



TEST REPORT

REPORT NUMBER: I22W00051-WWAN RF-Rev4

ON

Type of Equipment: LPWA Module

Type of Designation: SIM7075G

Brand Name: SIMCom

Manufacturer: SIMCom Wireless Solutions Limited

FCC ID: 2AJYU-8VC0004

ACCORDING TO

FCC CFR Part 2, FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS;
GENERAL RULES AND REGULATIONS, e-CFR

PART 22, PUBLIC MOBILE SERVICES, e-CFR

PART 24, PERSONAL COMMUNICATIONS SERVICES, e-CFR

PART 27, MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES, e-CFR

PART 90, PRIVATE LAND MOBILE RADIO SERVICES, e-CFR

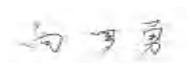
ANSI C63.26-2015 American National Standard for Comppliance Testing of Transmitters
Used in Licensed Radio Services

Chongqing Academy of Information and Communications Technology

Month date, year

Oct, 10, 2022

Signature



Xiang Luoyong

Director

Note:

The test results in this test report relate only to the devices specified in this report.
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Report No.: I22W00051-WWAN RF-Rev4

Revision Version

Report Number	Revision	Date	Memo
I22W00051-WWAN RF	00	2022-07-19	Initial creation of test report
I22W00051-WWAN RF-Rev1	01	2022-09-15	--
I22W00051-WWAN RF-Rev2	02	2022-09-27	--
I22W00051-WWAN RF-Rev3	03	2022-10-09	--
I22W00051-WWAN RF-Rev4	04	2022-10-10	--

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1. Test Laboratory

1.1. Testing Location

Name:	Chongqing Academy of Information and Communications Technology
FCC Registration number:	CN1239
Address:	Building C, Technology Innovation Center, No.8, Yuma Road, Chayuan New Area, Nan'an District, Chongqing, People's Republic of China
	No.19 East Road, Xiantao Big-data Valley, Yubei District, Chongqing, People's Republic of China
Postal Code:	401336
Telephone:	0086-23-88069965
Fax:	0086-23-88608777

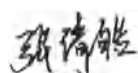
1.2. Testing Environment

Normal Temperature:	15-35°C
Relative Humidity:	30-60%

1.3. Project data

Testing Start Date:	2022-07-05
Testing End Date:	2022-10-08

1.4. Signature



2022-10-10

Zhang qinghao
(Prepared this test report)

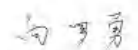
Date



2022-10-10

Li Xu
(Reviewed this test report)

Date



2022-10-10

Xiang Luoyong
Director of the laboratory
(Approved this test report)

Date

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2. Client Information

2.1. Applicant Information

Company Name:	SIMCom Wireless Solutions Limited
Address /Post:	SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai, China
City:	Shanghai
Country:	China
Telephone:	18616929436
Fax:	--
Email:	zhiqiang.bai703@simcom.com
Contact Person:	ZhiQiang Bai

2.2. Manufacturer Information

Company Name:	SIMCom Wireless Solutions Limited
Address /Post:	SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai, China
City:	Shanghai
Country:	China
Telephone:	18616929436
Fax:	--
Email:	zhiqiang.bai703@simcom.com
Contact Person:	ZhiQiang Bai

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3. Equipment under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

EUT Description	LPWA Module
Model name	SIM7075G
Brand name	SIMCom
GSM Frequency Band	2/5
NB-IoT Frequency Band	2/4/5/12/13/25/26/66/71
CAT-M Frequency Band	2/4/5/12/13/14/25/26/66
Type of modulation	GMSK/8PSK/BPSK/QPSK/16QAM
Nominal Voltage	3.8
Extreme High Voltage	4.3
Extreme Low Voltage	3.3

Note: Photographs of EUT are shown in ANNEX A of this test report.

Note: High and low voltage values in extreme condition test are given by manufacturer.

3.2. Internal Identification of EUT used during the test

EUT ID	SN or IMEI	HW Version	SW Version	Date of receipt
S1	865456056939661	V1.01	R2117.01	2022-06-24

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Outline of Equipment under Test

Technology	Band	UL Freq.(MHz)	DL Freq.(MHz)	Note
GSM	GSM850	824 – 849	869 – 894	--
	PCS1900	1850 – 1910	1930 – 1990	--
NB-IoT	Band2	1850 – 1910	1930 – 1990	--
	Band4	1710-1755	2110-2155	
	Band5	824 – 849	869 – 894	Covered by Band26 (Band5 is a subset of Band26. Both Bands share the same hardware and have the same radio performance. Separate measurement in Band5 is not required.)
	Band12	699 – 716	729 – 746	--
	Band13	777 – 787	746 – 756	--
	Band25	1850-1915	1930-1995	--
	Band26	814 – 849	859 – 894	--
	Band66	1710-1780	2110-2200	--
	Band71	663-698	617-652	--
	Band2	1850 – 1910	1930 – 1990	--
	Band4	1710 – 1755	2110 – 2155	--

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CAT-M	Band5	824 – 849	869 – 894	Covered by Band26 (Band5 is a subset of Band26. Both Bands share the same hardware and have the same radio performance. Separate measurement in Band5 is not required.)
	Band12	699 – 716	729 – 746	--
	Band13	777 – 787	746 – 756	--
	Band14	788 – 798	758 – 768	--
	Band25	1850-1915	1930-1995	--
	Band26	814 – 849	859 – 894	--
	Band66	1710-1780	2110-2200	--

3.4. Internal Identification of AE used during the test

*AE ID: is used to identify the test sample in the lab internally.

AE ID*	Description	Manufacturer	Model	Length
AE1	SIMCOM-EVB	SIMCom Wireless Solutions Limited	SIMCOM-EVB	11.6cm
AE2	Power Adapter	Something High Innovation (B.V.I.) Co., Ltd	P-050B-B2152	150cm
AE3	USB Cable		KLC-1707	60cm
AE4	GSM/WCDMA/L TE Antenna	SPEED Communication Technology	MF25D	11.6cm
AE5	GNSS Antenna	INPAQ TECHNOLOGY CO., LTD.	GPSGLONASS0 3D-S3-00-A	300cm

AE info are provided customer.

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4. Reference Documents

4.1. Documents supplied by applicant

PICS/PIXIT, referring to Annex B for detailed information, is supplied by the client or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC CFR Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS, e-CFR	--
PART 22	PUBLIC MOBILE SERVICES	--
PART 24	PERSONAL COMMUNICATIONS SERVICES,e-CFR,	--
PART 27	,MISCELLANEOUS WIRELESS OMMUNICATIONS SERVICES, e-CFR,	--
PART 90	PRIVATE LAND MOBILE RADIO SERVICES	--
ANSI C63.26-2015	--	2015

5. Test Equipments Utilized

5.1. RF Test System

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal.Due Date
1	spectrum analyzer	FSQ 26	201137/026	--	--	R&S	2023-06-29
2	Universal Radio Communication Tester	CMW500	152395	--	--	R&S	2023-06-29
3	Universal Radio Communication Tester	CMW500	164483	--	--	R&S	2023-06-29
4	spectrum analyzer	N9020A	MY50200376	--	--	Agilent	2023-06-29
5	DC Power Supply	N6705B	MY50000919	--	--	Agilent	2023-06-29
6	DC source	EY3010ET	478620	--	--	ELECALL	2023-06-29

