FCC/ISED RF TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

Over-Ear Wireless RF Headphones with Charging Dock

ISSUED TO
Compupal (Group) Corporation

No.1555 Jiashan Avenue, Jiashan 314113, Zhejiang, China

Report No.:	BL-SZ1680537-601
EUT Type:	Over-Ear Wireless RF Headphones with Charging Dock
Model Name:	HS-RF02, RFH01
Brand Name:	Compupal, AmazonBasics
Test Standard:	47 CFR Part 15 Subpart C RSS-210 Issue 9 (2016-8) RSS-Gen Issue 4 (2014-11)
FCC ID:	Z5Y-RFH01H
ISED Number:	10828A-RFH01H
Test conclusion:	Pass
Test Date:	Sep. 05, 2016 ~ Sep. 12, 2016
Date of Issue:	Sep. 23, 2016

Prepared by: _____
Cao Shaodong
(Engineer)
Date Sep. 23. 2016

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Date Sep. 23. 2016

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Revision History

Version	Issue Date	Revisions Content
Rev. 01	Sep. 23, 2016	Initial Issue

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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
Fax Number	+86 755 6182 4271

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 has been listed by US Federal Communications Commission to perform electromagnetic emission measurements. The recognition numbers of test site are 832625. 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% - 55%
Ambient Pressure	100 kPa - 102 kPa

1.4 Announce

(1) The test report reference to the report template version v5.5.

(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	Compupal (Group) Corporation
Address	No.1555 Jiashan Avenue, Jiashan 314113, Zhejiang, China

2.2 Manufacturer Information

Manufacturer	Compupal (Group) Corporation
Address	No.1555 Jiashan Avenue, Jiashan 314113, Zhejiang, China

2.3 Factory Information

Factory	Compupal (Group) Corporation
Address	No.1555 Jiashan Avenue, Jiashan 314113, Zhejiang, China

2.4 General Description for Equipment under Test (EUT)

EUT Type	Over-Ear Wireless RF Headphones with Charging Dock
Under Test Model Name	HS-RF02
Series Model Name	HS-RF02, RFH01
Description of Model name differentiation	All models are same with electrical parameters and internal circuit structure, only model name and brand name are different.
Hardware Version	Rev A
Software Version	Rev A
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A
Network and Wireless connectivity	2.4 GHz Hopping Frequency System

2.5 Ancillary Equipment

Ancillary Equipment 1	Battery	
	Brand Name	CEL
	Model No	CPL503030
	Serial No	N/A
	Capacitance	430 mAh
	Rated Voltage	3.7 V
	Limit Charge Voltage	4.2 V
Ancillary Equipment 2	Charger	
	Brand Name	N/A
	Model No	SW0500500-A04
	Serial No	N/A
	Rated Input	100-240 V~, 0.2 A, 50/60 Hz
	Rated Output	5 V⎓, 0.5 A

Ancillary Equipment 3	Audio Cable 1	
	Length (Approx.)	40 cm
Ancillary Equipment 4	Audio Cable 2	
	Length (Approx.)	180 cm
Ancillary Equipment 5	Charging Dock	

2.6 Technical Information

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

Modulation Technology	FHSS
Modulation Type	GFSK
Product Type	Mobile and portable
Transfer Rate	3 Mbps
Frequency Range	The frequency range used is 2406 MHz to 2475 MHz.
Number of channel	24 (at intervals of 3 MHz)
Tested Channel	Low (2406 MHz), Middle (2442 MHz), High (2475 MHz).
Antenna Type	PCB Antenna
Antenna Gain	1.79 dBi (All involve the antenna gain test item, has been included in the final results)
About the Product	The EUT is Over-Ear Wireless RF Headphones with Charging Dock, it contains 2.4 GHz Module operating at 2.4 GHz ISM band.

Channel List

Frequency Band	Channel No.	Frequency (MHz)
2406~2475MHz	1	2406
	2	2409
	3	2412
	:	:
	13	2442
	:	:
	24	2475

2.7 Additional Instructions

EUT Software Settings:

Mode	☒ Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

Power level setup in software			
Test Software Version	Working when the EUT is on electricity, without debugging.		
Mode	Channel	Frequency (MHz)	Soft Set
GFSK	CH1	2406	TX LEVEL is built-in set parameters and cannot be changed and selected.
	CH13	2442	
	CH24	2475	

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C (10-1-15 Edition)	Intentional Radiators
2	RSS-Gen (Issue 4, Nov. 2014)	General Requirements for Compliance of Radio Apparatus
3	RSS-210 (Issue 9, August 2016)	Licence-Exempt Radio Apparatus: Category I Equipment
4	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

3.2 Verdict

No.	Description	FCC Part No.	ISED Part No.	Test Result	Verdict	Remark
1	Antenna Requirement	15.203	RSS-Gen 8.3	--	Pass	Note1
2	20 dB and 99% Bandwidth	15.215(c)	RSS-Gen 6.6	ANNEX A.1	Pass	
3	AC Conducted Emission	15.207	RSS-Gen 8.8	ANNEX A.2	Pass	
4	Radiated Spurious Emission	15.249(a)	RSS-210 B.10 RSS-Gen 8.9	ANNEX A.3	Pass	
5	Band Edge(Restricted-band band-edge)	15.249(a)	RSS-210 B.10 RSS-Gen 8.10	ANNEX A.4	Pass	
Note 1: 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% - 55%	
Atmospheric Pressure	100 kPa - 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	2016.07.13	2017.07.12
Vector Signal Generator	ROHDE&SCHWARZ	SMBV100A	177746	2016.07.13	2017.07.12
Signal Generator	ROHDE&SCHWARZ	SMB100A	260592	2016.07.13	2017.07.12
Switch Unit with OSP-B157	ROHDE&SCHWARZ	OSP120	101270	2016.07.13	2017.07.12
Spectrum Analyzer	AGILENT	E4440A	MY45304434	2015.10.15	2016.10.14
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2016.07.05	2017.07.04
LISN	SCHWARZBECK	NSLK 8127	8127-687	2016.07.05	2017.07.04
Bluetooth Tester	ROHDE&SCHWARZ	CBT	101005	2016.07.13	2017.07.12
Power Splitter	KMW	DCPD-LDC	1305003215	--	--
Power Sensor	ROHDE&SCHWARZ	NRP-Z21	103971	2016.07.13	2017.07.12
Attenuator (20 dB)	KMW	ZA-S1-201	110617091	--	--
Attenuator (6 dB)	KMW	ZA-S1-61	1305003189	--	--
DC Power Supply	ROHDE&SCHWARZ	HMP2020	018141664	2016.07.13	2017.07.12
Temperature Chamber	ANGELANTIONI SCIENCE	NTH64-40A	1310	2016.07.13	2017.07.12
Test Antenna-Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2015.07.22	2017.07.21
Test Antenna-Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2015.07.22	2017.07.21
Test Antenna-Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1148	2015.07.22	2017.07.21
Test Antenna-Horn(15-26.5 GHz)	SCHWARZBECK	BBHA 9170	9170-305	2015.07.22	2017.07.21
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2015.02.28	2017.02.27
Shielded Enclosure	ChangNing	CN-130701	130703	--	--

