FCC Test Report

Report No.:	RFBCKS-WTW-P21050677
FCC ID:	2ASE7-BIOHB021G120
Test Model:	BIOHB021G121, BIOHB021G122
Received Date:	May 18, 2021
Test Date:	July 01 to 19, 2021
Issued Date:	Oct. 08, 2021
Applicant:	BioIntelliSense, Inc
Address:	570 El Camino Real #200, Redwood City, CA 94063 US
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

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Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RFBCKS-WTW-P21050677	Original release.	Oct. 08, 2021

1 Certificate of Conformity

Product:	Biohub2
Brand:	BioIntelliSense, Inc
Test Model:	BIOHB021G121, BIOHB021G122
Sample Status:	Engineering sample
Applicant:	BioIntelliSense, Inc
Test Date:	July 01 to 19, 2021
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10: 2013

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

Prepared by : Phoenix Huang , **Date:** Oct. 08, 2021

Phoenix Huang / Specialist

Approved by : , **Date:** Oct. 08, 2021

Clark Lin / Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -11.85 dB at 0.33359 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.1 dB at 2390.00 MHz and 2483.50 MHz.
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 ipex(MHF) not a standard connector.

Note:
1. For 2.4 GHz band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A.
2. 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	1.9 dB
Conducted emissions	-	2.5 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.4 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Biohub2
Brand	BioIntelliSense, Inc
Test Model	BIOHB021G121, BIOHB021G122
Status of EUT	Engineering sample
Power Supply Rating	5 Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in VHT mode
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11 Mbps 802.11g: up to 54 Mbps 802.11n: up to 300 Mbps VHT: up to 400 Mbps
Operating Frequency	2.412 ~ 2.462 GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7
Output Power	602.627 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. The EUT has below model names, more detailed information as below table.

Model	LTE Module	Adapter	Adapter Brand / Model
BIOHB021G121	CAT-M1 ME910G1-WW	Non-medical, US plug	Frecom / F12L20-050200SPAU
			UMEC / UP0121M-05PA
BIOHB021G122	CAT-M1 ME910G1-WW	Medical, US plug	UMEC / UP0131Z-05MA
			APD / WB-10Q05FU

2. The EUT has below radios as following table:

Radio 1	Radio 2
WLAN (2.4GHz + 5GHz) + Bluetooth	WWAN (FCC ID: 2ASE7-BIOHB02CTM10)

3. Simultaneously transmission condition.

Condition	Technology		
1	WLAN 2.4GHz	WLAN 5GHz	Bluetooth
2	WWAN	Bluetooth	-
3	WLAN 2.4GHz	Bluetooth	-
4	WLAN 5GHz	Bluetooth	-
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.			

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

Antenna No.	RF Chain No.	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type
1	0	4.67	2.4~2.4835	PCB	ipex(MHF)
		5.2	5.15~5.25		
		5.33	5.25~5.35		
		4.43	5.47~5.725		
		4.25	5.725~5.85		
2	1	3.62	2.4~2.4835	PCB	ipex(MHF)
		3.85	5.15~5.25		
		3.78	5.25~5.35		
		3.22	5.47~5.725		
		2.89	5.725~5.85		
Note: The Bluetooth technology will fix transmission on Chain (1).					

5. The EUT must be supplied power adapter and following different models could be chosen as following table:

No.	Brand	Model No.	Spec.	Plug
1	UMEC	UP0131Z-05MA	Input: 100-240Vac, 50/60Hz, 0.4A MAX Output: 5.0Vdc, 2.5A, 12.5W DC Output cable: Unshielded, 2m	Detachable
2	UMEC	UP0121M-05PA	Input: 100-240Vac, 50/60Hz, 0.4A Output: 5Vdc, 2.0A DC Output cable: Unshielded, 2m	US
3	APD	WB-10Q05FU	Input: 100-240Vac, 50/60Hz, 0.4A Output: 5.0Vdc, 2.0A DC Output cable: Unshielded, 2m	US
4	Frecom	F12L20-050200SPAU	Input: 100-240Vac, 50/60Hz, 0.3A Output: 5.0Vdc, 2.0A DC Output cable: Unshielded, 2m	US

Note:
1. For the conducted emissions test, the EUT was pre-tested with above adapters, the worst case was found in **Adapter 2**. Therefore only the test data of the adapter was recorded in this report.
2. For radiated emissions test, the EUT was pre-tested with above adapters, the worst case was found in **Adapter 1**. Therefore only the test data of the adapter was recorded in this report.

6. The EUT incorporates a MIMO function.

2.4GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
VHT20	2TX	2RX
VHT40	2TX	2RX
Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and VHT mode for 20MHz (40MHz), therefore the manufacturer will control the power for 802.11n mode is the same as the VHT or more lower than it and investigated worst case to representative mode in test report. (Final test mode refer to section 3.2.1)		

7. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.
8. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.2 Description of Test Modes

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

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

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

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1	DSSS	DBPSK	1

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1	DSSS	DBPSK	1

Antenna Port Conducted Measurement:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

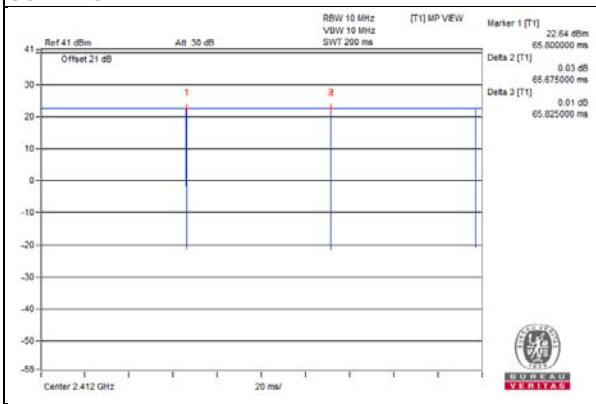
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	20deg. C, 70%RH	120Vac, 60Hz	Ryan Du
RE<1G	20deg. C, 70%RH	120Vac, 60Hz	Ryan Du
PLC	25deg. C, 71%RH	120Vac, 60Hz	Sampson Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Leon Dai

3.3 Duty Cycle of Test Signal

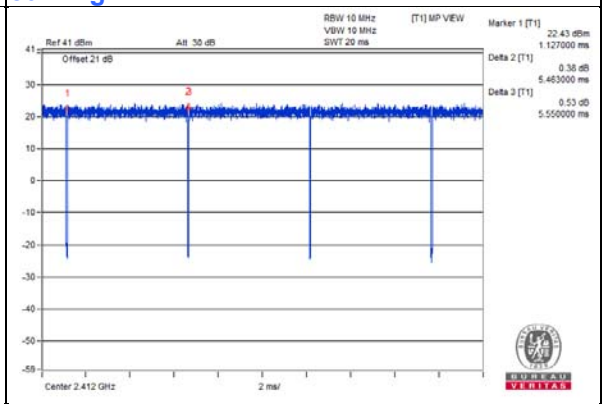
Duty cycle of test signal is ≥ 98 %, duty factor is not required.

802.11b: Duty cycle = 65.675 ms/65.825 ms = 0.998
802.11g: Duty cycle = 5.463 ms/5.55 ms = 0.984
VHT20: Duty cycle = 4.243 ms/4.303 ms = 0.986
VHT40: Duty cycle = 0.651 ms/0.66 ms = 0.986

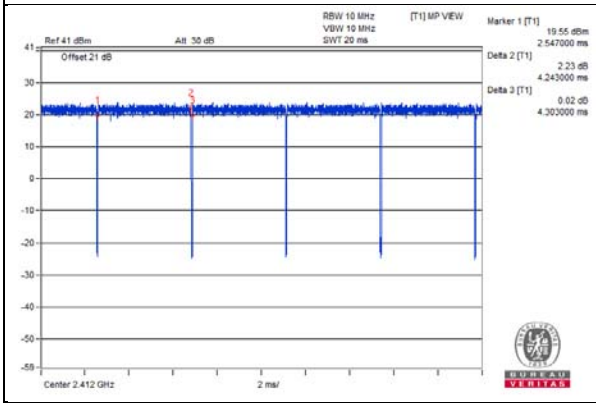
802.11b



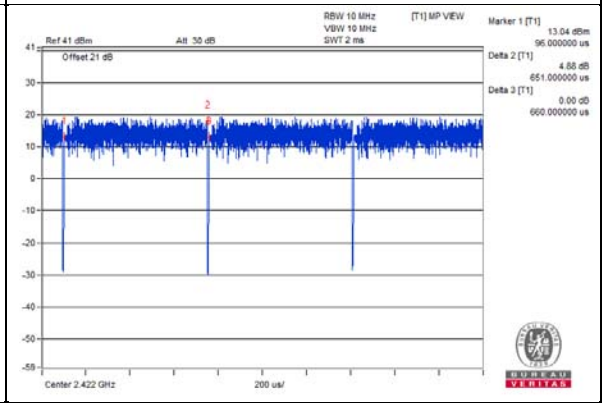
802.11g



VHT20



VHT40



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.

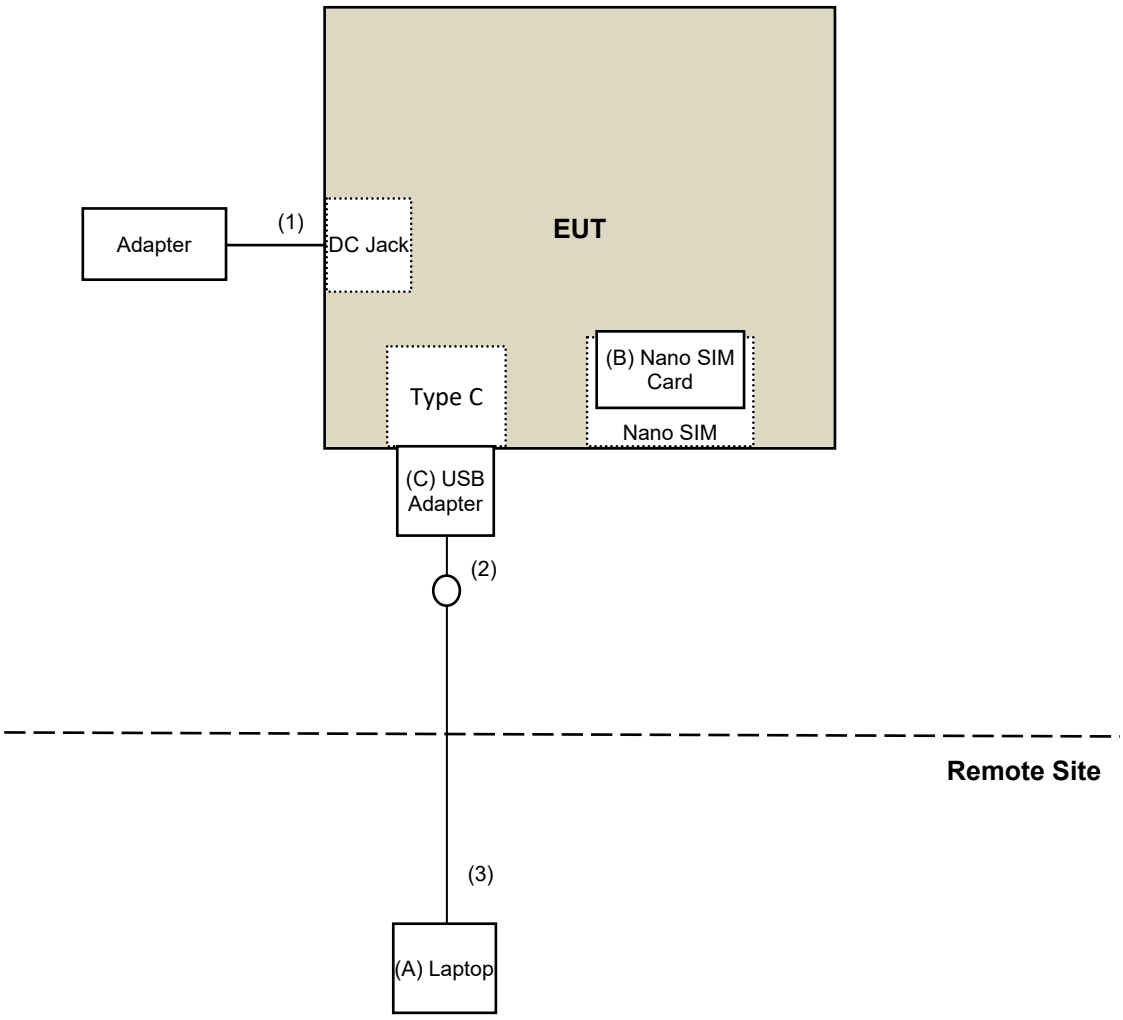
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	Lenovo	20U5S01X00 L14	PF-1ANPYA	NA	Provided by Lab
B.	Nano SIM Card	keysight	NA	NA	NA	Provided by Lab
C.	USB Adapter	transcend	NA	NA	NA	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	2	No	0	Supplied by client
2.	USB to RJ45	1	0.1	Yes	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



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 20dB 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

For Radiated Emission test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 06, 2021	July 05, 2022
Pre-Amplifier EMCI	EMC001340	980142	May 24, 2021	May 23, 2022
Loop Antenna Electro-Metrics	EM-6879	264	Mar. 05, 2021	Mar. 04, 2022
RF Cable	5D-FB	LOOPCAB-001	Jan. 07, 2021	Jan. 06, 2022
RF Cable	5D-FB	LOOPCAB-002	Jan. 07, 2021	Jan. 06, 2022
Pre-Amplifier Mini-Circuits	ZFL-1000VH2	QA0838008	Oct. 20, 2020	Oct. 19, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 05, 2020	Nov. 04, 2021
RF Cable	8D	966-3-1	Mar. 16, 2021	Mar. 15, 2022
RF Cable	8D	966-3-2	Mar. 16, 2021	Mar. 15, 2022
RF Cable	8D	966-3-3	Mar. 16, 2021	Mar. 15, 2022
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 24, 2020	Sep. 23, 2021
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 11, 2021	Jan. 10, 2022
RF Cable	EMC104-SM-SM-1500	180504	Apr. 26, 2021	Apr. 25, 2022
RF Cable	EMC104-SM-SM-2000	180601	June 08, 2021	June 07, 2022
RF Cable	EMC104-SM-SM-6000	210201	May 13, 2021	May 12, 2022
Spectrum Analyzer Keysight	N9030A	MY54490679	July 09, 2021	July 08, 2022
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 11, 2021	Jan. 10, 2022
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
RF Cable	EMC102-KM-KM-1200	160924	Jan. 11, 2021	Jan. 10, 2022
RF Cable	EMC-KM-KM-4000	200214	Mar. 10, 2021	Mar. 09, 2022
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: July 15 to 16, 2021

For Bandedge test: (802.11b)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 06, 2020	July 05, 2021
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 11, 2021	Jan. 10, 2022
RF Cable	EMC104-SM-SM-1500	180504	Apr. 26, 2021	Apr. 25, 2022
RF Cable	EMC104-SM-SM-2000	180601	June 08, 2021	June 07, 2022
RF Cable	EMC104-SM-SM-6000	210201	May 13, 2021	May 12, 2022
Spectrum Analyzer Keysight	N9030A	MY54490679	July 13, 2020	July 12, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 11, 2021	Jan. 10, 2022
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
RF Cable	EMC102-KM-KM-1200	160924	Jan. 11, 2021	Jan. 10, 2022
RF Cable	EMC-KM-KM-4000	200214	Mar. 10, 2021	Mar. 09, 2022
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: July 01, 2021

For Bandedge test: (other modulation test)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 06, 2021	July 05, 2022
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 11, 2021	Jan. 10, 2022
RF Cable	EMC104-SM-SM-1500	180504	Apr. 26, 2021	Apr. 25, 2022
RF Cable	EMC104-SM-SM-2000	180601	June 08, 2021	June 07, 2022
RF Cable	EMC104-SM-SM-6000	210201	May 13, 2021	May 12, 2022
Spectrum Analyzer Keysight	N9030A	MY54490679	July 13, 2020	July 12, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 11, 2021	Jan. 10, 2022
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
RF Cable	EMC102-KM-KM-1200	160924	Jan. 11, 2021	Jan. 10, 2022
RF Cable	EMC-KM-KM-4000	200214	Mar. 10, 2021	Mar. 09, 2022
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: July 08, 2021

Fort other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	101516	Mar. 08, 2021	Mar. 07, 2022
Power meter Anritsu	ML2495A	1529002	June 21, 2021	June 20, 2022
Power sensor Anritsu	MA2411B	1339443	May 31, 2021	May 30, 2022
10dB Attenuator Woken	MDCS18N-10	MDCS18N-10-01	Apr. 13, 2021	Apr. 12, 2022
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

NOTE: 1. The test was performed in Oven room 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: July 19, 2021

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 detects 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:

