RF TEST REPORT

Applicant	ZTE Corporation
FCC ID	SRQ-MF928
Product	LTE ufi Hotspot
Model	MF928
Report No.	R2006A0416-R1
Issue Date	July 16, 2020

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2019)/ FCC CFR 47 Part 22H (2019)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Peng Tao

Performed by: Peng Tao

Kai Xu

Approved by: Kai Xu

TA Technology (Shanghai) Co., Ltd.

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TABLE OF CONTENT

Summary of measurement results

No.	Test Case	Clause in FCC rules	Verdict
1	RF Power Output and Effective Radiated Power	2.1046 22.913(a)(5)	PASS
2	Occupied Bandwidth	2.1049	PASS
3	Band Edge Compliance	2.1051 / 22.917(a)	PASS
4	Peak-to-Average Power Ratio	22.913(d)/ KDB 971168 D01(5.7)	PASS
5	Frequency Stability	2.1055 / 22.355	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 / 22.917(a)	PASS
7	Radiates Spurious Emission	2.1053 / 22.917 (a)	PASS
Date of Testing: March 9, 2018 ~ March 27, 2018 and June 23, 2020 ~ July 14, 2020			
Note: All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

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
City:	Shanghai
Post code:	201201
Country:	P. R. China
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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

2.3. Applicant and Manufacturer Information

Applicant	ZTE Corporation
Applicant address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
Manufacturer	ZTE Corporation
Manufacturer address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

2.4. General Information

EUT Description			
Model	MF928		
IMEI	866987050000794		
Hardware Version	MF928-1.0.0		
Software Version	BD_RWMF928V0.0.0B02		
Power Supply	Battery/AC adapter		
Antenna Type	Internal Antenna		
Antenna Gain	1.02 dBi		
Test Mode(s)	LTE Band 5;		
Test Modulation	QPSK 16QAM;		
LTE Category	4		
Maximum E.R.P.	LTE Band 5:	23.15dBm	
Rated Power Supply Voltage	3.8V		
Extreme Voltage	Minimum: 3.4V Maximum: 4.35V		
Extreme Temperature	Lowest: -20°C Highest: +55°C		
Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	LTE Band 5	824 ~ 849	869 ~ 894
EUT Accessory			
Adapter 1	Manufacturer: DONGGUAN AOHAI POWER TECHNOLOGY CO., LTD. Model: STC-A51D-Z		
Adapter 2	Manufacturer: SHENZHEN RUIJING INDUSTRIAL CO LTD Model: STC-A51D-Z		
Battery	Manufacturer: HARBIN COSLIGHT POWER CO LTD Model: Li3820T43P3h715345		
USB Cable 1	Manufacturer: LUXSHARE-ICT 100cm Cable, Shielded		
USB Cable 2	Manufacturer: kingpower-tech 100cm Cable, Shielded		

Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.
2. There is more than USB cable, each one should be applied throughout the compliance test respectively, and however, only the worst case (USB cable 1) will be recorded in this report.

3. Applied Standards

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

Test standards:
FCC CFR 47 Part 22H (2019)

ANSI C63.26 (2015)

Reference standard:

FCC CFR47 Part 2 (2019)

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 (Z axis, horizontal polarization) and the worst case was recorded.

All mode and data rates and positions were investigated. Subsequently, only the worst case emissions are reported.
The following testing in LTE is set based on the maximum RF Output Power.
Test modes are chosen to be reported as the worst case configuration below:

Test modes are chosen as the worst case configuration below for LTE Band 5.

Test items	Bandwidth (MHz)				Modulation		RB			Test Channel		
	1.4	3	5	10	QPSK	16QAM	1	50%	100%	L	M	H
RF power output and Effective Radiated power	O	O	O	O	O	O	O	O	O	O	O	O
Occupied Bandwidth	O	O	O	O	O	O	-	-	O	O	O	O
Band Edge Compliance	O	O	O	O	O	O	O	-	O	O	-	O
Peak-to-Average Power Ratio	O	O	O	O	O	O	-	-	O	O	O	O
Frequency Stability	O	O	O	O	O	O	O	O	O	O	O	O
Spurious Emissions at Antenna Terminals	O	O	O	O	O	-	-	-	O	O	O	O
Radiates Spurious Emission	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 and Effective Radiated Power

Ambient condition

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

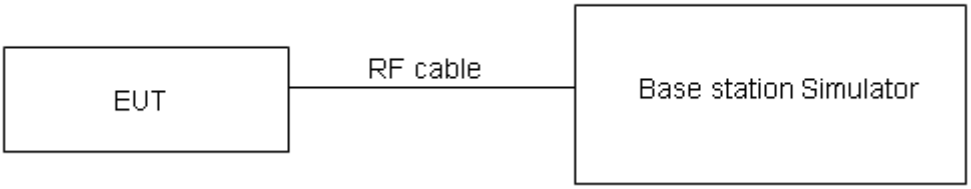
Methods of Measurement

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

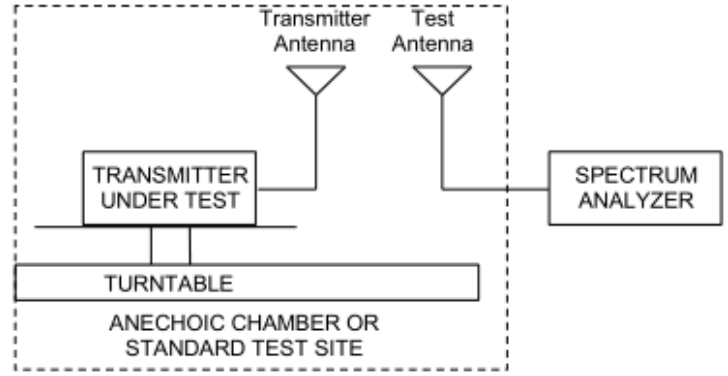
The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
a) Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a 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 (dBi)
where:dBd refers to gain relative to an ideal dipole.
EIRP (dBm) = ERP (dBm) + 2.15 (dB.)

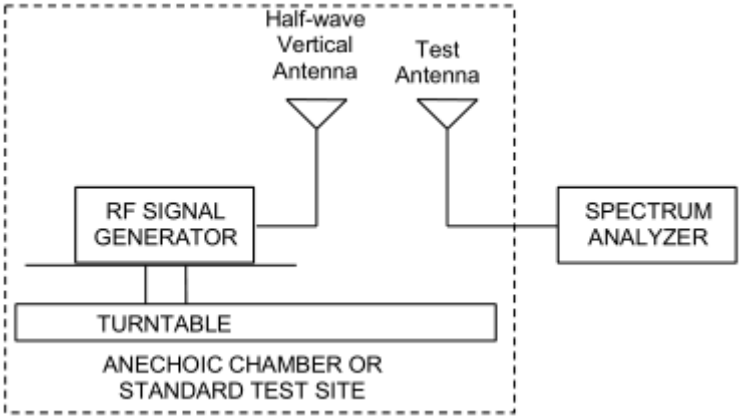
The RB allocation refers to section 5.1, using the maximum output power configuration.

Test Setup



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.

Rule Part 22.913(a)(5) specifies that "Mobile/portable stations are limited to 7 watts ERP".

Limit	≤ 7 W (38.45 dBm)

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 for RF power output, *k* = 2, *U*= 1.19 dB for ERP .

Test Results

Band	Bandwidth (MHz)	UL Channel	RB Size	RB Position	Modulation	Power (dBm)	ERP (dBm)
LTE Band5	1.4	20407	1	#0	QPSK	24.04	22.91
LTE Band5	1.4	20407	1	#Mid	QPSK	24.24	23.11
LTE Band5	1.4	20407	1	#Max	QPSK	24.10	22.97
LTE Band5	1.4	20407	3	#0	QPSK	24.03	22.90
LTE Band5	1.4	20407	3	#Mid	QPSK	24.02	22.89
LTE Band5	1.4	20407	3	#Max	QPSK	24.03	22.90
LTE Band5	1.4	20407	6	#0	QPSK	22.85	21.72
LTE Band5	1.4	20407	1	#0	QAM16	23.11	21.98
LTE Band5	1.4	20407	1	#Mid	QAM16	23.22	22.09
LTE Band5	1.4	20407	1	#Max	QAM16	23.04	21.91
LTE Band5	1.4	20407	3	#0	QAM16	23.02	21.89
LTE Band5	1.4	20407	3	#Mid	QAM16	23.02	21.89
LTE Band5	1.4	20407	3	#Max	QAM16	23.05	21.92
LTE Band5	1.4	20407	6	#0	QAM16	21.75	20.62
LTE Band5	1.4	20525	1	#0	QPSK	23.75	22.62
LTE Band5	1.4	20525	1	#Mid	QPSK	23.79	22.66
LTE Band5	1.4	20525	1	#Max	QPSK	23.67	22.54
LTE Band5	1.4	20525	3	#0	QPSK	23.72	22.59
LTE Band5	1.4	20525	3	#Mid	QPSK	23.72	22.59
LTE Band5	1.4	20525	3	#Max	QPSK	23.66	22.53
LTE Band5	1.4	20525	6	#0	QPSK	22.75	21.62
LTE Band5	1.4	20525	1	#0	QAM16	22.97	21.84
LTE Band5	1.4	20525	1	#Mid	QAM16	23.17	22.04
LTE Band5	1.4	20525	1	#Max	QAM16	23.03	21.9
LTE Band5	1.4	20525	3	#0	QAM16	22.81	21.68
LTE Band5	1.4	20525	3	#Mid	QAM16	22.75	21.62
LTE Band5	1.4	20525	3	#Max	QAM16	22.78	21.65
LTE Band5	1.4	20525	6	#0	QAM16	21.80	20.67
LTE Band5	1.4	20643	1	#0	QPSK	23.79	22.66
LTE Band5	1.4	20643	1	#Mid	QPSK	23.94	22.81
LTE Band5	1.4	20643	1	#Max	QPSK	23.77	22.64
LTE Band5	1.4	20643	3	#0	QPSK	23.76	22.63
LTE Band5	1.4	20643	3	#Mid	QPSK	23.76	22.63
LTE Band5	1.4	20643	3	#Max	QPSK	23.77	22.64
LTE Band5	1.4	20643	6	#0	QPSK	22.93	21.80
LTE Band5	1.4	20643	1	#0	QAM16	22.42	21.29
LTE Band5	1.4	20643	1	#Mid	QAM16	22.54	21.41
LTE Band5	1.4	20643	1	#Max	QAM16	22.44	21.31
LTE Band5	1.4	20643	3	#0	QAM16	22.80	21.67

LTE Band5	1.4	20643	3	#Mid	QAM16	22.81	21.68
LTE Band5	1.4	20643	3	#Max	QAM16	22.68	21.55
LTE Band5	1.4	20643	6	#0	QAM16	21.98	20.85
LTE Band5	3	20415	1	#0	QPSK	23.64	22.51
LTE Band5	3	20415	1	#Mid	QPSK	23.65	22.52
LTE Band5	3	20415	1	#Max	QPSK	23.56	22.43
LTE Band5	3	20415	8	#0	QPSK	22.96	21.83
LTE Band5	3	20415	8	#Mid	QPSK	22.96	21.83
LTE Band5	3	20415	8	#Max	QPSK	22.95	21.82
LTE Band5	3	20415	15	#0	QPSK	22.92	21.79
LTE Band5	3	20415	1	#0	QAM16	22.85	21.72
LTE Band5	3	20415	1	#Mid	QAM16	22.86	21.73
LTE Band5	3	20415	1	#Max	QAM16	22.69	21.56
LTE Band5	3	20415	8	#0	QAM16	21.71	20.58
LTE Band5	3	20415	8	#Mid	QAM16	22.10	20.97
LTE Band5	3	20415	8	#Max	QAM16	22.09	20.96
LTE Band5	3	20415	15	#0	QAM16	21.92	20.79
LTE Band5	3	20525	1	#0	QPSK	23.81	22.68
LTE Band5	3	20525	1	#Mid	QPSK	23.71	22.58
LTE Band5	3	20525	1	#Max	QPSK	23.56	22.43
LTE Band5	3	20525	8	#0	QPSK	22.90	21.77
LTE Band5	3	20525	8	#Mid	QPSK	22.91	21.78
LTE Band5	3	20525	8	#Max	QPSK	22.79	21.66
LTE Band5	3	20525	15	#0	QPSK	22.90	21.77
LTE Band5	3	20525	1	#0	QAM16	23.29	22.16
LTE Band5	3	20525	1	#Mid	QAM16	23.35	22.22
LTE Band5	3	20525	1	#Max	QAM16	23.44	22.31
LTE Band5	3	20525	8	#0	QAM16	22.00	20.87
LTE Band5	3	20525	8	#Mid	QAM16	22.01	20.88
LTE Band5	3	20525	8	#Max	QAM16	21.76	20.63
LTE Band5	3	20525	15	#0	QAM16	21.65	20.52
LTE Band5	3	20635	1	#0	QPSK	23.75	22.62
LTE Band5	3	20635	1	#Mid	QPSK	23.81	22.68
LTE Band5	3	20635	1	#Max	QPSK	23.81	22.68
LTE Band5	3	20635	8	#0	QPSK	22.83	21.70
LTE Band5	3	20635	8	#Mid	QPSK	22.83	21.70
LTE Band5	3	20635	8	#Max	QPSK	22.88	21.75
LTE Band5	3	20635	15	#0	QPSK	22.91	21.78
LTE Band5	3	20635	1	#0	QAM16	22.63	21.50
LTE Band5	3	20635	1	#Mid	QAM16	22.62	21.49
LTE Band5	3	20635	1	#Max	QAM16	22.66	21.53
LTE Band5	3	20635	8	#0	QAM16	21.64	20.51
LTE Band5	3	20635	8	#Mid	QAM16	21.64	20.51

LTE Band5	3	20635	8	#Max	QAM16	21.65	20.52
LTE Band5	3	20635	15	#0	QAM16	21.81	20.68
LTE Band5	5	20425	1	#0	QPSK	23.76	22.63
LTE Band5	5	20425	1	#Mid	QPSK	23.81	22.68
LTE Band5	5	20425	1	#Max	QPSK	23.85	22.72
LTE Band5	5	20425	12	#0	QPSK	22.94	21.81
LTE Band5	5	20425	12	#Mid	QPSK	22.95	21.82
LTE Band5	5	20425	12	#Max	QPSK	22.90	21.77
LTE Band5	5	20425	25	#0	QPSK	22.89	21.76
LTE Band5	5	20425	1	#0	QAM16	22.84	21.71
LTE Band5	5	20425	1	#Mid	QAM16	22.76	21.63
LTE Band5	5	20425	1	#Max	QAM16	22.57	21.44
LTE Band5	5	20425	12	#0	QAM16	21.75	20.62
LTE Band5	5	20425	12	#Mid	QAM16	21.76	20.63
LTE Band5	5	20425	12	#Max	QAM16	21.61	20.48
LTE Band5	5	20425	25	#0	QAM16	21.83	20.70
LTE Band5	5	20525	1	#0	QPSK	23.76	22.63
LTE Band5	5	20525	1	#Mid	QPSK	23.80	22.67
LTE Band5	5	20525	1	#Max	QPSK	23.70	22.57
LTE Band5	5	20525	12	#0	QPSK	22.90	21.77
LTE Band5	5	20525	12	#Mid	QPSK	22.91	21.78
LTE Band5	5	20525	12	#Max	QPSK	22.82	21.69
LTE Band5	5	20525	25	#0	QPSK	22.85	21.72
LTE Band5	5	20525	1	#0	QAM16	22.93	21.80
LTE Band5	5	20525	1	#Mid	QAM16	23.10	21.97
LTE Band5	5	20525	1	#Max	QAM16	23.03	21.90
LTE Band5	5	20525	12	#0	QAM16	21.68	20.55
LTE Band5	5	20525	12	#Mid	QAM16	21.64	20.51
LTE Band5	5	20525	12	#Max	QAM16	21.48	20.35
LTE Band5	5	20525	25	#0	QAM16	21.70	20.57
LTE Band5	5	20625	1	#0	QPSK	23.56	22.43
LTE Band5	5	20625	1	#Mid	QPSK	23.96	22.83
LTE Band5	5	20625	1	#Max	QPSK	23.98	22.85
LTE Band5	5	20625	12	#0	QPSK	22.90	21.77
LTE Band5	5	20625	12	#Mid	QPSK	22.90	21.77
LTE Band5	5	20625	12	#Max	QPSK	22.82	21.69
LTE Band5	5	20625	25	#0	QPSK	22.81	21.68
LTE Band5	5	20625	1	#0	QAM16	22.76	21.63
LTE Band5	5	20625	1	#Mid	QAM16	22.75	21.62
LTE Band5	5	20625	1	#Max	QAM16	22.61	21.48
LTE Band5	5	20625	12	#0	QAM16	21.63	20.50
LTE Band5	5	20625	12	#Mid	QAM16	21.63	20.50
LTE Band5	5	20625	12	#Max	QAM16	21.55	20.42

