

FCC Test Report

Report No.: RF170816E06H-1

FCC ID: RYK-WNFQ261ACNIBT

Test Model: WNFQ-261ACNI(BT)

Received Date: Aug. 23, 2018

Test Date: Oct. 23 to 30, 2018

Issued Date: Nov. 07, 2018

Applicant: SparkLAN Communications, Inc.

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**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RF170816E06H-1	Original release.	Nov. 07, 2018

1 Certificate of Conformity

Product: 802.11ac/a/b/g/n 2T2R Industrial-graded Wi-Fi / Bluetooth 4.2 Combo M.2 2230 Module

Brand: Sparklan

Test Model: WNFQ-261ACNI(BT)

Sample Status: R&D SAMPLE

Applicant: SparkLAN Communications, Inc.

Test Date: Oct. 23 to 30, 2018

Standard: 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 EMC characteristics under the conditions specified in this report.

Prepared by : Wendy Wu , **Date:** Nov. 07, 2018
Wendy Wu / Specialist

Approved by : May Chen , **Date:** Nov. 07, 2018
May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5149.72MHz, 5459.53MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is IPEX MHF 4 not a standard connector.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB test plots were recorded in Annex A.

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) ($\pm$)
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.33 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.10 dB
	6GHz ~ 18GHz	4.85 dB
	18GHz ~ 40GHz	5.24 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	802.11ac/a/b/g/n 2T2R Industrial-graded Wi-Fi / Bluetooth 4.2 Combo M.2 2230 Module
Brand	Sparklan
Test Model	WNFQ-261ACNI(BT)
Status of EUT	R&D SAMPLE
Power Supply Rating	3.3Vdc form host equipment
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n : up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	2.4GHz: 2.412 ~ 2.472GHz 5GHz: 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.50 ~ 5.72GHz, 5.745 ~ 5.825GHz
Number of Channel	2.4GHz: 802.11b, 802.11g, 802.11n (HT20): 13 802.11n (HT40): 9 5GHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 25 802.11n (HT40), 802.11ac (VHT40): 12 802.11ac (VHT80): 6
Output Power	2.4GHz: 514.66mW 5GHz: 5.18 ~ 5.24GHz: 118.189mW 5.26 ~ 5.32GHz: 117.661mW 5.50 ~ 5.72GHz: 113.517mW 5.745 ~ 5.825GH: 113.606mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC Class II change. The difference compared with the original report design is as the following:

◆ Added new antennas as below table:

Original										
Ant. Set.	Transmitter Circuit	Brand	Model	Ant. Type	2.4GHz Gain with cable loss (dBi)	5GHz Gain with cable loss (dBi)	2.4GHz Cable Loss (dBi)	5G Cable Loss (dBi)	Connector Type	Cable Length (mm)
1	Chain (0)	WNC	81-EBJ15.005	PIFA	3.00	Band 1&2: 2.56	1.15	Band 1&2: 1.70	IPEX	300
						Band 3: 4.76		Band 3: 1.74		
						Band 4: 4.76		Band 4: 1.79		
	Chain (1)	WNC	81-EBJ15.005	PIFA	3.62	Band 1&2: 3.08	1.15	Band 1&2: 1.70	IPEX	300
						Band 3: 3.31		Band 3: 1.74		
						Band 4: 2.42		Band 4: 1.79		
Ant. Set.	Transmitter Circuit	Brand	Model	Ant. Type	2.4GHz Gain with cable loss (dBi)	5GHz Gain with cable loss (dBi)	2.4GHz Cable Loss (dBi)	5G Cable Loss (dBi)	Connector Type	Cable Length (mm)
2	Chain (0)	INPAQ	DAM-I6-H-DB-800-10-17	Dipole	1.13	Band 1&2: 1.33	NA	NA	SMA RP Plug	900
						Band 3: -0.63				
						Band 4: -0.97				
	Chain (1)	INPAQ	DAM-I6-H-DB-800-10-17	Dipole	1.29	Band 1&2: 1.94	NA	NA	SMA RP Plug	900
						Band 3: -0.49				
						Band 4: -0.93				
Newly										
Ant. Set.	Transmitter Circuit	Brand	Model	Ant. Type	2.4GHz Gain with cable loss (dBi)		5GHz Gain with cable loss (dBi)		Connector Type	Cable Length (mm)
3	Chain (0) Chain (1)	Sparklan	AD-301N	Dipole	4.4		Band 1&2: 5.2 Band 3&4: 5.8		IPEX MHF 4 at modular side & RP-SMA (M) at antenna side	150
4	Chain (0) Chain (1)	Sparklan	AD-103AG	Dipole	2.02		Band 1&2: 1.93 Band 3&4: 2.03			150
5	Chain (0) Chain (1)	Sparklan	AD-305N	Dipole	5.0		5.0			150
6	Chain (0) Chain (1)	Sparklan	AD-303N	Dipole	3.0		3.0			150
7	Chain (0) Chain (1)	Sparklan	AD-302N	Dipole	3.0		2.0			150

Note:

1. Antenna Set 5 was selected for 2.4GHz Antenna Port Conducted test; Antenna Set 3 was selected for 5GHz Antenna Port Conducted test.

2. According to above conditions, only Antenna Port Conducted test, Power Spectral Density and Radiated Emissions test items need to be performed. And all data were verified to meet the requirements.

3. There are Bluetooth technology and WLAN technology used for the EUT.
4. The EUT incorporates a 2T2R function.

2.4GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
VHT20	MCS 0~8, Nss=1	2TX	2RX
	MCS 0~8, Nss=2	2TX	2RX
VHT40	MCS 0~9, Nss=1	2TX	2RX
	MCS 0~9, Nss=2	2TX	2RX
5GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS 0~8, Nss=1	2TX	2RX
	MCS 0~8, Nss=2	2TX	2RX
802.11ac (VHT40)	MCS 0~9, Nss=1	2TX	2RX
	MCS 0~9, Nss=2	2TX	2RX
802.11ac (VHT80)	MCS 0~9, Nss=1	2TX	2RX
	MCS 0~9, Nss=2	2TX	2RX

Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

5. The EUT was pre-tested under the following modes:

Test Mode	Data rate
Mode A	400ns GI
Mode B	800ns GI

From the above modes, the worst case was found in **Mode B**. Therefore only the test data of the mode was recorded in this report.

6. WLAN/BT coexistence mode:

◆ 2x2 WLAN + BT:

- 5GHz 802.11a/an (or 11ac) transmit concurrent with BT.
- 2.4GHz: timely shared coexistence.

7. The emission (conducted & radiated emission) of the simultaneous operation (WiFi <5GHz> & Bluetooth) have been evaluated and no non-compliance found. The detail combinations of transmitters / frequencies / modes as below table

Mode	Available Channel	Tested Channel	Modulation Technology
5 GHz (802.11ac (VHT40))	38 to 159	159	OFDM
+ Bluetooth (LE)	0 to 39	0	GFSK

8. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11ac (VHT20), 802.11ac (VHT20):

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

2 channels are provided for 802.11ac (VHT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210 MHz

FOR 5260 ~ 5320MHz

4 channels are provided for 802.11a, 802.11ac (VHT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

2 channels are provided for 802.11ac (VHT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290 MHz

FOR 5500 ~ 5720MHz

12 channels are provided for 802.11a, 802.11ac (VHT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz	144	5720 MHz

6 channels are provided for 802.11ac (VHT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz	142	5710 MHz

3 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	138	5690 MHz
122	5610 MHz		

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11ac (VHT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz		

2 channels are provided for 802.11ac (VHT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To			Description
	RE $\geq$ 1G	RE<1G	APCM	
-	√	√	√	-

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz **RE<1G**: Radiated Emission below 1GHz
APCM: Antenna Port Conducted Measurement

Radiated Emission Test (Above 1GHz):

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

Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11a	5500-5720	100 to 140	100, 116, 140, 144	OFDM	BPSK	6
802.11ac (VHT20)		100 to 140	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 134	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106	106, 122, 138	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

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	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5180-5240	36 to 48	60	OFDM	BPSK	6.5
	5260-5320	52 to 64				
	5500-5720	100 to 140				
	5745-5825	149 to 165				

Antenna Port Conducted Measurement:

- ☒ 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	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6
802.11ac (VHT20)		100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE $\geq$ 1G	23deg. C, 65%RH	120Vac, 60Hz	Steven Chiang
RE<1G	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