4.3 Measurement Uncertainty

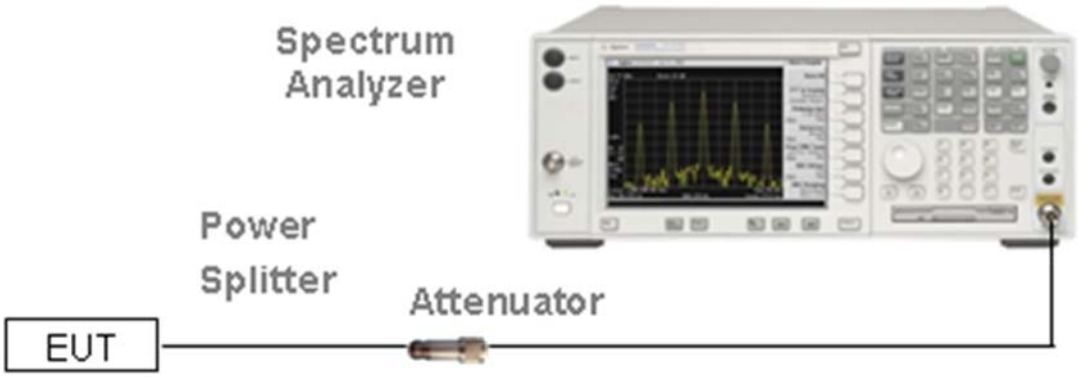
The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

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%

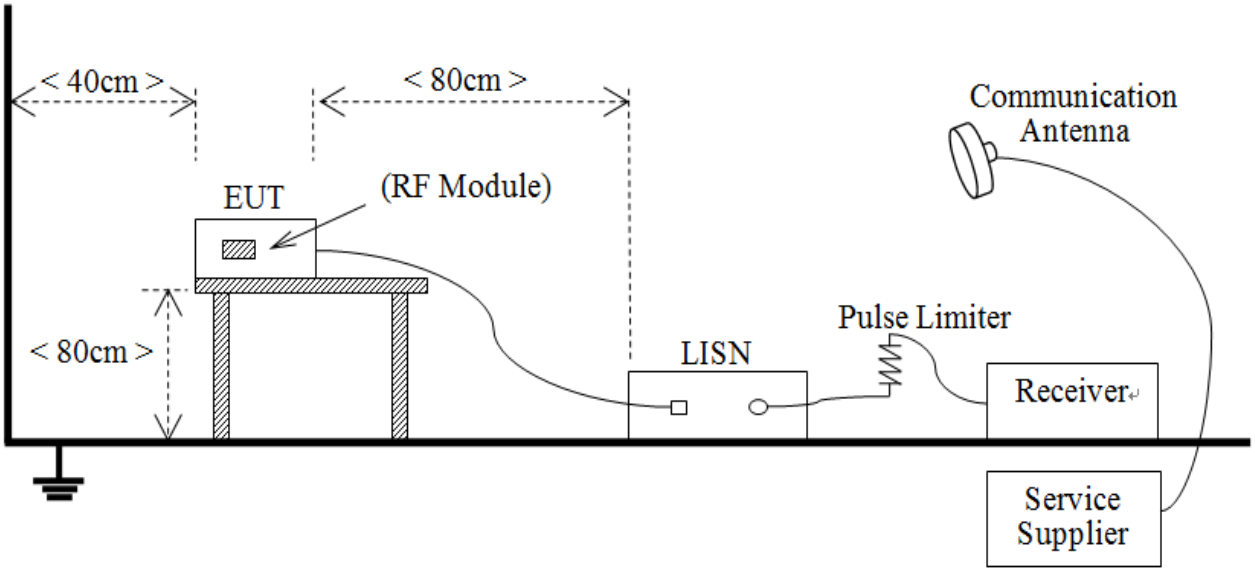
4.4 Description of Test Setup

4.4.1 For Antenna Port Test



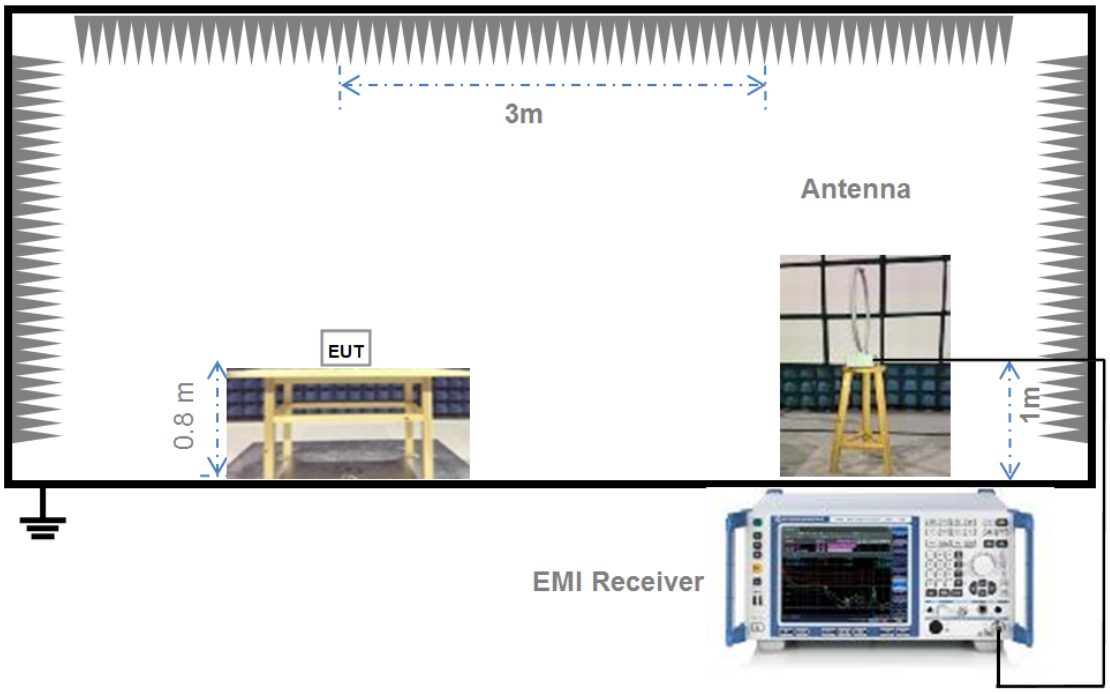
(Diagram 1)

4.4.2 For AC Power Supply Port Test



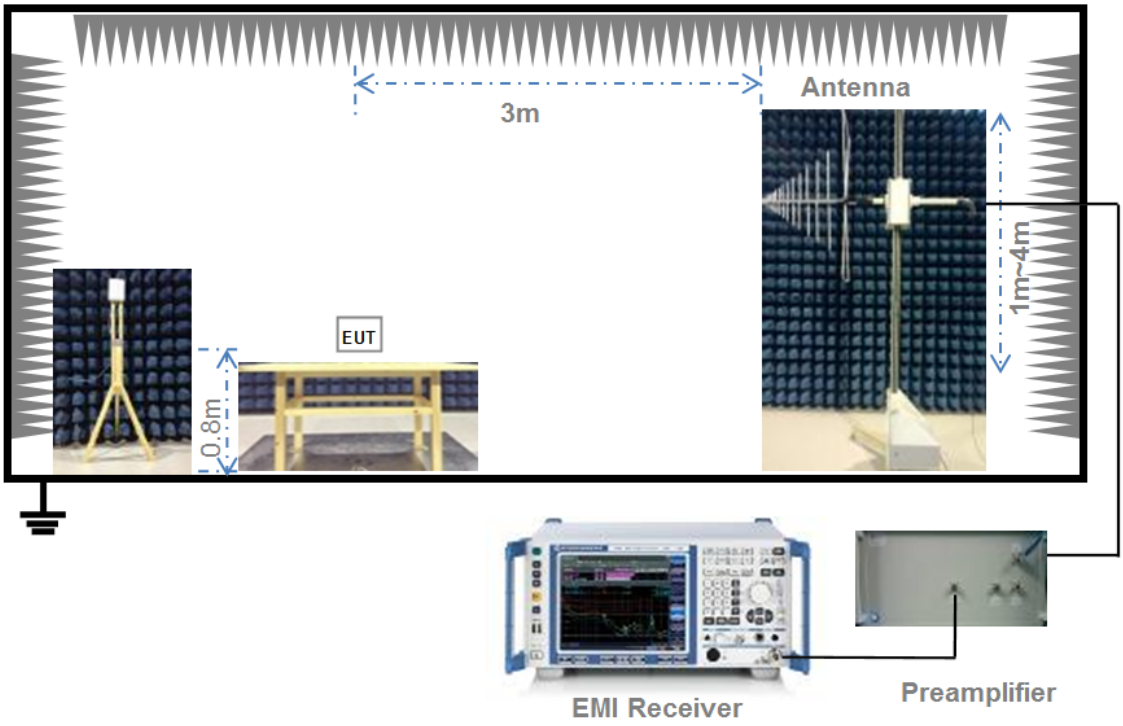
(Diagram 2)

