FCC Test Report

Report No.:	RF120531C10N-1
FCC ID:	ZHV-DTAEA
Test Model:	DTAEA
Received Date:	May 09, 2012
Test Date:	Jul. 16 ~ Jul. 30, 2015
Issued Date:	Apr. 18, 2016
Applicant:	Riverbed Technology Inc.
Address:	680 Folsom Street San Francisco, California USA 94107
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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Release Control Record

Issue No.	Description	Date Issued
RF120531C10N-1	Original release	Apr. 18, 2016

1 Certificate of Conformity

Product:	Wireless-N 300Mbps+300Mbps Ceiling Mount Dual Band Concurrent AP
Brand:	riverbed
Test Model:	DTAEA
Sample Status:	Engineering sample
Applicant:	Riverbed Technology Inc.
Test Date:	Jul. 16 ~ Jul. 30, 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 : _____ , **Date:** Apr. 18, 2016

Suntee Liu / Specialist

Approved by : _____ , **Date:** Apr. 18, 2016

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
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -11.51dB at 3.44141MHz.
15.407(b) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.4dB at 625.00MHz.
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	Antenna connector is IPEX not a standard connector.

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	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports0	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 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	Wireless-N 300Mbps+300Mbps Ceiling Mount Dual Band Concurrent AP
Brand	riverbed
Test Model	DTAEA
Status of EUT	Engineering sample
Power Supply Rating	12Vdc (adapter) 48Vdc (POE)
Modulation Type	64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 300Mbps
Operating Frequency	5180 ~ 5240MHz, 5745 ~ 5825MHz
Number of Channel	5180 ~ 5240MHz: 802.11a, 802.11n (HT20): 4 802.11n (HT40): 2 5745 ~ 5825MHz: 802.11a, 802.11n (HT20): 5 802.11n (HT40): 2
Output Power	5180 ~ 5240MHz: 542.074mW 5745 ~ 5825MHz: 443.734mW
Antenna Type	PIFA antenna with 2dBi gain
Antenna Connector	IPEX
Accessory Device	Adapter
Data Cable Supplied	NA

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitters and 2 receivers.

Modulation Mode	TX Function
802.11a	2TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX

2. The EUT uses following adapter and POE. POE is provided as support unit only.

Adapter	
Brand	Powertron
Model	PA1024-2HUB
Input Power	100-240Vac, 50-60Hz, 0.6A
Output Power	12Vdc, 2.0A, 24.0W
Power Line	1.5m non-shielded cable with one core

POE	
Model	PD-6083G300
Input Power	100-250Vac, 50/60Hz, 0.5A
Output Power	48Vdc, 0.35A

3.2 Description of Test Modes

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

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter
B	-	√	√	-	Power from POE

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

Note:
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on X-plane.
2. "-" means no effect.

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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
A	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
A	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0

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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
A, B	802.11n (HT20)	5180-5240	36 to 48	40	OFDM	BPSK	7.2
	802.11n (HT20)	5745-5825	149 to 165		OFDM	BPSK	7.2

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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
A, B	802.11n (HT20)	5180-5240	36 to 48	40	OFDM	BPSK	7.2
	802.11n (HT20)	5745-5825	149 to 165		OFDM	BPSK	7.2

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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
A	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
A	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0

Test Condition:

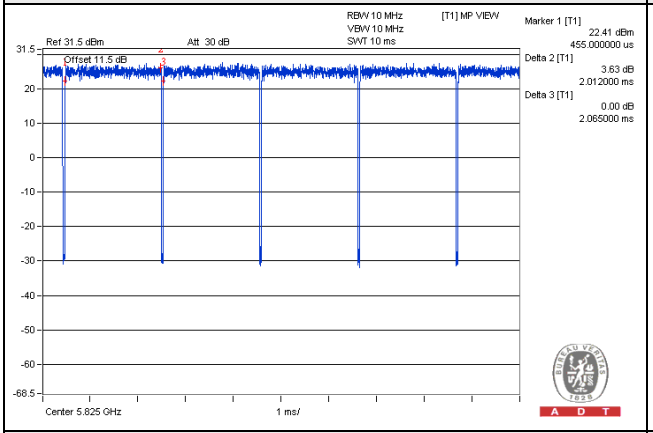
Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	18 deg. C, 70% RH	120Vac, 60Hz	Nick Hsu Jones Chang
RE<1G	18 deg. C, 70% RH	120Vac, 60Hz	Nick Hsu
PLC	23 deg. C, 66% RH	120Vac, 60Hz	Ben Huang
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Match Tsui

3.3 Duty Cycle of Test Signal

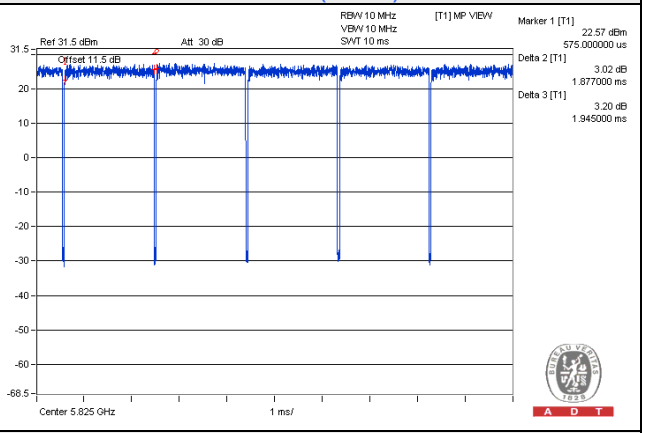
802.11a, 802.11n (HT20), 802.11n (HT40): Duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 2.012/2.065 = 0.974, Duty factor = 10 * log(1/0.974) = 0.11
802.11n (HT20): Duty cycle = 1.877/1.945 = 0.965, Duty factor = 10 * log(1/0.965) = 0.15
802.11n (HT40): Duty cycle = 0.475/0.530 = 0.896, Duty factor = 10 * log(1/0.896) = 0.48

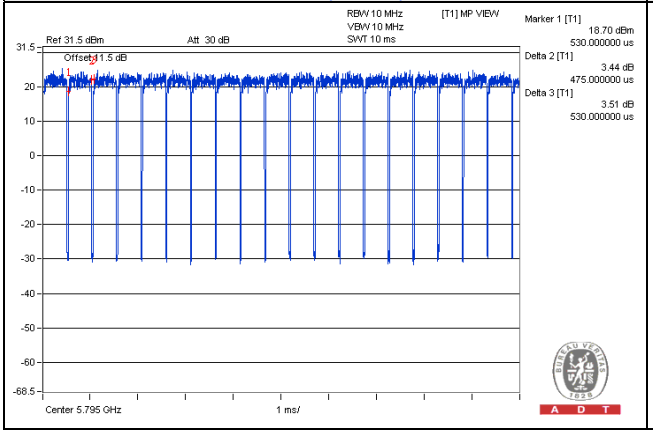
802.11a



802.11n (HT20)



802.11n (HT40)



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	E5410	1HC2XM1	FCC DoC Approved	-
B.	POE	NA	PD-6083G300	NA	NA	Provided by Manufacturer

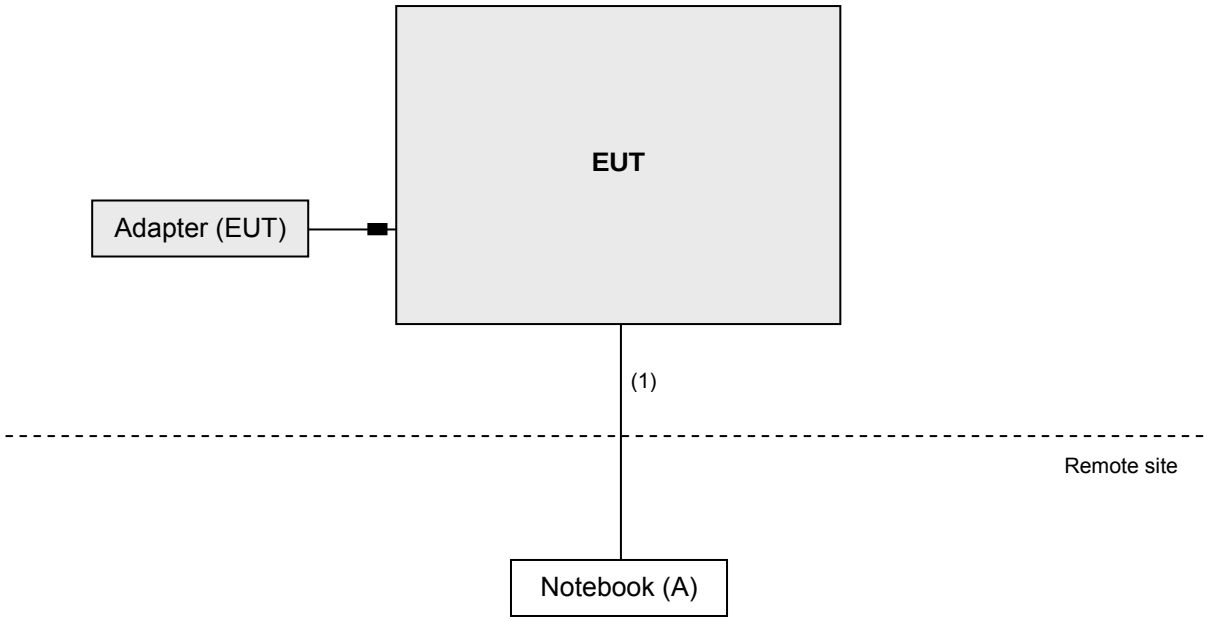
Note:

