

## TEST REPORT

**Product** : UWB Kbeacon  
**Trade mark** : Kbeacon  
**Model/Type reference** : K4W,K5W,K7W,K9W  
**Serial Number** : N/A  
**Report Number** : EED32Q80116702  
**FCC ID** : 2AXZL-K4W  
**Date of Issue** : Mar. 21, 2024  
**Test Standards** : 47 CFR Part 15 Subpart F  
**Test result** : PASS

Prepared for:

**KKM Company Limited**  
3CDE, Building6, Baoneng Science&Technology Park, Qingxiang Rd,  
Longhua Street, Longhua District,Shenzhen City,Guangdong Province,  
China

Prepared by:

**Centre Testing International Group Co., Ltd.**  
Hongwei Industrial Zone, Bao'an 70 District,  
Shenzhen, Guangdong, China  
**TEL: +86-755-3368 3668**  
**FAX: +86-755-3368 3385**

Compiled by:

*mark.chen.*

Reviewed by:

*Frazer. Li*

Mark Chen

Frazer Li

Approved by:

*Aaron Ma*

Date:

Mar. 21, 2024

Aaron Ma

Check No.: 5128240124



## 1 Contents

	Page
<b>1 CONTENTS</b> .....	<b>2</b>
<b>2 VERSION</b> .....	<b>3</b>
<b>3 TEST SUMMARY</b> .....	<b>4</b>
<b>4 GENERAL INFORMATION</b> .....	<b>5</b>
4.1 CLIENT INFORMATION .....	5
4.2 GENERAL DESCRIPTION OF EUT .....	5
4.3 TEST CONFIGURATION .....	6
4.4 TEST ENVIRONMENT .....	6
4.5 DESCRIPTION OF SUPPORT UNITS .....	6
<b>5 TEST RESULTS AND MEASUREMENT DATA</b> .....	<b>10</b>
5.1 ANTENNA REQUIREMENT .....	10
5.2 OPERATIONAL REQUIREMENTS .....	10
5.3 EIRP(EQUIVALENT ISOTROPIC RADIATED POWER) .....	11
5.4 -10DB BANDWIDTH .....	16
5.5 SPURIOUS EMISSIONS BELOW 1GHZ .....	18
5.6 SPURIOUS EMISSIONS ABOVE 1GHZ .....	22
<b>6 PHOTOGRAPHS OF TEST SETUP</b> .....	<b>30</b>
<b>7 PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS</b> .....	<b>33</b>

## 2 Version

Version No.	Date	Description
00	Mar. 21, 2024	Original

### 3 Test Summary

Test Item	Test Requirement	Result
Antenna Requirement	47 CFR Part 15,Subpart C Section §15.203	Pass
Operational Requirements	47 CFR Part 15,Subpart F Section §15.517(a)	Pass
AC Power Line Conducted Emissions	47 CFR Part 15,Subpart C Section §15.207	N/A
EIRP (Equivalent Isotropic Radiated Power)	47 CFR Part 15,Subpart F Section §15.517(c) & §15.517(e)	Pass
-10dB Bandwidth	47 CFR Part 15,Subpart F Section §15.503(a),(d) & §15.517(b)	Pass
Spurious Emissions Below 1GHz	47 CFR Part 15, Subpart F Section §15.209	Pass
Spurious Emissions Above 1GHz	47 CFR Part 15, Subpart F Section §15.517(c),(d) & §15.521(d)	Pass

**Remark:**

N/A:Only battery supply is supported and this item is not considered.

Company Name and Address shown on Report, the sample(s) and sample Information were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

Model No.:K4W,K5W,K7W,K9W

Only the model K4W was tested, their electrical circuit design,layout,components used and internal wiring are identical.Only the case design is different.

## 4 General Information

### 4.1 Client Information

Applicant:	KKM Company Limited
Address of Applicant:	3CDE, Building6, Baoneng Science&Technology Park, Qingxiang Rd, Longhua Street, Longhua District,Shenzhen City,Guangdong Province, China
Manufacturer:	KKM Company Limited
Address of Manufacturer:	3CDE, Building6, Baoneng Science&Technology Park, Qingxiang Rd, Longhua Street, Longhua District,Shenzhen City,Guangdong Province, China
Factory:	KKM Company Limited
Address of Factory:	3CDE, Building6, Baoneng Science&Technology Park, Qingxiang Rd, Longhua Street, Longhua District,Shenzhen City,Guangdong Province, China

### 4.2 General Description of EUT

Product Name:	UWB Kbeacon
Model No.:	K4W,K5W,K7W,K9W
Test Model No.:	K4W
Trade Mark:	Kbeacon
Product Type:	Indoor UWB system
Operation Range:	6201.74MHz to 6736.97MHz
Center Frequency:	6489.6MHz
Modulation Type:	BPM
Number of Channels:	1
Antenna Type:	Chip Antenna
Antenna Gain:	4.16dBi
Power Supply:	Battery DC 3V
Test Voltage:	DC 3V
Sample Received Date:	Jan. 24, 2024
Sample tested Date:	Mar. 12, 2024 to Mar. 14, 2024

### 4.3 Test Configuration

EUT Test Software Settings:	
Test Software:	RF test (manufacturer declare )
EUT Power Grade:	Default (Power level is built-in set parameters and cannot be changed and selected)

### 4.4 Test Environment

Operating Environment:	
Radiated Spurious Emissions:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar
RF Conducted:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar

### 4.5 Description of Support Units

The EUT has been tested independently.

### 4.6 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

**4.7 Measurement Uncertainty (95% confidence levels, k=2)**

No.	Item	Measurement Uncertainty
1	Radio Frequency	$7.9 \times 10^{-8}$
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-40GHz)
3	Radiated Spurious emission test	3.3dB (9kHz-30MHz)
		4.3dB (30MHz-1GHz)
		4.5dB (1GHz-18GHz)
		3.4dB (18GHz-40GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

## 4.8 Equipment List

3M Semi-anechoic Chamber (2)- Radiated disturbance Test					
Equipment	Manufacturer	Model	Serial No.	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05/22/2022	05/21/2025
Receiver	R&S	ESC17	100938-003	09/22/2023	09/21/2024
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	9163-618	05/22/2022	05/21/2025
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04/15/2021	04/14/2024
Multi device Controller	matturo	NCD/070/10711112	---	---	---
Horn Antenna	ETS-LINGREN	BBHA 9120D	9120D-1869	04/15/2021	04/14/2024
Microwave Preamplifier	Agilent	8449B	3008A02425	06/20/2023	06/19/2024
Test software	Fara	EZ-EMC	EMEC-3A1-Pre	---	---



3M full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
RSE Automatic test software	JS Tonscend	JS36-RSE	10166	---	---
Receiver	Keysight	N9038A	MY57290136	01-09-2024	01-08-2025
Spectrum Analyzer	Keysight	N9020B	MY57111112	01-19-2024	01-18-2025
Spectrum Analyzer	Keysight	N9030B	MY57140871	01-13-2024	01-12-2025
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-28-2021	04-27-2024
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-15-2021	04-14-2024
Horn Antenna	ETS-LINDGREN	3117	57407	07-04-2021	07-03-2024
Preamplifier	EMCI	EMC184055SE	980597	04-13-2023	04-12-2024
Preamplifier	EMCI	EMC001330	980563	03-28-2023	03-27-2024
Preamplifier	JS Tonscend	TAP-011858	AP21B806112	07-25-2023	07-24-2024
Communication test set	R&S	CMW500	102898	12-14-2023	12-13-2024
Temperature/ Humidity Indicator	biaozhi	GM1360	EE1186631	04-11-2023	04-10-2024
Fully Anechoic Chamber	TDK	FAC-3	---	01-09-2024	01-08-2027
Cable line	Times	SFT205-NMSM-2.50M	394812-0001	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0002	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0003	---	---
Cable line	Times	SFT205-NMSM-2.50M	393495-0001	---	---
Cable line	Times	EMC104-NMNM-1000	SN160710	---	---
Cable line	Times	SFT205-NMSM-3.00M	394813-0001	---	---
Cable line	Times	SFT205-NMNM-1.50M	381964-0001	---	---
Cable line	Times	SFT205-NMSM-7.00M	394815-0001	---	---
Cable line	Times	HF160-KMKM-3.00M	393493-0001	---	---

