

FCC Test Report (WLAN)

Report No.: RFBHQC-WTW-P22030336-1

FCC ID: 2AQ68RLP0003

Test Model: RLP0003

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Test Date: May 14 ~ Jun. 23, 2022

Issued Date: Jun. 30, 2022

Applicant: Hon Lin Technology Co., Ltd.

Address: 11F, No. 32, Jihu Rd., Neihu Dist., Taipei City 114, Taiwan R.O.C.

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

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

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

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



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Release Control Record

Issue No.	Description	Date Issued
RFBHQC-WTW-P22030336-1	Original release	Jun. 30, 2022

1 Certificate of Conformity

Product: Wi-Fi 6E BT5.2 WLAN Module

Brand: Foxconn

Test Model: RLP0003

Sample Status: Engineering sample

Applicant: Hon Lin Technology Co., Ltd.

Test Date: May 14 ~ Jun. 23, 2022

Standards: 47 CFR FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10:2013

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

Prepared by : Celine Chou , **Date:** Jun. 30, 2022
Celine Chou / Senior Specialist

Approved by : Jeremy Lin , **Date:** Jun. 30, 2022
Jeremy Lin / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(9)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -1.68dB at 0.27400MHz.
15.407(b) (1/2/3/4(i/ii)/9)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.7dB at 5150.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	N/A	For U-NII-3 Band only
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex (MHF 4L) 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	Frequency	Expanded Uncertainty (k=2) (\pm)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	2.93 dB
	200MHz ~ 1000MHz	2.95 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wi-Fi 6E BT5.2 WLAN Module
Brand	Foxconn
Test Model	RLP0003
Sample Status	Engineering sample
Power Supply Rating	3.3Vdc from host equipment
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 1733.3Mbps 802.11ax: up to 2402Mbps
Operating Frequency	5180 ~ 5250MHz
Number of Channel	5180 ~ 5250MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 4 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 2 802.11ac (VHT80), 802.11ax (HE80): 1
Output Power	153.082mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	NA
Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the original report (BV CPS report no.: RF201119E01-1) are changed FCC ID, applicant, brand name, model name and added antenna. All test data for U-NII-1 band have been an addendum test to this report, the other test data please refer to original test report.
2. This device of WLAN (2.4GHz & 5GHz U-NII-1 Band) can support hotspot mode.
3. Simultaneously transmission condition.

Condition	Technology	
1	WLAN (2.4GHz)	WLAN (6GHz)
2	WLAN (2.4GHz)	WLAN (5GHz)
3	WLAN (2.4GHz)	WLAN (5.9GHz)
4	WLAN (6GHz)	Bluetooth
5	WLAN (5GHz)	Bluetooth
6	WLAN (5.9GHz)	Bluetooth

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

4. The device of WLAN (2.4GHz) and Bluetooth technology can't transmit simultaneously, it was used timely shared coexistence technology.

5. The module has two variant designs as following table:

SKU No.	Description
SKU #1	M.2 2230 E-key
SKU #2	M.2 2230 AE-key

From the above variants designs, the worst case was found in SKU #1. Therefore only the test data of the mode was recorded in this report.

6. The product provides option to depopulate external LNA (Low-Noise amplifier) from 5GHz/6GHz receive path. This test report covers variation of with/without external LNA and test was conducted to confirm not change in RF compliance and EMC. And worst case was found in without external LNA.

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

Modulation Mode	Tx & Rx Configuration	
802.11a	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
802.11ac (VHT20)	2TX	2RX
802.11ac (VHT40)	2TX	2RX
802.11ac (VHT80)	2TX	2RX
802.11ac (VHT160)	2TX	2RX
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX
802.11ax (HE80)	2TX	2RX
802.11ax (HE160)	2TX	2RX
802.11ax (RU26/52/106/242/484/996/1992)	2TX	2RX

Note:

1. The EUT support Beamforming and non-beamforming mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data (Beamforming mode) were presented in test report.
2. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz), 802.11ac mode for 20MHz (40MHz, 80MHz, 160MHz) and 802.11ax mode for 20MHz (40MHz, 80MHz, 160MHz), therefore the manufacturer will control the power for 802.11n/ac mode is the same as the 802.11ax mode or more lower than it and investigated worst case to representative mode in test report. (Final test mode refer to section 3.3.1)

3.2 Description of Antenna

The antenna gain was declared by client; please refer to the following table:

Antenna Set	RF Chain No.	Brand	Model	Antenna Net Gain (dBi)	Frequency Range (GHz)	Cable Loss (dB)	Antenna Type	Connector Type	Cable Length
1	Chain0/1	HONGBO	260-25094	3.53	2.40~2.4835	0.76	PIFA	i-pex (MHF 4L)	300mm
				3.06	5.150~5.250	1.16			
				3.07	5.250~5.350	1.18			
				4.81	5.470~5.725	1.20			
				4.20	5.725~5.850	1.27			
2	Chain0/1	HONGBO	260-25083	5.09	5.850~5.895	1.29	PIFA	i-pex (MHF 4L)	300mm
				5.14	5.925~6.425	1.32			
				5.09	6.425~6.525	1.35			
				5.16	6.525~6.875	1.40			
				5.12	6.875~7.125	1.45			
3	Chain0/1	HONGBO	260-25084	3.22	2.40~2.4835	0.50	Monopole	i-pex (MHF 4L)	200mm
				3.35	5.150~5.250	0.76			
				3.42	5.250~5.350	0.78			
				4.77	5.470~5.725	0.81			
				4.72	5.725~5.850	0.85			
				4.71	5.850~5.895	0.86			
				4.75	5.925~6.425	0.87			
				4.29	6.425~6.525	0.91			
				4.81	6.525~6.875	0.96			
				4.74	6.875~7.125	0.98			
4	Chain0/1	Auden	ANTRG6U123-1801 / ANTRG6U123-1802	5.13 / 4.64	2.40~2.4835	-	PIFA (Slot)	i-pex (MHF 4L)	460mm / 740mm
				2.70 / 3.36	5.150~5.250				
				2.70 / 3.07	5.250~5.350				
				2.50 / 1.08	5.470~5.725				
				2.68 / 0.42	5.725~5.850				
				2.68 / 0.42	5.850~5.895				
				2.18 / 1.20	5.925~6.425				
				1.98 / 0.59	6.425~6.525				
				2.42 / 1.72	6.525~6.875				
				1.48 / 0.62	6.875~7.125				

Note:

1. Antenna Set 4 is the new antenna to be applied for this time.
2. The above Antenna information refers to the manufacturer's antenna specifications, the laboratory shall not be held responsible.

3.3 Description of Test Modes

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency
42	5210MHz

1 straddle channel is provided for 802.11ac (VHT160), 802.11ax (HE160):

Channel	Frequency
50	5250 MHz

3.3.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

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

Note: Radiated emission test (below 1GHz) and power line conducted emission test items chosen the worst maximum power.

Radiated Emission Test (Above 1GHz):

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

Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate Parameter	RU Configuration		
802.11a	5180-5250	36 to 48	36, 40, 48	OFDM	6Mb/s	-		
802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	MCS0	-		
802.11ax (HE40)		38 to 46	38, 46	OFDMA	MCS0	-		
802.11ax (HE80)		42	42	OFDMA	MCS0	-		
802.11ax (HE160)		50	50	OFDMA	MCS0	-		
Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate Parameter	RU Configuration		
20MHz Preamble	5180-5250	36 to 64	36	OFDMA	MCS0	26/0	52/37	106/53
			40			26/0	52/37	106/53
			48			26/8	52/40	106/54

Radiated Emission Test (Below 1GHz):

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

Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate Parameter	RU Configuration
802.11a	5180-5250	36 to 48	40	OFDM	6Mb/s	-

Power Line Conducted Emission Test:

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

Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate Parameter	RU Configuration
802.11a	5180-5250	36 to 48	40	OFDM	6Mb/s	-

Antenna Port Conducted Measurement:

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

Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate Parameter	RU Configuration		
802.11a	5180-5250	36 to 48	36, 40, 48	OFDM	6Mb/s	-		
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	MCS0	-		
802.11ac (VHT40)		38 to 46	38, 46	OFDM	MCS0	-		
802.11ac (VHT80)		42	42	OFDM	MCS0	-		
802.11ac (VHT160)		50	50	OFDM	MCS0	-		
802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	MCS0	-		
802.11ax (HE40)		38 to 46	38, 46	OFDMA	MCS0	-		
802.11ax (HE80)		42	42	OFDMA	MCS0	-		
802.11ax (HE160)		50	50	OFDMA	MCS0	-		
Mode		Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate Parameter	RU Configuration	
20MHz Preamble	5180-5250	36 to 64	36	OFDMA	MCS0	RU26	RU52	RU106
			40			26/0	52/37	106/53
			48			26/0	52/37	106/53
						26/8	52/40	106/54

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE \geq 1G	19 deg. C, 68% RH 23 deg. C, 64% RH	120Vac, 60Hz	Thomas Cheng Vincent Cgen
RE $<$ 1G	25 deg. C, 60% RH	120Vac, 60Hz	Jisyong Wang
PLC	23 deg. C, 68% RH	120Vac, 60Hz	Thomas Cheng
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Jisyong Wang

3.4 Duty Cycle of Test Signal

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

802.11a: Duty cycle = $1.974/2.000 = 0.987$

802.11ax (HE20): Duty cycle = $5.348/5.375 = 0.995$

802.11ax (HE40): Duty cycle = $5.400/5.440 = 0.993$

802.11ax (HE80): Duty cycle = $3.688/3.718 = 0.992$

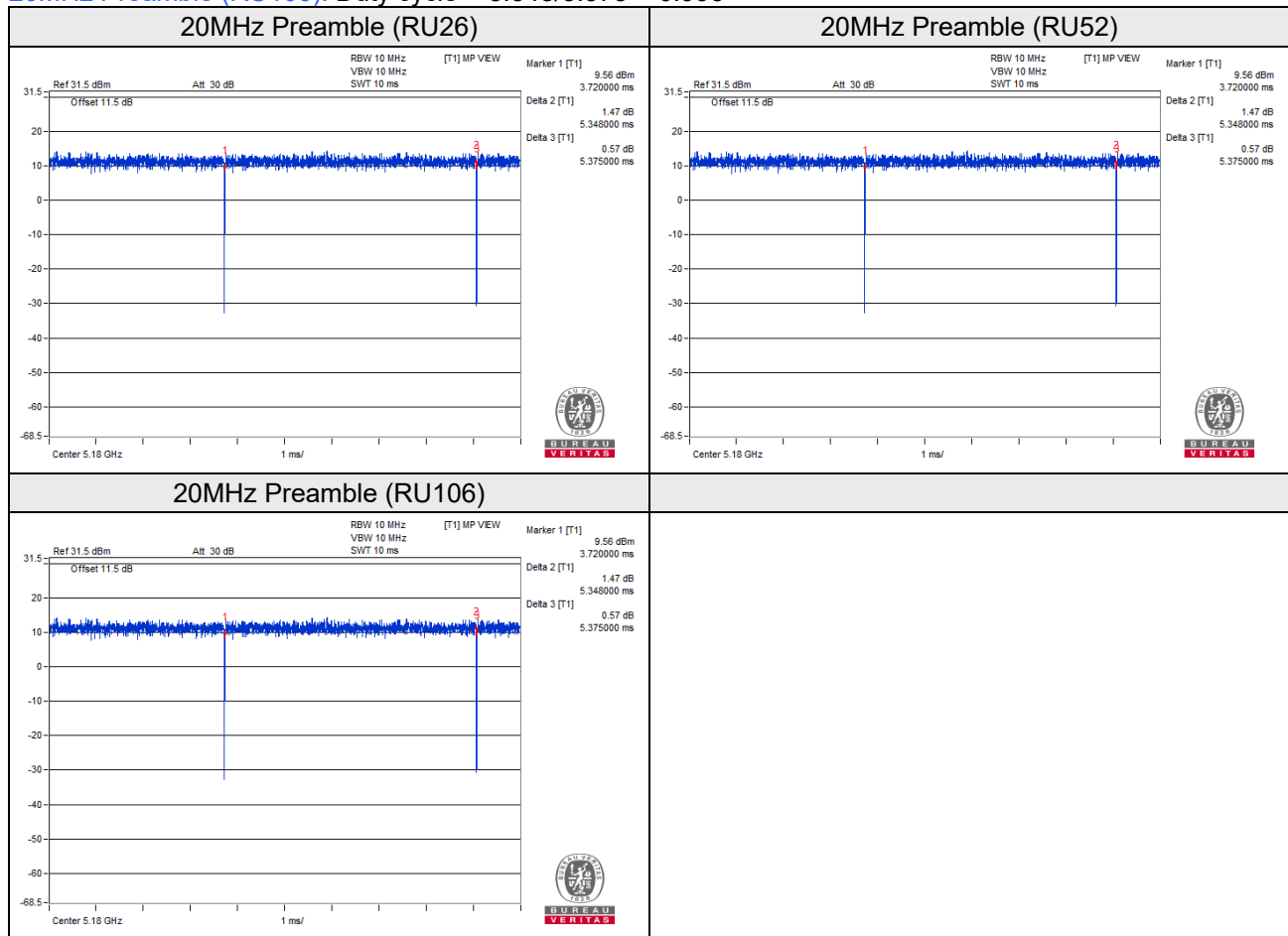
802.11ax (HE160): Duty cycle = $2.155/2.182 = 0.988$



20MHz Preamble (RU26): Duty cycle = $5.348/5.375 = 0.995$

20MHz Preamble (RU52): Duty cycle = $5.348/5.375 = 0.995$

20MHz Preamble (RU106): Duty cycle = $5.348/5.375 = 0.995$



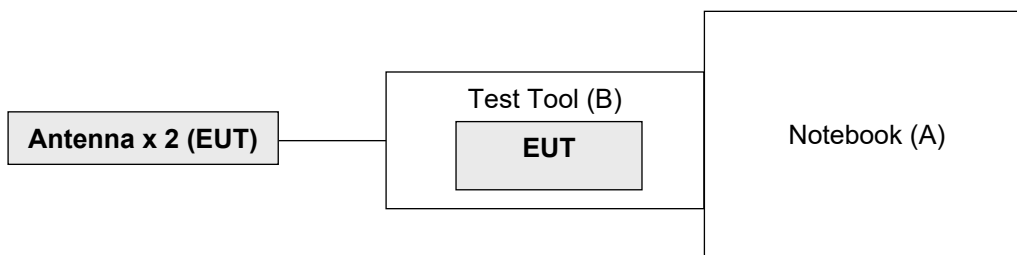
3.5 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	Tongfang	GK5NPFO	NA	FCC DoC Approved	Provided by client
B.	Test Tool	Foxconn	NA	NA	NA	Provided by client

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

3.5.1 Configuration of System under Test



3.6 General Description of Applied Standards and References

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

Test standard:

FCC Part 15, Subpart E (15.407)

ANSI C63.10:2013

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

References Test Guidance:

KDB 789033 D02 General UNII Test Procedure New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement (Radiated Versus Conducted)

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

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

Note:

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

Limits of unwanted emission out of the restricted bands

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK: 74 (dBµV/m)	AV: 54 (dBµV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2(dBµV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	15.407(b)(4)(i)	PK: -27 (dBm/MHz) ^{*1} PK: 10 (dBm/MHz) ^{*2} PK: 15.6 (dBm/MHz) ^{*3} PK: 27 (dBm/MHz) ^{*4}	PK: 68.2(dBµV/m) ^{*1} PK: 105.2 (dBµV/m) ^{*2} PK: 110.8(dBµV/m) ^{*3} PK: 122.2 (dBµV/m) ^{*4}
^{*1} beyond 75 MHz or more above of the band edge.		^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.		^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000 \sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 03, 2021	Dec. 02, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 11, 2022	Apr. 10, 2023
Broadband Horn Antenna SCHWARZBECK	BBHA 9170	148	Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 14, 2021	Nov. 13, 2022
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Oct. 28, 2021	Oct. 27, 2022
Fixed Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	Apr. 05, 2022	Apr. 04, 2023
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 25, 2021	Nov. 24, 2022
Loop Antenna TESEQ	HLA 6121	45745	Jul. 21, 2021	Jul. 20, 2022
Preamplifier EMCI	EMC001340	980201	Sep. 15, 2021	Sep. 14, 2022
Preamplifier EMCI	EMC 012645	980115	Oct. 05, 2021	Oct. 04, 2022
Preamplifier EMCI	EMC 184045	980116	Oct. 05, 2021	Oct. 04, 2022
Preamplifier EMCI	EMC 330H	980112	Oct. 05, 2021	Oct. 04, 2022
Peak Power Analyzer KEYSIGHT	8990B	MY51000485	Jan. 18, 2022	Jan. 17, 2023
Wideband Power Sensor KEYSIGHT	N1923A	MY58020002	Jan. 17, 2022	Jan. 16, 2023
RF Coaxial Cable EMCI	EMC104-SM-SM-800 0	171005	Oct. 05, 2021	Oct. 04, 2022
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000 (140807)	Oct. 05, 2021	Oct. 04, 2022
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 05, 2021	Oct. 04, 2022
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 10.

4.1.3 Test Procedures

Following FCC KDB 789033 D02 General UNII Test Procedures:
Radiated versus Conducted Measurements.

The unwanted emission limits in both the restricted and non-restricted bands are based on antenna-port conducted measurements in conjunction with cabinet emissions tests are permitted to demonstrate compliance.

The following steps was performed:

- a. Cabinet emissions measurements. Radiated measurement was performed to ensure that cabinet emissions are below the emission limits. For the cabinet-emission measurements the antenna was replaced by a termination matching the nominal impedance of the antenna.
- b. Conducted tests was performed using equipment that matches the nominal impedance of the antenna assembly used with the EUT
- c. EIRP calculation. A value representative of an upper bound on out-of-band antenna gain (in dBi) shall be added to the measured antenna-port conducted emission power to compute EIRP within the specified measurement bandwidth. (For emissions in the restricted bands, additional calculations are required to convert EIRP to field strength at the specified distance.) The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater
- d. EIRP adjustments for multiple outputs. (Follow the procedures specified in FCC KDB Publication 662911)
- e. For all of Radiation emission test

For Radiated emission below 30MHz

- e-1.1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- e-1.2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- e-1.3. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- e-1.4. 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-1.5. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.
2. KDB 414788 OATS and Chamber Correlation Justification
 - Based on FCC 15.31(f)(2) : measurements may be performed at a distance closer than that specified in the regulations; however, an attempts should be made to avoid making measurements in the near field.
 - OATs and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

For Radiated emission above 30MHz

- e-2.1. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- e-2.2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- e-2.3. 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.
- e-2.4. 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-2.5. 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.
- e-2.6. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

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

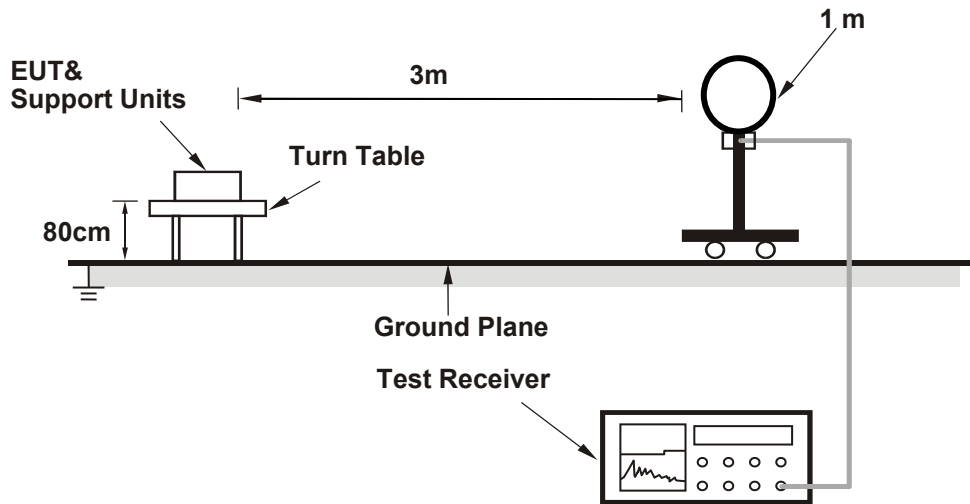
4.1.4 Deviation from Test Standard

No deviation.

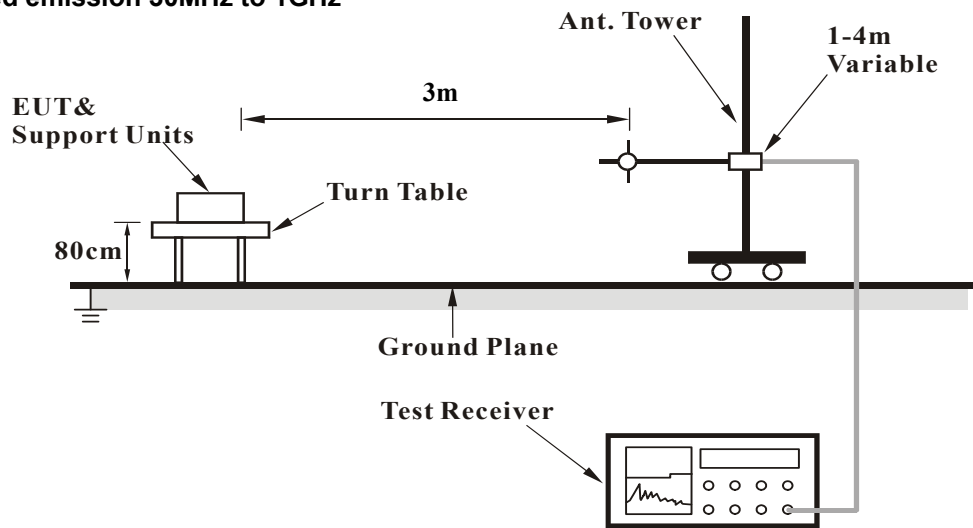
4.1.5 Test Setup

For Radiated Configuration:

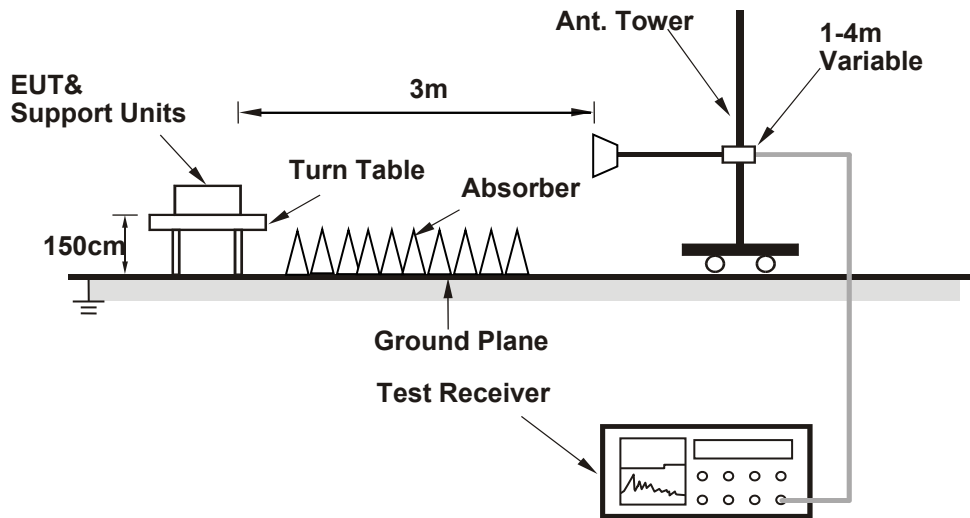
For Radiated emission below 30MHz



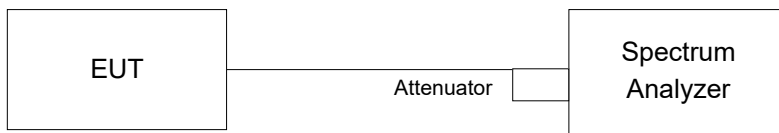
For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For Conducted Configuration:



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

4.1.6 EUT Operating Conditions

- a. Connected the EUT with the Laptop which is placed on the testing table.
- b. Controlling software (QRCT 4.0 Version 4.0.00189.0) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results (Radiated Measurement)

Radiated test data with 50ohm terminator on antenna port, please refer to original test report.

4.1.8 Test Results (Conducted Measurement)

Radiated versus Conducted Measurement	
<input checked="" type="checkbox"/> Conducted measurement	<input type="checkbox"/> Radiated measurement
<p><u>For Radiated measurement:</u> The level of unwanted emissions was measured when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation)</p> <p><u>For Conducted measurement:</u> The level of unwanted emissions was measured as their power in a specified load (conducted spurious emissions).</p>	

Conducted Measurement Factor
<p>a. The composite gain will be used when signal support the correlated signal.</p> <p>b. For the out of band spurious the gain for the specific band may have been used rather than the highest gain across all bands.</p> <p>c. For the band edge the gain for the specific band may have been used.</p> <p>d. In restricted bands below 1000 MHz, add upper bound on ground plane reflection: For $f = 30 - 1000$ MHz, add 4.7 dB.</p> <p>Note: The conducted emission test was considered some factor to compute test result.</p>

Above 1GHz data:

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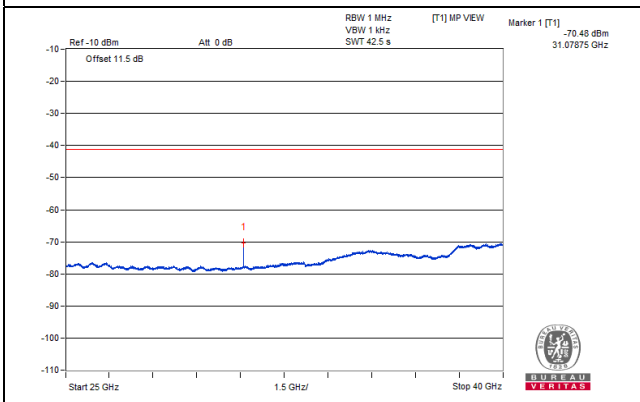
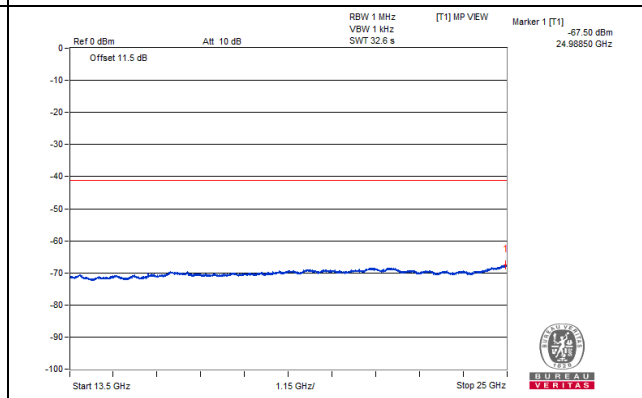
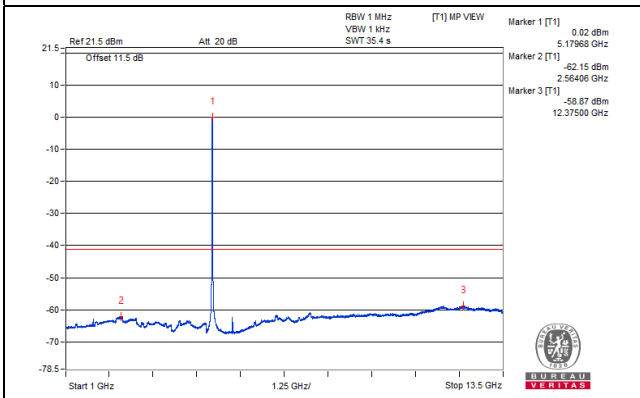
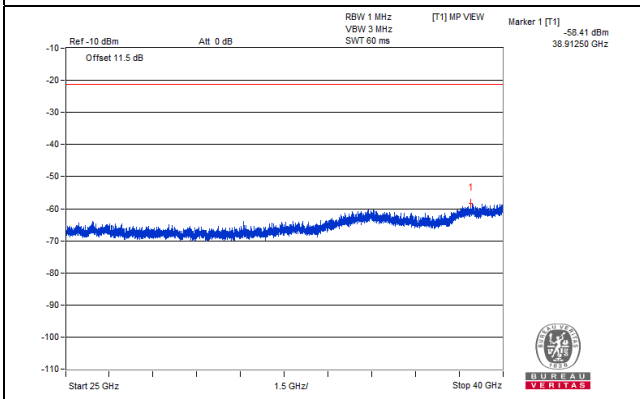
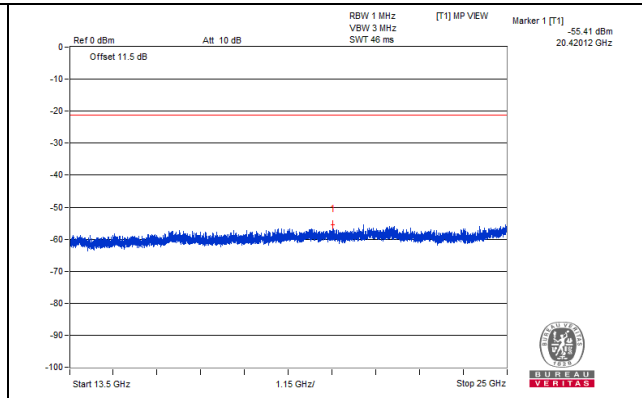
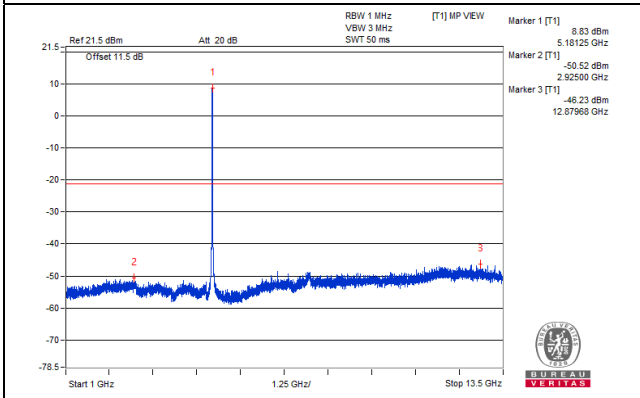
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3460.93	53.11 PK	68.20	-15.09	-52.72	-53.43	7.90	-42.15
2	#6906.25	55.92 PK	68.20	-12.28	-53.93	-48.29	7.90	-39.34
3	#10353.12	56.16 PK	68.20	-12.04	-49.25	-50.93	7.90	-39.10
4	15529.75	47.23 PK	74.00	-26.77	-59.61	-58.36	7.90	-48.03
5	15544.12	35.88 AV	54.00	-18.12	-70.52	-70.07	7.90	-59.38

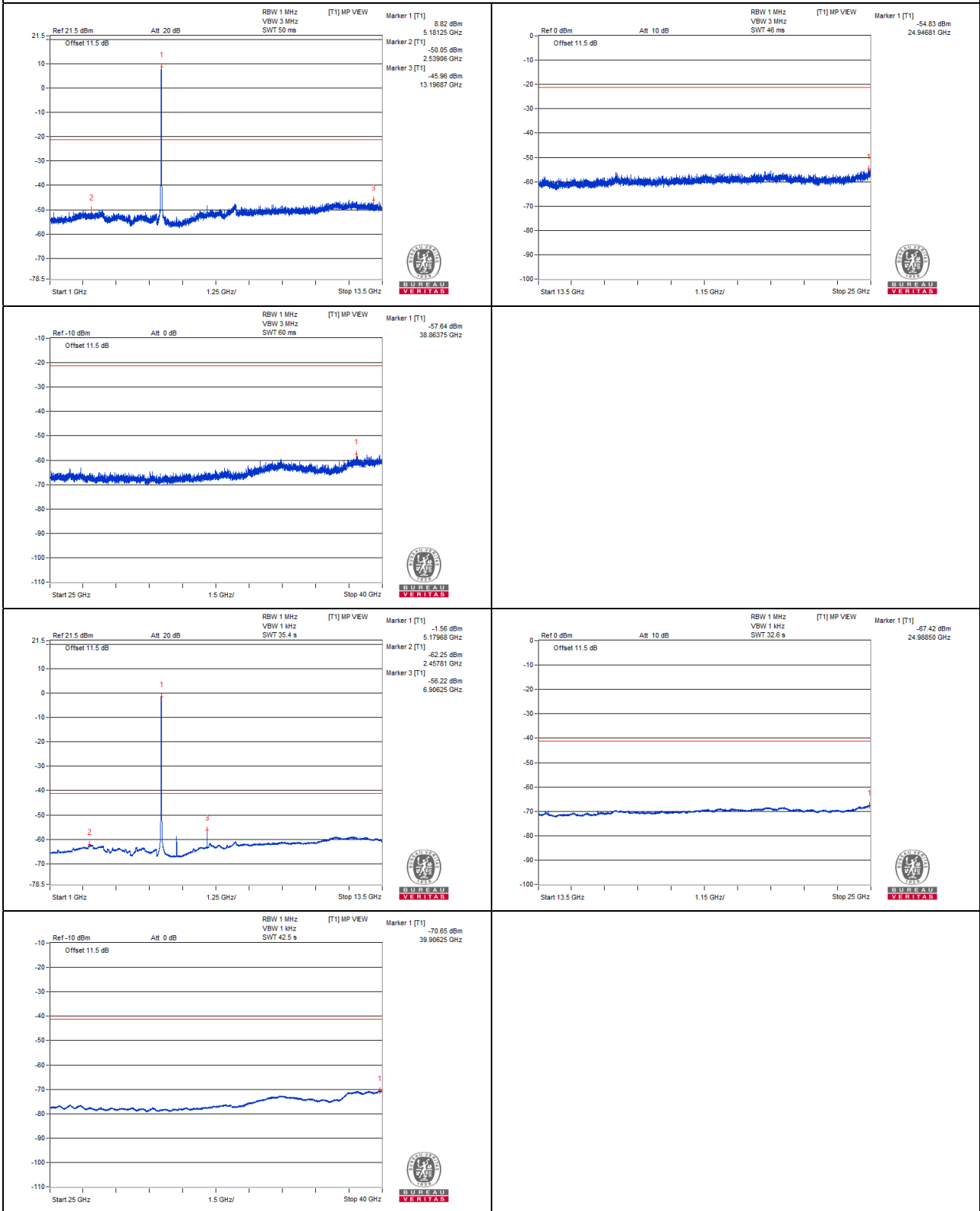
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1

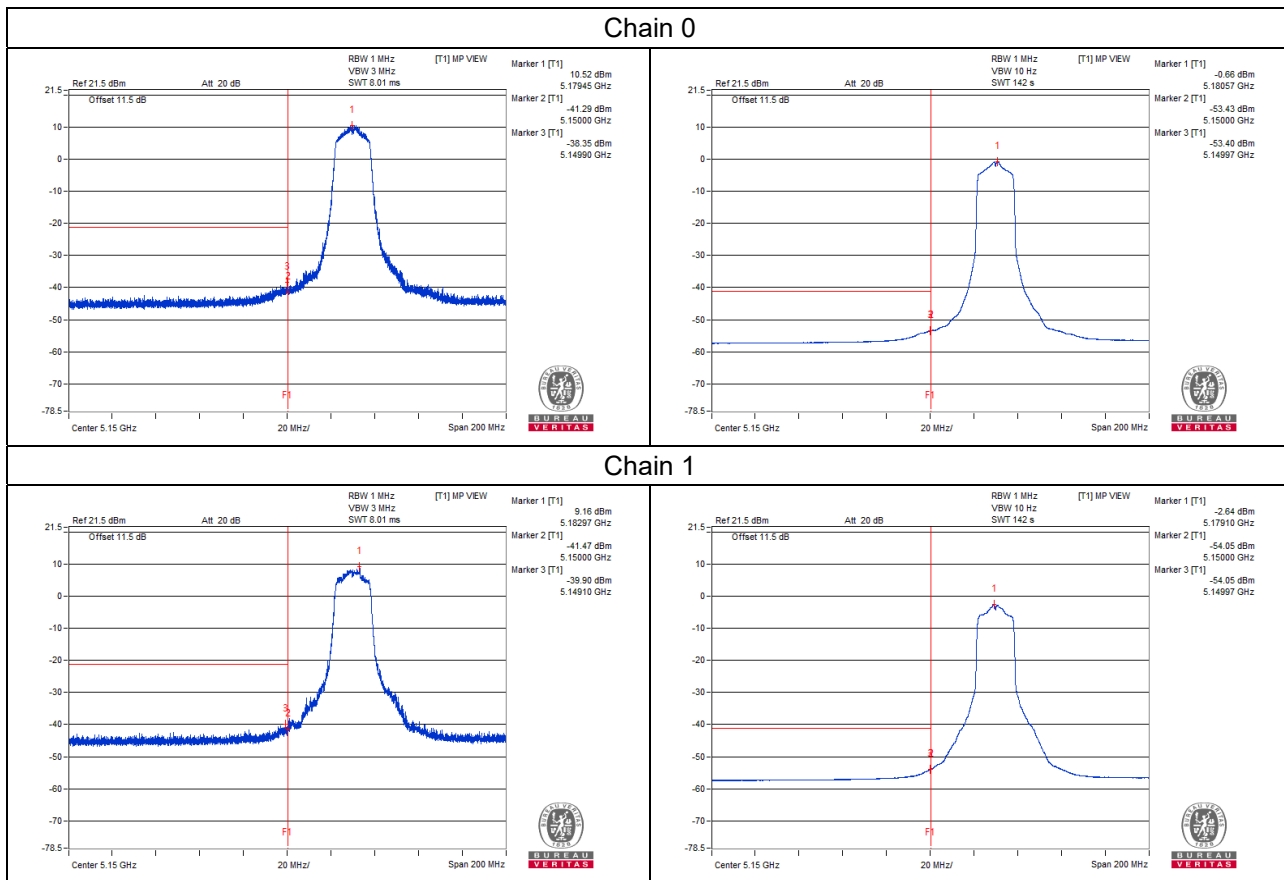


Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5149.90	64.55 PK	74.00	-9.45	-38.35	-41.91	6.05	-30.71
2	5149.97	50.61 AV	54.00	-3.39	-53.40	-54.05	6.05	-44.65

Note :

- Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.



