

Prüfbericht-Nr.: <i>Test report no.:</i>	CN20F4FJ 001	Auftrags-Nr.: <i>Order no.:</i>	168290636	Seite 1 von 20 <i>Page 1 of 20</i>
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2020-11-16	
Auftraggeber: <i>Client:</i>	ZEN Factory Group (Asia) Limited A5-B, 12/F, Block A, Hong Kong Industrial Centre, 489-491 Castle Peak Road, Kowloon, Hong Kong			
Prüfgegenstand: <i>Test item:</i>	Chat Pad Controller Keyboard for Xbox (Dongle)			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	NS-XB1CHATPAD, NS-XB1CHATPAD-C, RF-XB1CHATPAD, RF-XB1CHATPAD-C (Trademark: INSIGNIA)			
Auftrags-Inhalt: <i>Order content:</i>	FCC and IC approval			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.249 CFR47 FCC Part 15: Subpart C Section 15.209 CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart B Section 15.107 CFR47 FCC Part 15: Subpart B Section 15.109			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2020-11-16	Please refer to photo documents		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A002948033-001			
Prüfzeitraum: <i>Testing period:</i>	2020-11-16 - 2020-12-16			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	 Ryan G. H. Yang	genehmigt von: <i>authorized by:</i>	 Winnie Hou	
Datum: <i>Date:</i>	2020-12-22	Ausstellungsdatum: <i>Issue date:</i>	2020-12-22	
Stellung / Position	Assistant Project Manager	Stellung / Position	Technical Certifier	
Sonstiges / Other: FCC ID: WP85I02001 IC: 8632A-5I0200 HVIN: NS-XB1CHATPAD				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged:</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specifications(s) F(ail) = failed a.m. test specifications(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 FUNDAMENTAL & HARMONICS RADIATED EMISSION

RESULT: Pass

5.1.3 20dB BANDWIDTH

RESULT: Pass

5.1.4 99% BANDWIDTH

RESULT: Pass

5.1.5 RADIATED SPURIOUS EMISSION & BAND EDGE

RESULT: Pass

5.1.6 CONDUCTED EMISSION ON AC MAINS

RESULT: Pass

5.1.7 RADIATED EMISSION

RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Photographs of the Test Set-up

Appendix B: Test Results of General 2.4GHz

Appendix C: Test Results of FCC Part 15B and ICES-003

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of China

FCC Accreditation Designation No.: CN1260

ISED wireless device testing laboratory: 25069

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

TÜV Rheinland (Shenzhen) Co., Ltd.

Unwanted Emission Testing (TS9975)				
Equipment	Manufacturer	Model	Serial No.	Cal. until
EMI Test Receiver	R&S	ESR 7	102021	2021-08-11
Signal Analyzer	R&S	FSV 40	101439	2021-08-10
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2021-08-10
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2021-08-10
Amplifier	R&S	SCU-18F	180070	2021-08-10
Amplifier	R&S	SCU40A	100475	2021-09-10
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2022-08-08
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2022-08-08
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2022-08-08
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2022-09-13
Wideband Ridged Horn Antenna (12-18 GHz)	Steatite	QMS-00208	18313	2021-09-02
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2021-07-06

Conducted Emission				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
EMI Test Receiver	R&S	ESR3	102680	2021-05-19
Artificial Mains Network	R&S	ENV216	101445	2021-05-19
Radiated Emission				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Horn Antenna	R&S	HF907	102706	2022-08-07
Preamplifier	FIT	SCU-18F	180077	2021-08-16
Active magnetic loop antenna	SCHWARZBECK	FMZB1519B	00080	2021-08-20
Trilog-Broadband antenna	SCHWARZBECK	VULB9168	0945	2021-12-08

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-7}$
RF Power (conducted)	± 2.5 dB
Radiated Emission of Transmitter, valid up to 26.5 GHz	± 6 dB
Radiated Emission of Receiver, valid up to 26.5 GHz	± 6 dB
Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz)	± 3.70 dB / ± 3.30 dB
Radiated Emission (3m SAC), 30MHz to 1000MHz	± 4.52 dB
Radiated Emission (3m SAC), above 1000MHz	± 4.37 dB
Temperature	± 1 °C
Humidity	± 5 %
Voltage (DC)	± 1 %
Voltage (AC, <10kHz)	± 2 %

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd.. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at 362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The product is a USB dongle for Xbox, which supports 2.4GHz wireless technology.

According to the declaration of the applicant, the electrical circuit design, PCB layout and construction Design are identical for all models, only the model No. is different.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment	Chat Pad Controller Keyboard for Xbox (Dongle)
Type Designation	NS-XB1CHATPAD, NS-XB1CHATPAD-C, RF-XB1CHATPAD, RF-XB1CHATPAD-C
Trademark	INSIGNIA
FCC ID	WP85I02001
IC	8632A-5I0200
HVIN	NS-XB1CHATPAD
Operating Voltage	DC 5.0V via USB port
Testing Voltage	DC 5.0V
Technical Specification of 2.4GHz	
Frequency Range	2402 - 2480 MHz
Type of Modulation	GFSK
Channel Number	16 channels
Channel Separation	2MHz, 3MHz, 4MHz, 5MHz, 6MHz, 7MHz, 8MHz, 10MHz
Antenna Type	Chip antenna
Antenna Gain	1.7 dBi

Table 3: RF Channel and Frequency of 2.4GHz

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
1	2402	5	2422	9	2441	13	2463
2	2407	6	2426	10	2445	14	2466
3	2414	7	2436	11	2453	15	2473
4	2419	8	2439	12	2459	16	2480

Test frequencies are lowest channel: 2402 MHz, middle channel: 2441 MHz and highest channel: 2480 MHz

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, 2.4GHz transmitting mode
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- B. On, Wireless connecting mode
- C. On, Normal operation mode
- D. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Rating Label

- User Manual

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.10: 2013 and ANSI C63.4: 2014.

According to clause 3.1, all tests were performed on model NS-XB1CHATPAD in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 4: Auxiliary Equipment Used during Test

Description	Manufacturer	Model	S/N	Rating
Laptop	Lenovo	T480	PF-16A6N8	N/A
Keyboard	ZEN Factory Group (Asia) Limited	NS-XB1CHATPAD	N/A	DC 3.3V by battery

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

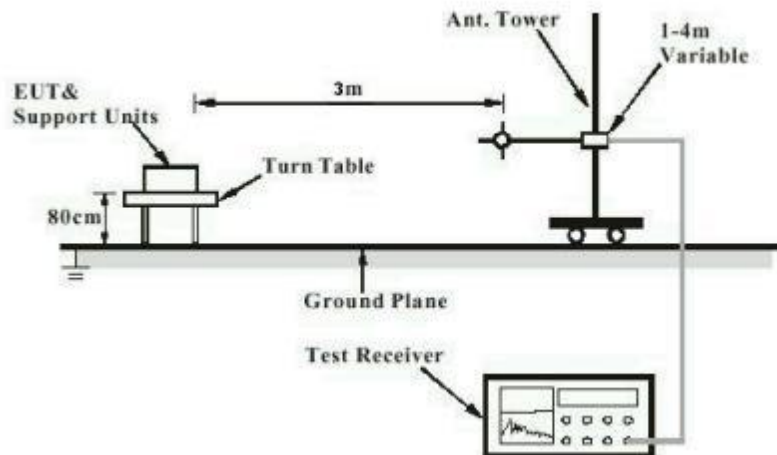


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

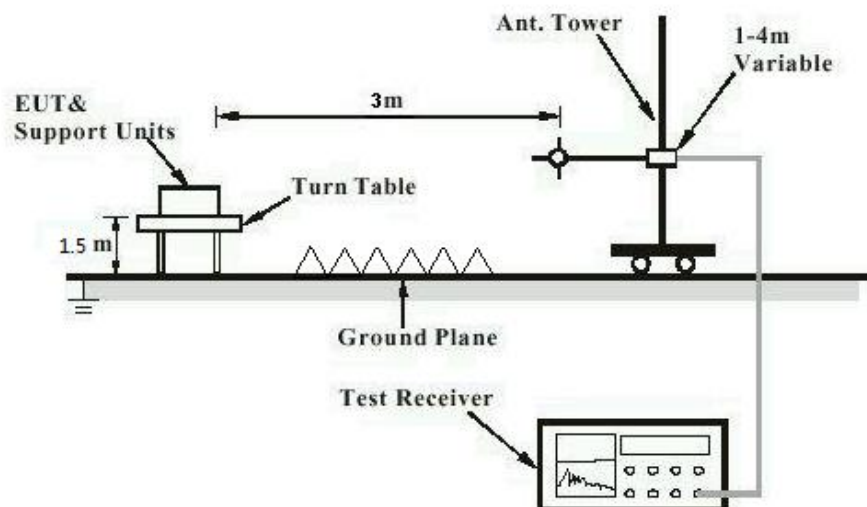
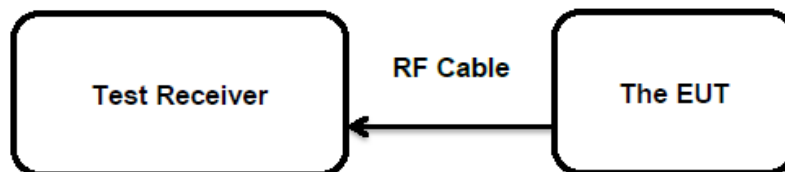


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:

Pass

Test Specification

Test standard : FCC Part 15.247(b)(4) and Part 15.203
RSS-Gen Clause 6.8

According to the manufacturer declared, the EUT has an internal antenna, the directional gain of antenna is 1.7 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

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5.1.2 Fundamental & Harmonics Radiated Emission

RESULT:**Pass****Test Specification**

Test standard : FCC Part 15.249(a)
RSS-210 Issue 10 B.10

Basic standard : ANSI C63.10: 2013
RSS-210 Issue 10 B.10(a) & Table A2

Limits : Refer to FCC Part 15.249(a) & 15.209(a)

Kind of test site : 3m Semi-anechoic Chamber

Test Setup

Date of testing : 2020-11-26 ~ 2020-11-27

Input voltage : DC 5.0V

Operation mode : A

Test channel : Low / Middle / High

Ambient temperature : 25 °C

Relative humidity : 56 %

Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix B.

