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**TEST REPORT**

**Report No.: 14121090HKG-001**

**WowWee Group Limited**

Application  
For  
Certification  
(Original Grant)  
(FCC ID: OKP1400)  
(IC: 7091A-1400)

Transceiver

Prepared and Checked by:



Wong Kwok Yeung, Kenneth  
Lead Engineer

Approved by:



Chan Chi Hung, Terry  
Senior Supervisor  
Date: April 23, 2015

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## GENERAL INFORMATION

Grantee:	WowWee Group Limited
Grantee Address:	Energy Plaza, Suite 301A-C, 92 Granville Road, T.S.T. East, Kowloon, Hong Kong.
Contact Person:	Dennis Tsoi
Tel:	(852)2739-5288
Fax:	(852) 2723-3425
e-mail:	dennistsoi@wowwee.com.hk
Manufacturer:	WowWee Group Limited
Manufacturer Address:	Energy Plaza, Suite 301A-C, 92 Granville Road, T.S.T. East, Kowloon, Hong Kong.
Brand Name:	WowWee
FCC Model:	1400
FCC Additional Model:	1401, 1402, 1405, 1406, 1408, 1409
FCC Asst. No.:	1410
IC Model:	1400
Type of EUT:	Transceiver
FCC Description of EUT:	Snap Pets 4 Assorted Snap Pets Assorted (1400) Snap Pets - Dog (Light Blue - Purple) (1401) Snap Pets - Dog (Peach - Pink) (1402) Snap Pets - Cat (Blue - Green) (1405) Snap Pets - Cat (Black) (1406) Snap Pets - Rabbit (Pink - Black) (1408) Snap Pets - Rabbit (Gold - Silver) (1409)
IC Description of EUT:	Snap Petz Assorted
Serial Number:	N/A
FCC ID / IC:	OKP1400 / 7091A-1400
Date of Sample Submitted:	December 31, 2015
Date of Test:	December 31, 2015 to January 21, 2015
Report No.:	14121090HKG-001
Report Date:	April 23, 2015
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

Report No.: 14121090HKG-001

FCC ID: OKP1400

IC: 7091A-1400

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## SUMMARY OF TEST RESULT

TEST SPECIFICATION	REFERENCE	RESULTS
Transmitter Power Line Conducted Emissions	15.207 / RSS-Gen 7.2.4	Pass
Radiated Emission Radiated Emission on the Bandedge	15.249 / RSS-210 A2.9	Pass
Radiated Emission in Restricted Bands	15.205 / RSS-210 2.2	Pass
Digital Device Radiated Emissions	15.209 / RSS-210 2.5	Pass

The equipment under test is found to be complying with the following standards:

FCC Part 15, October 1, 2013 Edition

RSS-210 Issue 8, December 2010

RSS-Gen Issue 4, November 2014

- Note: 1. The EUT uses a permanently attached antenna which, in accordance to section 15.203, is considered sufficient to comply with the provisions of this section.
2. Pursuant to FCC part 15 Section 15.215(c), the 20 dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered.

Report No.: 14121090HKG-001

FCC ID: OKP1400

IC: 7091A-1400

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## 1.0 **General Description**

### 1.1 Product Description

The Equipment Under Test (EUT) is a 2.4GHz Bluetooth 4.0 Camera. The EUT is powered by a 3.7V rechargeable battery pack. The Bluetooth module in the EUT is operating in the frequency range from 2402MHz to 2480MHz (40 channels with 2MHz channel spacing). After pairing with ios/Android device, the Camera can be controlled by the Application to take a photo, which can be fed back to the device.

For FCC certification, the Model: 1401, 1402, 1405, 1406, 1408, 1409 are the same as the Model: 1400 in hardware aspect. The difference in model number serves as marketing strategy. The models are different in color only.

Antenna Type: Internal, Integral

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

### 1.2 Related Submittal(s) Grants

This is a single application for certification of a transceiver.

### 1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). All radiated measurements were performed in an 3m Chamber. Preliminary scans were performed in the 3m Chamber only to determine worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the “**Justification Section**” of this Application.



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#### 1.4 Test Facility

The 3m Chamber facility used to collect the radiated data is located at Workshop No. 3, G/F., World-Wide Industrial Centre, 43-47 Shan Mei Street, Fo Tan, Sha Tin, N.T., Hong Kong. This test facility and site measurement data have been placed on file with the FCC and IC and conducted measurement is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been placed on file with the FCC and IC.