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

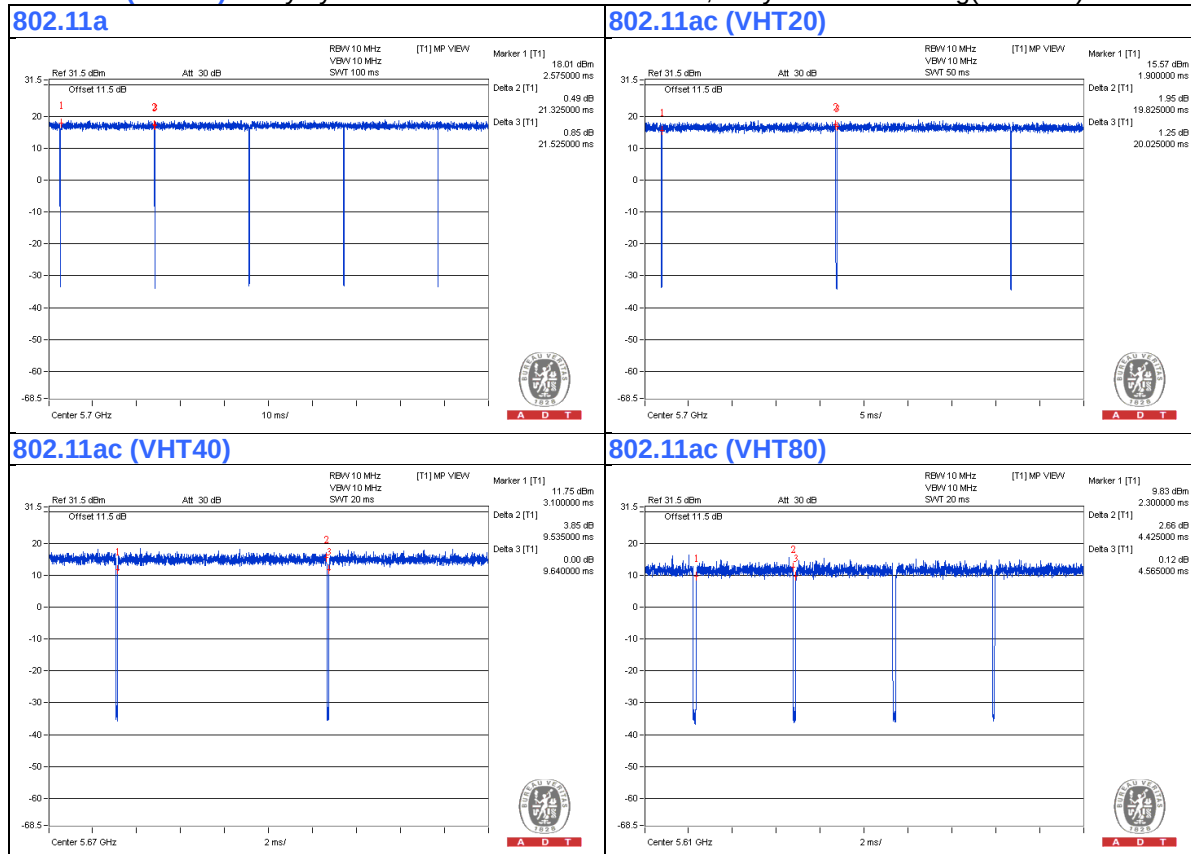
If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11a: Duty cycle = $21.325 \text{ ms} / 21.525 \text{ ms} = 0.991$

802.11ac (VHT20): Duty cycle = $19.825 \text{ ms} / 20.025 \text{ ms} = 0.99$

802.11ac (VHT40): Duty cycle = $9.535 \text{ ms} / 9.64 \text{ ms} = 0.989$

802.11ac (VHT80): Duty cycle = $4.425 \text{ ms} / 4.54 \text{ ms} = 0.975$, Duty factor = $10 * \log(1/0.975) = 0.11$



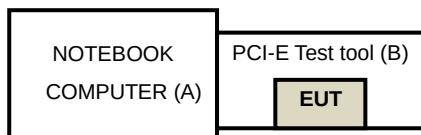
3.4 Description of Support Units

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

No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	NOTEBOOK COMPUTER	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
B	PCI-E Test tool	Qualcomm Atheros	NA	NA	NA	Supplied by Client

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

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

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

FCC Part 15, Subpart E (15.407)

KDB 789033 D02 General UNII Test Procedure New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

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:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 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}
	☐	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*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.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 05, 2018	July 04, 2019
Pre-Amplifier EMCI	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001	Jan. 15, 2018	Jan. 14, 2019
RF Cable	NA	LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 09, 2017	Nov. 08, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-4-1	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-2	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-3	Mar. 21, 2018	Mar. 20, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Sep. 27, 2018	Sep. 26, 2019
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier Mini-Circuits	ZVA-183-S+	AMP-ZVA-03	May 10, 2018	May 09, 2019
RF Cable	EMC104-SM-SM-1200	160923	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-2000	150318	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-5000	150321	Jan. 29, 2018	Jan. 28, 2019
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160925	Jan. 29, 2018	Jan. 28, 2019
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 20, 2018	June 19, 2019
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019

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 calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Oct. 23, 2018

4.1.3 Test Procedure

Following FCC KDB 558074 D01 DTS Meas. Guidance:

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.

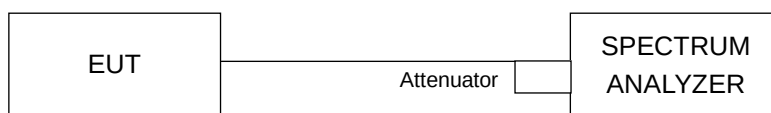
The following steps were performed:

- 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)

4.1.4 Deviation from Test Standard

No deviation.

4.1.5 Test Setup



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

4.1.6 EUT Operating Condition

1. Connect the EUT with the support unit A (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program "QDART 1.0.38" to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.1.7 Test Results (Conducted Measurement)

Radiated versus Conducted Measurement	
☒ Conducted measurement	☐ Radiated measurement
<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) <u>For Conducted measurement:</u> The level of unwanted emissions was measured as their power in a specified load (conducted spurious emissions).	

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

Above 1GHz Data
802.11a - Channel 36

Conducted spurious emission table

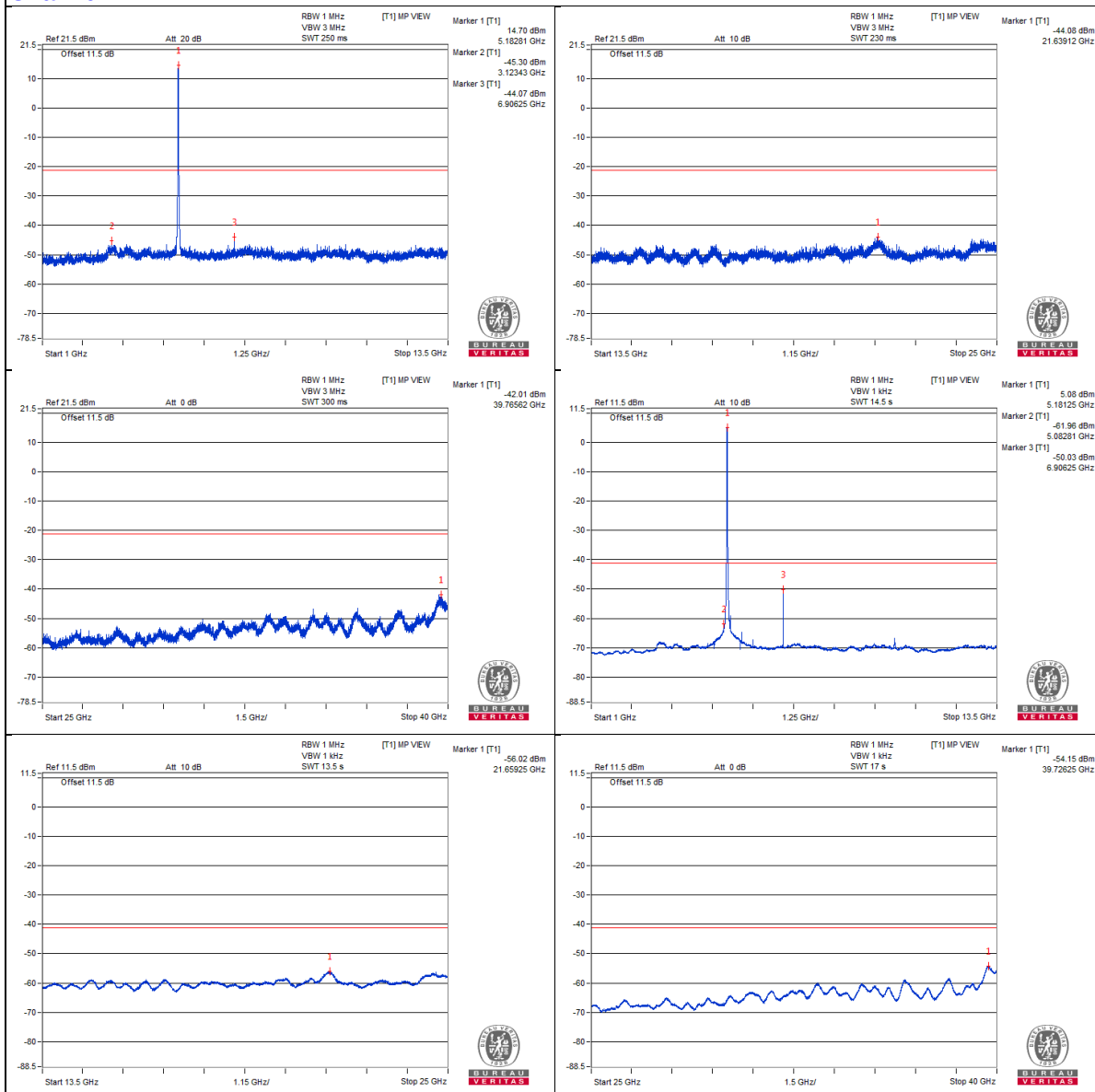
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3471.87 PK	57.5	68.2	-10.7	-49.36	-48.64	8.21	-37.76
2	6906.25 PK	61.12	68.2	-7.08	-44.07	-47.19	8.21	-34.14
3	10365.62 PK	58.53	68.2	-9.67	-46.5	-50.14	8.21	-36.73
4	15526.87 PK	58.57	74	-15.43	-47.37	-48.52	8.21	-36.69
5	15522.56 AV	46.55	54	-7.45	-59.75	-60.11	8.21	-48.71

