

TEST REPORT

CERTIFICATE OF CONFORMITY

Standard: 47 CFR FCC Part 15, Subpart C (Section 15.247)
Report No.: RFBDIS-WTW-P21120357
FCC ID: A8J-ECW270
Product: Cloud6 4x4 Outdoor
Brand: EnGenius
Model No.: ECW270
Received Date: 2022/6/30
Test Date: 2022/8/25 ~ 2022/10/24
Issued Date: 2023/1/11

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**FCC Registration /
Designation Number (1):** 788550 / TW0003

**FCC Registration /
Designation Number (2):** 281270 / TW0032

Approved by: _____

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Jeremy Lin / Project Engineer

Date: _____

2023/1/11

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Prepared by : Polly Chien / 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	15
4.7 Unwanted Emissions above 1 GHz	16
5 Limits of Test Items	17
5.1 RF Output Power	17
5.2 Power Spectral Density	17
5.3 6 dB Bandwidth	17
5.4 Conducted Out of Band Emissions	17
5.5 AC Power Conducted Emissions	17
5.6 Unwanted Emissions below 1 GHz	18
5.7 Unwanted Emissions above 1 GHz	18
6 Test Arrangements	19
6.1 RF Output Power	19
6.1.1 Test Setup	19
6.1.2 Test Procedure	19
6.2 Power Spectral Density	19
6.2.1 Test Setup	19
6.2.2 Test Procedure	19
6.3 6 dB Bandwidth	20
6.3.1 Test Setup	20
6.3.2 Test Procedure	20
6.4 Conducted Out of Band Emissions	20
6.4.1 Test Setup	20
6.4.2 Test Procedure	20
6.5 AC Power Conducted Emissions	21
6.5.1 Test Setup	21
6.5.2 Test Procedure	21
6.6 Unwanted Emissions below 1 GHz	22
6.6.1 Test Setup	22
6.6.2 Test Procedure	23
6.7 Unwanted Emissions above 1 GHz	24
6.7.1 Test Setup	24
6.7.2 Test Procedure	24
7 Test Results of Test Item	25



7.1	RF Output Power.....	25
7.2	Power Spectral Density.....	27
7.3	6 dB Bandwidth.....	29
7.4	Conducted Out of Band Emissions.....	31
7.5	AC Power Conducted Emissions.....	47
7.6	Unwanted Emissions below 1 GHz.....	49
7.7	Unwanted Emissions above 1 GHz.....	51
8	Pictures of Test Arrangements.....	67
9	Information of the Testing Laboratories.....	68



Release Control Record

Issue No.	Description	Date Issued
RFB DYS-WTW-P21120357	Original release.	2023/1/11

1 Certificate

Product: Cloud6 4x4 Outdoor

Brand: EnGenius

Test Model: ECW270

Sample Status: Engineering sample

Applicant: EnGenius Technologies, Inc.

Test Date: 2022/8/25 ~ 2022/10/24

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

Measurement ANSI C63.10-2013

procedure: 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 -12.75 dB at 2.48200 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Pass	Minimum passing margin is -3.9 dB at 48.28 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -0.4 dB at 2483.50 MHz
15.203	Antenna Requirement	Pass	Antenna connector is R-N type 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:

Measurement	Specification	Expanded Uncertainty (k=2) (±)
AC Power Conducted Emissions	9 kHz ~ 30 MHz	2.79 dB
Unwanted Emissions below 1 GHz	9 kHz ~ 30 MHz	3.00 dB
	30 MHz ~ 1 GHz	2.93 dB
Unwanted Emissions above 1 GHz	1 GHz ~ 18 GHz	1.76 dB
	18 GHz ~ 40 GHz	1.77 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	Cloud6 4x4 Outdoor
Brand	EnGenius
Test Model	ECW270
Status of EUT	Engineering sample
Power Supply Rating	54Vdc (from POE)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11n mode and VHT20/40 in 2.4 GHz mode 1024QAM for OFDMA in 11ax mode only
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 600Mbps VHT: up to 800Mbps 802.11ax: up to 1147.1Mbps
Operating Frequency	2.412 GHz ~ 2.462 GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20): 11 802.11n (HT40), VHT40, 802.11ax (HE40): 7
Output Power	CDD Mode: 680.062 mW (28.33 dBm) Beamforming Mode: 306.498 mW (24.86 dBm)

Note:

1. The EUT uses following accessories.

POE (Support unit)		
Brand	Model	Specification
EnGenius	EPA5012GP	AC Input : 100-240Vac, 1.12A, 50-60Hz DC Output : 54Vdc, 0.6A
Ground cable		
Brand	Model	Model
NA	NA	1.75m

2. There are WLAN (2.4 GHz & 5 GHz) technology used for the EUT.

3. Simultaneously transmission condition.

Condition	Technology	
1	WLAN (2.4 GHz)	WLAN (5 GHz)

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

4. 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.

ANT. No.	Type	Connector	Frequency Range	Gain (dBi)
1~4	Dipole	N type	2.40~2.4835GHz	5
5~8	Dipole	N type	5.15~5.85GHz	7

* 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	4TX	4RX
802.11g	4TX	4RX
802.11n (HT20)	4TX	4RX
802.11n (HT40)	4TX	4RX
VHT20	4TX	4RX
VHT40	4TX	4RX
802.11ax (HE20)	4TX	4RX
802.11ax (HE40)	4TX	4RX

Note:

1. All of modulation mode support beamforming function except 802.11b/g modulation mode.
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. The modulation and bandwidth are similar for 802.11n mode for 20 MHz (40 MHz) and VHT mode for 20 MHz (40 MHz), therefore the manufacturer will control the power for 802.11n/VHT mode is the same as the 802.11ax or more lower than it and investigated worst case to representative mode in test report.
4. The EUT doesn't support Tone RU mode.

3.3 Channel List

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

7 channels are provided for 802.11n (HT40), VHT40 and 802.11ax (HE40):

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

3.4 Test Mode Applicability and Tested Channel Detail

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	CDD	1, 6, 11	BPSK	6Mb/s
	802.11ax (HE20)	CDD & Beamforming	1, 6, 11	BPSK	MCS0
	802.11ax (HE40)	CDD & Beamforming	3, 6, 9	BPSK	MCS0
6 dB Bandwidth / Conducted Out of Band Emissions / Power Spectral Density	802.11b	CDD	1, 6, 11	DBPSK	1Mb/s
	802.11g	CDD	1, 6, 11	BPSK	6Mb/s
	802.11ax (HE20)	CDD	1, 6, 11	BPSK	MCS0
	802.11ax (HE40)	CDD	3, 6, 9	BPSK	MCS0
AC Power Conducted Emissions	802.11b	CDD	1	DBPSK	1Mb/s
Unwanted Emissions below 1 GHz	802.11b	CDD	1	DBPSK	1Mb/s
Unwanted Emissions above 1 GHz	802.11b	CDD	1, 6, 11	DBPSK	1Mb/s
	802.11g	CDD	1, 6, 11	BPSK	6Mb/s
	802.11ax (HE20)	CDD	1, 6, 11	BPSK	MCS0
	802.11ax (HE40)	CDD	3, 6, 9	BPSK	MCS0

Note: The EUT is designed to be positioned on the z-plane only.

3.5 Duty Cycle of Test Signal

Duty cycle of test signal is $\geq 98\%$, duty factor is not required.
 Duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11b: Duty cycle = $13.130 \text{ ms} / 13.375 \text{ ms} \times 100\% = 98.2\%$

802.11g: Duty cycle = $1.976 \text{ ms} / 2.104 \text{ ms} \times 100\% = 93.9\%$, duty factor = $10 * \log (1/\text{Duty cycle}) = 0.27 \text{ dB}$

802.11ax (HE20): Duty cycle = $5.420 \text{ ms} / 5.745 \text{ ms} \times 100\% = 94.3\%$, duty factor = $10 * \log (1/\text{Duty cycle}) = 0.25 \text{ dB}$

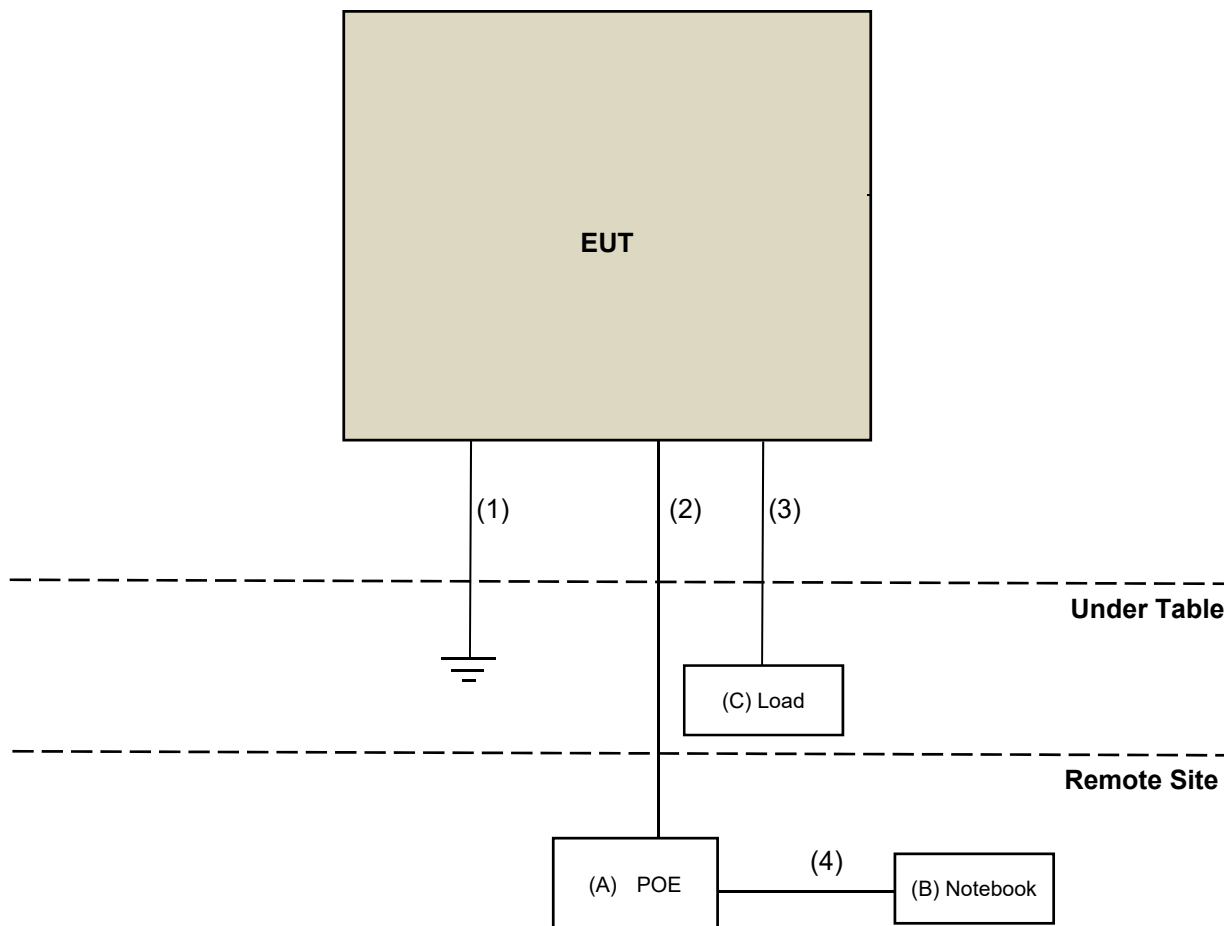
802.11ax (HE40): Duty cycle = $5.420 \text{ ms} / 5.710 \text{ ms} \times 100\% = 94.9\%$, duty factor = $10 * \log (1/\text{Duty cycle}) = 0.23 \text{ dB}$



3.6 Test Program Used and Operation Descriptions

Controlling software Verification EVT_2.4g + 5g_TX_20200812.cxtt 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	POE	EnGenius	EPA5012GP	N/A	N/A	Supplied by applicant
B	Notebook	Lenovo	20J4 MD A003TW	PF-11H9AK	FCC DoC Approved	Provided by Lab
C	Load	N/A	N/A	N/A	N/A	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	GND cable	1	1	N/A	0	Supplied by applicant
2	RJ-45 Cable	1	10	N/A	0	Provided by Lab
3	RJ-45 Cable	1	1.5	N/A	0	Provided by Lab
4	RJ-45 Cable	1	1	N/A	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	2022/1/18	2023/1/17
Power sensor Keysight	U2021XA	MY55380009	2022/3/23	2023/3/22
Wideband Power Sensor(N1923A) KEYSIGHT	N1923A	MY58020002	2022/1/17	2023/1/16

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2022/10/21 ~ 2022/10/24

4.2 Power Spectral Density

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Software BV	ADT_RF Test Software V6.6.5.4	N/A	N/A	N/A
Spectrum Analyzer R&S	FSV40	100979	2022/3/25	2023/3/24

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2022/10/21

4.3 6 dB Bandwidth

Refer to section 4.2 to get information of the instruments.

4.4 Conducted Out of Band Emissions

Refer to section 4.2 to get information of the instruments.

4.5 AC Power Conducted Emissions

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
DC-LISN SCHWARZBECK MESS- ELETRONIK	NNBM 8126G	8126G-069	2021/11/10	2022/11/9
LISN R&S	ESH3-Z5	100220	2021/11/25	2022/11/24
LISN ROHDE & SCHWARZ	ENV216	101826	2022/3/14	2023/3/13
RF Coaxial Cable WOKEN	5D-FB	Cable-cond1-01	2022/1/15	2023/1/14
Software BVADT	BVADT_Cond_ V7.3.7.4	N/A	N/A	N/A
Test Receiver Rohde&Schwarz	ESCI	100613	2021/12/3	2022/12/2
V-LISN Schwarzbeck	NNBL 8226-2	8226-142	2022/8/31	2023/8/30

Notes:

1. The test was performed in HY - Conduction 1.
2. Tested Date: 2022/9/7

4.6 Unwanted Emissions below 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower Max-Full	MFT-151SS-0.5T	N/A	N/A	N/A
Bi-log Broadband Antenna Schwarzbeck	VULB9168	9168-1213	2021/10/27	2022/10/26
Loop Antenna EMCI	EM-6879	269	2021/9/16	2022/9/15
Loop Antenna TESEQ	HLA 6121	45745	2022/7/27	2023/7/26
Pre-amplifier EMCI	EMC001340	980201	2021/9/15	2022/9/14
Pre_Amplifier EMCI	EMC330N	980782	2022/1/17	2023/1/16
RF Coaxial Cable EMCI	5D-NM-BM	140903+140902	2022/1/15	2023/1/14
	EMCCFD400-NM-NM-500	201233	2022/1/17	2023/1/16
	EMCCFD400-NM-NM-3000	201235	2022/1/17	2023/1/16
	EMCCFD400-NM-NM-9000	201236	2022/1/17	2023/1/16
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Spectrum Analyzer R&S	FSW43	101866	2022/1/14	2023/1/13
Test Receiver R&S	ESR3+	102782	2021/12/10	2022/12/9
Turn Table Max-Full	MF-7802BS	N/A	N/A	N/A
Turn Table Controller Max-Full	MF-7802BS	MF780208674	N/A	N/A

Notes:

1. The test was performed in WM - 966 chamber 8.
2. Tested Date: 2022/9/7

4.7 Unwanted Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower Max-Full	MFT-151SS-0.5T	N/A	N/A	N/A
Horn Antenna RFSPIN	DRH18-E	210103A18E	2021/11/14	2022/11/13
Horn Antenna Schwarzbeck	BBHA 9170	9170-1049	2021/11/14	2022/11/13
Pre_Amplifier EMCI	EMC118A45SE	980808	2021/12/30	2022/12/29
	EMC184045SE	980788	2022/1/17	2023/1/16
RF Coaxial Cable EMCI	EMC101G-KM-KM-2000	201254	2022/1/17	2023/1/16
	EMC101G-KM-KM-3000	201257	2022/1/17	2023/1/16
	EMC101G-KM-KM-5000	201260	2022/1/17	2023/1/16
	EMC104-SM-SM-1000	210102	2022/1/17	2023/1/16
	EMC104-SM-SM-3000	201231	2022/1/17	2023/1/16
	EMC104-SM-SM-9000	201243	2022/1/17	2023/1/16
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Spectrum Analyzer R&S	FSW43	101866	2022/1/14	2023/1/13
Test Receiver R&S	ESR3+	102782	2021/12/10	2022/12/9
Turn Table Max-Full	MF-7802BS	N/A	N/A	N/A
Turn Table Controller Max-Full	MF-7802BS	MF780208674	N/A	N/A

Notes:

1. The test was performed in WM - 966 chamber 8.
2. Tested Date: 2022/8/25

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 30 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 30 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 30 dB below the highest level of the desired power:

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

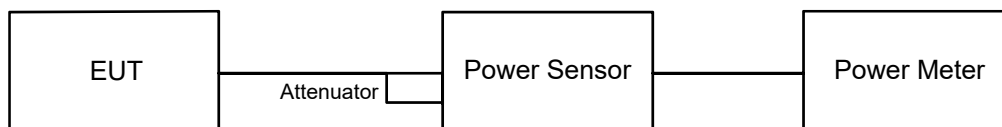
Notes:

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



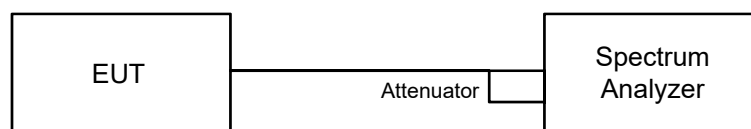
6.1.2 Test Procedure

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



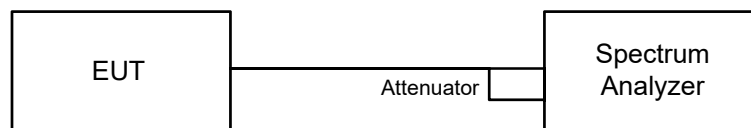
6.2.2 Test Procedure

- a. Measure the duty cycle (x).
- b. Set instrument center frequency to DTS channel center frequency.
- c. Set span to at least 1.5 times the OBW.
- d. Set RBW to: 3 kHz.
- e. Set VBW $\geq 3 \times$ RBW.
- f. Detector = power averaging (RMS) or sample detector (when RMS not available).
- g. Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW.
- h. Sweep time = auto couple.
- i. Do not use sweep triggering. Allow sweep to "free run".
- j. Employ trace averaging (RMS) mode over a minimum of 100 traces.
- k. Use the peak marker function to determine the maximum amplitude level.

Note: If Duty cycle < 98%, Add $10 \log (1/x)$, where x is the duty cycle measured in step (a), to the measured PSD to compute the average PSD during the actual transmission time.

6.3 6 dB Bandwidth

6.3.1 Test Setup

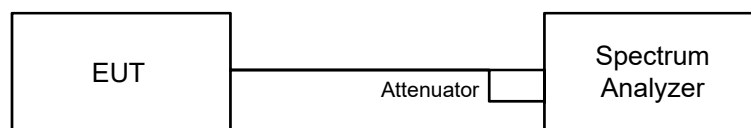


6.3.2 Test Procedure

- 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

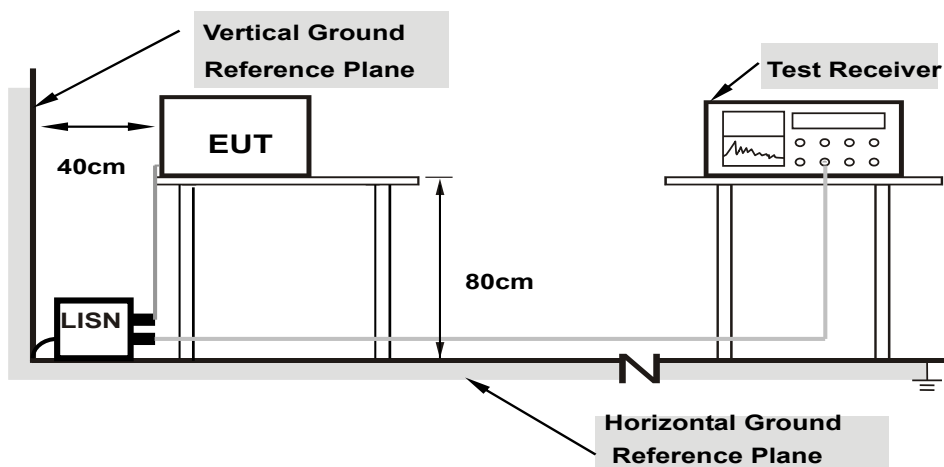
- Set the RBW = 100 kHz.
- Set the VBW ≥ 300 kHz.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

- 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

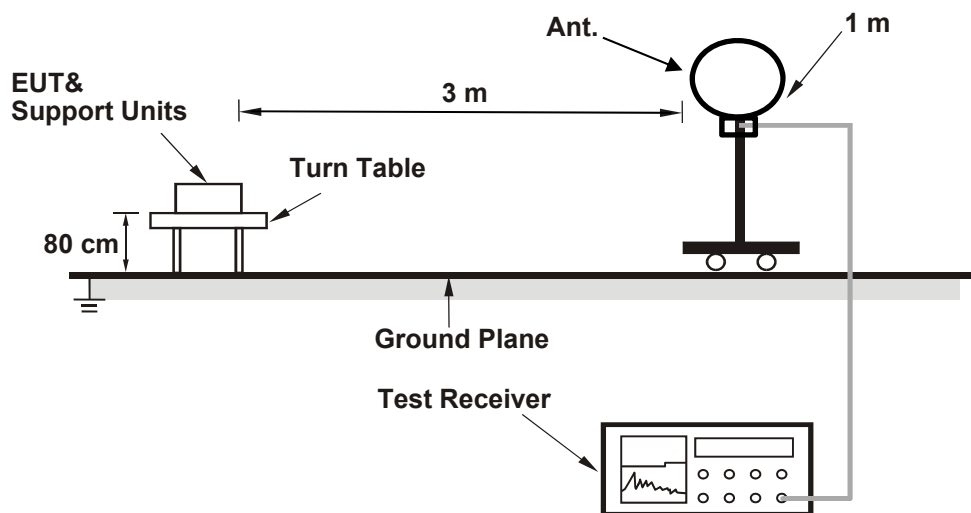
- The EUT was placed on a 0.8 meter to the top of table and placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The 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.

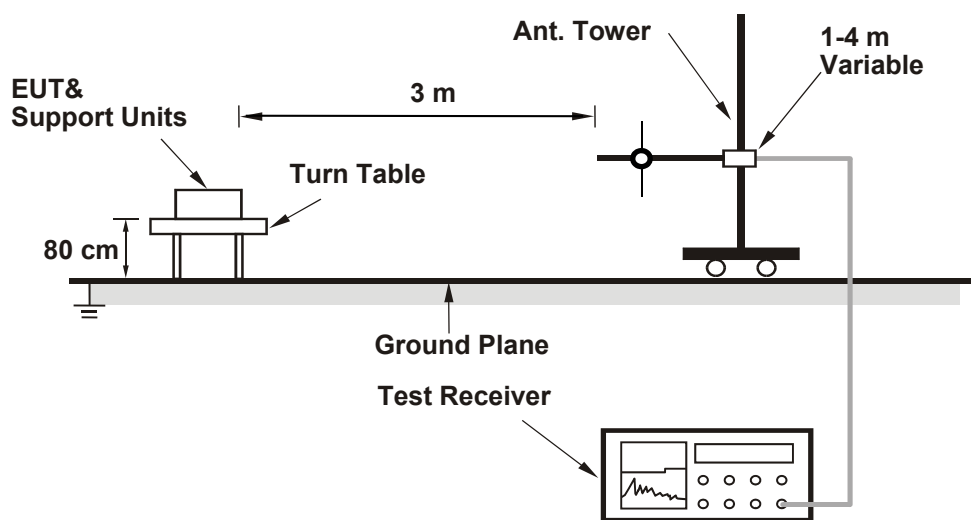
6.6 Unwanted Emissions below 1 GHz

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

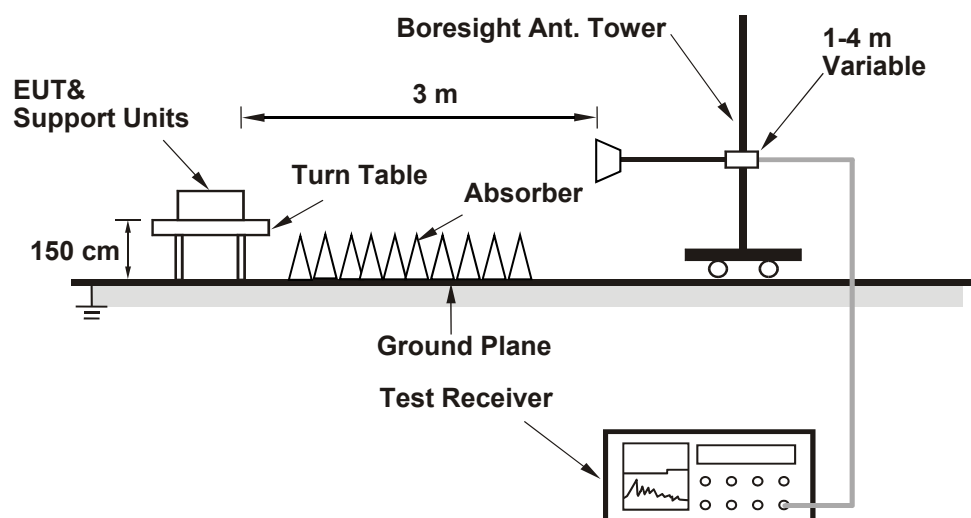
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the 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:	54Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Tim Chen
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802.11b

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	22.33	22.51	22.26	22.11	680.062	28.33	30	Pass
6	2437	22.34	22.57	22.08	22.09	675.357	28.30	30	Pass
11	2462	22.27	22.55	22.09	22.12	673.280	28.28	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 5 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	16.85	16.99	16.51	16.61	189.006	22.76	30	Pass
6	2437	22.17	22.34	22.05	22.01	655.391	28.17	30	Pass
11	2462	15.84	15.92	15.57	15.62	149.988	21.76	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 5 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	14.62	14.74	14.32	14.42	113.468	20.55	30	Pass
6	2437	21.91	22.14	21.67	21.73	614.749	27.89	30	Pass
11	2462	13.55	13.67	13.64	13.82	93.147	19.69	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 5 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	13.43	13.35	13.55	13.65	89.477	19.52	30	Pass
6	2437	15.36	15.21	15.03	15.07	131.524	21.19	30	Pass
9	2452	12.49	12.59	12.48	12.55	71.587	18.55	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 5 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11ax (HE20) Beamforming

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	14.62	14.74	14.32	14.42	113.468	20.55	24.98	Pass
6	2437	18.90	19.10	18.63	18.73	306.498	24.86	24.98	Pass
11	2462	13.55	13.67	13.64	13.82	93.147	19.69	24.98	Pass

Notes:

1. Directional gain = gain of antenna element + 10 log (4 of TX antenna elements)
2. The directional gain is 11.02 dBi > 6 dBi, so the output power limit shall be reduced to $30 - (11.02 - 6) = 24.98$ dBm.