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5.1.3 20dB Bandwidth

RESULT:**Pass****Test Specification**

Test standard : FCC Part 15.215
RSS-Gen clause 6.7
Basic standard : ANSI C63.10: 2013
Kind of test site : Shielded Room

Test Setup

Date of testing : 2020-12-16
Input voltage : DC 5.0V
Operation mode : A
Test channel : Low / Middle / High
Ambient temperature : 25 °C
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix B.

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5.1.4 99% Bandwidth

RESULT:

Pass

Test Specification

Test standard : RSS-Gen clause 6.7
Basic standard : ANSI C63.10: 2013
Kind of test site : Shielded Room

Test Setup

Date of testing : 2020-12-16
Input voltage : DC 5.0V
Operation mode : A
Test channel : Low / Middle / High
Ambient temperature : 25 °C
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix B.

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5.1.5 Radiated Spurious Emission & Band Edge

RESULT:**Pass****Test Specification**

Test standard : FCC Part 15.249(a)
RSS-210 Issue 10 B.10

Basic standard : ANSI C63.10: 2013

Limits : Refer to FCC Part 15.249(a) & 15.209(a)
RSS-210 Issue 10 B.10(a) & Table A2

Kind of test site : 3m Semi-anechoic Chamber

Test Setup

Date of testing : 2020-11-26

Input voltage : DC 5.0V

Operation mode : A

Test channel : Low / Middle / High

Ambient temperature : 25 °C

Relative humidity : 56 %

Atmospheric pressure : 101 kPa

Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix B.

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5.1.6 Conducted Emission on AC Mains

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.207(a) & FCC Part 15.107(a) RSS-Gen clause 8.8 & ICES-003 Issue 6
Basic standard	: ANSI C63.10: 2013 & ANSI C63.4: 2014
Frequency range	: 0.15 – 30MHz
Limits	: FCC Part 15.207(a) & FCC Part 15.107(a) RSS-Gen clause 8.8 & ICES-003 Issue 6 Table 2
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2020-12-11
Input voltage	: DC 5.0V
Operation mode	: B, C
Ambient temperature	: 22 °C
Relative humidity	: 54 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix B & C.

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5.1.7 Radiated Emission

RESULT:**Pass****Test Specification**

Test standard : FCC Part 15.109(a)
ICES-003 Issue 6

Basic standard : ANSI C63.4: 2014

Frequency range : 30 - 6000MHz

Classification : Class B

Limits : FCC Part 15.109(a)
ICES-003 Issue 6 Table 5 & Table 7

Kind of test site : 3m Semi-anechoic Chamber

Test Setup

Date of testing : 2020-12-11

Input voltage : DC 5.0V

Operation mode : C

Ambient temperature : 22 °C

Relative humidity : 54 %

Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix C

6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

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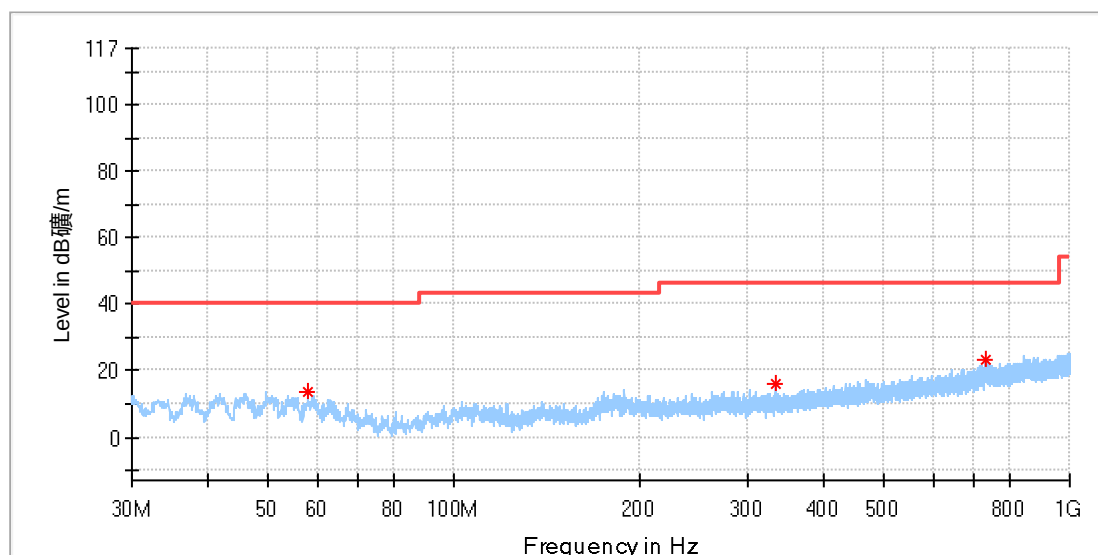
Note: Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz -26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

Appendix B.1: Fundamental & Harmonics Radiated Emission

30MHz - 1GHz

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_Low CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

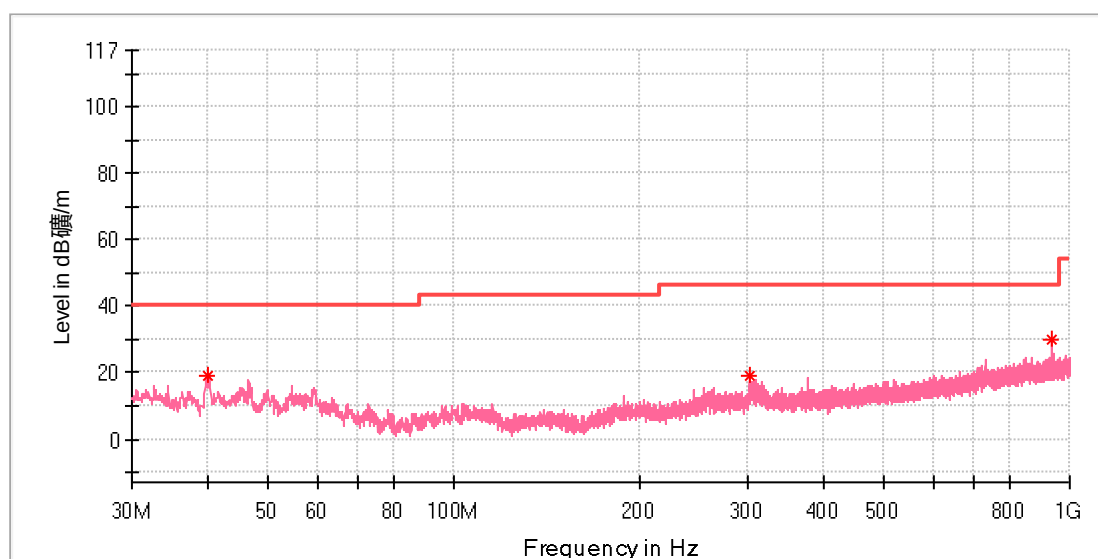
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
57.887500	13.53	---	40.00	26.47	100.0	H	332.0	-18.8
332.106500	15.92	---	46.00	30.08	100.0	H	90.0	-15.4
728.836500	23.15	---	46.00	22.85	100.0	H	184.0	-7.5

Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_Low CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

