

## Variant FCC Test Report

**Report No.:** RF150401C19I-1

**FCC ID:** ZQAT30

**Test Model:** A0013

**Received Date:** Jun. 08, 2018

**Test Date:** Jul. 20, 2018

**Issued Date:** Jul. 27, 2018

**Applicant:** Nest Labs Inc

**Address:** 3400 Hillview Ave. Palo Alto California, United States 94304

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan  
( R.O.C )

**Test Location:** No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City  
33383, Taiwan, R.O.C.

**FCC Registration /  
Designation Number:** 788550 / TW0003



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

## Table of Contents

<b>Release Control Record</b> .....	<b>3</b>
<b>1 Certificate of Conformity</b> .....	<b>4</b>
<b>2 Summary of Test Results</b> .....	<b>5</b>
2.1 Measurement Uncertainty.....	5
2.2 Modification Record .....	5
<b>3 General Information</b> .....	<b>6</b>
3.1 General Description of EUT .....	6
3.2 Description of Test Modes.....	7
3.2.1 Test Mode Applicability and Tested Channel Detail.....	8
3.3 Description of Support Units .....	9
3.3.1 Configuration of System under Test .....	9
3.4 General Description of Applied Standards.....	9
<b>4 Test Types and Results</b> .....	<b>10</b>
4.1 Radiated Emission and Bandedge Measurement .....	10
4.1.1 Limits of Radiated Emission and Bandedge Measurement .....	10
4.1.2 Test Instruments .....	11
4.1.3 Test Procedures.....	12
4.1.4 Deviation from Test Standard .....	12
4.1.5 Test Set Up .....	13
4.1.6 EUT Operating Conditions.....	14
4.1.7 Test Results .....	15
<b>5 Pictures of Test Arrangements</b> .....	<b>27</b>
<b>Appendix – Information on the Testing Laboratories</b> .....	<b>28</b>

### Release Control Record

Issue No.	Description	Date Issued
RF150401C19I-1	Original Release	Jul. 27, 2018

## 1 Certificate of Conformity

**Product:** Nest Learning Thermostat

**Test Model:** A0013

**Sample Status:** Production Unit

**Applicant:** Nest Labs Inc

**Test Date:** Jul. 20, 2018

**Standards:** 47 CFR FCC Part 15, Subpart C (Section 15.247)  
ANSI C63.10:2013

This report is issued as a supplementary report to BV ADT report no.: RF150401C19-1 R1. This report shall be used by combining with its original report.

**Prepared by :** Evonne Liu , **Date:** Jul. 27, 2018  
Evonne Liu / Specialist

**Approved by :** Dylan Chiou , **Date:** Jul. 27, 2018  
Dylan Chiou / Project Engineer

## 2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	N/A	Refer to Note
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.12 dB at 2483.56 MHz.
15.247(d)	Antenna Port Emission	N/A	Refer to Note
15.247(a)(2)	6 dB Bandwidth	N/A	Refer to Note
---	Occupied Bandwidth Measurement	N/A	Refer to Note
15.247(b)	Conducted power	N/A	Refer to Note
15.247(e)	Power Spectral Density	N/A	Refer to Note
15.203	Antenna Requirement	N/A	Refer to Note

Note: Only Radiated Emissions were performed for this report. Refer to original report for other test data.

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

<b>Product</b>	Nest Learning Thermostat
<b>Test Model</b>	A0013
<b>Status of EUT</b>	Production Unit
<b>Power Supply Rating</b>	5.0Vdc (Adapter)
<b>Modulation Type</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>Modulation Technology</b>	DSSS, OFDM
<b>Transfer Rate</b>	802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to 150.0 Mbps
<b>Operating Frequency</b>	2412 ~ 2462 MHz
<b>Number of Channel</b>	11 for 802.11b, 802.11g, 802.11n (HT20)
<b>Antenna Type</b>	Loop antenna with 1.1 dBi gain
<b>Antenna Connector</b>	N/A
<b>Accessory Device</b>	Refer to Note as below
<b>Data Cable Supplied</b>	Refer to Note as below

Note:

1. This report is issued as a supplementary report to BV ADT report no. RF150401C19-1 R1. The difference compared with original report is adding material of baking painting. Therefore, only Radiated Emissions was verified and recorded in this report.
2. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	Nest	A0017	I/P: 100-240Vac, 50/60Hz, 0.35A O/P: 5Vdc, 2.5A
USB Cable	Nest	NA	2.0m shielded cable w/o core
Stand	Nest	Stand	--

3. This device has 3 configurations as below.

Mode	Description
A	Polish steel
B	Mirror black
C	Brushed brass

4. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

### 3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

### 3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To		Description
	RE $\geq$ 1G	RE<1G	
A	√	√	-
B	√	√	-
C	√	√	-

Where **RE $\geq$ 1G**: Radiated Emission above 1 GHz

**RE<1G**: Radiated Emission below 1 GHz

**PLC**: Power Line Conducted Emission

**APCM**: Antenna Port Conducted Measurement  
(only Conducted Power)

**NOTE**: 1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane** for mode A, B, C.

#### **Radiated Emission Test (Above 1 GHz):**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B, C	802.11b	1 to 11	1	OFDM	BPSK	6.0

