

FCC Test Report (Co-Located)

Report No.: RF170905C13-3

FCC ID: PY317200377

Test Model: RBS50Y

Received Date: Sep. 05, 2017

Test Date: Sep. 27 ~ Sep. 28, 2017

Issued Date: Oct. 11, 2017

Applicant: NETGEAR, INC.

Address: 350 East Plumeria Drive San Jose, CA 95134

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

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

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

**FCC Registration /
Designation Number:** 788550 / TW0003



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Release Control Record

Issue No.	Description	Date Issued
RF170905C13-3	Original release.	Oct. 11, 2017

1 Certificate of Conformity

Product: Orbi Router, Orbi Satellite, Orbi AC3000 Tri-band WiFi System

Brand: NETGEAR

Test Model: RBS50Y

Sample Status: Engineering sample

Applicant: NETGEAR, INC.

Test Date: Sep. 27 ~ Sep. 28, 2017

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
47 CFR FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10-2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Celine Chou , **Date:** Oct. 11, 2017
Celine Chou / Specialist

Approved by : Ken Liu , **Date:** Oct. 11, 2017
Ken Liu / Senior Manager

2 Summary of Test Results

Applied Standard:	47 CFR FCC Part 15, Subpart C (Section 15.247) 47 CFR FCC Part 15, Subpart E (Section 15.407)		
FCC Clause	Test Item	Result	Remarks
15.207 15.407(b)(6)	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -10.84dB at 0.30294MHz.
15.205 / 15.209 / 15.247(d) 15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -0.4dB at 4874.00MHz.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB test plots were recorded in Annex A.

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	2.94 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.63 dB
	200MHz ~ 1000MHz	3.64 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Orbi Router, Orbi Satellite, Orbi AC3000 Tri-band WiFi System	
Brand	NETGEAR	
Test Model	RBS50Y	
Status of EUT	Engineering sample	
Power Supply Rating	12Vdc from adapter	
Modulation Type	WLAN	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
	Bluetooth LE	GFSK
Transfer Rate	WLAN	802.11b: 11/5.5/2/1Mbps 802.11a/g: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 300Mbps (2.4GHz) / 600Mbps (5GHz) 802.11ac: up to 867Mbps (2.4GHz) / 1734Mbps (5GHz)
	Bluetooth LE	1Mbps
Operating Frequency	WLAN	2.4GHz: 2412 ~ 2462MHz 5.0GHz: 5180 ~ 5240MHz, 5745 ~ 5825MHz
	Bluetooth LE	2402 ~ 2480MHz
Number of Channel	WLAN	2412 ~ 2462MHz: 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40) 5180 ~ 5240MHz: 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80) 5745 ~ 5825MHz: 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
	Bluetooth LE	40
Output Power	WLAN	CDD Mode: 2412 ~ 2462MHz: 819.478mW 5180 ~ 5240MHz 1TX: 52.000mW 5180 ~ 5240MHz 2TX: 52.124mW 5745 ~ 5825MHz: 930.220mW Beamforming Mode: 2412 ~ 2462MHz: 569.557mW 5180 ~ 5240MHz: 26.154mW 5745 ~ 5825MHz: 660.130mW
	Bluetooth LE	6.067mW

Antenna Type	WLAN	Refer to Note
	Bluetooth LE	Chip antenna with 1.5dBi gain
Antenna Connector	WLAN	Refer to Note
	Bluetooth LE	N/A
Accessory Device	Adapter	
Data Cable Supplied	N/A	

Note:

- The EUT incorporates a MIMO function. Physically, the EUT provides 4 completed transmitters and 4 receivers.

Band	Modulation Mode	Beamforming Mode	TX Function
2.4GHz	802.11b	Not Support	2TX
	802.11g	Not Support	2TX
	802.11n (HT20)	Support (CDD / NSS1)	2TX
	802.11n (HT40)	Support (CDD / NSS1)	2TX
5GHz Band 1	802.11a	Not Support	1TX / 2TX
	802.11n (HT20)	Not Support / Support (CDD / NSS=1)	1TX / 2TX
	802.11n (HT40)	Not Support / Support (CDD / NSS=1)	1TX / 2TX
	802.11ac (VHT20)	Not Support / Support (CDD / NSS=1)	1TX / 2TX
	802.11ac (VHT40)	Not Support / Support (CDD / NSS=1)	1TX / 2TX
	802.11ac (VHT80)	Not Support / Support (CDD / NSS=1)	1TX / 2TX
5GHz Band 4	802.11a	Not Support	4TX
	802.11n (HT20)	Support (CDD / NSS=1)	4TX
	802.11n (HT40)	Support (CDD / NSS=1)	4TX
	802.11ac (VHT20)	Support (CDD / NSS=1)	4TX
	802.11ac (VHT40)	Support (CDD / NSS=1)	4TX
	802.11ac (VHT80)	Support (CDD / NSS=1)	4TX

* For 802.11n, CDD mode is the worst case for final radiated emission and power line conducted emission tests after pretesting CDD mode and beamforming mode.

- The following RF Modules are for the EUT.

Brand	Model	RF Module	Band
NETGEAR	RBS50Y	Module 1	2.4G
			UNII-1
		Module 2	UNII-3
		BT Module	BT LE

- The EUT uses following antennas.

Ant. Type	Dipole		
Connector Type	i-pex(MHF)		
Directional Antenna Gain (dBi)			
Item	2.4G	UNII-1	UNII-3
-	5.31	5.97	7.57

4. The EUT consumes power from the following adapters.

Adapter 1 (US)	
Brand	NETGEAR
Model	AD2110F10
P/N	332-10999-01
Input Power	100-120Vac, 50/60Hz, 1.0A
Output Power	12Vdc, 2.5A
Power Line	3m power cable without core attached on adapter

Adapter 2 (US)	
Brand	NETGEAR
Model	2ADF030F1 NA
P/N	332-11000-01
Input Power	100-120Vac, 50/60Hz, 1.0A
Output Power	12Vdc, 2.5A
Power Line	3m power cable without core attached on adapter

3.2 Description of Test Modes

For 2.4GHz

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

Channel	Frequency	Channel	Frequency
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

For 5180~5240MHz:

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

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

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

5745~5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

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

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

For Bluetooth LE:

40 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE \geq 1G	RE<1G	PLC	OB	
A	√	√	√	√	Power from adapter 1
B	-	√	√	-	Power from adapter 2