802.11ax (HE40) Beamforming

Chan.	Chan. Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	13.43	13.35	13.55	13.65	89.477	19.52	24.98	Pass
6	2437	15.36	15.21	15.03	15.07	131.524	21.19	24.98	Pass
9	2452	12.49	12.59	12.48	12.55	71.587	18.55	24.98	Pass

Notes:

1. Directional gain = gain of antenna element + 10 log (4 of TX antenna elements)
2. The directional gain is 11.02 dBi > 6 dBi, so the output power limit shall be reduced to $30 - (11.02 - 6) = 24.98$ dBm.

7.2 Power Spectral Density

Input Power:	54Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Tim Chen
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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	Chain 2	Chain 3			
1	2412	-8.06	-8.02	-8.03	-8.07	-2.02	2.98	Pass
6	2437	-8.03	-8.12	-7.98	-8.00	-2.01	2.98	Pass
11	2462	-7.99	-7.94	-7.99	-8.02	-1.96	2.98	Pass

Notes:

- Method E) 2) b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
- Directional gain = gain of antenna element + 10 log (4 of TX antenna elements)
- The directional gain is 11.02 dBi > 6 dBi, so the power density limit shall be reduced to $8 - (11.02 - 6) = 2.98$ dBm/3kHz.

802.11g

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)				Duty Factor (dB)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	-16.00	-15.82	-16.66	-16.80	0.27	-10.01	2.98	Pass
6	2437	-10.37	-10.22	-10.81	-10.56	0.27	-4.19	2.98	Pass
11	2462	-16.78	-16.91	-17.72	-17.84	0.27	-10.99	2.98	Pass

Notes:

- Method E) 2) b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
- Directional gain = gain of antenna element + 10 log (4 of TX antenna elements)
- The directional gain is 11.02 dBi > 6 dBi, so the power density limit shall be reduced to $8 - (11.02 - 6) = 2.98$ dBm/3kHz.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)				Duty Factor (dB)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	-22.31	-21.84	-22.22	-22.86	0.25	-16.02	2.98	Pass
6	2437	-15.19	-14.79	-15.27	-15.02	0.25	-8.79	2.98	Pass
11	2462	-23.31	-23.06	-23.31	-23.09	0.25	-16.92	2.98	Pass

Notes:

- Method E) 2) b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
- Directional gain = gain of antenna element + 10 log (4 of TX antenna elements)
- The directional gain is 11.02 dBi > 6 dBi, so the power density limit shall be reduced to $8 - (11.02 - 6) = 2.98$ dBm/3kHz.

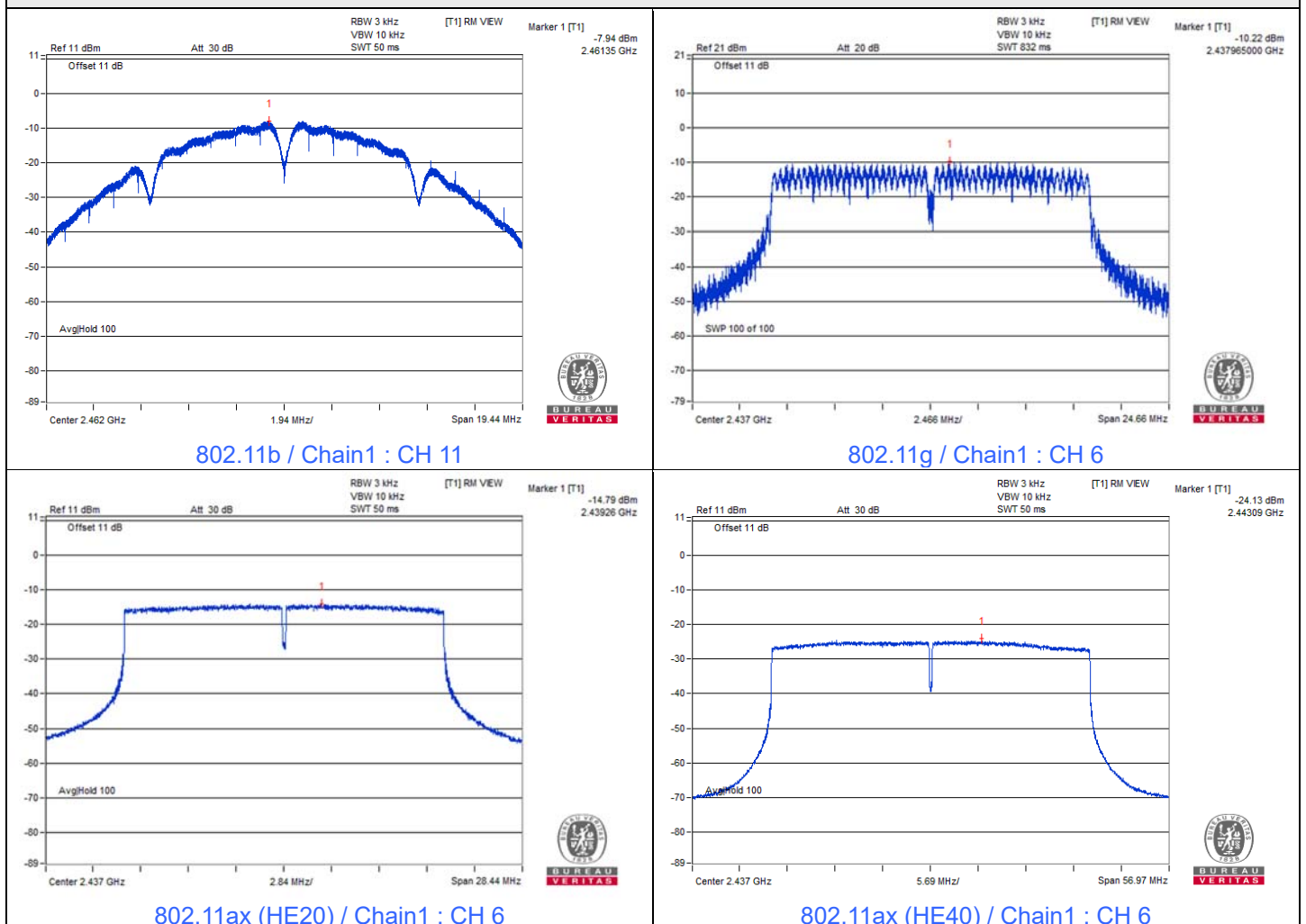
802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/3kHz)				Duty Factor (dB)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	-26.48	-26.57	-26.50	-26.35	0.23	-20.23	2.98	Pass
6	2437	-24.27	-24.13	-24.40	-24.56	0.23	-18.09	2.98	Pass
9	2452	-27.05	-27.65	-27.48	-27.49	0.23	-21.16	2.98	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 = gain of antenna element + 10 log (4 of TX antenna elements)
3. The directional gain is 11.02 dBi > 6 dBi, so the power density limit shall be reduced to $8-(11.02-6) = 2.98$ dBm/3kHz.

Spectrum Plot of Maximum Value



7.3 6 dB Bandwidth

Input Power:	54Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Tim Chen
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802.11b

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)				Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	8.08	8.08	8.07	7.13	0.5	Pass
6	2437	8.07	8.07	8.07	8.07	0.5	Pass
11	2462	8.07	8.07	8.07	8.06	0.5	Pass

802.11g

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)				Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	16.35	16.35	16.32	16.33	0.5	Pass
6	2437	16.35	16.12	16.32	16.34	0.5	Pass
11	2462	16.35	16.07	16.32	16.34	0.5	Pass

802.11ax (HE20)

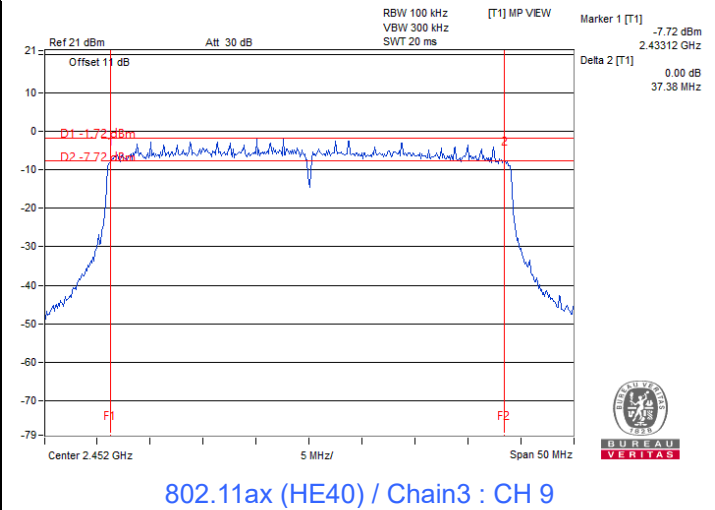
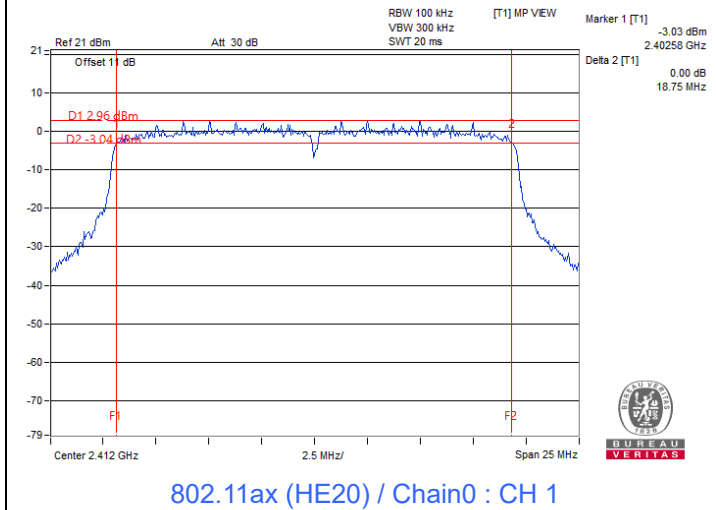
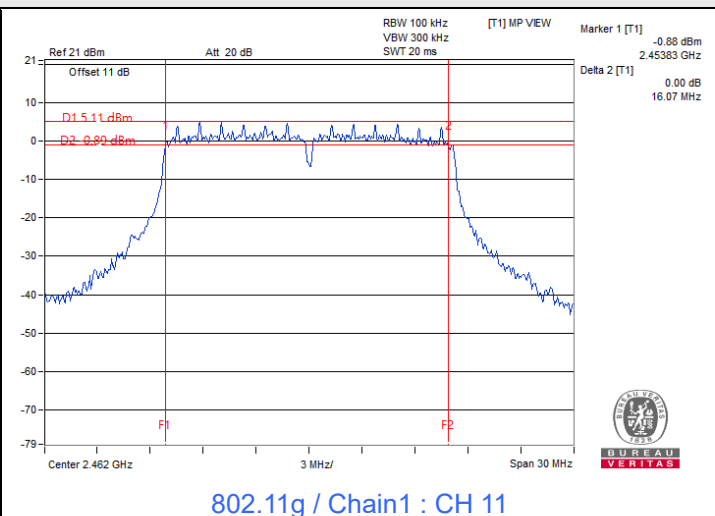
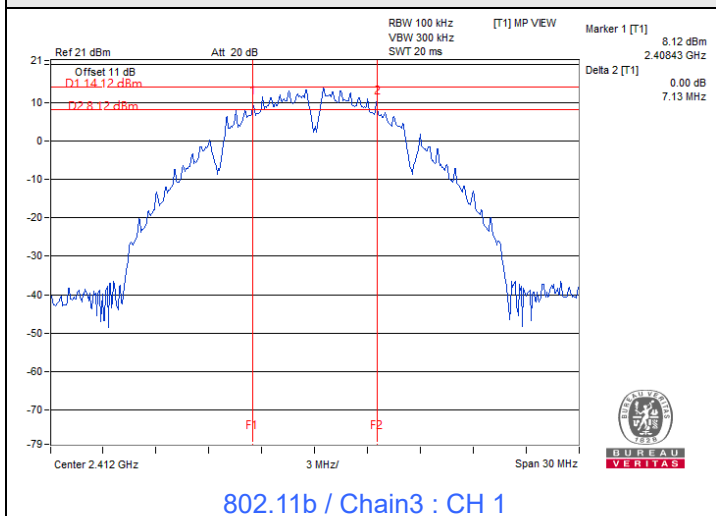
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)				Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	18.75	18.96	18.92	18.91	0.5	Pass
6	2437	18.81	18.97	18.89	18.95	0.5	Pass
11	2462	18.91	18.97	18.88	18.94	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)				Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1	Chain 2	Chain 3		
3	2422	37.95	37.73	38.04	37.46	0.5	Pass
6	2437	37.66	37.70	37.95	37.77	0.5	Pass
9	2452	37.97	37.97	37.98	37.38	0.5	Pass



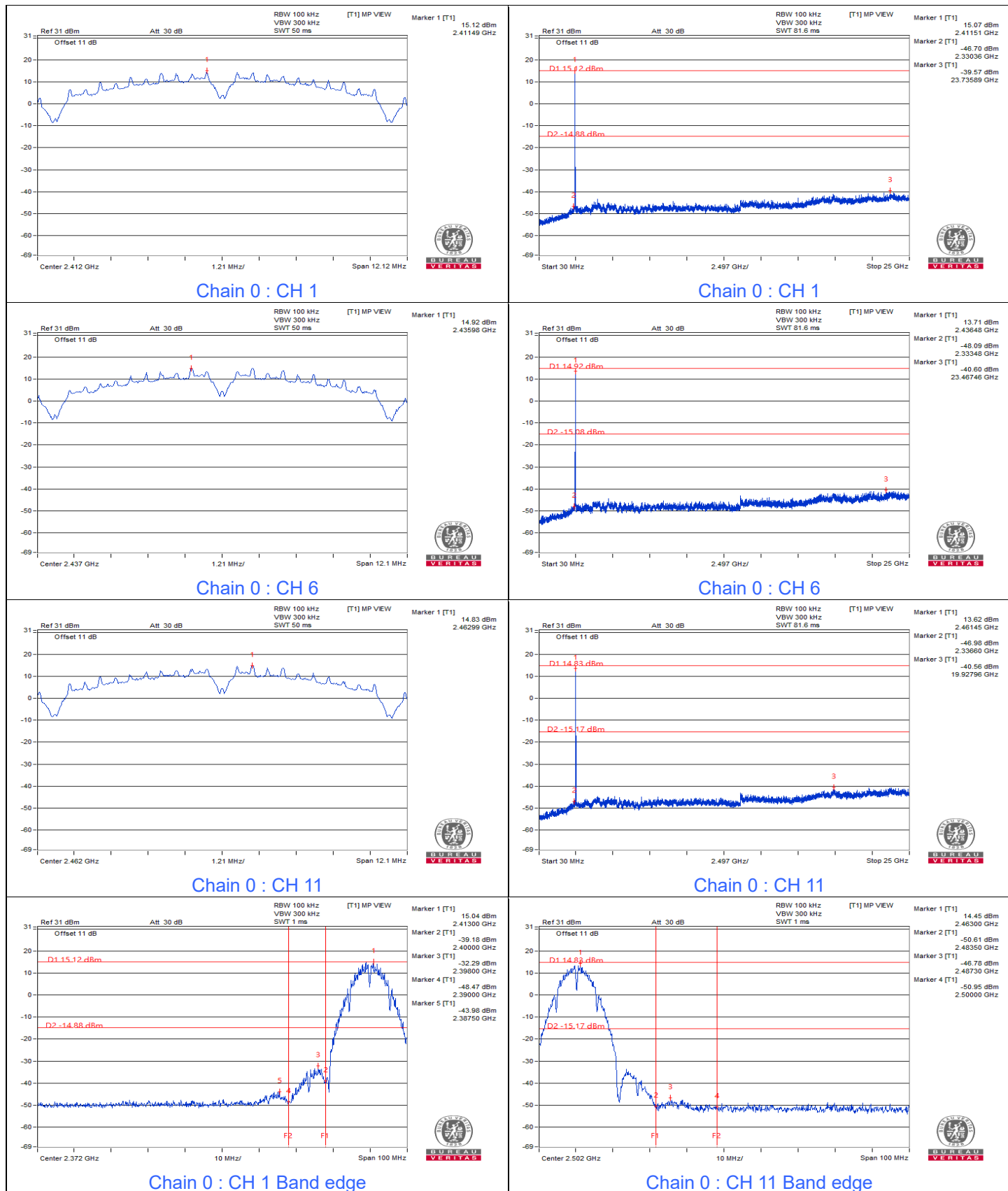
Spectrum Plot of Minimum Value

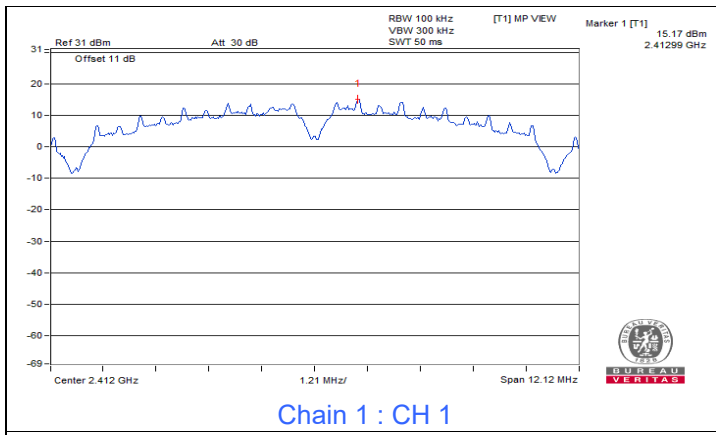


7.4 Conducted Out of Band Emissions

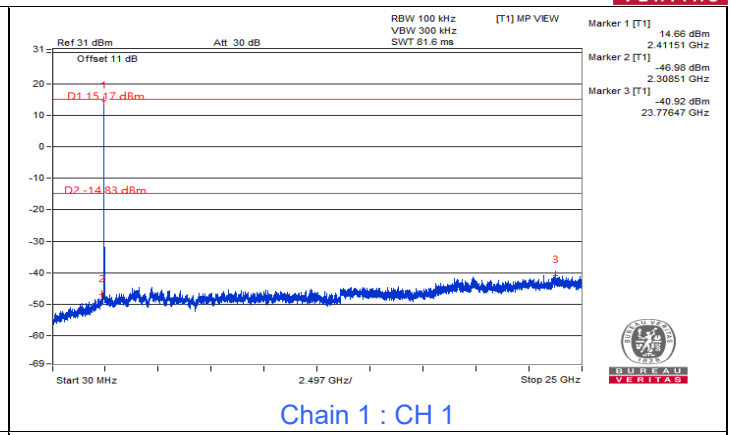
Input Power:	54Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Tim Chen
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802.11b