5.2. RSE Test System

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal.Due Date
1	Test Receiver	ESU26	100367	01	4.43 SP3	R&S	2023-06-29
2	Ultra-wideband Log Periodic Antenna	VULB 9163	01392	--	--	Schwarzbeck	2024-05-04
3	Double Ridged Guide Antenna	HF907	100357	--	--	R&S	2023-02-10
4	Universal Radio Communication Tester	CMW500	128181	--	--	R&S	2023-06-29
5	Double Ridged Guide Antenna	HF907	100356	--	--	R&S	2023-07-07
6	Generator	SMU 200A	104517	--	--	R&S	2023-06-29
7	Ultra-wideband Log Periodic Antenna	VULB 9163	00995	--	--	R&S	2023-04-03
8	Amplifier1	150A	1429	--	--	Beehive	2023/6/18
9	Amplifier2	SCU 18	10141	--	--	R&S	--

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5.3. Climate Chamber

No.	Name	Type	SN	Manufacture	Cal.Due Date
1	Climate chamber	SH-241	92010759	ESPEC	2023-06-29
2	Fully-Anechoic Chamber	FACT3-2	--	ETS	2023-06-25

5.4. Vibration table

No.	Name	Type	SN	Manufacture	Cal.Due Date
--	--	--	--	--	--

Anechoic chamber

Fully anechoic chamber by ETS-LINDGREN.

5.5. Test software

No.	Name	version	SN	Manufacture
1	EMC32	V 8.51.00	--	R&S

6. Test Results

6.1. Summary of Test Results

A brief summary of the tests carried out is shown as following.

FCC Rules	Name of Test	Result
2.1046,22.913(a),24.232(c),27.50,90.635(b)	Conducted RF Power Output	Pass
2.1046,22.913(a),24.232(c),27.50,90.635(b)	ERP and EIRP	Pass
2.1049,22.917(b), 24.238(b),90.209	Occupied Bandwidth	--
2.1051,24.238,2.1053,22.917, 27.53,90.691	Conducted spurious emissions	Pass
2.1051,24.238,2.1053,22.917, 27.53,90.691	Radiated Spurious Emission	Pass
2.1051,24.238, 2.1053, 22.917, 27.53,90.691	Band Edge	Pass
2.1055, 22.355,24.235, 27.54,90.213	Frequency Stability over Temperature Variation	Pass
2.1055, 22.355,24.235, 27.54,90.213	Frequency Stability over Voltage Variation	Pass
24.232, 27.50	Peak to Average Ratio	Pass
Note 1: No applicable performance criteria.		

-

6.2. Conducted RF Power Output

Specifications:	FCC Part 2.1046,22.913(a),24.232(c),27.50,90.635(b)
DUT Serial Number:	865456056939661
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

According to Part 22.913(a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to Part 24.232(c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to Part 27.50(c), portable stations (hand-held devices) in the 600 MHz uplink Band and the 698-746 MHz Band, and fixed and mobile stations in the 600 MHz uplink Band are limited to 3 watts ERP.

According to Part 27.50(d), fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz Band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz Bands are limited to 1 watt EIRP.

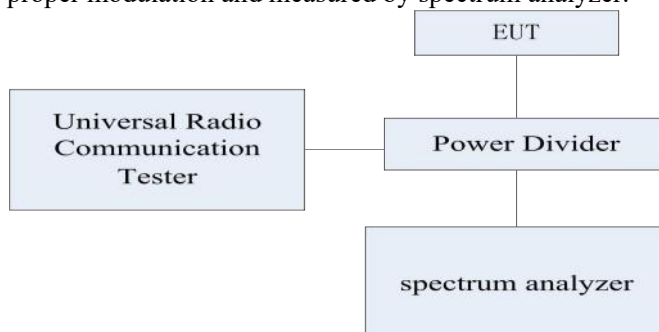
According to Part 90.635 (b), The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	0.62 dB (k=2)

Test Setup:

During the test, the EUT was controlled via the Wireless Telecommunications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.


Test Method:

- 1) The EUT was coupled to the spectrum analyzer and the Wireless Telecommunications Test Set through a power divider. The loss of the RF cables of the test system is calibrated to correct the readings.
 - 2) For RMS power test, the spectrum analyzer was set to RMS Detector function and Maximum hold mode.
 - 3) For Peak power test, the spectrum analyzer was set to Maxpeak Detector function and Maximum hold mode.
 - 4) The resolution Bandwidth of the spectrum analyzer was comparable to the emission Bandwidth.
- Note:** The full RB test result of 16QAM of CAT-M is configured as 5@0.

6.2.1 NB-IoT Band2 Conducted RF Power Output Results

NB-IoT Band 2

Maximum Average Conducted Power (dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low18601	Mid18900	High19199
3.75	BPSK	1@0	21.84	21.70	21.02
		1@47	21.98	21.68	21.96
	QPSK	1@0	21.82	21.79	21.93
		1@47	21.74	21.81	21.84
15	BPSK	1@0	21.99	21.93	21.28
		1@11	21.91	21.95	21.24
	QPSK	1@0	21.44	21.00	21.24
		1@11	21.37	21.14	21.17
		12@0	20.78	20.61	20.71

6.2.2 NB-IoT Band4 Conducted RF Power Output Results

NB-IoT Band 4

Maximum Average Conducted Power (dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low19951	Mid20175	High20399
3.75	BPSK	1@0	21.80	21.78	21.61
		1@47	21.84	21.77	21.66
	QPSK	1@0	22.03	21.62	21.84
		1@47	21.97	21.67	21.71
15	BPSK	1@0	21.15	21.99	21.85
		1@11	21.25	21.97	21.82
	QPSK	1@0	21.10	21.05	21.94
		1@11	21.07	21.94	21.87
		12@0	20.97	20.98	20.99

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6.2.3 NB-IoT Band12 Conducted RF Power Output Results

NB-IoT Band12

Maximum Average Conducted Power (dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low23011	Mid23095	High23179
3.75	BPSK	1@0	21.81	21.21	21.51
		1@47	21.78	21.23	21.52
	QPSK	1@0	21.77	21.30	21.56
		1@47	21.74	21.24	21.49
15	BPSK	1@0	21.83	21.75	21.88
		1@11	21.83	21.75	21.94
	QPSK	1@0	21.84	21.15	21.85
		1@11	21.82	21.93	21.73
		12@0	20.02	20.32	20.92

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6.2.4 NB-IoT Band13 Conducted RF Power Output Results

NB-IoT Band13

Maximum Average Conducted Power (dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low23181	Mid23230	High23279
3.75	BPSK	1@0	21.57	21.31	21.16
		1@47	21.59	21.30	21.20
	QPSK	1@0	21.01	21.35	21.36
		1@47	21.52	21.30	21.21
15	BPSK	1@0	21.32	21.48	21.42
		1@11	21.28	21.40	21.40
	QPSK	1@0	21.34	21.59	21.46
		1@11	21.27	21.49	21.36
		12@0	20.68	20.87	20.76

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6.2.5 NB-IoT Band25 Conducted RF Power Output Results

NB-IoT Band25

Maximum Average Conducted Power (dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low26041	Mid26365	High26689
3.75	BPSK	1@0	21.49	21.41	21.77
		1@47	21.44	21.37	21.74
	QPSK	1@0	21.22	21.15	21.42
		1@47	21.26	21.12	21.39
15	BPSK	1@0	21.23	21.10	21.52
		1@11	21.21	21.16	21.35
	QPSK	1@0	21.42	21.40	21.88
		1@11	21.18	21.23	21.68
		12@0	20.36	20.48	20.80

