

TEST REPORT

CERTIFICATE OF CONFORMITY

Standard: 47 CFR FCC Part 15, Subpart C (Section 15.247)
Report No.: RFBDKG-WTW-P24090144-2
FCC ID: JNZVR0039
Product: Video conference Equipment
Brand: Logitech, logi, logitech
Model No.: VR0039
Received Date: 2024/12/21
Test Date: 2024/12/25 ~ 2025/1/13
Issued Date: 2025/2/26
Applicant: Logitech Far East Ltd.
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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories
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FCC Registration /
Designation Number: 788550 / TW0003

Approved by:

Jeremy Lin

Jeremy Lin / Project Engineer

, Date:

2025/2/26

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Prepared by : Pettie Chen / Senior Specialist



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Table of Contents

Release Control Record	4
1 Certificate.....	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Supplementary Information	6
3 General Information	7
3.1 General Description.....	7
3.2 Antenna Description of EUT.....	8
3.3 Channel List.....	9
3.4 Test Mode Applicability and Tested Channel Detail.....	10
3.5 Duty Cycle of Test Signal.....	11
3.6 Test Program Used and Operation Descriptions	12
3.7 Connection Diagram of EUT and Peripheral Devices	12
3.8 Configuration of Peripheral Devices and Cable Connections	12
4 Test Instruments	13
4.1 RF Output Power.....	13
4.2 Power Spectral Density	13
4.3 6 dB Bandwidth	13
4.4 Conducted Out of Band Emissions	13
4.5 AC Power Conducted Emissions	14
4.6 Unwanted Emissions below 1 GHz	14
4.7 Unwanted Emissions above 1 GHz.....	15
5 Limits of Test Items.....	16
5.1 RF Output Power.....	16
5.2 Power Spectral Density	16
5.3 6 dB Bandwidth	16
5.4 Conducted Out of Band Emissions	16
5.5 AC Power Conducted Emissions	16
5.6 Unwanted Emissions below 1 GHz	17
5.7 Unwanted Emissions above 1 GHz.....	17
6 Test Arrangements.....	18
6.1 RF Output Power.....	18
6.1.1 Test Setup	18
6.1.2 Test Procedure.....	18
6.2 Power Spectral Density	18
6.2.1 Test Setup	18
6.2.2 Test Procedure.....	18
6.3 6 dB Bandwidth	19
6.3.1 Test Setup	19
6.3.2 Test Procedure.....	19
6.4 Conducted Out of Band Emissions	19
6.4.1 Test Setup	19
6.4.2 Test Procedure.....	19
6.5 AC Power Conducted Emissions	20
6.5.1 Test Setup	20
6.5.2 Test Procedure.....	20
6.6 Unwanted Emissions below 1 GHz	21
6.6.1 Test Setup	21
6.6.2 Test Procedure.....	22
6.7 Unwanted Emissions above 1 GHz.....	23
6.7.1 Test Setup	23
6.7.2 Test Procedure.....	23
7 Test Results of Test Item	24

7.1	RF Output Power.....	24
7.2	Power Spectral Density	26
7.3	6 dB Bandwidth	28
7.4	Conducted Out of Band Emissions	30
7.5	AC Power Conducted Emissions	36
7.6	Unwanted Emissions below 1 GHz	38
7.7	Unwanted Emissions above 1 GHz.....	40
8	Pictures of Test Arrangements	55
9	Information of the Testing Laboratories	56

Release Control Record

Issue No.	Description	Date Issued
RFBDKG-WTW-P24090144-2	Original release.	2025/2/26

1 Certificate

Product: Video conference Equipment

Brand: Logitech, logi, logitech

Test Model: VR0039

Sample Status: Engineering sample

Applicant: Logitech Far East Ltd.

Test Date: 2024/12/25 ~ 2025/1/13

Standard: 47 CFR FCC Part 15, Subpart C (Section 15.247)

Measurement Procedure: ANSI C63.10-2013

KDB 558074 D01 15.247 Meas Guidance v05r02

KDB 662911 D01 Multiple Transmitter Output v02r01

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.

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
Standard / Clause	Test Item	Result	Remark
15.247(b)	RF Output Power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.247(a)(2)	6 dB Bandwidth	Pass	Meet the requirement of limit.
15.247(d)	Conducted Out of Band Emissions	Pass	Meet the requirement of limit.
15.207	AC Power Conducted Emissions	Pass	Minimum passing margin is -5.74 dB at 0.63000 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Pass	Minimum passing margin is -5.1 dB at 233.70 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -4.0 dB at 2390.00 MHz
15.203	Antenna Requirement	Pass	Antenna connector is ipex(MHF) not a standard connector.

Note: 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:

Parameter	Specification	Uncertainty (±)
RF Output Power	-	1.371 dB
Power Spectral Density	-	1.017 dB
6 dB Bandwidth	-	206.5 Hz
Conducted Out of Band Emissions	9 kHz ~ 40 GHz	2.79 dB
AC Power Conducted Emissions	9 kHz ~ 30 MHz	2.90 dB
Unwanted Emissions below 1 GHz	9 kHz ~ 30 MHz	3.59 dB
	30 MHz ~ 1 GHz	3.6 dB
Unwanted Emissions above 1 GHz	1 GHz ~ 18 GHz	2.29 dB
	18 GHz ~ 40 GHz	2.29 dB

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

3 General Information

3.1 General Description

Product	Video conference Equipment
Brand	Logitech, logi, logitech
Test Model	VR0039
Status of EUT	Engineering sample
Power Supply Rating	120Vac
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM for OFDMA in 11ax mode
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	Up to 286.8 Mbps
Operating Frequency	2.412 GHz ~ 2.462 GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20), 802.11ax (HE20):11
Output Power	482.392 mW (26.83 dBm)

Note:

1. The EUT uses following accessories.

Item	Brand	Model
Stylus pen	Logitech, logi, logitech	-

2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

Antenna No.	RF Chain No.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	*Cable Length
BT & WLAN	0	INPAQ	46050019332	4.68	2.4 GHz ~ 2.4835 GHz	PIFA	ipex(MHF)	380mm
					5.15 GHz ~ 5.85 GHz			
WLAN	1	INPAQ	46050019432	3.96	2.4 GHz ~ 2.4835 GHz	PIFA	ipex(MHF)	465mm
				4.97	5.15 GHz ~ 5.85 GHz			

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

2. The EUT incorporates a MIMO function:

2.4 GHz Band		
Modulation Mode	TX & RX Configuration	
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11ax (HE20)	2TX	2RX

Note:

1. The modulation and bandwidth are similar for 802.11n mode for 20 MHz and 802.11ax mode for 20 MHz. Therefore, the investigated worst case is the representative mode in test report.

3.3 Channel List

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

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

3.4 Test Mode Applicability and Tested Channel Detail

Pre-Scan:	1. 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).
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Following channel(s) was (were) selected for the final test as listed below:

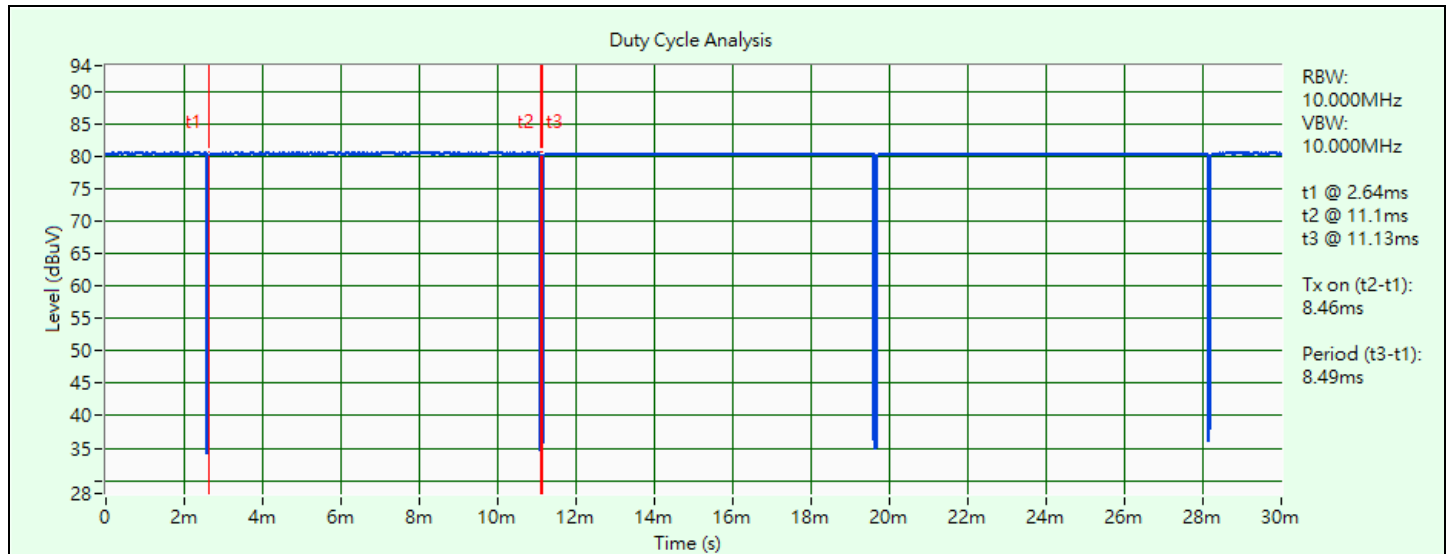
Test Item	Mode	Signal Mode	Tested Channel	Modulation	Data Rate Parameter
RF Output Power	802.11b	CDD	1, 6, 11	DBPSK	1Mb/s
	802.11g		1, 6, 11	BPSK	6Mb/s
	802.11ax (HE20)		1, 6, 11	BPSK	MCS0
Power Spectral Density	802.11b	CDD	1, 6, 11	DBPSK	1Mb/s
	802.11g		1, 6, 11	BPSK	6Mb/s
	802.11ax (HE20)		1, 6, 11	BPSK	MCS0
6 dB Bandwidth / Conducted Out of Band Emissions	802.11b	CDD	1, 6, 11	DBPSK	1Mb/s
	802.11g		1, 6, 11	BPSK	6Mb/s
	802.11ax (HE20)		1, 6, 11	BPSK	MCS0
AC Power Conducted Emissions	802.11ax (HE20)	CDD	6	BPSK	MCS0
Unwanted Emissions below 1 GHz	802.11ax (HE20)	CDD	6	BPSK	MCS0
Unwanted Emissions above 1 GHz	802.11b	CDD	1, 6, 11	DBPSK	1Mb/s
	802.11g		1, 6, 11	BPSK	6Mb/s
	802.11ax (HE20)		1, 6, 11	BPSK	MCS0

3.5 Duty Cycle of Test Signal

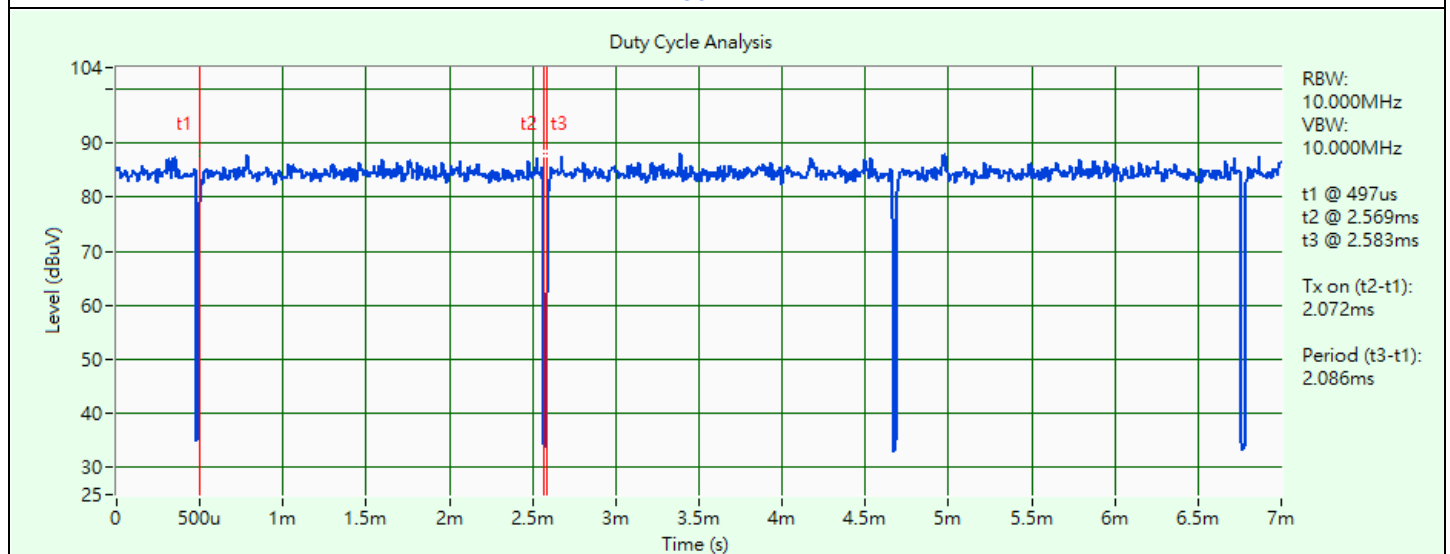
802.11b: Duty cycle = 8.46 ms / 8.49 ms x 100% = 99.6%

802.11g: Duty cycle = 2.072 ms / 2.086 ms x 100% = 99.3%

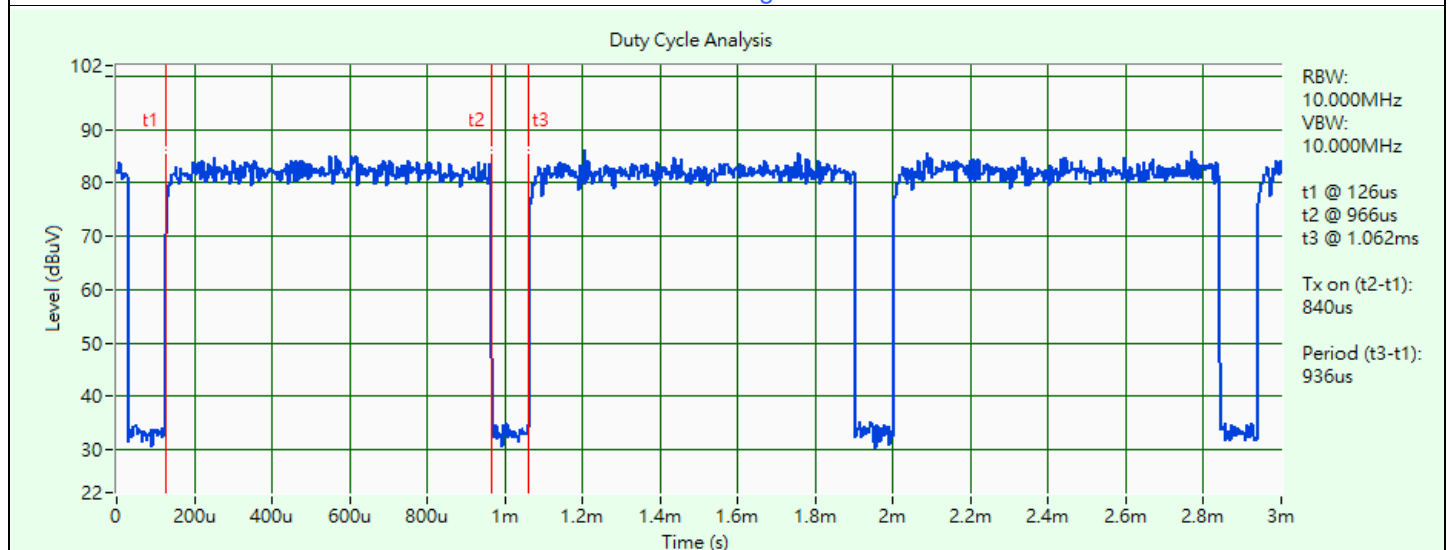
802.11ax (HE20): Duty cycle = 0.84 ms / 0.936 ms x 100% = 89.7%, duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 0.47 \text{ dB}$



