

RF TEST REPORT

Applicant	MeiG Smart Technology Co., Ltd
FCC ID	2APJ4-SLM336Q
Product	LTE Cat1 Module
Brand	MEIGLink
Model	SLM336Q
Report No.	R2407A0777-R1V2
Issue Date	August 26, 2024

Eurofins TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2023)/ FCC CFR 47 Part 22H (2023)**. 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
2.1. Applicant and Manufacturer Information	6
2.2. General Information	6
3. Applied Standards	7
4. Test Configuration	8
5. Test Case	9
5.1. RF Power Output and Effective Radiated Power	9
5.2. Occupied Bandwidth	10
5.3. Band Edge Compliance	11
5.4. Peak-to-Average Power Ratio (PAPR)	12
5.5. Frequency Stability	13
5.6. Spurious Emissions at Antenna Terminals	15
5.7. Radiated Spurious Emission	16
6. Test Result	19
6.1. RF Power Output and Effective Radiated Power	19
6.2. Occupied Bandwidth	23
6.3. Band Edge Compliance	28
6.4. Peak-to-Average Power Ratio (PAPR)	33
6.5. Frequency Stability	34
6.6. Spurious Emissions at Antenna Terminals	36
6.7. Radiated Spurious Emission	38
7. Main Test Instruments	40
ANNEX A: The EUT Appearance	41
ANNEX B: Test Setup Photos	42

Version	Revision Description	Issue Date
Rev.0	Initial issue of report.	August 7, 2024
Rev.1	Update data.	August 21, 2024
Rev.2	Update description.	August 26, 2024
Note: This revised report (Report No.: R2407A0777-R1V2) supersedes and replaces the previously issued report (Report No.: R2407A0777-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	Radiated Spurious Emission	2.1053 / 22.917 (a)	PASS
Date of Testing: July 8, 2024 ~ July 23, 2024 Date of Sample Received: July 4, 2024			
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 Eurofins 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 **Eurofins 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)

Eurofins 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)

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

1.3. Testing Location

Company: Eurofins TA Technology (Shanghai) Co., Ltd.
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City: Shanghai
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2. General Description of Equipment Under Test

2.1. Applicant and Manufacturer Information

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

2.2. General Information

EUT Description			
Model	SLM336Q		
SN	Conducted	M336QA1AHE013000171	
	Radiated	M336QA1AHE013000107	
Hardware Version	SLM336QA1A_MB_V1.01		
Software Version	V08		
Power Supply	External power supply		
Antenna Type	External Antenna		
Antenna Gain	3.52 dBi		
Test Mode(s)	LTE Band 5		
Test Modulation	(LTE) QPSK, 16QAM;		
Channel Bandwidth	Band	QPSK	16QAM
	LTE Band 5	1.4/3/5/10MHz	1.4/3/5MHz
LTE Category	1		
Maximum E.R.P.	LTE Band 5	24.44 dBm	
Rated Power Supply Voltage	3.8V		
Operating Voltage	Minimum: 3.5V Maximum: 4.2V		
Operating Temperature	Lowest: -35°C Highest: +75°C		
Testing Temperature	Lowest: -30°C Highest: +50°C		
Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	LTE Band 5	824 ~ 849	869 ~ 894
Auxiliary Test Equipment			
Mother board	Manufacturer: MeiG Smart Technology Co., Ltd Model: /		
Note: 1. The EUT is sent from the applicant to Eurofins TA and the information of the EUT is declared by the applicant.			

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 (2023)

FCC CFR47 Part 2 (2023)

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 (vertical), lie-down position (horizontal). The worst emission was found in stand-up position (vertical)

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

Subsequently, only the worst case emissions are reported.

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

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

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

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

5.1. RF Power Output and Effective Radiated Power

Ambient Condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Methods of Measurement

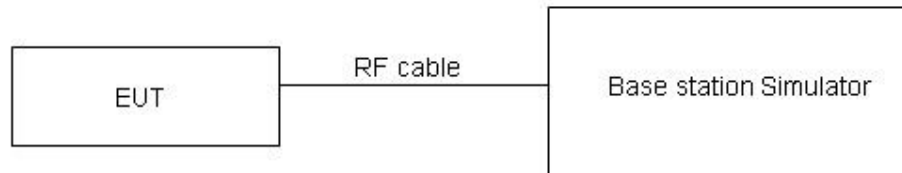
During the process of the testing, The EUT was connected to the Base Station Simulator with a known loss. The EUT is controlled by the Base Station Simulator test set to ensure max power transmission with proper modulation.

ERP can then be calculated as follows:

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

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

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

Refer to the section 6.1 of this report for test data.

5.2. Occupied Bandwidth

Ambient Condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

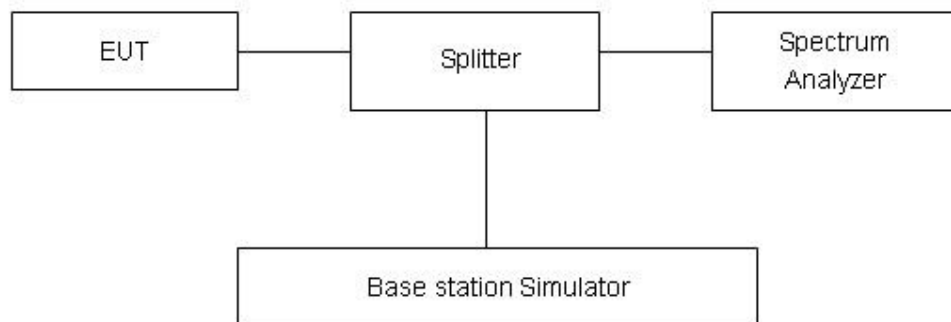
Method of Measurement

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 Results

Refer to the section 6.2 of this report for test data.

5.3. Band Edge Compliance

Ambient Condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

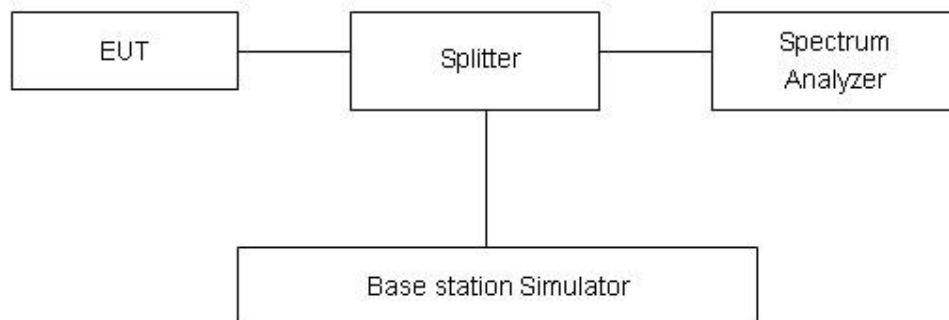
Method of Measurement

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

Test Results

Refer to the section 6.3 of this report for test data.

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

Ambient Condition

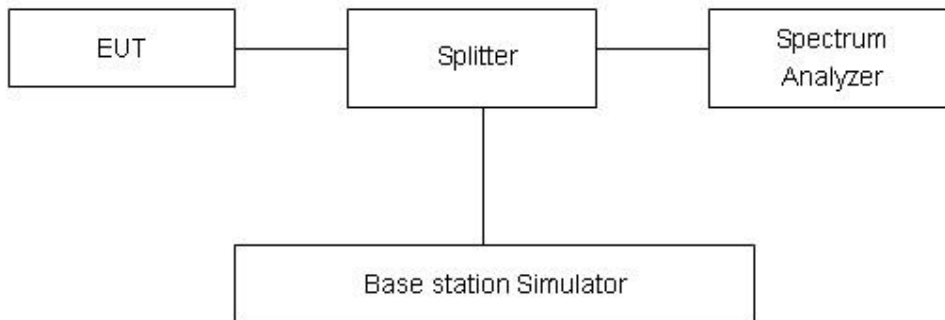
Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

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

Refer to the section 6.4 of this report for test data.

5.5. Frequency Stability

Ambient Condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

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

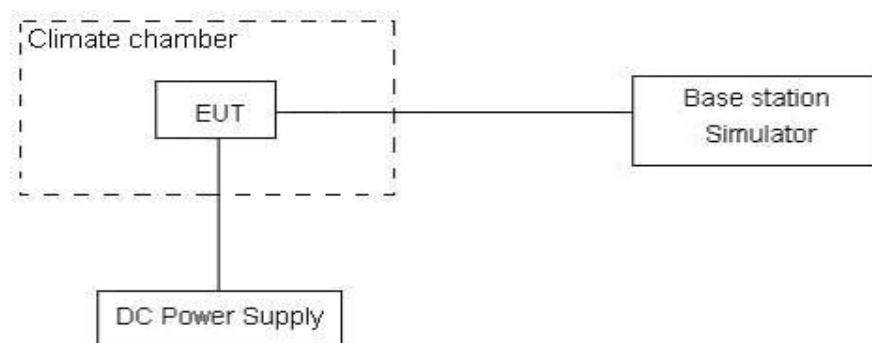
(Voltage Variation)

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 4.2 V, with a nominal voltage of 3.8V.

Test Setup



Limits

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

Limits	≤ 2.5 ppm
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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 Results

Refer to the section 6.5 of this report for test data.

5.6. Spurious Emissions at Antenna Terminals

Ambient Condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 9kHz to the 10th harmonic of the carrier.

The peak detector is used.

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

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

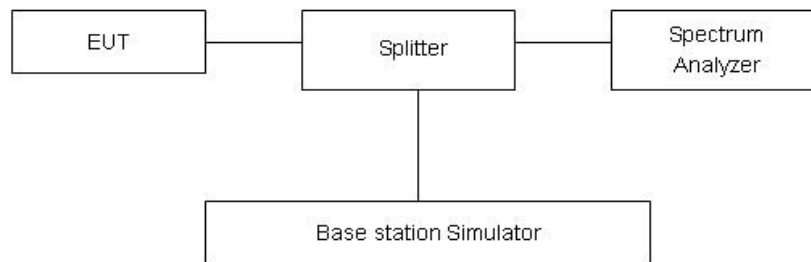
RBW is set to 100 kHz (30MHz~1000 MHz)

RBW is set to 1000 kHz (above 1000MHz)

Sweep is set to AUTO.

