

## FCC Test Report

**Report No.:** RF170426C21-2

**FCC ID:** 2AFD7-P3303-C

**Test Model:** P3303-C

**Received Date:** Apr. 26, 2017

**Test Date:** May 11, 2017 ~ May 16, 2017

**Issued Date:** Jun. 02, 2017

**Applicant:** Poynt Co.

**Address:** 490 S California Avenue Suite 200 Palo Alto, CA 94306 USA

**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 (1):** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan  
Hsien 333, Taiwan, R.O.C.



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### Release Control Record

Issue No.	Description	Date Issued
RF170426C21-2	Original Release	Jun. 02, 2017

## 1 Certificate of Conformity

**Product:** Smart Terminal

**Brand:** POYNT

**Test Model:** P3303-C

**Sample Status:** Identical Prototype

**Applicant:** Poynt Co.

**Test Date:** May 11, 2017 ~ May 16, 2017

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

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

**Prepared by :**



**Date:**

Jun. 02, 2017

Ivonne Wu / Supervisor

**Approved by :**



**Date:**

Jun. 02, 2017

David Huang / Project Engineer

## 2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -11.84 dB at 0.17384 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -6.46 dB at 4824.00 MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6 dB Bandwidth	Pass	Meet the requirement of limit.
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Frequency	Expanded Uncertainty (k=2) ( $\pm$ )
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

<b>Product</b>	Smart Terminal
<b>Brand</b>	POYNT
<b>Test Model</b>	P3303-C
<b>Status of EUT</b>	Identical Prototype
<b>Power Supply Rating</b>	12 Vdc (adapter) 7.6 Vdc (battery)
<b>Modulation Type</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>Modulation Technology</b>	DSSS, OFDM
<b>Transfer Rate</b>	802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to MCS7
<b>Operating Frequency</b>	2412 ~ 2462 MHz
<b>Number of Channel</b>	11 for 802.11b, 802.11g, 802.11n (HT20)
<b>Output Power</b>	161.065 mW
<b>Antenna Type</b>	PIFA antenna with 0.38 dBi gain
<b>Antenna Connector</b>	N/A
<b>Accessory Device</b>	Refer to Note as below
<b>Data Cable Supplied</b>	Refer to Note as below

Note:

1. The EUT contains following accessory devices & components.

<b>Product</b>	<b>Brand</b>	<b>Model</b>	<b>Description</b>
Adapter	FSP Group Inc.	FSP040-RHBN2 B	I/P: 100-240 Vac, 50/60 Hz, 1.5 A O/P: 12 Vdc, 3.33 A
Battery	WELL Tech Energy Inc.	P61B	7.6 Vdc, 2000 mAh
Docking	Quanta	DA0P61TB6B0	--
BT/WLAN Module	MEDIATEK	MT6625LN	--
NFC Chip	NXP	CLRC663	--
WWAN Module	Fibocom	L816-AM	--

2. 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

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

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



### 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 1 GHz **RE<1G**: Radiated Emission below 1 GHz  
**PLC**: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

**NOTE:** The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.  
**NOTE:** “-” means no effect.

#### **Radiated Emission Test (Above 1 GHz):**

- ☒ 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	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0

#### **Radiated Emission Test (Below 1 GHz):**

- ☒ 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	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1	DSSS	DBPSK	1.0

#### **Power Line Conducted Emission Test:**

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1	DSSS	DBPSK	1.0

### **Bandedge 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	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 11	OFDM	BPSK	MCS0

### **Antenna Port Conducted Measurement:**

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0

### **Test Condition:**

Applicable To	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang
APCM	25 deg. C, 65 % RH	120 Vac, 60 Hz	Carlos Chen

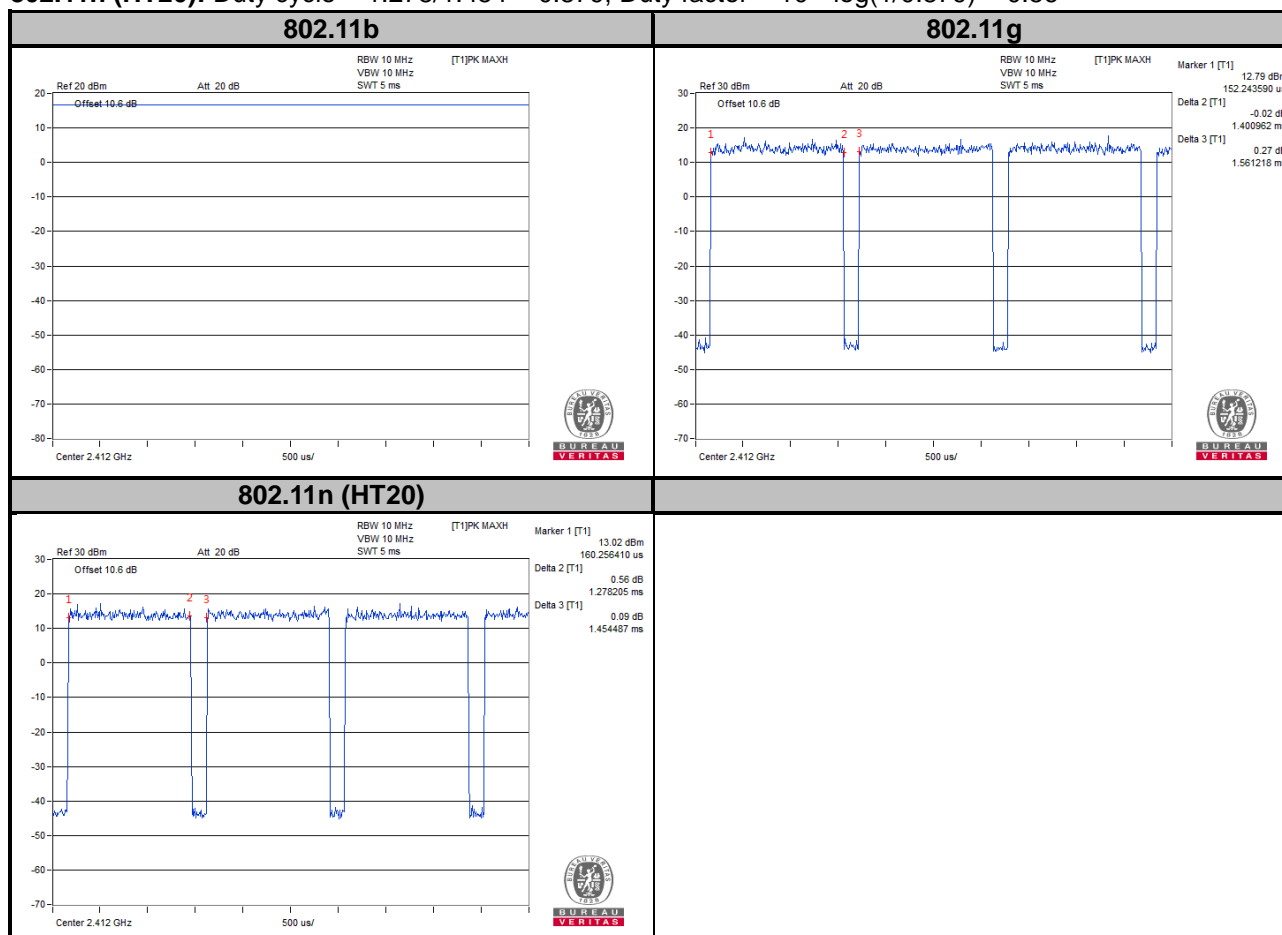
### 3.3 Duty Cycle of Test Signal

**802.11b:** Duty cycle of test signal is 100 %

Duty cycle of test signal is < 98 %

**802.11g:** Duty cycle =  $1.401/1.561 = 0.898$ , Duty factor =  $10 * \log(1/0.898) = 0.47$

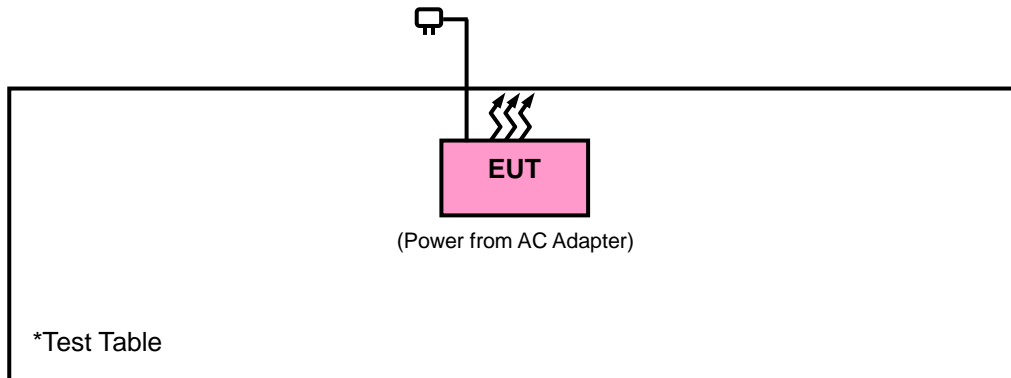
**802.11n (HT20):** Duty cycle =  $1.278/1.454 = 0.879$ , Duty factor =  $10 * \log(1/0.879) = 0.56$



### 3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

#### 3.4.1 Configuration of System under Test



### 3.5 General Description of Applied Standards

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

**FCC Part 15, Subpart C (15.247)**

**558074 D01 DTS Meas Guidance v04**

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 20 dB 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 1000 MHz, 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 20 dB under any condition of modulation.