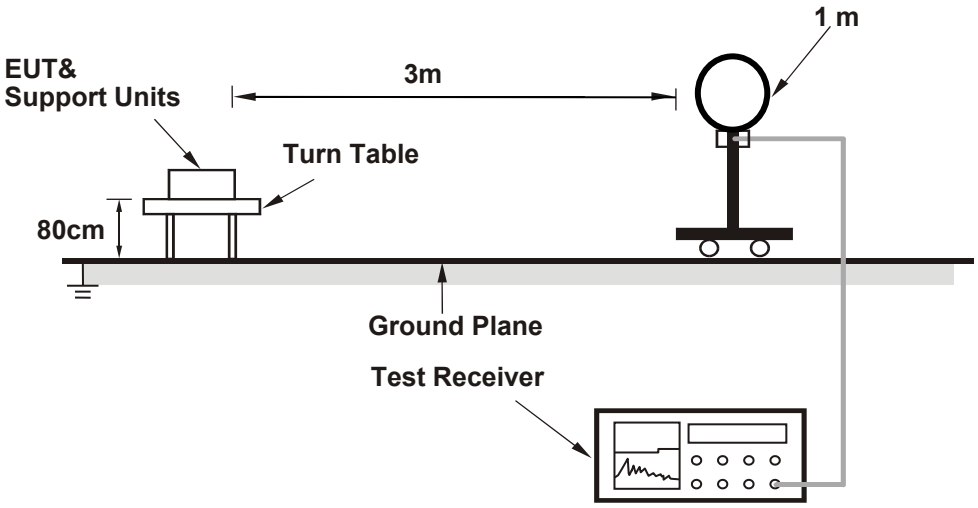
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

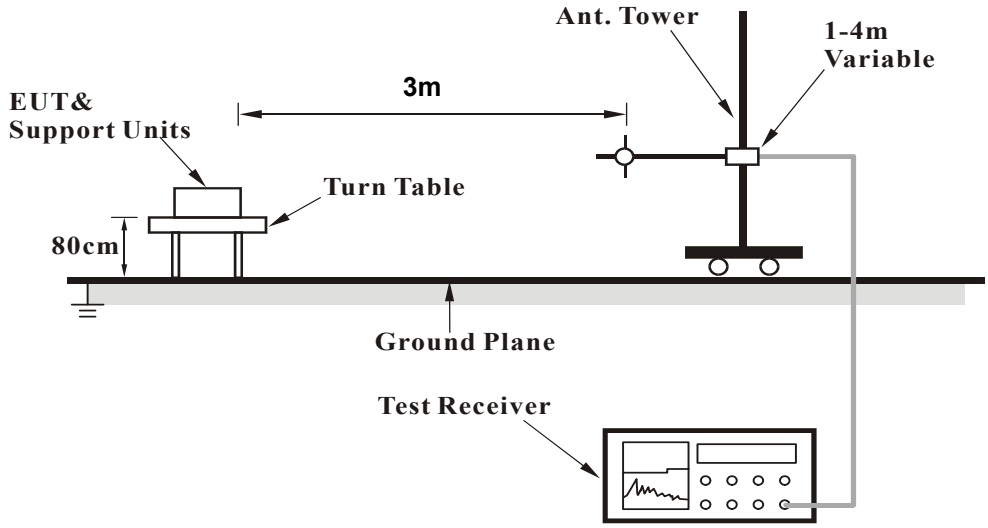
No deviation.

4.1.5 Test Setup

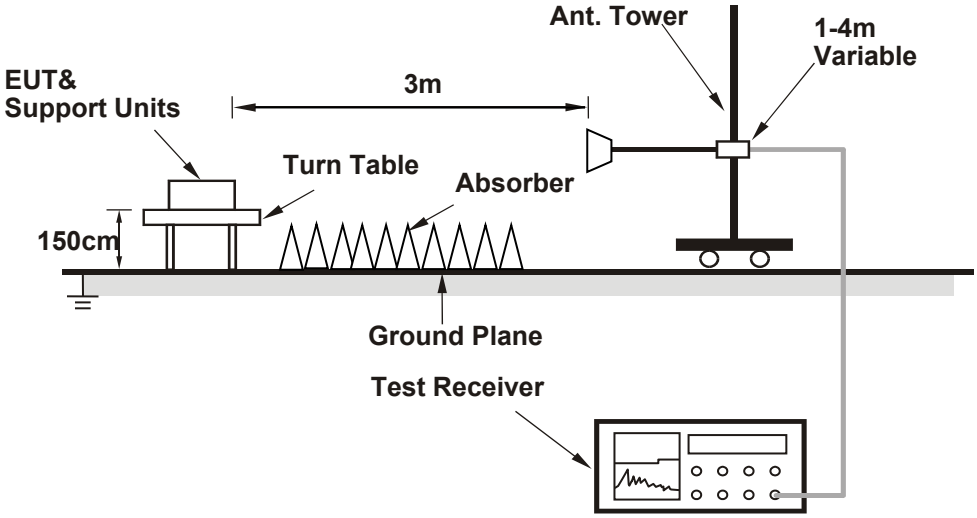
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

a. Placed the EUT on the testing table.
b. Controlling software (Run BioHub_Wi-Fi command.txt with ADB) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data:

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	2387.24	59.2 PK	74.0	-14.8	2.90 H	340	60.4	-1.2
2	2387.24	52.1 AV	54.0	-1.9	2.90 H	340	53.3	-1.2
3	*2412.00	107.5 PK			2.90 H	340	108.7	-1.2
4	*2412.00	105.1 AV			2.90 H	340	106.3	-1.2
5	4824.00	42.0 PK	74.0	-32.0	1.47 H	31	38.3	3.7
6	4824.00	34.5 AV	54.0	-19.5	1.47 H	31	30.8	3.7
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	2386.05	60.4 PK	74.0	-13.6	3.86 V	255	61.6	-1.2
2	2386.05	52.3 AV	54.0	-1.7	3.86 V	255	53.5	-1.2
3	*2412.00	108.3 PK			3.86 V	255	109.5	-1.2
4	*2412.00	106.1 AV			3.86 V	255	107.3	-1.2
5	4824.00	44.2 PK	74.0	-29.8	2.04 V	160	40.5	3.7
6	4824.00	43.2 AV	54.0	-10.8	2.04 V	160	39.5	3.7

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	2390.00	55.9 PK	74.0	-18.1	3.50 H	283	57.1	-1.2
2	2390.00	44.5 AV	54.0	-9.5	3.50 H	283	45.7	-1.2
3	*2437.00	107.1 PK			3.50 H	283	108.3	-1.2
4	*2437.00	105.2 AV			3.50 H	283	106.4	-1.2
5	2483.50	56.7 PK	74.0	-17.3	3.50 H	283	57.9	-1.2
6	2483.50	44.4 AV	54.0	-9.6	3.50 H	283	45.6	-1.2
7	4874.00	41.3 PK	74.0	-32.7	1.47 H	24	37.5	3.8
8	4874.00	33.9 AV	54.0	-20.1	1.47 H	24	30.1	3.8
9	7311.00	46.0 PK	74.0	-28.0	2.64 H	205	36.3	9.7
10	7311.00	34.1 AV	54.0	-19.9	2.64 H	205	24.4	9.7
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	55.5 PK	74.0	-18.5	3.62 V	258	56.7	-1.2
2	2390.00	43.6 AV	54.0	-10.4	3.62 V	258	44.8	-1.2
3	*2437.00	106.7 PK			3.62 V	258	107.9	-1.2
4	*2437.00	104.2 AV			3.62 V	258	105.4	-1.2
5	2483.50	56.3 PK	74.0	-17.7	3.62 V	258	57.5	-1.2
6	2483.50	44.4 AV	54.0	-9.6	3.62 V	258	45.6	-1.2
7	4874.00	43.8 PK	74.0	-30.2	1.94 V	164	40.0	3.8
8	4874.00	43.0 AV	54.0	-11.0	1.94 V	164	39.2	3.8
9	7311.00	45.9 PK	74.0	-28.1	1.32 V	282	36.2	9.7
10	7311.00	37.0 AV	54.0	-17.0	1.32 V	282	27.3	9.7

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	107.2 PK			3.50 H	284	108.4	-1.2
2	*2462.00	105.2 AV			3.50 H	284	106.4	-1.2
3	2483.50	57.5 PK	74.0	-16.5	3.50 H	284	58.7	-1.2
4	2483.50	49.3 AV	54.0	-4.7	3.50 H	284	50.5	-1.2
5	4924.00	41.6 PK	74.0	-32.4	1.43 H	36	37.7	3.9
6	4924.00	34.3 AV	54.0	-19.7	1.43 H	36	30.4	3.9
7	7386.00	46.2 PK	74.0	-27.8	2.66 H	197	36.5	9.7
8	7386.00	34.3 AV	54.0	-19.7	2.66 H	197	24.6	9.7
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	106.8 PK			3.66 V	250	108.0	-1.2
2	*2462.00	104.4 AV			3.66 V	250	105.6	-1.2
3	2483.50	58.7 PK	74.0	-15.3	3.66 V	250	59.9	-1.2
4	2483.50	46.4 AV	54.0	-7.6	3.66 V	250	47.6	-1.2
5	4924.00	44.4 PK	74.0	-29.6	1.98 V	175	40.5	3.9
6	4924.00	43.5 AV	54.0	-10.5	1.98 V	175	39.6	3.9
7	7386.00	46.2 PK	74.0	-27.8	1.34 V	272	36.5	9.7
8	7386.00	37.2 AV	54.0	-16.8	1.34 V	272	27.5	9.7

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	67.7 PK	74.0	-6.3	3.22 H	302	68.9	-1.2
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**3.22 H**	**302**	**55.1**	**-1.2**
3	*2412.00	109.8 PK			3.22 H	302	111.0	-1.2
4	*2412.00	99.2 AV			3.22 H	302	100.4	-1.2
5	4824.00	42.1 PK	74.0	-31.9	1.38 H	25	38.4	3.7
6	4824.00	34.6 AV	54.0	-19.4	1.38 H	25	30.9	3.7
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	65.1 PK	74.0	-8.9	3.47 V	243	66.3	-1.2
2	2390.00	53.6 AV	54.0	-0.4	3.47 V	243	54.8	-1.2
3	*2412.00	107.3 PK			3.47 V	243	108.5	-1.2
4	*2412.00	97.9 AV			3.47 V	243	99.1	-1.2
5	4824.00	44.0 PK	74.0	-30.0	1.97 V	186	40.3	3.7
6	4824.00	43.1 AV	54.0	-10.9	1.97 V	186	39.4	3.7

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	2390.00	55.8 PK	74.0	-18.2	3.24 H	291	57.0	-1.2
2	2390.00	44.4 AV	54.0	-9.6	3.24 H	291	45.6	-1.2
3	*2437.00	110.3 PK			3.24 H	291	111.5	-1.2
4	*2437.00	100.3 AV			3.24 H	291	101.5	-1.2
5	2483.50	56.5 PK	74.0	-17.5	3.24 H	291	57.7	-1.2
6	2483.50	44.4 AV	54.0	-9.6	3.24 H	291	45.6	-1.2
7	4874.00	41.7 PK	74.0	-32.3	1.42 H	29	37.9	3.8
8	4874.00	34.4 AV	54.0	-19.6	1.42 H	29	30.6	3.8
9	7311.00	45.8 PK	74.0	-28.2	2.71 H	185	36.1	9.7
10	7311.00	34.0 AV	54.0	-20.0	2.71 H	185	24.3	9.7
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	55.7 PK	74.0	-18.3	3.82 V	252	56.9	-1.2
2	2390.00	44.4 AV	54.0	-9.6	3.82 V	252	45.6	-1.2
3	*2437.00	110.2 PK			3.82 V	252	111.4	-1.2
4	*2437.00	100.4 AV			3.82 V	252	101.6	-1.2
5	2483.50	55.6 PK	74.0	-18.4	3.82 V	252	56.8	-1.2
6	2483.50	43.7 AV	54.0	-10.3	3.82 V	252	44.9	-1.2
7	4874.00	44.1 PK	74.0	-29.9	2.00 V	183	40.3	3.8
8	4874.00	43.1 AV	54.0	-10.9	2.00 V	183	39.3	3.8
9	7311.00	46.3 PK	74.0	-27.7	1.29 V	261	36.6	9.7
10	7311.00	37.2 AV	54.0	-16.8	1.29 V	261	27.5	9.7

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	109.6 PK			3.10 H	296	110.8	-1.2
2	*2462.00	99.1 AV			3.10 H	296	100.3	-1.2
3	2483.50	69.9 PK	74.0	-4.1	3.10 H	296	71.1	-1.2
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**3.10 H**	**296**	**55.1**	**-1.2**
5	4924.00	41.3 PK	74.0	-32.7	1.40 H	26	37.4	3.9
6	4924.00	33.8 AV	54.0	-20.2	1.40 H	26	29.9	3.9
7	7386.00	46.2 PK	74.0	-27.8	2.63 H	188	36.5	9.7
8	7386.00	34.4 AV	54.0	-19.6	2.63 H	188	24.7	9.7
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	107.9 PK			3.46 V	233	109.1	-1.2
2	*2462.00	98.0 AV			3.46 V	233	99.2	-1.2
3	2483.50	68.1 PK	74.0	-5.9	3.46 V	233	69.3	-1.2
4	2483.50	53.7 AV	54.0	-0.3	3.46 V	233	54.9	-1.2
5	4924.00	44.1 PK	74.0	-29.9	1.94 V	164	40.2	3.9
6	4924.00	43.0 AV	54.0	-11.0	1.94 V	164	39.1	3.9
7	7386.00	46.0 PK	74.0	-28.0	1.28 V	261	36.3	9.7
8	7386.00	37.3 AV	54.0	-16.7	1.28 V	261	27.6	9.7

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	68.6 PK	74.0	-5.4	2.84 H	295	69.8	-1.2
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**2.84 H**	**295**	**55.1**	**-1.2**
3	*2412.00	108.8 PK			2.84 H	295	110.0	-1.2
4	*2412.00	98.5 AV			2.84 H	295	99.7	-1.2
5	4824.00	41.9 PK	74.0	-32.1	1.47 H	21	38.2	3.7
6	4824.00	34.8 AV	54.0	-19.2	1.47 H	21	31.1	3.7
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	70.4 PK	74.0	-3.6	3.92 V	249	71.6	-1.2
2	2390.00	53.7 AV	54.0	-0.3	3.92 V	249	54.9	-1.2
3	*2412.00	108.8 PK			3.92 V	249	110.0	-1.2
4	*2412.00	98.6 AV			3.92 V	249	99.8	-1.2
5	4824.00	44.6 PK	74.0	-29.4	2.01 V	176	40.9	3.7
6	4824.00	43.4 AV	54.0	-10.6	2.01 V	176	39.7	3.7

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	2390.00	55.1 PK	74.0	-18.9	2.88 H	291	56.3	-1.2
2	2390.00	43.7 AV	54.0	-10.3	2.88 H	291	44.9	-1.2
3	*2437.00	109.9 PK			2.88 H	291	111.1	-1.2
4	*2437.00	100.7 AV			2.88 H	291	101.9	-1.2
5	2483.50	56.5 PK	74.0	-17.5	2.88 H	291	57.7	-1.2
6	2483.50	44.3 AV	54.0	-9.7	2.88 H	291	45.5	-1.2
7	4874.00	41.9 PK	74.0	-32.1	1.37 H	27	38.1	3.8
8	4874.00	34.6 AV	54.0	-19.4	1.37 H	27	30.8	3.8
9	7311.00	46.3 PK	74.0	-27.7	2.71 H	195	36.6	9.7
10	7311.00	34.3 AV	54.0	-19.7	2.71 H	195	24.6	9.7
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	55.7 PK	74.0	-18.3	3.79 V	251	56.9	-1.2
2	2390.00	44.1 AV	54.0	-9.9	3.79 V	251	45.3	-1.2
3	*2437.00	110.4 PK			3.79 V	251	111.6	-1.2
4	*2437.00	100.9 AV			3.79 V	251	102.1	-1.2
5	2483.50	56.3 PK	74.0	-17.7	3.79 V	251	57.5	-1.2
6	2483.50	44.1 AV	54.0	-9.9	3.79 V	251	45.3	-1.2
7	4874.00	44.0 PK	74.0	-30.0	1.92 V	172	40.2	3.8
8	4874.00	43.1 AV	54.0	-10.9	1.92 V	172	39.3	3.8
9	7311.00	45.8 PK	74.0	-28.2	1.40 V	266	36.1	9.7
10	7311.00	36.9 AV	54.0	-17.1	1.40 V	266	27.2	9.7

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	108.2 PK			2.83 H	275	109.4	-1.2
2	*2462.00	98.5 AV			2.83 H	275	99.7	-1.2
3	2483.50	68.8 PK	74.0	-5.2	2.83 H	275	70.0	-1.2
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**2.83 H**	**275**	**55.1**	**-1.2**
5	4924.00	41.4 PK	74.0	-32.6	1.41 H	27	37.5	3.9
6	4924.00	34.4 AV	54.0	-19.6	1.41 H	27	30.5	3.9
7	7386.00	46.1 PK	74.0	-27.9	2.71 H	209	36.4	9.7
8	7386.00	34.4 AV	54.0	-19.6	2.71 H	209	24.7	9.7
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	107.8 PK			3.88 V	237	109.0	-1.2
2	*2462.00	98.2 AV			3.88 V	237	99.4	-1.2
3	2483.50	71.2 PK	74.0	-2.8	3.88 V	237	72.4	-1.2
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**3.88 V**	**237**	**55.1**	**-1.2**
5	4924.00	44.7 PK	74.0	-29.3	2.02 V	171	40.8	3.9
6	4924.00	43.5 AV	54.0	-10.5	2.02 V	171	39.6	3.9
7	7386.00	46.6 PK	74.0	-27.4	1.35 V	286	36.9	9.7
8	7386.00	37.3 AV	54.0	-16.7	1.35 V	286	27.6	9.7