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 Results

Refer to the section 6.6 of this report for test data.

5.7. Radiated Spurious Emission

Ambient Condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

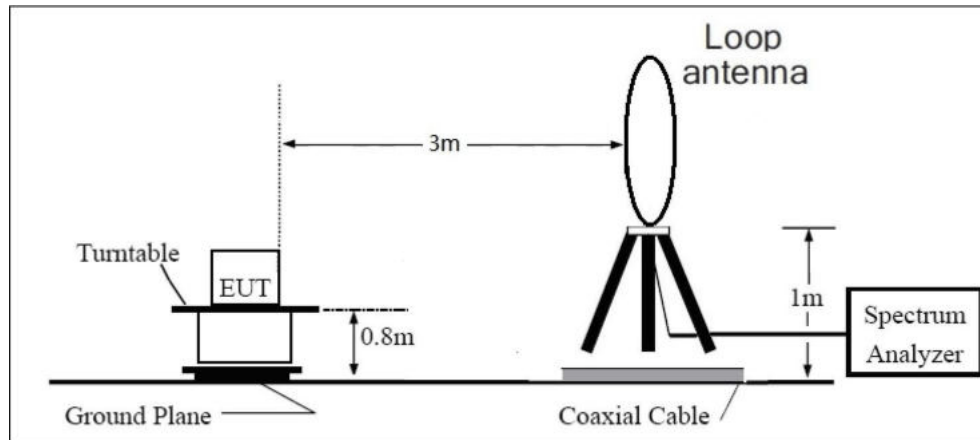
Method of Measurement

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, 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.

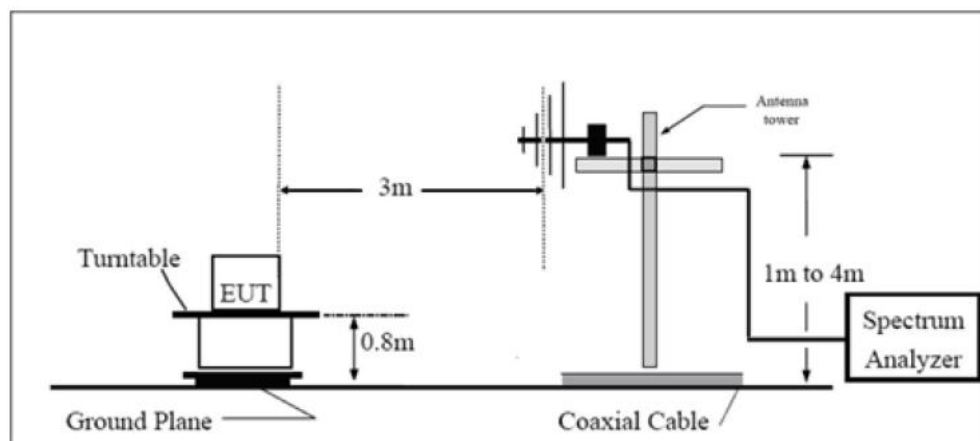
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test Setup

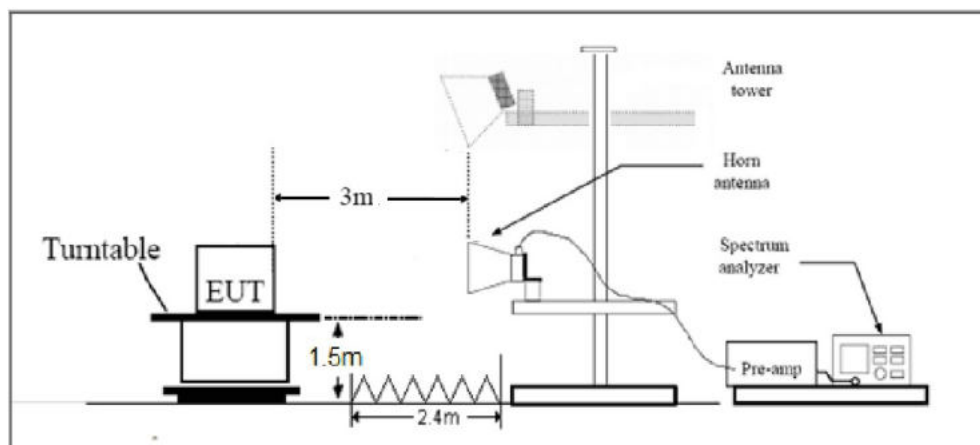
9KHz~ 30MHz



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 Results

Refer to the section 6.7 of this report for test data.

6. Test Result

6.1. RF Power Output and Effective Radiated Power

LTE Band 5						
Bandwidth (MHz)	UL Channel	RB Size	RB Position	Modulation	Power (dBm)	ERP (dBm)
1.4	20407	1	#0	QPSK	22.98	24.35
1.4	20407	1	#Mid	QPSK	23.02	24.39
1.4	20407	1	#Max	QPSK	22.93	24.30
1.4	20407	3	#0	QPSK	22.96	24.33
1.4	20407	3	#Mid	QPSK	23.07	24.44
1.4	20407	3	#Max	QPSK	23.01	24.38
1.4	20407	6	#0	QPSK	22.13	23.50
1.4	20525	1	#0	QPSK	22.57	23.94
1.4	20525	1	#Mid	QPSK	22.57	23.94
1.4	20525	1	#Max	QPSK	22.51	23.88
1.4	20525	3	#0	QPSK	22.61	23.98
1.4	20525	3	#Mid	QPSK	22.61	23.98
1.4	20525	3	#Max	QPSK	22.60	23.97
1.4	20525	6	#0	QPSK	21.79	23.16
1.4	20643	1	#0	QPSK	22.25	23.62
1.4	20643	1	#Mid	QPSK	22.28	23.65
1.4	20643	1	#Max	QPSK	22.22	23.59
1.4	20643	3	#0	QPSK	22.19	23.56
1.4	20643	3	#Mid	QPSK	22.18	23.55
1.4	20643	3	#Max	QPSK	22.19	23.56
1.4	20643	6	#0	QPSK	21.31	22.68
3	20415	1	#0	QPSK	22.67	24.04
3	20415	1	#Mid	QPSK	22.67	24.04
3	20415	1	#Max	QPSK	22.42	23.79
3	20415	8	#0	QPSK	21.85	23.22
3	20415	8	#Mid	QPSK	21.85	23.22
3	20415	8	#Max	QPSK	21.70	23.07
3	20415	15	#0	QPSK	21.76	23.13
3	20525	1	#0	QPSK	22.56	23.93
3	20525	1	#Mid	QPSK	22.65	24.02
3	20525	1	#Max	QPSK	22.36	23.73
3	20525	8	#0	QPSK	21.83	23.20
3	20525	8	#Mid	QPSK	21.85	23.22
3	20525	8	#Max	QPSK	21.77	23.14
3	20525	15	#0	QPSK	21.81	23.18

3	20635	1	#0	QPSK	22.05	23.42
3	20635	1	#Mid	QPSK	22.42	23.79
3	20635	1	#Max	QPSK	22.22	23.59
3	20635	8	#0	QPSK	21.31	22.68
3	20635	8	#Mid	QPSK	21.33	22.70
3	20635	8	#Max	QPSK	21.36	22.73
3	20635	15	#0	QPSK	21.34	22.71
5	20425	1	#0	QPSK	23.06	24.43
5	20425	1	#Mid	QPSK	22.84	24.21
5	20425	1	#Max	QPSK	22.81	24.18
5	20425	12	#0	QPSK	21.99	23.36
5	20425	12	#Mid	QPSK	21.99	23.36
5	20425	12	#Max	QPSK	21.81	23.18
5	20425	25	#0	QPSK	21.88	23.25
5	20525	1	#0	QPSK	22.80	24.17
5	20525	1	#Mid	QPSK	22.61	23.98
5	20525	1	#Max	QPSK	22.46	23.83
5	20525	12	#0	QPSK	21.80	23.17
5	20525	12	#Mid	QPSK	21.93	23.30
5	20525	12	#Max	QPSK	21.79	23.16
5	20525	25	#0	QPSK	21.78	23.15
5	20625	1	#0	QPSK	22.21	23.58
5	20625	1	#Mid	QPSK	22.39	23.76
5	20625	1	#Max	QPSK	22.38	23.75
5	20625	12	#0	QPSK	21.31	22.68
5	20625	12	#Mid	QPSK	21.33	22.70
5	20625	12	#Max	QPSK	21.46	22.83
5	20625	25	#0	QPSK	21.38	22.75
10	20450	1	#0	QPSK	23.04	24.41
10	20450	1	#Mid	QPSK	22.84	24.21
10	20450	1	#Max	QPSK	22.97	24.34
10	20450	25	#0	QPSK	21.95	23.32
10	20450	25	#Mid	QPSK	21.94	23.31
10	20450	25	#Max	QPSK	21.96	23.33
10	20450	50	#0	QPSK	21.96	23.33
10	20525	1	#0	QPSK	22.55	23.92
10	20525	1	#Mid	QPSK	22.72	24.09
10	20525	1	#Max	QPSK	22.41	23.78
10	20525	25	#0	QPSK	21.97	23.34
10	20525	25	#Mid	QPSK	21.99	23.36
10	20525	25	#Max	QPSK	21.82	23.19
10	20525	50	#0	QPSK	21.80	23.17
10	20600	1	#0	QPSK	22.63	24.00
10	20600	1	#Mid	QPSK	22.43	23.80