#### 4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Feb. 17, 2017	Feb. 16, 2018
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 16, 2016	Dec. 15, 2017
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 26, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Dec. 12, 2016	Dec. 13, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 14, 2016	Dec. 13, 2017
Fixed Attenuator Mini-Circuits	BW-N10W5+	NA	Jul. 08, 2016	Jul. 07, 2017
Loop Antenna	EM-6879	269	Aug. 11, 2016	Aug. 10, 2017
Bluetooth Tester	CBT	100946	Jul. 29, 2016	Jul. 28, 2018
Preamplifier EMCI	EMC 012645	980115	Oct. 21, 2016	Oct. 20, 2017
Preamplifier EMCI	EMC 184045	980116	Oct. 21, 2016	Oct. 20, 2017
Preamplifier EMCI	EMC 330H	980112	Oct. 21, 2016	Oct. 20, 2017
Power Meter Anritsu	ML2495A	1232002	Sep. 08, 2016	Sep. 07, 2017
Power Sensor Anritsu	MA2411B	1207325	Sep. 08, 2016	Sep. 07, 2017
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 21, 2016	Oct. 20, 2017
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 21, 2016	Oct. 20, 2017
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 21, 2016	Oct. 20, 2017
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	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 Chamber 10.
3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The FCC Site Registration No. is 690701.
5. The IC Site Registration No. is IC7450F-10.

#### 4.1.3 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1 GHz) / 1.5 meters (for above 1 GHz) 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 detected 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:**

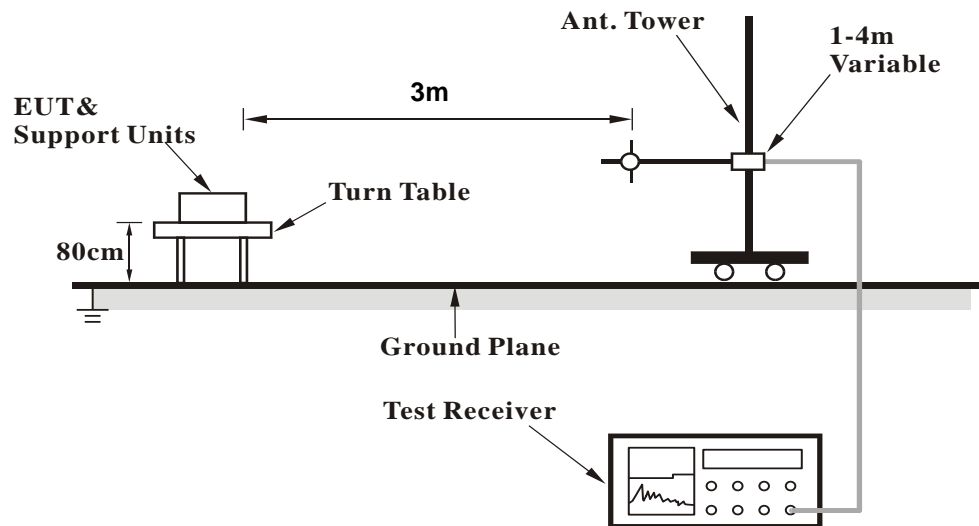
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz & 360 KHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1/T for Average (Duty cycle < 98 %) detection at frequency above 1 GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 Deviation from Test Standard

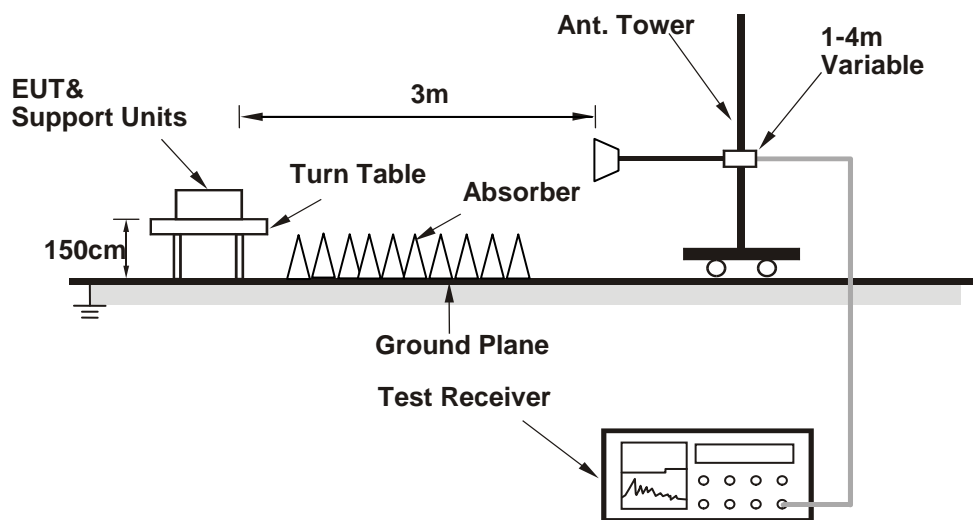
No deviation.

#### 4.1.5 Test Set Up

##### <Frequency Range below 1 GHz>



##### <Frequency Range above 1 GHz>



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

#### 4.1.6 EUT Operating Conditions

- Placed the EUT on a testing table.
- Use the software to control the EUT under transmission condition continuously at specific channel frequency.



#### 4.1.7 Test Results

#### Above 1 GHz Data :

#### 802.11b

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2385.69	51.96	58.47	74	-22.04	26.91	4.08	37.5	220	101	Peak
2389.92	40.51	47.04	54	-13.49	26.91	4.08	37.52	220	101	Average
2412	100.55	107.02			26.96	4.09	37.52	220	101	Average
2412	105.36	111.83			26.96	4.09	37.52	220	101	Peak
4824	47.54	62.84	54	-6.46	30.99	6.79	53.08	207	99	Average
4824	50.14	65.44	74	-23.86	30.99	6.79	53.08	207	99	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2388.03	50.75	57.26	74	-23.25	26.91	4.08	37.5	210	269	Peak
2389.92	38.32	44.85	54	-15.68	26.91	4.08	37.52	210	269	Average
2412	97.84	104.31			26.96	4.09	37.52	210	269	Average
2412	102.59	109.06			26.96	4.09	37.52	210	269	Peak
4824	46.95	62.25	54	-7.05	30.99	6.79	53.08	198	96	Average
4824	48.93	64.23	74	-25.07	30.99	6.79	53.08	198	96	Peak

#### Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2382.81	41.27	47.83	54	-12.73	26.86	4.08	37.5	216	104	Average
2383.26	51.16	57.72	74	-22.84	26.86	4.08	37.5	216	104	Peak
2437	102.68	108.96	54			4.12	37.46	216	104	Average
2437	107.66	113.94	74			4.12	37.46	216	104	Peak
2487.92	37.22	43.18	54	-16.78	27.2	4.16	37.32	216	104	Average
2494.72	50.23	56.12	74	-23.77	27.2	4.16	37.25	216	104	Peak
4874	46.3	61.44	54	-7.7	31.06	6.85	53.05	167	95	Average
4874	50.81	65.95	74	-23.19	31.06	6.85	53.05	167	95	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2382.81	39.37	45.93	54	-14.63	26.86	4.08	37.5	212	268	Average
2383.35	50.42	56.98	74	-23.58	26.86	4.08	37.5	212	268	Peak
2437	100.1	106.38	54			4.12	37.46	212	268	Average
2437	104.62	110.9	74			4.12	37.46	212	268	Peak
2488.08	36.13	42.09	54	-17.87	27.2	4.16	37.32	212	268	Average
2498.16	49.37	55.26	74	-24.63	27.2	4.16	37.25	212	268	Peak
4875	45.92	61.06	54	-8.08	31.06	6.85	53.05	152	233	Average
4875	49.45	64.59	74	-24.55	31.06	6.85	53.05	152	233	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	101.44	107.6			27.1	4.13	37.39	217	99	Average
2462	106.03	112.19			27.1	4.13	37.39	217	99	Peak
2483.52	37.17	43.19	54	-16.83	27.15	4.15	37.32	217	99	Average
2491.36	49.53	55.49	74	-24.47	27.2	4.16	37.32	217	99	Peak
4924	43.38	58.41	54	-10.62	31.12	6.88	53.03	188	97	Average
4924	45.7	60.73	74	-28.3	31.12	6.88	53.03	188	97	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	99.26	105.42			27.1	4.13	37.39	210	270	Average
2462	103.69	109.85			27.1	4.13	37.39	210	270	Peak
2483.52	36.26	42.28	54	-17.74	27.15	4.15	37.32	210	270	Average
2484.36	49.03	55.05	74	-24.97	27.15	4.15	37.32	210	270	Peak
4924	43.83	58.86	54	-10.17	31.12	6.88	53.03	208	83	Average
4924	45.64	60.67	74	-28.36	31.12	6.88	53.03	208	83	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

