

FCC Test Report

Report No.: RF130410C05C

FCC ID: FDI000000017

Test Model: WI-U2-433DM

Received Date: Aug. 31, 2015

Test Date: Sep. 08 ~ Sep. 10, 2015

Issued Date: Sep. 18, 2015

Applicant: Buffalo Inc.

Address: AKAMONDORI Bldg., 30-20, Ohsu 3-chome, Naka-ku, Nagoya 460-8315, Japan

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.

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



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Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Modification Record	6
3 General Information	7
3.1 General Description of EUT	7
3.2 Description of Test Modes	8
3.2.1 Test Mode Applicability and Tested Channel Detail.....	9
3.3 Duty Cycle of Test Signal	11
3.4 Description of Support Units	12
3.4.1 Configuration of System under Test	12
3.5 General Description of Applied Standards	12
4 Test Types and Results	13
4.1 Radiated Emission and Bandedge Measurement.....	13
4.1.1 Limits of Radiated Emission and Bandedge Measurement	13
4.1.2 Test Instruments	14
4.1.3 Test Procedures.....	15
4.1.4 Deviation from Test Standard	15
4.1.5 Test Set Up	16
4.1.6 EUT Operating Conditions.....	16
4.1.7 Test Results	17
4.2 Conducted Emission Measurement	36
4.2.1 Limits of Conducted Emission Measurement	36
4.2.2 Test Instruments	36
4.2.3 Test Procedures.....	37
4.2.4 Deviation from Test Standard	37
4.2.5 Test Setup.....	37
4.2.6 EUT Operating Conditions.....	37
4.2.7 Test Results	38
4.3 Transmit Power Measurement	40
4.3.1 Limits of Transmit Power Measurement	40
4.3.2 Test Setup.....	40
4.3.3 Test Instruments	40
4.3.4 Test Procedure	41
4.3.5 Deviation from Test Standard	41
4.3.6 EUT Operating Conditions.....	41
4.3.7 Test Result.....	42
4.4 Peak Power Spectral Density Measurement	47
4.4.1 Limits of Peak Power Spectral Density Measurement	47
4.4.2 Test Setup.....	47
4.4.3 Test Instruments	47
4.4.4 Test Procedures.....	47
4.4.5 Deviation from Test Standard	48
4.4.6 EUT Operating Conditions.....	48
4.4.7 Test Results	49
4.5 Frequency Stability.....	53
4.5.1 Limits of Frequency Stability Measurement	53
4.5.2 Test Setup.....	53
4.5.3 Test Instruments	53
4.5.4 Test Procedure	53
4.5.5 Deviation from Test Standard	53
4.5.6 EUT Operating Condition	53



4.5.7 Test Results	54
4.6 6dB Bandwidth Measurement.....	55
4.6.1 Limits of 6dB Bandwidth Measurement.....	55
4.6.2 Test Setup.....	55
4.6.3 Test Instruments	55
4.6.4 Test Procedure	55
4.6.5 Deviation from Test Standard	55
4.6.6 EUT Operating Condition	55
4.6.7 Test Results	56
5 Pictures of Test Arrangements.....	58
Appendix – Information on the Testing Laboratories	59



A D T

Release Control Record

Issue No.	Description	Date Issued
RF130410C05C	Original release	Sep. 18, 2015

1 Certificate of Conformity

Product: AirStation
Brand: Buffalo Inc.
Trade Mark: BUFFALO
Test Model: WI-U2-433DM
Sample Status: Engineering sample
Applicant: Buffalo Inc.
Test Date: Sep. 08 ~ Sep. 10, 2015
Standards: 47 CFR FCC Part 15, Subpart E (Section 15.407)
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 : Celine Chou , **Date:** Sep. 18, 2015
Celine Chou / Specialist

Approved by : Ken Liu , **Date:** Sep. 18, 2015
Ken Liu / Senior Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.207 15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -20.07dB at 0.18125MHz.
15.407(b) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.4dB at 5714.90MHz.
15.407(a)(1/2 /3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
15.407(a)(1/2 /3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

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) (\pm)
Conducted Emissions at mains ports0	150kHz ~ 30MHz	2.44 dB
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	AirStation
Brand	Buffalo Inc.
Trade Mark	BUFFALO
Test Model	WI-U2-433DM
Status of EUT	Engineering sample
Power Supply Rating	5.0Vdc from host equipment
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	OFDM
Transfer Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 150.0Mbps 802.11ac: up to 433.3Mbps
Operating Frequency	5150 ~ 5250MHz, 5725 ~ 5850MHz
Number of Channel	5150 ~ 5250MHz: 802.11a, 802.11n (20MHz): 4 802.11n (40MHz): 2 802.11ac (80MHz): 1 5725 ~ 5850MHz: 802.11a, 802.11n (20MHz): 5 802.11n (40MHz): 2 802.11ac (80MHz): 1
Output Power	33.963mW for 5150 ~ 5250MHz 35.563mW for 5725 ~ 5850MHz
Antenna Type	PIFA antenna with 2.72dBi gain
Antenna Connector	NA
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change.
2. This report is issued as a supplementary report to the original BV ADT report no.: RF130410C05-1. The difference compared with the original report is updating U-NII-1 and U-NII-3 band to new rules. All test data had been re-tested.
3. The EUT provides 1 completed transmitter and 1 receiver.

Modulation Mode	TX Function
802.11a	1TX
802.11n (20MHz)	1TX
802.11n (40MHz)	1TX
802.11ac (80MHz)	1TX

* The modulation and bandwidth are similar for 802.11n mode for 20MHz / 40MHz and 802.11ac mode for 20MHz / 40MHz, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

3.2 Description of Test Modes

For 5150 ~ 5250MHz

4 channels are provided for 802.11a, 802.11n (20MHz), 802.11ac (20MHz):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (40MHz), 802.11ac (40MHz):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (80MHz):

Channel	Frequency
42	5210MHz

For 5725 ~ 5850MHz

5 channels are provided for 802.11a, 802.11n (20MHz), 802.11ac (20MHz):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

2 channels are provided for 802.11n (40MHz), 802.11ac (40MHz):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (80MHz):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE≥1G**: Radiated Emission above 1GHz & Bandedge Measurement
RE<1G: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission
APCM: Antenna Port Conducted Measurement

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5150-5250	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11n (20MHz)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
-	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	13.5
-	802.11ac (80MHz)		42	42	OFDM	BPSK	29.3
-	802.11a	5725-5850	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (20MHz)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
-	802.11n (40MHz)		151 to 159	151, 159	OFDM	BPSK	13.5
-	802.11ac (80MHz)		155	155	OFDM	BPSK	29.3

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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5150-5250	36 to 48	36	OFDM	BPSK	6.0
	802.11a	5725-5850	149 to 165		OFDM	BPSK	6.0

Power Line Conducted Emission Test:

- 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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5150-5250	36 to 48	36	OFDM	BPSK	6.0
	802.11a	5725-5850	149 to 165		OFDM	BPSK	6.0

Antenna Port Conducted Measurement:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- 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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5150-5250	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11n (20MHz)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
-	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	13.5
-	802.11ac (80MHz)		42	42	OFDM	BPSK	29.3
-	802.11a	5725-5850	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (20MHz)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
-	802.11n (40MHz)		151 to 159	151, 159	OFDM	BPSK	13.5
-	802.11ac (80MHz)		155	155	OFDM	BPSK	29.3

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE≥1G	27deg. C, 62%RH	120Vac, 60Hz	Alan Wu
RE<1G	27deg. C, 61%RH	120Vac, 60Hz	Alan Wu
PLC	18deg. C, 70%RH	120Vac, 60Hz	Nick Hsu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Frank Liu