Note :

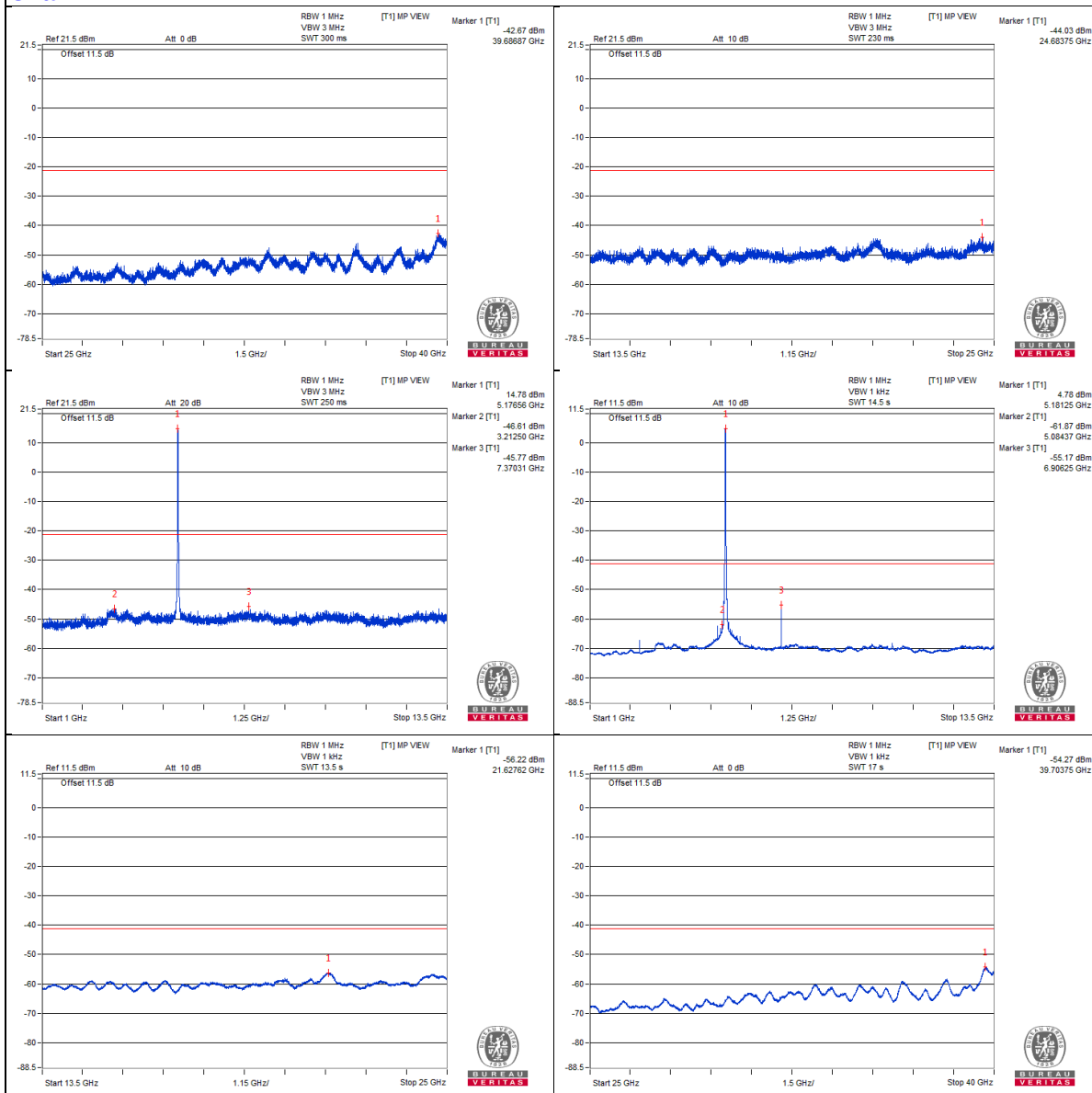
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

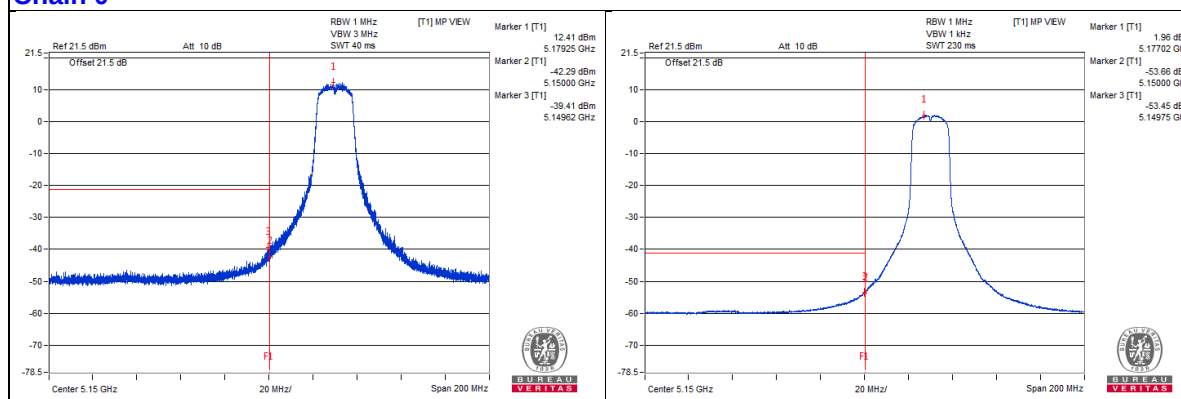
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5149.97 PK	67.52	74	-6.48	-40.33	-37.92	8.21	-27.74
2	5149.77 AV	53.53	54	-0.47	-53.45	-52.51	8.21	-41.73

Note :

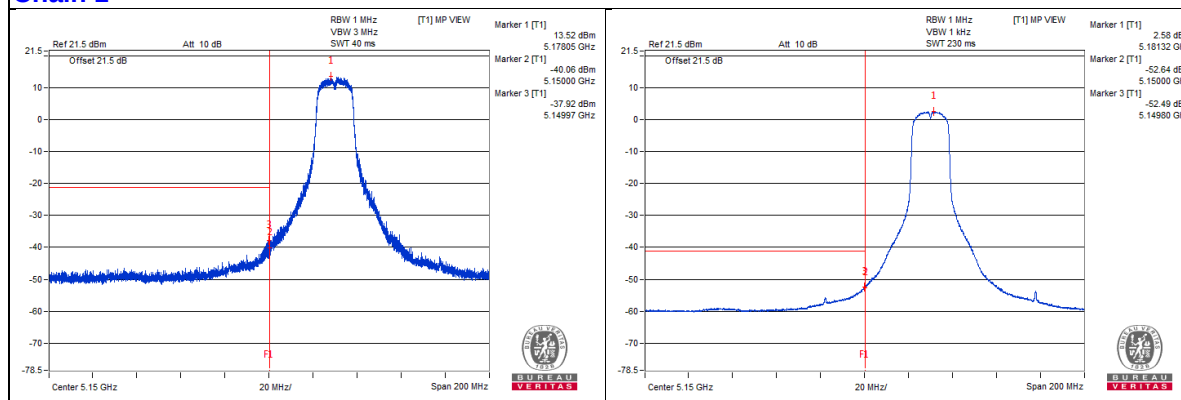
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11a - Channel 40

