MRT Technology (Suzhou) Co., Ltd
Phone: +86-512-66308358
Fax: +86-512-66308368
Web: www.mrt-cert.com

Report No.: 2009RSU035-U1
Report Version: V01
Issue Date: 2020-12-23

MEASUREMENT REPORT

FCC PART 15F

Ultra-Wideband Transmission Systems

FCC ID:	XBG-UBT100
APPLICANT:	AVALUE TECHNOLOGY INCORPORATION
Application Type:	Certification
Product:	UWB TAG
Model No.:	UB-T100
Brand Name:	Avalue
FCC Classification:	Wideband Transmitter (WBT)
FCC Rule Part(s):	Part 15, Section 15.519 (Hand Held UWB Systems)
Test Procedure(s):	ANSI C63.10-2013
Received Date:	August 12, 2020
Test Date:	August 12 ~ December 15, 2020

Reviewed By : Kevin Guo
(Kevin Guo)

Approved By : Robin Wu
(Robin Wu)

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANCI 63.10. Test results reported herein relate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date	Note
2009RSU035-U1	Rev. 01	Initial Report	2020-12-23	

CONTENTS

Description Page

1. General Information 5

1.1. Applicant 5
1.2. Manufacturer 5
1.3. Testing Facility 5

2. INTRODUCTION 6

2.1. Scope 6
2.2. MRT Test Location 6

3. PRODUCT INFORMATION 7

3.1. Feature of Equipment under Test 7
3.2. Test Mode 8
3.3. Description of Test Software 8
3.4. Device Capabilities 8
3.5. Test Configuration 8
3.6. EMI Suppression Device(s)/Modifications 8
3.7. Labeling Requirements 9

4. DESCRIPTION of TEST 10

4.1. Evaluation Procedure 10
4.2. AC Line Conducted Emissions 10
4.3. Radiated Emissions 11

5. ANTENNA REQUIREMENTS 12

6. TEST EQUIPMENT CALIBRATION DATE 13

7. MEASUREMENT UNCERTAINTY 14

8. TEST RESULT 15

8.1. Summary 15
8.2. Occupied Bandwidth and Operation Frequency Range Measurement 16
8.2.1. Test Limit 16
8.2.2. Test Procedure used 16
8.2.3. Test Setting 16
8.2.4. Test Setup 17
8.2.5. Test Result 18
8.3. Radiated Spurious Emission Measurements 19
8.3.1. Test Limit 19
8.3.2. Test Procedure Used 19

8.3.3. Test Setting 19
8.3.4. Test Setup 20
8.3.5. Test Result 22
8.4. Radiated Spurious Emission Measurements Above 960MHz 24
8.4.1. Test Limit 24
8.4.2. Test Procedure Used 24
8.4.3. Test Setting 24
8.4.4. Test Setup 25
8.4.5. Test Result 26
8.5. Peak Power within 50 MHz bandwidth 44
8.5.1. Test Limit 44
8.5.2. Test Procedure Used 44
8.5.3. Test Setting 44
8.5.4. Test Setup 45
8.5.5. Test Result 46
8.6. Dwell Time 48
8.6.1. Test Limit 48
8.6.2. Test Procedure used 48
8.6.3. Test Setting 48
8.6.4. Test Setup 48
8.6.5. Test Result 49
8.7. AC Conducted Emissions Measurement 50
8.7.1. Test Limit 50
8.7.2. Test Procedure Used 50
8.7.3. Test Setting 50
8.7.4. Test Setup 51
8.7.5. Test Result 52
9. CONCLUSION 56

1. General Information

1.1. Applicant

Honeywell International Inc

Honeywell Safety and Productivity Solutions

9680 Old Bailes Road, Fort Mill, SC 29707 United States

1.2. Manufacturer

Honeywell International Inc

Honeywell Safety and Productivity Solutions

9680 Old Bailes Road, Fort Mill, SC 29707 United States

1.3. Testing Facility

☒	**Test Site – MRT Suzhou Laboratory**	
	Laboratory Location (Suzhou - Wuzhong)	
	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China	
	Laboratory Location (Suzhou - SIP)	
	4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China	
	Laboratory Accreditations	
	A2LA: 3628.01	CNAS: L10551
	FCC: CN1166	ISED: CN0001
	VCCI: R-20025, G-20034, C-20020, T-20020	
☐	**Test Site – MRT Shenzhen Laboratory**	
	Laboratory Location (Shenzhen)	
	1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China	
	Laboratory Accreditations	
	A2LA: 3628.02	CNAS: L10551
	FCC: CN1284	ISED: CN0105
☐	**Test Site – MRT Taiwan Laboratory**	
	Laboratory Location (Taiwan)	
	No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)	
	Laboratory Accreditations	
	TAF: L3261-190725	
	FCC: 291082, TW3261	ISED: TW3261

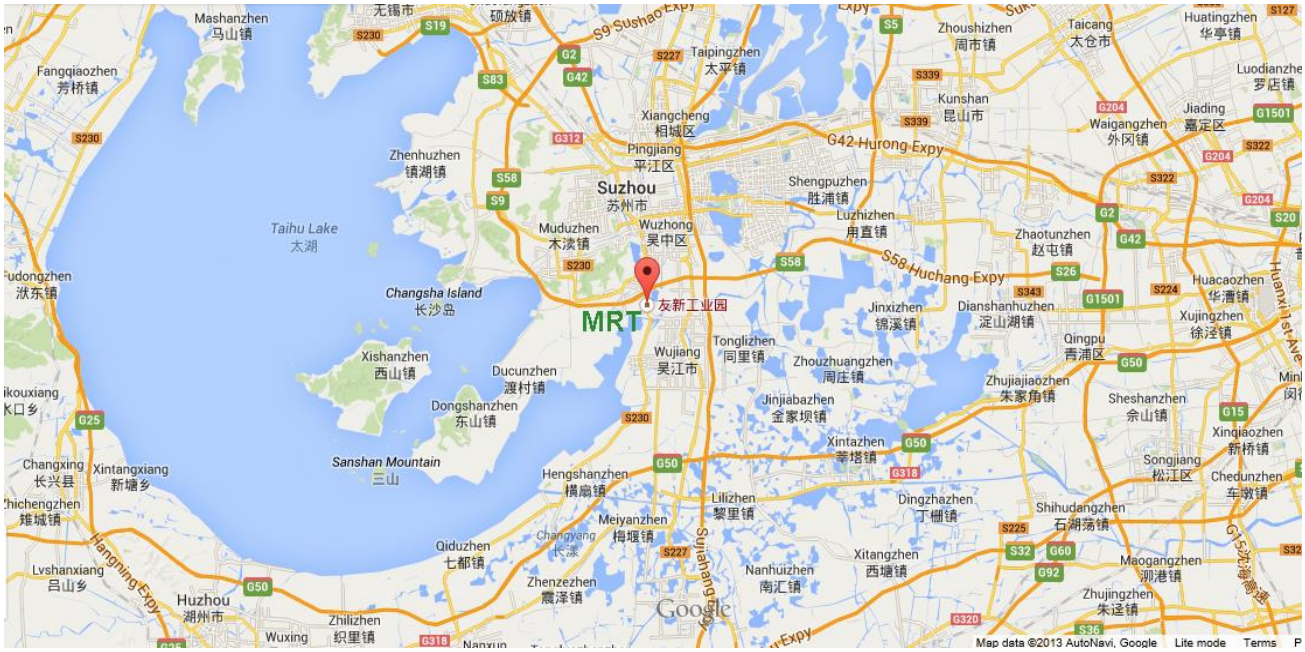
2. INTRODUCTION

2.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

2.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on September 30, 2013.



3. PRODUCT INFORMATION

3.1. Feature of Equipment under Test

Product Name	UWB TAG
Model No.	UB-T100
Brand Name	Avalue
Operation Frequency	UWB: 4500MHz
Modulation	BPM-BPSK
Physical rate	6.8Mbps
Test Device Serial No.	#1 ☐ Production ☐ Pre-Production ☒ Engineering

3.2. Test Mode

Test Mode	Mode 1: Transmit at 4500MHz

3.3. Description of Test Software

N/A

Power Setting

UWB Mode	Power Setting Final
UWB-TX	Default

3.4. Device Capabilities

This device contains the following capabilities:

UWB Device.

3.5. Test Configuration

The **UWB TAG** was tested per the guidance of ANSI C63.10-2013.

3.6. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

3.7. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

4. DESCRIPTION of TEST

4.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Procedures for measuring ultra-wideband devices (ANSI C63.10-2013).

Deviation from measurement procedure…….....None

4.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions were used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

4.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

5. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 antenna of the **UWB TAG** is **permanently attached.**
- There are no provisions for connection to an external antenna.

Conclusion:

The **UWB TAG** unit complies with the requirement of §15.203.

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	TAIYO YUDEN	AH086M555003-T	Chip	2.6dBi

6. TEST EQUIPMENT CALIBRATION DATE

Conducted Emission - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2021/04/14
Two-Line V-Network	R&S	ENV 216	MRTSUE06002	1 year	2021/06/12
Two-Line V-Network	R&S	ENV 216	MRTSUE06003	1 year	2021/06/12
Temperature/Humidity Meter	testo	608-H1	MRTSUE06404	1 year	2021/08/07

Radiated Disturbance - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cal. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2021/08/01
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2021/04/14
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2021/03/30
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06023	1 year	2021/10/17
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2021/12/15
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/10
Thermohygrometer	Testo	608-H1	MRTSUE06403	1 year	2021/08/07

Conducted Test Equipment - TR3

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2021/04/14
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06452	1 year	2021/07/10
Thermohygrometer	Testo	608-H1	MRTSUE06401	1 year	2021/08/07

Test Software

Software	Version	Function
e3	9.160520a	EMI Test Software
EMI	V3	EMI Test Software

7. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

AC Conducted Emission Measurement - SR2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 150kHz~30MHz: 3.46dB
Radiated Emission Measurement - AC1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: ± 4.18dB 1GHz ~ 40GHz: ± 4.76dB

8. TEST RESULT

8.1. Summary

Product Name: **UWB TAG**

FCC Classification: **Wideband Transmitter (WBT)**

FCC Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
FCC Section 15.519(b)	Operation Frequency	within the 3100-10,600 MHz	Conducted	Pass	Section 8.2
FCC Section 15.503(d)	Occupied Bandwidth	>500 MHz	Conducted	Pass	Section 8.2
FCC Section 15.209/15.519(c)	Radiated Spurious Emissions	Refer to Section 8.3	Radiated	Pass	Section 8.3
FCC Section 15.519(c)	Radiated Spurious Emissions above 960 MHz	Refer to Section8.4		Pass	Section 8.4
FCC Section 15.519 (d)	Radiated Spurious Emissions in GPS Band	Refer to Section8.4		Pass	Section 8.4
FCC Section 15.519(e)	Peak Power within 50 MHz Bandwidth	Refer to Section8.5		Pass	Section 8.5
FCC Section 15.519(a)(1)	Dwell Time	< 10s	Conducted	Pass	Section 8.6
FCC Section 15.207	AC Conducted Emission	Refer to Section 8.7	Conducted	Pass	Section 8.7

Notes:

1. Determining compliance is based on the test results met the regulation limits or requirements declared by clients, and the test results don't take into account the value of measurement uncertainty.
2. The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.

8.2. Occupied Bandwidth and Operation Frequency Range Measurement

8.2.1.Test Limit

The −10 dB bandwidth of a device operating under the provisions of this section must be contained within the 3100-10,600 MHz band under all conditions and the fundamental emission shall be at least 500 MHz.

8.2.2.Test Procedure used

ANSI C63.10-2013, section 6.8 & 10.1

8.2.3.Test Setting

The frequency at which the maximum power level is measured with the peak detector is designated f_M. The peak power measurements shall be made using a spectrum analyzer or EMI receiver with a 1 MHz resolution bandwidth and a video bandwidth of 1 MHz or greater. The instrument shall be set to peak detection using the maximum-hold trace mode. The outermost 1 MHz segments above and below f_M, where the peak power falls by 10 dB relative to the level at f_M, are designated as f_H and f_L, respectively:

a) For the lowest frequency bound f_L, the emission is searched from a frequency lower than f_M that has, by inspection, a peak power much lower than 10 dB less than the power at f_M and increased toward f_M until the peak power indicates 10 dB less than the power at f_M. The frequency of that segment is recorded.

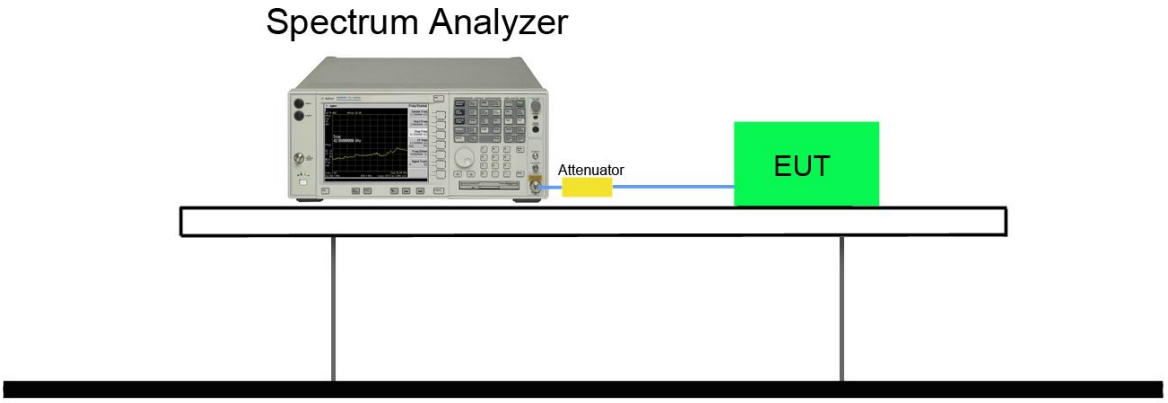
b) This process is repeated for the highest frequency bound f_H, beginning at a frequency higher than f_M that has, by inspection, a peak power much lower than 10 dB below the power at f_M. The frequency of that segment is recorded.

c) The two recorded frequencies represent the highest fH and lowest f_L bounds of the UWB transmission, and the −10 dB bandwidth (B − 10) is defined as ($f_H - f_L$). The center frequency (fc) is mathematically determined from ($f_H - f_L$) / 2.

d) The fractional bandwidth is defined as $2(f_H - f_L) / (f_H + f_L)$.

e) Determine whether the −10 dB bandwidth ($f_H - f_L$) is ≥500 MHz, or whether the fractional bandwidth $2(f_H - f_L) / (f_H + f_L)$ is ≥0.2.