Where **RE \geq 1G**: Radiated Emission above 1GHz & Bandedge Measurement
RE<1G: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission

Note:

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

Radiated Emission Test (Above 1GHz):

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

EUT Configure Mode	Mode	Freq. Range (MHz)	Available Channel	Tested Channel	Modulation Technology	TX Function
A	802.11b + 802.11ac (VHT20) + 802.11a + BT LE	2412 ~ 2462	1 to 11	6 + 36 + 165 + 39	DBPSK	2TX
		5180 ~ 5240	36 to 48		OFDM	1TX
		5745 ~ 5825	149 to 165		OFDM	4TX
		2402 ~ 2480	0 to 39		GFSK	1TX
A	802.11b + 802.11ac (VHT20) + 802.11a + BT LE	2412 ~ 2462	1 to 11	6 + 48 + 165 + 39	DBPSK	2TX
		5180 ~ 5240	36 to 48		OFDM	2TX
		5745 ~ 5825	149 to 165		OFDM	4TX
		2402 ~ 2480	0 to 39		GFSK	1TX

Radiated Emission Test (Below 1GHz):

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

EUT Configure Mode	Mode	Freq. Range (MHz)	Available Channel	Tested Channel	Modulation Technology	TX Function
A, B	802.11b + 802.11ac (VHT20) + 802.11a + BT LE	2412 ~ 2462	1 to 11	6 + 36 + 165 + 39	DBPSK	2TX
		5180 ~ 5240	36 to 48		OFDM	1TX
		5745 ~ 5825	149 to 165		OFDM	4TX
		2402 ~ 2480	0 to 39		GFSK	1TX
A, B	802.11b + 802.11ac (VHT20) + 802.11a + BT LE	2412 ~ 2462	1 to 11	6 + 48 + 165 + 39	DBPSK	2TX
		5180 ~ 5240	36 to 48		OFDM	2TX
		5745 ~ 5825	149 to 165		OFDM	4TX
		2402 ~ 2480	0 to 39		GFSK	1TX

Power Line Conducted Emission Test:

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

EUT Configure Mode	Mode	Freq. Range (MHz)	Available Channel	Tested Channel	Modulation Technology	TX Function
A, B	802.11b + 802.11ac (VHT20) + 802.11a + BT LE	2412 ~ 2462	1 to 11	6 + 48 + 165 + 39	DBPSK	2TX
		5180 ~ 5240	36 to 48		OFDM	2TX
		5745 ~ 5825	149 to 165		OFDM	4TX
		2402 ~ 2480	0 to 39		GFSK	1TX

Conducted Out-Band Emission Measurement

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

EUT Configure Mode	Mode	Freq. Range (MHz)	Available Channel	Tested Channel	Modulation Technology	TX Function
A	802.11b + 802.11ac (VHT20)	2412 ~ 2462	1 to 11	6 + 36	DBPSK	2TX
		5180 ~ 5240	36 to 48		OFDM	1TX
A	802.11b + 802.11ac (VHT20)	2412 ~ 2462	1 to 11	6 + 48	DBPSK	2TX
		5180 ~ 5240	36 to 48		OFDM	2TX

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE \geq 1G	25 deg. C, 70% RH	120Vac, 60Hz	Luis Lee
RE $<$ 1G	25 deg. C, 70% RH	120Vac, 60Hz	Luis Lee
PLC	25 deg. C, 75% RH	120Vac, 60Hz	Matthew Yang
OB	25 deg. C, 60% RH	120Vac, 60Hz	Ted Chang

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

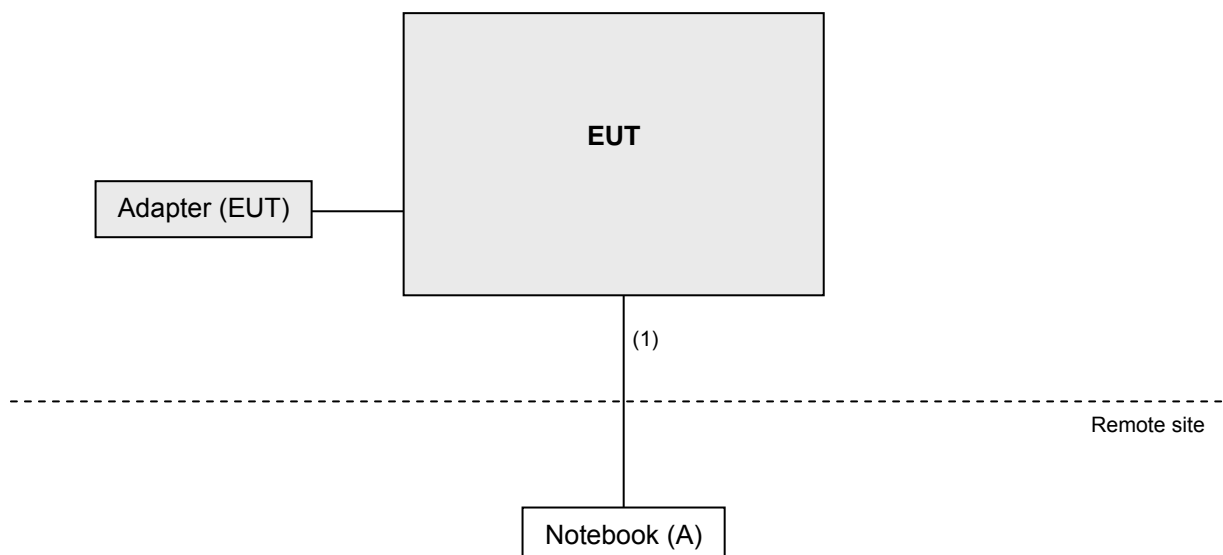
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	6RP2YM1	FCC DoC Approved	-

Note:

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

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

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specification of the EUT declared by the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)

FCC Part 15, Subpart E (15.407)

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. Other emissions shall be at least 30dB below the highest level of the desired power:

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 30dB 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 v01r04		Field Strength at 3m	
		PK: 74 (dBµV/m)	AV: 54 (dBµV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2(dBµV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	<input checked="" type="checkbox"/> 15.407(b)(4)(i)	PK: -27 (dBm/MHz) ^{*1} PK: 10 (dBm/MHz) ^{*2} PK: 15.6 (dBm/MHz) ^{*3} PK: 27 (dBm/MHz) ^{*4}	PK: 68.2(dBµV/m) ^{*1} PK: 105.2 (dBµV/m) ^{*2} PK: 110.8(dBµV/m) ^{*3} PK: 122.2 (dBµV/m) ^{*4}
	<input type="checkbox"/> 15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*1} beyond 75 MHz or more above of the band edge.		^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.		^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