LTE Band5	5	20625	25	#0	QAM16	21.72	20.59
LTE Band5	10	20450	1	#0	QPSK	23.67	22.54
LTE Band5	10	20450	1	#Mid	QPSK	23.96	22.83
LTE Band5	10	20450	1	#Max	QPSK	23.67	22.54
LTE Band5	10	20450	25	#0	QPSK	22.98	21.85
LTE Band5	10	20450	25	#Mid	QPSK	22.97	21.84
LTE Band5	10	20450	25	#Max	QPSK	22.96	21.83
LTE Band5	10	20450	50	#0	QPSK	22.91	21.78
LTE Band5	10	20450	1	#0	QAM16	22.93	21.80
LTE Band5	10	20450	1	#Mid	QAM16	23.61	22.48
LTE Band5	10	20450	1	#Max	QAM16	22.75	21.62
LTE Band5	10	20450	25	#0	QAM16	22.04	20.91
LTE Band5	10	20450	25	#Mid	QAM16	22.04	20.91
LTE Band5	10	20450	25	#Max	QAM16	22.03	20.90
LTE Band5	10	20450	50	#0	QAM16	21.81	20.68
LTE Band5	10	20525	1	#0	QPSK	23.71	22.58
LTE Band5	10	20525	1	#Mid	QPSK	24.09	22.96
LTE Band5	10	20525	1	#Max	QPSK	23.73	22.60
LTE Band5	10	20525	25	#0	QPSK	22.93	21.80
LTE Band5	10	20525	25	#Mid	QPSK	22.92	21.79
LTE Band5	10	20525	25	#Max	QPSK	22.85	21.72
LTE Band5	10	20525	50	#0	QPSK	22.95	21.82
LTE Band5	10	20525	1	#0	QAM16	23.49	22.36
LTE Band5	10	20525	1	#Mid	QAM16	23.88	22.75
LTE Band5	10	20525	1	#Max	QAM16	23.58	22.45
LTE Band5	10	20525	25	#0	QAM16	22.05	20.92
LTE Band5	10	20525	25	#Mid	QAM16	21.97	20.84
LTE Band5	10	20525	25	#Max	QAM16	21.88	20.75
LTE Band5	10	20525	50	#0	QAM16	21.83	20.70
LTE Band5	10	20600	1	#0	QPSK	23.80	22.67
LTE Band5	10	20600	1	#Mid	QPSK	24.28	23.15
LTE Band5	10	20600	1	#Max	QPSK	24.01	22.88
LTE Band5	10	20600	25	#0	QPSK	22.89	21.76
LTE Band5	10	20600	25	#Mid	QPSK	22.90	21.77
LTE Band5	10	20600	25	#Max	QPSK	22.96	21.83
LTE Band5	10	20600	50	#0	QPSK	22.94	21.81
LTE Band5	10	20600	1	#0	QAM16	22.67	21.54
LTE Band5	10	20600	1	#Mid	QAM16	23.52	22.39
LTE Band5	10	20600	1	#Max	QAM16	22.33	21.20
LTE Band5	10	20600	25	#0	QAM16	21.82	20.69
LTE Band5	10	20600	25	#Mid	QAM16	21.83	20.70
LTE Band5	10	20600	25	#Max	QAM16	21.87	20.74
LTE Band5	10	20600	50	#0	QAM16	21.91	20.78

5.2. Occupied Bandwidth

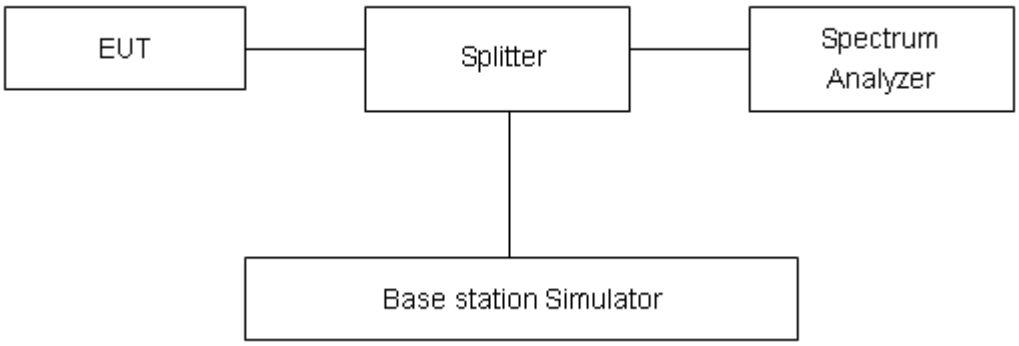
Ambient condition

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 5 (1.4MHz),
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 5 (3MHz/5MHz),
RBW is set to 300 kHz, VBW is set to 1 MHz for LTE Band 5 (10MHz),
99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

No specific occupied bandwidth requirements in part 2.1049.

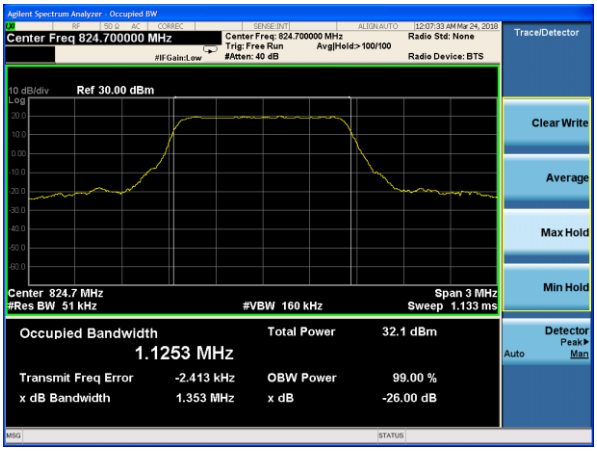
Measurement Uncertainty

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

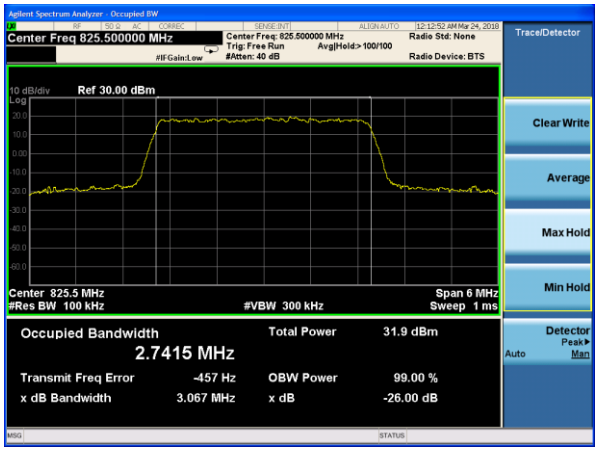
Test Result

LTE Band 5						
RB	**Modulation**	**Bandwidth (MHz)**	**Channel**	**Frequency (MHz)**	**99% Power Bandwidth(MHz)**	**-26dBc Bandwidth(MHz)**
100%	QPSK	1.4	20407	824.7	1.1253	1.353
			20525	836.5	1.1240	1.349
			20643	848.3	1.1324	1.345
		3	20415	825.5	2.7415	3.067
			20525	836.5	2.7433	3.060
			20635	847.5	2.7391	3.066
		5	20425	826.5	4.5208	5.025
			20525	836.5	4.5107	5.019
			20625	846.5	4.5106	5.019
		10	20450	829	9.0501	10.180
			20525	836.5	9.0029	10.060
			20600	844	9.0429	10.060
	16QAM	1.4	20407	824.7	1.1283	1.341
			20525	836.5	1.1184	1.325
			20643	848.3	1.1193	1.344
		3	20415	825.5	2.7515	3.057
			20525	836.5	2.7315	3.057
			20635	847.5	2.7403	3.071
		5	20425	826.5	4.5081	5.034
			20525	836.5	4.5296	5.035
			20625	846.5	4.5380	5.042
		10	20450	829	9.0333	10.040
			20525	836.5	9.0106	10.030
			20600	844	9.0292	10.090