## 5 Test results and Measurement Data

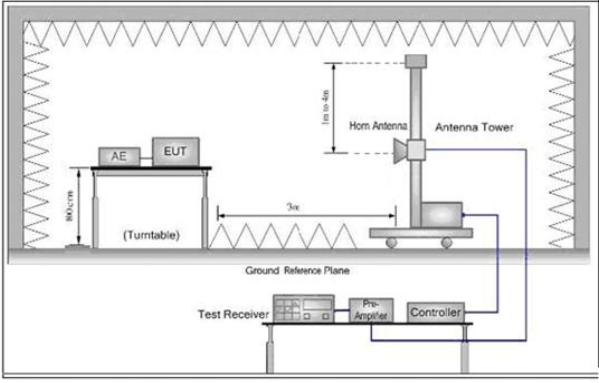
### 5.1 Antenna Requirement

<b>Standard requirement:</b>	47 CFR Part 15,Subpart C Section § 15.203
<p>15.203 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.</p>	
<b>EUT Antenna:</b>	Please see Internal photos
The antenna is PCB Antenna. The best case gain of the antenna is 4.16dBi.	

### 5.2 Operational Requirements

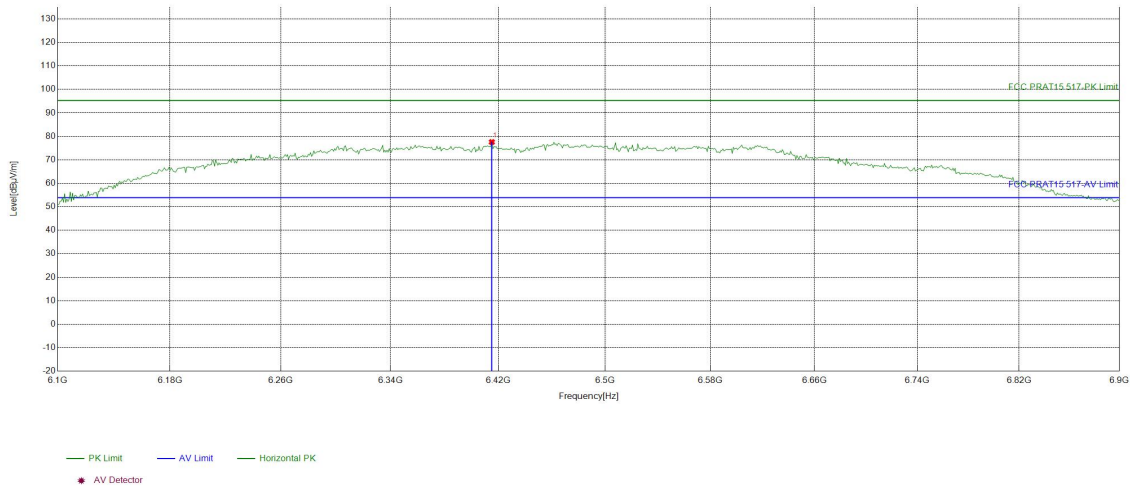
<b>Standard requirement:</b>	47 CFR Part 15,Subpart F Section §15.517(a)
<p>(1) Indoor UWB devices, by the nature of their design, must be capable of operation only indoors. The necessity to operate with a fixed indoor infrastructure, e.g., a transmitter that must be connected to the AC power lines, may be considered sufficient to demonstrate this.                  Result: Compliant, the EUT is a tag filed under a separate application. The statement required by Section 15.517(f) is located in the manual regarding the use of indoor equipment.</p> <p>(2) The emissions from the equipment operated under this section shall not be intentional directed outside of the building in which the equipment is located, such as through a window or a doorway, to perform an outside function, such as the detection of persons about to enter a building.                  Result: Not Applicable, Compliant.</p> <p>(3) The use of outdoor mounted antennas, e.g. antennas mounted on the outside of a building or on a telephone pole, or any other outdoors infrastructure is prohibited.                  Result: Not Applicable, Compliant.</p> <p>(4) Field disturbance sensors installed inside of metal or underground storage tanks are considered to operate indoors provided the emissions are directed towards the ground.                  Result: Not Applicable, Compliant.</p> <p>(5) A communications system shall transmit only when the intentional radiator is sending information to an associated receiver.</p>	
<b>Result:</b>	Compliant.

### 5.3 EIRP(Equivalent Isotropic Radiated Power)

Test Requirement:	47 CFR Part 15,Subpart F Section §15.517(c) & §15.517(e)
Test Method:	ANSI C63.10: 2013 section 10.3
Test Setup:	 <p>Remark:</p> <p>Due to some spectrum analyzer does not support 50MHz RBW setting, RBW set to the maximum value, and add a correction factor is allowed for Max Peak EIRP measurement. According to ANSI 63.10 Clause 10.3.9, the EIRP to field strength at a specified measurement distance of 3 m is below:  <math>E \text{ (dBuV/m)} = \text{EIRP(dBm)} + 95.3</math>          For peak power test, the spectrum analyzer was set to RBW=8MHz, VBW=10MHz, and add a conversion factor of <math>20 \cdot \log(50\text{MHz}/8\text{MHz})=15.92\text{dB}</math>.</p>
Test Procedure:	<ol style="list-style-type: none"> <li>1) The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semianechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>3) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength.Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li> <li>4) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>5) The test-receiver system was set to Peak detector with Maximum Hold Mode for Max Peak EIRP measurement and AV detector for Average EIRP measurement.</li> <li>6) Test the EUT in the lowest channel, the Highest channel</li> <li>7) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.</li> <li>8) Repeat above procedures until all frequencies measured was complete.</li> </ol> <p>Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor</p>

Limit:	(c) The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in § 15.209. The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:											
	<table border="1"> <thead> <tr> <th>Frequency in MHz</th> <th>EIRP in dBm</th> </tr> </thead> <tbody> <tr> <td>960-1610</td> <td>-75.3</td> </tr> <tr> <td>1610-1990</td> <td>-53.3</td> </tr> <tr> <td>1990-3100</td> <td>-51.3</td> </tr> <tr> <td>3100-10600</td> <td>-41.3</td> </tr> <tr> <td>Above 10600</td> <td>-51.3</td> </tr> </tbody> </table>	Frequency in MHz	EIRP in dBm	960-1610	-75.3	1610-1990	-53.3	1990-3100	-51.3	3100-10600	-41.3	Above 10600
Frequency in MHz	EIRP in dBm											
960-1610	-75.3											
1610-1990	-53.3											
1990-3100	-51.3											
3100-10600	-41.3											
Above 10600	-51.3											
Test Mode:	Continuous Tx Mode, Keep the EUT Transmitting with Modulation											
Test Results:	Pass											