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	69.6 PK	74.0	-4.4	2.84 H	297	70.8	-1.2
2	2390.00	52.6 AV	54.0	-1.4	2.84 H	297	53.8	-1.2
3	*2422.00	103.2 PK			2.84 H	297	104.4	-1.2
4	*2422.00	94.0 AV			2.84 H	297	95.2	-1.2
5	4844.00	42.3 PK	74.0	-31.7	1.37 H	38	38.5	3.8
6	4844.00	34.7 AV	54.0	-19.3	1.37 H	38	30.9	3.8
7	7266.00	46.4 PK	74.0	-27.6	2.70 H	205	36.9	9.5
8	7266.00	34.6 AV	54.0	-19.4	2.70 H	205	25.1	9.5
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	67.9 PK	74.0	-6.1	3.87 V	248	69.1	-1.2
2	2390.00	53.7 AV	54.0	-0.3	3.87 V	248	54.9	-1.2
3	*2422.00	103.7 PK			3.87 V	248	104.9	-1.2
4	*2422.00	94.2 AV			3.87 V	248	95.4	-1.2
5	4844.00	44.1 PK	74.0	-29.9	2.00 V	182	40.3	3.8
6	4844.00	43.1 AV	54.0	-10.9	2.00 V	182	39.3	3.8
7	7266.00	45.7 PK	74.0	-28.3	1.40 V	268	36.2	9.5
8	7266.00	36.9 AV	54.0	-17.1	1.40 V	268	27.4	9.5

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	2390.00	66.3 PK	74.0	-7.7	2.79 H	304	67.5	-1.2
2	2390.00	53.7 AV	54.0	-0.3	2.79 H	304	54.9	-1.2
3	*2437.00	104.6 PK			2.79 H	304	105.8	-1.2
4	*2437.00	95.0 AV			2.79 H	304	96.2	-1.2
5	2483.50	67.7 PK	74.0	-6.3	2.79 H	304	68.9	-1.2
6	2483.50	51.9 AV	54.0	-2.1	2.79 H	304	53.1	-1.2
7	4874.00	41.8 PK	74.0	-32.2	1.44 H	48	38.0	3.8
8	4874.00	34.7 AV	54.0	-19.3	1.44 H	48	30.9	3.8
9	7311.00	46.3 PK	74.0	-27.7	2.65 H	213	36.6	9.7
10	7311.00	34.3 AV	54.0	-19.7	2.65 H	213	24.6	9.7
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	66.4 PK	74.0	-7.6	3.81 V	251	67.6	-1.2
2	2390.00	53.8 AV	54.0	-0.2	3.81 V	251	55.0	-1.2
3	*2437.00	105.3 PK			3.81 V	251	106.5	-1.2
4	*2437.00	95.4 AV			3.81 V	251	96.6	-1.2
5	2483.50	68.1 PK	74.0	-5.9	3.81 V	251	69.3	-1.2
6	2483.50	52.3 AV	54.0	-1.7	3.81 V	251	53.5	-1.2
7	4874.00	44.5 PK	74.0	-29.5	1.95 V	167	40.7	3.8
8	4874.00	43.6 AV	54.0	-10.4	1.95 V	167	39.8	3.8
9	7311.00	46.5 PK	74.0	-27.5	1.32 V	265	36.8	9.7
10	7311.00	37.7 AV	54.0	-16.3	1.32 V	265	28.0	9.7

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	103.8 PK			2.75 H	280	105.0	-1.2
2	*2452.00	93.6 AV			2.75 H	280	94.8	-1.2
3	2483.50	70.4 PK	74.0	-3.6	2.75 H	280	71.6	-1.2
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**2.75 H**	**280**	**55.1**	**-1.2**
5	4904.00	41.4 PK	74.0	-32.6	1.38 H	36	37.5	3.9
6	4904.00	34.0 AV	54.0	-20.0	1.38 H	36	30.1	3.9
7	7356.00	46.2 PK	74.0	-27.8	2.72 H	198	36.3	9.9
8	7356.00	34.1 AV	54.0	-19.9	2.72 H	198	24.2	9.9
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	104.2 PK			3.81 V	250	105.4	-1.2
2	*2452.00	94.1 AV			3.81 V	250	95.3	-1.2
3	2483.50	68.9 PK	74.0	-5.1	3.81 V	250	70.1	-1.2
4	2483.50	53.6 AV	54.0	-0.4	3.81 V	250	54.8	-1.2
5	4904.00	44.3 PK	74.0	-29.7	1.97 V	170	40.4	3.9
6	4904.00	43.5 AV	54.0	-10.5	1.97 V	170	39.6	3.9
7	7356.00	46.5 PK	74.0	-27.5	1.36 V	275	36.6	9.9
8	7356.00	37.7 AV	54.0	-16.3	1.36 V	275	27.8	9.9

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.

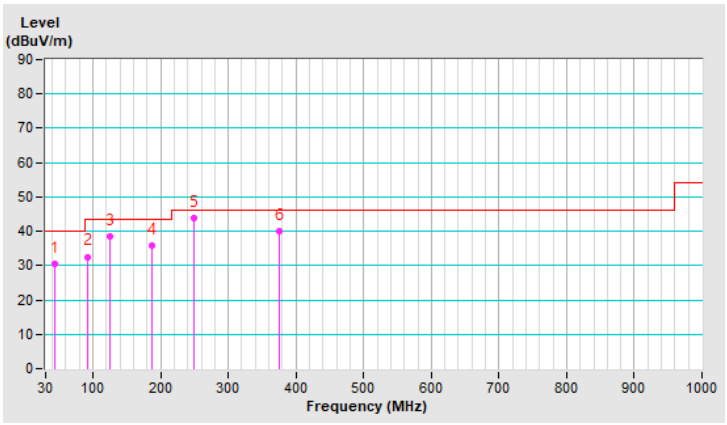
Below 1GHz Data:

RF Mode	TX 802.11b	Channel	CH 1：2412 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	43.00	30.4 QP	40.0	-9.6	1.00 H	71	38.8	-8.4
2	91.50	32.6 QP	43.5	-10.9	2.00 H	281	46.3	-13.7
3	125.01	38.5 QP	43.5	-5.0	2.00 H	297	47.8	-9.3
4	188.09	35.8 QP	43.5	-7.7	1.50 H	256	45.9	-10.1
5	250.00	44.0 QP	46.0	-2.0	1.00 H	133	52.6	-8.6
6	375.00	40.1 QP	46.0	-5.9	1.00 H	296	44.5	-4.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
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.

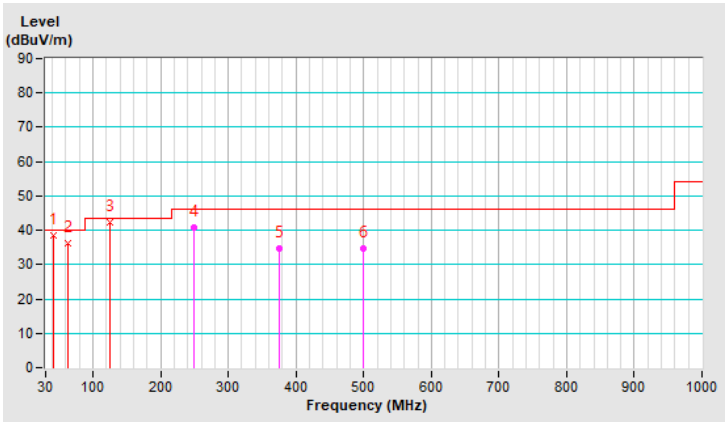


RF Mode	TX 802.11b	Channel	CH 1：2412 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	42.46	38.6 QP	40.0	-1.4	1.00 V	251	47.0	-8.4
2	63.03	36.1 QP	40.0	-3.9	1.50 V	358	45.0	-8.9
3	125.01	42.4 QP	43.5	-1.1	1.14 V	289	51.7	-9.3
4	250.00	40.7 QP	46.0	-5.3	1.50 V	202	49.3	-8.6
5	375.00	34.5 QP	46.0	-11.5	1.50 V	360	38.9	-4.4
6	500.01	34.8 QP	46.0	-11.2	1.00 V	192	35.8	-1.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
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.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 20, 2020	Oct. 19, 2021
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 27, 2020	Oct. 26, 2021
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 26, 2021	Mar. 25, 2022
50 ohms Terminator	50	3	Oct. 26, 2020	Oct. 25, 2021
RF Cable	5D-FB	COCCAB-001	Sep. 26, 2020	Sep. 25, 2021
Fixed attenuator EMCI	STI02-2200-10	005	Aug. 29, 2020	Aug. 28, 2021
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3 Tested Date: July 15, 2021

4.2.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

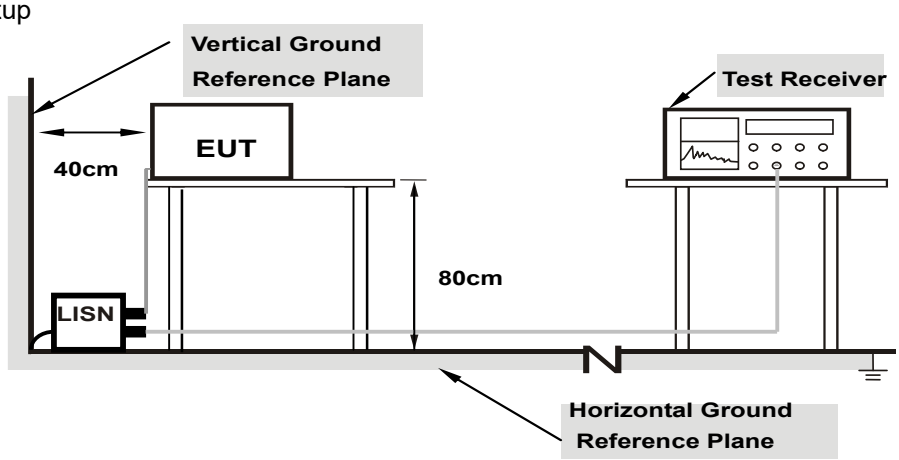
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

Note: 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.

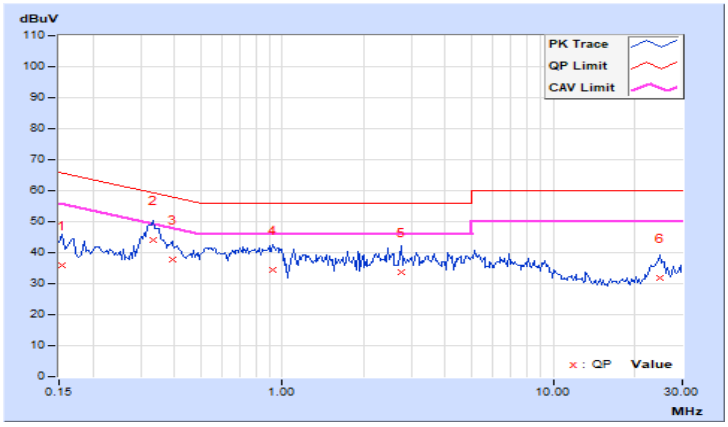
4.2.7 Test Results

RF Mode	TX 802.11b	Channel	CH 1：2412 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.97	25.78	16.20	35.75	26.17	65.79	55.79	-30.04	-29.62
2	**0.33359**	**10.02**	**34.06**	**27.49**	**44.08**	**37.51**	**59.36**	**49.36**	**-15.28**	**-11.85**
3	0.39219	10.03	27.93	21.60	37.96	31.63	58.02	48.02	-20.06	-16.39
4	0.92734	10.07	24.32	17.21	34.39	27.28	56.00	46.00	-21.61	-18.72
5	2.75781	10.17	23.62	15.68	33.79	25.85	56.00	46.00	-22.21	-20.15
6	24.78516	11.62	20.31	12.70	31.93	24.32	60.00	50.00	-28.07	-25.68

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

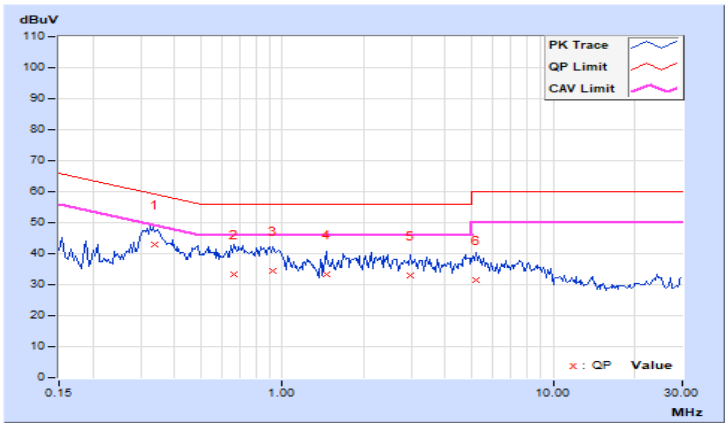


RF Mode	TX 802.11b	Channel	CH 1：2412 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.33678	10.01	33.13	27.39	43.14	37.40	59.28	49.28	-16.14	-11.88
2	0.66563	10.04	23.18	17.28	33.22	27.32	56.00	46.00	-22.78	-18.68
3	0.91953	10.05	24.34	17.83	34.39	27.88	56.00	46.00	-21.61	-18.12
4	1.44922	10.09	23.16	16.84	33.25	26.93	56.00	46.00	-22.75	-19.07
5	2.97266	10.18	22.74	16.20	32.92	26.38	56.00	46.00	-23.08	-19.62
6	5.20313	10.31	21.21	14.98	31.52	25.29	60.00	50.00	-28.48	-24.71

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

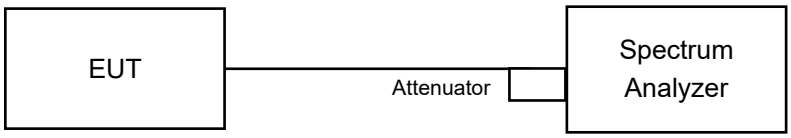


4.3 6dB Bandwidth Measurement

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

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	10.14	10.15	0.5	Pass
6	2437	11.09	10.17	0.5	Pass
11	2462	11.07	10.1	0.5	Pass

802.11g

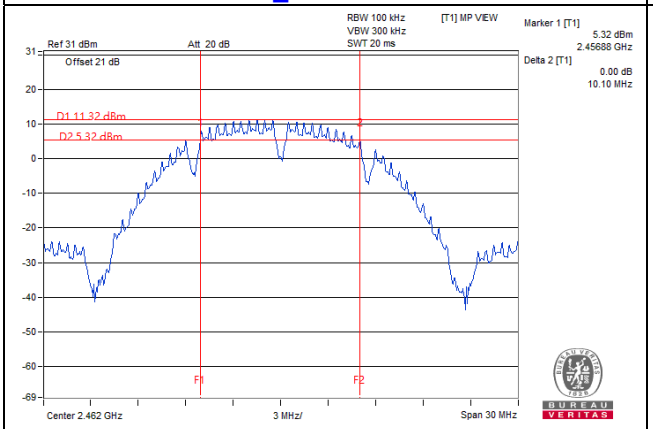
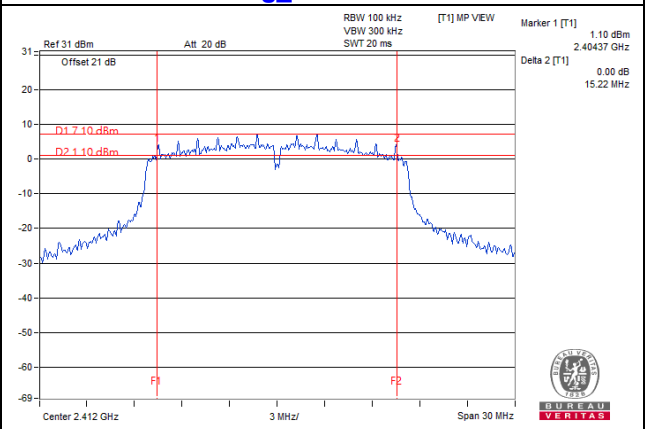
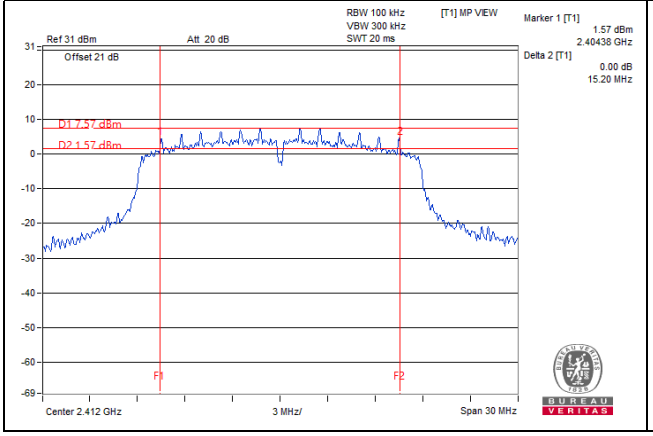
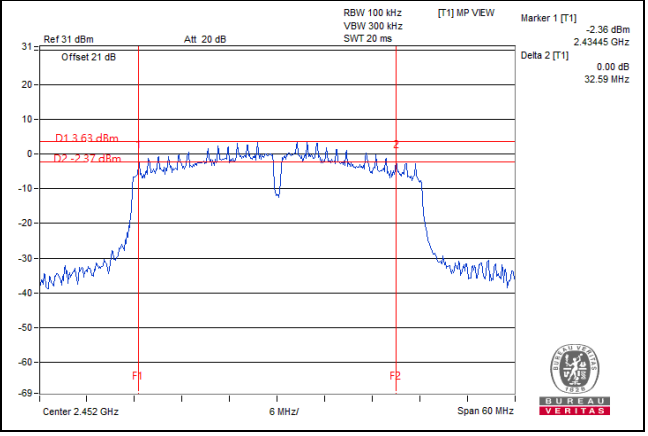
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.22	15.79	0.5	Pass
6	2437	15.98	16.37	0.5	Pass
11	2462	15.80	15.78	0.5	Pass