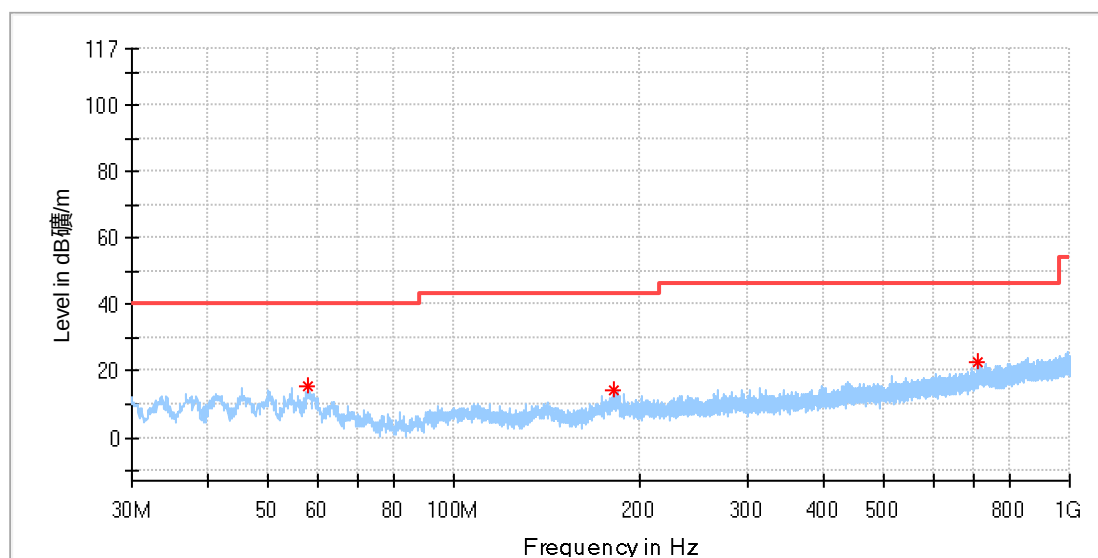
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
39.942500	19.19	---	40.00	20.81	100.0	V	102.0	-20.1
302.570000	19.08	---	46.00	26.92	100.0	V	7.0	-16.2
937.532000	29.86	---	46.00	16.14	100.0	V	193.0	-4.6

Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_High CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

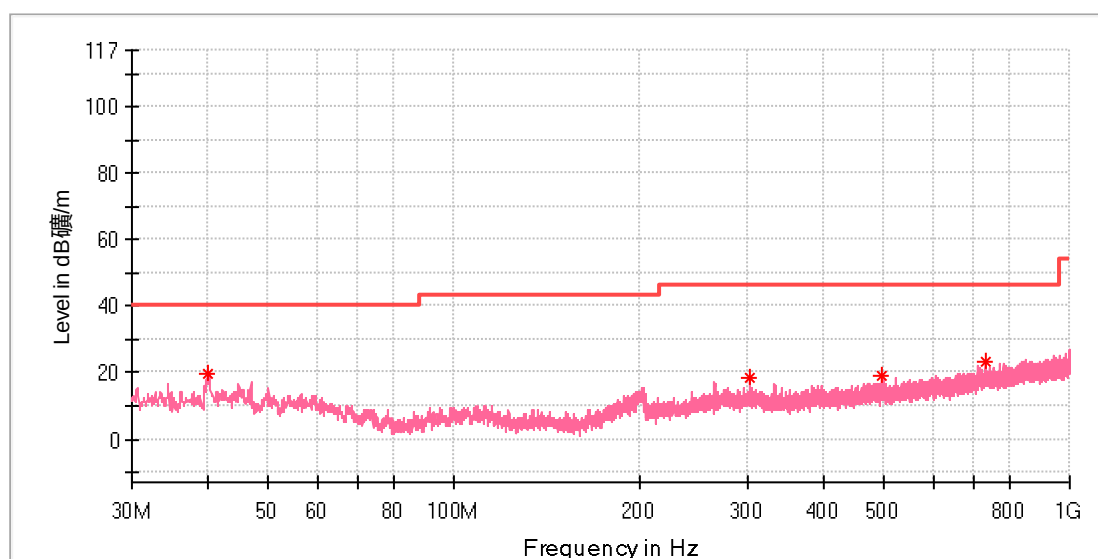
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
57.984500	15.33	---	40.00	24.67	100.0	H	25.0	-18.8
181.223000	14.13	---	43.50	29.37	100.0	H	277.0	-20.4
709.048500	22.48	---	46.00	23.52	100.0	H	326.0	-7.9

Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_High CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
39.942500	19.95	---	40.00	20.05	100.0	V	74.0	-20.1
303.152000	18.31	---	46.00	27.69	100.0	V	0.0	-16.2
495.260500	19.24	---	46.00	26.76	100.0	V	144.0	-11.9
728.788000	23.42	---	46.00	22.58	100.0	V	195.0	-7.5

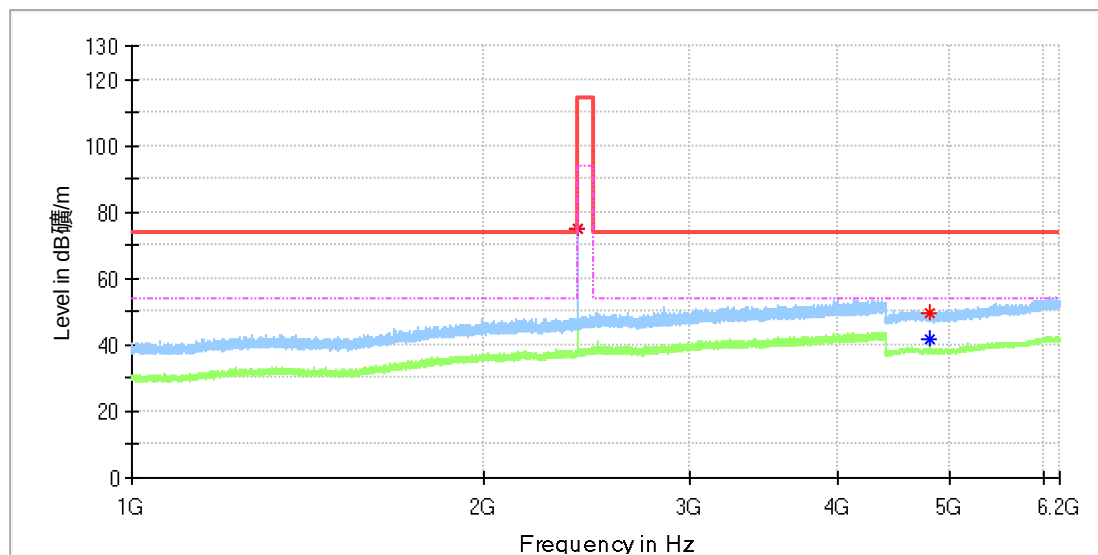
Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

1GHz - 18GHz

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_Low CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

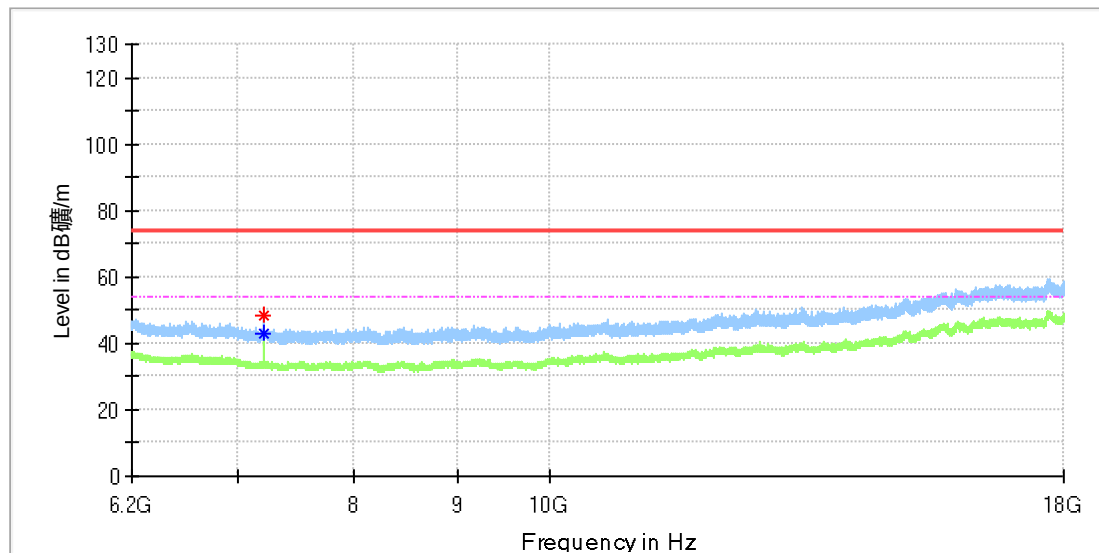
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2401.862500	75.18	---	114.00	38.82	100.0	H	342.0	7.0
2401.862500	---	74.89	94.00	19.11	100.0	H	342.0	7.0
4804.000000	49.71	---	74.00	24.29	100.0	H	285.0	11.8
4804.000000	---	41.83	54.00	12.17	100.0	H	285.0	11.8

Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_Low CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

