FCC RF TEST REPORT

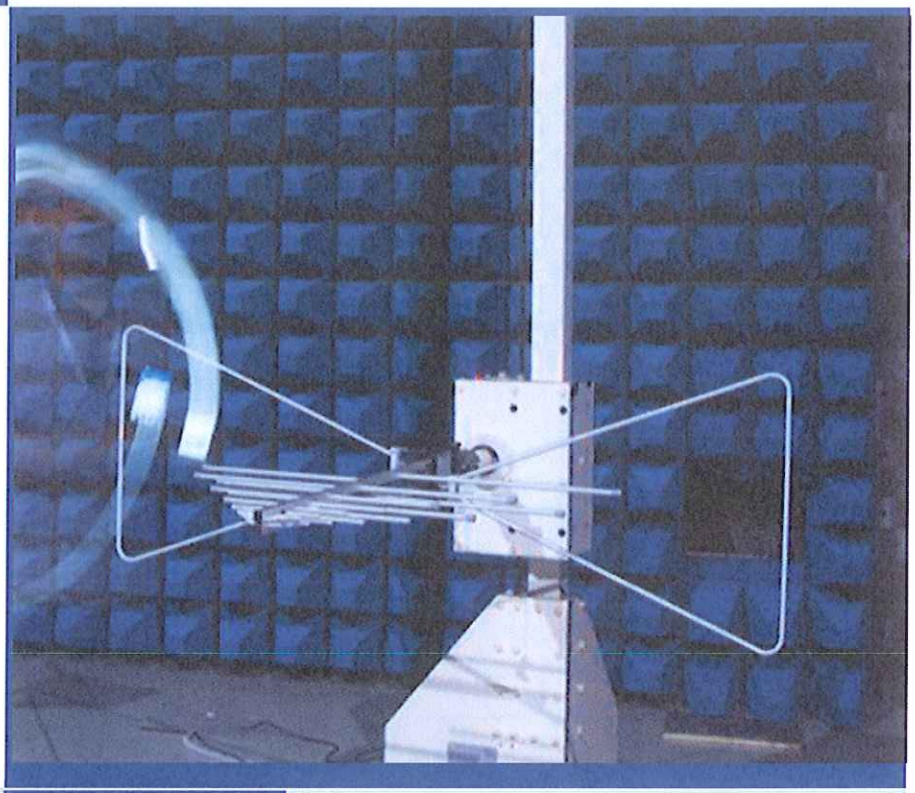
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

HP Tri-Mode Wireless Charging Pad

ISSUED TO
Neosen Energy LLC

1506 Capital Ave., Suite 150, Plano, TX, 75074



Tested by: Cao Shaodong
(Engineer)
Date Feb. 23, 2016

Approved by: Wei Yanquan
(Chief Engineer)
Date Feb. 23, 2016

Report No.:	BL-SZ15A0079-603
EUT Type:	HP Tri-Mode Wireless Charging Pad
Model Name:	NEO-031-1-1-3-5-2HP, NEO-032-1-1-3-5-2HP
Brand Name:	HP
Test Standard:	FCC Part 15 C
FCC ID:	2AF633211352HP
Test conclusion:	Pass
Test Date:	Feb. 2, 2016 ~ Feb. 18, 2016
Date of Issue:	Feb. 23, 2016

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Revision History

Version	Issue Date	Revisions
Rev. 01	Feb. 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 v1.1.

(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

Applicant	Neosen Energy LLC
Address	1506 Capital Ave., Suite 150, Plano, TX, 75074

2.2 Manufacturer

Manufacturer	Surface Mount Technology Ltd.
Address	12/F, Wyler Centre Phase 2, 200 Tai Lin Pai Road, Kwai Chung, NT, HKSAR.

2.3 Factory Information

Factory	Dongguan Superior Manufacturing Technology Co., Ltd
Address	No.1, 14 Hong Ye Road North, Tangxia Town, Dongguan, Guangdong Province, PR China 523710

2.4 General Description for Equipment under Test (EUT)

EUT Type	HP Tri-Mode Wireless Charging Pad
Model Name Under Test	NEO-031-1-1-3-5-2HP
Series Model Name	NEO-031-1-1-3-5-2HP, NEO-032-1-1-3-5-2HP
Hardware Version	3.0
Software Version	4.0
Network and Wireless connectivity	Qi, PMA, A4WP, BLE(Bluetooth Low Energy)
About the Product	Only the BLE (Bluetooth Low Energy) was tested in this report.

2.5 Ancillary Equipment

Ancillary Equipment 1	Charger	
	Brand Name	N/A
	Model No.	WAE009
	Serial No.	N/A
	Rated Input	100-240 V~, 0.6 A, 50/60 Hz
	Rated Output	12 V⎓,1.5 A

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
Transfer Rate	1 Mbps
Frequency Range	The frequency range used is 2402 MHz – 2480 MHz; The frequency block is 2400 MHz to 2483.5 MHz.
Number of channel	40 (at intervals of 2 MHz)
Tested Channel	0 (2402 MHz), 19 (2440 MHz), 39 (2480 MHz).
Antenna Type	Mono-pole Antenna
Antenna Gain	-1.4 dBi
About the Product	The equipment is wireless charger, it contains Bluetooth module operating at 2.4 GHz ISM band.

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C (10-1-14 Edition)	Miscellaneous Wireless Communications Services
2	KDB Publication 558074 D01v03r03	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247
3	ANSI C63.4-2014	American National Standard for Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
4	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

3.2 Verdict

No.	Description	FCC Part No.	Test Result	Verdict
1	Antenna Requirement	15.203 15.247(b)	Note 1	Pass
2	Output Power	15.247(b)	ANNEX A.1	Pass
3	6 dB Bandwidth	15.247(a)	ANNEX A.2	Pass
4	Conducted Spurious Emission	15.247(d)	ANNEX A.3	Pass
5	Conducted Emission	15.207	ANNEX A.4	Pass
6	Radiated Spurious Emission	15.209 15.247(d)	ANNEX A.5	Pass
7	Band Edge	15.209 15.247(d)	ANNEX A.6	Pass
8	Power spectral density (PSD)	15.247(e)	ANNEX A.7	Pass
Note 1: Please refer to section 5.1 Note 2: The EUT'S Bluetooth Low Energy Module had done full approve ID certification (FCC ID: SQK-7BLZXX) which in the report of 10101498H-A-R1, So only Conducted Emission, Radiated Spurious Emission and Band Edge was test in this report, The other test items please reference from original test report: 1010498H-A-R1 issued by UL Japan, Inc. Head Office EMC Lab. (NVLAP LAB CODE 200572-0) on November 21, 2013.				

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)	AC 110 V/ 60 Hz

4.2 Test Equipment List

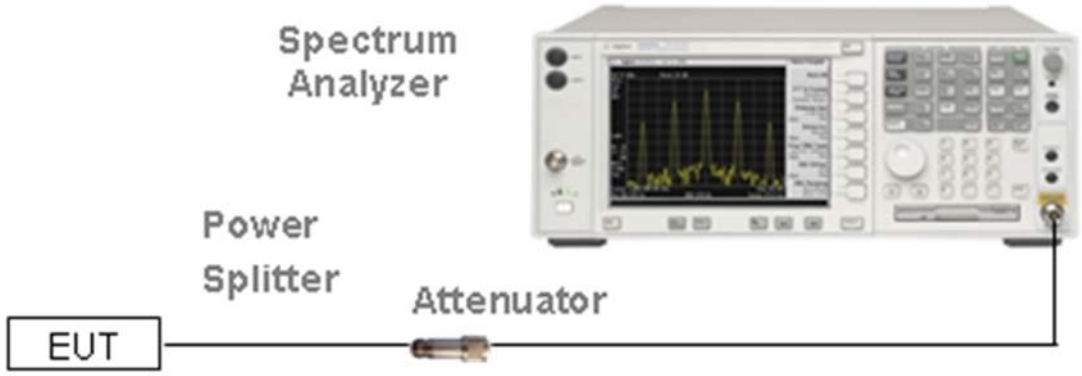
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2015.07.16	2016.07.15
Vector Signal Generator	ROHDE&SCHWARZ	SMBV100A	177746	2015.07.16	2016.07.15
Signal Generator	ROHDE&SCHWARZ	SMB100A	260592	2015.07.01	2016.06.30
Switch Unit with OSP-B157	ROHDE&SCHWARZ	OSP120	101270	2015.07.16	2016.07.15
Spectrum Analyzer	AGILENT	E4440A	MY45304434	2015.10.15	2016.10.14
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2015.07.14	2016.07.13
LISN	SCHWARZBECK	NSLK 8127	8127-687	2015.07.14	2016.07.13
Bluetooth Tester	ROHDE&SCHWARZ	CBT	101005	2015.07.16	2016.07.15
Power Splitter	KMW	DCPD-LDC	1305003215	2015.07.01	2016.06.30
Power Sensor	ROHDE&SCHWARZ	NRP-Z21	103971	2015.07.21	2016.07.20
Attenuator (20 dB)	KMW	ZA-S1-201	110617091	--	--
Attenuator (6 dB)	KMW	ZA-S1-61	1305003189	--	--
DC Power Supply	ROHDE&SCHWARZ	HMP2020	018141664	2015.07.17	2016.07.16
Temperature Chamber	ANGELANTIONI SCIENCE	NTH64-40A	1310	2015.08.07	2016.08.06
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	2016.02.27
Shielded Enclosure	ChangNing	CN-130701	130703	--	--

