



RF TEST REPORT

Applicant MeiG Smart Technology Co., Ltd
FCC ID 2APJ4-SLM750VSA
Product SLM750VSA
Brand MEIGLink
Model SLM750VSA
Report No. R2202A0142-R3
Issue Date March 1, 2022

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2020)/ FCC CFR47 Part 27C (2020)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Performed by: Peng Tao

Approved by: Kai Xu

TA Technology (Shanghai) Co., Ltd.

No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China

TEL: +86-021-50791141/2/3

FAX: +86-021-50791141/2/3-8000



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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)	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	27.53(h)	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)	PASS
8	Radiates Spurious Emission	2.1053 /27.53(h)	PASS

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.

Date of Testing: September 3, 2019 ~ September 24, 2019

SLM750VSA (Report No.: R2202A0142-R3) is a variant model of SLM750 (Report No.: R1908A0527-R3V1). Changed FCC ID and Product Applicant address and Manufacturer address. Test values partial duplicated from Original for variant. There is no test for variant in this report.

The difference between model SLM750VSA and model SLM750 is show in the below table:

	Model	SLM750VSA (Variant)	SLM750 (Original)
Hardware	PCB	Addsomebands, the related matching circuit wiring has changed	/
Software	Software Version	SLM750-V_4.0.13_EQ101	SLM750-V_2.0.2D_EQ100
RF	RF circuit	Add LTE Band7/40	/

Notes: The SLM750VSA support LTE Band 2/4/5/7/40;WCDMA B2/5;GSM 850/1900;

The SLM750 support LTE Band 2/4/5/12/13/17/25/26/B41, WCDMA B2/4/5, GSM 850/1900; CDMA BC0, CDMA BC1

The detailed product change description please refers to the *Difference Declaration Letter*.

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

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.

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
Post code: 201201
Country: P. R. China
Contact: Xu Kai
Telephone: +86-021-50791141/2/3
Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

2 General Description of Equipment under Test

Client Information

Applicant	MeiG Smart Technology Co., Ltd
Applicant address	Floor 2, Office Building No.5, Lingxia Road, Fenghuang Community, Fuyong Street, Bao 'an District, Shenzhen
Manufacturer	MeiG Smart Technology Co., Ltd
Manufacturer address	Floor 2, Office Building No.5, Lingxia Road, Fenghuang Community, Fuyong Street, Bao 'an District, Shenzhen

General information

EUT Description			
Model	SLM750VSA		
IMEI	863879041726491		
Hardware Version	SLM750-V_MB_V1.00		
Software Version	SLM750-V_4.0.13_EQ101		
Power Supply	External Power Supply		
Antenna Type	PCB Antenna		
Antenna Gain	LTE Band 4:2.5dBi		
Test Mode(s)	LTE Band 4		
Test Modulation	(LTE)QPSK 16QAM;		
LTE Category	4		
Maximum E.I.R.P./ E.R.P.	LTE Band 4:	25.20dBm	
Rated Power Supply Voltage:	3.8V		
Extreme Voltage	Minimum: 3.3V Maximum: 4.2V		
Extreme Temperature	Lowest: -40°C Highest: +85°C		
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	LTE Band 4	1710 ~ 1755	2110 ~ 2155
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 (2020)

FCC CFR47 Part 27C (2020)

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, 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 WCDMA/LTE is set based on the maximum RF Output Power.

The following testing in different Bandwidth is set to detail in the following table:

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

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	O
Effective Isotropic Radiated power	LTE 4	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Occupied Bandwidth	LTE 4	O	O	O	O	O	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	O
Peak-to-Average Power Ratio	LTE 4	O	O	O	O	O	O	O	O	-	-	O	O	O	O	O
Frequency Stability	LTE 4	O	O	O	O	O	O	O	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
Radiates Spurious Emission	LTE 4	O	-	O	-	-	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

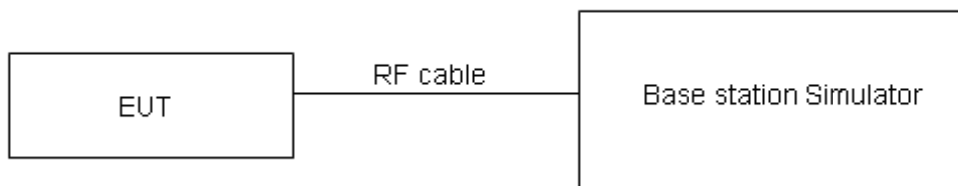
Ambient condition

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

LTE 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	22.13	22.38	22.63
		1	2	22.34	22.20	22.65
		1	5	22.29	22.25	22.55
		3	0	21.01	21.15	21.41
		3	2	21.06	21.19	21.35
		3	3	21.18	21.22	21.29
		6	0	21.14	21.25	21.36
	16QAM	1	0	21.10	21.96	21.94
		1	2	21.09	22.12	21.90
		1	5	20.99	22.00	21.63
		3	0	20.12	20.05	20.26
		3	2	20.11	20.04	20.23
		3	3	20.17	20.04	20.09
		6	0	20.31	20.36	20.21
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
3MHz	QPSK	1	0	22.15	22.42	22.66
		1	7	22.37	22.25	22.69
		1	14	22.32	22.30	22.59
		8	0	21.09	21.25	21.52
		8	4	21.16	21.27	21.45
		8	7	21.26	21.31	21.37
		15	0	21.17	21.29	21.39
	16QAM	1	0	21.13	21.98	21.97
		1	7	21.12	22.17	21.94
		1	14	21.01	22.04	21.66
		8	0	20.21	20.16	20.36
		8	4	20.20	20.15	20.33
		8	7	20.25	20.14	20.20
		15	0	20.34	20.40	20.24
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
5MHz	QPSK	1	0	22.12	22.40	22.62
		1	13	22.35	22.21	22.66
		1	24	22.29	22.25	22.55
		12	0	21.06	21.20	21.48
		12	6	21.14	21.23	21.40
		12	13	21.24	21.29	21.33
		25	0	21.15	21.28	21.37



	16QAM	1	0	21.10	21.94	21.94
		1	13	21.09	22.15	21.91
		1	24	20.98	22.02	21.62
		12	0	20.19	20.12	20.33
		12	6	20.17	20.10	20.29
		12	13	20.22	20.09	20.16
		25	0	20.32	20.36	20.19
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20000/1715	20175/1732.5	20350/1750
10MHz	QPSK	1	0	22.14	22.41	22.65
		1	25	22.38	22.26	22.70
		1	49	22.31	22.29	22.58
		25	0	21.09	21.25	21.52
		25	13	21.17	21.28	21.44
		25	25	21.26	21.33	21.38
		50	0	21.23	21.30	21.41
	16QAM	1	0	21.12	21.97	21.96
		1	25	21.12	22.19	21.94
		1	49	21.01	22.04	21.65
		25	0	20.22	20.17	20.37
		25	13	20.19	20.14	20.32
		25	25	20.25	20.14	20.20
		50	0	20.35	20.41	20.23
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
15MHz	QPSK	1	0	22.13	22.37	22.63
		1	38	22.36	22.25	22.67
		1	74	22.28	22.24	22.54
		36	0	21.07	21.21	21.49
		36	18	21.14	21.23	21.40
		36	39	21.23	21.30	21.34
		75	0	21.21	21.26	21.36
	16QAM	1	0	21.07	21.95	21.94
		1	38	21.10	22.16	21.92
		1	74	20.98	22.00	21.62
		36	0	20.19	20.15	20.34
		36	18	20.16	20.09	20.28
		36	39	20.23	20.10	20.17
		75	0	20.32	20.36	20.19
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20050/1720	20175/1732.5	20300/1745
20MHz	QPSK	1	0	22.10	22.33	22.60
		1	50	22.35	22.21	22.65



		1	99	22.26	22.23	22.51
		50	0	21.04	21.16	21.45
		50	25	21.12	21.19	21.37
		50	50	21.20	21.25	21.30
		100	0	21.18	21.21	21.32
	16QAM	1	0	21.05	21.91	21.89
		1	50	21.06	22.14	21.88
		1	99	20.96	21.97	21.60
		50	0	20.16	20.11	20.31
		50	25	20.13	20.07	20.25
		50	50	20.20	20.05	20.13
		100	0	20.30	20.32	20.16

5.2 Effective Isotropic Radiated Power

Ambient condition

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

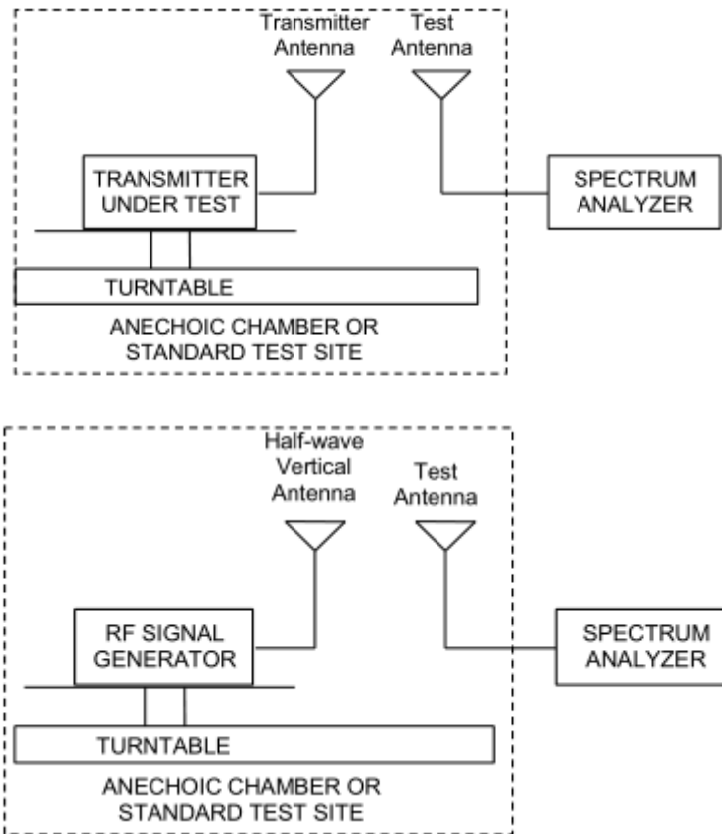
Methods of Measurement

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. $LOSS = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$
- e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation: $ERP \text{ (dBm)} = LVL \text{ (dBm)} + LOSS \text{ (dB)}$
- 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:
 $EIRP \text{ (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBi)}$
 where: dBd refers to gain relative to an ideal dipole.
 $EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB.)}$

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

(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(d)(4)

 $\leq 1 \text{ W (30 dBm)}$ **Measurement Uncertainty**

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

**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				EIRP(dBm)			Limit (dBm)
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			
				19957/1710.7	20175/1732.5	20393/1754.3	
1.4MHz	QPSK	1	0	24.63	24.88	25.13	30
		1	2	24.84	24.70	25.15	30
		1	5	24.79	24.75	25.05	30
		3	0	23.51	23.65	23.91	30
		3	2	23.56	23.69	23.85	30
		3	3	23.68	23.72	23.79	30
	16QAM	6	0	23.64	23.75	23.86	30
		1	0	23.60	24.46	24.44	30
		1	2	23.59	24.62	24.40	30
		1	5	23.49	24.50	24.13	30
		3	0	22.62	22.55	22.76	30
		3	2	22.61	22.54	22.73	30
		3	3	22.67	22.54	22.59	30
		6	0	22.81	22.86	22.71	30
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Limit (dBm)
				19965/1711.5	20175/1732.5	20385/1753.5	
3MHz	QPSK	1	0	24.65	24.92	25.16	30
		1	7	24.87	24.75	25.19	30
		1	14	24.82	24.80	25.09	30
		8	0	23.59	23.75	24.02	30
		8	4	23.66	23.77	23.95	30
		8	7	23.76	23.81	23.87	30
		15	0	23.67	23.79	23.89	30
	16QAM	1	0	23.63	24.48	24.47	30
		1	7	23.62	24.67	24.44	30
		1	14	23.51	24.54	24.16	30
		8	0	22.71	22.66	22.86	30
		8	4	22.70	22.65	22.83	30
		8	7	22.75	22.64	22.70	30
		15	0	22.84	22.90	22.74	30
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Limit (dBm)
				19975/1712.5	20175/1732.5	20375/1752.5	
5MHz	QPSK	1	0	24.62	24.90	25.12	30
		1	13	24.85	24.71	25.16	30
		1	24	24.79	24.75	25.05	30
		12	0	23.56	23.70	23.98	30



		12	6	23.64	23.73	23.90	30
		12	13	23.74	23.79	23.83	30
		25	0	23.65	23.78	23.87	30
	16QAM	1	0	23.60	24.44	24.44	30
		1	13	23.59	24.65	24.41	30
		1	24	23.48	24.52	24.12	30
		12	0	22.69	22.62	22.83	30
		12	6	22.67	22.60	22.79	30
		12	13	22.72	22.59	22.66	30
25	0	22.82	22.86	22.69	30		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Limit (dBm)
				20000/1715	20175/1732.5	20350/1750	
10MHz	QPSK	1	0	24.64	24.91	25.15	30
		1	25	24.88	24.76	25.20	30
		1	49	24.81	24.79	25.08	30
		25	0	23.59	23.75	24.02	30
		25	13	23.67	23.78	23.94	30
		25	25	23.76	23.83	23.88	30
		50	0	23.73	23.80	23.91	30
	16QAM	1	0	23.62	24.47	24.46	30
		1	25	23.62	24.69	24.44	30
		1	49	23.51	24.54	24.15	30
		25	0	22.72	22.67	22.87	30
		25	13	22.69	22.64	22.82	30
		25	25	22.75	22.64	22.70	30
		50	0	22.85	22.91	22.73	30
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Limit (dBm)
				20025/1717.5	20175/1732.5	20325/1747.5	
15MHz	QPSK	1	0	24.63	24.87	25.13	30
		1	38	24.86	24.75	25.17	30
		1	74	24.78	24.74	25.04	30
		36	0	23.57	23.71	23.99	30
		36	18	23.64	23.73	23.90	30
		36	39	23.73	23.80	23.84	30
		75	0	23.71	23.76	23.86	30
	16QAM	1	0	23.57	24.45	24.44	30
		1	38	23.60	24.66	24.42	30
		1	74	23.48	24.50	24.12	30
		36	0	22.69	22.65	22.84	30
		36	18	22.66	22.59	22.78	30
		36	39	22.73	22.60	22.67	30
		75	0	22.82	22.86	22.69	30
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			Limit



				20050/1720	20175/1732.5	20300/1745	(dBm)
20MHz	QPSK	1	0	24.60	24.83	25.10	30
		1	50	24.85	24.71	25.15	30
		1	99	24.76	24.73	25.01	30
		50	0	23.54	23.66	23.95	30
		50	25	23.62	23.69	23.87	30
		50	50	23.70	23.75	23.8	30
		100	0	23.68	23.71	23.82	30
	16QAM	1	0	23.55	24.41	24.39	30
		1	50	23.56	24.64	24.38	30
		1	99	23.46	24.47	24.1	30
		50	0	22.66	22.61	22.81	30
		50	25	22.63	22.57	22.75	30
		50	50	22.70	22.55	22.63	30
		100	0	22.80	22.82	22.66	30

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 51 kHz, VBW is set to 160 kHz for LTE Band 4 (1.4MHz).

RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4 (3MHz).

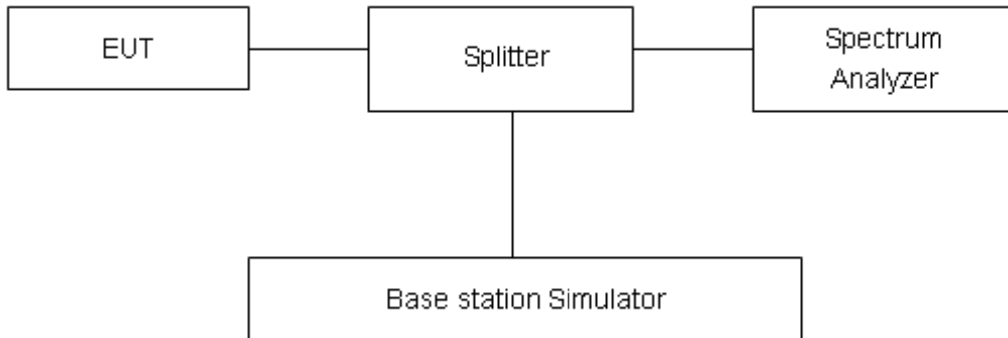
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4 (5MHz).

RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4 (10MHz).

RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4 (15MHz/20MHz).

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 $k = 2$, $U=624\text{Hz}$.