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

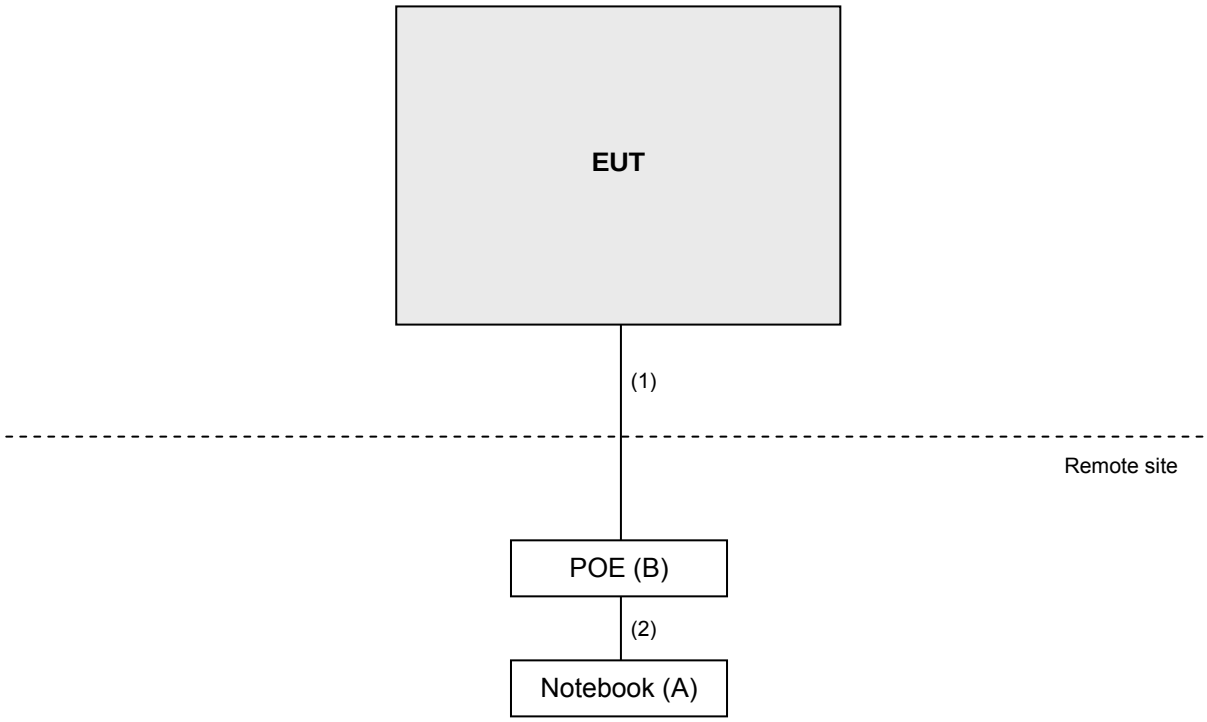
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45 , Cat5e	1	3	N	0	-
2.	RJ45 , Cat5e	1	3	N	0	-

3.4.1 Configuration of System under Test

Test mode A



Test mode B



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 v01r02
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 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 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:

$$E = \frac{1000000\sqrt{30P}}{3}$$ μV/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, 2014	Aug. 08, 2015
Preamplifier Agilent	8447D	2944A10631	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 09, 2014	Aug. 08, 2015
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

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 HP 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:

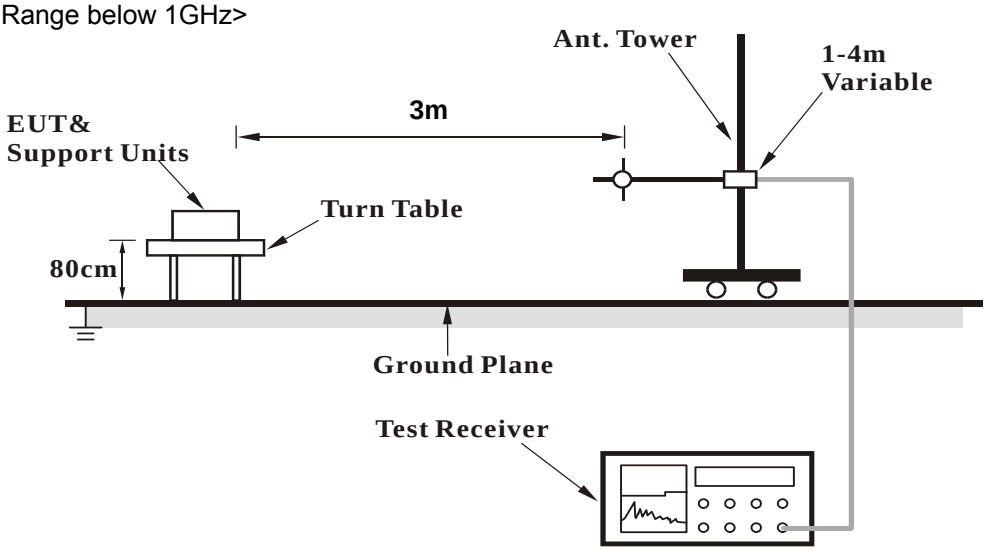
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 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

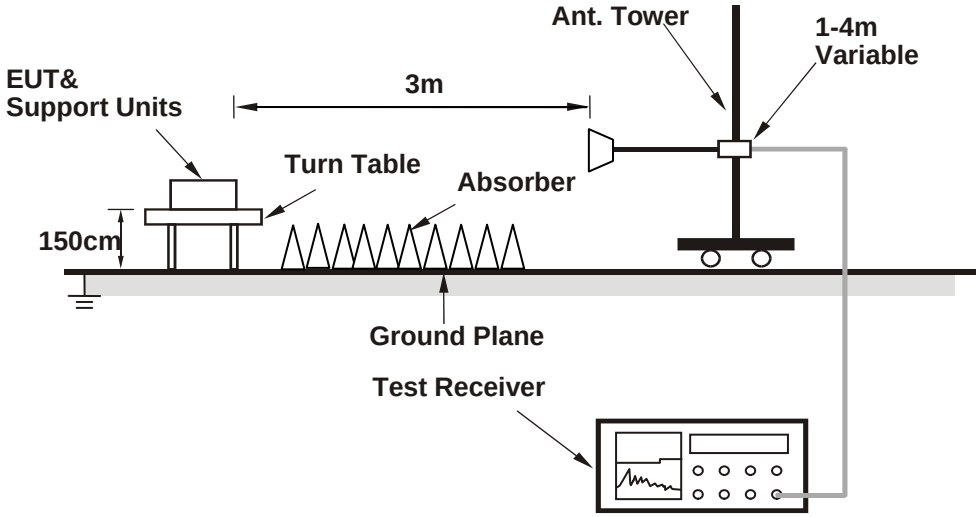
No deviation.

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

a. Placed the EUT on the testing table.
b. Prepared notebook to act as communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
d. The communication partner sent data to EUT by command "PING".

4.1.7 Test Results

Above 1GHz Worst-case Data

802.11a

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	69.7 PK	74.0	-4.3	1.09 H	102	63.70	6.00
2	5150.00	48.2 AV	54.0	-5.8	1.09 H	102	42.20	6.00
3	*5180.00	112.7 PK			1.17 H	103	73.20	39.50
4	*5180.00	102.9 AV			1.17 H	103	63.40	39.50
5	#10360.00	61.7 PK	74.0	-12.3	1.00 H	338	43.30	18.40
6	#10360.00	49.4 AV	54.0	-4.6	1.00 H	338	31.00	18.40
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	71.1 PK	74.0	-2.9	1.84 V	177	65.10	6.00
2	5150.00	52.4 AV	54.0	-1.6	1.84 V	177	46.40	6.00
3	*5180.00	119.6 PK			2.00 V	192	80.10	39.50
4	*5180.00	109.7 AV			2.00 V	192	70.20	39.50
5	#10360.00	64.1 PK	74.0	-9.9	1.02 V	143	45.70	18.40
6	#10360.00	50.8 AV	54.0	-3.2	1.02 V	143	32.40	18.40