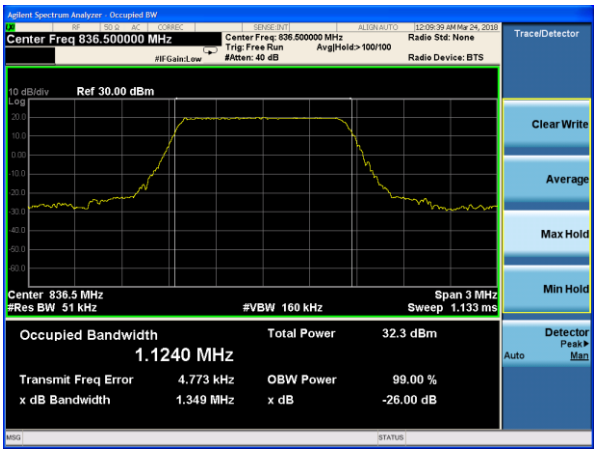
LTE Band 5 QPSK 1.4MHz CH-Low



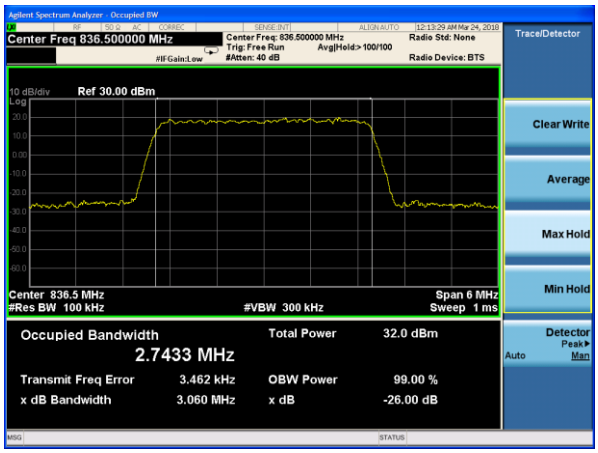
LTE Band 5 QPSK 3MHz CH-Low



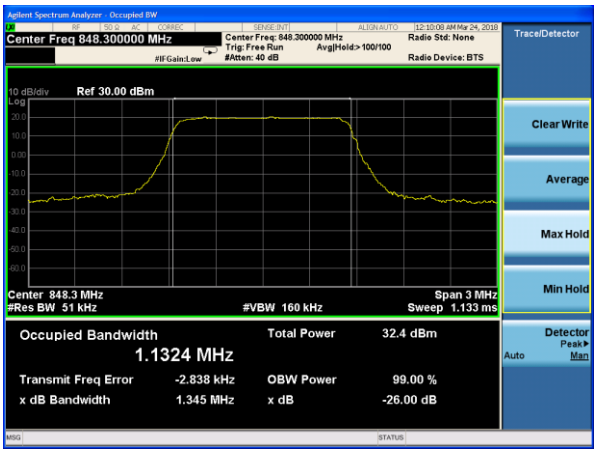
LTE Band 5 QPSK 1.4MHz CH-Middle



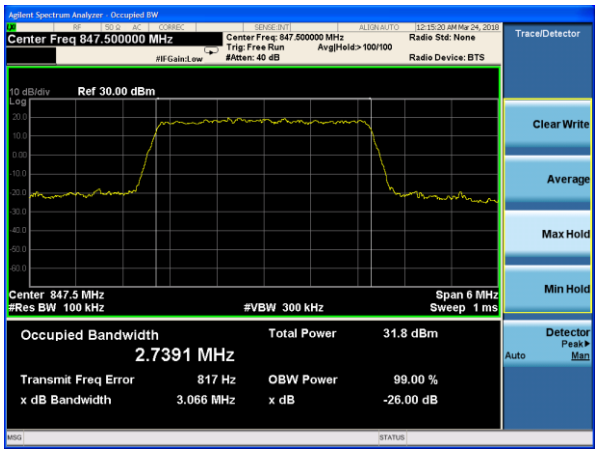
LTE Band 5 QPSK 3MHz CH-Middle



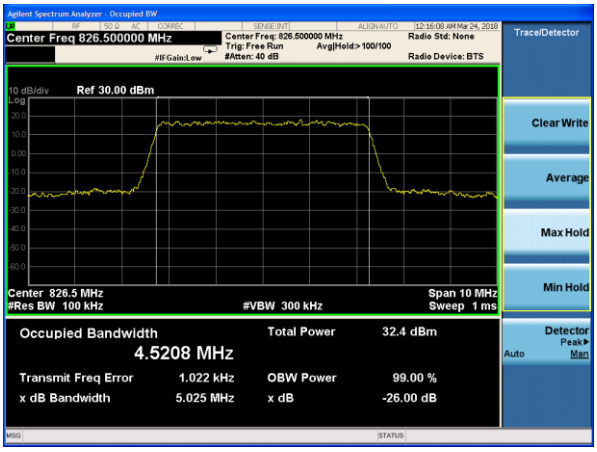
LTE Band 5 QPSK 1.4MHz CH-High



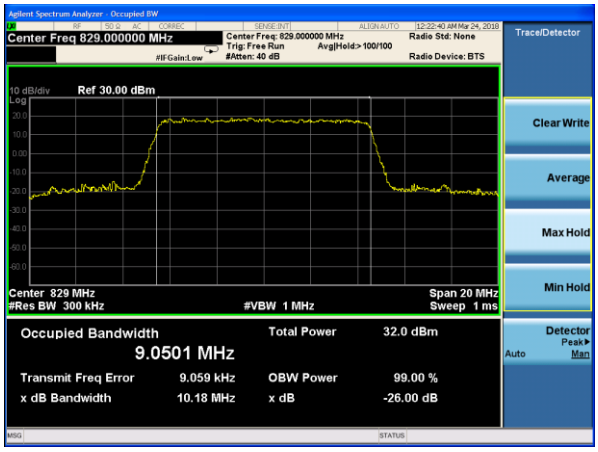
LTE Band 5 QPSK 3MHz CH-High



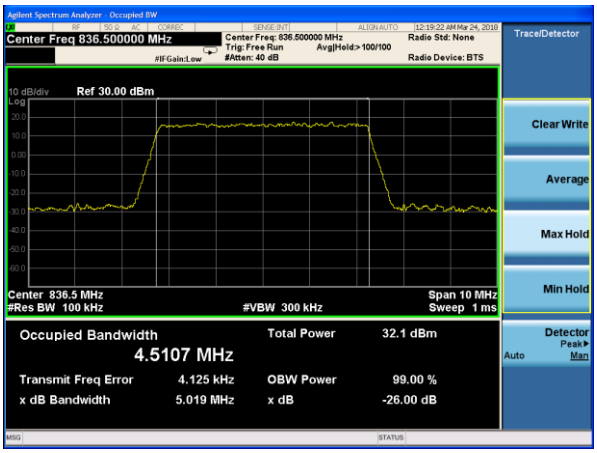
LTE Band 5 QPSK 5MHz CH-Low



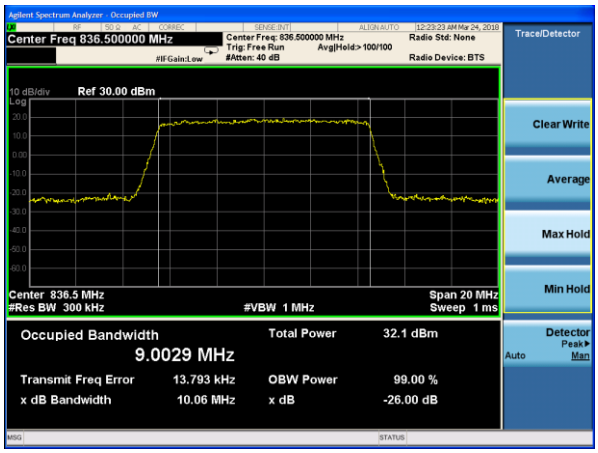
LTE Band 5 QPSK 10MHz CH-Low



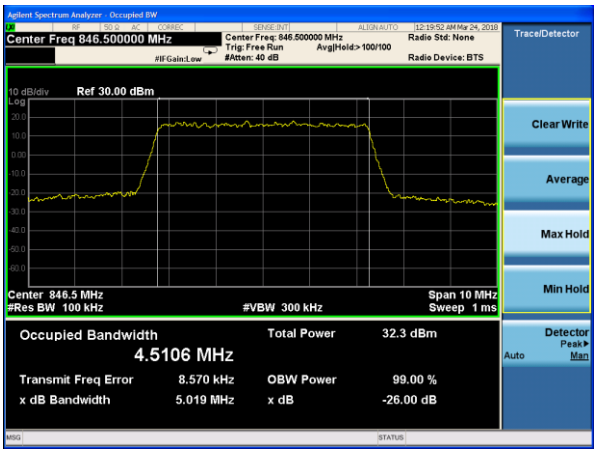
LTE Band 5 QPSK 5MHz CH-Middle



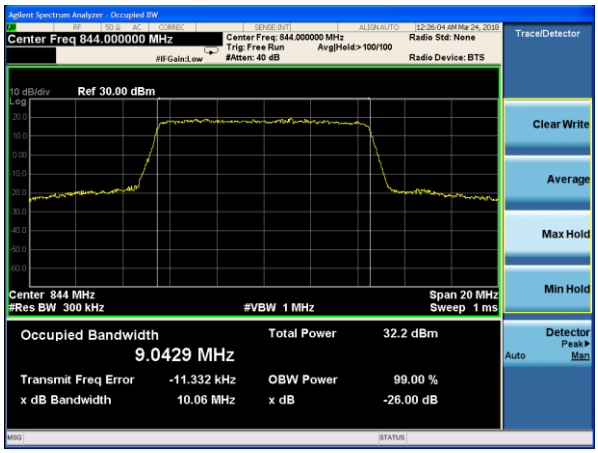
LTE Band 5 QPSK 10MHz CH-Middle



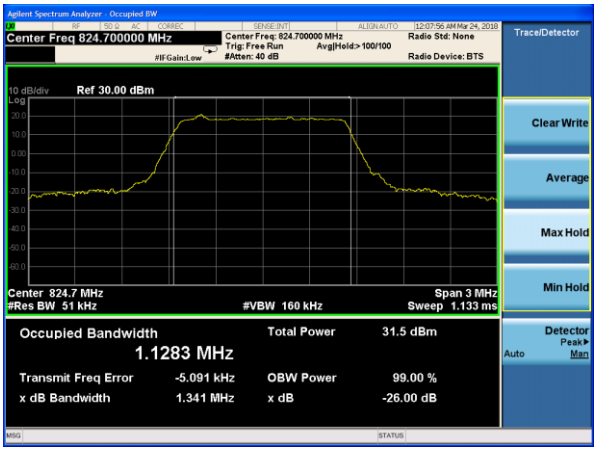
LTE Band 5 QPSK 5MHz CH-High



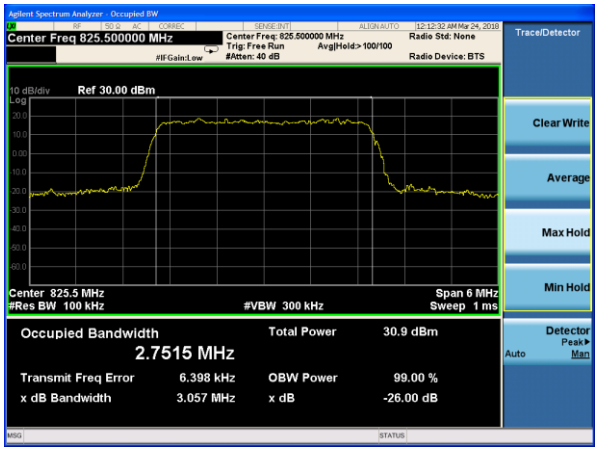
LTE Band 5 QPSK 10MHz CH-High



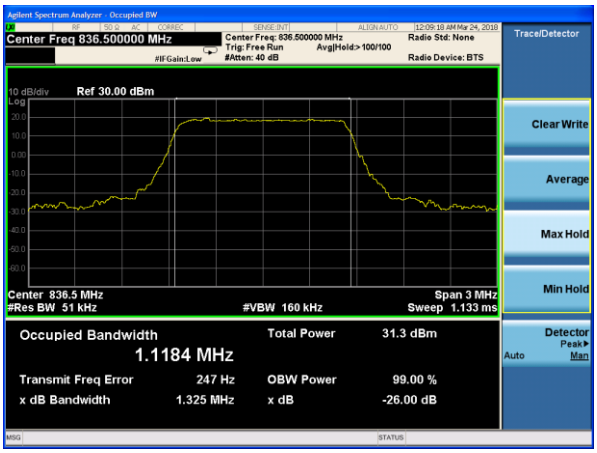
LTE Band 5 16QAM 1.4MHz CH-Low



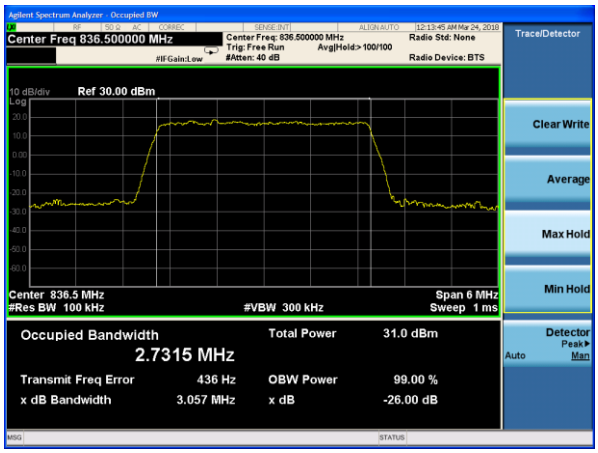
LTE Band 5 16QAM 3MHz CH-Low



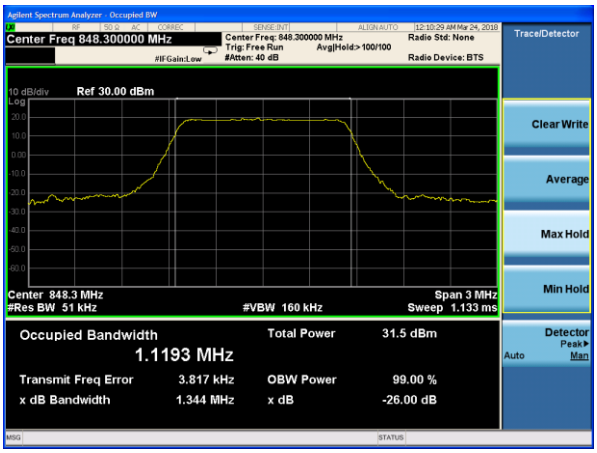
LTE Band 5 16QAM 1.4MHz CH-Middle



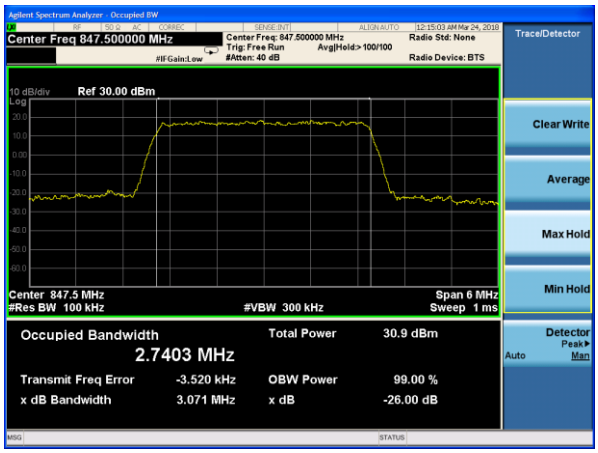
LTE Band 5 16QAM 3MHz CH-Middle



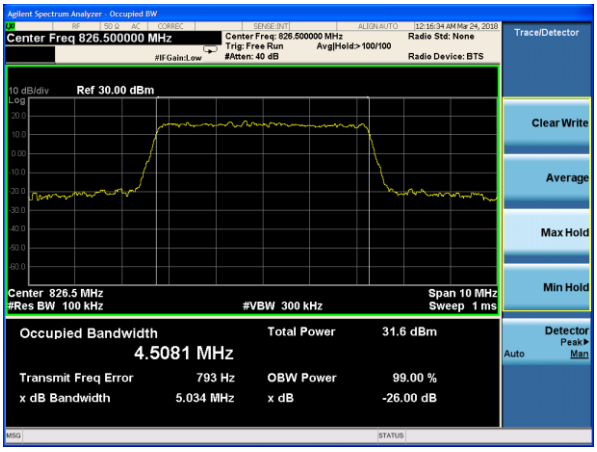
LTE Band 5 16QAM 1.4MHz CH-High



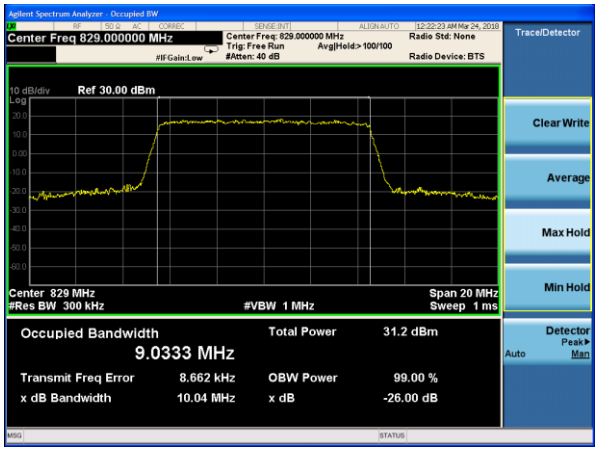
LTE Band 5 16QAM 3MHz CH-High



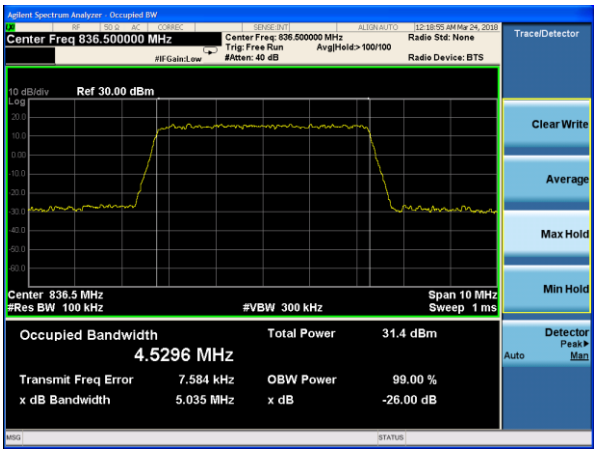
LTE Band 5 16QAM 5MHz CH-Low



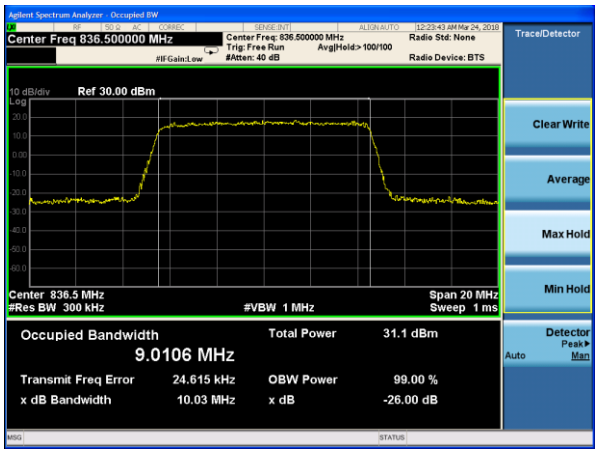
LTE Band 5 16QAM 10MHz CH-Low



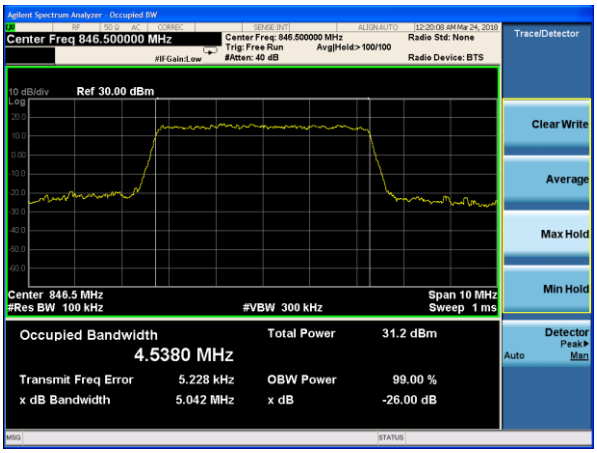
LTE Band 5 16QAM 5MHz CH-Middle



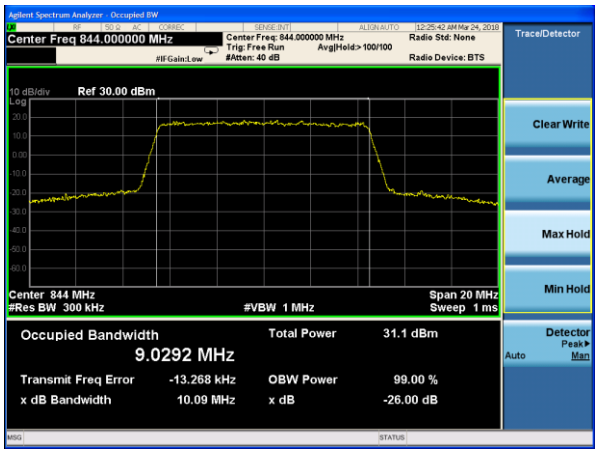
LTE Band 5 16QAM 10MHz CH-Middle



LTE Band 5 16QAM 5MHz CH-High



LTE Band 5 16QAM 10MHz CH-High



5.3. Band Edge Compliance

Ambient condition

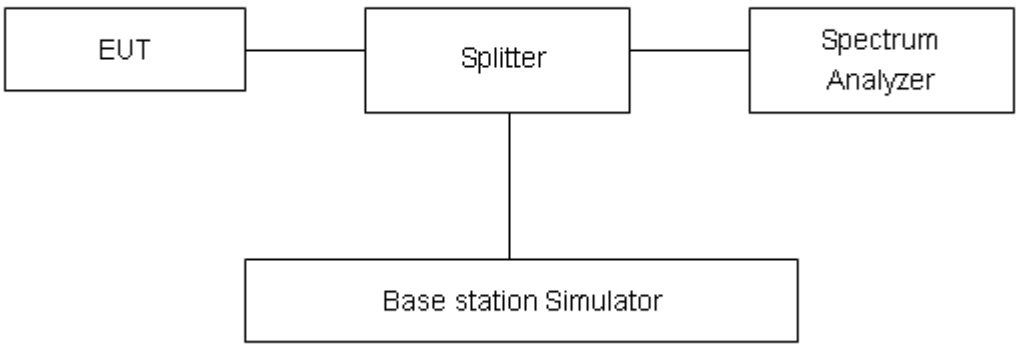
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 average detector is used.
RBW is set to 15 kHz, VBW is set to 51 kHz for LTE Band 5 (1.4MHz),
RBW is set to 30 kHz, VBW is set to 100 kHz for LTE Band 5 (3MHz),
RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 5 (5MHz),
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 5 (10MHz),

Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.”