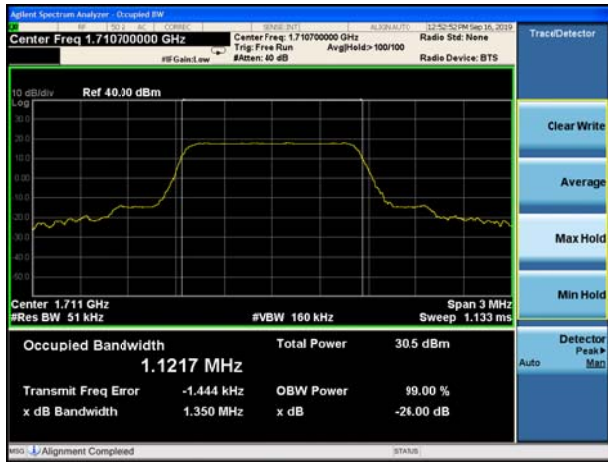


Test Result

LTE Band 4						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	19957	1710.7	1.1217	1.350
			20175	1732.5	1.1224	1.350
			20393	1754.3	1.1218	1.330
		3	19965	1711.5	2.7431	3.078
			20175	1732.5	2.7522	3.071
			20385	1753.5	2.7369	3.069
		5	19975	1712.5	4.5377	5.034
			20175	1732.5	4.5192	5.013
			20375	1752.5	4.5084	4.999
		10	20000	1715	9.0159	10.020
			20175	1732.5	9.014	9.962
			20350	1750	9.0374	9.990
		15	20025	1717.5	13.465	14.840
			20175	1732.5	13.405	14.610
			20325	1747.5	13.405	14.660
		20	20050	1720	17.88	19.280
			20175	1732.5	17.824	19.090
			20300	1745	17.862	19.250
	16QAM	1.4	19957	1710.7	1.124	1.335
			20175	1732.5	1.1231	1.318
			20393	1754.3	1.1184	1.342
		3	19965	1711.5	2.7471	3.061
			20175	1732.5	2.7359	3.055
			20385	1753.5	2.7337	3.038
		5	19975	1712.5	4.5201	4.976
			20175	1732.5	4.5258	5.003
			20375	1752.5	4.5315	4.971
		10	20000	1715	9.0049	9.973
			20175	1732.5	9.0265	10.020
			20350	1750	8.9865	9.899
15		20025	1717.5	13.467	14.640	
		20175	1732.5	13.417	13.700	
		20325	1747.5	13.456	14.620	
20		20050	1720	17.846	19.230	
		20175	1732.5	17.877	19.260	
		20300	1745	17.863	19.200	



