

TEST REPORT

Product : UWB Kbeacon
Trade mark : Kbeacon
Model/Type reference : K7W, C3, C3W
Serial Number : N/A
Report Number : EED32Q80655102
FCC ID : 2AXZL-K7W
Date of Issue : Jul. 30, 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**

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Date:

Jul. 30, 2024



Check No.: 6317170524

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2 Version

Version No.	Date	Description
00	Jul. 30, 2024	Original

3 Test Summary

Test Item	Test Requirement	Result
Antenna Requirement	47 CFR Part 15 Subpart F Section 15.519(a2) & Section 15.521(b) & Section 15.203	PASS
AC power-line conducted emissions	47 CFR Part 15 Subpart F Section 15.207 & Section 15.505 & Section 15.521(j)	N/A
Cessation Time	47 CFR Part 15 Subpart F Section 15.519(a)(1)	PASS
UWB Bandwidth (-10dB Bandwidth)	47 CFR Part 15 Subpart F Section 15.503 & Section 15.521(e)	PASS
EIRP (Equivalent Isotropic Radiated Power)	47 CFR Part 15 Subpart F Section 15.519 (c)&(e) & Section 15.521(g)	PASS
Spurious Emissions Below 1GHz	47 CFR Part 15 Subpart F Section 15.519(c) & Section 15.209 & Section 15.521(c)&(d)&(h)	PASS
Spurious Emissions Above 1GHz	47 CFR Part 15 Subpart F Section 15.519 (c)&(d) & Section 15.521(d)&(h)	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.: K7W, C3, C3W

Only the model K7W 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.:	K7W, C3, C3W
Test Model No.:	K7W
Trade Mark:	Kbeacon
Product Type:	Hand Held UWB systems
Operation Frequency:	UWB Channels 5: 6489.6MHz UWB Channels 9 :7987.2MHz
Modulation Type:	OFDM
Antenna Type:	PCB Antenna
Antenna Gain:	UWB Channels 5: 1.96dBi, UWB Channels 9 : 0.52dBi;
Power Supply:	Battery DC 3.0V,850mAh
Test Voltage:	DC 3.0V
Sample Received Date:	May 17, 2024
Sample tested Date:	May 25, 2024 to Jul. 06, 2024

4.3 Test Configuration

EUT Test Software Settings:	
Software:	RF Test
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

N/A

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	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-40GHz)
2	Radiated Spurious emission test	3.3dB (9kHz-30MHz)
		4.3dB (30MHz-1GHz)
		4.5dB (1GHz-18GHz)
		3.4dB (18GHz-40GHz)
3	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
4	Temperature test	0.64°C
5	Humidity test	3.8%
6	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	ESCI7	100938-003	09/22/2023	09/21/2024
Spectrum Analyzer	R&S	FSV40	101200	07/25/2023	07/24/2024
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	9163-618	05/22/2022	05/21/2025
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04/16/2024	04/15/2025
Microwave Preamplifier	Tonscend	EMC051845SE	980380	12/14/2023	12/13/2024
Horn Antenna	A.H.SYSTEMS	SAS-574	374	07/02/2023	07/01/2026
Horn Antenna	ETS-LINGREN	BBHA 9120D	9120D-1869	04/16/2024	04/15/2025
Preamplifier	Agilent	11909A	12-1	03/22/2024	03/21/2025
Preamplifier	CD	PAP-1840-60	6041.6042	07/03/2023 06/19/2024	07/02/2024 06/18/2025
Test software	Fara	EZ-EMC	EMEC-3A1-Pre	---	---
Cable line	Fulai(7M)	SF106	5219/6A	---	---
Cable line	Fulai(6M)	SF106	5220/6A	---	---
Cable line	Fulai(3M)	SF106	5216/6A	---	---
Cable line	Fulai(3M)	SF106	5217/6A	---	---

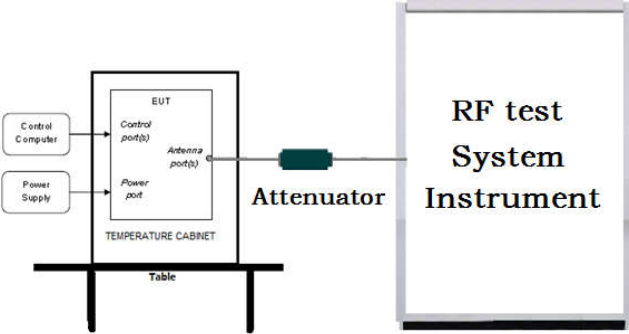
3M full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
RSE Automatic test software	JS Tonscend	JS36-RSE	10166	---	---
Receiver	Keysight	N9038A	MY57290136	01-09-2024	01-08-2025
Spectrum Analyzer	Keysight	N9020B	MY57111112	01-19-2024	01-18-2025
Spectrum Analyzer	Keysight	N9030B	MY57140871	01-13-2024	01-12-2025
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-28-2024	04-27-2025
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-16-2024	04-15-2025
Horn Antenna	ETS-LINDGREN	3117	57407	07-04-2021 07-03-2024	07-03-2024 07-02-2025
Preamplifier	EMCI	EMC184055SE	980597	04-12-2024	04-11-2025
Preamplifier	EMCI	EMC001330	980563	03-08-2024	03-07-2025
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	04-07-2024	04-06-2025
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

Standard requirement:	47 CFR Part 15 Subpart F Section 15.519(a2) & Section 15.521(b) & Section 15.203
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 with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of 15.211, 15.213, 15.217, 15.219, 15.221, or 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded. 15.519 requirement: The use of antennas mounted on outdoor structures, e.g., antennas mounted on the outside of a building or on a telephone pole, or any fixed outdoors infrastructure is prohibited. Antennas may be mounted only on the hand held UWB device.	
EUT Antenna:	Please see Internal photos
The antenna is PCB Antenna. The best case gain of the antenna is UWB Channels 5: 1.96dBi, UWB Channels 9 : 0.52dBi;	

