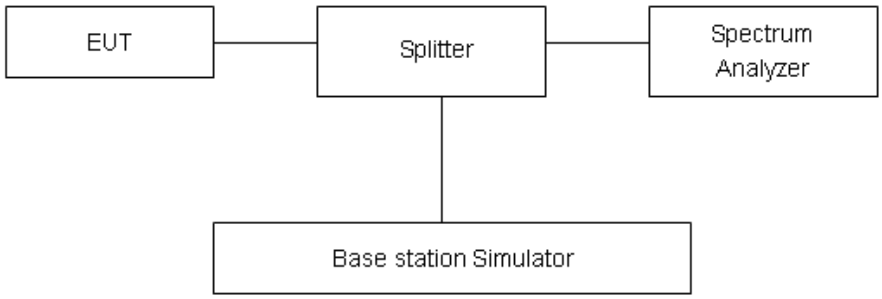
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 30MHz to the 10th harmonic of the carrier. The peak detector is used. Set RBW 1MHz and VBW3MHz， Sweep is set to ATUO.

Of those disturbances below (limit – 20 dB), the mark is not required for the EUT.

Test setup



Limits

Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB..”

Rule Part 27.53(f)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. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

LTE -4/13 Limit	-13 dBm

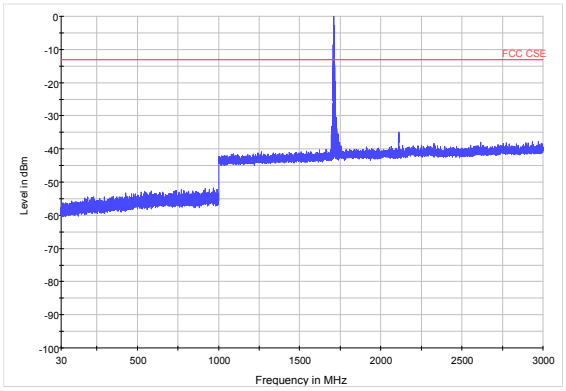
Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75％ confidence level for the normal distribution is with the coverage factor k = 1.96.

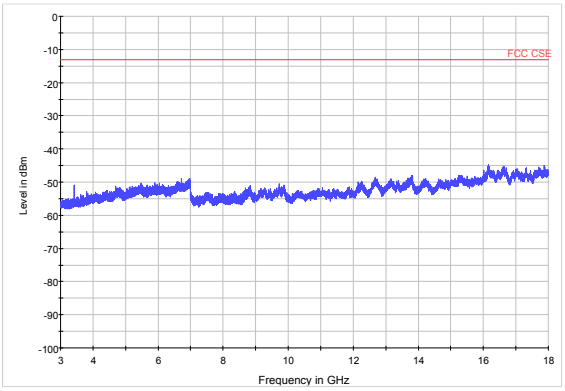
Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-12.75GHz	1.407 dB