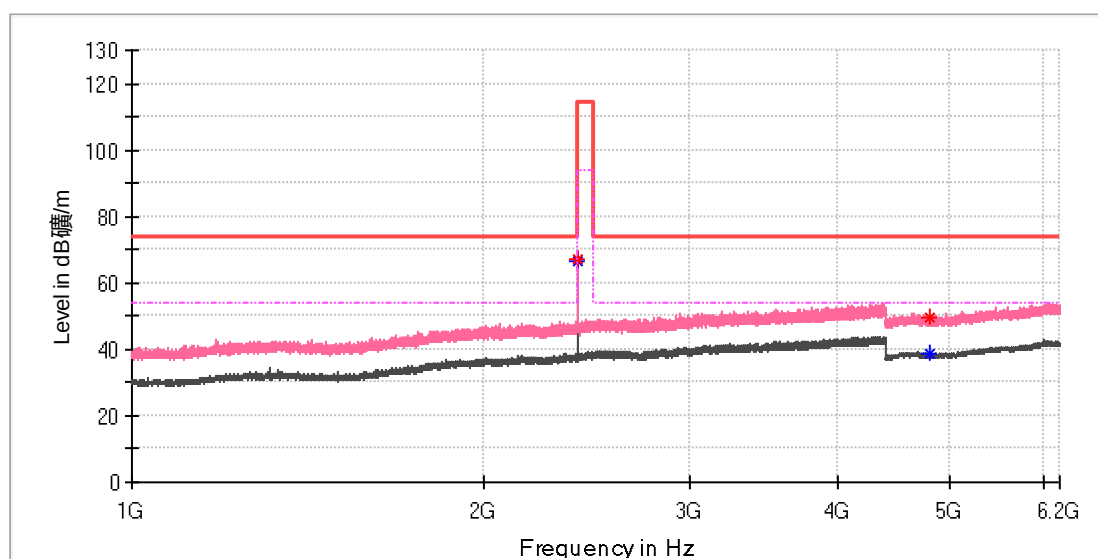
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7204.966667	48.58	---	74.00	25.42	100.0	H	282.0	8.8
7206.441667	---	43.01	54.00	10.99	100.0	H	282.0	8.8

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_Low CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

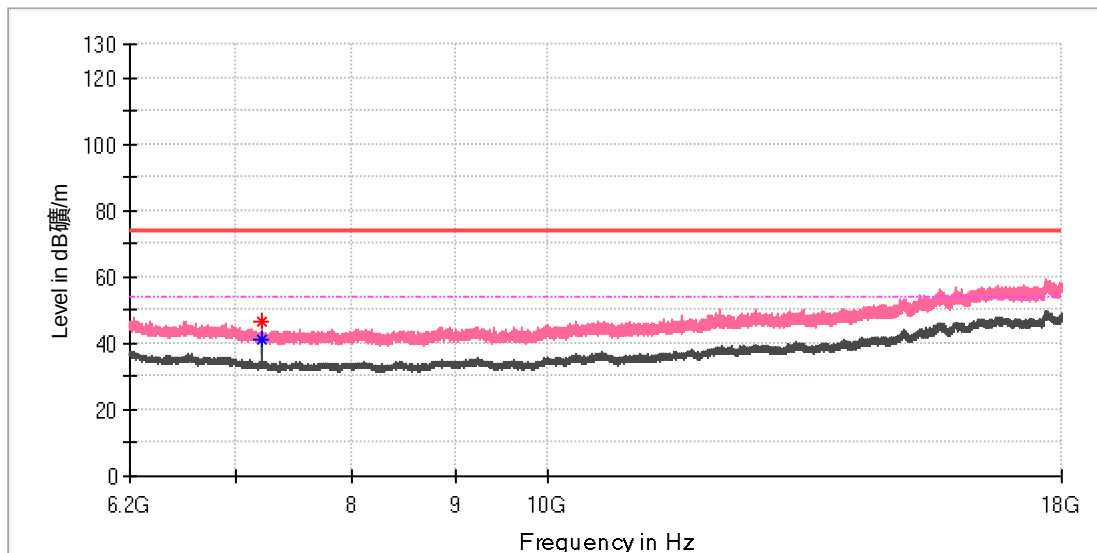
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2401.862500	66.91	---	114.00	47.09	100.0	V	94.0	7.0
2402.075000	---	66.39	94.00	27.61	100.0	V	94.0	7.0
4805.000000	---	38.51	54.00	15.49	100.0	V	168.0	11.8
4805.500000	49.31	---	74.00	24.69	100.0	V	159.0	11.8

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_Low CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

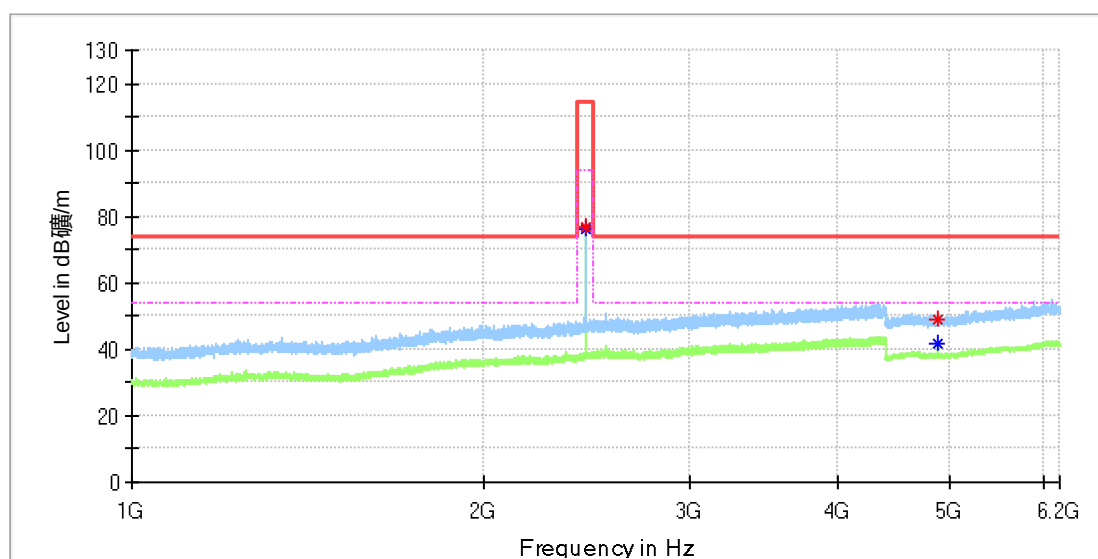
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7204.966667	46.49	---	74.00	27.51	100.0	V	154.0	8.8
7204.966667	---	41.27	54.00	12.73	100.0	V	154.0	8.8

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_Mid CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2440.962500	76.55	---	114.00	37.45	100.0	H	219.0	7.4
2440.962500	---	76.42	94.00	17.58	100.0	H	219.0	7.4
4882.000000	49.19	---	74.00	24.81	100.0	H	258.0	11.8
4882.000000	---	41.55	54.00	12.45	100.0	H	258.0	11.8

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
----	----	----	----	----	----		----	----

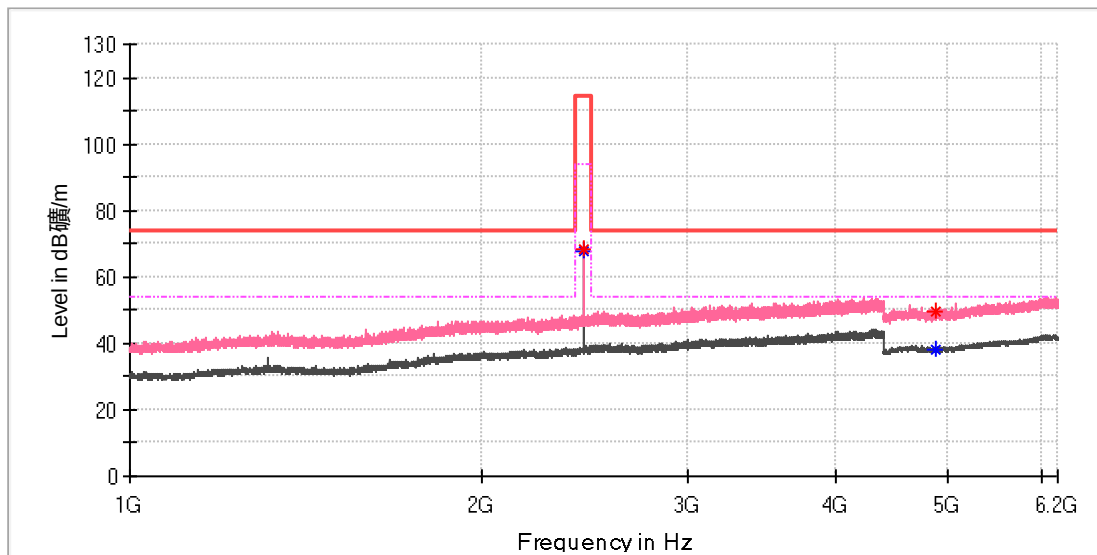
EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_Mid CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7318.541667	43.95	---	74.00	30.05	100.0	V	270.0	8.2
7323.458333	---	34.01	54.00	19.99	100.0	V	3.0	8.2