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6.2.6 NB-IoT Band 26 Conducted RF Power Output Results

(824MHz-849MHz)

Maximum Average Conducted Power (dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low26791	Mid26915	High27039
3.75	BPSK	1@0	21.76	21.46	21.51
		1@47	21.77	21.37	21.52
	QPSK	1@0	21.77	21.43	21.56
		1@47	21.74	21.34	21.49
15	BPSK	1@0	21.90	21.74	21.78
		1@11	21.84	21.58	21.74
	QPSK	1@0	21.89	21.82	21.85
		1@11	21.82	21.75	21.73
		12@0	20.05	20.05	20.92

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(814MHz-824MHz)

Maximum Average Conducted Power (dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low26691	Mid26740	High26789
3.75	BPSK	1@0	21.51	21.56	21.42
		1@47	21.49	21.61	21.35
	QPSK	1@0	21.48	21.51	21.46
		1@47	21.60	21.59	21.51
15	BPSK	1@0	21.82	21.59	21.67
		1@11	21.66	21.71	21.62
	QPSK	1@0	21.57	21.65	21.73
		1@11	21.69	21.75	21.67
		12@0	20.12	20.09	20.03

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6.2.7 NB-IoT Band66 Conducted RF Power Output Results

NB-IoT Band66

Maximum Average Conducted Power (dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low131973	Mid132322	High132671
3.75	BPSK	1@0	21.02	21.17	21.67
		1@47	21.78	21.16	21.70
	QPSK	1@0	21.74	21.75	21.48
		1@47	21.70	21.89	21.44
15	BPSK	1@0	21.73	21.00	21.48
		1@11	21.64	21.02	21.42
	QPSK	1@0	21.73	21.40	21.92
		1@11	21.46	21.12	21.45
		12@0	20.96	20.36	20.57

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6.2.8 NB-IoT Band71 Conducted RF Power Output Results

NB-IoT Band71

Maximum Average Conducted Power (dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low133123	Mid133297	High133471
3.75	BPSK	1@0	21.04	21.95	21.56
		1@47	21.01	21.97	21.50
	QPSK	1@0	21.37	21.69	21.30
		1@47	21.32	21.70	21.29
15	BPSK	1@0	21.74	21.55	21.21
		1@11	21.71	21.51	21.17
	QPSK	1@0	21.93	21.68	21.21
		1@11	21.77	21.46	21.00
		12@0	20.54	20.08	20.38

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6.2.9 CAT-M B2 Conducted RF Power Output Results

Mode	Bandwidth	Channel	RB	Index	Conducted Power	
					QPSK	16QAM
Band2	1.4MHz	18607	1#0	0	21.79	21.42
			6#0	0	20.28	20.83
		18900	1#0	0	21.39	21.67
			6#0	0	20.10	20.24
		19193	1#5	0	21.41	21.10
			6#0	0	20.42	20.21
	3MHz	18615	1#0	0	21.58	21.33
			6#0	0	20.96	20.13
		18900	1#0	0	21.51	21.22
			6#0	0	20.88	20.08
		19185	1#5	1	21.35	21.28
			6#0	1	20.78	20.93
	5MHz	18625	1#0	0	21.56	21.74
			6#0	0	20.26	20.54
		18900	1#0	0	21.49	21.64
			6#0	0	20.15	20.45
		19175	1#5	3	21.33	21.58
			6#0	3	20.10	20.46

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	10MHz	18650	1#0	0	21.40	21.54
			4#0	0	20.38	20.49
		18900	1#0	0	21.50	21.63
			4#0	0	20.47	20.61
		19150	1#5	7	21.27	21.52
			4#2	7	20.36	20.46
	15MHz	18675	1#0	0	21.61	21.74
			6#0	0	20.66	20.86
		18900	1#0	0	21.55	21.70
			6#0	0	20.58	20.75
		19125	1#5	0	21.38	21.41
			6#0	0	20.36	20.51
	20MHz	18700	1#0	0	21.56	21.64
			6#0	0	20.67	20.86
		18900	1#0	0	21.56	21.74
			6#0	0	20.60	20.79
		19100	1#5	0	21.47	21.63
			6#0	0	20.54	20.72

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6.2.10 CAT-M B4 Conducted RF Power Output Results

Mode	Bandwidth	Channel	RB	Index	Conducted Power	
					QPSK	16QAM
Band4	1.4MHz	19957	1#0	0	21.65	21.82
			6#0	0	20.83	20.02
		20175	1#0	0	21.28	21.85
			6#0	0	20.97	20.11
		20393	1#5	0	21.17	21.02
			6#0	0	20.98	20.19
	3MHz	19965	1#0	0	21.73	21.81
			6#0	0	20.35	20.64
		20175	1#0	0	21.28	21.81
			6#0	0	20.59	20.79
		20385	1#5	1	21.13	21.04
			6#0	1	20.58	20.85
	5MHz	19975	1#0	0	21.89	21.37
			6#0	0	20.86	20.91
		20175	1#0	0	21.14	21.45
			6#0	0	20.89	20.00
		20375	1#5	3	21.10	21.52
			6#0	3	20.97	20.18

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	10MHz	20000	1#0	0	21.84	21.36
			4#0	0	20.95	20.33
		20175	1#0	0	21.29	21.42
			4#0	0	20.21	20.51
		20350	1#5	7	21.06	21.47
			4#2	7	20.12	20.47
	15MHz	20025	1#0	0	21.57	21.40
			6#0	0	20.06	20.49
		20175	1#0	0	21.02	21.47
			6#0	0	20.11	20.55
		20325	1#5	0	21.08	21.89
			6#0	0	20.17	20.67
	20MHz	20050	1#0	0	21.01	21.46
			6#0	0	20.03	20.54
		20175	1#0	0	21.02	21.48
			6#0	0	20.11	20.53
		20300	1#5	0	21.04	21.51
			6#0	0	20.15	20.64

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6.2.11 CAT-M B12 Conducted RF Power Output Results

Mode	Bandwidth	Channel	RB	Index	Conducted Power	
					QPSK	16QAM
Band12	1.4MHz	23017	1#0	0	21.79	21.71
			6#0	0	20.47	20.86
		23095	1#0	0	21.88	21.60
			6#0	0	20.57	20.89
		23173	1#5	0	21.89	21.80
			6#0	0	20.74	20.11
	3MHz	23025	1#0	0	21.82	21.56
			6#0	0	20.32	20.65
		23095	1#0	0	21.87	21.61
			6#0	0	20.45	20.63
		23165	1#5	1	21.71	21.63
			6#0	1	20.26	20.59
	5MHz	23035	1#0	0	21.78	21.94
			6#0	0	20.80	20.91
		23095	1#0	0	21.88	21.05
			6#0	0	20.85	20.94
		23155	1#5	3	21.92	21.08
			6#0	3	20.74	20.87
	10MHz	23060	1#0	0	21.85	21.01
			4#0	0	20.90	20.99
		23095	1#0	0	21.93	21.01
			4#0	0	20.92	20.02
		23130	1#5	7	21.84	21.96
			4#2	7	20.91	20.10

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6.2.12 CAT-M B13 Conducted RF Power Output Results