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 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	114.6 PK			1.55 H	97	75.00	39.60
2	*5200.00	104.7 AV			1.55 H	97	65.10	39.60
3	#10400.00	61.4 PK	74.0	-12.6	1.53 H	0	42.90	18.50
4	#10400.00	48.5 AV	54.0	-5.5	1.53 H	0	30.00	18.50
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	*5200.00	117.3 PK			1.25 V	259	77.70	39.60
2	*5200.00	107.5 AV			1.25 V	259	67.90	39.60
3	#10400.00	68.0 PK	74.0	-6.0	1.02 V	130	49.50	18.50
4	#10400.00	52.8 AV	54.0	-1.2	1.02 V	130	34.30	18.50

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 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	114.7 PK			1.16 H	100	75.10	39.60
2	*5240.00	104.9 AV			1.16 H	100	65.30	39.60
3	5360.00	58.2 PK	74.0	-15.8	1.55 H	216	52.10	6.10
4	5360.00	46.6 AV	54.0	-7.4	1.55 H	216	40.50	6.10
5	#10480.00	62.9 PK	74.0	-11.1	1.12 H	180	43.90	19.00
6	#10480.00	49.9 AV	54.0	-4.1	1.12 H	180	30.90	19.00
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	*5240.00	120.3 PK			1.88 V	192	80.70	39.60
2	*5240.00	110.1 AV			1.88 V	192	70.50	39.60
3	5360.00	61.8 PK	74.0	-12.2	2.19 V	189	55.70	6.10
4	5360.00	50.5 AV	54.0	-3.5	2.19 V	189	44.40	6.10
5	#10480.00	67.1 PK	74.0	-6.9	1.05 V	307	48.10	19.00
6	#10480.00	52.8 AV	54.0	-1.2	1.05 V	307	33.80	19.00

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5714.00	57.6 PK	74.0	-16.4	1.33 H	62	50.80	6.80
2	#5714.00	46.5 AV	54.0	-7.5	1.33 H	62	39.70	6.80
3	#5722.00	71.3 PK	78.2	-6.9	1.62 H	187	64.50	6.80
4	#5725.00	57.9 PK	78.2	-20.3	1.62 H	187	51.10	6.80
5	*5745.00	108.5 PK			1.09 H	174	68.10	40.40
6	*5745.00	99.3 AV			1.09 H	174	58.90	40.40
7	11490.00	60.4 PK	74.0	-13.6	1.37 H	90	42.00	18.40
8	11490.00	47.4 AV	54.0	-6.6	1.37 H	90	29.00	18.40
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	#5714.00	70.8 PK	74.0	-3.2	1.85 V	193	64.00	6.80
2	#5714.00	51.4 AV	54.0	-2.6	1.85 V	193	44.60	6.80
3	#5722.00	76.8 PK	78.2	-1.4	1.75 V	22	70.00	6.80
4	#5725.00	66.8 PK	78.2	-11.4	2.10 V	193	60.00	6.80
5	*5745.00	115.1 PK			1.91 V	191	74.70	40.40
6	*5745.00	105.2 AV			1.91 V	191	64.80	40.40
7	11490.00	61.1 PK	74.0	-12.9	1.25 V	190	42.70	18.40
8	11490.00	47.7 AV	54.0	-6.3	1.25 V	190	29.30	18.40

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 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	113.6 PK			1.21 H	187	73.10	40.50
2	*5785.00	104.7 AV			1.21 H	187	64.20	40.50
3	11570.00	60.3 PK	74.0	-13.7	1.34 H	111	41.90	18.40
4	11570.00	47.3 AV	54.0	-6.7	1.34 H	111	28.90	18.40
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	*5785.00	119.1 PK			1.99 V	193	78.60	40.50
2	*5785.00	109.1 AV			1.99 V	193	68.60	40.50
3	11570.00	66.7 PK	74.0	-7.3	2.26 V	1	48.30	18.40
4	11570.00	52.4 AV	54.0	-1.6	2.26 V	1	34.00	18.40

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.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	112.3 PK			1.33 H	57	71.80	40.50
2	*5825.00	103.0 AV			1.33 H	57	62.50	40.50
3	#5850.00	57.4 PK	78.2	-20.8	1.54 H	3	50.50	6.90
4	#5853.00	66.3 PK	78.2	-11.9	1.54 H	3	59.30	7.00
5	#5861.00	62.5 PK	74.0	-11.5	1.84 H	14	55.50	7.00
6	#5861.00	47.5 AV	54.0	-6.5	1.84 H	14	40.50	7.00
7	11650.00	60.6 PK	74.0	-13.4	1.30 H	185	41.70	18.90
8	11650.00	47.6 AV	54.0	-6.4	1.30 H	185	28.70	18.90
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	118.0 PK			1.97 V	193	77.50	40.50
2	*5825.00	107.9 AV			1.97 V	193	67.40	40.50
3	#5850.00	61.1 PK	78.2	-17.1	1.95 V	19	54.20	6.90
4	#5853.00	73.9 PK	78.2	-4.3	1.95 V	19	66.90	7.00
5	#5861.00	66.5 PK	74.0	-7.5	2.15 V	156	59.50	7.00
6	#5861.00	50.9 AV	54.0	-3.1	2.15 V	156	43.90	7.00
7	11650.00	68.6 PK	74.0	-5.4	2.27 V	355	49.70	18.90
8	11650.00	52.2 AV	54.0	-1.8	2.27 V	355	33.30	18.90

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 (HT20)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	62.3 PK	74.0	-11.7	1.33 H	99	56.30	6.00
2	5150.00	49.4 AV	54.0	-4.6	1.33 H	99	43.40	6.00
3	*5180.00	112.8 PK			1.32 H	97	73.30	39.50
4	*5180.00	102.7 AV			1.32 H	97	63.20	39.50
5	#10360.00	61.9 PK	74.0	-12.1	1.30 H	181	43.50	18.40
6	#10360.00	48.7 AV	54.0	-5.3	1.30 H	181	30.30	18.40
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	71.6 PK	74.0	-2.4	1.93 V	180	65.60	6.00
2	5150.00	52.1 AV	54.0	-1.9	1.93 V	180	46.10	6.00
3	*5180.00	119.2 PK			2.00 V	189	79.70	39.50
4	*5180.00	108.9 AV			2.00 V	189	69.40	39.50
5	#10360.00	63.5 PK	74.0	-10.5	1.09 V	155	45.10	18.40
6	#10360.00	50.4 AV	54.0	-3.6	1.09 V	155	32.00	18.40

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 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	112.4 PK			1.32 H	96	72.80	39.60
2	*5200.00	102.5 AV			1.32 H	96	62.90	39.60
3	#10400.00	62.3 PK	74.0	-11.7	1.27 H	178	43.80	18.50
4	#10400.00	49.2 AV	54.0	-4.8	1.27 H	178	30.70	18.50
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	*5200.00	118.9 PK			1.90 V	192	79.30	39.60
2	*5200.00	108.8 AV			1.90 V	192	69.20	39.60
3	#10400.00	67.1 PK	74.0	-6.9	1.09 V	301	48.60	18.50
4	#10400.00	51.7 AV	54.0	-2.3	1.09 V	301	33.20	18.50

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 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	113.4 PK			1.17 H	101	73.80	39.60
2	*5240.00	103.2 AV			1.17 H	101	63.60	39.60
3	5360.00	56.9 PK	74.0	-17.1	1.38 H	168	50.80	6.10
4	5360.00	45.9 AV	54.0	-8.1	1.38 H	168	39.80	6.10
5	#10480.00	62.0 PK	74.0	-12.0	1.25 H	180	43.00	19.00
6	#10480.00	49.0 AV	54.0	-5.0	1.25 H	180	30.00	19.00
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	*5240.00	118.7 PK			1.88 V	187	79.10	39.60
2	*5240.00	108.2 AV			1.88 V	187	68.60	39.60
3	5360.00	60.2 PK	74.0	-13.8	2.04 V	189	54.10	6.10
4	5360.00	47.7 AV	54.0	-6.3	2.04 V	189	41.60	6.10
5	#10480.00	66.3 PK	74.0	-7.7	1.08 V	305	47.30	19.00
6	#10480.00	52.1 AV	54.0	-1.9	1.08 V	305	33.10	19.00

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5714.00	57.7 PK	74.0	-16.3	1.32 H	36	50.90	6.80
2	#5714.00	46.3 AV	54.0	-7.7	1.32 H	36	39.50	6.80
3	#5722.00	69.4 PK	78.2	-8.8	1.60 H	185	62.60	6.80
4	#5725.00	59.3 PK	78.2	-18.9	1.60 H	185	52.50	6.80
5	*5745.00	108.6 PK			1.32 H	189	68.20	40.40
6	*5745.00	98.5 AV			1.32 H	189	58.10	40.40
7	11490.00	59.9 PK	74.0	-14.1	1.33 H	88	41.50	18.40
8	11490.00	47.1 AV	54.0	-6.9	1.33 H	88	28.70	18.40
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	#5714.00	60.0 PK	74.0	-14.0	1.90 V	200	53.20	6.80
2	#5714.00	48.1 AV	54.0	-5.9	1.90 V	200	41.30	6.80
3	#5722.00	76.8 PK	78.2	-1.4	1.75 V	33	70.00	6.80
4	#5725.00	65.1 PK	78.2	-13.1	1.75 V	28	58.30	6.80
5	*5745.00	115.1 PK			1.90 V	191	74.70	40.40
6	*5745.00	105.0 AV			1.90 V	191	64.60	40.40
7	11490.00	60.9 PK	74.0	-13.1	1.25 V	187	42.50	18.40
8	11490.00	47.7 AV	54.0	-6.3	1.25 V	187	29.30	18.40

