RADIO TEST REPORT

Report No.:STS1912245W02

Issued for

Telit Communications S.p.A.

Viale Stazione di Prosecco 5/b, 34010, Trieste, Italy

Product Name:	Data Terminal Module	
Brand Name:	Telit	
Model Name:	ME910G1-WW	
Series Model:	N/A	
FCC ID:	RI7ME910G1WW	
IC:	5131A-ME910G1WW	
Test Standard:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 27 47 CFR FCC Part 90 47 CFR FCC Part 2	RSS-132 Issue 3 RSS-133 Issue 6 RSS-130 Issue 2 RSS-139 Issue 3 RSS-Gen Issue 5

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TEST RESULT CERTIFICATION

Applicant's Name.....:	Telit Communications S.p.A.
Address.....:	Viale Stazione di Prosecco 5/b, 34010, Trieste, Italy
Manufacture's Name.....:	Telit Communications S.p.A.
Address.....:	Viale Stazione di Prosecco 5/b, 34010, Trieste, Italy

Product description

Product Name .....:	Data Terminal Module
Brand Name .....:	Telit
Model Name.....:	ME910G1-WW
Series Model.....:	N/A
Test Standards.....:	47 CFR FCC Part 22 RSS-132 Issue 3 47 CFR FCC Part 24 RSS-133 Issue 6 47 CFR FCC Part 27 RSS-130 Issue 2 47 CFR FCC Part 90 RSS-139 Issue 3 47 CFR FCC Part 2 RSS-Gen Issue 5
Test Procedure .....:	KDB 971168 D01 v03r01, ANSI C63.26 2015

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC/IC requirements. And it is applicable only to the tested sample identified in the report.
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Date of Test.....:	
Date of receipt of test item .....:	16 Dec. 2019
Date (s) of performance of tests :	16 Dec. 2019 ~ 10 Mar. 2020
Date of Issue .....:	11 Mar. 2020
Test Result .....:	Pass

Testing Engineer : Chris Chen
(Chris Chen)

Technical Manager : Sean She
(Sean she)

Authorized Signatory : Vita Li
(Vita Li)

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	11 Mar. 2020	STS1912245W02	ALL	Initial Issue

1. TEST FACTORY & MEASUREMENT UNCERTAINTY

1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD
Add. : A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China
FCC test Firm Registration Number: 625569
IC test Firm Registration Number: 12108A
A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	RF output power, conducted	±0.68dB
2	Unwanted Emissions, conducted	±2.988dB
3	All emissions, radiated 30-1GHz	±6.7dB
4	All emissions, radiated 1G-6GHz	±5.5dB
5	All emissions, radiated>6G	±5.8dB
6	Conducted Emission (9KHz-150KHz)	±4.43dB
7	Conducted Emission (150KHz-30MHz)	±5dB

2. GENERAL INFORMATION

2.1 TECHNICAL SPECIFICATIONS AND REGULATIONS

2.1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Name:	Data Terminal Module
Trade Name	Telit
Model Name	ME910G1-WW
Model Difference	N/A
Frequency Bands:	NB-IOT FDD Band 2 NB-IOT FDD Band 4 NB-IOT FDD Band 5 NB-IOT FDD Band 12 NB-IOT FDD Band 13 NB-IOT FDD Band 25 NB-IOT FDD Band 26 NB-IOT FDD Band 66 NB-IOT FDD Band 71 NB-IOT FDD Band 85
Device Category	Category NB1 and NB2
SIM CARD:	Only support single SIM Card.
Antenna:	External Antenna The EUT doesn't have antenna, The adapter and antenna used for testing in this report is the after-market accessory
Antenna gain:	2.14 dBi for NB-IoT Band 2/4/5/12/13/25/26/66/71/85
Operating Voltage:	DC 3.8V
Extreme Vol. Limits:	3.2V to 4.5V
Extreme Temp. Tolerance:	-40℃ to +85℃

2.1.2 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Product Specification Subjective To This Standard	
Tx Frequency	NB-IOT Band 2:1850~1910MHz NB-IOT Band 4:1710~1755MHz NB-IOT Band 5:824~849MHz NB-IOT Band 12:699~716MHz NB-IOT Band 13:777~787MHz NB-IOT Band 25:1850~1915MHz NB-IOT Band 26:814~849MHz NB-IOT Band 66:1710~1780MHz NB-IOT Band 71:663~698MHz NB-IOT Band 85:698~716MHz
Rx Frequency	NB-IOT Band 2:1930 ~1990MHz NB-IOT Band 4:2110~2155MHz NB-IOT Band 5:869~894MHz NB-IOT Band 12:729~746MHz NB-IOT Band 13:746~756MHz NB-IOT Band 25:1930~1995MHz NB-IOT Band 26:859~894MHz NB-IOT Band 66:2110~2200MHz NB-IOT Band 71:617~652MHz NB-IOT Band 85:728~746MHz
Deployment	Stand-alone
Ntones	Single, multi-tone
Sub-carrier spacing	3.75KHz, 15KHz
Maximum Conducted Output Power	NB-IOT Band 2: 23.86 dBm NB-IOT Band 4: 23.62 dBm NB-IOT Band 5: 23.24 dBm NB-IOT Band 12: 23.56 dBm NB-IOT Band 13: 23.68 dBm NB-IOT Band 25: 23.7 dBm NB-IOT Band 26(L): 23.21dBm NB-IOT Band 26(U): 23.86 dBm NB-IOT Band 66: 23.81 dBm NB-IOT Band 71: 21.89 dBm NB-IOT Band 85: 23.63 dBm
Type of Modulation	BPSK /QPSK

List of Frequencies under Test

Operation bands	Mode	Frequencies under Test					
		Uplink			Downlink		
		Range	EARFCN	Frequencies (MHz)	Range	EARFCN	Frequencies (MHz)
2	Standalone	Low	18601	1850.1000	Low	601	1930.1000
		Mid	18900	1880.0000	Mid	900	1960.0000
		High	19199	1909.9000	High	1199	1989.9000
4	Standalone	Low	19951	1710.1000	Low	1951	2110.1000
		Mid	20175	1732.5000	Mid	2175	2132.5000
		High	20399	1754.9000	High	2399	2154.9000
5	Standalone	Low	20401	824.1000	Low	2401	869.1000

		Mid	20525	836.5000	Mid	2525	881.5000
		High	20649	848.9000	High	2649	893.9000
12	Standalone	Low	23011	699.1000	Low	5011	729.1000
		Mid	23095	707.5000	Mid	5095	737.5000
		High	23179	715.9000	High	5179	745.9000
13	Standalone	Low	23181	777.1000	Low	5181	746.1000
		Mid	23230	782.0000	Mid	5230	751.0000
		High	23279	786.9000	High	5279	755.9000
25	Standalone	Low	26041	1850.1000	Low	8041	1930.1000
		Mid	26365	1882.5000	Mid	8365	1962.5000
		High	26689	1914.9000	High	8689	1994.9000
26(L)	Standalone	Low	26691	814.1000	Low	8691	859.1000
		Mid	26740	819.0000	Mid	8740	864.0000
		High	26789	823.9000	High	8789	868.9000
26(U)	Standalone	Low	26791	824.1000	Low	8791	869.1000
		Mid	26915	836.5000	Mid	8915	881.5000
		High	27039	848.9000	High	9039	893.9000
66	Standalone	Low	131973	1710.1000	Low	66437	2110.1000
		Mid	132322	1745.0000	Mid	66786	2145.0000
		High	132671	1779.9000	High	67135	2179.9000
71	Standalone	Low	133123	663.1000	Low	68587	617.1000
		Mid	133297	680.5000	Mid	68761	634.5000
		High	133471	697.9000	High	68935	651.9000
85	Standalone	Low	134003	698.1000	Low	70367	728.1000
		Mid	134092	707.0000	Mid	70456	737.0000
		High	134181	715.9000	High	70545	745.9000

2.1.3 EMISSION DESIGNATOR

NB-IOT Band 2	Emission Designator	Emission Designator
Sub-carrier spacing (KHz)	(99%)BPSK	(99%)QPSK
3.75	56K0G7D	60K8G7D
15	127KG7D	191KG7D
NB-IOT Band 4	Emission Designator	Emission Designator
Sub-carrier spacing (KHz)	(99%)BPSK	(99%)QPSK
3.75	53K4G7D	59K5G7D
15	130KG7D	191KG7D
NB-IOT Band 5	Emission Designator	Emission Designator
Sub-carrier spacing (KHz)	(99%)BPSK	(99%)QPSK
3.75	55K1G7D	59K1G7D
15	129KG7D	190KG7D
NB-IOT Band 12	Emission Designator	Emission Designator
Sub-carrier spacing (KHz)	(99%)BPSK	(99%)QPSK
3.75	55K9G7D	51K5G7D
15	128KG7D	184KG7D
NB-IOT Band 13	Emission Designator	Emission Designator

Sub-carrier spacing (KHz)	(99%)BPSK	(99%)QPSK
3.75	56K3G7D	51K9G7D
15	129KG7D	184KG7D
NB-IOT Band 25	Emission Designator	Emission Designator
Sub-carrier spacing (KHz)	(99%)BPSK	(99%)QPSK
3.75	63K1G7D	60K1G7D
15	129KG7D	191KG7D
NB-IOT LTE Band 26 (Part 22)	Emission Designator	Emission Designator
Sub-carrier spacing (KHz)	(99%)BPSK	(99%)QPSK
3.75	55K2G7D	62K6G7D
15	132KG7D	191KG7D
NB-IOT LTE Band 26 (Part 90)	Emission Designator	Emission Designator
Sub-carrier spacing (KHz)	(99%)BPSK	(99%)QPSK
3.75	54K7G7D	59K9G7D
15	127KG7D	190KG7D
NB-IOT LTE Band 66	Emission Designator	Emission Designator
Sub-carrier spacing (KHz)	(99%)BPSK	(99%)QPSK
3.75	53K8G7D	59K7G7D
15	128KG7D	189KG7D
NB-IOT LTE Band 71	Emission Designator	Emission Designator
Sub-carrier spacing (KHz)	(99%)BPSK	(99%)QPSK
3.75	54K7G7D	52K7G7D
15	128KG7D	184KG7D
NB-IOT LTE Band 85	Emission Designator	Emission Designator
Sub-carrier spacing (KHz)	(99%)BPSK	(99%)QPSK
3.75	55K5G7D	51K9G7D
15	128KG7D	184KG7D

2.1.4 TEST CONFIGURATION OF EQUIPMENT UNDER TEST

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 v03r01 and ANSI C63.26 2015 Power Meas. License Digital Systems with maximum output power. Radiated measurements are performed by rotating the EUT in three different orthogonal test planes tofind the maximum emission.

Remark:

1. The mark ‘v’means that this configuration is chosen for testing
2. The mark ‘-’means that this bandwidth is not supported.
3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated

ITEMS	Band	Subcarrier Spacing (KHz)		Modulation		Test Channel		
		3.75	15	BPSK	QPSK	L	M	H
Max. Output Power, E.R.P.& E.I.R.P.	2	v	v	v	v	v	v	v
	4	v	v	v	v	v	v	v
	5	v	v	v	v	v	v	v
	12	v	v	v	v	v	v	v
	13	v	v	v	v	v	v	v
	25	v	v	v	v	v	v	v
	26	v	v	v	v	v	v	v
	66	v	v	v	v	v	v	v
	71	v	v	v	v	v	v	v
	85	v	v	v	v	v	v	v
Peak-to-Average Ratio	2	v	v	v	v		v	
	4	v	v	v	v		v	
	5	v	v	v	v		v	
	12	v	v	v	v		v	
	13	v	v	v	v		v	
	25	v	v	v	v		v	
	26	v	v	v	v		v	
	66	v	v	v	v		v	
	71	v	v	v	v		v	
	85	v	v	v	v		v	
26dB&99% Bandwidth	2	v	v	v	v	v	v	v
	4	v	v	v	v	v	v	v
	5	v	v	v	v	v	v	v
	12	v	v	v	v	v	v	v
	13	v	v	v	v	v	v	v
	25	v	v	v	v	v	v	v
	26	v	v	v	v	v	v	v
	66	v	v	v	v	v	v	v
	71	v	v	v	v	v	v	v
	85	v	v	v	v	v	v	v

Conducted Band Edge	2	v	v	v	v	v		v
	4	v	v	v	v	v		v
	5	v	v	v	v	v		v
	12	v	v	v	v	v		v
	13	v	v	v	v	v		v
	25	v	v	v	v	v		v
	26	v	v	v	v	v		v
	66	v	v	v	v	v		v
	71	v	v	v	v	v		v
	85	v	v	v	v	v		v
Conducted Spurious Emission	2	v	v	v	v	v	v	v
	4	v	v	v	v	v	v	v
	5	v	v	v	v	v	v	v
	12	v	v	v	v	v	v	v
	13	v	v	v	v	v	v	v
	25	v	v	v	v	v	v	v
	26	v	v	v	v	v	v	v
	66	v	v	v	v	v	v	v
	71	v	v	v	v	v	v	v
	85	v	v	v	v	v	v	v
Frequency Stability	2	v	v		v		v	
	4	v	v		v		v	
	5	v	v		v		v	
	12	v	v		v		v	
	13	v	v		v		v	
	25	v	v		v		v	
	26	v	v		v		v	
	66	v	v		v		v	
	71	v	v		v		v	
	85	v	v		v		v	
Radiated Spurious Emission	2	v	v	v	v	v	v	v
	4	v	v	v	v	v	v	v
	5	v	v	v	v	v	v	v
	12	v	v	v	v	v	v	v
	13	v	v	v	v	v	v	v
	25	v	v	v	v	v	v	v
	26	v	v	v	v	v	v	v
	66	v	v	v	v	v	v	v
	71	v	v	v	v	v	v	v
	85	v	v	v	v	v	v	v

2.1.5 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for filing to comply with below standards:

47 CFR FCC Part 22	RSS-132 Issue 3
47 CFR FCC Part 24	RSS-133 Issue 6
47 CFR FCC Part 27	RSS-130 Issue 2
47 CFR FCC Part 90	RSS-139 Issue 3
47 CFR FCC Part 2	RSS-Gen Issue 5

2.1.6 SPECIAL ACCESSORIES

The battery and the charger, earphone supplied by the applicant were used as accessories and being tested with eut intended for fcc grant together.

