

# RF TEST REPORT

<b>Applicant</b>	MeiG Smart Technology Co., Ltd
<b>FCC ID</b>	2APJ4-SLM130-NA
<b>Product</b>	LTE NB-IOT Module
<b>Brand</b>	MEIGLink
<b>Model</b>	SLM130-NA
<b>Report No.</b>	R2409A1238-R1
<b>Issue Date</b>	October 21, 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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## 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: September 3, 2024 ~ September 13, 2024			
Date of Sample Received: September 2, 2024			
<p>Note: PASS: The EUT complies with the essential requirements in the standard.</p> <p>FAIL: The EUT does not comply with the essential requirements in the standard.</p> <p>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.</p>			

## 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.  
Address: Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China  
City: Shanghai  
Post code: 201201  
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E-mail: Kain.Xu@cpt.eurofinscn.com

## 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	SLM130-NA		
SN	Conducted: M130CN6AHE062600015 Radiated: M130CN6AHE062600033		
Hardware Version	SLM130-NA_V1.01_PCB		
Software Version	M018		
Power Supply	External power supply		
Antenna Type	External Antenna		
Antenna Gain	1.35 dBi		
Test Mode(s)	NB-IoT Band 5		
Test Modulation	BPSK, QPSK		
Category	NB1		
Deployment	stand-alone		
Sub-carrier spacing	3.75KHz, 15KHz		
Ntones	single-tone, multi-tone		
Maximum E.R.P.	NB-IoT Band 5:	22.07 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		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	NB-IoT Band 5	824 ~ 849	869 ~ 894
Auxiliary Test Equipment			
Antenna	Manufacturer: Shenzhen Be-Comfortable Technology Co. Ltd Model: N19-0740-R0A		

	Gain: NB-IoT Band 5: 1.35 dBi
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). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (horizontal, horizontal polarization) and the worst case was recorded.

All modes as Subcarrier Spacing, modulations, Channel were investigated.

Subsequently, only the worst case emissions are reported.

The following testing in NB-IoT is set based on the maximum RF Output Power.

Test modes are chosen as the worst case configuration below for NB-IoT Band 5.

Test items	Deployment mode	Subcarrier Spacing (kHz)		Modulation		Test Channel		
	Stand-alone	3.75	15	BPSK	QPSK	L	M	H
RF power output and Effective Radiated power	O	O	O	O	O	O	O	O
Occupied Bandwidth	O	O	O	O	O	O	O	O
Band Edge Compliance	O	O	O	O	O	O	-	O
Peak-to-Average Power Ratio	O	O	O	O	O	-	O	-
Frequency Stability	O	O	O	O	O	-	O	-
Spurious Emissions at Antenna Terminals	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

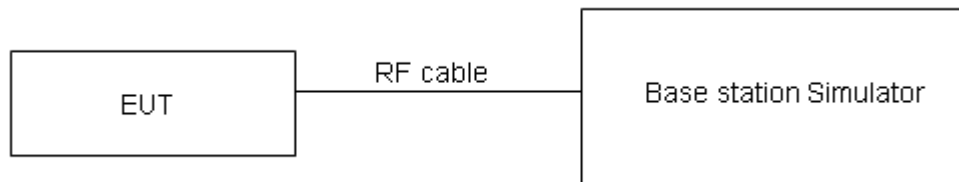
During the process of the testing, The EUT was connected to the Base Station Simulator with a known loss. The EUT is controlled by the Base Station Simulator test set to ensure max power transmission with proper modulation.

ERP can then be calculated as follows:

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

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

#### 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	$\leq 7 \text{ W}$ (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

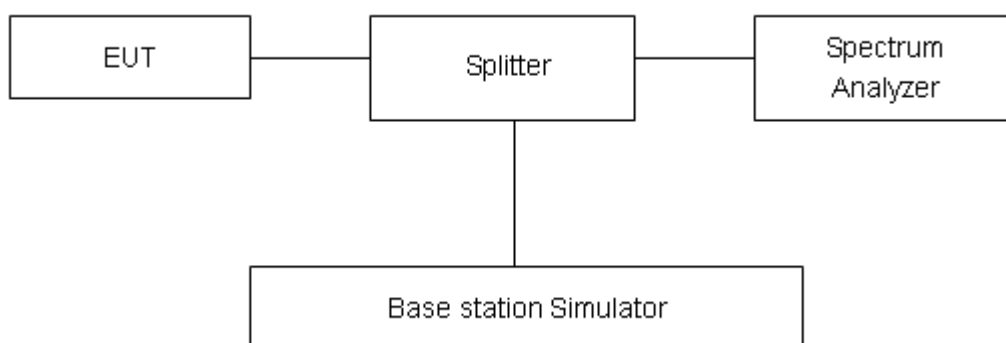
### Method of Measurement

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

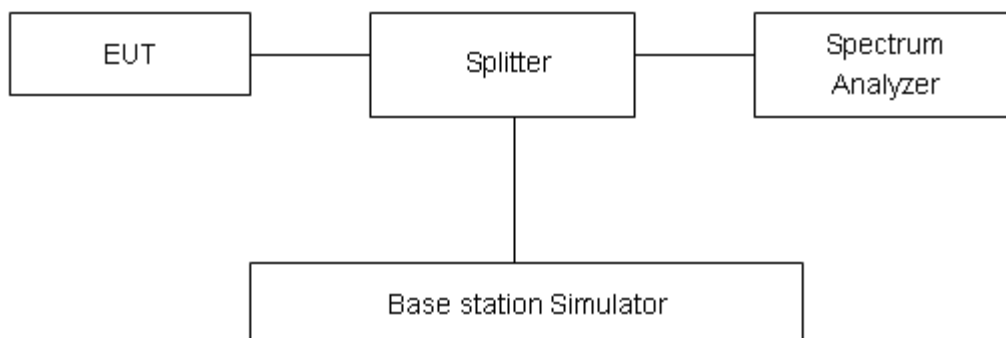
Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

