

FCC Test Report

Report No.: RF121015E01C-1

FCC ID: Q87-WAP300N

Test Model: WAP300N

Received Date: Mar. 01, 2016

Test Date: Mar. 16 to 24, 2016

Issued Date: May 09, 2016

Applicant: LINKSYS LLC

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

Issue No.	Reason for Change	Date Issued
RF121015E01-1	Original	Aug. 09, 2013
RF121015E01C-1	Upgrade the standard to section 15.407 under new rule for U-NII-1, U-NII-3 band.	May 09, 2016

Release Control Record

Issue No.	Description	Date Issued
RF121015E01C-1	Original release.	May 09, 2016




1 Certificate of Conformity

Product: Selectable Dual-Band Wireless-N Access Point
Brand: Linksys
Test Model: WAP300N
Sample Status: MASS-PRODUCTION
Applicant: LINKSYS LLC
Test Date: Mar. 16 to 24, 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:** May 09, 2016
Claire Kuan / Specialist

Approved by :  , **Date:** May 09, 2016
May Chen / 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) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5100.00MHz & 5121.00MHz & 5150.00MHz & 5397.00MHz & 5401.00MHz & 5671.00MHz & 5705.00MHz & 5715.00MHz & 5725.00MHz & 5850.00MHz & 5860.00MHz & 5896.00MHz & 10480.00MHz
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 R-SMA not a standard connector.

NOTE: 1. This report is prepared for FCC Class II change. (Upgrade the standard to section 15.407 under new rule for U-NII-1, U-NII-3 band)

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) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.31 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.40 dB
	6GHz ~ 18GHz	3.73 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.



3 General Information

3.1 General Description of EUT

Product	Selectable Dual-Band Wireless-N Access Point
Brand	Linksys
Test Model	WAP300N
Status of EUT	MASS-PRODUCTION
Driver version	4.0.1.0
Power Supply Rating	DC 12V from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 300Mbps
Operating Frequency	2.4GHz: 2.412GHz ~ 2.462GHz 5GHz: 5.18GHz ~ 5.24GHz, 5.745GHz ~ 5.825GHz
Number of Channel	2.4GHz: 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40) 5GHz: 9 for 802.11a, 802.11n (HT20) 4 for 802.11n (HT40)
Output Power	2.4GHz: 802.11b: 100.000mW 802.11g: 199.526mW 802.11n (HT20): 420.632mW 802.11n (HT40): 296.136mW 5GHz (5.18 ~ 5.24GHz): 802.11a: 67.143mW 802.11n (HT20): 97.008mW 802.11n (HT40): 95.739mW 5GHz (5.745 ~ 5.825GHz): 802.11a: 67.764mW 802.11n (HT20): 72.165mW 802.11n (HT40): 65.56mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	LAN cable (unshielded, 1.5m) x 1

Note:

1. This report is prepared for FCC Class II change. The difference compared with the Report No.: RF121015E01-1 design is as the following:
 - ◆ Upgrade the standard to section 15.407 under new rule for U-NII-1, U-NII-3 band.
2. According to above conditions, all test items (Except AC Power Conducted Emissions test) of U-NII-1, U-NII-3 band need to be performed. And all data was verified to meet the requirements.

3. The EUT must be supplied with power adapter as following table:

Brand	Model No.	Spec.
HON-KWANG	HK-AP-120A050-US	Input: 100-240V, 0.2A, 50/60Hz Output: 12V, 0.5A DC output cable: unshielded, 1.5m

4. The antenna provided to the EUT, please refer to the following table:

Antenna Type	Gain (dBi) (Include cable loss)	Connector type	Frequency range (MHz to MHz)
Dipole	3.5	R-SMA	2400-2500 5150-5850

5. The EUT incorporates a MIMO function.

MODULATION MODE	Tx/Rx FUNCTION
802.11b	1Tx/2Rx
802.11g	1Tx/2Rx
802.11a	1Tx/2Rx
802.11n (HT20)	2Tx/2Rx
802.11n (HT40)	2Tx/2Rx

6. 2.4GHz and 5GHz technology cannot transmit at same time.

7. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.

8. 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

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

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

APCM: Antenna Port Conducted Measurement

NOTE: 1. The test mode was reference to the worst case in the original test report.

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.

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
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
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
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

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.

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11n (HT20)	5180-5240, 5745-5825	38 to 46, 151 to 159	40	OFDM	BPSK	6.5

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.

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
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
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
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

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE \geq 1G	24deg. C, 68%RH	120Vac, 60Hz	Andy Ho
RE $<$ 1G	20deg. C, 67%RH	120Vac, 60Hz	Gary Cheng
APCM	15deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

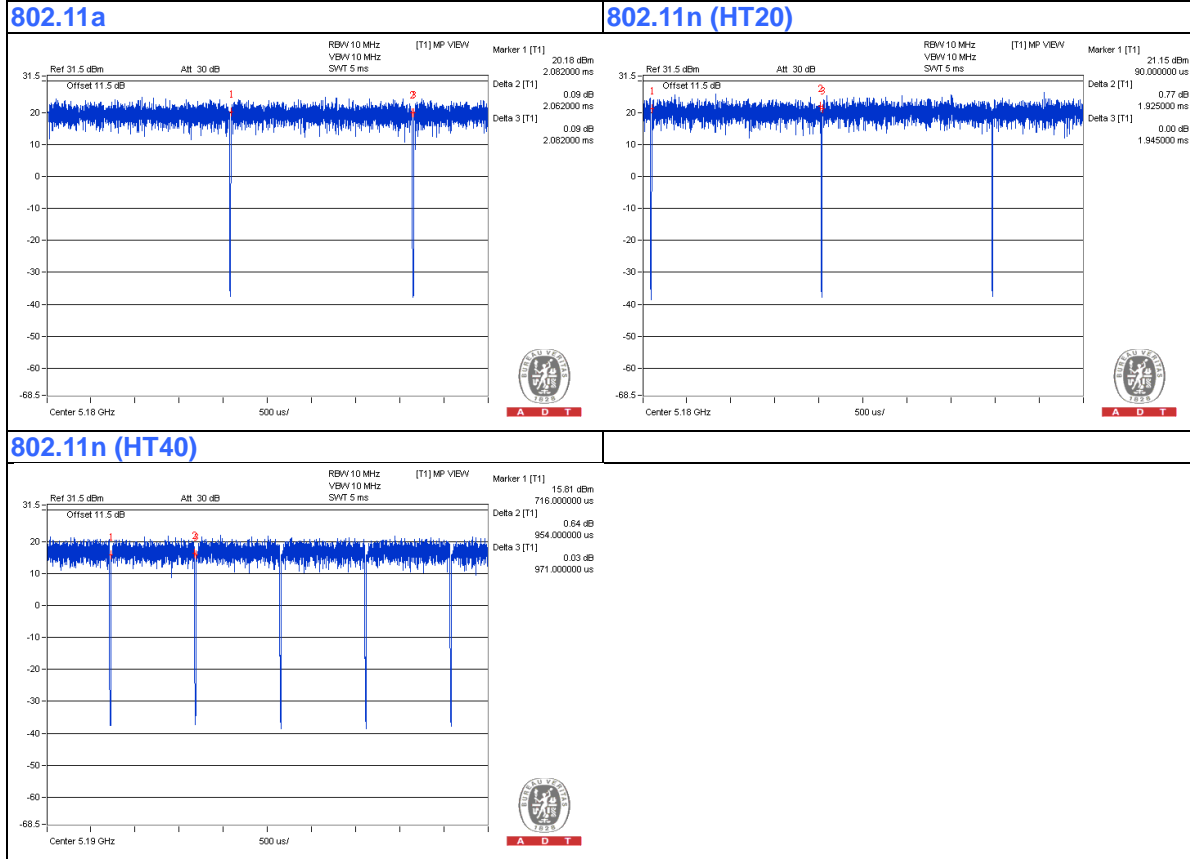
3.3 Duty Cycle of Test Signal

Duty cycle of test signal is $\geq 98\%$, duty factor is not required.