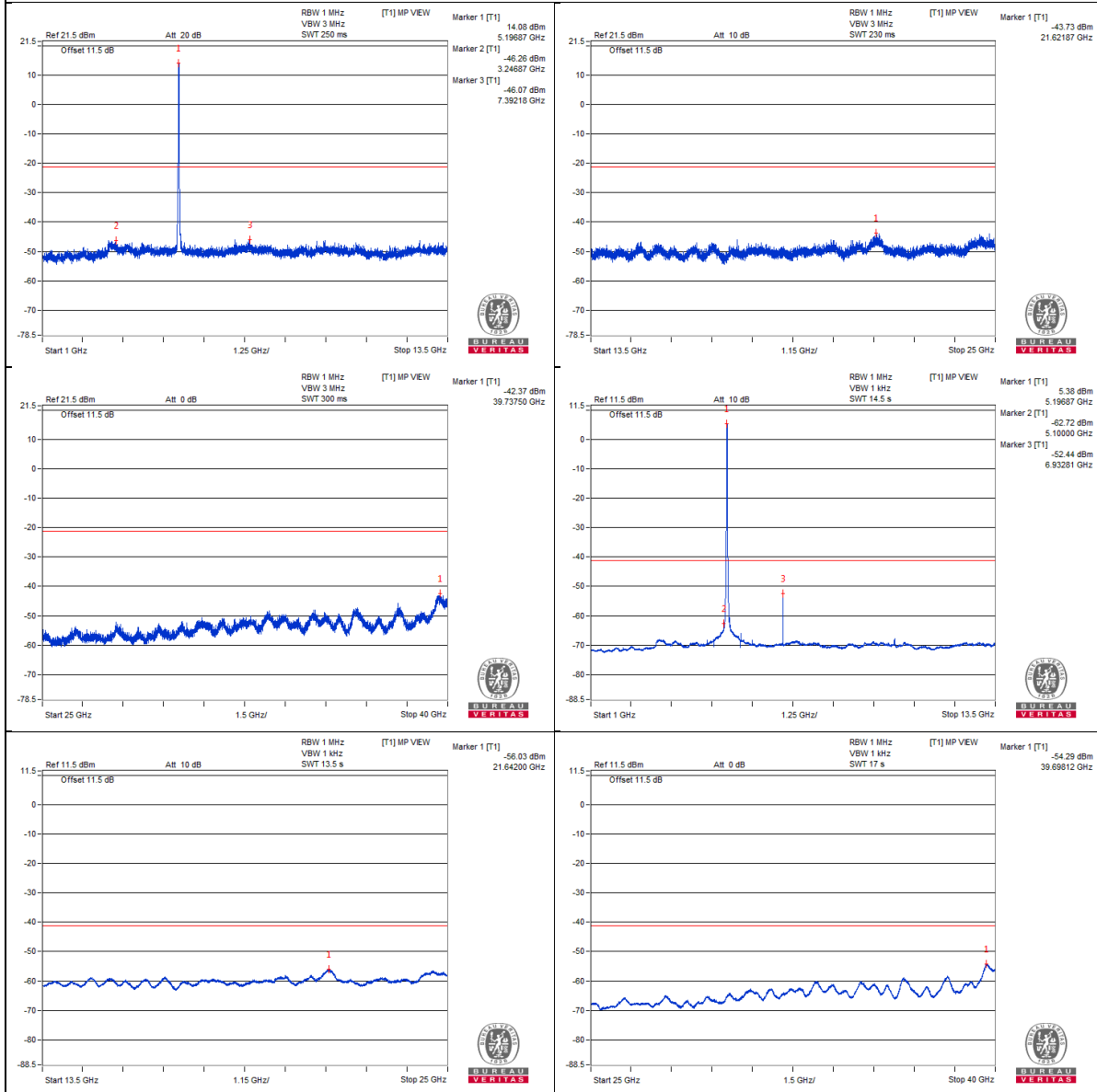
Conducted spurious emission table

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3450 PK	57.27	68.2	-10.93	-49.32	-49.1	8.21	-37.99
2	6932.81 PK	59.27	68.2	-8.93	-46.08	-48.75	8.21	-35.99
3	10404.68 PK	57.52	68.2	-10.68	-49.51	-48.47	8.21	-37.74
4	15605.93 PK	56.56	74	-17.44	-49.36	-50.57	8.21	-38.7
5	15600.18 AV	45.59	54	-8.41	-60.58	-61.22	8.21	-49.67

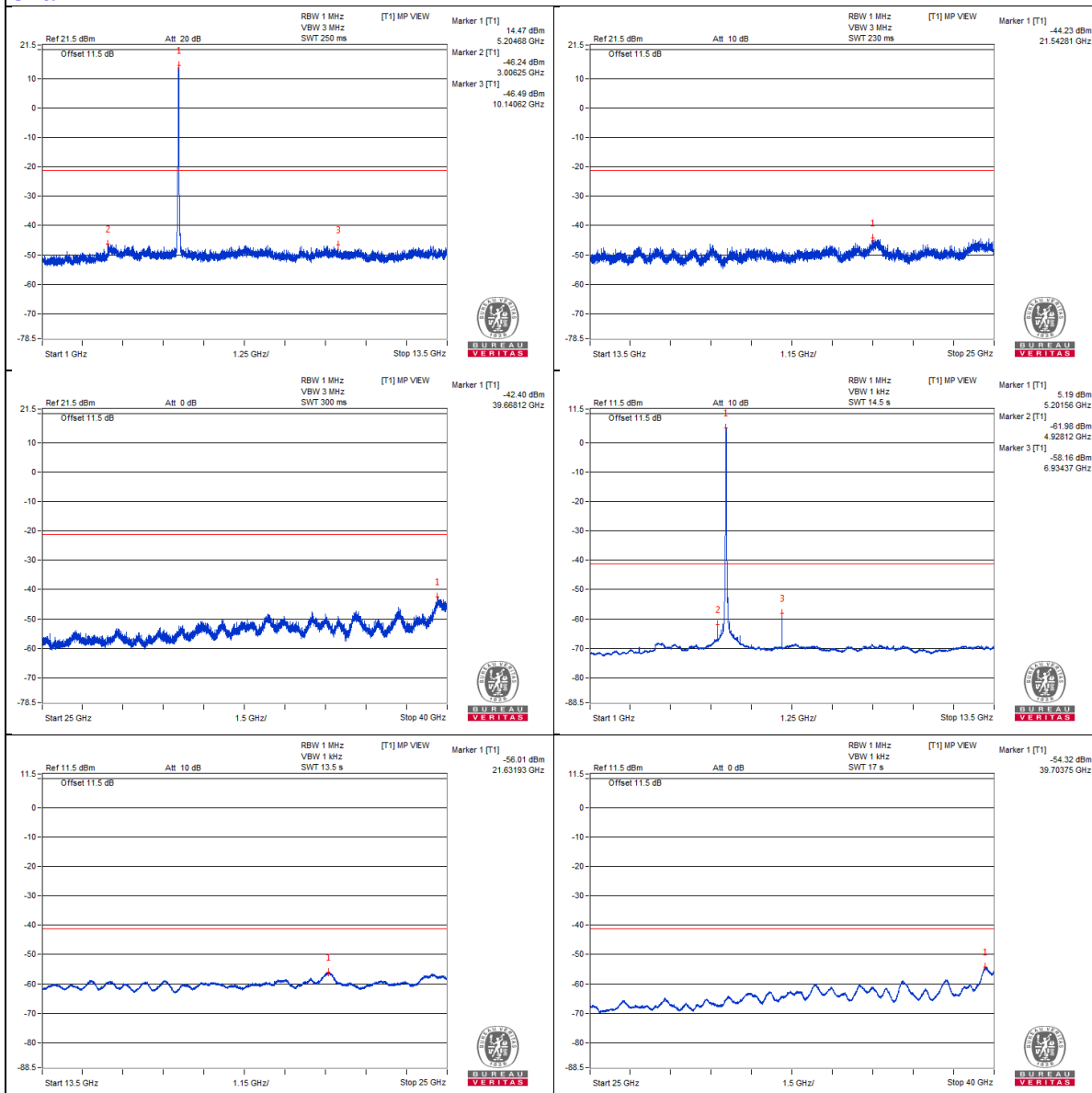
Note :

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

Chain 0



Chain 1



Bandedge table

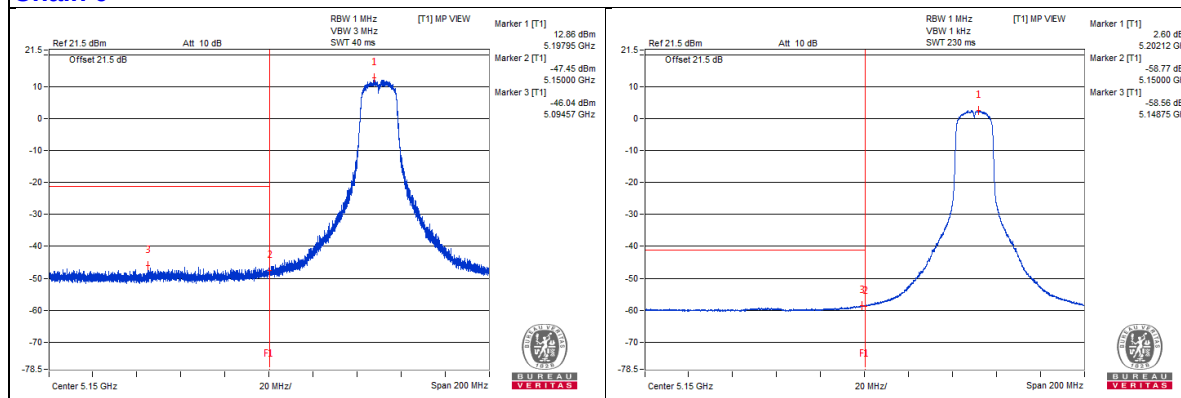
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5146.3 PK	59.67	74	-14.33	-48.57	-45.56	8.21	-38.6
2	5149.87 AV	48.34	54	-5.66	-58.71	-57.64	8.21	-49.93

Note :