#### 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  $k = 1.96$ ,  $U=0.684\text{dB}$ .

#### Test Results

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

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

### Ambient Condition

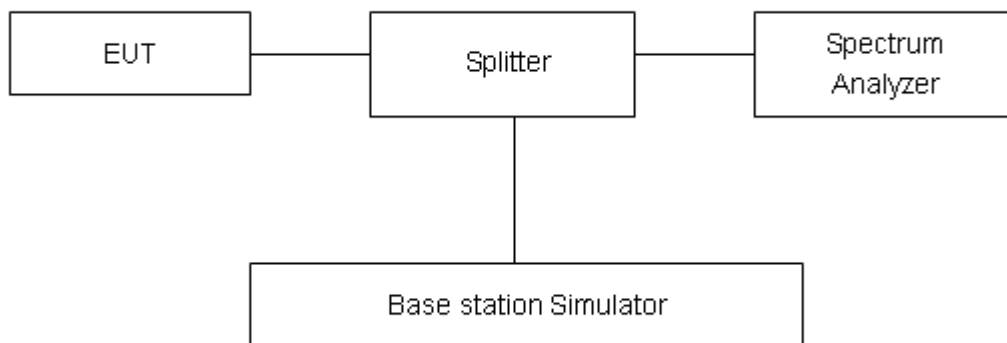
Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

### 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.

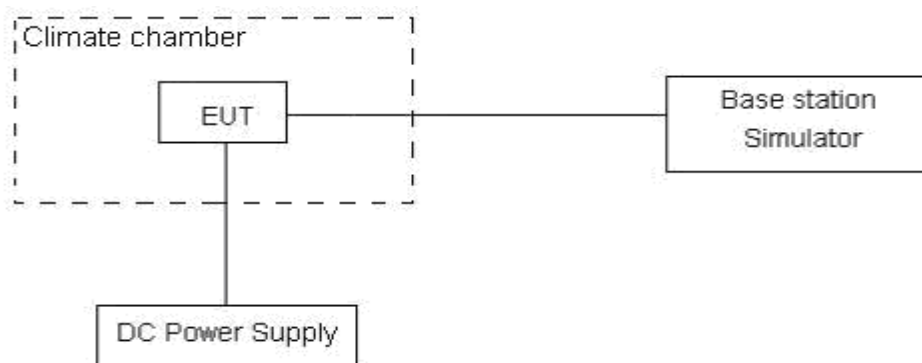
#### Frequency Stability (Voltage Variation)

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 3.6 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	$\leq 2.5$ 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)

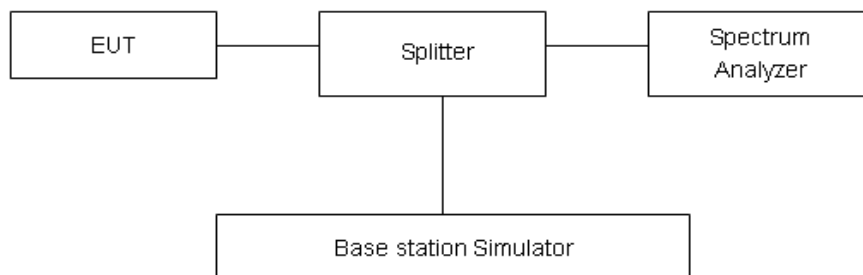
RBW is set to 100 kHz (30MHz~1000 MHz)

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-20GHz	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

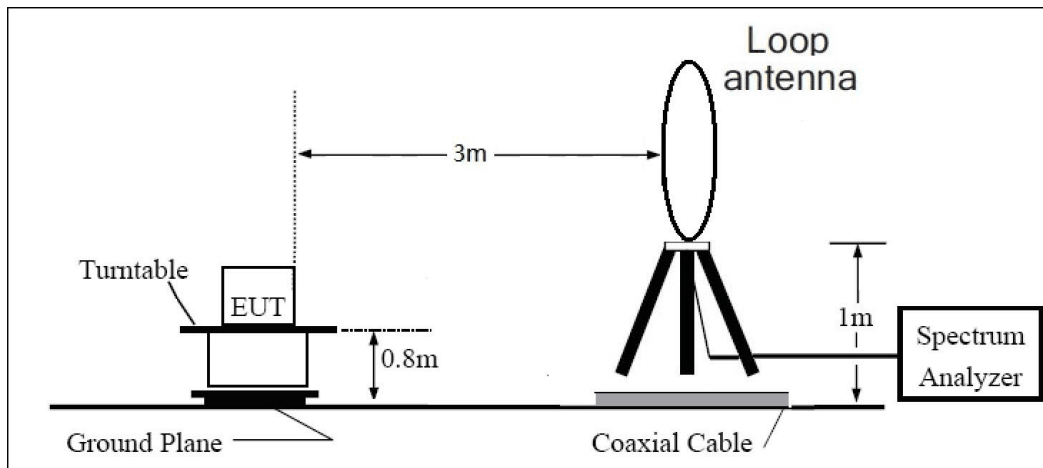
1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26-2015.
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable 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:  
$$\text{Power (EIRP)} = \text{PMea} - \text{PAG} - \text{Pcl} + \text{Ga}$$
  
The measurement results are amend as described below:  
$$\text{Power (EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $\text{ERP} = \text{EIRP} - 2.15\text{dB}$ .



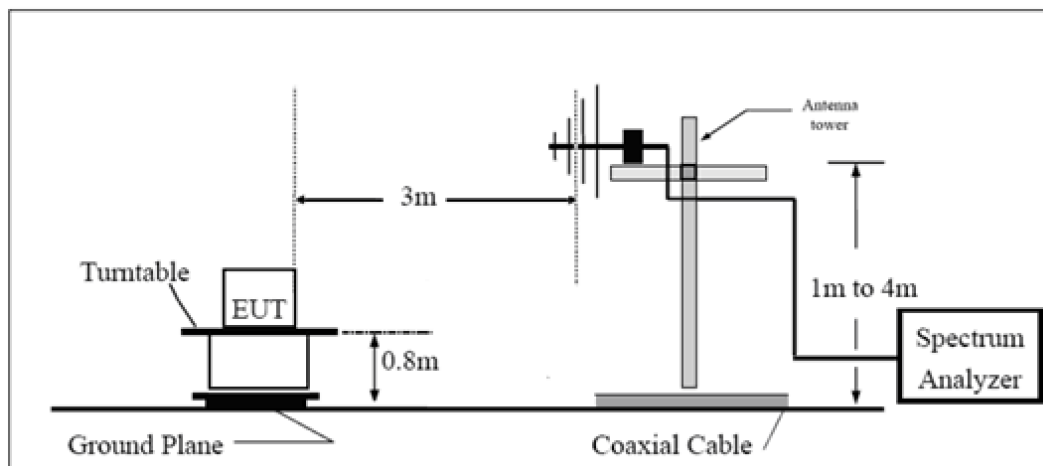
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