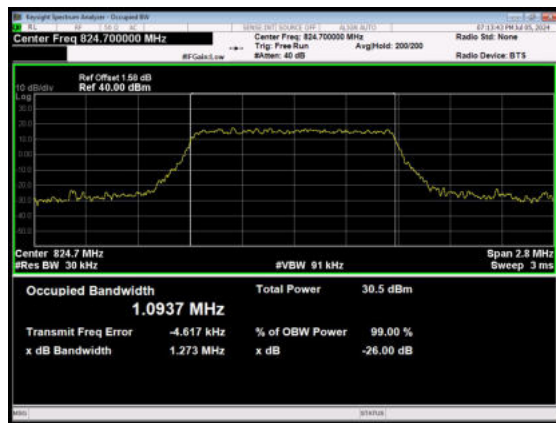
10	20600	1	#Max	QPSK	22.51	23.88
10	20600	25	#0	QPSK	21.61	22.98
10	20600	25	#Mid	QPSK	21.62	22.99
10	20600	25	#Max	QPSK	21.45	22.82
10	20600	50	#0	QPSK	21.53	22.90
1.4	20407	1	#0	16QAM	22.34	23.71
1.4	20407	1	#Mid	16QAM	22.45	23.82
1.4	20407	1	#Max	16QAM	22.34	23.71
1.4	20407	3	#0	16QAM	22.26	23.63
1.4	20407	3	#Mid	16QAM	22.25	23.62
1.4	20407	3	#Max	16QAM	22.22	23.59
1.4	20407	6	#0	16QAM	21.35	22.72
1.4	20525	1	#0	16QAM	22.21	23.58
1.4	20525	1	#Mid	16QAM	22.29	23.66
1.4	20525	1	#Max	16QAM	22.20	23.57
1.4	20525	3	#0	16QAM	21.91	23.28
1.4	20525	3	#Mid	16QAM	21.91	23.28
1.4	20525	3	#Max	16QAM	21.90	23.27
1.4	20525	6	#0	16QAM	20.97	22.34
1.4	20643	1	#0	16QAM	21.49	22.86
1.4	20643	1	#Mid	16QAM	21.50	22.87
1.4	20643	1	#Max	16QAM	21.47	22.84
1.4	20643	3	#0	16QAM	21.38	22.75
1.4	20643	3	#Mid	16QAM	21.37	22.74
1.4	20643	3	#Max	16QAM	21.43	22.80
1.4	20643	6	#0	16QAM	20.42	21.79
3	20415	1	#0	16QAM	22.15	23.52
3	20415	1	#Mid	16QAM	22.19	23.56
3	20415	1	#Max	16QAM	21.93	23.30
3	20415	8	#0	16QAM	21.00	22.37
3	20415	8	#Mid	16QAM	21.00	22.37
3	20415	8	#Max	16QAM	20.84	22.21
3	20415	15	#0	16QAM	20.79	22.16
3	20525	1	#0	16QAM	22.19	23.56
3	20525	1	#Mid	16QAM	22.30	23.67
3	20525	1	#Max	16QAM	21.91	23.28
3	20525	8	#0	16QAM	21.21	22.58
3	20525	8	#Mid	16QAM	21.22	22.59
3	20525	8	#Max	16QAM	21.13	22.50
3	20525	15	#0	16QAM	20.95	22.32
3	20635	1	#0	16QAM	21.17	22.54
3	20635	1	#Mid	16QAM	21.54	22.91
3	20635	1	#Max	16QAM	21.35	22.72
3	20635	8	#0	16QAM	20.56	21.93

3	20635	8	#Mid	16QAM	20.57	21.94
3	20635	8	#Max	16QAM	20.63	22.00
3	20635	15	#0	16QAM	20.52	21.89
5	20425	1	#0	16QAM	22.59	23.96
5	20425	1	#Mid	16QAM	22.41	23.78
5	20425	1	#Max	16QAM	22.44	23.81
5	20425	12	#0	16QAM	21.26	22.63
5	20425	12	#Mid	16QAM	21.26	22.63
5	20425	12	#Max	16QAM	21.09	22.46
5	20425	25	#0	16QAM	21.19	22.56
5	20525	1	#0	16QAM	22.18	23.55
5	20525	1	#Mid	16QAM	22.11	23.48
5	20525	1	#Max	16QAM	21.96	23.33
5	20525	12	#0	16QAM	21.18	22.55
5	20525	12	#Mid	16QAM	21.07	22.44
5	20525	12	#Max	16QAM	20.96	22.33
5	20525	25	#0	16QAM	20.99	22.36
5	20625	1	#0	16QAM	21.69	23.06
5	20625	1	#Mid	16QAM	21.71	23.08
5	20625	1	#Max	16QAM	21.76	23.13
5	20625	12	#0	16QAM	20.55	21.92
5	20625	12	#Mid	16QAM	20.57	21.94
5	20625	12	#Max	16QAM	20.70	22.07
5	20625	25	#0	16QAM	20.50	21.87

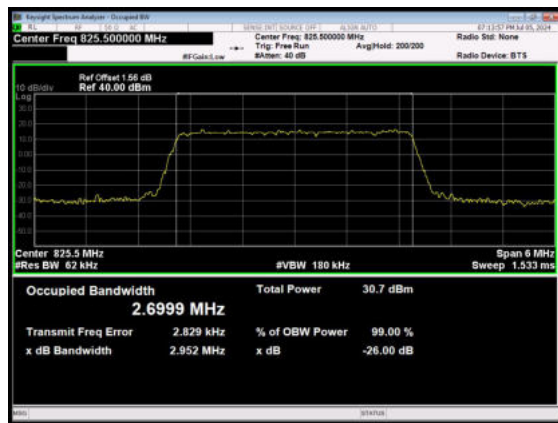
6.2. Occupied Bandwidth

LTE Band 5						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth (MHz)	-26dBc Bandwidth (MHz)
100%	QPSK	1.4	20407	824.7	1.094	1.273
			20525	836.5	1.096	1.316
			20643	848.3	1.096	1.281
		3	20415	825.5	2.700	2.952
			20525	836.5	2.697	2.948
			20635	847.5	2.702	2.969
		5	20425	826.5	4.510	4.937
			20525	836.5	4.506	4.914
			20625	846.5	4.503	4.934
		10	20450	829	8.969	10.112
			20525	836.5	9.003	10.037
			20600	844	8.997	10.144
	16QAM	1.4	20407	824.7	1.096	1.302
			20525	836.5	1.100	1.315
			20643	848.3	1.101	1.301
		3	20415	825.5	2.714	2.965
			20525	836.5	2.695	2.958
			20635	847.5	2.688	2.921
		5	20425	826.5	4.497	4.865
			20525	836.5	4.492	4.937
			20625	846.5	4.510	4.930

