

FCC Test Report (Radiated Test)

Report No.: RF151228C18D-1

FCC ID: 2AKPU1DX

Test Model: 1DX

Series Model: 1FX

Received Date: Dec. 28, 2015

Test Date: Mar. 22 ~ Mar. 23, 2017

Issued Date: Mar. 28, 2017

Applicant: iZotope, Inc.

Address: 60 Hampshire Street 02139 Cambridge Massachusetts United States

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

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



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Release Control Record

Issue No.	Description	Date Issued
RF151228C18D-1	Original release.	Mar. 28, 2017

1 Certificate of Conformity

Product: Communication Module

Brand: iZotope, Inc.

Test Model: 1DX

Series Model: 1FX

Sample Status: Engineering sample

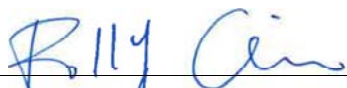
Applicant: iZotope, Inc.

Test Date: Mar. 22 ~ Mar. 23, 2017

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

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :


Polly Chien / Specialist

Date:

Mar. 28, 2017

Approved by :


Ken Liu / Senior Manager

Date:

Mar. 28, 2017

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	Pass	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 -4.2dB at 2390.00MHz.
15.247(d)	Antenna Port Emission	Pass	Refer to Note
15.247(a)(2)	6dB bandwidth	Pass	Refer to Note
15.247(b)	Conducted power	Pass	Refer to Note
15.247(e)	Power Spectral Density	Pass	Refer to Note
15.203	Antenna Requirement	Pass	No antenna connector is used.

Note: For other test items were recorded in Report No.: RF151228C18D.

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	30MHz ~ 200MHz	3.59 dB
	200MHz ~ 1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Communication Module
Brand	iZotope, Inc.
Test Model	1DX
Series Model	1FX
Model Difference	Refer to Note
Status of EUT	Engineering sample
Power Supply Rating	3.6Vdc VBAT and 3.3Vdc VDDIO
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: 11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 65Mbps
Operating Frequency	2412 ~ 2462MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20)
Output Power	173.780mW
Antenna Type	Monopole antenna with 4dBi gain
Antenna Connector	NA
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. This report is issued as a supplementary report of BV ADT report no.: RF151228C18B-3.
2. This report is prepared for FCC class II permissive change. The differences compared with original report are declaring the antenna gain from average value 1.4dBi to peak value 4dBi, changing applicant and brand. Therefore, radiated emission was re-tested.
3. The following models are provided to this EUT.

Brand	Model	Description
iZotope, Inc.	1DX	For marketing purpose
	1FX	

4. The EUT provides 1 completed transmitter and 1 receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	1TX

5. The above EUT information is declared by manufacturer and for more detailed features description, please refer 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	Channel	Frequency
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO		DESCRIPTION
	RE $\geq$ 1G	RE<1G	
-	√	√	-

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz & Bandedge Measurement **RE<1G**: Radiated Emission below 1GHz

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

Radiated Emission Test (Above 1GHz):

- ☒ 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)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5

Radiated Emission Test (Below 1GHz):

- ☒ 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)
-	802.11g	1 to 11	1	OFDM	BPSK	6.0

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE $\geq$ 1G	25deg. C, 69%RH	120Vac, 60Hz	Bond Tseng
RE<1G	24deg. C, 69%RH	120Vac, 60Hz	Bond Tseng

3.3 Description of Support Units

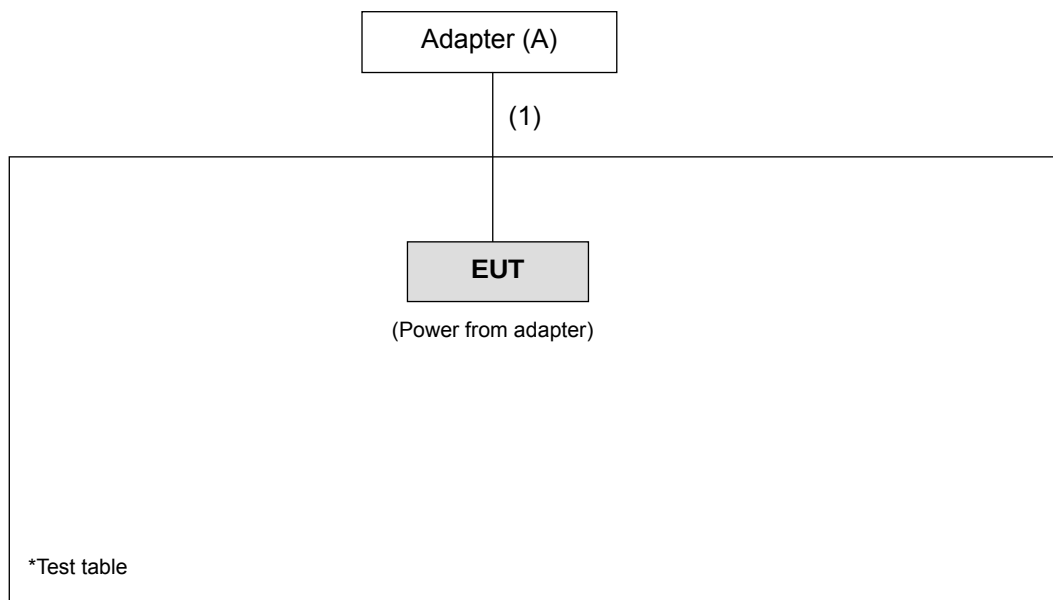
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Adapter	UPBRIGHT	FJ-SW0502000D	NA	NA	Provided by manufacturer