4.3 Test Configurations

Test Configurations (TC) NO.	Description	
	Signal Description	Operating Frequency
Transmitter		
TC01	FHSS modulation, GFSK	Ch No. 0/ 2402 MHz
TC02	FHSS modulation, GFSK	Ch No. 19/ 2440 MHz
TC03	FHSS modulation, GFSK	Ch No. 39/ 2480 MHz

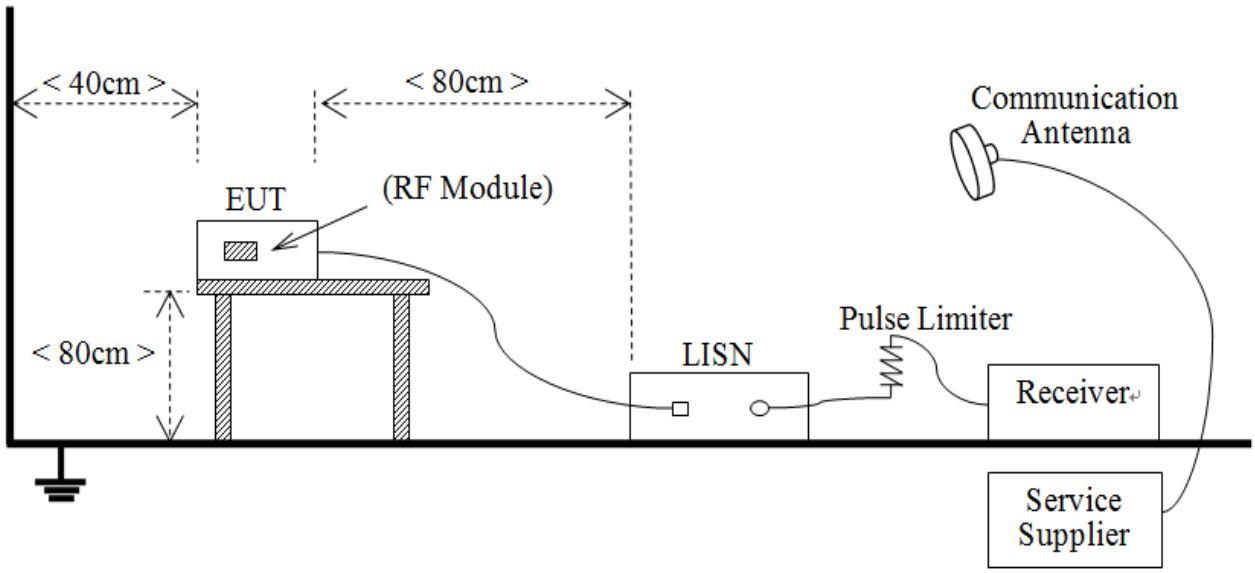
4.4 Description of Test Setup

4.4.1 For Antenna Port Test



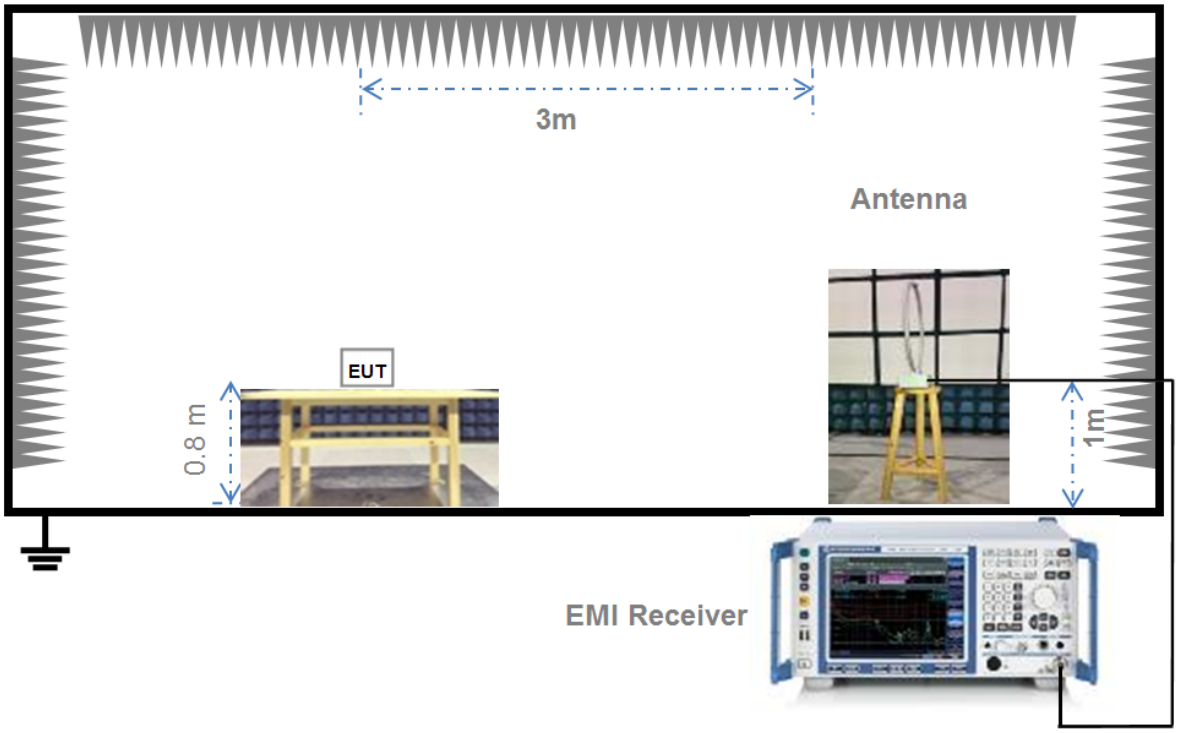
(Diagram 1)

4.4.2 For AC Power Supply Port Test



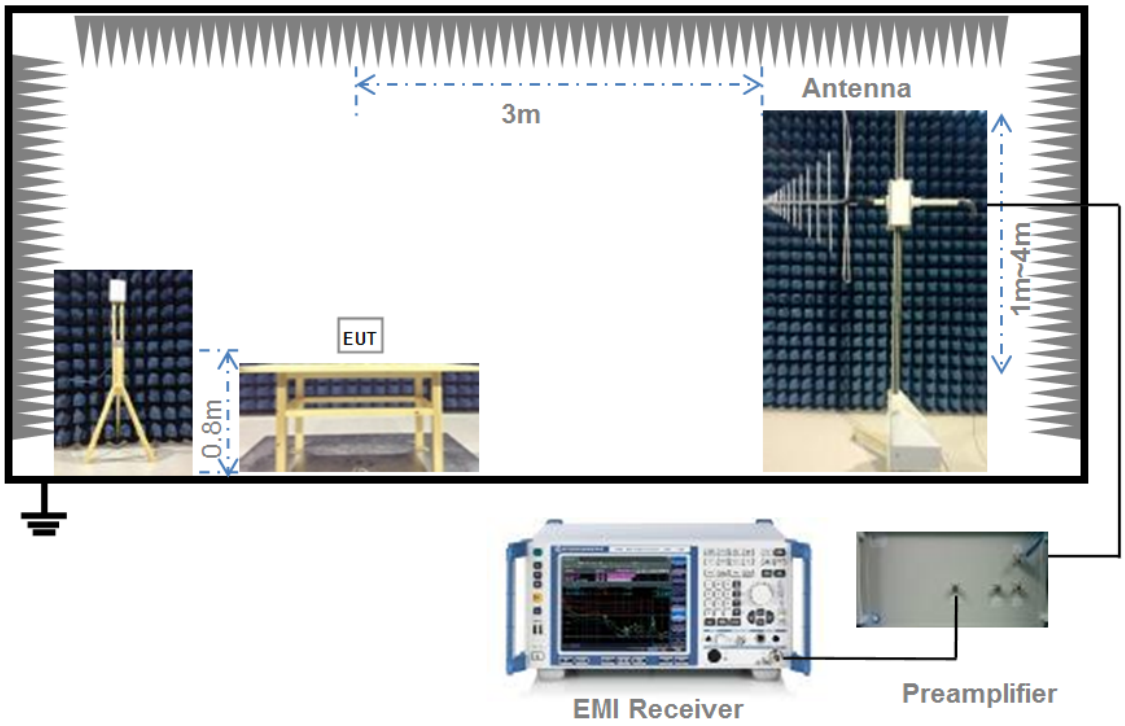
(Diagram 2)

