

# TEST REPORT

**Applicant:** SG Wireless Limited  
**Address:** Unit 4, 5/F, Sun Fung Industrial Building, 8 Ma Kok Street, Tsuen Wan, New Territories, Hong Kong  
**Equipment Type:** F1 Smart Module  
**Model Name:** SGW3501  
**Brand Name:** SG Wireless  
**FCC ID:** 2AS9406  
**Test Standard:** 47 CFR Part 2  
(Others refer to chapter 3.1)  
**Sample Arrival Date:** Oct. 05, 2024  
**Test Date:** Oct. 05, 2024 - Nov. 01, 2024  
**Date of Issue:** Nov. 11, 2024

## ISSUED BY:

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### Revision History

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Nov. 11, 2024</u>	<u>Initial Issue</u>

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# 1 GENERAL INFORMATION

## 1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

## 1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	<input checked="" type="checkbox"/> Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	<input type="checkbox"/> 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

## 2 PRODUCT INFORMATION

### 2.1 Applicant Information

Applicant	SG Wireless Limited
Address	Unit 4, 5/F, Sun Fung Industrial Building, 8 Ma Kok Street, Tsuen Wan, New Territories, Hong Kong

### 2.2 Manufacturer Information

Manufacturer	SG Wireless Limited
Address	Unit 4, 5/F, Sun Fung Industrial Building, 8 Ma Kok Street, Tsuen Wan, New Territories, Hong Kong

### 2.3 General Description for Equipment under Test (EUT)

EUT Name	F1 Smart Module
Model Name Under Test	SGW3501
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	1.2.3
Software Version	B0.2.0b0
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

## 2.4 Technical Information

All Network and Wireless connectivity for EUT	4G Network FDD LTE-M1 Band 2/4/5/12/13/14/17/18/19/25/26/66/71/85 FDD NB-IoT Band 2/4/5/12/13/14/17/18/19/25/26/66/71/85 Bluetooth (BLE) WIFI 802.11b, 802.11g, 802.11n(HT20/40) LoRa
About the Product	The equipment is F1 module, intended for used with information technology equipment.

The following is the technical information of the EUT tested frequency bands in this report.

Operating Bands	FDD LTE-M1 Band 2/4/5/12/13/14/17/18/19/25/26/66/71/85 FDD NB-IoT Band 2/4/5/12/13/14/17/18/19/25/26/66/71/85	
Modulation Type	LTE-M1	QPSK
		16QAM
	NB-IoT	BPSK
		QPSK
Antenna Type	Monopole Antenna (External)	
UE Category	M1/NB2	
Antenna Gain	FDD LTE-M1 Band 2: 6.0 dBi FDD LTE-M1 Band 4: 6.0 dBi FDD LTE-M1 Band 5: 6.0 dBi FDD LTE-M1 Band 12: 6.0 dBi FDD LTE-M1 Band 13: 6.0 dBi FDD LTE-M1 Band 14: 6.0 dBi FDD LTE-M1 Band 17: 6.0 dBi FDD LTE-M1 Band 18: 6.0 dBi FDD LTE-M1 Band 19: 6.0 dBi FDD LTE-M1 Band 25: 6.0 dBi FDD LTE-M1 Band 26(Part22): 6.0 dBi FDD LTE-M1 Band 26(Part90): 6.0 dBi FDD LTE-M1 Band 66: 6.0 dBi FDD LTE-M1 Band 71: 6.0 dBi FDD LTE-M1 Band 85: 6.0 dBi FDD NB-IoT Band 2: 6.0 dBi FDD NB-IoT Band 4: 6.0 dBi FDD NB-IoT Band 5: 6.0 dBi FDD NB-IoT Band 12: 6.0 dBi FDD NB-IoT Band 13: 6.0 dBi FDD NB-IoT Band 14: 6.0 dBi FDD NB-IoT Band 17: 6.0 dBi FDD NB-IoT Band 18: 6.0 dBi	

		FDD NB-IoT Band 19: 6.0 dBi FDD NB-IoT Band 25: 6.0 dBi FDD NB-IoT Band 26(Part22): 6.0 dBi FDD NB-IoT Band 26(Part90): 6.0 dBi FDD NB-IoT Band 66: 6.0 dBi FDD NB-IoT Band 71: 6.0 dBi FDD NB-IoT Band 85: 6.0 dBi	
The Max RF Output Power (EIRP/ERP)		FDD LTE-M1 Band 2: 27.00 dBm FDD LTE-M1 Band 4: 26.82 dBm FDD LTE-M1 Band 5: 25.24 dBm FDD LTE-M1 Band 12: 25.22 dBm FDD LTE-M1 Band 13: 25.02 dBm FDD LTE-M1 Band 14: 24.98 dBm FDD LTE-M1 Band 17: 25.05 dBm FDD LTE-M1 Band 25: 26.98 dBm FDD LTE-M1 Band 26(Part22): 25.40 dBm FDD LTE-M1 Band 26(Part90) 25.06 dBm FDD LTE-M1 Band 66: 27.08 dBm FDD LTE-M1 Band 71: 25.92 dBm FDD LTE-M1 Band 85: 25.00 dBm FDD NB-IoT Band 2: 26.52 dBm FDD NB-IoT Band 4: 27.79 dBm FDD NB-IoT Band 5: 25.20 dBm FDD NB-IoT Band 12: 24.79 dBm FDD NB-IoT Band 13: 24.49 dBm FDD NB-IoT Band 14: 24.76 dBm FDD NB-IoT Band 17: 24.76 dBm FDD NB-IoT Band 25: 26.50 dBm FDD NB-IoT Band 26(Part22): 25.16 dBm FDD NB-IoT Band 26(Part90): 24.81 dBm FDD NB-IoT Band 66: 20.50 dBm FDD NB-IoT Band 71: 25.16 dBm FDD NB-IoT Band 85: 24.85 dBm	
Band	Power Class	Tx Frequency Range	Rx Frequency Range
LTE B2	3	1850 MHz ~ 1910 MHz	1930 MHz ~ 1990 MHz
LTE B4	3	1710 MHz ~ 1755 MHz	2110 MHz ~ 2155 MHz
LTE B5	3	824 MHz ~ 849 MHz	869 MHz ~ 894 MHz
LTE B12	3	699 MHz ~ 716 MHz	729 MHz ~ 746 MHz
LTE B13	3	777 MHz ~ 787MHz	746 MHz ~ 756 MHz
LTE B14	3	788 MHz ~ 798 MHz	758 MHz ~ 768 MHz
LTE B17	3	704 MHz ~ 716 MHz	734 MHz ~ 746 MHz
LTE B18	3	815 MHz ~ 830 MHz	860 MHz ~ 875 MHz
LTE B19	3	830 MHz ~ 845 MHz	875 MHz ~ 890 MHz

LTE B25	3	1850 MHz ~ 1915 MHz	1930 MHz ~ 1995 MHz
LTE B26	3	814 MHz ~ 824 MHz <sup>Note2</sup>	859 MHz ~ 869 MHz <sup>Note2</sup>
		824 MHz ~ 849 MHz	869 MHz ~ 894 MHz
LTE B66	3	1710 MHz ~ 1780 MHz	2110 MHz ~ 2180 MHz
LTE B71	3	663 MHz ~ 698 MHz	617 MHz ~ 652 MHz
LTE B85	3	698 MHz ~ 716 MHz	728 MHz ~ 746 MHz

Note1: The EUT information provided by the applicant, except for The Max RF Conducted Power. For more detailed band specifications and features description, please refer to the manufacturer's specifications or user's manual.

Note2: These frequency ranges are only applicable in the United States.

Note3: LTE B18/19 is covered by B26, which has been proven to be the worst result. Therefore, the report only introduces the test data of B26.



### 3 SUMMARY OF TEST RESULTS

#### 3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 Subpart H	Cellular Radiotelephone Service
3	47 CFR Part 24 Subpart E	Broadband PCS
4	47 CFR Part 27	Miscellaneous Wireless Communications Services
5	47 CFR Part 90 Subpart S	Regulations Governing Licensing and Use of Frequencies in the 806-824, 851-869, 896-901, and 935-940 MHz Bands
6	47 CFR Part 90 Subpart R	Regulations Governing Licensing and Use of Frequencies in the 758-775 and 788-805 MHz Bands
7	ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
8	KDB 971168 D01 v03	Measurement Guidance for Certification of Licensed Digital Transmitters

### 3.2 Test Verdict

No.	Test Description	FCC Part No.	Test Result	Test Verdict
1	Conducted RF Output Power	2.1046	Reporting only (ANNEX A.1)	Pass
2	Effective (Isotropic) Radiated Power	2.1046 22.913 24.232 27.50 90.635(b) 90.542(a)	ANNEX A.1	Pass
3	Peak to Average Ratio	2.1046 24.232(d) 27.50(d)	ANNEX A.2	Pass
4	Occupied Bandwidth	2.1049 22.917 24.238 27.53 90.209	ANNEX A.3	Pass
5	Frequency Stability	2.1055 22.355 24.235 27.54 90.213	ANNEX A.4	Pass
6	Spurious Emission at Antenna Terminals	2.1051 22.917 24.238 27.53 90.691 90.543	ANNEX A.5	Pass
7	Band Edge	2.1051 22.917 24.238 27.53 90.691 90.543	ANNEX A.6	Pass
8	Field Strength of Spurious Radiation	2.1053 22.917 24.238 27.53 90.691 90.543	ANNEX A.7	Pass
Note:				

No.	Test Description	FCC Part No.	Test Result	Test Verdict
<p>Compared with the EUT of test report BL-SZ2430170-501, the changes of the EUT of this report as below:</p> <ol style="list-style-type: none"><li>1. Change model name.</li><li>2. Remove the security IC patch.</li></ol> <p>Other hardware circuit and software are the same as EUT referred in test report BL-SZ2430170-501.</p> <p>Therefore, based on the above differences, just Effective (Isotropic) Radiated Power &amp; Field Strength of Spurious Radiation (worst case) were retested in this report, others test data please refer to report BL-SZ2430170-501, which was issued by Shenzhen BALUN Technology Co., Ltd. on Aug. 13, 2024.</p>				

## 4 GENERAL TEST CONFIGURATIONS

### 4.1 Test Environments

During the measurement, the environmental conditions were within the listed ranges:

Relative Humidity		20% to 75%
Atmospheric Pressure		98 kPa to 102 kPa
Test Voltage of the EUT	NV (Normal Voltage)	5.0 V
	LV (Low Voltage)	4.5 V
	HV (High Voltage)	5.5 V
Test Temperature of the EUT	NT (Normal Temperature)	15 °C to 35 °C
	LT (Low Temperature)	-40 °C
	HT (High Temperature)	+85 °C

### 4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Version	Cal. Date	Cal. Due
<b>2/3/4/5G RF Test System</b>						
BL410 Test Software	BALUN	BL410R	N/A	3.0.536	N/A	N/A
Temperature Chamber	AHK	SP20	1412	N/A	2024.08.30	2025.08.29
Wideband Radio Communication Tester	R&S	CMW 500	167190	V4.0.60	2024.05.08	2025.05.07
Wideband Radio Communication Tester	R&S	CMW 500	102318	V3.2.71	2024.05.09	2025.05.08
Spectrum Analyzer	keysight	N9020A	MY50531628	A.16.09	2024.05.08	2025.05.07
Spectrum Analyzer	R&S	FSV40	101544	2.30.SP4	2023.12.27	2024.12.26
DC Power Supply	ITECH	IT6863A	80001402075 7810006	N/A	2024.07.24	2025.07.23
<b>Radiated Test System</b>						
Radiated Test System Test Software	BALUN	BL410-E	N/A	V22.930	N/A	N/A
Wideband Radio Communication Tester	R&S	CMW 500	167190	V4.0.60	2024.05.08	2025.05.07
Wideband Radio Communication Tester	R&S	CMW 500	102318	V3.2.71	2024.05.09	2025.05.08
Spectrum Analyzer	R&S	FSV40	101544	2.30.SP4	2023.12.27	2024.12.26
Test Antenna-Bi-Log(30 MHz-3 GHz)	Schwarzbeck	VULB 9163	9163-624	N/A	2024.07.06	2027.07.05
Test Antenna-Horn(1-18 GHz)	Schwarzbeck	BBHA 9120D	01917	N/A	2022.06.09	2025.06.08

Test Antenna-Horn(18-40 GHz)	A-INFO	LB-180400KF	J211060273	N/A	2024.06.15	2027.06.14
Anechoic Chamber	YIHENG	9m*6m*6m	144	N/A	2022.02.09	2025.09.03
EMI Receiver	Keysight	N9038A	MY53220118	A.14.16	2024.08.01	2025.07.31

### 4.3 Test Configurations

LTE-M1 Band	Bandwidth (MHz)						Modulation Type		RB#			Test Channel		
	1.4	3	5	10	15	20	QPSK	16-QAM	1	Half	Full	LCH	MCH	HCH
Effective (Isotropic) Radiated Power														
2	n	n	v	v	v	v	v	v	v	--	v	v	v	v
4	n	n	v	v	v	v	v	v	v	--	v	v	v	v
5	n	n	v	v	n	n	v	v	v	--	v	v	v	v
12	n	n	v	v	n	n	v	v	v	--	v	v	v	v
13	n	n	v	v	n	n	v	v	v	--	v	v	v	v
14	n	n	v	v	n	n	v	v	v	--	v	v	v	v
17	n	n	v	v	n	n	v	v	v	--	v	v	v	v
25	n	n	v	v	v	v	v	v	v	--	v	v	v	v
26(Part22)	n	n	v	v	v	n	v	v	v	--	v	v	v	v
26(Part90)	n	n	v	v	--	n	v	v	v	--	v	v	v	v
66	n	n	v	v	v	v	v	v	v	--	v	v	v	v
71	n	n	v	v	v	v	v	v	v	--	v	v	v	v
85	n	n	v	v	n	n	v	v	v	--	v	v	v	v
Field Strength of Spurious Radiation														
2	worst case													
4	worst case													
12	worst case													
13	worst case													
14	worst case													
17	worst case													
25	worst case													
26(Part22)	worst case													
26(Part90)	worst case													
66	worst case													
71	worst case													
85	worst case													
Note 1: The mark “v” means that this configuration is chosen for testing.														
Note 2: The mark “n” means that this bandwidth is not supported.														

NB-IoT Band	Bandwidth (KHz)		Modulation Type		RB#		Test Channel		
	3.75	15	QPSK	BPSK	1	Full	LCH	MCH	HCH
Effective (Isotropic) Radiated Power									
2	v	v	v	v	v	v	v	v	v
4	v	v	v	v	v	v	v	v	v
5	v	v	v	v	v	v	v	v	v
12	v	v	v	v	v	v	v	v	v
13	v	v	v	v	v	v	v	v	v
14	v	v	v	v	v	v	v	v	v
17	v	v	v	v	v	v	v	v	v
25	v	v	v	v	v	v	v	v	v
26(Part22)	v	v	v	v	v	v	v	v	v
26(Part90)	v	v	v	v	v	v	v	v	v
66	v	v	v	v	v	v	v	v	v
71	v	v	v	v	v	v	v	v	v
85	v	v	v	v	v	v	v	v	v
Field Strength of Spurious Radiation									
2	worst case								
4	worst case								
12	worst case								
13	worst case								
14	worst case								
17	worst case								
25	worst case								
26(Part22)	worst case								
26(Part90)	worst case								
66	worst case								
71	worst case								
85	worst case								
Note 1: The mark “v” means that this configuration is chosen for testing.									
Note 2: The mark “n” means that this bandwidth is not supported.									