Mode	Bandwidth	Channel	RB	Index	Conducted Power	
					QPSK	16QAM
Band13	5MHz	23205	1#0	0	21.52	21.77
			6#0	0	20.57	20.74
		23230	1#0	0	21.49	21.75
			6#0	3	20.55	20.73
		23255	1#5	3	21.53	21.71
			6#0	3	20.43	20.67
	10MHz	23230	1#0	0	21.47	21.71
			6#0	0	20.39	20.89
		23230	1#0	0	21.52	21.71
			6#0	0	20.45	20.81
		23230	1#5	7	21.47	21.74
			4#2	7	20.63	20.83

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6.2.13 CAT-M B14 Conducted RF Power Output Results

Mode	Bandwidth	Channel	RB	Index	Conducted Power	
					QPSK	16QAM
Band14	5MHz	23305	1#0	0	21.30	21.79
			6#0	0	20.42	20.83
		23330	1#0	0	21.41	21.89
			6#0	3	20.48	20.91
		23355	1#5	3	21.37	21.86
			6#0	3	20.45	20.88
	10MHz	23330	1#0	0	21.48	21.89
			6#0	0	20.53	20.93
		23330	1#0	0	21.47	21.74
			6#0	0	20.39	20.79
		23330	1#5	7	21.39	21.91
			4#2	7	20.42	20.87

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6.2.14 CAT-M B25 Conducted RF Power Output Results

Mode	Bandwidth	Channel	RB	Index	Conducted Power	
					QPSK	16QAM
Band25	1.4MHz	26047	1#0	0	21.45	21.82
			6#0	0	20.68	20.84
		26365	1#0	0	21.37	21.91
			6#0	0	20.61	20.97
		26683	1#5	0	21.44	21.86
			6#0	0	20.56	20.88
	3MHz	26055	1#0	0	21.57	21.74
			6#0	0	20.52	20.96
		26365	1#0	0	21.45	21.89
			6#0	0	20.51	20.74
		26675	1#5	1	21.48	21.73
			6#0	1	20.64	20.76
	5MHz	26065	1#0	0	21.59	21.94
			6#0	0	20.66	20.87
		26365	1#0	0	21.56	21.72
			6#0	0	20.63	20.75
		26665	1#5	3	21.47	21.91
			6#0	3	20.38	20.74

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	10MHz	26090	1#0	0	21.49	21.82
			4#0	0	20.44	20.89
		26365	1#0	0	21.51	21.98
			4#0	0	20.49	20.76
		26640	1#5	7	21.51	21.75
			4#2	7	20.42	20.86
	15MHz	26115	1#0	0	21.52	21.79
			6#0	0	20.48	20.89
		26365	1#0	0	21.36	21.84
			6#0	0	20.45	20.86
		26615	1#5	0	21.47	21.79
			6#0	0	20.42	20.81
	20MHz	26140	1#0	0	21.43	21.93
			6#0	0	20.52	20.71
		26365	1#0	0	21.57	21.01
			6#0	0	20.51	20.94
		26590	1#5	0	21.53	21.88
			6#0	0	20.55	20.79

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6.2.15 CAT-M B26 Conducted RF Power Output Results

(824MHz-849MHz)

Mode	Bandwidth	Channel	RB	Index	Conducted Power	
					QPSK	16QAM
Band26	1.4MHz	26797	1#0	0	21.56	21.35
			6#0	0	20.45	20.73
		26915	1#0	0	21.50	21.28
			6#0	0	20.42	20.65
		27033	1#5	0	21.30	21.14
			6#0	0	20.38	20.53
	3MHz	26805	1#0	0	21.82	21.56
			6#0	0	20.32	20.65
		26915	1#0	0	21.87	21.61
			6#0	0	20.45	20.63
		27025	1#5	1	21.71	21.63
			6#0	1	20.26	20.59
	5MHz	26815	1#0	0	21.47	21.88
			6#0	0	20.39	20.89
		26915	1#0	0	21.52	21.71
			6#0	0	20.45	20.81
		27015	1#5	3	21.47	21.74
			6#0	3	20.63	20.83
	10MHz	26840	1#0	0	21.77	21.40
			4#0	0	20.06	20.49
		26915	1#0	0	21.02	21.47
			4#0	0	20.11	20.55
		26990	1#5	7	21.08	21.52
			4#2	7	20.17	20.67

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(814MHz-824MHz)

Mode	Bandwidth	Channel	RB	Index	Conducted Power	
					QPSK	16QAM
Band26	1.4MHz	26697	1#0	0	21.47	21.75
			6#0	0	20.39	20.89
		26740	1#0	0	21.52	21.71
			6#0	0	20.45	20.81
		26783	1#5	0	21.47	21.74
			6#0	0	20.63	20.83
	3MHz	26705	1#0	0	21.56	21.64
			6#0	0	20.67	20.86
		26740	1#0	0	21.56	21.74
			6#0	0	20.60	20.79
		26775	1#5	1	21.47	21.63
			6#0	1	20.54	20.72
	5MHz	26715	1#0	0	21.56	21.35
			6#0	0	20.45	20.73
		26740	1#0	0	21.50	21.28
			6#0	0	20.42	20.65
		26765	1#5	3	21.30	21.14
			6#0	3	20.38	20.53
	10MHz	26740	1#0	0	21.13	21.04
			4#0	0	20.45	20.52

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6.2.16 CAT-M B66 Conducted RF Power Output Results

Mode	Bandwidth	Channel	RB	Index	Conducted Power	
					QPSK	16QAM
Band66	1.4MHz	131979	1#0	0	21.33	21.22
			6#0	0	20.98	20.26
		132322	1#0	0	21.53	21.63
			6#0	0	20.41	20.53
		132665	1#5	0	21.42	21.54
			6#0	0	20.45	20.52
	3MHz	131987	1#0	0	21.40	21.54
			6#0	0	20.38	20.49
		132322	1#0	0	21.50	21.63
			6#0	0	20.47	20.61
		132657	1#5	1	21.27	21.52
			6#0	1	20.36	20.46
	5MHz	131997	1#0	0	21.45	21.82
			6#0	0	20.68	20.84
		132322	1#0	0	21.37	21.91
			6#0	0	20.61	20.97
		132647	1#5	3	21.44	21.86
			6#0	3	20.56	20.88

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	10MHz	132022	1#0	0	21.30	21.14
			4#0	0	20.38	20.53
		132322	1#0	0	21.41	21.53
			4#0	0	20.42	20.54
		132622	1#5	7	21.18	21.42
			4#2	7	20.33	20.22
	15MHz	132047	1#0	0	21.92	22.08
			6#0	0	20.74	20.87
		132322	1#0	0	21.30	21.14
			6#0	0	20.38	20.53
		132597	1#5	0	21.42	21.83
			6#0	0	20.41	20.89
	20MHz	132072	1#0	0	21.55	21.73
			6#0	0	20.53	20.71
		132322	1#0	0	21.15	21.45
			6#0	0	20.33	20.58
		132572	1#5	0	21.47	21.71
			6#0	0	20.39	20.89

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6.3. ERP and EIRP

This is the test for the maximum radiated power from the EUT.

According to Part 22.913(a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to Part 24.232(c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to Part 27.50(c), portable stations (hand-held devices) in the 600 MHz uplink Band and the 698-746 MHz Band, and fixed and mobile stations in the 600 MHz uplink Band are limited to 3 watts ERP.

According to Part 27.50(d), fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz Band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz Bands are limited to 1 watt EIRP.