Test Result: PASS

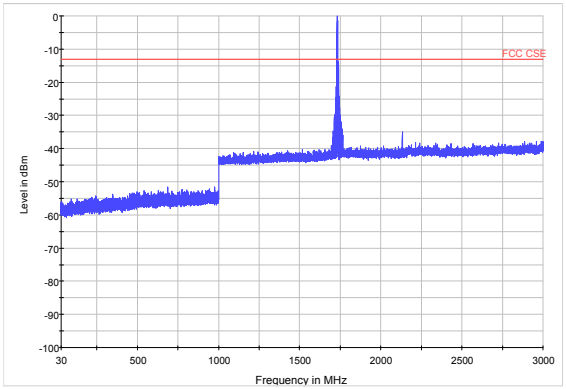
LTE Band 4 1.4MHz CH-Low 30MHz~3GHz



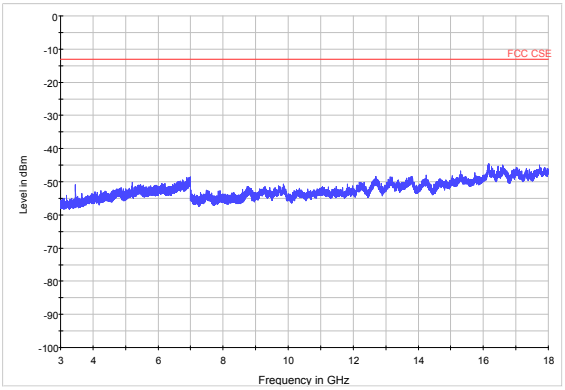
LTE Band 4 1.4MHz CH-Low 3GHz~18GHz



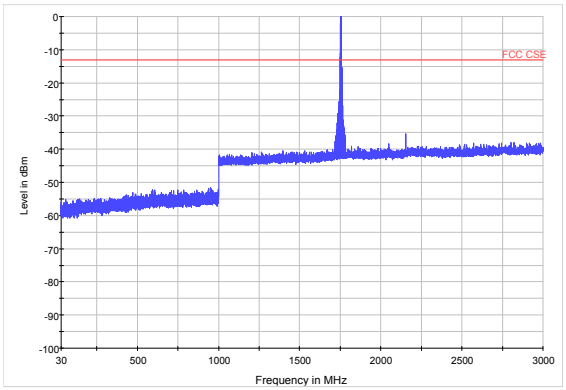
LTE Band 4 1.4MHz CH-Middle 30MHz~3GHz



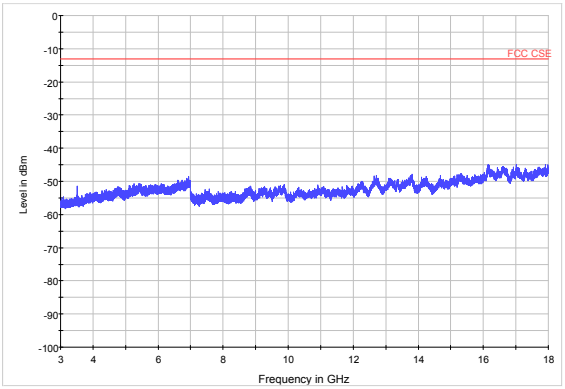
LTE Band 4 1.4MHz CH-Middle 3GHz~18GHz



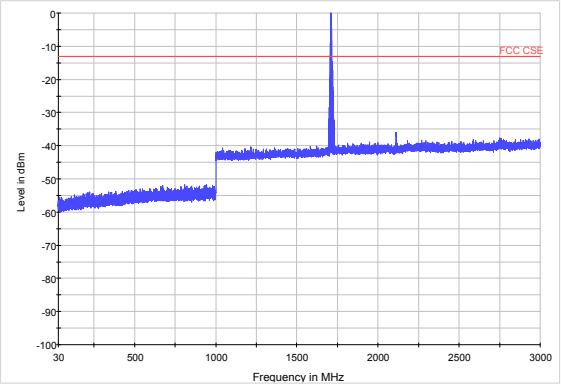
LTE Band 4 1.4MHz CH-High 30MHz~3GHz



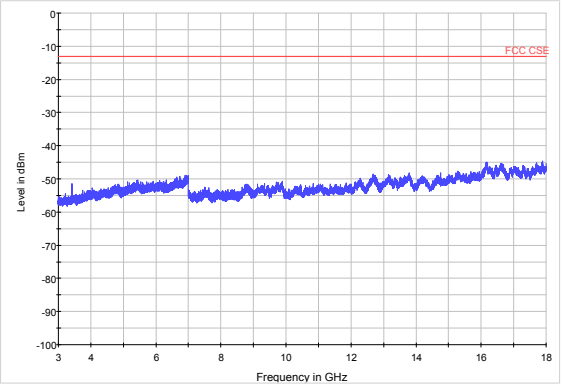
LTE Band 4 1.4MHz CH-High 3GHz~18GHz



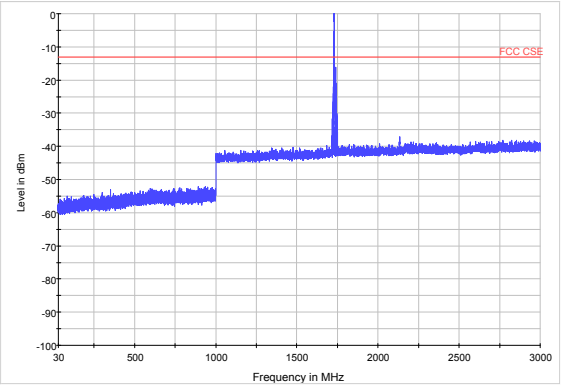
LTE Band 4 3MHz CH-Low 30MHz~3GHz



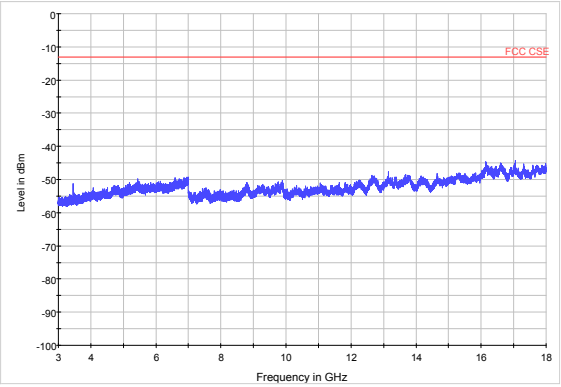
LTE Band 4 3MHz CH-Low 3GHz~18GHz



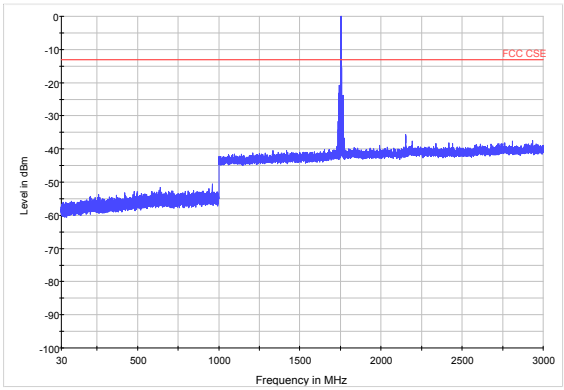
LTE Band 4 3MHz CH-Middle 30MHz~3GHz



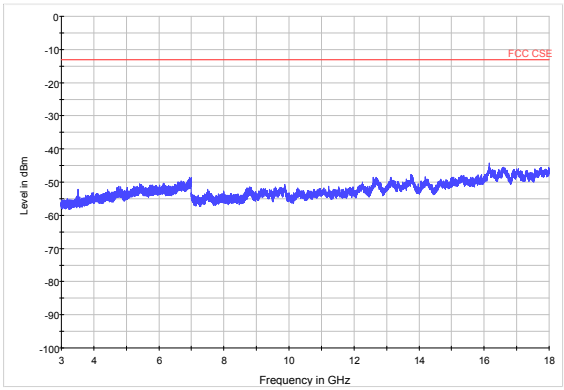
LTE Band 4 3MHz CH-Middle 3GHz~18GHz



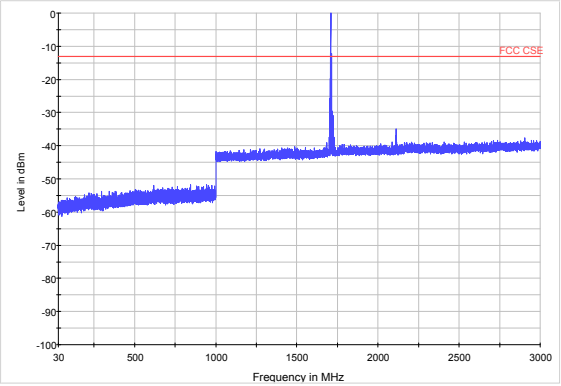
LTE Band 4 3MHz CH-High 30MHz~3GHz



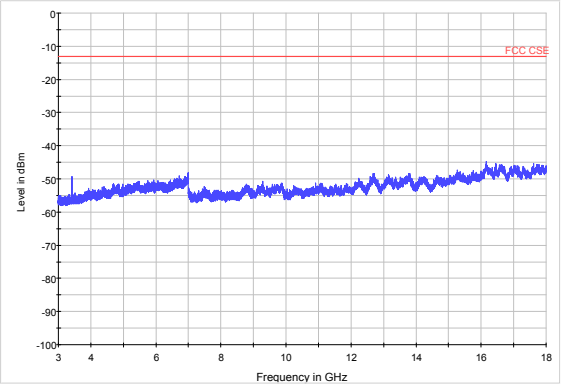
LTE Band 4 3MHz CH-High 3GHz~18GHz



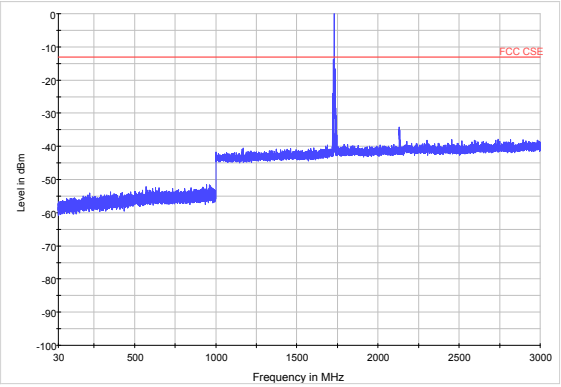
LTE Band 4 5MHz CH-Low 30MHz~3GHz



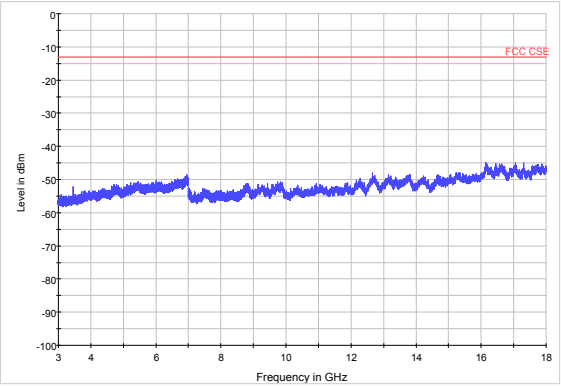
LTE Band 4 5MHz CH-Low 3GHz~18GHz



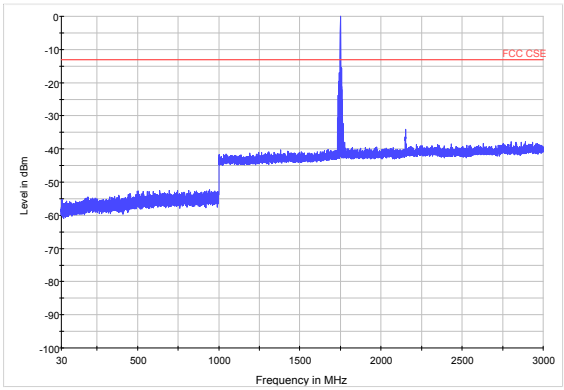
LTE Band 4 5MHz CH-Middle 30MHz~3GHz