## Test Result



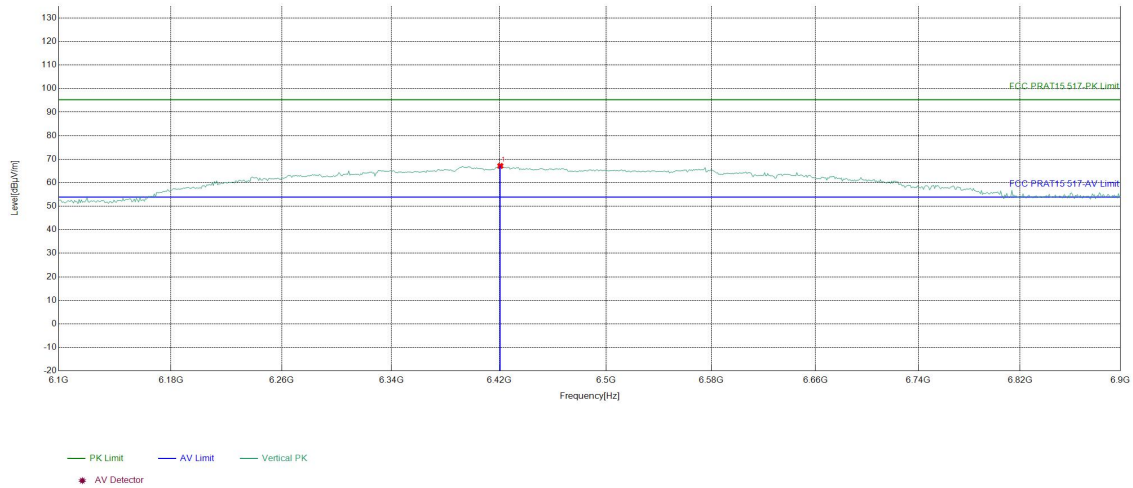
Peak Field Strength for fundamental @ RBW=8MHz					
Freq.[MHz]	Factor[dB]	Reading[dBμV]	Level [dBμV/m]	Polarity	Remark
6415.2	-10.39	87.97	77.58	Horizontal	Peak

Calculated Peak Field Strength of fundamental					
Freq. [MHz]	Measured Field Strength of fundamental (FSM) (dBuV/m)	Limit (dBuV/m)	Margin [dB]	Result	Polarity
6415.2	77.58	79.38	1.80	Pass	Horizontal

Note:

① Limit(dBuV/m) = EIRP(dBm) + 95.3 = 79.38(dBuV/m);

② EIRP(dBm) = 20 log (RBW/50) dBm = 20 log (8/50) dBm = -15.92(dBm);

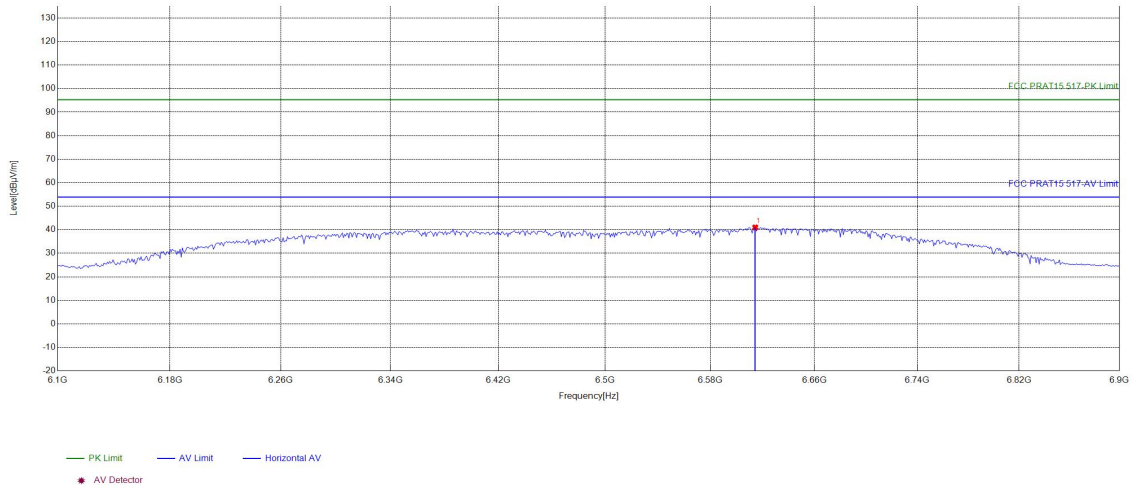


Peak Field Strength for fundamental @ RBW=8MHz					
Freq.[MHz]	Factor[dB]	Reading[dBμV]	Level [dBμV/m]	Polarity	Remark
6420.8	-10.34	77.47	67.13	Vertical	Peak

Calculated Peak Field Strength of fundamental					
Freq. [MHz]	Measured Field Strength of fundamental (FSM) (dBuV/m)	Limit (dBuV/m)	Margin [dB]	Result	Polarity
6420.8	67.13	79.38	12.25	Pass	Vertical

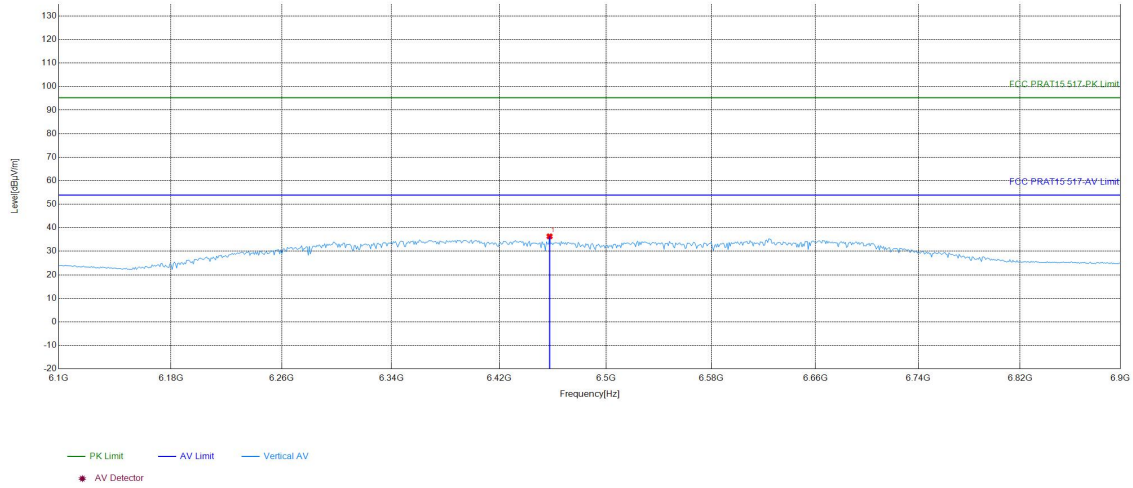
Note:

- ① Limit(dBuV/m) = EIRP(dBm) + 95.3=79.38(dBuV/m);
- ② EIRP(dBm)=20 log (RBW/50) dBm =20 log (8/50) dBm=-15.92(dBm);



Average Field Strength for fundamental @ RBW=1 MHz									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	6614.4	-8.79	49.81	41.02	54.00	12.98	PASS	Horizontal	AV

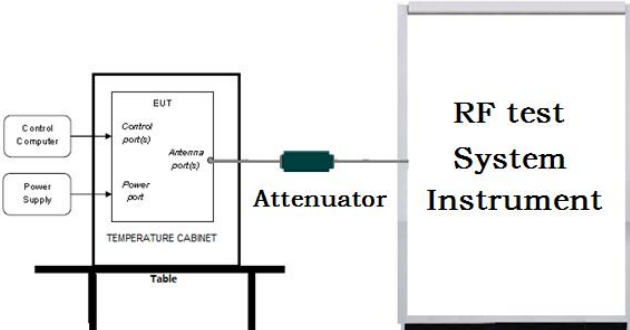
Note: Limit=95.3-41.3=54dBuV/m;