4.4.3 For Radiated Test (Below 30 MHz)



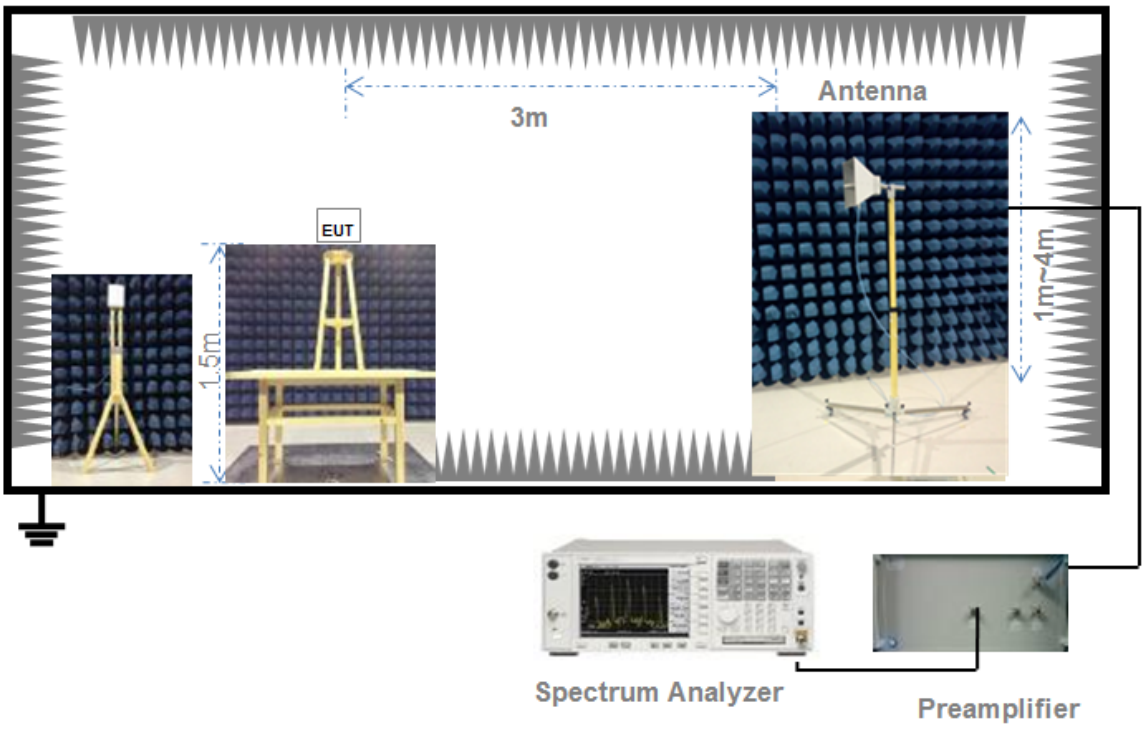
(Diagram 3)

4.4.4 For Radiated Test (30 MHz-1 GHz)



(Diagram 4)

4.4.5 For Radiated Test (Above 1 GHz)



(Diagram 5)

4.5 Test Conditions

Test Case	Test Conditions		
	Test Env.	Test Setup Note 1	Test Configuration Note 2
Peak Output Power	NTNV	Test Setup 1	TC01~TC03
Occupied Bandwidth	NTNV	Test Setup 1	TC01~TC03
Conducted Spurious Emission	NTNV	Test Setup 1	TC01~TC03
Conducted Emission	NTNV	Test Setup 2	TC01~TC03
Radiated Spurious Emission	NTNV	Test Setup 3 Test Setup 4 Test Setup 5	TC01~TC03
Band Edge	NTNV	Test Setup 1	TC01, TC03
Power spectral density (PSD)	NTNV	Test Setup 2	TC01~TC03
Note: 1. Please refer to section 4.4 for test setup details. 2. Please refer to section 4.3 for test configuration details.			

5 TEST ITEMS

5.1 Antenna Requirements

5.1.1 Standard Applicable

FCC §15.203 & 15.247(b)

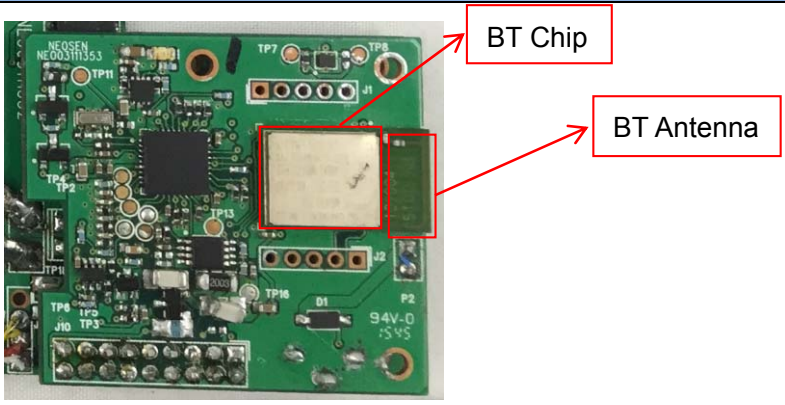
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply 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 Output Power

5.2.1 Test Limit

FCC § 15.247(b)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements.

5.2.2 Test Setup

See section 4.4.1 (Diagram 1)for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.2.3 Test Procedure

Maximum peak conducted output power

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

Set the RBW ≥ DTS bandwidth.

Set VBW ≥ 3 x RBW.

Set span ≥ 3 x RBW

Sweep time = auto couple.

Detector = peak.

Trace mode = max hold.

Allow trace to fully stabilize.

Use peak marker function to determine the peak amplitude level.

Measurements of duty cycle

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal.

Set the center frequency of the instrument to the center frequency of the transmission.

Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value.

Set VBW ≥ RBW. Set detector = peak or average.

The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)

5.2.4 Test Result

Please refer to ANNEX A.1.

5.3 6 dB Bandwidth

5.3.1 Limit

FCC §15.247(a)

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.

5.3.2 Test Setup

See section 4.4.1(Diagram 1) for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.3.3 Test Procedure

Use the following spectrum analyzer settings:

Set RBW = 100 kHz.

Set the video bandwidth (VBW) ≥ 3 RBW.

Detector = Peak.

Trace mode = max hold.

Sweep = auto couple.

Allow the trace to stabilize.

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.3.4 Test Result

Please refer to ANNEX A.2.

5.4 Conducted Spurious Emission

5.4.1 Limit

FCC §15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.4.2 Test Setup

See section 4.4.1(Diagram 1) for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

The DTS rules specify that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

a) If the maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

b) If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).

c) In either case, attenuation to levels below the 15.209 general radiated emissions limits is not required.

The following procedures shall be used to demonstrate compliance to these limits. Note that these procedures can be used in either an antenna-port conducted or radiated test set-up. Radiated tests must conform to the test site requirements and utilize maximization procedures defined herein.

Reference level measurement

Establish a reference level by using the following procedure:

Set instrument center frequency to DTS channel center frequency.

Set the span to ≥ 1.5 times the DTS bandwidth.

Set the RBW = 100 kHz.

Set the VBW ≥ 3 x RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum PSD level.

Emission level measurement

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

Set the RBW = 100 kHz.

Set the VBW ≥ 3 x RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in 11.1 a) or 11.1 b). Report the three highest emissions relative to the limit.

5.4.4 Test Result

Please refer to ANNEX A.3.

5.5 Conducted Emission

5.5.1 Limit

FCC §15.207

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 50 μH/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

5.5.2 Test Setup

See section 4.4.2 (Diagram 2) for test setup description for the AC power supply port. The photo of test setup please refer to ANNEX B.

5.5.3 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. Refer to recorded points and plots below.

5.5.4 Test Result

Please refer to ANNEX A.4.

5.6 Radiated Spurious Emission

5.6.1 Limit

FCC §15.209&15.247(d)

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).

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: 54 dBuV/m@3m (AV) and 74 dBuV/m@3m (PK).

5.6.2 Test Setup

See section 4.4.3~4.4.5 (Diagram 3, 4, 5) for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.6.3 Test Procedure

The measurement frequency range is from 30MHz 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

5.7 Band Edge

5.7.1 Limit

FCC §15.209&15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.7.2 Test Setup

See section 4.4.5 (Diagram 5) for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.7.3 Test Procedure

The following procedures may be used to determine the peak or average field strength or power of an unwanted emission that is within 2 MHz of the authorized band edge. If a peak detector is utilized, use the procedure described in 13.2.1. Use the procedure described in 13.2.2 when using an average detector and the EUT can be configured to transmit continuously (i.e., duty cycle ≥ 98%). Use the procedure described in 13.2.3 when using an average detector and the EUT cannot be configured to transmit continuously but the duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent). Use the procedure described in 13.2.4 when using an average detector for those cases where the EUT cannot be configured to transmit continuously and the duty cycle is not constant (duty cycle variations equal or exceed 2 percent).

When using a peak detector to measure unwanted emissions at or near the band edge (within 2 MHz of the authorized band), the following integration procedure can be used.

Set instrument center frequency to the frequency of the emission to be measured (must be within 2 MHz of the authorized band edge).

Set span to 2 MHz

RBW = 100 kHz.

VBW ≥ 3 x RBW.

Detector = peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweep to continue until the trace stabilizes (required measurement time may increase for low duty cycle applications)

Compute the power by integrating the spectrum over 1 MHz using the analyzer's band power measurement function with band limits set equal to the emission frequency (femission) ± 0.5 MHz. If the instrument does not have a band power function, then sum the amplitude levels (in power units) at 100 kHz intervals extending across the 1 MHz spectrum defined by femission ± 0.5 MHz.

5.7.4 Test Result

Please refer to ANNEX A.6.

5.8 Power Spectral density (PSD)

5.8.1 Limit

FCC §15.247(e)

The same method of determining the conducted output power shall be used to determine the power spectral density. If a peak output power is measured, then a peak power spectral density measurement is required. If an average output power is measured, then an average power spectral density measurement should be used.

5.8.2 Test Setup

See section 4.4.1 (Diagram 1) for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.8.3 Test Procedure

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.

Set the VBW ≥ 3 RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.8.4 Test Result

Please refer to ANNEX A.7.

