

## FCC Test Report

**Report No.:** RFBDYS-WTW-P22031091

**FCC ID:** 2AKCZ-108

**Test Model:** APL68-108

**Received Date:** Mar. 28, 2022

**Test Date:** Apr. 07 ~ May 27, 2022

**Issued Date:** Aug. 09, 2022

**Applicant:** SonicWall Inc.

**Address:** 1033 McCarthy Blvd., Milpitas, CA 95035, USA

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

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

**Test Location (1):** No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City  
33383, TAIWAN

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

**Test Location (2):** No. 70, Wenming Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

**FCC Registration /  
Designation Number:** 281270 / TW0032



This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

## Table of Contents

<b>Release Control Record</b> .....	<b>4</b>
<b>1 Certificate of Conformity</b> .....	<b>5</b>
<b>2 Summary of Test Results</b> .....	<b>6</b>
2.1 Measurement Uncertainty.....	6
2.2 Modification Record.....	6
<b>3 General Information</b> .....	<b>7</b>
3.1 General Description of EUT.....	7
3.2 Description of Test Modes.....	9
3.2.1 Test Mode Applicability and Tested Channel Detail.....	10
3.3 Duty Cycle of Test Signal.....	12
3.4 Description of Support Units.....	14
3.4.1 Configuration of System under Test.....	14
3.5 General Description of Applied Standards and References.....	14
<b>4 Test Types and Results</b> .....	<b>16</b>
4.1 Radiated Emission and Bandedge Measurement.....	16
4.1.1 Limits of Radiated Emission and Bandedge Measurement.....	16
4.1.2 Test Instruments.....	17
4.1.3 Test Procedures.....	18
4.1.4 Deviation from Test Standard.....	19
4.1.5 Test Setup.....	19
4.1.6 EUT Operating Conditions.....	20
4.1.7 Test Results.....	21
4.2 Conducted Emission Measurement.....	53
4.2.1 Limits of Conducted Emission Measurement.....	53
4.2.2 Test Instruments.....	53
4.2.3 Test Procedures.....	54
4.2.4 Deviation from Test Standard.....	54
4.2.5 Test Setup.....	54
4.2.6 EUT Operating Conditions.....	54
4.2.7 Test Results.....	55
4.3 6dB Bandwidth Measurement.....	63
4.3.1 Limits of 6dB Bandwidth Measurement.....	63
4.3.2 Test Setup.....	63
4.3.3 Test Instruments.....	63
4.3.4 Test Procedure.....	63
4.3.5 Deviation from Test Standard.....	63
4.3.6 EUT Operating Conditions.....	63
4.3.7 Test Result.....	64
4.4 Conducted Output Power Measurement.....	68
4.4.1 Limits of Conducted Output Power Measurement.....	68
4.4.2 Test Setup.....	68
4.4.3 Test Instruments.....	68
4.4.4 Test Procedures.....	68
4.4.5 Deviation from Test Standard.....	68
4.4.6 EUT Operating Conditions.....	68
4.4.7 Test Results.....	69
4.5 Power Spectral Density Measurement.....	73
4.5.1 Limits of Power Spectral Density Measurement.....	73
4.5.2 Test Setup.....	73
4.5.3 Test Instruments.....	73
4.5.4 Test Procedure.....	73
4.5.5 Deviation from Test Standard.....	74
4.5.6 EUT Operating Condition.....	74

4.5.7 Test Results .....	75
4.6 Conducted Out of Band Emission Measurement.....	80
4.6.1 Limits of Conducted Out of Band Emission Measurement .....	80
4.6.2 Test Setup.....	80
4.6.3 Test Instruments .....	80
4.6.4 Test Procedure .....	80
4.6.5 Deviation from Test Standard .....	80
4.6.6 EUT Operating Condition .....	80
4.6.7 Test Results .....	80
<b>Annex A - Band Edge Measurement .....</b>	<b>93</b>
<b>5 Pictures of Test Arrangements.....</b>	<b>102</b>
<b>Appendix – Information of the Testing Laboratories .....</b>	<b>103</b>

### Release Control Record

Issue No.	Description	Date Issued
RFBDYS-WTW-P22031091	Original release	Aug. 09, 2022

## 1 Certificate of Conformity

**Product:** Wireless Access Point

**Brand:** SONICWALL

**Test Model:** APL68-108

**Sample Status:** Engineering sample

**Applicant:** SonicWall Inc.

**Test Date:** Apr. 07 ~ May 27, 2022

**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 RF characteristics under the conditions specified in this report.

**Prepared by :** Celine Chou , **Date:** Aug. 09, 2022  
Celine Chou / Senior Specialist

**Approved by :** Jeremy Lin , **Date:** Aug. 09, 2022  
Jeremy Lin / 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 -6.28dB at 0.54200MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.13dB at 7311.00MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6dB 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	Antenna connector is I-PEX not a standard connector.

Note:

- For 2.4G band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

### 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	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.00 dB
	30MHz ~ 200MHz	2.91 dB
	200MHz ~ 1000MHz	2.93 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.76 dB
	18GHz ~ 40GHz	1.77 dB

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

Product	Wireless Access Point
Brand	SONICWALL
Test Model	APL68-108
Sample Status	Engineering sample
Power Supply Rating	12Vdc from adapter 48-56Vdc from POE
Modulation Type	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 300Mbps VHT: up to 400Mbps 802.11ax: up to 574Mbps
Operating Frequency	2412 ~ 2462MHz
Number of Channel	<b>2G traffic radio (Radio 2):</b> 802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20): 11 802.11n (HT40), VHT40, 802.11ax (HE40): 7 <b>Scanning radio (Radio 3):</b> 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7
Output Power	<b>2G traffic radio (Radio 2):</b> CDD Mode: 214.194mW Beamforming Mode: 214.194mW <b>Scanning radio (Radio 3):</b> CDD Mode: 17.742mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	BRACKET T-BAR LFP (Brand: Senao, model: 6301A4133020)
Cable Supplied	NA

**Note:**

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

Radio	Modulation Mode	Beamforming Mode	TX Function
2G traffic radio (Radio 2)	802.11b	Not Support	2TX
	802.11g	Not Support	2TX
	802.11n (HT20)	Support	2TX
	802.11n (HT40)	Support	2TX
	VHT20	Support	2TX
	VHT40	Support	2TX
	802.11ax (HE20)	Support	2TX
	802.11ax (HE40)	Support	2TX
Scanning radio (Radio 3)	802.11b	Not Support	1TX
	802.11g	Not Support	1TX
	802.11n (HT20)	Not Support	1TX
	802.11n (HT40)	Not Support	1TX
	VHT20	Not Support	1TX
	VHT40	Not Support	1TX

\* For 802.11ax mode, this EUT doesn't support partial RU mode.

\* The bandwidth and modulation are similar for HT20/HT40 on 802.11n mode and VHT20/VHT40 on 256QAM and HE20/HE40 on 802.11ax mode. Therefore the investigated worst case is the representative mode in test report. (Final test mode refer section 3.2.1)

\* CDD mode is the worst case for final tests after pretesting CDD mode and Beamforming mode except output power test.

2. The EUT consumes power from the following adapter and POE.

Adapter (Optional)	
Brand	Sunny
Model	SYS1546-3612-T3
Input Power	100-240Vac, 50-60Hz, 1.5A Max
Output Power	12Vdc, 3.0A
Power cord	Non-shielded AC (1.77m) Non-shielded DC (1.86m) with one core

POE (Support unit only)	
Brand	EnGenius
Model	EPA5006GAT
Input Power	100-240Vac, 50-60Hz, 0.8A
Output Power	48-56Vdc, 0.6A
Power cord	Non-shielded AC (0.5m)



3. The antenna information is listed as below.

No.	Type	Connector	Gain (dBi)					
			2400MHz	2450MHz	2500MHz	5150MHz	5500MHz	5850MHz
2G1	PIFA	I-PEX	3.05	3.14	3.21	-	-	-
2G2	PIFA	I-PEX	3.52	3.43	3.64	-	-	-
5G1	PIFA	I-PEX	-	-	-	4.52	4.63	5.07
5G2	PIFA	I-PEX	-	-	-	4.13	4.98	4.62
Scan	PIFA	I-PEX	3.83	3.93	3.81	3.81	4.23	4.89
BLE	PIFA	I-PEX	3.09	3.70	3.58	-	-	-

\* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

4. The simultaneous operation mode was determined by client.

No	Mode
1	2GHz traffic radio (Radio 2) + 5GHz traffic radio (Radio 1) + 5GHz Scanning radio (Radio 3) + BLE
2	5GHz traffic radio (Radio 1) + 2GHz Scanning radio (Radio 3) + BLE

\* 5GHz traffic radio (Radio 1) and 5GHz Scanning radio (Radio 3) cannot transmit in the same band at same time.

\* 2GHz traffic radio (Radio 2) and 2GHz Scanning radio (Radio 3) cannot transmit at same time.

\* Spurious emission of the simultaneous operation has been evaluated and no non-compliance was found.

### 3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20):

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), VHT40, 802.11ax (HE40):

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

### 3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
A	√	√	√	√	Powered by adapter
B	-	√	√	-	Powered by POE

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

Note:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.
2. Radiated emission test (below 1GHz) and power line conducted emission test items chosen the worst maximum power.

#### 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	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	Remark
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	Radio 2
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	
A	802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0	
A	802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0	
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	Radio 3
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	
A	VHT20	1 to 11	1, 6, 11	OFDM	BPSK	MCS0	
A	VHT40	3 to 9	3, 6, 9	OFDM	BPSK	MCS0	

#### 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	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	Remark
A, B	802.11ax (HE20)	1 to 11	6	OFDMA	BPSK	MCS0	Radio 2
A, B	802.11b	1 to 11	6	DSSS	DBPSK	1.0	Radio 3

#### 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)	Remark
A, B	802.11ax (HE20)	1 to 11	6	OFDMA	BPSK	MCS0	Radio 2
A, B	802.11b	1 to 11	6	DSSS	DBPSK	1.0	Radio 3

**Bandwidth, Power Spectral Density and Conducted Out of Band Emission 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)	Remark
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	Radio 2
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	
A	802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0	
A	802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0	
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	Radio 3
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	
A	VHT20	1 to 11	1, 6, 11	OFDM	BPSK	MCS0	
A	VHT40	3 to 9	3, 6, 9	OFDM	BPSK	MCS0	

**Conducted Output Power 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)	Remark
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	Radio 2
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	
A	VHT20	1 to 11	1, 6, 11	OFDM	BPSK	MCS0	
A	VHT40	3 to 9	3, 6, 9	OFDM	BPSK	MCS0	
A	802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0	
A	802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0	
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	Radio 3
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	
A	VHT20	1 to 11	1, 6, 11	OFDM	BPSK	MCS0	
A	VHT40	3 to 9	3, 6, 9	OFDM	BPSK	MCS0	

**Test Condition:**

Applicable to	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	26 deg. C, 66% RH	120Vac, 60Hz	Randy Wu Adair Peng
RE<1G	26 deg. C, 66% RH 25 deg. C, 77% RH	120Vac, 60Hz 48Vdc	Adair Peng
PLC	23 deg. C, 67% RH 25 deg. C, 75% RH	120Vac, 60Hz 48Vdc	Adair Peng Rex Wang
APCM	22 deg. C, 66% RH	120Vac, 60Hz	Gary Lin Jisyong Wang

### 3.3 Duty Cycle of Test Signal

#### 2G traffic radio (Radio 2)

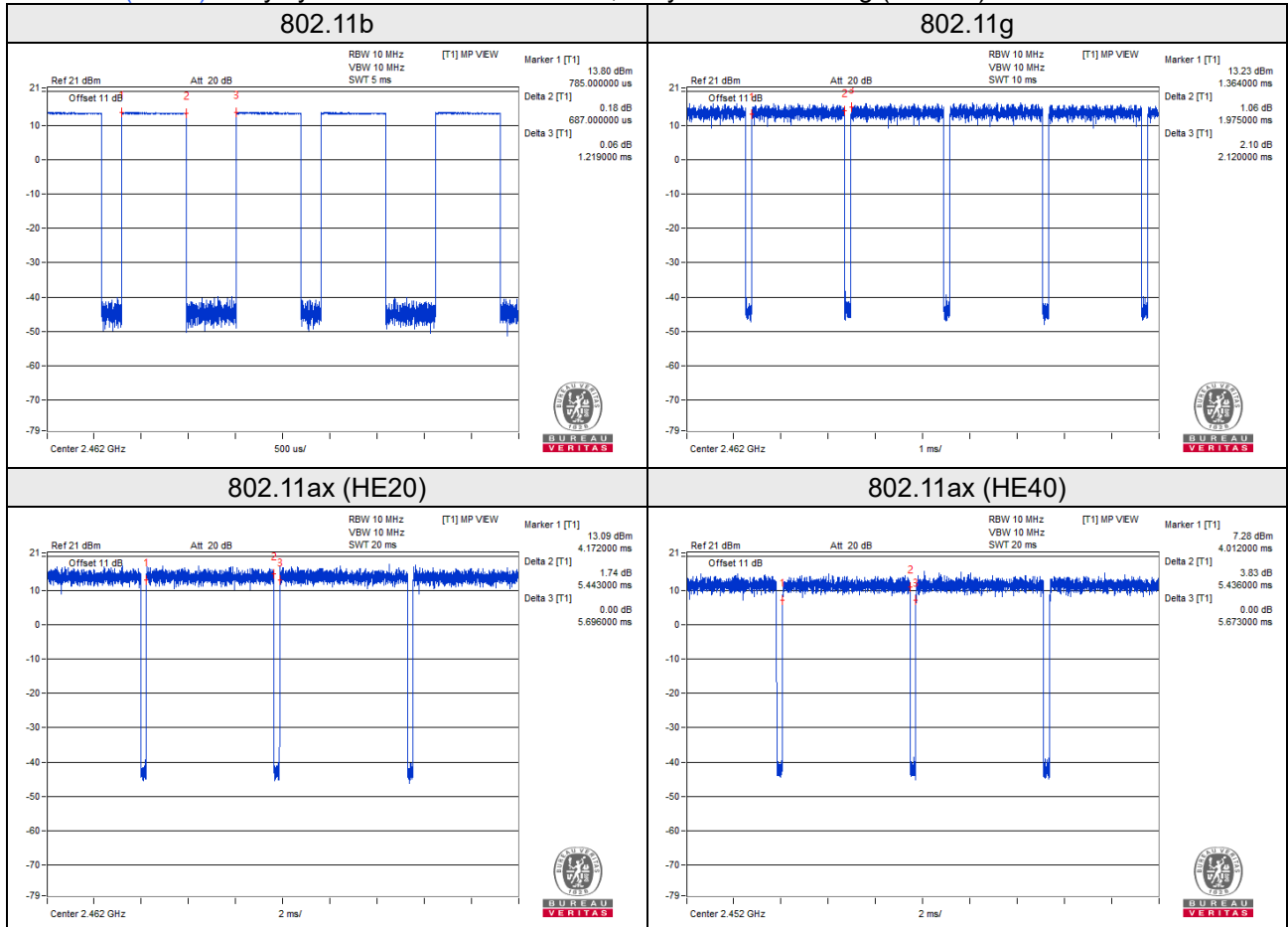
Duty cycle of test signal is < 98%, duty factor is required.

802.11b: Duty cycle =  $0.687/1.219 = 0.564$ , Duty factor =  $10 * \log(1/0.564) = 2.49$

802.11g: Duty cycle =  $1.975/2.120 = 0.932$ , Duty factor =  $10 * \log(1/0.932) = 0.31$

802.11ax (HE20): Duty cycle =  $5.443/5.696 = 0.956$ , Duty factor =  $10 * \log(1/0.956) = 0.20$

802.11ax (HE40): Duty cycle =  $5.436/5.673 = 0.958$ , Duty factor =  $10 * \log(1/0.958) = 0.19$



### Scanning radio (Radio 3)

802.11b: Duty cycle of test signal is  $\geq 98\%$ , duty factor is not required.

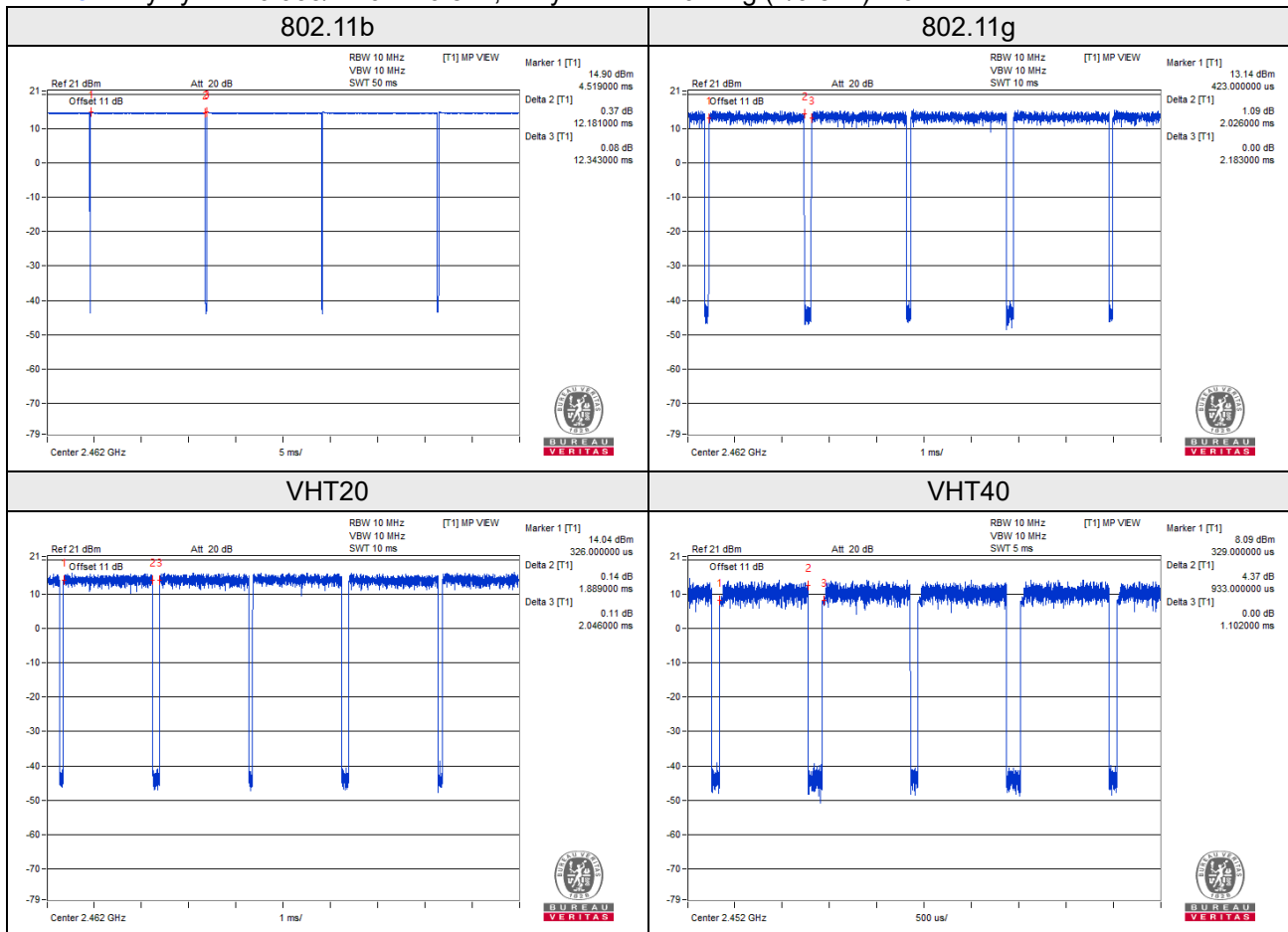
802.11g, VHT20, VHT40: Duty cycle of test signal is  $< 98\%$ , duty factor is required.

802.11b: Duty cycle =  $12.181/12.343 = 0.987$

802.11g: Duty cycle =  $2.026/2.183 = 0.928$ , Duty factor =  $10 * \log(1/0.928) = 0.32$

VHT20: Duty cycle =  $1.889/2.046 = 0.923$ , Duty factor =  $10 * \log(1/0.923) = 0.35$

VHT40: Duty cycle =  $0.933/1.102 = 0.847$ , Duty factor =  $10 * \log(1/0.847) = 0.72$



### 3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-
B.	Adapter	Sunny	SYS1546-3612-T3	NA	NA	Provided by client
C.	POE	EnGenius	EPA5006GAT	NA	NA	Provided by client
D.	USB Flash	HP	v250W	5	NA	-

Note:

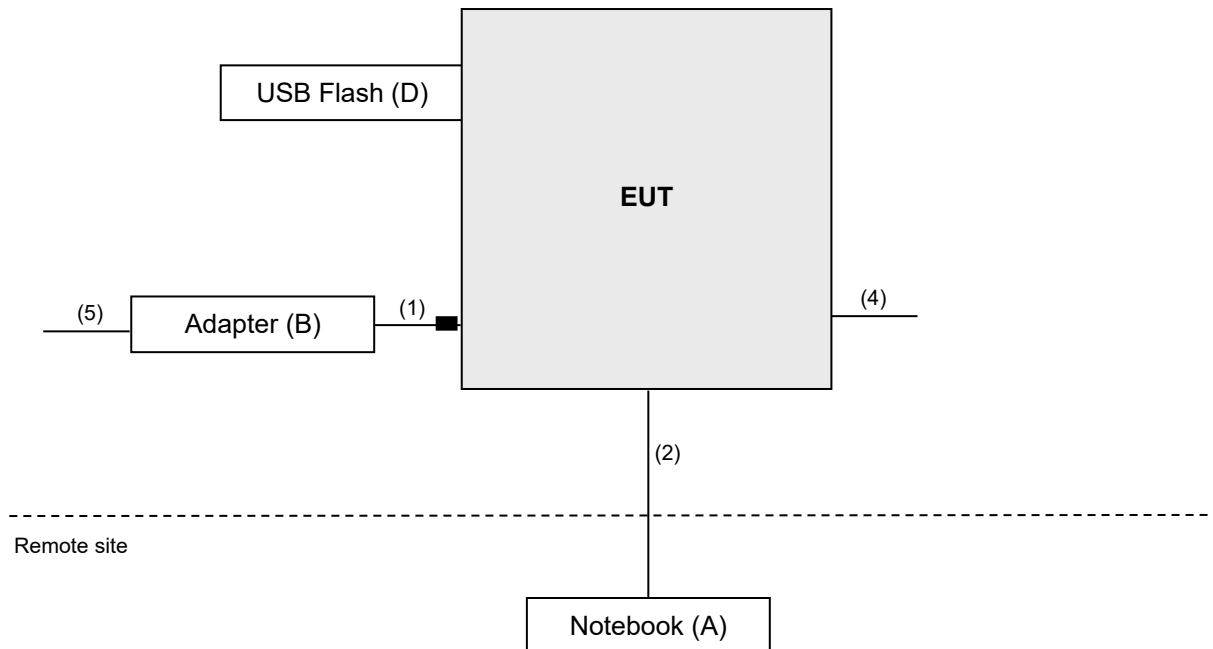
1. All power cords of the above support units are non-shielded (1.8m).
2. Items A acted as communication partner to transfer data.

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Power Cable	1	1.86	N	1	Provided by client
2.	LAN Cable	1	6.0	N	0	RJ45, Cat5e
3.	LAN Cable	1	1.5	N	0	RJ45, Cat5e
4.	USB Cable	1	1.5	Y	0	-
5.	AC Power Cable	1	1.77	N	0	Provided by client
6.	AC Power Cable	1	0.5	N	0	Provided by client

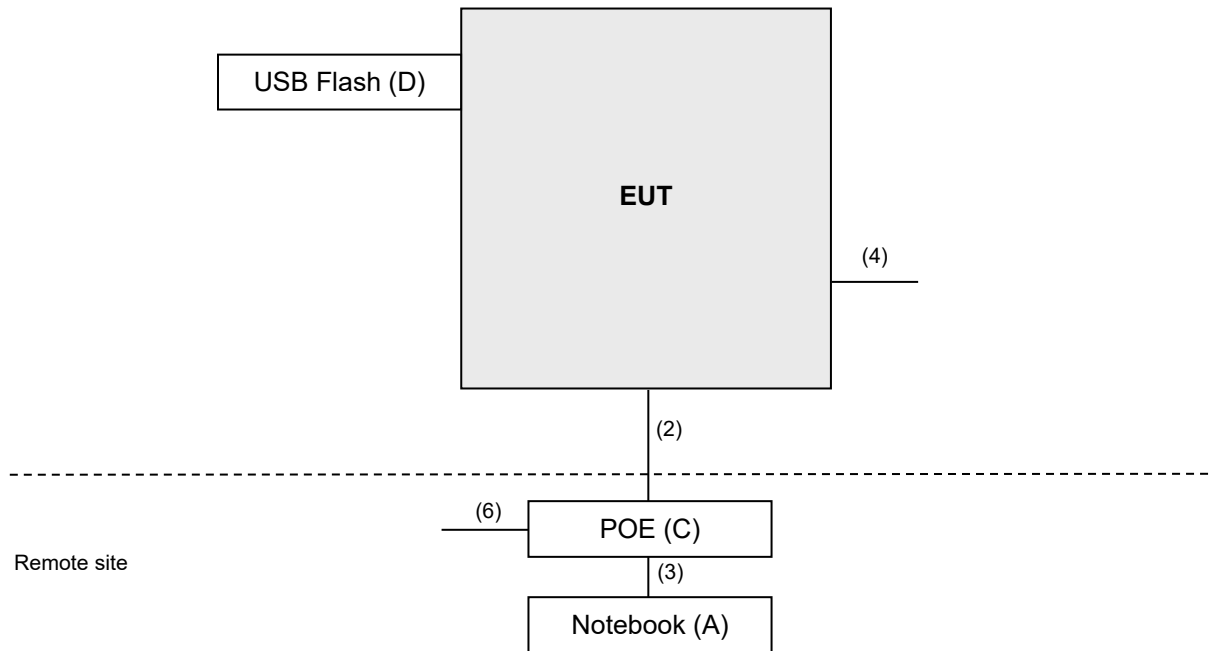
Note: The core(s) is(are) originally attached to the cable(s).

#### 3.4.1 Configuration of System under Test

Test Mode A



Test Mode B



**3.5 General Description of Applied Standards and References**

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

**Test standard:**

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

ANSI C63.10:2013

All test items have been performed and recorded as per the above standards.

**References Test Guidance:**

**KDB 558074 D01 15.247 Meas Guidance v05r02**

**KDB 662911 D01 Multiple Transmitter Output v02r01**

All test items have been performed as a reference to the above KDB test guidance.

## 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 20dB under any condition of modulation.



#### 4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102782	Dec. 10, 2021	Dec. 09, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSW43	101866	Jan. 14, 2022	Jan. 13, 2023
BILOG Antenna SCHWARZBECK	VULB9168	9168-1213	Oct. 27, 2021	Oct. 26, 2022
HORN Antenna RF SPIN	DRH18-E	210103A18E	Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9170	9170-1048	Nov. 14, 2021	Nov. 13, 2022
Loop Antenna TESEQ	HLA 6121	45745	Jul. 21, 2021	Jul. 20, 2022
Preamplifier EMCI (Below 1GHz)	EMC330N	980782	Jan. 17, 2022	Jan. 16, 2023
Preamplifier EMCI (Above 1GHz)	EMC118A45SE	980808	Dec. 30, 2021	Dec. 29, 2022
Preamplifier EMCI (18GHz~40GHz)	EMC184045SE	980788	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC104-SM-SM-(9 000+2000+1000)	201243+ 201231+ 210102	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMCCFD400-NM-N M-(9000+300+500)	201236+ 201235+ 201233	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC101G-KM-KM- (5000+3000+2000)	201260+201257+20125 4	Jan. 17, 2022	Jan. 16, 2023
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower & Turn Max-Full	MFT-151SS-0.5T	NA	NA	NA
Turn Table Max-Full	MF-7802BS	NA	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208674	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208674	NA	NA
Peak Power Analyzer KEYSIGHT	8990B	MY51000485	Jan. 18, 2022	Jan. 17, 2023
Wideband Power Sensor KEYSIGHT	N1923A	MY58020002	Jan. 17, 2022	Jan. 16, 2023

- 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 WM Chamber 8.

### 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. Parallel, perpendicular, and ground-parallel orientations 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.

#### 2G traffic radio (Radio 2)

(802.11b: RBW = 1MHz, VBW = 3kHz; 802.11g: RBW = 1MHz, VBW = 1kHz;  
802.11ax (HE20): RBW = 1MHz, VBW = 1kHz; 802.11ax (HE40): RBW = 1MHz, VBW = 1kHz)

#### Scanning radio (Radio 3)

(802.11b: RBW = 1MHz, VBW = 10Hz; 802.11g: RBW = 1MHz, VBW = 1kHz;  
VHT20: RBW = 1MHz, VBW = 1kHz; VHT40: RBW = 1MHz, VBW = 3kHz)

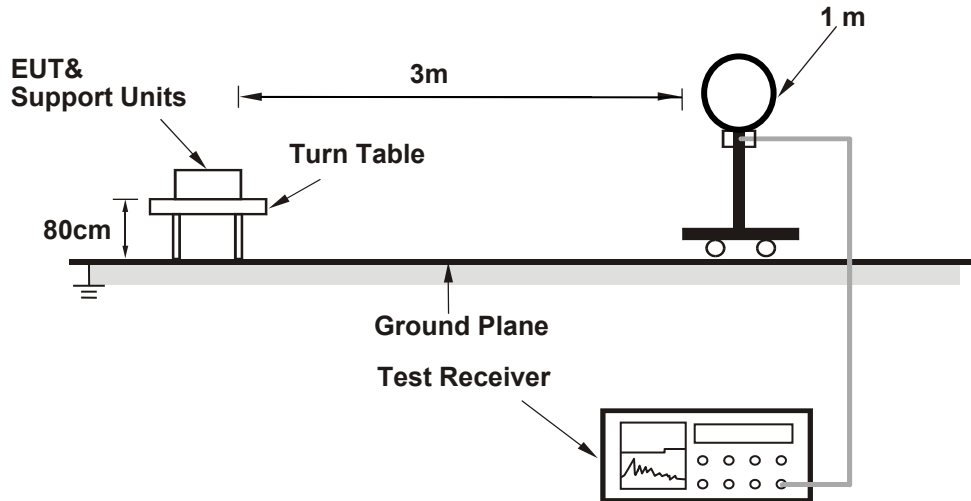
4. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 Deviation from Test Standard

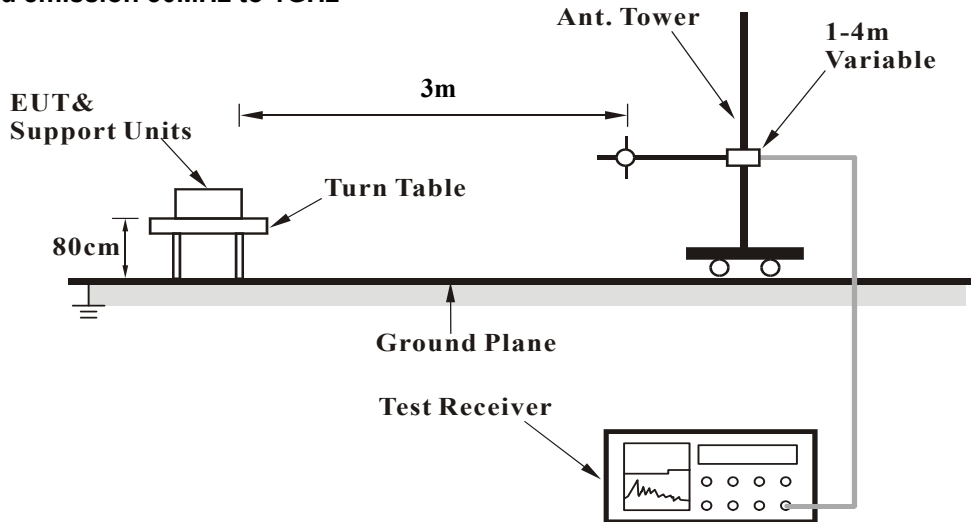
No deviation.