802.11a: Duty cycle = $1.439\text{ ms}/1.448\text{ ms} = 0.994$

802.11n (HT20): Duty cycle = $1.345\text{ ms}/1.355\text{ ms} = 0.993$

802.11n (HT40): Duty cycle = $0.667\text{ ms}/0.674\text{ ms} = 0.99$



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.

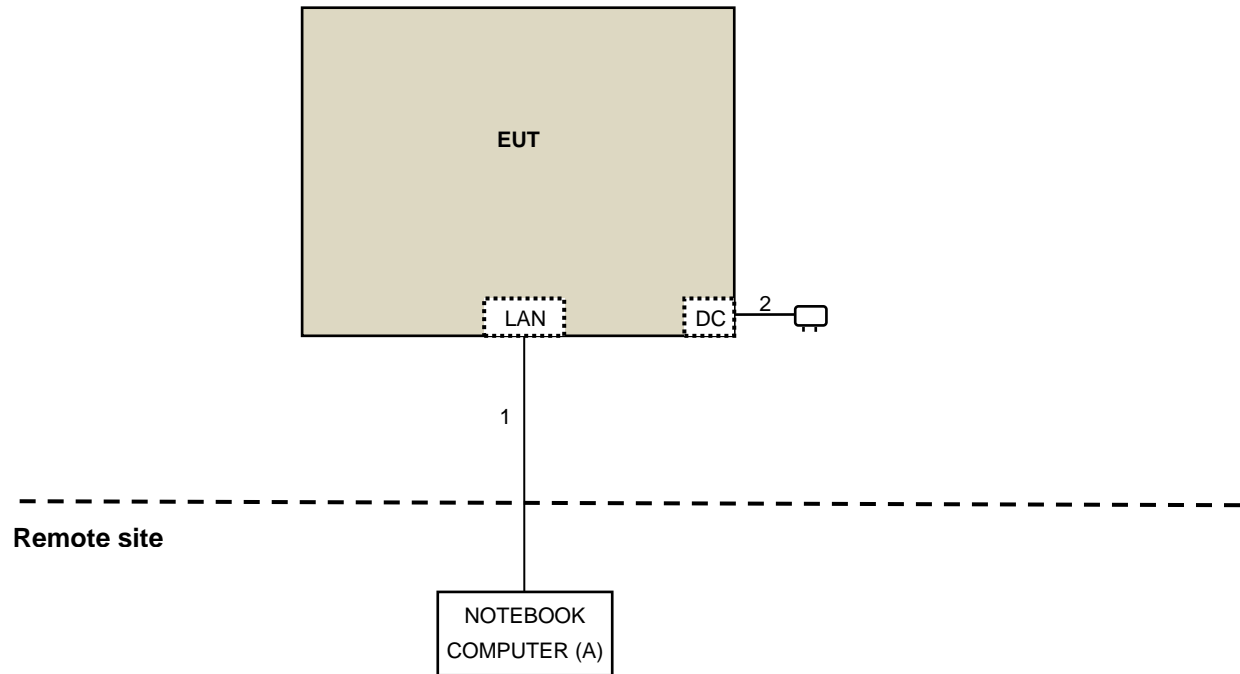
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	NOTEBOOK COMPUTER	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45	1	10	No	0	Provided by Lab
2.	DC	1	1.5	No	0	Supplied by Client

3.4.1 Configuration of System under 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

KDB 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 Procedure New Rules v01r01	FIELD STRENGTH AT 3m	
	PK:74 (dBμV/m)	AV:54 (dBμV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27 (dBm/MHz) ^{*1} PK:-17 (dBm/MHz) ^{*2}	PK:68.2 (dBμV/m) ^{*1} PK:78.2 (dBμV/m) ^{*2}

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

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

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

4.1.2 Test Instruments

For below 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 12, 2015	Aug. 11, 2016
Pre-Amplifier ^(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-07	May 08, 2015	May 07, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	138	Jan. 18, 2016	Jan. 17, 2017
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 03, 2015	Apr. 02, 2016
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. The FCC Site Registration No. is 147459
4. The CANADA Site Registration No. is 20331-1
5. Tested Date: Mar. 16, 2016

**For Above 1GHz:**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 12, 2015	Aug. 11, 2016
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Jan. 20, 2016	Jan. 19, 2017
Pre-Amplifier Agilent	8449B	3008A02465	Apr. 06, 2015	Apr. 05, 2016
RF Cable	EMC104-SM- SM-2000 EMC104-SM- SM-5000 EMC104-SM- SM-5000	150317 150321 150322	Mar. 31, 2015	Mar. 30, 2016
Spectrum Analyzer Keysight	N9030A	MY54490520	July 26, 2015	July 25, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Power Meter Anritsu	ML2495A	1014008	Apr. 28, 2015	Apr. 27, 2016
Power Sensor Anritsu	MA2411B	0917122	Apr. 28, 2015	Apr. 27, 2016
Spectrum Analyzer R&S	FSP40	100060	May 08, 2015	May 07, 2016
Temperature & Humidity Chamber GIANTFORCE	GTH-150-40-S P-AR	MAA0812-008	Jan. 15, 2016	Jan. 14, 2017

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 966 Chamber No. 3.
3. The FCC Site Registration No. is 147459
4. The CANADA Site Registration No. is 20331-1
5. Tested Date: Mar. 16 to 24, 2016

4.1.3 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

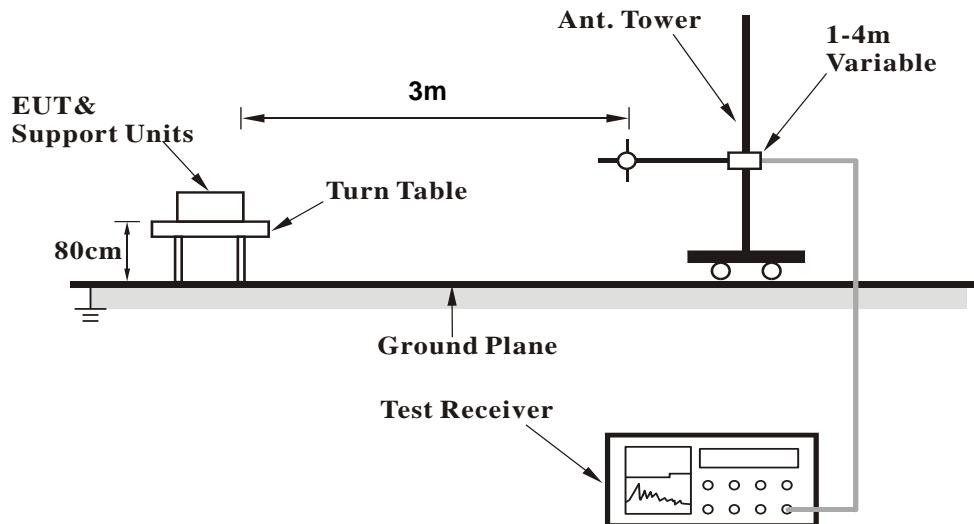
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