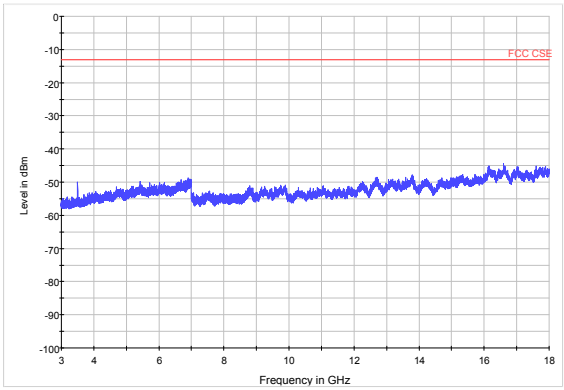
LTE Band 4 5MHz CH-Middle 3GHz~18GHz



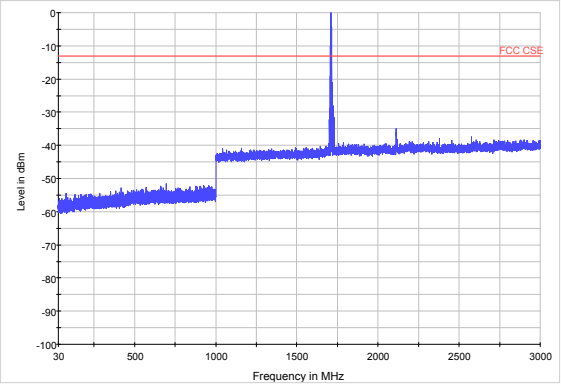
LTE Band 4 5MHz CH-High 30MHz~3GHz



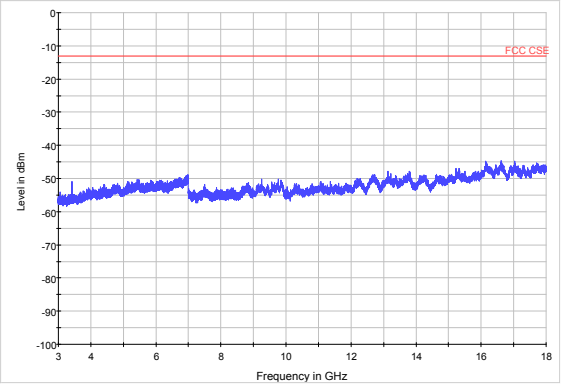
LTE Band 4 5MHz CH-High 3GHz~18GHz



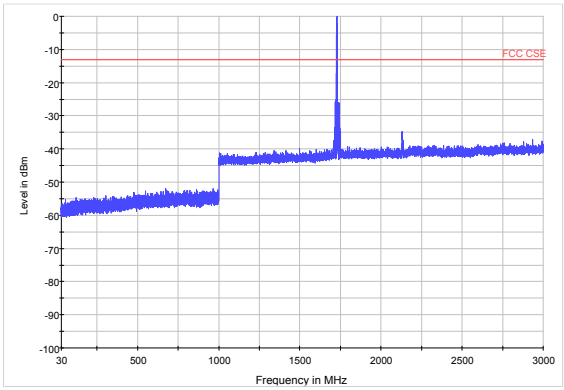
LTE Band 4 10MHz CH-Low 30MHz~3GHz



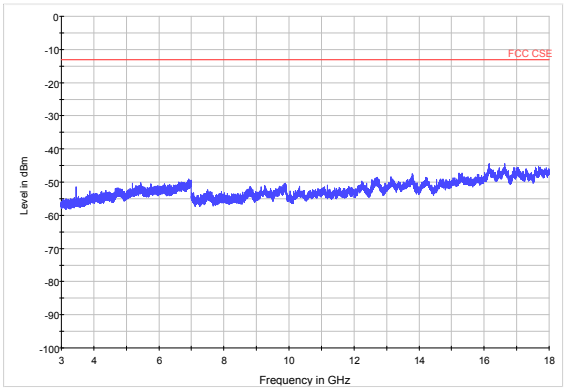
LTE Band 4 10MHz CH-Low 3GHz~18GHz



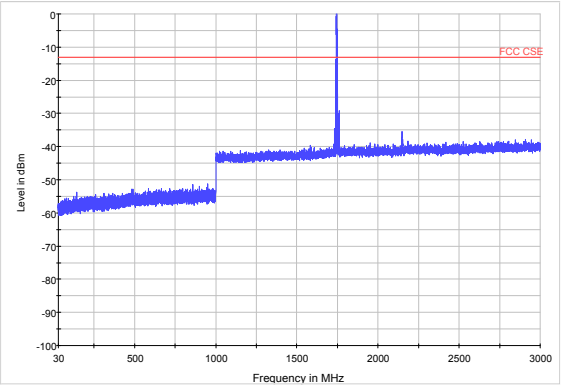
LTE Band 4 10MHz CH-Middle 30MHz~3GHz



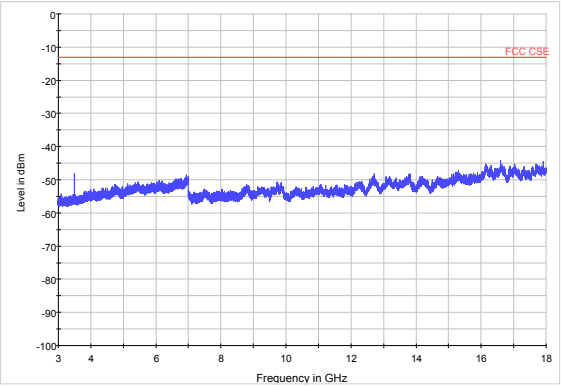
LTE Band 4 10MHz CH-Middle 3GHz~18GHz



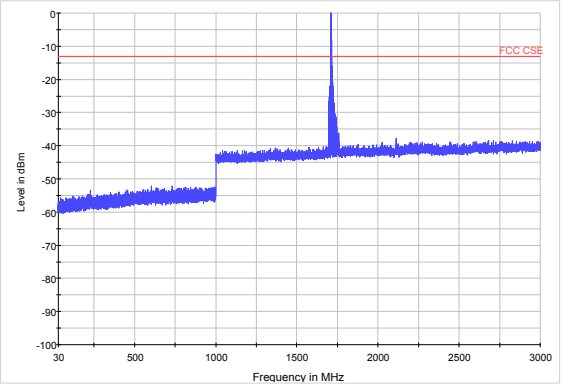
LTE Band 4 10MHz CH-High 30MHz~3GHz



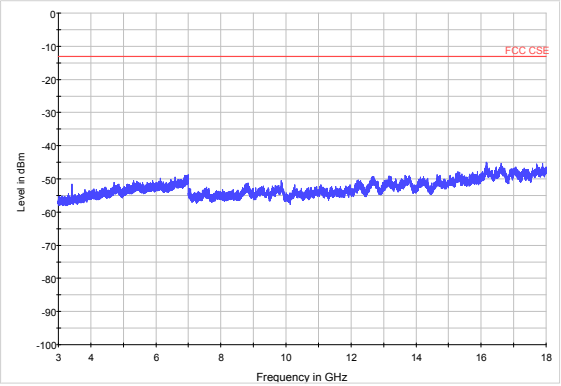
LTE Band 4 10MHz CH-High 3GHz~18GHz



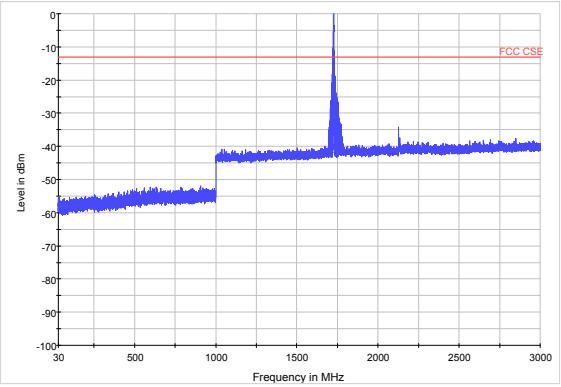
LTE Band 4 15MHz CH-Low 30MHz~3GHz



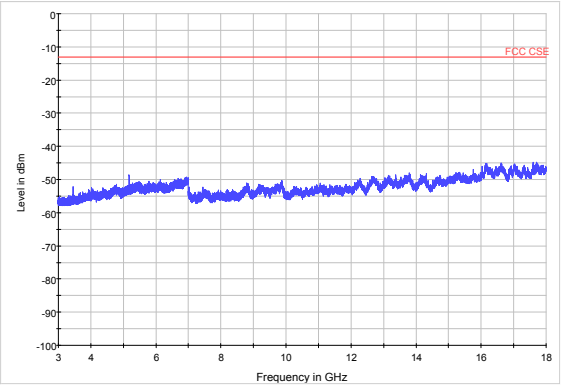
LTE Band 4 15MHz CH-Low 3GHz~18GHz



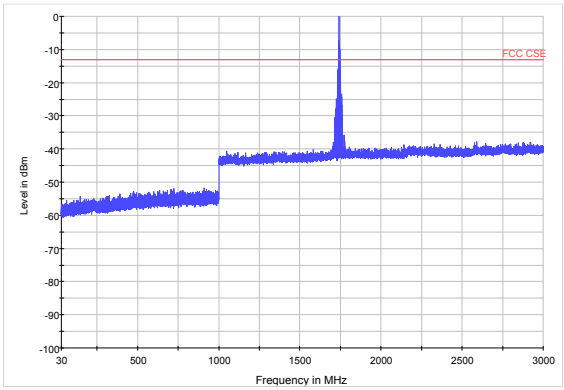
LTE Band 4 15MHz CH-Middle 30MHz~3GHz



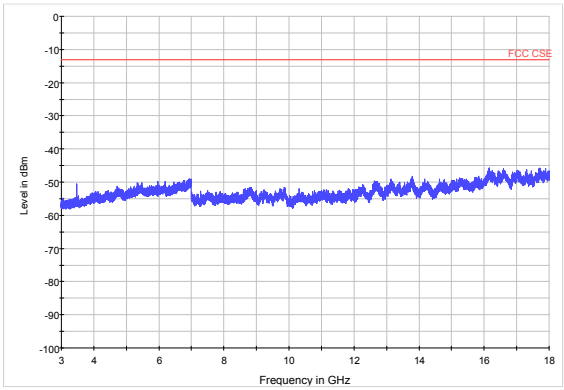
LTE Band 4 15MHz CH-Middle 3GHz~18GHz



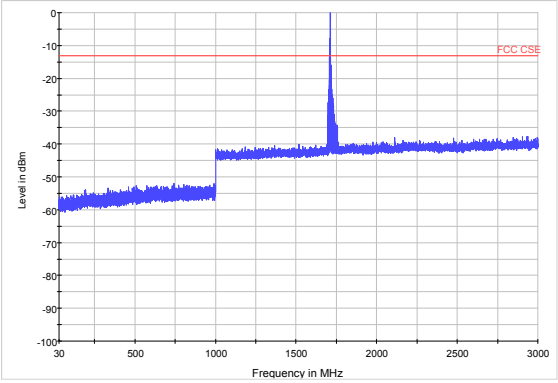
LTE Band 4 15MHz CH-High 30MHz~3GHz



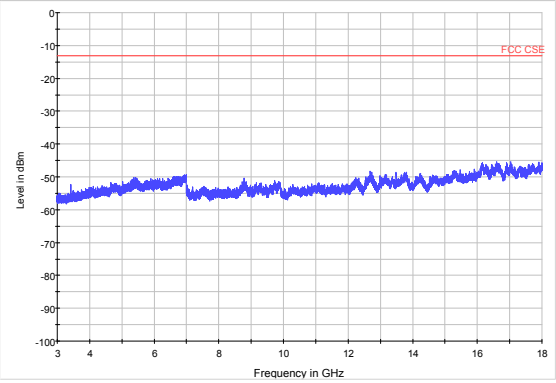
LTE Band 4 15MHz CH-High 3GHz~18GHz



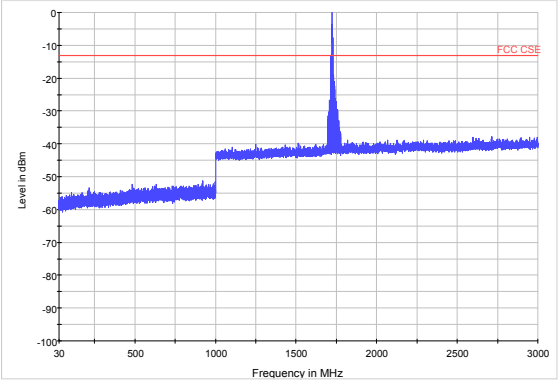