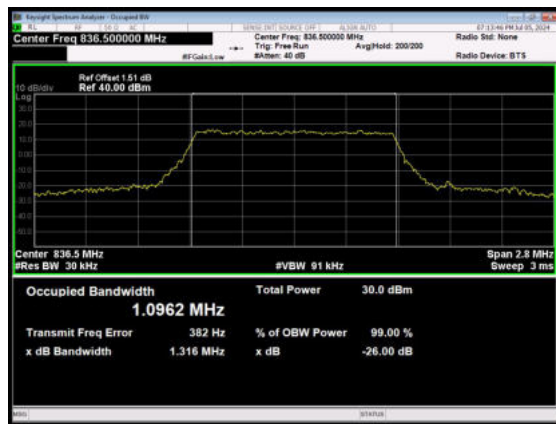
LTE Band 5 QPSK 1.4MHz CH-Low



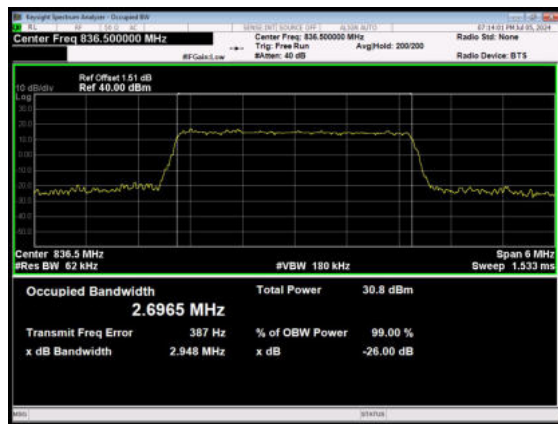
LTE Band 5 QPSK 3MHz CH-Low



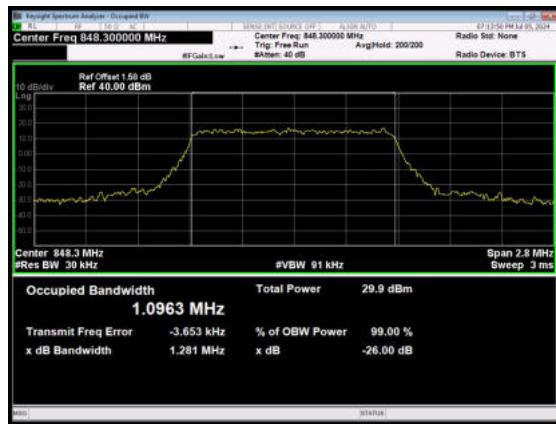
LTE Band 5 QPSK 1.4MHz CH-Middle



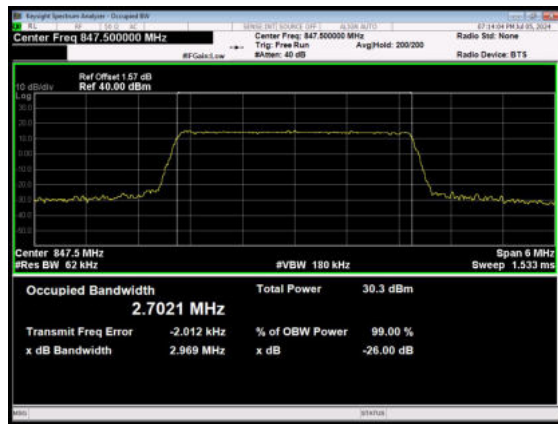
LTE Band 5 QPSK 3MHz CH-Middle



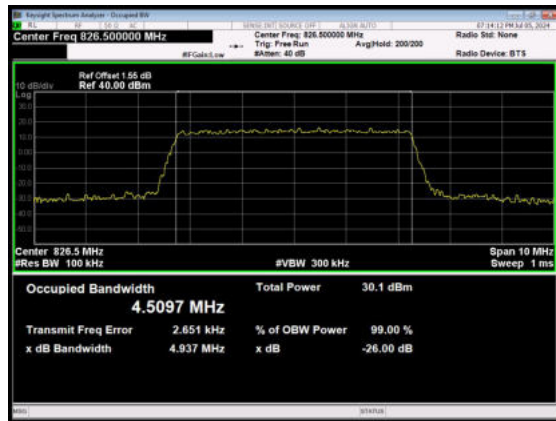
LTE Band 5 QPSK 1.4MHz CH-High



LTE Band 5 QPSK 3MHz CH-High



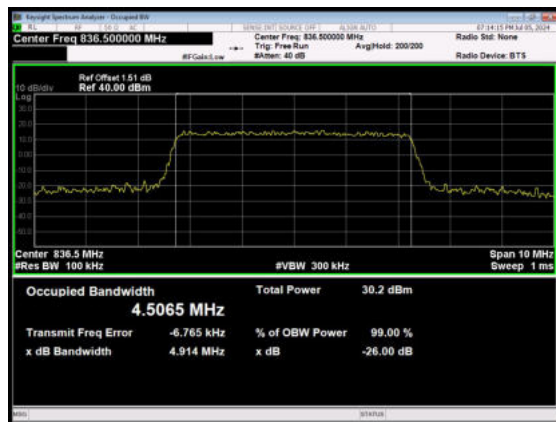
LTE Band 5 QPSK 5MHz CH-Low



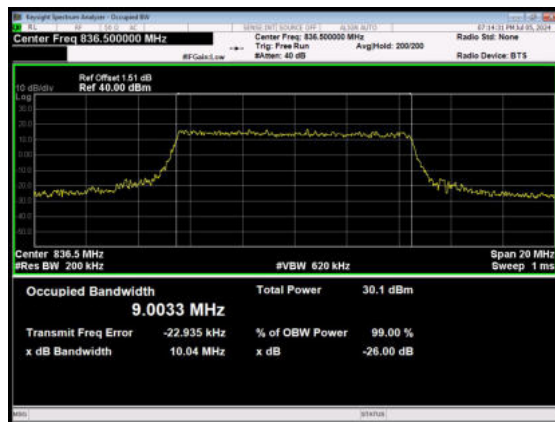
LTE Band 5 QPSK 10MHz CH-Low



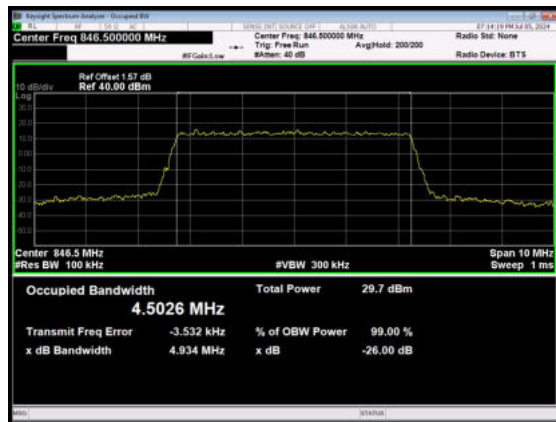
LTE Band 5 QPSK 5MHz CH-Middle



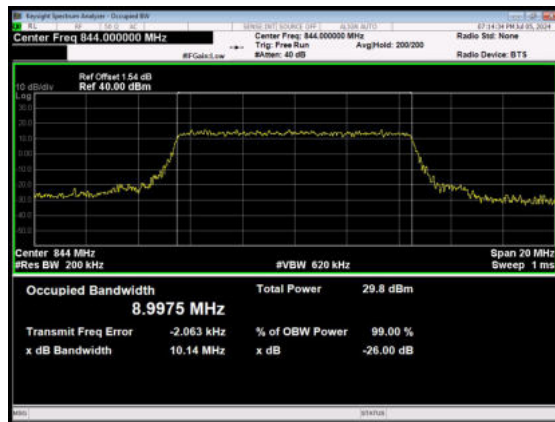
LTE Band 5 QPSK 10MHz CH-Middle



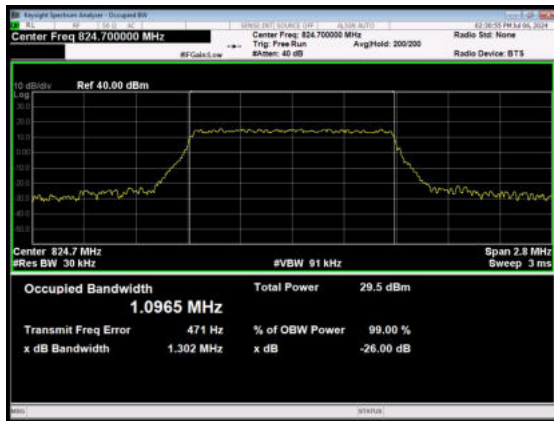
LTE Band 5 QPSK 5MHz CH-High



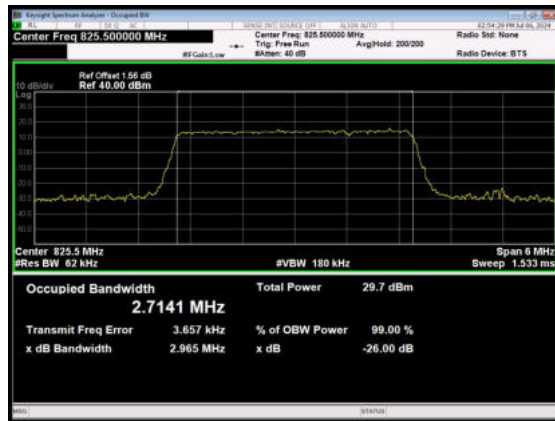
LTE Band 5 QPSK 10MHz CH-High



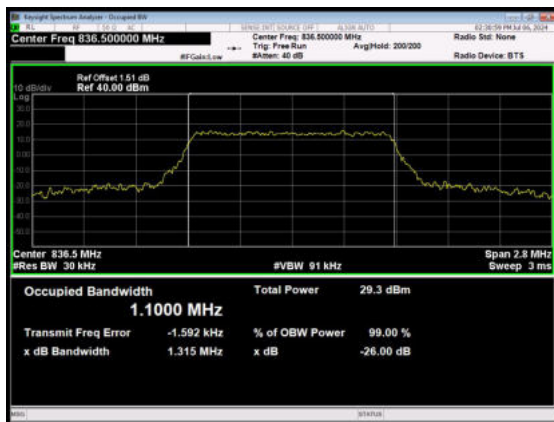
LTE Band 5 16QAM 1.4MHz CH-Low



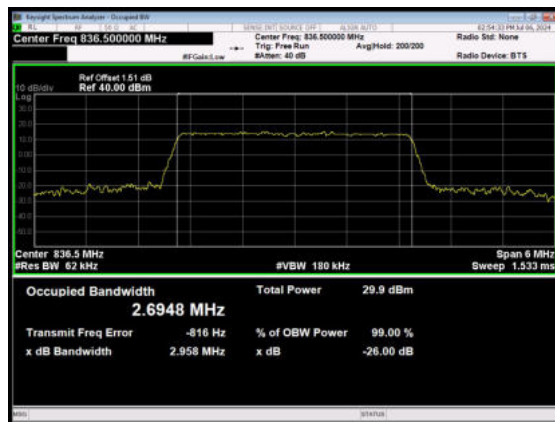
LTE Band 5 16QAM 3MHz CH-Low



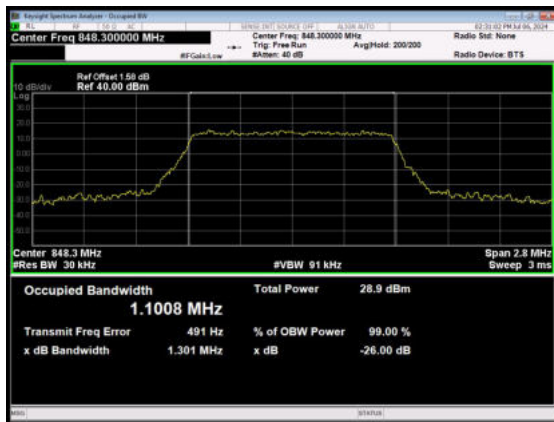
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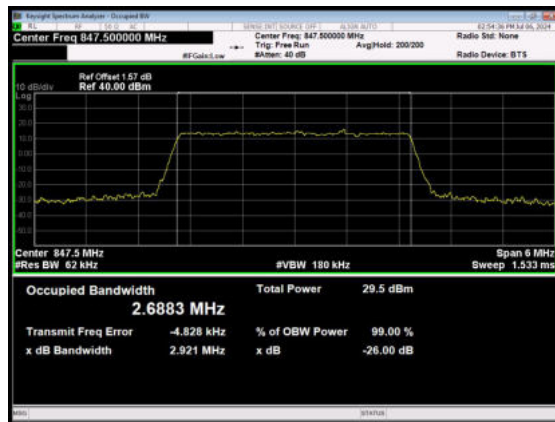
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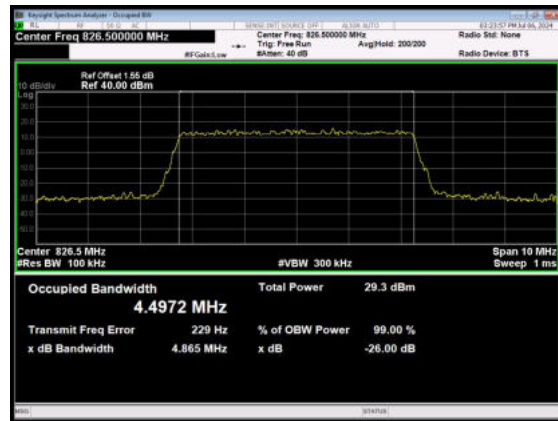
LTE Band 5 16QAM 1.4MHz CH-High



