

MRT Technology (Suzhou) Co., Ltd

Phone: +86-512-66308358 +86-512-66308368 www.mrt-cert.com

Report No.: 1504RSU01801 Report Version: Issue Date: 05-25-2015

# **MEASUREMENT REPORT**

FCC PART 15.249

FCC ID: 2ABES-ULTRA8

APPLICANT: Pathway Innovations and Technologies, Inc.

Certification **Application Type:** 

**Product:** Remote Control

Model No.: Ultra8, Ultra13, Ultra18, Ultra25, U800, U1300, U1800,

U2500

FCC Classification: Low Power Communication Device Transmitter (DXX)

FCC Rule Part(s): Part 15.249

Test Procedure(s): ANSI C63.10-2009

Test Date: Apr. 25 ~ May 21, 2015

Reviewed By : Robin Wu )

Approved By

(Marlin Chen)

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 ANSI C63.10-2009. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

FCC ID: 2ABES-ULTRA8 Page Number: 1 of 29





# **Revision History**

Report No.	Version	Description	Issue Date
1504RSU01801	Rev. 01	Initial report	05-21-2015
1504RSU01801	Rev. 02	Revised the description of test Software	05-25-2015

FCC ID: 2ABES-ULTRA8 Page Number: 2 of 29



# **CONTENTS**

De	scriptio	n	Page
1.	INTR	ODUCTION	5
	1.1.	Scope	5
	1.2.	MRT Test Location	5
2.	PROI	DUCT INFORMATION	6
	2.1.	Equipment Description	6
	2.2.	Mode of Operation	6
	2.3.	Test Configuration	6
	2.4.	EMI Suppression Device(s)/Modifications	6
	2.5.	Labeling Requirements	6
	2.6.	Test Software	7
3.	DESC	CRIPTION OF TEST	8
	3.1.	Evaluation Procedure	8
	3.2.	AC Line Conducted Emissions	8
	3.3.	Radiated Emissions	9
4.	ANTE	NNA REQUIREMENTS	10
5.	TEST	EQUIPMENT CALIBRATION DATE	11
6.	MEAS	SUREMENT UNCERTAINTY	12
7.	TEST	RESULT	13
	7.1.	Summary	13
	7.2.	Conducted Emission	
	7.2.1.	Test Limit	14
	7.2.2.	Test Setup	14
	7.2.3.	Test Result	14
	7.3.	Radiated Emission	15
	7.3.1.	Test Limit	15
	7.3.2.	Test Setup	16
	7.3.3.	Test Result	18
	7.4.	Radiated Outside of The Specified Frequency Bands Measurement	21
	7.4.1.	Test Result	21
R	CONG	CLUSION	29

Report No.: 1504RSU01801



# §2.1033 General Information

Applicant:	Pathway Innovations and Technologies, Inc.		
Applicant Address:	10211 Pacific Mesa Blvd, #412, San Diego, CA 92121, USA		
Manufacturer:	Shenzhen Kerun Visual Technology Co., Ltd		
Manufacturer Address:	6/F, Building 2, Zone S2, 1213 Liuxian Blvd, Honghualing Industrial Park,		
	Nanshan District, Shenzhen, Guangdong, China		
Test Site:	MRT Technology (Suzhou) Co., Ltd		
Test Site Address:	D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong		
	Economic Development Zone, Suzhou, China		
MRT Registration No.:	809388		
FCC Rule Part(s):	Part 15.249		
Model No.:	Ultra8, Ultra13, Ultra18, Ultra25, U800, U1300, U1800, U2500		
FCC ID:	2ABES-ULTRA8		
Test Device Serial No.:	N/A ☐ Production ☐ Pre-Production ☐ Engineering		
FCC Classification:	Low Power Communication Device Transmitter (DXX)		

## **Test Facility / Accreditations**

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- MRT facility is a FCC registered (MRT Reg. No. 809388) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules.
- MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.
- MRT facility is a VCCI registered (R-4179, G-814, C-4664, T-2206) test laboratory with the site description on file at VCCI Council.
- MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications and Radio testing for FCC, Industry Canada, EU and TELEC Rules.



