



## **FCC TEST REPORT**

**FCC ID: 2AZYW-301B**

**On Behalf of**

**HENGKAI TOYS FACTORY**

**Toy series**

**Model No.: 301B, 301, 302, 303, 304, 305, 301A, 302A, 303A, 304A, 305A, 302B,  
303B, 304B, 305B**

**Prepared for : HENGKAI TOYS FACTORY**  
**Address : CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG**  
**PROVINCE, CHINA**

**Prepared By : Shenzhen Alpha Product Testing Co., Ltd.**  
**Address : Building i, No.2, Lixin Road, Fuyong Street, Bao'an District,**  
**518103, Shenzhen, Guangdong, China**

**Report Number : A2105145-C01-R01**  
**Date of Receipt : May 19, 2021**  
**Date of Test : May 19, 2021- August 10, 2021**  
**Date of Report : August 10, 2021**  
**Version Number : V0**

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## TEST REPORT DECLARATION

Applicant : HENGKAI TOYS FACTORY  
Address : CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG  
PROVINCE, CHINA  
Manufacturer : HENGKAI TOYS FACTORY  
Address : CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG  
PROVINCE, CHINA  
EUT Description : Toy series  
(A) Model No. : 301B, 301, 302, 303, 304, 305, 301A, 302A, 303A,  
304A, 305A, 302B, 303B, 304B, 305B  
(B) Trademark : N/A

Measurement Standard Used:

**FCC Rules and Regulations Part 15 Subpart C Section 15.247**


**ANSI C63.10:2013**

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....: Yannis Wen  
Project Engineer

  
.....

Approved by (name + signature).....: Simple Guan  
Project Manager

  
.....

Date of issue.....: August 10, 2021

**Revision History**

Revision	Issue Date	Revisions	Revised By
V0	August 10, 2021	Initial released Issue	Yannis Wen

## 1. Summary Of Standards And Results

### 1.1.Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Test Item	Standards Paragraph	Result
Conducted Emission	FCC Part 15: 15.207 ANSI C63.10 :2013	P
6dB Bandwidth	FCC PART 15:15.247(a)(2) ANSI C63.10 :2013	P
Output Power	FCC Part 15: 15.247(b)(3) ANSI C63.10 :2013	P
Radiated Spurious Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.10 :2013	P
Conducted Spurious & Band Edge Emission	FCC Part 15: 15.247(d) ANSI C63.10 :2013	P
Power Spectral Density	FCC PART 15:15.247(e) ANSI C63.10 :2013	P
Radiated Band Edge Emission	FCC Part 15: 15.247(d) ANSI C63.10 :2013	P
Antenna Requirement	FCC Part 15: 15.203	P
Note:	1. P is an abbreviation for Pass. 2. F is an abbreviation for Fail. 3. N/A is an abbreviation for Not Applicable.	

## 2. General Information

### 2.1. Description of Device (EUT)

Description	: Toy series
Trademark	: N/A
Model Number	: 301B, 301, 302, 303, 304, 305, 301A, 302A, 303A, 304A, 305A, 302B, 303B, 304B, 305B
DIFF.	: There is no difference except for the appearance color and model name. So all the test were performed on the model 301B.
Test Voltage	: DC 3V from battery
Radio Technology	: 2.4G
Operation frequency	: 2405-2465MHz
Channel No.	: 61Channels
Modulation type	: GFSK
Antenna Type	: Internal antenna, Maximum Gain is 1.5dBi(This value is supplied by applicant).
Software version	: V1.0
Hardware version	: V1.0
Connector cable loss	: 0.5dB (This value is supplied by applicant).

Note: New batteries used during all test.

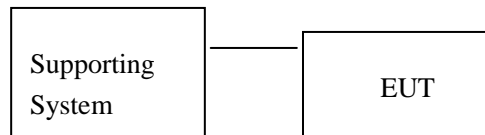
## 2.2.Accessories of Device (EUT)

Accessories1 : /  
 Manufacturer : /  
 Model : /  
 Ratings : /

## 2.3.Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification
1.	N/A	N/A	N/A	N/A	N/A

## 2.4.Block Diagram of connection between EUT and simulators



## 2.5.Test Mode Description

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
GFSK	Low :CH1	2405
	Middle: CH29	2433
	High: CH61	2465

## 2.6.Test Conditions

Items	Required	Actual
Temperature range:	15-35℃	24℃
Humidity range:	25-75%	56%
Pressure range:	86-106kPa	98kPa



## 2.7. Test Facility

Shenzhen Alpha Product Testing Co., Ltd

Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103,  
Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission

Registration Number: 293961

July 15, 2019 Certificated by IC

Registration Number: CN0085

## 2.8. Measurement Uncertainty

(95% confidence levels, k=2)

Item	Uncertainty
Uncertainty for Power point Conducted Emissions Test	2.74dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB(Polarize: V)
	2.57dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.77dB(Polarize: V)
	3.80dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.13dB(Polarize: H)
	4.16dB(Polarize: V)
Uncertainty for radio frequency	$5.4 \times 10^{-8}$
Uncertainty for conducted RF Power	0.37dB
Uncertainty for temperature	0.2°C
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

## 2.9. Test Equipment List

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	CHENYU	9*6*6	N/A	2020.09.02	1 Year
Spectrum analyzer	ROHDE&SC HWARZ	FSU	1166.1660.26	2020.09.02	1 Year
Spectrum analyzer	Agilent	N9020A	MY499100060	2020.09.02	1 Year
Receiver	ROHDE&SC HWARZ	ESR	1316.3003K03-10 2082-Wa	2020.09.02	1 Year
Receiver	R&S	ESCI	101165	2020.09.02	1 Year
Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2019.09.07	2 Year
Horn Antenna	SCHWARZB ECK	BBHA 9120 D	BBHA 9120 D(1201)	2020.04.12	2 Year
Loop Antenna	SCHWARZB ECK	FMZB 1519B	00059	2019.09.07	2 Year
Cable	Resenberger	N/A	No.1	2020.09.02	1 Year
Cable	SCHWARZB ECK	N/A	No.2	2020.09.02	1 Year
Cable	SCHWARZB ECK	N/A	No.3	2020.09.02	1 Year
Pre-amplifier	HP	HP8347A	2834A00455	2020.09.02	1 Year
Pre-amplifier	Agilent	8449B	3008A02664	2020.09.02	1 Year
Temperature controller	Terchy	MHQ	120	2020.09.02	1 Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126-466	2020.09.02	1 Year
L.I.S.N.#2	ROHDE&SC HWARZ	ENV216	101043	2020.09.02	1 Year
20db Attenuator	ICPROBING	IATS1	82347	2020.09.02	1 Year
Power meter	Agilent	E4419B	GB40202122	2020.09.02	1 Year

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	EZ-EMC	EZ	Alpha-3A1
CE	EZ-EMC	EZ	Alpha-3A1
RF-CE	MTS 8310	MW	V2.0.0.0

### 3. Maximum Conducted Output Power

#### 3.1. Limit

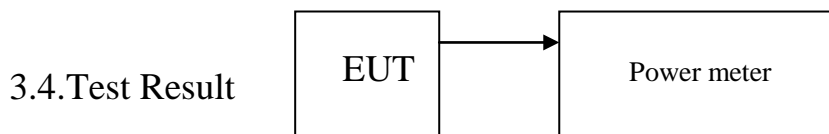
Please refer section 15.247.

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts, the e.i.r.p shall not exceed 4W

#### 3.2. Test Procedure

The transmitter output is connected to the RF Power Meter. The RF Power Meter is set to the average power detection.

#### 3.3. Test Setup



Mode	Freq (MHz)	Peak Output Power (dBm)	Limit (dBm)	Result
GFSK	2405	-13.692	21	Pass
	2433	-14.583	21	Pass
	2465	-15.485	21	Pass
Conclusion: PASS				

## 4. Power Spectral Density

### 4.1.Limit

4.1.1 Please refer section RSS-247 & 15.247.

4.1.2 For direct sequence systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

4.1.3 The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

### 4.2.Test Procedure

Details see the KDB558074 D01 Meas Guidance V05

4.2.1 Place the EUT on the table and set it in transmitting mode.

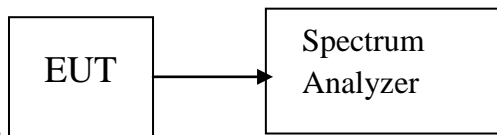
4.2.2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

4.2.3 Detector = PEAK. Set the spectrum analyzer as RBW = 3kHz(Set the RBW to:  $3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$ .), VBW = 10kHz(Set the  $\text{VBW} \geq 3 \times \text{RBW}$ ), span=1.5×DTS bandwidth., detail see the test plot.

