



RF TEST REPORT

Applicant ZTE Corporation
FCC ID SRQ-Z6750M
Product 5G NR Multi-Mode Mobile Phone
Model Z6750M
Report No. R2008A0534-R1V2
Issue Date October 29, 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.

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TABLE OF CONTENT

1. Test Laboratory	5
1.1. Notes of the Test Report	5
1.2. Test facility	5
1.3. Testing Location	5
2. General Description of Equipment under Test.....	6
2.3. Applicant and Manufacturer Information.....	6
2.4. General Information	6
3. Applied Standards	8
4. Test Configuration	9
5. Test Case Results	10
5.1. RF Power Output and Effective Radiated Power	10
5.2. Occupied Bandwidth	15
5.3. Band Edge Compliance	27
5.4. Peak-to-Average Power Ratio (PAPR).....	40
5.5. Frequency Stability.....	43
5.6. Spurious Emissions at Antenna Terminals.....	49
5.7. Radiates Spurious Emission	56
6. Main Test Instruments.....	62
ANNEX A: The EUT Appearance	63
ANNEX B: Test Setup Photos	64



Version	Revision description	Issue Date
Rev.0	/	October 21, 2020
Rev.1	Update data of Band Edge Compliance and Occupied Bandwidth for CA-5B	October 28, 2020
Rev.2	Update description in Chapter 5.1.	October 29, 2020
Note This revised report (Report No.: R2008A0534-R1V2) supersedes and replaces the previously issued report (Report No.: R2008A0534-R1V1). Please discard or destroy the previously issued report and dispose of it accordingly.		

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: August 14, 2020 ~ October 28, 2020			
Date of Sample Receiving: August 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
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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	Z6750M		
IMEI	865633050021551		
Hardware Version	Z6750MHW1.0		
Software Version	Z6750MV1.0.0B01		
Power Supply	Battery/AC adapter		
Antenna Type	Internal Antenna		
Antenna Gain	-1.75dBi		
Test Mode(s)	LTE Band 5; CA-5B		
Test Modulation	(LTE)QPSK 16QAM 64QAM;		
LTE Category	18		
Maximum E.R.P.	LTE Band 5:	20.84dBm	
	CA-5B:	21.12dBm	
Rated Power Supply Voltage	4.0V		
Extreme Voltage	Minimum: 3.5V	Maximum: 4.4V	
Extreme Temperature	Lowest: -30°C	Highest: +50°C	
Operating Voltage	Minimum: 3.5V	Maximum: 4.4V	
Operating Temperature	Lowest: -10°C	Highest: +55°C	
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	LTE Band 5	824 ~ 849	869 ~ 894
EUT Accessory			
Battery	Manufacturer: COSMX Model: Li3939T44P8h756547		
Adapter 1	Manufacturer: SHENZHEN RUIJING INDUSTRIAL CO LTD Model: STC-A5930A1-Z		
Adapter 2	Manufacturer: Jiangsu Chenyang Electron Co., Ltd. Model: STC-A5930A1-Z		
USB Cable 1	Manufacturer: kingpower-tech Model: USB-TC30-W-100-M		



USB Cable 2	Manufacturer: Luxshare Precision industry Co., Ltd. Model: USB-TC30-W-100-M
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, vertical 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	-
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	-
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 was connected to the Base Station Simulator with a known loss. The EUT is controlled by the Base Station Simulator test set to ensure max power transmission with proper modulation.

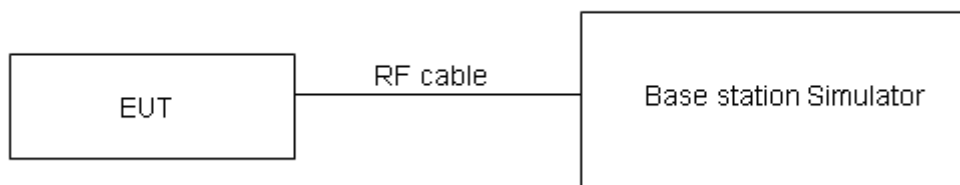
ERP can then be calculated as follows:

$EIRP \text{ (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBi)}$

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

$EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB.)}$

Test Setup



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	$\leq 7 \text{ W}$ (38.45 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 $k = 2$, $U = 0.4 \text{ dB}$ for RF power output, $k = 2$, $U = 1.19 \text{ dB}$ for ERP .



Test Results

LTE Band 5									
Bandwidth	Modulation	RB allocation	offset	Maximum Output Power(dBm)			ERP(dBm)		
				Channel/Frequency(MHz)					
				20407/824.7	20525/836.5	20643/848.3	20407/824.7	20525/836.5	20643/848.3
1.4MHz	QPSK	1	0	24.56	24.56	24.60	20.66	20.66	20.70
		1	2	24.49	24.56	24.58	20.59	20.66	20.68
		1	5	24.57	24.48	24.26	20.67	20.58	20.36
		3	0	24.55	24.64	24.57	20.65	20.74	20.67
		3	2	24.55	24.64	24.74	20.65	20.74	20.84
		3	3	24.63	24.59	24.71	20.73	20.69	20.81
		6	0	23.79	23.71	23.72	19.89	19.81	19.82
	16QAM	1	0	23.62	23.88	23.77	19.72	19.98	19.87
		1	2	23.60	23.84	23.63	19.70	19.94	19.73
		1	5	23.70	23.90	23.82	19.80	20.00	19.92
		3	0	23.38	23.57	23.47	19.48	19.67	19.57
		3	2	23.44	23.65	23.52	19.54	19.75	19.62
		3	3	23.44	23.66	23.55	19.54	19.76	19.65
		6	0	22.40	22.68	22.46	18.50	18.78	18.56
	64QAM	1	0	23.81	23.87	23.93	19.91	19.97	20.03
		1	2	23.77	23.97	23.90	19.87	20.07	20.00
		1	5	23.57	23.83	23.67	19.67	19.93	19.77
		3	0	23.39	23.58	23.48	19.49	19.68	19.58
		3	2	23.54	23.72	23.68	19.64	19.82	19.78
		3	3	23.33	23.56	23.42	19.43	19.66	19.52
		6	0	22.44	22.69	22.56	18.54	18.79	18.66
Bandwidth	Modulation	RB allocation	offset	Maximum Output Power(dBm)			ERP(dBm)		
				Channel/Frequency(MHz)					
				20415/825.5	20525/836.5	20635/847.5	20415/825.5	20525/836.5	20635/847.5
3MHz	QPSK	1	0	24.58	24.60	24.63	20.68	20.70	20.73
		1	7	24.47	24.59	24.62	20.57	20.69	20.72
		1	14	24.60	24.53	24.30	20.70	20.63	20.40
		8	0	23.65	23.76	23.70	19.75	19.86	19.80
		8	4	23.67	23.74	23.86	19.77	19.84	19.96
		8	7	23.73	23.70	23.81	19.83	19.80	19.91
		15	0	23.79	23.75	23.75	19.89	19.85	19.85
	16QAM	1	0	23.65	23.90	23.80	19.75	20.00	19.90
		1	7	23.63	23.84	23.67	19.73	19.94	19.77
		1	14	23.72	23.94	23.85	19.82	20.04	19.95
		8	0	22.49	22.70	22.59	18.59	18.80	18.69
		8	4	22.55	22.78	22.64	18.65	18.88	18.74
8		7	22.54	22.78	22.68	18.64	18.88	18.78	



		15	0	22.43	22.72	22.49	18.53	18.82	18.59
	64QAM	1	0	23.84	23.89	23.96	19.94	19.99	20.06
		1	7	23.80	23.97	23.92	19.90	20.07	20.02
		1	14	23.59	23.82	23.70	19.69	19.92	19.80
		8	0	22.50	22.71	22.60	18.60	18.81	18.70
		8	4	22.65	22.85	22.80	18.75	18.95	18.90
		8	7	22.43	22.68	22.55	18.53	18.78	18.65
		15	0	22.47	22.73	22.59	18.57	18.83	18.69
		Bandwidth	Modulation	RB allocation	offset	Maximum Output Power(dBm)			ERP(dBm)
Channel/Frequency(MHz)									
20425/826.5	20525/836.5					20625/846.5	20425/826.5	20525/836.5	20625/846.5
5MHz	QPSK	1	0	24.56	24.55	24.60	20.66	20.65	20.70
		1	13	24.46	24.59	24.60	20.56	20.69	20.70
		1	24	24.56	24.47	24.25	20.66	20.57	20.35
		12	0	23.63	23.72	23.67	19.73	19.82	19.77
		12	6	23.65	23.70	23.81	19.75	19.80	19.91
		12	13	23.70	23.69	23.78	19.80	19.79	19.88
		25	0	23.81	23.72	23.72	19.91	19.82	19.82
	16QAM	1	0	23.59	23.87	23.77	19.69	19.97	19.87
		1	13	23.61	23.83	23.65	19.71	19.93	19.75
		1	24	23.69	23.90	23.81	19.79	20.00	19.91
		12	0	22.47	22.69	22.57	18.57	18.79	18.67
		12	6	22.51	22.72	22.59	18.61	18.82	18.69
		12	13	22.52	22.74	22.65	18.62	18.84	18.75
		25	0	22.41	22.68	22.44	18.51	18.78	18.54
	64QAM	1	0	23.78	23.86	23.93	19.88	19.96	20.03
		1	13	23.78	23.96	23.90	19.88	20.06	20.00
		1	24	23.60	23.81	23.70	19.70	19.91	19.80
		12	0	22.50	22.74	22.62	18.60	18.84	18.72
		12	6	22.62	22.81	22.78	18.72	18.91	18.88
		12	13	22.41	22.64	22.52	18.51	18.74	18.62
		25	0	22.45	22.69	22.54	18.55	18.79	18.64
Bandwidth	Modulation	RB allocation	offset	Maximum Output Power(dBm)			ERP(dBm)		
				Channel/Frequency(MHz)					
				20450/829	20525/836.5	20600/844	20450/829	20525/836.5	20600/844
10MHz	QPSK	1	0	24.53	24.51	24.57	20.63	20.61	20.67
		1	25	24.45	24.55	24.58	20.55	20.65	20.68
		1	49	24.54	24.46	24.22	20.64	20.56	20.32
		25	0	23.60	23.67	23.63	19.70	19.77	19.73
		25	13	23.63	23.66	23.78	19.73	19.76	19.88
		25	25	23.67	23.64	23.74	19.77	19.74	19.84
		50	0	23.78	23.67	23.68	19.88	19.77	19.78
	16QAM	1	0	23.62	23.83	23.72	19.72	19.93	19.82



		1	25	23.57	23.81	23.61	19.67	19.91	19.71
		1	49	23.67	23.87	23.79	19.77	19.97	19.89
		25	0	22.44	22.65	22.54	18.54	18.75	18.64
		25	13	22.48	22.70	22.56	18.58	18.80	18.66
		25	25	22.49	22.69	22.61	18.59	18.79	18.71
		50	0	22.39	22.64	22.41	18.49	18.74	18.51
	64QAM	1	0	23.76	23.82	23.88	19.86	19.92	19.98
		1	25	23.74	23.94	23.86	19.84	20.04	19.96
		1	49	23.54	23.75	23.64	19.64	19.85	19.74
		25	0	22.45	22.66	22.55	18.55	18.76	18.65
		25	13	22.58	22.77	22.72	18.68	18.87	18.82
		25	25	22.38	22.59	22.48	18.48	18.69	18.58
		50	0	22.43	22.65	22.51	18.53	18.75	18.61

CA_5B	PCC	SCC	PCC RB		SCC1 RB		Maximum Output Power(dBm)			ERP(dBm)		
	Frequency (MHz)	Frequency (MHz)	Size	Offset	Size	Offset	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
3MHz+ 5MHz	825.6	829.5	1	14	1	0	23.52	22.55	22.31	19.62	18.65	18.41
			15	0	25	0	23.34	22.41	22.26	19.44	18.51	18.36
	834.1	838	1	14	1	0	23.19	22.34	22.20	19.29	18.44	18.30
			15	0	25	0	23.25	22.28	22.18	19.35	18.38	18.28
	842.6	846.5	1	14	1	0	22.77	21.91	21.74	18.87	18.01	17.84
			15	0	25	0	22.93	21.98	21.92	19.03	18.08	18.02
5MHz+ 3MHz	835	838.9	1	24	1	0	23.16	22.44	22.17	19.26	18.54	18.27
			25	0	15	0	23.18	22.23	22.19	19.28	18.33	18.29
	843.5	847.4	1	24	1	0	23.04	22.24	21.99	19.14	18.34	18.09
			25	0	15	0	22.95	22.04	21.93	19.05	18.14	18.03
5MHz+ 10MHz	826.8	834	1	24	1	0	24.77	23.95	23.80	20.87	20.05	19.90
			25	0	50	0	22.28	21.35	21.30	18.38	17.45	17.40
	831.8	839	1	24	1	0	24.74	23.99	23.81	20.84	20.09	19.91
			25	0	50	0	22.24	21.30	21.32	18.34	17.40	17.42
	836.8	844	1	24	1	0	24.70	23.98	23.82	20.80	20.08	19.92
			25	0	50	0	22.30	21.38	21.30	18.40	17.48	17.40
10MHz+ 5MHz	829	836.2	1	49	1	0	24.90	24.24	24.00	21.00	20.34	20.10
			50	0	25	0	22.47	21.53	21.48	18.57	17.63	17.58
	834	841.2	1	49	1	0	25.02	24.04	24.02	21.12	20.14	20.12
			50	0	25	0	22.49	21.52	21.51	18.59	17.62	17.61
	839	846.2	1	49	1	0	24.94	24.07	24.04	21.04	20.17	20.14
			50	0	25	0	22.49	21.59	21.51	18.59	17.69	17.61
10MHz+ 10MHz	829	838.9	1	49	1	0	24.94	23.97	23.92	21.04	20.07	20.02
			50	0	50	0	22.32	21.36	21.35	18.42	17.46	17.45
	831.6	841.5	1	49	1	0	24.96	24.01	23.95	21.06	20.11	20.05



			50	0	50	0	22.34	21.41	21.39	18.44	17.51	17.49
	834.1	844	1	49	1	0	24.91	24.05	23.98	21.01	20.15	20.08
			50	0	50	0	22.33	21.40	21.40	18.43	17.50	17.50

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 30 kHz, VBW is set to 91kHz for LTE Band 5 (1.4MHz),

RBW is set to 62 kHz, VBW is set to 180kHz for LTE Band 5 (3MHz),

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

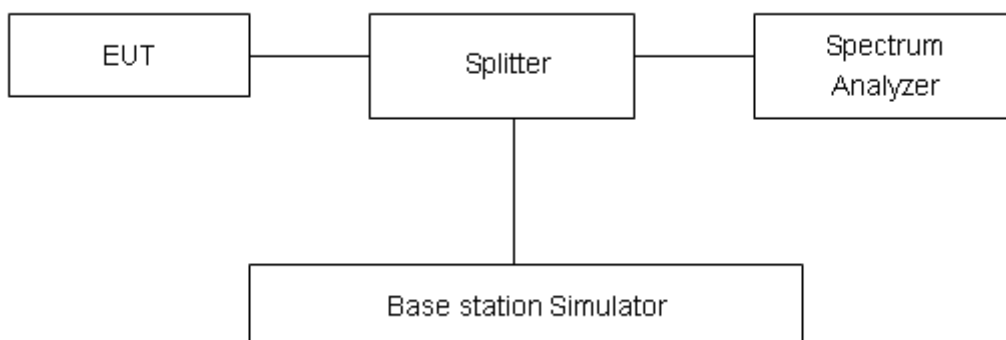
RBW is set to 200 kHz, VBW is set to 620kHz for LTE Band 5 (10MHz),

RBW is set to 240kHz, VBW is set to 750kHz for CA_5B (3MHz+5MHz, 5MHz+3MHz, 5MHz+10MHz, 10MHz+5MHz),

RBW is set to 300kHz, VBW is set to 910kHz for CA_5B (10MHz+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 $k = 2$, $U = 624\text{Hz}$.



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	1.0977	1.223
			20525	836.5	1.0911	1.235
			20643	848.3	1.0896	1.241
		3	20415	825.5	2.6972	3.005
			20525	836.5	2.7030	2.992
			20635	847.5	2.7062	2.987
		5	20425	826.5	4.5154	4.979
			20525	836.5	4.5078	4.920
			20625	846.5	4.5162	4.904
		10	20450	829	8.9803	9.813
			20525	836.5	8.9762	9.805
			20600	844	8.9701	9.746
	16QAM	1.4	20407	824.7	1.0896	1.239
			20525	836.5	1.0961	1.243
			20643	848.3	1.0894	1.222
		3	20415	825.5	2.6903	2.977
			20525	836.5	2.6956	2.996
			20635	847.5	2.7080	2.997
		5	20425	826.5	4.4949	4.888
			20525	836.5	4.5207	4.924
			20625	846.5	4.5098	4.967
		10	20450	829	8.9683	9.753
			20525	836.5	8.9805	9.677
			20600	844	8.9820	9.663
	64QAM	1.4	20407	824.7	1.0892	1.244
			20525	836.5	1.0948	1.238
			20643	848.3	1.0886	1.220
		3	20415	825.5	2.6870	2.990
			20525	836.5	2.6891	3.013
			20635	847.5	2.6946	3.018

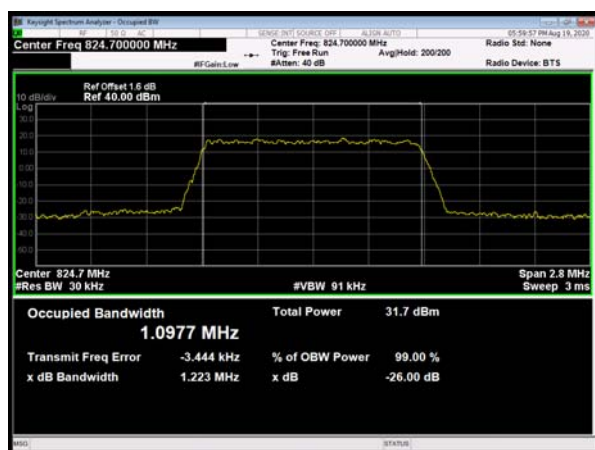


		5	20425	826.5	4.5159	4.916
			20525	836.5	4.5068	4.940
			20625	846.5	4.5309	4.970
		10	20450	829	8.9649	9.753
			20525	836.5	8.9696	9.610
			20600	844	8.9573	9.834

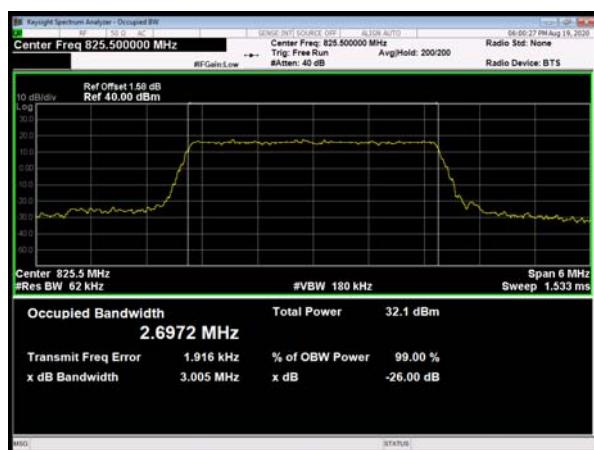
CA_5B	PCC		SCC1		PCC RB	SCC1 RB	Bandwidth(MHz)	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)			99% Power	-26dBc
CA_5B_3MHz+5MHz_QPSK	20501	834.1	20540	838	15#0	25#0	7.5717	8.178
CA_5B_3MHz+5MHz_16QAM	20501	834.1	20540	838	15#0	25#0	7.5320	8.085
CA_5B_3MHz+5MHz_64QAM	20501	834.1	20540	838	15#0	25#0	7.5342	8.156
CA_5B_5MHz+3MHz_QPSK	20510	835	20549	838.9	25#0	15#0	7.5624	8.137
CA_5B_5MHz+3MHz_16QAM	20510	835	20549	838.9	25#0	15#0	7.5186	8.106
CA_5B_5MHz+3MHz_64QAM	20510	835	20549	838.9	25#0	15#0	7.5271	8.071
CA_5B_5MHz+10MHz_QPSK	20478	831.8	20550	839	25#0	50#0	13.9000	14.790
CA_5B_5MHz+10MHz_16QAM	20478	831.8	20550	839	25#0	50#0	13.8940	14.690
CA_5B_5MHz+10MHz_64QAM	20478	831.8	20550	839	25#0	50#0	13.8950	14.780
CA_5B_10MHz+5MHz_QPSK	20500	834	20572	841.2	50#0	25#0	13.8440	14.640
CA_5B_10MHz+5MHz_16QAM	20500	834	20572	841.2	50#0	25#0	13.8640	14.580
CA_5B_10MHz+5MHz_64QAM	20500	834	20572	841.2	50#0	25#0	13.8270	14.650
CA_5B_10MHz+10MHz_QPSK	20476	831.6	20575	841.5	50#0	50#0	18.7390	19.810
CA_5B_10MHz+10MHz_16QAM	20476	831.6	20575	841.5	50#0	50#0	18.7840	19.720
CA_5B_10MHz+10MHz_64QAM	20476	831.6	20575	841.5	50#0	50#0	18.7730	19.810