FCC ID: 2ABES-ULTRA8 Page Number: 4 of 29



### 1. INTRODUCTION

### 1.1. 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.

#### 1.2. 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, Youxin Industrial Park, 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.



FCC ID: 2ABES-ULTRA8 Page Number: 5 of 29



# 2. PRODUCT INFORMATION

### 2.1. Equipment Description

Product Name	Remote Control
Model No.	Ultra8, Ultra13, Ultra18, Ultra25, U800, U1300, U1800, U2500
Working Voltage	DC 3.0V
Working Frequency	2403 MHz ~ 2480MHz
Type of Modulation	GFSK
Antenna Type	PCB Antenna
Antenna Gain	2dBi

#### 2.2. Mode of Operation

All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode	
Mode 1: Transmit	

## 2.3. Test Configuration

The **Remote Control FCC ID: 2ABES-ULTRA8** was tested as described in this report is in compliance with the requirements limits of FCC Rules Part 15.207,15.209, 15.215 and 15.249. ANSI C63.10-2009 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

# 2.4. EMI Suppression Device(s)/Modifications

Please see attachment for FCC ID label and label location.

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

## 2.5. 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 trade name and FCC ID must be displayed on the device per Section 15.19(a)(5).

FCC ID: 2ABES-ULTRA8 Page Number: 6 of 29



# 2.6. Test Software

The test unit set it by pressing the down , left ,or right button on the EUT and make the EUT work through batteries, the EUT will enter the test mode and continues transmits signal.

FCC ID: 2ABES-ULTRA8 Page Number: 7 of 29



### 3. DESCRIPTION OF TEST

#### 3.1. Evaluation Procedure

# 3.2. 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,  $50\Omega/50uH$  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 is 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 C63.10-2009 at Clause 4.3.

Line conducted emissions test results are shown in Section 7.2.

FCC ID: 2ABES-ULTRA8 Page Number: 8 of 29



#### 3.3. 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 was placed on top of the 0.8 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 BeamWidth of horn antenna, the horn antenna should be always directed to the EUT when rising height.

FCC ID: 2ABES-ULTRA8 Page Number: 9 of 29



# 4. 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 Remote Control is permanently attached.
- There are no provisions for connection to an external antenna.

#### **Conclusion:**

The Remote Control FCC ID: 2ABES-ULTRA8 unit complies with the requirement of §15.203.

FCC ID: 2ABES-ULTRA8 Page Number: 10 of 29



# 5. TEST EQUIPMENT CALIBRATION DATE

# Radiated Emission

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2016/04/23
Preamplifier	Agilent	83017A	MRTSUE06076	1 year	2015/12/13
Loop Antenna	Schwarzbeck	FMZB1519	MRTSUE06025	1 year	2015/11/08
TRILOG Antenna	Schwarzbeck	VULB9162	MRTSUE06022	1 year	2015/11/08
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06023	1 year	2015/11/08
Broadband Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06024	1 year	2015/12/11
Temperature/Humidity Meter	Anymetre	TH101B	MRTSUE06046	1 year	2015/11/14

FCC ID: 2ABES-ULTRA8 Page Number: 11 of 29



# 6. 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.

#### Radiated Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)):

9kHz ~ 1GHz: ± 4.18dB 1GHz ~ 18GHz: ± 4.76dB

FCC ID: 2ABES-ULTRA8 Page Number: 12 of 29

Report No.: 1504RSU01801



# 7. TEST RESULT

# 7.1. Summary

Company Name: <u>Pathway Innovations and Technologies, Inc.</u>

FCC ID: <u>2ABES-ULTRA8</u>

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.207	AC Conducted Emissions	< FCC 15.207 limits	Line	N/A	Section 7.2
15.207	150kHz - 30MHz	C FOC 15.207 IIIIIIIS	Conducted	IN/A	Section 7.2
		Emissions radiated			
		outside of the			
		specified frequency			
		bands, except for			
		harmonics, shall be			
15.209	General Field Strength	attenuated by at least	Radiated	Pass	Section 7.3
15.249	Limits	50 dB below the level	Radialed	Fa55	& 7.4
		of the fundamental or			
	to the genera	to the general radiated			
		emission limits in			
		§15.209, whichever is			
		the lesser attenuation.			

