

FCC Test Report

Report No.: RF121227E01E-1

FCC ID: NKR-DTVDWVB

Test Model: WVBR0-01

Series Model: WVBR0-25

Received Date: Dec. 03, 2015

Test Date: Jan. 04 to Mar. 05, 2016

Issued Date: Apr. 14, 2016

Applicant: Wistron NeWeb Corp.

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Release Control Record

Issue No.	Description	Date Issued
RF121227E01E-1	Original release.	Apr. 14, 2016



1 Certificate of Conformity

Product: Wireless Video Bridge

Brand: DIRECTV

Test Model: WVBR0-01

Series Model: WVBR0-25

Sample Status: ENGINEERING SAMPLE

Applicant: Wistron NeWeb Corp.

Test Date: Jan. 04 to Mar. 05, 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 : Wendy Wu , **Date:** Apr. 14, 2016
Wendy Wu / Specialist

Approved by : May Chen , **Date:** Apr. 14, 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)(6)	AC Power Conducted Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -18.47dB at 23.12891MHz.
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 5860.00MHz.
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 i-pex not a standard connector.

NOTE: 1. This report is prepared for FCC class II permissive change. (Upgraded the standard to section 15.407 under new rule and changed adapter)

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 ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.31 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.43 dB
	6GHz ~ 18GHz	3.49 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	Wireless Video Bridge
Brand	DIRECTV
Test Model	WVBR0-01
Series Model	WVBR0-25
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from power adapter
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	OFDM
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 600Mbps
Operating Frequency	5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	802.11a, 802.11n (HT20): 9 802.11n (HT40): 4
Output Power	5.18 ~ 5.24GHz: 802.11a: 300.219mW 802.11n (HT20): 297.037mW 802.11n (HT40): 414.775mW 5.745 ~ 5.825GHz: 802.11a: 387.64mW 802.11n (HT20): 394.703mW 802.11n (HT40): 250.938mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF121227E01B-1 design is as the following:

- ◆ Upgraded the standard to section 15.407 under new rule.
- ◆ Changed one new adapter as following table:

Newly		
Brand	Model No.	Spec.
DIRECTV	EPS10R3-16	Input: 120V, 0.5A, 60Hz AC power cable (unshielded, 0.9m) Output: 12V, 1.5A DC power cable (unshielded, 1.8m with 1 core)

2. According to above conditions, all test items of U-NII-1 band and U-NII-3 band need to be performed. And all data was verified to meet the requirements.

3. The EUT has two model names which are identical to each other in all aspects except for the following table:

Brand	Model Name	Description
DIRECTV	WVBR0-01	For marketing requirement
	WVBR0-25	

From the above models, model: **WVBR0-01** was selected as representative model for the test and its data was recorded in this report.

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

Transmitter Circuit	Antenna Type	Gain (dBi)	Frequency range (MHz to MHz)	Connector type
Chain (0)	Dipole	4.77	5150 ~ 5250	i-pex
		4.46	5250 ~ 5350	
		5.19	5470 ~ 5725	
		5.07	5745 ~ 5825	
Chain (1)	Dipole	4.11	5150 ~ 5250	i-pex
		3.46	5250 ~ 5350	
		3.96	5470 ~ 5725	
		4.09	5745 ~ 5825	
Chain (2)	Dipole	4.86	5150 ~ 5250	i-pex
		5.14	5250 ~ 5350	
		4.83	5470 ~ 5725	
		4.50	5745 ~ 5825	
Chain (3)	Dipole	5.12	5150 ~ 5250	i-pex
		5.01	5250 ~ 5350	
		4.57	5470 ~ 5725	
		4.65	5745 ~ 5825	

5. The EUT incorporates a MIMO function without beam forming.

MODULATION MODE	TX/RX FUNCTION
802.11a	4TX/4RX
802.11n (HT20)	4TX/4RX
802.11n (HT40)	4TX/4RX

6. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 31.

7. 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	PLC	APCM	
-	√	√	√	√	-

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

NOTE:

1. In original report, the EUT had been pre-tested on the positioned of each 2 axis. The radiated emission worst case was found when positioned on **Y-plane**

Radiated Emission Test (Above 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

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	36 to 48 149 to 165	157	OFDM	BPSK	6.5

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.

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11n (HT20)	5180-5240 5745-5825	36 to 48 149 to 165	157	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	21deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin
RE $<$ 1G	26deg. C, 69%RH	120Vac, 60Hz	Gary Cheng
PLC	25deg. C, 54%RH	120Vac, 60Hz	Jason Huang
APCM	20deg. C, 64%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

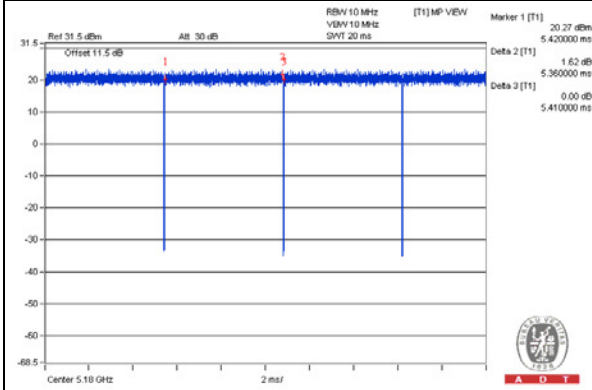
Duty cycle of test signal is $\geq 98\%$, duty factor is not required.

802.11a: Duty cycle = 5.36 ms/5.41 ms = 0.991

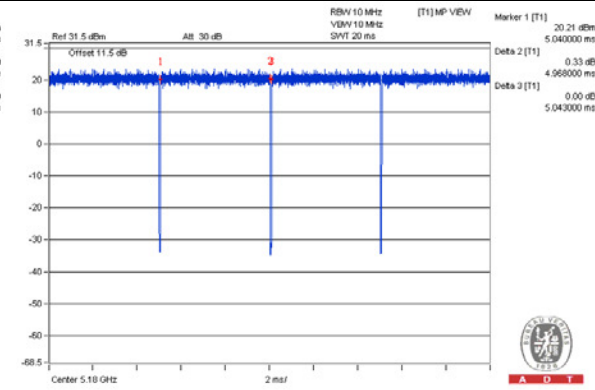
802.11n (HT20): Duty cycle = 4.968 ms/5.043 ms = 0.985

802.11n (HT40): Duty cycle = 2.413 ms/2.46 ms = 0.981

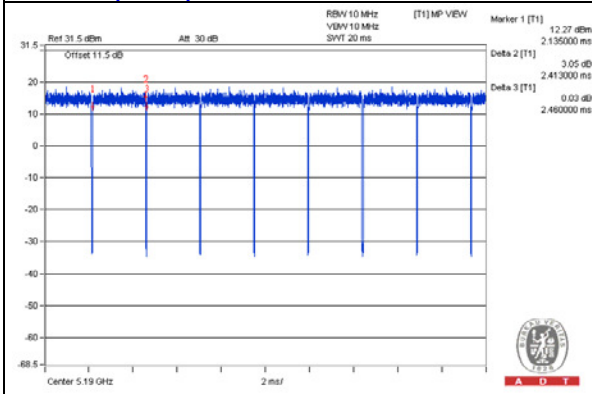
802.11a



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.