Note: Item A was placed under the test table.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Power cable	1	1.5	-	0	Provided by manufacturer

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 v03r05
 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 20dB 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 1000MHz, 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 20dB 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. 24, 2016	Oct. 23, 2017
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Apr. 19, 2016	Apr. 18, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Dec. 28, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Dec. 27, 2016	Dec. 26, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 14, 2016	Dec. 13, 2017
Loop Antenna	EM-6879	269	Aug. 11, 2016	Aug. 10, 2017
Preamplifier Agilent	8449B	3008A01638	Feb. 22, 2017	Feb. 21, 2018
Preamplifier Agilent	8447D	2944A10638	Aug. 09, 2016	Aug. 08, 2017
RF signal cable HUBER+SUHNER+ 震謙	SUCOFLEX 104	CABLE-CH9-02 (248780+MY13377)	Feb. 02, 2017	Feb. 01, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-03 (274092)	Aug. 09, 2016	Aug. 08, 2017
RF signal cable Woken	8D-FB	Cable-CH9-01	Aug. 09, 2016	Aug. 08, 2017
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	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 9.
 3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 215374.
 5. The IC Site Registration No. is IC 7450F-9.

4.1.3 Test Procedures

For Radiated emission below 30MHz

- 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. Both X and Y axes 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 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) 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 detect 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:

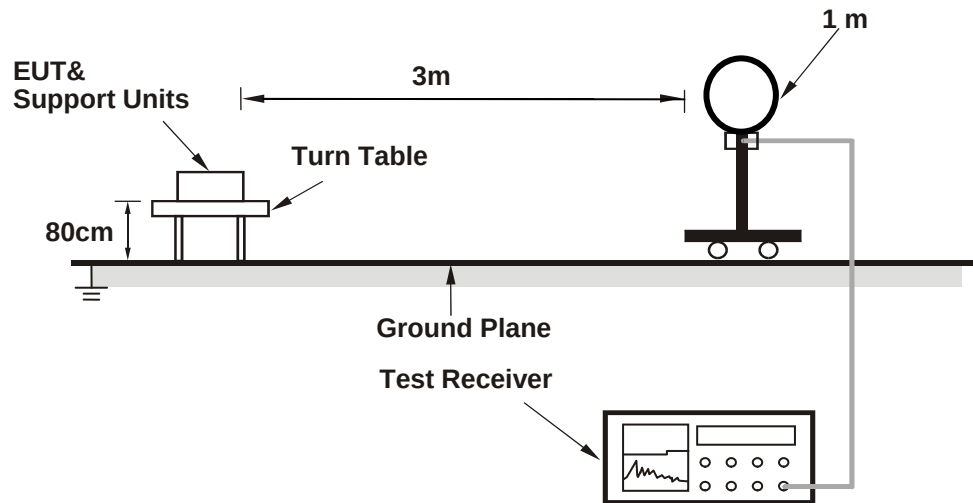
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

