

FCC Test Report

Report No.: RF160202D06-1

FCC ID: EMJSE6B

Test Model: E6B

Received Date: Feb. 2, 2016

Test Date: Feb. 23 ~ Mar. 4, 2016

Issued Date: Mar. 18, 2016

Applicant: PRIMAX ELECTRONICS LTD.

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

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Release Control Record

Issue No.	Description	Date Issued
RF160202D06-1	Original release.	Mar. 18, 2016

1 Certificate of Conformity

Product: My Passport Wireless Pro

Brand: WD

Test Model: E6B

Sample Status: Engineering sample

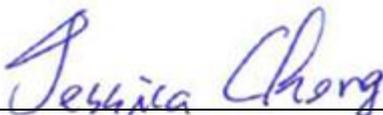
Applicant: PRIMAX ELECTRONICS LTD.

Test Date: Feb. 23 ~ Mar. 4, 2016

Standard: 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 :



Date: Mar. 18, 2016

Jessica Cheng / Senior Specialist

Approved by :



Date: Mar. 18, 2016

Rex Lai / Assistant Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -14.46dB at 0.41953MHz.
15.407(b)(1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -4.2dB at 5850.00MHz.
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 ports	150kHz ~ 30MHz	2.78 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1000MHz	4.00 dB
Radiated Emissions above 1 GHz	1GHz ~ 40GHz	3.36 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	My Passport Wireless Pro
Brand	WD
Test Model	E6B
Status of EUT	Engineering sample
Power Supply Rating	5Vdc from Adapter or host equipment or 3.75Vdc from battery
Modulation Type	64QAM, 16QAM, QPSK, BPSK 256QAM for OFDM in 11ac mode only.
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 150Mbps 802.11ac: up to 434Mbps
Operating Frequency	5180 ~ 5240MHz 5745 ~ 5825MHz
Number of Channel	5180 ~ 5240MHz 4 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40) 1 for 802.11ac (VHT80) 5745 ~ 5825MHz 5 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40) 1 for 802.11ac (VHT80)
Output Power	5180 ~ 5240MHz 10.617 mW 5745 ~ 5825MHz 10.765mW
Antenna Type	PCB antenna with 3.33dBi gain
Antenna Connector	N/A
Accessory Device	Adapter
Data Cable Supplied	Shielded USB 3.0 cable (0.4m)

Note:

- The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

Modulation Mode	TX FUNCTION
802.11a	1TX
802.11n (HT20)	1TX
802.11n (HT40)	1TX
802.11ac (VHT20)	1TX
802.11ac (VHT40)	1TX
802.11ac (VHT80)	1TX

Note: The modulation and bandwidth are similar for 802.11n mode for HT20 (HT40) and 802.11ac mode for VHT20 (VHT40), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

2. The EUT uses following adapter and battery.

Adapter	
Brand	SWITCHING MODE POWER SUPPLY
Model	APP524-051240U
Input Power	100-240Vac, 50/60Hz, 0.45A MAX
Output Power	5.1Vdc 2.4A
Battery	
Brand	ROOFER
Model	RDJ10 (Korra)
Spec.	3.75V/6400mAh (1S2P · 3.75V/3200mAh * 2)

3. The EUT was pre-tested with the following modes:

- ² Operating Mode (EUT stand-alone)
- ² Operating + Charging Mode (EUT + Adapter)

The worst emission level was found when the EUT tested under **Operating + Charging Mode (EUT + Adapter)** therefore, only its test data was recorded in this report.

4. 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

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (HT20):

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

2 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20):

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

2 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE ³ 1G	RE<1G	PLC	APCM	
A	√	√	√	√	Operating + Charging (EUT with Adapter)
B	-	-	√	-	Read and write function(EUT with Notebook)

Where **RE³1G**: Radiated Emission above 1GHz **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 **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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	13.5
	802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	13.5
	802.11ac (VHT80)		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)
A	802.11a	5180-5240	38 to 46	40	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)
A	802.11a	5180-5240	38 to 46	40	OFDM	BPSK	6.0
B	-	-	-	-	-	-	-

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)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	13.5
	802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	13.5
	802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Test Condition:

APPLICABLE TO	MODE	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE ³ 1G	A	18deg. C, 73%RH	5Vdc	Aaron You
RE<1G	A	18deg. C, 73%RH	5Vdc	Aaron You
PLC	A	22deg. C, 71%RH	120Vac, 60Hz (Adapter)	Aaron You
	B	22deg. C, 71%RH	120Vac, 60Hz (System)	Aaron You
APCM	A	25deg. C, 60%RH	5Vdc	Dalen Dai

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is 100 %.



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.	SD Card	Transcend	4GB	N/A	N/A	Provided by Lab
B.	USB 3.0 Hard Disk	WD	WDBACY5000ABL-PESN	WXQ1E61CMASL	FCC DoC Approved	Provided by Lab
C.	Notebook	DELL	E5410	BW33YM1	FCC DoC Approved	Provided by Lab
D.	Notebook PC	DELL	E6530	9331GV1	FCC DoC Approved	Provided by Lab
E.	NOTEBOOK COMPUTER	DELL	PP27L	8SNZ12S	FCC DoC Approved	Provided by Lab

Note:

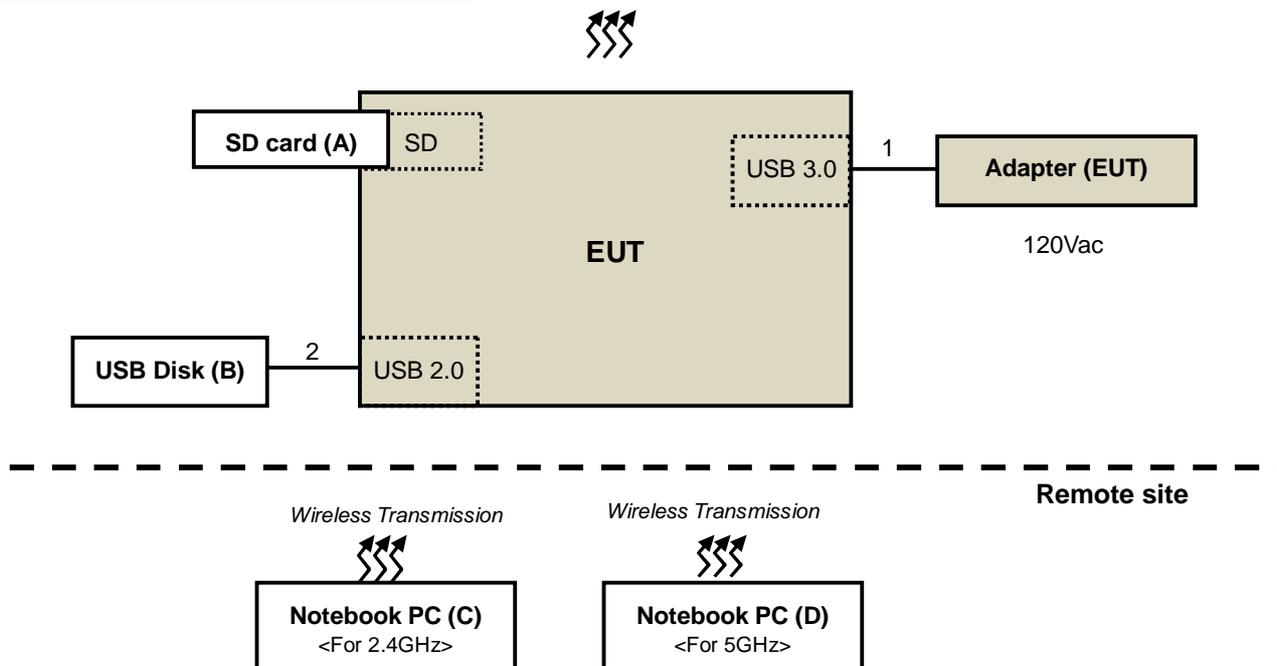
1. All power cords of the above support units are non-shielded (1.8m).
2. Items C-D acted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB cable	1	0.4	Y	0	Supplied by client
2.	USB cable	1	0.5	Y	0	Provided by Lab

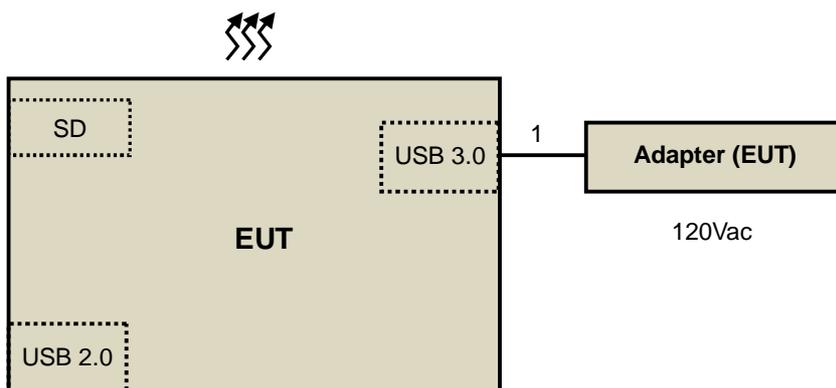
Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