2.1.7 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.1.8 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

2.1.9 CONFIGURATION OF EUT SYSTEM

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

E-1
EUT

Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	Serial No.	Note
N/A	N/A	N/A	N/A	N/A

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.1.10 MEASUREMENT INSTRUMENTS

The radiated emission testing was performed according to the procedures of ANSI C63.26 2015 and FCC CFR 47 rules of 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2019.07.29	2020.07.28
Signal Analyzer	Agilent	N9020A	MY51110105	2019.03.02	2020.03.01
Wireless Communications Test Set	R&S	CMW 500	133884	2019.03.02	2020.03.01
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2020.11.01
Horn Antenna	SCHWARZBECK	BBHA 9120D(1201)	9120D-1343	2018.10.19	2021.10.18
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	J211020657	2018.03.11	2021.03.10
Pre-Amplifier(0.1M-3GHz)	EM	EM330	060665	2019.10.09	2020.10.08
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2019.10.12	2020.10.11
Turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A
Temperature & Humidity	HH660	Mieo	N/A	2019.10.12	2020.10.11
Test SW	BULUN	BL410-E/18.905			

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Universal Radio communication tester	R&S	CMU200	11764	2019.10.11	2020.10.10
Wireless Communications Test Set	R&S	CMW 500	133884	2019.03.02	2020.03.01
Signal Analyzer	R&S	FSV40	101823	2019.10.11	2020.10.10
Signal Analyzer	Agilent	N9020A	MY49100060	2019.10.09	2020.10.08
Temperature & Humidity	HH660	Mieo	N/A	2019.10.12	2020.10.11
Test SW	FARAD	LZ-RF /LzRf-3A3			

2.1.11 MEASUREMENT RESULTS EXPLANATION EXAMPLE

For all conducted test items:
The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factorbetween EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.
The spectrum analyzer offset is derived from RF cable loss and attenuator factor.
Offset = RF Cable Loss + Attenuator Factor.

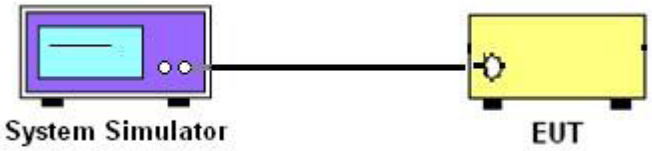
3. CONDUCTED OUTPUT POWER

3.1 DESCRIPTION OF THE CONDUCTED OUTPUT POWER MEASUREMENT

3.1.1 MEASUREMENT METHOD

A system simulator was used to establish communication with the eut. Its parameters were 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.
Configuration follows KDB 971168 D01 v03r01.

3.1.2 TEST SETUP



3.1.3 TEST PROCEDURES

1. The transmitter output port was connected to system simulator.

2. Set EUT at maximum power through the system simulator.

3. Select lowest/middle/highest channels for each band and different modulation.

4. Measure and record the power level from the system simulator.

5. Limit

Operating band	FCC Limit	ISED Limit
Band 2	EIRP 2 watts	EIRP 2 watts
Band 4	EIRP 1 watts	EIRP 1 watts
Band 5	ERP 7 watts	ERP 11.5 watts
Band 12	ERP 3 watts	ERP 3 watts
Band 13	ERP 3 watts	ERP 3 watts
Band 25	EIRP 2 watts	EIRP 2 watts
Band 26 Lower Band	< 100 watts	N/A
Band 26 Upper Band	ERP 7 watts	ERP 11.5 watts
Band 66	EIRP 1 watts	EIRP 1 watts
Band 71	ERP 3 watts	ERP 3 watts
Band 85	ERP 3 watts	ERP 3 watts

Note: ERP or EIRP = $P_{Meas} + G_T$
where
ERP or EIRP: effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, e.g. dBm)
P_{Meas}: measured transmitter output power, in dBm
G_T: gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

3.1.4 TEST RESULTS

Band	Modulation	Channel	Subcarrier Space (KHz)	RB Configure	Result (dBm)	EIRP (dBm) | (watts)		Limit (watts)	Verdict
Band 2	BPSK	18601	3.75	1@0	6.27	8.41	0.01	2	PASS
				1@47	6.23	8.37	0.01	2	PASS
			15	1@0	6.35	8.49	0.01	2	PASS
				1@11	6.32	8.46	0.01	2	PASS
Band 2	BPSK	18602	3.75	1@0	23.26	25.40	0.35	2	PASS
				1@47	23.27	25.41	0.35	2	PASS
			15	1@0	21.11	23.25	0.21	2	PASS
				1@11	21.08	23.22	0.21	2	PASS
Band 2	QPSK	18601	3.75	1@0	6.27	8.41	0.01	2	PASS
				1@47	6.25	8.39	0.01	2	PASS
			15	1@0	6.43	8.57	0.01	2	PASS
				1@11	6.33	8.47	0.01	2	PASS
				3@3	6.49	8.63	0.01	2	PASS
Band 2	QPSK	18602	3.75	1@0	23.3	25.44	0.35	2	PASS
				1@47	23.3	25.44	0.35	2	PASS
			15	1@0	21.25	23.39	0.22	2	PASS
				1@11	21.18	23.32	0.21	2	PASS
				3@3	23.53	25.67	0.37	2	PASS
Band 2	BPSK	18900	3.75	1@0	23.30	25.44	0.35	2	PASS
				1@47	23.25	25.39	0.35	2	PASS
			15	1@0	21.14	23.28	0.21	2	PASS
				1@11	21.04	23.18	0.21	2	PASS
Band 2	QPSK	18900	3.75	1@0	23.37	25.51	0.36	2	PASS
				1@47	23.27	25.41	0.35	2	PASS
			15	1@0	21.29	23.43	0.22	2	PASS
				1@11	21.20	23.34	0.22	2	PASS
				3@3	23.50	25.64	0.37	2	PASS
Band 2	BPSK	19198	3.75	1@0	22.67	24.81	0.30	2	PASS
				1@47	22.53	24.67	0.29	2	PASS
			15	1@0	21.26	23.40	0.22	2	PASS
				1@11	21.32	23.46	0.22	2	PASS
Band 2	BPSK	19199	3.75	1@0	6.45	8.59	0.01	2	PASS
				1@47	6.43	8.57	0.01	2	PASS
			15	1@0	6.45	8.59	0.01	2	PASS
				1@11	6.41	8.55	0.01	2	PASS
Band 2	QPSK	19198	3.75	1@0	22.79	24.93	0.31	2	PASS
				1@47	22.78	24.92	0.31	2	PASS
			15	1@0	21.45	23.59	0.23	2	PASS
				1@11	21.42	23.56	0.23	2	PASS
				3@3	23.86	26.00	0.40	2	PASS
Band 2	QPSK	19199	3.75	1@0	6.55	8.69	0.01	2	PASS
				1@47	6.47	8.61	0.01	2	PASS
			15	1@0	6.52	8.66	0.01	2	PASS
				1@11	6.48	8.62	0.01	2	PASS
				3@3	6.51	8.65	0.01	2	PASS

Band	Modulation	Channel	Subcarrier Space (KHz)	RB Configure	Result (dBm)	EIRP (dBm) | (watts)		Limit (watts)	Verdict
Band 4	BPSK	19951	3.75	1@0	6.51	8.65	0.01	1	PASS
				1@47	6.37	8.51	0.01	1	PASS
			15	1@0	6.37	8.51	0.01	1	PASS
				1@11	6.44	8.58	0.01	1	PASS
Band 4	BPSK	19952	3.75	1@0	23.52	25.66	0.37	1	PASS
				1@47	23.46	25.60	0.36	1	PASS
			15	1@0	21.22	23.36	0.22	1	PASS
				1@11	21.3	23.44	0.22	1	PASS
Band 4	QPSK	19951	3.75	1@0	6.54	8.68	0.01	1	PASS
				1@47	6.47	8.61	0.01	1	PASS
			15	1@0	6.49	8.63	0.01	1	PASS
				1@11	6.41	8.55	0.01	1	PASS
				3@3	6.40	8.54	0.01	1	PASS
Band 4	QPSK	19952	3.75	1@0	23.59	25.73	0.37	1	PASS
				1@47	23.54	25.68	0.37	1	PASS
			15	1@0	21.09	23.23	0.21	1	PASS
				1@11	21.47	23.61	0.23	1	PASS
				3@3	23.62	25.76	0.38	1	PASS
Band 4	BPSK	20175	3.75	1@0	22.51	24.65	0.29	1	PASS
				1@47	22.58	24.72	0.30	1	PASS
			15	1@0	21.39	23.53	0.23	1	PASS
				1@11	21.55	23.69	0.23	1	PASS
Band 4	QPSK	20175	3.75	1@0	22.90	25.04	0.32	1	PASS
				1@47	22.75	24.89	0.31	1	PASS
			15	1@0	21.13	23.27	0.21	1	PASS
				1@11	21.10	23.24	0.21	1	PASS
				3@3	23.21	25.35	0.34	1	PASS
Band 4	BPSK	20398	3.75	1@0	22.53	24.67	0.29	1	PASS
				1@47	22.44	24.58	0.29	1	PASS
			15	1@0	22.12	24.26	0.27	1	PASS
				1@11	22.37	24.51	0.28	1	PASS
Band 4	BPSK	20399	3.75	1@0	6.56	8.70	0.01	1	PASS
				1@47	6.44	8.58	0.01	1	PASS
			15	1@0	6.66	8.80	0.01	1	PASS
				1@11	6.65	8.79	0.01	1	PASS
Band 4	QPSK	20398	3.75	1@0	22.72	24.86	0.31	1	PASS
				1@47	22.69	24.83	0.30	1	PASS
			15	1@0	22.45	24.59	0.29	1	PASS
				1@11	22.35	24.49	0.28	1	PASS
				3@3	23.51	25.65	0.37	1	PASS
Band 4	QPSK	20399	3.75	1@0	6.60	8.74	0.01	1	PASS
				1@47	6.52	8.66	0.01	1	PASS
			15	1@0	6.75	8.89	0.01	1	PASS
				1@11	6.69	8.83	0.01	1	PASS
				3@3	6.76	8.90	0.01	1	PASS

Band	Modulation	Channel	Subcarrier Space (KHz)	RB Configure	Result (dBm)	ERP (dBm) | (watts)		Limit (watts) FCC | IC		Verdict
Band 5	BPSK	20401	3.75	1@0	6.01	8.15	0.01	7	11.5	PASS
				1@47	5.97	8.11	0.01	7	11.5	PASS
			15	1@0	6.16	8.30	0.01	7	11.5	PASS
				1@11	6.15	8.29	0.01	7	11.5	PASS
Band 5	BPSK	20402	3.75	1@0	22.61	24.75	0.30	7	11.5	PASS
				1@47	22.58	24.72	0.30	7	11.5	PASS
			15	1@0	22.82	24.96	0.31	7	11.5	PASS
				1@11	22.72	24.86	0.31	7	11.5	PASS
Band 5	QPSK	20401	3.75	1@0	6.05	8.19	0.01	7	11.5	PASS
				1@47	6.01	8.15	0.01	7	11.5	PASS
			15	1@0	6.24	8.38	0.01	7	11.5	PASS
				1@11	6.18	8.32	0.01	7	11.5	PASS
				3@3	6.22	8.36	0.01	7	11.5	PASS
Band 5	QPSK	20402	3.75	1@0	22.75	24.89	0.31	7	11.5	PASS
				1@47	22.66	24.80	0.30	7	11.5	PASS
			15	1@0	22.98	25.12	0.33	7	11.5	PASS
				1@11	22.87	25.01	0.32	7	11.5	PASS
				3@3	23.22	25.36	0.34	7	11.5	PASS
Band 5	BPSK	20525	3.75	1@0	22.75	24.89	0.31	7	11.5	PASS
				1@47	22.68	24.82	0.30	7	11.5	PASS
			15	1@0	21.79	23.93	0.25	7	11.5	PASS
				1@11	22.08	24.22	0.26	7	11.5	PASS
Band 5	QPSK	20525	3.75	1@0	22.85	24.99	0.32	7	11.5	PASS
				1@47	22.81	24.95	0.31	7	11.5	PASS
			15	1@0	21.89	24.03	0.25	7	11.5	PASS
				1@11	22.35	24.49	0.28	7	11.5	PASS
				3@3	23.24	25.38	0.35	7	11.5	PASS
Band 5	BPSK	20648	3.75	1@0	22.47	24.61	0.29	7	11.5	PASS
				1@47	22.3	24.44	0.28	7	11.5	PASS
			15	1@0	22.77	24.91	0.31	7	11.5	PASS
				1@11	22.76	24.90	0.31	7	11.5	PASS
Band 5	BPSK	20649	3.75	1@0	6.26	8.40	0.01	7	11.5	PASS
				1@47	6.24	8.38	0.01	7	11.5	PASS
			15	1@0	6.38	8.52	0.01	7	11.5	PASS
				1@11	6.35	8.49	0.01	7	11.5	PASS
Band 5	QPSK	20648	3.75	1@0	22.54	24.68	0.29	7	11.5	PASS
				1@47	22.54	24.68	0.29	7	11.5	PASS
			15	1@0	21.05	23.19	0.21	7	11.5	PASS
				1@11	22.94	25.08	0.32	7	11.5	PASS
				3@3	23.15	25.29	0.34	7	11.5	PASS
Band 5	QPSK	20649	3.75	1@0	6.36	8.50	0.01	7	11.5	PASS
				1@47	6.31	8.45	0.01	7	11.5	PASS
			15	1@0	6.51	8.65	0.01	7	11.5	PASS
				1@11	6.41	8.55	0.01	7	11.5	PASS
				3@3	6.36	8.50	0.01	7	11.5	PASS