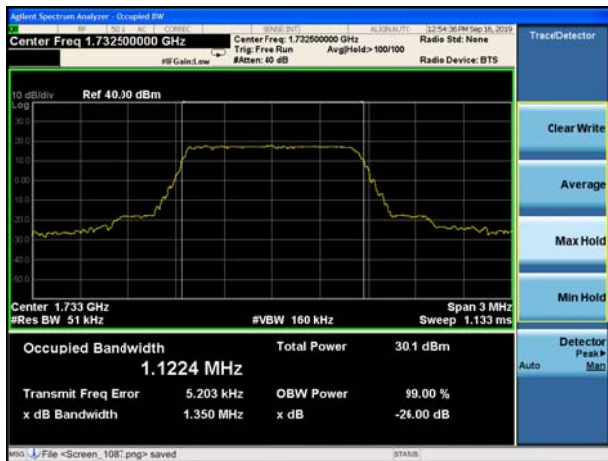
LTE Band 4 QPSK 1.4MHz CH-Low



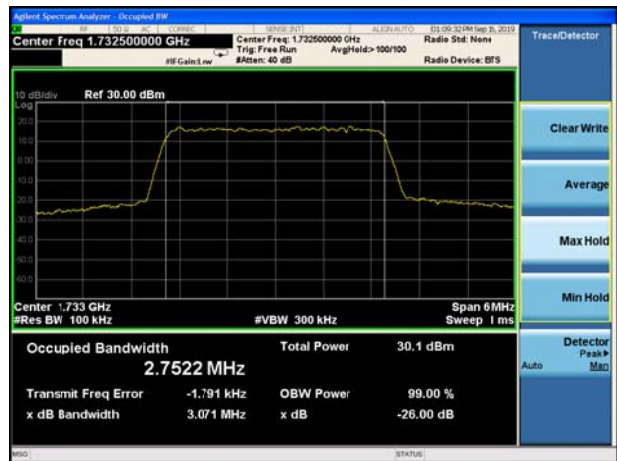
LTE Band 4 QPSK 3MHz CH-Low



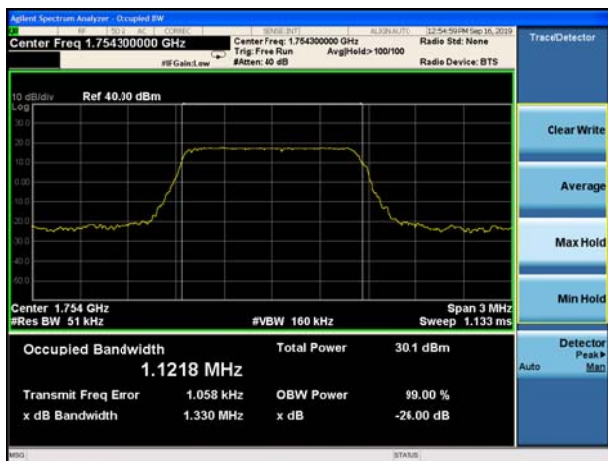
LTE Band 4 QPSK 1.4MHz CH-Middle



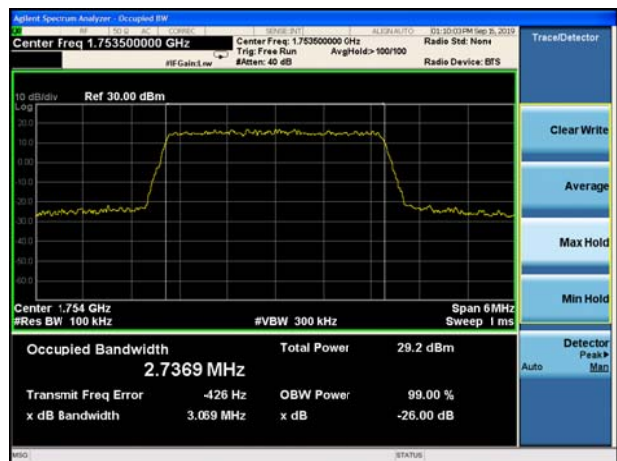
LTE Band 4 QPSK 3MHz CH-Middle



LTE Band 4 QPSK 1.4MHz CH-High

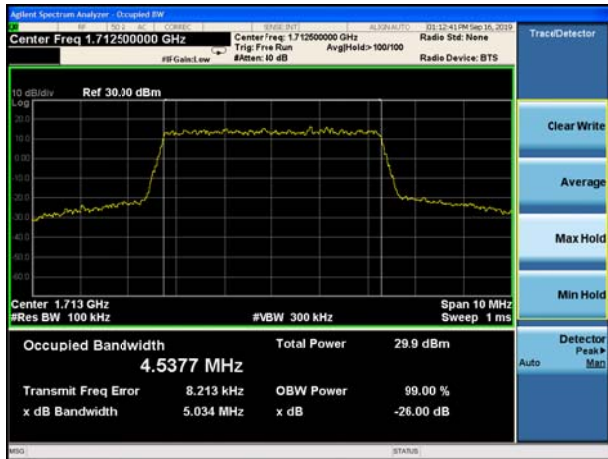


LTE Band 4 QPSK 3MHz CH-High





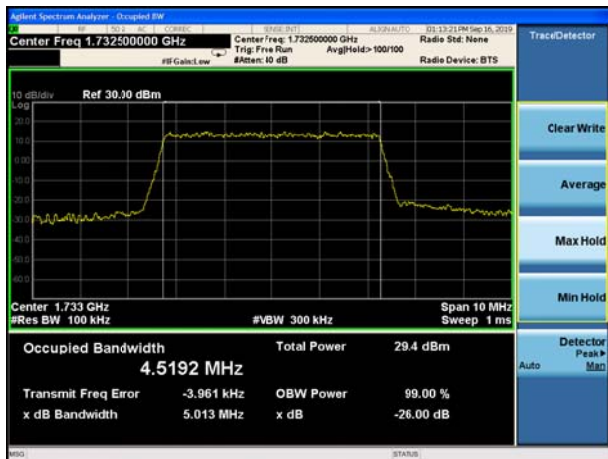
LTE Band 4 QPSK 5MHz CH-Low



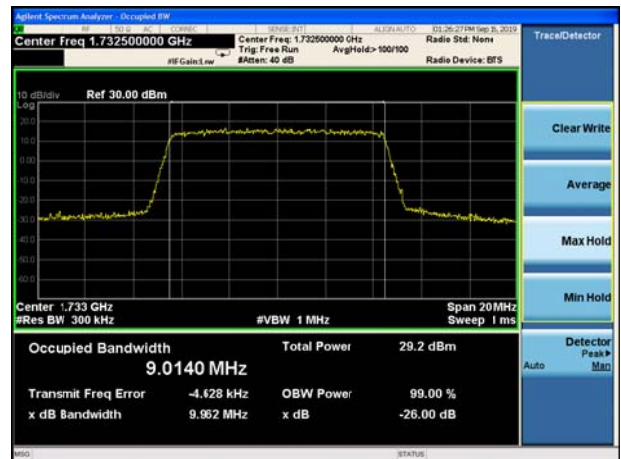
LTE Band 4 QPSK 10MHz CH-Low



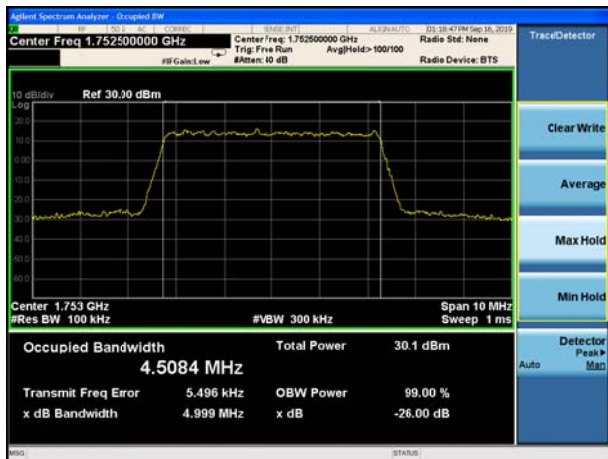
LTE Band 4 QPSK 5MHz CH-Middle



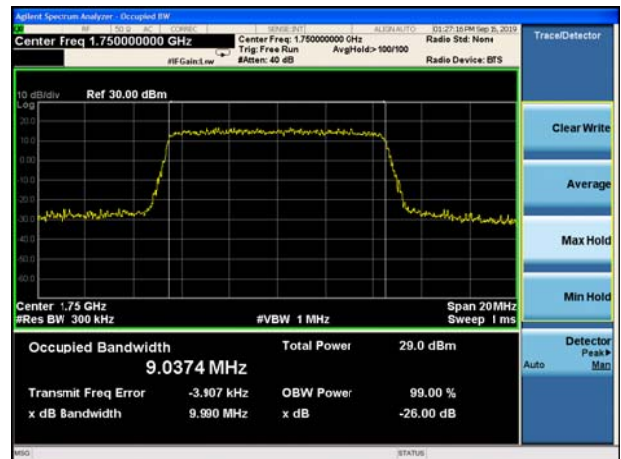
LTE Band 4 QPSK 10MHz CH-Middle



LTE Band 4 QPSK 5MHz CH-High

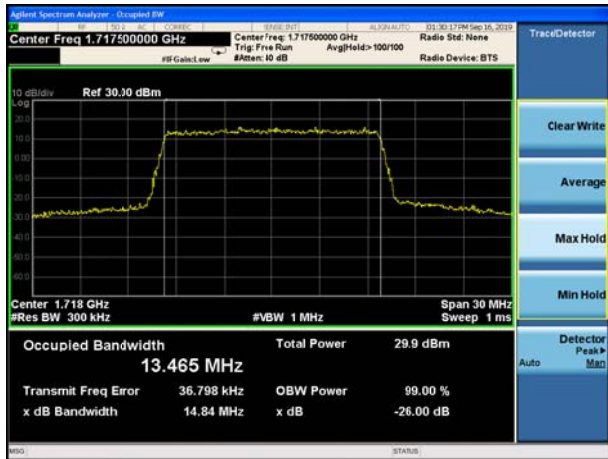


LTE Band 4 QPSK 10MHz CH-High

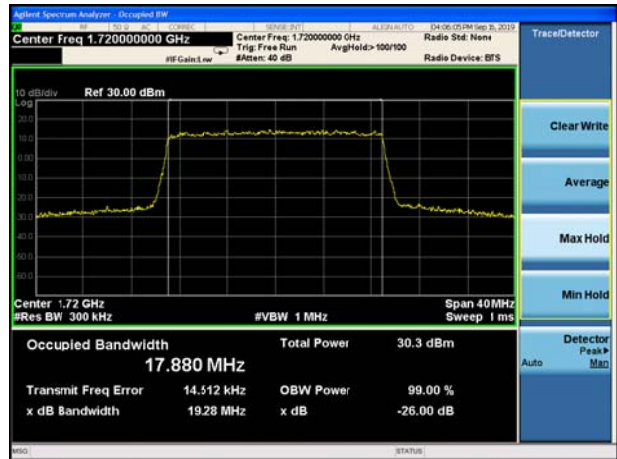




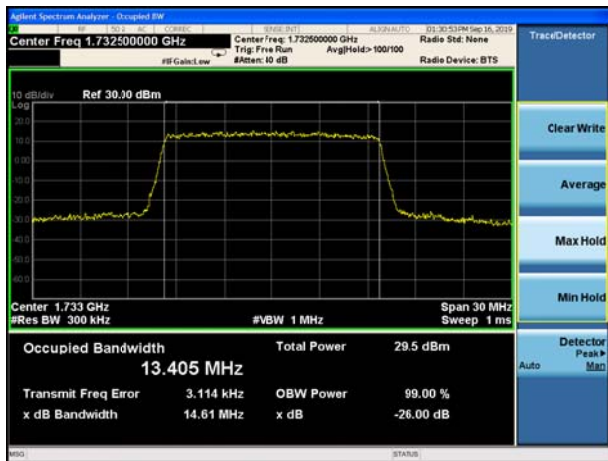
LTE Band 4 QPSK 15MHz CH-Low



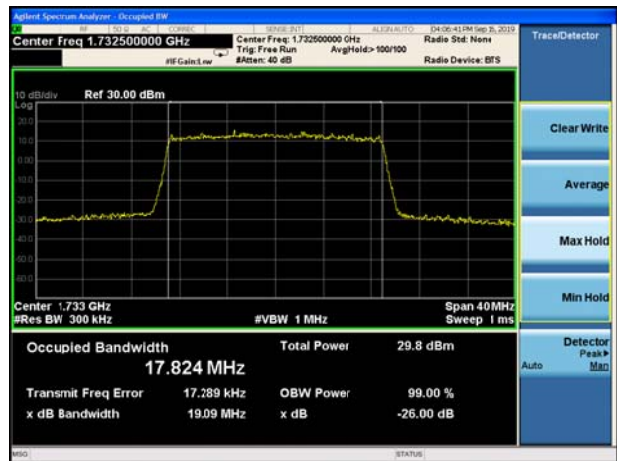
LTE Band 4 QPSK 20MHz CH-Low



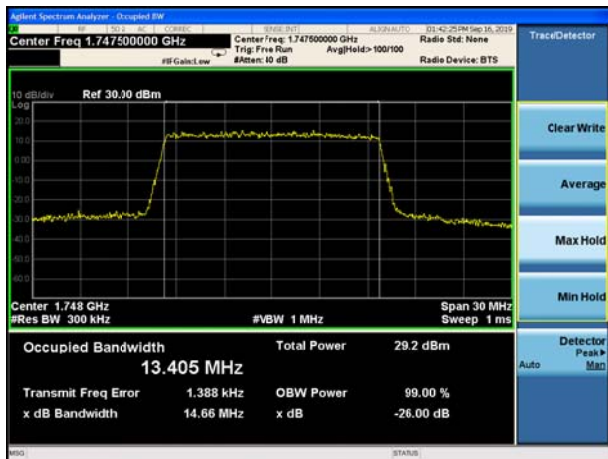
LTE Band 4 QPSK 15MHz CH-Middle



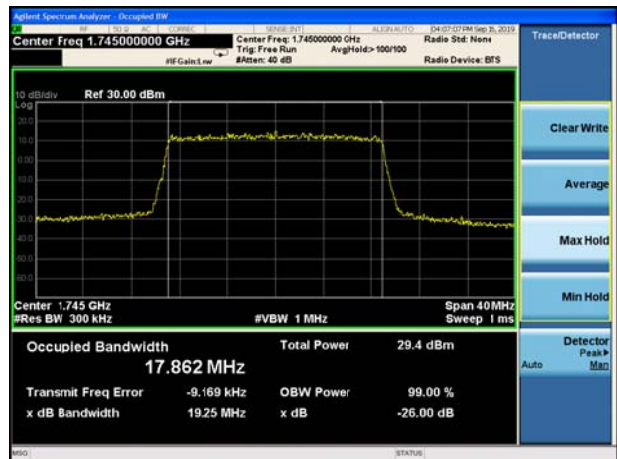
LTE Band 4 QPSK 20MHz CH-Middle



LTE Band 4 QPSK 15MHz CH-High

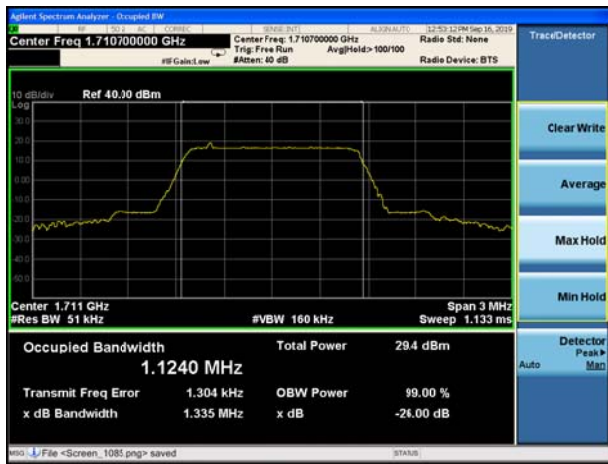


LTE Band 4 QPSK 20MHz CH-High

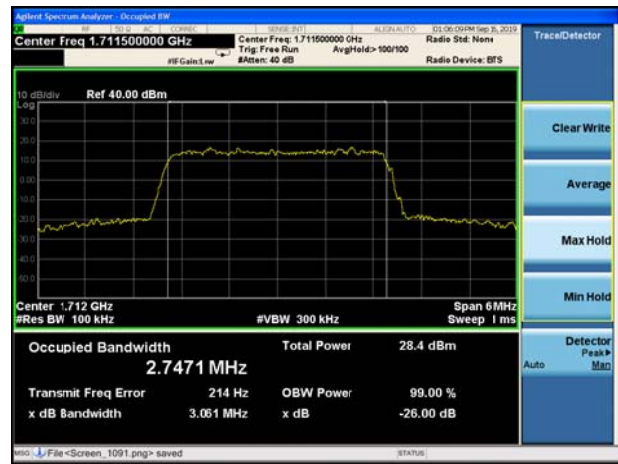




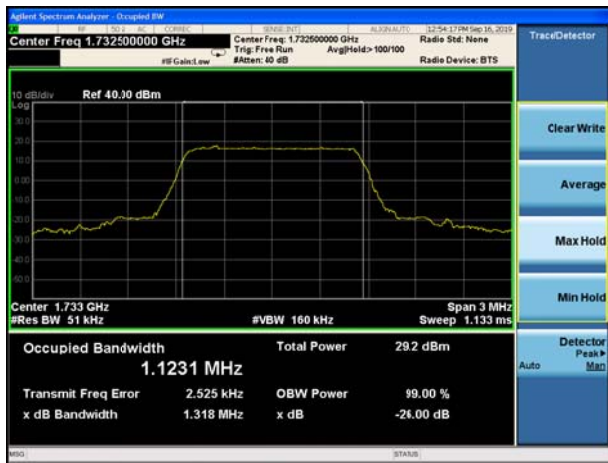
LTE Band 4 16QAM 1.4MHz CH-Low



LTE Band 4 16QAM 3MHz CH-Low



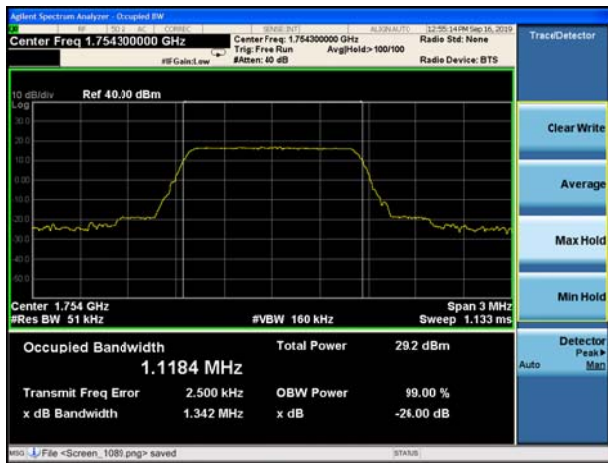
LTE Band 4 16QAM 1.4MHz CH-Middle



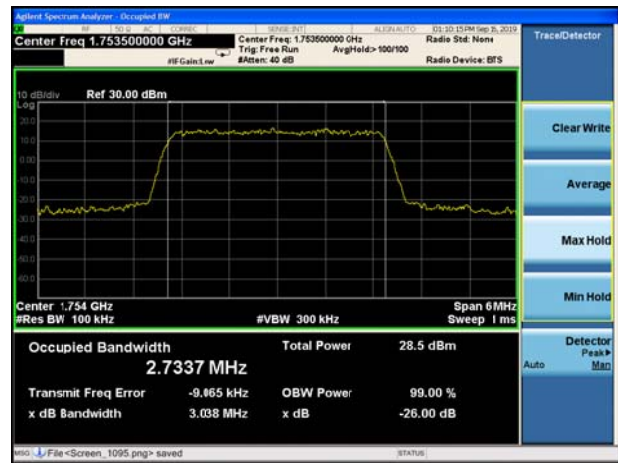
LTE Band 4 16QAM 3MHz CH-Middle



LTE Band 4 16QAM 1.4MHz CH-High

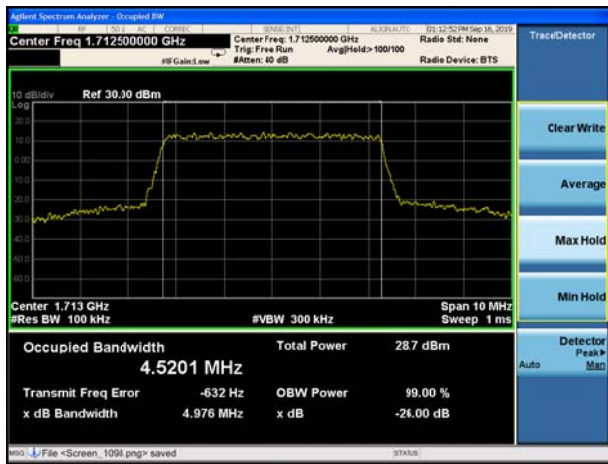


LTE Band 4 16QAM 3MHz CH-High





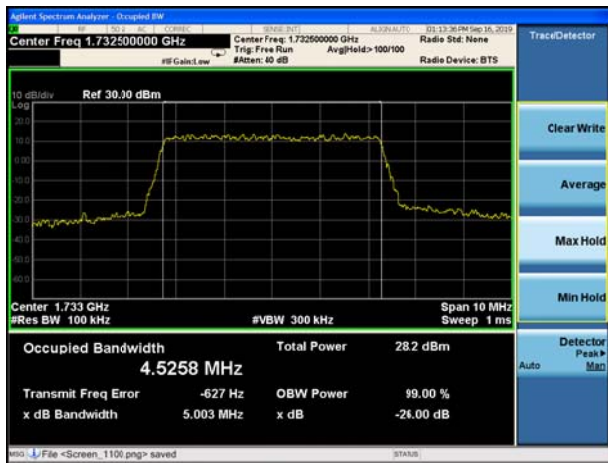
LTE Band 4 16QAM 5MHz CH-Low



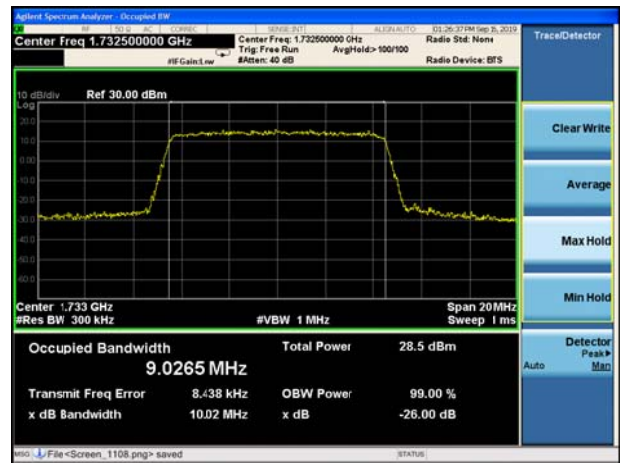
LTE Band 4 16QAM 10MHz CH-Low



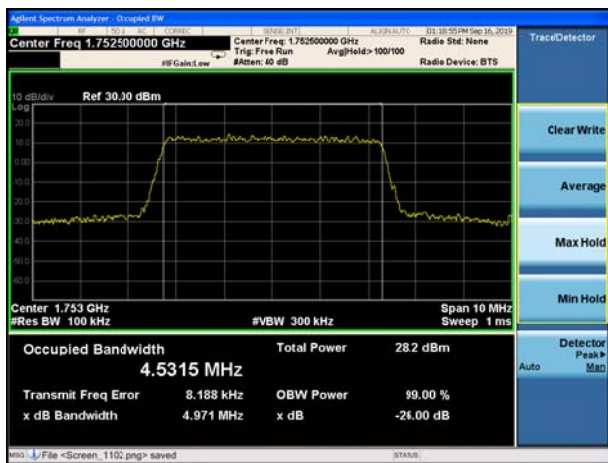
LTE Band 4 16QAM 5MHz CH-Middle



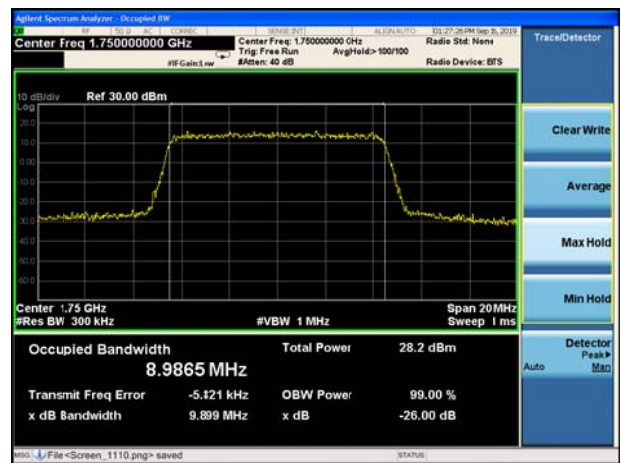
LTE Band 4 16QAM 10MHz CH-Middle



LTE Band 4 16QAM 5MHz CH-High

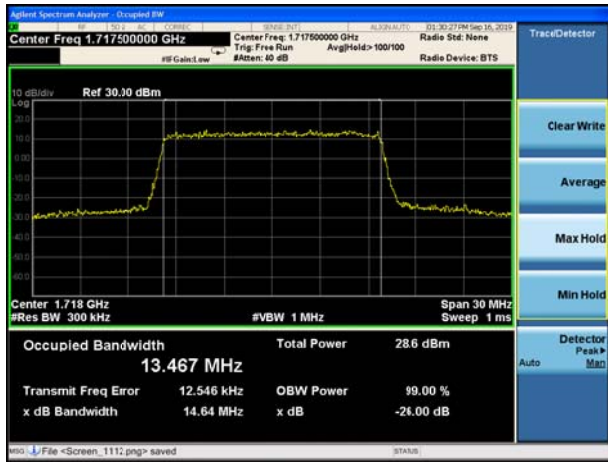


LTE Band 4 16QAM 10MHz CH-High

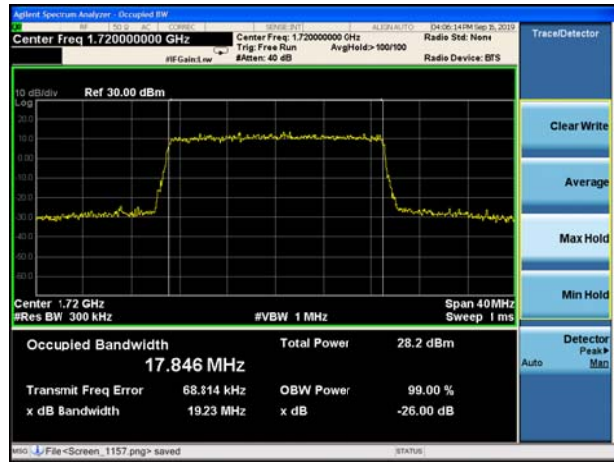




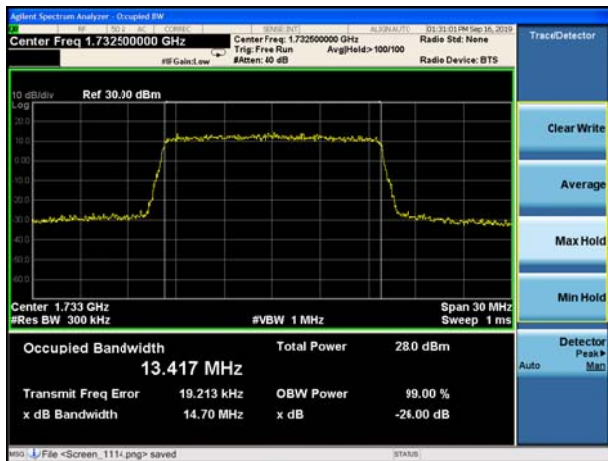
LTE Band 4 16QAM 15MHz CH-Low



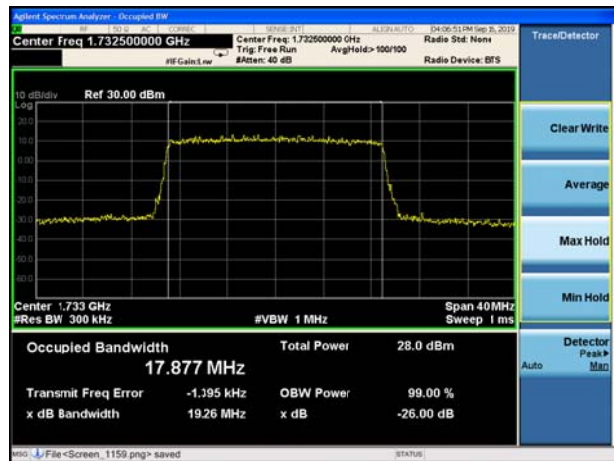
LTE Band 4 16QAM 20MHz CH-Low



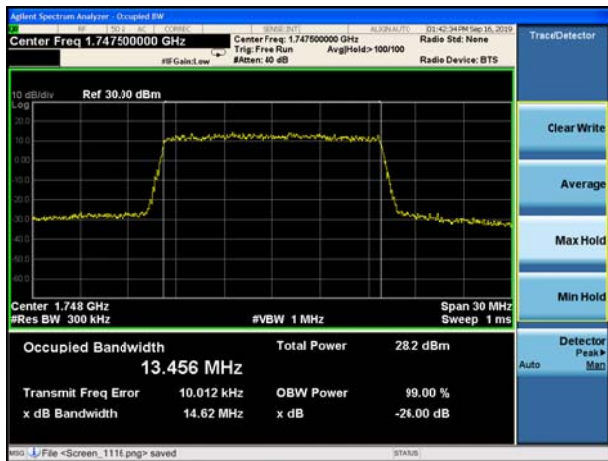
LTE Band 4 16QAM 15MHz CH-Middle



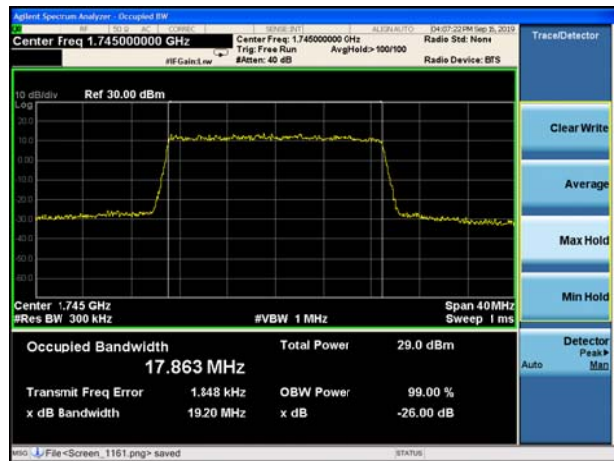
LTE Band 4 16QAM 20MHz CH-Middle



LTE Band 4 16QAM 15MHz CH-High



LTE Band 4 16QAM 20MHz CH-High



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

The EUT was connected to spectrum analyzer and system simulator via a power divider.