According to 22.913(a), The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

Note: The full RB test result of 16QAM of CAT-M is configured as 5@0.

Conducted RF Power+Antenna Gain(dBi)=EIRP

Conducted RF Power+Antenna Gain(dBd)=ERP

Antenna Gain(dBd)= Antenna Gain(dBi)-2.15

Frequency Band	AntennaGain (dBi)	AntennaGain (dBd)
NB-IOT Band2/CAT-M Band2	3	N/A
NB-IOT Band4/CAT-M Band4	6	N/A
NB-IOT Band5/CAT-M Band5	6	3.85
NB-IOT Band12/CAT-M Band12	6	3.85
NB-IOT Band13/CAT-M Band13	10	7.85
CAT-M Band14	10	7.85
NB-IOT Band25/CAT-M Band25	3	N/A
NB-IOT Band26/CAT-M Band26	6	3.85
NB-IOT Band66/CAT-M Band66	6	N/A
NB-IOT Band71	6	3.85

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NB-IoT Band 2

EIRP (dBm) (EIRP Limits : 30dBm Max EIRP=24.99dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low18601	Mid18900	High19199
3.75	BPSK	1@0	24.84	24.70	24.02
		1@47	24.98	24.68	24.96
	QPSK	1@0	24.82	24.79	24.93
		1@47	24.74	24.81	24.84
15	BPSK	1@0	24.99	24.93	24.28
		1@11	24.91	24.95	24.24
	QPSK	1@0	24.44	24.00	24.24
		1@11	24.37	24.14	24.17
		12@0	23.78	23.61	23.71

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NB-IoT Band 4

EIRP (dBm) (EIRP Limits : 30dBm Max EIRP=28.03dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low19951	Mid20175	High20399
3.75	BPSK	1@0	27.80	27.78	27.61
		1@47	27.84	27.77	27.66
	QPSK	1@0	28.03	27.62	27.84
		1@47	27.97	27.67	27.71
15	BPSK	1@0	27.15	27.99	27.85
		1@11	27.25	27.97	27.82
	QPSK	1@0	27.10	27.05	27.94
		1@11	27.07	27.94	27.87
		12@0	26.97	26.98	26.99

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NB-IoT Band12

ERP (dBm) (ERP Limits : 34.8 dBm Max ERP=25.79dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low23011	Mid23095	High23179
3.75	BPSK	1@0	25.66	25.06	25.36
		1@47	25.63	25.08	25.37
	QPSK	1@0	25.62	25.15	25.41
		1@47	25.59	25.09	25.34
15	BPSK	1@0	25.68	25.60	25.73
		1@11	25.68	25.60	25.79
	QPSK	1@0	25.69	25.00	25.70
		1@11	25.67	25.78	25.58
		12@0	23.87	24.17	24.77

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NB-IoT Band13

ERP (dBm) (ERP Limits : 34.8 dBm Max ERP=25.44dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low23181	Mid23230	High23279
3.75	BPSK	1@0	29.42	29.16	29.01
		1@47	29.44	29.15	29.05
	QPSK	1@0	28.86	29.2	29.21
		1@47	29.37	29.15	29.06
15	BPSK	1@0	29.17	29.33	29.27
		1@11	29.13	29.25	29.25
	QPSK	1@0	29.19	29.44	29.31
		1@11	29.12	29.34	29.21
		12@0	28.53	28.72	28.61

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NB-IoT Band25

EIRP (dBm) (EIRP Limits : 33dBm Max EIRP=24.88dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low26041	Mid26365	High26689
3.75	BPSK	1@0	24.49	24.41	24.77
		1@47	24.44	24.37	24.74
	QPSK	1@0	24.22	24.15	24.42
		1@47	24.26	24.12	24.39
15	BPSK	1@0	24.23	24.10	24.52
		1@11	24.21	24.16	24.35
	QPSK	1@0	24.42	24.40	24.88
		1@11	24.18	24.23	24.68
		12@0	23.36	23.48	23.80

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NB-IoT Band 26
(824MHz-849MHz)

ERP (dBm) (ERP Limits : 38.5dBm Max ERP=28.14dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low26791	Mid26915	High27039
3.75	BPSK	1@0	25.61	25.31	25.36
		1@47	25.62	25.22	25.37
	QPSK	1@0	25.62	25.28	25.41
		1@47	25.59	25.19	25.34
15	BPSK	1@0	25.75	25.59	25.63
		1@11	25.69	25.43	25.59
	QPSK	1@0	25.74	25.67	25.7
		1@11	25.67	25.6	25.58
		12@0	23.9	23.9	24.77

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(814MHz-824MHz)

ERP (dBm) (ERP Limits : 51.5 dBm Max ERP=25.67dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low26691	Mid26740	High26789
3.75	BPSK	1@0	25.36	25.41	25.27
		1@47	25.34	25.46	25.20
	QPSK	1@0	25.33	25.36	25.31
		1@47	25.45	25.44	25.36
15	BPSK	1@0	25.67	25.44	25.52
		1@11	25.51	25.56	25.47
	QPSK	1@0	25.42	25.50	25.58
		1@11	25.54	25.60	25.52
		12@0	23.97	23.94	23.88

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NB-IoT Band66

EIRP (dBm) (EIRP Limits : 30 dBm Max EIRP=27.92dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low131973	Mid132322	High132671
3.75	BPSK	1@0	27.02	27.17	27.67
		1@47	27.78	27.16	27.70
	QPSK	1@0	27.74	27.75	27.48
		1@47	27.70	27.89	27.44
15	BPSK	1@0	27.73	27.00	27.48
		1@11	27.64	27.02	27.42
	QPSK	1@0	27.73	27.40	27.92
		1@11	27.46	27.12	27.45
		12@0	26.96	26.36	26.57

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NB-IoT Band71

ERP (dBm) (ERP Limits : 33 dBm Max ERP=25.82dBm)					
Sub-carrier Spacing [kHz]	Modulation	N _{tones}	Channel		
			Low133123	Mid133297	High133471
3.75	BPSK	1@0	24.89	25.80	25.41
		1@47	24.86	25.82	25.35
	QPSK	1@0	25.22	25.54	25.15
		1@47	25.17	25.55	25.14
15	BPSK	1@0	25.59	25.40	25.06
		1@11	25.56	25.36	25.02
	QPSK	1@0	25.78	25.53	25.06
		1@11	25.62	25.31	24.85
		12@0	24.39	23.93	24.23

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CAT-M B2

Mode	Bandwidth	Channel	RB	Index	EIRP(Limits 33.0 dBm)	
					QPSK	16QAM
Band2	1.4MHz	18607	1#0	0	24.79	24.42
			6#0	0	23.28	23.83
		18900	1#0	0	24.39	24.67
			6#0	0	23.10	23.24
		19193	1#5	0	24.41	24.10
			6#0	0	23.42	23.21
	3MHz	18615	1#0	0	24.58	24.33
			6#0	0	23.96	23.13
		18900	1#0	0	24.51	24.22
			6#0	0	23.88	23.08
		19185	1#5	1	24.35	24.28
			6#0	1	23.78	23.93
	5MHz	18625	1#0	0	24.56	24.74
			6#0	0	23.26	23.54
		18900	1#0	0	24.49	24.64
			6#0	0	23.15	23.45
		19175	1#5	3	24.33	24.58
			6#0	3	23.10	23.46