5.2 Cessation Time

Test Requirement:	47 CFR Part 15 Subpart F Section 15.519(a)(1)
Test Method:	/
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Test Procedure:	EUT and receiving pairing device keep UWB normal connection. a. Set RBW of spectrum analyzer to 1 MHz and VBW to 3 MHz. b. Use a video trigger with the trigger level set to enable triggering only on full pulses. c. Set the center frequency on any frequency would be measure and set the frequency span to zero span. d. Measure the maximum time duration of one single pulse.
Limit:	≤10 seconds
Test Mode:	Normal
Test Results:	Pass

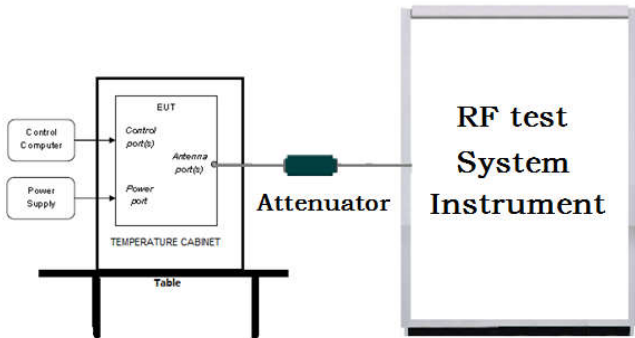
Test Result

Test Channel	Center Frequency (MHz)	Transmit Time (ms)	Limit (s)	Results
5	6489.6	390.00	≤ 10	pass
9	7987.2	220.00	≤ 10	pass

Test Graph



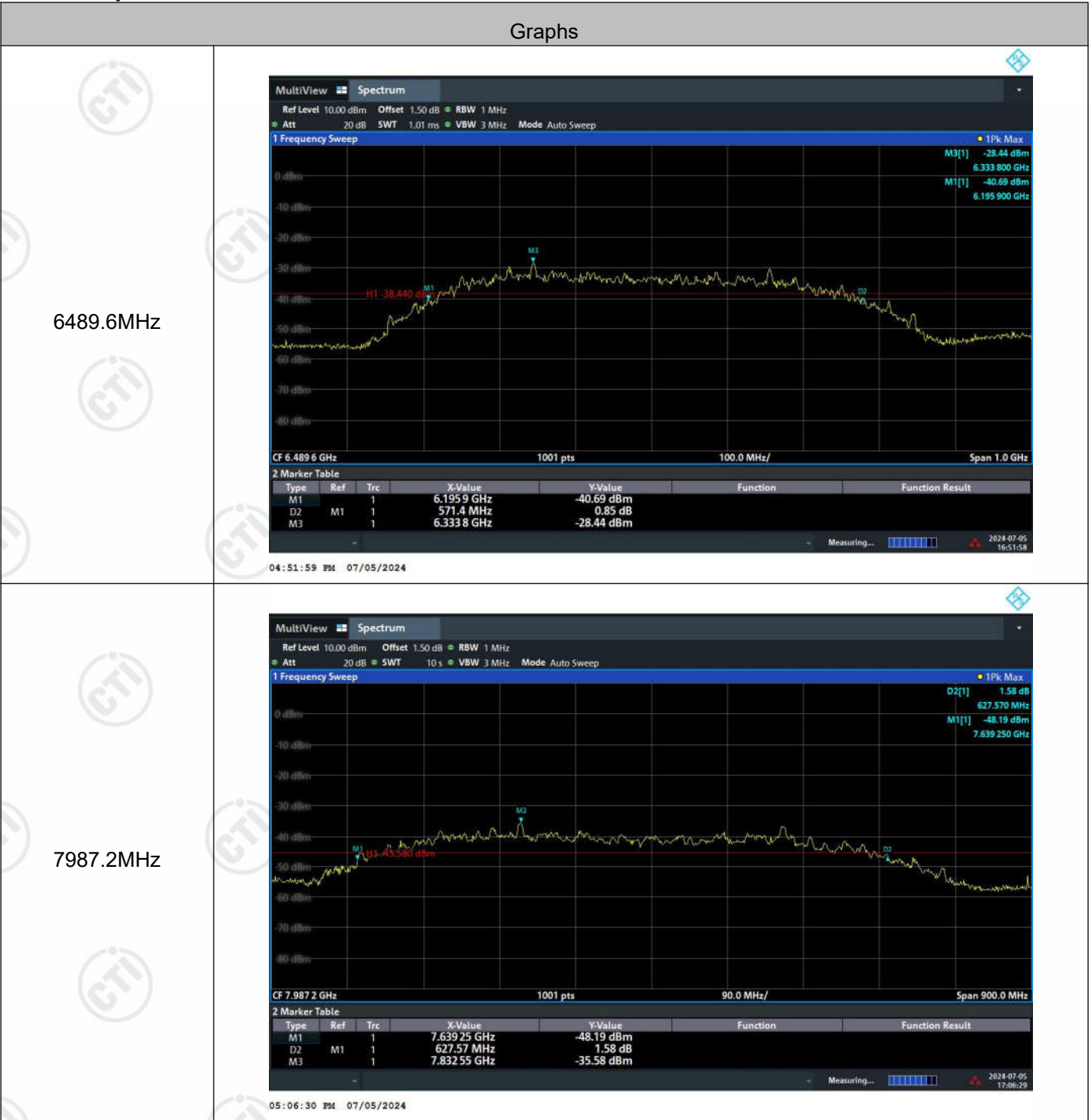
5.3 UWB Bandwidth (-10dB Bandwidth)

Test Requirement:	47 CFR Part 15 Subpart F Section 15.503 & Section 15.521(e)
Test Method:	ANSI C63.10:2013 Section 10.1
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Test Procedure:	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: b) 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 f_H 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(f_c) 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.
Limit:	≥ 500 MHz
Test Mode:	Continuous Tx Mode, Keep the EUT Transmitting with Modulation
Test Results:	Pass