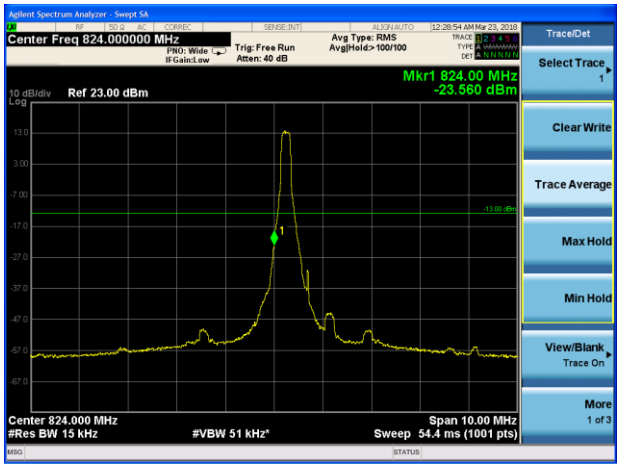
Limit	-13 dBm

Measurement Uncertainty

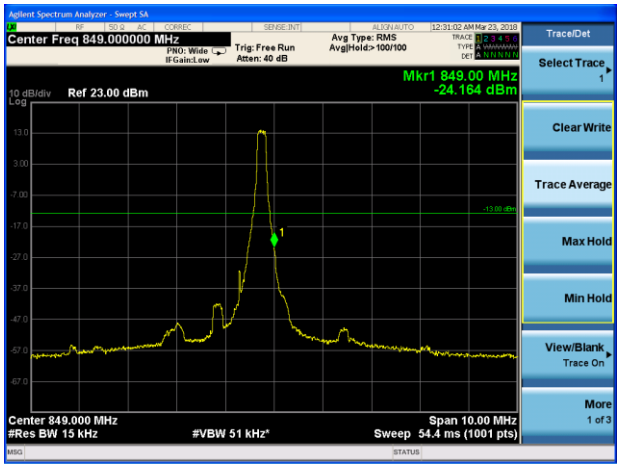
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96, U=0.684dB.

Test Result:

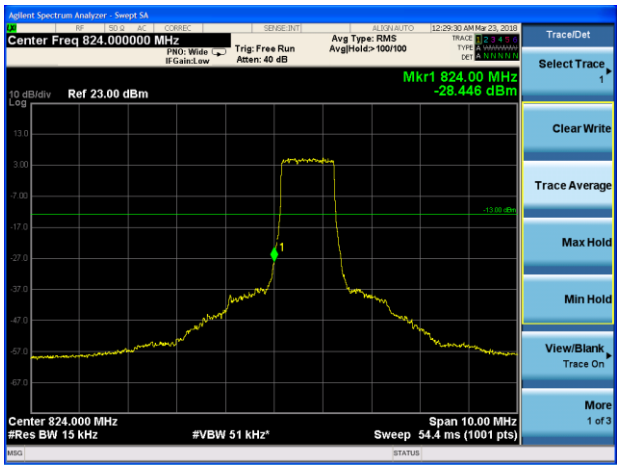
LTE Band 5 QPSK 1.4MHz CH-Low 1RB



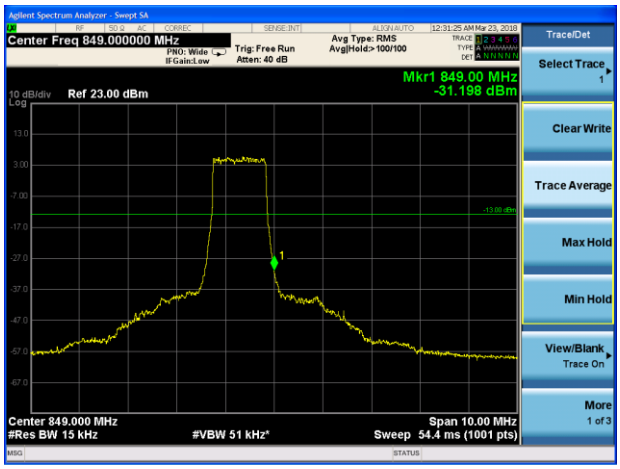
LTE Band 5 QPSK 1.4MHz CH-High 1RB



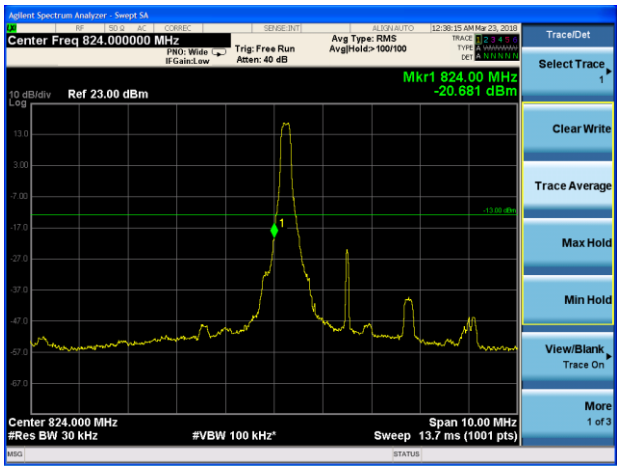
LTE Band 5 QPSK 1.4MHz CH-Low 100%RB



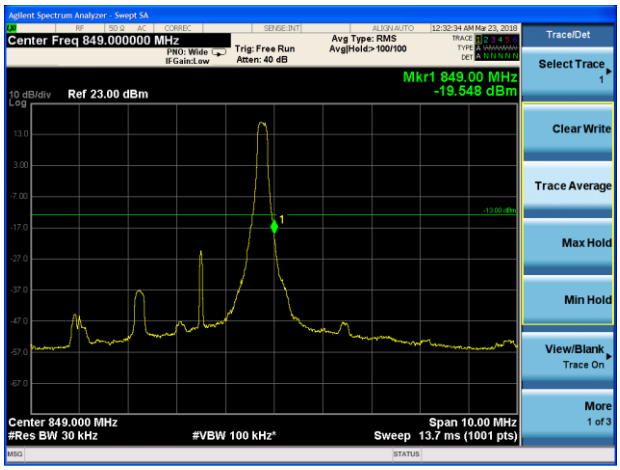
LTE Band 5 QPSK 1.4MHz CH-High 100%RB



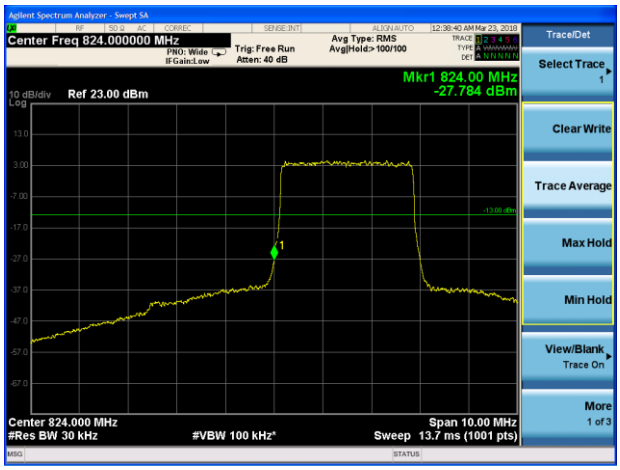
LTE Band 5 QPSK 3MHz CH-Low 1RB



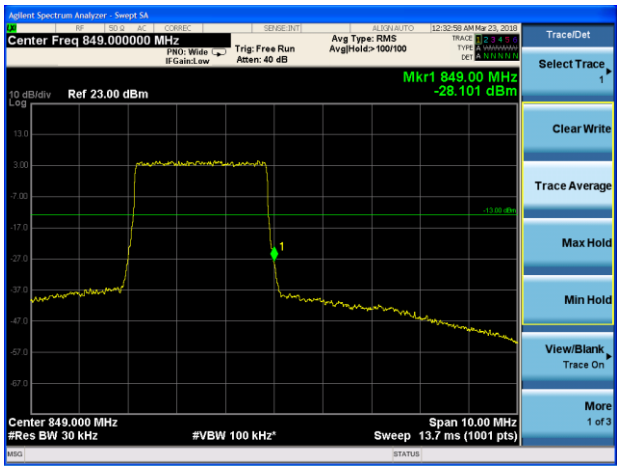
LTE Band 5 QPSK 3MHz CH-High 1RB



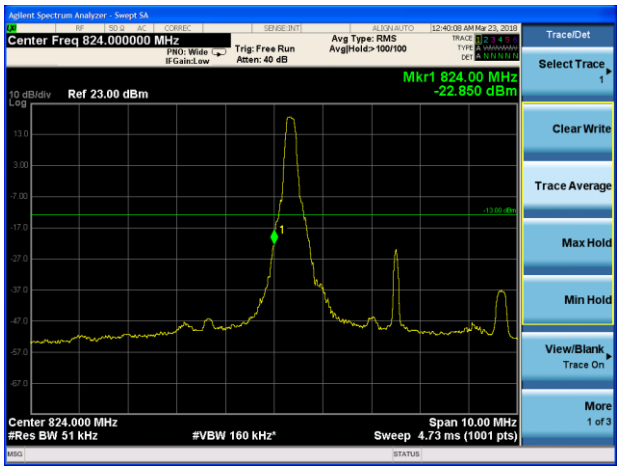
LTE Band 5 QPSK 3MHz CH-Low 100%RB



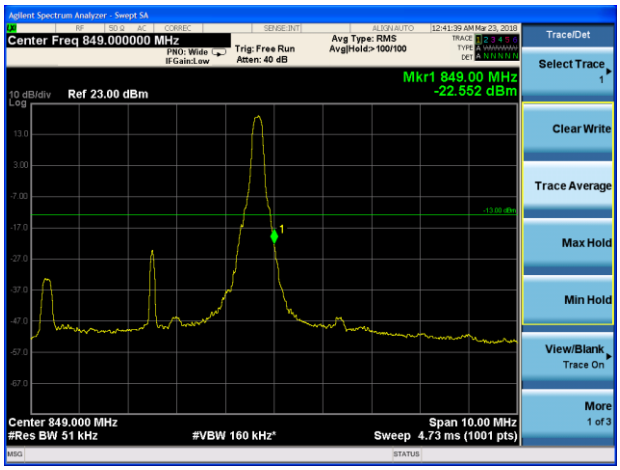
LTE Band 5 QPSK 3MHz CH-High 100%RB



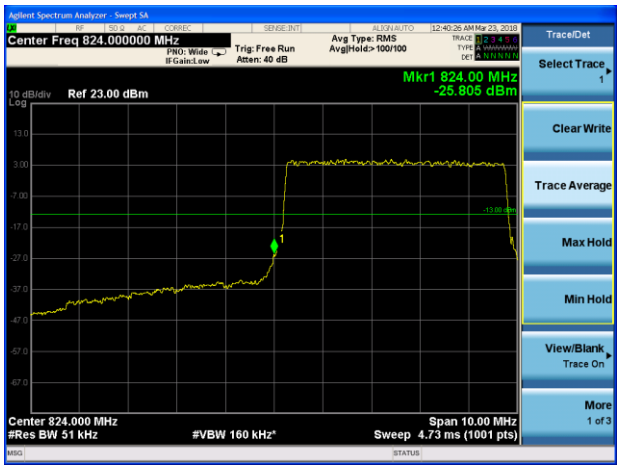
LTE Band 5 QPSK 5MHz CH-Low 1RB



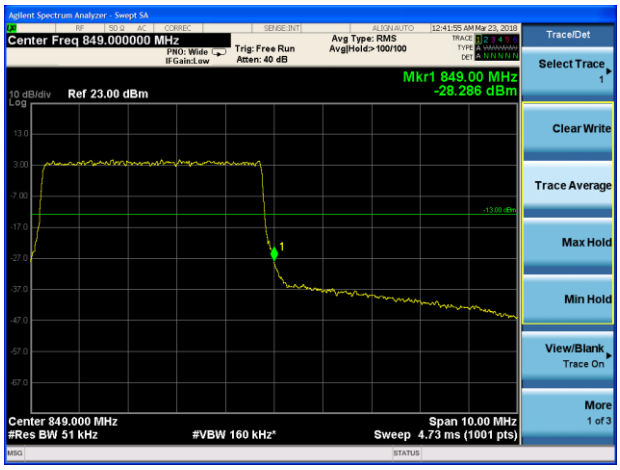
LTE Band 5 QPSK 5MHz CH-High 1RB



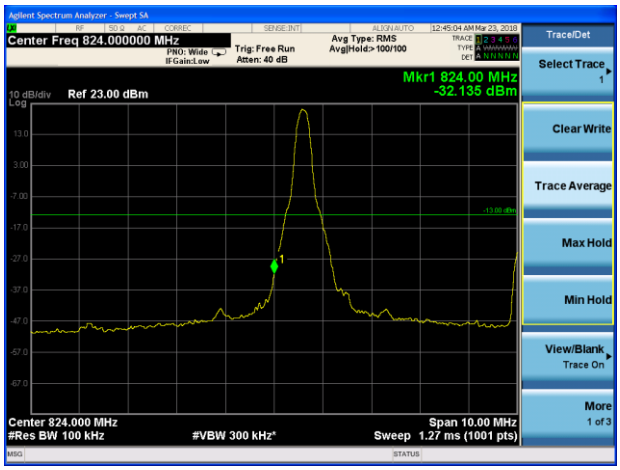
LTE Band 5 QPSK 5MHz CH-Low 100%RB



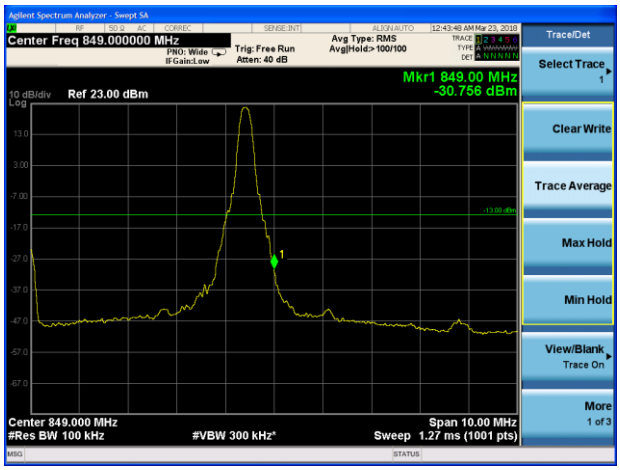
LTE Band 5 QPSK 5MHz CH-High 100%RB



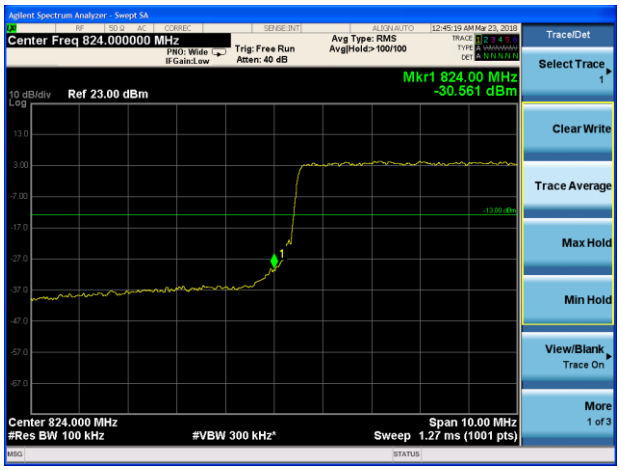
LTE Band 5 QPSK 10MHz CH-Low 1RB



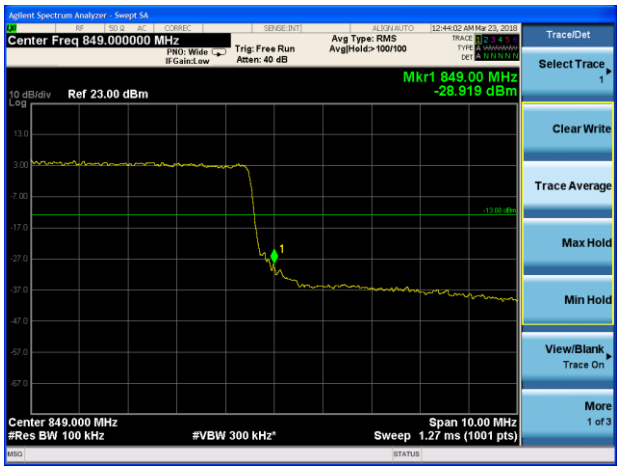
LTE Band 5 QPSK 10MHz CH-High 1RB



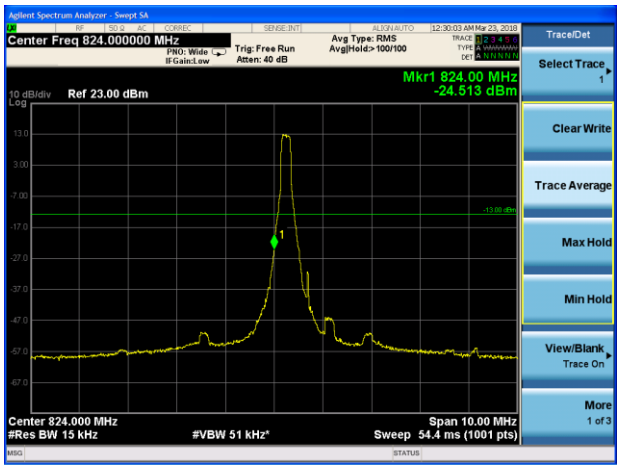
LTE Band 5 QPSK 10MHz CH-Low 100%RB



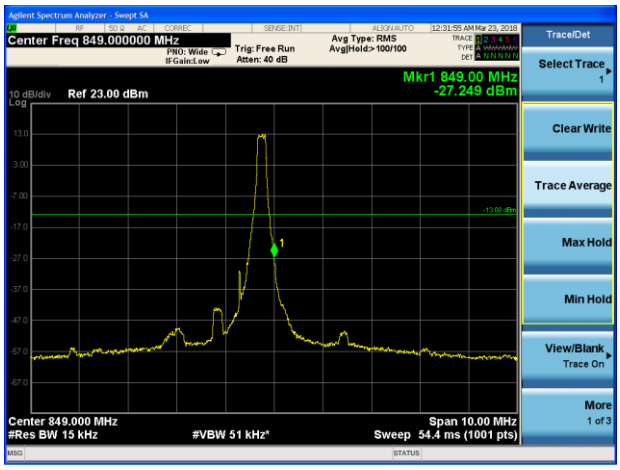
LTE Band 5 QPSK 10MHz CH-High 100%RB



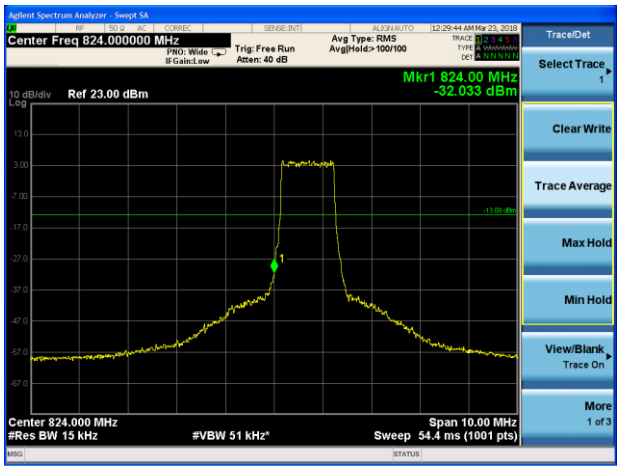
LTE Band 5 16QAM 1.4MHz CH-Low 1RB



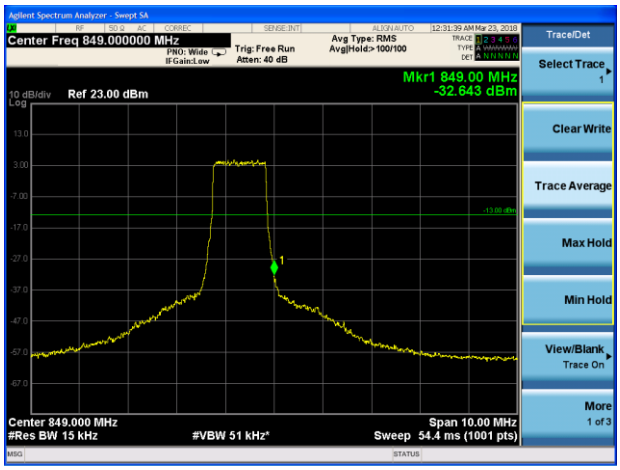
LTE Band 5 16QAM 1.4MHz CH-High 1RB



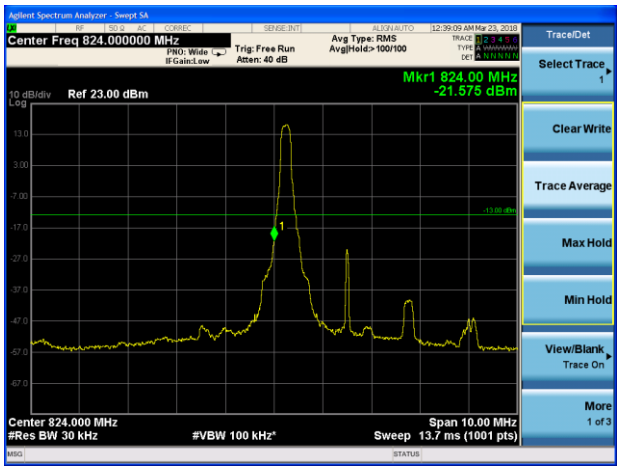
LTE Band 5 16QAM 1.4MHz CH-Low 100%RB



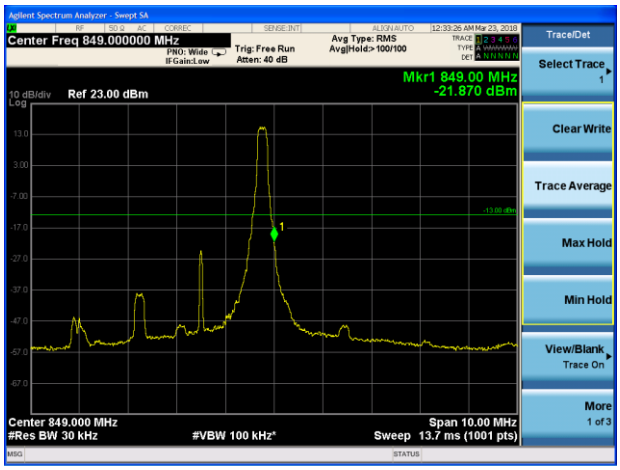
LTE Band 5 16QAM 1.4MHz CH-High 100%RB



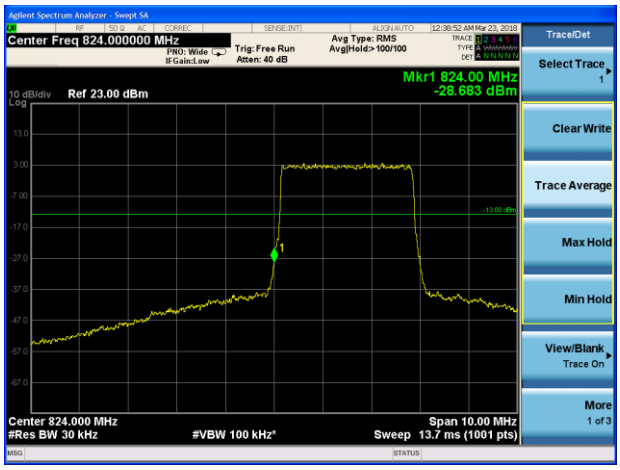
LTE Band 5 16QAM 3MHz CH-Low 1RB



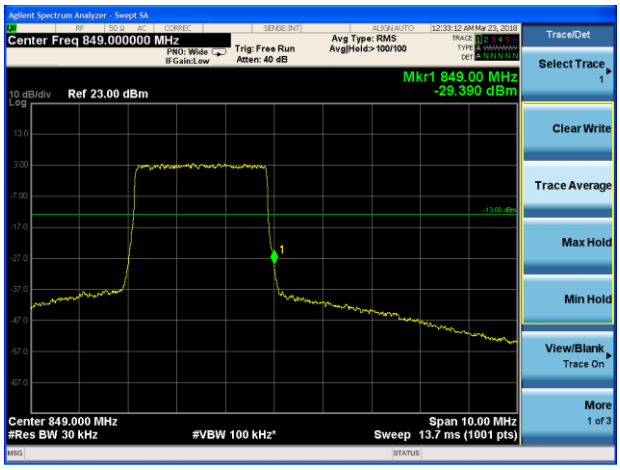
LTE Band 5 16QAM 3MHz CH-High 1RB



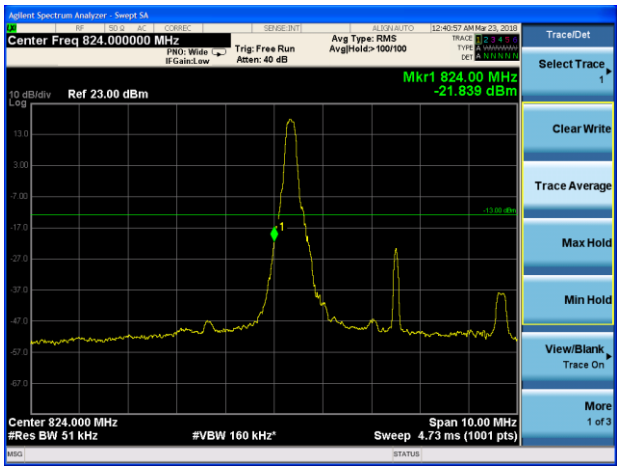
LTE Band 5 16QAM 3MHz CH-Low 100%RB



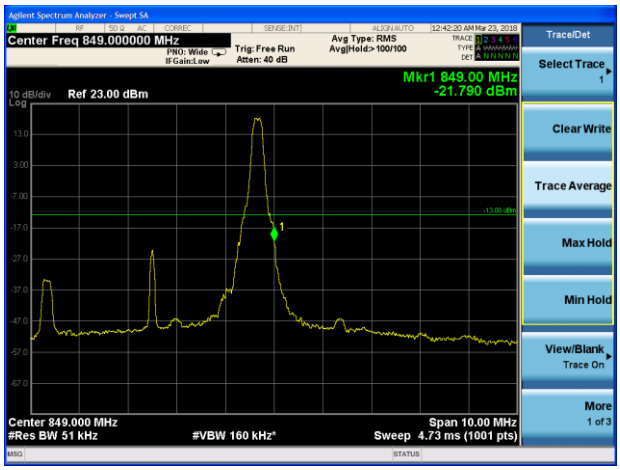
LTE Band 5 16QAM 3MHz CH-High 100%RB



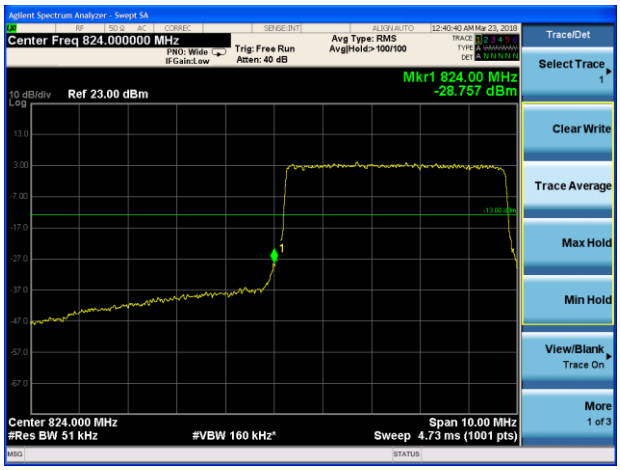
LTE Band 5 16QAM 5MHz CH-Low 1RB



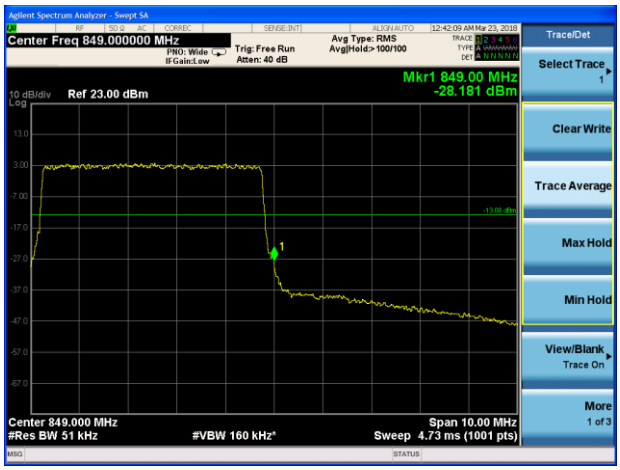
LTE Band 5 16QAM 5MHz CH-High 1RB



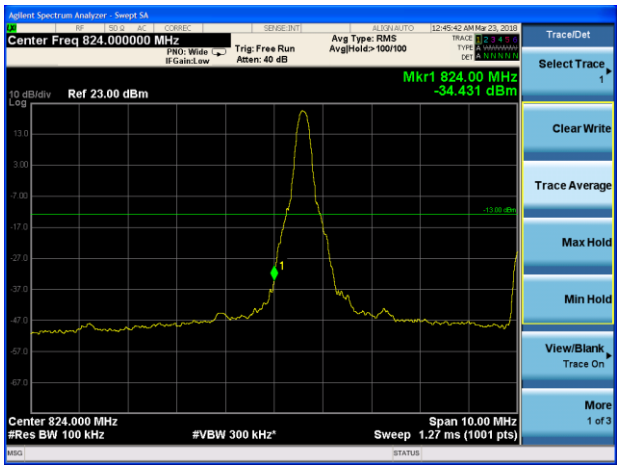
LTE Band 5 16QAM 5MHz CH-Low 100%RB



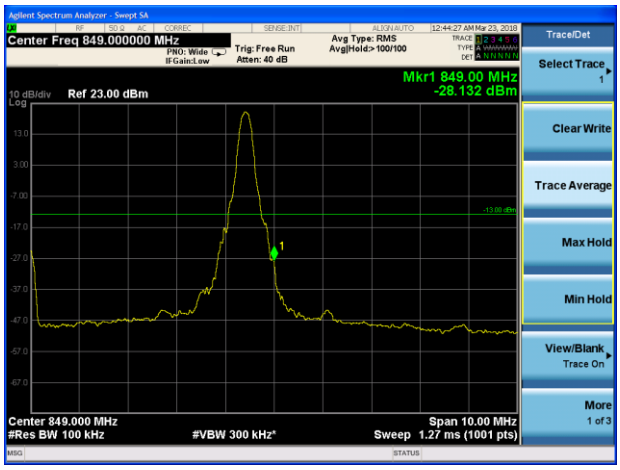
LTE Band 5 16QAM 5MHz CH-High 100%RB

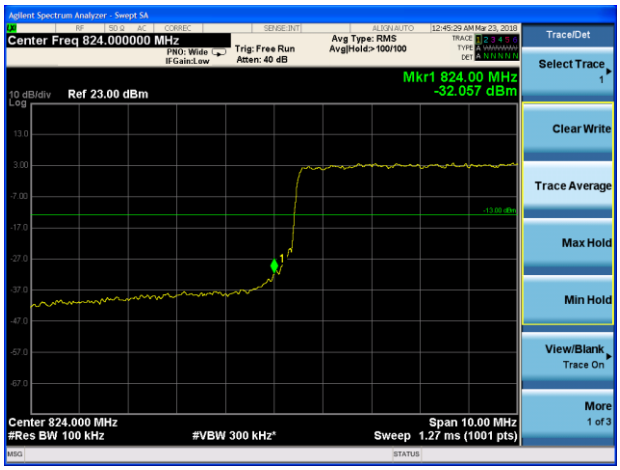
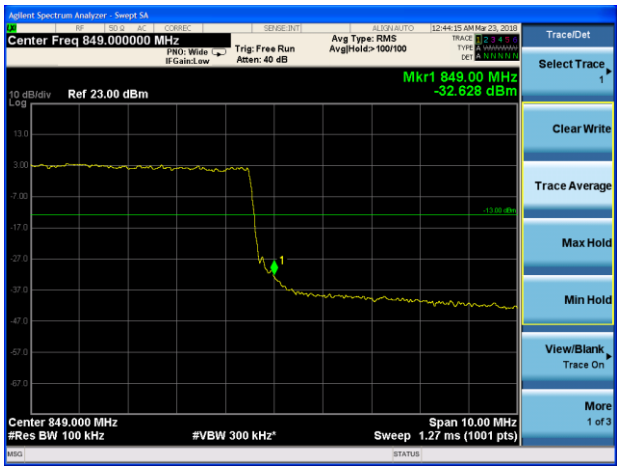