Band	Modulation	Channel	Subcarrier Space (KHz)	RB Configure	Result (dBm)	ERP (dBm) | (watts)		Limit (watts)	Verdict
Band 12	BPSK	23011	3.75	1@0	6.96	9.10	0.01	3	PASS
				1@47	6.95	9.09	0.01	3	PASS
			15	1@0	7.13	9.27	0.01	3	PASS
				1@11	7.11	9.25	0.01	3	PASS
Band 12	BPSK	23012	3.75	1@0	22.86	25.00	0.32	3	PASS
				1@47	22.87	25.01	0.32	3	PASS
			15	1@0	22.69	24.83	0.30	3	PASS
				1@11	22.58	24.72	0.30	3	PASS
Band 12	QPSK	23011	3.75	1@0	7.10	9.24	0.01	3	PASS
				1@47	7.03	9.17	0.01	3	PASS
			15	1@0	7.30	9.44	0.01	3	PASS
				1@11	7.21	9.35	0.01	3	PASS
				3@3	7.23	9.37	0.01	3	PASS
Band 12	QPSK	23012	3.75	1@0	22.96	25.10	0.32	3	PASS
				1@47	22.96	25.10	0.32	3	PASS
			15	1@0	22.85	24.99	0.32	3	PASS
				1@11	22.74	24.88	0.31	3	PASS
				3@3	23.12	25.26	0.34	3	PASS
Band 12	BPSK	23095	3.75	1@0	21.09	23.23	0.21	3	PASS
				1@47	21.26	23.40	0.22	3	PASS
			15	1@0	21.12	23.26	0.21	3	PASS
				1@11	21.07	23.21	0.21	3	PASS
Band 12	QPSK	23095	3.75	1@0	21.69	23.83	0.24	3	PASS
				1@47	21.82	23.96	0.25	3	PASS
			15	1@0	21.37	23.51	0.22	3	PASS
				1@11	21.27	23.41	0.22	3	PASS
				3@3	23.56	25.70	0.37	3	PASS
Band 12	BPSK	23178	3.75	1@0	22.3	24.44	0.28	3	PASS
				1@47	22.17	24.31	0.27	3	PASS
			15	1@0	22.59	24.73	0.30	3	PASS
				1@11	22.67	24.81	0.30	3	PASS
Band 12	BPSK	23179	3.75	1@0	7.27	9.41	0.01	3	PASS
				1@47	7.19	9.33	0.01	3	PASS
			15	1@0	7.26	9.40	0.01	3	PASS
				1@11	7.28	9.42	0.01	3	PASS
Band 12	QPSK	23178	3.75	1@0	22.51	24.65	0.29	3	PASS
				1@47	22.6	24.74	0.30	3	PASS
			15	1@0	21.01	23.15	0.21	3	PASS
				1@11	21.88	24.02	0.25	3	PASS
				3@3	23.02	25.16	0.33	3	PASS
Band 12	QPSK	23179	3.75	1@0	7.42	9.56	0.01	3	PASS
				1@47	7.35	9.49	0.01	3	PASS
			15	1@0	7.40	9.54	0.01	3	PASS
				1@11	7.33	9.47	0.01	3	PASS
				3@3	7.29	9.43	0.01	3	PASS

Band	Modulation	Channel	Subcarrier Space (KHz)	RB Configure	Result (dBm)	ERP (dBm) | (watts)		Limit (watts)	Verdict
Band 13	BPSK	23181	3.75	1@0	6.72	8.86	0.01	3	PASS
				1@47	6.67	8.81	0.01	3	PASS
			15	1@0	6.77	8.91	0.01	3	PASS
				1@11	6.75	8.89	0.01	3	PASS
Band 13	BPSK	23182	3.75	1@0	22.89	25.03	0.32	3	PASS
				1@47	22.87	25.01	0.32	3	PASS
			15	1@0	22.8	24.94	0.31	3	PASS
				1@11	22.64	24.78	0.30	3	PASS
Band 13	QPSK	23181	3.75	1@0	6.79	8.93	0.01	3	PASS
				1@47	6.73	8.87	0.01	3	PASS
			15	1@0	6.87	9.01	0.01	3	PASS
				1@11	6.83	8.97	0.01	3	PASS
				3@3	6.91	9.05	0.01	3	PASS
Band 13	QPSK	23182	3.75	1@0	22.96	25.10	0.32	3	PASS
				1@47	22.92	25.06	0.32	3	PASS
			15	1@0	22.93	25.07	0.32	3	PASS
				1@11	22.82	24.96	0.31	3	PASS
				3@3	23.22	25.36	0.34	3	PASS
Band 13	BPSK	23230	3.75	1@0	21.39	23.53	0.23	3	PASS
				1@47	21.85	23.99	0.25	3	PASS
			15	1@0	21.16	23.30	0.21	3	PASS
				1@11	21.05	23.19	0.21	3	PASS
Band 13	QPSK	23230	3.75	1@0	22.07	24.21	0.26	3	PASS
				1@47	22.48	24.62	0.29	3	PASS
			15	1@0	23.68	25.82	0.38	3	PASS
				1@11	21.28	23.42	0.22	3	PASS
				3@3	21.41	23.55	0.23	3	PASS
Band 13	BPSK	23278	3.75	1@0	22.84	24.98	0.31	3	PASS
				1@47	22.78	24.92	0.31	3	PASS
			15	1@0	22.63	24.77	0.30	3	PASS
				1@11	22.66	24.80	0.30	3	PASS
Band 13	BPSK	23279	3.75	1@0	6.77	8.91	0.01	3	PASS
				1@47	6.73	8.87	0.01	3	PASS
			15	1@0	6.90	9.04	0.01	3	PASS
				1@11	6.83	8.97	0.01	3	PASS
Band 13	QPSK	23278	3.75	1@0	22.92	25.06	0.32	3	PASS
				1@47	22.86	25.00	0.32	3	PASS
			15	1@0	22.92	25.06	0.32	3	PASS
				1@11	22.82	24.96	0.31	3	PASS
				3@3	23.08	25.22	0.33	3	PASS
Band 13	QPSK	23279	3.75	1@0	6.89	9.03	0.01	3	PASS
				1@47	6.85	8.99	0.01	3	PASS
			15	1@0	6.96	9.10	0.01	3	PASS
				1@11	6.96	9.10	0.01	3	PASS
				3@3	7.02	9.16	0.01	3	PASS

Band	Modulation	Channel	Subcarrier Space (KHz)	RB Configure	Result (dBm)	EIRP (dBm) | (watts)		Limit (watts)	Verdict
Band 25	BPSK	26041	3.75	1@0	6.12	8.26	0.01	2	PASS
				1@47	6.13	8.27	0.01	2	PASS
			15	1@0	6.28	8.42	0.01	2	PASS
				1@11	6.26	8.40	0.01	2	PASS
Band 25	BPSK	26042	3.75	1@0	22.58	24.72	0.30	2	PASS
				1@47	22.6	24.74	0.30	2	PASS
			15	1@0	21.3	23.44	0.22	2	PASS
				1@11	21.19	23.33	0.22	2	PASS
Band 25	QPSK	26041	3.75	1@0	6.31	8.45	0.01	2	PASS
				1@47	6.23	8.37	0.01	2	PASS
			15	1@0	6.37	8.51	0.01	2	PASS
				1@11	6.30	8.44	0.01	2	PASS
				3@3	6.39	8.53	0.01	2	PASS
Band 25	QPSK	26042	3.75	1@0	22.91	25.05	0.32	2	PASS
				1@47	22.74	24.88	0.31	2	PASS
			15	1@0	21.4	23.54	0.23	2	PASS
				1@11	21.29	23.43	0.22	2	PASS
				3@3	23.68	25.82	0.38	2	PASS
Band 25	BPSK	26365	3.75	1@0	23.28	25.42	0.35	2	PASS
				1@47	23.23	25.37	0.34	2	PASS
			15	1@0	21.06	23.20	0.21	2	PASS
				1@11	21.10	23.24	0.21	2	PASS
Band 25	QPSK	26365	3.75	1@0	23.34	25.48	0.35	2	PASS
				1@47	23.28	25.42	0.35	2	PASS
			15	1@0	21.32	23.46	0.22	2	PASS
				1@11	21.26	23.40	0.22	2	PASS
				3@3	23.40	25.54	0.36	2	PASS
Band 25	BPSK	26688	3.75	1@0	23.44	25.58	0.36	2	PASS
				1@47	23.36	25.50	0.35	2	PASS
			15	1@0	23.28	25.42	0.35	2	PASS
				1@11	23.29	25.43	0.35	2	PASS
Band 25	BPSK	26689	3.75	1@0	6.41	8.55	0.01	2	PASS
				1@47	6.38	8.52	0.01	2	PASS
			15	1@0	6.69	8.83	0.01	2	PASS
				1@11	6.65	8.79	0.01	2	PASS
Band 25	QPSK	26688	3.75	1@0	23.54	25.68	0.37	2	PASS
				1@47	23.48	25.62	0.36	2	PASS
			15	1@0	23.49	25.63	0.37	2	PASS
				1@11	23.41	25.55	0.36	2	PASS
				3@3	23.7	25.84	0.38	2	PASS
Band 25	QPSK	26689	3.75	1@0	6.58	8.72	0.01	2	PASS
				1@47	6.47	8.61	0.01	2	PASS
			15	1@0	6.82	8.96	0.01	2	PASS
				1@11	6.73	8.87	0.01	2	PASS
				3@3	6.79	8.93	0.01	2	PASS

Band 26 (Part 22)

Band	Modulation	Channel	Subcarrier Space (KHz)	RB Configure	Result (dBm)	ERP (dBm) | (watts)		Limit (watts)		Verdict
Band 26	BPSK	26791	3.75	1@0	6.33	8.47	0.01	7	11.5	PASS
				1@47	6.32	8.46	0.01	7	11.5	PASS
			15	1@0	6.32	8.46	0.01	7	11.5	PASS
				1@11	6.29	8.43	0.01	7	11.5	PASS
Band 26	BPSK	26792	3.75	1@0	23.01	25.15	0.33	7	11.5	PASS
				1@47	23	25.14	0.33	7	11.5	PASS
			15	1@0	23.84	25.98	0.40	7	11.5	PASS
				1@11	23.86	26.00	0.40	7	11.5	PASS
Band 26	QPSK	26791	3.75	1@0	6.38	8.52	0.01	7	11.5	PASS
				1@47	6.31	8.45	0.01	7	11.5	PASS
			15	1@0	6.45	8.59	0.01	7	11.5	PASS
				1@11	6.37	8.51	0.01	7	11.5	PASS
				3@3	6.36	8.50	0.01	7	11.5	PASS
Band 26	QPSK	26792	3.75	1@0	23.14	25.28	0.34	7	11.5	PASS
				1@47	23.07	25.21	0.33	7	11.5	PASS
			15	1@0	21.08	23.22	0.21	7	11.5	PASS
				1@11	21.01	23.15	0.21	7	11.5	PASS
				3@3	23.22	25.36	0.34	7	11.5	PASS
Band 26	BPSK	26915	3.75	1@0	22.51	24.65	0.29	7	11.5	PASS
				1@47	22.52	24.66	0.29	7	11.5	PASS
			15	1@0	22.31	24.45	0.28	7	11.5	PASS
				1@11	22.88	25.02	0.32	7	11.5	PASS
Band 26	QPSK	26915	3.75	1@0	22.79	24.93	0.31	7	11.5	PASS
				1@47	22.76	24.90	0.31	7	11.5	PASS
			15	1@0	21.02	23.16	0.21	7	11.5	PASS
				1@11	21.54	23.68	0.23	7	11.5	PASS
				3@3	23.27	25.41	0.35	7	11.5	PASS
Band 26	BPSK	27038	3.75	1@0	22.58	24.72	0.30	7	11.5	PASS
				1@47	22.42	24.56	0.29	7	11.5	PASS
			15	1@0	21.01	23.15	0.21	7	11.5	PASS
				1@11	21.95	24.09	0.26	7	11.5	PASS
Band 26	BPSK	27039	3.75	1@0	6.39	8.53	0.01	7	11.5	PASS
				1@47	6.31	8.45	0.01	7	11.5	PASS
			15	1@0	6.38	8.52	0.01	7	11.5	PASS
				1@11	6.36	8.50	0.01	7	11.5	PASS
Band 26	QPSK	27038	3.75	1@0	22.72	24.86	0.31	7	11.5	PASS
				1@47	22.56	24.70	0.30	7	11.5	PASS
			15	1@0	21.14	23.28	0.21	7	11.5	PASS
				1@11	21.15	23.29	0.21	7	11.5	PASS
				3@3	23.35	25.49	0.35	7	11.5	PASS
Band 26	QPSK	27039	3.75	1@0	6.46	8.60	0.01	7	11.5	PASS
				1@47	6.38	8.52	0.01	7	11.5	PASS
			15	1@0	6.47	8.61	0.01	7	11.5	PASS
				1@11	6.41	8.55	0.01	7	11.5	PASS
				3@3	6.42	8.56	0.01	7	11.5	PASS

Band 26 (Part 90)