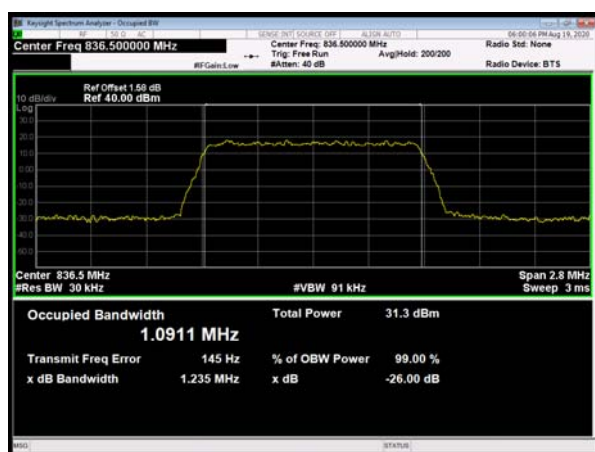
LTE Band 5 QPSK 1.4MHz CH-Low



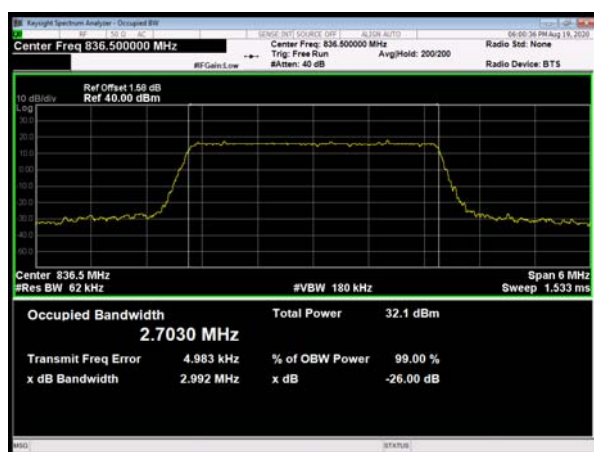
LTE Band 5 QPSK 3MHz CH-Low



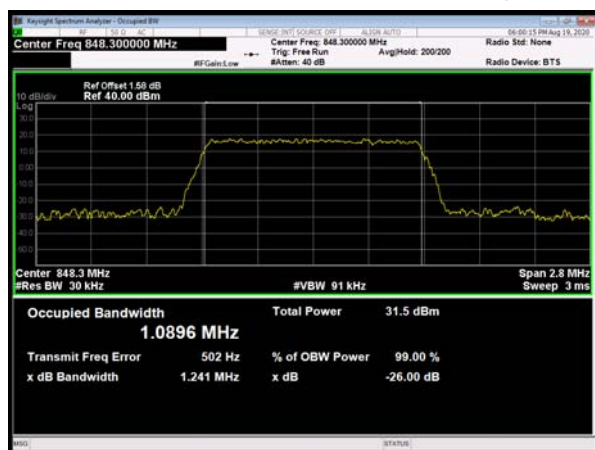
LTE Band 5 QPSK 1.4MHz CH-Middle



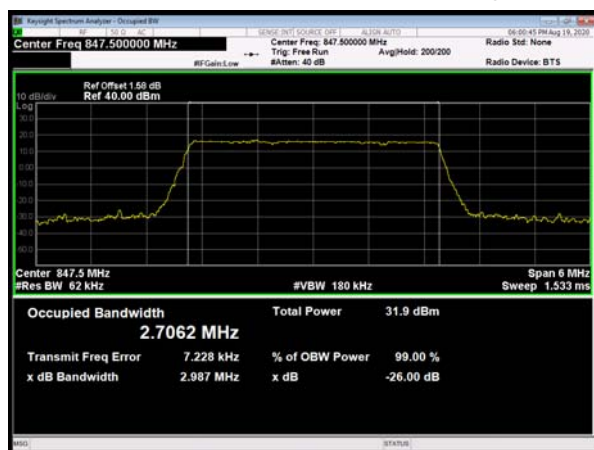
LTE Band 5 QPSK 3MHz CH-Middle



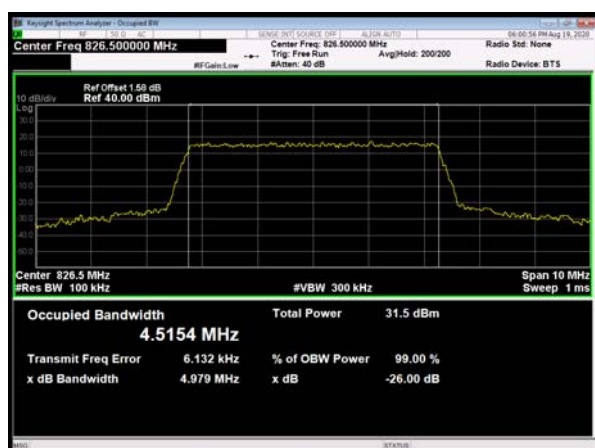
LTE Band 5 QPSK 1.4MHz CH-High



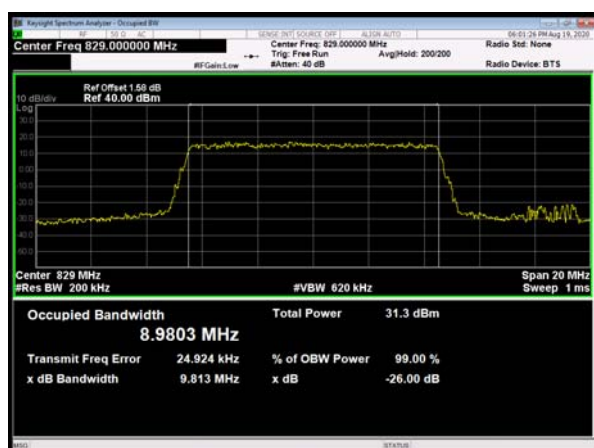
LTE Band 5 QPSK 3MHz CH-High



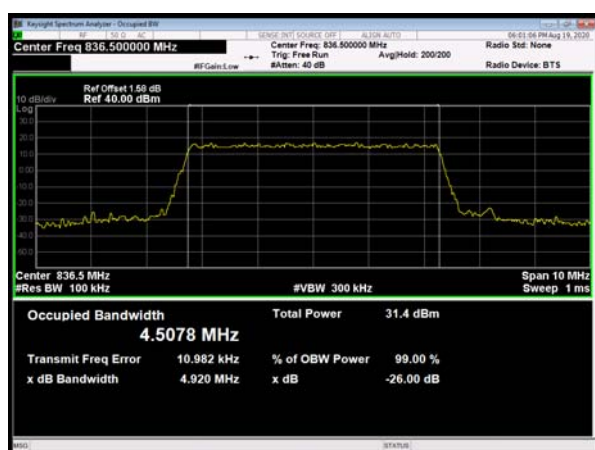
LTE Band 5 QPSK 5MHz CH-Low



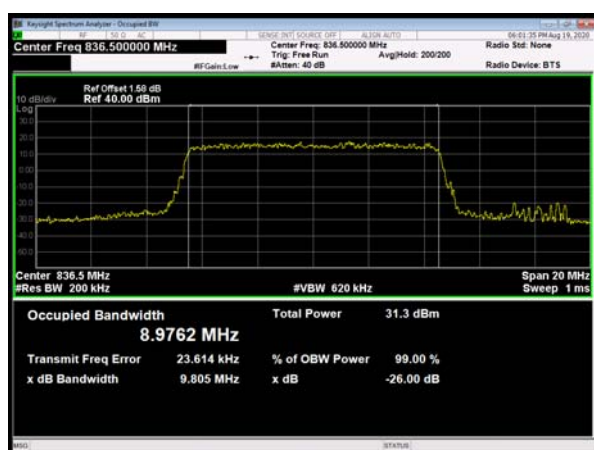
LTE Band 5 QPSK 10MHz CH-Low



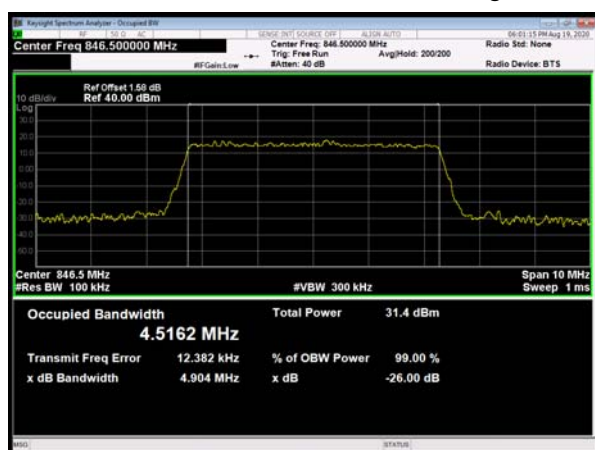
LTE Band 5 QPSK 5MHz CH-Middle



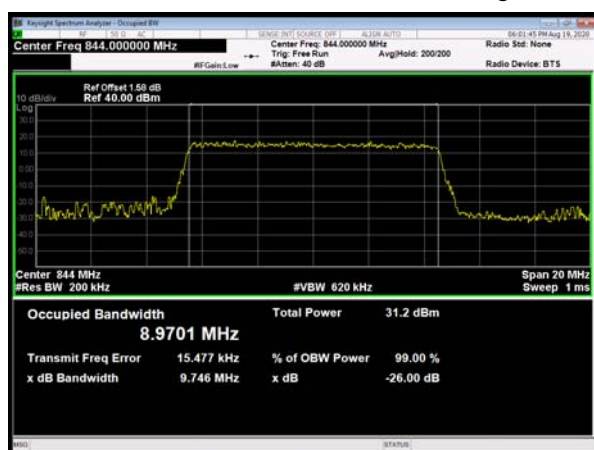
LTE Band 5 QPSK 10MHz CH-Middle



LTE Band 5 QPSK 5MHz CH-High

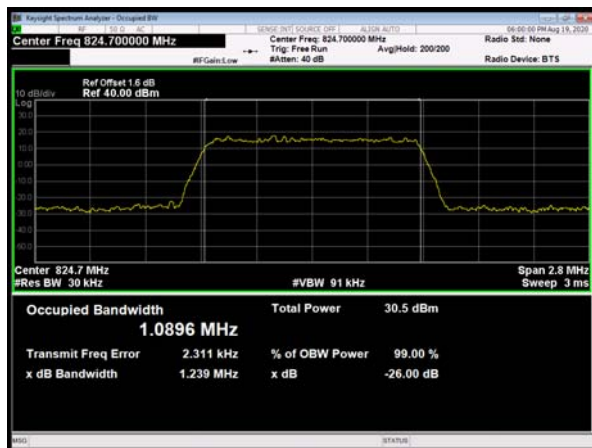


LTE Band 5 QPSK 10MHz CH-High

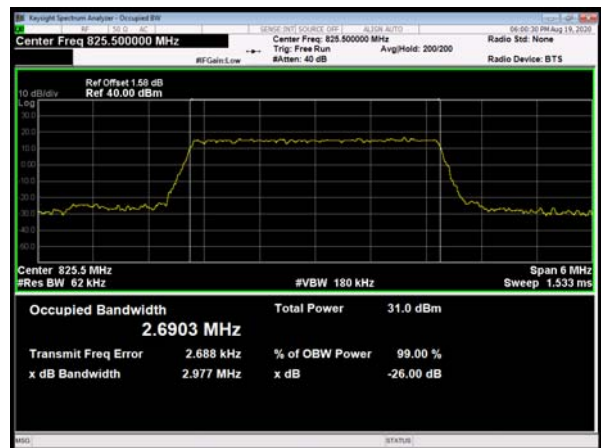




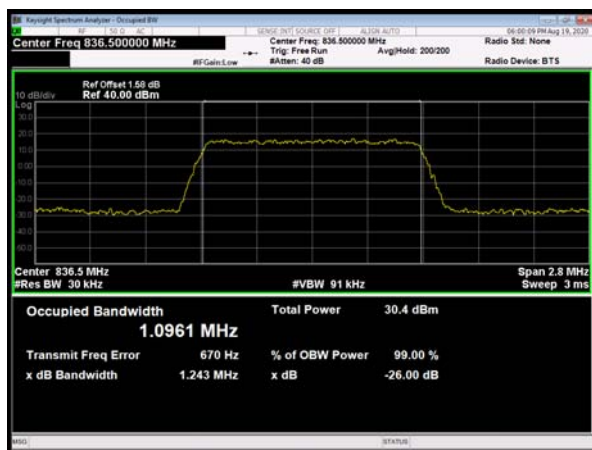
LTE Band 5 16QAM 1.4MHz CH-Low



LTE Band 5 16QAM 3MHz CH-Low



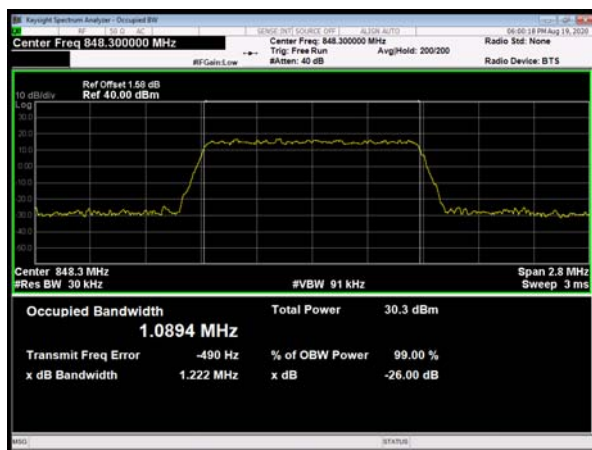
LTE Band 5 16QAM 1.4MHz CH-Middle



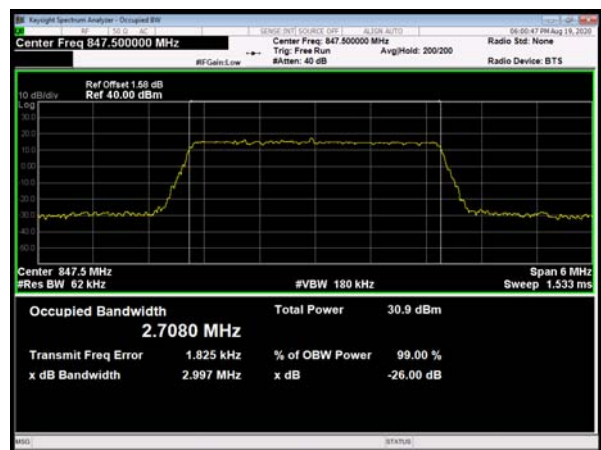
LTE Band 5 16QAM 3MHz CH-Middle



LTE Band 5 16QAM 1.4MHz CH-High

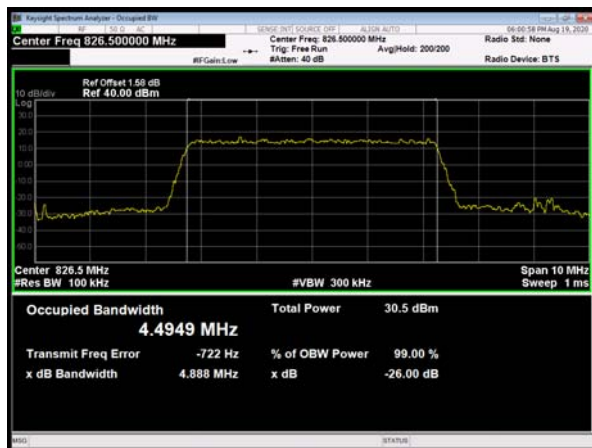


LTE Band 5 16QAM 3MHz CH-High

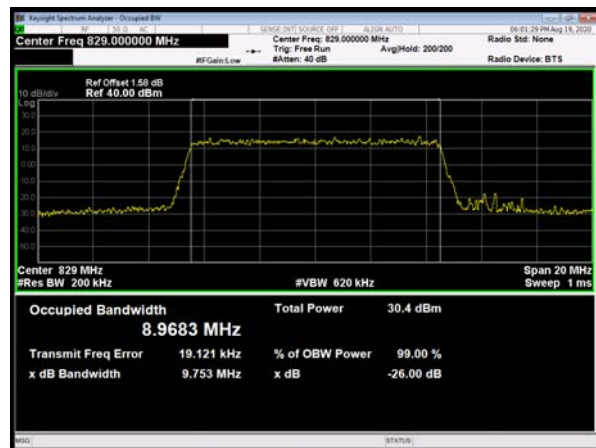




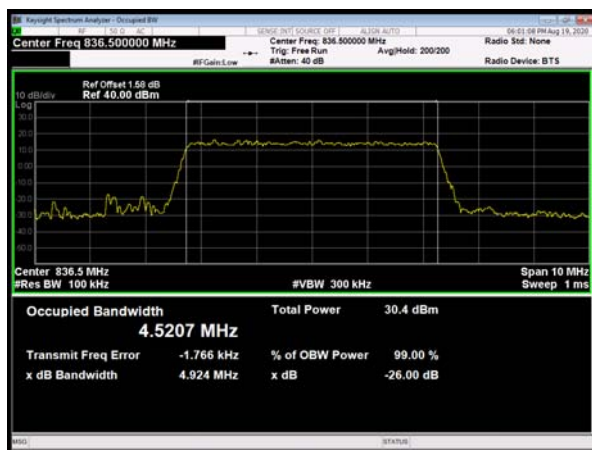
LTE Band 5 16QAM 5MHz CH-Low



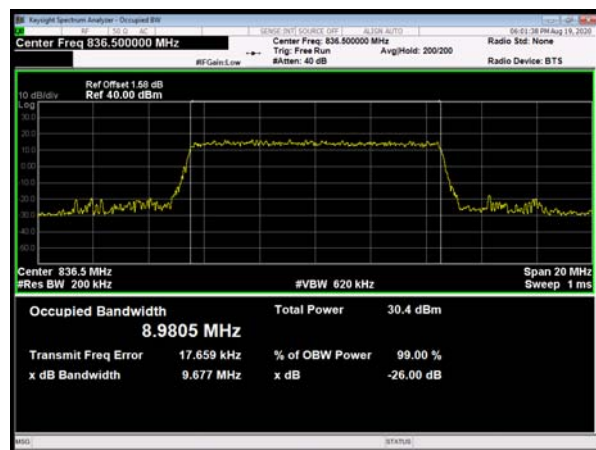
LTE Band 5 16QAM 10MHz CH-Low



LTE Band 5 16QAM 5MHz CH-Middle



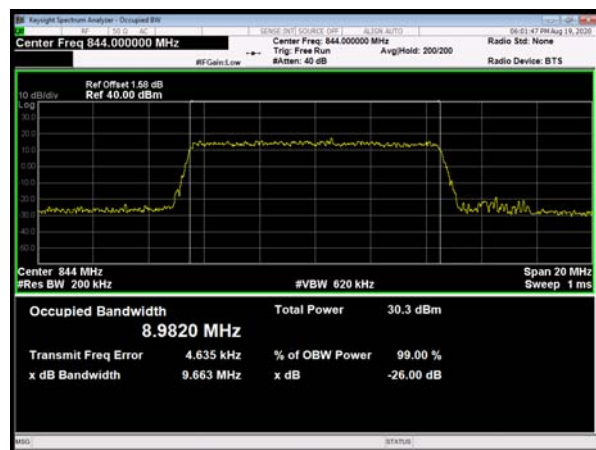
LTE Band 5 16QAM 10MHz CH-Middle



LTE Band 5 16QAM 5MHz CH-High

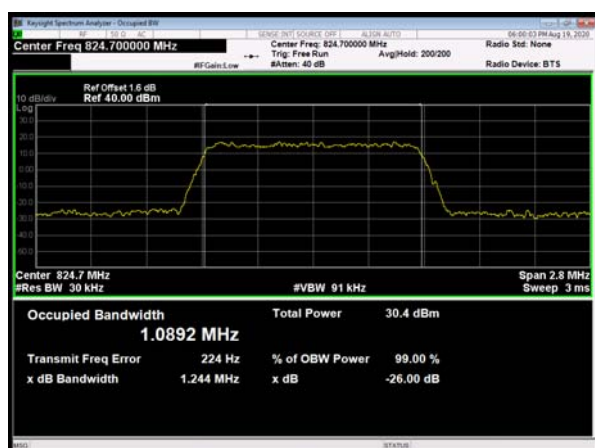


LTE Band 5 16QAM 10MHz CH-High

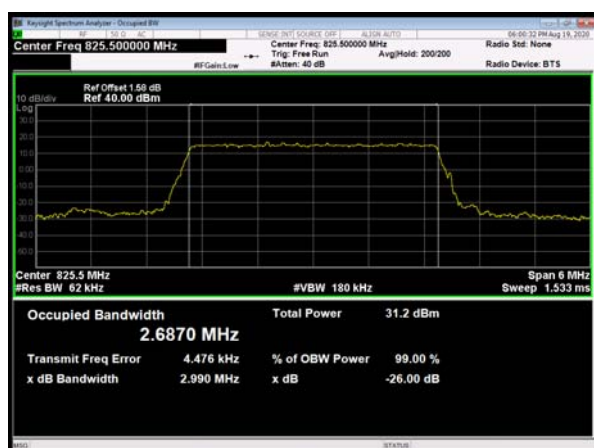




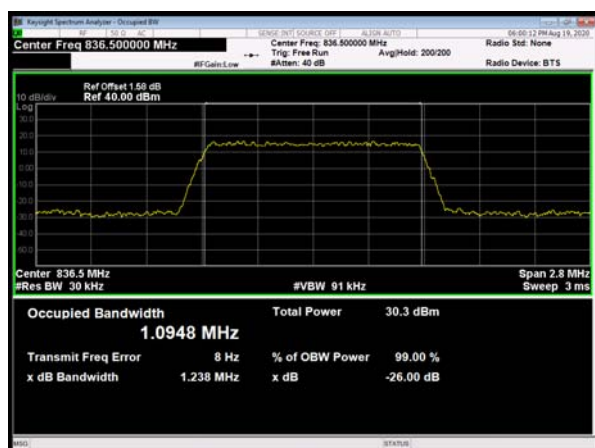
LTE Band 5 64QAM 1.4MHz CH-Low



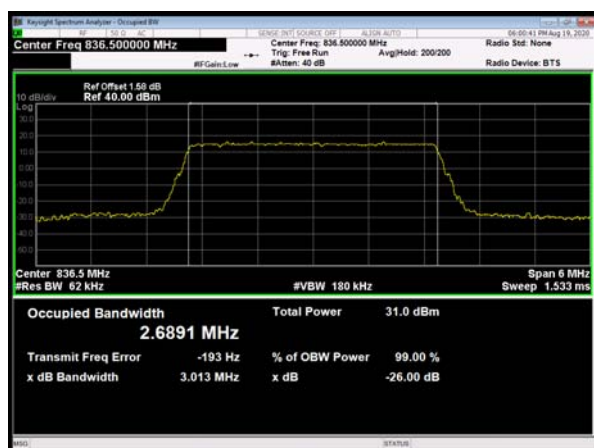