The band edges of low and high channels for the highest RF powers were measured.

For LTE Band 41 Set RBW \geq 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 (1.4MHz).

RBW is set to 30 kHz, VBW is set to 100 kHz for LTE Band 4 (3MHz).

RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4 (5MHz).

RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 4 (10MHz).

RBW is set to 150 kHz, VBW is set to 510 kHz for LTE Band 4 (15MHz).

RBW is set to 200 kHz, VBW is set to 620 kHz for LTE Band 4 (20MHz)

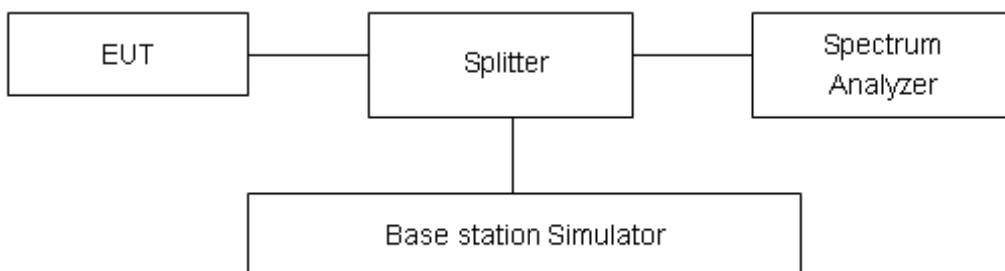
on spectrum analyzer.

Set spectrum analyzer with RMS detector.

The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

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”

Measurement Uncertainty

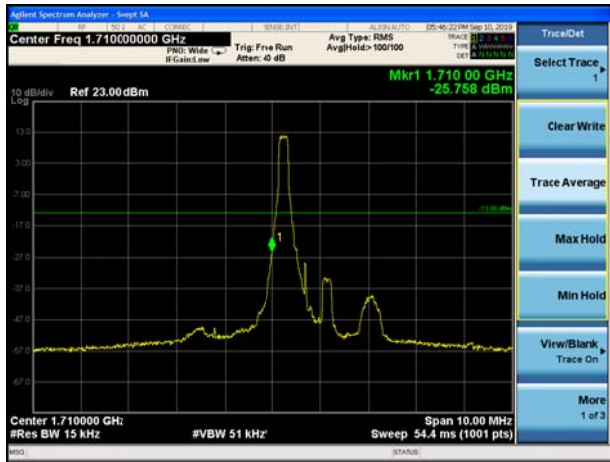
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U=0.684$ dB.