#### **Radiated Emission Test (Below 1 GHz):**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B, C	802.11b	1 to 11	1	OFDM	BPSK	6.0

#### **Test Condition:**

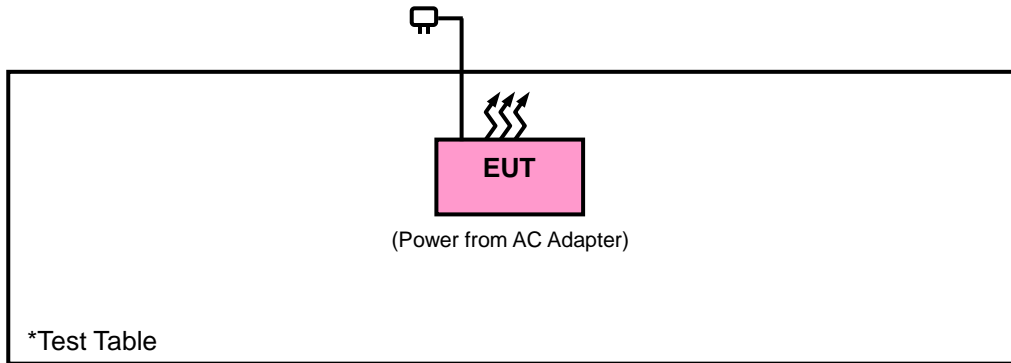
Applicable To	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Jisyong Wang
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Jisyong Wang



### 3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

#### 3.3.1 Configuration of System under Test



### 3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart C (15.247)**

**KDB 558074 D01 DTS Meas Guidance v04**

**ANSI C63.10-2013**

All test items have been performed and recorded as per the above standards.

## 4 Test Types and Results

### 4.1 Radiated Emission and Bandedge Measurement

#### 4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

#### 4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 17, 2017	Oct. 16, 2018
Spectrum Analyzer Agilent	N9010A	MY52220207	Dec. 07, 2017	Dec. 06, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 12, 2017	Dec. 11, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Dec. 11, 2017	Dec. 10, 2018
HORN Antenna SCHWARZBECK	9120D	209	Dec. 13, 2017	Dec. 12, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 01, 2017	Nov. 30, 2018
Fixed Attenuator Mini-Circuits	BW-N4W5+	PAD-ATT4-01	Jan. 29, 2018	Jan. 28, 2019
Loop Antenna	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier EMCI	EMC001340	980201	Nov. 01, 2017	Oct. 31, 2018
Preamplifier EMCI	EMC 012645	980115	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 184045	980116	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 330H	980112	Oct. 20, 2017	Oct. 19, 2018
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF Coaxial Cable	8D-FB	Cable-RF3-04	Oct. 19, 2017	Oct. 18, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	230129/4	Oct. 19, 2017	Oct. 18, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	250723/4	Oct. 19, 2017	Oct. 18, 2018
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 10.
3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is IC7450F-10.

#### 4.1.3 Test Procedures

##### **For Radiated Emission below 30 MHz**

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

##### **Note:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.

##### **For Radiated Emission above 30 MHz**

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna 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.
- d. 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.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

##### **Note:**

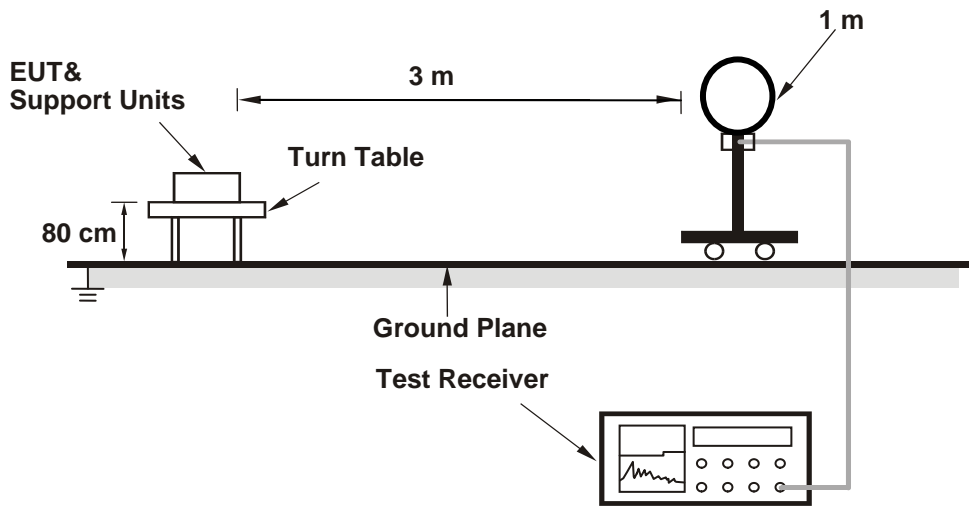
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle < 98 %) or 10 Hz (Duty cycle  $\geq 98$  %) for Average detection (AV) at frequency above 1 GHz.  
(11b: RBW = 1 MHz, VBW = 1 kHz ; 11g: RBW = 1 MHz, VBW = 1 kHz ;  
11n (HT20): RBW = 1 MHz, VBW = 1 kHz ; 11n (HT40): RBW = 1 MHz, VBW = 1 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 Deviation from Test Standard