#### 4.1.5 Test Setup

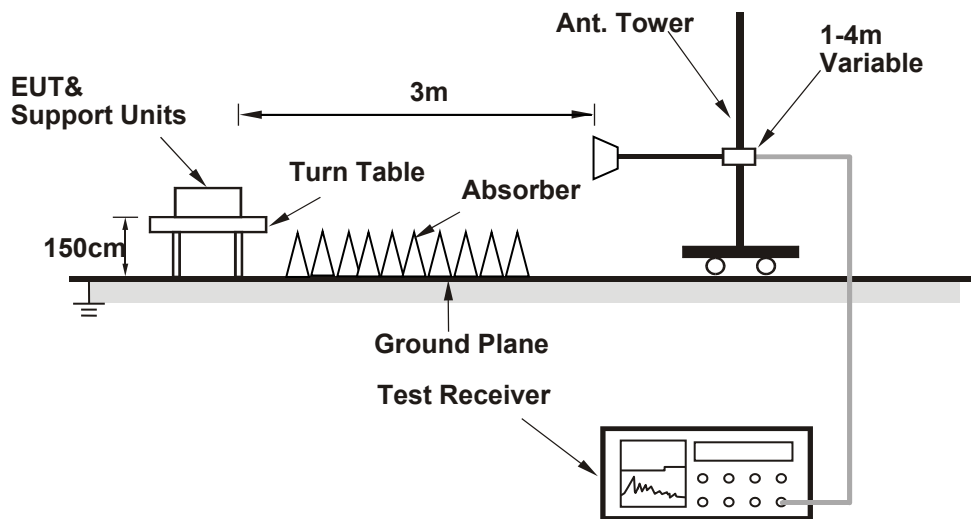
##### For Radiated emission below 30MHz



##### 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 an RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.

#### 4.1.7 Test Results

Above 1GHz Data:

2G traffic radio (Radio 2)

RF Mode	TX 802.11b	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2388.00	61.64 PK	74.00	-12.36	2.10 H	324	29.65	31.99
2	2388.00	53.25 AV	54.00	-0.75	2.10 H	324	21.26	31.99
3	*2412.00	113.31 PK			2.08 H	340	81.35	31.96
4	*2412.00	112.05 AV			2.08 H	340	80.09	31.96
5	4824.00	53.68 PK	74.00	-20.32	2.37 H	343	50.74	2.94
6	4824.00	48.33 AV	54.00	-5.67	2.37 H	343	45.39	2.94
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2388.00	61.08 PK	74.00	-12.92	2.00 V	50	29.09	31.99
2	2388.00	53.42 AV	54.00	-0.58	2.00 V	50	21.43	31.99
3	*2412.00	113.16 PK			2.19 V	45	81.20	31.96
4	*2412.00	111.92 AV			2.19 V	45	79.96	31.96
5	4824.00	55.80 PK	74.00	-18.20	1.48 V	20	52.86	2.94
6	4824.00	52.01 AV	54.00	-1.99	1.48 V	20	49.07	2.94

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	112.81 PK			1.05 H	291	80.88	31.93
2	*2437.00	110.44 AV			1.05 H	291	78.51	31.93
3	4874.00	51.70 PK	74.00	-22.30	1.75 H	10	48.85	2.85
4	4874.00	46.06 AV	54.00	-7.94	1.75 H	10	43.21	2.85
5	7311.00	59.43 PK	74.00	-14.57	1.45 H	37	50.79	8.64
6	7311.00	53.10 AV	54.00	-0.90	1.45 H	37	44.46	8.64

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	112.16 PK			2.16 V	45	80.23	31.93
2	*2437.00	110.04 AV			2.16 V	45	78.11	31.93
3	4874.00	56.63 PK	74.00	-17.37	2.22 V	11	53.78	2.85
4	4874.00	53.23 AV	54.00	-0.77	2.22 V	11	50.38	2.85
5	7311.00	59.00 PK	74.00	-15.00	1.19 V	308	50.36	8.64
6	7311.00	53.26 AV	54.00	-0.74	1.19 V	308	44.62	8.64

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX 802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	112.78 PK			1.14 H	35	80.84	31.94
2	*2462.00	110.53 AV			1.14 H	35	78.59	31.94
3	2483.50	58.72 PK	74.00	-15.28	1.23 H	54	26.74	31.98
4	2483.50	49.64 AV	54.00	-4.36	1.23 H	54	17.66	31.98
5	4924.00	55.39 PK	74.00	-18.61	1.70 H	12	52.55	2.84
6	4924.00	51.62 AV	54.00	-2.38	1.70 H	12	48.78	2.84
7	7386.00	59.01 PK	74.00	-14.99	1.49 H	38	50.70	8.31
8	7386.00	52.06 AV	54.00	-1.94	1.49 H	38	43.75	8.31
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	112.36 PK			1.76 V	341	80.42	31.94
2	*2462.00	110.80 AV			1.76 V	341	78.86	31.94
3	2483.50	58.96 PK	74.00	-15.04	1.87 V	323	26.98	31.98
4	2483.50	49.10 AV	54.00	-4.90	1.87 V	323	17.12	31.98
5	4924.00	56.55 PK	74.00	-17.45	1.06 V	38	53.71	2.84
6	4924.00	53.39 AV	54.00	-0.61	1.06 V	38	50.55	2.84
7	7386.00	59.17 PK	74.00	-14.83	1.13 V	313	50.86	8.31
8	7386.00	52.64 AV	54.00	-1.36	1.13 V	313	44.33	8.31

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX 802.11g	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2389.00	66.53 PK	74.00	-7.47	1.17 H	50	34.54	31.99
2	2389.00	53.63 AV	54.00	-0.37	1.17 H	50	21.64	31.99
3	*2412.00	117.40 PK			1.17 H	50	85.44	31.96
4	*2412.00	107.31 AV			1.17 H	50	75.35	31.96
5	4824.00	49.92 PK	74.00	-24.08	1.78 H	2	46.98	2.94
6	4824.00	37.26 AV	54.00	-16.74	1.78 H	2	34.32	2.94

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	67.35 PK	74.00	-6.65	2.22 V	45	35.37	31.98
2	2390.00	53.59 AV	54.00	-0.41	2.22 V	45	21.61	31.98
3	*2412.00	113.56 PK			2.22 V	45	81.60	31.96
4	*2412.00	103.82 AV			2.22 V	45	71.86	31.96
5	4824.00	51.78 PK	74.00	-22.22	1.78 V	20	48.84	2.94
6	4824.00	38.15 AV	54.00	-15.85	1.78 V	20	35.21	2.94

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.



RF Mode	TX 802.11g	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	118.27 PK			1.13 H	58	86.34	31.93
2	*2437.00	108.31 AV			1.13 H	58	76.38	31.93
3	4874.00	49.29 PK	74.00	-24.71	1.81 H	13	46.44	2.85
4	4874.00	36.82 AV	54.00	-17.18	1.81 H	13	33.97	2.85
5	7311.00	67.34 PK	74.00	-6.66	2.34 H	33	58.70	8.64
6	7311.00	53.64 AV	54.00	-0.36	2.34 H	33	45.00	8.64

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	115.96 PK			2.87 V	346	84.03	31.93
2	*2437.00	106.14 AV			2.87 V	346	74.21	31.93
3	4874.00	50.62 PK	74.00	-23.38	1.94 V	20	47.77	2.85
4	4874.00	38.26 AV	54.00	-15.74	1.94 V	20	35.41	2.85
5	7311.00	65.22 PK	74.00	-8.78	1.69 V	323	56.58	8.64
6	7311.00	50.73 AV	54.00	-3.27	1.69 V	323	42.09	8.64

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.

RF Mode	TX 802.11g	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	119.02 PK			1.23 H	48	87.08	31.94
2	*2462.00	108.48 AV			1.23 H	48	76.54	31.94
3	2483.50	66.25 PK	74.00	-7.75	1.23 H	48	34.27	31.98
4	2483.50	53.17 AV	54.00	-0.83	1.23 H	48	21.19	31.98
5	4924.00	51.54 PK	74.00	-22.46	1.75 H	10	48.70	2.84
6	4924.00	39.25 AV	54.00	-14.75	1.75 H	10	36.41	2.84
7	7386.00	66.50 PK	74.00	-7.50	1.26 H	36	58.19	8.31
8	7386.00	52.77 AV	54.00	-1.23	1.26 H	36	44.46	8.31
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	111.34 PK			1.14 V	337	79.40	31.94
2	*2462.00	100.82 AV			1.14 V	337	68.88	31.94
3	2483.50	62.45 PK	74.00	-11.55	1.34 V	340	30.47	31.98
4	2483.50	50.08 AV	54.00	-3.92	1.34 V	340	18.10	31.98
5	4924.00	48.22 PK	74.00	-25.78	1.73 V	52	45.38	2.84
6	4924.00	36.21 AV	54.00	-17.79	1.73 V	52	33.37	2.84
7	7386.00	53.13 PK	74.00	-20.87	1.67 V	336	44.82	8.31
8	7386.00	41.31 AV	54.00	-12.69	1.67 V	336	33.00	8.31

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX 802.11ax (HE20)	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	65.90 PK	74.00	-8.10	1.16 H	51	33.92	31.98
2	2390.00	53.76 AV	54.00	-0.24	1.16 H	51	21.78	31.98
3	*2412.00	119.87 PK			1.16 H	51	87.91	31.96
4	*2412.00	106.75 AV			1.16 H	51	74.79	31.96
5	4824.00	48.34 PK	74.00	-25.66	1.90 H	360	45.40	2.94
6	4824.00	35.86 AV	54.00	-18.14	1.90 H	360	32.92	2.94

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	66.10 PK	74.00	-7.90	2.20 V	56	34.12	31.98
2	2390.00	53.60 AV	54.00	-0.40	2.20 V	56	21.62	31.98
3	*2412.00	116.67 PK			2.18 V	52	84.71	31.96
4	*2412.00	103.27 AV			2.18 V	52	71.31	31.96
5	4824.00	51.02 PK	74.00	-22.98	1.87 V	20	48.08	2.94
6	4824.00	36.32 AV	54.00	-17.68	1.87 V	20	33.38	2.94

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX 802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	121.79 PK			1.14 H	54	89.86	31.93
2	*2437.00	109.09 AV			1.14 H	54	77.16	31.93
3	4874.00	48.51 PK	74.00	-25.49	2.20 H	5	45.66	2.85
4	4874.00	36.08 AV	54.00	-17.92	2.20 H	5	33.23	2.85
5	7311.00	68.99 PK	74.00	-5.01	2.56 H	33	60.35	8.64
<b>6</b>	<b>7311.00</b>	<b>53.87 AV</b>	<b>54.00</b>	<b>-0.13</b>	<b>2.56 H</b>	<b>33</b>	<b>45.23</b>	<b>8.64</b>

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	119.21 PK			2.35 V	60	87.28	31.93
2	*2437.00	105.34 AV			2.35 V	60	73.41	31.93
3	4874.00	49.73 PK	74.00	-24.27	1.91 V	25	46.88	2.85
4	4874.00	36.70 AV	54.00	-17.30	1.91 V	25	33.85	2.85
5	7311.00	69.65 PK	74.00	-4.35	1.02 V	312	61.01	8.64
6	7311.00	53.76 AV	54.00	-0.24	1.02 V	312	45.12	8.64

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX 802.11ax (HE20)	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	115.29 PK			1.11 H	54	83.35	31.94
2	*2462.00	102.58 AV			1.11 H	54	70.64	31.94
3	2483.50	67.68 PK	74.00	-6.32	1.32 H	44	35.70	31.98
4	2483.50	53.77 AV	54.00	-0.23	1.32 H	44	21.79	31.98
5	4924.00	46.64 PK	74.00	-27.36	2.21 H	12	43.80	2.84
6	4924.00	35.17 AV	54.00	-18.83	2.21 H	12	32.33	2.84

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	111.57 PK			1.55 V	330	79.63	31.94
2	*2462.00	98.98 AV			1.55 V	330	67.04	31.94
3	2483.50	61.51 PK	74.00	-12.49	1.63 V	315	29.53	31.98
4	2483.50	49.58 AV	54.00	-4.42	1.63 V	315	17.60	31.98
5	4924.00	47.06 PK	74.00	-26.94	2.14 V	14	44.22	2.84
6	4924.00	34.01 AV	54.00	-19.99	2.14 V	14	31.17	2.84

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.

RF Mode	TX 802.11ax (HE40)	Channel	CH 3 : 2422 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	68.79 PK	74.00	-5.21	1.76 H	45	36.81	31.98
2	2390.00	53.54 AV	54.00	-0.46	1.76 H	45	21.56	31.98
3	*2422.00	112.69 PK			1.56 H	51	80.74	31.95
4	*2422.00	100.47 AV			1.56 H	51	68.52	31.95
5	4844.00	46.84 PK	74.00	-27.16	1.66 H	64	43.93	2.91
6	4844.00	34.09 AV	54.00	-19.91	1.66 H	64	31.18	2.91

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	65.96 PK	74.00	-8.04	2.50 V	56	33.98	31.98
2	2390.00	52.90 AV	54.00	-1.10	2.50 V	56	20.92	31.98
3	*2422.00	110.40 PK			2.41 V	46	78.45	31.95
4	*2422.00	96.80 AV			2.41 V	46	64.85	31.95
5	4844.00	47.51 PK	74.00	-26.49	2.31 V	54	44.60	2.91
6	4844.00	35.17 AV	54.00	-18.83	2.31 V	54	32.26	2.91

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX 802.11ax (HE40)	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	65.13 PK	74.00	-8.87	1.24 H	63	33.15	31.98
2	2390.00	53.11 AV	54.00	-0.89	1.24 H	63	21.13	31.98
3	*2437.00	114.09 PK			1.13 H	55	82.16	31.93
4	*2437.00	101.40 AV			1.13 H	55	69.47	31.93
5	4874.00	46.18 PK	74.00	-27.82	1.24 H	54	43.33	2.85
6	4874.00	34.25 AV	54.00	-19.75	1.24 H	54	31.40	2.85

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	64.09 PK	74.00	-9.91	2.09 V	46	32.11	31.98
2	2390.00	50.18 AV	54.00	-3.82	2.09 V	46	18.20	31.98
3	*2437.00	109.80 PK			2.19 V	39	77.87	31.93
4	*2437.00	97.40 AV			2.19 V	39	65.47	31.93
5	4874.00	47.30 PK	74.00	-26.70	2.24 V	54	44.45	2.85
6	4874.00	35.59 AV	54.00	-18.41	2.24 V	54	32.74	2.85

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX 802.11ax (HE40)	Channel	CH 9 : 2452 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	110.67 PK			1.00 H	60	78.75	31.92
2	*2452.00	97.71 AV			1.00 H	60	65.79	31.92
3	2483.50	66.34 PK	74.00	-7.66	1.10 H	52	34.36	31.98
4	2483.50	53.08 AV	54.00	-0.92	1.10 H	52	21.10	31.98
5	4904.00	46.70 PK	74.00	-27.30	1.64 H	62	43.89	2.81
6	4904.00	33.71 AV	54.00	-20.29	1.64 H	62	30.90	2.81

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	105.41 PK			2.41 V	45	73.49	31.92
2	*2452.00	93.59 AV			2.41 V	45	61.67	31.92
3	2483.50	61.37 PK	74.00	-12.63	2.56 V	63	29.39	31.98
4	2483.50	49.06 AV	54.00	-4.94	2.56 V	63	17.08	31.98
5	4904.00	48.15 PK	74.00	-25.85	2.21 V	58	45.34	2.81
6	4904.00	35.60 AV	54.00	-18.40	2.21 V	58	32.79	2.81

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.



Scanning radio (Radio 3)

RF Mode	TX 802.11b	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.98 PK	74.00	-16.02	2.22 H	311	26.00	31.98
2	2390.00	44.28 AV	54.00	-9.72	2.22 H	311	12.30	31.98
3	*2412.00	103.36 PK			2.39 H	304	71.40	31.96
4	*2412.00	100.56 AV			2.39 H	304	68.60	31.96
5	4824.00	48.64 PK	74.00	-25.36	2.71 H	31	45.70	2.94
6	4824.00	35.34 AV	54.00	-18.66	2.71 H	31	32.40	2.94
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.78 PK	74.00	-16.22	2.02 V	319	25.80	31.98
2	2390.00	44.18 AV	54.00	-9.82	2.02 V	319	12.20	31.98
3	*2412.00	102.16 PK			2.10 V	321	70.20	31.96
4	*2412.00	99.46 AV			2.10 V	321	67.50	31.96
5	4824.00	48.54 PK	74.00	-25.46	2.10 V	324	45.60	2.94
6	4824.00	35.24 AV	54.00	-18.76	2.10 V	324	32.30	2.94

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	104.63 PK			2.41 H	315	72.70	31.93
2	*2437.00	101.83 AV			2.41 H	315	69.90	31.93
3	4874.00	48.85 PK	74.00	-25.15	2.75 H	35	46.00	2.85
4	4874.00	35.65 AV	54.00	-18.35	2.75 H	35	32.80	2.85
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	103.43 PK			2.09 V	323	71.50	31.93
2	*2437.00	100.63 AV			2.09 V	323	68.70	31.93
3	4874.00	48.65 PK	74.00	-25.35	2.15 V	321	45.80	2.85
4	4874.00	35.35 AV	54.00	-18.65	2.15 V	321	32.50	2.85

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX 802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	104.44 PK			2.92 H	315	72.50	31.94
2	*2462.00	101.54 AV			2.92 H	315	69.60	31.94
3	2483.50	58.28 PK	74.00	-15.72	2.77 H	311	26.30	31.98
4	2483.50	46.78 AV	54.00	-7.22	2.77 H	311	14.80	31.98
5	4924.00	48.64 PK	74.00	-25.36	2.68 H	30	45.80	2.84
6	4924.00	35.44 AV	54.00	-18.56	2.68 H	30	32.60	2.84

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	102.54 PK			1.00 V	323	70.60	31.94
2	*2462.00	99.94 AV			1.00 V	323	68.00	31.94
3	2483.50	57.98 PK	74.00	-16.02	2.12 V	320	26.00	31.98
4	2483.50	46.68 AV	54.00	-7.32	2.12 V	320	14.70	31.98
5	4924.00	48.54 PK	74.00	-25.46	2.07 V	325	45.70	2.84
6	4924.00	35.34 AV	54.00	-18.66	2.07 V	325	32.50	2.84

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.

RF Mode	TX 802.11g	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	58.18 PK	74.00	-15.82	2.22 H	316	26.20	31.98
2	2390.00	44.68 AV	54.00	-9.32	2.22 H	316	12.70	31.98
3	*2412.00	104.16 PK			2.15 H	314	72.20	31.96
4	*2412.00	94.26 AV			2.15 H	314	62.30	31.96
5	4824.00	48.34 PK	74.00	-25.66	2.52 H	25	45.40	2.94
6	4824.00	35.44 AV	54.00	-18.56	2.52 H	25	32.50	2.94

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.78 PK	74.00	-16.22	2.23 V	315	25.80	31.98
2	2390.00	44.48 AV	54.00	-9.52	2.23 V	315	12.50	31.98
3	*2412.00	103.66 PK			2.31 V	320	71.70	31.96
4	*2412.00	93.66 AV			2.31 V	320	61.70	31.96
5	4824.00	48.24 PK	74.00	-25.76	2.18 V	333	45.30	2.94
6	4824.00	35.24 AV	54.00	-18.76	2.18 V	333	32.30	2.94

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX 802.11g	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	104.63 PK			2.19 H	315	72.70	31.93
2	*2437.00	94.73 AV			2.19 H	315	62.80	31.93
3	4874.00	48.45 PK	74.00	-25.55	2.61 H	29	45.60	2.85
4	4874.00	35.45 AV	54.00	-18.55	2.61 H	29	32.60	2.85
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	103.83 PK			2.35 V	322	71.90	31.93
2	*2437.00	94.13 AV			2.35 V	322	62.20	31.93
3	4874.00	48.25 PK	74.00	-25.75	2.15 V	325	45.40	2.85
4	4874.00	35.35 AV	54.00	-18.65	2.15 V	325	32.50	2.85

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX 802.11g	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	106.24 PK			2.58 H	308	74.30	31.94
2	*2462.00	95.94 AV			2.58 H	308	64.00	31.94
3	2483.50	58.88 PK	74.00	-15.12	2.42 H	315	26.90	31.98
4	2483.50	47.48 AV	54.00	-6.52	2.42 H	315	15.50	31.98
5	4924.00	48.64 PK	74.00	-25.36	2.63 H	33	45.80	2.84
6	4924.00	35.54 AV	54.00	-18.46	2.63 H	33	32.70	2.84

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	105.34 PK			2.25 V	322	73.40	31.94
2	*2462.00	95.14 AV			2.25 V	322	63.20	31.94
3	2483.50	58.68 PK	74.00	-15.32	2.18 V	320	26.70	31.98
4	2483.50	47.28 AV	54.00	-6.72	2.18 V	320	15.30	31.98
5	4924.00	48.34 PK	74.00	-25.66	2.22 V	327	45.50	2.84
6	4924.00	35.34 AV	54.00	-18.66	2.22 V	327	32.50	2.84

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.

RF Mode	TX VHT20	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	58.48 PK	74.00	-15.52	2.58 H	310	26.50	31.98
2	2390.00	45.08 AV	54.00	-8.92	2.58 H	310	13.10	31.98
3	*2412.00	104.16 PK			2.70 H	307	72.20	31.96
4	*2412.00	94.16 AV			2.70 H	307	62.20	31.96
5	4824.00	48.54 PK	74.00	-25.46	2.66 H	34	45.60	2.94
6	4824.00	35.44 AV	54.00	-18.56	2.66 H	34	32.50	2.94

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.78 PK	74.00	-16.22	2.39 V	314	25.80	31.98
2	2390.00	44.68 AV	54.00	-9.32	2.39 V	314	12.70	31.98
3	*2412.00	103.66 PK			2.33 V	320	71.70	31.96
4	*2412.00	93.16 AV			2.33 V	320	61.20	31.96
5	4824.00	48.44 PK	74.00	-25.56	2.15 V	324	45.50	2.94
6	4824.00	35.34 AV	54.00	-18.66	2.15 V	324	32.40	2.94

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.

RF Mode	TX VHT20	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	106.03 PK			2.38 H	304	74.10	31.93
2	*2437.00	95.83 AV			2.38 H	304	63.90	31.93
3	4874.00	48.65 PK	74.00	-25.35	2.58 H	30	45.80	2.85
4	4874.00	35.55 AV	54.00	-18.45	2.58 H	30	32.70	2.85
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	105.13 PK			2.36 V	319	73.20	31.93
2	*2437.00	94.93 AV			2.36 V	319	63.00	31.93
3	4874.00	48.45 PK	74.00	-25.55	2.31 V	326	45.60	2.85
4	4874.00	35.35 AV	54.00	-18.65	2.31 V	326	32.50	2.85

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.



RF Mode	TX VHT20	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	106.54 PK			2.56 H	310	74.60	31.94
2	*2462.00	95.94 AV			2.56 H	310	64.00	31.94
3	2483.50	58.98 PK	74.00	-15.02	2.49 H	312	27.00	31.98
4	2483.50	47.88 AV	54.00	-6.12	2.49 H	312	15.90	31.98
5	4924.00	48.84 PK	74.00	-25.16	2.62 H	37	46.00	2.84
6	4924.00	35.64 AV	54.00	-18.36	2.62 H	37	32.80	2.84

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	105.34 PK			2.09 V	319	73.40	31.94
2	*2462.00	94.84 AV			2.09 V	319	62.90	31.94
3	2483.50	58.78 PK	74.00	-15.22	2.18 V	322	26.80	31.98
4	2483.50	47.38 AV	54.00	-6.62	2.18 V	322	15.40	31.98
5	4924.00	48.54 PK	74.00	-25.46	2.19 V	329	45.70	2.84
6	4924.00	35.44 AV	54.00	-18.56	2.19 V	329	32.60	2.84

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX VHT40	Channel	CH 3 : 2422 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	60.38 PK	74.00	-13.62	2.62 H	319	28.40	31.98
2	2390.00	47.68 AV	54.00	-6.32	2.62 H	319	15.70	31.98
3	*2422.00	103.75 PK			2.70 H	314	71.80	31.95
4	*2422.00	93.15 AV			2.70 H	314	61.20	31.95
5	4844.00	48.91 PK	74.00	-25.09	2.58 H	30	46.00	2.91
6	4844.00	35.41 AV	54.00	-18.59	2.58 H	30	32.50	2.91

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	59.78 PK	74.00	-14.22	2.28 V	312	27.80	31.98
2	2390.00	46.78 AV	54.00	-7.22	2.28 V	312	14.80	31.98
3	*2422.00	102.55 PK			2.30 V	322	70.60	31.95
4	*2422.00	91.95 AV			2.30 V	322	60.00	31.95
5	4844.00	48.61 PK	74.00	-25.39	2.27 V	326	45.70	2.91
6	4844.00	35.11 AV	54.00	-18.89	2.27 V	326	32.20	2.91

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX VHT40	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	103.53 PK			2.35 H	304	71.60	31.93
2	*2437.00	92.93 AV			2.35 H	304	61.00	31.93
3	4874.00	48.75 PK	74.00	-25.25	2.68 H	36	45.90	2.85
4	4874.00	35.25 AV	54.00	-18.75	2.68 H	36	32.40	2.85
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	102.23 PK			2.26 V	318	70.30	31.93
2	*2437.00	91.73 AV			2.26 V	318	59.80	31.93
3	4874.00	48.55 PK	74.00	-25.45	2.19 V	322	45.70	2.85
4	4874.00	35.15 AV	54.00	-18.85	2.19 V	322	32.30	2.85

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

RF Mode	TX VHT40	Channel	CH 9 : 2452 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	103.12 PK			2.36 H	311	71.20	31.92
2	*2452.00	91.92 AV			2.36 H	311	60.00	31.92
3	2483.50	65.88 PK	74.00	-8.12	2.30 H	312	33.90	31.98
4	2483.50	53.38 AV	54.00	-0.62	2.30 H	312	21.40	31.98
5	4904.00	48.51 PK	74.00	-25.49	2.62 H	34	45.70	2.81
6	4904.00	35.01 AV	54.00	-18.99	2.62 H	34	32.20	2.81

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	101.82 PK			2.31 V	321	69.90	31.92
2	*2452.00	90.62 AV			2.31 V	321	58.70	31.92
3	2483.50	64.68 PK	74.00	-9.32	2.39 V	314	32.70	31.98
4	2483.50	51.68 AV	54.00	-2.32	2.39 V	314	19.70	31.98
5	4904.00	48.31 PK	74.00	-25.69	2.20 V	326	45.50	2.81
6	4904.00	34.81 AV	54.00	-19.19	2.20 V	326	32.00	2.81

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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " \* " : Fundamental frequency.