Test Mode	UL Channel	Channel Bandwidth (MHz)	UL Channel No.	UL Frequency (MHz)
LTE-M1 Band 2	Low Range	5	18625	1852.5
		10	18650	1855
		15	18675	1857.5
		20	18700	1860
	Middle Range	5/10/15/20	18900	1880
	High Range	5	19175	1907.5
		10	19150	1905
		15	19125	1902.5
		20	19100	1900
	LTE-M1 Band 4	Low Range	5	19975
10			20000	1715
15			20025	1717.5
20			20050	1720
Middle Range		5/10/15/20	20175	1732.5
High Range		5	20375	1752.5
		10	20350	1750
		15	20325	1747.5
		20	20300	1745
LTE-M1 Band 5		Low Range	5	20425
	10		20450	829
	Middle Range	5/10	20525	836.5
	High Range	5	20625	846.5
		10	20600	844
LTE-M1 Band 12	Low Range	5	23035	701.5
		10	23060	704
	Middle Range	5/10	23095	707.5
	High Range	5	23155	713.5
		10	23130	711
LTE-M1 Band 13	Low Range	5	23205	779.5
		10	23230	782
	Middle Range	5/10	23230	782
	High Range	5	23255	784.5
		10	23230	782
LTE-M1 Band 14	Low Range	5	23305	790.5
		10	23330	793
	Middle Range	5/10	23330	793
	High Range	5	23355	795.5
		10	23330	793
LTE-M1 Band 17	Low Range	5	23755	706.5
		10	23780	709



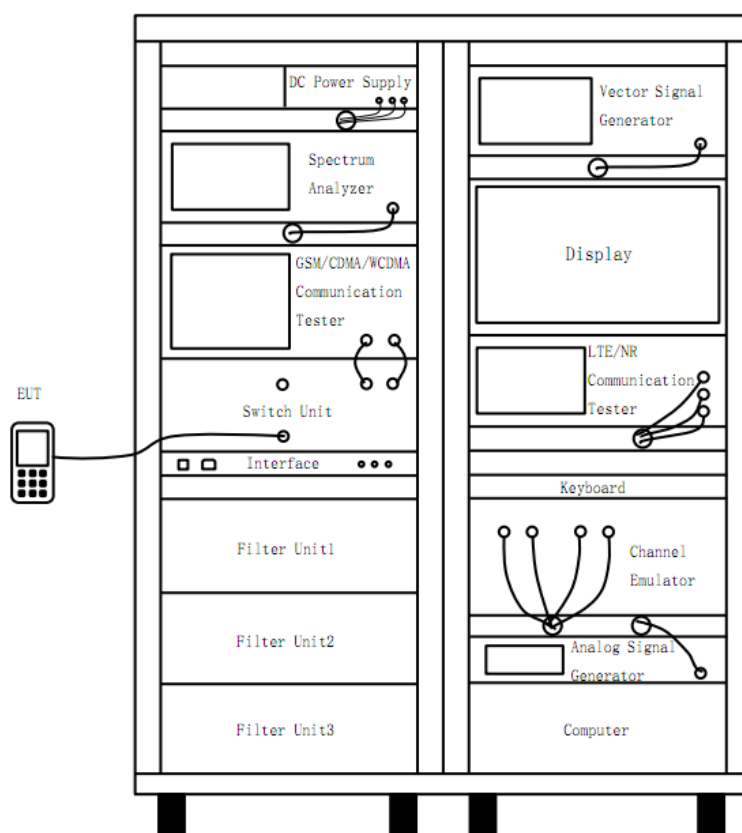
Test Mode	UL Channel	Channel Bandwidth (MHz)	UL Channel No.	UL Frequency (MHz)
	Middle Range	5/10	23790	710
	High Range	5	23825	713.5
		10	23800	711
LTE-M1 Band 25	Low Range	5	26065	1852.5
		10	26090	1855
		15	26115	1857.5
		20	26140	1860
	Middle Range	5/10/15/20	26365	1882.5
	High Range	5	26665	1912.5
		10	26640	1910
		15	26615	1907.5
		20	26590	1905
LTE-M1 Band 26 (Part22)	Low Range	5	26815	826.5
		10	26840	829
		15	26865	831.5
	Middle Range	5/10/15	26915	836.5
	High Range	5	27015	846.5
		10	26990	844
		15	26965	841.5
LTE-M1 Band 26 (Part90)	Low Range	5	26715	816.5
		10	26740	819
	Middle Range	5/10	26740	819
	High Range	5	26765	821.5
		10	26740	819
LTE-M1 Band 66	Low Range	5	131997	1712.5
		10	132022	1715
		15	132047	1717.5
		20	132072	1720
	Middle Range	5/10/15/20	132322	1745
	High Range	5	132647	1777.5
		10	132622	1775
		15	132597	1772.5
		20	132572	1770
LTE-M1 Band 71	Low Range	5	133147	665.5
		10	133172	668
		15	133197	670.5
		20	133222	673
	Middle Range	5/10/15/20	133297	680.5
	High Range	5	133447	695.5
		10	133422	693
		15	133397	690.5

Test Mode	UL Channel	Channel Bandwidth (MHz)	UL Channel No.	UL Frequency (MHz)
		20	133372	688
LTE-M1 Band 85	Low Range	5	134031	700.9
		10	134056	703.4
	Middle Range	5/10	134091	706.9
	High Range	5	134156	713.4
		10	134131	710.9

Test Mode	UL Channel	UL Channel No.	UL Frequency (MHz)
NB-IoT Band2	Low Range	18601	1850.1
	Middle Range	18900	1880.0
	High Range	19199	1909.9
NB-IoT Band4	Low Range	19951	1710.1
	Middle Range	20175	1732.5
	High Range	20399	1754.9
NB-IoT Band5	Low Range	20401	824.1
	Middle Range	20525	836.5
	High Range	20649	848.9
NB-IoT Band12	Low Range	23011	699.1
	Middle Range	23095	707.5
	High Range	23179	715.9
NB-IoT Band13	Low Range	23181	777.1
	Middle Range	23230	782.0
	High Range	23279	786.9
NB-IoT Band14	Low Range	23281	788.1
	Middle Range	23330	793.0
	High Range	23379	797.9
NB-IoT Band17	Low Range	23731	704.1
	Middle Range	23790	710.0
	High Range	23849	715.9
NB-IoT Band25	Low Range	26041	1850.1
	Middle Range	26365	1882.5
	High Range	26689	1914.9
NB-IoT Band26 (Part90)	Low Range	26691	814.1
	Middle Range	26740	819
	High Range	26789	823.9
NB-IoT Band26 (Part22)	Low Range	26791	824.1
	Middle Range	26915	836.5
	High Range	27039	848.9
NB-IoT Band66	Low Range	131973	1710.1
	Middle Range	132322	1745.0
	High Range	132671	1779.9
NB-IoT Band71	Low Range	133123	663.1
	Middle Range	133297	680.5
	High Range	133471	697.9
NB-IoT Band85	Low Range	134003	698.1
	Middle Range	134082	706
	High Range	134181	715.9

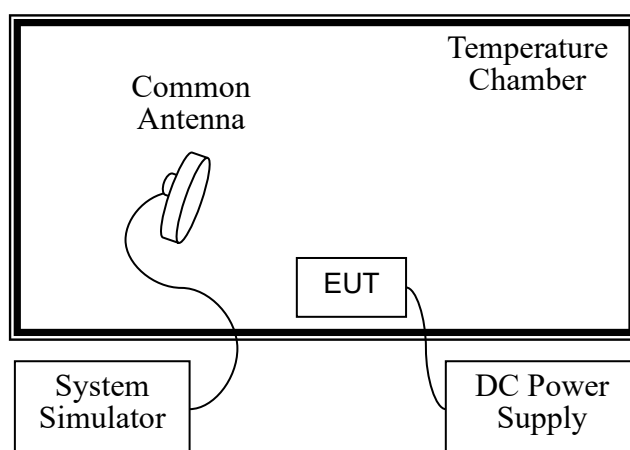
## 4.4 Test Setup

### 4.4.1 For Antenna Port Test



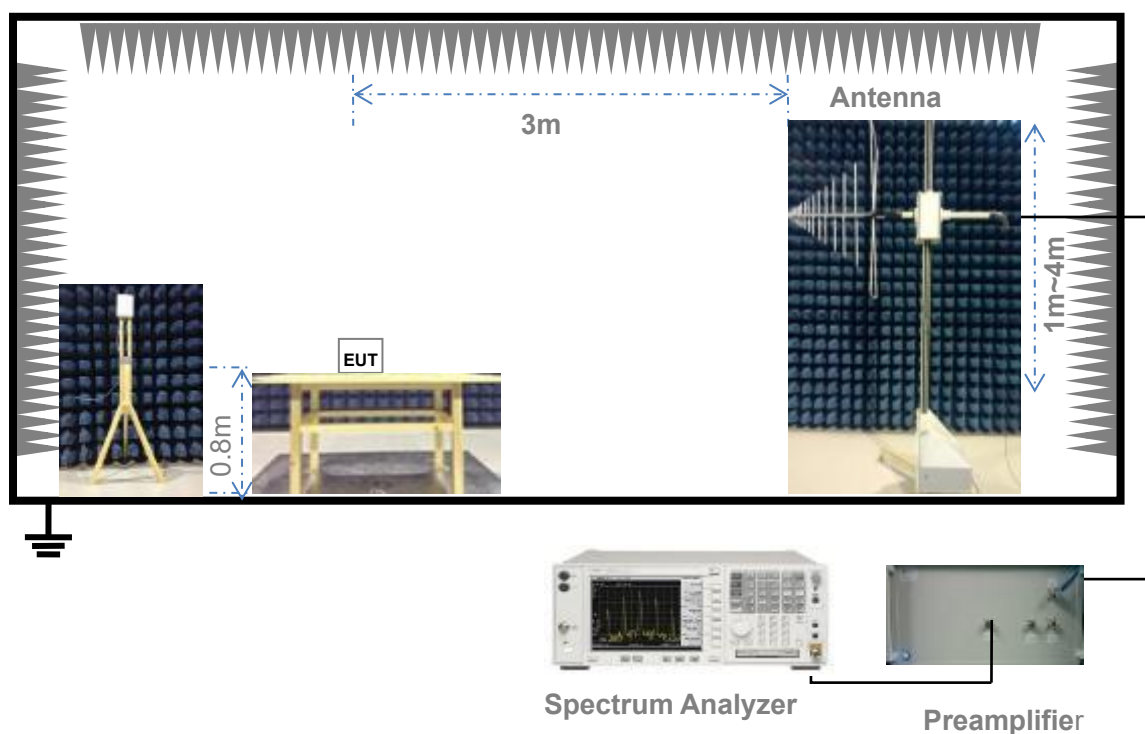
(Diagram 1)

### 4.4.2 For Frequency Stability Test



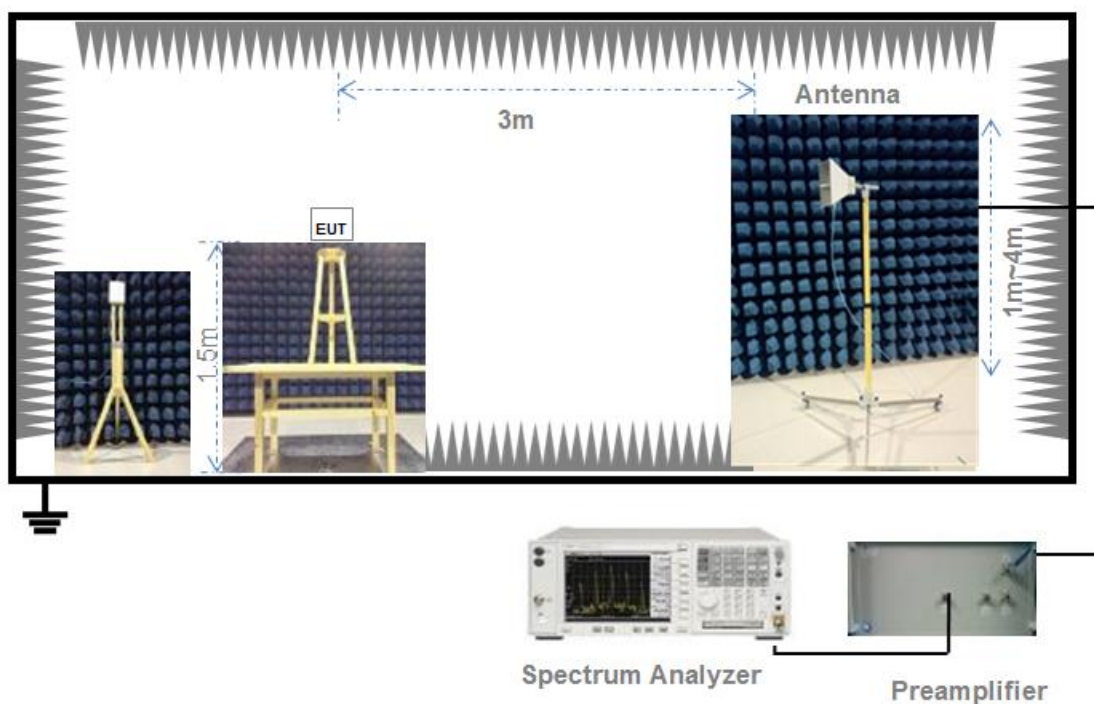
(Diagram 2)

#### 4.4.3 For Radiated Test (30 MHz ~ 1 GHz)



(Diagram 3)

#### 4.4.4 For Radiated Test (Above 1 GHz)



(Diagram 4)

## 5 TEST ITEMS

### 5.1 Transmitter Radiated Power (EIRP/ERP)

#### 5.1.1 Limit

FCC § 2.1046 & 22.913(a) & 24.232(c) & 27.50(a) & 27.50(b) & 27.50(c) & 27.50(d) & 27.50(h) & 27.50(j) & 27.50(k) & 90.635(b) & 90.542(a)

According to FCC section 22.913(a) (5), the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC section 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 FCC section 27.50(a) (3), for mobile and portable stations transmitting in the 2305-2315MHz band or the 2350-2360MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands.

FCC section 27.50(b) (10), portable stations (hand-held devices) transmitting in the 746-757MHz, 776-788MHz, and 805-806MHz bands are limited to 3 watts ERP.

FCC section 27.50(c) (10), portable stations (hand-held devices) in the 600MHz uplink band and the 698-746MHz band, and fixed and mobile stations in the 600MHz uplink band are limited to 3 watts ERP.

FCC section 27.50(d) (4), 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. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

(7) Fixed, mobile, and portable (hand-held) stations operating in the 2000-2020 MHz band are limited to 2 watts EIRP.

And FCC section 27.50(h) (2), for mobile and other user stations, mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

FCC section 27.50(j) (3), for mobile, and portable (hand-held) stations operating in the 3700-3980 MHz band are limited to 1 watt EIRP.

FCC section 27.50(k) (3), Mobile devices are limited to 1Watt (30 dBm) EIRP in the 3450-3550 MHz band.

According to FCC section 90.635(b), the maximum output power of the transmitter for mobile stations is 100 watts (20dBW).

According to FCC section 90.542(a) (7), portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

### 5.1.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description is used for conducted test, and the section 4.4.3 and 4.4.4 (Diagram 3, 4) test setup description is used for radiated test. The photo of test setup please refer to ANNEX B.

### 5.1.3 Test Procedure

#### **Description of the Conducted Output Power Measurement**

The EUT is coupled to the SS with attenuator through power splitter; the RF load attached to EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. A system simulator is used to establish communication with the EUT, and its parameters are set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The relevant equation for determining the conducted measured value is:

$$\text{Conducted Output Power Value (dBm)} = \text{Measured Value (dBm)} + \text{Path Loss (dB)}$$

where:

Conducted Output Power Value = final conducted measured value in the conducted power test, in dBm;

Measured Value = measured conducted power received by spectrum analyzer or power meter, in dBm;

Path Loss = signal attenuation in the connecting cable between the transmitter and spectrum analyzer or power meter, including external cable loss, in dB;

During the test, the data of Path Loss (dB) is added in the spectrum analyzer or power meter, so Measured Value (dBm) is the final values which contains the data of Path Loss (dB).

