

# FCC CERTIFICATION TEST REPORT

## FOR

**Applicant** : inMusic Brands,Inc  
**Address** : 200 SCENIC VIEW DRIVE, SUITE 201, RI02864, U.S.A.  
**Equipment under Test** : Wireless MIDI Controller  
**Model No** : Orbit  
**Trademark** : Numark  
**FCC ID** : Y4O-NK31ORBIT  
**Manufacturer** : Dong Guan Integrity Electronic Co.,Ltd  
**Address** : NO. 68, Huanghe Rd., Fenghuanggang, Tangxia  
Township, Dongguan City, Guangdong Province, China

**Issued By: Dongguan Dongdian Testing Service Co., Ltd.**

**Add:** No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City,  
Guangdong Province, China, 523808

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# REPORT

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## TEST REPORT DECLARE

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**FCC ID** : Y4O-NK31ORBIT  
**Manufacturer** : Dong Guan Integrity Electronic Co.,Ltd  
**Address** : NO. 68, Huanghe Rd., Fenghuanggang, Tangxia Township,  
Dongguan City, Guangdong Province, China

**Test Standard Used:** FCC Rules and Regulations Part 15 Subpart B: 2012

**Test procedure used:** ANSI C63.4:2009

**We Declare:**

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

**After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.**

<b>Report No:</b>	DDT-RE130017		
<b>Date of Test:</b>	2013/01/17---2013/01/17	<b>Date of Report:</b>	2013/01/18

**Prepared By:**



**Leo Liu/Engineer**

**Approved By:**



**Jamy Yu/EMC Manager**

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

## 1. Summary of test results

EMISSION		
Description of Test Item	Standard	Results
Power Line Conducted Emission Test	FCC Part 15: 2012 ANSI C63.4: 2009	PASS
Radiated Emission Test	FCC Part 15: 2012 ANSI C63.4: 2009	PASS

## 2. General test information

### 2.1. Description of EUT

EUT* Name	:	Wireless MIDI Controller
Model Number	:	Orbit
Difference of Model	:	N/A
EUT function description	:	Please reference user manual of this device
Power supply	:	DC 3.7 V from battery and DC5V from PC's USB port
FCC ID	:	Y4O-NK31ORBIT
Operation frequency	:	2470MHz
Other non wireless frequency	:	<108MHz
Modulation	:	GFSK
Antenna Type	:	Integrated PCB antenna, Maximum Gain: 0dBi
Date of Receipt	:	2013/01/16
Sample Type	:	Series production

Note1: EUT is the ab. of equipment under test.

Note2: For wireless function of this device was tested and reported in another FCC ID test report and the report No is: DDT-RE130016.

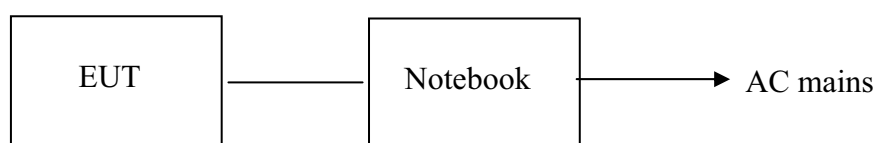
### 2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number or Type	Other
/	/	/	/

### 2.3. Assistant equipment used for test

Description of Assistant equipment	Manufacturer	Model number or Type	Other
Notebook	LENOVO	X61S	/
Power adapter	LENOVO	92P1107	/

### 2.4. Block diagram of EUT configuration for test



A software “MIDI-OX” was used to receiver data from EUT.

## 2.5. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-25°C
Humidity range:	40-75%
Pressure range:	86-106kPa

## 2.6. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808 Tel: +86-0769-22891499

FCC Registration Number: 270092 Industry Canada site registration number:10288A-1

## 2.7. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.40dB
Uncertainty for Radiation Emission test (150KHz-30MHz)	3.21dB
Uncertainty for Radiation Emission test (30MHz-1GHz)	2.78 dB (Polarize: V)
	3.20 dB (Polarize: H)
Uncertainty for Radiation Emission test (1GHz to 25GHz)	2.08dB(Polarize: V)
	2.56dB (Polarize: H)
Uncertainty for radio frequency	$1 \times 10^{-9}$
Uncertainty for conducted RF Power	0.65dB