## Test Setup

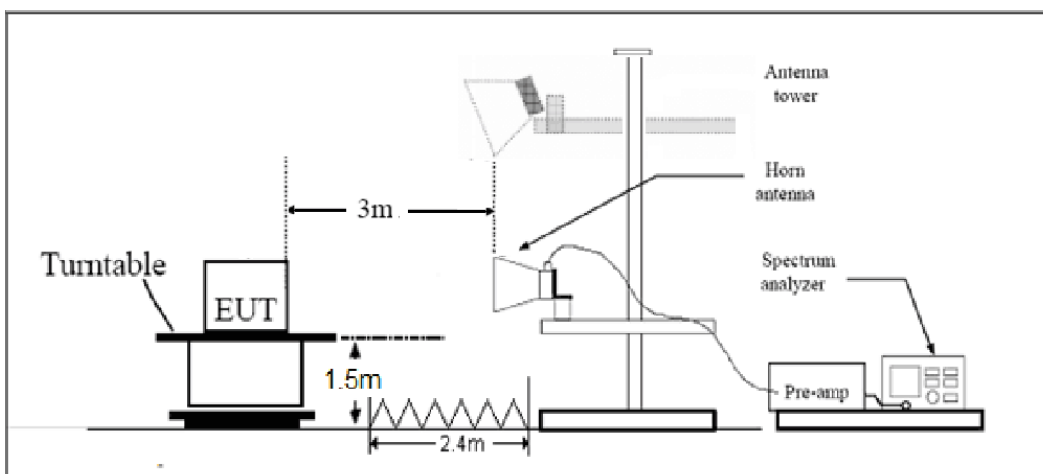
### 9KHz~ 30MHz



### 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

Mode	Modulation	Sub-carrier spacing (KHz)	Ntones	Conducted Power (dBm)			ERP (dBm)		
				20402/824.2	20525/836.5	20648/848.8	20402/824.2	20525/836.5	20648/848.8
Band 5 Standalone	BPSK	3.75	1@0	22.60	22.65	22.72	21.80	21.85	21.92
			1@47	22.62	22.67	22.73	21.82	21.87	21.93
		15	1@0	22.64	22.72	22.82	21.84	21.92	22.02
			1@11	22.66	22.73	22.83	21.86	21.93	22.03
	QPSK	3.75	1@0	22.61	22.69	22.73	21.81	21.89	21.93
			1@47	22.63	22.70	22.75	21.83	21.90	21.95
		15	1@0	22.69	22.77	22.85	21.89	21.97	22.05
			1@11	22.72	22.75	22.87	21.92	21.95	22.07
		15	12@0	20.25	20.48	20.64	19.45	19.68	19.84

## 6.2. Occupied Bandwidth

Mode	Modulation	Sub-carrier spacing (KHz)	Ntones	Bandwidth (KHz)					
				20402/824.2		20525/836.5		20648/848.8	
				99% Power	-26dBc	99% Power	-26dBc	99% Power	-26dBc
Band 5 Standalone	BPSK	3.75	1@0	47.21	36.90	47.39	33.60	47.21	33.56
	QPSK	3.75	1@0	56.76	37.72	58.95	40.95	59.04	41.22
	BPSK	15	1@0	104.07	104.30	104.33	103.90	96.91	90.90
	QPSK	15	1@0	110.63	116.40	168.00	129.30	108.11	102.50
	QPSK	15	12@0	181.89	234.40	183.27	233.10	183.40	250.30

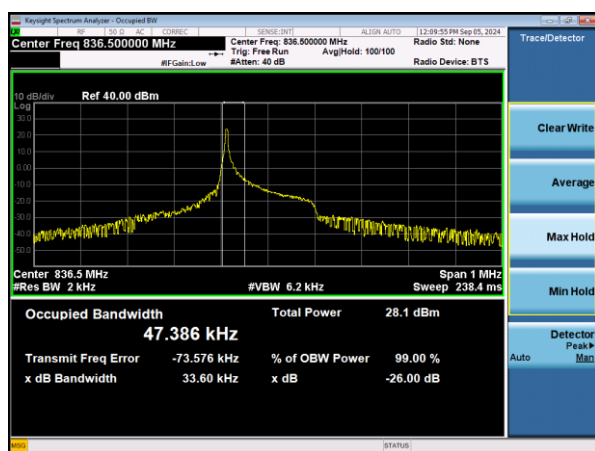
### NB-IoT Band 5 BPSK 3.75kHz 1@0 CH-Low



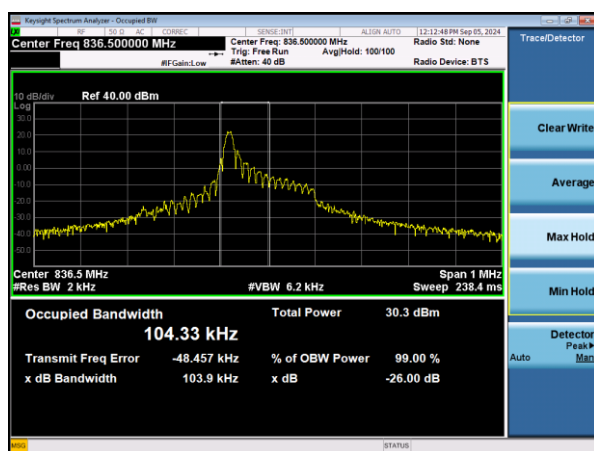
### NB-IoT Band 5 BPSK 15kHz 1@0 CH-Low



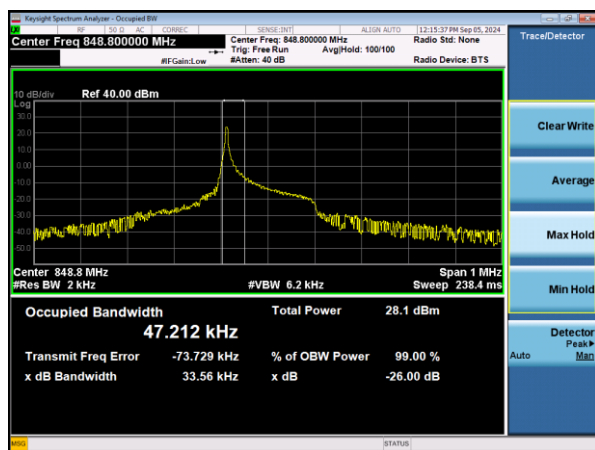
### NB-IoT Band 5 BPSK 3.75kHz 1@0 CH-Middle



