



# RF TEST REPORT

**Applicant** ZTE Corporation  
**FCC ID** SRQ-Z6251  
**Product** LTE/WCDMA/GSM Multi-Mode  
Digital Mobile Phone  
**Model** Z6251  
**Report No.** R2108A0760-R1V1  
**Issue Date** October 27, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2020)/ FCC CFR 47 Part 22H (2020)**. 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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Approved by: Kai Xu

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Version	Revision description	Issue Date
Rev.0	Initial issue of report.	October 22, 2021
Rev.1	Update description in Page 51.	October 27, 2021

Note: This revised report (Report No. R2108A0760-R1V1) supersedes and replaces the previously issued report (Report No. R2108A0760-R1). 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: September 2, 2021 ~ October 22, 2021

Date of Sample Received: August 27, 2021

Note: PASS: The EUT complies with the essential requirements in the standard.

FAIL: The EUT does not comply with the essential requirements in the standard.

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 measurements.

#### **A2LA (Certificate Number: 3857.01)**

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

### 1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.  
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## 2. General Description of Equipment under Test

### 2.1. 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

### 2.2. General Information

EUT Description			
Model	Z6251		
SN	862947050003473		
Hardware Version	Z6251HW1.0		
Software Version	Z6251_CCv1.0.0B08		
Power Supply	Battery / AC adapter		
Antenna Type	Internal Antenna		
Antenna Gain	-2.52dBi		
Test Mode(s)	GSM 850; WCDMA Band V; LTE Band 5;		
Test Modulation	(GSM/GPRS)GMSK, (EGPRS) GMSK/ 8PSK; (WCDMA) BPSK, QPSK, 16QAM; (LTE) QPSK, 16QAM, 64QAM;		
GPRS Multislot Class	12		
EGPRS Multislot Class	12		
HSDPA UE Category	14		
HSUPA UE Category	7		
HSPA+ UE Category	6		
LTE Category	5		
Maximum E.R.P.	GSM 850:	28.51dBm	
	WCDMA Band V:	19.55dBm	
	LTE Band 5:	19.80dBm	
Rated Power Supply Voltage	3.85V		
Operating Voltage	Minimum: 3.5V Maximum: 4.43V		
Operating Temperature	Lowest: -10°C Highest: +55°C		
Extreme Temperature	Lowest: -30°C Highest: +50°C		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM850	824 ~ 849	869 ~ 894
	WCDMA Band V	824 ~ 849	869 ~ 894



	LTE Band 5	824 ~ 849	869 ~ 894
<b>EUT Accessory</b>			
Adapter 1	Manufacturer: Jiangsu Chenyang Electron Co., Ltd. Model: STC-A520A-Z		
Adapter 2	Manufacturer: Shenzhen Ruijing Industrial Co Ltd Model: STC-A520A-Z		
Battery	Manufacturer: SCUD (Fujian) Electronics Co., LTD. Model: Li3839T44P8h866445		
USB Cable 1	Manufacturer: kingpower-tech Model: USB-TC20-W-100-M-L 100cm Cable, Shielded		
USB Cable 2	Manufacturer: Shenzhen Luxshare Precision Industry Co.,Ltd. Model: USB-TC20-W-100-M-L 100cm Cable, Shielded		
<p>Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.</p> <p>2. There are more than one Adapter and USB Cable, each one should be applied throughout the compliance test respectively, however, only the worst case (Adapter 2 and USB Cable 2) will be recorded in this report.</p>			



### 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 (2020)**

**FCC CFR47 Part 2 (2020)**

**Reference standard:**

**ANSI C63.26 (2015)**

**KDB 971168 D01 Power Meas License Digital Systems v03r01**



## 4. Test Configuration

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

All mode and data rates and positions and RB size and modulations were investigated.

Subsequently, only the worst case emissions are reported.

The following testing in GSM/WCDMA/LTE is set based on the maximum RF Output Power.

Test modes are chosen to be reported as the worst case configuration below:

Test items	Modes/Modulation	
	GSM 850	WCDMA Band V
RF Power Output and Effective Radiated power	GSM GPRS EGPRS	RMC/AMR HSDPA/HSUPA DC-HSDPA/HSPA+
Occupied Bandwidth	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Band Edge Compliance	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Peak-to-Average Power Ratio	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Frequency Stability	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Spurious Emissions at Antenna Terminals	GSM	RMC
Radiates Spurious Emission	GSM	RMC



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/ 64QAM	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	-
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.

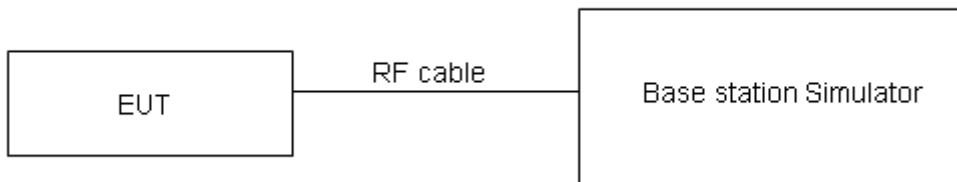
ERP can then be calculated as follows:

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

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

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

#### 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	≤ 7 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  $k = 2$ ,  $U = 0.4$  dB for RF power output,  $k = 2$ ,  $U = 1.19$  dB for ERP.

**Test Results**

GSM 850		Maximum Output Power (dBm)			ERP(dBm)		
		Channel 128	Channel 190	Channel 251	Channel 128	Channel 190	Channel 251
		824.2 (MHz)	836.6 (MHz)	848.8 (MHz)	824.2 (MHz)	836.6 (MHz)	848.8 (MHz)
GSM(GMSK)	Results	32.89	33.14	33.18	28.22	28.47	28.51
GPRS (GMSK)	1TXslot	32.87	33.14	33.15	28.20	28.47	28.48
	2TXslots	32.26	32.52	32.54	27.59	27.85	27.87
	3TXslots	30.66	30.89	30.93	25.99	26.22	26.26
	4TXslots	29.63	29.86	29.90	24.96	25.19	25.23
EGPRS (8PSK)	1TXslot	27.93	28.01	28.18	23.26	23.34	23.51
	2TXslots	26.81	26.89	26.96	22.14	22.22	22.29
	3TXslots	24.59	24.68	24.87	19.92	20.01	20.20
	4TXslots	23.55	23.67	23.85	18.88	19.00	19.18

WCDMA Band V		Maximum Output Power (dBm)			ERP(dBm)		
		Channel 4132	Channel 4183	Channel 4233	Channel 4132	Channel 4183	Channel 4233
		826.4 (MHz)	836.6 (MHz)	846.6 (MHz)	826.4 (MHz)	836.6 (MHz)	846.6 (MHz)
RMC		24.10	24.07	24.16	19.43	19.40	19.49
AMR		24.22	24.15	24.16	19.55	19.48	19.49
HSDPA	Sub - Test 1	23.50	23.41	23.80	18.83	18.74	19.13
	Sub - Test 2	23.52	23.65	23.54	18.85	18.98	18.87
	Sub - Test 3	23.20	23.09	23.14	18.53	18.42	18.47
	Sub - Test 4	23.06	23.01	23.32	18.39	18.34	18.65
HSUPA	Sub - Test 1	22.48	22.47	22.52	17.81	17.80	17.85
	Sub - Test 2	22.22	21.97	22.18	17.55	17.30	17.51
	Sub - Test 3	22.56	22.73	22.62	17.89	18.06	17.95
	Sub - Test 4	21.76	21.59	21.60	17.09	16.92	16.93
	Sub - Test 5	23.22	23.01	23.04	18.55	18.34	18.37
DC-HSDPA	Sub - Test 1	23.74	23.63	23.80	19.07	18.96	19.13
	Sub - Test 2	23.66	23.51	23.70	18.99	18.84	19.03
	Sub - Test 3	23.26	23.13	23.32	18.59	18.46	18.65
	Sub - Test 4	23.14	22.99	23.24	18.47	18.32	18.57
HSPA+	16QAM	22.26	22.05	22.30	17.59	17.38	17.63



LTE Band5				Maximum Output Power(dBm)			ERP(dBm)		
Bandwidth	Modulation	RB size	RB offset	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	24.04	24.21	24.44	19.37	19.54	19.77
		1	2	24.30	24.33	24.23	19.63	19.66	19.56
		1	5	24.14	24.16	24.33	19.47	19.49	19.66
		3	0	24.18	24.21	24.21	19.51	19.54	19.54
		3	2	24.09	24.21	24.16	19.42	19.54	19.49
		3	3	24.21	24.18	24.22	19.54	19.51	19.55
		6	0	23.20	23.26	23.10	18.53	18.59	18.43
	16QAM	1	0	23.56	23.37	23.31	18.89	18.70	18.64
		1	2	23.54	23.49	23.06	18.87	18.82	18.39
		1	5	23.45	23.35	23.29	18.78	18.68	18.62
		3	0	23.18	23.17	23.20	18.51	18.50	18.53
		3	2	23.21	23.21	23.14	18.54	18.54	18.47
		3	3	23.25	23.21	23.21	18.58	18.54	18.54
		6	0	22.15	22.23	22.25	17.48	17.56	17.58
	64QAM	1	0	23.19	22.97	23.33	18.52	18.30	18.66
		1	2	23.41	23.15	23.24	18.74	18.48	18.57
		1	5	23.16	22.98	23.30	18.49	18.31	18.63
		3	0	23.02	23.03	23.18	18.35	18.36	18.51
		3	2	23.07	23.05	23.21	18.40	18.38	18.54
		3	3	23.07	23.03	23.10	18.40	18.36	18.43
		6	0	22.06	22.12	22.16	17.39	17.45	17.49
Bandwidth	Modulation	RB size	RB offset	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	24.06	24.25	24.47	19.39	19.58	19.80
		1	7	24.28	24.36	24.27	19.61	19.69	19.60
		1	14	24.17	24.21	24.37	19.50	19.54	19.70
		8	0	23.28	23.33	23.34	18.61	18.66	18.67
		8	4	23.21	23.31	23.28	18.54	18.64	18.61
		8	7	23.31	23.29	23.32	18.64	18.62	18.65
		15	0	23.20	23.30	23.13	18.53	18.63	18.46
	16QAM	1	0	23.59	23.39	23.34	18.92	18.72	18.67
		1	7	23.57	23.49	23.10	18.90	18.82	18.43
		1	14	23.47	23.39	23.32	18.80	18.72	18.65
		8	0	22.29	22.30	22.32	17.62	17.63	17.65
		8	4	22.32	22.34	22.26	17.65	17.67	17.59
		8	7	22.35	22.33	22.34	17.68	17.66	17.67
		15	0	22.18	22.27	22.28	17.51	17.60	17.61



Bandwidth	Modulation	RB size	RB offset	Channel/Frequency(MHz)						
				20425	20525	20625	20425	20525	20625	
				/826.5	/836.5	/846.5	/826.5	/836.5	/846.5	
5MHz	64QAM	1	0	23.22	22.99	23.36	18.55	18.32	18.69	
		1	7	23.44	23.15	23.26	18.77	18.48	18.59	
		1	14	23.18	22.97	23.33	18.51	18.30	18.66	
		8	0	22.13	22.16	22.30	17.46	17.49	17.63	
		8	4	22.18	22.18	22.33	17.51	17.51	17.66	
		8	7	22.17	22.15	22.23	17.50	17.48	17.56	
		15	0	22.09	22.16	22.19	17.42	17.49	17.52	
5MHz	QPSK	1	0	24.04	24.20	24.44	19.37	19.53	19.77	
		1	13	24.27	24.36	24.25	19.60	19.69	19.58	
		1	24	24.13	24.15	24.32	19.46	19.48	19.65	
		12	0	23.26	23.29	23.31	18.59	18.62	18.64	
		12	6	23.19	23.27	23.23	18.52	18.60	18.56	
		12	13	23.28	23.28	23.29	18.61	18.61	18.62	
		25	0	23.22	23.27	23.10	18.55	18.60	18.43	
	16QAM	1	0	23.53	23.36	23.31	18.86	18.69	18.64	
		1	13	23.55	23.48	23.08	18.88	18.81	18.41	
		1	24	23.44	23.35	23.28	18.77	18.68	18.61	
		12	0	22.27	22.29	22.30	17.60	17.62	17.63	
		12	6	22.28	22.28	22.21	17.61	17.61	17.54	
		12	13	22.33	22.29	22.31	17.66	17.62	17.64	
		25	0	22.16	22.23	22.23	17.49	17.56	17.56	
	64QAM	1	0	23.16	22.96	23.33	18.49	18.29	18.66	
		1	13	23.42	23.14	23.24	18.75	18.47	18.57	
		1	24	23.19	22.96	23.33	18.52	18.29	18.66	
		12	0	22.13	22.19	22.32	17.46	17.52	17.65	
		12	6	22.15	22.14	22.31	17.48	17.47	17.64	
		12	13	22.15	22.11	22.20	17.48	17.44	17.53	
		25	0	22.07	22.12	22.14	17.40	17.45	17.47	
	Bandwidth	Modulation	RB size	RB offset	Channel/Frequency(MHz)					
					20450	20525	20600	20450	20525	20600
					/829	/836.5	/844	/829	/836.5	/844
	10MHz	QPSK	1	0	24.01	24.16	24.41	19.34	19.49	19.74
			1	25	24.26	24.32	24.23	19.59	19.65	19.56
			1	49	24.11	24.14	24.29	19.44	19.47	19.62
			25	0	23.23	23.24	23.27	18.56	18.57	18.60
25			13	23.17	23.23	23.20	18.50	18.56	18.53	
25			25	23.25	23.23	23.25	18.58	18.56	18.58	
50			0	23.19	23.22	23.06	18.52	18.55	18.39	
16QAM		1	0	23.26	23.32	23.26	18.59	18.65	18.59	
		1	25	23.51	23.46	23.04	18.84	18.79	18.37	



		1	49	23.42	23.32	23.26	18.75	18.65	18.59
		25	0	22.24	22.25	22.27	17.57	17.58	17.60
		25	13	22.25	22.26	22.18	17.58	17.59	17.51
		25	25	22.30	22.24	22.27	17.63	17.57	17.60
		50	0	22.14	22.19	22.20	17.47	17.52	17.53
	64QAM	1	0	23.14	22.92	23.28	18.47	18.25	18.61
		1	25	23.38	23.12	23.20	18.71	18.45	18.53
		1	49	23.13	22.90	23.27	18.46	18.23	18.60
		25	0	22.08	22.11	22.25	17.41	17.44	17.58
		25	13	22.11	22.10	22.25	17.44	17.43	17.58
		25	25	22.12	22.06	22.16	17.45	17.39	17.49
		50	0	22.05	22.08	22.11	17.38	17.41	17.44

## 5.2. Occupied Bandwidth

### Ambient condition

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

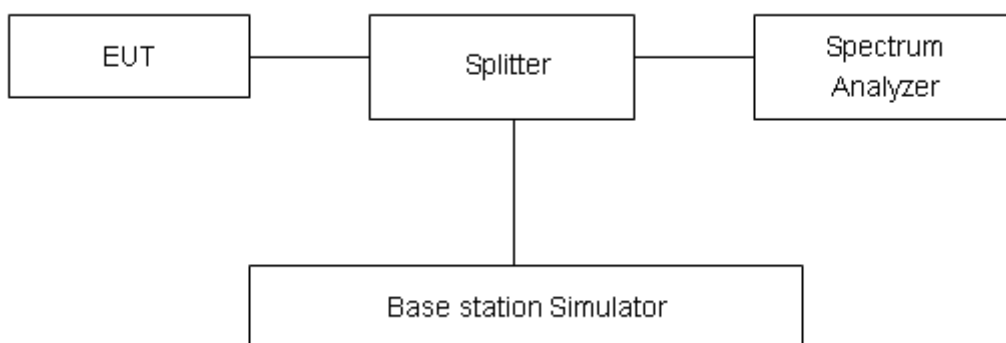
### Method of Measurement

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  $\geq 1\%EBW$ , VBW is set to 3x RBW.