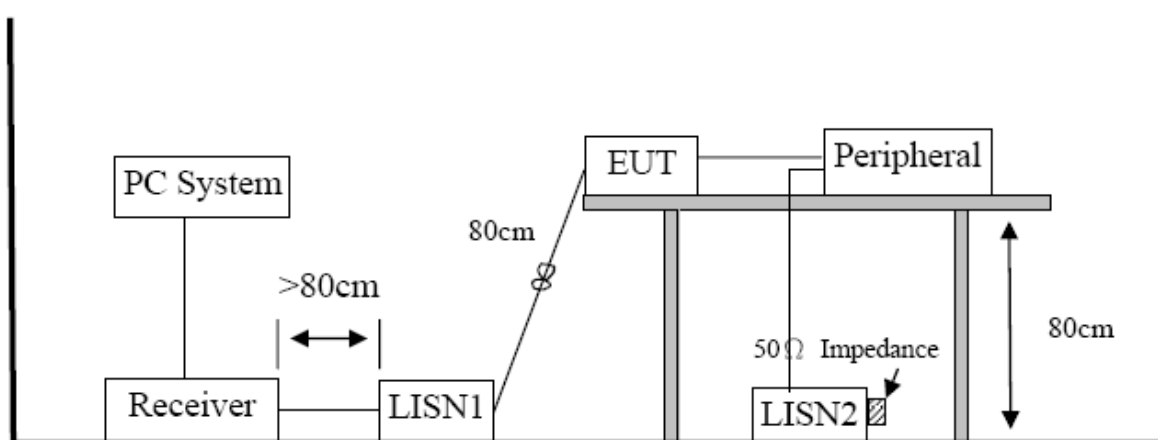
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

### 3. Power Line Conducted Emission Test

#### 3.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	R&S	ESU8	100316	2012/11/26	1 Year
2	LISN	R&S	ENV216	101109	2012/11/26	1 Year
3	Pulse Limiter	R&S	ESH3-Z2	101242	2012/11/26	1 Year
4	RF Cable	R&S	R01	10403	2012/11/26	1Year

#### 3.2. Block diagram of test setup



#### 3.3. Power Line Conducted Emission Limits(Class B)

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

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

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

#### 3.4. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 3.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected

to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 KHz.

### **3.5. Test Result**

**PASS. (See below detailed test result)**

Note1: All emissions not reported below are too low against the prescribed limits.

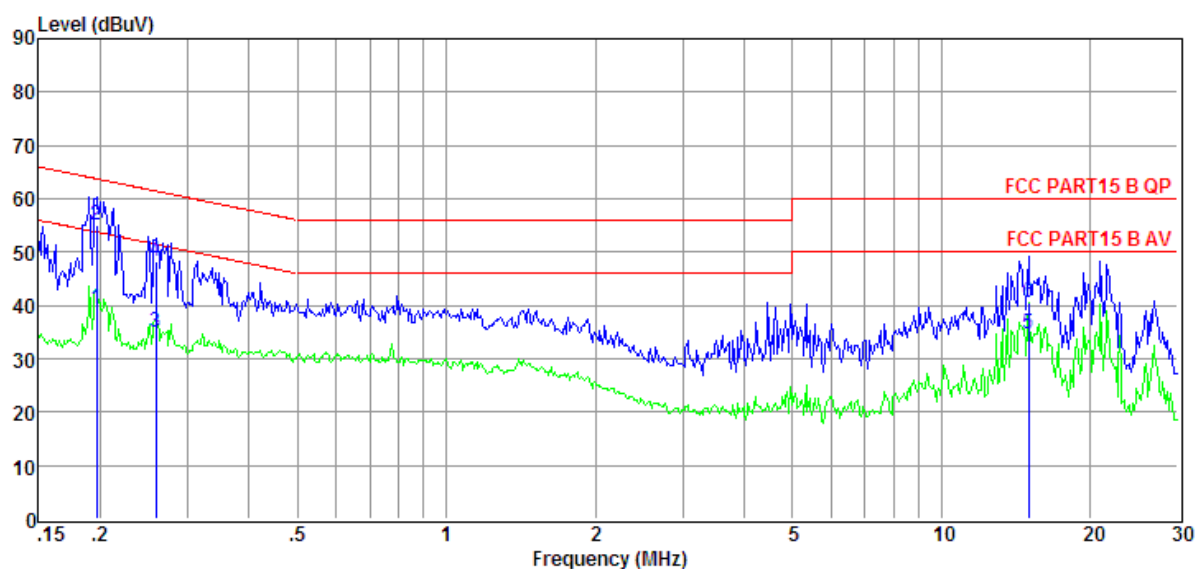
Note2: “----” means Peak detection; “----” mans Average detection