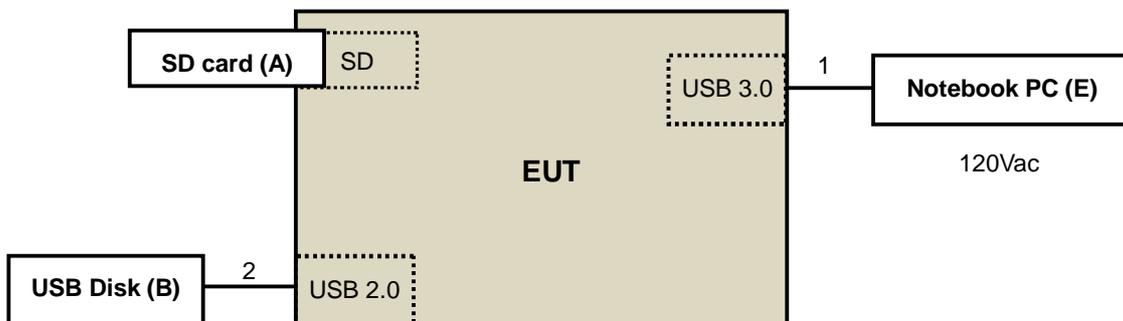
Mode A
Radiated Emission Test (Below 1GHz)
Power Line Conducted Emission Test



Mode A
Radiated Emission Test (Above 1GHz)



Mode B
Power Line Conducted Emission Test



3.5 General Description of Applied Standard

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)

KDB 789033 D02 General UNII Test Procedure New Rules v01r02

ANSI C63.10-2013

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

NOTE: The EUT 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 Procedure New Rules v01r02	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:

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



4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 26, 2015	Feb. 25, 2016
			Feb. 26, 2016	Feb. 25, 2017
HP Preamplifier	8449B	3008A01201	Feb. 26, 2015	Feb. 25, 2016
			Feb. 26, 2016	Feb. 25, 2017
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Mar. 01, 2015	Feb. 29, 2016
			Mar. 01, 2016	Feb. 28, 2017
Agilent TEST RECEIVER	N9038A	MY51210129	Feb. 02, 2016	Feb. 01, 2017
Schwarzbeck Antenna	VULB 9168	139	Jan. 04, 2016	Jan. 03, 2017
Schwarzbeck Antenna	VHBA 9123	480	May 29, 2015	May 28, 2017
Schwarzbeck Horn Antenna	BBHA-9170	212	Jan. 08, 2016	Jan. 07, 2017
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Jan. 21, 2016	Jan. 20, 2017
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.4	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF104	CABLE-CH6	Aug. 15, 2015	Aug. 14, 2016
SUHNER RF cable With 3dB PAD	SF102	Cable-CH8-3.6m	Aug. 15, 2015	Aug. 14, 2016
KEYSIGHT MIMO Powermeasurement Test set	U2021XA	U2021XA-001	May 04, 2015	May 03, 2016
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Jul. 14, 2015	Jul. 13, 2016
EMCO Horn Antenna	3115	00028257	Jan. 19, 2016	Jan. 18, 2017
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 23, 2015	Sep. 22, 2016
Anritsu Power Sensor	MA2411B	0738404	Apr. 21, 2015	Apr. 20, 2016
Anritsu Power Meter	ML2495A	0842014	Apr. 21, 2015	Apr. 20, 2016
Temperature & Humidity Chamber	MHU-225AU	920409	May 25, 2015	May 24, 2016
Programable DC Source IDRC	DSP-030-025HD	500158	Jul. 17, 2015	Jul. 16, 2016

- NOTE:**
1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
 2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 3. The test was performed in Chamber No. 6.
 4. The Industry Canada Reference No. IC 7450E-6.
 5. The FCC Site Registration No. is 447212.

4.1.3 Test Procedure

- 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:

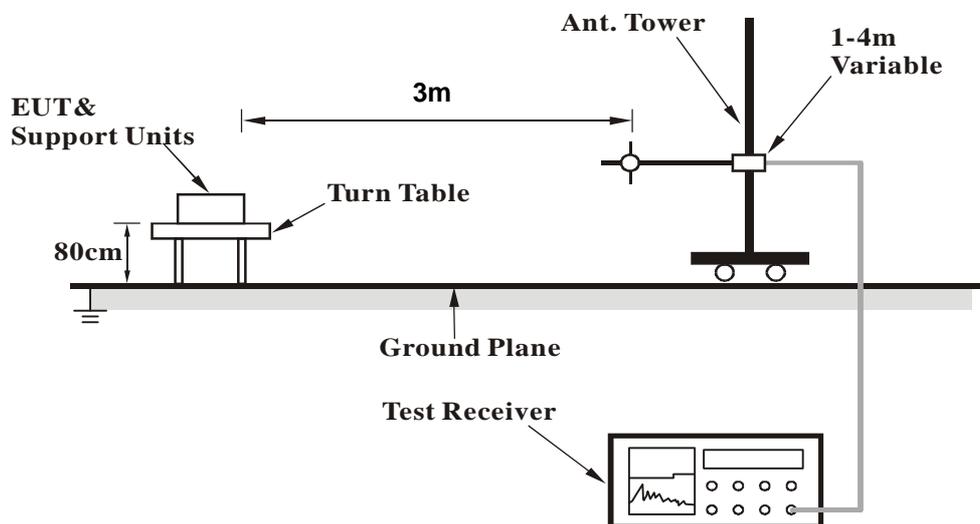
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 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

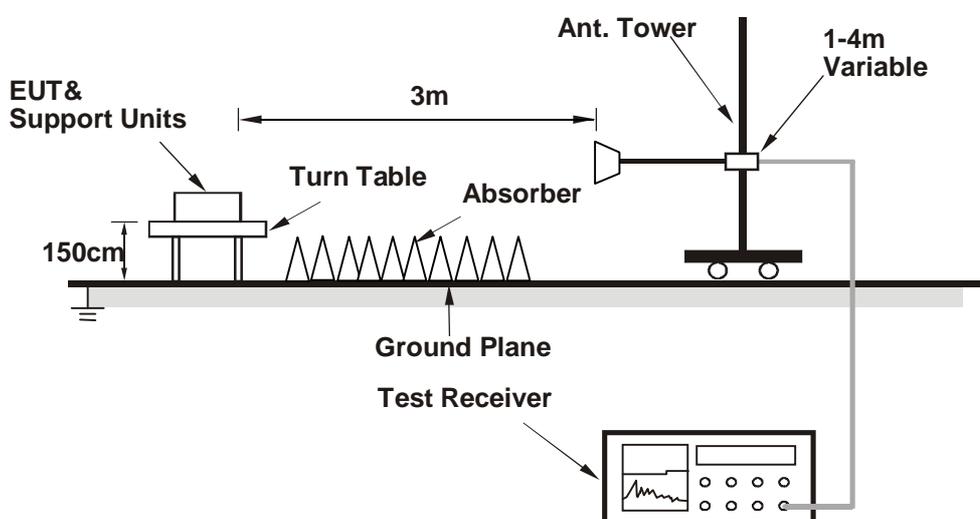
No deviation.

4.1.5 Test Setup

<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 Condition

Connected the EUT to adapter

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

4.1.7 Test Results
Mode A
BELOW 1GHZ WORST-CASE DATA
802.11a

CHANNEL	TX Channel 40	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	32.09	31.9 QP	40.0	-8.1	4.00 H	226	43.36	-11.42
2	77.14	25.2 QP	40.0	-14.8	4.00 H	256	38.50	-13.30
3	162.26	26.1 QP	43.5	-17.4	3.21 H	316	35.43	-9.31
4	528.05	30.3 QP	46.0	-15.7	1.96 H	174	33.24	-2.97
5	623.98	29.5 QP	46.0	-16.5	1.41 H	274	30.51	-0.99
6	814.05	31.7 QP	46.0	-14.3	1.00 H	0	29.72	1.95

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	32.62	31.7 QP	40.0	-8.4	1.27 V	77	42.91	-11.26
2	105.03	24.6 QP	43.5	-18.9	1.00 V	275	37.95	-13.37
3	337.44	24.1 QP	46.0	-21.9	1.55 V	247	31.21	-7.12
4	528.05	26.9 QP	46.0	-19.1	2.38 V	275	29.89	-2.97
5	730.10	30.3 QP	46.0	-15.7	2.97 V	170	29.93	0.35
6	893.06	32.5 QP	46.0	-13.5	2.41 V	124	29.66	2.86

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

Mode A
ABOVE 1GHz 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	60.3 PK	74.0	-13.7	3.48 H	209	51.77	8.53
2	5150.00	46.2 AV	54.0	-7.8	3.48 H	209	37.65	8.53
3	*5180.00	96.9 PK			3.48 H	209	88.20	8.71
4	*5180.00	87.2 AV			3.48 H	209	78.45	8.71
5	#10360.00	60.1 PK	74.0	-13.9	1.36 H	31	39.76	20.33
6	#10360.00	46.5 AV	54.0	-7.5	1.36 H	31	26.21	20.33