Below 1GHz worst-case data:

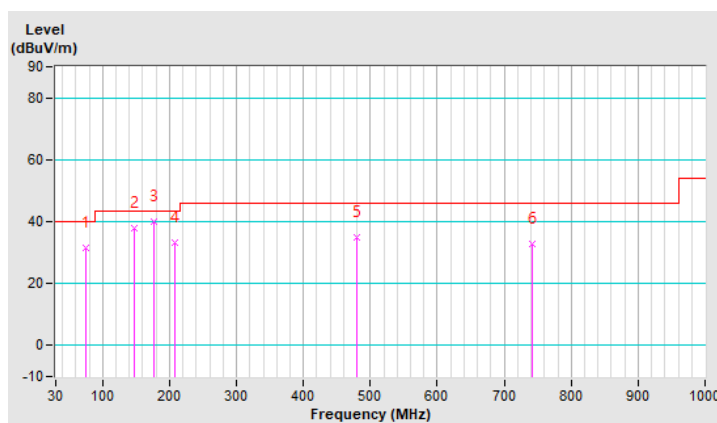
2G traffic radio (Radio 2)

RF Mode	TX 802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	A		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	74.99	31.58 QP	40.00	-8.42	1.99 H	310	48.31	-16.73
2	146.68	37.71 QP	43.50	-5.79	1.00 H	271	50.79	-13.08
3	176.20	40.11 QP	43.50	-3.39	1.00 H	252	54.24	-14.13
4	207.13	33.18 QP	43.50	-10.32	1.49 H	184	49.96	-16.78
5	479.86	34.80 QP	46.00	-11.20	1.00 H	32	43.00	-8.20
6	742.74	32.61 QP	46.00	-13.39	1.99 H	32	35.82	-3.21

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 of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

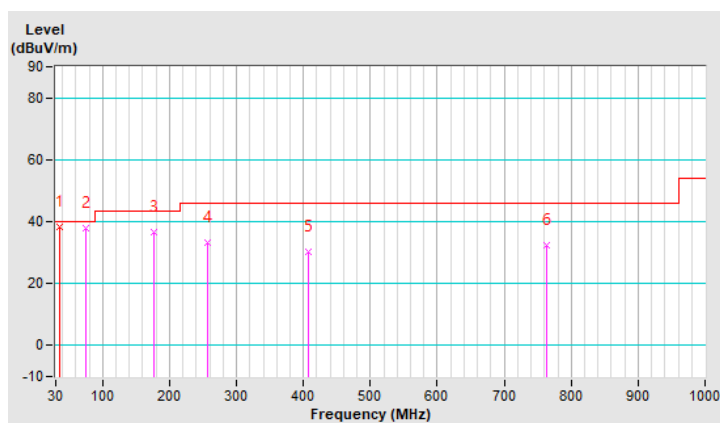


RF Mode	TX 802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	A		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	36.01	38.44 QP	40.00	-1.56	1.00 V	5	52.62	-14.18
2	74.99	38.08 QP	40.00	-1.92	1.00 V	254	54.81	-16.73
3	176.20	36.44 QP	43.50	-7.06	1.00 V	18	50.57	-14.13
4	256.33	33.08 QP	46.00	-12.92	1.00 V	283	47.31	-14.23
5	408.16	30.22 QP	46.00	-15.78	1.49 V	151	40.21	-9.99
6	762.42	32.37 QP	46.00	-13.63	1.00 V	306	35.30	-2.93

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 of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

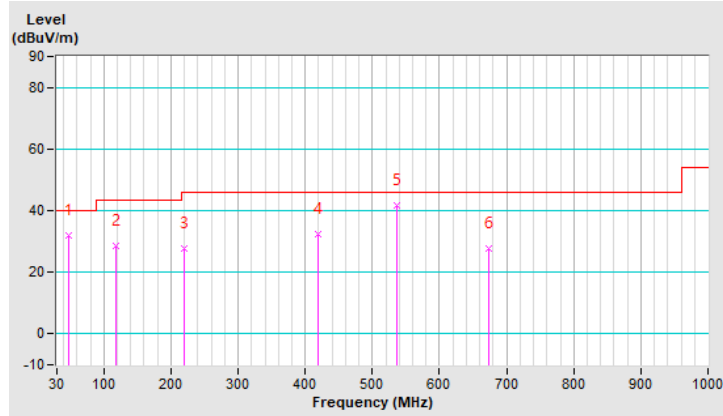


RF Mode	TX 802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	B		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	48.28	31.86 QP	40.00	-8.14	1.51 H	86	44.93	-13.07
2	117.16	28.74 QP	43.50	-14.76	1.51 H	244	44.36	-15.62
3	219.78	27.92 QP	46.00	-18.08	1.01 H	2	44.54	-16.62
4	419.41	32.41 QP	46.00	-13.59	2.00 H	138	42.09	-9.68
5	536.09	41.82 QP	46.00	-4.18	1.51 H	138	49.05	-7.23
6	672.45	27.77 QP	46.00	-18.23	1.01 H	270	32.33	-4.56

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 of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

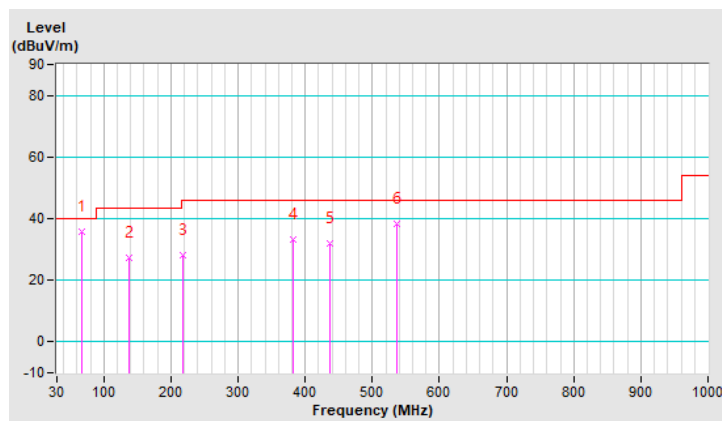


RF Mode	TX 802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	B		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	66.55	35.77 QP	40.00	-4.23	1.01 V	207	50.57	-14.80
2	138.25	27.12 QP	43.50	-16.38	1.01 V	195	40.84	-13.72
3	218.38	28.09 QP	46.00	-17.91	1.01 V	314	44.72	-16.63
4	381.45	33.41 QP	46.00	-12.59	1.01 V	162	44.01	-10.60
5	436.28	31.84 QP	46.00	-14.16	1.01 V	223	40.84	-9.00
6	536.09	38.34 QP	46.00	-7.66	1.01 V	166	45.57	-7.23

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 of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.





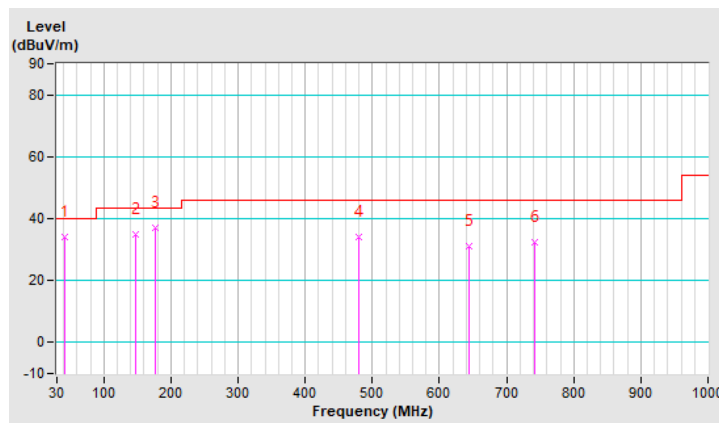
Scanning radio (Radio 3)

RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	A		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	42.65	34.20 QP	40.00	-5.80	2.00 H	263	47.52	-13.32
2	146.68	34.92 QP	43.50	-8.58	2.00 H	265	48.00	-13.08
3	176.20	36.88 QP	43.50	-6.62	1.51 H	255	51.01	-14.13
4	479.86	34.19 QP	46.00	-11.81	1.01 H	151	42.39	-8.20
5	644.33	31.28 QP	46.00	-14.72	1.01 H	18	35.88	-4.60
6	742.74	32.25 QP	46.00	-13.75	2.00 H	250	35.46	-3.21

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 of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

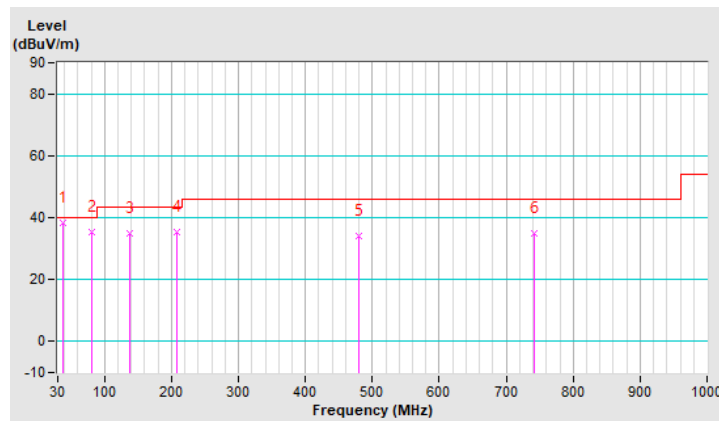


RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	A		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	38.43	38.22 QP	40.00	-1.78	1.49 V	147	51.93	-13.71
2	80.61	35.22 QP	40.00	-4.78	1.00 V	181	53.51	-18.29
3	138.25	34.74 QP	43.50	-8.76	1.00 V	319	48.46	-13.72
4	207.13	35.33 QP	43.50	-8.17	1.00 V	207	52.11	-16.78
5	479.86	34.16 QP	46.00	-11.84	1.99 V	45	42.36	-8.20
6	742.74	34.92 QP	46.00	-11.08	1.49 V	134	38.13	-3.21

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 of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

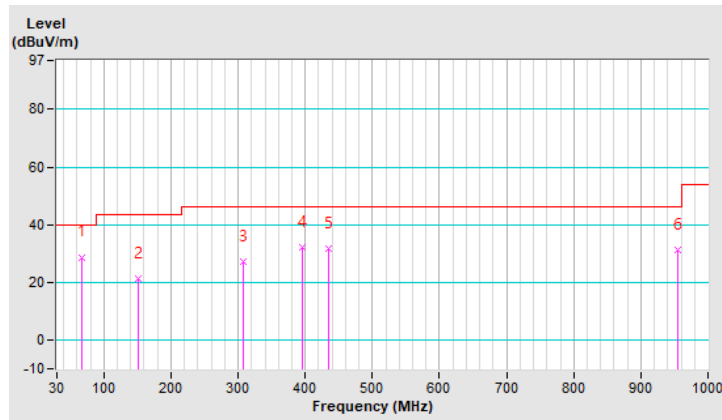


RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	B		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	66.55	28.80 QP	40.00	-11.20	1.01 H	221	43.70	-14.90
2	150.90	21.20 QP	43.50	-22.30	1.01 H	107	34.30	-13.10
3	306.94	27.20 QP	46.00	-18.80	1.01 H	236	39.60	-12.40
4	395.51	32.30 QP	46.00	-13.70	2.00 H	266	42.50	-10.20
5	434.87	31.80 QP	46.00	-14.20	2.00 H	354	40.80	-9.00
6	955.01	31.30 QP	46.00	-14.70	1.01 H	289	31.80	-0.50

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

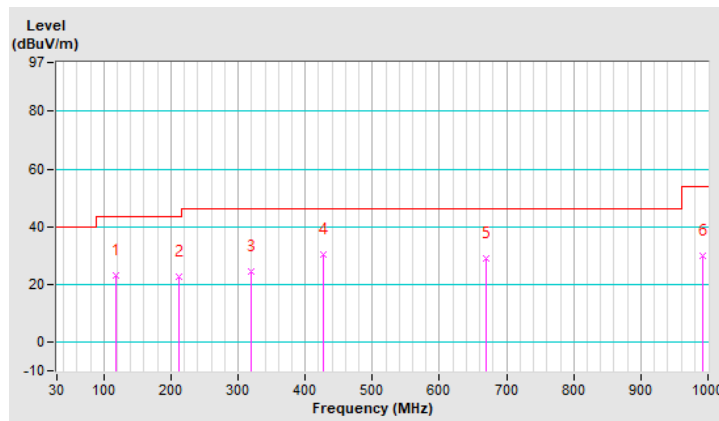


RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Test Mode	B		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	117.16	23.10 QP	43.50	-20.40	1.99 V	2	38.70	-15.60
2	212.75	22.70 QP	43.50	-20.80	1.49 V	197	39.40	-16.70
3	319.59	24.50 QP	46.00	-21.50	1.00 V	46	36.50	-12.00
4	426.43	30.40 QP	46.00	-15.60	1.00 V	176	39.90	-9.50
5	669.64	29.10 QP	46.00	-16.90	1.99 V	2	33.70	-4.60
6	991.57	30.10 QP	54.00	-23.90	1.00 V	113	30.40	-0.30

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



## 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	Dec. 03, 2021	Dec. 02, 2022
RF signal cable Woken	5D-FB	Cable-cond1-01	Jan. 15, 2022	Jan. 14, 2023
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Mar. 14, 2022	Mar. 13, 2023
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Sep. 07, 2021	Sep. 06, 2022
Software ADT	BV ADT_Cond_ V7.3.7.4	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 (Conduction 1).  
 3. The VCCI Site Registration No. is C-12040.

#### 4.2.3 Test Procedures

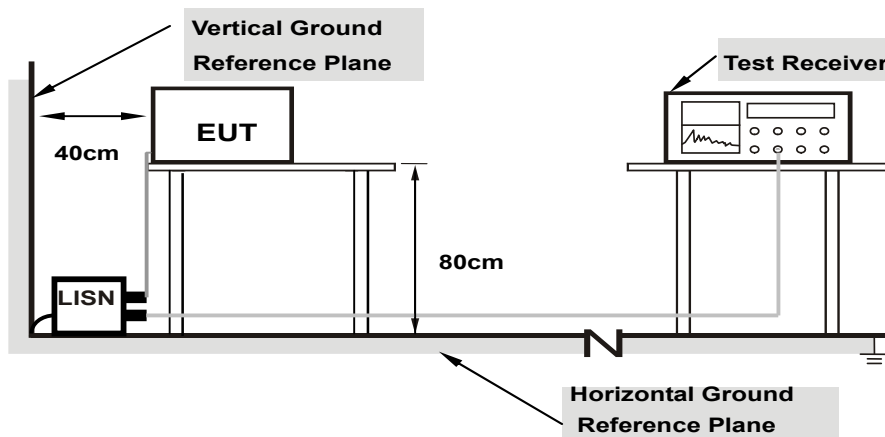
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance 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) was not recorded.

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

#### 4.2.4 Deviation from Test Standard

No deviation.

#### 4.2.5 Test Setup



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

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

#### 4.2.6 EUT Operating Conditions

Same as 4.1.6.

### 4.2.7 Test Results

Worst-case data:

2G traffic radio (Radio 2)

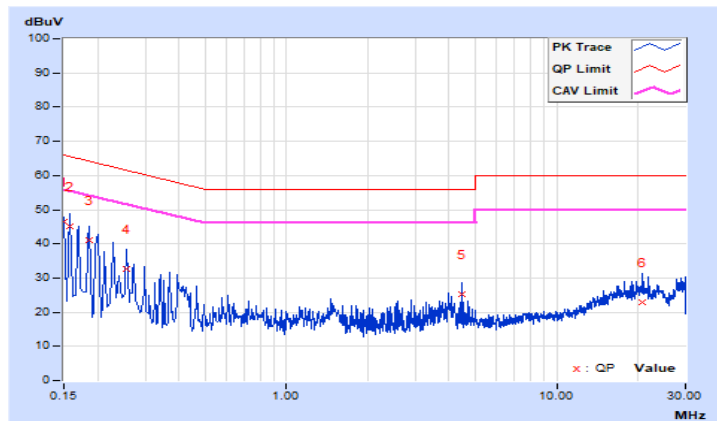
802.11ax (HE20)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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	0.15000	9.62	36.74	20.73	46.36	30.35	66.00
2	0.15760	9.62	35.58	16.09	45.20	25.71	65.59	55.59	-20.39	-29.88
3	0.18519	9.63	31.34	13.11	40.97	22.74	64.25	54.25	-23.28	-31.51
4	0.25557	9.65	22.85	10.84	32.50	20.49	61.57	51.57	-29.07	-31.08
5	4.47446	9.75	15.46	2.17	25.21	11.92	56.00	46.00	-30.79	-34.08
6	20.86127	9.87	13.01	5.89	22.88	15.76	60.00	50.00	-37.12	-34.24

Remarks:

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

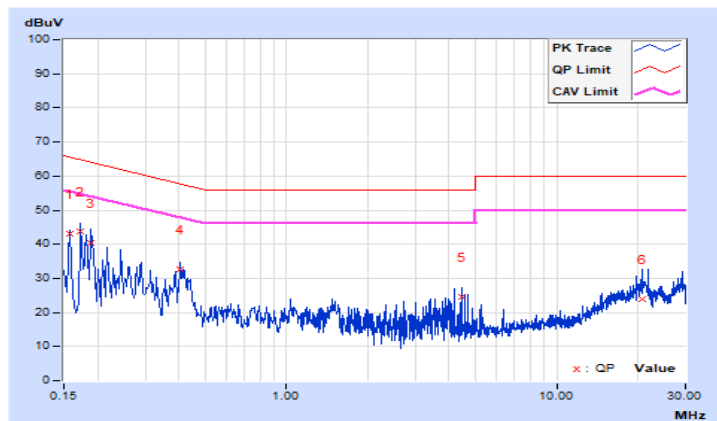


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq. [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	0.15760	9.62	33.52	17.49	43.14	27.11	65.59
2	0.17346	9.63	34.17	18.19	43.80	27.82	64.79	54.79	-20.99	-26.97
3	0.18910	9.64	30.91	14.15	40.55	23.79	64.08	54.08	-23.53	-30.29
4	0.40415	9.69	22.91	14.76	32.60	24.45	57.77	47.77	-25.17	-23.32
5	4.47055	9.75	14.88	1.77	24.63	11.52	56.00	46.00	-31.37	-34.48
6	20.65795	9.90	14.13	6.85	24.03	16.75	60.00	50.00	-35.97	-33.25

Remarks:

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



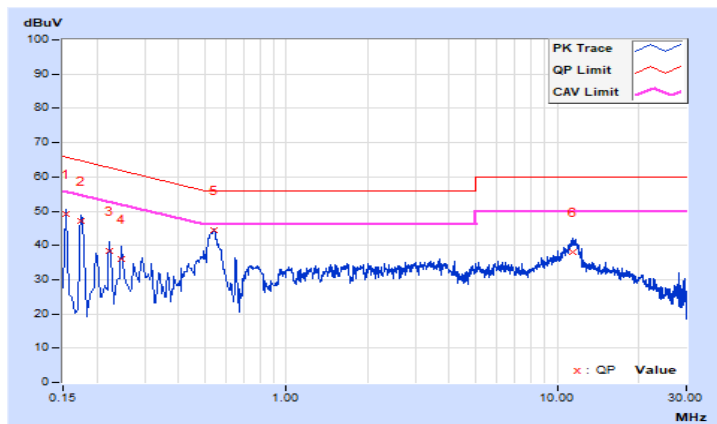


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq. [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	0.15400	9.62	39.65	24.85	49.27	34.47	65.78
2	0.17400	9.63	37.35	20.88	46.98	30.51	64.77	54.77	-17.79	-24.26
3	0.22200	9.65	28.87	14.68	38.52	24.33	62.74	52.74	-24.22	-28.41
4	0.24600	9.65	26.30	14.96	35.95	24.61	61.89	51.89	-25.94	-27.28
<b>5</b>	<b>0.54200</b>	<b>9.69</b>	<b>34.65</b>	<b>30.03</b>	<b>44.34</b>	<b>39.72</b>	<b>56.00</b>	<b>46.00</b>	<b>-11.66</b>	<b>-6.28</b>
6	11.47800	9.82	28.34	23.71	38.16	33.53	60.00	50.00	-21.84	-16.47

Remarks:

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

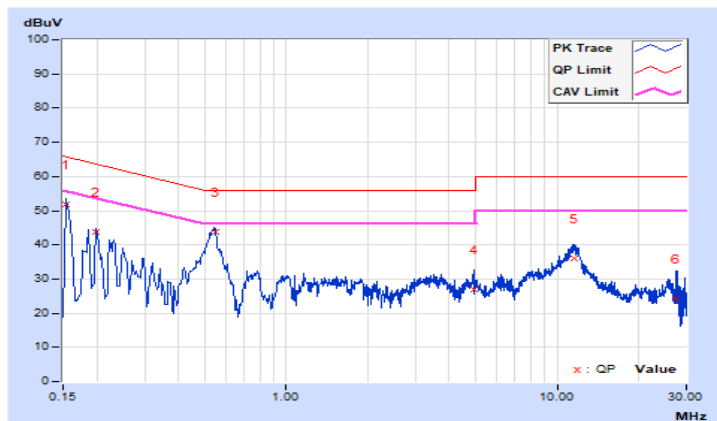


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	0.15400	9.62	42.12	25.47	51.74	35.09	65.78
2	0.19800	9.64	34.02	17.62	43.66	27.26	63.69	53.69	-20.03	-26.43
3	0.54600	9.69	34.08	29.40	43.77	39.09	56.00	46.00	-12.23	-6.91
4	4.91400	9.76	17.09	10.72	26.85	20.48	56.00	46.00	-29.15	-25.52
5	11.59800	9.83	26.28	21.41	36.11	31.24	60.00	50.00	-23.89	-18.76
6	27.39800	9.87	14.40	8.22	24.27	18.09	60.00	50.00	-35.73	-31.91

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.



Scanning radio (Radio 3)

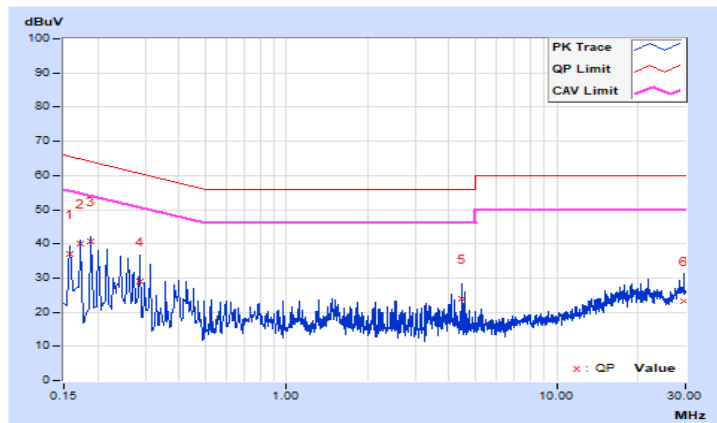
802.11b

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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	9.62	27.41	16.06	37.03	25.68	65.58	55.58	-28.55	-29.90
2	0.17346	9.63	30.41	16.24	40.04	25.87	64.79	54.79	-24.75	-28.92
3	0.18910	9.64	31.02	13.11	40.66	22.75	64.08	54.08	-23.42	-31.33
4	0.28685	9.66	19.31	7.48	28.97	17.14	60.62	50.62	-31.65	-33.48
5	4.47837	9.75	14.04	1.06	23.79	10.81	56.00	46.00	-32.21	-35.19
6	29.59230	9.89	13.39	7.02	23.28	16.91	60.00	50.00	-36.72	-33.09

Remarks:

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

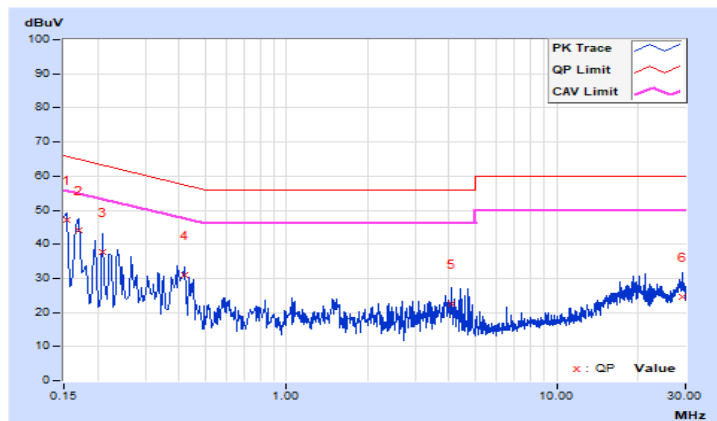


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq. [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	9.62	37.41	20.84	47.03	30.46	65.79
2	0.16955	9.63	34.51	18.59	44.14	28.22	64.98	54.98	-20.84	-26.76
3	0.20865	9.64	28.02	11.25	37.66	20.89	63.26	53.26	-25.60	-32.37
4	0.41979	9.69	21.42	13.41	31.11	23.10	57.45	47.45	-26.34	-24.35
5	4.07173	9.75	12.65	1.65	22.40	11.40	56.00	46.00	-33.60	-34.60
6	29.42026	9.87	14.66	8.59	24.53	18.46	60.00	50.00	-35.47	-31.54

Remarks:

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

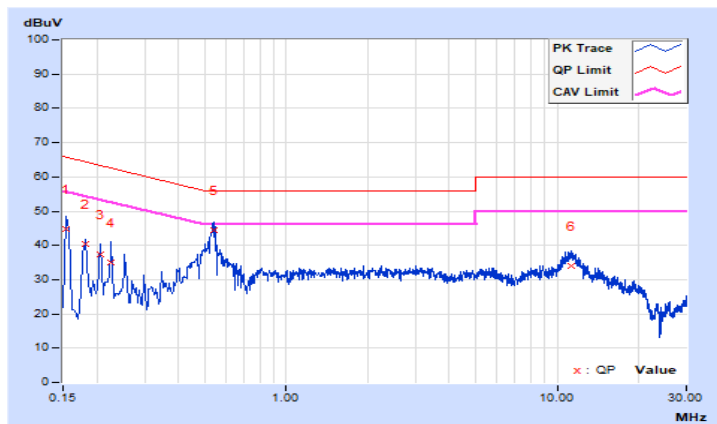


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq. [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	0.15400	9.62	35.25	14.52	44.87	24.14	65.78
2	0.18180	9.63	30.81	11.93	40.44	21.56	64.40	54.40	-23.96	-32.84
3	0.20577	9.64	27.62	11.53	37.26	21.17	63.37	53.37	-26.11	-32.20
4	0.22600	9.65	25.23	11.50	34.88	21.15	62.60	52.60	-27.72	-31.45
5	0.53800	9.69	34.66	23.99	44.35	33.68	56.00	46.00	-11.65	-12.32
6	11.21400	9.82	24.30	14.14	34.12	23.96	60.00	50.00	-25.88	-26.04

Remarks:

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

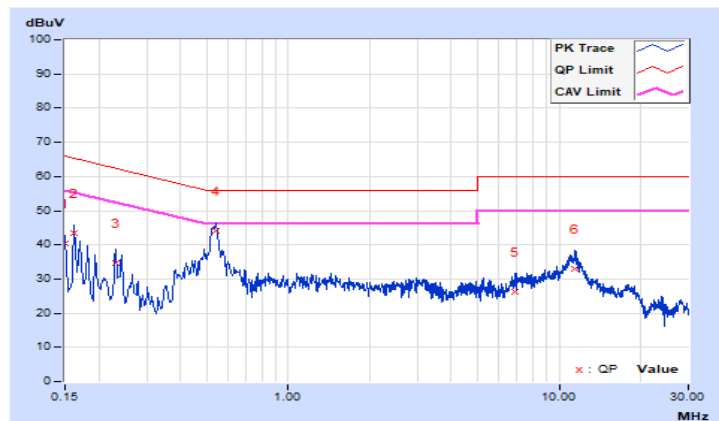


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	0.15000	9.62	30.88	14.55	40.50	24.17	66.00
2	0.16200	9.62	33.94	12.66	43.56	22.28	65.36	55.36	-21.80	-33.08
3	0.23000	9.65	25.16	11.18	34.81	20.83	62.45	52.45	-27.64	-31.62
4	0.54200	9.69	34.57	23.86	44.26	33.55	56.00	46.00	-11.74	-12.45
5	6.90600	9.78	16.55	7.11	26.33	16.89	60.00	50.00	-33.67	-33.11
6	11.39000	9.82	23.04	12.91	32.86	22.73	60.00	50.00	-27.14	-27.27

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.

