FCC RF TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

8BitDo N30 wireless mouse

ISSUED TO
SHENZHEN 8BITDO TECH CO., LTD

Room 210, Building 1, Nanhai Ecool, No.6 Xinghua Road, Shekou, Nanshan District, Shenzhen

Tested by: _____
Heng Aiping
(Engineer)
Date: Nov. 25, 2019

Approved by: _____
Wei Yanquan
(Chief Engineer)
Date: Nov. 29, 2019

Report No.:	BL-SZ1998270-601
EUT Name:	8BitDo N30 wireless mouse
Model Name:	85CA (refer section 2.4)
Brand Name:	8BITDO
Test Standard:	47 CFR Part 15 Subpart C
FCC ID:	2AOWF-N30MOUSE
Test Conclusion:	Pass
Test Date:	Oct. 09, 2019 ~ Nov. 19, 2019
Date of Issue:	Nov. 29, 2019

Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong, P. R. China 518055
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Revision History

Version	Issue Date	Revisions Content
Rev. 01	Nov. 29, 2019	Initial Issue

TABLE OF CONTENTS

1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

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

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196. The laboratory is a testing organization accredited by American Association for Laboratory Accreditation (A2LA) according to ISO/IEC 17025.The accreditation certificate is 4344.01. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	20℃ to 25℃
Ambient Relative Humidity	45% to 55%
Ambient Pressure	100 kPa to 102 kPa

1.4 Announce

(1) The test report reference to the report template version v6.7.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	SHENZHEN 8BITDO TECH CO., LTD
Address	Room 210, Building 1, Nanhai Ecool, No.6 Xinghua Road, Shekou, Nanshan District, Shenzhen

2.2 Manufacturer Information

Manufacturer	Shenzhen Zhongxingda Electronic Co., Ltd
Address	3-4/F, Bldg 10, Tongfuyu Industrial Zone, Lezhujiao Village, Xixiang, Baoan District, Shenzhen

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	8BitDo N30 wireless mouse
Model Name Under Test	85CA
Series Model Name	85C
Description of Model name differentiation	All models have the same electrical parameters and internal circuit structure, but only different model name and appearance
Hardware Version	1.0
Software Version	1.0
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Technical Information

Network and Wireless connectivity	2.4G ISM Band (FSK modulation)

The requirement for the following technical information of the EUT was tested in this report:

Modulation Technology	FHSS
Modulation Type	FSK
Product Type	☐ Mobile ☒ Portable ☐ Fix Location
Transfer Rate	2 Mbps
Frequency Range	The frequency range used is 2400 MHz to 2483.5 MHz.
Number of channel	34 (at intervals of 500 KHz)
Tested Channel	Low Channel (2408 MHz), Middle Channel (2440 MHz), High Channel (2474 MHz)
Antenna Type	PCB Antenna
Antenna Gain	2 dBi (In test items related to antenna gain, the final results reflect this figure.)

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C	Miscellaneous Wireless Communications Services
2	ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

3.2 Verdict

No.	Description	FCC Part No.	Test Result	Verdict	Remark
1	Antenna Requirement	15.203	--	Pass	Note [1]
2	20 dB and 99% Bandwidth	15.215(c)	ANNEX A.1	Pass	--
3	AC Conducted Emission	15.207	ANNEX A.2	Pass	--
4	Radiated Spurious Emission	15.249(a)	ANNEX A.3	Pass	--
5	Band Edge(Restricted-band band-edge)	15.249(a)	ANNEX A.4	Pass	--
Note: The EUT has a permanently and irreplaceable attached antenna, which complies with the requirement FCC 15.203.					

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

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

Relative Humidity	45% to 55%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+22℃ to +25℃
Working Voltage of the EUT	NV (Normal Voltage)	3.7 V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2019.06.13	2020.06.12
Vector Signal Generator	ROHDE&SCHWARZ	SMBV100A	260592	2019.06.13	2020.06.12
Signal Generator	ROHDE&SCHWARZ	SMB100A	177746	2019.08.23	2020.08.22
Switch Unit with OSP-B157	ROHDE&SCHWARZ	OSP120	101270	2019.06.13	2020.06.12
Spectrum Analyzer	AGILENT	E4440A	MY45304434	2019.11.07	2020.11.06
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2019.06.13	2020.06.12
LISN	SCHWARZBECK	NSLK 8127	8127-687	2019.06.13	2020.06.12
Bluetooth Tester	ROHDE&SCHWARZ	CBT	101005	2019.06.13	2020.06.12
Power Splitter	KMW	DCPD-LDC	1305003215	--	--
Power Sensor	ROHDE&SCHWARZ	NRP-Z21	103971	2019.06.13	2020.06.12
Attenuator (20 dB)	KMW	ZA-S1-201	110617091	--	--
Attenuator (6 dB)	KMW	ZA-S1-61	1305003189	--	--
DC Power Supply	ROHDE&SCHWARZ	HMP2020	018141664	2019.06.13	2020.06.12
Temperature Chamber	ANGELANTIONI SCIENCE	NTH64-40A	1310	2019.06.27	2020.06.26
Test Antenna-Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2017.11.09	2020.11.08
Test Antenna-Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2018.08.22	2020.08.21
Test Antenna-Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1148	2018.07.12	2020.07.11
Test Antenna-Horn(15-26.5 GHz)	SCHWARZBECK	BBHA 9170	9170-305	2019.06.21	2020.06.20
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2019.02.21	2021.02.20
Anechoic Chamber	EMC TECHNOLOGY LTD	21.1m*11.6m*7.35m	N/A	2018.08.09	2020.08.08
Shielded Enclosure	ChangNing	CN-130701	130703	--	--
Signal Generator	ROHDE&SCHWARZ	SMB100A	177746	2019.06.12	2020.06.11
Power Amplifier	OPHIR RF	5225F	1037	2019.02.17	2020.02.16
Power Amplifier	OPHIR RF	5273F	1016	2019.02.17	2020.02.16
Directional Coupler	Werlantone	C5982-10	109275	N/A	N/A

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Directional Coupler	Werlantone	CHP-273E	S00801z-01	N/A	N/A
Feld Strength Meter	Narda	EP601	511WX51129	2019.05.22	2020.05.21
Mouth Simulator	B&K	4227	2423931	2019.11.12	2020.11.11
Sound Calibrator	B&K	4231	2430337	2019.11.12	2020.11.11
Sound Level Meter	B&K	NL-20	00844023	2019.11.12	2020.11.11
Ear Simulator	B&K	4185	2409449	2019.11.12	2020.11.11
Ear Simulator	B&K	4195	2418189	2019.11.12	2020.11.11
Audio analyzer	B&K	UPL 16	100129	2019.11.12	2020.11.11