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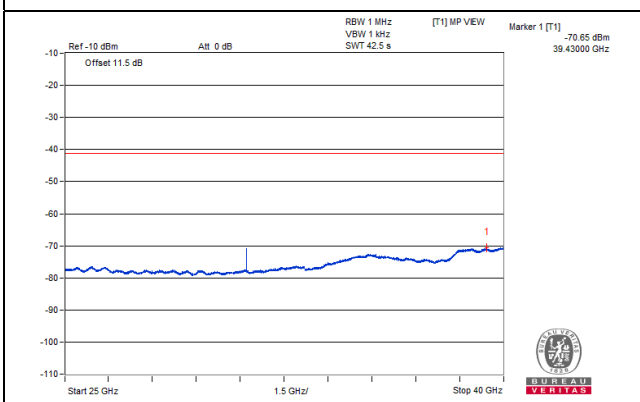
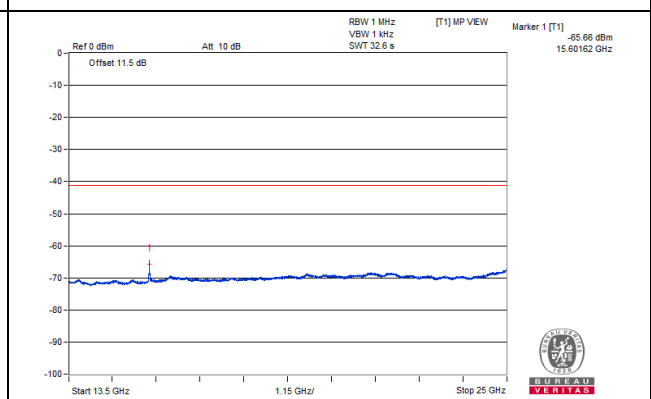
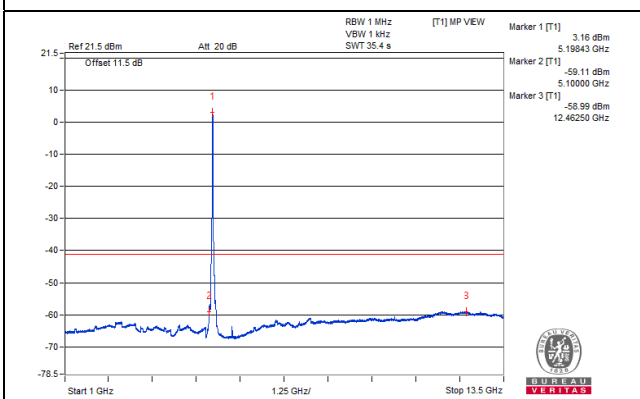
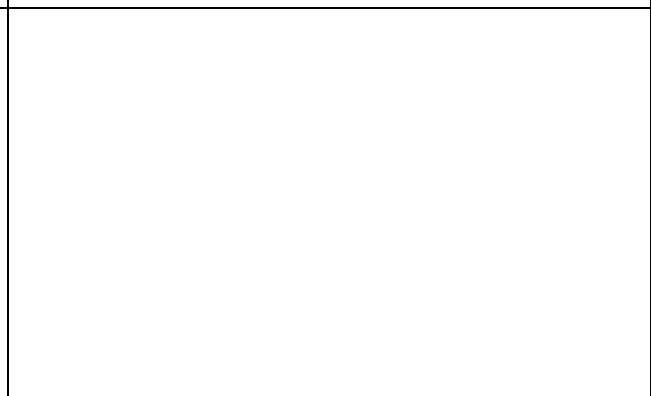
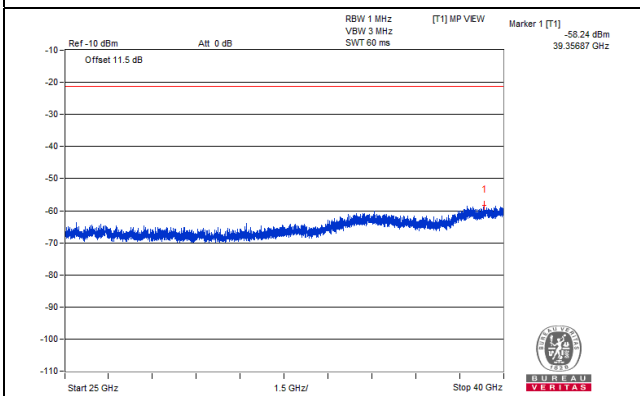
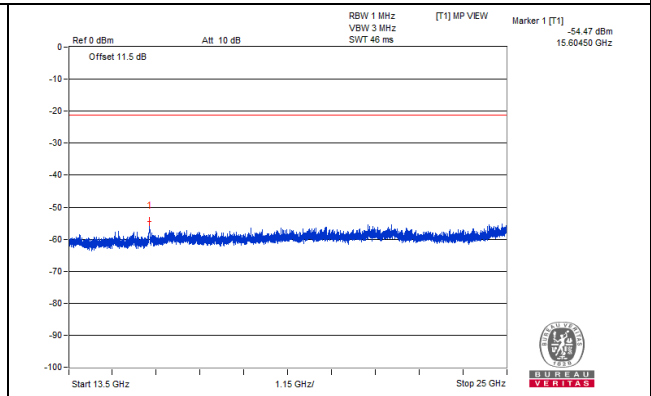
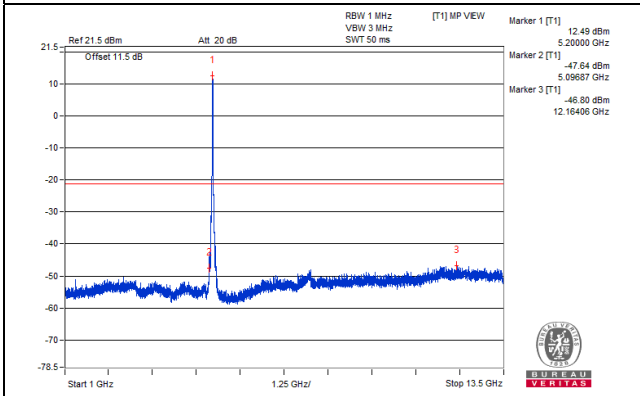
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3475.00	53.44 PK	68.20	-14.76	-52.27	-53.25	7.90	-41.82
2	#6946.87	54.92 PK	68.20	-13.28	-50.47	-52.20	7.90	-40.34
3	#10415.62	56.3 PK	68.20	-11.90	-52.33	-48.31	7.90	-38.96
4	15604.50	50.43 PK	74.00	-23.57	-54.47	-57.54	7.90	-44.83
5	15598.75	39.24 AV	54.00	-14.76	-66.26	-67.73	7.90	-56.02

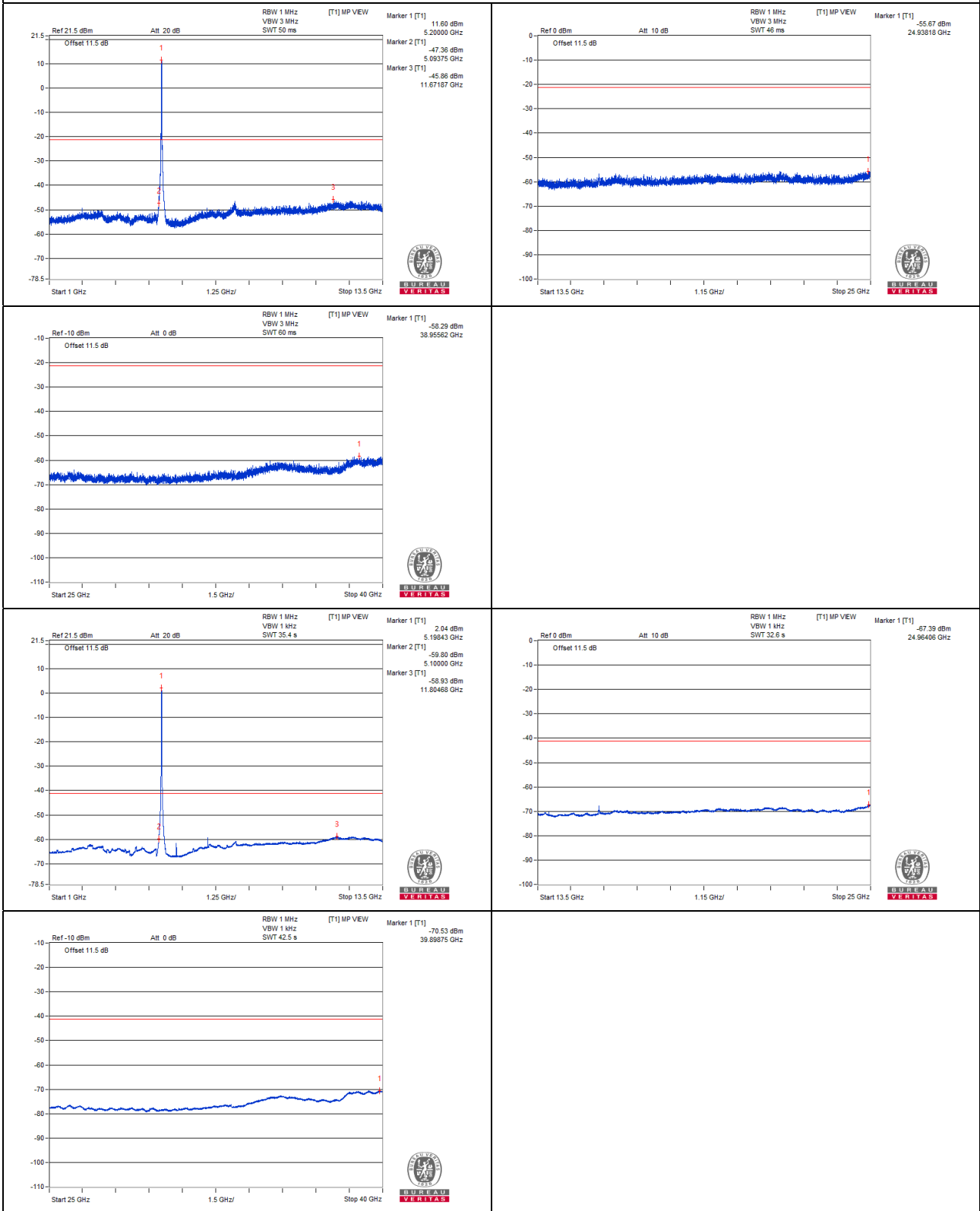
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1



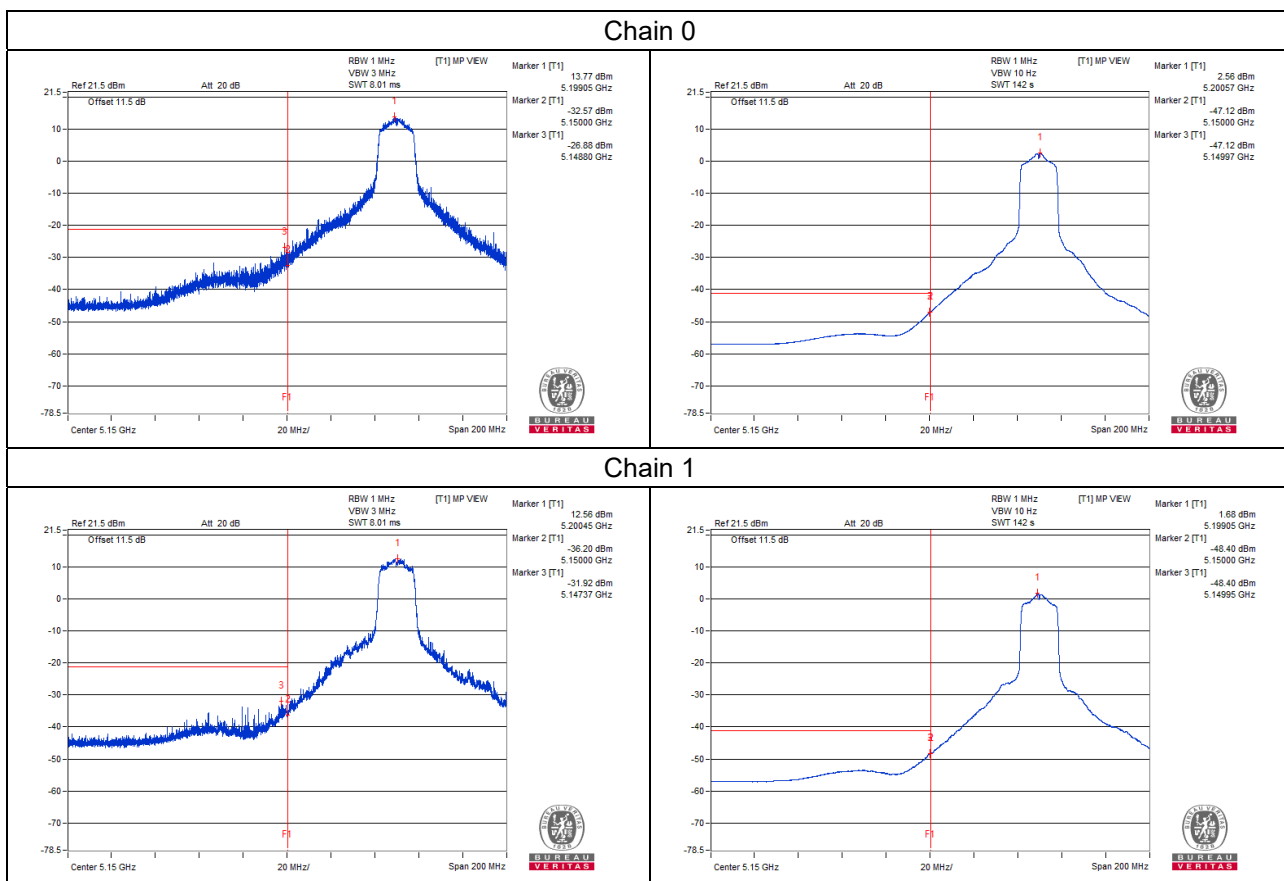
Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5148.80	75.02 PK	74.00	*1.02	-26.88	-35.24	6.05	-20.24
2	5149.95	56.61 AV	54.00	*2.61	-47.12	-48.40	6.05	-38.65

Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
 d = measurement distance in 3 meters.

* The unwanted emission was verified and the test result was passed by radiated measurement.
 (Please refer Appendix A)



802.11a - Channel 48

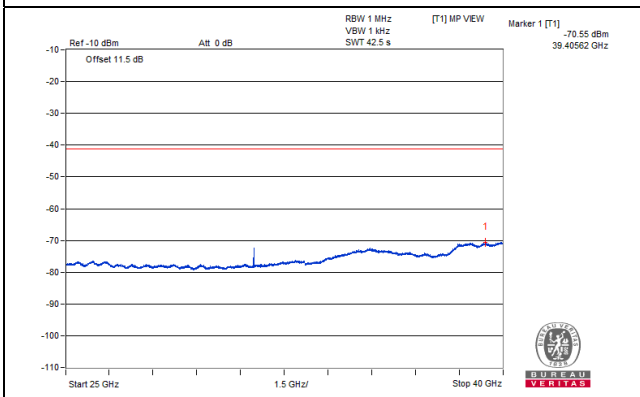
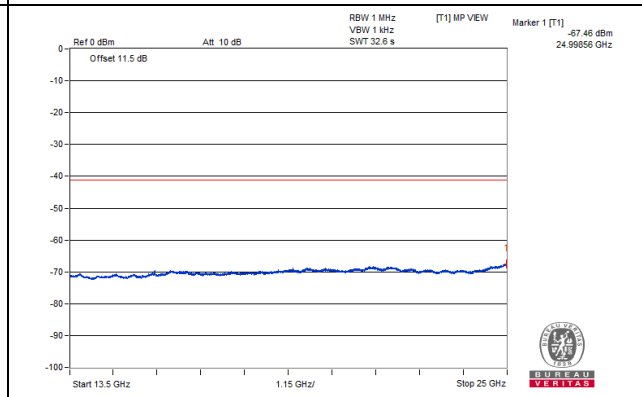
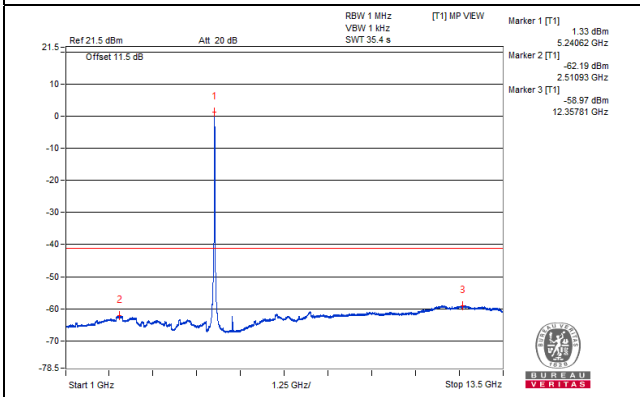
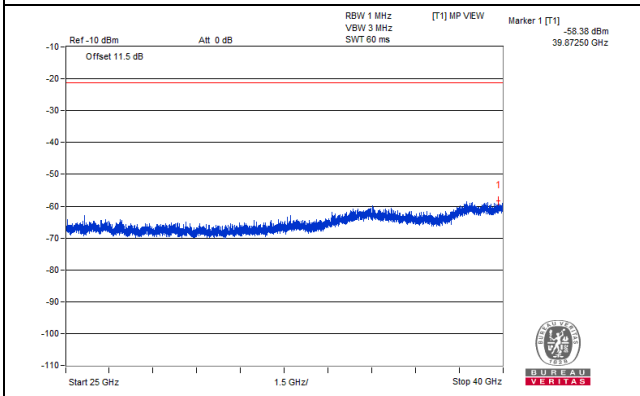
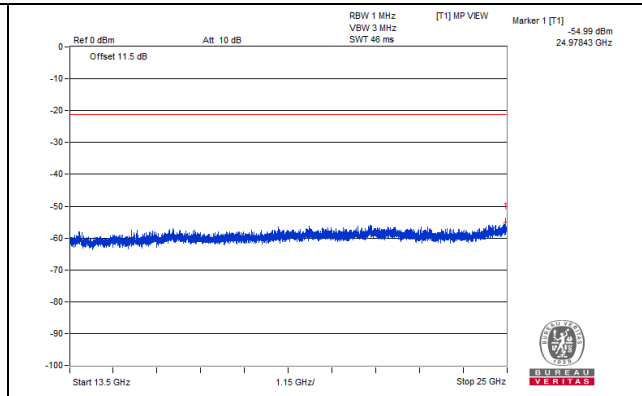
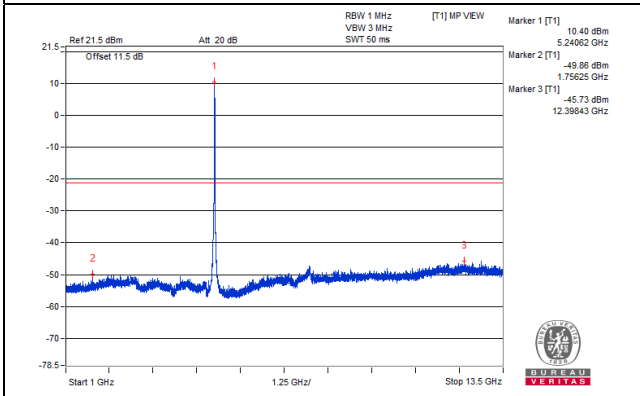
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3487.50	53.59 PK	68.20	-14.61	-52.15	-53.05	7.90	-41.67
2	#7000.00	54.97 PK	68.20	-13.23	-50.72	-51.74	7.90	-40.29
3	#10462.50	56.33 PK	68.20	-11.87	-50.43	-49.33	7.90	-38.93
4	15710.87	47.08 PK	74.00	-26.92	-58.26	-60.12	7.90	-48.18
5	15719.50	36.52 AV	54.00	-17.48	-69.78	-69.52	7.90	-58.74

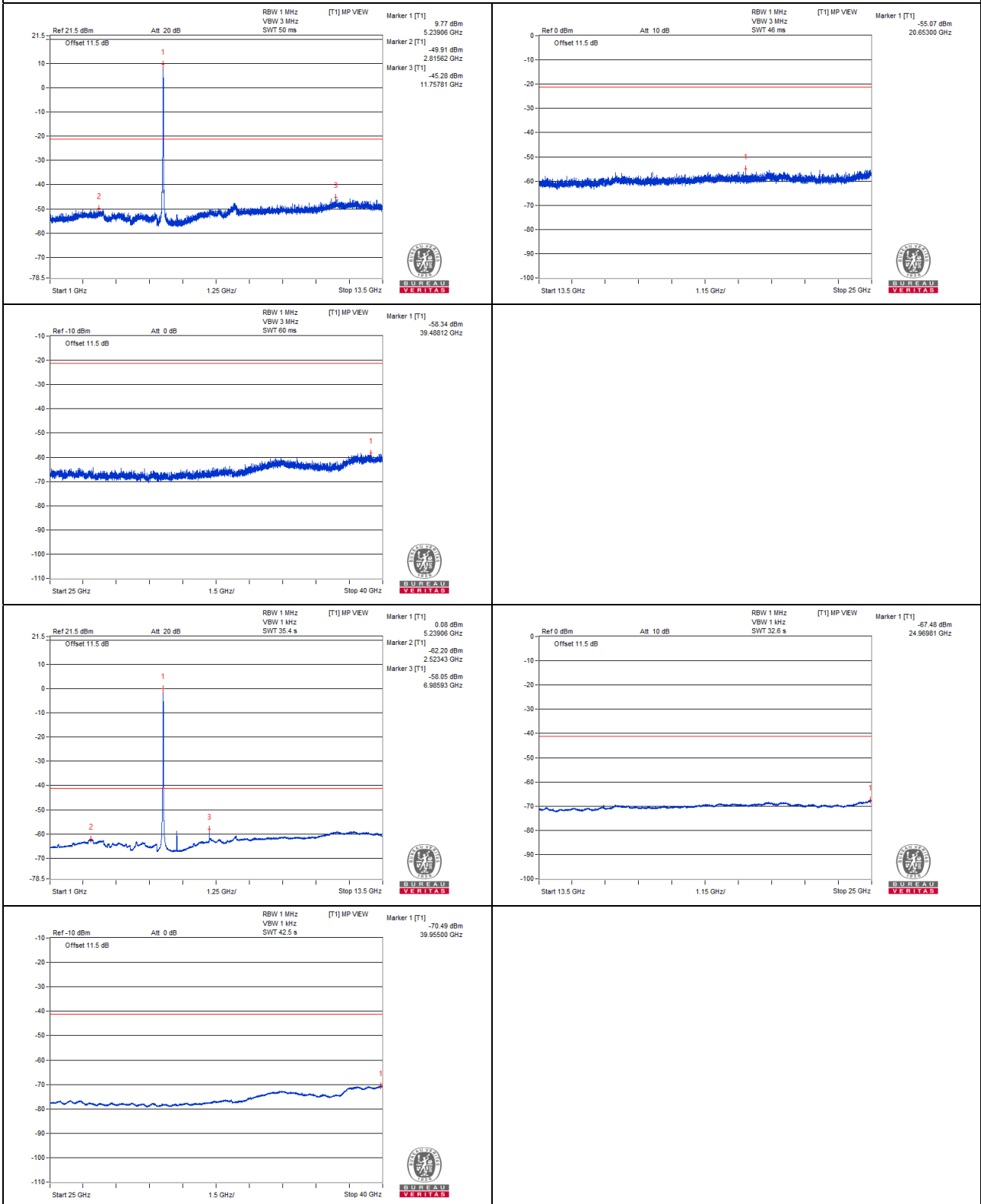
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1



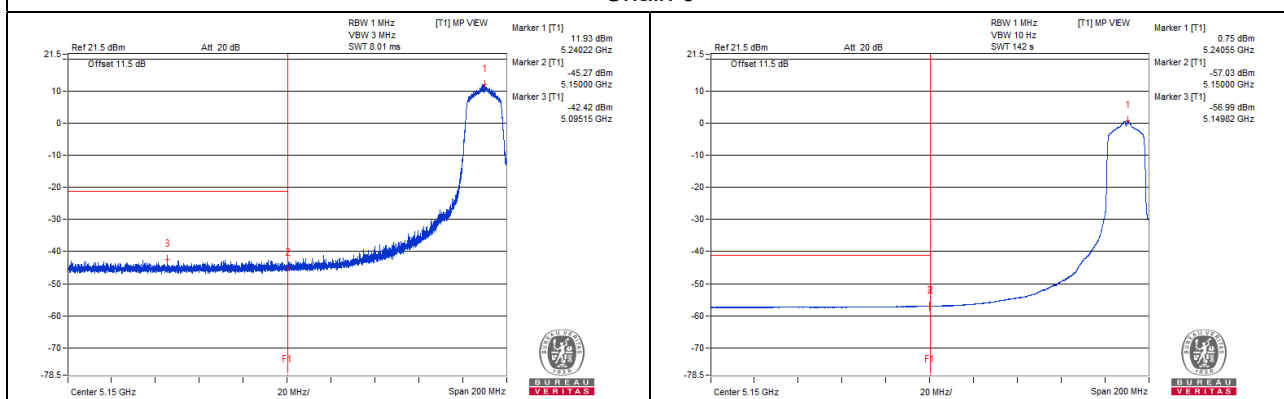
Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5121.67	60.87 PK	74.00	-13.13	-42.80	-44.21	6.05	-34.39
2	5148.90	47.18 AV	54.00	-6.82	-56.99	-57.29	6.05	-48.08

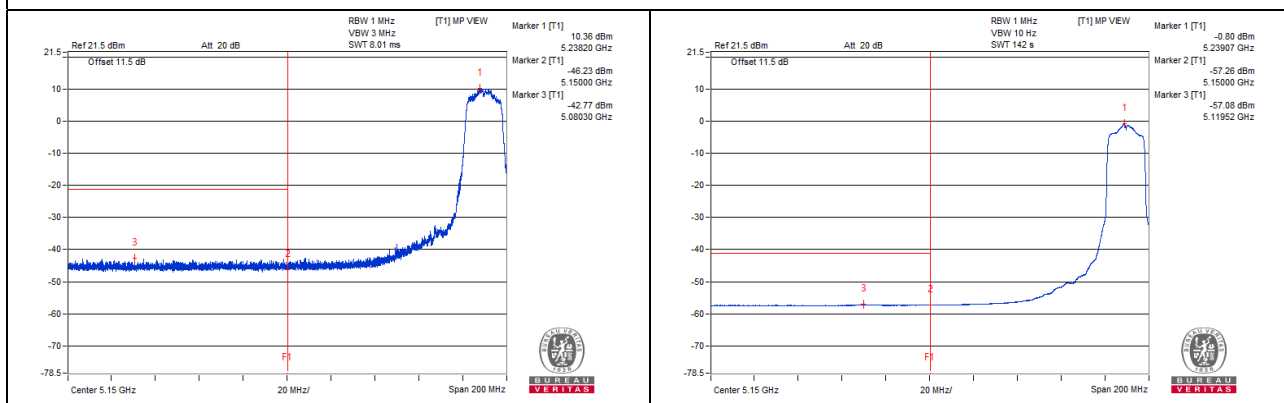
Note :

- Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ax (HE20) - Channel 36

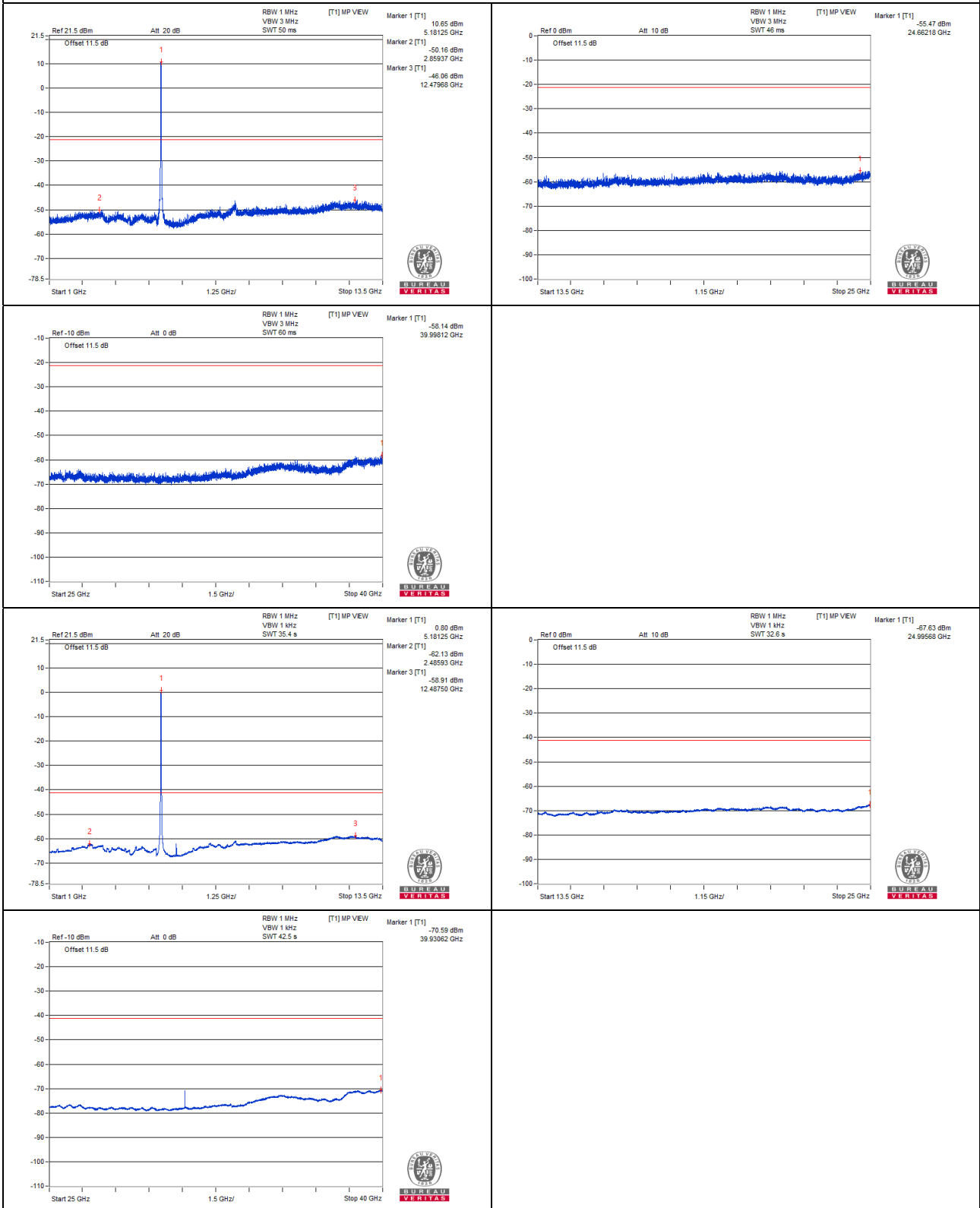
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3459.37	54.05 PK	68.20	-14.15	-50.83	-53.97	7.90	-41.21
2	#6906.25	56.04 PK	68.20	-12.16	-51.77	-48.95	7.90	-39.22
3	#10357.81	56.79 PK	68.20	-11.41	-48.74	-50.13	7.90	-38.47
4	15548.43	47.52 PK	74.00	-26.48	-59.63	-57.85	7.90	-47.74
5	15541.25	36.28 AV	54.00	-17.72	-69.70	-70.09	7.90	-58.98

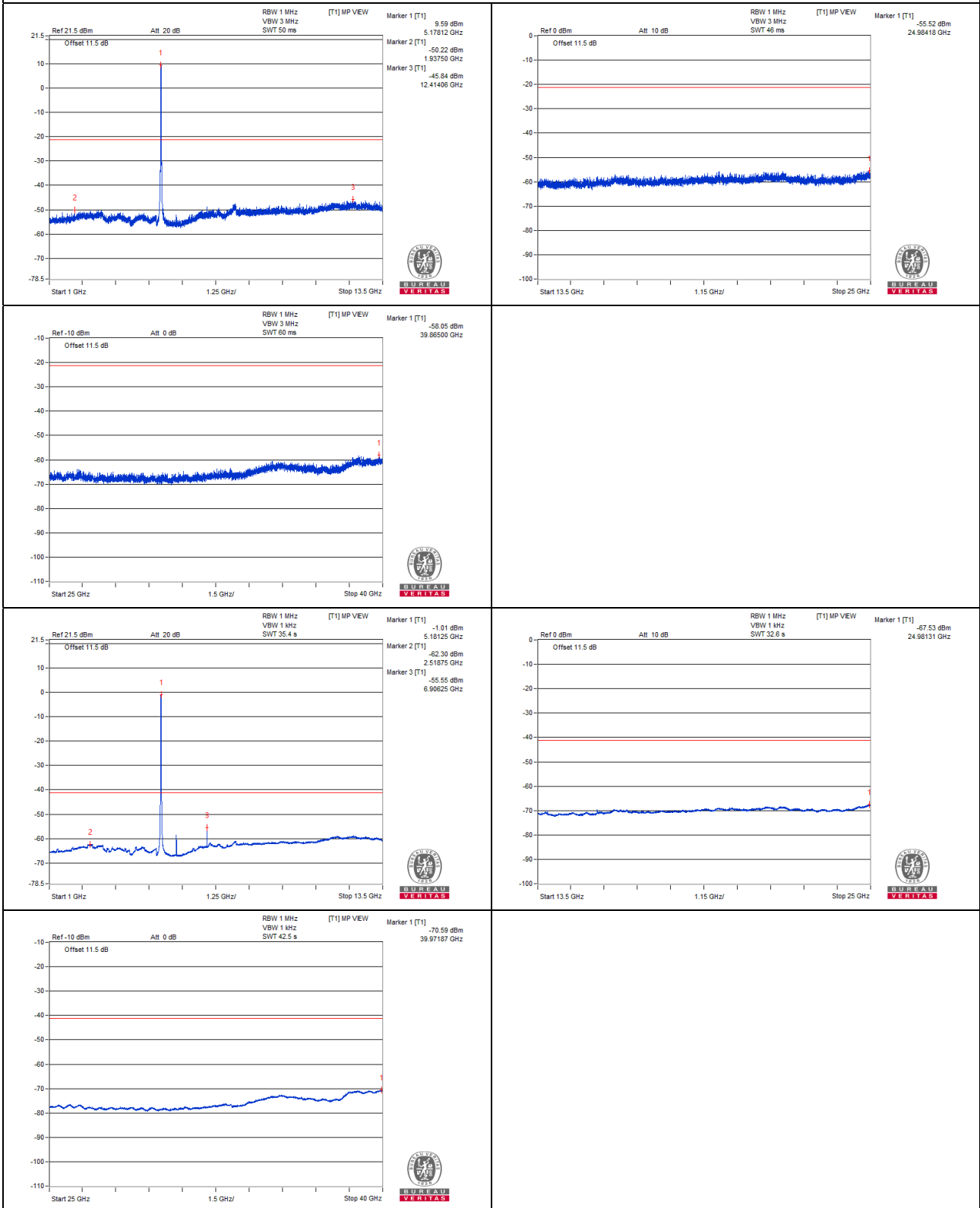
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1



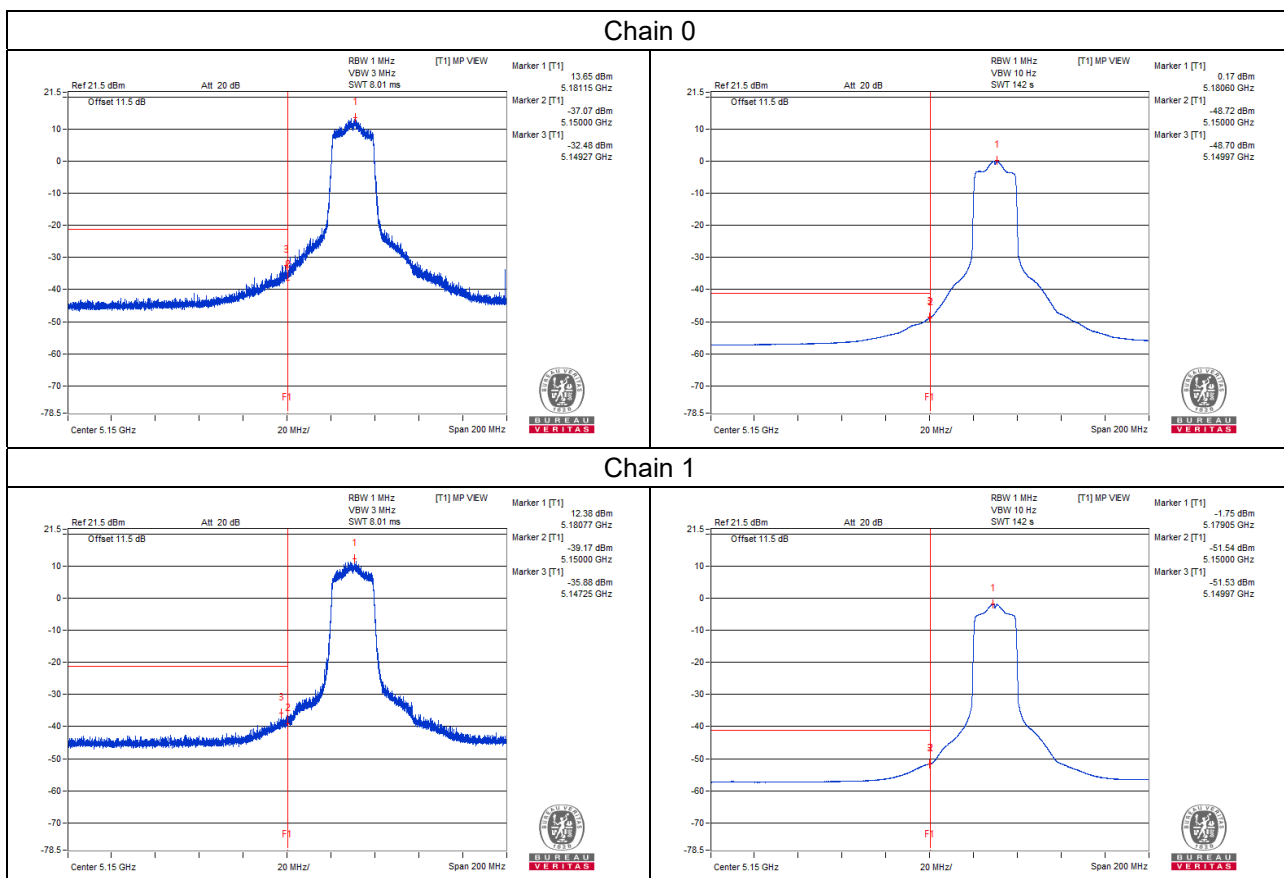
Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5149.27	69.87 PK	74.00	-4.13	-32.48	-38.15	6.05	-25.39
2	5149.97	54.43 AV	54.00	*0.43	-48.70	-51.53	6.05	-40.83

Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.