LTE Band 5 16QAM 10MHz CH-Low 1RB



LTE Band 5 16QAM 10MHz CH-High 1RB



LTE Band 5 16QAM 10MHz CH-Low 100%RB	LTE Band 5 16QAM 10MHz CH-High 100%RB
	

5.4. Peak-to-Average Power Ratio (PAPR)

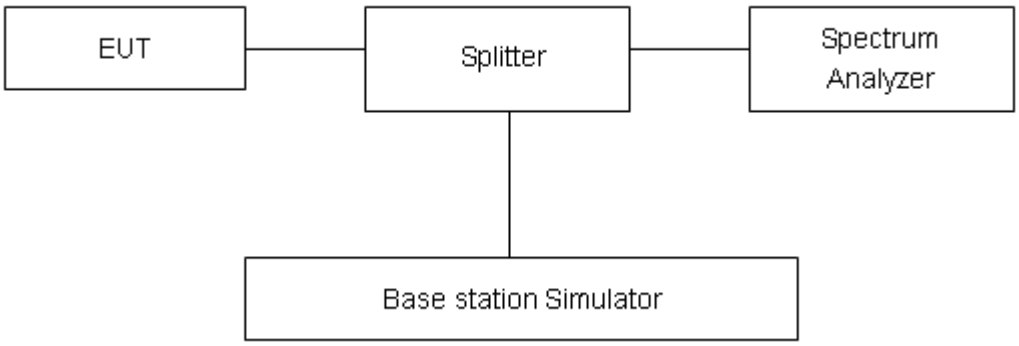
Ambient condition

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

Methods of Measurement

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

Test Setup



Limits

According to the Sec. 22.913(d), The peak-to-average ratio (PAR) of the transmission must 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 5								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	20407	824.7	27.57	22.95	4.62	≤13	PASS
		20525	836.5	28.10	23.12	4.98	≤13	PASS
		20643	848.3	27.78	22.99	4.79	≤13	PASS
	3	20415	825.5	27.64	22.98	4.66	≤13	PASS
		20525	836.5	28.22	23.16	5.06	≤13	PASS
		20635	847.5	27.86	23.02	4.84	≤13	PASS
	5	20425	826.5	27.60	22.96	4.64	≤13	PASS
		20525	836.5	28.20	23.15	5.05	≤13	PASS
		20625	846.5	27.73	23.00	4.73	≤13	PASS
	10	20450	829	27.77	22.99	4.78	≤13	PASS
		20525	836.5	27.97	23.08	4.89	≤13	PASS
		20600	844	27.67	22.95	4.72	≤13	PASS
16QAM	1.4	20407	824.7	27.32	21.92	5.40	≤13	PASS
		20525	836.5	27.94	22.08	5.86	≤13	PASS
		20643	848.3	27.44	21.86	5.58	≤13	PASS
	3	20415	825.5	27.43	21.95	5.48	≤13	PASS
		20525	836.5	28.07	22.12	5.95	≤13	PASS
		20635	847.5	27.61	21.89	5.72	≤13	PASS
	5	20425	826.5	27.36	21.93	5.43	≤13	PASS
		20525	836.5	27.95	22.08	5.87	≤13	PASS
		20625	846.5	27.34	21.84	5.50	≤13	PASS
	10	20450	829	27.47	21.91	5.56	≤13	PASS
		20525	836.5	27.81	22.04	5.77	≤13	PASS
		20600	844	27.35	21.81	5.54	≤13	PASS

5.5. 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 +55°C in 10°C step size,

(1) With all power removed, the temperature was decreased to 0°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 +55°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements. Frequency Stability (Voltage Variation)

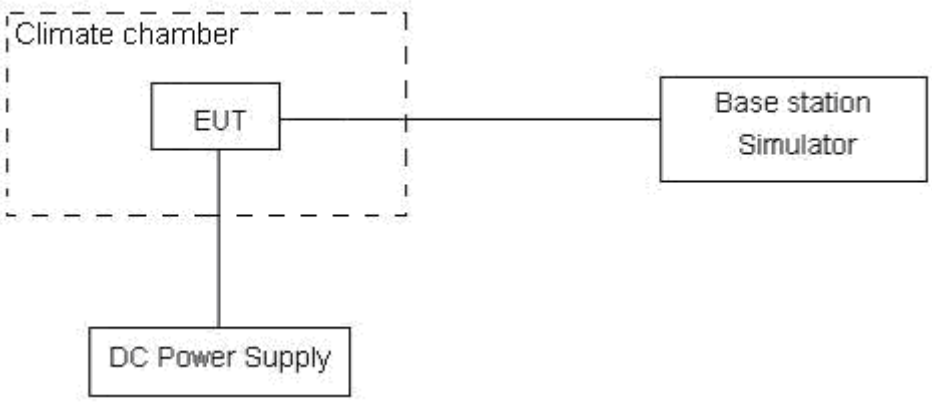
The frequency stability shall be measured with variation of primary supply voltage as follows:

(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 3.4 V and 4.35 V, with a nominal voltage of 3.8V.

Test setup



Limits

According to the Sec. 22.355, the frequency stability of the carrier shall be accurate to within 2.5 ppm of the received frequency for mobile stations.

Limits	≤ 2.5 ppm

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 5					
(QPSK, 10MHz BANDWIDTH)					
Condition		824	849	Delta (Hz)	Frequency Stability(ppm)
Temperature	Voltage	F low@-13dBm(MHz)	F high@-13dBm(MHz)		
Normal（25°C）	Normal	824.2332	848.7934	-4.95	-0.00592
Extreme（55°C）		824.2332	848.7934	-3.62	-0.00433
Extreme（50°C）		824.2332	848.7934	-3.55	-0.00424
Extreme（40°C）		824.2332	848.7934	-5.62	-0.00672
Extreme（30°C）		824.2332	848.7934	-2.37	-0.00283
Extreme（20°C）		824.2332	848.7934	-3.19	-0.00381
Extreme（10C）		824.2332	848.7934	-5.54	-0.00662
Extreme（0°C）		824.2332	848.7934	-6.26	-0.00748
Extreme（-10°C）		824.2332	848.7934	2.53	0.00302
Extreme（-20°C）		824.2332	848.7934	0.09	0.00011
Extreme（-30°C）		824.2332	848.7934	-0.35	-0.00042
25°C	LV	824.2332	848.7934	-4.99	-0.00597
	HV	824.2332	848.7934	-1.90	-0.00227
(16QAM,10MHz BANDWIDTH)					
Condition		824	849	Delta (Hz)	Frequency Stability(ppm)
Temperature	Voltage	F low@-13dBm(MHz)	F high@-13dBm(MHz)		
Normal（25°C）	Normal	824.3634	848.7256	-9.52	-0.01138
Extreme（55°C）		824.3634	848.7256	-10.17	-0.01216
Extreme（50°C）		824.3634	848.7256	-7.94	-0.00949
Extreme（40°C）		824.3634	848.7256	-9.51	-0.01137
Extreme（30°C）		824.3634	848.7256	-11.43	-0.01366
Extreme（20°C）		824.3634	848.7256	-8.97	-0.01072
Extreme（10C）		824.3634	848.7256	-9.64	-0.01152
Extreme（0°C）		824.3634	848.7256	-8.20	-0.00980
Extreme（-10°C）		824.3634	848.7256	1.92	0.00230
Extreme（-20°C）		824.3634	848.7256	-4.66	-0.00557
Extreme（-30°C）		824.3634	848.7256	1.42	0.00170
25°C	LV	824.3634	848.7256	-8.11	-0.00970
	HV	824.3634	848.7256	-8.50	-0.01016

5.6. 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 are set to 100 kHz and VBW are set to 300 kHz for below 1G, RBW are set to 1MHz and VBW are set to 3MHz for above 1G, Sweep is set to ATUO.

RBW is set to 1 kHz (0.009MHz~ 0.15 MHz),

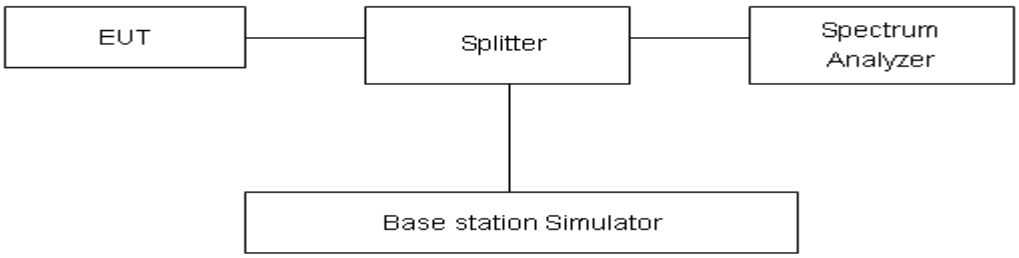
RBW is set to 10 kHz (0.15 MHz~ 30 MHz)

RBW is set to 100 kHz (30MHz~1000 MHz)

RBW is set to 1000 kHz (above 1000MHz)

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

Test setup



Limits

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.”

Limit	-13 dBm

Measurement Uncertainty

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

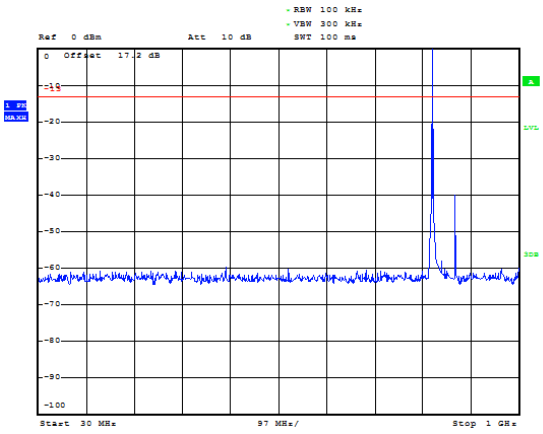
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-18GHz	1.407 dB

Test Result

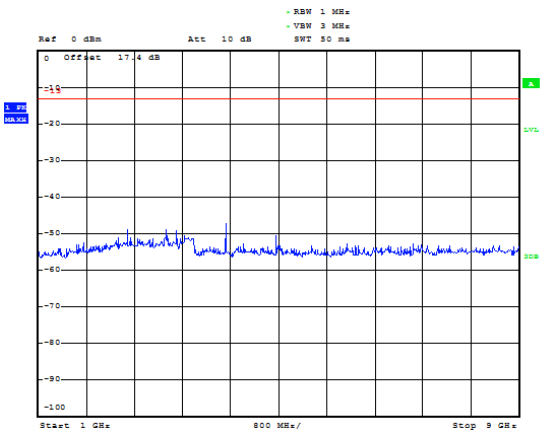
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