3.3 Duty Cycle of Test Signal

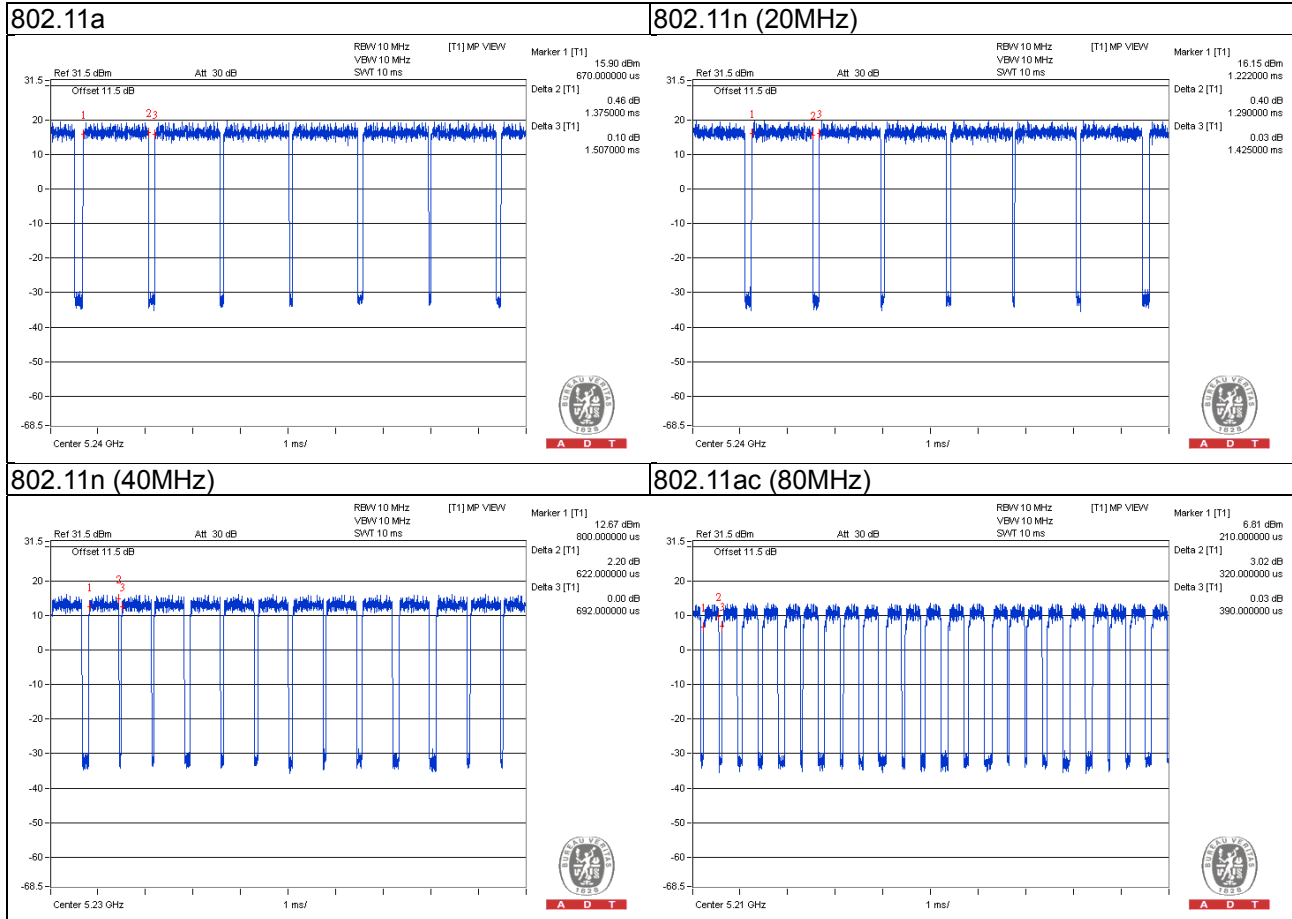
Duty cycle is < 98%, duty factor shall be considered.

802.11a: Duty cycle = $1.375/1.507 = 0.912$, Duty factor = $10 * \log(1/0.912) = 0.40$

802.11n (20MHz): Duty cycle = $1.290/1.425 = 0.905$, Duty factor = $10 * \log(1/0.905) = 0.43$

802.11n (40MHz): Duty cycle = $0.622/0.692 = 0.899$, Duty factor = $10 * \log(1/0.899) = 0.46$

802.11ac (80MHz): Duty cycle = $0.320/0.390 = 0.821$, Duty factor = $10 * \log(1/0.821) = 0.86$



3.4 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.

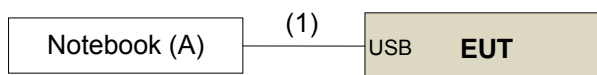
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5420	33MKMQ1	FCC DoC Approved	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as a communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB Cable	1	1.8	Y	0	-

3.4.1 Configuration of System under Test



3.5 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 E (15.407)

789033 D02 General UNII Test Procedures New Rules v01

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

Note: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

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.

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.

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

Applicable To	Limit	
789033 D02 General UNII Test Procedures New Rules v01	FIELD STRENGTH AT 3m	
	PK:74 (dBµV/m)	AV:54 (dBµV/m)
Applicable To	EIRP Limit	Equivalent Field Strength at 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBµV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27 (dBm/MHz) ^{*1} PK:-17 (dBm/MHz) ^{*2}	PK: 68.2(dBµV/m) ^{*1} PK:78.2 (dBµV/m) ^{*2}

NOTE: ^{*1} beyond 10MHz of the band edge ^{*2} within 10 MHz of band edge

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000 \sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$



4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 06, 2014	Oct. 05, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Jul. 08, 2015	Jul. 07, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Feb. 06, 2015	Feb. 05, 2016
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Feb. 05, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8449B	3008A01960	Aug. 09, 2015	Aug. 08, 2016
Preamplifier Agilent	8447D	2944A10631	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-02(295012+ 309220)	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03(250724)	Aug. 09, 2015	Aug. 08, 2016
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021703	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2014	Oct. 17, 2015
High Speed Peak Power Meter	ML2495A	0824011	Jul. 09, 2015	Jul. 08, 2016
Power Sensor	MA2411B	0738171	Jul. 09, 2015	Jul. 08, 2016
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 08, 2015	Jun. 07, 2016

- 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 4.
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 460141.
5. The IC Site Registration No. is IC7450F-4.

4.1.3 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 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:

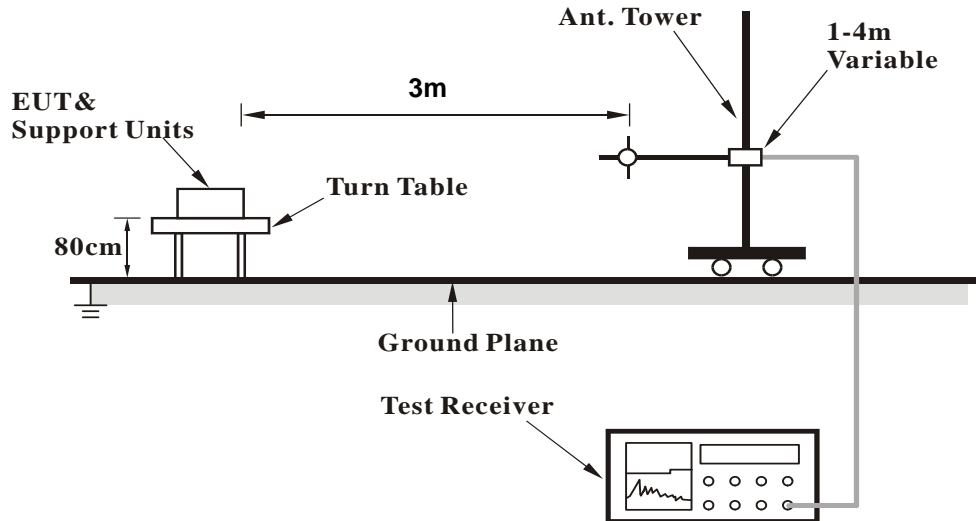
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

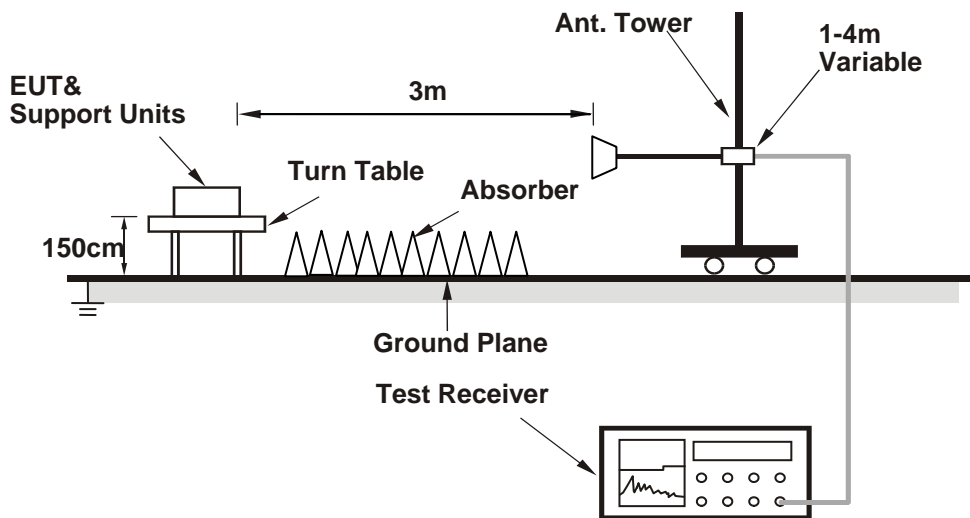
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

The EUT Connected with notebook via USB cable and set it under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Worst-Case Data:

802.11a

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5150.00	63.2 PK	74.0	-10.8	1.45 H	197	58.20	5.00
2	5150.00	47.8 AV	54.0	-6.2	1.45 H	197	42.80	5.00
3	*5180.00	107.0 PK			1.42 H	199	67.90	39.10
4	*5180.00	96.8 AV			1.42 H	199	57.70	39.10
5	#10360.00	58.7 PK	74.0	-15.3	1.00 H	309	41.60	17.10
6	#10360.00	49.4 AV	54.0	-4.6	1.00 H	309	32.30	17.10

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	5150.00	63.0 PK	74.0	-11.0	1.00 V	181	58.00	5.00
2	5150.00	47.1 AV	54.0	-6.9	1.00 V	181	42.10	5.00
3	*5180.00	106.0 PK			1.00 V	186	66.90	39.10
4	*5180.00	96.7 AV			1.00 V	186	57.60	39.10
5	#10360.00	58.6 PK	74.0	-15.4	1.02 V	351	41.50	17.10
6	#10360.00	48.6 AV	54.0	-5.4	1.02 V	351	31.50	17.10

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	*5200.00	106.8 PK			1.64 H	199	67.60	39.20
2	*5200.00	97.6 AV			1.64 H	199	58.40	39.20
3	#10400.00	58.4 PK	74.0	-15.6	1.00 H	304	41.10	17.30
4	#10400.00	49.2 AV	54.0	-4.8	1.00 H	304	31.90	17.30

