RF TEST REPORT

Applicant	Positioning Universal Inc
FCC ID	2AHRH-FJ1000LMV
Product	LTE Cat M1 Vehicle Telematics and Radio Telecommunications Device
Model	FJ1000LMV
Report No.	R1808A0404-R1
Issue Date	September 13, 2018

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2018)/ FCC CFR47 Part 27C (2018)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Jiangpeng Lan

Performed by: Jiangpeng Lan

Kai Xu

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)/27.50(h)(2)	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	27.53(h) /27.53(f) /27.53(c)	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(f)	PASS
8	Radiates Spurious Emission	2.1053 /27.53(h) /27.53(f)	PASS
Date of Testing: August 28, 2018 ~ September 7, 2018			
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.

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 (Designation number: CN1179, Test Firm Registration Number: 446626)

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
City:	Shanghai
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2 General Description of Equipment under Test

Client Information

Applicant	Positioning Universal Inc
Applicant address	4660 La Jolla Village Drive Suite 1100, San Diego, California, United States
Manufacturer	Positioning Universal Inc
Manufacturer address	4660 La Jolla Village Drive Suite 1100, San Diego, California, United States

General information

EUT Description			
Model	FJ1000LMV		
IMEI	886326030002705		
Hardware Version	TM120MV_P1		
Software Version	LR5.1.1.0-37753		
Power Supply	External Power Supply		
Antenna Type	Internal Antenna		
Test Mode(s)	LTE Band 4; LTE Band 13;		
Test Modulation	QPSK 16QAM;		
LTE Category	M1		
Maximum E.I.R.P./ E.R.P.	LTE Band 4:	23.20dBm	
	LTE Band 13:	19.52dBm	
Rated Power Supply Voltage:	12V		
Extreme Voltage	Minimum: 10V Maximum: 30V		
Extreme Temperature	Lowest: -30°C Highest: +75°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.			

3 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 (2018)

FCC CFR47 Part 27C (2018)

ANSI C63.26 (2015)

KDB 971168 D01 Power Meas License Digital Systems v03r01

4 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 (X axis, horizontal 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	O	O
	LTE 13	-	-	O	O	-	-	O	O	O	O	O	O	O	O
Occupied Bandwidth	LTE 4	O	O	O	O	O	O	O	O	-	-	O	-	O	-
	LTE 13	-	-	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	-
	LTE 13	-	-	O	O	-	-	O	O	-	-	O	-	O	-
Frequency Stability	LTE 4	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 13	-	-	O	O	-	-	O	O	-	-	O	O	O	O
Spurious Emissions at Antenna Terminals	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
Radiates Spurious Emission	LTE 4	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.														

5 Test Case Results

5.1 RF Power Output

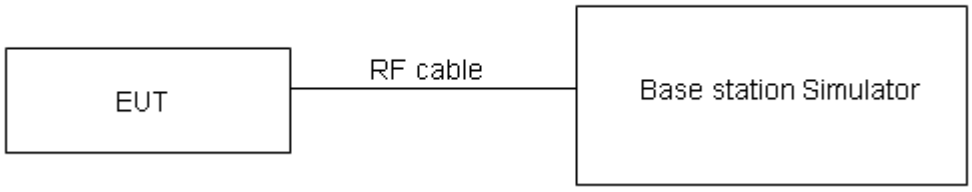
Ambient condition

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

Band4	Channel/ Frequency(MHz)	Index	RB# RB start	Conducted Power (dBm)	
				QPSK	16QAM
1.4MHz	19957 1710.7	0	1#0	22.10	20.87
		0	6#0	21.31	21.09
	20175/1732.5	0	1#0	22.48	21.42
		0	6#0	20.98	20.81
	20393/1754.3	0	1#5	22.00	21.05
		0	6#0	20.55	20.43
3MHz	19965/1711.5	0	1#0	22.74	22.04
		0	6#0	21.30	21.15
	20175/1732.5	0	1#0	22.37	21.40
		0	6#0	20.35	20.85
	20385/1753.5	1	1#5	22.02	21.05
		1	6#0	20.57	20.57
5MHz	19975/1712.5	0	1#0	22.45	22.28
		0	6#0	21.63	20.79
	20175/1732.5	0	1#0	22.18	22.05
		0	6#0	21.39	20.54
	20375/1752.5	3	1#5	21.88	21.81
		3	6#0	21.07	20.27
10MHz	20000/1715	0	1#0	22.43	22.24
		0	4#0	22.42	21.55
	20175/1732.5	0	1#0	22.24	22.08
		0	4#0	22.21	21.31
	20350/1750	7	1#5	21.84	21.79
		7	4#2	21.84	20.96
15MHz	20025/1717.5	0	1#0	22.44	22.37
		0	6#0	22.41	22.15
	20175/1732.5	0	1#0	22.23	22.12
		0	6#0	22.21	22.09
	20325/1747.5	11	1#5	21.82	21.75
		11	6#0	21.84	21.67
20MHz	20050/1720	0	1#0	22.43	22.34
		0	6#0	22.37	22.22
	20175/1732.5	0	1#0	22.28	22.09
		0	6#0	22.24	22.08
	20300/1745	15	1#5	21.82	21.80
		15	6#0	21.84	21.74

Band13	Channel/ Frequency(MHz)	Index	RB# RB start	Conducted Power (dBm)	
				QPSK	16QAM
5MHz	23205/779.5	0	1#0	22.58	22.49
		0	6#0	21.83	20.82
	23230/782	0	1#0	22.57	22.55
		0	6#0	21.81	20.79
	23255/784.5	3	1#5	22.62	22.55
		3	6#0	21.81	20.78
10MHz	23230/782	0	1#0	22.60	22.49
		0	4#0	22.58	21.75

5.2 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 D01 v03r01 Section 5.8 and ANSI C63.26 (2015).

a) Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.

b) Key the transmitter, then rotate the EUT 360° azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).

c) Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.

d) Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading.LOSS = Generator Output Power (dBm) – Analyzer reading (dBm)

e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation:ERP (dBm) = LVL (dBm) + LOSS (dB)

f) The maximum ERP is the maximum value determined in the preceding step.

g) When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g.transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and the point where power is applied to the antenna. ERP can then be calculated as follows:

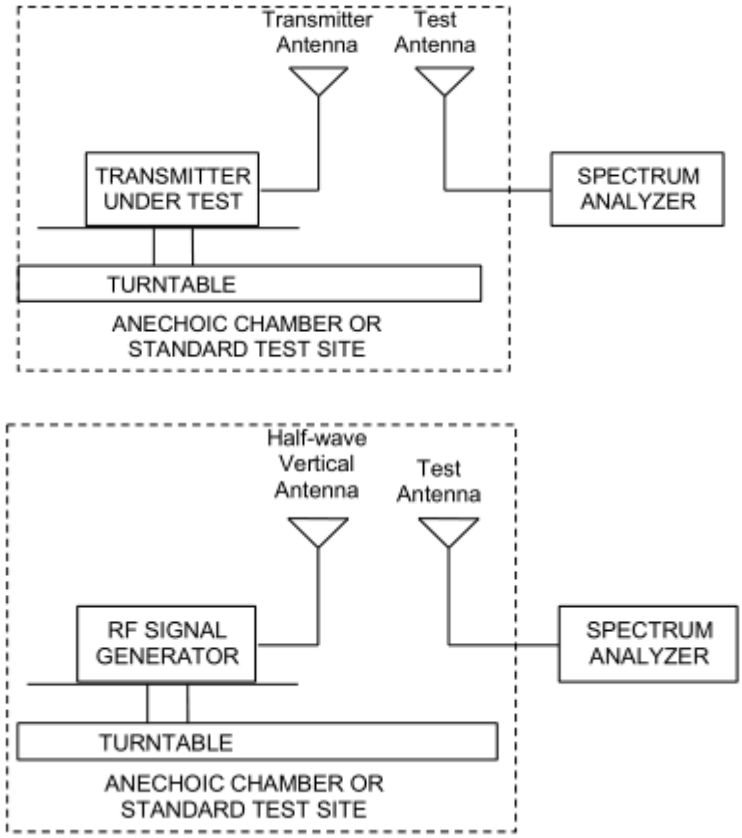
EIRP (dBm) = Output Power (dBm) - Losses (dB) + Antenna Gain (dBd)

where:dBd refers to gain relative to an ideal dipole.

EIRP (dBm) = ERP (dBm) + 2.15 (dB.)

The RB allocation refers to section 5.1, using the maximum output power configuration.

Test setup



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	≤ 3 W (34.77 dBm)
Part 27.50(d)(4)Limit	≤ 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

The measurement is performed for both of horizontal and vertical antenna Polarization, and only the data of worst mode is recorded in this report.

LTE Band 4							
Band width	Channel/ Frequency(MHz)	Polarization (H/V)	RB	Index	EIRP (dBm)	Limit (dBm)	Conclusion
1.4 MHz (QPSK)	19957 1710.7	H	1#0	0	22.88	30	Pass
	20175/1732.5	H	1#2	0	22.56	30	Pass
	20393/1754.3	H	1#5	0	22.43	30	Pass
3 MHz (QPSK)	19965/1711.5	H	1#0	0	23.02	30	Pass
	20175/1732.5	H	1#5	0	22.87	30	Pass
	20385/1753.5	H	1#5	1	22.64	30	Pass
5 MHz (QPSK)	19975/1712.5	H	1#0	0	23.12	30	Pass
	20175/1732.5	H	1#5	1	23.05	30	Pass
	20375/1752.5	H	1#5	3	22.97	30	Pass
10 MHz (QPSK)	20000/1715	H	4#0	0	23.10	30	Pass
	20175/1732.5	H	4#2	3	23.12	30	Pass
	20350/1750	H	4#2	7	22.54	30	Pass
15 MHz (QPSK)	20025/1717.5	H	1#0	0	23.20	30	Pass
	20175/1732.5	H	1#5	5	22.23	30	Pass
	20325/1747.5	H	1#5	11	21.45	30	Pass
20 MHz (QPSK)	20050/1720	H	6#0	0	22.33	30	Pass
	20175/1732.5	H	6#0	7	21.59	30	Pass
	20300/1745	H	6#0	15	20.98	30	Pass
1.4 MHz (16QAM)	19957 1710.7	H	1#0	0	22.06	30	Pass
	20175/1732.5	H	1#2	0	22.16	30	Pass
	20393/1754.3	H	1#5	0	21.68	30	Pass
3 MHz (16QAM)	19965/1711.5	H	1#0	0	22.43	30	Pass
	20175/1732.5	H	1#5	0	22.27	30	Pass
	20385/1753.5	H	1#5	1	22.14	30	Pass
5 MHz (16QAM)	19975/1712.5	H	1#0	0	22.49	30	Pass
	20175/1732.5	H	1#5	1	22.36	30	Pass
	20375/1752.5	H	1#5	3	22.27	30	Pass
10 MHz (16QAM)	20000/1715	H	4#0	0	22.65	30	Pass
	20175/1732.5	H	4#2	3	22.49	30	Pass
	20350/1750	H	4#2	7	22.03	30	Pass
15 MHz (16QAM)	20025/1717.5	H	1#0	0	22.69	30	Pass
	20175/1732.5	H	1#5	5	21.91	30	Pass
	20325/1747.5	H	1#5	11	21.13	30	Pass
20 MHz	20050/1720	H	6#0	0	21.98	30	Pass

(16QAM)	20175/1732.5	H	6#0	7	21.16	30	Pass
	20300/1745	H	6#0	15	20.54	30	Pass

LTE Band 13							
Band width	Channel/ Frequency(MHz)	Polarization (H/V)	RB	Index	ERP (dBm)	Limit (dBm)	Conclusion
5 MHz (QPSK)	23205/779.5	H	1#0	0	19.52	34.77	Pass
	23230/782	H	1#5	1	19.35	34.77	Pass
	23255/784.5	H	1#5	3	18.78	34.77	Pass
10 MHz (QPSK)	23230/782	H	4#2	3	18.95	34.77	Pass
5 MHz (16QAM)	23205/779.5	H	1#0	0	19.04	34.77	Pass
	23230/782	H	1#5	1	18.83	34.77	Pass
	23255/784.5	H	1#5	3	18.22	34.77	Pass
10 MHz (16QAM)	23230/782	H	4#2	3	18.50	34.77	Pass

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

5.3 Occupied Bandwidth

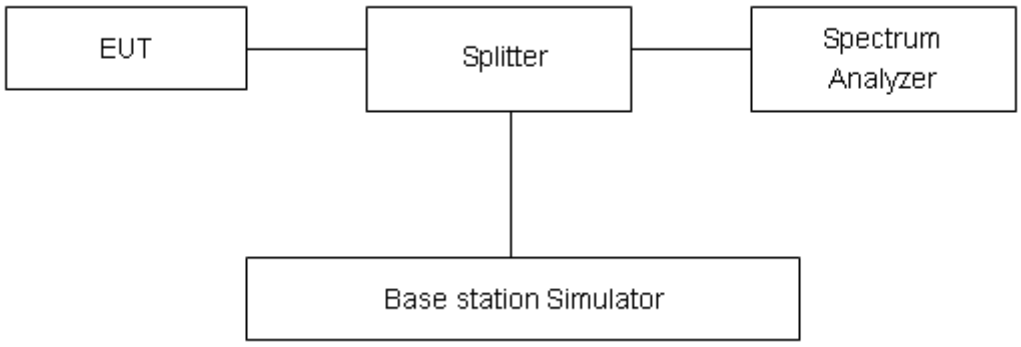
Ambient condition

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 51kHz, VBW is set to 160kHz for LTE Band 4/13
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

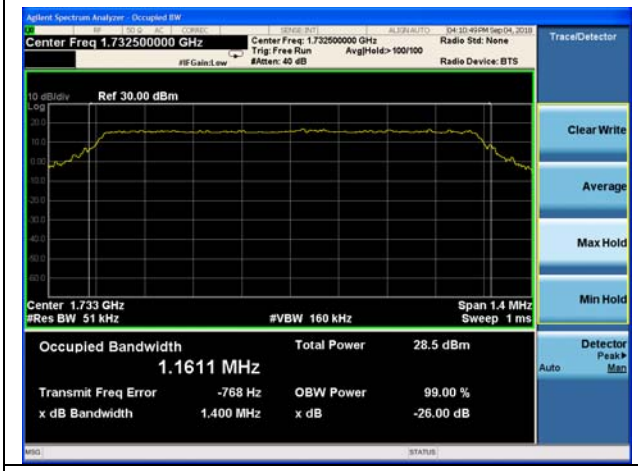
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U=624Hz.

Test Result

Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	RB	Index	Bandwidth(MHz)	
						99% Power	-26dBc
Band4	1.4MHz	QPSK	20175/1732.5	6#0	0	1.1611	1.400
		16QAM	20175/1732.5	6#0	0	1.0320	1.400
	3MHz	QPSK	20175/1732.5	6#0	0	1.1597	1.531
		16QAM	20175/1732.5	6#0	0	0.9821	1.448
	5MHz	QPSK	20175/1732.5	6#0	0	1.1658	1.527
		16QAM	20175/1732.5	6#0	0	1.0333	1.512
	10MHz	QPSK	20175/1732.5	6#0	0	1.1437	1.504
		16QAM	20175/1732.5	6#0	0	1.0434	1.503
	15MHz	QPSK	20175/1732.5	6#0	0	1.1875	1.969
		16QAM	20175/1732.5	6#0	0	1.0653	1.674
	20MHz	QPSK	20175/1732.5	6#0	0	1.1921	1.998
		16QAM	20175/1732.5	6#0	0	1.0609	1.684

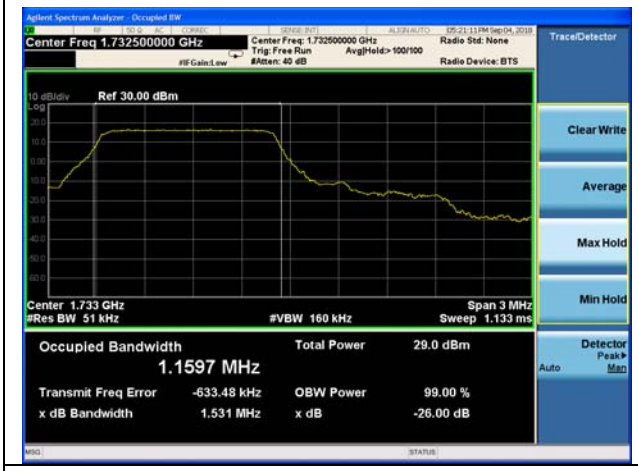
Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	RB	Index	Bandwidth(MHz)	
						99% Power	-26dBc
Band13	5MHz	QPSK	23230/782	6#0	0	1.1594	1.497
		16QAM	23230/782	6#0	0	1.0234	1.485
	10MHz	QPSK	23230/782	6#0	0	1.1582	1.498
		16QAM	23230/782	6#0	0	1.1544	1.486