Band	Modulation	Channel	Subcarrier Space (KHz)	RB Configure	Result (dBm)	Limit (watts)	Verdict
Band 26	BPSK	26691	3.75	1@0	5.32	100	PASS
				1@47	5.30	100	PASS
			15	1@0	5.38	100	PASS
				1@11	5.35	100	PASS
Band 26	BPSK	26692	3.75	1@0	22.51	100	PASS
				1@47	22.52	100	PASS
			15	1@0	22.82	100	PASS
				1@11	22.84	100	PASS
Band 26	QPSK	26691	3.75	1@0	5.40	100	PASS
				1@47	5.34	100	PASS
			15	1@0	5.37	100	PASS
				1@11	5.40	100	PASS
				3@3	5.33	100	PASS
Band 26	QPSK	26692	3.75	1@0	22.79	100	PASS
				1@47	22.69	100	PASS
			15	1@0	21.01	100	PASS
				1@11	21.96	100	PASS
				3@3	23.19	100	PASS
Band 26	BPSK	26740	3.75	1@0	22.71	100	PASS
				1@47	22.59	100	PASS
			15	1@0	22.18	100	PASS
				1@11	21.94	100	PASS
Band 26	QPSK	26740	3.75	1@0	22.75	100	PASS
				1@47	22.68	100	PASS
			15	1@0	21.04	100	PASS
				1@11	22.05	100	PASS
				3@3	23.21	100	PASS
Band 26	BPSK	26788	3.75	1@0	23.06	100	PASS
				1@47	22.99	100	PASS
			15	1@0	22.94	100	PASS
				1@11	22.85	100	PASS
Band 26	BPSK	26789	3.75	1@0	5.33	100	PASS
				1@47	5.30	100	PASS
			15	1@0	5.36	100	PASS
				1@11	5.37	100	PASS
Band 26	QPSK	26788	3.75	1@0	23.08	100	PASS
				1@47	23.02	100	PASS
			15	1@0	21.05	100	PASS
				1@11	22.96	100	PASS
				3@3	23.18	100	PASS
Band 26	QPSK	26789	3.75	1@0	5.54	100	PASS
				1@47	5.36	100	PASS
			15	1@0	5.43	100	PASS
				1@11	5.36	100	PASS
				3@3	5.42	100	PASS

Band	Modulation	Channel	Subcarrier Space (KHz)	RB Configure	Result (dBm)	EIRP (dBm) | (watts)		Limit (watts)	Verdict
Band 66	BPSK	131973	3.75	1@0	6.54	8.68	0.01	1	PASS
				1@47	6.51	8.65	0.01	1	PASS
			15	1@0	6.41	8.55	0.01	1	PASS
				1@11	6.37	8.51	0.01	1	PASS
Band 66	BPSK	131974	3.75	1@0	23.56	25.70	0.37	1	PASS
				1@47	23.55	25.69	0.37	1	PASS
			15	1@0	21.27	23.41	0.22	1	PASS
				1@11	21.28	23.42	0.22	1	PASS
Band 66	QPSK	131973	3.75	1@0	6.52	8.66	0.01	1	PASS
				1@47	6.55	8.69	0.01	1	PASS
			15	1@0	6.43	8.57	0.01	1	PASS
				1@11	6.49	8.63	0.01	1	PASS
				3@3	6.49	8.63	0.01	1	PASS
Band 66	QPSK	131974	3.75	1@0	23.65	25.79	0.38	1	PASS
				1@47	23.64	25.78	0.38	1	PASS
			15	1@0	21.59	23.73	0.24	1	PASS
				1@11	21.45	23.59	0.23	1	PASS
				3@3	23.68	25.82	0.38	1	PASS
Band 66	BPSK	132322	3.75	1@0	23.37	25.51	0.36	1	PASS
				1@47	23.28	25.42	0.35	1	PASS
			15	1@0	21.18	23.32	0.21	1	PASS
				1@11	21.04	23.18	0.21	1	PASS
Band 66	QPSK	132322	3.75	1@0	23.43	25.57	0.36	1	PASS
				1@47	23.34	25.48	0.35	1	PASS
			15	1@0	21.28	23.42	0.22	1	PASS
				1@11	21.21	23.35	0.22	1	PASS
				3@3	23.65	25.79	0.38	1	PASS
Band 66	BPSK	132670	3.75	1@0	22.56	24.70	0.30	1	PASS
				1@47	22.55	24.69	0.29	1	PASS
			15	1@0	23.4	25.54	0.36	1	PASS
				1@11	23.29	25.43	0.35	1	PASS
Band 66	BPSK	132671	3.75	1@0	6.43	8.57	0.01	1	PASS
				1@47	6.41	8.55	0.01	1	PASS
			15	1@0	6.61	8.75	0.01	1	PASS
				1@11	6.52	8.66	0.01	1	PASS
Band 66	QPSK	132670	3.75	1@0	22.85	24.99	0.32	1	PASS
				1@47	22.76	24.90	0.31	1	PASS
			15	1@0	23.52	25.66	0.37	1	PASS
				1@11	23.46	25.60	0.36	1	PASS
				3@3	23.81	25.95	0.39	1	PASS
Band 66	QPSK	132671	3.75	1@0	6.49	8.63	0.01	1	PASS
				1@47	6.44	8.58	0.01	1	PASS
			15	1@0	6.67	8.81	0.01	1	PASS
				1@11	6.59	8.73	0.01	1	PASS
				3@3	6.69	8.83	0.01	1	PASS

Band	Modulation	Channel	Subcarrier Space (KHz)	RB Configure	Result (dBm)	ERP (dBm) | (watts)		Limit (watts)	Verdict
Band 71	BPSK	133123	3.75	1@0	6.93	9.07	0.01	3	PASS
				1@47	6.90	9.04	0.01	3	PASS
			15	1@0	6.94	9.08	0.01	3	PASS
				1@11	6.92	9.06	0.01	3	PASS
Band 71	BPSK	133124	3.75	1@0	21.58	23.72	0.24	3	PASS
				1@47	21.56	23.70	0.23	3	PASS
			15	1@0	21.4	23.54	0.23	3	PASS
				1@11	21.38	23.52	0.22	3	PASS
Band 71	QPSK	133123	3.75	1@0	6.97	9.11	0.01	3	PASS
				1@47	6.94	9.08	0.01	3	PASS
			15	1@0	7.01	9.15	0.01	3	PASS
				1@11	6.95	9.09	0.01	3	PASS
				3@3	6.94	9.08	0.01	3	PASS
Band 71	QPSK	133124	3.75	1@0	21.51	23.65	0.23	3	PASS
				1@47	21.65	23.79	0.24	3	PASS
			15	1@0	21.46	23.60	0.23	3	PASS
				1@11	21.53	23.67	0.23	3	PASS
				3@3	21.05	23.19	0.21	3	PASS
Band 71	BPSK	133297	3.75	1@0	21.89	24.03	0.25	3	PASS
				1@47	21.42	23.56	0.23	3	PASS
			15	1@0	21.5	23.64	0.23	3	PASS
				1@11	21.75	23.89	0.24	3	PASS
Band 71	QPSK	133297	3.75	1@0	21.63	23.77	0.24	3	PASS
				1@47	21.85	23.99	0.25	3	PASS
			15	1@0	21.14	23.28	0.21	3	PASS
				1@11	21.19	23.33	0.22	3	PASS
				3@3	21.11	23.25	0.21	3	PASS
Band 71	BPSK	133470	3.75	1@0	21.53	23.67	0.23	3	PASS
				1@47	21.66	23.80	0.24	3	PASS
			15	1@0	21.55	23.69	0.23	3	PASS
				1@11	21.45	23.59	0.23	3	PASS
Band 71	BPSK	133471	3.75	1@0	7.16	9.30	0.01	3	PASS
				1@47	7.10	9.24	0.01	3	PASS
			15	1@0	7.16	9.30	0.01	3	PASS
				1@11	7.07	9.21	0.01	3	PASS
Band 71	QPSK	133470	3.75	1@0	21.58	23.72	0.24	3	PASS
				1@47	21.63	23.77	0.24	3	PASS
			15	1@0	21.4	23.54	0.23	3	PASS
				1@11	21.49	23.63	0.23	3	PASS
				3@3	21.57	23.71	0.23	3	PASS
Band 71	QPSK	133471	3.75	1@0	7.23	9.37	0.01	3	PASS
				1@47	7.16	9.30	0.01	3	PASS
			15	1@0	7.17	9.31	0.01	3	PASS
				1@11	7.11	9.25	0.01	3	PASS
				3@3	7.15	9.29	0.01	3	PASS

Band	Modulation	Channel	Subcarrier Space (KHz)	RB Configure	Result (dBm)	ERP (dBm) | (watts)		Limit (watts)	Verdict
Band 85	BPSK	134003	3.75	1@0	7.07	9.21	0.01	3	PASS
				1@47	6.93	9.07	0.01	3	PASS
			15	1@0	7.00	9.14	0.01	3	PASS
				1@11	7.03	9.17	0.01	3	PASS
Band 85	BPSK	134004	3.75	1@0	22.74	24.88	0.31	3	PASS
				1@47	22.74	24.88	0.31	3	PASS
			15	1@0	22.61	24.75	0.30	3	PASS
				1@11	22.54	24.68	0.29	3	PASS
Band 85	QPSK	134003	3.75	1@0	7.10	9.24	0.01	3	PASS
				1@47	6.99	9.13	0.01	3	PASS
			15	1@0	7.17	9.31	0.01	3	PASS
				1@11	7.11	9.25	0.01	3	PASS
				3@3	7.15	9.29	0.01	3	PASS
Band 85	QPSK	134004	3.75	1@0	22.91	25.05	0.32	3	PASS
				1@47	22.85	24.99	0.32	3	PASS
			15	1@0	22.86	25.00	0.32	3	PASS
				1@11	22.81	24.95	0.31	3	PASS
				3@3	23.03	25.17	0.33	3	PASS
Band 85	BPSK	134092	3.75	1@0	21.37	23.51	0.22	3	PASS
				1@47	21.55	23.69	0.23	3	PASS
			15	1@0	21.10	23.24	0.21	3	PASS
				1@11	21.10	23.24	0.21	3	PASS
Band 85	QPSK	134092	3.75	1@0	21.69	23.83	0.24	3	PASS
				1@47	21.38	23.52	0.22	3	PASS
			15	1@0	21.34	23.48	0.22	3	PASS
				1@11	21.34	23.48	0.22	3	PASS
				3@3	23.63	25.77	0.38	3	PASS
Band 85	BPSK	134180	3.75	1@0	22.89	25.03	0.32	3	PASS
				1@47	22.88	25.02	0.32	3	PASS
			15	1@0	22.58	24.72	0.30	3	PASS
				1@11	22.55	24.69	0.29	3	PASS
Band 85	BPSK	134181	3.75	1@0	7.16	9.30	0.01	3	PASS
				1@47	7.19	9.33	0.01	3	PASS
			15	1@0	7.30	9.44	0.01	3	PASS
				1@11	7.27	9.41	0.01	3	PASS
Band 85	QPSK	134180	3.75	1@0	23.02	25.16	0.33	3	PASS
				1@47	22.95	25.09	0.32	3	PASS
			15	1@0	22.84	24.98	0.31	3	PASS
				1@11	22.75	24.89	0.31	3	PASS
				3@3	21.18	23.32	0.21	3	PASS
Band 85	QPSK	134181	3.75	1@0	7.27	9.41	0.01	3	PASS
				1@47	7.27	9.41	0.01	3	PASS
			15	1@0	7.44	9.58	0.01	3	PASS
				1@11	7.40	9.54	0.01	3	PASS
				3@3	7.45	9.59	0.01	3	PASS

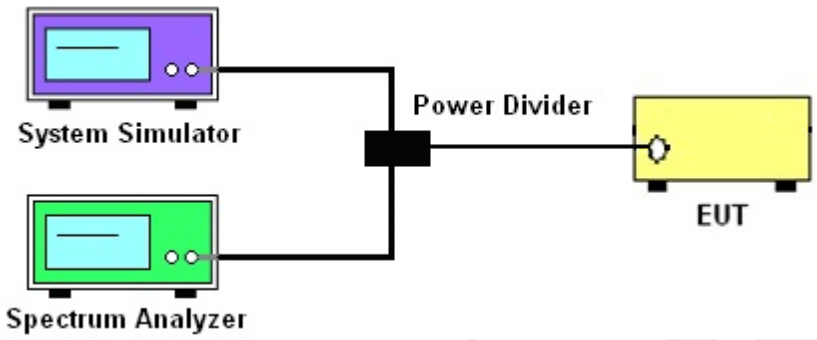
4. PEAK-TO-AVERAGE RATIO

4.1 DESCRIPTION OF THE CONDUCTED OUTPUT POWER MEASUREMENT

4.1.1 MEASUREMENT METHOD

Use one of the procedures presented in 4.1.3 to measure the total peak power and record as PPk. Use one of the applicable procedures presented 4.1.3 to measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:
PAPR (dB) = PPk (dBm) - PAvg (dBm).