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	*5200.00	105.6 PK			1.00 V	166	66.40	39.20
2	*5200.00	95.6 AV			1.00 V	166	56.40	39.20
3	#10400.00	58.1 PK	74.0	-15.9	1.00 V	356	40.80	17.30
4	#10400.00	48.0 AV	54.0	-6.0	1.00 V	356	30.70	17.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	*5240.00	107.4 PK			1.55 H	200	68.20	39.20
2	*5240.00	98.2 AV			1.55 H	200	59.00	39.20
3	5350.00	62.5 PK	74.0	-11.5	1.56 H	204	57.10	5.40
4	5350.00	47.0 AV	54.0	-7.0	1.56 H	204	41.60	5.40
5	#10480.00	58.1 PK	74.0	-15.9	1.00 H	302	40.80	17.30
6	#10480.00	48.7 AV	54.0	-5.3	1.00 H	302	31.40	17.30
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	*5240.00	106.1 PK			1.05 V	187	66.90	39.20
2	*5240.00	95.9 AV			1.05 V	187	56.70	39.20
3	5350.00	62.3 PK	74.0	-11.7	1.06 V	182	56.90	5.40
4	5350.00	46.8 AV	54.0	-7.2	1.06 V	182	41.40	5.40
5	#10480.00	57.7 PK	74.0	-16.3	1.00 V	354	40.40	17.30
6	#10480.00	47.6 AV	54.0	-6.4	1.00 V	354	30.30	17.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	#5714.90	63.4 PK	74.0	-10.6	1.62 H	200	57.40	6.00
2	#5714.90	45.9 AV	54.0	-8.1	1.62 H	200	39.90	6.00
3	#5722.90	60.7 PK	78.2	-17.5	1.62 H	200	54.60	6.10
4	#5725.00	43.3 PK	78.2	-34.9	1.62 H	200	37.20	6.10
5	*5745.00	104.7 PK			1.65 H	201	64.40	40.30
6	*5745.00	94.3 AV			1.65 H	201	54.00	40.30
7	11490.00	57.8 PK	74.0	-16.2	1.00 H	300	40.20	17.60
8	11490.00	48.7 AV	54.0	-5.3	1.00 H	300	31.10	17.60

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	#5714.90	63.1 PK	74.0	-10.9	1.00 V	198	57.10	6.00
2	#5714.90	45.4 AV	54.0	-8.6	1.00 V	198	39.40	6.00
3	#5722.90	60.3 PK	78.2	-17.9	1.00 V	198	54.20	6.10
4	#5725.00	42.9 PK	78.2	-35.3	1.00 V	198	36.80	6.10
5	*5745.00	100.3 PK			1.00 V	191	60.00	40.30
6	*5745.00	90.0 AV			1.00 V	191	49.70	40.30
7	11490.00	57.3 PK	74.0	-16.7	1.00 V	358	39.70	17.60
8	11490.00	48.0 AV	54.0	-6.0	1.00 V	358	30.40	17.60

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	*5785.00	104.5 PK			1.68 H	200	64.20	40.30
2	*5785.00	94.0 AV			1.68 H	200	53.70	40.30
3	11570.00	57.9 PK	74.0	-16.1	1.00 H	302	40.40	17.50
4	11570.00	48.7 AV	54.0	-5.3	1.00 H	302	31.20	17.50

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	*5785.00	100.5 PK			1.00 V	192	60.20	40.30
2	*5785.00	90.2 AV			1.00 V	192	49.90	40.30
3	11570.00	57.7 PK	74.0	-16.3	1.00 V	355	40.20	17.50
4	11570.00	47.8 AV	54.0	-6.2	1.00 V	355	30.30	17.50

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	*5825.00	105.0 PK			1.75 H	200	64.60	40.40
2	*5825.00	94.1 AV			1.75 H	200	53.70	40.40
3	#5850.00	38.8 PK	78.2	-39.4	1.74 H	201	32.40	6.40
4	#5852.10	58.4 PK	78.2	-19.8	1.74 H	201	52.00	6.40
5	#5860.10	57.6 PK	74.0	-16.4	1.74 H	201	51.20	6.40
6	#5860.10	44.6 AV	54.0	-9.4	1.74 H	201	38.20	6.40
7	11650.00	57.6 PK	74.0	-16.4	1.00 H	305	40.30	17.30
8	11650.00	48.5 AV	54.0	-5.5	1.00 H	305	31.20	17.30

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	*5825.00	100.6 PK			1.00 V	175	60.20	40.40
2	*5825.00	90.0 AV			1.00 V	175	49.60	40.40
3	#5850.00	38.6 PK	78.2	-39.6	1.00 V	170	32.20	6.40
4	#5852.10	58.2 PK	78.2	-20.0	1.00 V	170	51.80	6.40
5	#5860.10	57.3 PK	74.0	-16.7	1.00 V	170	50.90	6.40
6	#5860.10	44.0 AV	54.0	-10.0	1.00 V	170	37.60	6.40
7	11650.00	57.2 PK	74.0	-16.8	1.00 V	359	39.90	17.30
8	11650.00	47.5 AV	54.0	-6.5	1.00 V	359	30.20	17.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11n (20MHz)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5150.00	62.6 PK	74.0	-11.4	1.54 H	192	57.60	5.00
2	5150.00	47.4 AV	54.0	-6.6	1.54 H	192	42.40	5.00
3	*5180.00	106.5 PK			1.56 H	199	67.40	39.10
4	*5180.00	96.8 AV			1.56 H	199	57.70	39.10
5	#10360.00	58.1 PK	74.0	-15.9	1.00 H	302	41.00	17.10
6	#10360.00	48.5 AV	54.0	-5.5	1.00 H	302	31.40	17.10

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	5150.00	62.5 PK	74.0	-11.5	1.00 V	187	57.50	5.00
2	5150.00	46.3 AV	54.0	-7.7	1.00 V	187	41.30	5.00
3	*5180.00	105.7 PK			1.00 V	187	66.60	39.10
4	*5180.00	95.2 AV			1.00 V	187	56.10	39.10
5	#10360.00	57.3 PK	74.0	-16.7	1.00 V	355	40.20	17.10
6	#10360.00	48.3 AV	54.0	-5.7	1.00 V	355	31.20	17.10

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 40	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	*5200.00	106.6 PK			1.64 H	199	67.40	39.20
2	*5200.00	97.0 AV			1.64 H	199	57.80	39.20
3	#10400.00	58.2 PK	74.0	-15.8	1.00 H	308	40.90	17.30
4	#10400.00	48.8 AV	54.0	-5.2	1.00 H	308	31.50	17.30

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	*5200.00	105.5 PK			1.28 V	165	66.30	39.20
2	*5200.00	96.0 AV			1.28 V	165	56.80	39.20
3	#10400.00	57.9 PK	74.0	-16.1	1.00 V	354	40.60	17.30
4	#10400.00	47.8 AV	54.0	-6.2	1.00 V	354	30.50	17.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	*5240.00	106.9 PK			1.41 H	199	67.70	39.20
2	*5240.00	97.3 AV			1.41 H	199	58.10	39.20
3	5350.00	61.8 PK	74.0	-12.2	1.44 H	193	56.40	5.40
4	5350.00	46.6 AV	54.0	-7.4	1.44 H	193	41.20	5.40
5	#10480.00	57.6 PK	74.0	-16.4	1.00 H	301	40.30	17.30
6	#10480.00	48.4 AV	54.0	-5.6	1.00 H	301	31.10	17.30
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	*5240.00	105.1 PK			1.04 V	186	65.90	39.20
2	*5240.00	95.4 AV			1.04 V	186	56.20	39.20
3	5350.00	61.7 PK	74.0	-12.3	1.04 V	181	56.30	5.40
4	5350.00	45.9 AV	54.0	-8.1	1.04 V	181	40.50	5.40
5	#10480.00	57.4 PK	74.0	-16.6	1.00 V	353	40.10	17.30
6	#10480.00	47.9 AV	54.0	-6.1	1.00 V	353	30.60	17.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	#5714.90	63.4 PK	74.0	-10.6	1.61 H	200	57.40	6.00
2	#5714.90	46.4 AV	54.0	-7.6	1.61 H	200	40.40	6.00
3	#5722.90	62.2 PK	78.2	-16.0	1.61 H	200	56.10	6.10
4	#5725.00	42.3 PK	78.2	-35.9	1.61 H	200	36.20	6.10
5	*5745.00	104.0 PK			1.66 H	201	63.70	40.30
6	*5745.00	93.4 AV			1.66 H	201	53.10	40.30
7	11490.00	57.4 PK	74.0	-16.6	1.00 H	301	39.80	17.60
8	11490.00	48.5 AV	54.0	-5.5	1.00 H	301	30.90	17.60

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	#5714.90	62.7 PK	74.0	-11.3	1.00 V	196	56.70	6.00
2	#5714.90	45.8 AV	54.0	-8.2	1.00 V	196	39.80	6.00
3	#5722.90	61.7 PK	78.2	-16.5	1.00 V	196	55.60	6.10
4	#5725.00	41.8 PK	78.2	-36.4	1.00 V	196	35.70	6.10
5	*5745.00	100.4 PK			1.00 V	193	60.10	40.30
6	*5745.00	90.0 AV			1.00 V	193	49.70	40.30
7	11490.00	57.1 PK	74.0	-16.9	1.00 V	356	39.50	17.60
8	11490.00	47.7 AV	54.0	-6.3	1.00 V	356	30.10	17.60