# 802.11g

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.65	60.37	66.88	74	-13.63	26.91	4.08	37.5	218	98	Peak
2389.92	43.81	50.34	54	-10.19	26.91	4.08	37.52	218	98	Average
2412	92.9	99.37			26.96	4.09	37.52	218	98	Average
2412	102.17	108.64			26.96	4.09	37.52	218	98	Peak
4824	33.62	48.92	54	-20.38	30.99	6.79	53.08	211	98	Average
4824	44.18	59.48	74	-29.82	30.99	6.79	53.08	211	98	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.38	41.41	47.92	54	-12.59	26.91	4.08	37.5	213	260	Average
2389.83	59.78	66.31	74	-14.22	26.91	4.08	37.52	213	260	Peak
2412	90.17	96.64			26.96	4.09	37.52	213	260	Average
2412	99.55	106.02			26.96	4.09	37.52	213	260	Peak
4824	33.32	48.62	54	-20.68	30.99	6.79	53.08	149	249	Average
4824	44.71	60.01	74	-29.29	30.99	6.79	53.08	149	249	Peak

## Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2387.22	38.61	45.12	54	-15.39	26.91	4.08	37.5	215	104	Average
2389.02	50.94	57.45	74	-23.06	26.91	4.08	37.5	215	104	Peak
2437	96.39	102.67			27.06	4.12	37.46	215	104	Average
2437	105.52	111.8			27.06	4.12	37.46	215	104	Peak
2484.64	38.5	44.52	54	-15.5	27.15	4.15	37.32	215	104	Average
2495.2	51.2	57.09	74	-22.8	27.2	4.16	37.25	215	104	Peak
4874	33.84	48.98	54	-20.16	31.06	6.85	53.05	219	105	Average
4874	44.78	59.92	74	-29.22	31.06	6.85	53.05	219	105	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.11	37.54	44.05	54	-16.46	26.91	4.08	37.5	215	263	Average
2389.65	49.58	56.09	74	-24.42	26.91	4.08	37.5	215	263	Peak
2437	93.49	99.77			27.06	4.12	37.46	215	263	Average
2437	102.58	108.86			27.06	4.12	37.46	215	263	Peak
2484	37.02	43.04	54	-16.98	27.15	4.15	37.32	215	263	Average
2491.4	49.98	55.94	74	-24.02	27.2	4.16	37.32	215	263	Peak
4874	33.71	48.85	54	-20.29	31.06	6.85	53.05	158	231	Average
4874	45.26	60.4	74	-28.74	31.06	6.85	53.05	158	231	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	94.57	100.73			27.1	4.13	37.39	214	101	Average
2462	104.37	110.53			27.1	4.13	37.39	214	101	Peak
2483.52	39.16	45.18	54	-14.84	27.15	4.15	37.32	214	101	Average
2483.52	53.72	59.74	74	-20.28	27.15	4.15	37.32	214	101	Peak
4924	34.01	49.04	54	-19.99	31.12	6.88	53.03	218	102	Average
4924	41.77	56.8	74	-32.23	31.12	6.88	53.03	218	102	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	92.15	98.31			27.1	4.13	37.39	214	265	Average
2462	101.28	107.44			27.1	4.13	37.39	214	265	Peak
2483.52	37.41	43.43	54	-16.59	27.15	4.15	37.32	214	265	Average
2484.48	52.35	58.37	74	-21.65	27.15	4.15	37.32	214	265	Peak
4924	33.75	48.78	54	-20.25	31.12	6.88	53.03	162	238	Average
4924	41.86	56.89	74	-32.14	31.12	6.88	53.03	162	238	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

## 802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.92	46.22	52.75	54	-7.78	26.91	4.08	37.52	219	100	Average
2389.92	66.53	73.06	74	-7.47	26.91	4.08	37.52	219	100	Peak
2412	93.25	99.72			26.96	4.09	37.52	219	100	Average
2412	102.65	109.12			26.96	4.09	37.52	219	100	Peak
4824	33.53	48.83	54	-20.47	30.99	6.79	53.08	223	92	Average
4824	42.33	57.63	74	-31.67	30.99	6.79	53.08	223	92	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.47	64.89	71.4	74	-9.11	26.91	4.08	37.5	211	262	Peak
2389.92	43.95	50.48	54	-10.05	26.91	4.08	37.52	211	262	Average
2412	90.29	96.76			26.96	4.09	37.52	211	262	Average
2412	99.86	106.33			26.96	4.09	37.52	211	262	Peak
4824	33.41	48.71	54	-20.59	30.99	6.79	53.08	146	244	Average
4824	43.1	58.4	74	-30.9	30.99	6.79	53.08	146	244	Peak

### Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2384.7	39.42	45.98	54	-14.58	26.86	4.08	37.5	217	103	Average
2386.5	51.76	58.27	74	-22.24	26.91	4.08	37.5	217	103	Peak
2437	96.73	103.01			27.06	4.12	37.46	217	103	Average
2437	105.9	112.18			27.06	4.12	37.46	217	103	Peak
2484.64	38.71	44.73	54	-15.29	27.15	4.15	37.32	217	103	Average
2484.96	52.05	58.07	74	-21.95	27.15	4.15	37.32	217	103	Peak
4874	33.68	48.82	54	-20.32	31.06	6.85	53.05	214	108	Average
4874	43.04	58.18	74	-30.96	31.06	6.85	53.05	214	108	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2384.97	38.26	44.82	54	-15.74	26.86	4.08	37.5	210	264	Average
2386.23	50.37	56.88	74	-23.63	26.91	4.08	37.5	210	264	Peak
2437	93.94	100.22			27.06	4.12	37.46	210	264	Average
2437	103.16	109.44			27.06	4.12	37.46	210	264	Peak
2483.84	37.75	43.77	54	-16.25	27.15	4.15	37.32	210	264	Average
2487.84	50.71	56.67	74	-23.29	27.2	4.16	37.32	210	264	Peak
4874	33.54	48.68	54	-20.46	31.06	6.85	53.05	157	229	Average
4874	43.2	58.34	74	-30.8	31.06	6.85	53.05	157	229	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.



EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	95.22	101.38			27.1	4.13	37.39	213	105	Average
2462	104.76	110.92			27.1	4.13	37.39	213	105	Peak
2483.52	40.79	46.81	54	-13.21	27.15	4.15	37.32	213	105	Average
2484.52	58.61	64.63	74	-15.39	27.15	4.15	37.32	213	105	Peak
4924	33.85	48.88	54	-20.15	31.12	6.88	53.03	216	97	Average
4924	41.92	56.95	74	-32.08	31.12	6.88	53.03	216	97	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	92.27	98.43			27.1	4.13	37.39	211	267	Average
2462	101.73	107.89			27.1	4.13	37.39	211	267	Peak
2483.52	38.9	44.92	54	-15.1	27.15	4.15	37.32	211	267	Average
2485.16	55.81	61.83	74	-18.19	27.15	4.15	37.32	211	267	Peak
4924	33.53	48.56	54	-20.47	31.12	6.88	53.03	148	230	Average
4924	43.42	58.45	74	-30.58	31.12	6.88	53.03	148	230	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

### 9 kHz ~ 30 MHz DATA:

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

### 30 MHz ~ 1 GHz WORST-CASE DATA:

#### 802.11b

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
42.61	21.65	38.49	40	-18.35	13.58	0.66	31.08	133	196	Peak
250.19	25.27	44.24	46	-20.73	11.48	1.49	31.94	111	114	Peak
342.34	20.03	36.14	46	-25.97	13.96	1.75	31.82	119	181	Peak
500.45	27.26	39.46	46	-18.74	17.33	2.09	31.62	113	162	Peak
663.41	28.46	37.61	46	-17.54	20.37	2.38	31.9	107	29	Peak
725.49	28.12	36.06	46	-17.88	21.18	2.5	31.62	110	153	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
30	30.85	49.43	40	-9.15	11.98	0.58	31.14	126	337	Peak
41.64	27.66	44.49	40	-12.34	13.56	0.66	31.05	102	39	Peak
241.46	19.79	39.03	46	-26.21	11.11	1.46	31.81	101	276	Peak
500.45	26.01	38.21	46	-19.99	17.33	2.09	31.62	113	62	Peak
600.36	26.39	36.77	46	-19.61	19.61	2.26	32.25	137	303	Peak
663.41	25.85	35	46	-20.15	20.37	2.38	31.9	117	94	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
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 0.50 MHz.