802.11b



802.11g

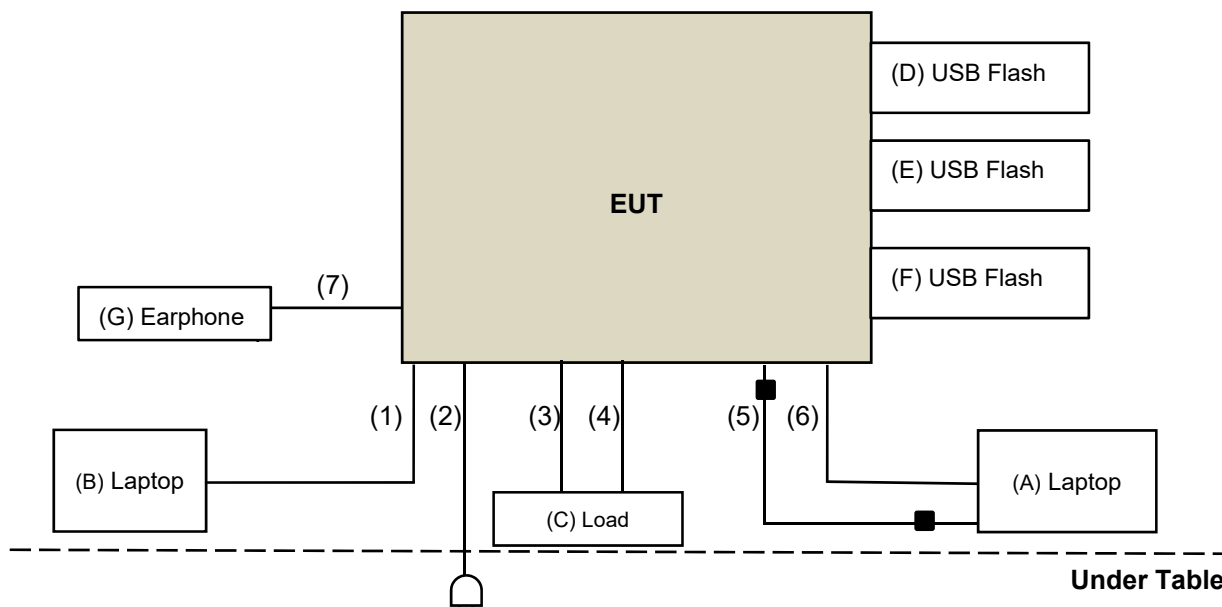


802.11ax (HE20)

3.6 Test Program Used and Operation Descriptions

Controlling software CMD has been activated to set the EUT under transmission condition continuously at specific channel frequency.

3.7 Connection Diagram of EUT and Peripheral Devices



3.8 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Laptop	Dell	14UR-4528LTW	GJ22NC2	N/A	Provided by Lab
B	Laptop	DELL	Inspiron 14R	8LRKKW1	N/A	Provided by Lab
C	Load	N/A	N/A	N/A	N/A	Provided by Lab
D	USB Flash	SanDisk	SDDDC3-032G	N/A	N/A	Provided by Lab
E	USB Flash	SanDisk	SDDDC3-032G	N/A	N/A	Provided by Lab
F	USB Flash	SanDisk	SDDDC3-032G	N/A	N/A	Provided by Lab
G	Earphone	APPLE	MB77PFEB	N/A	N/A	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	HDMI Cable	1	1.5	Yes	0	Provided by Lab
2	AC Power Cable	1	3	No	0	Supplied by applicant
3	RJ-45 Cable	1	1.5	No	0	Provided by Lab
4	RJ-45 Cable	1	1.5	No	0	Provided by Lab
5	HDMI Cable	1	1.5	Yes	2	Provided by Lab
6	Type C to A Cable	1	1.5	Yes	0	Provided by Lab
7	Earphone cable	1	1.2	No	0	Provided by Lab

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 RF Output Power

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Peak Power Analyzer Keysight	8990B	MY51000485	2024/1/21	2025/1/20
Wideband Power Sensor Keysight	N1923A	MY58020002	2024/1/18	2025/1/17
		MY58140009	2024/1/18	2025/1/17

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2025/1/6

4.2 Power Spectral Density

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Signal & Spectrum Analyzer R&S	FSV3044	101105	2024/2/27	2025/2/26
Software BV	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2025/1/6

4.3 6 dB Bandwidth

Refer to section 4.2 to get the tested date and information of the instruments.

4.4 Conducted Out of Band Emissions

Refer to section 4.2 to get the tested date and information of the instruments.

4.5 AC Power Conducted Emissions

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
50 ohm terminal resistance HUBER+SUHNER	E1-011277	02	2024/10/25	2025/10/24
	E1-011313	11	2024/2/1	2025/1/31
	E1-011595	21	2024/3/8	2025/3/7
DC-LISN Schwarzbeck	NNBM 8126G	8126G-069	2024/11/5	2025/11/4
EMI Test Receiver R&S	ESR3	102783	2024/12/17	2025/12/16
Fixed Attenuator STI	BNC5W10dB	PAD-COND2-01	2024/8/25	2025/8/24
LISN R&S	ESH2-Z5	100100	2024/3/6	2025/3/5
	ESH3-Z5	100312	2024/9/9	2025/9/8
RF Coaxial Cable Woken	5D-FB	Cable-cond2-01	2024/8/25	2025/8/24
Software BVADT	BVADT_Cond_ V7.4.1.0	N/A	N/A	N/A
V-LISN Schwarzbeck	NNBL 8226-2	8226-142	2024/8/28	2025/8/27

Notes:

1. The test was performed in HY - Conduction 2.
2. Tested Date: 2025/1/13

4.6 Unwanted Emissions below 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower & Turn BV ADT	AT100	AT93021705	N/A	N/A
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-160	2024/10/9	2025/10/8
Loop Antenna TESEQ	HLA 6121	45745	2024/8/21	2025/8/20
MXE EMI Receiver Keysight	N9038B	MY60180018	2024/3/13	2025/3/12
Preamplifier Agilent	8447D	2944A10638	2024/5/1	2025/4/30
RF Coaxial Cable Woken	8D-FB	Cable-CH9-01	2024/5/1	2025/4/30
Signal & Spectrum Analyzer R&S	FSW43	101866	2024/3/26	2025/3/25
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Turn Table BV ADT	TT100	TT93021705	N/A	N/A
Turn Table Controller BV ADT	SC100	SC93021705	N/A	N/A

Notes:

1. The test was performed in HY - 966 chamber 4.
2. Tested Date: 2025/1/13

4.7 Unwanted Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower & Turn BV ADT	AT100	AT93021705	N/A	N/A
Boresight antenna tower fixture BV	BAF-02	5	N/A	N/A
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-1169	2024/11/10	2025/11/9
	BBHA 9170	9170-480	2024/11/10	2025/11/9
		BBHA9170243	2024/11/10	2025/11/9
MXE EMI Receiver Keysight	N9038B	MY60180018	2024/3/13	2025/3/12
Preamplifier Agilent	8449B	3008A02367	2024/1/6	2025/1/5
Preamplifier EMCI	EMC 184045	980116	2024/9/24	2025/9/23
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	2024/7/6	2025/7/5
	EMC102-KM-KM-3000	150929	2024/7/6	2025/7/5
RF Coaxial Cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	2024/1/6	2025/1/5
RF Coaxial Cable HUBER+SUHNER&EMCI	SUCOFLEX 104& EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	2024/1/6	2025/1/5
Signal & Spectrum Analyzer R&S	FSW43	101866	2024/3/26	2025/3/25
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Turn Table BV ADT	TT100	TT93021705	N/A	N/A
Turn Table Controller BV ADT	SC100	SC93021705	N/A	N/A

Notes:

1. The test was performed in HY - 966 chamber 4.
2. Tested Date: 2024/12/25

5 Limits of Test Items

5.1 RF Output Power

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

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.

5.2 Power Spectral Density

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

5.3 6 dB Bandwidth

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

5.4 Conducted Out of Band Emissions

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

5.5 AC Power Conducted Emissions

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

Notes:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

5.6 Unwanted Emissions below 1 GHz

Radiated emissions up to 1 GHz which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

5.7 Unwanted Emissions above 1 GHz

Radiated emissions above 1 GHz which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
Above 960	500	3

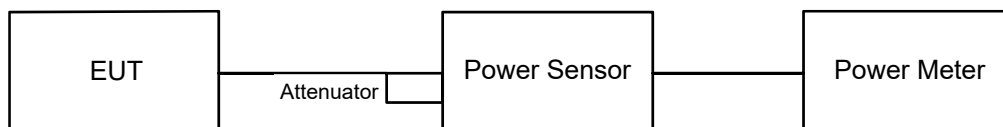
Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

6 Test Arrangements

6.1 RF Output Power

6.1.1 Test Setup



6.1.2 Test Procedure

Peak Power:

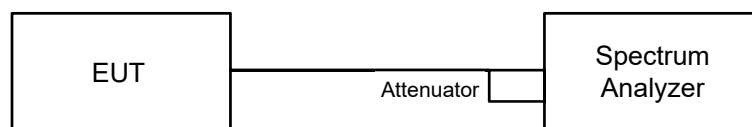
A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

Average Power:

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.

6.2 Power Spectral Density

6.2.1 Test Setup

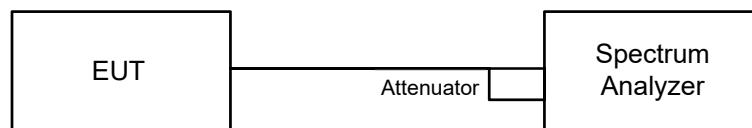


6.2.2 Test Procedure

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

6.3 6 dB Bandwidth

6.3.1 Test Setup

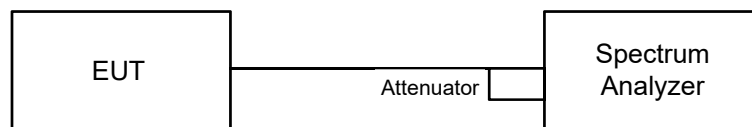


6.3.2 Test Procedure

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

6.4 Conducted Out of Band Emissions

6.4.1 Test Setup



6.4.2 Test Procedure

MEASUREMENT PROCEDURE REF

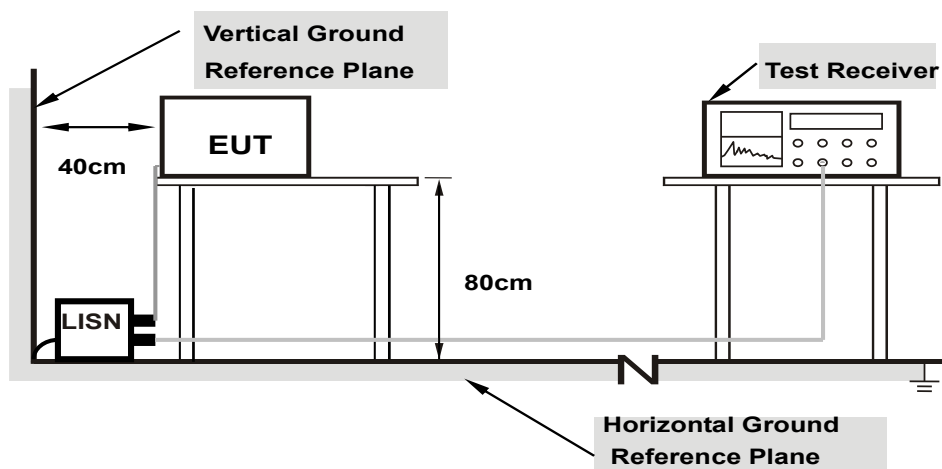
- Set the RBW = 100 kHz.
- Set the VBW ≥ 300 kHz.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOB

- Set RBW = 100 kHz.
- Set VBW ≥ 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.

6.5 AC Power Conducted Emissions

6.5.1 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).

6.5.2 Test Procedure

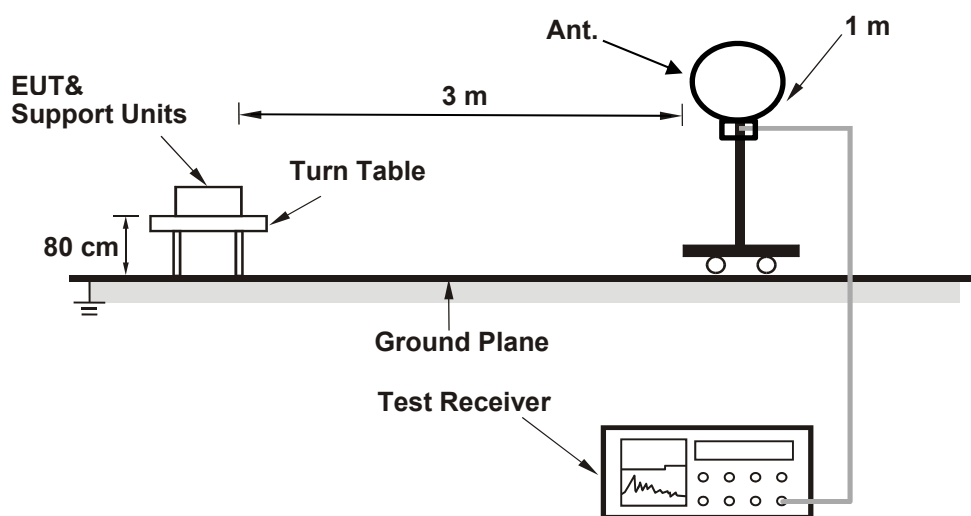
- The EUT was placed on a 0.8 meter to the top of table and placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50 uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

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

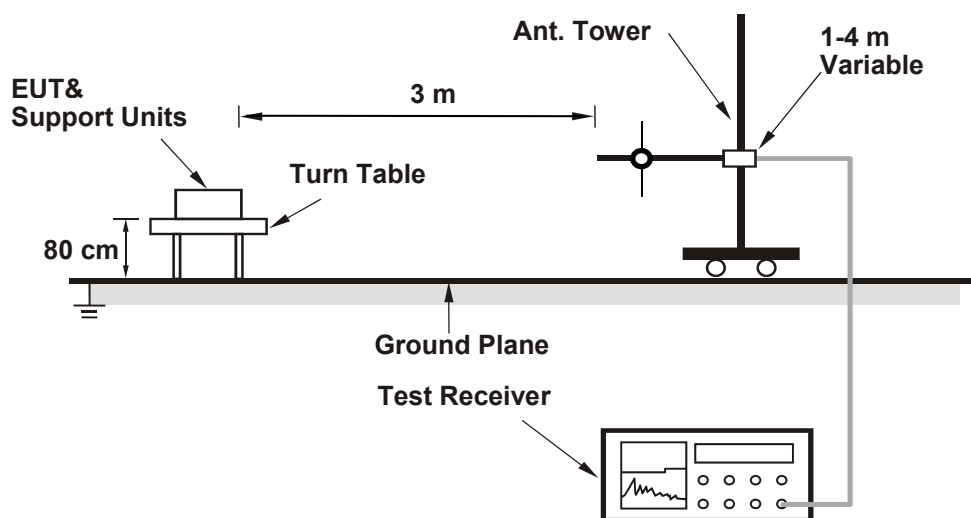
6.6 Unwanted Emissions below 1 GHz

6.6.1 Test Setup

For Radiated emission below 30 MHz



For Radiated emission above 30 MHz



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

6.6.2 Test Procedure

For Radiated emission below 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters 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. 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, except for the frequency band (9 kHz to 90 kHz and 110 kHz to 490 kHz) set to average detect function and peak detect function.