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	61.1 PK	74.0	-12.9	3.01 V	340	52.61	8.53
2	5150.00	46.8 AV	54.0	-7.2	3.01 V	340	38.25	8.53
3	*5180.00	99.1 PK			3.01 V	340	90.43	8.71
4	*5180.00	89.6 AV			3.01 V	340	80.85	8.71
5	#10360.00	61.2 PK	74.0	-12.8	2.39 V	294	40.91	20.33
6	#10360.00	47.1 AV	54.0	-6.9	2.39 V	294	26.75	20.33

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.
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	97.4 PK			1.48 H	210	88.61	8.82
2	*5200.00	87.9 AV			1.48 H	210	79.06	8.82
3	#10400.00	60.0 PK	74.0	-14.0	1.44 H	39	39.58	20.46
4	#10400.00	46.7 AV	54.0	-7.3	1.44 H	39	26.25	20.46

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	98.1 PK			3.00 V	347	89.32	8.82
2	*5200.00	88.2 AV			3.00 V	347	79.39	8.82
3	#10400.00	60.4 PK	74.0	-13.7	2.41 V	288	39.89	20.46
4	#10400.00	47.2 AV	54.0	-6.8	2.41 V	288	26.77	20.46

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.
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	96.8 PK			1.21 H	206	87.87	8.97
2	*5240.00	86.7 AV			1.21 H	206	77.76	8.97
3	5350.00	61.3 PK	74.0	-12.7	1.21 H	206	51.83	9.43
4	5350.00	46.7 AV	54.0	-7.3	1.21 H	206	37.25	9.43
5	#10480.00	60.2 PK	74.0	-13.9	1.40 H	25	39.26	20.89
6	#10480.00	47.0 AV	54.0	-7.0	1.40 H	25	26.10	20.89

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	97.6 PK			2.98 V	26	88.63	8.97
2	*5240.00	88.6 AV			2.98 V	26	79.61	8.97
3	5350.00	61.6 PK	74.0	-12.4	2.98 V	26	52.17	9.43
4	5350.00	47.5 AV	54.0	-6.5	2.98 V	26	38.07	9.43
5	#10480.00	60.7 PK	74.0	-13.3	2.27 V	299	39.81	20.89
6	#10480.00	47.6 AV	54.0	-6.4	2.27 V	299	26.70	20.89

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.
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	#5725.00	61.5 PK	74.0	-12.5	2.95 H	198	51.09	10.40
2	#5725.00	47.8 AV	54.0	-6.2	2.95 H	198	37.41	10.40
3	*5745.00	97.6 PK			2.95 H	198	87.24	10.35
4	*5745.00	88.0 AV			2.95 H	198	77.63	10.35
5	11490.00	60.9 PK	74.0	-13.2	1.62 H	60	38.59	22.26
6	11490.00	47.9 AV	54.0	-6.1	1.62 H	60	25.61	22.26
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	#5725.00	62.2 PK	74.0	-11.8	2.92 V	300	51.77	10.40
2	#5725.00	48.0 AV	54.0	-6.0	2.92 V	300	37.61	10.40
3	*5745.00	97.9 PK			2.92 V	300	87.54	10.35
4	*5745.00	88.2 AV			2.92 V	300	77.87	10.35
5	11490.00	61.3 PK	74.0	-12.8	2.38 V	227	38.99	22.26
6	11490.00	48.3 AV	54.0	-5.7	2.38 V	227	26.02	22.26

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": Fundamental frequency.
- " # ": 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	96.1 PK			2.89 H	204	85.82	10.26
2	*5785.00	87.0 AV			2.89 H	204	76.78	10.26
3	11570.00	61.1 PK	74.0	-12.9	1.51 H	66	38.73	22.35
4	11570.00	48.1 AV	54.0	-6.0	1.51 H	66	25.70	22.35

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	98.3 PK			3.93 V	283	88.00	10.26
2	*5785.00	89.0 AV			3.93 V	283	78.75	10.26
3	11570.00	61.4 PK	74.0	-12.6	2.40 V	230	39.06	22.35
4	11570.00	48.4 AV	54.0	-5.6	2.40 V	230	26.03	22.35

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 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	96.5 PK			2.99 H	198	86.19	10.27
2	*5825.00	87.3 AV			2.99 H	198	77.02	10.27
3	#5850.00	61.5 PK	74.0	-12.6	2.99 H	198	51.16	10.29
4	#5850.00	47.7 AV	54.0	-6.3	2.99 H	198	37.43	10.29
5	11650.00	60.6 PK	74.0	-13.4	1.58 H	52	38.55	22.06
6	11650.00	47.8 AV	54.0	-6.3	1.58 H	52	25.69	22.06
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	99.2 PK			2.98 V	284	88.96	10.27
2	*5825.00	89.4 AV			2.98 V	284	79.12	10.27
3	#5850.00	62.9 PK	74.0	-11.1	2.98 V	284	52.58	10.29
4	#5850.00	48.8 AV	54.0	-5.2	2.98 V	284	38.47	10.29
5	11650.00	61.1 PK	74.0	-12.9	2.51 V	243	39.06	22.06
6	11650.00	48.0 AV	54.0	-6.0	2.51 V	243	25.98	22.06

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.
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	60.9 PK	74.0	-13.1	1.50 H	209	52.41	8.53
2	5150.00	46.8 AV	54.0	-7.2	1.50 H	209	38.24	8.53
3	*5180.00	95.9 PK			1.50 H	209	87.16	8.71
4	*5180.00	85.6 AV			1.50 H	209	76.89	8.71
5	#10360.00	59.9 PK	74.0	-14.1	1.53 H	50	39.58	20.33
6	#10360.00	46.6 AV	54.0	-7.4	1.53 H	50	26.25	20.33

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	61.5 PK	74.0	-12.5	3.00 V	341	52.97	8.53
2	5150.00	47.5 AV	54.0	-6.5	3.00 V	341	39.01	8.53
3	*5180.00	96.9 PK			3.00 V	341	88.16	8.71
4	*5180.00	87.4 AV			3.00 V	341	78.68	8.71
5	#10360.00	60.2 PK	74.0	-13.8	2.08 V	274	39.88	20.33
6	#10360.00	47.0 AV	54.0	-7.0	2.08 V	274	26.64	20.33

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": Fundamental frequency.
- " # ": 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	95.8 PK			3.03 H	186	86.95	8.82
2	*5200.00	86.3 AV			3.03 H	186	77.45	8.82
3	#10400.00	59.6 PK	74.0	-14.4	1.60 H	43	39.18	20.46
4	#10400.00	46.6 AV	54.0	-7.5	1.60 H	43	26.09	20.46

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	96.9 PK			3.59 V	338	88.06	8.82
2	*5200.00	87.3 AV			3.59 V	338	78.49	8.82
3	#10400.00	60.3 PK	74.0	-13.7	2.17 V	280	39.85	20.46
4	#10400.00	47.2 AV	54.0	-6.8	2.17 V	280	26.74	20.46

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.
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	96.6 PK			1.31 H	210	87.58	8.97
2	*5240.00	86.2 AV			1.31 H	210	77.20	8.97
3	5350.00	60.6 PK	74.0	-13.4	1.31 H	210	51.16	9.43
4	5350.00	46.3 AV	54.0	-7.7	1.31 H	210	36.89	9.43
5	#10480.00	60.1 PK	74.0	-13.9	1.48 H	48	39.20	20.89
6	#10480.00	47.1 AV	54.0	-6.9	1.48 H	48	26.19	20.89

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	98.2 PK			2.81 V	340	89.26	8.97
2	*5240.00	88.1 AV			2.81 V	340	79.15	8.97
3	5350.00	61.5 PK	74.0	-12.5	2.81 V	340	52.07	9.43
4	5350.00	47.2 AV	54.0	-6.8	2.81 V	340	37.79	9.43
5	#10480.00	60.3 PK	74.0	-13.7	1.98 V	263	39.41	20.89
6	#10480.00	47.4 AV	54.0	-6.6	1.98 V	263	26.50	20.89

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.
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	#5725.00	61.3 PK	74.0	-12.7	2.70 H	198	50.86	10.40
2	#5725.00	47.8 AV	54.0	-6.2	2.70 H	198	37.36	10.40
3	*5745.00	96.9 PK			2.70 H	198	86.59	10.35
4	*5745.00	86.8 AV			2.70 H	198	76.49	10.35
5	11490.00	61.2 PK	74.0	-12.8	1.35 H	88	38.97	22.26
6	11490.00	48.1 AV	54.0	-5.9	1.35 H	88	25.80	22.26
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	#5725.00	62.7 PK	74.0	-11.4	2.58 V	285	52.25	10.40
2	#5725.00	49.0 AV	54.0	-5.0	2.58 V	285	38.58	10.40
3	*5745.00	99.0 PK			2.58 V	285	88.65	10.35
4	*5745.00	88.9 AV			2.58 V	285	78.55	10.35
5	11490.00	61.4 PK	74.0	-12.6	2.77 V	289	39.18	22.26
6	11490.00	48.4 AV	54.0	-5.7	2.77 V	289	26.09	22.26