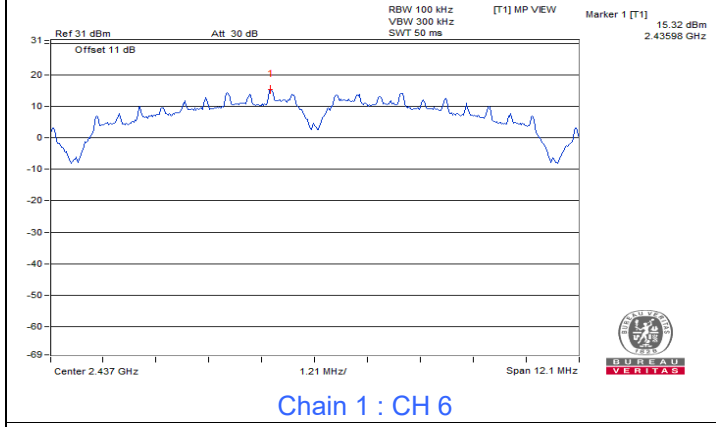




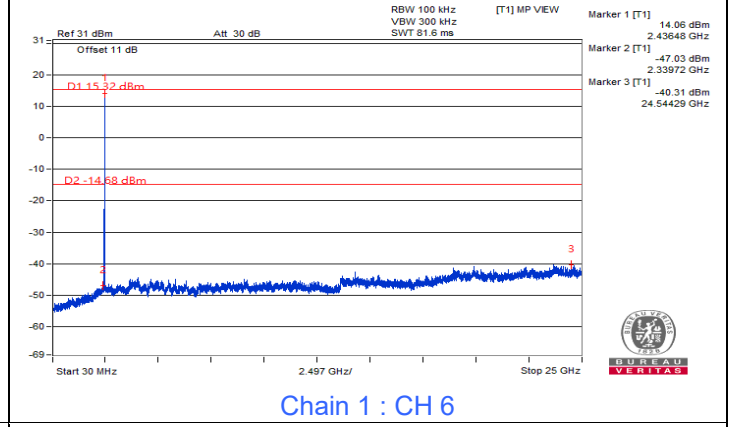
Chain 1 : CH 1



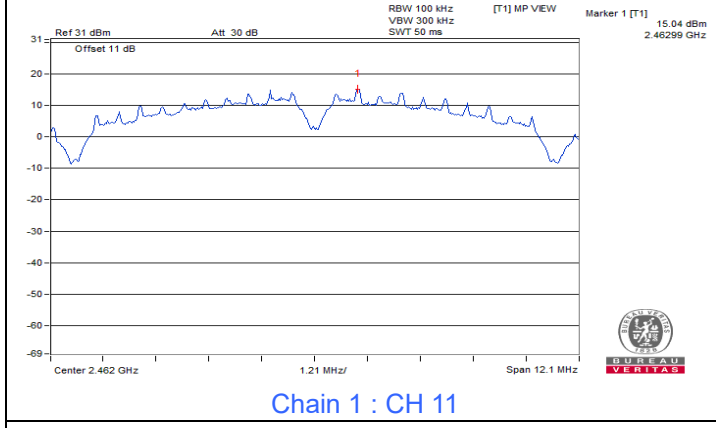
Chain 1 : CH 1



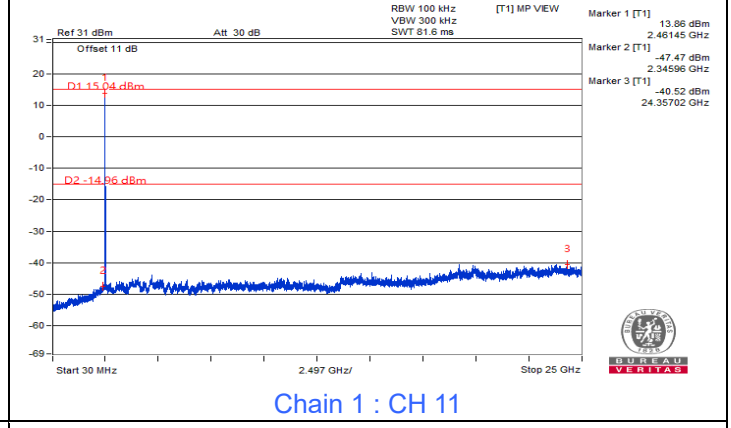
Chain 1 : CH 6



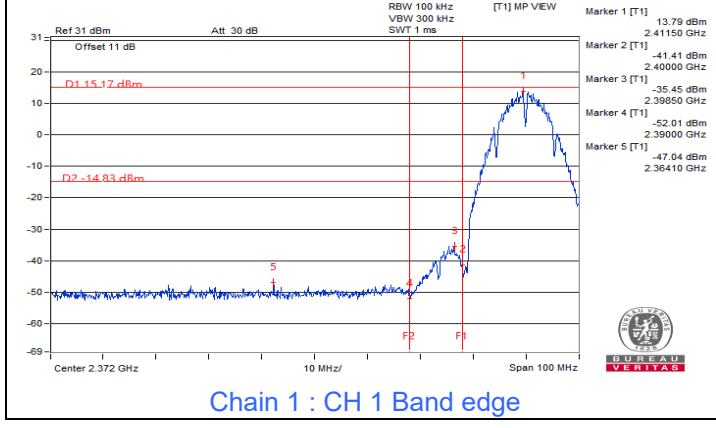
Chain 1 : CH 6



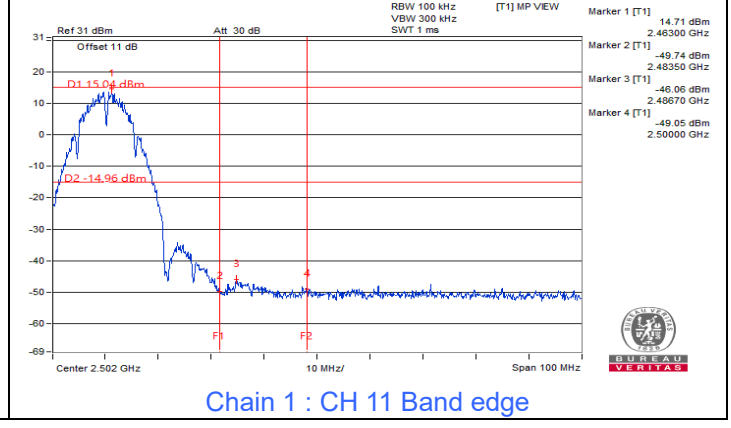
Chain 1 : CH 11



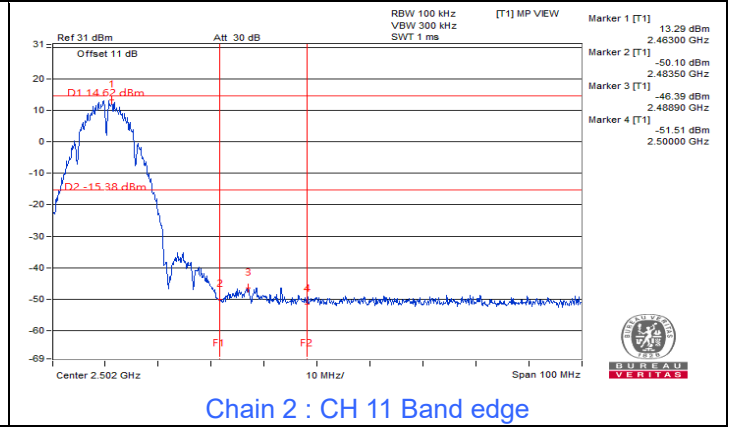
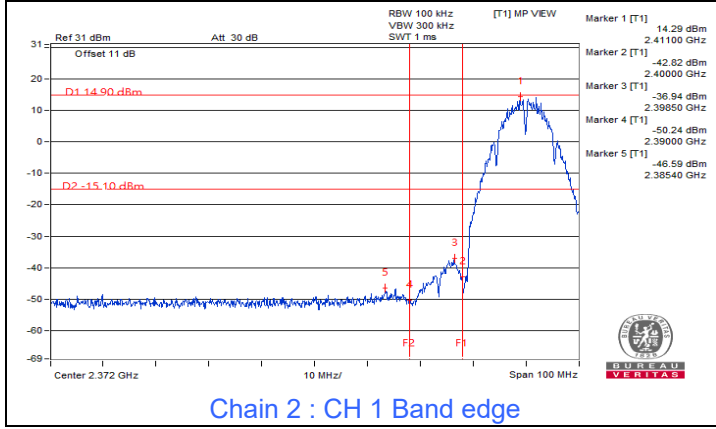
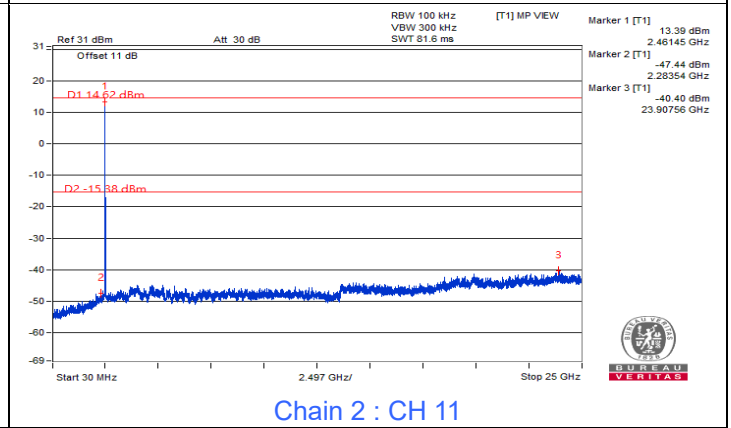
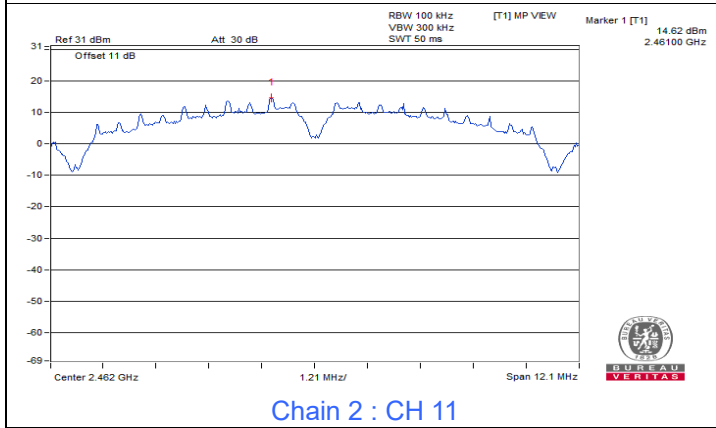
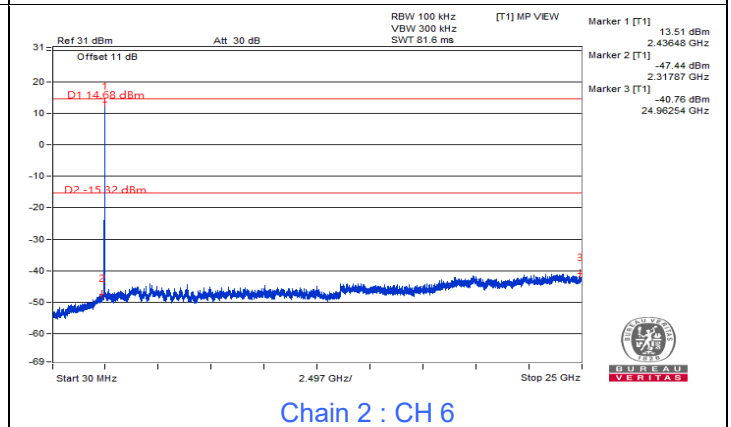
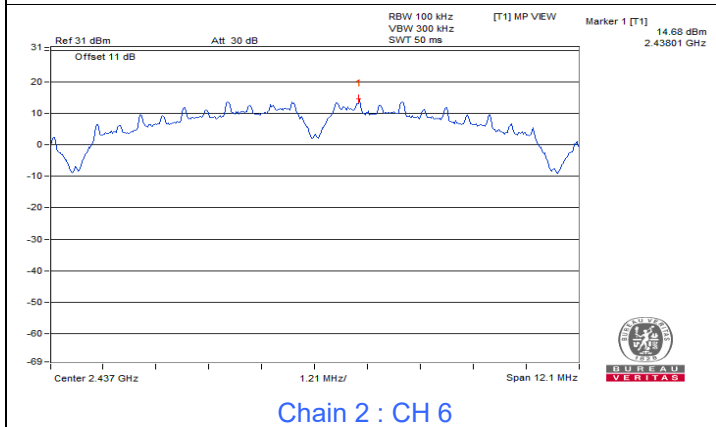
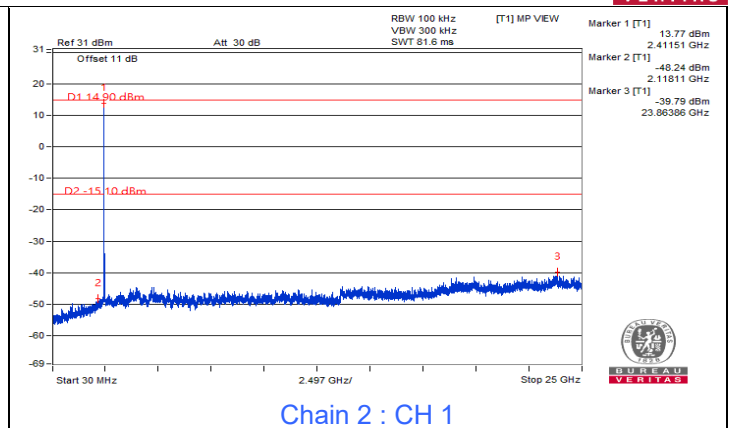
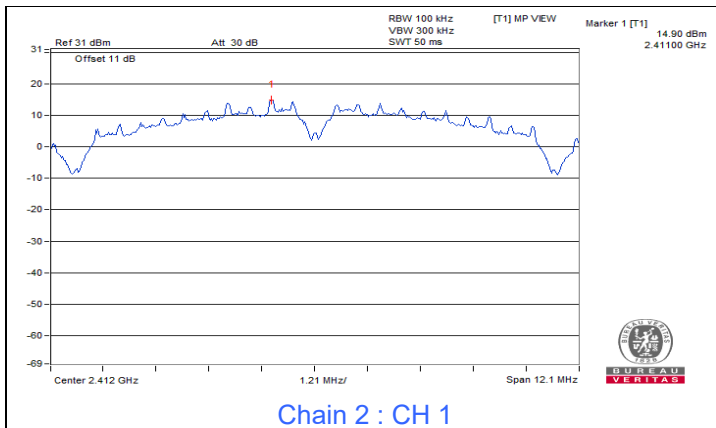
Chain 1 : CH 11