Notes:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200 Hz at frequency below 150 kHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz or 10 kHz at frequency (150 kHz to 30 MHz).
3. All modes of operation were investigated and the worst-case emissions are reported.

For Radiated emission above 30 MHz

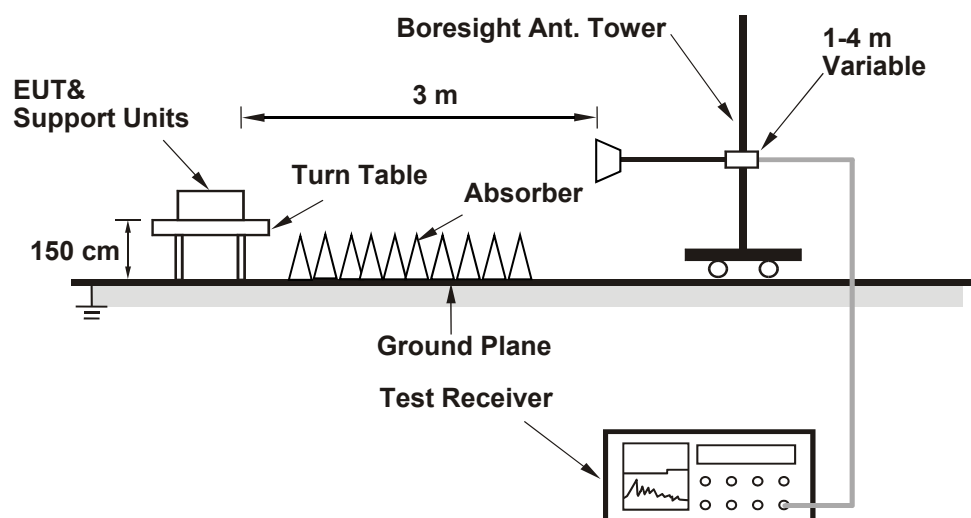
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the 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.

Notes:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

6.7 Unwanted Emissions above 1 GHz

6.7.1 Test Setup



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

6.7.2 Test Procedure

- The EUT was placed on the top of a rotating table 1.5 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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.
- 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.

Notes:

- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) and Average detection (AV) at frequency above 1 GHz.
- For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10 Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1 GHz.
- All modes of operation were investigated and the worst-case emissions are reported.

7 Test Results of Test Item

7.1 RF Output Power

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 60% RH	Tested By:	Alan Wu
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For Peak Power

802.11b

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
1	2412	18.11	17.22	117.437	20.70	30	Pass
6	2437	19.11	18.71	155.772	21.92	30	Pass
11	2462	16.78	16.32	90.498	19.57	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 4.68 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11g

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
1	2412	22.62	22.36	354.997	25.50	30	Pass
6	2437	23.00	22.13	362.831	25.60	30	Pass
11	2462	22.03	21.87	313.403	24.96	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 4.68 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
1	2412	21.62	21.18	276.431	24.42	30	Pass
6	2437	24.09	23.54	482.392	26.83	30	Pass
11	2462	20.83	20.33	228.954	23.60	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 4.68 dBi < 6 dBi, so the output power limit shall not be reduced.

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	15.59	14.72	65.873	18.19
6	2437	16.48	15.66	81.276	19.10
11	2462	14.29	13.78	50.732	17.05

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Average Power (mW)	Total Average Power (dBm)
		Chain 0	Chain 1		
1	2412	14.63	14.25	55.647	17.45
6	2437	15.31	14.72	63.611	18.04
11	2462	14.26	13.97	51.615	17.13

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Average Power (mW)	Total Average Power (dBm)
		Chain 0	Chain 1		
1	2412	14.02	13.42	47.213	16.74
6	2437	15.37	14.92	65.481	18.16
11	2462	13.56	12.91	42.242	16.26

7.2 Power Spectral Density

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 60% RH	Tested By:	Alan Wu
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802.11b

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
		Chain 0	Chain 1			
1	2412	-6.06	-6.87	-3.44	6.66	Pass
6	2437	-5.33	-5.46	-2.38	6.66	Pass
11	2462	-7.41	-8.14	-4.75	6.66	Pass

Notes:

1. Method E) 2) b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. Directional gain = $10 \log[(10^{\text{Chain0}/20} + 10^{\text{Chain1}/20})^2 / 2]$
3. The directional gain is 7.34 dBi > 6 dBi, so the power density limit shall be reduced to $8 - (7.34 - 6) = 6.66$ dBm/3kHz.

802.11g

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
		Chain 0	Chain 1			
1	2412	-10.08	-10.53	-7.29	6.66	Pass
6	2437	-9.32	-9.90	-6.59	6.66	Pass
11	2462	-10.27	-10.81	-7.52	6.66	Pass

Notes:

1. Method E) 2) b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. Directional gain = $10 \log[(10^{\text{Chain0}/20} + 10^{\text{Chain1}/20})^2 / 2]$
3. The directional gain is 7.34 dBi > 6 dBi, so the power density limit shall be reduced to $8 - (7.34 - 6) = 6.66$ dBm/3kHz.

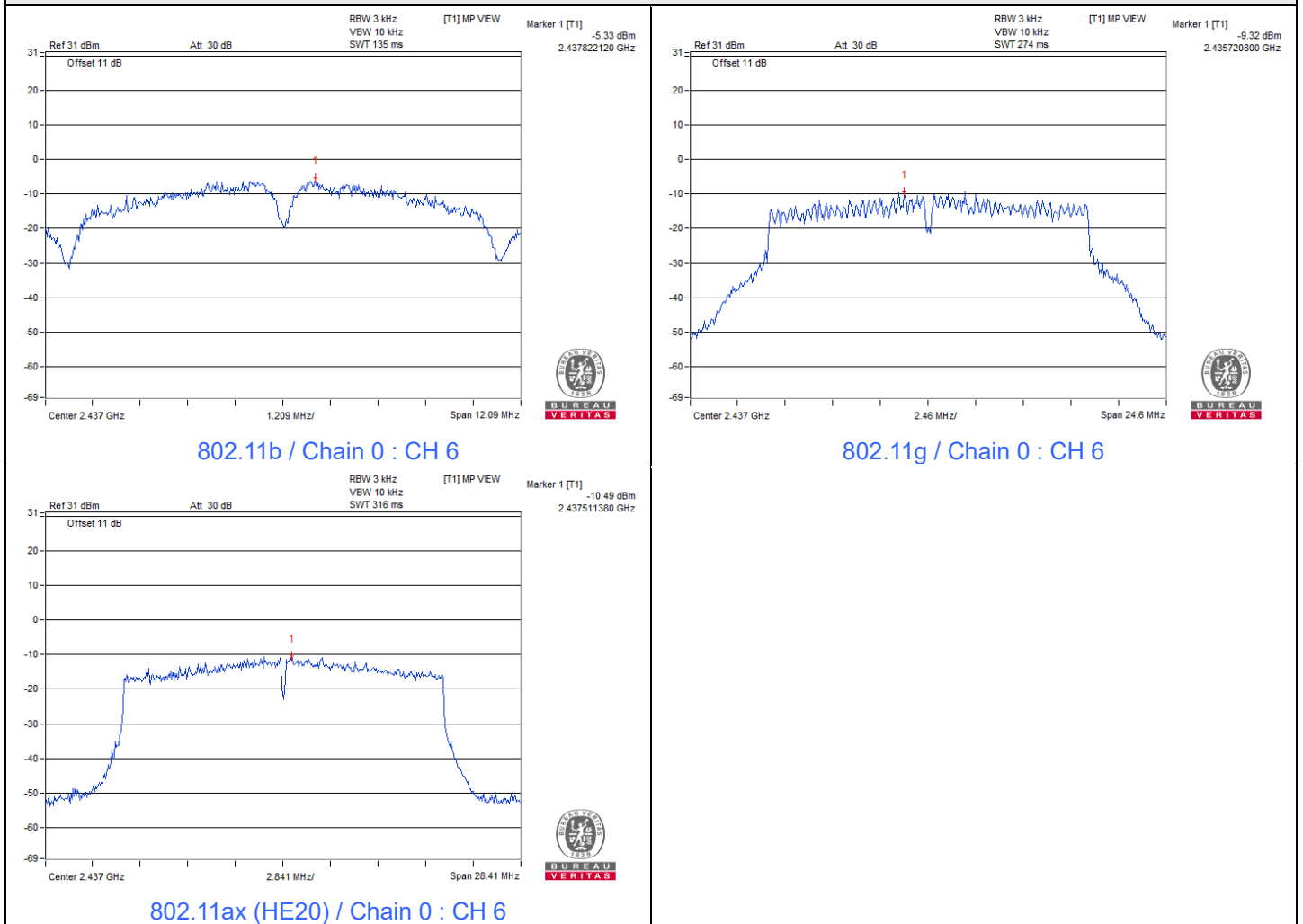
802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
		Chain 0	Chain 1			
1	2412	-11.45	-11.75	-8.59	6.66	Pass
6	2437	-10.49	-10.64	-7.55	6.66	Pass
11	2462	-11.74	-12.21	-8.96	6.66	Pass

Notes:

1. Method E) 2) b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. Directional gain = $10 \log[(10^{\text{Chain0}/20} + 10^{\text{Chain1}/20})^2 / 2]$
3. The directional gain is 7.34 dBi > 6 dBi, so the power density limit shall be reduced to $8 - (7.34 - 6) = 6.66$ dBm/3kHz.

Spectrum Plot of Maximum Value



7.3 6 dB Bandwidth

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 60% RH	Tested By:	Alan Wu
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802.11b

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1		
1	2412	7.11	8.08	0.5	Pass
6	2437	8.06	7.60	0.5	Pass
11	2462	8.07	8.07	0.5	Pass

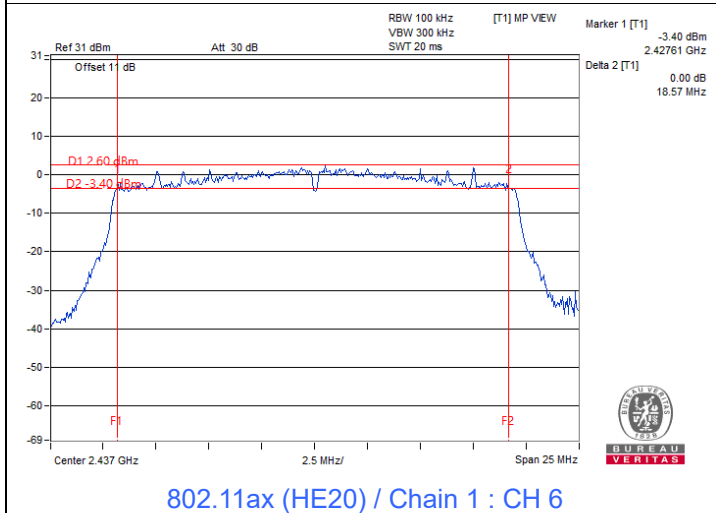
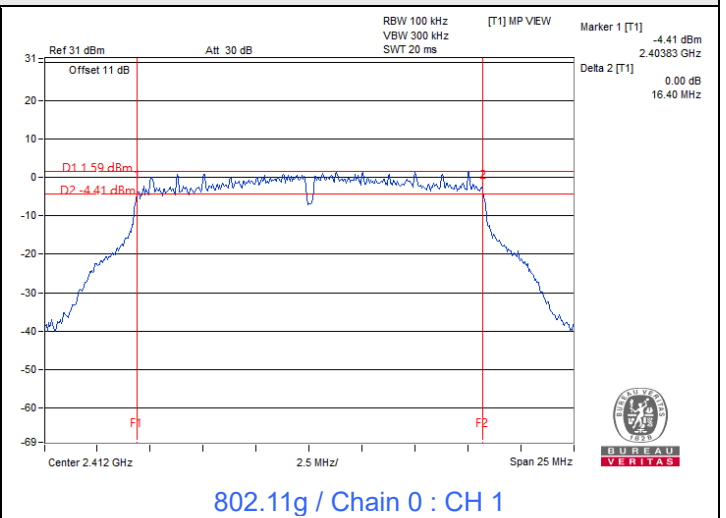
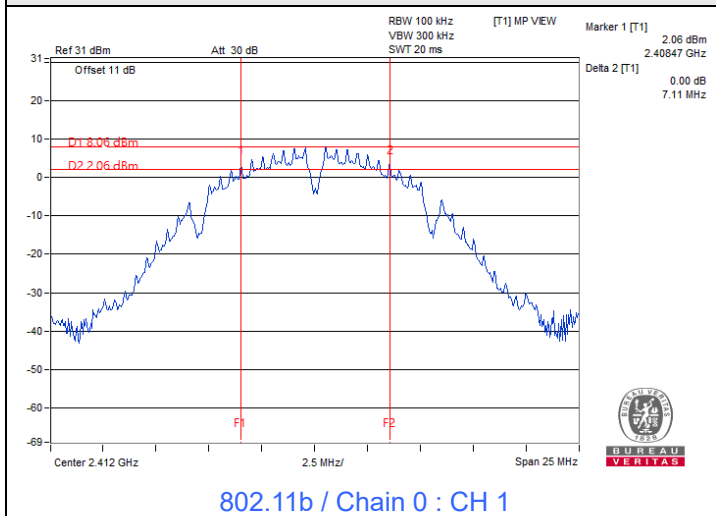
802.11g

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1		
1	2412	16.40	16.43	0.5	Pass
6	2437	16.40	16.42	0.5	Pass
11	2462	16.40	16.43	0.5	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1		
1	2412	18.78	18.89	0.5	Pass
6	2437	18.94	18.57	0.5	Pass
11	2462	18.67	18.85	0.5	Pass