## **Conducted Emission Test Result**



**Test Site** : DDT 1# Shield Room **E:\2013 report data\13QE0010.EM6**  
**Test Date** : 2013-01-17 **Tested By** : Leo  
**EUT** : Wireless MIDI Controller **Model Number** : Orbit  
**Power Supply** : DC 5V From PC input 120V/60Hz **Test Mode** : Operation and charging mode  
**Condition** : Temp:24.5'C,Humi:55% **LISN** : 2012 ENV216/NEUTRAL  
**Memo** :

Data : 1



Item	Freq	Read Level	LISN Factor	Cable Loss	Pluse Limiter Factor	Result Level	Limit Line	Over Limit	Detector	Phase
(Mark)	(MHz)	(dBμV)	(dB)	(dB)	(dB)	(dBμV)	(dBμV)	(dB)		
1	0.20	19.64	9.63	0.04	9.90	39.21	53.76	-14.55	Average	NEUTRAL
2	0.20	35.36	9.63	0.04	9.90	54.93	63.76	-8.83	QP	NEUTRAL
3	0.26	15.53	9.64	0.04	9.89	35.10	51.47	-16.37	Average	NEUTRAL
4	0.26	28.68	9.64	0.04	9.89	48.25	61.47	-13.22	QP	NEUTRAL
5	14.99	14.57	9.80	0.19	9.93	34.49	50.00	-15.51	Average	NEUTRAL
6	14.99	20.64	9.80	0.19	9.93	40.56	60.00	-19.44	QP	NEUTRAL

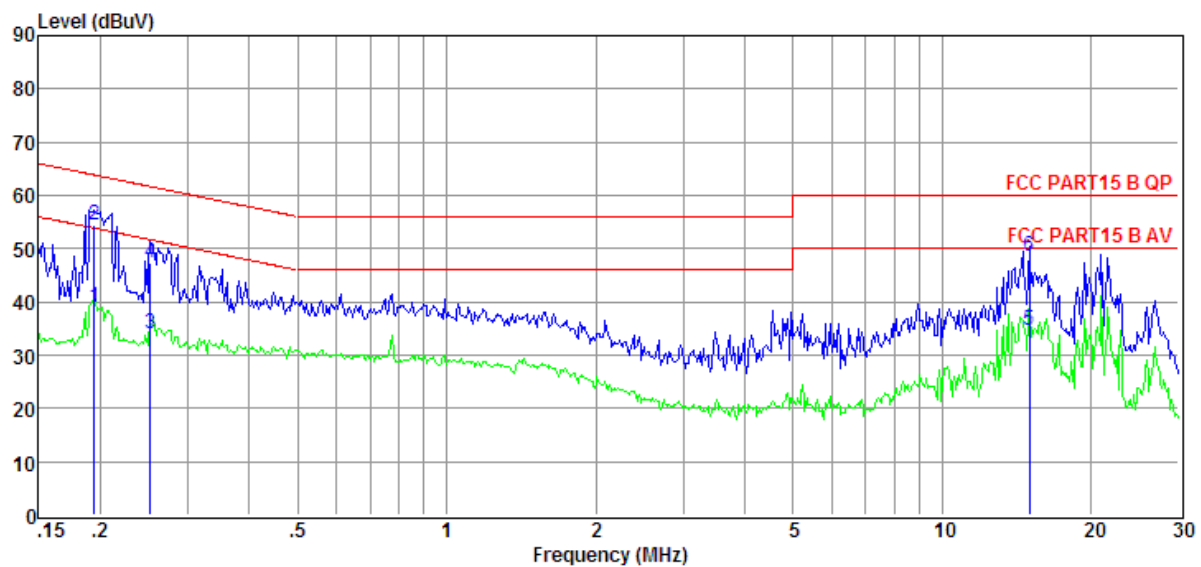
Note: 1. Result Level = Read Level + LISN Factor + Pluse Limiter Factor + Cable loss