LTE Band 4 QPSK 1.4MHz CH-Middle



LTE Band 4 16QAM 1.4MHz CH-Middle

LTE Band 4 QPSK 3MHz CH-Middle

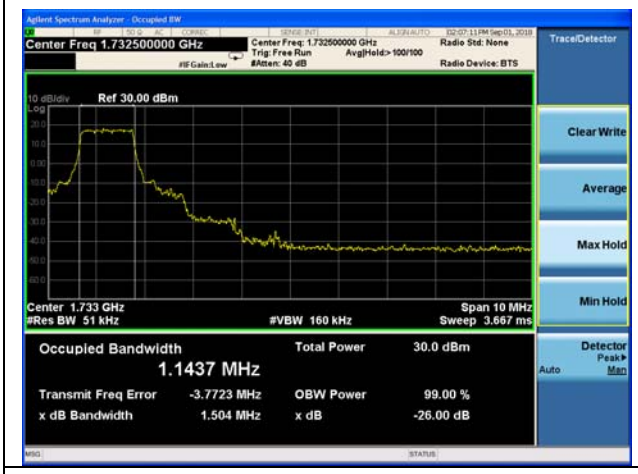


LTE Band 4 16QAM 3MHz CH-Middle

LTE Band 4 QPSK 5MHz CH-Middle

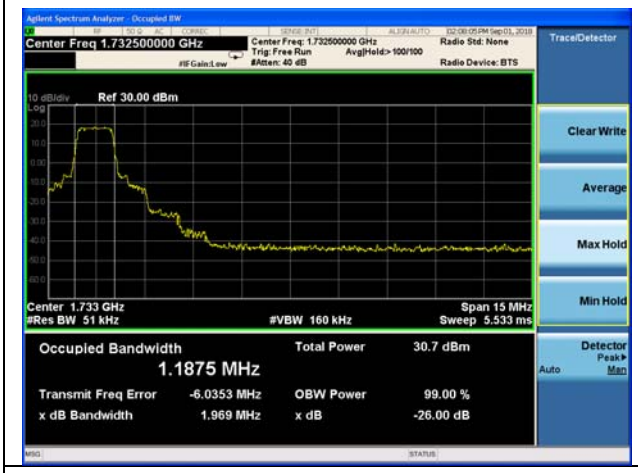
LTE Band 4 16QAM 5MHz CH-Middle

LTE Band 4 QPSK 10MHz CH-Middle



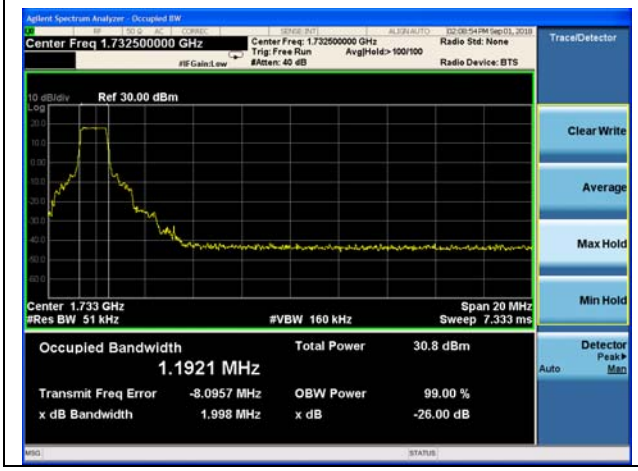
LTE Band 4 16QAM 10MHz CH-Middle

LTE Band 4 QPSK 15MHz CH-Middle



LTE Band 4 16QAM 15MHz CH-Middle

LTE Band 4 QPSK 20MHz CH-Middle



LTE Band 4 16QAM 20MHz CH-Middle

LTE Band 13 QPSK 5MHz CH-Middle

LTE Band 13 16QAM 5MHz CH-Middle

LTE Band 13 QPSK 10MHz CH-Middle

LTE Band 13 16QAM 10MHz CH-Middle

5.4 Band Edge Compliance

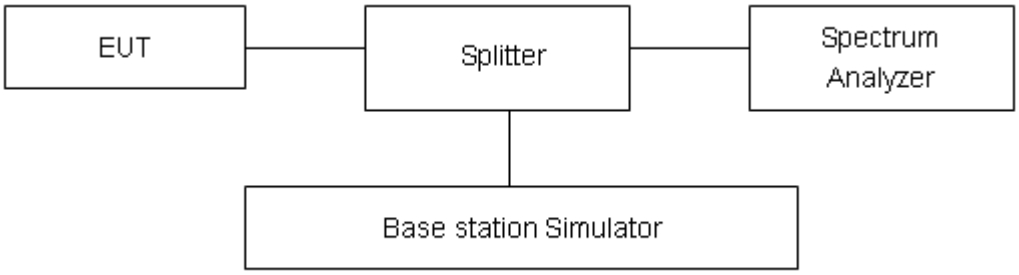
Ambient condition

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 D01 v03r01 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.
RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4.
RBW is set to 10 kHz, VBW is set to 30 kHz for LTE Band 13 (763MHz~775MHz).
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 13 (775MHz~777MHz).
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 13 (787MHz~793MHz).
RBW is set to 10 kHz, VBW is set to 30 kHz for LTE Band 13 (793MHz~805MHz).
on spectrum analyzer.
3. Set spectrum analyzer with RMS detector.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. 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"

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.

Part 27.53 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:
(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;
(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;
(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

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

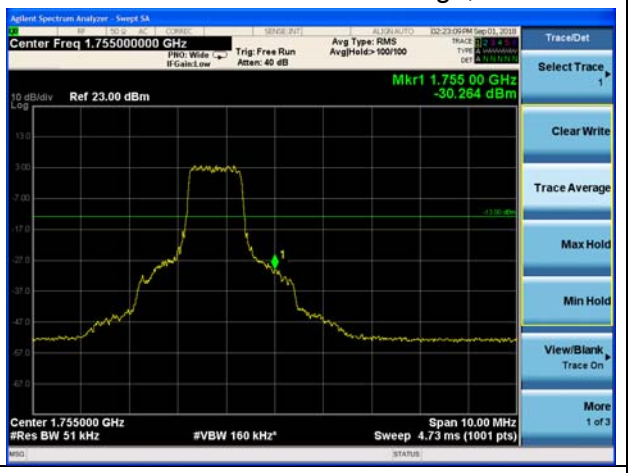
LTE Band 4 QPSK 5MHz CH-High, 100%RB

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

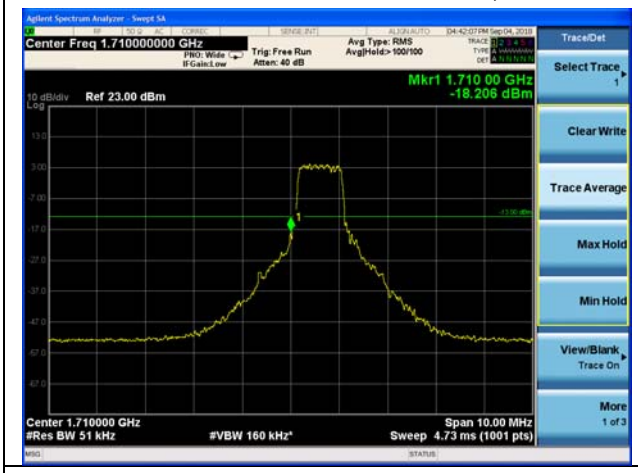
LTE Band 4 QPSK 20MHz CH-Low, 100%RB

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

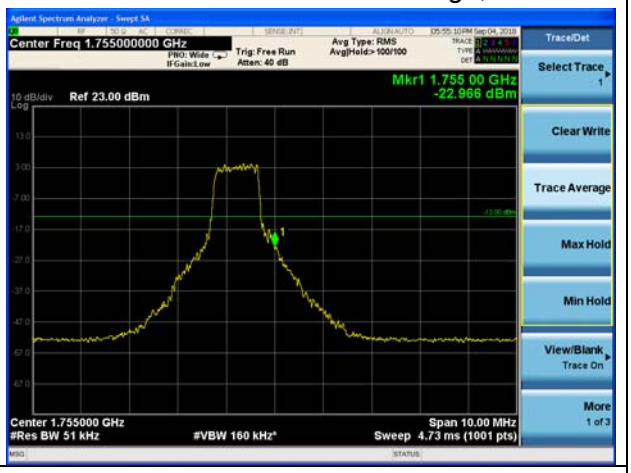
LTE Band 4 16QAM 1.4MHz CH-Low, 1 RB

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

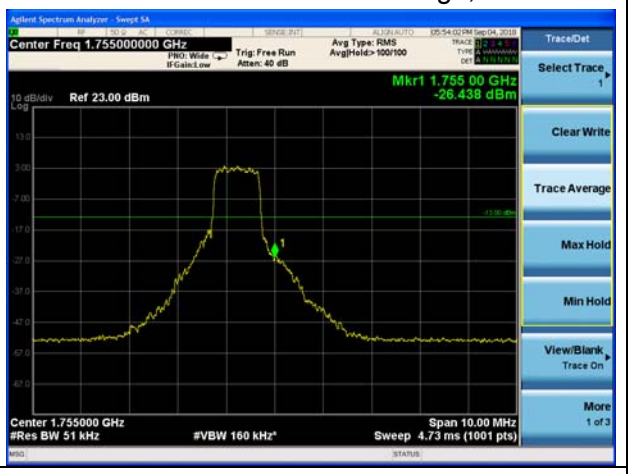


LTE Band 4 16QAM 3MHz CH-Low, 1 RB

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

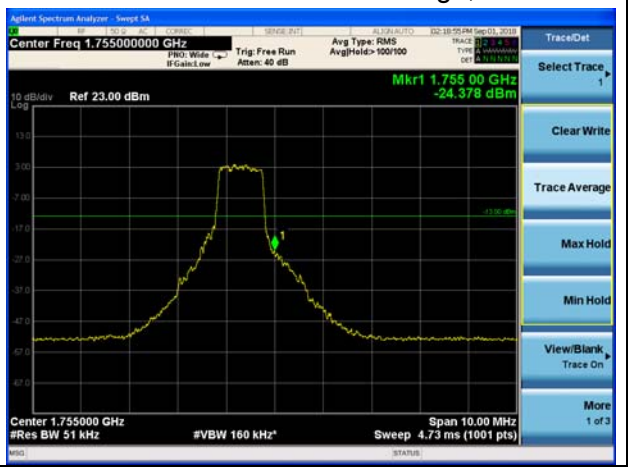


LTE Band 4 16QAM 5MHz CH-Low, 1 RB

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

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

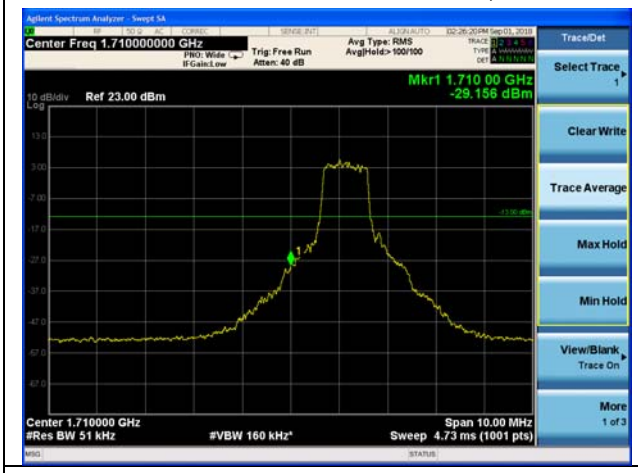
LTE Band 4 16QAM 5MHz CH-High, 100%RB



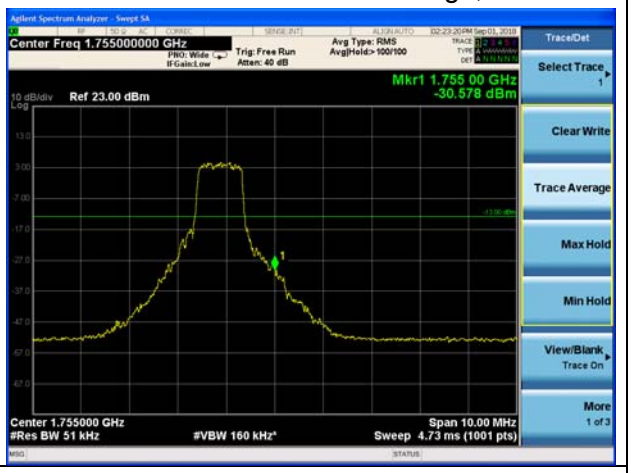
LTE Band 4 16QAM 10MHz CH-Low, 1 RB

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

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



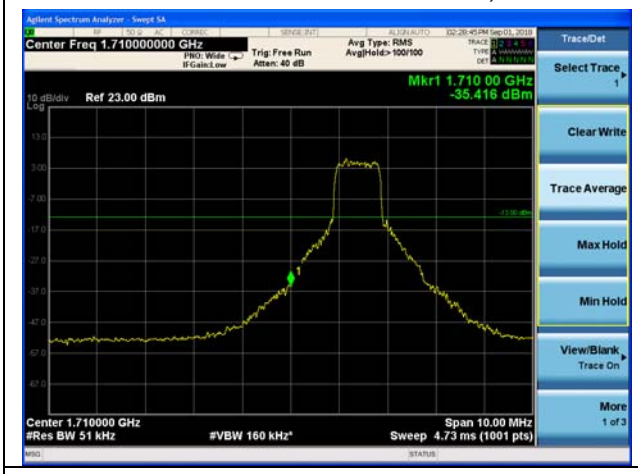
LTE Band 4 16QAM 10MHz CH-High, 100%RB



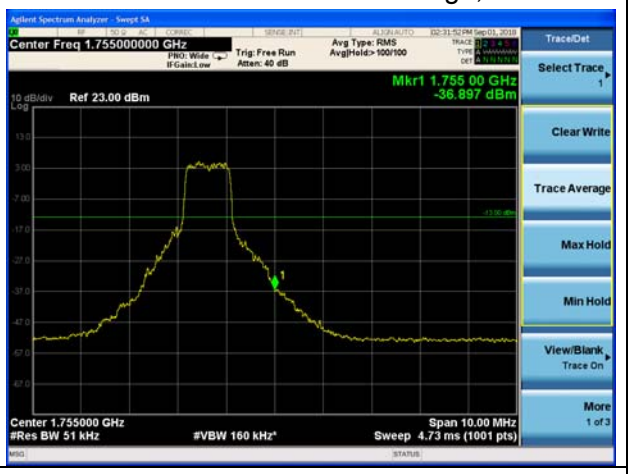
LTE Band 4 16QAM 15MHz CH-Low, 1 RB

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

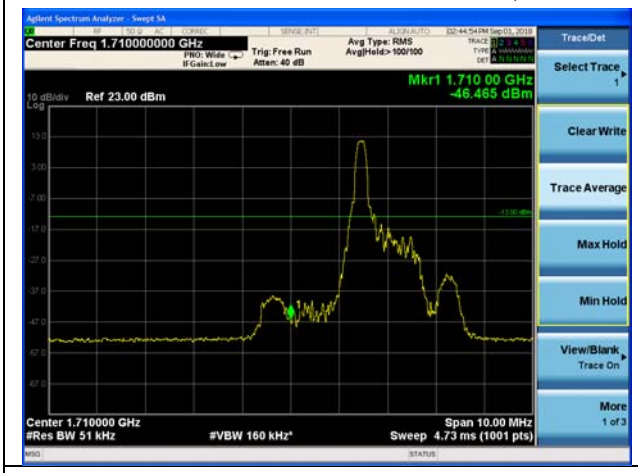
LTE Band 4 16QAM 15MHz CH-Low, 100%RB



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

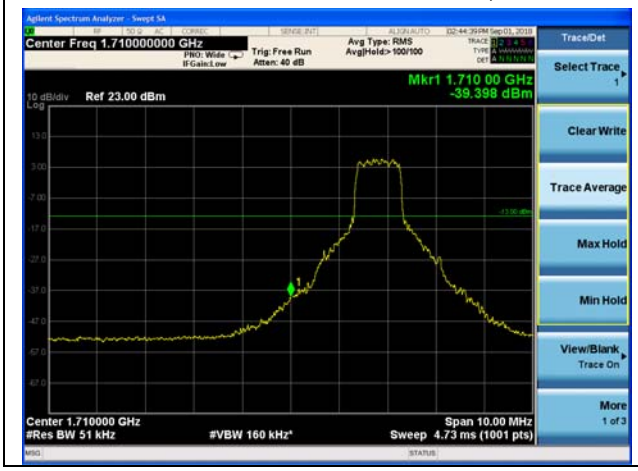


LTE Band 4 16QAM 20MHz CH-Low, 1 RB



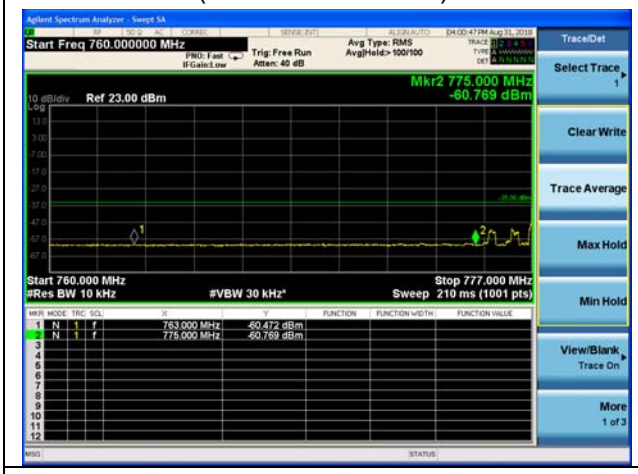
LTE Band 4 16QAM 20MHz CH-High, 1 RB

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

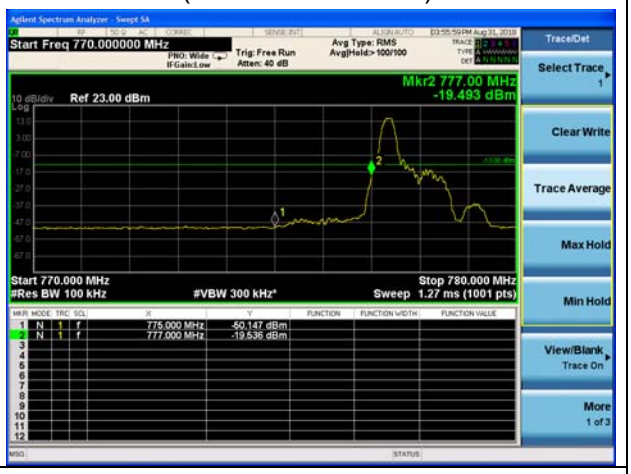


LTE Band 4 16QAM 20MHz CH-High, 100%RB

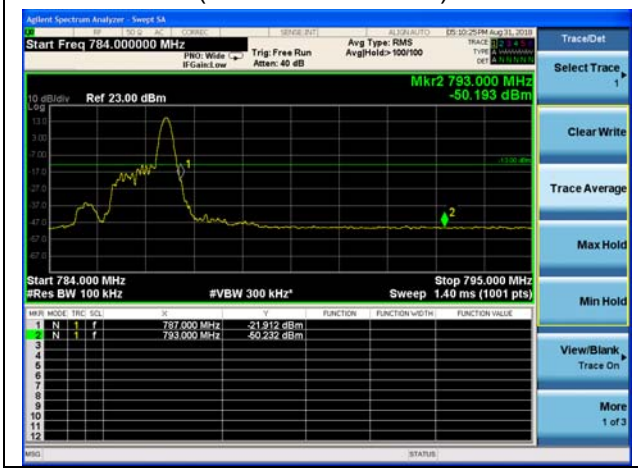
LTE Band 13 QPSK 5MHz CH-Low, 1 RB (763MHz ~775MHz)