ANNEX A TEST RESULT

A.1 Output Power

The Output Power measurement result reference from original test report: 10101498H-A-R1 issued by UL Japan, Inc. on Nov 21, 2013, **APPENDIX 1: Date of EMI test Maximum Peak Output Power.**

A.2 6dB Bandwidth

The 6dB Bandwidth measurement result reference from original test report: 10101498H-A-R1 issued by UL Japan, Inc. on Nov 21, 2013, **APPENDIX 1: Date of EMI test 6dB Bandwidth.**

A.3 Conducted Spurious Emissions

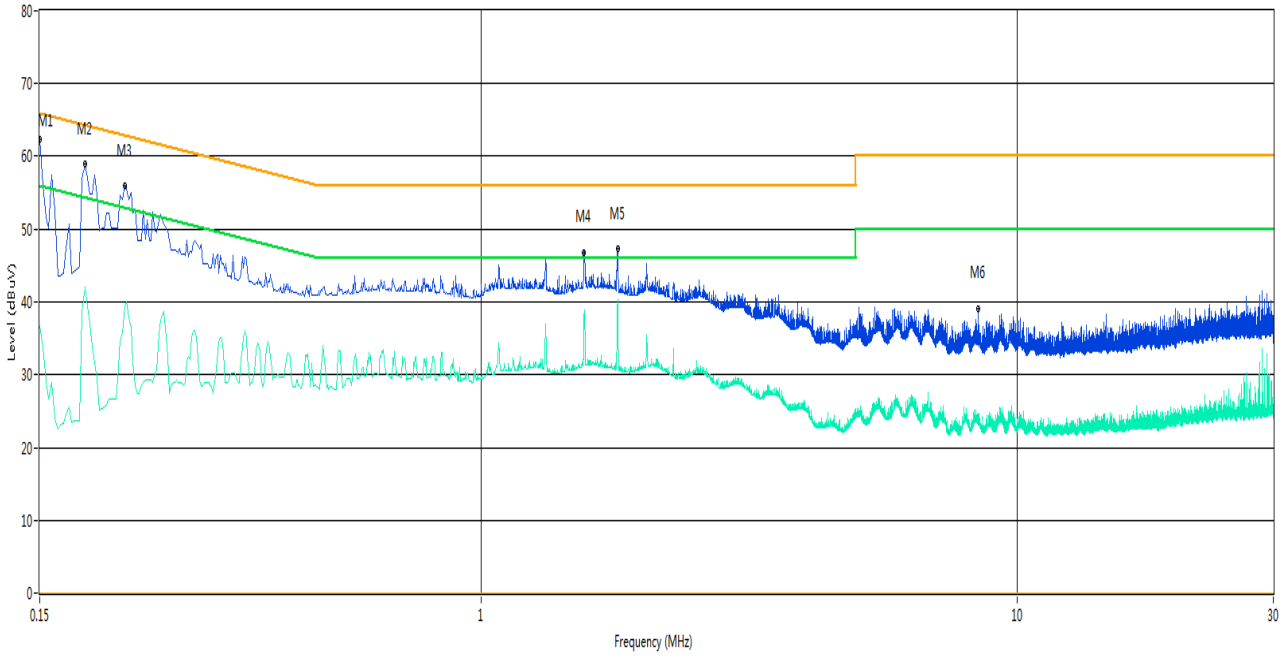
The Conducted Spurious Emissions measurement result reference from original test report: 10101498H-A-R1 issued by UL Japan, Inc. on Nov 21, 2013, **APPENDIX 1: Date of EMI test Conducted Spurious Emission.**

A.4 Conducted Emissions

Note: All configurations have been tested, only the worst configuration (High Channel) shown here.

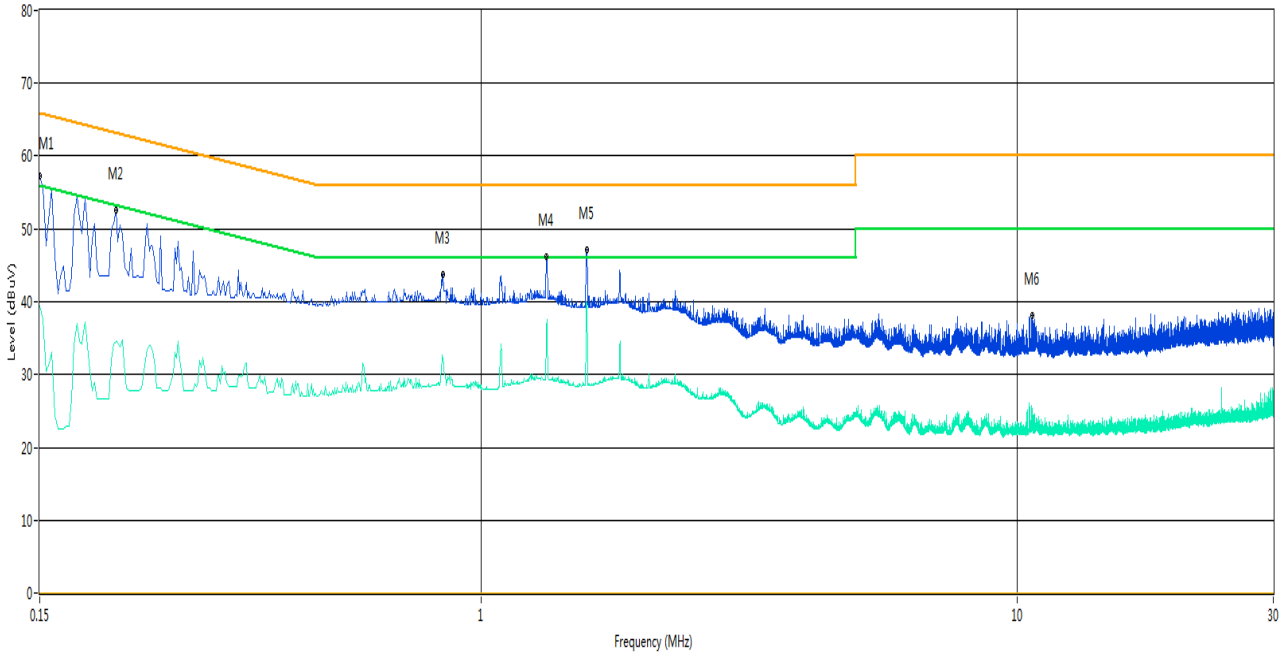
Test Data and Test Plots

PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.15	62.3	0.00	66.0	3.70	Peak	L Line	PASS
1**	0.15	36.6	0.00	56.0	19.40	AV	L Line	PASS
2	0.18	58.9	0.00	65.1	6.20	Peak	L Line	PASS
2**	0.18	42.0	0.00	55.1	13.10	AV	L Line	PASS
3	0.22	55.9	0.00	64.1	8.20	Peak	L Line	PASS
3**	0.22	39.5	0.00	54.1	14.60	AV	L Line	PASS
4	1.55	46.8	0.00	56.0	9.20	Peak	L Line	PASS
4**	1.55	37.7	0.00	46.0	8.30	AV	L Line	PASS
5	1.80	47.3	0.00	56.0	8.70	Peak	L Line	PASS
5**	1.80	40.5	0.00	46.0	5.50	AV	L Line	PASS
6	8.45	39.0	0.00	60.0	21.00	Peak	L Line	PASS
6**	8.45	24.6	0.00	50.0	25.40	AV	L Line	PASS

PHASE N



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.15	57.3	13.00	66.0	8.70	Peak	N Line	PASS
1**	0.15	39.5	13.00	56.0	16.50	AV	N Line	PASS
2	0.21	52.6	13.00	64.3	11.70	Peak	N Line	PASS
2**	0.21	34.5	13.00	54.3	19.80	AV	N Line	PASS
3	0.85	43.7	13.00	56.0	12.30	Peak	N Line	PASS
3**	0.85	32.3	13.00	46.0	13.70	AV	N Line	PASS
4	1.32	46.1	13.00	56.0	9.90	Peak	N Line	PASS
4**	1.32	36.4	13.00	46.0	9.60	AV	N Line	PASS
5	1.57	47.1	13.00	56.0	8.90	Peak	N Line	PASS
5**	1.57	39.8	13.00	46.0	6.20	AV	N Line	PASS
6	10.67	38.1	13.00	60.0	21.90	Peak	N Line	PASS
6**	10.67	25.3	13.00	50.0	24.70	AV	N Line	PASS