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 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	113.4 PK			1.58 H	170	72.90	40.50
2	*5785.00	103.0 AV			1.58 H	170	62.50	40.50
3	11570.00	60.8 PK	74.0	-13.2	1.29 H	100	42.40	18.40
4	11570.00	47.6 AV	54.0	-6.4	1.29 H	100	29.20	18.40
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	*5785.00	118.9 PK			2.06 V	185	78.40	40.50
2	*5785.00	109.2 AV			2.06 V	185	68.70	40.50
3	11570.00	66.5 PK	74.0	-7.5	2.26 V	0	48.10	18.40
4	11570.00	52.3 AV	54.0	-1.7	2.26 V	0	33.90	18.40

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 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	113.1 PK			1.55 H	57	72.60	40.50
2	*5825.00	103.2 AV			1.55 H	57	62.70	40.50
3	#5850.00	61.7 PK	78.2	-16.5	1.55 H	36	54.80	6.90
4	#5853.00	70.5 PK	78.2	-7.7	1.55 H	36	63.50	7.00
5	#5861.00	58.8 PK	74.0	-15.2	1.84 H	0	51.80	7.00
6	#5861.00	47.6 AV	54.0	-6.4	1.84 H	0	40.60	7.00
7	11650.00	60.8 PK	74.0	-13.2	1.40 H	190	41.90	18.90
8	11650.00	48.1 AV	54.0	-5.9	1.40 H	190	29.20	18.90
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	117.8 PK			1.89 V	183	77.30	40.50
2	*5825.00	107.6 AV			1.89 V	183	67.10	40.50
3	#5850.00	66.5 PK	78.2	-11.7	1.99 V	144	59.60	6.90
4	#5853.00	72.5 PK	78.2	-5.7	1.99 V	144	65.50	7.00
5	#5861.00	69.2 PK	74.0	-4.8	1.58 V	161	62.20	7.00
6	#5861.00	51.7 AV	54.0	-2.3	1.58 V	161	44.70	7.00
7	11650.00	67.3 PK	74.0	-6.7	2.24 V	358	48.40	18.90
8	11650.00	52.1 AV	54.0	-1.9	2.24 V	358	33.20	18.90

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 (HT40)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	65.9 PK	74.0	-8.1	1.37 H	99	59.90	6.00
2	5150.00	50.5 AV	54.0	-3.5	1.37 H	99	44.50	6.00
3	*5190.00	102.8 PK			1.46 H	99	63.30	39.50
4	*5190.00	93.3 AV			1.46 H	99	53.80	39.50
5	#10380.00	60.5 PK	74.0	-13.5	1.40 H	177	42.00	18.50
6	#10380.00	47.3 AV	54.0	-6.7	1.40 H	177	28.80	18.50
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	5150.00	70.8 PK	74.0	-3.2	2.01 V	91	64.80	6.00
2	5150.00	52.6 AV	54.0	-1.4	2.01 V	91	46.60	6.00
3	*5190.00	110.1 PK			2.18 V	191	70.60	39.50
4	*5190.00	100.1 AV			2.18 V	191	60.60	39.50
5	#10380.00	60.7 PK	74.0	-13.3	1.15 V	160	42.20	18.50
6	#10380.00	47.6 AV	54.0	-6.4	1.15 V	160	29.10	18.50

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 46	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	58.0 PK	74.0	-16.0	1.54 H	100	52.00	6.00
2	5150.00	46.1 AV	54.0	-7.9	1.54 H	100	40.10	6.00
3	*5230.00	112.1 PK			1.46 H	98	72.50	39.60
4	*5230.00	102.1 AV			1.46 H	98	62.50	39.60
5	5400.00	56.9 PK	74.0	-17.1	1.46 H	262	50.60	6.30
6	5400.00	45.8 AV	54.0	-8.2	1.46 H	262	39.50	6.30
7	#10460.00	61.2 PK	74.0	-12.8	1.29 H	179	42.70	18.50
8	#10460.00	48.3 AV	54.0	-5.7	1.29 H	179	29.80	18.50
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	5150.00	64.3 PK	74.0	-9.7	1.83 V	191	58.30	6.00
2	5150.00	48.0 AV	54.0	-6.0	1.83 V	191	42.00	6.00
3	*5230.00	116.9 PK			1.88 V	187	77.30	39.60
4	*5230.00	106.4 AV			1.88 V	187	66.80	39.60
5	5360.00	62.7 PK	74.0	-11.3	2.18 V	190	56.60	6.10
6	5360.00	49.9 AV	54.0	-4.1	2.18 V	190	43.80	6.10
7	#10460.00	65.4 PK	74.0	-8.6	2.04 V	14	46.50	18.90
8	#10460.00	52.1 AV	54.0	-1.9	2.04 V	14	33.20	18.90

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	66.2 PK	74.0	-7.8	1.34 H	143	59.40	6.80
2	#5714.90	50.6 AV	54.0	-3.4	1.34 H	143	43.80	6.80
3	#5722.90	73.4 PK	78.2	-4.8	1.32 H	144	66.60	6.80
4	#5725.00	55.5 PK	78.2	-22.7	1.10 H	142	48.70	6.80
5	*5755.00	105.0 PK			1.55 H	181	64.50	40.50
6	*5755.00	94.5 AV			1.55 H	181	54.00	40.50
7	11510.00	59.0 PK	74.0	-15.0	1.29 H	167	40.70	18.30
8	11510.00	46.5 AV	54.0	-7.5	1.29 H	167	28.20	18.30
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	#5714.90	67.7 PK	74.0	-6.3	1.00 V	256	60.90	6.80
2	#5714.90	52.3 AV	54.0	-1.7	1.00 V	256	45.50	6.80
3	#5722.90	75.9 PK	78.2	-2.3	1.00 V	259	69.10	6.80
4	#5725.00	55.6 PK	78.2	-22.6	1.00 V	257	48.80	6.80
5	*5755.00	108.6 PK			1.59 V	181	68.10	40.50
6	*5755.00	97.5 AV			1.59 V	181	57.00	40.50
7	11510.00	59.6 PK	74.0	-14.4	1.33 V	89	41.30	18.30
8	11510.00	46.1 AV	54.0	-7.9	1.33 V	89	27.80	18.30

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 159	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	109.2 PK			1.46 H	176	68.70	40.50
2	*5795.00	99.3 AV			1.46 H	176	58.80	40.50
3	#5850.00	50.5 PK	78.2	-27.7	1.47 H	175	43.60	6.90
4	#5852.10	67.8 PK	78.2	-10.4	1.60 H	183	60.80	7.00
5	#5860.10	67.9 PK	74.0	-6.1	1.52 H	175	60.90	7.00
6	#5860.10	48.4 AV	54.0	-5.6	1.52 H	175	41.40	7.00
7	11590.00	59.1 PK	74.0	-14.9	1.20 H	328	40.60	18.50
8	11590.00	47.6 AV	54.0	-6.4	1.20 H	328	29.10	18.50
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	*5795.00	113.4 PK			1.78 V	139	72.90	40.50
2	*5795.00	102.8 AV			1.78 V	139	62.30	40.50
3	#5850.00	55.7 PK	78.2	-22.5	1.65 V	329	48.80	6.90
4	#5852.10	71.2 PK	78.2	-7.0	1.64 V	332	64.20	7.00
5	#5860.10	72.4 PK	74.0	-1.6	1.64 V	330	65.40	7.00
6	#5860.10	50.2 AV	54.0	-3.8	1.64 V	330	43.20	7.00
7	11590.00	61.4 PK	74.0	-12.6	1.09 V	305	42.90	18.50
8	11590.00	48.9 AV	54.0	-5.1	1.09 V	305	30.40	18.50

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.