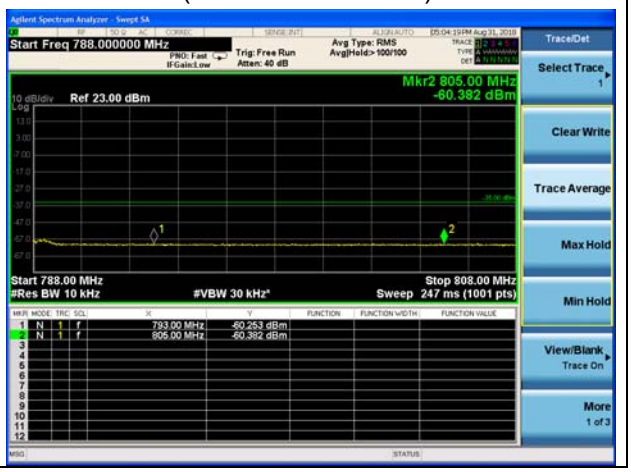
LTE Band 13 QPSK 5MHz CH-Low, 1 RB (775MHz ~777MHz)



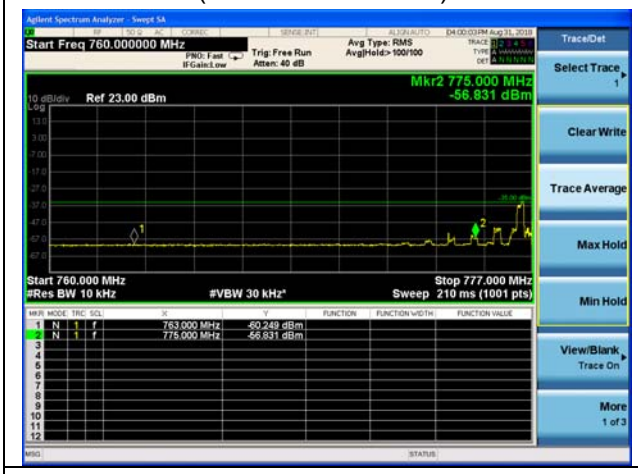
LTE Band 13 QPSK 5MHz CH-High, 1 RB (787MHz ~793MHz)



LTE Band 13 QPSK 5MHz CH-High, 1 RB (793MHz ~805MHz)

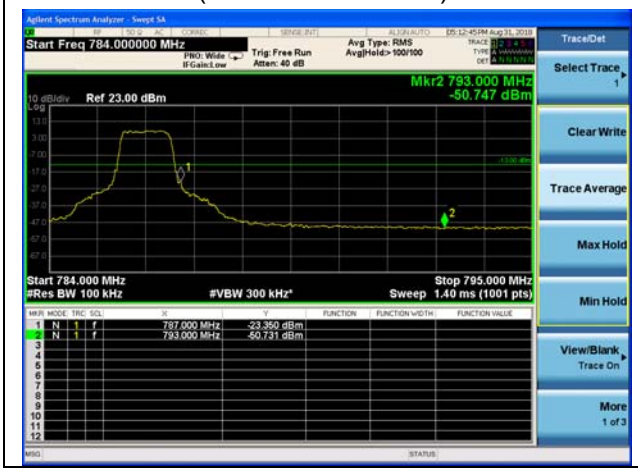


LTE Band 13 QPSK 5MHz CH-Low, 100%RB (763MHz ~775MHz)

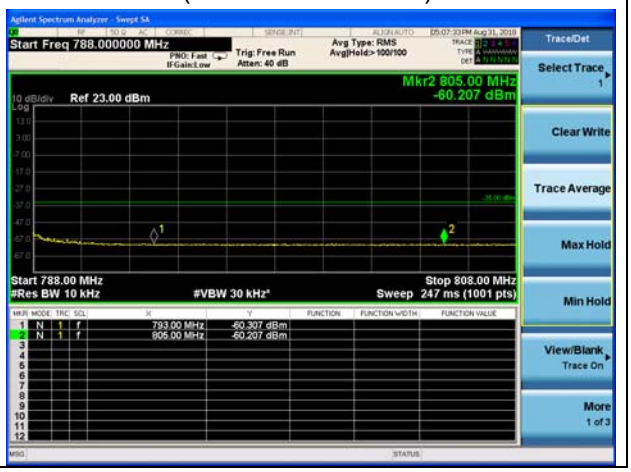


LTE Band 13 QPSK 5MHz CH-Low, 100%RB (775MHz ~777MHz)

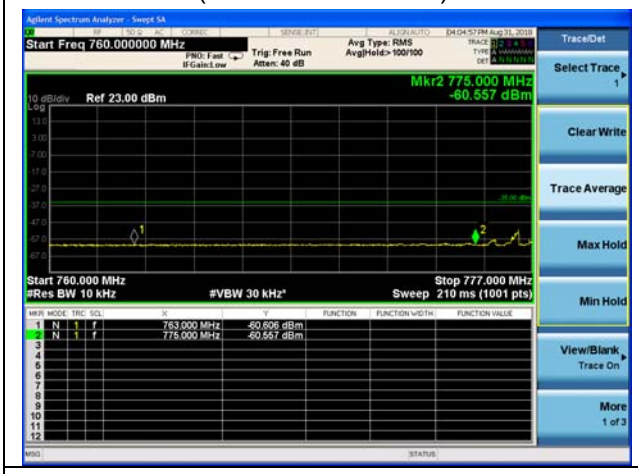
LTE Band 13 QPSK 5MHz CH-High, 100%RB (787MHz ~793MHz)



LTE Band 13 QPSK 5MHz CH-High, 100%RB (793MHz ~805MHz)

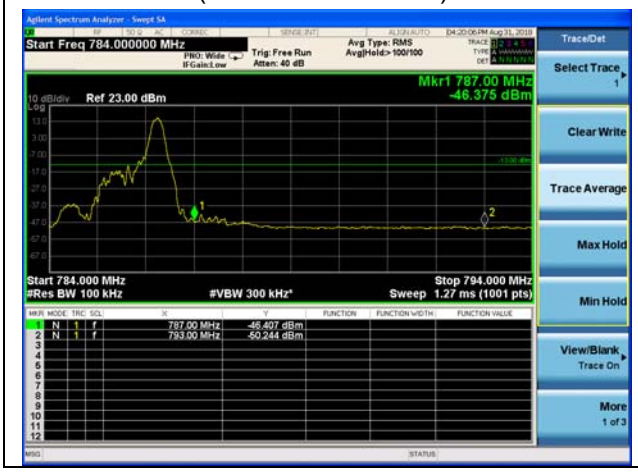


LTE Band 13 QPSK 10MHz CH-Low, 1 RB (763MHz ~775MHz)

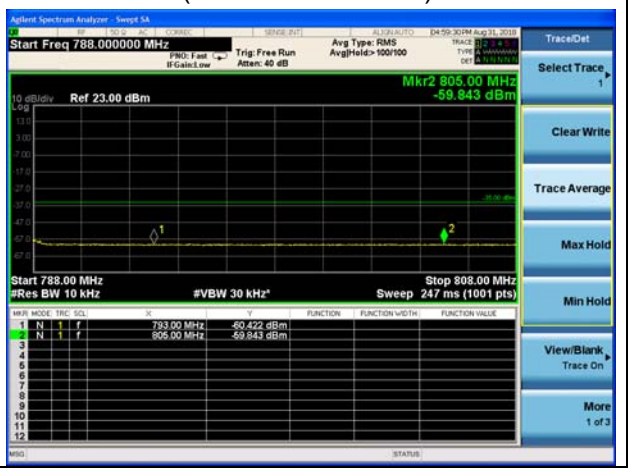


LTE Band 13 QPSK 10MHz CH-Low, 1 RB (775MHz ~777MHz)

LTE Band 13 QPSK 10MHz CH-High, 1 RB (787MHz ~793MHz)

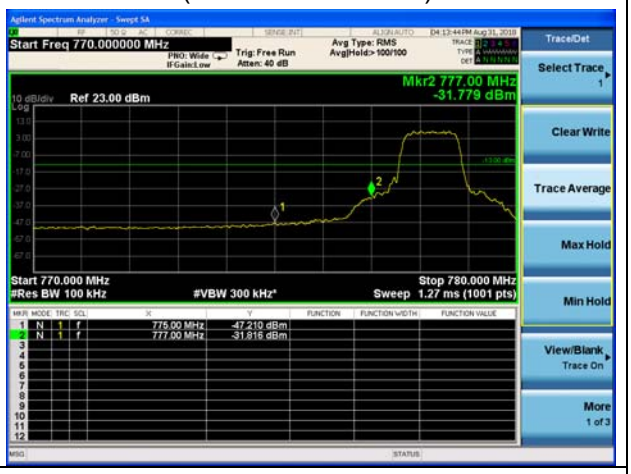


LTE Band 13 QPSK 10MHz CH-High, 1 RB (793MHz ~805MHz)

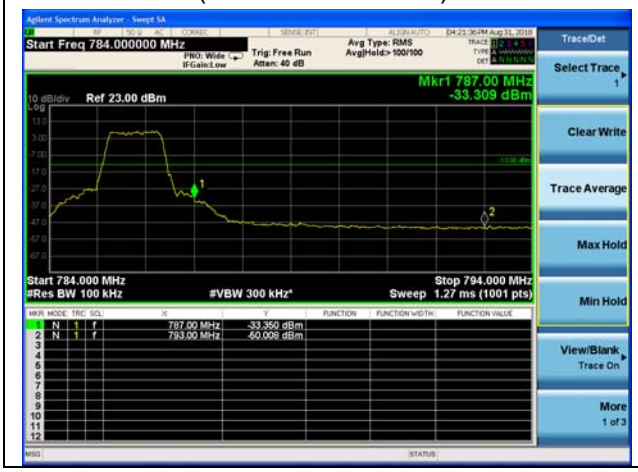


LTE Band 13 QPSK 10MHz CH-Low, 100%RB (763MHz ~775MHz)

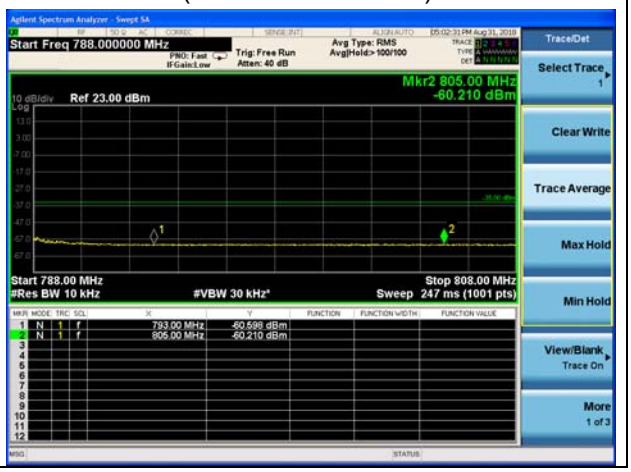
LTE Band 13 QPSK 10MHz CH-Low, 100%RB (775MHz ~777MHz)



LTE Band 13 QPSK 10MHz CH-High, 100%RB (787MHz ~793MHz)



LTE Band 13 QPSK 10MHz CH-High, 100%RB (793MHz ~805MHz)

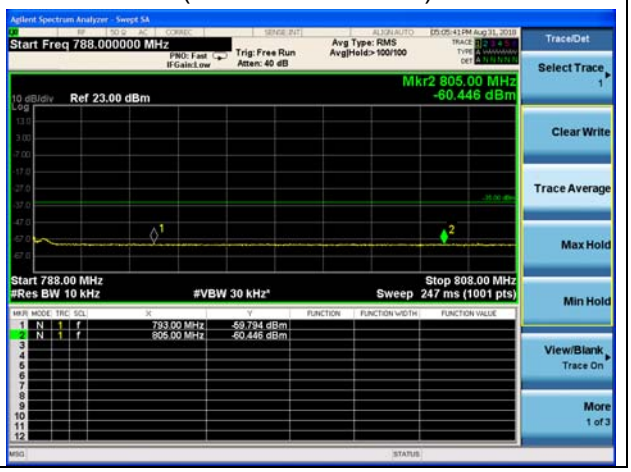


LTE Band 13 16QAM 5MHz CH-Low, 1 RB (763MHz ~775MHz)

LTE Band 13 16QAM 5MHz CH-Low, 1 RB (775MHz ~777MHz)

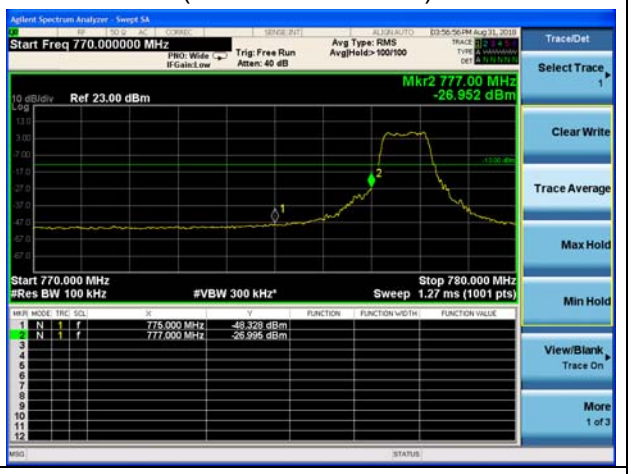
LTE Band 13 16QAM 5MHz CH-High, 1 RB (787MHz ~793MHz)

LTE Band 13 16QAM 5MHz CH-High, 1 RB (793MHz ~805MHz)

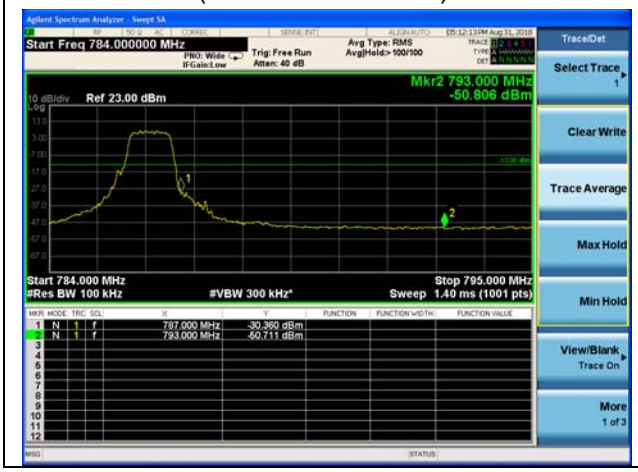


LTE Band 13 16QAM 5MHz CH-Low, 100%RB (763MHz ~775MHz)

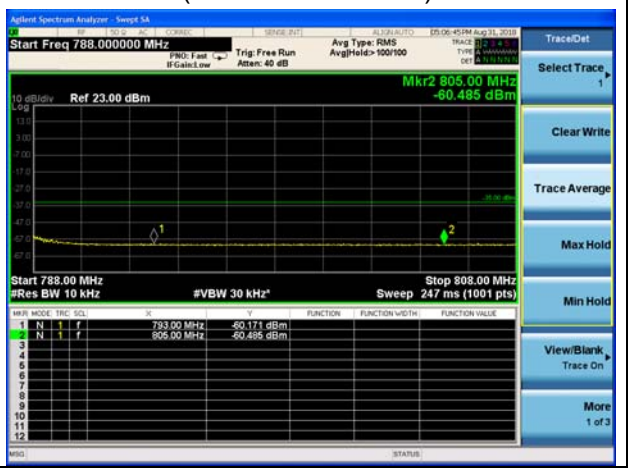
LTE Band 13 16QAM 5MHz CH-Low, 100%RB (775MHz ~777MHz)



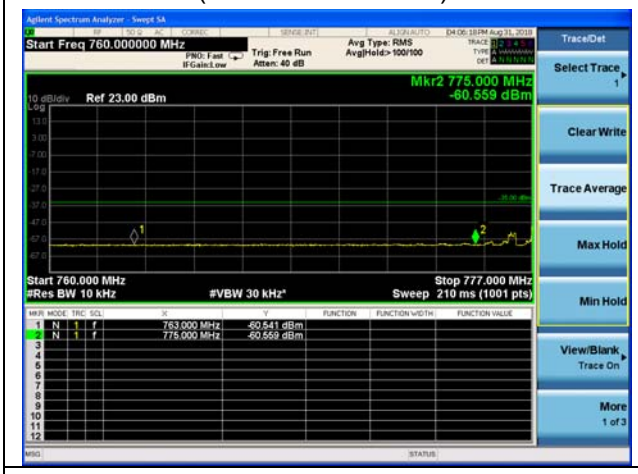
LTE Band 13 16QAM 5MHz CH-High, 100%RB (787MHz ~793MHz)