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_Mid CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

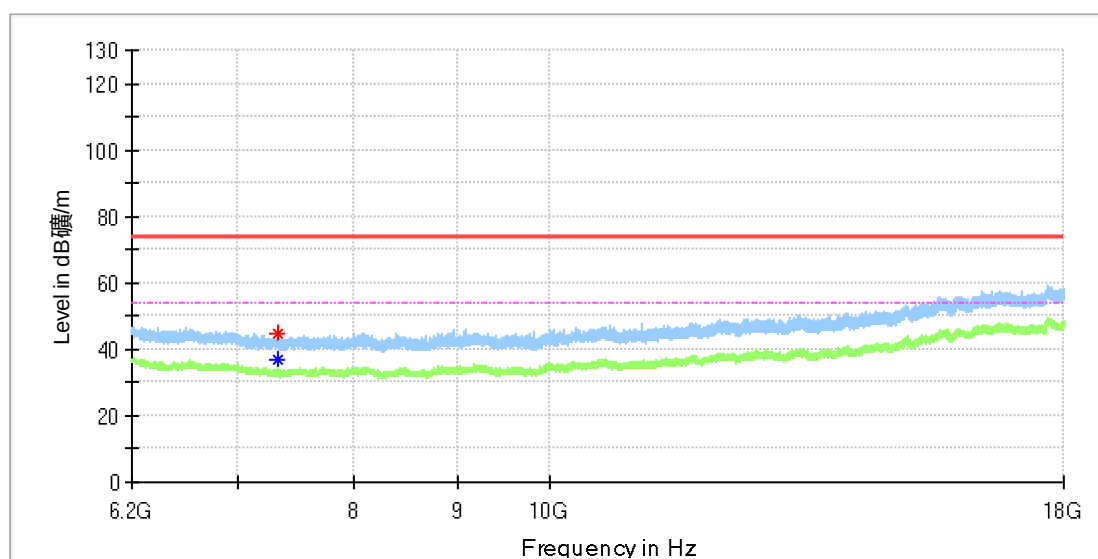
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2440.962500	---	67.72	94.00	26.28	100.0	V	26.0	7.4
2441.175000	68.23	---	114.00	45.77	100.0	V	26.0	7.4
4875.500000	49.59	---	74.00	24.41	100.0	V	232.0	11.8
4882.000000	---	38.26	54.00	15.74	100.0	V	356.0	11.8

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_Mid CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

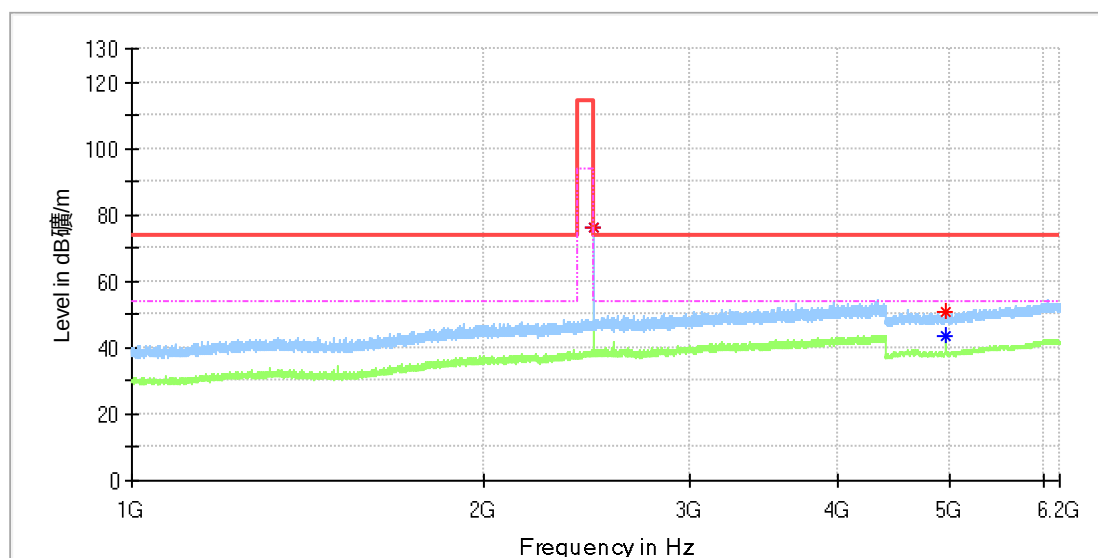
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7321.983333	44.93	---	74.00	29.07	100.0	H	281.0	8.2
7323.458333	---	36.87	54.00	17.13	100.0	H	281.0	8.2

Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_High CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



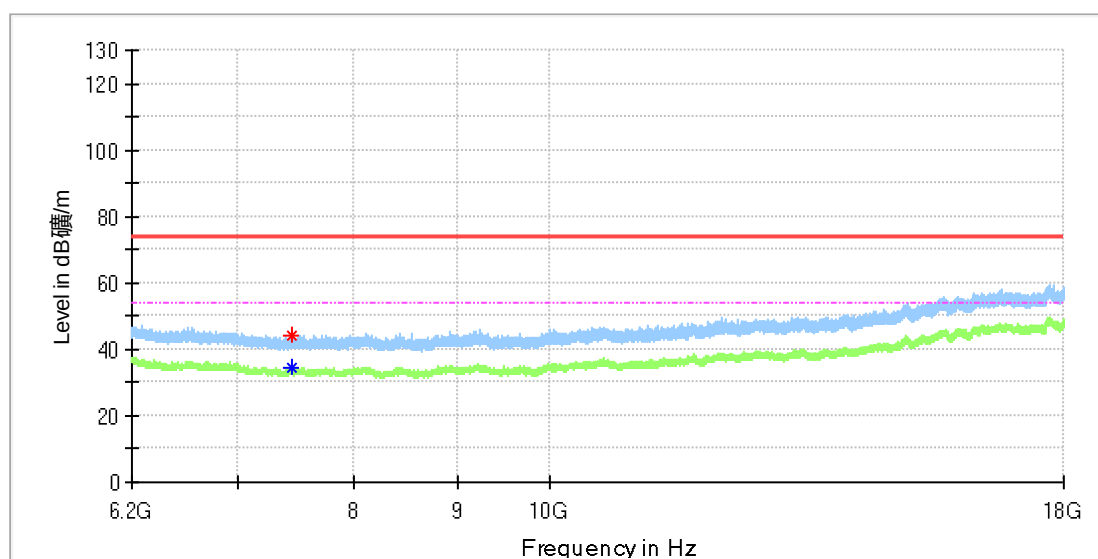
Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2480.062500	76.13	---	114.00	37.87	100.0	H	212.0	7.4
2480.062500	---	75.89	94.00	18.11	100.0	H	212.0	7.4
4960.000000	50.57	---	74.00	23.43	100.0	H	287.0	11.8
4960.000000	---	43.47	54.00	10.53	100.0	H	287.0	11.8

Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
----	----	----	----	----	----		----	----

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_High CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

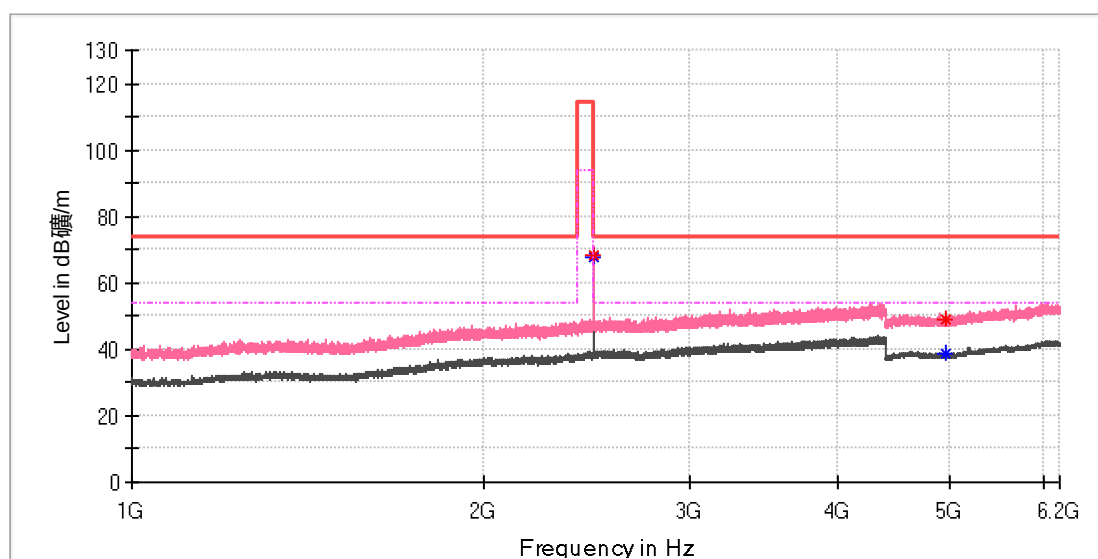


Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7438.016667	43.89	---	74.00	30.11	100.0	H	268.0	8.4
7440.475000	---	34.56	54.00	19.44	100.0	H	291.0	8.4