* The unwanted emission was verified and the test result was passed by radiated measurement.
(Please refer Appendix A)



802.11ax (HE20) - Channel 40

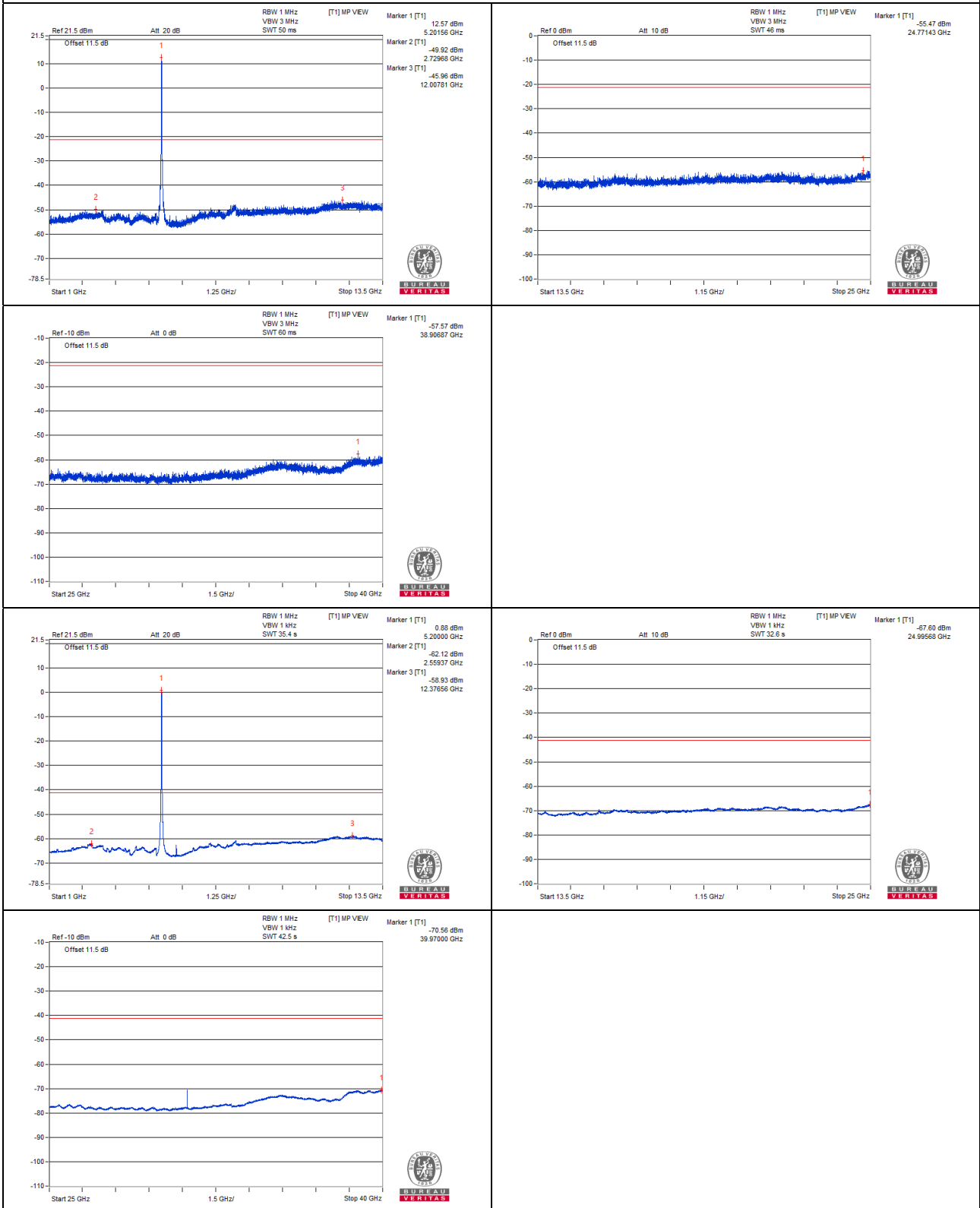
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3470.31	53.67 PK	68.20	-14.53	-53.03	-52.02	7.90	-41.59
2	#6932.81	55.52 PK	68.20	-12.68	-51.75	-49.78	7.90	-39.74
3	#10392.18	56.65 PK	68.20	-11.55	-49.65	-49.39	7.90	-38.61
4	15595.87	47.52 PK	74.00	-26.48	-59.28	-58.10	7.90	-47.74
5	15600.18	36.20 AV	54.00	-17.80	-69.62	-70.36	7.90	-59.06

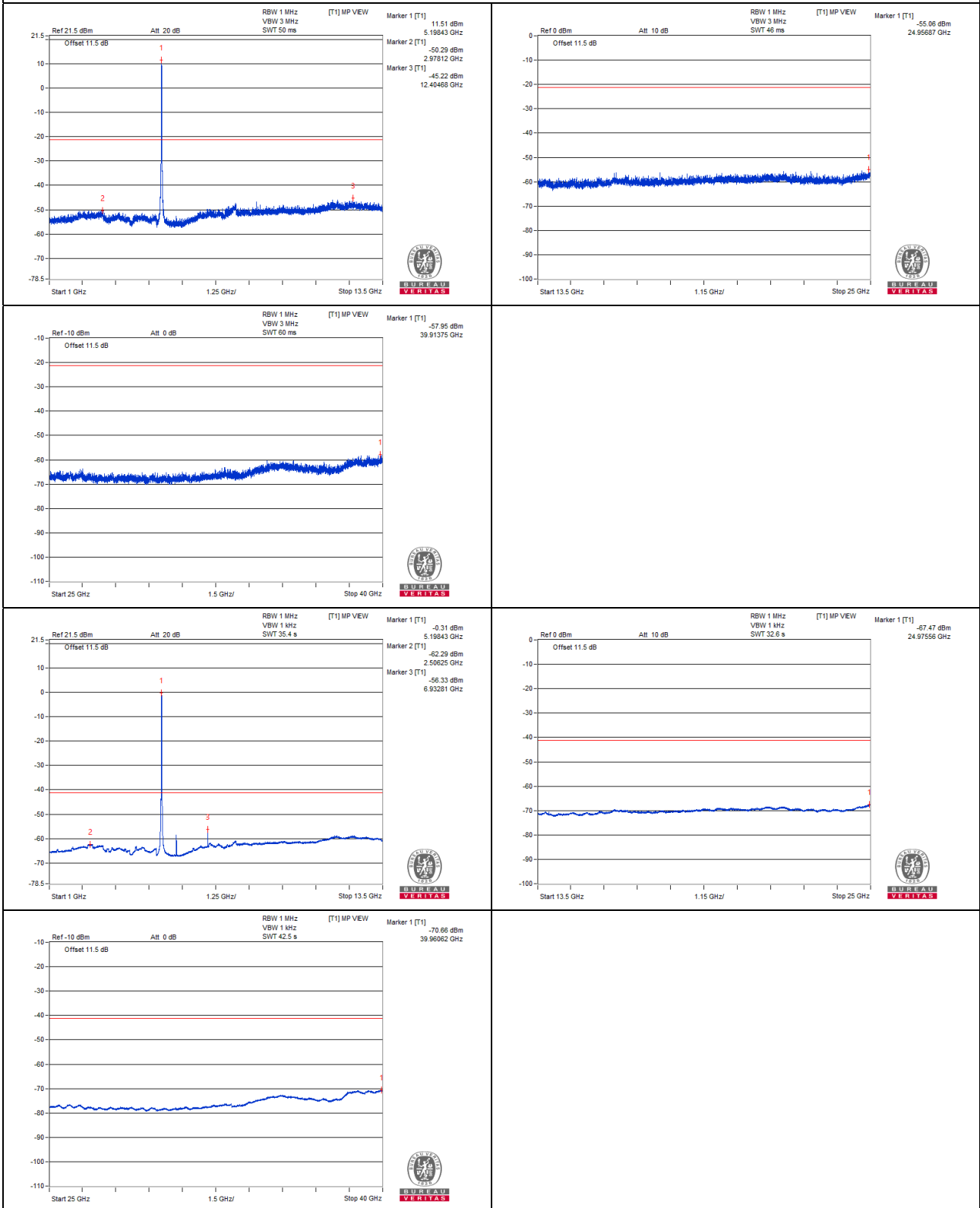
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1

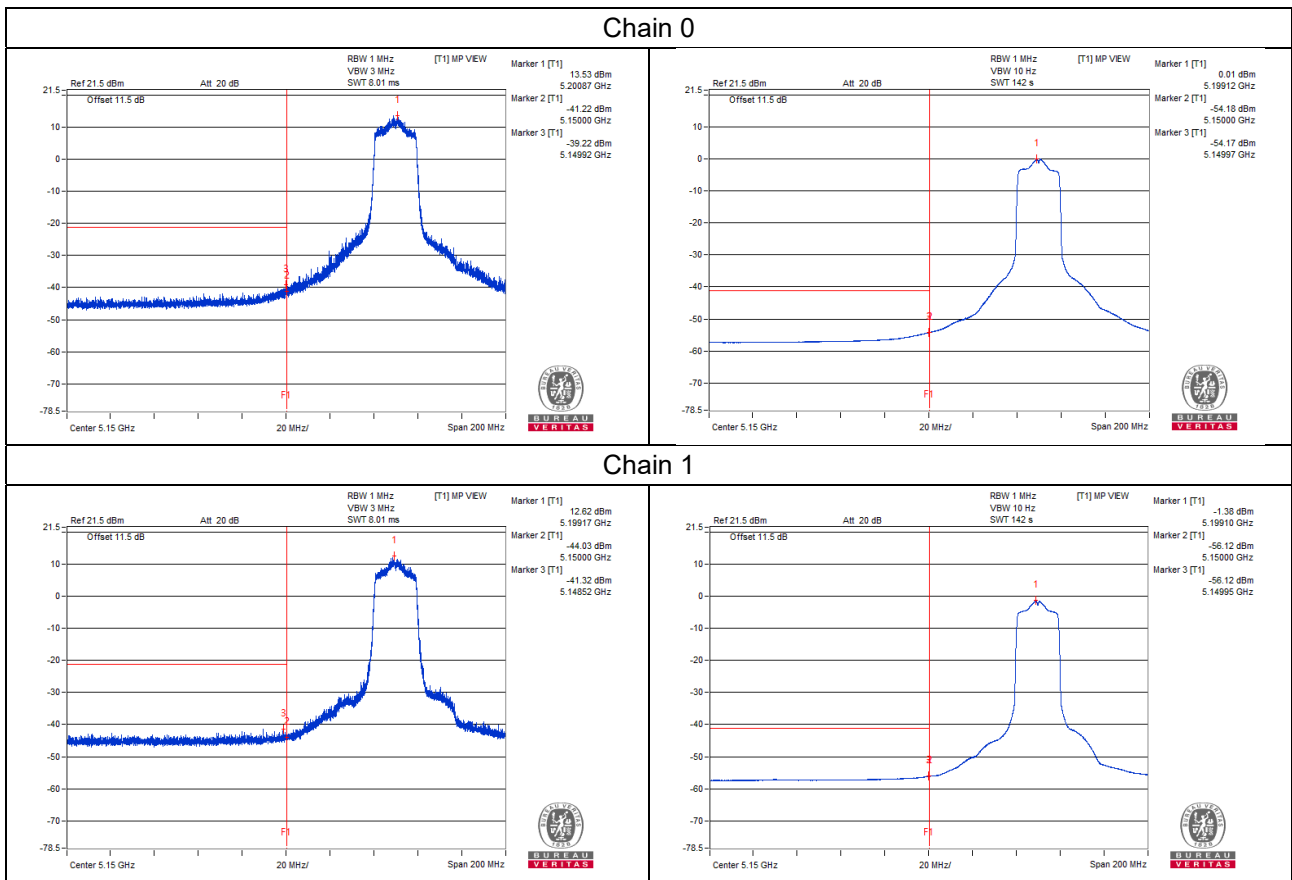


Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5148.52	63.56 PK	74.00	-10.44	-40.27	-41.32	6.05	-31.70
2	5150.00	49.28 AV	54.00	-4.72	-54.18	-56.12	6.05	-45.98

Note :

- Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.



802.11ax (HE20) - Channel 48

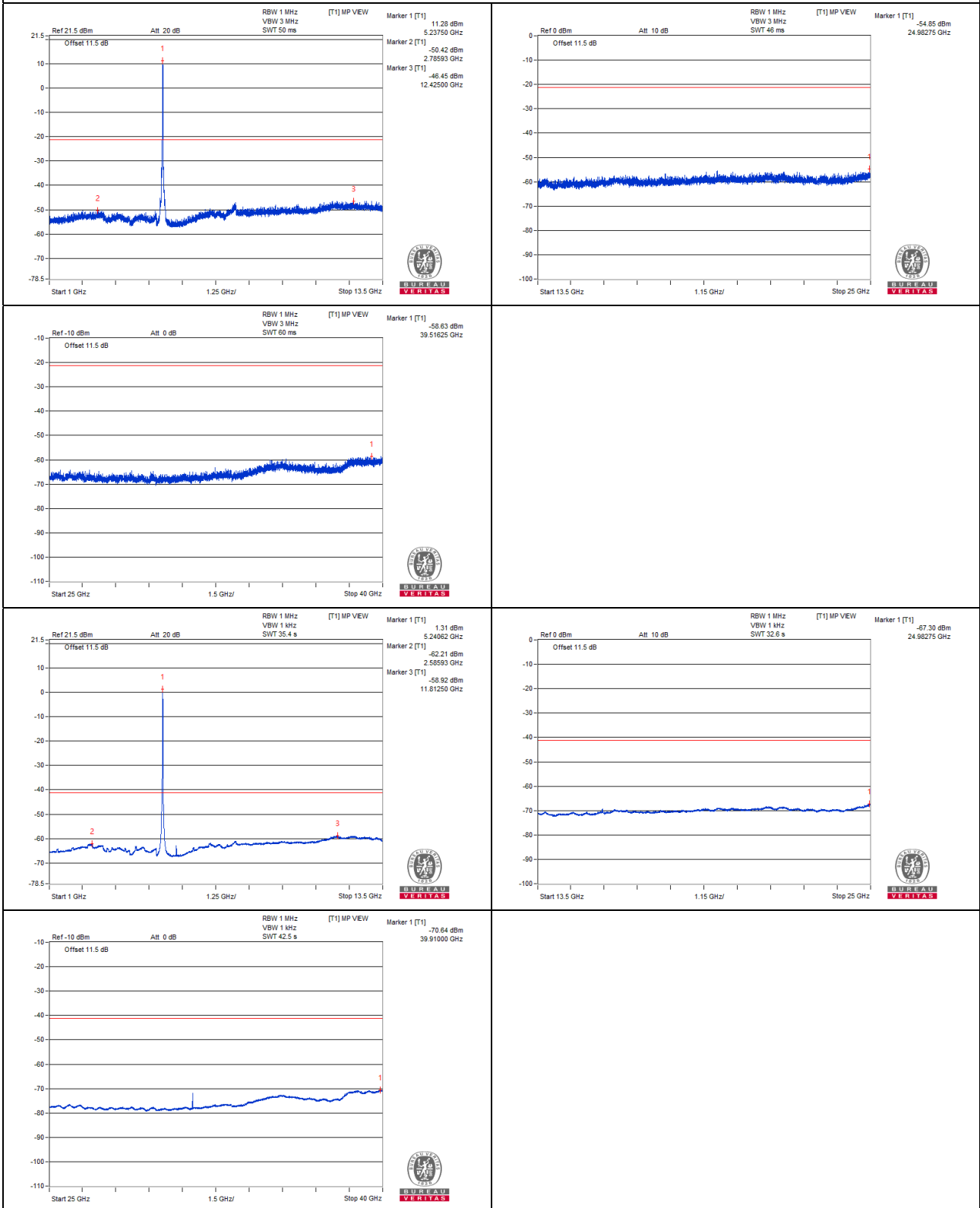
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#6981.25	55.47 PK	68.20	-12.73	-50.67	-50.74	7.90	-39.79
2	#10476.56	56.14 PK	68.20	-12.06	-49.57	-50.55	7.90	-39.12
3	15718.06	47.68 PK	74.00	-26.32	-58.24	-58.76	7.90	-47.58
4	15719.5	36.81 AV	54.00	-17.19	-69.48	-69.25	7.90	-58.45

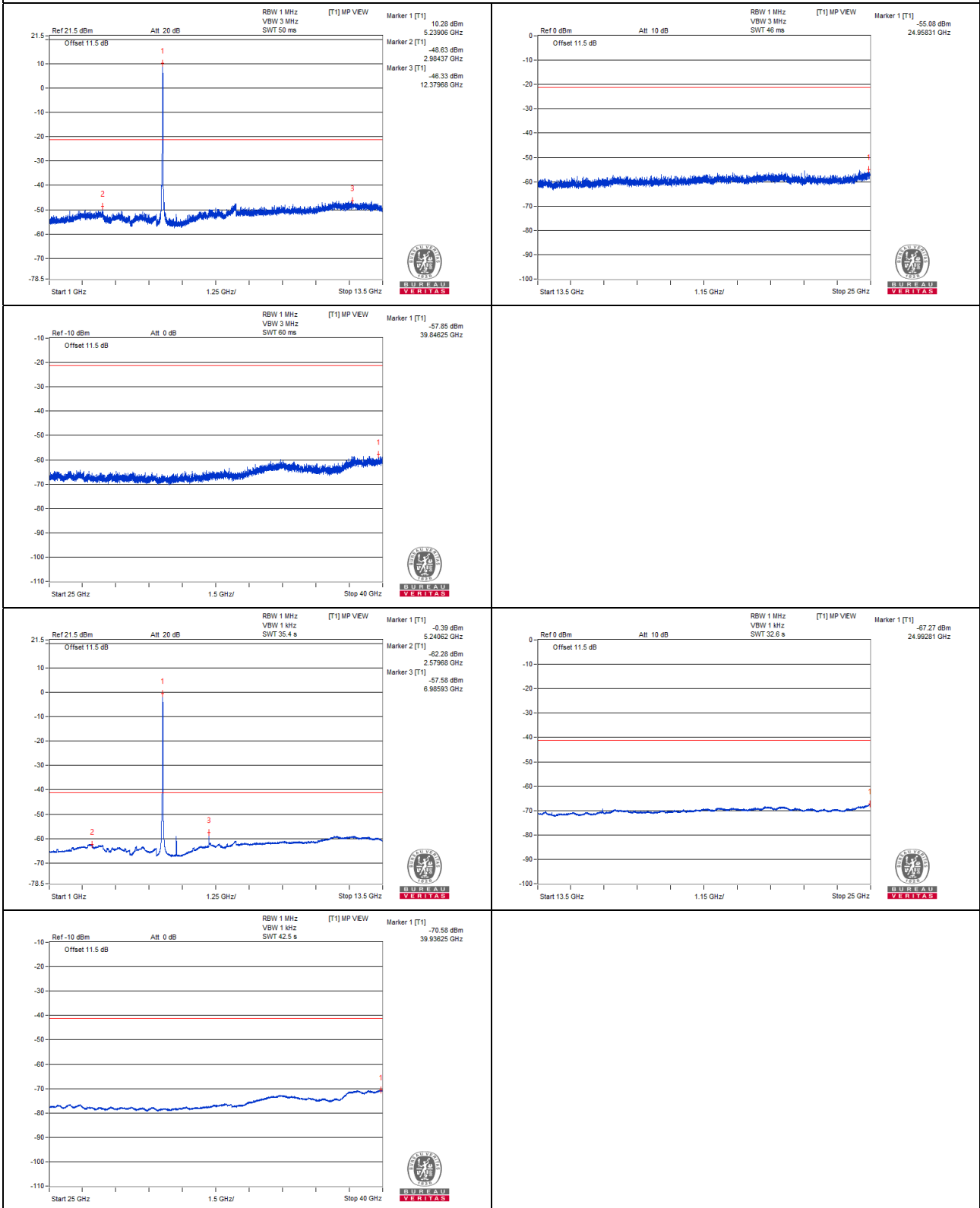
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1

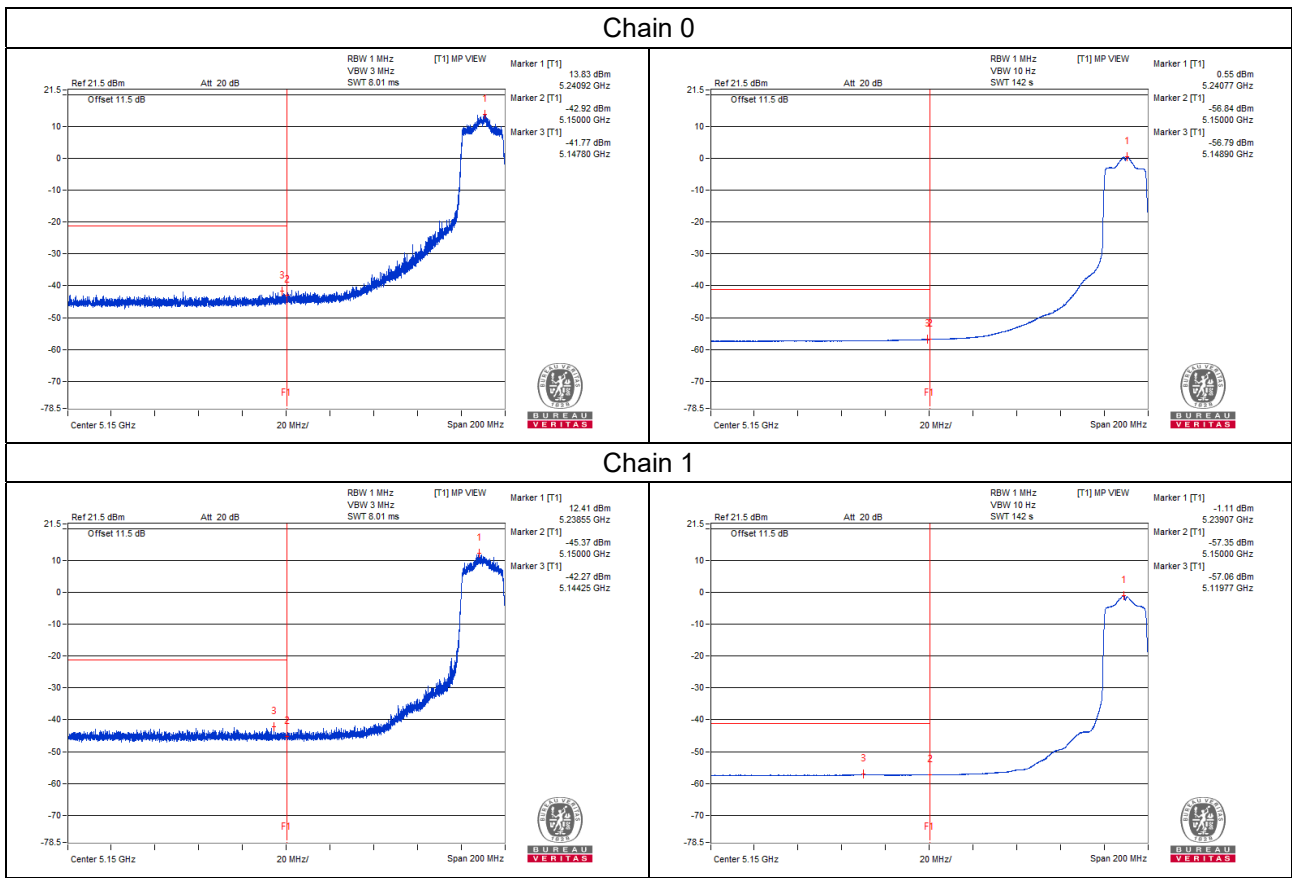


Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5148.80	61.19 PK	74.00	-12.81	-42.35	-44.07	6.05	-34.07
2	5148.90	47.28 AV	54.00	-6.72	-56.79	-57.30	6.05	-47.98

Note :

- Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.



802.11ax (HE40) - Channel 38

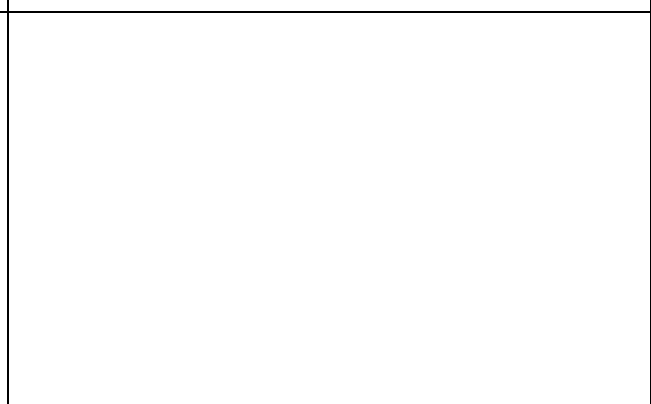
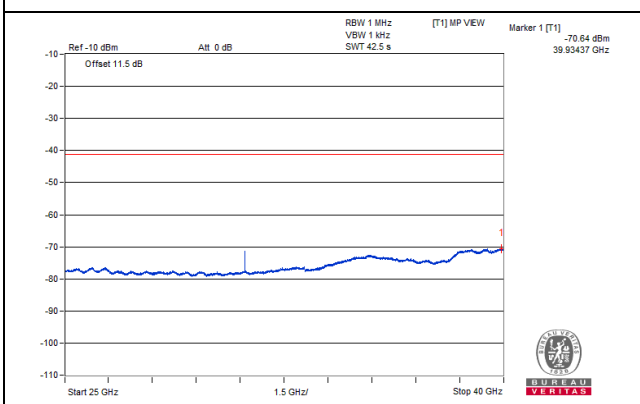
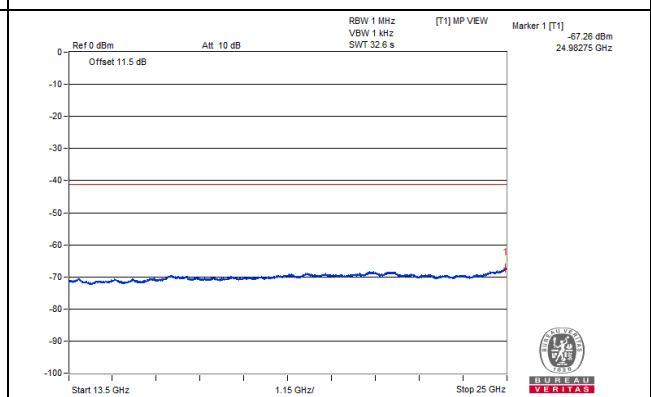
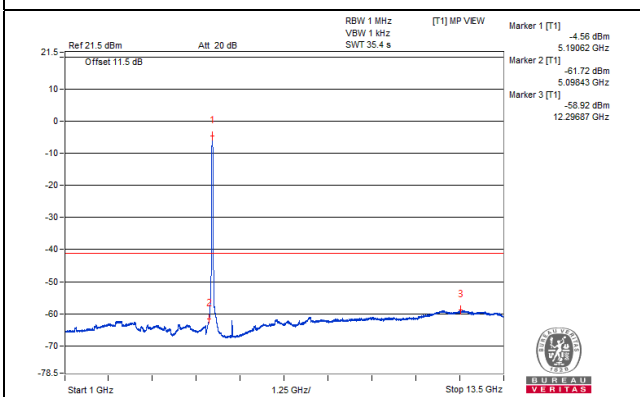
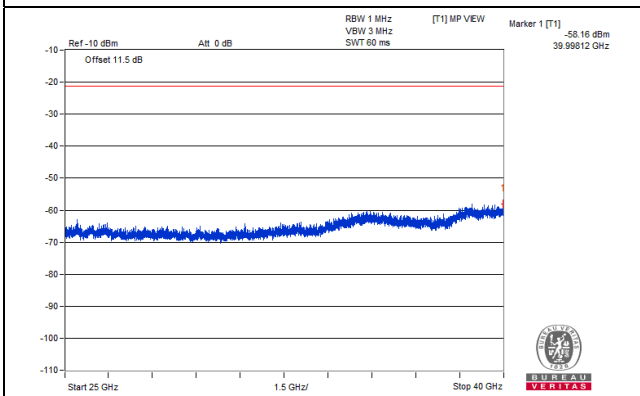
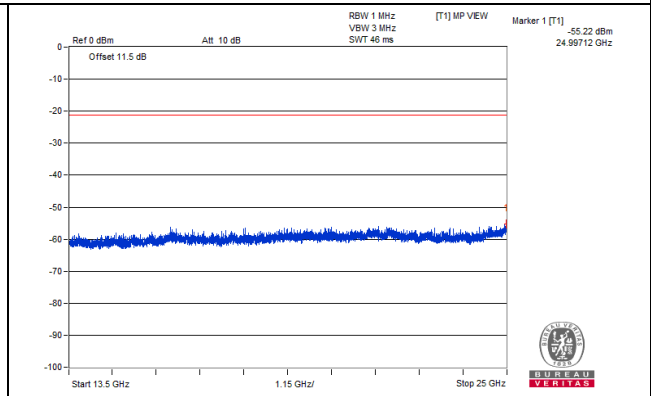
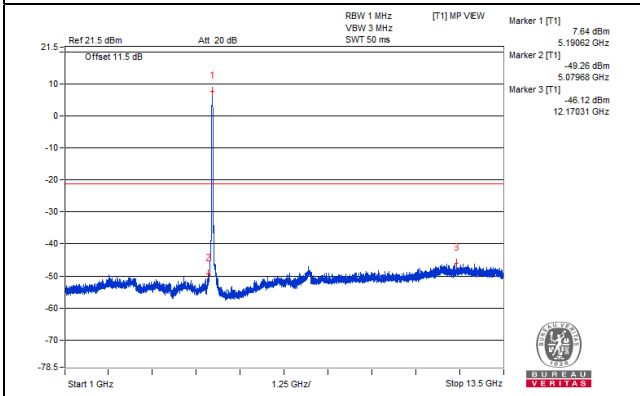
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3451.56	53.33 PK	68.20	-14.87	-52.98	-52.71	7.90	-41.93
2	#6920.31	56.41 PK	68.20	-11.79	-51.28	-48.63	7.90	-38.85
3	#10370.31	56.67 PK	68.20	-11.53	-49.51	-49.49	7.90	-38.59
4	15554.18	46.67 PK	74.00	-27.33	-60.10	-58.98	7.90	-48.59
5	15580.06	35.40 AV	54.00	-18.60	-70.83	-70.72	7.90	-59.86

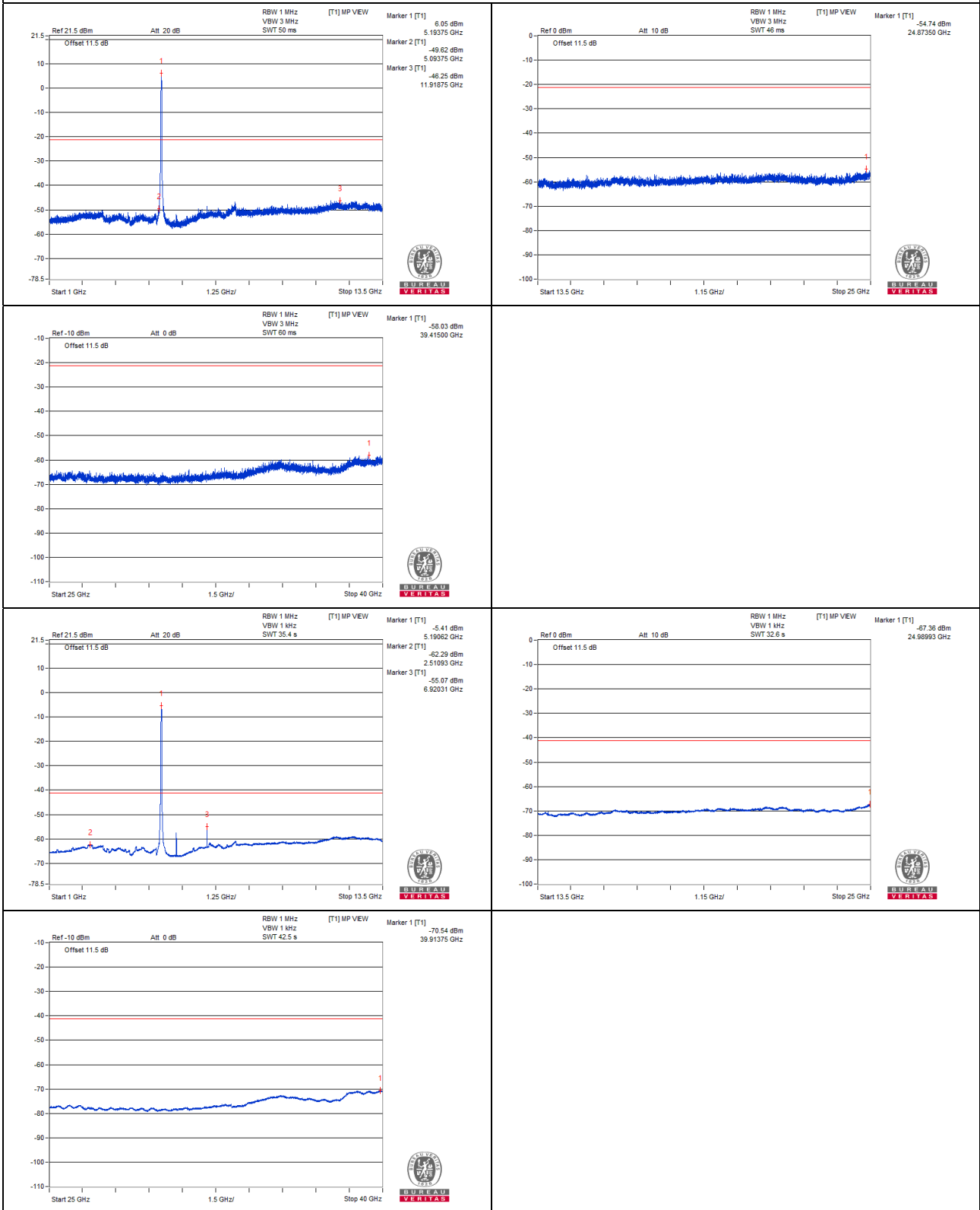
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1



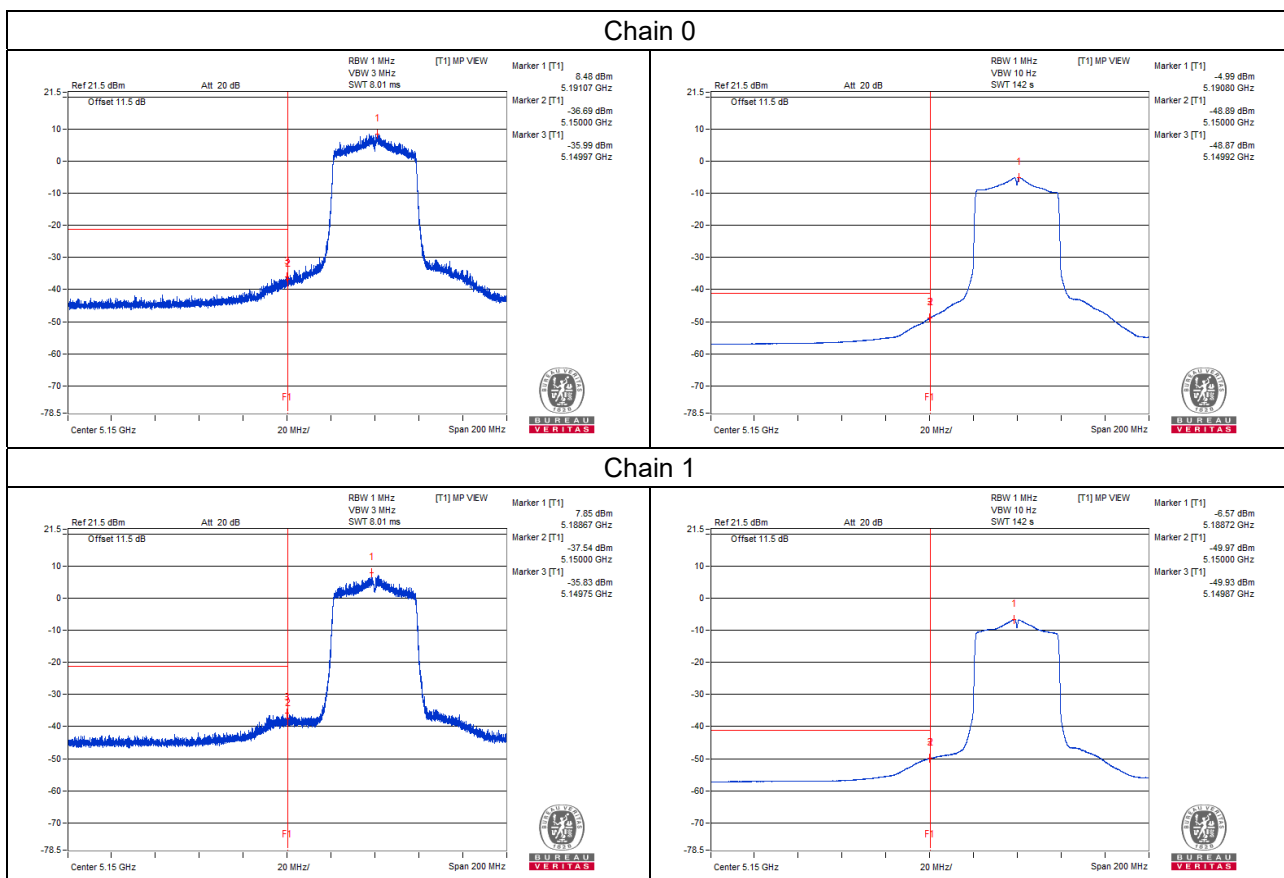
Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5149.77	67.86 PK	74.00	-6.14	-36.99	-35.99	6.05	-27.40
2	5149.97	54.94 AV	54.00	*0.94	-48.9	-49.93	6.05	-40.32

Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.

* The unwanted emission was verified and the test result was passed by radiated measurement.
(Please refer Appendix A)



802.11ax (HE40) - Channel 46

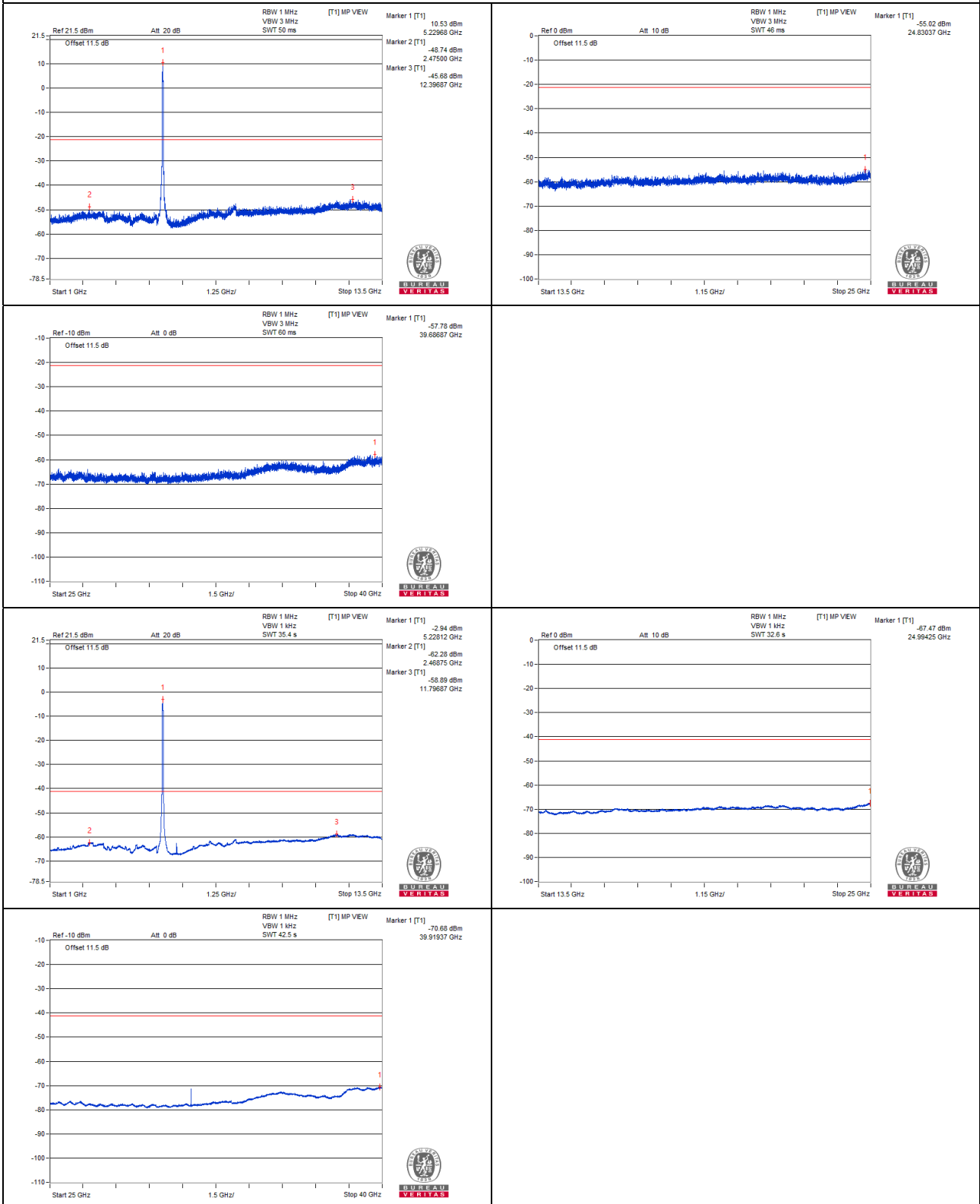
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3498.43	53.97 PK	68.20	-14.23	-52.89	-51.61	7.90	-41.29
2	#6973.43	56.41 PK	68.20	-11.79	-49.89	-49.64	7.90	-38.85
3	#10471.87	56.75 PK	68.20	-11.45	-49.50	-49.34	7.90	-38.51
4	15699.37	47.13 PK	74.00	-26.87	-59.26	-58.83	7.90	-48.13
5	15680.68	35.6 AV	54.00	-18.40	-70.58	-70.57	7.90	-59.66