8.2.4.Test Setup



8.2.5.Test Result

Product	UB-T100	Temperature	25°C
Test Engineer	Milo Li	Relative Humidity	60%
Test Site	TR3	Test Date	2020/8/12
Test Item	-10dB Occupied Bandwidth & Operation Frequency Range		

Test Mode	Frequency Bounds	Frequency (MHz)	Limit (MHz)	Result
UWB	f_M	4461.00	N/A	N/A
	f_L	4193.00	> 3100	Pass
	f_H	4814.00	< 10.600	Pass

Test Mode	Frequency (MHz)	10dB Bandwidth (MHz)	Limit (MHz)	Result
UWB	4500	621.00	≥ 500	Pass

UWB-4500MHz

8.3. Radiated Spurious Emission Measurements

8.3.1.Test Limit

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

8.3.2.Test Procedure Used

ANSI C63.10-2013, sections 10.2, 10.3

8.3.3.Test Setting

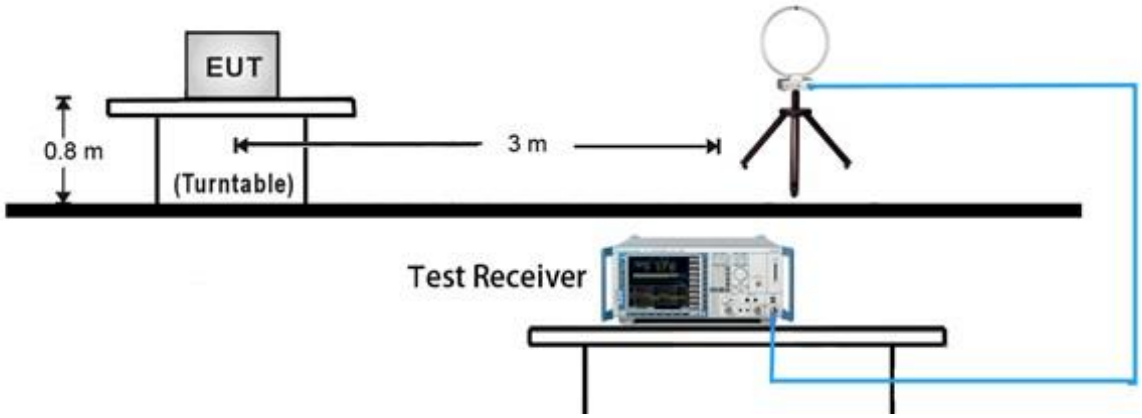
1. RBW = as specified in Table 1
2. VBW ≥ 3 RBW
3. Sweep Detector = peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize and record the test result with Table 1 measurement detector.

Table 1 - RBW as a function of frequency

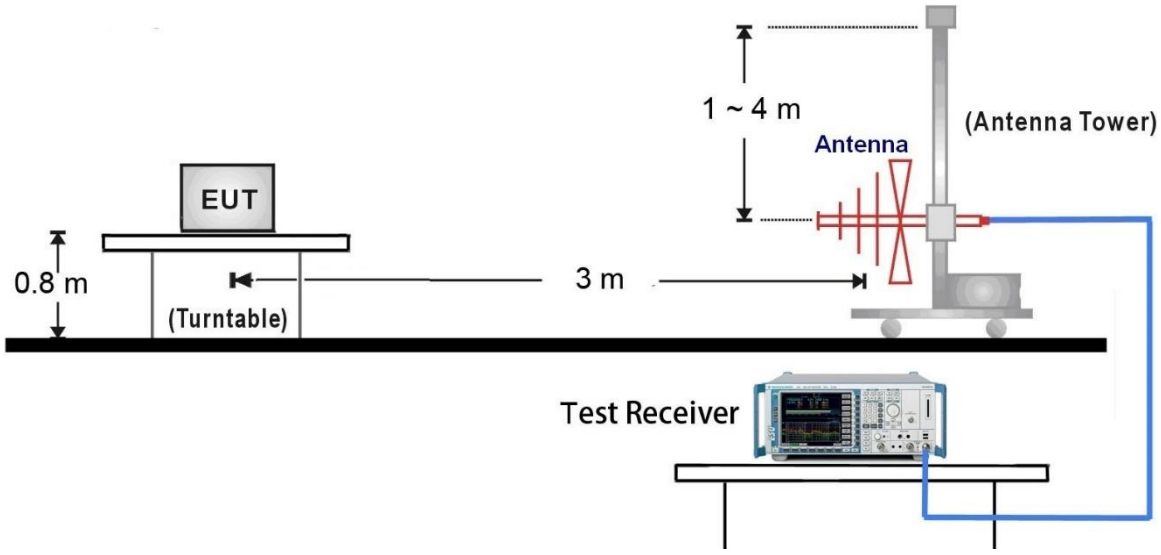
Frequency	RBW	Measurement Detector
9 ~ 150 kHz	200 ~ 300 Hz	Peak or CISPR quasi-peak
0.15 ~ 30 MHz	9 ~ 10 kHz	Peak or CISPR quasi-peak
30 ~ 1000 MHz	100 ~ 120 kHz	CISPR quasi-peak
Above 1000 MHz	1 MHz	Peak or Average

8.3.4.Test Setup

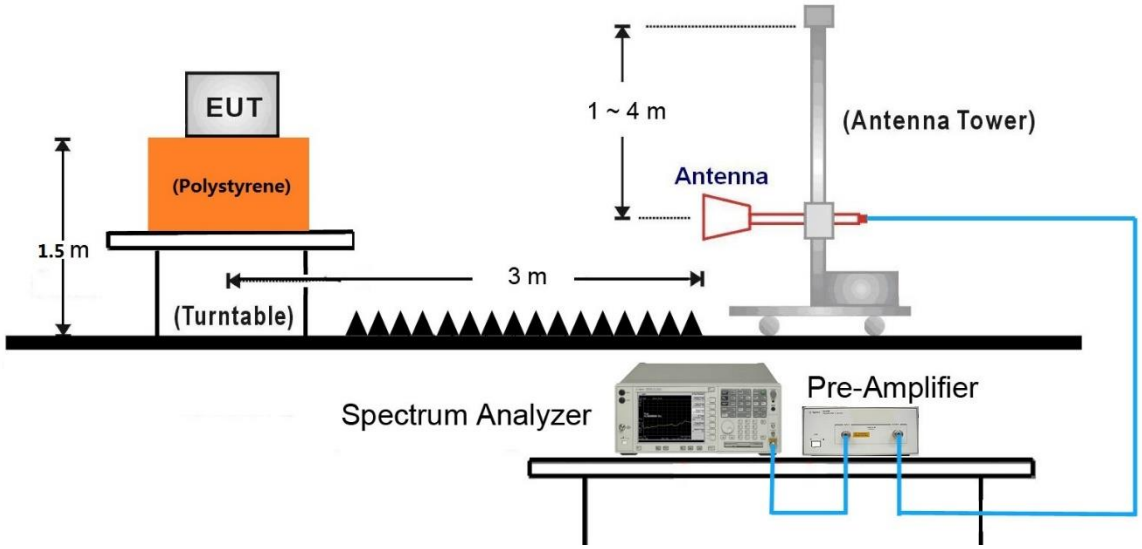
9kHz ~ 30MHz Test Setup:



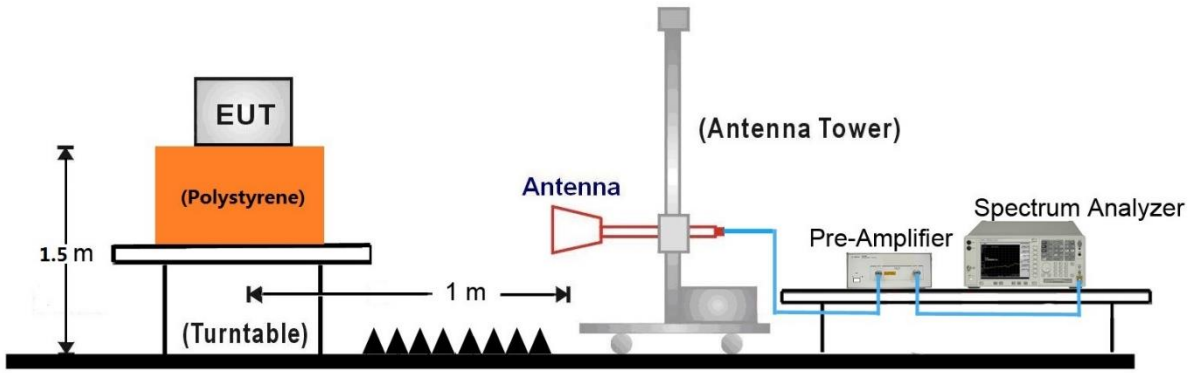
30MHz ~ 1GHz Test Setup:



1GHz ~ 18GHz Test Setup:

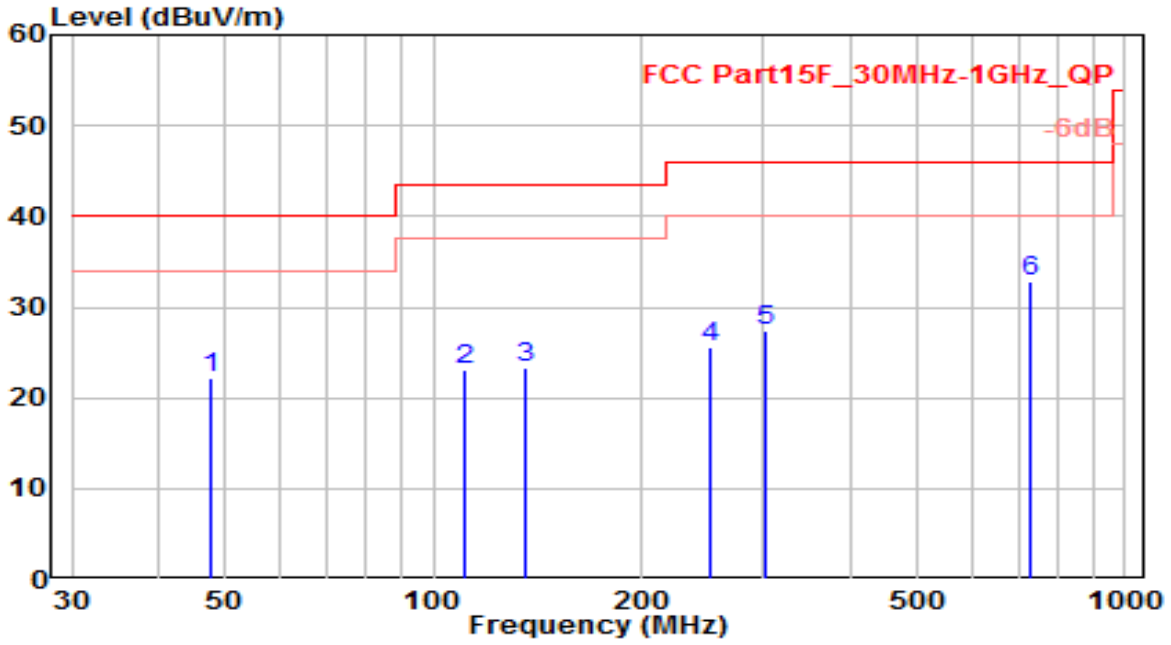


18GHz ~ 40GHz Test Setup:



8.3.5.Test Result

EUT	UB-T100	Date of Test	2020-10-22
Factor	VULB 9162	Temp. / Humidity	23°C /69%
Polarity	Horizontal	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

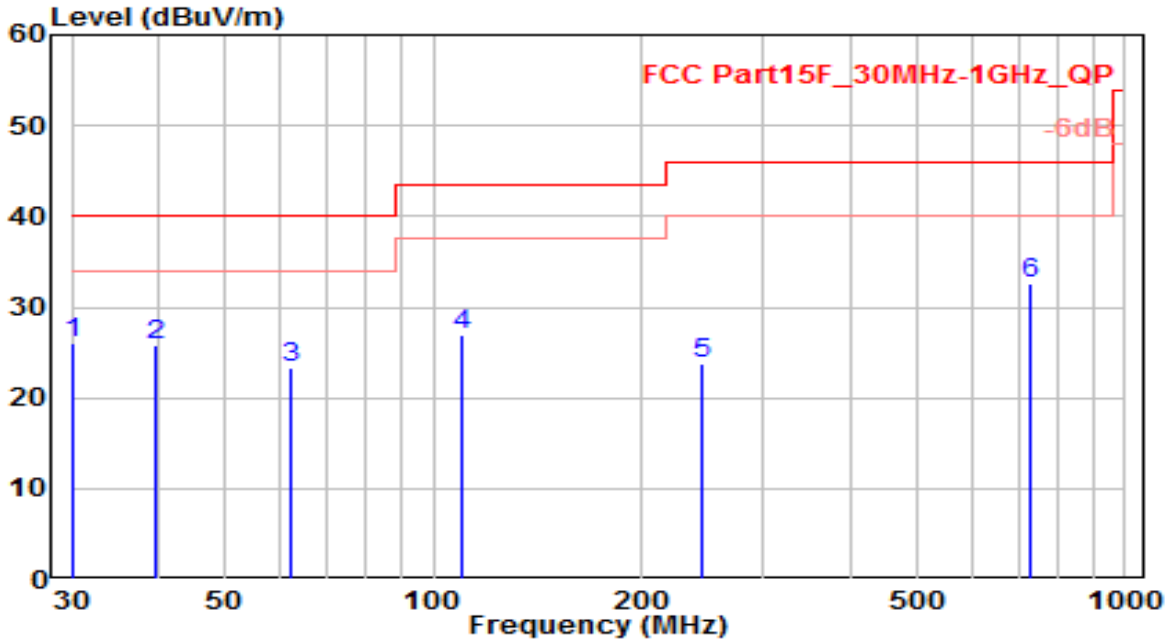


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		47.460	0.24	21.93	22.17	-17.83	40.00	100	250	QP
2		110.510	4.49	18.64	23.13	-20.37	43.50	100	335	QP
3		135.730	7.25	16.14	23.39	-20.11	43.50	100	140	QP
4		251.160	5.09	20.54	25.64	-20.36	46.00	150	240	QP
5		301.600	5.85	21.56	27.40	-18.60	46.00	200	160	QP
6	*	731.310	3.04	29.81	32.85	-13.15	46.00	150	110	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	VULB 9162	Temp. / Humidity	23°C /69%
Polarity	Vertical	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz



No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		30.000	7.60	18.40	26.00	-14.00	40.00	100	80	QP
2		39.700	4.96	20.96	25.92	-14.08	40.00	100	140	QP
3		62.010	3.84	19.56	23.40	-16.60	40.00	150	30	QP
4		109.540	8.24	18.73	26.98	-16.52	43.50	140	70	QP
5		245.340	3.48	20.38	23.86	-22.14	46.00	115	20	QP
6	*	729.370	2.91	29.78	32.69	-13.31	46.00	130	225	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

8.4. Radiated Spurious Emission Measurements Above 960MHz

8.4.1.Test Limit

Radiated emission average limits above 960MHz			
Frequency [MHz]	RBW [kHz]	EIRP of spurious [dBm]	Equivalent field strength limit @ 1m [dB(μV/m)]
960 - 1610	1000	-75.3	29.4
1610 - 1990	1000	-63.3	41.4
1990 - 3100	1000	-61.3	43.4
3100 - 10600	1000	-41.3	63.4
Above 10600	1000	-61.3	43.4
Radiated emission average limits in GPS Band			
1164 - 1240	≥ 1	-85.3	19.4
1559 - 1610	≥ 1	-85.3	19.4

Note 1: Because the limits are so low, some bands may have been scanned at a distance closer than 1 meter. If any emissions were detected in these bands, final measurements were made at distance of 1 meter or greater. The actual distance for final measurement was indicated in the measurement data.

Note 2: Equivalent field strength limit @ 1m = EIRP of spurious[dBm] + 95.2 + 20*log(3m/1m)

8.4.2.Test Procedure Used

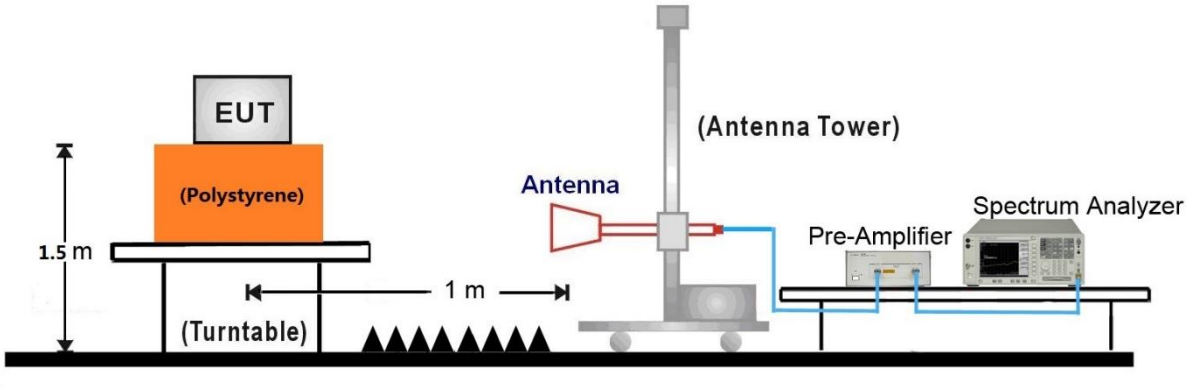
ANSI C63.10-2013, sections 10.2, 10.3

8.4.3.Test Setting

The rms detector is selected, make the trace to max hold and the sweep time and number of measurement bins are set to provide the requisite 1 ms integration time. In this test, the RBW may be reduced to a minimum of 1 kHz (30 kHz is recommended) to enhance the resolution of the individual spectral lines. A ratio of VBW / RBW > 3 shall be maintained when possible.

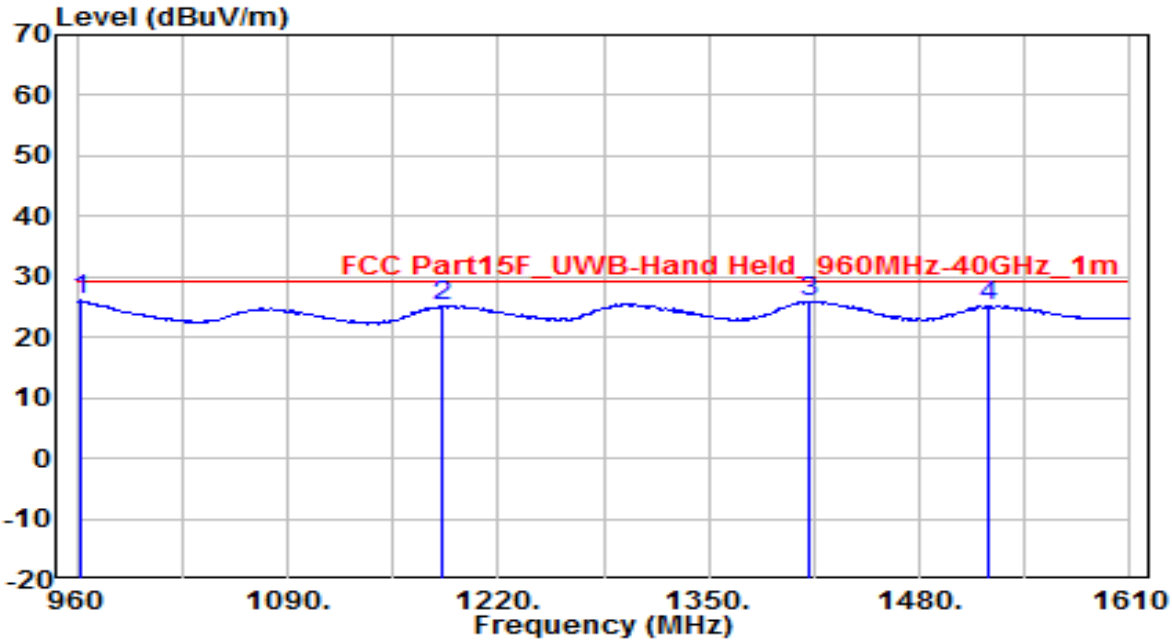
8.4.4.Test Setup

960MHz ~ 40GHz Test Setup:



8.4.5.Test Result

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Horizontal	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

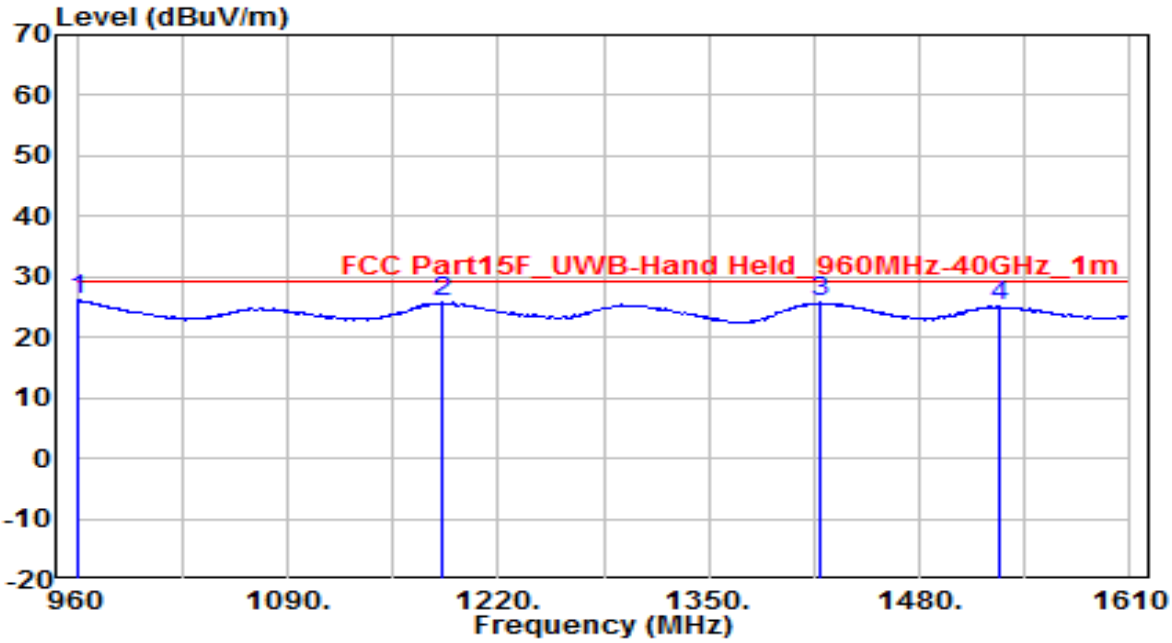


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	962.600	33.55	-7.50	26.05	-3.35	29.40	150	360	RMS
2		1185.550	31.90	-6.63	25.26	-4.14	29.40	150	360	RMS
3		1412.400	31.82	-5.81	26.01	-3.39	29.40	150	360	RMS
4		1522.900	31.03	-5.87	25.16	-4.24	29.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Vertical	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

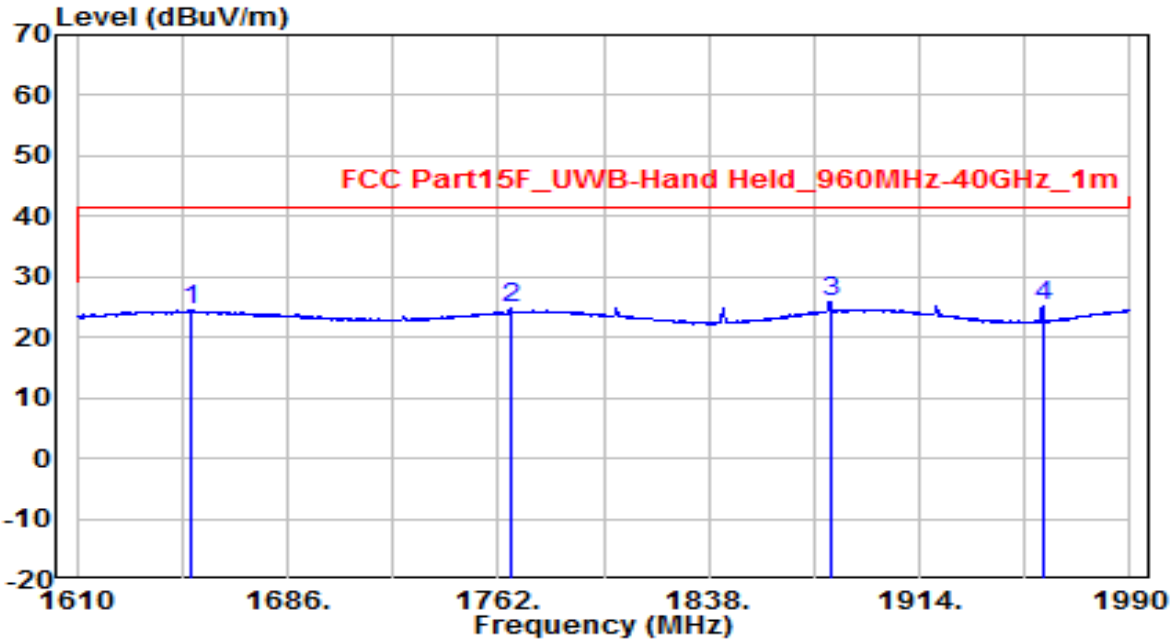


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	960.000	33.68	-7.49	26.20	-3.20	29.40	150	360	RMS
2		1185.550	32.41	-6.63	25.77	-3.63	29.40	150	360	RMS
3		1418.900	31.50	-5.81	25.69	-3.71	29.40	150	360	RMS
4		1528.750	30.95	-5.86	25.09	-4.31	29.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Horizontal	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

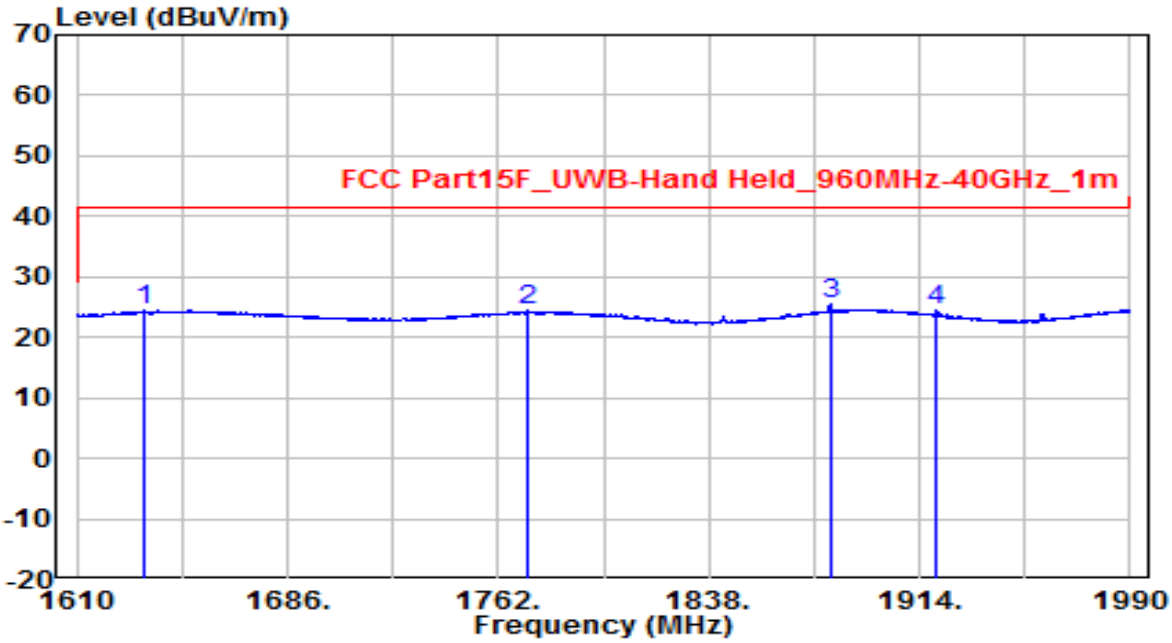


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		1651.040	30.40	-5.78	24.63	-16.77	41.40	150	360	RMS
2		1766.560	30.37	-5.41	24.96	-16.44	41.40	150	360	RMS
3	*	1881.700	30.69	-4.81	25.88	-15.52	41.40	150	360	RMS
4		1958.460	29.72	-4.40	25.32	-16.08	41.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Vertical	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