For example:

In the conducted output power test, when measured value for GSM850 is 24.7 dBm, and path loss is 8.5 dB, then final conducted output power value is:

$$\text{Conducted Output Power Value (dBm)} = 24.7 \text{ dBm} + 8.5 \text{ dB} = 33.2 \text{ dBm}$$

#### **Description of the Transmitter Radiated Power Measurement**

In many cases, the RF output power limits for licensed digital transmission devices is specified in terms of effective radiated power (ERP) or equivalent isotropic radiated power (EIRP). Typically, ERP is specified when the operating frequency is less than or equal to 1 GHz and EIRP is specified when the operating

frequency is greater than 1 GHz. Both are determined by adding the transmit antenna gain to the conducted RF output power with the primary difference between the two being that when determining the ERP, the transmit antenna gain is referenced to a dipole antenna (i.e., dBd) whereas when determining the EIRP, the transmit antenna gain is referenced to an isotropic antenna (dBi).

Final measurement calculation as below:

The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$$\text{ERP/EIRP} = P_{\text{Meas}} + \text{GT} - \text{LC}$$

where:

ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as  $P_{\text{Meas}}$ , typically dBW or dBm);

$P_{\text{Meas}}$  = measured transmitter output power or PSD, in dBm or dBW;

GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

dBd (ERP)=dBi (EIRP) -2.15 dB

LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

For example:

In the EIRP test, when  $P_{\text{Meas}}$  value for GSM1900 is 30.2 dBm, LC is 0.6 dB, and GT is -3.4 dB, then final EIRP value is:

$$\text{EIRP for GSM1900} = 30.2 \text{ dBm} - 3.4 \text{ dBi} - 0.6 \text{ dB} = 26.2 \text{ dBm}$$

The relevant equation for determining the ERP/EIRP from the radiated RF output power is:

$$\text{ERP/EIRP (dBm)} = \text{SA Read Value (dBm)} + \text{Correction Factor (dB)}$$

where:

ERP/EIRP = effective or equivalent radiated power, in dBm;

SA Read Value = measured transmitter power received by EMI receiver or spectrum analyzer, in dBm;

Correction Factor = total correction factor including cable loss, in dB;

During the test, the data of Correction Factor (dB) is added in the EMI receiver or spectrum analyzer, so SA Read Value (dBm) is the final values which contains the data of Correction Factor (dB).

For example:

In the ERP test, when SA read value for GSM850 is 21dBm, and correction factor is 8dB, then final ERP value for GSM850 is:



ERP (dBm) = 21dBm + 8dB = 29dBm

#### 5.1.4 Test Result

Please refer to ANNEX A.1.

## 5.2 Peak to Average Ratio

### 5.2.1 Limit

FCC § 2.1046 & 24.232(d) & 27.50(d) & 27.50(j) & 27.50(k)

In addition, when the transmitter power is measured in terms of average value, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

According to FCC section 24.232(d), 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 24.232 (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of § 24.51. 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.

FCC section 24.232(e), peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

According to FCC section 27.50(d) (5) & 27.50(j) & 27.50(k), in measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13dB.

### 5.2.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description is used for this test. The photo of test setup please refer to ANNEX B.

### 5.2.3 Test Procedure

Here the lowest, middle and highest channels are selected to perform testing to verify the peak-to-average ratio.

According to KDB 971168 D01, there is CCDF procedure for PAPR:

- a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
- b) Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
- c) Set the number of counts to a value that stabilizes the measured CCDF curve;
- d) Set the measurement interval as follows:
  - 1) for continuous transmissions, set to 1 ms,

2) for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.

e) Record the maximum PAPR level associated with a probability of 0.1%.

Alternate procedure for PAPR:

Use one of the procedures presented in 4.1 to measure the total peak power and record as  $P_{Pk}$ . Use one of the applicable procedures presented 4.2 to measure the total average power and record as  $P_{Avg}$ . Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$PAPR (dB) = P_{Pk} (dBm) - P_{Avg} (dBm).$$

#### 5.2.4 Test Result

Please refer to ANNEX A.2.

## 5.3 Occupied Bandwidth

### 5.3.1 Limit

#### FCC § 2.1049

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Many of the individual rule parts specify a relative OBW in lieu of the 99% OBW. In such cases, the OBW is defined as the width of the signal between two points, one below the carrier center frequency and on above the carrier center frequency, outside of which all emissions are attenuated by at least X dB below the transmitter power, where the value of X is typically specified as 26.

### 5.3.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description is used for this test. The photo of test setup please refer to ANNEX B.

### 5.3.3 Test Procedure

The following procedure shall be used for measuring power bandwidth.

- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the anticipated OBW).
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
- c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.
- d) NOTE—Steps a) through c) may require iteration to adjust within the specified tolerances.
- e) For -26 dB OBW, the dynamic range of the spectrum analyzer at the selected RBW shall be at least 10dB below the target “-X dB down” requirement, e.g. -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be 36dB below the reference value.
- f) Set the detection mode to peak, and the trace mode to max hold.
- g) For 99% OBW, use the 99 % power bandwidth function of the spectrum analyzer (if available) and report the measured bandwidth.

If the instrument does not have a 99 % power bandwidth function, the trace data points are to be recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is

recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99 % power bandwidth is the difference between these two frequencies.

h) For -26 dB OBW, determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).

Determine the “-X dB down amplitude” as equal to (reference value -X). Alternatively, this calculation can be performed by the analyzer by using the marker-delta function.

Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below “-X dB down amplitude” determined in step g). If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.

i) The OBW shall be reported by providing plot(s) of the measuring instrument display. The frequency and amplitude axes and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

j) Change variable modulations, coding, or channel bandwidth settings, then repeat above test procedures.

#### 5.3.4 Test Result

Please refer to ANNEX A.3.

## 5.4 Frequency Stability

### 5.4.1 Limit

FCC § 2.1055 & 22.355 & 24.235 & 27.54 & 90.213

FCC § 2.1055

The frequency stability shall be measured with variation of ambient temperature as follows:

- (1) The temperature is varied from -30°C to +50°C.
- (2) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10°C through the range.

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 carried battery equipment.
- (2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating and point which shall be specified by the manufacture.
- (3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

FCC § 22.355

Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

**Table C-1—Frequency Tolerance for Transmitters in the Public Mobile Services**

Frequency range (MHz)	Base, fixed (ppm)	Mobile > 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	n/a	n/a
929 to 960	1.5	n/a	n/a
2110 to 2220	10.0	n/a	n/a

FCC § 24.235

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

#### FCC § 27.54

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

#### FCC § 90.213

The frequency stability shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.

### 5.4.2 Test Setup

The section 4.4.2 (Diagram 2) test setup description is used for this test. The photo of test setup please refer to ANNEX B.

### 5.4.3 Test Procedure

1. The EUT is placed in a temperature chamber.
2. The temperature is set to 25°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured.
3. The temperature is increased by not more than 10 degrees, allowed to stabilize and soak, and then repeat the frequency error measurement.
4. Repeat procedure 3 until +50°C and -30°C is reached.
5. Change supply voltage, and repeat measurement until extreme voltage is reached.

### 5.4.4 Test Result

Please refer to ANNEX A.4.

## 5.5 Spurious Emission at Antenna Terminals

### 5.5.1 Limit

FCC § 2.1051 & 22.917(a) & 24.238(a) & 27.53(a) & 27.53(c) & 27.53(f) & 27.53(g) & 27.53(h) & 27.53(l) & 27.53(m) & 27.53(n) & 90.691 & 90.543

In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

FCC § 22.917(a) & 24.238(a)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. This is calculated to be -13 dBm.

FCC § 27.53(a) (4)

For mobile and portable stations operating in the 2305-2315MHz and 2350-2360MHz bands:

(1) By a factor of not less than:  $43 + 10 \log(P)$  dB on all frequencies between 2305 and 2320MHz and on all frequencies between 2345 and 2360MHz that are outside the licensed band(s) of operation, not less than  $55 + 10 \log(P)$  dB on all frequencies between 2320 and 2324MHz and on all frequencies between 2341 and 2345MHz, not less than  $61 + 10 \log(P)$  dB on all frequencies between 2324 and 2328MHz and on all frequencies between 2337 and 2341MHz, and not less than  $67 + 10 \log(P)$  dB on all frequencies between 2328 and 2337MHz.

(2) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2300 and 2305MHz,  $55 + 10 \log(P)$  dB on all frequencies between 2296 and 2300MHz,  $61 + 10 \log(P)$  dB on all frequencies between 2292 and 2296MHz,  $67 + 10 \log(P)$  dB on all frequencies between 2288 and 2292MHz, and  $70 + 10 \log(P)$  dB below 2288MHz.

(3) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2360 and 2365MHz, and not less than  $70 + 10 \log(P)$  dB above 2365MHz.

FCC § 27.53(c)

For operations in the 746–758 MHz band and the 776–788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746–758 MHz band, the power of any emission shall be attenuated outside the

band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;



(2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the

band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB;

(3) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.

However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth

of at least 30 kHz may be employed;

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

#### FCC § 27.53(f)

For operations in the 746–758 MHz, 775–788 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to - 70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

#### FCC § 27.53(g)

For operations in the 600MHz band and the 698-746MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43+10*\log(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

#### FCC § 27.53(h) (1)

Except as otherwise specified below, 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.

#### FCC § 27.53(l) (2)

For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz.

## FCC § 27.53(m) (4)

For mobile digital stations (BRS and EBS stations), the attenuation factor shall be not less than:

- $40 + 10 \log P$  dB ( $-10$  dBm,  $100$  nW) on all frequencies between the channel edge and  $5$  MHz from the channel edge.
- $43 + 10 \log P$  dB ( $-13$  dBm,  $50$  nW) on all frequencies between  $5$  MHz and  $X$  MHz from the channel edge,
- $55 + 10 \log P$  dB ( $-25$  dBm,  $3$  nW) on all frequencies more than  $X$  MHz from the channel edge, where  $X$  is the greater of  $6$  MHz or the actual emission bandwidth ( $26$  dB).

In addition, the attenuation factor shall not be less than  $43 + 10 \log (P)$  dB on all frequencies between  $2490.5$  MHz and  $2496$  MHz and  $55 + 10 \log (P)$  dB at or below  $2490.5$  MHz. Mobile Satellite Service licensees operating on frequencies below  $2495$  MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

## FCC § 27.53(n) (2)

For mobile operations in the  $3450$ - $3550$  MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed  $-13$  dBm/MHz.

## FCC § 90.691

(a) Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including  $37.5$  kHz, the power of any emission shall be attenuated below the transmitter power ( $P$ ) in watts by at least  $116 \log_{10}(f/6.1)$  decibels or  $50 + 10 \log_{10}(P)$  decibels or  $80$  decibels, whichever is the lesser attenuation, where  $f$  is the frequency removed from the center of the outer channel in the block in kilohertz and where  $f$  is greater than  $12.5$  kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than  $37.5$  kHz, the power of any emission shall be attenuated below the transmitter power ( $P$ ) in watts by at least  $43 + 10 \log_{10}(P)$  decibels or  $80$  decibels, whichever is the lesser attenuation, where  $f$  is the frequency removed from the center of the outer channel in the block in kilohertz and where  $f$  is greater than  $37.5$  kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

## FCC § 90.543

(e) For operations in the  $758$ – $768$  MHz and the  $788$ – $798$  MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power ( $P$ ) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between  $769$ – $775$  MHz and  $799$ – $805$  MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a  $6.25$  kHz band segment, for base and fixed stations.

(2) On all frequencies between  $769$ – $775$  MHz and  $799$ – $805$  MHz, by a factor not less than  $65 + 10 \log (P)$

dB in a 6.25 kHz band segment, for mobile and portable stations.

(3) On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least  $43 + 10 \log(P)$  dB.

(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(f) For operations in the 758–775 MHz and 788–805 MHz bands, all emissions including harmonics in the band 1559–1610 MHz shall be limited to -70 dBW/ MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

### 5.5.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

### 5.5.3 Test Procedure

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency blocks a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

1. The EUT is coupled to the system simulator and spectrum analyzer; the RF load attached to EUT antenna terminal is 50Ω; the path loss as the factor is calibrated to correct the reading.
2. Base Station is used to establish communication with the EUT, and its parameters are set to force the EUT transmitting at maximum output power.
3. The RF output of the transmitter is connected to the input of the spectrum analyzer through sufficient attenuation.
4. Spurious emissions are tested with 0.001MHz RBW for frequency less than 150kHz, 0.01MHz RBW for frequency less than 30MHz, 0.1MHz RBW for frequency less than 1GHz, and 1MHz RBW for frequency above 1GHz. And sweep point number are at least 401, referring to following formula.

Sweep point number = Span/RBW

VBW=3\*RBW

Detector Mode=mean or average power

5. Record the frequencies and levels of spurious emissions.

#### 5.5.4 Test Result

Please refer to ANNEX A.5.

## 5.6 Band Edge

### 5.6.1 Limit

FCC § 2.1051 & 22.917(a) & 24.238(a) & 27.53(a) & 27.53(c) & 27.53(g) & 27.53(h) & 27.53(l) & 27.53(m) & 27.53(n) & 90.691 & 90.543

In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

FCC § 22.917(a) & 24.238(a)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. This is calculated to be -13 dBm.

FCC § 27.53(a) (4)

For mobile and portable stations operating in the 2305-2315MHz and 2350-2360MHz bands:

(1) By a factor of not less than:  $43 + 10 \log(P)$  dB on all frequencies between 2305 and 2320MHz and on all frequencies between 2345 and 2360MHz that are outside the licensed band(s) of operation, not less than  $55 + 10 \log(P)$  dB on all frequencies between 2320 and 2324MHz and on all frequencies between 2341 and 2345MHz, not less than  $61 + 10 \log(P)$  dB on all frequencies between 2324 and 2328MHz and on all frequencies between 2337 and 2341MHz, and not less than  $67 + 10 \log(P)$  dB on all frequencies between 2328 and 2337MHz.

(2) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2300 and 2305MHz,  $55 + 10 \log(P)$  dB on all frequencies between 2296 and 2300MHz,  $61 + 10 \log(P)$  dB on all frequencies between 2292 and 2296MHz,  $67 + 10 \log(P)$  dB on all frequencies between 2288 and 2292MHz, and  $70 + 10 \log(P)$  dB below 2288MHz.

(3) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2360 and 2365MHz, and not less than  $70 + 10 \log(P)$  dB above 2365MHz.

FCC § 27.53(c)

For operations in the 746–758 MHz band and the 776–788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746–758 MHz band, the power of any emission shall be attenuated outside the

band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;

(2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the

band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB;

(3) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.

However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth

of at least 30 kHz may be employed;

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

#### FCC § 27.53(g)

For operations in the 600MHz band and the 698-746MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43+10*\log(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

#### FCC § 27.53(h) (1)

Except as otherwise specified below, 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.

#### FCC § 27.53(l) (2)

For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed  $-13$  dBm/MHz.

#### FCC § 27.53(m) (4)

For mobile digital stations (BRS and EBS stations), the attenuation factor shall be not less than:

- $40+10\log P$  dB ( $-10$  dBm, 100 nW) on all frequencies between the channel edge and 5 MHz from the channel edge.
- $43+10\log P$  dB ( $-13$  dBm, 50 nW) on all frequencies between 5 MHz and X MHz from the channel edge,

•  $55 + 10 \log P$  dB ( $-25$  dBm,  $3$  nW) on all frequencies more than  $X$  MHz from the channel edge, where  $X$  is the greater of  $6$  MHz or the actual emission bandwidth ( $26$  dB).

In addition, the attenuation factor shall not be less than  $43 + 10 \log (P)$  dB on all frequencies between  $2490.5$  MHz and  $2496$  MHz and  $55 + 10 \log (P)$  dB at or below  $2490.5$  MHz. Mobile Satellite Service licensees operating on frequencies below  $2495$  MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

#### FCC § 27.53(n) (2)

For mobile operations in the  $3450$ - $3550$  MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed  $-13$  dBm/MHz.