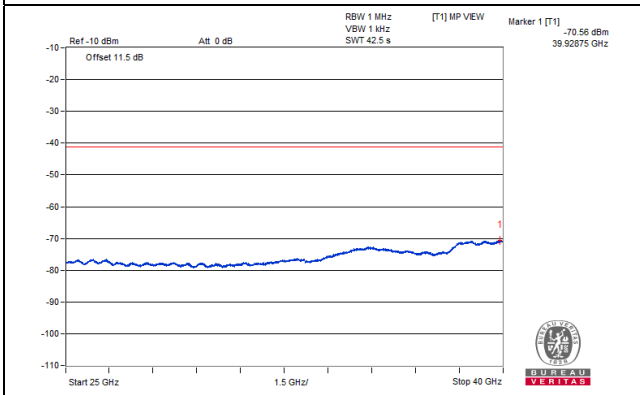
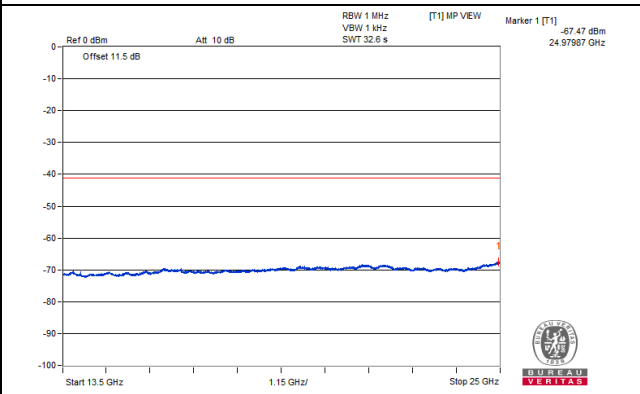
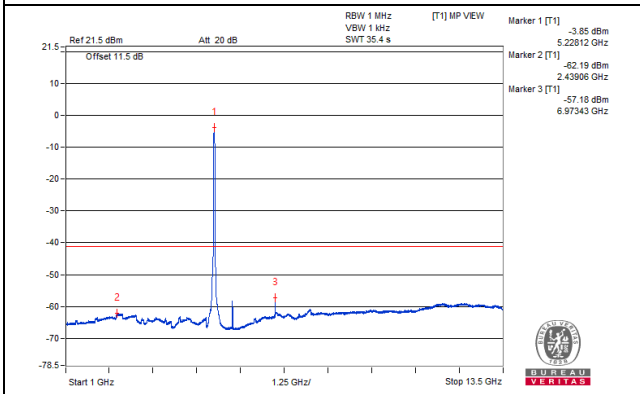
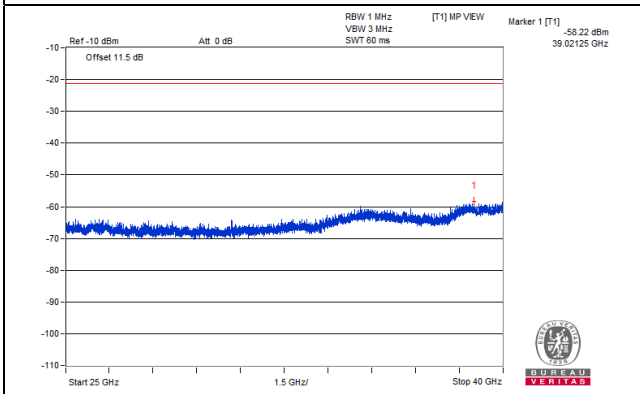
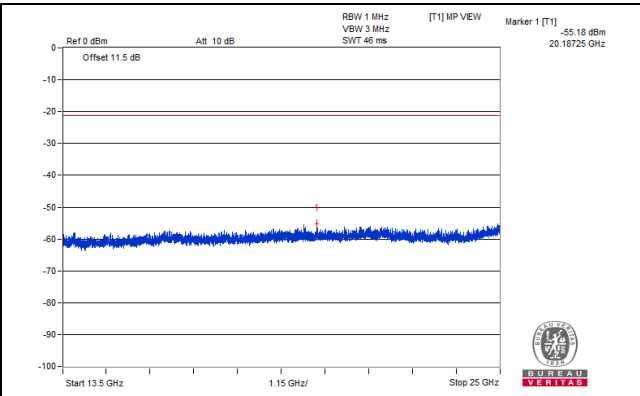
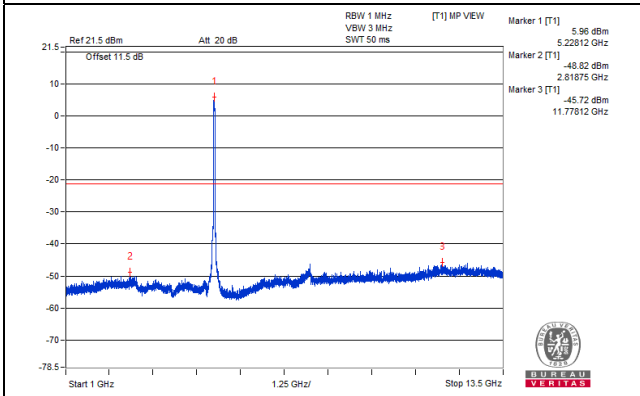
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1

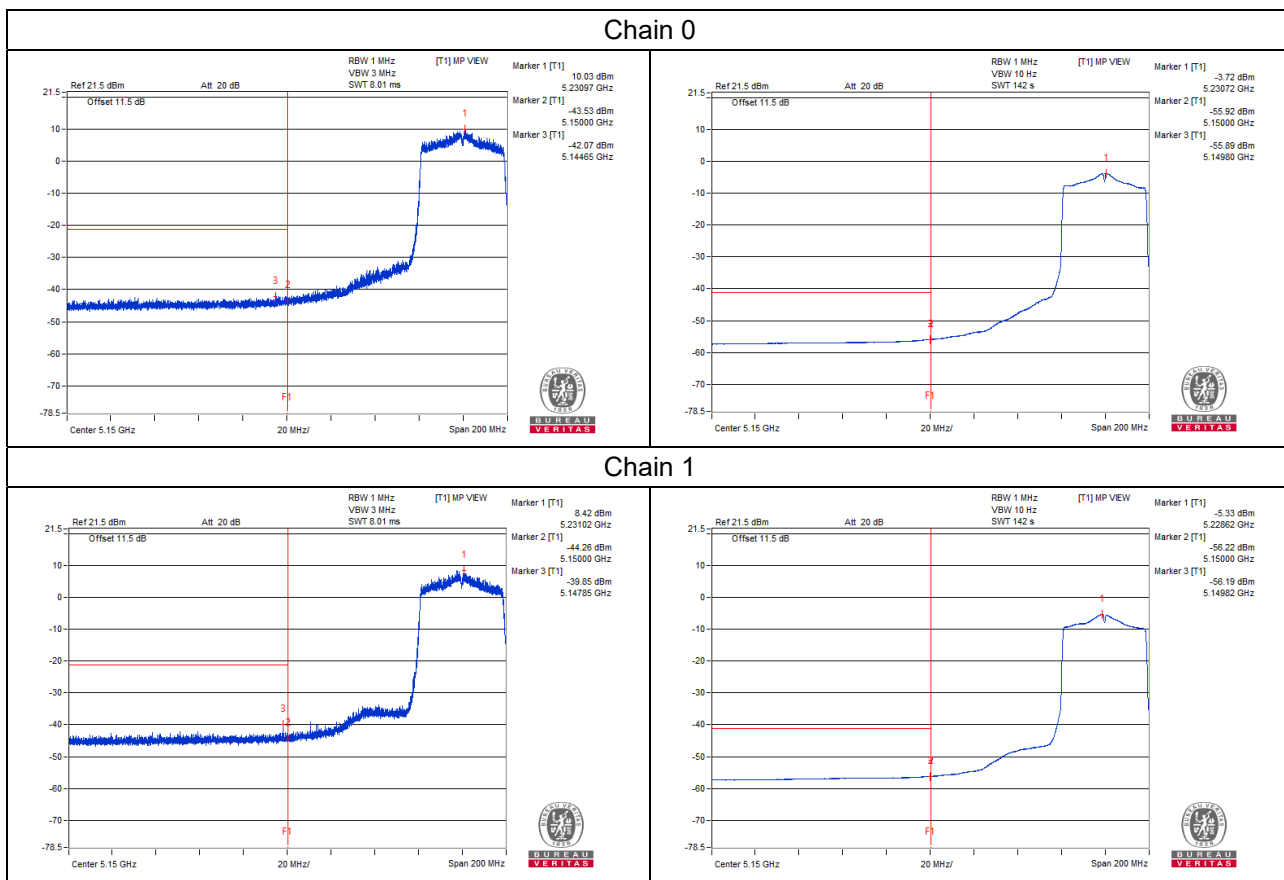


Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5147.82	62.88 PK	74.00	-11.12	-43.94	-39.86	6.05	-32.38
2	5149.82	48.27 AV	54.00	-5.73	-55.91	-56.19	6.05	-46.99

Note :

- Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.



802.11ax (HE80) - Channel 42

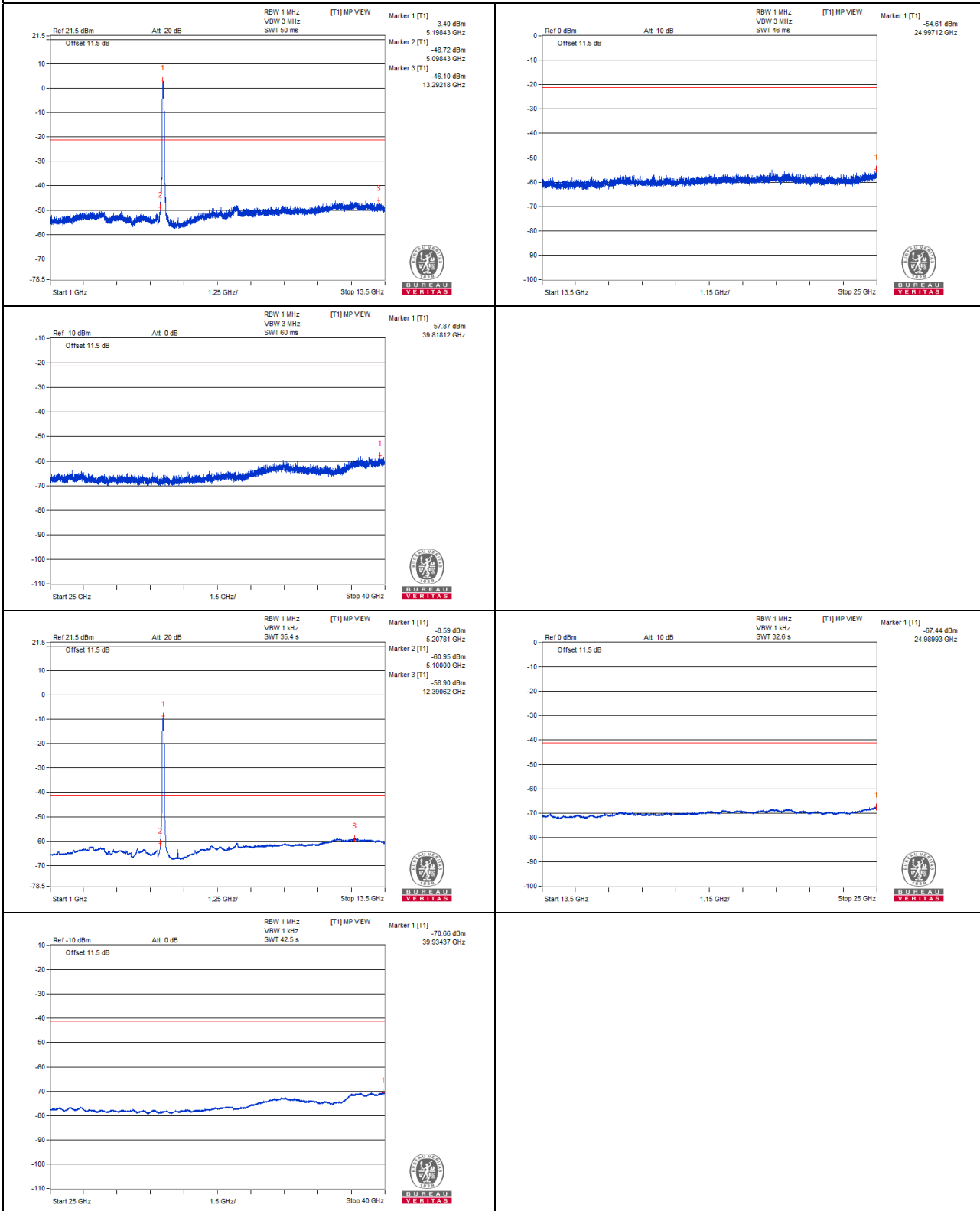
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3490.62	53.7 PK	68.20	-14.50	-52.04	-52.94	7.90	-41.56
2	#6964.06	55.45 PK	68.20	-12.75	-49.53	-52.36	7.90	-39.81
3	#10417.18	57.16 PK	68.20	-11.04	-49.30	-48.74	7.90	-38.10
4	15617.43	47.27 PK	74.00	-26.73	-59.97	-58.04	7.90	-47.99
5	15630.37	35.71 AV	54.00	-18.29	-70.26	-70.68	7.90	-59.55

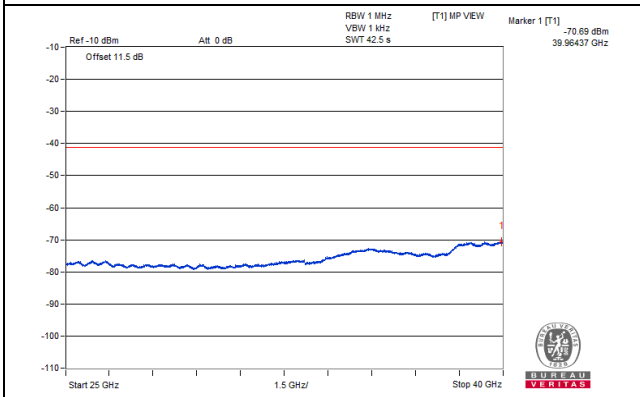
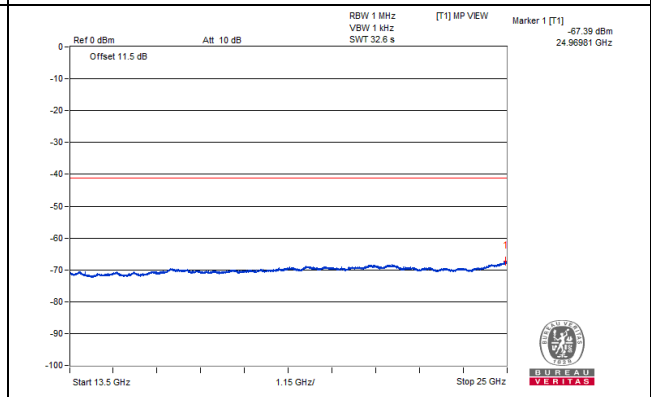
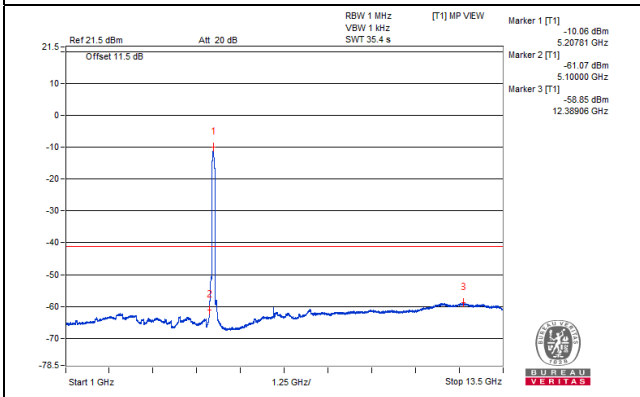
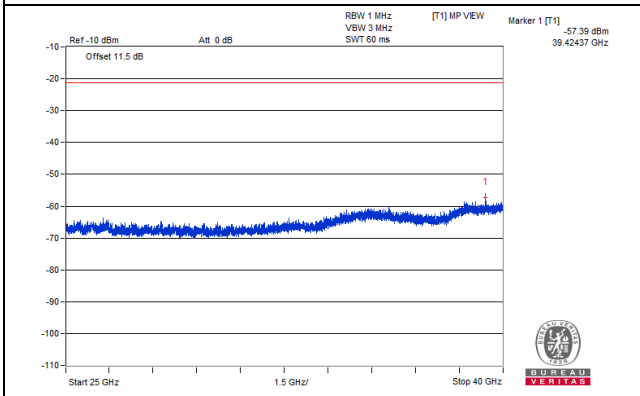
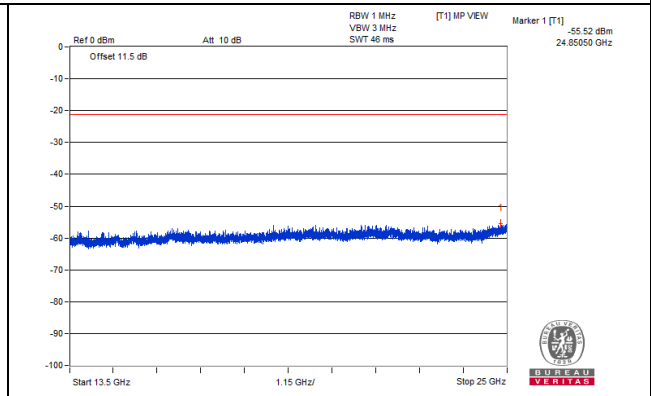
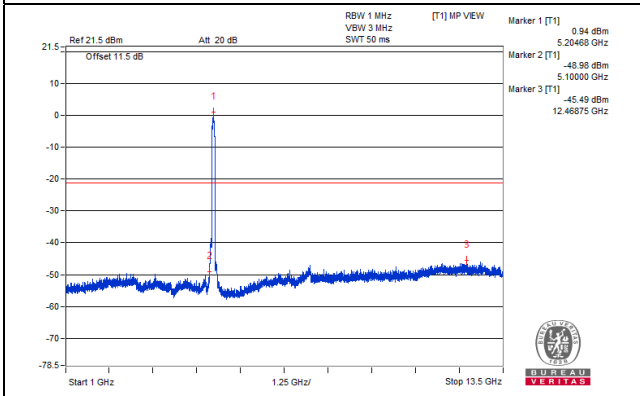
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1



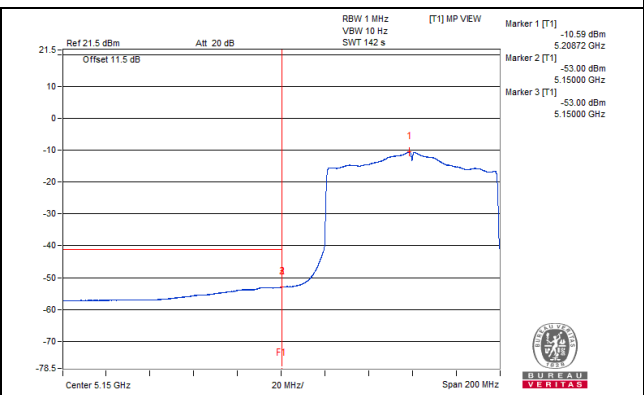
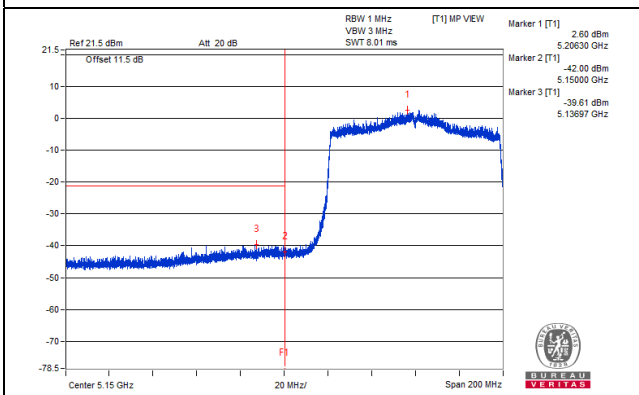
Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5148.35	65.30 PK	74.00	-8.70	-42.94	-37.00	6.05	-29.96
2	5147.52	52.01 AV	54.00	-1.99	-53.18	-51.58	6.05	-43.25

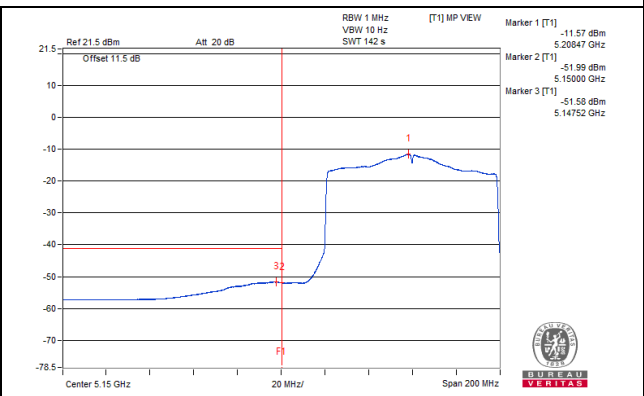
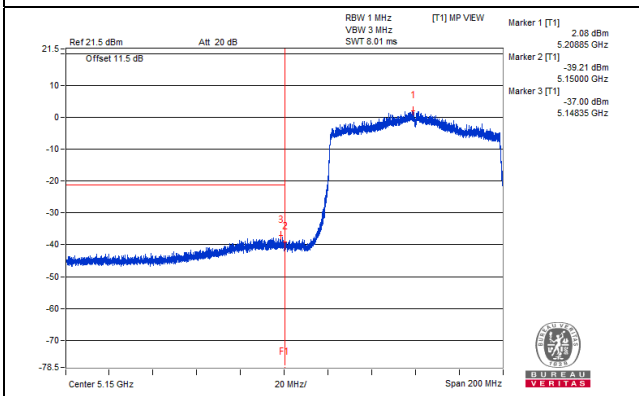
Note :

- Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ax (HE160) - Channel 50

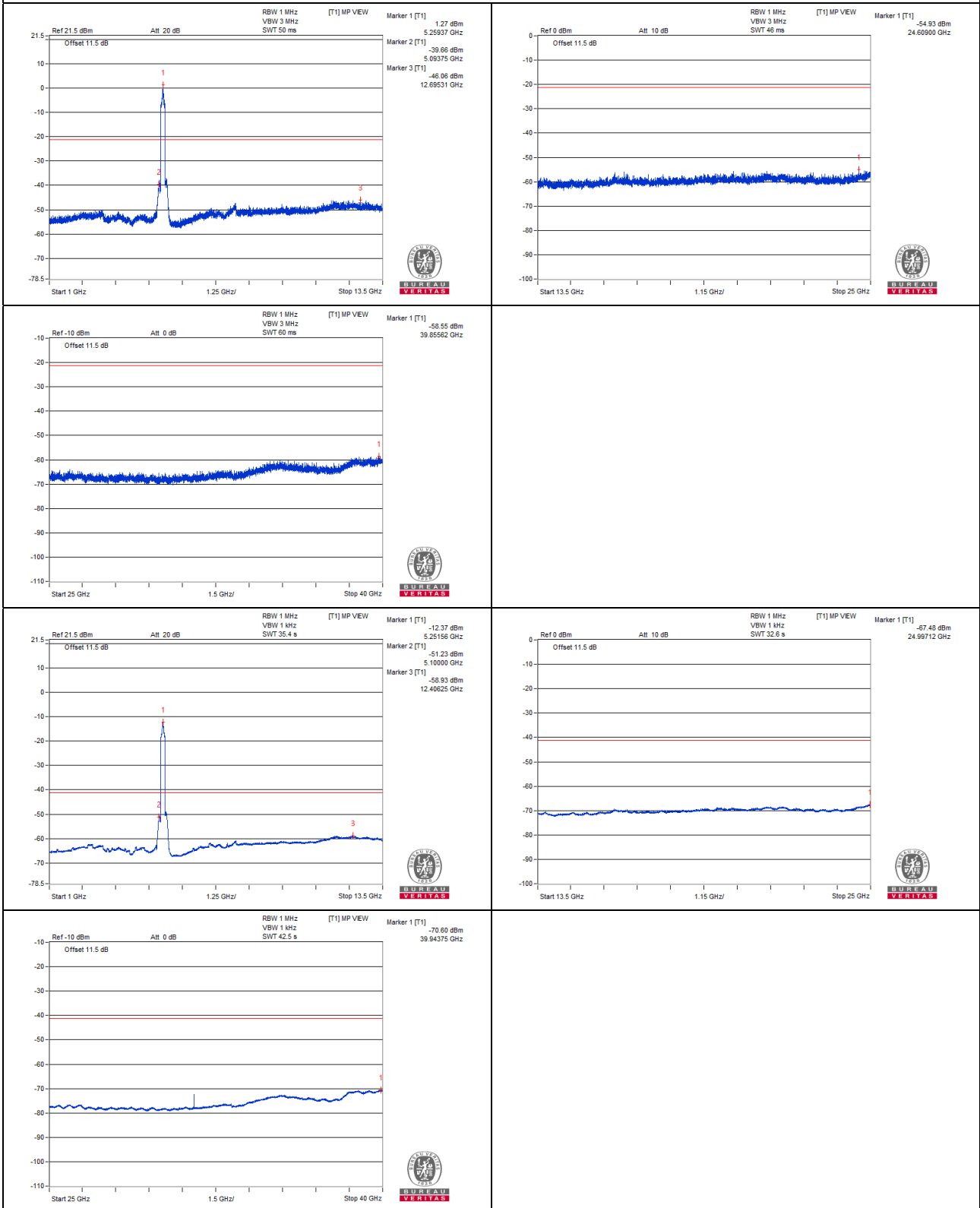
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3515.62	53.52 PK	74.00	-20.48	-52.00	-53.42	7.90	-41.74
2	3517.18	41.97 AV	54.00	-12.03	-64.26	-64.14	7.90	-53.29
3	#6995.31	55.58 PK	68.20	-12.62	-49.83	-51.51	7.90	-39.68
4	#10517.18	56.43 PK	68.20	-11.77	-49.89	-49.60	7.90	-38.83
5	15738.18	46.5 PK	74.00	-27.50	-60.19	-59.20	7.90	-48.76
6	15762.62	35.49 AV	54.00	-18.51	-71.01	-70.38	7.90	-59.77

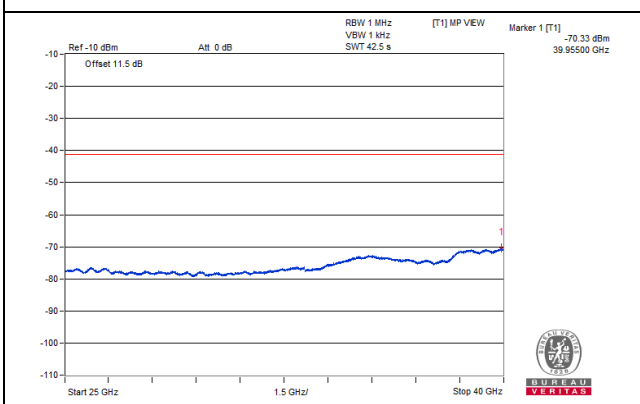
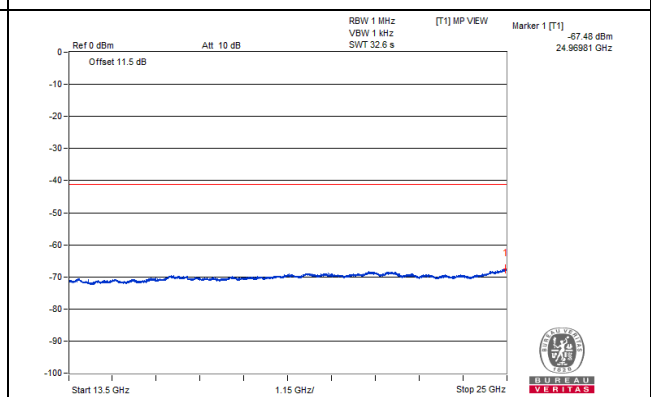
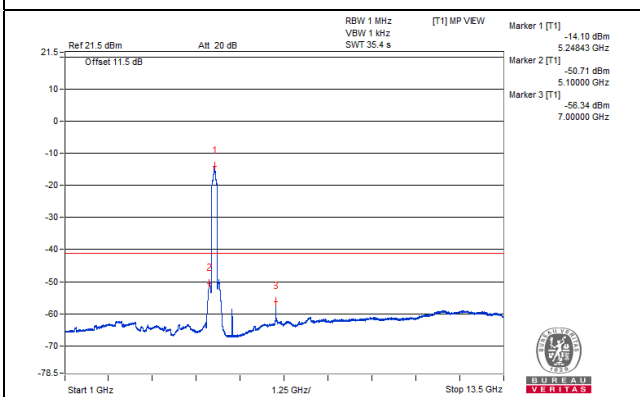
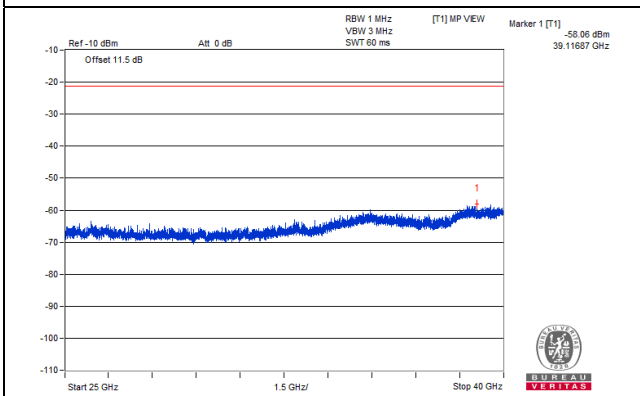
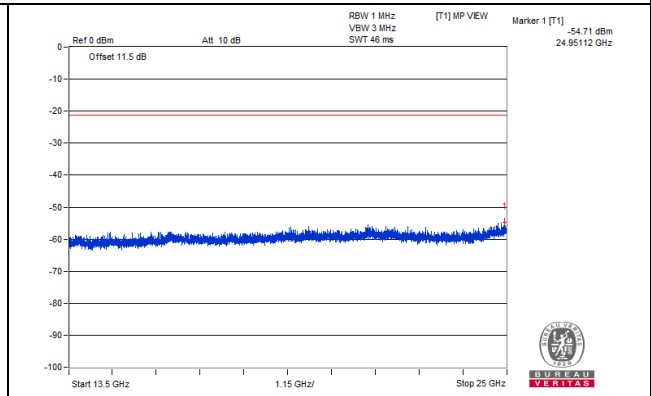
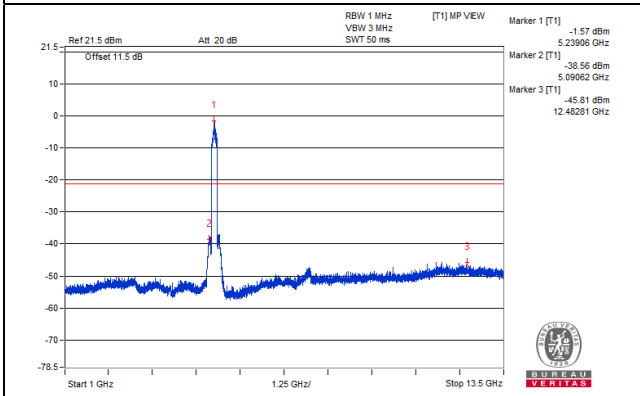
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1



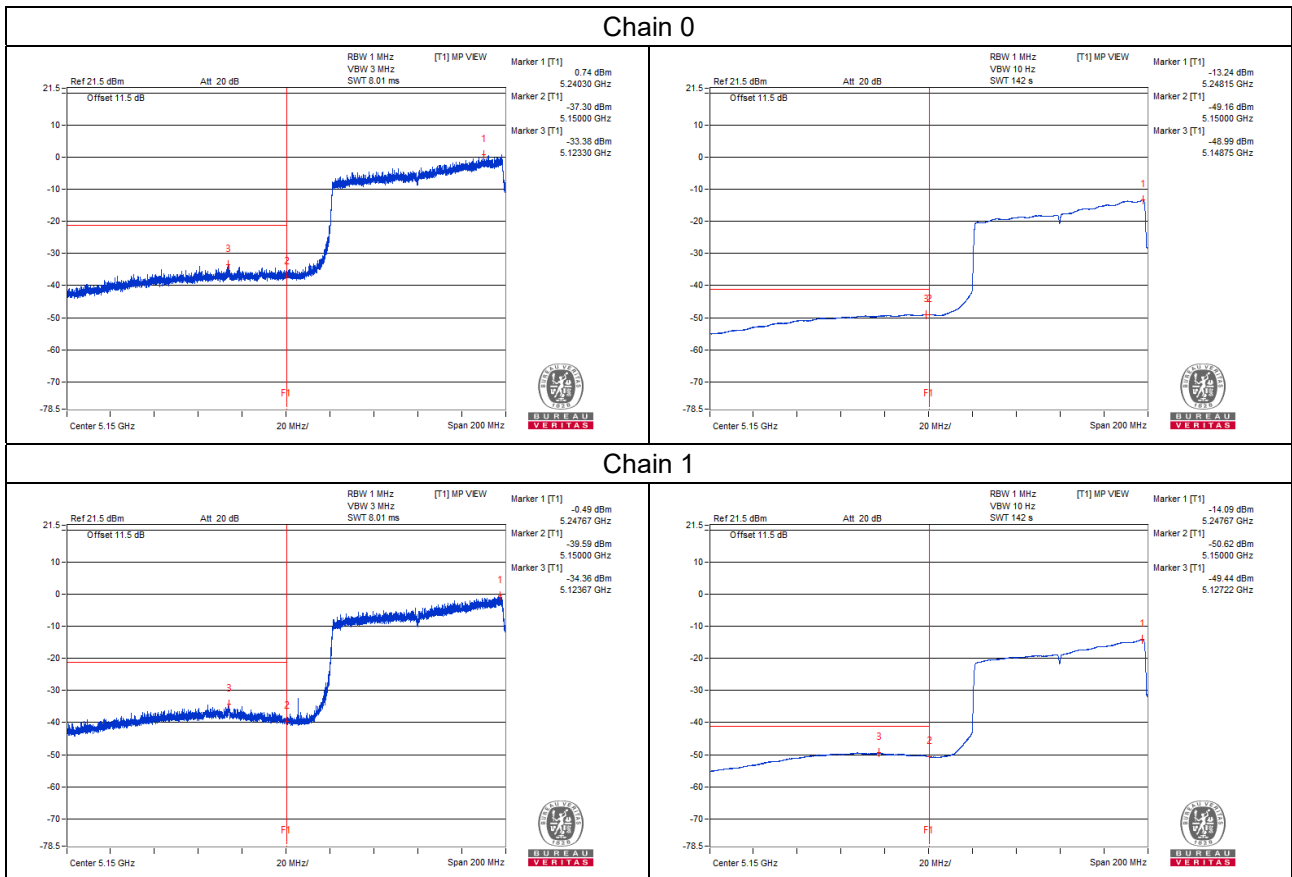
Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5123.62	69.98 PK	74.00	-4.02	-33.59	-35.25	6.05	-25.28
2	5127.27	54.85 AV	54.00	*0.85	-49.45	-49.49	6.05	-40.41

Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.

* The unwanted emission was verified and the test result was passed by radiated measurement.
(Please refer Appendix A)



20MHz Preamble 802.11ax (RU26) - Channel 36

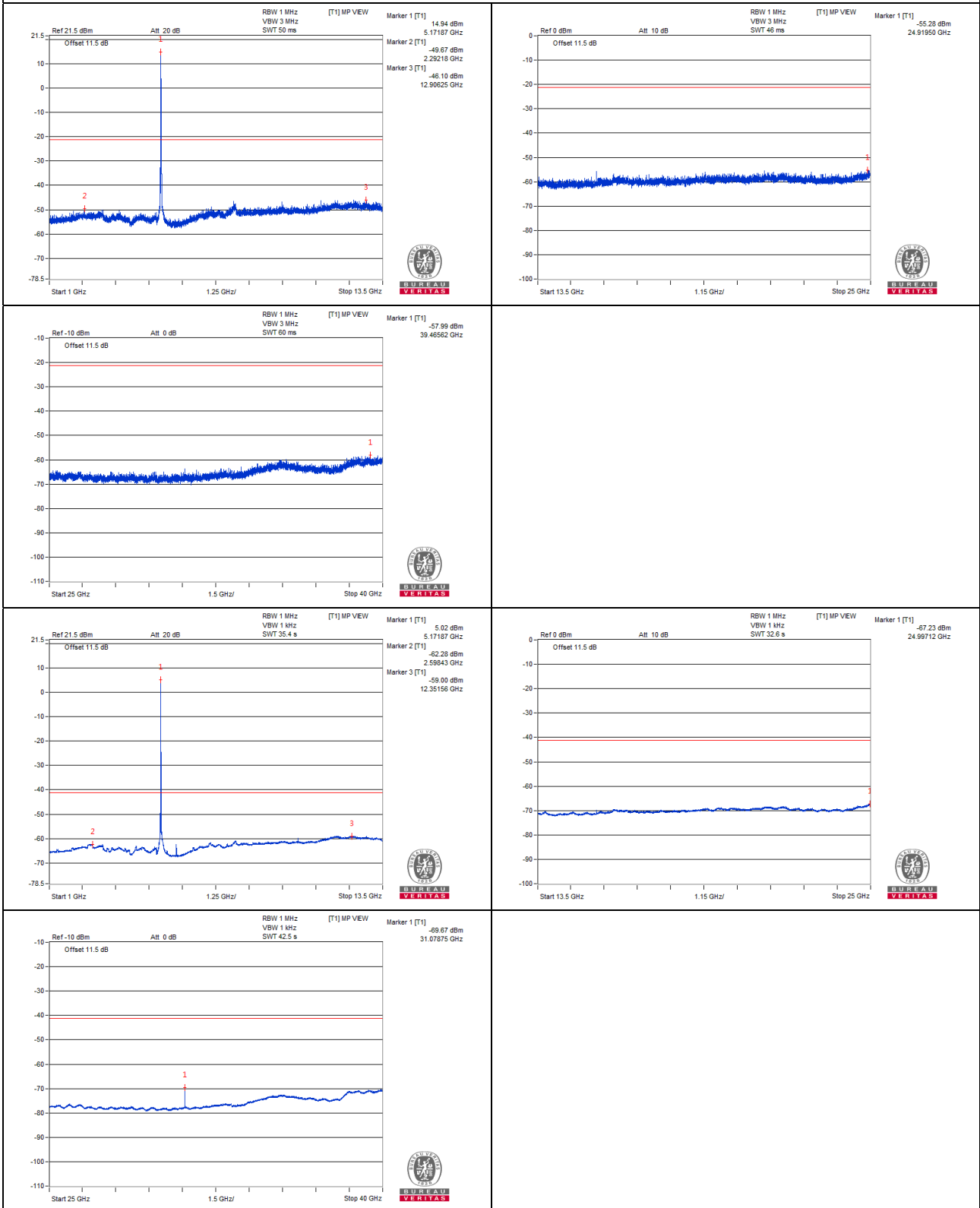
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3439.06	53.75 PK	68.20	-14.45	-54.52	-51.01	7.90	-41.51
2	#6895.31	55.48 PK	68.20	-12.72	-49.54	-52.25	7.90	-39.78
3	#10343.75	56.84 PK	68.20	-11.36	-49.35	-49.32	7.90	-38.42
4	15552.75	47.27 PK	74.00	-26.73	-59.26	-58.57	7.90	-47.99
5	15552.75	35.22 AV	54.00	-18.78	-71.06	-70.84	7.90	-60.04

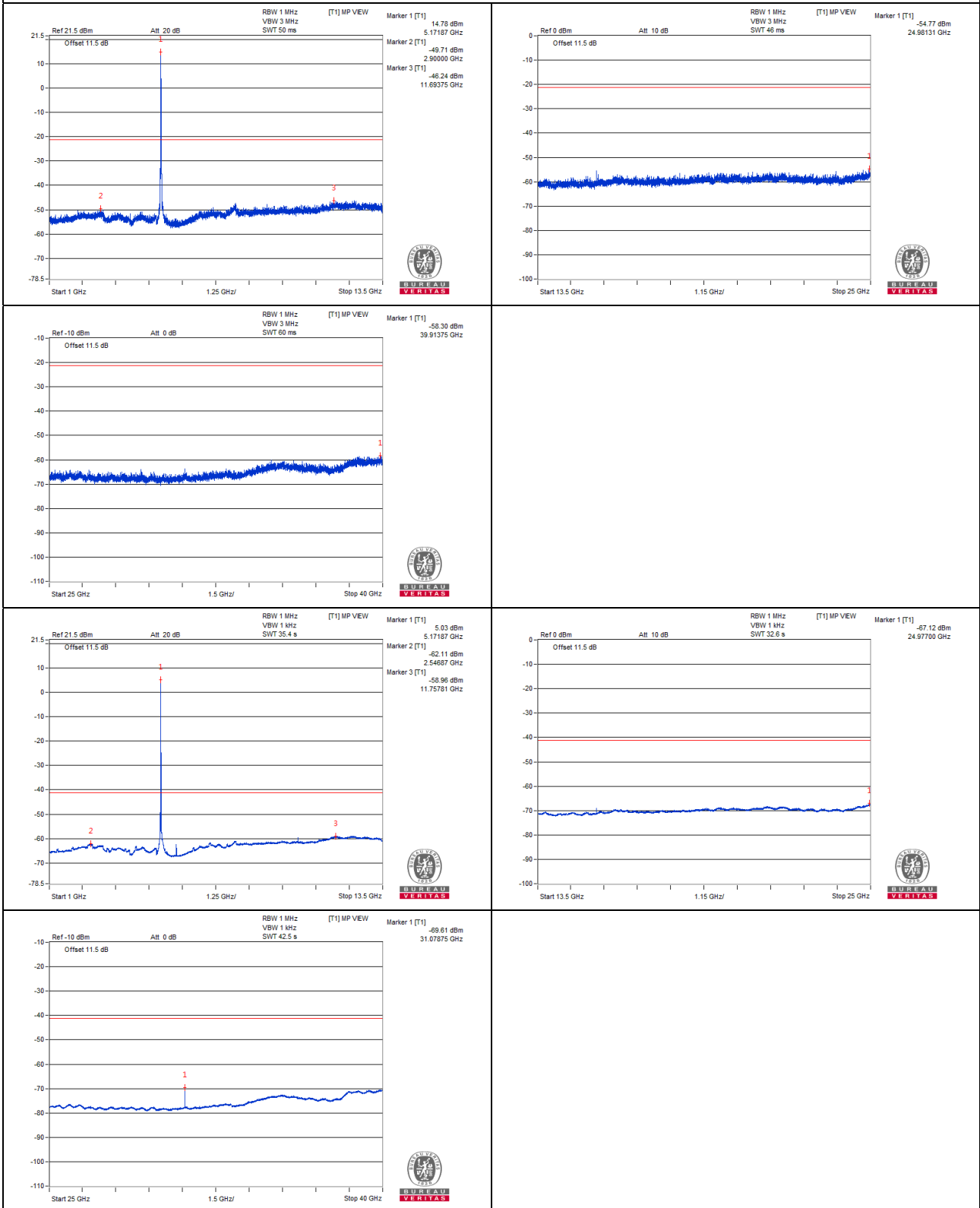
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1

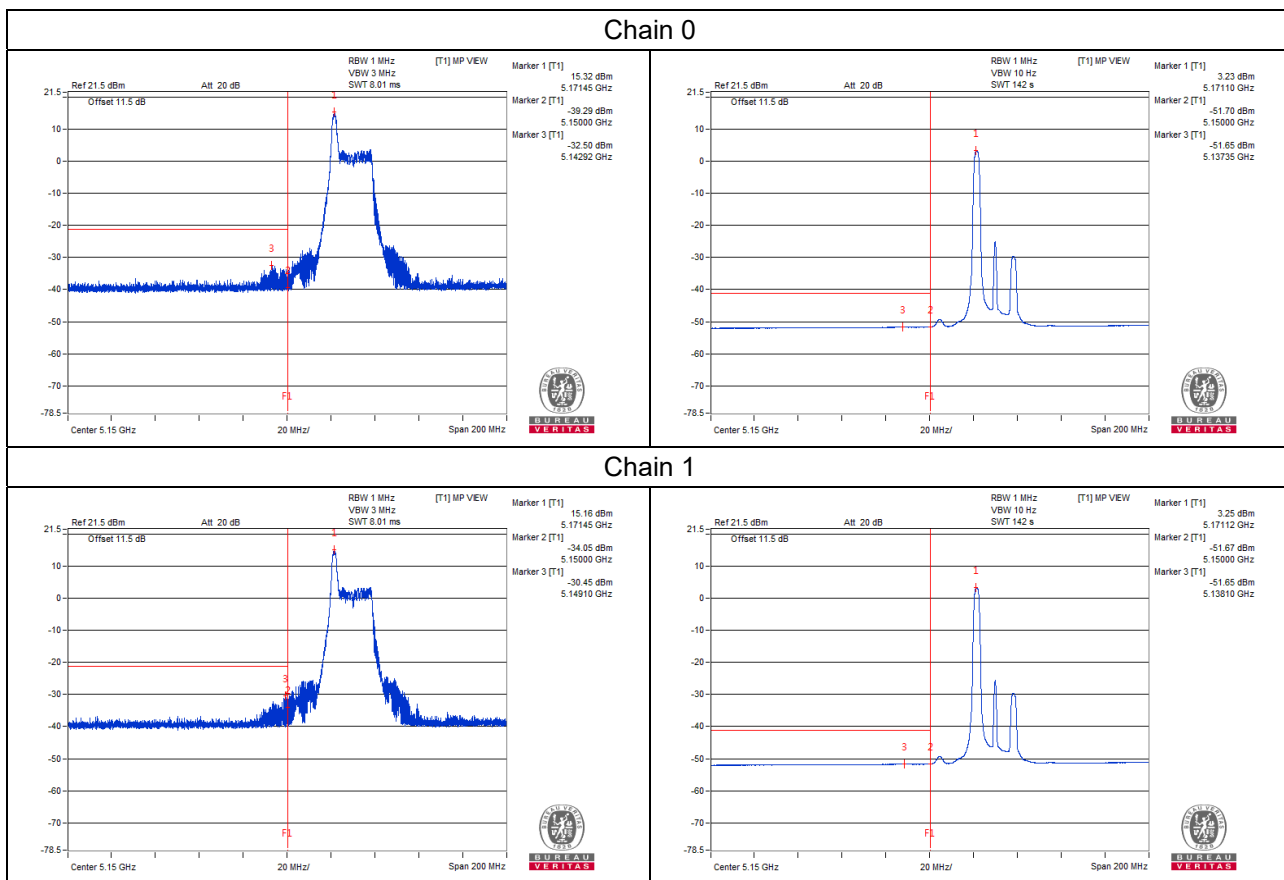


Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5149.47	72.25 PK	74.00	-1.75	-33.86	-30.80	6.05	-23.01
2	5137.12	52.66 AV	54.00	-1.34	-51.65	-51.67	6.05	-42.60

Note :

- Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.