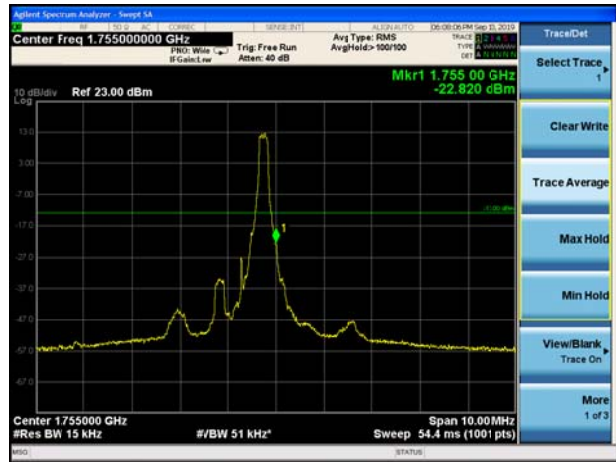
Test Result

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

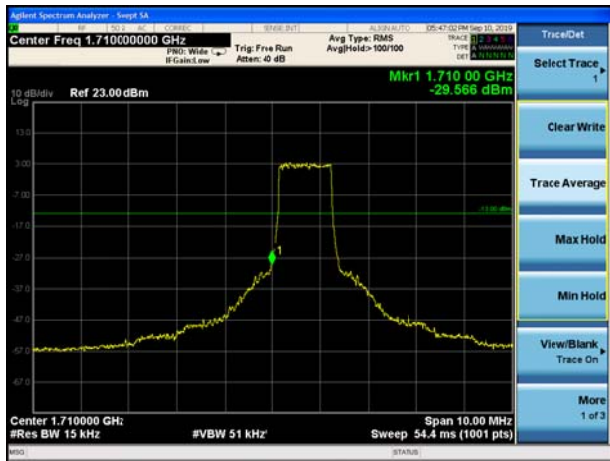
LTE Band 4 QPSK 1.4MHz CH-Low, 1 RB



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



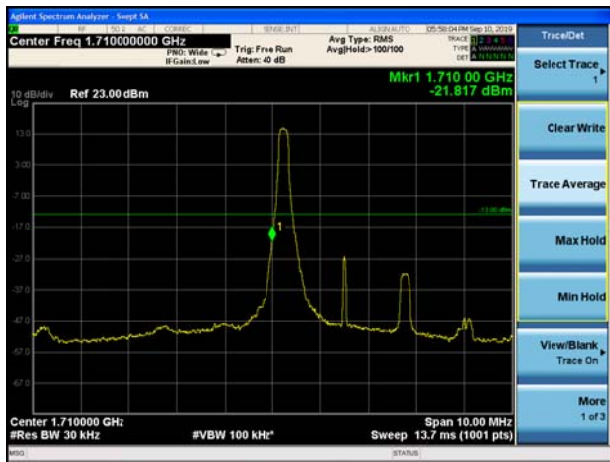
LTE Band 4 QPSK 1.4MHz CH-Low, 100%RB



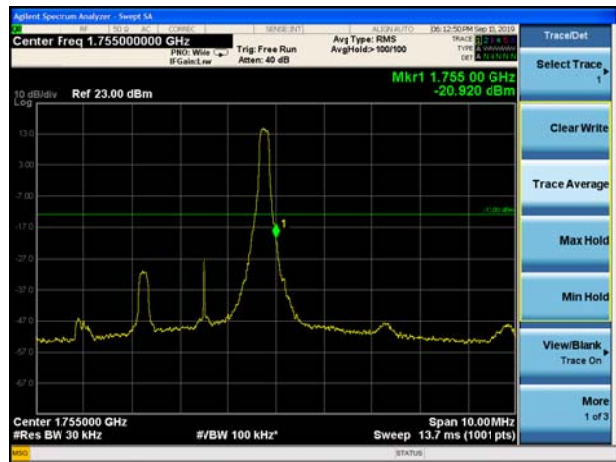
LTE Band 4 QPSK 1.4MHz CH-High, 100%RB



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



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

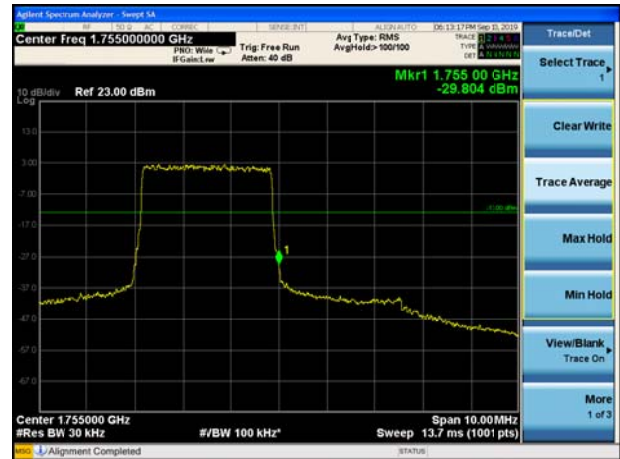




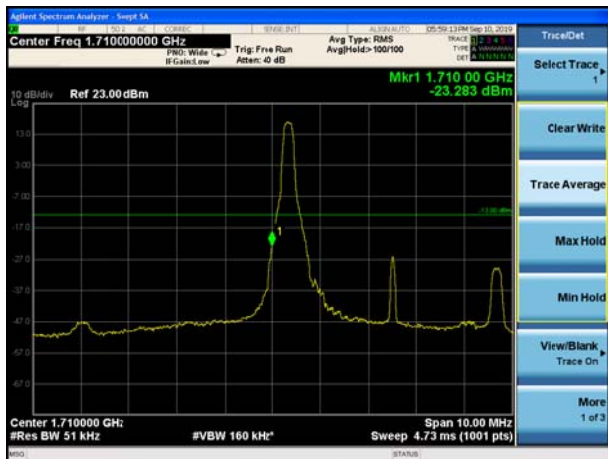
LTE Band 4 QPSK 3MHz CH-Low, 100%RB



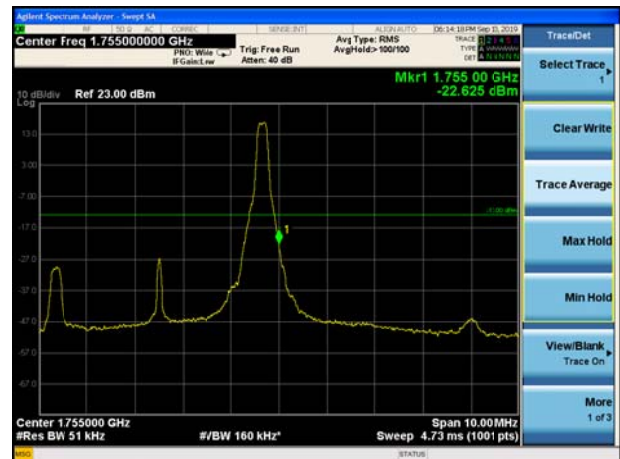
LTE Band 4 QPSK 3MHz CH-High, 100%RB



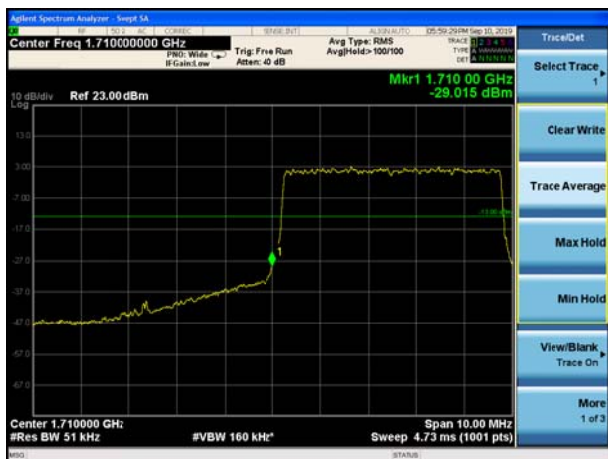
LTE Band 4 QPSK 5MHz CH-Low, 1 RB



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



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

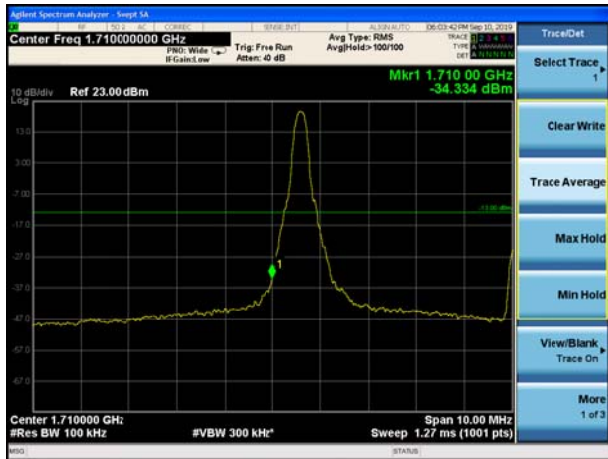


LTE Band 4 QPSK 5MHz CH-High, 100%RB

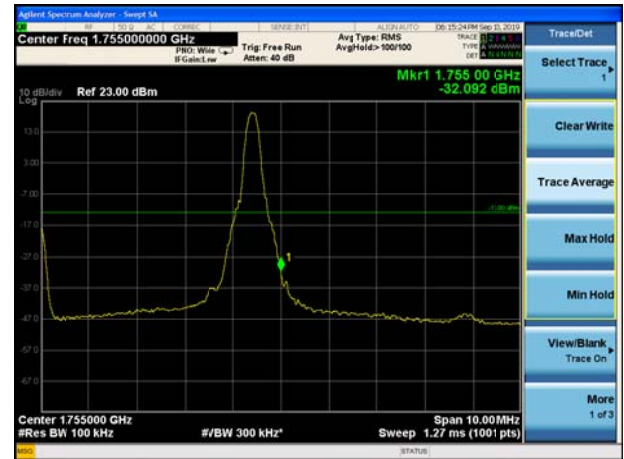




LTE Band 4 QPSK 10MHz CH-Low, 1 RB



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



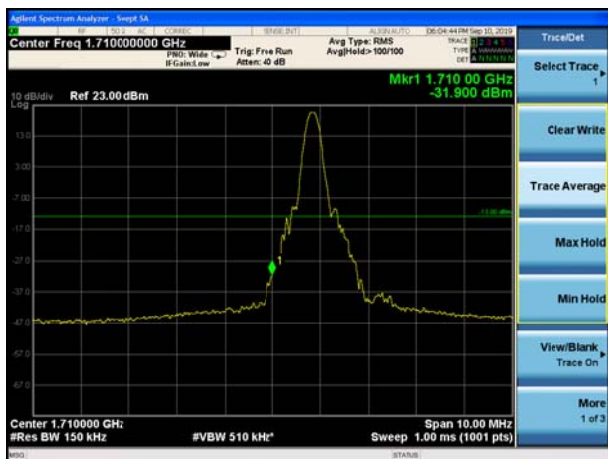
LTE Band 4 QPSK 10MHz CH-Low, 100%RB



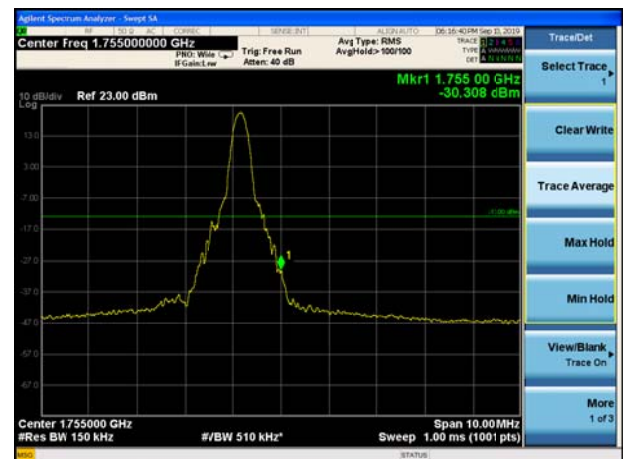
LTE Band 4 QPSK 10MHz CH-High, 100%RB



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

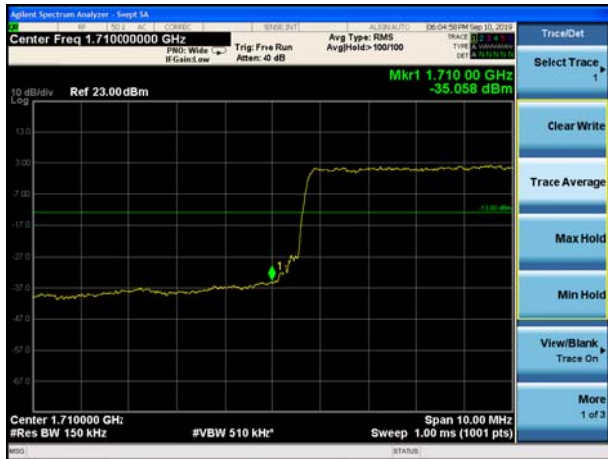


LTE Band 4 QPSK 15MHz CH-High, 1 RB





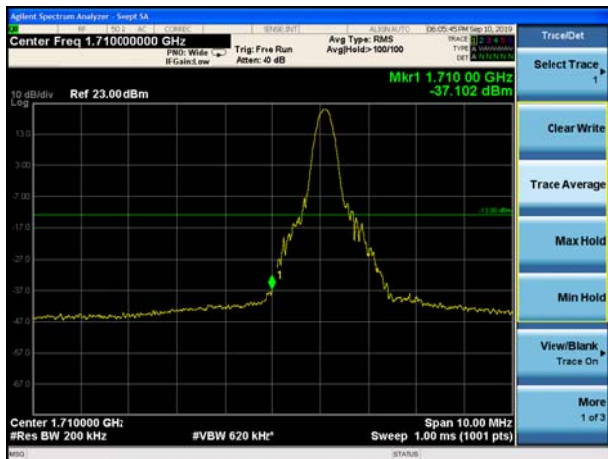
LTE Band 4 QPSK 15MHz CH-Low, 100%RB



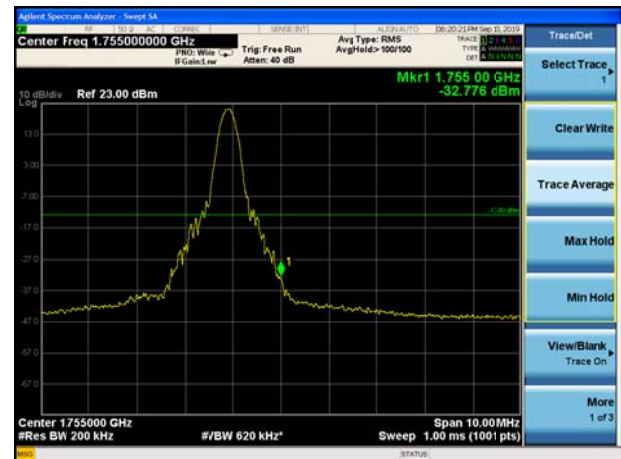
LTE Band 4 QPSK 15MHz CH-High, 100%RB



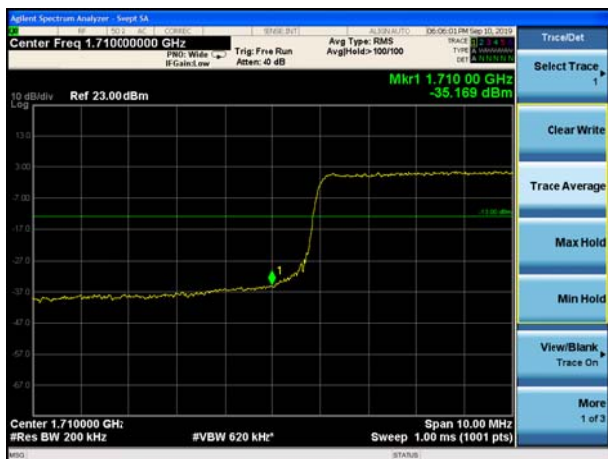
LTE Band 4 QPSK 20MHz CH-Low, 1 RB



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



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

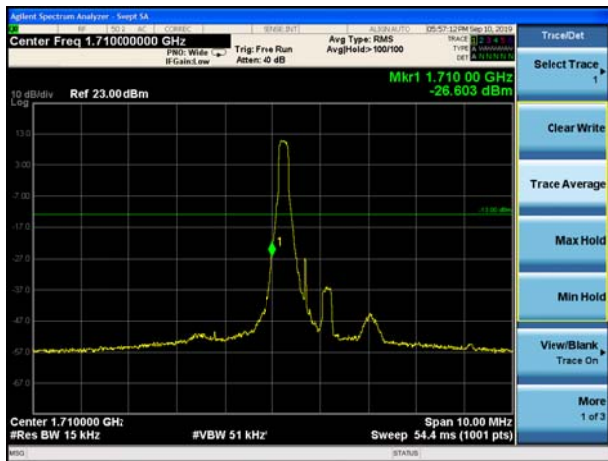


LTE Band 4 QPSK 20MHz CH-High, 100%RB

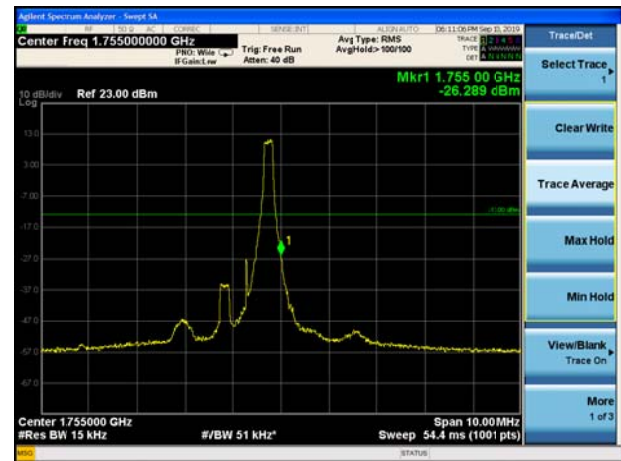




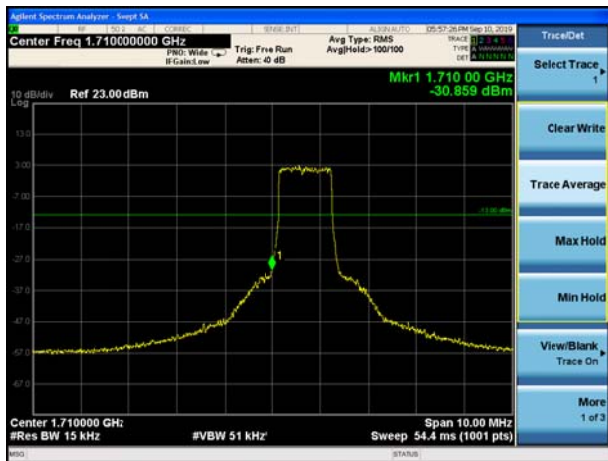
LTE Band 4 16QAM 1.4MHz CH-Low, 1 RB



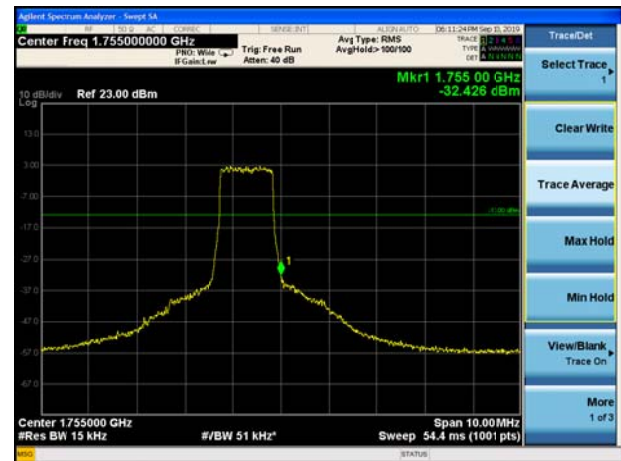
LTE Band 4 16QAM 1.4MHz CH-High, 1 RB



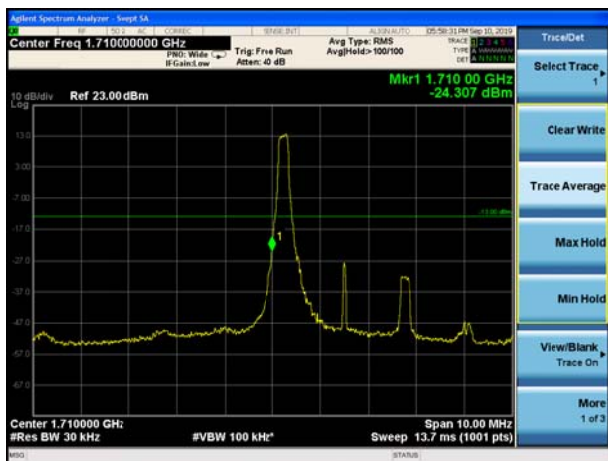
LTE Band 4 16QAM 1.4MHz CH-Low, 100%RB



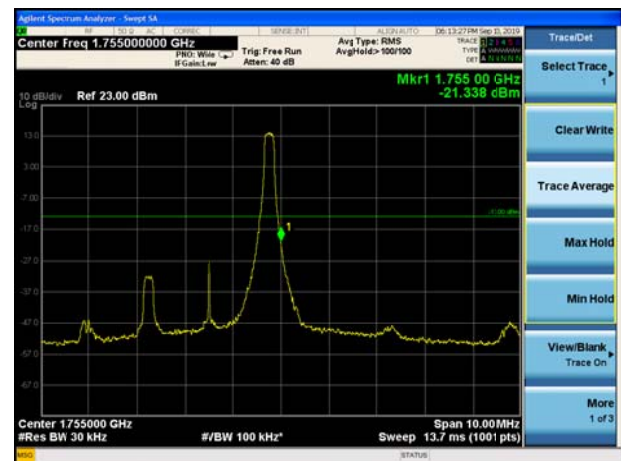
LTE Band 4 16QAM 1.4MHz CH-High, 100%RB



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



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





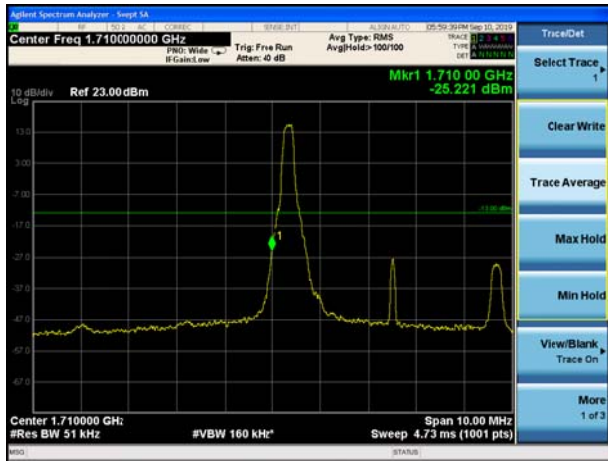
LTE Band 4 16QAM 3MHz CH-Low, 100%RB



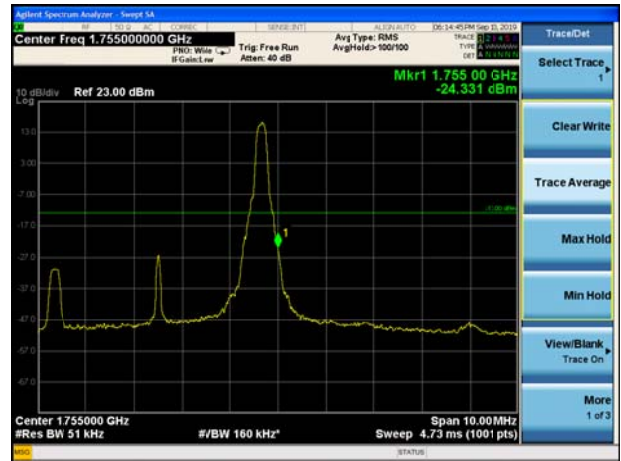
LTE Band 4 16QAM 3MHz CH-High, 100%RB



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

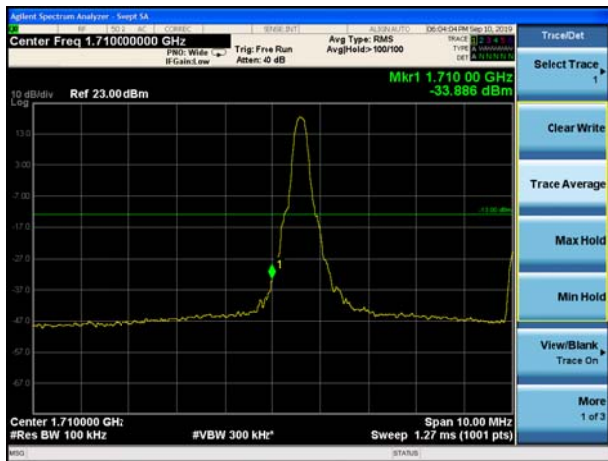


LTE Band 4 16QAM 5MHz CH-High, 100%RB

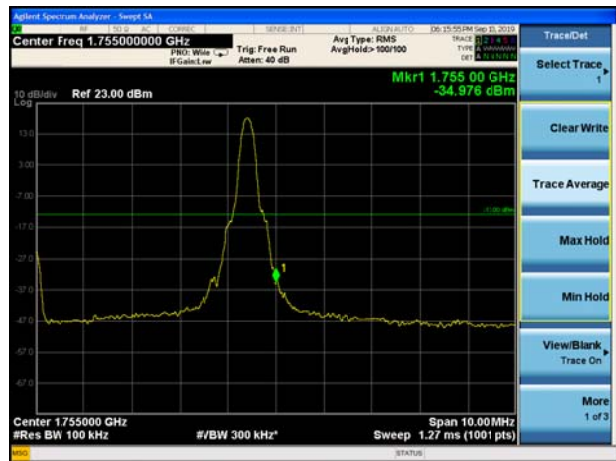




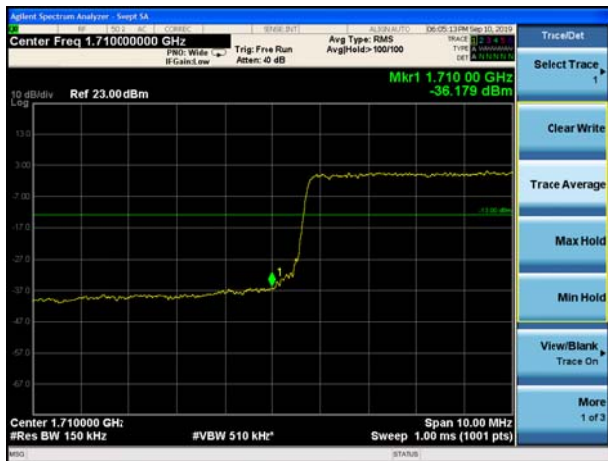
LTE Band 4 16QAM 10MHz CH-Low, 1 RB



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



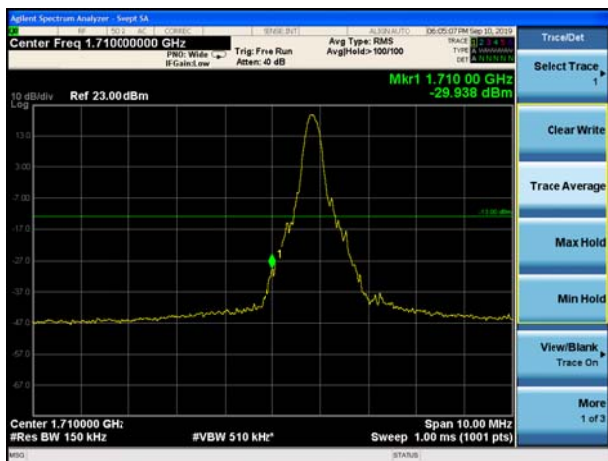
LTE Band 4 16QAM 10MHz CH-Low, 100%RB



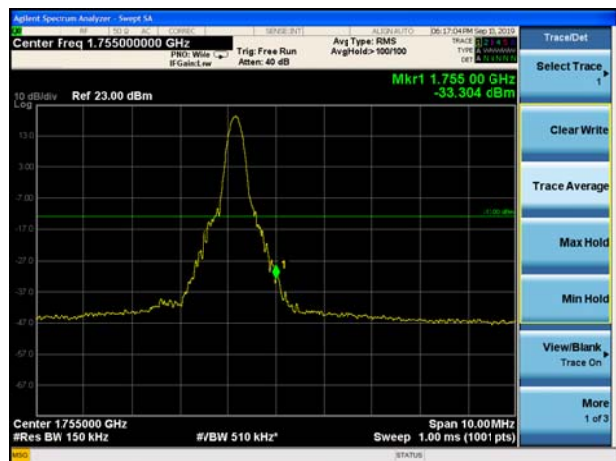
LTE Band 4 16QAM 10MHz CH-High, 100%RB



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

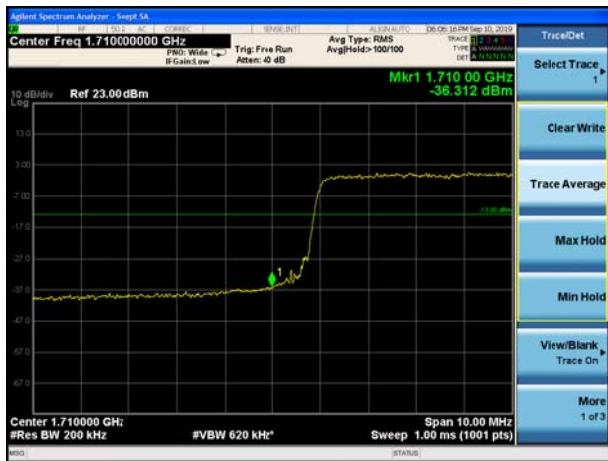


LTE Band 4 16QAM 15MHz CH-High, 1 RB





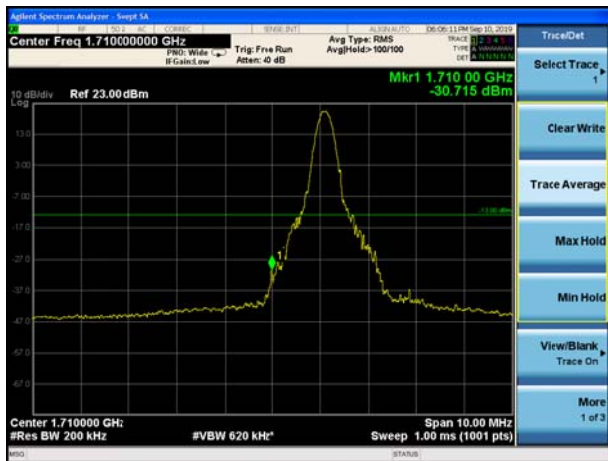
LTE Band 4 16QAM 15MHz CH-Low, 100%RB



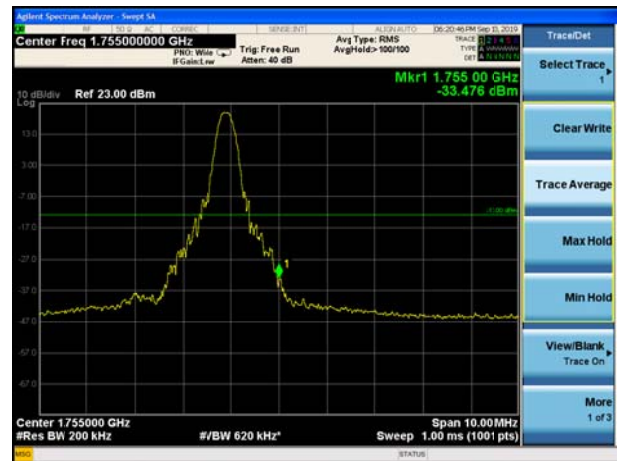
LTE Band 4 16QAM 15MHz CH-High, 100%RB



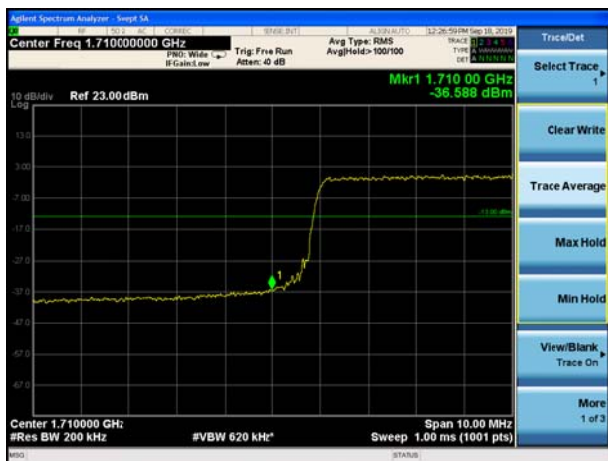
LTE Band 4 16QAM 20MHz CH-Low, 1 RB



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



5.5 Peak-to-Average Power Ratio (PAPR)

Ambient condition

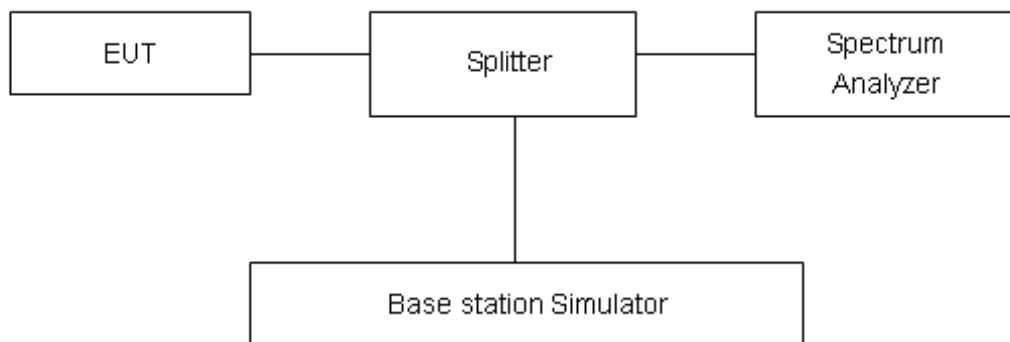