4.1.2 TEST SETUP



4.1.3 TEST PROCEDURES

1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.7 and ANSI C63.26 2015 Section 5.2.6

2. The EUT was connected to spectrum and system simulator via a power divider

3. Select lowest, middle, and highest channels for each band and different modulation.

4. Set the test probe and measure the peak and average power of the spectrum analyzer

5. Record the deviation as Peak to Average Ratio.

6. Limit

Operating band	FCC Limit	ISED Limit
Band 2	PAR ≤ 13 dB	PAR ≤ 13 dB
Band 4	PAR ≤ 13 dB	PAR ≤ 13 dB
Band 5	PAR ≤ 13 dB	PAR ≤ 13 dB
Band 12	PAR ≤ 13 dB	PAR ≤ 13 dB
Band 13	PAR ≤ 13 dB	PAR ≤ 13 dB
Band 25	PAR ≤ 13 dB	PAR ≤ 13 dB
Band 26 Lower Band	N/A	N/A
Band 26 Upper Band	PAR ≤ 13 dB	PAR ≤ 13 dB
Band 66	PAR ≤ 13 dB	PAR ≤ 13 dB
Band 71	PAR ≤ 13 dB	PAR ≤ 13 dB
Band 85	PAR ≤ 13 dB	PAR ≤ 13 dB

4.1.4 TEST RESULTS

NB-IoT Band 2 PAR [dB]				
Mode	Modulation	Subcarrier Space (KHz)	RB Configure	Middle
				P-A
Band 2 Standalone	BPSK	3.75	1@0	0.51
			1@47	3.15
		15	1@0	1.48
			1@11	1.56
	QPSK	3.75	1@0	2.12
			1@47	1.33
		15	1@0	1.58
			1@11	1.48
			3@3	6.83
Limit				≤13dB

NB-IoT Band 4 PAR [dB]				
Mode	Modulation	Subcarrier Space (KHz)	RB Configure	Middle
				P-A
Band 4 Standalone	BPSK	3.75	1@0	1.00
			1@47	2.14
		15	1@0	1.44
			1@11	1.50
	QPSK	3.75	1@0	1.97
			1@47	0.17
		15	1@0	1.51
			1@11	1.42
			3@3	6.14
Limit				≤13dB

NB-IoT Band 5 PAR [dB]				
Mode	Modulation	Subcarrier Space (KHz)	RB Configure	Middle
				P-A
Band 5 Standalone	BPSK	3.75	1@0	1.53
			1@47	1.67
		15	1@0	1.29
			1@11	1.39
	QPSK	3.75	1@0	1.32
			1@47	1.22
		15	1@0	1.39
			1@11	1.31
			3@3	6.12
Limit				≤13dB

NB-IoT Band 12 PAR [dB]				
Mode	Modulation	Subcarrier Space (KHz)	RB Configure	Middle
				P-A
Band 12 Standalone	BPSK	3.75	1@0	8.49
			1@47	1.88
		15	1@0	1.39
			1@11	3.97
	QPSK	3.75	1@0	0.58
			1@47	1.59
		15	1@0	7.65
			1@11	4.35
			3@3	8.46
Limit				≤13dB

NB-IoT Band 13 PAR [dB]				
Mode	Modulation	Subcarrier Space (KHz)	RB Configure	Middle
				P-A
Band 13 Standalone	BPSK	3.75	1@0	8.55
			1@47	5.62
		15	1@0	1.71
			1@11	4.81
	QPSK	3.75	1@0	1.71
			1@47	1.71
		15	1@0	4.38
			1@11	5.59
			3@3	9.54
Limit				≤13dB

NB-IoT Band 25 PAR [dB]				
Mode	Modulation	Subcarrier Space (KHz)	RB Configure	Middle
				P-A
Band 25 Standalone	BPSK	3.75	1@0	1.79
			1@47	1.79
		15	1@0	1.48
			1@11	1.37
	QPSK	3.75	1@0	1.53
			1@47	1.27
		15	1@0	1.55
			1@11	1.45
			3@3	7.25
Limit				≤13dB

NB-IoT Band 26(Part 22) PAR [dB]				
Mode	Modulation	Subcarrier Space (KHz)	RB Configure	Middle
				P-A
Band 26 (Part 22) Standalone	BPSK	3.75	1@0	1.34
			1@47	1.56
		15	1@0	1.28
			1@11	1.36
	QPSK	3.75	1@0	1.34
			1@47	0.88
		15	1@0	1.38
			1@11	1.30
			3@3	5.60
Limit				≤13dB

NB-IoT Band 26(Part 90) PAR [dB]				
Mode	Modulation	Subcarrier Space (KHz)	RB Configure	Middle
				P-A
Band 26 (Part 90) Standalone	BPSK	3.75	1@0	1.23
			1@47	1.55
		15	1@0	1.29
			1@11	1.38
	QPSK	3.75	1@0	1.34
			1@47	1.28
		15	1@0	1.39
			1@11	1.29
			3@3	6.55
Limit				/

NB-IoT Band 66 PAR [dB]				
Mode	Modulation	Subcarrier Space (KHz)	RB Configure	Middle
				P-A
Band 66 Standalone	BPSK	3.75	1@0	1.22
			1@47	1.74
		15	1@0	1.46
			1@11	1.52
	QPSK	3.75	1@0	1.41
			1@47	1.48
		15	1@0	1.55
			1@11	1.50
			3@3	6.99
Limit				≤13dB

NB-IoT Band 71 PAR [dB]				
Mode	Modulation	Subcarrier Space (KHz)	RB Configure	Middle
				P-A
Band 71 Standalone	BPSK	3.75	1@0	1.77
			1@47	6.52
		15	1@0	8.55
			1@11	2.20
	QPSK	3.75	1@0	7.86
			1@47	1.65
		15	1@0	5.25
			1@11	6.23
			3@3	11.22
Limit				≤13dB

NB-IoT Band 85 PAR [dBm]				
Mode	Modulation	Subcarrier Space (KHz)	RB Configure	Middle
				P-A
Band 85 Standalone	BPSK	3.75	1@0	1.77
			1@47	3.39
		15	1@0	1.42
			1@11	7.71
	QPSK	3.75	1@0	8.38
			1@47	7.01
		15	1@0	4.32
			1@11	4.29
			3@3	12.09
Limit				≤13dB

Note: Test chart See Appendix D

5. OCCUPIED BANDWIDTH

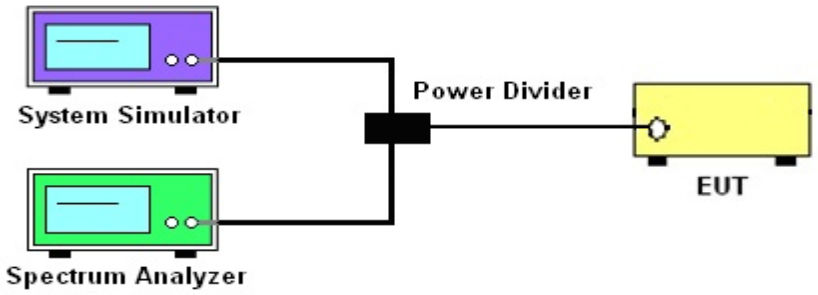
5.1 DESCRIPTION OF OCCUPIED BANDWIDTH MEASUREMENT

5.1.1 MEASUREMENT METHOD

1.The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

2.The 26 db emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 db below the maximum in-band spectral density of the modulated signal. spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

5.1.2 TEST SETUP



5.1.3 TEST PROCEDURES

1. The testing follows FCC KDB 971168 D01 v03r01 Section 4.2 and 4.3.

2. The EUT was connected to spectrum and system simulator via a power divider

3. Select lowest, middle, and highest channels for each band and different modulation.

4. Set the test probe and measure the Occupied Bandwidth of the spectrum analyzer

5. Measure and record the Occupied Bandwidth from the Spectrum Analyzer.

6. Limit: N/A

5.1.4 MEASUREMENT RESULT

NB-IoT Band 2 Bandwidth [kHz]/Standalone								
Modulation	Subcarrier Space (KHz)	RB Configure	Lowest		Middle		Highest	
			99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
BPSK	3.75	1@0	55.55	37.29	56.01	37.31	53.93	34.92
	15	1@0	114.28	113.8	123.12	114.4	127.26	112.3
QPSK	3.75	1@0	60.78	38.36	58.82	37.32	57.06	37.63
	15	1@0	116.81	114.5	125.61	100.6	120.12	113.1
	15	12@0	190.92	245.4	187.33	246.7	184.84	248.9
NB-IoT Band 4 Bandwidth [kHz]/Standalone								
Modulation	Subcarrier Space (KHz)	RB Configure	Lowest		Middle		Highest	
			99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
BPSK	3.75	1@0	53.31	36.88	52.46	36.85	53.4	35.15
	15	1@0	117.61	103.1	129.54	116.6	118.01	89.71
QPSK	3.75	1@0	59.22	37.82	59.54	38.19	55.21	37.06
	15	1@0	125.84	116.7	120.16	114.1	115.58	114.4
	15	12@0	188.62	245.8	190.68	250.7	186.24	254.6
NB-IoT Band 5 Bandwidth [kHz]/Standalone								
Modulation	Subcarrier Space (KHz)	RB Configure	Lowest		Middle		Highest	
			99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
BPSK	3.75	1@0	55.07	37.56	53.02	36.72	54.12	36.27
	15	1@0	126.86	117.3	125.32	119.5	129.38	118.5
QPSK	3.75	1@0	59.05	41.41	58.6	38.18	58.85	38.02
	15	1@0	121.09	128.7	114.85	113.1	112.31	112.9
	15	12@0	187.29	248.3	186.27	247.1	189.58	259.1
NB-IoT Band 12 Bandwidth [kHz]/Standalone								
Modulation	Subcarrier Space (KHz)	RB Configure	Lowest		Middle		Highest	
			99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
BPSK	3.75	1@0	34	54.75	36	54.35	34	55.94
	15	1@0	106	127.47	106.4	124.28	106	128.27
QPSK	3.75	1@0	34	51.55	37.6	51.55	37.6	51.95
	15	1@0	117.2	119.08	117.2	119.48	117.2	120.28
	15	12@0	250.8	184.22	250.8	184.22	250.8	184.22
NB-IoT Band 13 Bandwidth [kHz]/Standalone								
Modulation	Subcarrier Space (KHz)	RB Configure	Lowest		Middle		Highest	
			99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
BPSK	3.75	1@0	35.6	56.34	34	54.75	34	55.94
	15	1@0	106.4	128.67	106.4	127.07	106.4	128.27
QPSK	3.75	1@0	37.6	51.95	37.6	51.15	34	51.55
	15	1@0	117.6	120.28	117.2	118.68	117.2	119.88
	15	12@0	250.4	184.22	250.4	184.22	250.4	184.22

NB-IoT Band 25 Bandwidth [kHz]/Standalone								
Modulation	Subcarrier Space (KHz)	RB Configure	Lowest		Middle		Highest	
			99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
BPSK	3.75	1@0	54.88	36.98	63.12	41.63	55.09	36.68
	15	1@0	128.01	113.9	128.56	125.9	117.61	104.3
QPSK	3.75	1@0	60.11	40.56	57.32	37.45	59.65	41.52
	15	1@0	118.74	116.5	114.62	114.2	134.84	144.6
	15	12@0	189.76	235	190.54	244.8	189.56	236.1

NB-IoT Band 26 (Part 22) Bandwidth [kHz]/Standalone								
Modulation	Subcarrier Space (KHz)	RB Configure	Lowest		Middle		Highest	
			99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
BPSK	3.75	1@0	54.18	37.24	52.18	35.02	55.17	37.06
	15	1@0	120.43	100.4	131.82	119.5	124.18	130.2
QPSK	3.75	1@0	59.75	40.72	62.64	41.46	57.30	37.94
	15	1@0	116.61	117.3	124.42	128.9	120.44	101.2
	15	12@0	185.1	234	190.92	258.6	184.51	249

NB-IoT Band 26 (Part 90) Bandwidth [kHz]/Standalone								
Modulation	Subcarrier Space (KHz)	RB Configure	Lowest		Middle		Highest	
			99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
BPSK	3.75	1@0	54.31	36.02	54.54	34.66	54.67	37.28
	15	1@0	121.97	116.8	126.9	114.6	117.16	118
QPSK	3.75	1@0	59.30	41.42	59.89	38.45	58.41	37.96
	15	1@0	122.36	129.3	118.3	115.1	117.18	129.8
	15	12@0	189.53	243.8	189.5	244.7	189.7	244

NB-IoT Band 66 Bandwidth [kHz]/Standalone								
Modulation	Subcarrier Space (KHz)	RB Configure	Lowest		Middle		Highest	
			99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
BPSK	3.75	1@0	53.46	34.99	53.82	35.3	53.05	33.25
	15	1@0	118	102	118.11	115.8	128.33	128.5
QPSK	3.75	1@0	58.63	37.44	57.13	37.47	59.65	37.77
	15	1@0	124.81	116.5	116.42	114.4	114.53	128.3
	15	12@0	187.36	250.3	188.68	250.1	185.29	250

NB-IoT Band 71 Bandwidth [kHz]/Standalone								
Modulation	Subcarrier Space (KHz)	RB Configure	Lowest		Middle		Highest	
			99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
BPSK	3.75	1@0	32	54.75	32	53.95	32	54.75
	15	1@0	106	128.27	106.4	125.87	104.4	128.22
QPSK	3.75	1@0	37.6	52.75	37.6	52.75	37.6	52.75
	15	1@0	117.2	120.28	117.6	120.28	117.2	119.88
	15	12@0	250.4	184.22	250.4	184.22	250.8	184.22
NB-IoT Band 85 Bandwidth [kHz]/Standalone								
Modulation	Subcarrier Space (KHz)	RB Configure	Lowest		Middle		Highest	
			99% BW	26dB BW	99% BW	26dB BW	99% BW	26dB BW
BPSK	3.75	1@0	34	54.75	36	53.95	34	55.54
	15	1@0	106	127.47	106.4	124.28	106	128.27
QPSK	3.75	1@0	37.6	51.55	37.6	51.15	37.6	51.95
	15	1@0	117.2	119.08	117.2	119.08	117.2	119.88
	15	12@0	250.4	184.22	250.8	184.22	250.8	184.22

Note: Test chart See Appendix A

6. CONDUCTED BAND EDGE

6.1 DESCRIPTION OF CONDUCTED BAND EDGE MEASUREMENT

6.1.1 MEASUREMENT METHOD

1. §22.917(a) & RSS – 132
For operations in the 824 – 849 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

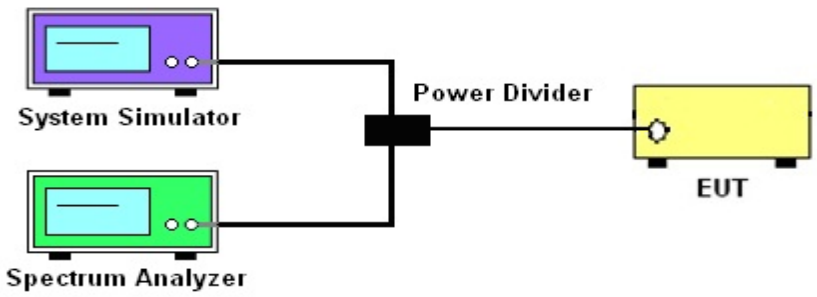
2. §24.238 (a) & RSS – 133
For operations in the 1850-1910 and 1930-1990 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 1MHz bandwidth. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed

3. §27.53 (h) & RSS – 139
For operations in the 1710 – 1755 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

4. §27.53(m)(4) & RSS – 199
For operations in the 2500 MHz ~ 2570 MHz band this section, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHzand 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licenseesoperating on frequencies below 2495 MHz may also submit a documented interference complaintagainst BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

5. §27.53 (g) & RSS – 130
For operations in the 698 -746 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100 kHz bandwidth. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

6.1.2 TEST SETUP



6.1.3 TEST PROCEDURES

1.The testing FCC KDB 971168 D01 v03r01 Section 6.0 and ANSI C63.26 2015 Section 5.7.