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	*5785.00	104.7 PK			1.54 H	199	64.40	40.30
2	*5785.00	94.0 AV			1.54 H	199	53.70	40.30
3	11570.00	57.8 PK	74.0	-16.2	1.00 H	304	40.30	17.50
4	11570.00	48.4 AV	54.0	-5.6	1.00 H	304	30.90	17.50

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	*5785.00	100.5 PK			1.00 V	191	60.20	40.30
2	*5785.00	89.7 AV			1.00 V	191	49.40	40.30
3	11570.00	57.5 PK	74.0	-16.5	1.00 V	356	40.00	17.50
4	11570.00	47.6 AV	54.0	-6.4	1.00 V	356	30.10	17.50

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	*5825.00	104.2 PK			1.61 H	201	63.80	40.40
2	*5825.00	93.6 AV			1.61 H	201	53.20	40.40
3	#5850.00	36.9 PK	78.2	-41.3	1.67 H	204	30.50	6.40
4	#5852.10	59.2 PK	78.2	-19.0	1.67 H	204	52.80	6.40
5	#5860.10	57.9 PK	74.0	-16.1	1.67 H	204	51.50	6.40
6	#5860.10	44.3 AV	54.0	-9.7	1.67 H	204	37.90	6.40
7	11650.00	57.1 PK	74.0	-16.9	1.00 H	303	39.80	17.30
8	11650.00	47.9 AV	54.0	-6.1	1.00 H	303	30.60	17.30

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	*5825.00	100.0 PK			1.00 V	174	59.60	40.40
2	*5825.00	89.6 AV			1.00 V	174	49.20	40.40
3	#5850.00	36.5 PK	78.2	-41.7	1.00 V	175	30.10	6.40
4	#5852.10	59.0 PK	78.2	-19.2	1.00 V	175	52.60	6.40
5	#5860.10	57.4 PK	74.0	-16.6	1.00 V	175	51.00	6.40
6	#5860.10	43.7 AV	54.0	-10.3	1.00 V	175	37.30	6.40
7	11650.00	56.6 PK	74.0	-17.4	1.00 V	355	39.30	17.30
8	11650.00	47.1 AV	54.0	-6.9	1.00 V	355	29.80	17.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11n (40MHz)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5150.00	62.6 PK	74.0	-11.4	1.49 H	193	57.60	5.00
2	5150.00	47.9 AV	54.0	-6.1	1.49 H	193	42.90	5.00
3	*5190.00	103.3 PK			1.42 H	198	64.20	39.10
4	*5190.00	93.8 AV			1.42 H	198	54.70	39.10
5	#10380.00	57.6 PK	74.0	-16.4	1.00 H	306	40.40	17.20
6	#10380.00	48.1 AV	54.0	-5.9	1.00 H	306	30.90	17.20

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	5150.00	62.0 PK	74.0	-12.0	1.00 V	184	57.00	5.00
2	5150.00	46.9 AV	54.0	-7.1	1.00 V	184	41.90	5.00
3	*5190.00	101.6 PK			1.00 V	185	62.50	39.10
4	*5190.00	91.9 AV			1.00 V	185	52.80	39.10
5	#10380.00	57.1 PK	74.0	-16.9	1.00 V	352	39.90	17.20
6	#10380.00	47.7 AV	54.0	-6.3	1.00 V	352	30.50	17.20

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 46	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	*5230.00	103.6 PK			1.54 H	199	64.40	39.20
2	*5230.00	93.9 AV			1.54 H	199	54.70	39.20
3	5350.00	62.2 PK	74.0	-11.8	1.51 H	197	56.80	5.40
4	5350.00	47.1 AV	54.0	-6.9	1.51 H	197	41.70	5.40
5	#10460.00	57.0 PK	74.0	-17.0	1.00 H	308	39.80	17.20
6	#10460.00	47.6 AV	54.0	-6.4	1.00 H	308	30.40	17.20

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	*5230.00	102.3 PK			1.05 V	188	63.10	39.20
2	*5230.00	92.7 AV			1.05 V	188	53.50	39.20
3	5350.00	61.2 PK	74.0	-12.8	1.02 V	186	55.80	5.40
4	5350.00	46.2 AV	54.0	-7.8	1.02 V	186	40.80	5.40
5	#10460.00	56.5 PK	74.0	-17.5	1.00 V	358	39.30	17.20
6	#10460.00	47.2 AV	54.0	-6.8	1.00 V	358	30.00	17.20

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	#5714.90	64.3 PK	74.0	-9.7	2.12 H	209	58.30	6.00
2	#5714.90	48.0 AV	54.0	-6.0	2.12 H	209	42.00	6.00
3	#5722.90	66.3 PK	78.2	-11.9	2.12 H	209	60.20	6.10
4	#5725.00	43.9 PK	78.2	-34.3	2.12 H	209	37.80	6.10
5	*5755.00	101.5 PK			2.11 H	202	61.20	40.30
6	*5755.00	91.9 AV			2.11 H	202	51.60	40.30
7	11510.00	56.7 PK	74.0	-17.3	1.00 H	307	39.30	17.40
8	11510.00	48.0 AV	54.0	-6.0	1.00 H	307	30.60	17.40

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	#5714.90	63.6 PK	74.0	-10.4	1.00 V	194	57.60	6.00
2	#5714.90	47.2 AV	54.0	-6.8	1.00 V	194	41.20	6.00
3	#5722.90	65.9 PK	78.2	-12.3	1.00 V	194	59.80	6.10
4	#5725.00	43.2 PK	78.2	-35.0	1.00 V	194	37.10	6.10
5	*5755.00	97.6 PK			1.00 V	192	57.30	40.30
6	*5755.00	87.0 AV			1.00 V	192	46.70	40.30
7	11510.00	56.3 PK	74.0	-17.7	1.00 V	352	38.90	17.40
8	11510.00	47.3 AV	54.0	-6.7	1.00 V	352	29.90	17.40

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	*5795.00	101.3 PK			1.54 H	200	61.00	40.30
2	*5795.00	91.0 AV			1.54 H	200	50.70	40.30
3	#5850.00	37.1 PK	78.2	-41.1	1.54 H	198	30.70	6.40
4	#5852.10	58.6 PK	78.2	-19.6	1.54 H	198	52.20	6.40
5	#5860.10	58.8 PK	74.0	-15.2	1.54 H	198	52.40	6.40
6	#5860.10	46.2 AV	54.0	-7.8	1.54 H	198	39.80	6.40
7	11590.00	56.4 PK	74.0	-17.6	1.00 H	304	39.10	17.30
8	11590.00	47.7 AV	54.0	-6.3	1.00 H	304	30.40	17.30

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	*5795.00	98.0 PK			1.07 V	159	57.70	40.30
2	*5795.00	87.3 AV			1.07 V	159	47.00	40.30
3	#5850.00	36.8 PK	78.2	-41.4	1.08 V	158	30.40	6.40
4	#5852.10	58.4 PK	78.2	-19.8	1.08 V	158	52.00	6.40
5	#5860.10	58.6 PK	74.0	-15.4	1.08 V	158	52.20	6.40
6	#5860.10	46.0 AV	54.0	-8.0	1.08 V	158	39.60	6.40
7	11590.00	55.8 PK	74.0	-18.2	1.00 V	356	38.50	17.30
8	11590.00	46.7 AV	54.0	-7.3	1.00 V	356	29.40	17.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (80MHz)

CHANNEL	TX Channel 42	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz	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	5150.00	64.1 PK	74.0	-9.9	1.60 H	202	59.10	5.00
2	5150.00	50.7 AV	54.0	-3.3	1.60 H	202	45.70	5.00
3	*5210.00	101.1 PK			1.62 H	200	61.90	39.20
4	*5210.00	91.5 AV			1.62 H	200	52.30	39.20
5	#10420.00	57.2 PK	74.0	-16.8	1.00 H	302	39.90	17.30
6	#10420.00	47.8 AV	54.0	-6.2	1.00 H	302	30.50	17.30

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	5150.00	63.2 PK	74.0	-10.8	1.00 V	185	58.20	5.00
2	5150.00	50.4 AV	54.0	-3.6	1.00 V	185	45.40	5.00
3	*5210.00	98.8 PK			1.00 V	186	59.60	39.20
4	*5210.00	88.9 AV			1.00 V	186	49.70	39.20
5	#10420.00	56.6 PK	74.0	-17.4	1.00 V	353	39.30	17.30
6	#10420.00	47.6 AV	54.0	-6.4	1.00 V	353	30.30	17.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	#5714.90	67.1 PK	74.0	-6.9	1.55 H	192	61.10	6.00
2	#5714.90	52.6 AV	54.0	-1.4	1.55 H	192	46.60	6.00
3	#5722.90	67.3 PK	78.2	-10.9	1.55 H	192	61.20	6.10
4	#5725.00	48.4 PK	78.2	-29.8	1.55 H	192	42.30	6.10
5	*5775.00	99.6 PK			1.58 H	199	59.30	40.30
6	*5775.00	88.8 AV			1.58 H	199	48.50	40.30
7	11550.00	56.5 PK	74.0	-17.5	1.00 H	303	39.10	17.40
8	11550.00	47.6 AV	54.0	-6.4	1.00 H	303	30.20	17.40