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	10MHz	18650	1#0	0	24.40	24.54
			4#0	0	23.38	23.49
		18900	1#0	0	24.50	24.63
			4#0	0	23.47	23.61
		19150	1#5	7	24.27	24.52
			4#2	7	23.36	23.46
	15MHz	18675	1#0	0	24.61	24.74
			6#0	0	23.66	23.86
		18900	1#0	0	24.55	24.70
			6#0	0	23.58	23.75
		19125	1#5	0	24.38	24.41
			6#0	0	23.36	23.51
	20MHz	18700	1#0	0	24.56	24.64
			6#0	0	23.67	23.86
		18900	1#0	0	24.56	24.74
			6#0	0	23.60	23.79
		19100	1#5	0	24.47	24.63
			6#0	0	23.54	23.72

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CAT-M B4

Mode	Bandwidth	Channel	RB	Index	EIRP(Limits 30.0 dBm)	
					QPSK	16QAM
Band4	1.4MHz	19957	1#0	0	27.65	27.82
			6#0	0	26.83	26.02
		20175	1#0	0	27.28	27.85
			6#0	0	26.97	26.11
		20393	1#5	0	27.17	27.02
			6#0	0	26.98	26.19
	3MHz	19965	1#0	0	27.73	27.81
			6#0	0	26.35	26.64
		20175	1#0	0	27.28	27.81
			6#0	0	26.59	26.79
		20385	1#5	1	27.13	27.04
			6#0	1	26.58	26.85
	5MHz	19975	1#0	0	27.89	27.37
			6#0	0	26.86	26.91
		20175	1#0	0	27.14	27.45
			6#0	0	26.89	26.00
		20375	1#5	3	27.10	27.52
			6#0	3	26.97	26.18

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	10MHz	20000	1#0	0	27.84	27.36
			4#0	0	26.95	26.33
		20175	1#0	0	27.29	27.42
			4#0	0	26.21	26.51
		20350	1#5	7	27.06	27.47
			4#2	7	26.12	26.47
	15MHz	20025	1#0	0	27.57	27.40
			6#0	0	26.06	26.49
		20175	1#0	0	27.02	27.47
			6#0	0	26.11	26.55
		20325	1#5	0	27.08	27.89
			6#0	0	26.17	26.67
	20MHz	20050	1#0	0	27.01	27.46
			6#0	0	26.03	26.54
		20175	1#0	0	27.02	27.48
			6#0	0	26.11	26.53
		20300	1#5	0	27.04	27.51
			6#0	0	26.15	26.64

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CAT-M B12

Mode	Bandwidth	Channel	RB	Index	ERP (Limits 34.8dBm)	
					QPSK	16QAM
Band12	1.4MHz	23017	1#0	0	25.64	25.56
			6#0	0	24.32	24.71
		23095	1#0	0	25.73	25.45
			6#0	0	24.42	24.74
		23173	1#5	0	25.74	25.65
			6#0	0	24.59	23.96
	3MHz	23025	1#0	0	25.67	25.41
			6#0	0	24.17	24.50
		23095	1#0	0	25.72	25.46
			6#0	0	24.30	24.48
		23165	1#5	1	25.56	25.48
			6#0	1	24.11	24.44
	5MHz	23035	1#0	0	25.63	25.79
			6#0	0	24.65	24.76
		23095	1#0	0	25.73	24.90
			6#0	0	24.70	24.79
		23155	1#5	3	25.77	24.93
			6#0	3	24.59	24.72
	10MHz	23060	1#0	0	25.70	24.86
			4#0	0	24.75	24.84
		23095	1#0	0	25.78	24.86
			4#0	0	24.77	23.87
		23130	1#5	7	25.69	25.81
			4#2	7	24.76	23.95

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CAT-M B13

Mode	Bandwidth	Channel	RB	Index	ERP (Limits 34.8dBm)	
					QPSK	16QAM
Band13	5MHz	23205	1#0	0	29.37	29.62
			6#0	0	28.42	28.59
		23230	1#0	0	29.34	29.60
			6#0	3	28.40	28.58
		23255	1#5	3	29.38	29.56
			6#0	3	28.28	28.52
	10MHz	23230	1#0	0	29.32	29.56
			6#0	0	28.24	28.74
		23230	1#0	0	29.37	29.56
			6#0	0	28.30	28.66
		23230	1#5	7	29.32	29.59
			4#2	7	28.48	28.68

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CAT-M B14

Mode	Bandwidth	Channel	RB	Index	ERP (Limits 34.8dBm)	
					QPSK	16QAM
Band14	5MHz	23305	1#0	0	29.15	29.64
			6#0	0	28.27	28.68
		23330	1#0	0	29.26	29.74
			6#0	3	28.33	28.76
		23355	1#5	3	29.22	29.71
			6#0	3	28.30	28.73
	10MHz	23330	1#0	0	29.33	29.74
			6#0	0	28.38	28.78
		23330	1#0	0	29.32	29.59
			6#0	0	28.24	28.64
		23330	1#5	7	29.24	29.76
			4#2	7	28.27	28.72

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CAT-M B25

Mode	Bandwidth	Channel	RB	Index	EiRP (Limits 33dBm)	
					QPSK	16QAM
Band25	1.4MHz	26047	1#0	0	24.45	24.82
			6#0	0	23.68	23.84
		26365	1#0	0	24.37	24.91
			6#0	0	23.61	23.97
		26683	1#5	0	24.44	24.86
			6#0	0	23.56	23.88
	3MHz	26055	1#0	0	24.57	24.74
			6#0	0	23.52	23.96
		26365	1#0	0	24.45	24.89
			6#0	0	23.51	23.74
		26675	1#5	1	24.48	24.73
			6#0	1	23.64	23.76
	5MHz	26065	1#0	0	24.59	24.94
			6#0	0	23.66	23.87
		26365	1#0	0	24.56	24.72
			6#0	0	23.63	23.75
		26665	1#5	3	24.47	24.91
			6#0	3	23.38	23.74

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	10MHz	26090	1#0	0	24.49	24.82
			4#0	0	23.44	23.89
		26365	1#0	0	24.51	24.98
			4#0	0	23.49	23.76
		26640	1#5	7	24.51	24.75
			4#2	7	23.42	23.86
	15MHz	26115	1#0	0	24.52	24.79
			6#0	0	23.48	23.89
		26365	1#0	0	24.36	24.84
			6#0	0	23.45	23.86
		26615	1#5	0	24.47	24.79
			6#0	0	23.42	23.81
	20MHz	26140	1#0	0	24.43	24.93
			6#0	0	23.52	23.71
		26365	1#0	0	24.57	24.01
			6#0	0	23.51	23.94
		26590	1#5	0	24.53	24.88
			6#0	0	23.55	23.79

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CAT-M B26

(824MHz-849MHz)

Mode	Bandwidth	Channel	RB	Index	ERP (Limits 38.5dBm)	
					QPSK	16QAM
Band26	1.4MHz	26797	1#0	0	25.41	25.20
			6#0	0	24.30	24.58
		26915	1#0	0	25.35	25.13
			6#0	0	24.27	24.50
		27033	1#5	0	25.15	24.99
			6#0	0	24.23	24.38
	3MHz	26805	1#0	0	25.67	25.41
			6#0	0	24.17	24.50
		26915	1#0	0	25.72	25.46
			6#0	0	24.30	24.48
		27025	1#5	1	25.56	25.48
			6#0	1	24.11	24.44
	5MHz	26815	1#0	0	25.32	25.73
			6#0	0	24.24	24.74
		26915	1#0	0	25.37	25.56
			6#0	0	24.30	24.66
		27015	1#5	3	25.32	25.59
			6#0	3	24.48	24.68
	10MHz	26840	1#0	0	25.62	25.25
			4#0	0	23.91	24.34
		26915	1#0	0	24.87	25.32
			4#0	0	23.96	24.40
		26990	1#5	7	24.93	25.37
			4#2	7	24.02	24.52