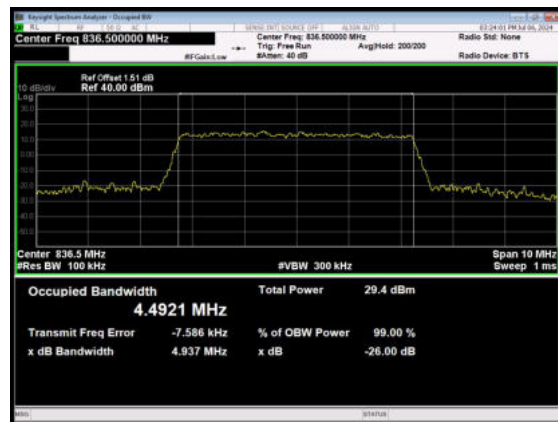
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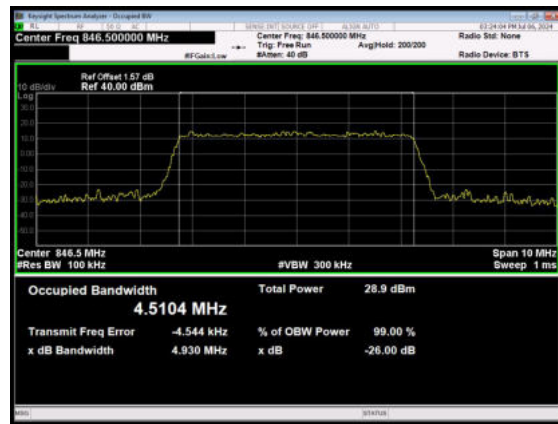
LTE Band 5 16QAM 5MHz CH-Low