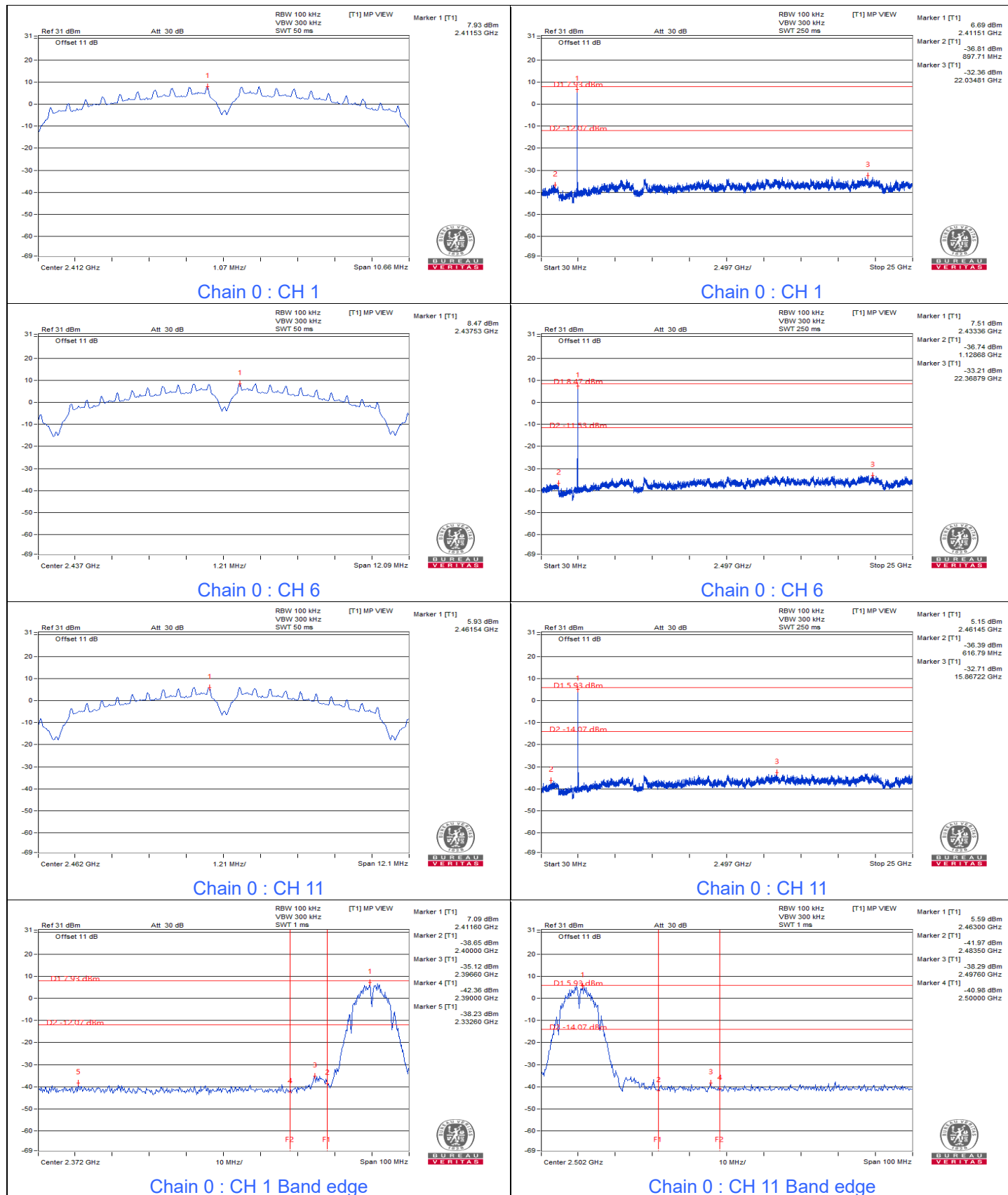
Spectrum Plot of Minimum Value

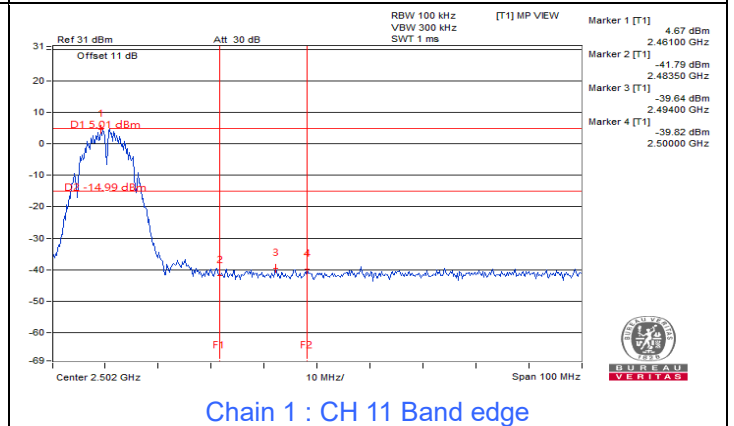
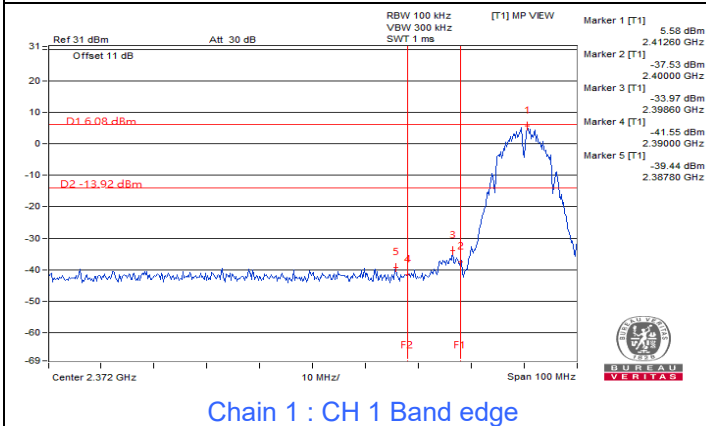
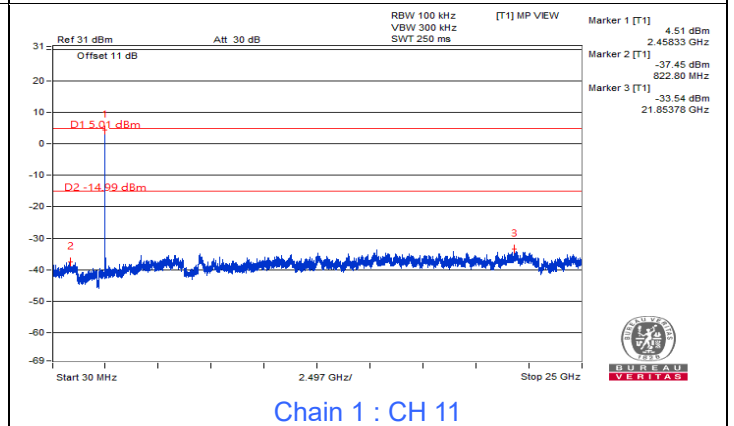
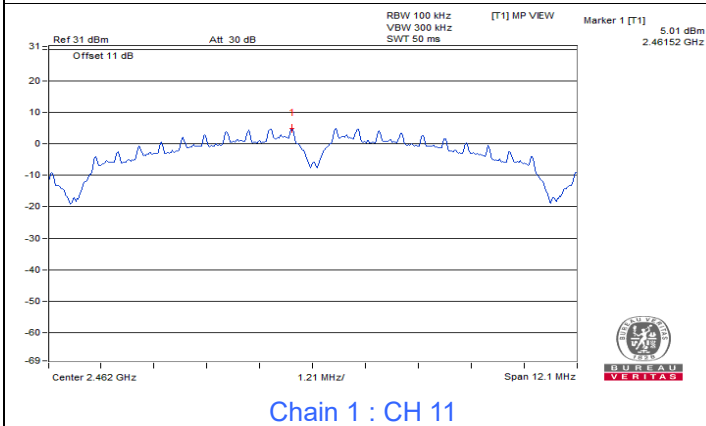
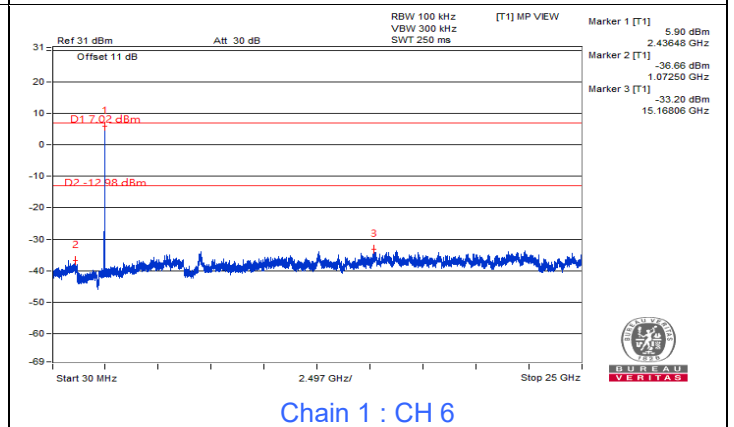
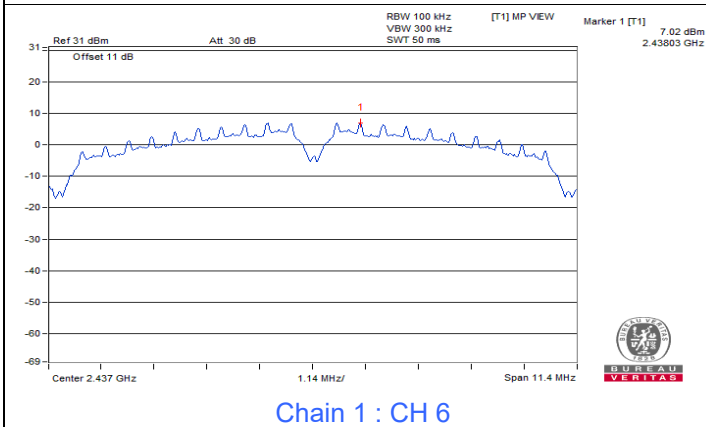
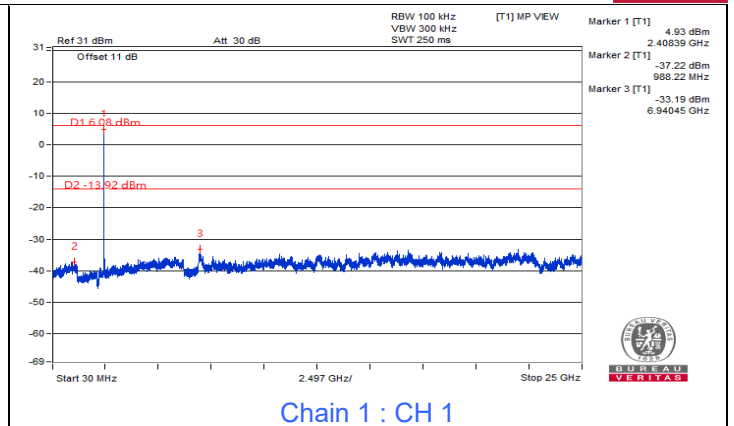
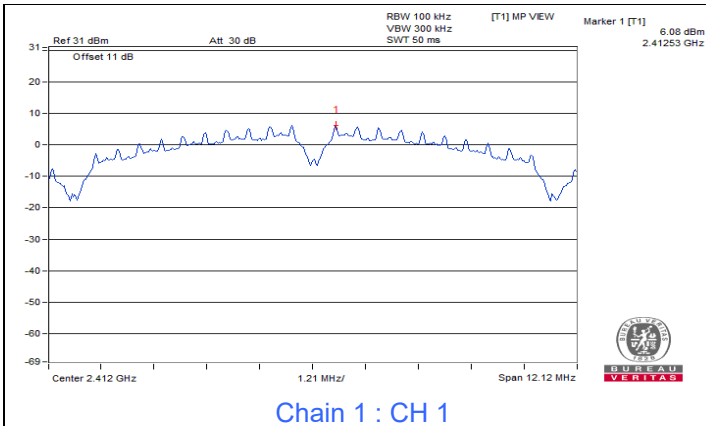