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

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 24, 2016	Oct. 23, 2017
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Aug. 18, 2017	Aug. 17, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Dec. 28, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Dec. 15, 2016	Dec. 14, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 14, 2016	Dec. 13, 2017
Loop Antenna EMCI	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier Agilent	8449B	3008A01960	Aug. 08, 2017	Aug. 07, 2018
Preamplifier Agilent	8447D	2944A10631	Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03 (250724)	Aug. 08, 2017	Aug. 07, 2018
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 17, 2016	Oct. 16, 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 HwaYa Chamber 4.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
5. The IC Site Registration No. is IC7450F-4.

4.1.3 Test Procedures

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Both X and Y axes of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case 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.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 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:

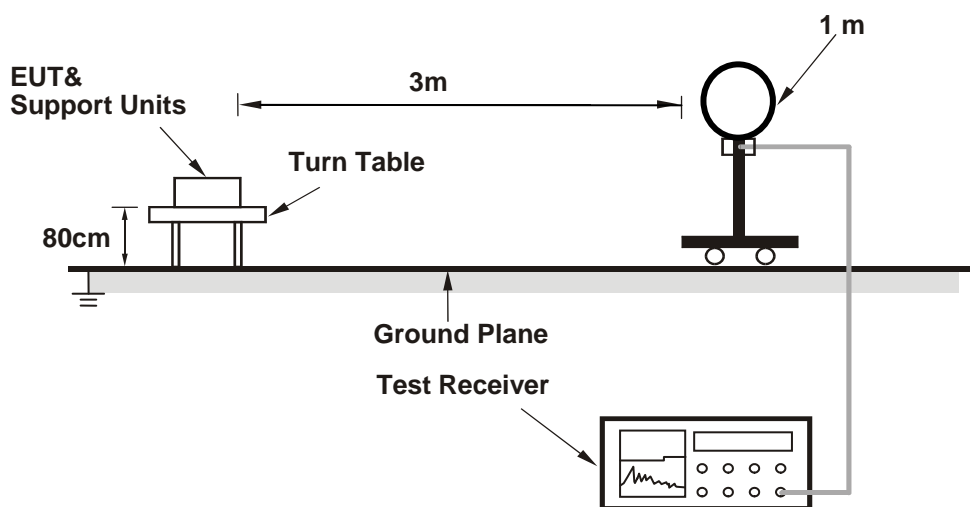
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

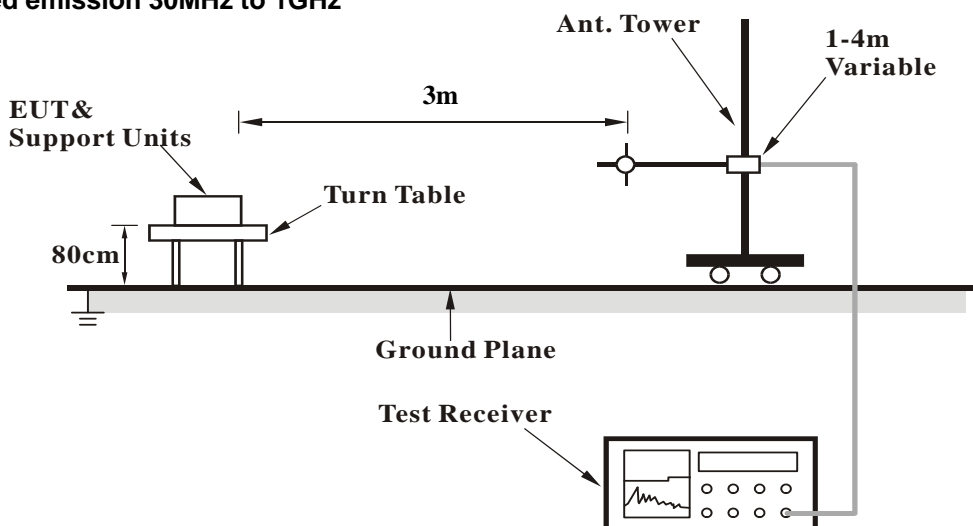
No deviation.

4.1.5 Test Setup

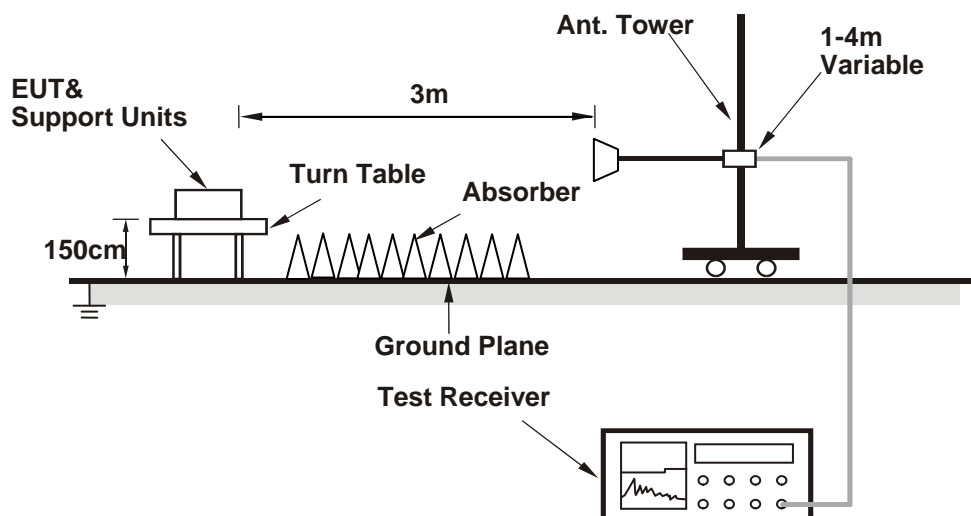
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

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

4.1.7 Test Results

Above 1GHz Data:

802.11b (2TX) + 802.11ac (VHT20) (1TX) + 802.11a (4TX) + BT LE (1TX)