A.5 Radiated Spurious Emission

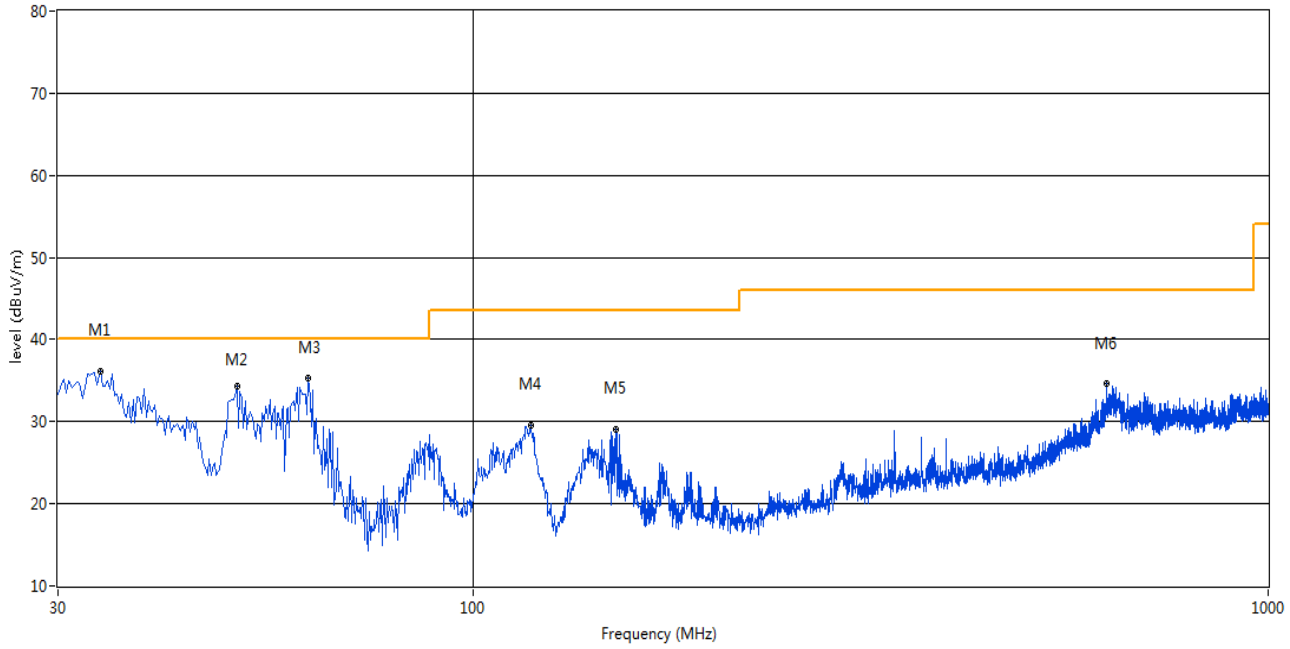
Note 1: The symbol of "--" in the table which means not application.

Note 2: For the test data above 1 GHz，According the ANSI C63.4-2014, 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.

Note 3: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

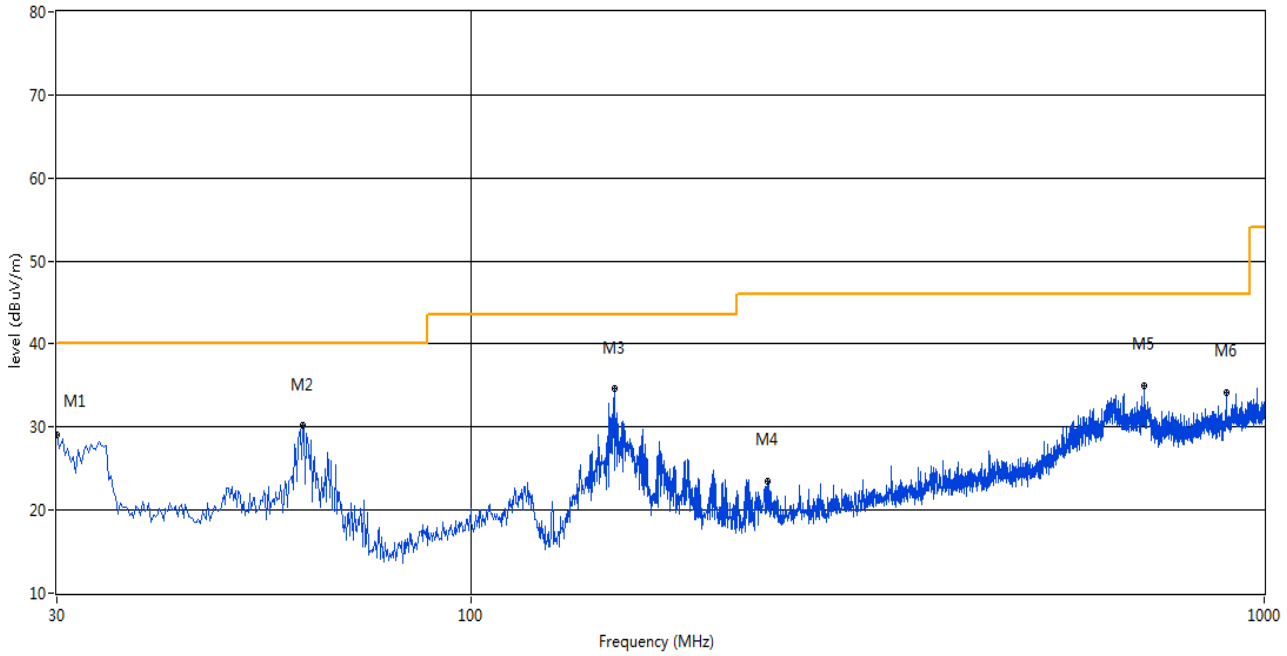
Note 4: All configurations have been tested, only the worst configuration (GFSK High Channel) shown here.

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	33.88	36.20	-21.72	40.0	3.80	Peak	142.00	100	Vertical	Pass
2	50.37	34.30	-18.74	40.0	5.70	Peak	24.00	100	Vertical	Pass
3	62.00	35.24	-20.38	40.0	4.76	Peak	147.00	100	Vertical	Pass
4	118.00	29.60	-21.44	43.5	13.90	Peak	123.00	100	Vertical	Pass
5	150.98	29.04	-23.51	43.5	14.46	Peak	12.00	100	Vertical	Pass
6	627.13	34.61	-10.25	46.0	11.39	Peak	318.00	100	Vertical	Pass

30 MHz to GHz, ANT H

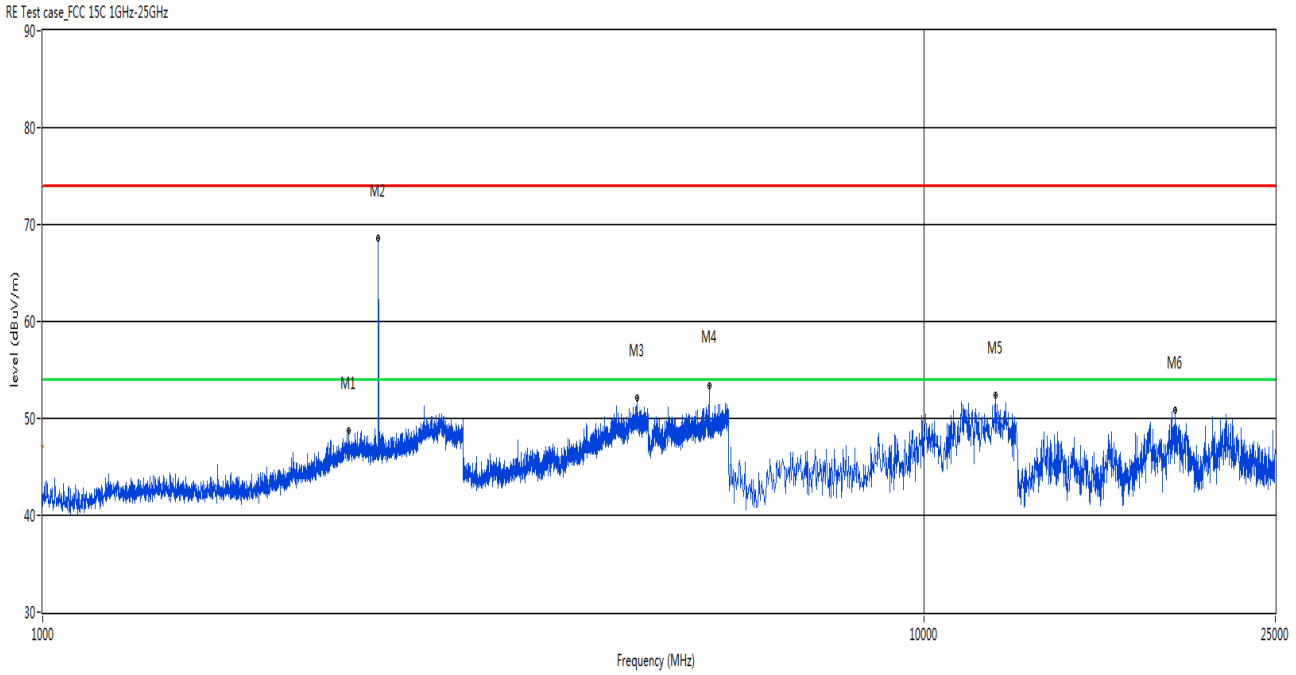


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	30.00	29.03	-21.72	40.0	10.97	Peak	352.00	100	Horizontal	Pass
2	61.27	30.19	-20.32	40.0	9.81	Peak	323.00	100	Horizontal	Pass
3	151.71	34.63	-23.48	43.5	8.87	Peak	99.00	100	Horizontal	Pass
4	236.07	23.53	-19.30	46.0	22.47	Peak	308.00	100	Horizontal	Pass
5	704.95	35.05	-8.90	46.0	10.95	Peak	290.00	100	Horizontal	Pass
6	895.02	34.18	-5.74	46.0	11.82	Peak	259.00	100	Horizontal	Pass

Note: The marked spikes near 2400 MHz with circle should be ignored because they are Fundamental signal.