Average Field Strength for fundamental @ RBW=1 MHz									
NO	Freq. [MHz]	Factor [dB]	Reading [dB $\mu$ V]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Result	Polarity	Remark
1	6457.6	-10.06	46.40	36.34	54.00	17.66	PASS	Vertical	AV

Note: Limit=95.3-41.3=54dBuV/m;

## 5.4 -10dB Bandwidth

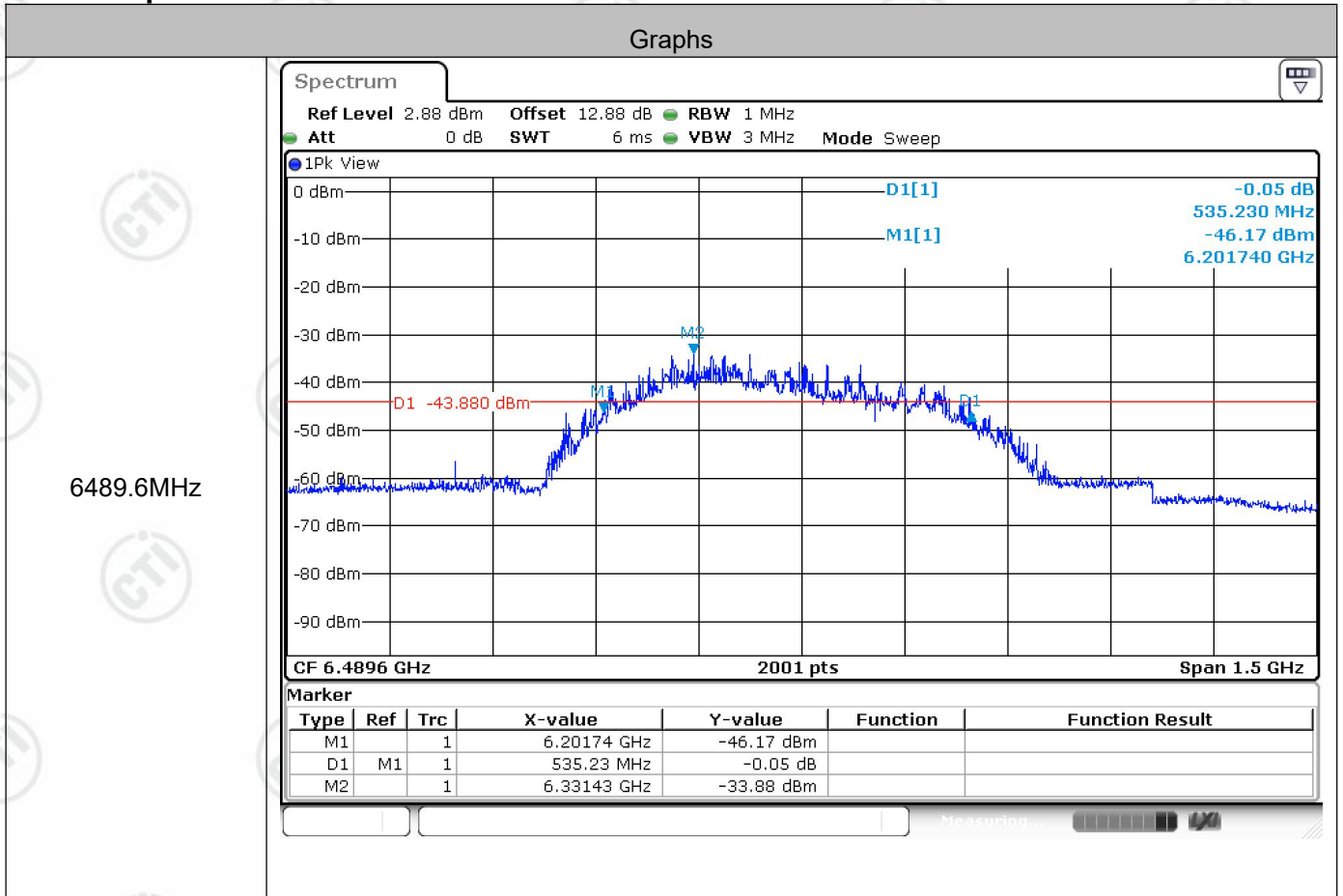
Test Requirement:	47 CFR Part 15, Subpart F Section § 15.503(a),(d) & § 15.517(b)
Test Method:	ANSI C63.10:2013 section 10.1
Test Setup:	 <p>Remark: Offset=Cable loss+ attenuation factor.</p>
Test Procedure:	<p>The frequency at which the maximum power level is measured with the peak detector is designated <math>f_M</math>. 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.</p> <p>The outermost 1 MHz segments above and below <math>f_M</math>, where the peak power falls by 10 dB relative to the level at <math>f_M</math>, are designated as <math>f_H</math> and <math>f_L</math>, respectively:</p> <ol style="list-style-type: none"> <li>For the lowest frequency bound <math>f_L</math>, the emission is searched from a frequency lower than <math>f_M</math> that has, by inspection, a peak power much lower than 10 dB less than the power at <math>f_M</math> and increased toward <math>f_M</math> until the peak power indicates 10 dB less than the power at <math>f_M</math>. The frequency of that segment is recorded.</li> <li>This process is repeated for the highest frequency bound <math>f_H</math>, beginning at a frequency higher than <math>f_M</math> that has, by inspection, a peak power much lower than 10 dB below the power at <math>f_M</math>. The frequency of that segment is recorded.</li> <li>The two recorded frequencies represent the highest <math>f_H</math> and lowest <math>f_L</math> bounds of the UWB transmission, and the -10 dB bandwidth (<math>B - 10</math>) is defined as <math>(f_H - f_L)</math>. The center frequency (<math>f_c</math>) is mathematically determined from <math>(f_H + f_L) / 2</math>.</li> <li>The fractional bandwidth is defined as <math>2(f_H - f_L) / (f_H + f_L)</math>.</li> </ol> <p>e) Determine whether the -10 dB bandwidth <math>(f_H - f_L)</math> is <math>\geq 500</math> MHz, or whether the fractional bandwidth <math>2(f_H - f_L) / (f_H + f_L)</math> is <math>\geq 0.2</math>.</p>
Limit:	$\geq 500$ MHz
Test Mode:	Continuous Tx Mode, Keep the EUT Transmitting with Modulation
Test Results:	Pass



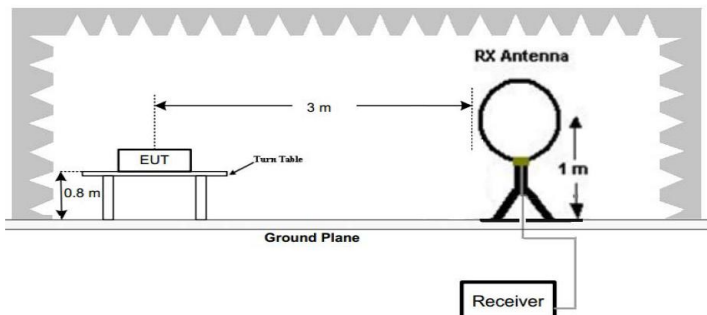
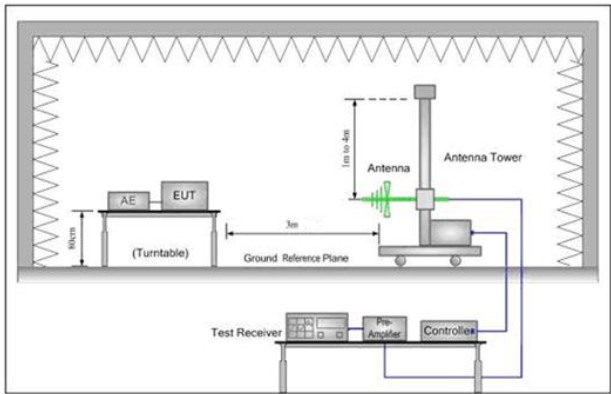
## Test Result