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## 2.0 **System Test Configuration**

### 2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2009).

The device was powered by new 3.7V rechargeable battery.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The unit was operated standalone and placed in the center of the turntable.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was mounted to a plastic stand if necessary and placed on the wooden turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

### 2.2 EUT Exercising Software

There was no special software to exercise the device. Once the unit is powered up, it transmits the RF signal continuously.

### 2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

### 2.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

### 2.5 Support Equipment List and Description

1. HP Probook 430 (Provided by Intertek)
2. 1 x USB Cable with length of 0.115 meter long (Provided by Applicant)

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### 3.0 **Emission Results**

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

#### 3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG - AV$$

where

FS = Field Strength in dB $\mu$ V/mRA = Receiver Amplitude (including preamplifier) in dB $\mu$ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

AV = Average Factor in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

$$FS = RR + LF$$

where

FS = Field Strength in dB $\mu$ V/mRR = RA - AG - AV in dB $\mu$ V

LF = CF + AF in dB

Assume a receiver reading of 52.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29 dB and average factor of 5 dB are subtracted, giving a field strength of 27 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$RA = 52.0 \text{ dB}\mu\text{V/m}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$AV = 5.0 \text{ dB}$$

$$FS = RR + LF$$

$$FS = 18 + 9 = 27 \text{ dB}\mu\text{V/m}$$

$$RR = 18.0 \text{ dB}\mu\text{V}$$

$$LF = 9.0 \text{ dB}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(27 \text{ dB}\mu\text{V/m})/20] = 22.4 \text{ } \mu\text{V/m}$$





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### 3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 36.436 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

### 3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgment: Passed by 11.4 dB

### 3.4 Conducted Emission Configuration Photograph

The worst case in line-conducted emission was found at 0.555MHz

For electronic filing, the worst case line-conducted configuration photographs are saved with filename: conducted photo.pdf.

### 3.5 Conducted Emission Data

For electronic filing, the graph and data table of conducted emission is saved with filename: conducted.pdf.

Judgment: Pass by 11.08 dB

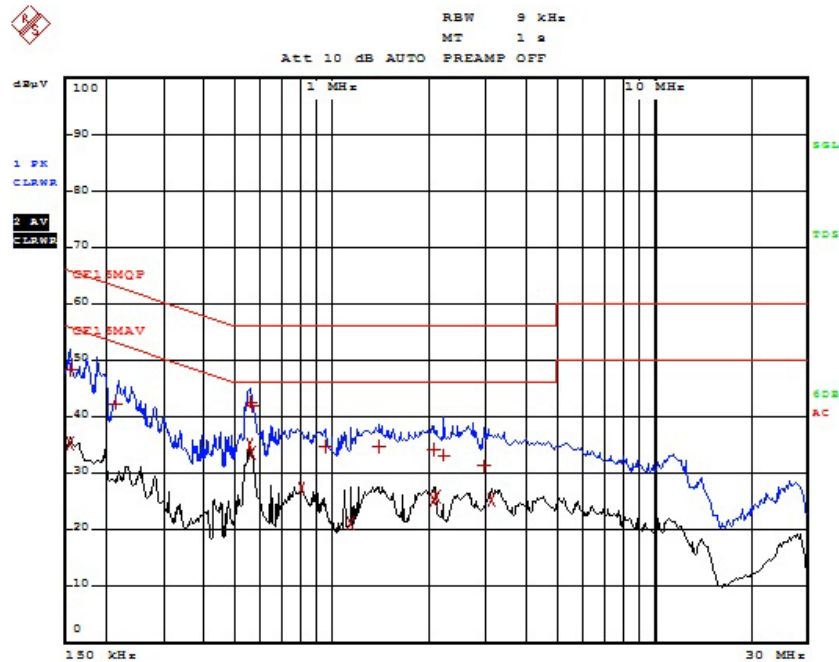
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## Worst-Case Operating Mode: Operating Mode