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_High CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



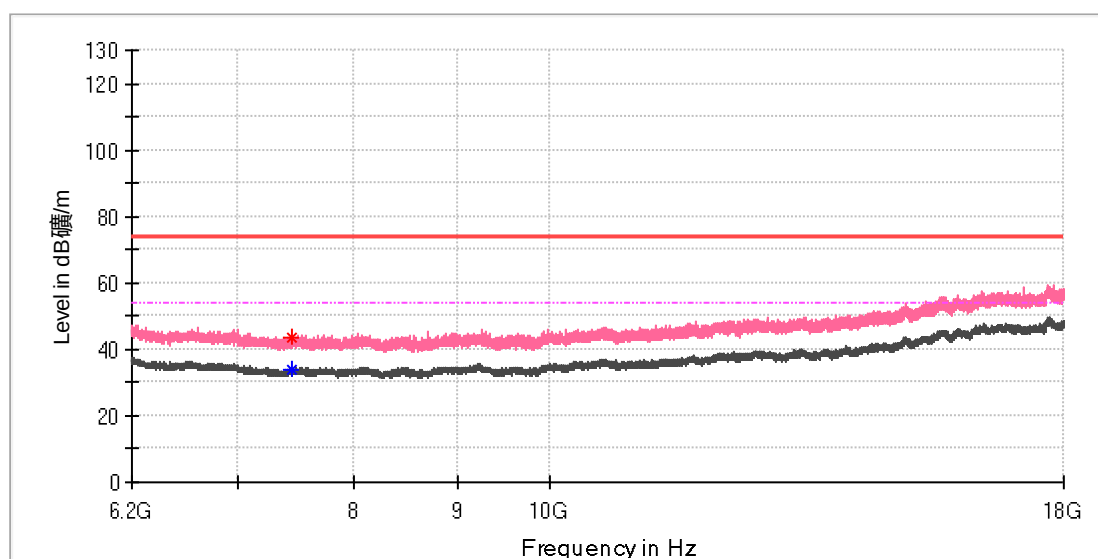
Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2480.062500	68.25	---	114.00	45.75	100.0	V	21.0	7.4
2480.062500	---	67.71	94.00	26.29	100.0	V	21.0	7.4
4960.500000	---	38.66	54.00	15.34	100.0	V	221.0	11.8
4962.500000	49.20	---	74.00	24.80	100.0	V	304.0	11.8

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

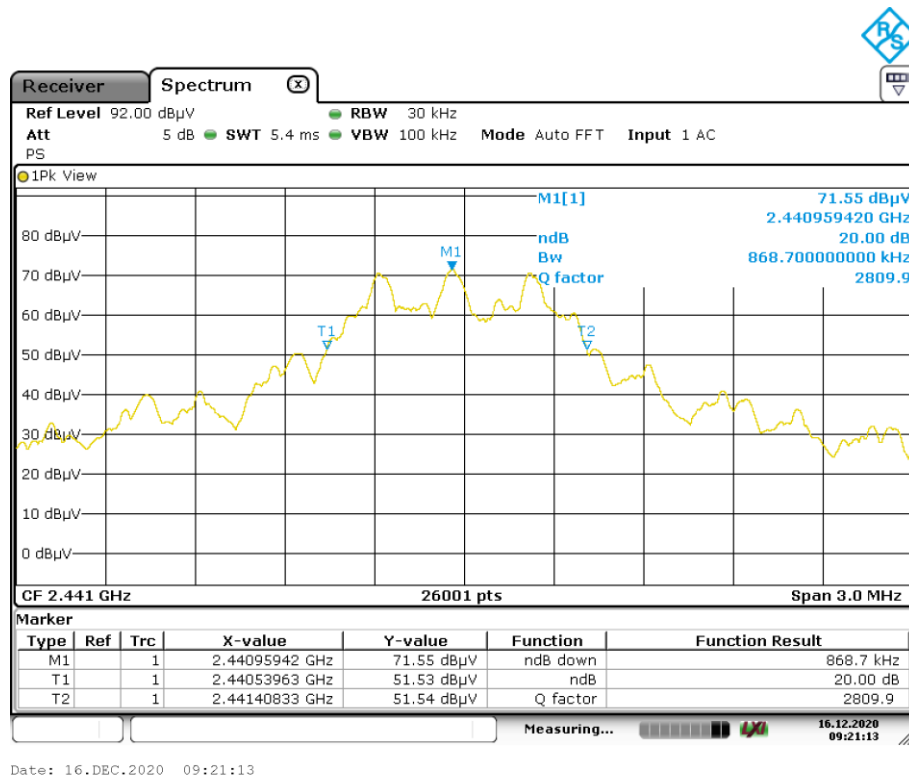
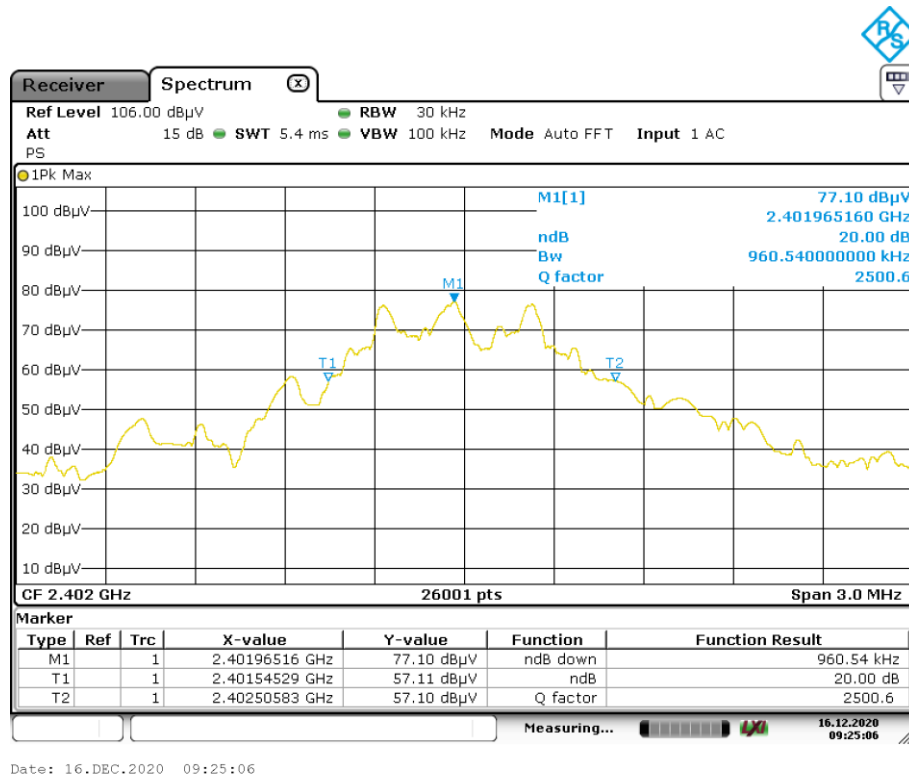
EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_High CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

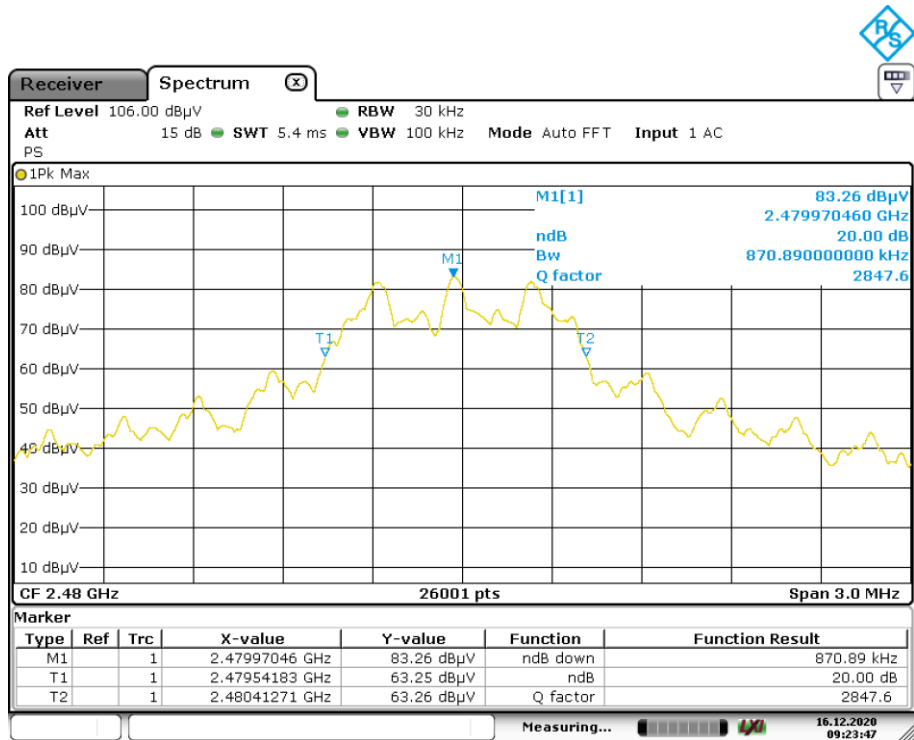


Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7440.475000	43.51	---	74.00	30.49	100.0	V	138.0	8.4
7440.475000	---	34.06	54.00	19.94	100.0	V	138.0	8.4