### 4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
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	Jul. 28, 2016	Jul. 27, 2017
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

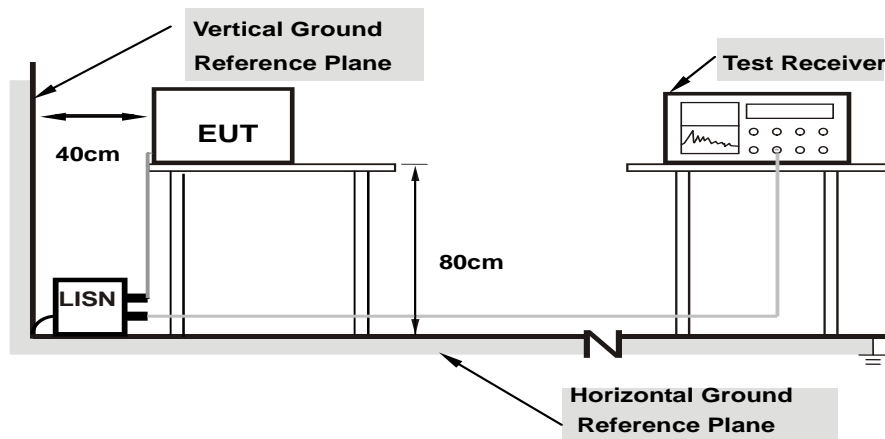
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) 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 Conditions

- Placed the EUT on a testing table.
- Use the software to control the EUT under transmission condition continuously at specific channel frequency.

#### 4.2.7 Test Results

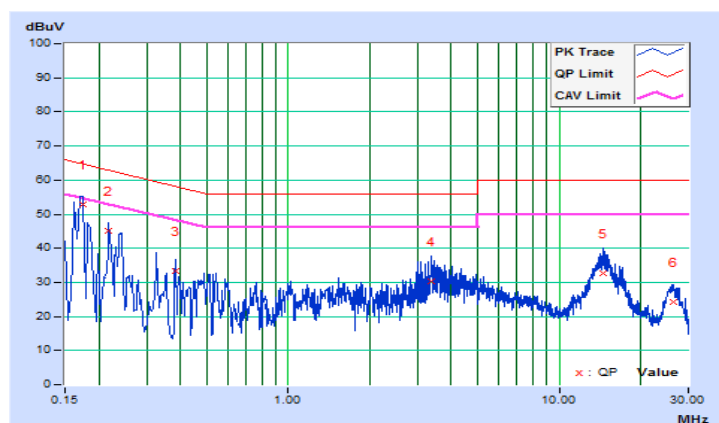
##### <EUT without Docking>

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Getaz Yang	Test Date	2017/5/11

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17384	10.36	42.57	24.43	52.93	34.79	64.77	54.77	-11.84	-19.98
2	0.21800	10.37	34.83	17.96	45.20	28.33	62.89	52.89	-17.69	-24.56
3	0.38200	10.40	22.83	8.65	33.23	19.05	58.24	48.24	-25.01	-29.19
4	3.35400	10.53	19.65	9.12	30.18	19.65	56.00	46.00	-25.82	-26.35
5	14.61000	11.07	21.49	12.87	32.56	23.94	60.00	50.00	-27.44	-26.06
6	26.37800	11.55	12.86	7.65	24.41	19.20	60.00	50.00	-35.59	-30.80

##### 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

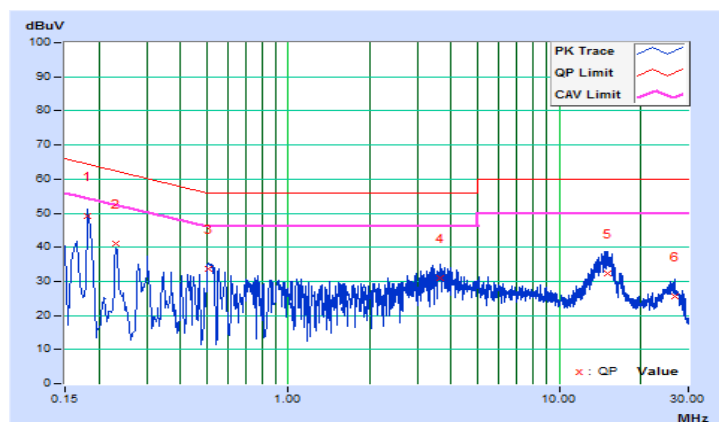


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Getaz Yang	Test Date	2017/5/11

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18200	10.13	39.04	19.91	49.17	30.04	64.39	54.39	-15.22	-24.35
2	0.23045	10.14	31.02	15.69	41.16	25.83	62.43	52.43	-21.27	-26.60
3	0.50530	10.16	23.45	13.07	33.61	23.23	56.00	46.00	-22.39	-22.77
4	3.63400	10.32	20.57	10.39	30.89	20.71	56.00	46.00	-25.11	-25.29
5	15.19800	10.76	21.73	11.00	32.49	21.76	60.00	50.00	-27.51	-28.24
6	26.66600	11.11	14.42	8.22	25.53	19.33	60.00	50.00	-34.47	-30.67

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



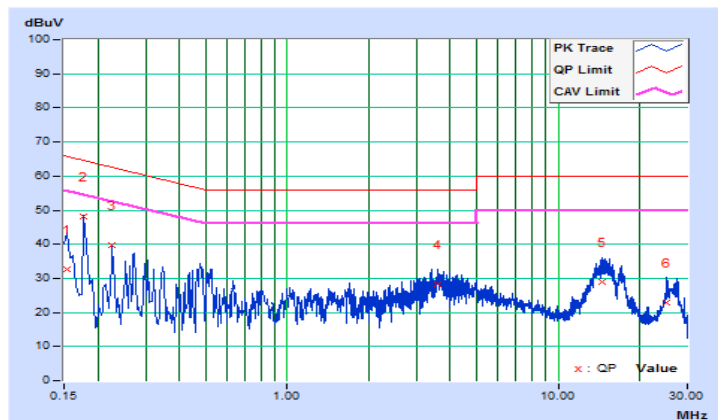
# <EUT with Docking>

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Getaz Yang	Test Date	2017/5/11

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	10.35	22.18	4.81	32.53	15.16	65.78	55.78	-33.25	-40.62
2	0.17801	10.36	37.62	20.71	47.98	31.07	64.58	54.58	-16.60	-23.51
3	0.22600	10.37	29.44	9.85	39.81	20.22	62.60	52.60	-22.79	-32.38
4	3.60600	10.55	17.90	9.05	28.45	19.60	56.00	46.00	-27.55	-26.40
5	14.51000	11.06	17.89	10.21	28.95	21.27	60.00	50.00	-31.05	-28.73
6	25.03000	11.51	11.30	4.75	22.81	16.26	60.00	50.00	-37.19	-33.74

## 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

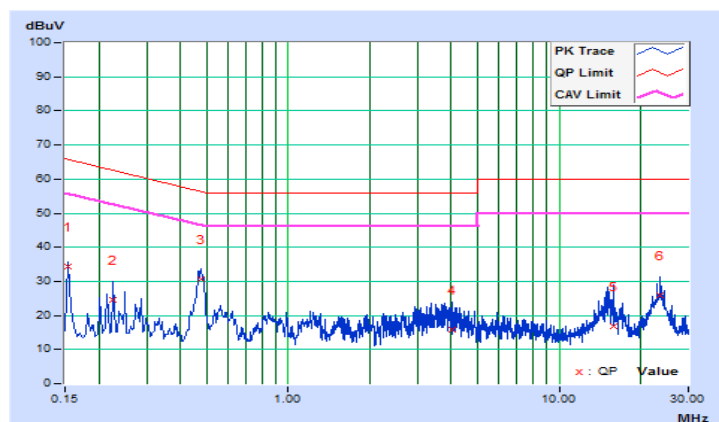


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Getaz Yang	Test Date	2017/5/11

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	10.11	24.18	2.22	34.29	12.33	65.78	55.78	-31.49	-43.45
2	0.22600	10.14	14.31	-1.68	24.45	8.46	62.60	52.60	-38.15	-44.14
3	0.47434	10.16	20.48	7.56	30.64	17.72	56.44	46.44	-25.80	-28.72
4	4.01800	10.34	5.40	-3.19	15.74	7.15	56.00	46.00	-40.26	-38.85
5	15.91400	10.79	5.90	-3.98	16.69	6.81	60.00	50.00	-43.31	-43.19
6	23.68600	11.04	14.88	1.78	25.92	12.82	60.00	50.00	-34.08	-37.18

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



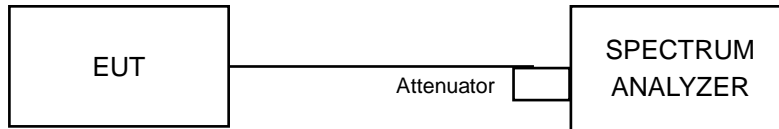


### 4.3 6 dB Bandwidth Measurement

#### 4.3.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

#### 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

- Set resolution bandwidth (RBW) = 100 kHz
- 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

#### 4.3.5 Deviation from Test Standard

No deviation.