LTE Band 13 16QAM 5MHz CH-High, 100%RB (793MHz ~805MHz)



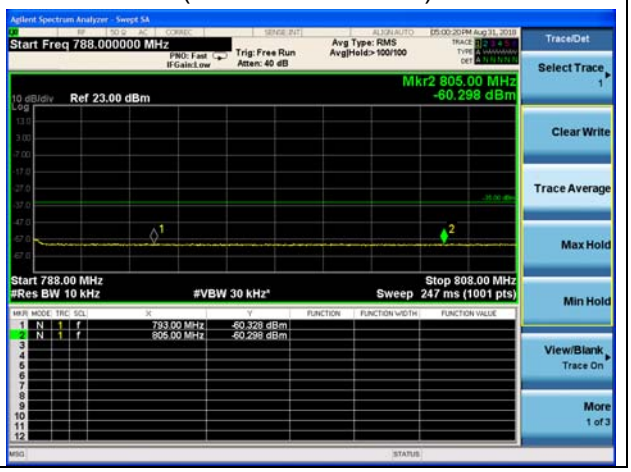
LTE Band 13 16QAM 10MHz CH-Low, 1 RB (763MHz ~775MHz)



LTE Band 13 16QAM 10MHz CH-Low, 1 RB (775MHz ~777MHz)

LTE Band 13 16QAM 10MHz CH-High, 1 RB (787MHz ~793MHz)

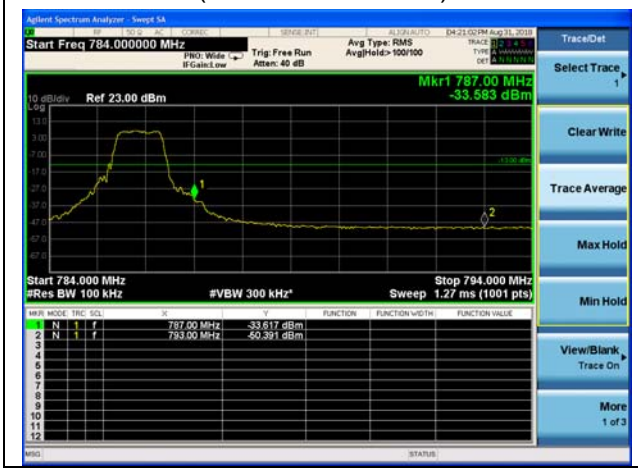
LTE Band 13 16QAM 10MHz CH-High, 1 RB (793MHz ~805MHz)



LTE Band 13 16QAM 10MHz CH-Low, 100%RB (763MHz ~775MHz)

LTE Band 13 16QAM 10MHz CH-Low, 100%RB (775MHz ~777MHz)

LTE Band 13 16QAM 10MHz CH-High, 100%RB (787MHz ~793MHz)



LTE Band 13 16QAM 10MHz CH-High, 100%RB (793MHz ~805MHz)

5.5 Peak-to-Average Power Ratio (PAPR)

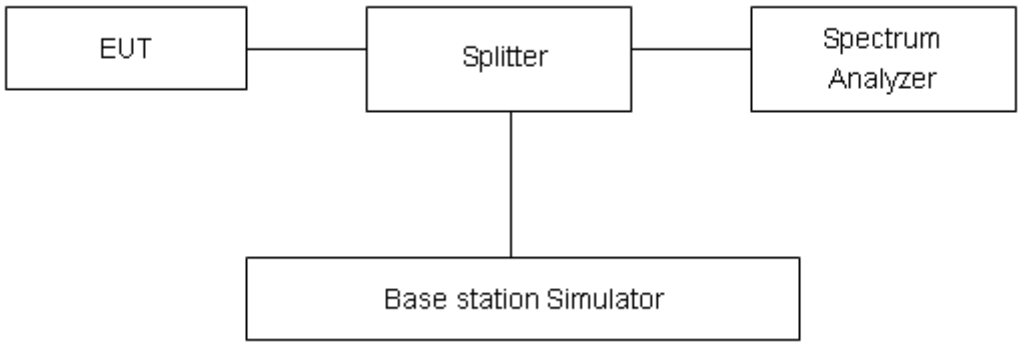
Ambient condition

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

Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	Peak-to-Average Power Ratio (PAPR)		
				Peak(dBm)	Avg(dBm)	PAPR(dB)
Band4	1.4MHz	QPSK	20175/1732.5	30.22	20.98	9.24
		16QAM	20175/1732.5	30.72	20.81	9.91
	3MHz	QPSK	20175/1732.5	30.80	20.35	10.45
		16QAM	20175/1732.5	31.79	20.85	10.94
	5MHz	QPSK	20175/1732.5	29.73	21.39	8.34
		16QAM	20175/1732.5	30.07	20.54	9.53
	10MHz	QPSK	20175/1732.5	30.56	22.21	8.35
		16QAM	20175/1732.5	29.95	21.31	8.64
	15MHz	QPSK	20175/1732.5	30.99	22.21	8.78
		16QAM	20175/1732.5	30.99	22.09	8.90
	20MHz	QPSK	20175/1732.5	29.97	22.24	7.73
		16QAM	20175/1732.5	30.54	22.08	8.46

Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	Peak-to-Average Power Ratio (PAPR)		
				Peak(dBm)	Avg(dBm)	PAPR(dB)
Band13	5MHz	QPSK	23230/782	30.99	21.81	9.18
		16QAM	23230/782	30.60	20.79	9.81
	10MHz	QPSK	23230/782	32.69	22.58	10.11
		16QAM	23230/782	31.79	21.75	10.04

5.6 Frequency Stability

Ambient condition

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

Method of Measurement

Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +75°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 +75°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

Frequency Stability (Voltage Variation)

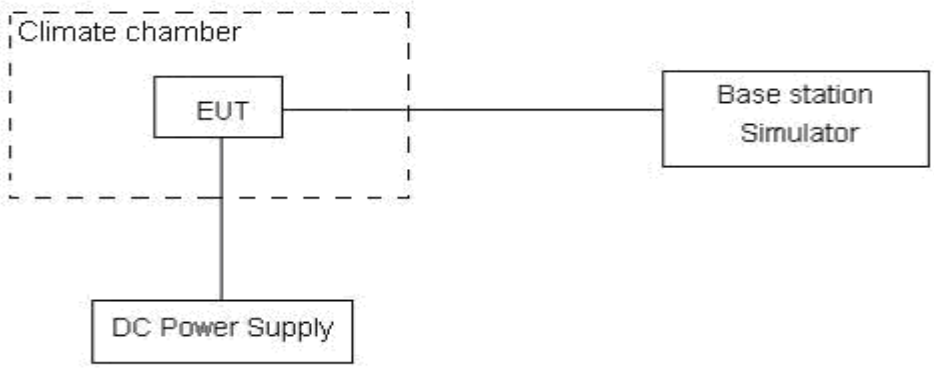
The frequency stability shall be measured with variation of primary supply voltage as follows:

(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 10V and 30V, with a nominal voltage of 12V.

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

LTE Band 4					
(QPSK, 20MHz BANDWIDTH)					
Condition		1710	1755	Delta(Hz)	Frequency Stability(ppm)
Temperature	Voltage	F low@-13dBm(MHz)	F high@-13dBm(MHz)		
Normal（25°C）	Normal	1711.2376	1753.8212	7.50	0.00433
Extreme（75°C）		1711.2371	1753.8218	8.07	0.00466
Extreme（70°C）		1711.2375	1753.8213	7.44	0.00429
Extreme（60°C）		1711.2371	1753.8217	7.09	0.00409
Extreme（50°C）		1711.2456	1753.8132	10.17	0.00587
Extreme（40°C）		1711.2412	1753.8178	10.36	0.00598
Extreme（30°C）		1711.2417	1753.8171	11.57	0.00668
Extreme（20°C）		1711.2423	1753.8168	8.33	0.00481
Extreme（10C）		1711.2385	1753.8203	11.09	0.00640
Extreme（0°C）		1711.2444	1753.8144	10.06	0.00581
Extreme（-10°C）		1711.2381	1753.8207	10.91	0.00630
Extreme（-20°C）		1711.2422	1753.8166	13.11	0.00757
Extreme（-30°C）		1711.2368	1753.8227	13.36	0.00771
25°C	LV	1711.2425	1753.8168	9.98	0.00576
	HV	1711.2369	1753.8219	8.03	0.00463
(16QAM, 20MHz BANDWIDTH)					
Condition		1710	1755	Delta(Hz)	Frequency Stability(ppm)
Temperature	Voltage	F low@-13dBm(MHz)	F high@-13dBm(MHz)		
Normal（25°C）	Normal	1711.2331	1753.8258	20.10	0.01160
Extreme（75°C）		1711.2337	1753.8252	19.01	0.01097
Extreme（70°C）		1711.2332	1753.8257	20.50	0.01183
Extreme（60°C）		1711.2335	1753.8253	19.48	0.01124
Extreme（50°C）		1711.2254	1753.8338	19.15	0.01105
Extreme（40°C）		1711.2296	1753.8292	20.10	0.01160
Extreme（30°C）		1711.2289	1753.8299	20.67	0.01193
Extreme（20°C）		1711.2286	1753.8302	20.63	0.01191
Extreme（10C）		1711.2321	1753.8267	24.11	0.01392
Extreme（0°C）		1711.2262	1753.8326	19.97	0.01153
Extreme（-10°C）		1711.2325	1753.8263	19.83	0.01145
Extreme（-20°C）		1711.2284	1753.8304	18.07	0.01043
Extreme（-30°C）		1711.2338	1753.8252	22.53	0.01300
25°C	LV	1711.2286	1753.8302	18.10	0.01045
	HV	1711.2337	1753.8251	18.00	0.01039

LTE Band 13					
(QPSK, 20MHz BANDWIDTH)					
Condition		777	787	Delta (Hz)	Frequency Stability(ppm)
Temperature	Voltage	F low@-13dBm(MHz)	F high@-13dBm(MHz)		
Normal（25°C）	Normal	777.5622	786.5358	3.36	0.00430
Extreme（75°C）		777.5696	786.5432	1.12	0.00143
Extreme（70°C）		777.5670	786.5406	2.89	0.00370
Extreme（60°C）		777.5617	786.5353	2.95	0.00377
Extreme（50°C）		777.5702	786.5438	1.89	0.00242
Extreme（40°C）		777.5656	786.5392	3.12	0.00399
Extreme（30°C）		777.5663	786.5399	3.97	0.00508
Extreme（20°C）		777.5666	786.5402	2.27	0.00290
Extreme（10C）		777.5631	786.5367	2.28	0.00292
Extreme（0°C）		777.5690	786.5426	2.68	0.00343
Extreme（-10°C）		777.5627	786.5363	3.16	0.00404
Extreme（-20°C）		777.5668	786.5404	3.06	0.00391
Extreme（-30°C）		777.5614	786.5352	1.23	0.00157
25°C	LV	777.5666	786.5402	1.20	0.00153
	HV	777.5615	786.5351	3.17	0.00405
(16QAM,20MHz BANDWIDTH)					
Condition		777	787	Delta (Hz)	Frequency Stability(ppm)
Temperature	Voltage	F low@-13dBm(MHz)	F high@-13dBm(MHz)		
Normal（25°C）	Normal	777.558	786.5303	3.26	0.00417
Extreme（75°C）		777.5506	786.5229	2.23	0.00285
Extreme（70°C）		777.5532	786.5255	2.85	0.00364
Extreme（60°C）		777.5585	786.5308	1.82	0.00233
Extreme（50°C）		777.55	786.5223	6.64	0.00849
Extreme（40°C）		777.5546	786.5269	3.15	0.00403
Extreme（30°C）		777.5539	786.5262	4.11	0.00526
Extreme（20°C）		777.5536	786.5259	3.22	0.00412
Extreme（10C）		777.5571	786.5294	2.49	0.00318
Extreme（0°C）		777.5512	786.5235	2.16	0.00276
Extreme（-10°C）		777.5575	786.5298	3.40	0.00435
Extreme（-20°C）		777.5534	786.5257	3.21	0.00410
Extreme（-30°C）		777.5588	786.5311	2.96	0.00379
25°C	LV	777.5536	786.5259	3.15	0.00403
	HV	777.5587	786.5314	3.49	0.00446

5.7 Spurious Emissions at Antenna Terminals

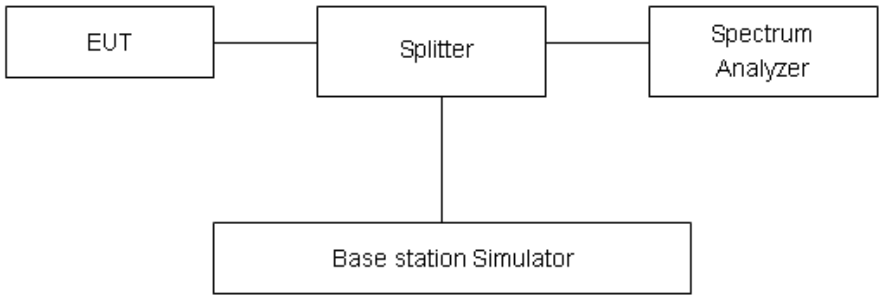
Ambient condition

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 9kHz to the 10th harmonic of the carrier. The peak detector is used.
RBW is set to 100kHz, VBW is set to 300kHz for 30MHz~1GHz
RBW is set to 1MHz, VBW is set to 3MHz for above 1GHz, Sweep is set to ATUO.
Of those disturbances below (limit – 20 dB), the mark is not required for the EUT.
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

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.

Part 27.53 (h) Limit		-13 dBm
Part 27.53(f) Limit	Limit out of the band 1559-1610 MHz	-13 dBm
	Limit in the band 1559-1610 MHz	-40 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.

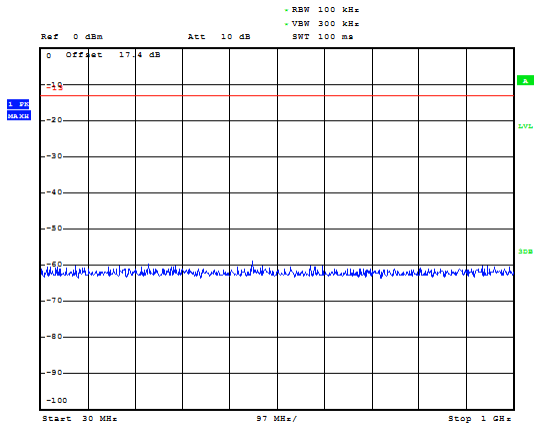
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-18GHz	1.407 dB

Test Result

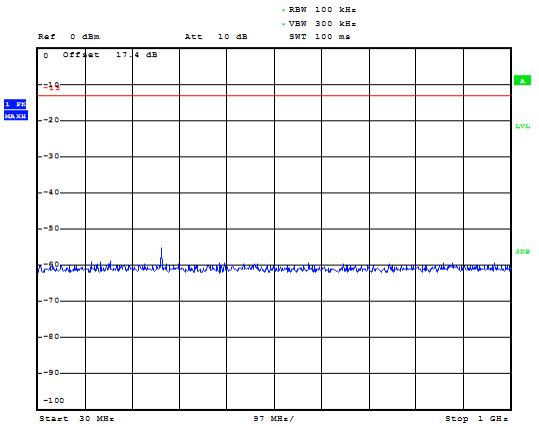
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