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	#5714.90	63.0 PK	74.0	-11.0	1.00 V	190	57.00	6.00
2	#5714.90	49.0 AV	54.0	-5.0	1.00 V	190	43.00	6.00
3	#5722.90	67.0 PK	78.2	-11.2	1.00 V	190	60.90	6.10
4	#5725.00	48.2 PK	78.2	-30.0	1.00 V	190	42.10	6.10
5	*5775.00	95.2 PK			1.00 V	193	54.90	40.30
6	*5775.00	84.6 AV			1.00 V	193	44.30	40.30
7	11550.00	56.1 PK	74.0	-17.9	1.00 V	358	38.70	17.40
8	11550.00	47.0 AV	54.0	-7.0	1.00 V	358	29.60	17.40

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Below 1GHz Worst-Case Data: 802.11a

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	39.60	30.5 QP	40.0	-9.5	1.24 H	12	44.90	-14.40
2	59.01	33.5 QP	40.0	-6.5	2.00 H	207	47.70	-14.20
3	165.73	37.2 QP	43.5	-6.3	2.00 H	291	51.20	-14.00
4	216.18	39.8 QP	46.0	-6.2	1.49 H	225	56.40	-16.60
5	319.02	35.6 QP	46.0	-10.4	1.00 H	275	47.80	-12.20
6	798.30	36.3 QP	46.0	-9.7	1.49 H	247	39.30	-3.00
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	57.07	33.2 QP	40.0	-6.8	1.00 V	12	47.40	-14.20
2	103.64	28.4 QP	43.5	-15.1	2.00 V	324	46.10	-17.70
3	165.73	36.0 QP	43.5	-7.5	1.00 V	292	50.00	-14.00
4	239.46	31.0 QP	46.0	-15.0	2.00 V	314	46.10	-15.10
5	421.86	31.8 QP	46.0	-14.2	1.24 V	228	42.50	-10.70
6	798.30	36.0 QP	46.0	-10.0	1.24 V	285	39.00	-3.00

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

- Note:** 1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCS 30	100288	Apr. 27, 2015	Apr. 26, 2016
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 30, 2014	Dec. 29, 2015
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 21, 2015	Jul. 20, 2016
Software ADT	BV ADT_Cond_ V7.3.7.3	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 Shielded Room 2.
 3. The VCCI Site Registration No. is C-2047.

4.2.3 Test Procedures

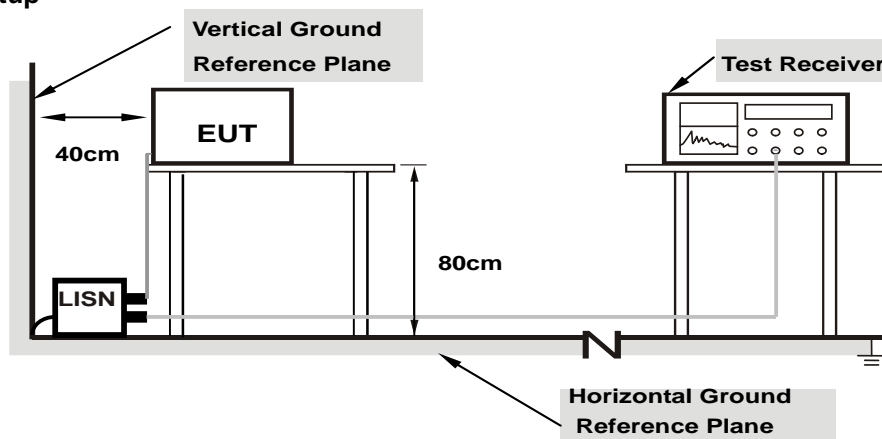
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

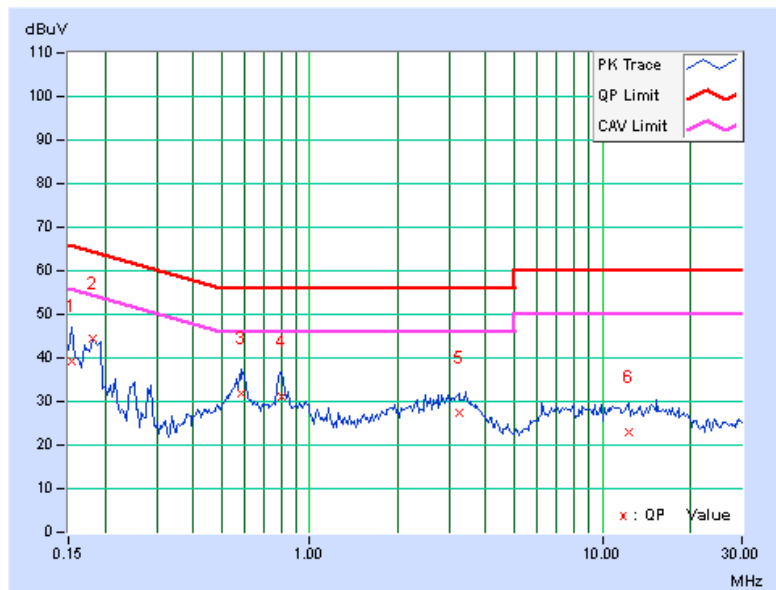
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.15391	9.91	29.37	16.82	39.28	26.73	65.79
2	0.18125	9.91	34.44	16.46	44.35	26.37	64.43	54.43	-20.07	-28.05
3	0.58750	9.95	21.79	14.31	31.74	24.26	56.00	46.00	-24.26	-21.74
4	0.80234	9.98	21.09	10.25	31.07	20.23	56.00	46.00	-24.93	-25.77
5	3.22656	10.14	17.44	11.98	27.58	22.12	56.00	46.00	-28.42	-23.88
6	12.34766	10.43	12.41	7.08	22.84	17.51	60.00	50.00	-37.16	-32.49

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

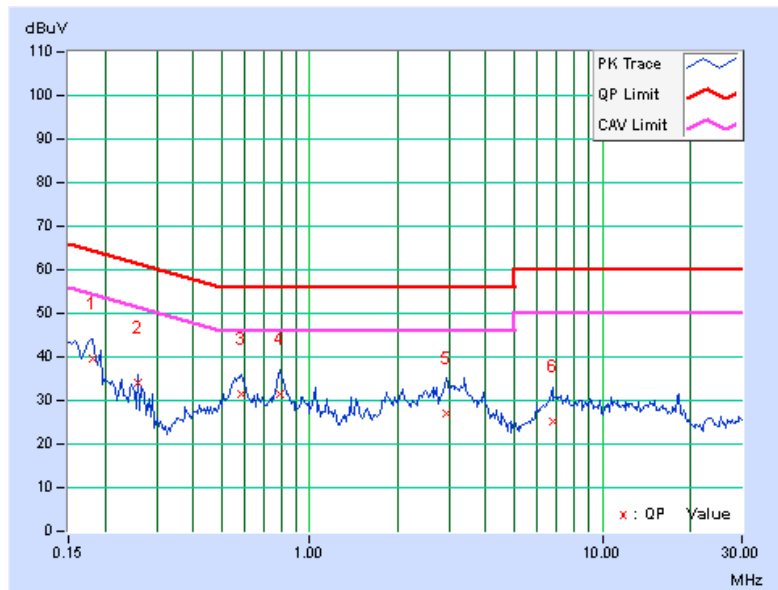


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.18125	9.92	29.76	14.34	39.68	24.26	64.43
2	0.25938	9.93	24.23	5.10	34.16	15.03	61.45	51.45	-27.29	-36.42
3	0.58359	9.97	21.61	13.95	31.58	23.92	56.00	46.00	-24.42	-22.08
4	0.79453	9.99	21.35	10.73	31.34	20.72	56.00	46.00	-24.66	-25.28
5	2.91797	10.15	16.82	11.80	26.97	21.95	56.00	46.00	-29.03	-24.05
6	6.75781	10.33	14.73	9.15	25.06	19.48	60.00	50.00	-34.94	-30.52

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



4.3 Transmit Power Measurement

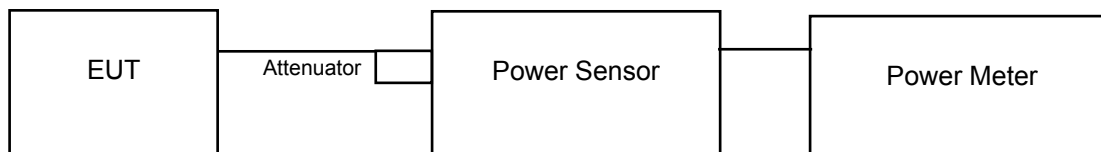
4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p \leq 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
	√	Mobile and Portable client device	250mW (24 dBm)
U-NII-2A	---		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	---		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

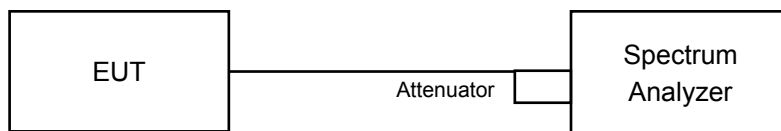
*B is the 26 dB emission bandwidth in megahertz