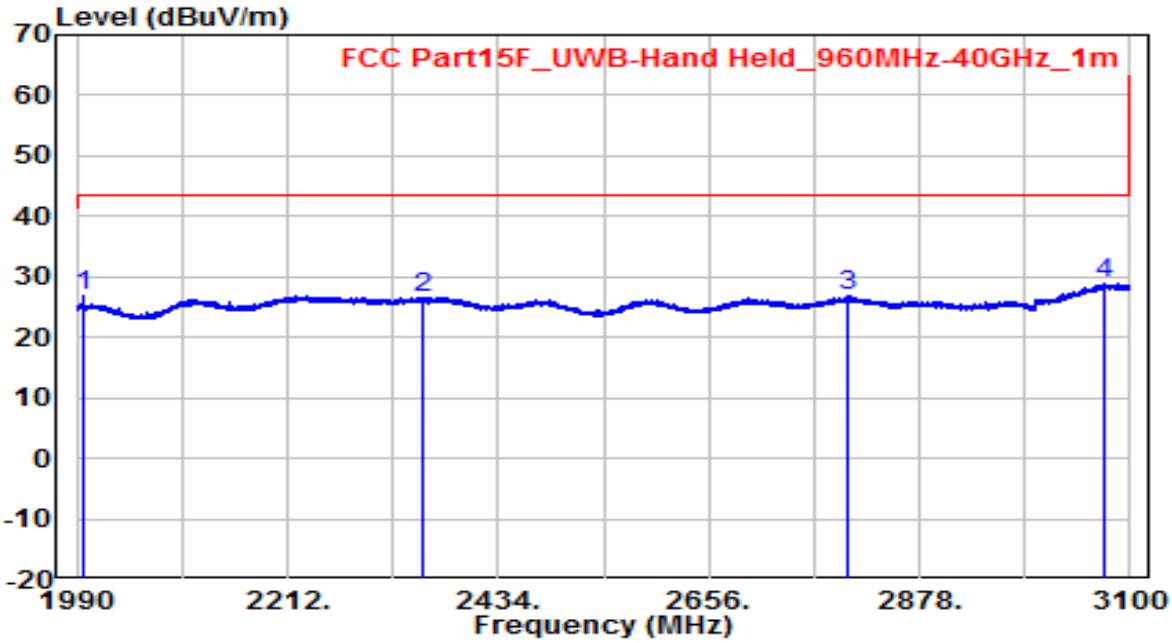


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		1634.320	30.28	-5.80	24.48	-16.92	41.40	150	360	RMS
2		1772.830	29.74	-5.38	24.36	-17.04	41.40	150	360	RMS
3	*	1881.700	30.22	-4.81	25.41	-15.99	41.40	150	360	RMS
4		1919.890	29.07	-4.61	24.47	-16.93	41.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Horizontal	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

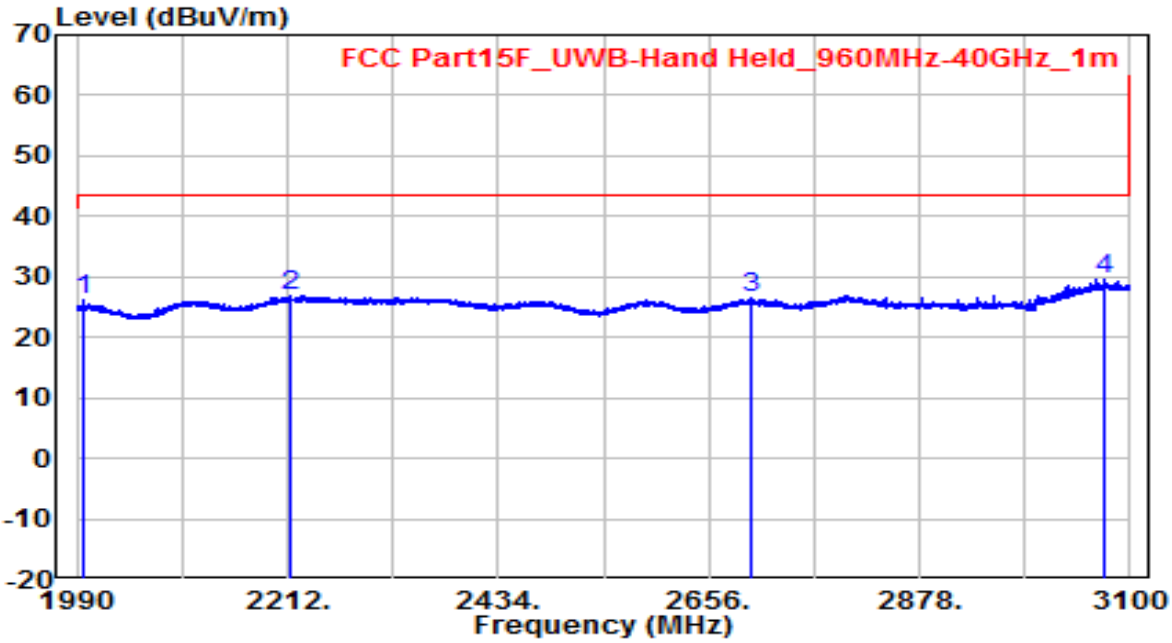


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		1996.660	30.98	-4.11	26.88	-16.52	43.40	150	360	RMS
2		2353.303	28.55	-2.02	26.54	-16.86	43.40	150	360	RMS
3		2802.520	28.79	-2.00	26.79	-16.61	43.40	150	360	RMS
4	*	3073.915	31.11	-2.11	29.00	-14.40	43.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Vertical	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

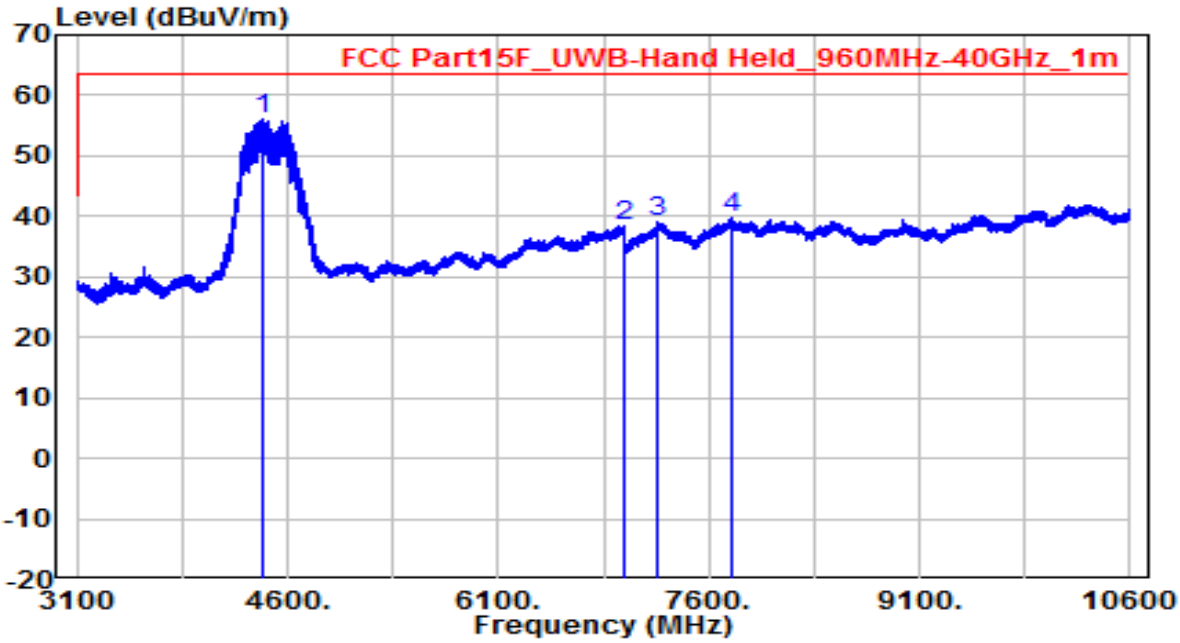


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		1996.660	30.13	-4.11	26.03	-17.37	43.40	150	360	RMS
2		2215.441	28.61	-1.77	26.84	-16.56	43.40	150	360	RMS
3		2700.067	28.50	-2.09	26.40	-17.00	43.40	150	360	RMS
4	*	3072.139	31.80	-2.12	29.68	-13.72	43.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Horizontal	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

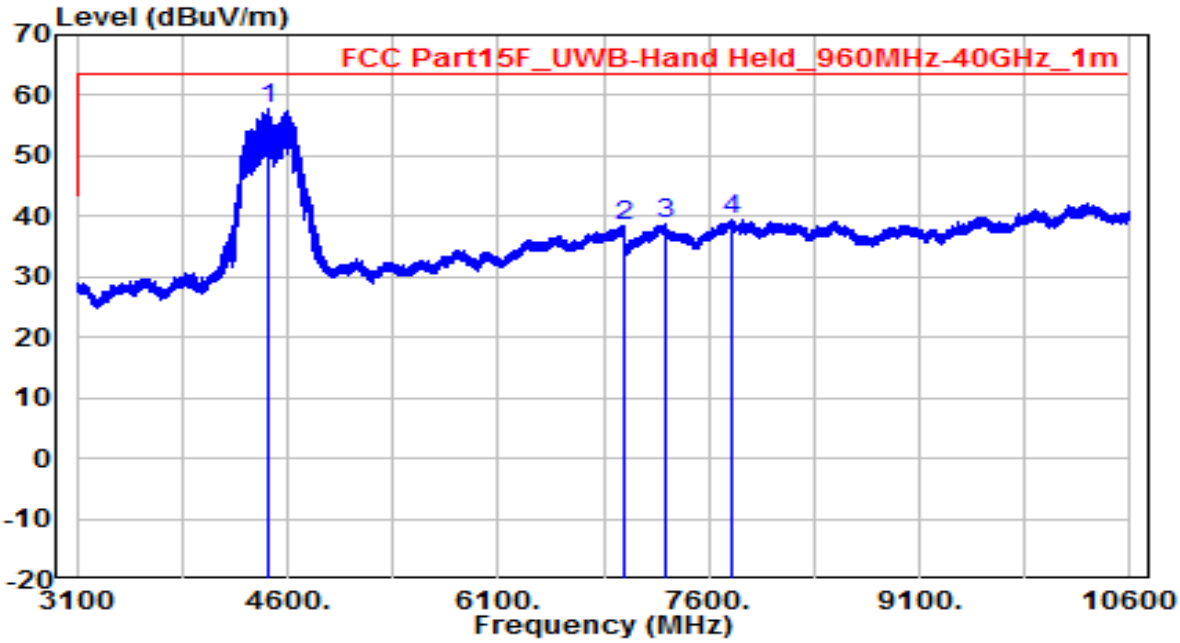


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	4428.906	53.21	2.93	56.14	-7.26	63.40	150	360	RMS
2		6996.719	27.03	11.46	38.49	-24.91	63.40	150	360	RMS
3		7240.938	26.63	12.39	39.02	-24.38	63.40	150	360	RMS
4		7755.156	26.83	12.88	39.71	-23.69	63.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Vertical	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

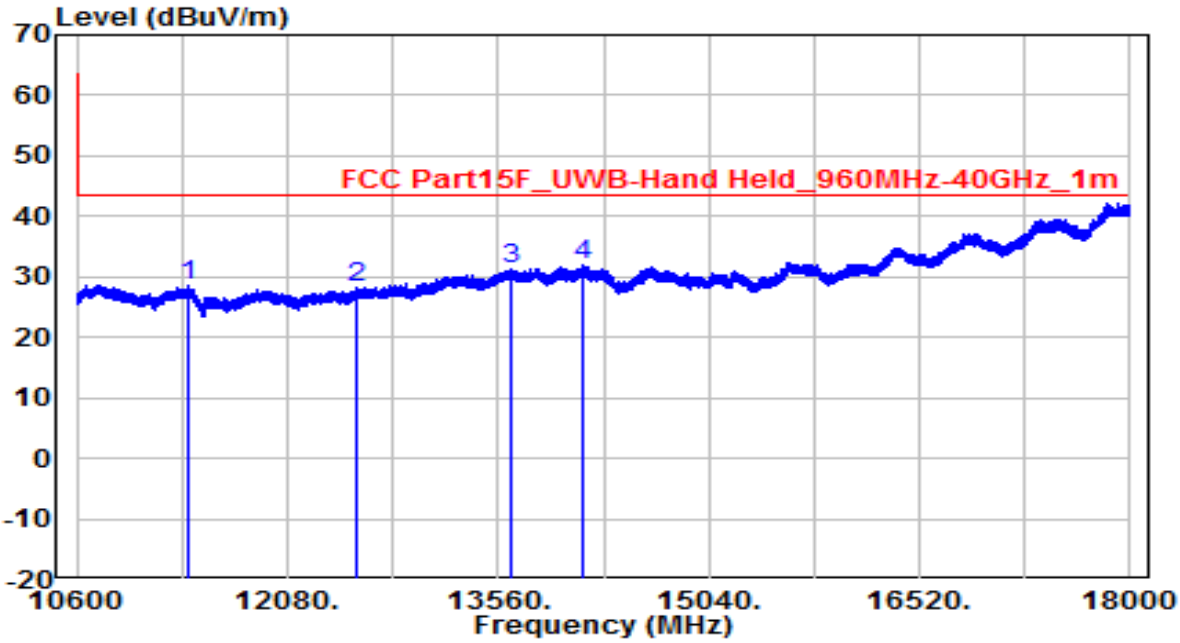


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	4460.313	54.78	3.05	57.83	-5.57	63.40	150	360	RMS
2		6993.203	27.11	11.45	38.56	-24.84	63.40	150	360	RMS
3		7283.125	26.44	12.34	38.77	-24.63	63.40	150	360	RMS
4		7761.953	26.52	12.88	39.40	-24.00	63.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Horizontal	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