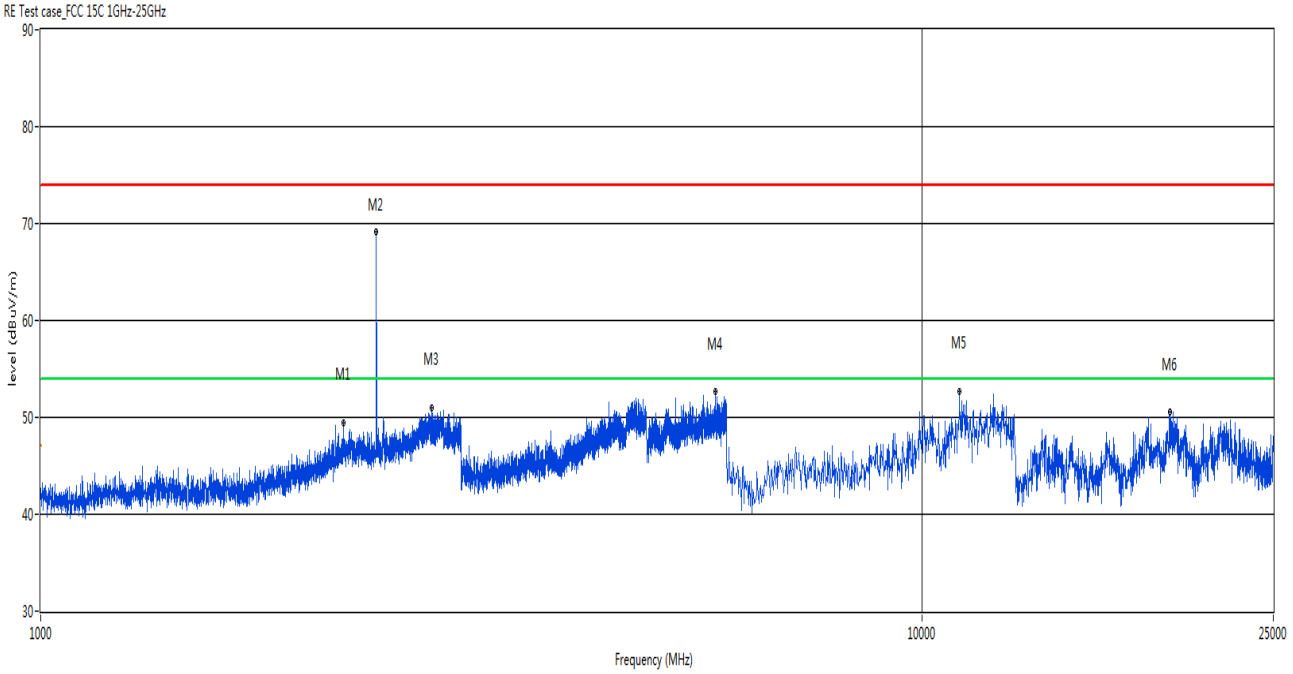
Test Data and Plots(1GHz ~ 10th Harmonic)

LOW CHANNEL 1 GHz to 25 GHz, ANT V



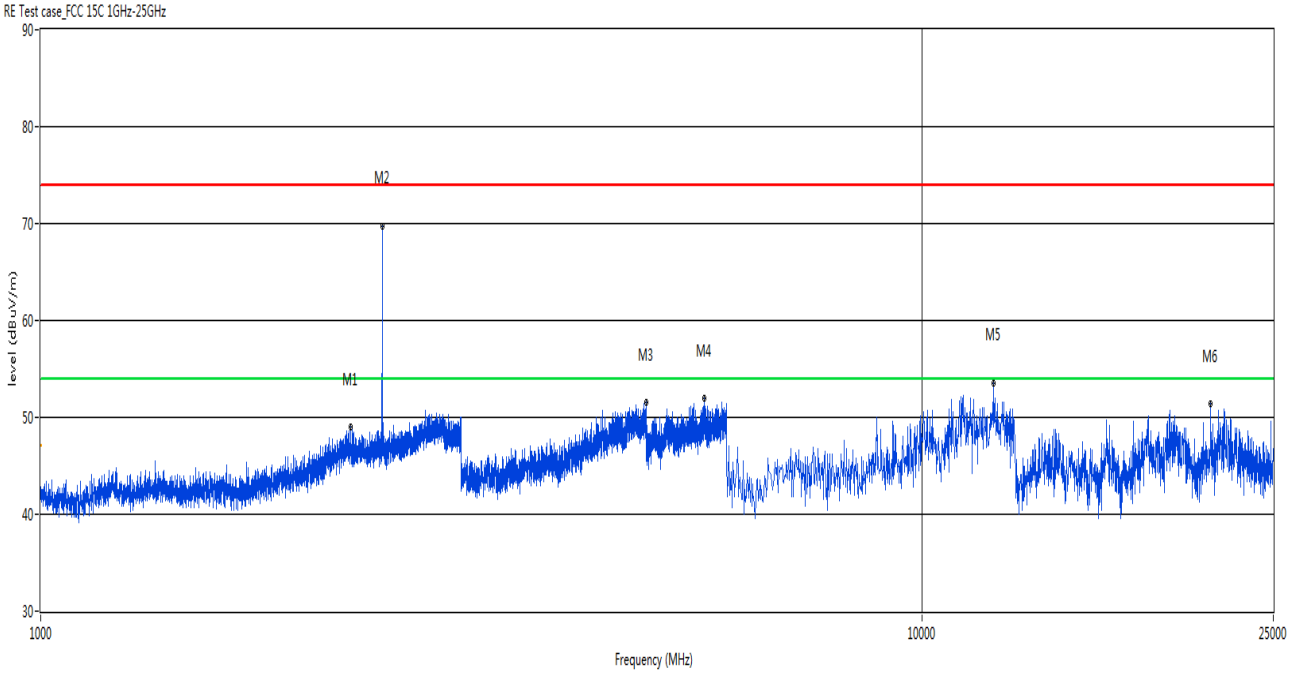
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2222.19	48.68	-0.30	74.0	25.32	Peak	86.20	100	Vertical	Pass
2	2402.15	68.58	-0.34	74.0	5.42	Peak	207.50	100	Vertical	Pass
3	4717.82	52.06	13.53	74.0	21.94	Peak	0.80	100	Vertical	Pass
4	5700.82	53.35	15.15	74.0	20.65	Peak	111.30	100	Vertical	Pass
5	12053.66	52.39	20.82	74.0	21.61	Peak	205.80	100	Vertical	Pass
6	19239.60	50.83	13.88	74.0	23.17	Peak	265.20	100	Vertical	Pass

LOW CHANNEL 1 GHz to 25 GHz, ANT H



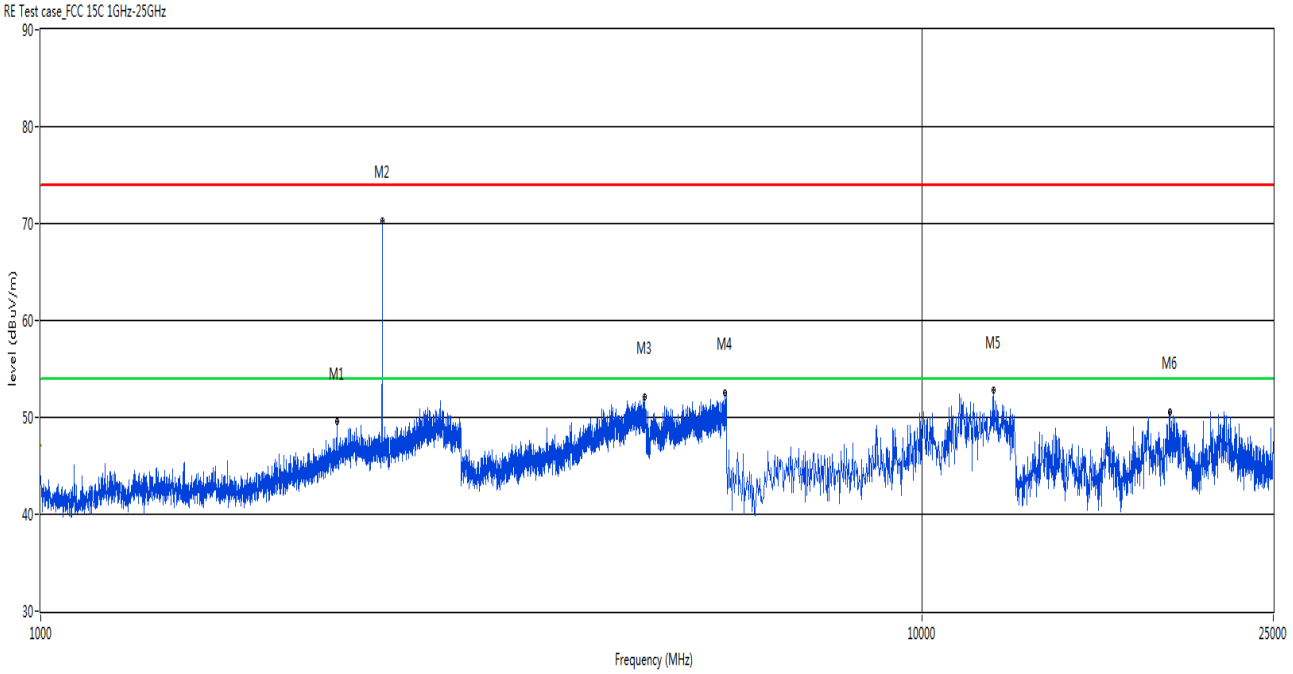
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2203.70	49.46	-0.40	74.0	24.54	Peak	102.30	100	Horizontal	Pass
2	2402.65	69.17	-0.26	74.0	4.83	Peak	197.40	100	Horizontal	Pass
3	2776.56	51.00	1.47	74.0	23.00	Peak	207.80	100	Horizontal	Pass
4	5818.55	52.66	15.51	74.0	21.34	Peak	126.90	100	Horizontal	Pass
5	11020.38	52.70	20.14	74.0	21.30	Peak	285.90	100	Horizontal	Pass
6	19079.87	50.51	13.68	74.0	23.49	Peak	206.30	100	Horizontal	Pass