### NB-IoT Band 5 BPSK 15kHz 1@0 CH-Middle



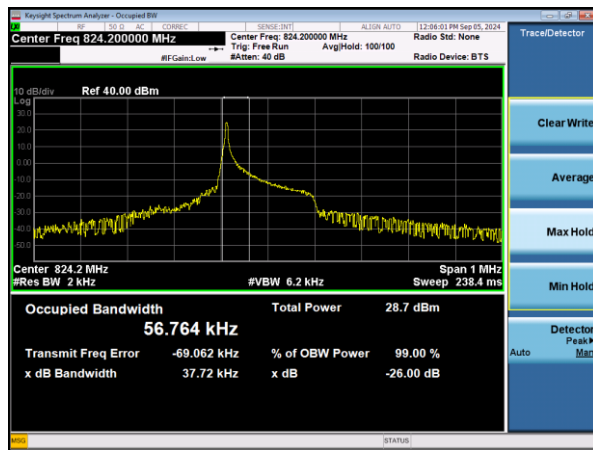
### NB-IoT Band 5 BPSK 3.75kHz 1@0 CH-High



### NB-IoT Band 5 BPSK 15kHz 1@0 CH-High



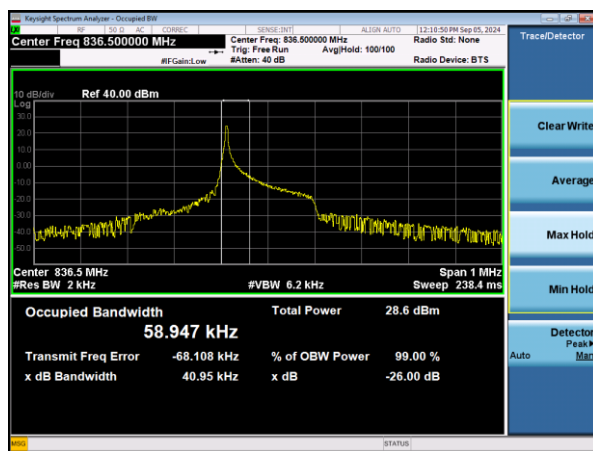
### NB-IoT Band 5 QPSK 3.75kHz 1@0 CH-Low



### NB-IoT Band 5 QPSK 15kHz 1@0 CH-Low



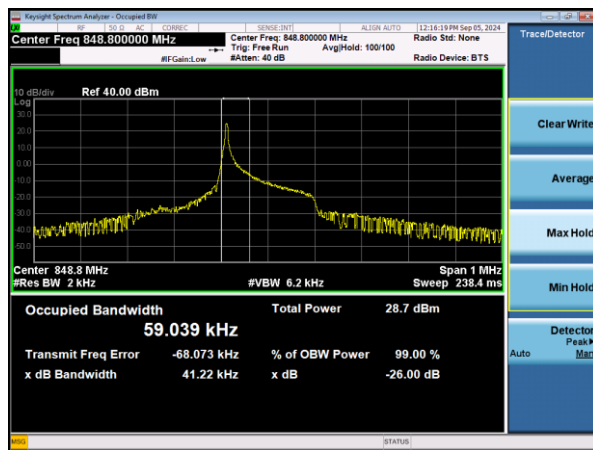
### NB-IoT Band 5 QPSK 3.75kHz 1@0 CH-Middle



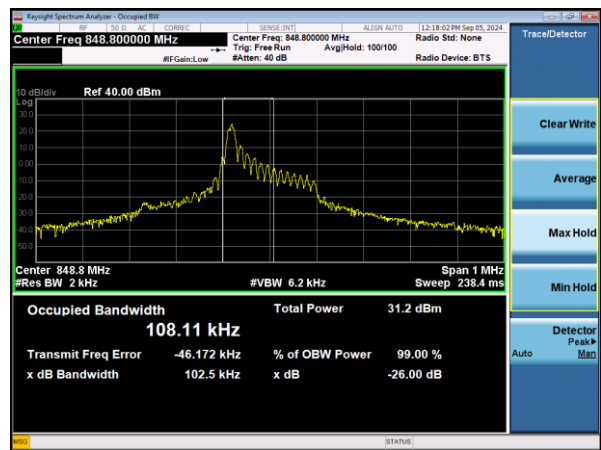
### NB-IoT Band 5 QPSK 15kHz 1@0 CH-Middle



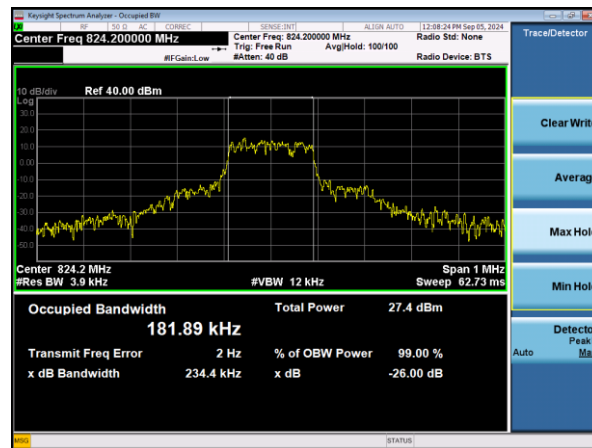
### NB-IoT Band 5 QPSK 3.75kHz 1@0 CH-High



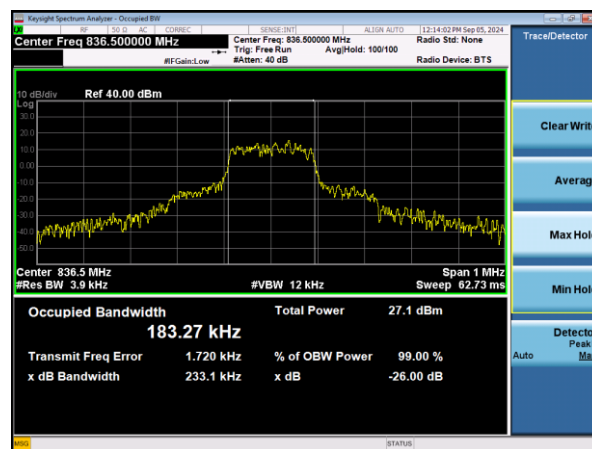
### NB-IoT Band 5 QPSK 15kHz 1@0 CH-High