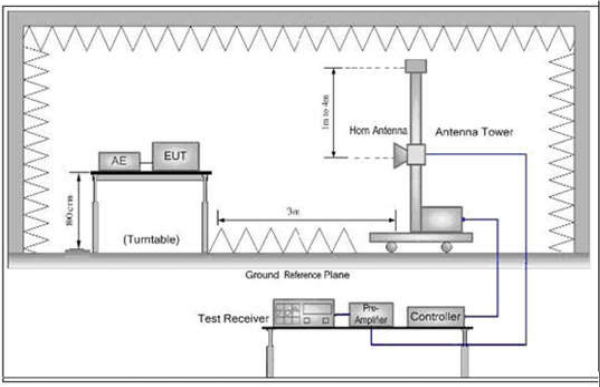
Test Result

Test Frequency (MHz)	FM(MHz)	FL (MHz)	FH (MHz)	10dB bandwidth(MHz)	Limit (MHz)	Results
6489.6	6333.800	6195.900	6767.300	571.400	≥ 500	pass
7987.2	7832.550	7639.250	8266.82	627.570	≥ 500	pass

Test Graph

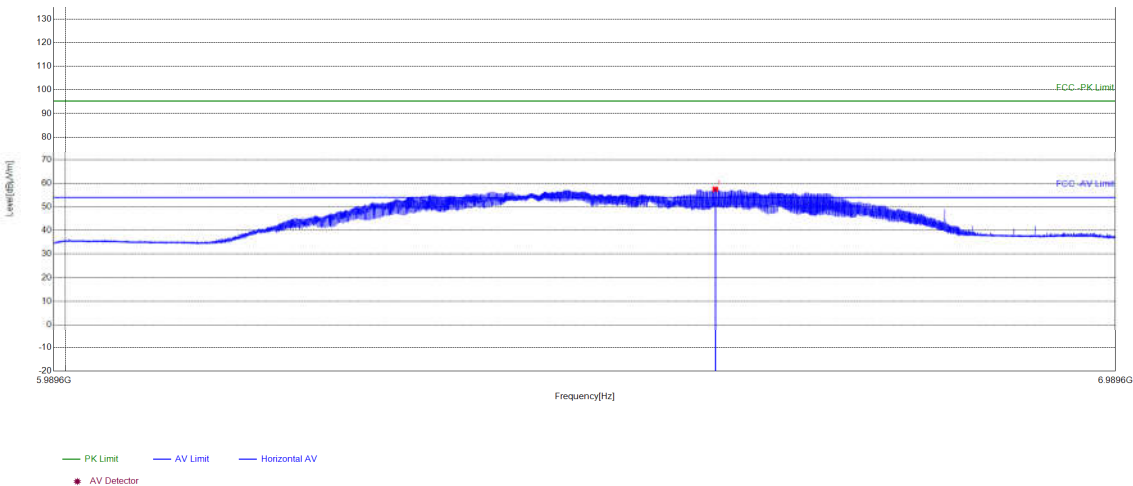


5.4 EIRP (Equivalent Isotropic Radiated Power)

Test Requirement:	47 CFR Part 15 Subpart F Section 15.519 (c)&(e) & Section 15.521(g)
Test Method:	ANSI C63.10: 2013 Section 10.3
Test Setup:	 Remark: 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: $E \text{ (dBuV/m)} = \text{EIRP(dBm)} + 95.3$ For peak power test, the spectrum analyzer was set to RBW=8MHz, VBW=10MHz, and add a conversion factor of $20 \cdot \log(50\text{MHz}/8\text{MHz}) = 15.92\text{dB}$.
Test Procedure:	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. 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. 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. 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. 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. 6) Test the EUT in the lowest channel, the Highest channel 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. 8) Repeat above procedures until all frequencies measured was complete. Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamplifier Factor

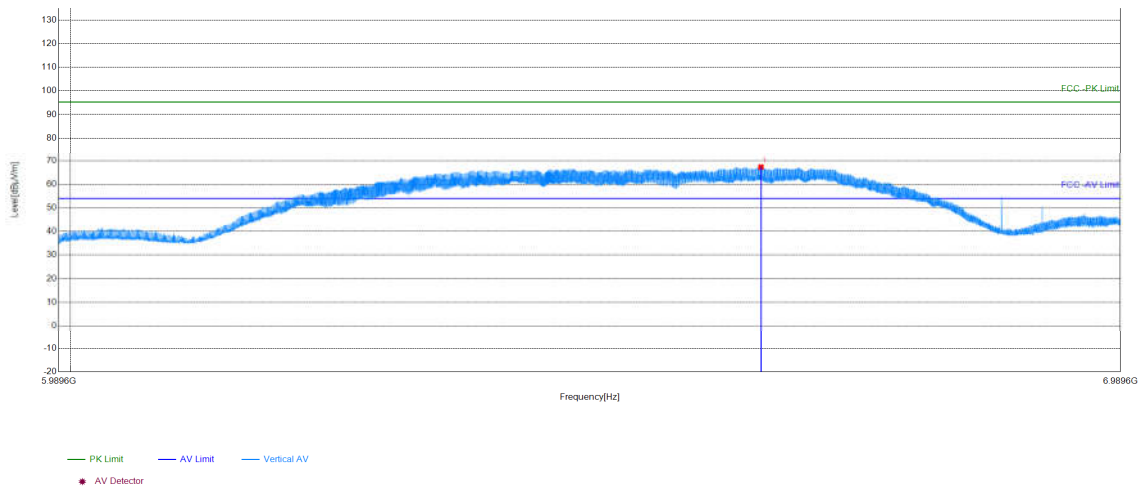
Limit:	Measurement Distance: 3m			
	Limit:			
	Frequency	Limit	Detector	Measurement distance (m)
	960MHz-1610MHz	-75.3 dBm (EIRP, RBW=1MHz)	AV	3
	1610MHz-1990MHz	-63.3 dBm (EIRP, RBW=1MHz)	AV	3
	1990MHz-3100MHz	-61.3 dBm (EIRP, RBW=1MHz)	AV	3
	3100MHz-10600MHz	-41.3 dBm (EIRP, RBW=1MHz)	AV	3
	Above 10600MHz	-61.3 dBm (EIRP, RBW=1MHz)	AV	3
	Fundamental	0 dBm (EIRP, RBW=50MHz)	Peak	3
	Thus, the field strength limit for the test above 1GHz is below:			
	Frequency	Limit	Detector	Measurement Distance
		Field Strength (dBuV/m)		
	960MHz-1610MHz	20.00	AV	3
	1610MHz-1990MHz	32.00	AV	3
	1990MHz-3100MHz	34.00	AV	3
	3100MHz-10600MHz	54.00	AV	3
	Above 10600MHz	34.00	AV	3
	Fundamental	95.30	Peak	3
Test Mode:	Continuous Tx Mode, Keep the EUT Transmitting with Modulation			
Test Results:	Pass			