20MHz Preamble 802.11ax (RU26) - Channel 40

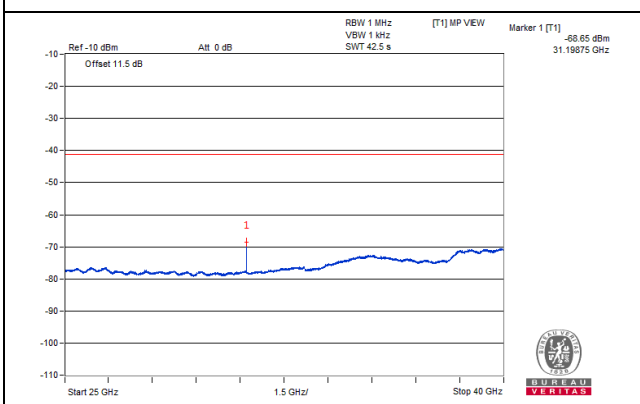
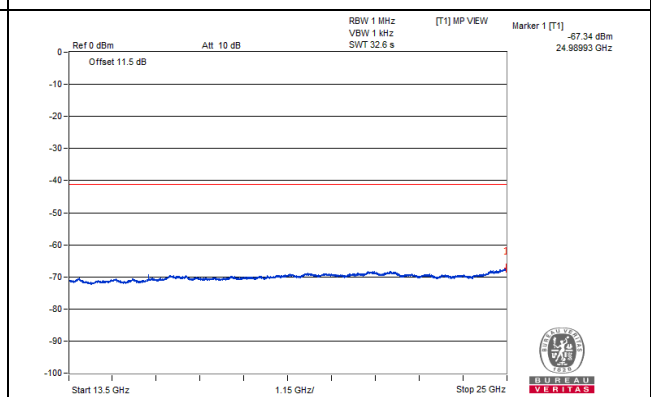
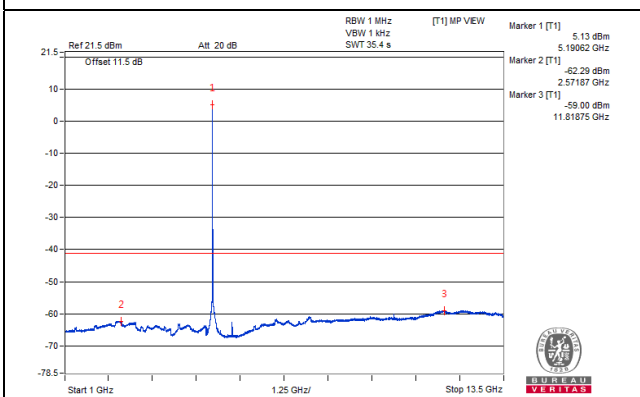
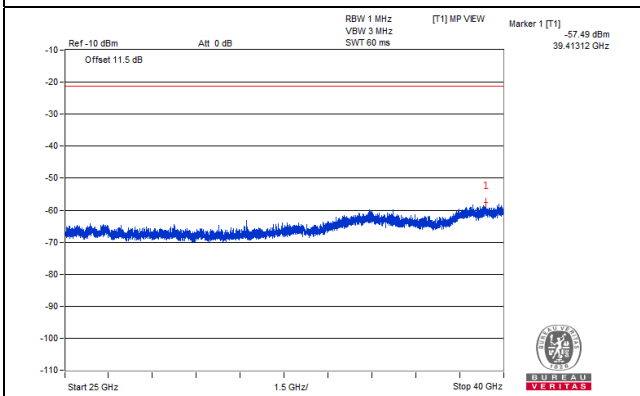
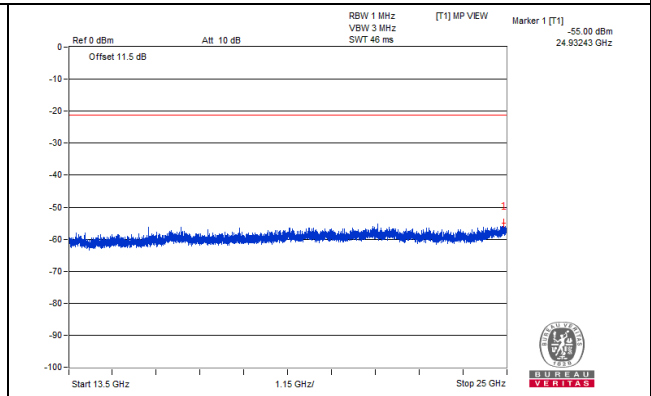
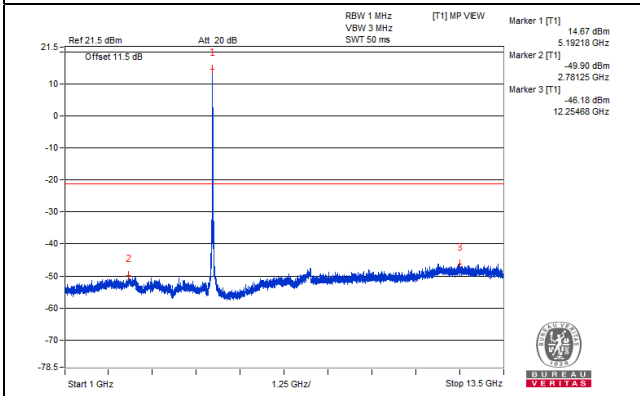
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3467.18	53.95 PK	68.20	-14.25	-52.45	-52.01	7.90	-41.31
2	#6935.93	55.04 PK	68.20	-13.16	-50.57	-51.78	7.90	-40.22
3	#10381.25	57.02 PK	68.20	-11.18	-48.97	-49.33	7.90	-38.24
4	15588.68	46.79 PK	74.00	-27.21	-59.83	-58.97	7.90	-48.47
5	15611.68	35.47 AV	54.00	-18.53	-70.78	-70.62	7.90	-59.79

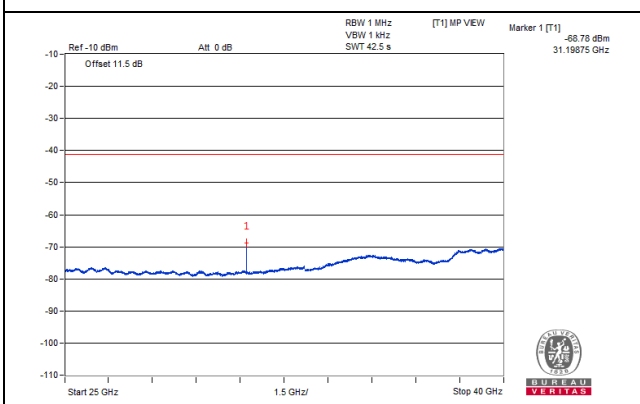
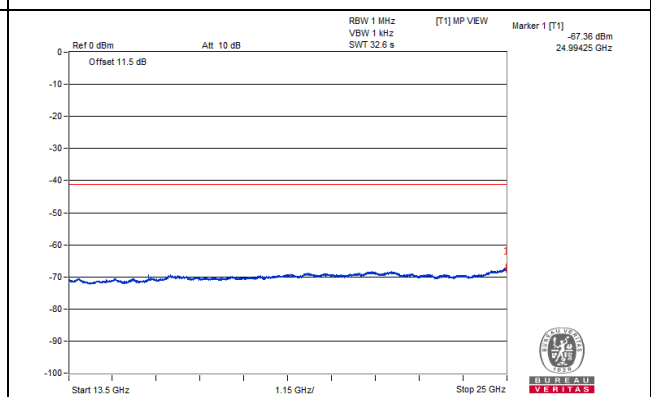
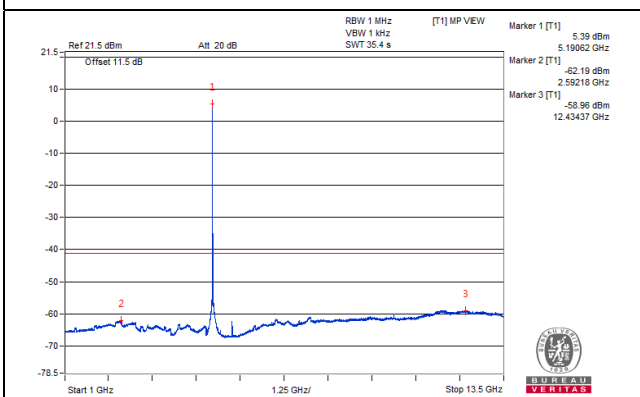
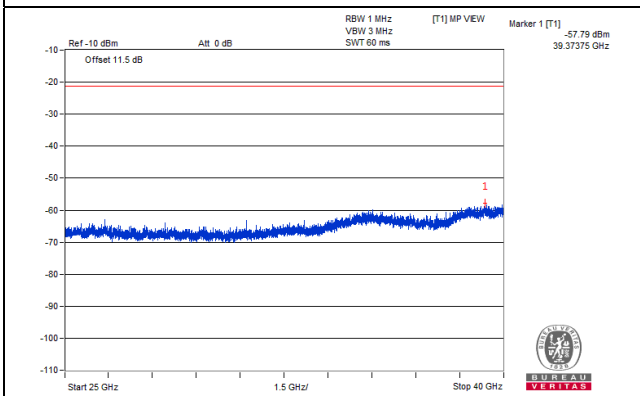
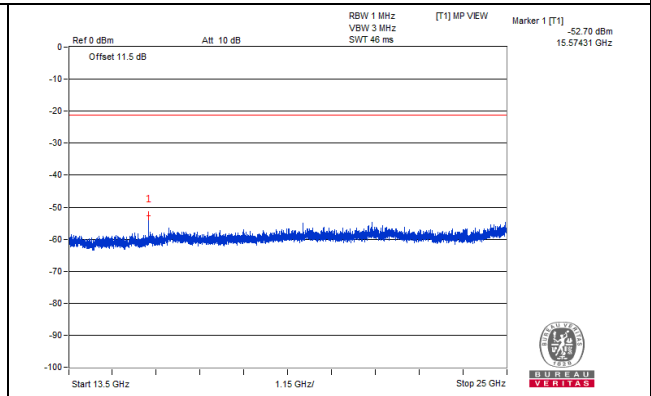
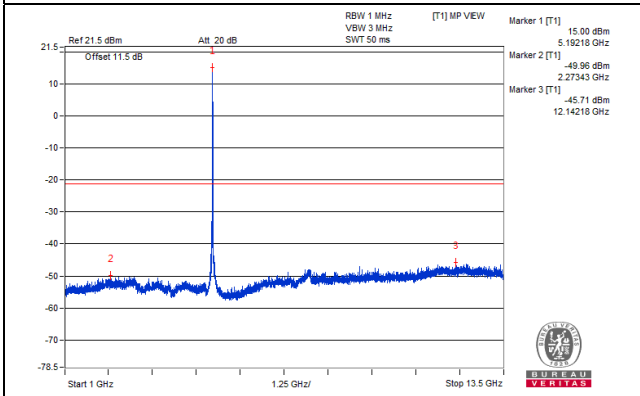
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1

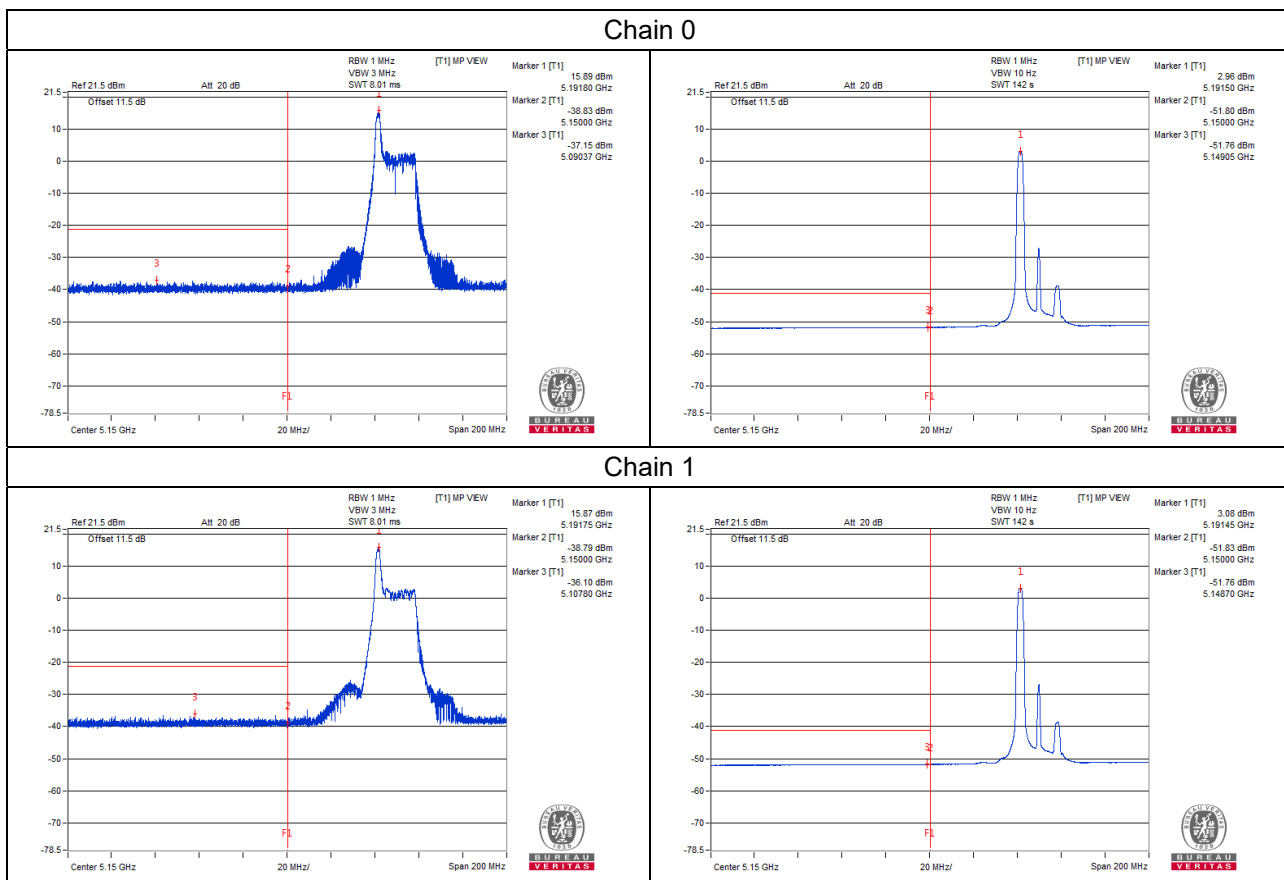


Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5090.37	66.69 PK	74.00	-7.31	-37.15	-38.16	6.05	-28.57
2	5148.45	52.55 AV	54.00	-1.45	-51.76	-51.79	6.05	-42.71

Note :

- Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.



20MHz Preamble 802.11ax (RU26) - Channel 48

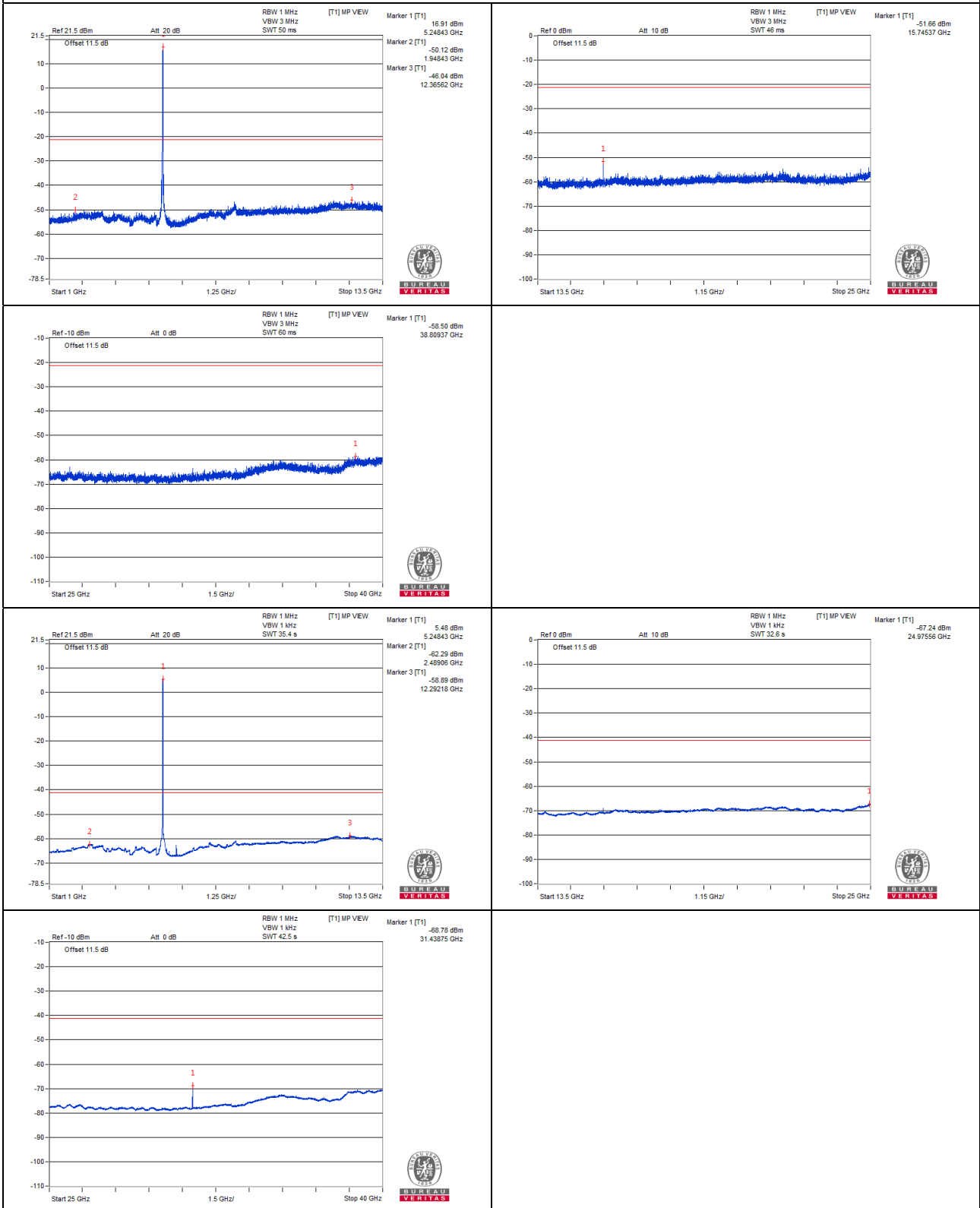
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3501.56	53.28 PK	74.00	-20.72	-52.99	-52.80	7.90	-41.98
2	3509.37	41.88 AV	54.00	-12.12	-64.19	-64.40	7.90	-53.38
3	#6989.06	55.50 PK	68.20	-12.70	-52.05	-49.63	7.90	-39.76
4	#10465.62	56.68 PK	68.20	-11.52	-50.53	-48.65	7.90	-38.58
5	15729.56	46.62 PK	74.00	-27.38	-60.69	-58.65	7.90	-48.64
6	15705.12	35.46 AV	54.00	-18.54	-70.63	-70.79	7.90	-59.80

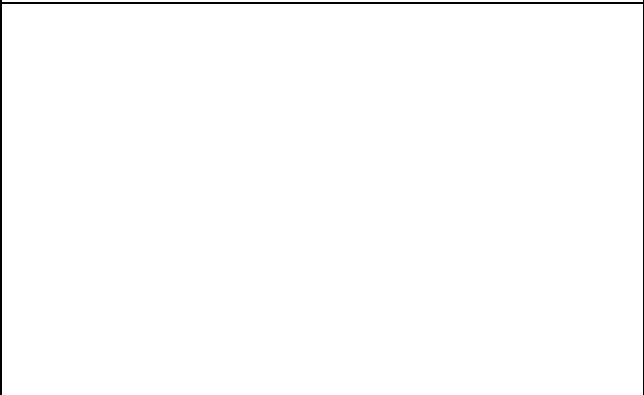
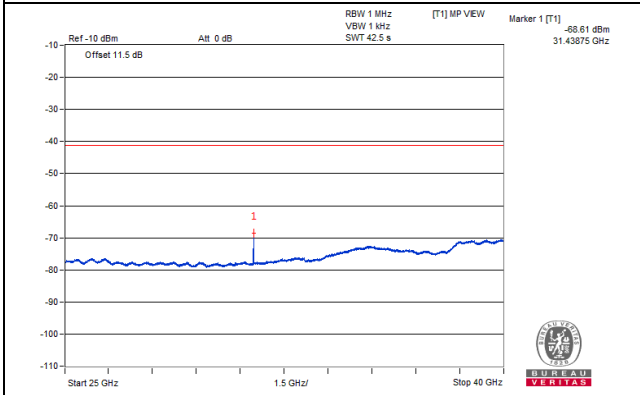
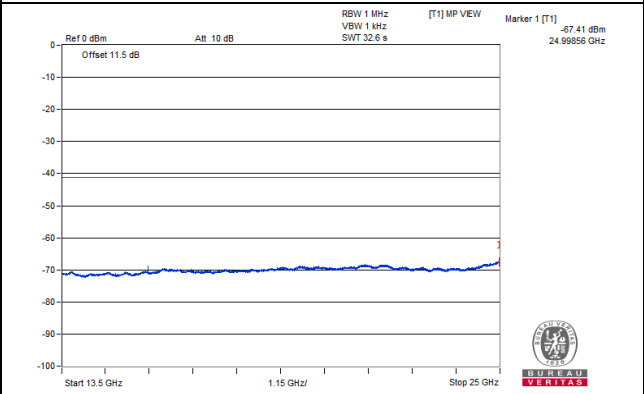
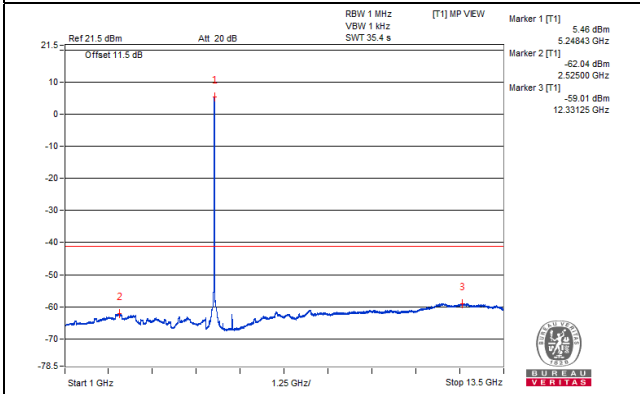
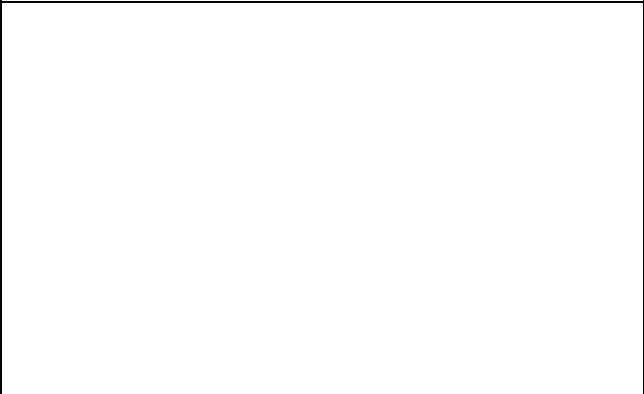
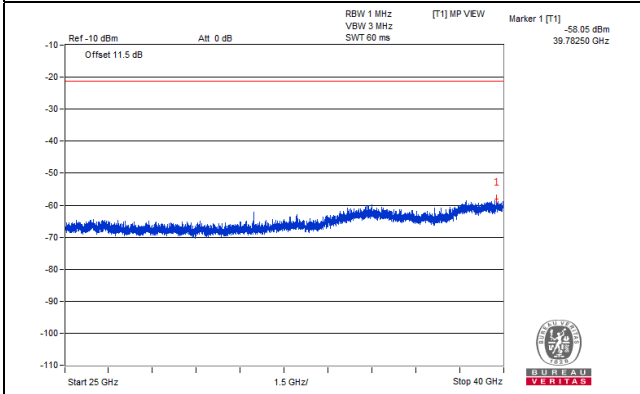
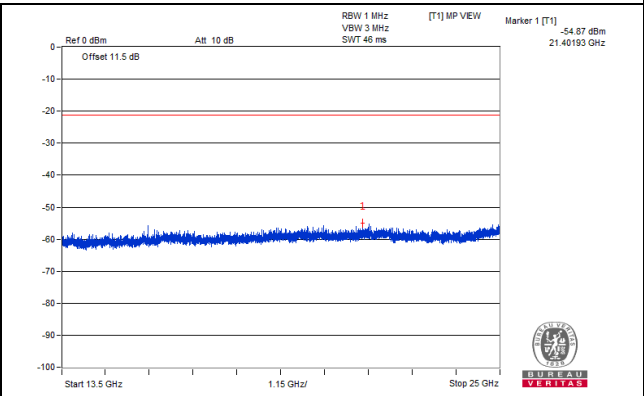
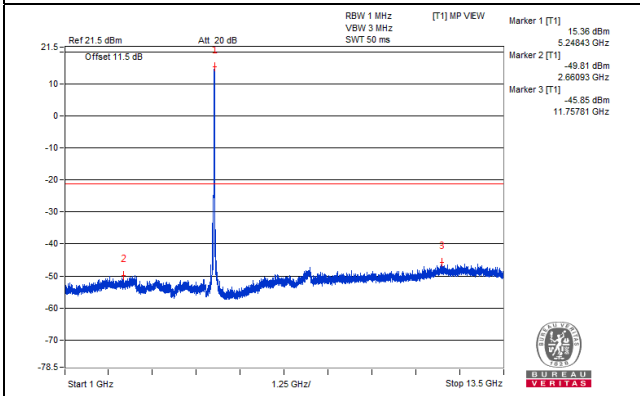
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1

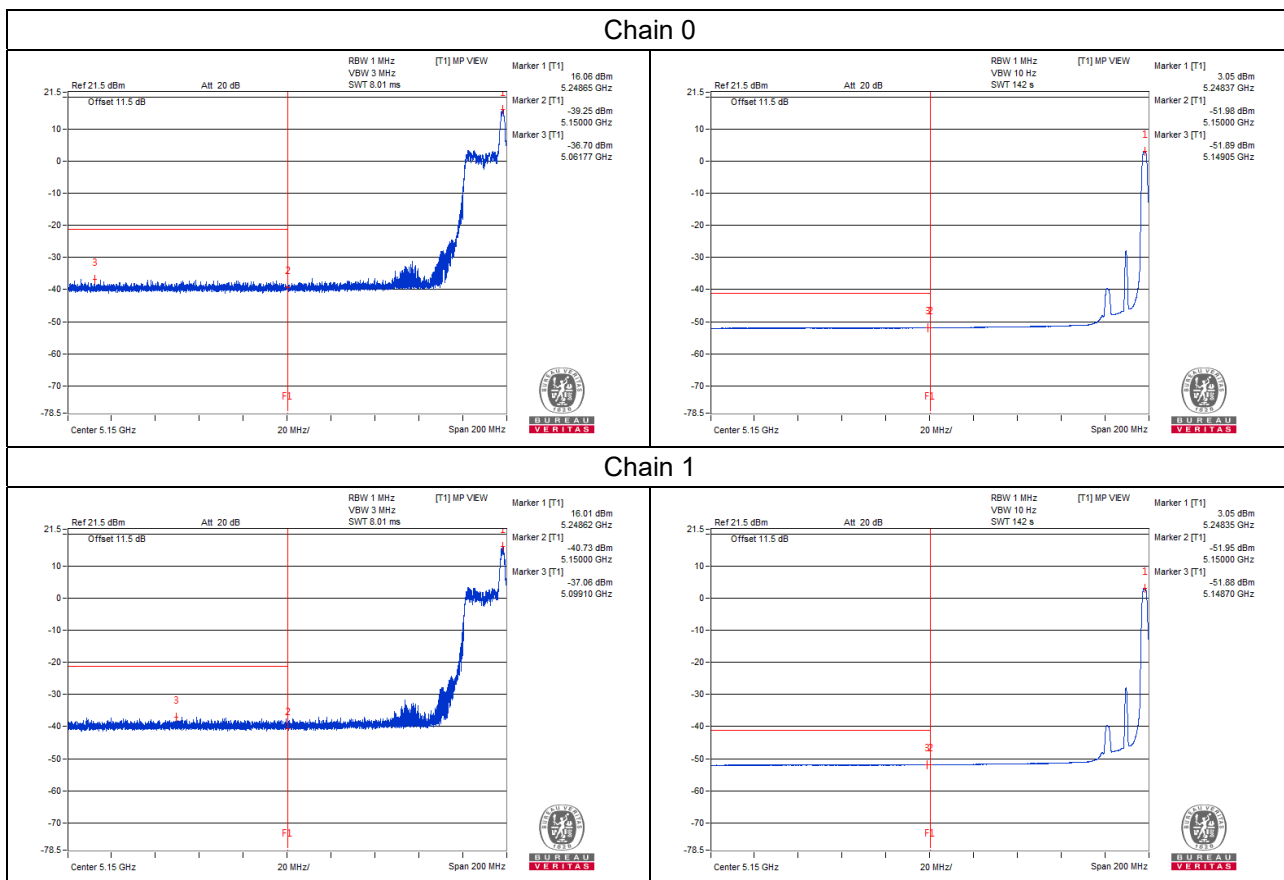


Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5061.77	66.5 PK	74.00	-7.50	-36.70	-39.33	6.05	-28.76
2	5145.80	52.41 AV	54.00	-1.59	-51.92	-51.90	6.05	-42.85

Note :

- Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.