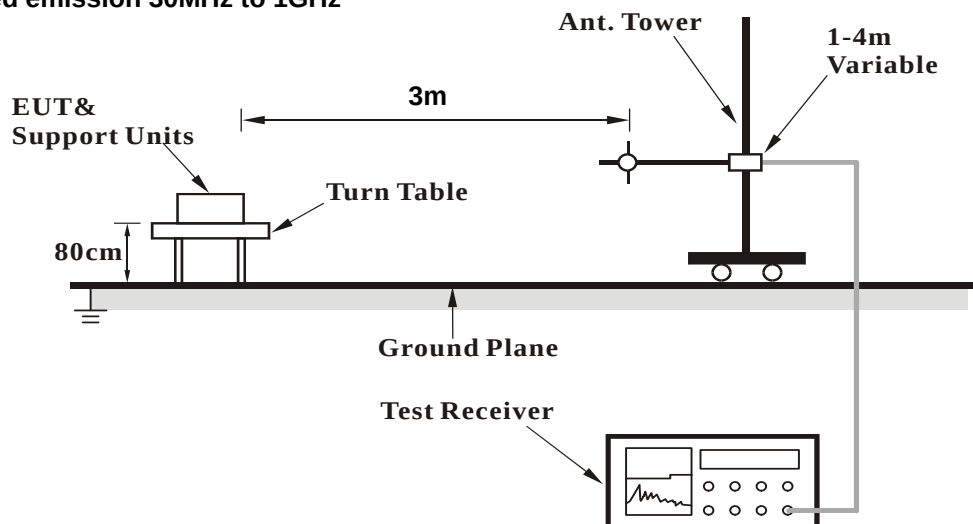
No deviation.

4.1.5 Test Set Up

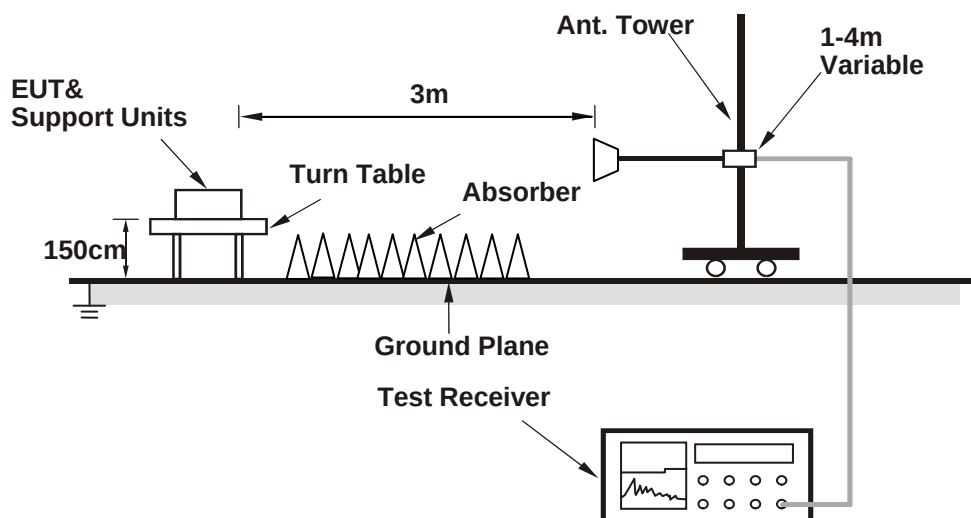
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Worst-case Data :

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.0 PK	74.0	-15.0	3.91 H	11	26.80	32.20
2	2390.00	49.2 AV	54.0	-4.8	3.91 H	11	17.00	32.20
3	*2412.00	109.9 PK			3.91 H	11	77.60	32.30
4	*2412.00	106.5 AV			3.91 H	11	74.20	32.30
5	4824.00	47.2 PK	74.0	-26.8	1.59 H	266	45.20	2.00
6	4824.00	33.9 AV	54.0	-20.1	1.59 H	266	31.90	2.00
7	#7236.00	54.5 PK	74.0	-19.5	1.54 H	78	46.50	8.00
8	#7236.00	44.6 AV	54.0	-9.4	1.54 H	78	36.60	8.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.7 PK	74.0	-16.3	3.84 V	300	25.50	32.20
2	2390.00	48.5 AV	54.0	-5.5	3.84 V	300	16.30	32.20
3	*2412.00	103.0 PK			3.84 V	300	70.70	32.30
4	*2412.00	99.3 AV			3.84 V	300	67.00	32.30
5	4824.00	46.3 PK	74.0	-27.7	1.72 V	225	44.30	2.00
6	4824.00	33.2 AV	54.0	-20.8	1.72 V	225	31.20	2.00
7	#7236.00	56.1 PK	74.0	-17.9	3.30 V	191	48.10	8.00
8	#7236.00	47.4 AV	54.0	-6.6	3.30 V	191	39.40	8.00