4.4.3 For Radiated Test (Below 30 MHz)



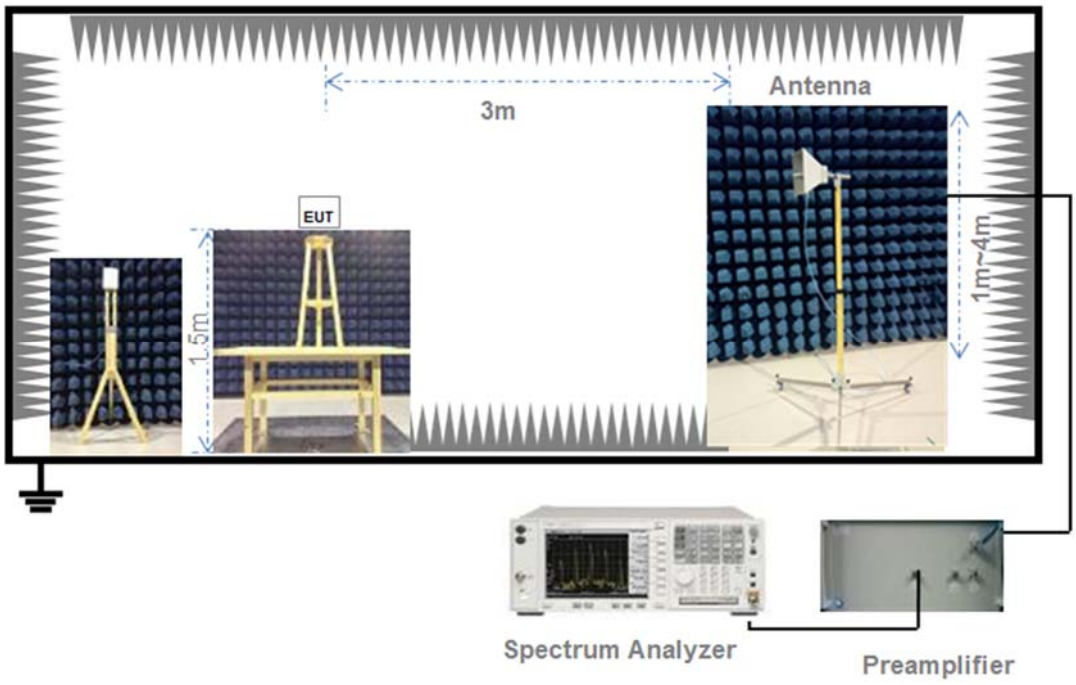
(Diagram 3)

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 Standard Applicable

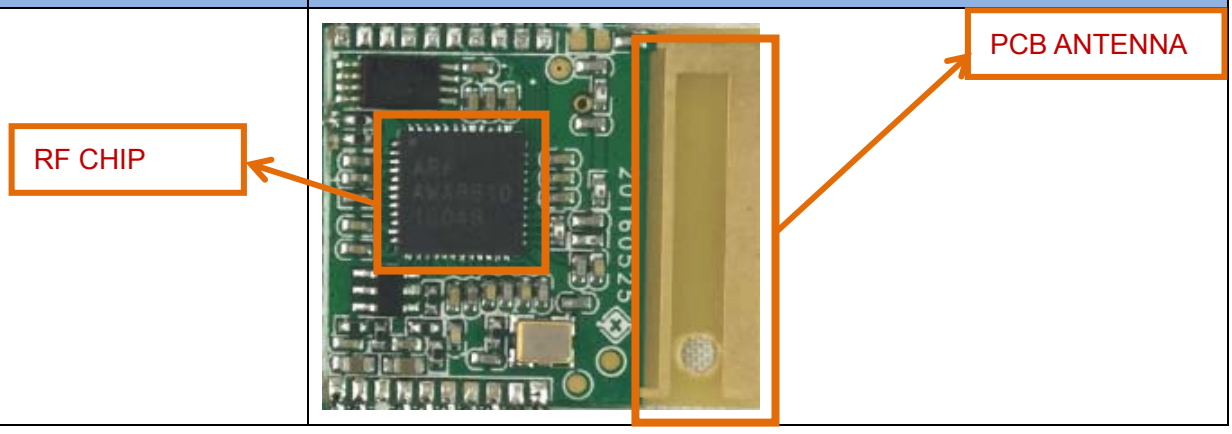
FCC §15.203 & 15.247(b); RSS-Gen 8.3

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 An embedded-in	An embedded-in antenna design is used.

Reference Documents	Item
Photo	

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

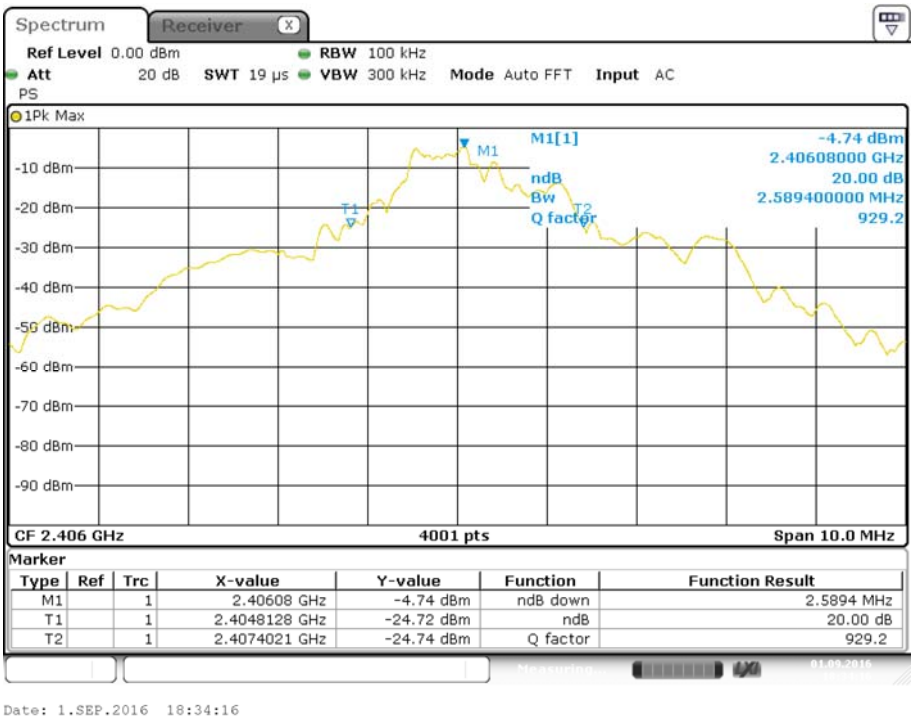
Test Data

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2406	2.589	3.824
Middle	2442	2.454	2.682
High	2475	2.145	2.437