LOW CHANNEL 1 GHz to 25 GHz, ANT V



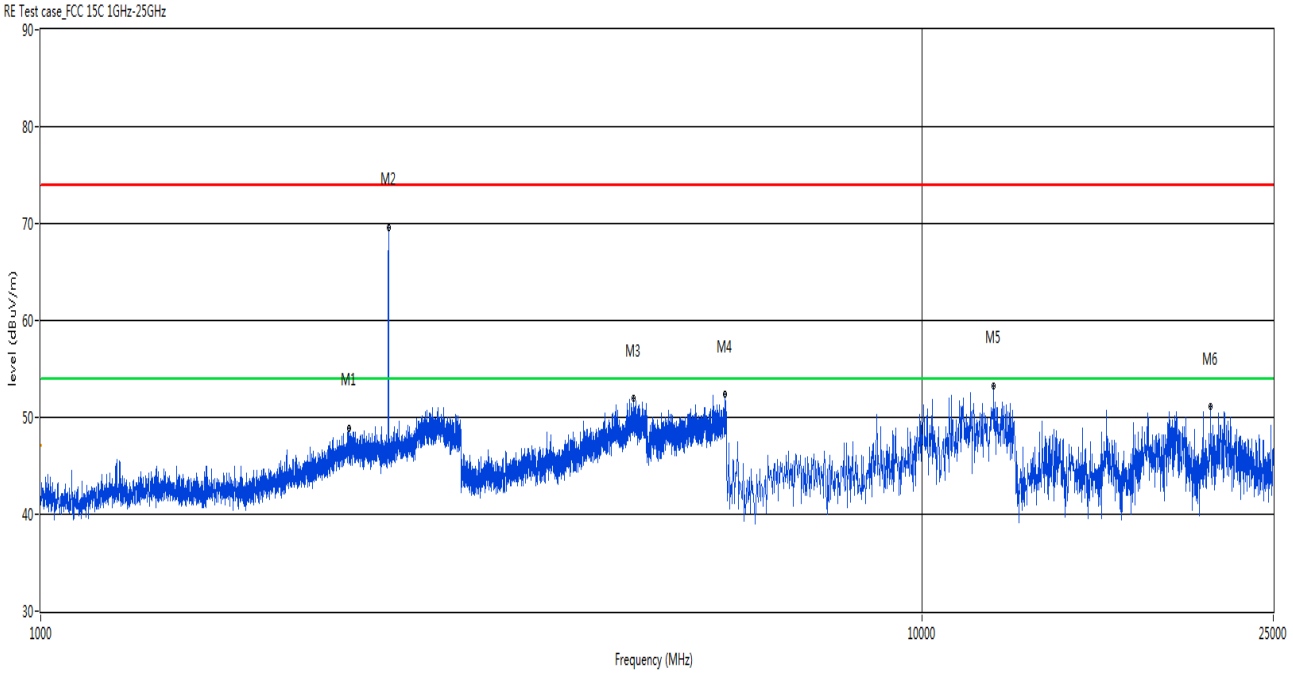
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2247.69	48.99	-0.37	74.0	25.01	Peak	270.60	100	Vertical	Pass
2	2440.14	69.74	-0.39	74.0	4.26	Peak	207.20	100	Vertical	Pass
3	4861.78	51.52	13.47	74.0	22.48	Peak	72.60	100	Vertical	Pass
4	5655.84	51.93	15.58	74.0	22.07	Peak	45.80	100	Vertical	Pass
5	12053.66	53.55	20.82	74.0	20.45	Peak	205.80	100	Vertical	Pass
6	21236.27	51.38	11.25	74.0	22.62	Peak	254.90	100	Vertical	Pass

LOW CHANNEL 1 GHz to 25 GHz, ANT H



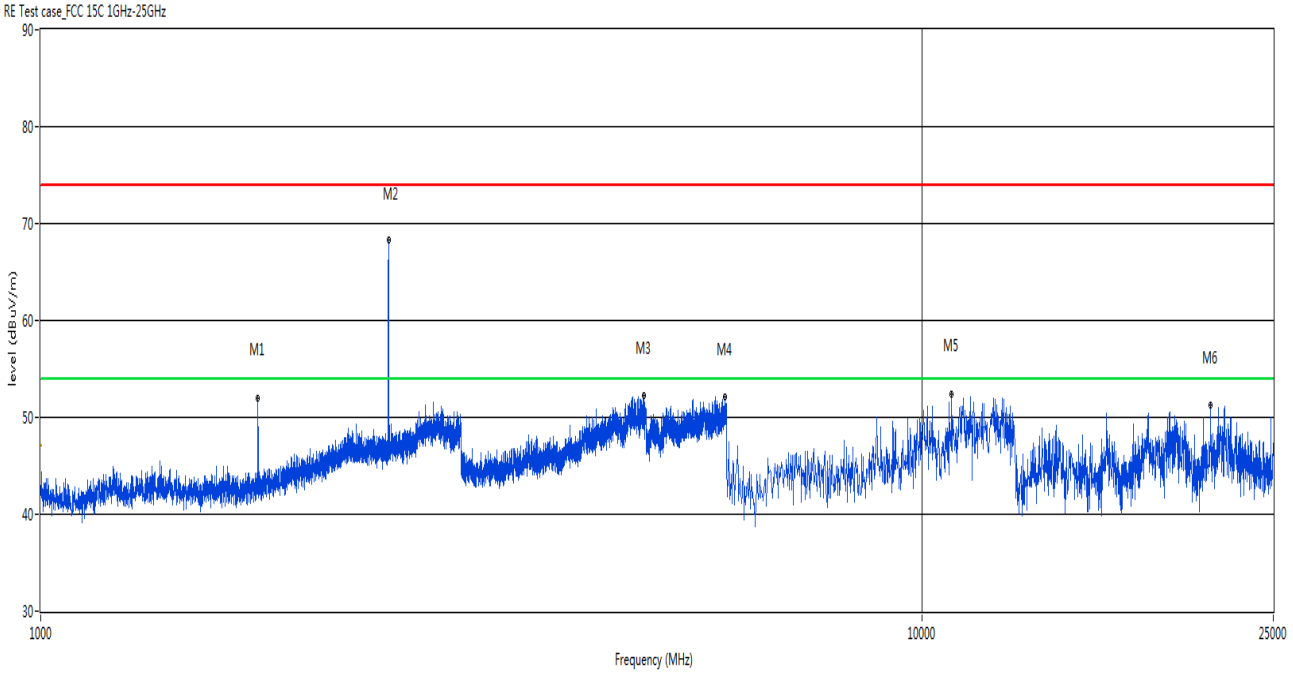
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2168.71	49.57	-1.00	74.0	24.43	Peak	346.10	100	Horizontal	Pass
2	2440.14	70.29	-0.39	74.0	3.71	Peak	131.40	100	Horizontal	Pass
3	4837.04	52.13	13.65	74.0	21.87	Peak	44.70	100	Horizontal	Pass
4	5964.76	52.55	15.65	74.0	21.45	Peak	358.70	100	Horizontal	Pass
5	12053.66	52.79	20.82	74.0	21.21	Peak	205.80	100	Horizontal	Pass
6	19079.87	50.57	13.68	74.0	23.43	Peak	206.30	100	Horizontal	Pass

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	2239.19	48.92	-0.18	74.0	25.08	Peak	49.40	100	Vertical	Pass
2	2480.13	69.60	-0.60	74.0	4.40	Peak	207.50	100	Vertical	Pass
3	4699.07	51.97	13.27	74.0	22.03	Peak	69.30	100	Vertical	Pass
4	5975.26	52.38	15.68	74.0	21.62	Peak	1.40	100	Vertical	Pass
5	12053.66	53.30	20.82	74.0	20.70	Peak	205.80	100	Vertical	Pass
6	21236.27	51.06	11.25	74.0	22.94	Peak	254.90	100	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	1763.81	51.94	-3.73	74.0	22.06	Peak	122.00	100	Horizontal	Pass
2	2480.63	68.32	-0.60	74.0	5.68	Peak	125.40	100	Horizontal	Pass
3	4828.04	52.24	13.74	74.0	21.76	Peak	359.00	100	Horizontal	Pass
4	5965.51	52.05	15.61	74.0	21.95	Peak	163.00	100	Horizontal	Pass
5	10795.76	52.36	19.71	74.0	21.64	Peak	304.00	100	Horizontal	Pass
6	21236.27	51.26	11.25	74.0	22.74	Peak	254.90	100	Horizontal	Pass