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.
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	95.2 PK			3.03 H	201	84.93	10.26
2	*5785.00	86.1 AV			3.03 H	201	75.84	10.26
3	11570.00	61.3 PK	74.0	-12.8	1.28 H	91	38.90	22.35
4	11570.00	48.2 AV	54.0	-5.8	1.28 H	91	25.84	22.35

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	98.2 PK			3.16 V	283	87.97	10.26
2	*5785.00	88.1 AV			3.16 V	283	77.81	10.26
3	11570.00	61.7 PK	74.0	-12.3	2.69 V	283	39.31	22.35
4	11570.00	48.5 AV	54.0	-5.5	2.69 V	283	26.14	22.35

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 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	95.6 PK			2.88 H	199	85.31	10.27
2	*5825.00	86.0 AV			2.88 H	199	75.69	10.27
3	#5850.00	61.9 PK	74.0	-12.1	2.88 H	199	51.63	10.29
4	#5850.00	47.6 AV	54.0	-6.4	2.88 H	199	37.34	10.29
5	11650.00	60.8 PK	74.0	-13.2	1.00 H	58	38.74	22.06
6	11650.00	47.9 AV	54.0	-6.1	1.00 H	58	25.80	22.06
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	97.8 PK			3.55 V	287	87.53	10.27
2	*5825.00	87.5 AV			3.55 V	287	77.18	10.27
3	#5850.00	63.1 PK	74.0	-10.9	3.55 V	287	52.77	10.29
4	#5850.00	47.8 AV	54.0	-6.2	3.55 V	287	37.55	10.29
5	11650.00	61.1 PK	74.0	-12.9	2.59 V	275	39.08	22.06
6	11650.00	48.2 AV	54.0	-5.8	2.59 V	275	26.14	22.06

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.
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	60.5 PK	74.0	-13.5	2.62 H	184	51.99	8.53
2	5150.00	46.0 AV	54.0	-8.0	2.62 H	184	37.49	8.53
3	*5190.00	94.1 PK			2.62 H	184	85.32	8.77
4	*5190.00	83.6 AV			2.62 H	184	74.78	8.77
5	#10380.00	59.5 PK	74.0	-14.5	1.44 H	73	39.10	20.40
6	#10380.00	46.5 AV	54.0	-7.5	1.44 H	73	26.07	20.40

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	5150.00	61.2 PK	74.0	-12.8	3.00 V	341	52.68	8.53
2	5150.00	46.8 AV	54.0	-7.2	3.00 V	341	38.27	8.53
3	*5190.00	95.7 PK			3.00 V	341	86.94	8.77
4	*5190.00	85.4 AV			3.00 V	341	76.63	8.77
5	#10380.00	59.7 PK	74.0	-14.3	2.90 V	268	39.28	20.40
6	#10380.00	46.6 AV	54.0	-7.4	2.90 V	268	26.24	20.40

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": Fundamental frequency.
- " # ": 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	94.9 PK			2.84 H	185	85.92	8.94
2	*5230.00	84.5 AV			2.84 H	185	75.52	8.94
3	5350.00	60.7 PK	74.0	-13.3	2.84 H	185	51.28	9.43
4	5350.00	46.5 AV	54.0	-7.5	2.84 H	185	37.04	9.43
5	#10460.00	59.9 PK	74.0	-14.1	1.41 H	69	39.08	20.79
6	#10460.00	46.8 AV	54.0	-7.2	1.41 H	69	26.00	20.79

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	95.6 PK			3.59 V	340	86.61	8.94
2	*5230.00	85.0 AV			3.59 V	340	76.09	8.94
3	5350.00	61.7 PK	74.0	-12.3	3.59 V	340	52.26	9.43
4	5350.00	47.3 AV	54.0	-6.7	3.59 V	340	37.89	9.43
5	#10460.00	60.0 PK	74.0	-14.0	2.84 V	273	39.21	20.79
6	#10460.00	47.0 AV	54.0	-7.0	2.84 V	273	26.18	20.79

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.
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	#5725.00	62.0 PK	74.0	-12.1	2.69 H	201	51.55	10.40
2	#5725.00	48.1 AV	54.0	-5.9	2.69 H	201	37.69	10.40
3	*5755.00	96.5 PK			2.69 H	201	86.15	10.34
4	*5755.00	86.6 AV			2.69 H	201	76.30	10.34
5	11510.00	61.3 PK	74.0	-12.7	1.46 H	73	38.97	22.29
6	11510.00	48.2 AV	54.0	-5.8	1.46 H	73	25.88	22.29
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	#5725.00	62.7 PK	74.0	-11.3	3.03 V	288	52.31	10.40
2	#5725.00	48.4 AV	54.0	-5.6	3.03 V	288	37.98	10.40
3	*5755.00	97.6 PK			3.03 V	288	87.21	10.34
4	*5755.00	87.6 AV			3.03 V	288	77.21	10.34
5	11510.00	61.5 PK	74.0	-12.5	2.39 V	277	39.20	22.29
6	11510.00	48.4 AV	54.0	-5.6	2.39 V	277	26.13	22.29

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.
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	96.4 PK			2.90 H	197	86.15	10.24
2	*5795.00	86.4 AV			2.90 H	197	76.18	10.24
3	#5850.00	61.3 PK	74.0	-12.7	2.90 H	197	51.01	10.29
4	#5850.00	47.7 AV	54.0	-6.3	2.90 H	197	37.40	10.29
5	11590.00	61.4 PK	74.0	-12.6	1.41 H	68	38.99	22.37
6	11590.00	48.3 AV	54.0	-5.7	1.41 H	68	25.91	22.37

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	97.5 PK			3.01 V	282	87.26	10.24
2	*5795.00	88.6 AV			3.01 V	282	78.33	10.24
3	#5850.00	62.4 PK	74.0	-11.6	3.01 V	282	52.13	10.29
4	#5850.00	49.8 AV	54.0	-4.2	3.01 V	282	39.51	10.29
5	11590.00	61.5 PK	74.0	-12.5	2.31 V	287	39.14	22.37
6	11590.00	48.6 AV	54.0	-5.5	2.31 V	287	26.18	22.37

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": Fundamental frequency.
- " # ": The radiated frequency is out of the restricted band.

802.11ac 80MHz

CHANNEL	TX Channel 42	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	60.8 PK	74.0	-13.2	2.69 H	210	52.28	8.53
2	5150.00	46.6 AV	54.0	-7.4	2.69 H	210	38.04	8.53
3	*5210.00	88.2 PK			2.69 H	210	79.35	8.86
4	*5210.00	77.8 AV			2.69 H	210	68.98	8.86
5	5350.00	61.4 PK	74.0	-12.6	2.69 H	210	51.99	9.43
6	5350.00	46.5 AV	54.0	-7.5	2.69 H	210	37.08	9.43
7	#10420.00	59.8 PK	74.0	-14.3	1.18 H	52	39.17	20.58
8	#10420.00	46.6 AV	54.0	-7.4	1.18 H	52	25.98	20.58

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	61.8 PK	74.0	-12.2	3.59 V	340	53.23	8.53
2	5150.00	47.2 AV	54.0	-6.9	3.59 V	340	38.62	8.53
3	*5210.00	89.3 PK			3.59 V	340	80.45	8.86
4	*5210.00	78.8 AV			3.59 V	340	69.90	8.86
5	5350.00	61.8 PK	74.0	-12.2	3.59 V	340	52.34	9.43
6	5350.00	47.3 AV	54.0	-6.7	3.59 V	340	37.89	9.43
7	#10420.00	60.0 PK	74.0	-14.0	2.49 V	300	39.40	20.58
8	#10420.00	46.7 AV	54.0	-7.3	2.49 V	300	26.11	20.58

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": Fundamental frequency.
- " # ": 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	#5725.00	63.1 PK	74.0	-10.9	1.11 H	203	52.70	10.40
2	#5725.00	48.1 AV	54.0	-5.9	1.11 H	203	37.72	10.40
3	*5775.00	92.0 PK			1.11 H	203	81.69	10.29
4	*5775.00	81.3 AV			1.11 H	203	71.05	10.29
5	#5850.00	63.0 PK	74.0	-11.0	1.11 H	203	52.67	10.29
6	#5850.00	48.8 AV	54.0	-5.2	1.11 H	203	38.54	10.29
7	11550.00	61.6 PK	74.0	-12.4	1.57 H	84	39.25	22.33
8	11550.00	48.2 AV	54.0	-5.8	1.57 H	84	25.83	22.33

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	#5725.00	64.0 PK	74.0	-10.0	3.01 V	300	53.58	10.40
2	#5725.00	48.8 AV	54.0	-5.2	3.01 V	300	38.44	10.40
3	*5775.00	92.3 PK			3.01 V	300	82.04	10.29
4	*5775.00	81.9 AV			3.01 V	300	71.60	10.29
5	#5850.00	63.3 PK	74.0	-10.7	3.01 V	300	53.05	10.29
6	#5850.00	49.4 AV	54.0	-4.7	3.01 V	300	39.06	10.29
7	11550.00	61.7 PK	74.0	-12.3	2.17 V	284	39.37	22.33
8	11550.00	48.4 AV	54.0	-5.7	2.17 V	284	26.02	22.33

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.
6. " # ": The radiated frequency is out of the restricted band.