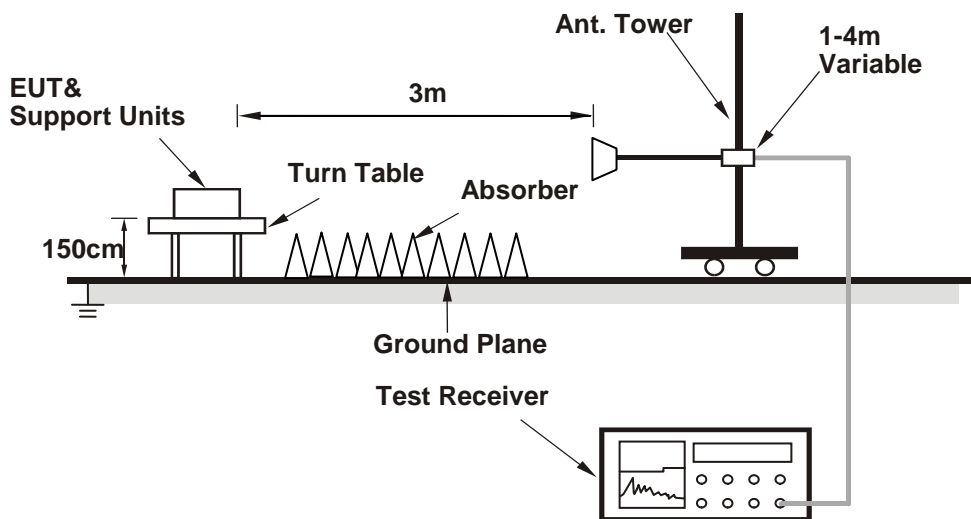
No deviation.

4.1.5 Test 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 Conditions

1. Placed the EUT on testing table.
2. Connect the EUT with the support unit A (Notebook Computer) which is placed in a remote area.
3. The communication partner run test program "QA Tool[RT5x9xQA V1.0.7.6.exe]" to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.1.7 Test Results

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	63.4 PK	74.0	-10.6	1.41 H	200	60.84	2.56
2	5150.00	47.1 AV	54.0	-6.9	1.41 H	200	44.54	2.56
3	*5180.00	102.7 PK			1.41 H	200	100.05	2.65
4	*5180.00	91.7 AV			1.41 H	200	89.05	2.65
5	#10360.00	57.5 PK	74.0	-16.5	1.49 H	218	44.28	13.22
6	#10360.00	43.1 AV	54.0	-10.9	1.49 H	218	29.88	13.22
7	15540.00	55.1 PK	74.0	-18.9	1.57 H	300	39.62	15.48
8	15540.00	42.0 AV	54.0	-12.0	1.57 H	300	26.52	15.48

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	69.7 PK	74.0	-4.3	2.48 V	180	67.14	2.56
2	5150.00	53.2 AV	54.0	-0.8	2.48 V	180	50.64	2.56
3	*5180.00	108.5 PK			2.48 V	180	105.85	2.65
4	*5180.00	97.1 AV			2.48 V	180	94.45	2.65
5	#10360.00	61.4 PK	74.0	-12.6	1.31 V	207	48.18	13.22
6	#10360.00	48.3 AV	54.0	-5.7	1.31 V	207	35.08	13.22
7	15540.00	60.4 PK	74.0	-13.6	2.15 V	315	44.92	15.48
8	15540.00	45.3 AV	54.0	-8.7	2.15 V	315	29.82	15.48

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	5150.00	61.2 PK	74.0	-12.8	1.35 H	196	58.64	2.56
2	5150.00	48.2 AV	54.0	-5.8	1.35 H	196	45.64	2.56
3	*5200.00	105.2 PK			1.35 H	196	102.49	2.71
4	*5200.00	94.4 AV			1.35 H	196	91.69	2.71
5	#10400.00	57.7 PK	74.0	-16.3	1.42 H	211	44.23	13.47
6	#10400.00	44.4 AV	54.0	-9.6	1.42 H	211	30.93	13.47
7	15600.00	56.2 PK	74.0	-17.8	1.55 H	329	40.77	15.43
8	15600.00	42.7 AV	54.0	-11.3	1.55 H	329	27.27	15.43

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	67.8 PK	74.0	-6.2	2.28 V	180	65.24	2.56
2	5150.00	52.4 AV	54.0	-1.6	2.28 V	180	49.84	2.56
3	*5200.00	112.6 PK			2.28 V	180	109.89	2.71
4	*5200.00	101.7 AV			2.28 V	180	98.99	2.71
5	#10400.00	63.3 PK	74.0	-10.7	1.56 V	181	49.83	13.47
6	#10400.00	49.4 AV	54.0	-4.6	1.56 V	181	35.93	13.47
7	15600.00	59.7 PK	74.0	-14.3	1.35 V	140	44.27	15.43
8	15600.00	45.7 AV	54.0	-8.3	1.35 V	140	30.27	15.43

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	104.3 PK			1.45 H	214	101.49	2.81
2	*5240.00	93.1 AV			1.45 H	214	90.29	2.81
3	5350.00	51.3 PK	74.0	-22.7	1.45 H	214	48.21	3.09
4	5350.00	38.6 AV	54.0	-15.4	1.45 H	214	35.51	3.09
5	#10480.00	57.8 PK	74.0	-16.2	1.51 H	230	44.40	13.40
6	#10480.00	43.6 AV	54.0	-10.4	1.51 H	230	30.20	13.40
7	15720.00	55.2 PK	74.0	-18.8	1.50 H	305	40.19	15.01
8	15720.00	41.8 AV	54.0	-12.2	1.50 H	305	26.79	15.01

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	110.2 PK			2.42 V	182	107.39	2.81
2	*5240.00	99.3 AV			2.42 V	182	96.49	2.81
3	5350.00	56.0 PK	74.0	-18.0	2.42 V	182	52.91	3.09
4	5350.00	42.6 AV	54.0	-11.4	2.42 V	182	39.51	3.09
5	#10480.00	63.1 PK	74.0	-10.9	1.24 V	206	49.70	13.40
6	#10480.00	49.5 AV	54.0	-4.5	1.24 V	206	36.10	13.40
7	15720.00	61.2 PK	74.0	-12.8	2.12 V	306	46.19	15.01
8	15720.00	46.5 AV	54.0	-7.5	2.12 V	306	31.49	15.01

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	#5715.00	61.5 PK	74.0	-12.5	1.47 H	210	57.71	3.79
2	#5715.00	46.7 AV	54.0	-7.3	1.47 H	210	42.91	3.79
3	#5725.00	72.4 PK	78.2	-5.8	1.47 H	210	68.60	3.80
4	*5745.00	102.4 PK			1.47 H	210	98.60	3.80
5	*5745.00	91.4 AV			1.47 H	210	87.60	3.80
6	11490.00	57.5 PK	74.0	-16.5	1.51 H	223	42.47	15.03
7	11490.00	43.4 AV	54.0	-10.6	1.51 H	223	28.37	15.03
8	#17235.00	55.4 PK	74.0	-18.6	1.56 H	302	35.80	19.60
9	#17235.00	42.2 AV	54.0	-11.8	1.56 H	302	22.60	19.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	67.1 PK	74.0	-6.9	1.93 V	188	63.31	3.79
2	#5715.00	50.7 AV	54.0	-3.3	1.93 V	188	46.91	3.79
3	#5725.00	78.1 PK	78.2	-0.1	1.93 V	188	74.30	3.80
4	*5745.00	108.9 PK			1.93 V	188	105.10	3.80
5	*5745.00	97.7 AV			1.93 V	188	93.90	3.80
6	11490.00	63.2 PK	74.0	-10.8	1.25 V	218	48.17	15.03
7	11490.00	49.4 AV	54.0	-4.6	1.25 V	218	34.37	15.03
8	#17235.00	61.0 PK	74.0	-13.0	2.14 V	311	41.40	19.60
9	#17235.00	46.5 AV	54.0	-7.5	2.14 V	311	26.90	19.60