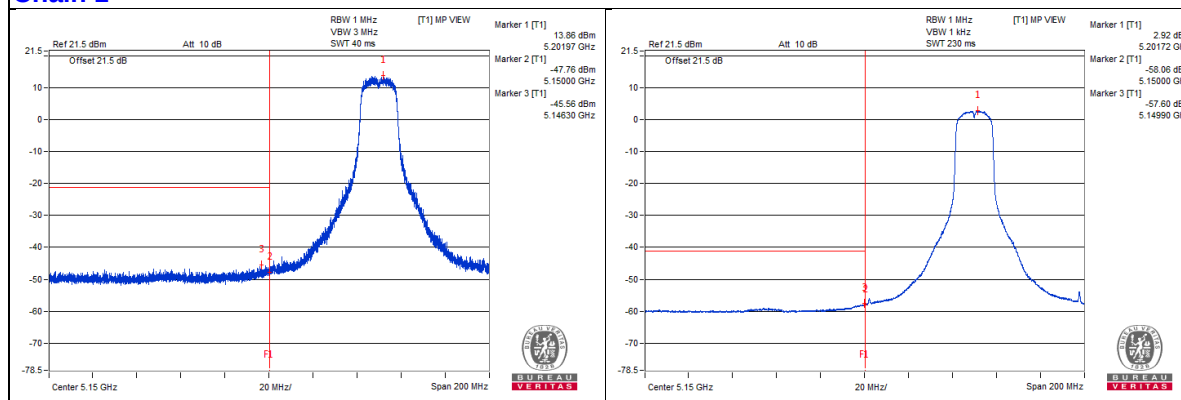
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11a - Channel 48

Conducted spurious emission table

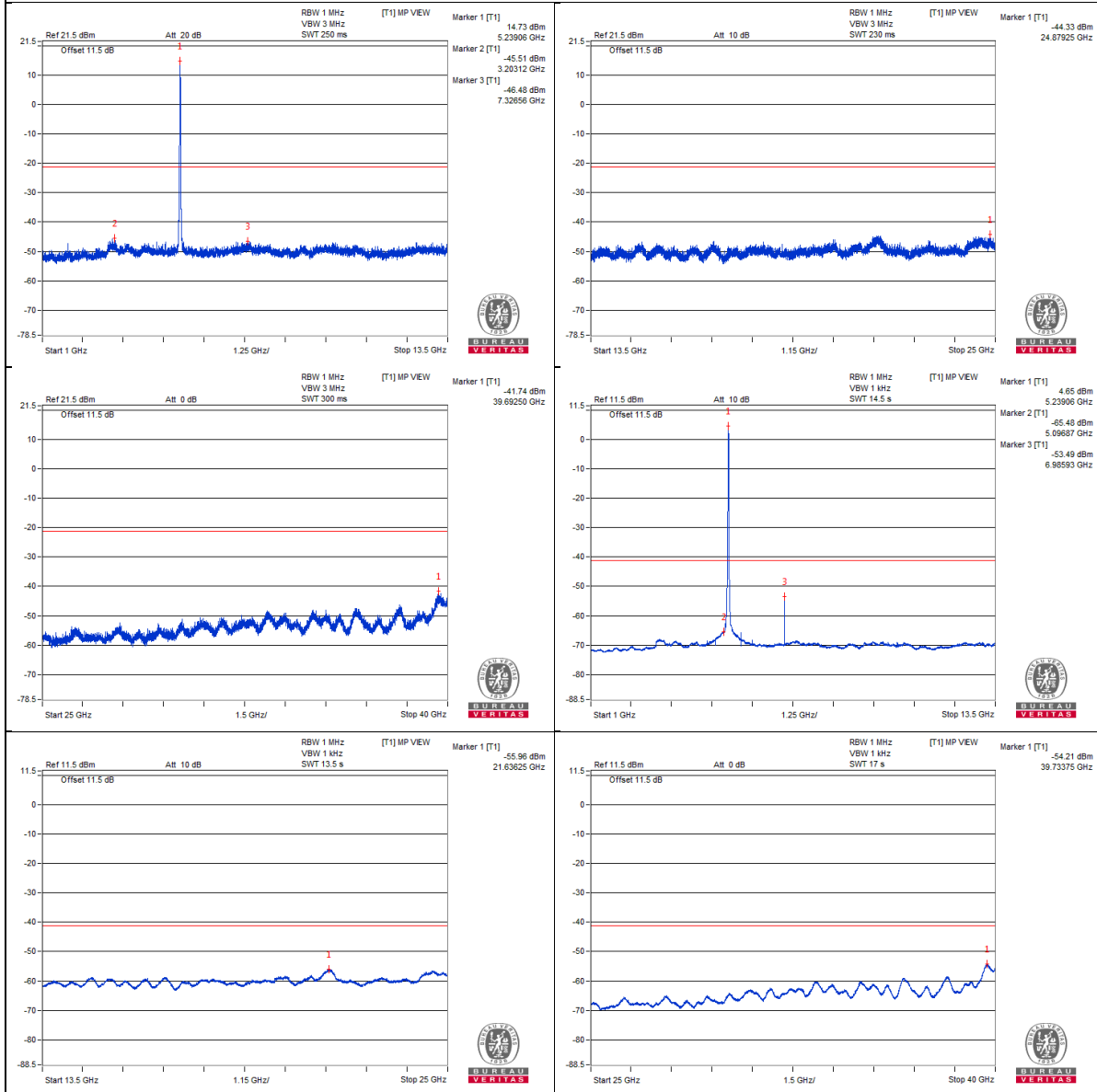
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3506.25 PK	58.01	74	-15.99	-49.81	-47.45	8.21	-37.25
2	3504.68 AV	36.98	54	-17.02	-69.45	-69.56	8.21	-58.28
3	6985.93 PK	58.7	68.2	-9.5	-46.73	-49.18	8.21	-36.56
4	10487.5 PK	57.08	68.2	-11.12	-49.04	-49.79	8.21	-38.18
5	15735.31 PK	56.69	74	-17.31	-51.42	-48.61	8.21	-38.57
6	15725.25 AV	45.41	54	-8.59	-60.97	-61.17	8.21	-49.85

Note :

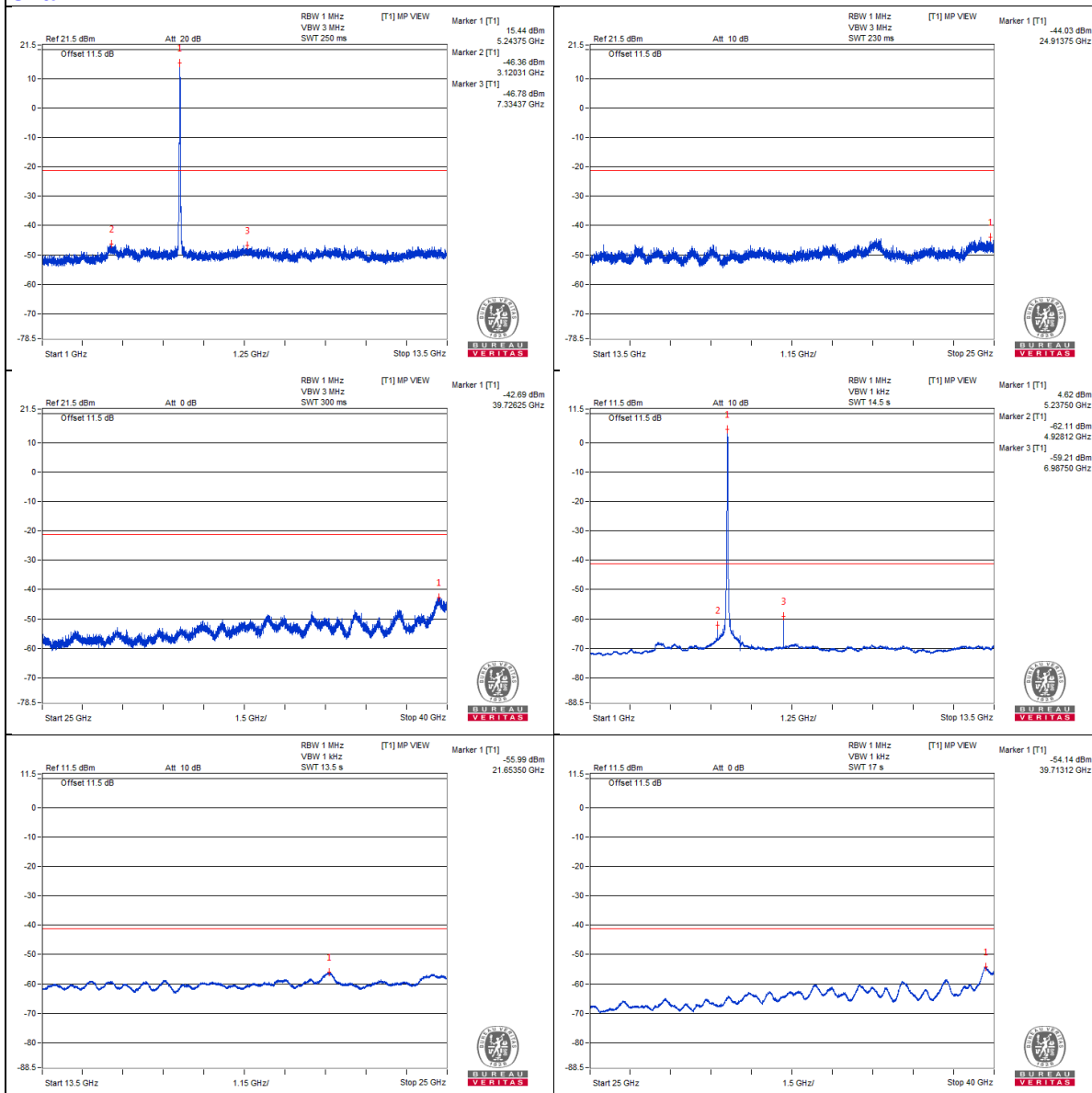
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