Test Result
(1)Channel 5:



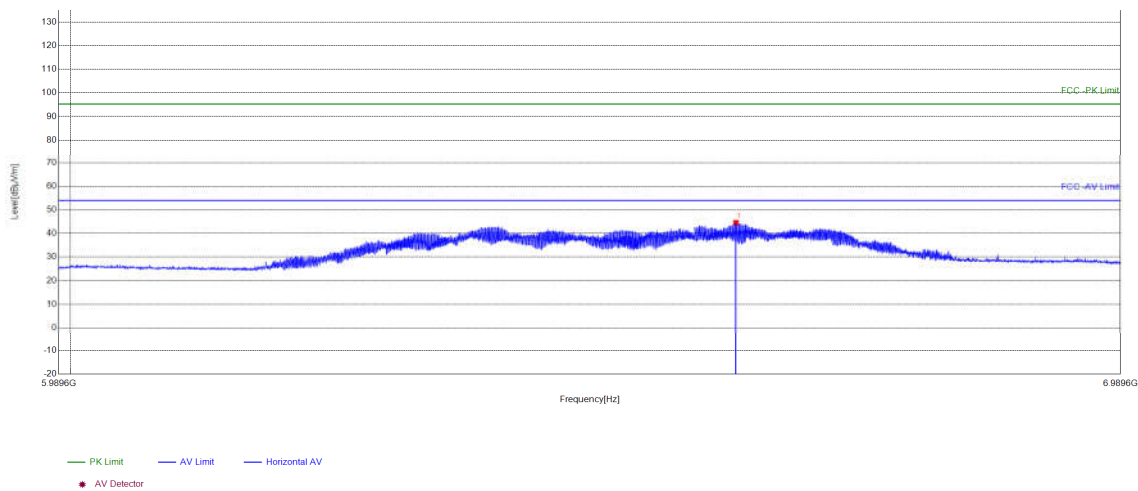
Peak Field Strength for fundamental @ RBW=8MHz					
Freq.[MHz]	Factor[dB]	Reading[dBμV]	Level [dBμV/m]	Polarity	Remark
6594.4403	-8.98	66.38	57.40	Horizontal	PK

Calculated Peak Field Strength of fundamental @ RBW=50MHz						
Freq. [MHz]	Measured Field Strength of fundamental (FSM) (dBuV/m)	Calculated Field Strength of fundamental (FSc) (dBuV/m)	Limit (dBuV/m)	Margin [dB]	Result	Polarity
6594.44	57.40	73.32	95.30	21.98	pass	Horizontal
Note: FSc = FSM + 20log(50MHz/8MHz) = FSM + 15.92						

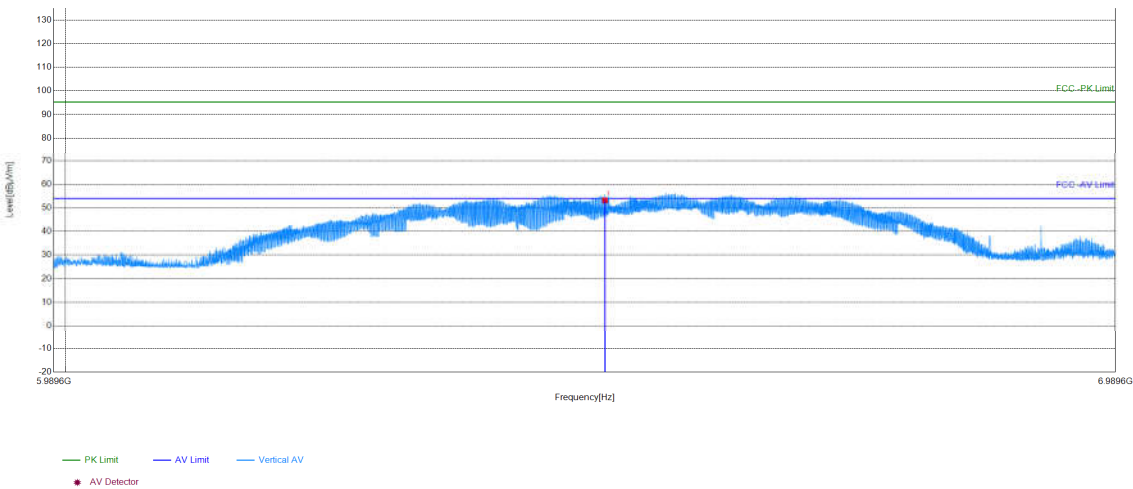


Peak Field Strength for fundamental @ RBW=8MHz					
Freq.[MHz]	Factor[dB]	Reading[dBμV]	Level [dBμV/m]	Polarity	Remark
6633.5763	-8.60	75.89	67.29	Vertical	PK

Calculated Peak Field Strength of fundamental @ RBW=50MHz						
Freq. [MHz]	Measured Field Strength of fundamental (FSM) (dBuV/m)	Calculated Field Strength of fundamental (FSc) (dBuV/m)	Limit (dBuV/m)	Margin [dB]	Result	Polarity
6633.57	67.29	83.21	95.30	12.09	Pass	Vertical
Note: FSc = FSM + 20log(50MHz/8MHz) = FSM + 15.92						