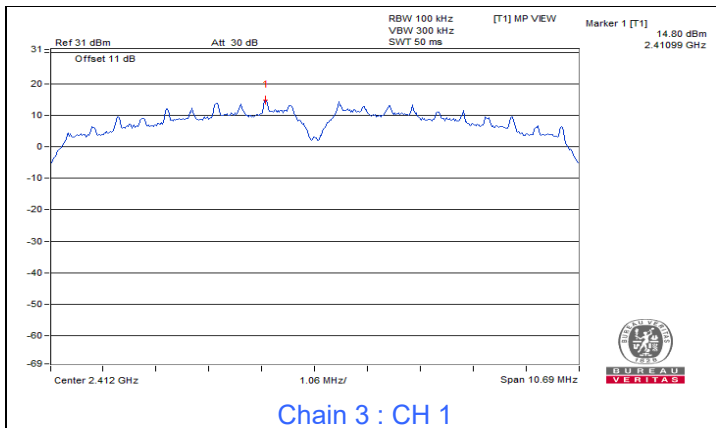


Chain 1 : CH 1 Band edge

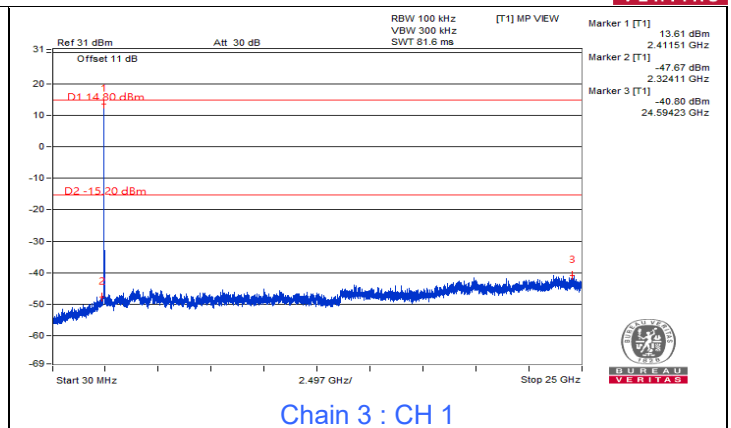


Chain 1 : CH 11 Band edge

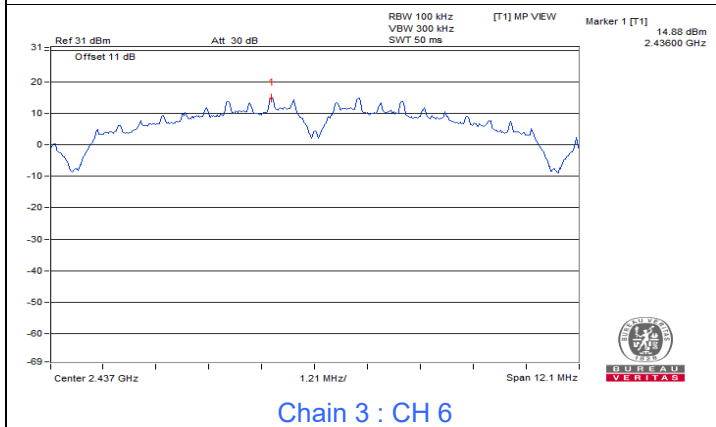




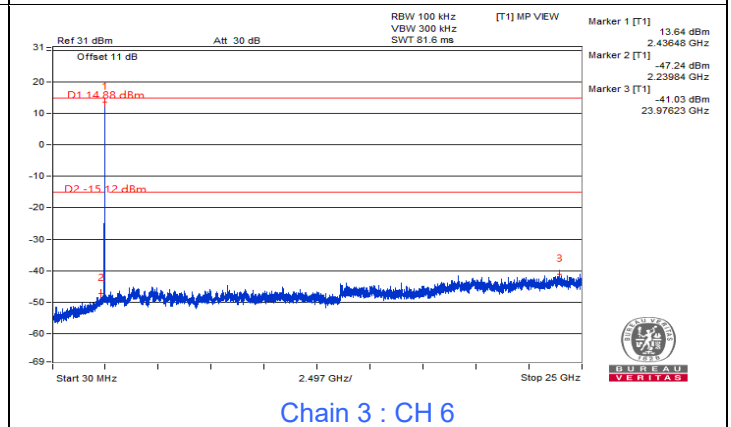
Chain 3 : CH 1



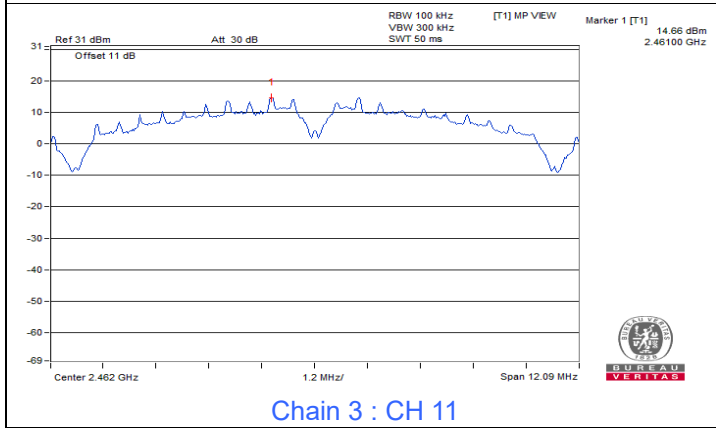
Chain 3 : CH 1



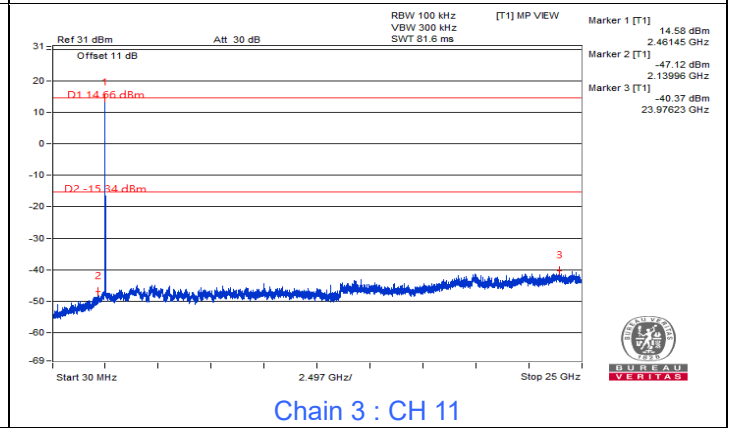
Chain 3 : CH 6



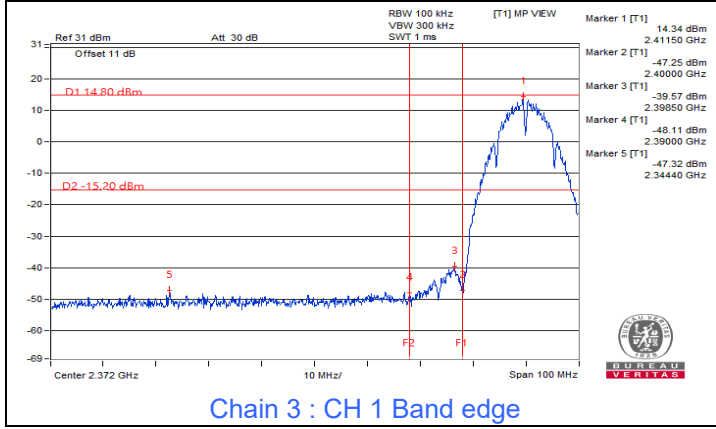
Chain 3 : CH 6



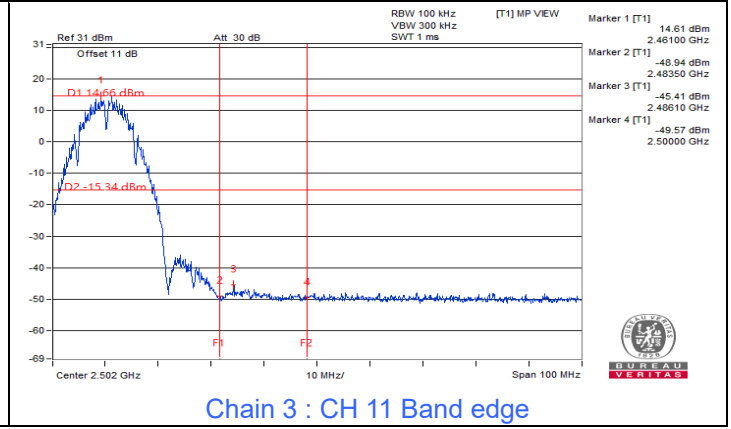
Chain 3 : CH 11



Chain 3 : CH 11

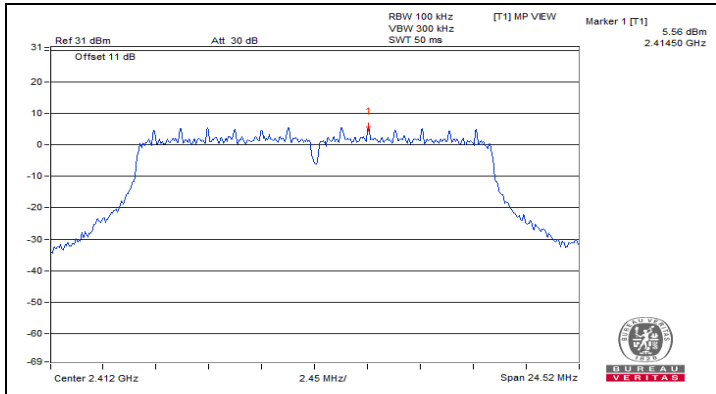


Chain 3 : CH 1 Band edge

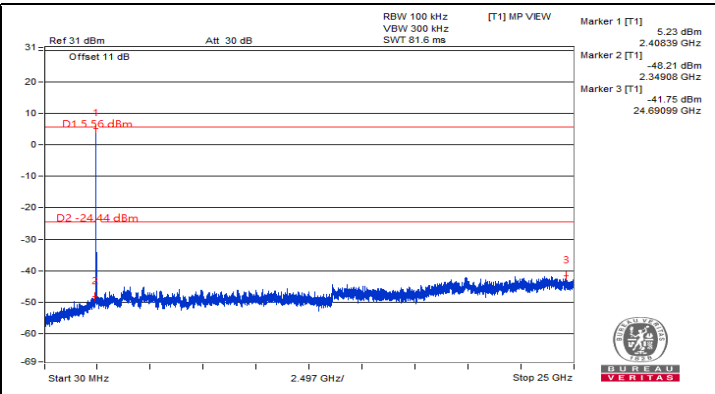


Chain 3 : CH 11 Band edge

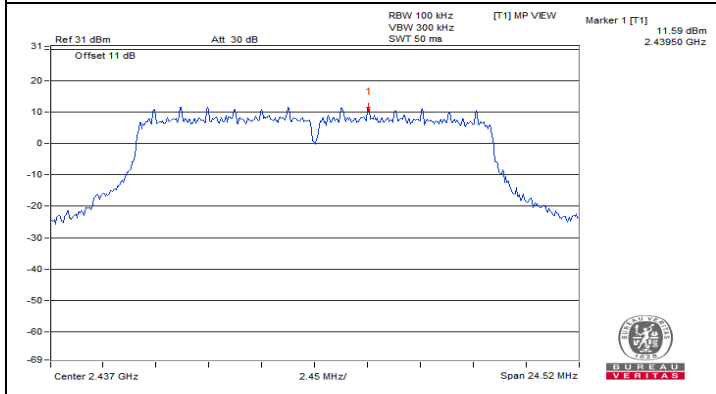
802.11g



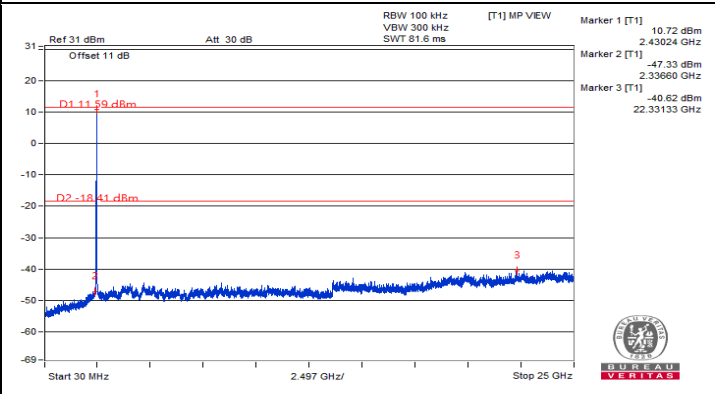
Chain 0 : CH 1



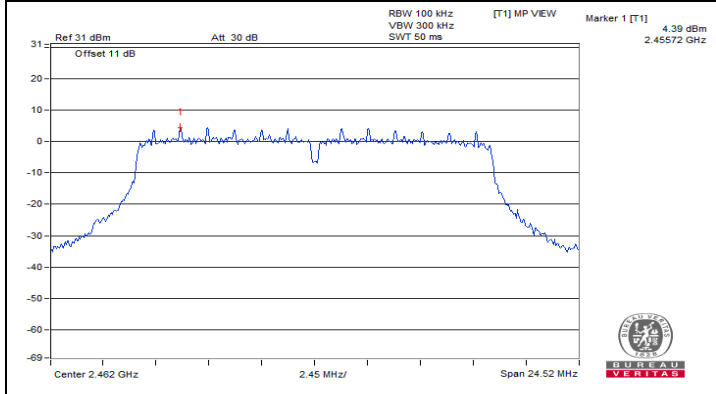
Chain 0 : CH 1



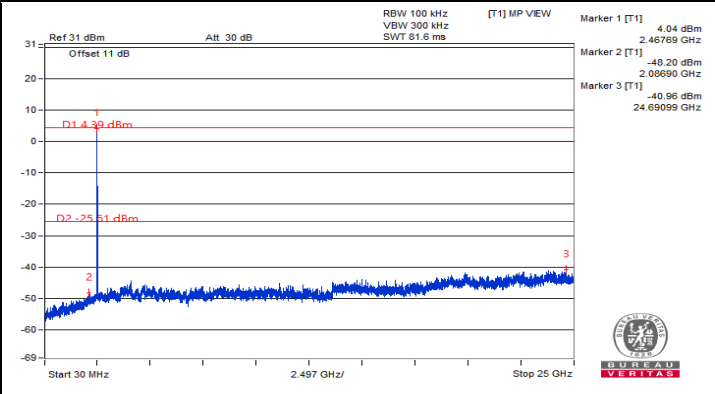
Chain 0 : CH 6



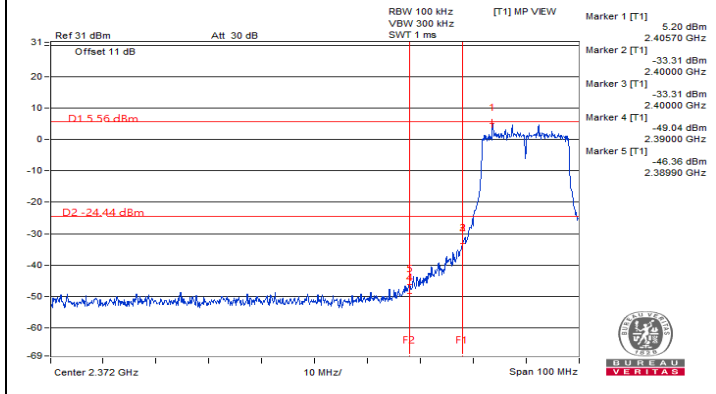
Chain 0 : CH 6



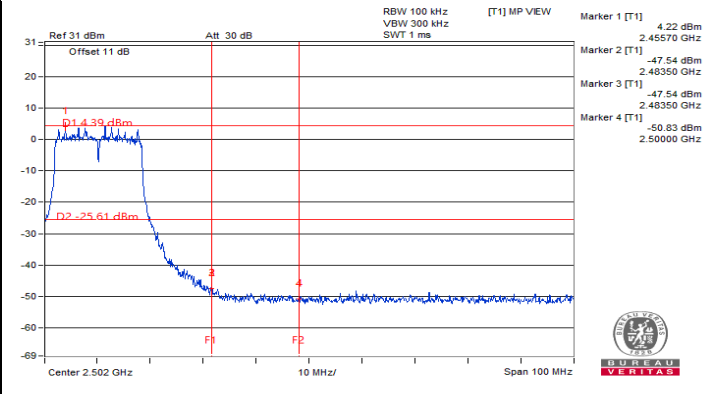
Chain 0 : CH 11



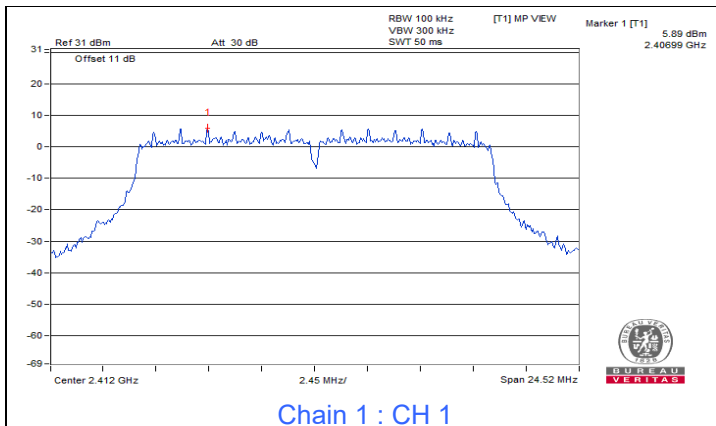
Chain 0 : CH 11



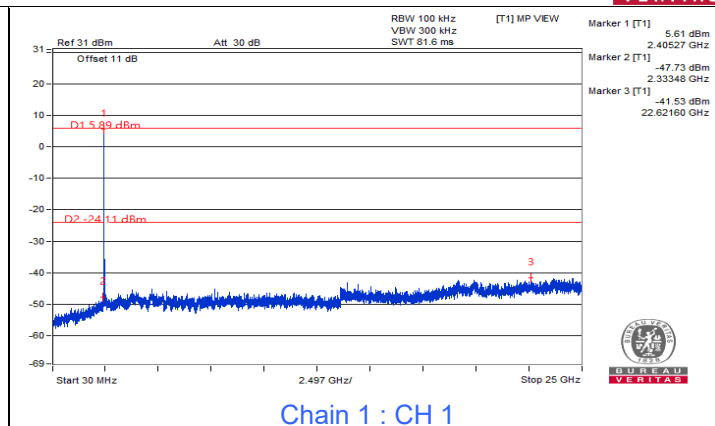
Chain 0 : CH 1 Band edge



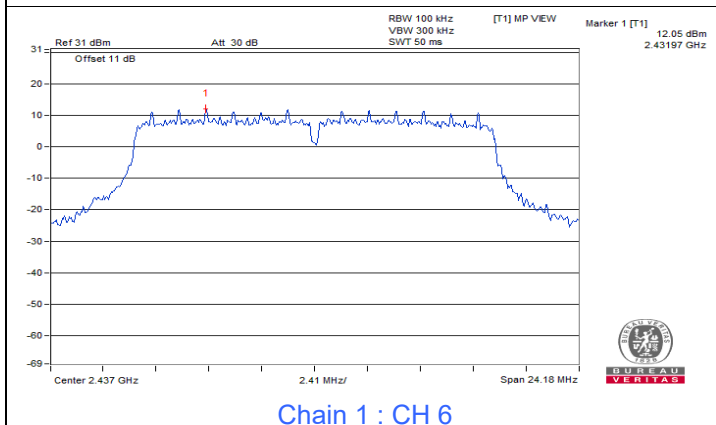
Chain 0 : CH 11 Band edge



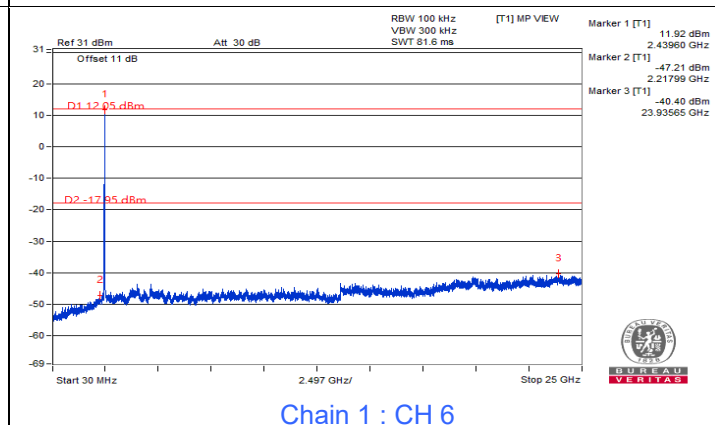
Chain 1 : CH 1



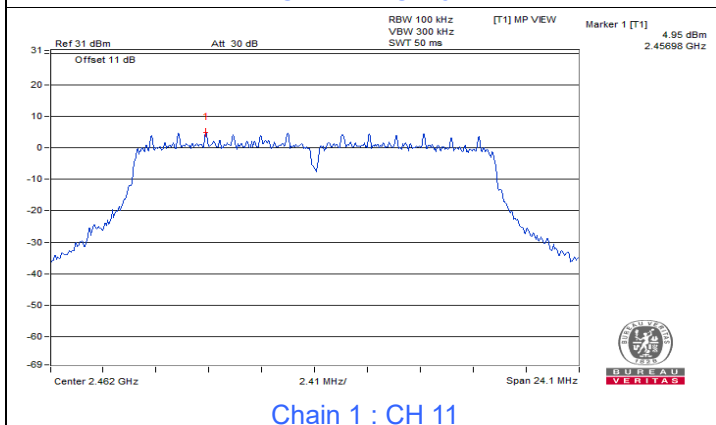
Chain 1 : CH 1



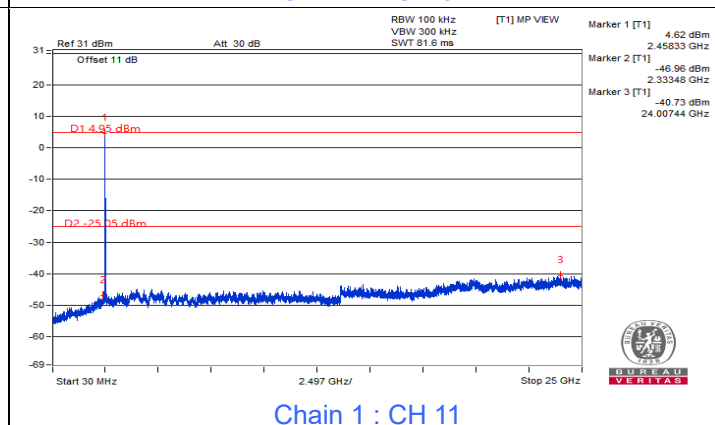
Chain 1 : CH 6



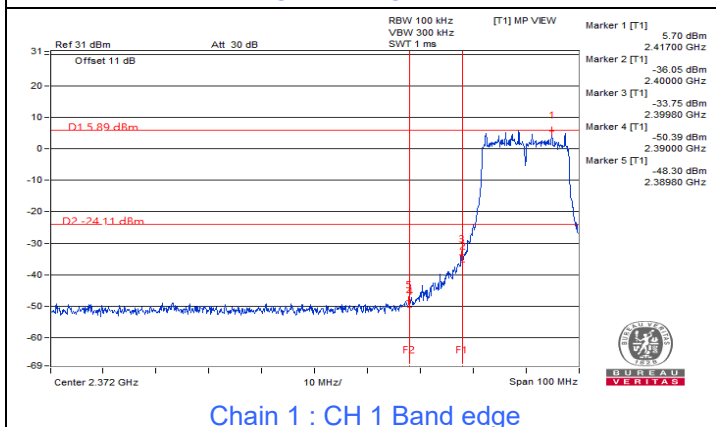
Chain 1 : CH 6



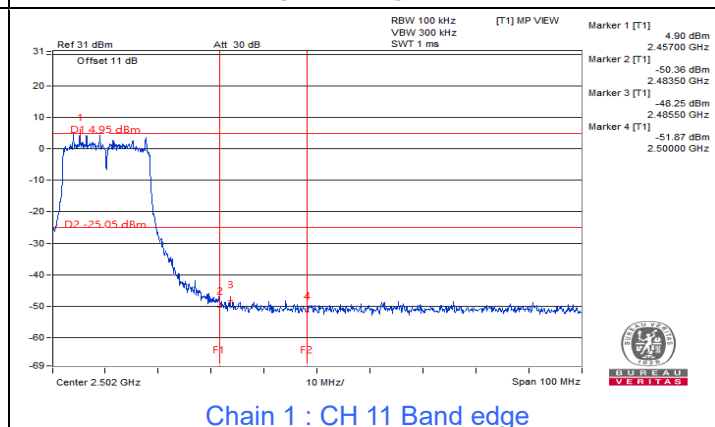
Chain 1 : CH 11