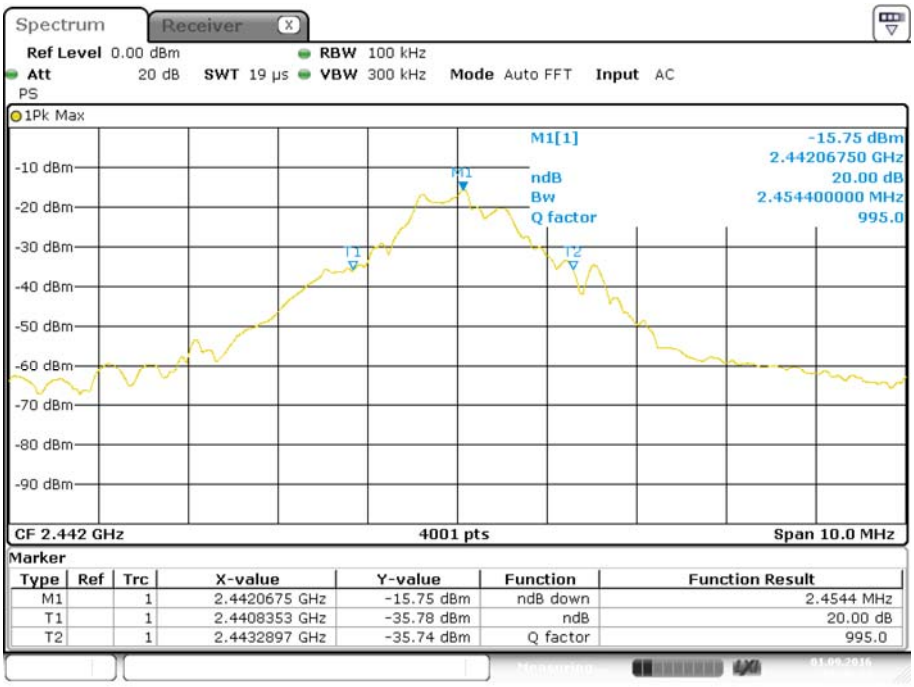
Test plots

20 dB Bandwidth

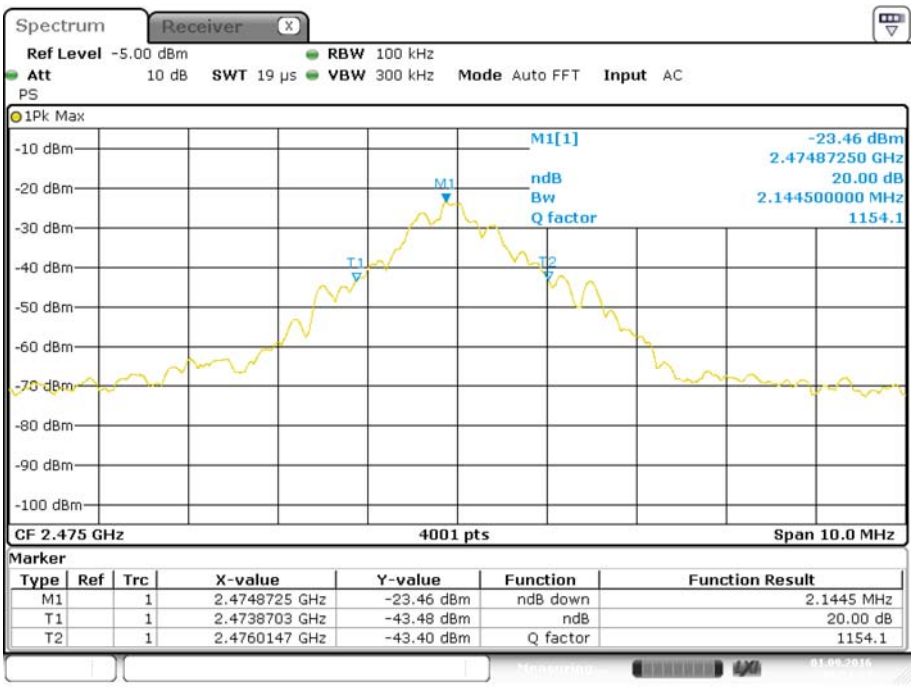
Low Channel



Middle Channel

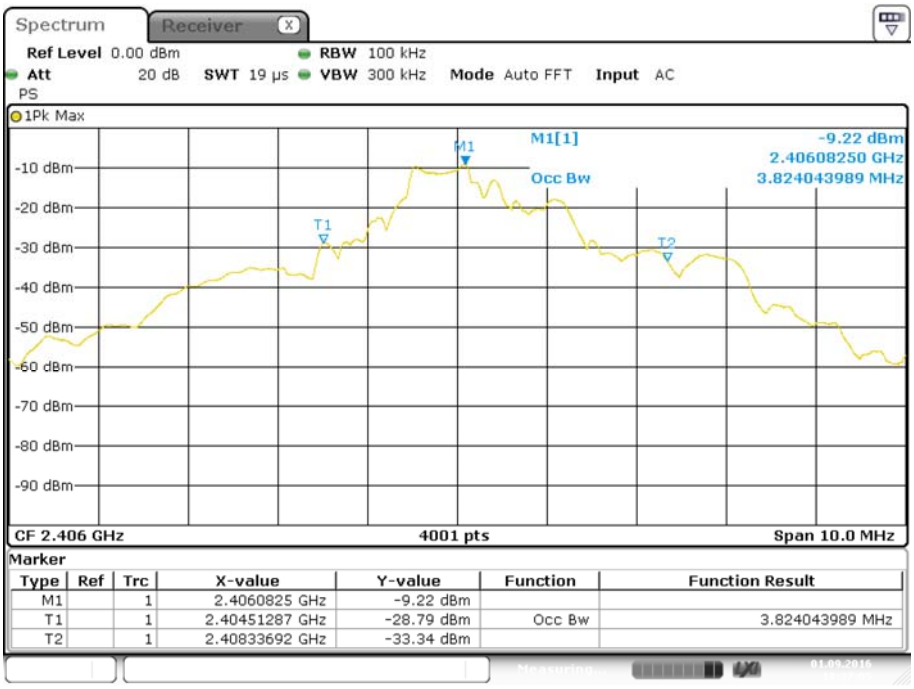


High Channel