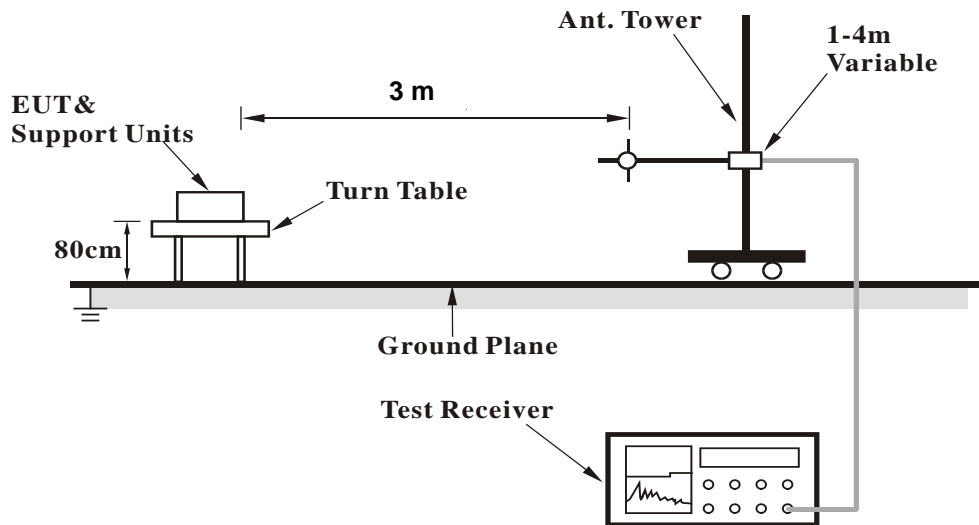
No deviation.

4.1.5 Test Set Up

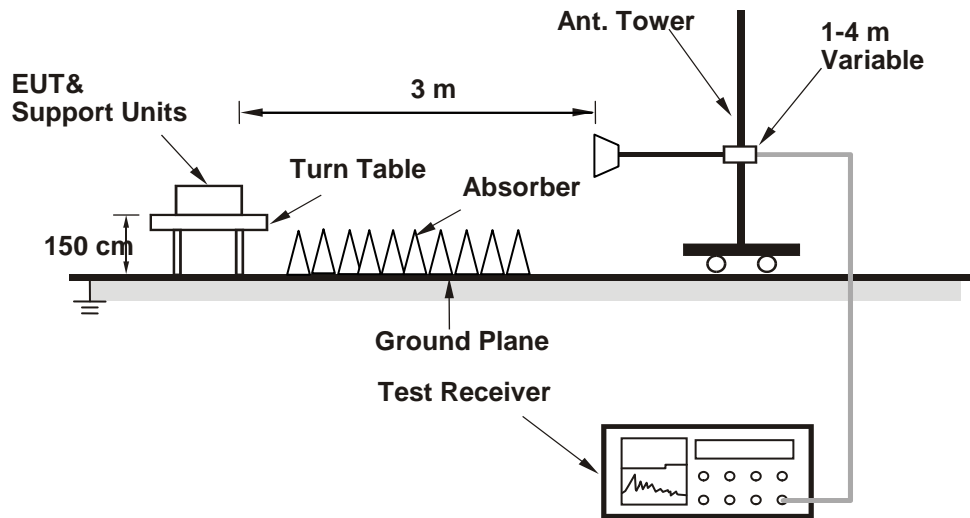
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



**<Radiated Emission above 1 GHz>**



For the actual test configuration, please refer to the attached file (Test Setup Photo).

**4.1.6 EUT Operating Conditions**

- a. Placed the EUT on a testing table.
- b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

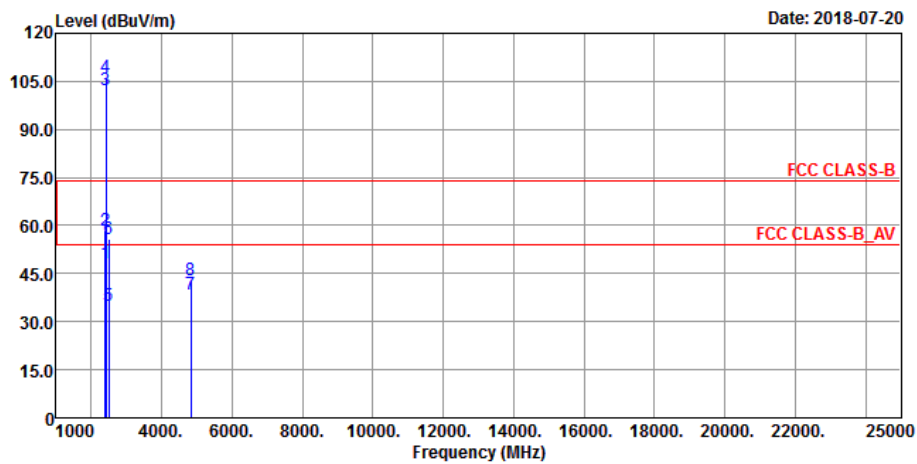
Above 1 GHz Data :