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





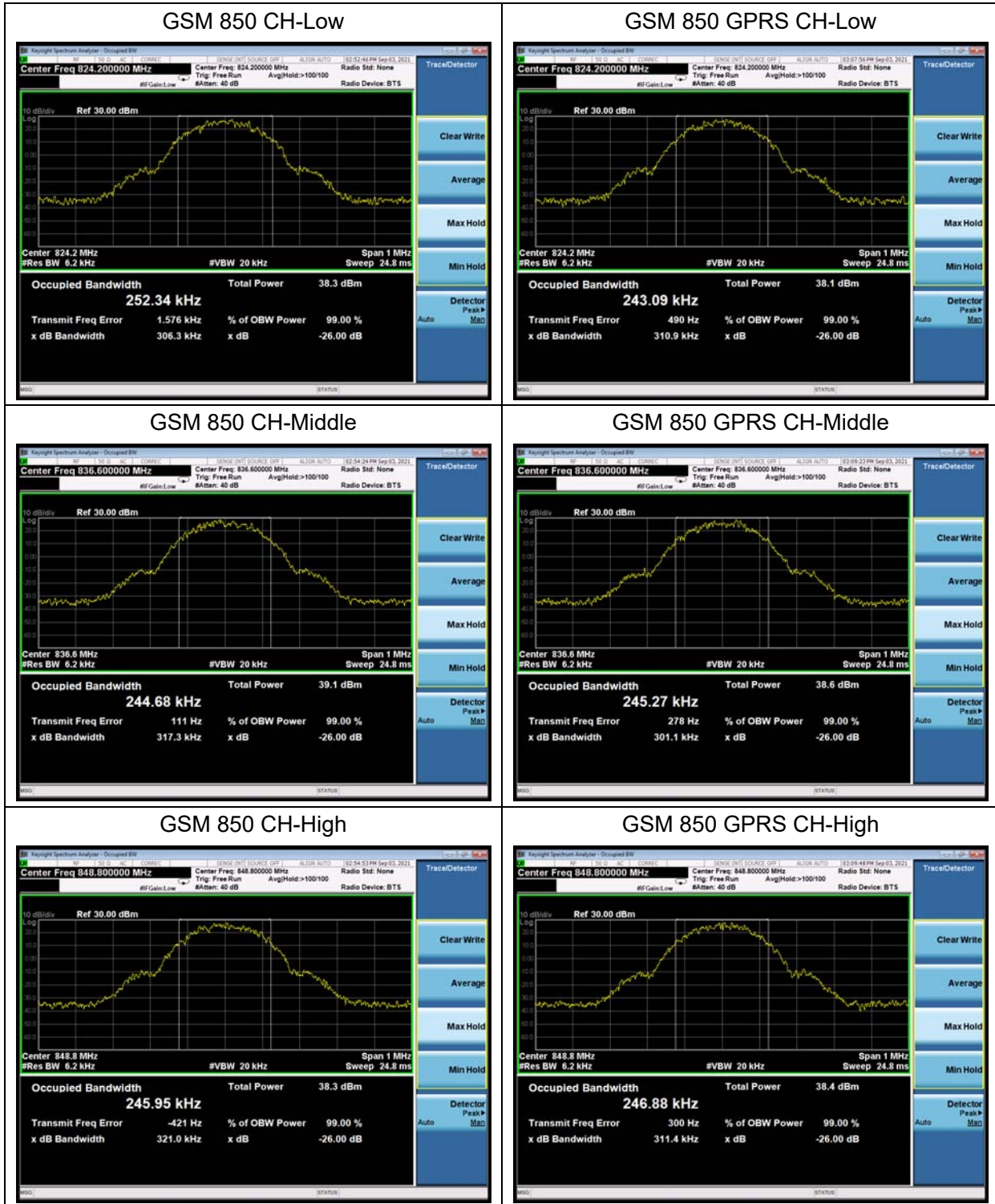
## Test Result

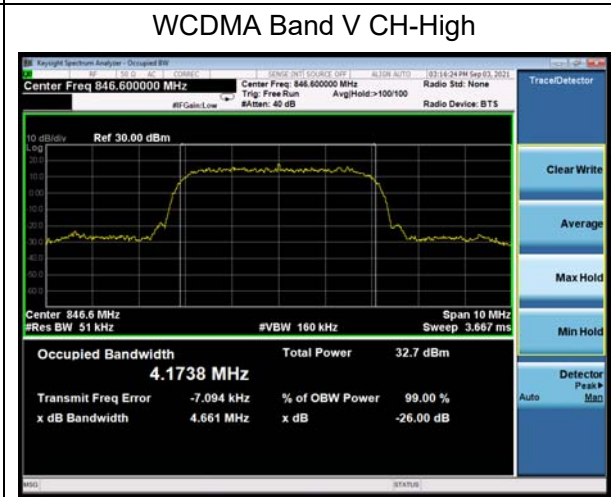
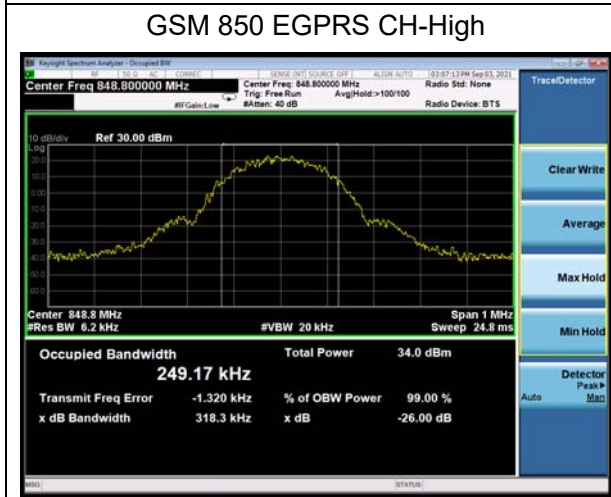
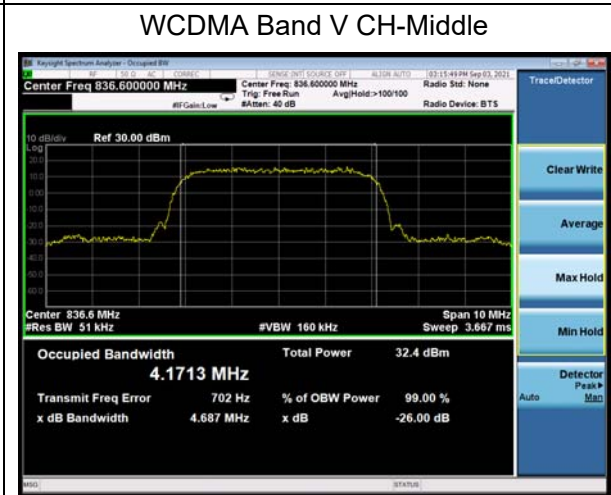
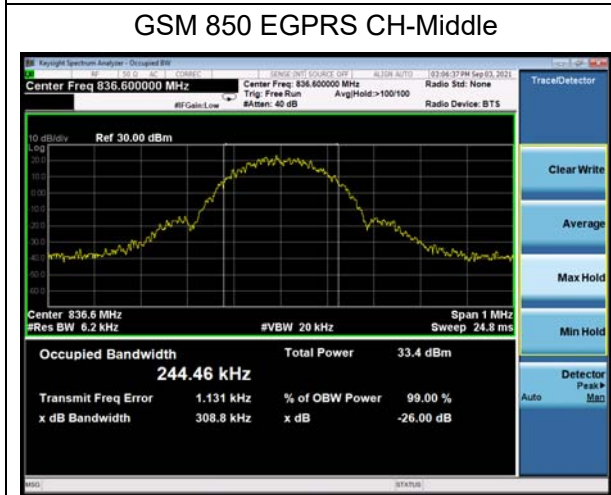
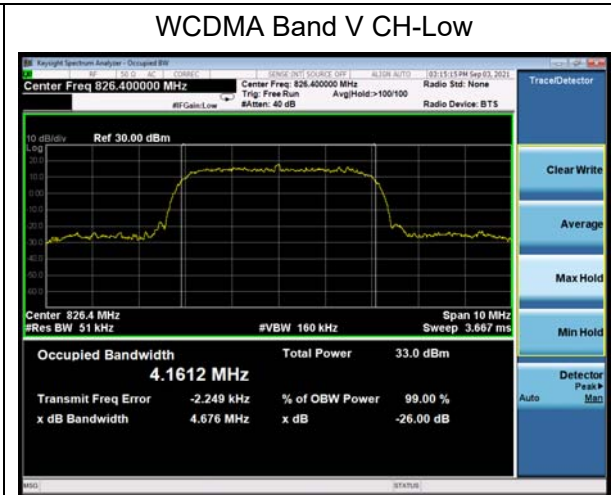
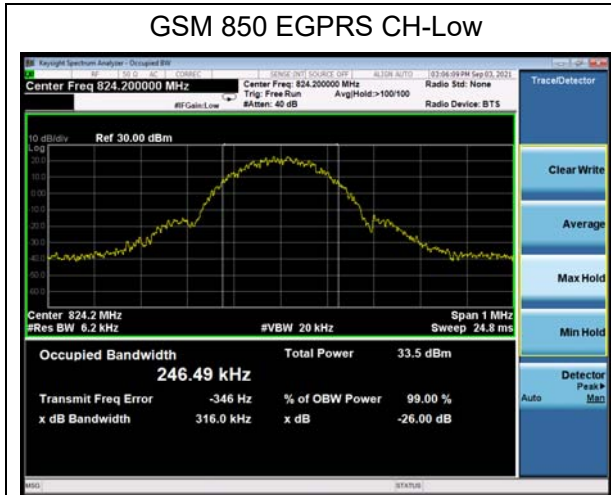
Mode	Channel	Frequency (MHz)	99% Power Bandwidth (MHz)	-26dBc Bandwidth(MHz)
GSM 850 (GMSK)	128	824.2	0.252	0.306
	190	836.6	0.245	0.317
	251	848.8	0.246	0.321
GPRS 850 (GMSK)	128	824.2	0.243	0.311
	190	836.6	0.245	0.301
	251	848.8	0.247	0.311
EGPRS 850 (8PSK)	128	824.2	0.246	0.316
	190	836.6	0.244	0.309
	251	848.8	0.249	0.318
WCDMA Band V (RMC)	4132	826.4	4.161	4.676
	4183	836.6	4.171	4.687
	4233	846.6	4.174	4.661

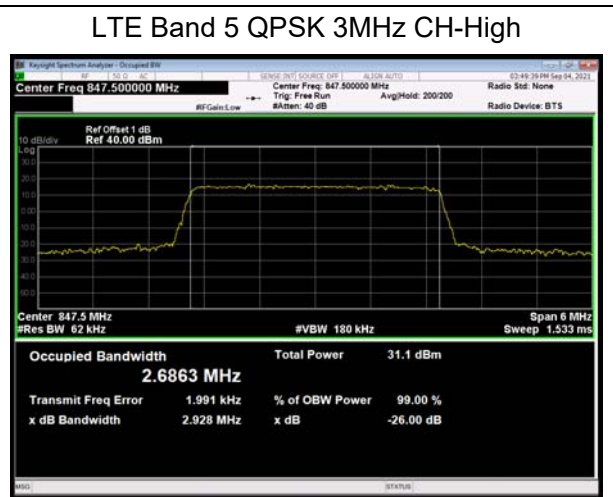
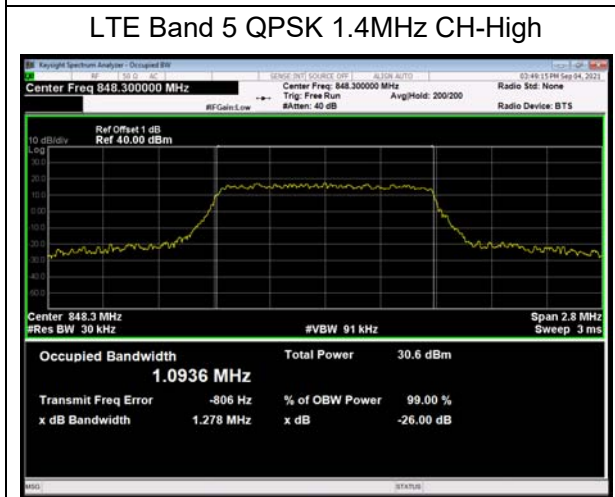
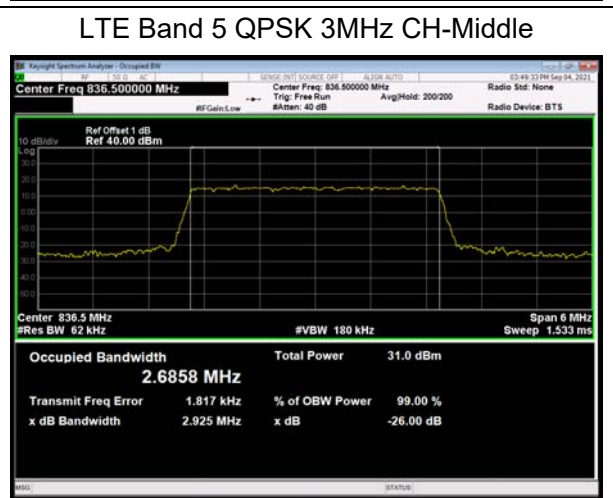
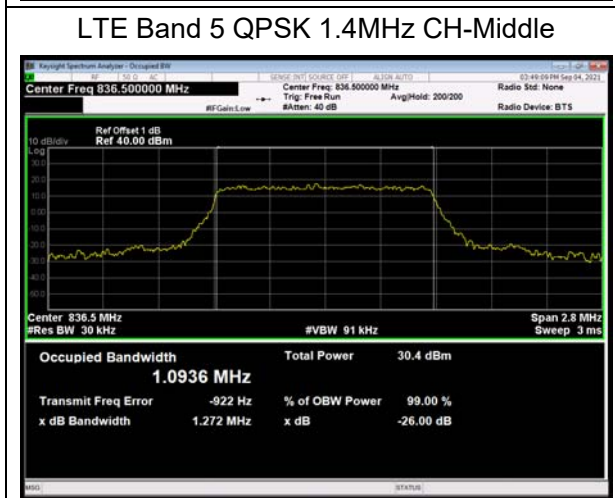
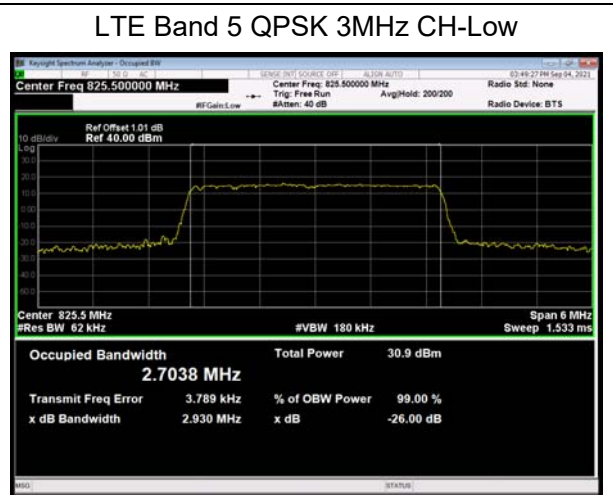
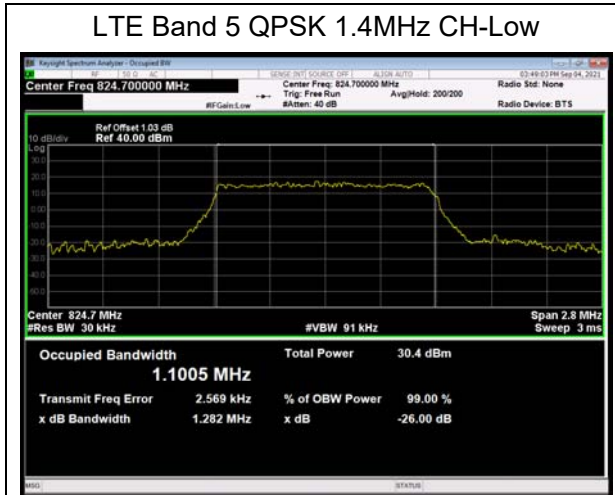
LTE Band 5						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	20407	824.7	1.100	1.282
			20525	836.5	1.094	1.272
			20643	848.3	1.094	1.278
		3	20415	825.5	2.704	2.930
			20525	836.5	2.686	2.925
			20635	847.5	2.686	2.928
		5	20425	826.5	4.507	4.934
			20525	836.5	4.510	4.925
			20625	846.5	4.504	4.872
		10	20450	829	8.995	9.664
			20525	836.5	8.995	9.666
			20600	844	8.981	9.696
	16QAM	1.4	20407	824.7	1.094	1.278
			20525	836.5	1.091	1.278
			20643	848.3	1.096	1.284
		3	20415	825.5	2.682	2.924
			20525	836.5	2.677	2.893
			20635	847.5	2.696	2.954
		5	20425	826.5	4.502	4.868
			20525	836.5	4.502	4.961
			20625	846.5	4.497	4.888
		10	20450	829	8.986	9.678
			20525	836.5	8.961	9.653

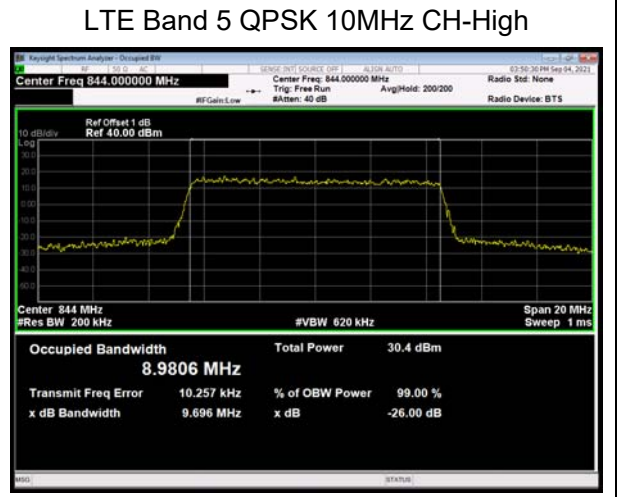
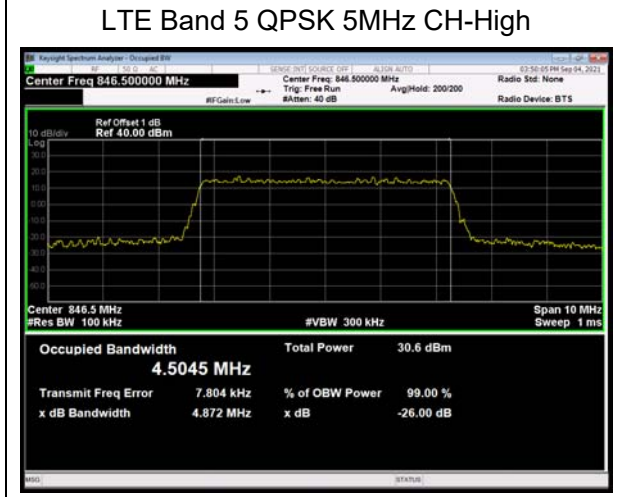
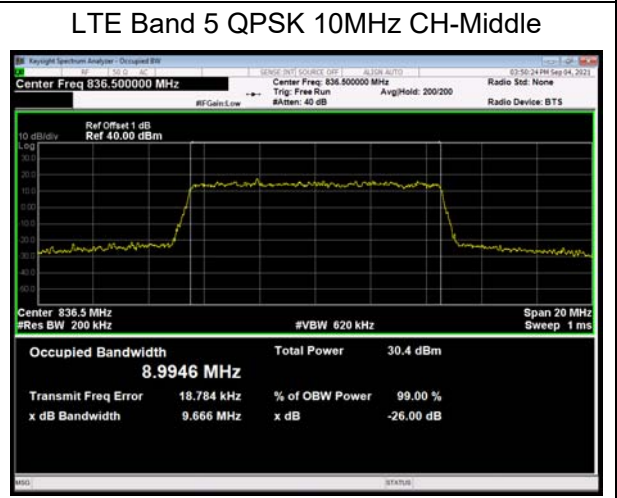
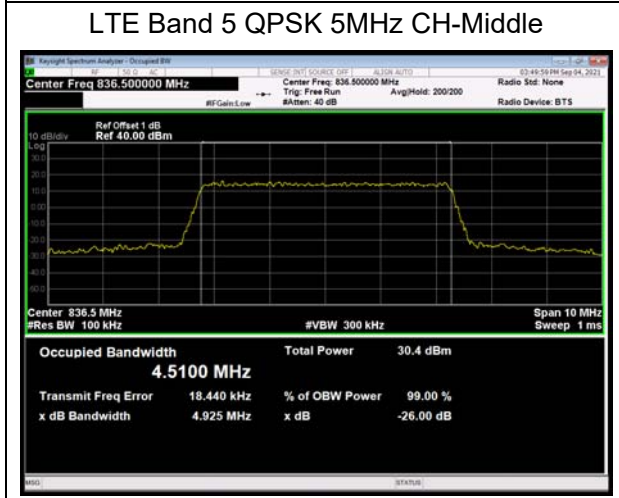
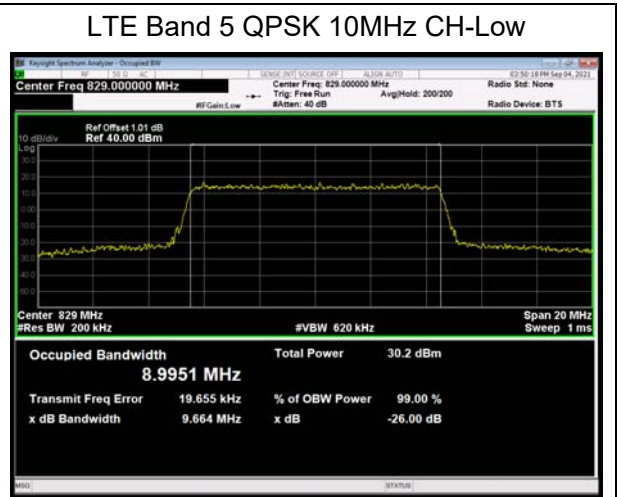
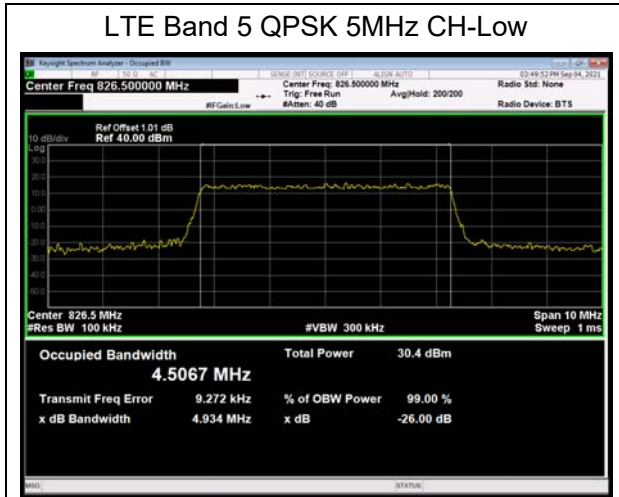