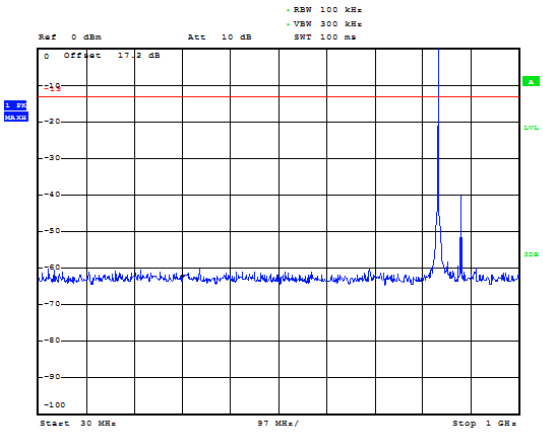
LTE Band 5 1.4MHz CH-Low 30MHz~1GHz



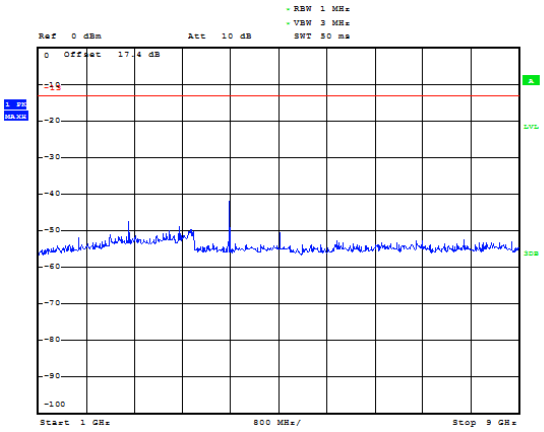
LTE Band 5 1.4MHz CH-Low 1GHz~9GHz



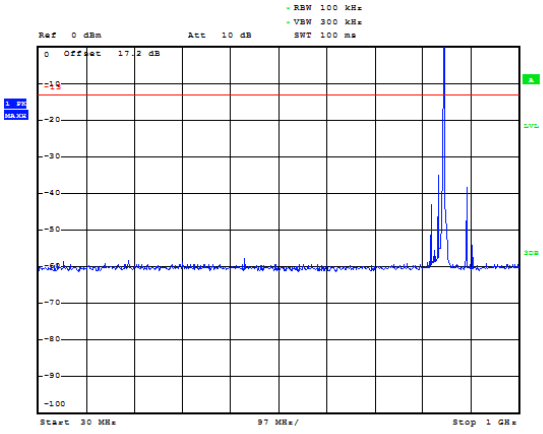
LTE Band 5 1.4MHz CH-Middle 30MHz~1GHz



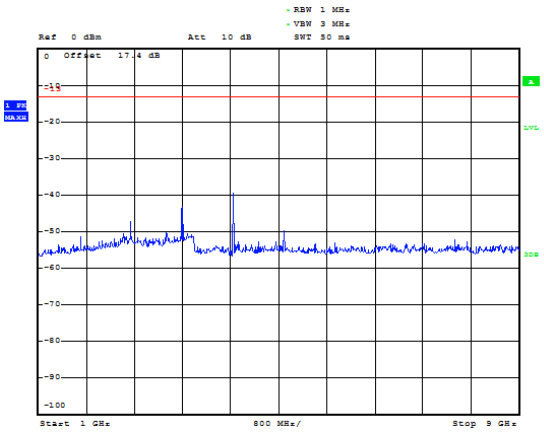
LTE Band 5 1.4MHz CH-Middle 1GHz~9GHz



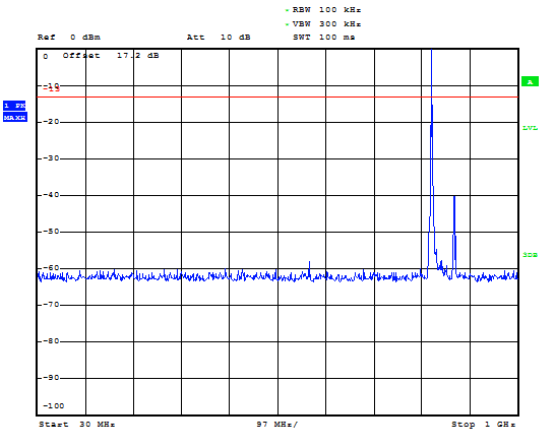
LTE Band 5 1.4MHz CH-High 30MHz~1GHz



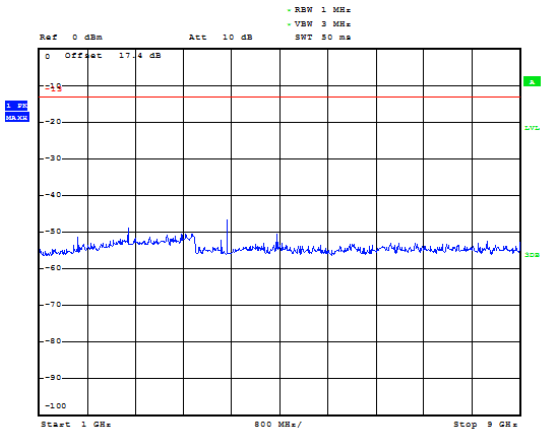
LTE Band 5 1.4MHz CH-High 1GHz~9GHz



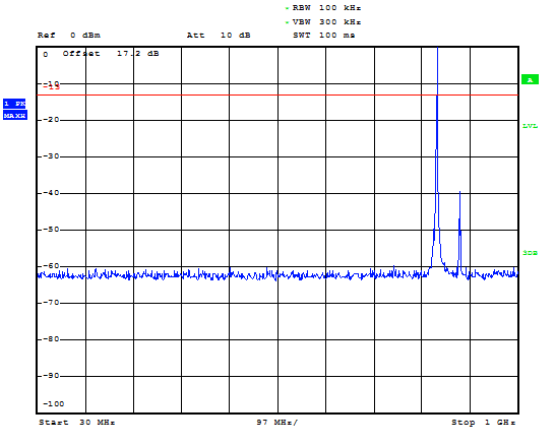
LTE Band 5 3MHz CH-Low 30MHz~1GHz



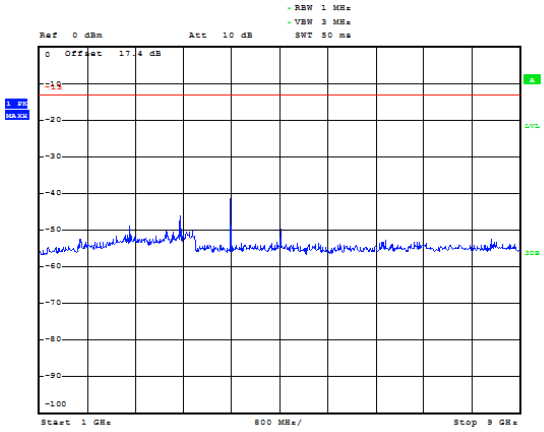
LTE Band 5 3MHz CH-Low 1GHz~9GHz



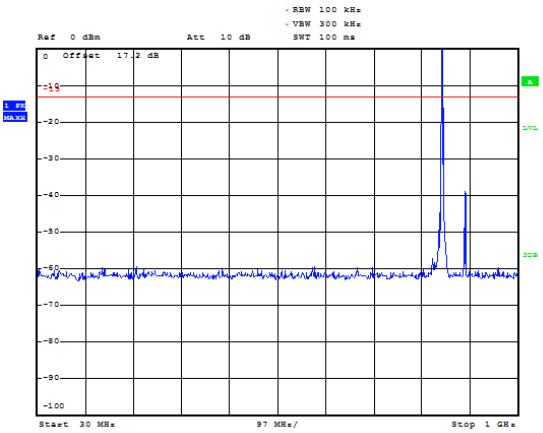
LTE Band 5 3MHz CH-Middle 30MHz~1GHz



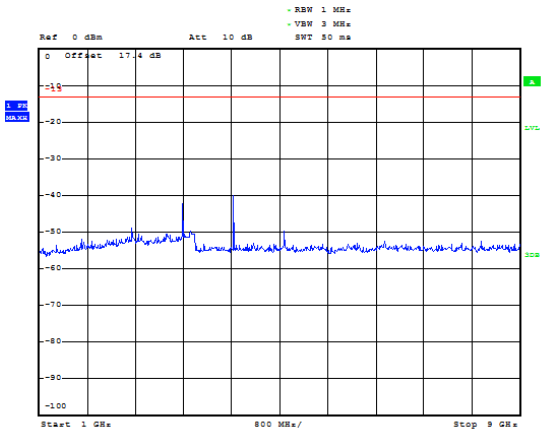
LTE Band 5 3MHz CH-Middle 1GHz~9GHz



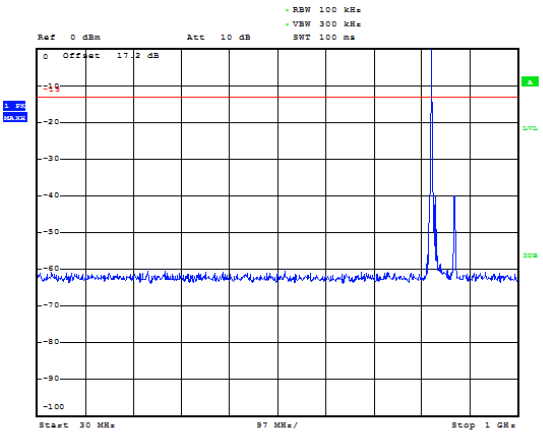
LTE Band 5 3MHz CH-High 30MHz~1GHz



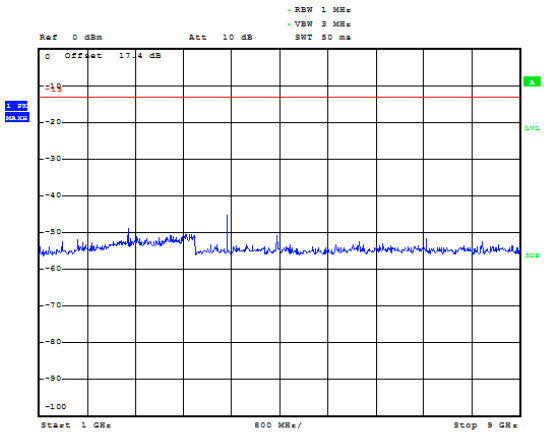
LTE Band 5 3MHz CH-High 1GHz~9GHz



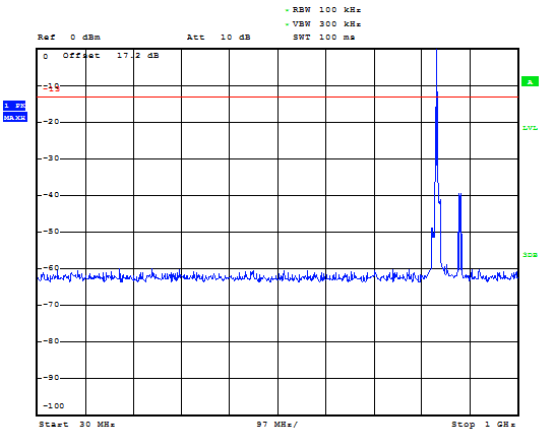
LTE Band 5 5MHz CH-Low 30MHz~1GHz



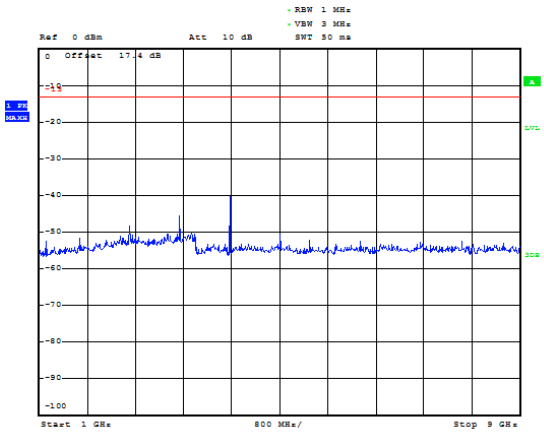
LTE Band 5 5MHz CH-Low 1GHz~9GHz



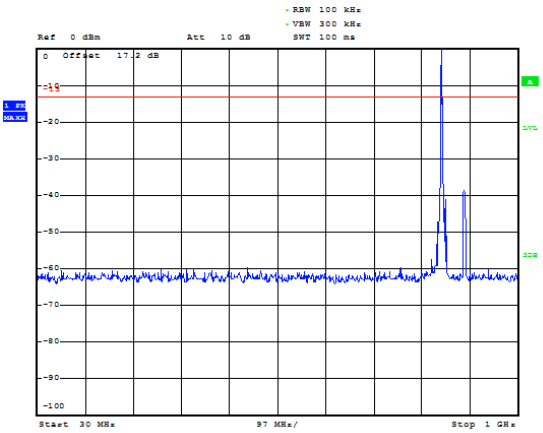
LTE Band 5 5MHz CH-Middle 30MHz~1GHz



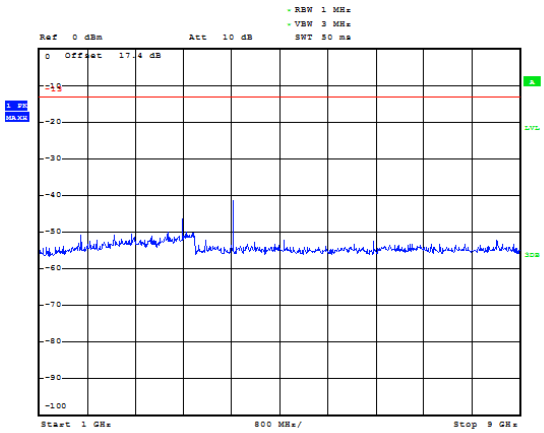
LTE Band 5 5MHz CH-Middle 1GHz~9GHz



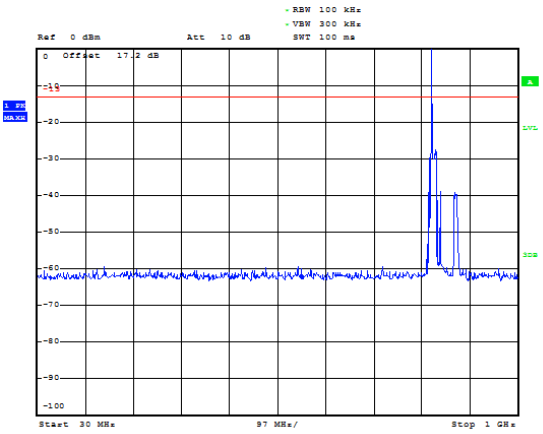
LTE Band 5 5MHz CH-High 30MHz~1GHz



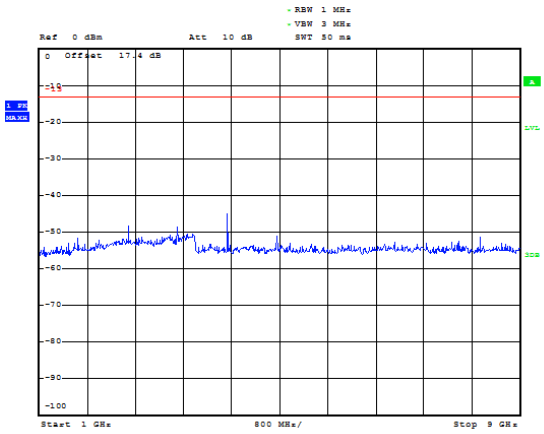
LTE Band 5 5MHz CH-High 1GHz~9GHz



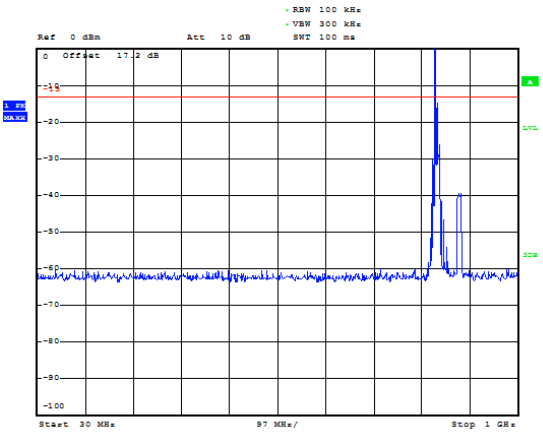
LTE Band 5 10MHz CH-Low 30MHz~1GHz



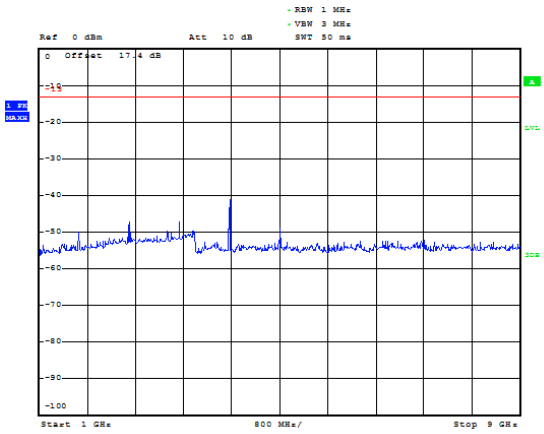
LTE Band 5 10MHz CH-Low 1GHz~9GHz



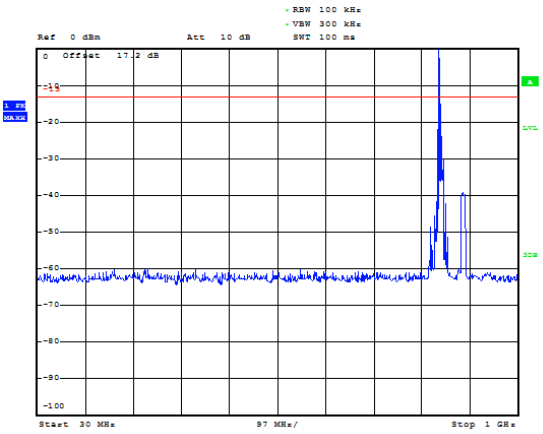
LTE Band 5 10MHz CH-Middle 30MHz~1GHz



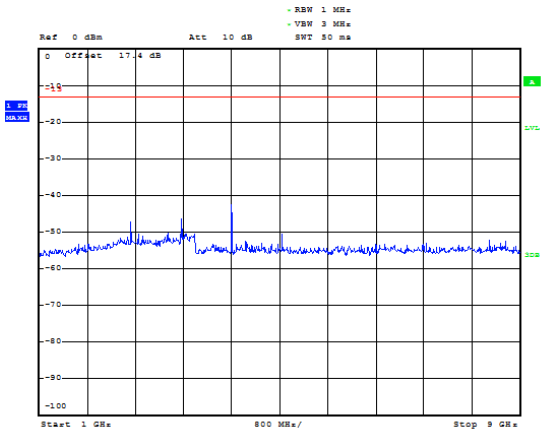
LTE Band 5 10MHz CH-Middle 1GHz~9GHz



LTE Band 5 10MHz CH-High 30MHz~1GHz



LTE Band 5 10MHz CH-High 1GHz~9GHz



5.7. Radiates Spurious Emission

Ambient condition

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

Method of Measurement

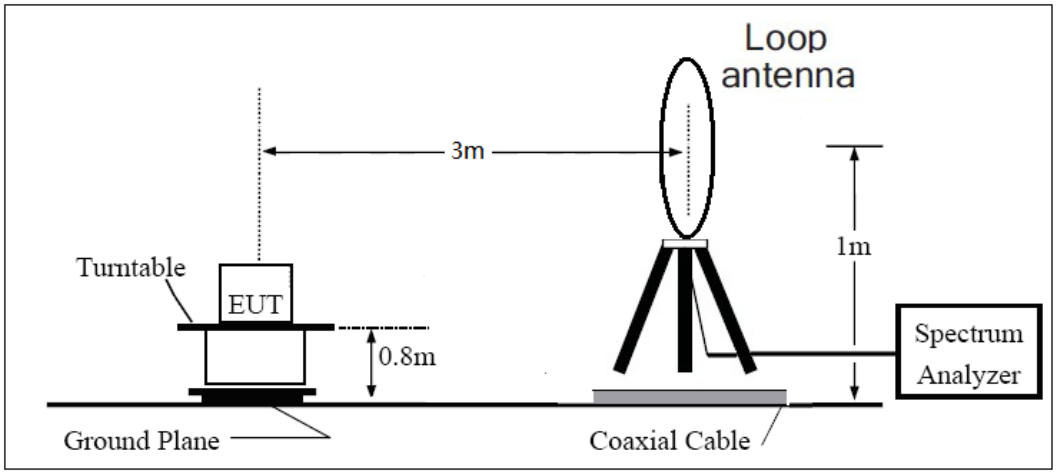
1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable 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.