4.3 Measurement Uncertainty

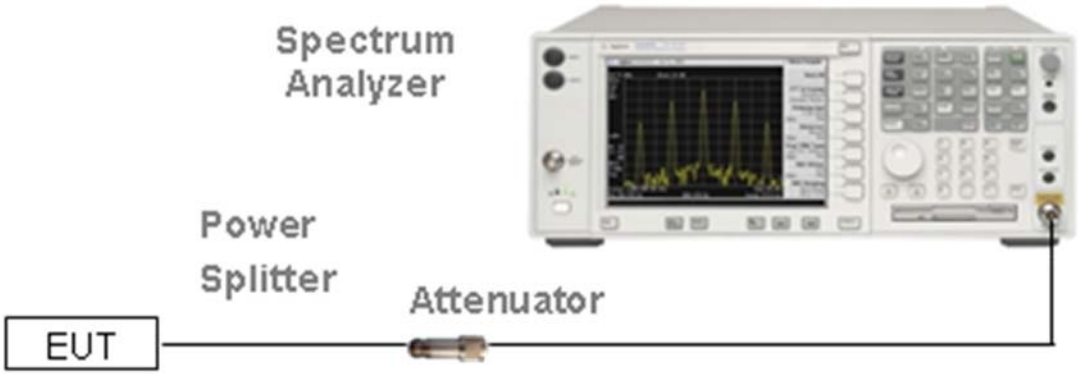
The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Occupied Channel Bandwidth	±4%
RF output power, conducted	±1.4 dB
Power Spectral Density, conducted	±2.5 dB
Unwanted Emissions, conducted	±2.8 dB
All emissions, radiated	±5.4 dB
Temperature	±1°C
Humidity	±4%

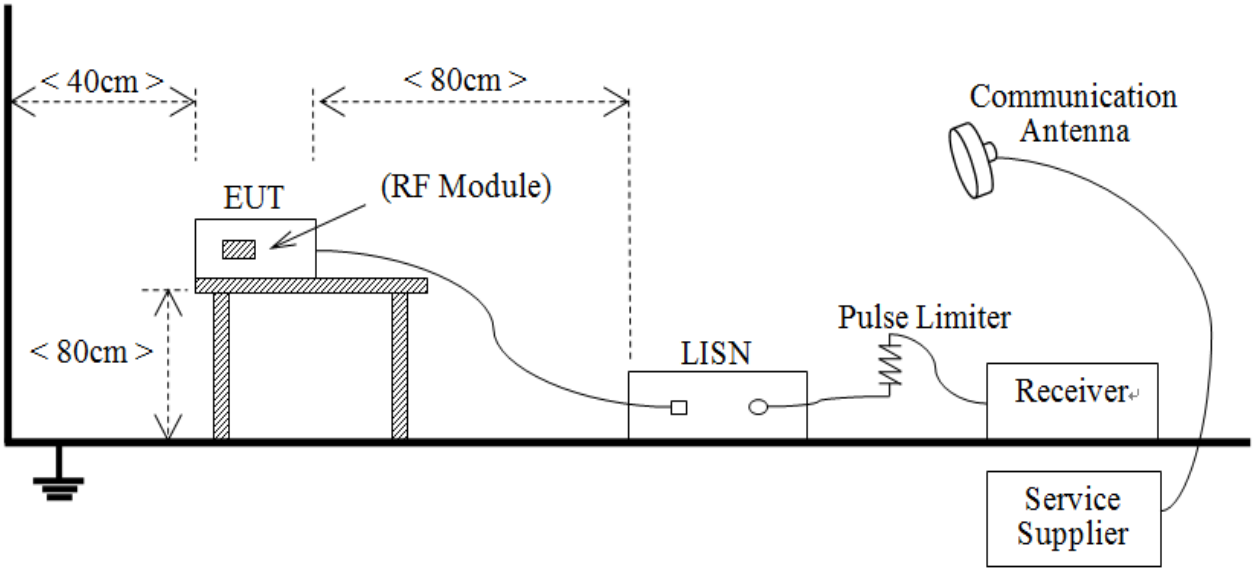
4.4 Description of Test Setup

4.4.1 For Antenna Port Test



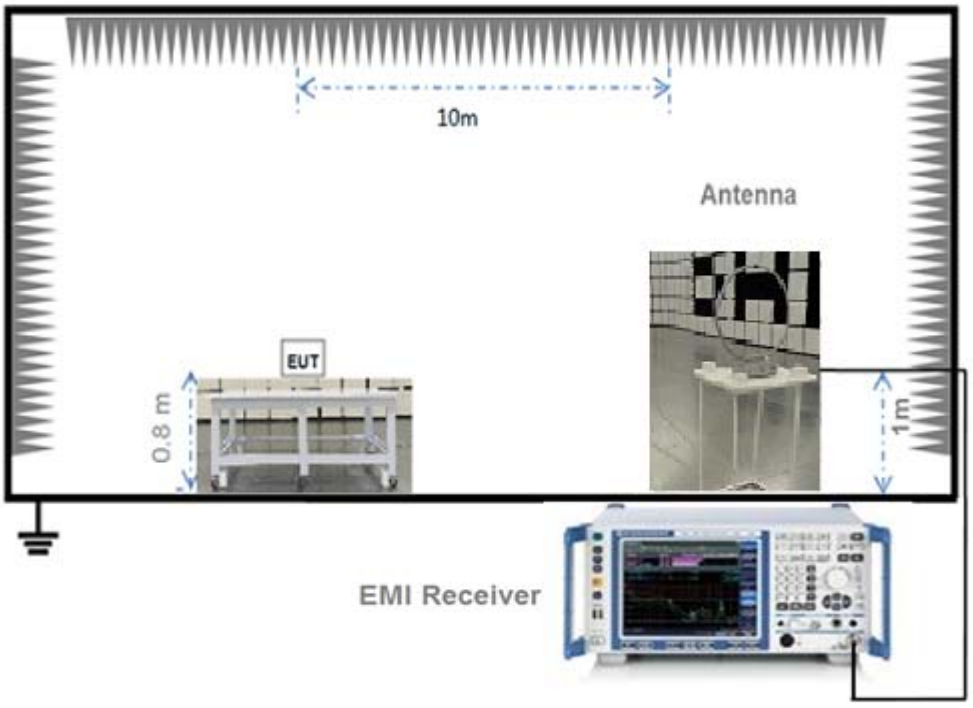
(Diagram 1)

4.4.2 For AC Power Supply Port Test



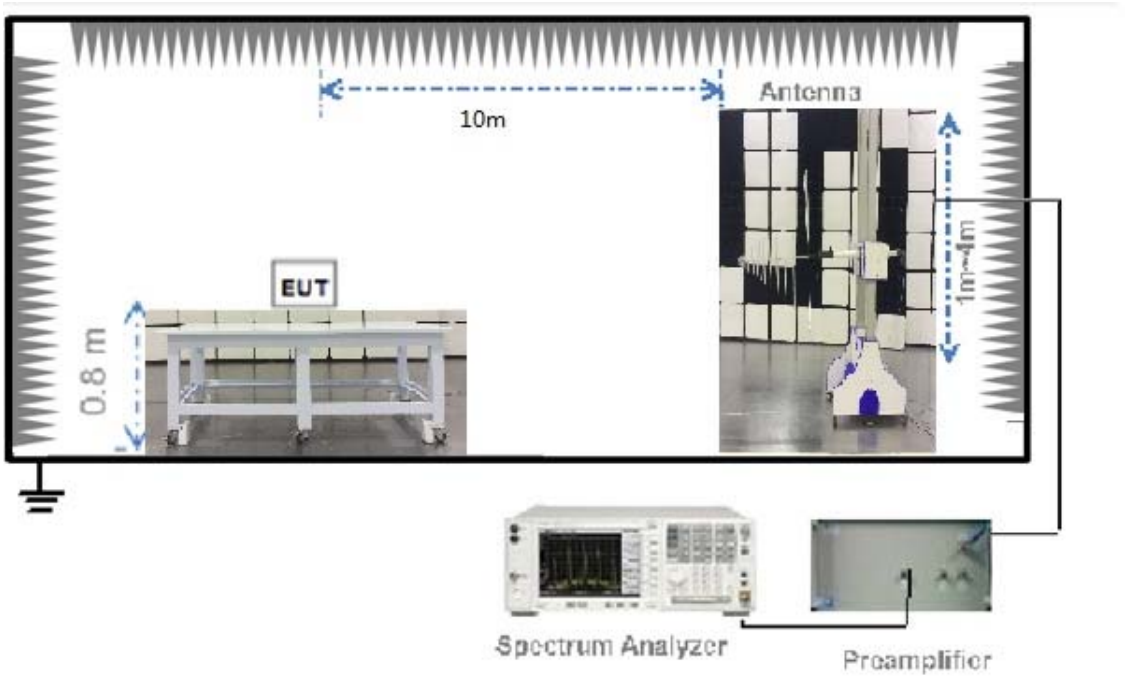
(Diagram 2)