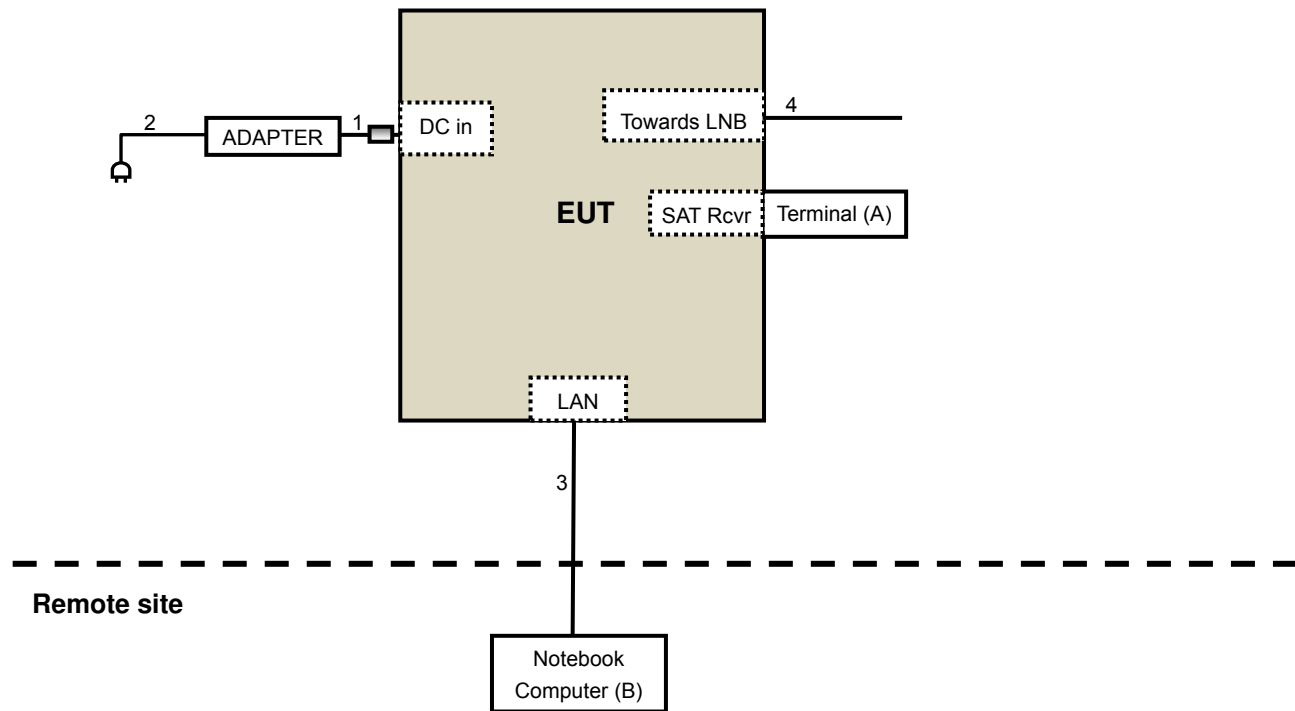
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Terminal	NA	NA	NA	NA	Supplied by Client
B.	Notebook Computer	DELL	PP27L	7YLB32S	FCC DoC	Provided by Lab

Note:

- 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.	DC	1	1.8	Yes	1	Supplied by Client
2.	AC	1	0.9	No	0	Provided by Lab
3.	RJ45	1	10	No	0	Provided by Lab
4.	Coaxial	1	1	No	0	Provided by Lab

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 v01r02	FIELD STRENGTH AT 3m	
	PK:74 (dBuV/m)	AV:54 (dBuV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBuV/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(dBuV/m) ^{*1} PK:78.2 (dBuV/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 test:

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. 13, 2014	Jan. 12, 2016
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2015	Jan. 17, 2016
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-07	May 08, 2015	May 07, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	138	Feb. 03, 2015	Feb. 02, 2016
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 calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Loop antenna was used for all emissions below 30 MHz.
4. The test was performed in 966 Chamber No. 3.
5. The FCC Site Registration No. is 147459
6. The CANADA Site Registration No. is 20331-1
- 7 Tested Date: Jan. 05, 2016

For U-NII-3 band test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Feb. 06, 2015	Feb. 05, 2016
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 19, 2015	Sep. 18, 2016
RF Cable	EMC104-SM- SM-2000 EMC104-SM- SM-5000 EMC104-SM- SM-5000	150318 150323 150324	Mar. 31, 2015	Mar. 30, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 16, 2015	Jan. 15, 2016
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Feb. 05, 2015	Feb. 04, 2016
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 17, 2015	Jan. 16, 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. 4.
3. The FCC Site Registration No. is 292998
4. The CANADA Site Registration No. is 20331-2
5. Tested Date: Jan. 04, 2016

**For Other test items:**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Jan. 19, 2016	Jan. 18, 2017
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 19, 2015	Sep. 18, 2016
RF Cable	EMC104-SM- SM-2000 EMC104-SM- SM-5000 EMC104-SM- SM-5000	150318 150323 150324	Mar. 31, 2015	Mar. 30, 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
Spectrum Analyzer R&S	FSP 40	100060	May 08, 2015	May 07, 2016
Power meter Anritsu	ML2495A	1014008	Apr. 28, 2015	Apr. 27, 2016
Power sensor Anritsu	MA2411B	0917122	Apr. 28, 2015	Apr. 27, 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. 4.
3. The FCC Site Registration No. is 292998
4. The CANADA Site Registration No. is 20331-2
5. Tested Date: Feb. 03 to Mar. 05, 2016

4.1.3 Test Procedure

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

Note:

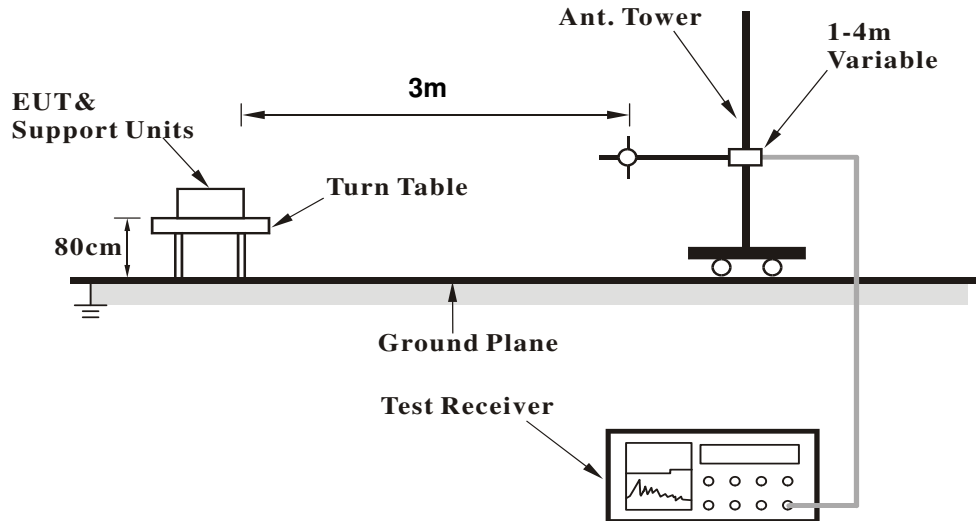
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

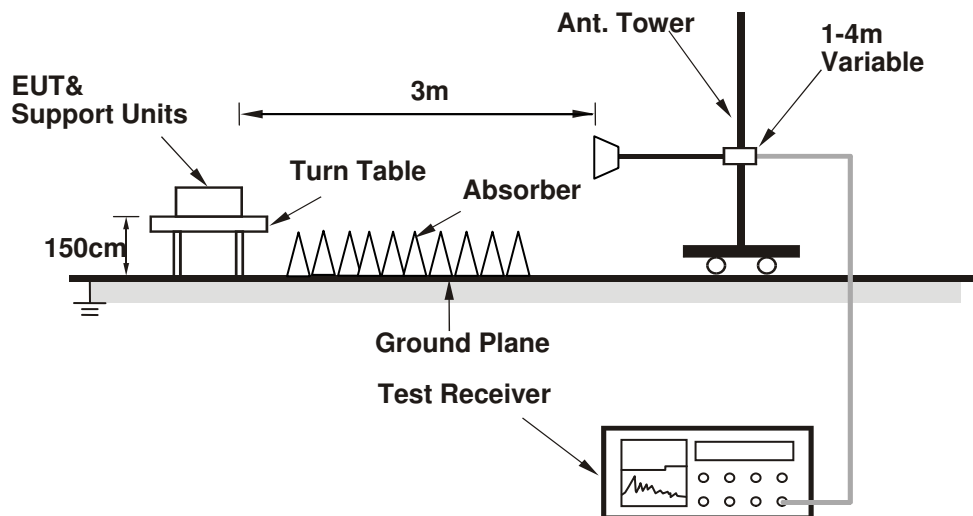
No deviation.

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 Condition

1. Connect the EUT with the support unit C (Notebook Computer) which is placed on remote site.
2. Controlling software (RF SOP Quantenna test command.txt) has been activated to set the EUT on specific status.