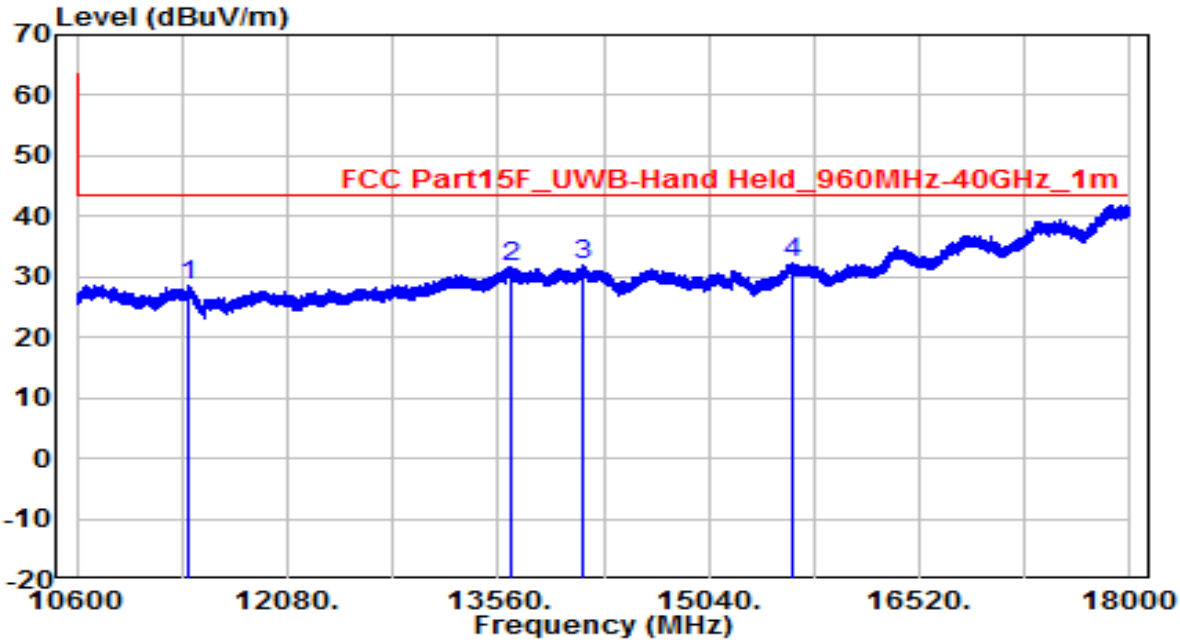


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		11378.390	9.95	18.52	28.46	-14.94	43.40	150	360	RMS
2		12558.220	9.52	18.75	28.27	-15.13	43.40	150	360	RMS
3		13652.960	8.70	22.53	31.23	-12.17	43.40	150	360	RMS
4	*	14153.620	9.22	22.70	31.93	-11.47	43.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Vertical	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

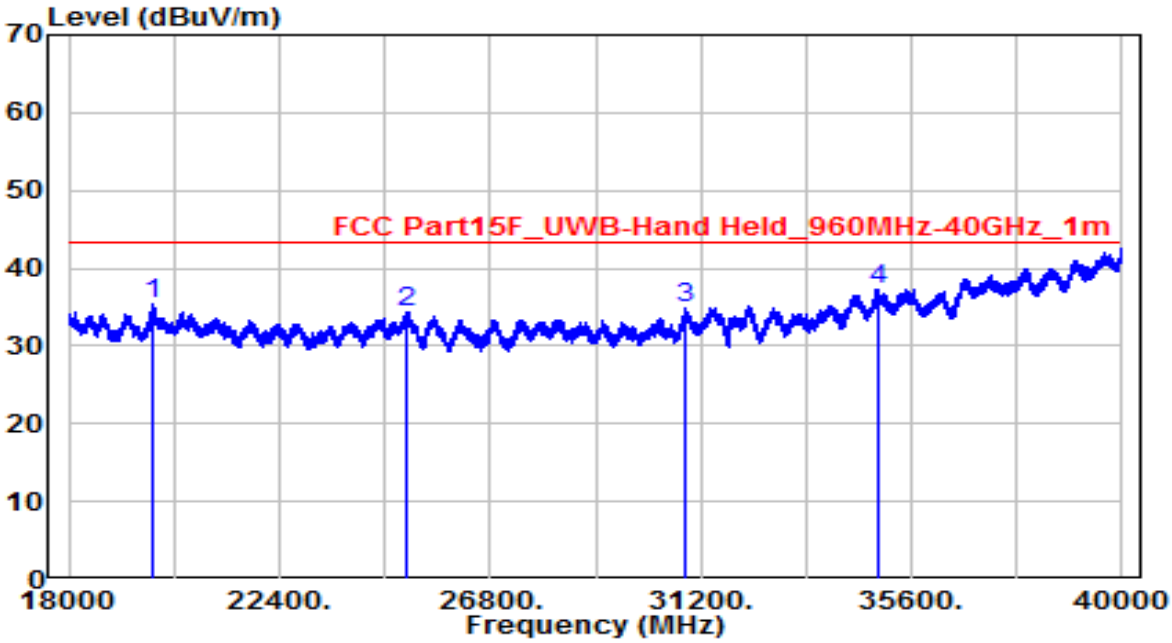


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		11392.030	10.04	18.55	28.60	-14.80	43.40	150	360	RMS
2		13652.960	9.26	22.53	31.79	-11.61	43.40	150	360	RMS
3		14150.610	9.08	22.73	31.81	-11.59	43.40	150	360	RMS
4	*	15619.970	10.85	21.46	32.31	-11.09	43.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9170_1m	Temp. / Humidity	23°C /69%
Polarity	Horizontal	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

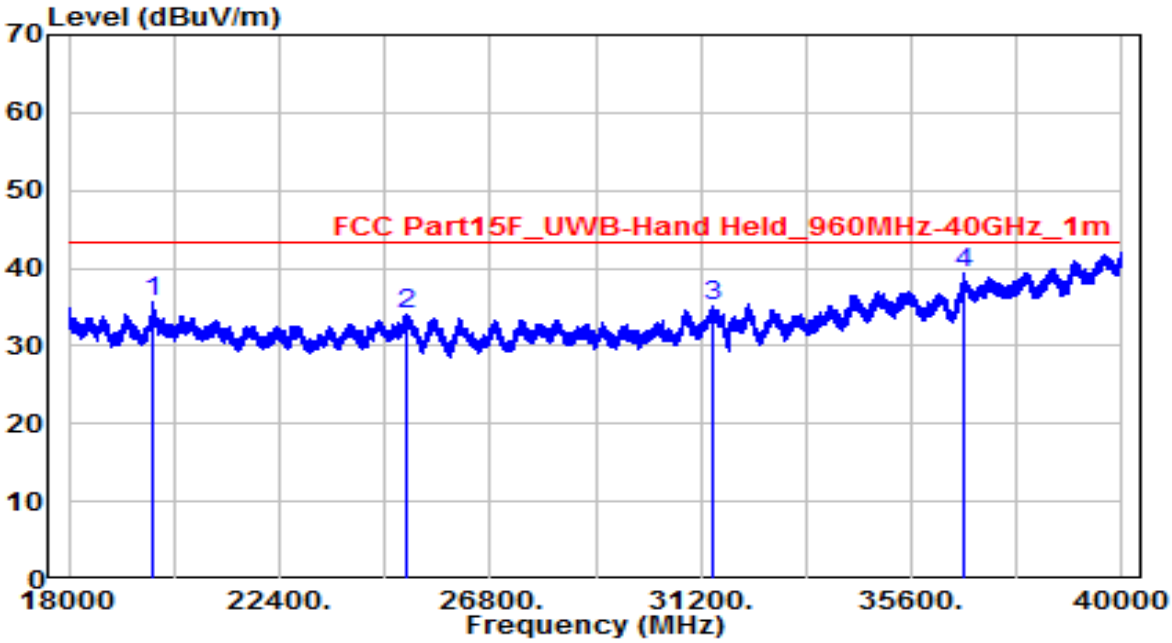


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		19742.130	30.68	4.65	35.33	-8.07	43.40	150	360	RMS
2		25036.560	28.80	5.56	34.36	-9.04	43.40	150	360	RMS
3		30894.060	27.82	7.15	34.97	-8.43	43.40	150	360	RMS
4	*	34882.250	26.37	10.92	37.29	-6.11	43.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9170_1m	Temp. / Humidity	23°C /69%
Polarity	Vertical	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

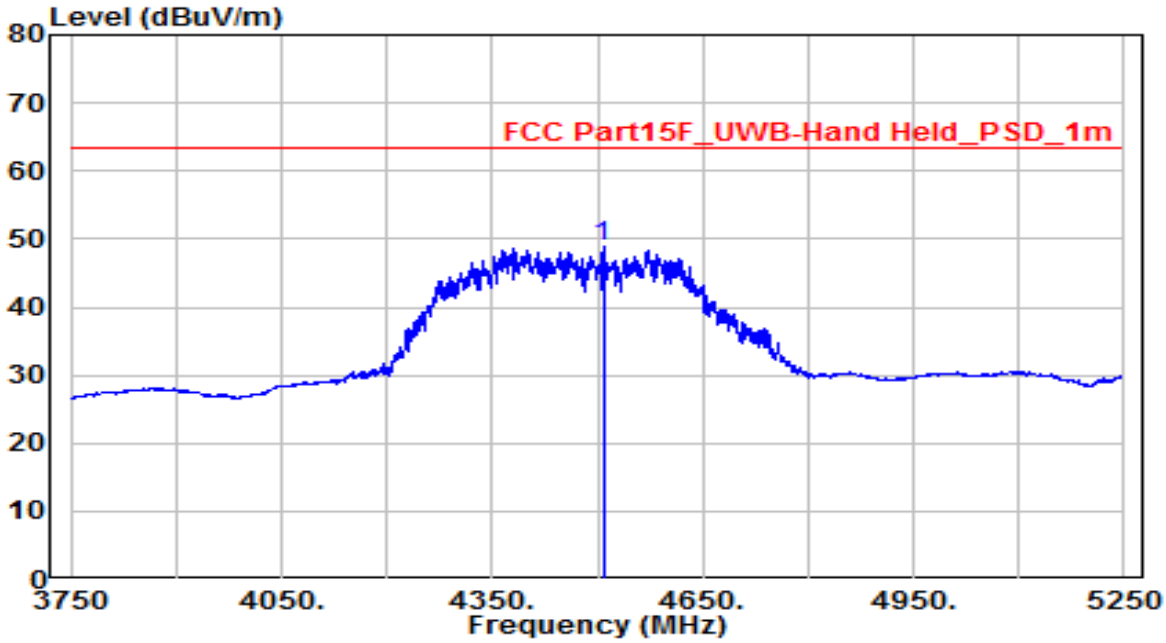


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		19757.250	31.05	4.65	35.70	-7.70	43.40	150	360	RMS
2		25062.690	28.49	5.54	34.03	-9.37	43.40	150	360	RMS
3		31442.690	27.19	7.83	35.03	-8.37	43.40	150	360	RMS
4	*	36686.940	28.15	11.22	39.37	-4.03	43.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Horizontal	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

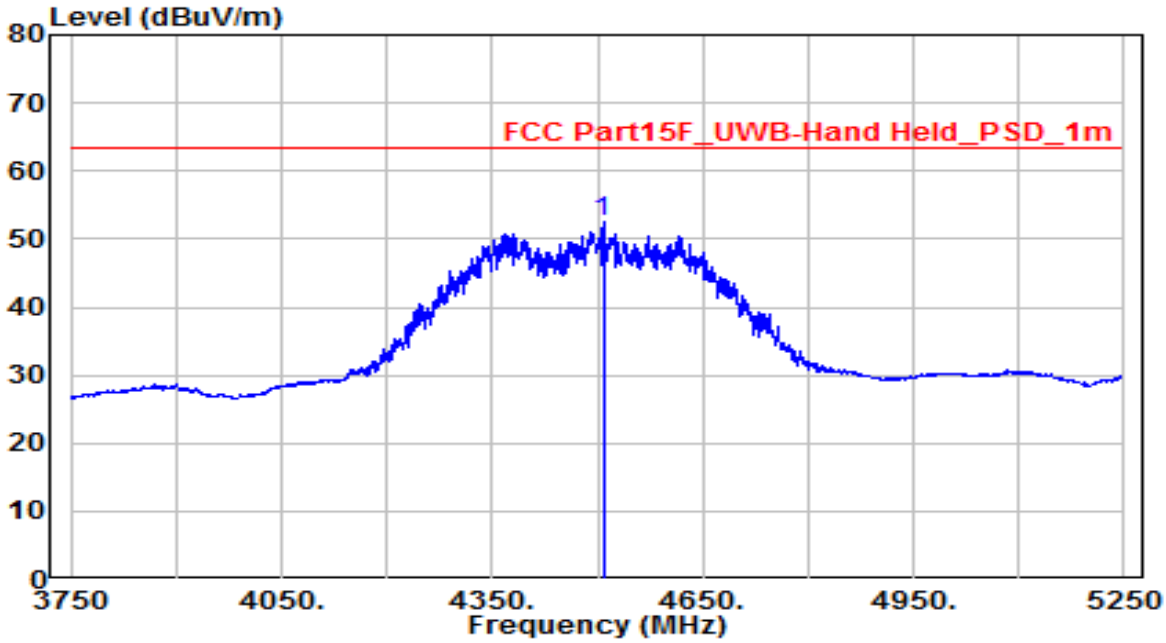


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	4508.000	45.73	3.07	48.80	-14.60	63.40	150	175	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Vertical	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