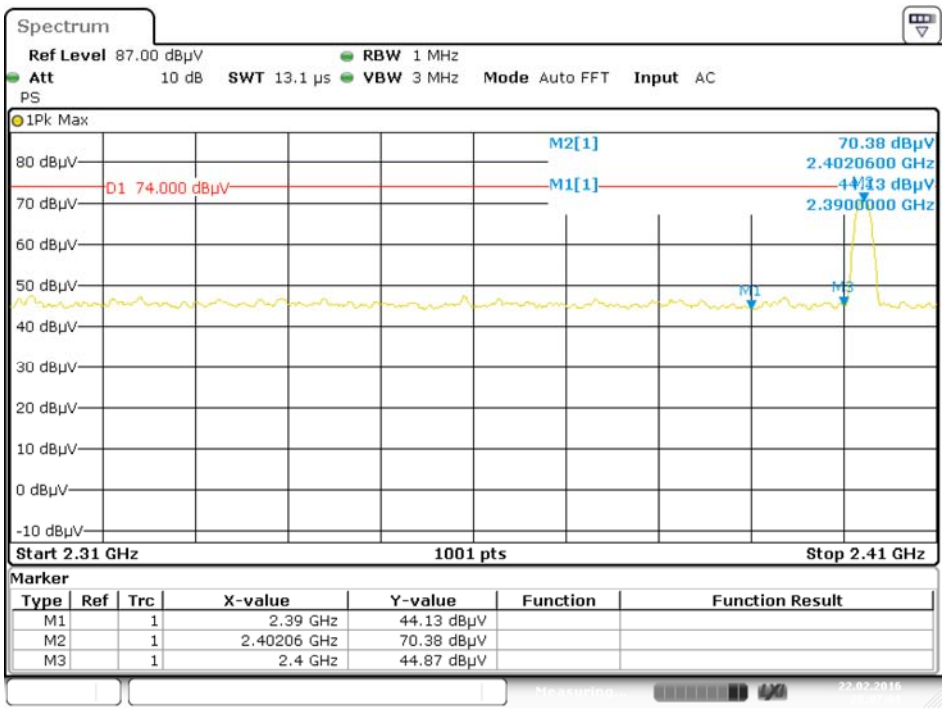
A.6 Band Edge

Note 1: The lowest and highest channels are tested to verify the band edge emissions. Please refer to the following the plots for emissions values.

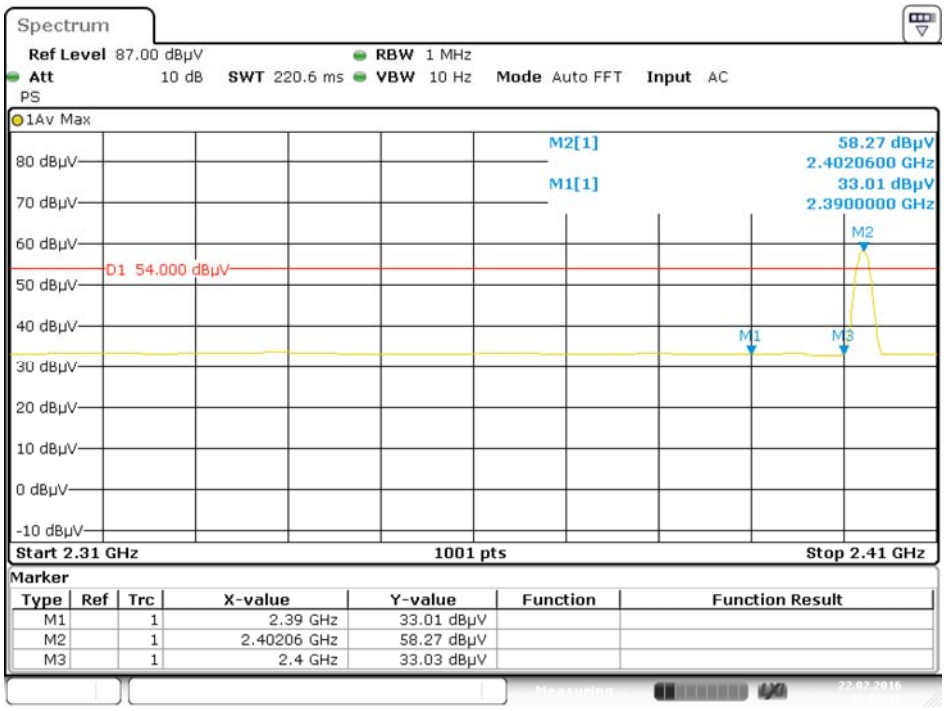
Note 2: The test data all are tested in the vertical and horizontal antenna which the trace is max hold. So these plots have shown the worst case.

Test Data and plots

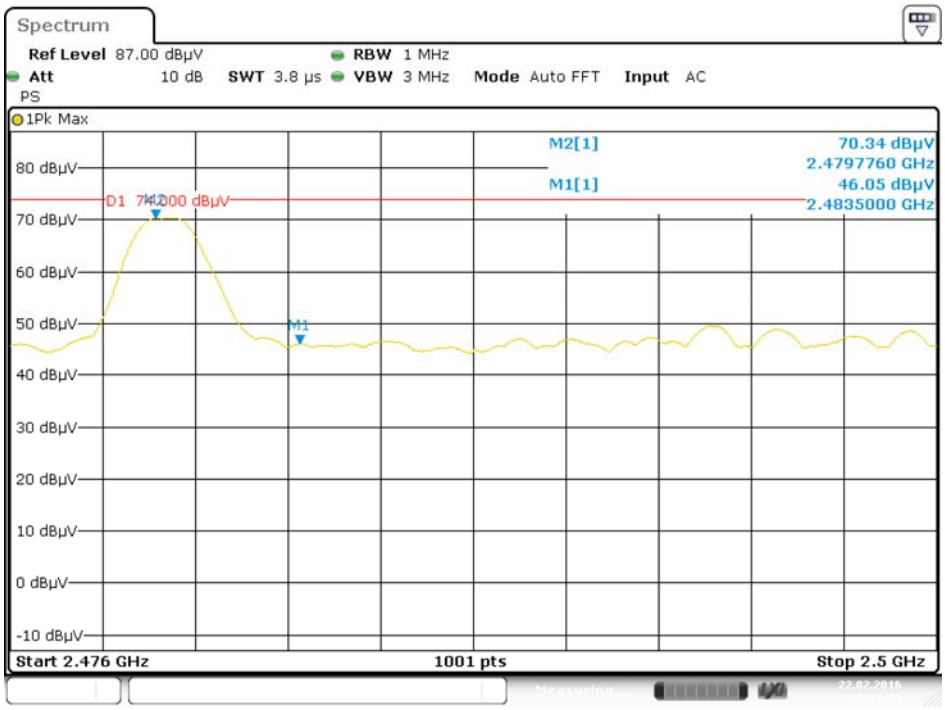
Low Channel Peak



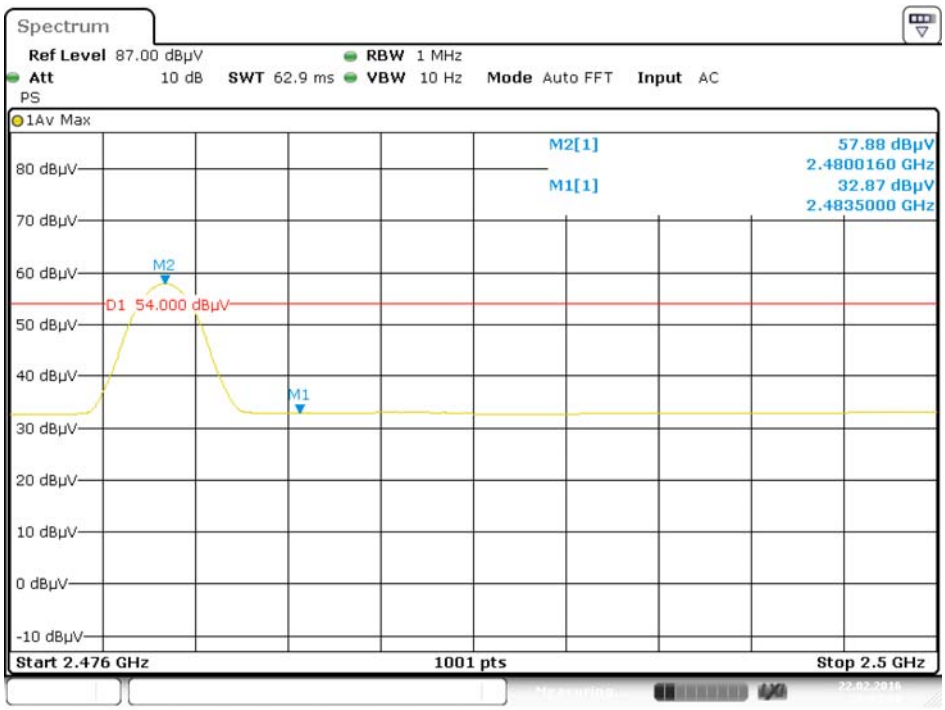
Low Channel AV



High Channel Peak



High Channel AV



A.7 Power Spectral Density (PSD)

The Power Spectral Density measurement result reference from original test report: 10101498H-A-R1 issued by UL Japan, Inc. on Nov 21, 2013, **APPENDIX 1: Date of EMI test Power Density.**

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ15A0079-AR3.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ1515A0079-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ15A0079-AI.PDF”.

--END OF REPORT--