EDIT PEAK LIST (Final Measurement Results)				
Trace1:	CF15MQP			
Trace2:	CF15MAV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB	
1 Quasi Peak	154.5 kHz	48.30 N gnd	-17.44	
2 CISPR Average	154.5 kHz	35.32 N gnd	-20.42	
1 Quasi Peak	217.5 kHz	42.33 L1 gnd	-20.56	
2 CISPR Average	217.5 kHz	34.91 N gnd	-11.08	
1 Quasi Peak	355.5 kHz	42.67 L1 gnd	-13.32	
1 Quasi Peak	569.5 kHz	41.90 N gnd	-14.09	
2 CISPR Average	569.5 kHz	33.60 L1 gnd	-12.39	
2 CISPR Average	802.5 kHz	27.43 N gnd	-18.56	
1 Quasi Peak	955.5 kHz	34.86 N gnd	-21.13	
2 CISPR Average	1.14 MHz	21.22 N gnd	-24.77	
1 Quasi Peak	1.4035 MHz	34.88 N gnd	-21.11	
1 Quasi Peak	2.0625 MHz	34.37 N gnd	-21.63	
2 CISPR Average	2.067 MHz	25.28 N gnd	-20.71	
2 CISPR Average	2.1255 MHz	25.86 N gnd	-20.14	
1 Quasi Peak	2.238 MHz	33.32 N gnd	-22.67	
1 Quasi Peak	2.9805 MHz	31.42 N gnd	-24.58	
2 CISPR Average	3.12 MHz	25.44 N gnd	-20.56	

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Applicant: WowWee Group Limited

Date of Test: January 21, 2015

Model: 1400

Worst-Case Operating Mode: Transmitting

Table 1

**Radiated Emissions**  
**Pursuant to FCC Part 15 Section 15.249 Requirement**

**Lowest Channel**

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Average Factor (dB)	Calculated at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
H	2402.000	94.0	33	29.4	90.4	37.3	53.1	94.0	-40.9
<b>V</b>	<b>4804.000</b>	<b>57.3</b>	<b>33</b>	<b>34.9</b>	<b>59.2</b>	<b>37.3</b>	<b>21.9</b>	<b>54.0</b>	<b>-32.1</b>
V	7206.000	53.4	33	37.9	58.3	37.3	21.0	54.0	-33.0
V	9608.000	50.0	33	40.4	57.4	37.3	20.1	54.0	-33.9
<b>V</b>	<b>12010.000</b>	<b>48.8</b>	<b>33</b>	<b>40.5</b>	<b>56.3</b>	<b>37.3</b>	<b>19.0</b>	<b>54.0</b>	<b>-35.0</b>
V	14412.000	48.1	33	40.0	55.1	37.3	17.8	54.0	-36.2

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
H	2402.000	94.0	33	29.4	90.4	114.0	-23.6
<b>V</b>	<b>4804.000</b>	<b>57.3</b>	<b>33</b>	<b>34.9</b>	<b>59.2</b>	<b>74.0</b>	<b>-14.8</b>
V	7206.000	53.4	33	37.9	58.3	74.0	-15.7
V	9608.000	50.0	33	40.4	57.4	74.0	-16.6
<b>V</b>	<b>12010.000</b>	<b>48.8</b>	<b>33</b>	<b>40.5</b>	<b>56.3</b>	<b>74.0</b>	<b>-17.7</b>
V	14412.000	48.1	33	40.0	55.1	74.0	-18.9

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emission over 1000MHz.

5. Emission (the row indicated by **bold italic**) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

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Applicant: WowWee Group Limited

Date of Test: January 21, 2015

Model: 1400

Worst-Case Operating Mode: Transmitting

Table 2

**Radiated Emissions**  
**Pursuant to FCC Part 15 Section 15.249 Requirement**

**Middle Channel**

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Average Factor (dB)	Calculated at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
H	2440.000	94.7	33	29.4	91.1	37.3	53.8	94.0	-40.2
V	<b>4880.000</b>	<b>57.6</b>	<b>33</b>	<b>34.9</b>	<b>59.5</b>	<b>37.3</b>	<b>22.2</b>	<b>54.0</b>	<b>-31.8</b>
V	<b>7320.000</b>	<b>53.7</b>	<b>33</b>	<b>37.9</b>	<b>58.6</b>	<b>37.3</b>	<b>21.3</b>	<b>54.0</b>	<b>-32.7</b>
V	9760.000	50.3	33	40.4	57.7	37.3	20.4	54.0	-33.6
V	<b>12200.000</b>	<b>49.0</b>	<b>33</b>	<b>40.5</b>	<b>56.5</b>	<b>37.3</b>	<b>19.2</b>	<b>54.0</b>	<b>-34.8</b>
V	14640.000	50.0	33	38.4	55.4	37.3	18.1	54.0	-35.9

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
H	2440.000	94.7	33	29.4	91.1	114.0	-22.9
V	<b>4880.000</b>	<b>57.6</b>	<b>33</b>	<b>34.9</b>	<b>59.5</b>	<b>74.0</b>	<b>-14.5</b>
V	<b>7320.000</b>	<b>53.7</b>	<b>33</b>	<b>37.9</b>	<b>58.6</b>	<b>74.0</b>	<b>-15.4</b>
V	9760.000	50.3	33	40.4	57.7	74.0	-16.3
V	<b>12200.000</b>	<b>49.0</b>	<b>33</b>	<b>40.5</b>	<b>56.5</b>	<b>74.0</b>	<b>-17.5</b>
V	14640.000	50.0	33	38.4	55.4	74.0	-18.6

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emission over 1000MHz.