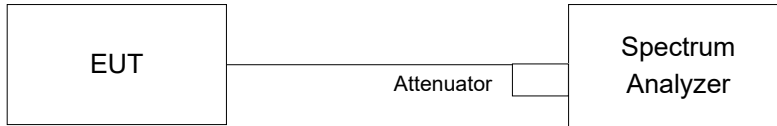


### 4.3 6dB Bandwidth Measurement

#### 4.3.1 Limits of 6dB Bandwidth Measurement

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

#### 4.3.5 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

##### 2G traffic radio (Radio 2)

##### 802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	8.09	8.07	0.50	Pass
6	2437	8.07	8.08	0.50	Pass
11	2462	8.08	7.58	0.50	Pass

##### 802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.97	15.77	0.50	Pass
6	2437	15.76	16.04	0.50	Pass
11	2462	16.01	15.48	0.50	Pass

##### 802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	18.40	18.10	0.50	Pass
6	2437	18.14	18.23	0.50	Pass
11	2462	18.25	18.37	0.50	Pass

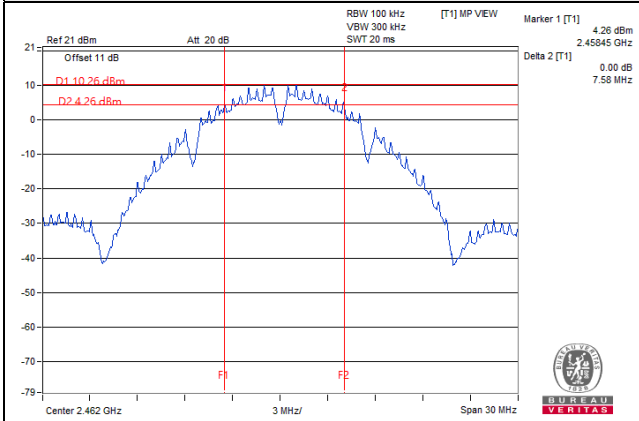
##### 802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	36.68	36.28	0.50	Pass
6	2437	37.75	37.40	0.50	Pass
9	2452	37.97	37.93	0.50	Pass

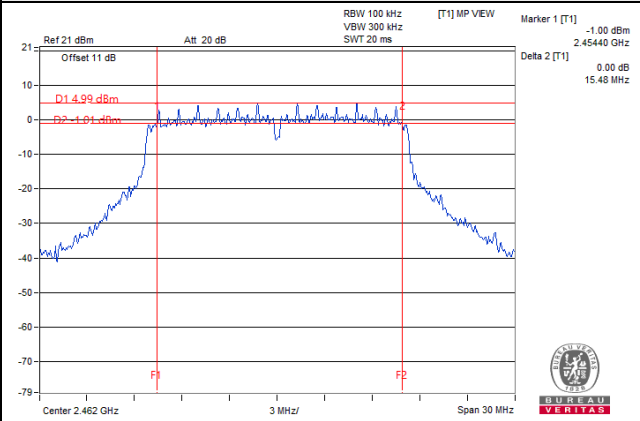


### Spectrum Plot of Worst Value

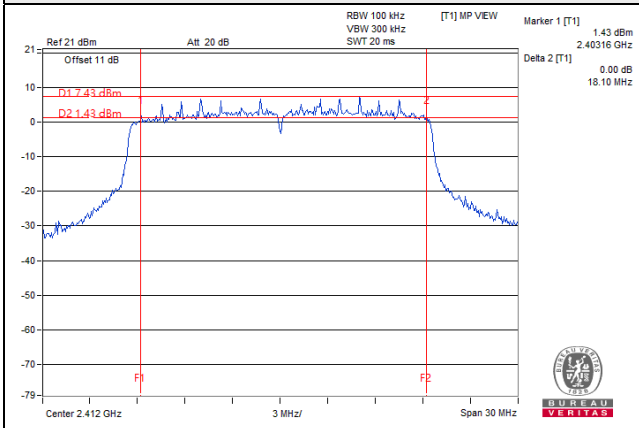
#### 802.11b



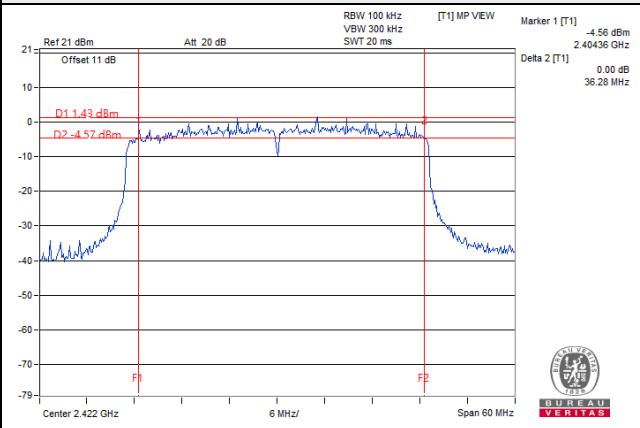
#### 802.11g



#### 802.11ax (HE20)



#### 802.11ax (HE40)



Scanning radio (Radio 3)

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	7.10	0.50	Pass
6	2437	7.11	0.50	Pass
11	2462	7.11	0.50	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	15.78	0.50	Pass
6	2437	16.09	0.50	Pass
11	2462	16.34	0.50	Pass

VHT20

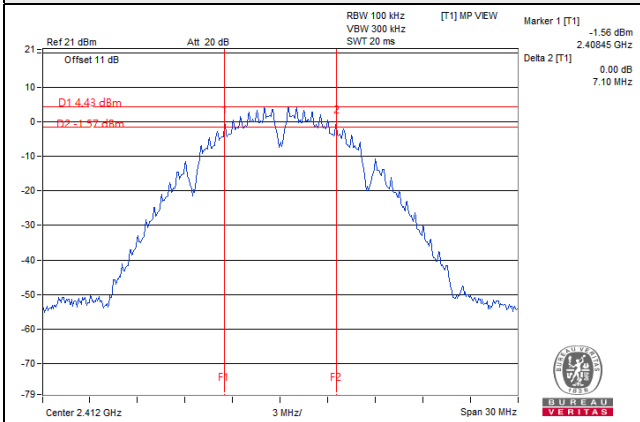
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.37	0.50	Pass
6	2437	17.20	0.50	Pass
11	2462	17.30	0.50	Pass

VHT40

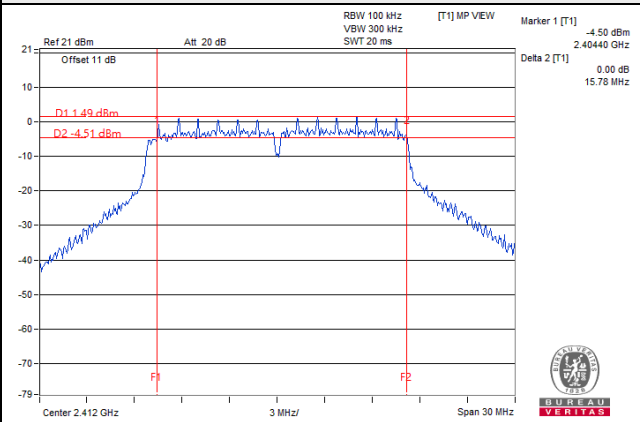
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
3	2422	35.49	0.50	Pass
6	2437	36.71	0.50	Pass
9	2452	36.77	0.50	Pass

### Spectrum Plot of Worst Value

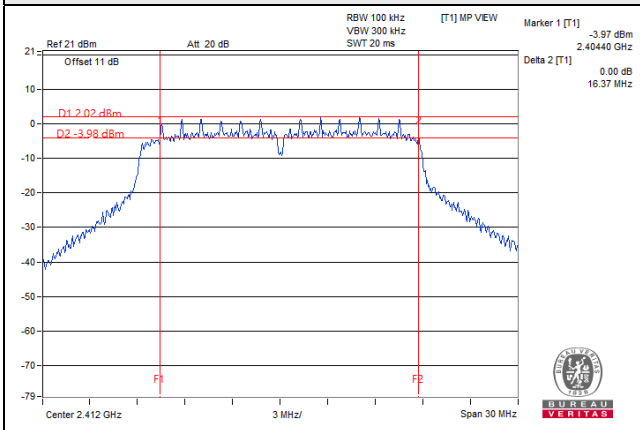
#### 802.11b



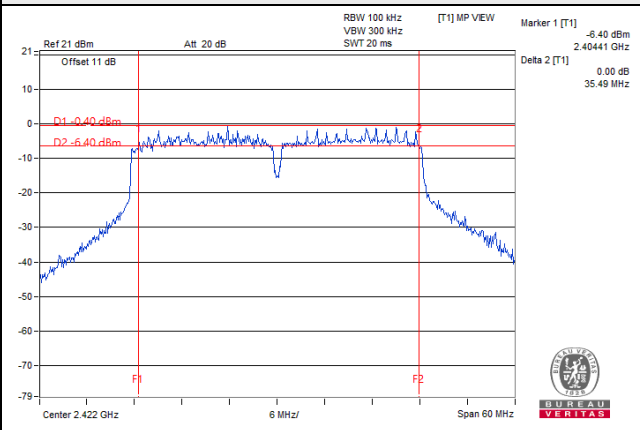
#### 802.11g



#### VHT20



#### VHT40



## 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 (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

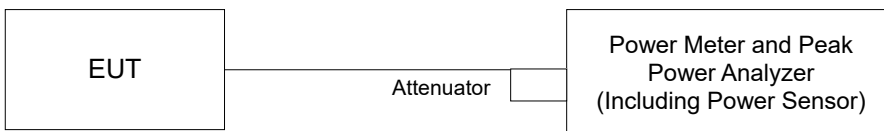
Array Gain = 0 dB (i.e., no array gain) for  $N_{ANT} \leq 4$ ;

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

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

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

### 4.4.2 Test Setup



### 4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.4.4 Test Procedures

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

### 4.4.5 Deviation from Test Standard

No deviation.

### 4.4.6 EUT Operating Conditions

Same as item 4.3.6.

#### 4.4.7 Test Results

2G traffic radio (Radio 2)

CDD Mode

802.11b

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.02	20.55	213.963	23.30	30.00	Pass
6	2437	18.52	18.82	147.329	21.68	30.00	Pass
11	2462	18.51	18.83	147.341	21.68	30.00	Pass

802.11g

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.82	19.23	159.961	22.04	30.00	Pass
6	2437	20.05	20.31	208.557	23.19	30.00	Pass
11	2462	15.37	15.53	70.162	18.46	30.00	Pass

VHT20

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.43	17.66	113.680	20.56	30.00	Pass
6	2437	20.05	20.33	209.053	23.20	30.00	Pass
11	2462	13.41	13.69	45.316	16.56	30.00	Pass

VHT40

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	14.92	15.24	64.465	18.09	30.00	Pass
6	2437	15.22	15.45	68.341	18.35	30.00	Pass
9	2452	11.63	12.32	31.615	15.00	30.00	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.54	17.79	116.872	20.68	30.00	Pass
6	2437	20.14	20.45	<b>214.194</b>	23.31	30.00	Pass
11	2462	13.52	13.81	46.534	16.68	30.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	15.02	15.35	66.046	18.20	30.00	Pass
6	2437	15.34	15.57	70.256	18.47	30.00	Pass
9	2452	11.74	12.41	32.346	15.10	30.00	Pass

### Beamforming Mode

#### VHT20

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.43	17.66	113.680	20.56	29.56	Pass
6	2437	20.05	20.33	209.053	23.20	29.56	Pass
11	2462	13.41	13.69	45.316	16.56	29.56	Pass

Note: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.44\text{dBi} > 6\text{dBi}$ , so the power limit shall be reduced to  $30 - (6.44 - 6) = 29.56\text{dBm}$ .

#### VHT40

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	14.92	15.24	64.465	18.09	29.56	Pass
6	2437	15.22	15.45	68.341	18.35	29.56	Pass
9	2452	11.63	12.32	31.615	15.00	29.56	Pass

Note: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.44\text{dBi} > 6\text{dBi}$ , so the power limit shall be reduced to  $30 - (6.44 - 6) = 29.56\text{dBm}$ .

#### 802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.54	17.79	116.872	20.68	29.56	Pass
6	2437	20.14	20.45	<b>214.194</b>	23.31	29.56	Pass
11	2462	13.52	13.81	46.534	16.68	29.56	Pass

Note: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.44\text{dBi} > 6\text{dBi}$ , so the power limit shall be reduced to  $30 - (6.44 - 6) = 29.56\text{dBm}$ .

#### 802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	15.02	15.35	66.046	18.20	29.56	Pass
6	2437	15.34	15.57	70.256	18.47	29.56	Pass
9	2452	11.74	12.41	32.346	15.10	29.56	Pass

Note: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.44\text{dBi} > 6\text{dBi}$ , so the power limit shall be reduced to  $30 - (6.44 - 6) = 29.56\text{dBm}$ .

Scanning radio (Radio 3)

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	17.660	12.47	30.00	Pass
6	2437	<b>17.742</b>	12.49	30.00	Pass
11	2462	16.943	12.29	30.00	Pass

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	17.258	12.37	30.00	Pass
6	2437	17.418	12.41	30.00	Pass
11	2462	16.255	12.11	30.00	Pass

VHT20

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	17.258	12.37	30.00	Pass
6	2437	17.539	12.44	30.00	Pass
11	2462	17.458	12.42	30.00	Pass

VHT40

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	17.140	12.34	30.00	Pass
6	2437	16.904	12.28	30.00	Pass
9	2452	15.311	11.85	30.00	Pass

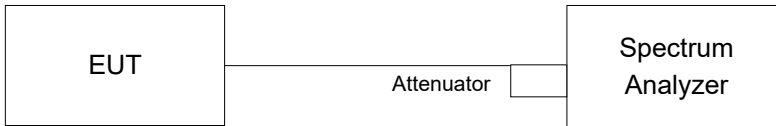


## 4.5 Power Spectral Density Measurement

### 4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm in any 3 kHz.

### 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

For Average Power (Duty cycle  $\geq 98\%$ )

- Set instrument center frequency to DTS channel center frequency.
- Set span to at least 1.5 times the OBW.
- Set RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- Set VBW  $\geq 3 \times \text{RBW}$ .
- Detector = power averaging (RMS) or sample detector (when RMS not available).
- Ensure that the number of measurement points in the sweep  $\geq 2 \times \text{span}/\text{RBW}$ .
- Sweep time = auto couple.
- Employ trace averaging (RMS) mode over a minimum of 100 traces.
- Use the peak marker function to determine the maximum amplitude level.

For Average Power (Duty cycle  $< 98\%$ )

- Measure the duty cycle (x).
- Set instrument center frequency to DTS channel center frequency.
- Set span to at least 1.5 times the OBW.
- Set RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- Set VBW  $\geq 3 \times \text{RBW}$ .
- Detector = power averaging (RMS) or sample detector (when RMS not available).
- Ensure that the number of measurement points in the sweep  $\geq 2 \times \text{span}/\text{RBW}$ .
- Sweep time = auto couple.
- Do not use sweep triggering. Allow sweep to "free run".
- Employ trace averaging (RMS) mode over a minimum of 100 traces.
- Use the peak marker function to determine the maximum amplitude level.
- Add  $10 \log (1/x)$ , where x is the duty cycle measured in step (a), to the measured PSD to compute the average PSD during the actual transmission time.

#### **4.5.5 Deviation from Test Standard**

No deviation.

#### **4.5.6 EUT Operating Condition**

Same as item 4.3.6

#### 4.5.7 Test Results

##### 2G traffic radio (Radio 2)

##### 802.11b

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-13.85	3.01	2.49	-8.35	7.56	Pass
	6	2437	-15.14	3.01	2.49	-9.64	7.56	Pass
	11	2462	-15.05	3.01	2.49	-9.55	7.56	Pass
1	1	2412	-13.23	3.01	2.49	-7.73	7.56	Pass
	6	2437	-14.61	3.01	2.49	-9.11	7.56	Pass
	11	2462	-14.56	3.01	2.49	-9.06	7.56	Pass

Note:

- Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure value and add  $10 \log (N_{ANT})$  dB.
- Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.44\text{dBi} > 6\text{dBi}$ , so the power density limit shall be reduced to  $8 - (6.44 - 6) = 7.56\text{dBm}$ .
- Refer to section 3.3 for duty cycle spectrum plot.

##### 802.11g

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-14.27	3.01	0.31	-10.95	7.56	Pass
	6	2437	-13.36	3.01	0.31	-10.04	7.56	Pass
	11	2462	-18.05	3.01	0.31	-14.73	7.56	Pass
1	1	2412	-13.71	3.01	0.31	-10.39	7.56	Pass
	6	2437	-12.84	3.01	0.31	-9.52	7.56	Pass
	11	2462	-17.65	3.01	0.31	-14.33	7.56	Pass

Note:

- Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure value and add  $10 \log (N_{ANT})$  dB.
- Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.44\text{dBi} > 6\text{dBi}$ , so the power density limit shall be reduced to  $8 - (6.44 - 6) = 7.56\text{dBm}$ .
- Refer to section 3.3 for duty cycle spectrum plot.

### 802.11ax (HE20)

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-19.64	3.01	0.20	-16.43	7.56	Pass
	6	2437	-17.10	3.01	0.20	-13.89	7.56	Pass
	11	2462	-24.04	3.01	0.20	-20.83	7.56	Pass
1	1	2412	-19.24	3.01	0.20	-16.03	7.56	Pass
	6	2437	-16.87	3.01	0.20	-13.66	7.56	Pass
	11	2462	-23.61	3.01	0.20	-20.40	7.56	Pass

Note:

- Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure value and add  $10 \log (N_{ANT})$  dB.
- Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.44\text{dBi} > 6\text{dBi}$ , so the power density limit shall be reduced to  $8 - (6.44 - 6) = 7.56\text{dBm}$ .
- Refer to section 3.3 for duty cycle spectrum plot.

### 802.11ax (HE40)

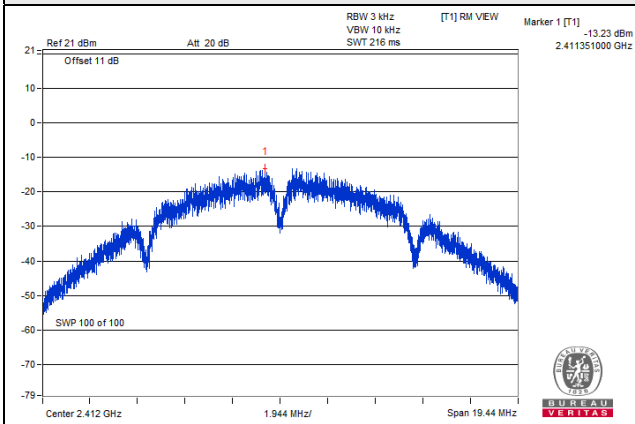
TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	3	2422	-24.27	3.01	0.19	-21.07	7.56	Pass
	6	2437	-23.93	3.01	0.19	-20.73	7.56	Pass
	9	2452	-27.76	3.01	0.19	-24.56	7.56	Pass
1	3	2422	-23.91	3.01	0.19	-20.71	7.56	Pass
	6	2437	-23.65	3.01	0.19	-20.45	7.56	Pass
	9	2452	-27.04	3.01	0.19	-23.84	7.56	Pass

Note:

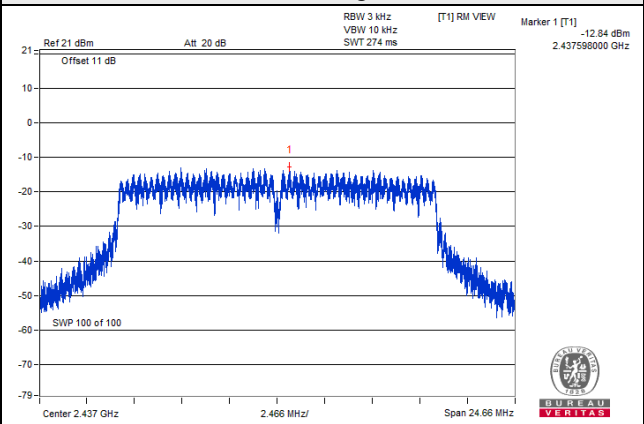
- Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure value and add  $10 \log (N_{ANT})$  dB.
- Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.44\text{dBi} > 6\text{dBi}$ , so the power density limit shall be reduced to  $8 - (6.44 - 6) = 7.56\text{dBm}$ .
- Refer to section 3.3 for duty cycle spectrum plot.

### Spectrum Plot of Worst Value

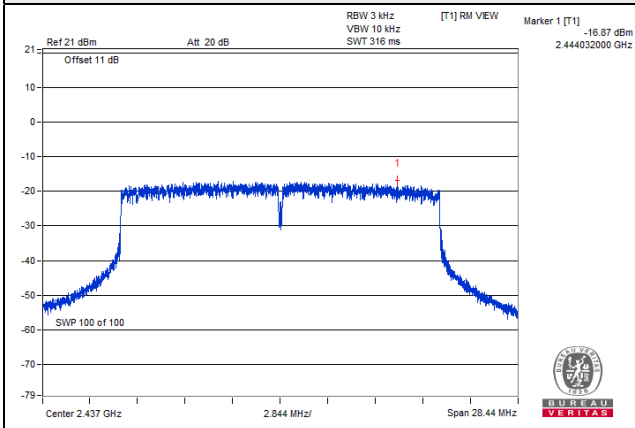
802.11b



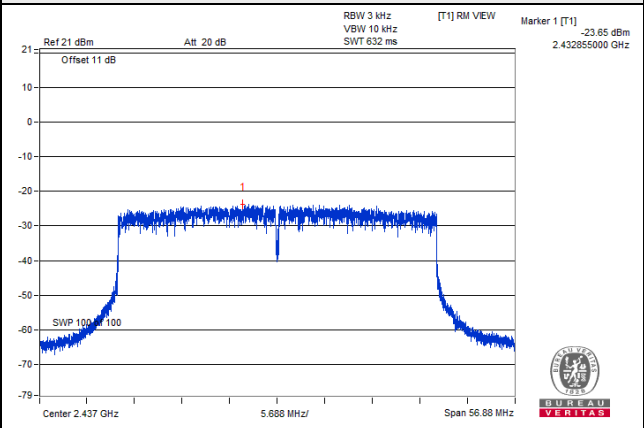
802.11g



802.11ax (HE20)



802.11ax (HE40)



### Scanning radio (Radio 3)

#### 802.11b

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-19.74	8.00	Pass
6	2437	-19.62	8.00	Pass
11	2462	-19.80	8.00	Pass

#### 802.11g

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-23.02	0.32	-22.70	8.00	Pass
6	2437	-23.03	0.32	-22.71	8.00	Pass
11	2462	-23.30	0.32	-22.98	8.00	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

#### VHT20

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-24.07	0.35	-23.72	8.00	Pass
6	2437	-23.84	0.35	-23.49	8.00	Pass
11	2462	-23.99	0.35	-23.64	8.00	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

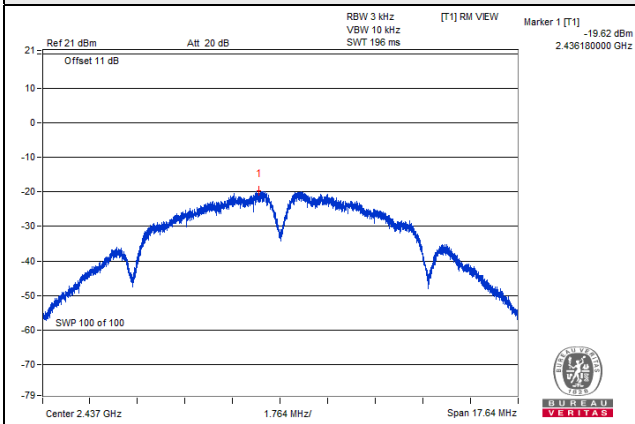
#### VHT40

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
3	2422	-25.50	0.72	-24.78	8.00	Pass
6	2437	-25.76	0.72	-25.04	8.00	Pass
9	2452	-25.89	0.72	-25.17	8.00	Pass

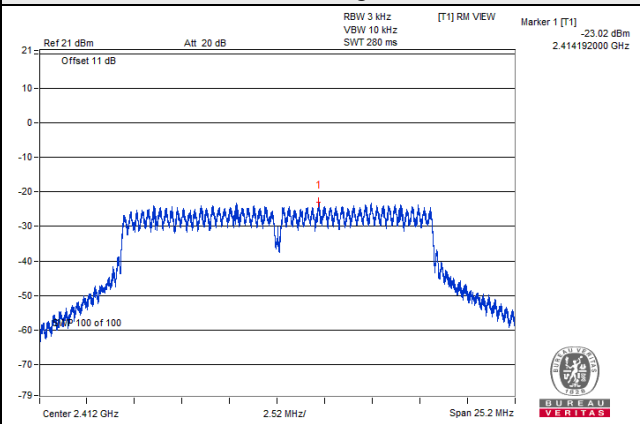
Note: Refer to section 3.3 for duty cycle spectrum plot.

### Spectrum Plot of Worst Value

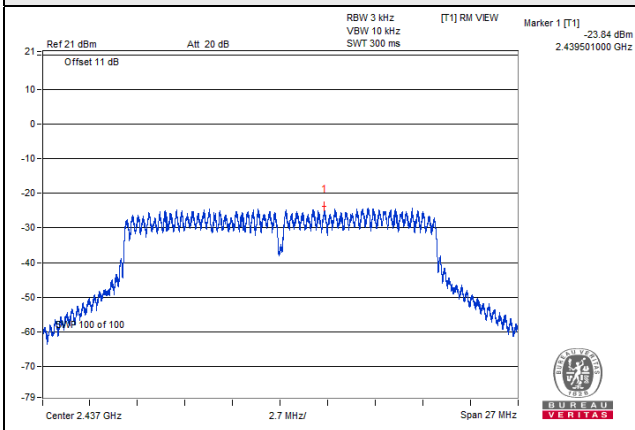
#### 802.11b



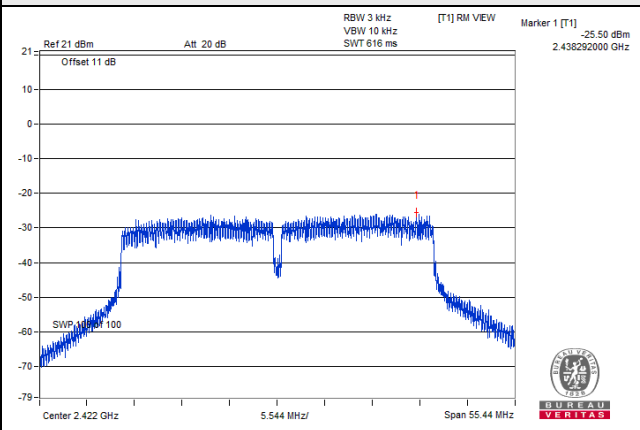
#### 802.11g



#### VHT20



#### VHT40

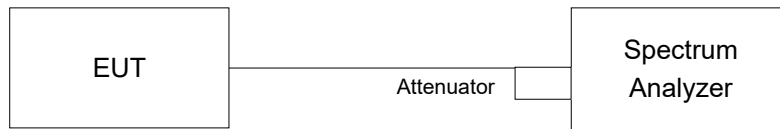


## 4.6 Conducted Out of Band Emission Measurement

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

Below 30dB of the highest emission level of operating band (in 100kHz 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

- Set the RBW = 100 kHz.
- Set the VBW  $\geq$  300 kHz.
- Detector = peak.
- 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 = peak.
- Sweep = auto couple.
- Trace Mode = max hold.
- Allow trace to fully stabilize.
- 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

Same as item 4.3.6

### 4.6.7 Test Results

The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

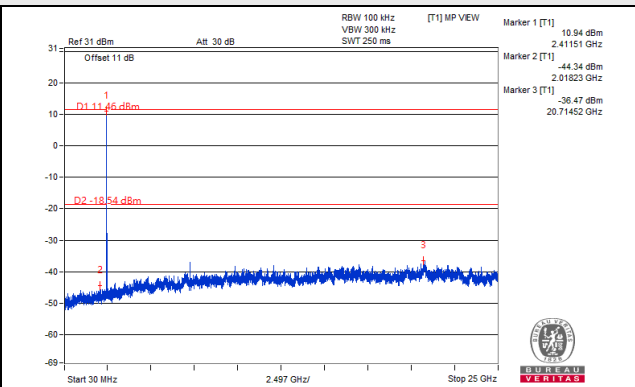
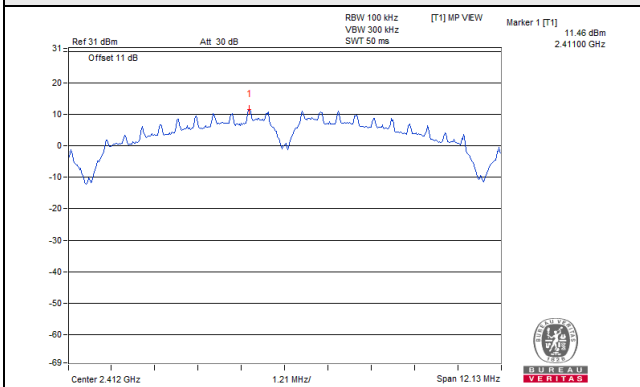
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.



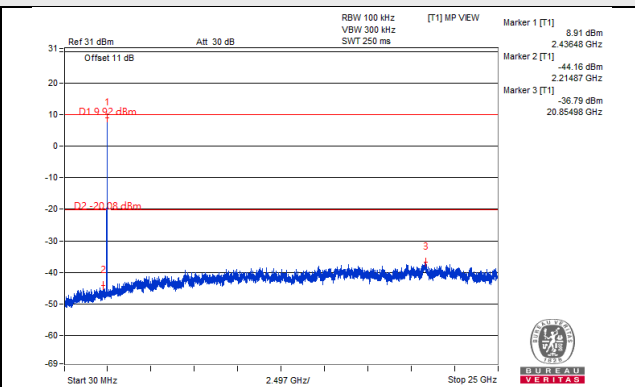
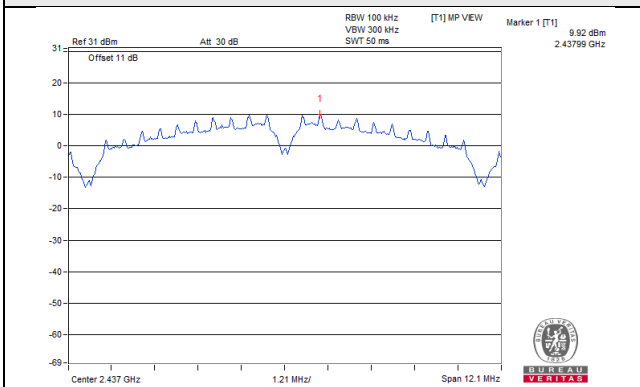
2G traffic radio (Radio 2)

802.11b\_Chain 0

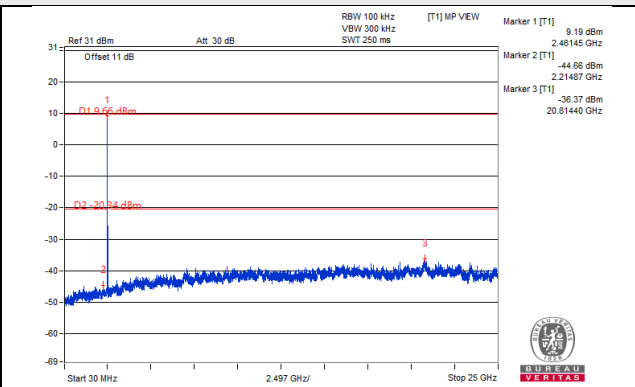
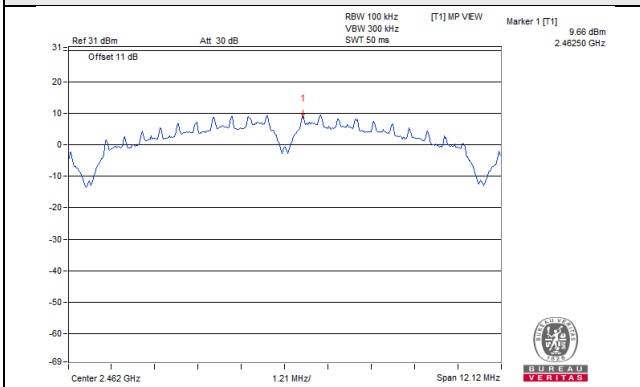
CH 1