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
ROHDE & SCHWARZ TEST RECEIVER	ESCS 30	100276	Apr. 01, 2015	Mar. 31, 2016
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ENV216	101197	Apr. 27, 2015	Apr. 26, 2016
LISN With Adapter (for EUT)	AD10	C10Ada-002	Apr. 27, 2015	Apr. 26, 2016
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100218	Nov. 25, 2015	Nov. 24, 2016
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK8129	8129229	May 06, 2015	May 05, 2016
Software	Cond_V7.3.7	NA	NA	NA
RF cable (JYEBAO) With 10dB PAD	5D-FB	Cable-C10.01	Feb. 15, 2016	Feb. 14, 2017
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-011484	May 19, 2015	May 18, 2016
ROHDE & SCHWARZ Artificial Mains Network (For TV EUT)	ESH3-Z5	100220	Nov. 13, 2015	Nov. 12, 2016
LISN With Adapter (for TV EUT)	100220	N/A	Nov. 13, 2015	Nov. 12, 2016

Notes: 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 Shielded Room No. 10.

3. The VCCI Site Registration No. C-1852.

4.2.3 Test Procedure

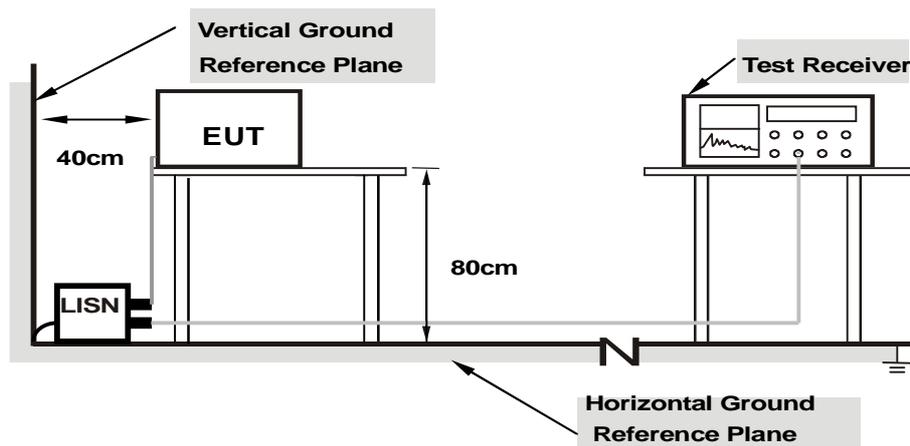
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.2.6 EUT Operating Condition

Mode A

Connected the EUT to adapter

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

Mode B

- a. Turned on the power of all equipmen
- b. Connected the EUT to Notebook via USB 3.0 cable
- c. Notebook read and wrote messages from EUT.

4.2.7 Test Results

Mode A

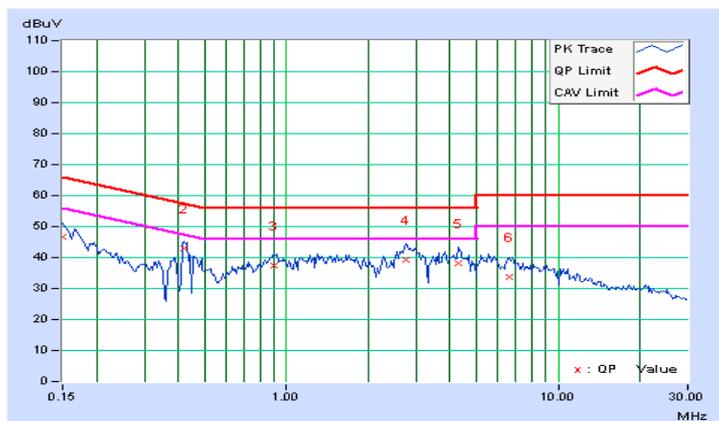
802.11a: CH40

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15001	9.66	36.91	22.48	46.57	32.14	66.00	56.00	-19.43	-23.86
2	0.41953	9.68	33.31	22.05	42.99	31.73	57.46	47.46	-14.46	-15.72
3	0.90000	9.75	27.71	15.18	37.46	24.93	56.00	46.00	-18.54	-21.07
4	2.75391	9.92	29.33	21.51	39.25	31.43	56.00	46.00	-16.75	-14.57
5	4.30859	10.01	28.03	18.97	38.04	28.98	56.00	46.00	-17.96	-17.02
6	6.57813	10.05	23.56	15.53	33.61	25.58	60.00	50.00	-26.39	-24.42

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

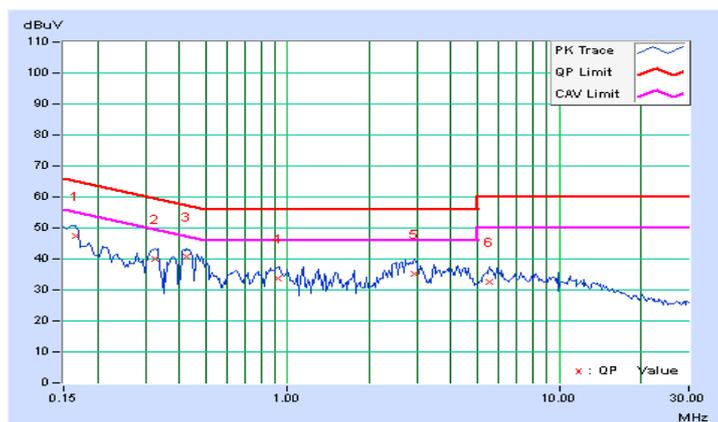


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	9.69	37.72	23.23	47.41	32.92	65.18	55.18	-17.77	-22.26
2	0.32578	9.71	30.35	19.79	40.06	29.50	59.56	49.56	-19.50	-20.06
3	0.42344	9.72	31.03	20.18	40.75	29.90	57.38	47.38	-16.63	-17.48
4	0.92344	9.79	23.96	11.68	33.75	21.47	56.00	46.00	-22.25	-24.53
5	2.92969	9.99	25.38	16.03	35.37	26.02	56.00	46.00	-20.63	-19.98
6	5.52734	10.13	22.63	13.27	32.76	23.40	60.00	50.00	-27.24	-26.60

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



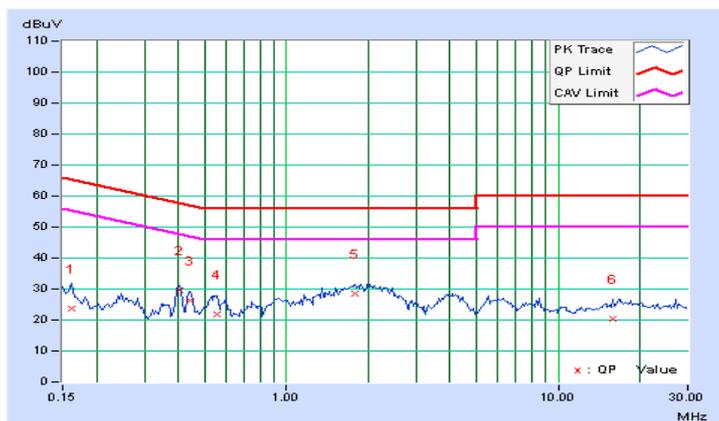
Mode B

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	----------	-------------------	--------------------------------

No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	9.66	14.14	2.85	23.80	12.51	65.38	55.38	-41.58	-42.87
2	0.40391	9.64	19.91	19.10	29.55	28.74	57.77	47.77	-28.22	-19.03
3	0.43906	9.64	16.60	15.03	26.24	24.67	57.08	47.08	-30.84	-22.41
4	0.55625	9.65	12.37	3.26	22.02	12.91	56.00	46.00	-33.98	-33.09
5	1.79688	9.72	18.86	12.25	28.58	21.97	56.00	46.00	-27.42	-24.03
6	15.94531	9.93	10.41	6.30	20.34	16.23	60.00	50.00	-39.66	-33.77

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

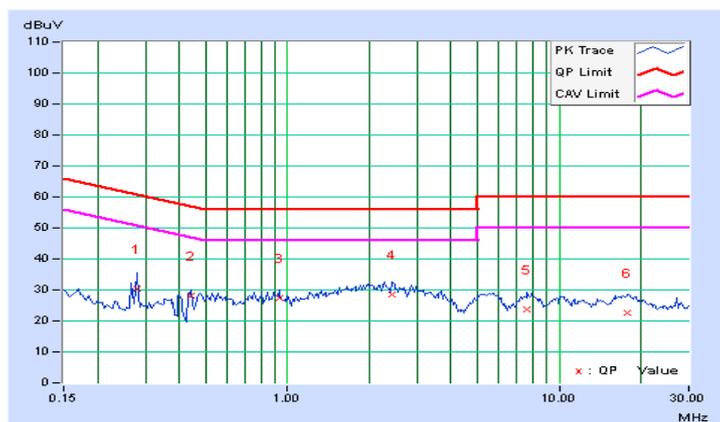


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.27891	9.69	20.82	17.99	30.51	27.68	60.85	50.85	-30.34	-23.17
2	0.43906	9.68	18.33	16.60	28.01	26.28	57.08	47.08	-29.07	-20.80
3	0.93125	9.72	17.64	8.86	27.36	18.58	56.00	46.00	-28.64	-27.42
4	2.42969	9.78	18.63	11.37	28.41	21.15	56.00	46.00	-27.59	-24.85
5	7.60938	9.89	13.73	7.75	23.62	17.64	60.00	50.00	-36.38	-32.36
6	17.91016	10.02	12.56	6.90	22.58	16.92	60.00	50.00	-37.42	-33.08