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	109.3 PK			2.47 H	8	76.90	32.40
2	*2437.00	105.8 AV			2.47 H	8	73.40	32.40
3	4874.00	47.9 PK	74.0	-26.1	2.71 H	162	45.70	2.20
4	4874.00	34.7 AV	54.0	-19.3	2.71 H	162	32.50	2.20
5	7311.00	53.4 PK	74.0	-20.6	3.47 H	325	45.30	8.10
6	7311.00	42.2 AV	54.0	-11.8	3.47 H	325	34.10	8.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	105.8 PK			3.91 V	282	73.40	32.40
2	*2437.00	102.5 AV			3.91 V	282	70.10	32.40
3	4874.00	46.7 PK	74.0	-27.3	1.81 V	125	44.50	2.20
4	4874.00	32.9 AV	54.0	-21.1	1.81 V	125	30.70	2.20
5	7311.00	52.9 PK	74.0	-21.1	2.86 V	173	44.80	8.10
6	7311.00	39.4 AV	54.0	-14.6	2.86 V	173	31.30	8.10

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.1 PK			2.69 H	8	76.50	32.60
2	*2462.00	105.7 AV			2.69 H	8	73.10	32.60
3	2483.50	59.8 PK	74.0	-14.2	2.69 H	8	27.10	32.70
4	2483.50	48.7 AV	54.0	-5.3	2.69 H	8	16.00	32.70
5	4924.00	46.9 PK	74.0	-27.1	2.53 H	176	44.70	2.20
6	4924.00	34.0 AV	54.0	-20.0	2.53 H	176	31.80	2.20
7	7386.00	53.5 PK	74.0	-20.5	2.93 H	358	45.30	8.20
8	7386.00	42.6 AV	54.0	-11.4	2.93 H	358	34.40	8.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.8 PK			3.59 V	187	74.20	32.60
2	*2462.00	103.8 AV			3.59 V	187	71.20	32.60
3	2483.50	57.9 PK	74.0	-16.1	3.59 V	187	25.20	32.70
4	2483.50	47.0 AV	54.0	-7.0	3.59 V	187	14.30	32.70
5	4924.00	46.4 PK	74.0	-27.6	1.41 V	19	44.20	2.20
6	4924.00	32.9 AV	54.0	-21.1	1.41 V	19	30.70	2.20
7	7386.00	52.8 PK	74.0	-21.2	3.54 V	55	44.60	8.20
8	7386.00	40.8 AV	54.0	-13.2	3.54 V	55	32.60	8.20

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.8 PK	74.0	-12.2	3.51 H	15	29.60	32.20
2	2390.00	49.8 AV	54.0	-4.2	3.51 H	15	17.60	32.20
3	*2412.00	109.4 PK			3.51 H	15	77.10	32.30
4	*2412.00	98.5 AV			3.51 H	15	66.20	32.30
5	4824.00	46.7 PK	74.0	-27.3	2.56 H	182	44.70	2.00
6	4824.00	33.9 AV	54.0	-20.1	2.56 H	182	31.90	2.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.3 PK	74.0	-15.7	2.73 V	95	26.10	32.20
2	2390.00	46.2 AV	54.0	-7.8	2.73 V	95	14.00	32.20
3	*2412.00	101.6 PK			2.73 V	95	69.30	32.30
4	*2412.00	91.5 AV			2.73 V	95	59.20	32.30
5	4824.00	45.6 PK	74.0	-28.4	1.28 V	162	43.60	2.00
6	4824.00	32.4 AV	54.0	-21.6	1.28 V	162	30.40	2.00

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	108.1 PK			3.43 H	32	75.70	32.40
2	*2437.00	98.2 AV			3.43 H	32	65.80	32.40
3	4874.00	47.1 PK	74.0	-26.9	1.52 H	139	44.90	2.20
4	4874.00	33.7 AV	54.0	-20.3	1.52 H	139	31.50	2.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	104.6 PK			2.95 V	195	72.20	32.40
2	*2437.00	95.0 AV			2.95 V	195	62.60	32.40
3	4874.00	45.8 PK	74.0	-28.2	1.99 V	266	43.60	2.20
4	4874.00	32.9 AV	54.0	-21.1	1.99 V	266	30.70	2.20

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.2 PK			3.77 H	14	75.60	32.60
2	*2462.00	97.8 AV			3.77 H	14	65.20	32.60
3	2483.50	62.9 PK	74.0	-11.1	3.77 H	14	30.20	32.70
4	2483.50	48.5 AV	54.0	-5.5	3.77 H	14	15.80	32.70
5	4924.00	47.0 PK	74.0	-27.0	1.62 H	82	44.80	2.20
6	4924.00	33.9 AV	54.0	-20.1	1.62 H	82	31.70	2.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.9 PK			1.74 V	87	73.30	32.60
2	*2462.00	94.8 AV			1.74 V	87	62.20	32.60
3	2483.50	59.3 PK	74.0	-14.7	1.74 V	87	26.60	32.70
4	2483.50	46.4 AV	54.0	-7.6	1.74 V	87	13.70	32.70
5	4924.00	45.9 PK	74.0	-28.1	2.49 V	269	43.70	2.20
6	4924.00	32.8 AV	54.0	-21.2	2.49 V	269	30.60	2.20