LTE Band 5 64QAM 3MHz CH-Low



LTE Band 5 64QAM 1.4MHz CH-Middle



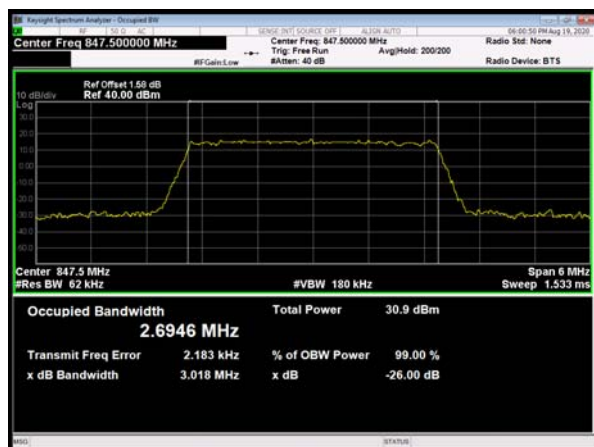
LTE Band 5 64QAM 3MHz CH-Middle



LTE Band 5 64QAM 1.4MHz CH-High

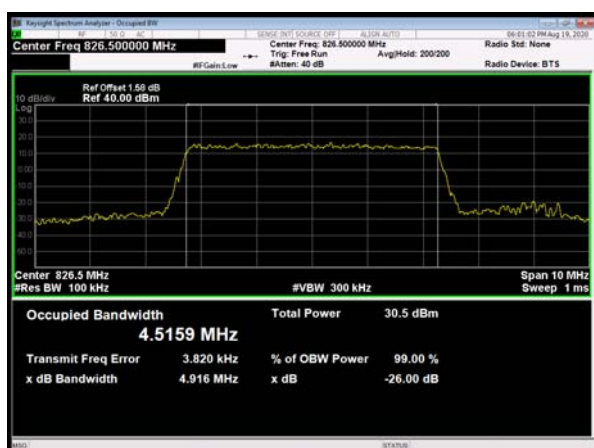


LTE Band 5 64QAM 3MHz CH-High

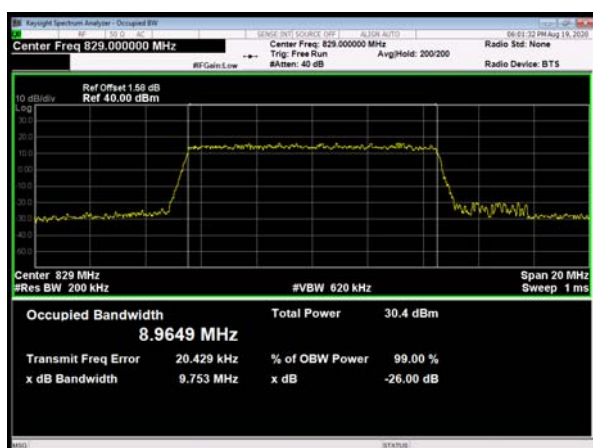




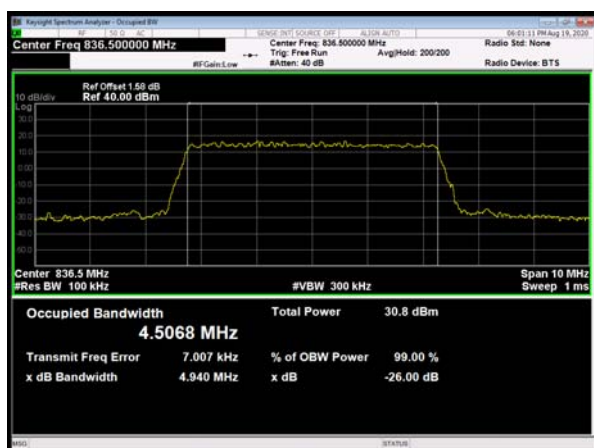
LTE Band 5 64QAM 5MHz CH-Low



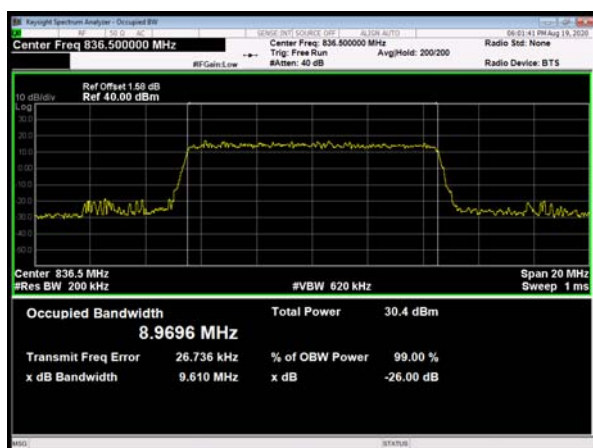
LTE Band 5 64QAM 10MHz CH-Low



LTE Band 5 64QAM 5MHz CH-Middle



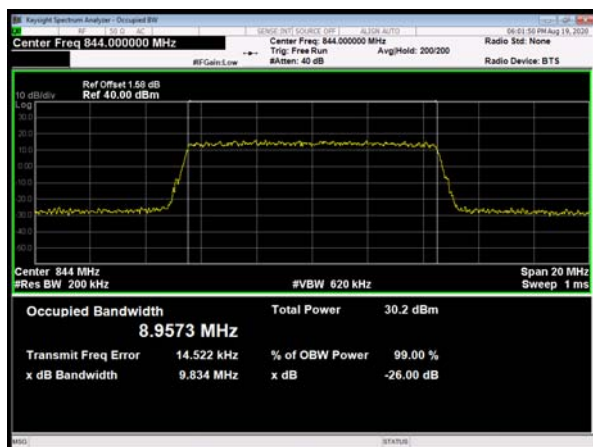
LTE Band 5 64QAM 10MHz CH-Middle



LTE Band 5 64QAM 5MHz CH-High

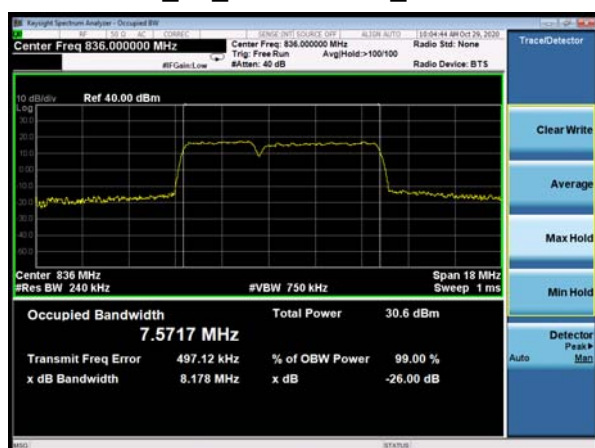


LTE Band 5 64QAM 10MHz CH-High





CA_5B_3MHz+5MHz_QPSK



CA_5B_5MHz+3MHz_QPSK



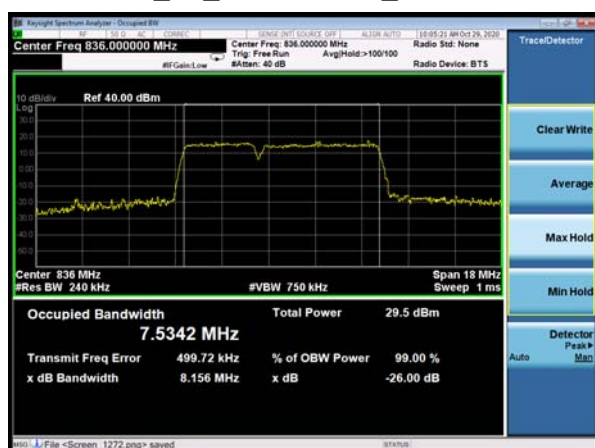
CA_5B_3MHz+5MHz_16QAM



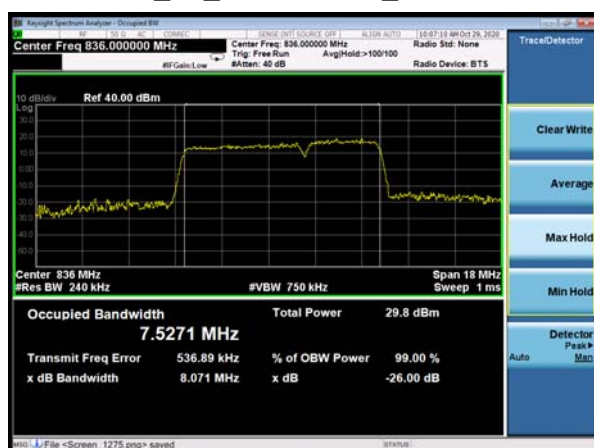
CA_5B_5MHz+3MHz_16QAM

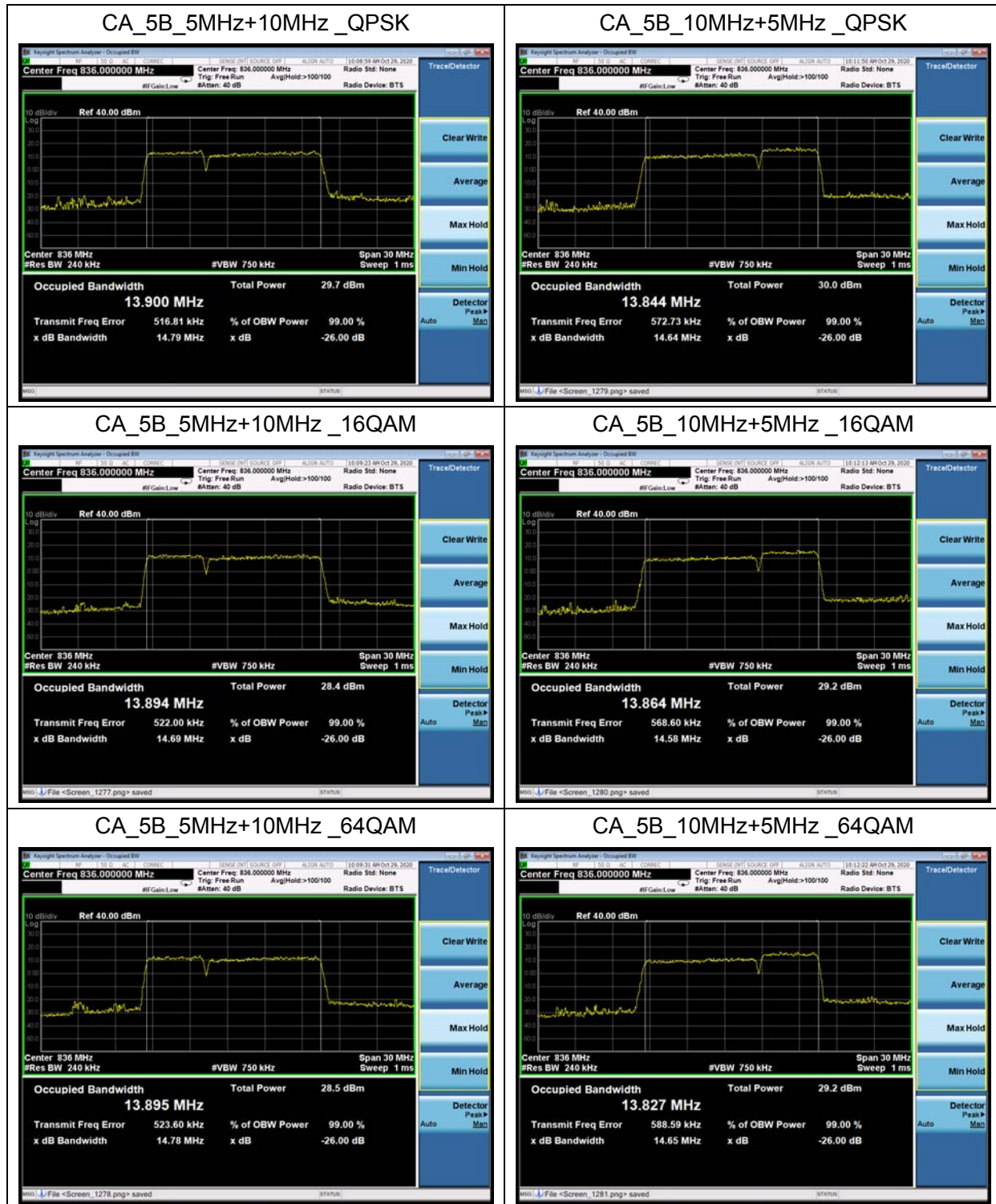


CA_5B_3MHz+5MHz_64QAM



CA_5B_5MHz+3MHz_64QAM





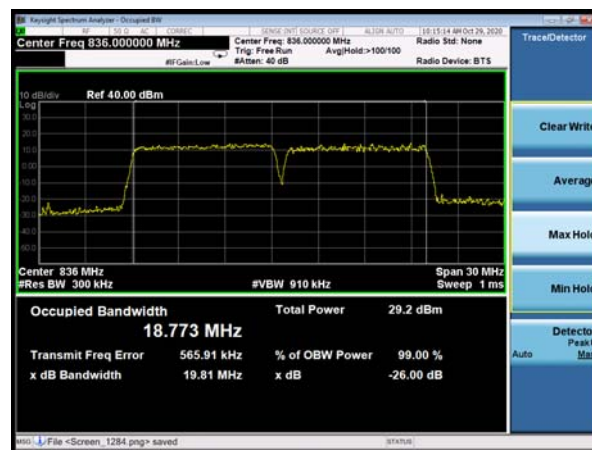
CA_5B_10MHz+10MHz_QPSK



CA_5B_10MHz+10MHz_16QAM



CA_5B_10MHz+10MHz_64QAM



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 15kHz, VBW is set to 43kHz for LTE Band 5 (1.4MHz),

RBW is set to 30kHz,VBW is set to 91kHz for LTE Band 5 (3MHz),

RBW is set to 51kHz,VBW is set to 150kHz for LTE Band 5 (5MHz),

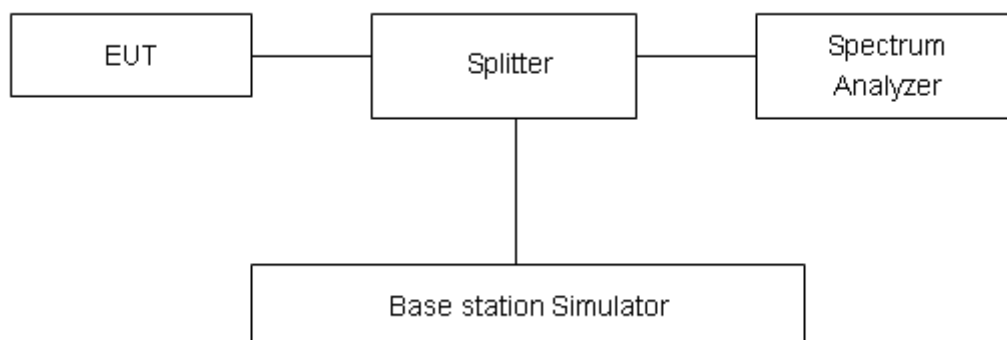
RBW is set to 100kHz,VBW is set to 300kHz for LTE Band 5 (10MHz),

RBW is set to 100kHz,VBW is set to 300kHz for CA_5B 3MHz+5MHz,

RBW is set to 220kHz,VBW is set to 680kHz for CA_5B 10MHz+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
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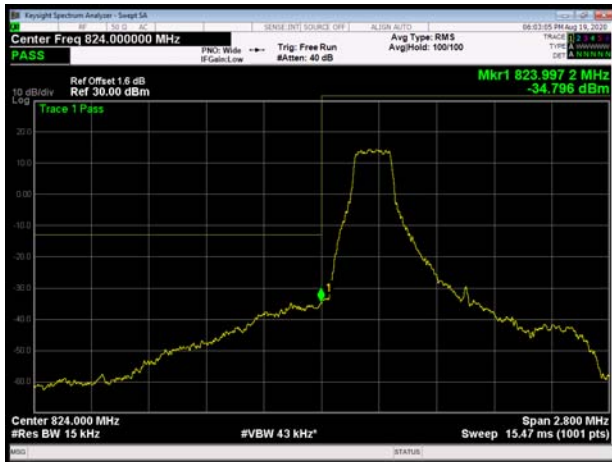
Measurement Uncertainty

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

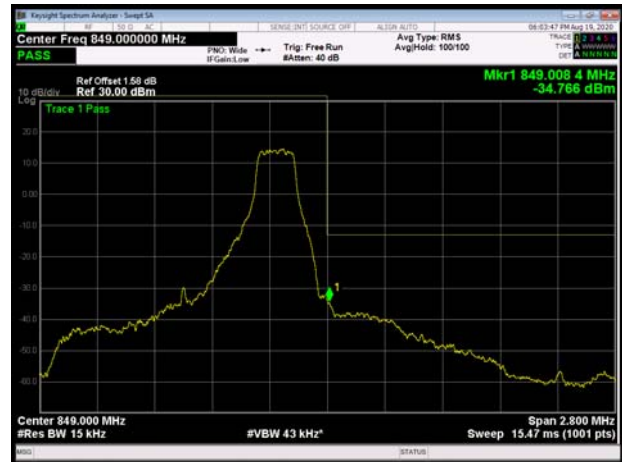


Test Result:

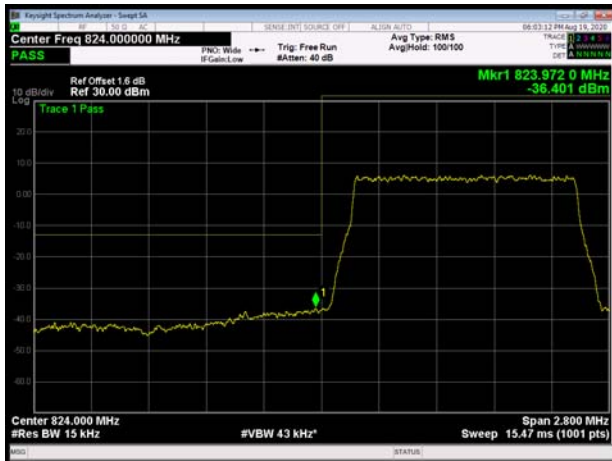
LTE Band 5 QPSK 1.4MHz CH-Low 1RB



LTE Band 5 QPSK 1.4MHz CH-High 1RB



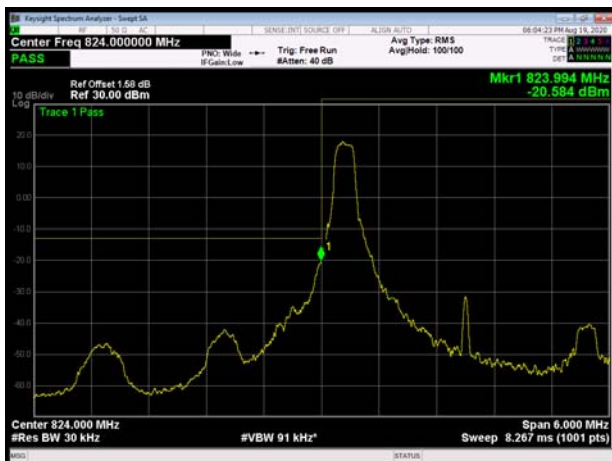
LTE Band 5 QPSK 1.4MHz CH-Low 100%RB



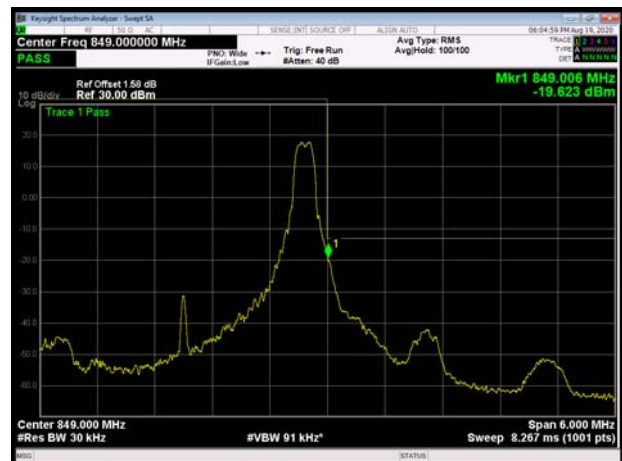
LTE Band 5 QPSK 1.4MHz CH-High 100%RB



LTE Band 5 QPSK 3MHz CH-Low 1RB

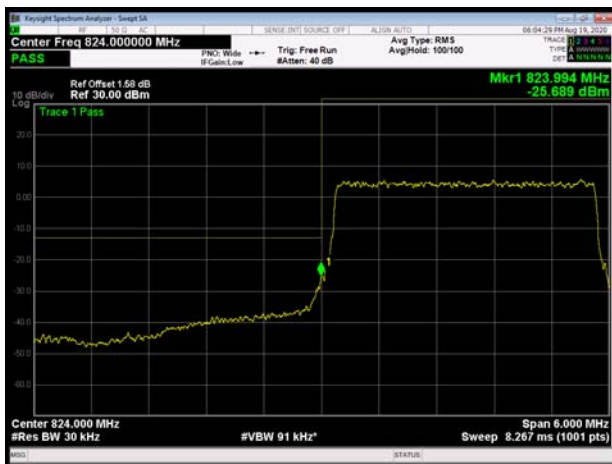


LTE Band 5 QPSK 3MHz CH-High 1RB

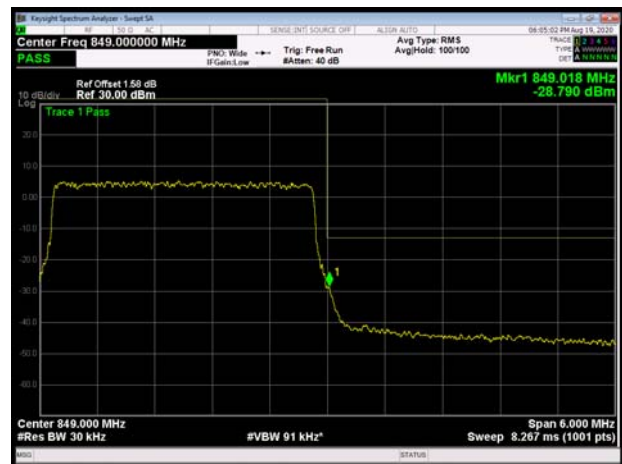




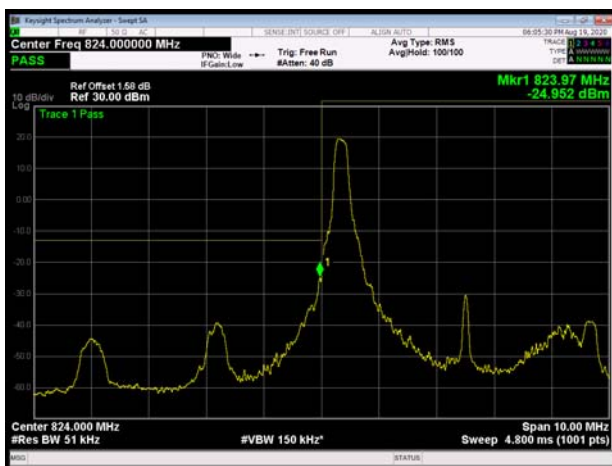
LTE Band 5 QPSK 3MHz CH-Low 100%RB



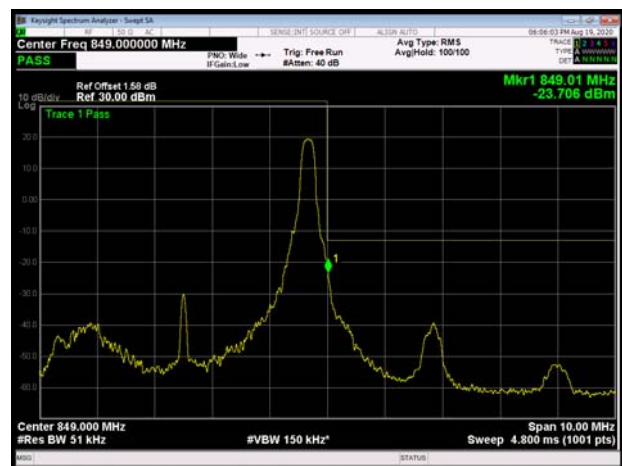
LTE Band 5 QPSK 3MHz CH-High 100%RB



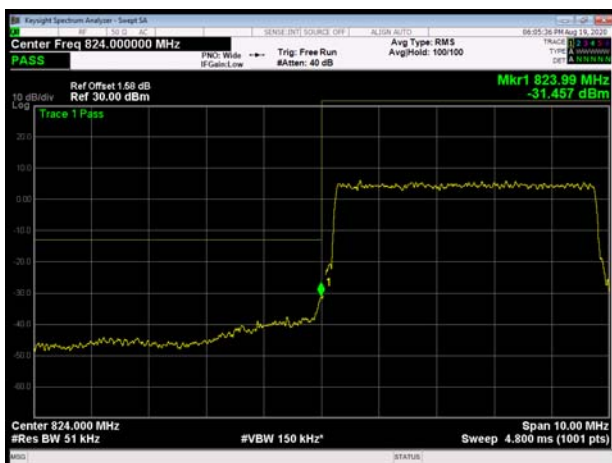
LTE Band 5 QPSK 5MHz CH-Low 1RB



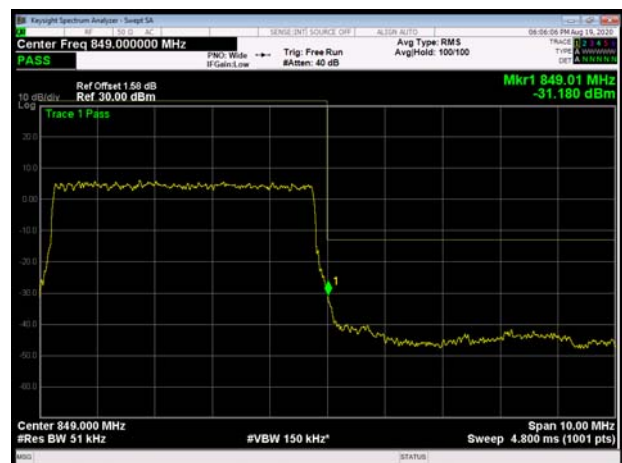
LTE Band 5 QPSK 5MHz CH-High 1RB



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



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

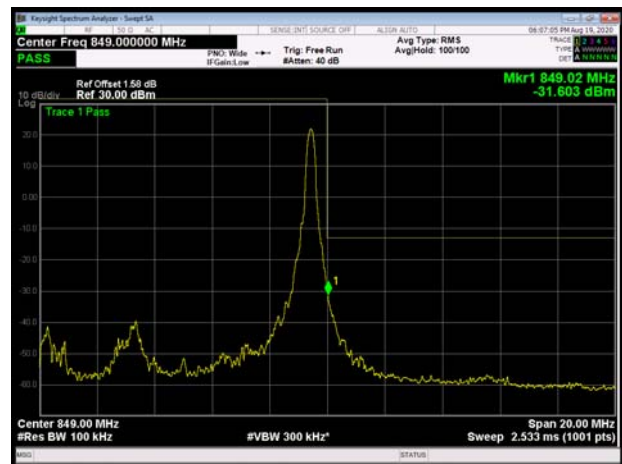




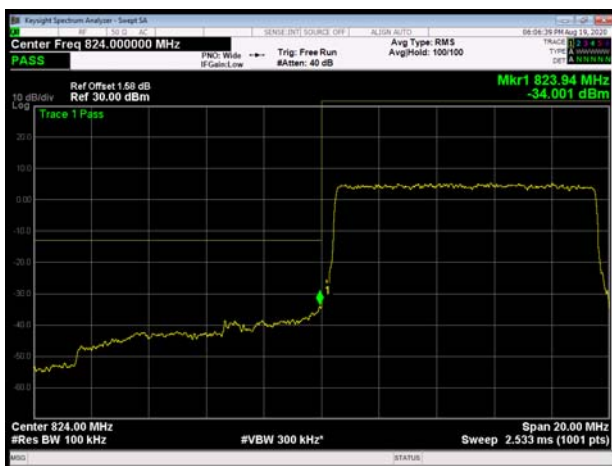
LTE Band 5 QPSK 10MHz CH-Low 1RB



LTE Band 5 QPSK 10MHz CH-High 1RB



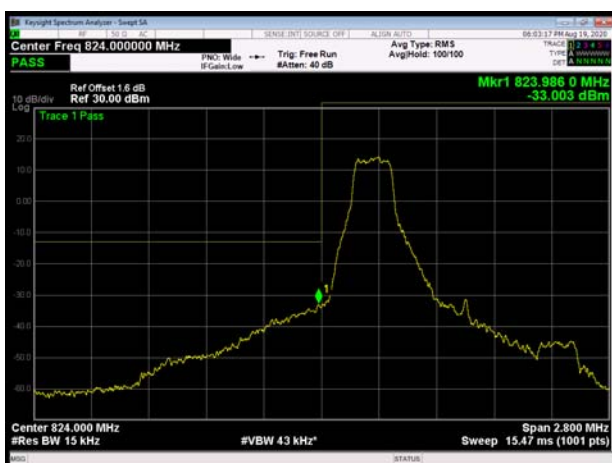
LTE Band 5 QPSK 10MHz CH-Low 100%RB



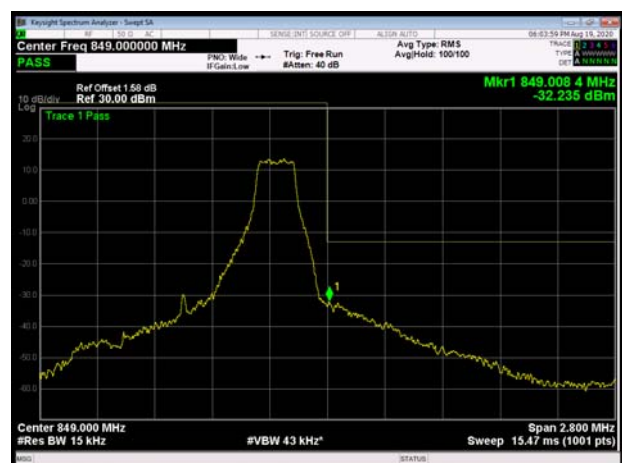
LTE Band 5 QPSK 10MHz CH-High 100%RB



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

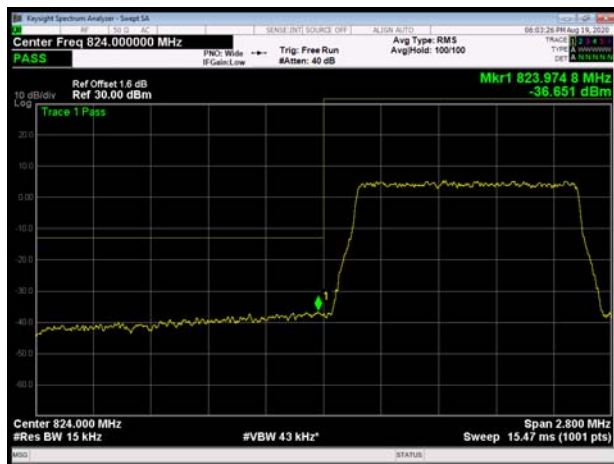


LTE Band 5 16QAM 1.4MHz CH-High 1RB





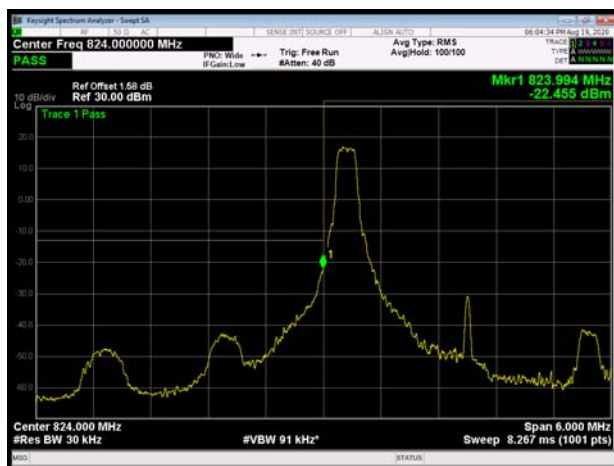
LTE Band 5 16QAM 1.4MHz CH-Low 100%RB



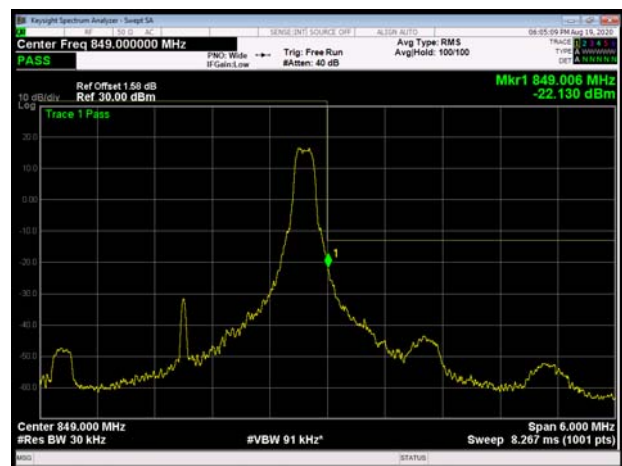
LTE Band 5 16QAM 1.4MHz CH-High 100%RB



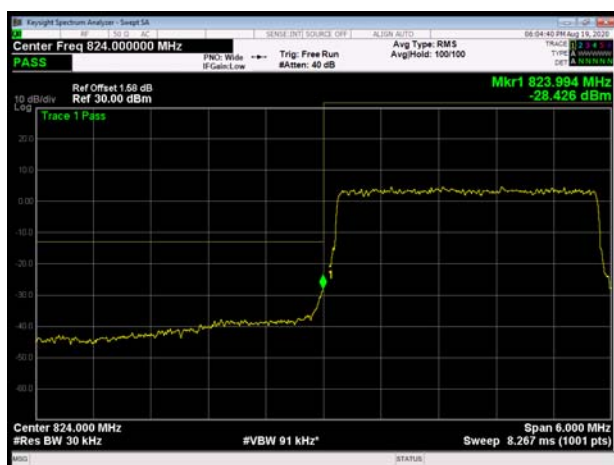
LTE Band 5 16QAM 3MHz CH-Low 1RB



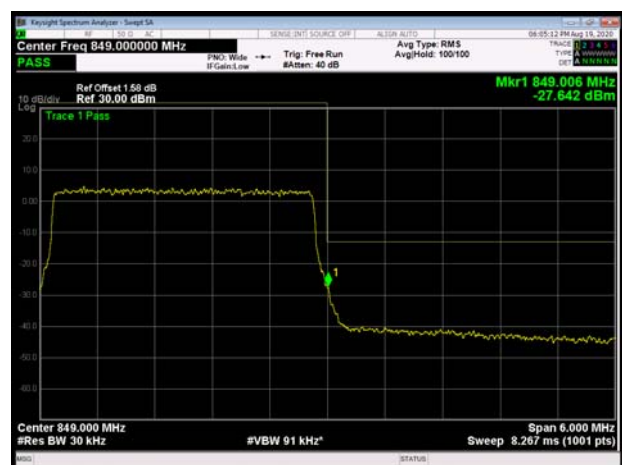
LTE Band 5 16QAM 3MHz CH-High 1RB



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

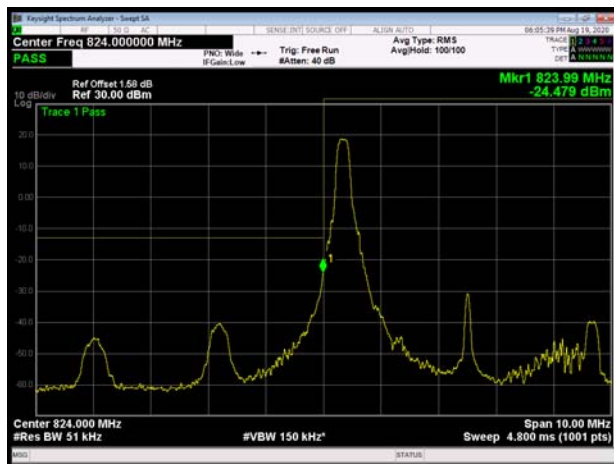


LTE Band 5 16QAM 3MHz CH-High 100%RB

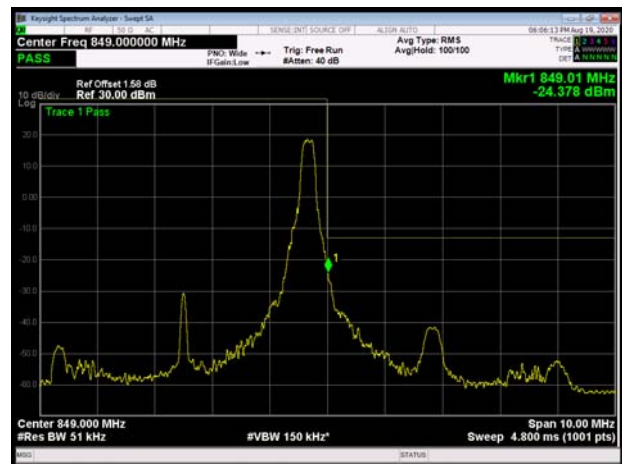




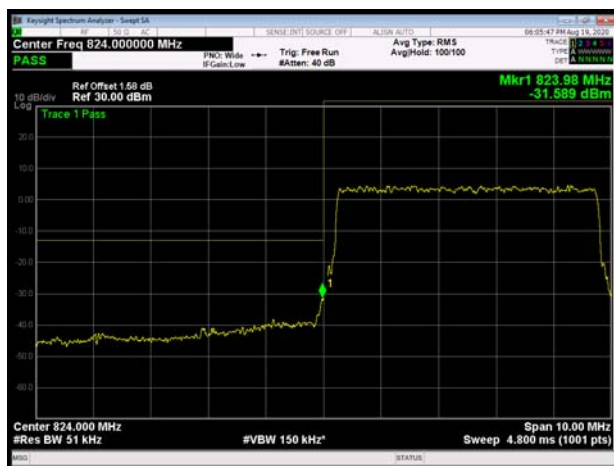
LTE Band 5 16QAM 5MHz CH-Low 1RB



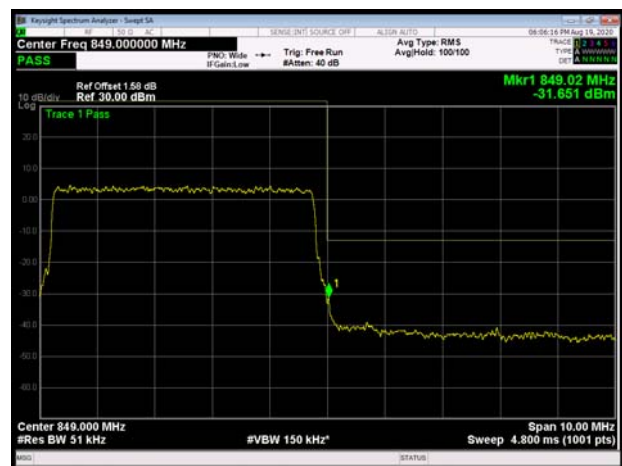
LTE Band 5 16QAM 5MHz CH-High 1RB



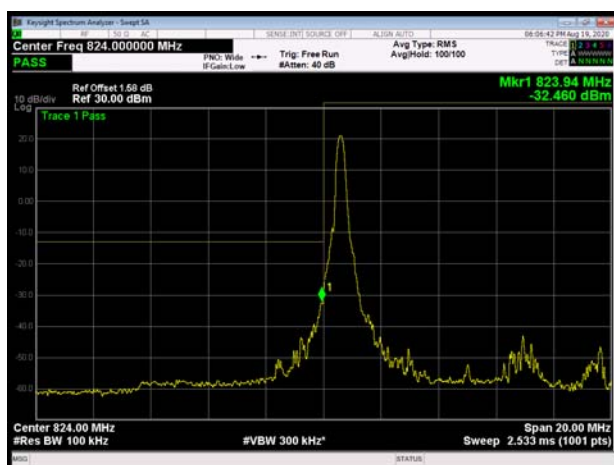
LTE Band 5 16QAM 5MHz CH-Low 100%RB



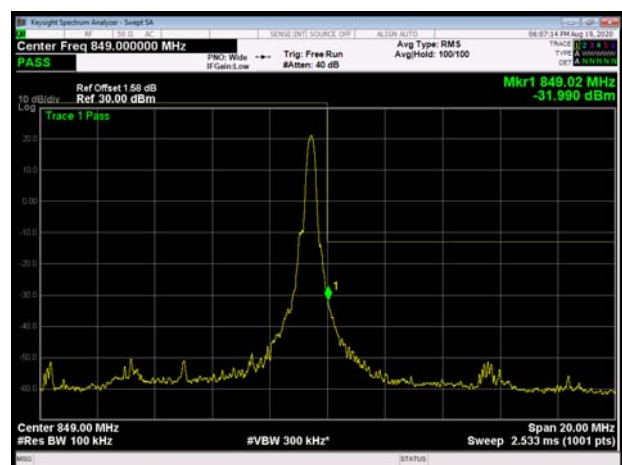
LTE Band 5 16QAM 5MHz CH-High 100%RB



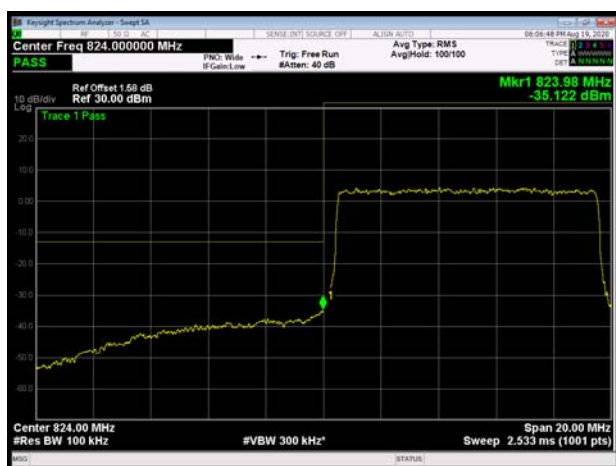
LTE Band 5 16QAM 10MHz CH-Low 1RB



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



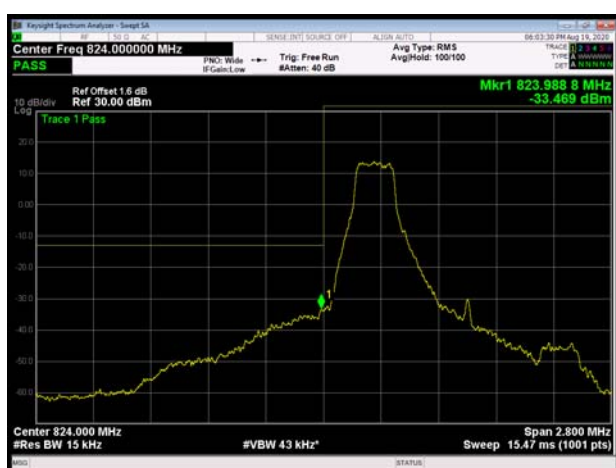
LTE Band 5 16QAM 10MHz CH-Low 100%RB



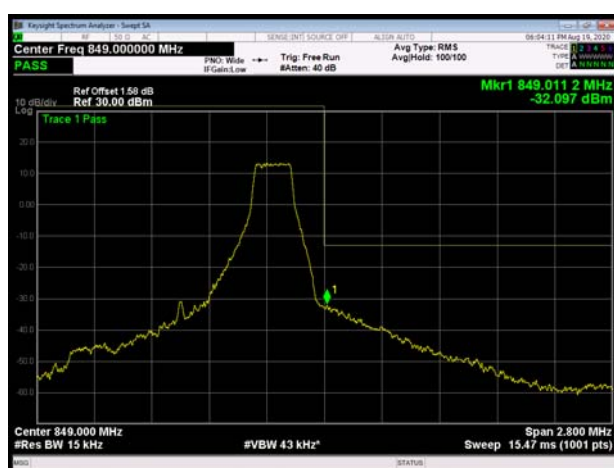
LTE Band 5 16QAM 10MHz CH-High 100%RB



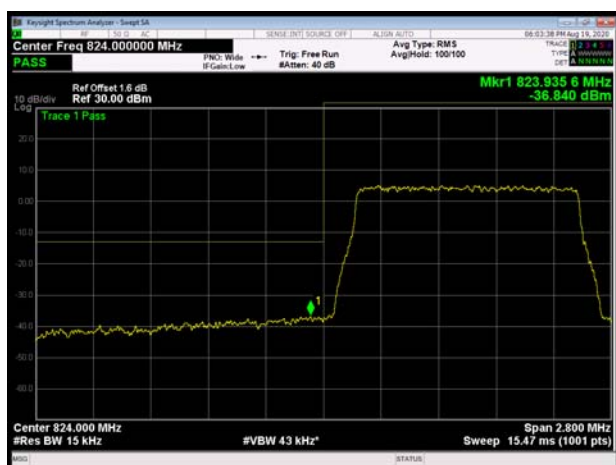
LTE Band 5 64QAM 1.4MHz CH-Low 1RB



LTE Band 5 64QAM 1.4MHz CH-High 1RB



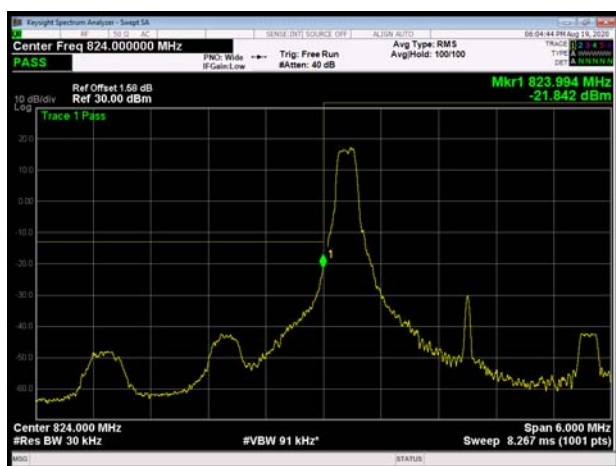
LTE Band 5 64QAM 1.4MHz CH-Low 100%RB



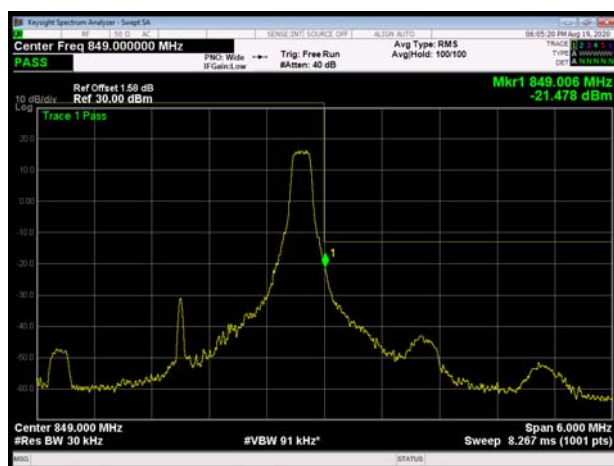
LTE Band 5 64QAM 1.4MHz CH-High 100%RB



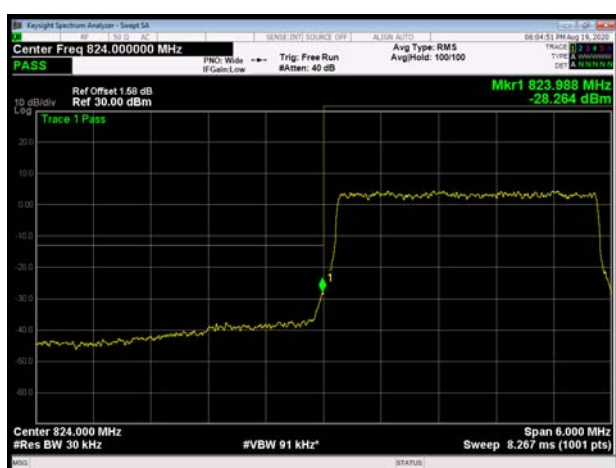
LTE Band 5 64QAM 3MHz CH-Low 1RB



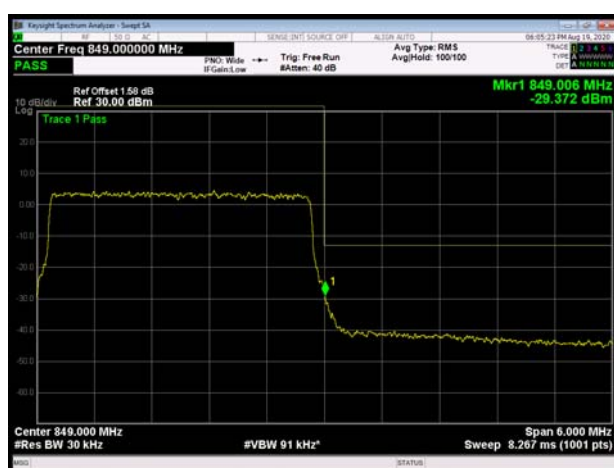
LTE Band 5 64QAM 3MHz CH-High 1RB



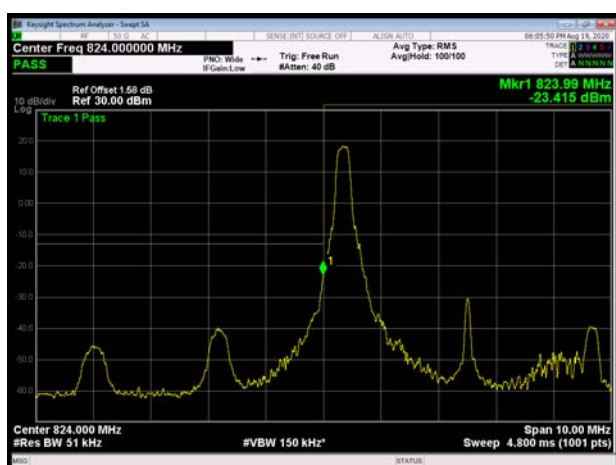
LTE Band 5 64QAM 3MHz CH-Low 100%RB



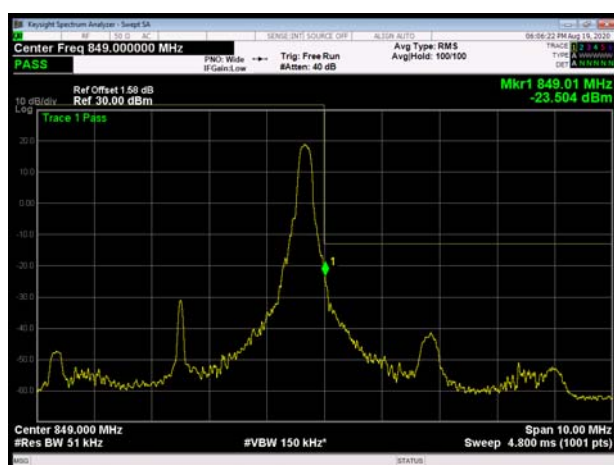
LTE Band 5 64QAM 3MHz CH-High 100%RB



LTE Band 5 64QAM 5MHz CH-Low 1RB

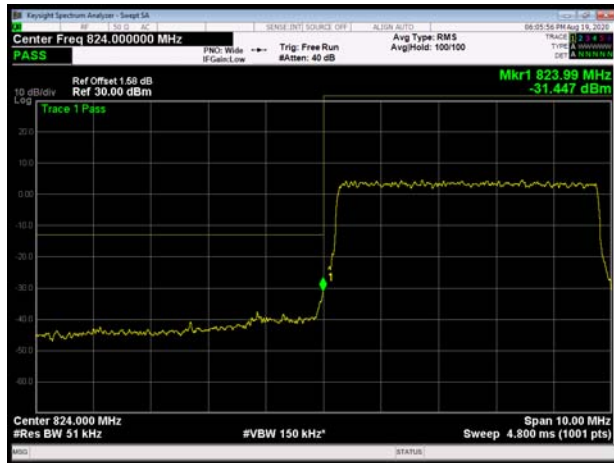


LTE Band 5 64QAM 5MHz CH-High 1RB

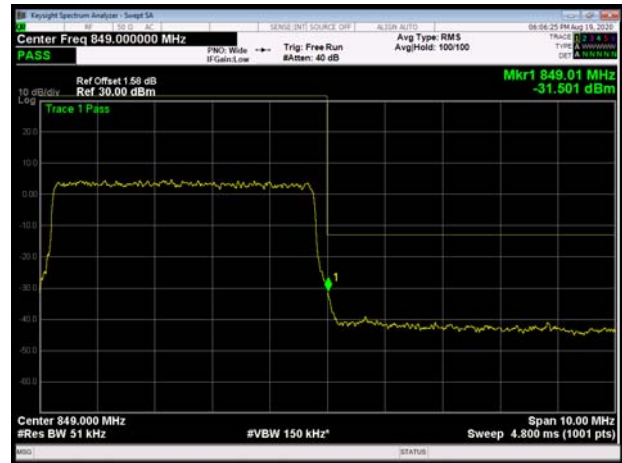




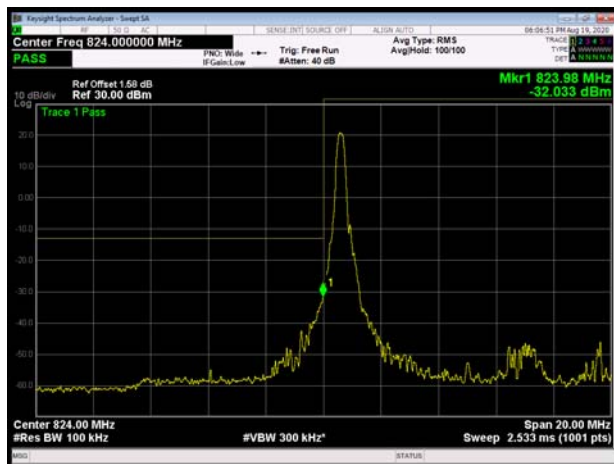
LTE Band 5 64QAM 5MHz CH-Low 100%RB



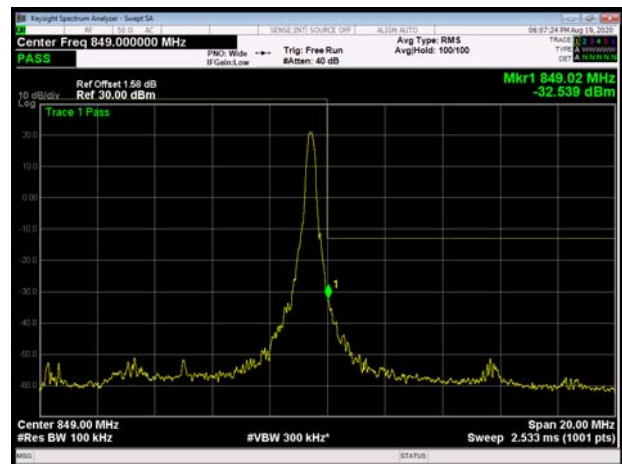
LTE Band 5 64QAM 5MHz CH-High 100%RB



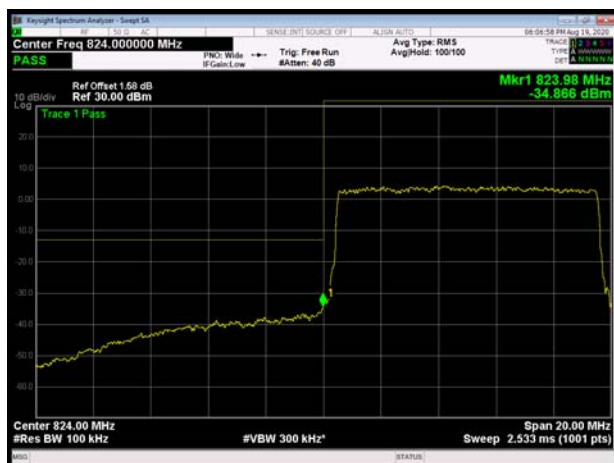
LTE Band 5 64QAM 10MHz CH-Low 1RB



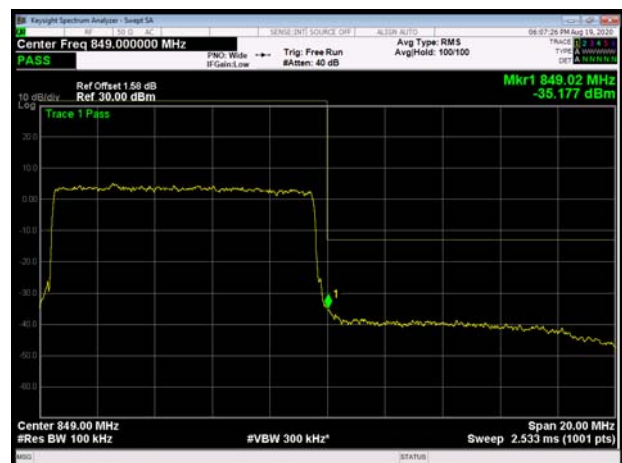
LTE Band 5 64QAM 10MHz CH-High 1RB



LTE Band 5 64QAM 10MHz CH-Low 100%RB

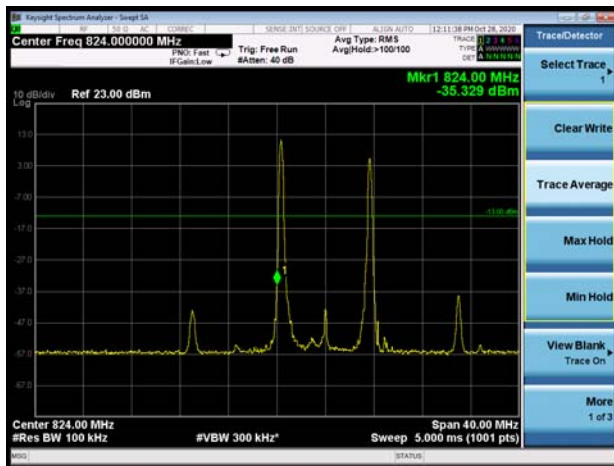


LTE Band 5 64QAM 10MHz CH-High 100%RB

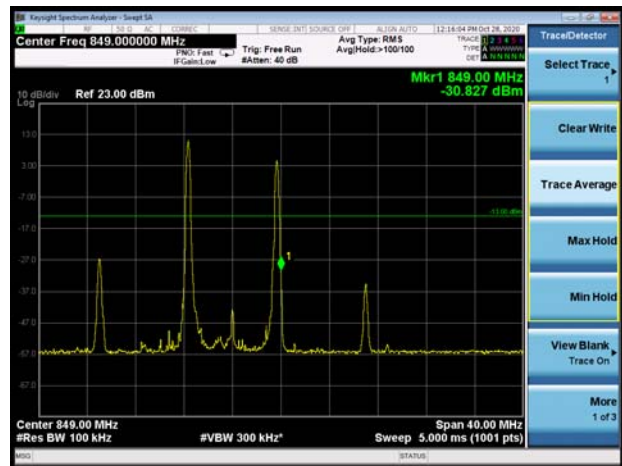




CA_5B_3MHz+5MHz_QPSK CH-Low 1RB



CA_5B_3MHz+5MHz_QPSK CH-High 1RB



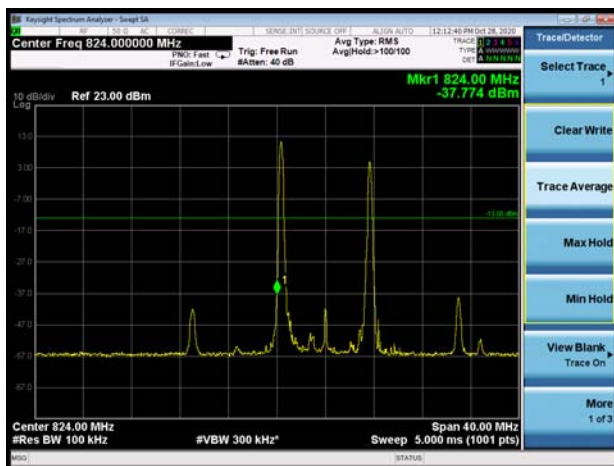
CA_5B_3MHz+5MHz_QPSK CH-Low 100%RB



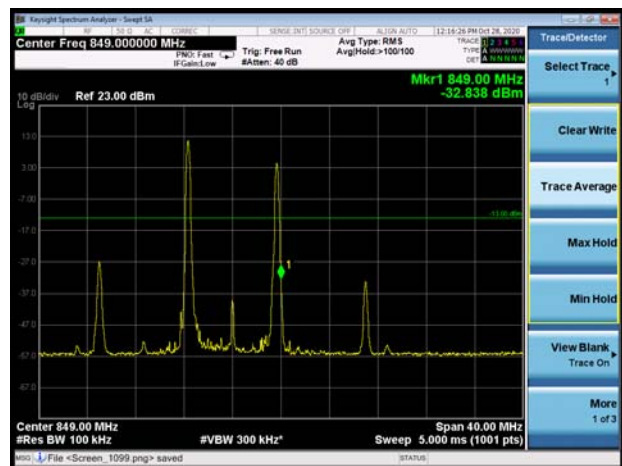
CA_5B_3MHz+5MHz_QPSK CH-High 100%RB



CA_5B_3MHz+5MHz_16QAM CH-Low 1RB



CA_5B_3MHz+5MHz_16QAM CH-High 1RB





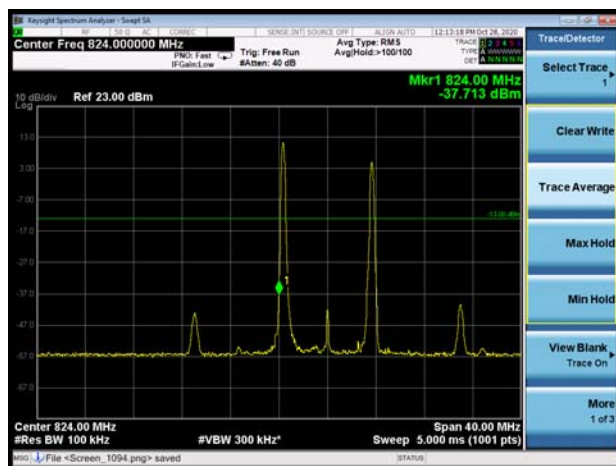
CA_5B_3MHz+5MHz_16QAM CH-Low 100%RB



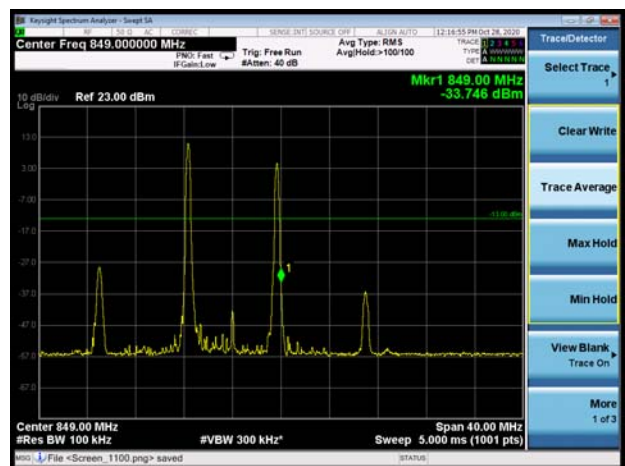
CA_5B_3MHz+5MHz_16QAM CH-High 100%RB



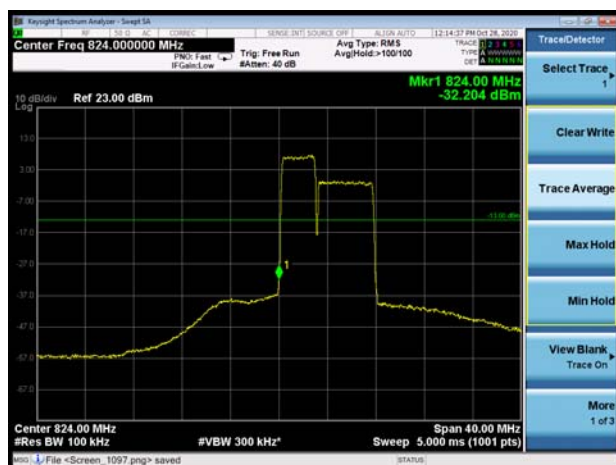
CA_5B_3MHz+5MHz_64QAM CH-Low 1RB



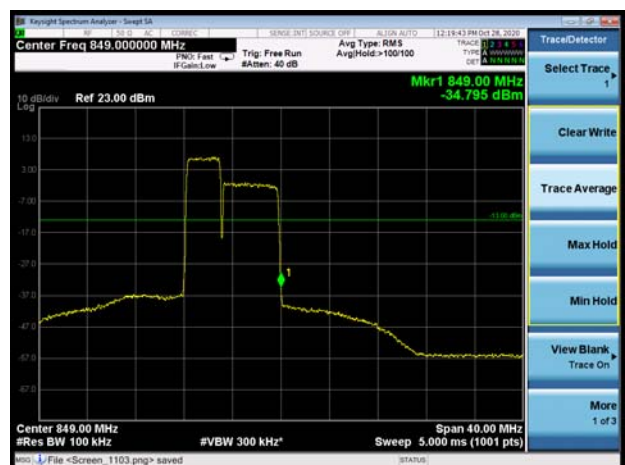
CA_5B_3MHz+5MHz_64QAM CH-High 1RB



CA_5B_3MHz+5MHz_64QAM CH-Low 100%RB

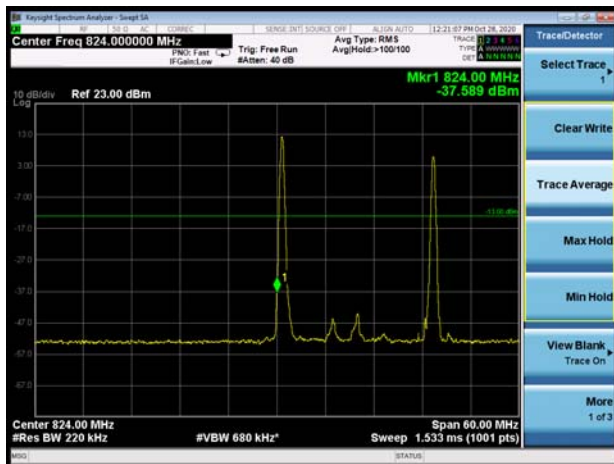


CA_5B_3MHz+5MHz_64QAM CH-High 100%RB

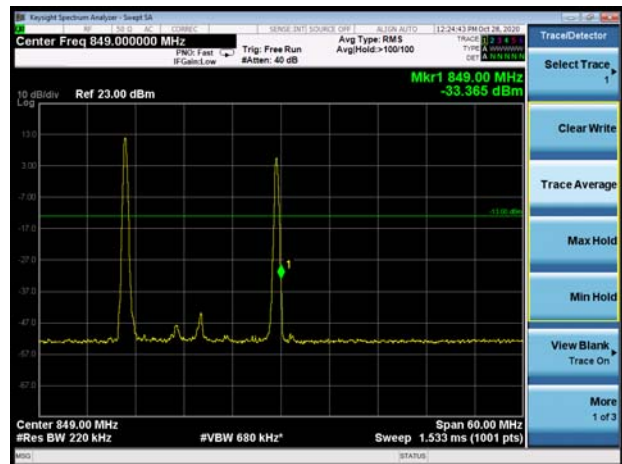




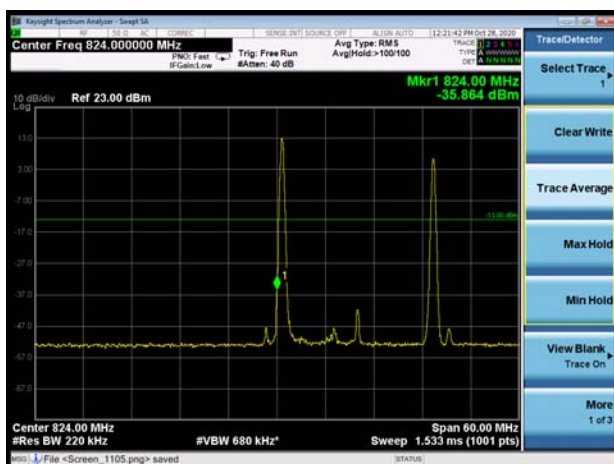