2. The EUT was connected to spectrum analyzer and system simulator via a power divider.

3. The band edges of low and high channels for the highest RF powers were measured. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.

4. Set spectrum analyzer with RMS/AVG detector.

5. The RF fundamental frequency should be excluded against the limit line in the operating frquency band.

6. Limit

Operating band	FCC Limit	ISED Limit
Band 2	< - 13 dBm /1%EBW	< - 13 dBm / 1%OBW
Band 4	< - 13 dBm /1%EBW	< - 13 dBm / 1%OBW
Band 5	< - 13 dBm /1%EBW	< - 13 dBm / 1%OBW
Band 12	< - 13 dBm /30kHz	< - 13 dBm /30kHz
Band 13	< - 13 dBm /30kHz	< - 13 dBm /30kHz
Band 25	< - 13 dBm /1%EBW	< - 13 dBm / 1%OBW
Band 26 Lower Band	< - 20 dBm /1%EBW	N/A
Band 26 Upper Band	< - 13 dBm /1%EBW	< - 13 dBm / 1%OBW
Band 66	< - 13 dBm /1%EBW	< - 13 dBm / 1%OBW
Band 71	< - 13 dBm /30kHz	< - 13 dBm /30kHz
Band 85	< - 13 dBm /30kHz	< - 13 dBm /30kHz

6.1.4 MEASUREMENT RESULT

Note: Test chart See Appendix B

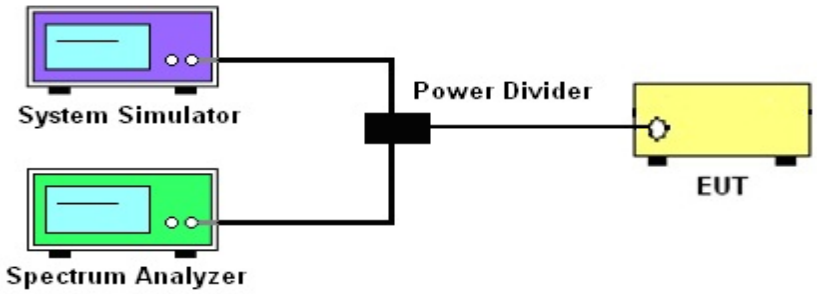
7. CONDUCTED SPURIOUS EMISSION

7.1 DESCRIPTION OF CONDUCTED SPURIOUS EMISSION MEASUREMENT

7.1.1 MEASUREMENT METHOD

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.
For Band 7:
The power of any emission outside of the authorized operating frequ ency ranges must be lower than the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.
It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

7.1.2 TEST SETUP



7.1.3 TEST PROCEDURES

1.The testing FCC KDB 971168 D01 v03r01 Section 6.0 and ANSI C63.26 2015 Section 5.7.

2. The EUT was connected to spectrum analyzer and system simulator via a power divider.

3. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement

4. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.

5. The RF fundamental frequency should be excluded against the limit line in the operating frquency band.

6. Limit

Operating band	FCC Limit	ISED Limit
Band 2	< - 13 dBm /1MHz	< - 13 dBm /1MHz
Band 4	< - 13 dBm /1MHz	< - 13 dBm /1MHz
Band 5	< - 13 dBm /100kHz @ < 1GHz < - 13 dBm /1MHz @ > 1GHz	< - 13 dBm / 100 kHz
Band 12	< - 13 dBm /100kHz	< - 13 dBm /100kHz
Band 13	< - 13 dBm /100kHz	< - 13 dBm /100kHz
Band 25	< - 13 dBm /1MHz	< - 13 dBm /1MHz
Band 26 Lower Band	< - 13 dBm /100kHz	N/A
Band 26 Upper Band	< - 13 dBm /100kHz @ < 1GHz < - 13 dBm /1MHz @ > 1GHz	< - 13 dBm / 100 kHz
Band 66	< - 13 dBm /1MHz	< - 13 dBm /1MHz
Band 71	< - 13 dBm /100kHz	< - 13 dBm /100kHz
Band 85	< - 13 dBm /100kHz	< - 13 dBm /100kHz

7.1.4 TEST RESULTS

Note: Test chart See Appendix C

8. RADIATED SPURIOUS EMISSION

8.1 DESCRIPTION OF RADIATED SPURIOUS EMISSION

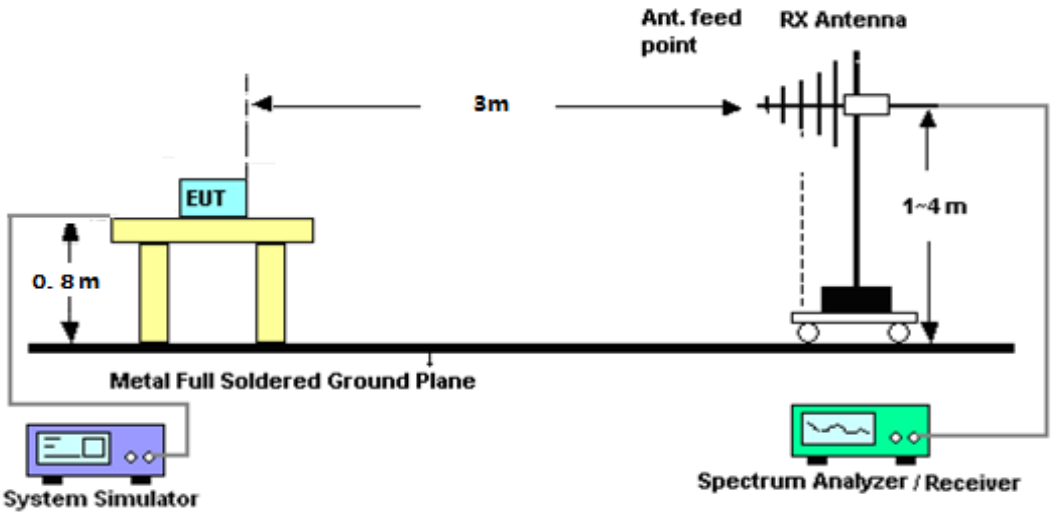
8.1.1 MEASUREMENT METHOD

The radiated spurious emission was measured by substitution method according to ANSI C63.26 2015. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.
For Band 7 The power of any emission outside of the authorized operating frequency ranges must attenuated below the transmitter power (P) by a factor of at least 55 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

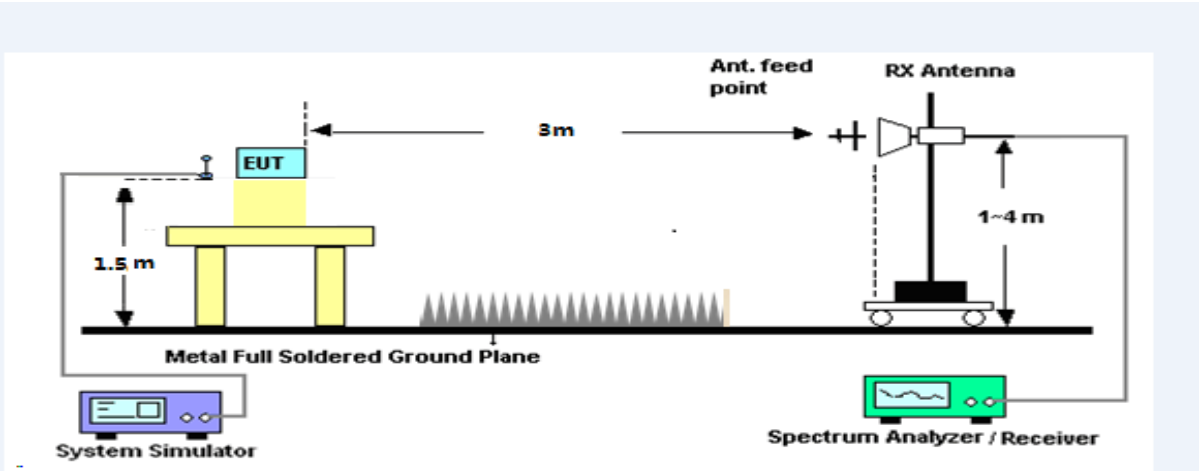
Note: The radiated spurious emissions which are attenuated more than 20 dB below the permissible Value for above 18GHz, so it's don't need not be reported.

8.1.2 TEST SETUP

The procedure of radiated spurious emissions is as follows:
a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as, RSE=Rx (dBuV) +CL (dB) +SA (dB) +Gain (dBi) -107 (dBuV to dBm) The SA is calibrated using following setup.
b) EUT was placed on 1.5 m non-conductive stand at a 3 m test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 m from the test item for emission measurements. The height of receiving antenna is 0.8m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic measured with peak detector and 1MHz bandwidth.
Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.
The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the ARpl is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below:
Power=PMea+ARpl
For radiated test from 30MHz to 1GHz



For radiated test from above 1GHz



8.1.3 TEST PROCEDURES

1. The testing FCC KDB 971168 D01 Section 7 and ANSI C63.26 2015 Section 5.5.

2. The EUT was placed on a rotatable wooden table with 1.5 meter above ground.

3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.

4. The table was rotated 360 degrees to determine the position of the highest spurious emission.

5. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations

6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.

7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.

8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.

9. Taking the record of output power at antenna port.

10. Repeat step 7 to step 8 for another polarization.

11. Limit

Operating band	FCC Limit	ISED Limit
Band 2	< - 13 dBm /1MHz	< - 13 dBm /1MHz
Band 4	< - 13 dBm /1MHz	< - 13 dBm /1MHz
Band 5	< - 13 dBm /100kHz @ < 1GHz < - 13 dBm /1MHz @ > 1GHz	< - 13 dBm / 100 kHz
Band 12	< - 13 dBm /100kHz	< - 13 dBm /100kHz
Band 13	< - 13 dBm /100kHz	< - 13 dBm /100kHz
Band 25	< - 13 dBm /1MHz	< - 13 dBm /1MHz
Band 26 Lower Band	< - 13 dBm /100kHz	N/A
Band 26 Upper Band	< - 13 dBm /100kHz @ < 1GHz < - 13 dBm /1MHz @ > 1GHz	< - 13 dBm / 100 kHz
Band 66	< - 13 dBm /1MHz	< - 13 dBm /1MHz
Band 71	< - 13 dBm /100kHz	< - 13 dBm /100kHz
Band 85	< - 13 dBm /100kHz	< - 13 dBm /100kHz

8.1.4 TEST RESULTS

Note: Test data See Appendix E

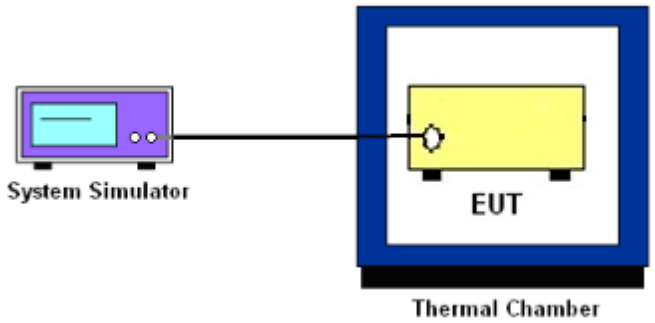
9. FREQUENCY STABILITY

9.1 DESCRIPTION OF FREQUENCY STABILITY MEASUREMENT

9.1.1 MEASUREMENT METHOD

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency or within authorized bands.

9.1.2 TEST SETUP



9.1.3 TEST PROCEDURES FOR TEMPERATURE VARIATION

1. The EUT was set up in the thermal chamber and connected with the system simulator.

2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

9.1.4 TEST PROCEDURES FOR VOLTAGE VARIATION

1. The testing follows FCC KDB 971168 D01v01r03 Section 9.

2. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simlator.

3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.