CHANNEL	CH 6 + CH 36 + CH 165 + CH 39	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	108.4 PK			3.52 H	311	74.8	33.6
2	*2437.00	104.6 AV			3.52 H	311	71.0	33.6
3	*2480.00	96.0 PK			1.87 H	216	62.1	33.9
4	*2480.00	91.3 AV			1.87 H	216	57.4	33.9
5	2483.50	56.8 PK	74.0	-17.2	1.82 H	209	22.9	33.9
6	2483.50	46.1 AV	54.0	-7.9	1.82 H	209	12.2	33.9
7	4874.00	57.2 PK	74.0	-16.8	3.48 H	91	49.1	8.1
8	4874.00	53.6 AV	54.0	-0.4	3.48 H	91	45.5	8.1
9	4960.00	49.8 PK	74.0	-24.2	2.95 H	358	41.3	8.5
10	4960.00	37.0 AV	54.0	-17.0	2.95 H	358	28.5	8.5
11	5150.00	57.7 PK	74.0	-16.3	3.47 H	142	50.3	7.4
12	5150.00	46.3 AV	54.0	-7.7	3.47 H	142	38.9	7.4
13	*5180.00	105.1 PK			3.47 H	142	63.8	41.3
14	*5180.00	93.5 AV			3.47 H	142	52.2	41.3
15	#5628.00	59.8 PK	68.2	-8.4	1.46 H	26	51.3	8.5
16	*5825.00	118.9 PK			1.46 H	26	76.0	42.9
17	*5825.00	108.1 AV			1.46 H	26	65.2	42.9
18	#5949.60	60.5 PK	68.2	-7.7	1.46 H	26	51.1	9.4
19	#10360.00	61.2 PK	74.0	-12.8	2.68 H	199	41.2	20.0
20	#10360.00	48.4 AV	54.0	-5.6	2.68 H	199	28.4	20.0
21	11650.00	62.9 PK	74.0	-11.1	2.90 H	288	41.5	21.4
22	11650.00	49.8 AV	54.0	-4.2	2.90 H	288	28.4	21.4

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	CH 6 + CH 36 + CH 165 + CH 39	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*2437.00	122.9 PK			1.88 V	13	89.3	33.6
2	*2437.00	119.2 AV			1.88 V	13	85.6	33.6
3	*2480.00	98.7 PK			1.77 V	38	64.8	33.9
4	*2480.00	94.1 AV			1.77 V	38	60.2	33.9
5	2483.50	58.0 PK	74.0	-16.0	1.71 V	30	24.1	33.9
6	2483.50	46.8 AV	54.0	-7.2	1.71 V	30	12.9	33.9
7	4874.00	56.6 PK	74.0	-17.4	1.95 V	54	48.5	8.1
8	4874.00	52.2 AV	54.0	-1.8	1.95 V	54	44.1	8.1
9	4960.00	50.1 PK	74.0	-23.9	2.51 V	115	41.6	8.5
10	4960.00	37.9 AV	54.0	-16.1	2.51 V	115	29.4	8.5
11	5150.00	64.7 PK	74.0	-9.3	1.38 V	120	57.3	7.4
12	5150.00	49.1 AV	54.0	-4.9	1.38 V	120	41.7	7.4
13	*5180.00	111.9 PK			1.38 V	120	70.6	41.3
14	*5180.00	100.3 AV			1.38 V	120	59.0	41.3
15	#5639.20	60.1 PK	68.2	-8.1	1.71 V	51	52.3	7.8
16	*5825.00	127.0 PK			1.71 V	51	84.1	42.9
17	*5825.00	115.9 AV			1.71 V	51	73.0	42.9
18	#5993.60	60.8 PK	68.2	-7.4	1.71 V	51	52.1	8.7
19	#10360.00	62.0 PK	74.0	-12.0	1.49 V	192	42.0	20.0
20	#10360.00	48.9 AV	54.0	-5.1	1.49 V	192	28.9	20.0
21	11650.00	63.6 PK	74.0	-10.4	1.88 V	316	42.2	21.4
22	11650.00	50.3 AV	54.0	-3.7	1.88 V	316	28.9	21.4

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.

802.11b (2TX) + 802.11ac (VHT20) (2TX) + 802.11a (4TX) + BT LE (1TX)

CHANNEL	CH 6 + CH 48 + CH 165 + CH 39	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	108.1 PK			3.88 H	354	74.5	33.6
2	*2437.00	103.4 AV			3.88 H	354	69.8	33.6
3	*2480.00	96.5 PK			1.70 H	228	62.6	33.9
4	*2480.00	91.3 AV			1.70 H	228	57.4	33.9
5	2483.50	57.1 PK	74.0	-16.9	1.88 H	239	23.2	33.9
6	2483.50	46.2 AV	54.0	-7.8	1.88 H	239	12.3	33.9
7	4874.00	57.1 PK	74.0	-16.9	3.10 H	95	49.0	8.1
8	4874.00	53.5 AV	54.0	-0.5	3.10 H	95	45.4	8.1
9	4960.00	49.8 PK	74.0	-24.2	3.01 H	55	41.3	8.5
10	4960.00	38.0 AV	54.0	-16.0	3.01 H	55	29.5	8.5
11	*5240.00	111.8 PK			3.55 H	135	70.3	41.5
12	*5240.00	101.3 AV			3.55 H	135	59.8	41.5
13	5350.00	58.6 PK	74.0	-15.4	3.55 H	135	50.6	8.0
14	5350.00	46.2 AV	54.0	-7.8	3.55 H	135	38.2	8.0
15	#5644.80	60.5 PK	68.2	-7.7	1.69 H	50	51.9	8.6
16	*5825.00	119.3 PK			1.69 H	50	76.4	42.9
17	*5825.00	108.5 AV			1.69 H	50	65.6	42.9
18	#5925.60	61.1 PK	68.2	-7.1	1.69 H	50	51.7	9.4
19	#10480.00	62.9 PK	74.0	-11.1	1.98 H	61	42.6	20.3
20	#10480.00	50.0 AV	54.0	-4.0	1.98 H	61	29.7	20.3
21	11650.00	63.3 PK	74.0	-10.7	2.61 H	309	41.9	21.4
22	11650.00	50.2 AV	54.0	-3.8	2.61 H	309	28.8	21.4