Below 1GHz Worst-case Data:

802.11n (HT20)

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		
TEST MODE	A		

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	57.12	30.4 QP	40.0	-9.6	1.99 H	95	45.20	-14.80
2	249.60	39.9 QP	46.0	-6.1	1.00 H	233	54.30	-14.40
3	375.98	41.2 QP	46.0	-4.8	1.00 H	129	52.10	-10.90
4	500.42	32.4 QP	46.0	-13.6	1.49 H	134	40.70	-8.30
5	**625.00**	**45.6 QP**	**46.0**	**-0.4**	**1.28 H**	**286**	**51.00**	**-5.40**
6	875.67	39.0 QP	46.0	-7.0	1.49 H	144	39.90	-0.90
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	57.29	30.7 QP	40.0	-9.3	1.00 V	177	45.50	-14.80
2	68.79	36.5 QP	40.0	-3.5	1.00 V	14	52.50	-16.00
3	249.60	34.0 QP	46.0	-12.0	1.50 V	175	48.40	-14.40
4	375.98	40.4 QP	46.0	-5.6	1.00 V	14	51.30	-10.90
5	624.99	43.8 QP	46.0	-2.2	1.00 V	123	49.20	-5.40
6	875.67	38.1 QP	46.0	-7.9	1.00 V	159	39.00	-0.90

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

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		
TEST MODE	B		

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	57.12	31.6 QP	40.0	-8.4	1.99 H	98	46.40	-14.80
2	140.72	31.9 QP	43.5	-11.6	1.99 H	75	46.50	-14.60
3	249.60	31.6 QP	46.0	-14.4	1.00 H	262	46.00	-14.40
4	375.98	38.2 QP	46.0	-7.8	1.00 H	239	49.10	-10.90
5	624.85	42.2 QP	46.0	-3.8	1.00 H	132	47.60	-5.40
6	875.67	40.1 QP	46.0	-5.9	1.49 H	67	41.00	-0.90
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	44.66	34.7 QP	40.0	-5.3	1.04 V	96	49.40	-14.70
2	59.17	34.6 QP	40.0	-5.4	1.08 V	6	49.40	-14.80
3	375.98	36.7 QP	46.0	-9.3	1.00 V	100	47.60	-10.90
4	500.42	33.1 QP	46.0	-12.9	1.00 V	226	41.40	-8.30
5	624.85	42.7 QP	46.0	-3.3	1.00 V	239	48.10	-5.40
6	875.67	38.1 QP	46.0	-7.9	1.51 V	176	39.00	-0.90

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	ESCI	100613	Nov. 11, 2014	Nov. 10, 2015
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 02, 2015	Mar. 01, 2016
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 21, 2014	Jul. 20, 2015
			Jul. 21, 2015	Jul. 20, 2016
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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 HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

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.

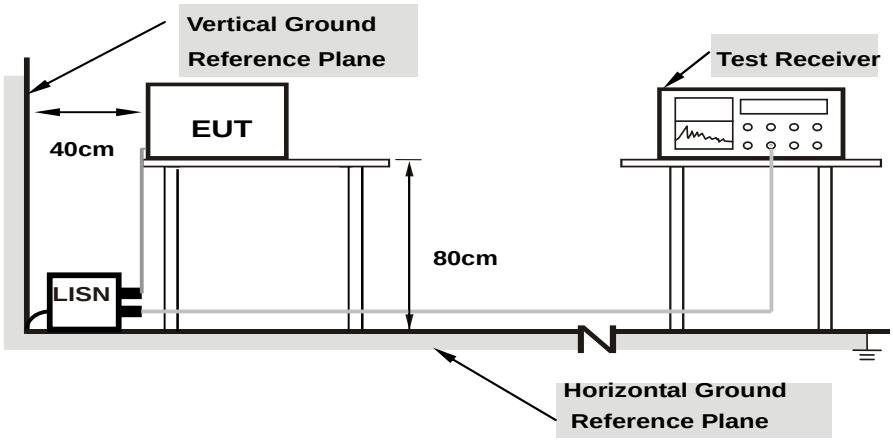
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: 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.

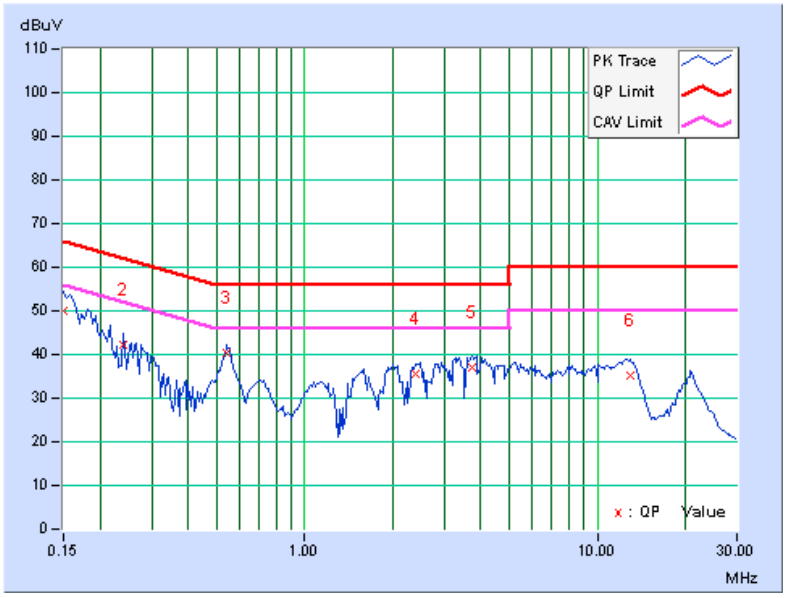
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.14	49.87	33.59	50.01	33.73	66.00	56.00	-15.99	-22.27
2	0.23984	0.22	42.07	29.65	42.29	29.87	62.10	52.10	-19.82	-22.24
3	0.54063	0.17	40.16	34.06	40.33	34.23	56.00	46.00	-15.67	-11.77
4	2.39453	0.26	35.43	29.91	35.69	30.17	56.00	46.00	-20.31	-15.83
5	3.71875	0.33	36.73	31.48	37.06	31.81	56.00	46.00	-18.94	-14.19
6	12.98438	0.66	34.35	29.33	35.01	29.99	60.00	50.00	-24.99	-20.01

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.

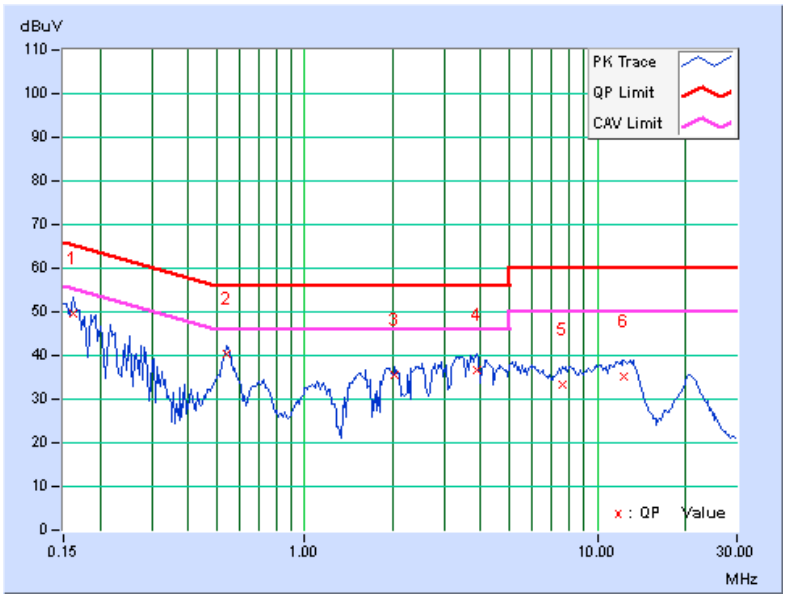


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.25	49.54	33.39	49.79	33.64	65.38	55.38	-15.58	-21.73
2	0.54063	0.26	40.16	34.04	40.42	34.30	56.00	46.00	-15.58	-11.70
3	2.02734	0.34	35.36	29.36	35.70	29.70	56.00	46.00	-20.30	-16.30
4	3.87891	0.44	36.28	29.13	36.72	29.57	56.00	46.00	-19.28	-16.43
5	7.62500	0.57	32.64	26.18	33.21	26.75	60.00	50.00	-26.79	-23.25
6	12.39844	0.73	34.35	29.07	35.08	29.80	60.00	50.00	-24.92	-20.20

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.

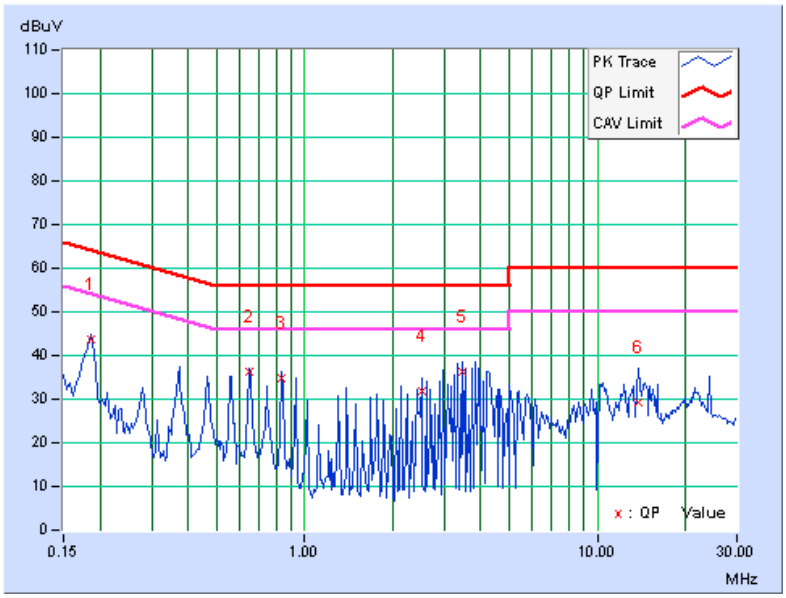


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18516	0.13	43.42	35.84	43.55	35.97	64.25	54.25	-20.71	-18.29
2	0.65000	0.16	36.18	33.77	36.34	33.93	56.00	46.00	-19.66	-12.07
3	0.83750	0.17	34.65	29.84	34.82	30.01	56.00	46.00	-21.18	-15.99
4	2.51172	0.25	31.62	30.56	31.87	30.81	56.00	46.00	-24.13	-15.19
5	**3.44141**	**0.31**	**35.82**	**34.18**	**36.13**	**34.49**	**56.00**	**46.00**	**-19.87**	**-11.51**
6	13.85938	0.84	28.45	28.29	29.29	29.13	60.00	50.00	-30.71	-20.87

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.