2. If QP Result comply with AV limit, AV Result is deemed to comply with AV limit

## Conducted Emission Test Result

**Test Site** : DDT 1# Shield Room **E:\2013 report data\13QE0010.EM6**  
**Test Date** : 2013-01-17 **Tested By** : Leo  
**EUT** : Wireless MIDI Controller **Model Number** : Orbit  
**Power Supply** : DC 5V From PC input 120V/60Hz **Test Mode** : Operation and charging mode  
**Condition** : Temp:24.5'C,Humi:55% **LISN** : 2012 ENV216/LINE  
**Memo** :

Data : 3



Item	Freq	Read Level	LISN Factor	Cable Loss	Pluse Limiter Factor	Result Level	Limit Line	Over Limit	Detector	Phase
(Mark)	(MHz)	(dBμV)	(dB)	(dB)	(dB)	(dBμV)	(dBμV)	(dB)		
1	0.19	19.26	9.63	0.04	9.90	38.83	53.84	-15.01	Average	LINE
2	0.19	34.91	9.63	0.04	9.90	54.48	63.84	-9.36	QP	LINE
3	0.25	14.57	9.63	0.04	9.89	34.13	51.69	-17.56	Average	LINE
4	0.25	27.88	9.63	0.04	9.89	47.44	61.69	-14.25	QP	LINE
5	14.99	14.59	9.86	0.19	9.93	34.57	50.00	-15.43	Average	LINE
6	14.99	28.71	9.86	0.19	9.93	48.69	60.00	-11.31	QP	LINE

Note: 1. Result Level = Read Level + LISN Factor + Pluse Limiter Factor + Cable loss

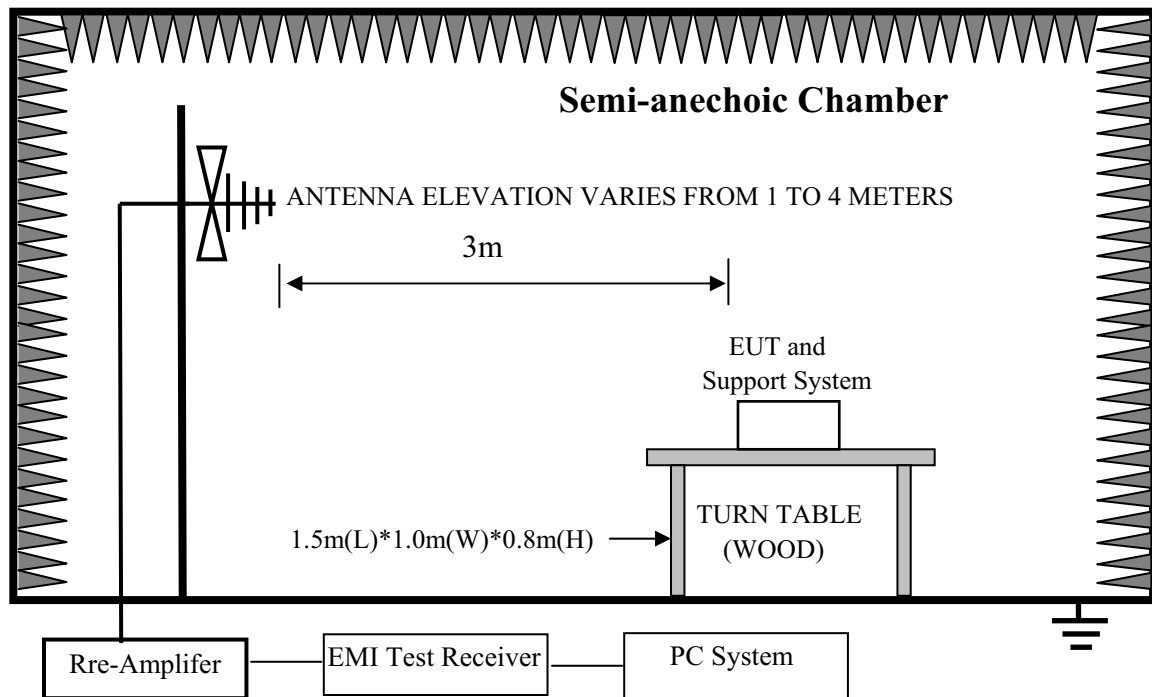
2. If QP Result comply with AV limit, AV Result is deemed to comply with AV limit