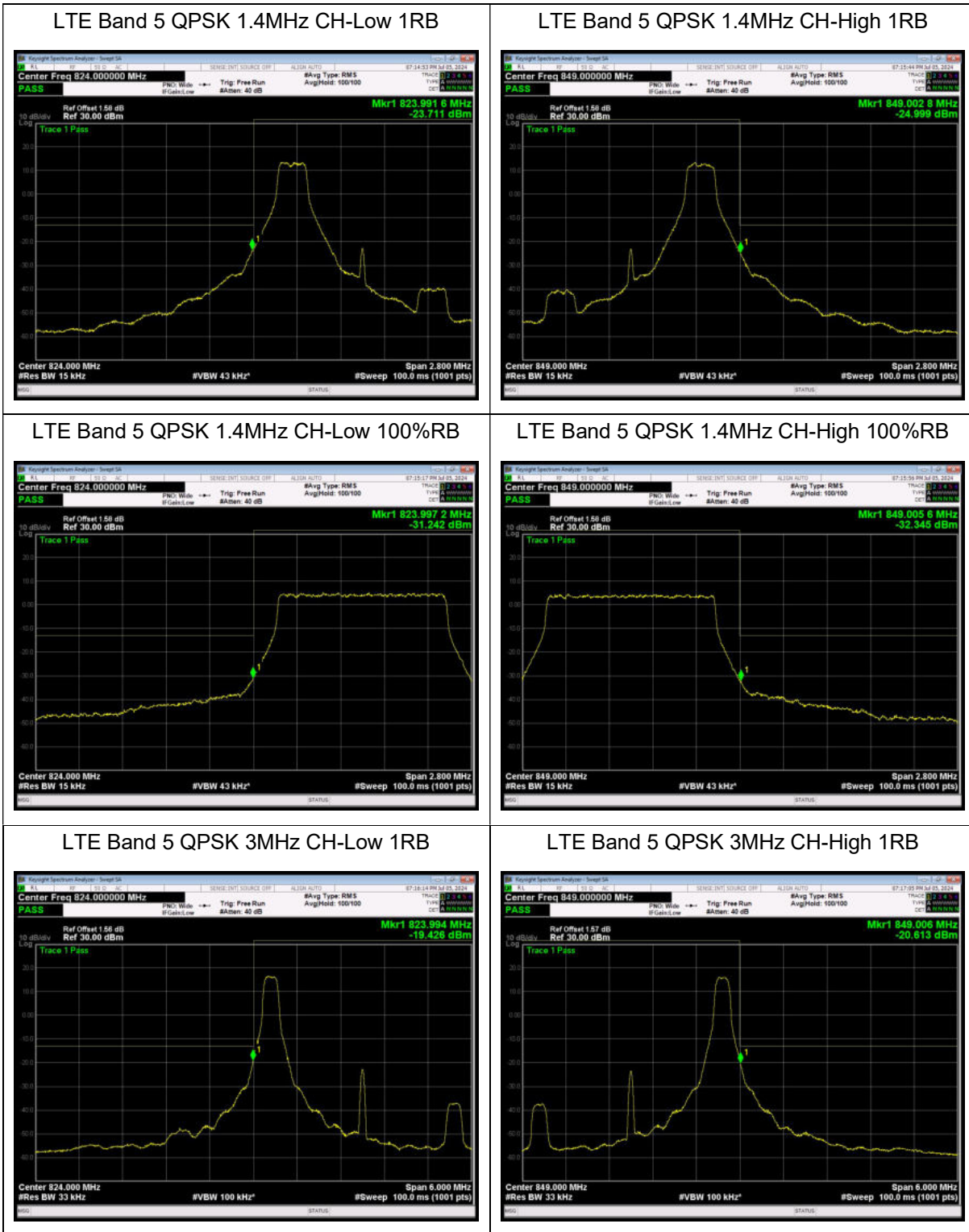
LTE Band 5 16QAM 5MHz CH-Middle



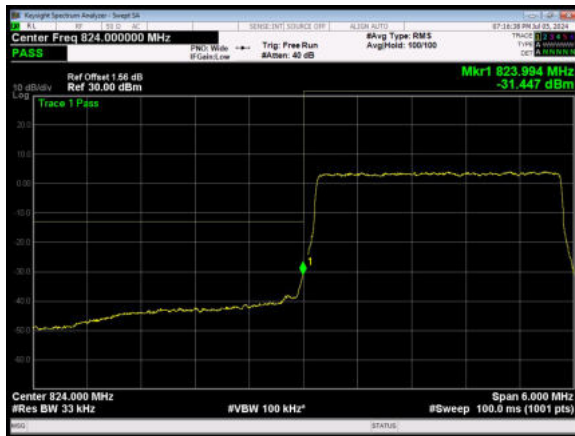
LTE Band 5 16QAM 5MHz CH-High



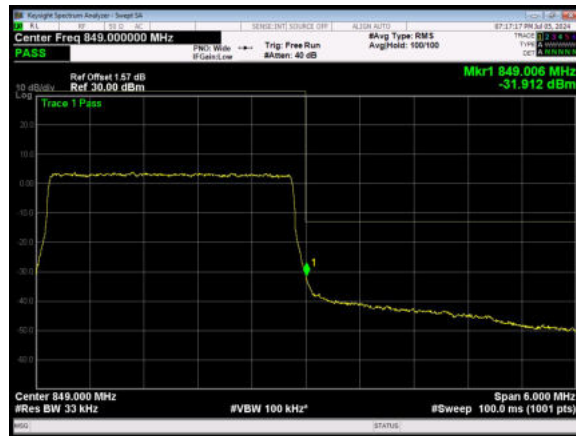
6.3. Band Edge Compliance



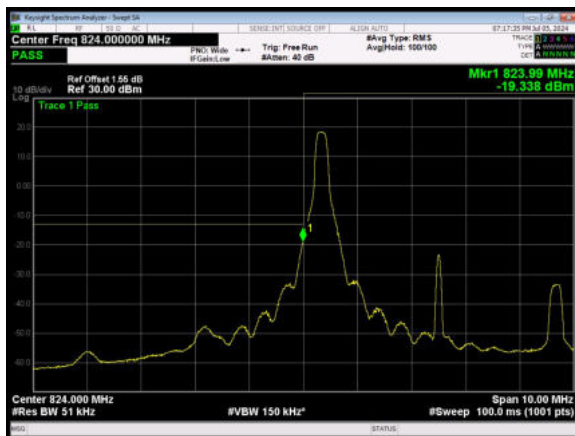
LTE Band 5 QPSK 3MHz CH-Low 100%RB



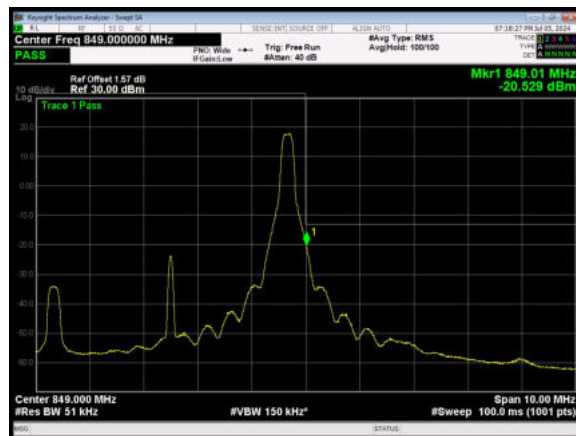
LTE Band 5 QPSK 3MHz CH-High 100%RB



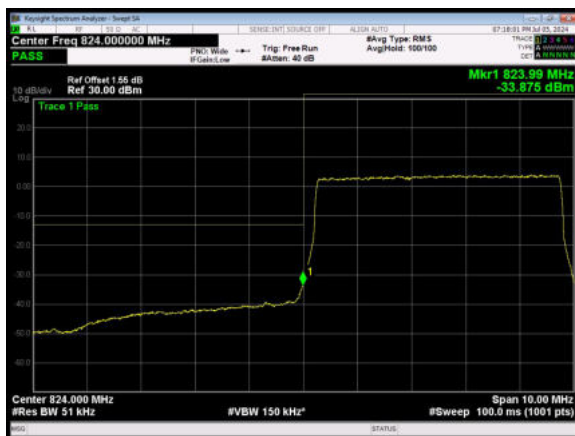
LTE Band 5 QPSK 5MHz CH-Low 1RB



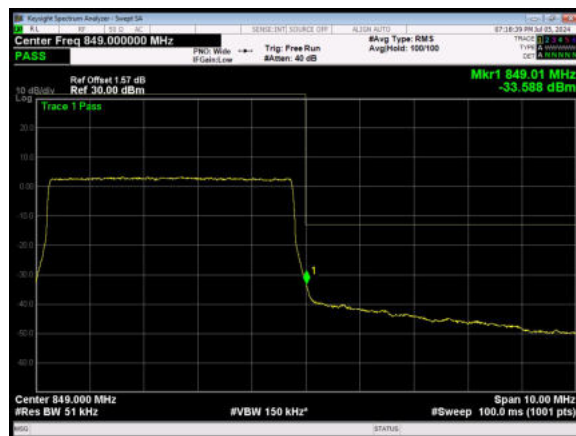
LTE Band 5 QPSK 5MHz CH-High 1RB



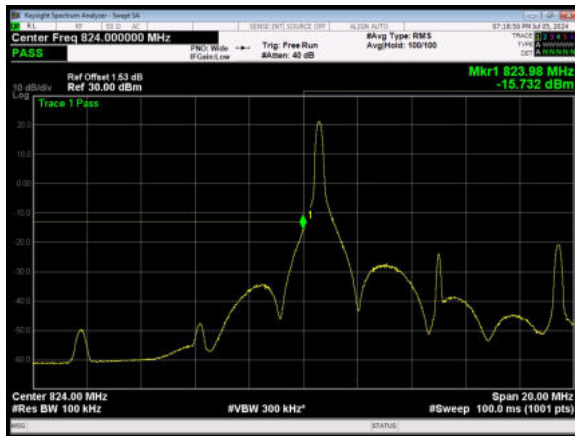
LTE Band 5 QPSK 5MHz CH-Low 100%RB



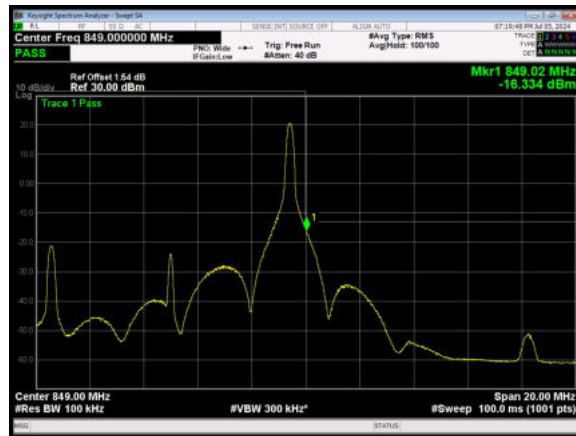
LTE Band 5 QPSK 5MHz CH-High 100%RB



LTE Band 5 QPSK 10MHz CH-Low 1RB



LTE Band 5 QPSK 10MHz CH-High 1RB



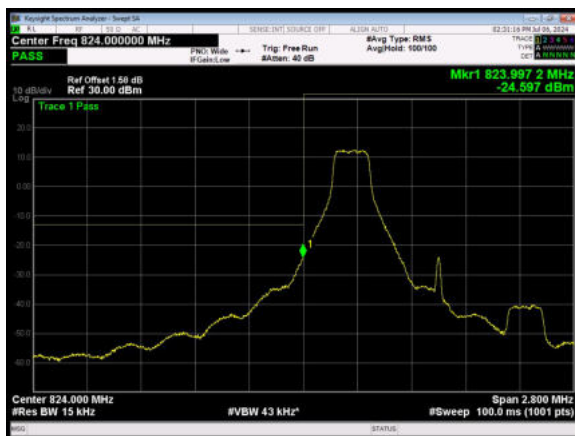
LTE Band 5 QPSK 10MHz CH-Low 100%RB



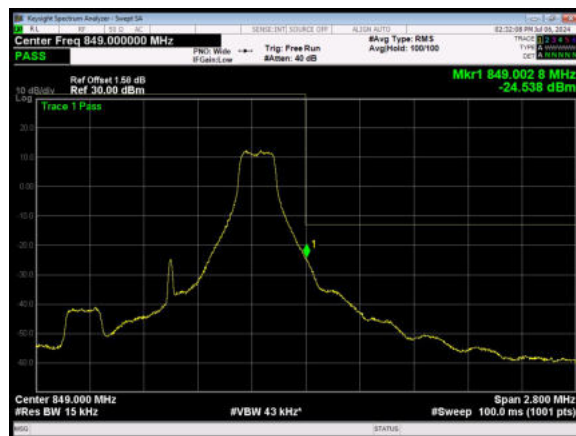
LTE Band 5 QPSK 10MHz CH-High 100%RB



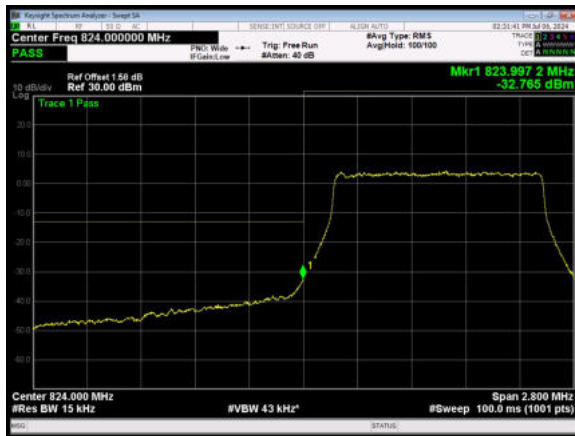
LTE Band 5 16QAM 1.4MHz CH-Low 1RB



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



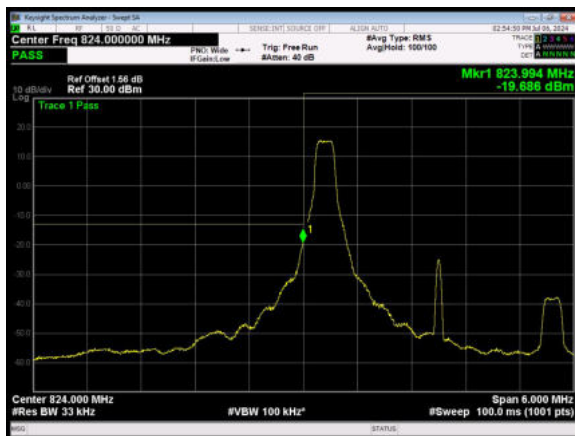
LTE Band 5 16QAM 1.4MHz CH-Low 100%RB



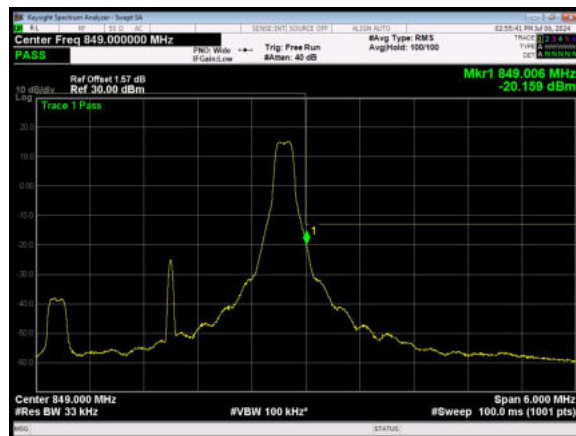
LTE Band 5 16QAM 1.4MHz CH-High 100%RB



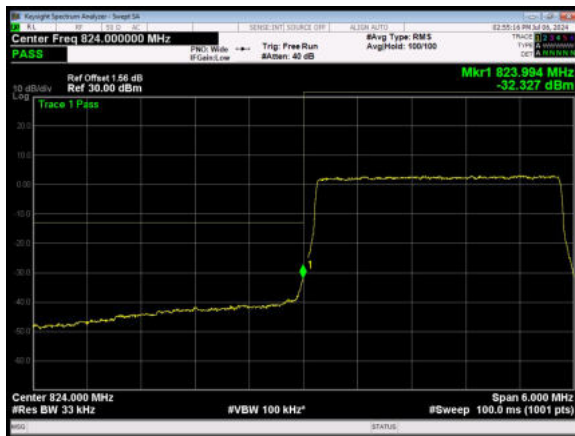
LTE Band 5 16QAM 3MHz CH-Low 1RB



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



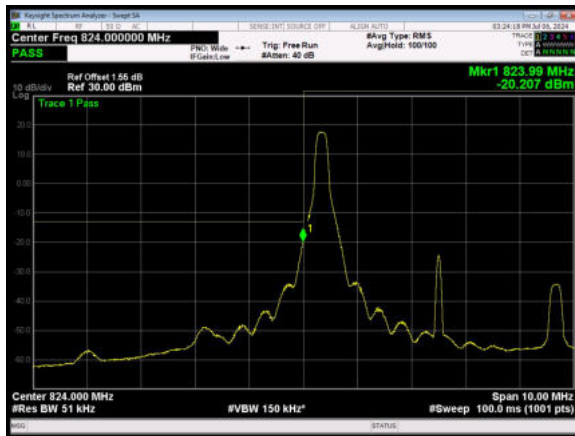
LTE Band 5 16QAM 3MHz CH-Low 100%RB



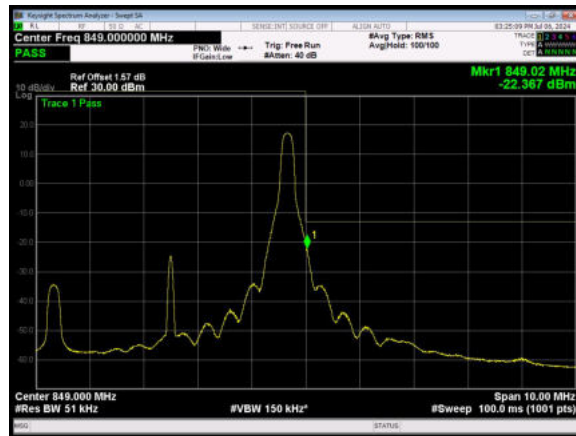
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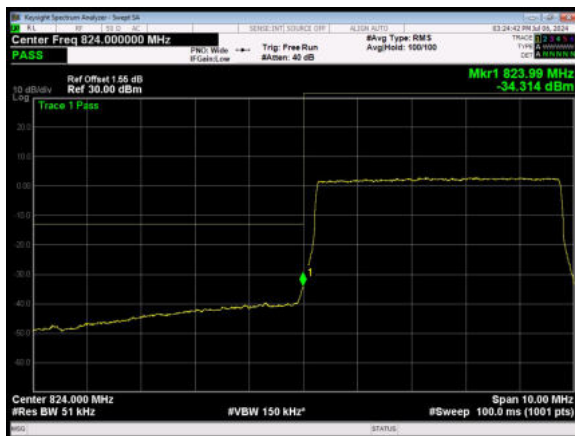
LTE Band 5 16QAM 5MHz CH-Low 1RB