#### 4.3.6 EUT Operating Conditions

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

#### 4.3.7 Test Result

##### 802.11b

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	9.59	0.5	Pass
6	2437	9.60	0.5	Pass
11	2462	9.59	0.5	Pass

##### 802.11g

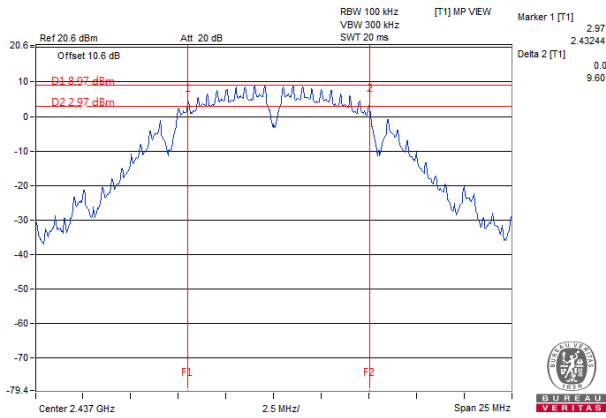
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	15.74	0.5	Pass
6	2437	15.13	0.5	Pass
11	2462	15.75	0.5	Pass

##### 802.11n (HT20)

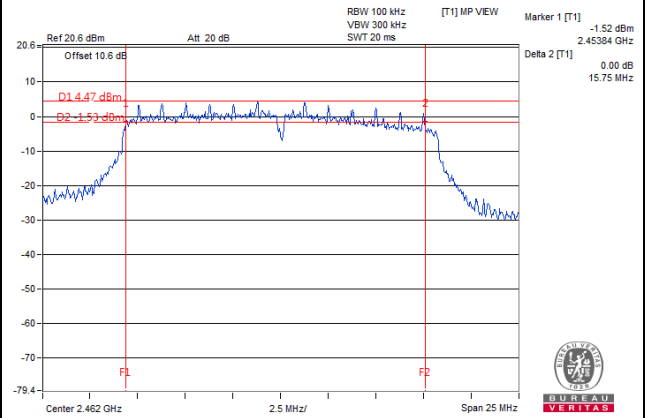
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.31	0.5	Pass
6	2437	15.18	0.5	Pass
11	2462	16.36	0.5	Pass

## Spectrum Plot of Worst Value

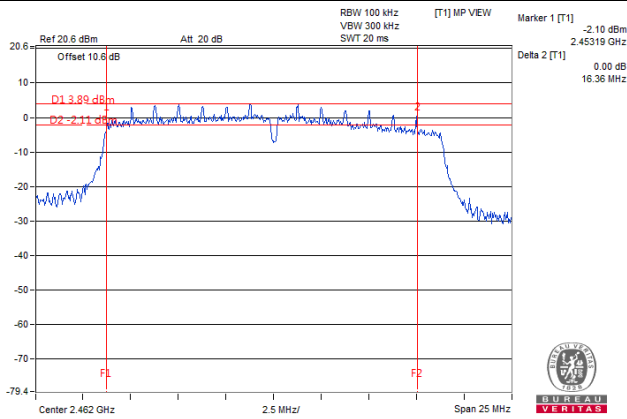
### 802.11b



### 802.11g



### 802.11n (HT20)



**802.11b**

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	Pass / Fail
1	2412	12.54	Pass
6	2437	13.00	Pass
11	2462	13.40	Pass

**802.11g**

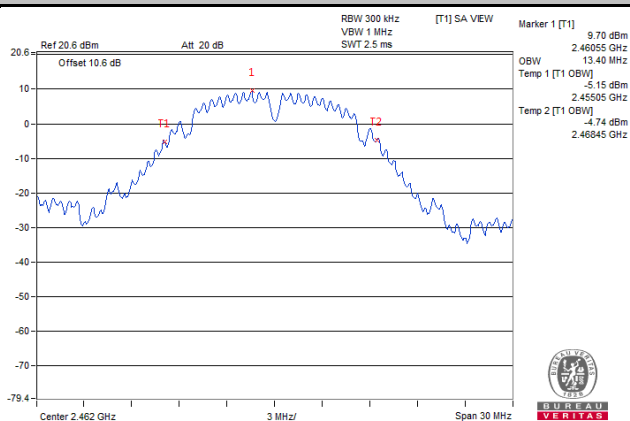
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	Pass / Fail
1	2412	16.68	Pass
6	2437	16.55	Pass
11	2462	16.90	Pass

**802.11n (HT20)**

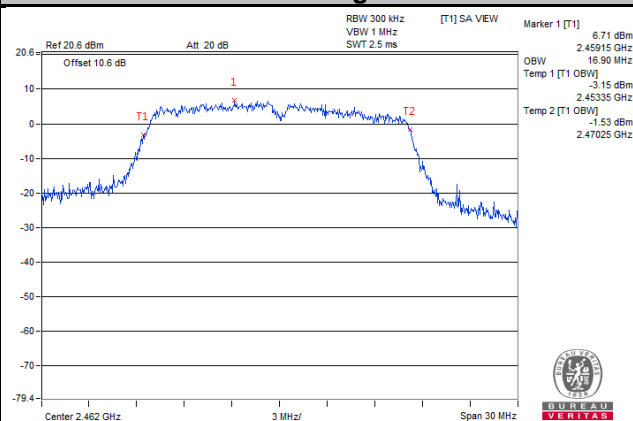
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	Pass / Fail
1	2412	17.69	Pass
6	2437	17.65	Pass
11	2462	17.85	Pass

## Spectrum Plot of Worst Value

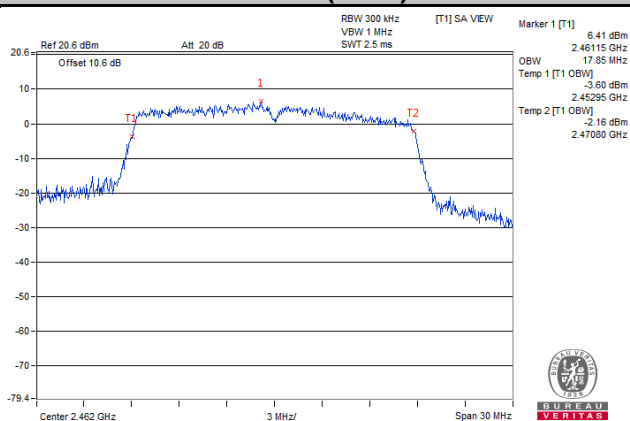
### 802.11b



### 802.11g



### 802.11n (HT20)

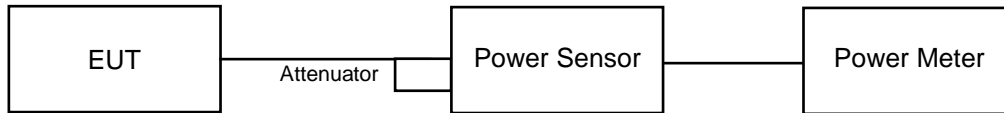


#### 4.4 Conducted Output Power Measurement

##### 4.4.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30 dBm)

##### 4.4.2 Test Setup



##### 4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

##### 4.4.4 Test Procedures

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

##### 4.4.5 Deviation from Test Standard

No deviation.