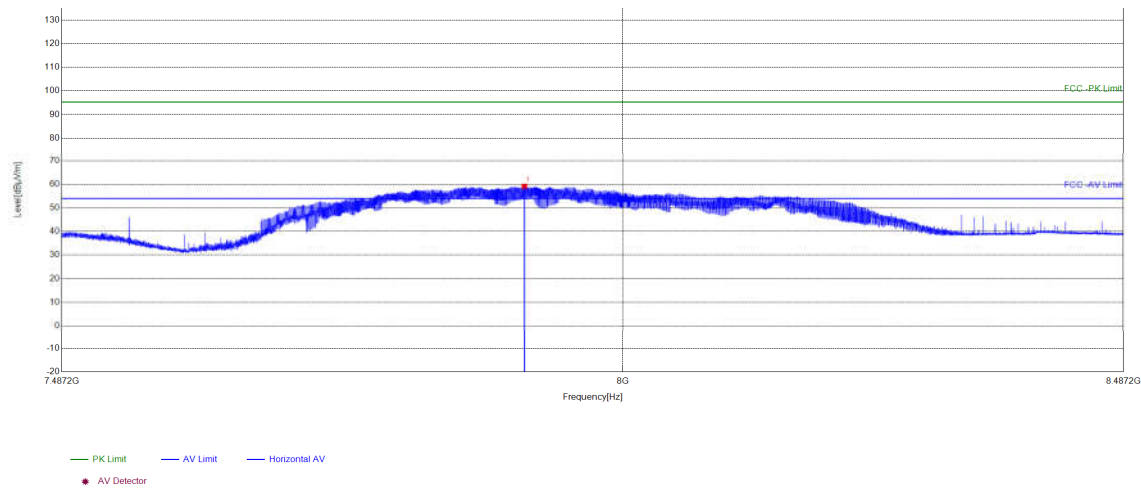


Average Field Strength for fundamental @ RBW=1 MHz									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	6609.52	-8.83	53.38	44.55	54.00	9.45	PASS	Horizontal	AV



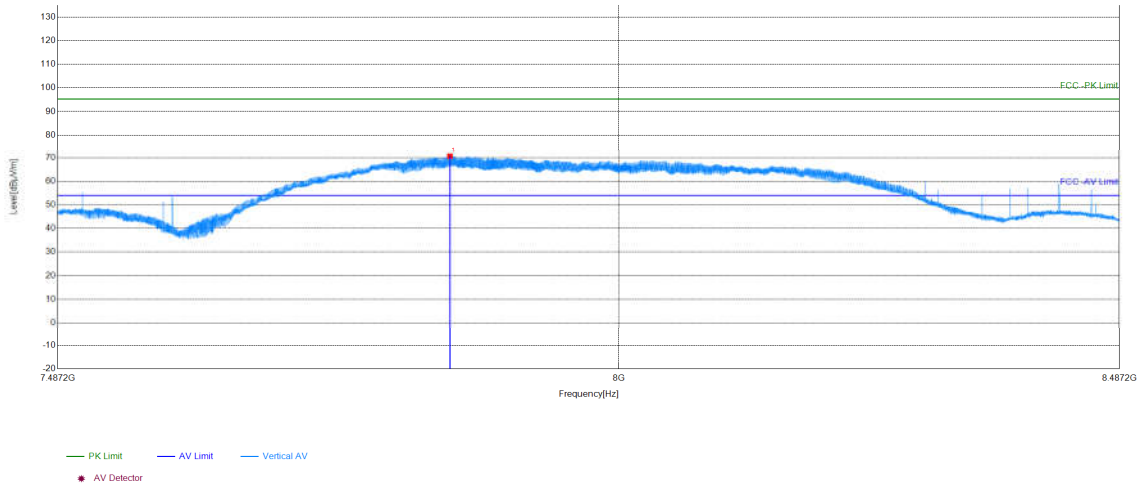
Average Field Strength for fundamental @ RBW=1 MHz									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	6489.5	-9.82	63.00	53.18	54.00	0.82	PASS	Vertical	AV

Test Result
(2)Channel 9:



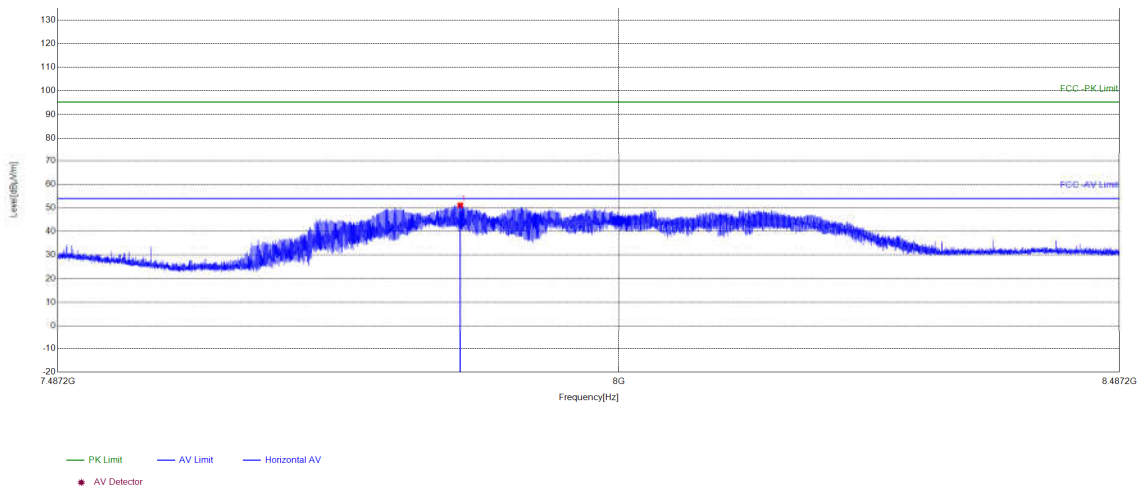
Peak Field Strength for fundamental @ RBW=8MHz					
Freq.[MHz]	Factor[dB]	Reading[dBμV]	Level [dBμV/m]	Polarity	Remark
7907.5614	-4.30	63.36	59.06	Horizontal	PK

Calculated Peak Field Strength of fundamental @ RBW=50MHz						
Freq. [MHz]	Measured Field Strength of fundamental (FSM) (dBuV/m)	Calculated Field Strength of fundamental (FSc) (dBuV/m)	Limit (dBuV/m)	Margin [dB]	Result	Polarity
7907.56	59.06	74.98	95.30	20.32	pass	Horizontal
Note: FSc = FSM + 20log(50MHz/8MHz) = FSM + 15.92						