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	5147.50	66.4 PK	74.0	-7.6	1.41 H	269	65.78	0.62
2	5147.50	53.8 AV	54.0	-0.2	1.41 H	269	53.18	0.62
3	*5180.00	115.1 PK			1.41 H	269	114.37	0.73
4	*5180.00	106.2 AV			1.41 H	269	105.47	0.73
5	#10360.00	63.2 PK	74.0	-10.8	1.91 H	93	52.45	10.75
6	#10360.00	52.5 AV	54.0	-1.5	1.91 H	93	41.75	10.75
7	15540.00	60.4 PK	74.0	-13.6	2.04 H	336	47.25	13.15
8	15540.00	48.5 AV	54.0	-5.5	2.04 H	336	35.35	13.15

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	5147.50	66.0 PK	74.0	-8.0	1.50 V	180	65.38	0.62
2	5147.50	53.2 AV	54.0	-0.8	1.50 V	180	52.58	0.62
3	*5180.00	114.9 PK			1.50 V	180	114.17	0.73
4	*5180.00	106.0 AV			1.50 V	180	105.27	0.73
5	#10360.00	64.0 PK	74.0	-10.0	2.91 V	117	53.25	10.75
6	#10360.00	52.7 AV	54.0	-1.3	2.91 V	117	41.95	10.75
7	15540.00	63.5 PK	74.0	-10.5	1.82 V	304	50.35	13.15
8	15540.00	52.5 AV	54.0	-1.5	1.82 V	304	39.35	13.15

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	62.4 PK	74.0	-11.6	1.23 H	272	61.76	0.64
2	5150.00	49.7 AV	54.0	-4.3	1.23 H	272	49.06	0.64
3	*5200.00	117.0 PK			1.23 H	272	116.21	0.79
4	*5200.00	107.5 AV			1.23 H	272	106.71	0.79
5	5359.80	58.1 PK	74.0	-15.9	1.23 H	272	56.92	1.18
6	5359.80	48.1 AV	54.0	-5.9	1.23 H	272	46.92	1.18
7	#10400.00	65.8 PK	74.0	-8.2	1.90 H	102	54.70	11.10
8	#10400.00	52.6 AV	54.0	-1.4	1.90 H	102	41.50	11.10
9	15600.00	62.5 PK	74.0	-11.5	2.04 H	352	49.28	13.22
10	15600.00	50.6 AV	54.0	-3.4	2.04 H	352	37.38	13.22

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.0 PK	74.0	-12.0	1.48 V	189	61.36	0.64
2	5150.00	49.1 AV	54.0	-4.9	1.48 V	189	48.46	0.64
3	*5200.00	116.8 PK			1.48 V	189	116.01	0.79
4	*5200.00	107.3 AV			1.48 V	189	106.51	0.79
5	5359.80	57.7 PK	74.0	-16.3	1.48 V	189	56.52	1.18
6	5359.80	47.5 AV	54.0	-6.5	1.48 V	189	46.32	1.18
7	#10400.00	66.0 PK	74.0	-8.0	2.96 V	122	54.90	11.10
8	#10400.00	52.8 AV	54.0	-1.2	2.96 V	122	41.70	11.10
9	15600.00	65.4 PK	74.0	-8.6	1.76 V	288	52.18	13.22
10	15600.00	52.6 AV	54.0	-1.4	1.76 V	288	39.38	13.22

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	117.7 PK			1.29 H	273	116.78	0.92
2	*5240.00	107.1 AV			1.29 H	273	106.18	0.92
3	5360.00	58.0 PK	74.0	-16.0	1.29 H	273	56.82	1.18
4	5360.00	47.4 AV	54.0	-6.6	1.29 H	273	46.22	1.18
5	#10480.00	65.4 PK	74.0	-8.6	1.93 H	89	54.46	10.94
6	#10480.00	51.4 AV	54.0	-2.6	1.93 H	89	40.46	10.94
7	15720.00	62.4 PK	74.0	-11.6	2.00 H	341	49.87	12.53
8	15720.00	50.6 AV	54.0	-3.4	2.00 H	341	38.07	12.53

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	117.5 PK			1.52 V	188	116.58	0.92
2	*5240.00	106.9 AV			1.52 V	188	105.98	0.92
3	5360.00	57.5 PK	74.0	-16.5	1.52 V	188	56.32	1.18
4	5360.00	46.8 AV	54.0	-7.2	1.52 V	188	45.62	1.18
5	#10480.00	65.4 PK	74.0	-8.6	2.98 V	129	54.46	10.94
6	#10480.00	52.6 AV	54.0	-1.4	2.98 V	129	41.66	10.94
7	15720.00	65.3 PK	74.0	-8.7	2.43 V	263	52.77	12.53
8	15720.00	53.0 AV	54.0	-1.0	2.43 V	263	40.47	12.53

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	#5710.00	64.3 PK	74.0	-9.7	3.22 H	104	58.37	5.93
2	#5710.00	48.7 AV	54.0	-5.3	3.22 H	104	42.77	5.93
3	#5725.00	76.8 PK	78.2	-1.4	3.22 H	104	70.89	5.91
4	*5745.00	114.1 PK			3.22 H	104	108.21	5.89
5	*5745.00	104.1 AV			3.22 H	104	98.21	5.89
6	11490.00	57.5 PK	74.0	-16.5	1.54 H	296	45.11	12.39
7	11490.00	43.3 AV	54.0	-10.7	1.54 H	296	30.91	12.39
8	#17235.00	61.1 PK	74.0	-12.9	1.99 H	259	40.11	20.99
9	#17235.00	47.2 AV	54.0	-6.8	1.99 H	259	26.21	20.99

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	#5710.00	65.7 PK	74.0	-8.3	1.85 V	90	59.77	5.93
2	#5710.00	50.3 AV	54.0	-3.7	1.85 V	90	44.37	5.93
3	#5725.00	78.0 PK	78.2	-0.2	1.85 V	90	72.09	5.91
4	*5745.00	114.9 PK			1.85 V	90	109.01	5.89
5	*5745.00	104.9 AV			1.85 V	90	99.01	5.89
6	11490.00	58.9 PK	74.0	-15.1	1.70 V	300	46.51	12.39
7	11490.00	46.2 AV	54.0	-7.8	1.70 V	300	33.81	12.39
8	#17235.00	62.7 PK	74.0	-11.3	1.74 V	273	41.71	20.99
9	#17235.00	49.8 AV	54.0	-4.2	1.74 V	273	28.81	20.99

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	117.1 PK			3.17 H	119	111.25	5.85
2	*5785.00	109.7 AV			3.17 H	119	103.85	5.85
3	11570.00	60.7 PK	74.0	-13.3	1.56 H	305	48.38	12.32
4	11570.00	47.0 AV	54.0	-7.0	1.56 H	305	34.68	12.32
5	#17355.00	64.6 PK	74.0	-9.4	1.96 H	263	43.33	21.27
6	#17355.00	50.7 AV	54.0	-3.3	1.96 H	263	29.43	21.27

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	118.0 PK			1.73 V	96	112.15	5.85
2	*5785.00	110.5 AV			1.73 V	96	104.65	5.85
3	11570.00	62.1 PK	74.0	-11.9	1.51 V	309	49.78	12.32
4	11570.00	49.9 AV	54.0	-4.1	1.51 V	309	37.58	12.32
5	#17355.00	66.2 PK	74.0	-7.8	1.73 V	274	44.93	21.27
6	#17355.00	53.3 AV	54.0	-0.7	1.73 V	274	32.03	21.27

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	114.5 PK			1.14 H	77	108.72	5.78
2	*5825.00	104.4 AV			1.14 H	77	98.62	5.78
3	#5850.00	68.8 PK	78.2	-9.4	1.14 H	77	63.07	5.73
4	#5860.00	66.9 PK	74.0	-7.1	1.14 H	77	61.20	5.70
5	#5860.00	52.0 AV	54.0	-2.0	1.14 H	77	46.30	5.70
6	11650.00	58.8 PK	74.0	-15.2	1.50 H	301	46.44	12.36
7	11650.00	44.6 AV	54.0	-9.4	1.50 H	301	32.24	12.36
8	#17475.00	62.2 PK	74.0	-11.8	1.92 H	253	41.03	21.17
9	#17475.00	48.3 AV	54.0	-5.7	1.92 H	253	27.13	21.17

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	116.0 PK			1.82 V	92	110.22	5.78
2	*5825.00	105.9 AV			1.82 V	92	100.12	5.78
3	#5850.00	70.0 PK	78.2	-8.2	1.82 V	92	64.27	5.73
4	#5860.00	68.2 PK	74.0	-5.8	1.82 V	92	62.50	5.70
5	#5860.00	53.9 AV	54.0	-0.1	1.82 V	92	48.20	5.70
6	11650.00	60.1 PK	74.0	-13.9	1.68 V	292	47.74	12.36
7	11650.00	47.5 AV	54.0	-6.5	1.68 V	292	35.14	12.36
8	#17475.00	63.9 PK	74.0	-10.1	1.77 V	268	42.73	21.17
9	#17475.00	51.1 AV	54.0	-2.9	1.77 V	268	29.93	21.17

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	70.6 PK	74.0	-3.4	1.53 H	271	69.96	0.64
2	5150.00	53.8 AV	54.0	-0.2	1.53 H	271	53.16	0.64
3	*5180.00	115.7 PK			1.53 H	271	114.97	0.73
4	*5180.00	105.7 AV			1.53 H	271	104.97	0.73
5	#10360.00	63.5 PK	74.0	-10.5	1.88 H	108	52.75	10.75
6	#10360.00	52.7 AV	54.0	-1.3	1.88 H	108	41.95	10.75
7	15540.00	60.3 PK	74.0	-13.7	2.02 H	340	47.15	13.15
8	15540.00	48.7 AV	54.0	-5.3	2.02 H	340	35.55	13.15