7.4 Conducted Out of Band Emissions

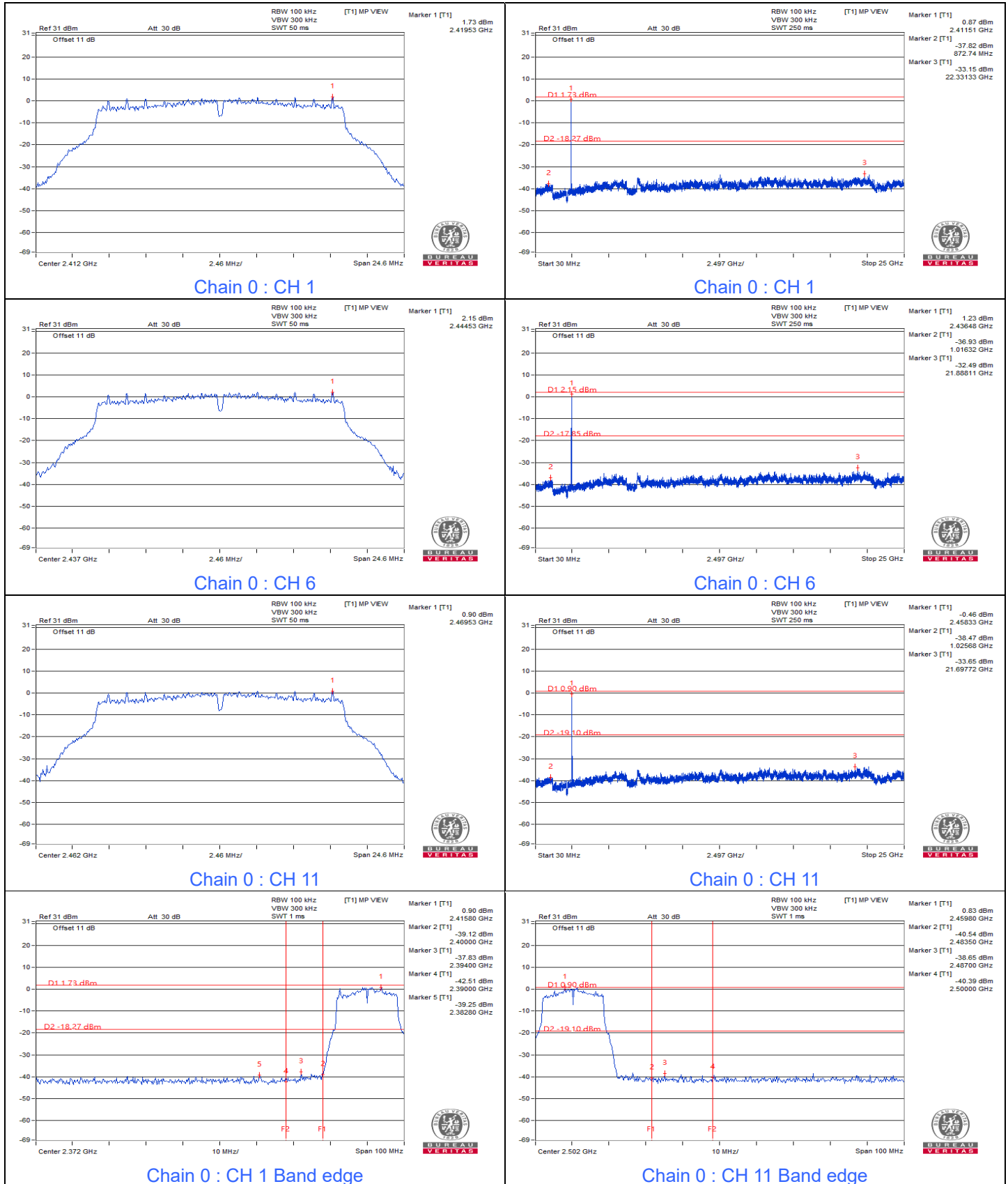
Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 60% RH	Tested By:	Alan Wu
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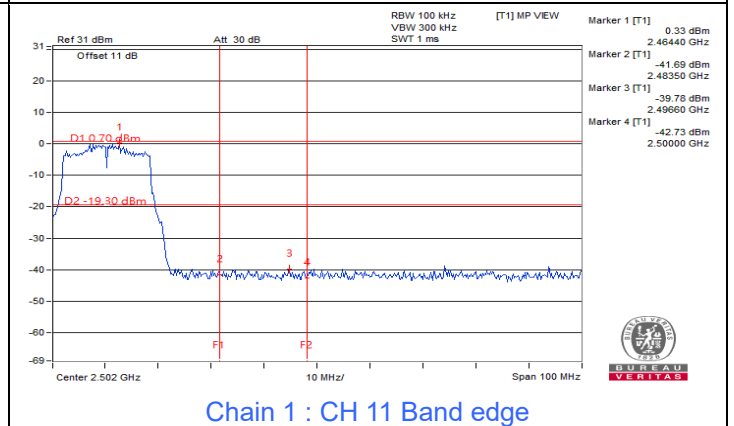
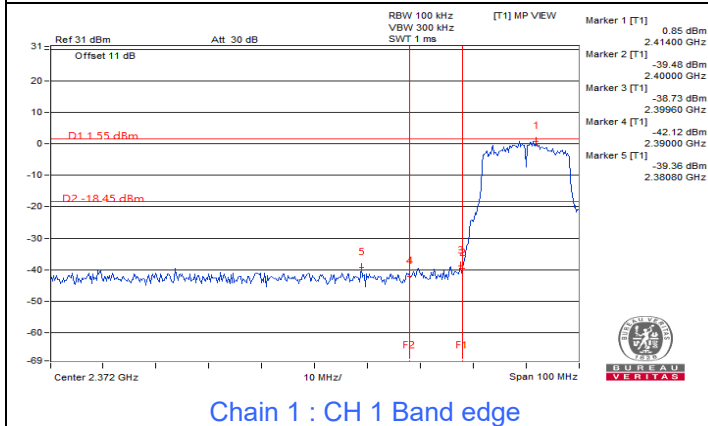
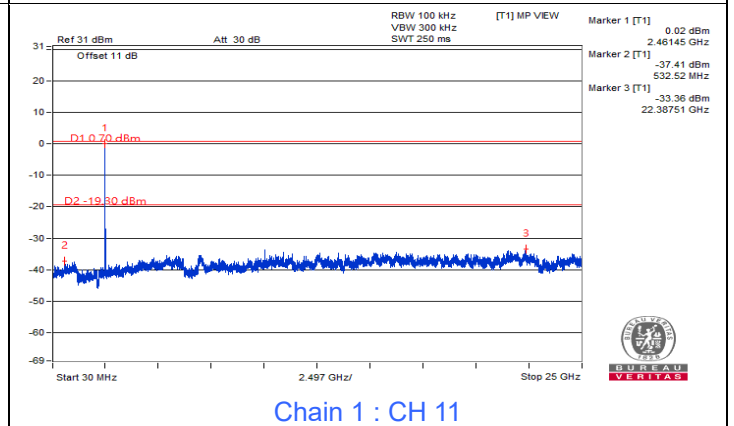
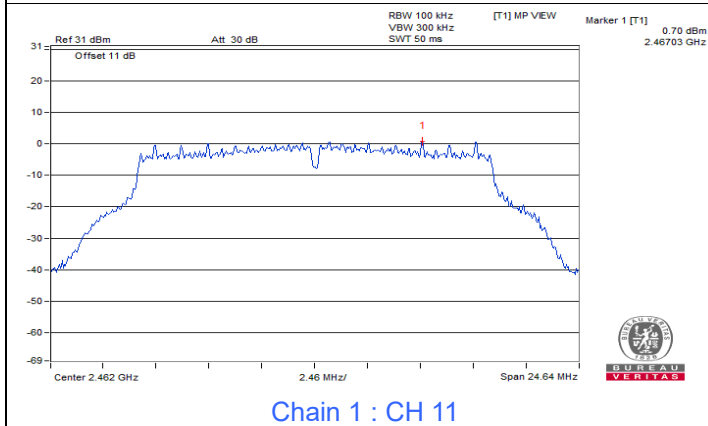
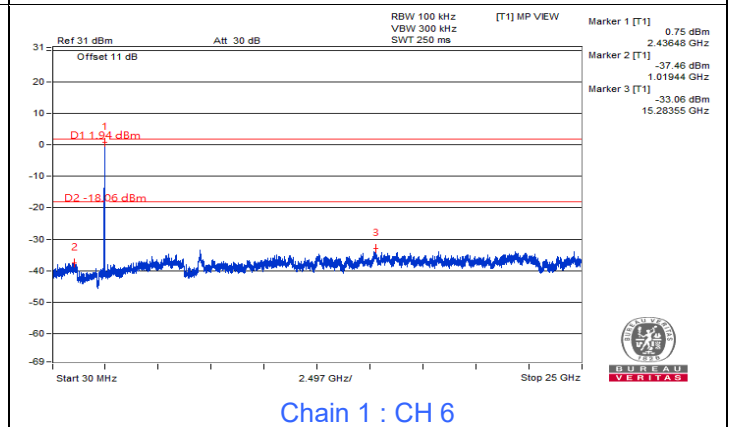
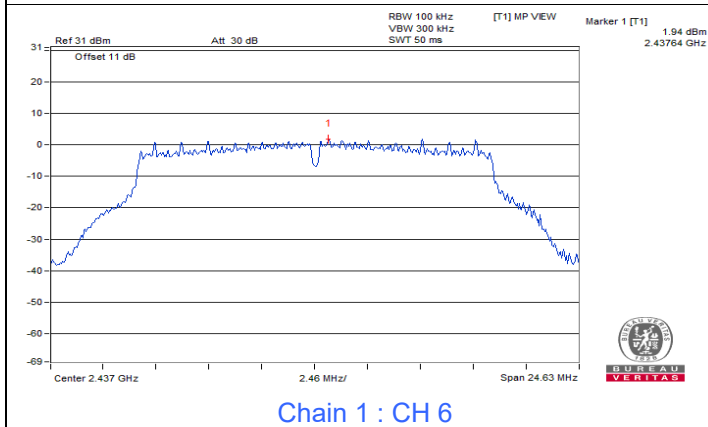
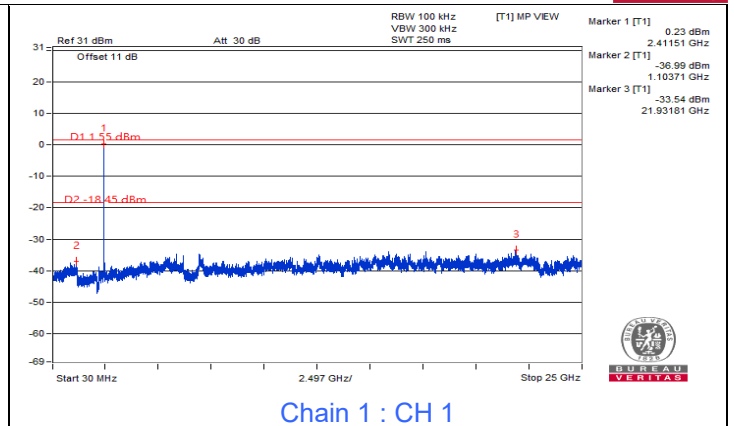
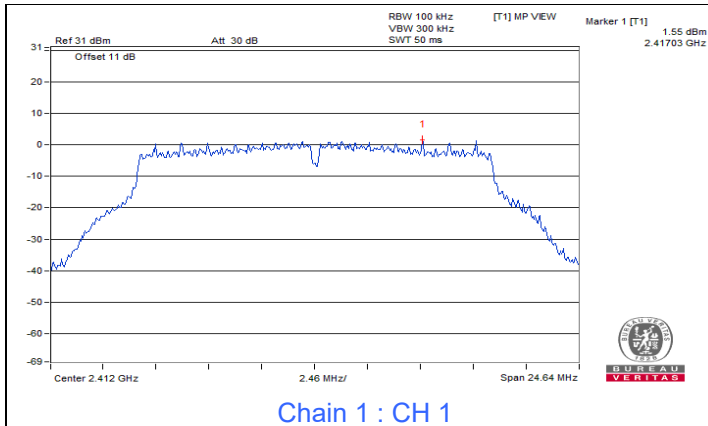
802.11b