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

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

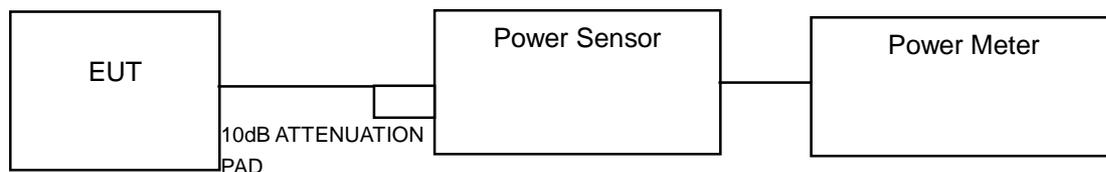
Array Gain = 0 dB (i.e., no array gain) for channel widths \geq 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

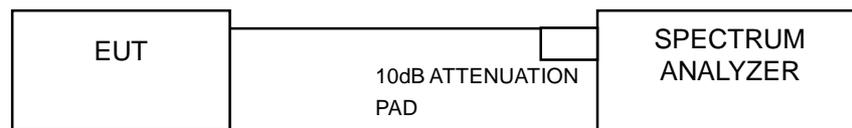
For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT



FOR 26dB & OCCUPIED BANDWIDTH



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

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 26 BANDWIDTH

- 1) Set RBW = approximately 1% of the emission bandwidth.
- 2) Set the VBW > RBW.
- 3) Detector = Peak.
- 4) Trace mode = max hold.
- 5) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

FOR OCCUPIED BANDWIDTH

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to AVERAGE. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Result

POWER OUTPUT:

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	MAXIMUM CONDUCTED POWER (mW)	MAXIMUM CONDUCTED POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	10.617	10.26	24	PASS
40	5200	10.593	10.25	24	PASS
48	5240	10.52	10.22	24	PASS
149	5745	10.765	10.32	24	PASS
157	5785	10.74	10.31	24	PASS
165	5825	10.691	10.29	24	PASS

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	MAXIMUM CONDUCTED POWER (mW)	MAXIMUM CONDUCTED POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	8.166	9.12	24	PASS
40	5200	8.279	9.18	24	PASS
48	5240	8.241	9.16	24	PASS
149	5745	8.299	9.19	24	PASS
157	5785	8.241	9.16	24	PASS
165	5825	8.147	9.11	24	PASS

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	MAXIMUM CONDUCTED POWER (mW)	MAXIMUM CONDUCTED POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
38	5190	8.204	9.14	24	PASS
46	5230	8.26	9.17	24	PASS
151	5755	8.299	9.19	24	PASS
159	5795	8.337	9.21	24	PASS

802.11ac (VHT80)

CHANNEL	CHANNEL FREQUENCY (MHz)	MAXIMUM CONDUCTED POWER (mW)	MAXIMUM CONDUCTED POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
42	5210	6.592	8.19	24	PASS
155	5775	6.622	8.21	24	PASS

26dB BANDWIDTH:
802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
36	5180	21.46	PASS
40	5200	21.51	PASS
48	5240	21.53	PASS

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
36	5180	22.10	PASS
40	5200	21.98	PASS
48	5240	22.11	PASS

802.11n (HT40)

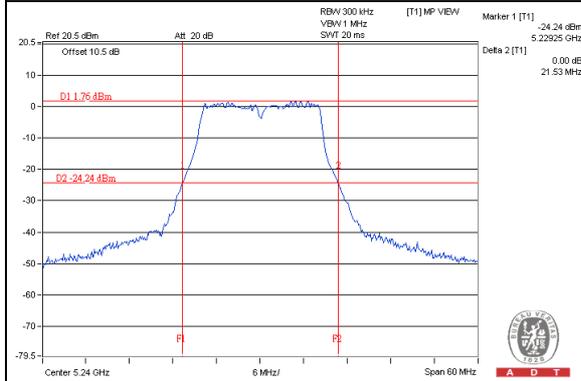
CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
38	5190	44.22	PASS
46	5230	44.44	PASS

802.11ac (VHT80)

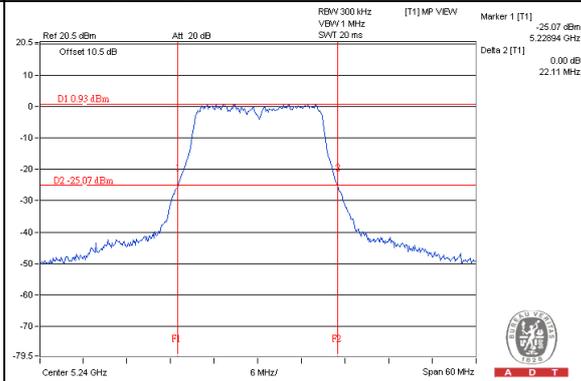
CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
42	5210	83.34	PASS

SPECTRUM PLOT OF WORST VALUE

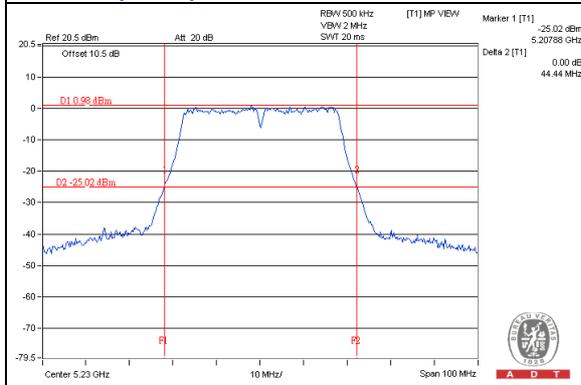
802.11a



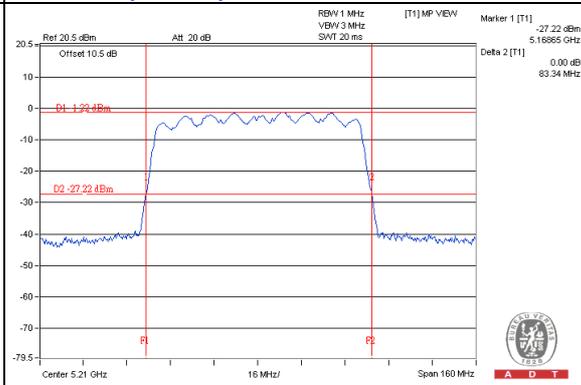
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



OCCUPIED BANDWIDTH:
802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	PASS / FAIL
36	5180	16.80	PASS
40	5200	16.80	PASS
48	5240	16.80	PASS
149	5745	16.78	PASS
157	5785	16.80	PASS
165	5825	16.80	PASS

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	PASS / FAIL
36	5180	17.88	PASS
40	5200	17.88	PASS
48	5240	17.88	PASS
149	5745	17.90	PASS
157	5785	17.80	PASS
165	5825	17.80	PASS

802.11n (HT40)

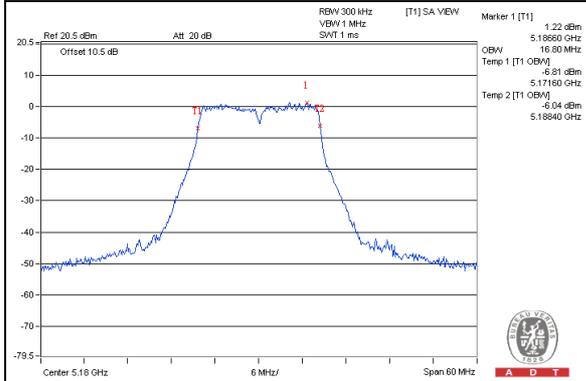
CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	PASS / FAIL
38	5190	37.40	PASS
46	5230	37.20	PASS
151	5755	37.25	PASS
159	5795	37.17	PASS

802.11ac (VHT80)

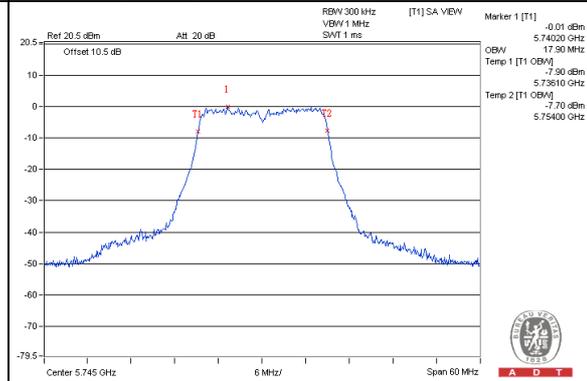
CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	PASS / FAIL
42	5210	75.36	PASS
155	5775	75.13	PASS

