RF TEST REPORT

Applicant	Quectel Wireless Solutions Co., Ltd
FCC ID	XMR201807BC95D
Product	NB-IoT Module
Brand	Quectel
Model	BC95-D
Report No.	R1806A0285-R1V1
Issue Date	July 12, 2018

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2017)/ FCC CFR47 Part 27C (2017)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Performed by: Jiangpeng Lan	*Approved by: Kai Xu*

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Table of Contents

Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	RF power output	2.1046	PASS
2	Effective Isotropic Radiated power	27.50(d)(9)	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	27.53(h)	PASS
5	Peak-to-Average Power Ratio	27.50(d)/KDB971168 D01(5.7)	PASS
6	Frequency Stability	2.1055 / 27.54	PASS
7	Spurious Emissions at Antenna Terminals	2.1051 /27.53(h)	PASS
8	Radiates Spurious Emission	2.1053 /27.53(h)	PASS
Date of Testing: June 11, 2018 ~ June 22, 2018			
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.			

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

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

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

1.3 Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City:	Shanghai
Post code:	201201
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2 General Description of Equipment under Test

Client Information

Applicant	Quectel Wireless Solutions Co., Ltd
Applicant address	7th Floor, Hongye Building, No.1801 Hongmei Road, Xuhui District, Shanghai 200233, China
Manufacturer	Quectel Wireless Solutions Co., Ltd
Manufacturer address	7th Floor, Hongye Building, No.1801 Hongmei Road, Xuhui District, Shanghai 200233, China

General information

EUT Description			
Model	BC95-D		
IMEI	866786040000140		
Hardware Version	V3.1		
Software Version	BC95DJAR01A04		
Power Supply	External Power Supply		
Antenna Type	The EUT don't have standard Antenna, The Antenna used for testing in this report is the after-market accessory (Dipole Antenna)		
Test Mode(s)	NB-IOT Band 111; NB-IOT Band 222		
Test Modulation	BPSK, QPSK		
Category	NB1		
Deployment	stand-alone		
Sub-carrier spacing	3.75KHz, 15KHz		
Ntones	single, multi-tone		
Maximum E.I.R.P./ E.R.P.	NB-IOT Band 111:	22.69dBm	
	NB-IOT Band 222:	22.63dBm	
Rated Power Supply Voltage:	3.6V		
Extreme Voltage	Minimum: 3.1V Maximum: 4.2V		
Extreme Temperature	Lowest: -40°C Highest: +85°C		
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	NB-IOT Band 111	1915.1 ~ 1919.9	722.1 ~ 727.9
	NB-IOT Band 222	1915.1 ~ 1919.9	1995.1 ~ 2019.9
Note: 1. The information of the EUT is declared by the manufacturer.			

Accessory equipment	
Evaluation Board	RF Cable
Dipole Antenna (MAX. Antenna Gain=4dBi)	DC 5V Adaptor

3 Applied Standards

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

Test standards

FCC CFR47 Part 2 (2017)

FCC CFR47 Part 27C (2017)

ANSI/TIA-603-E (2016)

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 (X axis, horizontal polarization) 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 NB-IOT is set based on the maximum RF Output Power.
The following testing in different Bandwidth is set to detailin the following table:

Test modes are chosen to be reported as the worst case configuration below for NB-IOT Band 111/ NB-IOT Band 222:

Test items	Modes	Deployment mode	Subcarrier Spacing (kHz)		Modulation		Test Channel		
		Stand-alone	3.75	15	BPSK	QPSK	L	M	H
RF power output	NB-IOT B111	O	O	O	O	O	O	O	O
	NB-IOT B222	O	O	O	O	O	O	O	O
Effective Isotropic Radiated power	NB-IOT B111	O	O	O	O	O	O	O	O
	NB-IOT B222	O	O	O	O	O	O	O	O
Occupied Bandwidth	NB-IOT B111	O	O	O	O	O	O	O	O
	NB-IOT B222	O	O	O	O	O	O	O	O
Band Edge Compliance	NB-IOT B111	O	O	O	O	O	O	-	O
	NB-IOT B222	O	O	O	O	O	O	-	O
Peak-to-Average Power Ratio	NB-IOT B111	O	O	O	O	O	-	O	-
	NB-IOT B222	O	O	O	O	O	-	O	-
Frequency Stability	NB-IOT B111	O	O	O	O	O	O	-	O
	NB-IOT B222	O	O	O	O	O	O	-	O
Spurious Emissions at Antenna Terminals	NB-IOT B111	O	O	-	-	O	O	O	O
	NB-IOT B222	O	O	-	-	O	O	O	O
Radiates Spurious Emission	NB-IOT B111	O	O	-	-	O	O	O	O
	NB-IOT B222	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

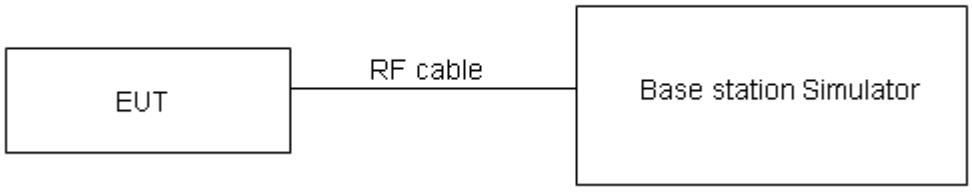
Ambient condition

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

Methods of Measurement

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

Test Setup



The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.

Limits

No specific RF power output requirements in part 2.1046.

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	Modulation	Sub-carrier spacing (KHz)	Ntones	Conducted Power (dBm) for low/mid/high channel		
				32113/1915.2	32136/1917.5	32159/1919.8
NB-IOT Band111 Standalone	BPSK	3.75	1@0	23.77	23.72	23.68
			1@47	23.72	23.75	23.67
		15	1@0	23.77	23.76	23.74
			1@11	23.80	23.71	23.76
	QPSK	3.75	1@0	23.74	23.72	23.69
			1@47	23.72	23.69	23.69
		15	1@0	23.79	23.74	23.76
			1@11	23.83	23.77	23.79
		15	12@0	23.35	23.11	23.18

Mode	Modulation	Sub-carrier spacing (KHz)	Ntones	Conducted Power (dBm) for low/mid/high channel		
				31113/1915.2	31136/1917.5	31159/1919.8
NB-IOT Band222 Standalone	BPSK	3.75	1@0	23.72	23.71	23.68
			1@47	23.70	23.69	23.65
		15	1@0	23.59	23.65	23.70
			1@11	23.57	23.63	23.69
	QPSK	3.75	1@0	23.73	23.72	23.69
			1@47	23.70	23.65	23.70
		15	1@0	23.62	23.61	23.66
			1@11	23.65	23.63	23.58
		15	12@0	22.98	23.07	23.15

5.2 Effective Isotropic Radiated Power

Ambient condition

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

Methods of Measurement

1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI/TIA-603-E (2016).

a) Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.

b) Key the transmitter, then rotate the EUT 360° azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).

c) Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.

d) Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading.LOSS = Generator Output Power (dBm) – Analyzer reading (dBm)

e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation:ERP (dBm) = LVL (dBm) + LOSS (dB)

f) The maximum ERP is the maximum value determined in the preceding step.

g) When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g.transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and the point where power is applied to the antenna. ERP can then be calculated as follows:

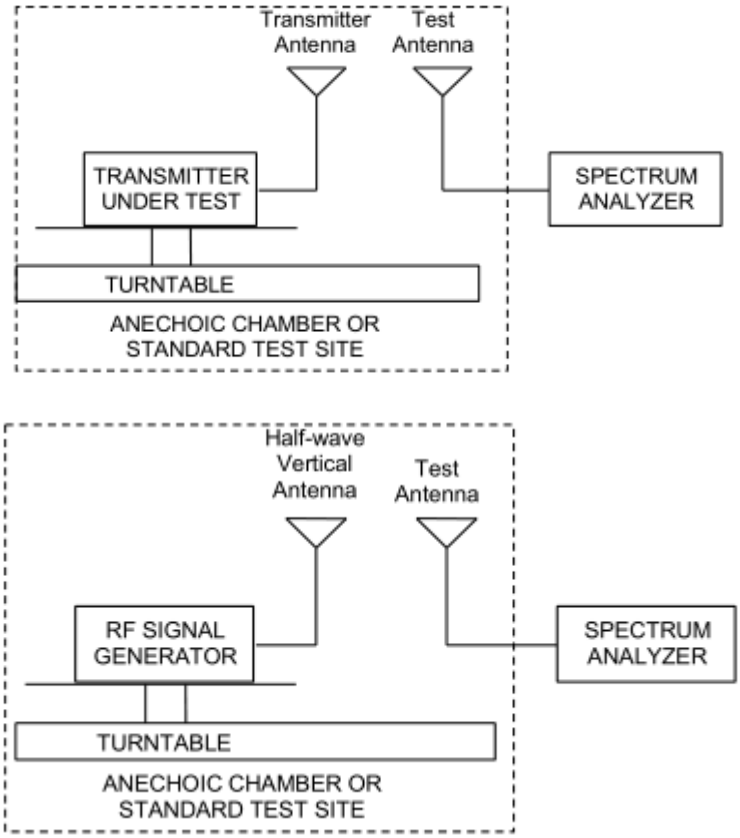
ERP (dBm) = Output Power (dBm) - Losses (dB) + Antenna Gain (dBd)

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

EIRP (dBm) = ERP (dBm) + 2.15 (dB.)

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

Test setup



Note: Area side:2.4mX3.6m

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

Limits

Rule Part 27.50(d) (9) Fixed, mobile and portable (hand-held) stations operating in the 1915-1920 MHz band are limited to 300 milliwatts EIRP

Part 27.50(d)(9)Limit	≤ 300 mW (24.77 dBm)

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 1.19 dB

Test Results

The measurement is performed for both of horizontal and vertical antenna Polarization, and only the data of worst mode is recorded in this report.

Mode	Channel	Frequency (MHz)	Modulation	Polarization	Sub-carrier spacing (KHz)	Ntones	EIRP (dBm)	Limit (dBm)	Conclusion
NB-IOT Band111	32113	1915.2	BPSK	H	3.75	1@0	22.15	24.77	Pass
			QPSK	H	3.75	1@0	22.19	24.77	Pass
			BPSK	H	15	1@0	22.58	24.77	Pass
			QPSK	H	15	1@0	22.69	24.77	Pass
	32136	1917.5	BPSK	H	3.75	1@0	22.06	24.77	Pass
			QPSK	H	3.75	1@0	22.10	24.77	Pass
			BPSK	H	15	1@0	22.52	24.77	Pass
			QPSK	H	15	1@0	22.64	24.77	Pass
	32159	1919.8	BPSK	H	3.75	1@0	22.51	24.77	Pass
			QPSK	H	3.75	1@0	22.65	24.77	Pass
			BPSK	H	15	1@0	22.21	24.77	Pass
			QPSK	H	15	1@0	22.19	24.77	Pass
NB-IOT Band 222	31113	1915.2	BPSK	H	3.75	1@0	22.13	24.77	Pass
			QPSK	H	3.75	1@0	22.17	24.77	Pass
			BPSK	H	15	1@0	22.45	24.77	Pass
			QPSK	H	15	1@0	22.58	24.77	Pass
	31136	1917.5	BPSK	H	3.75	1@0	22.01	24.77	Pass
			QPSK	H	3.75	1@0	22.08	24.77	Pass
			BPSK	H	15	1@0	22.31	24.77	Pass
			QPSK	H	15	1@0	22.43	24.77	Pass
	31159	1919.8	BPSK	H	3.75	1@0	22.50	24.77	Pass
			QPSK	H	3.75	1@0	22.63	24.77	Pass
			BPSK	H	15	1@0	22.20	24.77	Pass
			QPSK	H	15	1@0	22.16	24.77	Pass

5.3 Occupied Bandwidth

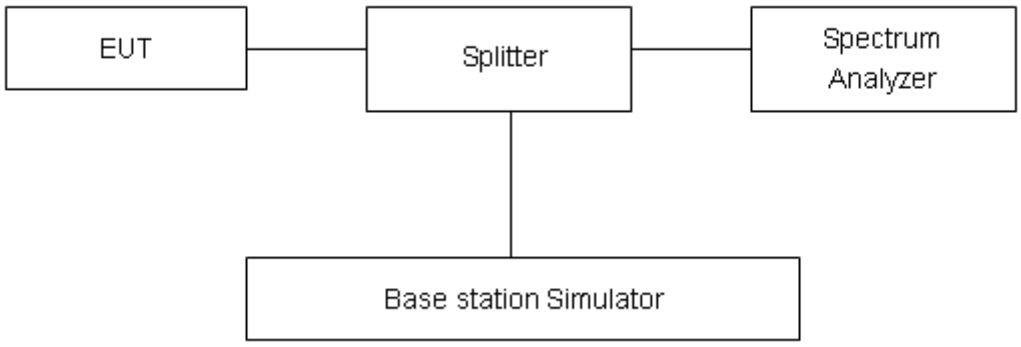
Ambient condition

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 2kHz, VBW is set to 6.2kHz for NB-IOT Band 111/ NB-IOT Band 222.
99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

No specific occupied bandwidth requirements in part 2.1049.