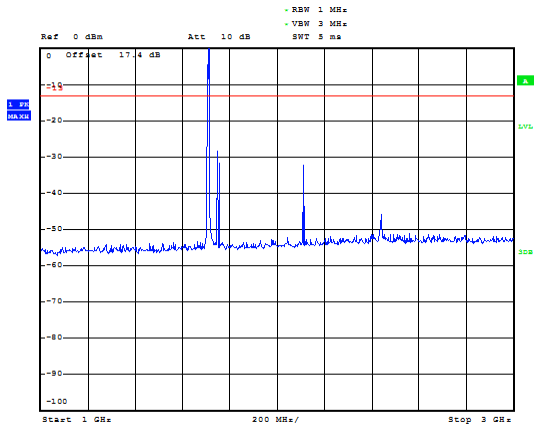
LTE Band 4 1.4MHz CH-Low 30MHz~1GHz



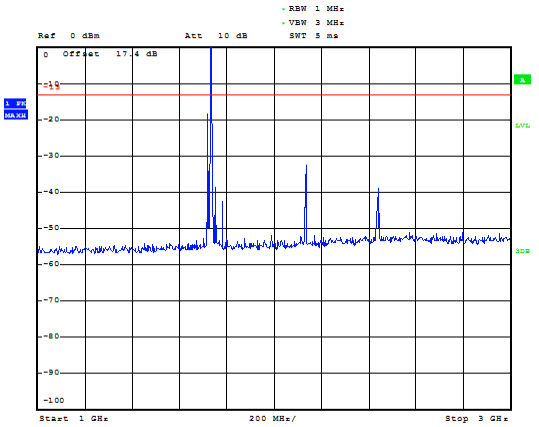
LTE Band 4 1.4MHz CH-Middle 30MHz~1GHz



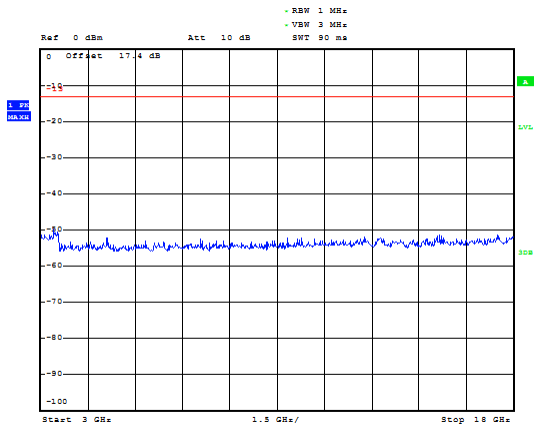
LTE Band 4 1.4MHz CH-Low 1GHz~3GHz



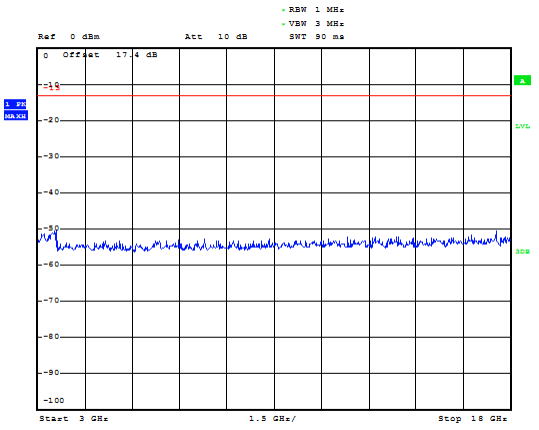
LTE Band 4 1.4MHz CH-Middle 1GHz~3GHz



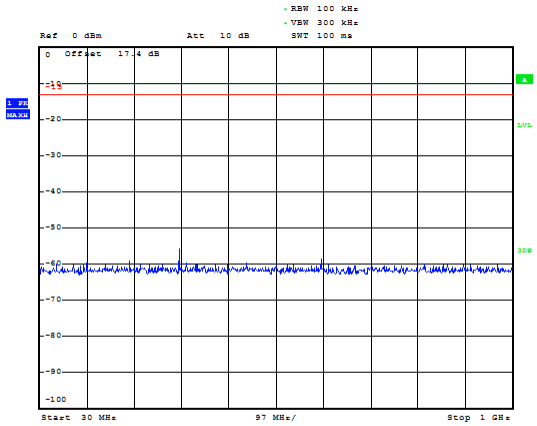
LTE Band 4 1.4MHz CH-Low 3GHz~18GHz



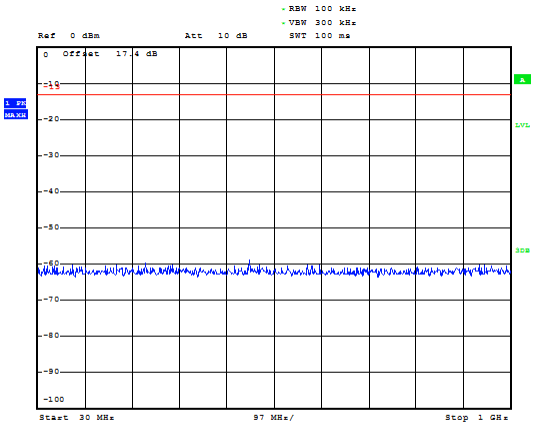
LTE Band 4 1.4MHz CH-Middle 3GHz~18GHz



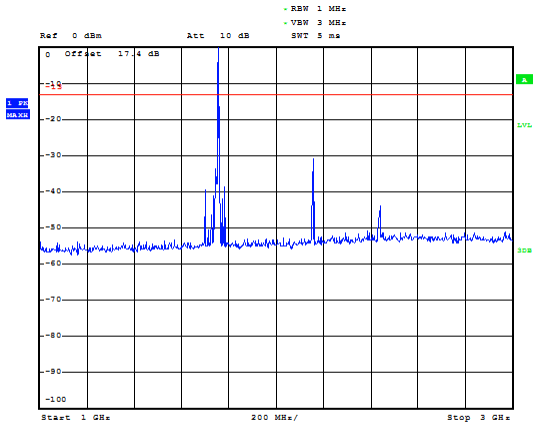
LTE Band 4 1.4MHz CH-High 30MHz~1GHz



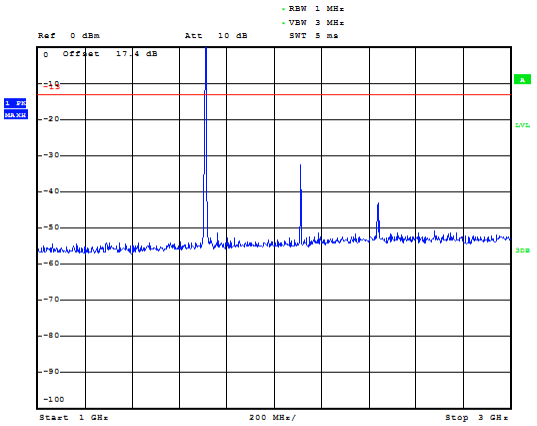
LTE Band 4 3MHz CH-Low 30MHz~1GHz



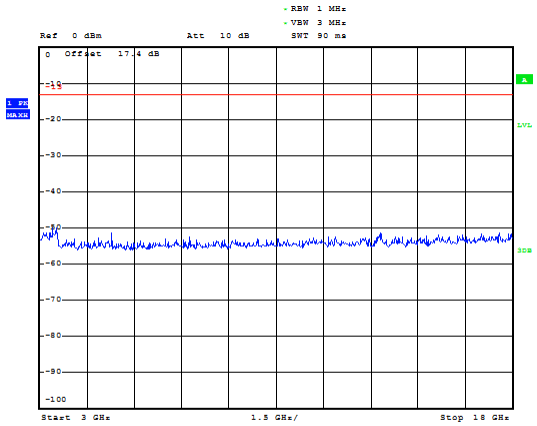
LTE Band 4 1.4MHz CH-High 1GHz~3GHz



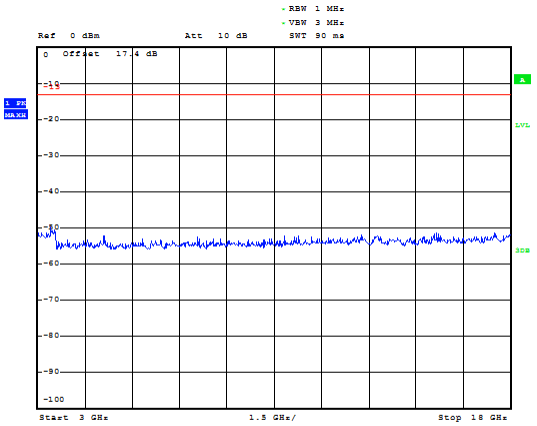
LTE Band 4 3MHz CH-Low 1GHz~3GHz



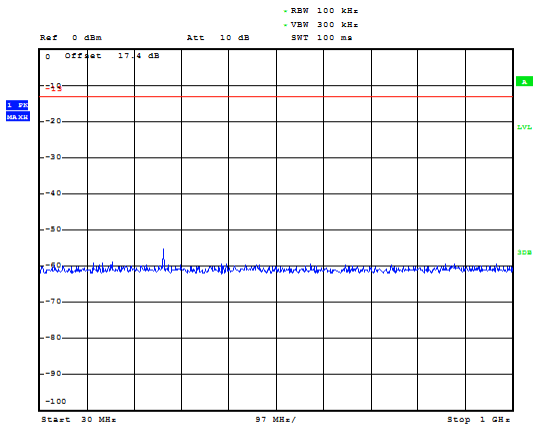
LTE Band 4 1.4MHz CH-High 3GHz~18GHz



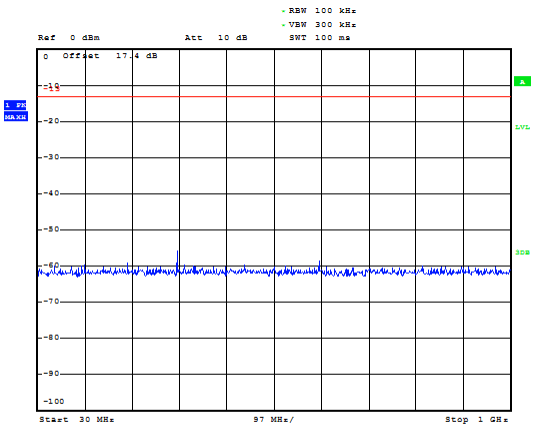
LTE Band 4 3MHz CH-Low 3GHz~18GHz



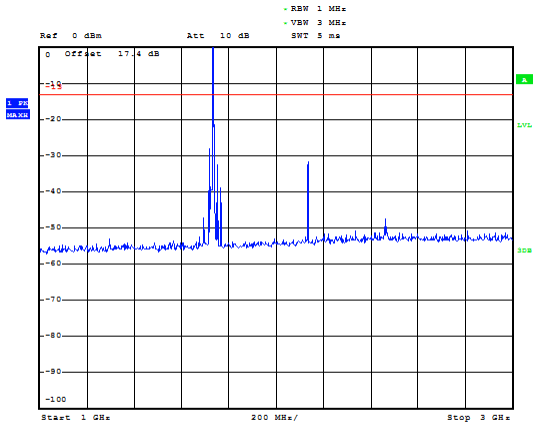
LTE Band 4 3MHz CH-Middle 30MHz~1GHz



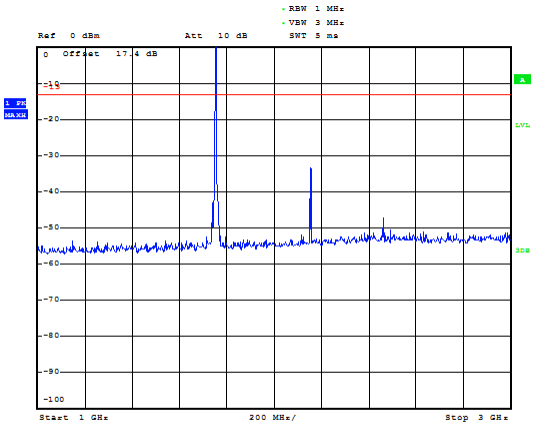
LTE Band 4 3MHz CH-High 30MHz~1GHz



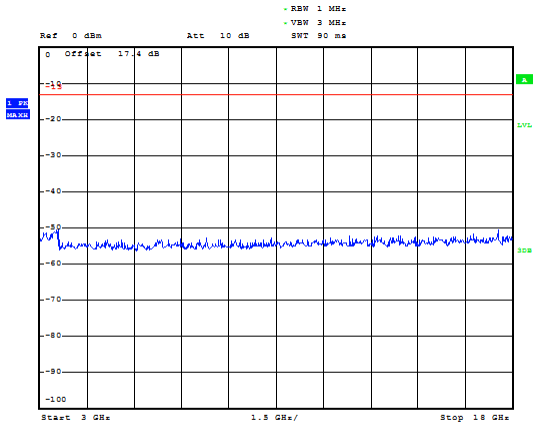
LTE Band 4 3MHz CH-Middle 1GHz~3GHz



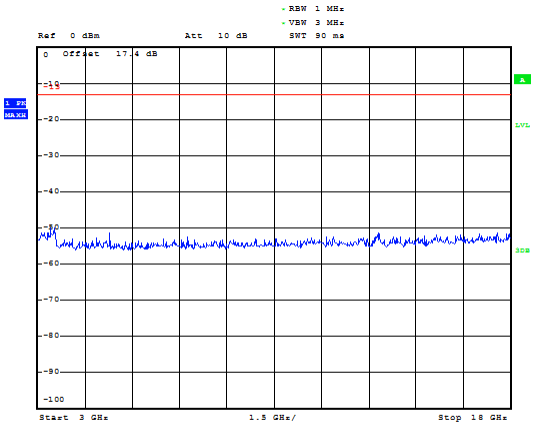
LTE Band 4 3MHz CH-High 1GHz~3GHz



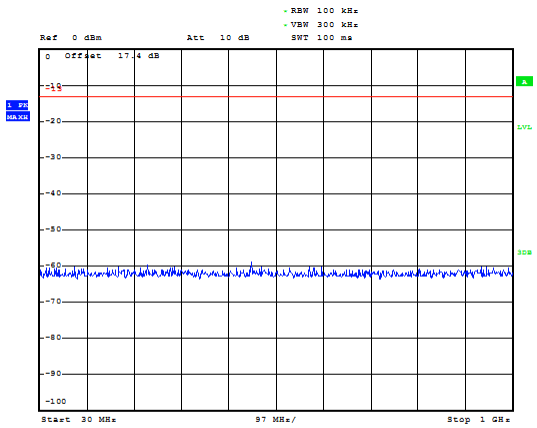
LTE Band 4 3MHz CH-Middle 3GHz~18GHz



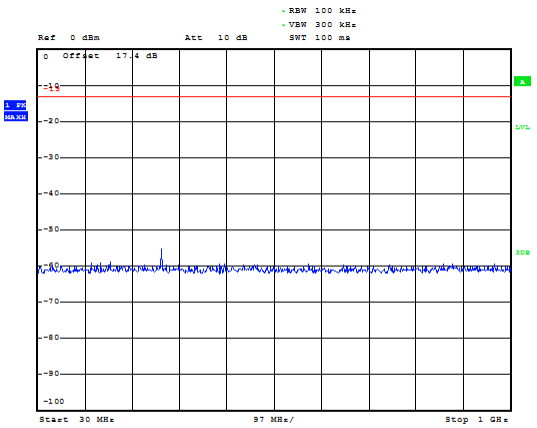
LTE Band 4 3MHz CH-High 3GHz~18GHz



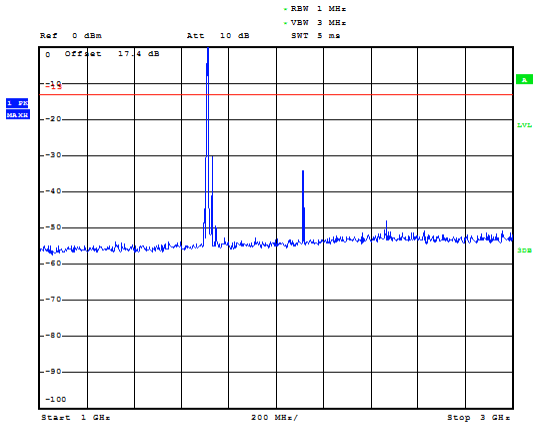
LTE Band 4 5MHz CH-Low 30MHz~1GHz



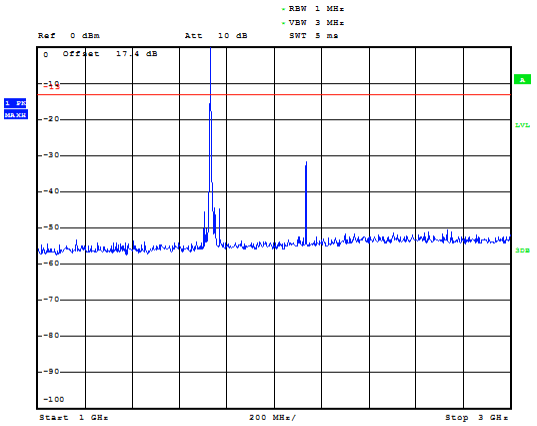
LTE Band 4 5MHz CH-Middle 30MHz~1GHz



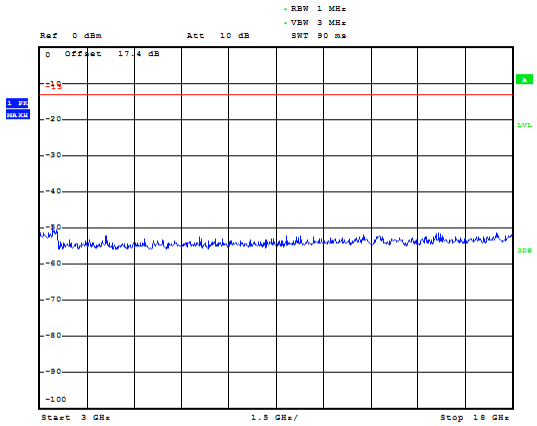
LTE Band 4 5MHz CH-Low 1GHz~3GHz



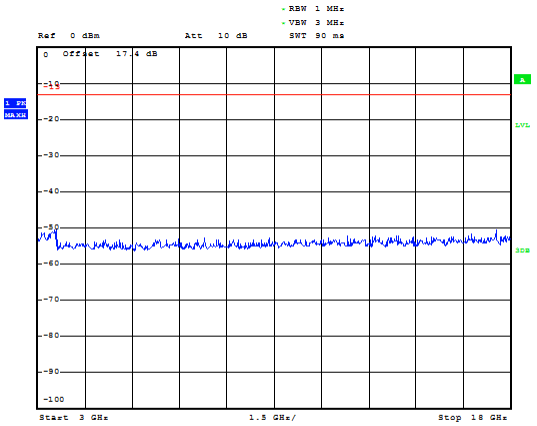
LTE Band 4 5MHz CH-Middle 1GHz~3GHz



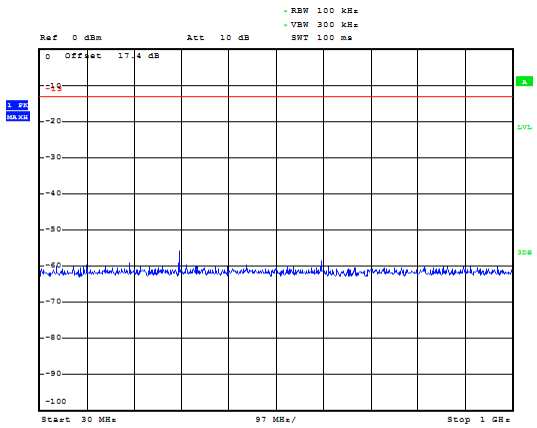
LTE Band 4 5MHz CH-Low 3GHz~18GHz



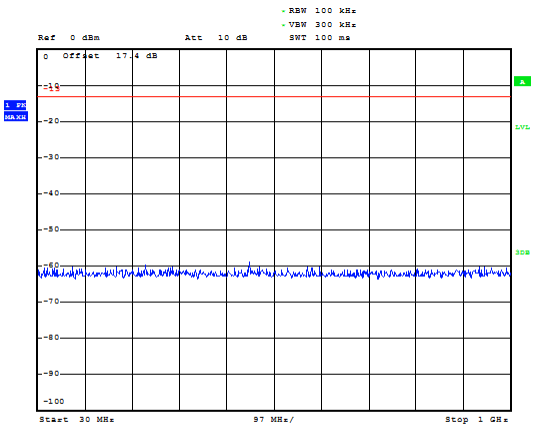