4.4.3 For Radiated Test (Below 30 MHz)



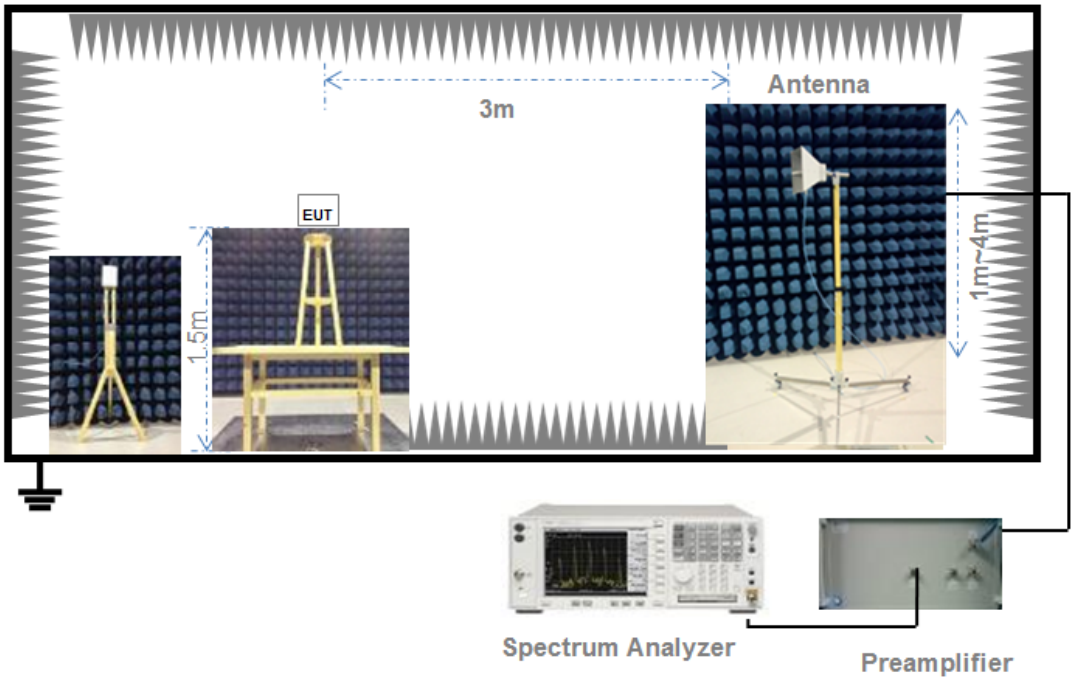
(Diagram 3)

4.4.4 For Radiated Test (30 MHz-1 GHz)



(Diagram 4)

4.4.5 For Radiated Test (Above 1 GHz)



(Diagram 5)

5 TEST ITEMS

5.1 Antenna Requirements

5.1.1 Relevant Standards

FCC §15.203 & 15.247(b); RSS-Gen 8.3

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.
If directional gain of transmitting antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

5.1.2 Antenna Anti-Replacement Construction

The Antenna Anti-Replacement as following method:

Protected Method	Description
The antenna is embedded in the product.	An embedded-in antenna design is used.

Reference Documents	Item
Photo	Please refer to the EUT Photo documents.

5.1.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

5.2 20 dB and 99% Bandwidth

5.2.1 Limit

FCC §15.215(c);

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

RSS-Gen 6.6

The emission bandwidth (×dB) 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 × 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 in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3× the resolution bandwidth.

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured

5.2.2 Test Setups

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.2.3 Test Procedure

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW ≥ 1% of the 20 dB bandwidth

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

5.2.4 Test Result

Please refer to ANNEX A.1.

5.3 AC Conducted Emission

5.3.1 Limit

FCC §15.207; RSS-Gen 8.8

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

5.3.2 Test Setups

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.3.3 Test Procedure

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed.
Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

5.3.4 Test Result

Please refer to ANNEX A.2.

5.4 Radiated Spurious Emission

5.4.1 Limit

FCC §15.249(a); RSS-210 B.10& RSS-Gen 8.9

Except as provided in paragraph (a) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (μV/m)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note:

1. For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

2. For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).

5.4.2 Test Setups

See section 4.4.2-4.4.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented. The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

5.4.4 Test Result

Please refer to ANNEX A.3.

5.5 Band Edge (Restricted-band band-edge)

5.5.1 Limit

FCC §15.249(a); RSS-210 B.10&RSS-Gen 8.10

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

5.5.2 Test Setups

See section 4.4.3 to 4.4.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

5.5.4 Test Result

Please refer to ANNEX A.4.

ANNEX A TEST RESULT

A.1 20 dB and 99% Bandwidth

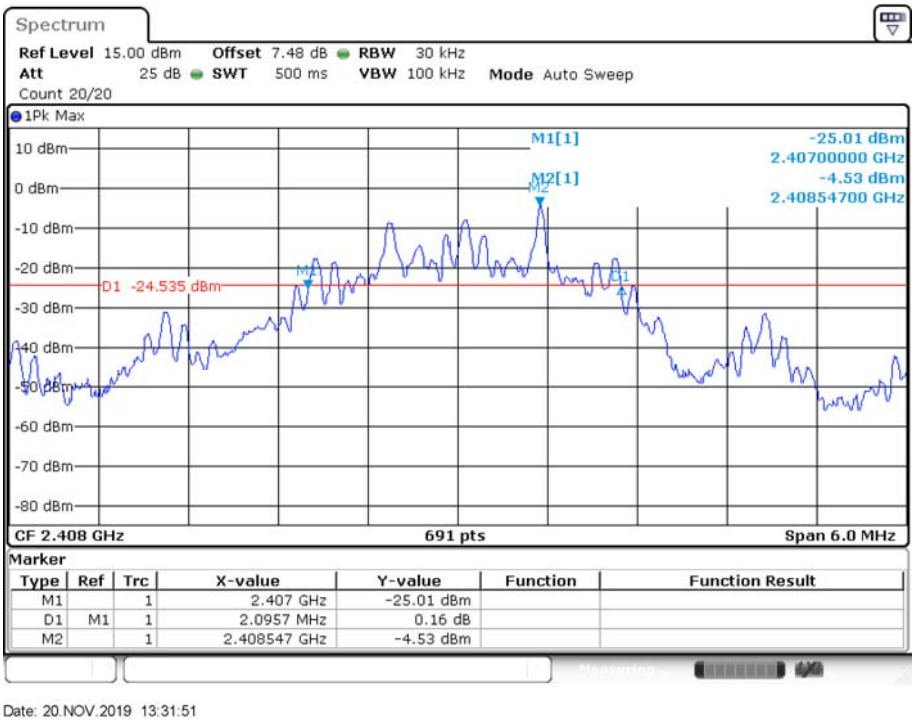
Test Data

Channel	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2.095703	2.248915
Middle	2.104248	2.257598
High	2.104248	2.248915