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

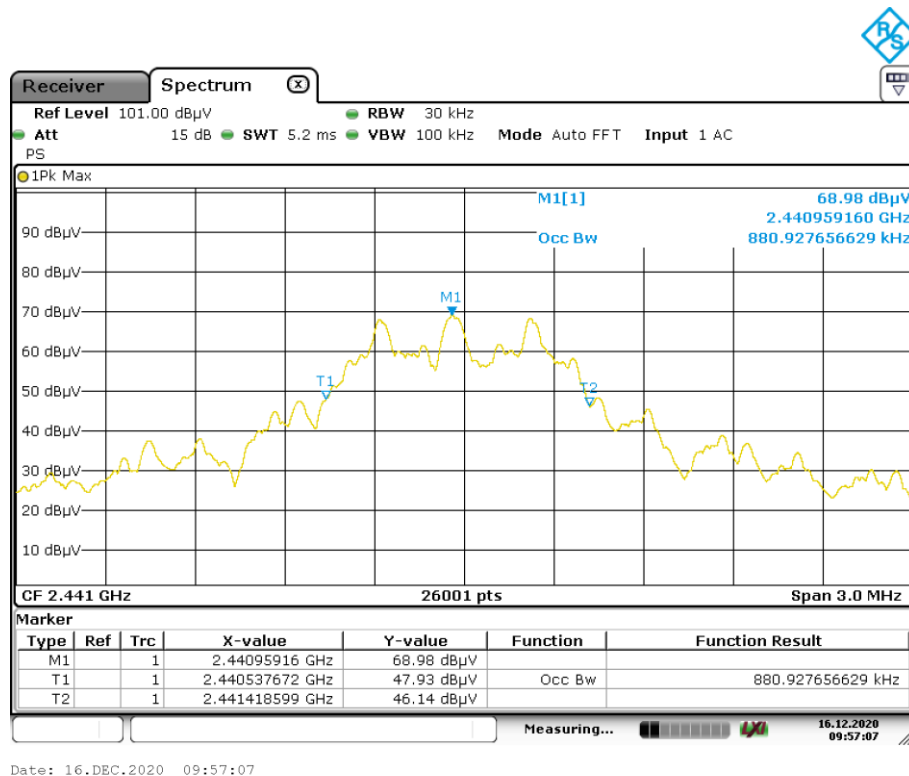
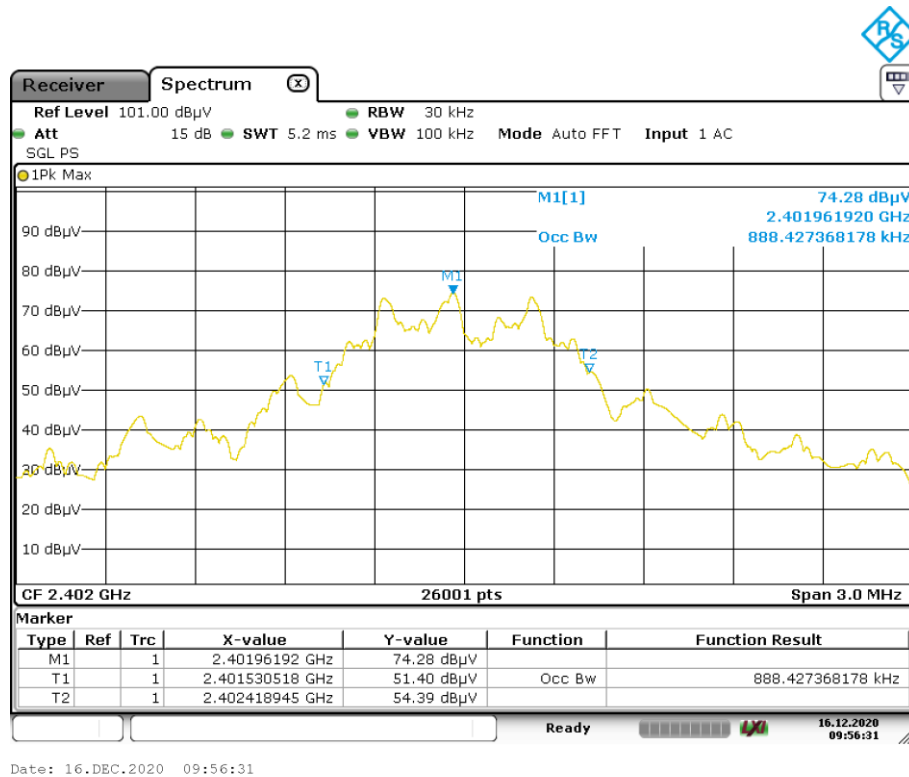
Appendix B.2: Test Results of 20dB Bandwidth

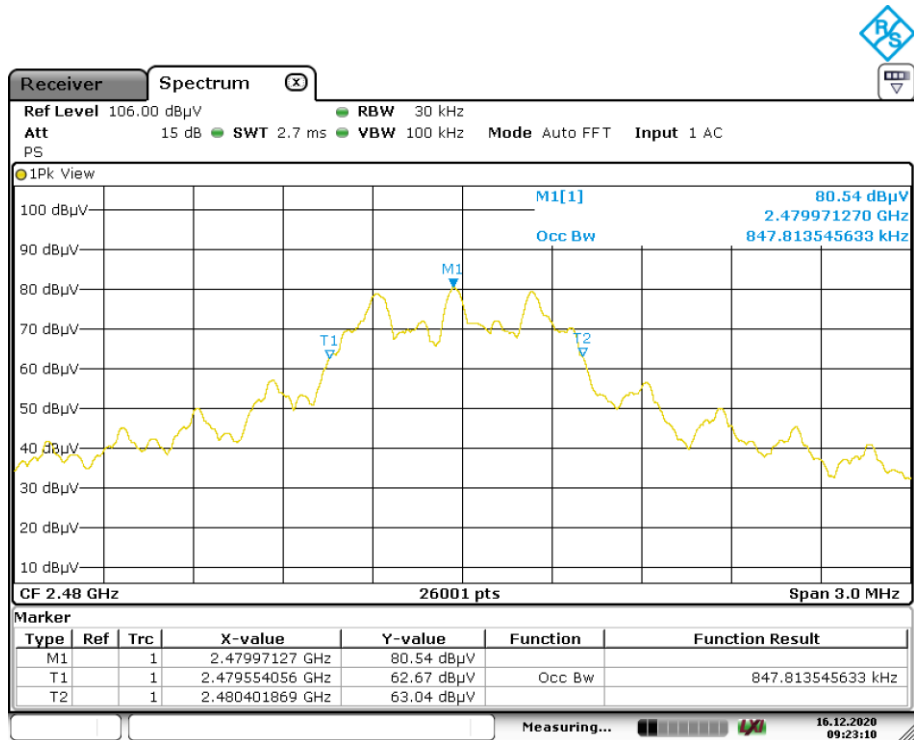




Date: 16.DEC.2020 09:23:47

Appendix B.3: Test Results of 99% Bandwidth





Date: 16.DEC.2020 09:23:10

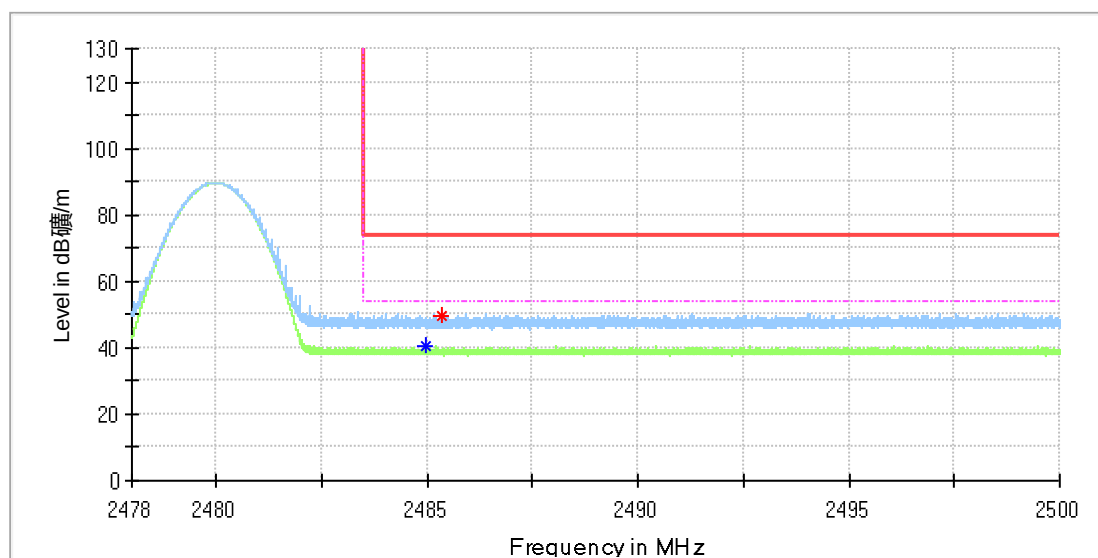
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
----	----	----	----	----	----		----	----