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	#5725.00	55.4 PK	78.2	-22.8	1.41 H	209	51.60	3.80
2	*5785.00	105.5 PK			1.41 H	209	101.67	3.83
3	*5785.00	94.7 AV			1.41 H	209	90.87	3.83
4	#5850.00	50.4 PK	78.2	-27.8	1.41 H	209	46.57	3.83
5	11570.00	58.1 PK	74.0	-15.9	1.45 H	225	43.26	14.84
6	11570.00	44.8 AV	54.0	-9.2	1.45 H	225	29.96	14.84
7	#17355.00	56.8 PK	74.0	-17.2	1.58 H	316	36.56	20.24
8	#17355.00	43.2 AV	54.0	-10.8	1.58 H	316	22.96	20.24

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	61.6 PK	78.2	-16.6	1.79 V	191	57.80	3.80
2	*5785.00	111.2 PK			1.79 V	191	107.37	3.83
3	*5785.00	100.4 AV			1.79 V	191	96.57	3.83
4	#5850.00	56.7 PK	78.2	-21.5	1.79 V	191	52.87	3.83
5	11570.00	64.1 PK	74.0	-9.9	1.28 V	213	49.26	14.84
6	11570.00	50.5 AV	54.0	-3.5	1.28 V	213	35.66	14.84
7	#17355.00	61.8 PK	74.0	-12.2	2.09 V	324	41.56	20.24
8	#17355.00	47.8 AV	54.0	-6.2	2.09 V	324	27.56	20.24

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	105.6 PK			1.43 H	198	101.77	3.83
2	*5825.00	94.9 AV			1.43 H	198	91.07	3.83
3	#5850.00	57.1 PK	78.2	-21.1	1.43 H	198	53.27	3.83
4	#5860.00	60.2 PK	74.0	-13.8	1.43 H	198	56.36	3.84
5	#5860.00	45.0 AV	54.0	-9.0	1.43 H	198	41.16	3.84
6	11650.00	57.7 PK	74.0	-16.3	1.44 H	216	43.03	14.67
7	11650.00	44.3 AV	54.0	-9.7	1.44 H	216	29.63	14.67
8	#17475.00	56.7 PK	74.0	-17.3	1.55 H	308	35.87	20.83
9	#17475.00	43.1 AV	54.0	-10.9	1.55 H	308	22.27	20.83

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	110.9 PK			1.79 V	190	107.07	3.83
2	*5825.00	99.6 AV			1.79 V	190	95.77	3.83
3	#5850.00	75.5 PK	78.2	-2.7	1.79 V	190	71.67	3.83
4	#5860.00	67.6 PK	74.0	-6.4	1.79 V	190	63.76	3.84
5	#5860.00	48.8 AV	54.0	-5.2	1.79 V	190	44.96	3.84
6	11650.00	64.5 PK	74.0	-9.5	1.25 V	222	49.83	14.67
7	11650.00	50.7 AV	54.0	-3.3	1.25 V	222	36.03	14.67
8	#17475.00	61.2 PK	74.0	-12.8	2.10 V	312	40.37	20.83
9	#17475.00	47.5 AV	54.0	-6.5	2.10 V	312	26.67	20.83

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 (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.6 PK	74.0	-10.4	1.40 H	198	61.04	2.56
2	5150.00	47.6 AV	54.0	-6.4	1.40 H	198	45.04	2.56
3	*5180.00	104.5 PK			1.40 H	198	101.85	2.65
4	*5180.00	92.0 AV			1.40 H	198	89.35	2.65
5	#10360.00	57.6 PK	74.0	-16.4	1.44 H	201	44.38	13.22
6	#10360.00	44.1 AV	54.0	-9.9	1.44 H	201	30.88	13.22
7	15540.00	56.8 PK	74.0	-17.2	1.50 H	314	41.32	15.48
8	15540.00	43.1 AV	54.0	-10.9	1.50 H	314	27.62	15.48

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	69.8 PK	74.0	-4.2	2.48 V	184	67.24	2.56
2	5150.00	53.4 AV	54.0	-0.6	2.48 V	184	50.84	2.56
3	*5180.00	110.6 PK			2.48 V	184	107.95	2.65
4	*5180.00	99.6 AV			2.48 V	184	96.95	2.65
5	#10360.00	61.8 PK	74.0	-12.2	3.10 V	254	48.58	13.22
6	#10360.00	47.0 AV	54.0	-7.0	3.10 V	254	33.78	13.22
7	15540.00	64.0 PK	74.0	-10.0	3.30 V	148	48.52	15.48
8	15540.00	50.5 AV	54.0	-3.5	3.30 V	148	35.02	15.48

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	107.4 PK			1.35 H	210	104.69	2.71
2	*5200.00	96.4 AV			1.35 H	210	93.69	2.71
3	#10400.00	57.3 PK	74.0	-16.7	1.41 H	189	43.83	13.47
4	#10400.00	44.0 AV	54.0	-10.0	1.41 H	189	30.53	13.47
5	15600.00	56.9 PK	74.0	-17.1	1.53 H	322	41.47	15.43
6	15600.00	43.4 AV	54.0	-10.6	1.53 H	322	27.97	15.43

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	112.1 PK			2.27 V	182	109.39	2.71
2	*5200.00	102.0 AV			2.27 V	182	99.29	2.71
3	#10400.00	61.9 PK	74.0	-12.1	3.06 V	240	48.43	13.47
4	#10400.00	47.3 AV	54.0	-6.7	3.06 V	240	33.83	13.47
5	15600.00	63.9 PK	74.0	-10.1	3.28 V	148	48.47	15.43
6	15600.00	50.4 AV	54.0	-3.6	3.28 V	148	34.97	15.43

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	106.5 PK			1.41 H	201	103.69	2.81
2	*5240.00	96.0 AV			1.41 H	201	93.19	2.81
3	5350.00	50.6 PK	74.0	-23.4	1.41 H	201	47.51	3.09
4	5350.00	39.2 AV	54.0	-14.8	1.41 H	201	36.11	3.09
5	#10480.00	57.7 PK	74.0	-16.3	1.39 H	208	44.30	13.40
6	#10480.00	44.5 AV	54.0	-9.5	1.39 H	208	31.10	13.40
7	15720.00	56.4 PK	74.0	-17.6	1.52 H	328	41.39	15.01
8	15720.00	42.9 AV	54.0	-11.1	1.52 H	328	27.89	15.01

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	112.1 PK			2.22 V	186	109.29	2.81
2	*5240.00	101.6 AV			2.22 V	186	98.79	2.81
3	5350.00	56.1 PK	74.0	-17.9	2.22 V	186	53.01	3.09
4	5350.00	43.0 AV	54.0	-11.0	2.22 V	186	39.91	3.09
5	#10480.00	61.9 PK	74.0	-12.1	3.03 V	253	48.50	13.40
6	#10480.00	47.0 AV	54.0	-7.0	3.03 V	253	33.60	13.40
7	15720.00	64.5 PK	74.0	-9.5	3.27 V	145	49.49	15.01
8	15720.00	50.8 AV	54.0	-3.2	3.27 V	145	35.79	15.01