4.2.4 Record the max reading.

4.2.5 Repeat the above procedure until the measurements for all frequencies are completed.

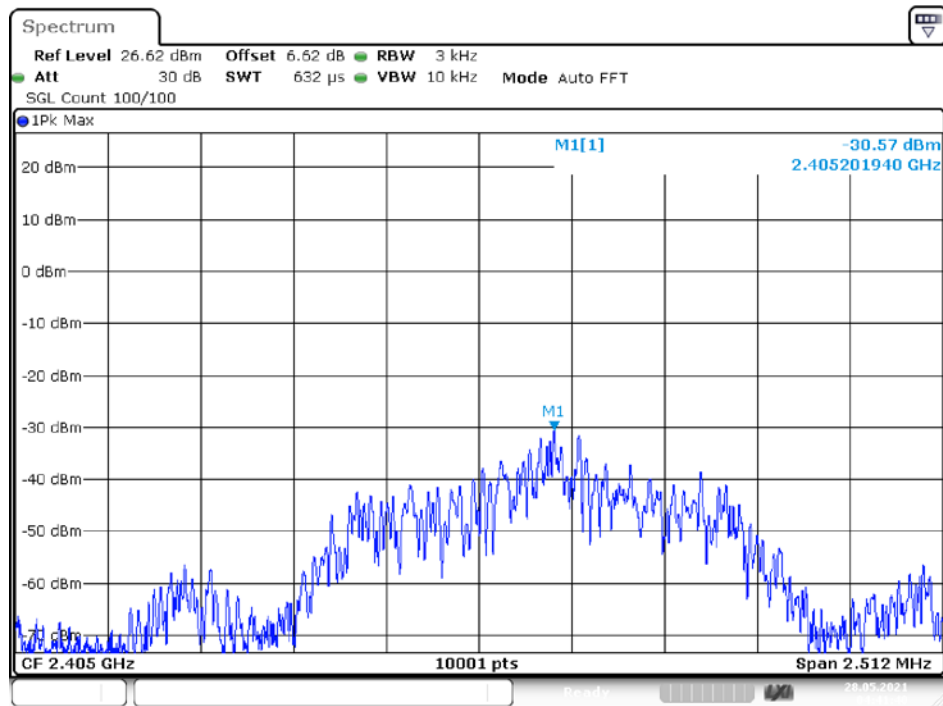
### 4.3.Test Setup



### 4.4.Test Results

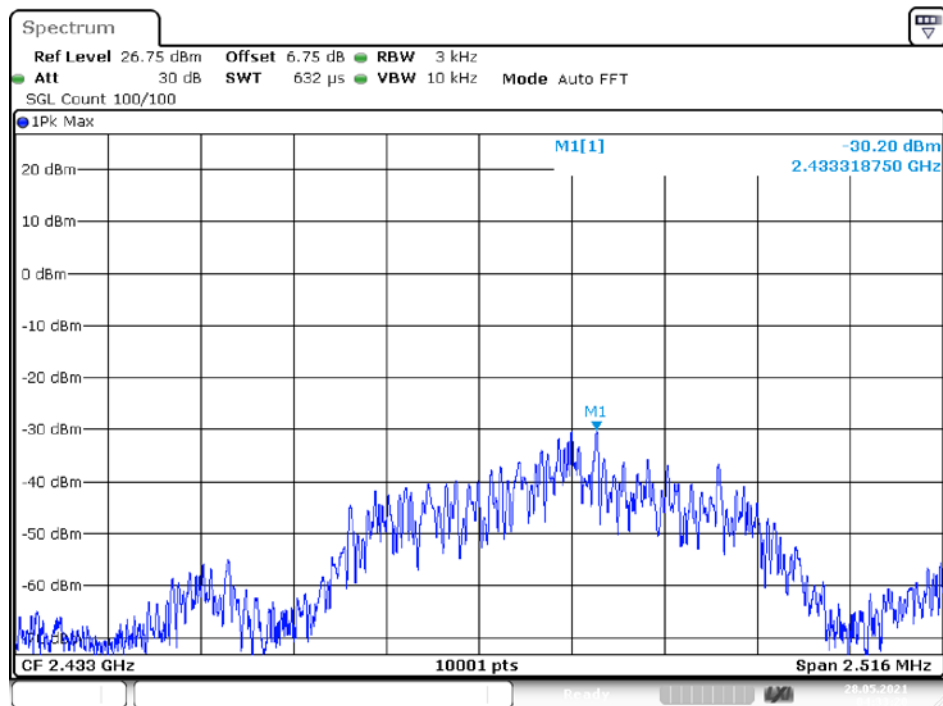
Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limit (dBm)	Result
CH1	2405	-30.572	8	PASS
CH29	2433	-30.203	8	PASS
CH61	2465	-31.455	8	PASS
Conclusion: PASS				

## PSD NVNT user 2405MHz Ant1



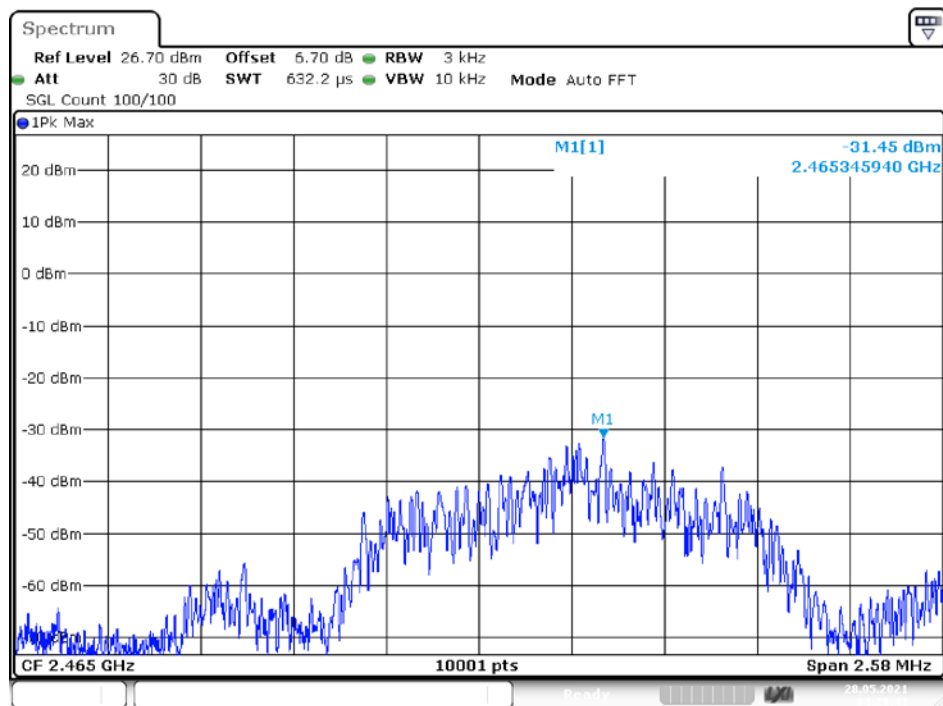
Date: 28.MAY.2021 04:41:40

## PSD NVNT user 2433MHz Ant1



Date: 28.MAY.2021 04:33:20

## PSD NVNT user 2465MHz Ant1



Date: 28.MAY.2021 04:29:43

## 5. Bandwidth

### 5.1.Limit

Please refer section RSS-247 & 15.247

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 kHz.

### 5.2.Test Procedure

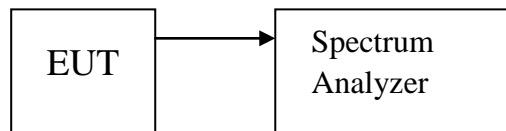
Details see the KDB558074 D01 Meas Guidance v05r02

a) The bandwidth is measured at an amplitude level reduced 6dB from the reference level.

The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

b) The test receiver set  $RBW = 100\text{kHz}$ ,  $VBW \geq 3 * RBW = 300\text{kHz}$ , Sweep time set auto, detail see the test plot.