CA_5B_10MHz+10MHz_QPSK CH-Low 1RB



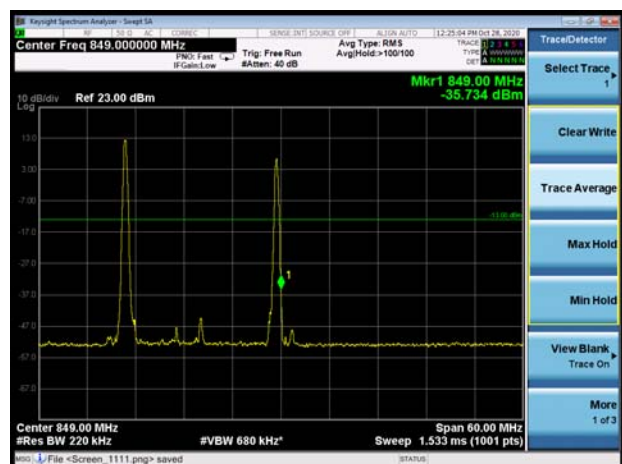
CA_5B_10MHz+10MHz_QPSK CH-High 1RB

CA_5B_10MHz+10MHz_QPSK CH-Low
100%RBCA_5B_10MHz+10MHz_QPSK CH-High
100%RB

CA_5B_10MHz+10MHz_16QAM CH-Low 1RB



CA_5B_10MHz+10MHz_16QAM CH-High 1RB



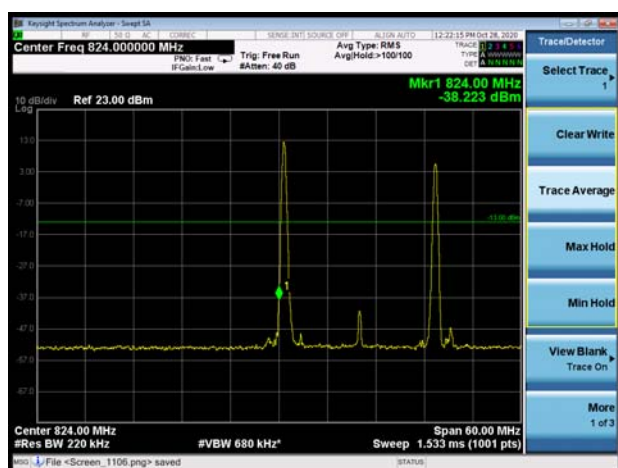
CA_5B_10MHz+10MHz_16QAM CH-Low
100%RB



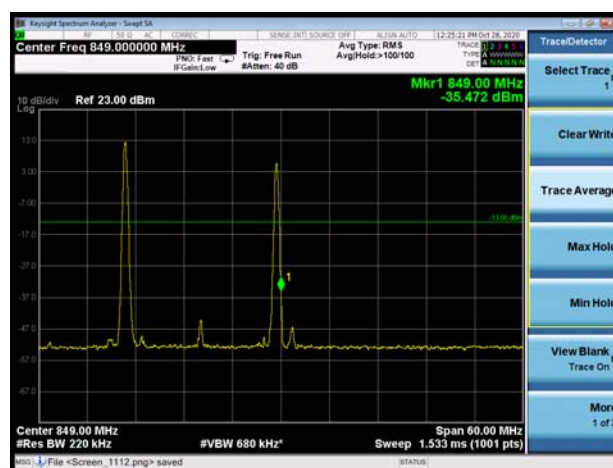
CA_5B_10MHz+10MHz_16QAM CH-High
100%RB



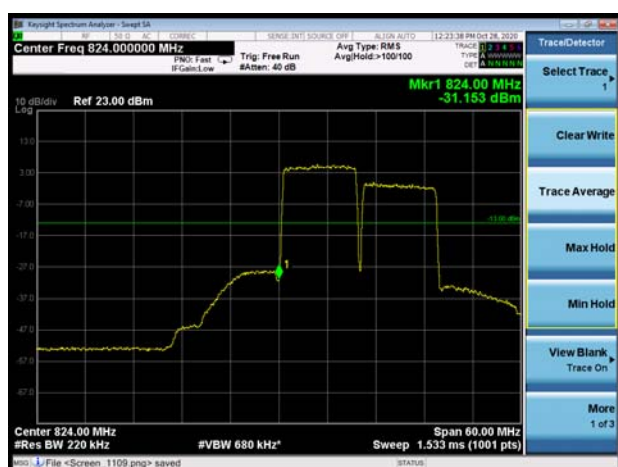
CA 5B 10MHz+10MHz 64QAM CH-Low 1RB



CA 5B 10MHz+10MHz 64QAM CH-High 1RB



CA_5B_10MHz+10MHz_64QAM CH-Low
100%RB



CA_5B_10MHz+10MHz_64QAM CH-High
100%RB



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

Ambient condition

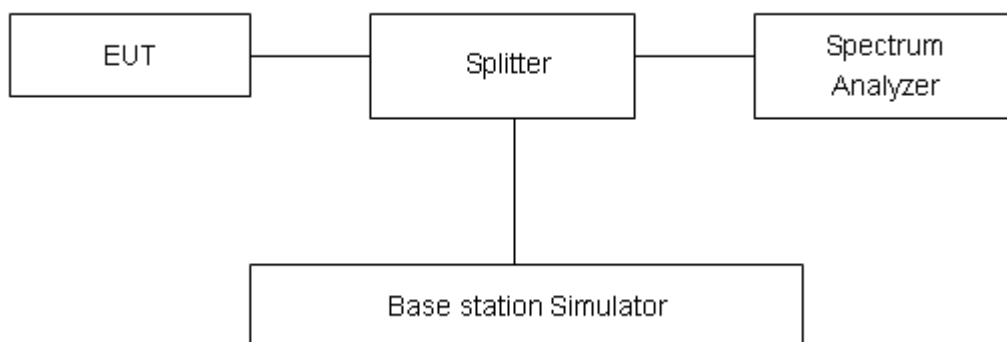
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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	28.79	23.44	5.35	≤13	PASS
		20525	836.5	28.71	23.42	5.29	≤13	PASS
		20643	848.3	28.59	23.27	5.32	≤13	PASS
	3	20415	825.5	28.77	23.48	5.29	≤13	PASS
		20525	836.5	28.70	23.51	5.19	≤13	PASS
		20635	847.5	28.60	23.40	5.20	≤13	PASS
	5	20425	826.5	28.88	23.49	5.39	≤13	PASS
		20525	836.5	28.85	23.52	5.33	≤13	PASS
		20625	846.5	28.71	23.47	5.24	≤13	PASS
	10	20450	829	28.71	23.51	5.20	≤13	PASS
		20525	836.5	28.78	23.53	5.25	≤13	PASS
		20600	844	28.65	23.48	5.17	≤13	PASS
16QAM	1.4	20407	824.7	28.47	22.45	6.02	≤13	PASS
		20525	836.5	28.68	22.47	6.21	≤13	PASS
		20643	848.3	28.50	22.38	6.12	≤13	PASS
	3	20415	825.5	28.63	22.53	6.10	≤13	PASS
		20525	836.5	28.54	22.51	6.03	≤13	PASS
		20635	847.5	28.45	22.43	6.02	≤13	PASS
	5	20425	826.5	28.65	22.51	6.14	≤13	PASS
		20525	836.5	28.57	22.53	6.04	≤13	PASS
		20625	846.5	28.42	22.43	5.99	≤13	PASS
	10	20450	829	28.49	22.52	5.97	≤13	PASS
		20525	836.5	28.55	22.53	6.02	≤13	PASS
		20600	844	28.39	22.47	5.92	≤13	PASS
64QAM	1.4	20407	824.7	28.41	22.40	6.01	≤13	PASS
		20525	836.5	28.67	22.48	6.19	≤13	PASS
		20643	848.3	28.51	22.40	6.11	≤13	PASS
	3	20415	825.5	28.62	22.51	6.11	≤13	PASS
		20525	836.5	28.54	22.52	6.02	≤13	PASS
		20635	847.5	28.47	22.44	6.03	≤13	PASS
	5	20425	826.5	28.65	22.52	6.13	≤13	PASS
		20525	836.5	28.58	22.55	6.03	≤13	PASS
		20625	846.5	28.47	22.45	6.02	≤13	PASS
	10	20450	829	28.50	22.50	6.00	≤13	PASS
		20525	836.5	28.53	22.53	6.00	≤13	PASS
		20600	844	28.37	22.43	5.94	≤13	PASS



Mode	Bandwidth	PCC		SCC1		Modulation	Peak-to-Average Power Ratio (PAPR)		
		Channel	Frequency (MHz)	Channel	Frequency (MHz)		Peak (dBm)	Avg (dBm)	PAPR (dB)
CA_5B	CA_5B_3MHz+5MHz_QPSK	20501	834.1	20540	838	QPSK	28.60	23.24	5.36
	CA_5B_3MHz+5MHz_16QAM	20501	834.1	20540	838	16QAM	28.61	22.31	6.30
	CA_5B_3MHz+5MHz_64QAM	20501	834.1	20540	838	64QAM	28.61	22.33	6.28
	CA_5B_5MHz+3MHz_QPSK	20510	835	20549	838.9	QPSK	28.60	23.24	5.36
	CA_5B_5MHz+3MHz_16QAM	20510	835	20549	838.9	16QAM	28.60	22.29	6.31
	CA_5B_5MHz+3MHz_64QAM	20510	835	20549	838.9	64QAM	28.46	22.26	6.20
	CA_5B_5MHz+10MHz_QPSK	20478	831.8	20550	839	QPSK	28.63	22.61	6.02
	CA_5B_5MHz+10MHz_16QAM	20478	831.8	20550	839	16QAM	28.28	21.62	6.66
	CA_5B_5MHz+10MHz_64QAM	20478	831.8	20550	839	64QAM	27.86	21.59	6.27
	CA_5B_10MHz+5MHz_QPSK	20500	834	20572	841.2	QPSK	28.56	22.51	6.05
	CA_5B_10MHz+5MHz_16QAM	20500	834	20572	841.2	16QAM	28.25	21.57	6.68
	CA_5B_10MHz+5MHz_64QAM	20500	834	20572	841.2	64QAM	27.80	21.55	6.25
	CA_5B_10MHz+10MHz_QPSK	20476	831.6	20575	841.5	QPSK	28.63	22.57	6.06
	CA_5B_10MHz+10MHz_16QAM	20476	831.6	20575	841.5	16QAM	28.31	21.60	6.71
	CA_5B_10MHz+10MHz_64QAM	20476	831.6	20575	841.5	64QAM	28.18	21.57	6.61

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.

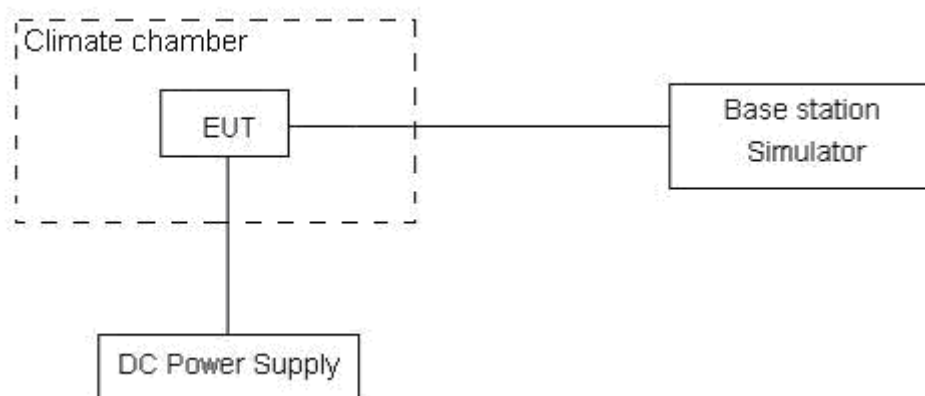
(3) Repeat the above measurements at 10°C increments from -30°C to +55°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements. Frequency Stability (Voltage Variation)

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

Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced 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 3.5 V and 4.4V, with a nominal voltage of 4.0 V.

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
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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 $k = 3$, $U = 0.01$ ppm.



Test Result

LTE Band 5								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	1.4MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	5.25	2.49	2.74	0.00279	0.00133	0.00146	PASS
Extreme (50℃)		9.61	15.62	1.29	0.00511	0.00831	0.00069	PASS
Extreme (40℃)		4.00	14.96	7.44	0.00213	0.00796	0.00396	PASS