### NB-IoT Band 5 QPSK 15kHz 12@0 CH-Low



### NB-IoT Band 5 QPSK 15kHz 12@0 CH-Middle

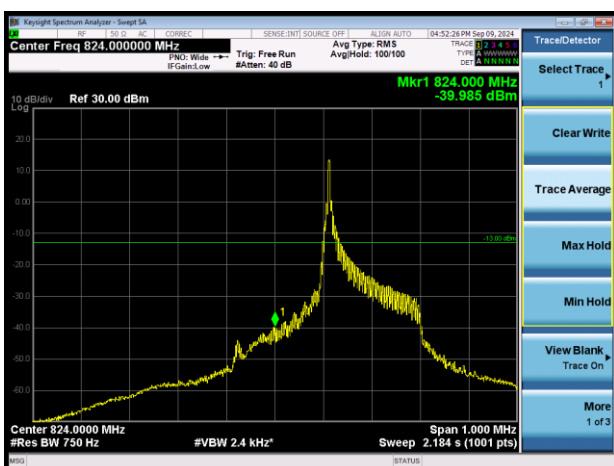


### NB-IoT Band 5 QPSK 15kHz 12@0 CH-High

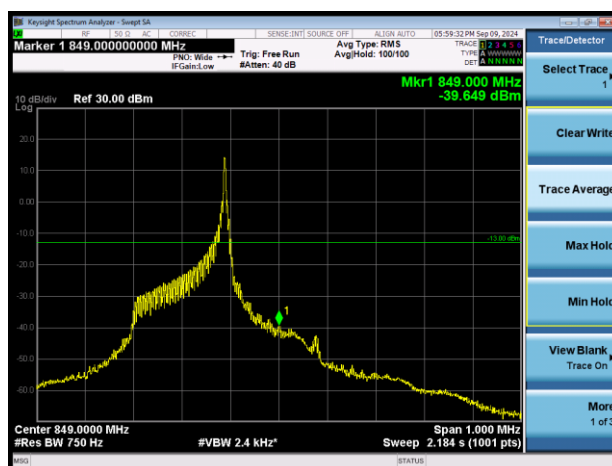


### 6.3. Band Edge Compliance

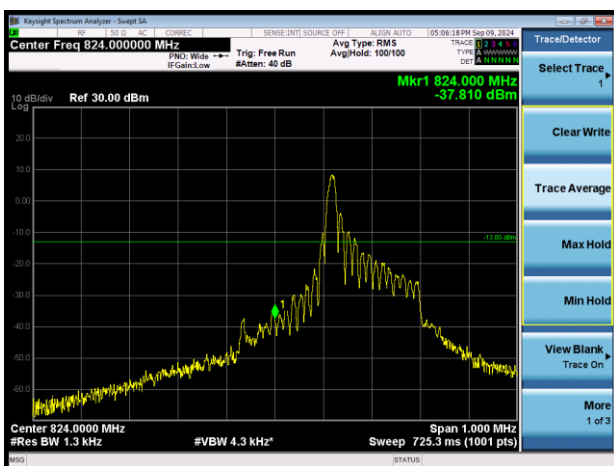
NB-IoT Band 5 BPSK 3.75kHz 1@0 CH-Low



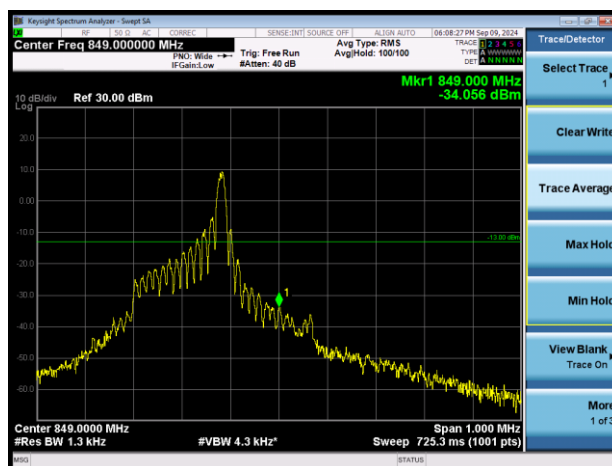
NB-IoT Band 5 BPSK 3.75kHz 1@47 CH-High



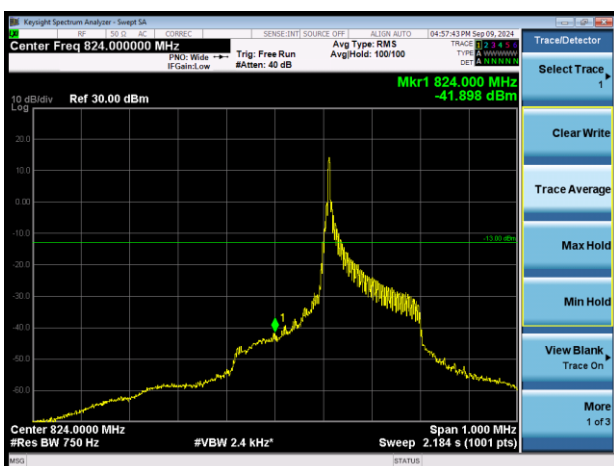
NB-IoT Band 5 BPSK 15kHz 1@0 CH-Low



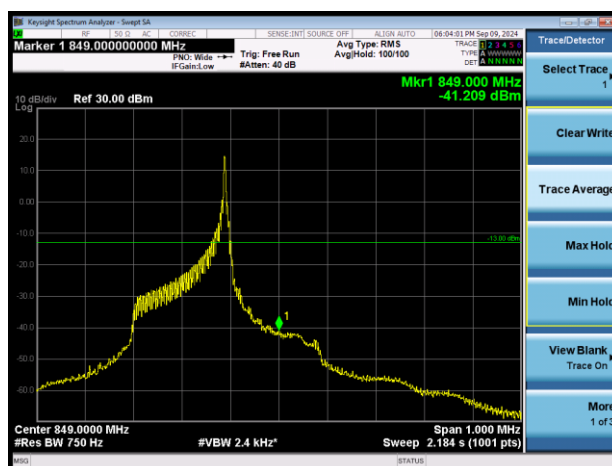
NB-IoT Band 5 BPSK 15kHz 1@11 CH-High



NB-IoT Band 5 QPSK 3.75kHz 1@0 CH-Low

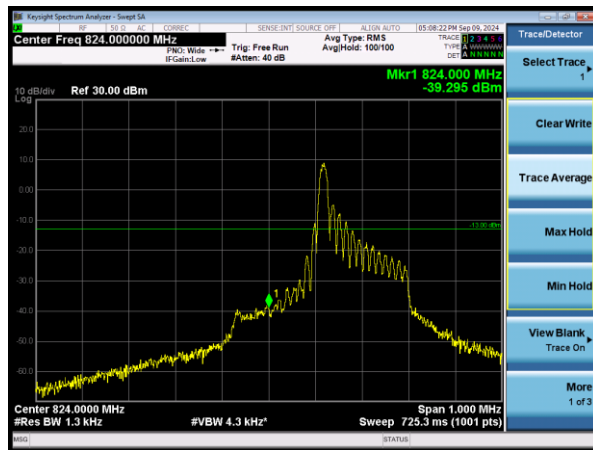