LTE Band 4 20MHz CH-Low 30MHz~3GHz



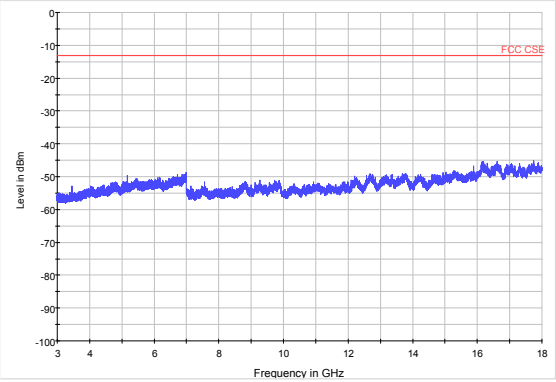
LTE Band 4 20MHz CH-Low 3GHz~18GHz



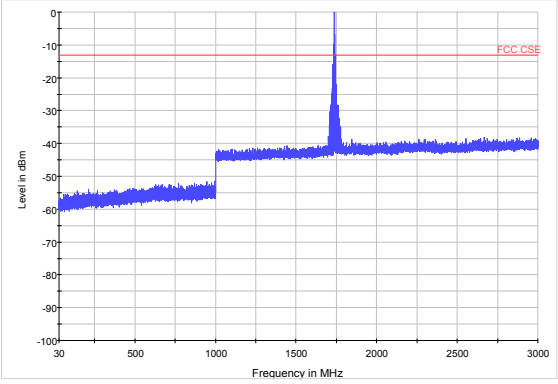
LTE Band 4 20MHz CH-Middle 30MHz~3GHz



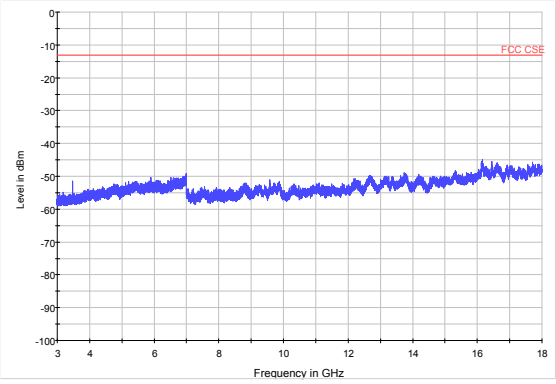
LTE Band 4 20MHz CH-Middle 3GHz~18GHz



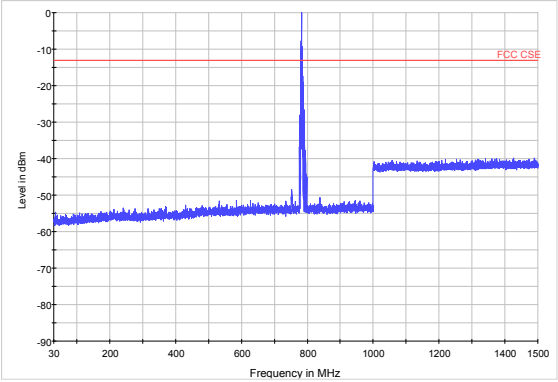
LTE Band 4 20MHz CH-High 30MHz~3GHz



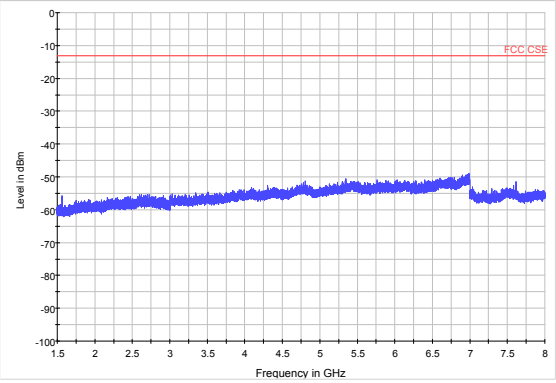
LTE Band 4 20MHz CH-High 3GHz~18GHz



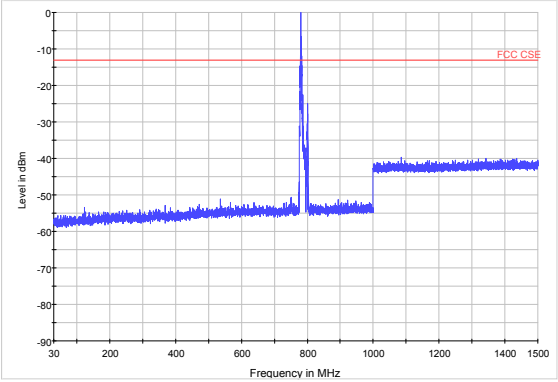
LTE Band 13 5MHz CH-Low 30MHz~1.5GHz



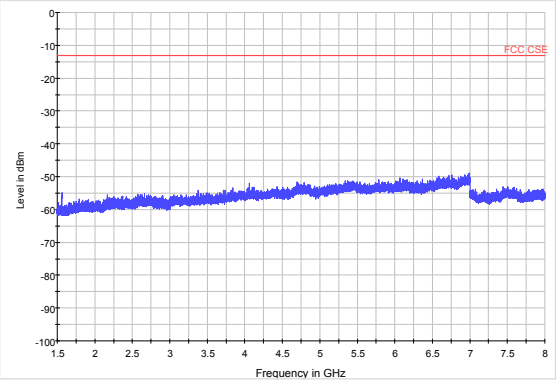
LTE Band 13 5MHz CH-Low 1.5GHz~8GHz



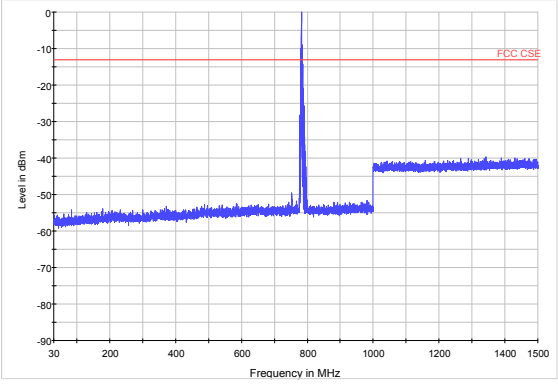
LTE Band 13 5MHz CH-Middle 30MHz~1.5GHz



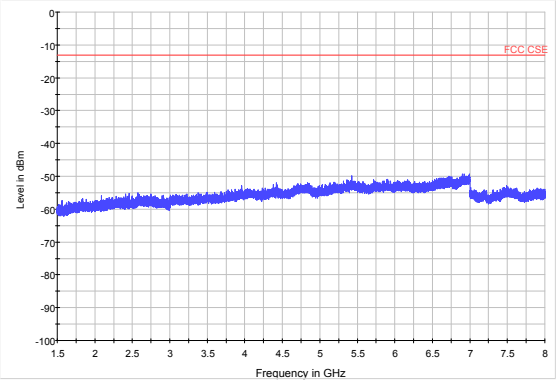
LTE Band 13 5MHz CH-Middle 1.5GHz~8GHz



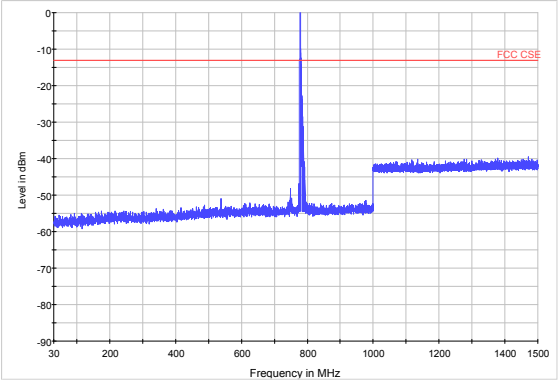
LTE Band 13 5MHz CH-High 30MHz~1.5GHz



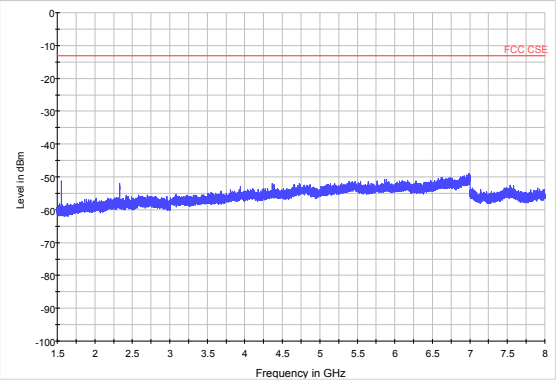
LTE Band 13 5MHz CH-High 1.5GHz~8GHz



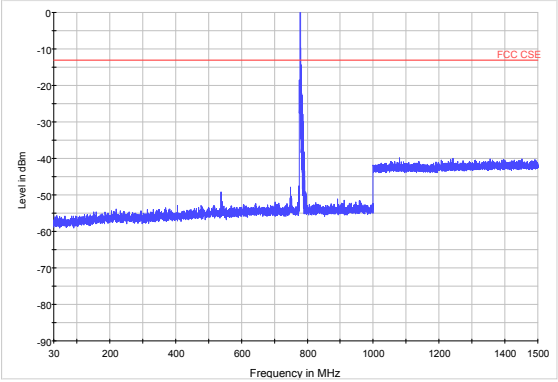
LTE Band 13 10MHz CH-Low 30MHz~1.5GHz



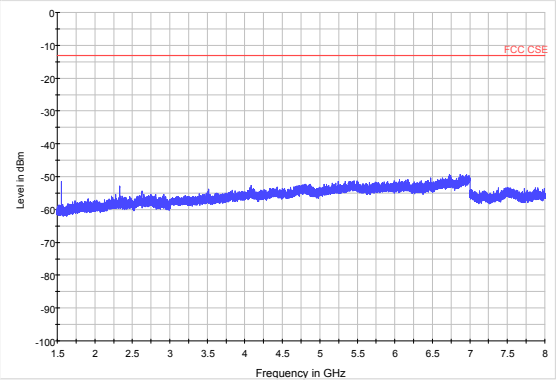
LTE Band 13 10MHz CH-Low 1.5GHz~8GHz



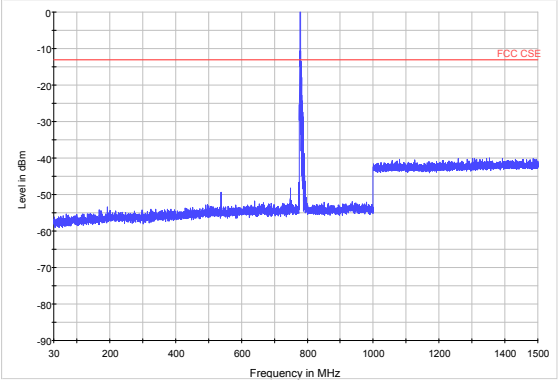
LTE Band 13 10MHz CH-Middle 30MHz~1.5GHz



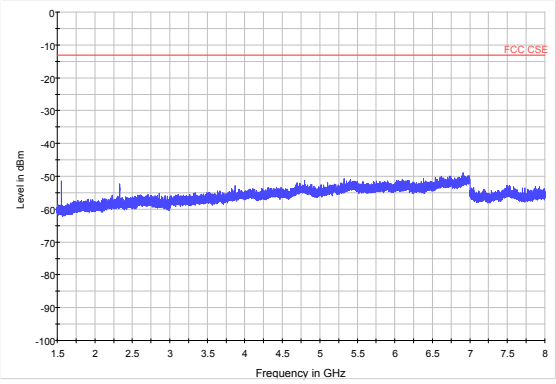
LTE Band 13 10MHz CH-Middle 1.5GHz~8GHz