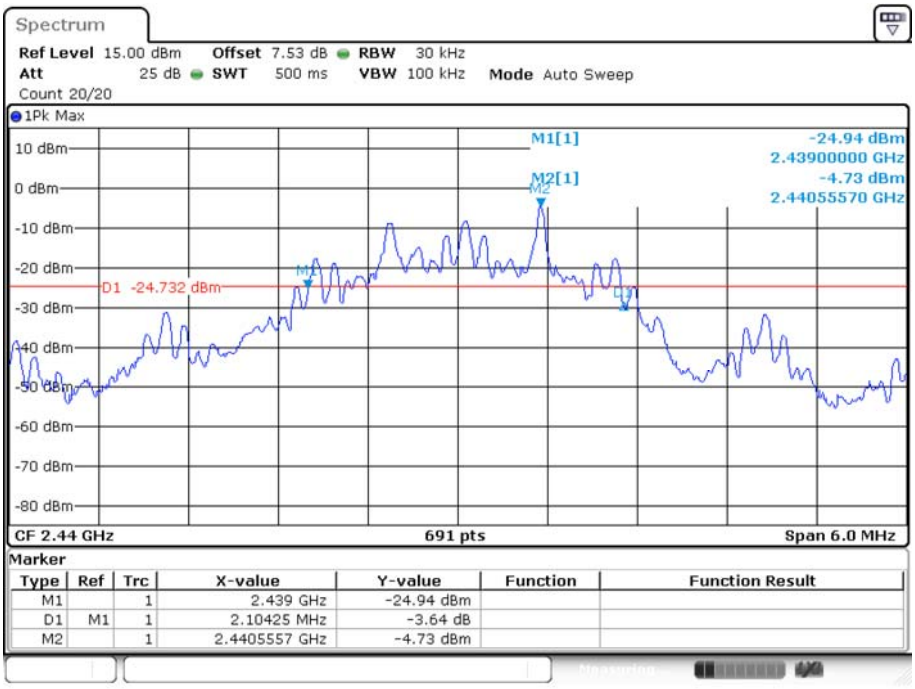
Test plots

20 dB Bandwidth

Low Channel



Middle Channel



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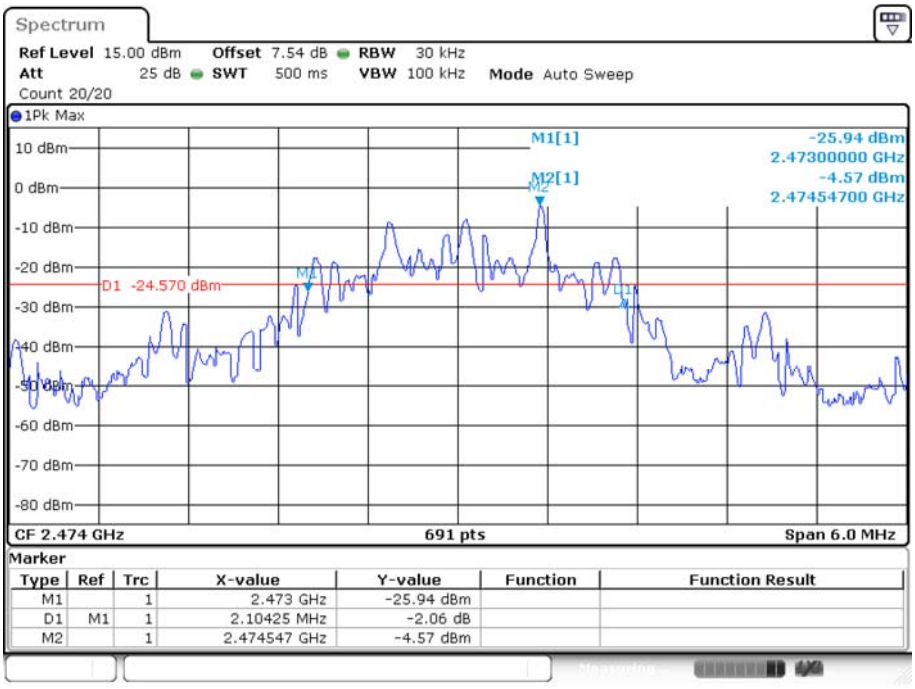
High Channel



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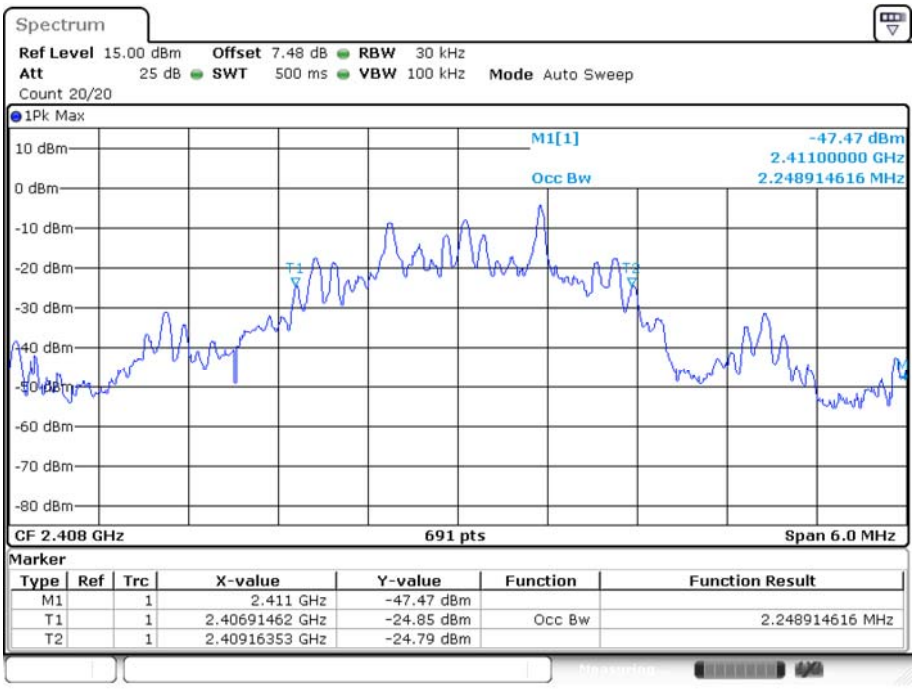
99% Bandwidth