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 the normal 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	26.66	21.90	4.76	≤13	PASS
		20175	1732.5	25.98	21.71	4.27	≤13	PASS
		20393	1754.3	26.06	21.77	4.29	≤13	PASS
	3	19965	1711.5	26.78	22.01	4.77	≤13	PASS
		20175	1732.5	26.24	22.08	4.16	≤13	PASS
		20385	1753.5	25.88	21.74	4.14	≤13	PASS
	5	19975	1712.5	26.75	21.97	4.78	≤13	PASS
		20175	1732.5	26.04	21.80	4.24	≤13	PASS
		20375	1752.5	26.13	21.98	4.15	≤13	PASS
	10	20000	1715	26.87	22.15	4.72	≤13	PASS
		20175	1732.5	25.97	21.78	4.19	≤13	PASS
		20350	1750	26.25	21.92	4.33	≤13	PASS
	15	20025	1717.5	26.85	22.24	4.61	≤13	PASS
		20175	1732.5	25.90	21.64	4.26	≤13	PASS
		20325	1747.5	26.17	21.71	4.46	≤13	PASS
20	20050	1720	26.62	21.98	4.64	≤13	PASS	
	20175	1732.5	26.52	22.34	4.18	≤13	PASS	
	20300	1745	26.47	22.18	4.29	≤13	PASS	
16QAM	1.4	19957	1710.7	27.02	21.46	5.56	≤13	PASS
		20175	1732.5	25.78	20.50	5.28	≤13	PASS
		20393	1754.3	25.86	20.54	5.32	≤13	PASS
	3	19965	1711.5	26.46	20.77	5.69	≤13	PASS
		20175	1732.5	26.37	21.35	5.02	≤13	PASS
		20385	1753.5	25.79	20.71	5.08	≤13	PASS
	5	19975	1712.5	26.33	20.56	5.77	≤13	PASS
		20175	1732.5	25.92	20.86	5.06	≤13	PASS
		20375	1752.5	25.91	20.84	5.07	≤13	PASS
	10	20000	1715	26.27	20.66	5.61	≤13	PASS
		20175	1732.5	26.20	21.17	5.03	≤13	PASS
		20350	1750	25.98	20.62	5.36	≤13	PASS
	15	20025	1717.5	26.53	20.93	5.60	≤13	PASS
		20175	1732.5	26.16	21.09	5.07	≤13	PASS
		20325	1747.5	25.89	20.49	5.40	≤13	PASS
20	20050	1720	26.50	21.02	5.48	≤13	PASS	
	20175	1732.5	26.72	21.85	4.87	≤13	PASS	
	20300	1745	26.62	21.48	5.14	≤13	PASS	

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 -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 -40°C to +85°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

Frequency Stability (Voltage Variation)

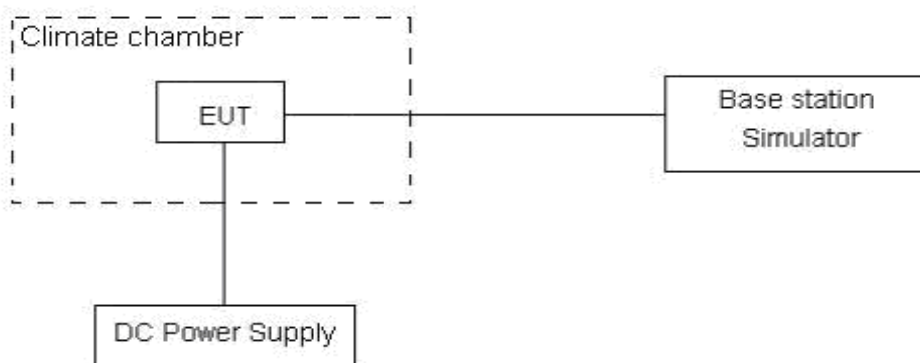
The frequency stability shall be measured with variation of primary supply voltage as follows:

(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 3.3 V and 4.2 V, with a nominal voltage of 3.8V.

Test setup



Limits

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Measurement Uncertainty

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



Test Result

LTE Band 4						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25°C)	Normal	17.42	2.16	0.00927	0.00115	PASS
Extreme (90°C)		17.81	3.82	0.00948	0.00203	PASS
Extreme (80°C)		13.50	4.81	0.00718	0.00256	PASS
Extreme (70°C)		2.79	15.77	0.00148	0.00839	PASS
Extreme (60°C)		14.48	13.09	0.00770	0.00696	PASS
Extreme (50°C)		17.11	14.84	0.00910	0.00789	PASS
Extreme (40°C)		12.30	11.67	0.00654	0.00621	PASS
Extreme (30°C)		16.28	1.96	0.00866	0.00104	PASS
Extreme (20°C)		3.76	4.82	0.00200	0.00257	PASS
Extreme (10°C)		7.85	16.25	0.00418	0.00865	PASS
Extreme (0°C)		3.13	3.48	0.00167	0.00185	PASS
Extreme (-10°C)		9.70	7.84	0.00516	0.00417	PASS
Extreme (-20°C)		4.42	3.18	0.00235	0.00169	PASS
Extreme (-30°C)		13.96	2.64	0.00743	0.00141	PASS
Extreme (-40°C)		1.71	10.14	0.00091	0.00539	PASS
25°C	LV	14.41	1.64	0.00767	0.00087	PASS
	HV	16.72	14.34	0.00889	0.00763	PASS

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.

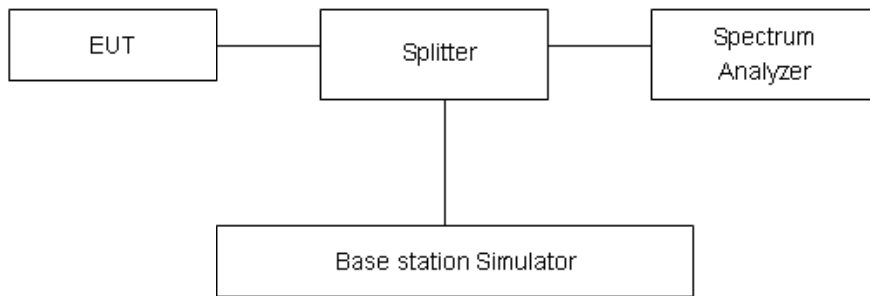
RBW is set to 100kHz, VBW is set to 300kHz for 30MHz~1GHz

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..”

Part 27.53(h)Limit	-13 dBm
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Measurement Uncertainty

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

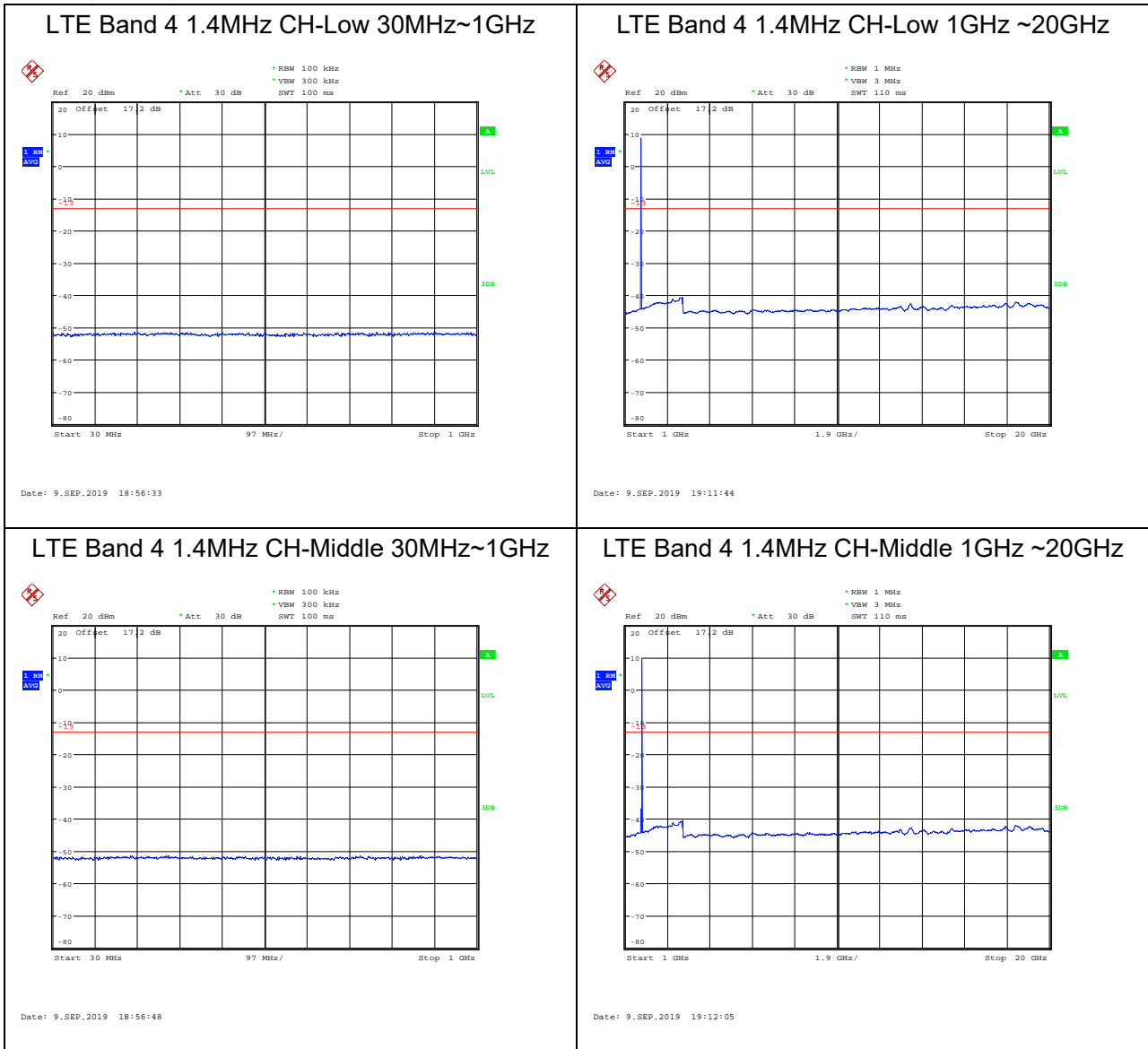
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-27GHz	1.407 dB



Test Result

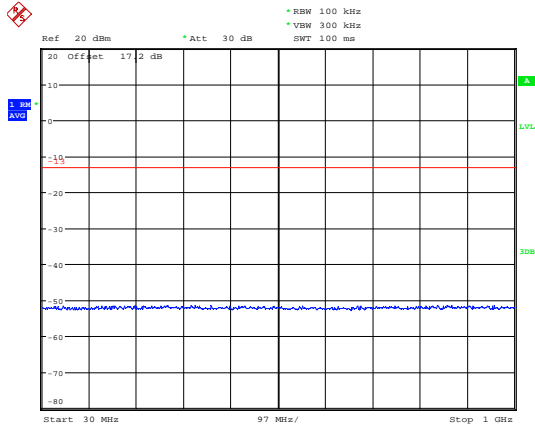
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.