Test Frequency (MHz)	fM (MHz)	fL (MHz)	fH (MHz)	-10dB Bandwidth (MHz)	Limit (MHz)	Results
6489.6	6331.43	6201.74	6736.97	535.23	≧ 500	pass

## Test Graph



## 5.5 Spurious Emissions Below 1GHz

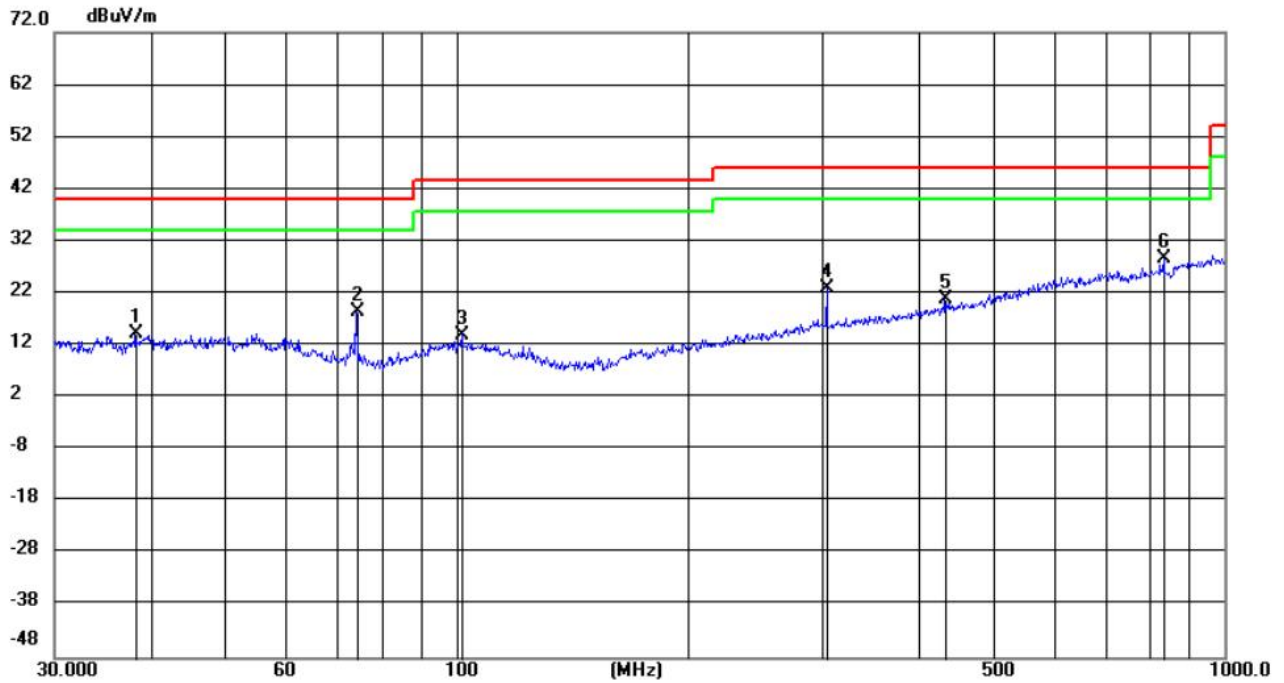
Test Requirement:	47 CFR Part 15, Subpart F Section §15.209
Test Method:	ANSI C63.10: 2013 section 10.2
Test Setup:	 <p style="text-align: center;">Figure 1. Below 30MHz</p>  <p style="text-align: center;">Figure 2. 30MHz to 1GHz</p>
Test Procedure:	<ol style="list-style-type: none"> <li>1) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>3) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li> <li>4) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>5) The test-receiver system was set to Peak detector with Maximum Hold Mode. And use Quasi-Peak to measure the six highest frequencies.</li> <li>6) Test the EUT in the lowest channel, the Highest channel and only recorded worst channel--Lowest channel in the test report.</li> <li>7) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.</li> <li>8) Repeat above procedures until all frequencies measured was complete.</li> </ol>

	<p>Remark:</p> <p>1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor.                  2. According to FCC Part 15.521(h), test was performed from 9kHz to 40GHz for the EUT. Emission below 30MHz was very low, so it's not recorded in the test report.</p>																																												
Limit:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Field strength (microvolt/meter)</th> <th>Limit (dBuV/m)</th> <th>Remark</th> <th>Measurement distance (m)</th> </tr> </thead> <tbody> <tr> <td>0.009MHz-0.490MHz</td> <td>2400/F(kHz)</td> <td>-</td> <td>-</td> <td>300</td> </tr> <tr> <td>0.490MHz-1.705MHz</td> <td>24000/F(kHz)</td> <td>-</td> <td>-</td> <td>30</td> </tr> <tr> <td>1.705MHz-30MHz</td> <td>30</td> <td>-</td> <td>-</td> <td>30</td> </tr> <tr> <td>30MHz-88MHz</td> <td>100</td> <td>40.0</td> <td>Quasi-peak</td> <td>3</td> </tr> <tr> <td>88MHz-216MHz</td> <td>150</td> <td>43.5</td> <td>Quasi-peak</td> <td>3</td> </tr> <tr> <td>216MHz-960MHz</td> <td>200</td> <td>46.0</td> <td>Quasi-peak</td> <td>3</td> </tr> <tr> <td>960MHz-1000MHz</td> <td>-</td> <td>20</td> <td>AV</td> <td>3</td> </tr> </tbody> </table>					Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30	1.705MHz-30MHz	30	-	-	30	30MHz-88MHz	100	40.0	Quasi-peak	3	88MHz-216MHz	150	43.5	Quasi-peak	3	216MHz-960MHz	200	46.0	Quasi-peak	3	960MHz-1000MHz	-	20	AV	3
Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)																																									
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300																																									
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30																																									
1.705MHz-30MHz	30	-	-	30																																									
30MHz-88MHz	100	40.0	Quasi-peak	3																																									
88MHz-216MHz	150	43.5	Quasi-peak	3																																									
216MHz-960MHz	200	46.0	Quasi-peak	3																																									
960MHz-1000MHz	-	20	AV	3																																									
Test Mode:	Continuous Tx Mode, Keep the EUT Transmitting with Modulation																																												
Test Results:	Pass																																												