#### Notes:

- All modes of operation and data rates were investigated. For radiated emission test, every axis
  (X, Y, Z) was also verified. The test results shown in the following sections represent the worst
  case emissions.
- 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.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.

FCC ID: 2ABES-ULTRA8 Page Number: 13 of 29



## 7.2. Conducted Emission

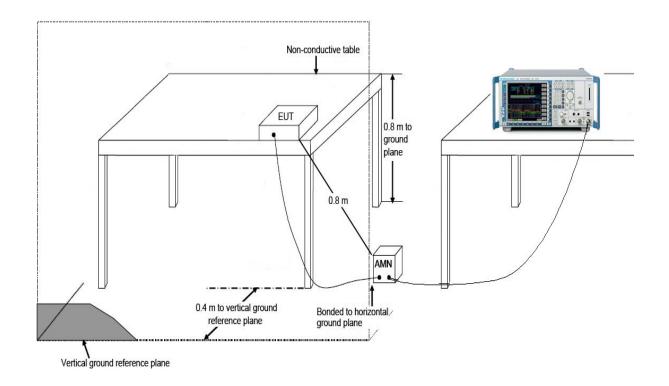
#### 7.2.1. Test Limit

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 0.15 MHz to 0.5 MHz.

# 7.2.2. Test Setup



#### 7.2.3. Test Result

The EUT was battery-powered device, not applicable for this test item.

FCC ID: 2ABES-ULTRA8 Page Number: 14 of 29



#### 7.3. Radiated Emission

#### 7.3.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.209					
Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (uV/m)			
0.009-0.490	2400/F(kHz)	300			
0.490-1.705	24000/F(kHz)	30			
1.705-30.0	30	30			
30-80	100**	3			
80-216	150**	3			
216-960	200**	3			
Above 960	500	3			

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

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: E field strength  $(dBuV/m) = 20 \log E$  field strength (uV/m).

FCC Part 15 Subpart C Paragraph 15.249						
Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)				
902-928(MHz)	50	500				
2400-2483.5(MHz)	50	500				
5725-5875(MHz)	50	500				
24.0-24.25(GHz)	250	2500				

FCC Part 15.249 (d), Emissions radiated outside of the specified frequency bands, except for

harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general

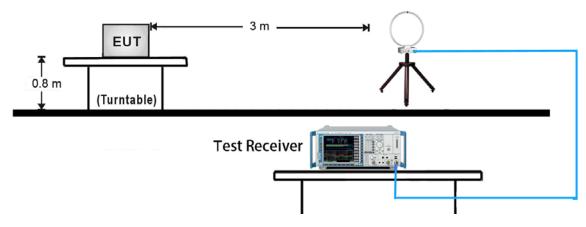
FCC ID: 2ABES-ULTRA8 Page Number: 15 of 29



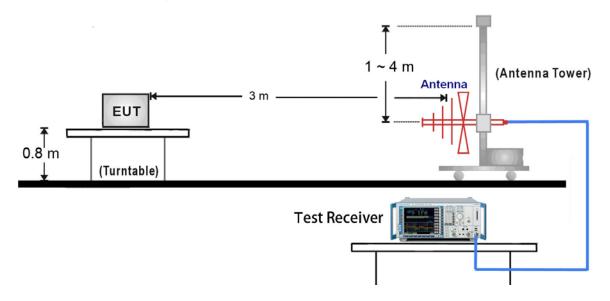
radiated emission limits in §15.209, whichever is the lesser attenuation.