4.3.2 Test Setup

For 802.11a, 802.11n (20MHz), 802.11n (40MHz), 802.11ac (20MHz), 802.11ac (40MHz)



For 802.11ac (80MHz)



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR AVERAGE POWER MEASUREMENT

For 802.11a, 802.11n (20MHz), 802.11n (40MHz), 802.11ac (20MHz), 802.11ac (40MHz)

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

For 802.11ac (80MHz)

- a. Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- b. Set sweep trigger to "free run".
- c. Set RBW = 1 MHz.
- d. Set VBW \geq 3 MHz
- e. Number of points in sweep \geq 2 Span / RBW.
- f. Sweep time \leq (number of points in sweep) * T
- g. Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
- h. Detector = RMS.
- i. Trace mode = max hold.
- j. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

Power Output:

802.11a

Chan.	Freq. (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	33.806	15.29	24	Pass
40	5200	33.963	15.31	24	Pass
48	5240	33.343	15.23	24	Pass
149	5745	34.435	15.37	30	Pass
157	5785	33.574	15.26	30	Pass
165	5825	33.884	15.30	30	Pass

802.11n (20MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	33.037	15.19	24	Pass
40	5200	32.734	15.15	24	Pass
48	5240	33.113	15.20	24	Pass
149	5745	33.343	15.23	30	Pass
157	5785	34.754	15.41	30	Pass
165	5825	33.497	15.25	30	Pass

802.11n (40MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
38	5190	32.434	15.11	24	Pass
46	5230	33.189	15.21	24	Pass
151	5755	35.563	15.51	30	Pass
159	5795	34.356	15.36	30	Pass

802.11ac (80MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
42	5210	33.189	15.21	24	Pass
155	5775	33.420	15.24	30	Pass

26dB Bandwidth:

802.11a

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	Pass / Fail
36	5180	21.34	Pass
40	5200	21.39	Pass
48	5240	21.38	Pass

802.11n (20MHz)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	Pass / Fail
36	5180	22.06	Pass
40	5200	21.94	Pass
48	5240	22.11	Pass

802.11n (40MHz)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	Pass / Fail
38	5190	45.12	Pass
46	5230	45.19	Pass

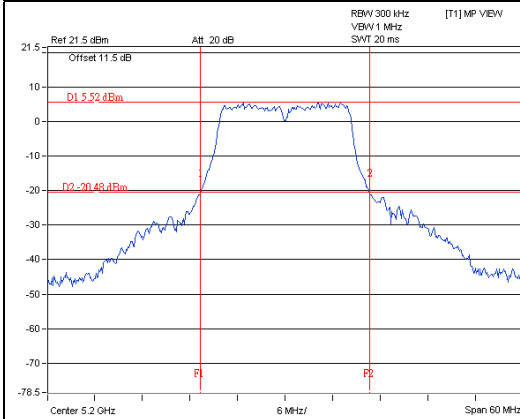
802.11ac (80MHz)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	Pass / Fail
42	5210	105.20	Pass

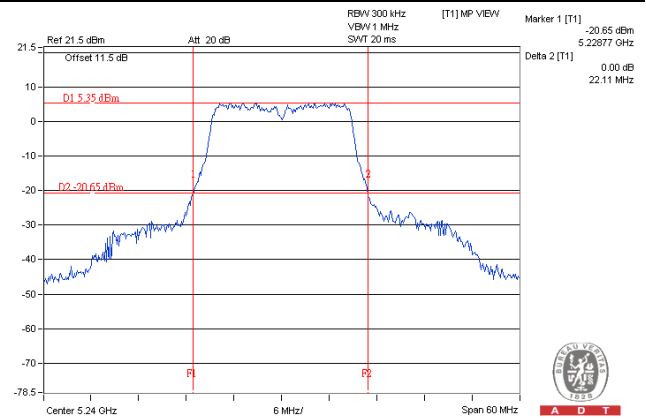
Spectrum Plot of Worst Value

802.11a

802.11n (20MHz)



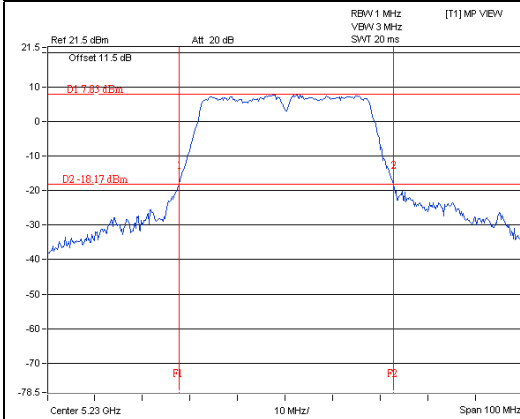
A D T



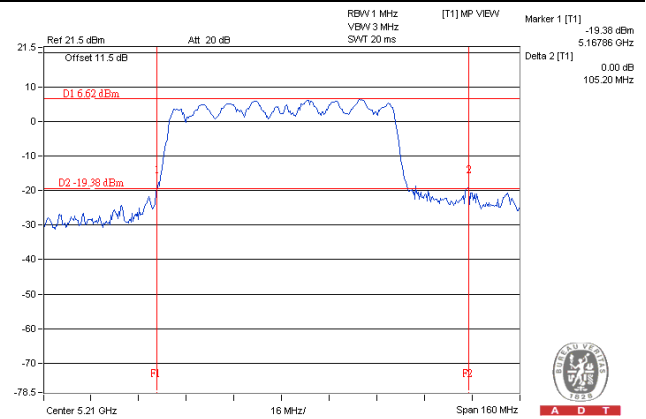
A D T

802.11n (40MHz)

802.11ac (80MHz)



A D T



A D T

Occupied Bandwidth:
802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)
36	5180	16.92
40	5200	16.92
48	5240	16.80
149	5745	16.68
157	5785	16.80
165	5825	16.80

802.11n (20MHz)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)
36	5180	17.88
40	5200	17.88
48	5240	17.88
149	5745	17.88
157	5785	17.88
165	5825	17.76

802.11n (40MHz)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)
38	5190	36.72
46	5230	36.84
151	5755	36.72
159	5795	36.84

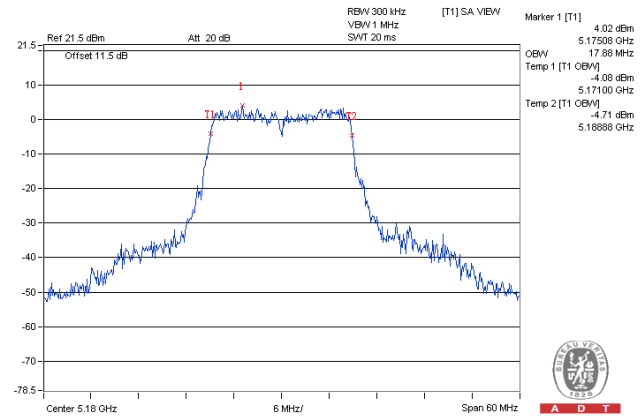
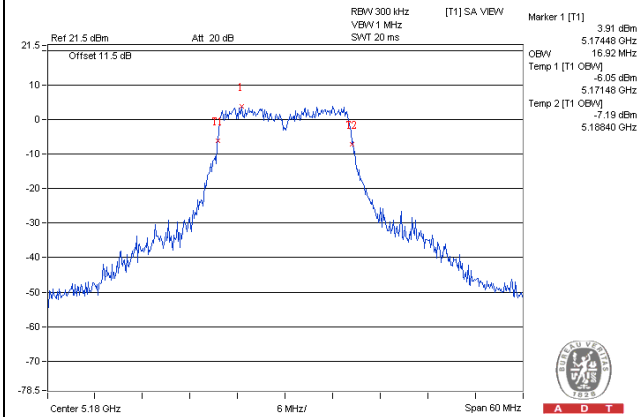
802.11ac (80MHz)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)
42	5210	75.88
155	5775	75.88

Spectrum Plot of Worst Value

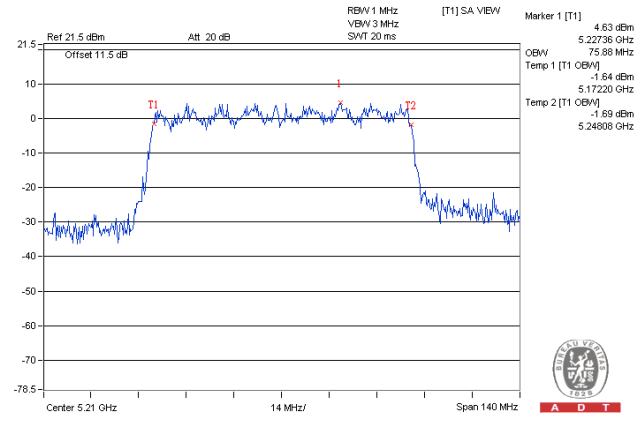
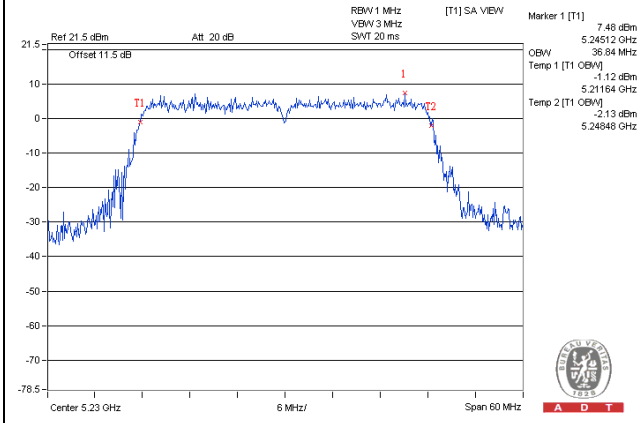
802.11a