64QAM		1.4	20600	844	8.977	9.786	
			20407	824.7	1.095	1.291	
			20525	836.5	1.099	1.295	
		3	20643	848.3	1.092	1.282	
			20415	825.5	2.698	2.911	
			20525	836.5	2.683	2.904	
		5	20635	847.5	2.690	2.895	
			20425	826.5	4.495	4.898	
			20525	836.5	4.498	4.949	
		10	20625	846.5	4.497	4.927	
			20450	829	9.012	9.711	
			20525	836.5	8.990	9.684	
				20600	844	8.978	9.659

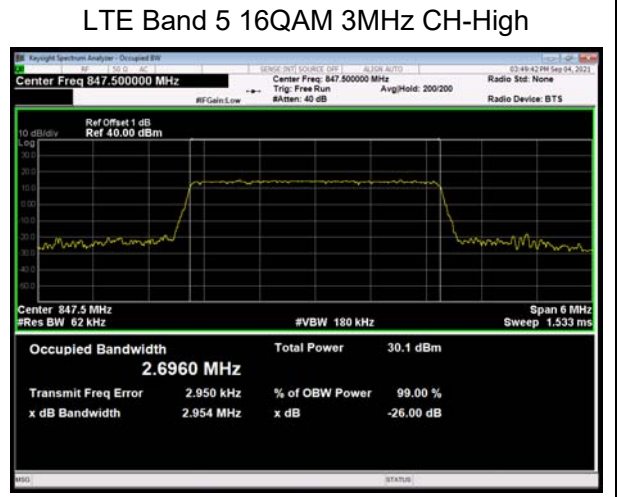
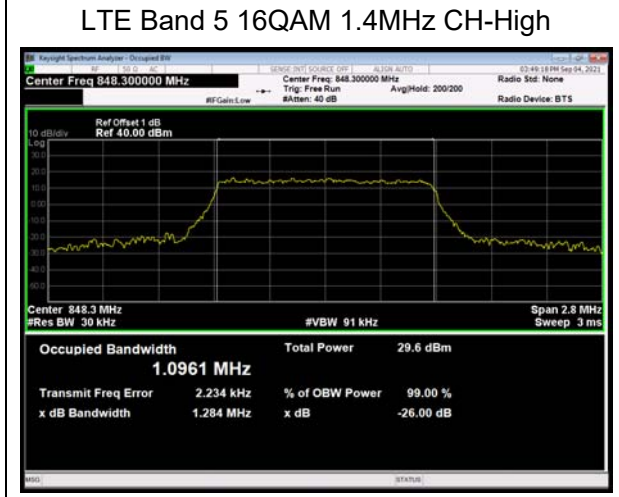
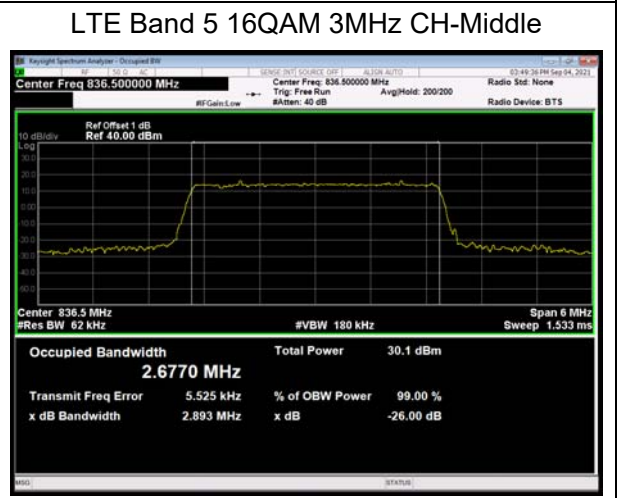
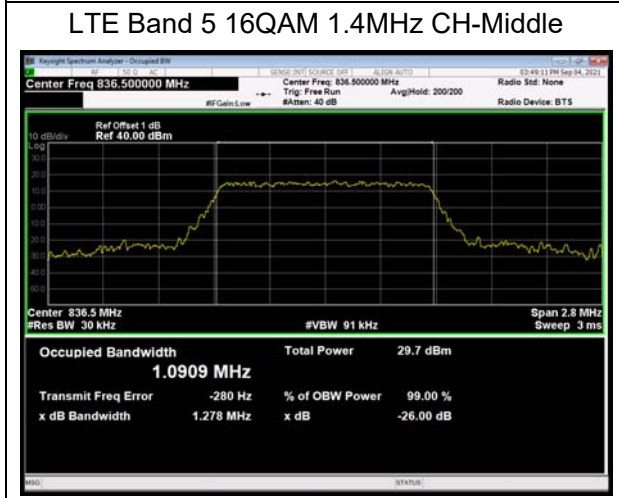
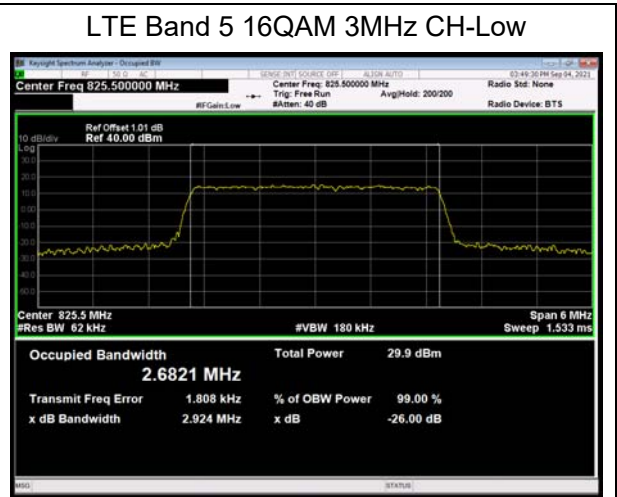
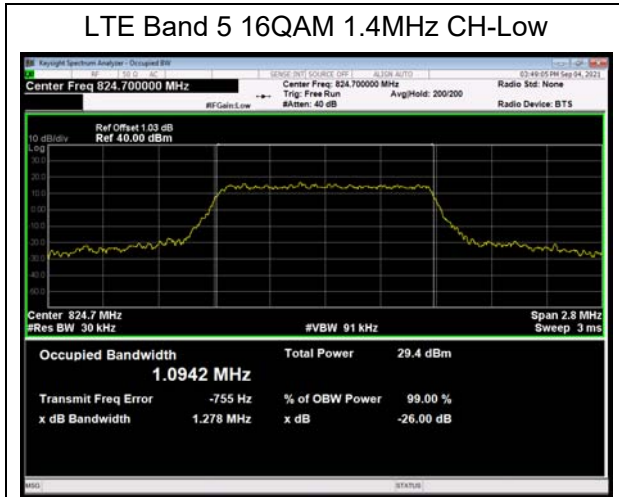


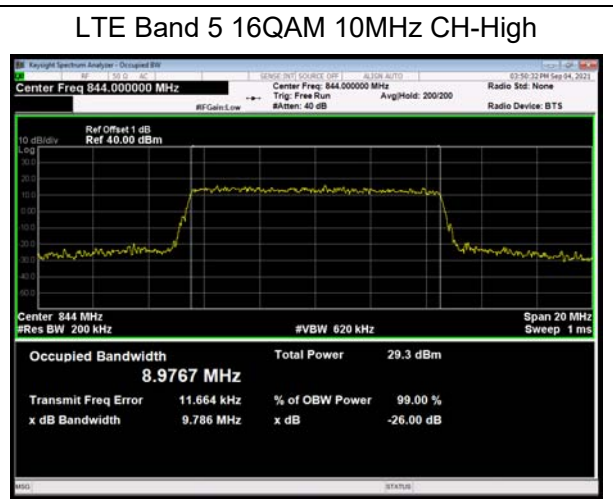
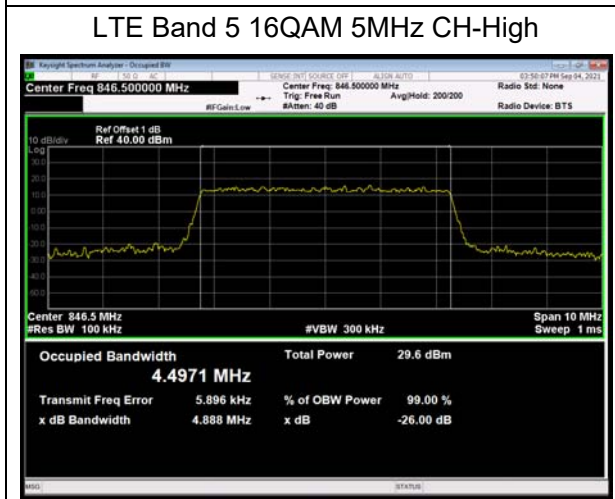
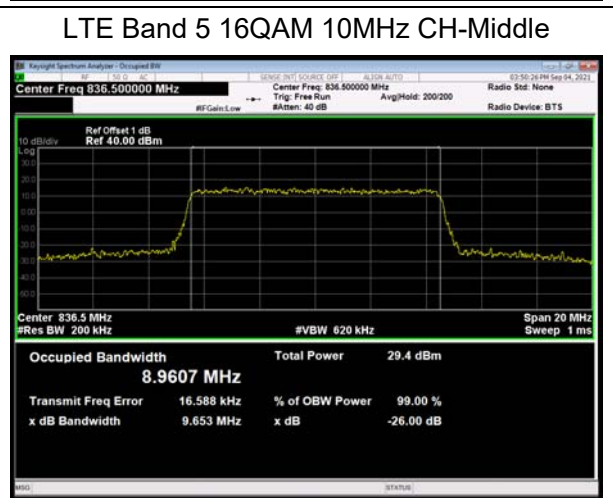
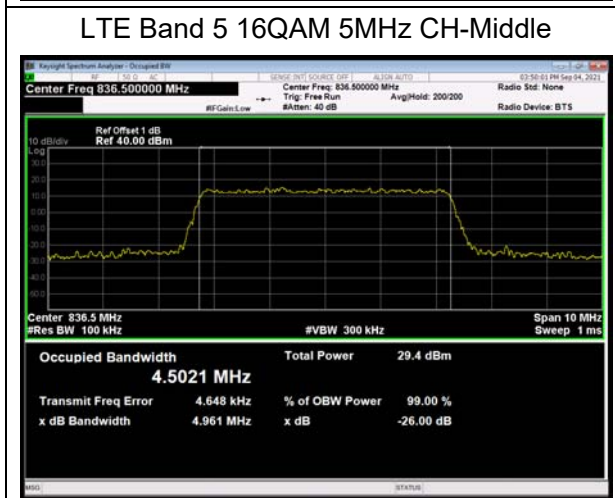
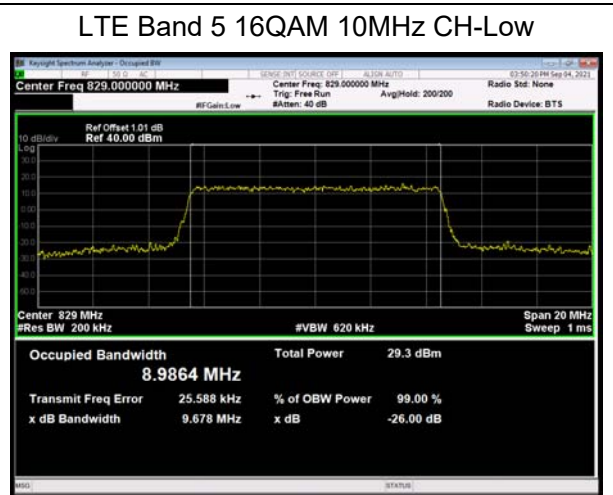
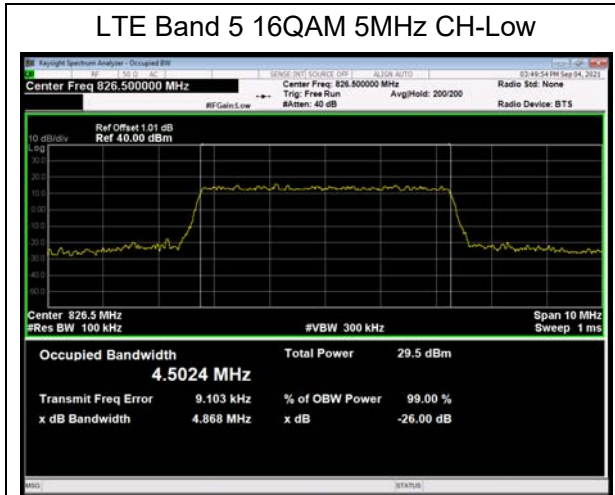