## 4. Radiated emission test

### 4.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI Test Receiver	R&S	ESU8	100316	2012/11/26	1Year
2	Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	2012/11/26	1Year
3	Pre-Amplifier	R&S	SCU-01	10049	2012/11/26	1Year
4	RF Cable	R&S	R01	10403	2012/11/26	1Year

### 4.2. Block diagram of test setup



### 4.3. Radiated emission limit(Class B)

Frequency (MHz)	Distance (Meters)	Field Strengths Limits dB(μV)/m
30--88	3	40.0
88--216	3	43.5
216--960	3	46.0
960--1000	3	54.0

Note: (1) The smaller limit shall apply at the cross point between two frequency bands.

(2) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

#### **4.4. Test Procedure**

##### **Procedure of Preliminary Test**

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 4.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

Mains cables, telephone lines or other connections to auxiliary equipment located outside the test are shall drape to the floor, be fitted with ferrite clamps or ferrite tubes placed on the floor at the point where the cable reaches the floor and then routed to the place where they leave the turntable. No extension cords shall be used to mains receptacle.

The antenna was placed at 3 meter away from the EUT as stated in ANSI C63.4. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.

The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

The test mode(s) described in clause 2.4 were scanned during the preliminary test:

After the preliminary scan, we found the test mode producing the highest emission level. The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

##### **Procedure of Final Test**

EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.

The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.

The test data of the worst-case condition(s) was recorded.

The bandwidth setting of the test receiver is 120 kHz.

#### **4.5. Test result**

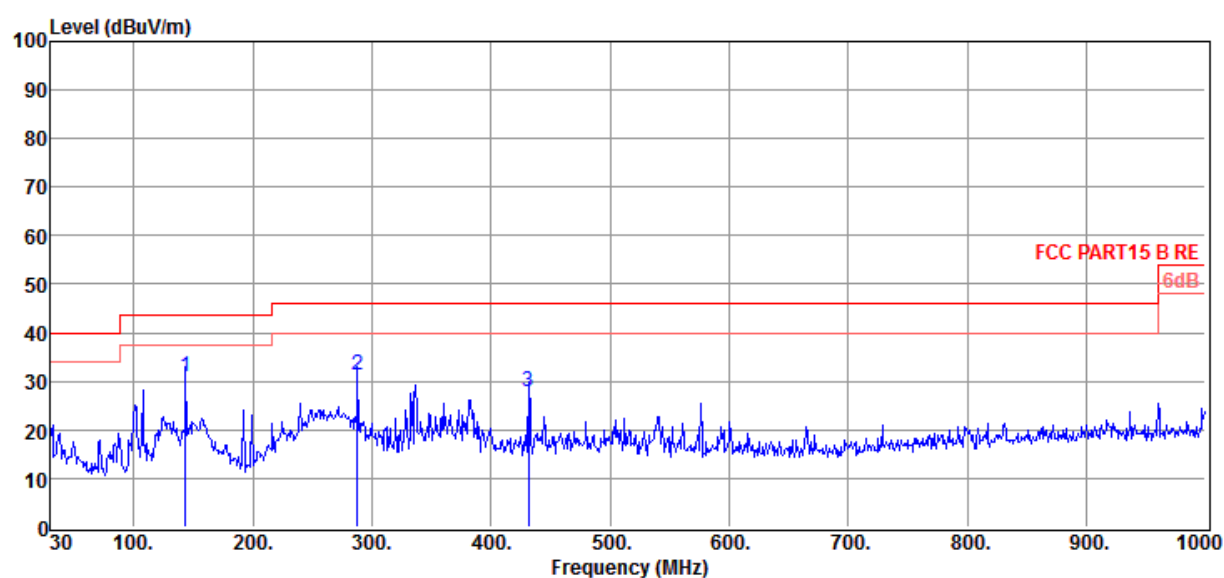
##### **PASS. (See below detailed test result)**

Note1: All emissions not reported below are too low against the prescribed limits.