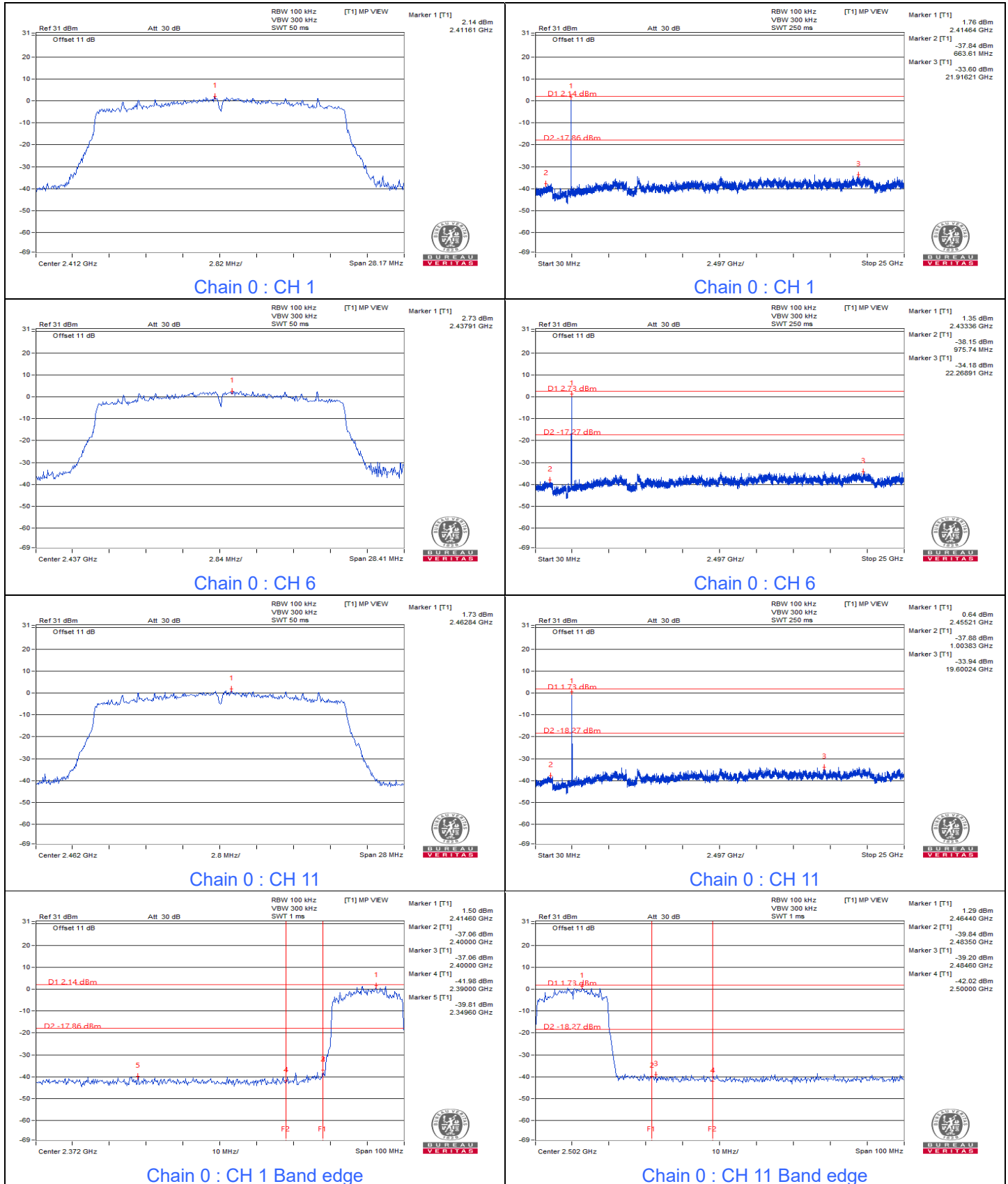


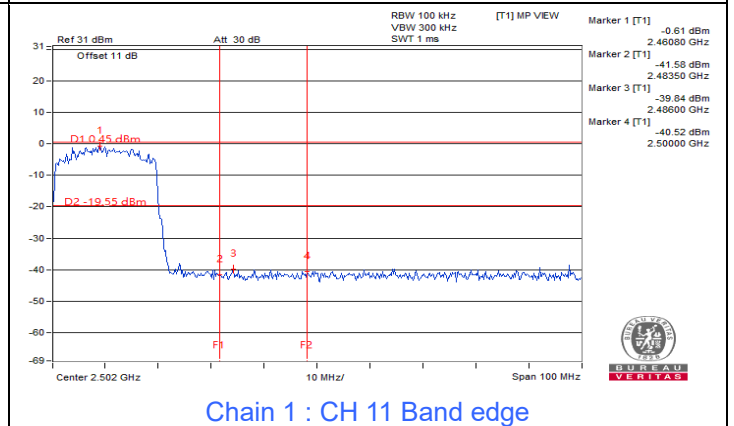
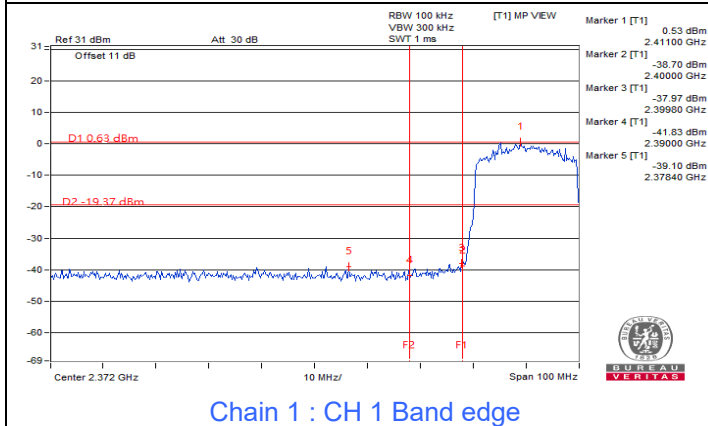
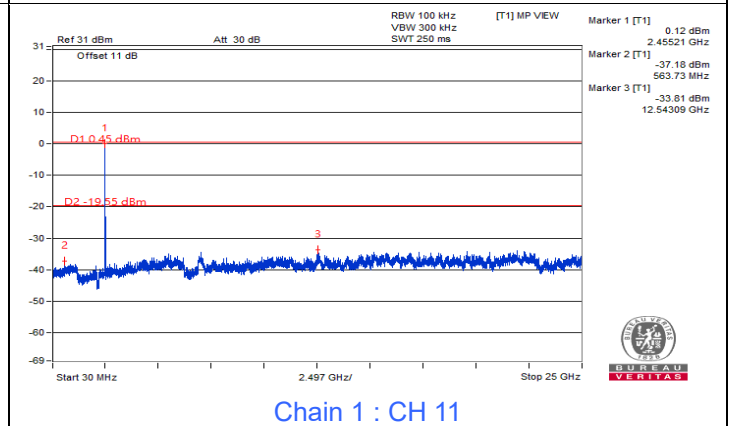
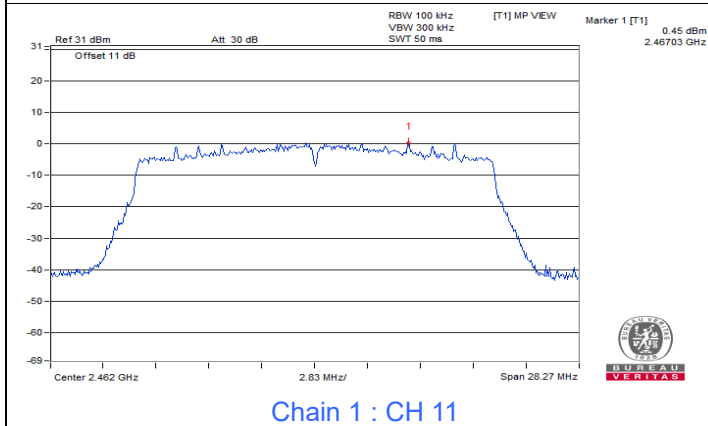
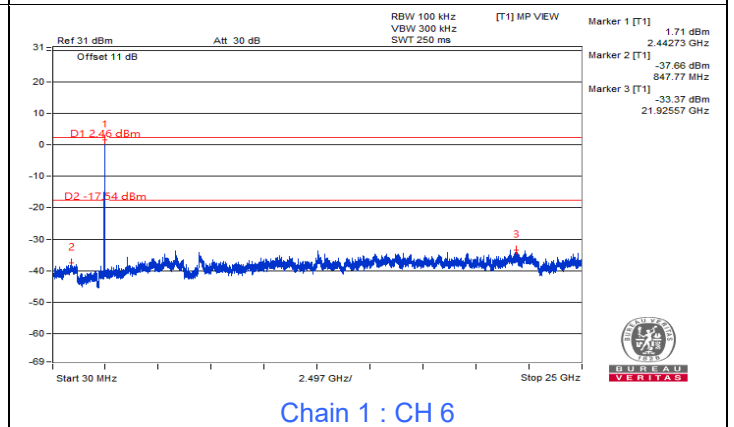
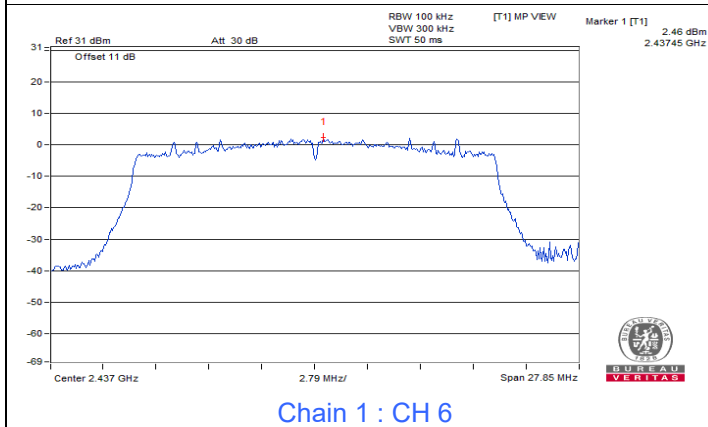
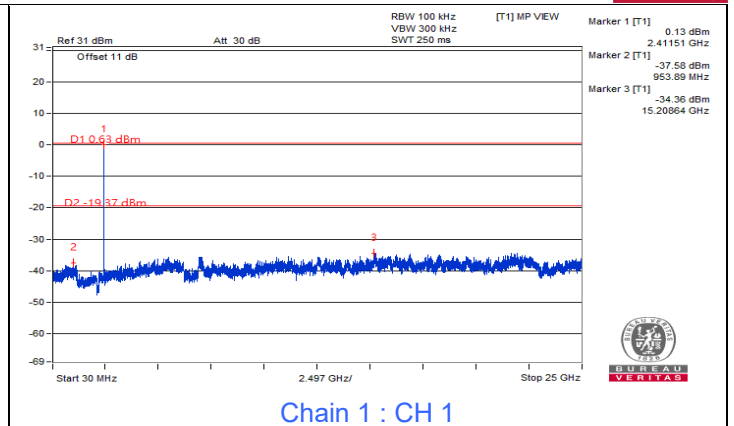
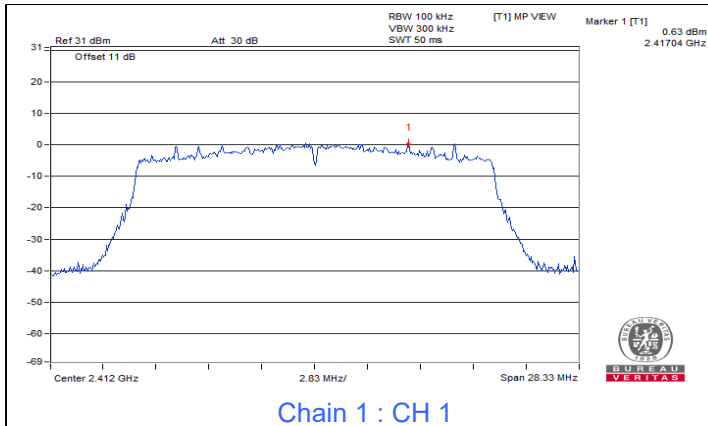
802.11g





802.11ax (HE20)





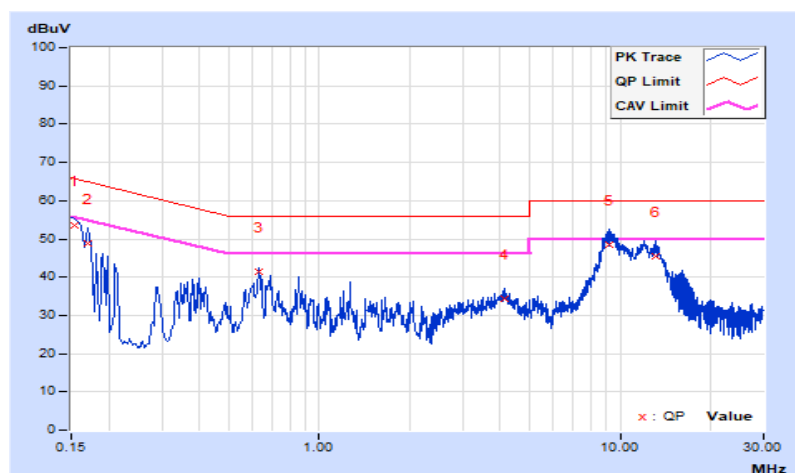
7.5 AC Power Conducted Emissions

RF Mode	802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	10.10	43.47	29.68	53.57	39.78	65.78	55.78	-12.21	-16.00
2	0.17000	10.10	38.88	25.43	48.98	35.53	64.96	54.96	-15.98	-19.43
3	0.63048	10.12	31.30	28.53	41.42	38.65	56.00	46.00	-14.58	-7.35
4	4.11800	10.25	23.99	18.56	34.24	28.81	56.00	46.00	-21.76	-17.19
5	9.15800	10.30	38.23	29.62	48.53	39.92	60.00	50.00	-11.47	-10.08
6	13.12600	10.38	35.14	26.61	45.52	36.99	60.00	50.00	-14.48	-13.01

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

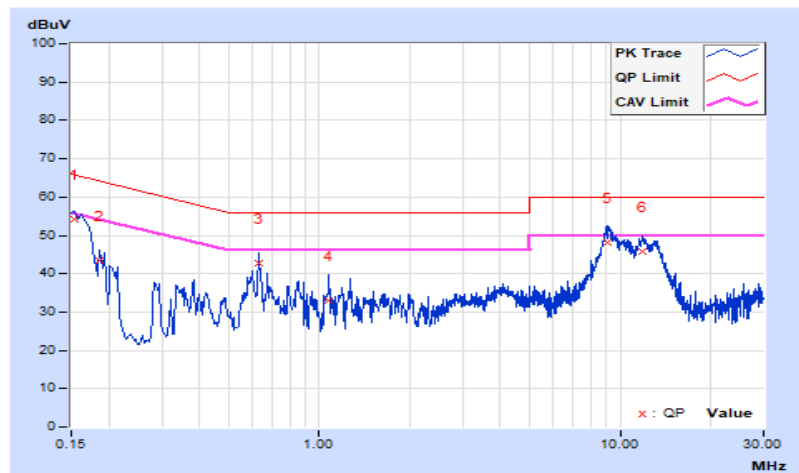


RF Mode	802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	10.13	43.96	30.16	54.09	40.29	65.78	55.78	-11.69	-15.49
2	0.18600	10.14	33.44	17.57	43.58	27.71	64.21	54.21	-20.63	-26.50
3	0.63000	10.15	32.62	30.11	42.77	40.26	56.00	46.00	-13.23	-5.74
4	1.07800	10.17	22.66	13.68	32.83	23.85	56.00	46.00	-23.17	-22.15
5	9.03400	10.36	37.91	29.36	48.27	39.72	60.00	50.00	-11.73	-10.28
6	11.92600	10.43	35.42	29.42	45.85	39.85	60.00	50.00	-14.15	-10.15

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



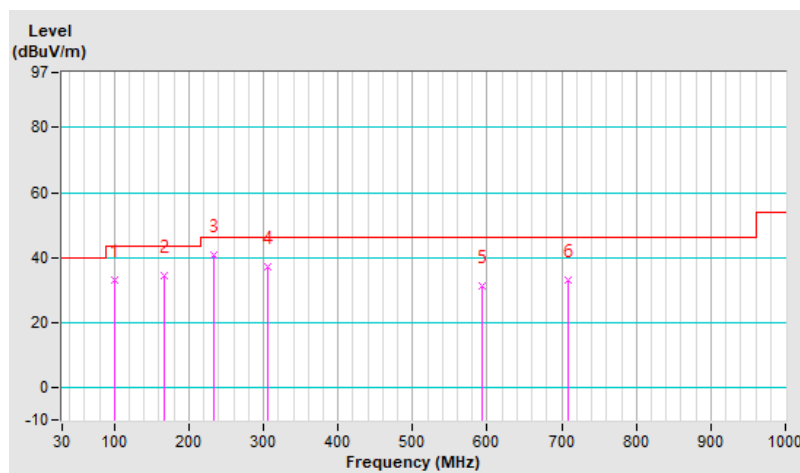
7.6 Unwanted Emissions below 1 GHz

RF Mode	802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

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	100.81	33.0 QP	43.5	-10.5	1.50 H	190	46.0	-13.0
2	167.74	34.6 QP	43.5	-8.9	1.00 H	117	43.1	-8.5
3	233.70	40.9 QP	46.0	-5.1	2.00 H	38	51.0	-10.1
4	305.48	37.0 QP	46.0	-9.0	1.00 H	261	43.6	-6.6
5	593.57	31.3 QP	46.0	-14.7	2.00 H	106	32.5	-1.2
6	708.03	33.0 QP	46.0	-13.0	1.00 H	56	32.2	0.8

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 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

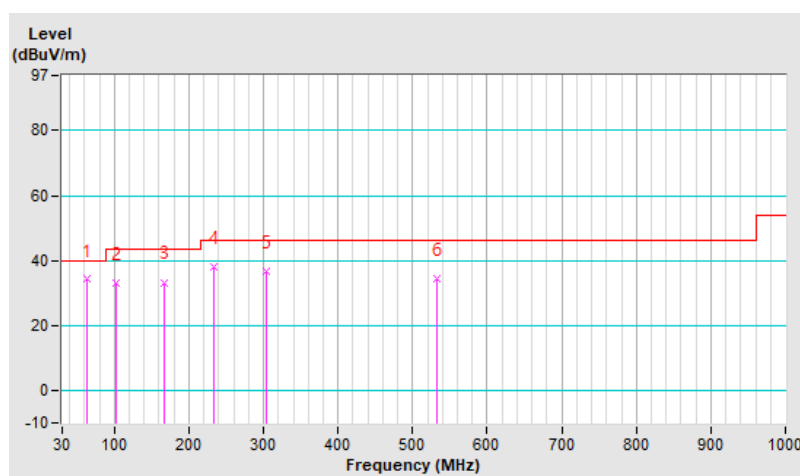


RF Mode	802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

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	63.95	34.2 QP	40.0	-5.8	1.00 V	53	44.1	-9.9
2	102.75	33.1 QP	43.5	-10.4	1.00 V	178	45.8	-12.7
3	167.74	33.3 QP	43.5	-10.2	1.00 V	114	41.8	-8.5
4	233.70	38.1 QP	46.0	-7.9	1.50 V	88	48.2	-10.1
5	304.51	36.7 QP	46.0	-9.3	1.50 V	123	43.4	-6.7
6	533.43	34.6 QP	46.0	-11.4	1.00 V	35	37.2	-2.6

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 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



7.7 Unwanted Emissions above 1 GHz

RF Mode	802.11b	Channel	CH 1 : 2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

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	69.9 PK	74.0	-4.1	1.67 H	26	37.3	32.6
2	2390.00	46.1 AV	54.0	-7.9	1.67 H	26	13.5	32.6
3	*2412.00	109.9 PK			1.67 H	26	77.4	32.5
4	*2412.00	107.4 AV			1.67 H	26	74.9	32.5
5	4824.00	51.5 PK	74.0	-22.5	2.01 H	2	47.0	4.5
6	4824.00	47.2 AV	54.0	-6.8	2.01 H	2	42.7	4.5
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	69.6 PK	74.0	-4.4	2.03 V	332	37.0	32.6
2	2390.00	45.8 AV	54.0	-8.2	2.03 V	332	13.2	32.6
3	*2412.00	109.0 PK			2.03 V	332	76.5	32.5
4	*2412.00	106.4 AV			2.03 V	332	73.9	32.5
5	4824.00	52.3 PK	74.0	-21.7	1.65 V	312	47.8	4.5
6	4824.00	48.2 AV	54.0	-5.8	1.65 V	312	43.7	4.5

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, the limit was restricted at the RF Output Power.

RF Mode	802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

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	67.1 PK	74.0	-6.9	1.30 H	9	34.5	32.6
2	2390.00	45.4 AV	54.0	-8.6	1.30 H	9	12.8	32.6
3	*2437.00	110.9 PK			1.30 H	9	78.5	32.4
4	*2437.00	107.9 AV			1.30 H	9	75.5	32.4
5	2483.50	68.3 PK	74.0	-5.7	1.30 H	9	35.8	32.5
6	2483.50	47.1 AV	54.0	-6.9	1.30 H	9	14.6	32.5
7	4874.00	52.0 PK	74.0	-22.0	2.04 H	2	47.4	4.6
8	4874.00	47.5 AV	54.0	-6.5	2.04 H	2	42.9	4.6
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	65.9 PK	74.0	-8.1	2.18 V	331	33.3	32.6
2	2390.00	45.2 AV	54.0	-8.8	2.18 V	331	12.6	32.6
3	*2437.00	110.0 PK			2.18 V	331	77.6	32.4
4	*2437.00	107.0 AV			2.18 V	331	74.6	32.4
5	2483.50	68.1 PK	74.0	-5.9	2.18 V	331	35.6	32.5
6	2483.50	46.9 AV	54.0	-7.1	2.18 V	331	14.4	32.5
7	4874.00	51.7 PK	74.0	-22.3	1.59 V	312	47.1	4.6
8	4874.00	47.4 AV	54.0	-6.6	1.59 V	312	42.8	4.6

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, the limit was restricted at the RF Output Power.