Extreme (30℃)		15.88	5.65	12.69	0.00844	0.00301	0.00675	PASS
Extreme (20℃)		7.19	2.31	13.60	0.00383	0.00123	0.00723	PASS
Extreme (10℃)		15.52	14.03	9.41	0.00825	0.00746	0.00501	PASS
Extreme (0℃)		2.83	8.04	7.99	0.00151	0.00428	0.00425	PASS
Extreme (-10℃)		16.40	2.96	1.04	0.00872	0.00157	0.00055	PASS
Extreme (-20℃)		1.93	17.90	3.73	0.00103	0.00952	0.00198	PASS
Extreme (-30℃)		16.97	4.34	14.98	0.00903	0.00231	0.00797	PASS
25℃	LV	15.02	13.62	11.19	0.00799	0.00725	0.00595	PASS
	HV	5.24	14.04	3.96	0.00279	0.00747	0.00211	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	4.18	5.81	17.01	0.00222	0.00309	0.00905	PASS
Extreme (50℃)		16.13	4.75	16.43	0.00858	0.00253	0.00874	PASS
Extreme (40℃)		12.17	15.29	14.07	0.00647	0.00813	0.00749	PASS
Extreme (30℃)		3.23	7.43	16.72	0.00172	0.00395	0.00889	PASS
Extreme (20℃)		17.91	4.50	6.70	0.00953	0.00240	0.00357	PASS
Extreme (10℃)		11.96	10.77	4.86	0.00636	0.00573	0.00258	PASS
Extreme (0℃)		10.03	5.44	1.23	0.00534	0.00289	0.00066	PASS
Extreme (-10℃)		5.35	4.49	14.51	0.00285	0.00239	0.00772	PASS
Extreme (-20℃)		15.60	4.58	17.00	0.00830	0.00244	0.00904	PASS
Extreme (-30℃)		14.85	13.02	16.01	0.00790	0.00692	0.00852	PASS
25℃	LV	6.70	11.54	6.69	0.00356	0.00614	0.00356	PASS
	HV	14.73	5.04	8.12	0.00783	0.00268	0.00432	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	8.95	8.93	6.19	0.00476	0.00475	0.00329	PASS
Extreme (50℃)		15.33	2.22	15.28	0.00816	0.00118	0.00813	PASS



Extreme (40℃)		6.10	9.43	7.66	0.00324	0.00502	0.00408	PASS
Extreme (30℃)		17.93	8.80	10.53	0.00954	0.00468	0.00560	PASS
Extreme (20℃)		2.44	3.87	15.44	0.00130	0.00206	0.00821	PASS
Extreme (10℃)		16.19	9.37	7.23	0.00861	0.00498	0.00384	PASS
Extreme (0℃)		9.13	9.28	13.83	0.00486	0.00494	0.00736	PASS
Extreme (-10℃)		5.67	2.36	4.67	0.00301	0.00126	0.00248	PASS
Extreme (-20℃)		17.01	16.81	13.84	0.00905	0.00894	0.00736	PASS
Extreme (-30℃)		2.59	6.70	17.75	0.00138	0.00356	0.00944	PASS
25℃	LV	1.98	14.95	14.93	0.00106	0.00795	0.00794	PASS
	HV	4.90	5.33	3.28	0.00261	0.00283	0.00174	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	13.76	7.67	6.76	0.00732	0.00408	0.00359	PASS
Extreme (50℃)		11.45	4.10	14.55	0.00609	0.00218	0.00774	PASS
Extreme (40℃)		12.12	10.52	9.05	0.00645	0.00560	0.00482	PASS
Extreme (30℃)		10.06	16.83	11.15	0.00535	0.00895	0.00593	PASS
Extreme (20℃)		3.05	9.78	12.02	0.00162	0.00520	0.00640	PASS
Extreme (10℃)		5.39	9.28	9.87	0.00287	0.00494	0.00525	PASS
Extreme (0℃)		6.71	15.12	12.55	0.00357	0.00804	0.00667	PASS
Extreme (-10℃)		14.48	15.45	3.65	0.00770	0.00822	0.00194	PASS
Extreme (-20℃)		17.28	7.33	6.07	0.00919	0.00390	0.00323	PASS
Extreme (-30℃)		1.50	12.80	1.87	0.00080	0.00681	0.00100	PASS
25℃	LV	15.36	3.63	6.19	0.00817	0.00193	0.00329	PASS
	HV	2.99	14.71	10.99	0.00159	0.00782	0.00585	PASS



CA_5B_QPSK		20MHz+10MHz (Bandwidth)		20MHz+20MHz (Bandwidth)		Verdict
Condition		Delta (Hz)	Frequency Stability (ppm)	Delta (Hz)	Frequency Stability (ppm)	
Temperature	Voltage					
Normal (25℃)	Normal	9.86	0.00525	16.16	0.00860	PASS
Extreme (50℃)		2.65	0.00141	7.95	0.00423	PASS
Extreme (40℃)		16.35	0.00870	16.07	0.00855	PASS
Extreme (30℃)		2.65	0.00141	8.32	0.00443	PASS
Extreme (20℃)		14.88	0.00791	5.68	0.00302	PASS
Extreme (10℃)		10.89	0.00579	13.47	0.00717	PASS
Extreme (0℃)		10.77	0.00573	15.28	0.00813	PASS
Extreme (-10℃)		13.23	0.00704	16.79	0.00893	PASS
Extreme (-20℃)		12.97	0.00690	9.47	0.00504	PASS
Extreme (-30℃)		17.76	0.00945	2.59	0.00138	PASS
25℃	LV	9.59	0.00510	14.43	0.00768	PASS
	HV	5.46	0.00290	8.41	0.00448	PASS
CA_5B_16QAM		20MHz+10MHz (Bandwidth)		20MHz+20MHz (Bandwidth)		Verdict
Condition		Delta (Hz)	Frequency Stability (ppm)	Delta (Hz)	Frequency Stability (ppm)	
Temperature	Voltage					
Normal (25℃)	Normal	3.80	0.00202	15.35	0.00816	PASS
Extreme (50℃)		7.94	0.00422	2.98	0.00159	PASS
Extreme (40℃)		11.09	0.00590	6.60	0.00351	PASS
Extreme (30℃)		2.30	0.00122	1.38	0.00073	PASS
Extreme (20℃)		15.98	0.00850	2.27	0.00121	PASS
Extreme (10℃)		12.15	0.00646	13.55	0.00721	PASS
Extreme (0℃)		7.88	0.00419	1.05	0.00056	PASS
Extreme (-10℃)		16.37	0.00871	6.06	0.00322	PASS
Extreme (-20℃)		15.25	0.00811	5.80	0.00308	PASS
Extreme (-30℃)		13.24	0.00704	9.71	0.00516	PASS
25℃	LV	16.18	0.00860	10.84	0.00576	PASS
	HV	5.23	0.00278	1.73	0.00092	PASS
CA_5B_64QAM		20MHz+10MHz (Bandwidth)		20MHz+20MHz (Bandwidth)		Verdict
Condition		Delta (Hz)	Frequency Stability (ppm)	Delta (Hz)	Frequency Stability (ppm)	
Temperature	Voltage					
Normal (25℃)	Normal	2.46	0.00131	10.20	0.00542	PASS
Extreme (50℃)		6.05	0.00322	16.53	0.00879	PASS