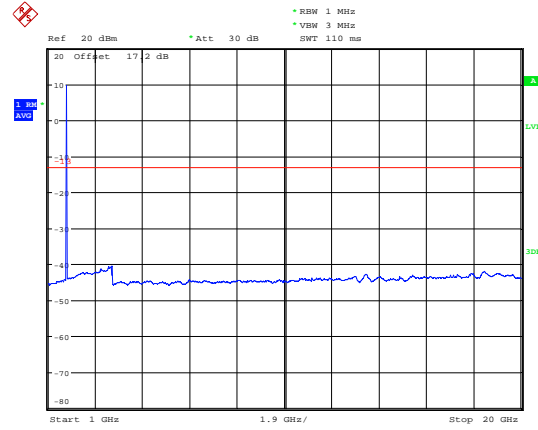


LTE Band 4 1.4MHz CH-High 30MHz~1GHz



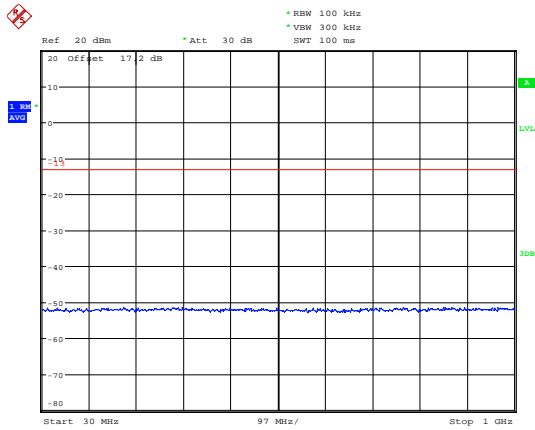
Date: 9.SEP.2019 18:57:10

LTE Band 4 1.4MHz CH-High 1GHz~20GHz



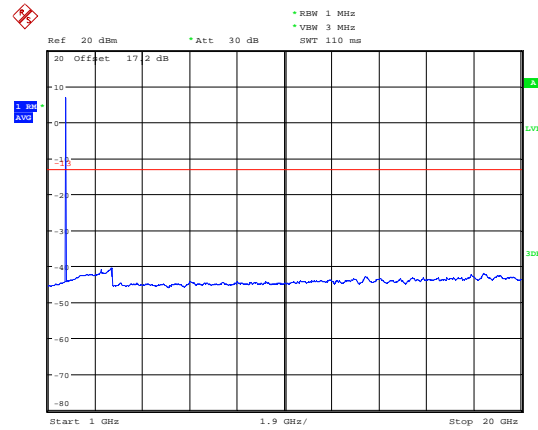
Date: 9.SEP.2019 19:12:16

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



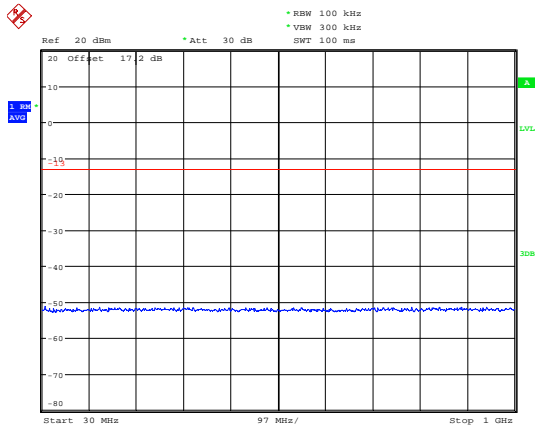
Date: 9.SEP.2019 18:57:27

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



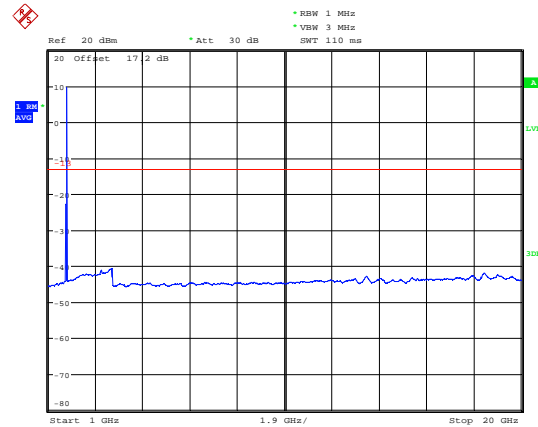
Date: 9.SEP.2019 19:12:33

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



Date: 9.SEP.2019 18:57:38

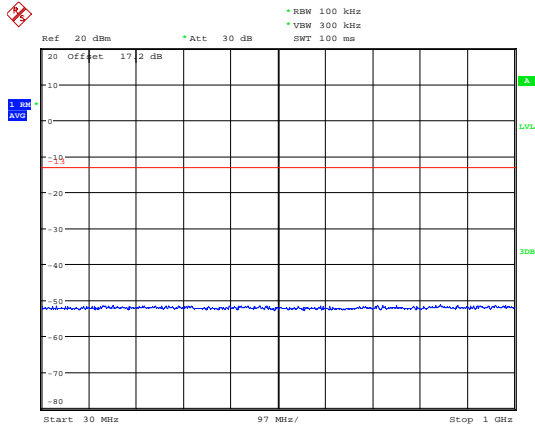
LTE Band 4 3MHz CH-Middle 1GHz~20GHz



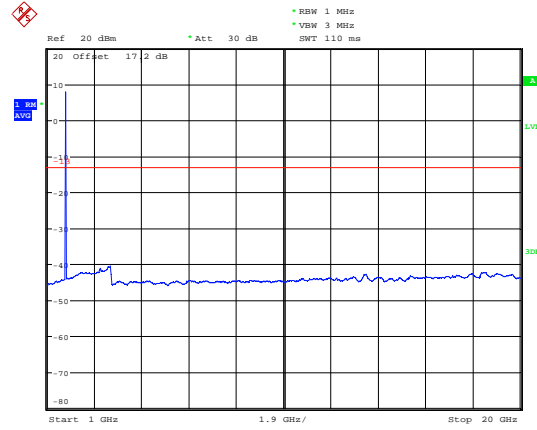
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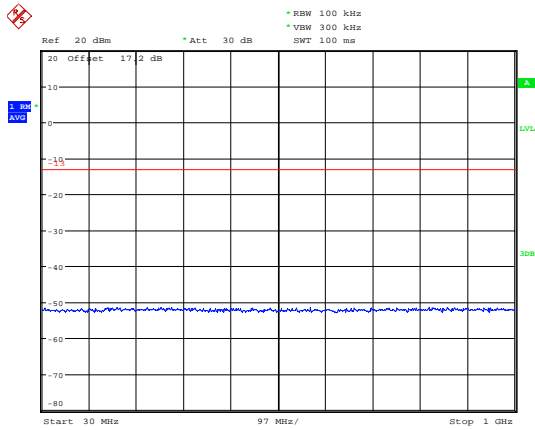
LTE Band 4 3MHz CH-High 30MHz~1GHz