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_Low CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_High CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

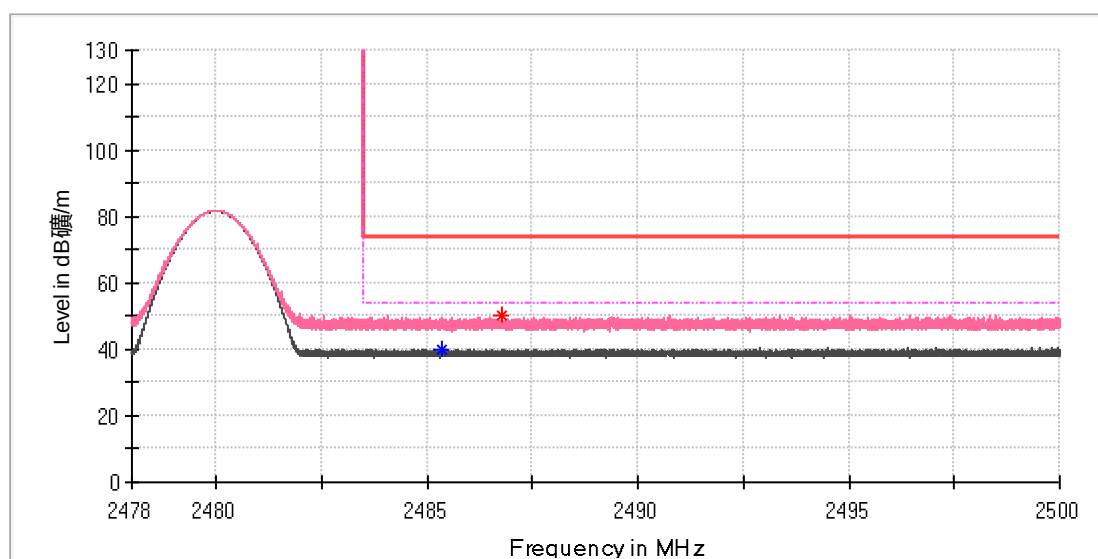
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2484.968500	---	40.63	54.00	13.37	100.0	H	84.0	7.4
2485.371375	49.61	---	74.00	24.39	100.0	H	150.0	7.4

Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Model:	NS-XB1CHATPAD
Test Mode:	TX_2.4G_High CH
Test Voltage::	DC 5V
Remark:	Temp 23 Humi:45%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2485.365875	---	39.98	54.00	14.02	100.0	V	88.0	7.4
2486.754625	50.06	---	74.00	23.94	100.0	V	88.0	7.4

Final_Result

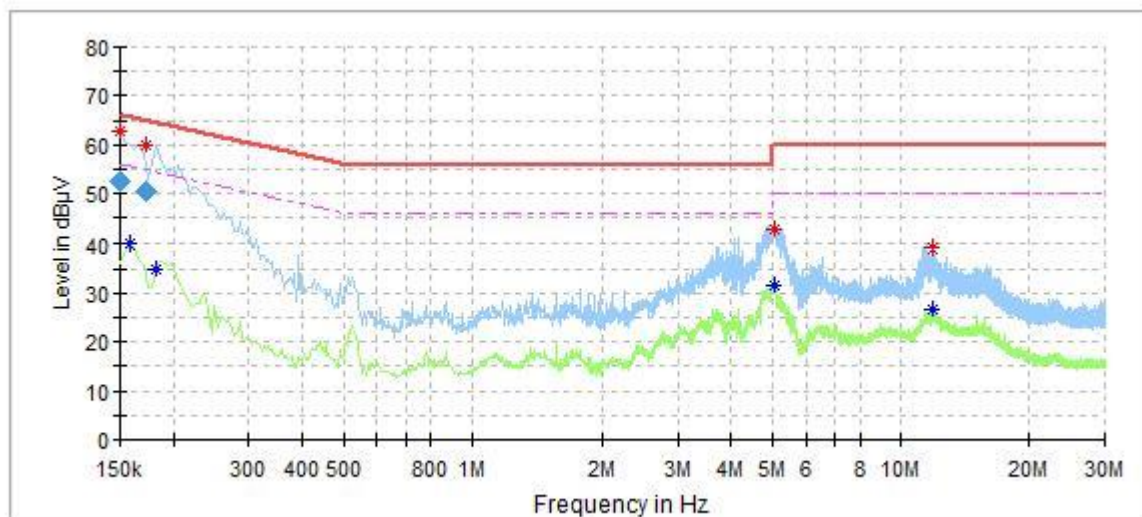
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

Appendix B.5: Test Plots of Conducted Emission on AC Mains

Wireless connecting mode

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Order No.:	168290636 30
Model:	NS-XB1CHATPAD
Test Mode:	wireless connecting mode
Test Voltage:	AC 230V/50Hz
Test By:	Ouyang Wang
Review By:	Gary Chen
Remark:	SR1



Critical Freqs

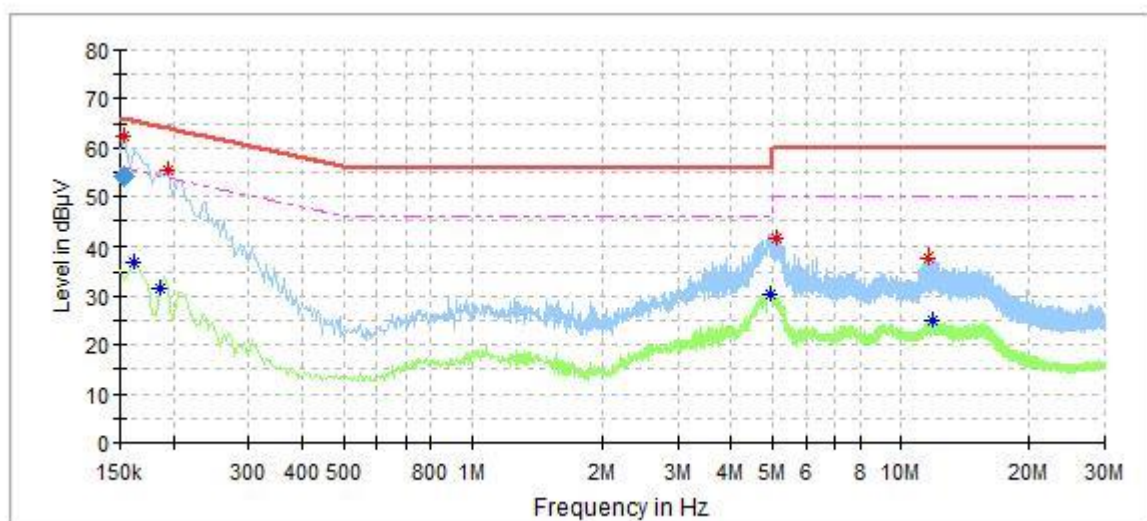
Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.150000	62.61	---	66.00	3.39	L1	9.6
0.158000	---	39.61	55.57	15.96	L1	9.6
0.172500	59.99	---	64.39	4.40	L1	9.6
0.182000	---	34.68	54.39	19.72	L1	9.6
5.044000	---	31.70	50.00	18.30	L1	10.0
5.068000	42.67	---	60.00	17.33	L1	10.0
11.832000	---	26.58	50.00	23.42	L1	10.2
11.908000	38.85	---	60.00	21.15	L1	10.2

Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	52.65	---	66.00	13.35	200.0	9.000	L1	9.6
0.172500	50.41	---	64.84	14.43	200.0	9.000	L1	9.6

EUT Information

EUT Name:	Chat Pad Controller Keyboard for Xbox (Dongle)
Order No.:	168290636 30
Model:	NS-XB1CHATPAD
Test Mode:	wireless connecting mode
Test Voltage:	AC 230V/50Hz
Test By:	Ouyang Wang
Review By:	Gary Chen
Remark:	SR1



Critical Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.154000	62.28	---	65.78	3.51	N	9.6
0.162000	---	36.88	55.36	18.48	N	9.6
0.186000	---	31.69	54.21	22.52	N	9.6
0.194000	55.43	---	63.86	8.43	N	9.6
4.940000	---	30.44	46.00	15.56	N	9.9
5.132000	41.55	---	60.00	18.45	N	9.9
11.656000	37.82	---	60.00	22.18	N	10.2
11.912000	---	25.19	50.00	24.81	N	10.2

Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.154000	54.04	---	65.78	11.74	200.0	9.000	N	9.6