VHT20

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.20	15.40	0.5	Pass
6	2437	16.41	16.37	0.5	Pass
11	2462	16.40	15.78	0.5	Pass

VHT40

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.31	35.19	0.5	Pass
6	2437	35.50	36.44	0.5	Pass
9	2452	32.59	35.18	0.5	Pass

Spectrum Plot of Worst Value	
802.11b_Chain 1 / CH11	**802.11g_Chain 0 / CH1**
	
VHT20_Chain 0 / CH1	**VHT40_Chain 0 / CH9**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

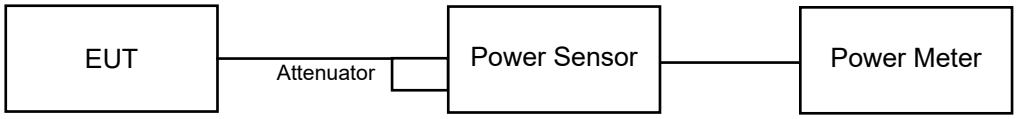
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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 ≥ 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

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

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

FOR PEAK POWER

802.11b

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	23.21	22.89	403.947	26.06	30	Pass
6	2437	20.81	22.06	281.198	24.49	30	Pass
11	2462	21.65	22.05	306.542	24.86	30	Pass

802.11g

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.03	24.68	546.695	27.38	30	Pass
6	2437	24.52	24.72	579.622	27.63	30	Pass
11	2462	23.72	23.84	477.608	26.79	30	Pass

VHT20

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	23.72	23.81	475.941	26.78	30	Pass
6	2437	24.75	24.83	602.627	27.80	30	Pass
11	2462	23.64	24.03	484.136	26.85	30	Pass

VHT40

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	23.04	23.92	447.976	26.51	30	Pass
6	2437	24.26	24.49	547.876	27.39	30	Pass
9	2452	23.35	23.83	457.818	26.61	30	Pass

FOR AVERAGE POWER

802.11b

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Average Power (mW)	Total Average Power (dBm)
		Chain 0	Chain 1		
1	2412	21.65	21.57	289.767	24.62
6	2437	19.23	20.42	193.907	22.88
11	2462	20.03	21.05	228.043	23.58

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Average Power (mW)	Total Average Power (dBm)
		Chain 0	Chain 1		
1	2412	17.61	18.39	126.701	21.03
6	2437	20.59	21.34	250.696	23.99
11	2462	16.92	18.54	120.654	20.82

VHT20

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Average Power (mW)	Total Average Power (dBm)
		Chain 0	Chain 1		
1	2412	17.99	18.72	137.424	21.38
6	2437	20.32	21.15	237.963	23.77
11	2462	17.11	18.72	125.878	21.00

VHT40

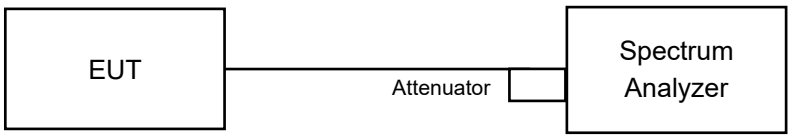
Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Average Power (mW)	Total Average Power (dBm)
		Chain 0	Chain 1		
3	2422	16.04	17.49	96.284	19.84
6	2437	18.54	19.86	168.277	22.26
9	2452	16.33	17.42	98.161	19.92

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

a. Set analyzer center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. Use the peak marker function to determine the maximum amplitude level within the RBW.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1			
1	2412	-1.40	-0.91	1.86	6.83	Pass
6	2437	-4.21	-2.20	-0.08	6.83	Pass
11	2462	-3.62	-1.84	0.37	6.83	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 7.17 dBi > 6 dBi, so the power density limit shall be reduced to 8-(7.17-6) = 6.83 dBm.

802.11g

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1			
1	2412	-6.28	-6.26	-3.26	6.83	Pass
6	2437	-4.03	-4.92	-1.44	6.83	Pass
11	2462	-7.49	-5.94	-3.64	6.83	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 7.17 dBi > 6 dBi, so the power density limit shall be reduced to 8-(7.17-6) = 6.83 dBm.

VHT20

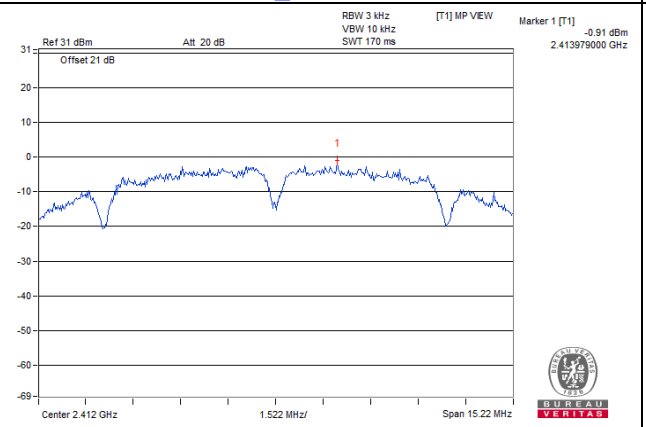
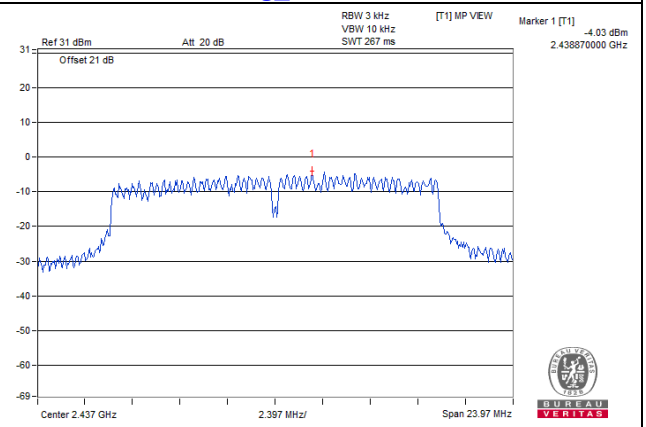
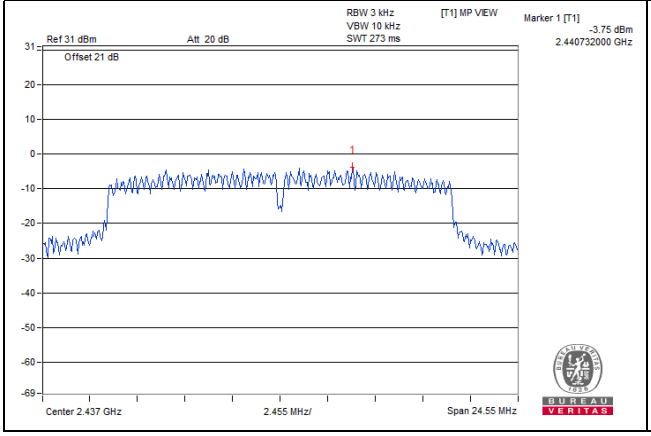
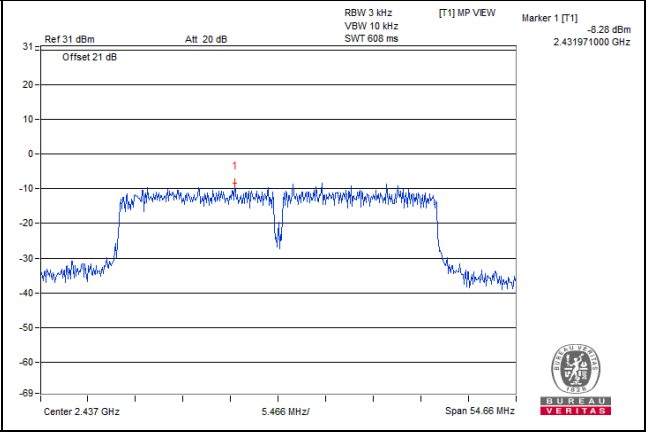
Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1			
1	2412	-6.62	-5.75	-3.15	6.83	Pass
6	2437	-4.12	-3.75	-0.92	6.83	Pass
11	2462	-7.53	-5.61	-3.45	6.83	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 7.17 dBi > 6 dBi, so the power density limit shall be reduced to 8-(7.17-6) = 6.83 dBm.

VHT40

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1			
3	2422	-11.44	-9.14	-7.13	6.83	Pass
6	2437	-8.76	-8.28	-5.50	6.83	Pass
9	2452	-9.81	-8.62	-6.16	6.83	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 7.17 dBi > 6 dBi, so the power density limit shall be reduced to 8-(7.17-6) = 6.83 dBm.

Spectrum Plot of Worst Value	
802.11b_Chain 1 / CH1	**802.11g_Chain 0 / CH6**
	
VHT20_Chain 1 / CH6	**VHT40_Chain 1 / CH6**
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 20dB 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

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

MEASUREMENT PROCEDURE OOBE

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

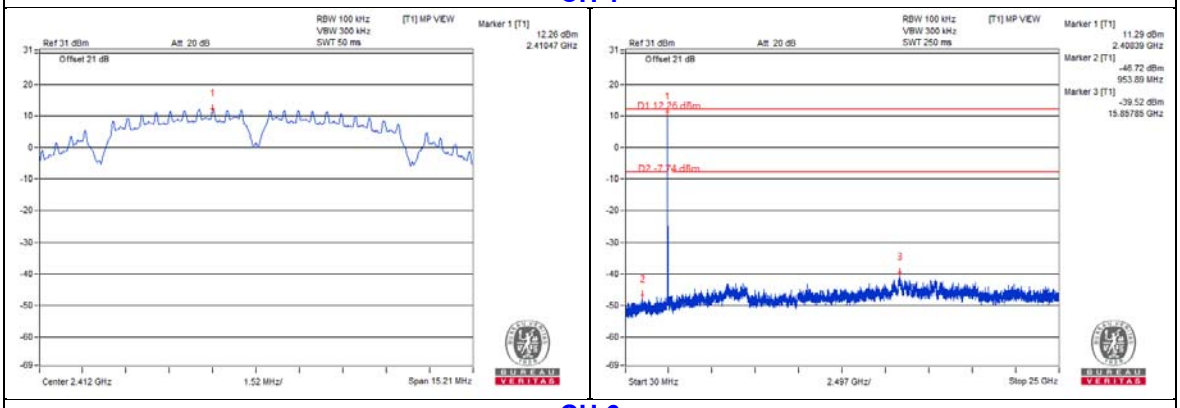
Same as Item 4.3.6

4.6.7 Test Results

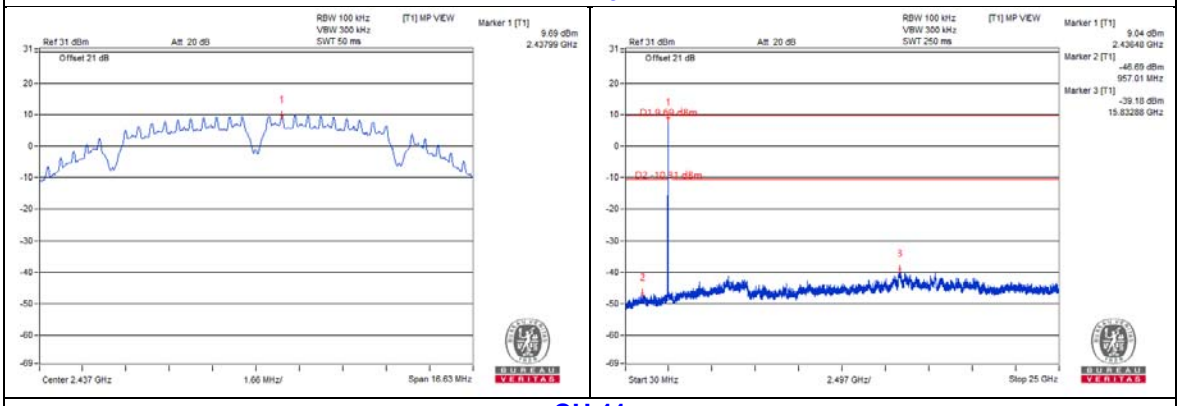
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b
Chain 0