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(814MHz-824MHz)

Mode	Bandwidth	Channel	RB	Index	ERP (Limits 51.5dBm)	
					QPSK	16QAM
Band26	1.4MHz	26697	1#0	0	25.32	25.60
			6#0	0	24.24	24.74
		26740	1#0	0	25.37	25.56
			6#0	0	24.30	24.66
		26783	1#5	0	25.32	25.59
			6#0	0	24.48	24.68
	3MHz	26705	1#0	0	25.41	25.49
			6#0	0	24.52	24.71
		26740	1#0	0	25.41	25.59
			6#0	0	24.45	24.64
		26775	1#5	1	25.32	25.48
			6#0	1	24.39	24.57
	5MHz	26715	1#0	0	25.41	25.20
			6#0	0	24.30	24.58
		26740	1#0	0	25.35	25.13
			6#0	0	24.27	24.50
		26765	1#5	3	25.15	24.99
			6#0	3	24.23	24.38
	10MHz	26740	1#0	0	24.98	24.89
			4#0	0	24.30	24.37

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CAT-M B66

Mode	Bandwidth	Channel	RB	Index	EIRP (Limits 30dBm)	
					QPSK	16QAM
Band66	1.4MHz	131979	1#0	0	27.33	27.22
			6#0	0	26.98	26.26
		132322	1#0	0	27.53	27.63
			6#0	0	26.41	26.53
		132665	1#5	0	27.42	27.54
			6#0	0	26.45	26.52
	3MHz	131987	1#0	0	27.40	27.54
			6#0	0	26.38	26.49
		132322	1#0	0	27.50	27.63
			6#0	0	26.47	26.61
		132657	1#5	1	27.27	27.52
			6#0	1	26.36	26.46
	5MHz	131997	1#0	0	27.45	27.82
			6#0	0	26.68	26.84
		132322	1#0	0	27.37	27.91
			6#0	0	26.61	26.97
		132647	1#5	3	27.44	27.86
			6#0	3	26.56	26.88

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	10MHz	132022	1#0	0	27.30	27.14
			4#0	0	26.38	26.53
		132322	1#0	0	27.41	27.53
			4#0	0	26.42	26.54
		132622	1#5	7	27.18	27.42
			4#2	7	26.33	26.22
	15MHz	132047	1#0	0	27.92	28.08
			6#0	0	26.74	26.87
		132322	1#0	0	27.30	27.14
			6#0	0	26.38	26.53
		132597	1#5	0	27.42	27.83
			6#0	0	26.41	26.89
	20MHz	132072	1#0	0	27.55	27.73
			6#0	0	26.53	26.71
		132322	1#0	0	27.15	27.45
			6#0	0	26.33	26.58
		132572	1#5	0	27.47	27.71
			6#0	0	26.39	26.89

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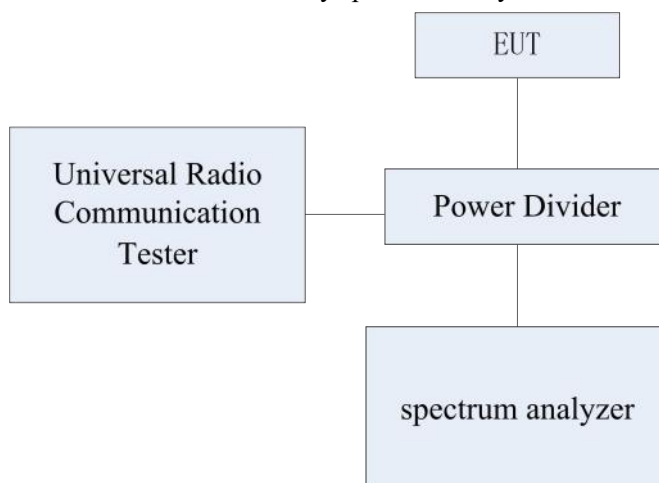
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6.4. Occupied Bandwidth

Specifications:	FCC Part 2.1049,22.917(b), 24.238(b),90.209
DUT Serial Number:	865456056939661
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	--

Test Setup

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	500 kHz (k=2)

Test Method

The 99% occupied Bandwidth was calculated from the spectrum analyzer. Markers in the spectrum analyzer were then placed between the calculated frequencies to show the calculated 99% power Band. The 26dB Bandwidth was also measured and recorded.

Note: --

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6.4.1 NB-IoT B2 Mode Occupied Bandwidth Results

Frequency ID	N _{UL}	N _{tones}	Sub-carrier Spacing [kHz]	Occupied Bandwidth (99%) (kHz)		Occupied Bandwidth(26dB) (kHz)	
				QPSK	BPSK	QPSK	BPSK
Low Range	18601	12@0	15	195.85	188.38	252.5	244.2
Mid Range	18900			185.23	182.30	250.9	237.3
High Range	19199			184.61	191.21	253.6	251.6

6.4.2 NB-IoT B4 Mode Occupied Bandwidth Results

Frequency ID	N _{UL}	N _{tones}	Sub-carrier Spacing [kHz]	Occupied Bandwidth (99%) (kHz)		Occupied Bandwidth(26dB) (kHz)	
				QPSK	BPSK	QPSK	BPSK
Low Range	19951	12@0	15	195.40	189.66	252.3	243.2
Mid Range	20175			187.82	190.32	240.0	248.1
High Range	20399			185.01	186.14	238.6	249.9

6.4.3 NB-IoT B12 Mode Occupied Bandwidth Results

Frequency ID	N _{UL}	N _{tones}	Sub-carrier Spacing [kHz]	Occupied Bandwidth (99%) (kHz)		Occupied Bandwidth(26dB) (kHz)	
				QPSK	BPSK	QPSK	BPSK
Low Range	23011	12@0	15	191.04	188.31	261.0	251.7
Mid Range	23095			188.17	187.70	250.4	252.0
High Range	23179			184.72	185.60	239.5	256.0

6.4.4 NB-IoT B13 Mode Occupied Bandwidth Results

Frequency ID	N _{UL}	N _{tones}	Sub-carrier Spacing [kHz]	Occupied Bandwidth (99%) (kHz)		Occupied Bandwidth(26dB) (kHz)	
				QPSK	BPSK	QPSK	BPSK
Low Range	23181	12@0	15	192.50	194.22	258.2	248.0
Mid Range	23230			187.49	198.90	237.8	263.2
High Range	23279			194.08	191.99	252.1	251.4

6.4.5 NB-IoT B25 Mode Occupied Bandwidth Results

Frequency ID	N _{UL}	N _{tones}	Sub-carrier Spacing [kHz]	Occupied Bandwidth (99%) (kHz)		Occupied Bandwidth(26dB) (kHz)	
				QPSK	BPSK	QPSK	BPSK
Low Range	26041	12@0	15	191.22	190.68	251.4	261.8
Mid Range	26365			187.48	186.74	248.4	240.1
High Range	26689			187.82	193.30	241.3	246.1