Extreme (40℃)		9.66	0.00514	10.76	0.00573	PASS
Extreme (30℃)		12.50	0.00665	11.15	0.00593	PASS
Extreme (20℃)		15.38	0.00818	7.85	0.00418	PASS
Extreme (10℃)		4.46	0.00237	5.57	0.00296	PASS
Extreme (0℃)		2.34	0.00124	2.40	0.00127	PASS
Extreme (-10℃)		2.92	0.00155	15.53	0.00826	PASS
Extreme (-20℃)		8.24	0.00438	6.38	0.00340	PASS
Extreme (-30℃)		1.80	0.00096	5.25	0.00279	PASS
25℃	LV	17.60	0.00936	10.91	0.00580	PASS
	HV	9.07	0.00483	7.78	0.00414	PASS

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),

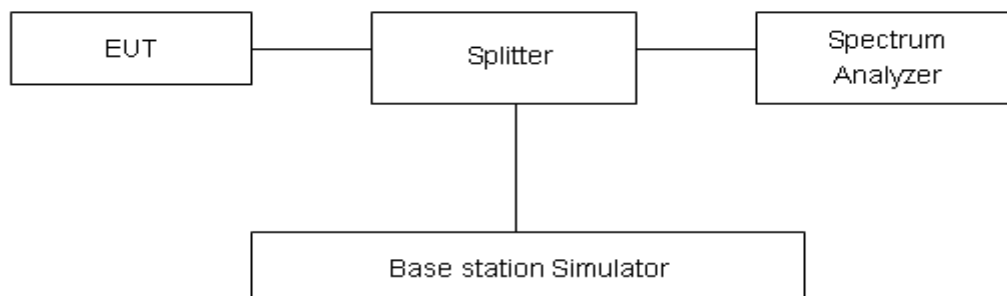
RBW is set to 10 kHz (0.15 MHz~ 30 MHz)

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
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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-18GHz	1.407 dB

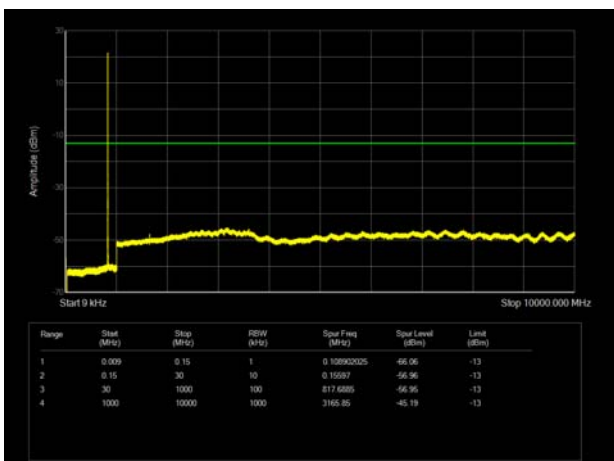


Test Result

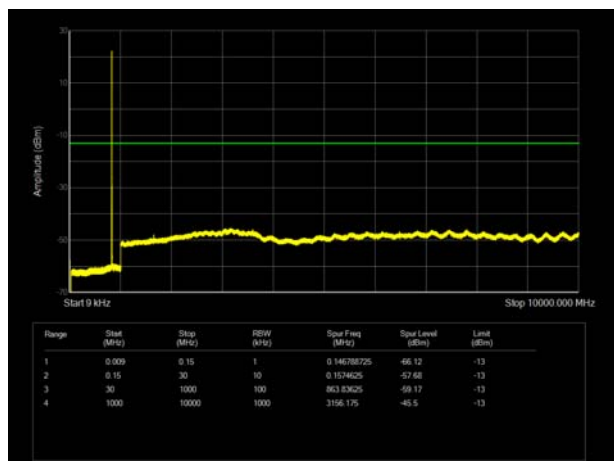
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

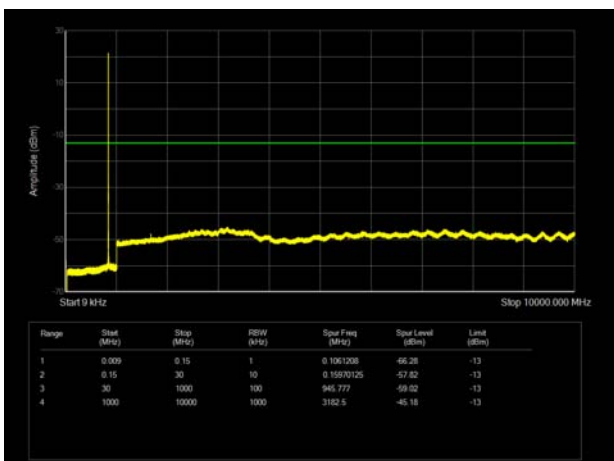
LTE Band 5 1.4MHz CH-Low 9kHz~10GHz



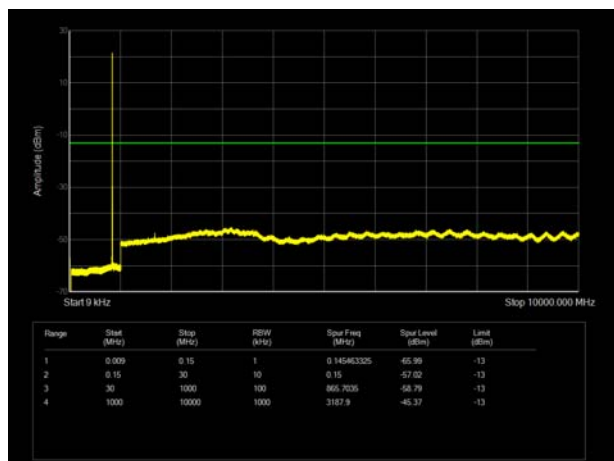
LTE Band 5 3MHz CH-Low 9kHz~10GHz



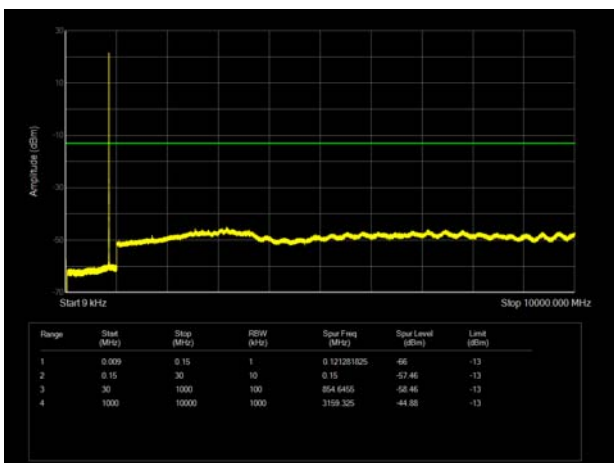
LTE Band 5 1.4MHz CH-Middle 9kHz~10GHz



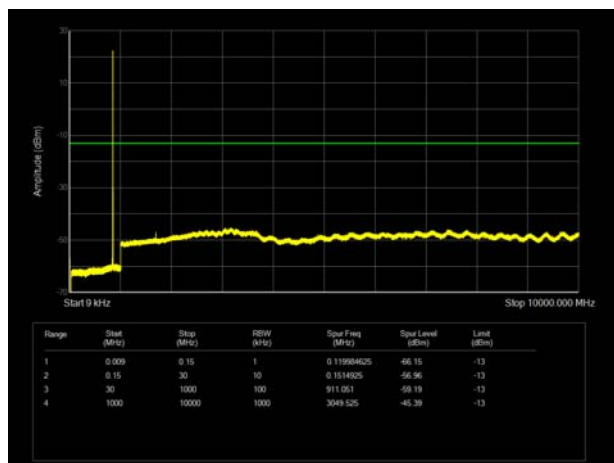
LTE Band 5 3MHz CH-Middle 9kHz~10GHz



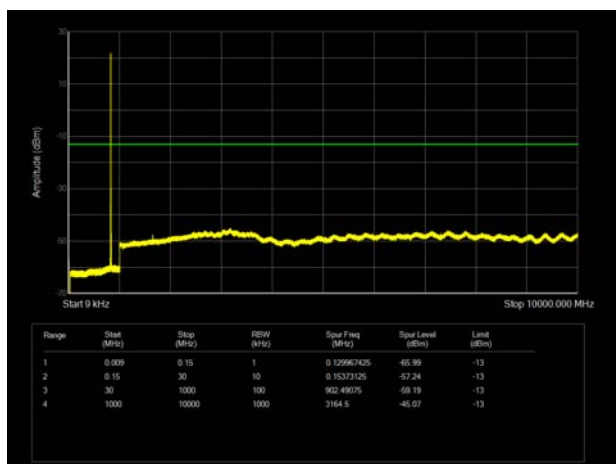
LTE Band 5 1.4MHz CH-High 9kHz~10GHz



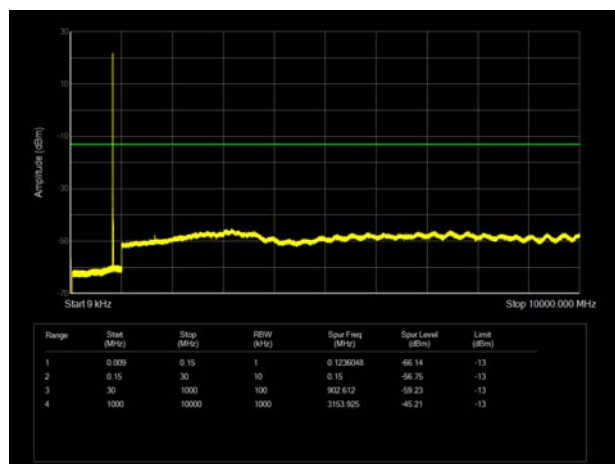
LTE Band 5 3MHz CH-High 9kHz~10GHz



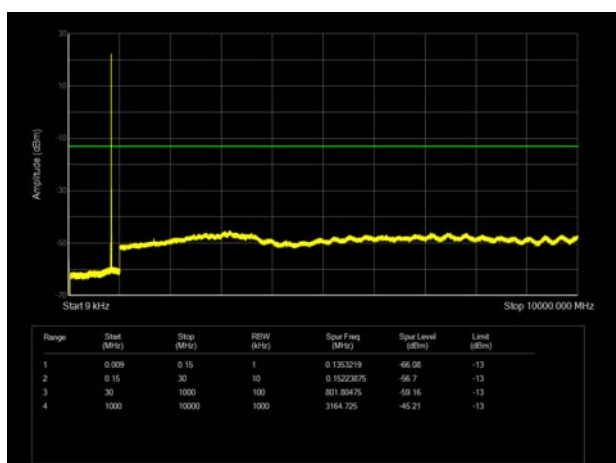
LTE Band 5 5MHz CH-Low 9kHz~10GHz



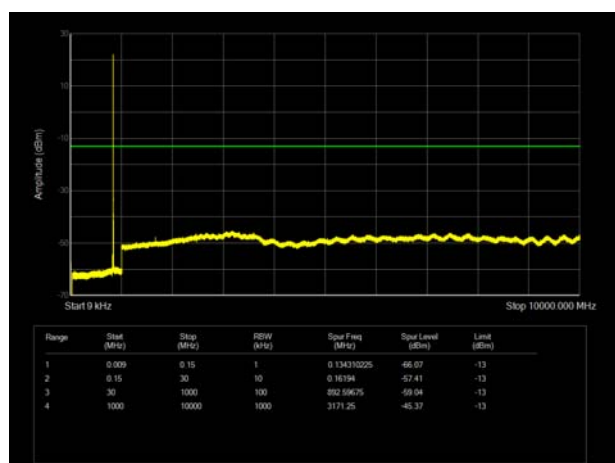
LTE Band 5 10MHz CH-Low 9kHz~10GHz



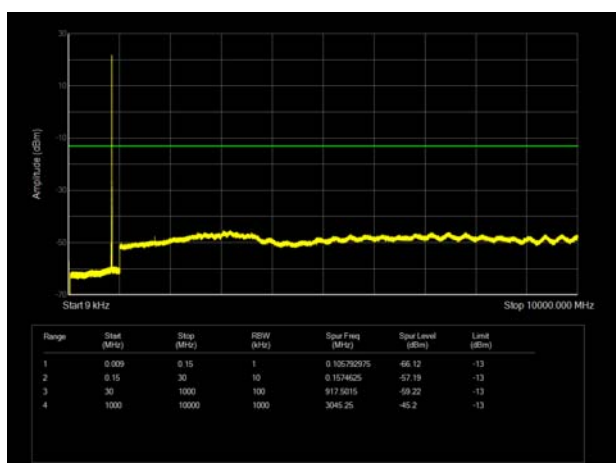
LTE Band 5 5MHz CH-Middle 9kHz~10GHz



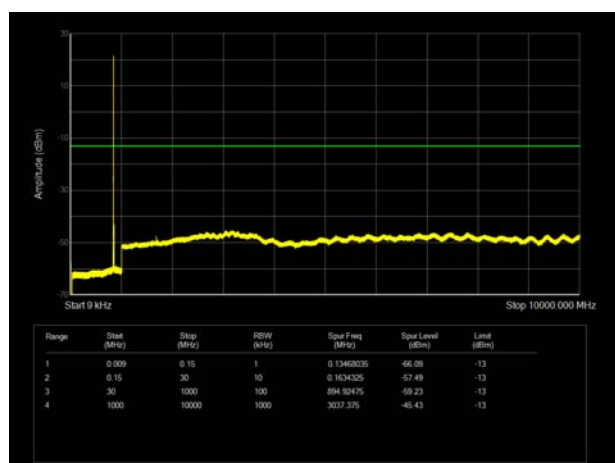
LTE Band 5 10MHz CH-Middle 9kHz~10GHz

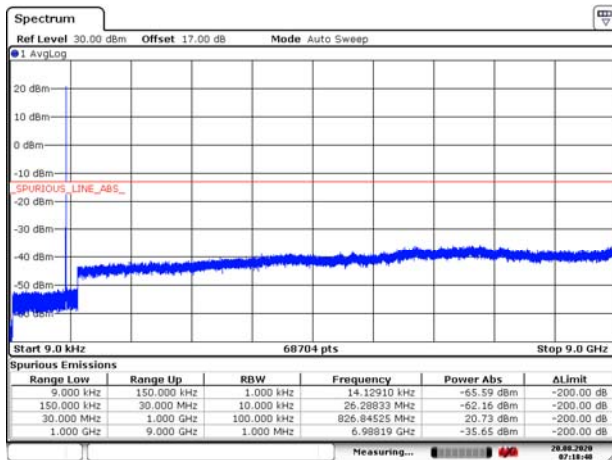


LTE Band 5 5MHz CH-High 9kHz~10GHz

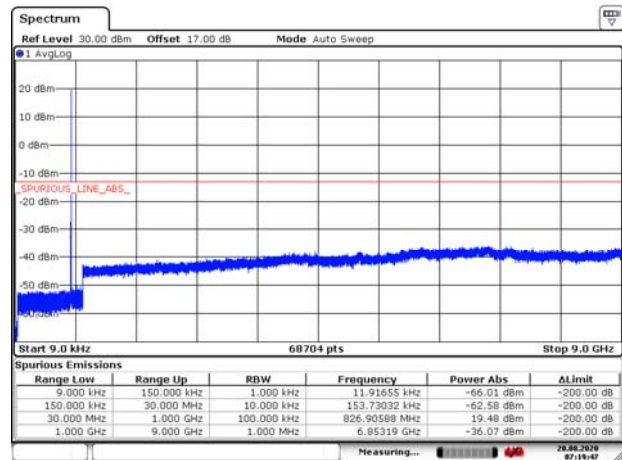


LTE Band 5 10MHz CH-High 9kHz~10GHz

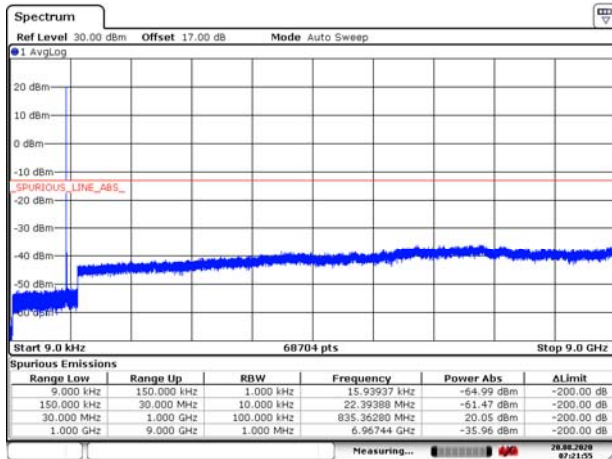


CA_5B_3MHz+5MHz_QPSK CH-Low
9kHz~9GHz

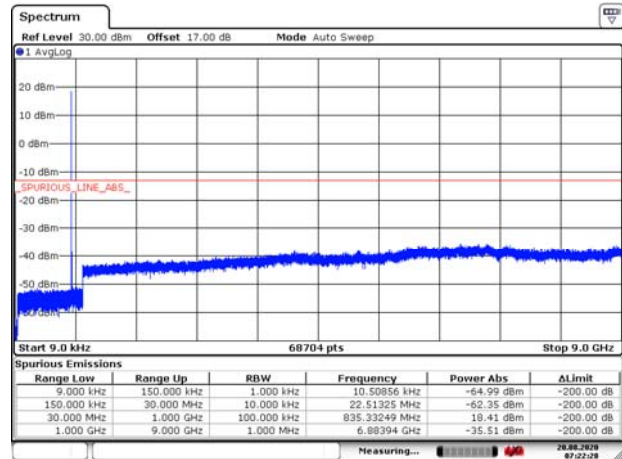
Date: 20 AUG 2020 07:18:48

CA_5B_3MHz+5MHz_16QAM CH-Low
9kHz~9GHz

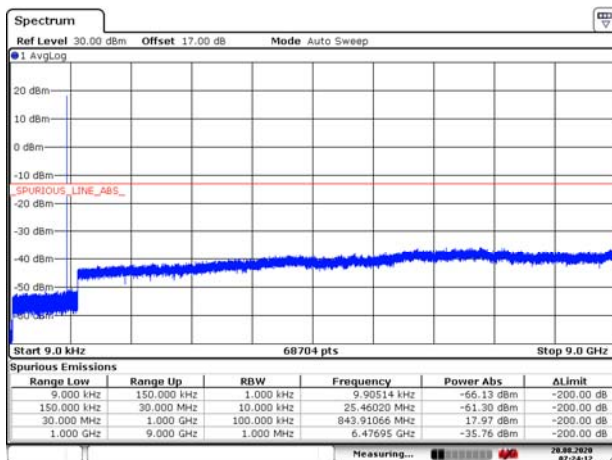
Date: 20 AUG 2020 07:19:48

CA_5B_3MHz+5MHz_QPSK CH-Middle
9kHz~9GHz

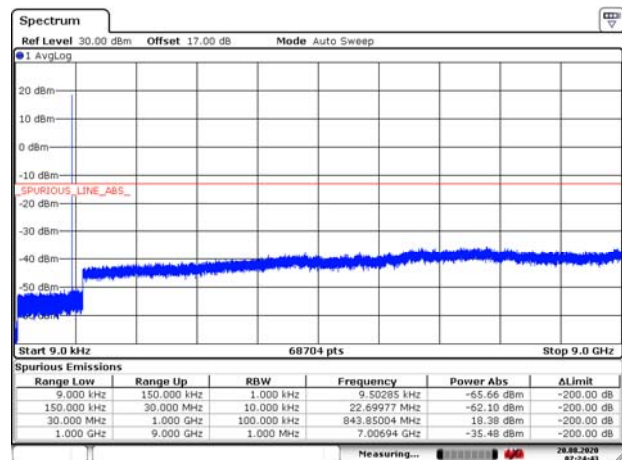
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CA_5B_3MHz+5MHz_16QAM CH-Middle
9kHz~9GHz