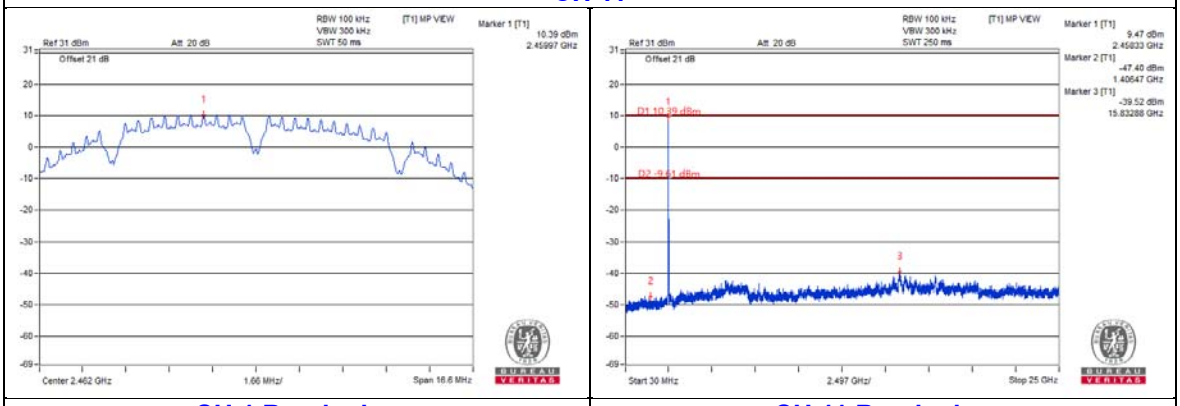
CH 1



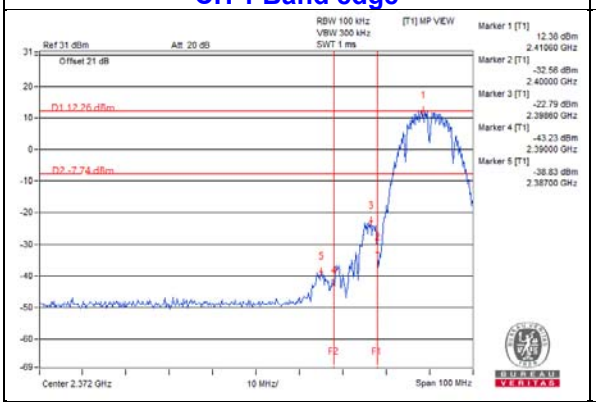
CH 6



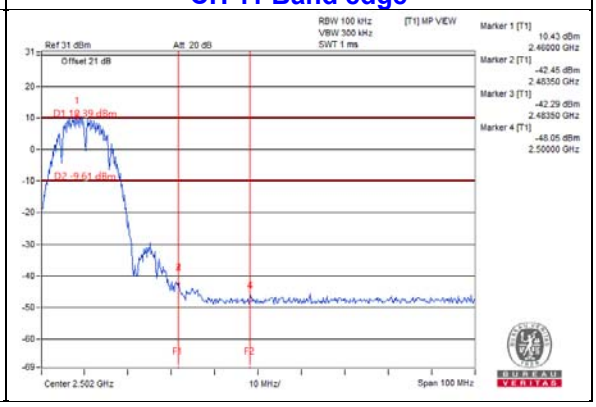
CH 11



CH 1 Band edge

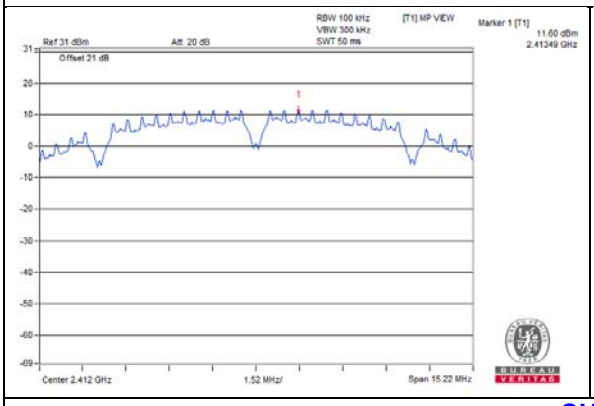


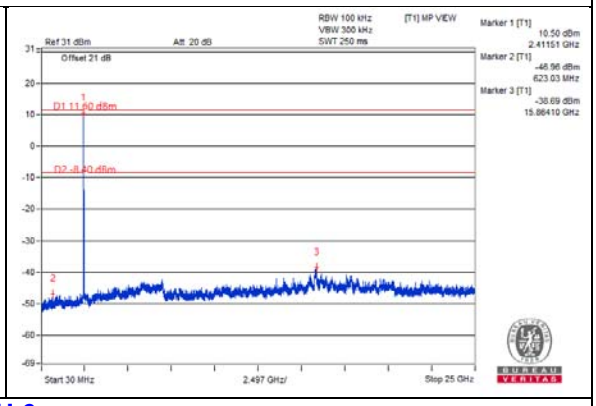
CH 11 Band edge



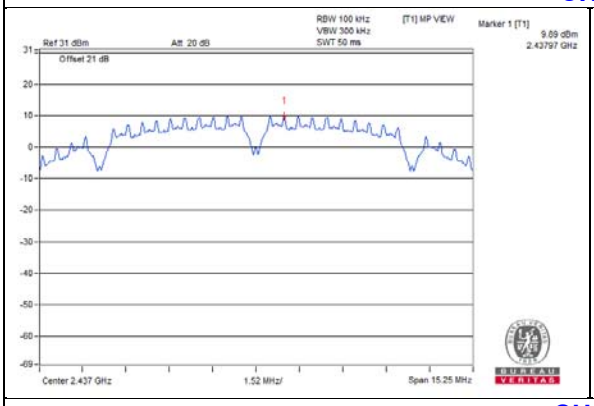
Chain 1

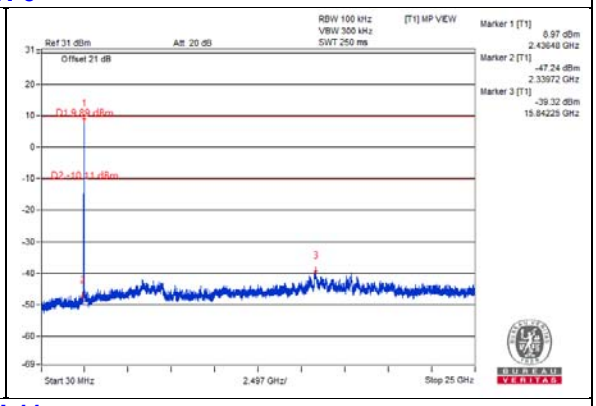
CH 1



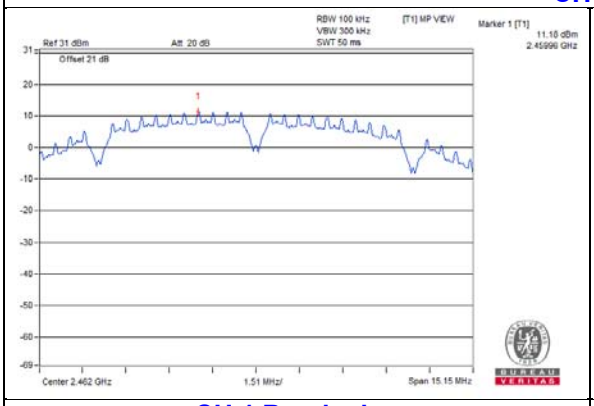


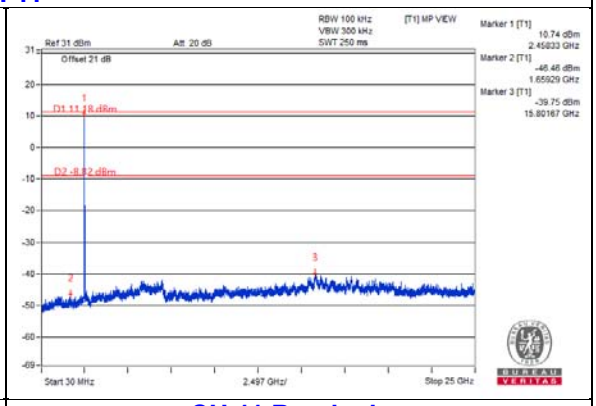
CH 6



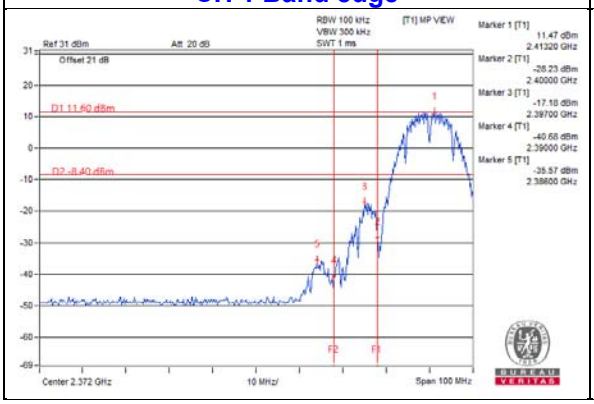


CH 11

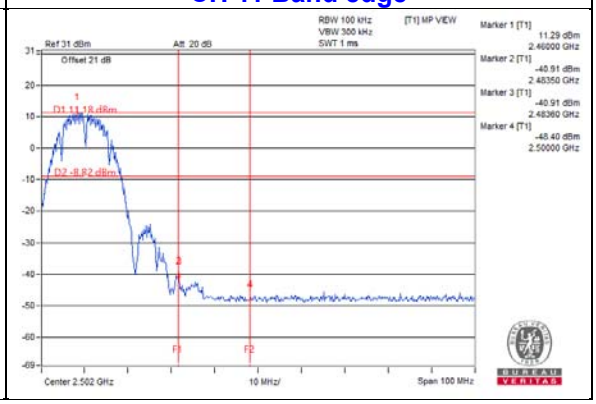




CH 1 Band edge

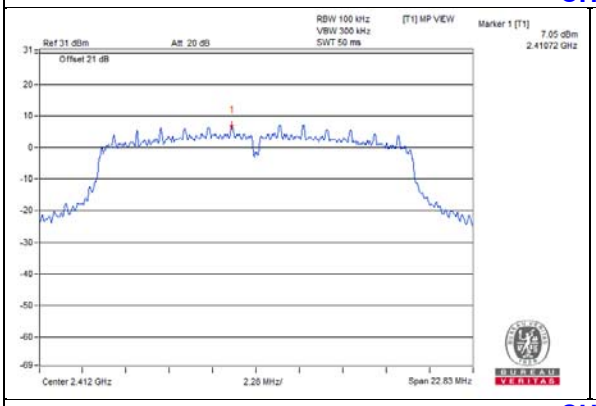


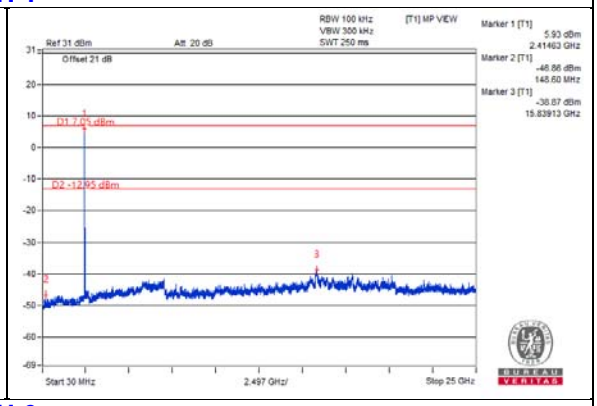
CH 11 Band edge



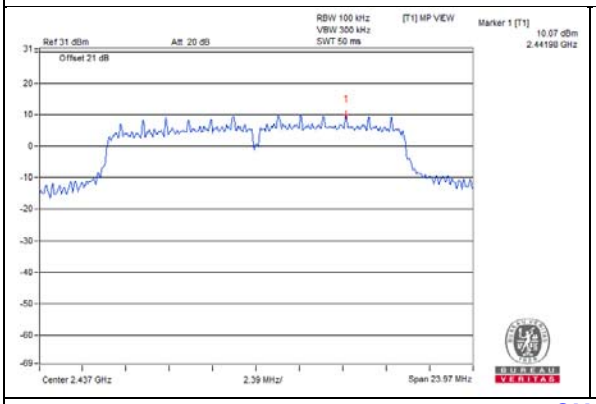
802.11g
Chain 0

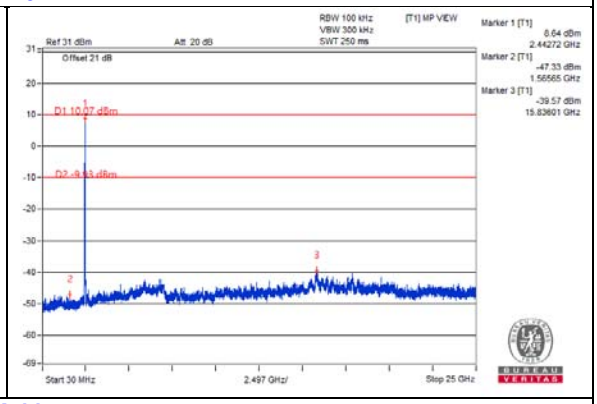
CH 1



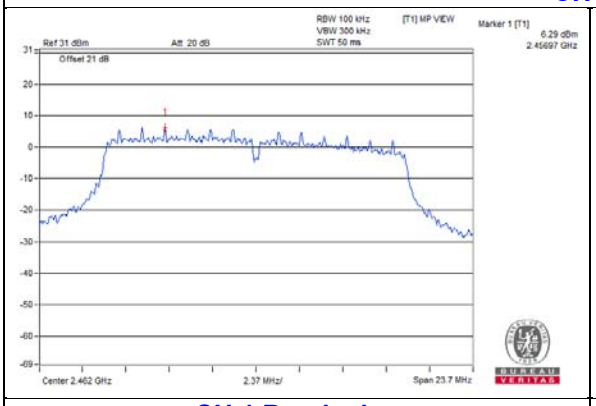


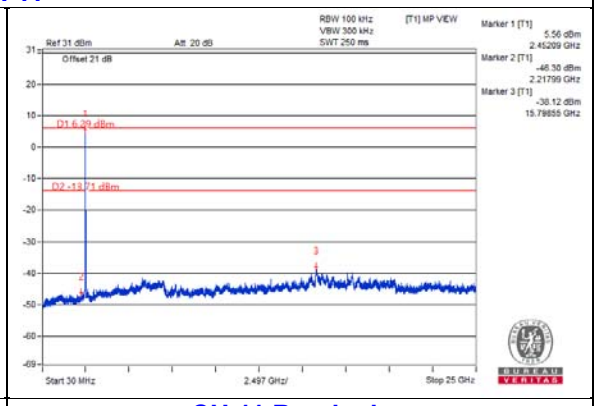
CH 6



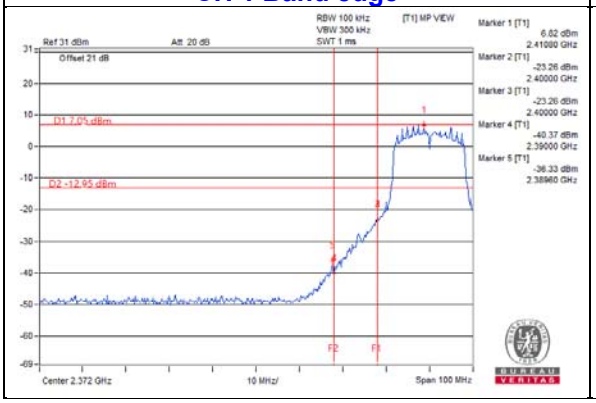


CH 11

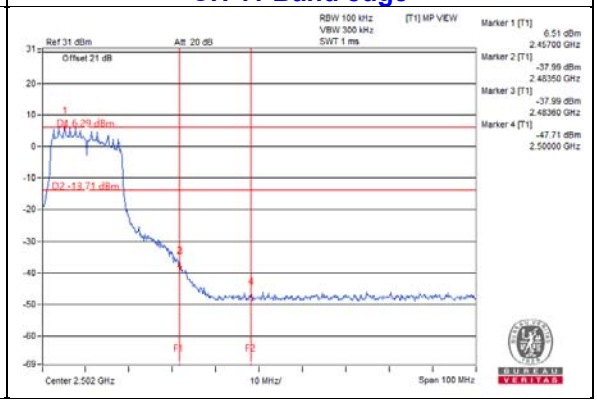




CH 1 Band edge

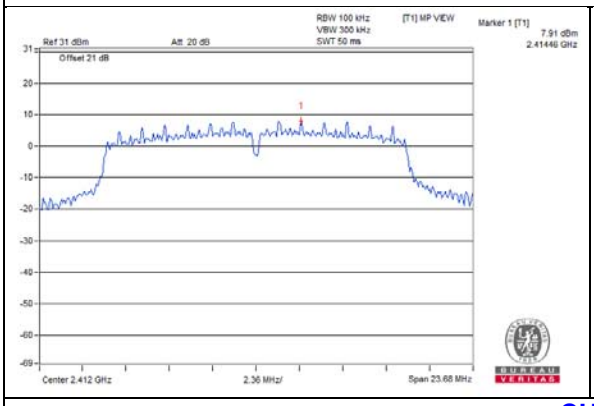


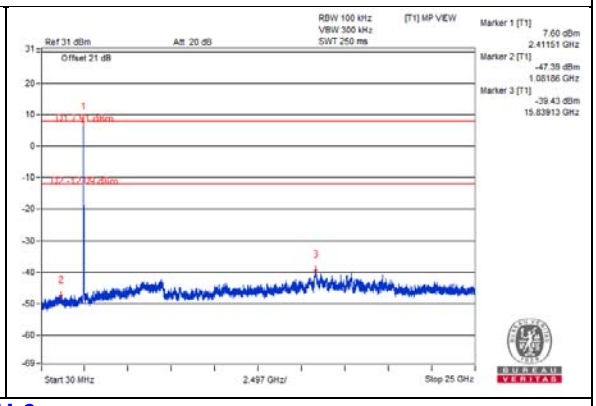
CH 11 Band edge



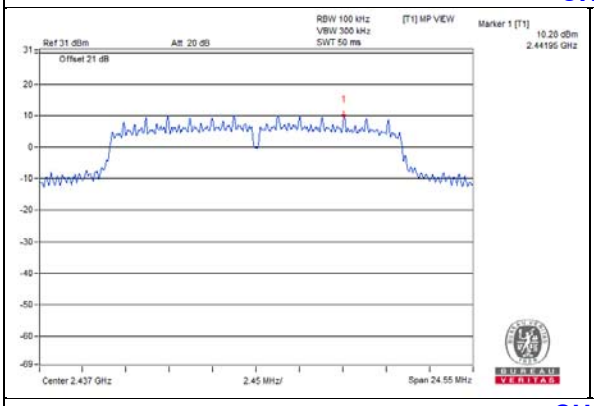
Chain 1

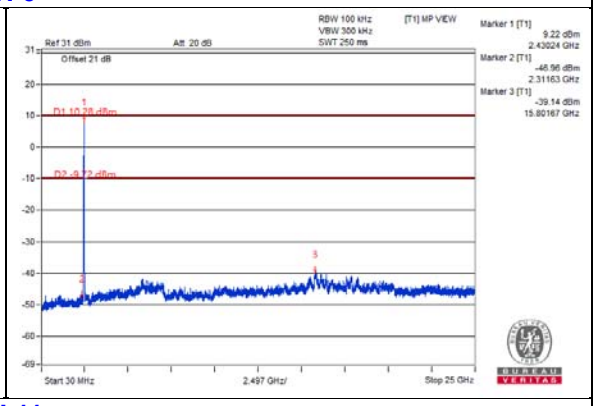
CH 1



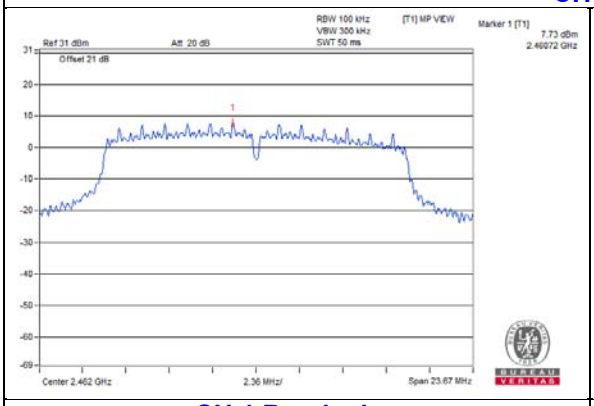