6.4.6 NB-IoT B26 Mode Occupied Bandwidth Results

(814 MHz ~824MHz)

Mode	Channel/Ferquency (MHz)	Occupied Bandwidth 99% (kHz)	Occupied Bandwidth 26dB (kHz)
BPSK	26691/814.1	196.37	240.3
QPSK	26691/814.1	190.64	262.6
BPSK	26740/819.0	192.35	262.4
QPSK	26740/819.0	194.05	248.6
BPSK	26789/823.9	188.65	257.6
QPSK	26789/823.9	190.80	247.7

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(824 MHz ~849MHz)

Mode	Channel/Ferquency (MHz)	Occupied Bandwidth 99% (kHz)	Occupied Bandwidth 26dB (kHz)
BPSK	26791/824.1	190.25	259.3
QPSK	26791/824.1	190.92	253.6
BPSK	26915/836.5	193.64	254.8
QPSK	26915/836.5	183.79	258.6
BPSK	27039/848.9	189.19	251.4
QPSK	27039/848.9	190.51	260.7

6.4.7 NB-IoT B66 Mode Occupied Bandwidth Results

Frequency ID	N _{UL}	N _{tones}	Sub-carrier Spacing [kHz]	Occupied Bandwidth (99%) (kHz)		Occupied Bandwidth(26dB) (kHz)	
				QPSK	BPSK	QPSK	BPSK
Low Range	131973	12@0	15	192.33	191.48	250.2	251.3
Mid Range	132322			188.71	194.01	236.5	239.0
High Range	132671			191.45	193.61	260.2	260.0

6.4.8 NB-IoT B71 Mode Occupied Bandwidth Results

Frequency ID	N _{UL}	N _{tones}	Sub-carrier Spacing [kHz]	Occupied Bandwidth (99%) (kHz)		Occupied Bandwidth(26dB) (kHz)	
				QPSK	BPSK	QPSK	BPSK
Low Range	133123	12@0	15	193.50	191.75	259.6	261.2
Mid Range	133297			188.14	197.61	255.8	240.4
High Range	133471			192.61	197.54	251.6	251.0

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6.4.9 CAT-M B2 Mode Occupied Bandwidth Results

Bandwidth	Modulation	Channel/Ferquency (MHz)	RB	Index	Occupied Bandwidth 99% (MHz)	Occupied Bandwidth 26dB (MHz)
1.4MHz	QPSK	18900/1880	6@0	0	1.079	1.251
	16QAM	18900/1880	5@0		0.9042	1.070
3MHz	QPSK	18900/1880	6@0	0	1.078	1.234
	16QAM	18900/1880	5@0		0.9089	1.076
5MHz	QPSK	18900/1880	6@0	0	1.086	1.228
	16QAM	18900/1880	5@0		0.9160	1.094
10MHz	QPSK	18900/1880	6@0	0	1.090	1.213
	16QAM	18900/1880	5@0		0.9213	1.146
15MHz	QPSK	18900/1880	6@0	0	1.106	1.276
	16QAM	18900/1880	5@0		0.9307	1.122
20MHz	QPSK	18900/1880	6@0	0	1.104	1.259
	16QAM	18900/1880	5@0		0.9307	1.122

6.4.10 CAT-M B4 Mode Occupied Bandwidth Results

Bandwidth	Modulation	Channel/Ferquency (MHz)	RB	Index	Occupied Bandwidth 99% (MHz)	Occupied Bandwidth 26dB (MHz)
1.4MHz	QPSK	20175/1732.5	6@0	0	1.078	1.238
	16QAM	20175/1732.5	5@0		0.9069	1.072
3MHz	QPSK	20175/1732.5	6@0	0	1.078	1.228
	16QAM	20175/1732.5	5@0		0.9063	1.077
5MHz	QPSK	20175/1732.5	6@0	0	1.088	1.246
	16QAM	20175/1732.5	5@0		0.9132	1.093
10MHz	QPSK	20175/1732.5	6@0	0	1.092	1.215
	16QAM	20175/1732.5	5@0		0.9181	1.102
15MHz	QPSK	20175/1732.5	6@0	0	1.105	1.248
	16QAM	20175/1732.5	5@0		0.9288	1.106
20MHz	QPSK	20175/1732.5	6@0	0	1.102	1.258
	16QAM	20175/1732.5	5@0		0.9311	1.106

6.4.11 CAT-M B12 Mode Occupied Bandwidth Results

Bandwidth	Modulation	Channel/Ferquency (MHz)	RB	Index	Occupied Bandwidth 99% (MHz)	Occupied Bandwidth 26dB (MHz)
1.4MHz	QPSK	23095/707.5	6@0	0	1.080	1.250
	16QAM	23095/707.5	5@0		0.9067	1.075
3MHz	QPSK	23095/707.5	6@0	0	1.078	1.235
	16QAM	23095/707.5	5@0		0.9063	1.092
5MHz	QPSK	23095/707.5	6@0	0	1.085	1.263
	16QAM	23095/707.5	5@0		0.9132	1.084
10MHz	QPSK	23095/707.5	6@0	0	1.092	1.219
	16QAM	23095/707.5	5@0		0.9183	1.087

6.4.12 CAT-M B13 Mode Occupied Bandwidth Results

Bandwidth	Modulation	Channel/Ferquency (MHz)	RB	Index	Occupied Bandwidth 99% (MHz)	Occupied Bandwidth 26dB (MHz)
5MHz	QPSK	23230/782	6@0	0	1.085	1.246
	16QAM	23230/782	5@0		0.9129	1.083
10MHz	QPSK	23230/782	6@0	0	1.087	1.201
	16QAM	23230/782	5@0		0.9165	1.093

6.4.13 CAT-M B14 Mode Occupied Bandwidth Results

Bandwidth	Modulation	Channel/Ferquency (MHz)	RB	Index	Occupied Bandwidth 99% (MHz)	Occupied Bandwidth 26dB (MHz)
5MHz	QPSK	23330/793	6@0	0	1.082	1.242
	16QAM	23330/793	5@0		0.9137	1.070
10MHz	QPSK	23330/793	6@0	0	1.088	1.233
	16QAM	23330/793	5@0		0.9139	1.063

6.4.14 CAT-M B25 Mode Occupied Bandwidth Results

Bandwidth	Modulation	Channel/Ferquency (MHz)	RB	Index	Occupied Bandwidth 99% (MHz)	Occupied Bandwidth 26dB (MHz)
1.4MHz	QPSK	26365/1882.5	6@0	0	1.079	1.235
	16QAM	26365/1882.5	5@0		0.9074	1.081
3MHz	QPSK	26365/1882.5	6@0	0	1.078	1.230
	16QAM	26365/1882.5	5@0		0.9067	1.076
5MHz	QPSK	26365/1882.5	6@0	0	1.085	1.254
	16QAM	26365/1882.5	5@0		0.9104	1.087
10MHz	QPSK	26365/1882.5	6@0	0	1.092	1.231
	16QAM	26365/1882.5	5@0		0.9244	1.148
15MHz	QPSK	26365/1882.5	6@0	0	1.095	1.265
	16QAM	26365/1882.5	5@0		0.9269	1.119
20MHz	QPSK	26365/1882.5	6@0	0	1.099	1.283
	16QAM	26365/1882.5	5@0		0.9349	1.105

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