## Radiated Spurious Emission below 1GHz:

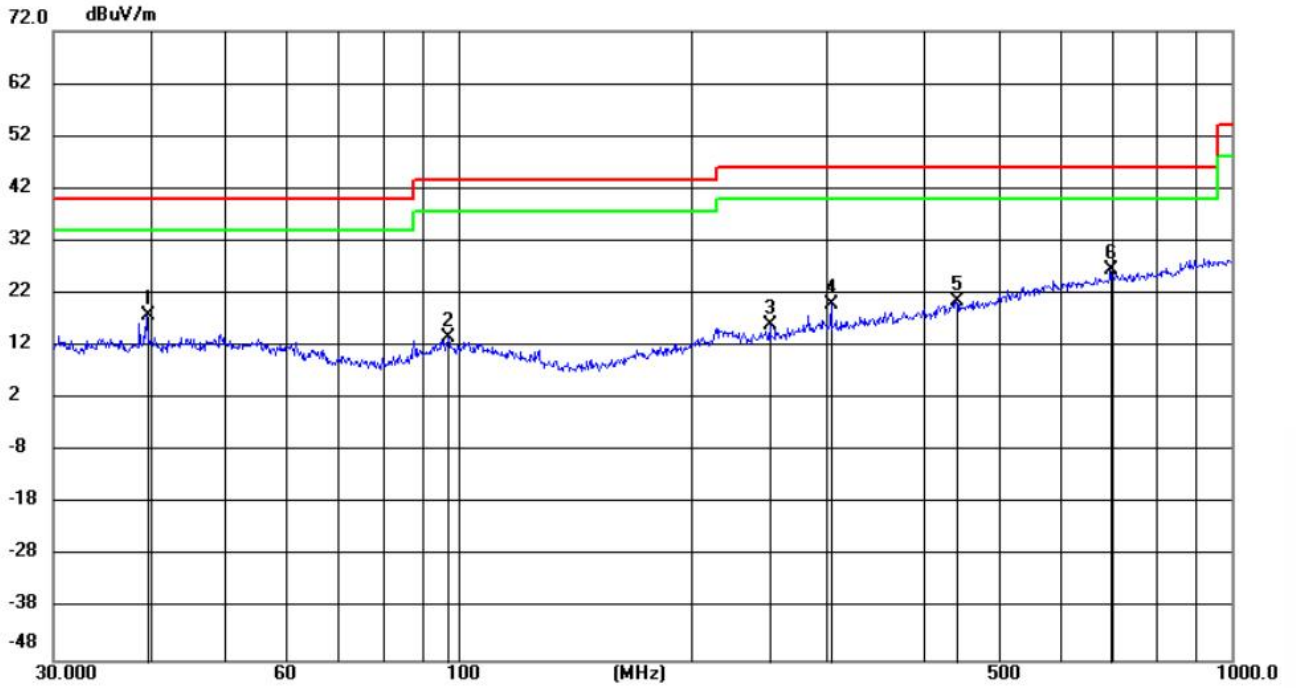
### Test Result

Polarity: Horizontal



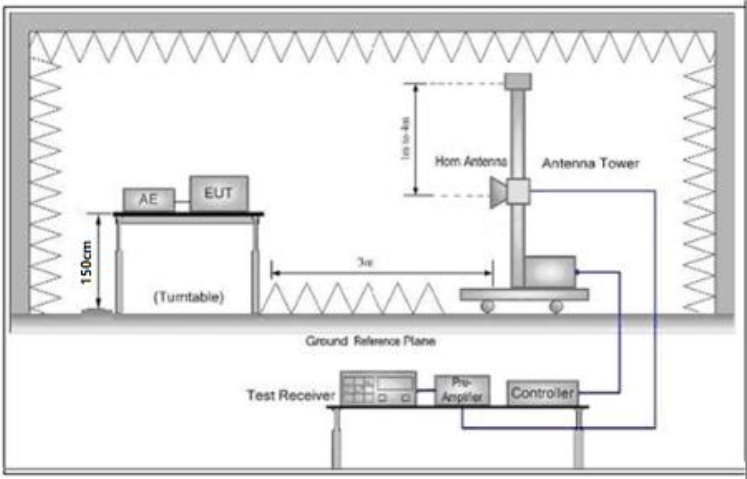
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Antenna Height cm	Table Degree	Comment
1		38.2387	0.41	13.76	14.17	40.00	-25.83	peak	199	28	
2		74.3823	8.02	10.29	18.31	40.00	-21.69	peak	199	259	
3		101.7334	0.63	13.47	14.10	43.50	-29.40	peak	199	122	
4		304.2363	6.13	16.75	22.88	46.00	-23.12	peak	100	342	
5		433.4566	1.49	19.41	20.90	46.00	-25.10	peak	199	322	
6	*	833.6093	2.23	26.36	28.59	46.00	-17.41	peak	100	189	

Polarity: Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		39.6174	3.84	13.94	17.78	40.00	-22.22	peak	100	58	
2		97.1148	0.60	13.12	13.72	43.50	-29.78	peak	100	315	
3		253.2588	1.11	14.82	15.93	46.00	-30.07	peak	100	7	
4		304.1830	3.31	16.75	20.06	46.00	-25.94	peak	200	176	
5		441.5103	0.87	19.59	20.46	46.00	-25.54	peak	100	109	
6	*	698.9368	2.30	24.20	26.50	46.00	-19.50	peak	200	2	

## 5.6 Spurious Emissions Above 1GHz

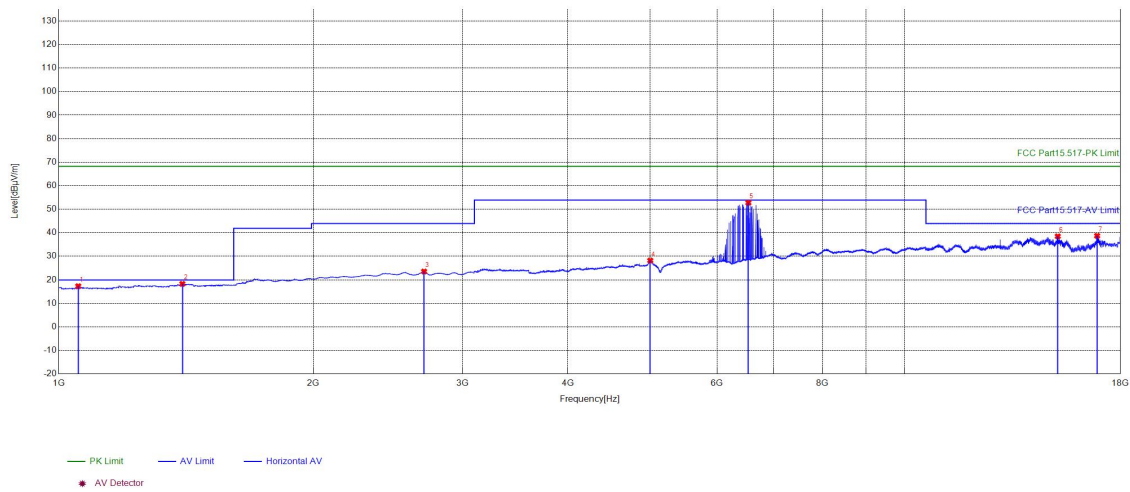
Test Requirement:	47 CFR Part 15, Subpart F Section §15.517(c),(d) & §15.521(d)
Test Method:	ANSI C63.10: 2013 section 10.3
Test Setup:	 <p style="text-align: center;">Figure .Above 1 GHz</p>
Test Procedure:	<ol style="list-style-type: none"> <li>1) The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>3) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li> <li>4) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>5) The test-receiver system was set to Peak detector with Maximum Hold Mode.</li> <li>6) Test the EUT in the lowest channel, the Highest channel</li> <li>7) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.</li> <li>8) Repeat above procedures until all frequencies measured was complete</li> </ol> <p>Remark</p> <ol style="list-style-type: none"> <li>1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor.</li> <li>2: As the EUT operate at 6489.6MHz, according to Part 15.521(h), test was performed at frequency up to 40GHz. For frequency above 18GHz, emission was very low, so it's not recorded in the test report.</li> </ol>