NB-IoT Band 5 QPSK 3.75kHz 1@47 CH-High

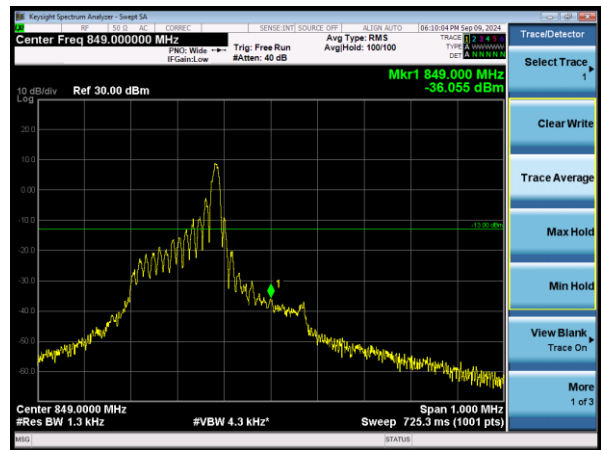




### NB-IoT Band 5 QPSK 15kHz 1@0 CH-Low



### NB-IoT Band 5 QPSK 15kHz 1@11 CH-High



### NB-IoT Band 5 QPSK 15kHz 12@0 CH-Low

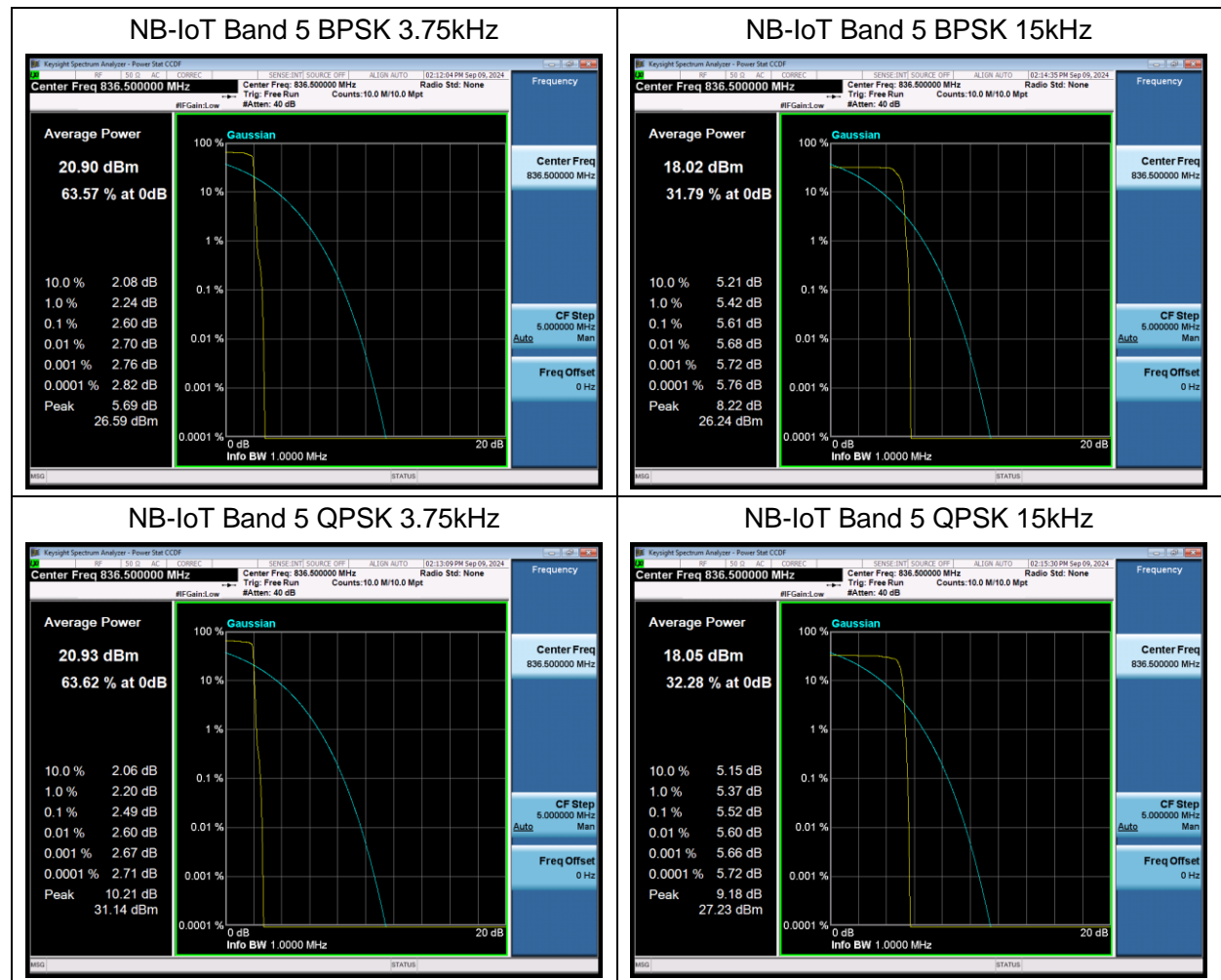


### NB-IoT Band 5 QPSK 15kHz 12@0 CH-High



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

Mode	Modulation	Sub-carrier spacing (KHz)	Channel/ Frequency(MHz)	Peak-to-Average Power Ratio (PAPR)		
				Peak(dBm)	Avg(dBm)	PAPR(dB)
Band 5 Standalone	BPSK	3.75	20525/836.5	23.50	20.90	2.60
	QPSK	3.75	20525/836.5	23.42	20.93	2.49
	BPSK	15	20525/836.5	23.63	18.02	5.61
	QPSK	15	20525/836.5	23.57	18.05	5.52