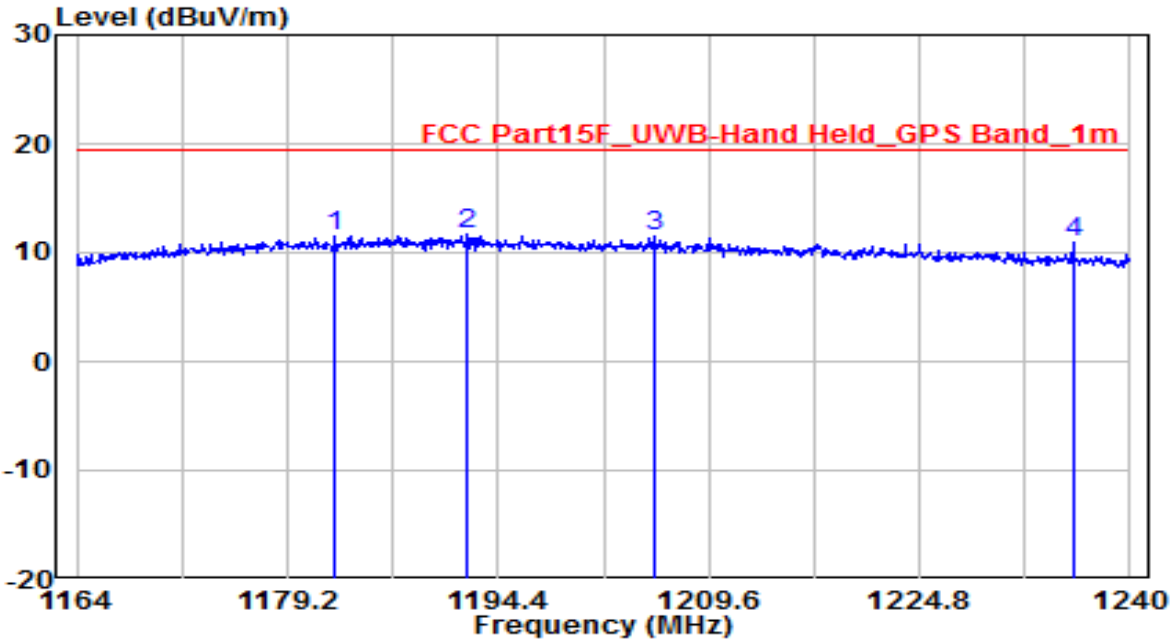


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	4508.000	49.42	3.07	52.49	-10.91	63.40	160	0	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Horizontal	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

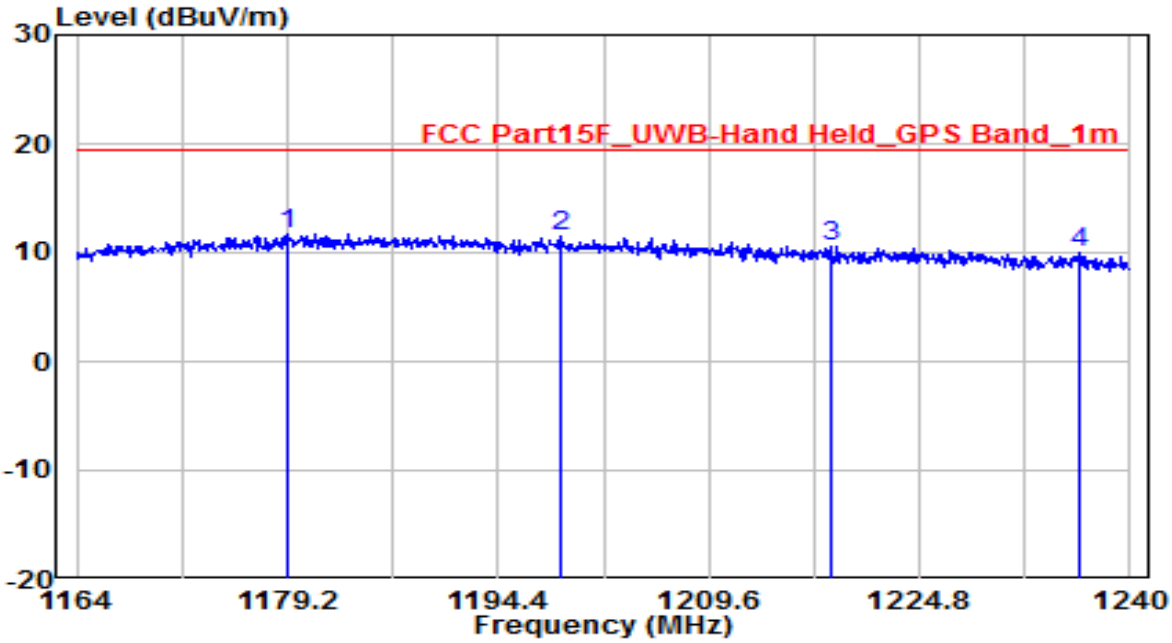


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		1182.620	18.24	-6.66	11.58	-7.82	19.40	150	360	RMS
2	*	1192.196	18.31	-6.56	11.75	-7.65	19.40	150	360	RMS
3		1205.648	18.01	-6.42	11.59	-7.81	19.40	150	360	RMS
4		1235.896	16.97	-6.11	10.86	-8.54	19.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Vertical	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

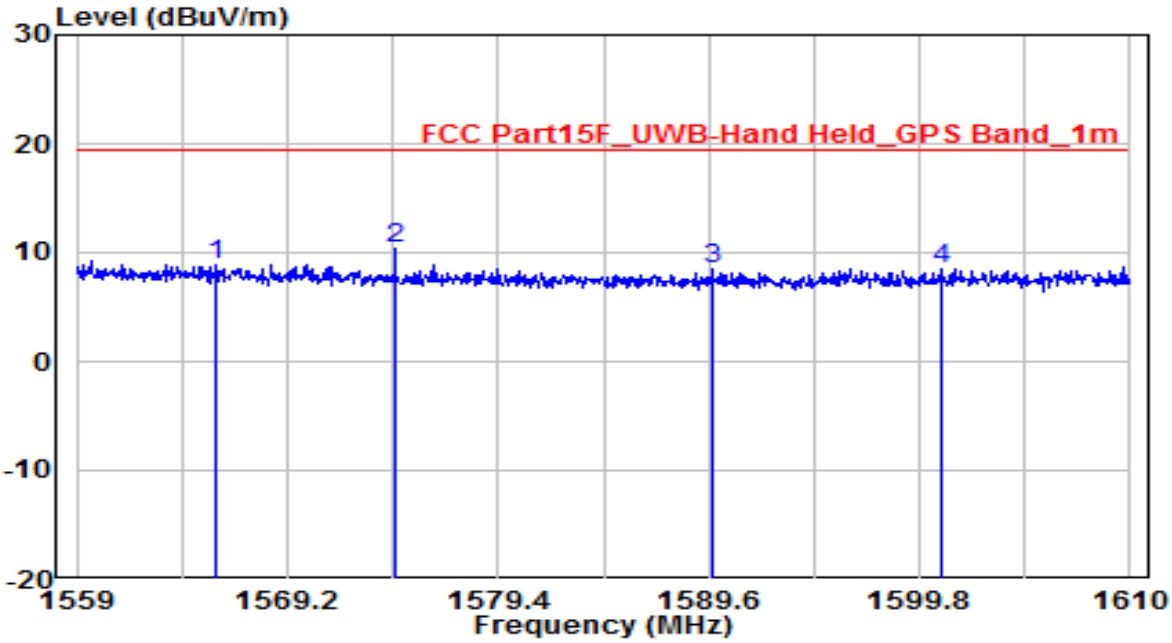


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	1179.124	18.46	-6.70	11.76	-7.64	19.40	150	360	RMS
2		1198.960	17.93	-6.49	11.43	-7.97	19.40	150	360	RMS
3		1218.340	16.91	-6.29	10.62	-8.78	19.40	150	360	RMS
4		1236.276	16.13	-6.10	10.03	-9.37	19.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Horizontal	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

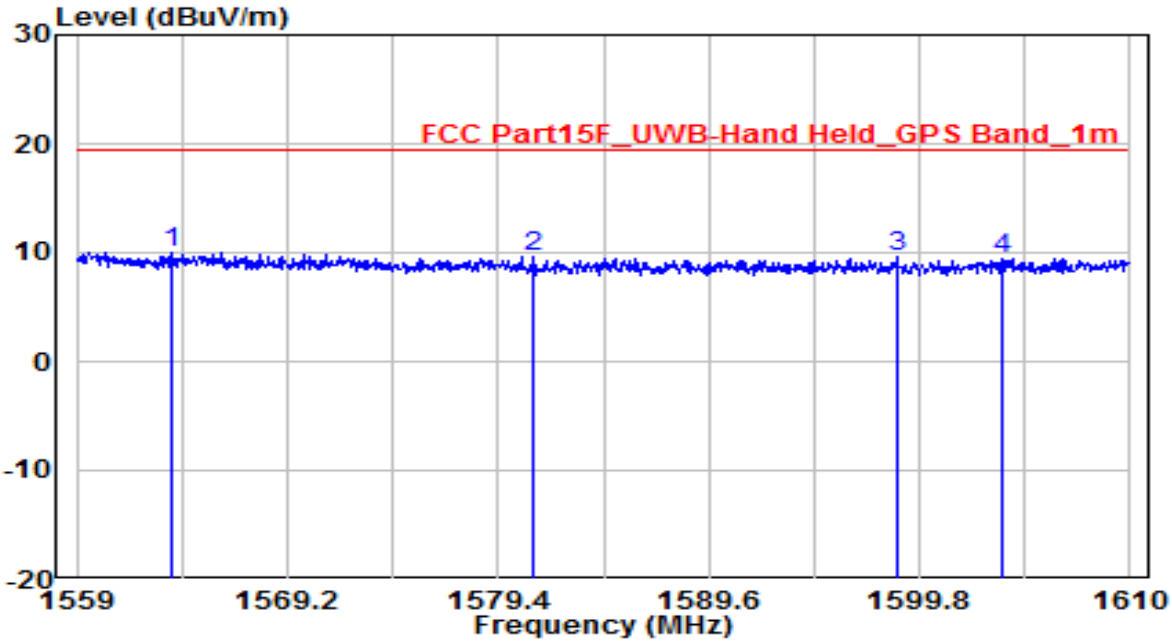


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		1565.783	14.80	-5.84	8.95	-10.45	19.40	150	360	RMS
2	*	1574.402	16.15	-5.85	10.30	-9.10	19.40	150	360	RMS
3		1589.753	14.42	-5.85	8.56	-10.84	19.40	150	360	RMS
4		1600.820	14.41	-5.86	8.56	-10.84	19.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Vertical	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz



No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	1563.539	15.83	-5.84	9.98	-9.42	19.40	150	360	RMS
2		1581.083	15.39	-5.85	9.54	-9.86	19.40	150	360	RMS
3		1598.678	15.40	-5.86	9.54	-9.86	19.40	150	360	RMS
4		1603.778	15.29	-5.85	9.44	-9.96	19.40	150	360	RMS

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

8.5. Peak Power within 50 MHz bandwidth

8.5.1.Test Limit

This test was performed to measure effective radiated power emanated by transmitter at carrier frequency. Specification test limits are given in the following table.

Peak Power Limit (EIRP)

Assigned frequency band (MHz)	EIRP in 50MHz BW (dBm)	Equivalent field strength limit in MHz @ 1m (dBμV/m)
FCC section 15.519(e)		
3100 ~ 10,600	0	80.3

Note 1: Because the limits are so low, some bands may have been scanned at a distance closer than 1 meter. If any emissions were detected in these bands, final measurements were made at distance of 1 meter or greater. The actual distance for final measurement was indicated in the measurement data.

Note 2: Peak power limit at 1m =0 + 95.2 + 20*log(3MHz/50MHz) + 20*log(3m/1m) = 80.3dBμv/m

8.5.2.Test Procedure Used

ANSI C63.10-2013, Section 10.3

8.5.3.Test Setting

Bandwidth conversion of peak power measurements

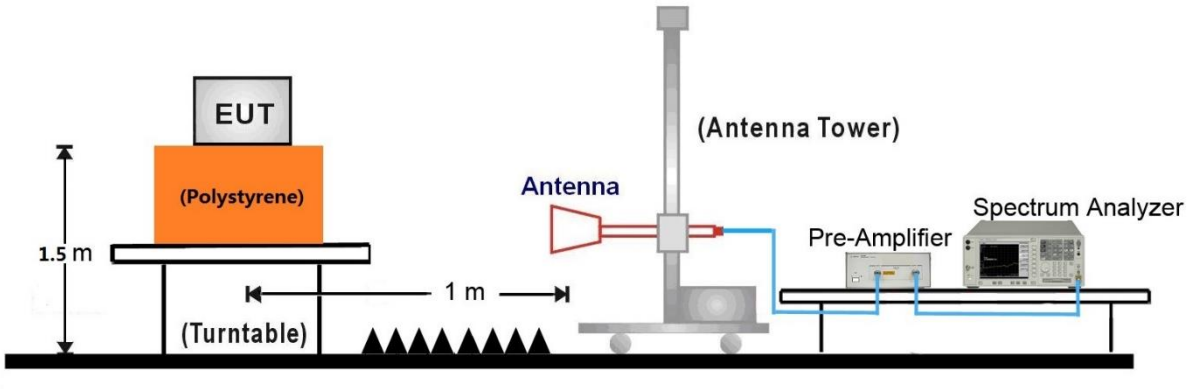
It is acceptable to employ an RBW(1MHz) of less than 50 MHz (but no less than 1 MHz) when performing the required peak power measurements. When this approach is employed, the peak emissions EIRP limit (0 dBm / 50 MHz) is converted to a limit commensurate with the RBW by employing a [20 log (RBW/50 MHz)] relationship. For example, the peak power limit could be expressed in a 3 MHz bandwidth as follows in Equation:

$$EIRP = 0dBm + 20log(3MHz/50MHz)\ dB = -24dBm$$

When a resolution bandwidth of less than 50 MHz is used, this measurement shall be performed over a 50 MHz span centered on the frequency associated with the highest detected average emission level.