Measurement Uncertainty

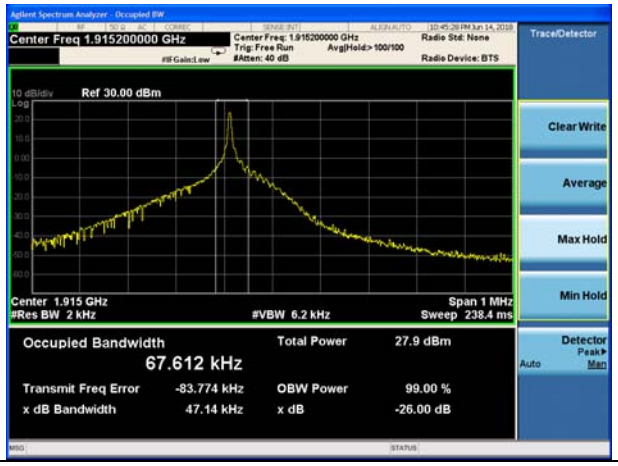
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U=624Hz.

Test Result

Mode	Modulation	Sub-carrier spacing (KHz)	Ntones	Bandwidth(KHz) for low/mid/high channel					
				32113/1915.2		32136/1917.5		32159/1919.8	
				99% Power	-26dBc	99% Power	-26dBc	99% Power	-26dBc
NB-IOT Band 111	BPSK	3.75	1@0	67.61	47.14	68.66	47.59	68.94	47.14
	QPSK	3.75	1@0	76.82	53.39	75.68	52.15	79.71	55.44
	BPSK	15	1@0	90.67	109.60	93.94	124.00	88.56	120.60
	QPSK	15	1@0	100.05	126.40	106.82	139.60	106.82	139.90
	QPSK	15	12@0	197.37	295.00	191.12	304.30	191.99	273.90

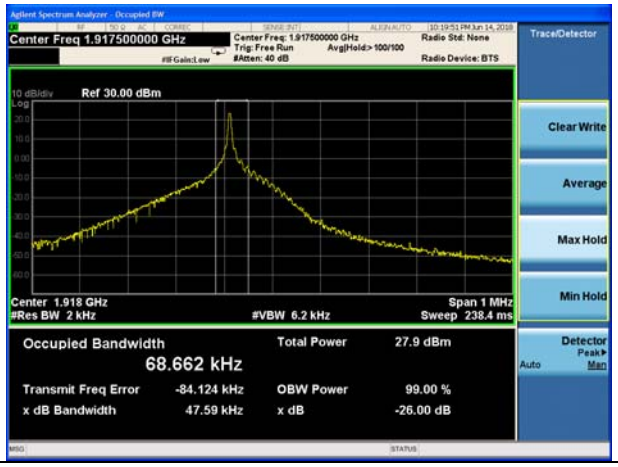
Mode	Modulation	Sub-carrier spacing (KHz)	Ntones	Bandwidth(KHz) for low/mid/high channel					
				31113/1915.2		31136/1917.5		31159/1919.8	
				99% Power	-26dBc	99% Power	-26dBc	99% Power	-26dBc
NB-IOT Band 222	BPSK	3.75	1@0	67.10	47.41	67.74	47.16	69.90	49.20
	QPSK	3.75	1@0	76.69	52.98	78.02	54.48	81.08	54.95
	BPSK	15	1@0	90.02	120.60	91.69	120.70	88.67	119.20
	QPSK	15	1@0	100.94	138.60	106.61	140.20	108.30	139.40
	QPSK	15	12@0	188.83	259.40	199.74	309.9	198.74	320.50

NB-IOT Band 111 BPSK 3.75kHz 1@0 CH-Low



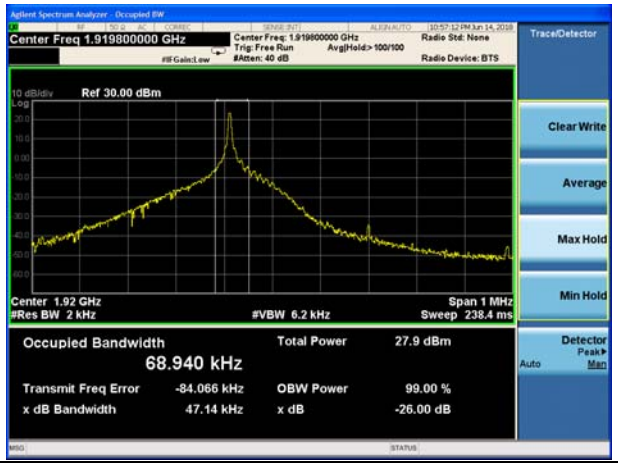
NB-IOT Band 111 BPSK 15kHz 1@0 CH-Low

NB-IOT Band 111 BPSK 3.75kHz 1@0 CH-Middle



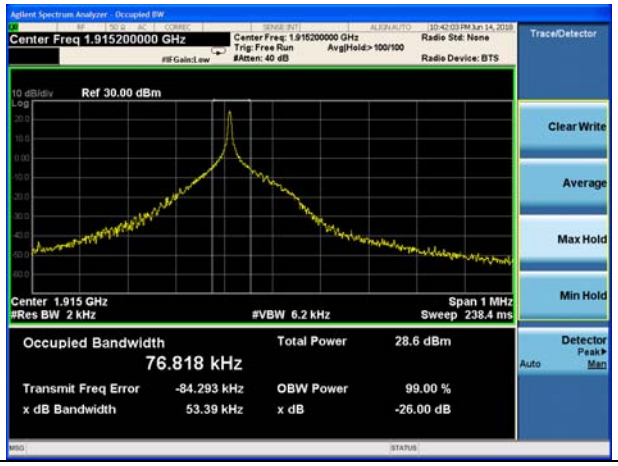
NB-IOT Band 111 BPSK 15kHz 1@0 CH-Middle

NB-IOT Band 111 BPSK 3.75kHz 1@0 CH-High

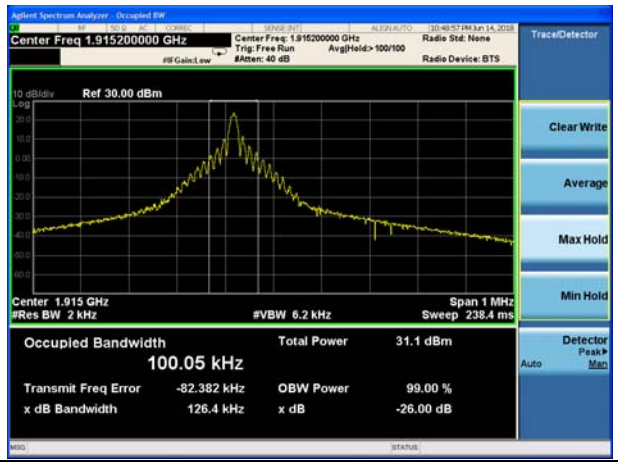


NB-IOT Band 111BPSK 15kHz 1@0 CH-High

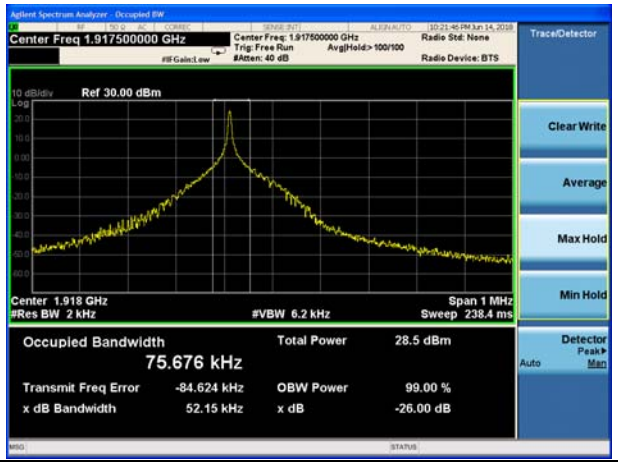
NB-IOT Band 111 QPSK 3.75kHz 1@0 CH-Low



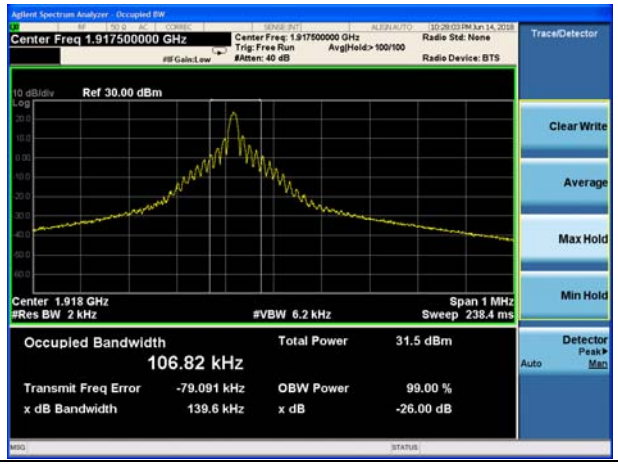
NB-IOT Band 111 QPSK 15kHz 1@0 CH-Low



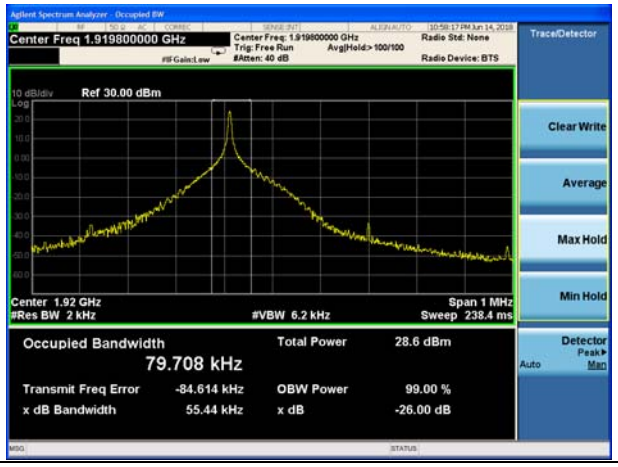
NB-IOT Band 111 QPSK 3.75kHz 1@0 CH-Middle



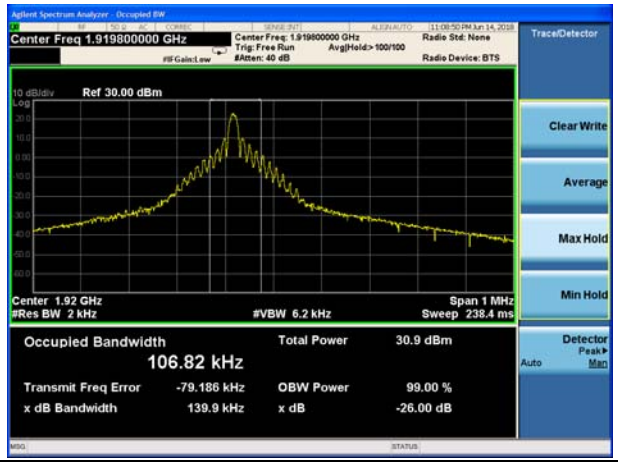
NB-IOT Band 111 QPSK 15kHz 1@0 CH-Middle