5. Emission (the row indicated by **bold italic**) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

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Applicant: WowWee Group Limited

Date of Test: January 21, 2015

Model: 1400

Worst-Case Operating Mode: Transmitting

Table 3

**Radiated Emissions**  
**Pursuant to FCC Part 15 Section 15.249 Requirement**

**Highest Channel**

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Average Factor (dB)	Calculated at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
H	2480.000	95.3	33	29.4	91.7	37.3	54.4	94.0	-39.6
V	<b>4960.000</b>	<b>57.9</b>	<b>33</b>	<b>34.9</b>	<b>59.8</b>	<b>37.3</b>	<b>22.5</b>	<b>54.0</b>	<b>-31.5</b>
V	<b>7440.000</b>	<b>53.9</b>	<b>33</b>	<b>37.9</b>	<b>58.8</b>	<b>37.3</b>	<b>21.5</b>	<b>54.0</b>	<b>-32.5</b>
V	9920.000	50.3	33	40.4	57.7	37.3	20.4	54.0	-33.6
V	<b>12400.000</b>	<b>49.4</b>	<b>33</b>	<b>40.5</b>	<b>56.9</b>	<b>37.3</b>	<b>19.6</b>	<b>54.0</b>	<b>-34.4</b>
V	14880.000	50.3	33	38.4	55.7	37.3	18.4	54.0	-35.6

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
H	2480.000	95.3	33	29.4	91.7	114.0	-22.3
V	<b>4960.000</b>	<b>57.9</b>	<b>33</b>	<b>34.9</b>	<b>59.8</b>	<b>74.0</b>	<b>-14.2</b>
V	<b>7440.000</b>	<b>53.9</b>	<b>33</b>	<b>37.9</b>	<b>58.8</b>	<b>74.0</b>	<b>-15.2</b>
V	9920.000	50.3	33	40.4	57.7	74.0	-16.3
V	<b>12400.000</b>	<b>49.4</b>	<b>33</b>	<b>40.5</b>	<b>56.9</b>	<b>74.0</b>	<b>-17.1</b>
V	14880.000	50.3	33	38.4	55.7	74.0	-18.3

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emission over 1000MHz.

5. Emission (the row indicated by **bold italic**) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

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Applicant: WowWee Group Limited

Date of Test: January 21, 2015

Model: 1400

Worst-Case Operating Mode: Bluetooth Operating

Table 3

**Radiated Emissions**  
**Pursuant to FCC Part 15 Section 15.209 Requirement**

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	36.436	34.6	16	10.0	28.6	40.0	-11.4
V	96.243	34.3	16	12.0	30.3	43.5	-13.2
V	192.345	31.3	16	16.0	31.3	43.5	-12.2
<b>V</b>	<b>240.543</b>	<b>29.2</b>	<b>16</b>	<b>19.0</b>	<b>32.2</b>	<b>46.0</b>	<b>-13.8</b>
H	480.355	24.2	16	26.0	34.2	46.0	-11.8
H	720.125	18.9	16	30.0	32.9	46.0	-13.1

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emission over 1000MHz.

5. Emission (the row indicated by **bold italic**) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.



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#### 4.0 **Equipment Photographs**

For electronic filing, the photographs are saved with filename: external photos.pdf and internal photos.pdf.

#### 5.0 **Product Labelling**

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

#### 6.0 **Technical Specifications**

For electronic filing, the block diagram and schematic of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

#### 7.0 **Instruction Manual**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States and Canada.

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## 8.0 **Miscellaneous Information**

The miscellaneous information includes details of the test procedure and measured bandwidth / calculation of factor such as pulse desensitization and averaging factor (calculation and timing diagram).

### 8.1 Radiated Emission on the Bandedge (for Section 15.249)

From the following plots, they show that the fundamental emissions are confined in the specified band (2400MHz to 2483.5MHz). In case of the fundamental emissions are within two standard bandwidths from the bandedge, the delta measurement technique is used for determining bandedge compliance. Standard bandwidth is the bandwidth specified by ANSI C63.4 (2009) for frequency being measured.

Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50dB below the level of the fundamental or to the general radiated emissions limits in Section 15.209, whichever is the lesser attenuation, which meet the requirement of part 15.249(d).

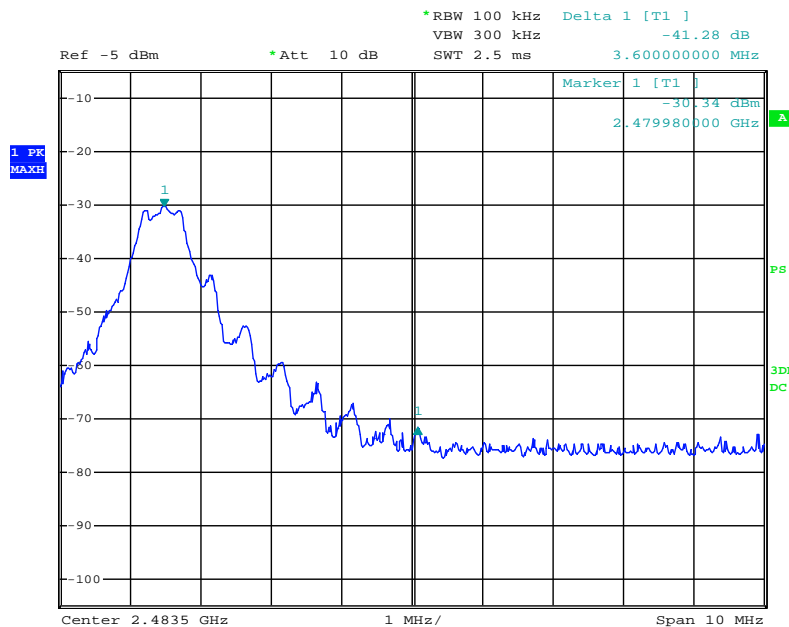
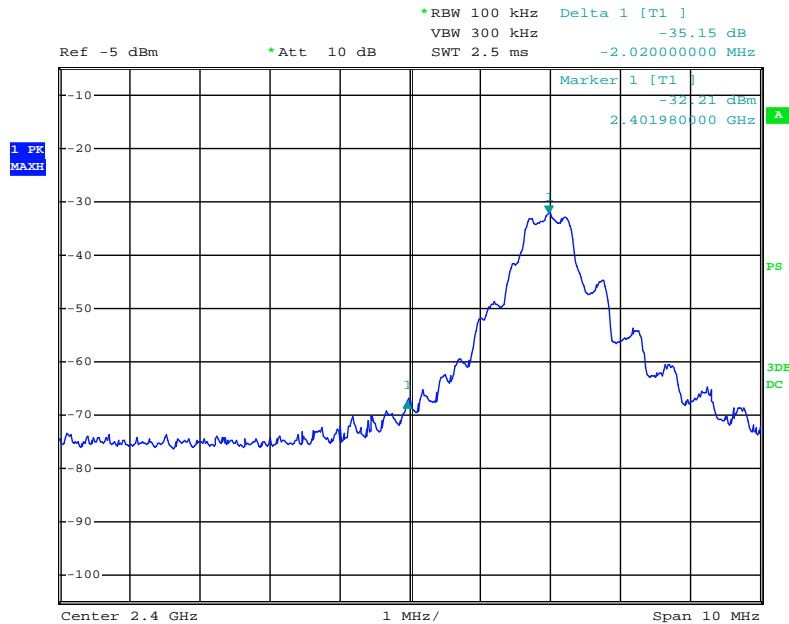




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### Peak Measurement

Bandedge compliance is determined by applying marker-delta method, i.e. (Bandedge Plot).

Lower bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

=90.4 dB $\mu$ V/m – 35.2 dB

=55.2 dB $\mu$ V/m

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

=53.1 dB $\mu$ V/m – 35.2 dB

=17.9 dB $\mu$ V/m

Upper bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

=91.7 dB $\mu$ V/m - 41.3 dB

=50.4 dB $\mu$ V/m

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

=54.4 dB $\mu$ V/m – 41.3 dB

=13.1 dB $\mu$ V/m

The resultant field strength meets the general radiated emission limit in Section 15.209, which does not exceed 74 dB $\mu$ V/m (Peak Limit) and 54 dB $\mu$ V/m (Average Limit).



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## 8.2 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. The effective period (Teff) is approximately 0.34ms for a digital “1” bit which illustrated on technical specification, with a resolution bandwidth (3dB) of 1MHz, so the pulse desensitivity factor is 0dB.