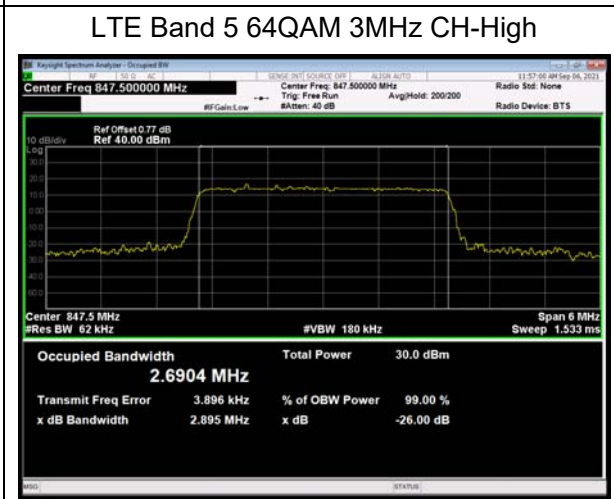
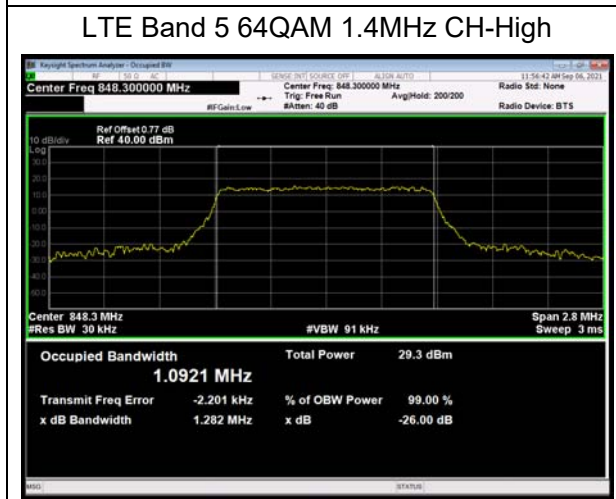
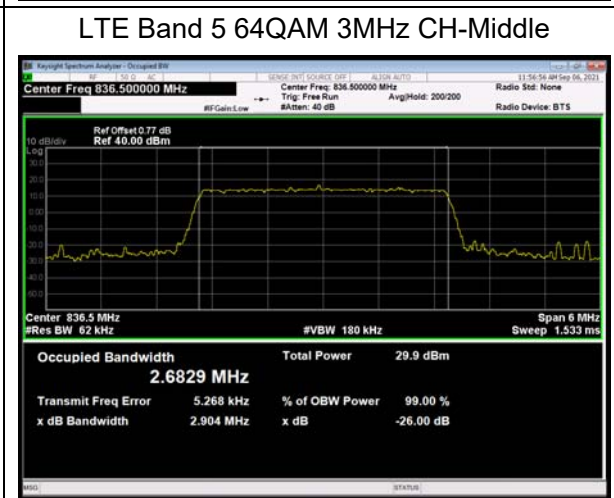
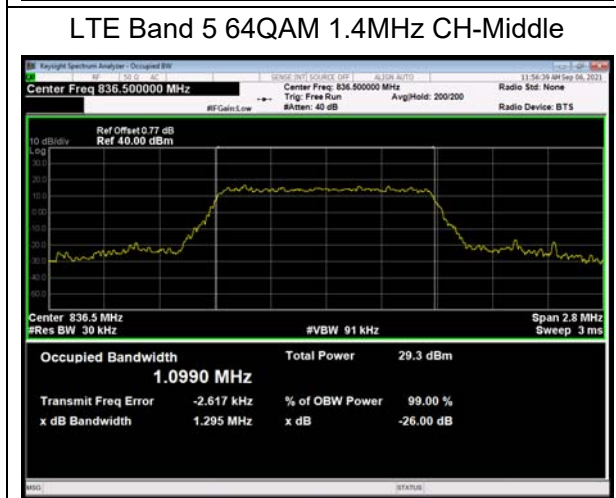
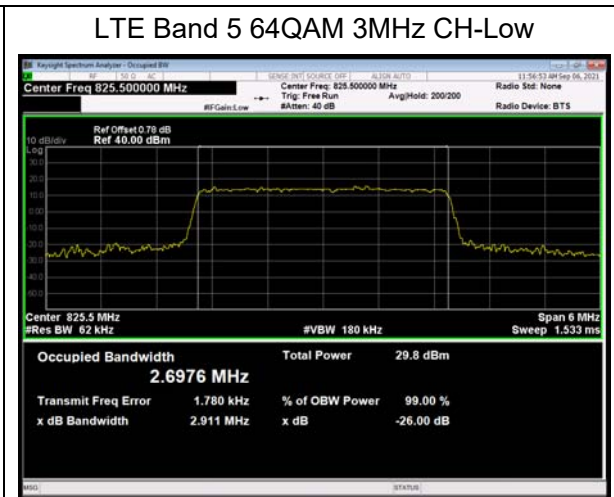
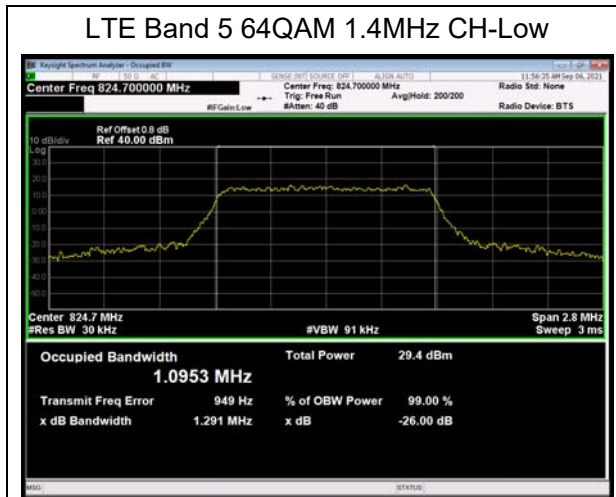


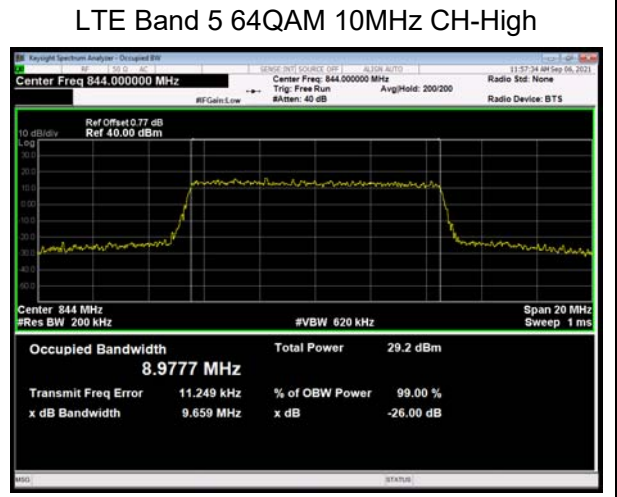
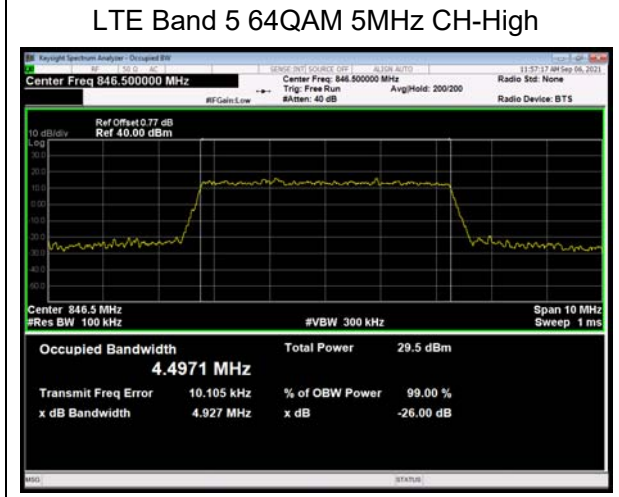
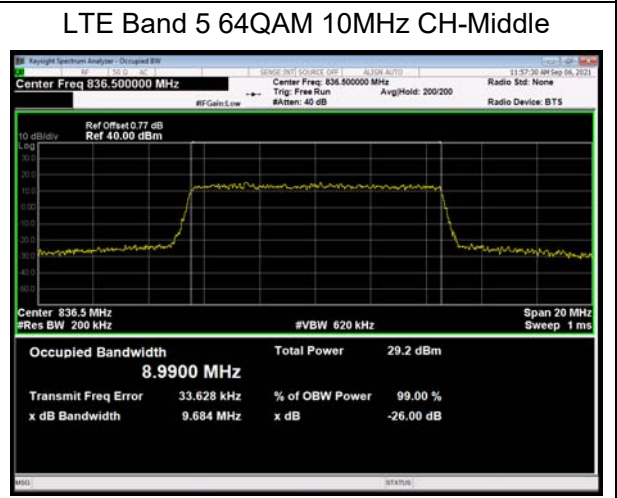
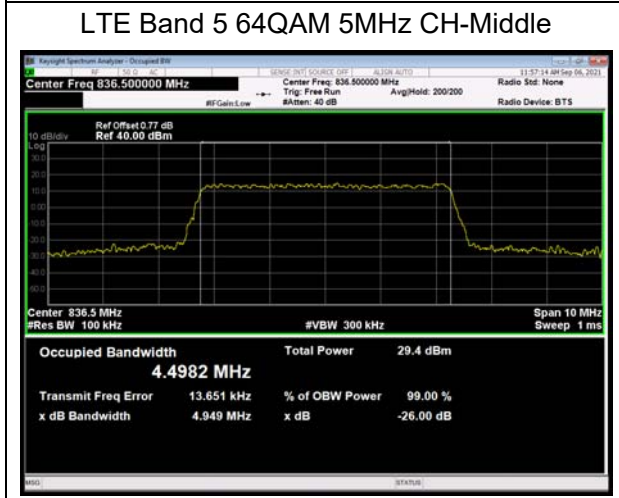
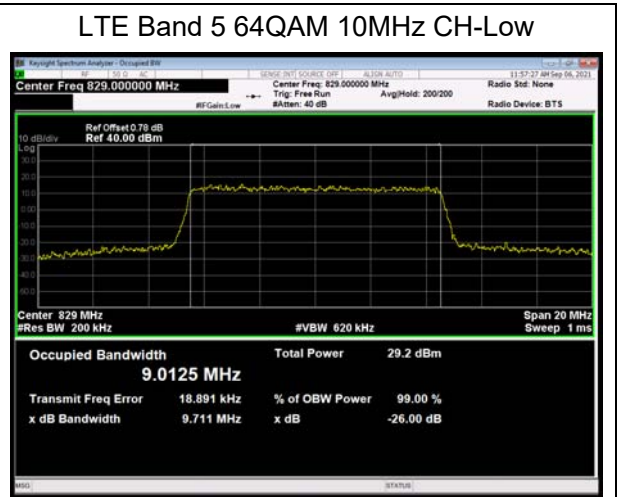
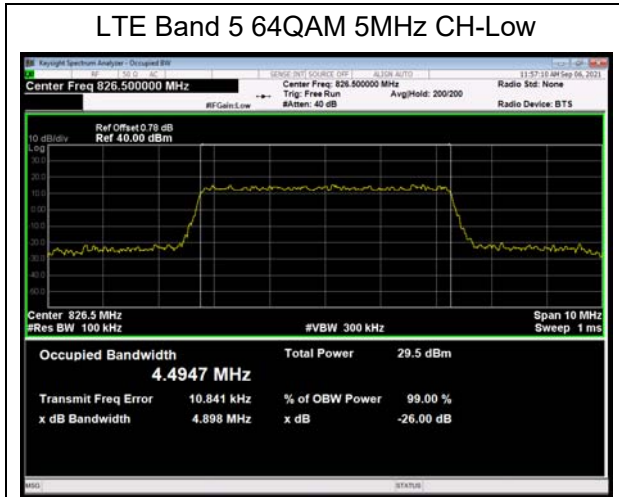












### 5.3. Band Edge Compliance

#### Ambient condition

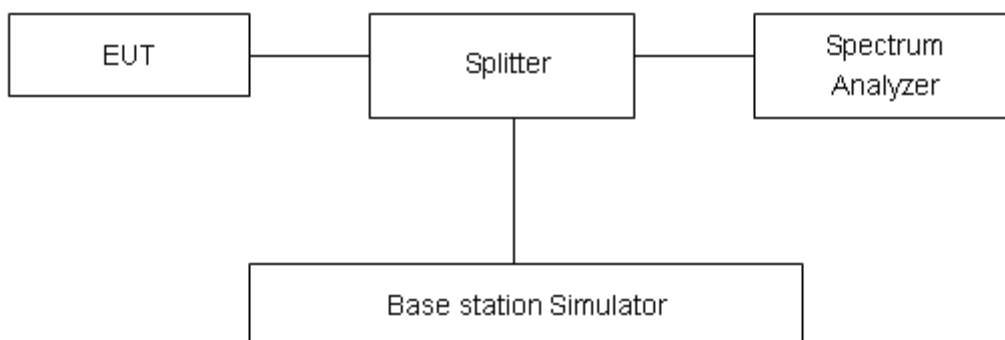
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### 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  $\geq 1\%EBW$ , VBW is set to 3x RBW.

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  $k = 1.96$ ,  $U=0.684dB$ .



Test Result:

GSM 850 CH-Low



GSM 850 CH-High



GSM 850 GPRS CH-Low



GSM 850 GPRS CH-High



GSM 850 EGPRS CH-Low



GSM 850 EGPRS CH-High





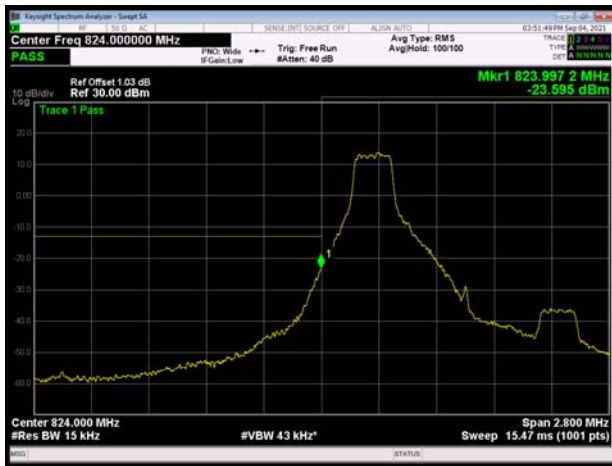
WCDMA Band V CH-Low



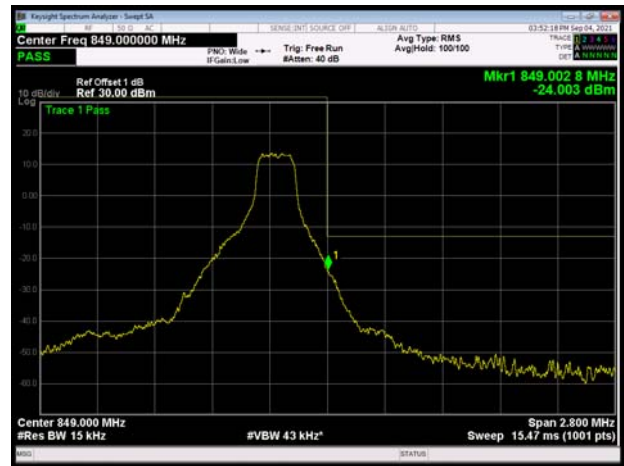
WCDMA Band V CH-High



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



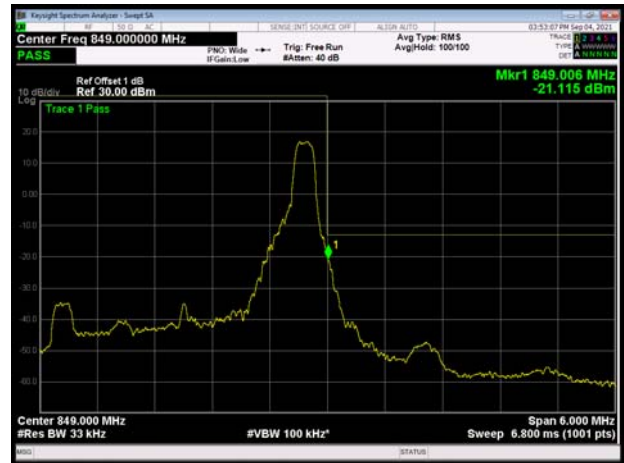




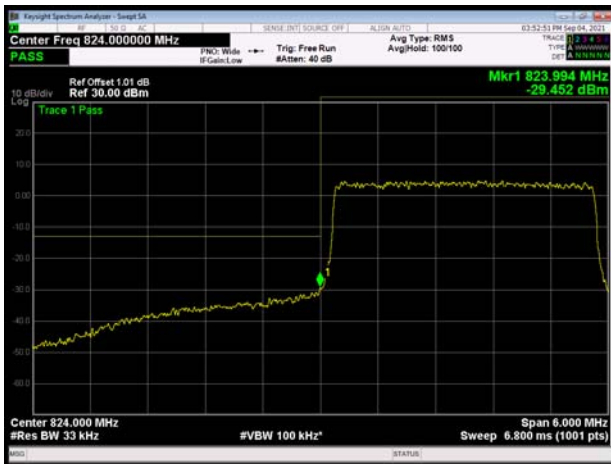
LTE Band 5 QPSK 3MHz CH-Low 1RB



LTE Band 5 QPSK 3MHz CH-High 1RB



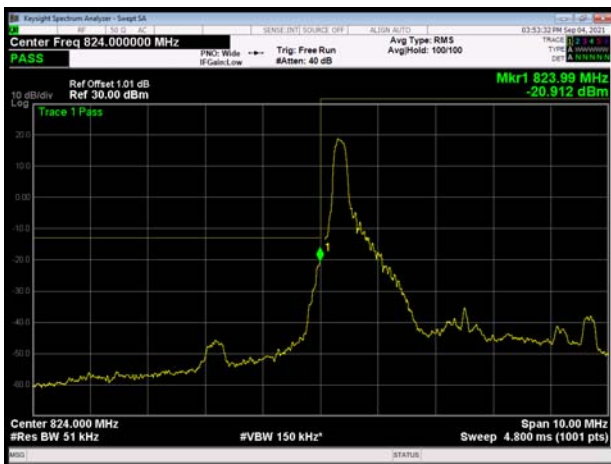
LTE Band 5 QPSK 3MHz CH-Low 100%RB



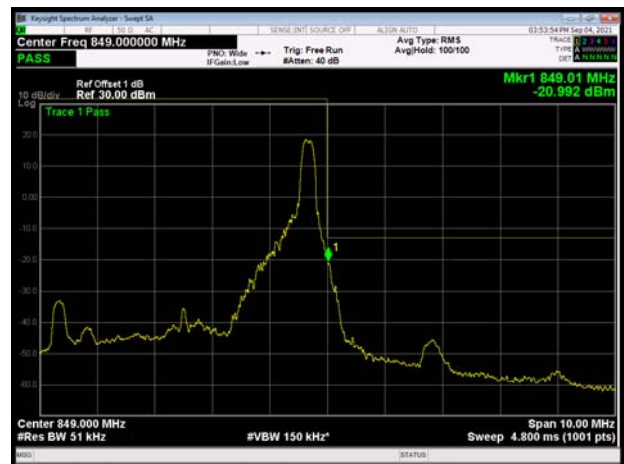
LTE Band 5 QPSK 3MHz CH-High 100%RB



LTE Band 5 QPSK 5MHz CH-Low 1RB

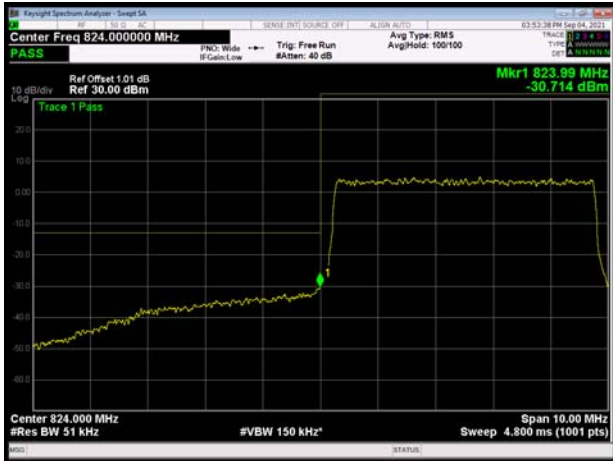


LTE Band 5 QPSK 5MHz CH-High 1RB





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



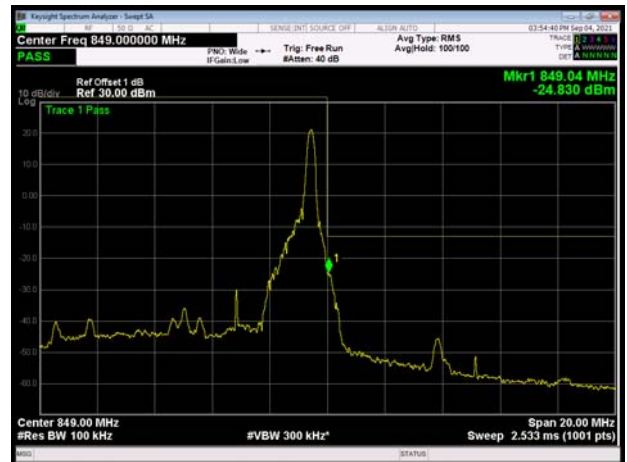
LTE Band 5 QPSK 5MHz CH-High 100%RB



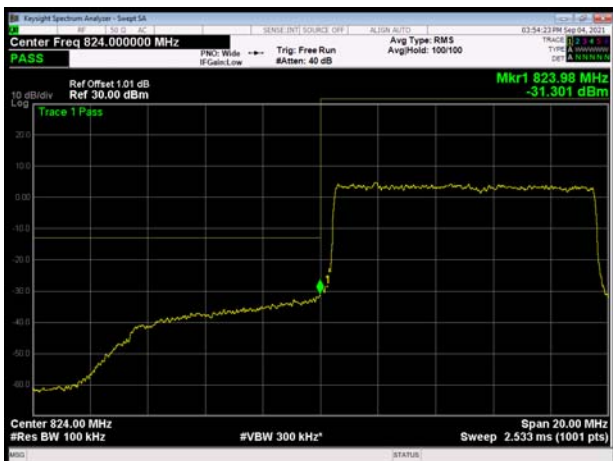
LTE Band 5 QPSK 10MHz CH-Low 1RB



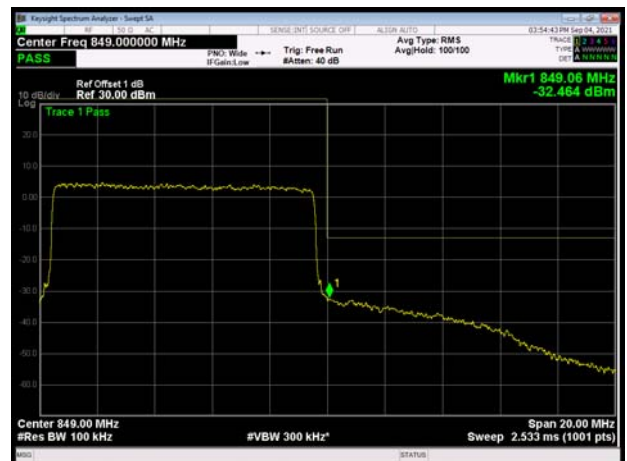
LTE Band 5 QPSK 10MHz CH-High 1RB



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

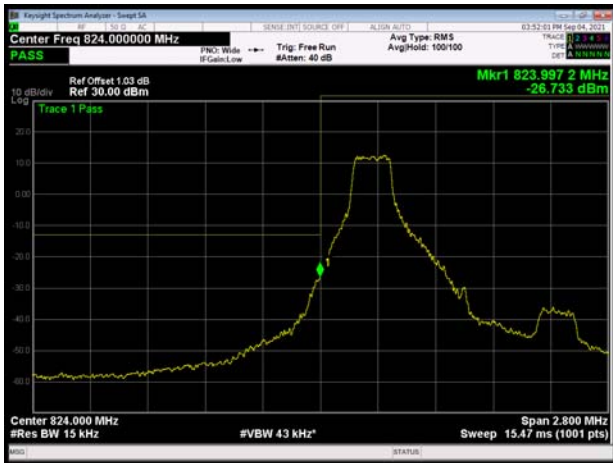


LTE Band 5 QPSK 10MHz CH-High 100%RB

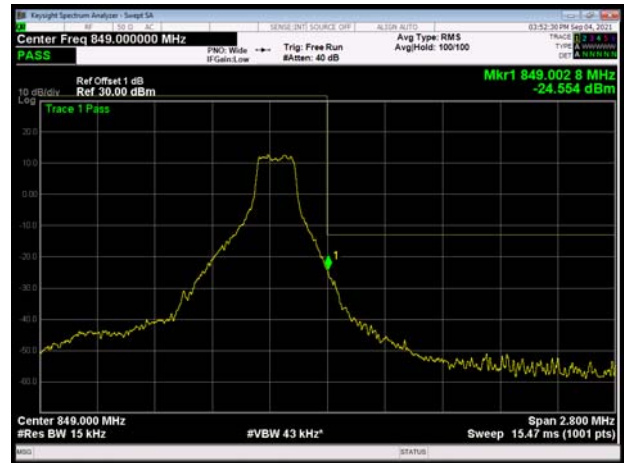




LTE Band 5 16QAM 1.4MHz CH-Low 1RB



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



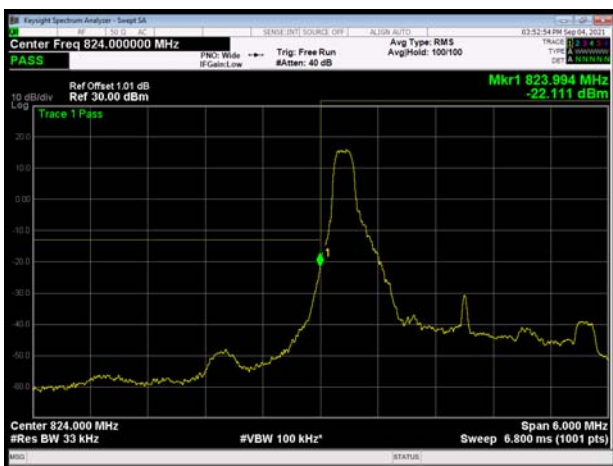
LTE Band 5 16QAM 1.4MHz CH-Low 100%RB



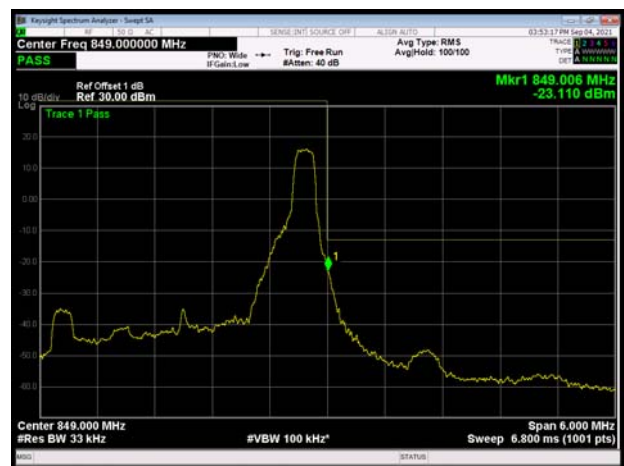
LTE Band 5 16QAM 1.4MHz CH-High 100%RB



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



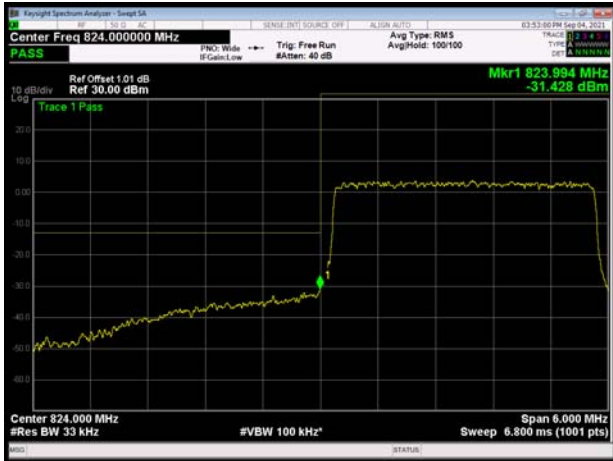
LTE Band 5 16QAM 3MHz CH-High 1RB







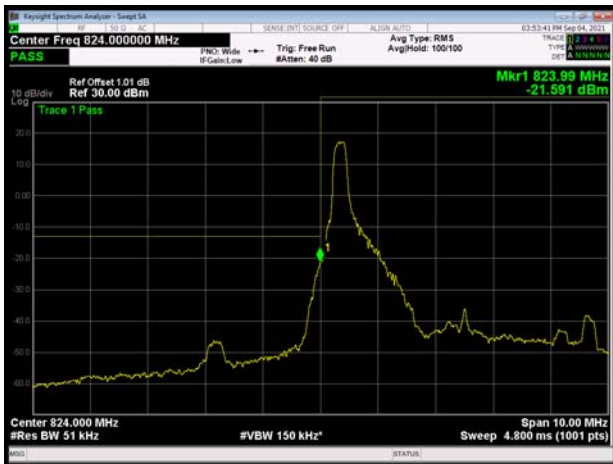
LTE Band 5 16QAM 3MHz CH-Low 100%RB



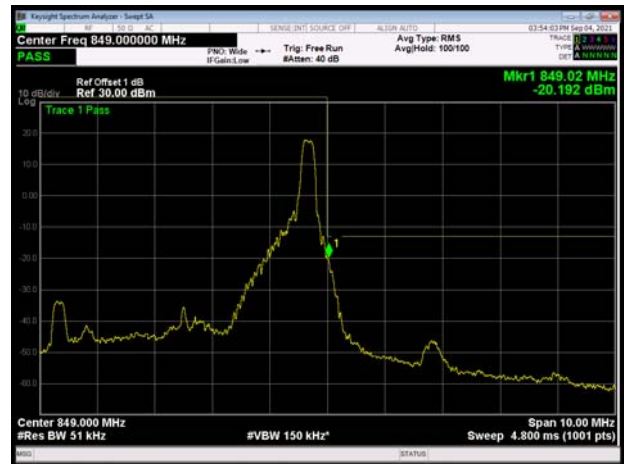
LTE Band 5 16QAM 3MHz CH-High 100%RB



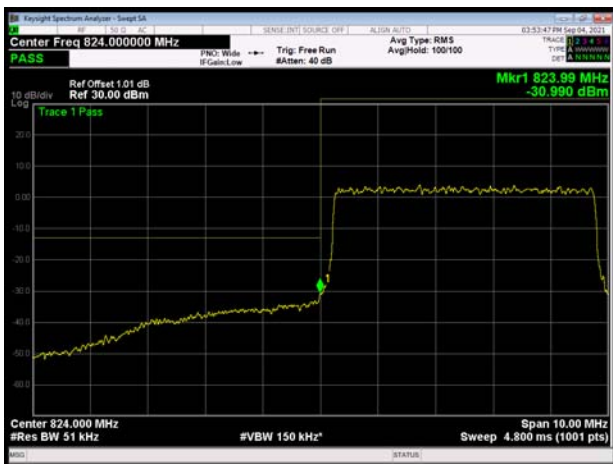
LTE Band 5 16QAM 5MHz CH-Low 1RB



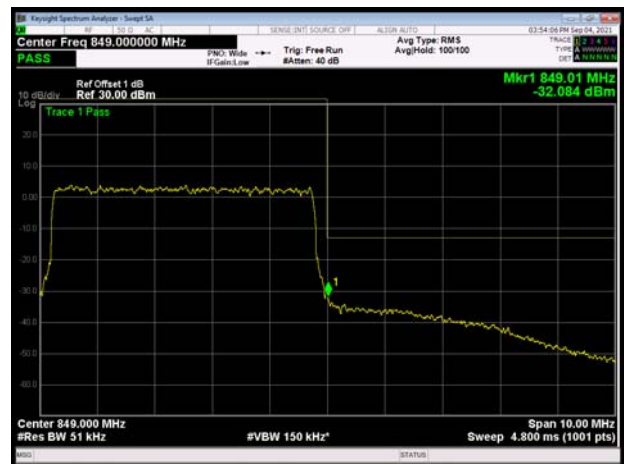
LTE Band 5 16QAM 5MHz CH-High 1RB



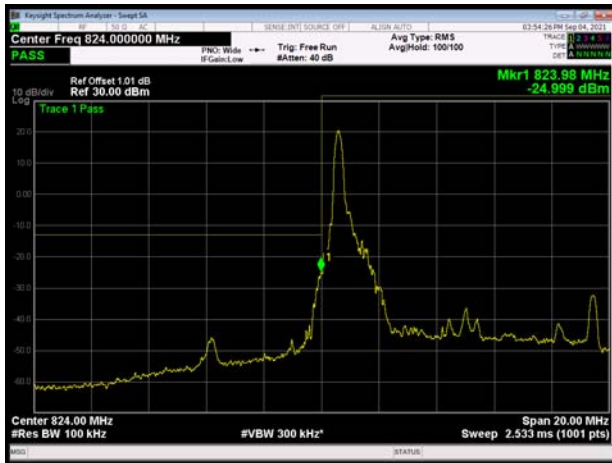
LTE Band 5 16QAM 5MHz CH-Low 100%RB



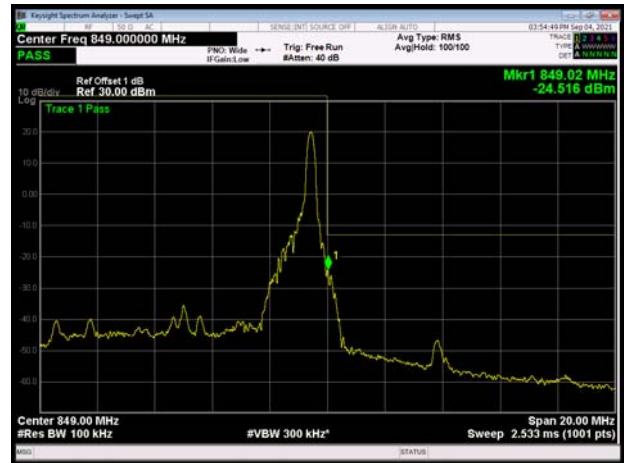
LTE Band 5 16QAM 5MHz CH-High 100%RB



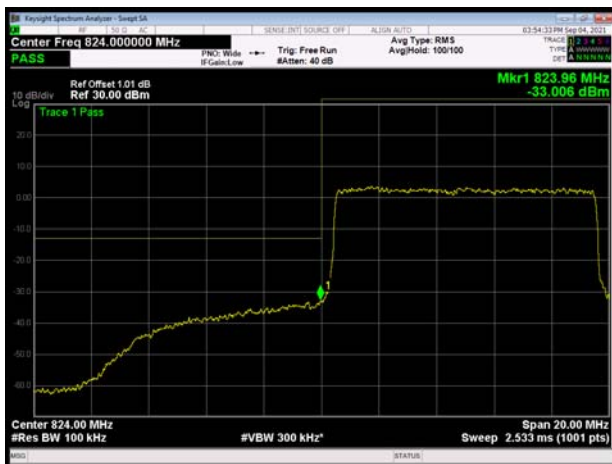
LTE Band 5 16QAM 10MHz CH-Low 1RB



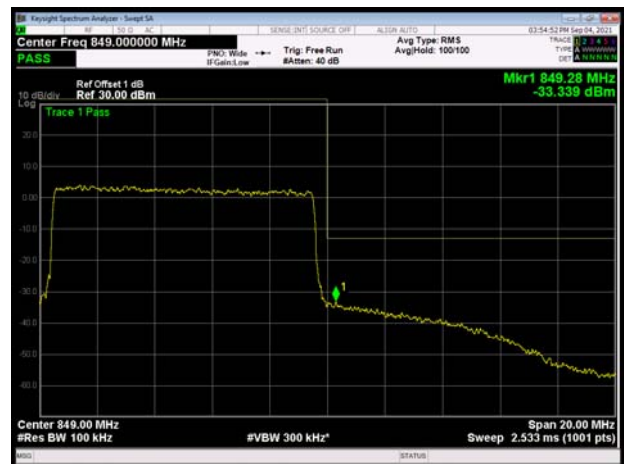
LTE Band 5 16QAM 10MHz CH-High 1RB



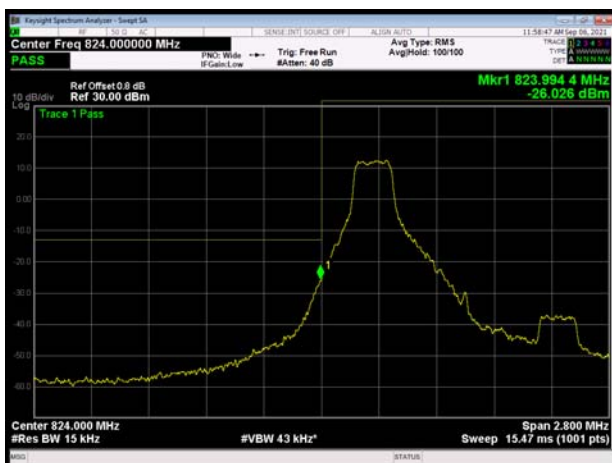
LTE Band 5 16QAM 10MHz CH-Low 100%RB



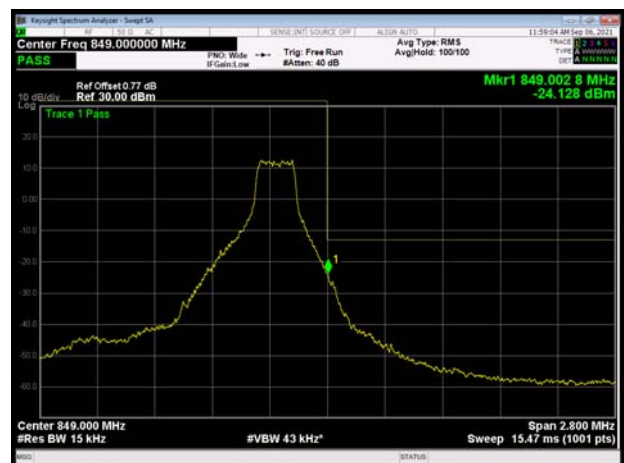
LTE Band 5 16QAM 10MHz CH-High 100%RB



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



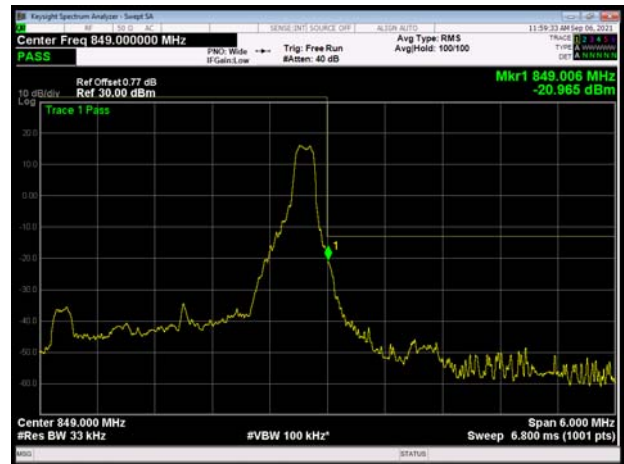
LTE Band 5 64QAM 1.4MHz CH-High 100%RB



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



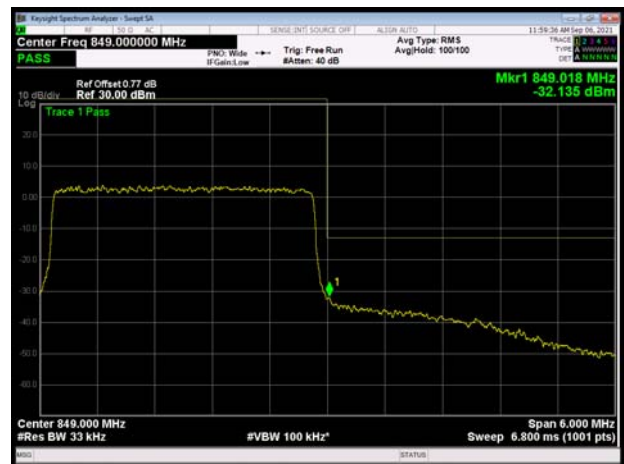
LTE Band 5 64QAM 3MHz CH-High 1RB



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



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

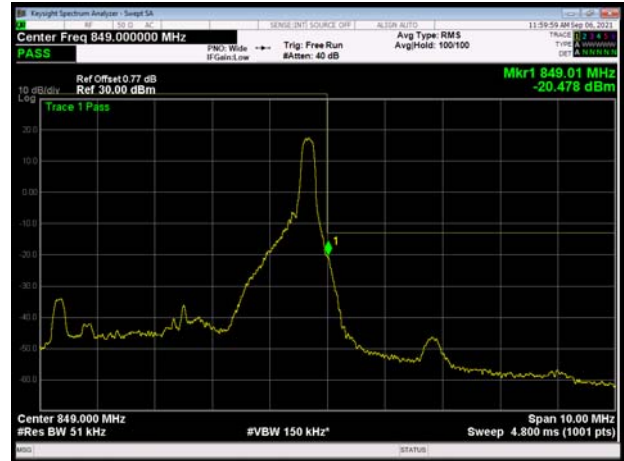




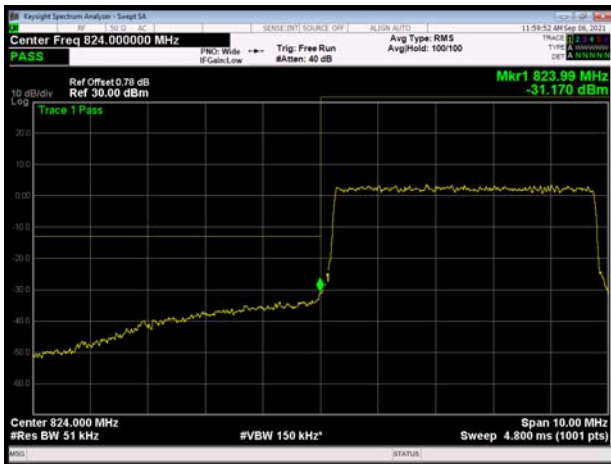
LTE Band 5 64QAM 5MHz CH-Low 1RB



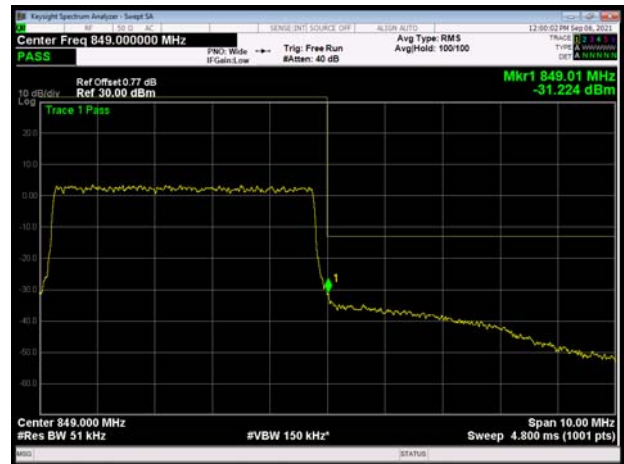
LTE Band 5 64QAM 5MHz CH-High 1RB



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



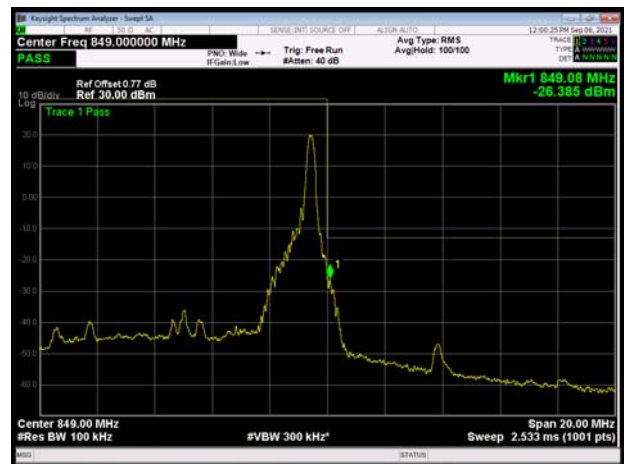
LTE Band 5 64QAM 5MHz CH-High 100%RB



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



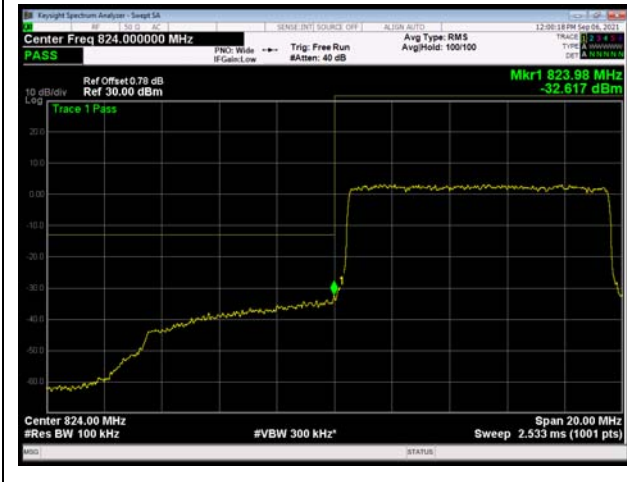
LTE Band 5 64QAM 10MHz CH-High 1RB







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



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



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

### Ambient condition

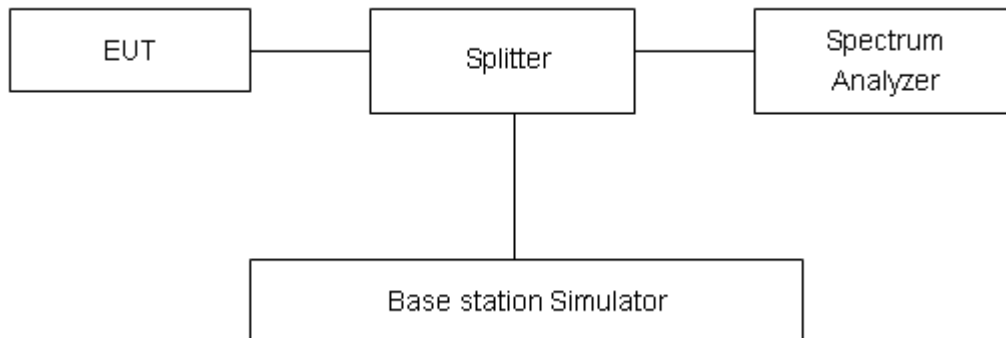
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

### 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**

Mode	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
GSM 850 (GMSK)	128	824.2	32.48	29.88	2.60	≤13	PASS
	190	836.6	32.74	30.14	2.60	≤13	PASS
	251	848.8	32.75	30.15	2.60	≤13	PASS
GPRS 850 (GMSK)	128	824.2	32.47	29.87	2.60	≤13	PASS
	190	836.6	32.73	30.13	2.60	≤13	PASS
	251	848.8	32.75	30.15	2.60	≤13	PASS
EGPRS 850 (8PSK)	128	824.2	30.36	24.17	6.19	≤13	PASS
	190	836.6	31.06	25.00	6.06	≤13	PASS
	251	848.8	31.22	25.15	6.07	≤13	PASS
WCDMA Band V (RMC)	4132	826.4	26.59	23.64	2.95	≤13	PASS
	4183	836.6	26.71	23.62	3.09	≤13	PASS
	4233	846.6	26.72	23.71	3.01	≤13	PASS

LTE Band 5								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	20407	824.7	2.38	22.42	4.77	≤13	PASS
		20525	836.5	2.37	22.45	5.27	≤13	PASS
		20643	848.3	2.37	22.50	4.94	≤13	PASS
	3	20415	825.5	5.63	22.39	4.88	≤13	PASS
		20525	836.5	5.61	22.45	5.36	≤13	PASS
		20635	847.5	5.61	22.50	5.06	≤13	PASS
	5	20425	826.5	9.44	22.46	5.00	≤13	PASS
		20525	836.5	9.44	22.48	5.43	≤13	PASS
		20625	846.5	9.38	22.56	5.12	≤13	PASS