Mode A

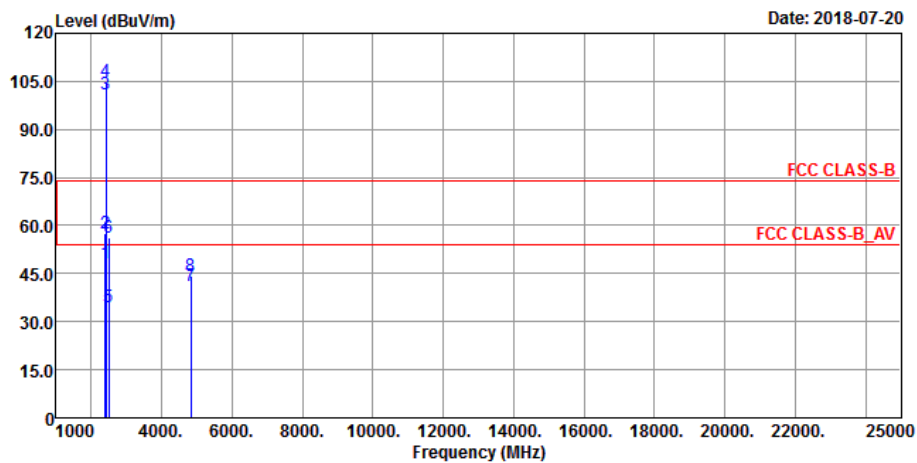
802.11b

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Jisyong Wang

Horizontal



Vertical



**Antennal Polarity & Test Distance: Horizontal at 3 m**

Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386	48.43	55.5	54	-5.57	26.91	3.52	37.5	106	45	Average
2386	58.41	65.48	74	-15.59	26.91	3.52	37.5	106	45	Peak
2412	102.25	109.27			26.96	3.54	37.52	106	45	Average
2412	106.24	113.26			26.96	3.54	37.52	106	45	Peak
2492	35.13	41.56	54	-18.87	27.2	3.62	37.25	106	45	Average
2492	55.77	62.2	74	-18.23	27.2	3.62	37.25	106	45	Peak
4824	38.68	55	54	-15.32	30.99	5.77	53.08	109	161	Average
4824	43.02	59.34	74	-30.98	30.99	5.77	53.08	109	161	Peak

**Antennal Polarity & Test Distance: Vertical at 3 m**

Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386	48.15	55.22	54	-5.85	26.91	3.52	37.5	127	28	Average
2386	57.71	64.78	74	-16.29	26.91	3.52	37.5	127	28	Peak
2412	100.95	107.97			26.96	3.54	37.52	127	28	Average
2412	104.9	111.92			26.96	3.54	37.52	127	28	Peak
2488	34.46	40.96	54	-19.54	27.2	3.62	37.32	127	28	Average
2488	56.03	62.53	74	-17.97	27.2	3.62	37.32	127	28	Peak
4824	41.06	57.38	54	-12.94	30.99	5.77	53.08	126	309	Average
4824	44.43	60.75	74	-29.57	30.99	5.77	53.08	126	309	Peak

Remarks:

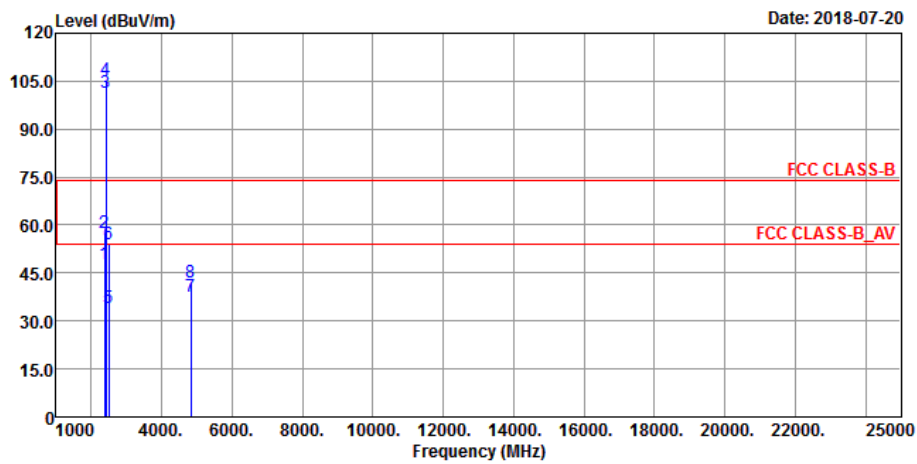
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.