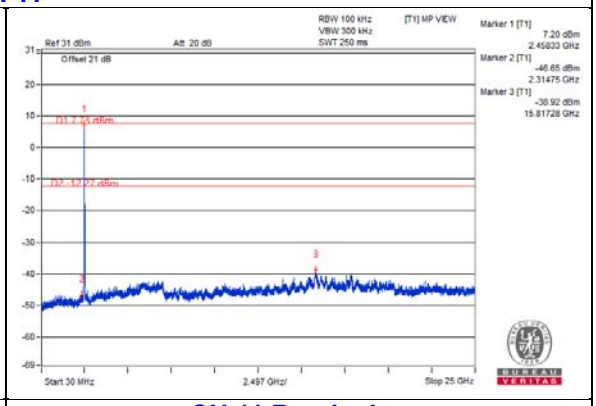
CH 6



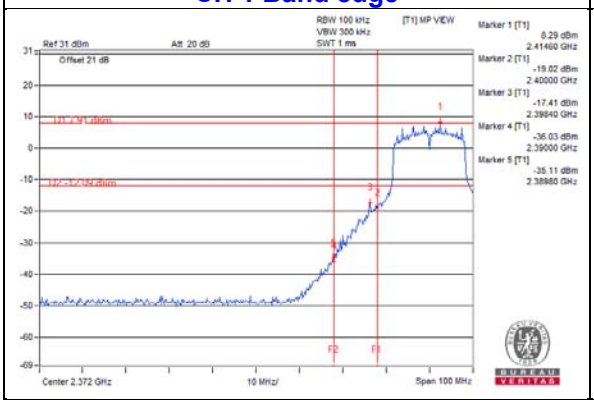


CH 11

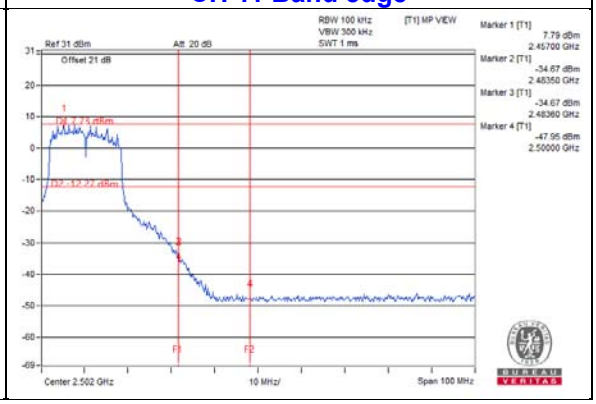




CH 1 Band edge

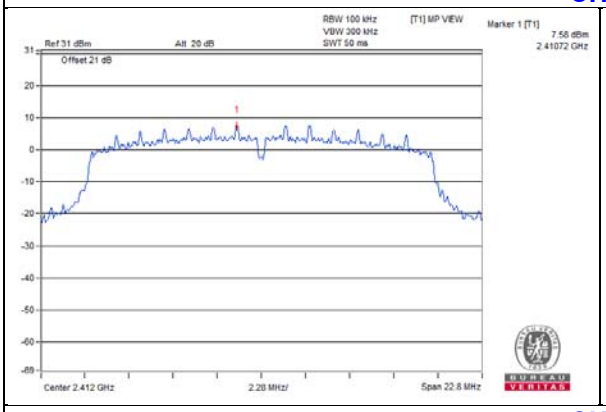


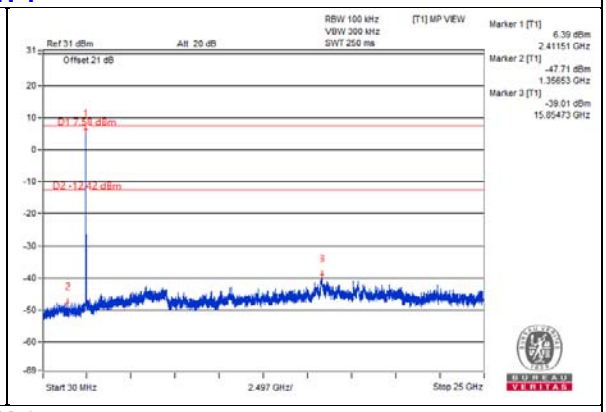
CH 11 Band edge



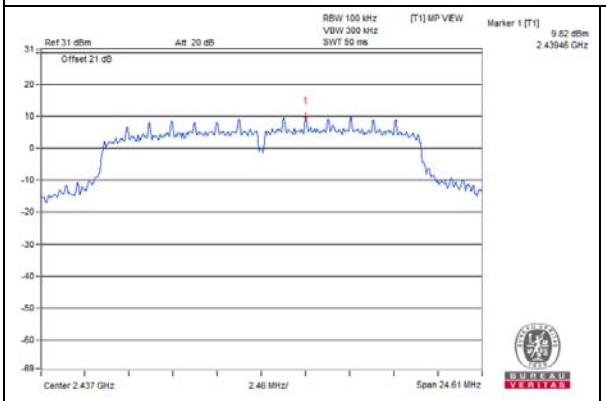
VHT20
Chain 0

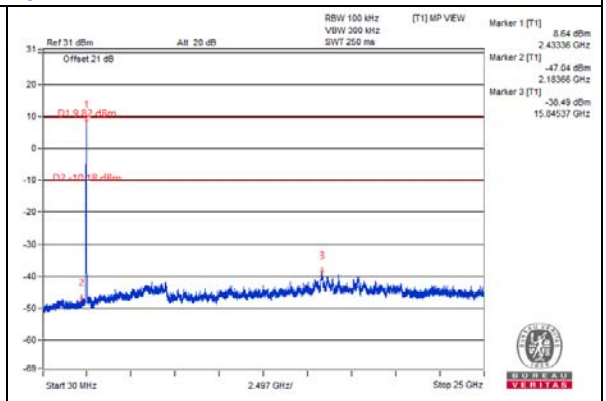
CH 1



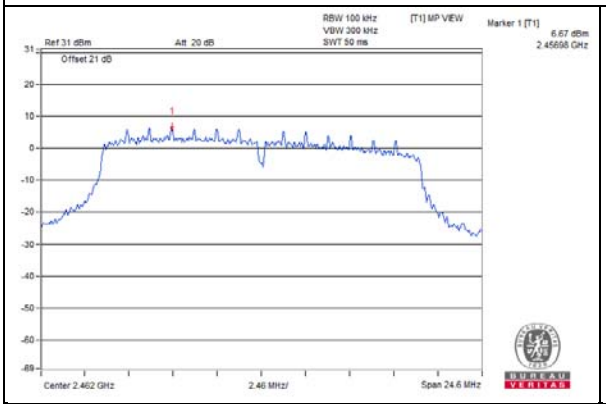


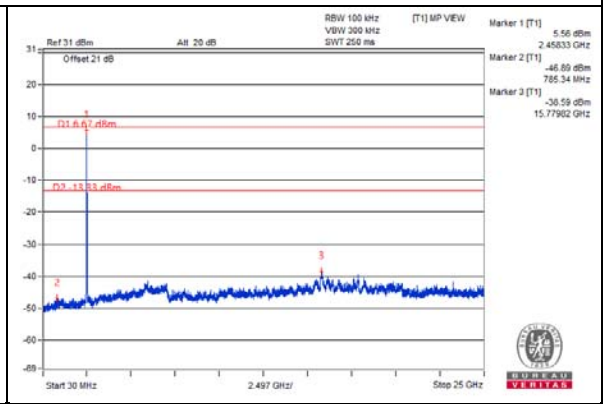
CH 6



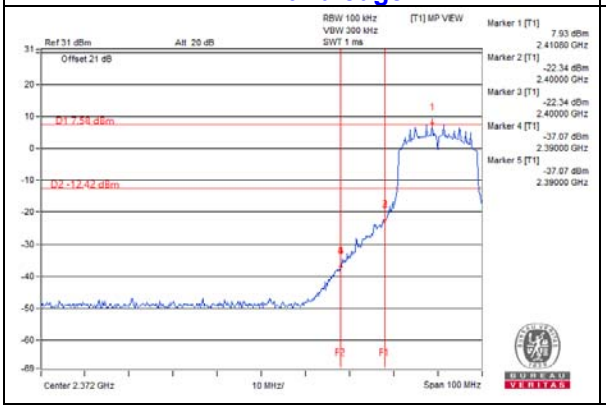


CH 11

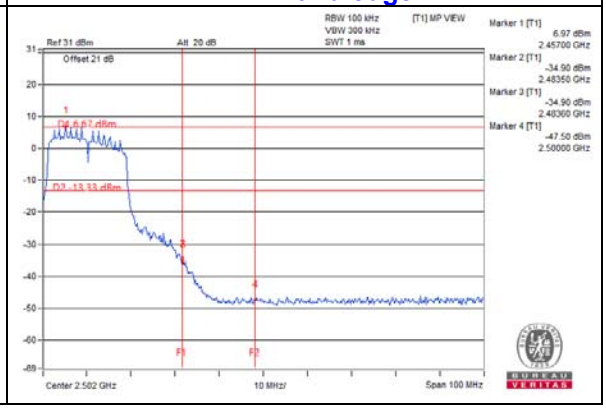




CH 1 Band edge

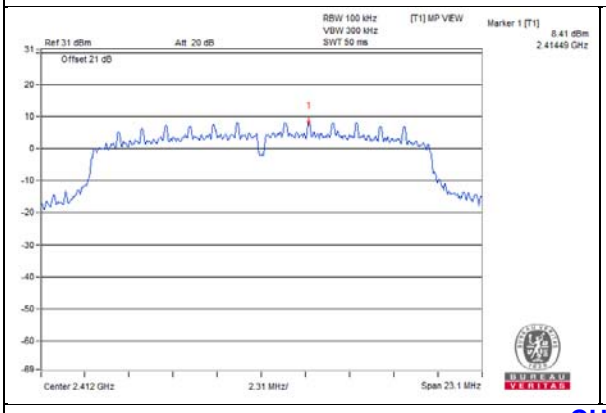


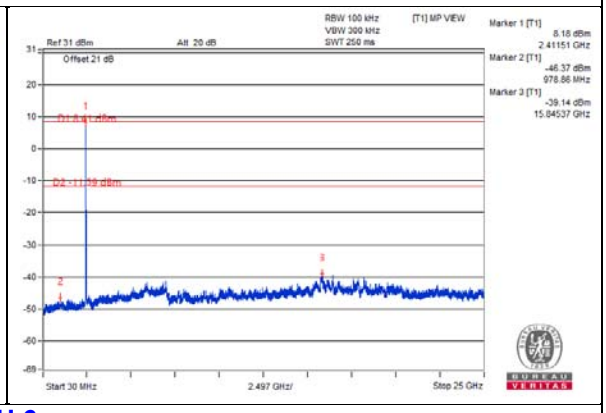
CH 11 Band edge



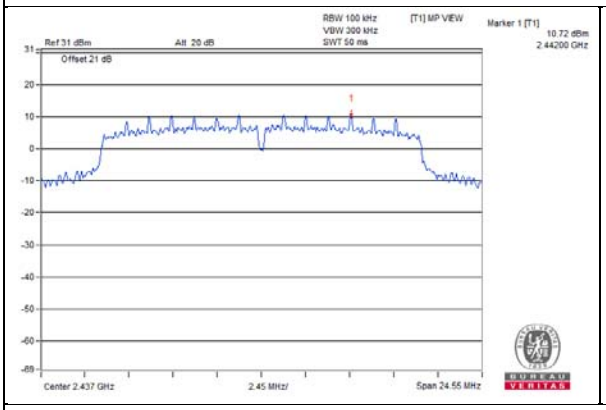
Chain 1

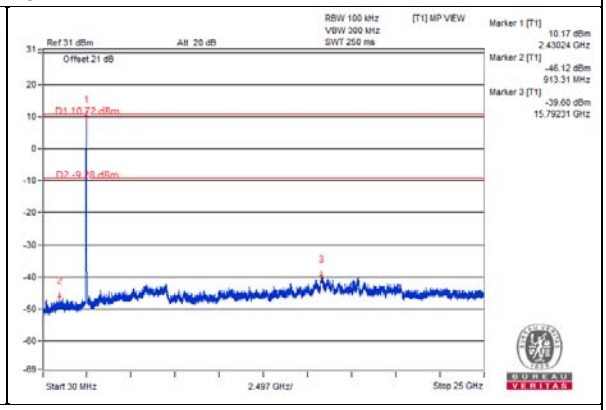
CH 1



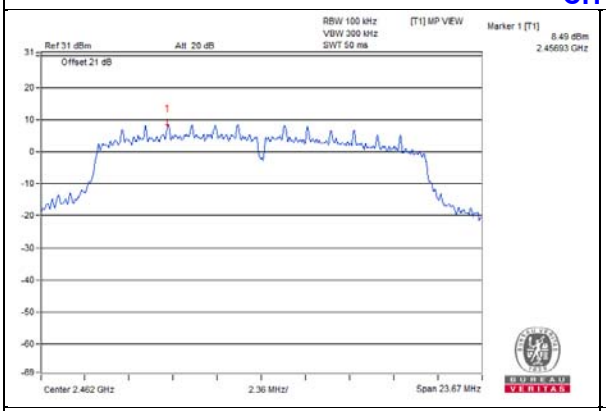


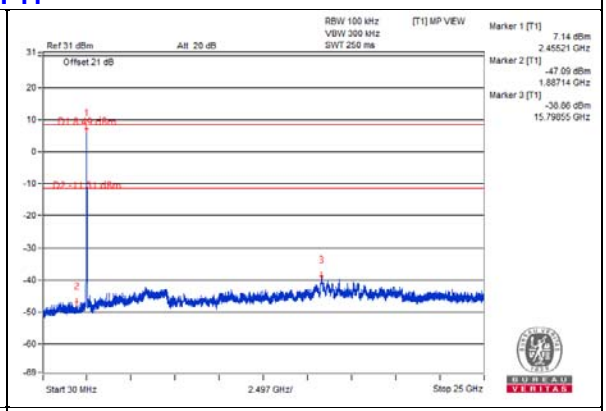
CH 6



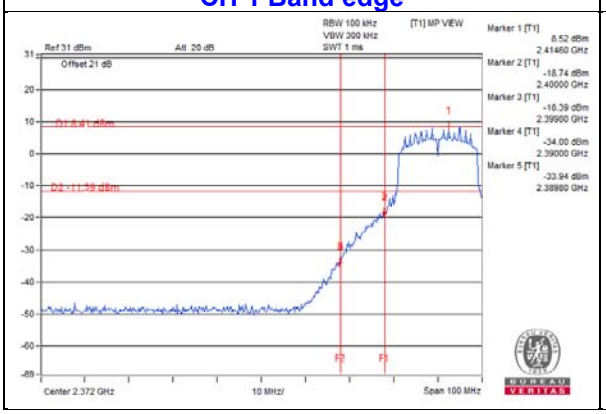


CH 11

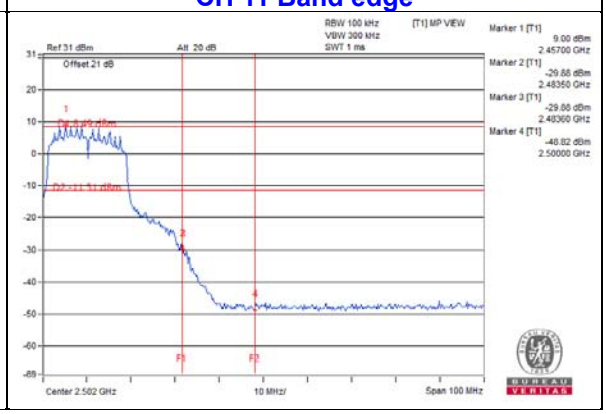




CH 1 Band edge

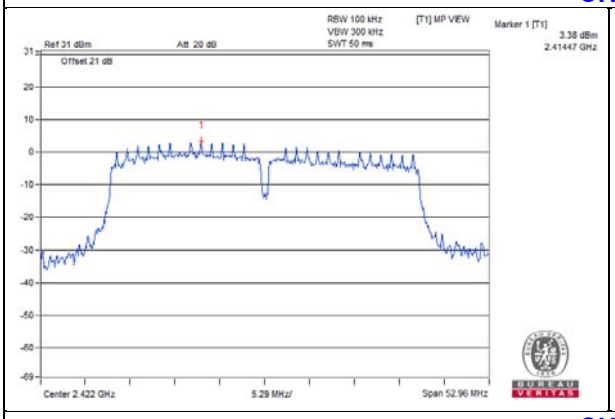


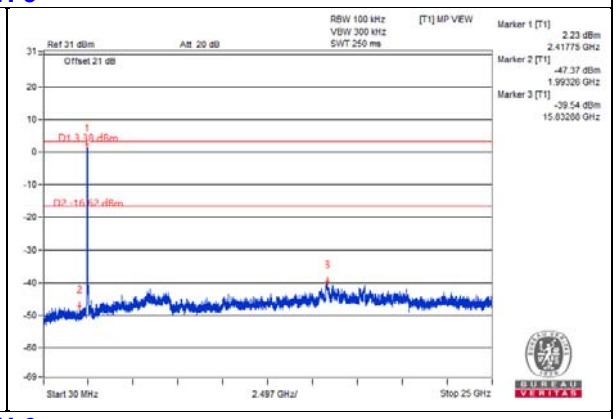
CH 11 Band edge



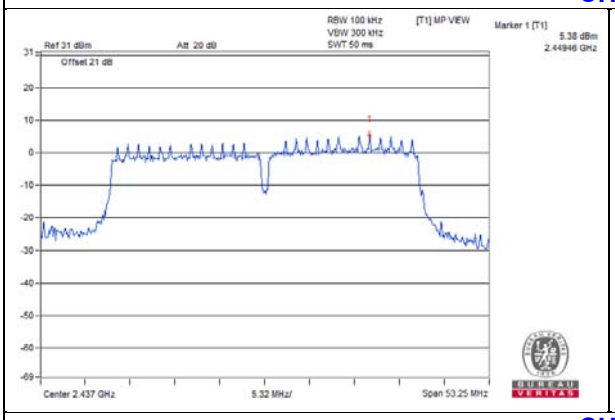
VHT40
Chain 0

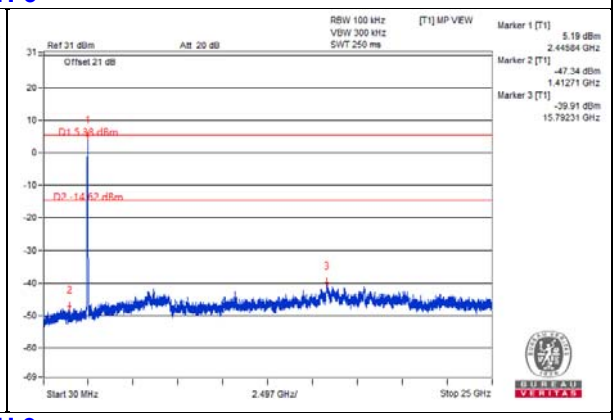
CH 3



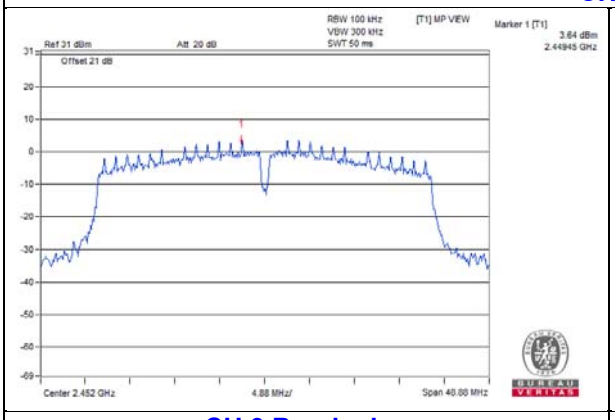


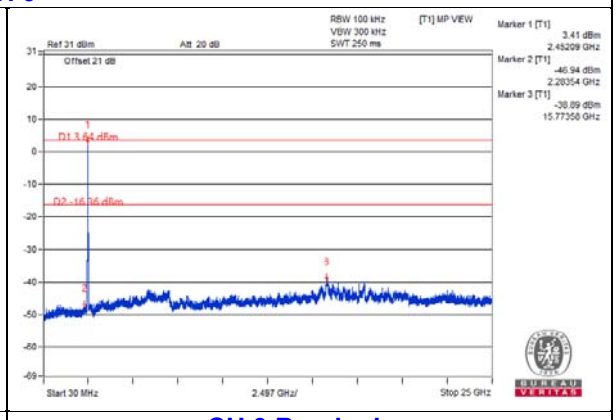