802.11n (20MHz)



802.11n (40MHz)

802.11ac (80MHz)

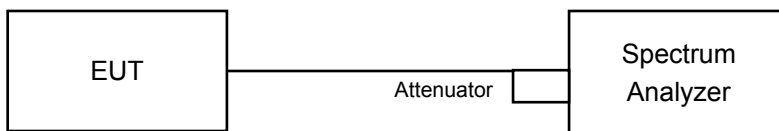


4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
		Indoor Access Point	
	√	Mobile and Portable client device	11dBm/ MHz
U-NII-2A	---		11dBm/ MHz
U-NII-2C	---		11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

For U-NII-1 band:

Using method SA-2

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
- Sweep time = auto, trigger set to “free run”.
- Trace average at least 100 traces in power averaging mode.
- Record the max value and add 10 log (1/duty cycle)

For U-NII-3 band:

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
- Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
- Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500\text{ kHz}/300\text{ kHz})$
- Sweep time = auto, trigger set to “free run”.
- Trace average at least 100 traces in power averaging mode.
- Record the max value and add 10 log (1/duty cycle)

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

For U-NII-1 Band

802.11a

Chan.	Freq. (MHz)	PSD w/o duty factor (dBm)	Duty factor	PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
36	5180	0.27	0.40	0.67	11.00	Pass
40	5200	0.80	0.40	1.20	11.00	Pass
48	5240	0.93	0.40	1.33	11.00	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

Chan.	Freq. (MHz)	PSD w/o duty factor (dBm)	Duty factor	PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
36	5180	-0.52	0.43	-0.09	11.00	Pass
40	5200	-0.06	0.43	0.37	11.00	Pass
48	5240	0.82	0.43	1.25	11.00	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

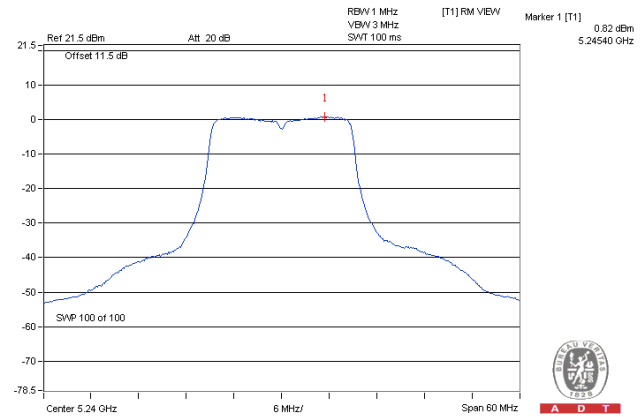
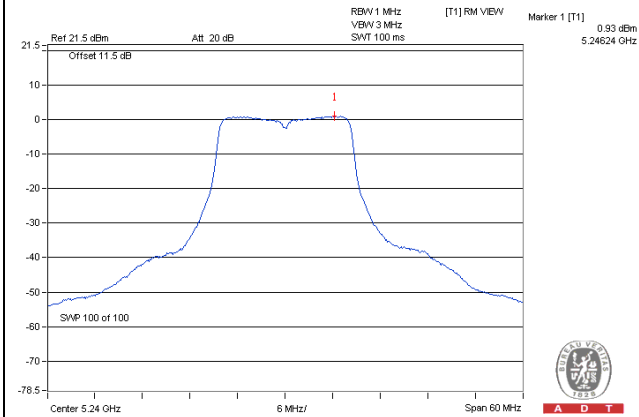
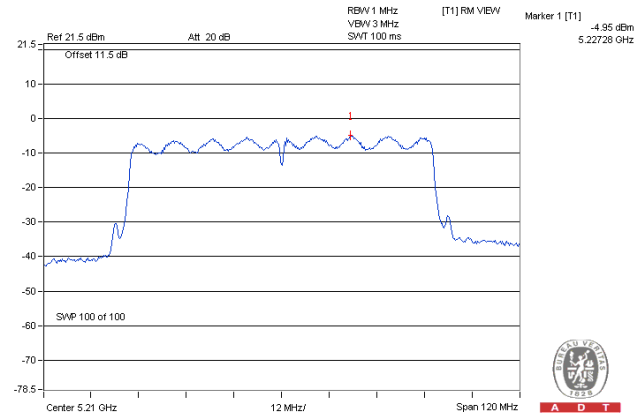
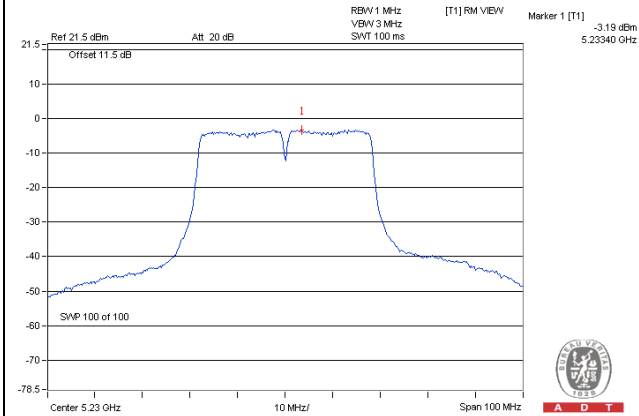
Chan.	Freq. (MHz)	PSD w/o duty factor (dBm)	Duty factor	PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
38	5190	-3.97	0.46	-3.51	11.00	Pass
46	5230	-3.19	0.46	-2.73	11.00	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (80MHz)

Chan.	Freq. (MHz)	PSD w/o duty factor (dBm)	Duty factor	PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
42	5210	-4.95	0.86	-4.09	11.00	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value**802.11a****802.11n (20MHz)****802.11n (40MHz)****802.11ac (80MHz)**

For U-NII-3 Band
802.11a

Chan.	Freq. (MHz)	PSD (dBm/300k Hz)	PSD (dBm/500k Hz)	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
149	5745	-8.39	-6.17	0.40	-5.77	30.00	Pass
157	5785	-8.59	-6.37	0.40	-5.97	30.00	Pass
165	5825	-8.52	-6.30	0.40	-5.90	30.00	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

Chan.	Freq. (MHz)	PSD (dBm/300k Hz)	PSD (dBm/500k Hz)	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
149	5745	-8.87	-6.65	0.43	-6.22	30.00	Pass
157	5785	-9.04	-6.82	0.43	-6.39	30.00	Pass
165	5825	-8.69	-6.47	0.43	-6.04	30.00	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

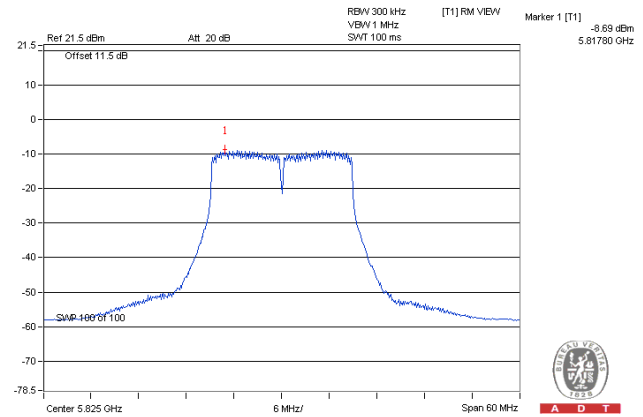
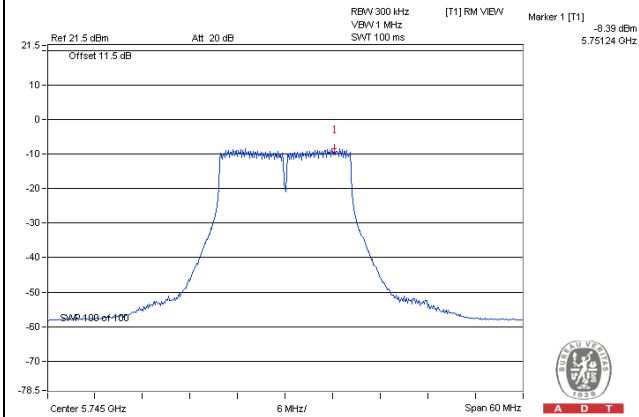
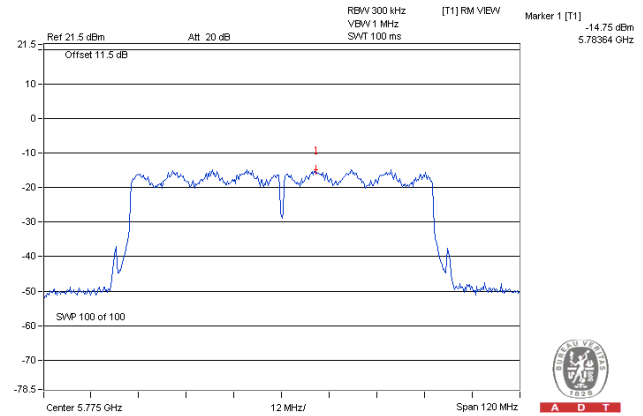
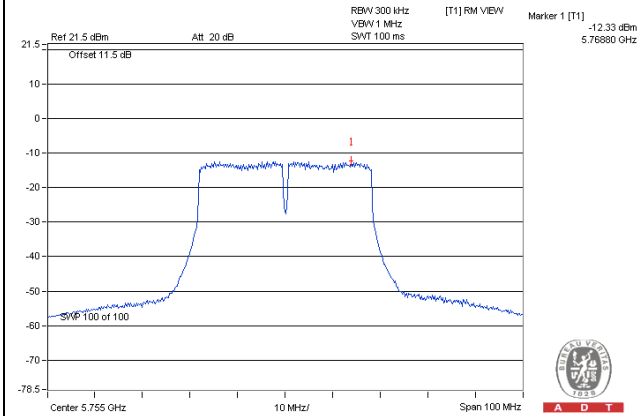
Chan.	Freq. (MHz)	PSD (dBm/300k Hz)	PSD (dBm/500k Hz)	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
151	5755	-12.33	-10.11	0.46	-9.65	30.00	Pass
159	5795	-12.68	-10.46	0.46	-10.00	30.00	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (80MHz)