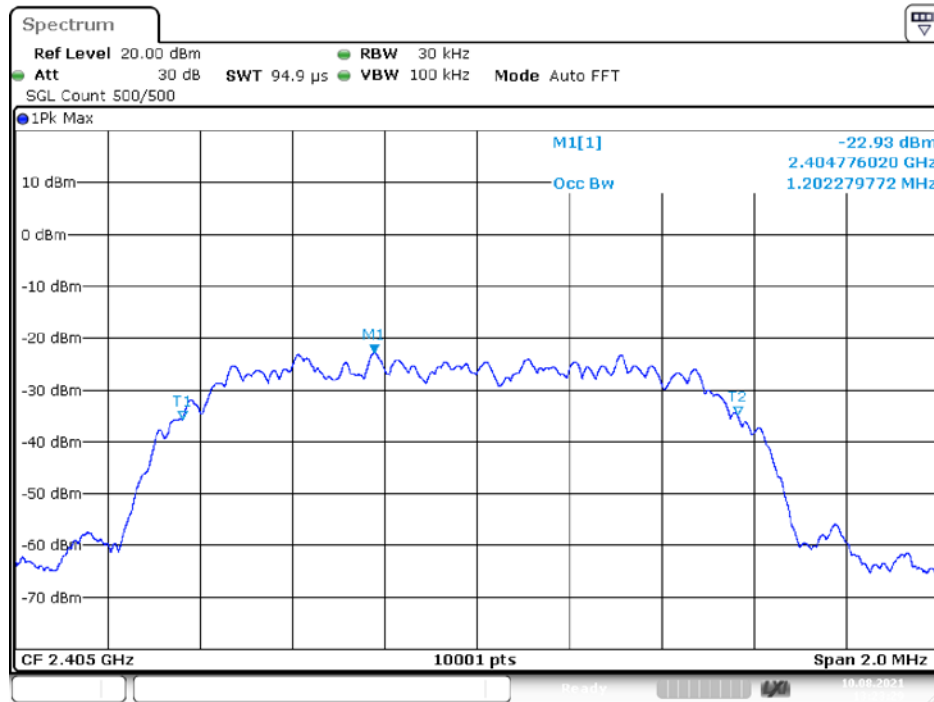
### 5.3.Test Setup



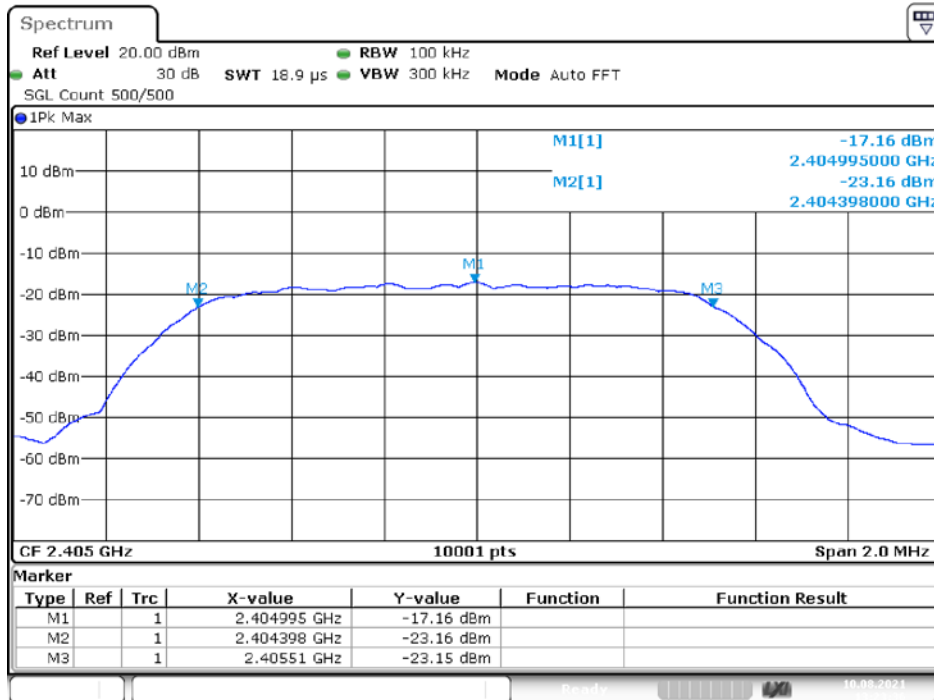
### 5.4.Test Result

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE	2405	Ant 1	1.2023	1.112	0.5	Pass
NVNT	BLE	2433	Ant 1	1.2021	1.1006	0.5	Pass
NVNT	BLE	2465	Ant 1	1.2025	1.1068	0.5	Pass