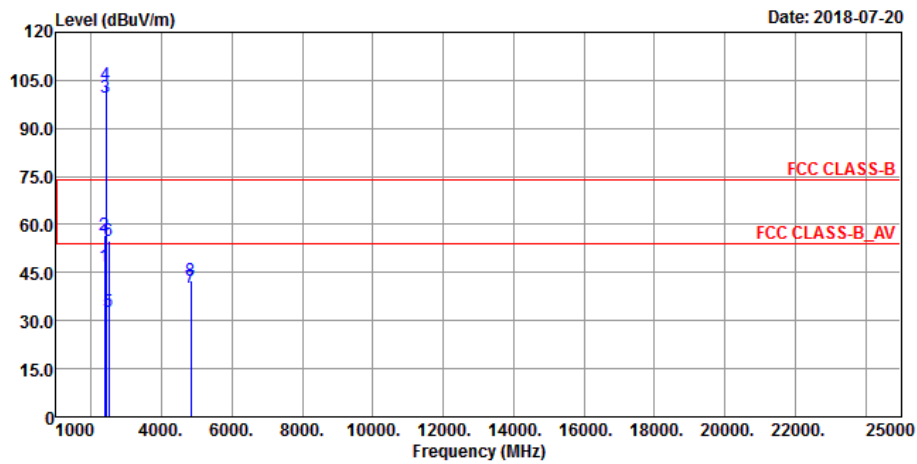
**Mode B**

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Jisyong Wang

**Horizontal**



**Vertical**



**Antennal Polarity & Test Distance: Horizontal at 3 m**

Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2375	47.85	54.92	54	-6.15	26.91	3.52	37.5	129	108	Average
2375	57.78	64.85	74	-16.22	26.91	3.52	37.5	129	108	Peak
2412	101.25	108.27			26.96	3.54	37.52	129	108	Average
2412	105.23	112.25			26.96	3.54	37.52	129	108	Peak
2491	34.23	40.66	54	-19.77	27.2	3.62	37.25	129	108	Average
2491	54.23	60.66	74	-19.77	27.2	3.62	37.25	129	108	Peak
4824	37.85	54.17	54	-16.15	30.99	5.77	53.08	165	231	Average
4824	42.01	58.33	74	-31.99	30.99	5.77	53.08	165	231	Peak

**Antennal Polarity & Test Distance: Vertical at 3 m**

Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2377	47.12	54.19	54	-6.88	26.91	3.52	37.5	165	222	Average
2377	56.85	63.92	74	-17.15	26.91	3.52	37.5	165	222	Peak
2412	99.85	106.87			26.96	3.54	37.52	165	222	Average
2412	103.52	110.54			26.96	3.54	37.52	165	222	Peak
2489	32.89	39.39	54	-21.11	27.2	3.62	37.32	165	222	Average
2489	55.01	61.51	74	-18.99	27.2	3.62	37.32	165	222	Peak
4824	40.23	56.55	54	-13.77	30.99	5.77	53.08	102	222	Average
4824	42.52	58.84	74	-31.48	30.99	5.77	53.08	102	222	Peak

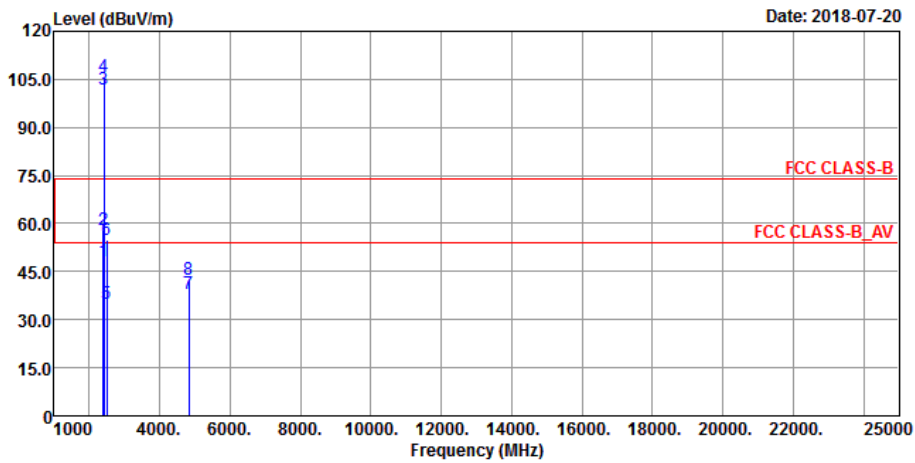
Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