RF Mode	802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

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	108.1 PK			1.26 H	10	75.6	32.5
2	*2462.00	105.4 AV			1.26 H	10	72.9	32.5
3	2483.50	69.6 PK	74.0	-4.4	1.26 H	10	37.1	32.5
4	2483.50	47.2 AV	54.0	-6.8	1.26 H	10	14.7	32.5
5	4924.00	49.6 PK	74.0	-24.4	1.97 H	0	44.8	4.8
6	4924.00	42.6 AV	54.0	-11.4	1.97 H	0	37.8	4.8
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	107.3 PK			2.07 V	331	74.8	32.5
2	*2462.00	104.9 AV			2.07 V	331	72.4	32.5
3	2483.50	69.3 PK	74.0	-4.7	2.07 V	331	36.8	32.5
4	2483.50	47.1 AV	54.0	-6.9	2.07 V	331	14.6	32.5
5	4924.00	50.0 PK	74.0	-24.0	1.94 V	300	45.2	4.8
6	4924.00	43.3 AV	54.0	-10.7	1.94 V	300	38.5	4.8

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, the limit was restricted at the RF Output Power.

RF Mode	802.11g	Channel	CH 1 : 2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

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	70.0 PK	74.0	-4.0	2.01 H	140	37.4	32.6
2	2390.00	49.8 AV	54.0	-4.2	2.01 H	140	17.2	32.6
3	*2412.00	112.6 PK			2.01 H	140	80.1	32.5
4	*2412.00	101.8 AV			2.01 H	140	69.3	32.5
5	4824.00	47.7 PK	74.0	-26.3	2.02 H	2	43.2	4.5
6	4824.00	34.7 AV	54.0	-19.3	2.02 H	2	30.2	4.5
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	67.7 PK	74.0	-6.3	1.96 V	327	35.1	32.6
2	2390.00	47.8 AV	54.0	-6.2	1.96 V	327	15.2	32.6
3	*2412.00	110.6 PK			1.96 V	327	78.1	32.5
4	*2412.00	100.8 AV			1.96 V	327	68.3	32.5
5	4824.00	47.0 PK	74.0	-27.0	3.20 V	311	42.5	4.5
6	4824.00	34.3 AV	54.0	-19.7	3.20 V	311	29.8	4.5

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, the limit was restricted at the RF Output Power.

RF Mode	802.11g	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

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	111.8 PK			2.06 H	128	79.4	32.4
2	*2437.00	102.0 AV			2.06 H	128	69.6	32.4
3	4874.00	47.9 PK	74.0	-26.1	2.05 H	21	43.3	4.6
4	4874.00	34.5 AV	54.0	-19.5	2.05 H	21	29.9	4.6
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	110.6 PK			1.95 V	330	78.2	32.4
2	*2437.00	100.9 AV			1.95 V	330	68.5	32.4
3	4874.00	47.6 PK	74.0	-26.4	3.32 V	309	43.0	4.6
4	4874.00	34.2 AV	54.0	-19.8	3.32 V	309	29.6	4.6

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, the limit was restricted at the RF Output Power.

RF Mode	802.11g	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

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	111.2 PK			2.08 H	123	78.7	32.5
2	*2462.00	101.3 AV			2.08 H	123	68.8	32.5
3	2483.50	67.5 PK	74.0	-6.5	2.08 H	123	35.0	32.5
4	2483.50	49.7 AV	54.0	-4.3	2.08 H	123	17.2	32.5
5	4924.00	46.7 PK	74.0	-27.3	2.13 H	21	41.9	4.8
6	4924.00	34.1 AV	54.0	-19.9	2.13 H	21	29.3	4.8
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	110.0 PK			1.50 V	63	77.5	32.5
2	*2462.00	100.6 AV			1.50 V	63	68.1	32.5
3	2483.50	65.2 PK	74.0	-8.8	1.50 V	63	32.7	32.5
4	2483.50	49.5 AV	54.0	-4.5	1.50 V	63	17.0	32.5
5	4924.00	46.4 PK	74.0	-27.6	3.26 V	316	41.6	4.8
6	4924.00	33.9 AV	54.0	-20.1	3.26 V	316	29.1	4.8

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, the limit was restricted at the RF Output Power.

RF Mode	802.11ax (HE20)	Channel	CH 1 : 2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=2 kHz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

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	66.8 PK	74.0	-7.2	2.00 H	140	34.2	32.6
2	2390.00	49.9 AV	54.0	-4.1	2.00 H	140	17.3	32.6
3	*2412.00	112.7 PK			2.00 H	140	80.2	32.5
4	*2412.00	100.7 AV			2.00 H	140	68.2	32.5
5	4824.00	46.6 PK	74.0	-27.4	1.98 H	31	42.1	4.5
6	4824.00	34.9 AV	54.0	-19.1	1.98 H	31	30.4	4.5
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	65.4 PK	74.0	-8.6	1.70 V	62	32.8	32.6
2	2390.00	48.4 AV	54.0	-5.6	1.70 V	62	15.8	32.6
3	*2412.00	111.8 PK			1.70 V	62	79.3	32.5
4	*2412.00	100.3 AV			1.70 V	62	67.8	32.5
5	4824.00	47.7 PK	74.0	-26.3	3.21 V	307	43.2	4.5
6	4824.00	35.6 AV	54.0	-18.4	3.21 V	307	31.1	4.5

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, the limit was restricted at the RF Output Power.

RF Mode	802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=2 kHz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

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	114.8 PK			1.84 H	136	82.4	32.4
2	*2437.00	102.8 AV			1.84 H	136	70.4	32.4
3	4874.00	47.2 PK	74.0	-26.8	2.32 H	23	42.6	4.6
4	4874.00	34.9 AV	54.0	-19.1	2.32 H	23	30.3	4.6
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	114.0 PK			1.62 V	62	81.6	32.4
2	*2437.00	102.1 AV			1.62 V	62	69.7	32.4
3	4874.00	48.6 PK	74.0	-25.4	3.09 V	310	44.0	4.6
4	4874.00	35.8 AV	54.0	-18.2	3.09 V	310	31.2	4.6

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, the limit was restricted at the RF Output Power.

RF Mode	802.11ax (HE20)	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=2 kHz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

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	112.4 PK			1.78 H	137	79.9	32.5
2	*2462.00	100.6 AV			1.78 H	137	68.1	32.5
3	2483.50	66.9 PK	74.0	-7.1	1.78 H	137	34.4	32.5
4	2483.50	49.8 AV	54.0	-4.2	1.78 H	137	17.3	32.5
5	4924.00	45.8 PK	74.0	-28.2	2.34 H	22	41.0	4.8
6	4924.00	33.9 AV	54.0	-20.1	2.34 H	22	29.1	4.8
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	112.1 PK			1.52 V	61	79.6	32.5
2	*2462.00	99.5 AV			1.52 V	61	67.0	32.5
3	2483.50	65.9 PK	74.0	-8.1	1.52 V	61	33.4	32.5
4	2483.50	49.7 AV	54.0	-4.3	1.52 V	61	17.2	32.5
5	4924.00	46.5 PK	74.0	-27.5	3.29 V	318	41.7	4.8
6	4924.00	34.1 AV	54.0	-19.9	3.29 V	318	29.3	4.8

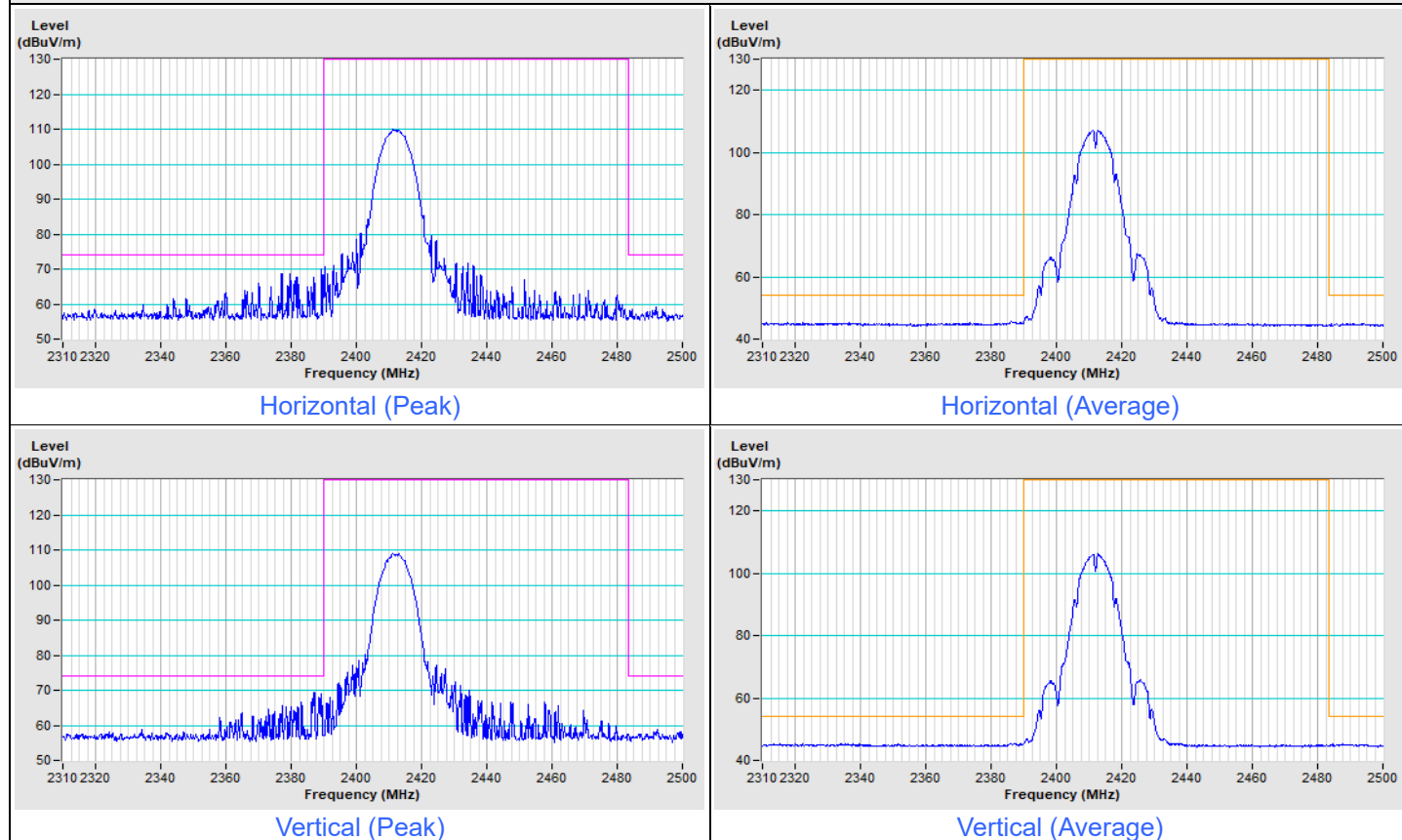
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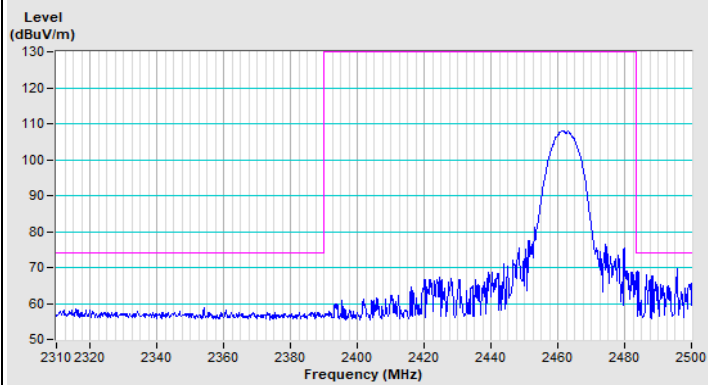
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.

Plot of Band Edge

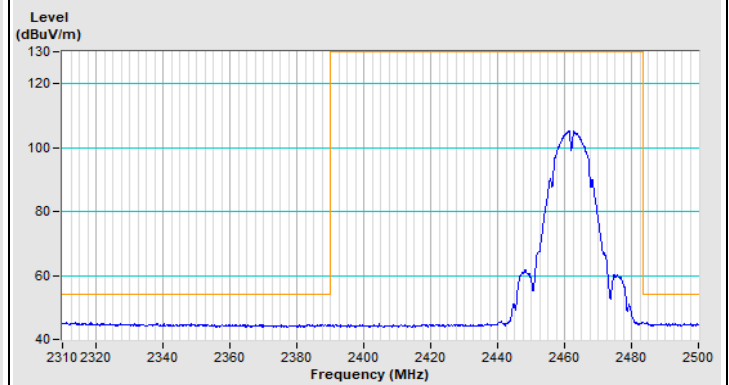
Frequency Range	2.31 GHz ~ 2.5 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
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802.11b Channel 1

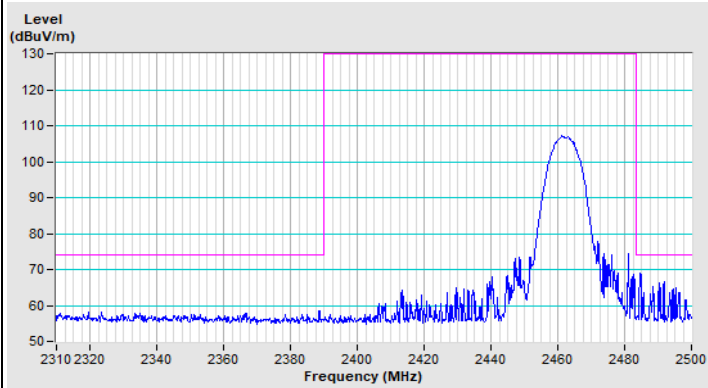


802.11b Channel 11

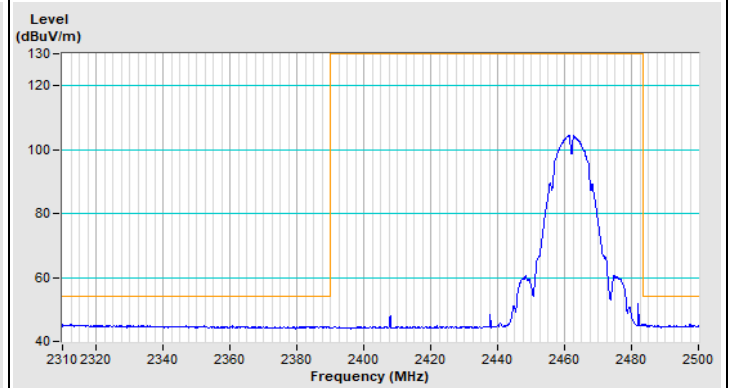
Horizontal (Peak)



Horizontal (Average)