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	#5693.00	58.6 PK	74.0	-15.4	1.38 H	199	54.82	3.78
2	#5693.00	45.5 AV	54.0	-8.5	1.38 H	199	41.72	3.78
3	#5725.00	72.4 PK	78.2	-5.8	1.38 H	199	68.60	3.80
4	*5745.00	104.5 PK			1.38 H	199	100.70	3.80
5	*5745.00	94.1 AV			1.38 H	199	90.30	3.80
6	11490.00	57.2 PK	74.0	-16.8	1.35 H	188	42.17	15.03
7	11490.00	44.2 AV	54.0	-9.8	1.35 H	188	29.17	15.03
8	#17235.00	56.3 PK	74.0	-17.7	1.51 H	301	36.70	19.60
9	#17235.00	42.8 AV	54.0	-11.2	1.51 H	301	23.20	19.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5693.00	64.8 PK	74.0	-9.2	1.91 V	181	61.02	3.78
2	#5693.00	49.0 AV	54.0	-5.0	1.91 V	181	45.22	3.78
3	#5725.00	78.1 PK	78.2	-0.1	1.91 V	181	74.30	3.80
4	*5745.00	109.9 PK			1.91 V	181	106.10	3.80
5	*5745.00	99.2 AV			1.91 V	181	95.40	3.80
6	11490.00	62.0 PK	74.0	-12.0	3.18 V	266	46.97	15.03
7	11490.00	47.1 AV	54.0	-6.9	3.18 V	266	32.07	15.03
8	#17235.00	63.5 PK	74.0	-10.5	3.30 V	131	43.90	19.60
9	#17235.00	50.4 AV	54.0	-3.6	3.30 V	131	30.80	19.60

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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	#5725.00	51.4 PK	78.2	-26.8	1.39 H	197	47.60	3.80
2	*5785.00	104.3 PK			1.39 H	197	100.47	3.83
3	*5785.00	94.1 AV			1.39 H	197	90.27	3.83
4	#5850.00	50.3 PK	78.2	-27.9	1.39 H	197	46.47	3.83
5	11570.00	57.9 PK	74.0	-16.1	1.41 H	193	43.06	14.84
6	11570.00	44.6 AV	54.0	-9.4	1.41 H	193	29.76	14.84
7	#17355.00	56.6 PK	74.0	-17.4	1.46 H	305	36.36	20.24
8	#17355.00	42.8 AV	54.0	-11.2	1.46 H	305	22.56	20.24

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	57.8 PK	78.2	-20.4	1.98 V	177	54.00	3.80
2	*5785.00	110.8 PK			1.98 V	177	106.97	3.83
3	*5785.00	100.3 AV			1.98 V	177	96.47	3.83
4	#5850.00	56.6 PK	78.2	-21.6	1.98 V	177	52.77	3.83
5	11570.00	61.9 PK	74.0	-12.1	3.13 V	260	47.06	14.84
6	11570.00	46.9 AV	54.0	-7.1	3.13 V	260	32.06	14.84
7	#17355.00	63.5 PK	74.0	-10.5	3.33 V	135	43.26	20.24
8	#17355.00	50.2 AV	54.0	-3.8	3.33 V	135	29.96	20.24

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	104.1 PK			1.36 H	211	100.27	3.83
2	*5825.00	93.7 AV			1.36 H	211	89.87	3.83
3	#5850.00	60.3 PK	78.2	-17.9	1.36 H	211	56.47	3.83
4	#5877.00	55.5 PK	74.0	-18.5	1.36 H	211	51.66	3.84
5	#5877.00	43.6 AV	54.0	-10.4	1.36 H	211	39.76	3.84
6	11650.00	57.8 PK	74.0	-16.2	1.38 H	195	43.13	14.67
7	11650.00	44.5 AV	54.0	-9.5	1.38 H	195	29.83	14.67
8	#17475.00	56.9 PK	74.0	-17.1	1.52 H	303	36.07	20.83
9	#17475.00	43.3 AV	54.0	-10.7	1.52 H	303	22.47	20.83

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	111.0 PK			1.98 V	175	107.17	3.83
2	*5825.00	99.0 AV			1.98 V	175	95.17	3.83
3	#5850.00	65.9 PK	78.2	-12.3	1.98 V	175	62.07	3.83
4	#5877.00	61.7 PK	74.0	-12.3	1.98 V	175	57.86	3.84
5	#5877.00	47.2 AV	54.0	-6.8	1.98 V	175	43.36	3.84
6	11650.00	59.1 PK	74.0	-14.9	1.03 V	212	44.43	14.67
7	11650.00	46.2 AV	54.0	-7.8	1.03 V	212	31.53	14.67
8	#17475.00	56.4 PK	74.0	-17.6	1.38 V	149	35.57	20.83
9	#17475.00	44.2 AV	54.0	-9.8	1.38 V	149	23.37	20.83

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 (HT40)

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	63.4 PK	74.0	-10.6	1.42 H	219	60.84	2.56
2	5150.00	48.9 AV	54.0	-5.1	1.42 H	219	46.34	2.56
3	*5190.00	97.8 PK			1.42 H	219	95.12	2.68
4	*5190.00	88.2 AV			1.42 H	219	85.52	2.68
5	#10380.00	55.4 PK	74.0	-18.6	1.43 H	183	42.06	13.34
6	#10380.00	41.3 AV	54.0	-12.7	1.43 H	183	27.96	13.34
7	15570.00	54.3 PK	74.0	-19.7	1.51 H	295	38.85	15.45
8	15570.00	40.6 AV	54.0	-13.4	1.51 H	295	25.15	15.45
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	69.8 PK	74.0	-4.2	2.47 V	178	67.24	2.56
2	5150.00	53.2 AV	54.0	-0.8	2.47 V	178	50.64	2.56
3	*5190.00	104.3 PK			2.47 V	178	101.62	2.68
4	*5190.00	93.6 AV			2.47 V	178	90.92	2.68
5	#10380.00	56.4 PK	74.0	-17.6	1.00 V	221	43.06	13.34
6	#10380.00	43.2 AV	54.0	-10.8	1.00 V	221	29.86	13.34
7	15570.00	53.6 PK	74.0	-20.4	1.38 V	141	38.15	15.45
8	15570.00	41.3 AV	54.0	-12.7	1.38 V	141	25.85	15.45

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 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	5150.00	58.5 PK	74.0	-15.5	1.40 H	230	55.94	2.56
2	5150.00	45.5 AV	54.0	-8.5	1.40 H	230	42.94	2.56
3	*5230.00	105.3 PK			1.40 H	230	102.53	2.77
4	*5230.00	93.4 AV			1.40 H	230	90.63	2.77
5	5350.00	48.2 PK	74.0	-25.8	1.40 H	230	45.11	3.09
6	5350.00	39.4 AV	54.0	-14.6	1.40 H	230	36.31	3.09
7	#10460.00	55.9 PK	74.0	-18.1	1.47 H	190	42.48	13.42
8	#10460.00	42.2 AV	54.0	-11.8	1.47 H	190	28.78	13.42
9	15690.00	54.8 PK	74.0	-19.2	1.51 H	311	39.66	15.14
10	15690.00	41.0 AV	54.0	-13.0	1.51 H	311	25.86	15.14

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	64.5 PK	74.0	-9.5	2.26 V	179	61.94	2.56
2	5150.00	49.3 AV	54.0	-4.7	2.26 V	179	46.74	2.56
3	*5230.00	111.7 PK			2.26 V	179	108.93	2.77
4	*5230.00	98.7 AV			2.26 V	179	95.93	2.77
5	5350.00	54.5 PK	74.0	-19.5	2.26 V	179	51.41	3.09
6	5350.00	43.6 AV	54.0	-10.4	2.26 V	179	40.51	3.09
7	#10460.00	57.9 PK	74.0	-16.1	1.02 V	208	44.48	13.42
8	#10460.00	44.7 AV	54.0	-9.3	1.02 V	208	31.28	13.42
9	15690.00	54.7 PK	74.0	-19.3	1.39 V	136	39.56	15.14
10	15690.00	42.3 AV	54.0	-11.7	1.39 V	136	27.16	15.14