## 8.3 Calculation of Average Factor

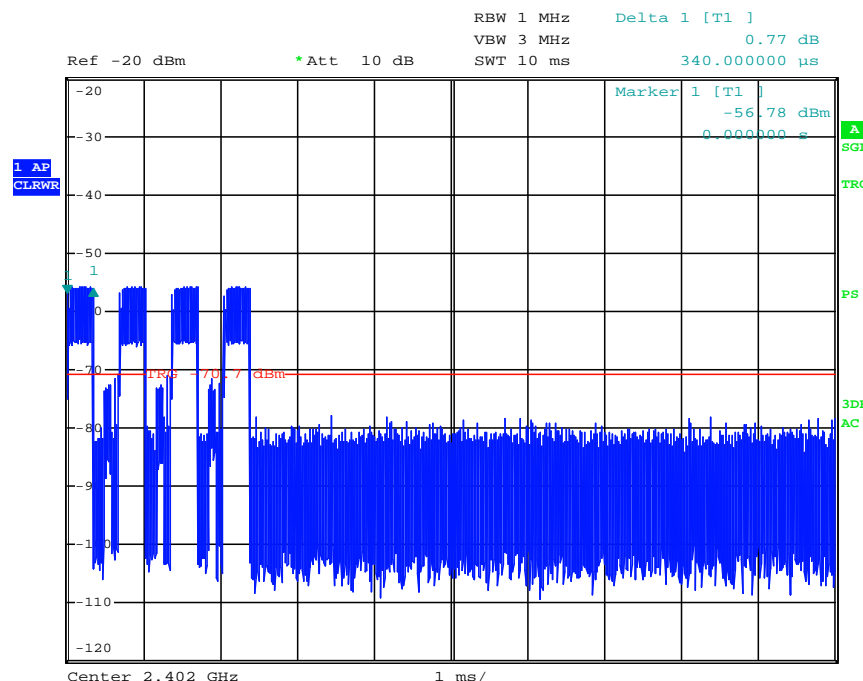
The duty cycle is simply the on-time divided by the period:

The duration of one cycle = 100 ms

Effective period of the cycle =  $4 \times 0.34 = 1.36\text{ms}$

DC =  $1.36/100 = 0.0136$

Therefore, the averaging factor is found by  $20\log 0.0136 = -37.3\text{dB}$ .

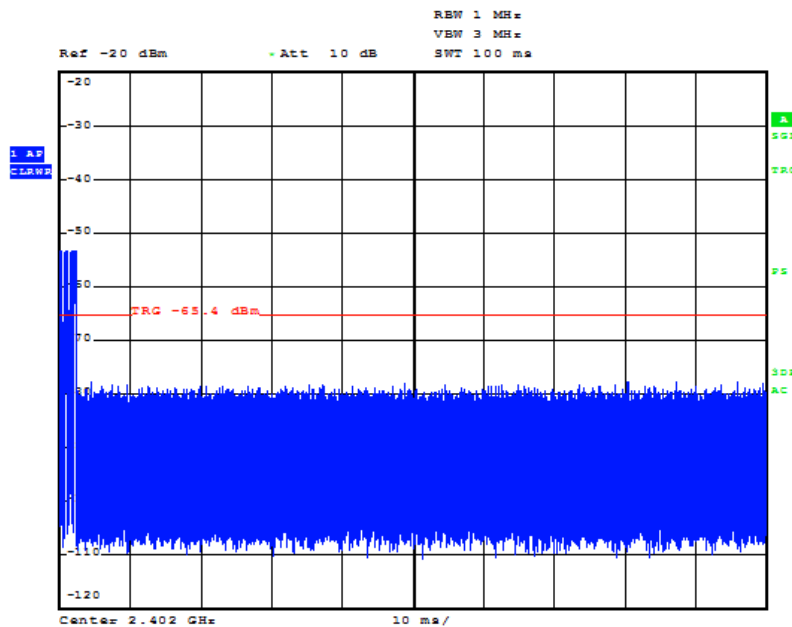
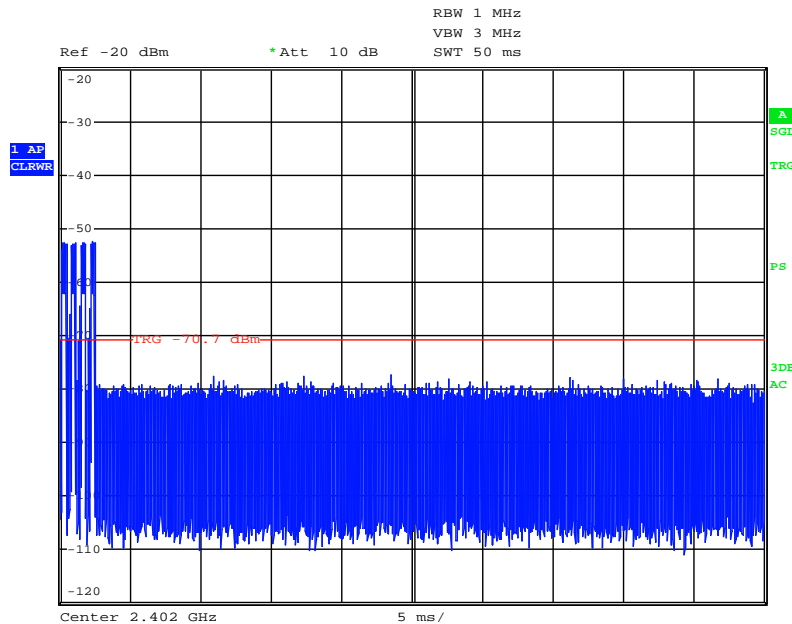