NB-IOT Band 111 QPSK 3.75kHz 1@0 CH-High

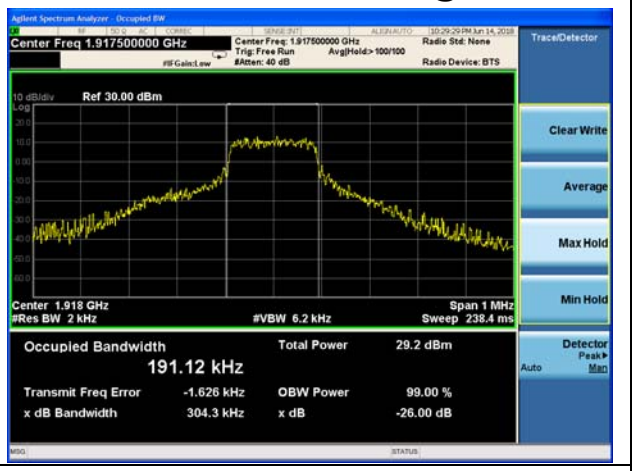


NB-IOT Band 111 QPSK 15kHz 1@0 CH-High



NB-IOT Band 111 QPSK 15kHz 12@0 CH-Low

NB-IOT Band 111 QPSK 15kHz 12@0 CH-Middle

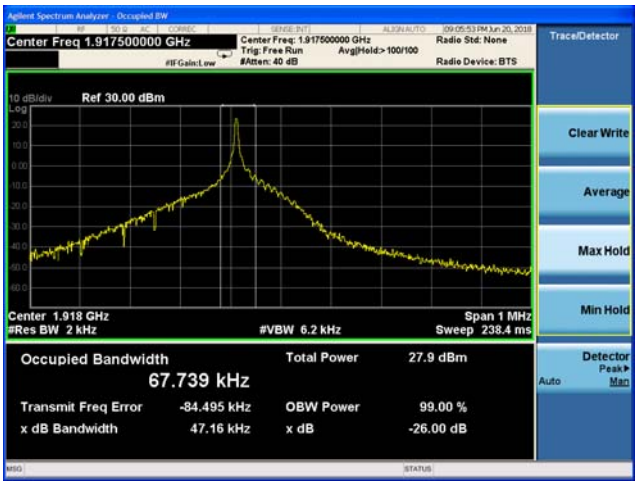


NB-IOT Band 111 QPSK 15kHz 12@0 CH-High

NB-IOT Band 222 BPSK 3.75kHz 1@0 CH-Low

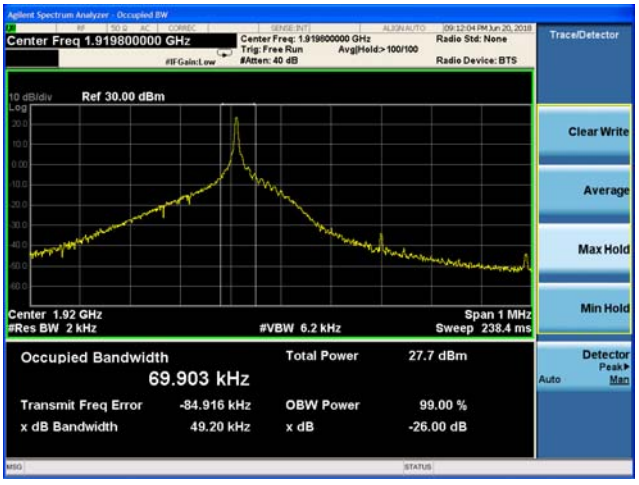
NB-IOT Band 222 BPSK 15kHz 1@0 CH-Low

NB-IOT Band 222 BPSK 3.75kHz 1@0 CH-Middle



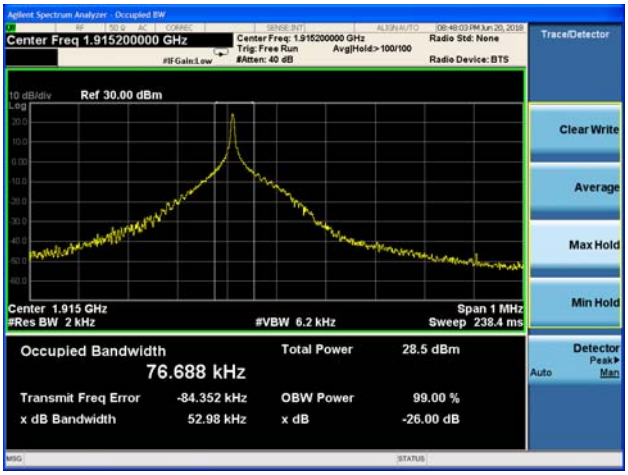
NB-IOT Band 222 BPSK 15kHz 1@0 CH-Middle

NB-IOT Band 222 BPSK 3.75kHz 1@0 CH-High

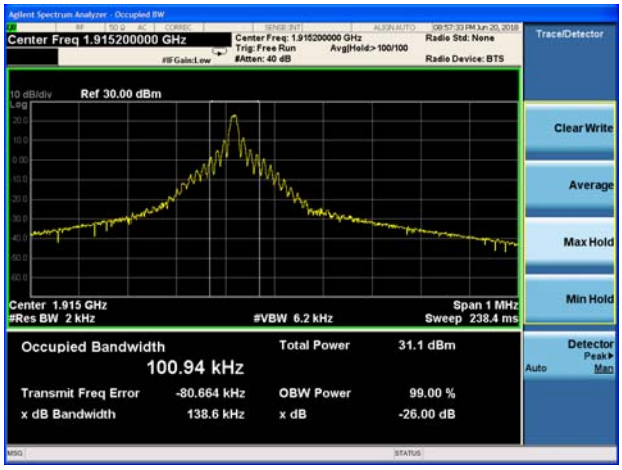


NB-IOT Band 222BPSK 15kHz 1@0 CH-High

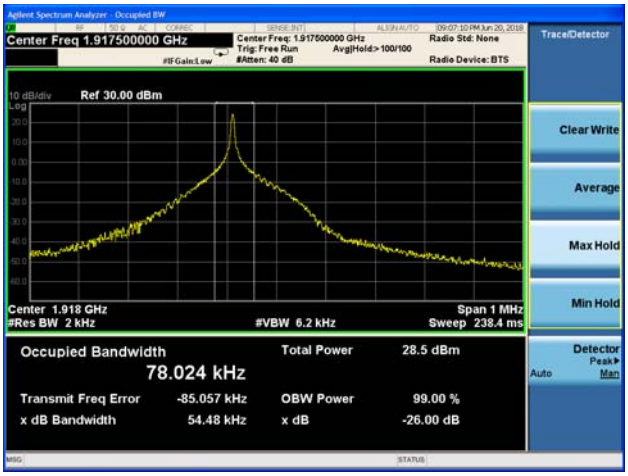
NB-IOT Band 222 QPSK 3.75kHz 1@0 CH-Low



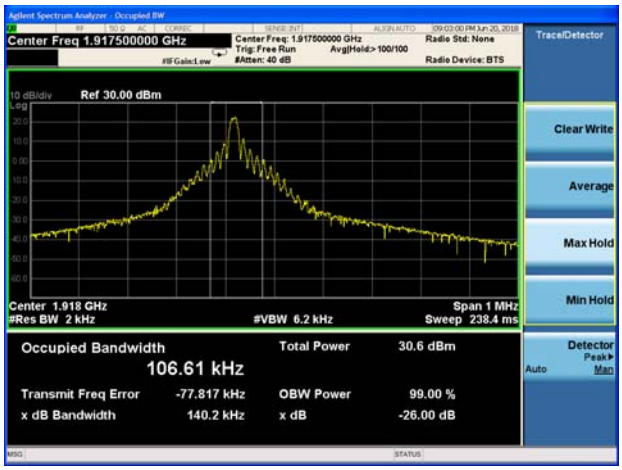
NB-IOT Band 222 QPSK 15kHz 1@0 CH-Low



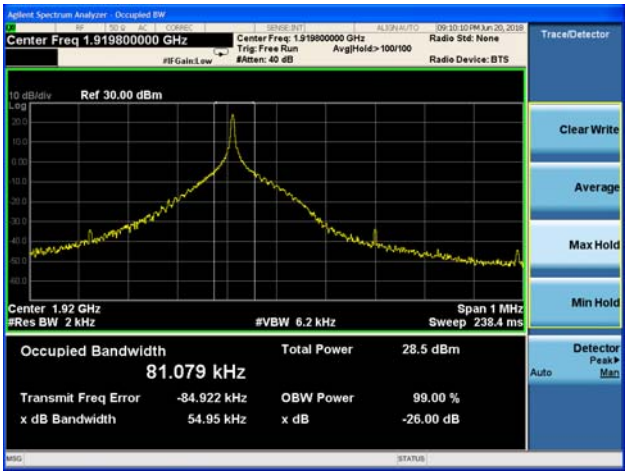
NB-IOT Band 222 QPSK 3.75kHz 1@0 CH-Middle



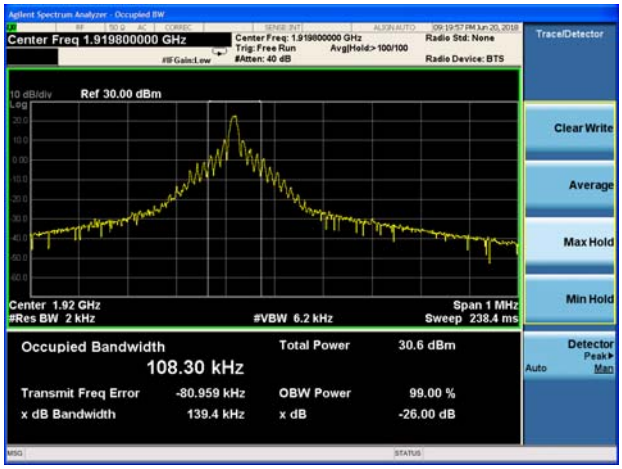
NB-IOT Band 222 QPSK 15kHz 1@0 CH-Middle



NB-IOT Band 222 QPSK 3.75kHz 1@0 CH-High



NB-IOT Band 222 QPSK 15kHz 1@0 CH-High



NB-IOT Band 222 QPSK 15kHz 12@0 CH-Low

NB-IOT Band 222 QPSK 15kHz 12@0 CH-Middle

NB-IOT Band 222 QPSK 15kHz 12@0 CH-High

5.4 Band Edge Compliance

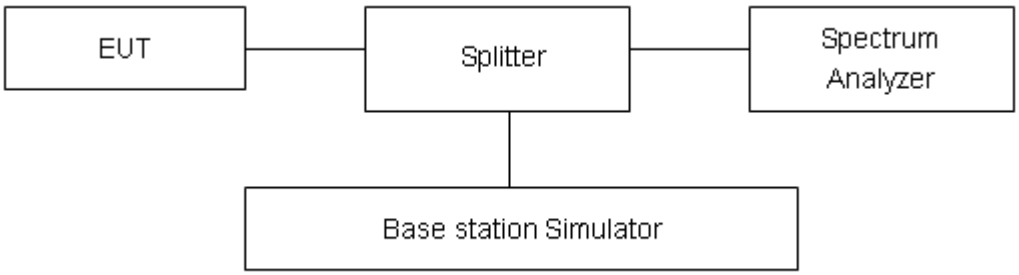
Ambient condition

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 testing follows KDB 971168 D01 v03r01 Section 6.0
1.The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured.
3. RBW is set to 51Hz, VBW is set to 160Hz for 3.75KHz single carrier,
RBW is set to 200Hz, VBW is set to 620Hz for 15KHz single carrier,
RBW is set to 2kHz, VBW is set to 6.2KHz for 15KHz full carrier,
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. Checked that all the results comply with the emission limit line.

Test Setup



Limits

Rule Part 27.53(h)/ specifies that " for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$ (P) dB"

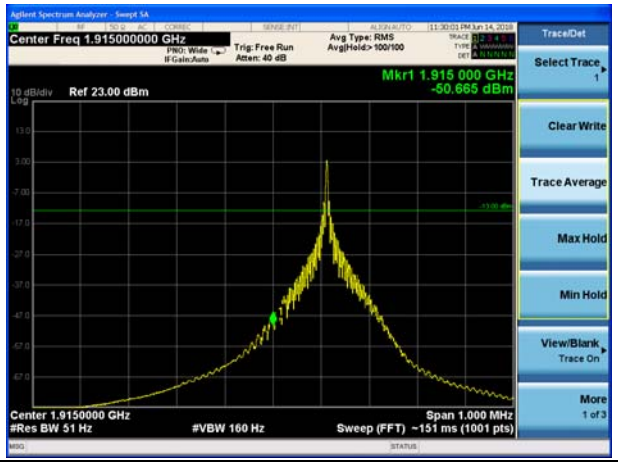
Measurement Uncertainty

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

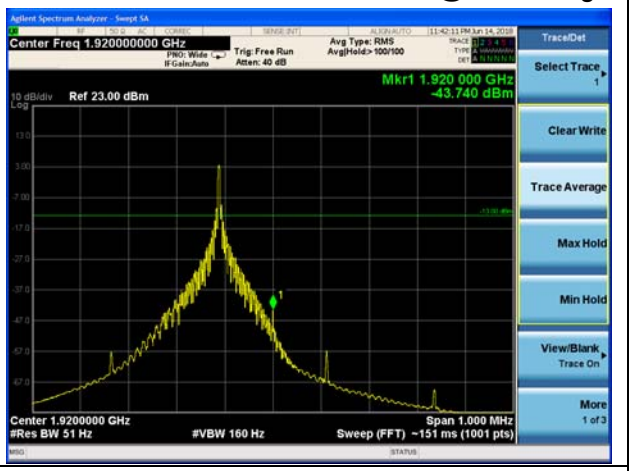
Test Result

All the test traces in the plots shows the test results clearly.