#### FCC § 90.691

(a) Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including  $37.5$  kHz, the power of any emission shall be attenuated below the transmitter power ( $P$ ) in watts by at least  $116 \log_{10}(f/6.1)$  decibels or  $50 + 10 \log_{10}(P)$  decibels or  $80$  decibels, whichever is the lesser attenuation, where  $f$  is the frequency removed from the center of the outer channel in the block in kilohertz and where  $f$  is greater than  $12.5$  kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than  $37.5$  kHz, the power of any emission shall be attenuated below the transmitter power ( $P$ ) in watts by at least  $43 + 10 \log_{10}(P)$  decibels or  $80$  decibels, whichever is the lesser attenuation, where  $f$  is the frequency removed from the center of the outer channel in the block in kilohertz and where  $f$  is greater than  $37.5$  kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

#### FCC § 90.543

(e) For operations in the  $758$ – $768$  MHz and the  $788$ – $798$  MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power ( $P$ ) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between  $769$ – $775$  MHz and  $799$ – $805$  MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a  $6.25$  kHz band segment, for base and fixed stations.

(2) On all frequencies between  $769$ – $775$  MHz and  $799$ – $805$  MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a  $6.25$  kHz band segment, for mobile and portable stations.

(3) On any frequency between  $775$ – $788$  MHz, above  $805$  MHz, and below  $758$  MHz, by at least  $43 + 10 \log (P)$  dB.

(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a  $6.25$  kHz segment.

### 5.6.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

### 5.6.3 Test Procedure

The EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50 Ohm; the path loss as the factor is calibrated to correct the reading.

1. The EUT is coupled to the system simulator and spectrum analyzer; the RF load attached to EUT antenna terminal is 50 Ohm; the path loss as the factor is calibrated to correct the reading.
2. Base Station is used to establish communication with the EUT, and its parameters are set to force the EUT transmitting at maximum output power.
3. The RF output of the transmitter is connected to the input of the spectrum analyzer through sufficient attenuation.
4. The center of the spectrum analyzer was set to block edge frequency.
5. Band edge are tested with 1%\*cBW (RBW), and sweep point number referred to following formula.

$$\text{Sweep point number} = 2 * \text{Span} / \text{RBW}$$

$$\text{VBW} = 3 \text{RBW}$$

6. Record the frequencies and levels of spurious emissions.

For mobile and portable stations, on all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than  $65 + 10 \log(P)$  dB in a 6.25 kHz band segment. Since it was not possible to set the resolution bandwidth to 6.25 kHz with the available equipment, a bandwidth of 10 kHz was used instead to show compliance. By using a 10 kHz bandwidth on the spectrum analyzer.

$$10 * \log(10 \text{ kHz} / 6.25 \text{ kHz}) = 2.04 \text{ dB}$$

$$\text{Limit Line} = -35 \text{ dBm} + 2.04 \text{ dB} = -32.96 \text{ dBm}$$

### 5.6.4 Test Result

Please refer to ANNEX A.6.



## 5.7 Field Strength of Spurious Radiation

### 5.7.1 Limit

FCC § 2.1053 & 22.917(a) & 24.238(a) & 27.53(a) & 27.53(c) & 27.53(f) & 27.53(g) & 27.53(h) & 27.53(l) & 27.53(m) & 27.53(n) & 90.691 & 90.543

FCC § 22.917(a) & 24.238(a)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. This is calculated to be -13 dBm.

FCC § 27.53(a) (4)

For mobile and portable stations operating in the 2305-2315MHz and 2350-2360MHz bands:

(1) By a factor of not less than:  $43 + 10 \log(P)$  dB on all frequencies between 2305 and 2320MHz and on all frequencies between 2345 and 2360MHz that are outside the licensed band(s) of operation, not less than  $55 + 10 \log(P)$  dB on all frequencies between 2320 and 2324MHz and on all frequencies between 2341 and 2345MHz, not less than  $61 + 10 \log(P)$  dB on all frequencies between 2324 and 2328MHz and on all frequencies between 2337 and 2341MHz, and not less than  $67 + 10 \log(P)$  dB on all frequencies between 2328 and 2337MHz.

(2) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2300 and 2305MHz,  $55 + 10 \log(P)$  dB on all frequencies between 2296 and 2300MHz,  $61 + 10 \log(P)$  dB on all frequencies between 2292 and 2296MHz,  $67 + 10 \log(P)$  dB on all frequencies between 2288 and 2292MHz, and  $70 + 10 \log(P)$  dB below 2288MHz.

(3) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2360 and 2365MHz, and not less than  $70 + 10 \log(P)$  dB above 2365MHz.

FCC § 27.53(c)

For operations in the 746–758 MHz band and the 776–788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746–758 MHz band, the power of any emission shall be attenuated outside the

band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;

(2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the

band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;

(3) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than  $76 + 10 \log(P)$  dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than  $65 + 10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of

measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.

However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth

of at least 30 kHz may be employed;

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

FCC § 27.53(f)

For operations in the 746–758 MHz, 775–788 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to - 70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

FCC § 27.53(g)

For operations in the 600MHz band and the 698-746MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43+10\log(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC § 27.53(h) (1)

Except as otherwise specified below, 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.

FCC § 27.53(l) (2)

For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz.

FCC § 27.53(m) (4)

For mobile digital stations (BRS and EBS stations), the attenuation factor shall be not less than:

- $40+10\log P$  dB (-10 dBm, 100 nW) on all frequencies between the channel edge and 5 MHz from the channel edge.
- $43+10\log P$  dB (-13 dBm, 50 nW) on all frequencies between 5 MHz and X MHz from the channel edge,
- $55+10\log P$  dB (-25 dBm, 3 nW) on all frequencies more than X MHz from the channel edge, where X is the greater of 6 MHz or the actual emission bandwidth (26 dB).

In addition, the attenuation factor shall not be less than  $43 + 10 \log (P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log (P)$  dB at or below 2490.5 MHz. Mobile Satellite Service

licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

#### FCC § 27.53(n) (2)

For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz.

#### FCC § 90.691

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $116 \log_{10}(f/6.1)$  decibels or  $50 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

#### FCC § 90.543

(e) For operations in the 758–768 MHz and the 788–798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than  $76 + 10 \log(P)$  dB in a 6.25 kHz band segment, for base and fixed stations.

(2) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than  $65 + 10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations.

(3) On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least  $43 + 10 \log(P)$  dB.

(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(f) For operations in the 758–775 MHz and 788–805 MHz bands, all emissions including harmonics in the band 1559– 1610 MHz shall be limited to -70 dBW/ MHz equivalent isotropically radiated power (EIRP) for

wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

### 5.7.2 Test Setup

The section 4.4.3 and 4.4.4 (Diagram 3, 4) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

### 5.7.3 Test Procedure

1. On a test site, the EUT shall be placed at 80cm height on a turn table, and in the position close to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to correspond to the fundamental frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.
4. During the measurement of the EUT, the resolution bandwidth was to 1 MHz and the average bandwidth  
was set to 1 MHz.
5. The transmitter shall be switched on; the measuring receiver shall be tuned to the frequency of the transmitter under test.
6. The test antenna shall be raised and lowered through the specified range of height until the maximum signal level is detected by the measuring receiver.
7. The transmitter shall be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
8. The test antenna shall be raised and lowered again through the specified range of height until the maximum signal level is detected by the measuring receiver.
9. The maximum signal level detected by the measuring receiver shall be noted.
10. The EUT was replaced by half-wave dipole (824 ~ 849 MHz) or horn antenna (1 850 ~ 1 910 MHz) connected to a signal generator.
11. In necessary, the input attenuator setting on the measuring receiver shall be adjusted in order to increase  
the sensitivity of the measuring receiver.
12. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.

13. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
14. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
15. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

Final measurement calculation as below:

The relevant equation for determining the ERP/EIRP from the radiated RF output power is:

$$\text{ERP/EIRP (dBm)} = \text{SA Read Value (dBm)} + \text{Correction Factor (dB)}$$

where:

ERP/EIRP = effective or equivalent radiated power, in dBm;

SA Read Value = measured transmitter power received by EMI receiver or spectrum analyzer, in dBm;

Correction Factor = total correction factor including cable loss, in dB;

During the test, the data of Correction Factor (dB) is added in the EMI receiver or spectrum analyzer, so SA Read Value (dBm) is the final values which contains the data of Correction Factor (dB).

For example:

In the ERP test, when SA read value for GSM850 is 21dBm, and correction factor is 8dB, then final ERP value for GSM850 is:

$$\text{ERP (dBm)} = 21\text{dBm} + 8\text{dB} = 29\text{dBm}$$

#### 5.7.4 Test Result

Please refer to ANNEX A.7.

## ANNEX A TEST RESULTS

### A.1 Transmitter Radiated Power (EIRP/ERP)

#### LTE-M1 Mode Test Data

Test BW	Test Channel	Test Mode	Test RB (Size#Offset#)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND2</b>									
5 MHz	LCH	QPSK	RB1#0	20.79	6	26.79	0.478	2.00	Pass
			RB6#0	19.93	6	25.93	0.392	2.00	Pass
		16-QAM	RB1#0	20.88	6	26.88	0.488	2.00	Pass
			RB5#0	18.99	6	24.99	0.316	2.00	Pass
	MCH	QPSK	RB1#0	20.74	6	26.74	0.472	2.00	Pass
			RB6#0	19.83	6	25.83	0.383	2.00	Pass
		16-QAM	RB1#0	20.65	6	26.65	0.462	2.00	Pass
			RB5#0	18.93	6	24.93	0.311	2.00	Pass
	HCH	QPSK	RB1#0	20.83	6	26.83	0.482	2.00	Pass
			RB6#0	19.97	6	25.97	0.395	2.00	Pass
		16-QAM	RB1#0	20.76	6	26.76	0.474	2.00	Pass
			RB5#0	19.1	6	25.10	0.324	2.00	Pass
10 MHz	LCH	QPSK	RB1#0	20.76	6	26.76	0.474	2.00	Pass
			RB6#0	19.84	6	25.84	0.384	2.00	Pass
		16-QAM	RB1#0	20.75	6	26.75	0.473	2.00	Pass
			RB5#0	19.84	6	25.84	0.384	2.00	Pass
	MCH	QPSK	RB1#0	20.76	6	26.76	0.474	2.00	Pass
			RB6#0	19.93	6	25.93	0.392	2.00	Pass
		16-QAM	RB1#0	20.76	6	26.76	0.474	2.00	Pass
			RB5#0	19.94	6	25.94	0.393	2.00	Pass
	HCH	QPSK	RB1#0	20.97	6	26.76	0.474	2.00	Pass
			RB6#0	20.06	6	25.93	0.392	2.00	Pass
		16-QAM	RB1#0	20.74	6	26.74	0.472	2.00	Pass
			RB5#0	20.01	6	26.01	0.399	2.00	Pass
15 MHz	LCH	QPSK	RB1#0	20.84	6	26.84	0.483	2.00	Pass
			RB6#0	20.82	6	26.82	0.481	2.00	Pass
		16-QAM	RB1#0	20.87	6	26.87	0.486	2.00	Pass
			RB5#0	20.77	6	26.77	0.475	2.00	Pass
	MCH	QPSK	RB1#0	20.83	6	26.83	0.482	2.00	Pass
			RB6#0	20.81	6	26.81	0.480	2.00	Pass
		16-QAM	RB1#0	20.72	6	26.72	0.470	2.00	Pass
			RB5#0	20.78	6	26.78	0.476	2.00	Pass
	HCH	QPSK	RB1#0	20.93	6	26.93	0.493	2.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset#)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND2</b>									
20 MHz		16-QAM	RB6#0	20.82	6	26.82	0.481	2.00	Pass
			RB1#0	21	6	27.00	0.501	2.00	Pass
			RB5#0	20.73	6	26.73	0.471	2.00	Pass
	LCH	QPSK	RB1#0	20.86	6	26.86	0.485	2.00	Pass
			RB6#0	20.82	6	26.82	0.481	2.00	Pass
		16-QAM	RB1#0	20.88	6	26.88	0.488	2.00	Pass
			RB5#0	20.84	6	26.84	0.483	2.00	Pass
	MCH	QPSK	RB1#0	20.84	6	26.84	0.483	2.00	Pass
			RB6#0	20.81	6	26.81	0.480	2.00	Pass
		16-QAM	RB1#0	20.81	6	26.81	0.480	2.00	Pass
			RB5#0	20.77	6	26.77	0.475	2.00	Pass
	HCH	QPSK	RB1#0	20.92	6	26.92	0.492	2.00	Pass
			RB6#0	20.86	6	26.86	0.485	2.00	Pass
		16-QAM	RB1#0	20.91	6	26.91	0.491	2.00	Pass
			RB5#0	20.78	6	26.78	0.476	2.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND4</b>									
5 MHz	LCH	QPSK	RB1#0	20.42	6	26.42	0.439	1.00	Pass
			RB6#0	19.44	6	25.44	0.350	1.00	Pass
		16-QAM	RB1#0	20.46	6	26.46	0.443	1.00	Pass
			RB5#0	18.37	6	24.37	0.274	1.00	Pass
	MCH	QPSK	RB1#0	20.48	6	26.48	0.445	1.00	Pass
			RB6#0	19.51	6	25.51	0.356	1.00	Pass
		16-QAM	RB1#0	20.5	6	26.50	0.447	1.00	Pass
			RB5#0	18.63	6	24.63	0.290	1.00	Pass
	HCH	QPSK	RB1#0	20.72	6	26.72	0.470	1.00	Pass
			RB6#0	19.68	6	25.68	0.370	1.00	Pass
		16-QAM	RB1#0	20.75	6	26.75	0.473	1.00	Pass
			RB5#0	18.73	6	24.73	0.297	1.00	Pass
10 MHz	LCH	QPSK	RB1#0	20.38	6	26.38	0.435	1.00	Pass
			RB6#0	19.36	6	25.36	0.344	1.00	Pass
		16-QAM	RB1#0	20.28	6	26.28	0.425	1.00	Pass
			RB5#0	19.44	6	25.44	0.350	1.00	Pass
	MCH	QPSK	RB1#0	20.51	6	26.51	0.448	1.00	Pass
			RB6#0	19.53	6	25.53	0.357	1.00	Pass
		16-QAM	RB1#0	20.4	6	26.40	0.437	1.00	Pass
			RB5#0	19.58	6	25.58	0.361	1.00	Pass
	HCH	QPSK	RB1#0	20.74	6	26.74	0.472	1.00	Pass
			RB6#0	19.66	6	25.66	0.368	1.00	Pass
		16-QAM	RB1#0	20.68	6	26.68	0.466	1.00	Pass
			RB5#0	19.67	6	25.67	0.369	1.00	Pass
15 MHz	LCH	QPSK	RB1#0	20.41	6	26.41	0.438	1.00	Pass
			RB6#0	20.36	6	26.36	0.433	1.00	Pass
		16-QAM	RB1#0	20.32	6	26.32	0.429	1.00	Pass
			RB5#0	20.4	6	26.40	0.437	1.00	Pass
	MCH	QPSK	RB1#0	20.55	6	26.55	0.452	1.00	Pass
			RB6#0	20.55	6	26.55	0.452	1.00	Pass
		16-QAM	RB1#0	20.51	6	26.51	0.448	1.00	Pass
			RB5#0	20.55	6	26.55	0.452	1.00	Pass
	HCH	QPSK	RB1#0	20.73	6	26.73	0.471	1.00	Pass
			RB6#0	20.66	6	26.66	0.463	1.00	Pass
		16-QAM	RB1#0	20.82	6	26.82	0.481	1.00	Pass
			RB5#0	20.71	6	26.71	0.469	1.00	Pass
20 MHz	LCH	QPSK	RB1#0	20.43	6	26.43	0.440	1.00	Pass



Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND4</b>									
		16-QAM	RB6#0	20.43	6	26.43	0.440	1.00	Pass
			RB1#0	20.33	6	26.33	0.430	1.00	Pass
			RB5#0	20.4	6	26.40	0.437	1.00	Pass
	MCH	QPSK	RB1#0	20.61	6	26.61	0.458	1.00	Pass
			RB6#0	20.55	6	26.55	0.452	1.00	Pass
		16-QAM	RB1#0	20.48	6	26.48	0.445	1.00	Pass
			RB5#0	20.53	6	26.53	0.450	1.00	Pass
	HCH	QPSK	RB1#0	20.78	6	26.78	0.476	1.00	Pass
			RB6#0	20.7	6	26.70	0.468	1.00	Pass
		16-QAM	RB1#0	20.82	6	26.82	0.481	1.00	Pass
			RB5#0	20.7	6	26.70	0.468	1.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND5</b>										
5 MHz	LCH	QPSK	RB1#0	20.13	6	3.85	23.98	0.250	7.00	Pass
			RB6#0	19.54	6	3.85	23.39	0.218	7.00	Pass
		16-QAM	RB1#0	20.18	6	3.85	24.03	0.253	7.00	Pass
			RB5#0	18.68	6	3.85	22.53	0.179	7.00	Pass
	MCH	QPSK	RB1#0	21.09	6	3.85	24.94	0.312	7.00	Pass
			RB6#0	20.09	6	3.85	23.94	0.248	7.00	Pass
		16-QAM	RB1#0	21.09	6	3.85	24.94	0.312	7.00	Pass
			RB5#0	19.1	6	3.85	22.95	0.197	7.00	Pass
	HCH	QPSK	RB1#0	21.33	6	3.85	25.18	0.330	7.00	Pass
			RB6#0	20.3	6	3.85	24.15	0.260	7.00	Pass
		16-QAM	RB1#0	21.39	6	3.85	25.24	0.334	7.00	Pass
			RB5#0	19.3	6	3.85	23.15	0.207	7.00	Pass
10 MHz	LCH	QPSK	RB1#0	21.1	6	3.85	24.95	0.313	7.00	Pass
			RB6#0	20.07	6	3.85	23.92	0.247	7.00	Pass
		16-QAM	RB1#0	20.96	6	3.85	24.81	0.303	7.00	Pass
			RB5#0	20.08	6	3.85	23.93	0.247	7.00	Pass
	MCH	QPSK	RB1#0	21.01	6	3.85	24.86	0.306	7.00	Pass
			RB6#0	19.98	6	3.85	23.83	0.242	7.00	Pass
		16-QAM	RB1#0	20.92	6	3.85	24.77	0.300	7.00	Pass
			RB5#0	19.98	6	3.85	23.83	0.242	7.00	Pass
	HCH	QPSK	RB1#0	21.2	6	3.85	25.05	0.320	7.00	Pass
			RB6#0	20.16	6	3.85	24.01	0.252	7.00	Pass
		16-QAM	RB1#0	21.18	6	3.85	25.03	0.318	7.00	Pass
			RB5#0	20.17	6	3.85	24.02	0.252	7.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND12</b>										
5 MHz	LCH	QPSK	RB1#0	20.02	6	3.85	23.87	0.244	3.00	Pass
			RB6#0	19.49	6	3.85	23.34	0.216	3.00	Pass
		16-QAM	RB1#0	20.06	6	3.85	23.91	0.246	3.00	Pass
			RB5#0	18.66	6	3.85	22.51	0.178	3.00	Pass
	MCH	QPSK	RB1#0	21.16	6	3.85	25.01	0.317	3.00	Pass
			RB6#0	20.17	6	3.85	24.02	0.252	3.00	Pass
		16-QAM	RB1#0	21.05	6	3.85	24.90	0.309	3.00	Pass
			RB5#0	19.19	6	3.85	23.04	0.201	3.00	Pass
	HCH	QPSK	RB1#0	21.24	6	3.85	25.09	0.323	3.00	Pass
			RB6#0	20.2	6	3.85	24.05	0.254	3.00	Pass
		16-QAM	RB1#0	21.37	6	3.85	25.22	0.333	3.00	Pass
			RB5#0	19.28	6	3.85	23.13	0.206	3.00	Pass
10 MHz	LCH	QPSK	RB1#0	21.04	6	3.85	24.89	0.308	3.00	Pass
			RB6#0	20.02	6	3.85	23.87	0.244	3.00	Pass
		16-QAM	RB1#0	20.91	6	3.85	24.76	0.299	3.00	Pass
			RB5#0	20.06	6	3.85	23.91	0.246	3.00	Pass
	MCH	QPSK	RB1#0	21.14	6	3.85	24.99	0.316	3.00	Pass
			RB6#0	20.15	6	3.85	24.00	0.251	3.00	Pass
		16-QAM	RB1#0	21.02	6	3.85	24.87	0.307	3.00	Pass
			RB5#0	20.18	6	3.85	24.03	0.253	3.00	Pass
	HCH	QPSK	RB1#0	21.15	6	3.85	25.00	0.316	3.00	Pass
			RB6#0	20.1	6	3.85	23.95	0.248	3.00	Pass
		16-QAM	RB1#0	21.13	6	3.85	24.98	0.315	3.00	Pass
			RB5#0	20.13	6	3.85	23.98	0.250	3.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND13</b>										
5 MHz	LCH	QPSK	RB1#0	19.86	6	3.85	23.71	0.235	3.00	Pass
			RB6#0	19.32	6	3.85	23.17	0.207	3.00	Pass
		16-QAM	RB1#0	20.01	6	3.85	23.86	0.243	3.00	Pass
			RB5#0	18.37	6	3.85	22.22	0.167	3.00	Pass
	MCH	QPSK	RB1#0	20.95	6	3.85	24.80	0.302	3.00	Pass
			RB6#0	19.89	6	3.85	23.74	0.237	3.00	Pass
		16-QAM	RB1#0	21.03	6	3.85	24.88	0.308	3.00	Pass
			RB5#0	18.88	6	3.85	22.73	0.187	3.00	Pass
	HCH	QPSK	RB1#0	21.06	6	3.85	24.91	0.310	3.00	Pass
			RB6#0	19.96	6	3.85	23.81	0.240	3.00	Pass
		16-QAM	RB1#0	21.17	6	3.85	25.02	0.318	3.00	Pass
			RB5#0	19	6	3.85	22.85	0.193	3.00	Pass
10 MHz	MCH	QPSK	RB1#0	20.87	6	3.85	24.72	0.296	3.00	Pass
			RB6#0	19.85	6	3.85	23.70	0.234	3.00	Pass
		16-QAM	RB1#0	20.89	6	3.85	24.74	0.298	3.00	Pass
			RB5#0	19.92	6	3.85	23.77	0.238	3.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND14</b>										
5 MHz	LCH	QPSK	RB1#0	19.96	6	3.85	23.81	0.240	3.00	Pass
			RB6#0	19.35	6	3.85	23.20	0.209	3.00	Pass
		16-QAM	RB1#0	20.03	6	3.85	23.88	0.244	3.00	Pass
			RB5#0	18.43	6	3.85	22.28	0.169	3.00	Pass
	MCH	QPSK	RB1#0	21.07	6	3.85	24.92	0.310	3.00	Pass
			RB6#0	19.96	6	3.85	23.81	0.240	3.00	Pass
		16-QAM	RB1#0	21.01	6	3.85	24.86	0.306	3.00	Pass
			RB5#0	18.98	6	3.85	22.83	0.192	3.00	Pass
	HCH	QPSK	RB1#0	21.13	6	3.85	24.98	0.315	3.00	Pass
			RB6#0	20.02	6	3.85	23.87	0.244	3.00	Pass
		16-QAM	RB1#0	21.05	6	3.85	24.90	0.309	3.00	Pass
			RB5#0	19.02	6	3.85	22.87	0.194	3.00	Pass
10 MHz	MCH	QPSK	RB1#0	20.96	6	3.85	24.81	0.303	3.00	Pass
			RB6#0	19.84	6	3.85	23.69	0.234	3.00	Pass
		16-QAM	RB1#0	20.99	6	3.85	24.84	0.305	3.00	Pass
			RB5#0	19.98	6	3.85	23.83	0.242	3.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND17</b>										
5MHz	LCH	QPSK	RB1#0	21.11	6	3.85	24.96	0.313	3.00	Pass
			RB6#0	20.11	6	3.85	23.96	0.249	3.00	Pass
		16-QAM	RB1#0	21.15	6	3.85	25.00	0.316	3.00	Pass
			RB5#0	19.22	6	3.85	23.07	0.203	3.00	Pass
	MCH	QPSK	RB1#0	21.15	6	3.85	25.00	0.316	3.00	Pass
			RB6#0	20.22	6	3.85	24.07	0.255	3.00	Pass
		16-QAM	RB1#0	21.11	6	3.85	24.96	0.313	3.00	Pass
			RB5#0	19.32	6	3.85	23.17	0.207	3.00	Pass
	HCH	QPSK	RB1#0	21.2	6	3.85	25.05	0.320	3.00	Pass
			RB6#0	20.17	6	3.85	24.02	0.252	3.00	Pass
		16-QAM	RB1#0	21.13	6	3.85	24.98	0.315	3.00	Pass
			RB5#0	19.28	6	3.85	23.13	0.206	3.00	Pass
10 MHz	LCH	QPSK	RB1#0	21.15	6	3.85	25.00	0.316	3.00	Pass
			RB6#0	20.19	6	3.85	24.04	0.254	3.00	Pass
		16-QAM	RB1#0	21.13	6	3.85	24.98	0.315	3.00	Pass
			RB5#0	20.17	6	3.85	24.02	0.252	3.00	Pass
	MCH	QPSK	RB1#0	21.19	6	3.85	25.04	0.319	3.00	Pass
			RB6#0	20.19	6	3.85	24.04	0.254	3.00	Pass
		16-QAM	RB1#0	20.97	6	3.85	24.82	0.303	3.00	Pass
			RB5#0	20.22	6	3.85	24.07	0.255	3.00	Pass
	HCH	QPSK	RB1#0	21.13	6	3.85	24.98	0.315	3.00	Pass
			RB6#0	20.1	6	3.85	23.95	0.248	3.00	Pass
		16-QAM	RB1#0	21.16	6	3.85	25.01	0.317	3.00	Pass
			RB5#0	20.14	6	3.85	23.99	0.251	3.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND25</b>									
5 MHz	LCH	QPSK	RB1#0	19.83	6	25.83	0.383	2.00	Pass
			RB6#0	19.35	6	25.35	0.343	2.00	Pass
		16-QAM	RB1#0	19.9	6	25.90	0.389	2.00	Pass
			RB5#0	18.47	6	24.47	0.280	2.00	Pass
	MCH	QPSK	RB1#0	20.71	6	26.71	0.469	2.00	Pass
			RB6#0	19.85	6	25.85	0.385	2.00	Pass
		16-QAM	RB1#0	20.67	6	26.67	0.465	2.00	Pass
			RB5#0	18.94	6	24.94	0.312	2.00	Pass
	HCH	QPSK	RB1#0	20.88	6	26.88	0.488	2.00	Pass
			RB6#0	20.01	6	26.01	0.399	2.00	Pass
		16-QAM	RB1#0	20.72	6	26.72	0.470	2.00	Pass
			RB5#0	19.08	6	25.08	0.322	2.00	Pass
10 MHz	LCH	QPSK	RB1#0	20.83	6	26.83	0.482	2.00	Pass
			RB6#0	19.87	6	25.87	0.386	2.00	Pass
		16-QAM	RB1#0	20.82	6	26.82	0.481	2.00	Pass
			RB5#0	19.95	6	25.95	0.394	2.00	Pass
	MCH	QPSK	RB1#0	20.81	6	26.81	0.480	2.00	Pass
			RB6#0	19.87	6	25.87	0.386	2.00	Pass
		16-QAM	RB1#0	20.75	6	26.75	0.473	2.00	Pass
			RB5#0	19.86	6	25.86	0.385	2.00	Pass
	HCH	QPSK	RB1#0	20.89	6	26.89	0.489	2.00	Pass
			RB6#0	20.02	6	26.02	0.400	2.00	Pass
		16-QAM	RB1#0	20.76	6	26.76	0.474	2.00	Pass
			RB5#0	20.08	6	26.08	0.406	2.00	Pass
15 MHz	LCH	QPSK	RB1#0	20.82	6	26.82	0.481	2.00	Pass
			RB6#0	20.79	6	26.79	0.478	2.00	Pass
		16-QAM	RB1#0	20.82	6	26.82	0.481	2.00	Pass
			RB5#0	20.79	6	26.79	0.478	2.00	Pass
	MCH	QPSK	RB1#0	20.85	6	26.85	0.484	2.00	Pass
			RB6#0	20.85	6	26.85	0.484	2.00	Pass
		16-QAM	RB1#0	20.74	6	26.74	0.472	2.00	Pass
			RB5#0	20.82	6	26.82	0.481	2.00	Pass
	HCH	QPSK	RB1#0	20.96	6	26.96	0.497	2.00	Pass
			RB6#0	20.94	6	26.94	0.494	2.00	Pass
		16-QAM	RB1#0	20.77	6	26.77	0.475	2.00	Pass
			RB5#0	20.88	6	26.88	0.488	2.00	Pass
20 MHz	LCH	QPSK	RB1#0	20.91	6	26.91	0.491	2.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND25</b>									
		16-QAM	RB6#0	20.87	6	26.87	0.486	2.00	Pass
			RB1#0	20.72	6	26.72	0.470	2.00	Pass
			RB5#0	20.85	6	26.85	0.484	2.00	Pass
	MCH	QPSK	RB1#0	20.86	6	26.86	0.485	2.00	Pass
			RB6#0	20.85	6	26.85	0.484	2.00	Pass
		16-QAM	RB1#0	20.7	6	26.70	0.468	2.00	Pass
			RB5#0	20.84	6	26.84	0.483	2.00	Pass
	HCH	QPSK	RB1#0	20.98	6	26.98	0.499	2.00	Pass
			RB6#0	20.98	6	26.98	0.499	2.00	Pass
		16-QAM	RB1#0	20.82	6	26.82	0.481	2.00	Pass
			RB5#0	20.93	6	26.93	0.493	2.00	Pass



Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND26(Part22)</b>										
5 MHz	LCH	QPSK	RB1#0	21.27	6	3.85	25.12	0.325	7.00	Pass
			RB6#0	20.26	6	3.85	24.11	0.258	7.00	Pass
		16-QAM	RB1#0	21.32	6	3.85	25.17	0.329	7.00	Pass
			RB5#0	19.21	6	3.85	23.06	0.202	7.00	Pass
	MCH	QPSK	RB1#0	21.24	6	3.85	25.09	0.323	7.00	Pass
			RB6#0	20.26	6	3.85	24.11	0.258	7.00	Pass
		16-QAM	RB1#0	21.26	6	3.85	25.11	0.324	7.00	Pass
			RB5#0	19.31	6	3.85	23.16	0.207	7.00	Pass
	HCH	QPSK	RB1#0	21.5	6	3.85	25.35	0.343	7.00	Pass
			RB6#0	20.5	6	3.85	24.35	0.272	7.00	Pass
		16-QAM	RB1#0	21.55	6	3.85	25.40	0.347	7.00	Pass
			RB5#0	19.59	6	3.85	23.44	0.221	7.00	Pass
10 MHz	LCH	QPSK	RB1#0	21.34	6	3.85	25.19	0.330	7.00	Pass
			RB6#0	20.28	6	3.85	24.13	0.259	7.00	Pass
		16-QAM	RB1#0	21.37	6	3.85	25.22	0.333	7.00	Pass
			RB5#0	20.33	6	3.85	24.18	0.262	7.00	Pass
	MCH	QPSK	RB1#0	21.24	6	3.85	25.09	0.323	7.00	Pass
			RB6#0	20.2	6	3.85	24.05	0.254	7.00	Pass
		16-QAM	RB1#0	21.17	6	3.85	25.02	0.318	7.00	Pass
			RB5#0	20.2	6	3.85	24.05	0.254	7.00	Pass
	HCH	QPSK	RB1#0	21.45	6	3.85	25.30	0.339	7.00	Pass
			RB6#0	20.38	6	3.85	24.23	0.265	7.00	Pass
		16-QAM	RB1#0	21.53	6	3.85	25.38	0.345	7.00	Pass
			RB5#0	20.47	6	3.85	24.32	0.270	7.00	Pass
15 MHz	LCH	QPSK	RB1#0	21	6	3.85	24.85	0.305	7.00	Pass
			RB6#0	20.93	6	3.85	24.78	0.301	7.00	Pass
		16-QAM	RB1#0	20.91	6	3.85	24.76	0.299	7.00	Pass
			RB5#0	20.91	6	3.85	24.76	0.299	7.00	Pass
	MCH	QPSK	RB1#0	21.18	6	3.85	25.03	0.318	7.00	Pass
			RB6#0	21.13	6	3.85	24.98	0.315	7.00	Pass
		16-QAM	RB1#0	21.08	6	3.85	24.93	0.311	7.00	Pass
			RB5#0	21.05	6	3.85	24.90	0.309	7.00	Pass
	HCH	QPSK	RB1#0	21.33	6	3.85	25.18	0.330	7.00	Pass
			RB6#0	21.24	6	3.85	25.09	0.323	7.00	Pass
		16-QAM	RB1#0	21.45	6	3.85	25.30	0.339	7.00	Pass
			RB5#0	21.16	6	3.85	25.01	0.317	7.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND26(Part90)</b>										
5 MHz	LCH	QPSK	RB1#0	20.95	6	3.85	24.80	0.302	100	Pass
			RB6#0	19.92	6	3.85	23.77	0.238	100	Pass
		16-QAM	RB1#0	20.82	6	3.85	24.67	0.293	100	Pass
			RB5#0	18.95	6	3.85	22.80	0.191	100	Pass
	MCH	QPSK	RB1#0	21.07	6	3.85	24.92	0.310	100	Pass
			RB6#0	20	6	3.85	23.85	0.243	100	Pass
		16-QAM	RB1#0	20.93	6	3.85	24.78	0.301	100	Pass
			RB5#0	19.05	6	3.85	22.90	0.195	100	Pass
	HCH	QPSK	RB1#0	21.17	6	3.85	25.02	0.318	100	Pass
			RB6#0	20.09	6	3.85	23.94	0.248	100	Pass
		16-QAM	RB1#0	21.21	6	3.85	25.06	0.321	100	Pass
			RB5#0	19.11	6	3.85	22.96	0.198	100	Pass
10 MHz	MCH	QPSK	RB1#0	20.99	6	3.85	24.84	0.305	100	Pass
			RB6#0	19.93	6	3.85	23.78	0.239	100	Pass
		16-QAM	RB1#0	20.97	6	3.85	24.82	0.303	100	Pass
			RB5#0	20.01	6	3.85	23.86	0.243	100	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND66</b>									
5 MHz	LCH	QPSK	RB1#0	20.38	6	26.38	0.435	1.00	Pass
			RB6#0	19.41	6	25.41	0.348	1.00	Pass
		16-QAM	RB1#0	20.48	6	26.48	0.445	1.00	Pass
			RB5#0	18.38	6	24.38	0.274	1.00	Pass
	MCH	QPSK	RB1#0	20.65	6	26.65	0.462	1.00	Pass
			RB6#0	19.68	6	25.68	0.370	1.00	Pass
		16-QAM	RB1#0	20.7	6	26.70	0.468	1.00	Pass
			RB5#0	18.74	6	24.74	0.298	1.00	Pass
	HCH	QPSK	RB1#0	20.88	6	26.88	0.488	1.00	Pass
			RB6#0	19.85	6	25.85	0.385	1.00	Pass
		16-QAM	RB1#0	20.95	6	26.95	0.495	1.00	Pass
			RB5#0	18.9	6	24.90	0.309	1.00	Pass
10 MHz	LCH	QPSK	RB1#0	20.34	6	26.34	0.431	1.00	Pass
			RB6#0	19.36	6	25.36	0.344	1.00	Pass
		16-QAM	RB1#0	20.36	6	26.36	0.433	1.00	Pass
			RB5#0	19.39	6	25.39	0.346	1.00	Pass
	MCH	QPSK	RB1#0	20.67	6	26.67	0.465	1.00	Pass
			RB6#0	19.69	6	25.69	0.371	1.00	Pass
		16-QAM	RB1#0	20.73	6	26.73	0.471	1.00	Pass
			RB5#0	19.67	6	25.67	0.369	1.00	Pass
	HCH	QPSK	RB1#0	20.92	6	26.92	0.492	1.00	Pass
			RB6#0	19.84	6	25.84	0.384	1.00	Pass
		16-QAM	RB1#0	21.05	6	27.05	0.507	1.00	Pass
			RB5#0	19.92	6	25.92	0.391	1.00	Pass
15 MHz	LCH	QPSK	RB1#0	20.4	6	26.40	0.437	1.00	Pass
			RB6#0	20.42	6	26.42	0.439	1.00	Pass
		16-QAM	RB1#0	20.42	6	26.42	0.439	1.00	Pass
			RB5#0	20.35	6	26.35	0.432	1.00	Pass
	MCH	QPSK	RB1#0	20.7	6	26.70	0.468	1.00	Pass
			RB6#0	20.68	6	26.68	0.466	1.00	Pass
		16-QAM	RB1#0	20.91	6	26.91	0.491	1.00	Pass
			RB5#0	20.67	6	26.67	0.465	1.00	Pass
	HCH	QPSK	RB1#0	20.9	6	26.90	0.490	1.00	Pass
			RB6#0	20.9	6	26.90	0.490	1.00	Pass
		16-QAM	RB1#0	21.08	6	27.08	0.511	1.00	Pass
			RB5#0	20.85	6	26.85	0.484	1.00	Pass
20 MHz	LCH	QPSK	RB1#0	20.39	6	26.39	0.436	1.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND66</b>									
		16-QAM	RB6#0	20.42	6	26.42	0.439	1.00	Pass
			RB1#0	20.49	6	26.49	0.446	1.00	Pass
			RB5#0	20.44	6	26.44	0.441	1.00	Pass
	MCH	QPSK	RB1#0	20.74	6	26.74	0.472	1.00	Pass
			RB6#0	20.72	6	26.72	0.470	1.00	Pass
		16-QAM	RB1#0	20.77	6	26.77	0.475	1.00	Pass
			RB5#0	20.77	6	26.77	0.475	1.00	Pass
		HCH	RB1#0	20.96	6	26.96	0.497	1.00	Pass
			RB6#0	20.88	6	26.88	0.488	1.00	Pass
		16-QAM	RB1#0	20.99	6	26.99	0.500	1.00	Pass
			RB5#0	20.86	6	26.86	0.485	1.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND71</b>										
5MHz	LCH	QPSK	RB1#0	22	6	3.85	25.85	0.385	3.00	Pass
			RB6#0	21.02	6	3.85	24.87	0.307	3.00	Pass
		16-QAM	RB1#0	22.07	6	3.85	25.92	0.391	3.00	Pass
			RB5#0	20.11	6	3.85	23.96	0.249	3.00	Pass
	MCH	QPSK	RB1#0	21.58	6	3.85	25.43	0.349	3.00	Pass
			RB6#0	20.61	6	3.85	24.46	0.279	3.00	Pass
		16-QAM	RB1#0	21.65	6	3.85	25.50	0.355	3.00	Pass
			RB5#0	19.74	6	3.85	23.59	0.229	3.00	Pass
	HCH	QPSK	RB1#0	21.16	6	3.85	25.01	0.317	3.00	Pass
			RB6#0	20.08	6	3.85	23.93	0.247	3.00	Pass
		16-QAM	RB1#0	21.13	6	3.85	24.98	0.315	3.00	Pass
			RB5#0	19.19	6	3.85	23.04	0.201	3.00	Pass
10 MHz	LCH	QPSK	RB1#0	21.84	6	3.85	25.69	0.371	3.00	Pass
			RB6#0	20.89	6	3.85	24.74	0.298	3.00	Pass
		16-QAM	RB1#0	21.76	6	3.85	25.61	0.364	3.00	Pass
			RB5#0	20.87	6	3.85	24.72	0.296	3.00	Pass
	MCH	QPSK	RB1#0	21.52	6	3.85	25.37	0.344	3.00	Pass
			RB6#0	20.55	6	3.85	24.40	0.275	3.00	Pass
		16-QAM	RB1#0	21.48	6	3.85	25.33	0.341	3.00	Pass
			RB5#0	20.58	6	3.85	24.43	0.277	3.00	Pass
	HCH	QPSK	RB1#0	21.17	6	3.85	25.02	0.318	3.00	Pass
			RB6#0	20.12	6	3.85	23.97	0.249	3.00	Pass
		16-QAM	RB1#0	21.23	6	3.85	25.08	0.322	3.00	Pass
			RB5#0	20.12	6	3.85	23.97	0.249	3.00	Pass
15 MHz	LCH	QPSK	RB1#0	21.76	6	3.85	25.61	0.364	3.00	Pass
			RB6#0	21.75	6	3.85	25.60	0.363	3.00	Pass
		16-QAM	RB1#0	21.67	6	3.85	25.52	0.356	3.00	Pass
			RB5#0	21.69	6	3.85	25.54	0.358	3.00	Pass
	MCH	QPSK	RB1#0	21.44	6	3.85	25.29	0.338	3.00	Pass
			RB6#0	21.42	6	3.85	25.27	0.337	3.00	Pass
		16-QAM	RB1#0	21.43	6	3.85	25.28	0.337	3.00	Pass
			RB5#0	21.38	6	3.85	25.23	0.333	3.00	Pass
	HCH	QPSK	RB1#0	21.18	6	3.85	25.03	0.318	3.00	Pass
			RB6#0	21.11	6	3.85	24.96	0.313	3.00	Pass
		16-QAM	RB1#0	21.33	6	3.85	25.18	0.330	3.00	Pass
			RB5#0	21.05	6	3.85	24.90	0.309	3.00	Pass
20 MHz	LCH	QPSK	RB1#0	21.65	6	3.85	25.50	0.355	3.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND71</b>										
		16-QAM	RB6#0	21.58	6	3.85	25.43	0.349	3.00	Pass
			RB1#0	21.72	6	3.85	25.57	0.361	3.00	Pass
			RB5#0	21.6	6	3.85	25.45	0.351	3.00	Pass
	MCH	QPSK	RB1#0	21.39	6	3.85	25.24	0.334	3.00	Pass
			RB6#0	21.34	6	3.85	25.19	0.330	3.00	Pass
		16-QAM	RB1#0	21.41	6	3.85	25.26	0.336	3.00	Pass
			RB5#0	21.34	6	3.85	25.19	0.330	3.00	Pass
	HCH	QPSK	RB1#0	21.26	6	3.85	25.11	0.324	3.00	Pass
			RB6#0	21.18	6	3.85	25.03	0.318	3.00	Pass
		16-QAM	RB1#0	21.22	6	3.85	25.07	0.321	3.00	Pass
			RB5#0	21.19	6	3.85	25.04	0.319	3.00	Pass

Test BW	Test Channel I	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>LTE-M1 BAND85</b>										
5MHz	LCH	QPSK	RB1#0	20.7	6	3.85	24.55	0.285	3.00	Pass
			RB6#0	19.73	6	3.85	23.58	0.228	3.00	Pass
		16-QAM	RB1#0	20.69	6	3.85	24.54	0.284	3.00	Pass
			RB5#0	18.73	6	3.85	22.58	0.181	3.00	Pass
	MCH	QPSK	RB1#0	20.9	6	3.85	24.75	0.299	3.00	Pass
			RB6#0	19.92	6	3.85	23.77	0.238	3.00	Pass
		16-QAM	RB1#0	20.79	6	3.85	24.64	0.291	3.00	Pass
			RB5#0	19.04	6	3.85	22.89	0.195	3.00	Pass
	HCH	QPSK	RB1#0	20.99	6	3.85	24.84	0.305	3.00	Pass
			RB6#0	19.96	6	3.85	23.81	0.240	3.00	Pass
		16-QAM	RB1#0	21.15	6	3.85	25.00	0.316	3.00	Pass
			RB5#0	19.02	6	3.85	22.87	0.194	3.00	Pass
10 MHz	LCH	QPSK	RB1#0	20.78	6	3.85	24.63	0.290	3.00	Pass
			RB6#0	19.76	6	3.85	23.61	0.230	3.00	Pass
		16-QAM	RB1#0	20.77	6	3.85	24.62	0.290	3.00	Pass
			RB5#0	19.78	6	3.85	23.63	0.231	3.00	Pass
	MCH	QPSK	RB1#0	20.86	6	3.85	24.71	0.296	3.00	Pass
			RB6#0	19.88	6	3.85	23.73	0.236	3.00	Pass
		16-QAM	RB1#0	20.97	6	3.85	24.82	0.303	3.00	Pass
			RB5#0	19.94	6	3.85	23.79	0.239	3.00	Pass
	HCH	QPSK	RB1#0	21.05	6	3.85	24.90	0.309	3.00	Pass
			RB6#0	20	6	3.85	23.85	0.243	3.00	Pass
		16-QAM	RB1#0	21.11	6	3.85	24.96	0.313	3.00	Pass
			RB5#0	20.08	6	3.85	23.93	0.247	3.00	Pass

## NB-IoT Mode Test Data

Test Sub-carrier spacing	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
<b>NB-IoT BAND2</b>									
3.75kHz	LCH	QPSK	RB1#0	19.78	6	25.78	0.378	2.00	Pass
			RB1#47	19.72	6	25.72	0.373	2.00	Pass
		BPSK	RB1#0	19.72	6	25.72	0.373	2.00	Pass
			RB1#47	19.74	6	25.74	0.375	2.00	Pass
	MCH	QPSK	RB1#0	19.68	6	25.68	0.370	2.00	Pass
			RB1#47	19.7	6	25.70	0.372	2.00	Pass
		BPSK	RB1#0	19.66	6	25.66	0.368	2.00	Pass
			RB1#47	19.64	6	25.64	0.366	2.00	Pass
	HCH	QPSK	RB1#0	19.94	6	25.94	0.393	2.00	Pass
			RB1#47	19.96	6	25.96	0.394	2.00	Pass
		BPSK	RB1#0	19.96	6	25.96	0.394	2.00	Pass
			RB1#47	19.89	6	25.89	0.388	2.00	Pass
15kHz	LCH	QPSK	RB1#0	19.96	6	25.96	0.394	2.00	Pass
			RB1#11	19.95	6	25.95	0.394	2.00	Pass
			RB12#0	20.44	6	26.44	0.441	2.00	Pass
		BPSK	RB1#0	19.87	6	25.87	0.386	2.00	Pass
			RB1#11	19.87	6	25.87	0.386	2.00	Pass
	MCH	QPSK	RB1#0	19.97	6	25.97	0.395	2.00	Pass
			RB1#11	20.02	6	26.02	0.400	2.00	Pass
			RB12#0	20.45	6	26.45	0.442	2.00	Pass
		BPSK	RB1#0	19.93	6	25.93	0.392	2.00	Pass
			RB1#11	19.93	6	25.93	0.392	2.00	Pass
	HCH	QPSK	RB1#0	20.22	6	26.22	0.419	2.00	Pass
			RB1#11	20.2	6	26.20	0.417	2.00	Pass
			RB12#0	20.52	6	26.52	0.449	2.00	Pass
		BPSK	RB1#0	20.17	6	26.17	0.414	2.00	Pass
			RB1#11	20.17	6	26.17	0.414	2.00	Pass