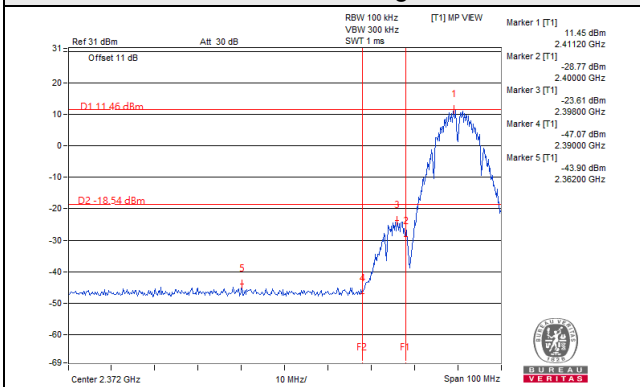
CH 6



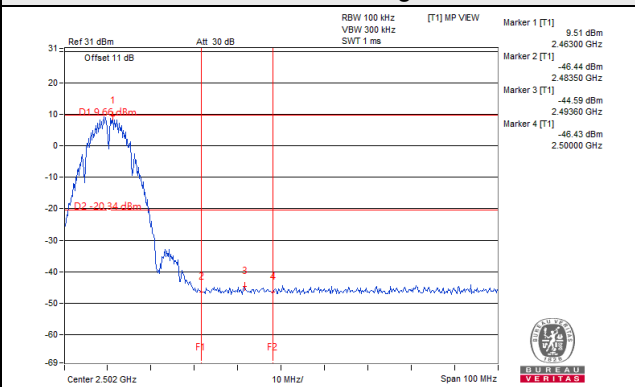
CH 11



CH 1 Band edge

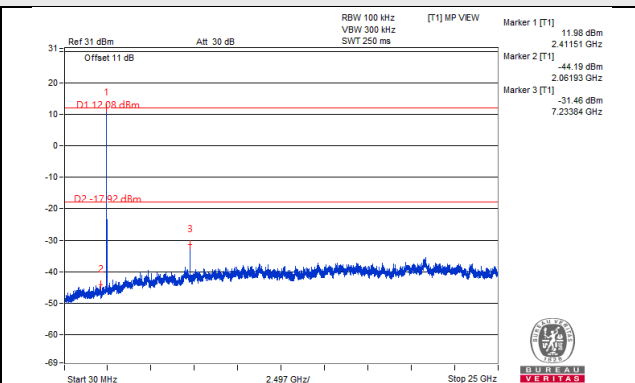
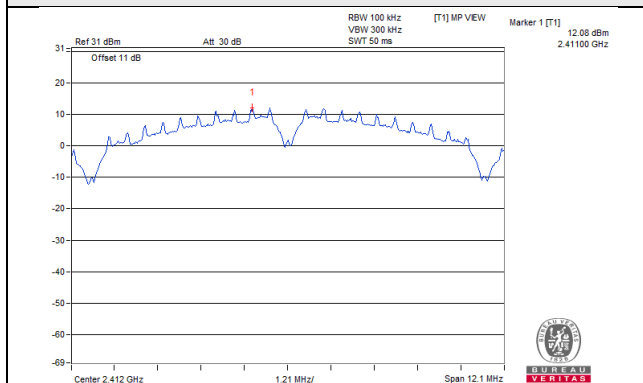


CH 11 Band edge

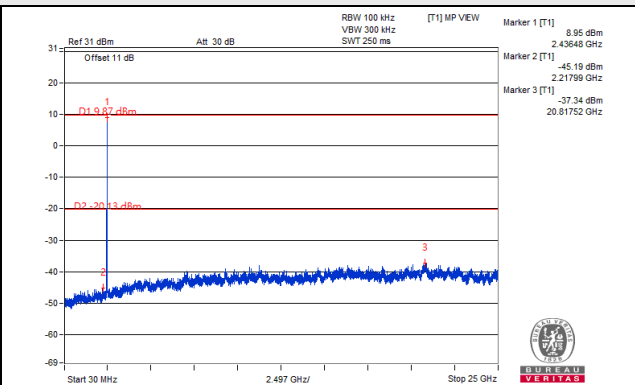
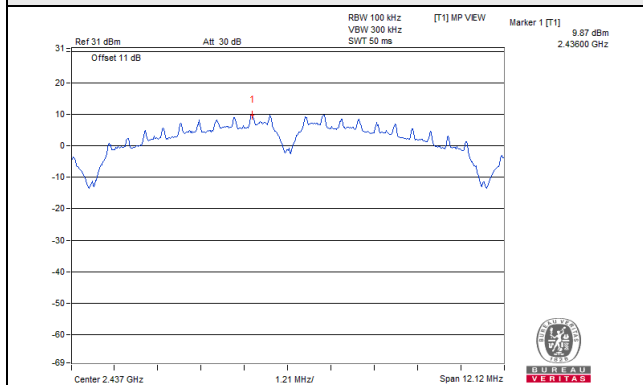


802.11b\_Chain 1

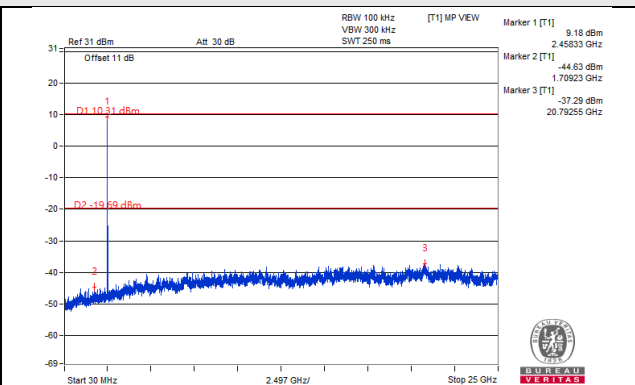
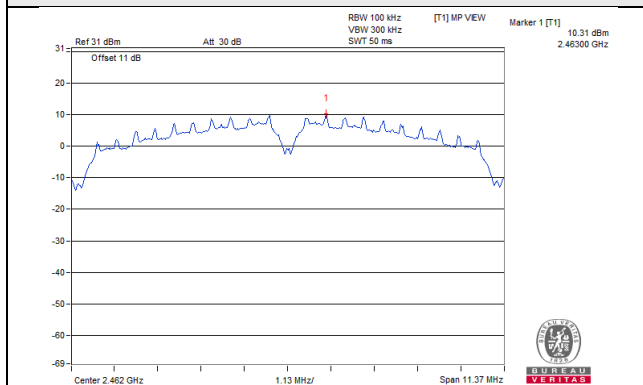
CH 1



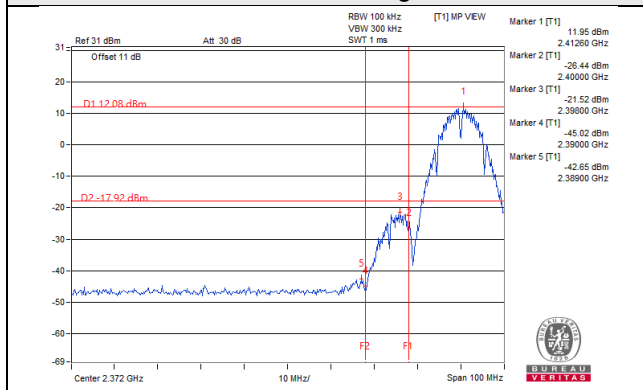
CH 6



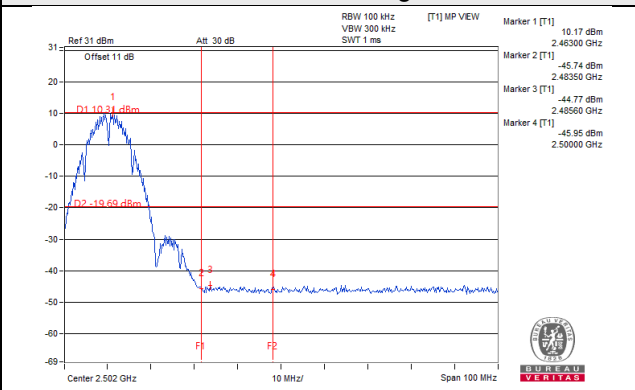
CH 11



CH 1 Band edge



CH 11 Band edge

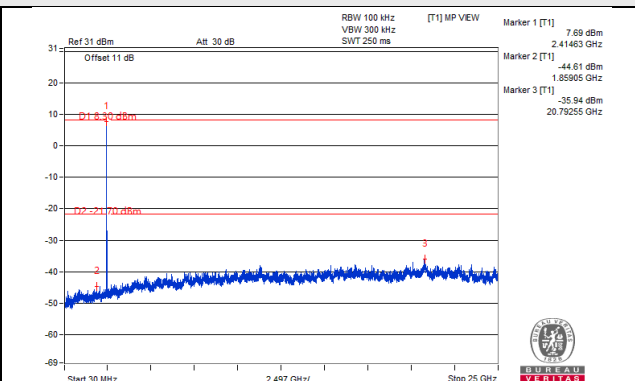
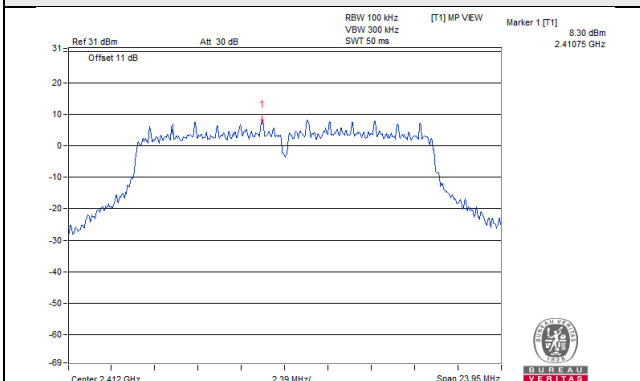




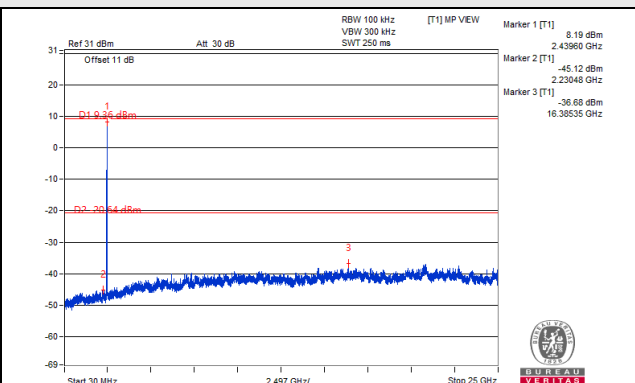
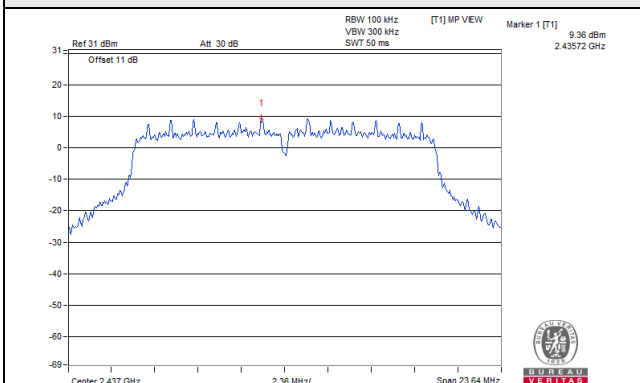
BUREAU VERITAS

# 802.11g\_Chain 0

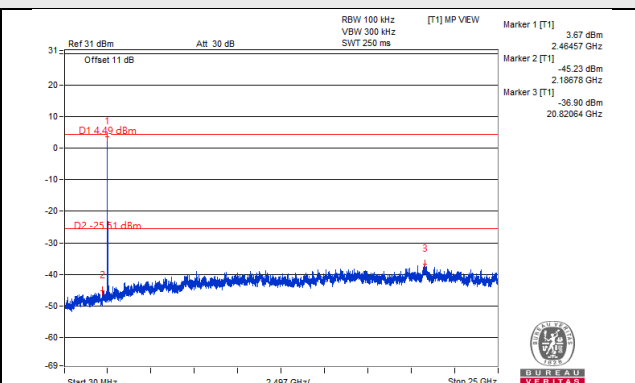
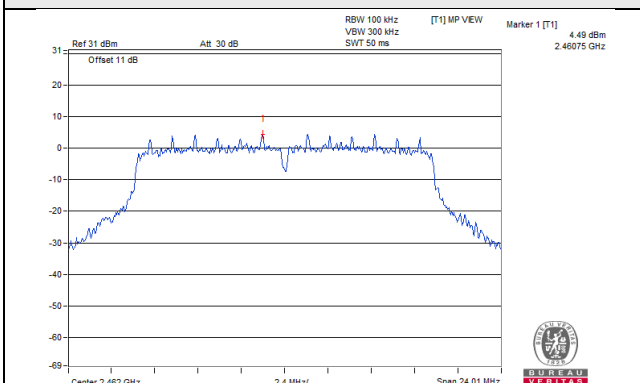
## CH 1



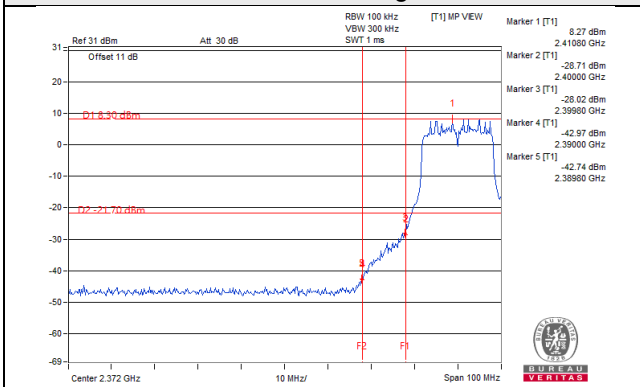
## CH 6



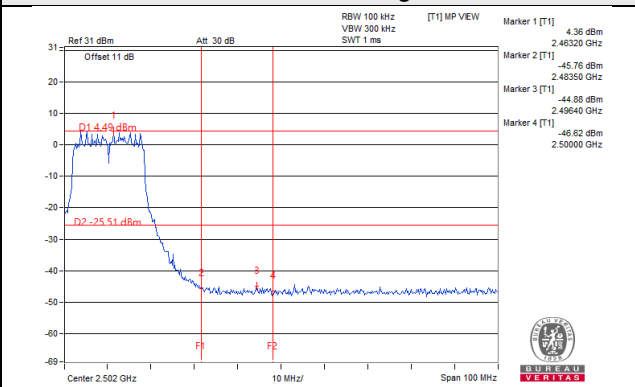
## CH 11



## CH 1 Band edge

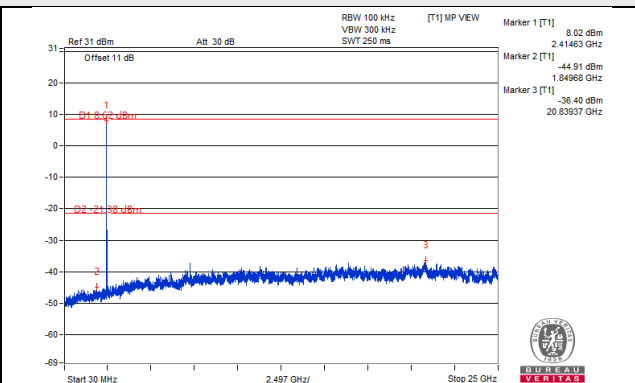
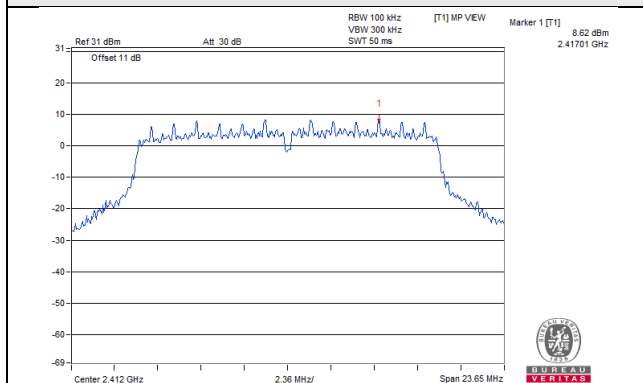


## CH 11 Band edge

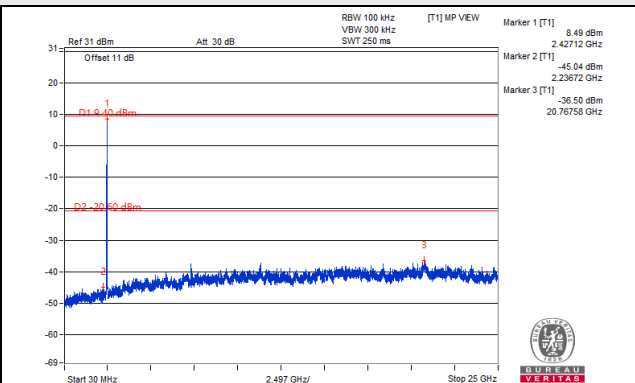
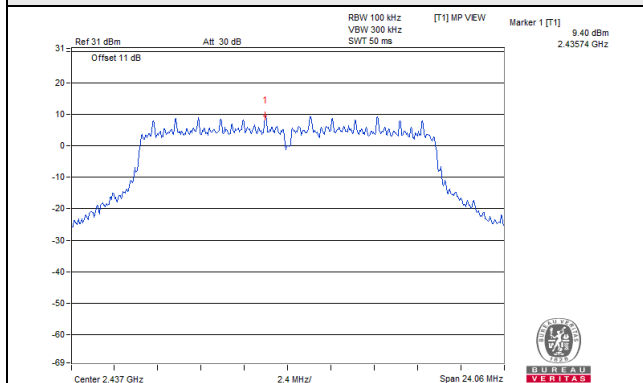


# 802.11g\_Chain 1

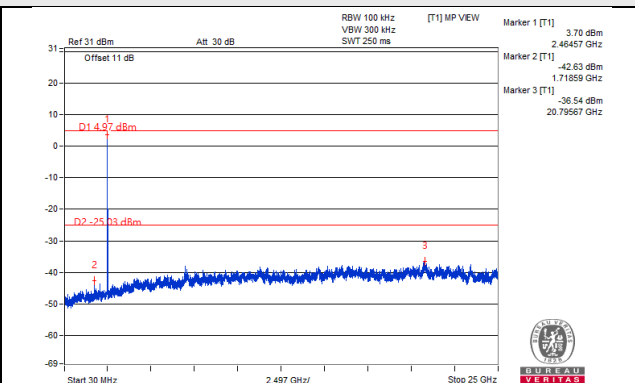
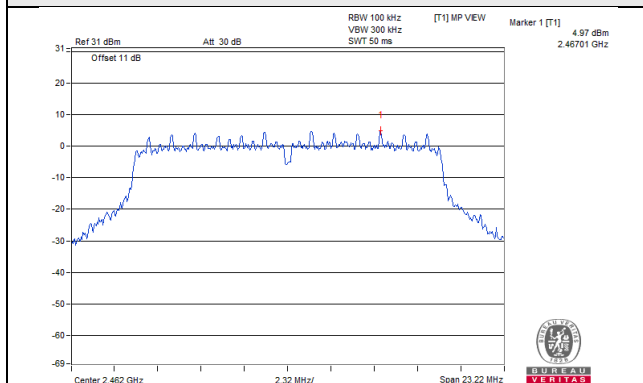
## CH 1



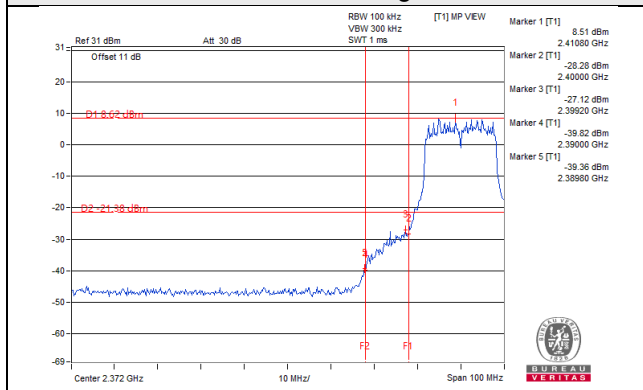
## CH 6



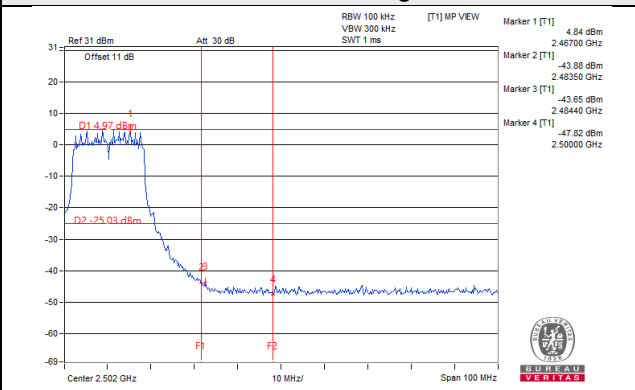
## CH 11



## CH 1 Band edge

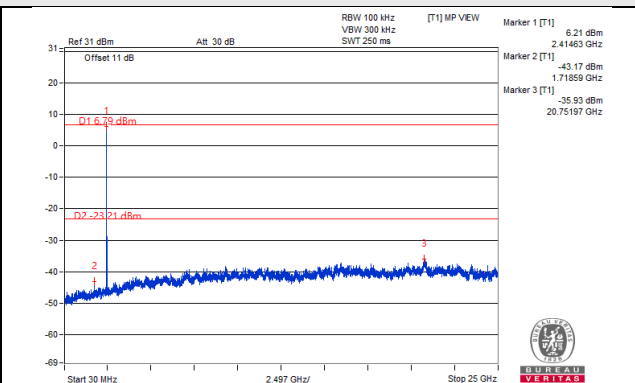
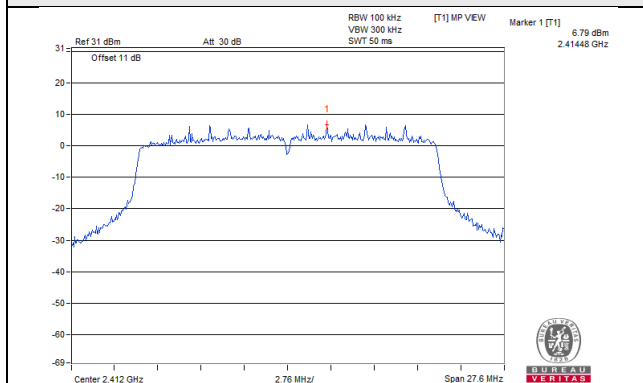


## CH 11 Band edge

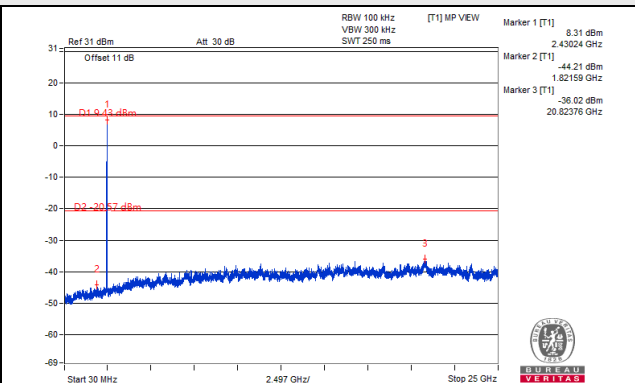
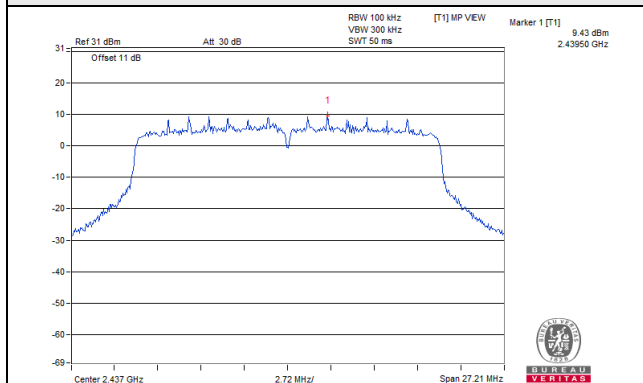


# 802.11ax (HE20)\_Chain 0

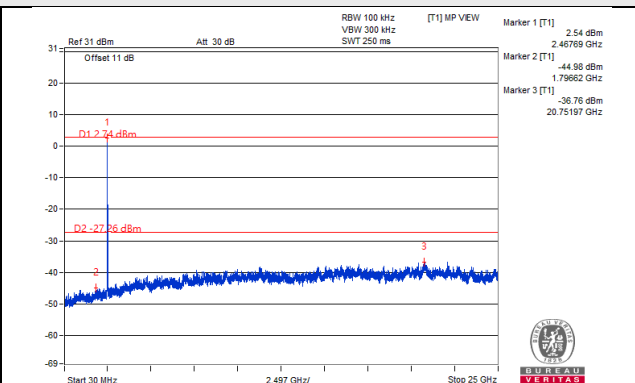
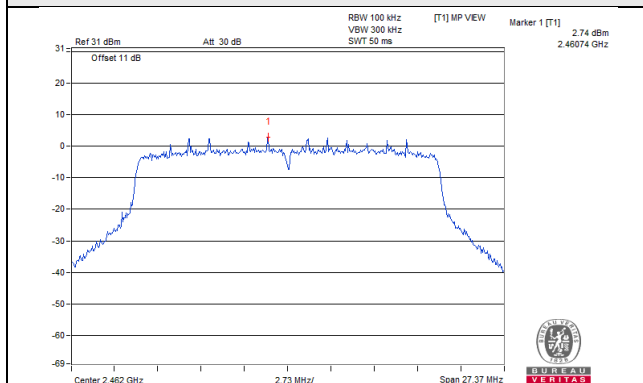
## CH 1



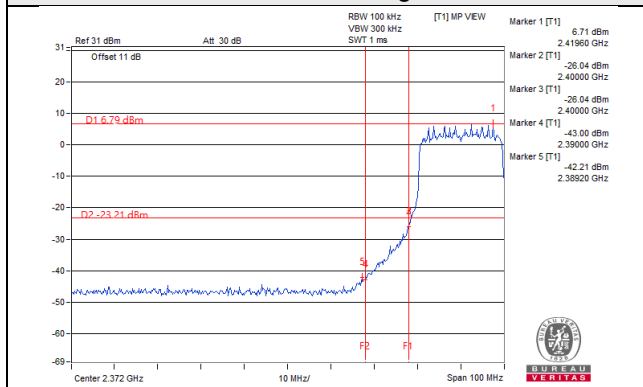
## CH 6



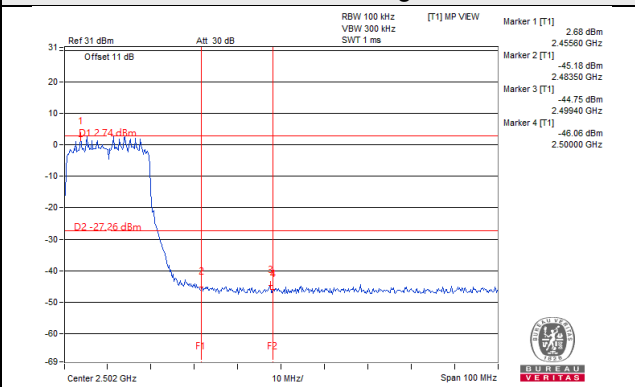
## CH 11



## CH 1 Band edge

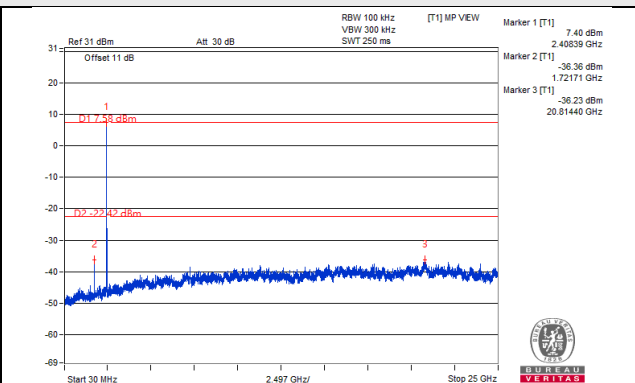
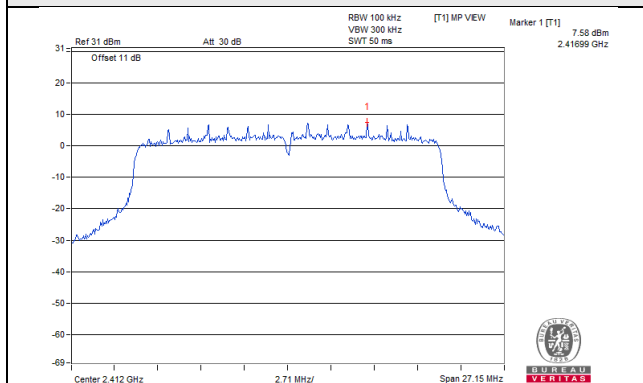


## CH 11 Band edge

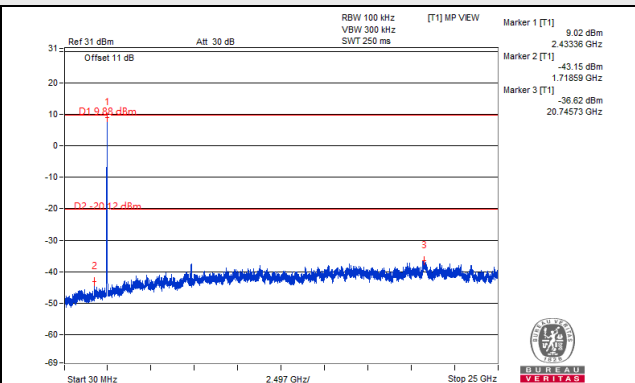
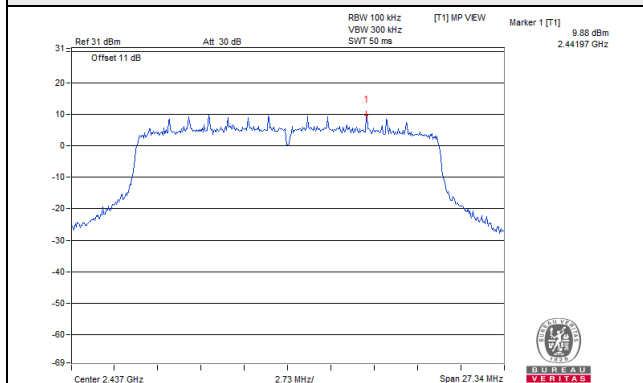


# 802.11ax (HE20)\_Chain 1

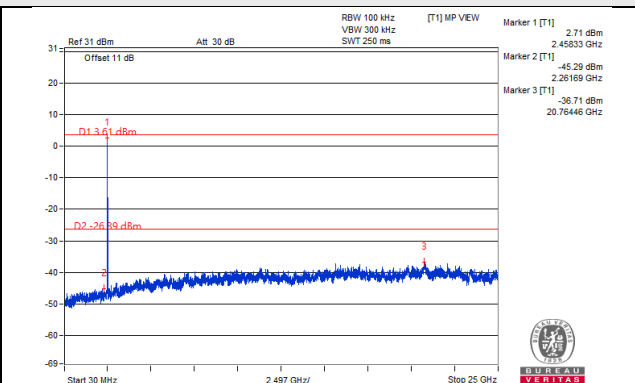
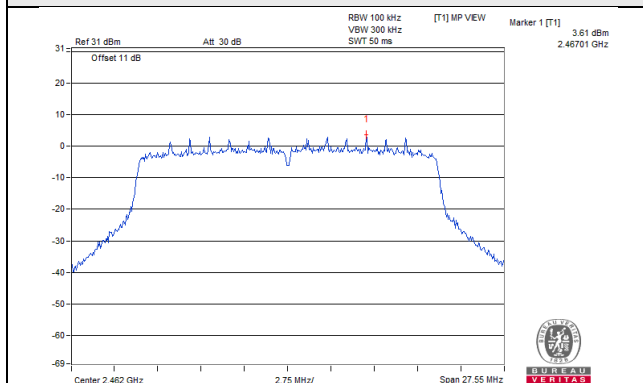
## CH 1