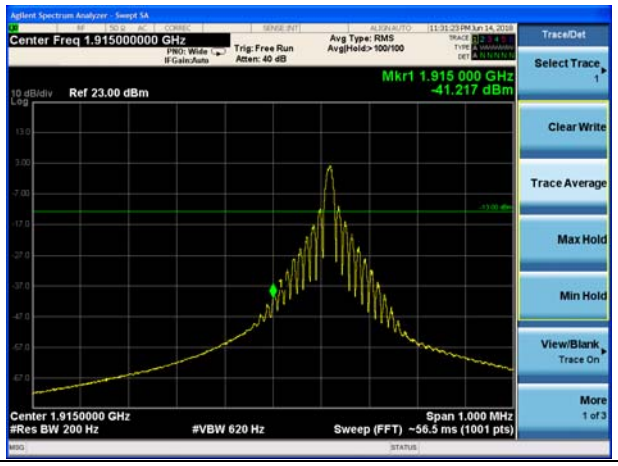
NB-IOT Band 111 BPSK 3.75kHz 1@0 CH-Low



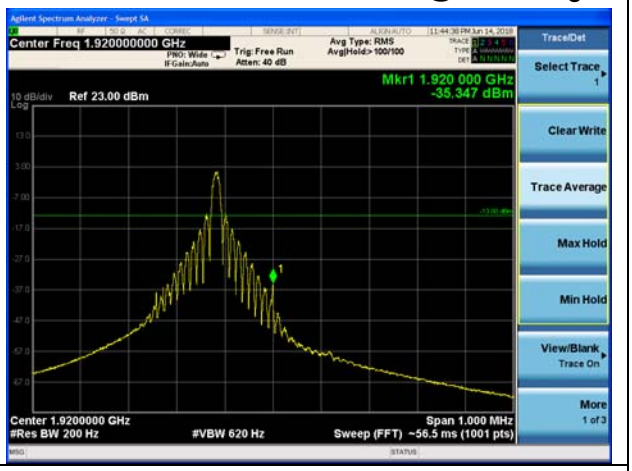
NB-IOT Band 111 BPSK 3.75kHz 1@47 CH-High



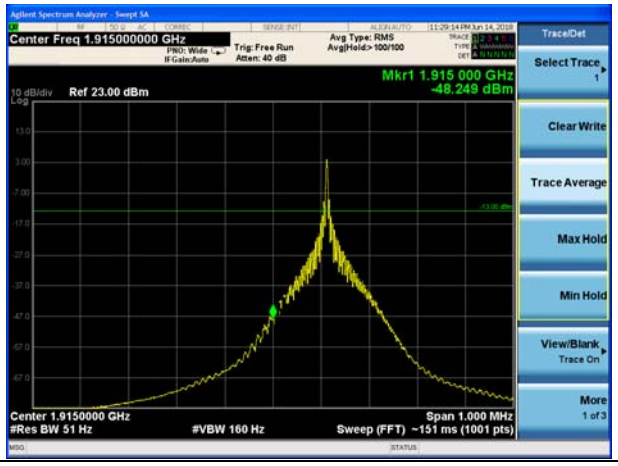
NB-IOT Band 111 BPSK 15kHz 1@0 CH-Low



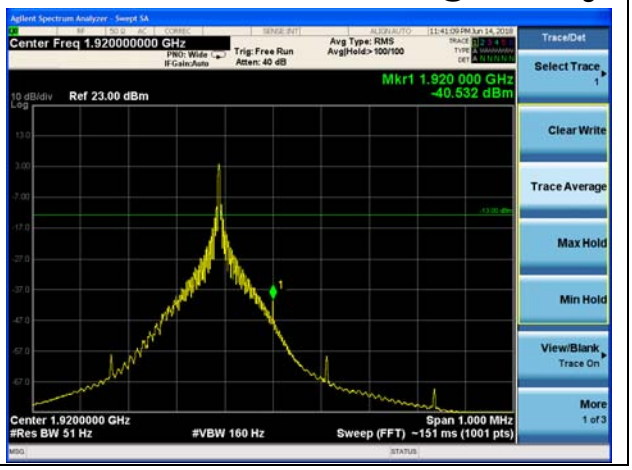
NB-IOT Band 111 BPSK 15kHz 1@11 CH-High



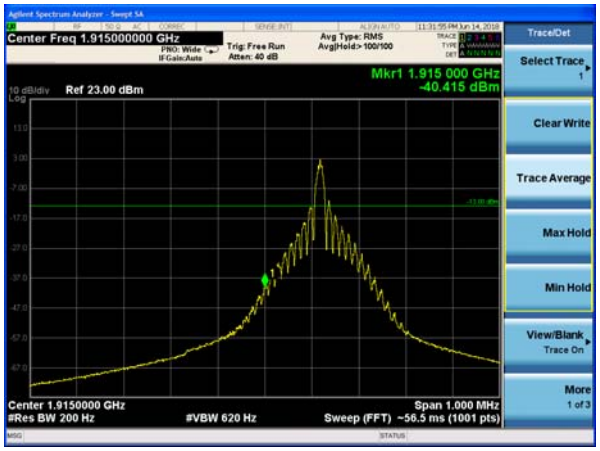
NB-IOT Band 111 QPSK 3.75kHz 1@0 CH-Low



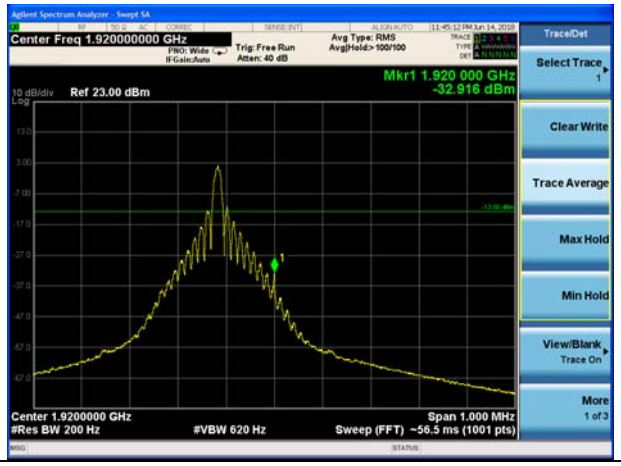
NB-IOT Band 111 QPSK 3.75kHz 1@47 CH-High



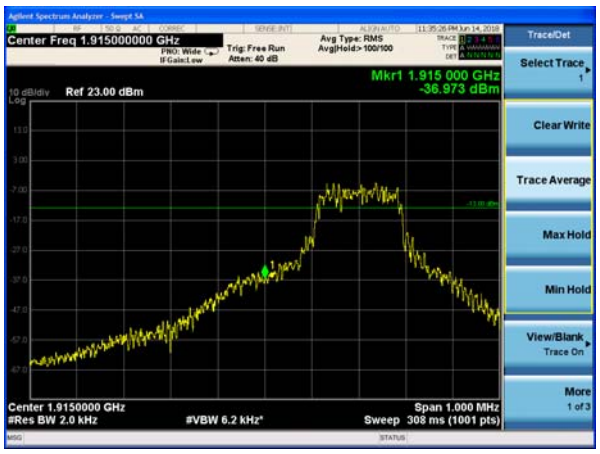
NB-IOT Band 111 QPSK 15kHz 1@0 CH-Low



NB-IOT Band 111 QPSK 15kHz 1@11 CH-High

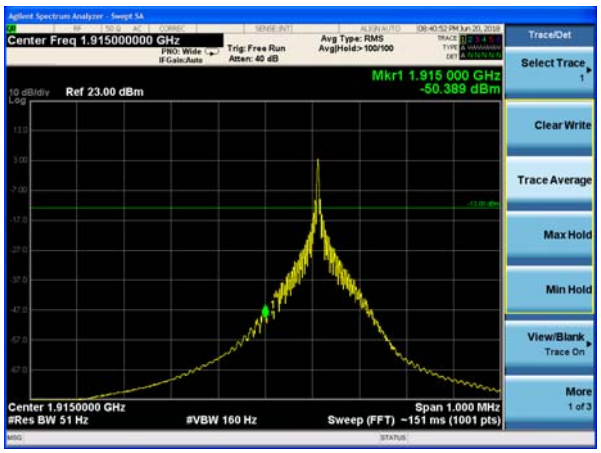


NB-IOT Band 111 QPSK 15kHz 12@0 CH-Low

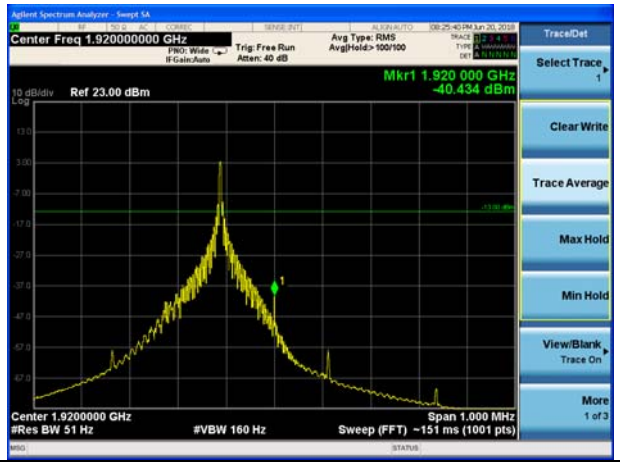


NB-IOT Band 111QPSK 15kHz 12@0 CH-High

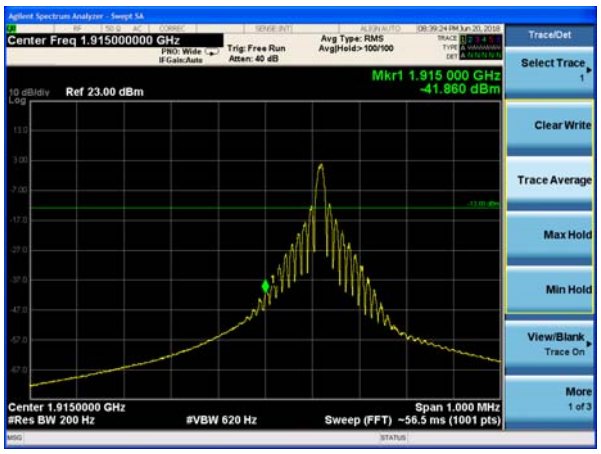
NB-IOT Band 222 BPSK 3.75kHz 1@0 CH-Low



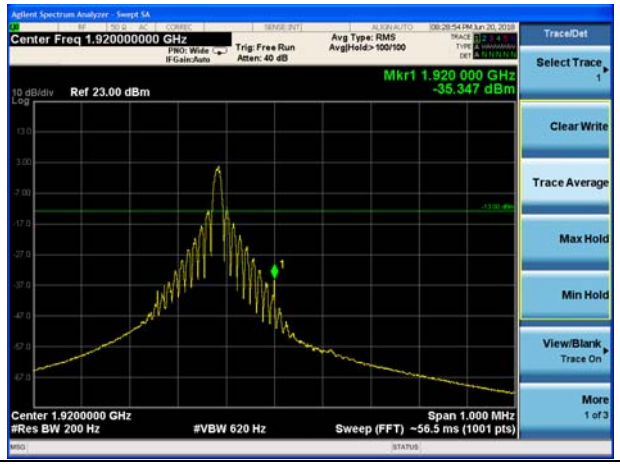
NB-IOT Band 222 BPSK 3.75kHz 1@47 CH-High



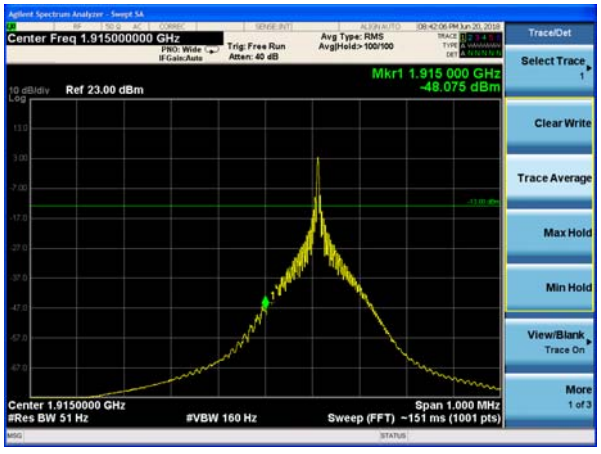
NB-IOT Band 222 BPSK 15kHz 1@0 CH-Low



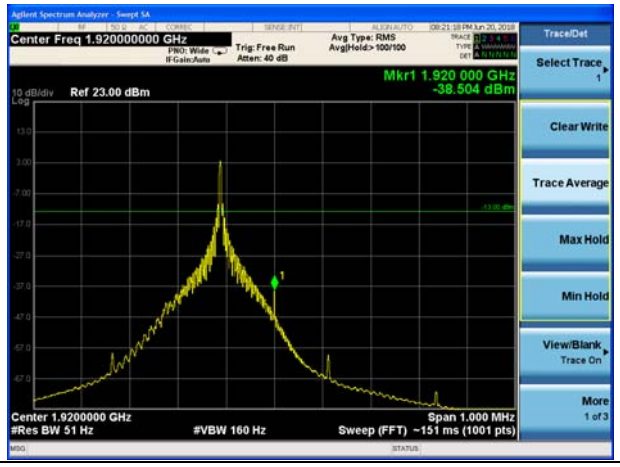
NB-IOT Band 222 BPSK 15kHz 1@11 CH-High



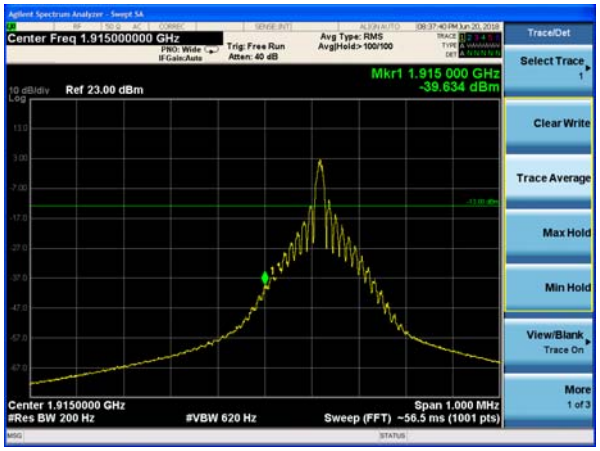
NB-IOT Band 222 QPSK 3.75kHz 1@0 CH-Low



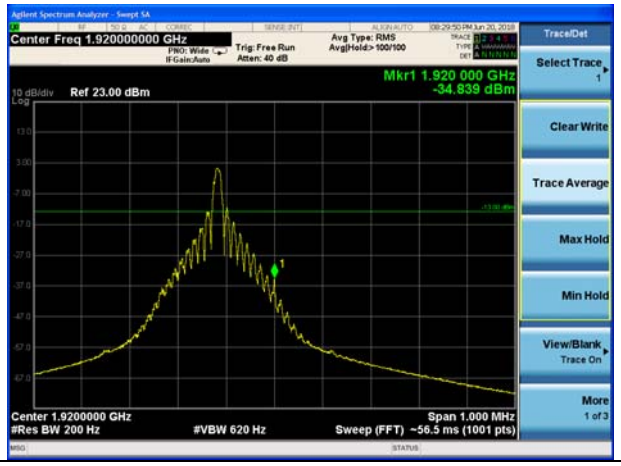
NB-IOT Band 222 QPSK 3.75kHz 1@47 CH-High