Low Channel



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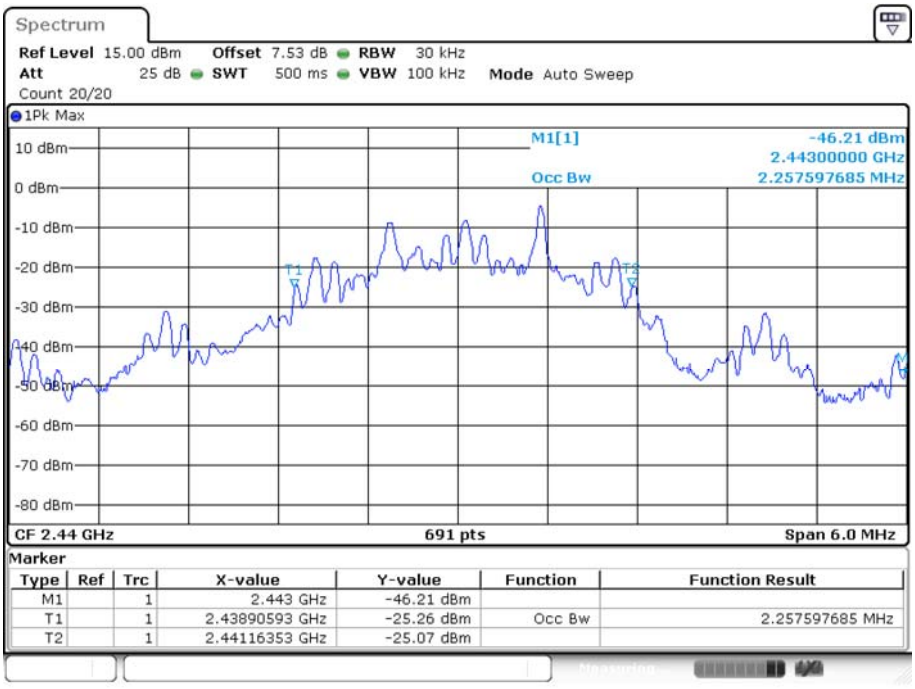
Middle Channel



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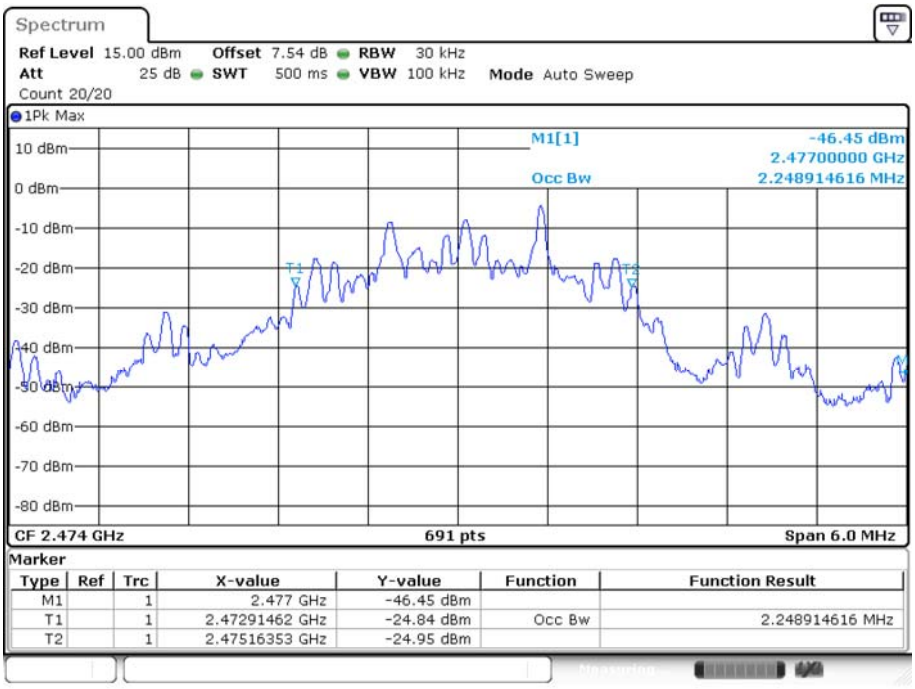
High Channel



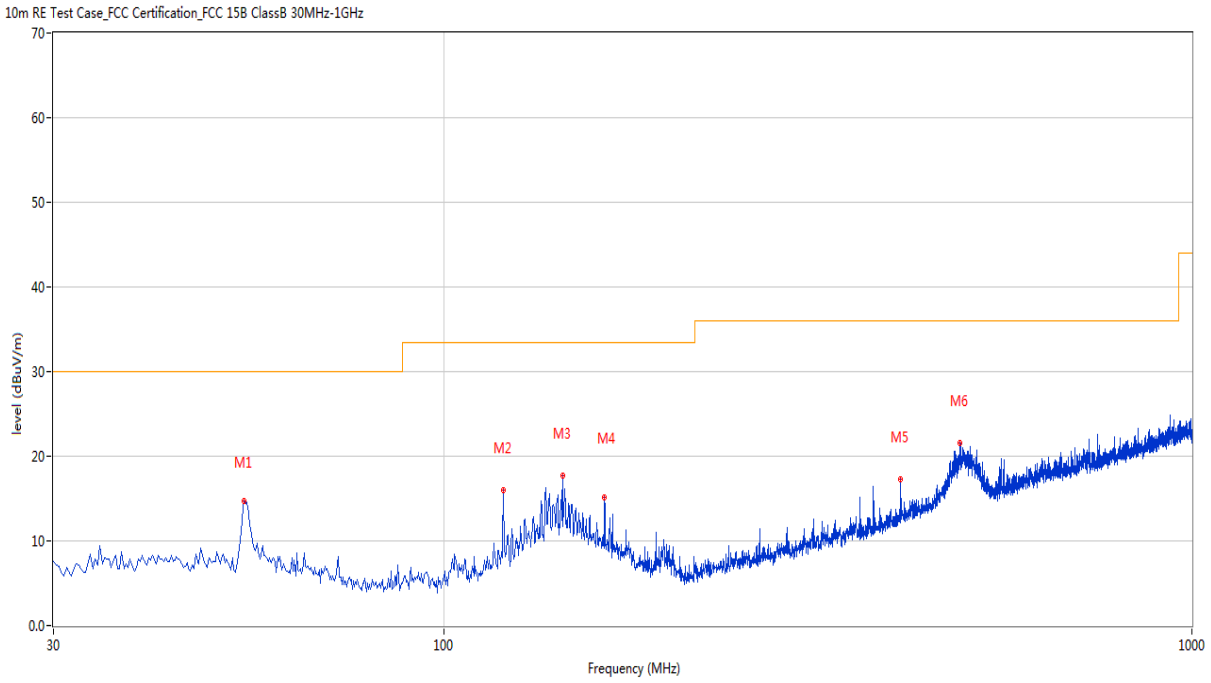
A.2 AC Conducted Emission

Note: Dedicated heat sink that cannot be connected to a utility (AC) power line.
Note: not application.