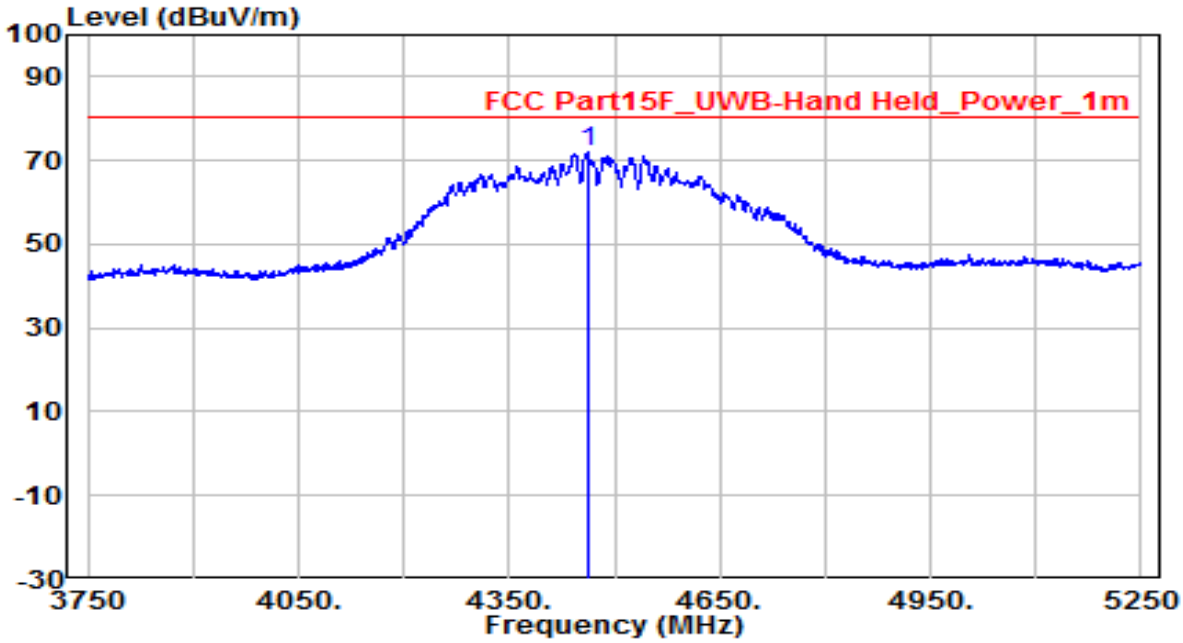
8.5.4.Test Setup

1GHz ~ 40GHz Test Setup:



8.5.5.Test Result

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Horizontal	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz

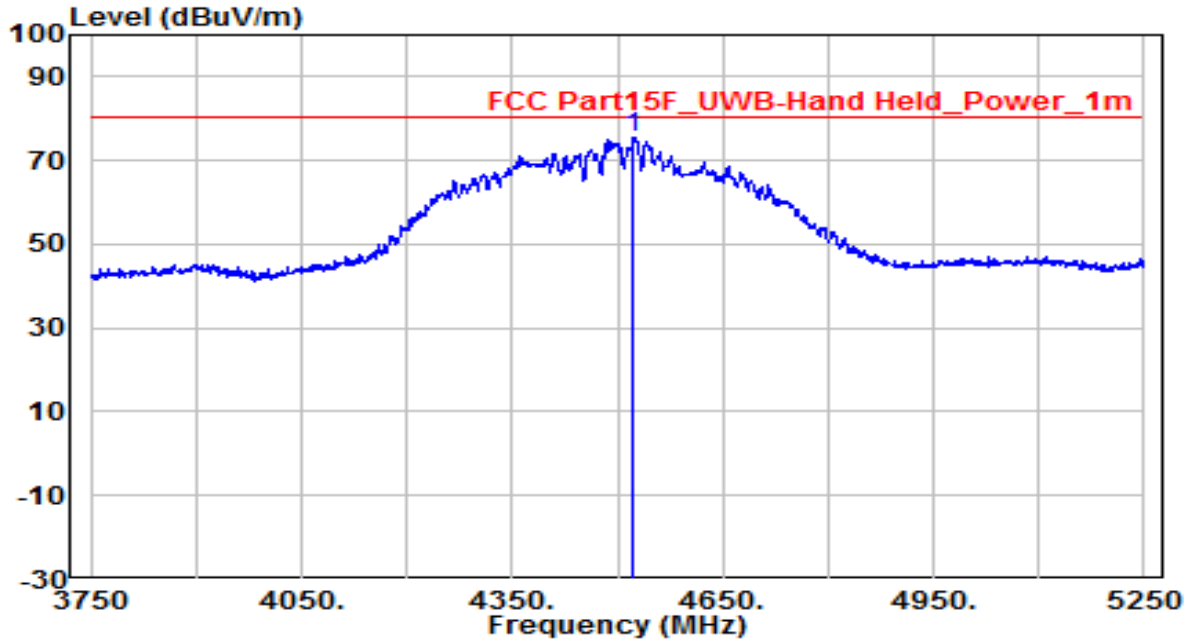


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	4461.000	69.00	3.05	72.05	-8.25	80.30	150	175	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. EIRP= E-field -80.3 = -8.25dBm@50MHz

EUT	UB-T100	Date of Test	2020-10-22
Factor	BBHA 9120D_1m	Temp. / Humidity	23°C /69%
Polarity	Vertical	Site / Test Engineer	AC1 / Milo Li
Test Mode	UWB-TX_4.5GHz	Test Voltage	AC 120V/60Hz



No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	4523.000	72.19	3.16	75.35	-4.95	80.30	160	0	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. EIRP= E-field -80.3 = -4.95dBm@50MHz

8.6. Dwell Time

8.6.1.Test Limit

A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

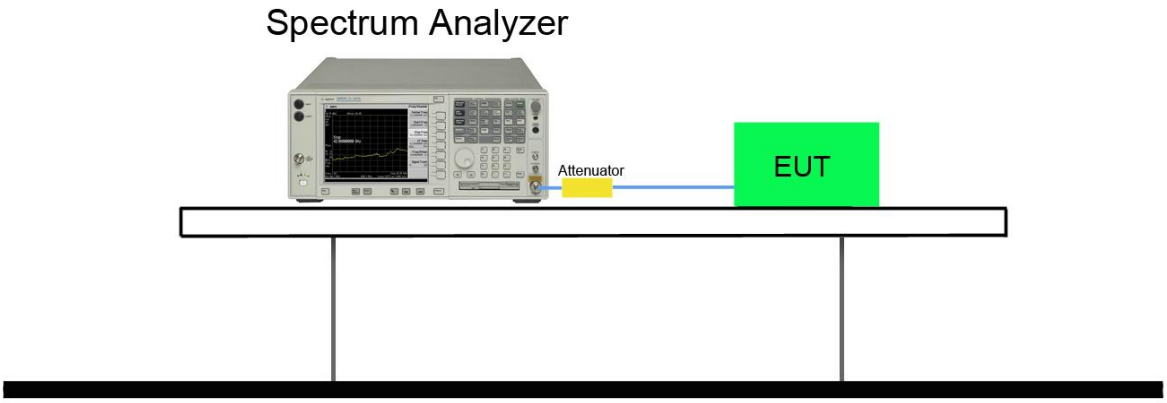
8.6.2.Test Procedure used

ANSI C63.10-2013, Section 10.3

8.6.3.Test Setting

(1) RBW = 3MHz
(2) VBW = 3MHz
(3) Detector = Peak
(4) Trace mode = Clear Write
(5) Sweep = 10s
(6) Span = 0Hz

8.6.4.Test Setup

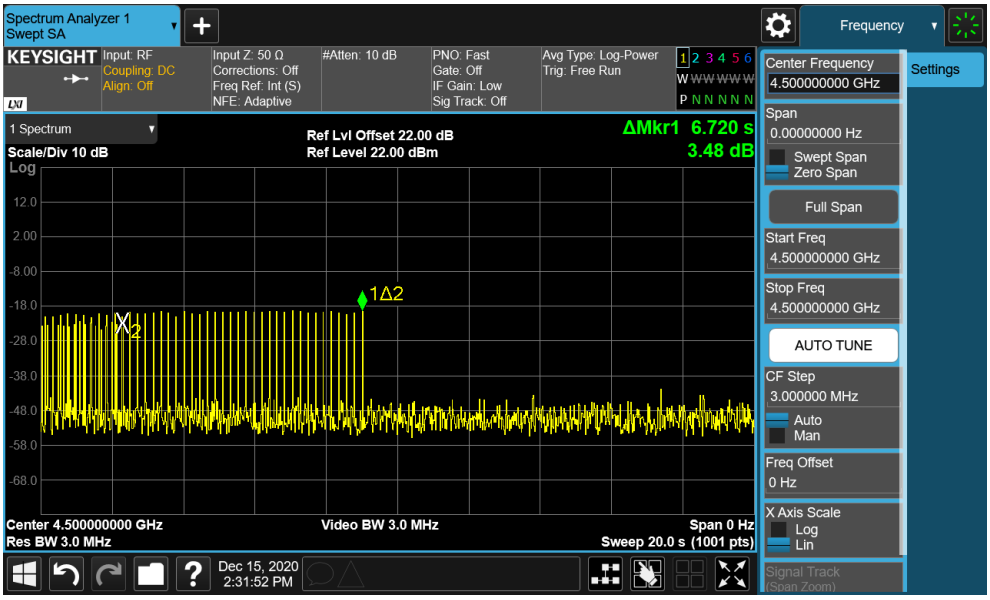


8.6.5.Test Result

Product	UB-T100	Temperature	25°C
Test Engineer	Fran	Relative Humidity	60%
Test Site	TR3	Test Date	2020/12/15
Test Item	Dwell Time		

Test Mode	Frequency (MHz)	Dwell Time (s)	Limit (s)	Result
UWB	4500	6.720s	≦ 10s	Pass

UWB-4500MHz



8.7. AC Conducted Emissions Measurement

8.7.1.Test Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

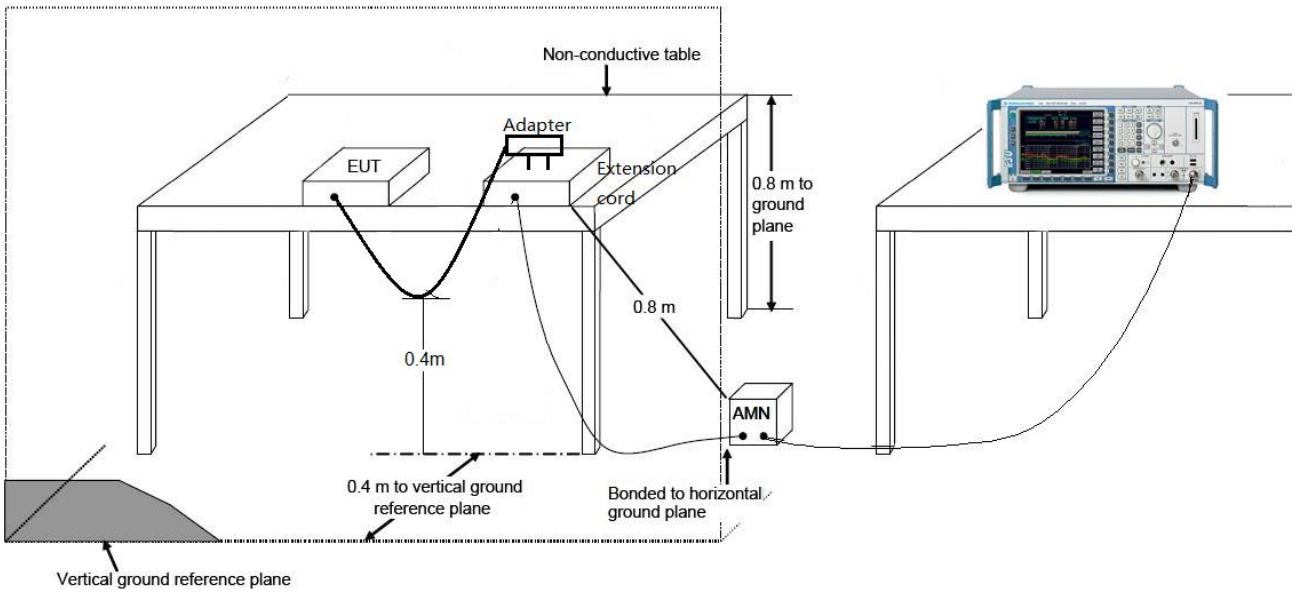
8.7.2.Test Procedure Used

FCC Part 15 Subpart C Paragraph 15.207

8.7.3.Test Setting

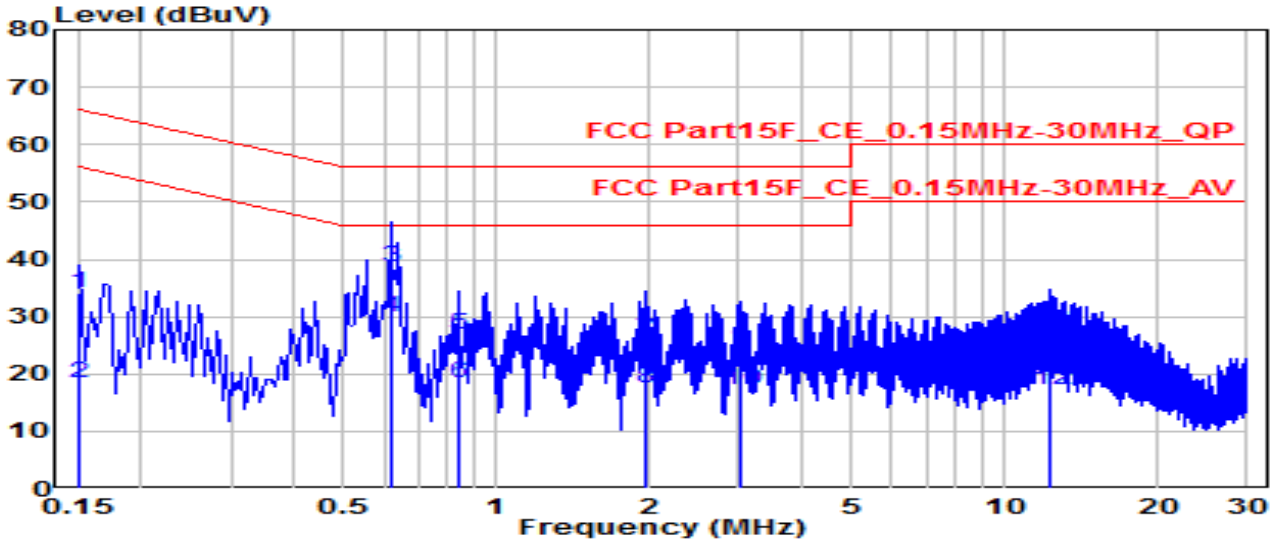
The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