SPECTRUM PLOT OF WORST VALUE

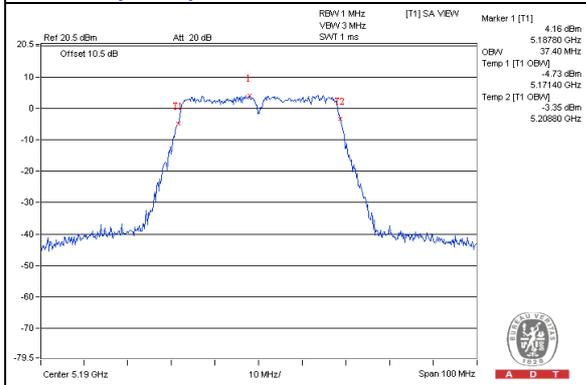
802.11a



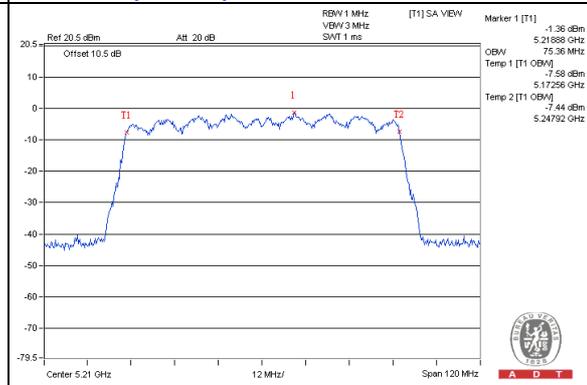
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

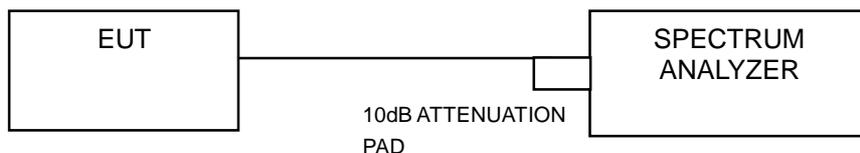


4.4 Peak Power Spectral Density Measurement

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 Procedure

For U-NII-1 band:

Using method SA-1

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

For U-NII-3 band:

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 500 kHz, Set VBW ≥ 3 RBW, Detector = RMS
- 3) Sweep time = auto, trigger set to “free run”.
- 4) Trace average at least 100 traces in power averaging mode.
- 5) Record the max value

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

Same as Item 4.3.6.

4.4.7 Test Results

For U-NII-1 Band

802.11a

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
36	5180	-2.29	11	PASS
40	5200	-1.98	11	PASS
48	5240	-1.98	11	PASS

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
36	5180	-3.44	11	PASS
40	5200	-3.12	11	PASS
48	5240	-2.96	11	PASS

802.11n (HT40)

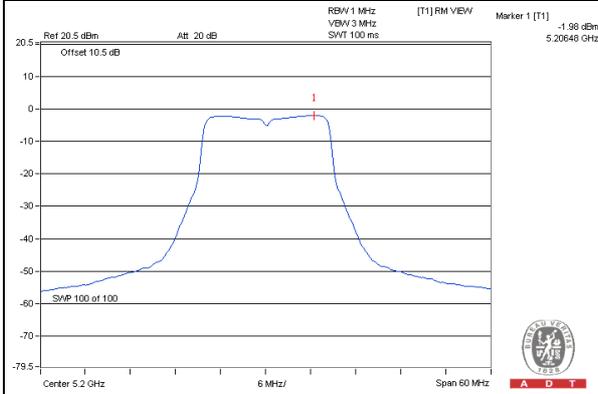
CHANNEL	FREQUENCY (MHz)	PSD (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
38	5190	-5.16	11	PASS
46	5230	-5.38	11	PASS

802.11ac (VHT80)

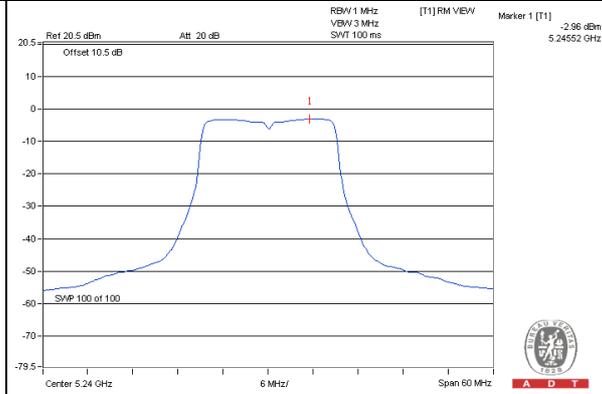
CHANNEL	FREQUENCY (MHz)	PSD (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
42	5210	-10.74	11	PASS

SPECTRUM PLOT OF WORST VALUE

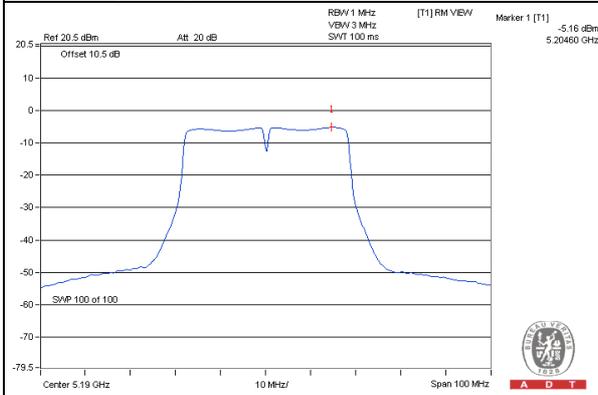
802.11a



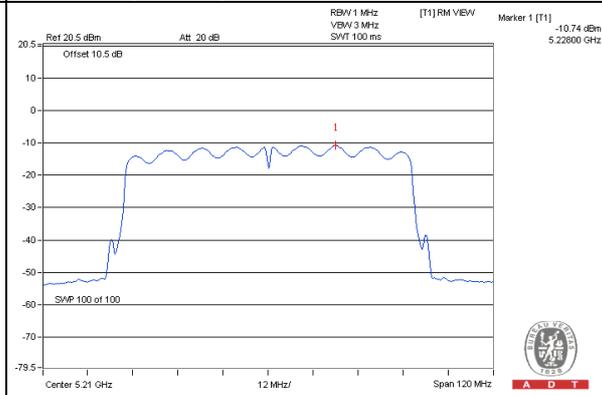
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



For U-NII-3 Band

802.11a

Channel	Freq. (MHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	PASS /FAIL
149	5745	3.40	30	PASS
157	5785	3.00	30	PASS
165	5825	3.21	30	PASS

802.11n (HT20)

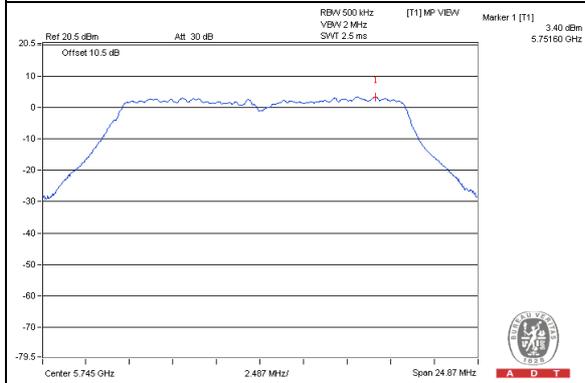
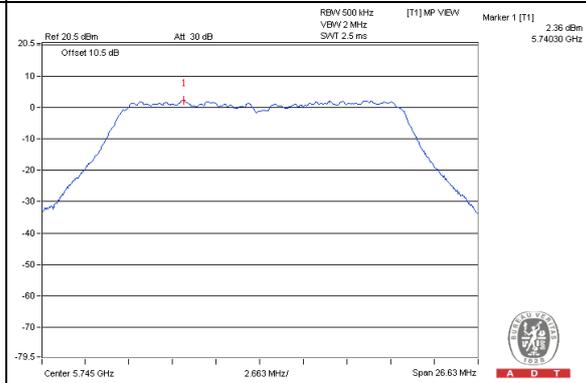
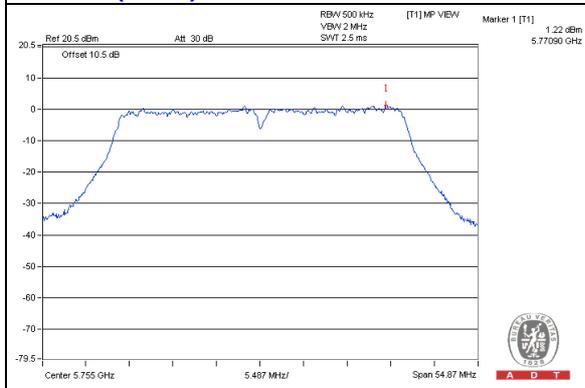
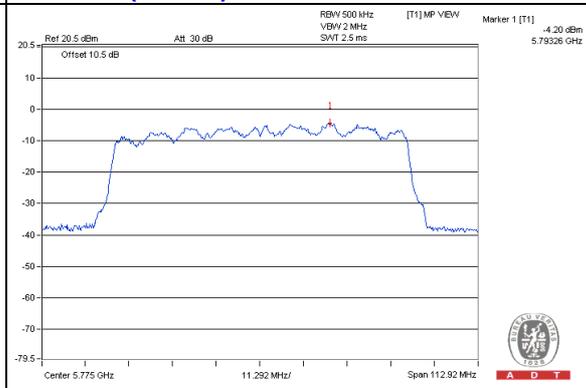
Channel	Freq. (MHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	PASS /FAIL
149	5745	2.36	30	PASS
157	5785	1.41	30	PASS
165	5825	1.80	30	PASS