LTE Band 4 5MHz CH-Middle 3GHz~18GHz



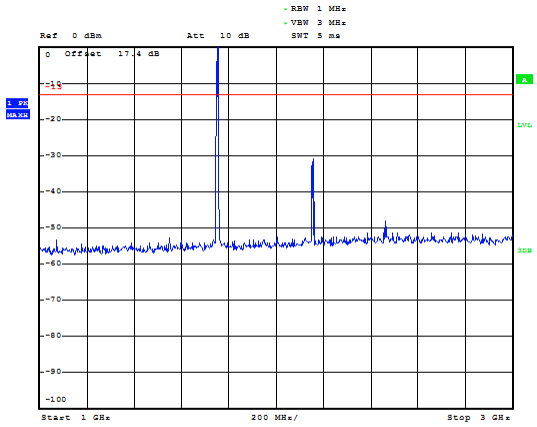
LTE Band 4 5MHz CH-High 30MHz~1GHz



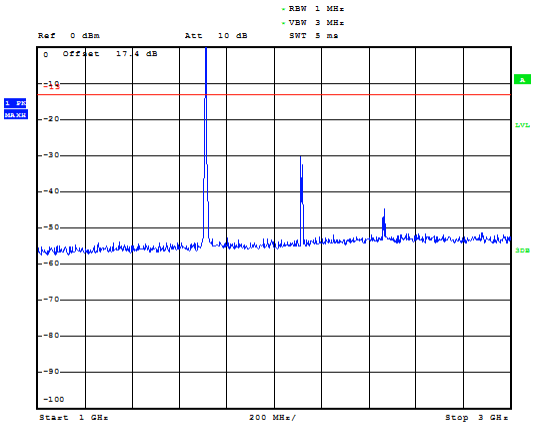
LTE Band 4 10MHz CH-Low 30MHz~1GHz



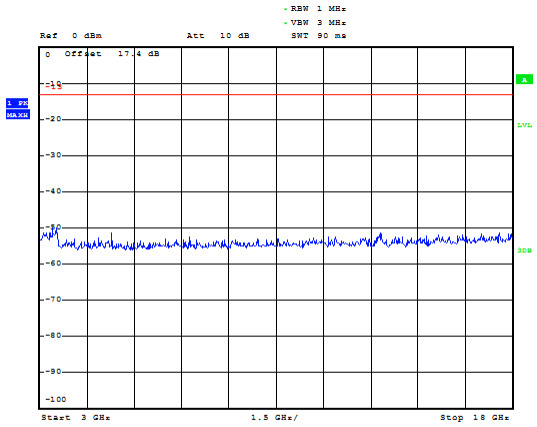
LTE Band 4 5MHz CH-High 1GHz~3GHz



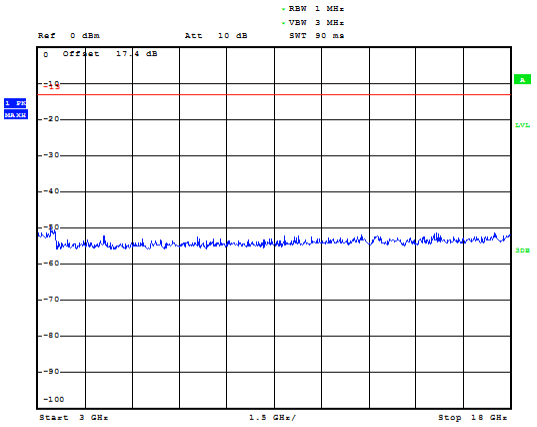
LTE Band 4 10MHz CH-Low 1GHz~3GHz



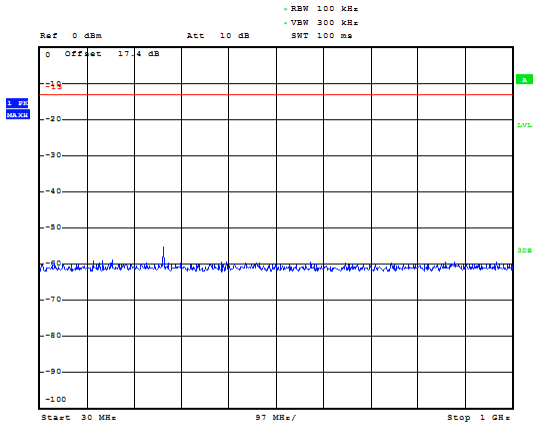
LTE Band 4 5MHz CH-High 3GHz~18GHz



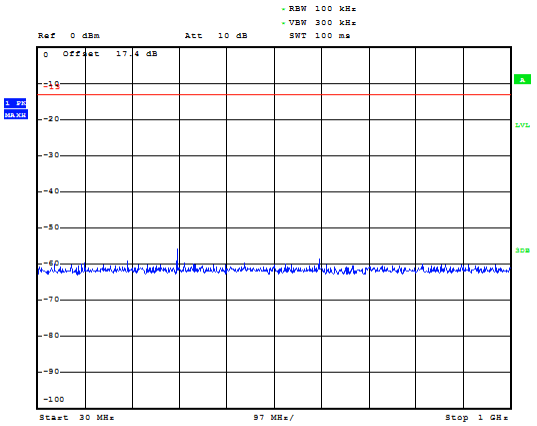
LTE Band 4 10MHz CH-Low 3GHz~18GHz



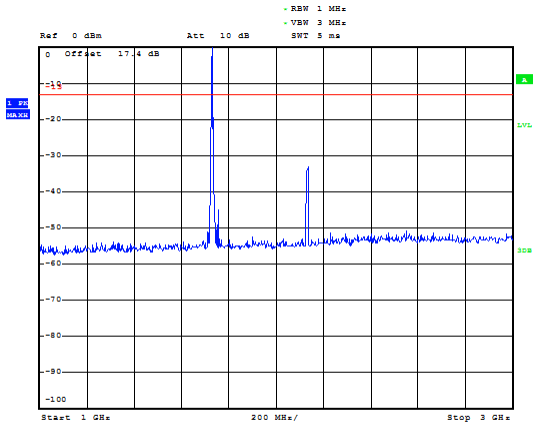
LTE Band 4 10MHz CH-Middle 30MHz~1GHz



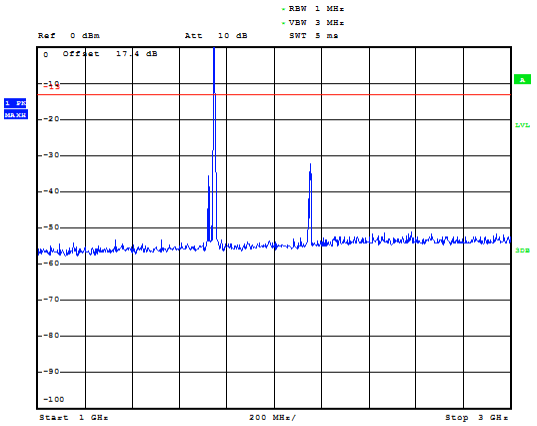
LTE Band 4 10MHz CH-High 30MHz~1GHz



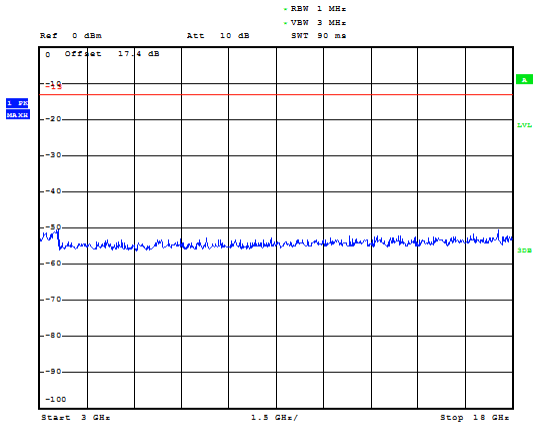
LTE Band 4 10MHz CH-Middle 1GHz~3GHz



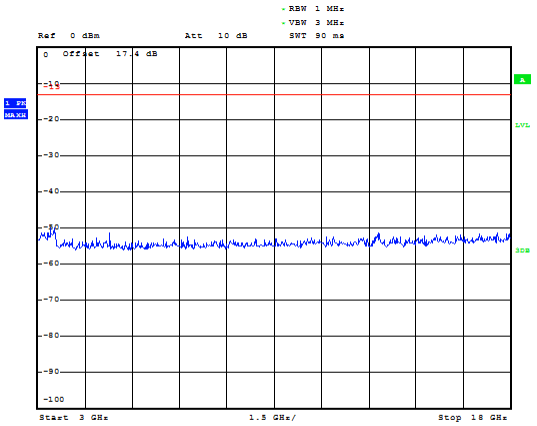
LTE Band 4 10MHz CH-High 1GHz~3GHz



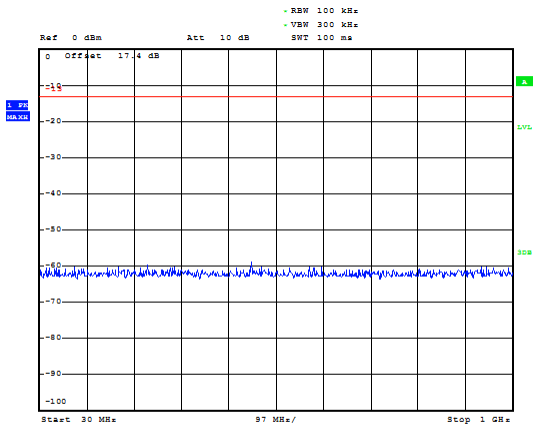
LTE Band 4 10MHz CH-Middle 3GHz~18GHz



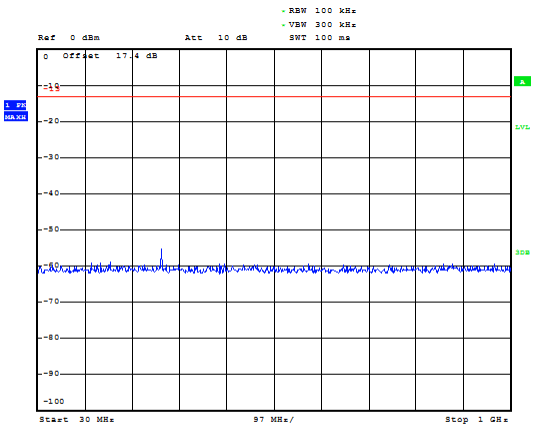
LTE Band 4 10MHz CH-High 3GHz~18GHz



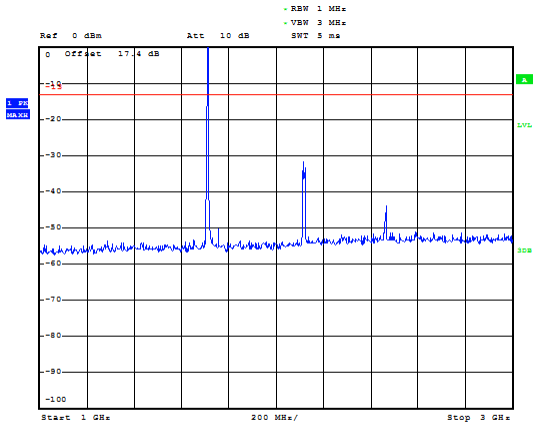
LTE Band 4 15MHz CH-Low 30MHz~1GHz



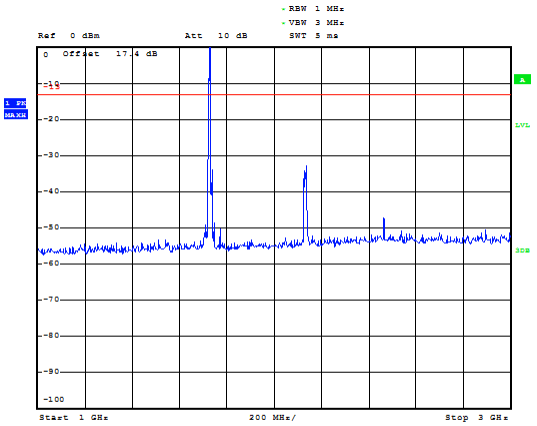
LTE Band 4 15MHz CH-Middle 30MHz~1GHz



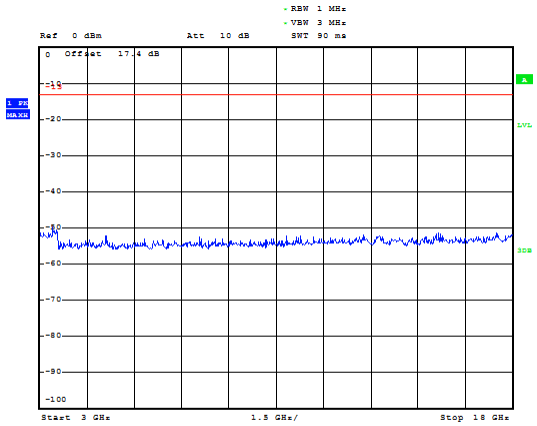
LTE Band 4 15MHz CH-Low 1GHz~3GHz



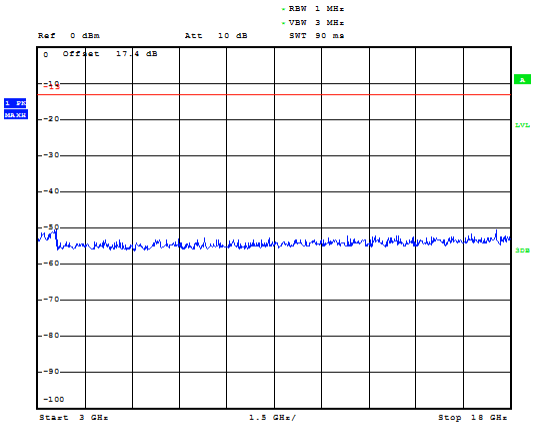
LTE Band 4 15MHz CH-Middle 1GHz~3GHz



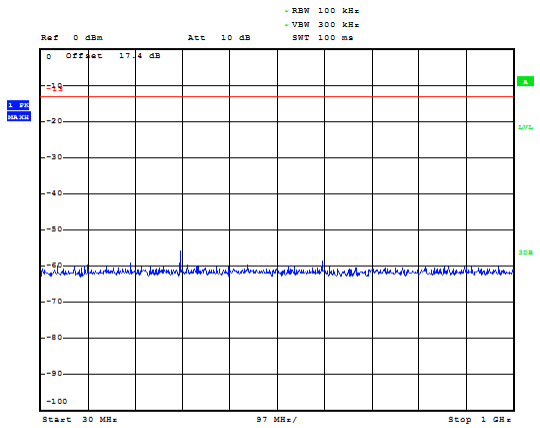
LTE Band 4 15MHz CH-Low 3GHz~18GHz



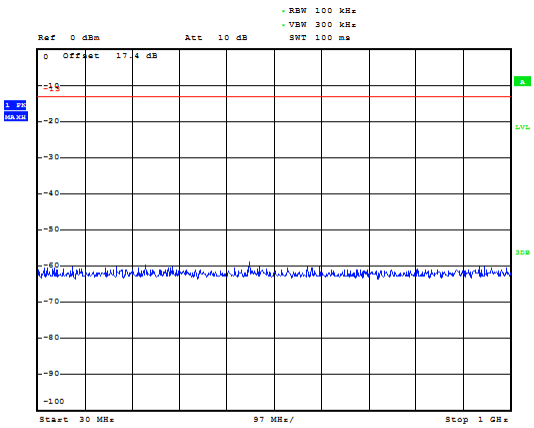
LTE Band 4 15MHz CH-Middle 3GHz~18GHz



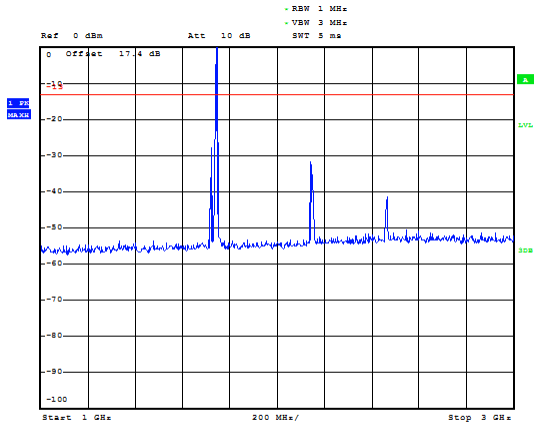
LTE Band 4 15MHz CH-High 30MHz~1GHz



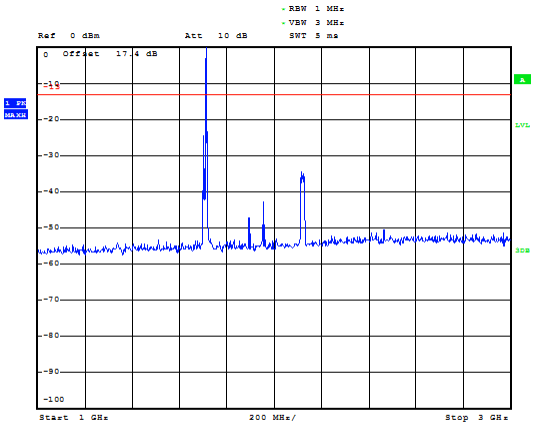
LTE Band 4 20MHz CH-Low 30MHz~1GHz



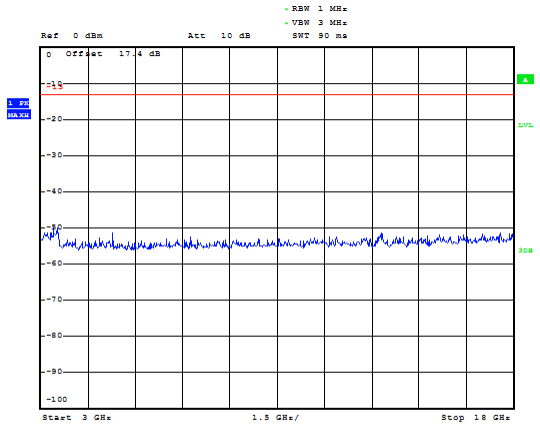
LTE Band 4 15MHz CH-High 1GHz~3GHz



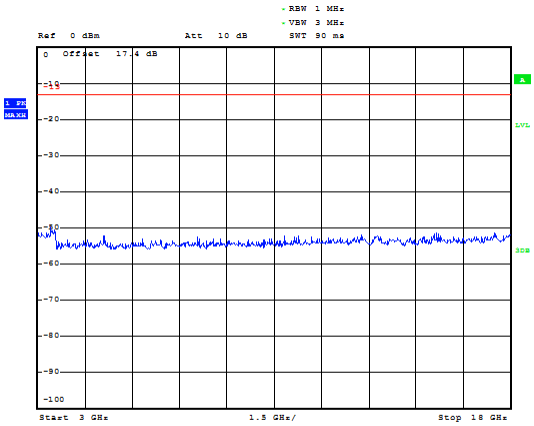
LTE Band 4 20MHz CH-Low 1GHz~3GHz



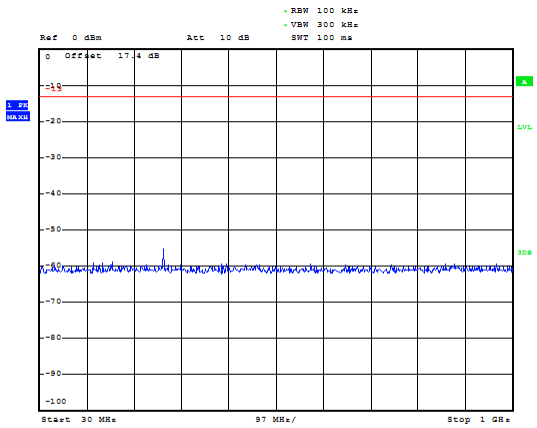
LTE Band 4 15MHz CH-High 3GHz~18GHz



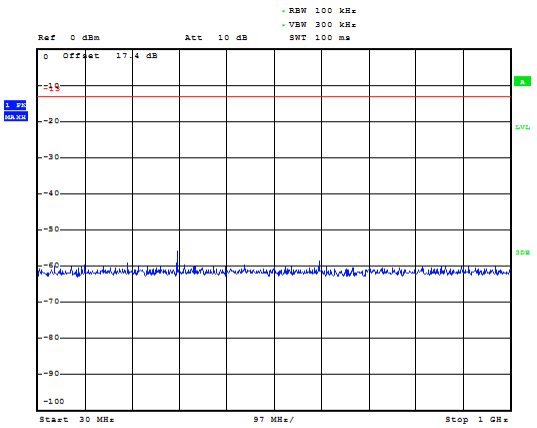