## OBW NVNT BLE 2405MHz Ant1

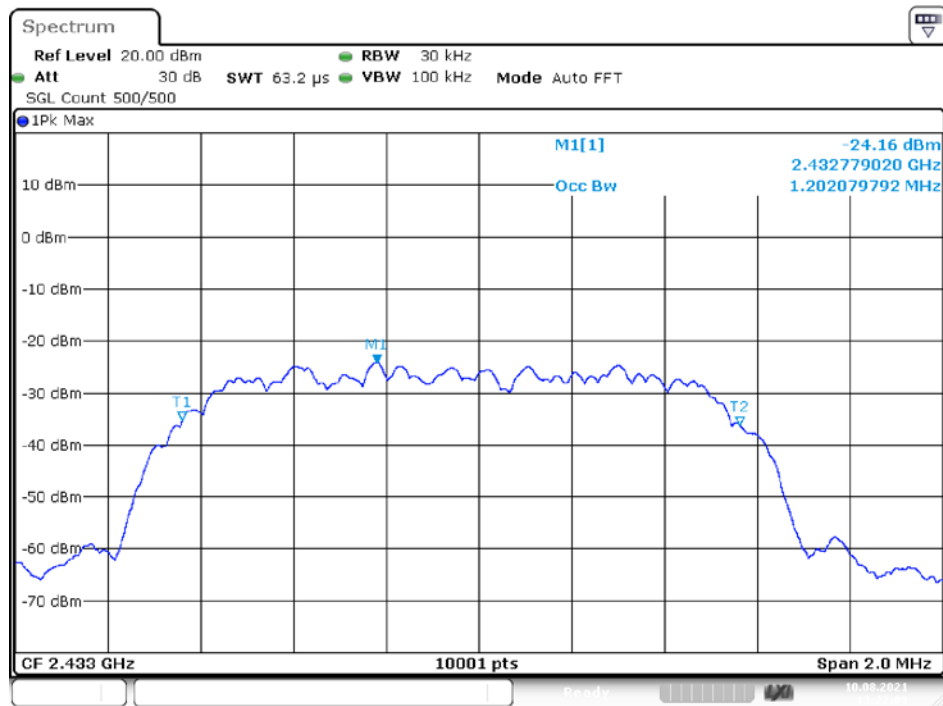


## -6 dB BW NVNT BLE 2405MHz Ant1



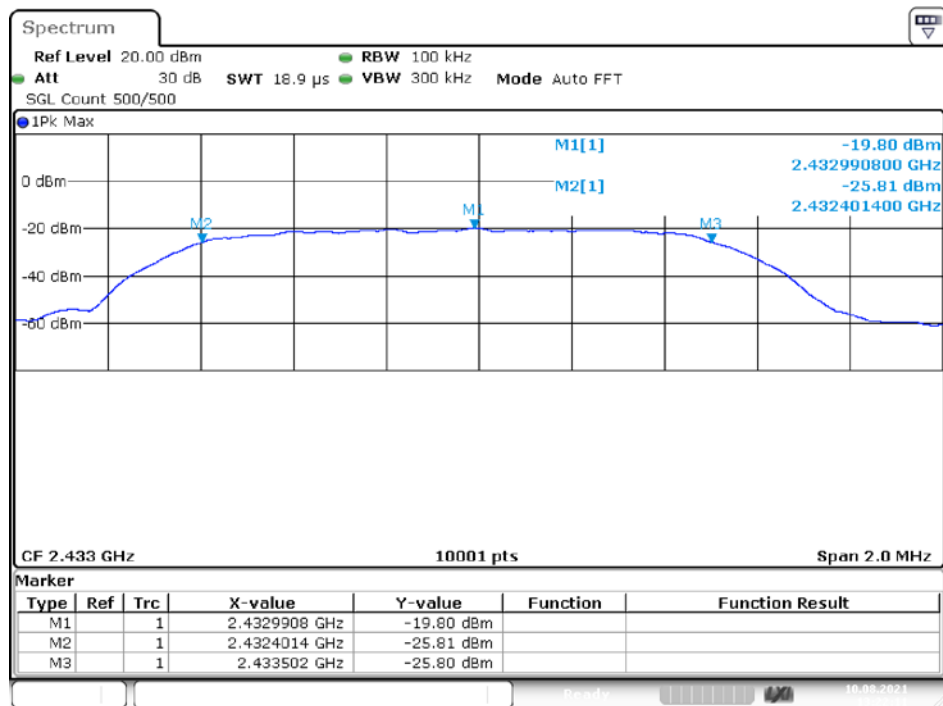


## OBW NVNT BLE 2433MHz Ant1



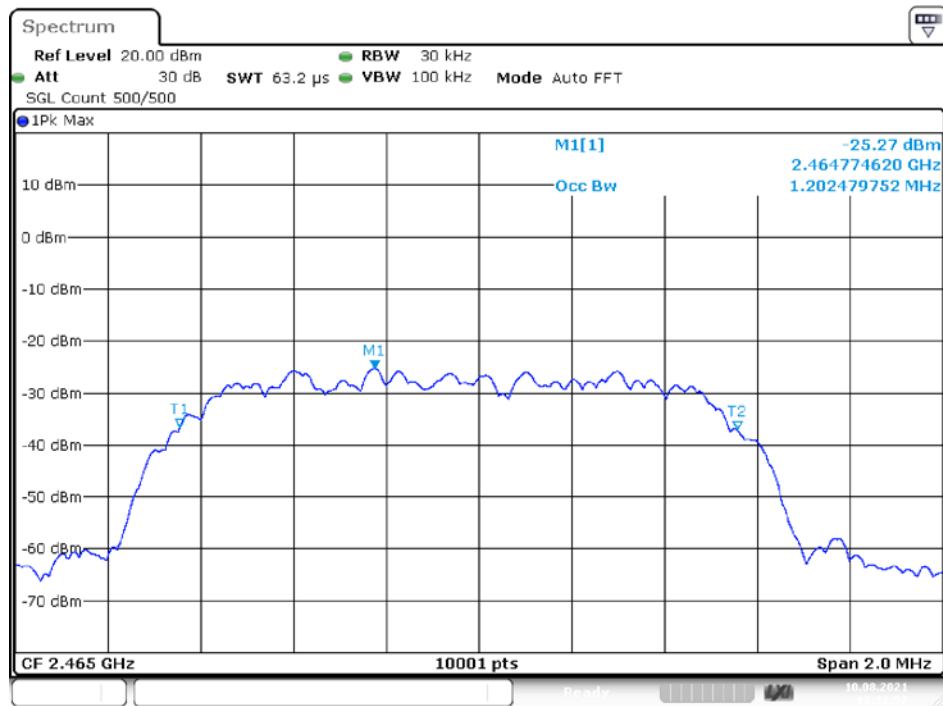
Date: 10.AUG.2021 13:22:03

## -6 dB BW NVNT BLE 2433MHz Ant1



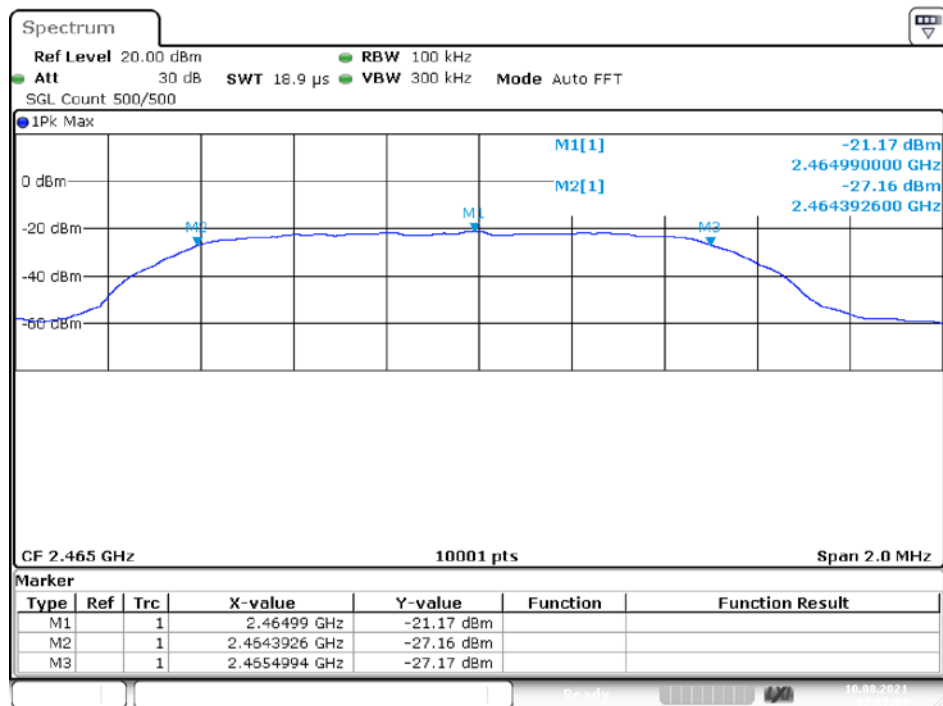
Date: 10.AUG.2021 13:22:10

## OBW NVNT BLE 2465MHz Ant1



Date: 10.AUG.2021 13:22:57

## -6 dB BW NVNT BLE 2465MHz Ant1



Date: 10.AUG.2021 13:23:04

## 6. Radiated Emissions

### 6.1.Limit

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

#### 15.205 Restricted frequency band

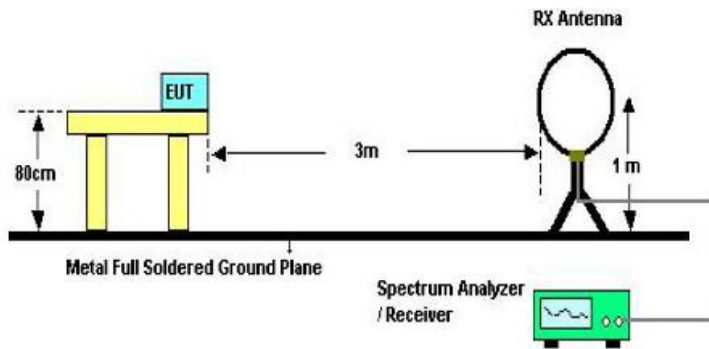
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )

#### 15.209 Limit

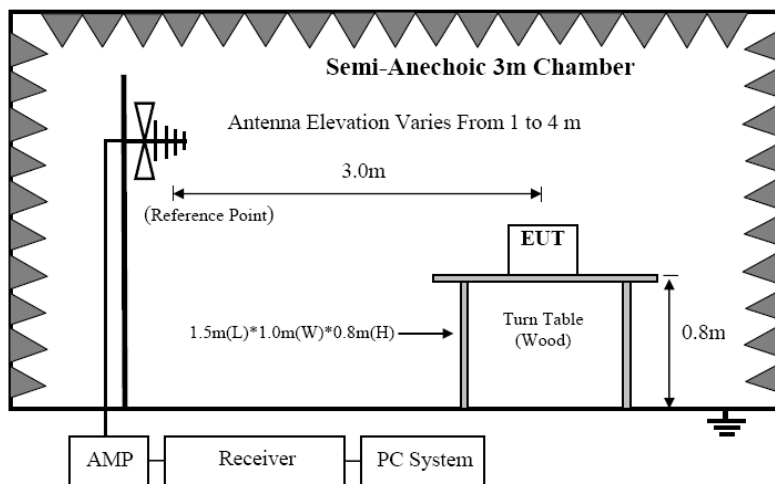
FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
0.009-0.490	300	2400/F(KHz)	/
0.490-1.705	30	24000/F(KHz)	/
1.705-30	30	30	29.5
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

## 6.2. Block Diagram of Test setup

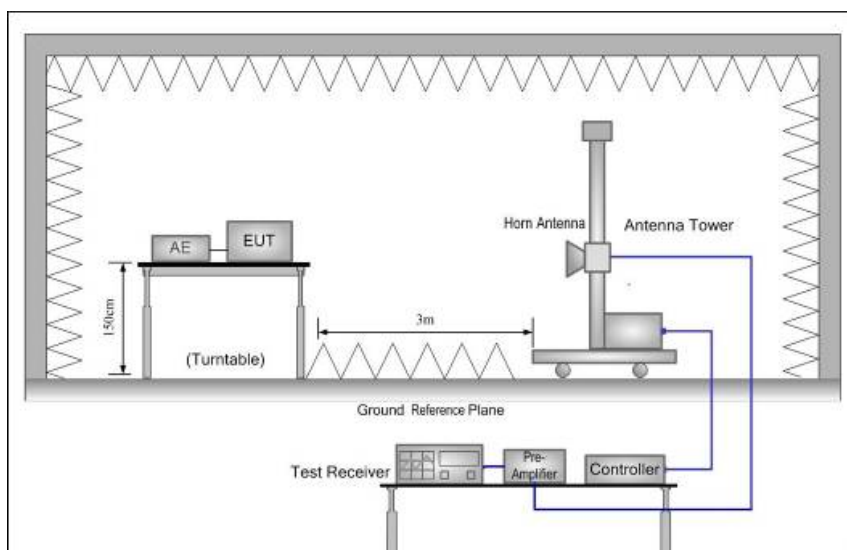
### 8.2.1 In 3m Anechoic Chamber Test Setup Diagram for below 30MHz



### 8.2.1 In 3m Anechoic Chamber Test Setup Diagram for below 1GHz



### 8.2.2 In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

### 6.3. Test Procedure

- (1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.
- (2) Setup EUT and simulator as shown in section 1.4 and 6.1
- (3) Test antenna was located 3m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.
  - (a) Change work frequency or channel of device if practicable.
  - (b) Change modulation type of device if practicable.
  - (c) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions
- (4) Spectrum frequency from 9KHz to 25GHz (tenth harmonic of fundamental frequency) was investigated
- (5) For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 :2013on Radiated Emission test.
- (6) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RBW is set at 1MHz, VBW is set at 10Hz for Average measure.