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	69.3 PK	74.0	-4.7	1.60 V	179	68.66	0.64
2	5150.00	53.2 AV	54.0	-0.8	1.60 V	179	52.56	0.64
3	*5180.00	115.9 PK			1.60 V	179	115.17	0.73
4	*5180.00	105.6 AV			1.60 V	179	104.87	0.73
5	#10360.00	63.9 PK	74.0	-10.1	2.88 V	126	53.15	10.75
6	#10360.00	52.9 AV	54.0	-1.1	2.88 V	126	42.15	10.75
7	15540.00	63.2 PK	74.0	-10.8	1.86 V	309	50.05	13.15
8	15540.00	52.1 AV	54.0	-1.9	1.86 V	309	38.95	13.15

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	116.7 PK			1.14 H	82	115.91	0.79
2	*5200.00	106.3 AV			1.14 H	82	105.51	0.79
3	#10400.00	65.0 PK	74.0	-9.0	1.94 H	87	53.90	11.10
4	#10400.00	51.1 AV	54.0	-2.9	1.94 H	87	40.00	11.10
5	15600.00	61.8 PK	74.0	-12.2	2.03 H	330	48.58	13.22
6	15600.00	50.3 AV	54.0	-3.7	2.03 H	330	37.08	13.22

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	116.9 PK			1.56 V	195	116.11	0.79
2	*5200.00	106.5 AV			1.56 V	195	105.71	0.79
3	#10400.00	66.4 PK	74.0	-7.6	2.97 V	116	55.30	11.10
4	#10400.00	52.9 AV	54.0	-1.1	2.97 V	116	41.80	11.10
5	15600.00	65.0 PK	74.0	-9.0	1.73 V	279	51.78	13.22
6	15600.00	52.2 AV	54.0	-1.8	1.73 V	279	38.98	13.22

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	116.4 PK			1.65 H	271	115.48	0.92
2	*5240.00	106.0 AV			1.65 H	271	105.08	0.92
3	5350.00	58.3 PK	74.0	-15.7	1.65 H	271	57.12	1.18
4	5350.00	48.0 AV	54.0	-6.0	1.65 H	271	46.82	1.18
5	#10480.00	62.9 PK	74.0	-11.1	1.94 H	94	51.96	10.94
6	#10480.00	52.1 AV	54.0	-1.9	1.94 H	94	41.16	10.94
7	15720.00	60.1 PK	74.0	-13.9	1.99 H	333	47.57	12.53
8	15720.00	48.0 AV	54.0	-6.0	1.99 H	333	35.47	12.53

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	116.6 PK			1.56 V	193	115.68	0.92
2	*5240.00	106.2 AV			1.56 V	193	105.28	0.92
3	5350.00	57.6 PK	74.0	-16.4	1.56 V	193	56.42	1.18
4	5350.00	47.5 AV	54.0	-6.5	1.56 V	193	46.32	1.18
5	#10480.00	65.7 PK	74.0	-8.3	2.92 V	122	54.76	10.94
6	#10480.00	52.3 AV	54.0	-1.7	2.92 V	122	41.36	10.94
7	15720.00	65.5 PK	74.0	-8.5	1.79 V	303	52.97	12.53
8	15720.00	52.9 AV	54.0	-1.1	1.79 V	303	40.37	12.53

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	#5710.00	65.1 PK	74.0	-8.9	3.26 H	88	59.17	5.93
2	#5710.00	49.6 AV	54.0	-4.4	3.26 H	88	43.67	5.93
3	#5725.00	76.5 PK	78.2	-1.7	3.26 H	88	70.59	5.91
4	*5745.00	113.4 PK			3.26 H	88	107.51	5.89
5	*5745.00	102.6 AV			3.26 H	88	96.71	5.89
6	11490.00	56.6 PK	74.0	-17.4	1.53 H	302	44.21	12.39
7	11490.00	40.8 AV	54.0	-13.2	1.53 H	302	28.41	12.39
8	#17235.00	63.7 PK	74.0	-10.3	2.00 H	248	42.71	20.99
9	#17235.00	47.1 AV	54.0	-6.9	2.00 H	248	26.11	20.99

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	#5710.00	66.6 PK	74.0	-7.4	1.85 V	88	60.67	5.93
2	#5710.00	51.2 AV	54.0	-2.8	1.85 V	88	45.27	5.93
3	#5725.00	78.0 PK	78.2	-0.2	1.85 V	88	72.09	5.91
4	*5745.00	114.9 PK			1.85 V	88	109.01	5.89
5	*5745.00	104.1 AV			1.85 V	88	98.21	5.89
6	11490.00	58.4 PK	74.0	-15.6	1.78 V	263	46.01	12.39
7	11490.00	49.5 AV	54.0	-4.5	1.78 V	263	37.11	12.39
8	#17235.00	66.1 PK	74.0	-7.9	1.79 V	92	45.11	20.99
9	#17235.00	50.4 AV	54.0	-3.6	1.79 V	92	29.41	20.99

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	116.5 PK			3.27 H	115	110.65	5.85
2	*5785.00	108.8 AV			3.27 H	115	102.95	5.85
3	11570.00	60.3 PK	74.0	-13.7	1.50 H	326	47.98	12.32
4	11570.00	46.8 AV	54.0	-7.2	1.50 H	326	34.48	12.32
5	#17355.00	64.4 PK	74.0	-9.6	2.02 H	249	43.13	21.27
6	#17355.00	50.4 AV	54.0	-3.6	2.02 H	249	29.13	21.27

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	118.0 PK			1.79 V	91	112.15	5.85
2	*5785.00	110.3 AV			1.79 V	91	104.45	5.85
3	11570.00	62.8 PK	74.0	-11.2	1.51 V	320	50.48	12.32
4	11570.00	49.9 AV	54.0	-4.1	1.51 V	320	37.58	12.32
5	#17355.00	66.8 PK	74.0	-7.2	1.70 V	289	45.53	21.27
6	#17355.00	53.7 AV	54.0	-0.3	1.70 V	289	32.43	21.27

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	114.6 PK			3.20 H	111	108.82	5.78
2	*5825.00	104.0 AV			3.20 H	111	98.22	5.78
3	#5850.00	71.4 PK	78.2	-6.8	3.20 H	111	65.67	5.73
4	#5860.00	68.0 PK	74.0	-6.0	3.20 H	111	62.30	5.70
5	#5860.00	52.3 AV	54.0	-1.7	3.20 H	111	46.60	5.70
6	11650.00	58.3 PK	74.0	-15.7	1.61 H	303	45.94	12.36
7	11650.00	45.1 AV	54.0	-8.9	1.61 H	303	32.74	12.36
8	#17475.00	64.6 PK	74.0	-9.4	2.01 H	250	43.43	21.17
9	#17475.00	47.8 AV	54.0	-6.2	2.01 H	250	26.63	21.17

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	116.1 PK			1.80 V	91	110.32	5.78
2	*5825.00	105.5 AV			1.80 V	91	99.72	5.78
3	#5850.00	72.7 PK	78.2	-5.5	1.80 V	91	66.97	5.73
4	#5860.00	69.5 PK	74.0	-4.5	1.80 V	91	63.80	5.70
5	#5860.00	53.9 AV	54.0	-0.1	1.80 V	91	48.20	5.70
6	11650.00	59.6 PK	74.0	-14.4	1.64 V	288	47.24	12.36
7	11650.00	47.9 AV	54.0	-6.1	1.64 V	288	35.54	12.36
8	#17475.00	67.0 PK	74.0	-7.0	1.75 V	253	45.83	21.17
9	#17475.00	51.0 AV	54.0	-3.0	1.75 V	253	29.83	21.17

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	66.8 PK	74.0	-7.2	1.30 H	270	66.16	0.64
2	5150.00	53.8 AV	54.0	-0.2	1.30 H	270	53.16	0.64
3	*5190.00	107.8 PK			1.30 H	270	107.05	0.75
4	*5190.00	98.2 AV			1.30 H	270	97.45	0.75
5	5350.00	54.2 PK	74.0	-19.8	1.30 H	270	53.02	1.18
6	5350.00	42.3 AV	54.0	-11.7	1.30 H	270	41.12	1.18
7	#10380.00	58.4 PK	74.0	-15.6	1.55 H	301	47.47	10.93
8	#10380.00	44.5 AV	54.0	-9.5	1.55 H	301	33.57	10.93
9	15570.00	64.7 PK	74.0	-9.3	1.93 H	267	51.51	13.19
10	15570.00	48.2 AV	54.0	-5.8	1.93 H	267	35.01	13.19

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	68.6 PK	74.0	-5.4	1.63 V	174	67.96	0.64
2	5150.00	53.6 AV	54.0	-0.4	1.63 V	174	52.96	0.64
3	*5190.00	108.6 PK			1.63 V	174	107.85	0.75
4	*5190.00	98.6 AV			1.63 V	174	97.85	0.75
5	5350.00	54.7 PK	74.0	-19.3	1.63 V	174	53.52	1.18
6	5350.00	42.8 AV	54.0	-11.2	1.63 V	174	41.62	1.18
7	#10380.00	59.2 PK	74.0	-14.8	1.73 V	292	48.27	10.93
8	#10380.00	46.5 AV	54.0	-7.5	1.73 V	292	35.57	10.93
9	15570.00	66.0 PK	74.0	-8.0	1.69 V	293	52.81	13.19
10	15570.00	49.9 AV	54.0	-4.1	1.69 V	293	36.71	13.19