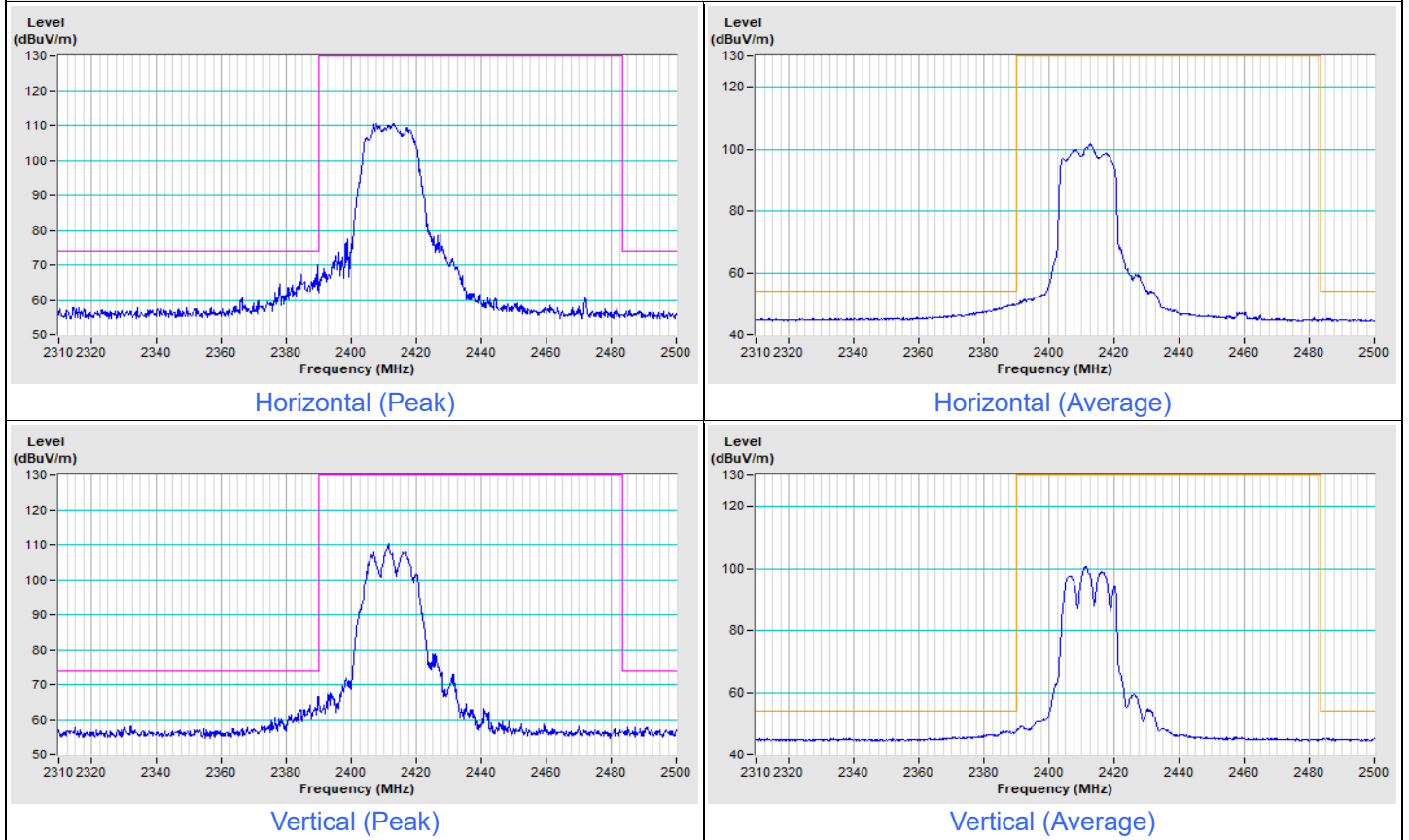
Vertical (Peak)



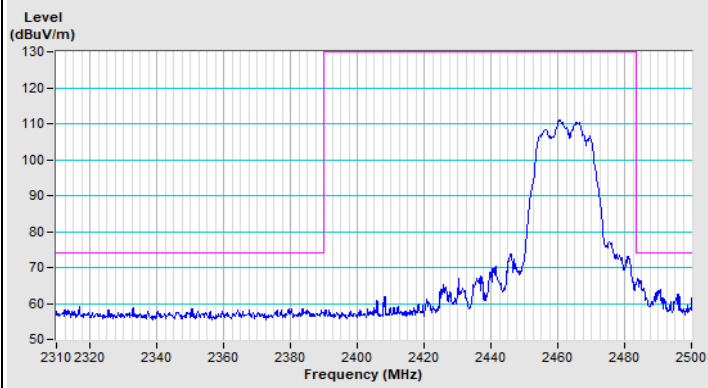
Vertical (Average)

Frequency Range	2.31 GHz ~ 2.5 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
-----------------	--------------------	-------------------------------	--

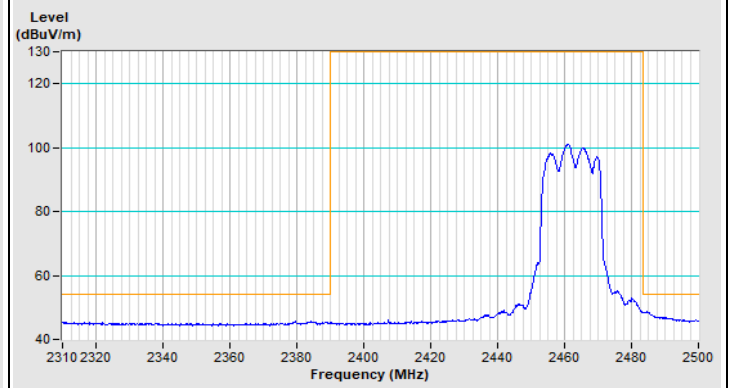
802.11g Channel 1



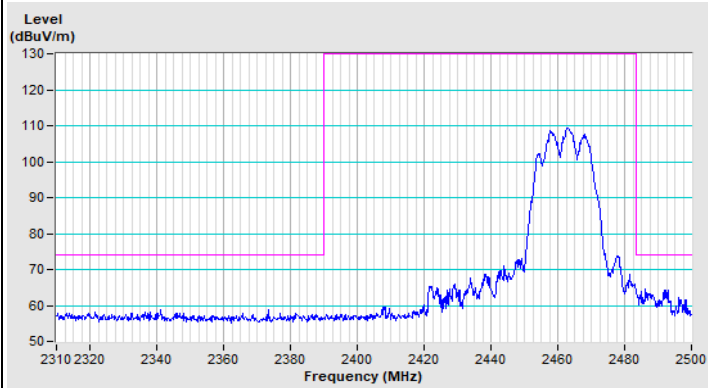
802.11g Channel 11



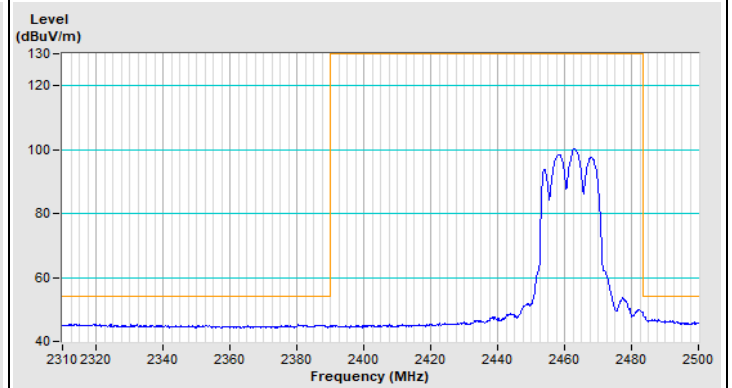
Horizontal (Peak)



Horizontal (Average)



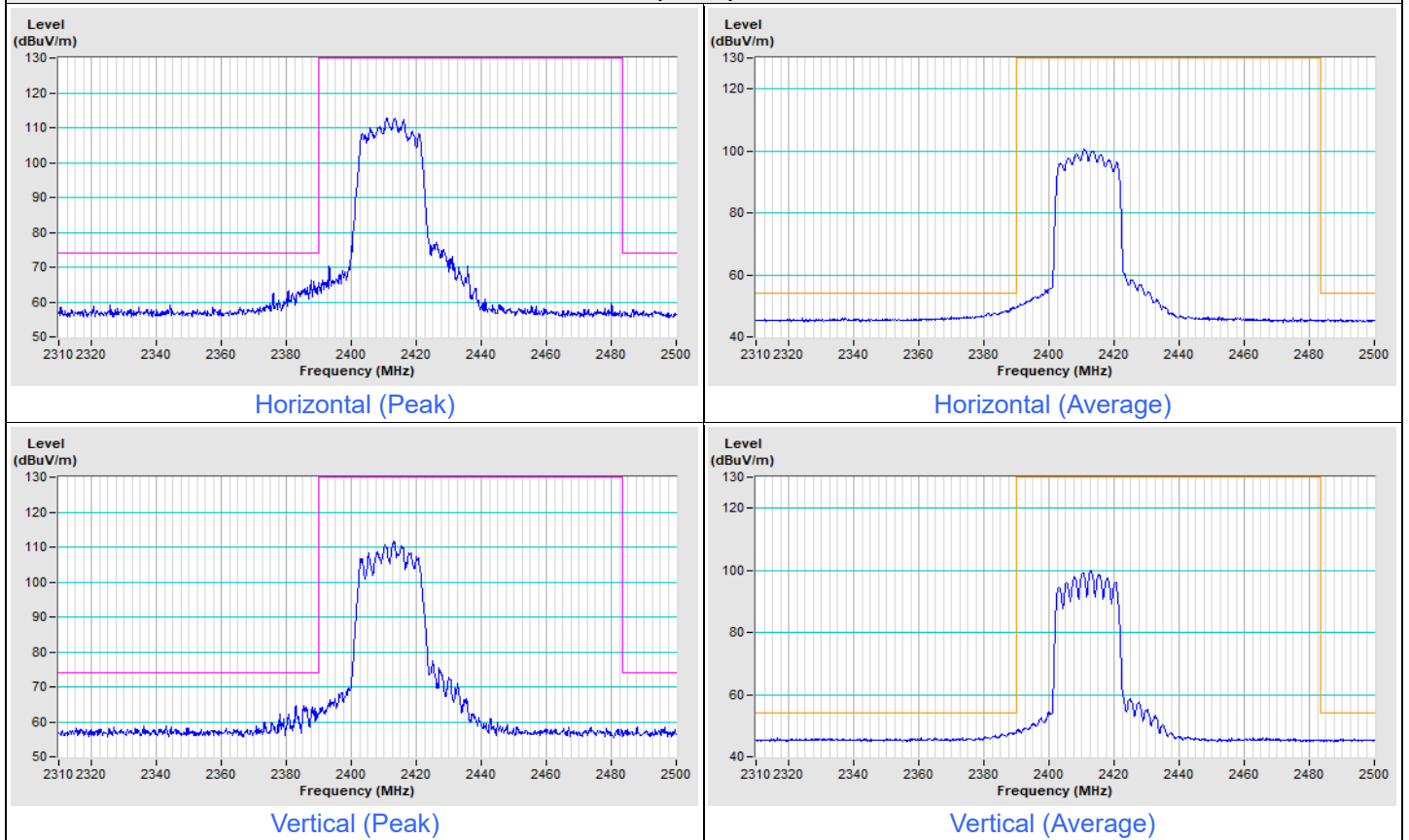
Vertical (Peak)



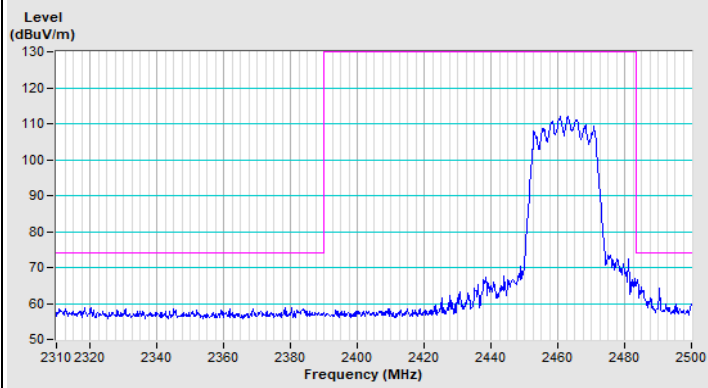
Vertical (Average)

Frequency Range	2.31 GHz ~ 2.5 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=2 kHz, DET=Peak
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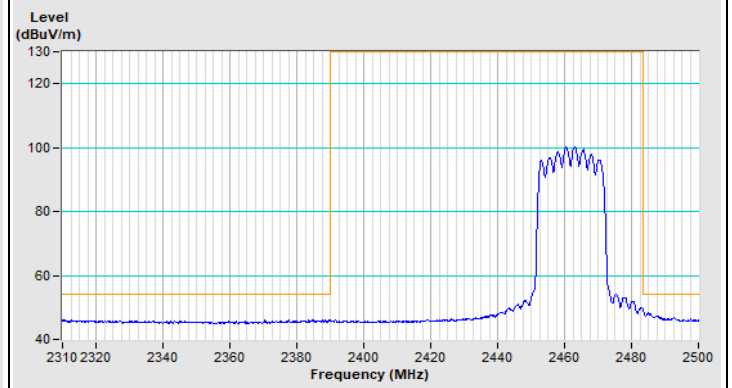
802.11ax (HE20) Channel 1



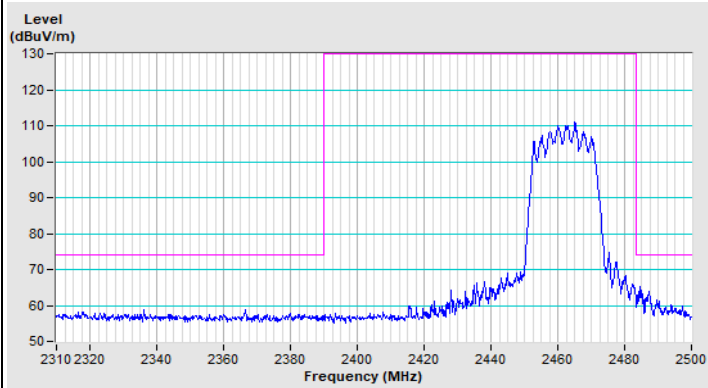
802.11ax (HE20) Channel 11



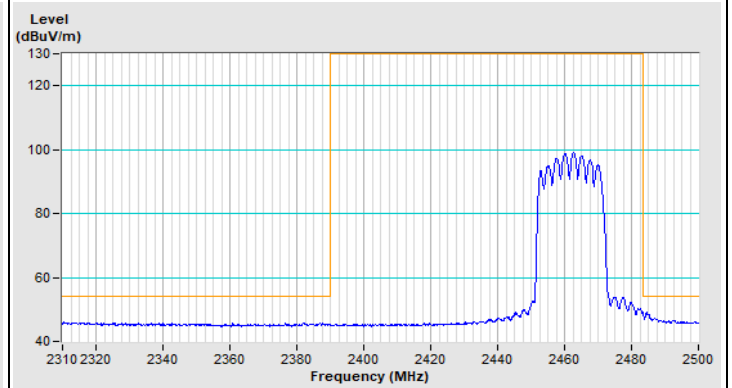
Horizontal (Peak)



Horizontal (Average)



Vertical (Peak)



Vertical (Average)

8 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo)

9 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.

If you have any comments, please feel free to contact us at the following:

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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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