# 7.3.2. Test Setup

## 9kHz ~ 30MHz Test Setup:



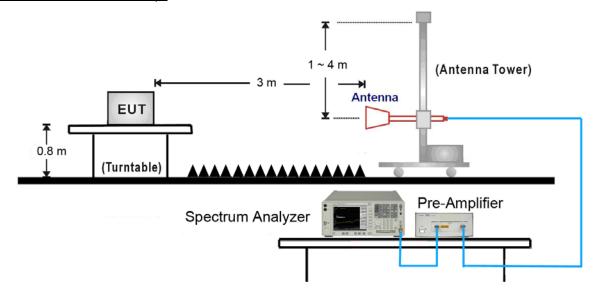
# 30MHz ~ 1GHz Test Setup:



FCC ID: 2ABES-ULTRA8 Page Number: 16 of 29



# 1GHz ~ 25GHz Test Setup:





## 7.3.3. Test Result

Test Mode:	Transmission	Test Site:	AC1	
Test Engineer:	Roy Cheng	Test Date:	2015.05.18	
Remark:	Fundamental Radiated Emission			

Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
	62.7	31.2	93.9	114.0	-20.1	PK	Horizontal
0.400	62.5	31.2	93.7	94.0	-0.3	AV	Horizontal
2403	53.6	31.2	84.8	114.0	-29.2	PK	Vertical
	53.2	31.2	84.4	94.0	-9.6	AV	Vertical
	61.4	31.2	92.6	114.0	-21.4	PK	Horizontal
2442	60.3	31.2	91.5	94.0	-2.5	AV	Horizontal
2442	52.9	31.2	84.1	114.0	-29.9	PK	Vertical
	51.5	31.2	82.7	94.0	-11.3	AV	Vertical
	61.9	31.2	93.0	114.0	-21.0	PK	Horizontal
2480	61.6	31.2	92.8	94.0	-1.2	AV	Horizontal
	49.2	31.2	80.4	114.0	-33.6	PK	Vertical
	48.6	31.2	79.8	94.0	-14.2	AV	Vertical

Note: Measure Level  $(dB\mu V/m)$  = Reading Level  $(dB\mu V)$  + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

FCC ID: 2ABES-ULTRA8 Page Number: 18 of 29



Test Mode:	Transmission	Test Site:	AC1					
Test Engineer:	Roy Cheng	Test Date:	2015.05.18					
Remark:	Harmonic Radiated Emission							
Remark:	Average measurement was not performed if peak level lower than average							
	limit.							
	2. The worst case of Radiated S	purious Emission.						
	3. Other frequency was 20dB below limit line within 1-18GHz, there is not show in							
	the report.							

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	4808.0	38.2	2.7	40.9	74.0	-33.1	PK	Horizontal
	4808.0	37.9	2.7	40.6	54.0	-13.4	AV	Horizontal
	4808.0	39.3	2.7	42.0	74.0	-32.0	PK	Vertical
	4808.0	38.6	2.7	41.3	54.0	-12.7	AV	Vertical
*	7205.0	39.0	7.8	46.8	74.0	-27.2	PK	Horizontal
*	7205.5	38.5	7.8	46.3	54.0	-7.7	AV	Horizontal
*	7213.5	39.6	7.8	47.4	74.0	-26.6	PK	Vertical
*	7215.0	38.9	7.8	46.7	54.0	-7.3	AV	Vertical
*	9612.0	35.4	10.9	46.3	74.0	-27.7	PK	Horizontal
*	9612.3	33.8	10.9	44.7	54.0	-9.3	AV	Horizontal
*	9612.0	35.4	10.9	46.3	74.0	-27.7	PK	Vertical
*	9612.5	33.5	10.9	44.4	54.0	-9.6	AV	Vertical
	12015.0	35.3	11.9	47.2	74.0	-26.8	PK	Horizontal
	12015.0	34.0	11.9	45.9	54.0	-8.1	AV	Horizontal
	12015.0	35.2	11.9	47.1	74.0	-26.9	PK	Vertical
	12015.2	33.7	11.9	45.6	54.0	-8.4	AV	Vertical

Note 1: "\*" is not in restricted band, its limit is 50dBc of the fundamental emission level (93.9dBµV/m) or 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB).

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB).