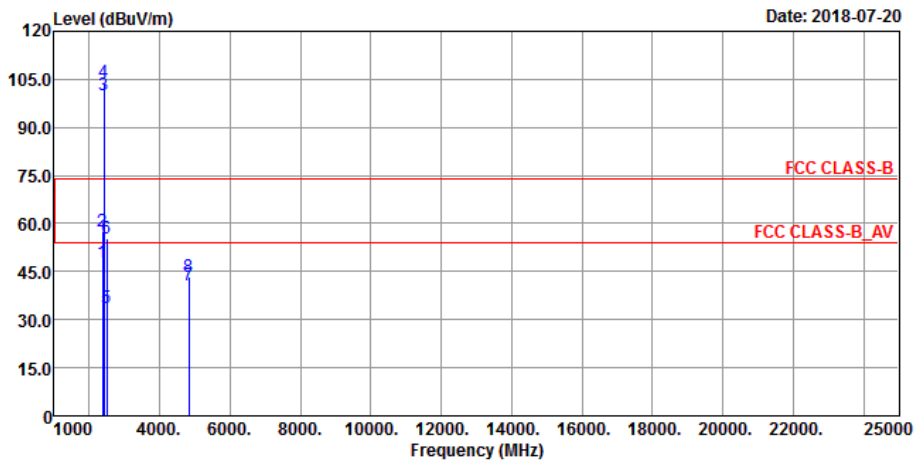
**Mode C**

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Jisyong Wang

**Horizontal**



**Vertical**



**Antennal Polarity & Test Distance: Horizontal at 3 m**

Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	48.11	55.18	54	-5.89	26.91	3.52	37.5	121	111	Average
2390	58.13	65.2	74	-15.87	26.91	3.52	37.5	121	111	Peak
2412	102.01	109.03			26.96	3.54	37.52	121	111	Average
2412	106.03	113.05			26.96	3.54	37.52	121	111	Peak
2490	34.98	41.41	54	-19.02	27.2	3.62	37.25	121	111	Average
2490	55.03	61.46	74	-18.97	27.2	3.62	37.25	121	111	Peak
4824	38.25	54.57	54	-15.75	30.99	5.77	53.08	132	222	Average
4824	42.45	58.77	74	-31.55	30.99	5.77	53.08	132	222	Peak

**Antennal Polarity & Test Distance: Vertical at 3 m**

Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2380	47.89	54.96	54	-6.11	26.91	3.52	37.5	125	31	Average
2380	57.48	64.55	74	-16.52	26.91	3.52	37.5	125	31	Peak
2412	100.03	107.05			26.96	3.54	37.52	125	31	Average
2412	104.02	111.04			26.96	3.54	37.52	125	31	Peak
2487	33.52	40.02	54	-20.48	27.2	3.62	37.32	125	31	Average
2487	55.25	61.75	74	-18.75	27.2	3.62	37.32	125	31	Peak
4824	40.78	57.1	54	-13.22	30.99	5.77	53.08	111	165	Average
4824	43.25	59.57	74	-30.75	30.99	5.77	53.08	111	165	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