LTE Band 4 20MHz CH-Low 3GHz~18GHz



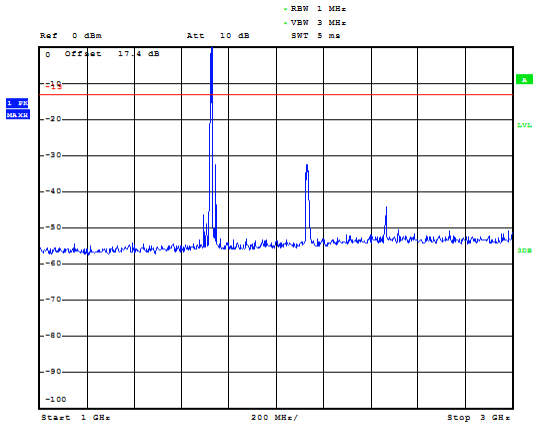
LTE Band 4 20MHz CH-Middle 30MHz~1GHz



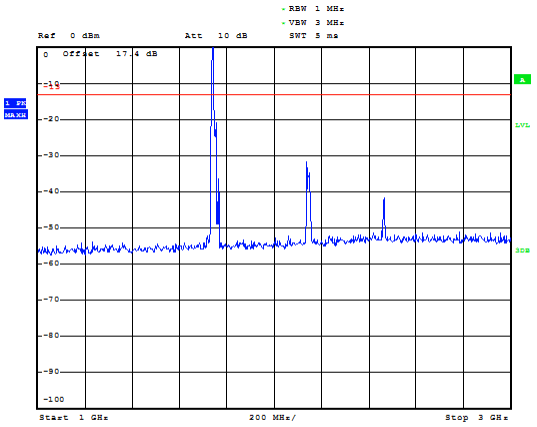
LTE Band 4 20MHz CH- High 30MHz~1GHz



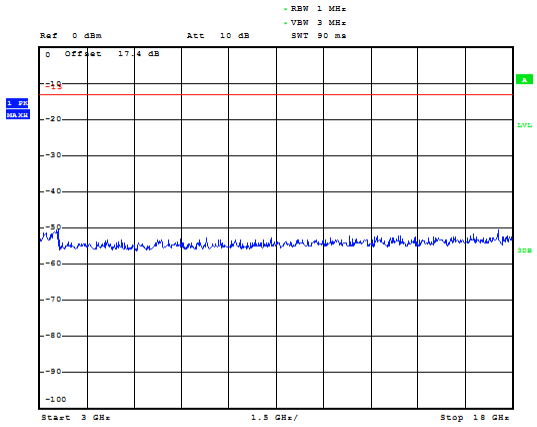
LTE Band 4 20MHz CH-Middle 1GHz~3GHz



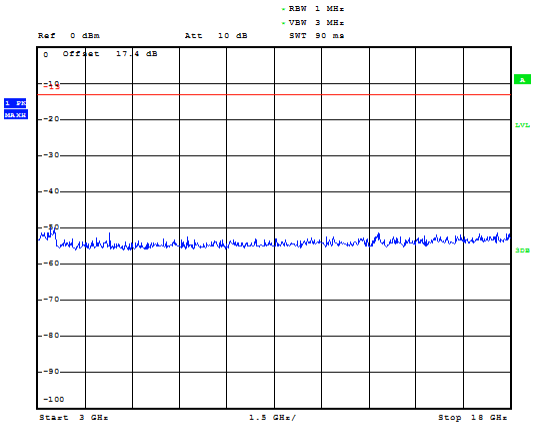
LTE Band 4 20MHz CH- High 1GHz~3GHz



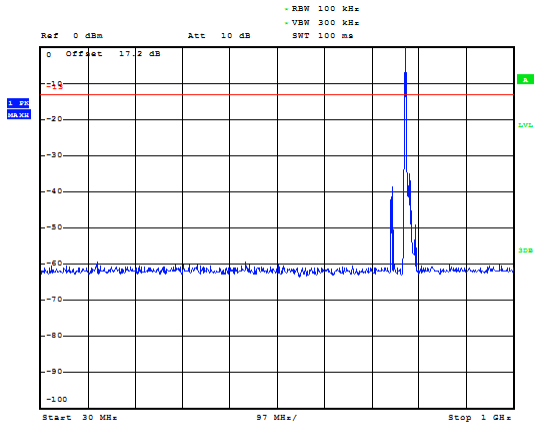
LTE Band 4 20MHz CH-Middle 3GHz~18GHz



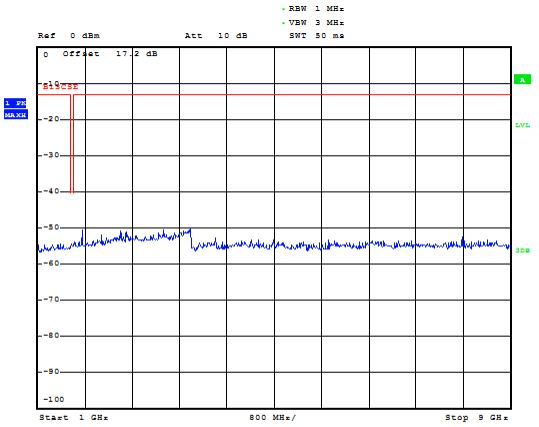
LTE Band 4 20MHz CH-High 3GHz~18GHz



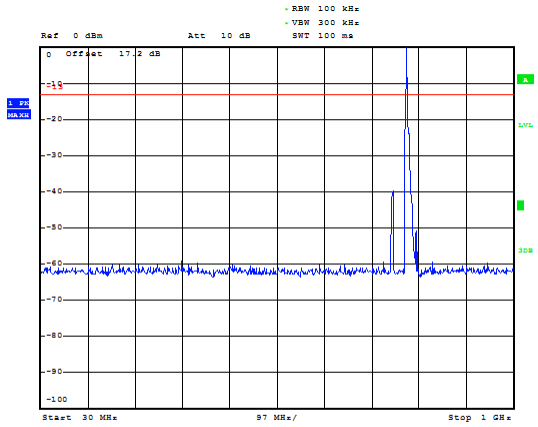
LTE Band 13 5MHz CH-Low 30MHz~1GHz



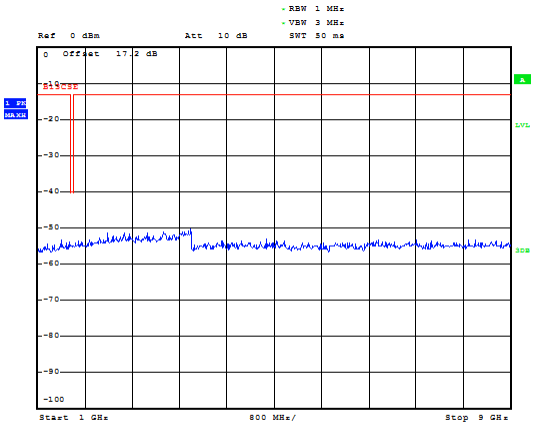
LTE Band 13 5MHz CH-Low 1GHz~9GHz



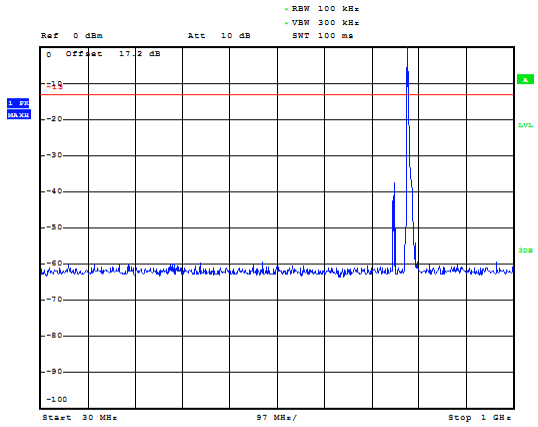
LTE Band 13 5MHz CH-Middle 30MHz~1GHz



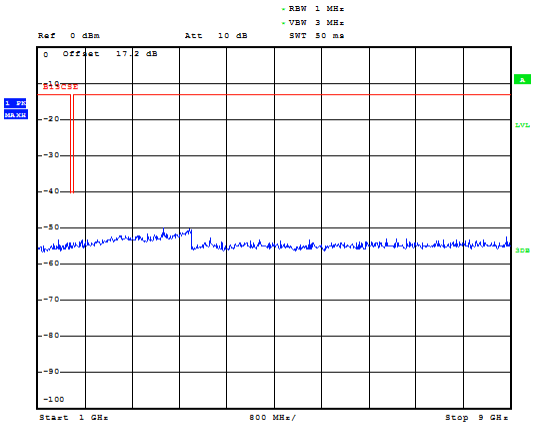
LTE Band 13 5MHz CH-Middle 1GHz~9GHz



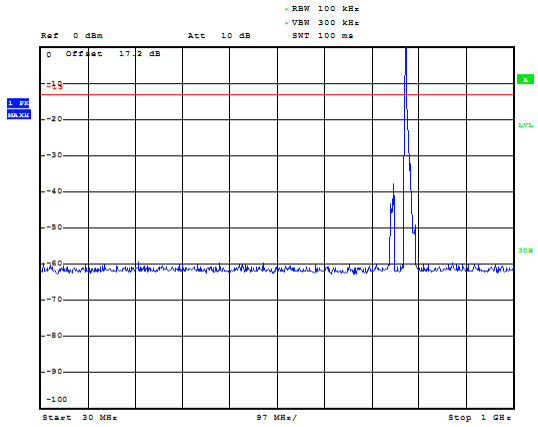
LTE Band 13 5MHz CH-High 30MHz~1GHz



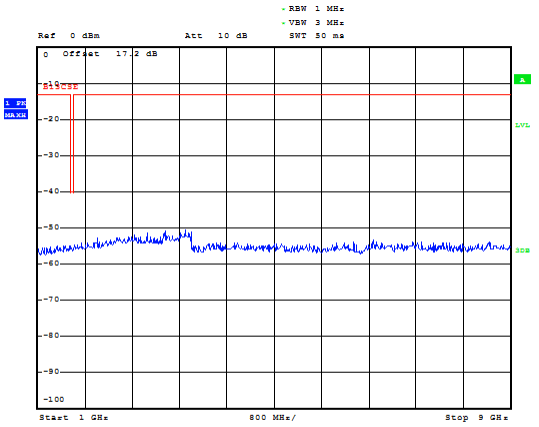
LTE Band 13 5MHz CH-High 1GHz~9GHz



LTE Band 13 10MHz CH-Middle 30MHz~1GHz



LTE Band 13 10MHz CH-Middle 1GHz~9GHz



5.8 Radiates Spurious Emission

Ambient condition

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

Method of Measurement

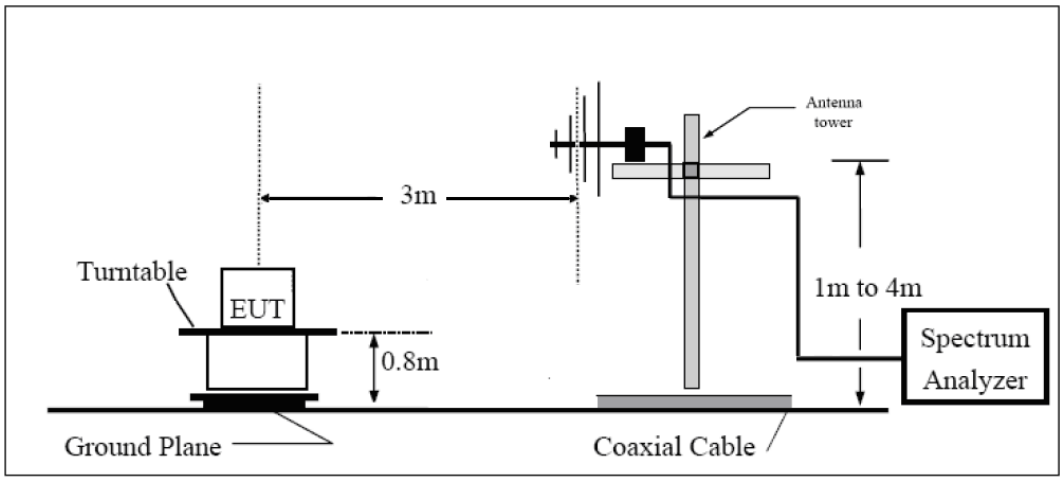
1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Above 30MHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable 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 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 for above 1GHz and RBW=100kHz,VBW=300kHz for 30MHz to 1GHz,, 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.

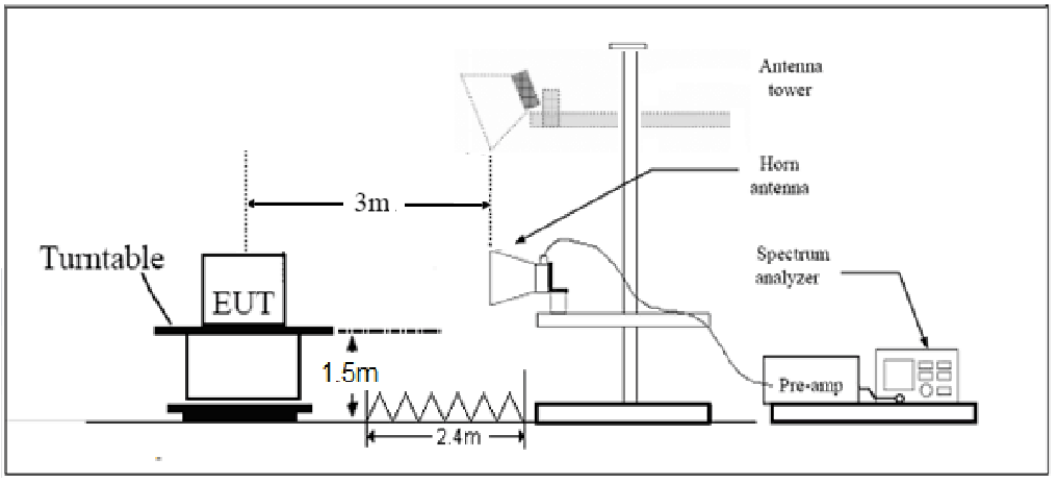
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

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 lie-down position (X axis) and the worst case was recorded.

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.