##### 4.4.6 EUT Operating Conditions

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

#### 4.4.7 Test Results

##### 802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	65.766	18.18	30	Pass
6	2437	118.032	20.72	30	Pass
11	2462	115.611	20.63	30	Pass

##### 802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	114.288	20.58	30	Pass
6	2437	154.525	21.89	30	Pass
11	2462	156.315	21.94	30	Pass

##### 802.11n (HT20)

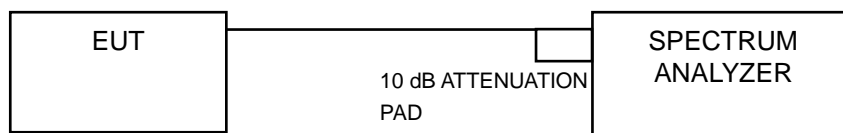
Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	114.815	20.60	30	Pass
6	2437	159.588	22.03	30	Pass
11	2462	161.065	22.07	30	Pass

## 4.5 Power Spectral Density Measurement

### 4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8 dBm.

### 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

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- Set the VBW  $\geq 3 \times \text{RBW}$ .
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.

### 4.5.5 Deviation from Test Standard

No deviation.

### 4.5.6 EUT Operating Condition

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



#### 4.5.7 Test Results

##### 802.11b

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-6.69	8	Pass
6	2437	-4.74	8	Pass
11	2462	-4.17	8	Pass

##### 802.11g

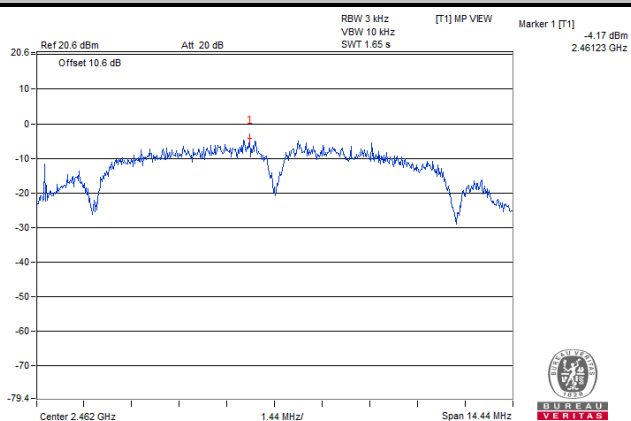
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-12.92	8	Pass
6	2437	-10.33	8	Pass
11	2462	-10.40	8	Pass

##### 802.11n (HT20)

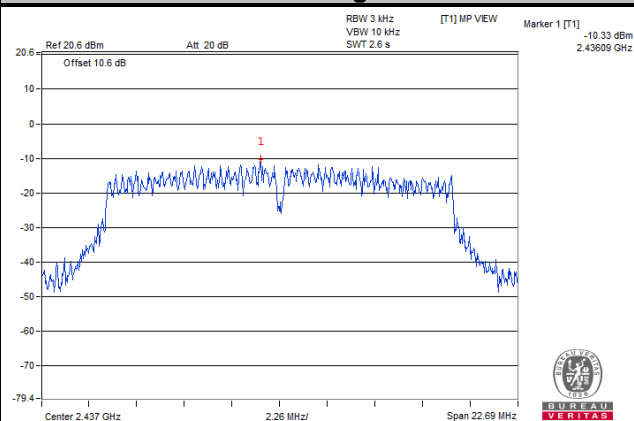
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-13.14	8	Pass
6	2437	-9.76	8	Pass
11	2462	-10.29	8	Pass

## Spectrum Plot of Worst Value

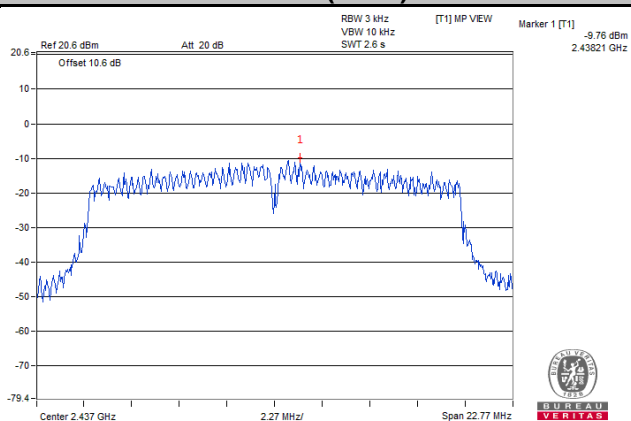
### 802.11b



### 802.11g



### 802.11n (HT20)

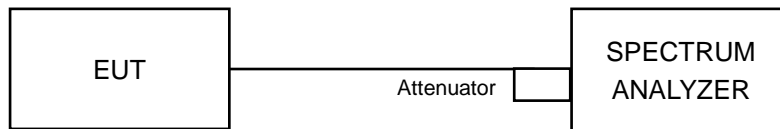


## 4.6 Conducted Out of Band Emission Measurement

### 4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 20 dB of the highest emission level of operating band (in 100 kHz Resolution Bandwidth).

### 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

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

#### MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW  $\geq$  300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

### 4.6.5 Deviation from Test Standard

No deviation.