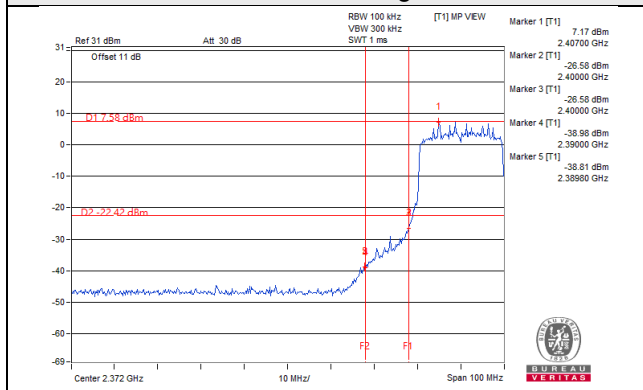
## CH 6



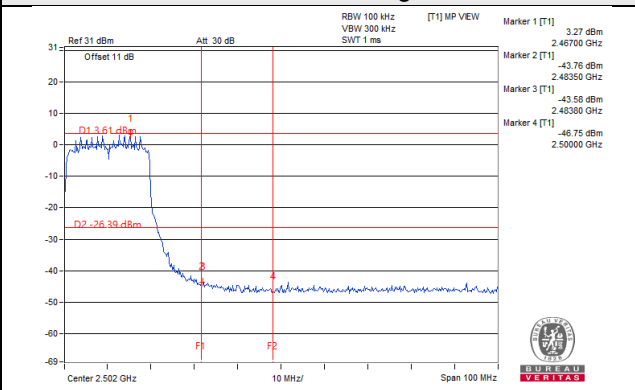
## CH 11



## CH 1 Band edge

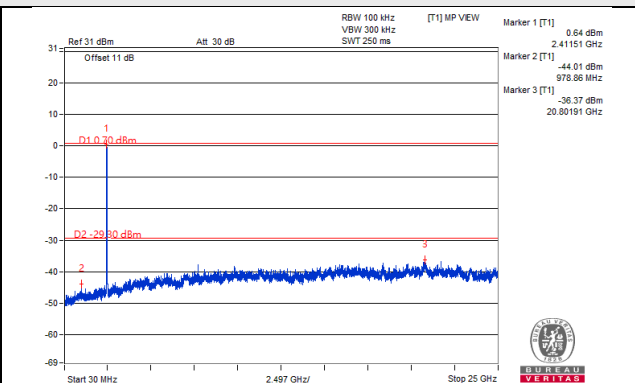
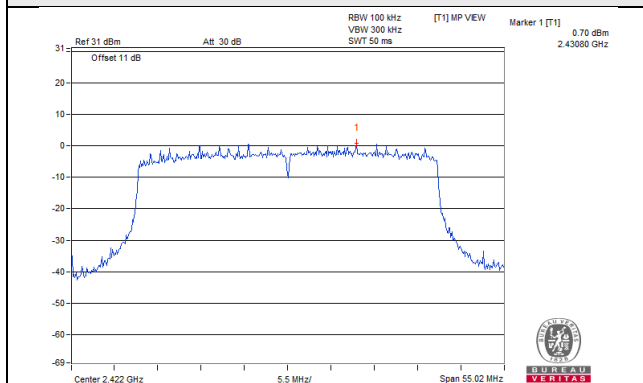


## CH 11 Band edge

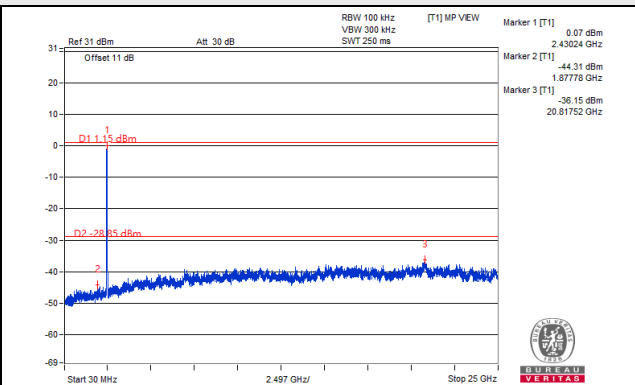
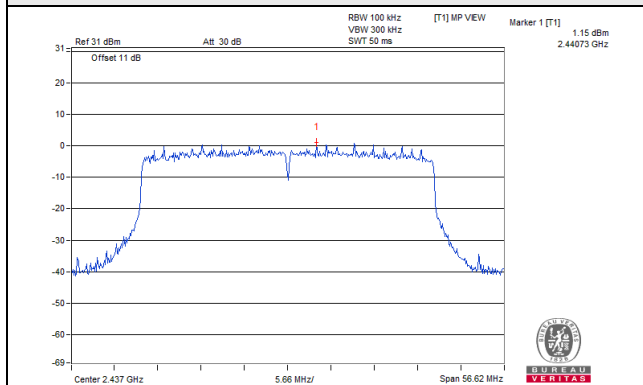


802.11ax (HE40)\_Chain 0

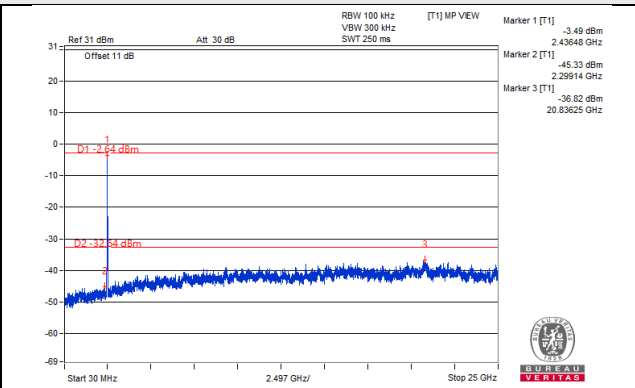
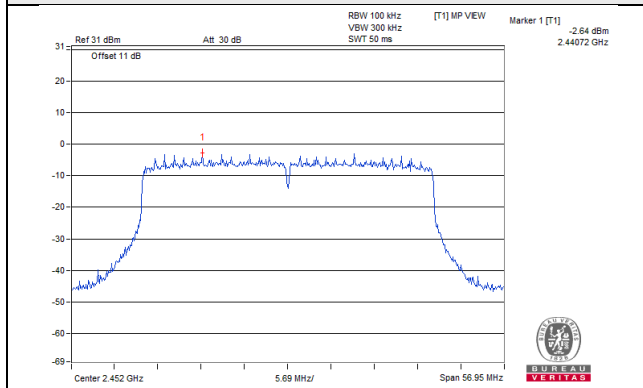
CH 3



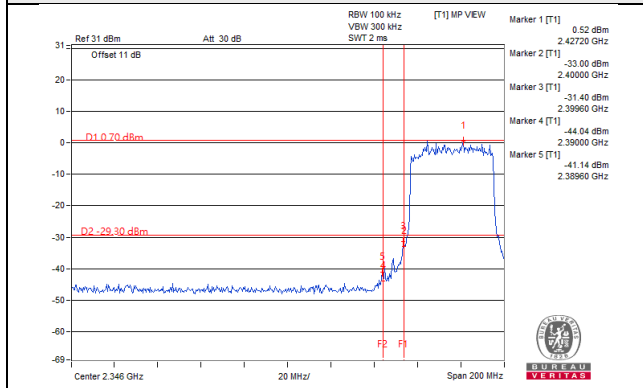
CH 6



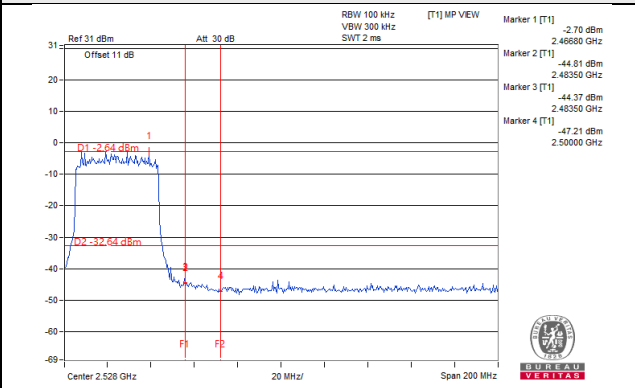
CH 9



CH 3 Band edge

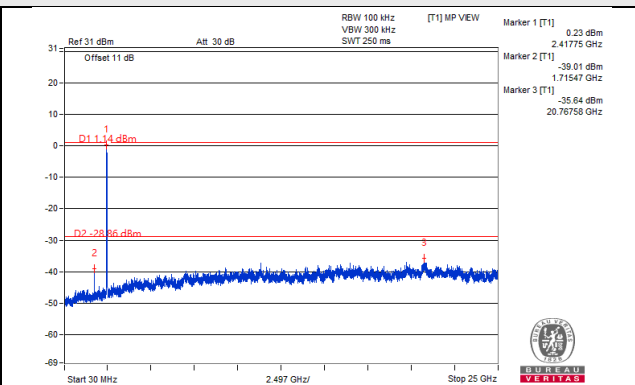
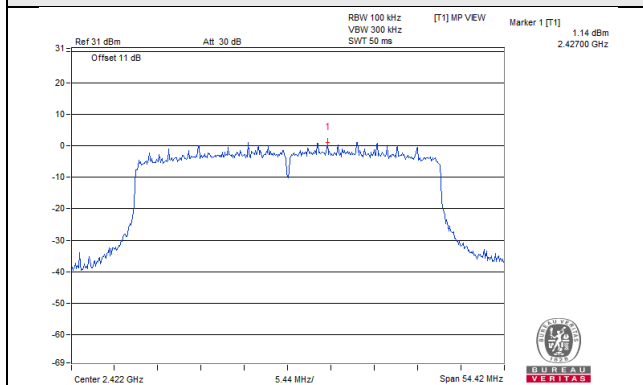


CH 9 Band edge

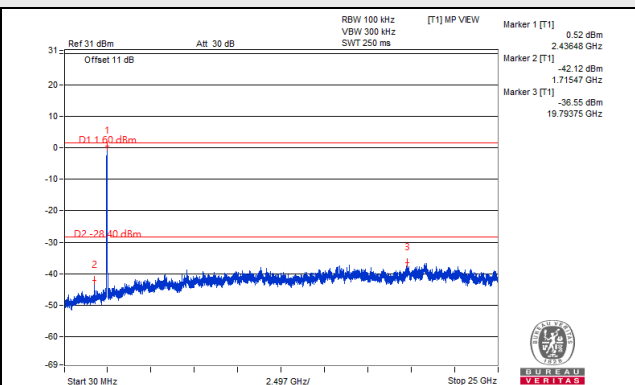
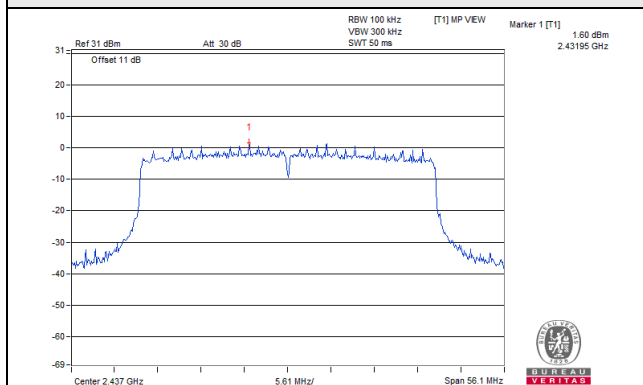


802.11ax (HE40)\_Chain 1

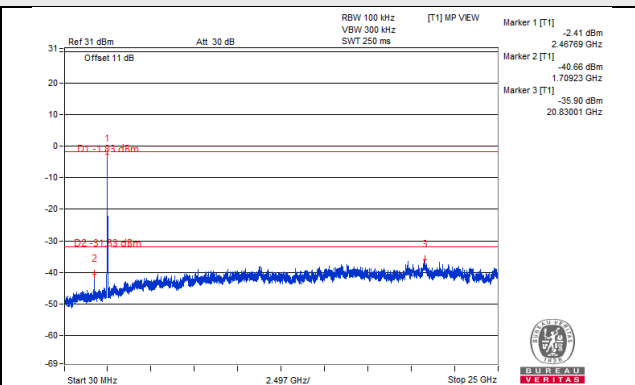
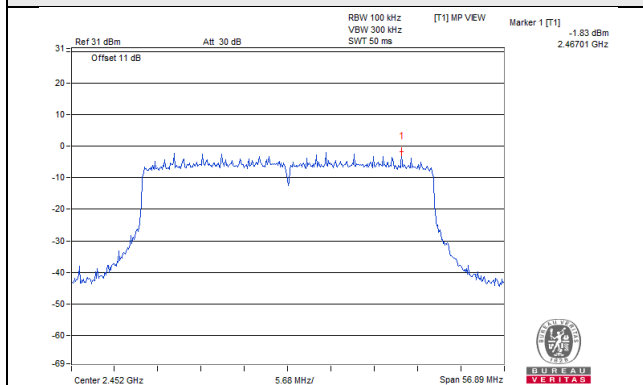
CH 3



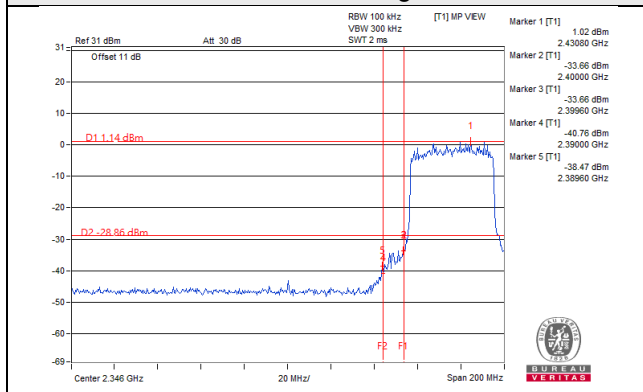
CH 6



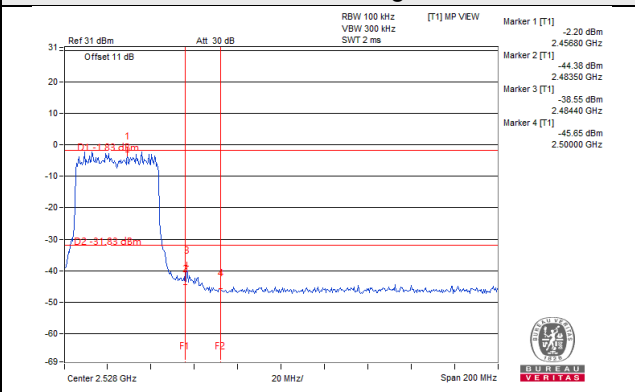
CH 9



CH 3 Band edge



CH 9 Band edge

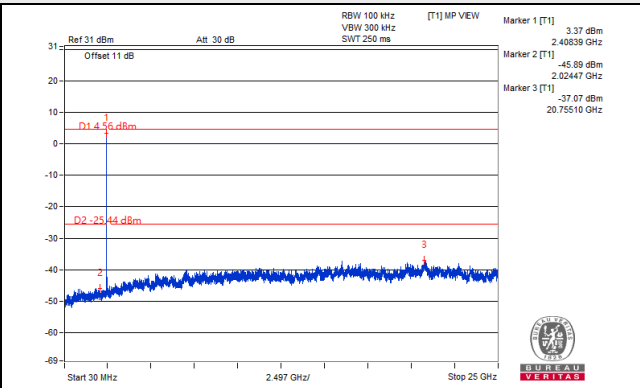
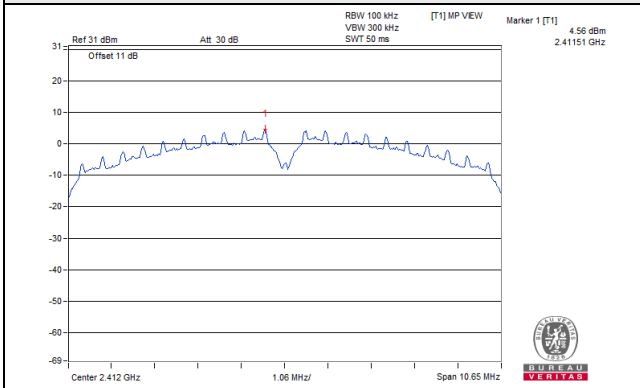




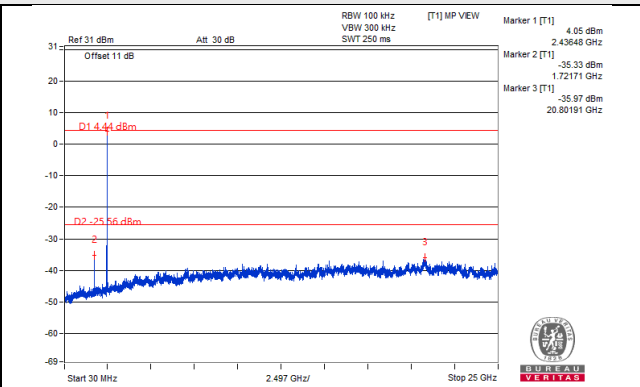
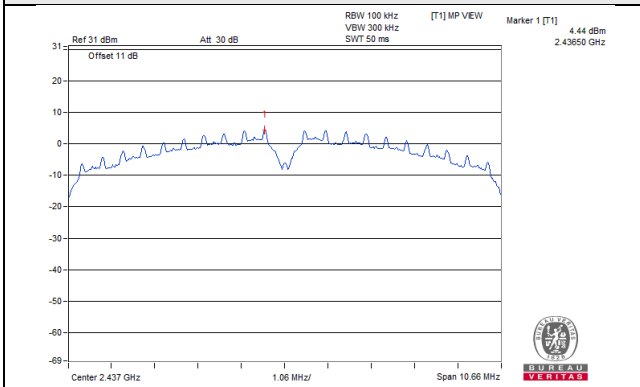
### Scanning radio (Radio 3)

802.11b

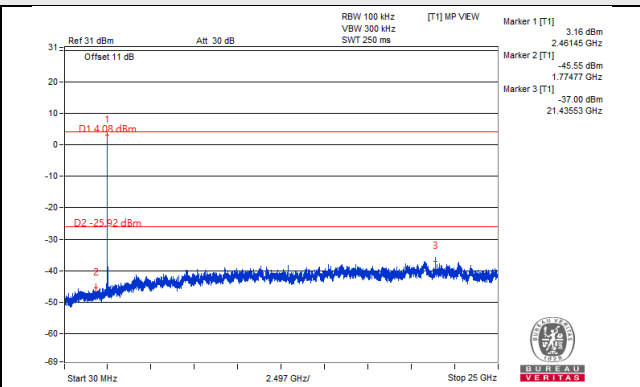
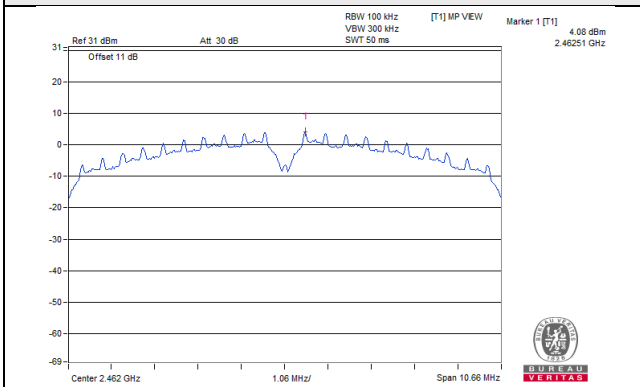
#### CH 1



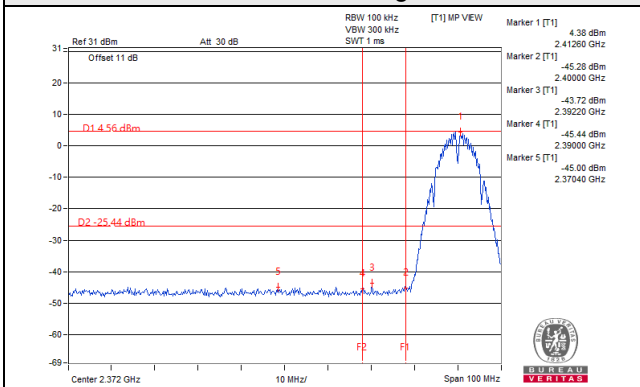
#### CH 6



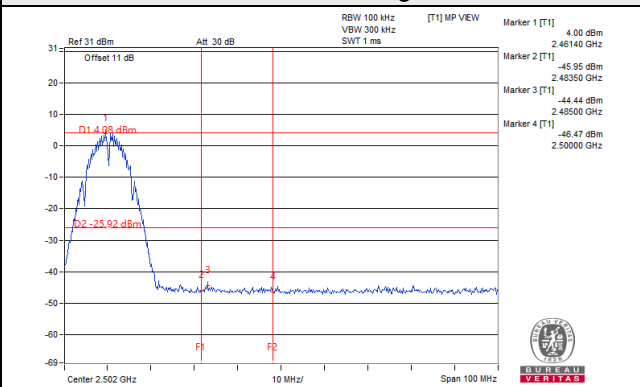
#### CH 11



#### CH 1 Band edge

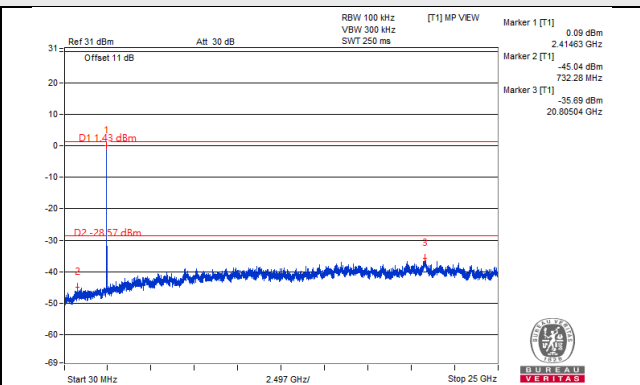
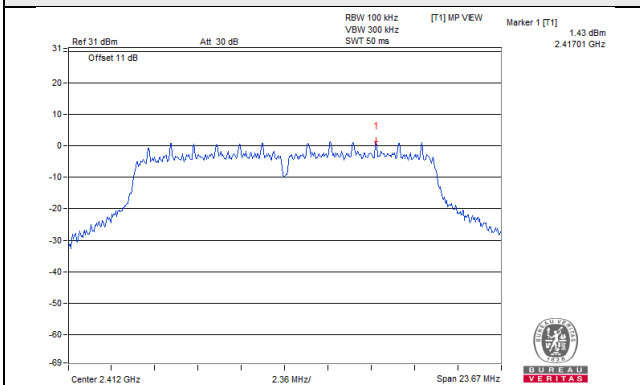


#### CH 11 Band edge

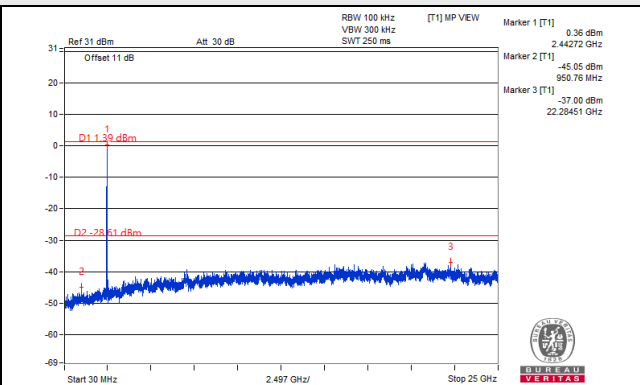
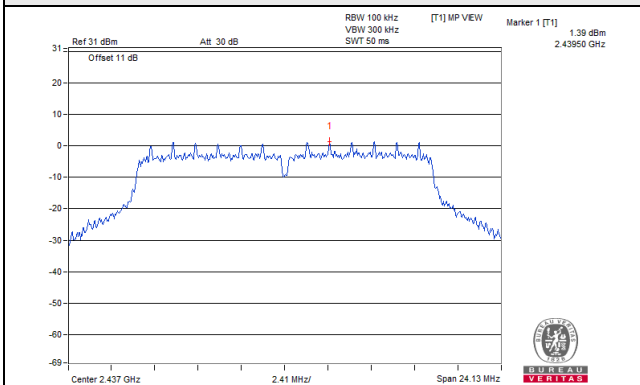


802.11g

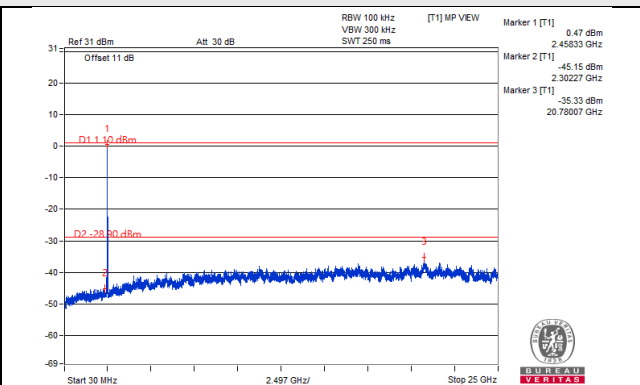
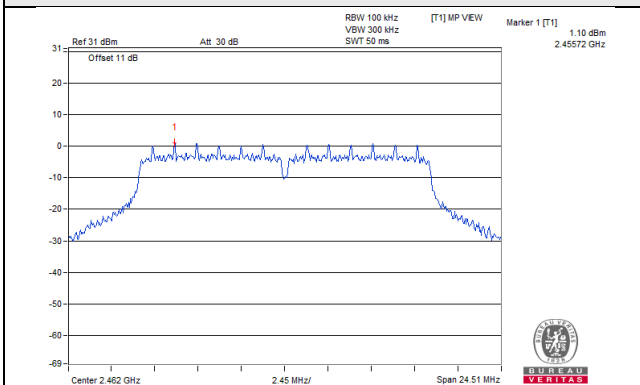
CH 1



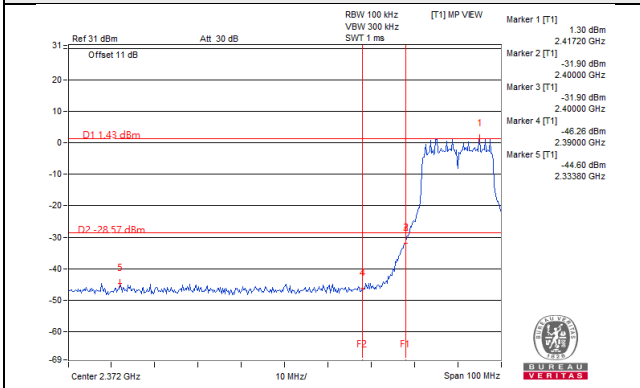
CH 6



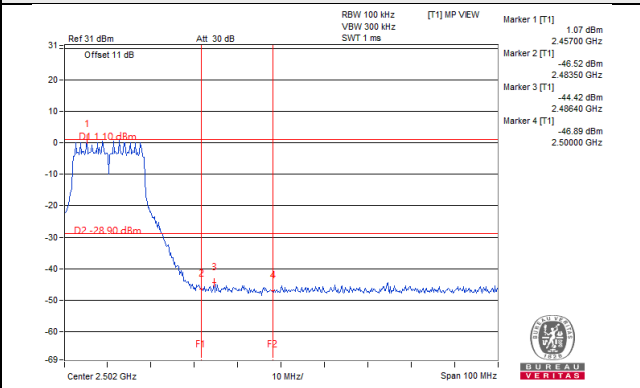
CH 11



CH 1 Band edge

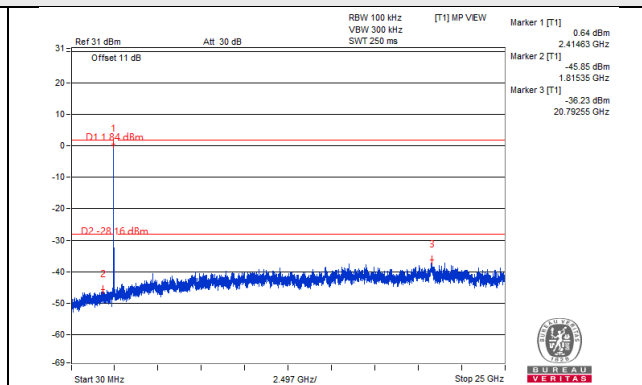
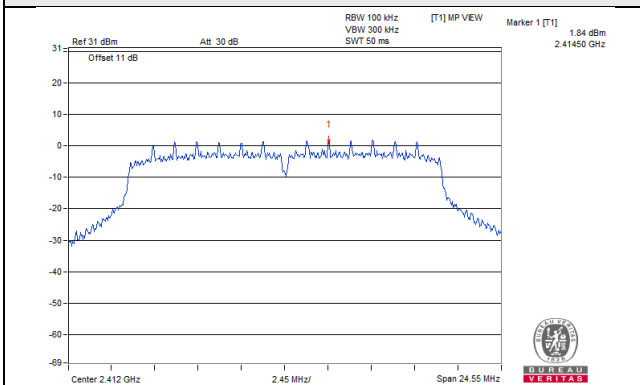


CH 11 Band edge

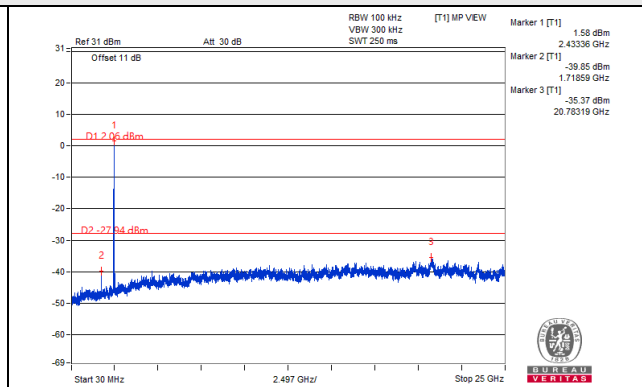
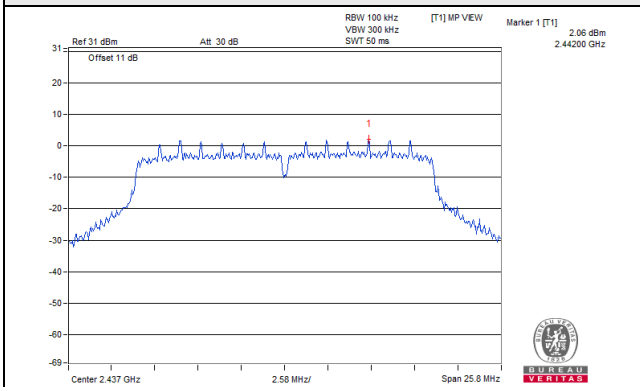