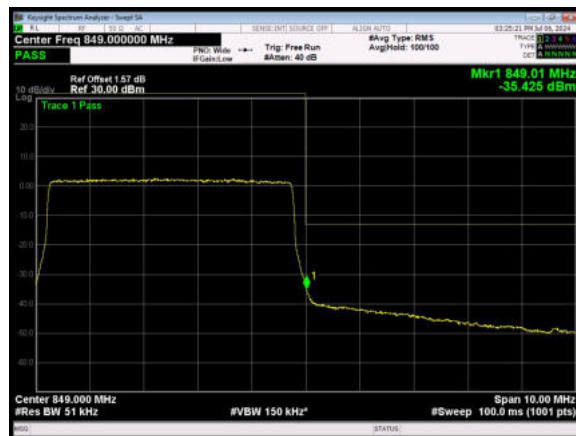
LTE Band 5 16QAM 5MHz CH-High 1RB



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



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



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

LTE Band 5				
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	PAPR (dB)
QPSK	1.4	20407	824.7	5.53
		20525	836.5	4.82
		20643	848.3	5.54
	3	20415	825.5	5.64
		20525	836.5	4.88
		20635	847.5	5.64
	5	20425	826.5	5.68
		20525	836.5	4.88
		20625	846.5	5.51
	10	20450	829	5.39
		20525	836.5	5.03
		20600	844	5.43
16QAM	1.4	20407	824.7	6.19
		20525	836.5	5.57
		20643	848.3	6.38
	3	20415	825.5	6.34
		20525	836.5	5.67
		20635	847.5	6.39
	5	20425	826.5	6.36
		20525	836.5	5.60
		20625	846.5	6.23

6.5. Frequency Stability

LTE Band 5						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	1.4MHz	16QAM	QPSK	16QAM	QPSK	
Temperature	Voltage					
Normal (25℃)	Normal	11.16	9.16	0.01334	0.01095	PASS
Extreme (50℃)		4.17	2.17	0.00499	0.00259	PASS
Extreme (40℃)		3.06	12.03	0.00366	0.01438	PASS
Extreme (30℃)		9.35	15.68	0.01117	0.01874	PASS
Extreme (20℃)		5.48	15.67	0.00655	0.01873	PASS
Extreme (10℃)		6.69	12.51	0.00799	0.01495	PASS
Extreme (0℃)		12.13	11.56	0.01450	0.01382	PASS
Extreme (-10℃)		1.71	7.65	0.00204	0.00914	PASS
Extreme (-20℃)		7.39	13.41	0.00884	0.01603	PASS
Extreme (-30℃)		9.30	11.73	0.01111	0.01402	PASS
25℃	LV	14.37	16.08	0.01717	0.01922	PASS
	HV	5.04	5.00	0.00603	0.00597	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz	16QAM	QPSK	16QAM	QPSK	
Temperature	Voltage					
Normal (25℃)	Normal	16.07	5.65	0.01921	0.00675	PASS
Extreme (50℃)		7.34	11.52	0.00877	0.01377	PASS
Extreme (40℃)		5.07	14.10	0.00606	0.01686	PASS
Extreme (30℃)		3.91	10.83	0.00467	0.01294	PASS
Extreme (20℃)		1.66	13.23	0.00199	0.01582	PASS
Extreme (10℃)		17.34	17.38	0.02073	0.02077	PASS
Extreme (0℃)		1.29	3.66	0.00154	0.00437	PASS
Extreme (-10℃)		14.91	4.50	0.01783	0.00537	PASS
Extreme (-20℃)		7.46	12.04	0.00892	0.01439	PASS
Extreme (-30℃)		5.59	3.97	0.00668	0.00475	PASS
25℃	LV	5.98	1.27	0.00715	0.00152	PASS
	HV	4.76	9.48	0.00568	0.01134	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz	16QAM	QPSK	16QAM	QPSK	
Temperature	Voltage					
Normal (25℃)	Normal	13.71	14.51	0.01639	0.01734	PASS
Extreme (50℃)		10.39	4.84	0.01242	0.00578	PASS
Extreme (40℃)		4.09	12.04	0.00489	0.01439	PASS
Extreme (30℃)		1.22	8.23	0.00145	0.00984	PASS

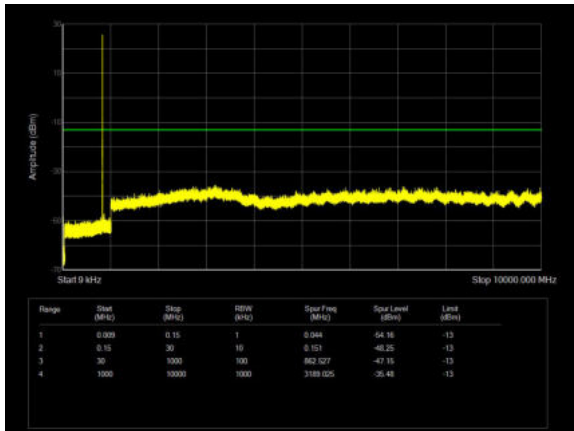
Extreme (20℃)		15.22	7.24	0.01819	0.00865	PASS
Extreme (10℃)		14.33	16.99	0.01713	0.02031	PASS
Extreme (0℃)		9.26	11.37	0.01107	0.01359	PASS
Extreme (-10℃)		5.40	7.41	0.00645	0.00886	PASS
Extreme (-20℃)		13.79	15.13	0.01649	0.01809	PASS
Extreme (-30℃)		14.38	16.48	0.01718	0.01970	PASS
25℃	LV	4.80	16.71	0.00574	0.01998	PASS
	HV	15.97	10.28	0.01909	0.01228	PASS
Condition		Freq.Error (Hz)		Frequency Stability (ppm)		Verdict
BANDWIDTH	10MHz					
Temperature	Voltage	QPSK		QPSK		
Normal (25℃)	Normal	2.74		0.00327		PASS
Extreme (50℃)		17.57		0.02100		PASS
Extreme (40℃)		9.24		0.01105		PASS
Extreme (30℃)		12.31		0.01472		PASS
Extreme (20℃)		10.61		0.01268		PASS
Extreme (10℃)		10.98		0.01313		PASS
Extreme (0℃)		15.13		0.01808		PASS
Extreme (-10℃)		10.99		0.01313		PASS
Extreme (-20℃)		12.94		0.01547		PASS
Extreme (-30℃)		11.06		0.01322		PASS
25℃	LV	9.10		0.01088		PASS
	HV	6.42		0.00767		PASS

6.6. Spurious Emissions at Antenna Terminals

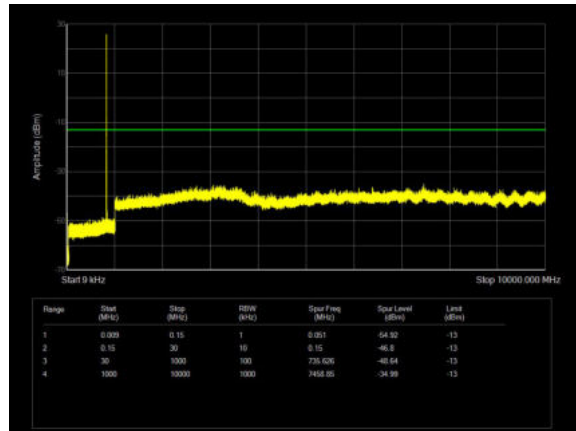
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