CH 6



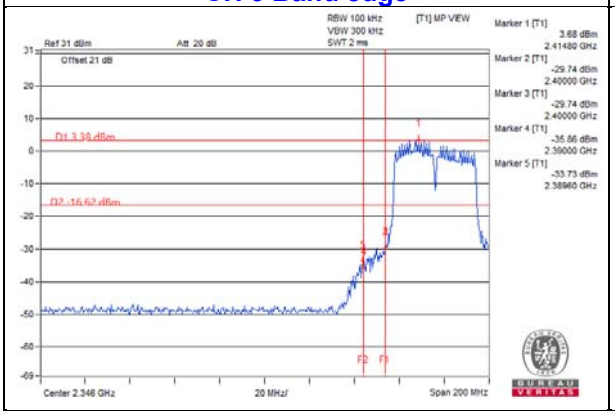


CH 9

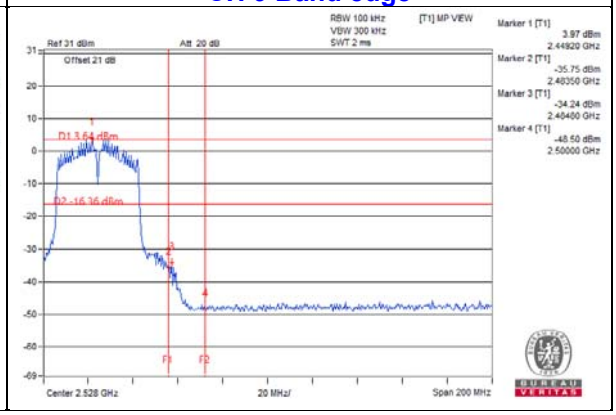




CH 3 Band edge

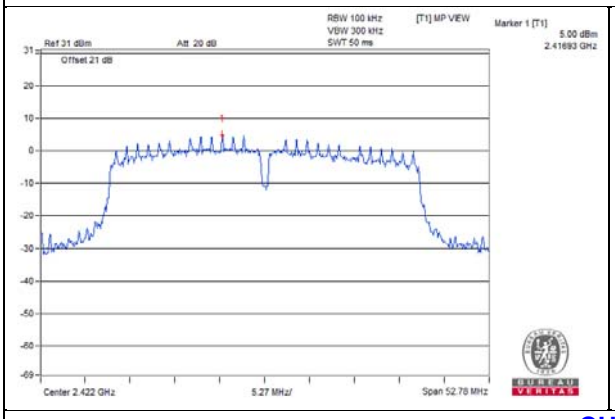


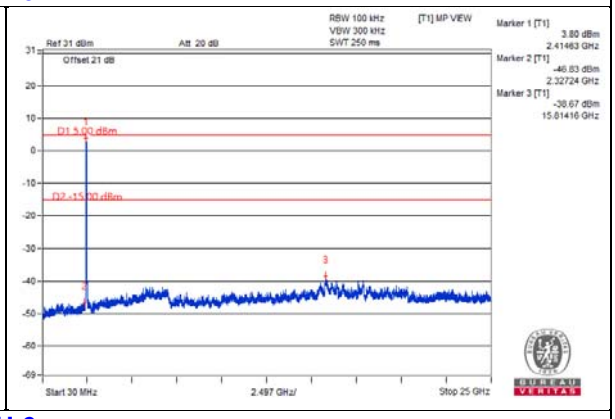
CH 9 Band edge



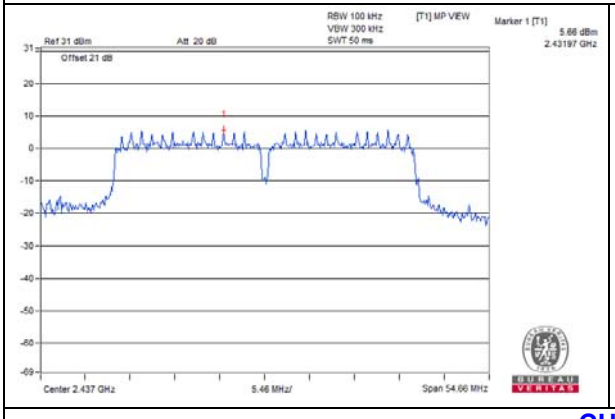
Chain 1

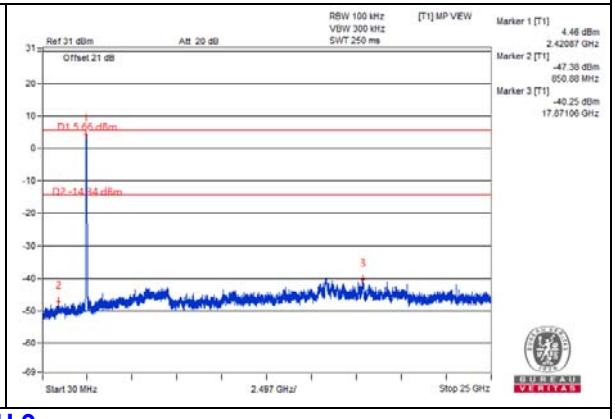
CH 3



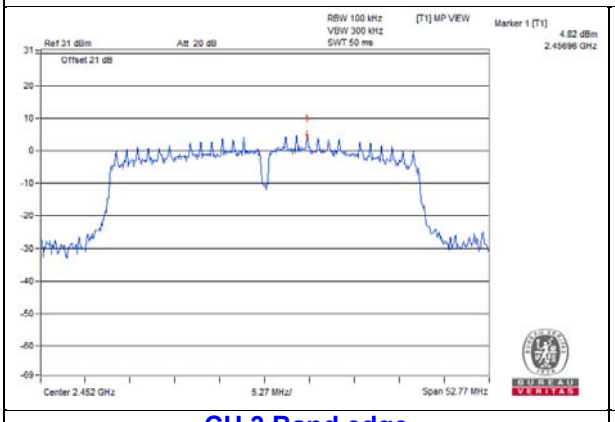


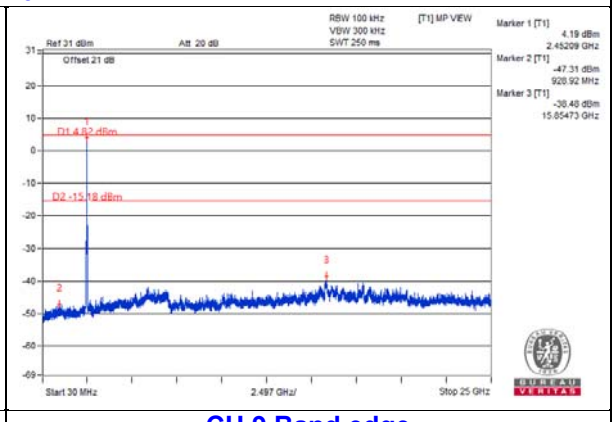
CH 6



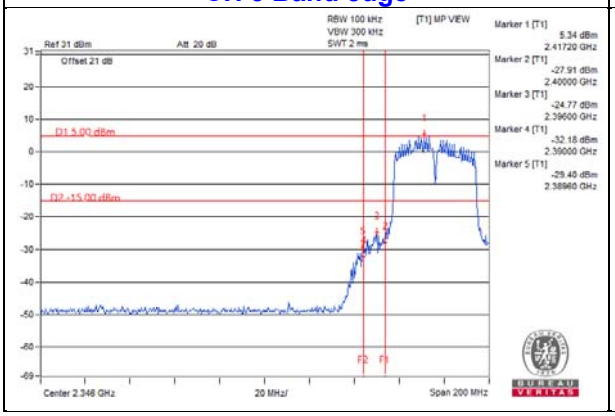


CH 9

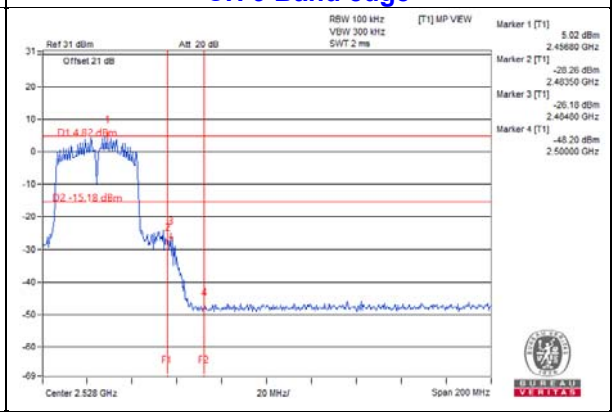




CH 3 Band edge



CH 9 Band edge



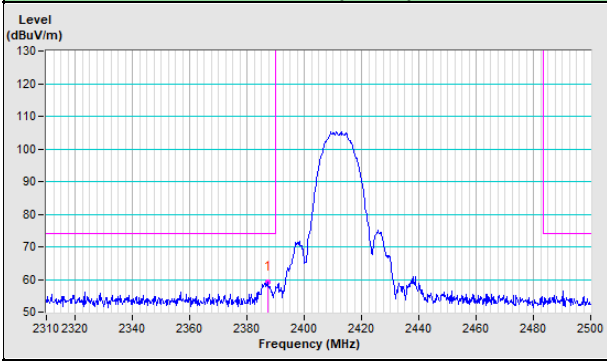
5 Pictures of Test Arrangements

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

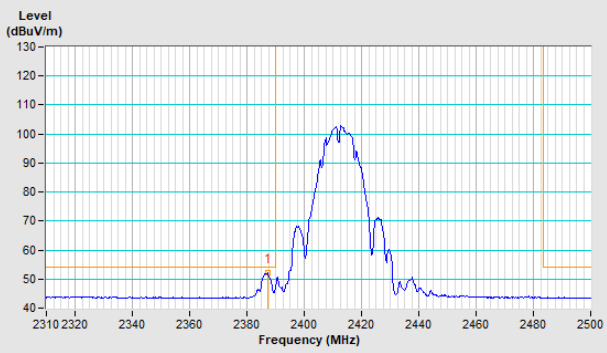
Annex A - Band-Edge Measurement

802.11b Channel 1

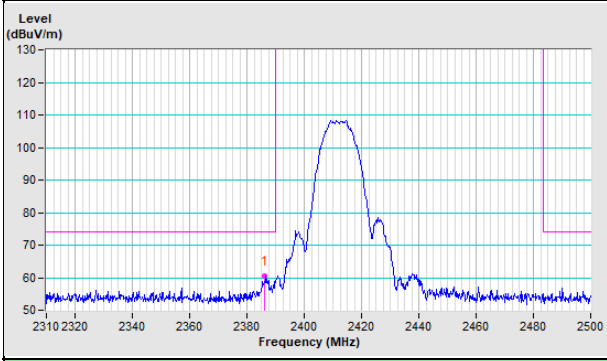
Horizontal (Peak)



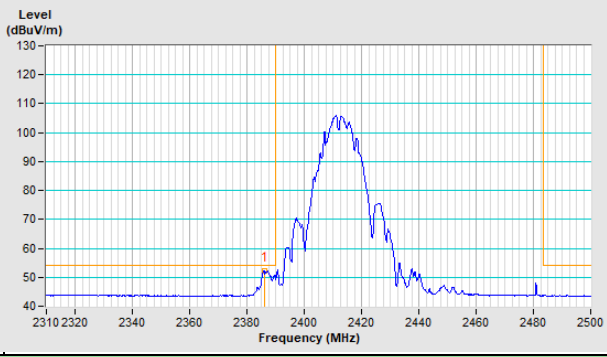
Horizontal (Average)



Vertical (Peak)

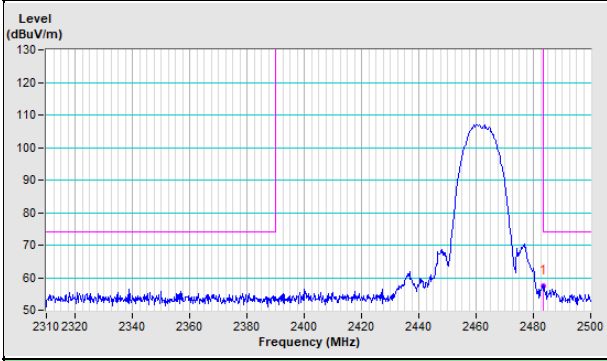


Vertical (Average)

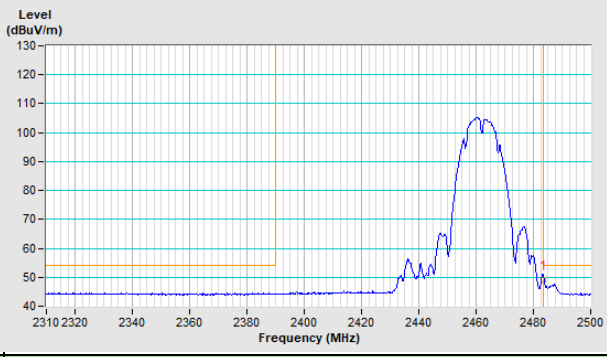


802.11b Channel 11

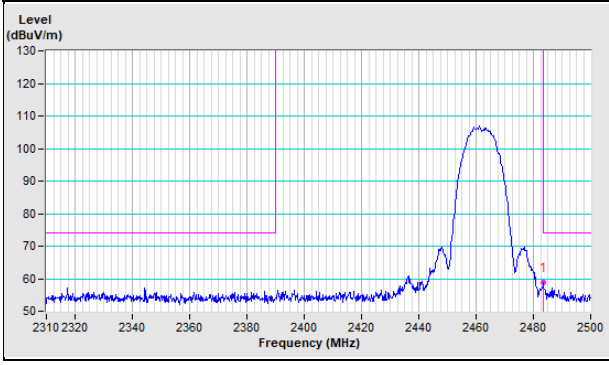
Horizontal (Peak)



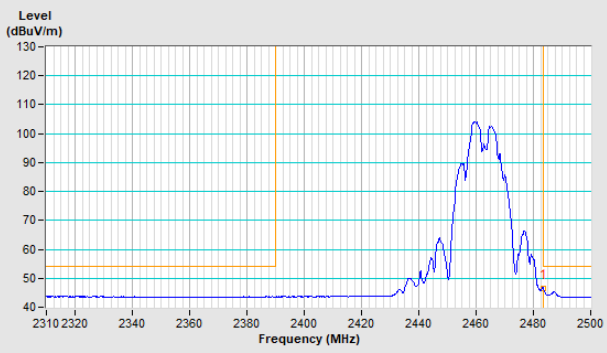
Horizontal (Average)



Vertical (Peak)

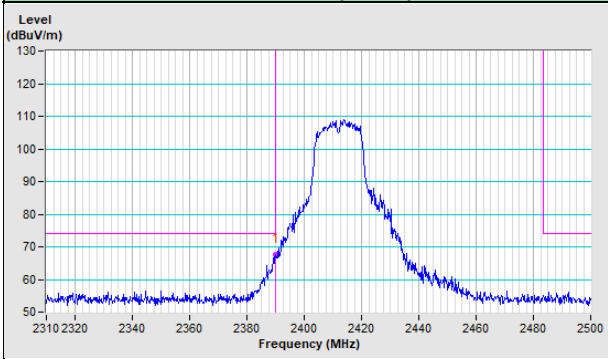


Vertical (Average)