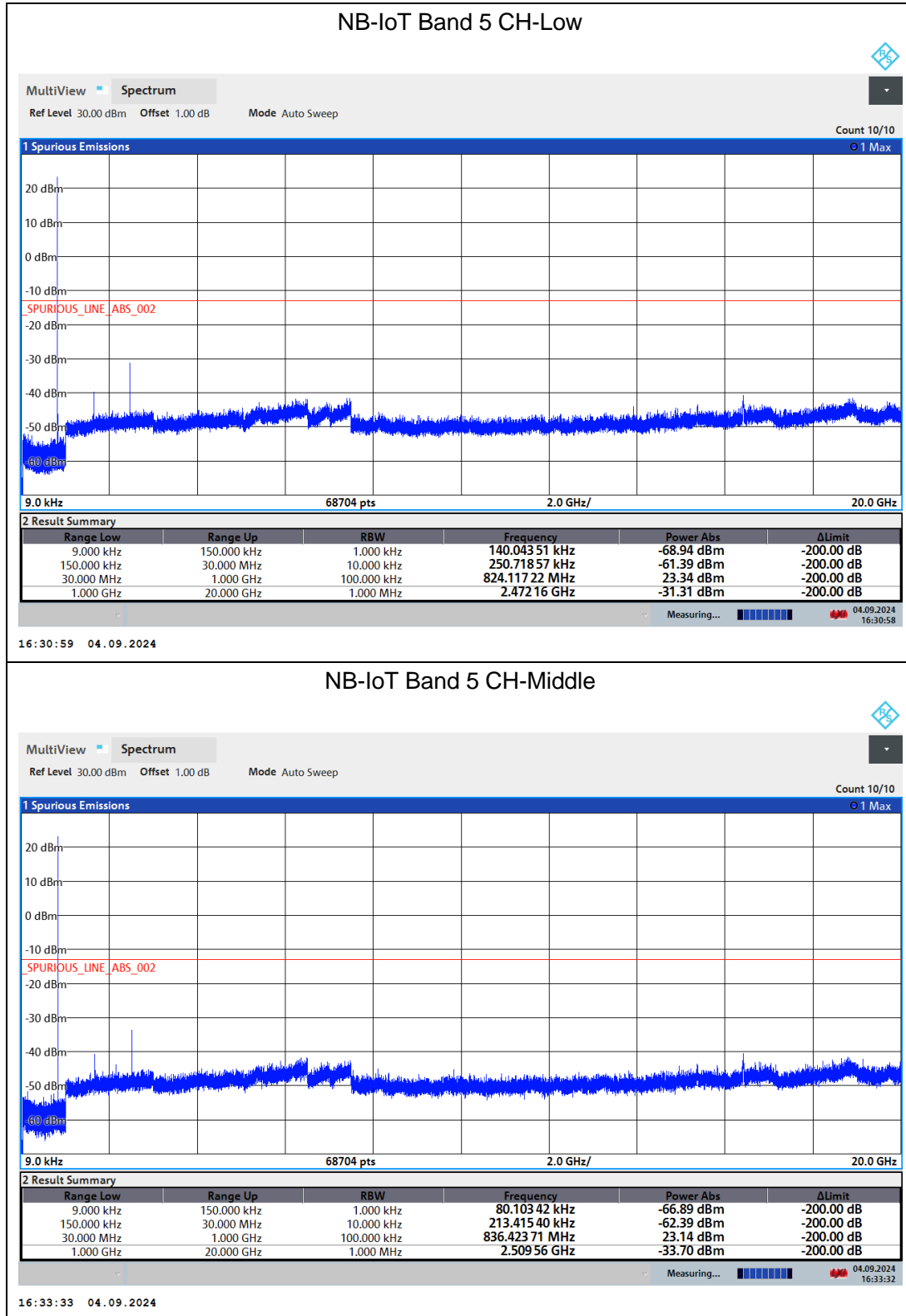
## 6.5. Frequency Stability

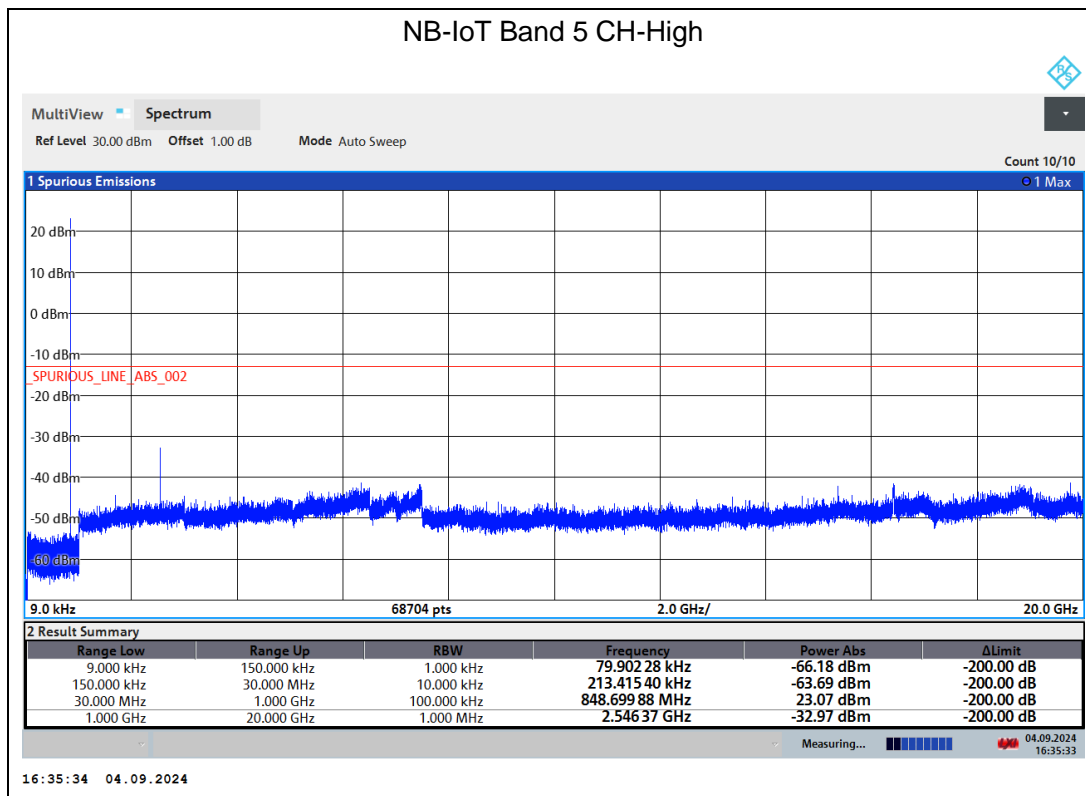
	Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
	BANDWIDTH	3.75					
BAND5	Temperature	Voltage	BPSK	QPSK	BPSK	QPSK	PASS
	Normal (25°C)	Normal	1.11	2.17	0.00059	0.00115	
	Extreme (50°C)		1.86	1.65	0.00099	0.00088	
	Extreme (40°C)		3.98	17.03	0.00212	0.00906	
	Extreme (30°C)		3.49	9.14	0.00186	0.00486	
	Extreme (20°C)		12.83	7.73	0.00682	0.00411	
	Extreme (10°C)		4.59	3.48	0.00244	0.00185	
	Extreme (0°C)		8.99	2.60	0.00478	0.00138	
	Extreme (-10°C)		16.30	16.76	0.00867	0.00892	
	Extreme (-20°C)		7.94	17.01	0.00422	0.00905	
	Extreme (-30°C)		1.50	17.34	0.00080	0.00922	
	25°C	LV	14.10	9.34	0.00750	0.00497	
		HV	11.89	12.92	0.00632	0.00687	
BAND5	Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
	BANDWIDTH	15					
	Temperature	Voltage	BPSK	QPSK	BPSK	QPSK	PASS
	Normal (25°C)	Normal	11.78	15.81	0.00627	0.00841	
	Extreme (50°C)		9.26	6.49	0.00492	0.00345	
	Extreme (40°C)		1.64	17.02	0.00087	0.00906	
	Extreme (30°C)		1.28	4.34	0.00068	0.00231	
	Extreme (20°C)		12.63	1.07	0.00672	0.00057	
	Extreme (10°C)		12.51	7.14	0.00666	0.00380	
	Extreme (0°C)		17.46	8.29	0.00929	0.00441	
	Extreme (-10°C)		8.99	9.93	0.00478	0.00528	
	Extreme (-20°C)		3.80	1.72	0.00202	0.00092	
	Extreme (-30°C)		1.37	13.25	0.00073	0.00705	
	25°C	LV	1.59	14.27	0.00085	0.00759	
		HV	13.75	2.76	0.00731	0.00147	

## 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.





## 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.

NB-IoT Band 5 QPSK 3.75MHz CH-Low

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	Result Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1648.00	-49.52	1.70	8.70	Horizontal	-44.67	-13.00	31.67	25
3	2471.95	-39.00	2.30	12.00	Horizontal	-31.45	-13.00	18.45	175
4	3295.90	-63.45	2.70	12.70	Horizontal	-55.60	-13.00	42.60	14
5	4119.90	-59.74	3.00	12.50	Horizontal	-52.39	-13.00	39.39	23
6	4944.30	-61.72	3.40	12.50	Horizontal	-54.77	-13.00	41.77	3
7	5768.60	-61.25	3.40	12.80	Horizontal	-54.00	-13.00	41.00	99
8	6592.20	-58.11	4.10	11.50	Horizontal	-52.86	-13.00	39.86	78
9	7416.90	-55.79	4.20	12.20	Horizontal	-49.94	-13.00	36.94	135