LTE Band 13 10MHz CH-High 30MHz~1.5GHz



LTE Band 13 10MHz CH- High 1.5GHz~8GHz



4.8 Radiates Spurious Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

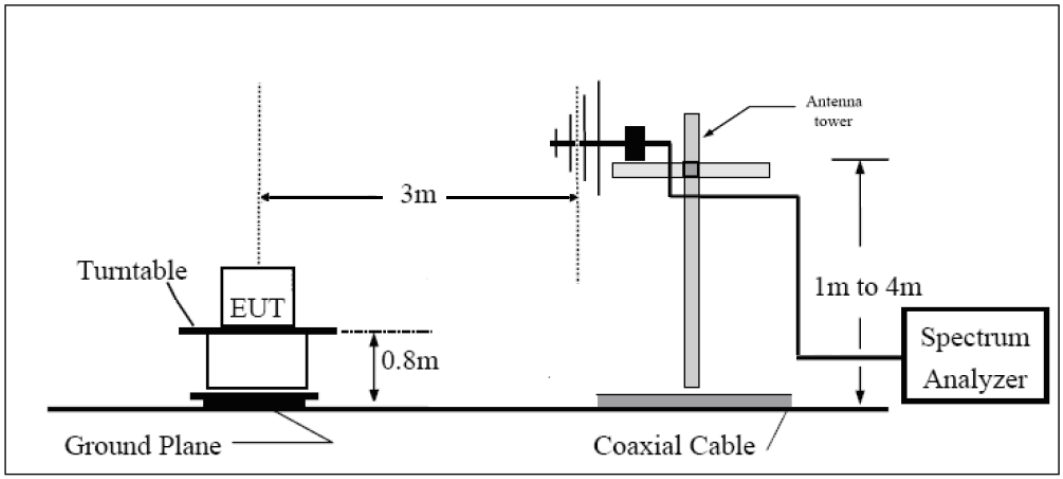
Method of Measurement

1. The testing follows FCC KDB 971168 v02r02 Section 5.8 and ANSI / TIA-603-D-2010 Section 2.2.12.
2. Above 30MHz： The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test.Set Test Receiver or Spectrum RBW=1MHz,VBW=3MHz, And the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:
Power(EIRP)=PMea- PAg - Pcl + Ga
The measurement results are amend as described below:
Power(EIRP)=PMea- Pcl + Ga
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP

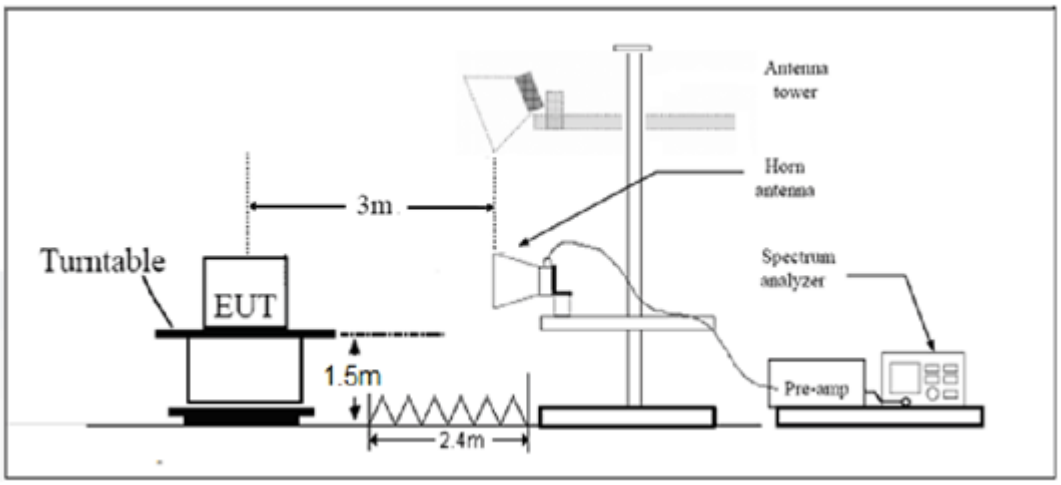
= EIRP-2.15dBi.

Test setup

30MHz~~~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

Limits

Rule Part 27.53(h) specifies that “the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.”

Rule Part 27.53(f)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. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

LTE -4/13 Limit	-13 dBm

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95％ confidence level for the normal distribution is with the coverage factor k = ±1.96, U= ±3.55 dB.