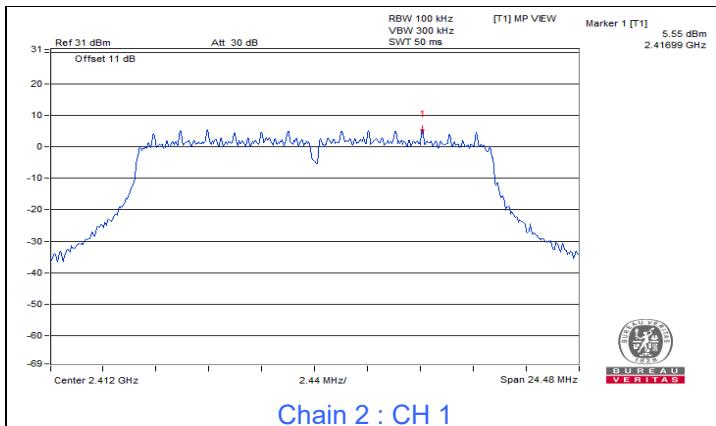
Chain 1 : CH 11



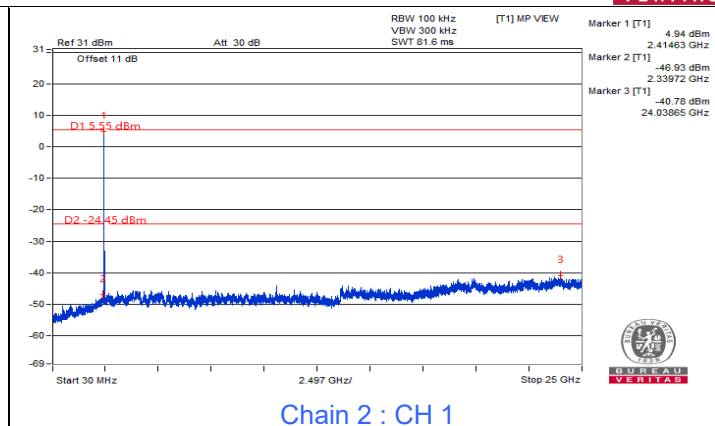
Chain 1 : CH 1 Band edge



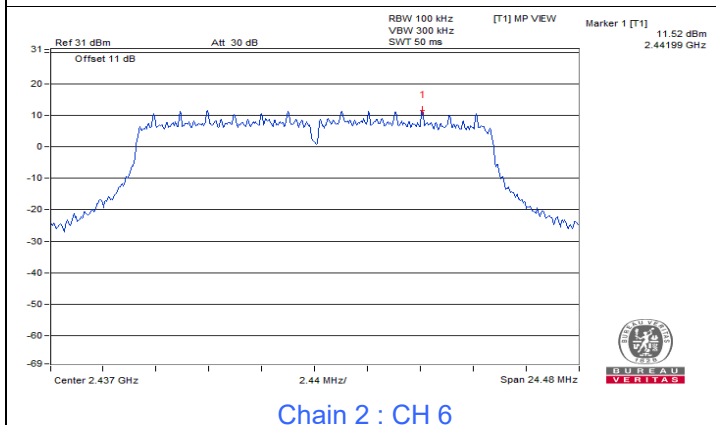
Chain 1 : CH 11 Band edge



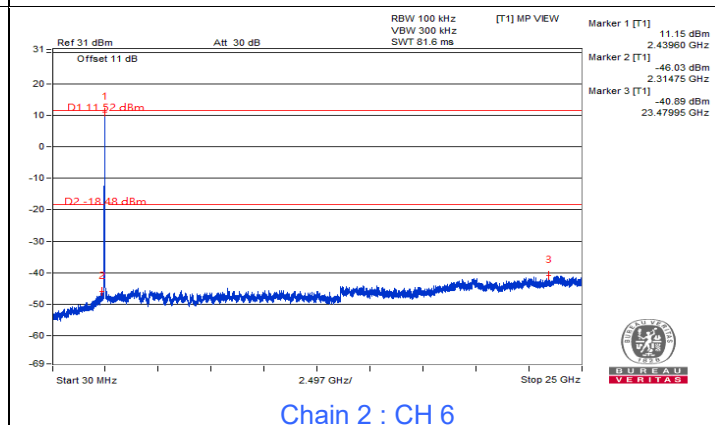
Chain 2 : CH 1



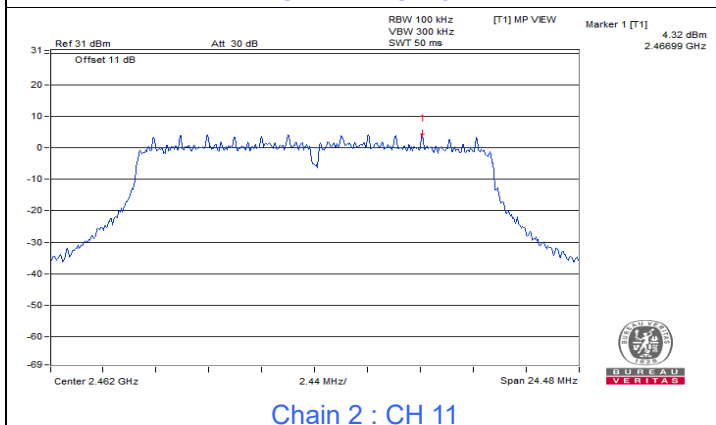
Chain 2 : CH 1



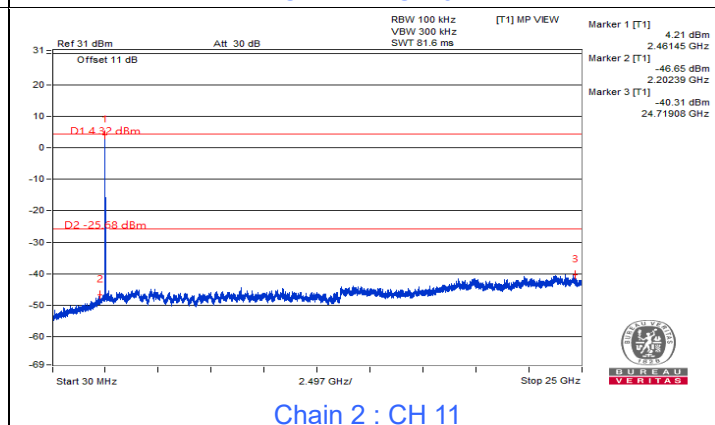
Chain 2 : CH 6



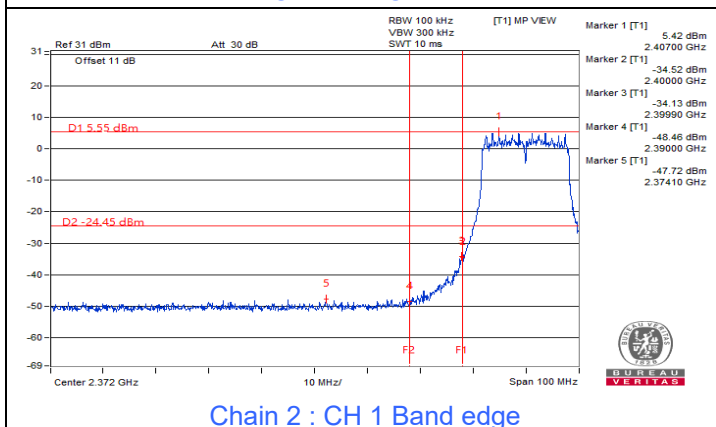
Chain 2 : CH 6



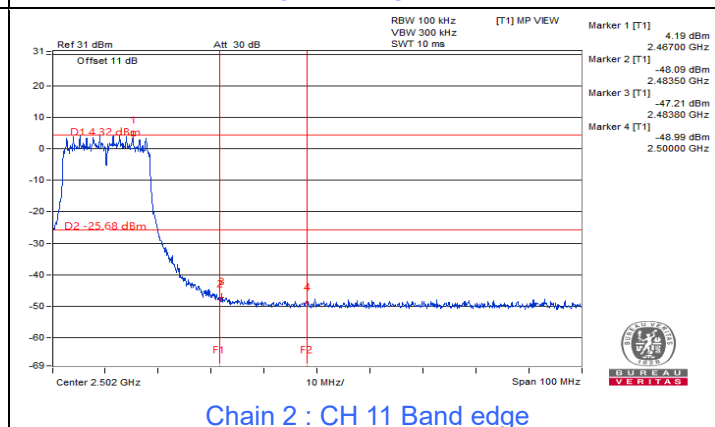
Chain 2 : CH 11



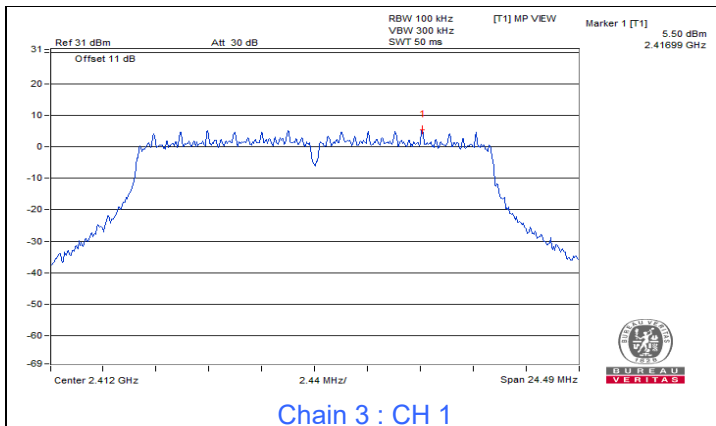
Chain 2 : CH 11



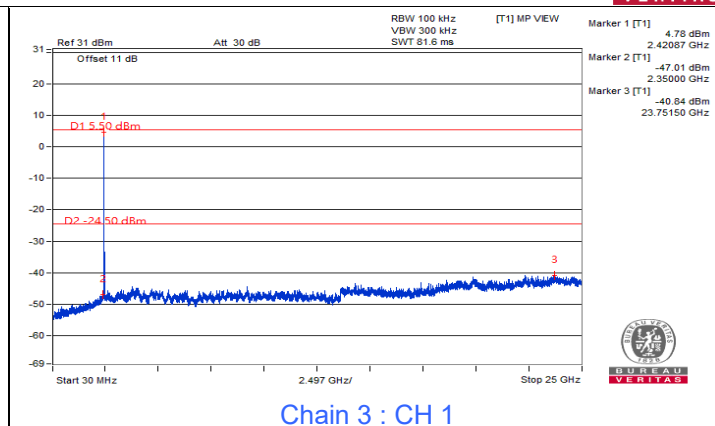
Chain 2 : CH 1 Band edge



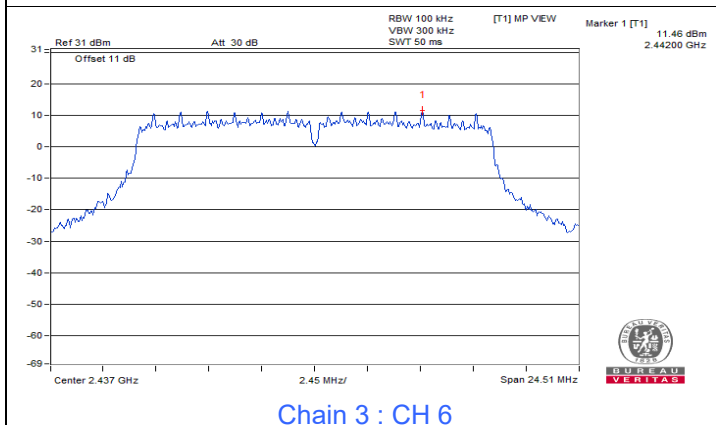
Chain 2 : CH 11 Band edge



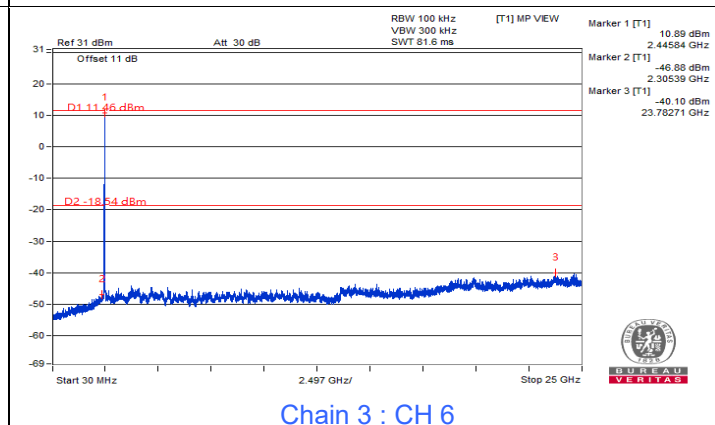
Chain 3 : CH 1



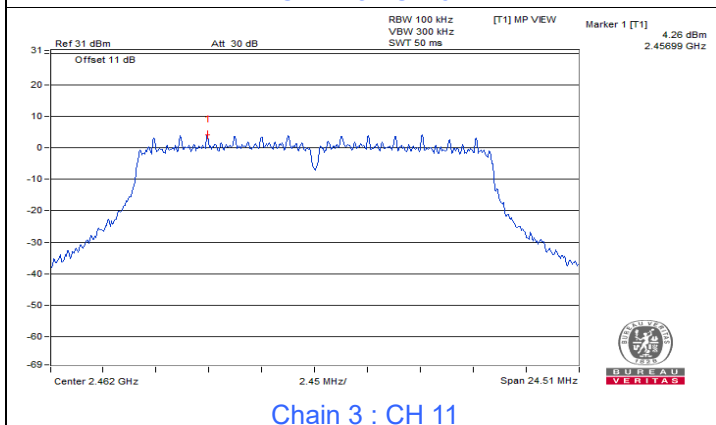
Chain 3 : CH 1



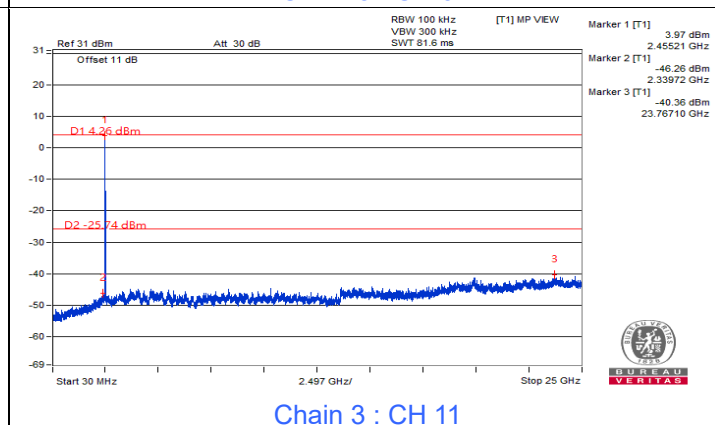
Chain 3 : CH 6



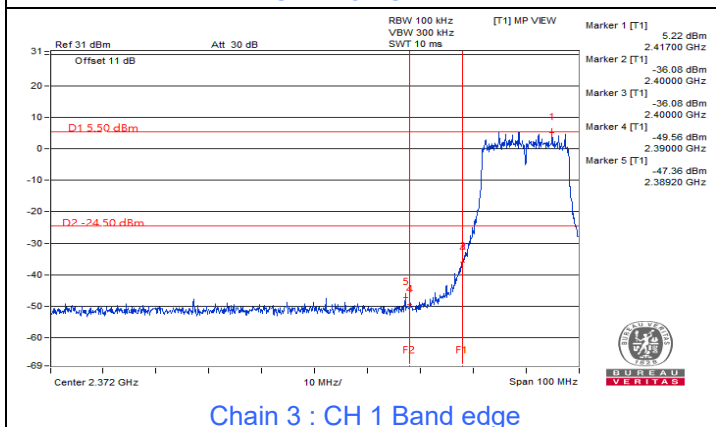
Chain 3 : CH 6



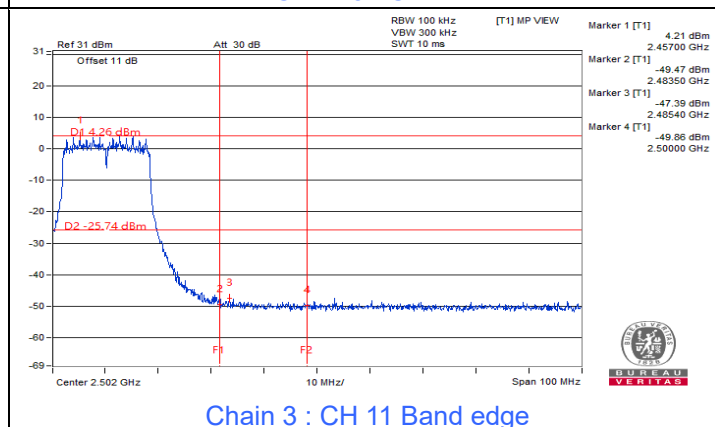
Chain 3 : CH 11



Chain 3 : CH 11

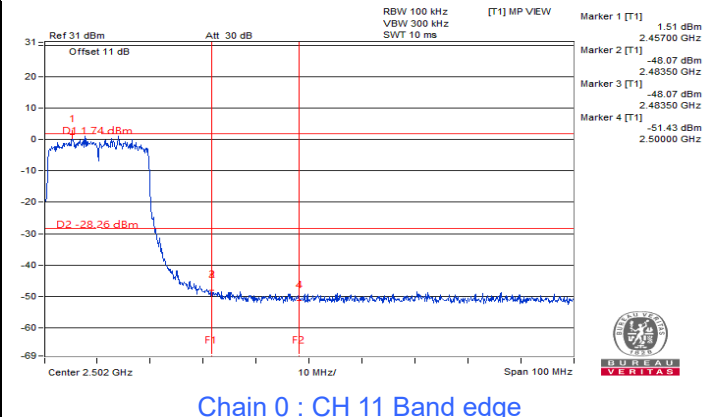
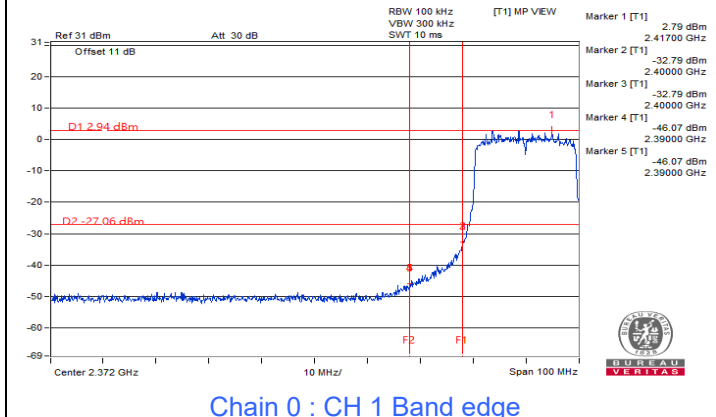
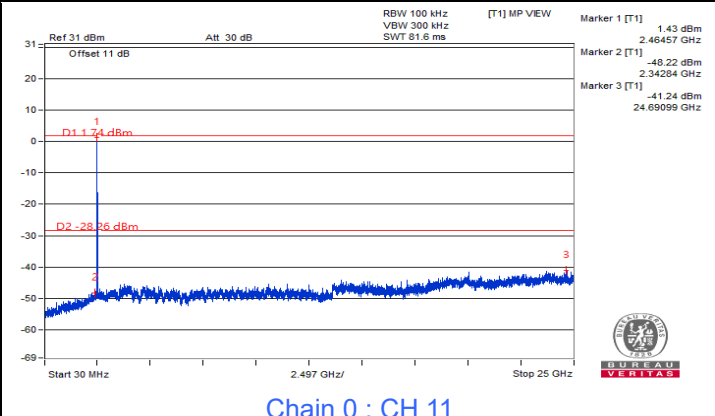
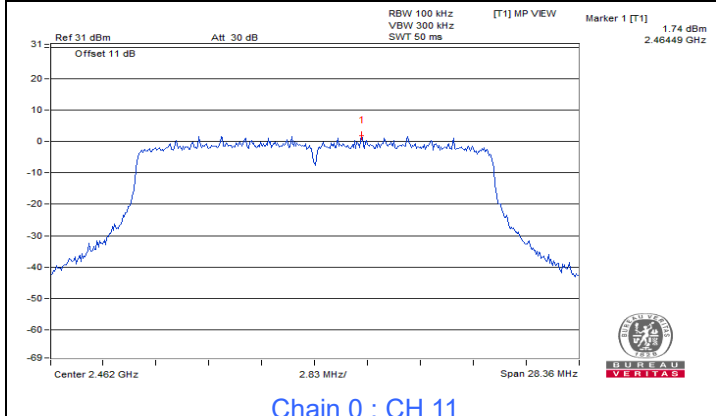
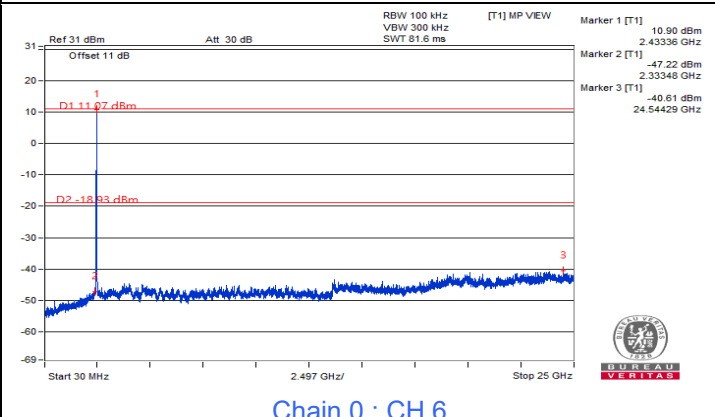
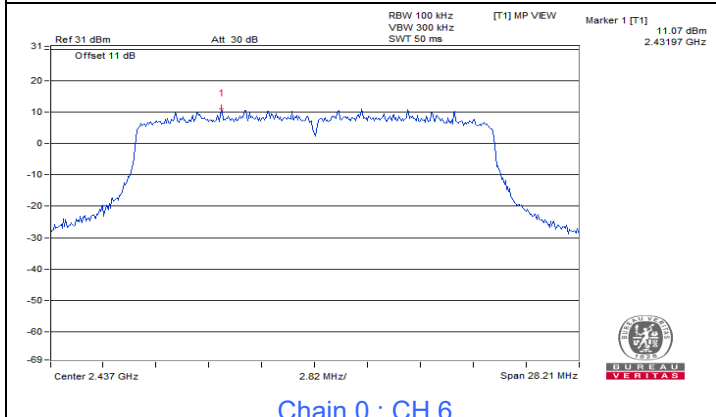
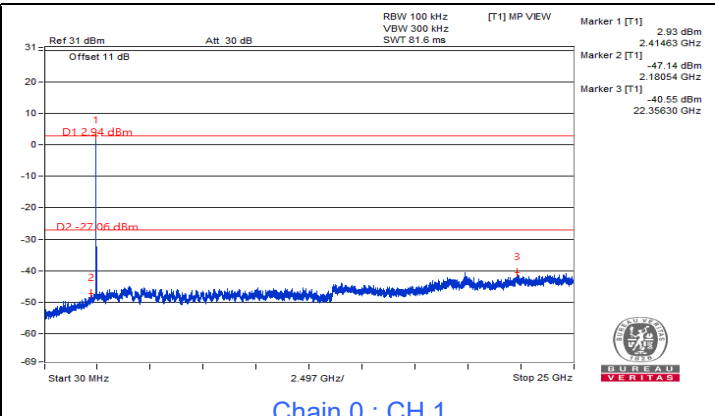
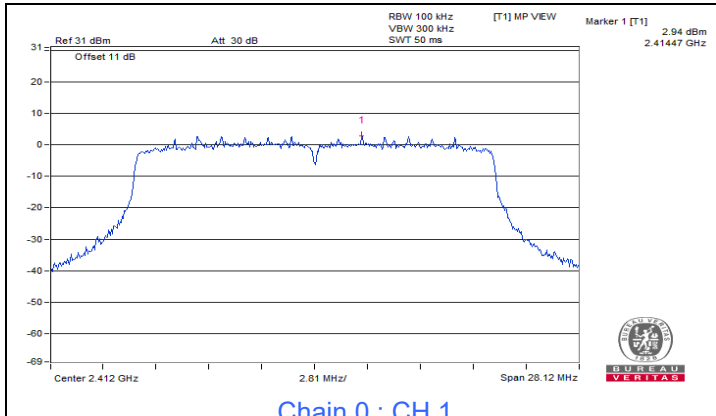


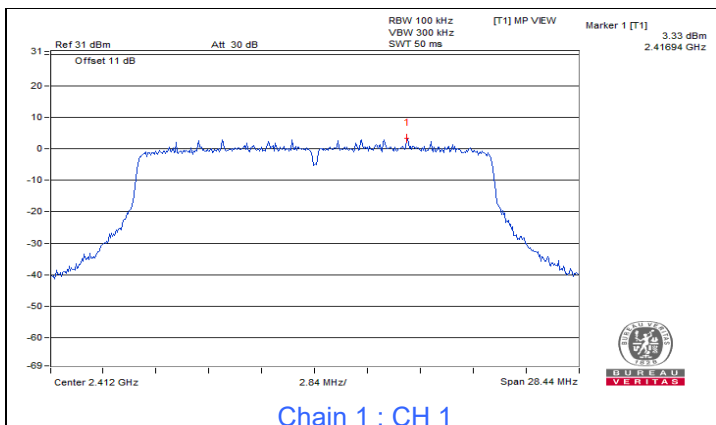
Chain 3 : CH 1 Band edge



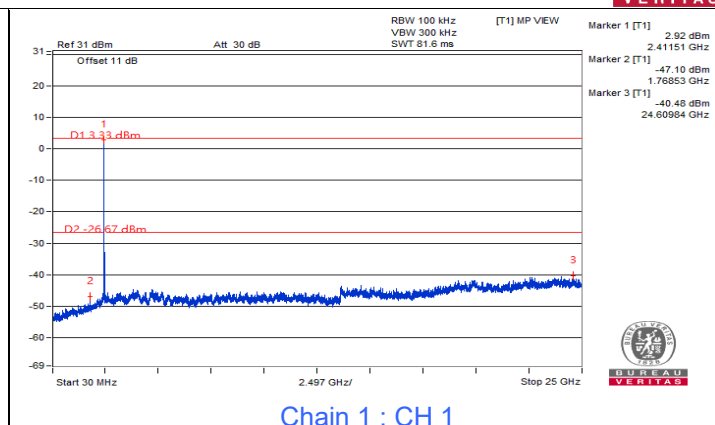
Chain 3 : CH 11 Band edge

802.11ax (HE20)