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	CH 6 + CH 48 + CH 165 + CH 39	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*2437.00	122.9 PK			1.83 V	5	89.3	33.6
2	*2437.00	119.2 AV			1.83 V	5	85.6	33.6
3	*2480.00	100.1 PK			1.82 V	23	66.2	33.9
4	*2480.00	95.3 AV			1.82 V	23	61.4	33.9
5	#2483.20	56.7 PK	74.0	-17.3	1.83 V	25	22.8	33.9
6	#2483.20	46.2 AV	54.0	-7.8	1.83 V	25	12.3	33.9
7	4874.00	56.6 PK	74.0	-17.4	1.98 V	42	48.5	8.1
8	4874.00	52.3 AV	54.0	-1.7	1.98 V	42	44.2	8.1
9	4960.00	50.7 PK	74.0	-23.3	2.89 V	38	42.2	8.5
10	4960.00	38.3 AV	54.0	-15.7	2.89 V	38	29.8	8.5
11	5150.00	72.4 PK	74.0	-1.6	1.42 V	259	65.0	7.4
12	5150.00	53.3 AV	54.0	-0.7	1.42 V	259	45.9	7.4
13	*5240.00	117.1 PK			1.42 V	259	75.8	41.3
14	*5240.00	105.9 AV			1.42 V	259	64.6	41.3
15	#5639.20	60.1 PK	68.2	-8.1	1.83 V	64	52.3	7.8
16	*5825.00	127.2 PK			1.83 V	64	84.3	42.9
17	*5825.00	115.9 AV			1.83 V	64	73.0	42.9
18	#5976.00	60.6 PK	68.2	-7.6	1.83 V	64	52.0	8.6
19	#10360.00	62.3 PK	74.0	-11.7	1.75 V	223	42.3	20.0
20	#10360.00	49.3 AV	54.0	-4.7	1.75 V	223	29.3	20.0
21	11650.00	64.0 PK	74.0	-10.0	2.41 V	119	42.6	21.4
22	11650.00	51.2 AV	54.0	-2.8	2.41 V	119	29.8	21.4

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

802.11b (2TX) + 802.11ac (VHT20) (1TX) + 802.11a (4TX) + BT LE (1TX)

CHANNEL	CH 6 + CH 36 + CH 165 + CH 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	A		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	84.23	27.4 QP	40.0	-12.6	2.00 H	137	46.6	-19.2
2	128.86	23.4 QP	43.5	-20.1	2.00 H	306	38.8	-15.4
3	169.61	20.7 QP	43.5	-22.8	1.50 H	275	34.6	-13.9
4	369.47	28.3 QP	46.0	-17.7	1.00 H	154	39.0	-10.7
5	582.91	41.1 QP	46.0	-4.9	1.50 H	171	47.7	-6.6
6	747.85	34.3 QP	46.0	-11.7	2.00 H	13	37.1	-2.8

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	47.36	27.6 QP	40.0	-12.4	1.51 V	339	42.1	-14.5
2	130.80	18.4 QP	43.5	-25.1	1.01 V	18	33.7	-15.3
3	371.41	26.0 QP	46.0	-20.0	1.26 V	201	36.7	-10.7
4	569.33	38.6 QP	46.0	-7.4	1.51 V	190	45.7	-7.1
5	745.91	35.2 QP	46.0	-10.8	1.26 V	6	38.0	-2.8
6	885.62	40.0 QP	46.0	-6.0	1.26 V	80	41.0	-1.0

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

CHANNEL	CH 6 + CH 36 + CH 165 + CH 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	88.11	25.5 QP	43.5	-18.0	2.00 H	146	45.3	-19.8
2	150.20	21.8 QP	43.5	-21.7	1.25 H	266	35.6	-13.8
3	212.30	19.2 QP	43.5	-24.3	1.00 H	117	35.3	-16.1
4	582.91	40.3 QP	46.0	-5.7	1.50 H	151	46.9	-6.6
5	747.85	42.9 QP	46.0	-3.1	1.00 H	16	45.7	-2.8
6	957.41	37.1 QP	46.0	-8.9	1.25 H	303	36.3	0.8

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	45.42	28.9 QP	40.0	-11.1	2.00 V	26	43.6	-14.7
2	66.77	27.6 QP	40.0	-12.4	2.00 V	23	43.4	-15.8
3	119.16	22.3 QP	43.5	-21.2	1.00 V	165	38.4	-16.1
4	408.28	24.8 QP	46.0	-21.2	1.00 V	66	34.9	-10.1
5	580.97	37.8 QP	46.0	-8.2	1.00 V	32	44.4	-6.6
6	730.38	31.3 QP	46.0	-14.7	1.00 V	248	34.7	-3.4

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

802.11b (2TX) + 802.11ac (VHT20) (2TX) + 802.11a (4TX) + BT LE (1TX)

CHANNEL	CH 6 + CH 48 + CH 165 + CH 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	A		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	140.50	24.4 QP	43.5	-19.1	2.00 H	89	38.6	-14.2
2	295.73	22.8 QP	46.0	-23.2	1.25 H	226	34.9	-12.1
3	390.81	23.6 QP	46.0	-22.4	2.00 H	231	34.0	-10.4
4	579.03	41.8 QP	46.0	-4.2	1.50 H	157	48.5	-6.7
5	747.85	37.8 QP	46.0	-8.2	1.50 H	312	40.6	-2.8
6	936.07	42.0 QP	46.0	-4.0	1.50 H	7	41.8	0.2

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	74.53	30.5 QP	40.0	-9.5	1.25 V	158	47.1	-16.6
2	113.34	25.9 QP	43.5	-17.6	1.00 V	199	42.7	-16.8
3	319.02	27.8 QP	46.0	-18.2	1.00 V	135	39.3	-11.5
4	596.50	40.4 QP	46.0	-5.6	1.50 V	163	46.6	-6.2
5	745.91	34.5 QP	46.0	-11.5	1.25 V	234	37.3	-2.8
6	932.19	41.3 QP	46.0	-4.7	1.50 V	280	41.1	0.2

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

CHANNEL	CH 6 + CH 48 + CH 165 + CH 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	74.53	24.9 QP	40.0	-15.1	2.00 H	121	41.5	-16.6
2	169.61	20.0 QP	43.5	-23.5	1.49 H	245	33.9	-13.9
3	487.83	31.4 QP	46.0	-14.6	1.49 H	7	40.1	-8.7
4	580.97	40.6 QP	46.0	-5.4	1.24 H	153	47.2	-6.6
5	825.46	36.3 QP	46.0	-9.7	2.00 H	13	37.9	-1.6
6	938.01	42.5 QP	46.0	-3.5	2.00 H	205	42.0	0.5