**9 kHz ~ 30 MHz Data:**

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

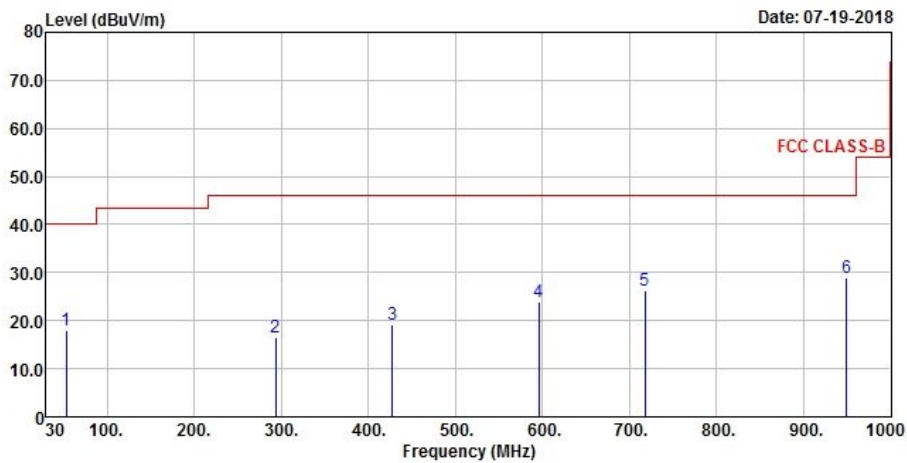
**30 MHz ~ 1 GHz Worst-Case Data:**

802.11b

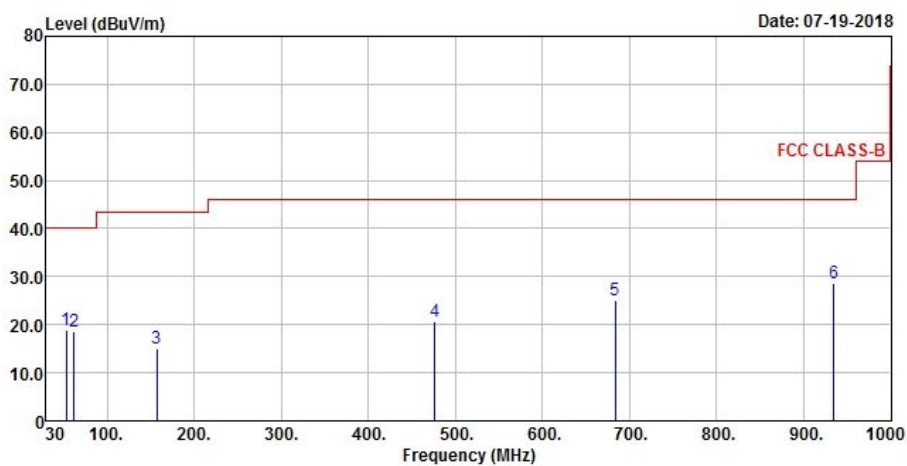
Mode A

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Jisyong Wang

**Horizontal**



**Vertical**



Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
53.28	17.86	35.98	40	-22.14	12.66	0.55	31.33	102	147	Peak
293.84	16.62	33.96	46	-29.38	12.77	1.63	31.74	110	154	Peak
427.7	19.07	33.02	46	-26.93	15.89	2.18	32.02	107	81	Peak
595.51	24.04	33.86	46	-21.96	19.5	2.88	32.2	123	222	Peak
717.73	26.17	33.39	46	-19.83	21.07	3.39	31.68	141	55	Peak
949.56	28.88	32.69	46	-17.12	23.79	4.22	31.82	114	24	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
53.28	18.79	36.91	40	-21.21	12.66	0.55	31.33	112	23	Peak
62.01	18.6	37.75	40	-21.4	11.71	0.59	31.45	125	33	Peak
157.07	14.96	33.03	43.5	-28.54	12.72	1.01	31.8	142	55	Peak
476.2	20.76	33.39	46	-25.24	16.85	2.39	31.87	111	42	Peak
683.78	25.06	33.04	46	-20.94	20.62	3.24	31.84	113	54	Peak
935.01	28.58	32.66	46	-17.42	23.71	4.17	31.96	115	74	Peak

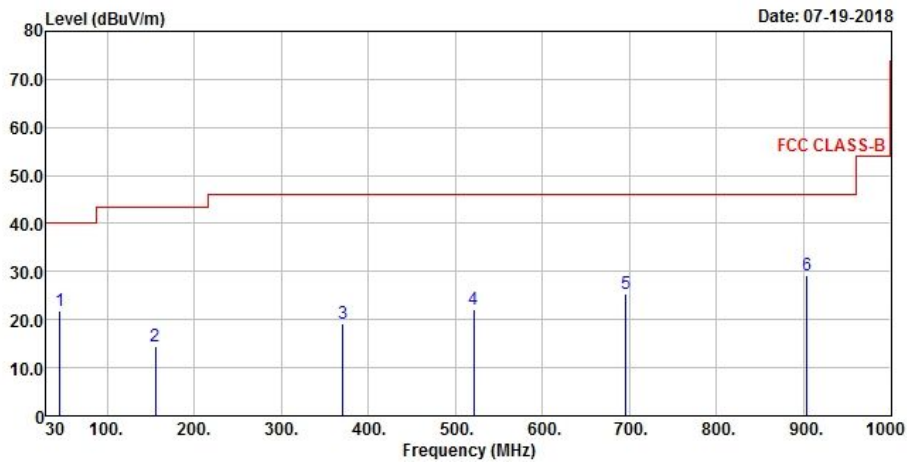
Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value

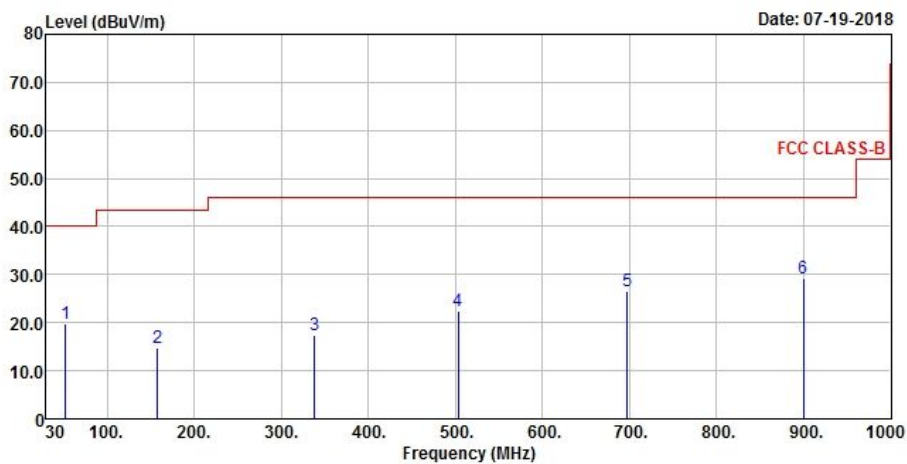
**Mode B**

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Jisyong Wang

**Horizontal**



**Vertical**



Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
45.52	21.77	38.92	40	-18.23	13.5	0.51	31.16	108	42	Peak
155.13	14.6	32.62	43.5	-28.9	12.72	1	31.74	123	26	Peak
370.47	19.11	34.43	46	-26.89	14.63	1.97	31.92	111	221	Peak
520.82	22.2	33.4	46	-23.8	17.79	2.59	31.58	104	114	Peak
695.42	25.28	33.05	46	-20.72	20.76	3.28	31.81	124	24	Peak
903.97	29.32	33.77	46	-16.68	23.53	4.05	32.03	141	55	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
52.31	19.82	37.84	40	-20.18	12.76	0.54	31.32	110	24	Peak
158.04	14.7	32.79	43.5	-28.8	12.73	1.01	31.83	113	35	Peak
338.46	17.44	33.56	46	-28.56	13.87	1.83	31.82	132	27	Peak
503.36	22.48	34.16	46	-23.52	17.4	2.53	31.61	123	47	Peak
697.36	26.46	34.18	46	-19.54	20.78	3.3	31.8	118	236	Peak
900.09	29.1	33.57	46	-16.9	23.51	4.03	32.01	123	180	Peak