20MHz Preamble 802.11ax (RU52) - Channel 36

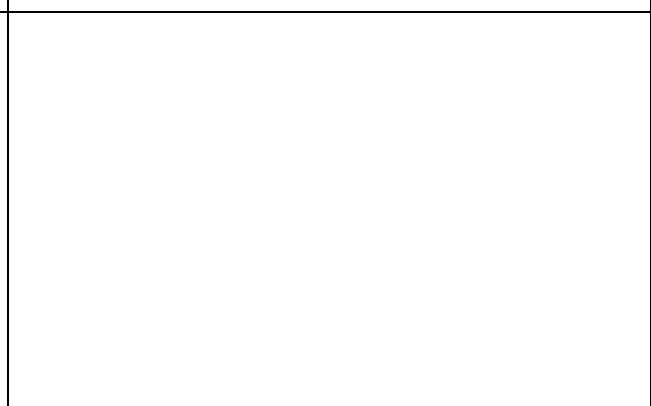
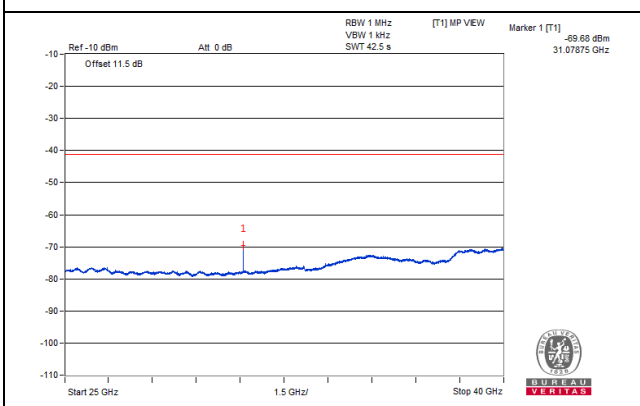
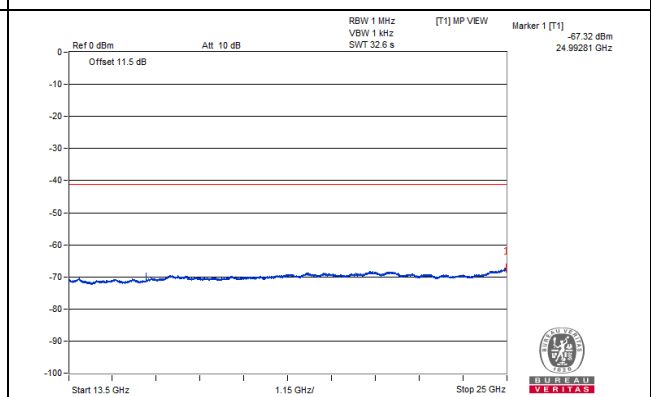
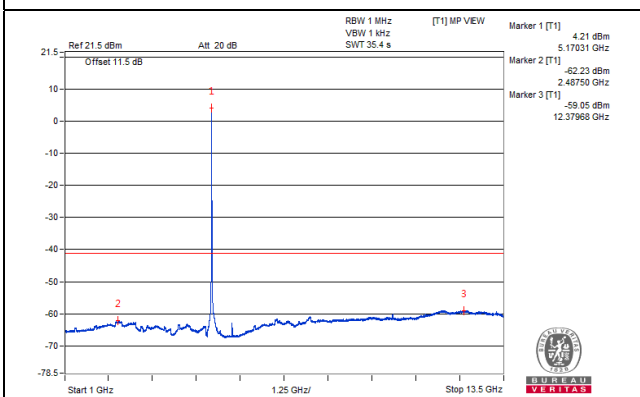
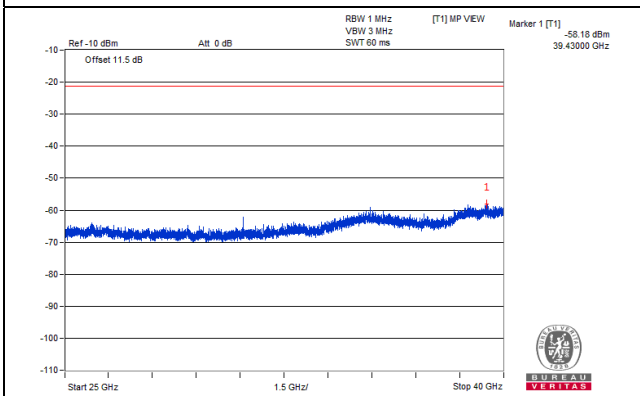
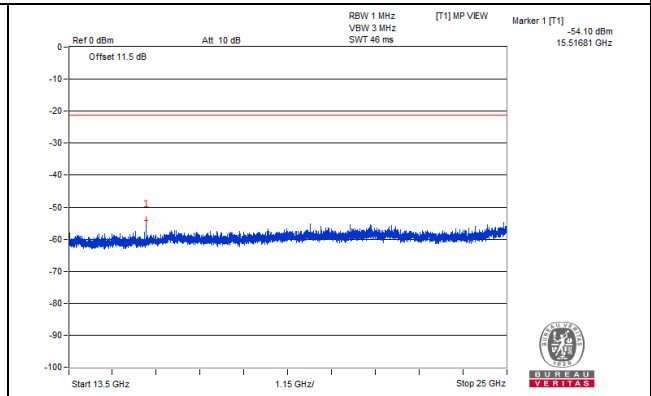
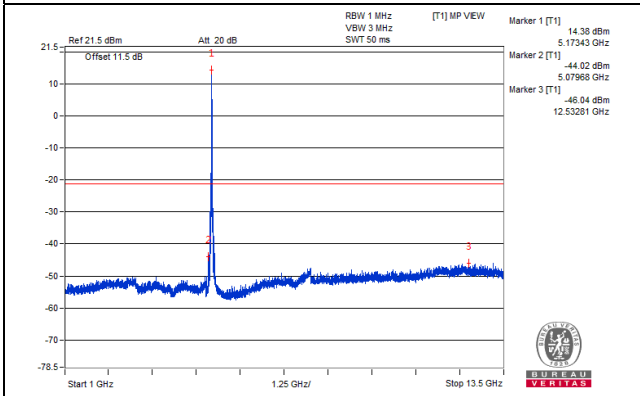
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3470.31	53.16 PK	68.20	-15.04	-54.76	-51.76	7.90	-42.10
2	#6900.00	55.05 PK	68.20	-13.15	-53.00	-49.82	7.90	-40.21
3	#10346.87	58.12 PK	68.20	-10.08	-48.04	-48.07	7.90	-37.14
4	15521.12	47.37 PK	74.00	-26.63	-58.33	-59.33	7.90	-47.89
5	15521.12	35.47 AV	54.00	-18.53	-70.80	-70.60	7.90	-59.79

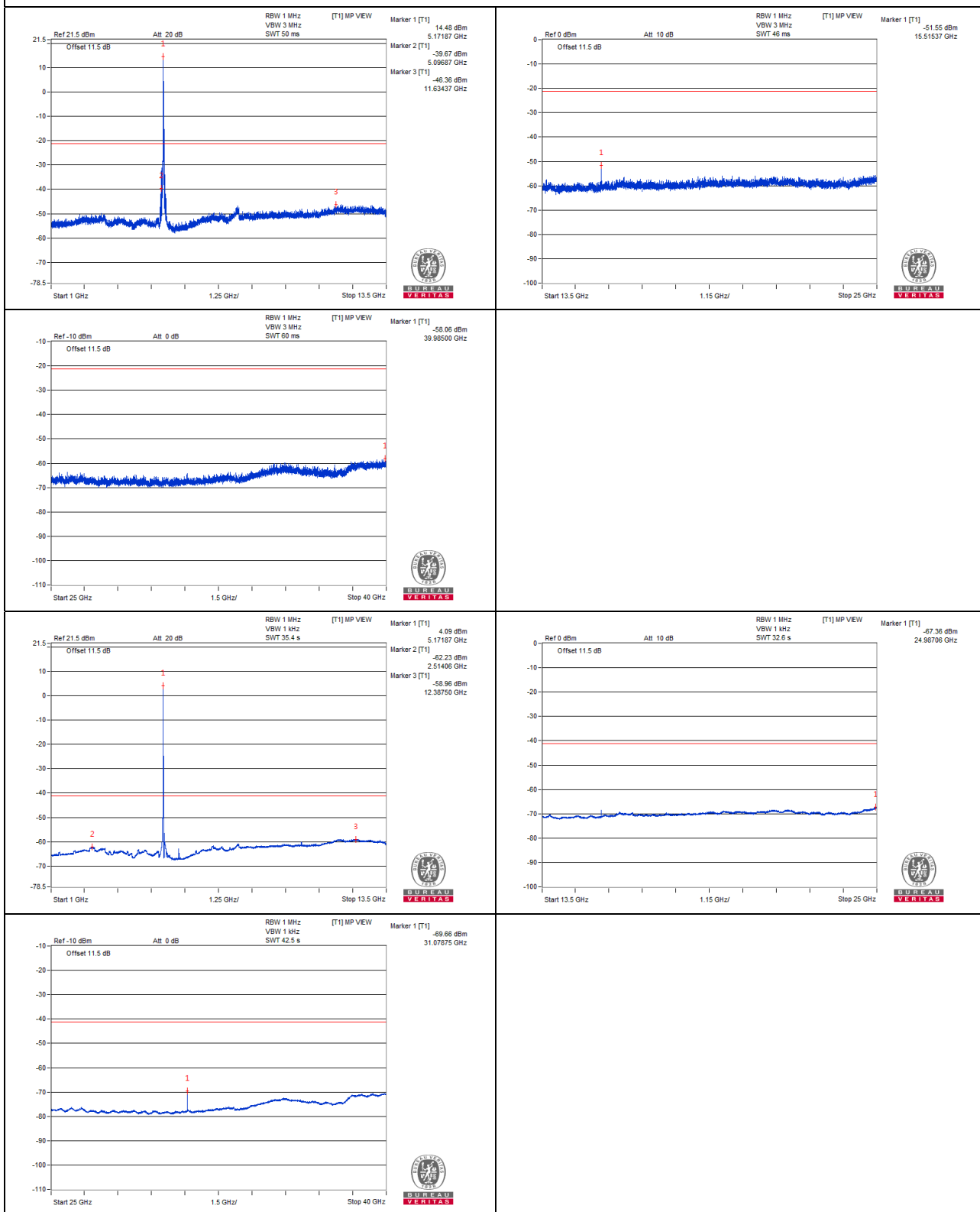
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1



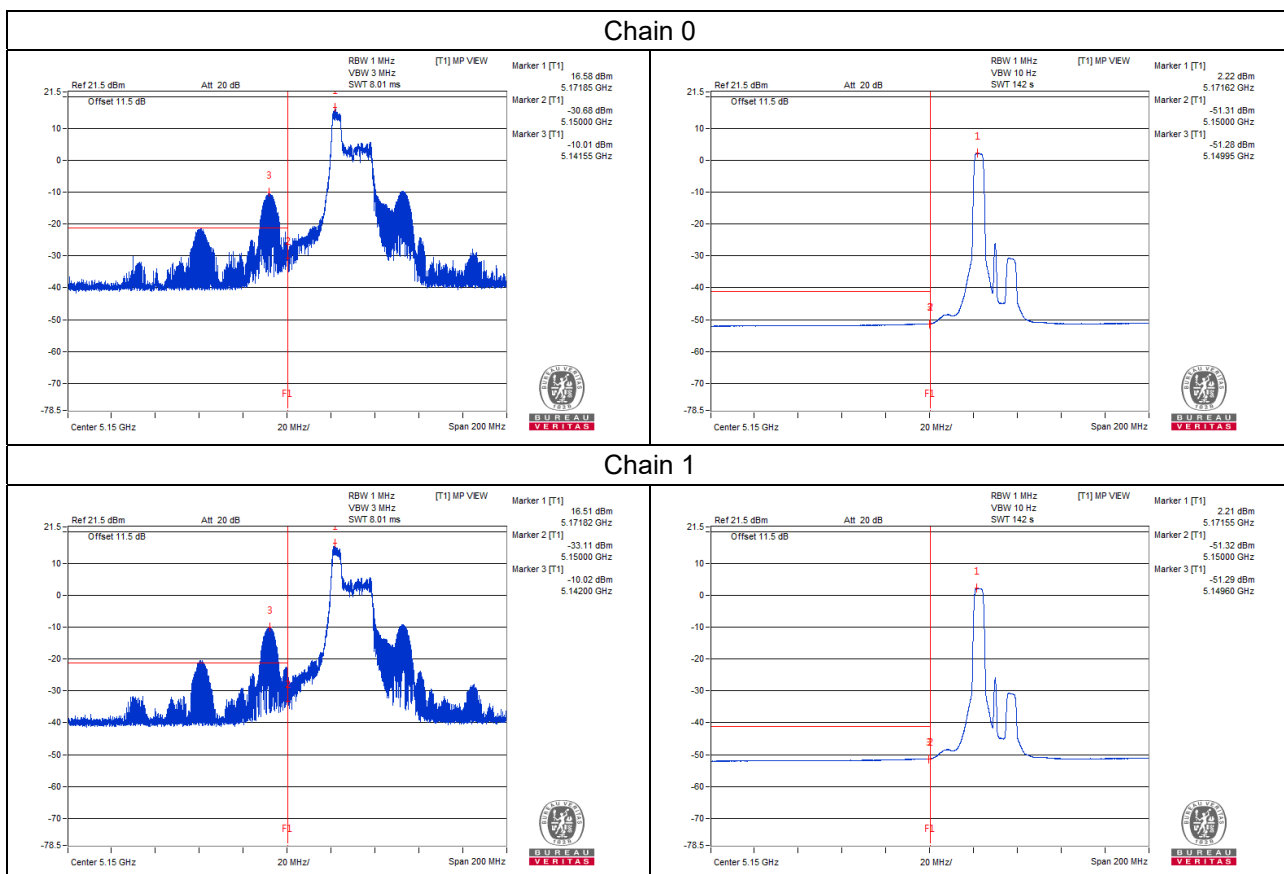
Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5141.55	94.25 PK	74.00	*20.25	-10.01	-10.13	6.05	-1.01
2	5149.85	53.02 AV	54.00	-0.98	-51.31	-51.29	6.05	-42.24

Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.

* The unwanted emission was verified and the test result was passed by radiated measurement.
(Please refer Appendix A)



20MHz Preamble 802.11ax (RU52) - Channel 40

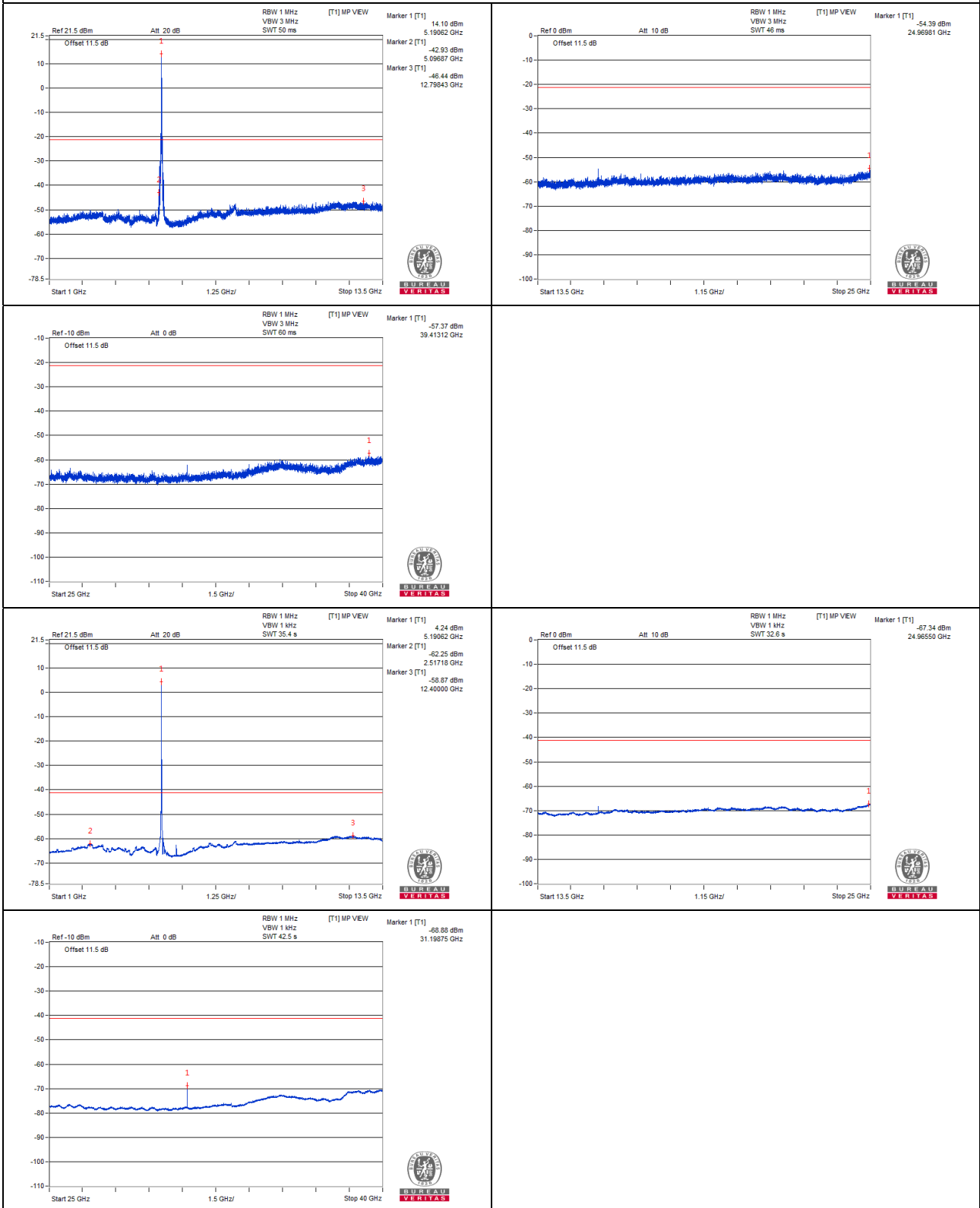
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3475.00	53.43 PK	68.20	-14.77	-52.01	-53.63	7.90	-41.83
2	#6925.00	55.50 PK	68.20	-12.70	-50.08	-51.36	7.90	-39.76
3	#10389.06	57.31 PK	68.20	-10.89	-47.69	-50.48	7.90	-37.95
4	15580.06	47.64 PK	74.00	-26.36	-58.38	-58.69	7.90	-47.62
5	15580.06	36.34 AV	54.00	-17.66	-69.67	-70.00	7.90	-58.92

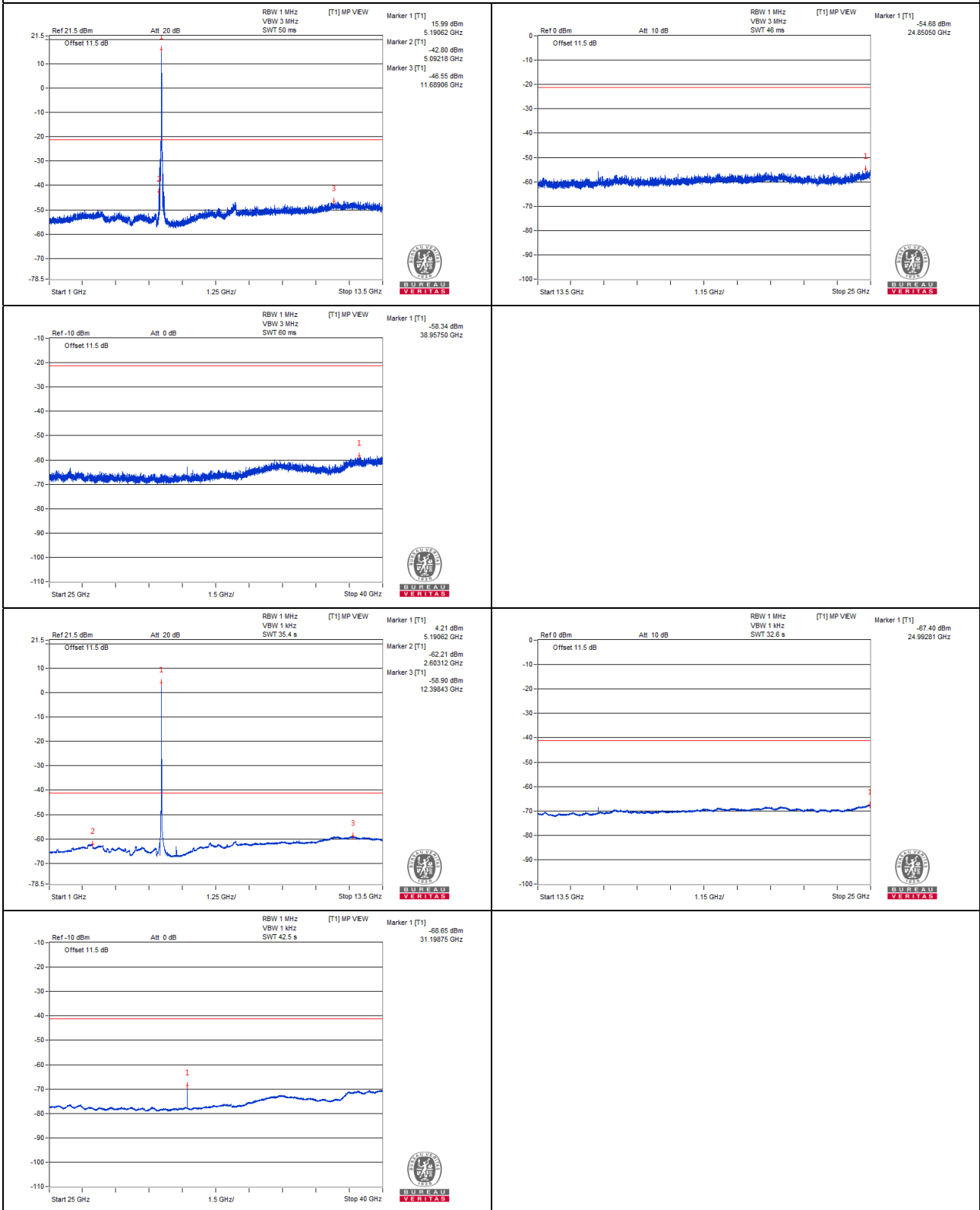
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1

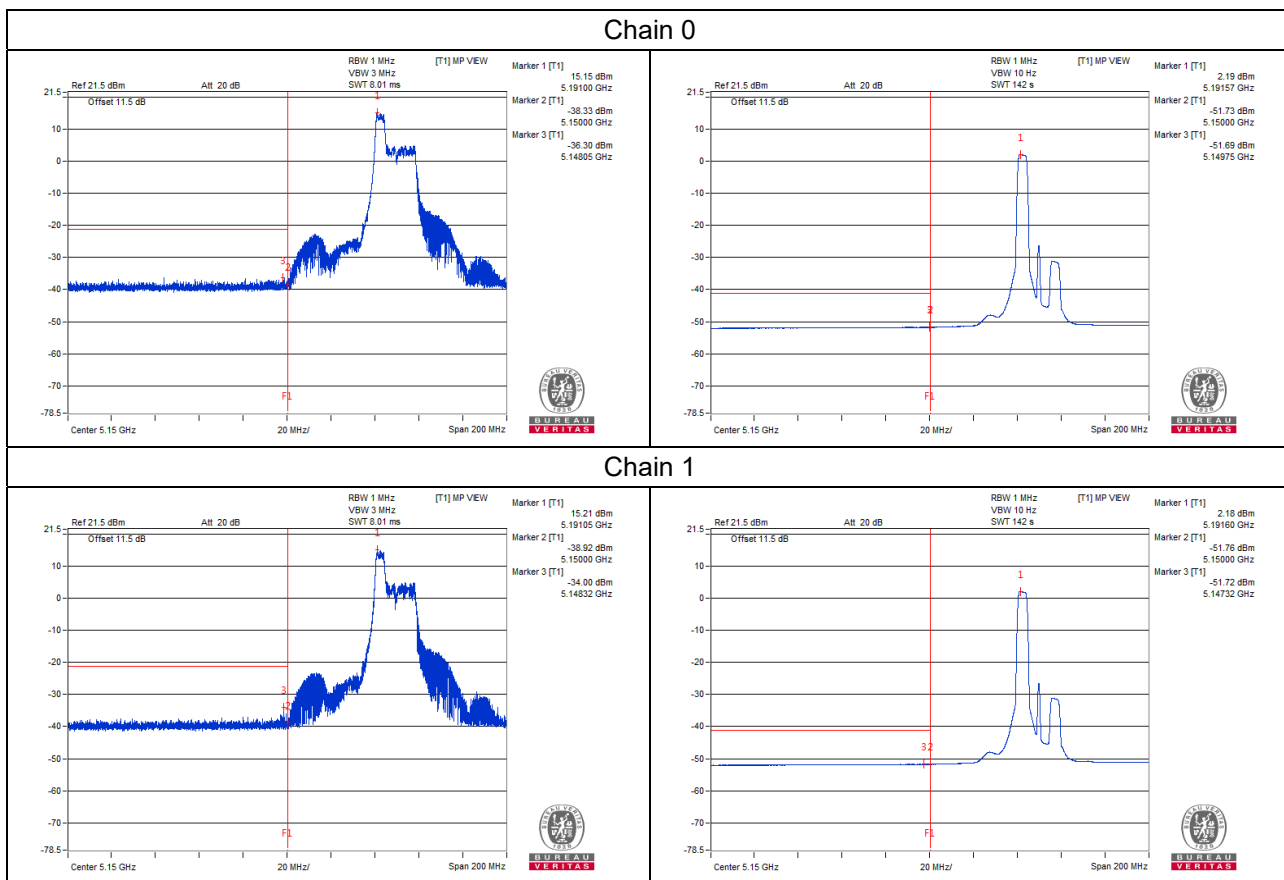


Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5148.32	68.46 PK	74.00	-5.54	-39.17	-34.00	6.05	-26.80
2	5149.75	52.59 AV	54.00	-1.41	-51.69	-51.77	6.05	-42.67

Note :

- Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.



20MHz Preamble 802.11ax (RU52) - Channel 48

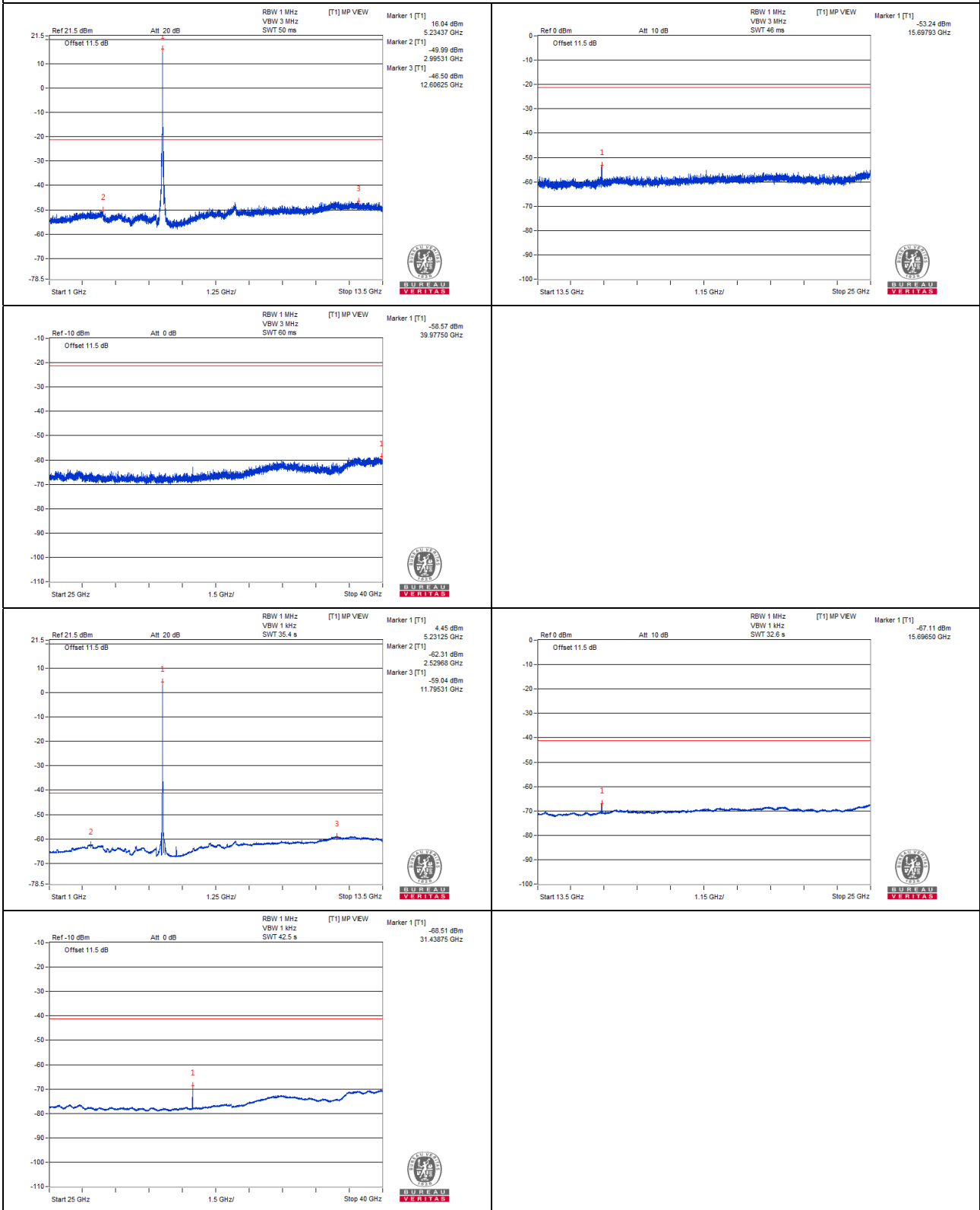
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3484.37	53.32 PK	68.20	-14.88	-52.37	-53.39	7.90	-41.94
2	3507.81	41.92 AV	54.00	-12.08	-64.20	-64.31	7.90	-53.34
3	#7004.68	55.47 PK	68.20	-12.73	-49.36	-52.66	7.90	-39.79
4	#10470.31	56.58 PK	68.20	-11.62	-50.12	-49.11	7.90	-38.68
5	15700.81	48.00 PK	74.00	-26.00	-57.45	-59.03	7.90	-47.26
6	15700.81	36.31 AV	54.00	-17.69	-69.76	-69.97	7.90	-58.95

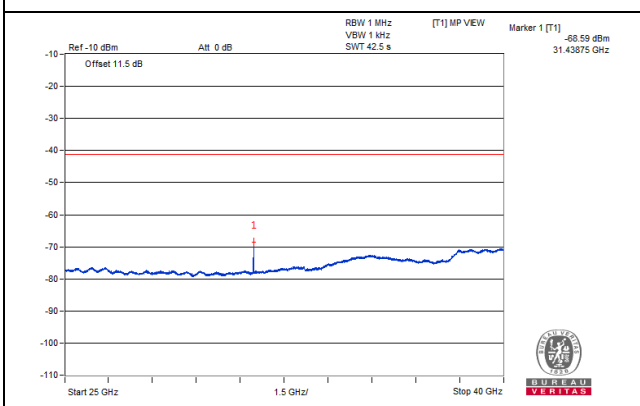
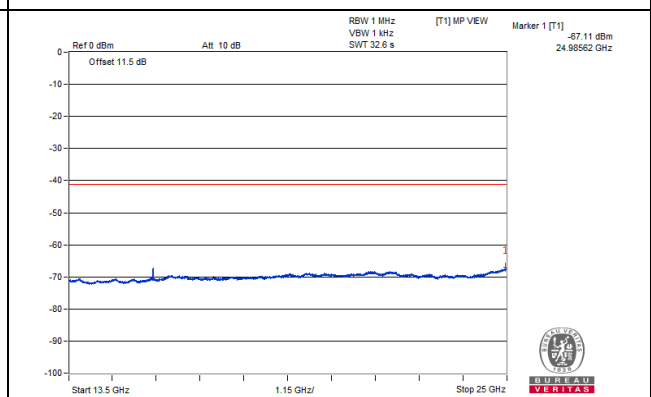
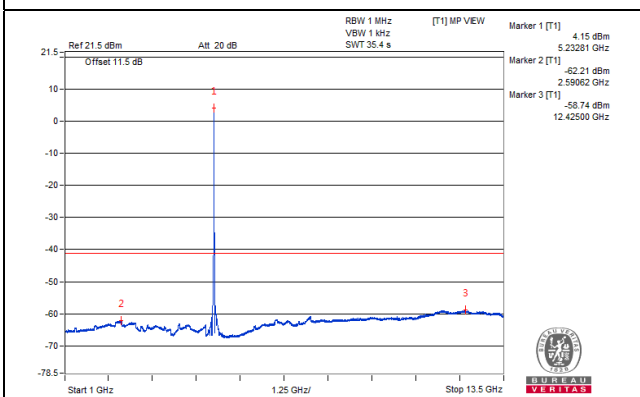
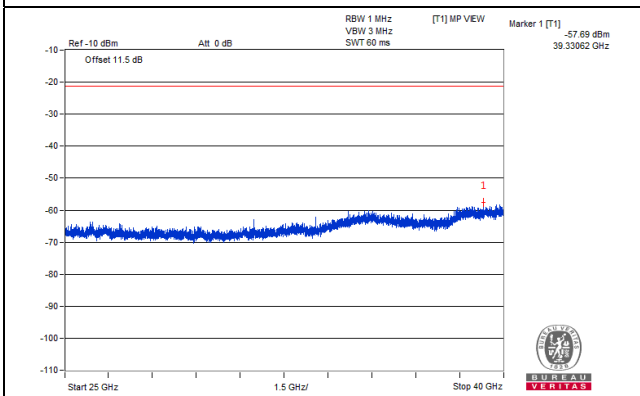
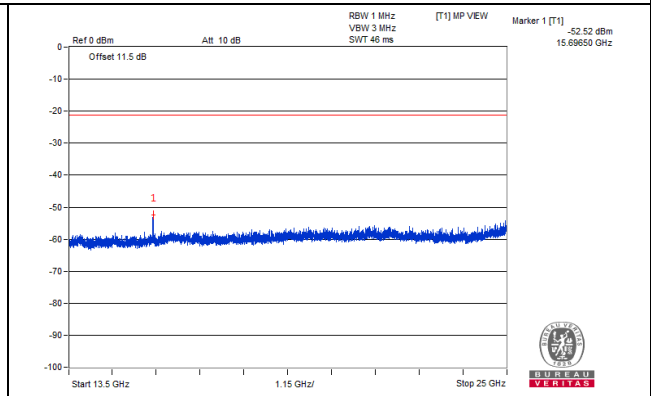
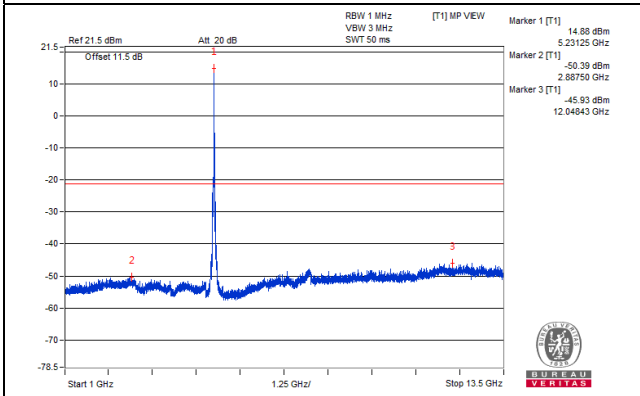
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1

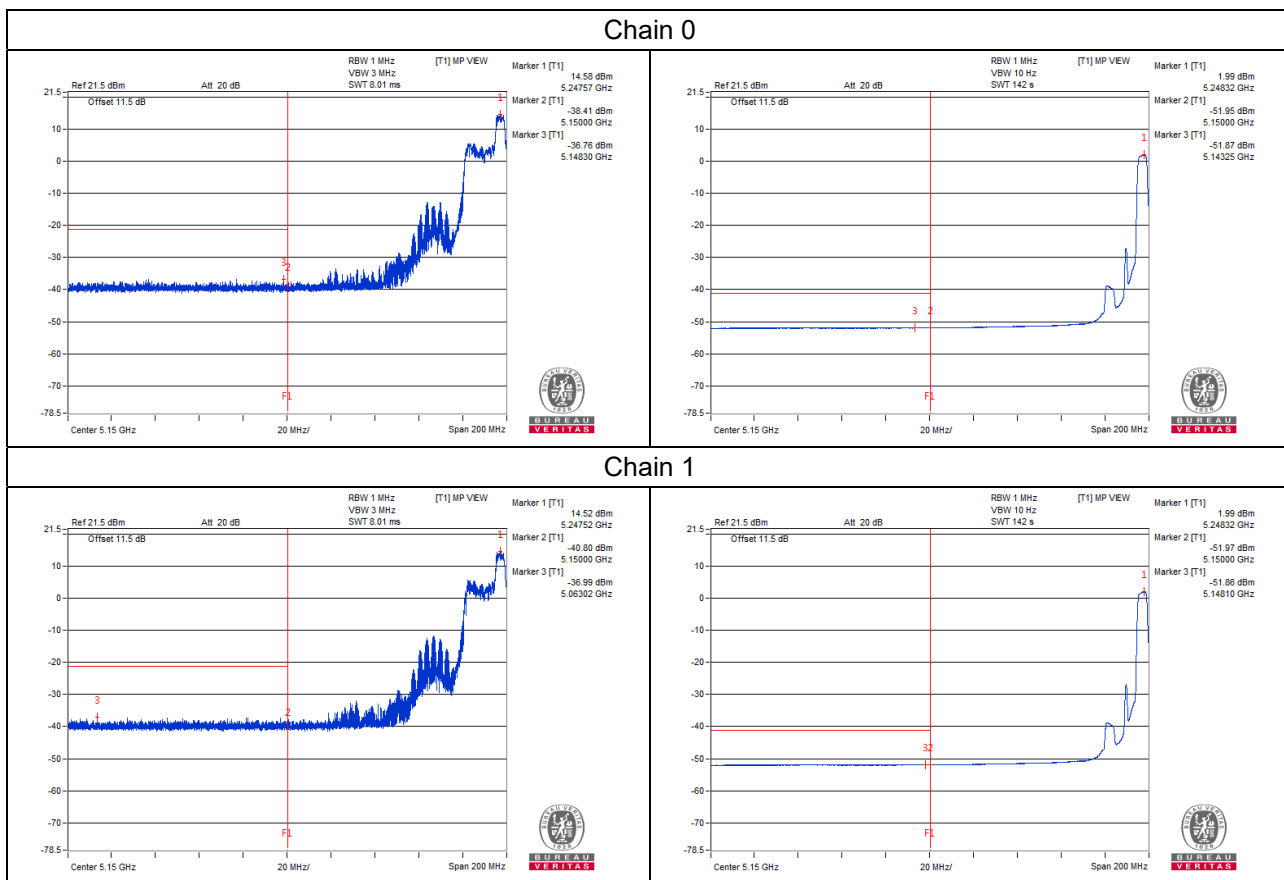


Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5063.02	66.35 PK	74.00	-7.65	-39.24	-36.99	6.05	-28.91
2	5148.10	52.43 AV	54.00	-1.57	-51.92	-51.86	6.05	-42.83

Note :

- Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.



20MHz Preamble 802.11ax (RU106) - Channel 36

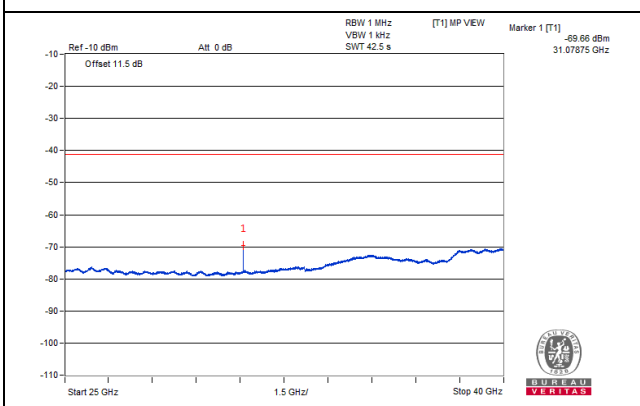
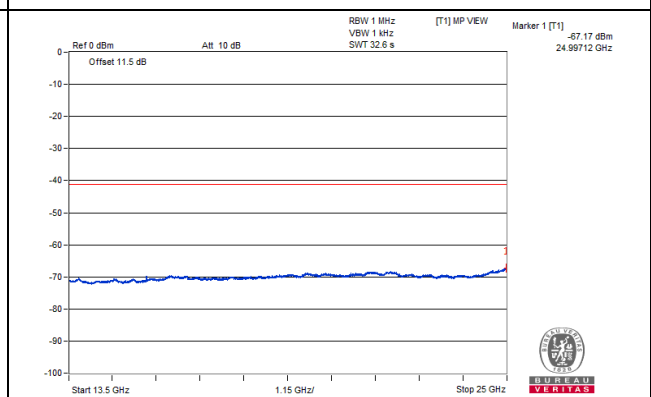
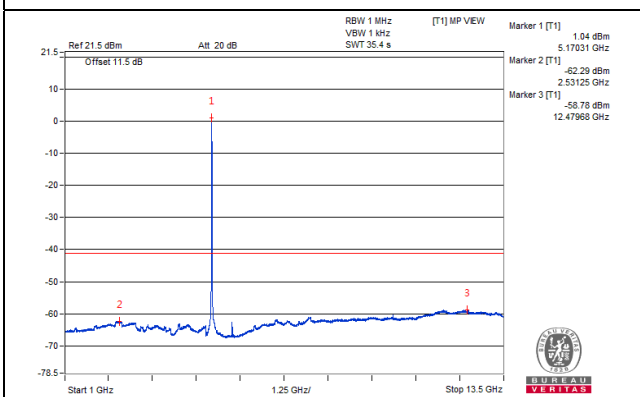
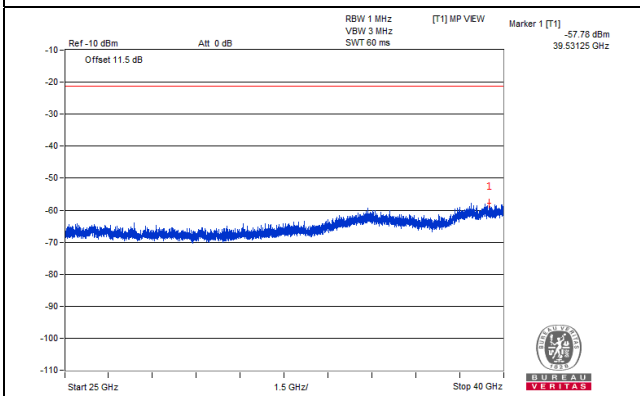
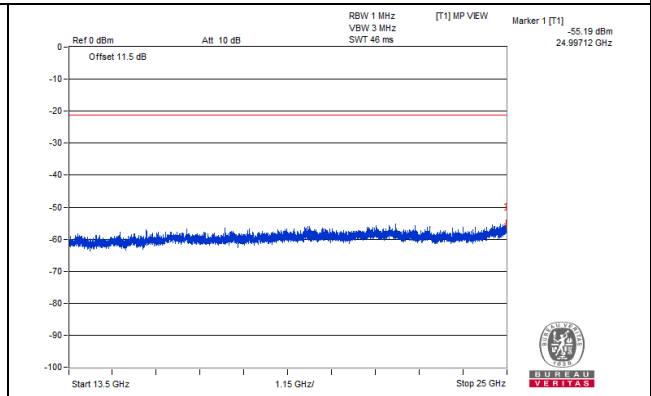
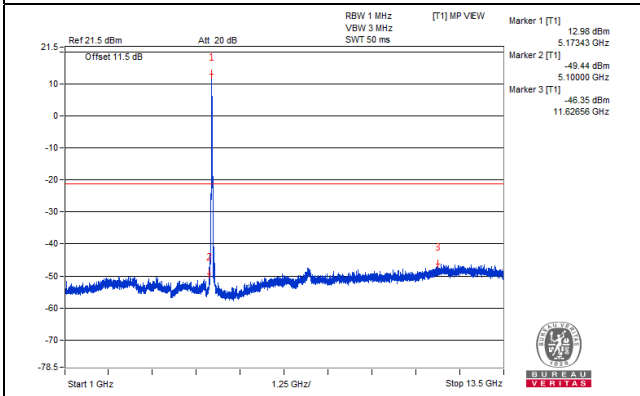
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3434.37	53.50 PK	68.20	-14.70	-53.29	-52.13	7.90	-41.76
2	#6912.50	54.67 PK	68.20	-13.53	-51.05	-52.00	7.90	-40.59
3	#10364.06	57.32 PK	68.20	-10.88	-48.18	-49.64	7.90	-37.94
4	15525.43	47.91 PK	74.00	-26.09	-57.57	-59.07	7.90	-47.35
5	15524.00	36.51 AV	54.00	-17.49	-69.72	-69.60	7.90	-58.75