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.4 PK	74.0	-8.6	1.54 H	272	64.76	0.64
2	5150.00	49.8 AV	54.0	-4.2	1.54 H	272	49.16	0.64
3	*5230.00	112.6 PK			1.54 H	272	111.70	0.90
4	*5230.00	102.3 AV			1.54 H	272	101.40	0.90
5	5350.00	58.3 PK	74.0	-15.7	1.54 H	272	57.12	1.18
6	5350.00	45.0 AV	54.0	-9.0	1.54 H	272	43.82	1.18
7	#10460.00	63.4 PK	74.0	-10.6	1.96 H	90	52.43	10.97
8	#10460.00	52.5 AV	54.0	-1.5	1.96 H	90	41.53	10.97
9	15690.00	60.4 PK	74.0	-13.6	2.09 H	328	47.76	12.64
10	15690.00	48.5 AV	54.0	-5.5	2.09 H	328	35.86	12.64

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	64.8 PK	74.0	-9.2	1.49 V	199	64.16	0.64
2	5150.00	49.1 AV	54.0	-4.9	1.49 V	199	48.46	0.64
3	*5230.00	113.4 PK			1.49 V	199	112.50	0.90
4	*5230.00	102.7 AV			1.49 V	199	101.80	0.90
5	5350.00	57.6 PK	74.0	-16.4	1.49 V	199	56.42	1.18
6	5350.00	44.5 AV	54.0	-9.5	1.49 V	199	43.32	1.18
7	#10460.00	63.7 PK	74.0	-10.3	2.94 V	111	52.73	10.97
8	#10460.00	52.5 AV	54.0	-1.5	2.94 V	111	41.53	10.97
9	15690.00	63.8 PK	74.0	-10.2	1.85 V	310	51.16	12.64
10	15690.00	52.9 AV	54.0	-1.1	1.85 V	310	40.26	12.64

REMARKS:

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

CHANNEL	TX Channel 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	#5710.00	68.7 PK	74.0	-5.3	3.21 H	111	62.77	5.93
2	#5710.00	51.6 AV	54.0	-2.4	3.21 H	111	45.67	5.93
3	#5725.00	67.2 PK	78.2	-11.0	3.21 H	111	61.29	5.91
4	*5755.00	106.1 PK			3.21 H	111	100.22	5.88
5	*5755.00	96.0 AV			3.21 H	111	90.12	5.88
6	11510.00	53.5 PK	74.0	-20.5	1.54 H	294	41.14	12.36
7	11510.00	40.2 AV	54.0	-13.8	1.54 H	294	27.84	12.36
8	#17265.00	59.8 PK	74.0	-14.2	1.98 H	257	39.01	20.79
9	#17265.00	44.0 AV	54.0	-10.0	1.98 H	257	23.21	20.79

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5710.00	70.3 PK	74.0	-3.7	1.82 V	93	64.37	5.93
2	#5710.00	53.2 AV	54.0	-0.8	1.82 V	93	47.27	5.93
3	#5725.00	68.8 PK	78.2	-9.4	1.82 V	93	62.89	5.91
4	*5755.00	107.6 PK			1.82 V	93	101.72	5.88
5	*5755.00	97.5 AV			1.82 V	93	91.62	5.88
6	11510.00	54.8 PK	74.0	-19.2	1.75 V	307	42.44	12.36
7	11510.00	42.3 AV	54.0	-11.7	1.75 V	307	29.94	12.36
8	#17265.00	61.3 PK	74.0	-12.7	1.80 V	299	40.51	20.79
9	#17265.00	46.1 AV	54.0	-7.9	1.80 V	299	25.31	20.79

REMARKS:

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

CHANNEL	TX Channel 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	111.1 PK			3.17 H	89	105.26	5.84
2	*5795.00	100.6 AV			3.17 H	89	94.76	5.84
3	#5850.00	68.1 PK	78.2	-10.1	3.17 H	89	62.37	5.73
4	#5870.00	66.7 PK	74.0	-7.3	3.17 H	89	61.02	5.68
5	#5870.00	49.6 AV	54.0	-4.4	3.17 H	89	43.92	5.68
6	11590.00	58.4 PK	74.0	-15.6	1.59 H	313	46.08	12.32
7	11590.00	44.7 AV	54.0	-9.3	1.59 H	313	32.38	12.32
8	#17385.00	64.3 PK	74.0	-9.7	1.95 H	256	42.67	21.63
9	#17385.00	48.0 AV	54.0	-6.0	1.95 H	256	26.37	21.63

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	112.6 PK			1.84 V	91	106.76	5.84
2	*5795.00	102.1 AV			1.84 V	91	96.26	5.84
3	#5850.00	69.6 PK	78.2	-8.6	1.84 V	91	63.87	5.73
4	#5870.00	68.3 PK	74.0	-5.7	1.84 V	91	62.62	5.68
5	#5870.00	51.2 AV	54.0	-2.8	1.84 V	91	45.52	5.68
6	11590.00	59.7 PK	74.0	-14.3	1.76 V	306	47.38	12.32
7	11590.00	46.8 AV	54.0	-7.2	1.76 V	306	34.48	12.32
8	#17385.00	66.1 PK	74.0	-7.9	1.70 V	289	44.47	21.63
9	#17385.00	50.2 AV	54.0	-3.8	1.70 V	289	28.57	21.63

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 157	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	71.15	31.9 QP	40.0	-8.1	2.00 H	303	42.19	-10.33
2	110.80	34.0 QP	43.5	-9.5	2.00 H	69	45.29	-11.33
3	141.23	31.1 QP	43.5	-12.4	2.00 H	76	40.02	-8.90
4	201.91	31.8 QP	43.5	-11.7	1.00 H	84	43.34	-11.52
5	400.01	32.1 QP	46.0	-13.9	2.00 H	46	37.16	-5.02
6	924.99	33.4 QP	46.0	-12.6	1.00 H	334	28.44	4.97

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	101.90	33.8 QP	43.5	-9.7	1.00 V	64	46.50	-12.74
2	111.55	32.9 QP	43.5	-10.6	1.00 V	112	44.16	-11.22
3	202.05	26.8 QP	43.5	-16.7	2.00 V	216	38.31	-11.53
4	400.01	29.9 QP	46.0	-16.1	1.50 V	282	34.95	-5.02
5	475.01	35.5 QP	46.0	-10.5	1.00 V	282	38.63	-3.09
6	925.09	30.3 QP	46.0	-15.8	1.00 V	253	25.25	5.00

REMARKS:

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

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.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100375	May 06, 2015	May 05, 2016
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 01, 2015	Aug. 31, 2016
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016
RF Cable	5D-FB	COCCAB-001	Mar. 09, 2015	Mar. 08, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 23, 2015	Sep. 22, 2016
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2015	Sep. 30, 2016
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: Jan. 07, 2016

4.2.3 Test Procedure

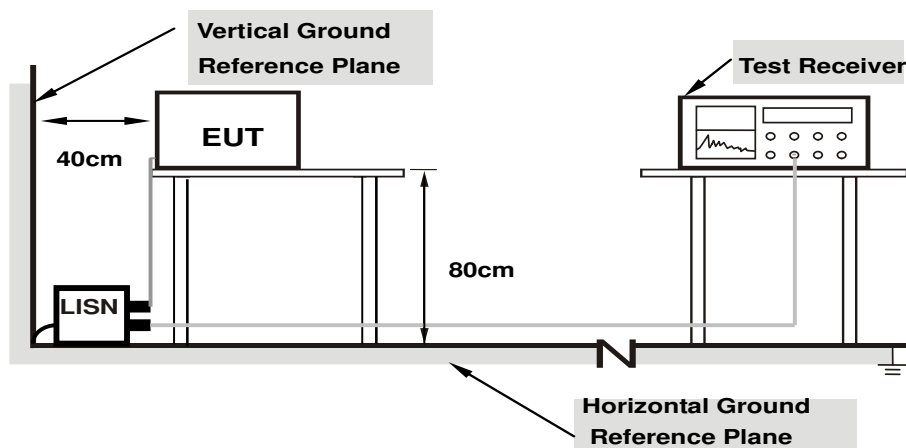
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