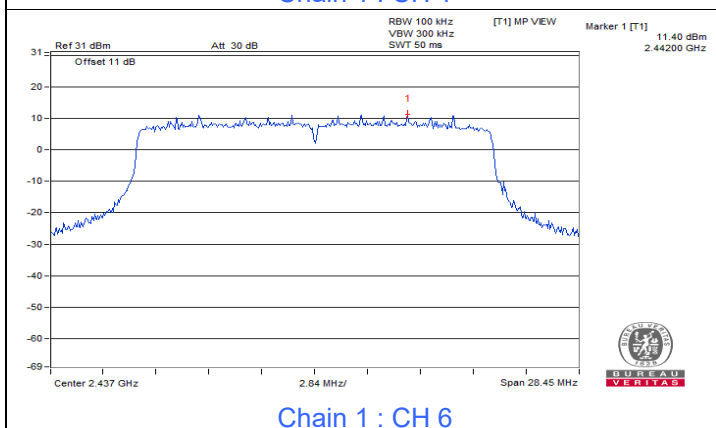




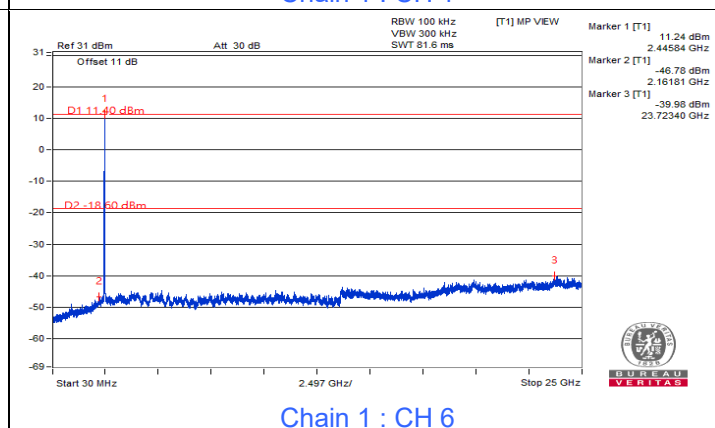
Chain 1 : CH 1



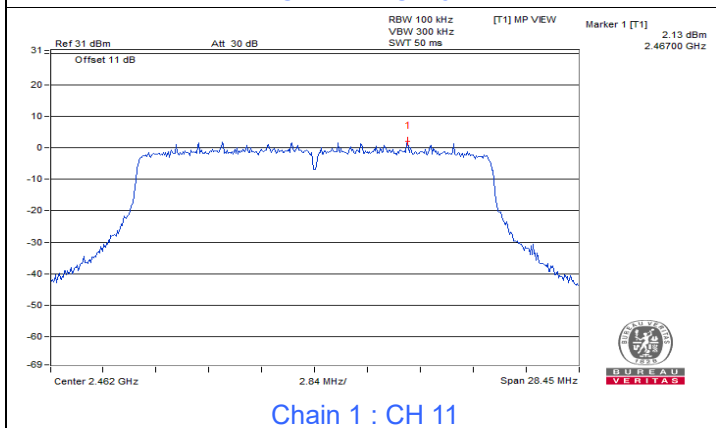
Chain 1 : CH 1



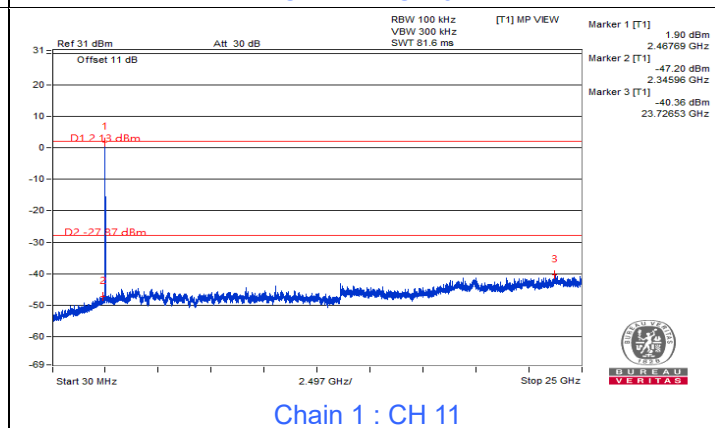
Chain 1 : CH 6



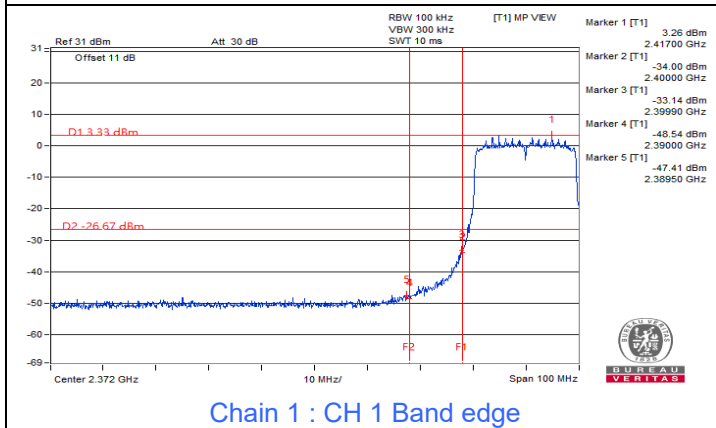
Chain 1 : CH 6



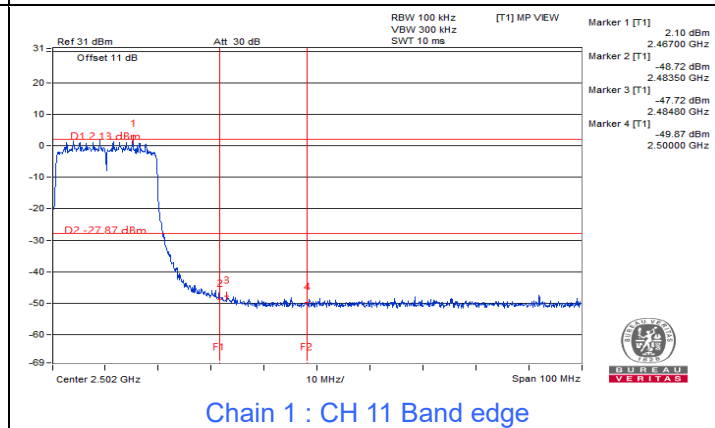
Chain 1 : CH 11



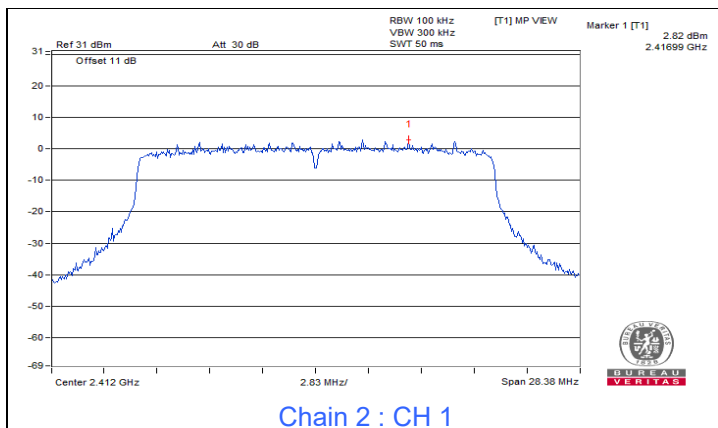
Chain 1 : CH 11



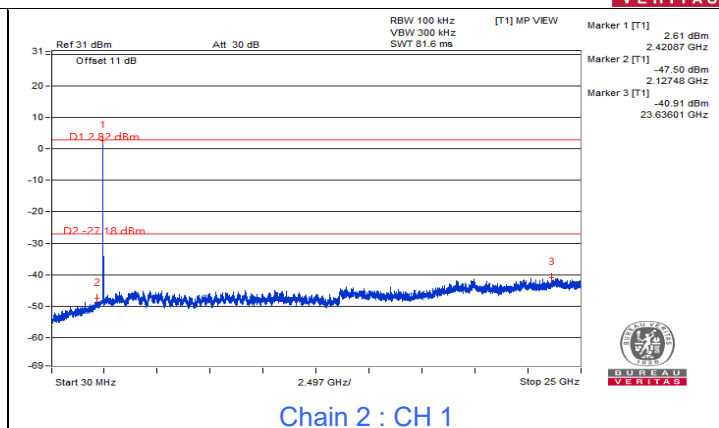
Chain 1 : CH 1 Band edge



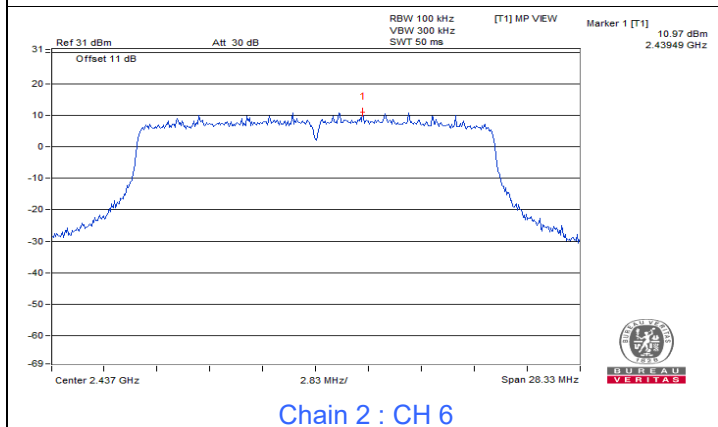
Chain 1 : CH 11 Band edge



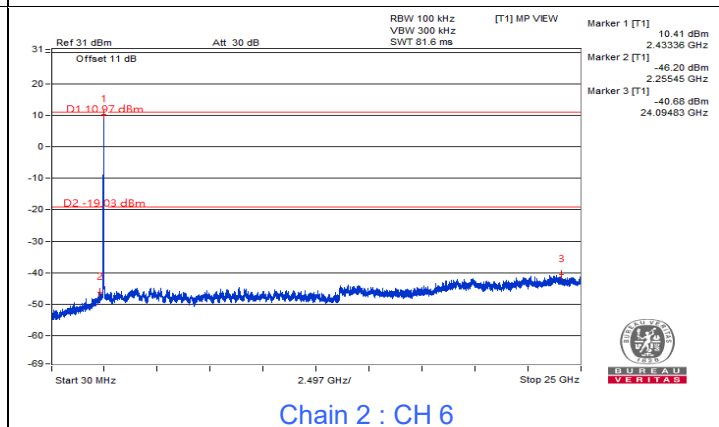
Chain 2 : CH 1



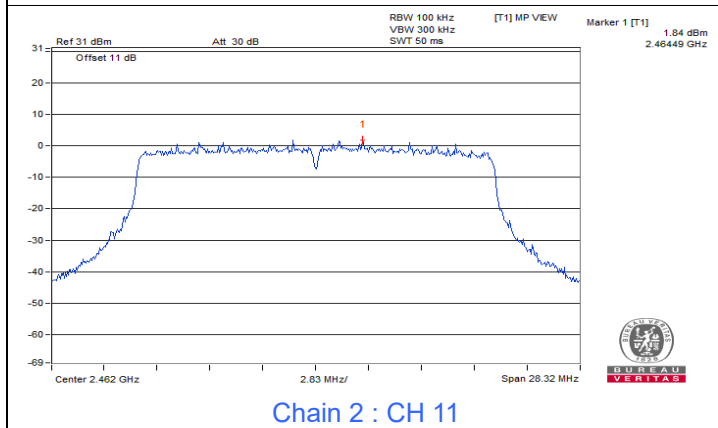
Chain 2 : CH 1



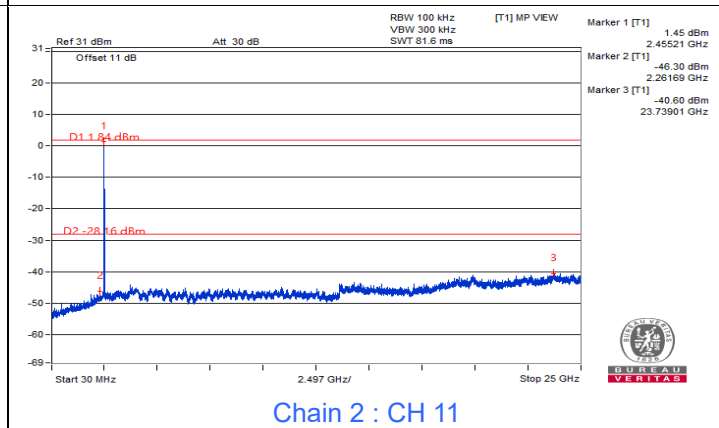
Chain 2 : CH 6



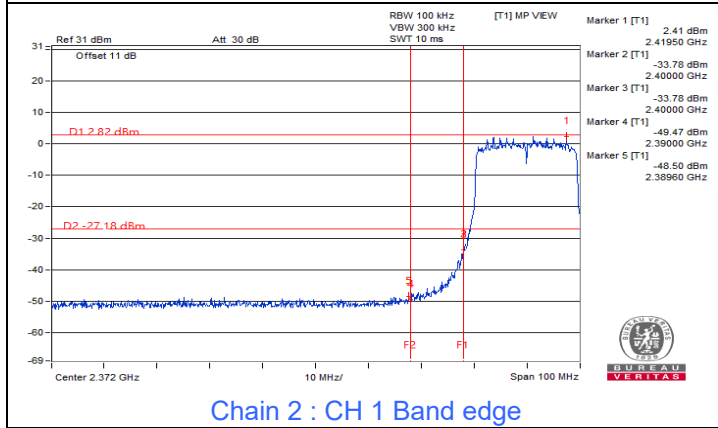
Chain 2 : CH 6



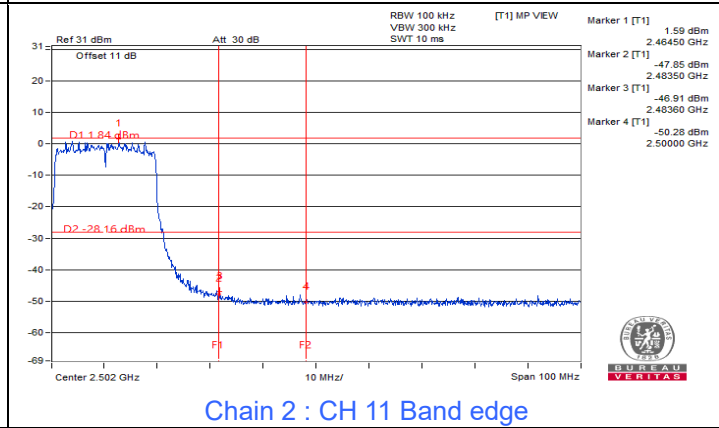
Chain 2 : CH 11



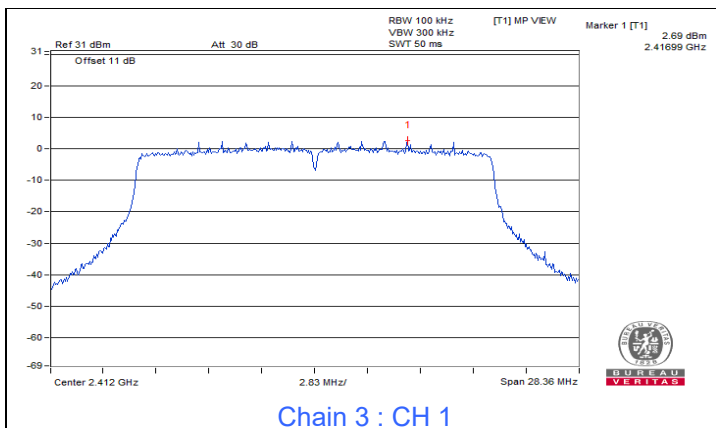
Chain 2 : CH 11



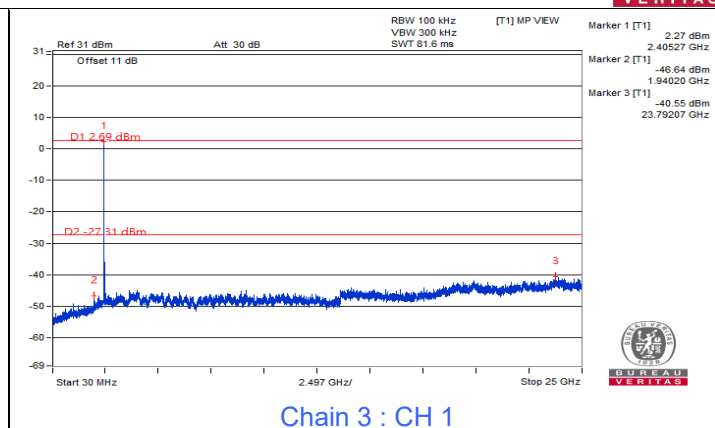
Chain 2 : CH 1 Band edge



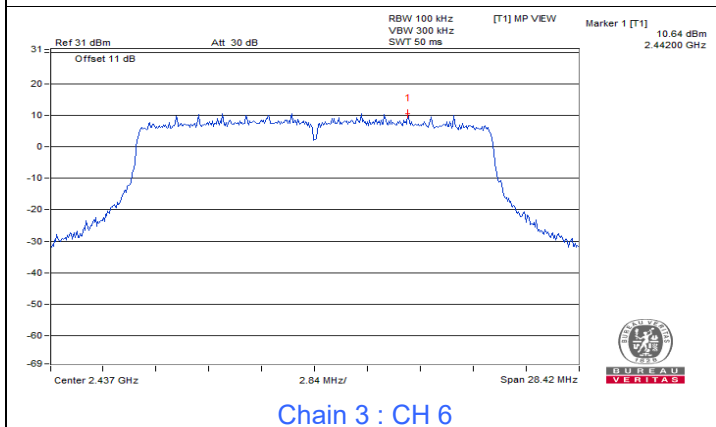
Chain 2 : CH 11 Band edge



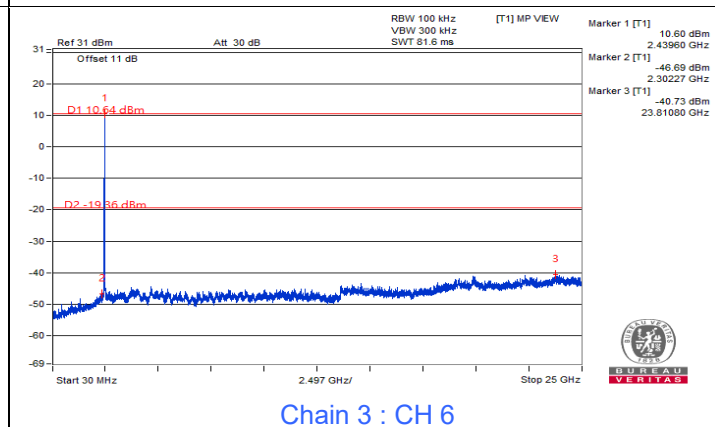
Chain 3 : CH 1



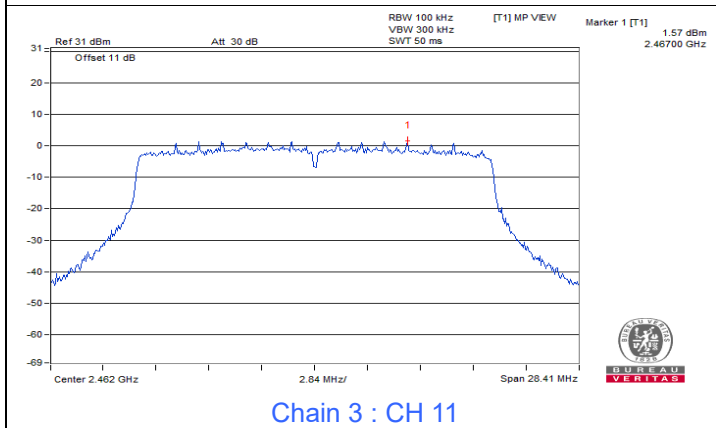
Chain 3 : CH 1



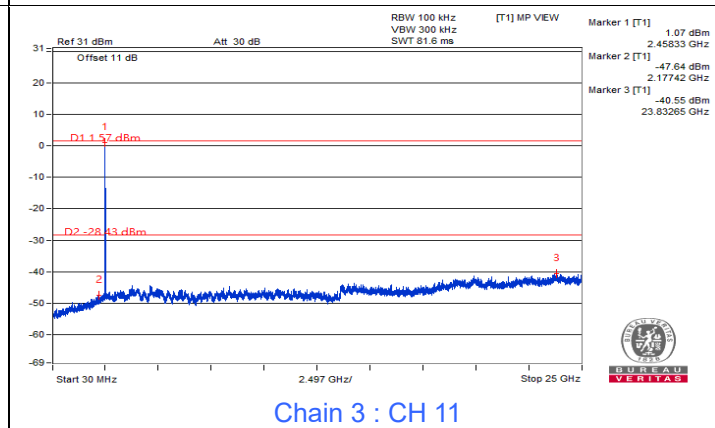
Chain 3 : CH 6



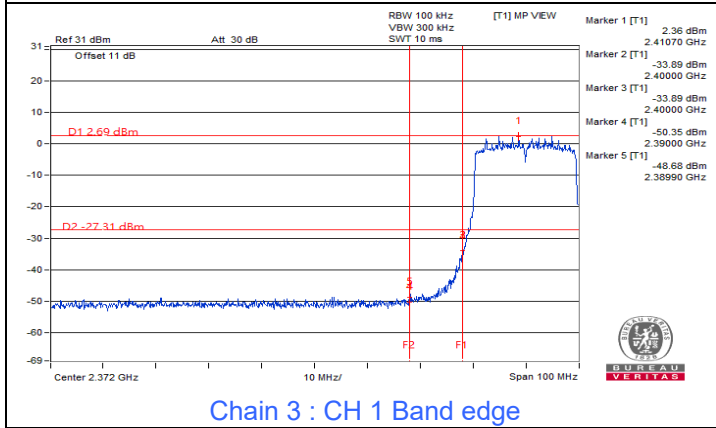
Chain 3 : CH 6



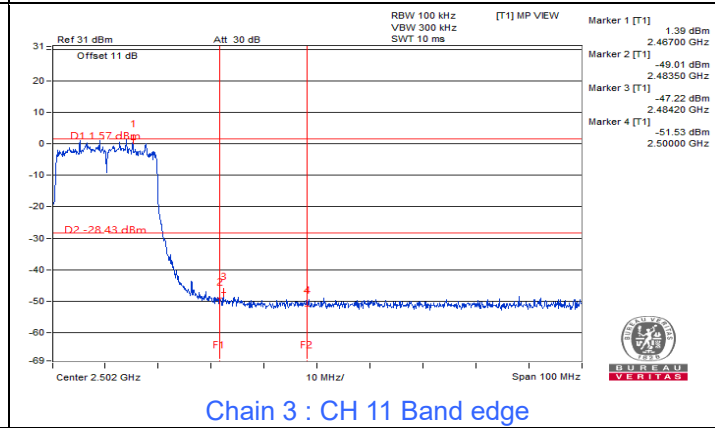
Chain 3 : CH 11



Chain 3 : CH 11

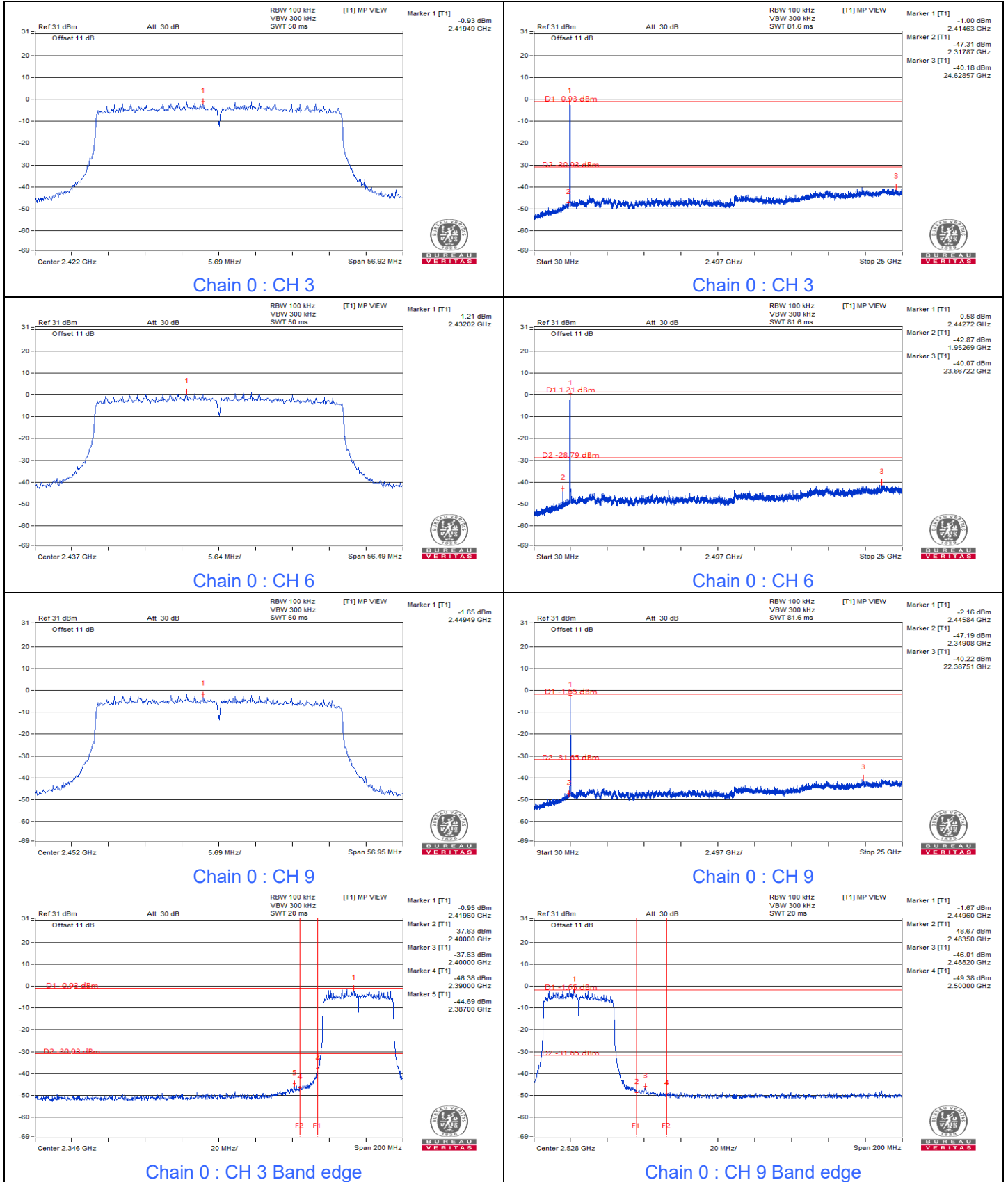


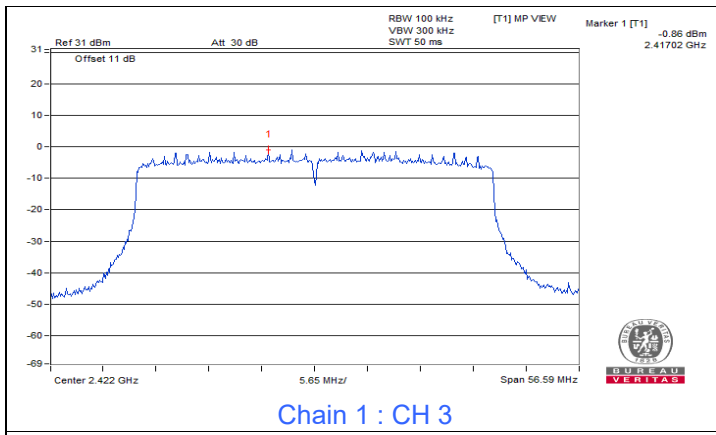
Chain 3 : CH 1 Band edge



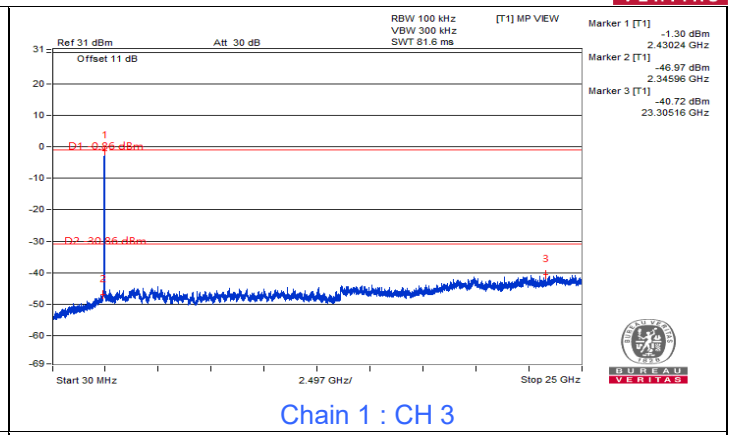
Chain 3 : CH 11 Band edge

802.11ax (HE40)