4. The variation in frequency was measured for the worst case.

5. Limit

Operating band	FCC Limit	ISED Limit
Band 2	Within authorized bands	2.5 ppm
Band 4	Within authorized bands	Within authorized bands
Band 5	2.5 ppm	2.5 ppm
Band 12	Within authorized bands	Within authorized bands
Band 13	Within authorized bands	Within authorized bands
Band 25	Within authorized bands	2.5 ppm
Band 26 Lower Band	2.5 ppm	N/A

Band 26 Upper Band	2.5 ppm	2.5 ppm
Band 66	Within authorized bands	Within authorized bands
Band 71	Within authorized bands	Within authorized bands
Band 85	Within authorized bands	Within authorized bands

9.1.5 TEST RESULTS

NB-IoT Band 2 (QPSK) / 1880MHz / 3.75KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-8.61	-0.005	2.5ppm	PASS
80		5.39	0.003		
70		-29.50	-0.016		
60		-34.44	-0.018		
50		-34.05	-0.018		
40		-29.21	-0.016		
30		-30.00	-0.016		
20		-18.15	-0.010		
10		9.63	0.005		
0		16.89	0.009		
-10		20.00	0.011		
-20		26.11	0.014		
-30		17.67	0.009		
-40		35.36	0.019		
25	Maximum Voltage	-32.84	-0.017		
25	BEP	-14.95	-0.008		

NB-IoT Band 2 (QPSK) / 1880MHz /15KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-22.40	-0.012	2.5ppm	PASS
80		-24.13	-0.013		
70		-36.98	-0.020		
60		-47.55	-0.025		
50		-36.38	-0.019		
40		-40.77	-0.022		
30		-40.70	-0.022		
20		-25.33	-0.013		
10		16.01	0.009		
0		21.94	0.012		
-10		25.99	0.014		
-20		25.69	0.014		
-30		-24.40	-0.013		
-40		-34.42	-0.018		
25	Maximum Voltage	-35.31	-0.019		
25	BEP	-25.33	-0.013		

NB-IoT Band 2 (QPSK) / 1880MHz / 3.75KHz/1@47					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-13.32	-0.007	2.5ppm	PASS
80		6.69	0.004		
70		-27.78	-0.015		
60		-33.56	-0.018		
50		-25.69	-0.014		
40		-30.10	-0.016		
30		-28.92	-0.015		
20		-13.63	-0.007		
10		15.01	0.008		
0		24.18	0.013		
-10		24.53	0.013		
-20		23.89	0.013		
-30		-13.56	-0.007		
-40		20.26	0.011		
25	Maximum Voltage	-27.54	-0.015		
25	BEP	-19.23	-0.010		

NB-IoT Band 2 (QPSK) / 1880MHz /15KHz/1@11					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-24.82	-0.013	2.5ppm	PASS
80		-25.16	-0.013		
70		-34.33	-0.018		
60		-46.01	-0.024		
50		-41.61	-0.022		
40		-31.46	-0.017		
30		-43.93	-0.023		
20		-26.52	-0.014		
10		17.01	0.009		
0		25.63	0.014		
-10		25.71	0.014		
-20		24.81	0.013		
-30		-20.77	-0.011		
-40		-36.79	-0.020		
25	Maximum Voltage	-35.95	-0.019		
25	BEP	-27.32	-0.015		

NB-IoT Band 4 (QPSK) / 1732.5MHz / 3.75KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-7.72	-0.004	2.5ppm	PASS
80		-7.12	-0.004		
70		-34.28	-0.018		
60		-38.65	-0.021		
50		-35.79	-0.019		
40		-30.93	-0.016		
30		-29.13	-0.015		
20		-6.54	-0.003		
10		-14.20	-0.008		
0		16.35	0.009		
-10		18.04	0.010		
-20		19.08	0.010		
-30		8.94	0.005		
-40		8.75	0.005		
25	Maximum Voltage	-23.92	-0.013		
25	BEP	-19.33	-0.010		

NB-IoT Band 4 (QPSK) / 1732.5MHz /15KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-28.74	-0.015	2.5ppm	PASS
80		-36.59	-0.019		
70		-47.18	-0.025		
60		-52.19	-0.028		
50		-45.73	-0.024		
40		-44.82	-0.024		
30		-47.05	-0.025		
20		-42.10	-0.022		
10		-32.20	-0.017		
0		19.08	0.010		
-10		20.51	0.011		
-20		19.94	0.011		
-30		-27.95	-0.015		
-40		-36.95	-0.020		
25	Maximum Voltage	-34.17	-0.018		
25	BEP	-50.95	-0.027		

NB-IoT Band 4 (QPSK) / 1732.5MHz / 3.75KHz/1@47					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-9.20	-0.005	2.5ppm	PASS
80		-8.37	-0.004		
70		-31.51	-0.017		
60		-34.13	-0.018		
50		-34.92	-0.019		
40		-34.13	-0.018		
30		-25.11	-0.013		
20		-9.97	-0.005		
10		-13.73	-0.007		
0		7.93	0.004		
-10		12.95	0.007		
-20		17.85	0.009		
-30		9.78	0.005		
-40		-24.30	-0.013		
25	Maximum Voltage	-22.70	-0.012		
25	BEP	-17.94	-0.010		

NB-IoT Band 4 (QPSK) / 1732.5MHz /15KHz/1@11					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-30.03	-0.016	2.5ppm	PASS
80		-34.36	-0.018		
70		-44.06	-0.023		
60		-53.54	-0.028		
50		-40.70	-0.022		
40		-46.68	-0.025		
30		-31.07	-0.017		
20		-38.71	-0.021		
10		-28.98	-0.015		
0		19.98	0.011		
-10		18.94	0.010		
-20		20.96	0.011		
-30		-24.42	-0.013		
-40		-43.30	-0.023		
25	Maximum Voltage	-33.70	-0.018		
25	BEP	-55.16	-0.029		

NB-IoT Band 5 (QPSK) / 836.5MHz / 3.75KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	3.02	0.002	2.5ppm	PASS
80		5.69	0.003		
70		-13.50	-0.007		
60		-18.08	-0.010		
50		-15.31	-0.008		
40		-12.09	-0.006		
30		-12.32	-0.007		
20		-7.81	-0.004		
10		8.33	0.004		
0		7.60	0.004		
-10		10.79	0.006		
-20		8.67	0.005		
-30		6.61	0.004		
-40		-13.55	-0.007		
25	Maximum Voltage	-14.52	-0.008		
25	BEP	-12.67	-0.007		

NB-IoT Band 5 (QPSK) / 836.5MHz /15KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-11.36	-0.006	2.5ppm	PASS
80		-14.62	-0.008		
70		-21.64	-0.012		
60		-23.25	-0.012		
50		-22.66	-0.012		
40		-17.07	-0.009		
30		-22.80	-0.012		
20		-8.94	-0.005		
10		9.74	0.005		
0		-17.98	-0.010		
-10		16.57	0.009		
-20		14.33	0.008		
-30		-19.07	-0.010		
-40		-21.57	-0.011		
25	Maximum Voltage	-18.28	-0.010		
25	BEP	-11.83	-0.006		

NB-IoT Band 5 (QPSK) / 836.5MHz / 3.75KHz/1@47					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-5.97	-0.003	2.5ppm	PASS
80		-5.18	-0.003		
70		-14.33	-0.008		
60		-16.99	-0.009		
50		-15.26	-0.008		
40		-17.82	-0.009		
30		-13.15	-0.007		
20		-4.21	-0.002		
10		3.50	0.002		
0		11.49	0.006		
-10		10.51	0.006		
-20		10.26	0.005		
-30		10.84	0.006		
-40		5.28	0.003		
25	Maximum Voltage	-12.77	-0.007		
25	BEP	-9.50	-0.005		

NB-IoT Band 5 (QPSK) / 836.5MHz /15KHz/1@11					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-13.20	-0.007	2.5ppm	PASS
80		-15.13	-0.008		
70		-17.51	-0.009		
60		-22.54	-0.012		
50		-22.93	-0.012		
40		-17.29	-0.009		
30		-20.10	-0.011		
20		-10.24	-0.005		
10		10.57	0.006		
0		-15.44	-0.008		
-10		16.04	0.009		
-20		15.21	0.008		
-30		-14.63	-0.008		
-40		-18.67	-0.010		
25	Maximum Voltage	-17.57	-0.009		
25	BEP	-13.40	-0.007		

NB-IoT Band 12 (QPSK) / 707.5MHz / 3.75KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	2.53	0.004	2.5ppm	PASS
80		2.22	0.003		
70		1.89	0.003		
60		2.27	0.003		
50		-2.13	-0.003		
40		-1.92	-0.003		
30		-2.50	-0.004		
20		-2.92	-0.004		
10		-2.06	-0.003		
0		-2.63	-0.004		
-10		2.10	0.003		
-20		2.66	0.004		
-30		-2.65	-0.004		
-40		-3.25	-0.005		
25	Maximum Voltage	-3.22	-0.005		
25	BEP	-4.55	-0.006		

NB-IoT Band 12 (QPSK) / 707.5MHz /15KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	6.79	0.010	2.5ppm	PASS
80		7.70	0.011		
70		6.90	0.010		
60		8.60	0.012		
50		7.95	0.011		
40		8.75	0.012		
30		9.58	0.014		
20		8.47	0.012		
10		9.64	0.014		
0		8.97	0.013		
-10		9.51	0.013		
-20		7.17	0.010		
-30		8.84	0.012		
-40		9.31	0.013		
25	Maximum Voltage	7.55	0.011		
25	BEP	10.81	0.015		

NB-IoT Band 12 (QPSK) / 707.5MHz / 3.75KHz/1@47					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	1.65	0.002	2.5ppm	PASS
80		-2.10	-0.003		
70		2.39	0.003		
60		2.89	0.004		
50		-2.03	-0.003		
40		1.96	0.003		
30		2.98	0.004		
20		1.80	0.003		
10		-2.65	-0.004		
0		2.33	0.003		
-10		2.26	0.003		
-20		2.27	0.003		
-30		-1.93	-0.003		
-40		3.06	0.004		
25	Maximum Voltage	-1.92	-0.003		
25	BEP	-2.07	-0.003		

NB-IoT Band 12 (QPSK) / 707.5MHz /15KHz/1@11					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	10.39	0.015	2.5ppm	PASS
80		11.17	0.016		
70		12.45	0.018		
60		11.27	0.016		
50		8.54	0.012		
40		10.50	0.015		
30		11.42	0.016		
20		9.36	0.013		
10		10.16	0.014		
0		12.07	0.017		
-10		10.79	0.015		
-20		10.93	0.015		
-30		8.57	0.012		
-40		9.91	0.014		
25	Maximum Voltage	7.68	0.011		
25	BEP	10.61	0.015		

NB-IoT Band 13 (QPSK) / 782MHz / 3.75KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-4.79	-0.006	2.5ppm	PASS
80		-5.05	-0.006		
70		-4.86	-0.006		
60		-5.18	-0.007		
50		-4.76	-0.006		
40		-4.12	-0.005		
30		-4.22	-0.005		
20		-3.76	-0.005		
10		-4.29	-0.005		
0		-4.99	-0.006		
-10		-5.99	-0.008		
-20		-6.35	-0.008		
-30		-5.72	-0.007		
-40		-6.72	-0.009		
25	Maximum Voltage	-8.50	-0.011		
25	BEP	-8.01	-0.010		

NB-IoT Band 13 (QPSK) / 782MHz /15KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-7.27	-0.009	2.5ppm	PASS
80		-7.87	-0.010		
70		-7.22	-0.009		
60		-7.05	-0.009		
50		-6.98	-0.009		
40		7.71	0.010		
30		-7.75	-0.010		
20		7.11	0.009		
10		-8.85	-0.011		
0		8.15	0.010		
-10		7.04	0.009		
-20		9.27	0.012		
-30		-6.92	-0.009		
-40		7.48	0.010		
25	Maximum Voltage	6.38	0.008		
25	BEP	-8.90	-0.011		

NB-IoT Band 13 (QPSK) / 782MHz / 3.75KHz/1@47					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-4.23	-0.005	2.5ppm	PASS
80		-4.98	-0.006		
70		-3.91	-0.005		
60		-4.62	-0.006		
50		-4.82	-0.006		
40		-5.89	-0.008		
30		-4.11	-0.005		
20		-4.32	-0.006		
10		-5.72	-0.007		
0		-4.19	-0.005		
-10		-5.01	-0.006		
-20		-4.69	-0.006		
-30		-5.39	-0.007		
-40		-5.48	-0.007		
25	Maximum Voltage	-4.35	-0.006		
25	BEP	-4.68	-0.006		

NB-IoT Band 13 (QPSK) / 782MHz /15KHz/1@11					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	8.50	0.011	2.5ppm	PASS
80		8.18	0.010		
70		6.85	0.009		
60		7.37	0.009		
50		-5.82	-0.007		
40		8.28	0.011		
30		6.95	0.009		
20		-5.31	-0.007		
10		-8.05	-0.010		
0		7.60	0.010		
-10		-9.64	-0.012		
-20		7.57	0.010		
-30		7.93	0.010		
-40		-7.02	-0.009		
25	Maximum Voltage	-5.98	-0.008		
25	BEP	-6.64	-0.008		

NB-IoT Band 25 (QPSK) / 1882.5MHz / 3.75KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	12.47	0.007	2.5ppm	PASS
80		10.00	0.005		
70		-35.53	-0.019		
60		-35.99	-0.019		
50		-27.25	-0.014		
40		-26.31	-0.014		
30		-24.08	-0.013		
20		-9.40	-0.005		
10		9.43	0.005		
0		19.48	0.010		
-10		19.43	0.010		
-20		23.12	0.012		
-30		12.99	0.007		
-40		-13.43	-0.007		
25	Maximum Voltage	-20.46	-0.011		
25	BEP	-19.08	-0.010		

NB-IoT Band 25 (QPSK) / 1882.5MHz /15KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-27.94	-0.015	2.5ppm	PASS
80		-22.95	-0.012		
70		-33.77	-0.018		
60		-43.39	-0.023		
50		-39.28	-0.021		
40		-40.28	-0.021		
30		-44.57	-0.024		
20		-21.70	-0.012		
10		17.82	0.009		
0		26.55	0.014		
-10		23.88	0.013		
-20		23.80	0.013		
-30		-32.97	-0.018		
-40		-40.47	-0.022		
25	Maximum Voltage	-26.88	-0.014		
25	BEP	-21.69	-0.012		