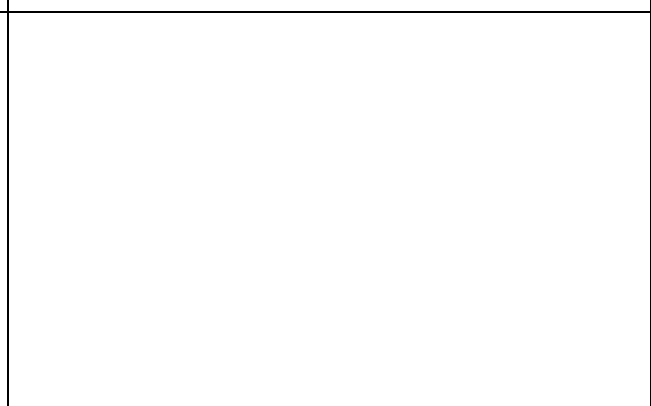
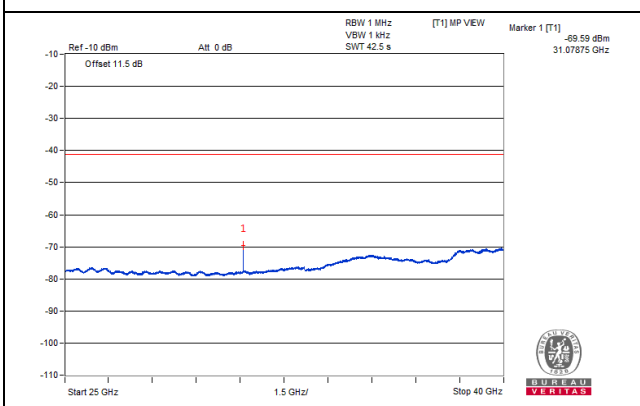
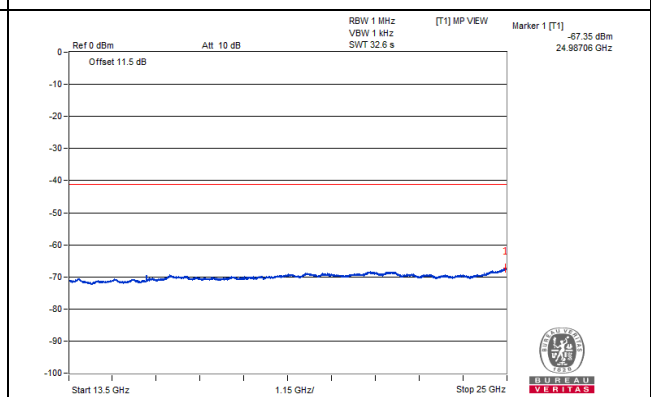
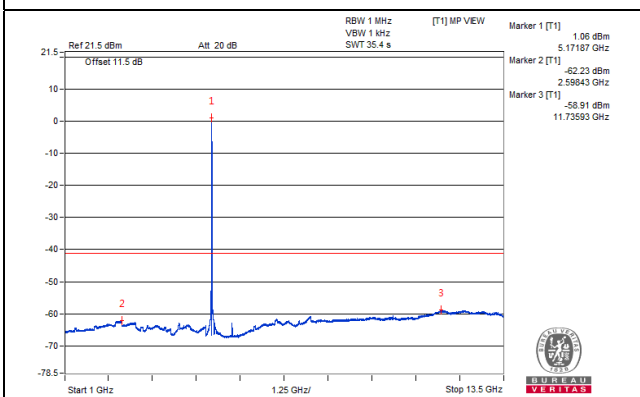
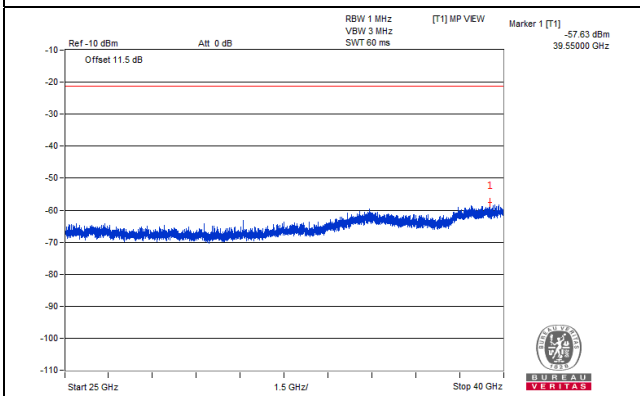
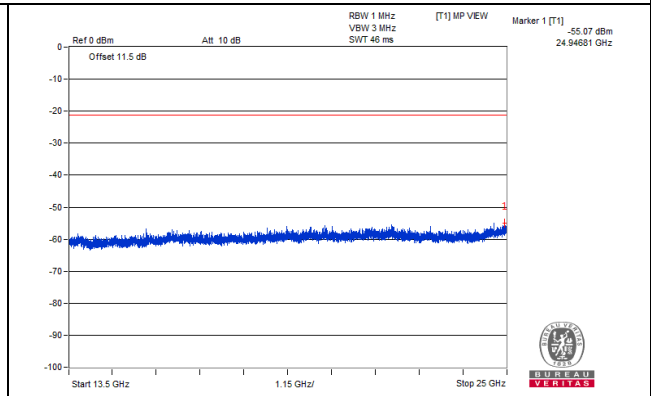
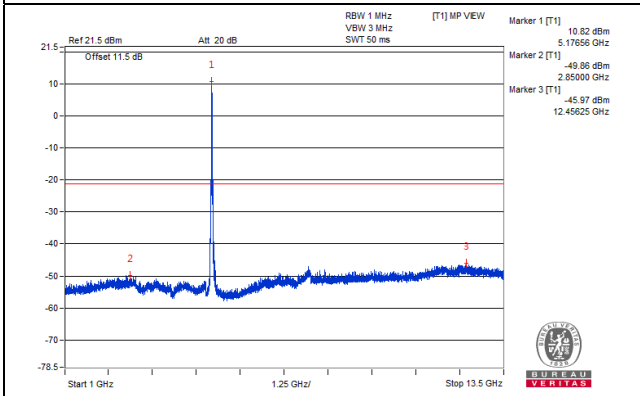
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1



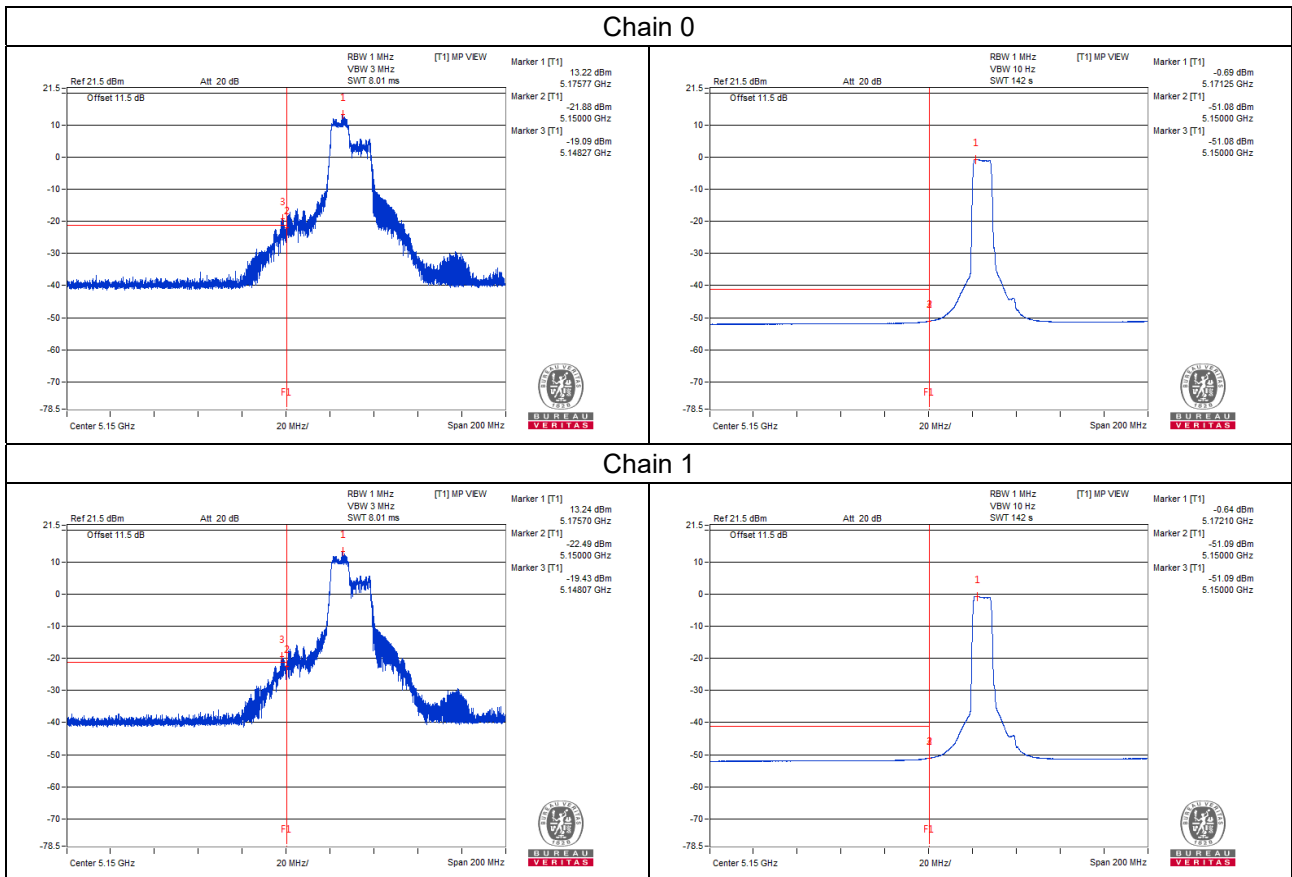
Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5148.52	84.57 PK	74.00	*10.57	-19.60	-19.90	6.05	-10.69
2	5150.00	53.24 AV	54.00	-0.76	-51.08	-51.09	6.05	-42.02

Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.

* The unwanted emission was verified and the test result was passed by radiated measurement.
(Please refer Appendix A)



20MHz Preamble 802.11ax (RU106) - Channel 40

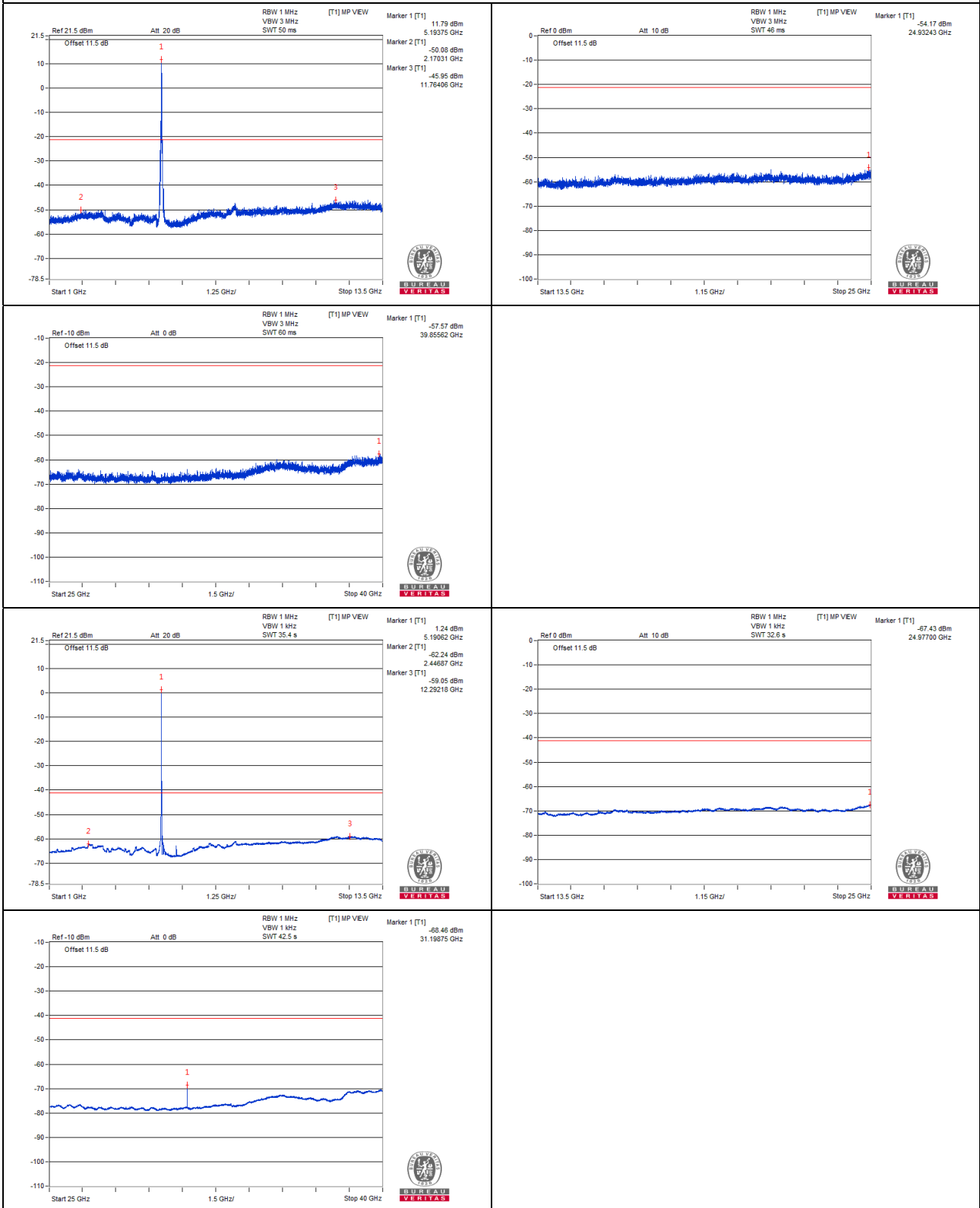
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	#3454.68	54.03 PK	68.20	-14.17	-51.93	-52.37	7.90	-41.23
2	#6931.25	55.33 PK	68.20	-12.87	-52.24	-49.78	7.90	-39.93
3	#10389.06	57.30 PK	68.20	-10.90	-49.03	-48.72	7.90	-37.96
4	15580.06	48.45 PK	74.00	-25.55	-60.49	-56.04	7.90	-46.81
5	15584.37	36.88 AV	54.00	-17.12	-69.57	-69.03	7.90	-58.38

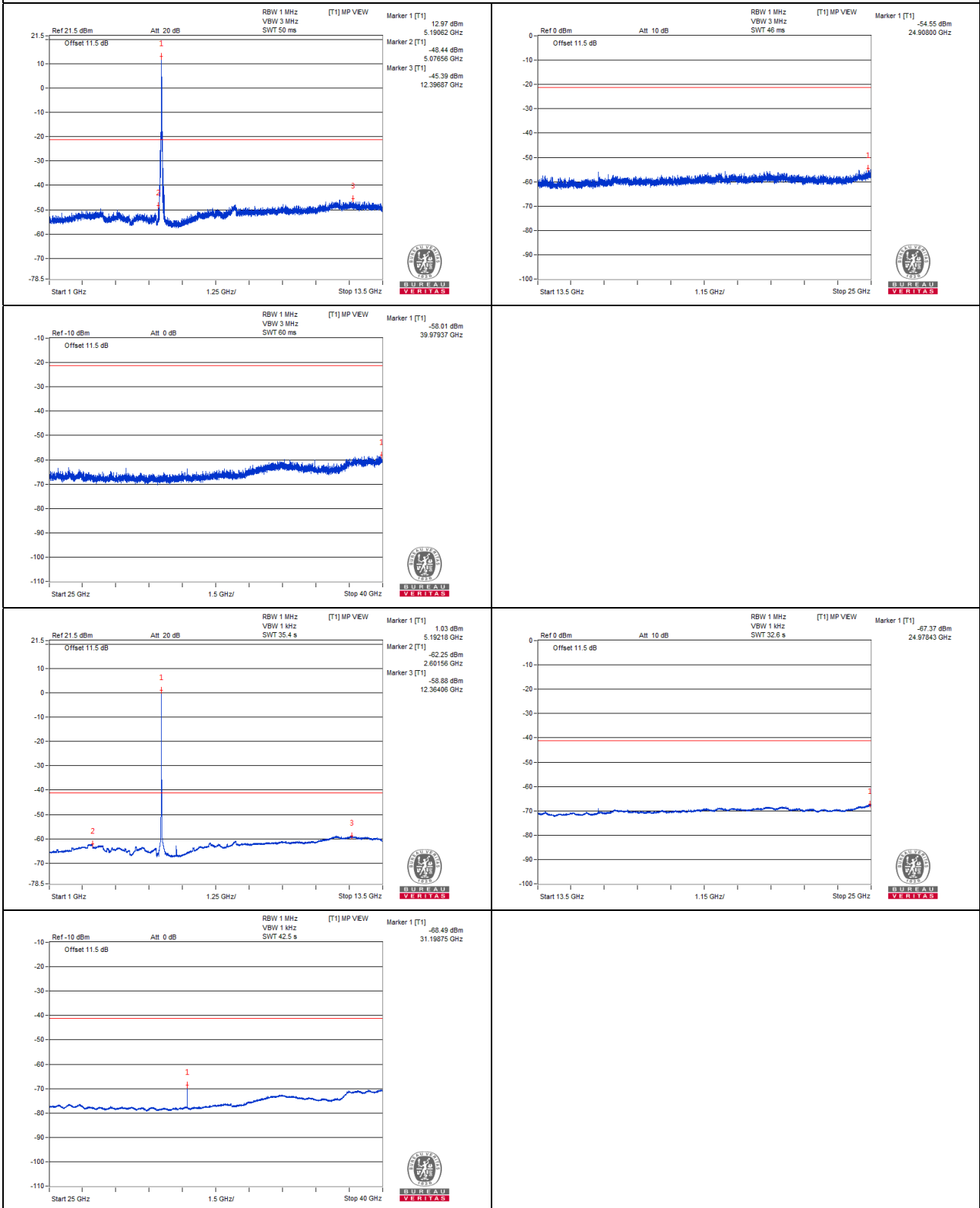
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1

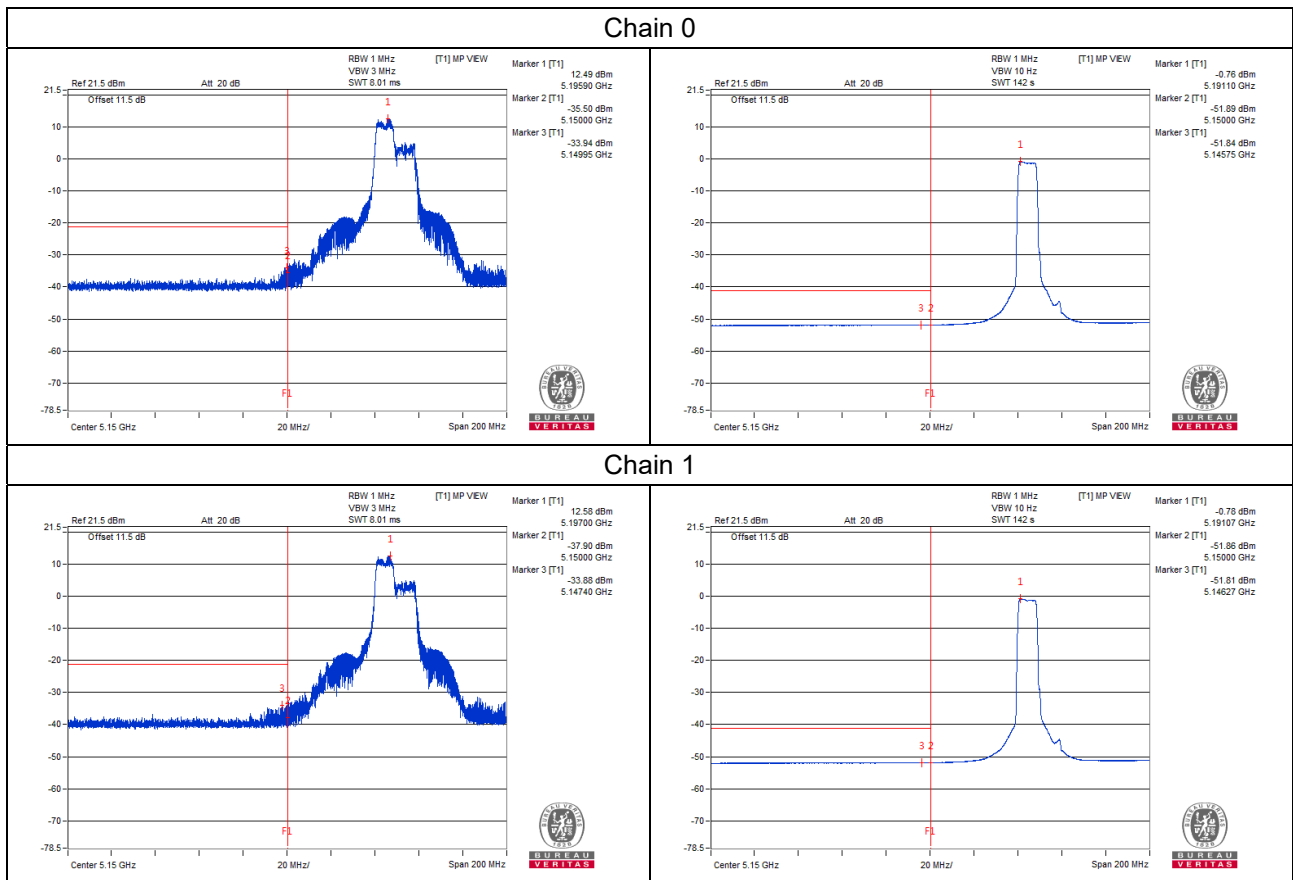


Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5147.02	69.11 PK	74.00	-4.89	-35.23	-35.19	6.05	-26.15
2	5149.6	52.49 AV	54.00	-1.51	-51.86	-51.81	6.05	-42.77

Note :

- Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.



20MHz Preamble 802.11ax (RU106) - Channel 48

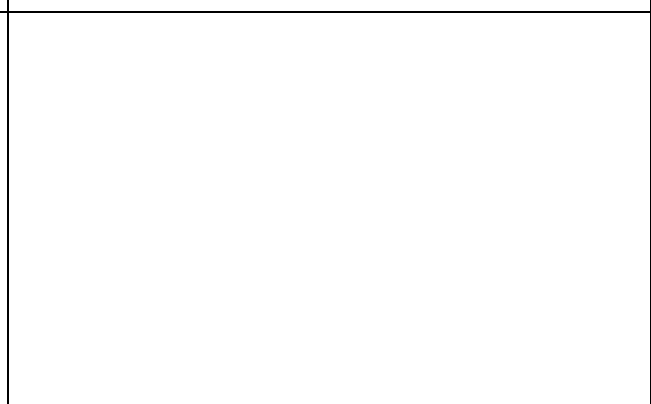
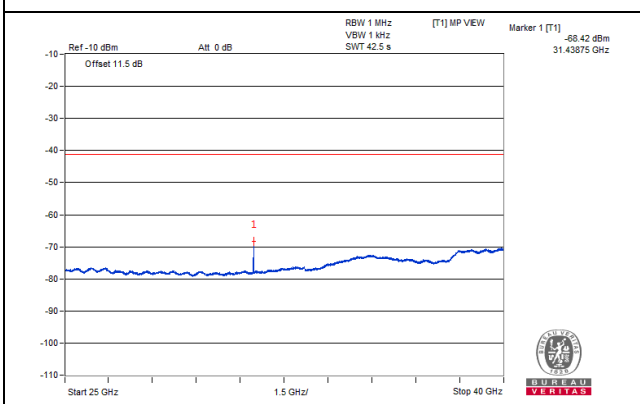
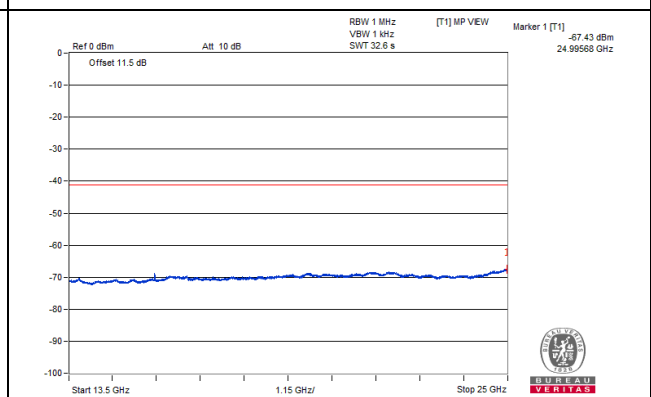
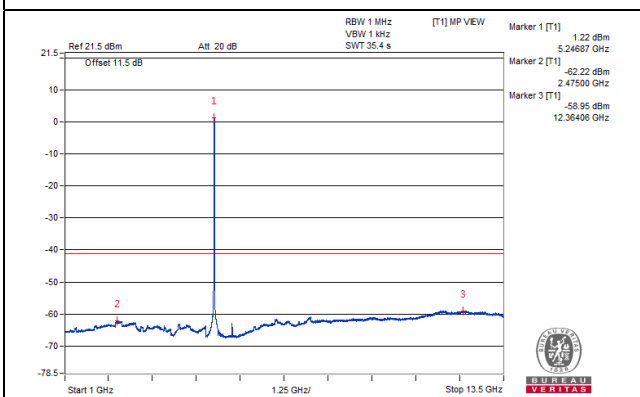
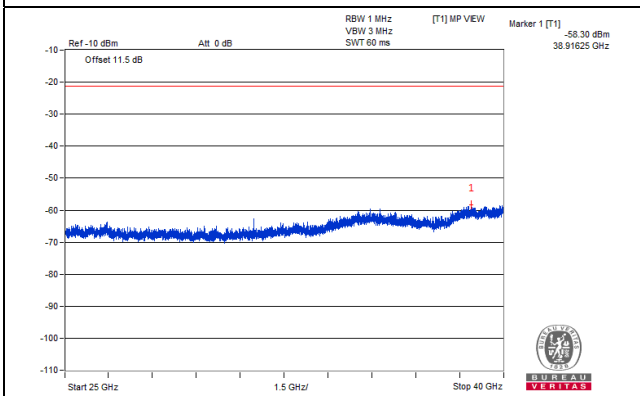
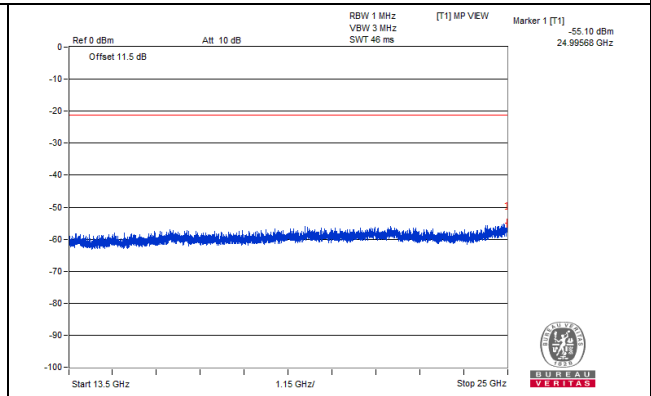
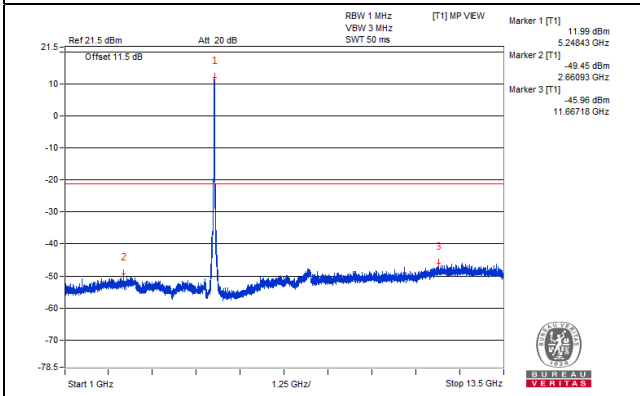
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3510.93	53.68 PK	74.00	-20.32	-53.94	-51.41	7.90	-41.58
2	3512.50	41.96 AV	54.00	-12.04	-64.05	-64.38	7.90	-53.30
3	#6968.75	55.17 PK	68.20	-13.03	-51.75	-50.36	7.90	-40.09
4	#10484.37	56.22 PK	68.20	-11.98	-50.03	-49.87	7.90	-39.04
5	15732.43	49.01 PK	74.00	-24.99	-57.53	-56.82	7.90	-46.25
6	15735.31	37.55 AV	54.00	-16.45	-68.75	-68.49	7.90	-57.71

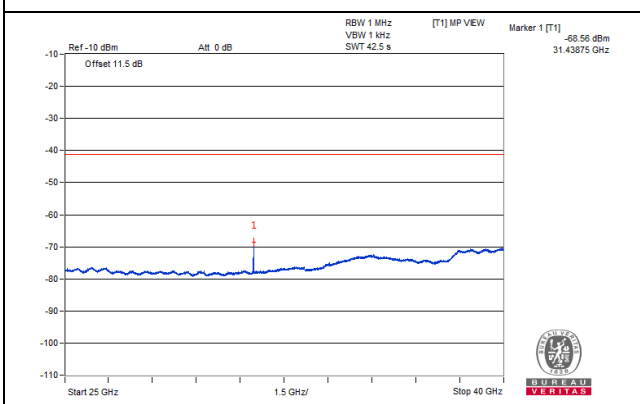
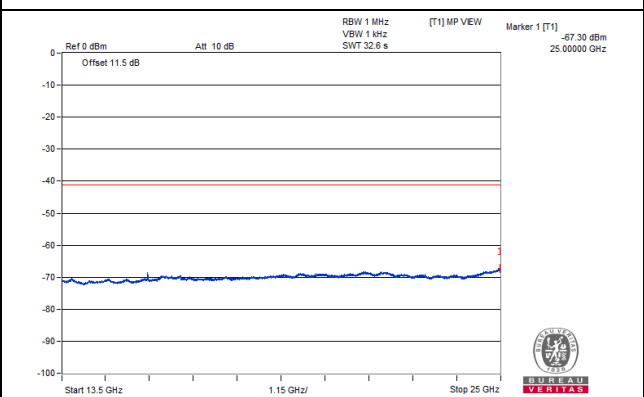
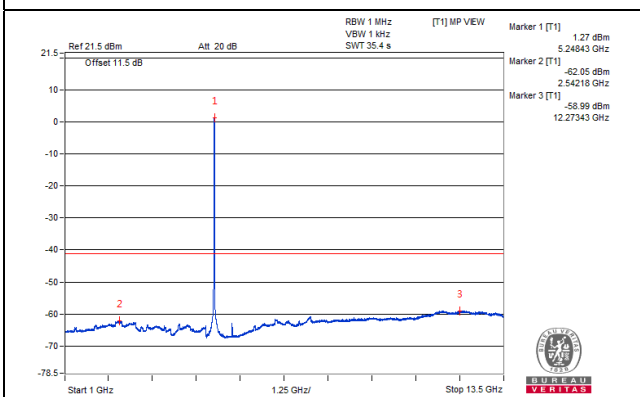
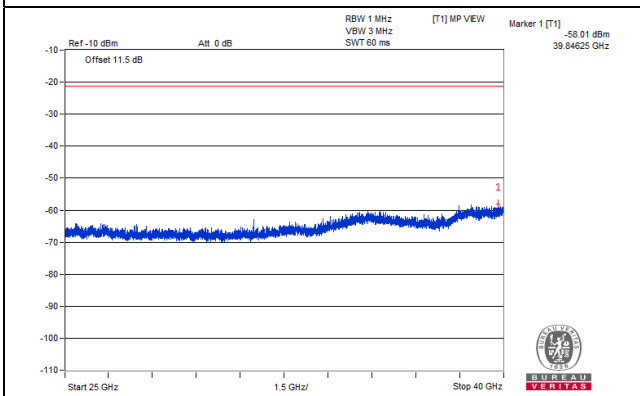
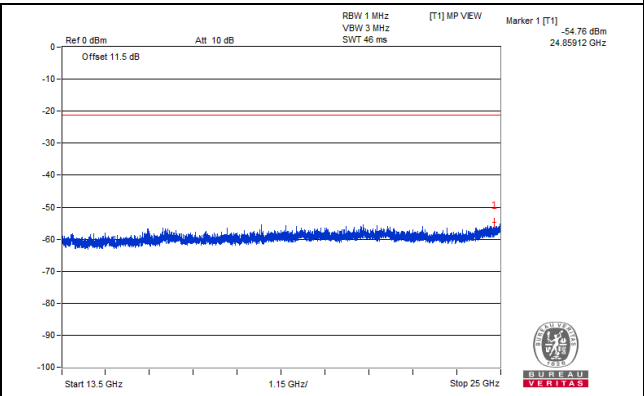
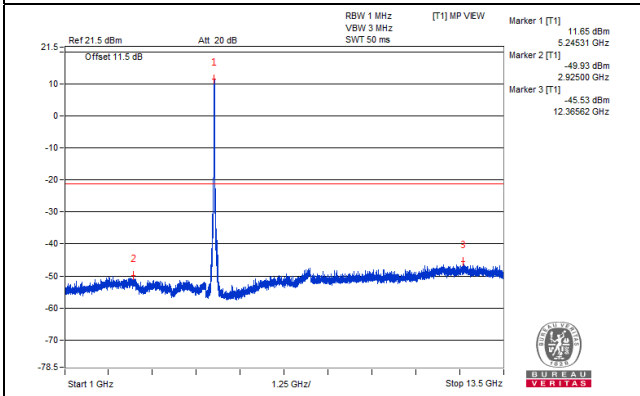
Note :

1. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
2. Non-restricted frequency, the limit was restricted at the conducted out of band emission.
3. #: Non-restricted frequency, no limit for average emission.

Chain 0



Chain 1

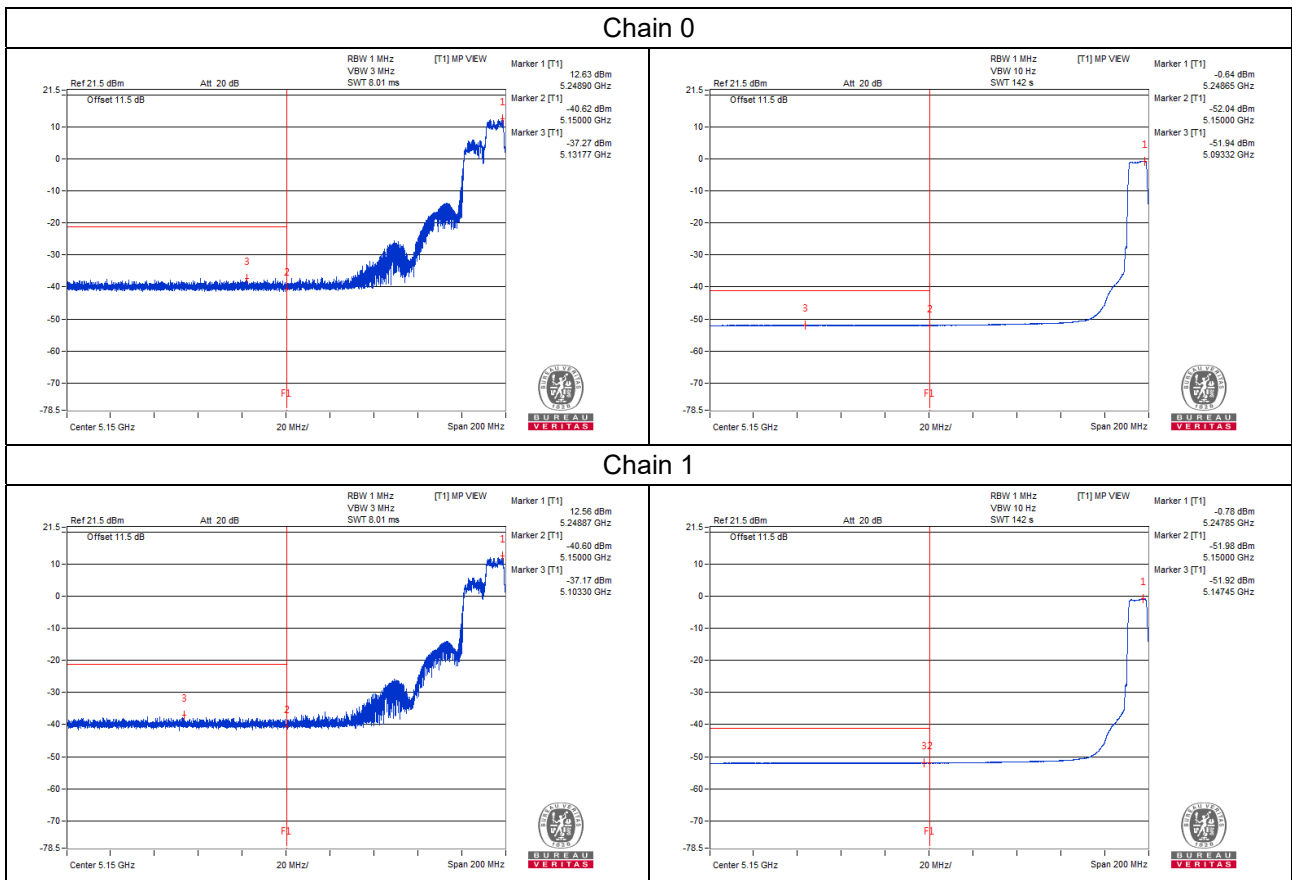


Bandedge table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5103.30	66.48 PK	74.00	-7.52	-38.64	-37.17	6.05	-28.78
2	5094.75	52.38 AV	54.00	-1.62	-51.94	-51.94	6.05	-42.88

Note :

- Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.



Below 1GHz Worst-Case Data:

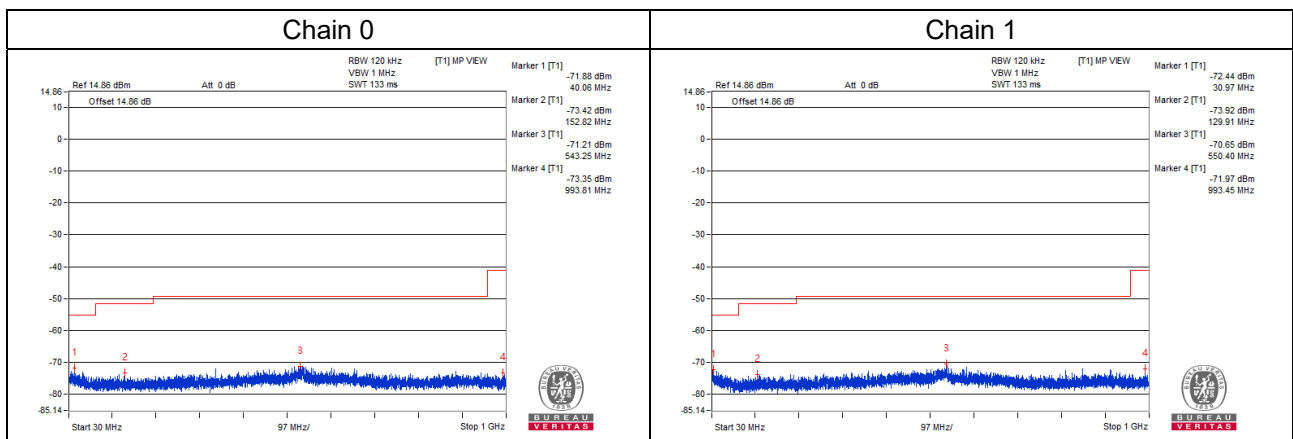
802.11a - Channel 40

Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	40.06	31.20	40.00	-8.80	-71.88	-74.85	6.05	-64.06
2	152.94	29.48	43.50	-14.02	-73.55	-76.69	6.05	-65.78
3	355.31	30.76	46.00	-15.24	-72.17	-75.61	6.05	-64.50
4	550.4	33.21	46.00	-12.79	-71.63	-70.65	6.05	-62.05
5	601.81	31.36	46.00	-14.64	-72.85	-73.07	6.05	-63.90
6	854.25	30.96	46.00	-15.04	-74.98	-72.19	6.05	-64.30

Note :

- Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
- Non-restricted frequency, the limit was restricted at the conducted out of band emission.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102783	Dec. 20, 2021	Dec. 19, 2022
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 04, 2021	Sep. 03, 2022
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Feb. 17, 2022	Feb. 16, 2023
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Sep. 17, 2021	Sep. 16, 2022
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Shielded Room 2.