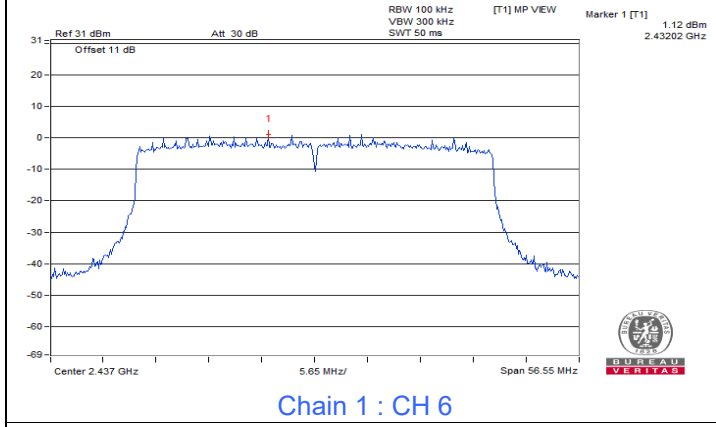




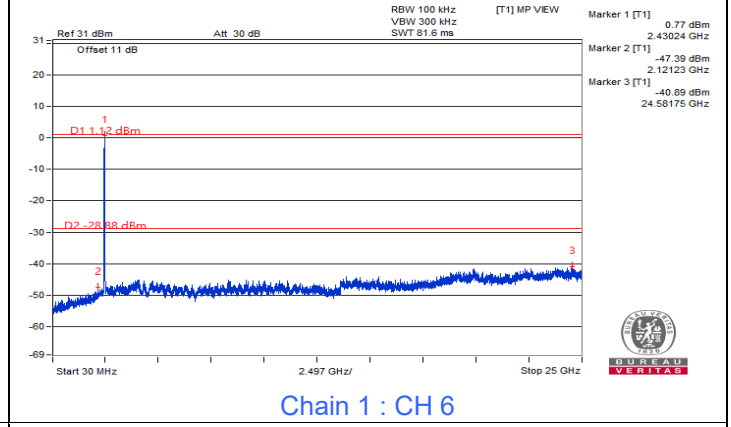
Chain 1 : CH 3



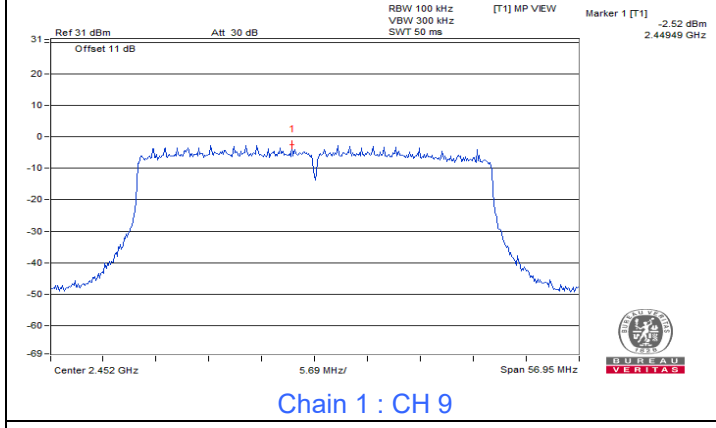
Chain 1 : CH 3



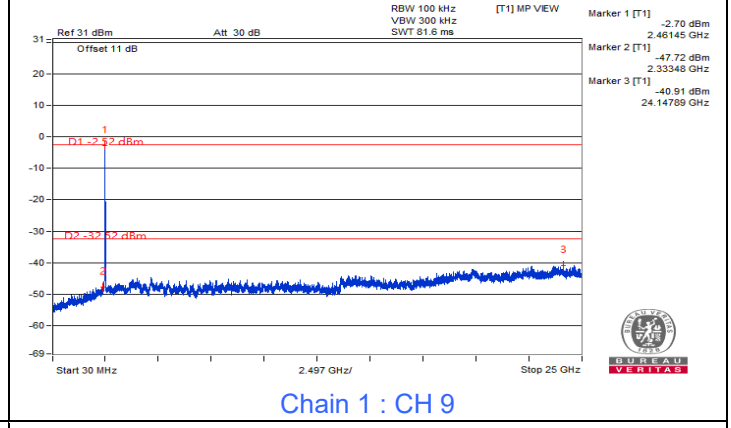
Chain 1 : CH 6



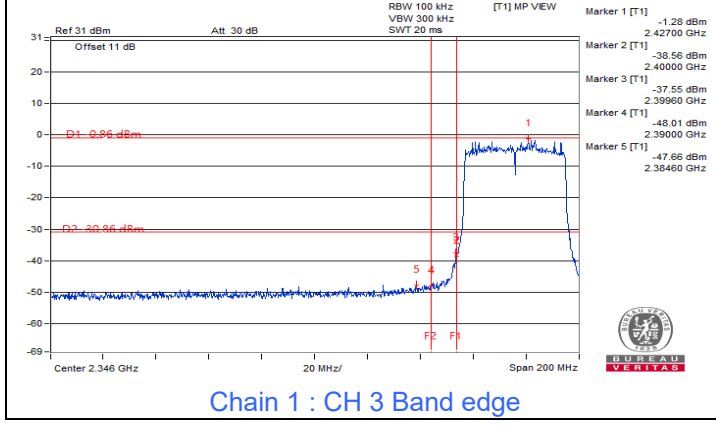
Chain 1 : CH 6



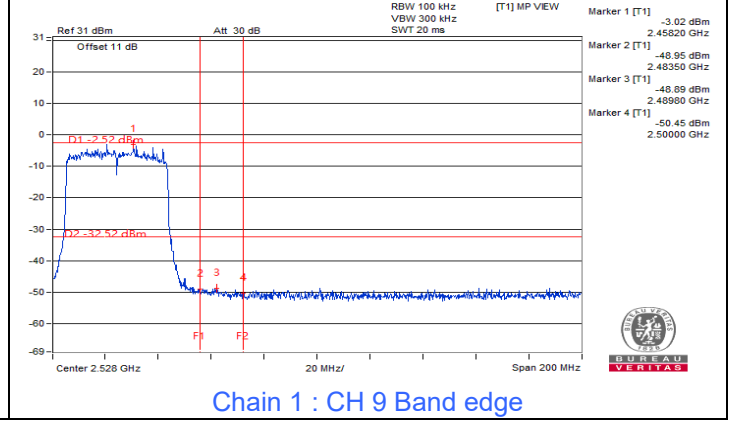
Chain 1 : CH 9



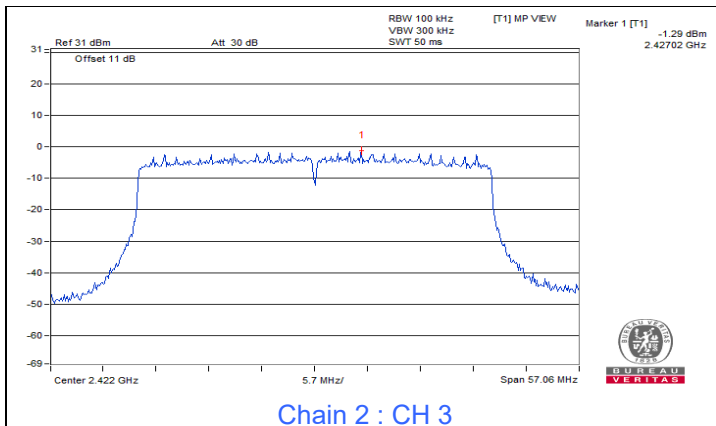
Chain 1 : CH 9



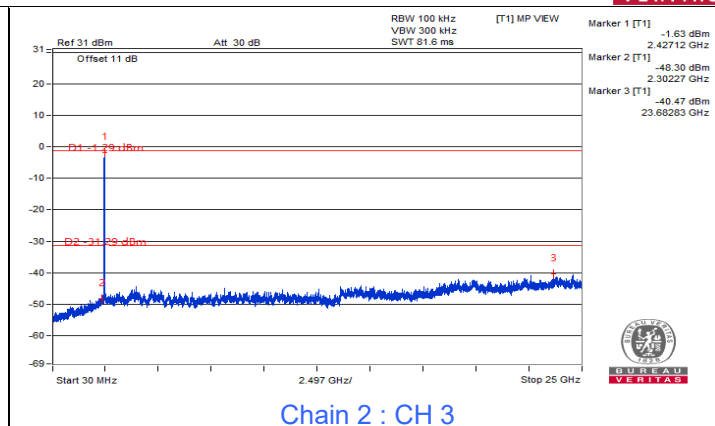
Chain 1 : CH 3 Band edge



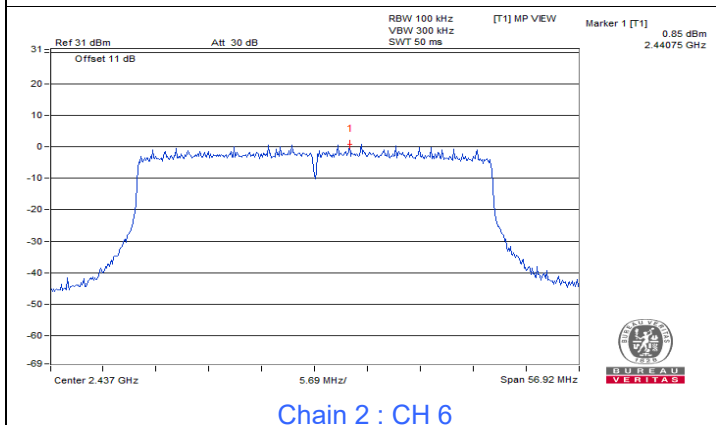
Chain 1 : CH 9 Band edge



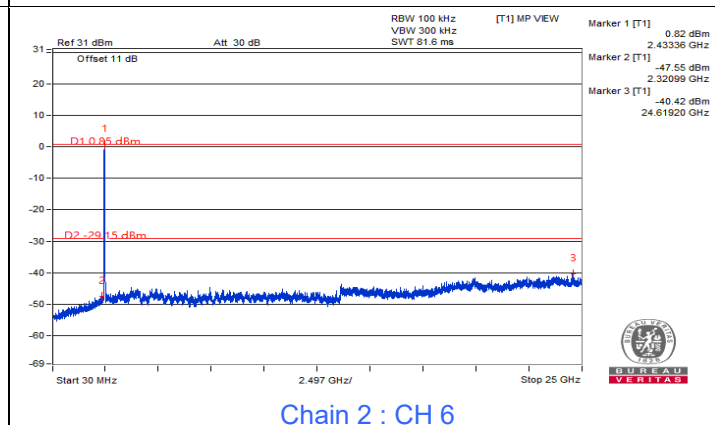
Chain 2 : CH 3



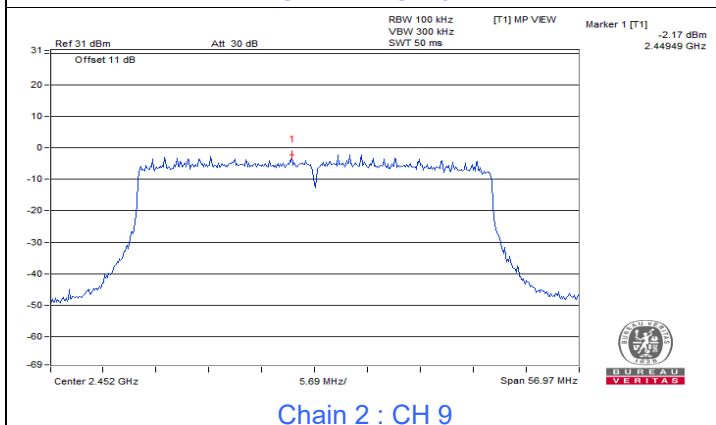
Chain 2 : CH 3



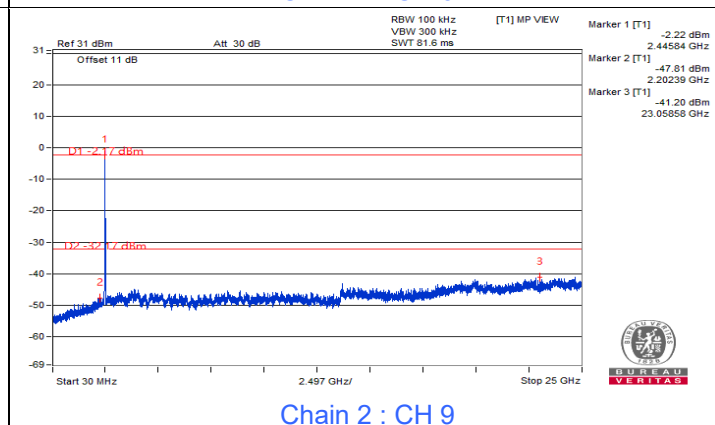
Chain 2 : CH 6



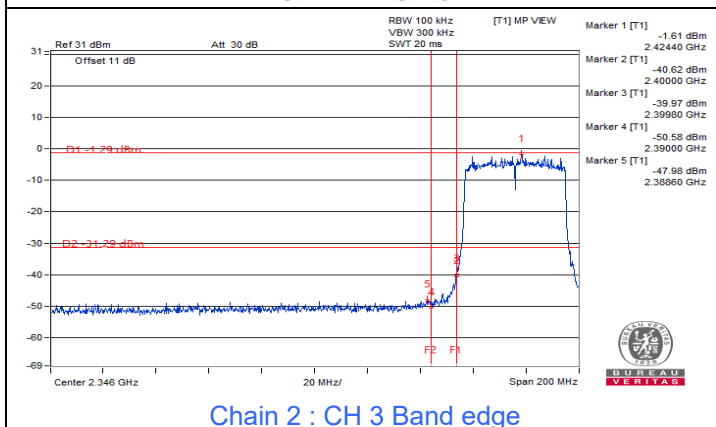
Chain 2 : CH 6



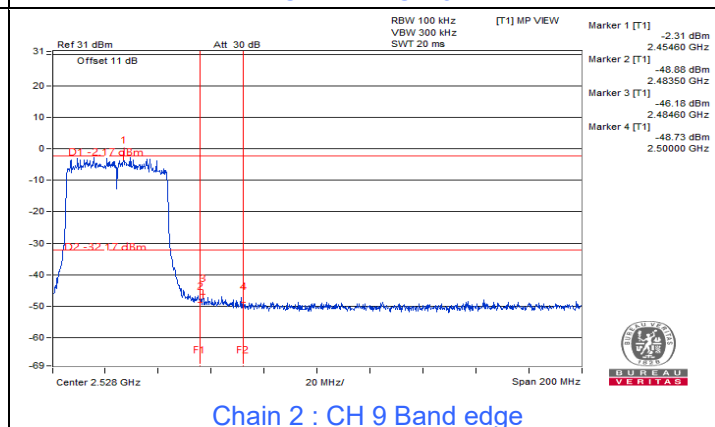
Chain 2 : CH 9



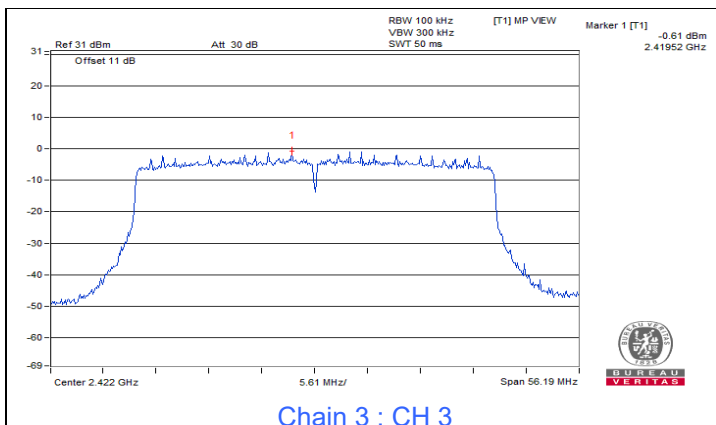
Chain 2 : CH 9



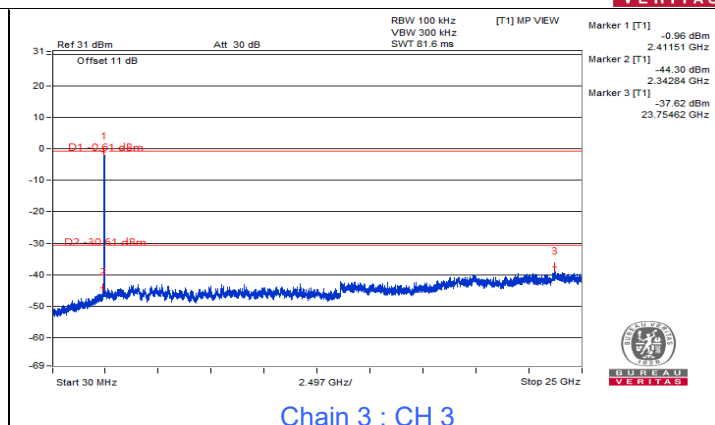
Chain 2 : CH 3 Band edge



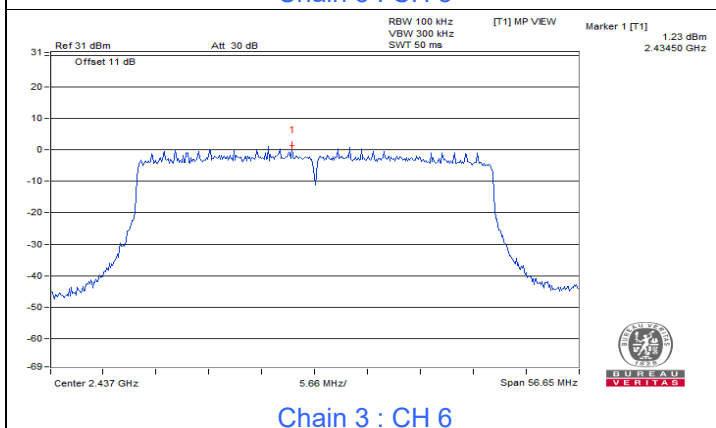
Chain 2 : CH 9 Band edge



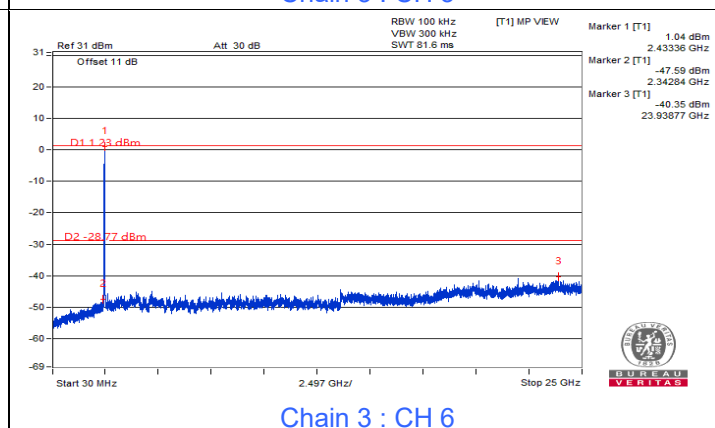
Chain 3 : CH 3



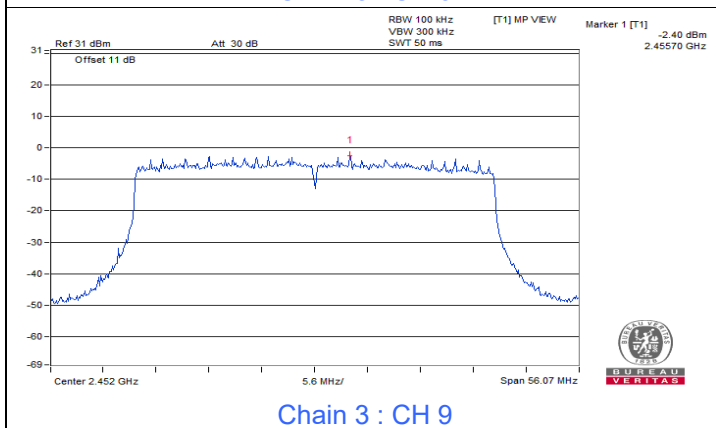
Chain 3 : CH 3



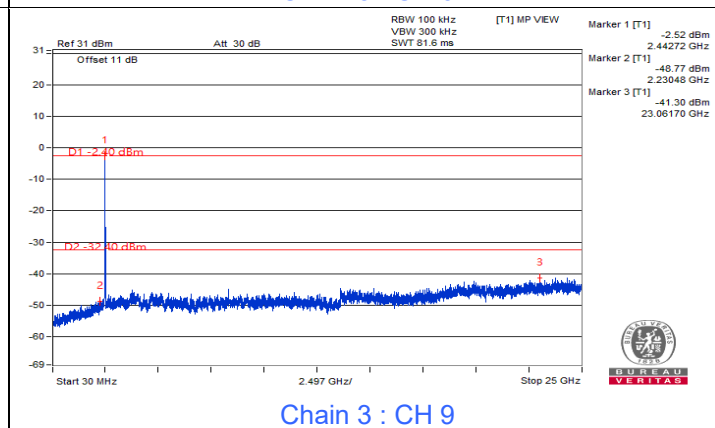
Chain 3 : CH 6



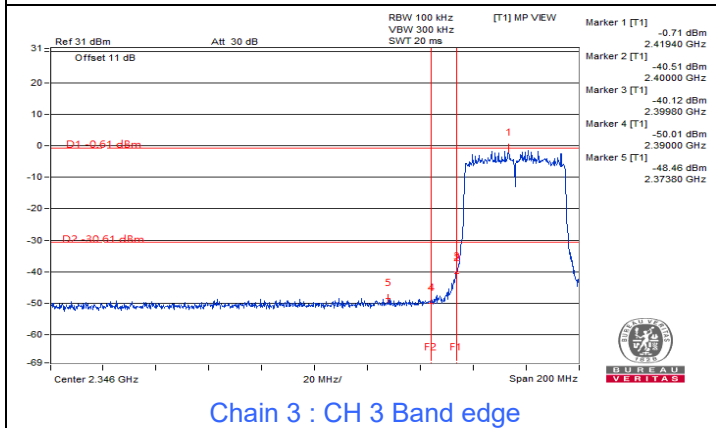
Chain 3 : CH 6



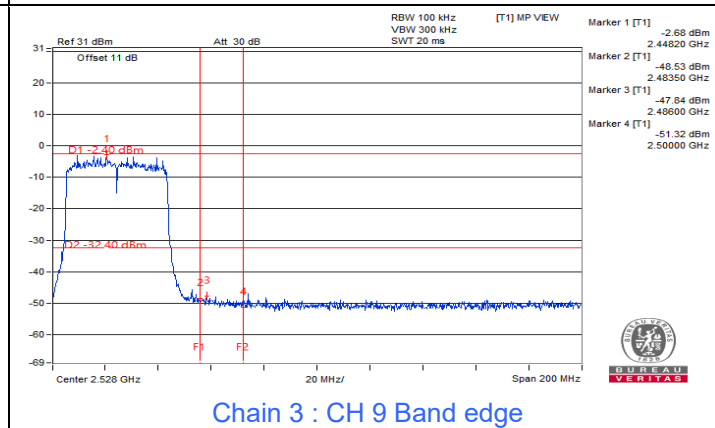
Chain 3 : CH 9



Chain 3 : CH 9



Chain 3 : CH 3 Band edge



Chain 3 : CH 9 Band edge

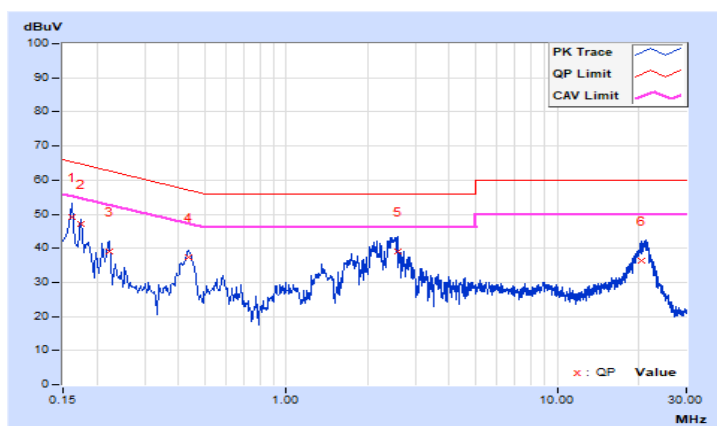
7.5 AC Power Conducted Emissions

RF Mode	802.11b	Channel	CH 1 : 2412 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	54Vdc	Environmental Conditions	25°C, 75% RH
Tested By	Edison Lee		

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	0.16190	9.69	39.40	26.36	49.09	36.05	65.37	55.37	-16.28	-19.32
2	0.17400	9.70	37.37	25.74	47.07	35.44	64.77	54.77	-17.70	-19.33
3	0.22152	9.73	29.19	17.45	38.92	27.18	62.76	52.76	-23.84	-25.58
4	0.43485	9.80	27.66	21.87	37.46	31.67	57.16	47.16	-19.70	-15.49
5	2.57000	9.91	29.08	20.41	38.99	30.32	56.00	46.00	-17.01	-15.68
6	20.59400	10.16	26.09	17.39	36.25	27.55	60.00	50.00	-23.75	-22.45

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

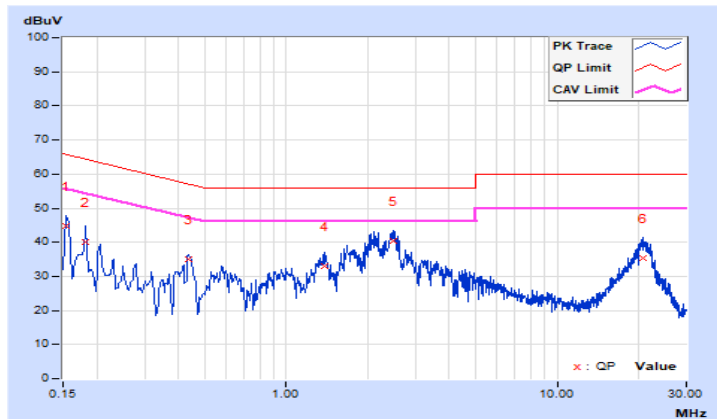


RF Mode	802.11b	Channel	CH 1 : 2412 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	54Vdc	Environmental Conditions	25°C, 75% RH
Tested By	Edison Lee		

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	9.68	35.23	24.66	44.91	34.34	65.78	55.78	-20.87	-21.44
2	0.18200	9.71	30.48	19.91	40.19	29.62	64.39	54.39	-24.20	-24.77
3	0.43371	9.81	25.04	17.85	34.85	27.66	57.18	47.18	-22.33	-19.52
4	1.37800	9.88	23.17	18.52	33.05	28.40	56.00	46.00	-22.95	-17.60
5	2.48200	9.93	30.40	23.32	40.33	33.25	56.00	46.00	-15.67	-12.75
6	20.88600	10.20	25.14	16.38	35.34	26.58	60.00	50.00	-24.66	-23.42

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



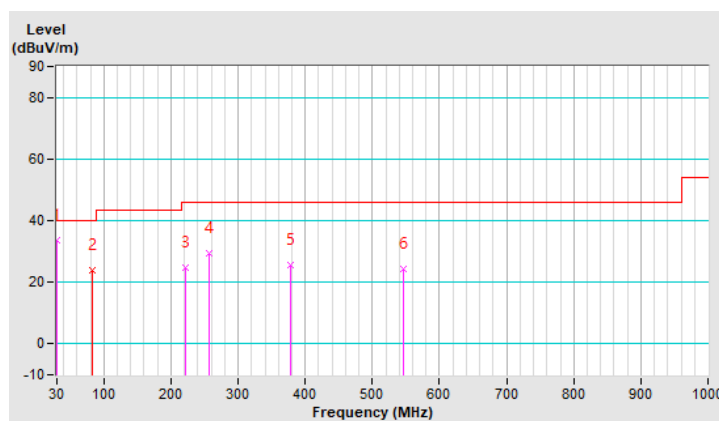
7.6 Unwanted Emissions below 1 GHz

RF Mode	802.11b	Channel	CH 1 : 2412 MHz
Frequency Range	9 kHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
Input Power	54Vdc	Environmental Conditions	23°C, 66% RH
Tested By	Edison Lee		

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	30.00	33.7 QP	40.0	-6.3	2.00 H	236	48.2	-14.5
2	82.44	24.0 QP	40.0	-16.0	2.00 H	277	42.5	-18.5
3	222.59	24.6 QP	46.0	-21.4	1.01 H	93	41.2	-16.6
4	256.33	29.5 QP	46.0	-16.5	1.01 H	18	43.7	-14.2
5	378.64	25.4 QP	46.0	-20.6	1.01 H	126	36.1	-10.7
6	545.93	24.5 QP	46.0	-21.5	1.01 H	348	31.6	-7.1

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 emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

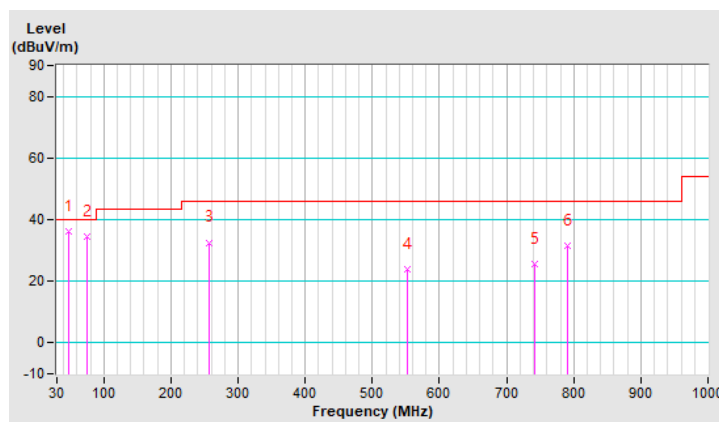


RF Mode	802.11b	Channel	CH 1 : 2412 MHz
Frequency Range	9 kHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
Input Power	54Vdc	Environmental Conditions	23°C, 66% RH
Tested By	Edison Lee		

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	48.28	36.1 QP	40.0	-3.9	1.00 V	223	43.0	-6.9
2	74.99	34.6 QP	40.0	-5.4	1.49 V	15	41.5	-6.9
3	256.33	32.6 QP	46.0	-13.4	1.00 V	142	39.5	-6.9
4	552.96	23.9 QP	46.0	-22.1	1.00 V	172	30.8	-6.9
5	742.74	25.5 QP	46.0	-20.5	1.99 V	2	32.4	-6.9
6	790.54	31.6 QP	46.0	-14.4	1.00 V	167	38.5	-6.9

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 of frequency range 30 MHz ~ 1 GHz.
5. The emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be 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 (AV) RB = 1 MHz, VB = 10 Hz
Input Power	54Vdc	Environmental Conditions	23°C, 66% RH
Tested By	Tim Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	58.2 PK	74.0	-15.8	1.34 H	137	26.2	32.0
2	2390.00	45.6 AV	54.0	-8.4	1.34 H	137	13.6	32.0
3	*2412.00	101.3 PK			1.34 H	137	69.3	32.0
4	*2412.00	98.1 AV			1.34 H	137	66.1	32.0
5	4824.00	50.2 PK	74.0	-23.8	1.62 H	341	47.2	3.0
6	4824.00	40.1 AV	54.0	-13.9	1.62 H	341	37.1	3.0
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	62.9 PK	74.0	-11.1	1.56 V	170	30.9	32.0
2	2390.00	53.0 AV	54.0	-1.0	1.56 V	170	21.0	32.0
3	*2412.00	121.2 PK			1.55 V	173	89.2	32.0
4	*2412.00	118.2 AV			1.55 V	173	86.2	32.0
5	4824.00	50.5 PK	74.0	-23.5	1.90 V	177	47.5	3.0
6	4824.00	41.8 AV	54.0	-12.2	1.90 V	177	38.8	3.0

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.
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 (AV) RB = 1 MHz, VB = 10 Hz
Input Power	54Vdc	Environmental Conditions	23°C, 66% RH
Tested By	Tim Chen		

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	102.0 PK			2.06 H	166	70.1	31.9
2	*2437.00	99.2 AV			2.06 H	166	67.3	31.9
3	4874.00	50.1 PK	74.0	-23.9	1.52 H	134	47.3	2.8
4	4874.00	40.4 AV	54.0	-13.6	1.52 H	134	37.6	2.8

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	*2437.00	121.5 PK			2.02 V	121	89.6	31.9
2	*2437.00	118.2 AV			2.02 V	121	86.3	31.9
3	4874.00	53.1 PK	74.0	-20.9	2.02 V	175	50.3	2.8
4	4874.00	47.7 AV	54.0	-6.3	2.02 V	175	44.9	2.8

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	802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	54Vdc	Environmental Conditions	23°C, 66% RH
Tested By	Tim Chen		

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	102.2 PK			2.07 H	227	70.2	32.0
2	*2462.00	99.6 AV			2.07 H	227	67.6	32.0
3	2483.50	59.1 PK	74.0	-14.9	2.07 H	227	27.1	32.0
4	2483.50	46.6 AV	54.0	-7.4	2.07 H	227	14.6	32.0
5	4924.00	50.2 PK	74.0	-23.8	1.65 H	243	47.4	2.8
6	4924.00	40.1 AV	54.0	-13.9	1.65 H	243	37.3	2.8

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	122.5 PK			1.58 V	169	90.5	32.0
2	*2462.00	119.4 AV			1.58 V	169	87.4	32.0
3	2483.50	58.6 PK	74.0	-15.4	1.55 V	171	26.6	32.0
4	2483.50	49.2 AV	54.0	-4.8	1.55 V	171	17.2	32.0
5	2488.78	62.2 PK	74.0	-11.8	1.60 V	170	30.2	32.0
6	2488.78	52.9 AV	54.0	-1.1	1.60 V	170	20.9	32.0
7	4924.00	52.5 PK	74.0	-21.5	1.63 V	205	49.7	2.8
8	4924.00	47.4 AV	54.0	-6.6	1.63 V	205	44.6	2.8

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 (AV) RB = 1 MHz, VB = 1 kHz
Input Power	54Vdc	Environmental Conditions	23°C, 66% RH
Tested By	Tim Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.7 PK	74.0	-16.3	1.46 H	220	25.7	32.0
2	2390.00	44.6 AV	54.0	-9.4	1.46 H	220	12.6	32.0
3	*2412.00	103.3 PK			1.45 H	218	71.3	32.0
4	*2412.00	94.1 AV			1.45 H	218	62.1	32.0
5	4824.00	48.6 PK	74.0	-25.4	1.66 H	344	45.6	3.0
6	4824.00	35.6 AV	54.0	-18.4	1.66 H	344	32.6	3.0
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	68.1 PK	74.0	-5.9	1.54 V	168	36.1	32.0
2	2390.00	53.0 AV	54.0	-1.0	1.54 V	168	21.0	32.0
3	*2412.00	120.7 PK			1.53 V	169	88.7	32.0
4	*2412.00	109.8 AV			1.53 V	169	77.8	32.0
5	4824.00	48.7 PK	74.0	-25.3	1.92 V	180	45.7	3.0
6	4824.00	36.2 AV	54.0	-17.8	1.92 V	180	33.2	3.0

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.
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 (AV) RB = 1 MHz, VB = 1 kHz
Input Power	54Vdc	Environmental Conditions	23°C, 66% RH
Tested By	Tim Chen		

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	110.0 PK			1.47 H	223	78.1	31.9
2	*2437.00	101.1 AV			1.47 H	223	69.2	31.9
3	4874.00	49.3 PK	74.0	-24.7	1.63 H	342	46.5	2.8
4	4874.00	36.4 AV	54.0	-17.6	1.63 H	342	33.6	2.8

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	*2437.00	125.9 PK			1.50 V	178	94.0	31.9
2	*2437.00	116.4 AV			1.50 V	178	84.5	31.9
3	4874.00	49.7 PK	74.0	-24.3	1.82 V	172	46.9	2.8
4	4874.00	37.0 AV	54.0	-17.0	1.82 V	172	34.2	2.8

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 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	54Vdc	Environmental Conditions	23°C, 66% RH
Tested By	Tim Chen		

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	102.1 PK			1.52 H	220	70.1	32.0
2	*2462.00	92.9 AV			1.52 H	220	60.9	32.0
3	2483.50	57.4 PK	74.0	-16.6	1.56 H	223	25.4	32.0
4	2483.50	46.7 AV	54.0	-7.3	1.56 H	223	14.7	32.0
5	4924.00	47.5 PK	74.0	-26.5	1.66 H	348	44.7	2.8
6	4924.00	34.9 AV	54.0	-19.1	1.66 H	348	32.1	2.8

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	118.3 PK			2.19 V	176	86.3	32.0
2	*2462.00	108.8 AV			2.19 V	176	76.8	32.0
3	2483.50	69.5 PK	74.0	-4.5	1.49 V	173	37.5	32.0
4	2483.50	53.2 AV	54.0	-0.8	1.49 V	173	21.2	32.0
5	4924.00	48.4 PK	74.0	-25.6	1.91 V	183	45.6	2.8
6	4924.00	35.9 AV	54.0	-18.1	1.91 V	183	33.1	2.8

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 (AV) RB = 1 MHz, VB = 1 kHz
Input Power	54Vdc	Environmental Conditions	23°C, 66% RH
Tested By	Tim Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	58.0 PK	74.0	-16.0	1.32 H	209	26.0	32.0
2	2390.00	45.0 AV	54.0	-9.0	1.32 H	209	13.0	32.0
3	*2412.00	103.5 PK			1.00 H	218	71.5	32.0
4	*2412.00	91.7 AV			1.00 H	218	59.7	32.0
5	4824.00	47.9 PK	74.0	-26.1	1.69 H	350	44.9	3.0
6	4824.00	36.2 AV	54.0	-17.8	1.69 H	350	33.2	3.0

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	68.1 PK	74.0	-5.9	1.70 V	213	36.1	32.0
2	2390.00	53.5 AV	54.0	-0.5	1.70 V	213	21.5	32.0
3	*2412.00	120.6 PK			1.47 V	185	88.6	32.0
4	*2412.00	107.8 AV			1.47 V	185	75.8	32.0
5	4824.00	49.3 PK	74.0	-24.7	1.62 V	137	46.3	3.0
6	4824.00	37.1 AV	54.0	-16.9	1.62 V	137	34.1	3.0

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.
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 (AV) RB = 1 MHz, VB = 1 kHz
Input Power	54Vdc	Environmental Conditions	23°C, 66% RH
Tested By	Tim Chen		

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	113.0 PK			1.02 H	217	81.1	31.9
2	*2437.00	99.7 AV			1.02 H	217	67.8	31.9
3	2483.50	57.8 PK	74.0	-16.2	1.23 H	211	25.8	32.0
4	2483.50	46.7 AV	54.0	-7.3	1.23 H	211	14.7	32.0
5	4874.00	48.8 PK	74.0	-25.2	1.64 H	350	46.0	2.8
6	4874.00	36.1 AV	54.0	-17.9	1.64 H	350	33.3	2.8

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	*2437.00	128.7 PK			1.55 V	185	96.8	31.9
2	*2437.00	115.9 AV			1.55 V	185	84.0	31.9
3	2483.50	66.0 PK	74.0	-8.0	1.38 V	206	34.0	32.0
4	2483.50	53.0 AV	54.0	-1.0	1.38 V	206	21.0	32.0
5	4874.00	49.3 PK	74.0	-24.7	1.89 V	160	46.5	2.8
6	4874.00	36.8 AV	54.0	-17.2	1.89 V	160	34.0	2.8

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 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	54Vdc	Environmental Conditions	23°C, 66% RH
Tested By	Tim Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	104.6 PK			1.00 H	221	72.6	32.0
2	*2462.00	91.5 AV			1.00 H	221	59.5	32.0
3	2483.50	58.2 PK	74.0	-15.8	1.23 H	207	26.2	32.0
4	2483.50	46.8 AV	54.0	-7.2	1.23 H	207	14.8	32.0
5	4924.00	47.1 PK	74.0	-26.9	1.63 H	342	44.3	2.8
6	4924.00	37.0 AV	54.0	-17.0	1.63 H	342	34.2	2.8

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	120.5 PK			1.44 V	180	88.5	32.0
2	*2462.00	107.1 AV			1.44 V	180	75.1	32.0
3	2483.50	68.4 PK	74.0	-5.6	1.50 V	183	36.4	32.0
4	2483.50	53.6 AV	54.0	-0.4	1.50 V	183	21.6	32.0
5	4924.00	48.1 PK	74.0	-25.9	1.26 V	168	45.3	2.8
6	4924.00	37.9 AV	54.0	-16.1	1.26 V	168	35.1	2.8

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 (HE40)	Channel	CH 3 : 2422 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	54Vdc	Environmental Conditions	23°C, 66% RH
Tested By	Tim Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	58.2 PK	74.0	-15.8	1.31 H	175	26.2	32.0
2	2390.00	45.0 AV	54.0	-9.0	1.31 H	175	13.0	32.0
3	*2422.00	98.7 PK			1.29 H	173	66.8	31.9
4	*2422.00	87.4 AV			1.29 H	173	55.5	31.9
5	4844.00	48.0 PK	74.0	-26.0	1.58 H	321	45.1	2.9
6	4844.00	34.5 AV	54.0	-19.5	1.58 H	321	31.6	2.9
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	2390.00	66.4 PK	74.0	-7.6	2.17 V	209	34.4	32.0
2	2390.00	53.5 AV	54.0	-0.5	2.17 V	209	21.5	32.0
3	*2422.00	117.1 PK			1.39 V	201	85.2	31.9
4	*2422.00	103.9 AV			1.39 V	201	72.0	31.9
5	4844.00	48.9 PK	74.0	-25.1	1.68 V	135	46.0	2.9
6	4844.00	35.1 AV	54.0	-18.9	1.68 V	135	32.2	2.9

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, the limit was restricted at the RF Output Power.