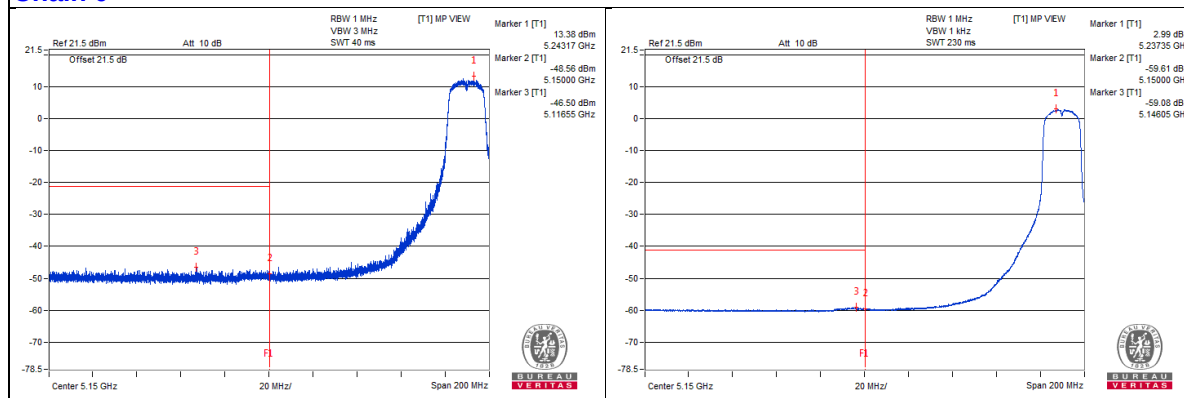
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5144.62 PK	59.04	74	-14.96	-49.2	-46.19	8.21	-36.22
2	5145.27 AV	47.27	54	-6.73	-59.5	-58.94	8.21	-47.99

Note :

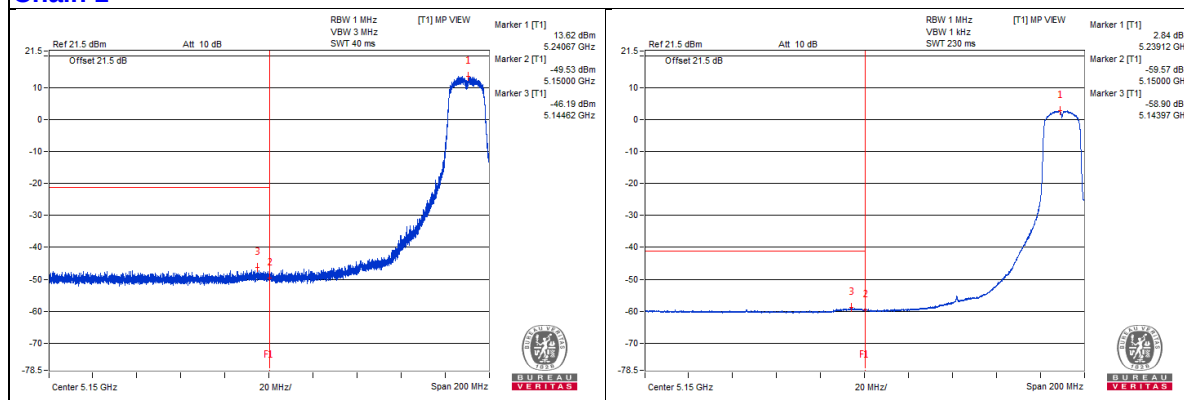
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11a - Channel 52

Conducted spurious emission table

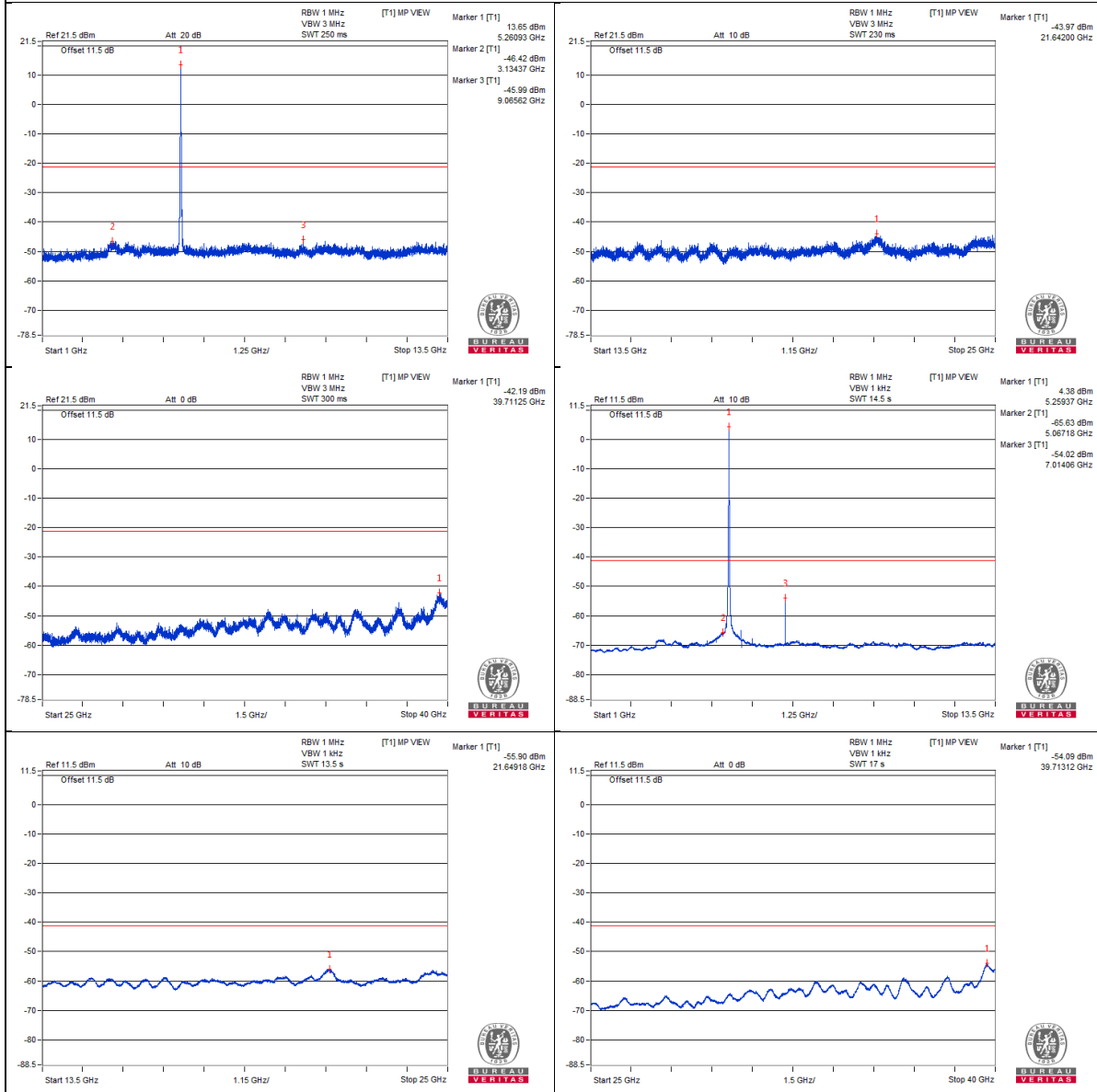
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3526.56 PK	57.49	74	-16.51	-49.61	-48.45	8.21	-37.77
2	3523.43 AV	37.27	54	-16.73	-69.3	-69.13	8.21	-57.99
3	7014.06 PK	57.9	68.2	-10.3	-47.73	-49.65	8.21	-37.36
4	10528.12 PK	57.36	68.2	-10.84	-50.3	-48.2	8.21	-37.9
5	15798.56 PK	57.62	74	-16.38	-48.33	-49.47	8.21	-37.64
6	15791.37 AV	46.25	54	-7.75	-60.16	-60.31	8.21	-49.01

Note :