	10	20450	829	18.66	22.54	5.24	≤13	PASS
		20525	836.5	18.66	22.52	5.36	≤13	PASS
		20600	844	18.68	22.57	5.20	≤13	PASS
16QAM	1.4	20407	824.7	2.37	21.37	5.63	≤13	PASS
		20525	836.5	2.37	21.47	6.08	≤13	PASS
		20643	848.3	2.38	21.52	5.76	≤13	PASS
	3	20415	825.5	5.61	21.36	5.76	≤13	PASS
		20525	836.5	5.57	21.52	6.18	≤13	PASS



	5	20635	847.5	5.65	21.53	5.90	≤13	PASS	
		20425	826.5	9.37	21.49	5.80	≤13	PASS	
		20525	836.5	9.46	21.51	6.13	≤13	PASS	
	10	20625	846.5	9.39	21.56	5.90	≤13	PASS	
		20450	829	18.66	21.49	6.03	≤13	PASS	
		20525	836.5	18.61	21.50	6.16	≤13	PASS	
	64QAM	1.4	20600	844	18.76	21.55	6.00	≤13	PASS
			20407	824.7	26.86	21.25	5.61	≤13	PASS
			20525	836.5	27.39	21.36	6.03	≤13	PASS
3		20643	848.3	27.41	21.50	5.91	≤13	PASS	
		20415	825.5	27.04	21.24	5.80	≤13	PASS	
		20525	836.5	27.53	21.33	6.20	≤13	PASS	
5		20635	847.5	27.25	21.38	5.87	≤13	PASS	
		20425	826.5	27.13	21.32	5.81	≤13	PASS	
		20525	836.5	27.58	21.38	6.20	≤13	PASS	
10		20625	846.5	27.40	21.47	5.93	≤13	PASS	
		20450	829	27.48	21.38	6.10	≤13	PASS	
		20525	836.5	27.57	21.36	6.21	≤13	PASS	
			20600	844	27.41	21.39	6.02	≤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 +50°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 +50°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

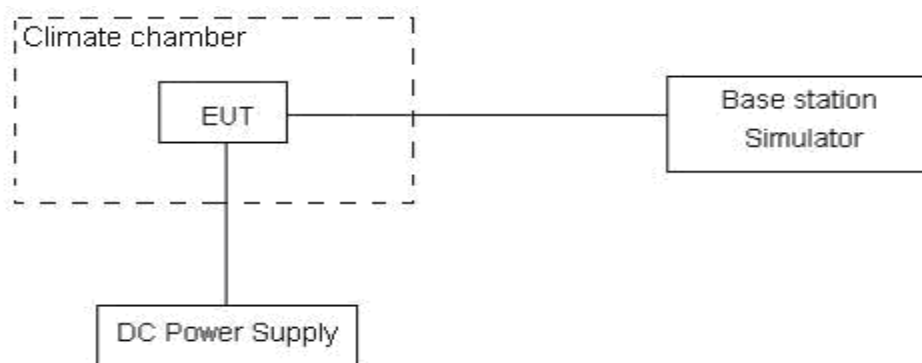
#### Frequency Stability (Voltage Variation)

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 4.43V, with a nominal voltage of 3.85V.

### 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  $k = 3$ ,  $U = 0.01\text{ppm}$ .

**Test Result**

	Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
	Temperature	Voltage	GMSK	8PSK	GMSK	8PSK	
GSM850	Normal (25°C)	Normal	9.10	9.75	0.01088	0.01165	PASS
	Extreme (50°C)		11.34	14.97	0.01356	0.01790	PASS
	Extreme (40°C)		1.04	7.51	0.00125	0.00898	PASS
	Extreme (30°C)		7.89	15.32	0.00943	0.01832	PASS
	Extreme (20°C)		6.04	11.79	0.00722	0.01409	PASS
	Extreme (10°C)		5.71	4.23	0.00683	0.00506	PASS
	Extreme (0°C)		3.15	5.08	0.00376	0.00607	PASS
	Extreme (-10°C)		10.67	5.81	0.01276	0.00694	PASS
	Extreme (-20°C)		1.59	3.55	0.00190	0.00424	PASS
	Extreme (-30°C)		9.33	9.71	0.01115	0.01161	PASS
	25°C	LV	2.11	12.95	0.00252	0.01547	PASS
		HV	4.47	15.38	0.00534	0.01838	PASS

	Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
	Temperature	Voltage	BPSK	QPSK	BPSK	QPSK	
WCDMA B5	Normal (25°C)	Normal	3.90	3.55	0.00466	0.00424	PASS
	Extreme (50°C)		10.87	10.03	0.01299	0.01199	PASS
	Extreme (40°C)		5.06	14.91	0.00604	0.01782	PASS
	Extreme (30°C)		7.93	15.23	0.00948	0.01821	PASS
	Extreme (20°C)		4.40	13.63	0.00526	0.01629	PASS
	Extreme (10°C)		7.91	13.41	0.00946	0.01603	PASS
	Extreme (0°C)		13.82	17.56	0.01651	0.02099	PASS
	Extreme (-10°C)		13.65	5.15	0.01631	0.00616	PASS
	Extreme (-20°C)		13.10	4.89	0.01566	0.00585	PASS
	Extreme (-30°C)		17.02	9.93	0.02034	0.01186	PASS
	25°C	LV	3.32	15.07	0.00397	0.01802	PASS
		HV	15.94	6.13	0.01905	0.00733	PASS



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°C)	Normal	12.90	15.47	3.93	0.01543	0.01850	0.00470	PASS
Extreme (50°C)		8.74	16.60	17.48	0.01045	0.01984	0.02090	PASS
Extreme (40°C)		12.55	12.54	8.49	0.01500	0.01499	0.01015	PASS
Extreme (30°C)		15.19	5.76	11.10	0.01816	0.00689	0.01327	PASS
Extreme (20°C)		5.34	12.00	11.81	0.00638	0.01435	0.01411	PASS
Extreme (10°C)		11.52	2.14	10.25	0.01378	0.00256	0.01225	PASS
Extreme (0°C)		1.18	6.34	6.59	0.00141	0.00757	0.00788	PASS
Extreme (-10°C)		17.27	6.13	1.22	0.02064	0.00733	0.00146	PASS
Extreme (-20°C)		2.97	10.04	5.82	0.00355	0.01200	0.00695	PASS
Extreme (-30°C)		14.19	10.39	12.04	0.01696	0.01242	0.01440	PASS
25°C	LV	9.31	3.09	10.62	0.01113	0.00370	0.01270	PASS
	HV	12.87	4.98	10.72	0.01538	0.00596	0.01282	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°C)	Normal	7.51	17.09	15.10	0.00897	0.02043	0.01805	PASS
Extreme (50°C)		5.57	8.92	4.43	0.00666	0.01066	0.00529	PASS
Extreme (40°C)		7.86	2.59	6.24	0.00939	0.00310	0.00746	PASS
Extreme (30°C)		15.67	8.32	3.24	0.01874	0.00995	0.00387	PASS
Extreme (20°C)		14.47	12.96	13.13	0.01730	0.01549	0.01569	PASS
Extreme (10°C)		14.63	9.13	1.50	0.01749	0.01091	0.00179	PASS
Extreme (0°C)		17.91	6.07	1.59	0.02141	0.00726	0.00190	PASS
Extreme (-10°C)		5.13	7.03	2.67	0.00613	0.00840	0.00319	PASS
Extreme (-20°C)		9.78	4.79	16.58	0.01169	0.00572	0.01982	PASS
Extreme (-30°C)		13.13	12.21	12.45	0.01569	0.01459	0.01488	PASS
25°C	LV	15.88	9.63	13.82	0.01899	0.01151	0.01652	PASS
	HV	15.41	15.19	9.18	0.01843	0.01815	0.01098	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°C)	Normal	8.64	16.72	6.26	0.01032	0.01999	0.00749	PASS
Extreme (50°C)		14.82	16.03	14.54	0.01771	0.01917	0.01738	PASS