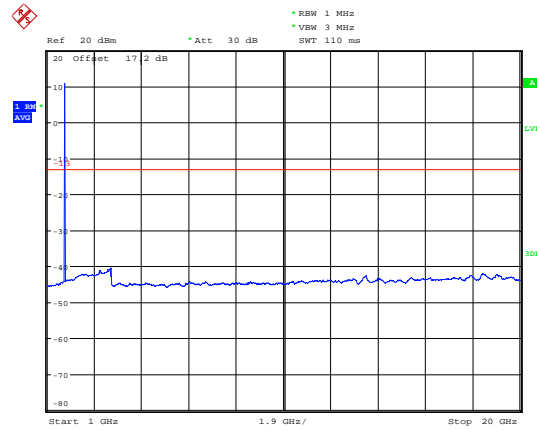
LTE Band 4 3MHz CH-High 1GHz ~20GHz



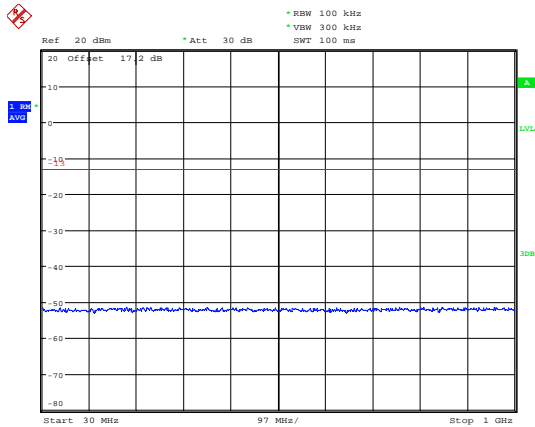
LTE Band 4 5MHz CH-Low 30MHz~1GHz



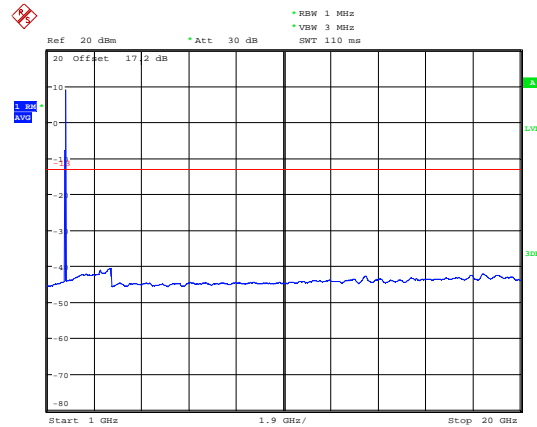
LTE Band 4 5MHz CH-Low 1GHz ~20GHz



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

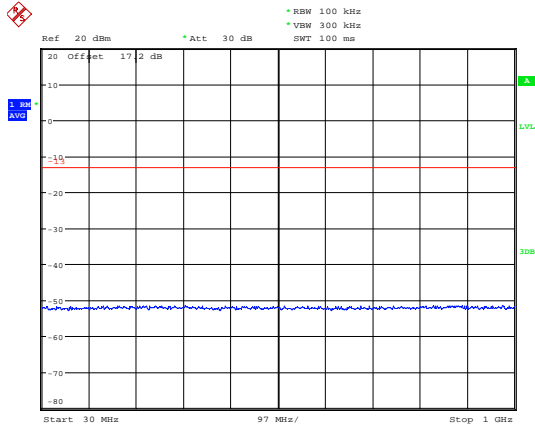


LTE Band 4 5MHz CH-Middle 1GHz ~20GHz



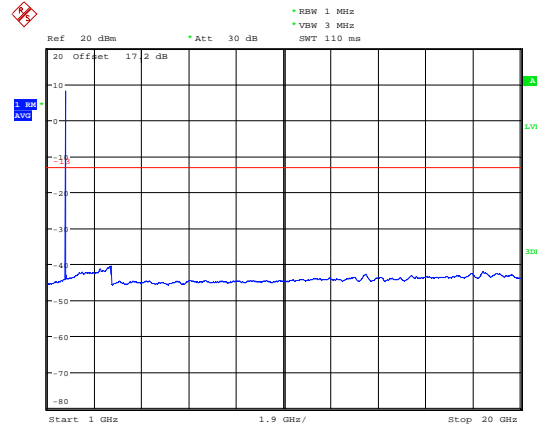


LTE Band 4 5MHz CH-High 30MHz~1GHz



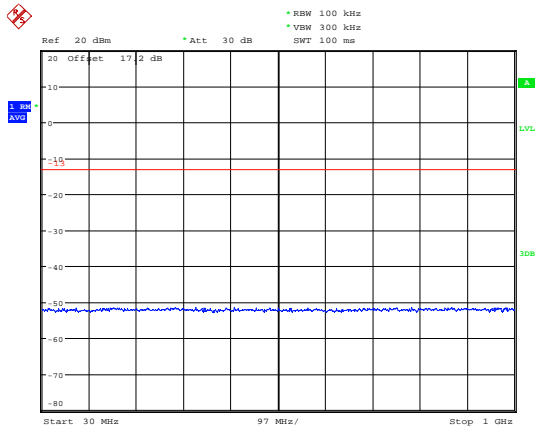
Date: 9.SEP.2019 18:58:52

LTE Band 4 5MHz CH-High 1GHz ~20GHz



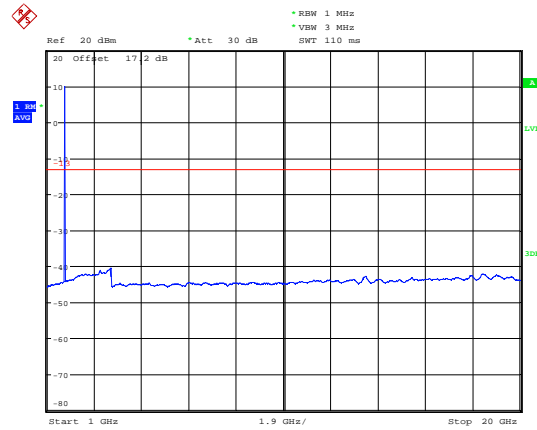
Date: 9.SEP.2019 19:14:23

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



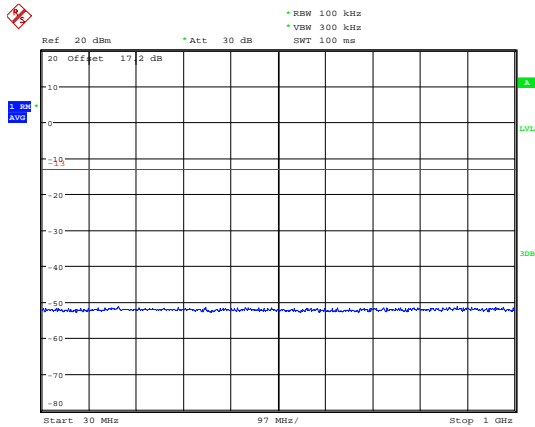
Date: 9.SEP.2019 18:59:57

LTE Band 4 10MHz CH-Low 1GHz ~20GHz



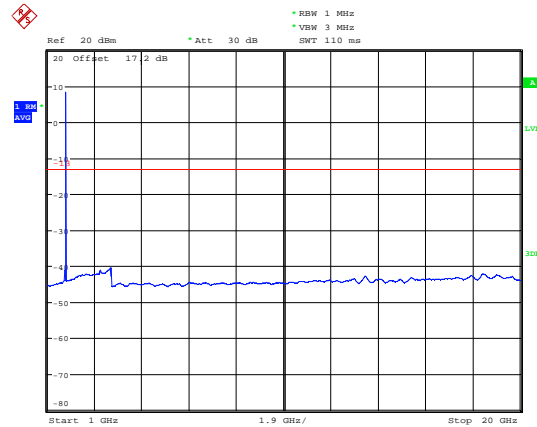
Date: 9.SEP.2019 19:15:41

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



Date: 9.SEP.2019 19:00:18

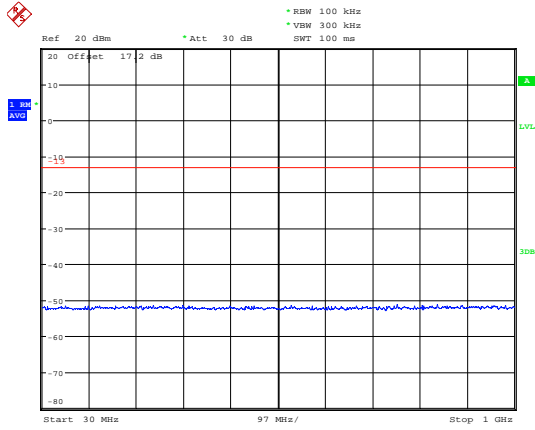
LTE Band 4 10MHz CH-Middle 1GHz ~20GHz



Date: 9.SEP.2019 19:16:03

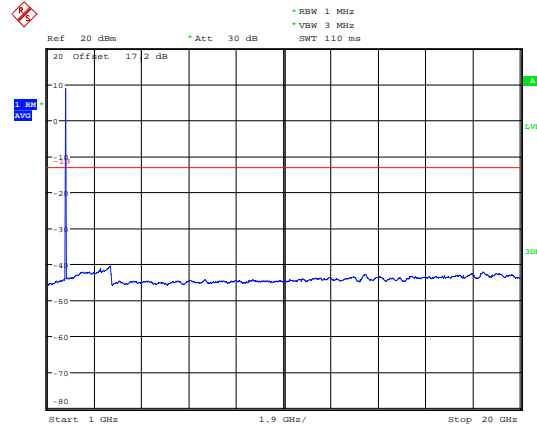


LTE Band 4 10MHz CH-High 30MHz~1GHz



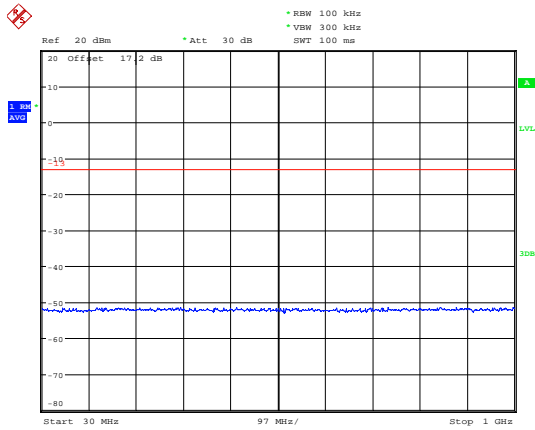
Date: 9.SEP.2019 19:00:29

LTE Band 4 10MHz CH-High 1GHz ~20GHz



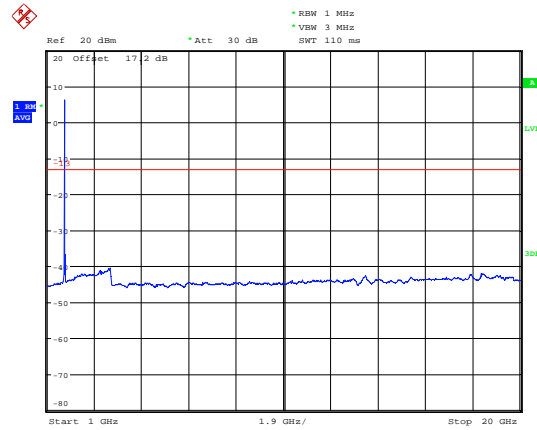
Date: 9.SEP.2019 19:16:17

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



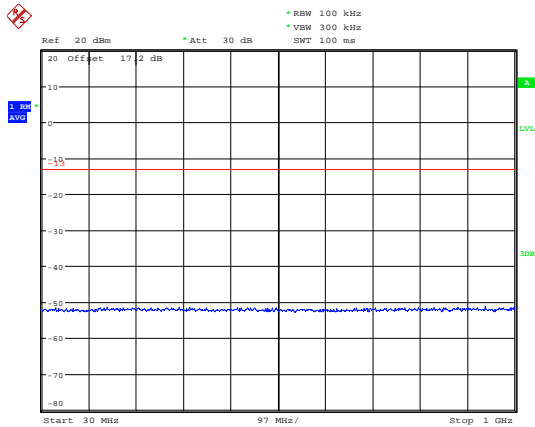
Date: 9.SEP.2019 19:01:23

LTE Band 4 15MHz CH-Low 1GHz ~20GHz



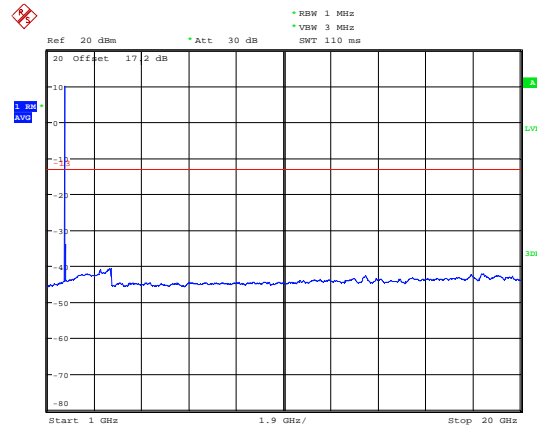
Date: 9.SEP.2019 19:18:43

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



Date: 9.SEP.2019 19:02:14

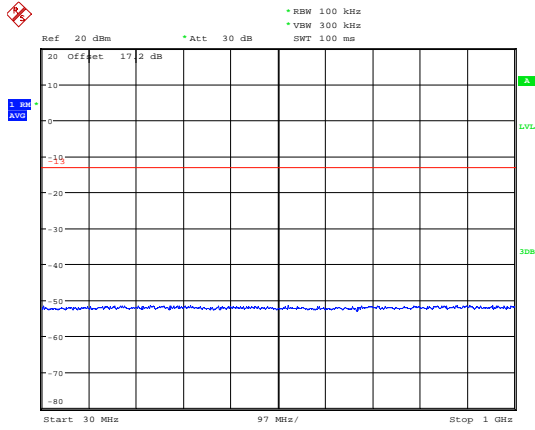
LTE Band 4 15MHz CH-Middle 1GHz ~20GHz



Date: 9.SEP.2019 19:19:09

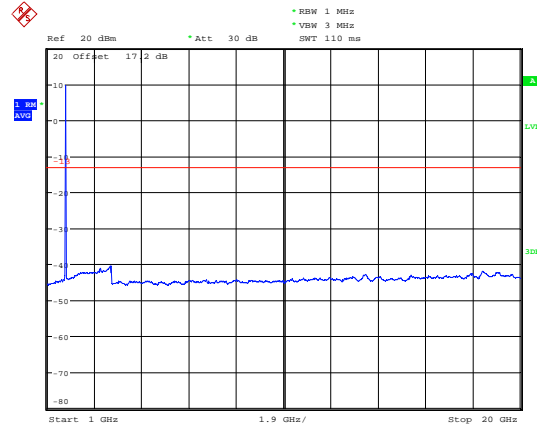


LTE Band 4 15MHz CH-High 30MHz~1GHz



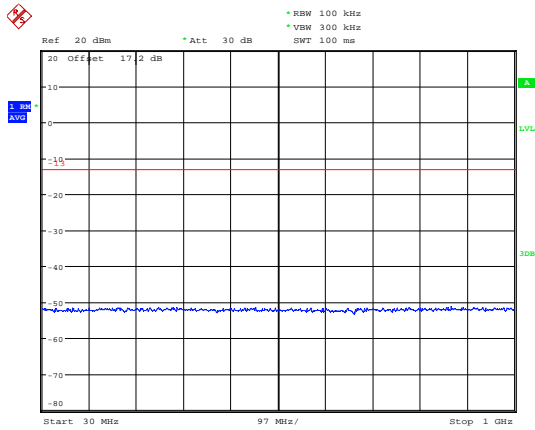
Date: 9.SEP.2019 19:02:22

LTE Band 4 15MHz CH-High 1GHz ~20GHz



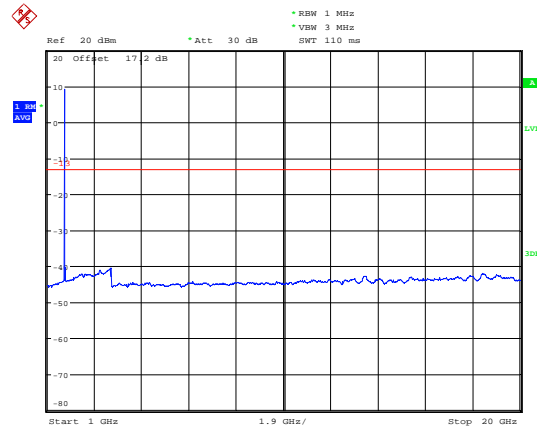
Date: 9.SEP.2019 19:19:26

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



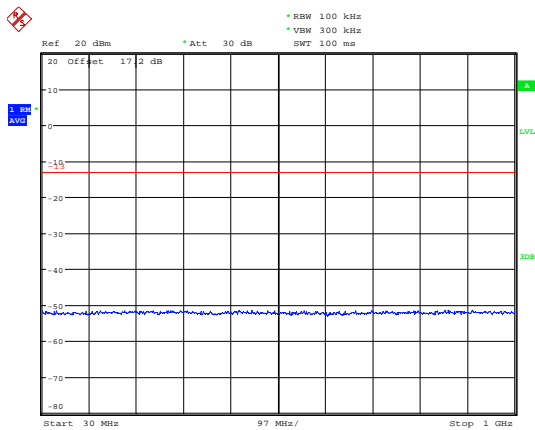
Date: 9.SEP.2019 19:02:37

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



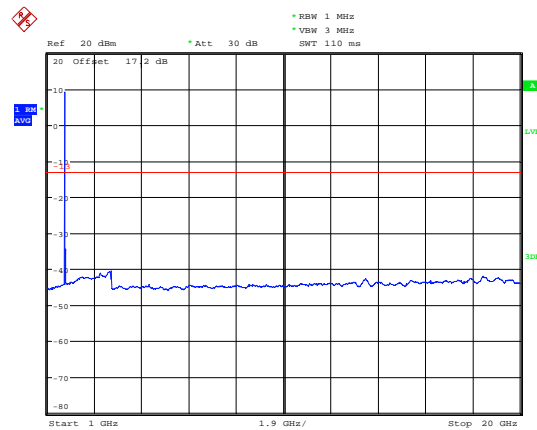
Date: 9.SEP.2019 19:19:47

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



Date: 9.SEP.2019 19:02:52

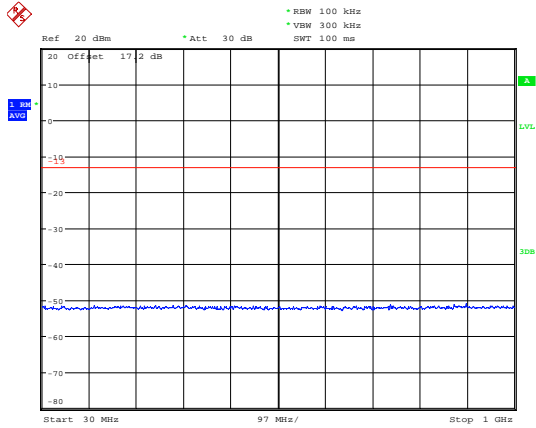
LTE Band 4 20MHz CH-Middle 1GHz ~20GHz



Date: 9.SEP.2019 19:19:59

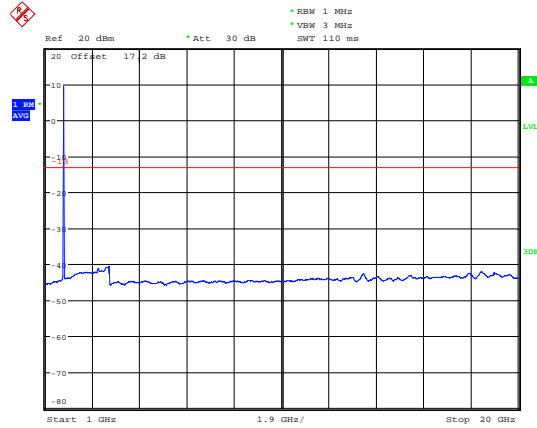


LTE Band 4 20MHz CH-High 30MHz~1GHz



Date: 9.SEP.2019 19:03:02

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



Date: 9.SEP.2019 19:20:15

5.8 Radiates Spurious Emission

Ambient condition

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

Method of Measurement

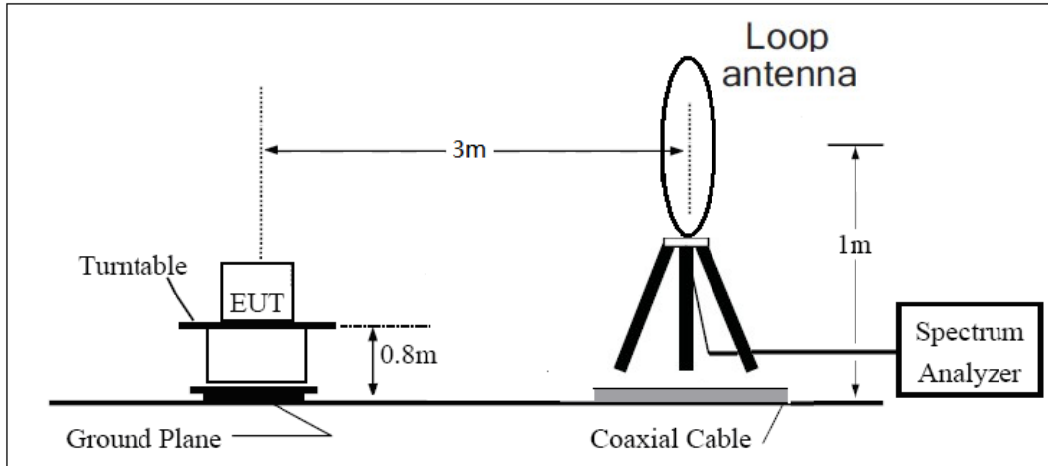
1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable 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 loop antenna, 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=200Hz,VBW=600Hz for 9kHz150kHz , RBW=10kHz, VBW=30kHz 150kHz-30MHz ,RBW=100kHz,VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 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.

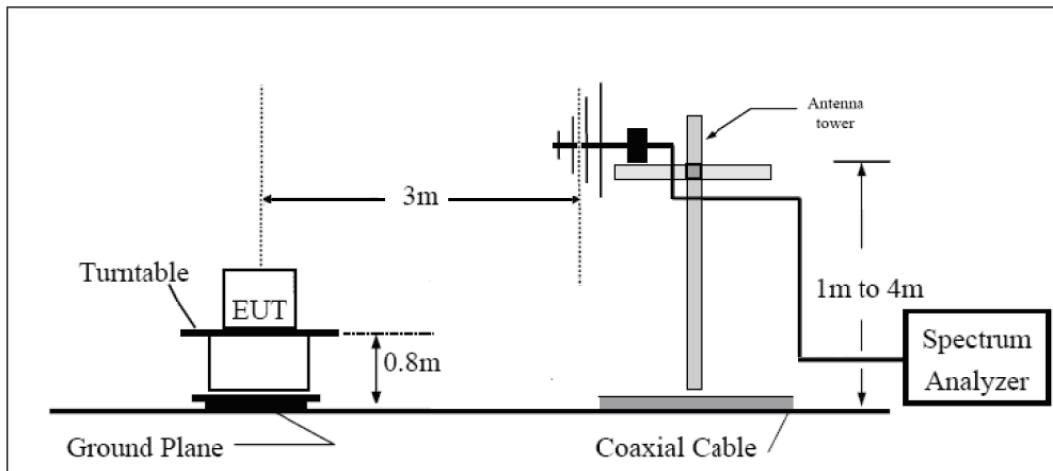
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

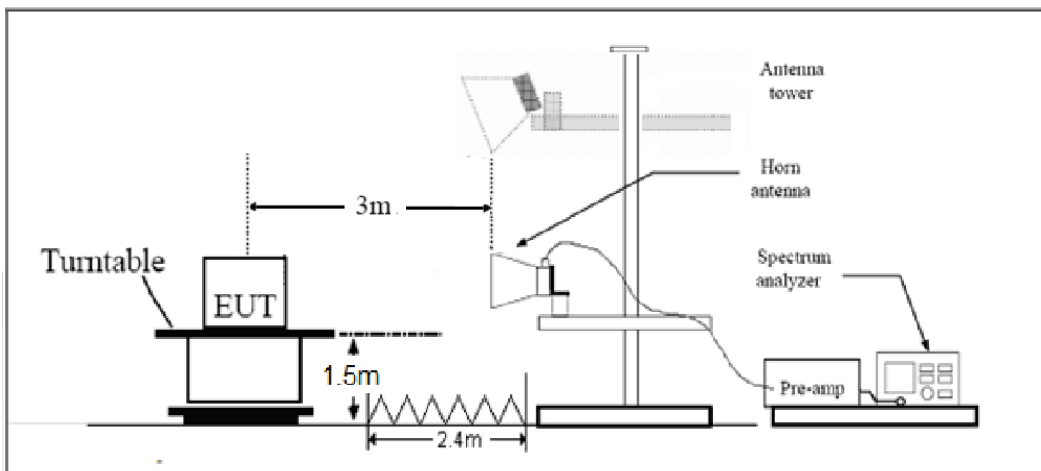
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m



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(h) Limit	-13 dBm
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Measurement Uncertainty

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

**Test Result**

Sweep the whole frequency band through the range from 9kHz 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-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	-66.52	2.6	10.75	Horizontal	-58.37	-13.00	45.37	225
3	5197.5	-58.42	2.4	11.05	Horizontal	-49.77	-13.00	36.77	315
4	6930.0	-57.23	4.5	11.15	Horizontal	-50.58	-13.00	37.58	45
5	8662.5	-55.77	5.1	11.35	Horizontal	-49.52	-13.00	36.52	90
6	10395.0	-55.57	5.3	11.95	Horizontal	-48.92	-13.00	35.92	315
7	12127.5	-55.42	5.5	13.55	Horizontal	-47.37	-13.00	34.37	90
8	13860.0	-52.25	6.3	13.75	Horizontal	-44.80	-13.00	31.80	45
9	15592.5	-54.75	6.7	13.85	Horizontal	-47.60	-13.00	34.60	0
10	17325.0	-51.96	6.8	14.25	Horizontal	-44.51	-13.00	31.51	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-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	-67.38	2.6	10.75	Horizontal	-59.23	-13.00	46.23	225
3	5191.5	-58.38	2.4	11.05	Horizontal	-49.73	-13.00	36.73	135
4	6930.0	-57.86	4.5	11.15	Horizontal	-51.21	-13.00	38.21	45
5	8662.5	-57.10	5.1	11.35	Horizontal	-50.85	-13.00	37.85	90
6	10395.0	-55.38	5.3	11.95	Horizontal	-48.73	-13.00	35.73	225
7	12127.5	-54.73	5.5	13.55	Horizontal	-46.68	-13.00	33.68	315
8	13860.0	-51.93	6.3	13.75	Horizontal	-44.48	-13.00	31.48	45
9	15592.5	-54.84	6.7	13.85	Horizontal	-47.69	-13.00	34.69	0
10	17325.0	-52.42	6.8	14.25	Horizontal	-44.97	-13.00	31.97	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.



TE 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	3447.0	-62.95	2.6	10.75	Horizontal	-54.80	-13.00	41.80	315
3	5170.5	-56.24	2.4	11.05	Horizontal	-47.59	-13.00	34.59	135
4	6930.0	-59.43	4.5	11.15	Horizontal	-52.78	-13.00	39.78	90
5	8662.5	-57.01	5.1	11.35	Horizontal	-50.76	-13.00	37.76	225
6	10395.0	-57.11	5.3	11.95	Horizontal	-50.46	-13.00	37.46	315
7	12127.5	-55.62	5.5	13.55	Horizontal	-47.57	-13.00	34.57	270
8	13860.0	-52.90	6.3	13.75	Horizontal	-45.45	-13.00	32.45	0
9	15592.5	-54.82	6.7	13.85	Horizontal	-47.67	-13.00	34.67	180
10	17325.0	-52.81	6.8	14.25	Horizontal	-45.36	-13.00	32.36	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.



6 Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMW500	113824	2019-05-19	2020-05-18
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2019-05-19	2020-05-18
Signal Analyzer	R&S	FSV30	100815	2018-12-16	2019-12-15
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2017-09-26	2020-09-25
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
Horn Antenna	STEATITE	QSH-SL-26-40-K-15	16779	2017-07-20	2020-07-19
Signal generator	R&S	SMB 100A	102594	2019-05-19	2020-05-18
Climatic Chamber	ESPEC	SU-242	93000506	2017-12-17	2020-12-16
Preamplifier	R&S	SCU18	102327	2019-05-19	2020-05-18
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2019-05-19	2020-05-18
RF Cable	Agilent	SMA 15cm	0001	2019-06-14	2020-09-13
Software	R&S	EMC32	9.26.0	/	/

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



ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.



ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.



ANNEX C: Product Change Description

The Product Change Description are submitted separately.