Test Result

LTE Band 4 QPSK 1.4MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3421.4	-53.65	2.6	10.15	Vertical	-46.1	-13	33.1	90
3	5132.1	-54.35	2.4	11.35	Vertical	-45.4	-13	32.4	135
4	6842.8	-50.25	4.5	10.85	Vertical	-43.9	-13	30.9	225
5	8553.5	-46.85	5.1	11.35	Vertical	-40.6	-13	27.6	270
6	10264.2	-44.85	5.3	11.95	Vertical	-38.2	-13	25.2	180
7	11974.9	-45.15	5.5	13.55	Vertical	-37.1	-13	24.1	45
8	13685.6	-43.35	6.3	13.75	Vertical	-35.9	-13	22.9	135
9	15396.3	-44.55	6.7	13.85	Vertical	-37.4	-13	24.4	225
10	17107.0	-42.35	6.8	14.25	Vertical	-34.9	-13	21.9	90

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 1.4MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3465.0	-57.25	2.6	10.75	Vertical	-49.1	-13	36.1	135
3	5197.5	-54.65	2.4	11.05	Vertical	-46.0	-13	33.0	90
4	6930.0	-47.95	4.5	11.15	Vertical	-41.3	-13	28.3	135
5	8662.5	-46.35	5.1	11.35	Vertical	-40.1	-13	27.1	225
6	10395.0	-45.45	5.3	11.95	Vertical	-38.8	-13	25.8	270
7	12127.5	-45.85	5.5	13.55	Vertical	-37.8	-13	24.8	180
8	13860.0	-43.35	6.3	13.75	Vertical	-35.9	-13	22.9	45
9	15592.5	-43.65	6.7	13.85	Vertical	-36.5	-13	23.5	135
10	17325.0	-42.95	6.8	14.25	Vertical	-35.5	-13	22.5	225

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 1.4MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3508.6	-50.45	2.6	10.15	Vertical	-42.9	-13	29.9	90
3	5262.9	-54.75	2.4	11.05	Vertical	-46.1	-13	33.1	45
4	7017.2	-49.35	4.5	11.15	Vertical	-42.7	-13	29.7	135
5	8771.5	-46.75	5.1	11.35	Vertical	-40.5	-13	27.5	45
6	10525.8	-44.15	5.3	11.95	Vertical	-37.5	-13	24.5	90
7	12280.1	-45.75	5.5	13.55	Vertical	-37.7	-13	24.7	90
8	14034.4	-41.75	6.3	13.75	Vertical	-34.3	-13	21.3	135
9	15788.7	-43.95	6.7	13.85	Vertical	-36.8	-13	23.8	225
10	17543.0	-41.55	6.8	14.25	Vertical	-34.1	-13	21.1	270

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 3MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3423.0	-52.15	2.6	10.15	Vertical	-44.6	-13	31.6	180
3	5134.5	-54.55	2.4	11.35	Vertical	-45.6	-13	32.6	45
4	6846.0	-50.05	4.5	10.85	Vertical	-43.7	-13	30.7	135
5	8557.5	-46.65	5.1	11.35	Vertical	-40.4	-13	27.4	225
6	10269.0	-45.35	5.3	11.95	Vertical	-38.7	-13	25.7	90
7	11980.5	-45.45	5.5	13.55	Vertical	-37.4	-13	24.4	90
8	13692.0	-43.15	6.3	13.75	Vertical	-35.7	-13	22.7	45
9	15403.5	-44.55	6.7	13.85	Vertical	-37.4	-13	24.4	90
10	17115.0	-42.35	6.8	14.25	Vertical	-34.9	-13	21.9	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 3MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3465.0	-55.05	2.6	10.75	Vertical	-46.9	-13	33.9	225
3	5197.5	-54.65	2.4	11.05	Vertical	-46.0	-13	33.0	270
4	6930.0	-48.05	4.5	11.15	Vertical	-41.4	-13	28.4	180
5	8662.5	-46.95	5.1	11.35	Vertical	-40.7	-13	27.7	45
6	10395.0	-44.65	5.3	11.95	Vertical	-38.0	-13	25.0	135
7	12127.5	-45.25	5.5	13.55	Vertical	-37.2	-13	24.2	225
8	13860.0	-42.35	6.3	13.75	Vertical	-34.9	-13	21.9	90
9	15592.5	-44.65	6.7	13.85	Vertical	-37.5	-13	24.5	225
10	17325.0	-42.75	6.8	14.25	Vertical	-35.3	-13	22.3	0

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 3MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3507.0	-52.35	2.6	10.15	Vertical	-44.8	-13	31.8	135
3	5260.5	-53.75	2.4	11.05	Vertical	-45.1	-13	32.1	90
4	7014.0	-49.35	4.5	11.15	Vertical	-42.7	-13	29.7	135
5	8767.5	-47.75	5.1	11.35	Vertical	-41.5	-13	28.5	225
6	10521.0	-45.15	5.3	11.95	Vertical	-38.5	-13	25.5	270
7	12274.5	-45.75	5.5	13.55	Vertical	-37.7	-13	24.7	180
8	14028.0	-42.35	6.3	13.75	Vertical	-34.9	-13	21.9	45
9	15781.5	-43.95	6.7	13.85	Vertical	-36.8	-13	23.8	135
10	17535.0	-41.85	6.8	14.25	Vertical	-34.4	-13	21.4	225

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 5MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3425.0	-53.95	2.6	10.15	Vertical	-46.4	-13	33.4	90
3	5137.5	-54.55	2.4	11.35	Vertical	-45.6	-13	32.6	180
4	6850.0	-51.05	4.5	10.85	Vertical	-44.7	-13	31.7	90
5	8562.5	-47.65	5.1	11.35	Vertical	-41.4	-13	28.4	135
6	10275.0	-45.35	5.3	11.95	Vertical	-38.7	-13	25.7	225
7	11987.5	-45.45	5.5	13.55	Vertical	-37.4	-13	24.4	270
8	13700.0	-44.15	6.3	13.75	Vertical	-36.7	-13	23.7	180
9	15412.5	-44.55	6.7	13.85	Vertical	-37.4	-13	24.4	45
10	17125.0	-42.35	6.8	14.25	Vertical	-34.9	-13	21.9	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3465.0	-54.75	2.6	10.75	Vertical	-46.6	-13	33.6	225
3	5197.5	-54.85	2.4	11.05	Vertical	-46.2	-13	33.2	90
4	6930.0	-47.95	4.5	11.15	Vertical	-41.3	-13	28.3	135
5	8662.5	-46.35	5.1	11.35	Vertical	-40.1	-13	27.1	225
6	10395.0	-44.95	5.3	11.95	Vertical	-38.3	-13	25.3	90
7	12127.5	-45.95	5.5	13.55	Vertical	-37.9	-13	24.9	135
8	13860.0	-42.95	6.3	13.75	Vertical	-35.5	-13	22.5	225
9	15592.5	-43.95	6.7	13.85	Vertical	-36.8	-13	23.8	270
10	17325.0	-41.85	6.8	14.25	Vertical	-34.4	-13	21.4	180

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 5MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3505.0	-50.25	2.6	10.15	Vertical	-42.7	-13	29.7	45
3	5257.5	-54.55	2.4	11.05	Vertical	-45.9	-13	32.9	135
4	7010.0	-48.95	4.5	11.15	Vertical	-42.3	-13	29.3	225
5	8762.5	-47.65	5.1	11.35	Vertical	-41.4	-13	28.4	90
6	10515.0	-44.75	5.3	11.95	Vertical	-38.1	-13	25.1	270
7	12267.5	-46.15	5.5	13.55	Vertical	-38.1	-13	25.1	225
8	14020.0	-42.65	6.3	13.75	Vertical	-35.2	-13	22.2	135
9	15772.5	-43.35	6.7	13.85	Vertical	-36.2	-13	23.2	90
10	17525.0	-41.55	6.8	14.25	Vertical	-34.1	-13	21.1	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 10MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3430.0	-52.45	2.6	10.15	Vertical	-44.9	-13	31.9	225
3	5145.0	-53.75	2.4	11.35	Vertical	-44.8	-13	31.8	270
4	6860.0	-47.95	4.5	10.85	Vertical	-41.6	-13	28.6	180
5	8575.0	-47.35	5.1	11.35	Vertical	-41.1	-13	28.1	45
6	10290.0	-45.55	5.3	11.95	Vertical	-38.9	-13	25.9	135
7	12005.0	-45.95	5.5	13.55	Vertical	-37.9	-13	24.9	225
8	13720.0	-41.95	6.3	13.75	Vertical	-34.5	-13	21.5	90
9	15435.0	-44.95	6.7	13.85	Vertical	-37.8	-13	24.8	90
10	17150.0	-42.75	6.8	14.25	Vertical	-35.3	-13	22.3	90

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 10MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3465.0	-53.05	2.6	10.75	Vertical	-44.9	-13	31.9	135
3	5197.5	-54.25	2.4	11.05	Vertical	-45.6	-13	32.6	225
4	6930.0	-47.95	4.5	11.15	Vertical	-41.3	-13	28.3	270
5	8662.5	-46.45	5.1	11.35	Vertical	-40.2	-13	27.2	180
6	10395.0	-45.65	5.3	11.95	Vertical	-39.0	-13	26.0	45
7	12127.5	-45.95	5.5	13.55	Vertical	-37.9	-13	24.9	135
8	13860.0	-41.95	6.3	13.75	Vertical	-34.5	-13	21.5	225
9	15592.5	-44.95	6.7	13.85	Vertical	-37.8	-13	24.8	90
10	17325.0	-42.75	6.8	14.25	Vertical	-35.3	-13	22.3	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 10MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3500.0	-49.75	2.6	10.15	Vertical	-42.2	-13	29.2	225
3	5250.0	-53.65	2.4	11.05	Vertical	-45.0	-13	32.0	315
4	7000.0	-48.65	4.5	11.15	Vertical	-42.0	-13	29.0	270
5	8750.0	-47.35	5.1	11.35	Vertical	-41.1	-13	28.1	225
6	10500.0	-46.75	5.3	11.95	Vertical	-40.1	-13	27.1	135
7	12250.0	-45.45	5.5	13.55	Vertical	-37.4	-13	24.4	90
8	14000.0	-42.05	6.3	13.75	Vertical	-34.6	-13	21.6	135
9	15750.0	-45.15	6.7	13.85	Vertical	-38.0	-13	25.0	225
10	17500.0	-42.85	6.8	14.25	Vertical	-35.4	-13	22.4	270