Part 27.53 (h) Limit		-13 dBm
Part 27.53(f) Limit	Limit out of the band 1559-1610 MHz	-13 dBm
	Limit in the band 1559-1610 MHz	-40 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

Sweep the whole frequency band through the range from 30MHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3421.4	-62.28	2.6	10.15	Horizontal	-54.73	-13.00	41.73	315
3	5131.1	-50.46	2.4	11.35	Horizontal	-41.51	-13.00	28.51	270
4	6842.8	-54.61	4.5	10.85	Horizontal	-48.26	-13.00	35.26	135
5	8553.5	-53.75	5.1	11.35	Horizontal	-47.50	-13.00	34.50	270
6	10264.2	-52.51	5.3	11.95	Horizontal	-45.86	-13.00	32.86	135
7	11974.9	-52.49	5.5	13.55	Horizontal	-44.44	-13.00	31.44	0
8	13685.6	-52.18	6.3	13.75	Horizontal	-44.73	-13.00	31.73	45
9	15396.3	-54.41	6.7	13.85	Horizontal	-47.26	-13.00	34.26	0
10	17107.0	-52.07	6.8	14.25	Horizontal	-44.62	-13.00	31.62	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 Horizontal position.									

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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3464.3	-63.49	2.6	10.75	Horizontal	-55.34	-13.00	42.34	90
3	5197.5	-50.56	2.4	11.05	Horizontal	-41.91	-13.00	28.91	135
4	6930.0	-55.59	4.5	11.15	Horizontal	-48.94	-13.00	35.94	135
5	8662.5	-54.27	5.1	11.35	Horizontal	-48.02	-13.00	35.02	45
6	10395.0	-51.91	5.3	11.95	Horizontal	-45.26	-13.00	32.26	315
7	12127.5	-53.35	5.5	13.55	Horizontal	-45.30	-13.00	32.30	315
8	13860.0	-51.99	6.3	13.75	Horizontal	-44.54	-13.00	31.54	270
9	15592.5	-54.24	6.7	13.85	Horizontal	-47.09	-13.00	34.09	135
10	17325.0	-51.53	6.8	14.25	Horizontal	-44.08	-13.00	31.08	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 Horizontal position.									

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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3507.8	-60.46	2.6	10.15	Horizontal	-52.91	-13.00	39.91	135
3	5261.6	-50.29	2.4	11.05	Horizontal	-41.64	-13.00	28.64	0
4	7017.2	-53.58	4.5	11.15	Horizontal	-46.93	-13.00	33.93	45
5	8771.5	-53.58	5.1	11.35	Horizontal	-47.33	-13.00	34.33	0
6	10525.8	-50.47	5.3	11.95	Horizontal	-43.82	-13.00	30.82	90
7	12280.1	-52.82	5.5	13.55	Horizontal	-44.77	-13.00	31.77	90
8	14034.4	-49.82	6.3	13.75	Horizontal	-42.37	-13.00	29.37	270
9	15788.7	-51.38	6.7	13.85	Horizontal	-44.23	-13.00	31.23	270
10	17543.0	-50.71	6.8	14.25	Horizontal	-43.26	-13.00	30.26	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 Horizontal position.									

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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3425.0	-63.94	2.6	10.15	Horizontal	-56.39	-13.00	43.39	135
3	5131.1	-50.26	2.4	11.35	Horizontal	-41.31	-13.00	28.31	270
4	6850.0	-55.15	4.5	10.85	Horizontal	-48.80	-13.00	35.80	135
5	8562.5	-53.30	5.1	11.35	Horizontal	-47.05	-13.00	34.05	0
6	10275.0	-54.35	5.3	11.95	Horizontal	-47.70	-13.00	34.70	45
7	11987.5	-51.11	5.5	13.55	Horizontal	-43.06	-13.00	30.06	0
8	13700.0	-52.03	6.3	13.75	Horizontal	-44.58	-13.00	31.58	90
9	15412.5	-54.18	6.7	13.85	Horizontal	-47.03	-13.00	34.03	90
10	17125.0	-51.44	6.8	14.25	Horizontal	-43.99	-13.00	30.99	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 Horizontal position.									

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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3460.5	-61.75	2.6	10.75	Horizontal	-53.60	-13.00	40.60	90
3	5191.5	-47.45	2.4	11.05	Horizontal	-38.80	-13.00	25.80	90
4	6930.0	-54.71	4.5	11.15	Horizontal	-48.06	-13.00	35.06	270
5	8662.5	-53.61	5.1	11.35	Horizontal	-47.36	-13.00	34.36	135
6	10395.0	-51.24	5.3	11.95	Horizontal	-44.59	-13.00	31.59	270
7	12127.5	-49.07	5.5	13.55	Horizontal	-41.02	-13.00	28.02	135
8	13860.0	-49.68	6.3	13.75	Horizontal	-42.23	-13.00	29.23	225
9	15592.5	-52.02	6.7	13.85	Horizontal	-44.87	-13.00	31.87	270
10	17325.0	-50.70	6.8	14.25	Horizontal	-43.25	-13.00	30.25	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 Horizontal position.									

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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3500.6	-59.23	2.6	10.15	Horizontal	-51.68	-13.00	38.68	90
3	5251.1	-48.46	2.4	11.05	Horizontal	-39.81	-13.00	26.81	0
4	7010.0	-53.30	4.5	11.15	Horizontal	-46.65	-13.00	33.65	45
5	8762.5	-51.25	5.1	11.35	Horizontal	-45.00	-13.00	32.00	135
6	10515.0	-50.49	5.3	11.95	Horizontal	-43.84	-13.00	30.84	270
7	12267.5	-52.00	5.5	13.55	Horizontal	-43.95	-13.00	30.95	90
8	14020.0	-47.45	6.3	13.75	Horizontal	-40.00	-13.00	27.00	270
9	15772.5	-46.73	6.7	13.85	Horizontal	-39.58	-13.00	26.58	315
10	17525.0	-51.54	6.8	14.25	Horizontal	-44.09	-13.00	31.09	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 Horizontal position.									

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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3440.0	-53.97	2.6	10.15	Horizontal	-46.42	-13.00	33.42	0
3	5133.4	-50.92	2.4	11.35	Horizontal	-41.97	-13.00	28.97	90
4	6880.0	-48.50	4.5	10.85	Horizontal	-42.15	-13.00	29.15	90
5	8600.0	-51.28	5.1	11.35	Horizontal	-45.03	-13.00	32.03	135
6	10320.0	-49.28	5.3	11.95	Horizontal	-42.63	-13.00	29.63	135
7	12040.0	-53.72	5.5	13.55	Horizontal	-45.67	-13.00	32.67	45
8	13760.0	-48.84	6.3	13.75	Horizontal	-41.39	-13.00	28.39	315
9	15480.0	-49.70	6.7	13.85	Horizontal	-42.55	-13.00	29.55	315
10	17200.0	-51.34	6.8	14.25	Horizontal	-43.89	-13.00	30.89	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 Horizontal position.									

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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3465.0	-53.74	2.6	10.75	Horizontal	-45.59	-13.00	32.59	135
3	5170.9	-51.63	2.4	11.05	Horizontal	-42.98	-13.00	29.98	270
4	6930.0	-49.09	4.5	11.15	Horizontal	-42.44	-13.00	29.44	135
5	8662.5	-51.94	5.1	11.35	Horizontal	-45.69	-13.00	32.69	0
6	10395.0	-52.11	5.3	11.95	Horizontal	-45.46	-13.00	32.46	45
7	12127.5	-51.99	5.5	13.55	Horizontal	-43.94	-13.00	30.94	0
8	13860.0	-48.01	6.3	13.75	Horizontal	-40.56	-13.00	27.56	90
9	15592.5	-53.33	6.7	13.85	Horizontal	-46.18	-13.00	33.18	135
10	17325.0	-49.97	6.8	14.25	Horizontal	-42.52	-13.00	29.52	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 Horizontal position.									

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

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3490.0	-51.35	2.6	10.15	Horizontal	-43.80	-13.00	30.80	135
3	5208.4	-52.44	2.4	11.05	Horizontal	-43.79	-13.00	30.79	270
4	6980.0	-49.71	4.5	11.15	Horizontal	-43.06	-13.00	30.06	135
5	8725.0	-52.32	5.1	11.35	Horizontal	-46.07	-13.00	33.07	225
6	10470.0	-52.70	5.3	11.95	Horizontal	-46.05	-13.00	33.05	270
7	12215.0	-53.13	5.5	13.55	Horizontal	-45.08	-13.00	32.08	135
8	13960.0	-49.29	6.3	13.75	Horizontal	-41.84	-13.00	28.84	90
9	15705.0	-52.64	6.7	13.85	Horizontal	-45.49	-13.00	32.49	0
10	17450.0	-50.48	6.8	14.25	Horizontal	-43.03	-13.00	30.03	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 Horizontal 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	1555.8	-66.31	2.00	10.15	Horizontal	-60.31	-13.00	47.31	270
3	2338.5	-61.40	2.50	11.35	Horizontal	-54.70	-13.00	41.70	225
4	3118.0	-61.31	4.20	10.85	Horizontal	-56.81	-13.00	43.81	270
5	3897.5	-59.40	5.20	11.35	Horizontal	-55.40	-13.00	42.40	135
6	4677.0	-58.08	5.50	11.95	Horizontal	-53.78	-13.00	40.78	0
7	5456.5	-58.84	5.70	13.55	Horizontal	-53.14	-13.00	40.14	45
8	6236.0	-55.65	6.30	13.75	Horizontal	-50.35	-13.00	37.35	0
9	7015.5	-53.10	6.80	13.85	Horizontal	-48.20	-13.00	35.20	90
10	7795.0	-52.01	6.90	14.25	Horizontal	-46.81	-13.00	33.81	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 Horizontal 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	1564.0	-66.18	2.00	10.75	Horizontal	-59.58	-40.00	19.58	90
3	2346.0	-62.08	2.51	11.05	Horizontal	-55.69	-13.00	42.69	0
4	3128.0	-61.70	4.20	11.15	Horizontal	-56.90	-13.00	43.90	135
5	3910.0	-59.40	5.20	11.15	Horizontal	-55.60	-13.00	42.60	135
6	4692.0	-57.92	5.50	11.95	Horizontal	-53.62	-13.00	40.62	45
7	5474.0	-57.99	5.70	13.55	Horizontal	-52.29	-13.00	39.29	315
8	6256.0	-56.17	6.30	13.75	Horizontal	-50.87	-13.00	37.87	270
9	7038.0	-52.68	6.80	13.85	Horizontal	-47.78	-13.00	34.78	225
10	7820.0	-52.53	6.90	14.25	Horizontal	-47.33	-13.00	34.33	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 Horizontal 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	1569.0	-66.53	2.00	10.15	Horizontal	-60.53	-40.00	20.53	0
3	2353.5	-62.52	2.51	11.05	Horizontal	-56.13	-13.00	43.13	135
4	3138.0	-61.30	4.20	11.15	Horizontal	-56.50	-13.00	43.50	315
5	3922.5	-58.69	5.20	11.15	Horizontal	-54.89	-13.00	41.89	270
6	4707.0	-57.44	5.50	11.95	Horizontal	-53.14	-13.00	40.14	135
7	5491.5	-57.55	5.70	13.55	Horizontal	-51.85	-13.00	38.85	270
8	6276.0	-56.07	6.30	13.75	Horizontal	-50.77	-13.00	37.77	135
9	7060.5	-51.67	6.80	13.85	Horizontal	-46.77	-13.00	33.77	0
10	7845.0	-52.01	6.90	14.25	Horizontal	-46.81	-13.00	33.81	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 Horizontal 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	1556.5	-67.64	2.00	10.15	Horizontal	-61.64	-13.00	48.64	45
3	2346.0	-62.72	2.51	11.35	Horizontal	-56.03	-13.00	43.03	315
4	3128.0	-62.08	4.20	10.85	Horizontal	-57.58	-13.00	44.58	0
5	3910.0	-59.16	5.20	11.35	Horizontal	-55.16	-13.00	42.16	90
6	4692.0	-57.88	5.50	11.95	Horizontal	-53.58	-13.00	40.58	90
7	5474.0	-57.86	5.70	13.55	Horizontal	-52.16	-13.00	39.16	135
8	6256.0	-56.92	6.30	13.75	Horizontal	-51.62	-13.00	38.62	135
9	7038.0	-53.16	6.80	13.85	Horizontal	-48.26	-13.00	35.26	45
10	7820.0	-52.78	6.90	14.25	Horizontal	-47.58	-13.00	34.58	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 Horizontal 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	1555.3	-67.69	2.00	10.75	Horizontal	-61.09	-13.00	48.09	270
3	2346.0	-61.83	2.51	11.05	Horizontal	-55.44	-13.00	42.44	225
4	3128.0	-61.39	4.20	11.15	Horizontal	-56.59	-13.00	43.59	315
5	3910.0	-58.80	5.20	11.15	Horizontal	-55.00	-13.00	42.00	270
6	4692.0	-58.12	5.50	11.95	Horizontal	-53.82	-13.00	40.82	135
7	5474.0	-57.09	5.70	13.55	Horizontal	-51.39	-13.00	38.39	270
8	6256.0	-56.21	6.30	13.75	Horizontal	-50.91	-13.00	37.91	135
9	7038.0	-52.68	6.80	13.85	Horizontal	-47.78	-13.00	34.78	0
10	7820.0	-53.63	6.90	14.25	Horizontal	-48.43	-13.00	35.43	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 Horizontal 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	1564.0	-65.84	2.00	10.15	Horizontal	-59.84	-40.00	19.84	225
3	2346.0	-61.51	2.51	11.05	Horizontal	-55.12	-13.00	42.12	315
4	3128.0	-61.99	4.20	11.15	Horizontal	-57.19	-13.00	44.19	0
5	3910.0	-58.66	5.20	11.15	Horizontal	-54.86	-13.00	41.86	90
6	4692.0	-57.13	5.50	11.95	Horizontal	-52.83	-13.00	39.83	90
7	5474.0	-58.57	5.70	13.55	Horizontal	-52.87	-13.00	39.87	270
8	6256.0	-56.54	6.30	13.75	Horizontal	-51.24	-13.00	38.24	135
9	7038.0	-52.94	6.80	13.85	Horizontal	-48.04	-13.00	35.04	270
10	7820.0	-52.55	6.90	14.25	Horizontal	-47.35	-13.00	34.35	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 Horizontal position.

6 Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMW500	113824	2018-05-20	2019-05-19
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2018-05-20	2019-05-19
Signal Analyzer	R&S	FSV30	100815	2017-12-17	2018-12-16
EMI Test Receiver	R&S	ESCI	100948	2018-05-20	2019-05-19
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2017-09-26	2019-09-25
Trilog Antenna	SCHWARZBECK	VUBL 9163	9163-201	2017-11-18	2019-11-17
Horn Antenna	R&S	HF907	100126	2018-07-07	2020-07-06
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2020-06-19
Signal generator	R&S	SMB 100A	102594	2018-05-20	2019-05-19
Climatic Chamber	ESPEC	SU-242	93000506	2017-12-17	2020-12-16
Preampflier	R&S	SCU18	102327	2018-05-20	2019-05-19
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2018-05-21	2019-05-20
RF Cable	Agilent	SMA 15cm	0001	/	/
Software	R&S	EMC32	9.26.0	/	/

*******END OF REPORT *******

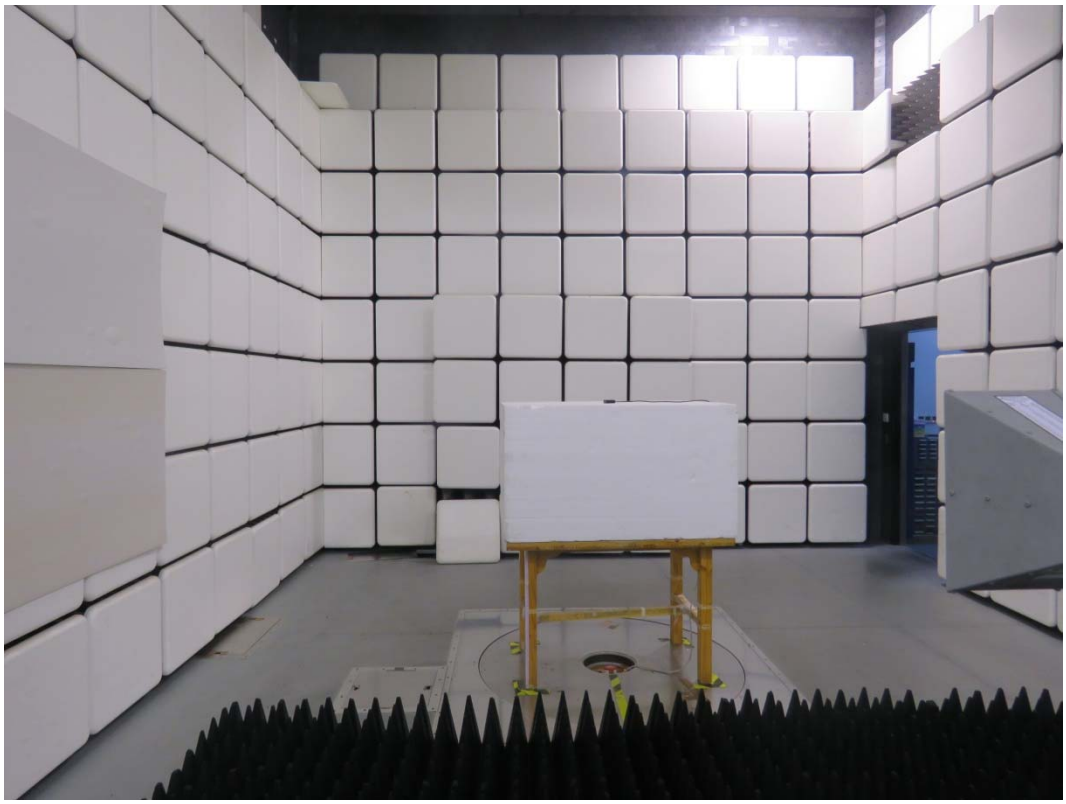
ANNEX A: EUT Appearance and Test Setup

A.1 EUT Appearance

a: EUT

Picture 1 EUT and Accessory

A.2 Test Setup



Picture 2: Radiated Spurious Emissions Test setup