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	49.30	30.6 QP	40.0	-9.4	1.00 V	311	45.0	-14.4
2	74.53	25.0 QP	40.0	-15.0	2.00 V	201	41.6	-16.6
3	441.26	24.8 QP	46.0	-21.2	1.00 V	196	34.1	-9.3
4	503.36	30.2 QP	46.0	-15.8	1.00 V	168	38.5	-8.3
5	575.15	42.0 QP	46.0	-4.0	1.00 V	114	48.8	-6.8
6	932.19	41.2 QP	46.0	-4.8	1.50 V	159	41.0	0.2

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.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 21, 2016	Nov. 20, 2017
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 22, 2016	Dec. 21, 2017
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 10, 2017	Mar. 09, 2018
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 15, 2017	Aug. 14, 2018
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

- Note:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 1.
 3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

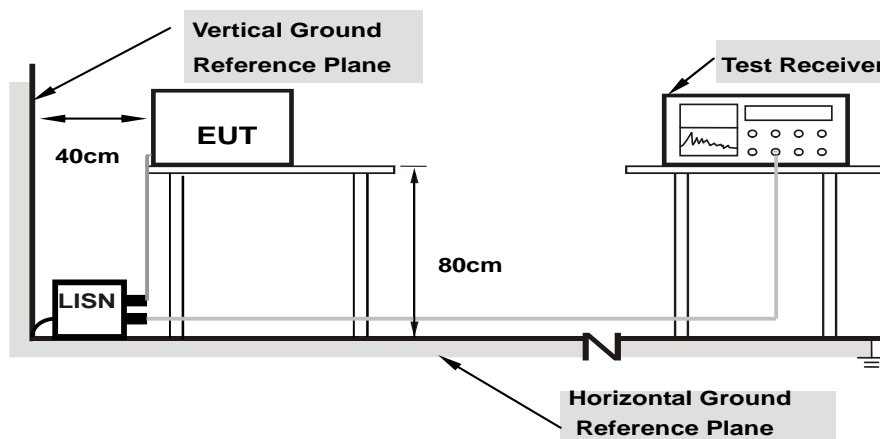
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

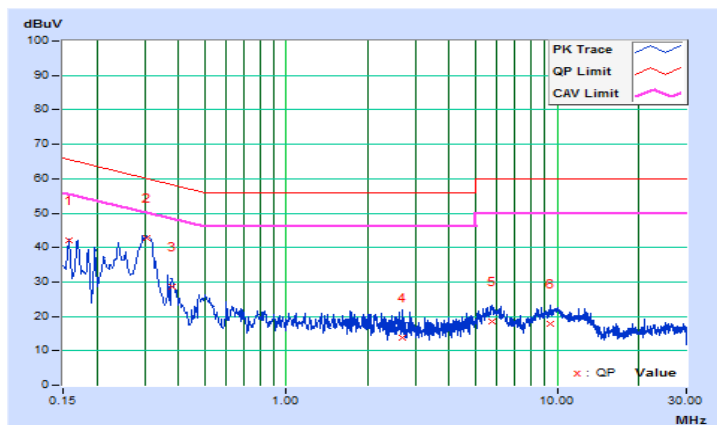
802.11b (2TX) + 802.11ac (VHT20) (2TX) + 802.11a (4TX) + BT LE (1TX)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	CH 6 + CH 48 + CH 165 + CH 39	Test Mode	A

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.15782	10.45	31.79	18.71	42.24	29.16	65.58
2	0.30454	10.49	32.41	26.65	42.90	37.14	60.12	50.12	-17.22	-12.98
3	0.37700	10.51	18.23	11.01	28.74	21.52	58.35	48.35	-29.61	-26.83
4	2.69541	10.57	3.34	-2.47	13.91	8.10	56.00	46.00	-42.09	-37.90
5	5.72566	10.73	7.64	1.27	18.37	12.00	60.00	50.00	-41.63	-38.00
6	9.49881	10.91	6.97	2.45	17.88	13.36	60.00	50.00	-42.12	-36.64

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

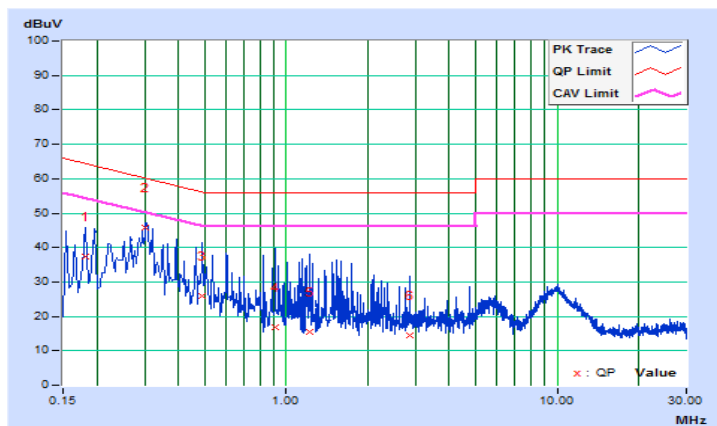


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	CH 6 + CH 48 + CH 165 + CH 39	Test Mode	A

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.18122	10.22	27.29	15.11	37.51	25.33	64.43
2	0.30294	10.23	35.44	29.09	45.67	39.32	60.16	50.16	-14.49	-10.84
3	0.49017	10.24	15.66	9.48	25.90	19.72	56.16	46.16	-30.26	-26.44
4	0.91245	10.26	6.73	3.36	16.99	13.62	56.00	46.00	-39.01	-32.38
5	1.22134	10.27	5.37	0.72	15.64	10.99	56.00	46.00	-40.36	-35.01
6	2.85963	10.35	4.20	-1.95	14.55	8.40	56.00	46.00	-41.45	-37.60

Remarks:

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

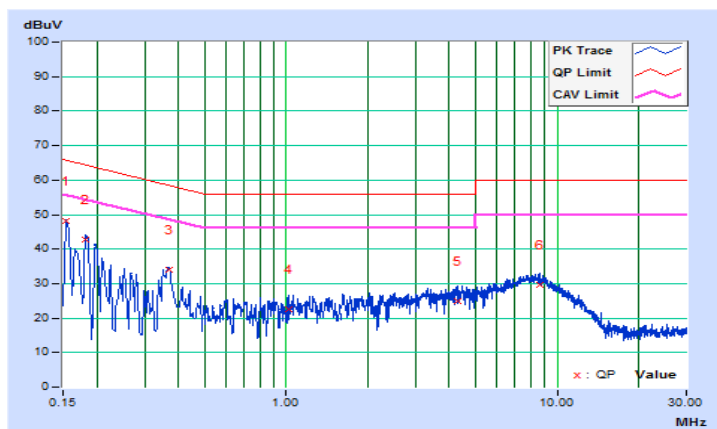


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	CH 6 + CH 48 + CH 165 + CH 39	Test Mode	B

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.15391	10.45	37.70	23.99	48.15	34.44	65.79
2	0.18170	10.45	32.30	17.63	42.75	28.08	64.41	54.41	-21.66	-26.33
3	0.36816	10.51	23.60	17.85	34.11	28.36	58.54	48.54	-24.43	-20.18
4	1.01799	10.48	12.06	5.44	22.54	15.92	56.00	46.00	-33.46	-30.08
5	4.28678	10.66	14.31	6.06	24.97	16.72	56.00	46.00	-31.03	-29.28
6	8.63470	10.86	18.71	13.03	29.57	23.89	60.00	50.00	-30.43	-26.11

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

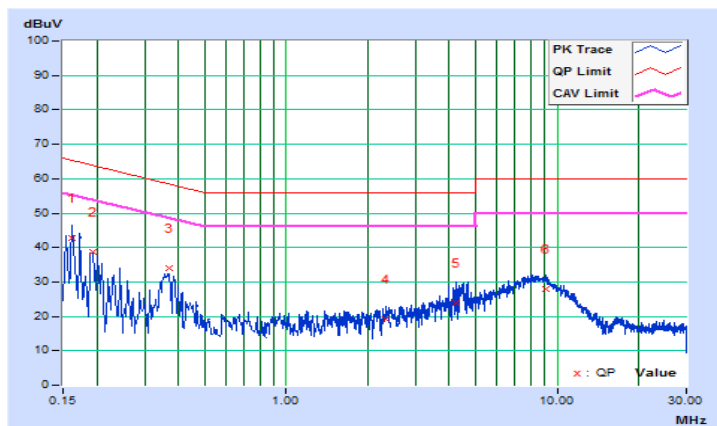


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	CH 6 + CH 48 + CH 165 + CH 39	Test Mode	B

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.16173	10.21	32.68	14.65	42.89	24.86	65.37
2	0.19255	10.22	28.49	12.57	38.71	22.79	63.93	53.93	-25.22	-31.14
3	0.36896	10.23	23.90	18.03	34.13	28.26	58.52	48.52	-24.39	-20.26
4	2.32787	10.33	8.92	2.44	19.25	12.77	56.00	46.00	-36.75	-33.23
5	4.22031	10.42	13.49	4.89	23.91	15.31	56.00	46.00	-32.09	-30.69
6	9.03743	10.63	17.35	12.16	27.98	22.79	60.00	50.00	-32.02	-27.21

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

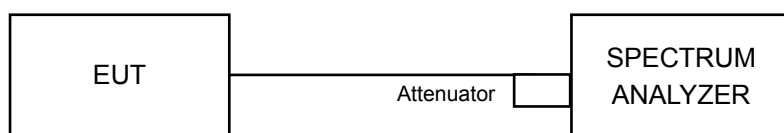


4.3 Conducted Out of Band Emission Measurement

4.3.1 Limits of Conducted Out of Band Emission Measurement

Below 30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

MEASUREMENT PROCEDURE REF

- Set the RBW = 100 kHz.
- Set the VBW \geq 300 kHz.
- Detector = average.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOB

- Set RBW = 100 kHz.
- Set VBW \geq 300 kHz.
- Detector = average.
- Sweep = auto couple.
- Trace Mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level.

4.3.5 Deviation from Test Standard

No deviation.