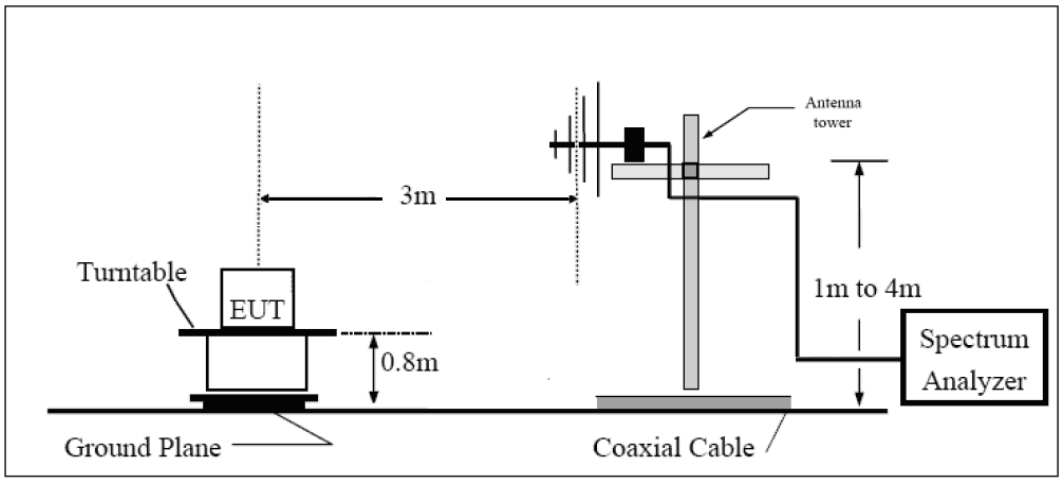
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

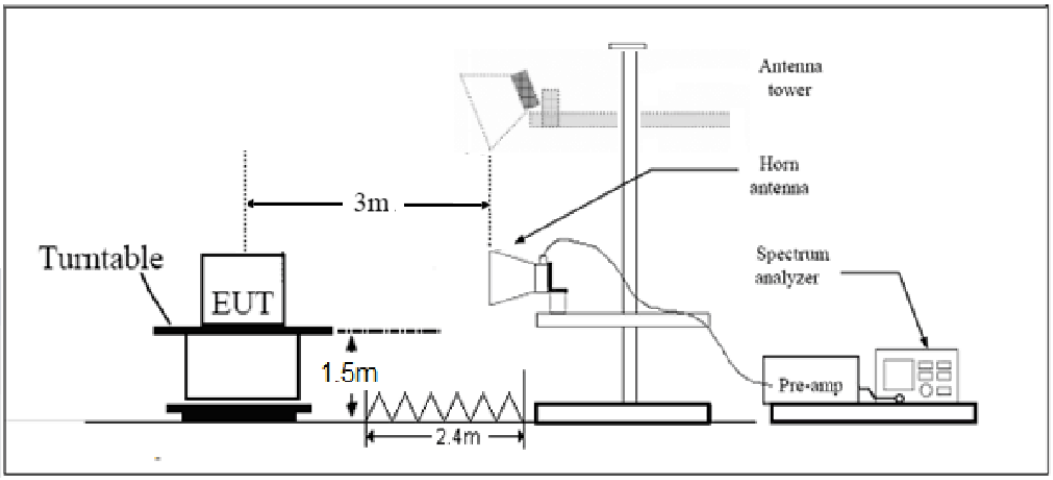
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Limits

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.”

Limit	-13 dBm

Measurement Uncertainty

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

Test Result

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 5 1.4MHz CH-Low

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1648.3	-53.40	2.00	10.75	Horizontal	-46.80	-13.00	33.80	0
3	2474.6	-59.57	2.51	11.05	Horizontal	-53.18	-13.00	40.18	315
4	3296.6	-55.42	4.20	11.15	Horizontal	-50.62	-13.00	37.62	270
5	4120.9	-52.31	5.20	11.15	Horizontal	-48.51	-13.00	35.51	315
6	4945.9	-51.97	5.50	11.95	Horizontal	-47.67	-13.00	34.67	135
7	5772.8	-51.24	5.70	13.55	Horizontal	-45.54	-13.00	32.54	180
8	6590.6	-49.17	6.30	13.75	Horizontal	-43.87	-13.00	30.87	0
9	7421.3	-46.12	6.80	13.85	Horizontal	-41.22	-13.00	28.22	45
10	8249.6	-46.37	6.90	14.25	Horizontal	-41.17	-13.00	28.17	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 5 1.4MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1671.9	-53.88	2.00	10.75	Horizontal	-47.28	-13.00	34.28	0
3	2509.5	-58.68	2.51	11.05	Horizontal	-52.29	-13.00	39.29	45
4	3348.8	-56.36	4.20	11.15	Horizontal	-51.56	-13.00	38.56	45
5	4185.4	-54.64	5.20	11.15	Horizontal	-50.84	-13.00	37.84	225
6	5020.5	-49.80	5.50	11.95	Horizontal	-45.50	-13.00	32.50	315
7	5855.6	-51.95	5.70	13.55	Horizontal	-46.25	-13.00	33.25	90
8	6690.4	-49.19	6.30	13.75	Horizontal	-43.89	-13.00	30.89	225
9	7526.3	-46.44	6.80	13.85	Horizontal	-41.54	-13.00	28.54	315
10	8363.6	-47.88	6.90	14.25	Horizontal	-42.68	-13.00	29.68	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 5 1.4MHz CH-High

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1695.8	-55.39	2.00	10.75	Horizontal	-48.79	-13.00	35.79	180
3	2544.8	-59.69	2.51	11.05	Horizontal	-53.30	-13.00	40.30	315
4	3391.9	-56.04	4.20	11.15	Horizontal	-51.24	-13.00	38.24	135
5	4240.1	-52.44	5.20	11.15	Horizontal	-48.64	-13.00	35.64	225
6	5090.3	-49.83	5.50	11.95	Horizontal	-45.53	-13.00	32.53	0
7	5935.9	-51.77	5.70	13.55	Horizontal	-46.07	-13.00	33.07	0
8	6789.0	-48.65	6.30	13.75	Horizontal	-43.35	-13.00	30.35	315
9	7631.6	-47.30	6.80	13.85	Horizontal	-42.40	-13.00	29.40	135
10	8482.9	-49.11	6.90	14.25	Horizontal	-43.91	-13.00	30.91	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 5 3MHz CH-Low

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1648.3	-52.63	2.00	10.75	Horizontal	-46.03	-13.00	33.03	45
3	2476.5	-57.19	2.51	11.05	Horizontal	-50.80	-13.00	37.80	135
4	3372.8	-55.74	4.20	11.15	Horizontal	-50.94	-13.00	37.94	270
5	4105.9	-53.40	5.20	11.15	Horizontal	-49.60	-13.00	36.60	225
6	5010.4	-51.10	5.50	11.95	Horizontal	-46.80	-13.00	33.80	0
7	5938.1	-51.40	5.70	13.55	Horizontal	-45.70	-13.00	32.70	315
8	6739.9	-49.57	6.30	13.75	Horizontal	-44.27	-13.00	31.27	45
9	7545.0	-47.19	6.80	13.85	Horizontal	-42.29	-13.00	29.29	90
10	8349.0	-47.63	6.90	14.25	Horizontal	-42.43	-13.00	29.43	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 5 3MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1673.0	-54.20	2.00	10.75	Horizontal	-47.60	-13.00	34.60	90
3	2509.5	-57.47	2.51	11.05	Horizontal	-51.08	-13.00	38.08	180
4	3405.8	-57.09	4.20	11.15	Horizontal	-52.29	-13.00	39.29	180
5	4105.9	-53.06	5.20	11.15	Horizontal	-49.26	-13.00	36.26	225
6	4984.5	-51.64	5.50	11.95	Horizontal	-47.34	-13.00	34.34	45
7	5914.5	-51.07	5.70	13.55	Horizontal	-45.37	-13.00	32.37	135
8	6839.3	-49.51	6.30	13.75	Horizontal	-44.21	-13.00	31.21	270
9	7769.3	-45.89	6.80	13.85	Horizontal	-40.99	-13.00	27.99	0
10	8697.0	-47.86	6.90	14.25	Horizontal	-42.66	-13.00	29.66	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 5 3MHz CH-High

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1695.0	-61.44	2.00	10.75	Horizontal	-54.84	-13.00	41.84	315
3	2542.5	-58.78	2.51	11.05	Horizontal	-52.39	-13.00	39.39	135
4	3352.1	-55.91	4.20	11.15	Horizontal	-51.11	-13.00	38.11	45
5	4081.1	-53.19	5.20	11.15	Horizontal	-49.39	-13.00	36.39	135
6	5001.8	-49.37	5.50	11.95	Horizontal	-45.07	-13.00	32.07	45
7	5964.4	-51.78	5.70	13.55	Horizontal	-46.08	-13.00	33.08	180
8	6792.8	-49.01	6.30	13.75	Horizontal	-43.71	-13.00	30.71	0
9	7668.0	-47.47	6.80	13.85	Horizontal	-42.57	-13.00	29.57	0
10	8541.0	-47.29	6.90	14.25	Horizontal	-42.09	-13.00	29.09	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 5 5MHz CH-Low

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1653.0	-53.43	2.00	10.75	Horizontal	-46.83	-13.00	33.83	225
3	2479.5	-56.95	2.51	11.05	Horizontal	-50.56	-13.00	37.56	225
4	3358.9	-56.25	4.20	11.15	Horizontal	-51.45	-13.00	38.45	315
5	4006.1	-52.58	5.20	11.15	Horizontal	-48.78	-13.00	35.78	0
6	4994.6	-51.28	5.50	11.95	Horizontal	-46.98	-13.00	33.98	270
7	5960.3	-51.54	5.70	13.55	Horizontal	-45.84	-13.00	32.84	45
8	6793.1	-50.02	6.30	13.75	Horizontal	-44.72	-13.00	31.72	270
9	7633.5	-46.90	6.80	13.85	Horizontal	-42.00	-13.00	29.00	90
10	8466.4	-49.34	6.90	14.25	Horizontal	-44.14	-13.00	31.14	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 5 5MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1673.0	-54.50	2.00	10.75	Horizontal	-47.90	-13.00	34.90	225
3	2509.5	-56.58	2.51	11.05	Horizontal	-50.19	-13.00	37.19	135
4	3465.8	-54.64	4.20	11.15	Horizontal	-49.84	-13.00	36.84	315
5	4218.8	-52.50	5.20	11.15	Horizontal	-48.70	-13.00	35.70	270
6	5166.4	-50.31	5.50	11.95	Horizontal	-46.01	-13.00	33.01	180
7	5814.4	-52.83	5.70	13.55	Horizontal	-47.13	-13.00	34.13	180
8	6766.5	-49.33	6.30	13.75	Horizontal	-44.03	-13.00	31.03	135
9	7615.5	-47.37	6.80	13.85	Horizontal	-42.47	-13.00	29.47	225
10	8464.9	-47.45	6.90	14.25	Horizontal	-42.25	-13.00	29.25	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 5 5MHz CH-High

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1693.0	-51.93	2.00	10.75	Horizontal	-45.33	-13.00	32.33	270
3	2539.5	-58.30	2.51	11.05	Horizontal	-51.91	-13.00	38.91	180
4	3386.6	-56.28	4.20	11.15	Horizontal	-51.48	-13.00	38.48	135
5	4233.4	-52.51	5.20	11.15	Horizontal	-48.71	-13.00	35.71	135
6	5076.0	-49.93	5.50	11.95	Horizontal	-45.63	-13.00	32.63	135
7	5926.9	-51.32	5.70	13.55	Horizontal	-45.62	-13.00	32.62	45
8	6772.9	-49.79	6.30	13.75	Horizontal	-44.49	-13.00	31.49	315
9	7619.3	-47.46	6.80	13.85	Horizontal	-42.56	-13.00	29.56	135
10	8462.3	-47.72	6.90	14.25	Horizontal	-42.52	-13.00	29.52	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 5 10MHz CH-Low

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1658.0	-58.60	2.00	10.75	Horizontal	-52.00	-13.00	39.00	90
3	2487.0	-57.25	2.51	11.05	Horizontal	-50.86	-13.00	37.86	45
4	3316.5	-55.96	4.20	11.15	Horizontal	-51.16	-13.00	38.16	315
5	4146.0	-53.23	5.20	11.15	Horizontal	-49.43	-13.00	36.43	315
6	4979.6	-51.37	5.50	11.95	Horizontal	-47.07	-13.00	34.07	90
7	5802.4	-51.20	5.70	13.55	Horizontal	-45.50	-13.00	32.50	135
8	6633.8	-48.62	6.30	13.75	Horizontal	-43.32	-13.00	30.32	90
9	7461.8	-46.82	6.80	13.85	Horizontal	-41.92	-13.00	28.92	180
10	8290.5	-47.83	6.90	14.25	Horizontal	-42.63	-13.00	29.63	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 5 10MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1673.0	-53.31	2.00	10.75	Horizontal	-46.71	-13.00	33.71	90
3	2509.5	-57.17	2.51	11.05	Horizontal	-50.78	-13.00	37.78	0
4	3346.1	-56.52	4.20	11.15	Horizontal	-51.72	-13.00	38.72	270
5	4182.8	-52.84	5.20	11.15	Horizontal	-49.04	-13.00	36.04	225
6	5018.3	-50.73	5.50	11.95	Horizontal	-46.43	-13.00	33.43	45
7	5855.3	-51.05	5.70	13.55	Horizontal	-45.35	-13.00	32.35	135
8	6694.1	-49.44	6.30	13.75	Horizontal	-44.14	-13.00	31.14	225
9	7528.5	-47.58	6.80	13.85	Horizontal	-42.68	-13.00	29.68	315
10	8356.9	-48.82	6.90	14.25	Horizontal	-43.62	-13.00	30.62	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 5 10MHz CH-High

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1688.0	-52.74	2.00	10.75	Horizontal	-46.14	-13.00	33.14	225
3	2532.0	-56.73	2.51	11.05	Horizontal	-50.34	-13.00	37.34	
4	3376.1	-54.84	4.20	11.15	Horizontal	-50.04	-13.00	37.04	135
5	4219.1	-53.16	5.20	11.15	Horizontal	-49.36	-13.00	36.36	0
6	5064.4	-51.23	5.50	11.95	Horizontal	-46.93	-13.00	33.93	135
7	5907.8	-51.62	5.70	13.55	Horizontal	-45.92	-13.00	32.92	90
8	6751.1	-49.12	6.30	13.75	Horizontal	-43.82	-13.00	30.82	135
9	7595.3	-46.89	6.80	13.85	Horizontal	-41.99	-13.00	28.99	90
10	8443.5	-45.96	6.90	14.25	Horizontal	-40.76	-13.00	27.76	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.									

6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMW500	113824	2020-05-18	2021-05-17
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2020-05-18	2021-05-17
Universal Radio Communication Tester	Key sight	E5515C	MY48367192	2020-05-27	2021-05-26
Signal Analyzer	R&S	FSV30	100815	2019-12-15	2020-12-14
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2017-09-26	2020-09-25
Trilog Antenna	SCHWARZBECK	VUBL 9163	9163-201	2017-11-18	2020-11-17
Horn Antenna	R&S	HF907	102723	2018-08-11	2021-08-10
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2021-06-19
Signal generator	R&S	SMB 100A	102594	2020-05-18	2021-05-17
Climatic Chamber	ESPEC	SU-242	93000506	2017-12-17	2020-12-16
Preampflier	R&S	SCU18	102327	2020-05-18	2021-05-17
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2020-05-18	2021-05-17
RF Cable	Agilent	SMA 15cm	0001	2020-06-12	2020-12-11
Software	R&S	EMC32	9.26.0	/	/

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