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	#5715.00	61.5 PK	74.0	-12.5	1.41 H	218	57.71	3.79
2	#5715.00	48.9 AV	54.0	-5.1	1.41 H	218	45.11	3.79
3	#5725.00	64.7 PK	78.2	-13.5	1.41 H	218	60.90	3.80
4	*5755.00	97.3 PK			1.41 H	218	93.49	3.81
5	*5755.00	87.6 AV			1.41 H	218	83.79	3.81
6	11510.00	55.6 PK	74.0	-18.4	1.49 H	185	40.61	14.99
7	11510.00	41.6 AV	54.0	-12.4	1.49 H	185	26.61	14.99
8	#17265.00	53.7 PK	74.0	-20.3	1.46 H	297	33.93	19.77
9	#17265.00	40.1 AV	54.0	-13.9	1.46 H	297	20.33	19.77

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	#5715.00	67.8 PK	74.0	-6.2	2.00 V	180	64.01	3.79
2	#5715.00	53.2 AV	54.0	-0.8	2.00 V	180	49.41	3.79
3	#5725.00	71.1 PK	78.2	-7.1	2.00 V	180	67.30	3.80
4	*5755.00	103.6 PK			2.00 V	180	99.79	3.81
5	*5755.00	92.7 AV			2.00 V	180	88.89	3.81
6	11510.00	56.6 PK	74.0	-17.4	1.05 V	231	41.61	14.99
7	11510.00	43.2 AV	54.0	-10.8	1.05 V	231	28.21	14.99
8	#17265.00	53.6 PK	74.0	-20.4	1.42 V	153	33.83	19.77
9	#17265.00	41.4 AV	54.0	-12.6	1.42 V	153	21.63	19.77

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	104.5 PK			1.42 H	227	100.66	3.84
2	*5795.00	92.6 AV			1.42 H	227	88.76	3.84
3	#5850.00	60.4 PK	78.2	-17.8	1.42 H	227	56.57	3.83
4	#5860.00	55.3 PK	74.0	-18.7	1.42 H	227	51.46	3.84
5	#5860.00	41.6 AV	54.0	-12.4	1.42 H	227	37.76	3.84
6	11590.00	55.7 PK	74.0	-18.3	1.51 H	192	40.91	14.79
7	11590.00	42.2 AV	54.0	-11.8	1.51 H	192	27.41	14.79
8	#17385.00	54.6 PK	74.0	-19.4	1.48 H	311	34.20	20.40
9	#17385.00	41.0 AV	54.0	-13.0	1.48 H	311	20.60	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	*5795.00	107.8 PK			1.96 V	180	103.96	3.84
2	*5795.00	97.8 AV			1.96 V	180	93.96	3.84
3	#5850.00	66.3 PK	78.2	-11.9	1.96 V	180	62.47	3.83
4	#5860.00	61.7 PK	74.0	-12.3	1.96 V	180	57.86	3.84
5	#5860.00	45.7 AV	54.0	-8.3	1.96 V	180	41.86	3.84
6	11590.00	58.0 PK	74.0	-16.0	1.02 V	217	43.21	14.79
7	11590.00	44.7 AV	54.0	-9.3	1.02 V	217	29.91	14.79
8	#17385.00	54.6 PK	74.0	-19.4	1.39 V	131	34.20	20.40
9	#17385.00	42.4 AV	54.0	-11.6	1.39 V	131	22.00	20.40

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) – 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.

Below 1GHz Data
802.11n (HT20)

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 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	106.68	26.6 QP	43.5	-16.9	2.50 H	286	43.52	-16.91
2	125.01	28.2 QP	43.5	-15.4	1.50 H	65	43.32	-15.17
3	186.15	30.6 QP	43.5	-12.9	2.00 H	262	46.05	-15.41
4	250.00	35.2 QP	46.0	-10.8	1.00 H	312	49.63	-14.42
5	320.01	34.8 QP	46.0	-11.2	1.00 H	34	46.74	-11.90
6	750.01	37.0 QP	46.0	-9.0	1.00 H	360	39.71	-2.67

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	51.80	34.9 QP	40.0	-5.1	1.00 V	176	43.85	-8.94
2	66.28	33.8 QP	40.0	-6.2	1.00 V	261	43.96	-10.18
3	82.91	26.2 QP	40.0	-13.8	1.50 V	360	40.37	-14.21
4	124.99	31.2 QP	43.5	-12.4	1.00 V	347	41.45	-10.30
5	250.00	33.3 QP	46.0	-12.7	2.00 V	305	43.13	-9.84
6	874.99	35.7 QP	46.0	-10.3	1.00 V	2	32.34	3.38

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

4.2 Transmit Power Measurement

4.2.1 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 D01 Multiple Transmitter Output v02r01 Method of conducted output power measurement on IEEE 802.11 devices,

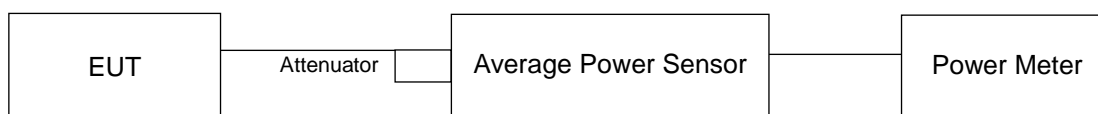
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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 = $10 \log(N_{ANT}/N_{SS})$ dB.

4.2.2 Test Setup



4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 Test Procedures

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.

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Conditions

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

4.2.7 Test Results

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
36	5180	35.156	15.46	30	Pass
40	5200	67.143	18.27	30	Pass
48	5240	47.643	16.78	30	Pass
149	5745	40.179	16.04	30	Pass
157	5785	67.764	18.31	30	Pass
165	5825	62.087	17.93	30	Pass

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	15.29	15.12	66.315	18.22	30	Pass
40	5200	16.70	17.01	97.008	19.87	30	Pass
48	5240	16.68	16.89	95.424	19.80	30	Pass
149	5745	14.81	14.19	56.511	17.52	30	Pass
157	5785	15.73	15.41	72.165	18.58	30	Pass
165	5825	14.68	14.42	57.045	17.56	30	Pass

802.11n (HT40)

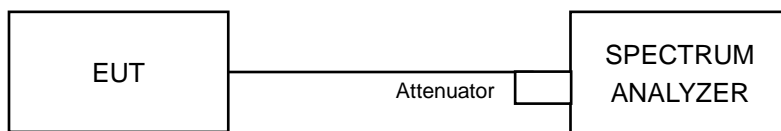
Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	12.34	12.87	36.504	15.62	30	Pass
46	5230	16.73	16.87	95.739	19.81	30	Pass
151	5755	10.99	10.73	24.39	13.87	30	Pass
159	5795	15.38	14.92	65.56	18.17	30	Pass

4.3 Peak Power Spectral Density Measurement

4.3.1 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

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedures

For 802.11a, 802.11n (HT20) & 802.11n (HT40):

For U-NII-1:

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:

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

Same as Item 4.2.6.