RF Mode	802.11ax (HE40)	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	54Vdc	Environmental Conditions	23°C, 66% RH
Tested By	Tim Chen		

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	101.9 PK			1.28 H	177	70.0	31.9
2	*2437.00	89.3 AV			1.28 H	177	57.4	31.9
3	2483.50	57.7 PK	74.0	-16.3	1.30 H	185	25.7	32.0
4	2483.50	46.9 AV	54.0	-7.1	1.30 H	185	14.9	32.0
5	4874.00	47.4 PK	74.0	-26.6	1.76 H	333	44.6	2.8
6	4874.00	34.9 AV	54.0	-19.1	1.76 H	333	32.1	2.8
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	*2437.00	118.0 PK			1.80 V	214	86.1	31.9
2	*2437.00	105.6 AV			1.80 V	214	73.7	31.9
3	2483.50	66.5 PK	74.0	-7.5	1.34 V	213	34.5	32.0
4	2483.50	53.6 AV	54.0	-0.4	1.34 V	213	21.6	32.0
5	4874.00	49.3 PK	74.0	-24.7	1.69 V	134	46.5	2.8
6	4874.00	35.1 AV	54.0	-18.9	1.69 V	134	32.3	2.8

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 (HE40)	Channel	CH 9 : 2452 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	54Vdc	Environmental Conditions	23°C, 66% RH
Tested By	Tim Chen		

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	98.9 PK			1.10 H	220	66.9	32.0
2	*2452.00	87.4 AV			1.10 H	220	55.4	32.0
3	2483.50	58.1 PK	74.0	-15.9	1.23 H	217	26.1	32.0
4	2483.50	46.8 AV	54.0	-7.2	1.23 H	217	14.8	32.0
5	4904.00	47.9 PK	74.0	-26.1	1.58 H	350	45.0	2.9
6	4904.00	34.8 AV	54.0	-19.2	1.58 H	350	31.9	2.9
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	114.7 PK			1.52 V	190	82.7	32.0
2	*2452.00	103.0 AV			1.52 V	190	71.0	32.0
3	2483.50	66.7 PK	74.0	-7.3	1.12 V	191	34.7	32.0
4	2483.50	53.5 AV	54.0	-0.5	1.12 V	191	21.5	32.0
5	4904.00	48.7 PK	74.0	-25.3	1.69 V	137	45.8	2.9
6	4904.00	34.9 AV	54.0	-19.1	1.69 V	137	32.0	2.9

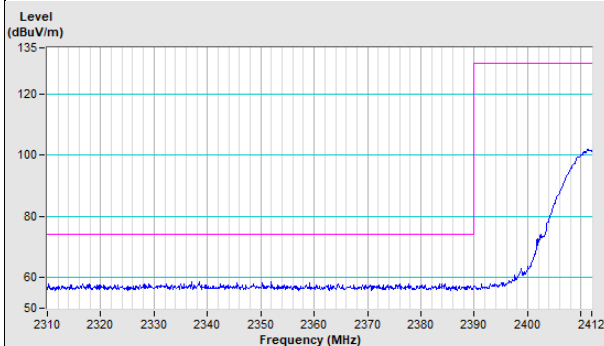
Remarks:

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, the limit was restricted at the RF Output Power.

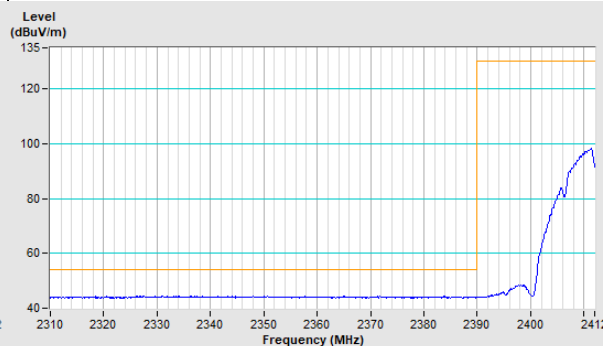


802.11b Channel 1

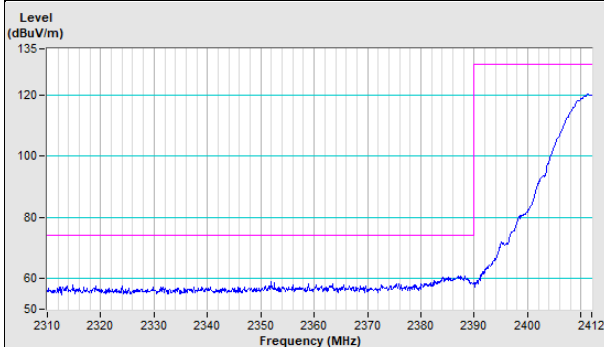
Horizontal (Peak)



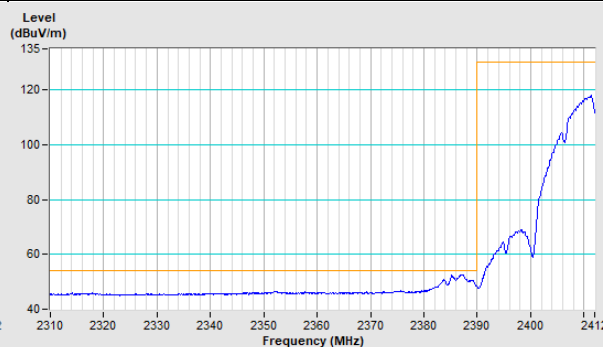
Horizontal (Average)



Vertical (Peak)

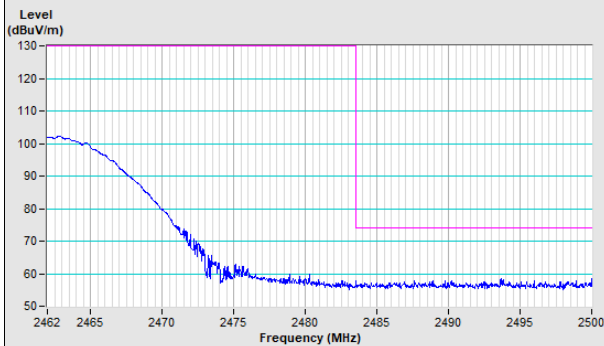


Vertical (Average)

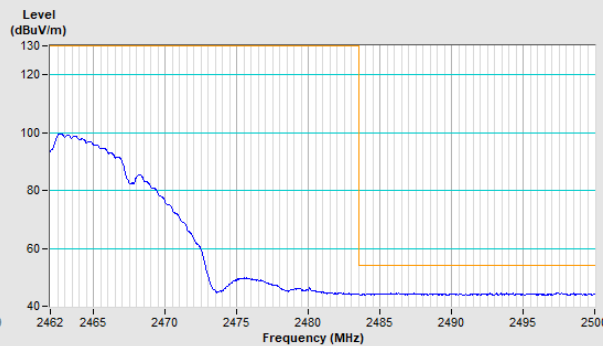


802.11b Channel 11

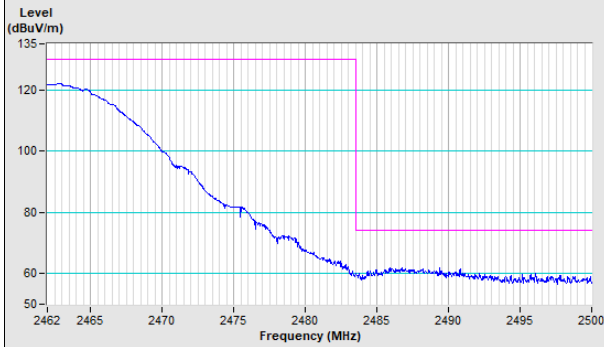
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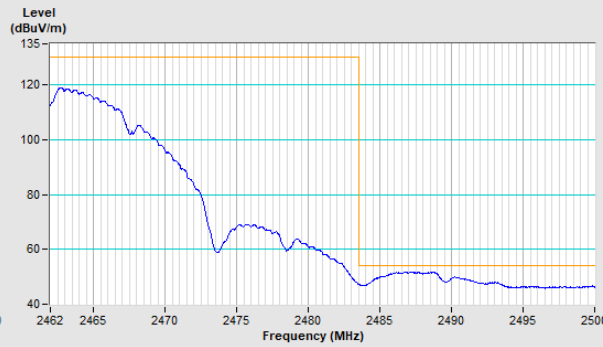
Horizontal (Average)



Vertical (Peak)

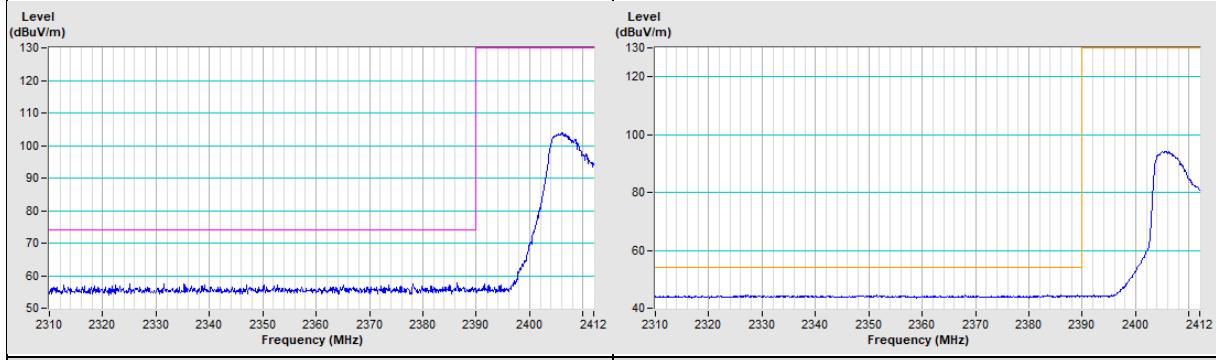


Vertical (Average)

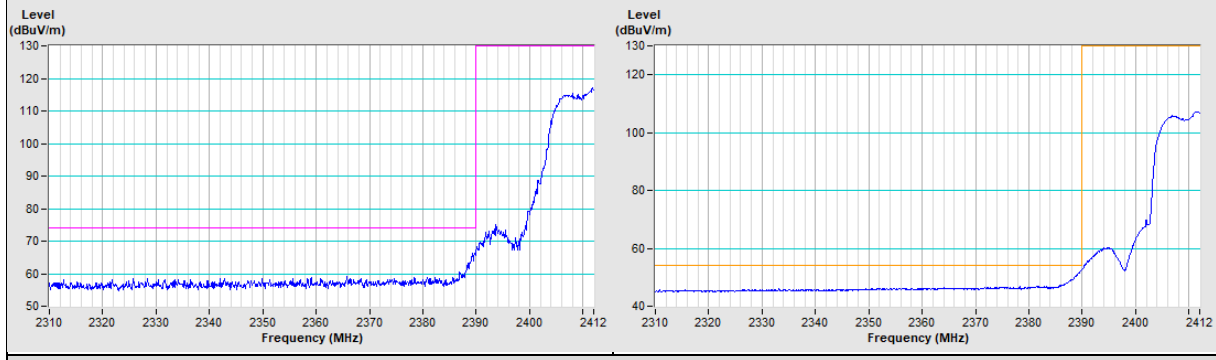


802.11g Channel 1

Horizontal (Peak)	Horizontal (Average)
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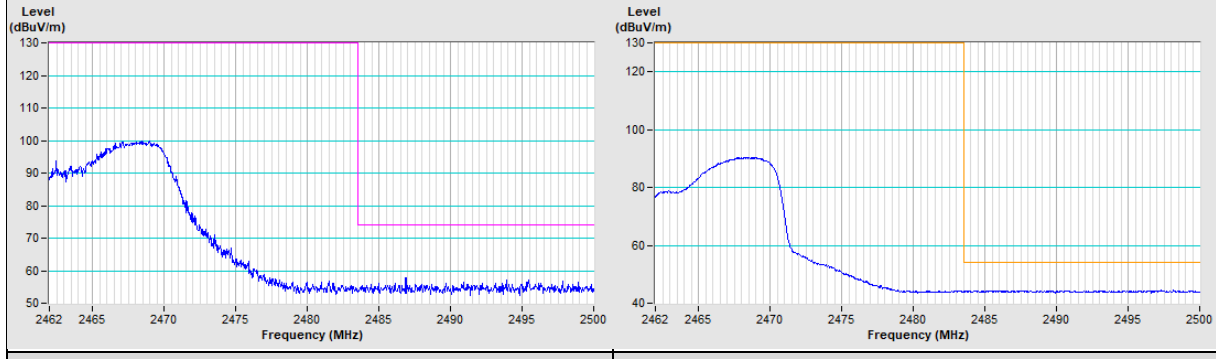


Vertical (Peak)	Vertical (Average)
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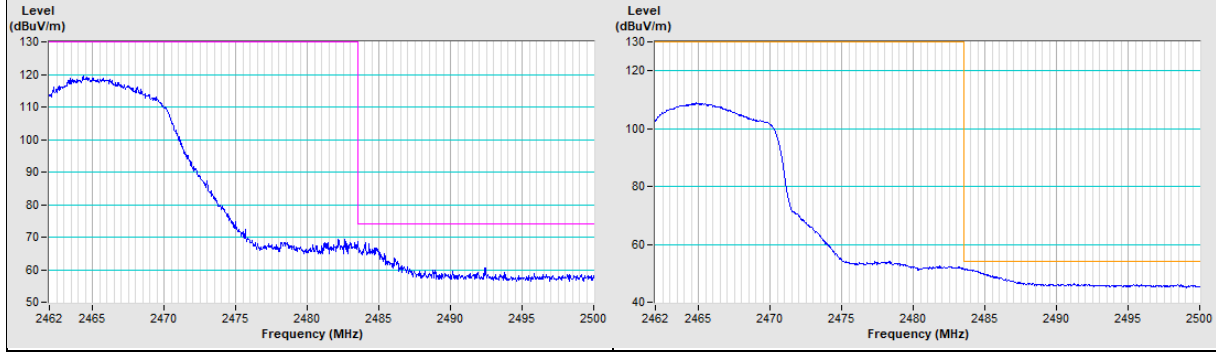


802.11g Channel 11

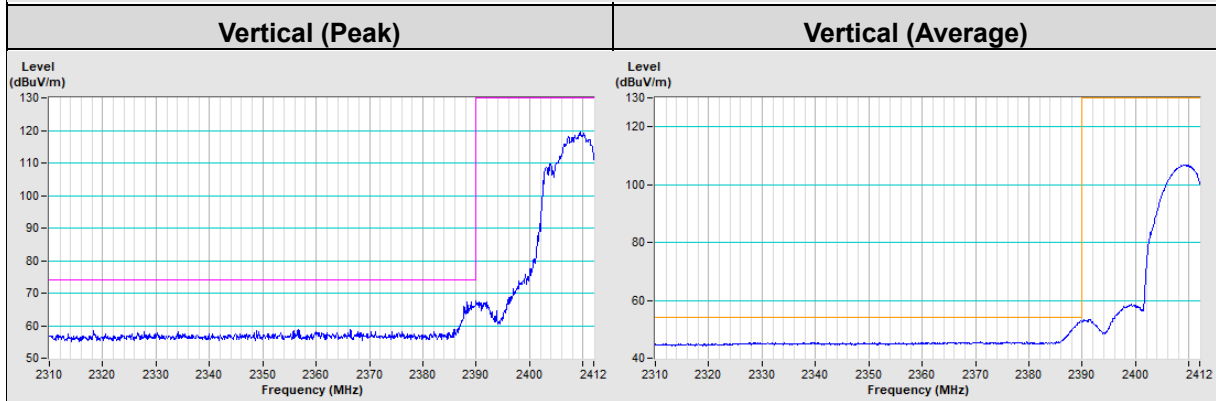
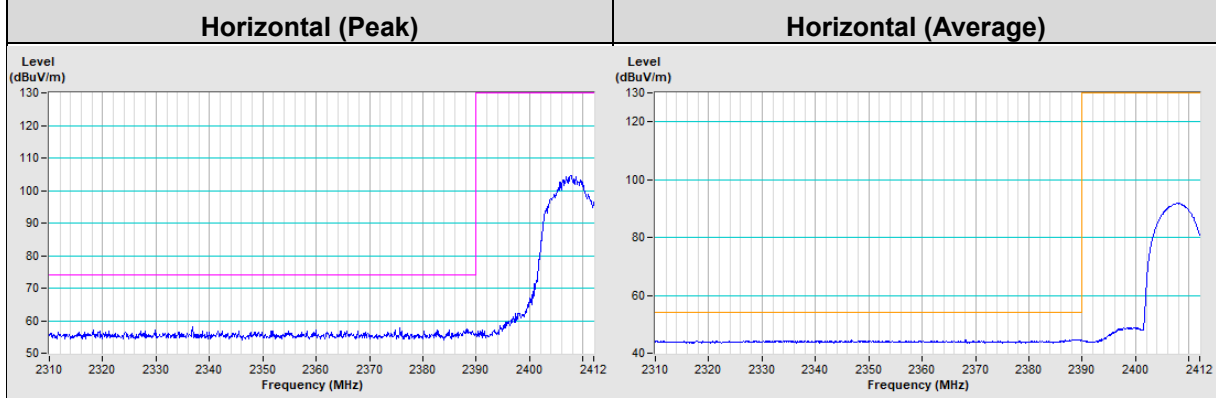
Horizontal (Peak)	Horizontal (Average)
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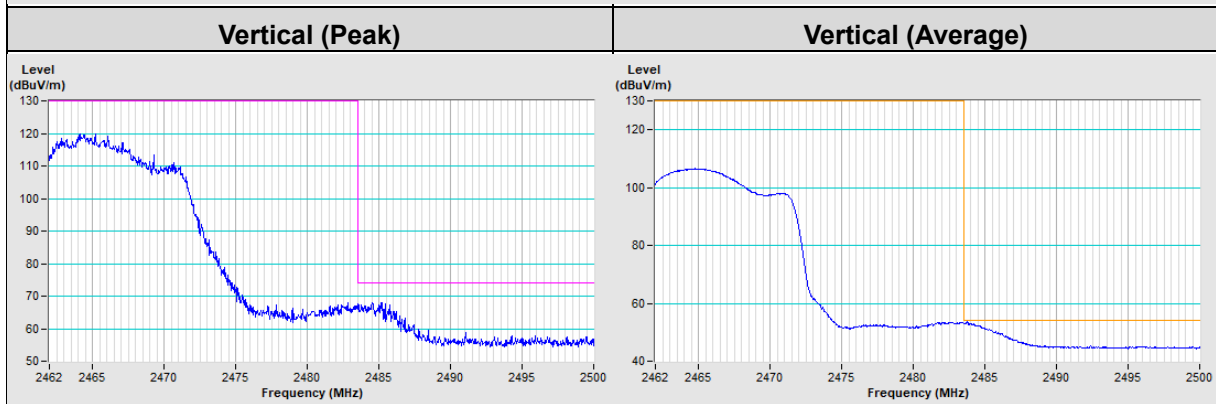
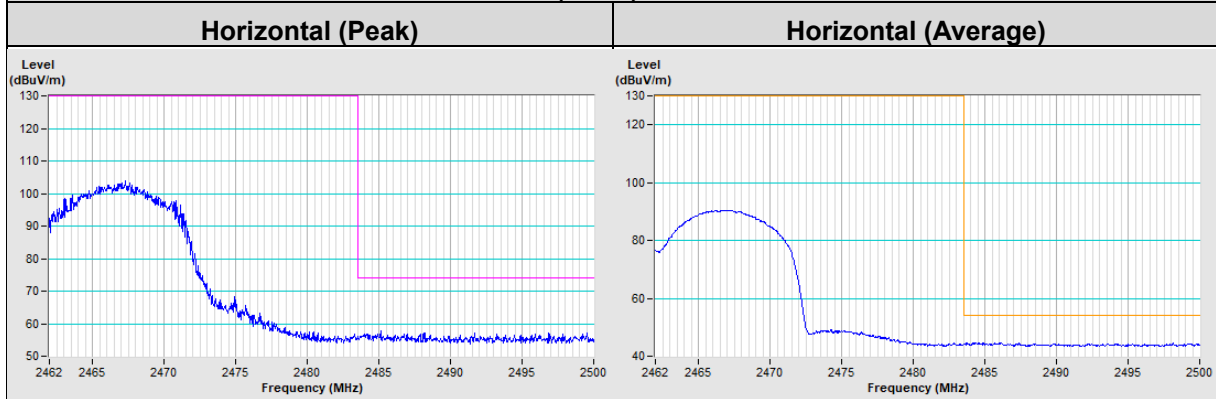
Vertical (Peak)	Vertical (Average)
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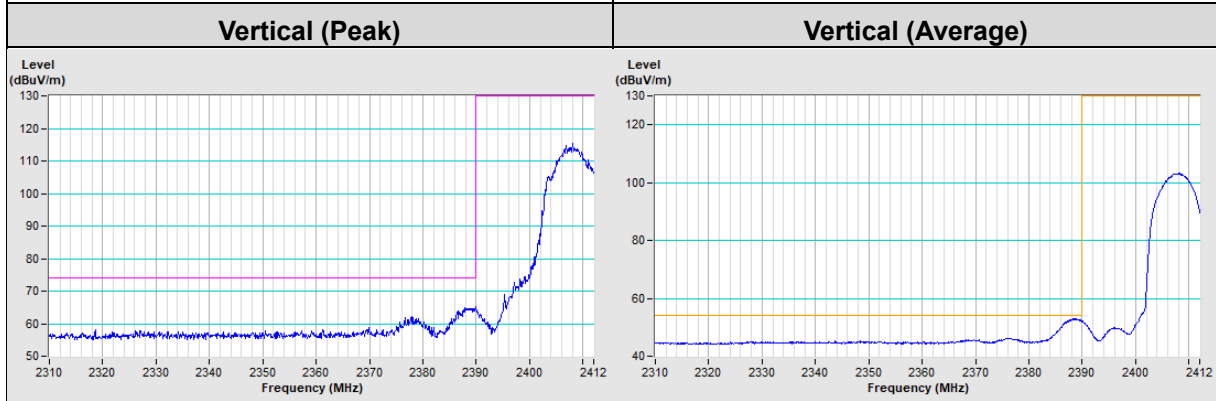
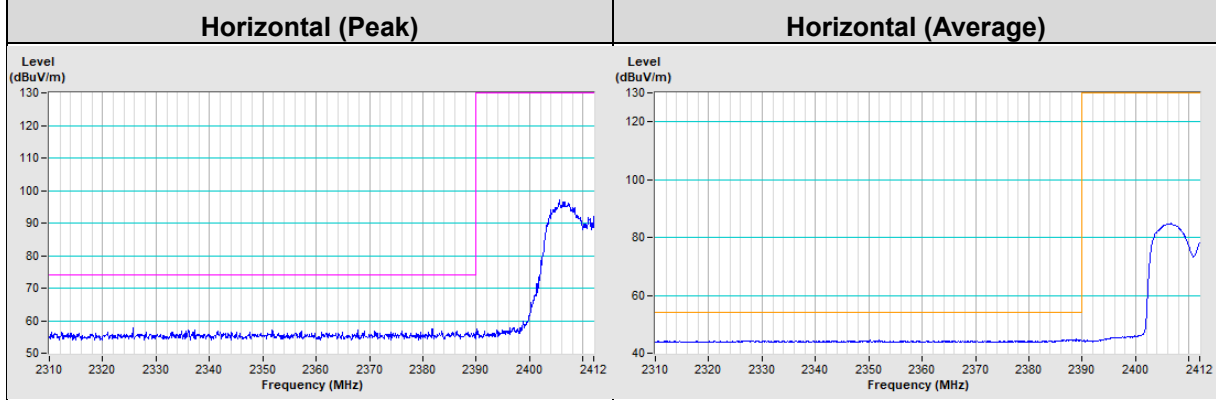
802.11ax (HE20) Channel 1



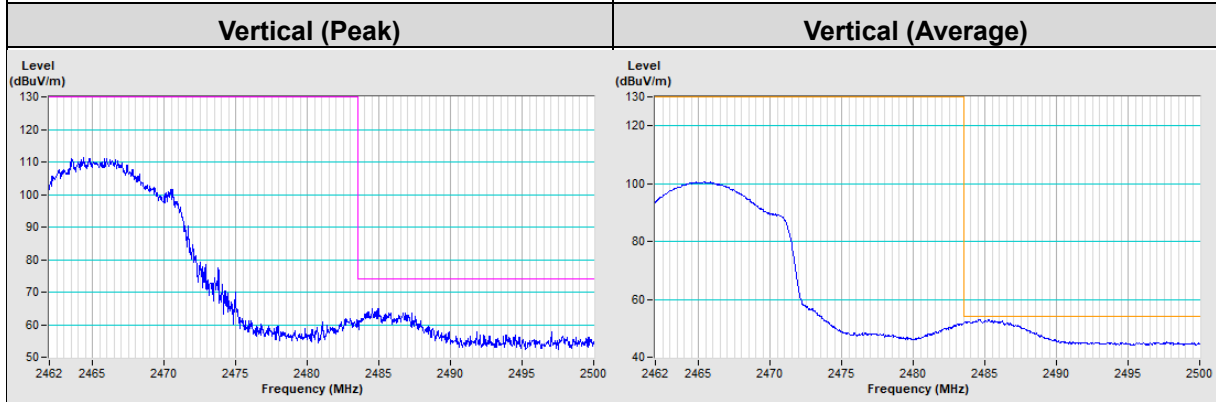
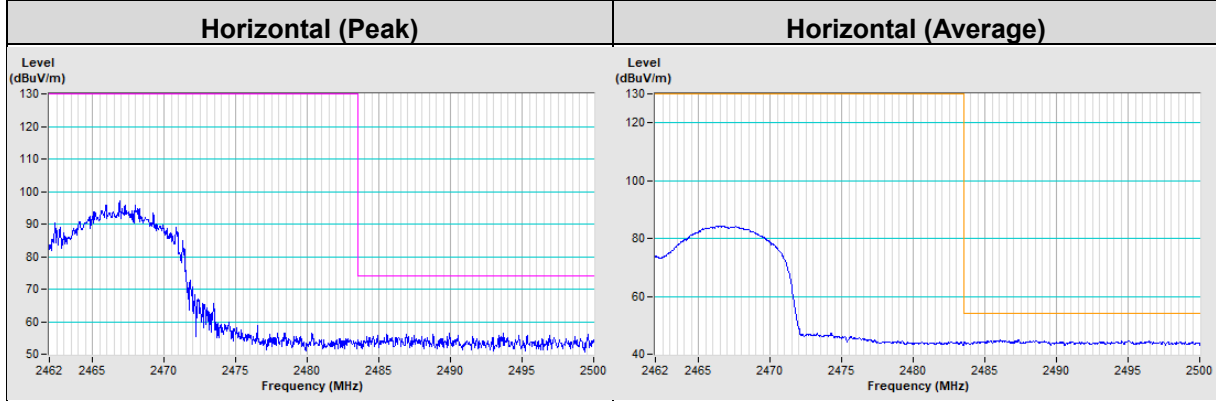
802.11ax (HE20) Channel 11



802.11ax (HE40) Channel 3



802.11ax (HE40) Channel 9



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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Web Site: <http://ee.bureauveritas.com.tw>

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

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