Test Sub-carrier spacing	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
<b>NB-IoT BAND4</b>									
3.75kHz	LCH	QPSK	RB1#0	21.07	6	27.07	0.509	1.00	Pass
			RB1#47	21.08	6	27.08	0.511	1.00	Pass
		BPSK	RB1#0	21.1	6	27.10	0.513	1.00	Pass
			RB1#47	21.04	6	27.04	0.506	1.00	Pass
	MCH	QPSK	RB1#0	20.77	6	26.77	0.475	1.00	Pass
			RB1#47	20.77	6	26.77	0.475	1.00	Pass
		BPSK	RB1#0	20.74	6	26.74	0.472	1.00	Pass
			RB1#47	20.74	6	26.74	0.472	1.00	Pass
	HCH	QPSK	RB1#0	20.37	6	26.37	0.434	1.00	Pass
			RB1#47	20.38	6	26.38	0.435	1.00	Pass
		BPSK	RB1#0	20.31	6	26.31	0.428	1.00	Pass
			RB1#47	20.33	6	26.33	0.430	1.00	Pass
15kHz	LCH	QPSK	RB1#0	21.4	6	27.40	0.550	1.00	Pass
			RB1#11	21.41	6	27.41	0.551	1.00	Pass
			RB12#0	21.79	6	27.79	0.601	1.00	Pass
		BPSK	RB1#0	21.34	6	27.34	0.542	1.00	Pass
			RB1#11	21.32	6	27.32	0.540	1.00	Pass
	MCH	QPSK	RB1#0	21.18	6	27.18	0.522	1.00	Pass
			RB1#11	21.17	6	27.17	0.521	1.00	Pass
			RB12#0	21.54	6	27.54	0.568	1.00	Pass
		BPSK	RB1#0	21.12	6	27.12	0.515	1.00	Pass
			RB1#11	21.11	6	27.11	0.514	1.00	Pass
	HCH	QPSK	RB1#0	20.66	6	26.66	0.463	1.00	Pass
			RB1#11	20.66	6	26.66	0.463	1.00	Pass
			RB12#0	21.02	6	27.02	0.504	1.00	Pass
		BPSK	RB1#0	20.59	6	26.59	0.456	1.00	Pass
			RB1#11	20.59	6	26.59	0.456	1.00	Pass

Test Sub-carrier spacing	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>NB-IoT BAND5</b>										
3.75kHz	LCH	QPSK	RB1#0	20.39	6	3.85	24.24	0.265	7.00	Pass
			RB1#47	20.4	6	3.85	24.25	0.266	7.00	Pass
		BPSK	RB1#0	20.38	6	3.85	24.23	0.265	7.00	Pass
			RB1#47	20.37	6	3.85	24.22	0.264	7.00	Pass
	MCH	QPSK	RB1#0	20.45	6	3.85	24.30	0.269	7.00	Pass
			RB1#47	20.45	6	3.85	24.30	0.269	7.00	Pass
		BPSK	RB1#0	20.43	6	3.85	24.28	0.268	7.00	Pass
			RB1#47	20.44	6	3.85	24.29	0.269	7.00	Pass
	HCH	QPSK	RB1#0	20.67	6	3.85	24.52	0.283	7.00	Pass
			RB1#47	20.67	6	3.85	24.52	0.283	7.00	Pass
		BPSK	RB1#0	20.63	6	3.85	24.48	0.281	7.00	Pass
			RB1#47	20.64	6	3.85	24.49	0.281	7.00	Pass
15kHz	LCH	QPSK	RB1#0	20.93	6	3.85	24.78	0.301	7.00	Pass
			RB1#11	20.92	6	3.85	24.77	0.300	7.00	Pass
			RB12#0	21.33	6	3.85	25.18	0.330	7.00	Pass
		BPSK	RB1#0	20.86	6	3.85	24.71	0.296	7.00	Pass
			RB1#11	20.88	6	3.85	24.73	0.297	7.00	Pass
	MCH	QPSK	RB1#0	20.61	6	3.85	24.46	0.279	7.00	Pass
			RB1#11	20.59	6	3.85	24.44	0.278	7.00	Pass
			RB12#0	20.99	6	3.85	24.84	0.305	7.00	Pass
		BPSK	RB1#0	20.58	6	3.85	24.43	0.277	7.00	Pass
			RB1#11	20.57	6	3.85	24.42	0.277	7.00	Pass
	HCH	QPSK	RB1#0	20.93	6	3.85	24.78	0.301	7.00	Pass
			RB1#11	20.93	6	3.85	24.78	0.301	7.00	Pass
			RB12#0	21.35	6	3.85	25.20	0.331	7.00	Pass
		BPSK	RB1#0	20.86	6	3.85	24.71	0.296	7.00	Pass
			RB1#11	20.9	6	3.85	24.75	0.299	7.00	Pass

Test Sub-carrier spacing	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>NB-IoT BAND12</b>										
3.75kHz	LCH	QPSK	RB1#0	20.23	6	3.85	24.08	0.256	3.00	Pass
			RB1#47	20.24	6	3.85	24.09	0.256	3.00	Pass
		BPSK	RB1#0	20.2	6	3.85	24.05	0.254	3.00	Pass
			RB1#47	20.21	6	3.85	24.06	0.255	3.00	Pass
	MCH	QPSK	RB1#0	20.34	6	3.85	24.19	0.262	3.00	Pass
			RB1#47	20.34	6	3.85	24.19	0.262	3.00	Pass
		BPSK	RB1#0	20.33	6	3.85	24.18	0.262	3.00	Pass
			RB1#47	20.33	6	3.85	24.18	0.262	3.00	Pass
	HCH	QPSK	RB1#0	20.48	6	3.85	24.33	0.271	3.00	Pass
			RB1#47	20.48	6	3.85	24.33	0.271	3.00	Pass
		BPSK	RB1#0	20.45	6	3.85	24.30	0.269	3.00	Pass
			RB1#47	20.46	6	3.85	24.31	0.270	3.00	Pass
15kHz	LCH	QPSK	RB1#0	20.43	6	3.85	24.28	0.268	3.00	Pass
			RB1#11	20.43	6	3.85	24.28	0.268	3.00	Pass
			RB12#0	20.78	6	3.85	24.63	0.290	3.00	Pass
		BPSK	RB1#0	20.38	6	3.85	24.23	0.265	3.00	Pass
			RB1#11	20.37	6	3.85	24.22	0.264	3.00	Pass
	MCH	QPSK	RB1#0	20.5	6	3.85	24.35	0.272	3.00	Pass
			RB1#11	20.47	6	3.85	24.32	0.270	3.00	Pass
			RB12#0	20.84	6	3.85	24.69	0.294	3.00	Pass
		BPSK	RB1#0	20.46	6	3.85	24.31	0.270	3.00	Pass
			RB1#11	20.47	6	3.85	24.32	0.270	3.00	Pass
	HCH	QPSK	RB1#0	20.66	6	3.85	24.51	0.282	3.00	Pass
			RB1#11	20.66	6	3.85	24.51	0.282	3.00	Pass
			RB12#0	20.94	6	3.85	24.79	0.301	3.00	Pass
		BPSK	RB1#0	20.63	6	3.85	24.48	0.281	3.00	Pass
			RB1#11	20.66	6	3.85	24.51	0.282	3.00	Pass

Test Sub-carrier spacing	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>NB-IoT BAND13</b>										
3.75kHz	LCH	QPSK	RB1#0	19.93	6	3.85	23.78	0.239	3.00	Pass
			RB1#47	19.93	6	3.85	23.78	0.239	3.00	Pass
		BPSK	RB1#0	19.92	6	3.85	23.77	0.238	3.00	Pass
			RB1#47	19.9	6	3.85	23.75	0.237	3.00	Pass
	MCH	QPSK	RB1#0	20.08	6	3.85	23.93	0.247	3.00	Pass
			RB1#47	20.09	6	3.85	23.94	0.248	3.00	Pass
		BPSK	RB1#0	20	6	3.85	23.85	0.243	3.00	Pass
			RB1#47	20.07	6	3.85	23.92	0.247	3.00	Pass
	HCH	QPSK	RB1#0	19.93	6	3.85	23.78	0.239	3.00	Pass
			RB1#47	19.94	6	3.85	23.79	0.239	3.00	Pass
		BPSK	RB1#0	19.9	6	3.85	23.75	0.237	3.00	Pass
			RB1#47	19.92	6	3.85	23.77	0.238	3.00	Pass
15kHz	LCH	QPSK	RB1#0	20.04	6	3.85	23.89	0.245	3.00	Pass
			RB1#11	20.12	6	3.85	23.97	0.249	3.00	Pass
			RB12#0	20.57	6	3.85	24.42	0.277	3.00	Pass
		BPSK	RB1#0	20.03	6	3.85	23.88	0.244	3.00	Pass
			RB1#11	20.02	6	3.85	23.87	0.244	3.00	Pass
	MCH	QPSK	RB1#0	20.22	6	3.85	24.07	0.255	3.00	Pass
			RB1#11	20.21	6	3.85	24.06	0.255	3.00	Pass
			RB12#0	20.64	6	3.85	24.49	0.281	3.00	Pass
		BPSK	RB1#0	20.18	6	3.85	24.03	0.253	3.00	Pass
			RB1#11	20.21	6	3.85	24.06	0.255	3.00	Pass
			RB12#0	20.61	6	3.85	24.46	0.279	3.00	Pass
	HCH	QPSK	RB1#0	20.08	6	3.85	23.93	0.247	3.00	Pass
			RB1#11	20.06	6	3.85	23.91	0.246	3.00	Pass
			RB12#0	20.61	6	3.85	24.46	0.279	3.00	Pass
		BPSK	RB1#0	20.07	6	3.85	23.92	0.247	3.00	Pass
			RB1#11	20.05	6	3.85	23.90	0.245	3.00	Pass

Test Sub-carrier spacing	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>NB-IoT BAND14</b>										
3.75kHz	LCH	QPSK	RB1#0	19.9	6	3.85	23.75	0.237	3.00	Pass
			RB1#47	19.95	6	3.85	23.80	0.240	3.00	Pass
		BPSK	RB1#0	19.89	6	3.85	23.74	0.237	3.00	Pass
			RB1#47	19.92	6	3.85	23.77	0.238	3.00	Pass
	MCH	QPSK	RB1#0	20.1	6	3.85	23.95	0.248	3.00	Pass
			RB1#47	20.1	6	3.85	23.95	0.248	3.00	Pass
		BPSK	RB1#0	20.09	6	3.85	23.94	0.248	3.00	Pass
			RB1#47	20.08	6	3.85	23.93	0.247	3.00	Pass
	HCH	QPSK	RB1#0	20.23	6	3.85	24.08	0.256	3.00	Pass
			RB1#47	20.24	6	3.85	24.09	0.256	3.00	Pass
		BPSK	RB1#0	20.28	6	3.85	24.13	0.259	3.00	Pass
			RB1#47	20.27	6	3.85	24.12	0.258	3.00	Pass
15kHz	LCH	QPSK	RB1#0	20.15	6	3.85	24.00	0.251	3.00	Pass
			RB1#11	20.14	6	3.85	23.99	0.251	3.00	Pass
			RB12#0	20.65	6	3.85	24.50	0.282	3.00	Pass
		BPSK	RB1#0	20.09	6	3.85	23.94	0.248	3.00	Pass
			RB1#11	20.09	6	3.85	23.94	0.248	3.00	Pass
	MCH	QPSK	RB1#0	20.35	6	3.85	24.20	0.263	3.00	Pass
			RB1#11	20.34	6	3.85	24.19	0.262	3.00	Pass
			RB12#0	20.8	6	3.85	24.65	0.292	3.00	Pass
		BPSK	RB1#0	20.29	6	3.85	24.14	0.259	3.00	Pass
			RB1#11	20.32	6	3.85	24.17	0.261	3.00	Pass
			RB12#0	20.91	6	3.85	24.76	0.299	3.00	Pass
	HCH	QPSK	RB1#0	20.46	6	3.85	24.31	0.270	3.00	Pass
			RB1#11	20.48	6	3.85	24.33	0.271	3.00	Pass
			RB12#0	20.91	6	3.85	24.76	0.299	3.00	Pass
		BPSK	RB1#0	20.44	6	3.85	24.29	0.269	3.00	Pass
			RB1#11	20.47	6	3.85	24.32	0.270	3.00	Pass

Test Sub-carrier spacing	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>NB-IoT BAND17</b>										
3.75kHz	LCH	QPSK	RB1#0	20.27	6	3.85	24.12	0.258	3.00	Pass
			RB1#47	20.27	6	3.85	24.12	0.258	3.00	Pass
		BPSK	RB1#0	20.25	6	3.85	24.10	0.257	3.00	Pass
			RB1#47	20.25	6	3.85	24.10	0.257	3.00	Pass
	MCH	QPSK	RB1#0	20.42	6	3.85	24.27	0.267	3.00	Pass
			RB1#47	20.43	6	3.85	24.28	0.268	3.00	Pass
		BPSK	RB1#0	20.39	6	3.85	24.24	0.265	3.00	Pass
			RB1#47	20.4	6	3.85	24.25	0.266	3.00	Pass
	HCH	QPSK	RB1#0	20.45	6	3.85	24.30	0.269	3.00	Pass
			RB1#47	20.45	6	3.85	24.30	0.269	3.00	Pass
		BPSK	RB1#0	20.45	6	3.85	24.30	0.269	3.00	Pass
			RB1#47	20.46	6	3.85	24.31	0.270	3.00	Pass
15kHz	LCH	QPSK	RB1#0	20.37	6	3.85	24.22	0.264	3.00	Pass
			RB1#11	20.41	6	3.85	24.26	0.267	3.00	Pass
			RB12#0	20.77	6	3.85	24.62	0.290	3.00	Pass
		BPSK	RB1#0	20.35	6	3.85	24.20	0.263	3.00	Pass
			RB1#11	20.39	6	3.85	24.24	0.265	3.00	Pass
	MCH	QPSK	RB1#0	20.62	6	3.85	24.47	0.280	3.00	Pass
			RB1#11	20.63	6	3.85	24.48	0.281	3.00	Pass
			RB12#0	20.91	6	3.85	24.76	0.299	3.00	Pass
		BPSK	RB1#0	20.61	6	3.85	24.46	0.279	3.00	Pass
			RB1#11	20.6	6	3.85	24.45	0.279	3.00	Pass
	HCH	QPSK	RB1#0	20.59	6	3.85	24.44	0.278	3.00	Pass
			RB1#11	20.62	6	3.85	24.47	0.280	3.00	Pass
			RB12#0	20.89	6	3.85	24.74	0.298	3.00	Pass
		BPSK	RB1#0	20.61	6	3.85	24.46	0.279	3.00	Pass
			RB1#11	20.61	6	3.85	24.46	0.279	3.00	Pass

Test Sub-carrier spacing	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
<b>NB-IoT BAND25</b>									
3.75kHz	LCH	QPSK	RB1#0	19.67	6	25.67	0.369	2.00	Pass
			RB1#47	19.68	6	25.68	0.370	2.00	Pass
		BPSK	RB1#0	19.6	6	25.60	0.363	2.00	Pass
			RB1#47	19.62	6	25.62	0.365	2.00	Pass
	MCH	QPSK	RB1#0	19.73	6	25.73	0.374	2.00	Pass
			RB1#47	19.73	6	25.73	0.374	2.00	Pass
		BPSK	RB1#0	19.68	6	25.68	0.370	2.00	Pass
			RB1#47	19.68	6	25.68	0.370	2.00	Pass
	HCH	QPSK	RB1#0	20.01	6	26.01	0.399	2.00	Pass
			RB1#47	19.99	6	25.99	0.397	2.00	Pass
		BPSK	RB1#0	19.97	6	25.97	0.395	2.00	Pass
			RB1#47	19.98	6	25.98	0.396	2.00	Pass
15kHz	LCH	QPSK	RB1#0	19.98	6	25.98	0.396	2.00	Pass
			RB1#11	19.95	6	25.95	0.394	2.00	Pass
			RB12#0	20.43	6	26.43	0.440	2.00	Pass
		BPSK	RB1#0	19.88	6	25.88	0.387	2.00	Pass
			RB1#11	19.88	6	25.88	0.387	2.00	Pass
	MCH	QPSK	RB1#0	19.99	6	25.99	0.397	2.00	Pass
			RB1#11	19.97	6	25.97	0.395	2.00	Pass
			RB12#0	20.39	6	26.39	0.436	2.00	Pass
		BPSK	RB1#0	20.08	6	26.08	0.406	2.00	Pass
			RB1#11	19.9	6	25.90	0.389	2.00	Pass
	HCH	QPSK	RB1#0	20.24	6	26.24	0.421	2.00	Pass
			RB1#11	20.24	6	26.24	0.421	2.00	Pass
			RB12#0	20.5	6	26.50	0.447	2.00	Pass
		BPSK	RB1#0	20.14	6	26.14	0.411	2.00	Pass
			RB1#11	20.16	6	26.16	0.413	2.00	Pass