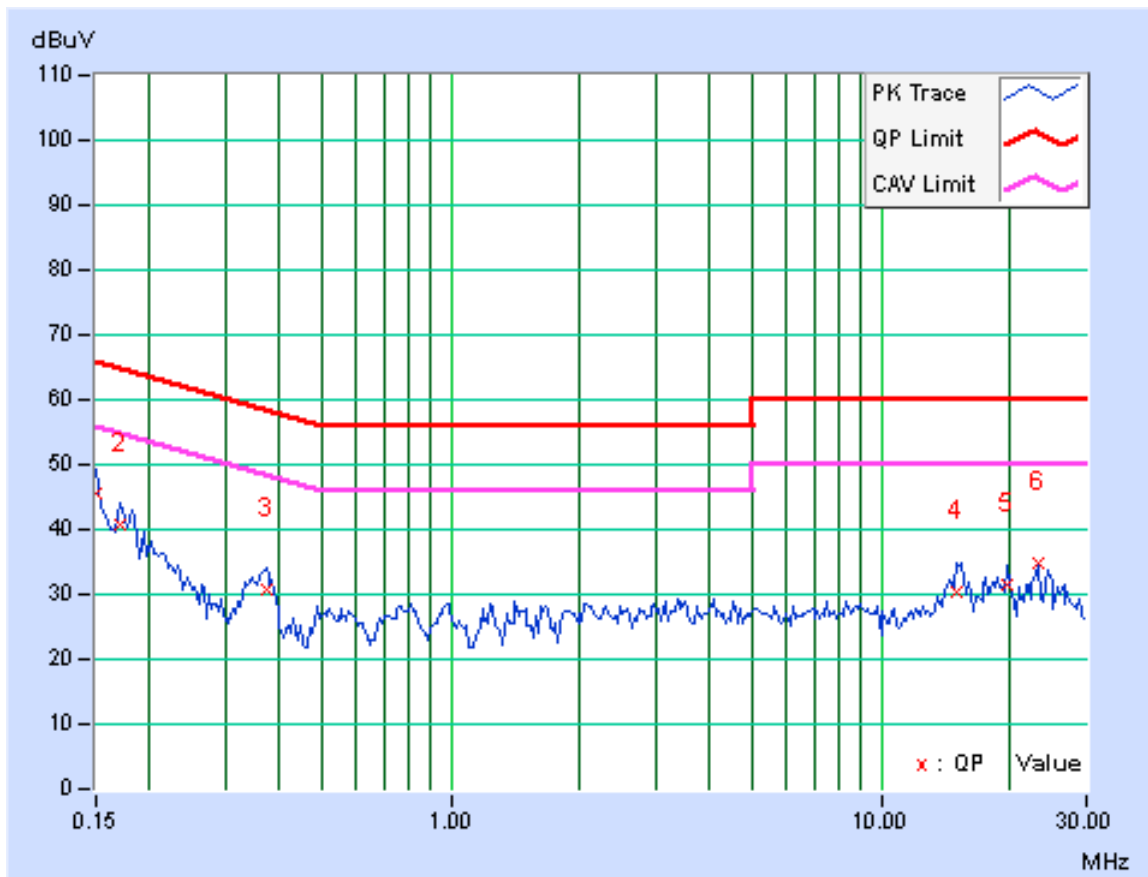
4.2.7 Test Results

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

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	
1	0.15000	10.26	35.12	23.16	45.38	33.42	66.00	56.00	-20.62	-22.58
2	0.16953	10.24	30.58	17.93	40.82	28.17	64.98	54.98	-24.16	-26.81
3	0.37266	10.24	20.50	15.69	30.74	25.93	58.44	48.44	-27.70	-22.51
4	15.01953	10.77	19.54	13.72	30.31	24.49	60.00	50.00	-29.69	-25.51
5	19.71094	10.91	20.51	17.04	31.42	27.95	60.00	50.00	-28.58	-22.05
6	23.12891	10.96	23.74	20.35	34.70	31.31	60.00	50.00	-25.30	-18.69

REMARKS:

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

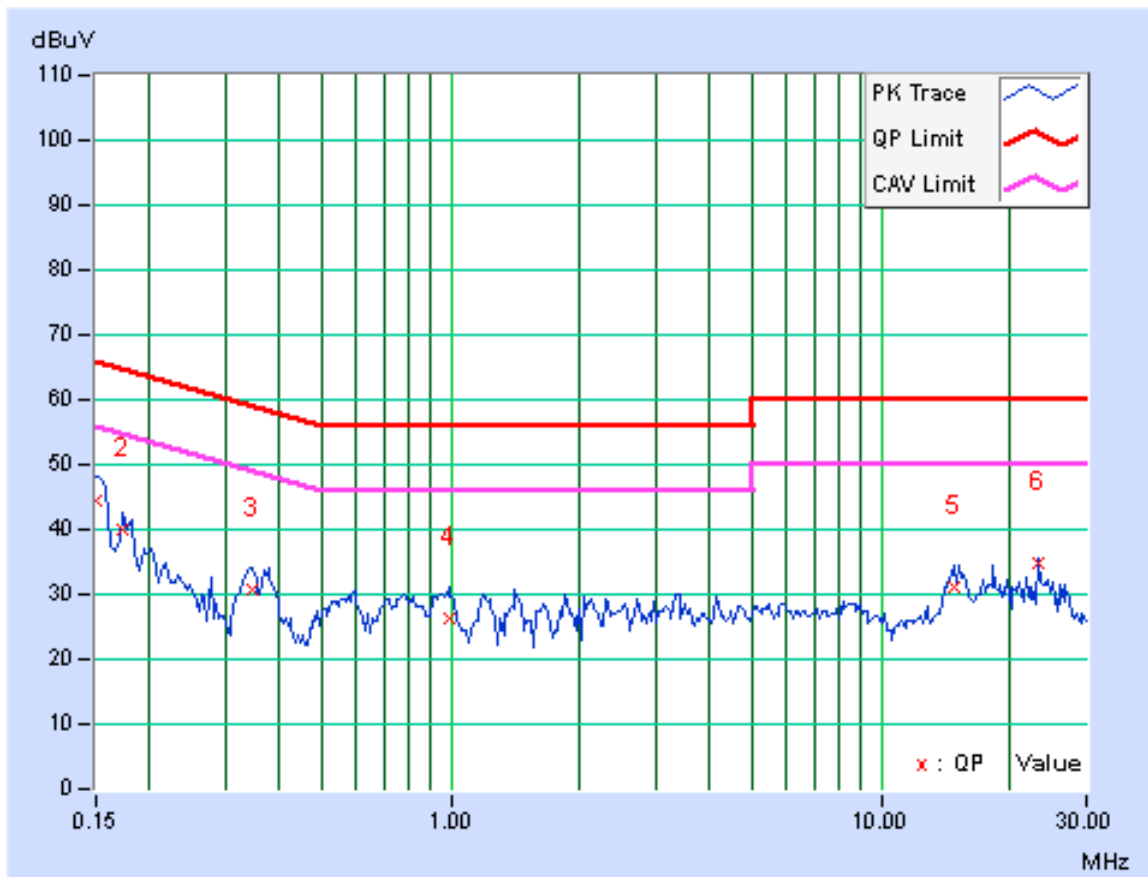


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor (dB)	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.24	34.33	22.06	44.57	32.30	66.00	56.00	-21.43	-23.70
2	0.17344	10.22	29.93	16.90	40.15	27.12	64.79	54.79	-24.64	-27.67
3	0.34531	10.21	20.63	16.96	30.84	27.17	59.07	49.07	-28.23	-21.90
4	0.98984	10.16	16.32	12.02	26.48	22.18	56.00	46.00	-29.52	-23.82
5	14.69531	10.77	20.41	14.44	31.18	25.21	60.00	50.00	-28.82	-24.79
6	23.12891	10.98	23.82	20.55	34.80	31.53	60.00	50.00	-25.20	-18.47

REMARKS:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

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

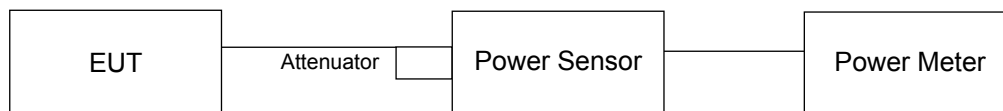
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

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

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

4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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 from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Result

POWER OUTPUT:

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	18.82	18.35	19.20	18.60	300.219	24.77	30	Pass
40	5200	18.76	18.20	18.96	18.78	295.445	24.70	30	Pass
48	5240	19.00	18.00	18.97	18.61	294.026	24.68	30	Pass
149	5745	17.15	17.14	17.31	17.00	207.587	23.17	30	Pass
157	5785	20.13	19.74	20.02	19.54	387.64	25.88	30	Pass
165	5825	18.11	17.99	18.34	18.12	260.762	24.16	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	Chain 2	Chain 3				
36	5180	18.82	18.00	19.15	18.78	297.037	24.73	30	Pass
40	5200	19.08	17.96	18.96	18.42	291.634	24.65	30	Pass
48	5240	18.98	17.94	18.98	18.46	290.512	24.63	30	Pass
149	5745	17.32	17.30	17.61	17.06	216.147	23.35	30	Pass
157	5785	20.12	19.77	20.01	19.86	394.703	25.96	30	Pass
165	5825	18.21	18.00	18.32	17.98	260.044	24.15	30	Pass

802.11n (HT40)

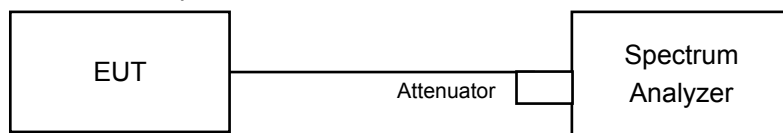
Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	16.04	15.54	16.11	15.66	153.634	21.86	30	Pass
46	5230	20.23	20.34	20.11	19.94	414.775	26.18	30	Pass
151	5755	13.09	13.40	13.26	13.51	85.871	19.34	30	Pass
159	5795	17.97	17.73	18.30	17.88	250.938	24.00	30	Pass

4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedure

For U-NII-1 band:

Using method SA-1

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

For U-NII-3:

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

Same as Item 4.3.6.