Limit:	<p>(c) The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in § 15.209. The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Frequency in MHz</th> <th style="text-align: center;">EIRP in dBm</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">960-1610</td> <td style="text-align: center;">-75.3</td> </tr> <tr> <td style="text-align: center;">1610-1990</td> <td style="text-align: center;">-53.3</td> </tr> <tr> <td style="text-align: center;">1990-3100</td> <td style="text-align: center;">-51.3</td> </tr> <tr> <td style="text-align: center;">3100-10600</td> <td style="text-align: center;">-41.3</td> </tr> <tr> <td style="text-align: center;">Above 10600</td> <td style="text-align: center;">-51.3</td> </tr> </tbody> </table> <p>(d) In addition to the radiated emission limits specified in the table in paragraph (c) of this section, UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Frequency in MHz</th> <th style="text-align: center;">EIRP in dBm</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1164-1240</td> <td style="text-align: center;">-85.3</td> </tr> <tr> <td style="text-align: center;">1559-1610</td> <td style="text-align: center;">-85.3</td> </tr> </tbody> </table>	Frequency in MHz	EIRP in dBm	960-1610	-75.3	1610-1990	-53.3	1990-3100	-51.3	3100-10600	-41.3	Above 10600	-51.3	Frequency in MHz	EIRP in dBm	1164-1240	-85.3	1559-1610	-85.3
Frequency in MHz	EIRP in dBm																		
960-1610	-75.3																		
1610-1990	-53.3																		
1990-3100	-51.3																		
3100-10600	-41.3																		
Above 10600	-51.3																		
Frequency in MHz	EIRP in dBm																		
1164-1240	-85.3																		
1559-1610	-85.3																		
Test Mode:	Continuous Tx Mode, Keep the EUT Transmitting with Modulation																		
Test Results:	Pass																		

## Test Result

Test_Mode	UWB	Test_Frequency	6489.6MHz
Tset_Engineer	wangzhurun	Test_Date	2024/02/07
Remark	\		

## Test Graph

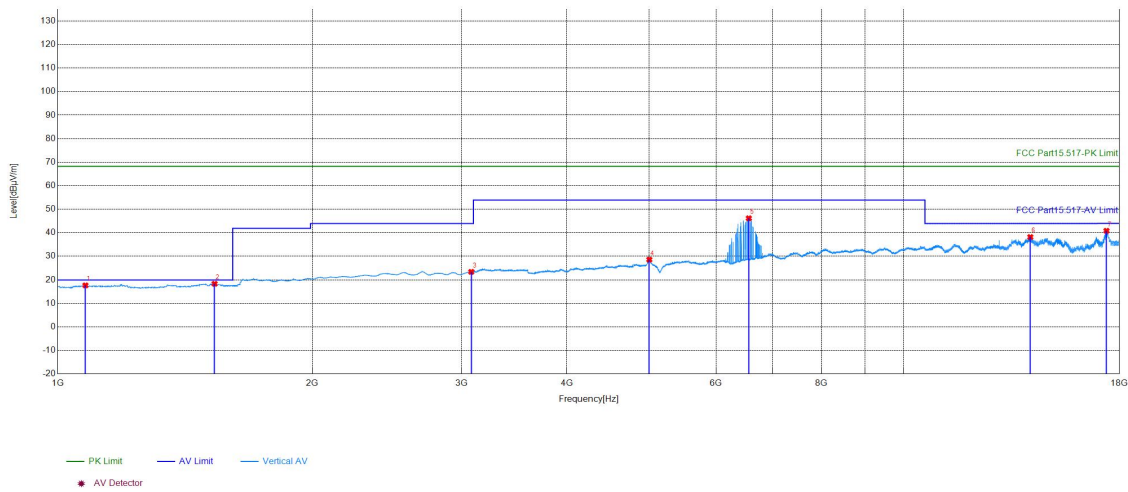


Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	1054.3443	-24.27	41.56	17.29	19.90	2.61	PASS	Horizontal	AV
2	1399.95	-25.10	43.37	18.27	19.90	1.63	PASS	Horizontal	AV
3	2703.3333	-20.33	43.86	23.53	43.90	20.37	PASS	Horizontal	AV
4	5004.4404	-13.53	41.72	28.19	53.90	25.71	PASS	Horizontal	AV
5	6536.8437	-9.44	62.19	52.75	53.90	1.15	PASS	Horizontal	AV
6	15176.6177	7.66	30.82	38.48	43.94	5.46	PASS	Horizontal	AV
7	16894.3294	7.75	30.95	38.70	43.95	5.25	PASS	Horizontal	AV



Test_Mode	UWB	Test_Frequency	6489.6MHz
Tset_Engineer	wangzhurun	Test_Date	2024/02/07
Remark	\		

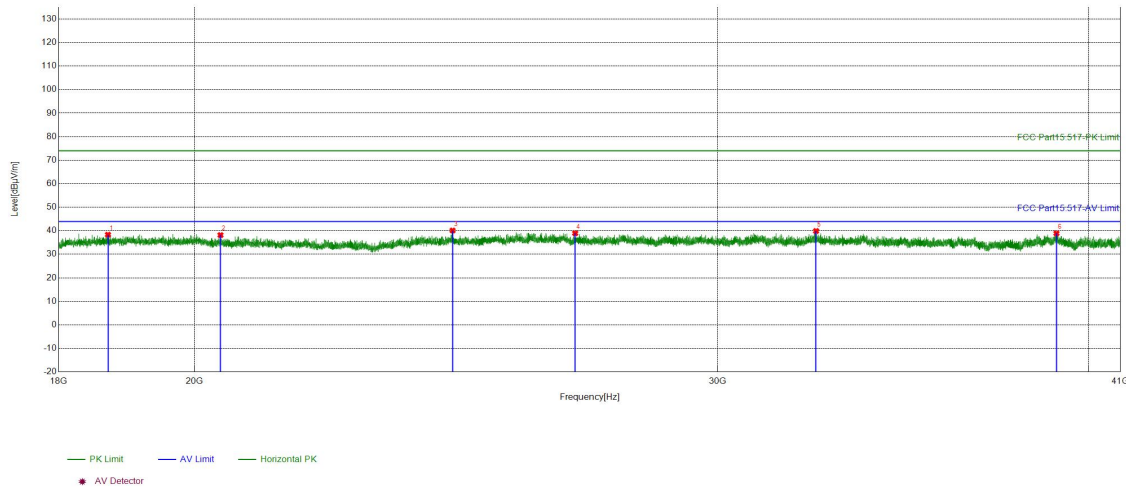
### Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	1078.1582	-25.01	42.64	17.63	19.90	2.27	PASS	Vertical	AV
2	1532.4525	-25.26	43.57	18.31	19.90	1.59	PASS	Vertical	AV
3	3082.2222	-19.64	43.02	23.38	43.90	20.52	PASS	Vertical	AV
4	5005.1905	-13.53	42.11	28.58	53.90	25.32	PASS	Vertical	AV
5	6562.3462	-9.23	55.38	46.15	53.90	7.75	PASS	Vertical	AV
6	14123.4923	7.37	30.80	38.17	43.93	5.76	PASS	Vertical	AV
7	17376.1176	9.85	30.98	40.83	43.96	3.13	PASS	Vertical	AV

Test_Mode	UWB	Test_Frequency	6489.6MHz
Tset_Engineer	wangzhurun	Test_Date	2024/02/07
Remark	\		