### 6.4. Test Result

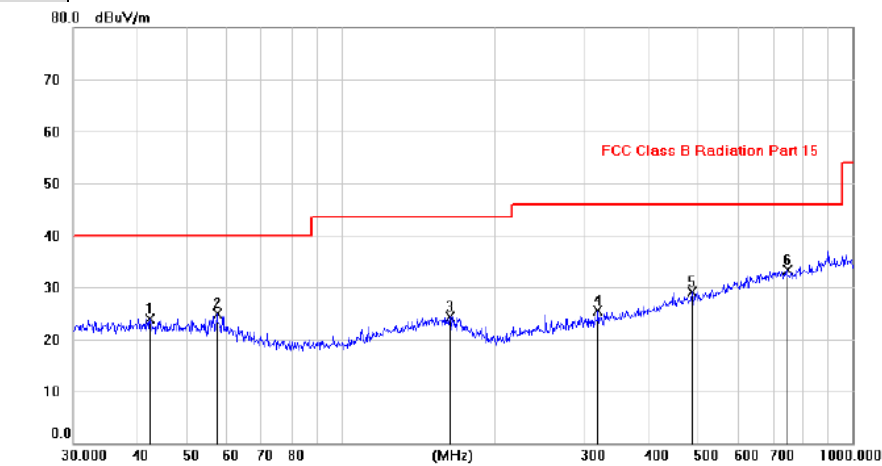
We have scanned the 10th harmonic from 9KHz to the EUT's highest frequency..  
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

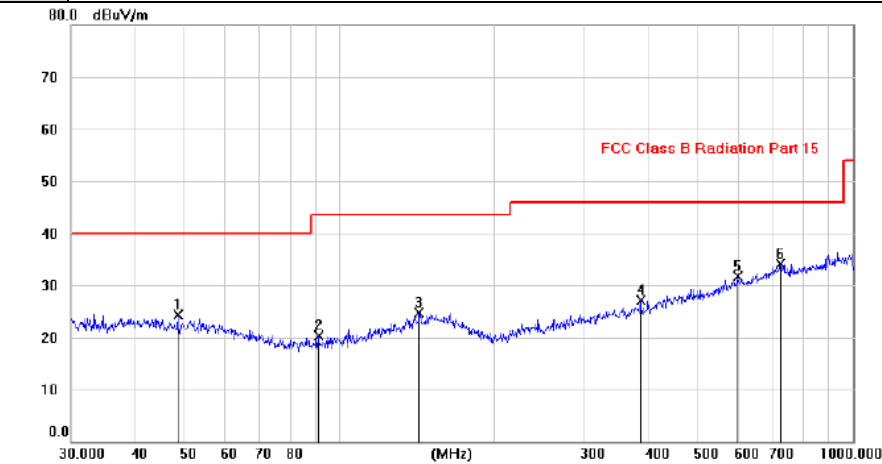
From 30MHz to 1000MHz: Conclusion: PASS

**Pol** Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		42.4112	9.63	14.29	23.92	40.00	-16.08	peak		
2		57.3655	11.54	13.41	24.95	40.00	-15.05	peak		
3		163.2772	9.67	14.73	24.40	43.50	-19.10	peak		
4		318.5935	10.96	14.59	25.55	46.00	-20.45	peak		
5		487.0873	11.00	18.04	29.04	46.00	-16.96	peak		
6	*	745.4758	11.03	22.37	33.40	46.00	-12.60	peak		

**Pol** Horizontal



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		48.3657	10.25	14.06	24.31	40.00	-15.69	peak		
2		91.1320	10.06	10.19	20.25	43.50	-23.25	peak		
3		143.3261	10.24	14.56	24.80	43.50	-18.70	peak		
4		385.7761	11.00	16.01	27.01	46.00	-18.99	peak		
5		596.5258	11.50	20.15	31.65	46.00	-14.35	peak		
6	*	722.6544	12.11	22.05	34.16	46.00	-11.84	peak		

\*:Maximum data x:Over limit !:over margin

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Remark: All modes have been tested, and only worst data of (GFSK) was listed in this report.

From 1G-25GHz

Test Mode: GFSK TX Low									
Freq (MHz)	Read Level (dBuV/m)	Polar (H/V)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4810	44.42	V	33.95	10.18	34.26	54.29	74	-19.71	PK
4810	39.31	V	33.95	10.18	34.26	49.18	54	-4.82	AV
7215	/	/	/	/	/	/	/	/	/
9620	/	/	/	/	/	/	/	/	/
4810	45.64	H	33.95	10.18	34.26	55.51	74	-18.49	PK
4810	36.23	H	33.95	10.18	34.26	46.10	54	-7.9	AV
7215	/	/	/	/	/	/	/	/	/
9620	/	/	/	/	/	/	/	/	/
Test Mode: GFSK TX Mid									
4810	41.73	V	33.93	10.2	34.29	51.57	74	-22.43	PK
4810	33.61	V	33.93	10.2	34.29	43.45	54	-10.55	AV
7215	/	/	/	/	/	/	/	/	/
9620	/	/	/	/	/	/	/	/	/
4810	45.36	H	33.93	10.2	34.29	55.20	74	-18.8	PK
4810	32.98	H	33.93	10.2	34.29	42.82	54	-11.18	AV
7215	/	/	/	/	/	/	/	/	/
9620	/	/	/	/	/	/	/	/	/
Test Mode: GFSK TX High									
4810	43.39	V	33.98	10.22	34.25	53.34	74	-20.66	PK
4810	34.91	V	33.98	10.22	34.25	44.86	54	-9.14	AV
7215	/	/	/	/	/	/	/	/	/
9620	/	/	/	/	/	/	/	/	/
4810	43.46	H	33.98	10.22	34.25	53.41	74	-20.59	PK
4810	32.72	H	33.98	10.22	34.25	42.67	54	-11.33	AV
7215	/	/	/	/	/	/	/	/	/
9620	/	/	/	/	/	/	/	/	/
Note:									
1, Result = Read level + Antenna factor + cable loss-Amp factor									
2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

*Remark: All modes have been tested, and only worst data of (GFSK) was listed in this report.*

## Conducted method

EUT Description	Toy series	Model No.	PT1933
Temperature	24°C	Humidity	56%
Test mode	GFSK(2405MHz)	Test mode	GFSK(2433MHz)

Spectrum

Ref Level 6.62 dBm Offset 5.62 dB RBW 100 kHz

Att 30 dB SWT 250 ms VBW 300 kHz Mode Auto Sweep

SGL Count 10/10

IPk Max

0 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

-80 dBm

-90 dBm

M1[1]

M2[1]

M3

M4

M5

-17.17 dBm

2.4120 GHz

-44.97 dBm

18.2831 GHz

-34.560 dBm

Start 30.0 MHz

1001 pts

Stop 25.0 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1	1	2.412 GHz	-17.17 dBm		
M2	1	1	18.2831 GHz	-44.97 dBm		
M3	1	1	4.6494 GHz	-50.45 dBm		
M4	1	1	7.0965 GHz	-49.69 dBm		
M5	1	1	9.8182 GHz	-50.48 dBm		

Date: 20.MAY.2021 04:45:01

Spectrum

Ref Level 6.75 dBm Offset 5.75 dB RBW 100 kHz

Att 30 dB SWT 250 ms VBW 300 kHz Mode Auto Sweep

SGL Count 10/10

IPk Max

0 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

-80 dBm

-90 dBm

M1[1]

M2[1]

M3

M4

M5

-16.32 dBm

2.4370 GHz

-45.25 dBm

18.2831 GHz

-35.161 dBm

Start 30.0 MHz

1001 pts

Stop 25.0 GHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1	1	2.437 GHz	-16.32 dBm		
M2	1	1	18.2831 GHz	-45.25 dBm		
M3	1	1	5.049 GHz	-50.20 dBm		
M4	1	1	7.1215 GHz	-49.77 dBm		
M5	1	1	9.8932 GHz	-48.87 dBm		

Date: 20.MAY.2021 04:36:49

Test mode	GFSK(2465MHz)
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Spectrum

Ref Level 6.70 dBm Offset 5.70 dB RBW 100 kHz

Att 30 dB SWT 250 ms VBW 300 kHz Mode Auto Sweep

SGL Count 10/10

IPk Max

0 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

-80 dBm

-90 dBm

M1[1]

M2[1]