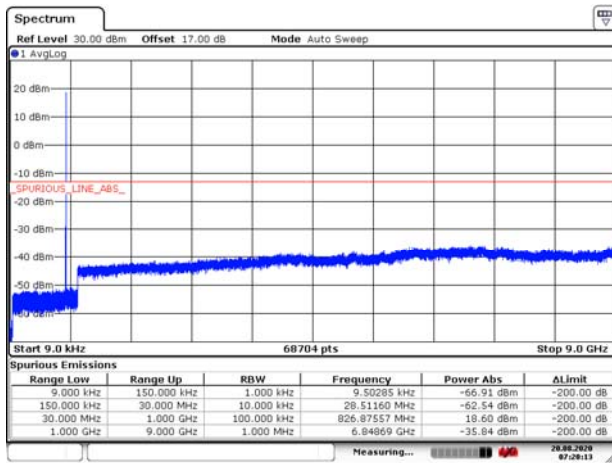
Date: 20 AUG 2020 07:22:28

CA_5B_3MHz+5MHz_QPSK CH-High
9kHz~9GHz

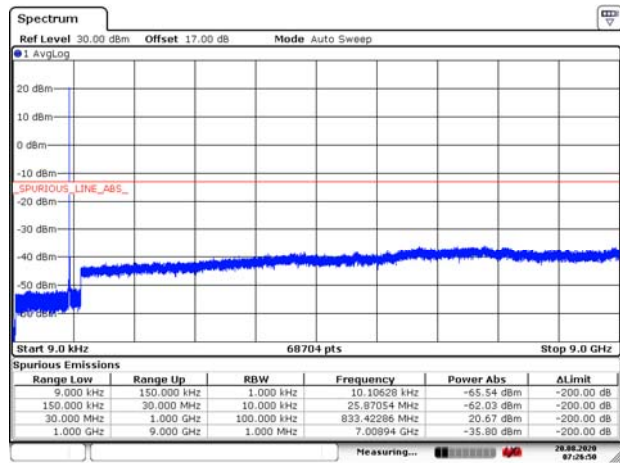
Date: 20 AUG 2020 07:24:12

CA_5B_3MHz+5MHz_16QAM CH-High
9kHz~9GHz

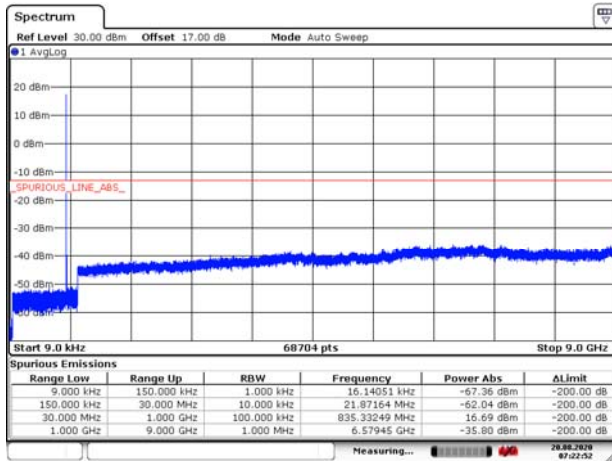
Date: 20 AUG 2020 07:24:43

CA_5B_3MHz+5MHz_64QAM CH-Low
9kHz~9GHz

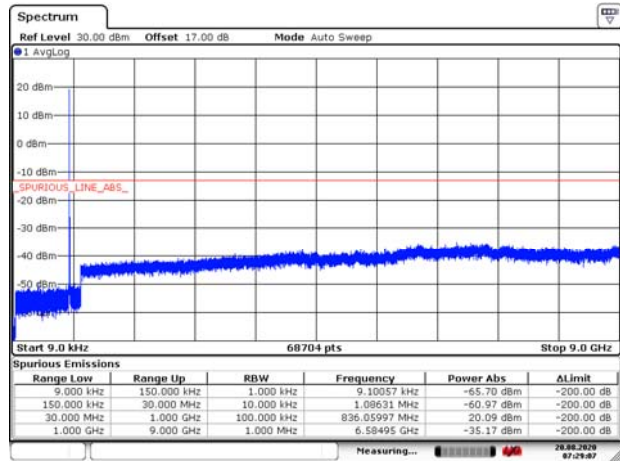
Date: 20 AUG 2020 07:20:13

CA_5B_10MHz+10Hz_QPSK CH-Low
9kHz~9GHz

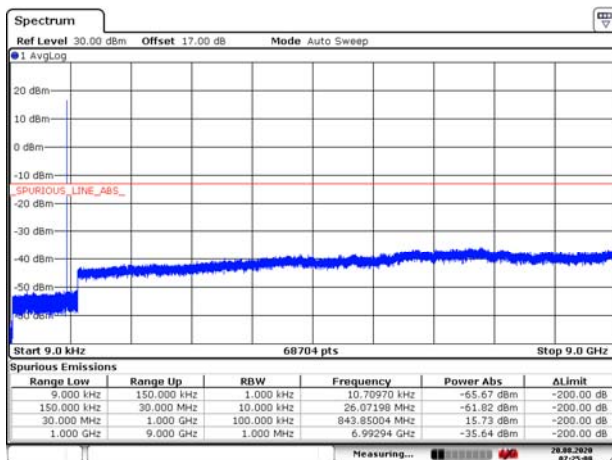
Date: 20 AUG 2020 07:28:50

CA_5B_3MHz+5MHz_64QAM CH-Middle
9kHz~9GHz

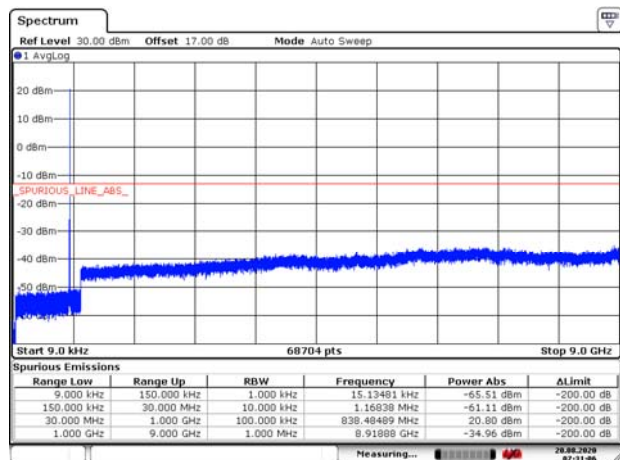
Date: 20 AUG 2020 07:22:52

CA_5B_10MHz+10Hz_QPSK CH-Middle
9kHz~9GHz

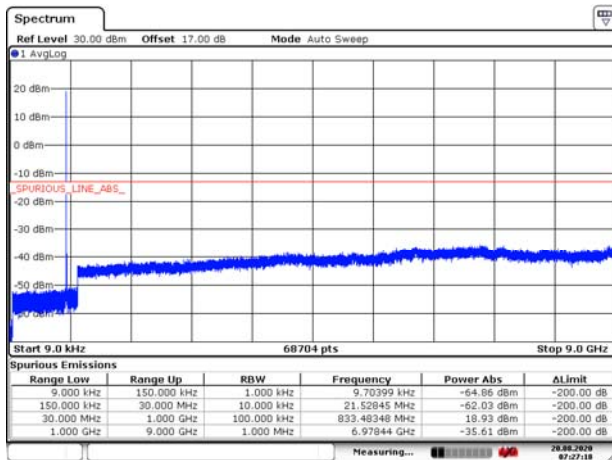
Date: 20 AUG 2020 07:29:06

CA_5B_3MHz+5MHz_64QAM CH-High
9kHz~9GHz

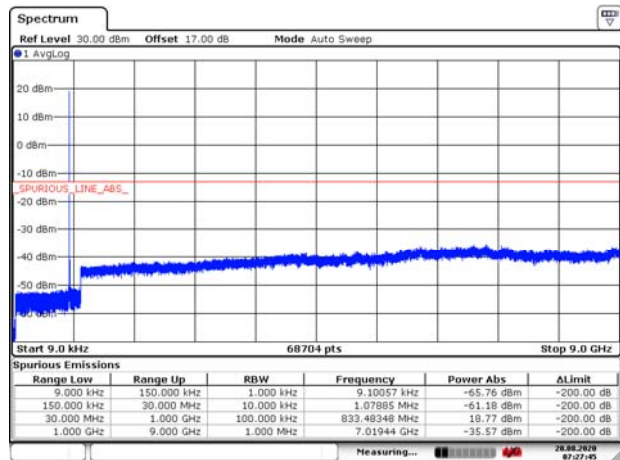
Date: 20 AUG 2020 07:25:09

CA_5B_10MHz+10Hz_QPSK CH-High
9kHz~9GHz

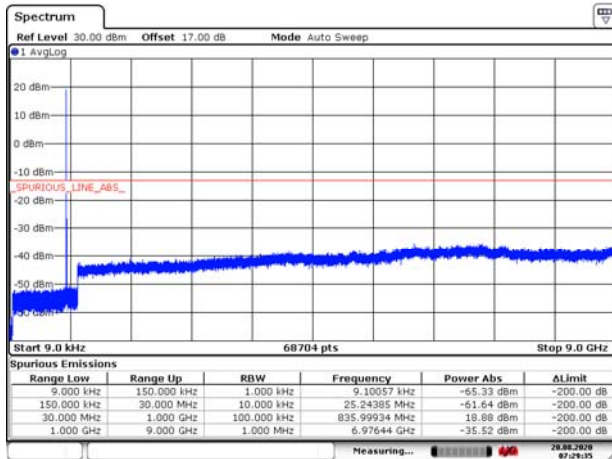
Date: 20 AUG 2020 07:31:06

CA_5B_10MHz+10Hz_16QAM CH-Low
9kHz~9GHz

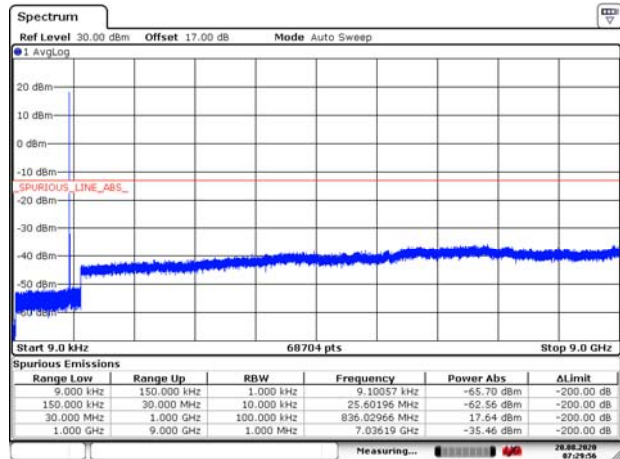
Date: 20 AUG 2020 07:27:18

CA_5B_10MHz+10Hz_64QAM CH-Low
9kHz~9GHz

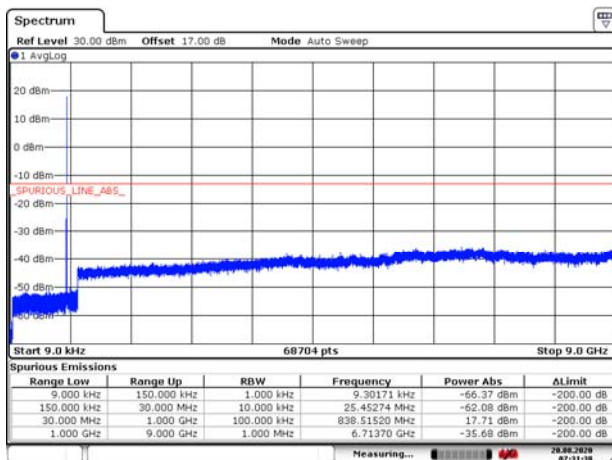
Date: 20 AUG 2020 07:27:45

CA_5B_10MHz+10Hz_16QAM CH-Middle
9kHz~9GHz

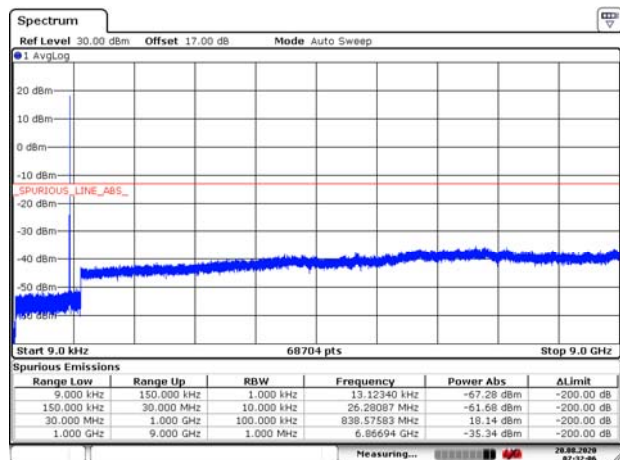
Date: 20 AUG 2020 07:29:35

CA_5B_10MHz+10Hz_64QAM CH-Middle
9kHz~9GHz

Date: 20 AUG 2020 07:29:56

CA_5B_10MHz+10Hz_16QAM CH-High
9kHz~9GHz

Date: 20 AUG 2020 07:31:37

CA_5B_10MHz+10Hz_64QAM CH-High
9kHz~9GHz

Date: 20 AUG 2020 07:32:08

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 9kHz-150kHz , 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:

$$\text{Power(EIRP)} = \text{PMea} - \text{PAG} - \text{Pcl} + \text{Ga}$$
The measurement results are amend as described below:

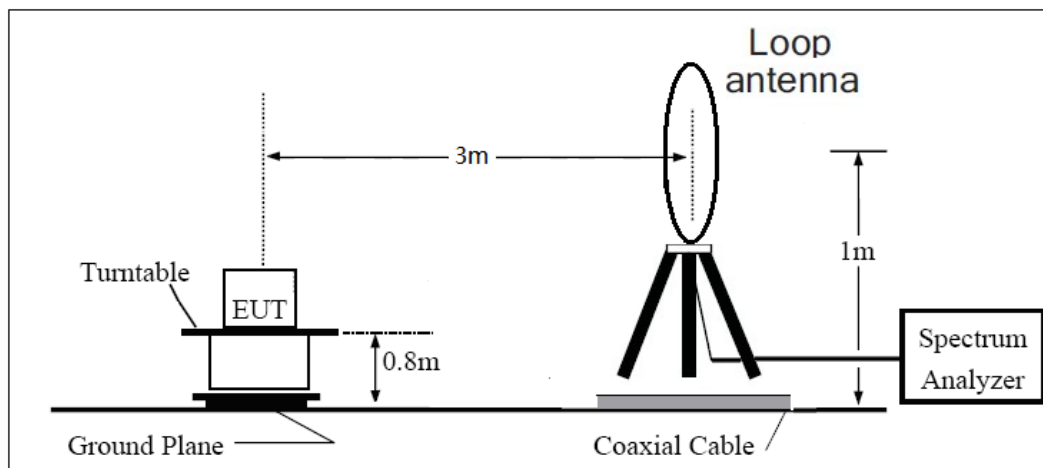
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi)

and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15\text{dBi}$.

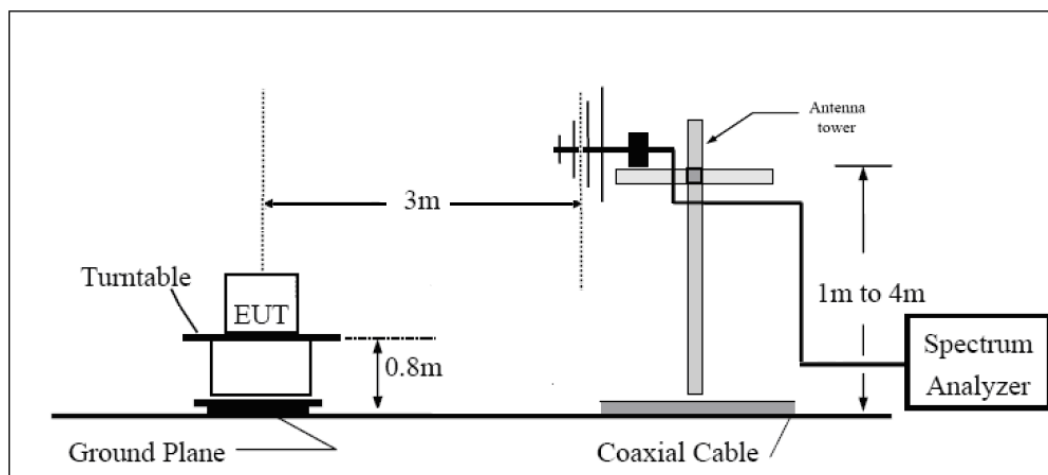
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

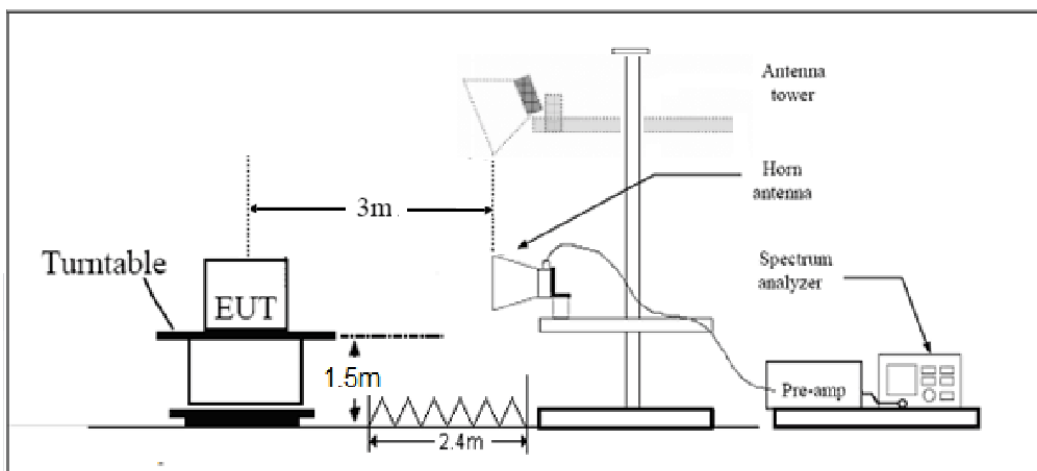
9KHz ~ 30MHz



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
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U = 3.55$ 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-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	-67.11	2.00	10.75	Horizontal	-60.51	-13.00	47.51	90
3	2509.5	-50.68	2.51	11.05	Horizontal	-44.29	-13.00	31.29	90
4	3346.0	-58.26	4.20	11.15	Horizontal	-53.46	-13.00	40.46	180
5	4182.5	-54.67	5.20	11.15	Horizontal	-50.87	-13.00	37.87	315
6	5019.0	-54.90	5.50	11.95	Horizontal	-50.60	-13.00	37.60	45
7	5855.5	-56.12	5.70	13.55	Horizontal	-50.42	-13.00	37.42	180
8	6692.0	-57.48	6.30	13.75	Horizontal	-52.18	-13.00	39.18	180
9	7528.5	-52.68	6.80	13.85	Horizontal	-47.78	-13.00	34.78	315
10	8365.0	-54.16	6.90	14.25	Horizontal	-48.96	-13.00	35.96	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 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	1668.6	-67.23	2.00	10.75	Horizontal	-60.63	-13.00	47.63	315
3	2503.3	-50.26	2.51	11.05	Horizontal	-43.87	-13.00	30.87	90
4	3466.2	-58.08	4.20	11.15	Horizontal	-53.28	-13.00	40.28	90
5	4215.9	-55.24	5.20	11.15	Horizontal	-51.44	-13.00	38.44	45
6	5165.6	-54.50	5.50	11.95	Horizontal	-50.20	-13.00	37.20	315
7	5815.3	-56.24	5.70	13.55	Horizontal	-50.54	-13.00	37.54	270
8	6765.0	-56.90	6.30	13.75	Horizontal	-51.60	-13.00	38.60	45
9	7614.7	-53.84	6.80	13.85	Horizontal	-48.94	-13.00	35.94	315
10	8464.4	-52.83	6.90	14.25	Horizontal	-47.63	-13.00	34.63	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 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	1664.4	-66.42	2.00	10.75	Horizontal	-59.82	-13.00	46.82	270
3	2496.6	-49.82	2.51	11.05	Horizontal	-43.43	-13.00	30.43	90
4	3346.0	-58.31	4.20	11.15	Horizontal	-53.51	-13.00	40.51	315
5	4182.5	-55.85	5.20	11.15	Horizontal	-52.05	-13.00	39.05	90
6	5019.0	-54.64	5.50	11.95	Horizontal	-50.34	-13.00	37.34	270
7	5855.5	-56.25	5.70	13.55	Horizontal	-50.55	-13.00	37.55	270
8	6692.0	-57.49	6.30	13.75	Horizontal	-52.19	-13.00	39.19	270
9	7528.5	-54.18	6.80	13.85	Horizontal	-49.28	-13.00	36.28	315
10	8365.0	-53.45	6.90	14.25	Horizontal	-48.25	-13.00	35.25	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.

CA 5B _3M+5M CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1668.2	-65.62	2.00	10.75	Horizontal	-59.02	-13.00	46.02	45
3	2502.3	-65.14	2.51	11.05	Horizontal	-58.75	-13.00	45.75	315
4	3336.4	-60.53	4.20	11.15	Horizontal	-55.73	-13.00	42.73	270
5	4170.5	-59.76	5.20	11.15	Horizontal	-55.96	-13.00	42.96	315
6	5004.6	-58.35	5.50	11.95	Horizontal	-54.05	-13.00	41.05	0
7	5838.7	-59.35	5.70	13.55	Horizontal	-53.65	-13.00	40.65	315
8	6672.8	-56.63	6.30	13.75	Horizontal	-51.33	-13.00	38.33	90
9	7506.9	-54.58	6.80	13.85	Horizontal	-49.68	-13.00	36.68	45
10	8341.0	-54.75	6.90	14.25	Horizontal	-49.55	-13.00	36.55	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.



CA 5B _5M+3M CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1670.0	-67.16	2.00	10.75	Horizontal	-60.56	-13.00	47.56	225
3	2505.0	-63.69	2.51	11.05	Horizontal	-57.30	-13.00	44.30	0
4	3340.0	-61.78	4.20	11.15	Horizontal	-56.98	-13.00	43.98	315
5	4175.0	-59.64	5.20	11.15	Horizontal	-55.84	-13.00	42.84	45
6	5010.0	-57.36	5.50	11.95	Horizontal	-53.06	-13.00	40.06	0
7	5845.0	-59.42	5.70	13.55	Horizontal	-53.72	-13.00	40.72	90
8	6680.0	-57.15	6.30	13.75	Horizontal	-51.85	-13.00	38.85	45
9	7515.0	-54.32	6.80	13.85	Horizontal	-49.42	-13.00	36.42	225
10	8350.0	-54.63	6.90	14.25	Horizontal	-49.43	-13.00	36.43	180
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2.The worst emission was found in the antenna is 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	2020-04-02	2023-04-01
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
Preamplifier	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 *****



ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.



ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.