NB-IoT Band 25 (QPSK) / 1882.5MHz / 3.75KHz/1@47					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	7.87	0.004	2.5ppm	PASS
80		9.16	0.005		
70		-28.18	-0.015		
60		-34.73	-0.018		
50		-32.92	-0.018		
40		-25.76	-0.014		
30		-23.06	-0.012		
20		-16.62	-0.009		
10		15.29	0.008		
0		16.16	0.009		
-10		19.76	0.011		
-20		21.40	0.011		
-30		14.26	0.008		
-40		-33.25	-0.018		
25	Maximum Voltage	-21.94	-0.012		
25	BEP	-16.93	-0.009		

NB-IoT Band 25 (QPSK) / 1882.5MHz /15KHz/1@11					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-28.15	-0.015	2.5ppm	PASS
80		-25.32	-0.013		
70		-33.37	-0.018		
60		-45.33	-0.024		
50		-34.29	-0.018		
40		-40.43	-0.022		
30		-45.16	-0.024		
20		-20.59	-0.011		
10		20.96	0.011		
0		26.81	0.014		
-10		28.82	0.015		
-20		26.59	0.014		
-30		-30.63	-0.016		
-40		-45.20	-0.024		
25	Maximum Voltage	-33.89	-0.018		
25	BEP	-22.76	-0.012		

NB-IoT Band 26(Part 22) (QPSK) / 836.5MHz / 3.75KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	8.85	0.005	2.5ppm	PASS
80		6.19	0.003		
70		-13.18	-0.007		
60		-16.15	-0.009		
50		-16.42	-0.009		
40		-12.25	-0.007		
30		-8.38	-0.004		
20		-8.37	-0.004		
10		7.47	0.004		
0		7.55	0.004		
-10		10.57	0.006		
-20		10.04	0.005		
-30		10.57	0.006		
-40	N/A	-14.42	-0.008		
25	Maximum Voltage	-7.00	-0.004		
25	BEP	-9.17	-0.005		

NB-IoT Band 26(Part 22) (QPSK) / 836.5MHz /15KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-10.76	-0.006	2.5ppm	PASS
80		-15.06	-0.008		
70		-17.64	-0.009		
60		-20.13	-0.011		
50		-22.26	-0.012		
40		-22.04	-0.012		
30		-13.95	-0.007		
20		-15.25	-0.008		
10		11.79	0.006		
0		14.55	0.008		
-10		-18.94	-0.010		
-20		14.65	0.008		
-30		-14.91	-0.008		
-40		-24.86	-0.013		
25	Maximum Voltage	-16.14	-0.009		
25	BEP	-21.27	-0.011		

NB-IoT Band 26 (QPSK) / 836.5MHz / 3.75KHz/1@47					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	7.91	0.004	2.5ppm	PASS
80		7.93	0.004		
70		-17.98	-0.010		
60		-15.88	-0.008		
50		-17.75	-0.009		
40		-15.02	-0.008		
30		-13.28	-0.007		
20		-5.06	-0.003		
10		-4.85	-0.003		
0		10.44	0.006		
-10		11.07	0.006		
-20		12.10	0.006		
-30		13.25	0.007		
-40		5.69	0.003		
25	Maximum Voltage	-10.59	-0.006		
25	BEP	-11.47	-0.006		

NB-IoT Band 26(Part 22) (QPSK) / 836.5MHz /15KHz/1@11					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-9.70	-0.005	2.5ppm	PASS
80		-11.13	-0.006		
70		-17.90	-0.010		
60		-21.74	-0.012		
50		-21.17	-0.011		
40		-19.13	-0.010		
30		-14.68	-0.008		
20		-14.98	-0.008		
10		10.60	0.006		
0		12.66	0.007		
-10		17.75	0.009		
-20		15.61	0.008		
-30		-11.79	-0.006		
-40		-16.87	-0.009		
25	Maximum Voltage	-16.47	-0.009		
25	BEP	-20.61	-0.011		

NB-IoT Band 26(Part 90) (QPSK) / 819MHz / 3.75KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	7.16	0.004	2.5ppm	PASS
80		4.08	0.002		
70		-16.59	-0.009		
60		-20.89	-0.011		
50		-11.76	-0.006		
40		-8.85	-0.005		
30		-12.09	-0.006		
20		-2.58	-0.001		
10		12.82	0.007		
0		6.65	0.004		
-10		11.61	0.006		
-20		10.18	0.005		
-30		16.16	0.009		
-40		-13.45	-0.007		
25	Maximum Voltage	-6.63	-0.004		
25	BEP	-9.87	-0.005		

NB-IoT Band 26(Part 90) (QPSK) / 819MHz /15KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-7.17	-0.004	2.5ppm	PASS
80		-15.36	-0.008		
70		-17.69	-0.009		
60		-23.11	-0.012		
50		-15.31	-0.008		
40		-22.37	-0.012		
30		-18.39	-0.010		
20		-19.03	-0.010		
10		13.46	0.007		
0		9.93	0.005		
-10		-19.13	-0.010		
-20		17.85	0.009		
-30		-12.12	-0.006		
-40		-18.47	-0.010		
25	Maximum Voltage	-12.83	-0.007		
25	BEP	-23.17	-0.012		

NB-IoT Band 26(Part 90) (QPSK) / 819MHz / 3.75KHz/1@47					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	12.69	0.007	2.5ppm	PASS
80		8.77	0.005		
70		-19.37	-0.010		
60		-12.46	-0.007		
50		-12.97	-0.007		
40		-14.67	-0.008		
30		-12.53	-0.007		
20		-11.31	-0.006		
10		-2.64	-0.001		
0		12.63	0.007		
-10		11.53	0.006		
-20		12.24	0.007		
-30		9.17	0.005		
-40		-2.15	-0.001		
25	Maximum Voltage	-5.04	-0.003		
25	BEP	-13.81	-0.007		

NB-IoT Band 26(Part 90) (QPSK) / 819MHz /15KHz/1@11					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-10.56	-0.006	2.5ppm	PASS
80		-10.28	-0.005		
70		-18.05	-0.010		
60		-23.89	-0.013		
50		-23.65	-0.013		
40		-22.90	-0.012		
30		-14.17	-0.008		
20		-15.86	-0.008		
10		12.62	0.007		
0		16.33	0.009		
-10		17.16	0.009		
-20		9.45	0.005		
-30		-12.32	-0.007		
-40		-13.02	-0.007		
25	Maximum Voltage	-11.91	-0.006		
25	BEP	-15.17	-0.008		

NB-IoT Band 66 (QPSK) / 1745MHz / 3.75KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	12.36	0.007	2.5ppm	PASS
80		13.19	0.007		
70		-20.83	-0.011		
60		-28.90	-0.015		
50		-23.43	-0.012		
40		-25.12	-0.013		
30		-15.36	-0.008		
20		23.67	0.013		
10		14.10	0.008		
0		30.37	0.016		
-10		25.94	0.014		
-20		25.66	0.014		
-30		26.24	0.014		
-40		10.54	0.006		
25	Maximum Voltage	-17.97	-0.010		
25	BEP	-18.78	-0.010		

NB-IoT Band 66 (QPSK) / 1745MHz /15KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-20.07	-0.011	2.5ppm	PASS
80		-24.81	-0.013		
70		-29.17	-0.016		
60		-31.49	-0.017		
50		-42.49	-0.023		
40		-18.10	-0.010		
30		-35.28	-0.019		
20		-18.77	-0.010		
10		21.76	0.012		
0		27.68	0.015		
-10		28.24	0.015		
-20		29.38	0.016		
-30		17.02	0.009		
-40		-25.96	-0.014		
25	Maximum Voltage	-36.16	-0.019		
25	BEP	-29.38	-0.016		

NB-IoT Band 66 (QPSK) / 1745MHz / 3.75KHz/1@47					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	14.36	0.008	2.5ppm	PASS
80		12.32	0.007		
70		-21.74	-0.012		
60		-30.78	-0.016		
50		-30.61	-0.016		
40		-21.17	-0.011		
30		-16.26	-0.009		
20		-12.02	-0.006		
10		26.89	0.014		
0		20.60	0.011		
-10		26.48	0.014		
-20		22.46	0.012		
-30		-20.53	-0.011		
-40		-27.82	-0.015		
25	Maximum Voltage	-12.95	-0.007		
25	BEP	-18.55	-0.010		

NB-IoT Band 66 (QPSK) / 1745MHz /15KHz/1@11					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-17.92	-0.010	2.5ppm	PASS
80		-25.36	-0.013		
70		-38.92	-0.021		
60		-31.37	-0.017		
50		-37.06	-0.020		
40		-17.55	-0.009		
30		-39.40	-0.021		
20		-15.99	-0.009		
10		26.39	0.014		
0		30.73	0.016		
-10		33.50	0.018		
-20		30.00	0.016		
-30		20.59	0.011		
-40		-30.94	-0.016		
25	Maximum Voltage	-35.78	-0.019		
25	BEP	-21.37	-0.011		

NB-IoT Band 71 (QPSK) / 680.5MHz / 3.75KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	5.81	0.009	2.5ppm	PASS
80		4.35	0.006		
70		6.02	0.009		
60		6.29	0.009		
50		4.15	0.006		
40		5.42	0.008		
30		4.02	0.006		
20		4.84	0.007		
10		5.44	0.008		
0		3.98	0.006		
-10		4.46	0.007		
-20		4.98	0.007		
-30		4.84	0.007		
-40		5.22	0.008		
25	Maximum Voltage	4.76	0.007		
25	BEP	5.88	0.009		

NB-IoT Band 71 (QPSK) / 680.5MHz /15KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	7.05	0.010	2.5ppm	PASS
80		8.64	0.013		
70		8.73	0.013		
60		7.97	0.012		
50		11.36	0.017		
40		10.43	0.015		
30		9.74	0.014		
20		8.21	0.012		
10		9.18	0.013		
0		6.34	0.009		
-10		9.70	0.014		
-20		8.54	0.013		
-30		8.87	0.013		
-40		10.23	0.015		
25	Maximum Voltage	8.00	0.012		
25	BEP	6.84	0.010		

NB-IoT Band 71 (QPSK) / 680.5MHz / 3.75KHz/1@47					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	4.89	0.007	2.5ppm	PASS
80		3.55	0.005		
70		5.19	0.008		
60		2.62	0.004		
50		3.49	0.005		
40		3.59	0.005		
30		3.18	0.005		
20		5.05	0.007		
10		4.55	0.007		
0		4.03	0.006		
-10		6.11	0.009		
-20		5.85	0.009		
-30		4.55	0.007		
-40		4.55	0.007		
25	Maximum Voltage	4.18	0.006		
25	BEP	5.15	0.008		

NB-IoT Band 71 (QPSK) / 680.5MHz /15KHz/1@11					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	8.31	0.012	2.5ppm	PASS
80		7.87	0.012		
70		8.28	0.012		
60		10.29	0.015		
50		8.57	0.013		
40		9.41	0.014		
30		8.94	0.013		
20		9.61	0.014		
10		9.54	0.014		
0		7.15	0.011		
-10		9.46	0.014		
-20		8.17	0.012		
-30		8.25	0.012		
-40		10.74	0.016		
25	Maximum Voltage	8.90	0.013		
25	BEP	9.20	0.014		

NB-IoT Band 85 (QPSK) / 707MHz / 3.75KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-3.98	-0.006	2.5ppm	PASS
80		-4.25	-0.006		
70		-5.22	-0.007		
60		-4.01	-0.006		
50		-5.25	-0.007		
40		-4.48	-0.006		
30		-4.33	-0.006		
20		-5.68	-0.008		
10		-4.38	-0.006		
0		-5.88	-0.008		
-10		-5.38	-0.008		
-20		-5.58	-0.008		
-30		-6.22	-0.009		
-40		-6.98	-0.010		
25	Maximum Voltage	-6.51	-0.009		
25	BEP	-8.43	-0.012		

NB-IoT Band 85 (QPSK) / 707MHz /15KHz/1@0					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	7.08	0.010	2.5ppm	PASS
80		6.11	0.009		
70		6.22	0.009		
60		-6.14	-0.009		
50		5.51	0.008		
40		-6.35	-0.009		
30		-6.19	-0.009		
20		-7.72	-0.011		
10		6.98	0.010		
0		-8.18	-0.012		
-10		-7.70	-0.011		
-20		5.74	0.008		
-30		6.42	0.009		
-40		6.22	0.009		
25	Maximum Voltage	-6.07	-0.009		
25	BEP	-8.61	-0.012		

NB-IoT Band 85 (QPSK) / 707MHz / 3.75KHz/1@47					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	-4.94	-0.007	2.5ppm	PASS
80		-5.31	-0.008		
70		-5.01	-0.007		
60		-4.28	-0.006		
50		-5.58	-0.008		
40		-4.09	-0.006		
30		-6.59	-0.009		
20		-5.28	-0.007		
10		-4.48	-0.006		
0		-5.28	-0.007		
-10		-5.54	-0.008		
-20		-5.92	-0.008		
-30		-7.01	-0.010		
-40		-6.85	-0.010		
25	Maximum Voltage	-6.52	-0.009		
25	BEP	-7.22	-0.010		

NB-IoT Band 85 (QPSK) / 707MHz /15KHz/1@11					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
85	Normal Voltage	8.63	0.012	2.5ppm	PASS
80		5.99	0.008		
70		6.19	0.009		
60		7.71	0.011		
50		6.29	0.009		
40		7.30	0.010		
30		-5.21	-0.007		
20		7.90	0.011		
10		6.81	0.010		
0		7.04	0.010		
-10		6.57	0.009		
-20		5.69	0.008		
-30		-30	7.540		
-40		7.81	0.011		
25	Maximum Voltage	7.01	0.010		
25	BEP	5.92	0.008		

10. MODULATION CHARACTERISTICS

10.1 Test Limit

Other types of equipment", the use of higher order modulations such as OFDM or LTE or other modulation are acceptable for use.

Result: PASS

Note: The device implement digital modulation such as QPSK and 16QAM, hence the EUT is deemed to comply with this requirement without additional testing.

APPENDIX-PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

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