4.4.7 Test Results

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
36	5180	5.00	4.03	4.92	4.94	10.76	12.26	Pass
40	5200	4.81	3.89	4.91	4.70	10.62	12.26	Pass
48	5240	4.81	4.21	5.71	4.58	10.88	12.26	Pass

- Note:** 1. 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.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.74\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17-(10.74-6) = 12.26\text{dBm}$.

802.11n (HT20)

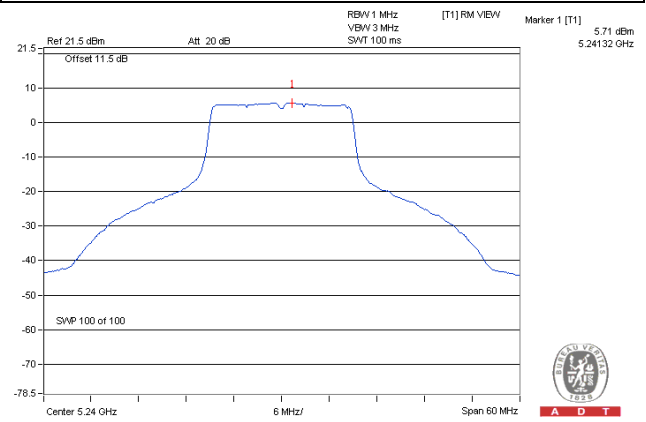
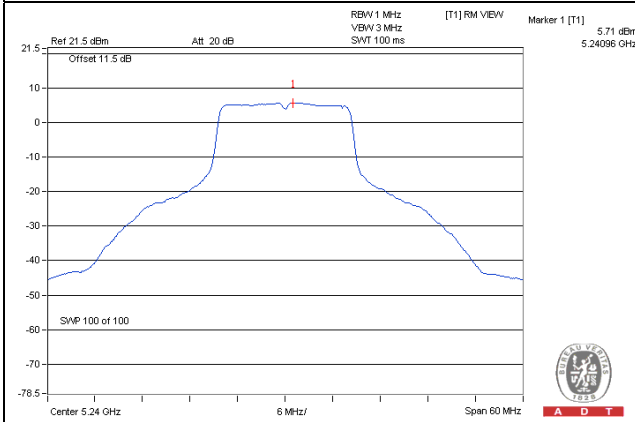
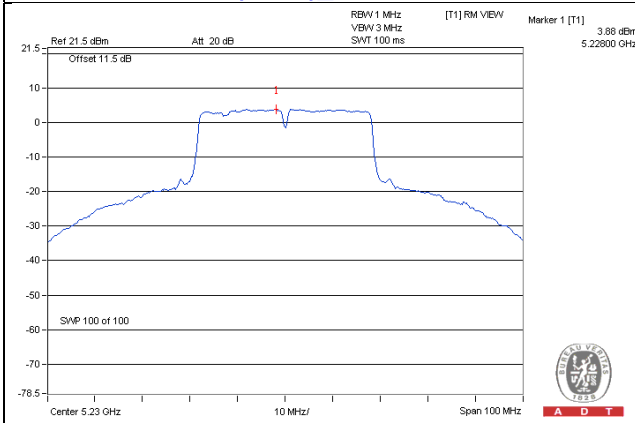
Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
36	5180	4.66	3.89	4.77	4.32	10.44	12.26	Pass
40	5200	4.64	4.19	4.85	4.36	10.54	12.26	Pass
48	5240	4.84	4.27	5.63	4.55	10.87	12.26	Pass

- Note:** 1. 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.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.74\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17-(10.74-6) = 12.26\text{dBm}$.

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	Chain 2	Chain 3			
38	5190	-1.41	-2.24	-0.91	-1.68	4.49	12.26	Pass
46	5230	3.22	-2.25	3.75	3.36	8.59	12.26	Pass

- Note:** 1. 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.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.74\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17-(10.74-6) = 12.26\text{dBm}$.

Spectrum Plot of Worst Value**802.11a_Chain 2 / CH48****802.11n (HT20)_Chain 2 / CH48****802.11n (HT40)_Chain 2 / CH46**

**For U-NII-3:
802.11a**

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-4.42	-2.20	6.02	3.82	25.39	Pass
	157	5785	0.67	2.89	6.02	8.91	25.39	Pass
	165	5825	-3.55	-1.33	6.02	4.69	25.39	Pass
1	149	5745	-3.15	-0.93	6.02	5.09	25.39	Pass
	157	5785	1.00	3.22	6.02	9.24	25.39	Pass
	165	5825	-2.71	-0.49	6.02	5.53	25.39	Pass
2	149	5745	-3.70	-1.48	6.02	4.54	25.39	Pass
	157	5785	0.03	2.25	6.02	8.27	25.39	Pass
	165	5825	-3.12	-0.90	6.02	5.12	25.39	Pass
3	149	5745	-3.90	-1.68	6.02	4.34	25.39	Pass
	157	5785	0.08	2.30	6.02	8.32	25.39	Pass
	165	5825	-3.41	-1.19	6.02	4.83	25.39	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.61\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(10.61-6) = 25.39\text{dBm}$.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-4.18	-1.96	6.02	4.06	25.39	Pass
	157	5785	0.52	2.74	6.02	8.76	25.39	Pass
	165	5825	-3.56	-1.34	6.02	4.68	25.39	Pass
1	149	5745	-3.68	-1.46	6.02	4.56	25.39	Pass
	157	5785	0.67	2.89	6.02	8.91	25.39	Pass
	165	5825	-2.75	-0.53	6.02	5.49	25.39	Pass
2	149	5745	-4.18	-1.96	6.02	4.06	25.39	Pass
	157	5785	-0.48	1.74	6.02	7.76	25.39	Pass
	165	5825	-3.49	-1.27	6.02	4.75	25.39	Pass
3	149	5745	-4.09	-1.87	6.02	4.15	25.39	Pass
	157	5785	-0.41	1.81	6.02	7.83	25.39	Pass
	165	5825	-3.31	-1.09	6.02	4.93	25.39	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.61\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(10.61-6) = 25.39\text{dBm}$.

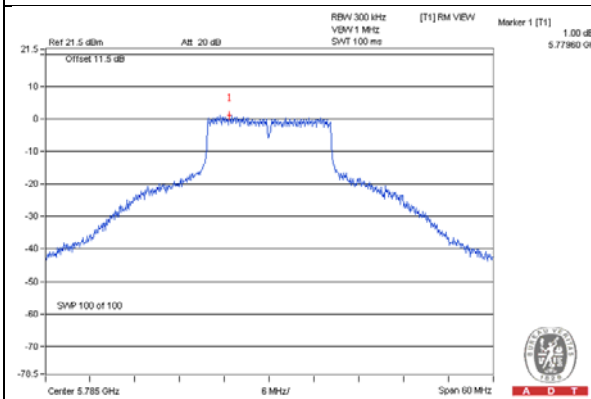
802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	151	5755	-11.65	-9.43	6.02	-3.41	25.39	Pass
	159	5795	-7.55	-5.33	6.02	0.69	25.39	Pass
1	151	5755	-10.84	-8.62	6.02	-2.60	25.39	Pass
	159	5795	-6.72	-4.50	6.02	1.52	25.39	Pass
2	151	5755	-11.57	-9.35	6.02	-3.33	25.39	Pass
	159	5795	-7.26	-5.04	6.02	0.98	25.39	Pass
3	151	5755	-11.82	-9.60	6.02	-3.58	25.39	Pass
	159	5795	-7.00	-4.78	6.02	1.24	25.39	Pass

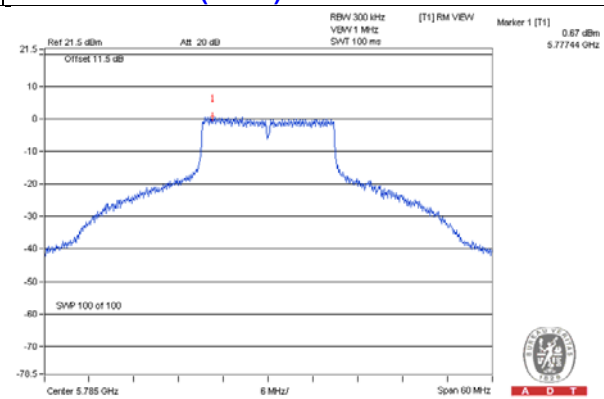
Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.61 \text{dBi} > 6 \text{dBi}$, so the power density limit shall be reduced to $30 - (10.61 - 6) = 25.39 \text{dBm}$.