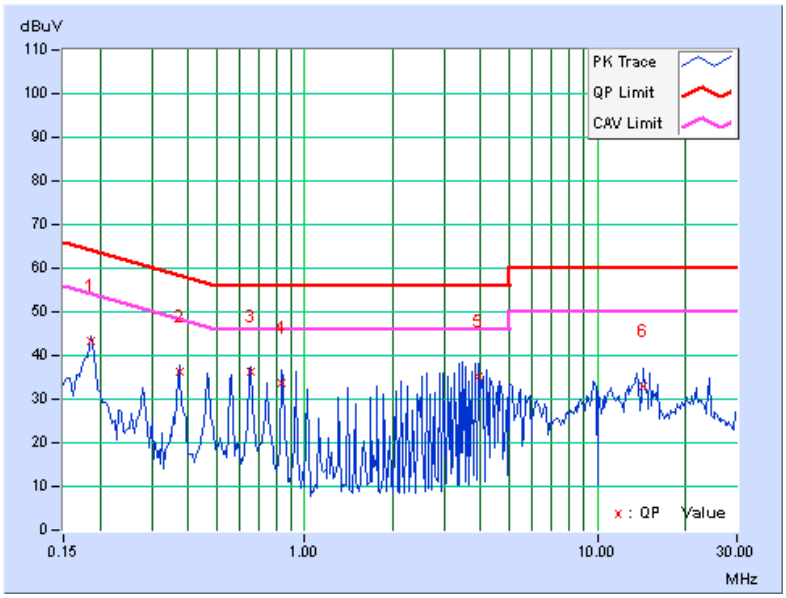


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18516	0.14	43.06	35.49	43.20	35.63	64.25	54.25	-21.06	-18.63
2	0.37266	0.15	36.10	35.14	36.25	35.29	58.44	48.44	-22.19	-13.15
3	0.65391	0.18	36.20	33.79	36.38	33.97	56.00	46.00	-19.62	-12.03
4	0.83750	0.19	33.37	28.42	33.56	28.61	56.00	46.00	-22.44	-17.39
5	3.91406	0.34	34.87	31.83	35.21	32.17	56.00	46.00	-20.79	-13.83
6	14.34766	0.76	32.30	32.20	33.06	32.96	60.00	50.00	-26.94	-17.04

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 Measurment

4.3.1 Limits of Transmit Power Measurement

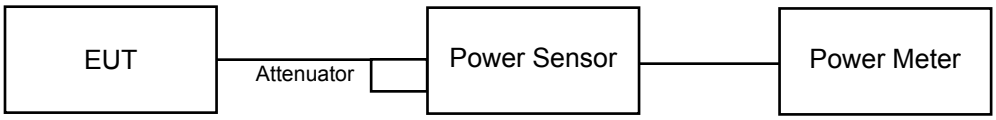
Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client 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 ≥ 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(NANT/NSS) dB.

4.3.2 Test Setup



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.

4.3.5 Deviation fromTest 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 (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	22.64	22.54	363.127	25.60	30	Pass
40	5200	24.56	23.71	520.722	27.17	30	Pass
48	5240	24.38	24.28	**542.074**	27.34	30	Pass
149	5745	18.91	17.93	139.891	21.46	30	Pass
157	5785	23.95	22.38	421.295	26.25	30	Pass
165	5825	23.44	21.92	376.397	25.76	30	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	22.70	22.17	351.025	25.45	30	Pass
40	5200	23.79	23.10	443.506	26.47	30	Pass
48	5240	23.34	23.27	428.098	26.32	30	Pass
149	5745	19.55	18.95	168.681	22.27	30	Pass
157	5785	23.91	22.96	**443.734**	26.47	30	Pass
165	5825	23.18	22.09	369.778	25.68	30	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	16.27	16.45	86.521	19.37	30	Pass
46	5230	23.84	24.06	496.786	26.96	30	Pass
151	5755	17.05	16.25	92.869	19.68	30	Pass
159	5795	23.09	22.06	364.398	25.62	30	Pass

26dB Bandwidth:

802.11a

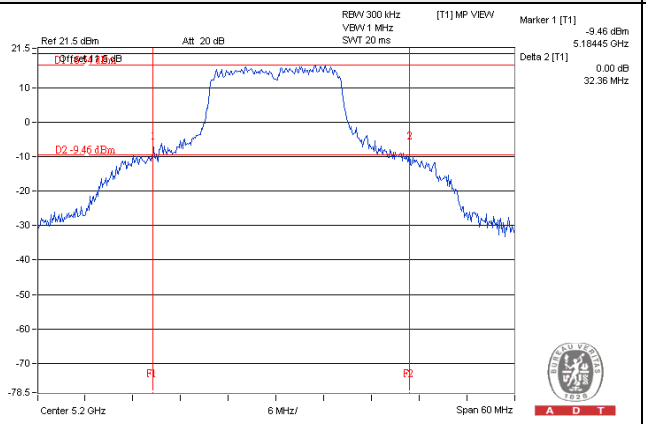
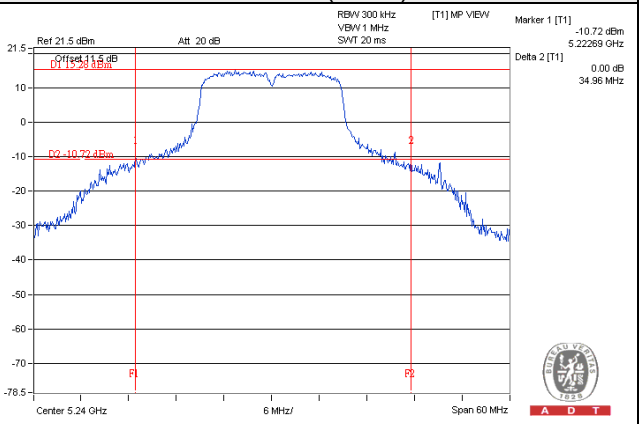
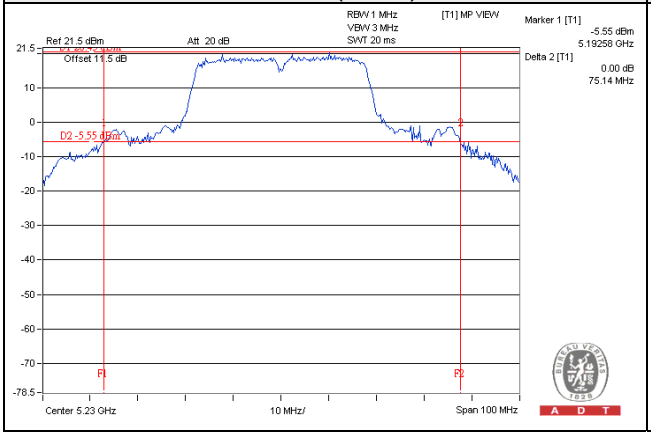
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	25.12	25.71	Pass
40	5200	24.52	32.36	Pass
48	5240	23.59	31.32	Pass

802.11n (HT20)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	27.85	29.53	Pass
40	5200	27.15	33.83	Pass
48	5240	24.79	34.96	Pass

802.11n (HT40)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
38	5190	48.24	47.27	Pass
46	5230	73.95	75.14	Pass

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	
	

Occupied Bandwidth:

802.11a

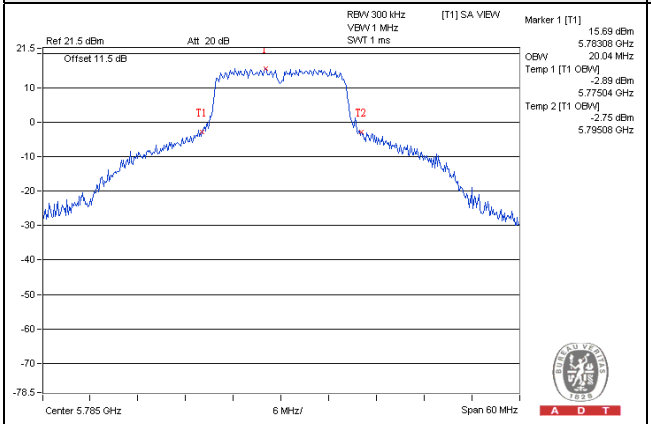
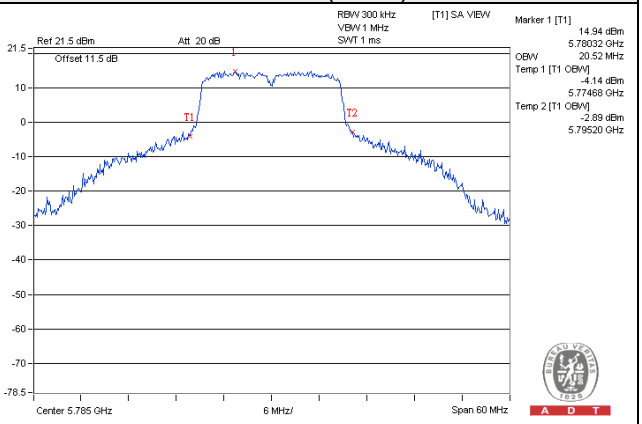
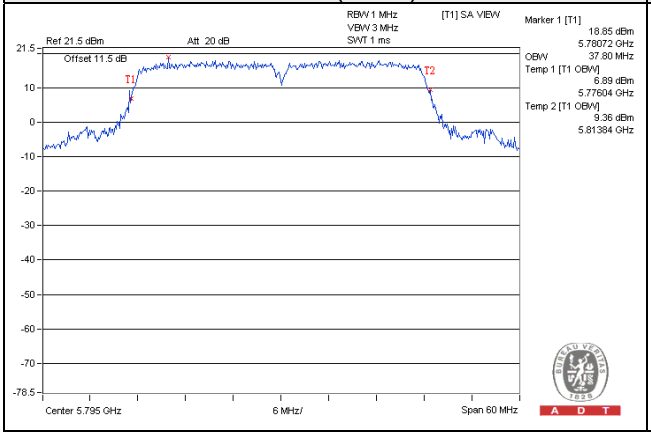
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.92	17.04
40	5200	16.92	17.28
48	5240	16.92	17.28
149	5745	16.61	16.78
157	5785	16.92	20.04
165	5825	16.92	18.00

802.11n (HT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18.12	18.12
40	5200	18.12	18.36
48	5240	18.12	18.36
149	5745	18.24	18.00
157	5785	18.60	20.52
165	5825	18.12	19.32

802.11n (HT40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.84	36.96
46	5230	37.20	37.56
151	5755	37.08	36.96
159	5795	37.32	37.80

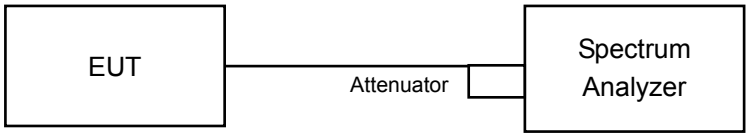
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	
	

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

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.

b. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS

c. Sweep time = auto, trigger set to “free run”.

d. Trace average at least 100 traces in power averaging mode.

e. Record the max value and add 10 log (1/duty cycle)

For U-NII-3 band:

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.

b. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS

c. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.

d. 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 = 10log(500 kHz/300kHz)

e. Sweep time = auto, trigger set to “free run”.

f. Trace average at least 100 traces in power averaging mode.

g. 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 (dBm)		Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1					
36	5180	10.50	10.83	13.68	0.11	13.79	17	Pass
40	5200	9.81	11.64	13.84	0.11	13.95	17	Pass
48	5240	9.03	10.72	12.97	0.11	13.08	17	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi, therefore the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

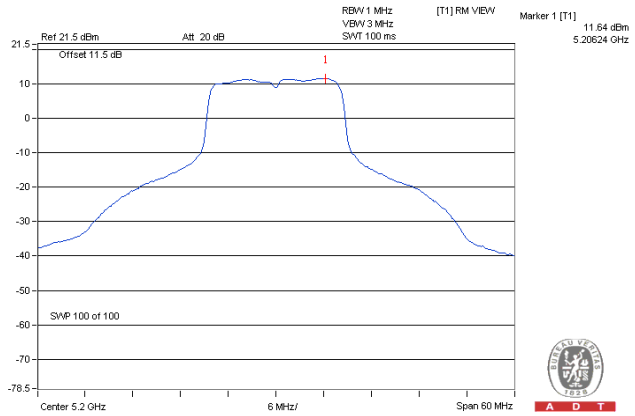
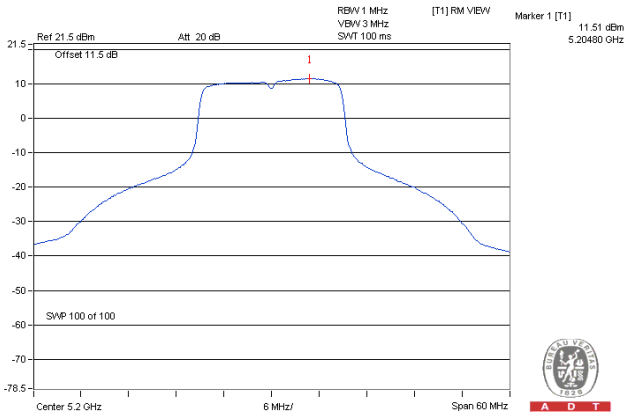
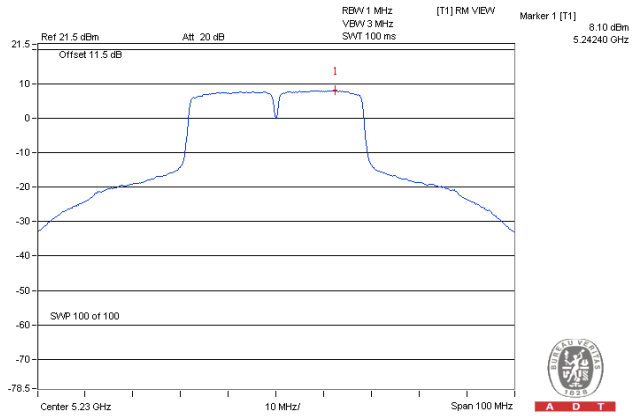
Chan.	Freq. (MHz)	PSD (dBm)		Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1					
36	5180	10.37	10.20	13.30	0.15	13.45	17	Pass
40	5200	10.30	11.51	13.96	0.15	14.11	17	Pass
48	5240	9.62	10.38	13.03	0.15	13.18	17	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi, therefore the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

Chan.	Freq. (MHz)	PSD (dBm)		Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1					
38	5190	0.02	0.88	3.48	0.48	3.96	17	Pass
46	5230	5.91	8.10	10.15	0.48	10.63	17	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi, therefore the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	
	

For U-NII-3 Band

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	149	5745	-2.33	-0.11	3.01	0.11	3.01	30	Pass
	157	5785	2.04	4.26	3.01	0.11	7.38	30	Pass
	165	5825	1.21	3.43	3.01	0.11	6.55	30	Pass
1	149	5745	-1.37	0.85	3.01	0.11	3.97	30	Pass
	157	5785	2.66	4.88	3.01	0.11	8.00	30	Pass
	165	5825	2.27	4.49	3.01	0.11	7.61	30	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi, therefore the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