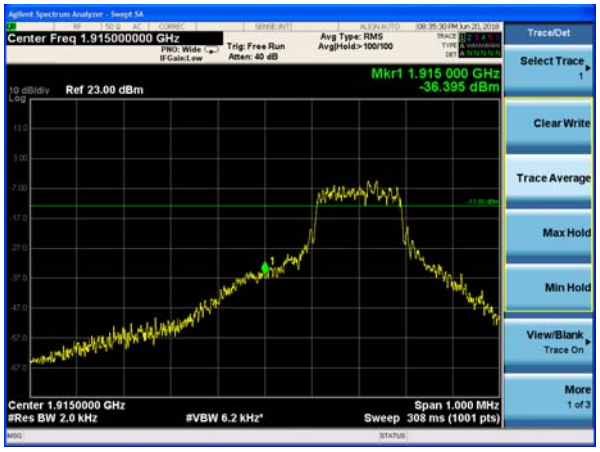
NB-IOT Band 222 QPSK 15kHz 1@0 CH-Low



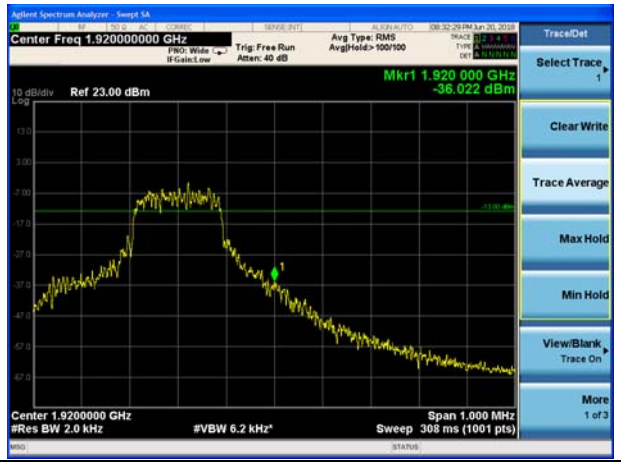
NB-IOT Band 222 QPSK 15kHz 1@11 CH-High



NB-IOT Band 222 QPSK 15kHz 12@0 CH-Low



NB-IOT Band 222QPSK 15kHz 12@0 CH-High



5.5 Peak-to-Average Power Ratio (PAPR)

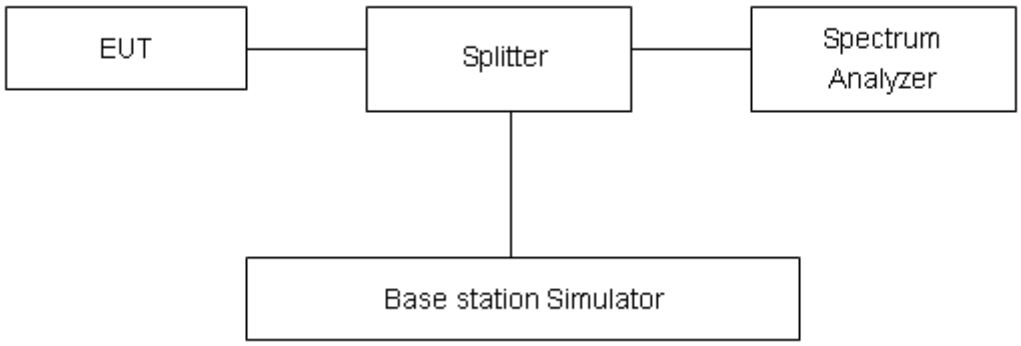
Ambient condition

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

Methods of Measurement

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

Test Setup



Limits

Rule Part 27.50(d)(5) Equipment employed must be authorized in accordance with the provisions of 24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for thenormal distribution is with the coverage factor k = 2, U= 0.4 dB.

Test Results

Mode	Modulation	Sub-carrier spacing (KHz)	Channel/ Frequency (MHz)	Peak-to-Average Power Ratio (PAPR)			Limit (dB)	Conclusion
				Peak (dBm)	Avg (dBm)	PAPR (dB)		
NB-IOT Band 111	BPSK	3.75	32136/1917.5	26.15	23.72	2.43	≤13	PASS
	QPSK	3.75	32136/1917.5	26.41	23.72	2.69	≤13	PASS
	BPSK	15	32136/1917.5	29.24	23.76	5.48	≤13	PASS
	QPSK	15	32136/1917.5	29.39	23.74	5.65	≤13	PASS
Mode	Modulation	Sub-carrier spacing (KHz)	Channel/ Frequency (MHz)	Peak-to-Average Power Ratio (PAPR)			Limit (dB)	Conclusion
				Peak (dBm)	Avg (dBm)	PAPR (dB)		
NB-IOT Band 222	BPSK	3.75	31136/1917.5	26.11	23.71	2.40	≤13	PASS
	QPSK	3.75	31136/1917.5	26.40	23.72	2.68	≤13	PASS
	BPSK	15	31136/1917.5	29.12	23.65	5.47	≤13	PASS
	QPSK	15	31136/1917.5	29.20	23.61	5.59	≤13	PASS

5.6 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 -40°C to +85°C in 10°C step size.

(1)With all power removed, the temperature was decreased to -10°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 -40°C to +85°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

Frequency Stability (Voltage Variation)

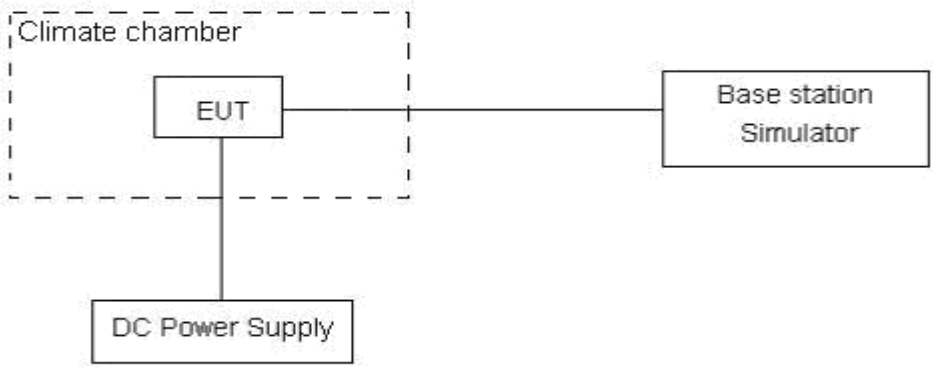
The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 3.1 V and 4.2 V, with a nominal voltage of 3.6V.

Test setup



Limits

No specific frequency stability requirements in part 27.54

Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75％ confidence level for the normal distribution is with the coverage factor k = 3,U=0.01ppm.

Test Result

NB-IOT Band 111					
BPSK (15KHz)					
Temperature	Voltage	1915	1920	Delta	Frequency
		F low@-13dBm(MHz)	F high@-13dBm(MHz)	(Hz)	Stability(ppm)
Normal（25°C）	Normal	1915.1451	1919.8271	0.45	0.00024
Extreme（85°C）		1915.1438	1919.8284	9.09	0.00484
Extreme（80°C）		1915.1389	1919.8333	3.72	0.00198
Extreme（70°C）		1915.1421	1919.8322	16.17	0.00860
Extreme（60°C）		1915.1447	1919.8275	11.84	0.00630
Extreme（50°C）		1915.1387	1919.8335	3.03	0.00161
Extreme（40°C）		1915.1397	1919.8325	10.06	0.00535
Extreme（30°C）		1915.1395	1919.8327	8.52	0.00453
Extreme（20°C）		1915.1394	1919.8332	9.28	0.00494
Extreme（10°C）		1915.1399	1919.8323	17.78	0.00946
Extreme（0°C）		1915.1405	1919.8317	3.14	0.00167
Extreme（-10°C）		1915.1419	1919.8303	9.68	0.00515
Extreme（-20°C）		1915.1395	1919.8327	5.21	0.00277
Extreme（-30°C）		1915.1443	1919.8279	4.35	0.00231
Extreme（-40°C）		1915.1463	1919.8259	6.79	0.00361
25°C	LV	1915.1422	1919.8362	8.13	0.00432
	HV	1915.1444	1919.8282	5.11	0.00272

NB-IOT Band 111					
QPSK (15KHZ)					
Temperature	Voltage	1915	1920	Delta	Frequency
		F low@-13dBm(MHz)	F high@-13dBm(MHz)	(Hz)	Stability(ppm)
Normal（25°C）	Normal	1915.1301	1919.8421	7.92	0.00421
Extreme（85°C）		1915.1314	1919.8408	-0.44	-0.00023
Extreme（80°C）		1915.1363	1919.8359	-0.17	-0.00009
Extreme（70°C）		1915.1352	1919.8373	-3.58	-0.00190
Extreme（60°C）		1915.1305	1919.8417	-9.82	-0.00522
Extreme（50°C）		1915.1365	1919.8357	0.94	0.00050
Extreme（40°C）		1915.1355	1919.8367	3.94	0.00210
Extreme（30°C）		1915.1357	1919.8365	1.49	0.00079
Extreme（20°C）		1915.1362	1919.8367	-3.14	-0.00167
Extreme（10°C）		1915.1353	1919.8369	-8.53	-0.00454
Extreme（0°C）		1915.1347	1919.8375	-5.84	-0.00311
Extreme（-10°C）		1915.1333	1919.8389	1.34	0.00071
Extreme（-20°C）		1915.1357	1919.8365	3.28	0.00174
Extreme（-30°C）		1915.1309	1919.8413	-0.76	-0.00040
Extreme（-40°C）		1915.1289	1919.8433	-2.31	-0.00123
25°C	LV	1915.1331	1919.8392	3.51	0.00187
	HV	1915.1312	1919.8416	6.27	0.00334

NB-IOT Band 222					
BPSK (15KHz)					
Temperature	Voltage	1915	1920	Delta	Frequency
		F low@-13dBm(MHz)	F high@-13dBm(MHz)	(Hz)	Stability(ppm)
Normal（25°C）	Normal	1915.1472	1919.8235	1.80	0.00096
Extreme（85°C）		1915.1459	1919.8248	9.20	0.00489
Extreme（80°C）		1915.1415	1919.8297	5.07	0.00270
Extreme（70°C）		1915.1442	1919.8286	16.28	0.00866
Extreme（60°C）		1915.1468	1919.8239	11.95	0.00636
Extreme（50°C）		1915.1408	1919.8299	4.38	0.00233
Extreme（40°C）		1915.1418	1919.8289	10.17	0.00541
Extreme（30°C）		1915.1416	1919.8291	9.87	0.00525
Extreme（20°C）		1915.1415	1919.8296	9.39	0.00499
Extreme（10°C）		1915.1427	1919.8287	17.89	0.00952
Extreme（0°C）		1915.1426	1919.8281	4.49	0.00239
Extreme（-10°C）		1915.144	1919.8267	9.79	0.00521
Extreme（-20°C）		1915.1416	1919.8291	6.56	0.00349
Extreme（-30°C）		1915.1464	1919.8243	5.70	0.00303
Extreme（-40°C）		1915.1484	1919.8223	6.90	0.00367
25°C	LV	1915.1443	1919.8326	8.24	0.00438
	HV	1915.1465	1919.8246	6.46	0.00344