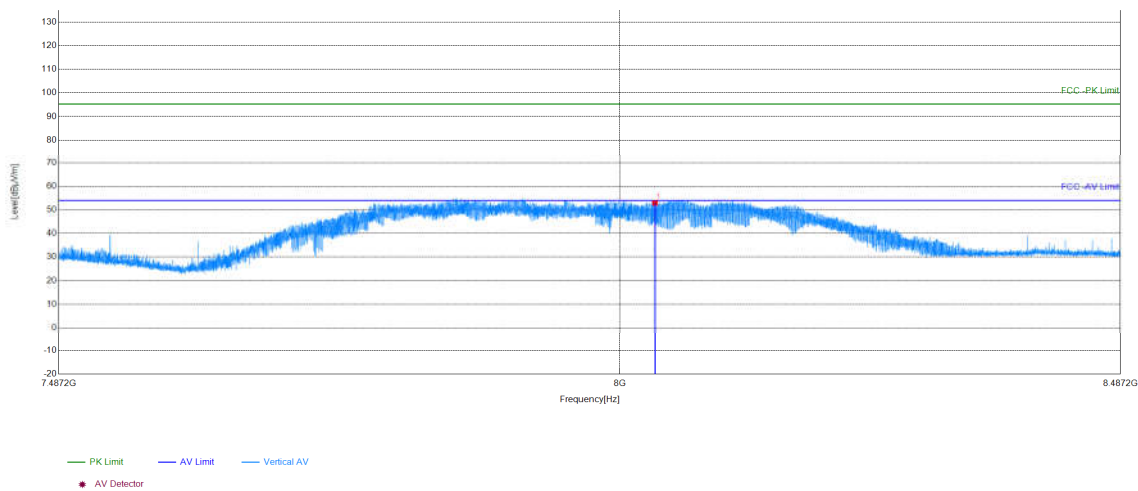


Peak Field Strength for fundamental @ RBW=8MHz					
Freq.[MHz]	Factor[dB]	Reading[dBμV]	Level [dBμV/m]	Polarity	Remark
7842.0903	-4.21	74.83	70.62	Vertical	PK

Calculated Peak Field Strength of fundamental @ RBW=50MHz						
Freq. [MHz]	Measured Field Strength of fundamental (FSM) (dBuV/m)	Calculated Field Strength of fundamental (FSc) (dBuV/m)	Limit (dBuV/m)	Margin [dB]	Result	Polarity
7842.09	70.62	86.54	95.30	8.76	Pass	Vertical
Note: FSc = FSM + 20log(50MHz/8MHz) = FSM + 15.92						

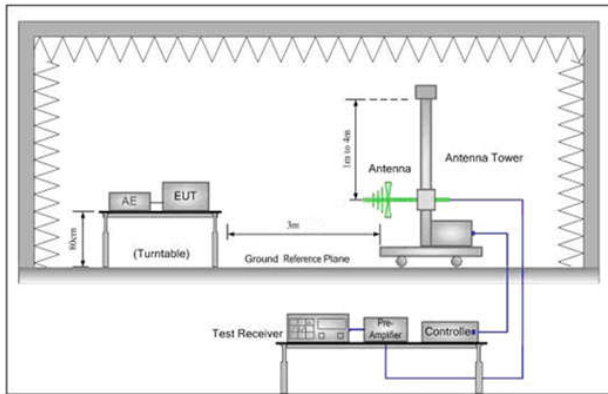


Average Field Strength for fundamental @ RBW=1 MHz									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	7851.62	-4.21	55.34	51.13	54.00	2.87	PASS	Horizontal	AV



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	8033.36	-4.06	56.96	52.90	54.00	1.10	PASS	Vertical	AV

5.5 Spurious Emissions Below 1GHz

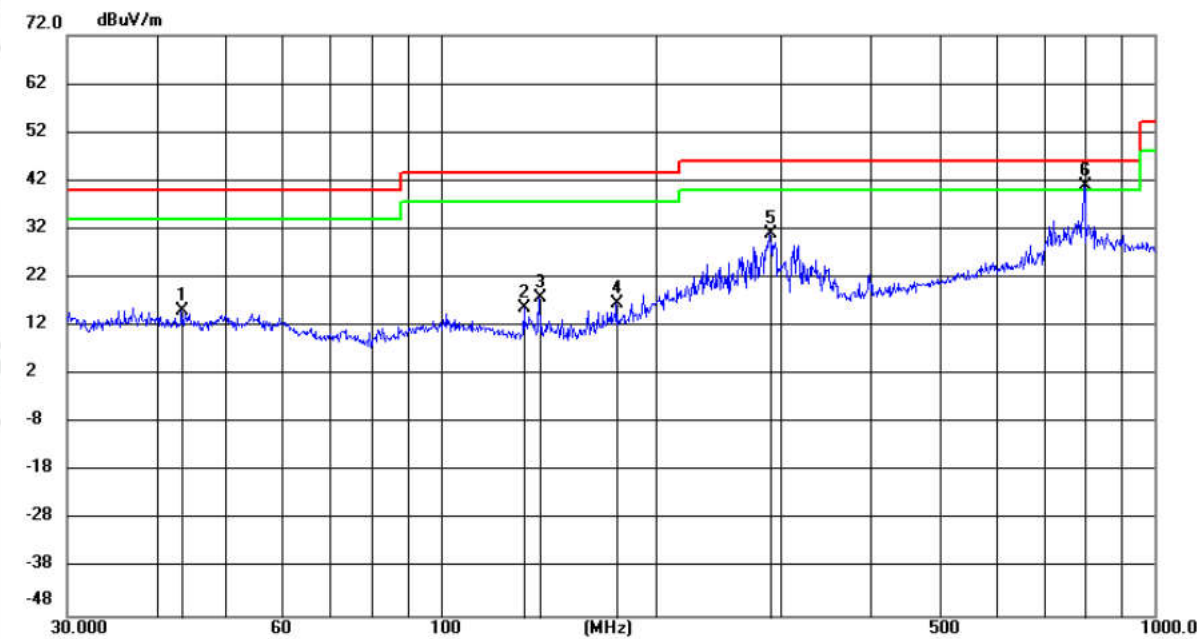
Test Requirement:	47 CFR Part 15 Subpart F Section 15.519(c) & Section 15.209 & Section 15.521(c)&(d)&(h)																																								
Test Method:	ANSI C63.10: 2013 Section 10.2																																								
Test Setup:																																									
Test Procedure:	1) 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. 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. 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. 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. 5) The test-receiver system was set to Peak detector with Maximum Hold Mode. And use Quasi-Peak to measure the six highest frequencies. 6) Test the EUT in the lowest channel, the Highest channel and only recorded worst channel--Lowest channel in the test report. 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. 8) Repeat above procedures until all frequencies measured was complete Remark 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.																																								
Limit:	<table><tr><th>Frequency</th><th>Field strength (microvolt/meter)</th><th>Limit (dBuV/m)</th><th>Remark</th><th>Measurement distance (m)</th></tr><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></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