VHT20

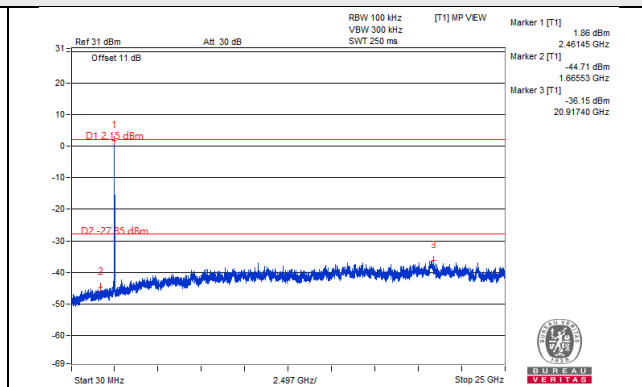
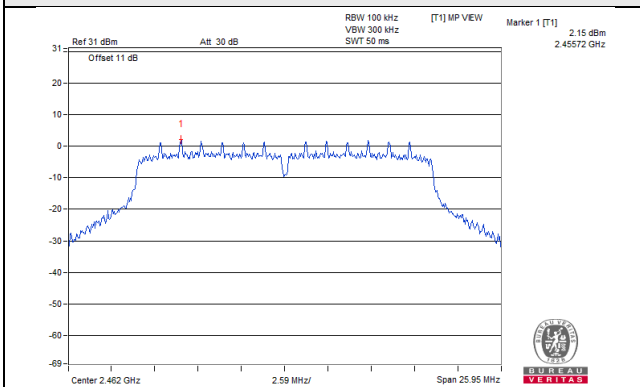
CH 1



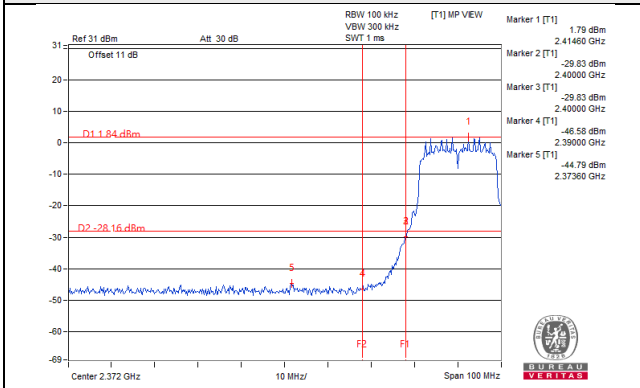
CH 6



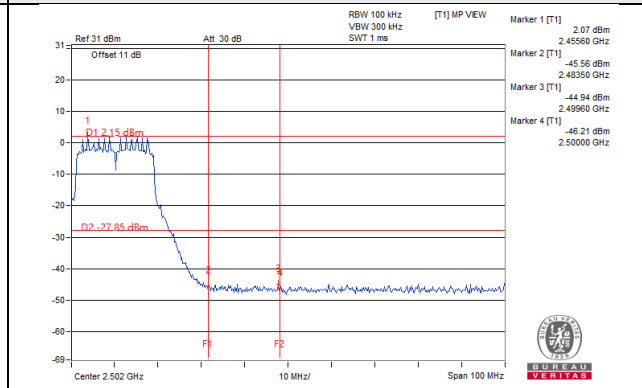
CH 11



CH 1 Band edge

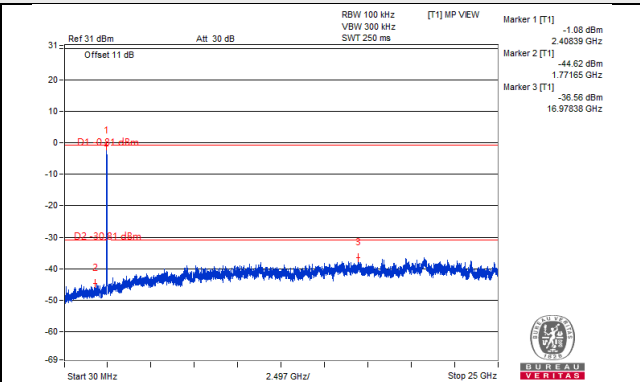
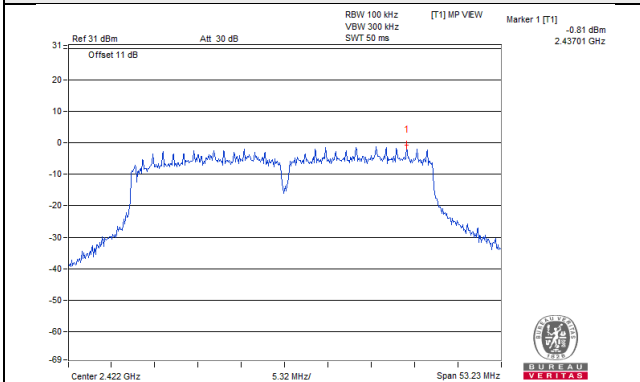


CH 11 Band edge

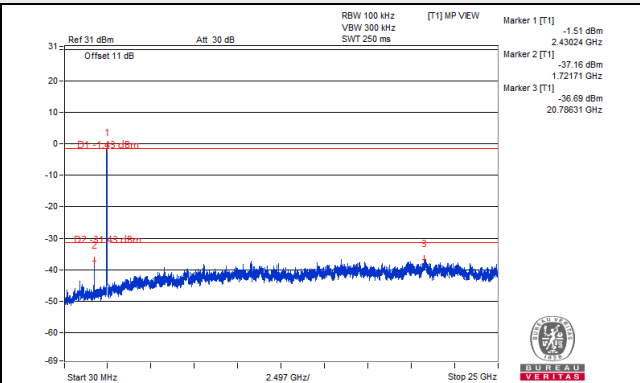
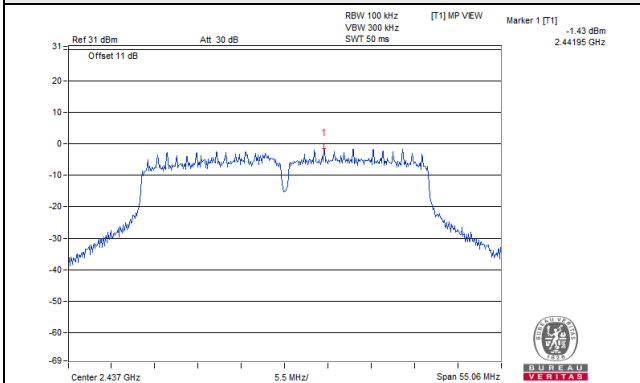


VHT40

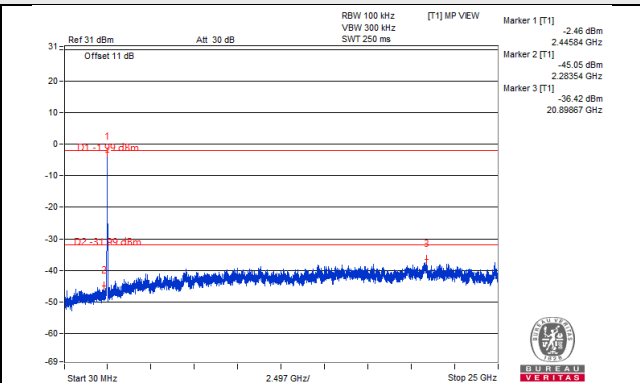
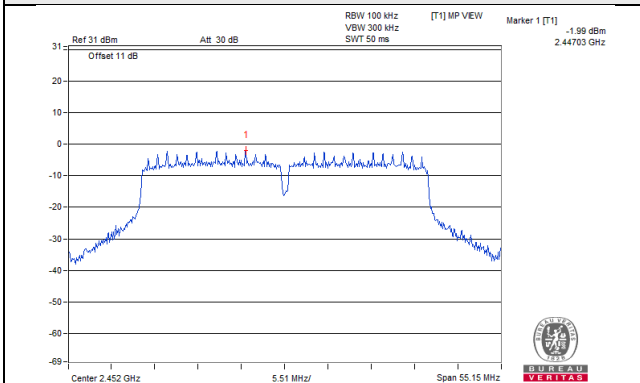
CH 3



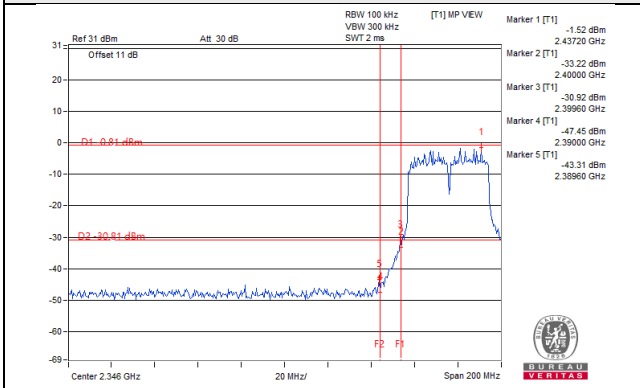
CH 6



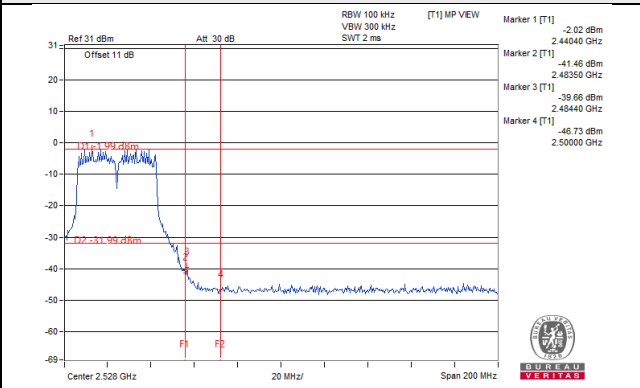
CH 9



CH 3 Band edge

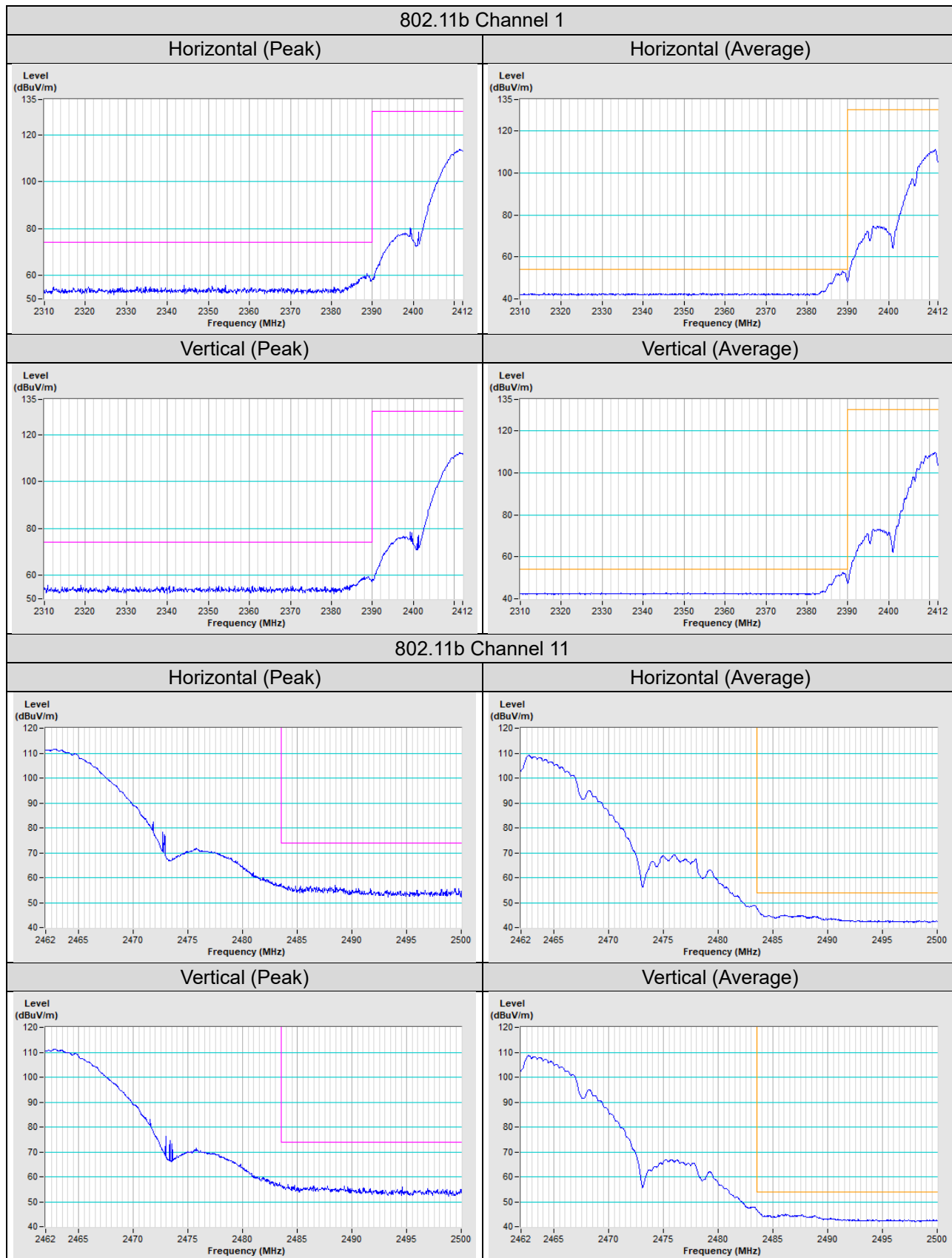


CH 9 Band edge



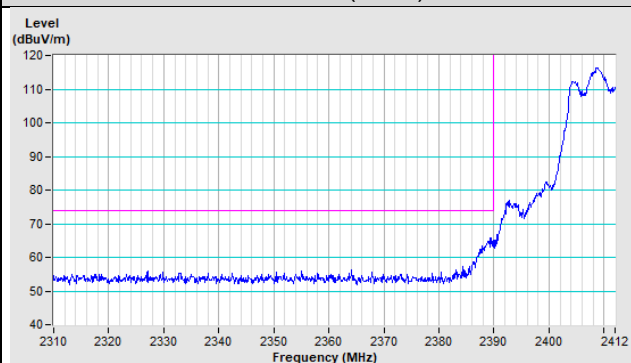
## Annex A - Band Edge Measurement

2G traffic radio (Radio 2)

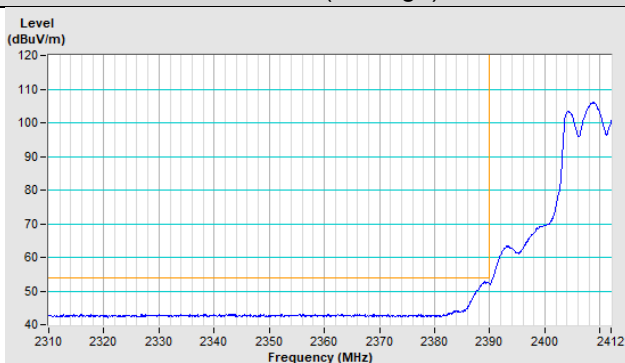


### 802.11g Channel 1

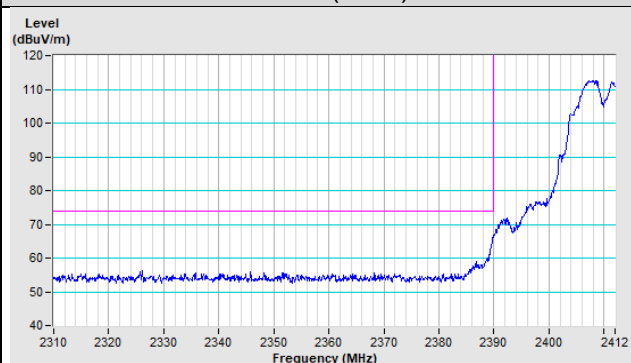
Horizontal (Peak)



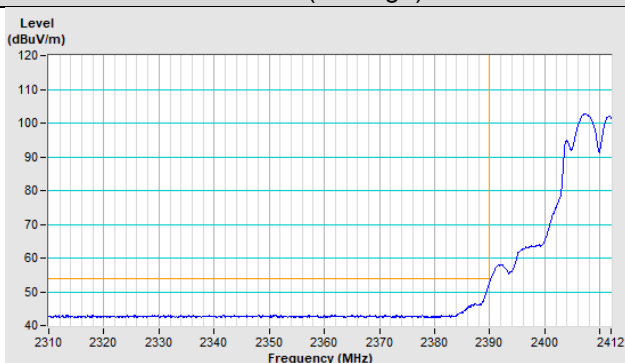
Horizontal (Average)



Vertical (Peak)

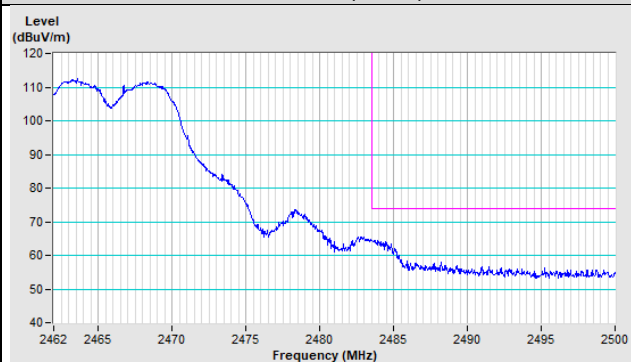


Vertical (Average)

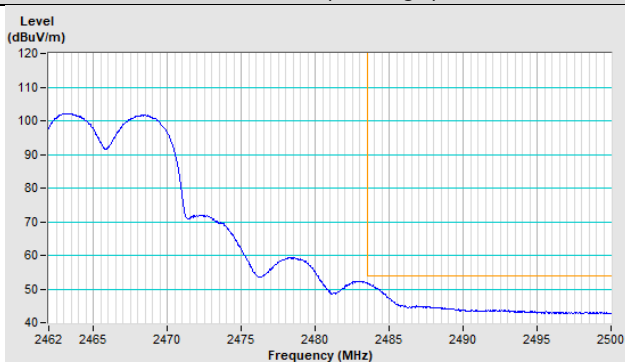


### 802.11g Channel 11

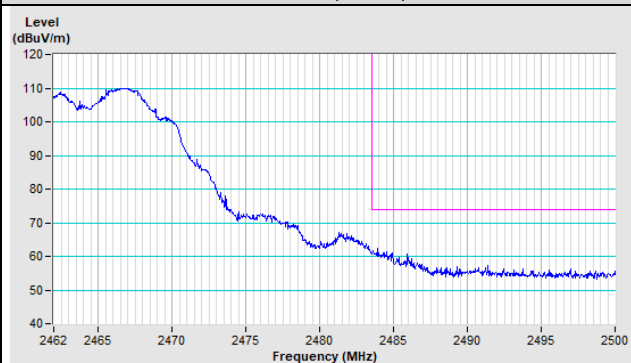
Horizontal (Peak)



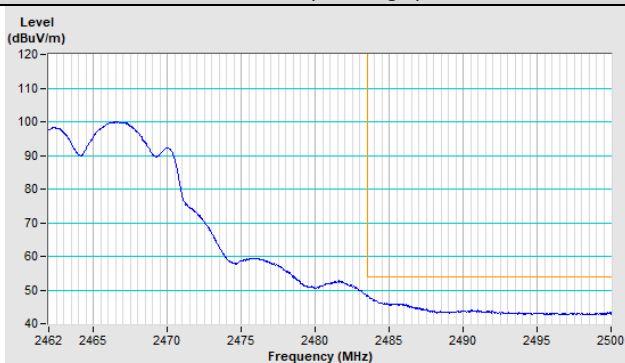
Horizontal (Average)



Vertical (Peak)

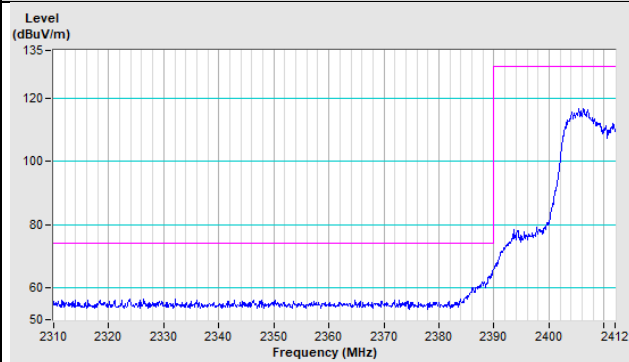


Vertical (Average)

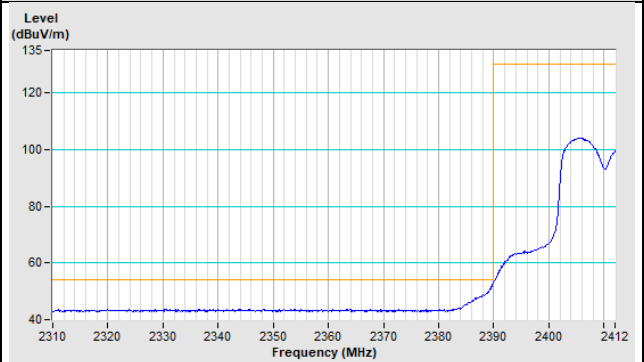


### 802.11ax (HE20) Channel 1

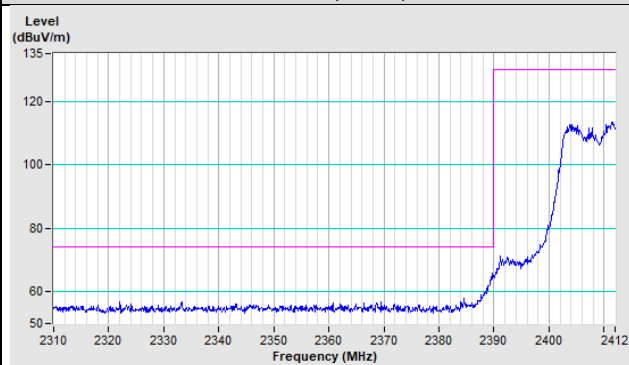
Horizontal (Peak)



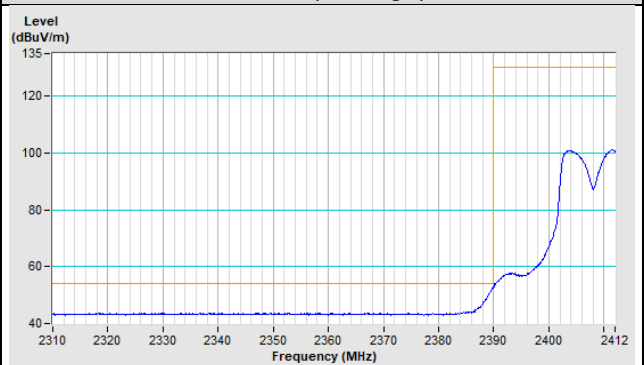
Horizontal (Average)



Vertical (Peak)

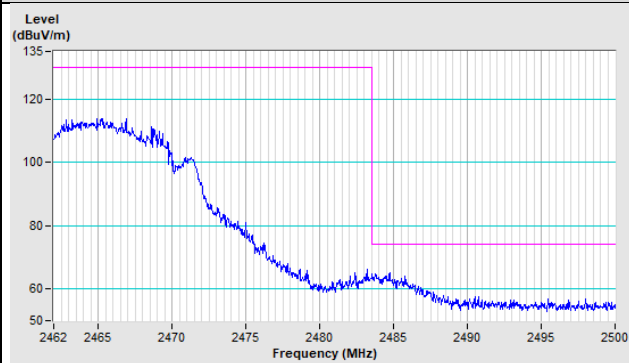


Vertical (Average)

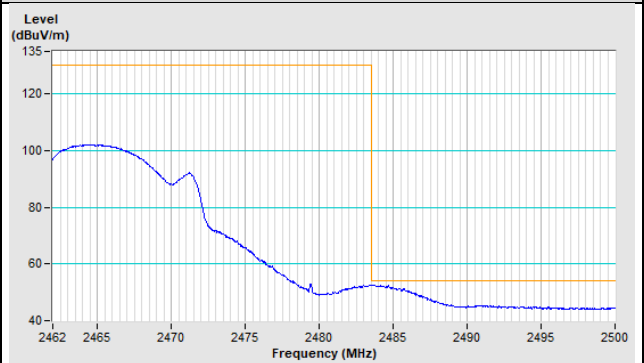


### 802.11ax (HE20) Channel 11

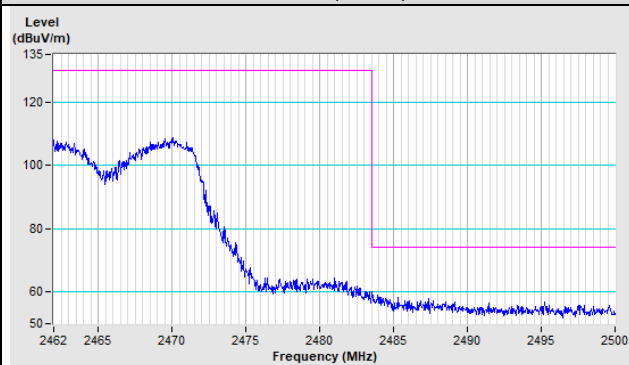
Horizontal (Peak)



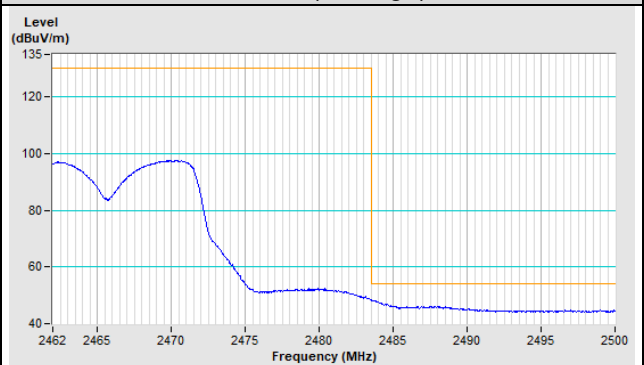
Horizontal (Average)



Vertical (Peak)

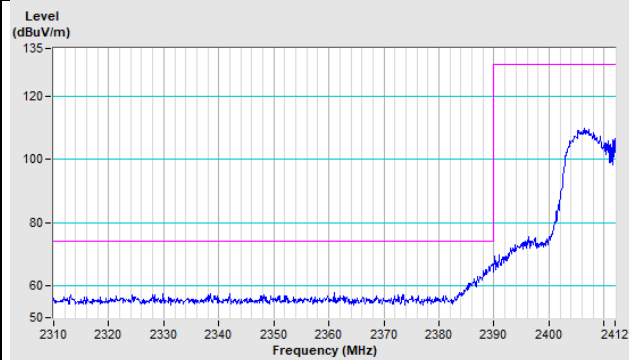


Vertical (Average)

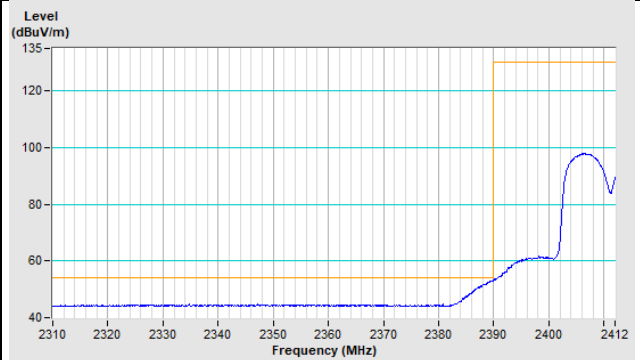


### 802.11ax (HE40) Channel 3

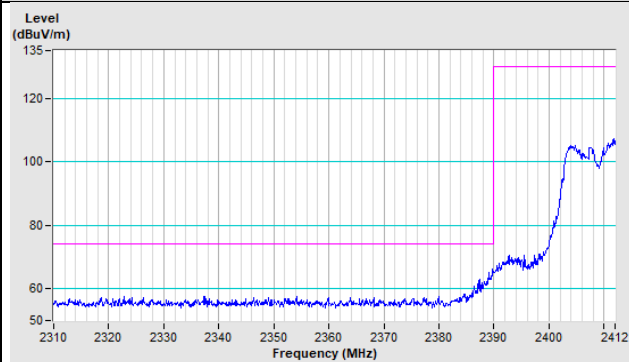
Horizontal (Peak)



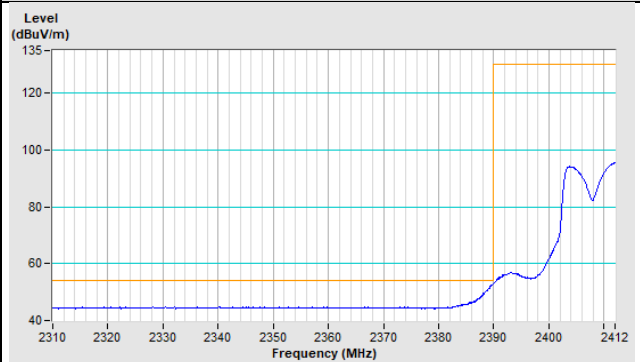
Horizontal (Average)



Vertical (Peak)

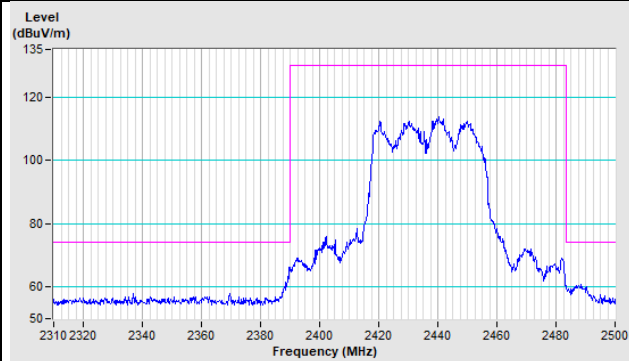


Vertical (Average)