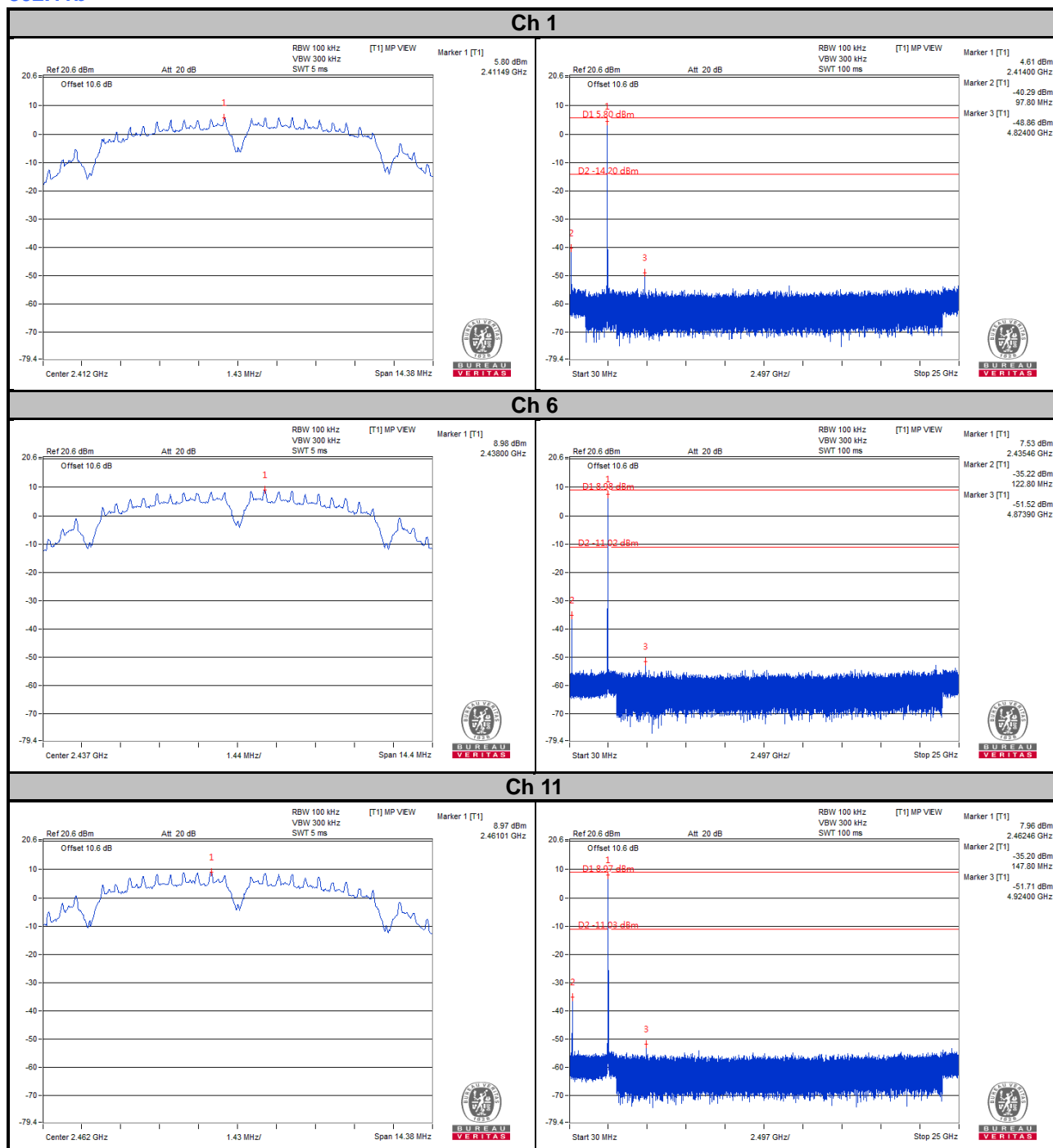
### 4.6.6 EUT Operating Condition

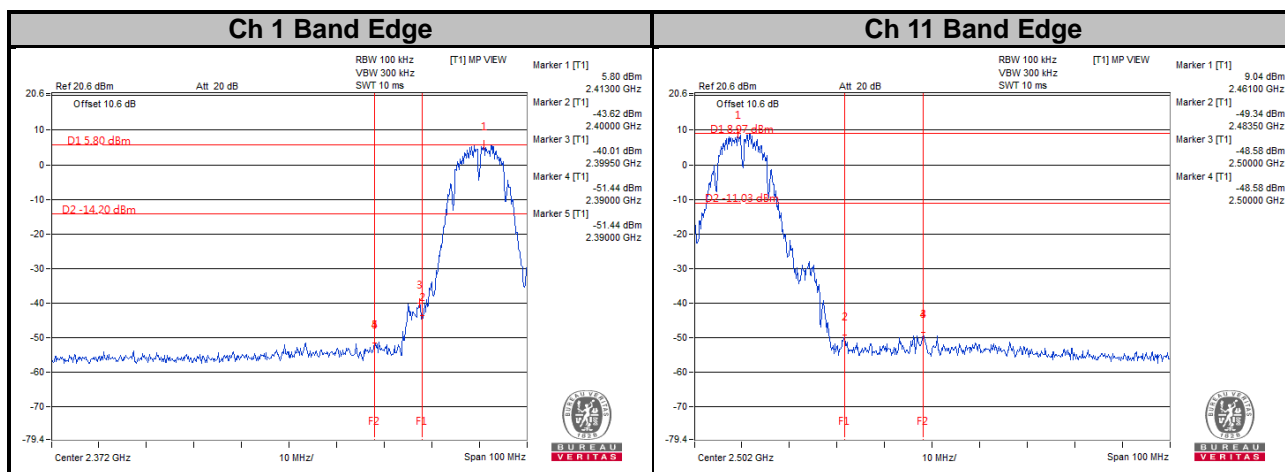
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

## 4.6.7 Test Results

The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20 dB offset below D1. It shows compliance with the requirement.

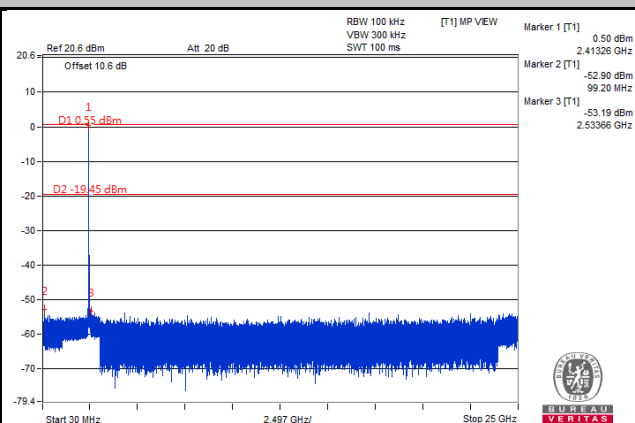
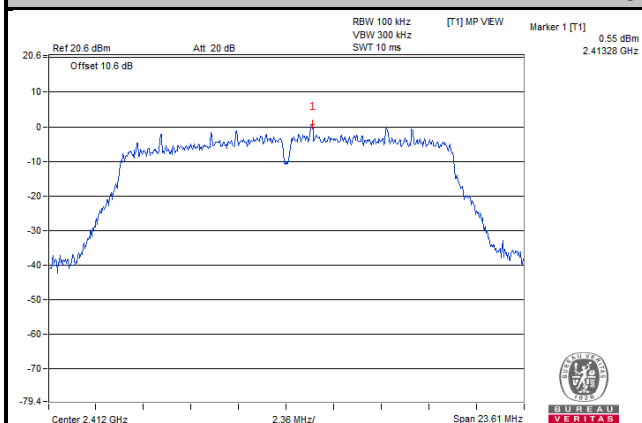
### 802.11b



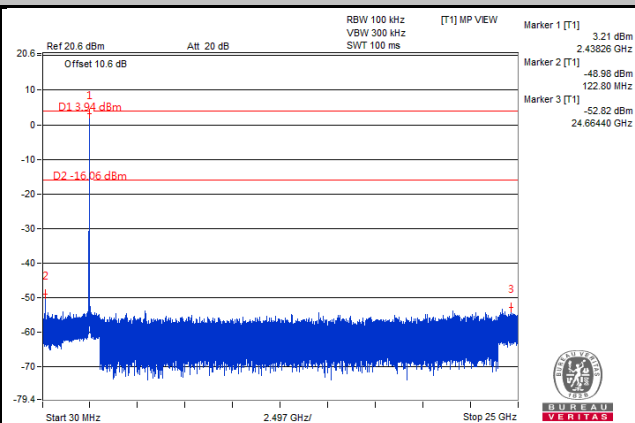
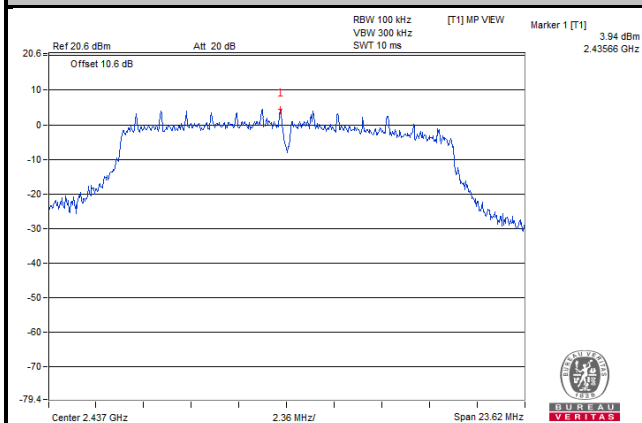


802.11g

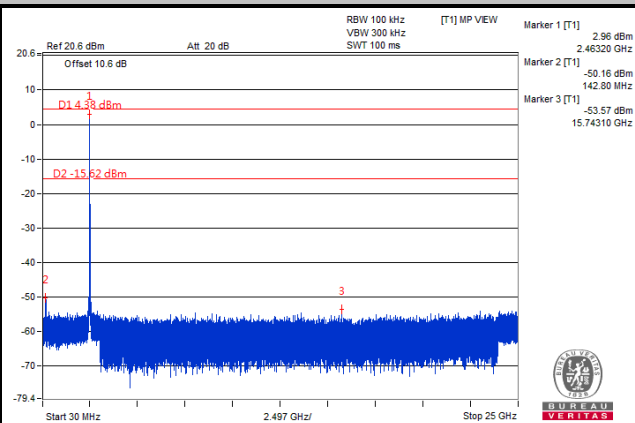
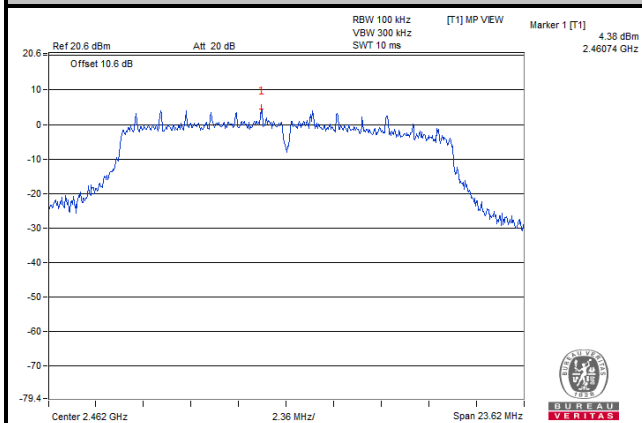
### Ch 1