NB-IOT Band 222					
QPSK (15KHZ)					
Temperature	Voltage	1915	1920	Delta	Frequency
		F low@-13dBm(MHz)	F high@-13dBm(MHz)	(Hz)	Stability(ppm)
Normal（25°C）	Normal	1915.1337	1919.8385	4.71	0.00251
Extreme（85°C）		1915.1351	1919.8372	-3.65	-0.00194
Extreme（80°C）		1915.1399	1919.8323	-3.38	-0.00180
Extreme（70°C）		1915.1388	1919.8337	-4.69	-0.00249
Extreme（60°C）		1915.1341	1919.8381	-10.93	-0.00581
Extreme（50°C）		1915.1401	1919.8321	-2.27	-0.00121
Extreme（40°C）		1915.1391	1919.8331	0.73	0.00039
Extreme（30°C）		1915.1393	1919.8329	-1.72	-0.00091
Extreme（20°C）		1915.1398	1919.8331	-6.35	-0.00338
Extreme（10°C）		1915.1389	1919.8333	-9.64	-0.00513
Extreme（0°C）		1915.1383	1919.8339	-9.05	-0.00481
Extreme（-10°C）		1915.1369	1919.8353	-1.87	-0.00099
Extreme（-20°C）		1915.1393	1919.8329	0.07	0.00004
Extreme（-30°C）		1915.1345	1919.8377	-3.97	-0.00211
Extreme（-40°C）		1915.1325	1919.8397	-3.42	-0.00182
25°C	LV	1915.1367	1919.8356	0.30	0.00016
	HV	1915.1348	1919.8381	5.16	0.00274

5.7 Spurious Emissions at Antenna Terminals

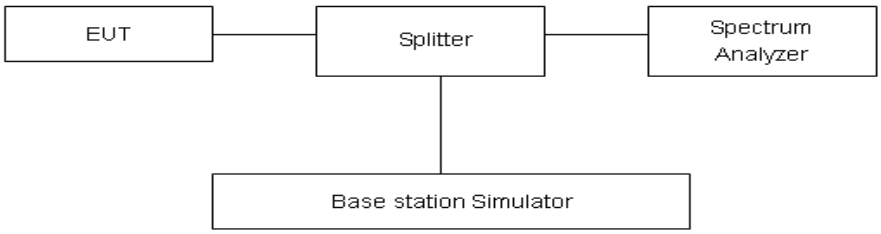
Ambient condition

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 is set to 100kHz, VBW is set to 300kHz for 30MHz~1GHz
RBW is set to 1MHz, VBW is set to 3MHz for above 1GHz, Sweep is set to ATUO.
Of those disturbances below (limit – 20 dB), the mark is not required for the EUT.
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup



Limits

Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB..”

Part 27.53(h) Limit	-13 dBm

Measurement Uncertainty

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

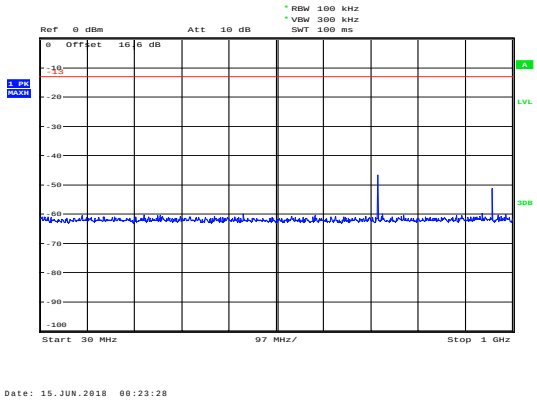
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-20GHz	1.407 dB

Test Result

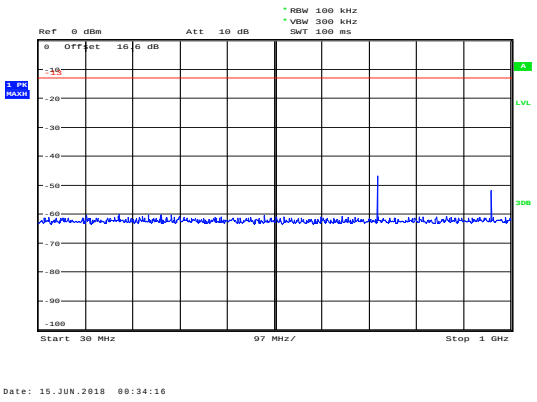
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

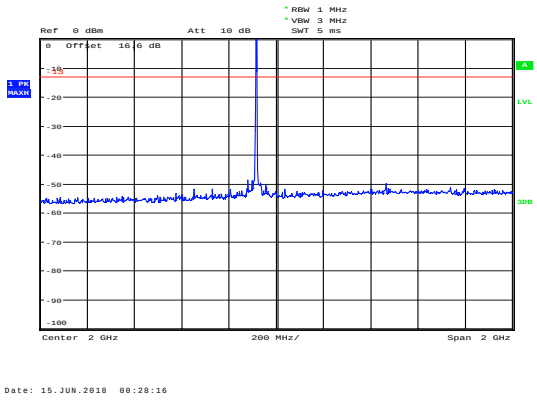
NB-IOT Band 111 CH-Low 30MHz~1GHz



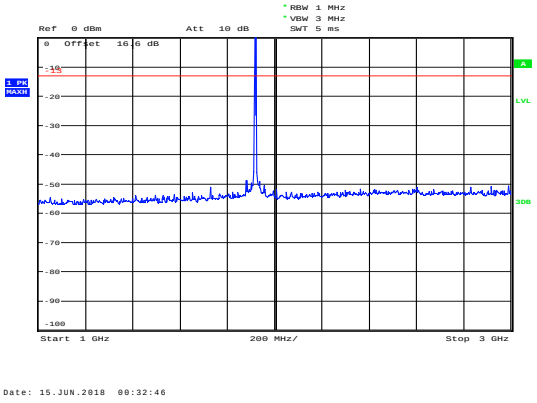
NB-IOT Band 111 CH-Middle 30MHz~1GHz



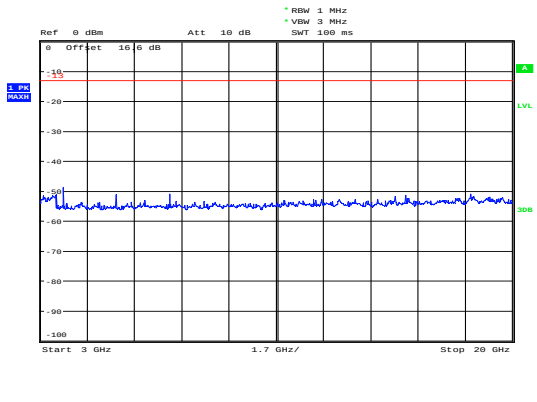
NB-IOT Band 111 CH-Low 1GHz~3GHz



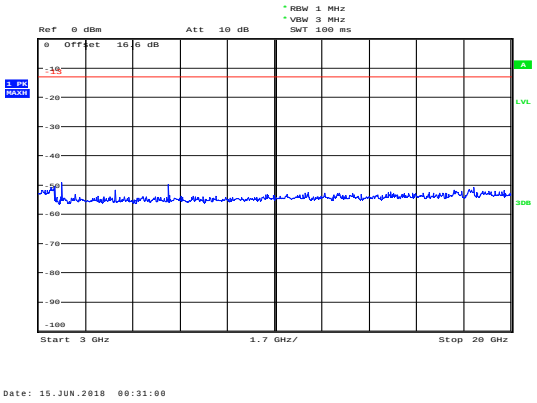
NB-IOT Band 111 CH-Middle 1GHz~3GHz



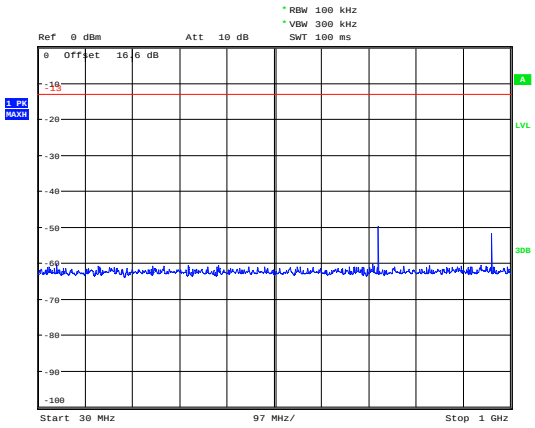
NB-IOT Band 111CH-Low 3GHz~20GHz



NB-IOT Band 111 CH-Middle 3GHz~20GHz

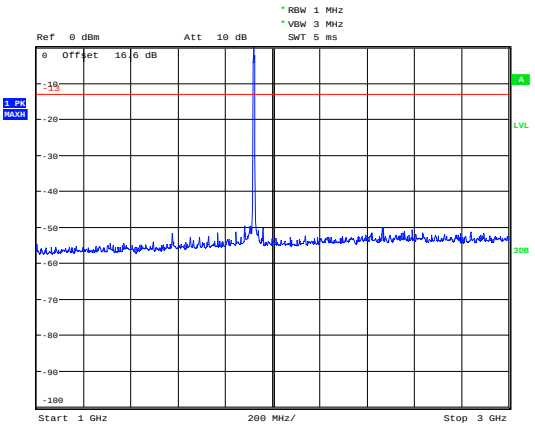


NB-IOT Band 111 CH-High 30MHz~1GHz



Date: 15.JUN.2018 00:36:32

NB-IOT Band 111 CH-High 1GHz~3GHz



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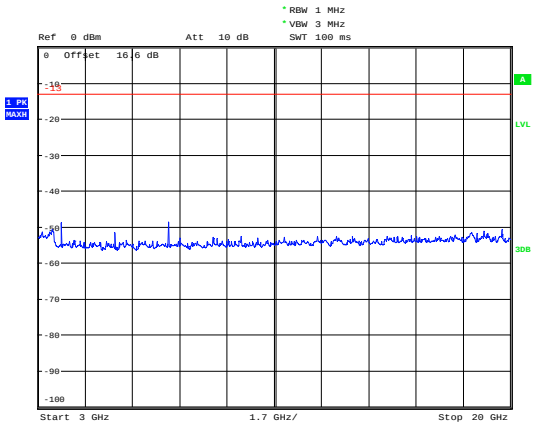
NB-IOT Band 111 CH-High 3GHz~20GHz



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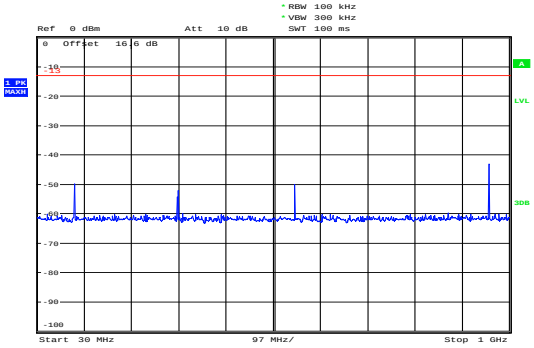
NB-IOT Band 222 CH-Low 30MHz~1GHz



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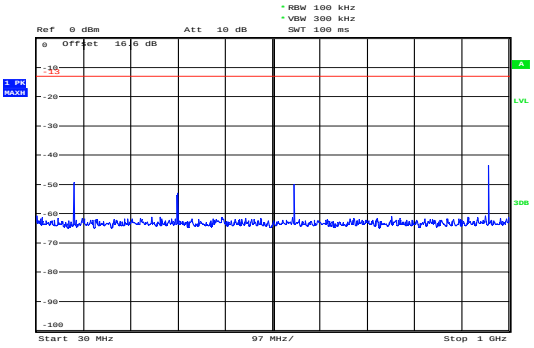
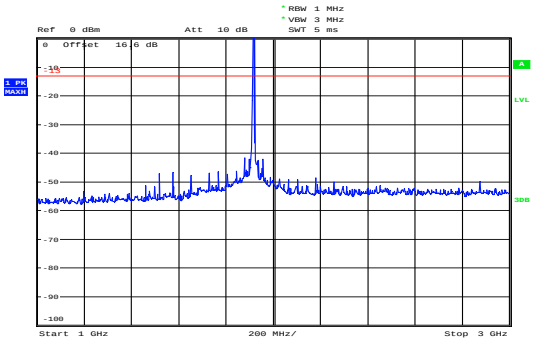
NB-IOT Band 222 CH-Middle 30MHz~1GHz



Date: 20.JUN.2018 21:55:18

NB-IOT Band 222 CH-Low 1GHz~3GHz



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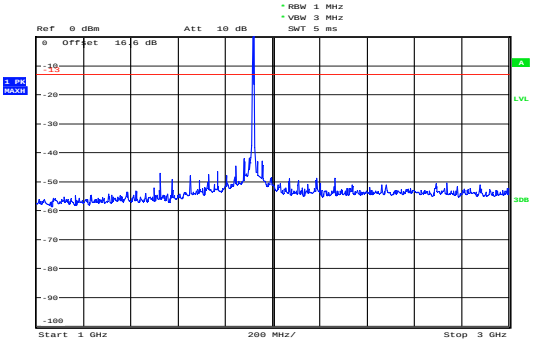
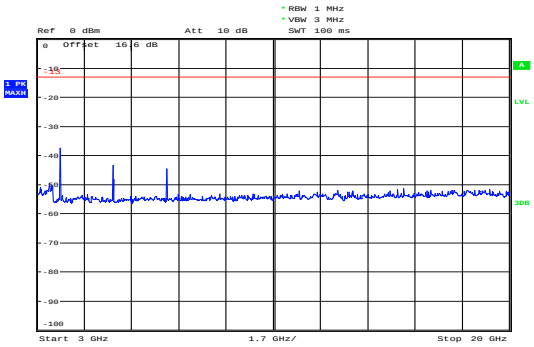
NB-IOT Band 222 CH-Middle 1GHz~3GHz