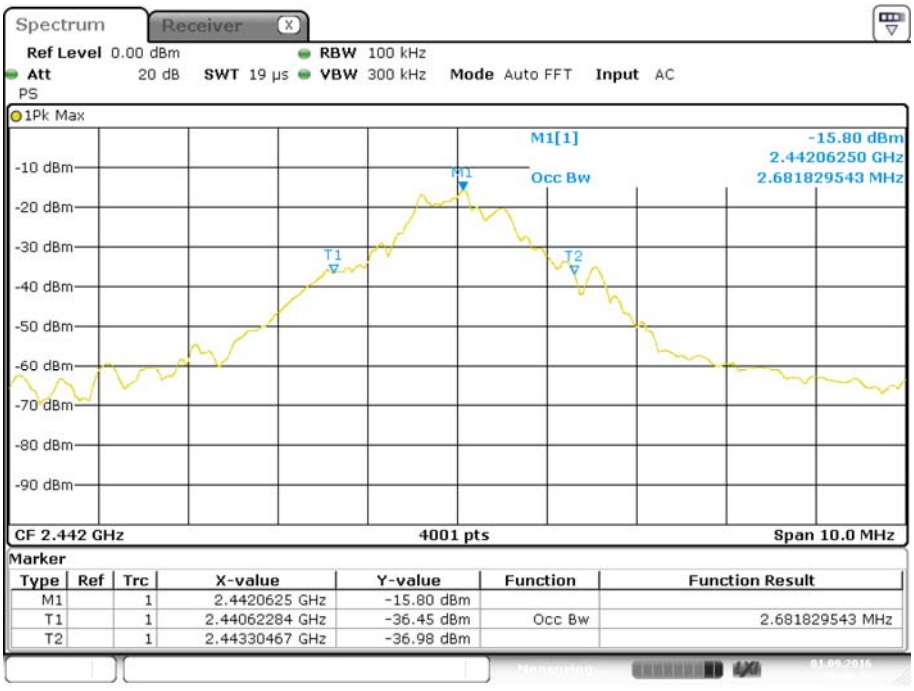


99% Bandwidth

Low Channel



Middle Channel



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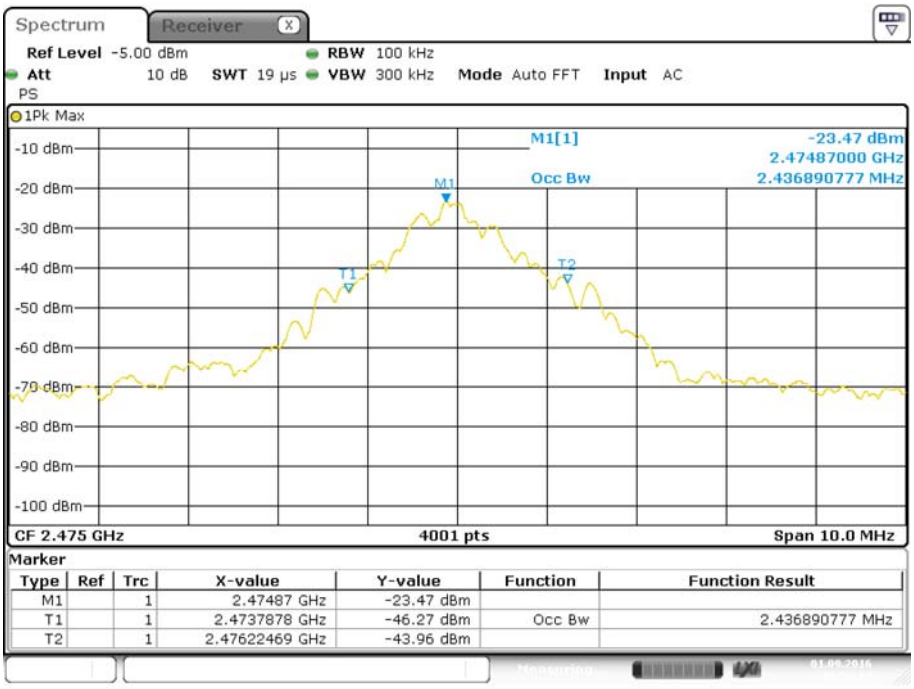
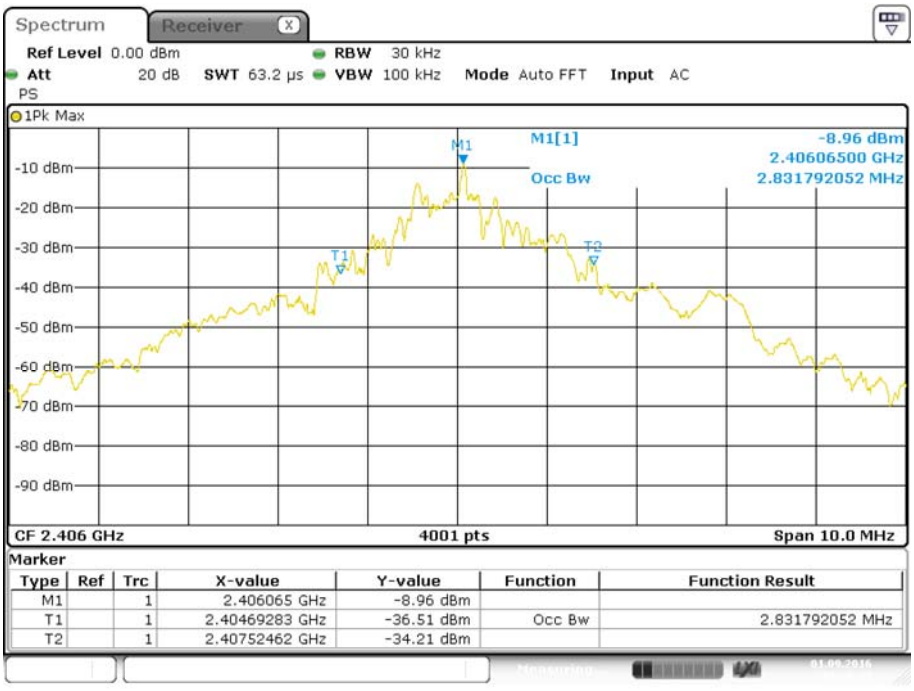