Test Result

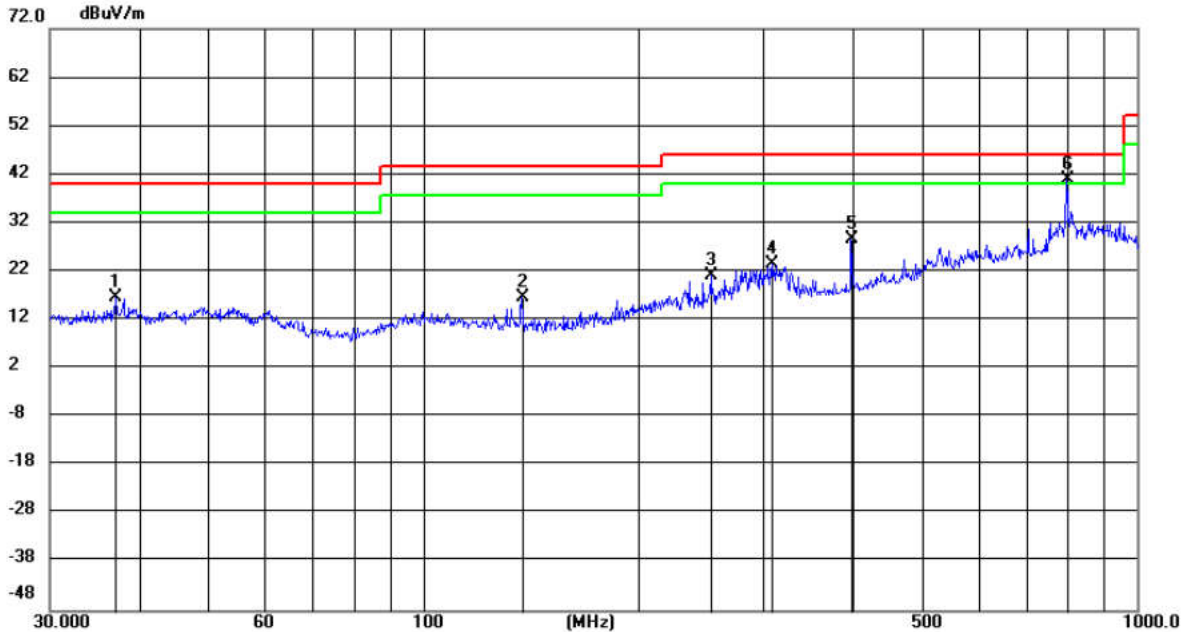
Remark:Only the worst case data of channel 5 was recorded in the report.

Polarity: Horizontal



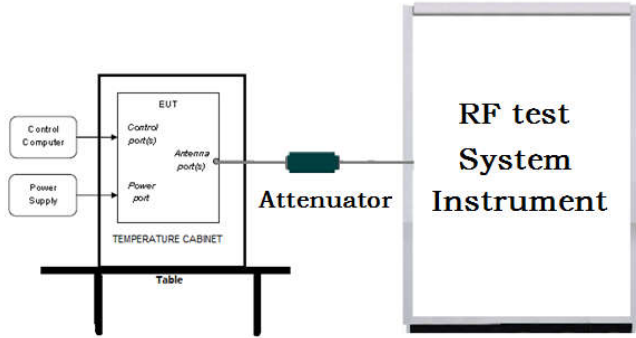
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		43.4371	1.17	14.05	15.22	40.00	-24.78	QP	100	53	
2		131.2504	5.69	10.02	15.71	43.50	-27.79	QP	100	218	
3		137.4924	8.21	9.71	17.92	43.50	-25.58	QP	100	63	
4		176.7947	4.84	11.81	16.65	43.50	-26.85	QP	100	208	
5		289.3569	14.71	16.25	30.96	46.00	-15.04	QP	100	311	
6	*	798.2796	15.18	25.79	40.97	46.00	-5.03	QP	100	208	

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	Comment
1		37.1418	3.16	13.61	16.77	40.00	-23.23	QP	200	321	
2		137.4924	7.07	9.71	16.78	43.50	-26.72	QP	200	238	
3		253.0812	6.33	14.81	21.14	46.00	-24.86	QP	200	238	
4		308.6419	6.73	16.85	23.58	46.00	-22.42	QP	200	197	
5		398.6806	10.06	18.64	28.70	46.00	-17.30	QP	200	146	
6	*	797.1607	15.17	25.78	40.95	46.00	-5.05	QP	100	7	