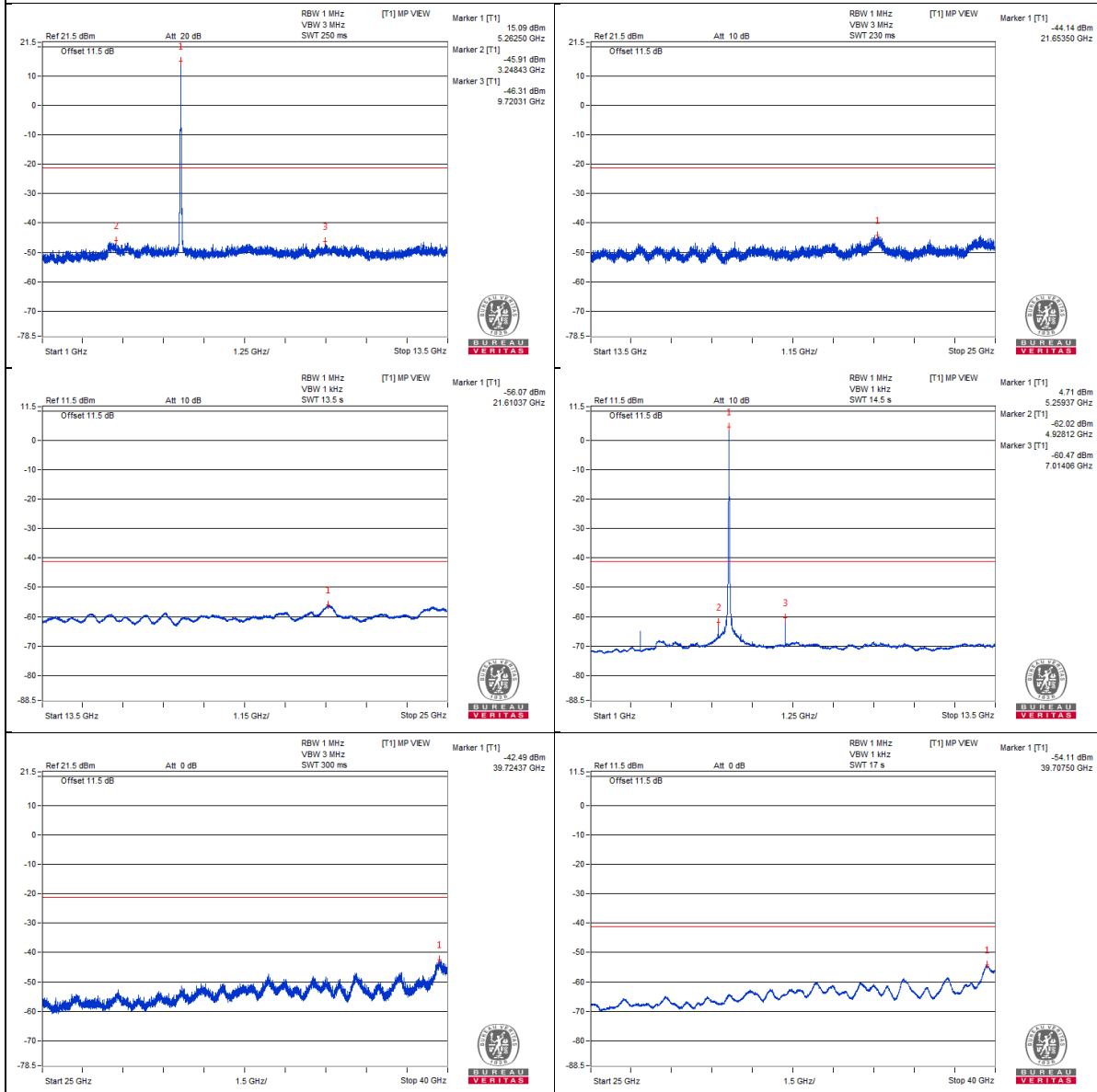
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

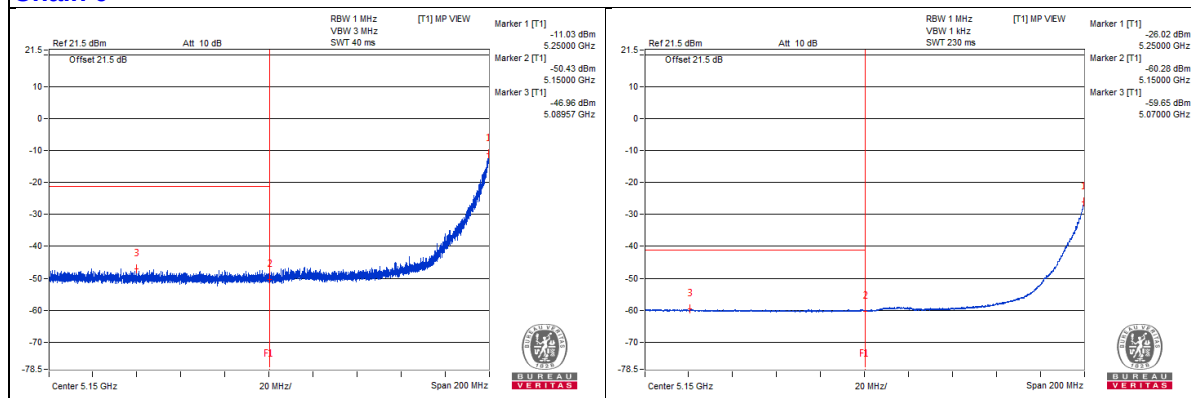
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5359.75 PK	59.44	74	-14.56	-46.17	-48.12	8.21	-35.82
2	5356.1 AV	47.33	54	-6.67	-59.5	-58.83	8.21	-47.93

Note :

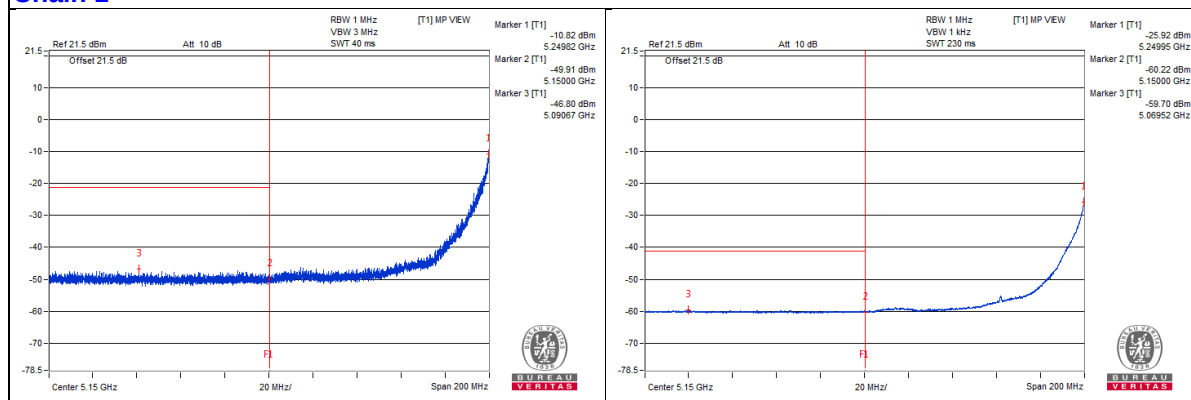
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11a - Channel 60

Conducted spurious emission table

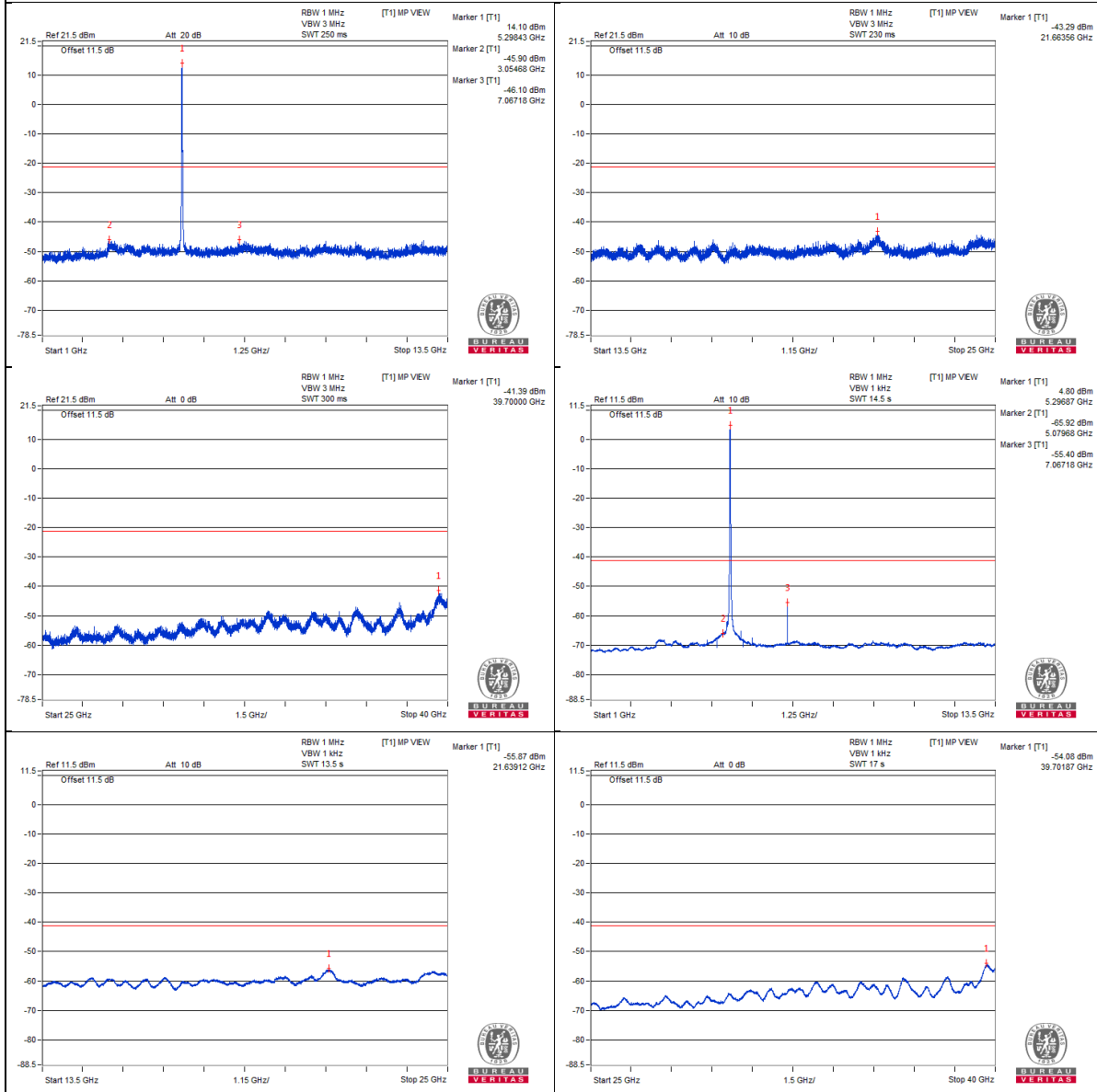
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3525 PK	58.38	74	-15.62	-48.34	-47.87	8.21	-36.88
2	3535.93 AV	37.54	54	-16.46	-69.25	-68.65	8.21	-57.72
3	7067.18 PK	59.24	68.2	-8.96	-46.1	-48.8	8.21	-36.02
4	10582.81 PK	57.38	68.2	-10.82	-48.82	-49.39	8.21	-37.88
5	10600 AV	36.91	54	-17.09	-69.77	-69.37	8.21	-58.35
6	15899.18 PK	57.75	74	-16.25	-49.45	-48.12	8.21	-37.51
7	15893.43 AV	46.26	54	-7.74	-60.23	-60.21	8.21	-49