A.3 Radiated Emission

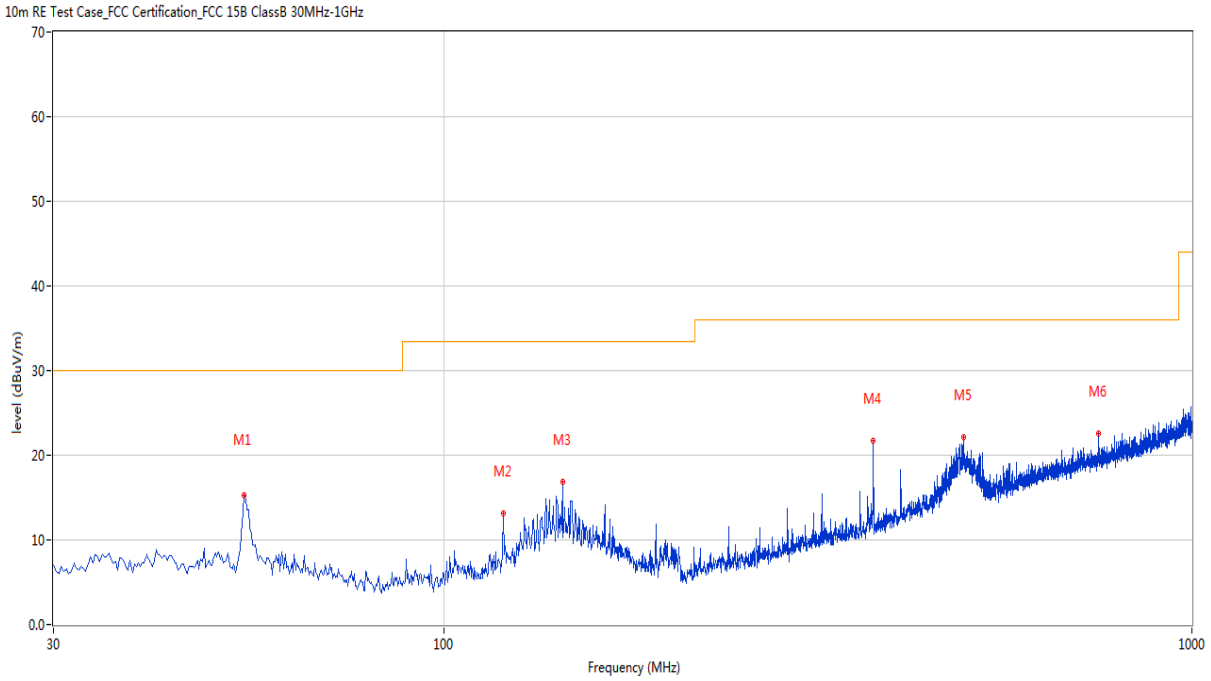
Note [1]: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.
Note [2]: The EUT is working in the Normal link mode below 1 GHz.

30 MHz to 1 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	54.001	14.71	-27.62	30.0	-15.29	Peak	224.00	200	Vertical	Pass
2	119.945	15.98	-28.03	33.5	-17.52	Peak	41.00	100	Vertical	Pass
3	143.947	17.64	-26.15	33.5	-15.86	Peak	360.00	100	Vertical	Pass
4	163.827	15.12	-26.17	33.5	-18.38	Peak	359.00	100	Vertical	Pass
5	407.963	17.27	-22.79	36.0	-18.73	Peak	0.00	400	Vertical	Pass
6	489.423	21.57	-20.91	36.0	-14.43	Peak	0.00	400	Vertical	Pass

30 MHz to 1 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	54.001	15.24	-27.62	30.0	-14.76	Peak	218.00	300	Horizontal	Pass
2	119.945	13.10	-28.03	33.5	-20.40	Peak	256.00	300	Horizontal	Pass
3	143.947	16.91	-26.15	33.5	-16.59	Peak	92.00	400	Horizontal	Pass
4	374.991	21.73	-23.84	36.0	-14.27	Peak	117.00	200	Horizontal	Pass
5	495.241	22.19	-20.53	36.0	-13.81	Peak	262.00	200	Horizontal	Pass
6	750.530	22.59	-14.91	36.0	-13.41	Peak	10.00	200	Horizontal	Pass

Test Data (1 GHz ~ 10th Harmonic)

Note [1]: The marked spikes near 2400 MHz is the fundamental signal.

Note [2]: Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Note [3]: Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Note [4]: Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20 dB from the applicable limit) and considered that's already beyond the background noise floor.

Note [5]: Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.

LOW CHANNEL 1 GHz to 25 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1484.600	37.33	-17.30	74.0	-36.67	Peak	252.00	150	Vertical	Pass
1**	1484.600	27.01	-17.30	54.0	-26.99	AV	252.00	150	Vertical	Pass
2	2408.700	75.71	-11.99	114.0	-38.29	Peak	325.00	150	Vertical	Pass[Note1]
2**	2408.700	74.78	-11.99	94.0	-19.22	AV	325.00	150	Vertical	Pass[Note1]
3	4998.200	50.86	-2.79	74.0	-23.14	Peak	18.00	150	Vertical	Pass
3**	4998.200	39.50	-2.79	54.0	-14.50	AV	18.00	150	Vertical	Pass
4	7225.975	50.00	-3.29	74.0	-24.00	Peak	98.00	150	Vertical	Pass
4**	7225.975	48.44	-3.29	54.0	-5.56	AV	98.00	150	Vertical	Pass
5	10663.612	50.00	-0.06	74.0	-24.00	Peak	313.00	150	Vertical	Pass
5**	10663.612	40.44	-0.06	54.0	-13.56	AV	313.00	150	Vertical	Pass
6	14236.800	52.64	2.39	74.0	-21.36	Peak	360.00	150	Vertical	Pass
6**	14236.800	42.82	2.39	54.0	-11.18	AV	360.00	150	Vertical	Pass

LOW CHANNEL 1 GHz to 25 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1395.300	37.68	-17.04	74.0	-36.32	Peak	313.00	150	Horizontal	Pass
1**	1395.300	27.17	-17.04	54.0	-26.83	AV	313.00	150	Horizontal	Pass
2	2407.400	86.76	-11.83	114.0	-27.24	Peak	97.00	150	Horizontal	Pass[Note1]
2**	2407.400	82.38	-11.83	94.0	-11.62	AV	97.00	150	Horizontal	Pass[Note1]
3	4817.400	49.04	-3.22	74.0	-24.96	Peak	265.00	150	Horizontal	Pass
3**	4817.400	47.06	-3.22	54.0	-6.94	AV	265.00	150	Horizontal	Pass
4	7225.975	49.06	-3.29	74.0	-24.94	Peak	130.00	150	Horizontal	Pass
4**	7225.975	48.44	-3.29	54.0	-5.56	AV	130.00	150	Horizontal	Pass
5	9937.675	50.00	-0.43	74.0	-24.00	Peak	0.00	150	Horizontal	Pass
5**	9937.675	40.28	-0.43	54.0	-13.72	AV	0.00	150	Horizontal	Pass
6	14501.401	52.95	1.69	74.0	-21.05	Peak	360.00	150	Horizontal	Pass
6**	14501.401	44.81	1.69	54.0	-9.19	AV	360.00	150	Horizontal	Pass