5.6 Spurious Emissions Above 1GHz

Test Requirement:	47 CFR Part 15 Subpart F Section 15.519 (c)&(d) & Section 15.521(d)&(h)																																								
Test Method:	ANSI C63.10: 2013 Section 10.3																																								
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.																																								
Test Procedure:	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. 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. 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. 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. 5) The test-receiver system was set to Peak detector with Maximum Hold Mode. 6) Test the EUT in the lowest channel, the Highest channel 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. 8) Repeat above procedures until all frequencies measured was complete Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor2; As the EUT operate at 6489.6MHz and 7987.2MHz, 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.																																								
Limit:	<table><tr><th>Frequency</th><th>Limit (dBuV/m)</th><th>RBW</th><th>Detector</th><th>Measurement distance (m)</th></tr><tr><td>1000MHz-1610MHz</td><td>20.0</td><td>1MHz</td><td>AV</td><td>3</td></tr><tr><td>1610MHz-1990MHz</td><td>32.0</td><td>1MHz</td><td>AV</td><td>3</td></tr><tr><td>1990MHz-3100MHz</td><td>34.0</td><td>1MHz</td><td>AV</td><td>3</td></tr><tr><td>3100MHz-10600MHz</td><td>54.0</td><td>1MHz</td><td>AV</td><td>3</td></tr><tr><td>Above 10600MHz</td><td>34.0</td><td>1MHz</td><td>AV</td><td>3</td></tr><tr><td>1164MHz-1240MHz</td><td>10.0</td><td>1KHz</td><td>AV</td><td>3</td></tr><tr><td>1559MHz-1610MHz</td><td>10.0</td><td>1KHz</td><td>AV</td><td>3</td></tr></table>	Frequency	Limit (dBuV/m)	RBW	Detector	Measurement distance (m)	1000MHz-1610MHz	20.0	1MHz	AV	3	1610MHz-1990MHz	32.0	1MHz	AV	3	1990MHz-3100MHz	34.0	1MHz	AV	3	3100MHz-10600MHz	54.0	1MHz	AV	3	Above 10600MHz	34.0	1MHz	AV	3	1164MHz-1240MHz	10.0	1KHz	AV	3	1559MHz-1610MHz	10.0	1KHz	AV	3
Frequency	Limit (dBuV/m)	RBW	Detector	Measurement distance (m)																																					
1000MHz-1610MHz	20.0	1MHz	AV	3																																					
1610MHz-1990MHz	32.0	1MHz	AV	3																																					
1990MHz-3100MHz	34.0	1MHz	AV	3																																					
3100MHz-10600MHz	54.0	1MHz	AV	3																																					
Above 10600MHz	34.0	1MHz	AV	3																																					
1164MHz-1240MHz	10.0	1KHz	AV	3																																					
1559MHz-1610MHz	10.0	1KHz	AV	3																																					
Test Mode:	Continuous Tx Mode, Keep the EUT Transmitting with Modulation																																								
Test Results:	Pass																																								

Test Result

Transmitting with modulation Mode at 6489.6MHz									
1164MHz ≤ f ≤ 1240MHz & 1559MHz ≤ f ≤ 1610MHz									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1176.02	-25.69	28.26	2.57	10.00	7.43	PASS	Horizontal	AV
2	1592.94	-25.31	28.51	3.20	10.00	6.80	PASS	Horizontal	AV
3	1164.00	-25.69	28.03	2.34	10.00	7.66	PASS	Vertical	AV
4	1570.79	-25.30	27.73	2.43	10.00	7.57	PASS	Vertical	AV
frequency out of 1164MHz ≤ f ≤ 1240MHz & 1559MHz ≤ f ≤ 1610MHz band									
1	1215.54	-25.67	44.37	18.70	20.00	1.30	PASS	Horizontal	AV
2	1806.27	-24.73	50.22	25.49	32.00	6.51	PASS	Horizontal	AV
3	2174.44	-22.72	43.78	21.06	34.00	12.94	PASS	Horizontal	AV
4	4215.36	-15.75	40.02	24.27	54.00	29.73	PASS	Horizontal	AV
5	8991.08	-2.75	35.34	32.59	54.00	21.41	PASS	Horizontal	AV
6	11268.2	-1.32	34.87	33.55	34.00	0.45	PASS	Horizontal	AV
7	1187.45	-25.70	42.58	16.88	20.00	3.12	PASS	Vertical	AV
8	1816.92	-24.67	45.35	20.68	32.00	11.32	PASS	Vertical	AV
9	2173.33	-22.72	43.82	21.10	34.00	12.90	PASS	Vertical	AV
10	4609.90	-14.55	40.13	25.58	54.00	28.42	PASS	Vertical	AV
11	9634.65	-2.12	34.97	32.85	54.00	21.15	PASS	Vertical	AV
12	11269.7	-1.32	31.94	30.62	34.00	3.38	PASS	Vertical	AV

Transmitting with modulation Mode at 7987.2MHz									
1164MHz ≤ f ≤ 1240MHz & 1559MHz ≤ f ≤ 1610MHz									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1214.21	-25.67	27.83	2.16	10.00	7.84	PASS	Horizontal	AV
2	1579.21	-25.30	28.23	2.93	10.00	7.07	PASS	Horizontal	AV
3	1187.58	-25.70	28.73	3.03	10.00	6.97	PASS	Vertical	AV
4	1601.67	-25.31	27.86	2.55	10.00	7.45	PASS	Vertical	AV
frequency out of 1164MHz ≤ f ≤ 1240MHz & 1559MHz ≤ f ≤ 1610MHz band									
1	1216.15	-25.66	42.29	20.63	20.00	3.37	PASS	Horizontal	AV
2	1807.03	-24.73	50.56	25.83	32.00	6.17	PASS	Horizontal	AV
3	2830	-20.15	42.61	22.46	34.00	11.54	PASS	Horizontal	AV
4	4117.10	-16.04	40.34	24.30	54.00	29.70	PASS	Horizontal	AV
5	9667.65	-2.69	35.00	32.31	54.00	21.69	PASS	Horizontal	AV
6	11967.6	-0.73	31.72	31.99	34.00	3.01	PASS	Horizontal	AV
7	1187.45	-25.70	42.50	16.80	20.00	3.20	PASS	Vertical	AV
8	1808.17	-24.72	45.53	20.81	32.00	11.19	PASS	Vertical	AV
9	2815.55	-20.18	42.77	22.59	34.00	11.41	PASS	Vertical	AV
10	4803.42	-13.55	39.37	25.82	54.00	28.18	PASS	Vertical	AV
11	10041.9	-0.93	33.42	32.49	54.00	21.51	PASS	Vertical	AV
12	11734.5	-0.79	31.26	30.47	34.00	3.53	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.

7 PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No.EED32Q80655101 for EUT external and internal photos.

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.

*** End of Report ***