Remarks:

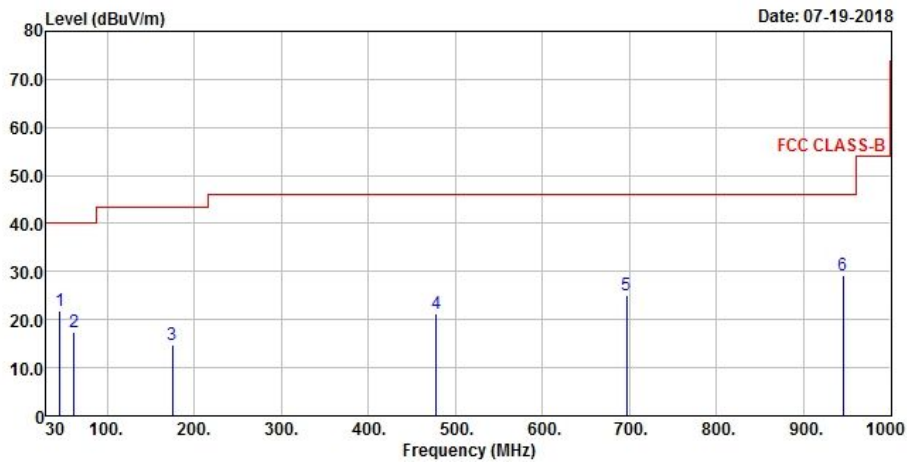
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value



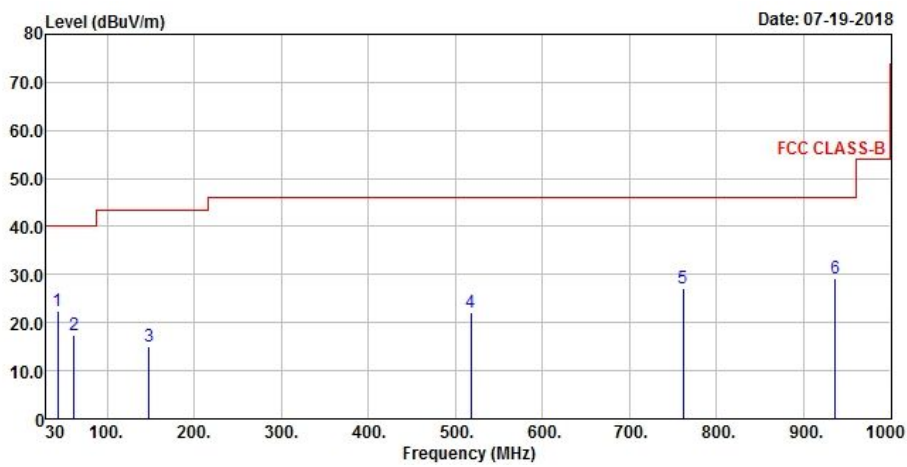
### Mode C

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Jisyong Wang

### Horizontal



### Vertical



Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
45.52	21.82	38.97	40	-18.18	13.5	0.51	31.16	124	100	Peak
62.01	17.41	36.56	40	-22.59	11.71	0.59	31.45	114	28	Peak
174.53	14.77	34.18	43.5	-28.73	11.28	1.09	31.78	132	17	Peak
478.14	21.28	33.85	46	-24.72	16.89	2.4	31.86	110	53	Peak
696.39	25.09	32.83	46	-20.91	20.77	3.3	31.81	105	78	Peak
945.68	29.2	33.08	46	-16.8	23.77	4.21	31.86	108	211	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
43.58	22.49	39.51	40	-17.51	13.59	0.5	31.11	112	87	Peak
62.01	17.4	36.55	40	-22.6	11.71	0.59	31.45	147	224	Peak
148.34	15.09	33.1	43.5	-28.41	12.64	0.97	31.62	102	34	Peak
517.91	22.09	33.35	46	-23.91	17.73	2.58	31.57	108	78	Peak
761.38	27.26	33.48	46	-18.74	21.68	3.54	31.44	106	99	Peak
935.98	29.37	33.44	46	-16.63	23.71	4.17	31.95	113	58	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value

## 5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

## Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab**

Tel: 886-2-26052180

Fax: 886-2-26051924

**Hsin Chu EMC/RF/Telecom Lab**

Tel: 886-3-6668565

Fax: 886-3-6668323

**Hwa Ya EMC/RF/Safety Lab**

Tel: 886-3-3183232

Fax: 886-3-3270892

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

The address and road map of all our labs can be found in our web site also.

--- END ---