FCC ID: 2ABES-ULTRA8 Page Number: 19 of 29



Test Mode:	Transmission	Test Site:	AC1					
Test Engineer:	Roy Cheng	Test Date:	2015.05.18					
Remark:	The worst case of General Radiated Emission							

Frequency (MHz)	Reading Level (dBµV)	Factor (dB)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
398.1	16.0	16.6	32.6	46.0	-13.4	QP	Horizontal
475.7	16.2	17.8	34.0	46.0	-12.0	QP	Horizontal
216.7	14.8	12.5	27.3	46.0	-18.7	QP	Vertical
622.7	15.3	20.2	35.6	46.0	-10.4	QP	Vertical
2207.0	42.9	-3.6	39.3	74.0	-34.7	PK	Horizontal
3227.0	39.3	-1.6	37.6	74.0	-36.4	PK	Horizontal
2241.0	41.4	-3.5	37.9	74.0	-36.1	PK	Vertical
3235.5	38.9	-1.7	37.2	74.0	-36.8	PK	Vertical

Note 1: Measure Level  $(dB\mu V/m)$  = Reading Level  $(dB\mu V)$  + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre Amplifier Gain (dB)

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

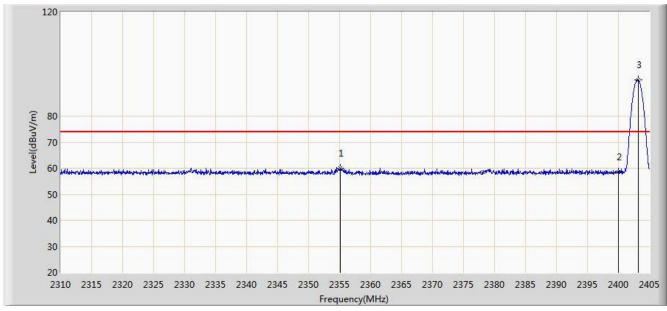
FCC ID: 2ABES-ULTRA8 Page Number: 20 of 29



# 7.4. Radiated Outside of The Specified Frequency Bands Measurement

## 7.4.1. Test Result

Site: AC1	Time: 2015/05/19 - 18:52
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Remote Control	Power: By Battery
Note: Mode 1	



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1			2355.125	60.082	28.809	-13.918	74.000	31.273	PK
2			2400.000	58.579	27.392	-15.421	74.000	31.187	PK
3		*	2403.195	93.858	62.676	N/A	N/A	31.183	PK

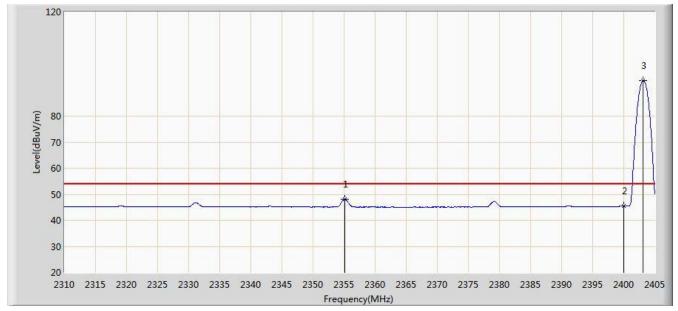
Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

FCC ID: 2ABES-ULTRA8 Page Number: 21 of 29



Site: AC1	Time: 2015/05/19 - 18:58
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Remote Control	Power: By Battery
Note: Mode 1	



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1			2355.173	48.221	16.948	-5.779	54.000	31.273	AV
2			2400.000	45.499	14.312	-8.501	54.000	31.187	AV
3		*	2403.052	93.665	62.482	N/A	N/A	31.183	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

FCC ID: 2ABES-ULTRA8 Page Number: 22 of 29



Site: AC1	Time: 2015/05/19 - 18:59
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Remote Control	Power: By Battery
Note: Mode 1	·

120 80 70 60 40 30 20 2310 2315 2320 2325 2330 2335 2340 2345 2350 2355 2360 2365 2370 2375 2380 2385 2390 2395 2400 2405

No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1			2387.948	59.956	28.749	-14.044	74.000	31.206	PK
2			2400.000	58.849	27.662	-15.151	74.000	31.187	PK
3		*	2403.147	84.763	53.581	N/A	N/A	31.183	PK

Frequency(MHz)

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

FCC ID: 2ABES-ULTRA8 Page Number: 23 of 29



Site: AC1	Time: 2015/05/19 - 19:00
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Remote Control	Power: By Battery
Note: Mode 1	·

120 80 70 60 50 40 30 20 2310 2315 2320 2325 2330 2335 2340 2345 2350 2355 2360 2365 2370 2375 2380 2385 2390 2395 2400 2405