8.7.4.Test Setup



8.7.5.Test Result

EUT	UB-T100	Date of Test	2020-10-23
Factor	CE_ENV216-L1 (Filter ON)	Temp. / Humidity	24°C /57%
Polarity	Line1	Site / Test Engineer	SR2 / Fran
Test Mode	TX_4.5GHz	Test Voltage	AC 120V/60Hz

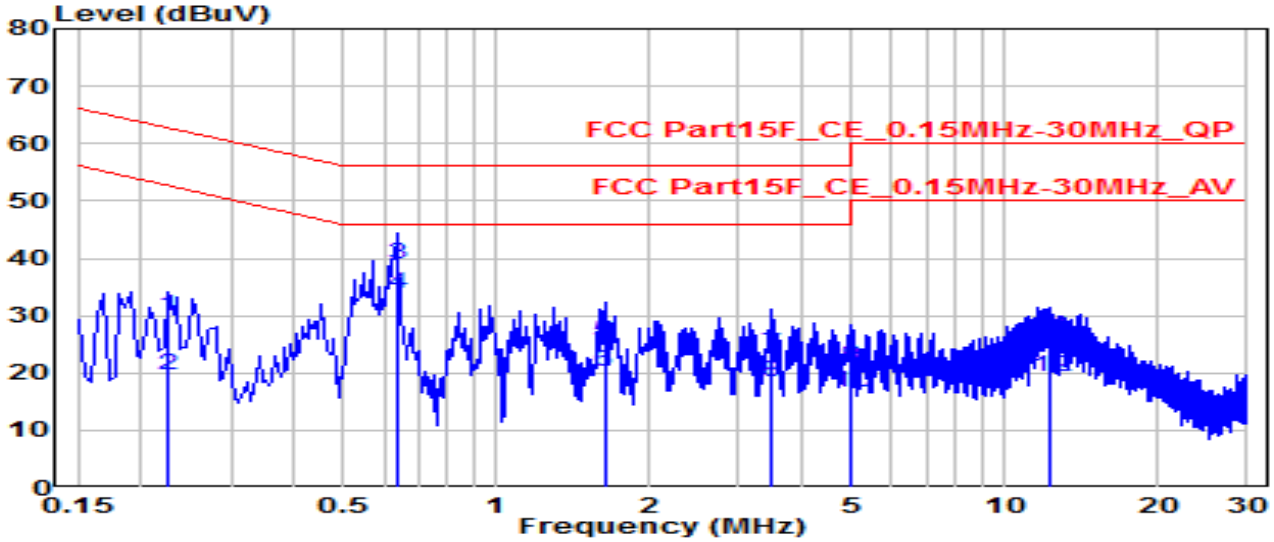


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Remark (QP/PK/AV)
1		0.150	24.36	9.61	33.97	-32.03	66.00	QP
2		0.150	8.78	9.61	18.39	-37.61	56.00	Average
3	*	0.618	29.15	9.64	38.79	-17.21	56.00	QP
4	*	0.618	20.35	9.64	29.98	-16.02	46.00	Average
5		0.843	17.24	9.65	26.89	-29.11	56.00	QP
6		0.843	8.75	9.65	18.40	-27.60	46.00	Average
7		1.977	16.24	9.69	25.93	-30.07	56.00	QP
8		1.977	7.82	9.69	17.51	-28.49	46.00	Average
9		3.034	14.64	9.71	24.35	-31.65	56.00	QP
10		3.034	7.45	9.71	17.15	-28.85	46.00	Average
11		12.362	17.31	9.90	27.21	-32.79	60.00	QP
12		12.362	7.42	9.90	17.32	-32.68	50.00	Average

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).

EUT	UB-T100	Date of Test	2020-10-23
Factor	CE_ENV216-N (Filter ON)	Temp. / Humidity	24°C /57%
Polarity	Neutral	Site / Test Engineer	SR2 / Fran
Test Mode	TX_4.5GHz	Test Voltage	AC 120V/60Hz

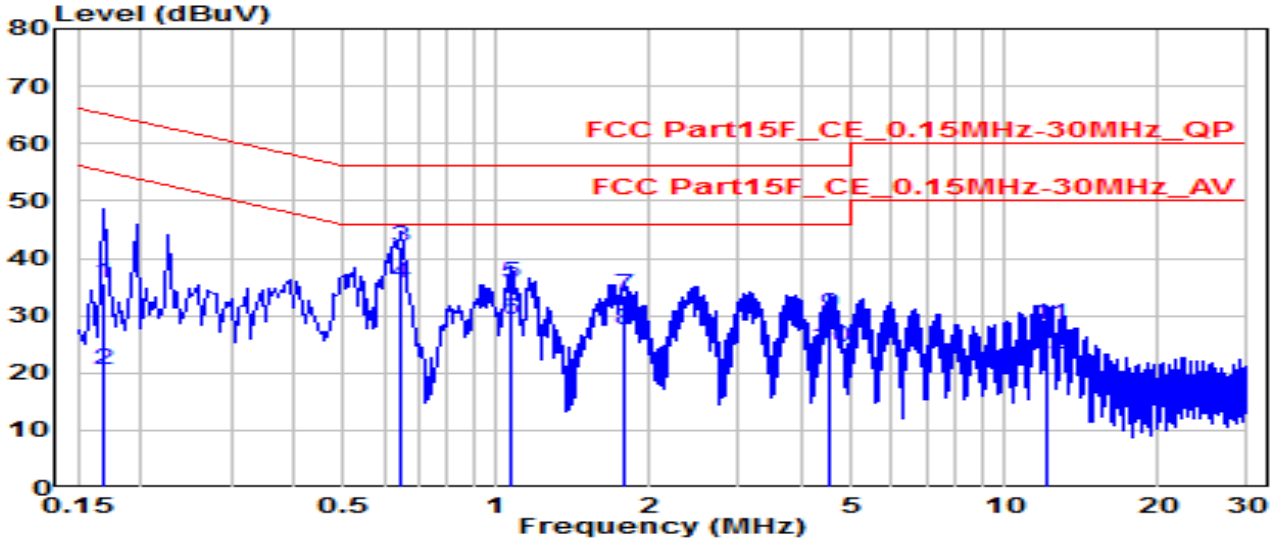


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Remark (QP/PK/AV)
1		0.226	20.21	9.62	29.83	-32.74	62.58	QP
2		0.226	9.92	9.62	19.55	-33.03	52.58	Average
3	*	0.636	29.23	9.65	38.88	-17.12	56.00	QP
4	*	0.636	24.18	9.65	33.83	-12.17	46.00	Average
5		1.630	15.53	9.68	25.21	-30.79	56.00	QP
6		1.630	10.65	9.68	20.33	-25.67	46.00	Average
7		3.493	13.53	9.72	23.25	-32.75	56.00	QP
8		3.493	8.69	9.72	18.41	-27.59	46.00	Average
9		4.956	11.38	9.75	21.13	-34.87	56.00	QP
10		4.956	6.71	9.75	16.46	-29.54	46.00	Average
11		12.303	16.37	9.93	26.30	-33.70	60.00	QP
12		12.303	9.41	9.93	19.34	-30.66	50.00	Average

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).

EUT	UB-T100	Date of Test	2020-10-23
Factor	CE_ENV216-L1 (Filter ON)	Temp. / Humidity	24°C /57%
Polarity	Line1	Site / Test Engineer	SR2 / Fran
Test Mode	TX_4.5GHz	Test Voltage	AC 240V/60Hz

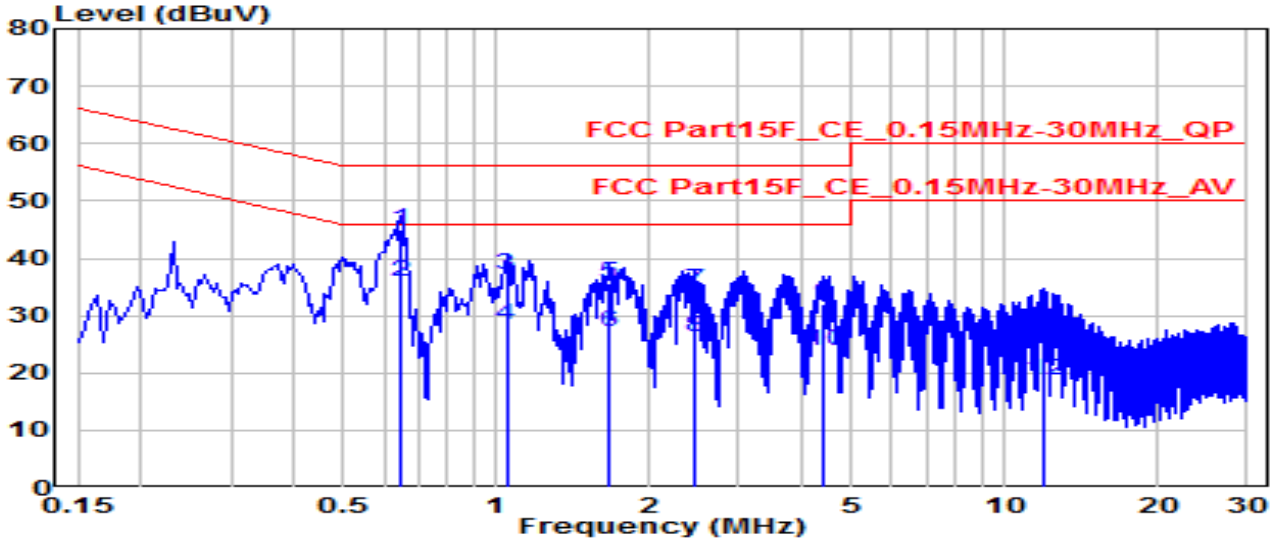


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Remark (QP/PK/AV)
1		0.168	26.11	9.61	35.72	-29.34	65.06	QP
2		0.168	11.02	9.61	20.63	-34.42	55.06	Average
3	*	0.645	32.47	9.64	42.11	-13.89	56.00	QP
4	*	0.645	25.95	9.64	35.59	-10.41	46.00	Average
5		1.068	25.90	9.66	35.56	-20.44	56.00	QP
6		1.068	19.61	9.66	29.27	-16.73	46.00	Average
7		1.783	23.74	9.68	33.42	-22.58	56.00	QP
8		1.783	17.66	9.68	27.34	-18.66	46.00	Average
9		4.519	20.55	9.73	30.28	-25.72	56.00	QP
10		4.519	14.68	9.73	24.41	-21.59	46.00	Average
11		12.155	18.41	9.90	28.31	-31.69	60.00	QP
12		12.155	13.27	9.90	23.17	-26.83	50.00	Average

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).

EUT	UB-T100	Date of Test	2020-10-23
Factor	CE_ENV216-N (Filter ON)	Temp. / Humidity	24°C /57%
Polarity	Neutral	Site / Test Engineer	SR2 / Fran
Test Mode	TX_4.5GHz	Test Voltage	AC 240V/60Hz



No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Remark (QP/PK/AV)
1	*	0.649	35.38	9.65	45.03	-10.97	56.00	QP
2	*	0.649	26.15	9.65	35.80	-10.20	46.00	Average
3		1.045	27.40	9.67	37.07	-18.93	56.00	QP
4		1.045	18.72	9.67	28.39	-17.61	46.00	Average
5		1.671	26.01	9.68	35.69	-20.31	56.00	QP
6		1.671	17.56	9.68	27.24	-18.76	46.00	Average
7		2.440	24.77	9.70	34.47	-21.53	56.00	QP
8		2.440	16.46	9.70	26.16	-19.84	46.00	Average
9		4.411	22.15	9.74	31.89	-24.11	56.00	QP
10		4.411	14.05	9.74	23.79	-22.21	46.00	Average
11		11.934	18.12	9.92	28.04	-31.96	60.00	QP
12		11.934	8.76	9.92	18.68	-31.32	50.00	Average

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).

9. CONCLUSION

The data collected relate only the item(s) tested and show that the **UWB TAG** is in compliance with Part 15F of the FCC Rules.

The End