10	8241.00	-56.91	4.30	12.50	Horizontal	-50.86	-13.00	37.86	48

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.

NB-IoT Band 5 QPSK 3.75MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	Result Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1672.70	-50.97	1.70	8.70	Horizontal	-46.12	-13.00	33.12	23
3	2509.60	-43.80	2.30	12.00	Horizontal	-36.25	-13.00	23.25	14
4	3345.90	-62.76	2.70	12.70	Horizontal	-54.91	-13.00	41.91	79
5	4182.10	-57.22	3.00	12.50	Horizontal	-49.87	-13.00	36.87	14
6	5019.30	-61.68	3.40	12.50	Horizontal	-54.73	-13.00	41.73	89
7	5855.50	-60.60	3.40	12.80	Horizontal	-53.35	-13.00	40.35	76
8	6692.00	-59.20	4.10	11.50	Horizontal	-53.95	-13.00	40.95	135
9	7528.50	-57.07	4.20	12.20	Horizontal	-51.22	-13.00	38.22	48
10	8365.00	-55.72	4.30	12.50	Horizontal	-49.67	-13.00	36.67	92

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.

## NB-IoT Band 5 QPSK 3.75MHz CH-High

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	Result Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1697.60	-55.28	1.70	8.70	Horizontal	-50.43	-13.00	37.43	11
3	2546.50	-44.80	2.30	12.00	Horizontal	-37.25	-13.00	24.25	241
4	3395.10	-64.30	2.70	12.70	Horizontal	-56.45	-13.00	43.45	135
5	4244.10	-56.84	3.00	12.50	Horizontal	-49.49	-13.00	36.49	1
6	5093.30	-61.62	3.40	12.50	Horizontal	-54.67	-13.00	41.67	78
7	5942.30	-61.77	3.40	12.80	Horizontal	-54.52	-13.00	41.52	30
8	6791.20	-59.44	4.10	11.50	Horizontal	-54.19	-13.00	41.19	2
9	7640.10	-57.04	4.20	12.20	Horizontal	-51.19	-13.00	38.19	90
10	8489.00	-54.86	4.30	12.50	Horizontal	-48.81	-13.00	35.81	12

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.

## 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
Spectrum Analyzer	Keysight	N9020A	MY50510203	2024-05-07	2025-05-06
Wireless Communication Tester	StarPoint	SP8315	SP8315-1225	2024-05-08	2025-05-07
DC Power Supply	UNI-T	UTP1310+	C220795889	2024-05-08	2025-05-07
Spectrum Analyzer	R&S	FSV3030	101411	2023-12-05	2024-12-04
Attenuator	HASCO	HA18A-10	0003	/	/
Spectrum Analyzer	R&S	FSV30	104028	2024-05-07	2025-05-06
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	1439	2024-07-06	2027-07-05
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 \*\*\*\*\*