Chan.	Freq. (MHz)	PSD (dBm/300k Hz)	PSD (dBm/500k Hz)	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
155	5775	-14.75	-12.53	0.86	-11.67	30.00	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

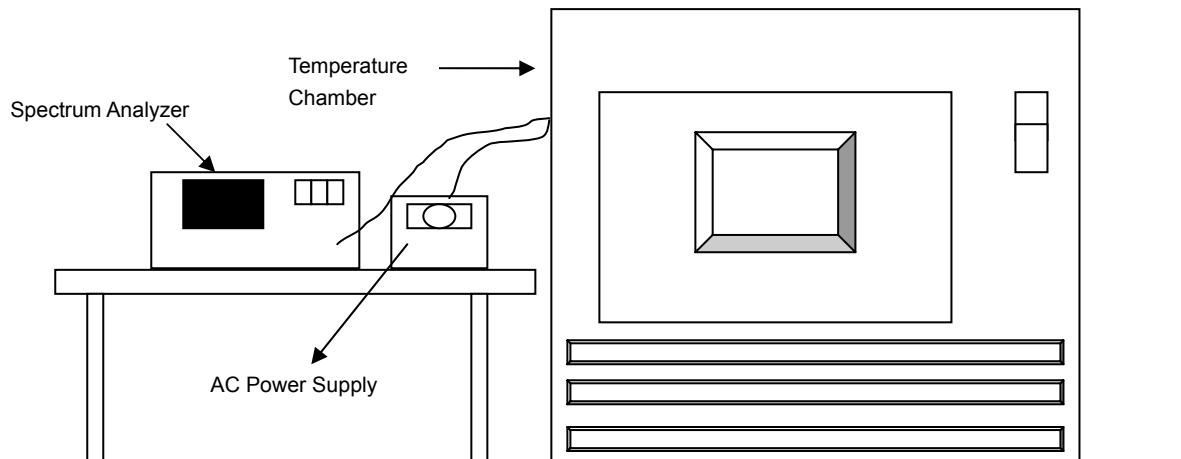
Spectrum Plot of Worst Value**802.11a****802.11n (20MHz)****802.11n (40MHz)****802.11ac (80MHz)**

4.5 Frequency Stability

4.5.1 Limits of Frequency Stability Measurement

The frequency of the carrier signal shall be maintained within band of operation

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

4.5.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5179.9752	-0.00048	5179.976	-0.00046	5179.9761	-0.00046	5179.9773	-0.00044
40	120	5179.9768	-0.00045	5179.9748	-0.00049	5179.9777	-0.00043	5179.9777	-0.00043
30	120	5180.0181	0.00035	5180.0176	0.00034	5180.0187	0.00036	5180.0179	0.00035
20	120	5180.0171	0.00033	5180.018	0.00035	5180.0181	0.00035	5180.0165	0.00032
10	120	5180.0081	0.00016	5180.009	0.00017	5180.0064	0.00012	5180.0068	0.00013
0	120	5179.9875	-0.00024	5179.9848	-0.00029	5179.9867	-0.00026	5179.9885	-0.00022
-10	120	5180.0022	0.00004	5180.0035	0.00007	5180.0012	0.00002	5179.9989	-0.00002
-20	120	5179.9824	-0.00034	5179.984	-0.00031	5179.9803	-0.00038	5179.9848	-0.00029
-30	120	5180.0208	0.00040	5180.0234	0.00045	5180.0209	0.00040	5180.0216	0.00042

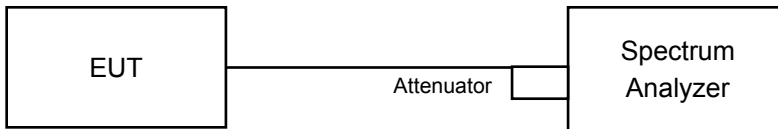
Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5180.0177	0.00034	5180.0171	0.00033	5180.0173	0.00033	5180.0171	0.00033
	120	5180.0171	0.00033	5180.018	0.00035	5180.0181	0.00035	5180.0165	0.00032
	102	5180.0167	0.00032	5180.018	0.00035	5180.0191	0.00037	5180.0168	0.00032

4.6 6dB Bandwidth Measurement

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.6.7 Test Results

802.11a

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	16.37	0.5	Pass
157	5785	16.37	0.5	Pass
165	5825	16.37	0.5	Pass

802.11n (20MHz)

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	17.08	0.5	Pass
157	5785	17.08	0.5	Pass
165	5825	17.01	0.5	Pass

802.11n (40MHz)

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
151	5755	35.74	0.5	Pass
159	5795	35.92	0.5	Pass

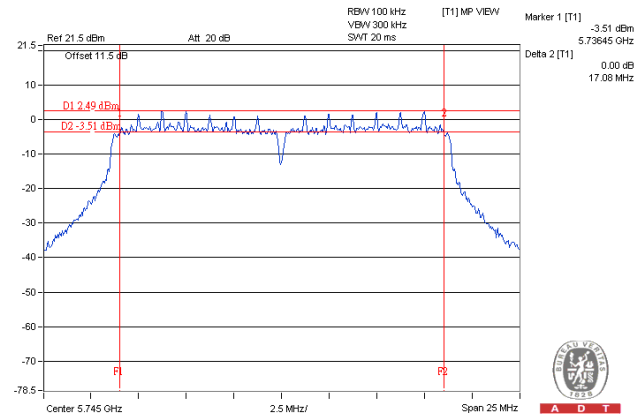
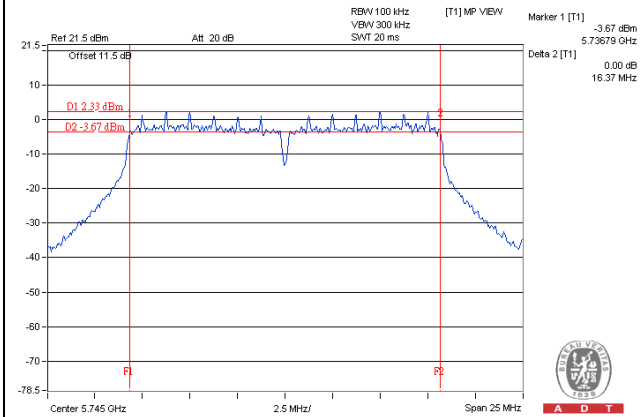
802.11ac (80MHz)

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
155	5775	75.47	0.5	Pass

Spectrum Plot of Worst Value

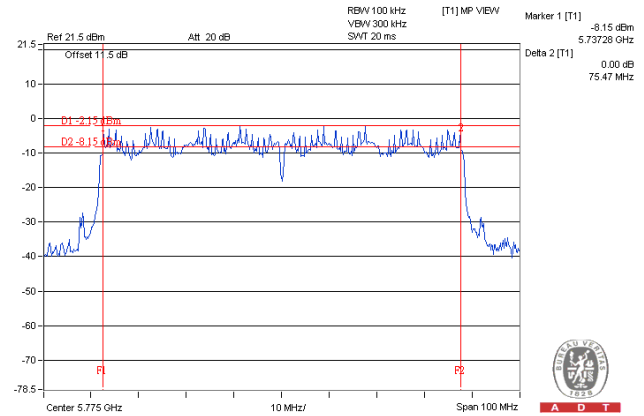
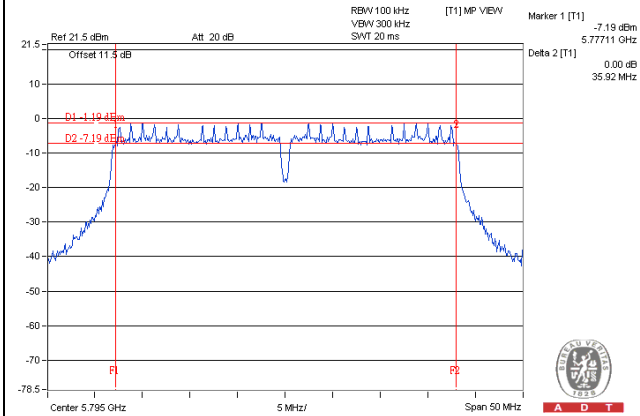
802.11a

802.11n (20MHz)



802.11n (40MHz)

802.11ac (80MHz)



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: 886-3-5935343

Fax: 886-3-5935342

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.

--- END ---