802.11n (HT40)

Channel	Freq. (MHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	PASS /FAIL
151	5755	1.22	30	PASS
159	5795	1.09	30	PASS

802.11ac (VHT80)

Channel	Freq. (MHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	PASS /FAIL
155	5775	-4.20	30	PASS

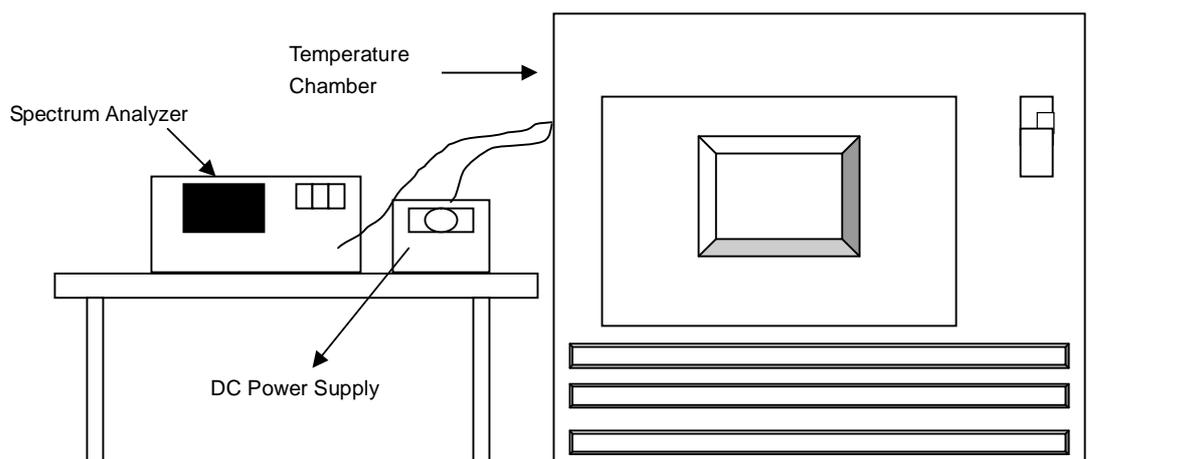
SPECTRUM PLOT OF WORST VALUE**802.11a****802.11n (HT20)****802.11n (HT40)****802.11ac (VHT80)**

4.5 Frequency Stability Measurement

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

- a. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- b. Turn the EUT on and couple its output to a spectrum analyzer.
- c. Turn the EUT off and set the chamber to the highest temperature specified.
- d. 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.
- e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- f. 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 (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
50	5.0	5180.043511	8.3997490	5180.043069	8.3144788	5180.043088	8.3180962	5180.043337	8.3661759
40	5.0	5180.043144	8.3289854	5180.042905	8.2828185	5180.042990	8.2992177	5180.04242	8.1892800
30	5.0	5180.042532	8.2107858	5180.042493	8.2032819	5180.042571	8.2182520	5180.042961	8.2936988
20	5.0	5180.043165	8.3330067	5180.043096	8.3196911	5180.042757	8.2541921	5180.04328	8.3552687
10	5.0	5180.04303	8.3069479	5180.042685	8.2403475	5180.042969	8.2951715	5180.043171	8.3341205
0	5.0	5180.042679	8.2392727	5180.042887	8.2793436	5180.042689	8.2411336	5180.042787	8.2601129
-10	5.0	5180.042912	8.2841058	5180.043212	8.3420849	5180.043258	8.3508837	5180.042893	8.2804394
-20	5.0	5180.043212	8.3420478	5180.043293	8.3578134	5180.043424	8.3830503	5180.043437	8.3855214

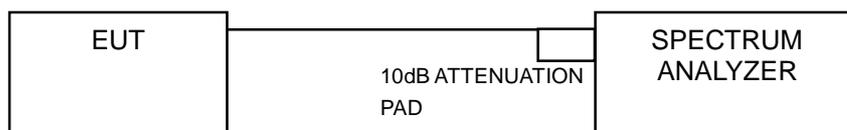
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5180MHz									
TEMP. (°C)	POWER SUPPLY (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
20	5.75	5180.042615	8.2269007	5180.042403	8.1859073	5180.042691	8.2415907	5180.042198	8.1462597
	5.0	5180.043165	8.3330067	5180.043096	8.3196911	5180.042757	8.2541921	5180.04328	8.3552687
	4.25	5180.042638	8.2313657	5180.042974	8.2961390	5180.042747	8.2523302	5180.042989	8.2990626

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

- a. Set resolution bandwidth (RBW) = 100kHz
- b. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- c. Trace mode = max hold.
- d. Sweep = auto couple.
- e. 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

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHZ)	MINIMUM LIMIT (MHZ)	PASS / FAIL
149	5745	16.58	0.5	PASS
157	5785	16.60	0.5	PASS
165	5825	16.60	0.5	PASS

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHZ)	MINIMUM LIMIT (MHZ)	PASS / FAIL
149	5745	17.76	0.5	PASS
157	5785	17.75	0.5	PASS
165	5825	17.72	0.5	PASS

802.11n (HT40)

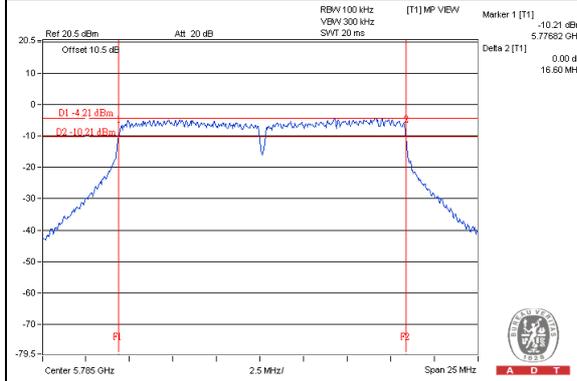
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHZ)	MINIMUM LIMIT (MHZ)	PASS / FAIL
151	5755	36.58	0.5	PASS
159	5795	36.59	0.5	PASS

802.11ac (VHT80)

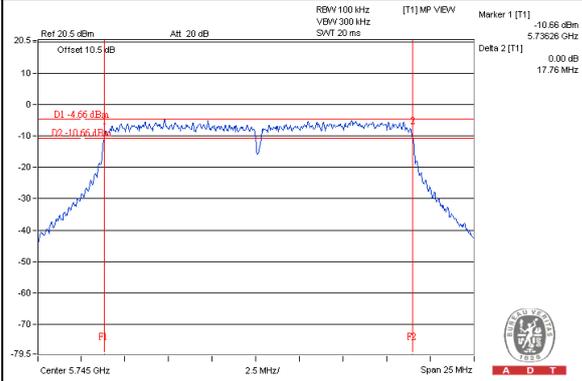
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHZ)	MINIMUM LIMIT (MHZ)	PASS / FAIL
155	5775	75.28	0.5	PASS

SPECTRUM PLOT OF WORST VALUE

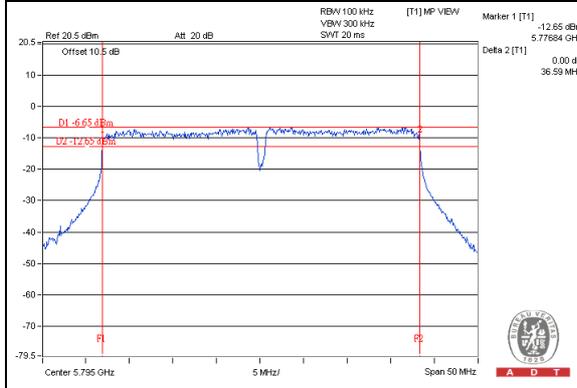
802.11a



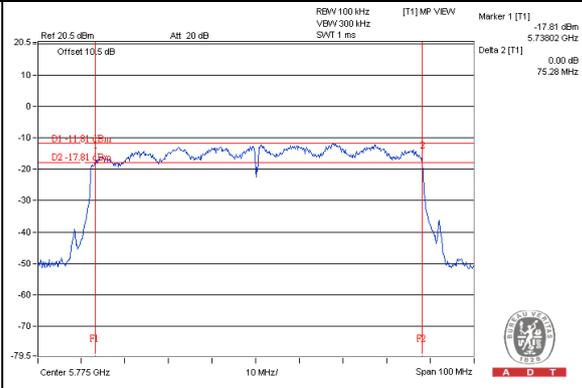
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



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:

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

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