4.3.7 Test Results

For U-NII-1:

802.11a

Channel	Frequency (MHz)	Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
36	5180	2.70	17	Pass
40	5200	4.56	17	Pass
48	5240	2.89	17	Pass

802.11n (HT20)

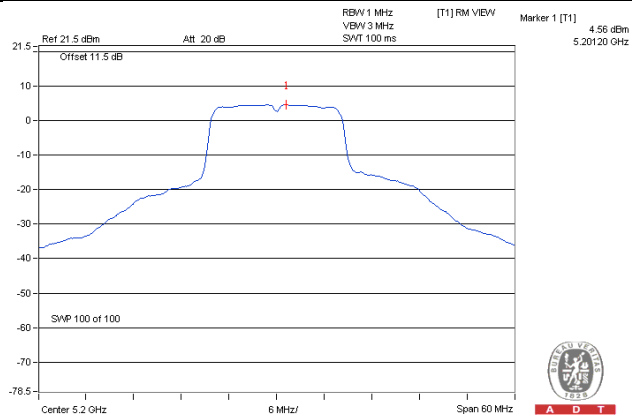
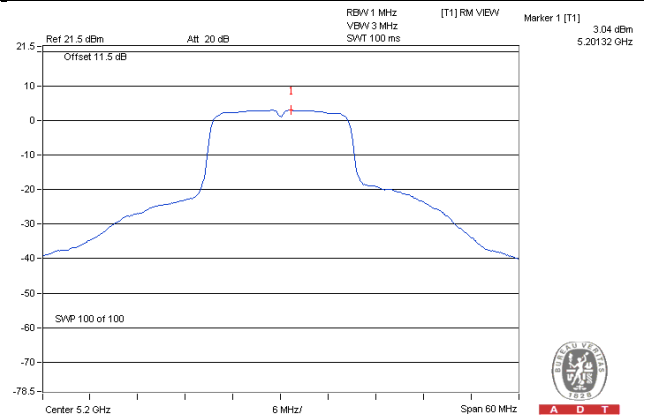
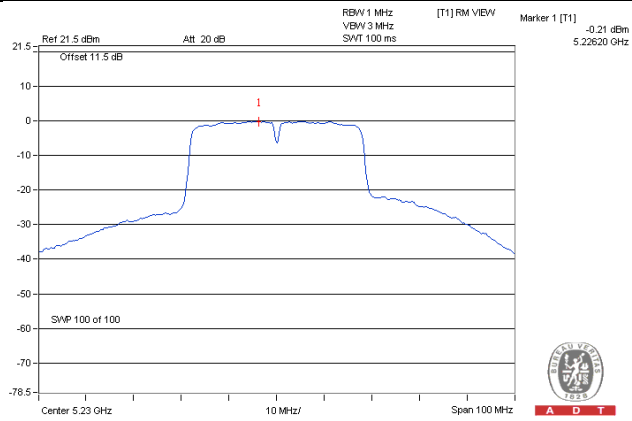
Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	2.85	2.32	5.60	16.49	Pass
40	5200	2.38	3.04	5.73	16.49	Pass
48	5240	2.73	2.70	5.73	16.49	Pass

- Note:**
- Method a) 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.
 - Directional gain = $3.5\text{dBi} + 10\log(2) = 6.51\text{dBi} > 6\text{dBi}$, therefore the limit needs to reduce, so the power density limit shall be reduced to $17 - (6.51 - 6) = 16.49\text{dBm}$.

802.11n (HT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
38	5190	-4.55	-4.96	-1.74	16.49	Pass
46	5230	-0.21	-0.51	2.65	16.49	Pass

- Note:**
- Method a) 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.
 - Directional gain = $3.5\text{dBi} + 10\log(2) = 6.51\text{dBi} > 6\text{dBi}$, therefore the limit needs to reduce, so the power density limit shall be reduced to $17 - (6.51 - 6) = 16.49\text{dBm}$.

Spectrum Plot of Worst Value**802.11a / CH40****802.11n (HT20)_Chain 1 / CH40****802.11n (HT40)_Chain 0 / CH46**

For U-NII-3:
802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
149	5745	-5.15	-2.93	30	Pass
157	5785	-2.77	-0.55	30	Pass
165	5825	-2.73	-0.51	30	Pass

802.11n (HT20)

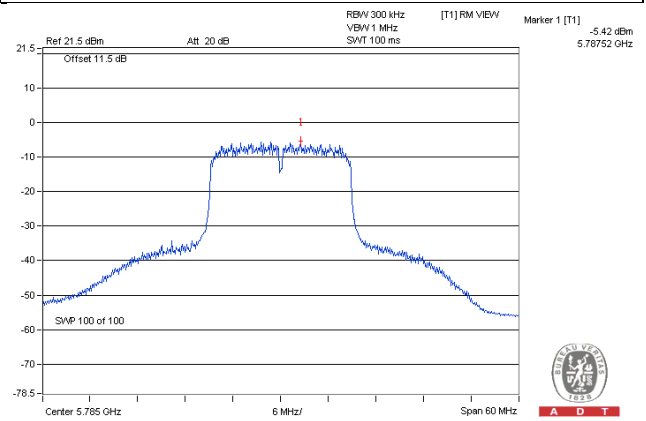
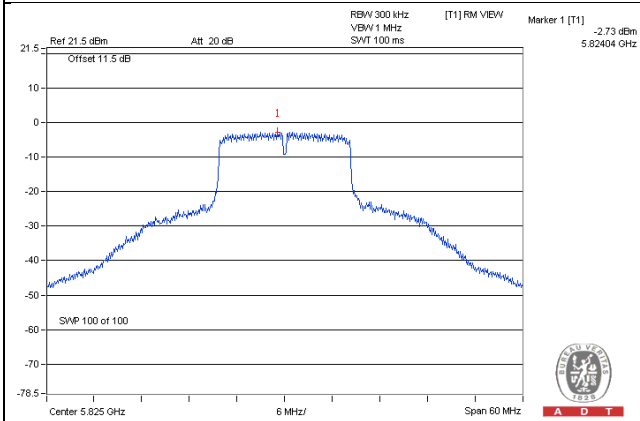
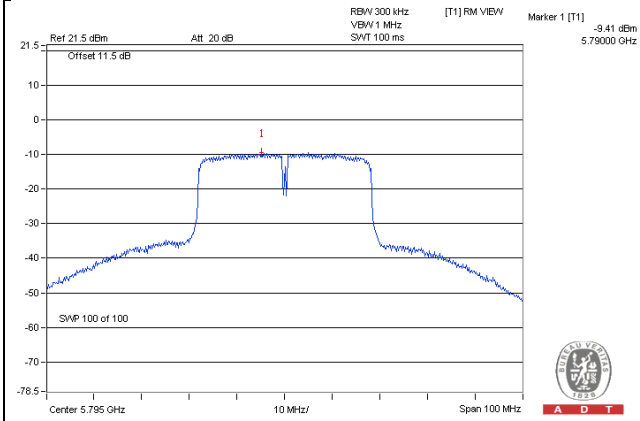
TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-7.60	-5.38	3.01	-2.37	29.49	Pass
	157	5785	-6.59	-4.37	3.01	-1.36	29.49	Pass
	165	5825	-7.34	-5.12	3.01	-2.11	29.49	Pass
1	149	5745	-7.32	-5.10	3.01	-2.09	29.49	Pass
	157	5785	-5.42	-3.20	3.01	-0.19	29.49	Pass
	165	5825	-7.36	-5.14	3.01	-2.13	29.49	Pass

Note: 1. Directional gain = $3.5\text{dBi} + 10\log(2) = 6.51\text{dBi} > 6\text{dBi}$, therefore the limit needs to reduce, so the power density limit shall be reduced to $30 - (6.51 - 6) = 29.49\text{dBm}$.

802.11n (HT40)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	151	5755	-14.40	-12.18	3.01	-9.17	29.49	Pass
	159	5795	-9.41	-7.19	3.01	-4.18	29.49	Pass
1	151	5755	-14.50	-12.28	3.01	-9.27	29.49	Pass
	159	5795	-10.48	-8.26	3.01	-5.25	29.49	Pass

Note: 1. Directional gain = $3.5\text{dBi} + 10\log(2) = 6.51\text{dBi} > 6\text{dBi}$, therefore the limit needs to reduce, so the power density limit shall be reduced to $30 - (6.51 - 6) = 29.49\text{dBm}$.