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 15MHz CH Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3435.0	-51.55	2.6	10.15	Vertical	-44.0	-13	31.0	180
3	5152.5	-55.05	2.4	11.35	Vertical	-46.1	-13	33.1	45
4	6870.0	-47.45	4.5	10.85	Vertical	-41.1	-13	28.1	135
5	8587.5	-46.55	5.1	11.35	Vertical	-40.3	-13	27.3	225
6	10305.0	-45.65	5.3	11.95	Vertical	-39.0	-13	26.0	90
7	12022.5	-44.95	5.5	13.55	Vertical	-36.9	-13	23.9	180
8	13740.0	-41.55	6.3	13.75	Vertical	-34.1	-13	21.1	90
9	15457.5	-44.15	6.7	13.85	Vertical	-37.0	-13	24.0	135
10	17175.0	-43.15	6.8	14.25	Vertical	-35.7	-13	22.7	225

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 15MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3465.0	-57.45	2.6	10.75	Vertical	-49.3	-13	36.3	270
3	5197.5	-54.45	2.4	11.05	Vertical	-45.8	-13	32.8	180
4	6930.0	-48.95	4.5	11.15	Vertical	-42.3	-13	29.3	45
5	8662.5	-47.15	5.1	11.35	Vertical	-40.9	-13	27.9	135
6	10395.0	-44.95	5.3	11.95	Vertical	-38.3	-13	25.3	225
7	12127.5	-45.75	5.5	13.55	Vertical	-37.7	-13	24.7	90
8	13860.0	-42.85	6.3	13.75	Vertical	-35.4	-13	22.4	135
9	15592.5	-43.65	6.7	13.85	Vertical	-36.5	-13	23.5	225
10	17325.0	-43.05	6.8	14.25	Vertical	-35.6	-13	22.6	315

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 15MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3495.0	-50.85	2.6	10.15	Vertical	-43.3	-13	30.3	90
3	5242.5	-54.65	2.4	11.05	Vertical	-46.0	-13	33.0	135
4	6990.0	-49.75	4.5	11.15	Vertical	-43.1	-13	30.1	225
5	8737.5	-46.25	5.1	11.35	Vertical	-40.0	-13	27.0	270
6	10485.0	-45.25	5.3	11.95	Vertical	-38.6	-13	25.6	180
7	12232.5	-45.45	5.5	13.55	Vertical	-37.4	-13	24.4	45
8	13980.0	-43.05	6.3	13.75	Vertical	-35.6	-13	22.6	135
9	15727.5	-43.15	6.7	13.85	Vertical	-36.0	-13	23.0	225
10	17475.0	-42.85	6.8	14.25	Vertical	-35.4	-13	22.4	90

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 20MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3440.0	-52.75	2.6	10.15	Vertical	-45.2	-13	32.2	135
3	5160.0	-53.85	2.4	11.35	Vertical	-44.9	-13	31.9	90
4	6880.0	-49.95	4.5	10.85	Vertical	-43.6	-13	30.6	135
5	8600.0	-46.45	5.1	11.35	Vertical	-40.2	-13	27.2	225
6	10320.0	-44.85	5.3	11.95	Vertical	-38.2	-13	25.2	270
7	12040.0	-45.35	5.5	13.55	Vertical	-37.3	-13	24.3	180
8	13760.0	-43.45	6.3	13.75	Vertical	-36.0	-13	23.0	45
9	15480.0	-42.35	6.7	13.85	Vertical	-35.2	-13	22.2	135
10	17200.0	-42.25	6.8	14.25	Vertical	-34.8	-13	21.8	225

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 20MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3465.0	-51.35	2.6	10.75	Vertical	-43.2	-13	30.2	90
3	5197.5	-52.05	2.4	11.05	Vertical	-43.4	-13	30.4	270
4	6930.0	-47.15	4.5	11.15	Vertical	-40.5	-13	27.5	225
5	8662.5	-47.15	5.1	11.35	Vertical	-40.9	-13	27.9	90
6	10395.0	-45.05	5.3	11.95	Vertical	-38.4	-13	25.4	135
7	12127.5	-45.55	5.5	13.55	Vertical	-37.5	-13	24.5	225
8	13860.0	-42.85	6.3	13.75	Vertical	-35.4	-13	22.4	270
9	15592.5	-44.05	6.7	13.85	Vertical	-36.9	-13	23.9	180
10	17325.0	-41.95	6.8	14.25	Vertical	-34.5	-13	21.5	45

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 4 QPSK 20MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3490.0	-53.05	2.6	10.15	Vertical	-45.5	-13	32.5	135
3	5235.0	-52.55	2.4	11.05	Vertical	-43.9	-13	30.9	225
4	6980.0	-47.25	4.5	11.15	Vertical	-40.6	-13	27.6	90
5	8725.0	-47.45	5.1	11.35	Vertical	-41.2	-13	28.2	90
6	10470.0	-45.25	5.3	11.95	Vertical	-38.6	-13	25.6	90
7	12215.0	-45.05	5.5	13.55	Vertical	-37.0	-13	24.0	135
8	13960.0	-44.25	6.3	13.75	Vertical	-36.8	-13	23.8	225
9	15705.0	-43.45	6.7	13.85	Vertical	-36.3	-13	23.3	270
10	17450.0	-42.85	6.8	14.25	Vertical	-35.4	-13	22.4	180

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 13 QPSK 5MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1497.0	-57.10	2.00	10.15	Vertical	-51.1	-13	38.1	225
3	2245.5	-56.00	2.50	11.35	Vertical	-49.3	-13	36.3	90
4	2994.0	-52.70	4.20	10.85	Vertical	-48.2	-13	35.2	135
5	3742.5	-49.90	5.20	11.35	Vertical	-45.9	-13	32.9	90
6	4491.0	-49.10	5.50	11.95	Vertical	-44.8	-13	31.8	135
7	5239.5	-50.40	5.70	13.55	Vertical	-44.7	-13	31.7	225
8	5988.0	-47.00	6.30	13.75	Vertical	-41.7	-13	28.7	270
9	6736.5	-56.00	6.80	13.85	Vertical	-51.1	-13	38.1	225
10	7485.0	-54.50	6.90	14.25	Vertical	-49.3	-13	36.3	90

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 13 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1502.0	-57.70	2.00	10.75	Vertical	-51.1	-13	38.1	135
3	2253.0	-56.79	2.51	11.05	Vertical	-50.4	-13	37.4	225
4	3004.0	-52.50	4.20	11.15	Vertical	-47.7	-13	34.7	90
5	3755.0	-49.70	5.20	11.15	Vertical	-45.9	-13	32.9	180
6	4506.0	-49.60	5.50	11.95	Vertical	-45.3	-13	32.3	90
7	5257.0	-50.50	5.70	13.55	Vertical	-44.8	-13	31.8	135
8	6008.0	-47.80	6.30	13.75	Vertical	-42.5	-13	29.5	225
9	6759.0	-56.00	6.80	13.85	Vertical	-51.1	-13	38.1	135
10	7510.0	-55.60	6.90	14.25	Vertical	-50.4	-13	37.4	225

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is vertical position.

LTE Band 13 QPSK 5MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1507.0	-56.20	2.00	10.15	Vertical	-50.2	-13	37.2	45
3	2260.5	-55.79	2.51	11.05	Vertical	-49.4	-13	36.4	135
4	3014.0	-52.30	4.20	11.15	Vertical	-47.5	-13	34.5	225
5	3767.5	-50.60	5.20	11.15	Vertical	-46.8	-13	33.8	90
6	4521.0	-49.00	5.50	11.95	Vertical	-44.7	-13	31.7	90
7	5274.5	-50.20	5.70	13.55	Vertical	-44.5	-13	31.5	135
8	6028.0	-47.50	6.30	13.75	Vertical	-42.2	-13	29.2	225
9	6781.5	-55.10	6.80	13.85	Vertical	-50.2	-13	37.2	45
10	7535.0	-54.60	6.90	14.25	Vertical	-49.4	-13	36.4	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 13 QPSK 10MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1502.0	-56.50	2.00	10.15	Vertical	-50.5	-13	37.5	45
3	2253.0	-56.49	2.51	11.35	Vertical	-49.8	-13	36.8	135
4	3004.0	-51.70	4.20	10.85	Vertical	-47.2	-13	34.2	225
5	3755.0	-50.60	5.20	11.35	Vertical	-46.6	-13	33.6	90
6	4506.0	-49.30	5.50	11.95	Vertical	-45.0	-13	32.0	135
7	5257.0	-49.90	5.70	13.55	Vertical	-44.2	-13	31.2	225
8	6008.0	-47.90	6.30	13.75	Vertical	-42.6	-13	29.6	270
9	6759.0	-55.40	6.80	13.85	Vertical	-50.5	-13	37.5	45
10	7510.0	-55.00	6.90	14.25	Vertical	-49.8	-13	36.8	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 13 QPSK 10MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1502.0	-56.40	2.00	10.75	Vertical	-49.8	-13	36.8	135
3	2253.0	-56.59	2.51	11.05	Vertical	-50.2	-13	37.2	225
4	3004.0	-52.30	4.20	11.15	Vertical	-47.5	-13	34.5	90
5	3755.0	-50.40	5.20	11.15	Vertical	-46.6	-13	33.6	135
6	4506.0	-49.90	5.50	11.95	Vertical	-45.6	-13	32.6	225
7	5257.0	-49.50	5.70	13.55	Vertical	-43.8	-13	30.8	270
8	6008.0	-48.40	6.30	13.75	Vertical	-43.1	-13	30.1	180
9	6759.0	-54.70	6.80	13.85	Vertical	-49.8	-13	36.8	135
10	7510.0	-55.40	6.90	14.25	Vertical	-50.2	-13	37.2	225