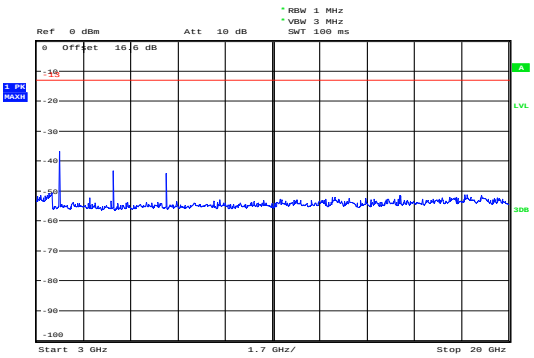
Date: 20.JUN.2018 21:47:24

NB-IOT Band 222 CH-Low 3GHz~20GHz



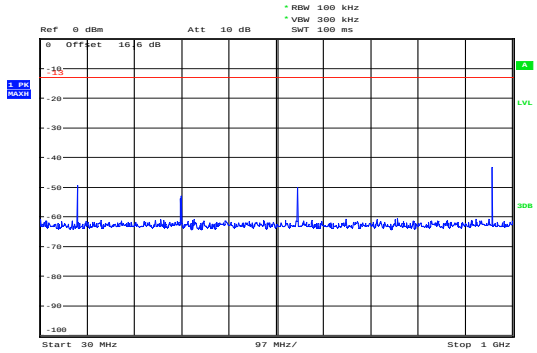
Date: 20.JUN.2018 21:43:43

NB-IOT Band 222 CH-Middle 3GHz~20GHz



Date: 20.JUN.2018 21:41:48

NB-IOT Band 222 CH-High 30MHz~1GHz



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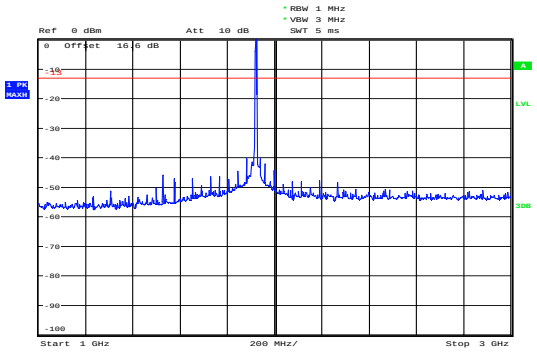
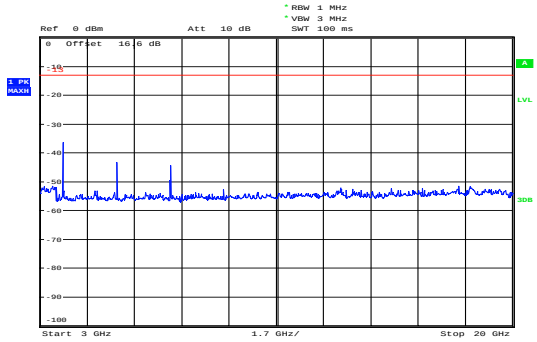
NB-IOT Band 222 CH-High 1GHz~3GHz



Date: 20.JUN.2018 21:45:52

NB-IOT Band 222 CH-High 3GHz~20GHz



Date: 20.JUN.2018 21:45:19

5.8 Radiates Spurious Emission

Ambient condition

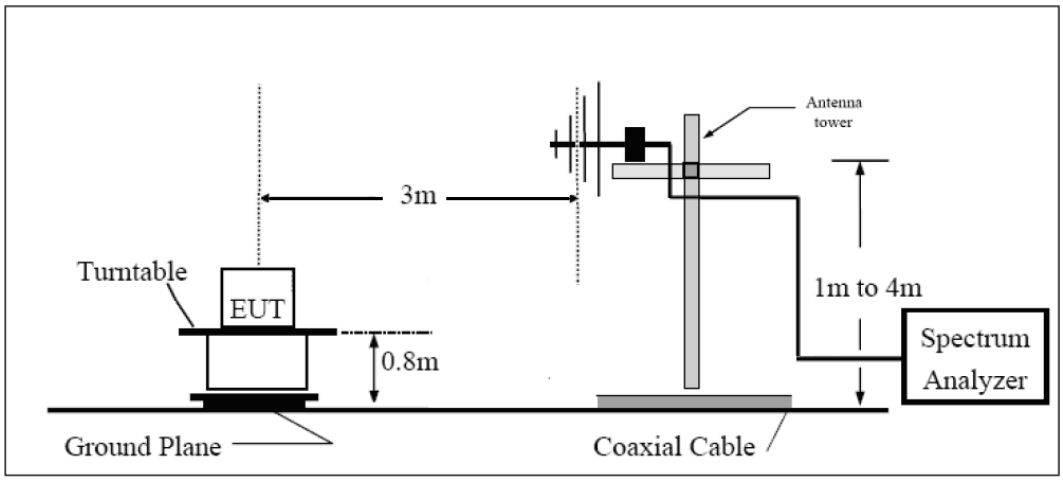
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

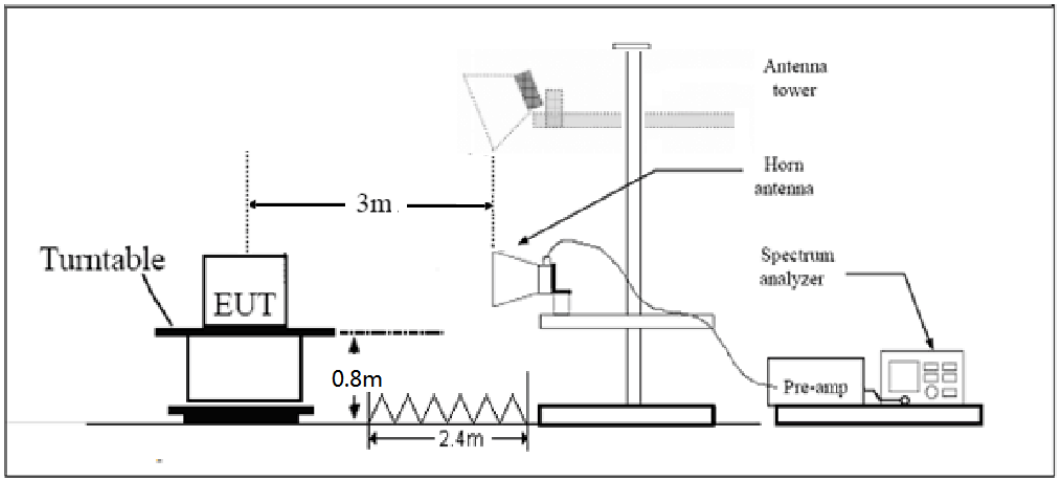
1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI/TIA-603-E (2016).
2. The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. 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).
3. A log-periodic antenna or double-ridged waveguide 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=1MHz,VBW=3MHz, And the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:
Power(EIRP)=PMea- PAg - Pcl + Ga
The measurement results are amend as described below:
Power(EIRP)=PMea- Pcl + Ga
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

30MHz~~~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

Limits

Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.”

Limit	-13 dBm

Measurement Uncertainty

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

Test Result

For radiated spurious emissions test, the worst mode (3.75KHZ+QPSK) should be reflected in the report.

Sweep the whole frequency band through the range from 30MHz to the 10th harmonic of the carrier, the emissions below base noise will not recorded in the report.

NB-IOT Band 111 _3.75KHZ+QPSK _CH-Low

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3839.6	-61.35	5.1	11.05	Horizontal	-55.4	-13.00	42.4	225
3	5759.4	-59.93	5.42	12.65	Horizontal	-52.7	-13.00	39.7	135
4	7679.2	-55.85	6.7	13.85	Horizontal	-48.7	-13.00	35.7	180
5	9599.0	-54.14	7.01	14.75	Horizontal	-46.4	-13.00	33.4	315
6	11518.8	-50.57	7.48	15.95	Horizontal	-42.1	-13.00	29.1	180
7	13438.6	-49.64	7.51	16.55	Horizontal	-40.6	-13.00	27.6	90
8	15358.4	-48.71	8.24	15.35	Horizontal	-41.6	-13.00	28.6	0
9	17278.2	-46.34	8.41	14.95	Horizontal	-39.8	-13.00	26.8	45
10	19198.0	/	/	/	/	/	/	/	/
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									

NB-IOT Band 111 _3.75KHZ+QPSK _ CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3835.0	-54.65	5.10	11.05	Horizontal	-48.7	-13.00	35.7	225
3	5752.5	-56.03	5.42	12.65	Horizontal	-48.8	-13.00	35.8	45
4	7670.0	-52.25	6.70	13.85	Horizontal	-45.1	-13.00	32.1	180
5	9587.5	-53.94	7.01	14.75	Horizontal	-46.2	-13.00	33.2	315
6	11505.0	-50.77	7.48	15.95	Horizontal	-42.3	-13.00	29.3	0
7	13422.5	-50.04	7.51	16.55	Horizontal	-41.0	-13.00	28.0	0
8	15340.0	-48.61	8.24	15.35	Horizontal	-41.5	-13.00	28.5	135
9	17257.5	-46.54	8.41	14.95	Horizontal	-40.0	-13.00	27.0	180
10	19175.0	/	/	/	/	/	/	/	/
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									

NB-IOT Band 111_3.75KHZ+QPSK _CH-High

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3830.4	-55.15	5.10	11.05	Horizontal	-49.2	-13.00	36.2	0
3	5745.6	-55.93	5.42	12.65	Horizontal	-48.7	-13.00	35.7	315
4	7660.8	-53.15	6.70	13.85	Horizontal	-46.0	-13.00	33.0	270
5	9576.0	-54.54	7.01	14.75	Horizontal	-46.8	-13.00	33.8	135
6	11491.2	-50.47	7.48	15.95	Horizontal	-42.0	-13.00	29.0	45
7	13406.4	-49.54	7.51	16.55	Horizontal	-40.5	-13.00	27.5	135
8	15321.6	-50.71	8.24	15.35	Horizontal	-43.6	-13.00	30.6	180
9	17236.8	-46.14	8.41	14.95	Horizontal	-39.6	-13.00	26.6	0
10	19152.0	/	/	/	/	/	/	/	/
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									

NB-IOT Band 222 _3.75KHZ+QPSK _CH-Low

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3830.4	-55.05	5.1	11.05	Horizontal	-49.1	-13.00	36.1	0
3	5745.6	-56.13	5.42	12.65	Horizontal	-48.9	-13.00	35.9	0
4	7660.8	-53.05	6.7	13.85	Horizontal	-45.9	-13.00	32.9	45
5	9576.0	-54.24	7.01	14.75	Horizontal	-46.5	-13.00	33.5	180
6	11491.2	-51.37	7.48	15.95	Horizontal	-42.9	-13.00	29.9	135
7	13406.4	-50.64	7.51	16.55	Horizontal	-41.6	-13.00	28.6	315
8	15321.6	-46.61	8.24	15.35	Horizontal	-39.5	-13.00	26.5	270
9	17236.8	-45.14	8.41	14.95	Horizontal	-38.6	-13.00	25.6	0
10	19152.0	/	/	/	/	/	/	/	/
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									

NB-IOT Band 222 _3.75KHZ+QPSK _ CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3835.0	-55.65	5.10	11.05	Horizontal	-49.7	-13.00	36.7	315
3	5752.5	-56.63	5.42	12.65	Horizontal	-49.4	-13.00	36.4	225
4	7670.0	-53.25	6.70	13.85	Horizontal	-46.1	-13.00	33.1	135
5	9587.5	-54.74	7.01	14.75	Horizontal	-47.0	-13.00	34.0	45
6	11505.0	-51.17	7.48	15.95	Horizontal	-42.7	-13.00	29.7	180
7	13422.5	-48.74	7.51	16.55	Horizontal	-39.7	-13.00	26.7	135
8	15340.0	-48.71	8.24	15.35	Horizontal	-41.6	-13.00	28.6	0
9	17257.5	-45.44	8.41	14.95	Horizontal	-38.9	-13.00	25.9	90
10	19175.0	/	/	/	/	/	/	/	/
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									

NB-IOT Band 222 _3.75KHZ+QPSK _CH-High

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3839.6	-56.15	5.10	11.05	Horizontal	-50.2	-13.00	37.2	90
3	5759.4	-56.53	5.42	12.65	Horizontal	-49.3	-13.00	36.3	45
4	7679.2	-53.15	6.70	13.85	Horizontal	-46.0	-13.00	33.0	135
5	9599.0	-54.74	7.01	14.75	Horizontal	-47.0	-13.00	34.0	225
6	11518.8	-50.87	7.48	15.95	Horizontal	-42.4	-13.00	29.4	315
7	13438.6	-49.64	7.51	16.55	Horizontal	-40.6	-13.00	27.6	180
8	15358.4	-48.71	8.24	15.35	Horizontal	-41.6	-13.00	28.6	0
9	17278.2	-45.84	8.41	14.95	Horizontal	-39.3	-13.00	26.3	180
10	19198.0	/	/	/	/	/	/	/	/
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									