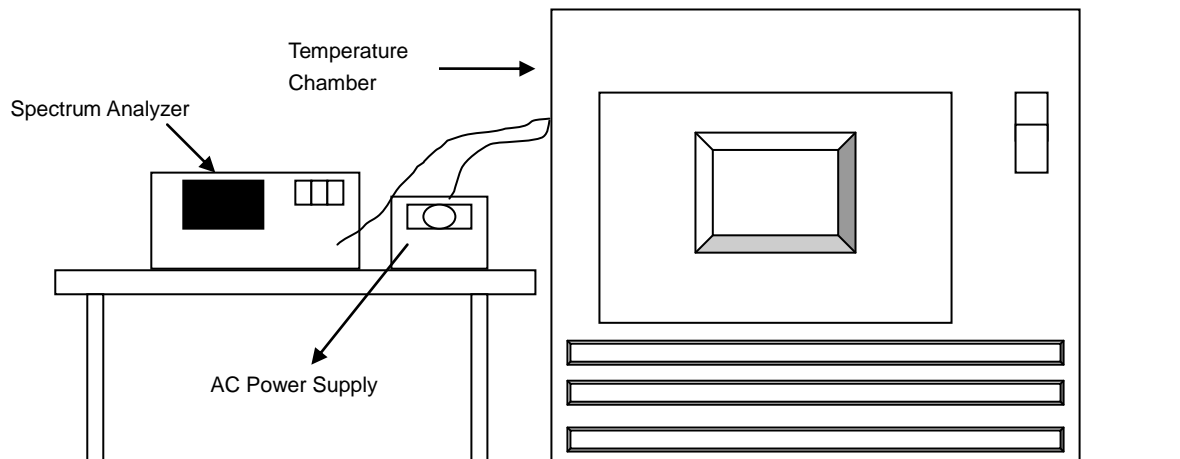
Spectrum Plot of Worst Value**802.11a / CH165****802.11n (HT20)_Chain 1 / CH157****802.11n (HT40)_Chain 0 / CH159**

4.4 Frequency Stability Measurement

4.4.1 Limits of Frequency Stability Measurement

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

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

- 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.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

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



4.4.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5180.0095	0.00018	5180.0113	0.00022	5180.0117	0.00023	5180.0123	0.00024
40	120	5179.9836	-0.00032	5179.982	-0.00035	5179.9844	-0.00030	5179.984	-0.00031
30	120	5179.9945	-0.00011	5179.9956	-0.00008	5179.995	-0.00010	5179.995	-0.00010
20	120	5179.9876	-0.00024	5179.9868	-0.00025	5179.9875	-0.00024	5179.9872	-0.00025
10	120	5179.9821	-0.00035	5179.9817	-0.00035	5179.981	-0.00037	5179.9816	-0.00036
0	120	5180.0215	0.00042	5180.0188	0.00036	5180.0212	0.00041	5180.0198	0.00038
-10	120	5179.9795	-0.00040	5179.981	-0.00037	5179.9814	-0.00036	5179.982	-0.00035
-20	120	5179.9998	0.00000	5179.9985	-0.00003	5179.9991	-0.00002	5179.9992	-0.00002
-30	120	5180.0147	0.00028	5180.0132	0.00025	5180.0155	0.00030	5180.0129	0.00025

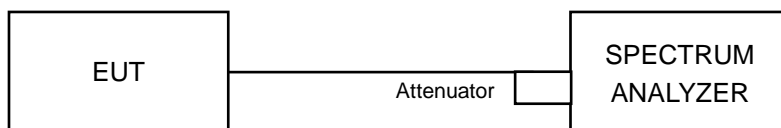
Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5179.9874	-0.00024	5179.9872	-0.00025	5179.9875	-0.00024	5179.9878	-0.00024
	120	5179.9876	-0.00024	5179.9868	-0.00025	5179.9875	-0.00024	5179.9872	-0.00025
	102	5179.987	-0.00025	5179.9858	-0.00027	5179.9883	-0.00023	5179.9873	-0.00025

4.5 6dB Bandwidth Measurement

4.5.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

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 Procedures

MEASUREMENT PROCEDURE REF

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

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

4.5.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	15.89	0.5	Pass
157	5785	15.82	0.5	Pass
165	5825	15.92	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.11	16.08	0.5	Pass
157	5785	16.17	17.24	0.5	Pass
165	5825	16.42	15.96	0.5	Pass

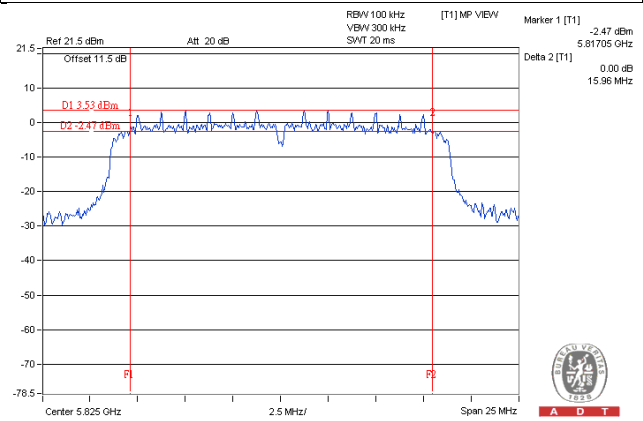
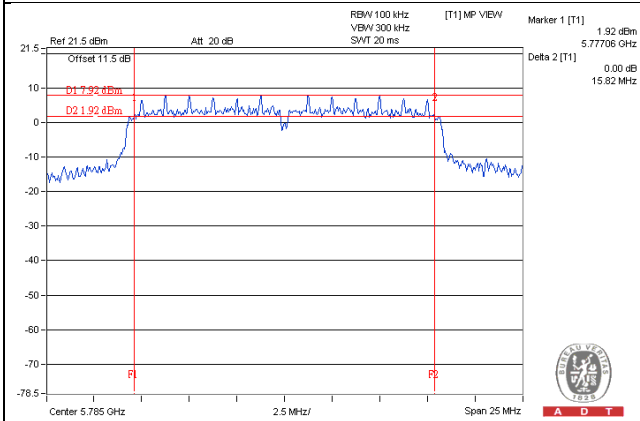
802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.25	35.25	0.5	Pass
159	5795	35.26	35.24	0.5	Pass

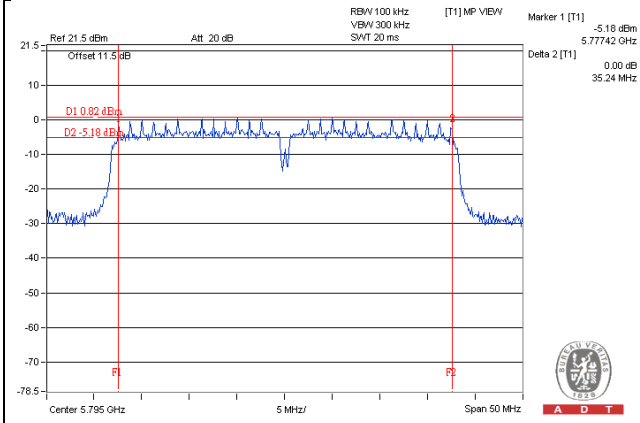
Spectrum Plot of Worst Value

802.11a / CH157

802.11n (HT20)_Chain 1 / CH165



802.11n (HT40)_Chain 1 / CH159



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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Fax: 886-2-26051924

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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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