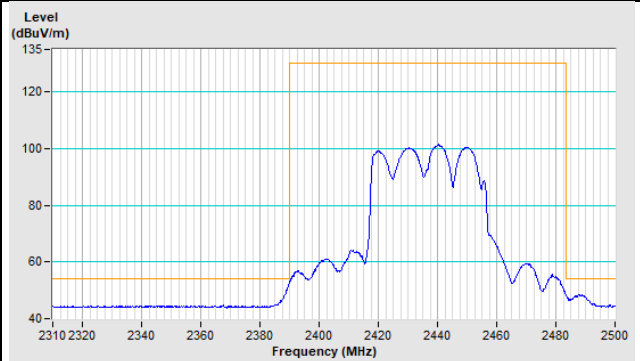


### 802.11ax (HE40) Channel 6

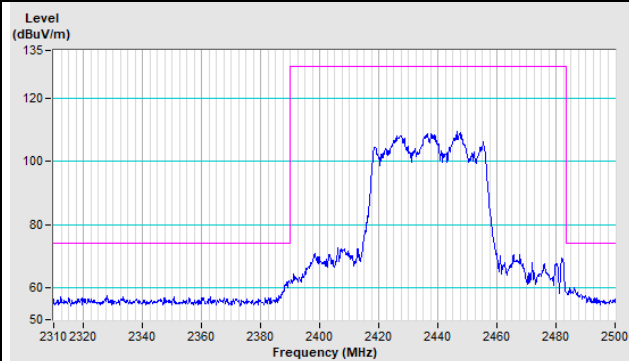
Horizontal (Peak)



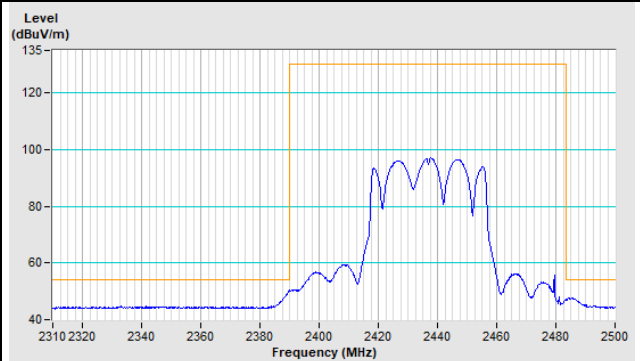
Horizontal (Average)



Vertical (Peak)



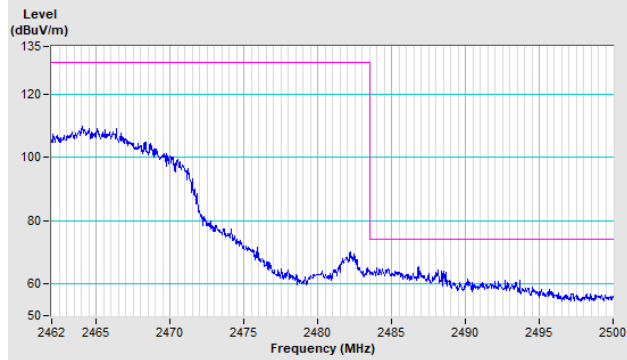
Vertical (Average)



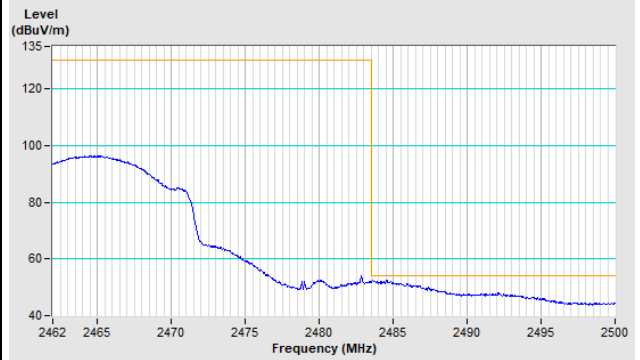


### 802.11ax (HE40) Channel 9

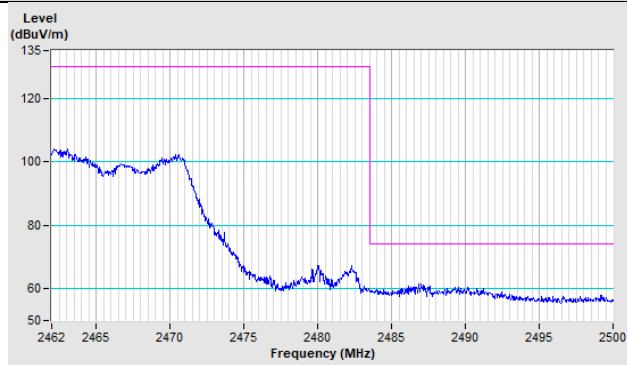
**Horizontal (Peak)**



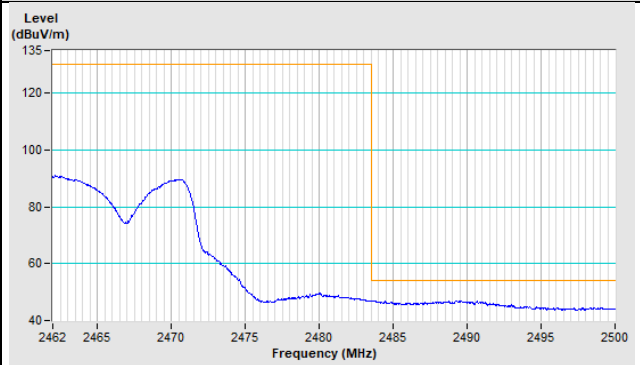
**Horizontal (Average)**



**Vertical (Peak)**



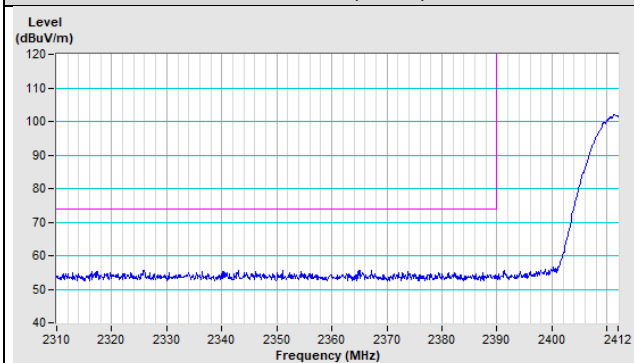
**Vertical (Average)**



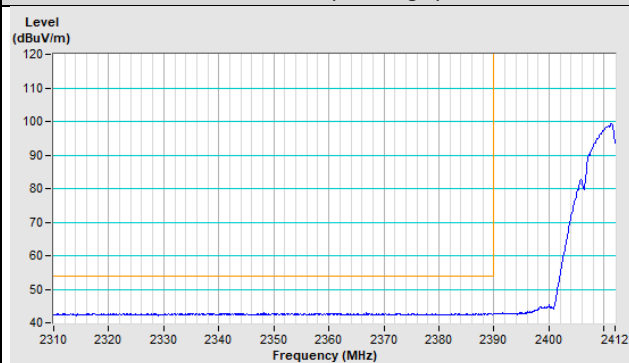
### Scanning radio (Radio 3)

#### 802.11b Channel 1

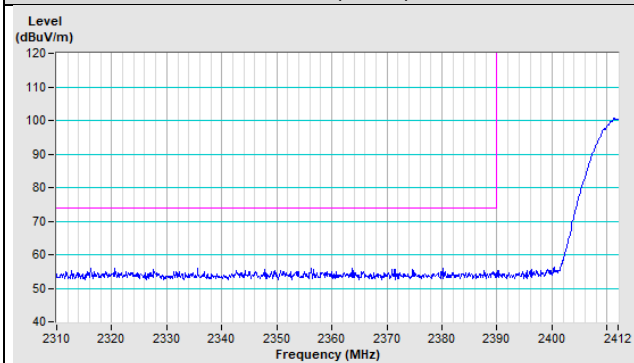
Horizontal (Peak)



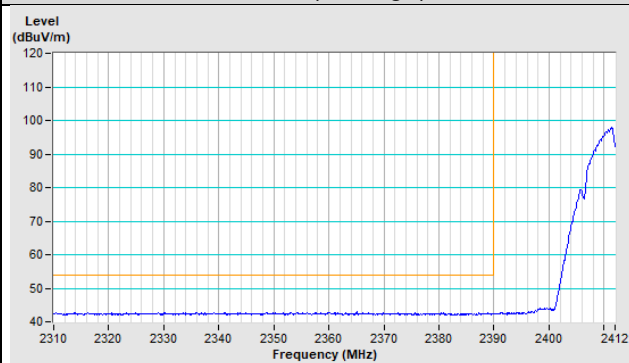
Horizontal (Average)



Vertical (Peak)

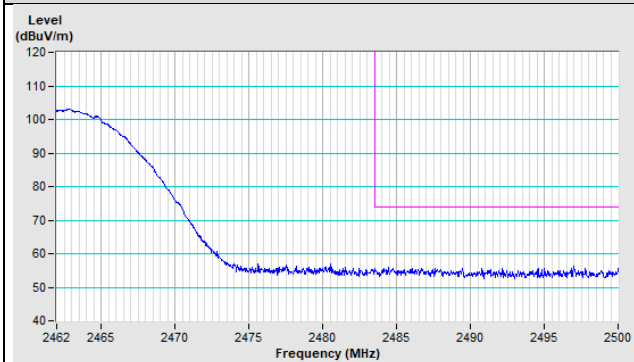


Vertical (Average)

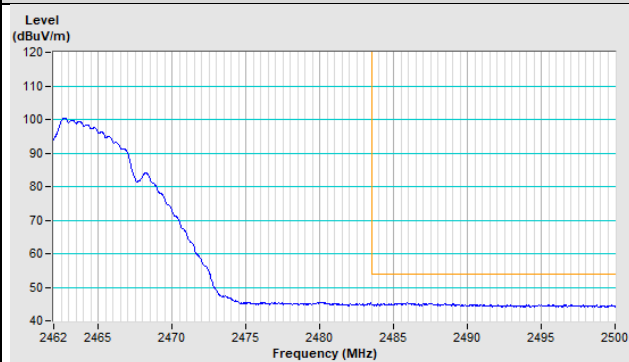


#### 802.11b Channel 11

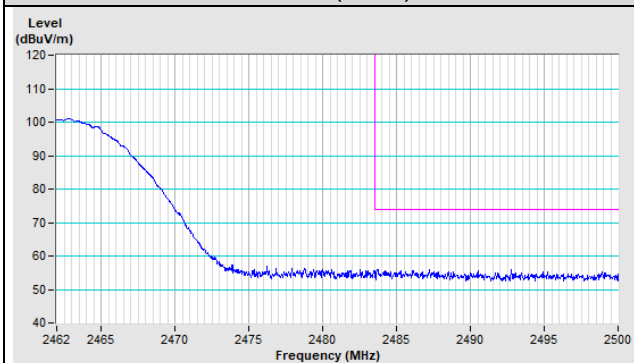
Horizontal (Peak)



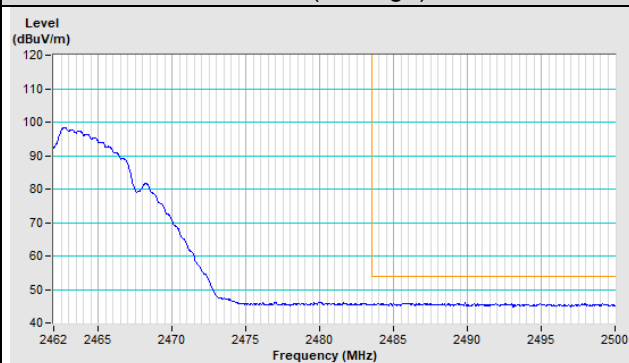
Horizontal (Average)



Vertical (Peak)

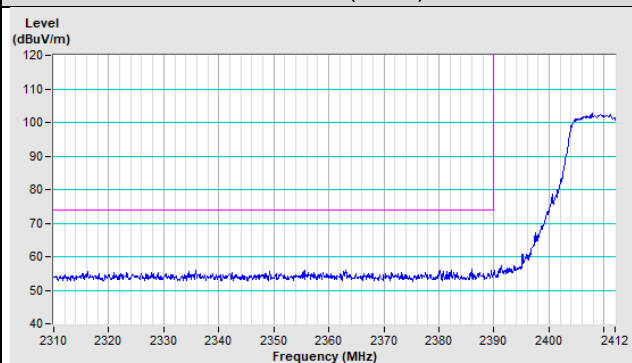


Vertical (Average)

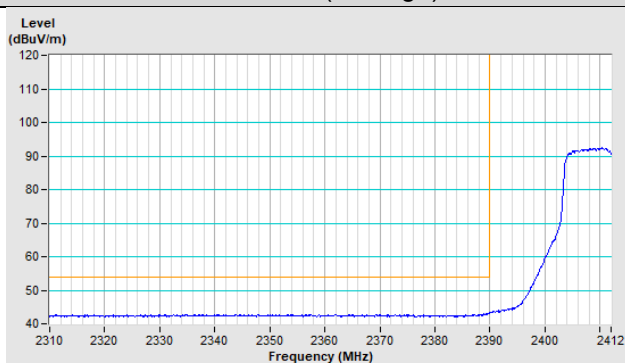


### 802.11g Channel 1

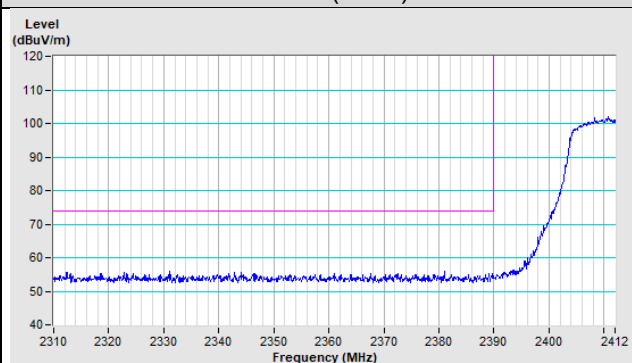
Horizontal (Peak)



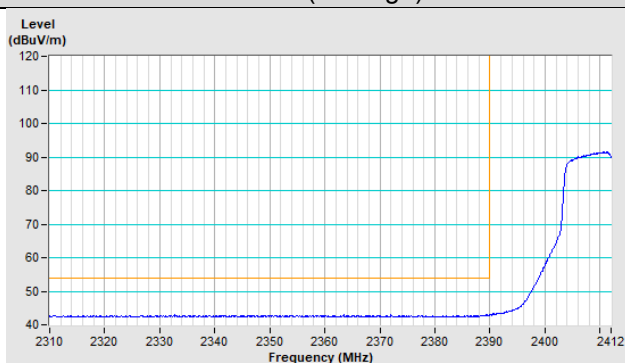
Horizontal (Average)



Vertical (Peak)

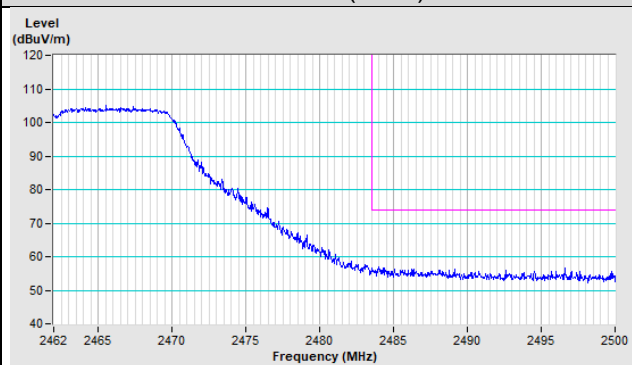


Vertical (Average)

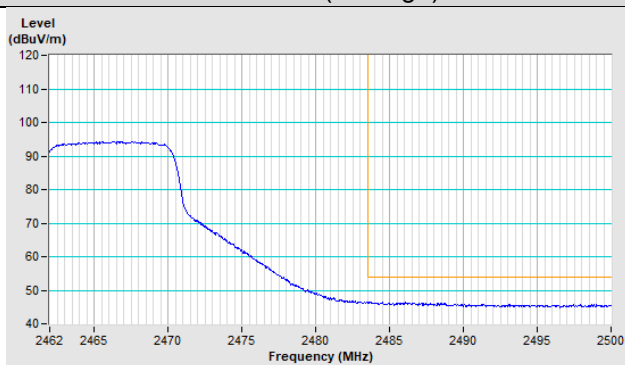


### 802.11g Channel 11

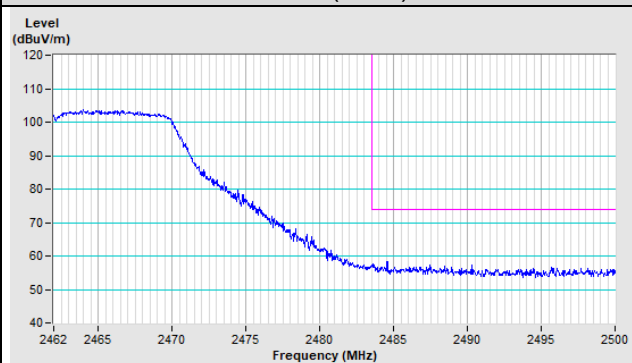
Horizontal (Peak)



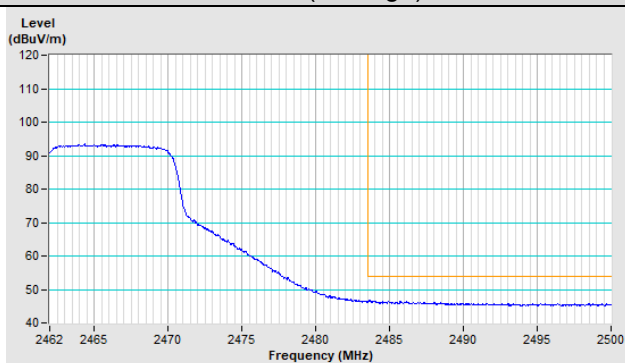
Horizontal (Average)



Vertical (Peak)

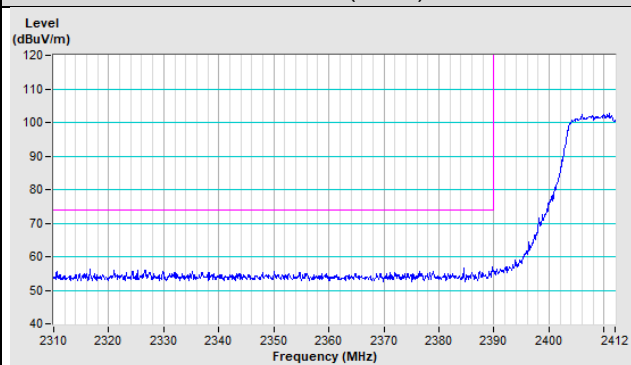


Vertical (Average)

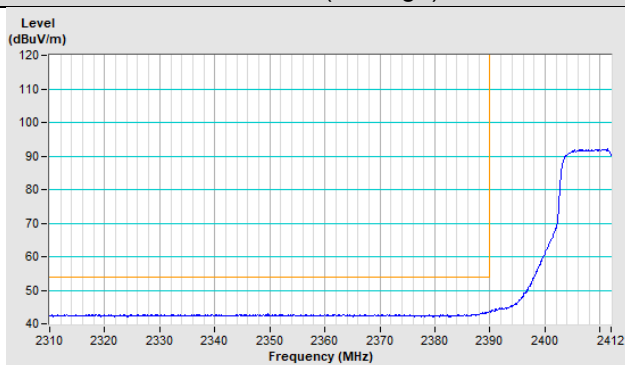


### VHT20 Channel 1

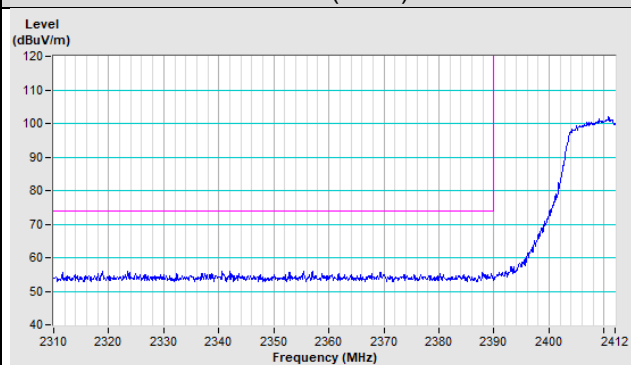
Horizontal (Peak)



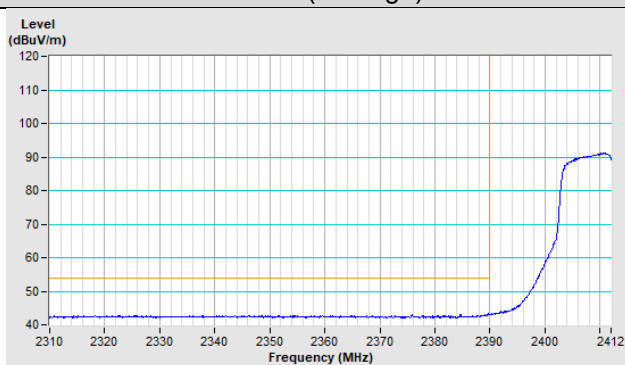
Horizontal (Average)



Vertical (Peak)

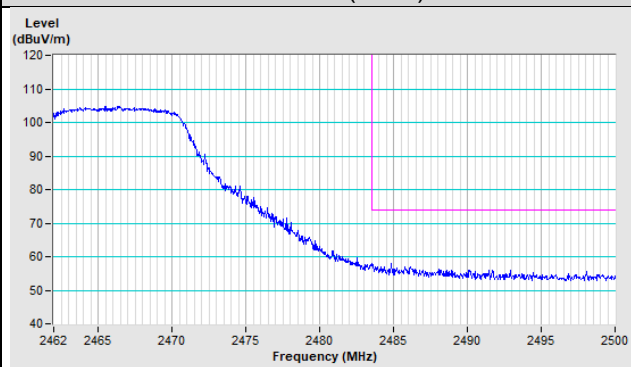


Vertical (Average)

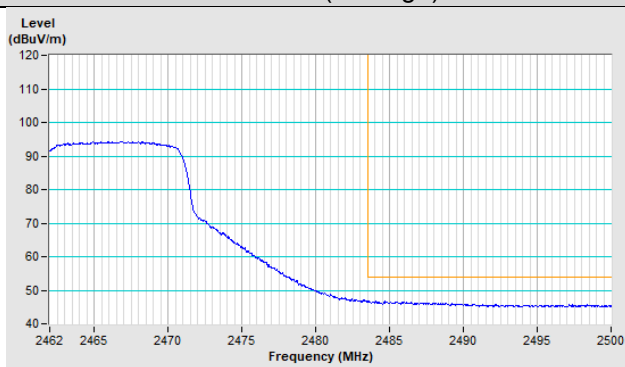


### VHT20 Channel 11

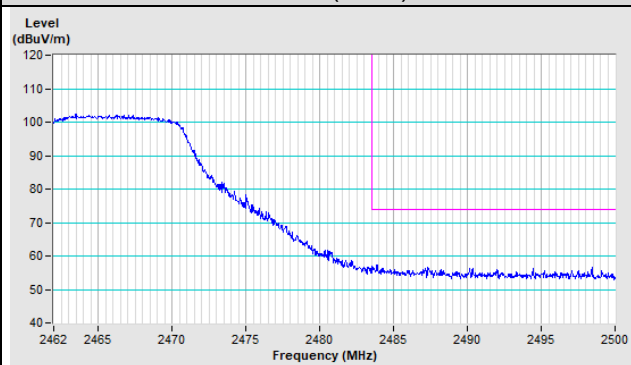
Horizontal (Peak)



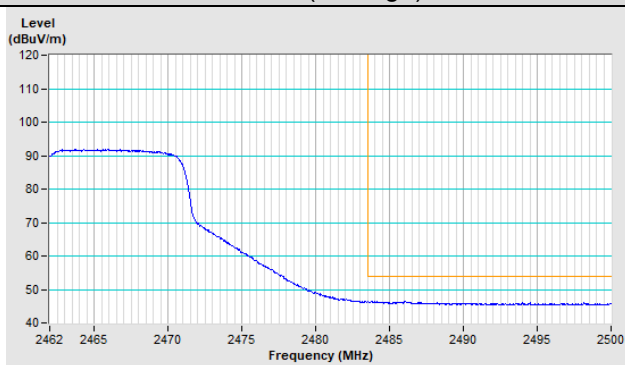
Horizontal (Average)



Vertical (Peak)

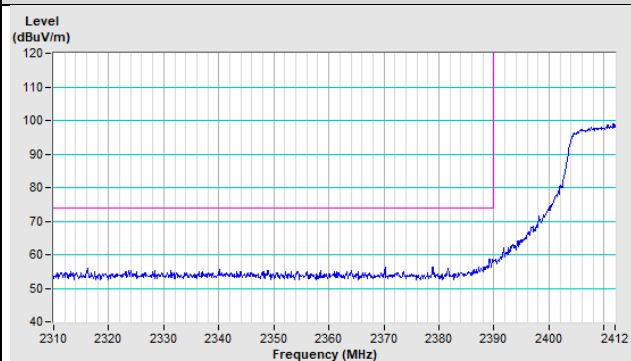


Vertical (Average)

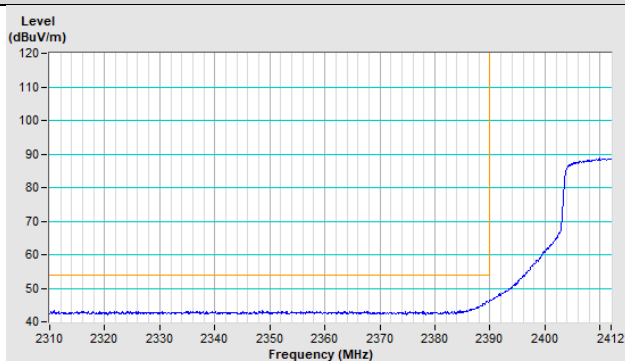


### VHT40 Channel 3

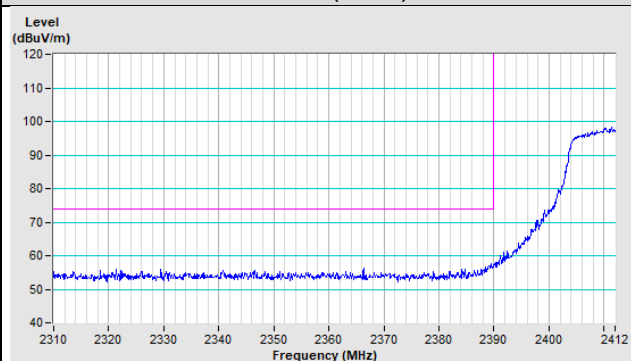
Horizontal (Peak)



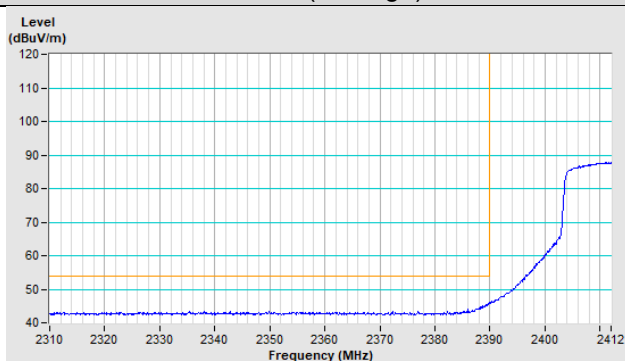
Horizontal (Average)



Vertical (Peak)

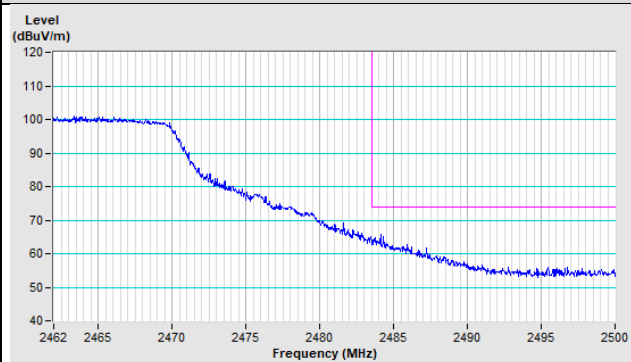


Vertical (Average)

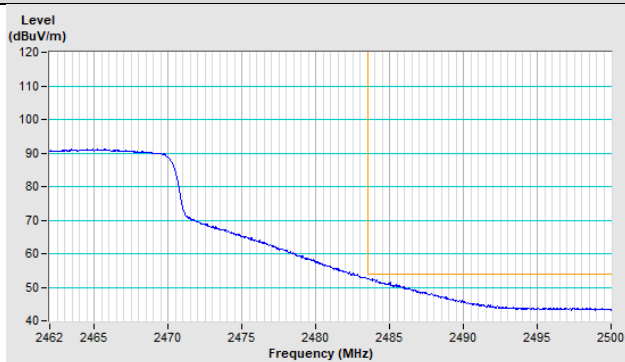


### VHT40 Channel 9

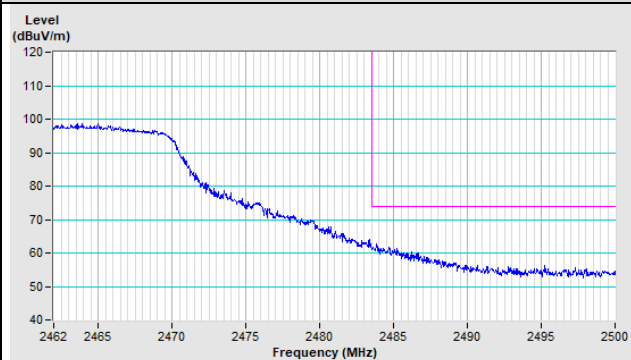
Horizontal (Peak)



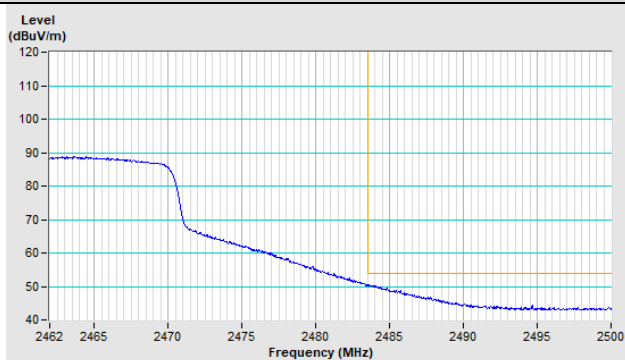
Horizontal (Average)



Vertical (Peak)



Vertical (Average)



## 5 Pictures of Test Arrangements

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

## Appendix – Information of 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:

### Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

### Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

### Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

**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 ---