Middle CHANNEL 1 GHz to 25 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1293.600	37.55	-17.08	74.0	-36.45	Peak	41.00	150	Vertical	Pass
1**	1293.600	27.12	-17.08	54.0	-26.88	AV	41.00	150	Vertical	Pass
2	2439.600	75.42	-12.48	114.0	-38.58	Peak	326.00	150	Vertical	Pass[Note1]
2**	2439.600	74.33	-12.48	94.0	-19.67	AV	326.00	150	Vertical	Pass[Note1]
3	4881.200	48.73	-3.20	74.0	-25.27	Peak	48.00	150	Vertical	Pass
3**	4881.200	45.06	-3.20	54.0	-8.94	AV	48.00	150	Vertical	Pass
4	7321.713	50.83	-3.27	74.0	-23.17	Peak	57.00	150	Vertical	Pass
4**	7321.713	48.27	-3.27	54.0	-5.73	AV	57.00	150	Vertical	Pass
5	11495.638	50.44	0.30	74.0	-23.56	Peak	114.00	150	Vertical	Pass
5**	11495.638	41.03	0.30	54.0	-12.97	AV	114.00	150	Vertical	Pass
6	13878.487	52.43	2.18	74.0	-21.57	Peak	166.00	150	Vertical	Pass
6**	13878.487	42.71	2.18	54.0	-11.29	AV	166.00	150	Vertical	Pass

Middle CHANNEL 1 GHz to 25 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1335.400	37.47	-17.10	74.0	-36.53	Peak	115.00	150	Horizontal	Pass
1**	1335.400	26.77	-17.10	54.0	-27.23	AV	115.00	150	Horizontal	Pass
2	2439.500	84.99	-12.48	114.0	-29.01	Peak	85.00	150	Horizontal	Pass[Note1]
2**	2439.500	82.99	-12.48	94.0	-11.01	AV	85.00	150	Horizontal	Pass[Note1]
3	4881.400	49.14	-3.21	74.0	-24.86	Peak	130.00	150	Horizontal	Pass
3**	4881.400	47.36	-3.21	54.0	-6.64	AV	130.00	150	Horizontal	Pass
4	7321.713	51.89	-3.27	74.0	-22.11	Peak	97.00	150	Horizontal	Pass
4**	7321.713	49.34	-3.27	54.0	-4.66	AV	97.00	150	Horizontal	Pass
5	12025.213	50.45	1.11	74.0	-23.55	Peak	360.00	150	Horizontal	Pass
5**	12025.213	41.39	1.11	54.0	-12.61	AV	360.00	150	Horizontal	Pass
6	16259.625	54.80	1.94	74.0	-19.20	Peak	154.00	150	Horizontal	Pass
6**	16259.625	45.54	1.94	54.0	-8.46	AV	154.00	150	Horizontal	Pass

High CHANNEL 1 GHz to 25 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1362.800	37.39	-17.18	74.0	-36.61	Peak	77.00	150	Vertical	Pass
1**	1362.800	27.31	-17.18	54.0	-26.69	AV	77.00	150	Vertical	Pass
2	2473.600	75.06	-12.29	114.0	-38.94	Peak	141.00	150	Vertical	Pass[Note1]
2**	2473.600	73.00	-12.29	94.0	-21	AV	141.00	150	Vertical	Pass[Note1]
3	5085.200	50.83	-2.74	74.0	-23.17	Peak	141.00	150	Vertical	Pass
3**	5085.200	39.31	-2.74	54.0	-14.69	AV	141.00	150	Vertical	Pass
4	7420.900	52.77	-3.28	74.0	-21.23	Peak	306.00	150	Vertical	Pass
4**	7420.900	50.05	-3.28	54.0	-3.95	AV	306.00	150	Vertical	Pass
5	10416.650	49.49	0.59	74.0	-24.51	Peak	296.00	150	Vertical	Pass
5**	10416.650	40.62	0.59	54.0	-13.38	AV	296.00	150	Vertical	Pass
6	13296.000	51.94	1.26	74.0	-22.06	Peak	335.00	150	Vertical	Pass
6**	13296.000	41.80	1.26	54.0	-12.20	AV	335.00	150	Vertical	Pass

High CHANNEL 1 GHz to 25 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1530.600	37.52	-17.24	74.0	-36.48	Peak	119.00	150	Horizontal	Pass
1**	1530.600	26.55	-17.24	54.0	-27.45	AV	119.00	150	Horizontal	Pass
2	2474.600	84.67	-12.23	114.0	-29.33	Peak	310.00	150	Horizontal	Pass[Note1]
2**	2474.600	84.29	-12.23	94.0	-9.71	AV	310.00	150	Horizontal	Pass[Note1]
3	4949.200	50.52	-2.80	74.0	-23.48	Peak	66.00	150	Horizontal	Pass
3**	4949.200	48.47	-2.80	54.0	-5.53	AV	66.00	150	Horizontal	Pass
4	7423.775	51.96	-3.15	74.0	-22.04	Peak	85.00	150	Horizontal	Pass
4**	7423.775	50.96	-3.15	54.0	-3.04	AV	85.00	150	Horizontal	Pass
5	10866.875	49.66	0.48	74.0	-24.34	Peak	74.00	150	Horizontal	Pass
5**	10866.875	41.45	0.48	54.0	-12.55	AV	74.00	150	Horizontal	Pass
6	13834.125	52.09	2.63	74.0	-21.91	Peak	59.00	150	Horizontal	Pass
6**	13834.125	42.76	2.63	54.0	-11.24	AV	59.00	150	Horizontal	Pass

HOPPING 1 GHz to 25 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1449.000	38.02	-17.03	74.0	-35.98	Peak	328.00	150	Vertical	Pass
1**	1449.000	26.85	-17.03	54.0	-27.15	AV	328.00	150	Vertical	Pass
2	2409.600	74.72	-12.19	114.0	-39.28	Peak	350.00	150	Vertical	Pass[Note1]
2**	2409.600	67.67	-12.19	94.0	-26.33	AV	350.00	150	Vertical	Pass[Note1]
3	2470.400	74.41	-12.10	114.0	-39.59	Peak	153.00	150	Vertical	Pass
3**	2470.400	71.70	-12.10	94.0	-22.3	AV	153.00	150	Vertical	Pass
4	4852.800	49.79	-3.19	74.0	-24.21	Peak	173.00	150	Vertical	Pass
4**	4852.800	38.24	-3.19	54.0	-15.76	AV	173.00	150	Vertical	Pass
5	7370.013	49.22	-3.56	74.0	-24.78	Peak	297.00	150	Vertical	Pass
5**	7370.013	47.66	-3.56	54.0	-6.34	AV	297.00	150	Vertical	Pass
6	16152.263	54.48	2.03	74.0	-19.52	Peak	118.00	150	Vertical	Pass
6**	16152.263	44.93	2.03	54.0	-9.07	AV	118.00	150	Vertical	Pass