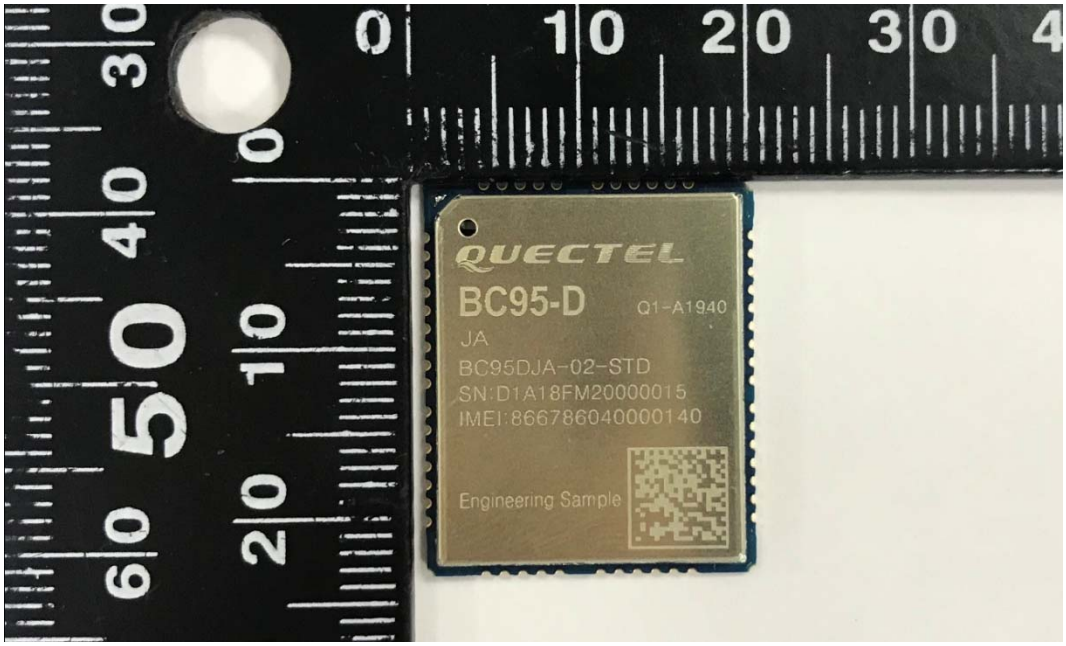
6 Main Test Instruments

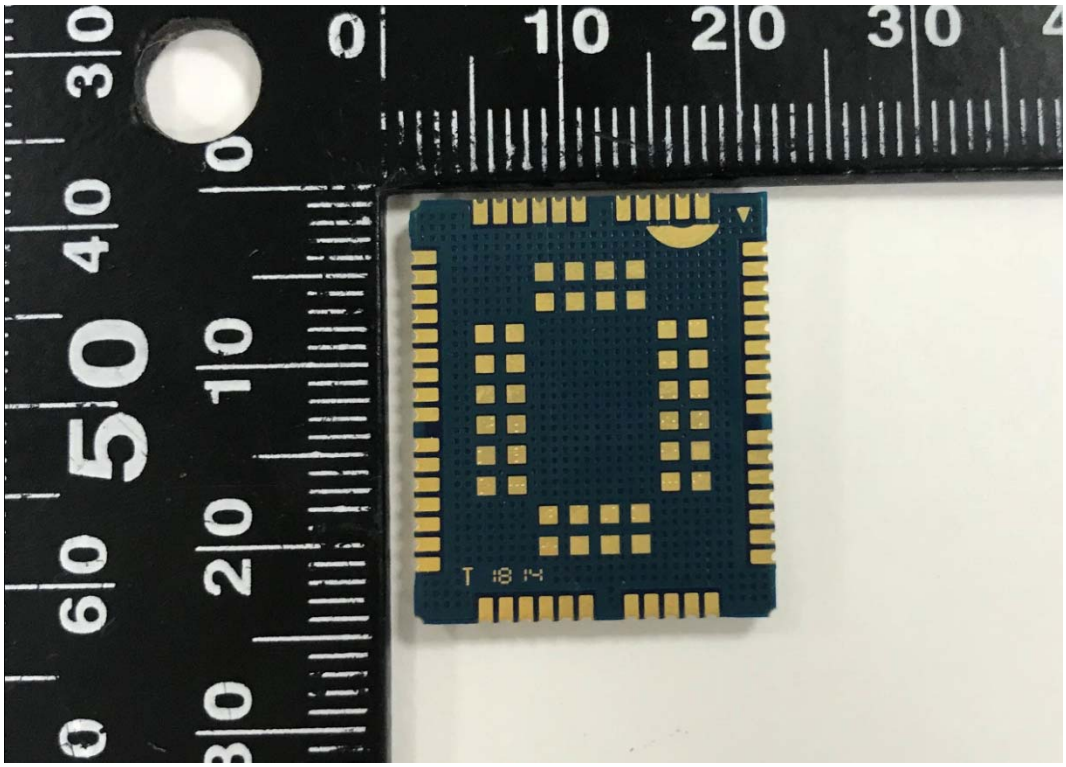
Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Wireless Test Set	StarPoint	SP8315	SP8315-1203	2018-05-20	2019-05-19
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	2018-05-20	2019-05-19
Spectrum Analyzer	Key sight	N9010A	MY50210259	2018-05-20	2019-05-19
Signal Analyzer	R&S	FSV30	100815	2017-12-17	2018-12-16
Signal generator	R&S	SMB 100A	102594	2018-05-20	2019-05-19
EMI Test Receiver	R&S	ESCI	100948	2018-05-20	2019-05-19
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2014-12-06	2019-12-05
Trilog Antenna	SCHWARZBECK	VUBL 9163	9163-201	2017-11-18	2020-11-17
Horn Antenna	R&S	HF907	100126	2014-12-06	2019-12-05
Horn Antenna	ETS-Lindgren	3160-09	00102643	2015-01-30	2020-01-29
Climatic Chamber	Re Ce	PT-30B	20101891	2015-07-18	2018-07-17
RF Cable	Agilent	SMA 15cm	0001	NA	NA
Preampflier	R&S	SCU18	102327	2017-06-18	2018-06-17
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2018-05-20	2019-05-19
Software	R&S	EMC32	V 8.52.0	NA	NA

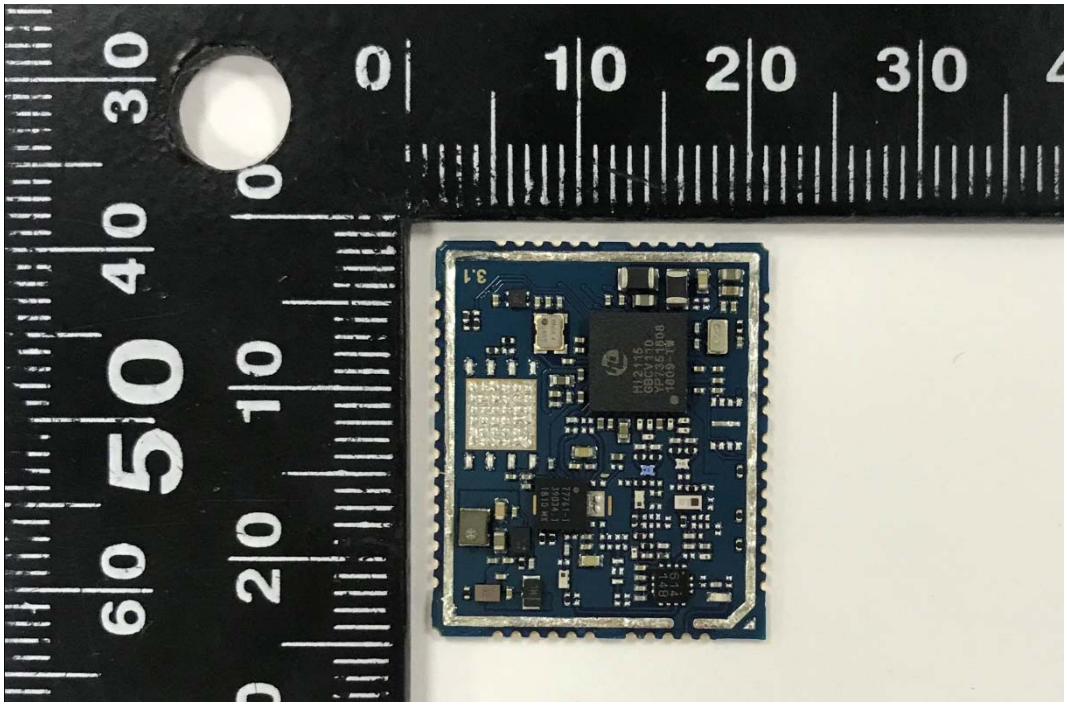
*******END OF REPORT *******

ANNEX A: EUT Appearance and Test Setup

A.1 EUT Appearance



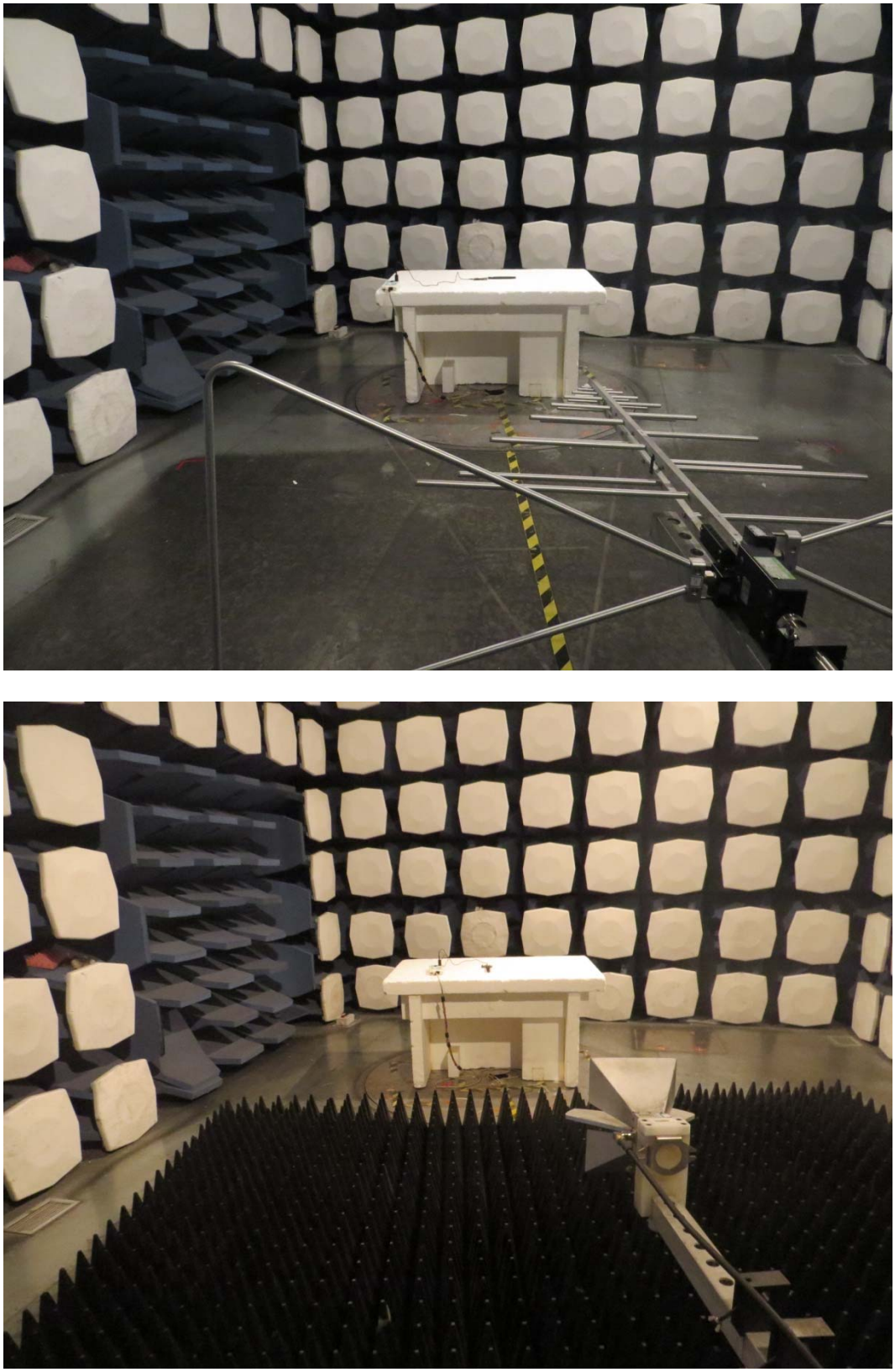




a: EUT

Picture 1 EUT and Accessory

A.2 Test Setup



Picture 2: Radiated Spurious Emissions Test setup