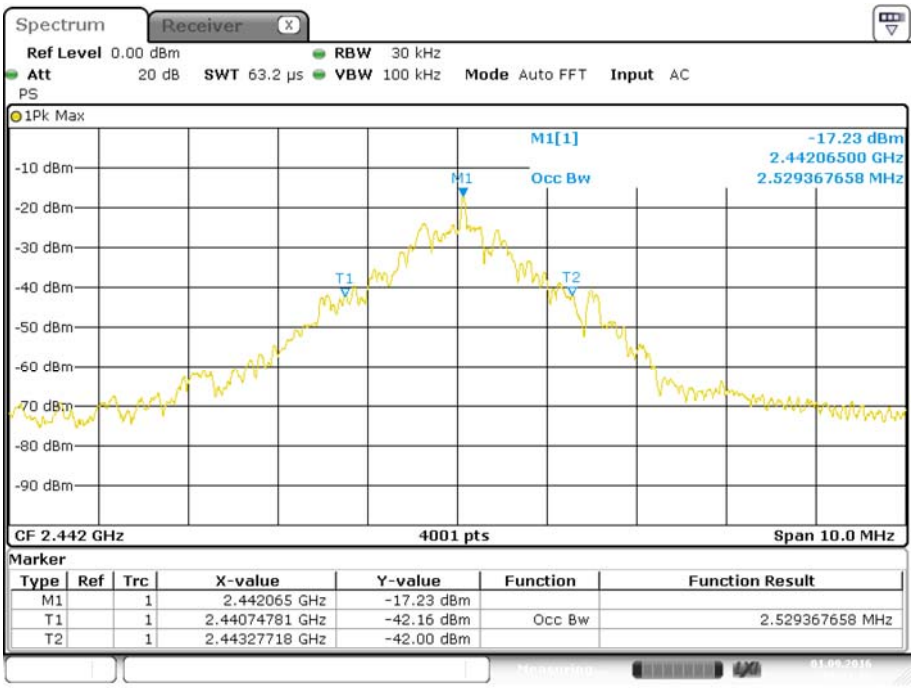
RSS-Gen 6.6

99% Bandwidth

Low Channel



Middle Channel



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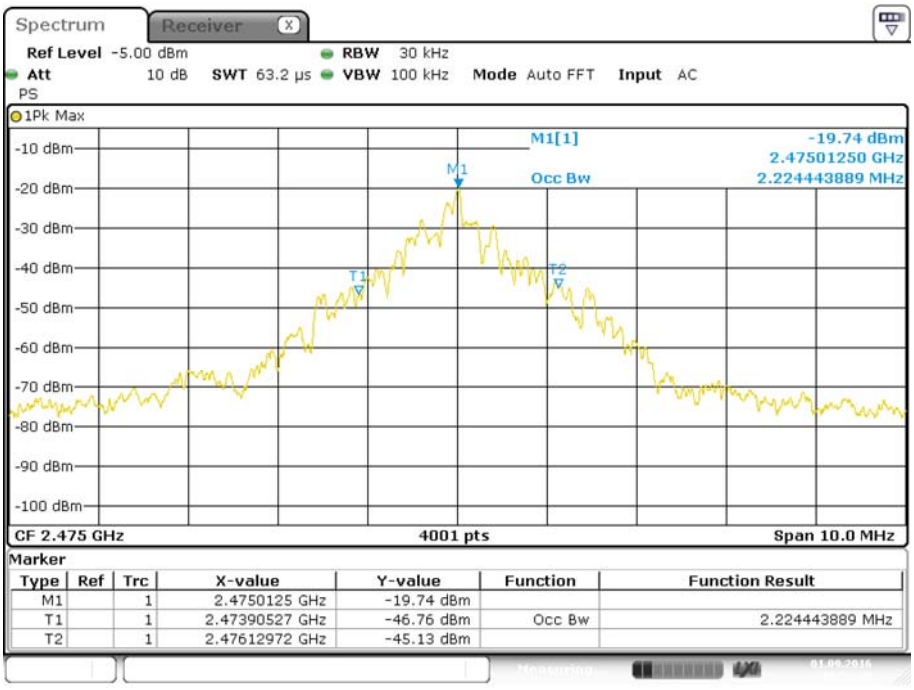

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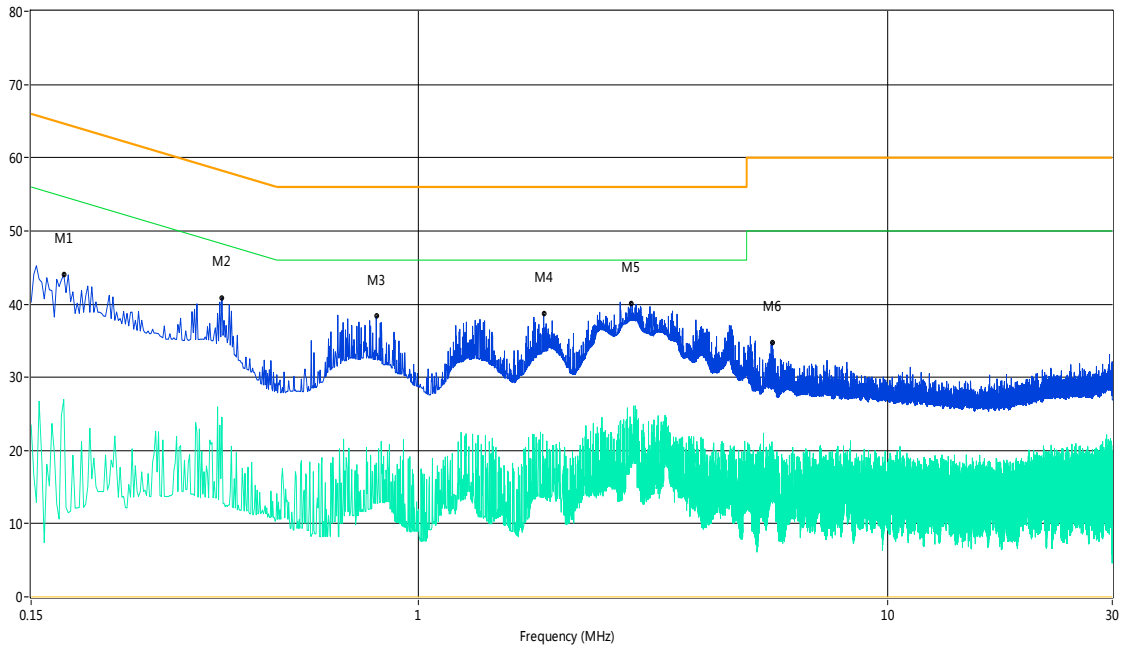
A.2 AC Conducted Emission

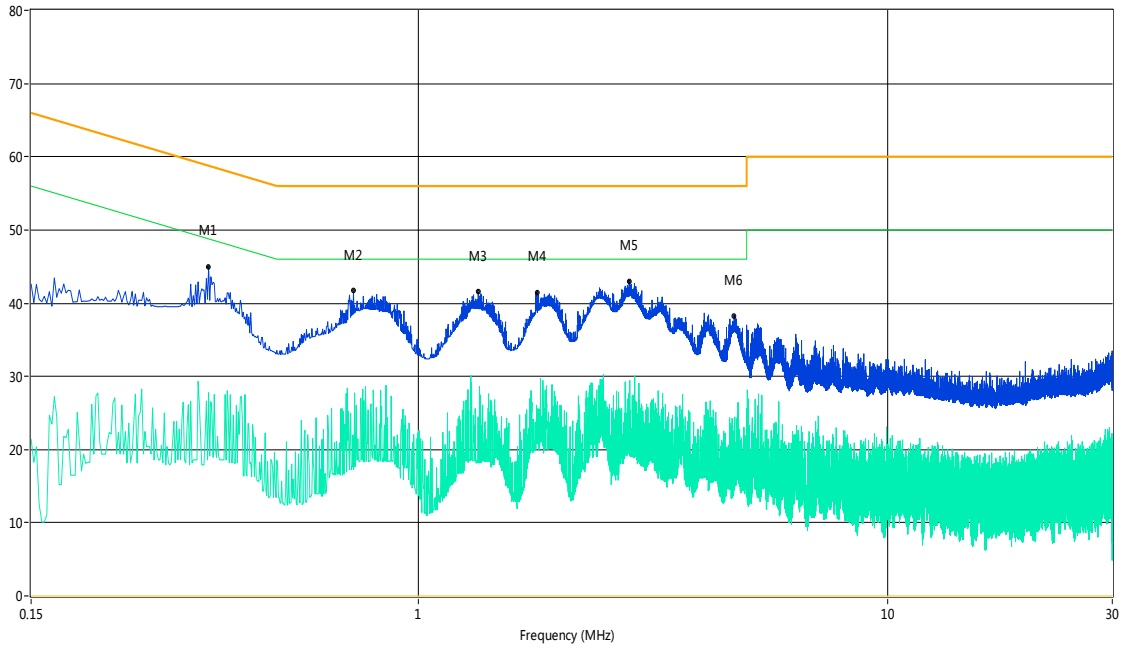
Note 1: The EUT is working in the Normal link mode.
Note 2: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 60 Hz and 240 VAC, 50 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration (120 VAC, 60 Hz) shown here.

PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.18	44.0	11.00	65.3	21.30	Peak	L Line	Pass
1**	0.18	27.0	11.00	55.3	28.30	AV	L Line	Pass
2	0.38	40.9	11.00	59.4	18.50	Peak	L Line	Pass
2**	0.38	24.6	11.00	49.4	24.80	AV	L Line	Pass
3	0.81	38.3	11.00	56.0	17.70	Peak	L Line	Pass
3**	0.81	18.3	11.00	46.0	27.70	AV	L Line	Pass
4	1.85	38.7	11.00	56.0	17.30	Peak	L Line	Pass
4**	1.85	8.4	11.00	46.0	37.60	AV	L Line	Pass
5	2.83	40.1	11.00	56.0	15.90	Peak	L Line	Pass
5**	2.83	12.3	11.00	46.0	33.70	AV	L Line	Pass
6	5.67	34.8	11.00	60.0	25.20	Peak	L Line	Pass
6**	5.67	16.4	11.00	50.0	33.60	AV	L Line	Pass

PHASE N

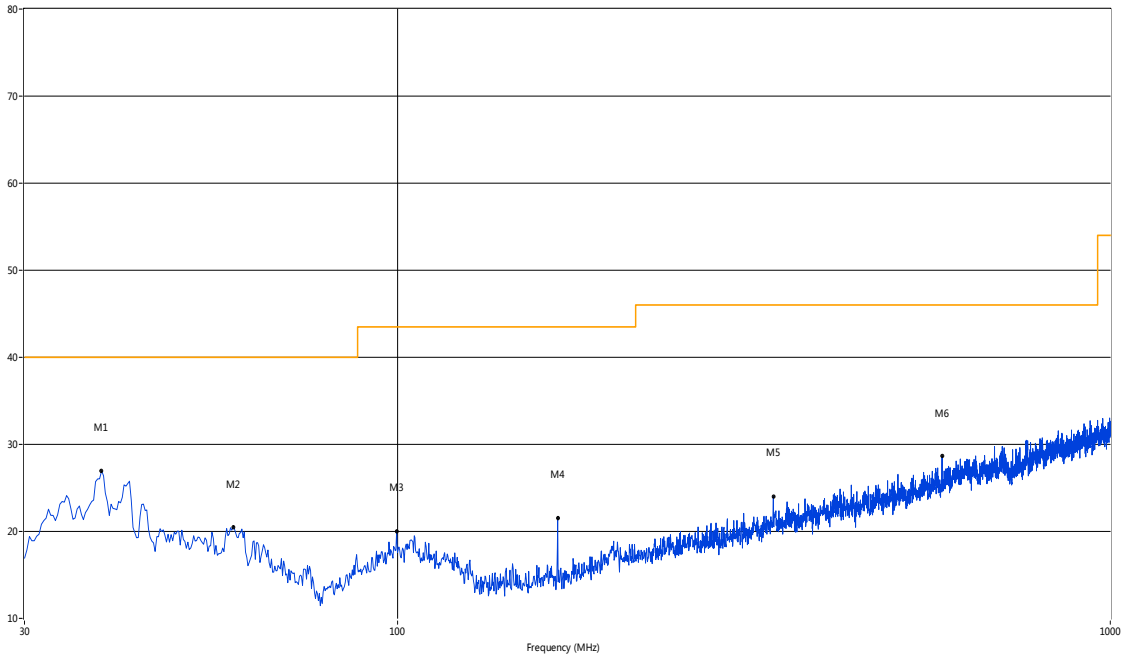


No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.36	45.0	11.00	60.1	15.10	Peak	N Line	Pass
1**	0.36	27.8	11.00	50.1	22.30	AV	N Line	Pass
2	0.73	41.7	11.00	56.0	14.30	Peak	N Line	Pass
2**	0.73	16.3	11.00	46.0	29.70	AV	N Line	Pass
3	1.34	41.6	11.00	56.0	14.40	Peak	N Line	Pass
3**	1.34	22.4	11.00	46.0	23.60	AV	N Line	Pass
4	1.79	41.5	11.00	56.0	14.50	Peak	N Line	Pass
4**	1.79	12.5	11.00	46.0	33.50	AV	N Line	Pass
5	2.81	43.0	11.00	56.0	13.00	Peak	N Line	Pass
5**	2.81	22.5	11.00	46.0	23.50	AV	N Line	Pass
6	4.70	38.3	11.00	56.0	17.70	Peak	N Line	Pass
6**	4.70	17.3	11.00	46.0	28.70	AV	N Line	Pass

A.3 Radiated Emission

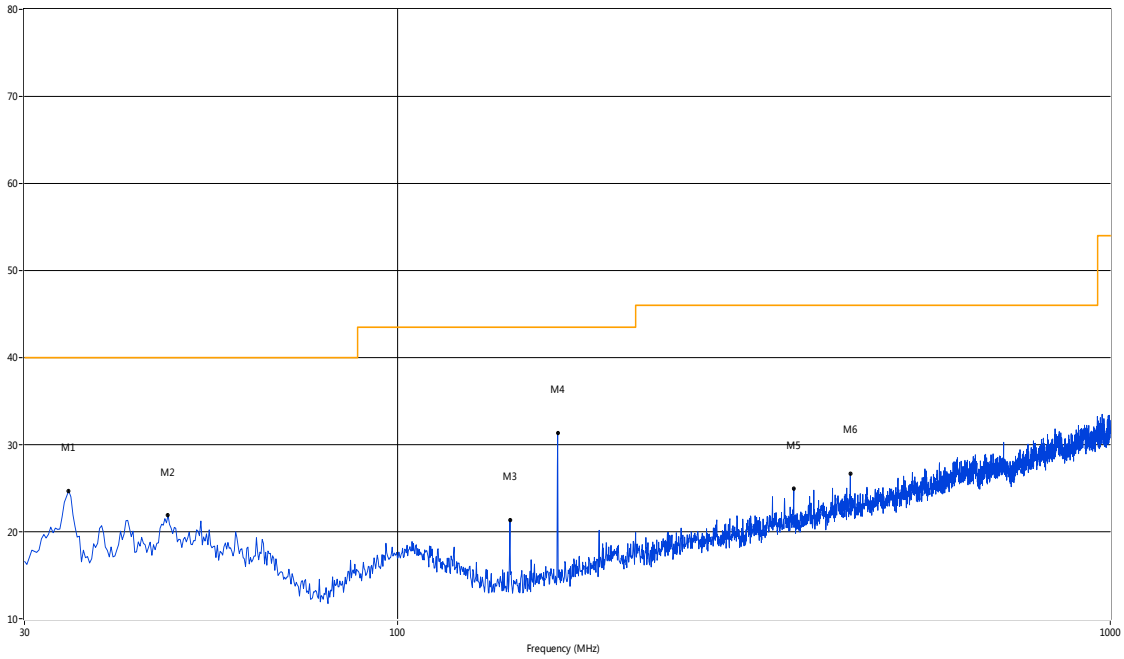
Note 1: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.
Note 2: The EUT is working in the Normal link mode below 1 GHz.

30 MHz to 1 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	38.49	26.97	-20.10	40.0	13.03	Peak	228.40	100	Vertical	Pass
2	58.85	20.47	-19.94	40.0	19.53	Peak	0.00	100	Vertical	Pass
3	99.82	20.04	-20.20	43.5	23.46	Peak	344.40	100	Vertical	Pass
4	167.95	21.55	-22.82	43.5	21.95	Peak	284.00	100	Vertical	Pass
5	336.93	24.04	-16.47	46.0	21.96	Peak	65.30	100	Vertical	Pass
6	580.82	28.64	-11.47	46.0	17.36	Peak	130.60	100	Vertical	Pass

30 MHz to 1 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	34.61	24.70	-21.38	40.0	15.30	Peak	244.20	100	Horizontal	Pass
2	47.70	21.90	-18.72	40.0	18.10	Peak	122.40	100	Horizontal	Pass
3	143.95	21.36	-23.56	43.5	22.14	Peak	20.60	100	Horizontal	Pass
4	167.95	31.38	-22.82	43.5	12.12	Peak	-0.00	100	Horizontal	Pass
5	359.96	24.99	-16.15	46.0	21.01	Peak	25.80	100	Horizontal	Pass
6	431.96	26.69	-14.65	46.0	19.31	Peak	-0.00	100	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.

Note 6: 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.