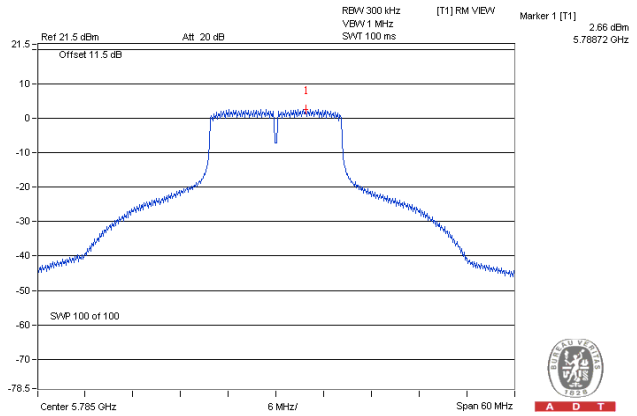
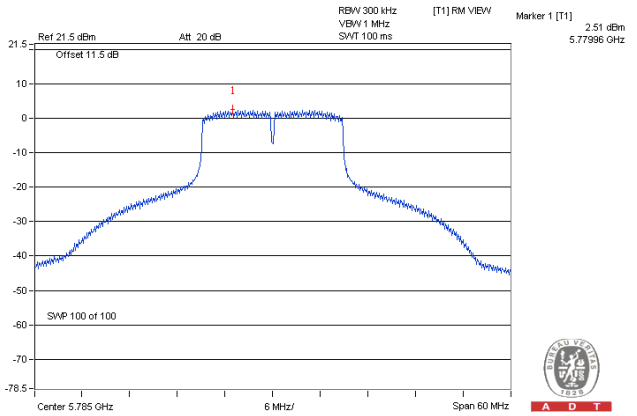
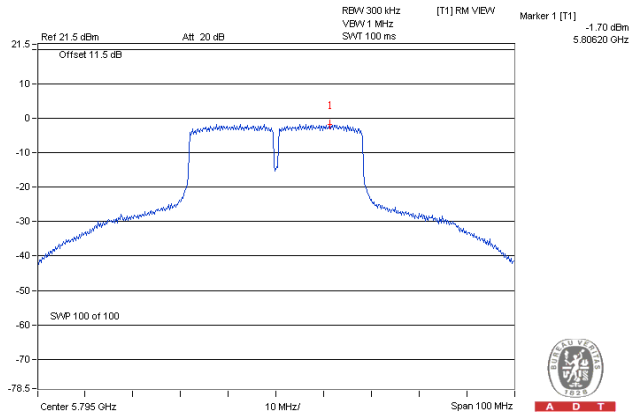
TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	149	5745	-1.80	0.42	3.01	0.15	3.58	30	Pass
	157	5785	2.03	4.25	3.01	0.15	7.41	30	Pass
	165	5825	0.81	3.03	3.01	0.15	6.19	30	Pass
1	149	5745	-1.23	0.99	3.01	0.15	4.15	30	Pass
	157	5785	2.51	4.73	3.01	0.15	7.89	30	Pass
	165	5825	1.98	4.20	3.01	0.15	7.36	30	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi, therefore the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	151	5755	-8.59	-6.37	3.01	0.48	-2.88	30	Pass
	159	5795	-3.39	-1.17	3.01	0.48	2.32	30	Pass
1	151	5755	-7.34	-5.12	3.01	0.48	-1.63	30	Pass
	159	5795	-1.70	0.52	3.01	0.48	4.01	30	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi, therefore the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

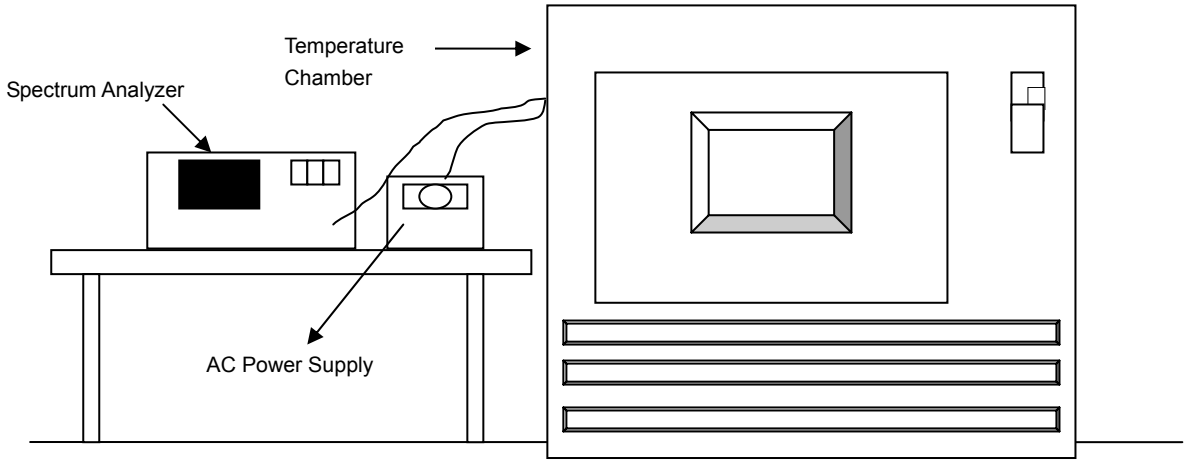
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	
	

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

a. The EUT was placed inside the environmental test chamber and powered by nominal AC 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: 5240MHz									
Temp. (℃)	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	5240.0185	0.00035	5240.0202	0.00039	5240.0187	0.00036	5240.0164	0.00031
40	120	5239.9912	-0.00017	5239.9919	-0.00015	5239.9892	-0.00021	5239.9886	-0.00022
30	120	5240.007	0.00013	5240.0095	0.00018	5240.005	0.00010	5240.0049	0.00009
20	120	5239.9946	-0.00010	5239.9935	-0.00012	5239.9942	-0.00011	5239.9916	-0.00016
10	120	5240.0118	0.00023	5240.0129	0.00025	5240.0106	0.00020	5240.0126	0.00024
0	120	5239.9791	-0.00040	5239.983	-0.00032	5239.9831	-0.00032	5239.9784	-0.00041
-10	120	5239.995	-0.00010	5239.9951	-0.00009	5239.9947	-0.00010	5239.9915	-0.00016
-20	120	5240.0207	0.00040	5240.0188	0.00036	5240.02	0.00038	5240.0211	0.00040
-30	120	5239.9833	-0.00032	5239.9792	-0.00040	5239.9819	-0.00035	5239.9798	-0.00039

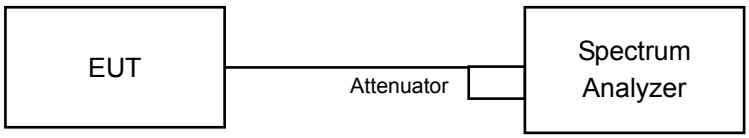
Frequency Stability Versus Temp.									
Operating Frequency: 5240MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5239.9955	-0.00009	5239.9936	-0.00012	5239.9946	-0.00010	5239.9926	-0.00014
	120	5239.9946	-0.00010	5239.9935	-0.00012	5239.9942	-0.00011	5239.9916	-0.00016
	102	5239.9944	-0.00011	5239.9929	-0.00014	5239.995	-0.00010	5239.9915	-0.00016

4.6 6dB Bandwidth Measurment

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) ≥ 3 x 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

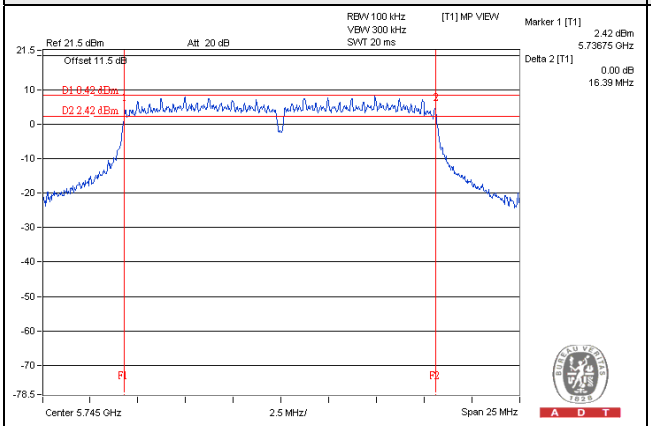
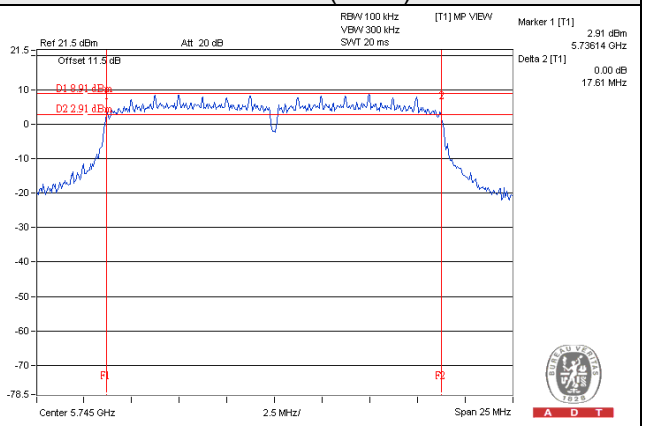
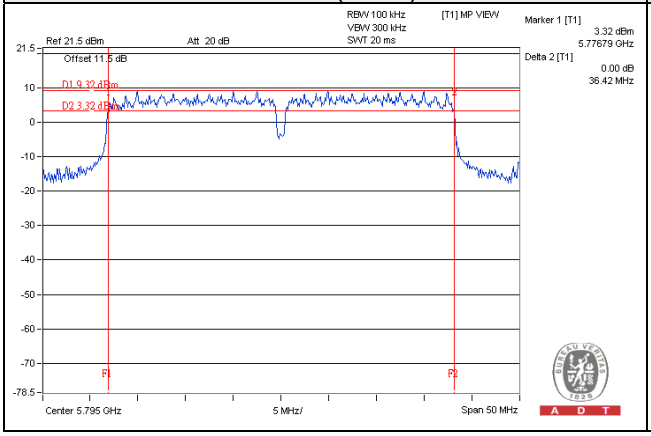
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.11	16.39	0.5	Pass
157	5785	15.74	16.39	0.5	Pass
165	5825	15.79	16.37	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.59	17.61	0.5	Pass
157	5785	17.25	17.61	0.5	Pass
165	5825	16.58	17.09	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.86	36.23	0.5	Pass
159	5795	35.76	36.42	0.5	Pass

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	
	

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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Web Site: www.bureauveritas-adt.com

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

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