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.2 PK	74.0	-12.8	2.22 H	5	29.00	32.20
2	2390.00	49.5 AV	54.0	-4.5	2.22 H	5	17.30	32.20
3	*2412.00	107.2 PK			2.22 H	5	74.90	32.30
4	*2412.00	96.7 AV			2.22 H	5	64.40	32.30
5	4824.00	46.6 PK	74.0	-27.4	1.88 H	122	44.60	2.00
6	4824.00	34.0 AV	54.0	-20.0	1.88 H	122	32.00	2.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.6 PK	74.0	-16.4	3.34 V	160	25.40	32.20
2	2390.00	46.6 AV	54.0	-7.4	3.34 V	160	14.40	32.20
3	*2412.00	101.5 PK			3.34 V	160	69.20	32.30
4	*2412.00	91.3 AV			3.34 V	160	59.00	32.30
5	4824.00	45.6 PK	74.0	-28.4	1.71 V	89	43.60	2.00
6	4824.00	32.7 AV	54.0	-21.3	1.71 V	89	30.70	2.00

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	106.7 PK			2.48 H	12	74.30	32.40
2	*2437.00	96.9 AV			2.48 H	12	64.50	32.40
3	4874.00	47.3 PK	74.0	-26.7	1.66 H	127	45.10	2.20
4	4874.00	34.2 AV	54.0	-19.8	1.66 H	127	32.00	2.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	102.0 PK			2.93 V	242	69.60	32.40
2	*2437.00	92.0 AV			2.93 V	242	59.60	32.40
3	4874.00	45.8 PK	74.0	-28.2	1.99 V	268	43.60	2.20
4	4874.00	32.8 AV	54.0	-21.2	1.99 V	268	30.60	2.20

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.2 PK			1.77 H	8	75.60	32.60
2	*2462.00	97.4 AV			1.77 H	8	64.80	32.60
3	2483.50	62.1 PK	74.0	-11.9	1.77 H	8	29.40	32.70
4	2483.50	48.6 AV	54.0	-5.4	1.77 H	8	15.90	32.70
5	4924.00	46.8 PK	74.0	-27.2	2.12 H	224	44.60	2.20
6	4924.00	33.5 AV	54.0	-20.5	2.12 H	224	31.30	2.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.8 PK			2.59 V	315	72.20	32.60
2	*2462.00	95.1 AV			2.59 V	315	62.50	32.60
3	2483.50	57.8 PK	74.0	-16.2	2.59 V	315	25.10	32.70
4	2483.50	46.3 AV	54.0	-7.7	2.59 V	315	13.60	32.70
5	4924.00	45.5 PK	74.0	-28.5	2.32 V	187	43.30	2.20
6	4924.00	32.6 AV	54.0	-21.4	2.32 V	187	30.40	2.20

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz Worst-case Data: 802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	31.94	29.7 QP	40.0	-10.3	1.24 H	15	45.70	-16.00
2	249.66	34.0 QP	46.0	-12.0	1.00 H	98	47.20	-13.20
3	302.14	36.0 QP	46.0	-10.0	1.00 H	173	47.10	-11.10
4	370.18	33.7 QP	46.0	-12.3	1.00 H	136	43.30	-9.60
5	492.65	31.8 QP	46.0	-14.2	1.49 H	235	38.40	-6.60
6	722.02	36.6 QP	46.0	-9.4	1.24 H	194	37.90	-1.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	51.38	34.5 QP	40.0	-5.5	1.00 V	16	48.40	-13.90
2	133.03	36.9 QP	43.5	-6.6	1.00 V	201	51.50	-14.60
3	212.73	33.8 QP	43.5	-9.7	1.00 V	100	49.40	-15.60
4	311.86	37.3 QP	46.0	-8.7	1.00 V	258	48.10	-10.80
5	434.33	35.0 QP	46.0	-11.0	1.00 V	181	42.90	-7.90
6	729.80	35.8 QP	46.0	-10.2	1.00 V	176	36.80	-1.00

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

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 accredited and approved 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

Web Site: www.bureauveritas-adt.com

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

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