Extreme (40°C)		8.29	14.21	7.84	0.00991	0.01699	0.00937	PASS
Extreme (30°C)		6.04	1.87	5.56	0.00721	0.00223	0.00665	PASS
Extreme (20°C)		10.10	1.25	12.92	0.01207	0.00150	0.01545	PASS
Extreme (10°C)		10.03	16.54	3.67	0.01199	0.01977	0.00439	PASS
Extreme (0°C)		3.68	10.01	10.04	0.00440	0.01196	0.01200	PASS
Extreme (-10°C)		17.99	7.69	4.56	0.02151	0.00920	0.00545	PASS
Extreme (-20°C)		7.34	7.51	2.58	0.00877	0.00898	0.00309	PASS
Extreme (-30°C)		6.43	6.29	12.09	0.00769	0.00752	0.01445	PASS
25°C	LV	5.11	3.66	12.24	0.00611	0.00438	0.01463	PASS
	HV	3.35	7.98	3.71	0.00401	0.00954	0.00444	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°C)	Normal	10.48	11.30	7.20	0.01253	0.01351	0.00860	PASS
Extreme (50°C)		17.19	5.54	15.49	0.02055	0.00662	0.01852	PASS
Extreme (40°C)		17.53	12.34	12.74	0.02096	0.01476	0.01522	PASS
Extreme (30°C)		5.50	5.60	16.43	0.00658	0.00669	0.01964	PASS
Extreme (20°C)		14.00	16.75	12.42	0.01674	0.02002	0.01484	PASS
Extreme (10°C)		13.20	13.16	12.07	0.01578	0.01574	0.01443	PASS
Extreme (0°C)		16.05	3.36	5.55	0.01919	0.00401	0.00663	PASS
Extreme (-10°C)		13.88	1.01	10.49	0.01659	0.00120	0.01255	PASS
Extreme (-20°C)		12.85	4.66	13.23	0.01536	0.00557	0.01582	PASS
Extreme (-30°C)		11.57	3.47	3.62	0.01384	0.00415	0.00433	PASS
25°C	LV	4.07	10.65	5.75	0.00487	0.01274	0.00687	PASS
	HV	15.94	9.04	8.80	0.01906	0.01081	0.01052	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),

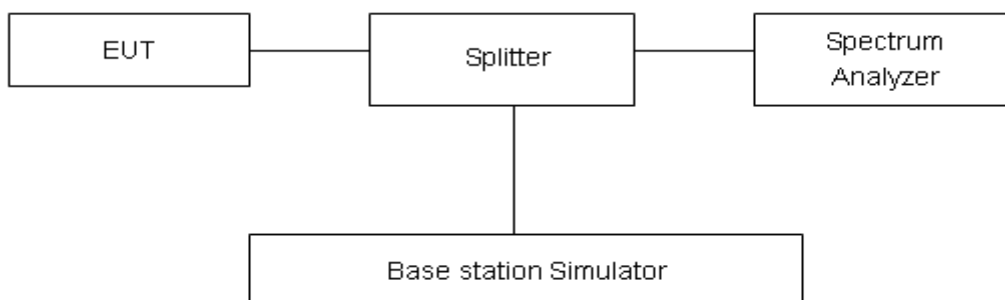
RBW is set to 10 kHz (0.15 MHz~ 30 MHz)

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

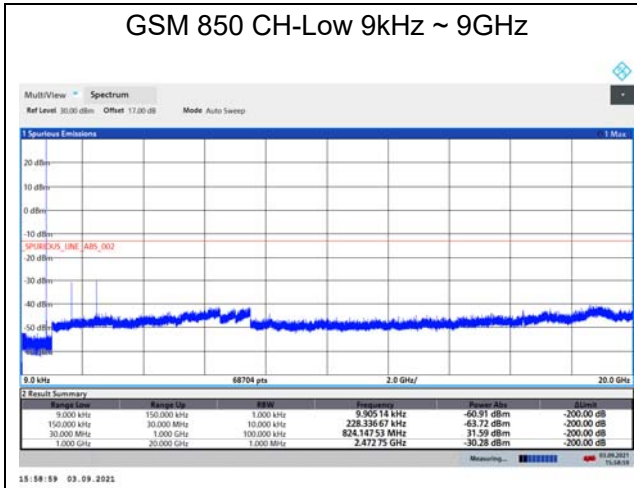


### Test Result

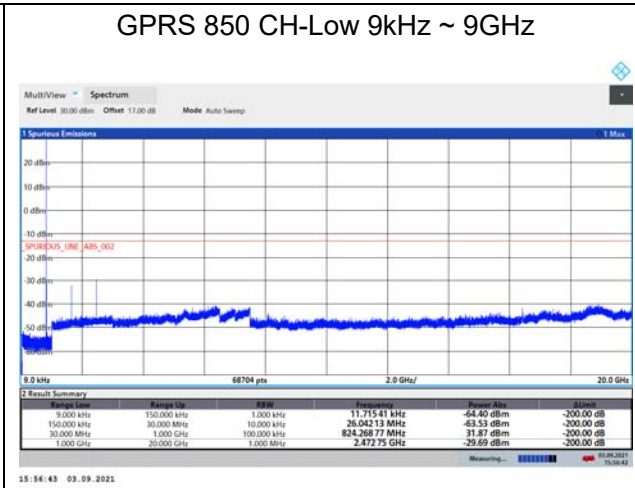
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