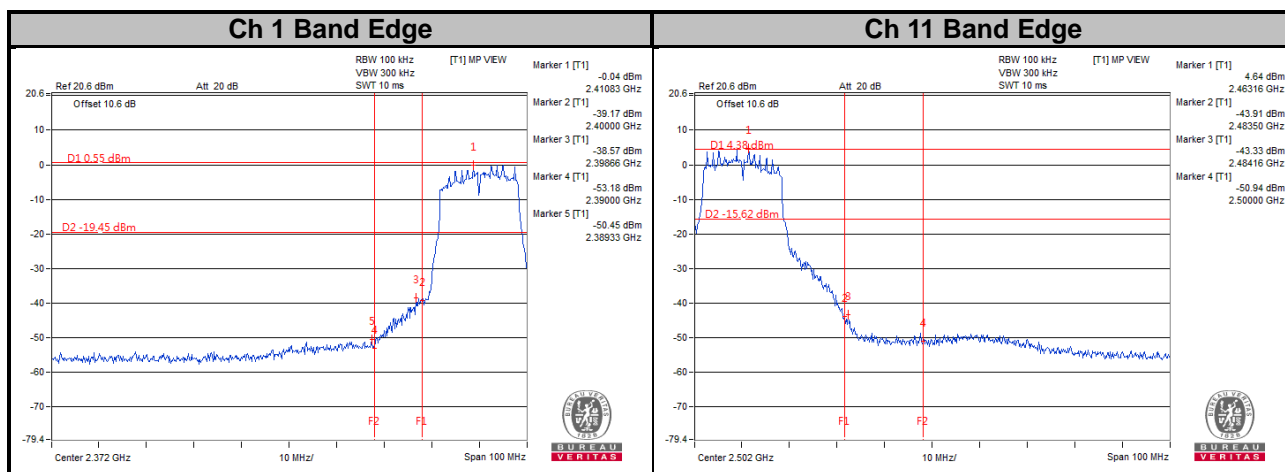


### Ch 6



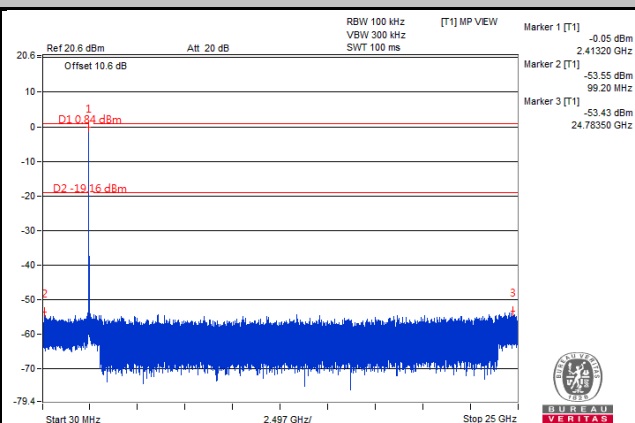
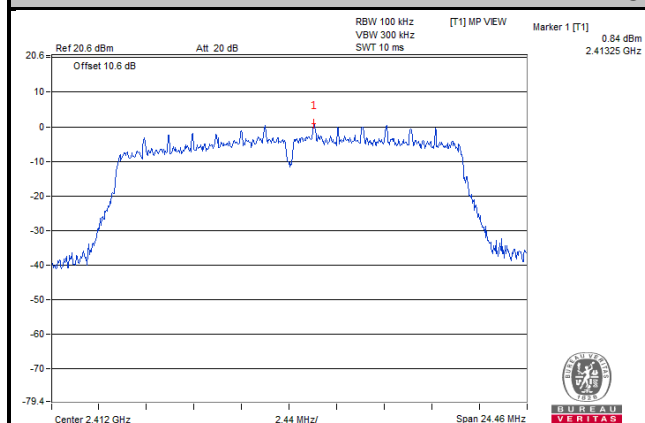
### Ch 11



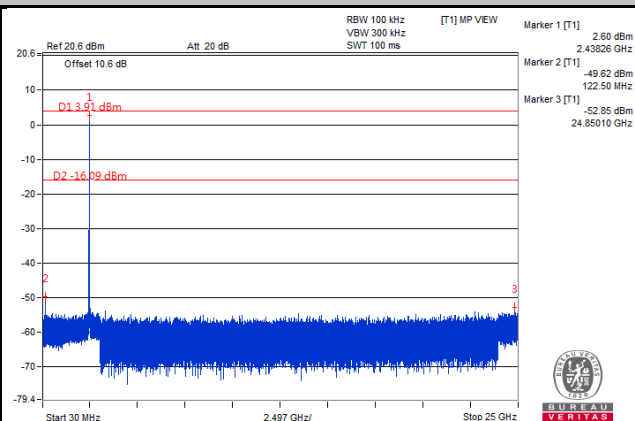
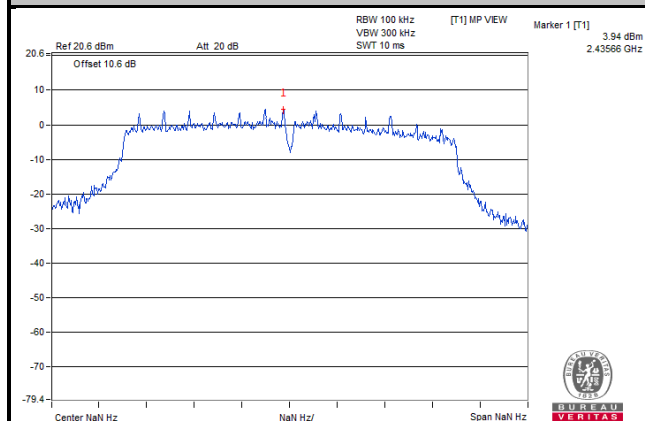


## 802.11n (HT20)

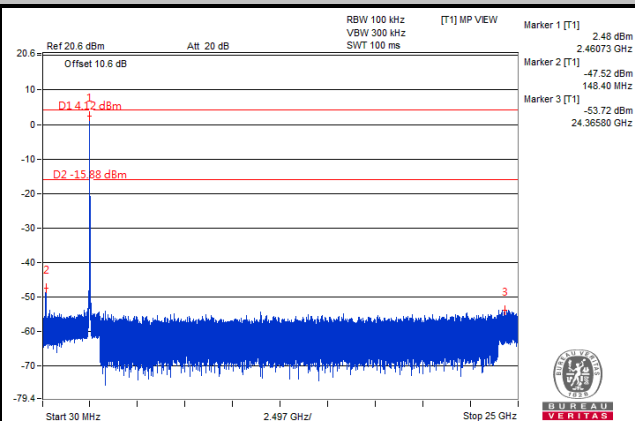
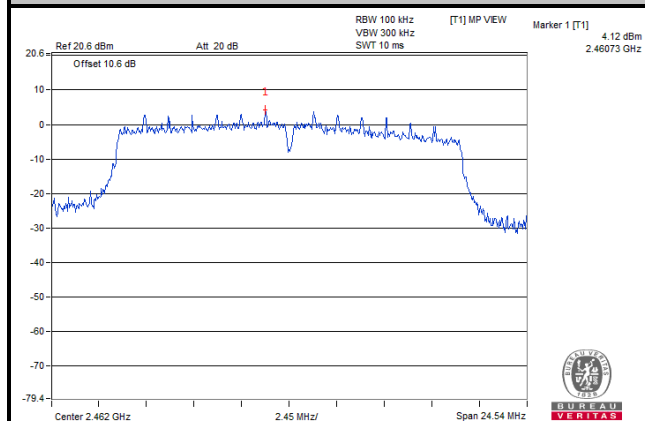
### Ch 1



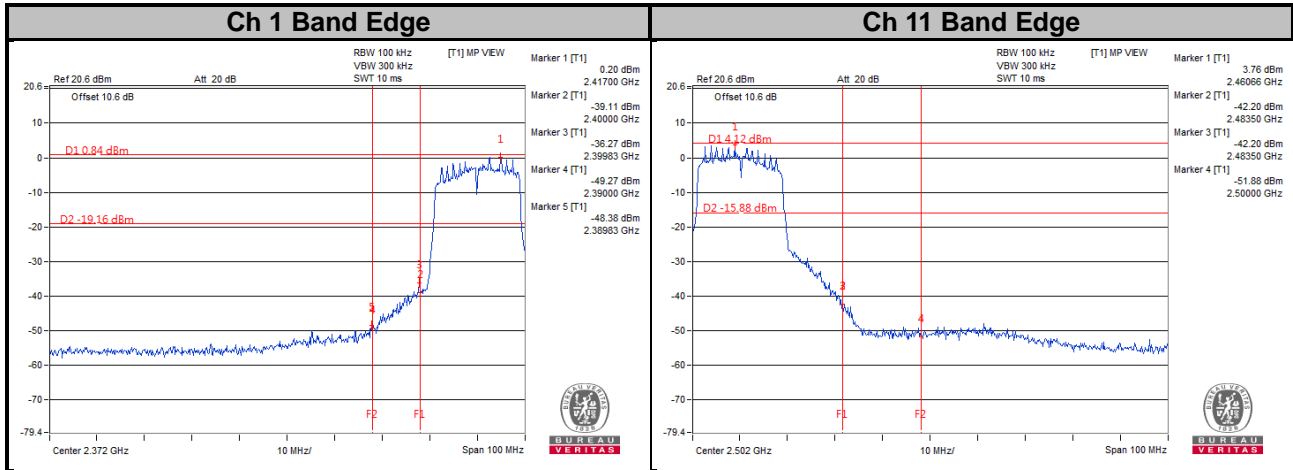
### Ch 6



### Ch 11







## 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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**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

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

--- END ---