No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1			2379.397	45.338	14.116	-8.662	54.000	31.222	AV
2			2400.000	45.209	14.022	-8.791	54.000	31.187	AV
3		*	2403.195	84.387	53.205	N/A	N/A	31.183	AV

Frequency(MHz)

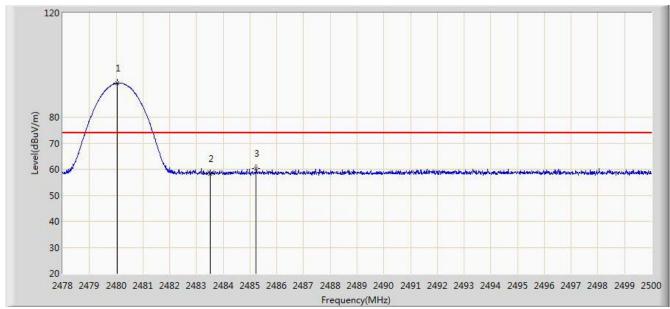
Note: Measure Level ( $dB\mu V/m$ ) = Reading Level ( $dB\mu V$ ) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

FCC ID: 2ABES-ULTRA8 Page Number: 24 of 29



Site: AC1	2015/05/19 - 19:02
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Remote Control	Power: By Battery
Note: Mode 1	·



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1		*	2480.046	93.034	61.850	N/A	N/A	31.184	PK
2			2483.500	58.347	27.154	-15.653	74.000	31.194	PK
3			2485.227	60.423	29.225	-13.577	74.000	31.198	PK

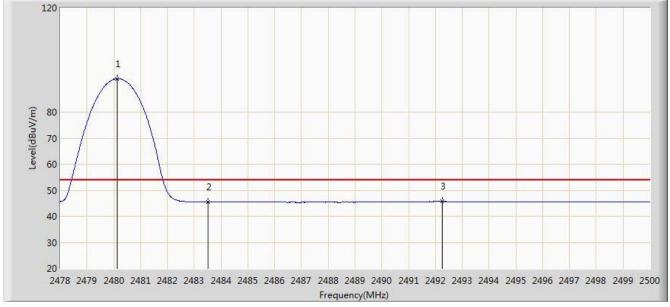
Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

FCC ID: 2ABES-ULTRA8 Page Number: 25 of 29



Site: AC1	Time: 2015/05/19 - 19:06
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Remote Control	Power: By Battery
Note: Mode 1	



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1		*	2480.123	92.827	61.643	N/A	N/A	31.185	AV
2			2483.500	45.455	14.262	-8.545	54.000	31.194	AV
3			2492.256	45.659	14.443	-8.341	54.000	31.216	AV

Note: Measure Level ( $dB\mu V/m$ ) = Reading Level ( $dB\mu V$ ) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

FCC ID: 2ABES-ULTRA8 Page Number: 26 of 29



Site: AC1	Time: 2015/05/19 - 19:06
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Remote Control	Power: By Battery
Note: Mode 1	

120 2 3 40 30 20 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 Frequency(MHz)

No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1		*	2480.112	80.425	49.241	N/A	N/A	31.184	PK
2			2483.500	57.997	26.804	-16.003	74.000	31.194	PK
3			2484.435	59.548	28.352	-14.452	74.000	31.195	PK

Note: Measure Level ( $dB\mu V/m$ ) = Reading Level ( $dB\mu V$ ) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

FCC ID: 2ABES-ULTRA8 Page Number: 27 of 29



Site: AC1	Time: 2015/05/19 - 19:08
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Remote Control	Power: By Battery
Note: Mode 1	·

No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1		*	2480.145	79.828	48.644	N/A	N/A	31.185	AV
2			2483.500	45.357	14.164	-8.643	54.000	31.194	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

FCC ID: 2ABES-ULTRA8 Page Number: 28 of 29



# 8. CONCLUSION

The data collected relate only the item(s) tested and show that the **Remote Control FCC ID: 2ABES-ULTRA8** is in compliance with Part 15C of the FCC Rules.

FCC ID: 2ABES-ULTRA8 Page Number: 29 of 29

The End