M3

M4

M5

-17.89 dBm

2.4620 GHz

-44.76 dBm

18.3330 GHz

-37.237 dBm

Start 30.0 MHz

1001 pts

Stop 25.0 GHz

Marker

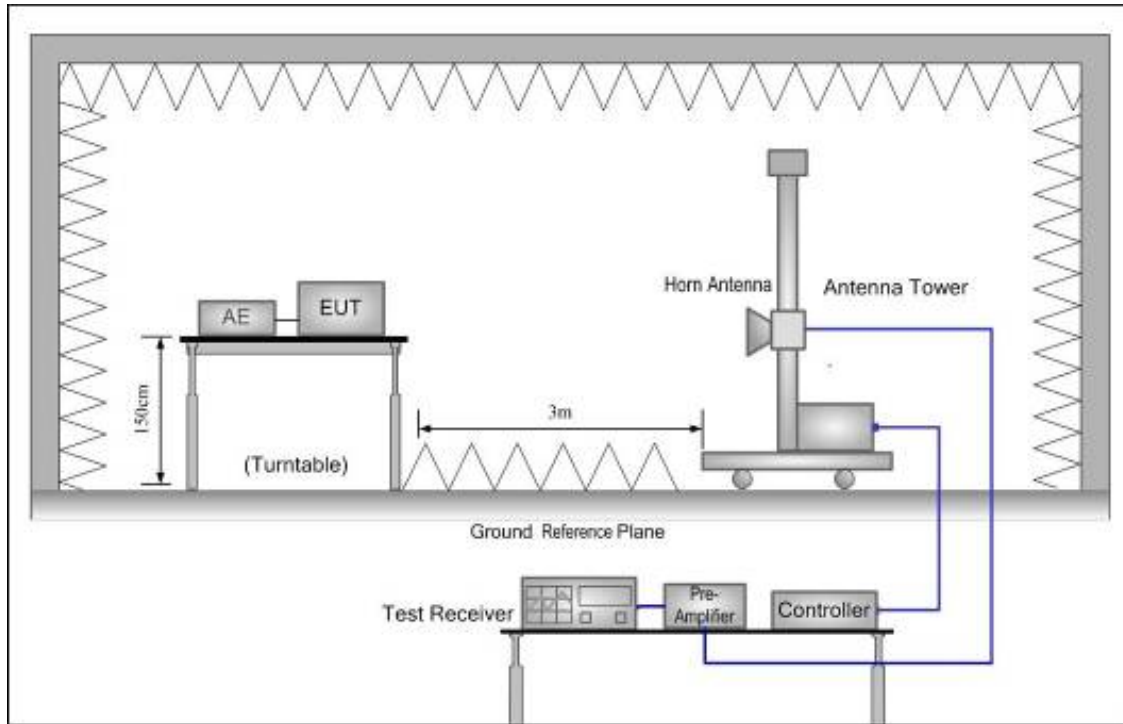
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1	1	2.462 GHz	-17.89 dBm		
M2	1	1	18.333 GHz	-44.76 dBm		
M3	1	1	4.8492 GHz	-50.82 dBm		
M4	1	1	7.546 GHz	-50.93 dBm		
M5	1	1	10.018 GHz	-49.24 dBm		

Date: 20.MAY.2021 04:30:23



## 7. Band Edge Compliance

### 7.1. Block Diagram of Test Setup



### 7.2. Limit

All the lower and upper band-edges emissions appearing within restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

### 7.3. Test Procedure

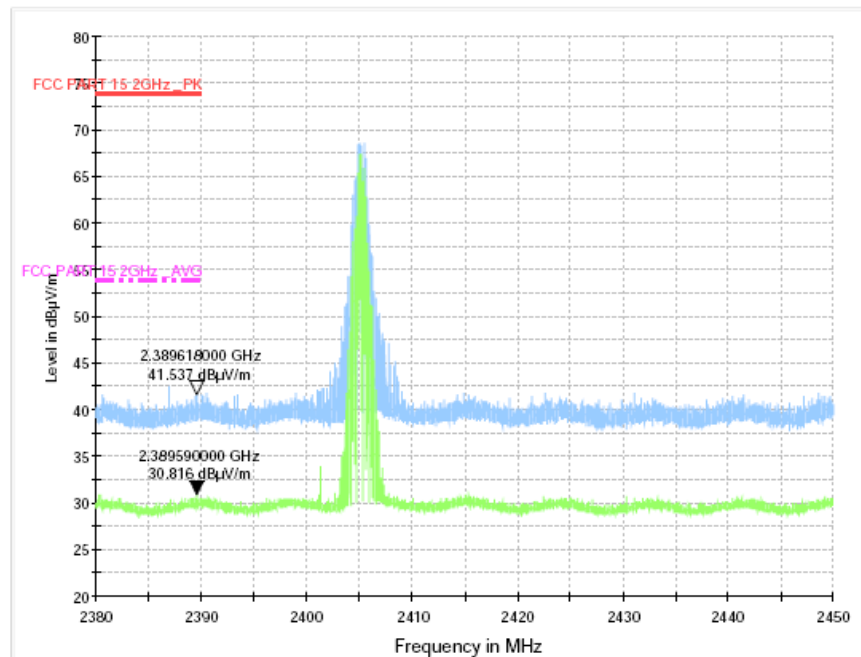
All restriction band and non- restriction band have been tested, only worse case is reported.

### 7.4. Test Result

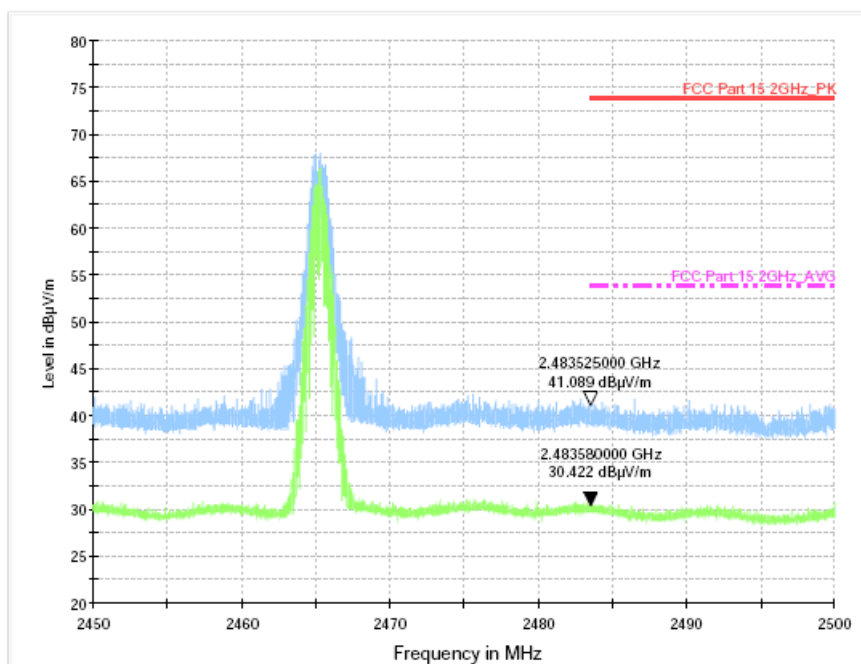
PASS. (See below detailed test data)

Radiated Method:

Test Mode: GFSK-Low

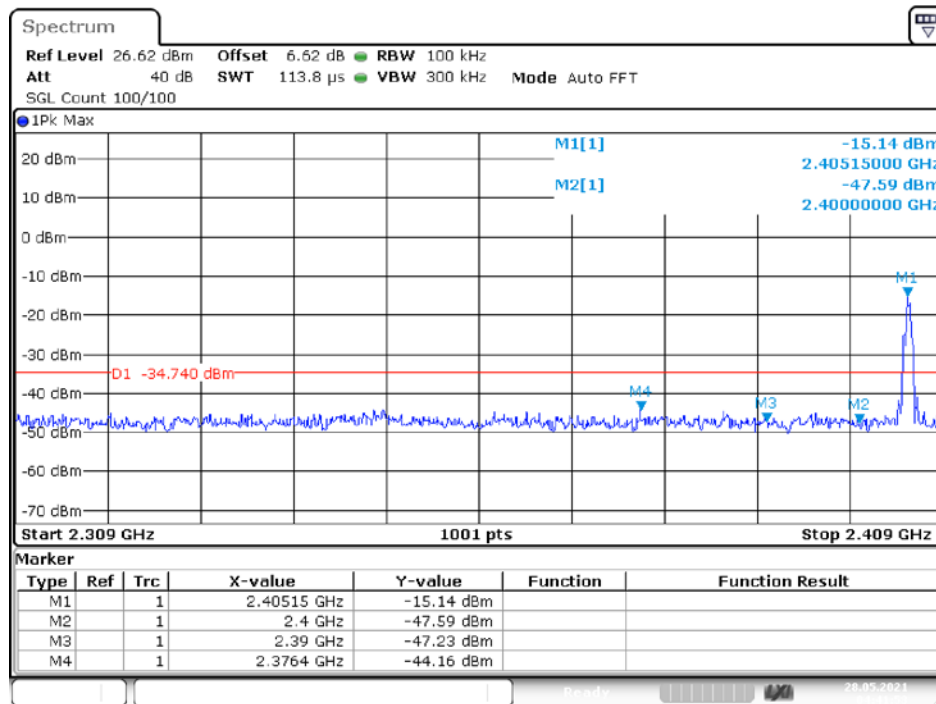


Test Mode: GFSK-High



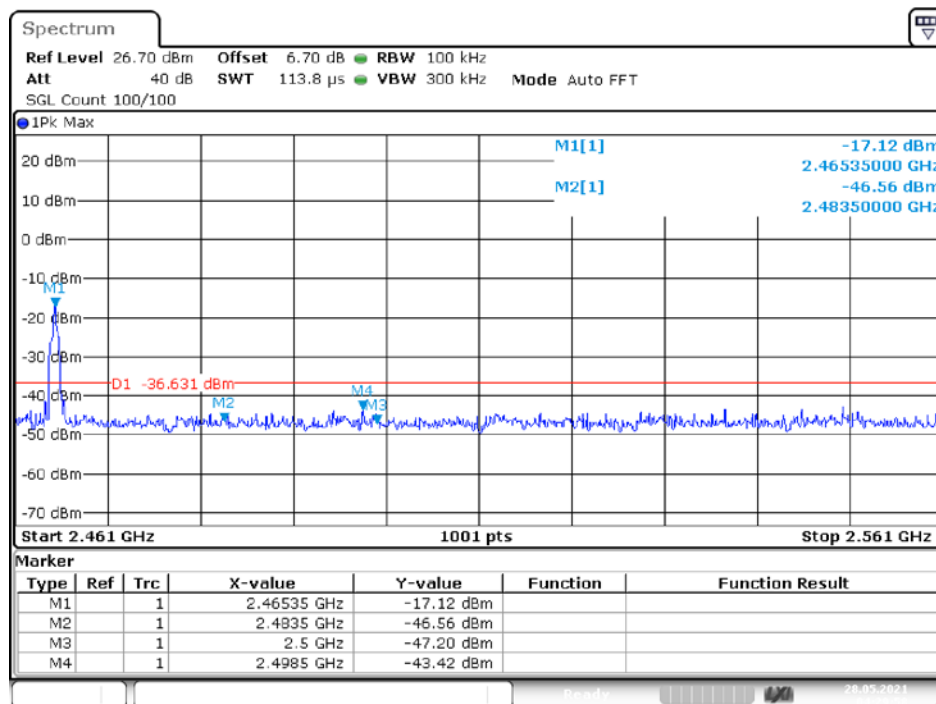
## Conducted Method

## Band Edge NVNT 1-DH1 2405MHz Ant1 Emission



Date: 28.MAY.2021 04:41:53

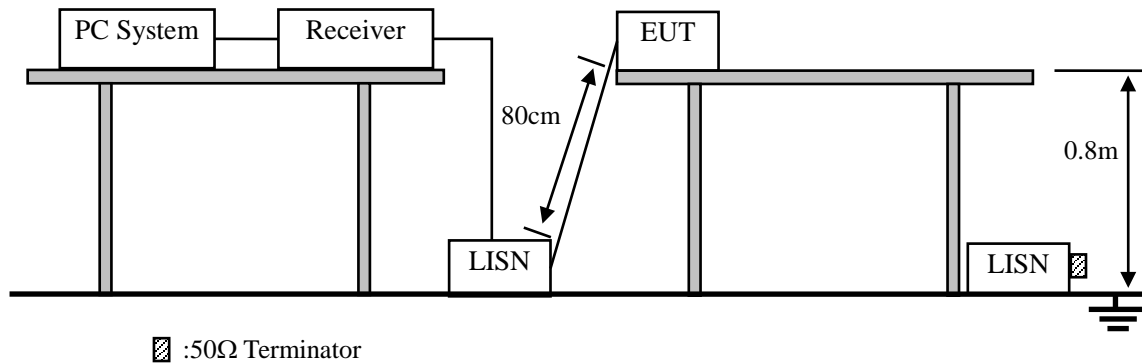
## Band Edge NVNT 1-DH1 2465MHz Ant1 Emission



Date: 28.MAY.2021 04:29:58

## 8. Power Line Conducted Emissions

### 8.1. Block Diagram of Test Setup



### 8.2. Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB( $\mu$ V)	Average Level dB( $\mu$ V)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. \* Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

### 8.3. Test Procedure

- (1) The EUT was placed on a non-metallic table, 80cm above the ground plane.
- (2) Setup the EUT and simulator as shown in 10.1
- (3) The EUT Power connected to the power mains through a power adapter and a line impedance stabilization network (L.I.S.N1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N2), this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 :2013 on conducted Emission test.
- (4) The bandwidth of test receiver is set at 10KHz.
- (5) The frequency range from 150 KHz to 30MHz is checked.

### 8.4. Test Result

The EUT is supplied by battery, so this item does not applicable.

## **9. Antenna Requirements**

### **9.1. Standard Requirement**

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.

### **9.2. Antenna Connected Construction**

The antenna is Internal antenna and no consideration of replacement. Please see EUT photo for details.

### **9.3. Results**

The EUT antenna is Internal Antenna. It complies with the standard requirement.