LOW CHANNEL 1 GHz to 25 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1355.91	41.34	-4.49	74	32.66	Peak	120.8	150	Vertical	Pass
2	1574.36	43.12	-4.44	74	30.89	Peak	118	150	Vertical	Pass
3	**2406.65**	91.60	1.92	114	22.4	Peak	321.70	150	Vertical	Pass[Note1]
3**	**2406.65**	N/A	1.92	94	N/A	AV	321.70	150	Vertical	Pass[Note6]
4**	4812.40	41.33	13.93	54	12.67	AV	241.20	150	Vertical	Pass
4	4812.40	59.73	13.93	74	14.27	Peak	241.20	150	Vertical	Pass
5	12087.35	41.42	9.08	74	32.58	Peak	144.2	150	Vertical	Pass
6	20836.94	45.24	9.71	74	28.77	Peak	9.5	150	Vertical	Pass

LOW CHANNEL 1 GHz to 25 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1019.98	41.91	-3.75	74	32.09	Peak	150.6	150	Horizontal	Pass
2	2518.48	47.38	1.51	74	26.62	Peak	147.5	150	Horizontal	Pass
3**	**2406.65**	N/A	1.92	94	N/A	AV	42.50	150	Horizontal	Pass[Note6]
3	**2406.65**	103.32	1.92	114	10.68	Peak	42.50	150	Horizontal	Pass[Note1]
4**	4811.75	41.16	13.91	54	12.84	AV	64.30	150	Horizontal	Pass
4	4811.75	60.14	13.91	74	13.86	Peak	64.30	150	Horizontal	Pass
5	15526.62	45.81	11.85	74	28.19	Peak	16.3	150	Horizontal	Pass
6	19419.30	43.00	12.82	74	31.00	Peak	286.7	150	Horizontal	Pass

Middle CHANNEL 1 GHz to 25 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (Db)	Limit (dBuV/m)	Margin (Db)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1277.43	43.34	-4.40	74	30.66	Peak	62	150	Vertical	Pass
2	1428.89	43.70	-4.36	74	30.30	Peak	301.7	150	Vertical	Pass
3	1684.83	43.10	-4.04	74	30.90	Peak	148.6	150	Vertical	Pass
4	**2441.64**	83.51	1.50	114	30.49	Peak	319.90	150	Vertical	Pass Note1
4**	**2441.64**	N/A	1.50	94	N/A	AV	319.90	150	Vertical	Pass Note6
5	15401.83	46.25	9.73	74	27.75	Peak	44.3	150	Vertical	Pass
6	23282.86	46.88	9.22	74	27.12	Peak	337.2	150	Vertical	Pass

Middle CHANNEL 1 GHz to 25 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1563.44	43.97	-1.96	74	30.03	Peak	18.4	150	Horizontal	Pass
2	2612.39	43.69	2.08	74	30.31	Peak	13.6	150	Horizontal	Pass
3	**2442.14**	89.57	1.50	114	24.43	Peak	58.80	150	Horizontal	Pass Note1
3**	**2442.14**	N/A	1.50	94	N/A	AV	58.80	150	Horizontal	Pass Note6
4	8583.20	45.59	19.00	74	28.41	Peak	58.8	150	Horizontal	Pass
5	13197.17	44.20	9.74	74	29.80	Peak	260	150	Horizontal	Pass
6	24840.27	45.60	11.78	74	28.40	Peak	296.5	150	Horizontal	Pass

High CHANNEL 1 GHz to 25 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1059.99	42.28	-6.01	74	31.72	Peak	198.6	150	Vertical	Pass
2	1544.86	39.37	-4.65	74	34.63	Peak	312.4	150	Vertical	Pass
3	**2475.13**	84.26	1.85	114	29.74	Peak	18.90	150	Vertical	Pass Note1
3**	**2475.13**	N/A	1.85	94	N/A	AV	18.90	150	Vertical	Pass Note6
4	7212.98	44.85	20.49	74	29.15	Peak	106.1	150	Vertical	Pass
5	17741.68	44.15	8.79	74	29.85	Peak	350	150	Vertical	Pass
6	24970.05	43.54	9.71	74	30.46	Peak	207.2	150	Vertical	Pass

High CHANNEL 1 GHz to 25 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1171.83	44.78	-2.02	74	29.22	Peak	282	150	Horizontal	Pass
2	2878.12	44.34	9.31	74	29.66	Peak	327.8	150	Horizontal	Pass
3	**2475.63**	85.67	1.88	114	28.33	Peak	52.60	150	Horizontal	Pass Note1
3**	**2475.63**	N/A	1.88	94	N/A	AV	52.60	150	Horizontal	Pass Note6
4	6965.89	43.51	13.87	74	30.49	Peak	272	150	Horizontal	Pass
5	13384.36	46.03	9.67	74	27.97	Peak	43.3	150	Horizontal	Pass
6	20797.01	47.46	12.05	74	26.54	Peak	244.3	150	Horizontal	Pass

A.4 Band Edge(Restricted-band band-edge)

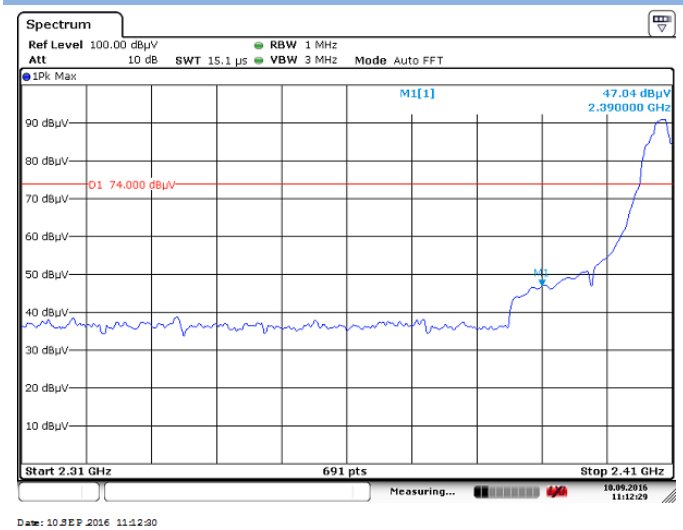
Test Data and Test Plots

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.

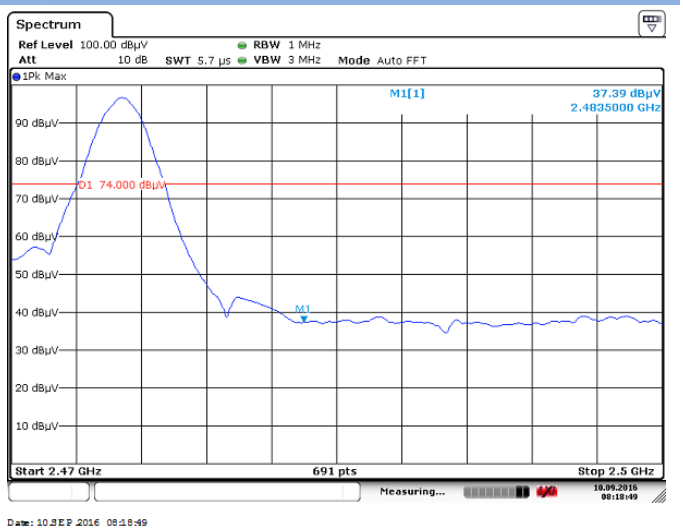
Note 2: According the ANSI C63.10-2013, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Test Mode	Test Channel	Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Remark	Verdict
GFSK	Low	2406	47.04	74	26.96	PEAK	Pass
		2406	N/A	54	N/A	AVERAGE	Pass[Note2]
GFSK	HIGH	2475	37.39	74	36.61	PEAK	Pass
		2475	N/A	54	N/A	AVERAGE	Pass[Note2]

LOW CHANNEL



High CHANNEL



ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ1680537-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ1680537-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ1680537-AI.PDF”.

--END OF REPORT--