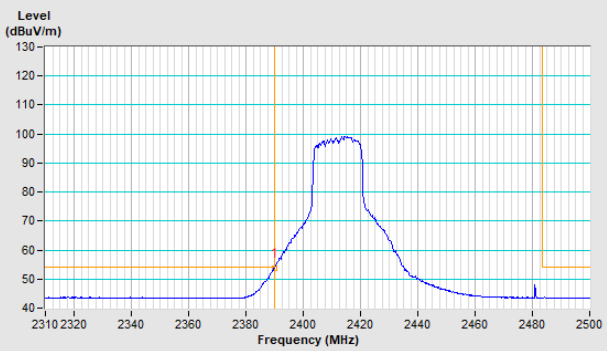


802.11g Channel 1

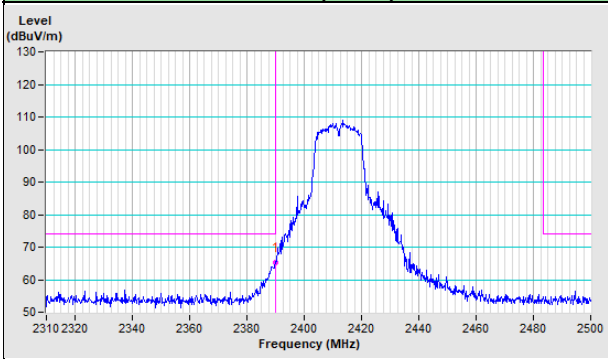
Horizontal (Peak)



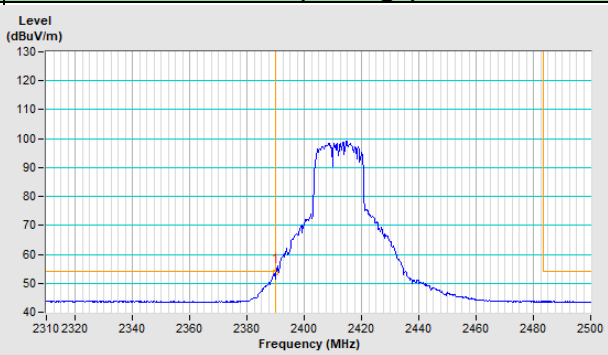
Horizontal (Average)



Vertical (Peak)

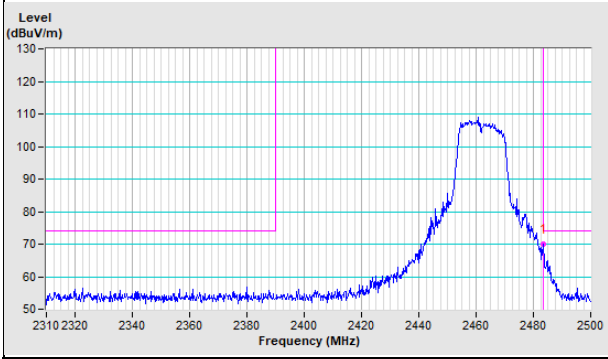


Vertical (Average)

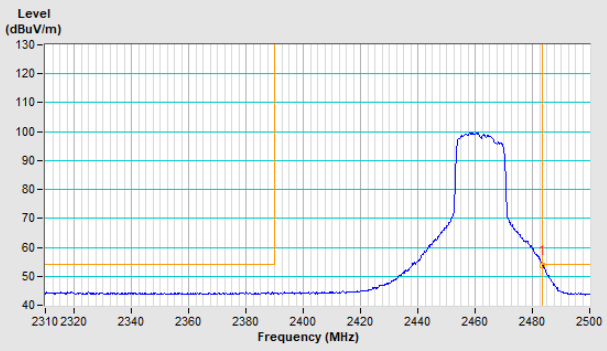


802.11g Channel 11

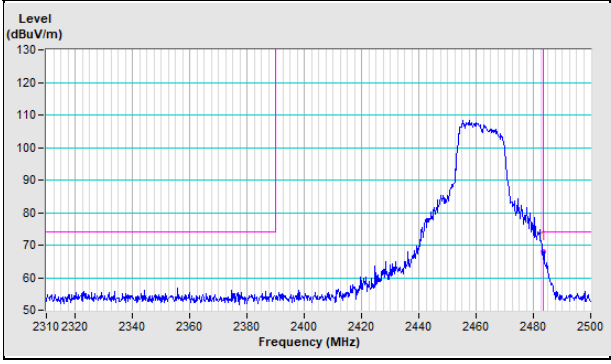
Horizontal (Peak)



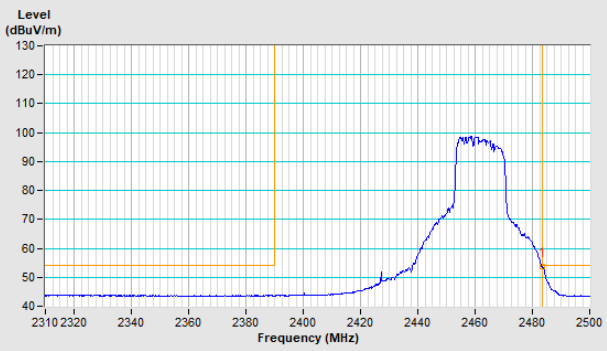
Horizontal (Average)



Vertical (Peak)

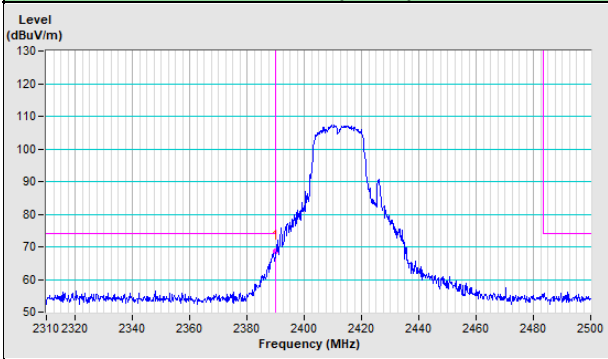


Vertical (Average)

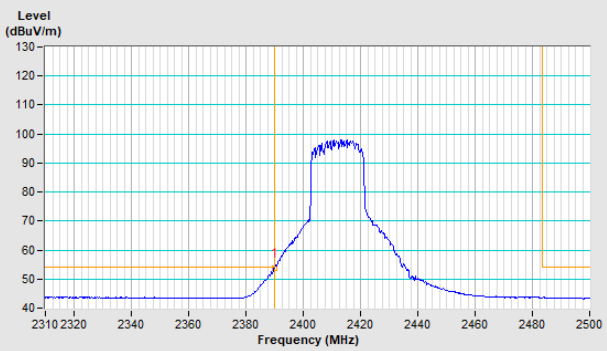


VHT20 Channel 1

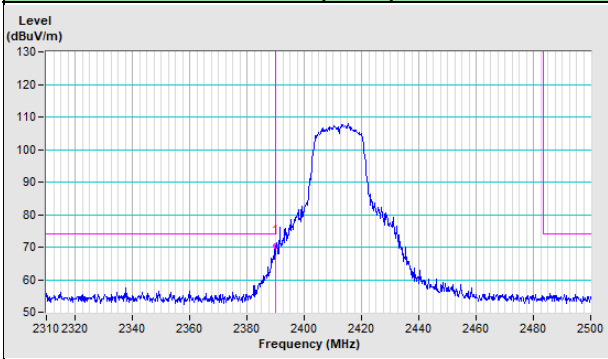
Horizontal (Peak)



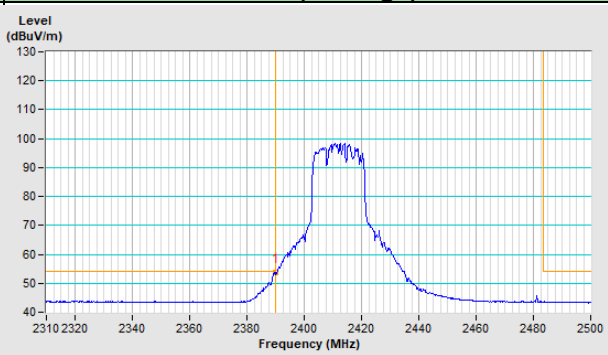
Horizontal (Average)



Vertical (Peak)

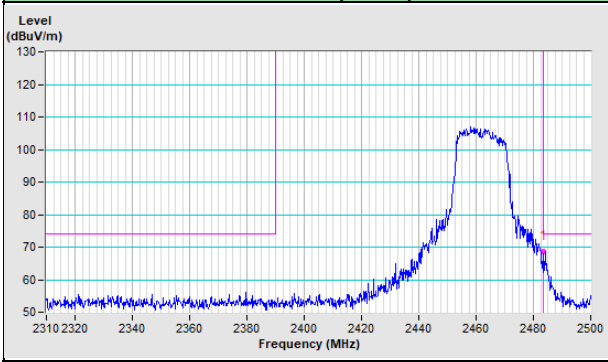


Vertical (Average)

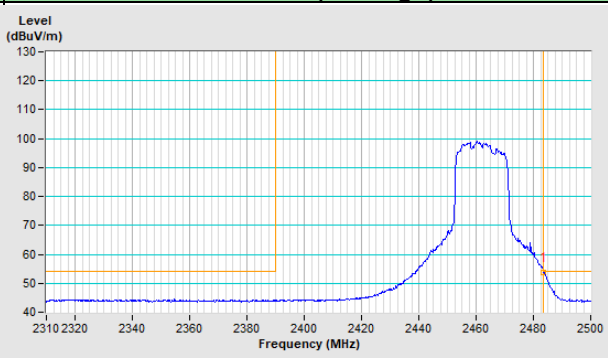


VHT20 Channel 11

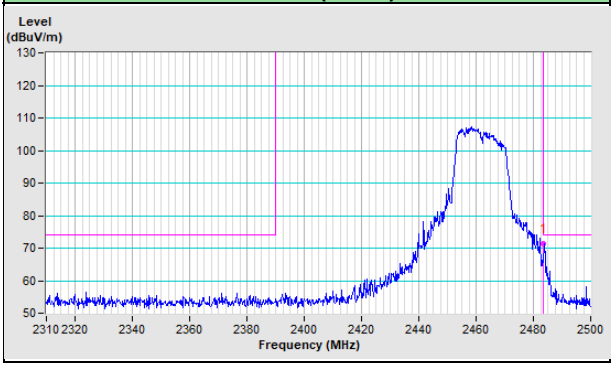
Horizontal (Peak)



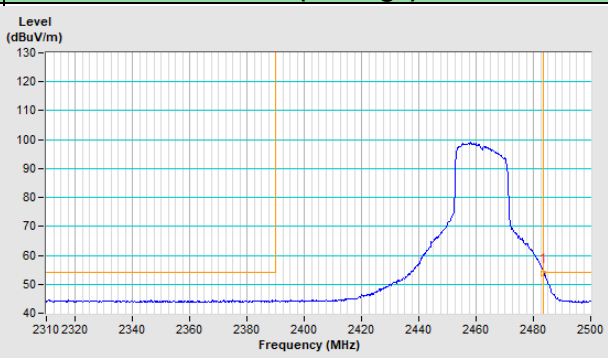
Horizontal (Average)



Vertical (Peak)

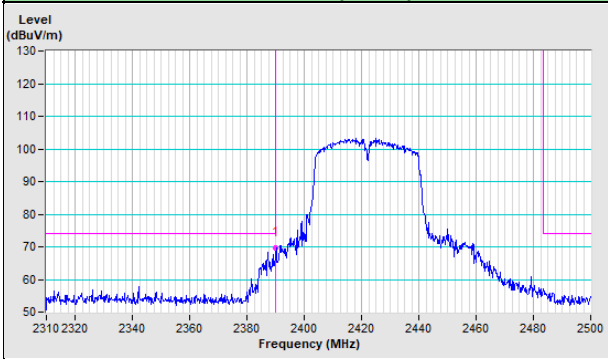


Vertical (Average)

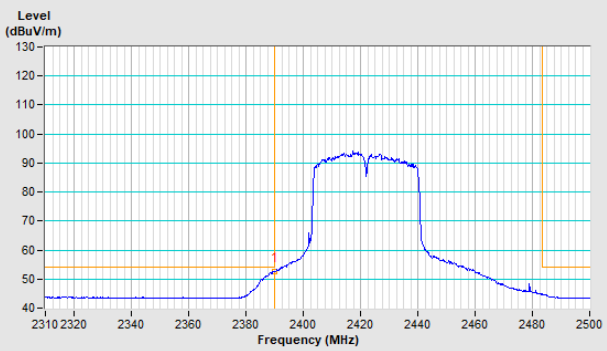


VHT40 Channel 3

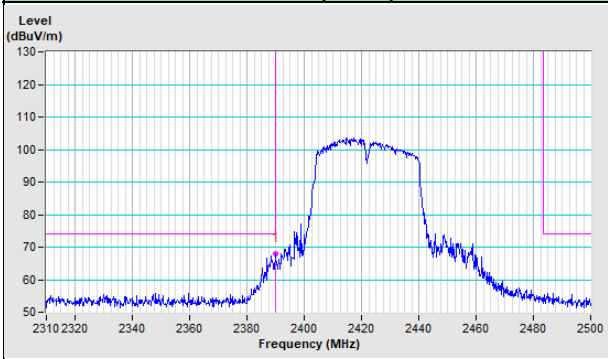
Horizontal (Peak)



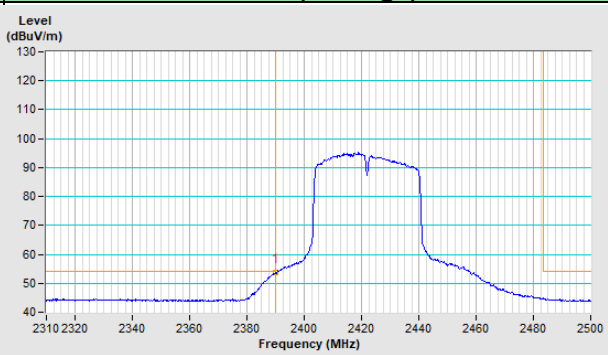
Horizontal (Average)



Vertical (Peak)

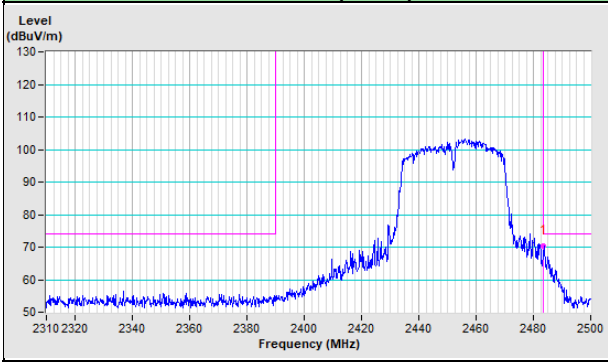


Vertical (Average)

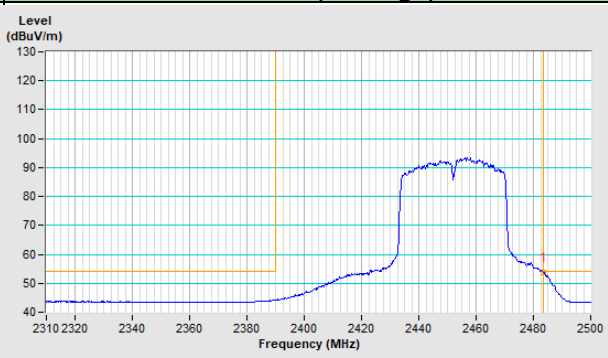


VHT40 Channel 9

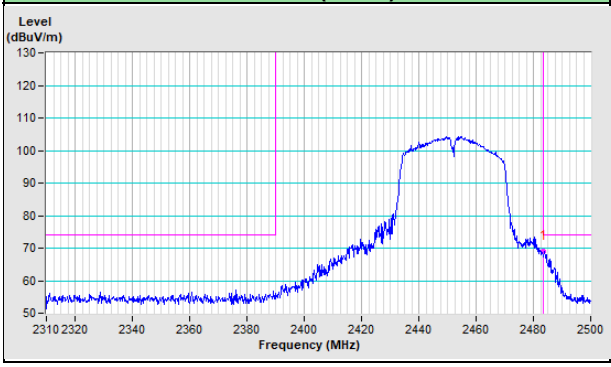
Horizontal (Peak)



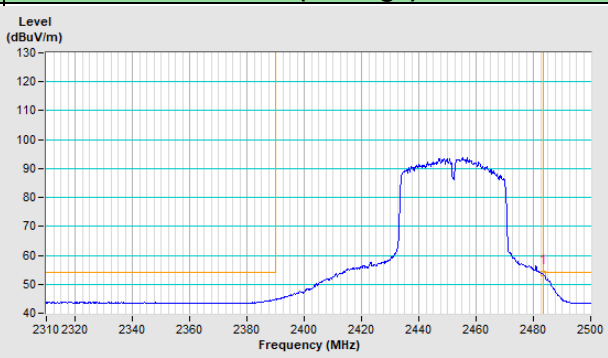
Horizontal (Average)



Vertical (Peak)



Vertical (Average)



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 according to ISO/IEC 17025.

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

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