Spectrum Plot of Worst Value

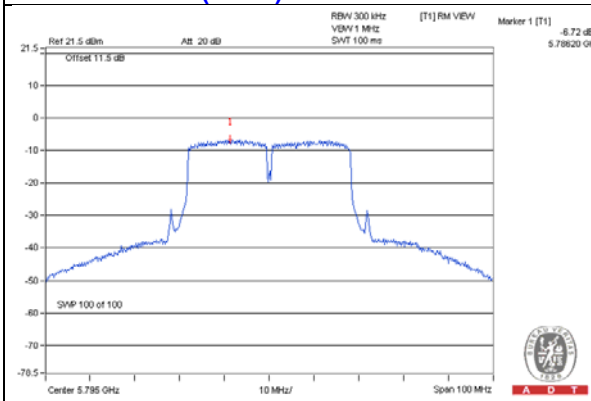
802.11a – Chain 1: CH 157



802.11n (HT20) – Chain 1: CH 157



802.11n (HT40) – Chain 1: CH 159

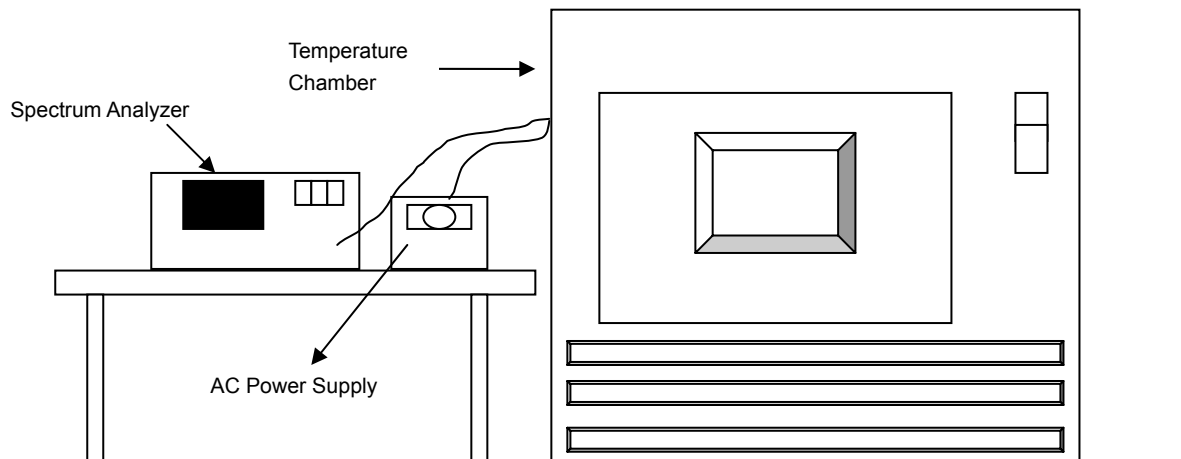


4.5 Frequency Stability Measurement

4.5.1 Limits of Frequency Stability Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5180MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5180.0205	0.00040	5180.0197	0.00038	5180.0197	0.00038	5180.0201	0.00039
40	120	5180.009	0.00017	5180.0097	0.00019	5180.0087	0.00017	5180.0078	0.00015
30	120	5179.9775	-0.00043	5179.9765	-0.00045	5179.9768	-0.00045	5179.9802	-0.00038
20	120	5180.0178	0.00034	5180.0202	0.00039	5180.0176	0.00034	5180.019	0.00037
10	120	5179.9818	-0.00035	5179.9829	-0.00033	5179.98	-0.00039	5179.9805	-0.00038
0	120	5180.0109	0.00021	5180.0075	0.00014	5180.0107	0.00021	5180.0117	0.00023
-10	120	5179.9957	-0.00008	5179.997	-0.00006	5179.9978	-0.00004	5179.9983	-0.00003
-20	120	5179.9848	-0.00029	5179.9868	-0.00025	5179.989	-0.00021	5179.9862	-0.00027
-30	120	5179.9906	-0.00018	5179.9927	-0.00014	5179.9919	-0.00016	5179.9917	-0.00016

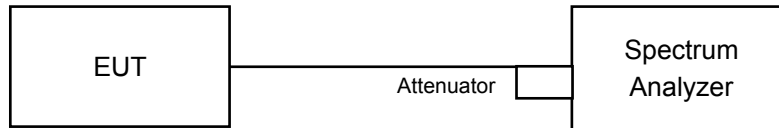
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5180MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5180.0185	0.00036	5180.0193	0.00037	5180.0174	0.00034	5180.0189	0.00036
	120	5180.0178	0.00034	5180.0202	0.00039	5180.0176	0.00034	5180.019	0.00037
	102	5180.0177	0.00034	5180.0205	0.00040	5180.0168	0.00032	5180.019	0.00037

4.6 6dB Bandwidth Measurement

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

802.11a

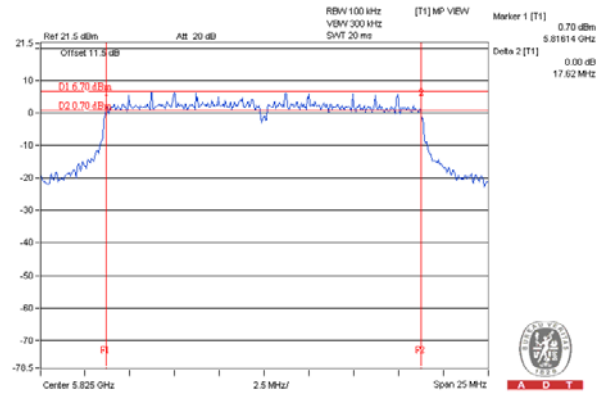
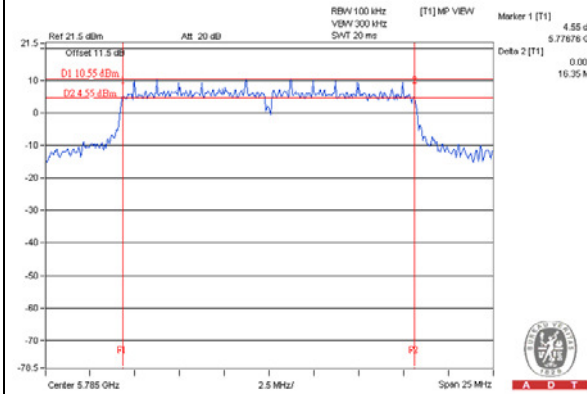
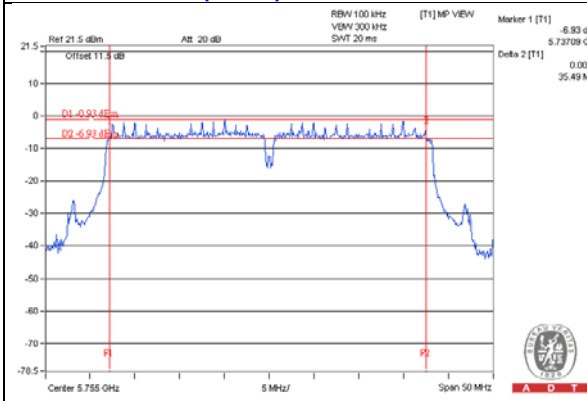
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	16.42	16.45	16.41	16.42	0.5	Pass
157	5785	16.41	16.39	16.35	16.35	0.5	Pass
165	5825	16.43	16.43	16.42	16.39	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	17.66	17.67	17.66	17.66	0.5	Pass
157	5785	17.64	17.64	17.63	17.62	0.5	Pass
165	5825	17.65	17.66	17.62	17.62	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	35.49	36.16	36.26	36.16	0.5	Pass
159	5795	36.35	35.92	36.34	36.33	0.5	Pass

Spectrum Plot of Worst Value**802.11a – Chain 3: CH 157****802.11n (HT20) – Chain 3: CH 165****802.11n (HT40) – Chain 0: CH 151**

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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