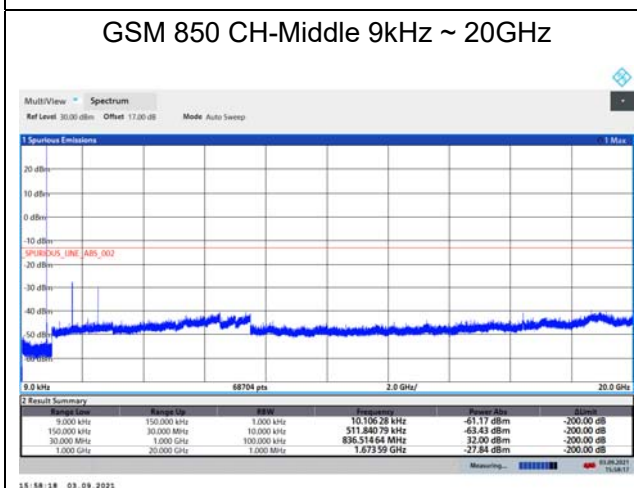
#### GSM 850 CH-Low 9kHz ~ 9GHz



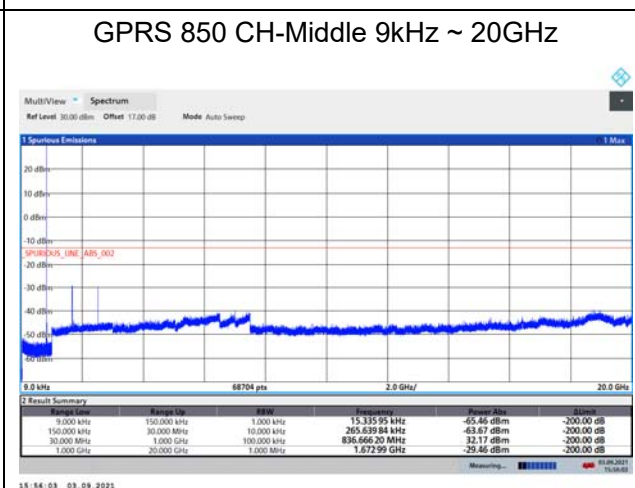
#### GPRS 850 CH-Low 9kHz ~ 9GHz



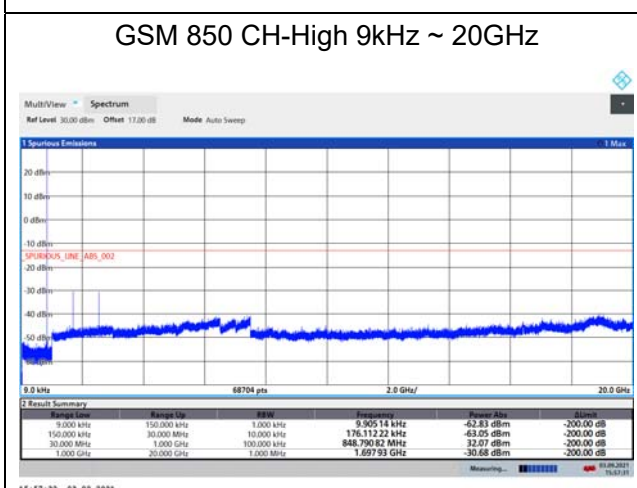
#### GSM 850 CH-Middle 9kHz ~ 20GHz



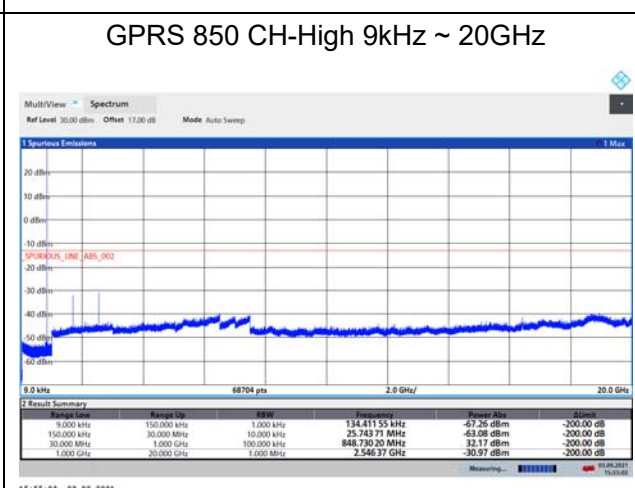
#### GPRS 850 CH-Middle 9kHz ~ 20GHz



#### GSM 850 CH-High 9kHz ~ 20GHz



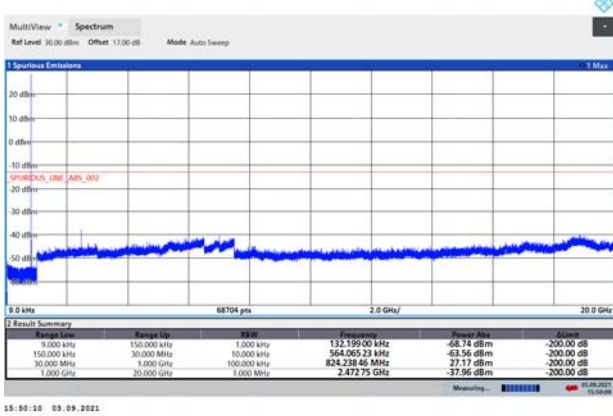
#### GPRS 850 CH-High 9kHz ~ 20GHz



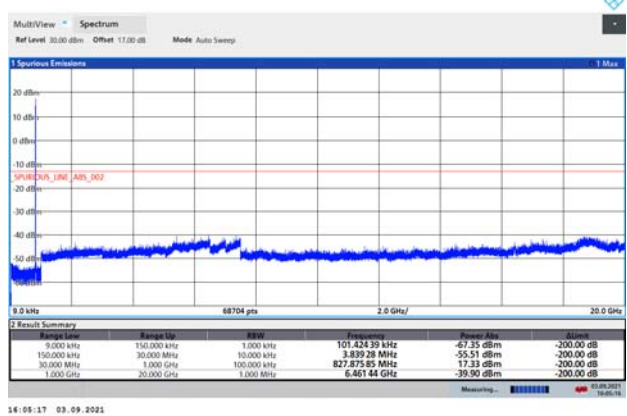




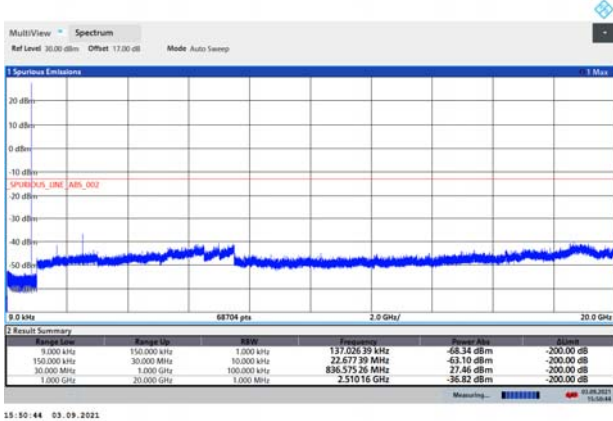
### EGPRS 850 CH-Low 9kHz ~ 20GHz



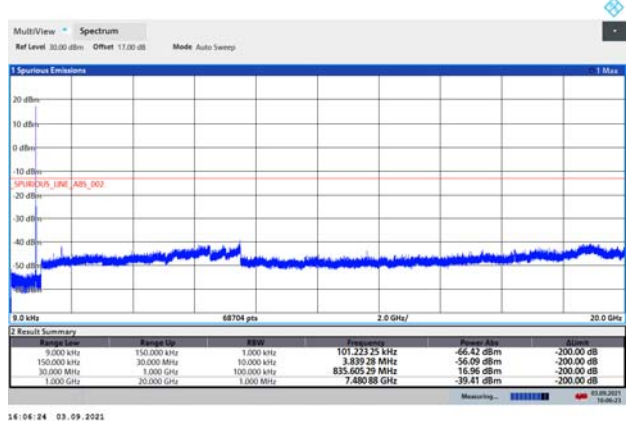
### WCDMA BAND V CH-Low 9kHz ~ 20GHz



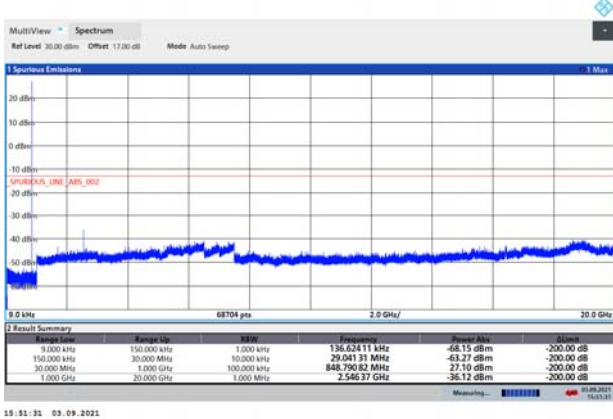
### EGPRS 850 CH-Middle 9kHz ~ 20GHz



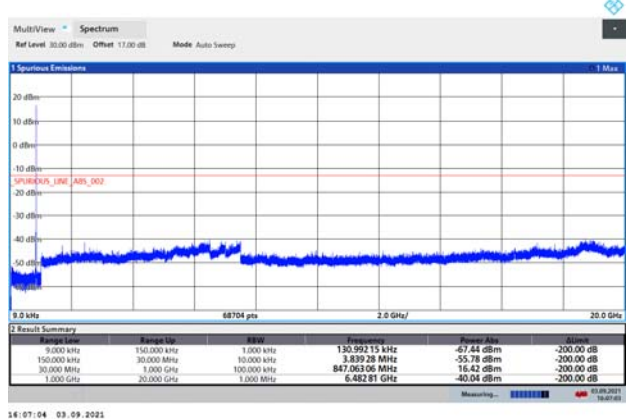
### WCDMA BAND V CH-Middle 9kHz ~ 20GHz



### EGPRS 850 CH-High 9kHz ~ 20GHz

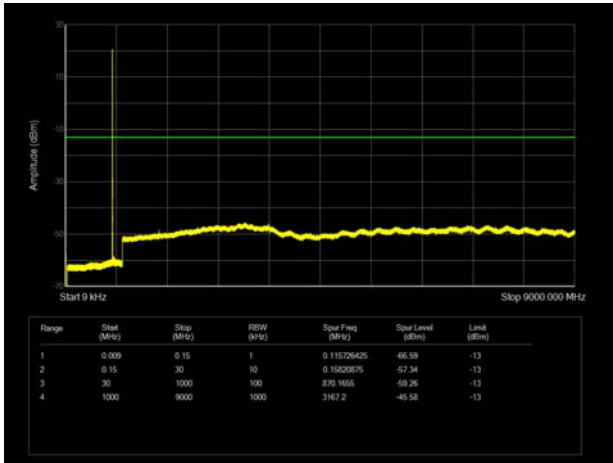


### WCDMA BAND V CH-High 9kHz ~ 20GHz

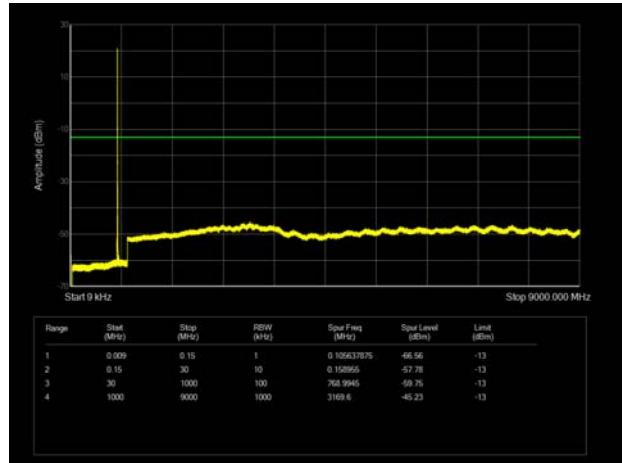




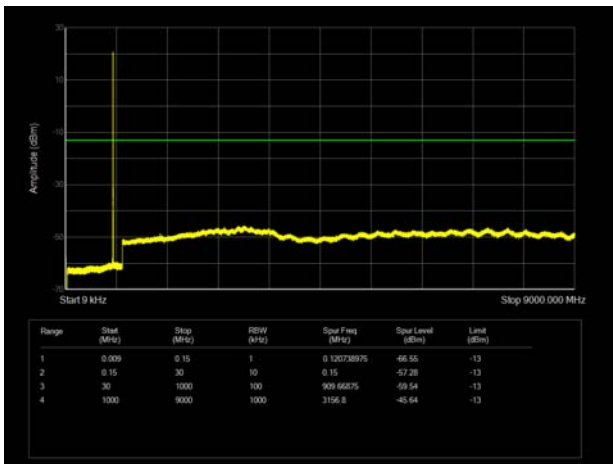
LTE Band 5 1.4MHz CH-Low 9kHz~9GHz



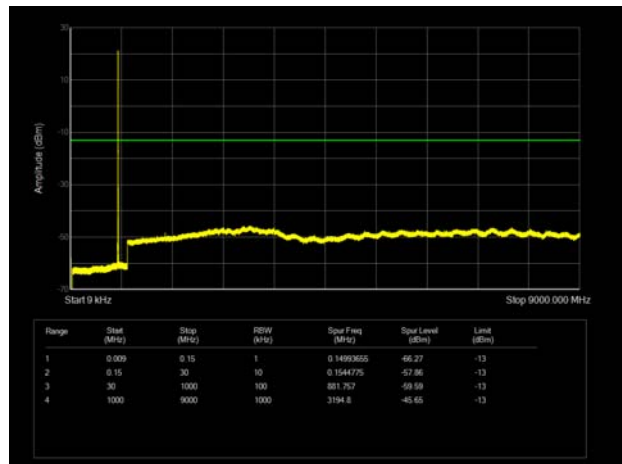
LTE Band 5 3MHz CH-Low 9kHz~9GHz



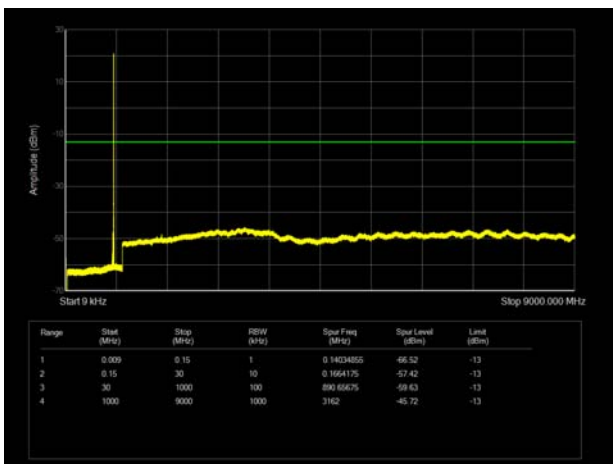
LTE Band 5 1.4MHz CH-Middle 9kHz~9GHz



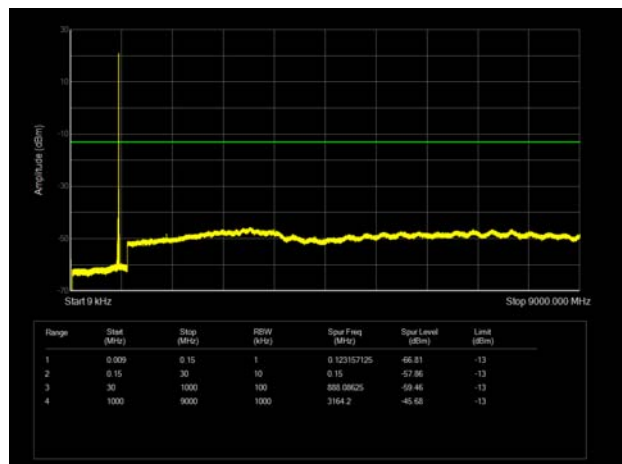
LTE Band 5 3MHz CH-Middle 9kHz~9GHz



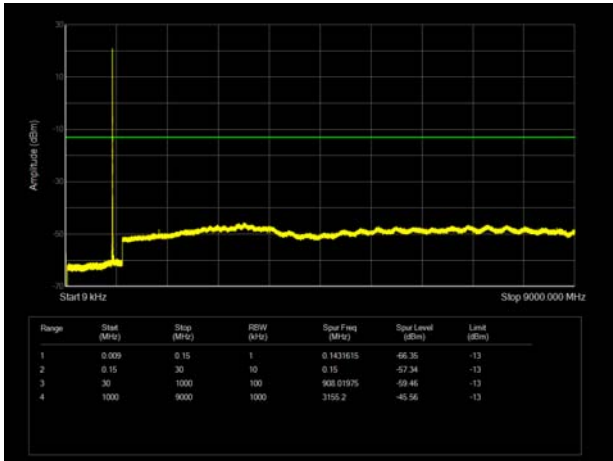
LTE Band 5 1.4MHz CH-High 9kHz~9GHz



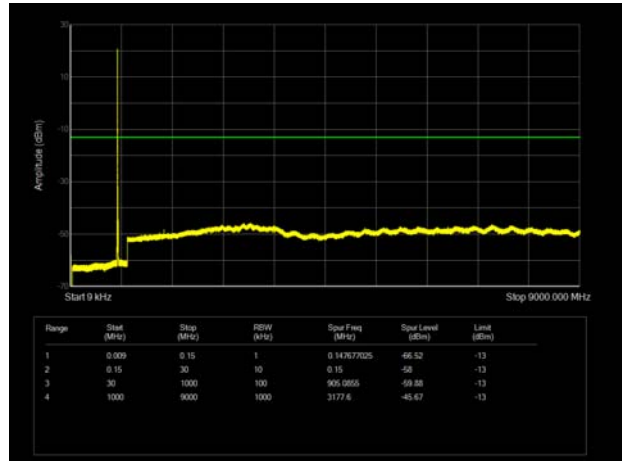
LTE Band 5 3MHz CH-High 9kHz~9GHz



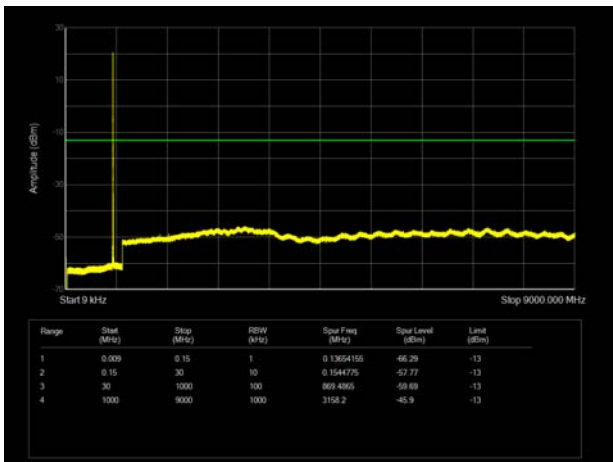
LTE Band 5 5MHz CH-Low 9kHz~9GHz



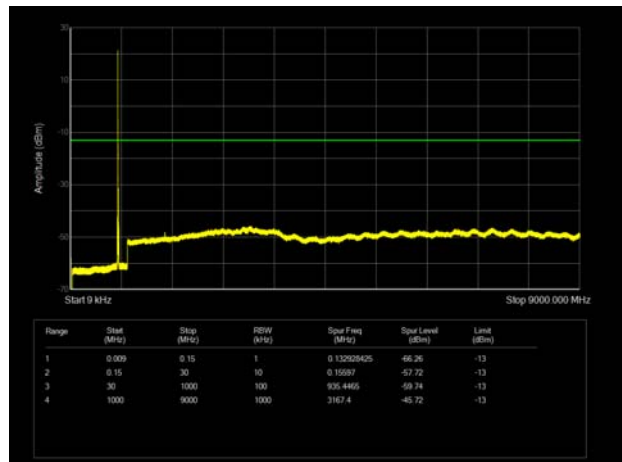
LTE Band 5 10MHz CH-Low 9kHz~9GHz



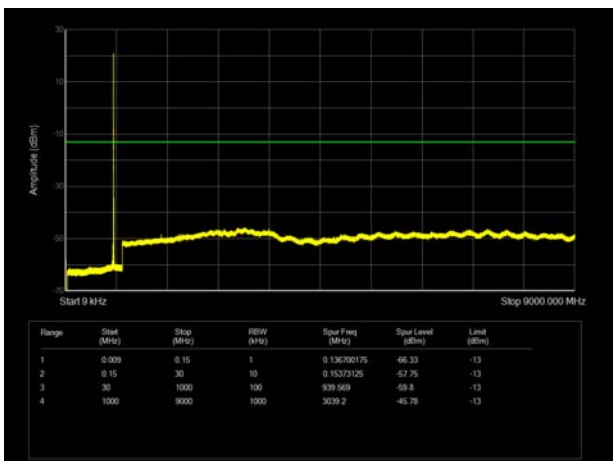
LTE Band 5 5MHz CH-Middle 9kHz~9GHz



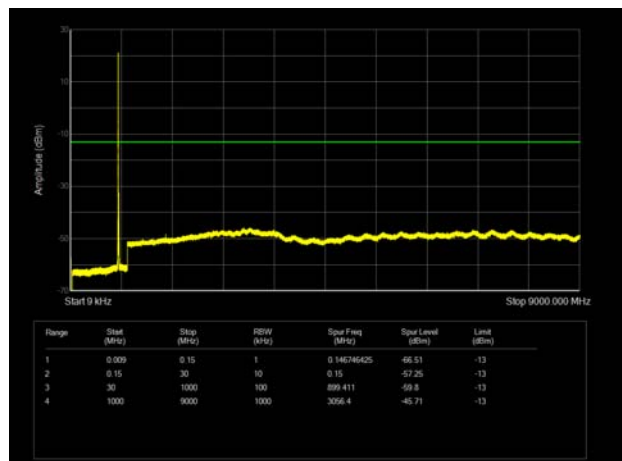
LTE Band 5 10MHz CH-Middle 9kHz~9GHz



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



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



## 5.7. Radiates Spurious Emission

### Ambient condition

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

### Method of Measurement

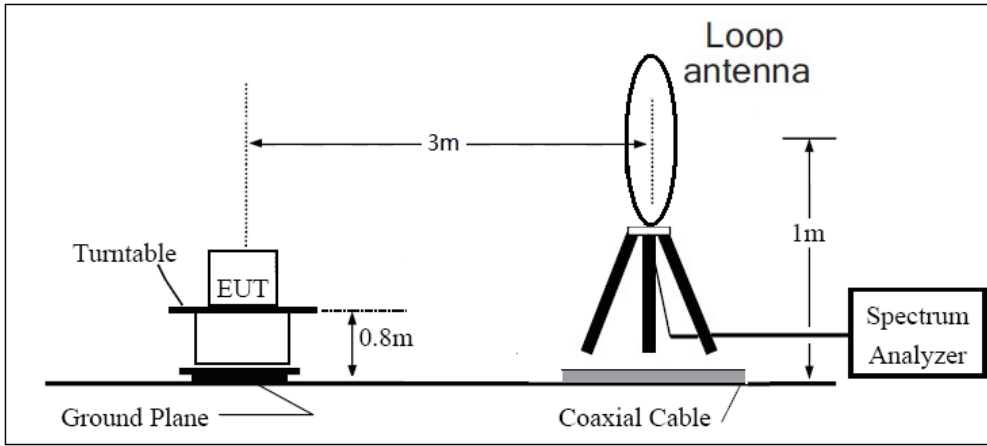
1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable 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=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 dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP

= EIRP-2.15dB.

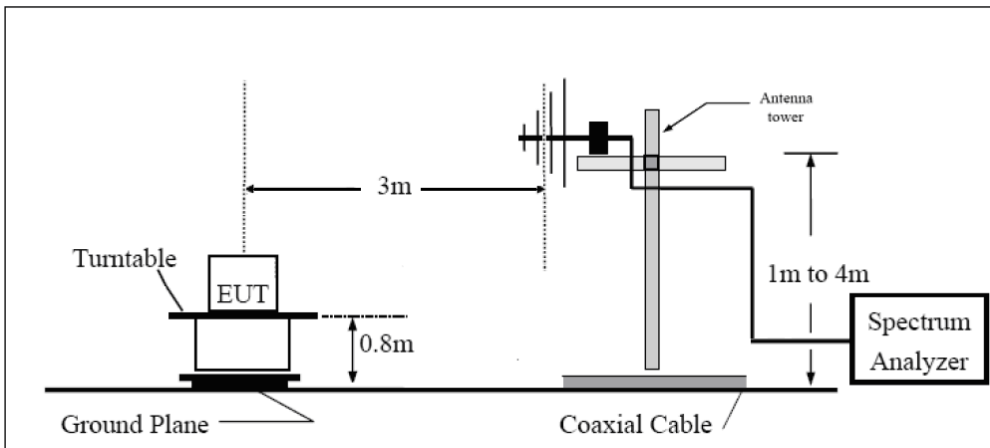
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

**Test setup**

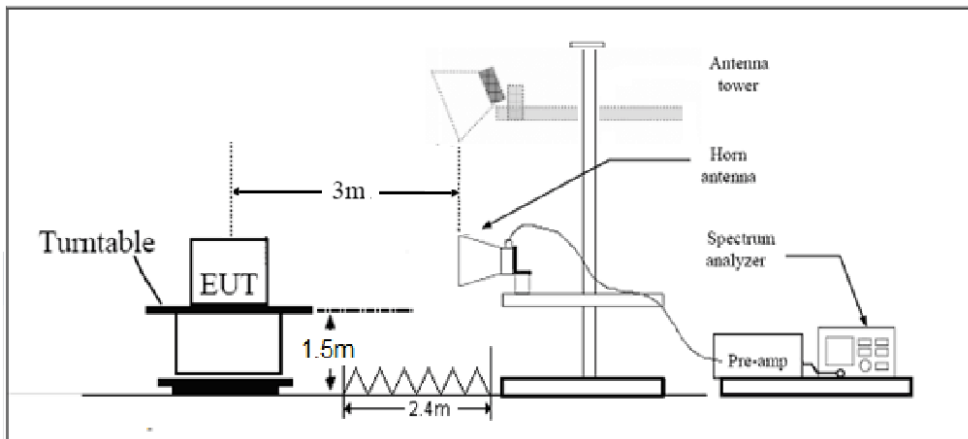
**9KHz ~ 30MHz**



**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.

## GSM 850 CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1673.10	-47.40	1.70	8.70	Horizontal	-42.55	-13.00	29.55	45
3	2509.65	-52.30	2.30	12.00	Horizontal	-44.75	-13.00	31.75	90
4	3346.40	-46.49	2.70	12.70	Horizontal	-38.64	-13.00	25.64	45
5	4183.00	-50.11	3.00	12.50	Horizontal	-42.76	-13.00	29.76	135
6	5019.60	-52.49	3.40	12.50	Horizontal	-45.54	-13.00	32.54	135
7	5856.20	-57.01	3.40	12.80	Horizontal	-49.76	-13.00	36.76	45
8	6692.80	-51.36	4.10	11.50	Horizontal	-46.11	-13.00	33.11	0
9	7529.40	-54.60	4.20	12.20	Horizontal	-48.75	-13.00	35.75	135
10	8366.00	-54.07	4.30	12.50	Horizontal	-48.02	-13.00	35.02	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.

## WCDMA Band V CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1673.20	-64.16	1.70	8.70	Horizontal	-59.31	-13.00	46.31	90
3	2509.80	-64.81	2.30	12.00	Horizontal	-57.26	-13.00	44.26	225
4	3346.40	-66.11	2.70	12.70	Horizontal	-58.26	-13.00	45.26	45
5	4183.00	-63.72	3.00	12.50	Horizontal	-56.37	-13.00	43.37	270
6	5019.60	-61.30	3.40	12.50	Horizontal	-54.35	-13.00	41.35	315
7	5856.20	-61.87	3.40	12.80	Horizontal	-54.62	-13.00	41.62	90
8	6692.80	-57.50	4.10	11.50	Horizontal	-52.25	-13.00	39.25	45
9	7529.40	-55.11	4.20	12.20	Horizontal	-49.26	-13.00	36.26	225
10	8366.00	-55.34	4.30	12.50	Horizontal	-49.29	-13.00	36.29	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	1671.90	-61.50	1.70	8.70	Vertical	-56.65	-13.00	43.65	225
3	2507.90	-62.49	2.30	12.00	Vertical	-54.94	-13.00	41.94	90
4	3346.00	-66.00	2.70	12.70	Vertical	-58.15	-13.00	45.15	180
5	4182.50	-62.60	3.00	12.50	Vertical	-55.25	-13.00	42.25	45
6	5019.00	-61.18	3.40	12.50	Vertical	-54.23	-13.00	41.23	315
7	5855.50	-61.32	3.40	12.80	Vertical	-54.07	-13.00	41.07	90
8	6692.00	-56.32	4.10	11.50	Vertical	-51.07	-13.00	38.07	45
9	7528.50	-55.37	4.20	12.20	Vertical	-49.52	-13.00	36.52	225
10	8365.00	-54.61	4.30	12.50	Vertical	-48.56	-13.00	35.56	90

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

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

## LTE Band 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	1668.60	-60.80	1.70	8.70	Vertical	-55.95	-13.00	42.95	45
3	2503.30	-63.36	2.30	12.00	Vertical	-55.81	-13.00	42.81	225
4	3466.20	-64.96	2.70	12.70	Vertical	-57.11	-13.00	44.11	135
5	4215.90	-62.61	3.00	12.50	Vertical	-55.26	-13.00	42.26	0
6	5165.60	-60.21	3.40	12.50	Vertical	-53.26	-13.00	40.26	315
7	5815.30	-62.00	3.40	12.80	Vertical	-54.75	-13.00	41.75	90
8	6765.00	-57.87	4.10	11.50	Vertical	-52.62	-13.00	39.62	270
9	7614.70	-54.11	4.20	12.20	Vertical	-48.26	-13.00	35.26	45
10	8464.40	-55.28	4.30	12.50	Vertical	-49.23	-13.00	36.23	270

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

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





## LTE Band 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	1664.40	-60.94	1.70	8.70	Vertical	-56.09	-13.00	43.09	315
3	2496.60	-62.15	2.30	12.00	Vertical	-54.60	-13.00	41.60	180
4	3346.00	-66.21	2.70	12.70	Vertical	-58.36	-13.00	45.36	45
5	4182.50	-62.99	3.00	12.50	Vertical	-55.64	-13.00	42.64	180
6	5019.00	-60.97	3.40	12.50	Vertical	-54.02	-13.00	41.02	135
7	5855.50	-60.50	3.40	12.80	Vertical	-53.25	-13.00	40.25	315
8	6692.00	-57.42	4.10	11.50	Vertical	-52.17	-13.00	39.17	90
9	7528.50	-55.40	4.20	12.20	Vertical	-49.55	-13.00	36.55	45
10	8365.00	-54.79	4.30	12.50	Vertical	-48.74	-13.00	35.74	270

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

## 6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMW500	113645	2021-05-15	2022-05-14
Climate Chamber	Weiss	VT4002	58226119450010	2021-05-15	2022-05-14
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2021-05-15	2022-05-14
Universal Radio Communication Tester	Key sight	E5515C	MY48367192	2021-05-15	2022-05-14
Signal Analyzer	R&S	FSV3030	101411	2020-12-13	2021-12-12
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2020-04-02	2023-04-01
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	391	2019-12-16	2021-12-15
Horn Antenna	R&S	HF907	102723	2020-08-11	2023-08-10
Horn Antenna	ETS-Lindgren	3160-09	00102643	2021-10-10	2024-10-09
Signal generator	R&S	SMB 100A	180235	2021-05-15	2022-05-14
Climatic Chamber	ESPEC	SU-242	93000506	2020-12-13	2021-12-12
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2021-05-15	2022-05-14
RF Cable	Agilent	SMA 15cm	0001	2021-06-09	2021-12-08
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.