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## 8.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of transmitter operating under the Part 15, Subpart C rules.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axis to obtain maximum emission levels. The antenna height and polarization are also varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.



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#### 8.4 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements were made as described in ANSI C63.4 (2009).

The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.1). Above 1000 MHz, a resolution bandwidth of 3 MHz is used.

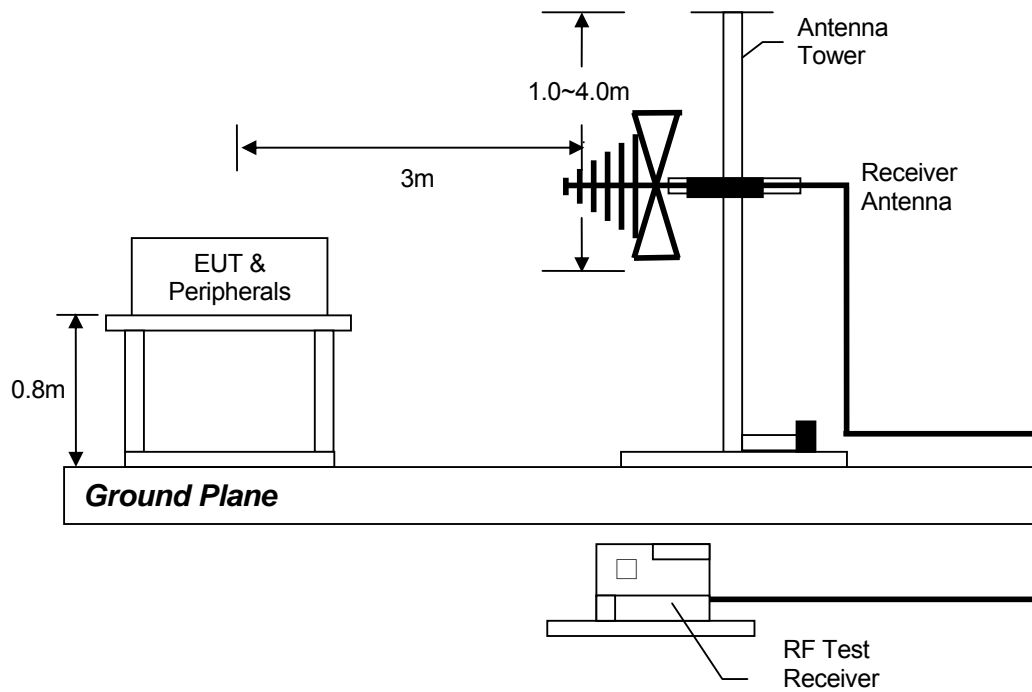
Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the forbidden bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.

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#### 8.4.1 Radiated Emission Test Setup

The figure below shows the test setup, which is utilized to make these measurements.