HOPPING 1 GHz to 25 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1328.800	37.26	-17.07	74.0	-36.74	Peak	252.00	150	Horizontal	Pass
1**	1328.800	26.78	-17.07	54.0	-27.22	AV	252.00	150	Horizontal	Pass
2	2407.600	84.22	-11.82	114.0	-29.78	Peak	318.00	150	Horizontal	Pass[Note1]
2**	2407.600	80.50	-11.82	94.0	-13.5	AV	318.00	150	Horizontal	Pass[Note1]
3	2470.300	82.27	-12.10	114.0	-31.73	Peak	75.00	150	Horizontal	Pass
3**	2470.300	79.70	-12.10	94.0	-14.3	AV	75.00	150	Horizontal	Pass
4	4901.200	50.69	-2.62	74.0	-23.31	Peak	61.00	150	Horizontal	Pass
4**	4901.200	45.39	-2.62	54.0	-8.61	AV	61.00	150	Horizontal	Pass
5	7349.025	48.96	-3.46	74.0	-25.04	Peak	101.00	150	Horizontal	Pass
5**	7349.025	47.72	-3.46	54.0	-6.28	AV	101.00	150	Horizontal	Pass
6	13002.263	51.42	1.87	74.0	-22.58	Peak	0.00	150	Horizontal	Pass
6**	13002.263	43.00	1.87	54.0	-11.00	AV	0.00	150	Horizontal	Pass

A.3 Band Edge(Restricted-band band-edge)

Test Data and Test Plots

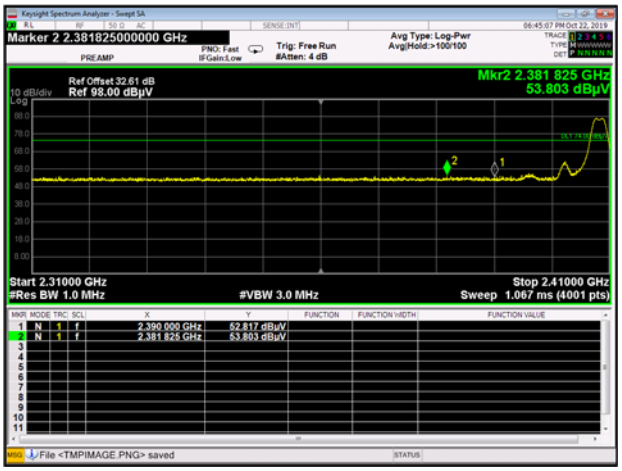
Note [1]: The test data all are tested in the vertical and horizontal antenna which the trace is max hold. So these plots have shown the worst case.

Note [2]: According the ANSI C63.10-2013, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

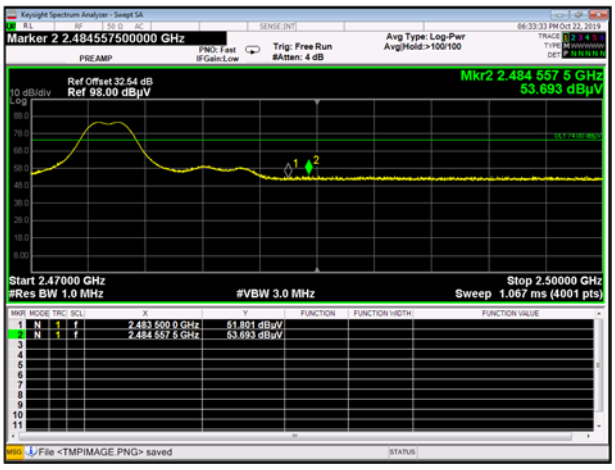
Test Mode	Test Channel	Frequency (MHz)	Level (dBuV/m)	Factor (dB)	Limit Line (dBuV/m)	Margin (dB)	Remark	Verdict
GFSK	Low	2390.00	53.803	32.61	74	20.197	PEAK	Pass
		2390.00	N/A	N/A	54	N/A	AVERAGE	Pass
GFSK	HIGH	2483.50	53.693	32.54	74	20.307	PEAK	Pass
		2483.50	N/A	N/A	54	N/A	AVERAGE	Pass
GFSK(Hopping)	Low	2390.00	53.755	32.61	74	20.245	PEAK	Pass
		2390.00	N/A	N/A	54	N/A	AVERAGE	Pass
GFSK(Hopping)	HIGH	2483.50	71.354	32.54	74	2.646	PEAK	Pass
		2483.50	44.004	32.54	54	9.996	AVERAGE	Pass

Test Plots

GFSK LOW CHANNEL , PEAK

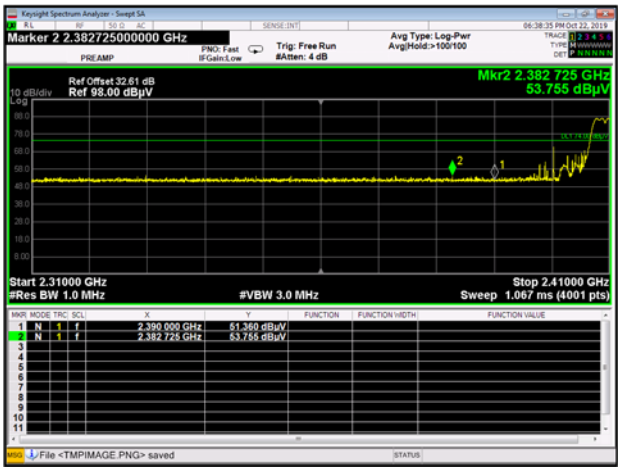


GFSK HIGH CHANNEL , PEAK

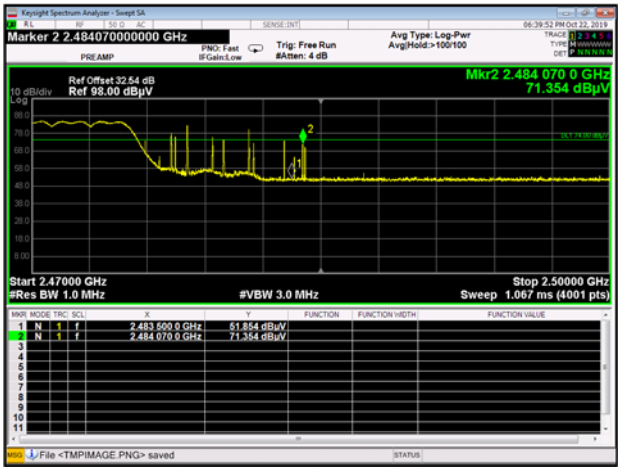


Hopping Mode:

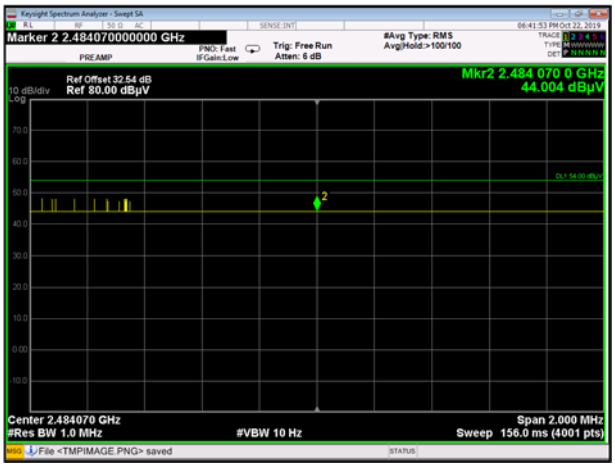
GFSK LOW FREQUENCY BAND, PEAK



GFSK LOW FREQUENCY BAND, PEAK



GFSK HIGH FREQUENCY BAND, AVERAGE



ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ1998270-DFS.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ1998270-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ1998270-AI.PDF”.

--END OF REPORT--