3. The VCCI Site Registration No. is C-12047.

4.2.3 Test Procedures

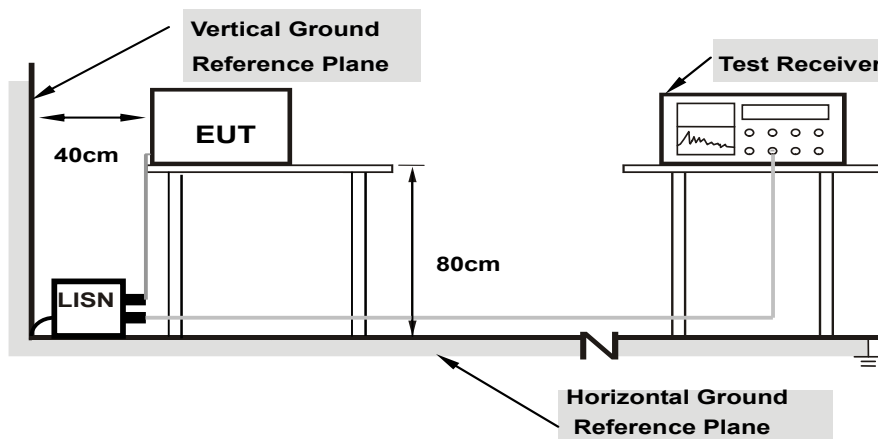
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

Worst-case data:

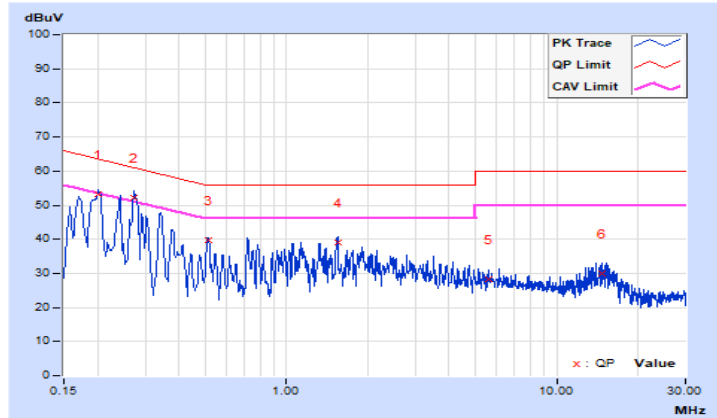
802.11a

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.20200	10.14	43.16	35.58	53.30	45.72	63.53
2	0.27400	10.15	41.90	39.17	52.05	49.32	61.00	51.00	-8.95	-1.68
3	0.51400	10.17	29.44	27.47	39.61	37.64	56.00	46.00	-16.39	-8.36
4	1.54412	10.21	29.01	22.65	39.22	32.86	56.00	46.00	-16.78	-13.14
5	5.58200	10.26	17.92	8.12	28.18	18.38	60.00	50.00	-31.82	-31.62
6	14.75800	10.33	19.73	16.27	30.06	26.60	60.00	50.00	-29.94	-23.40

Remarks:

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

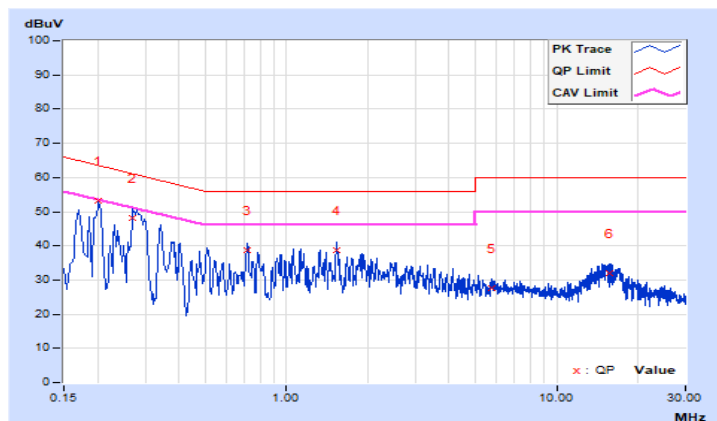


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.20200	10.15	43.07	35.25	53.22	45.40	63.53	53.53	-10.31	-8.13
2	0.26992	10.16	37.87	33.29	48.03	43.45	61.12	51.12	-13.09	-7.67
3	0.71800	10.19	28.39	25.77	38.58	35.96	56.00	46.00	-17.42	-10.04
4	1.53800	10.22	28.61	24.16	38.83	34.38	56.00	46.00	-17.17	-11.62
5	5.73000	10.29	17.38	7.73	27.67	18.02	60.00	50.00	-32.33	-31.98
6	15.63000	10.45	21.63	15.05	32.08	25.50	60.00	50.00	-27.92	-24.50

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p \leq 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
	√	Mobile and Portable client device	250mW (24 dBm)
U-NII-2A	√		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C			250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3			1 Watt (30 dBm)

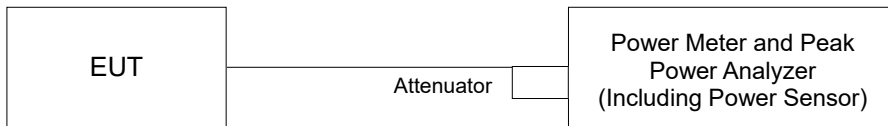
*B is the 26 dB emission bandwidth in megahertz

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

Unequal antenna gains, with equal transmit powers.

If transmit signals are correlated, then directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}]$ dBi
 [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

Method PM is 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 and set the detector to average. Duty factor is not added to measured value.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11a

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	16.07	15.60	76.765	18.85	23.95	Pass
40	5200	19.02	18.65	153.082	21.85	23.95	Pass
48	5240	17.38	17.14	106.462	20.27	23.95	Pass

Note: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $24 - (6.05 - 6) = 23.95\text{dBm}$.

802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	15.61	15.40	71.065	18.52	23.95	Pass
40	5200	15.96	14.78	69.506	18.42	23.95	Pass
48	5240	16.04	14.52	68.493	18.36	23.95	Pass

Note: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $24 - (6.05 - 6) = 23.95\text{dBm}$.

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	13.82	12.80	43.154	16.35	23.95	Pass
46	5230	15.43	14.48	62.968	17.99	23.95	Pass

Note: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $24 - (6.05 - 6) = 23.95\text{dBm}$.

802.11ac (VHT80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	11.31	10.88	25.767	14.11	23.95	Pass

Note: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $24 - (6.05 - 6) = 23.95\text{dBm}$.

802.11ac (VHT160)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
50	5250 (For U-NII-1)	8.09	7.01	11.465	10.59	23.95	Pass
	5250 (For U-NII-2A)	8.52	7.27	12.445	10.95	24.00	Pass

Note:

1. 5180-5250MHz: Directional gain = $10 \log[(10^{G^1/20} + 10^{G^2/20} + \dots + 10^{G^N/20})^2/2]$ = 6.05dBi > 6dBi, so the power limit shall be reduced to 24 - (6.05 - 6) = 23.95dBm.
2. 5250-5320MHz: Directional gain = $10 \log[(10^{G^1/20} + 10^{G^2/20} + \dots + 10^{G^N/20})^2/2]$ = 5.90dBi < 6dBi, so the power limit not need to reduced.

802.11ax (HE20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	15.79	15.45	73.007	18.63	23.95	Pass
40	5200	16.06	14.89	71.196	18.52	23.95	Pass
48	5240	16.13	14.58	69.728	18.43	23.95	Pass

Note: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $24 - (6.05 - 6) = 23.95\text{dBm}$.

802.11ax (HE40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	13.96	12.98	44.750	16.51	23.95	Pass
46	5230	15.68	14.53	65.362	18.15	23.95	Pass

Note: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $24 - (6.05 - 6) = 23.95\text{dBm}$.

802.11ax (HE80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	11.43	10.96	26.373	14.21	23.95	Pass

Note: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $24 - (6.05 - 6) = 23.95\text{dBm}$.

802.11ax (HE160)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
50	5250 (For U-NII-1)	8.16	7.07	11.640	10.66	23.95	Pass
	5250 (For U-NII-2A)	8.61	7.38	12.731	11.05	24.00	Pass

Note:

- 5180-5250MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $24 - (6.05 - 6) = 23.95\text{dBm}$.
- 5250-5320MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.90\text{dBi} < 6\text{dBi}$, so the power limit not need to reduced.

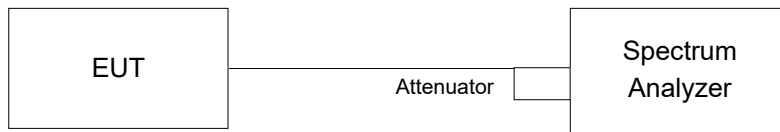
20MHz Preamble

RU Configuration	Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
			Chain 0	Chain 1				
26/0	36	5180	12.50	12.31	34.804	15.42	23.95	Pass
26/0	40	5200	12.64	12.30	35.348	15.48	23.95	Pass
26/8	48	5240	12.38	11.92	32.858	15.17	23.95	Pass
52/37	36	5180	13.92	14.74	54.446	17.36	23.95	Pass
52/37	40	5200	14.15	14.59	54.776	17.39	23.95	Pass
52/40	48	5240	13.96	14.50	53.072	17.25	23.95	Pass
106/53	36	5180	13.68	14.84	53.814	17.31	23.95	Pass
106/53	40	5200	14.01	14.72	54.825	17.39	23.95	Pass
106/54	48	5240	14.20	14.50	54.487	17.36	23.95	Pass

Note: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $24 - (6.05 - 6) = 23.95\text{dBm}$.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

4.4.4 Test Result

802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.32	16.44
40	5200	16.87	16.78
48	5240	16.32	16.44

802.11ax (HE20)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18.96	18.84
40	5200	18.96	18.84
48	5240	18.96	18.84

802.11ax (HE40)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	37.92	37.68
46	5230	37.68	37.68

802.11ax (HE80)

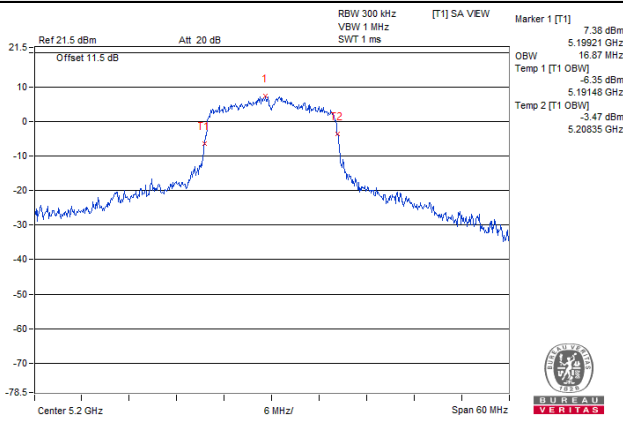
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	77.76	75.84

802.11ax (HE160)

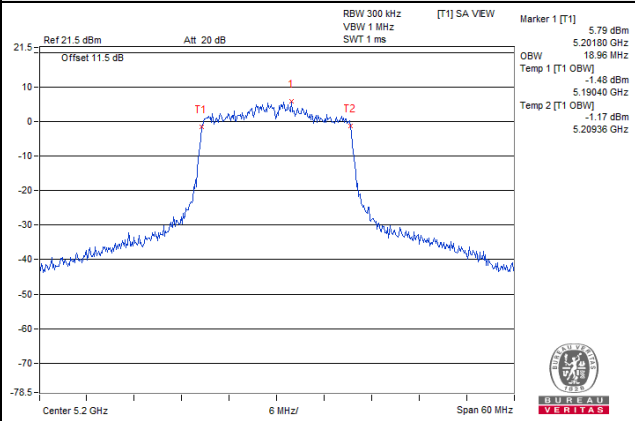
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
50	5250 (For U-NII-1)	77.76	77.76
	5250 (For U-NII-2A)	77.76	77.76

Spectrum Plot of Worst Value

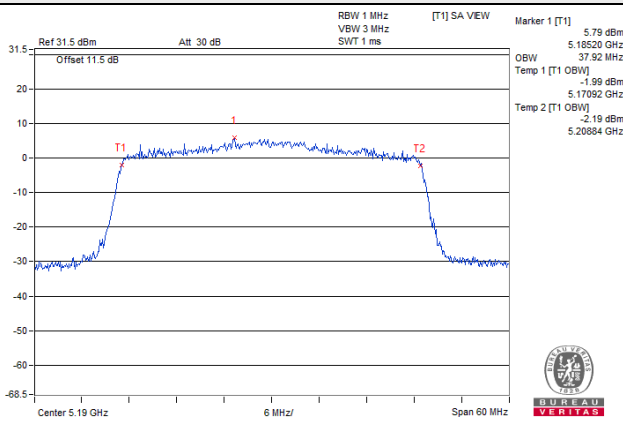
802.11a



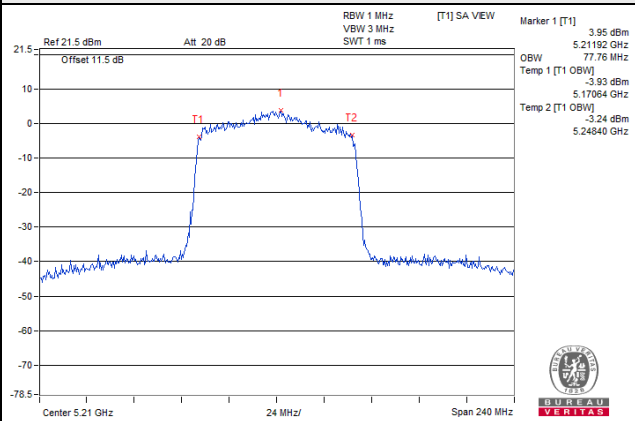
802.11ax (HE20)



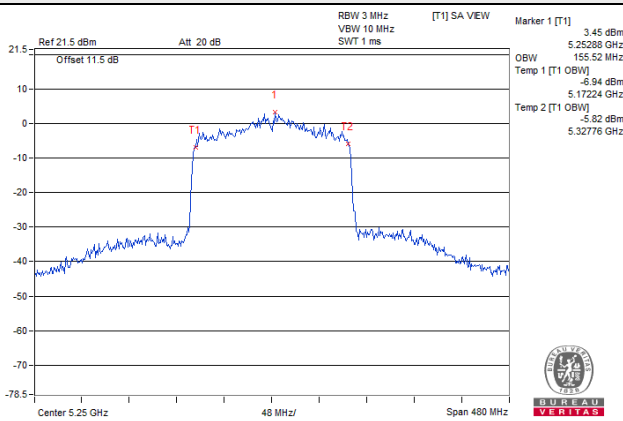
802.11ax (HE40)



802.11ax (HE80)

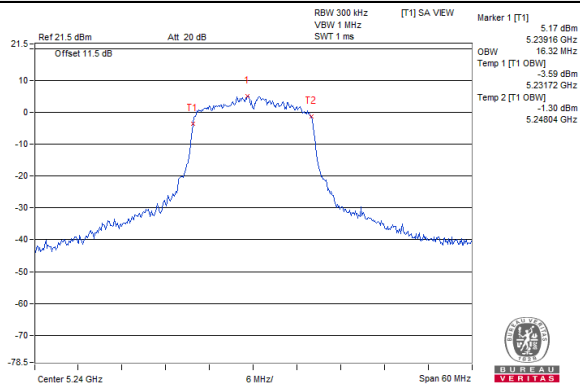


802.11ax (HE160)

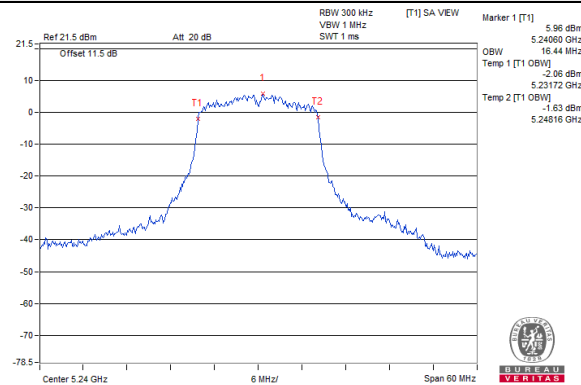


Spectrum Plot for near By DFS Band

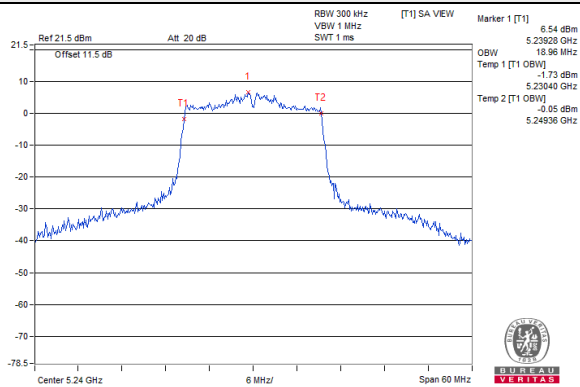
802.11a / Chain 0 / CH 48



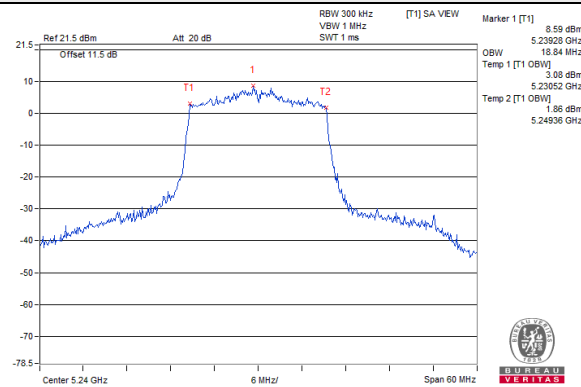
802.11a / Chain 1 / CH 48



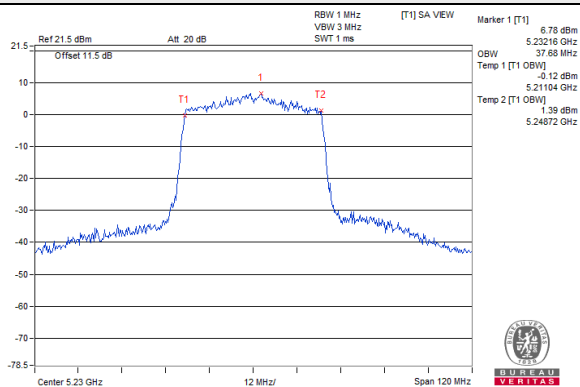
802.11ax (HE20) / Chain 0 / CH 48



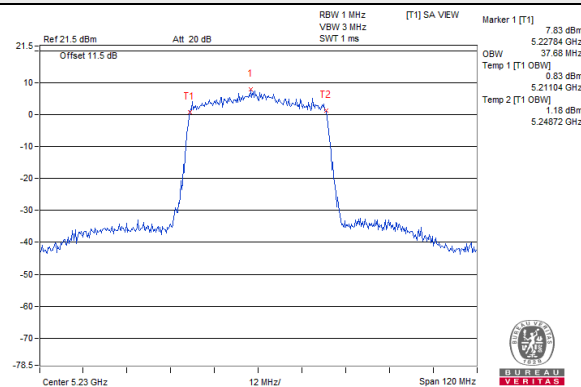
802.11ax (HE20) / Chain 1 / CH 48



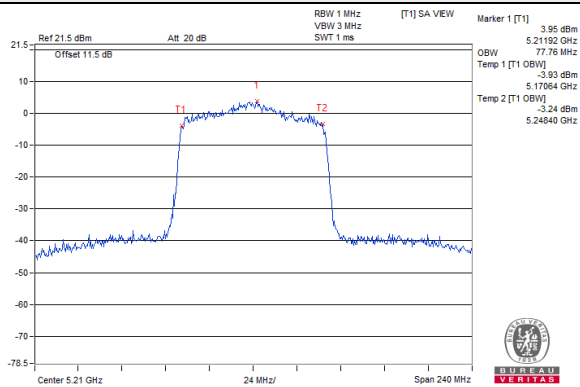
802.11ax (HE40) / Chain 0 / CH 46



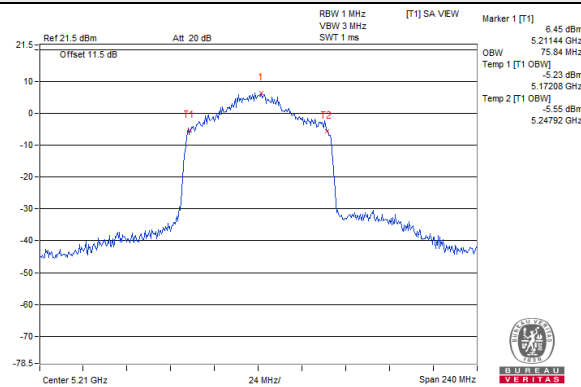
802.11ax (HE40) / Chain 1 / CH 46



802.11ax (HE80) / Chain 0 / CH 42



802.11ax (HE80) / Chain 1 / CH 42

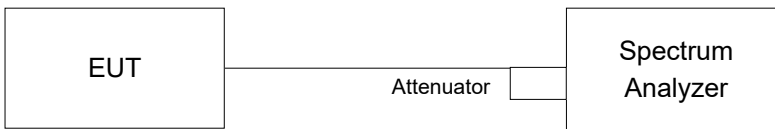


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
		Indoor Access Point	
	√	Mobile and Portable client device	11dBm/ MHz
U-NII-2A	√		11dBm/ MHz
U-NII-2C			11dBm/ MHz
U-NII-3			30dBm/ 500kHz

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedures

Duty cycle of test signal is > 98%

Using method SA-1

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
- Sweep time = auto, trigger set to “free run”.
- Trace average at least 100 traces in power averaging mode.
- Record the max value

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as 4.3.6.

4.5.7 Test Results

802.11a

Chan.	Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	2.95	2.32	5.66	10.95	Pass
40	5200	5.89	5.61	8.76	10.95	Pass
48	5240	4.22	4.14	7.19	10.95	Pass

Note:

- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11 - (6.05 - 6) = 10.95\text{dBm}$.

802.11ax (HE20)

Chan.	Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	2.46	2.48	5.48	10.95	Pass
40	5200	3.03	1.78	5.46	10.95	Pass
48	5240	3.06	1.58	5.39	10.95	Pass

Note:

- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11 - (6.05 - 6) = 10.95\text{dBm}$.

802.11ax (HE40)

Chan.	Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
38	5190	-2.19	-3.01	0.43	10.95	Pass
46	5230	-0.52	-2.72	1.53	10.95	Pass

Note:

- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11 - (6.05 - 6) = 10.95\text{dBm}$.

802.11ax (HE80)

Chan.	Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
42	5210	-7.66	-7.98	-4.81	10.95	Pass

Note:

- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11 - (6.05 - 6) = 10.95\text{dBm}$.

802.11ax (HE160)

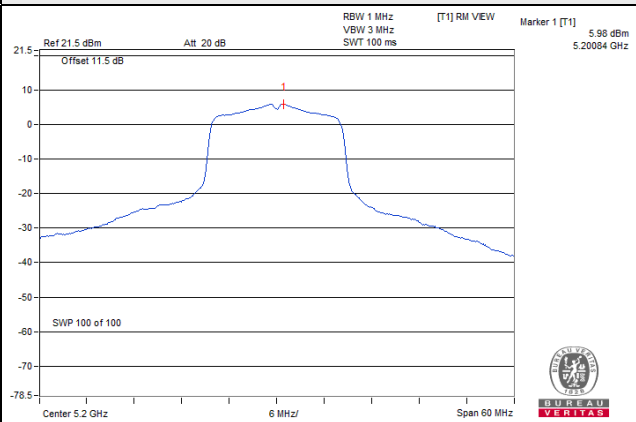
Chan.	Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
50	5250 (For U-NII-1)	-10.53	-11.13	-7.81	10.95	Pass
	5250 (For U-NII-2A)	-10.38	-11.47	-7.88	11.00	Pass

Note:

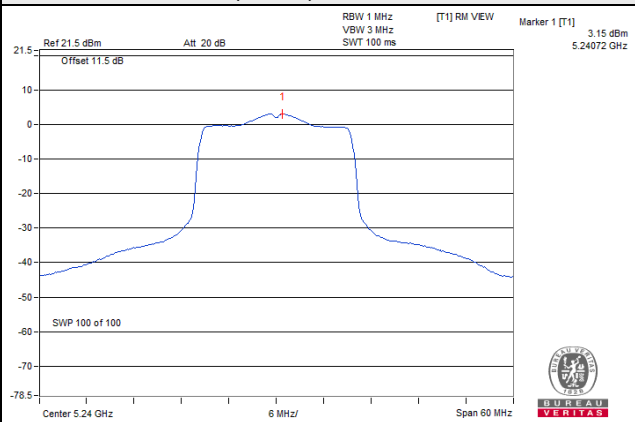
- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- 5180-5250MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $11 - (6.05 - 6) = 10.95\text{dBm}$.
- 5250-5320MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 5.90\text{dBi} < 6\text{dBi}$, so the power limit not need to reduced.

Spectrum Plot of Worst Value

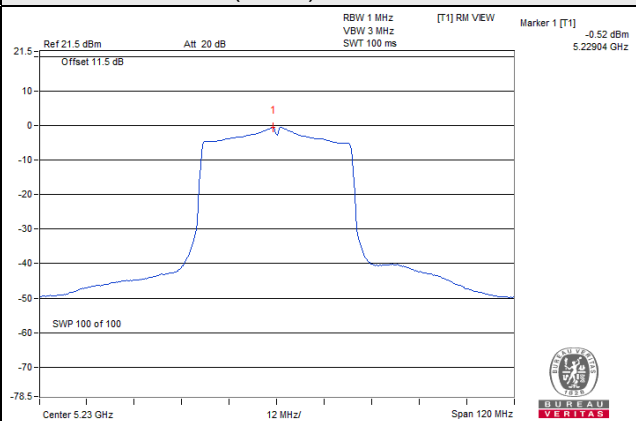
802.11a / Chain 0 / CH 40



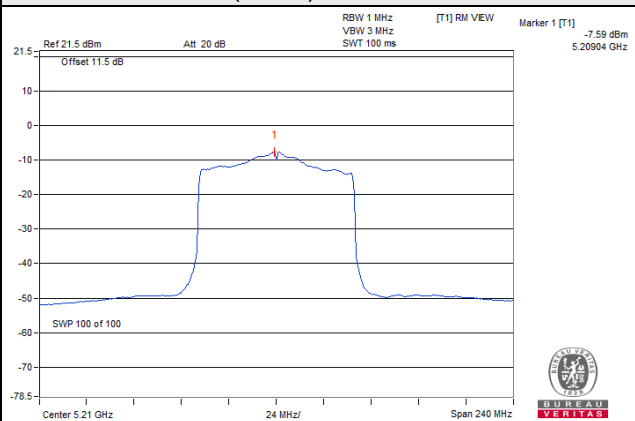
802.11ax (HE20) / Chain 0 / CH 48



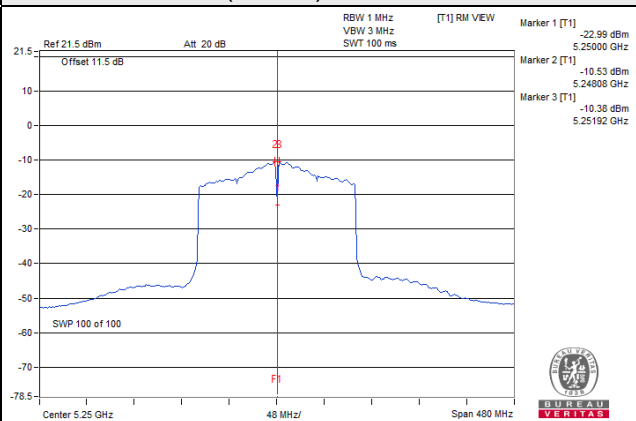
802.11ax (HE40) / Chain 0 / CH 46



802.11ax (HE80) / Chain 0 / CH 42



802.11ax (HE160) / Chain 0 / CH 50



20MHz Preamble

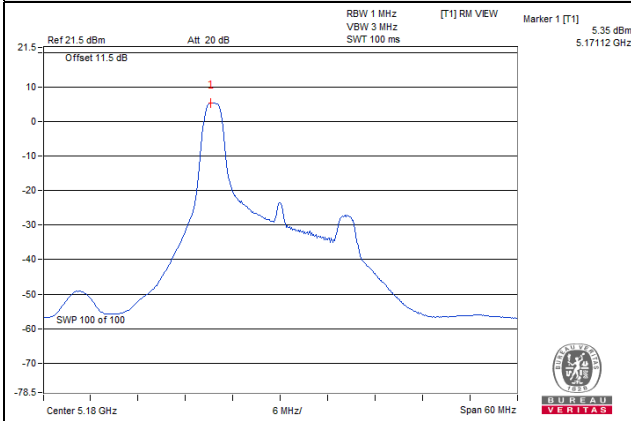
RU Configuration	Chan.	Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
			Chain 0	Chain 1			
26/0	36	5180	5.35	4.87	8.13	10.95	Pass
26/0	40	5200	4.95	4.47	7.73	10.95	Pass
26/8	48	5240	5.05	4.46	7.78	10.95	Pass
52/37	36	5180	3.58	4.12	6.87	10.95	Pass
52/37	40	5200	3.26	3.67	6.48	10.95	Pass
52/40	48	5240	3.56	3.92	6.75	10.95	Pass
106/53	36	5180	1.24	1.76	4.52	10.95	Pass
106/53	40	5200	0.75	1.42	4.11	10.95	Pass
106/54	48	5240	1.02	1.05	4.05	10.95	Pass

Note:

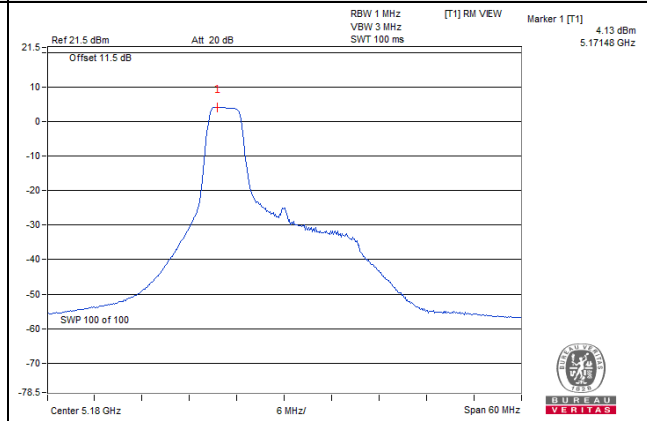
- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 6.05\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11 - (6.05 - 6) = 10.95\text{dBm}$.

Spectrum Plot of Worst Value

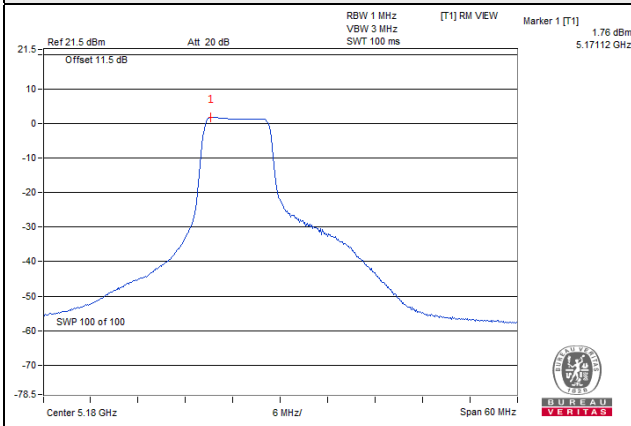
20MHz Preamble (RU26) / Chain 0 / CH36



20MHz Preamble (RU52) / Chain 1 / CH36



20MHz Preamble (RU106) / Chain 1 / CH36

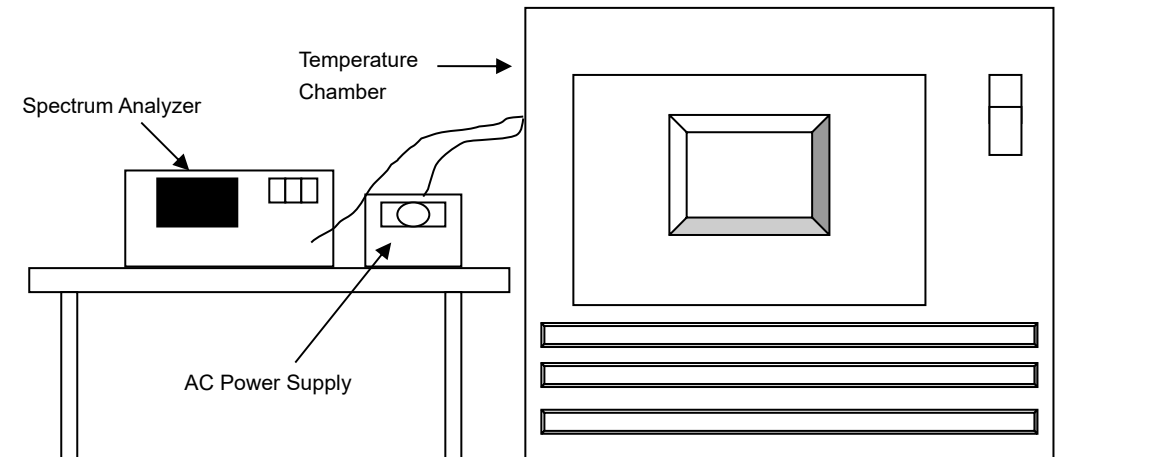


4.6 Frequency Stability

4.6.1 Limits of Frequency Stability Measurement

The frequency of the carrier signal shall be maintained within band of operation

4.6.2 Test Setup



4.6.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 15, 2021	Sep. 14, 2022
Standard Temperature And Humidity Chamber TERCHY	HRM-120RF	931022	Jan. 03, 2022	Jan. 02, 2023
Digital Multimeter Fluke	87-III	70360755	Jul. 08, 2021	Jul. 07, 2022
AC Power Supply Extech	CFW-105	E000603	NA	NA
DC Power Supply TOPWARD	6306A	727263	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.6.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- Repeat step d with every 10 degrees reduction until the lowest temperature achieved.
- The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
70	120	5180.0032	Pass	5180.0026	Pass	5179.9991	Pass	5180.0032	Pass
60	120	5179.986	Pass	5179.9871	Pass	5179.9834	Pass	5179.985	Pass
50	120	5179.9848	Pass	5179.9857	Pass	5179.985	Pass	5179.9871	Pass
40	120	5179.9865	Pass	5179.9867	Pass	5179.9865	Pass	5179.9831	Pass
30	120	5179.9819	Pass	5179.9864	Pass	5179.9861	Pass	5179.9823	Pass
20	120	5180.0214	Pass	5180.0243	Pass	5180.0224	Pass	5180.0228	Pass
10	120	5179.9933	Pass	5179.993	Pass	5179.993	Pass	5179.9967	Pass
0	120	5180.0244	Pass	5180.021	Pass	5180.0246	Pass	5180.0253	Pass
-10	120	5180.0039	Pass	5180.0066	Pass	5180.0063	Pass	5180.003	Pass

Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	138	5180.0231	Pass	5180.019	Pass	5180.0219	Pass	5180.02	Pass
	120	5180.0214	Pass	5180.0243	Pass	5180.0224	Pass	5180.0228	Pass
	102	5180.0268	Pass	5180.0232	Pass	5180.0263	Pass	5180.0253	Pass

5 Pictures of Test Arrangements

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

6 Appendix A – Radiated Emission Measurement

6.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

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

Note:

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

Limits of unwanted emission out of the restricted bands

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK: 74 (dBµV/m)	AV: 54 (dBµV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2(dBµV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	15.407(b)(4)(i)	PK: -27 (dBm/MHz) ^{*1} PK: 10 (dBm/MHz) ^{*2} PK: 15.6 (dBm/MHz) ^{*3} PK: 27 (dBm/MHz) ^{*4}	PK: 68.2(dBµV/m) ^{*1} PK: 105.2 (dBµV/m) ^{*2} PK: 110.8(dBµV/m) ^{*3} PK: 122.2 (dBµV/m) ^{*4}
^{*1} beyond 75 MHz or more above of the band edge.		^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.		^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000 \sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$

6.1.2 Test Instruments

Same as 4.1.2.

6.1.3 Test Procedures

- a. 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.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

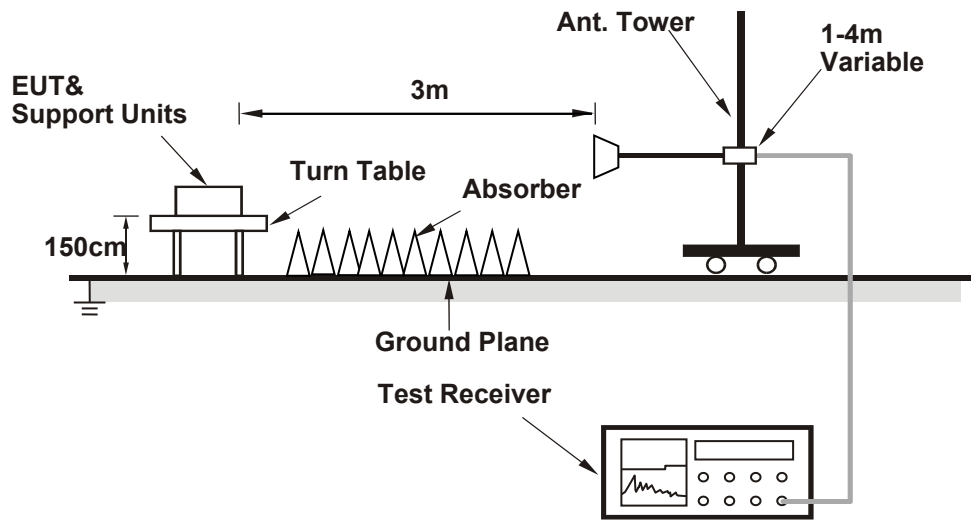
Note:

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

6.1.4 Deviation from Test Standard

No deviation.

6.1.5 Test Setup



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

6.1.6 EUT Operating Conditions

Same as 4.1.6.

6.1.7 Test Results

Above 1GHz data:

RF Mode	TX 802.11a	Channel	CH 40 : 5200 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	58.3 PK	74.0	-15.7	3.08 H	253	75.2	-16.9
2	5150.00	47.6 AV	54.0	-6.4	3.08 H	253	64.5	-16.9
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	5150.00	65.2 PK	74.0	-8.8	1.54 V	216	82.1	-16.9
2	5150.00	52.3 AV	54.0	-1.7	1.54 V	216	69.2	-16.9

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. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ax (HE20)	Channel	CH 36 : 5180 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	54.3 PK	74.0	-19.7	3.10 H	251	71.2	-16.9
2	5150.00	44.5 AV	54.0	-9.5	3.10 H	251	61.4	-16.9
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	5150.00	59.0 PK	74.0	-15.0	1.54 V	216	75.9	-16.9
2	5150.00	48.9 AV	54.0	-5.1	1.54 V	216	65.8	-16.9

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. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ax (HE40)	Channel	CH 38 : 5190 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	53.2 PK	74.0	-20.8	3.07 H	251	70.1	-16.9
2	5150.00	43.4 AV	54.0	-10.6	3.07 H	251	60.3	-16.9
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	5150.00	58.9 PK	74.0	-15.1	1.51 V	216	75.8	-16.9
2	5150.00	48.8 AV	54.0	-5.2	1.51 V	216	65.7	-16.9

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. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ax (HE160)	Channel	CH 50 : 5250 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	53.7 PK	74.0	-20.3	2.62 H	254	70.6	-16.9
2	5150.00	43.7 AV	54.0	-10.3	2.62 H	254	60.6	-16.9
3	5350.00	57.8 PK	74.0	-16.2	2.62 H	254	74.6	-16.8
4	5350.00	46.2 AV	54.0	-7.8	2.62 H	254	63.0	-16.8
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	5150.00	58.1 PK	74.0	-15.9	1.29 V	215	75.0	-16.9
2	5150.00	48.6 AV	54.0	-5.4	1.29 V	215	65.5	-16.9
3	5350.00	60.4 PK	74.0	-13.6	1.29 V	215	77.2	-16.8
4	5350.00	51.0 AV	54.0	-3.0	1.29 V	215	67.8	-16.8

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. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 20MHz Preamble 802.11ax (RU52)	Channel	CH 36 : 5180 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	56.97 PK	74.00	-17.03	1.19 H	253	73.93	-16.96
2	5150.00	42.71 AV	54.00	-11.29	1.19 H	253	59.67	-16.96
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	5150.00	60.35 PK	74.00	-13.65	1.27 V	208	77.31	-16.96
2	5150.00	45.49 AV	54.00	-8.51	1.27 V	208	62.45	-16.96

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. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 20MHz Preamble 802.11ax (RU106)	Channel	CH 36 : 5180 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	70.30 PK	74.00	-3.70	3.64 H	248	87.20	-16.90
2	5150.00	48.50 AV	54.00	-5.50	3.64 H	248	65.40	-16.90
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	5150.00	72.20 PK	74.00	-1.80	1.26 V	210	89.10	-16.90
2	5150.00	51.60 AV	54.00	-2.40	1.26 V	210	68.50	-16.90

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. " # ": The radiated frequency is out of the restricted band.

Appendix B – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

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

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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