## Radiated Emission Test Result

**Test Site** : DDT 3m Chamber **E:\2013 Report data\13QE0010.EM6**  
**Test Date** : 01-17-2013 **Tested By** : Damon\_Hu  
**EUT** : Wireless MIDI Controller **Model Number** : Orbit  
**Power Supply** : DC 5V from PC input 120V/60Hz **Test Mode** : Operation and Charging  
**Condition** : Temp:24.5°C,Humi:55% **Antenna/Distance** : VULB 9163/3m/HORIZONTAL  
**Memo** :

Data : 3



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	143.49	62.12	8.23	40.91	1.39	30.83	43.50	-12.67	QP	HORIZONTAL
2	288.02	58.51	12.83	42.40	2.17	31.11	46.00	-14.89	QP	HORIZONTAL
3	431.58	52.56	15.52	42.86	2.67	27.89	46.00	-18.11	QP	HORIZONTAL

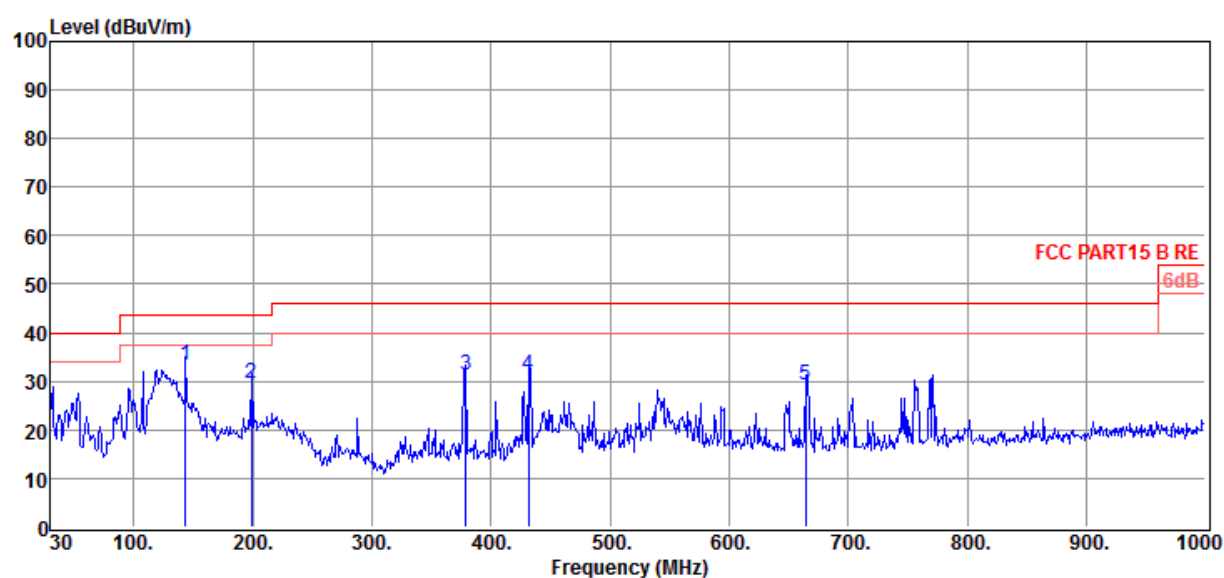
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

2. If Peak Result comply with QP limit,QP Result is deemed to comply with QP limit

## Radiated Emission Test Result

**Test Site** : DDT 3m Chamber **E:\2013 Report data\13QE0010.EM6**  
**Test Date** : 01-17-2013 **Tested By** : Damon\_Hu  
**EUT** : Wireless MIDI Controller **Model Number** : Orbit  
**Power Supply** : DC 5V from PC input 120V/60Hz **Test Mode** : Operation and Charging  
**Condition** : Temp:24.5°C,Humi:55% **Antenna/Distance** : VULB 9163/3m/VERTICAL  
**Memo** :

Data : 4



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	143.49	64.51	8.23	40.91	1.39	33.22	43.50	-10.28	QP	VERTICAL
2	198.78	58.89	10.57	41.49	1.75	29.72	43.50	-13.78	QP	VERTICAL
3	379.20	56.87	14.59	42.73	2.54	31.27	46.00	-14.73	QP	VERTICAL
4	431.58	56.03	15.52	42.86	2.67	31.36	46.00	-14.64	QP	VERTICAL
5	664.38	50.18	18.68	43.12	3.51	29.25	46.00	-16.75	QP	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

2. If Peak Result comply with QP limit,QP Result is deemed to comply with QP limit