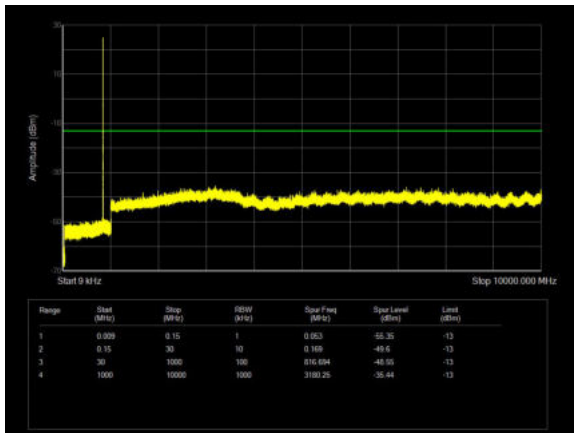
LTE Band 5 1.4MHz CH-Low 9kHz~10GHz



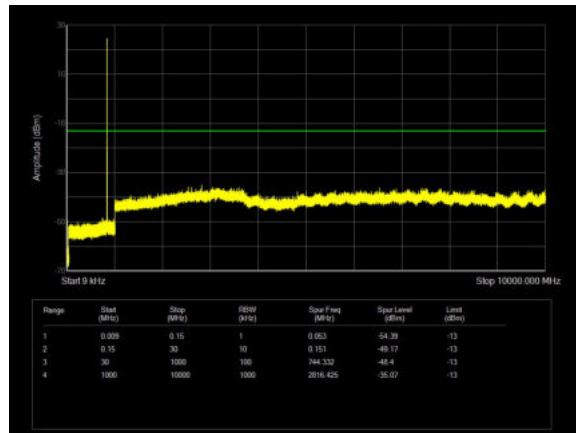
LTE Band 5 3MHz CH-Low 9kHz~10GHz



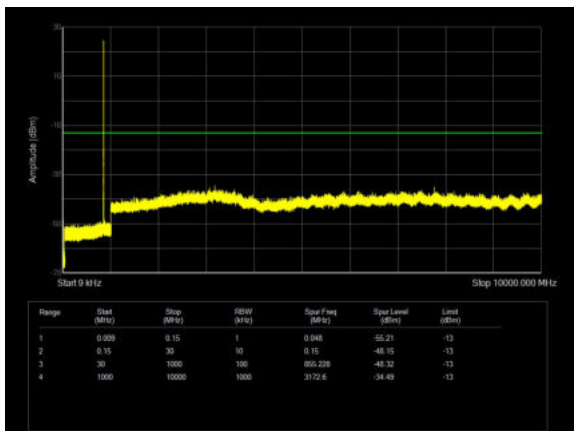
LTE Band 5 1.4MHz CH-Middle 9kHz~10GHz



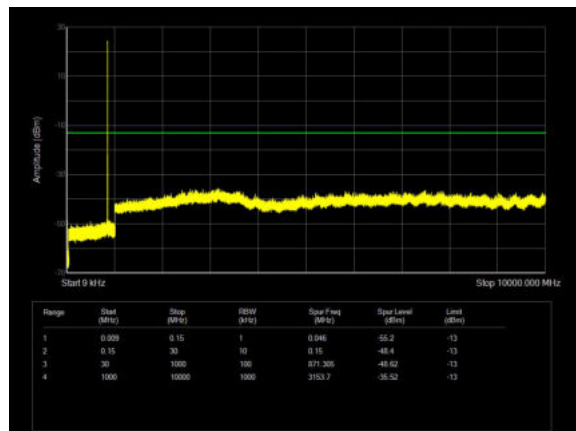
LTE Band 5 3MHz CH-Middle 9kHz~10GHz



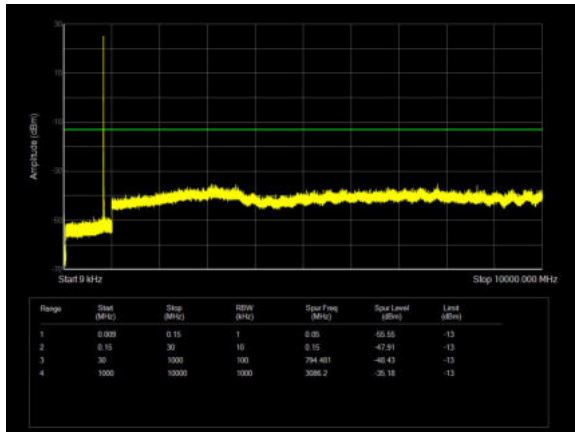
LTE Band 5 1.4MHz CH-High 9kHz~10GHz



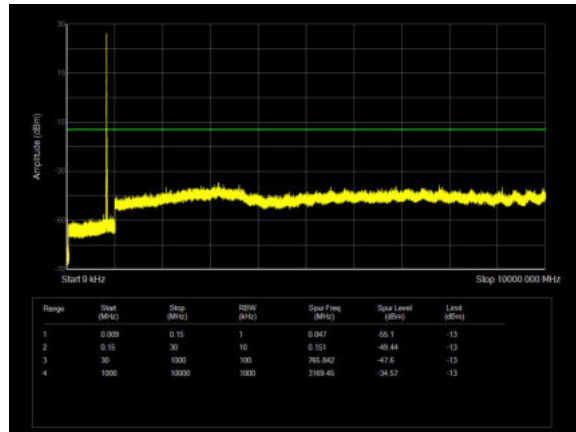
LTE Band 5 3MHz CH-High 9kHz~10GHz



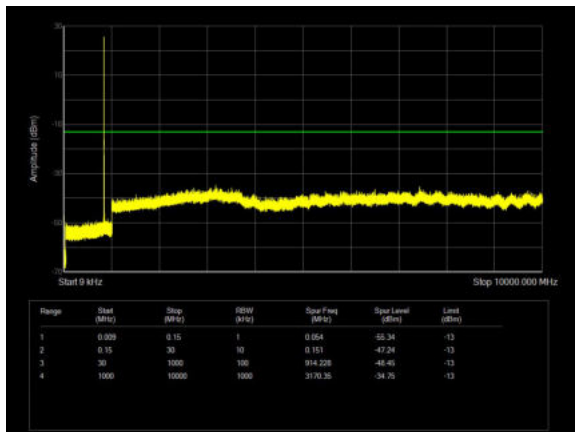
LTE Band 5 5MHz CH-Low 9kHz~10GHz



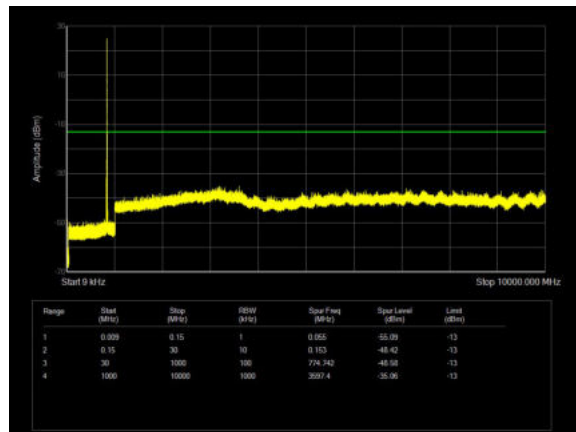
LTE Band 5 10MHz CH-Low 9kHz~10GHz



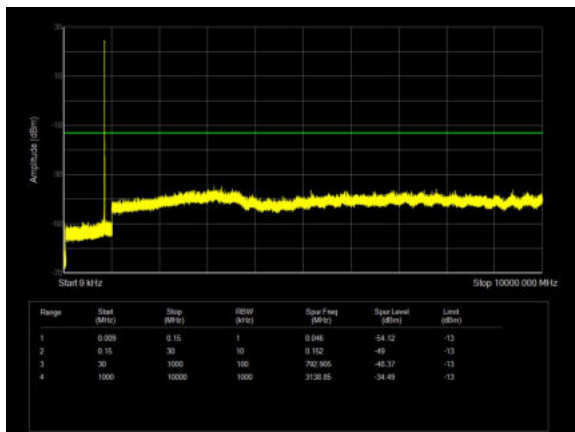
LTE Band 5 5MHz CH-Middle 9kHz~10GHz



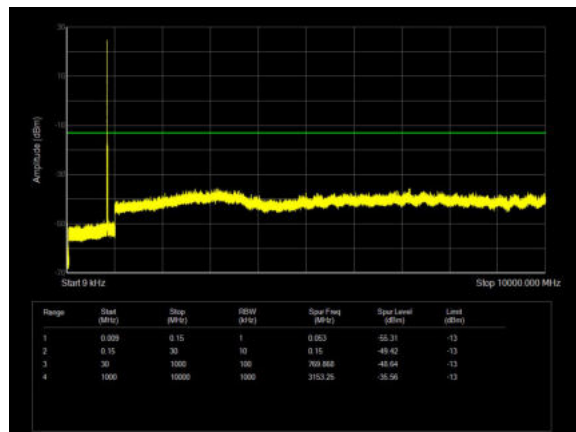
LTE Band 5 10MHz CH-Middle 9kHz~10GHz



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



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



6.7. Radiated Spurious Emission

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	Result Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1673.00	-58.83	1.70	8.70	Vertical	-53.98	-13.00	40.98	57
3	2509.50	-62.61	2.30	12.00	Vertical	-55.06	-13.00	42.06	17
4	3344.10	-62.23	2.70	12.70	Vertical	-54.38	-13.00	41.38	94
5	4180.20	-56.30	3.00	12.50	Vertical	-48.95	-13.00	35.95	82
6	5019.00	-64.35	3.40	12.50	Vertical	-57.40	-13.00	44.40	95
7	5855.50	-62.61	3.40	12.80	Vertical	-55.36	-13.00	42.36	284
8	6692.00	-58.01	4.10	11.50	Vertical	-52.76	-13.00	39.76	85
9	7528.50	-57.04	4.20	12.20	Vertical	-51.19	-13.00	38.19	72
10	8365.00	-57.75	4.30	12.50	Vertical	-51.70	-13.00	38.70	51

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	Result Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1668.60	-61.17	1.70	8.70	Vertical	-56.32	-13.00	43.32	55
3	2503.30	-61.80	2.30	12.00	Vertical	-54.25	-13.00	41.25	67
4	3337.20	-61.18	2.70	12.70	Vertical	-53.33	-13.00	40.33	69
5	4171.88	-54.35	3.00	12.50	Vertical	-47.00	-13.00	34.00	95
6	5006.25	-60.82	3.40	12.50	Vertical	-53.87	-13.00	40.87	85
7	5840.63	-62.54	3.40	12.80	Vertical	-55.29	-13.00	42.29	257
8	6675.00	-58.29	4.10	11.50	Vertical	-53.04	-13.00	40.04	187
9	7509.38	-56.84	4.20	12.20	Vertical	-50.99	-13.00	37.99	258
10	8343.75	-57.70	4.30	12.50	Vertical	-51.65	-13.00	38.65	34

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	Result Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1664.40	-61.19	1.70	8.70	Vertical	-56.34	-13.00	43.34	154
3	2496.60	-60.15	2.30	12.00	Vertical	-52.60	-13.00	39.60	195
4	3328.40	-55.92	2.70	12.70	Vertical	-48.07	-13.00	35.07	297
5	4160.40	-50.14	3.00	12.50	Vertical	-42.79	-13.00	29.79	85
6	4991.90	-60.07	3.40	12.50	Vertical	-53.12	-13.00	40.12	87
7	5820.50	-63.32	3.40	12.80	Vertical	-56.07	-13.00	43.07	178
8	6652.00	-58.83	4.10	11.50	Vertical	-53.58	-13.00	40.58	257
9	7483.50	-55.50	4.20	12.20	Vertical	-49.65	-13.00	36.65	25
10	8315.00	-56.38	4.30	12.50	Vertical	-50.33	-13.00	37.33	94
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.									

7. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Climate Chamber	WEISS	VT 4002	58226119450010	2024-05-07	2025-05-06
Wireless Communication Tester	R&S	CMW500	150415	2024-05-07	2025-05-06
Spectrum Analyzer	Keysight	N9020A	MY50510203	2024-05-07	2025-05-06
DC Power Supply	UNI-T	UTP1310+	C220795889	2024-05-08	2025-05-07
Radiated Spurious Emission					
Spectrum Analyzer	R&S	FSV30	100815	2023-12-05	2024-12-04
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2023-04-16	2026-04-15
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	391	2022-09-29	2025-09-28
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	1439	2024-07-06	2027-07-05
Horn Antenna	SCHWARZBECK	BBHA 9120D	1594	2023-12-05	2026-12-04
Horn Antenna	SCHWARZBECK	BBHA 9120D	01799	2022-09-01	2025-08-31
Software	R&S	EMC32	10.35.10	/	/

ANNEX A: The EUT Appearance

The EUT Appearance is submitted separately.

ANNEX B: Test Setup Photos

The Test Setup Photos is submitted separately.

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