## 10. Test Setup Photo

### 10.1. Photos of Radiated emission



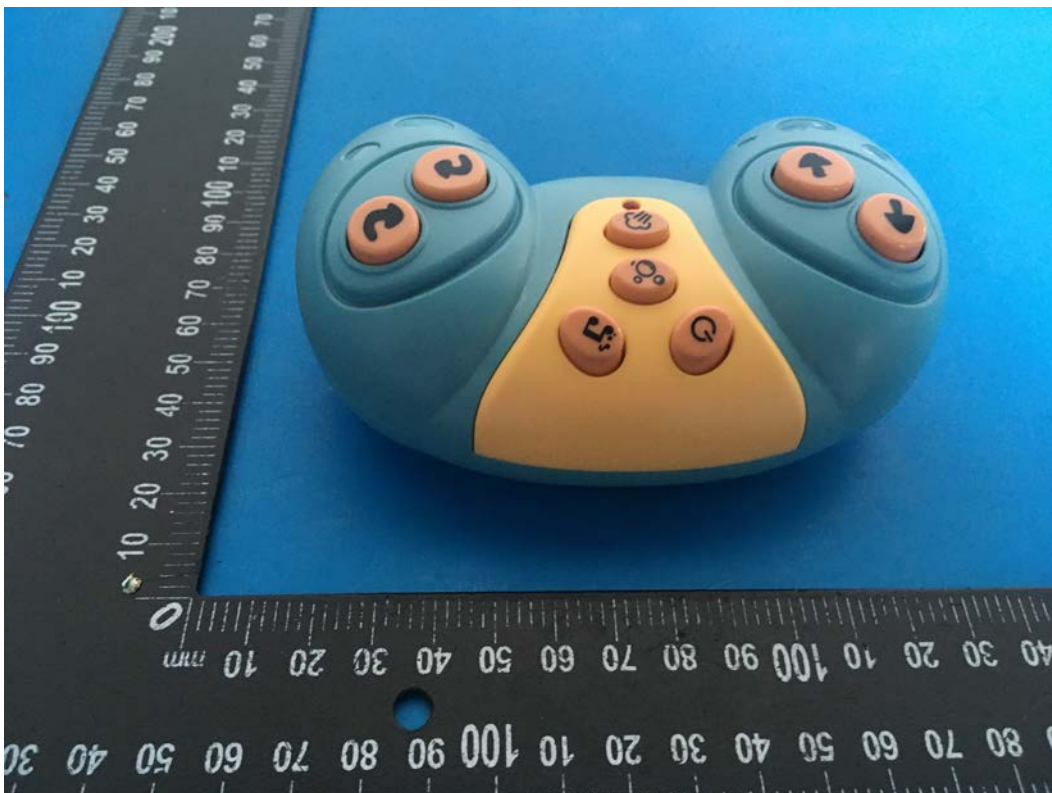
## 11.Photos Of EUT

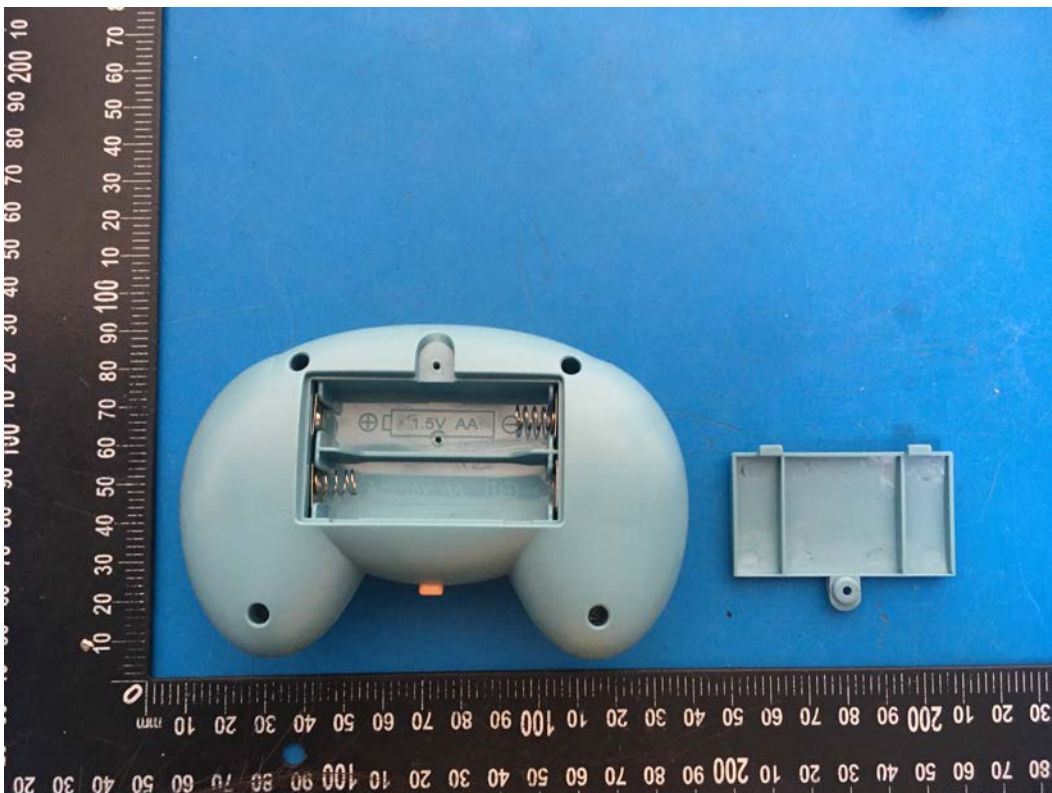






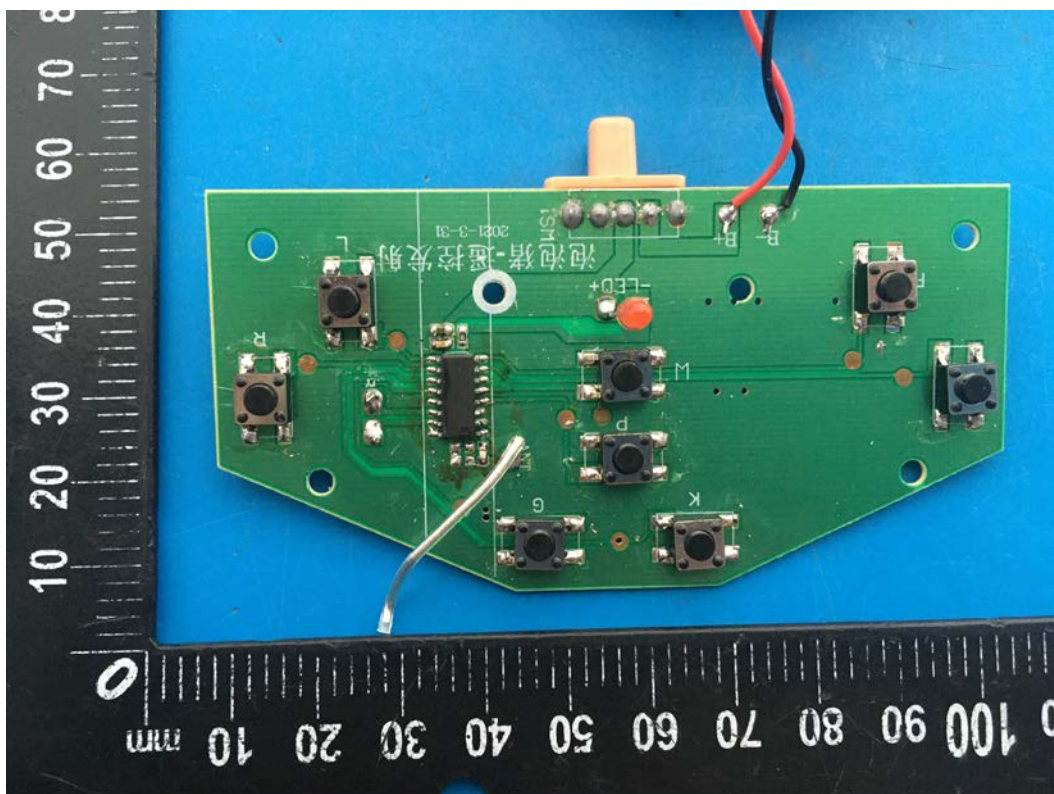
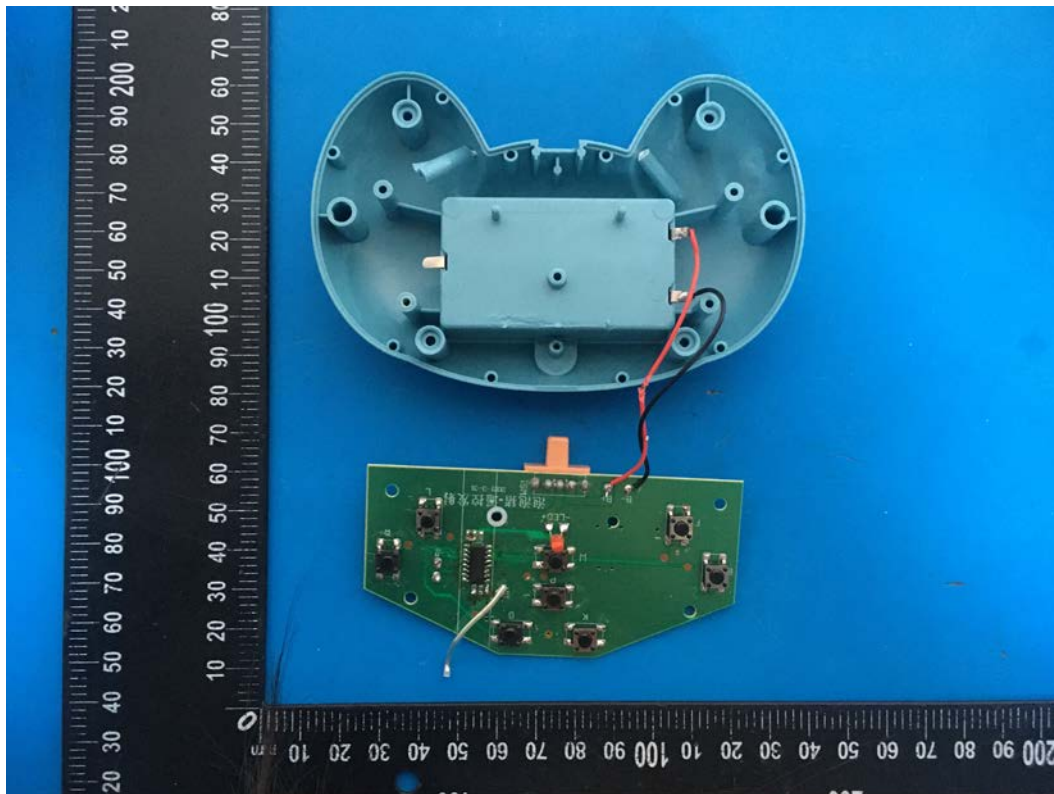


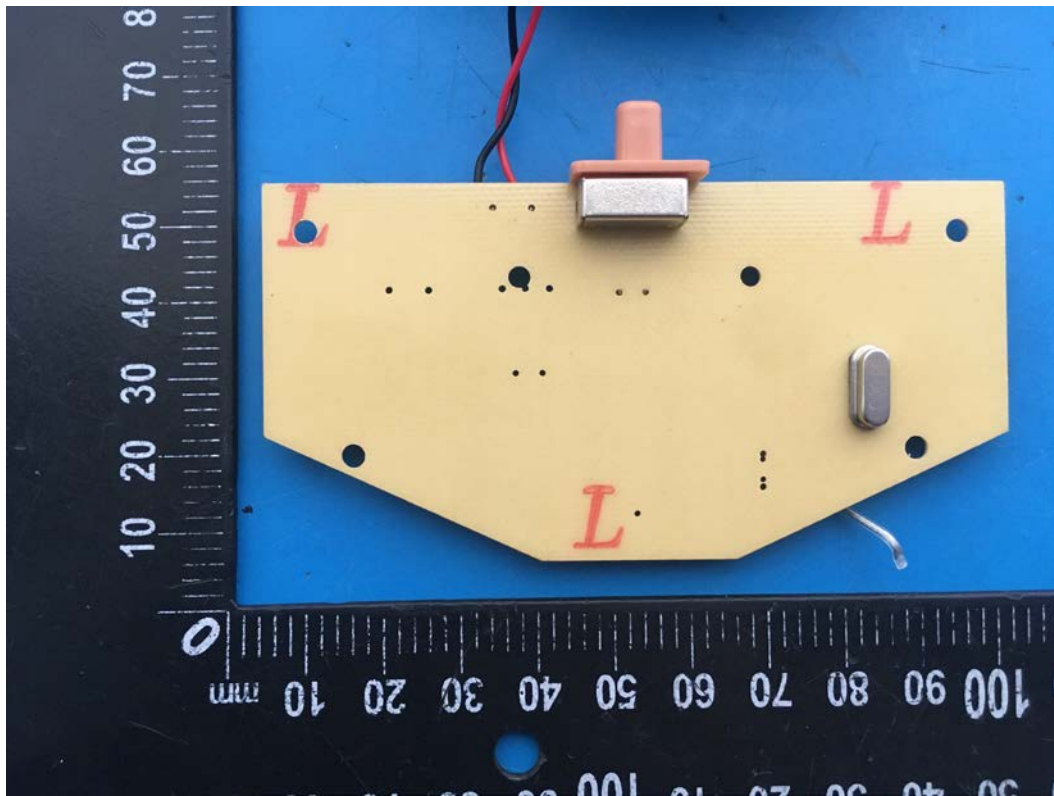












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