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 13 QPSK 10MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1502.0	-56.40	2.00	10.15	Vertical	-50.4	-13	37.4	225
3	2253.0	-55.29	2.51	11.05	Vertical	-48.9	-13	35.9	90
4	3004.0	-51.90	4.20	11.15	Vertical	-47.1	-13	34.1	270
5	3755.0	-50.30	5.20	11.15	Vertical	-46.5	-13	33.5	225
6	4506.0	-48.70	5.50	11.95	Vertical	-44.4	-13	31.4	135
7	5257.0	-50.00	5.70	13.55	Vertical	-44.3	-13	31.3	225
8	6008.0	-47.20	6.30	13.75	Vertical	-41.9	-13	28.9	90
9	6759.0	-55.30	6.80	13.85	Vertical	-50.4	-13	37.4	225
10	7510.0	-54.10	6.90	14.25	Vertical	-48.9	-13	35.9	90

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

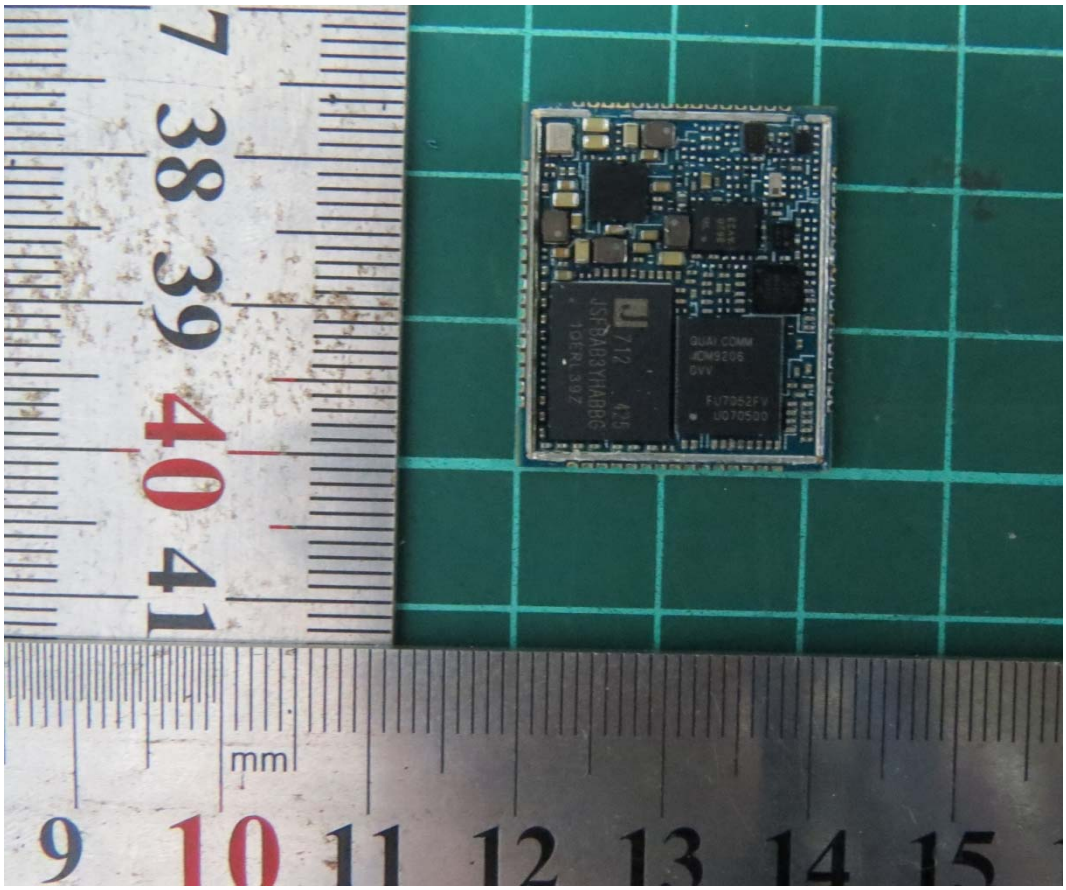
2. The worst emission was found in the antenna is vertical position.

5 Main Test Instruments

Name	Type	Manufacturer	Serial Number	Calibration Date	Expiration Time
Base Station Simulator	CMW500	R&S	113645	2017-05-14	2018-05-13
Power Splitter	SHX-GF2-2-13	Hua Xiang	10120101	2017-05-14	2018-05-13
Universal Radio Communication Tester	E5515C	Agilent	MY48367192	2017-05-14	2018-05-13
Spectrum Analyzer	N9010A	Agilent	MY47191109	2017-05-14	2018-05-13
Signal Analyzer	FSV30	R&S	100815	2016-12-16	2017-12-15
Signal generator	SMB 100A	R&S	102594	2017-05-14	2018-05-13
EMI Test Receiver	ESCI	R&S	100948	2017-05-20	2018-05-19
Trilog Antenna	VUBL 9163	SCHWARZBECK	9163-201	2014-12-06	2017-12-05
Horn Antenna	HF907	R&S	100126	2014-12-06	2017-12-05
Horn Antenna	3160-09	ETS-Lindgren	00102643	2015-01-30	2018-01-29
Climatic Chamber	PT-30B	Re Ce	20101891	2015-07-18	2018-07-17
RF Cable	SMA 15cm	Agilent	0001	2017-02-06	2017-08-05

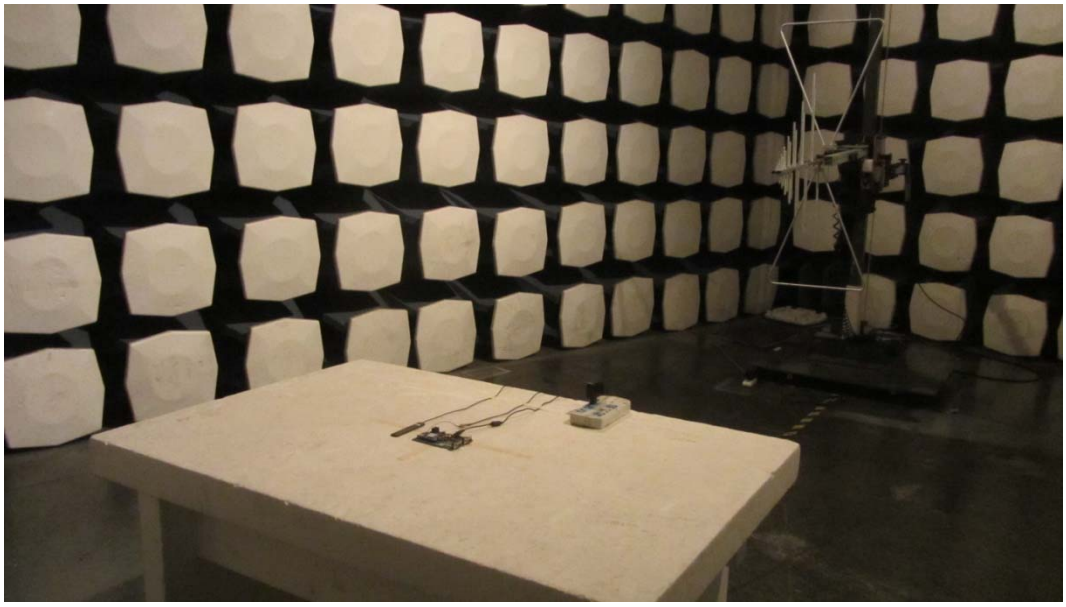
ANNEX A: EUT Appearance and Test Setup

A.1 EUT Appearance



Picture 1 EUT and Accessory

A.2 Test Setup



Picture 2: Radiated Spurious Emissions Test setup