Test Sub-carrier spacing	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>NB-IoT BAND26(Part22)</b>										
3.75kHz	LCH	QPSK	RB1#0	20.4	6	3.85	24.25	0.266	7.00	Pass
			RB1#47	20.41	6	3.85	24.26	0.267	7.00	Pass
		BPSK	RB1#0	20.38	6	3.85	24.23	0.265	7.00	Pass
			RB1#47	20.37	6	3.85	24.22	0.264	7.00	Pass
	MCH	QPSK	RB1#0	20.45	6	3.85	24.30	0.269	7.00	Pass
			RB1#47	20.46	6	3.85	24.31	0.270	7.00	Pass
		BPSK	RB1#0	20.42	6	3.85	24.27	0.267	7.00	Pass
			RB1#47	20.44	6	3.85	24.29	0.269	7.00	Pass
	HCH	QPSK	RB1#0	20.68	6	3.85	24.53	0.284	7.00	Pass
			RB1#47	20.69	6	3.85	24.54	0.284	7.00	Pass
		BPSK	RB1#0	20.68	6	3.85	24.53	0.284	7.00	Pass
			RB1#47	20.7	6	3.85	24.55	0.285	7.00	Pass
15kHz	LCH	QPSK	RB1#0	20.62	6	3.85	24.47	0.280	7.00	Pass
			RB1#11	20.61	6	3.85	24.46	0.279	7.00	Pass
			RB12#0	21.04	6	3.85	24.89	0.308	7.00	Pass
		BPSK	RB1#0	20.55	6	3.85	24.40	0.275	7.00	Pass
			RB1#11	20.56	6	3.85	24.41	0.276	7.00	Pass
	MCH	QPSK	RB1#0	20.67	6	3.85	24.52	0.283	7.00	Pass
			RB1#11	20.65	6	3.85	24.50	0.282	7.00	Pass
			RB12#0	21.09	6	3.85	24.94	0.312	7.00	Pass
		BPSK	RB1#0	20.63	6	3.85	24.48	0.281	7.00	Pass
			RB1#11	20.62	6	3.85	24.47	0.280	7.00	Pass
			RB12#0	21.31	6	3.85	25.16	0.328	7.00	Pass
	HCH	QPSK	RB1#0	20.92	6	3.85	24.77	0.300	7.00	Pass
			RB1#11	20.93	6	3.85	24.78	0.301	7.00	Pass
			RB12#0	21.31	6	3.85	25.16	0.328	7.00	Pass
		BPSK	RB1#0	20.91	6	3.85	24.76	0.299	7.00	Pass
			RB1#11	20.89	6	3.85	24.74	0.298	7.00	Pass



Test Sub-carrier spacing	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>NB-IoT BAND26(Part90)</b>										
3.75kHz	LCH	QPSK	RB1#0	20.34	6	3.85	24.19	0.262	100.000	Pass
			RB1#47	20.35	6	3.85	24.20	0.263	100.000	Pass
		BPSK	RB1#0	20.34	6	3.85	24.19	0.262	100.000	Pass
			RB1#47	20.32	6	3.85	24.17	0.261	100.000	Pass
	MCH	QPSK	RB1#0	20.21	6	3.85	24.06	0.255	100.000	Pass
			RB1#47	20.25	6	3.85	24.10	0.257	100.000	Pass
		BPSK	RB1#0	20.19	6	3.85	24.04	0.254	100.000	Pass
			RB1#47	20.24	6	3.85	24.09	0.256	100.000	Pass
	HCH	QPSK	RB1#0	20.37	6	3.85	24.22	0.264	100.000	Pass
			RB1#47	20.4	6	3.85	24.25	0.266	100.000	Pass
		BPSK	RB1#0	20.39	6	3.85	24.24	0.265	100.000	Pass
			RB1#47	20.36	6	3.85	24.21	0.264	100.000	Pass
15kHz	LCH	QPSK	RB1#0	20.5	6	3.85	24.35	0.272	100.000	Pass
			RB1#11	20.57	6	3.85	24.42	0.277	100.000	Pass
			RB12#0	20.96	6	3.85	24.81	0.303	100.000	Pass
		BPSK	RB1#0	20.53	6	3.85	24.38	0.274	100.000	Pass
			RB1#11	20.55	6	3.85	24.40	0.275	100.000	Pass
	MCH	QPSK	RB1#0	20.46	6	3.85	24.31	0.270	100.000	Pass
			RB1#11	20.44	6	3.85	24.29	0.269	100.000	Pass
			RB12#0	20.88	6	3.85	24.73	0.297	100.000	Pass
		BPSK	RB1#0	20.4	6	3.85	24.25	0.266	100.000	Pass
			RB1#11	20.41	6	3.85	24.26	0.267	100.000	Pass
			RB12#0	20.96	6	3.85	24.81	0.303	100.000	Pass
	HCH	QPSK	RB1#0	20.59	6	3.85	24.44	0.278	100.000	Pass
			RB1#11	20.58	6	3.85	24.43	0.277	100.000	Pass
			RB12#0	20.96	6	3.85	24.81	0.303	100.000	Pass
		BPSK	RB1#0	20.53	6	3.85	24.38	0.274	100.000	Pass
			RB1#11	20.55	6	3.85	24.40	0.275	100.000	Pass

Test Sub-carrier spacing	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
<b>NB-IoT BAND66</b>									
3.75kHz	LCH	QPSK	RB1#0	13.24	6	19.24	0.084	1.00	Pass
			RB1#47	13.23	6	19.23	0.084	1.00	Pass
		BPSK	RB1#0	13.16	6	19.16	0.082	1.00	Pass
			RB1#47	13.23	6	19.23	0.084	1.00	Pass
	MCH	QPSK	RB1#0	13.72	6	19.72	0.094	1.00	Pass
			RB1#47	13.75	6	19.75	0.094	1.00	Pass
		BPSK	RB1#0	13.72	6	19.72	0.094	1.00	Pass
			RB1#47	13.71	6	19.71	0.094	1.00	Pass
	HCH	QPSK	RB1#0	13.75	6	19.75	0.094	1.00	Pass
			RB1#47	13.77	6	19.77	0.095	1.00	Pass
		BPSK	RB1#0	13.72	6	19.72	0.094	1.00	Pass
			RB1#47	13.77	6	19.77	0.095	1.00	Pass
15kHz	LCH	QPSK	RB1#0	13.5	6	19.50	0.089	1.00	Pass
			RB1#11	13.5	6	19.50	0.089	1.00	Pass
			RB12#0	14.01	6	20.01	0.100	1.00	Pass
		BPSK	RB1#0	13.46	6	19.46	0.088	1.00	Pass
			RB1#11	13.47	6	19.47	0.089	1.00	Pass
	MCH	QPSK	RB1#0	14.02	6	20.02	0.100	1.00	Pass
			RB1#11	13.99	6	19.99	0.100	1.00	Pass
			RB12#0	14.39	6	20.39	0.109	1.00	Pass
		BPSK	RB1#0	13.95	6	19.95	0.099	1.00	Pass
			RB1#11	13.97	6	19.97	0.099	1.00	Pass
			RB12#0	14.5	6	20.50	0.112	1.00	Pass
	HCH	QPSK	RB1#0	13.93	6	19.93	0.098	1.00	Pass
			RB1#11	14.02	6	20.02	0.100	1.00	Pass
			RB12#0	14.5	6	20.50	0.112	1.00	Pass
		BPSK	RB1#0	13.97	6	19.97	0.099	1.00	Pass
			RB1#11	13.99	6	19.99	0.100	1.00	Pass

Test Sub-carrier spacing	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>NB-IoT BAND71</b>										
3.75kHz	LCH	QPSK	RB1#0	20.81	6	3.85	24.66	0.292	3.00	Pass
			RB1#47	20.83	6	3.85	24.68	0.294	3.00	Pass
		BPSK	RB1#0	20.77	6	3.85	24.62	0.290	3.00	Pass
			RB1#47	20.79	6	3.85	24.64	0.291	3.00	Pass
	MCH	QPSK	RB1#0	20.38	6	3.85	24.23	0.265	3.00	Pass
			RB1#47	20.38	6	3.85	24.23	0.265	3.00	Pass
		BPSK	RB1#0	20.35	6	3.85	24.20	0.263	3.00	Pass
			RB1#47	20.36	6	3.85	24.21	0.264	3.00	Pass
	HCH	QPSK	RB1#0	19.8	6	3.85	23.65	0.232	3.00	Pass
			RB1#47	19.82	6	3.85	23.67	0.233	3.00	Pass
		BPSK	RB1#0	19.78	6	3.85	23.63	0.231	3.00	Pass
			RB1#47	19.79	6	3.85	23.64	0.231	3.00	Pass
15kHz	LCH	QPSK	RB1#0	21.01	6	3.85	24.86	0.306	3.00	Pass
			RB1#11	21.01	6	3.85	24.86	0.306	3.00	Pass
			RB12#0	21.31	6	3.85	25.16	0.328	3.00	Pass
		BPSK	RB1#0	20.94	6	3.85	24.79	0.301	3.00	Pass
			RB1#11	20.99	6	3.85	24.84	0.305	3.00	Pass
	MCH	QPSK	RB1#0	20.51	6	3.85	24.36	0.273	3.00	Pass
			RB1#11	20.47	6	3.85	24.32	0.270	3.00	Pass
			RB12#0	20.81	6	3.85	24.66	0.292	3.00	Pass
		BPSK	RB1#0	20.47	6	3.85	24.32	0.270	3.00	Pass
			RB1#11	20.49	6	3.85	24.34	0.272	3.00	Pass
	HCH	QPSK	RB1#0	19.91	6	3.85	23.76	0.238	3.00	Pass
			RB1#11	19.92	6	3.85	23.77	0.238	3.00	Pass
			RB12#0	20.25	6	3.85	24.10	0.257	3.00	Pass
		BPSK	RB1#0	19.89	6	3.85	23.74	0.237	3.00	Pass
			RB1#11	19.92	6	3.85	23.77	0.238	3.00	Pass

Test Sub-carrier spacing	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output AV Power (dBm)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
<b>NB-IoT BAND85</b>										
3.75kHz	LCH	QPSK	RB1#0	20.21	6	3.85	24.06	0.255	3.00	Pass
			RB1#47	20.22	6	3.85	24.07	0.255	3.00	Pass
		BPSK	RB1#0	20.23	6	3.85	24.08	0.256	3.00	Pass
			RB1#47	20.25	6	3.85	24.10	0.257	3.00	Pass
	MCH	QPSK	RB1#0	20.35	6	3.85	24.20	0.263	3.00	Pass
			RB1#47	20.35	6	3.85	24.20	0.263	3.00	Pass
		BPSK	RB1#0	20.33	6	3.85	24.18	0.262	3.00	Pass
			RB1#47	20.33	6	3.85	24.18	0.262	3.00	Pass
	HCH	QPSK	RB1#0	20.49	6	3.85	24.34	0.272	3.00	Pass
			RB1#47	20.49	6	3.85	24.34	0.272	3.00	Pass
		BPSK	RB1#0	20.48	6	3.85	24.33	0.271	3.00	Pass
			RB1#47	20.48	6	3.85	24.33	0.271	3.00	Pass
15kHz	LCH	QPSK	RB1#0	20.41	6	3.85	24.26	0.267	3.00	Pass
			RB1#11	20.4	6	3.85	24.25	0.266	3.00	Pass
			RB12#0	20.78	6	3.85	24.63	0.290	3.00	Pass
		BPSK	RB1#0	20.36	6	3.85	24.21	0.264	3.00	Pass
			RB1#11	20.41	6	3.85	24.26	0.267	3.00	Pass
	MCH	QPSK	RB1#0	20.46	6	3.85	24.31	0.270	3.00	Pass
			RB1#11	20.49	6	3.85	24.34	0.272	3.00	Pass
			RB12#0	20.79	6	3.85	24.64	0.291	3.00	Pass
		BPSK	RB1#0	20.45	6	3.85	24.30	0.269	3.00	Pass
			RB1#11	20.46	6	3.85	24.31	0.270	3.00	Pass
	HCH	QPSK	RB1#0	20.65	6	3.85	24.50	0.282	3.00	Pass
			RB1#11	20.64	6	3.85	24.49	0.281	3.00	Pass
			RB12#0	21	6	3.85	24.85	0.305	3.00	Pass
		BPSK	RB1#0	20.64	6	3.85	24.49	0.281	3.00	Pass
			RB1#11	20.63	6	3.85	24.48	0.281	3.00	Pass

## A.2 Peak to Average Ratio

Note: The Peak to Average Ratio please refer to the Report No. BL-SZ2430170-501, which issued by Shenzhen BALUN Technology Co., Ltd. on Aug. 13, 2024, Section A.2 Peak to Average Ratio.

## A.3 Occupied Bandwidth

Note: The Occupied Bandwidth please refer to the Report No. BL-SZ2430170-501, which issued by Shenzhen BALUN Technology Co., Ltd. on Aug. 13, 2024, Section A.3 Occupied Bandwidth.

## A.4 Frequency Stability

Note: The Frequency Stability please refer to the Report No. BL-SZ2430170-501, which issued by Shenzhen BALUN Technology Co., Ltd. on Aug. 13, 2024, Section A.4 Frequency Stability.

## A.5 Spurious Emission at Antenna Terminals

Note: The Spurious Emission at Antenna Terminals please refer to the Report No. BL-SZ2430170-501, which issued by Shenzhen BALUN Technology Co., Ltd. on Aug. 13, 2024, Section A.5 Spurious Emission at Antenna Terminals

## A.6 Band Edge

Note: The Band Edge please refer to the Report No. BL-SZ2430170-501, which issued by Shenzhen BALUN Technology Co., Ltd. on Aug. 13, 2024, Section A.6 Band Edge.

## A.7 Field Strength of Spurious Radiation

Note 1: All modes have been tested, and only the worst case data are shown here.

Note 2: The frequencies of verdict which are marked by "N/A" should be ignored because they are UE carrier frequency.

Note 3: Test plots please refer to the document "Annex No.:BL-SZ24A1042-501 Data Part 1.pdf".

Note 4: The disturbance above 26.5GHz was very low, and the above harmonics were the highest point could be found when testing, so only the worst case data displayed in this report.

### LTE-M1 Mode Test Data

Test Band	Test Bandwidth	Test Channel	Verdict <sup>Note3</sup>
LTE-M1 Band 14	5 MHz	LCH	Pass

### NB-IoT Mode Test Data

Test Band	Test Bandwidth	Test Channel	Verdict <sup>Note3</sup>
NB-IoT Band 14	15 KHz	LCH	Pass

## **ANNEX B TEST SETUP PHOTOS**

Please refer to the document “BL-SZ24A1042-AR-1.PDF”.

## **ANNEX C EUT EXTERNAL PHOTOS**

Please refer to the document “BL-SZ24A1042-AW.PDF”.

## **ANNEX D EUT INTERNAL PHOTOS**

Please refer to the document “BL-SZ24A1042-AI.PDF”.

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--END OF REPORT--