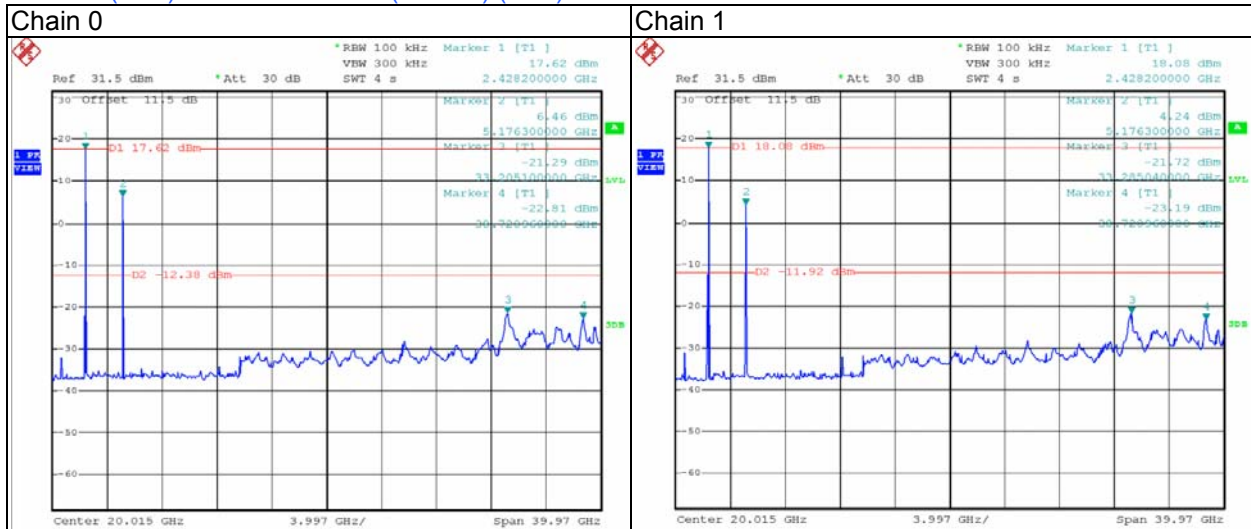
4.3.6 EUT Operating Condition

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

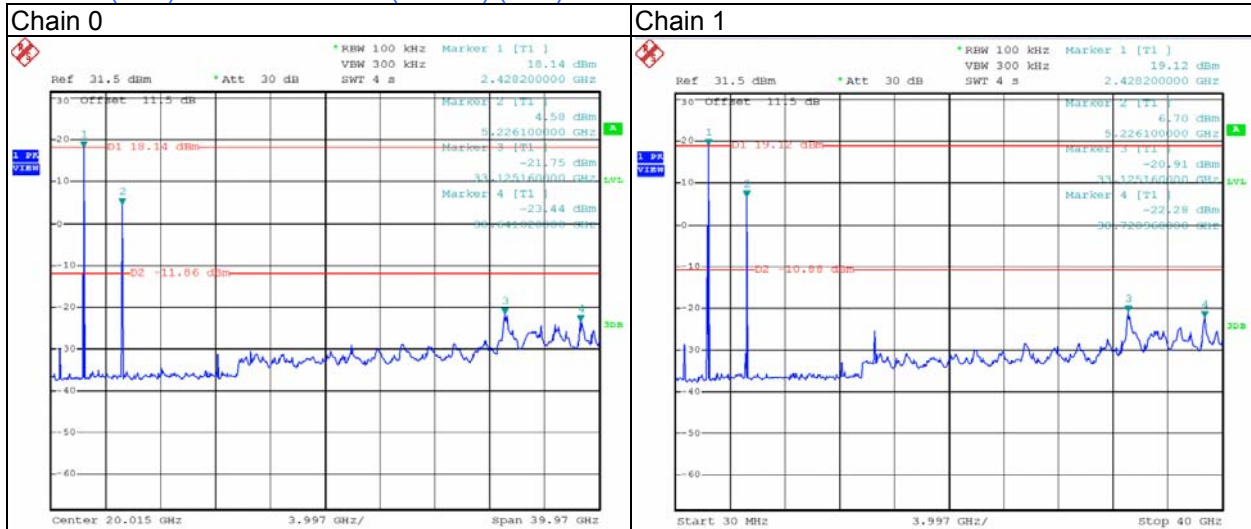
4.3.7 Test Results

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

802.11b (2TX) CH 6 + 802.11ac (VHT20) (1TX) CH 36



802.11b (2TX) CH 6 + 802.11ac (VHT20) (2TX) CH 48

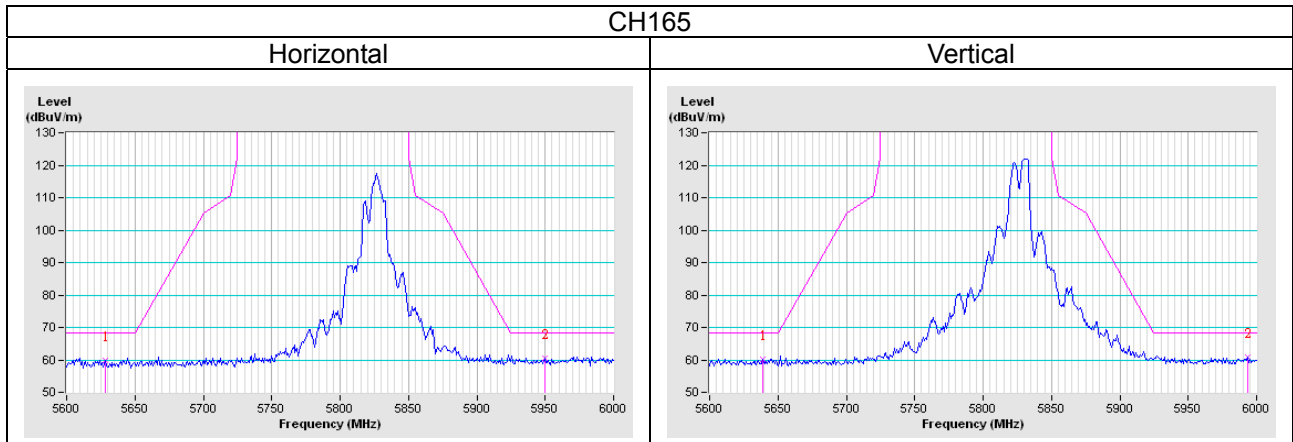


5 Pictures of Test Arrangements

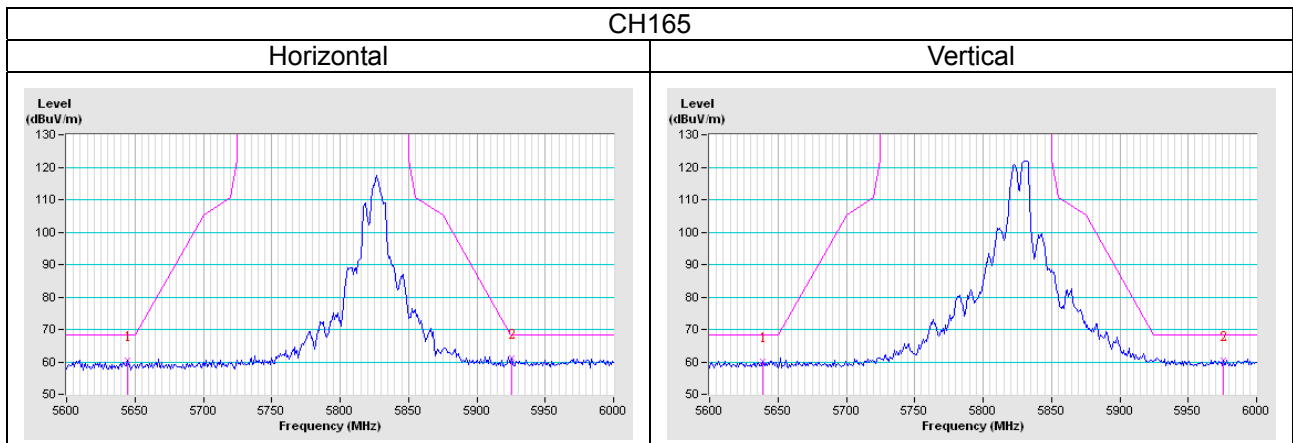
Please refer to the attached file (Test Setup Photo).

Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11b (2TX) + 802.11ac (VHT20) (1TX) + 802.11a (4TX) + BT LE (1TX)



802.11b (2TX) + 802.11ac (VHT20) (2TX) + 802.11a (4TX) + BT LE (1TX)



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 FCC recognized accredited test firms and 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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Tel: 886-3-6668565

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Hwa Ya EMC/RF/Safety Lab

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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