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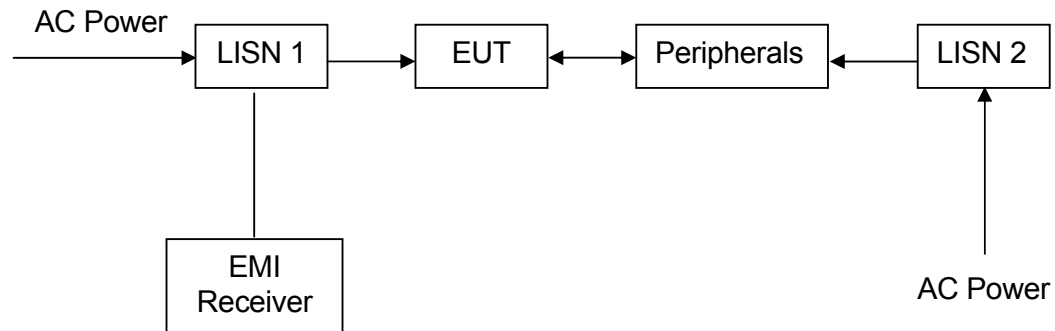
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## 8.4.2 Conducted Emission Test Procedures

For tabletop equipment, the EUT along with its peripherals were placed on a 1.0m(W)×1.5m(L) and 0.8m in height wooden table. For floor-standing equipment, the EUT and all cables were insulated, if required, from the ground plane by up to 12 mm of insulating material. The EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled.

All connecting cables of EUT and peripherals were moved to find the maximum emission.

## 8.4.3 Conducted Emission Test Setup







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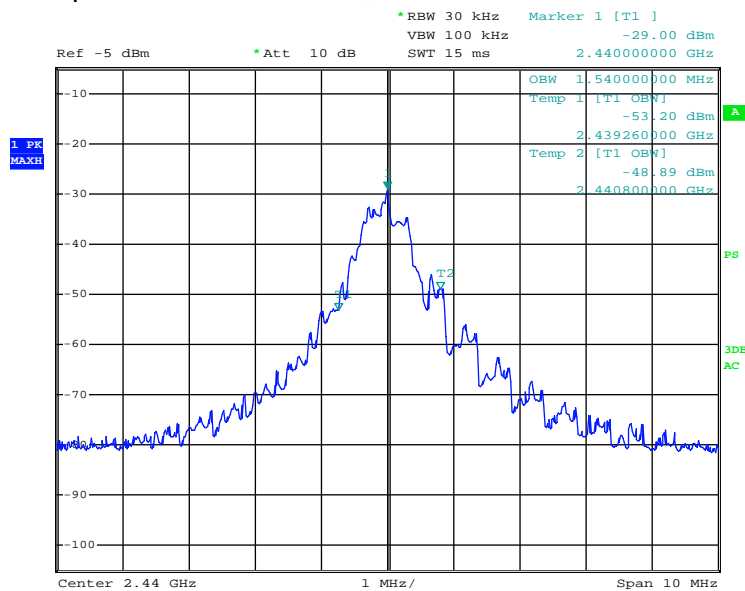


## 8.5 Occupied Bandwidth

### Occupied Bandwidth Results: Bluetooth

Bluetooth	Occupied Bandwidth (MHz)
Low Channel: 2402	1.48
Middle Channel: 2440	1.54
High Channel: 2480	1.24

Worst case plot is shown as below;



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## 9.0 **Confidentiality Request**

For electronic filing, a preliminary copy of the confidentiality request is saved with filename: request.pdf.

## 10.0 **Equipment List**

### 1) Radiated Emissions Test

Equipment	EMI Test Receiver	Log Periodic Antenna	Spectrum Analyzer
Registration No.	EW-2500	EW-0446	EW-2188
Manufacturer	R&S	EMCO	AGILENTTECH
Model No.	ESCI	3146	E4407B
Calibration Date	Nov. 06, 2014	Nov. 10, 2014	Apr. 16, 2014
Calibration Due Date	Nov. 06, 2015	May 10, 2016	Apr. 16, 2015

Equipment	Biconical Antenna	Double Ridged Guide Antenna
Registration No.	EW-0571	EW-1133
Manufacturer	EMCO	EMCO
Model No.	3104C	3115
Calibration Date	Nov. 01, 2013	Apr. 30, 2014
Calibration Due Date	May 01, 2015	Oct. 30, 2015

### 2) Conducted Emissions Test

Equipment	EMI Test Receiver	LISN	Pulse Limiter
Registration No.	EW-2500	EW-0192	EW-0698
Manufacturer	R&S	R&S	R&S
Model No.	ESCI	ESH3-Z5	ESH3-Z2
Calibration Date	Nov. 06, 2014	Jul. 24, 2014	Jul. 07, 2014
Calibration Due Date	Nov. 06, 2015	Apr. 15, 2015	Jul. 07, 2015

### 3) Bandedge Measurement

Equipment	Spectrum Analyzer
Registration No.	EW-2329
Manufacturer	R&S
Model No.	FSP3
Calibration Date	Jun. 19, 2014
Calibration Due Date	Jun. 19, 2015

## END OF TEST REPORT

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