### Test Graph

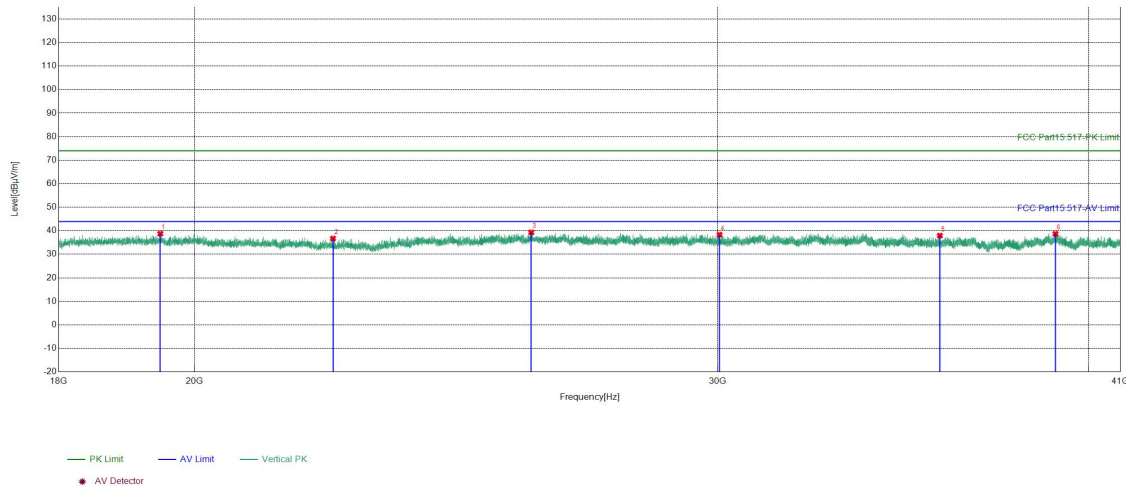


### Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	18699.228	-25.26	63.59	38.33	74.00	35.67	PASS	Horizontal	PK
2	20404.0562	-24.06	62.22	38.16	74.00	35.84	PASS	Horizontal	PK
3	24427.3771	-19.82	59.93	40.11	74.00	33.89	PASS	Horizontal	PK
4	26864.5546	-19.99	58.93	38.94	74.00	35.06	PASS	Horizontal	PK
5	32381.0952	-15.55	55.45	39.90	74.00	34.10	PASS	Horizontal	PK
6	39015.4806	-10.75	49.64	38.89	74.00	35.11	PASS	Horizontal	PK

Test_Mode	UWB	Test_Frequency	6489.6MHz
Tset_Engineer	wangzhurun	Test_Date	2024/02/07
Remark	\		

### Test Graph

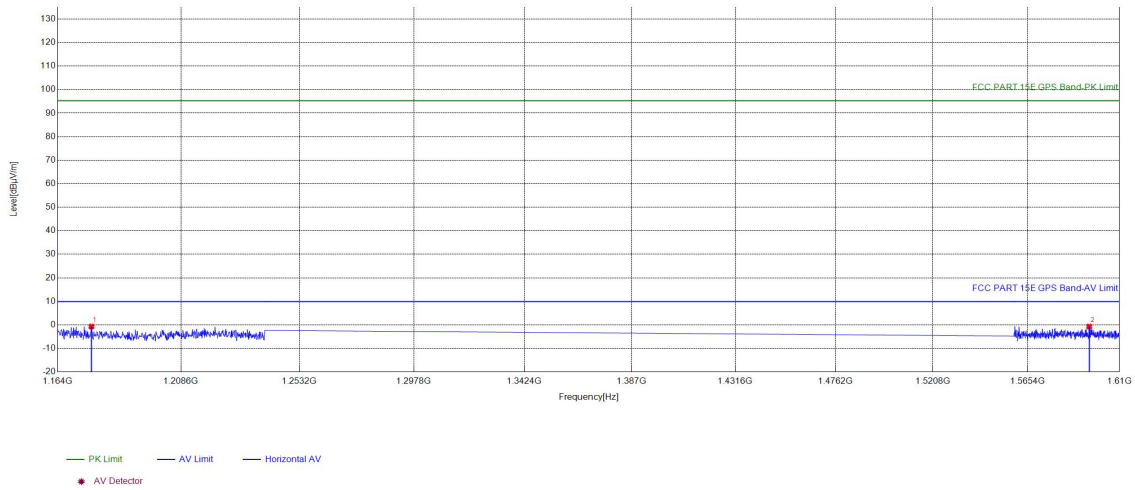


### Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	19473.899	-23.94	62.70	38.76	74.00	35.24	PASS	Vertical	PK
2	22263.4505	-24.61	61.28	36.67	74.00	37.33	PASS	Vertical	PK
3	25963.8386	-19.07	58.37	39.30	74.00	34.70	PASS	Vertical	PK
4	30045.1218	-19.65	57.98	38.33	74.00	35.67	PASS	Vertical	PK
5	35642.6257	-14.76	52.69	37.93	74.00	36.07	PASS	Vertical	PK
6	38986.0394	-10.78	49.48	38.70	74.00	35.30	PASS	Vertical	PK

Test_Mode	UWB	Test_Frequency	6489.6MHz
Tset_Engineer	wangzhurun	Test_Date	2024/02/07
Remark	Radiated Emissions in the GPS Bands		

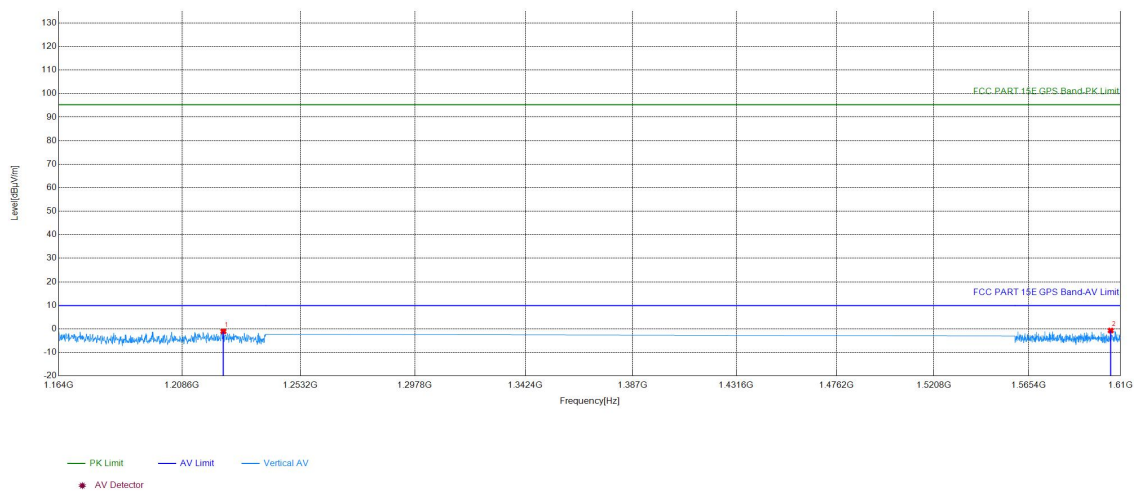
### Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1176.0333	-25.69	24.98	-0.71	9.90	10.61	PASS	Horizontal	AV
2	1595.21	-25.32	24.62	-0.70	9.90	10.60	PASS	Horizontal	AV

Test_Mode	UWB	Test_Frequency	6489.6MHz
Tset_Engineer	wangzhurun	Test_Date	2024/02/07
Remark	Radiated Emissions in the GPS Bands		

### Test Graph



### Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1224.04	-25.65	24.58	-1.07	9.90	10.97	PASS	Vertical	AV
2	1605.24	-25.30	24.58	-0.72	9.90	10.62	PASS	Vertical	AV

### Remark:

1) Scan from 9kHz to 40GHz, disturbance above 18GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.