Note :

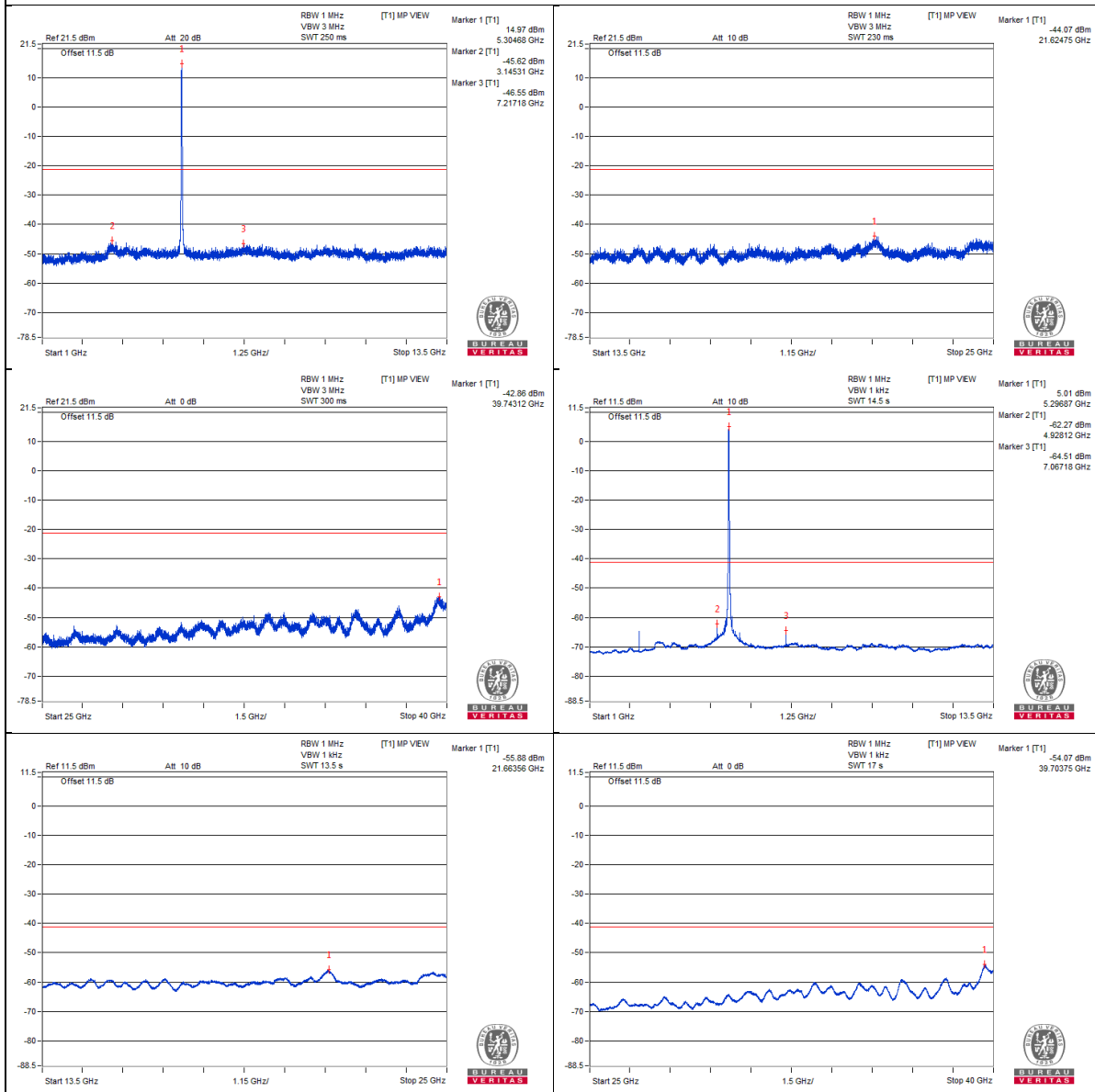
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

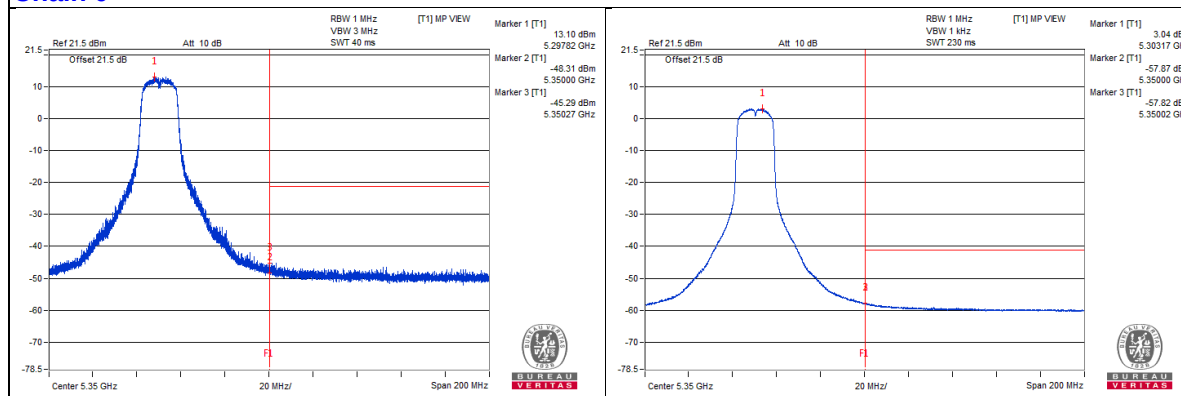
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5352.82 PK	60.78	74	-13.22	-47.26	-44.55	8.21	-34.48
2	5350.02 AV	49.28	54	-4.72	-57.82	-56.65	8.21	-45.98

Note :

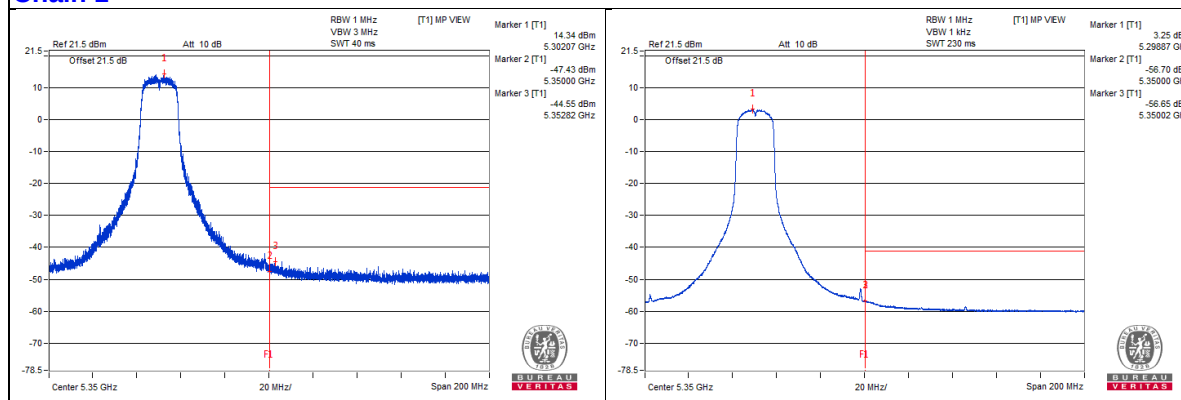
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11a - Channel 64

Conducted spurious emission table

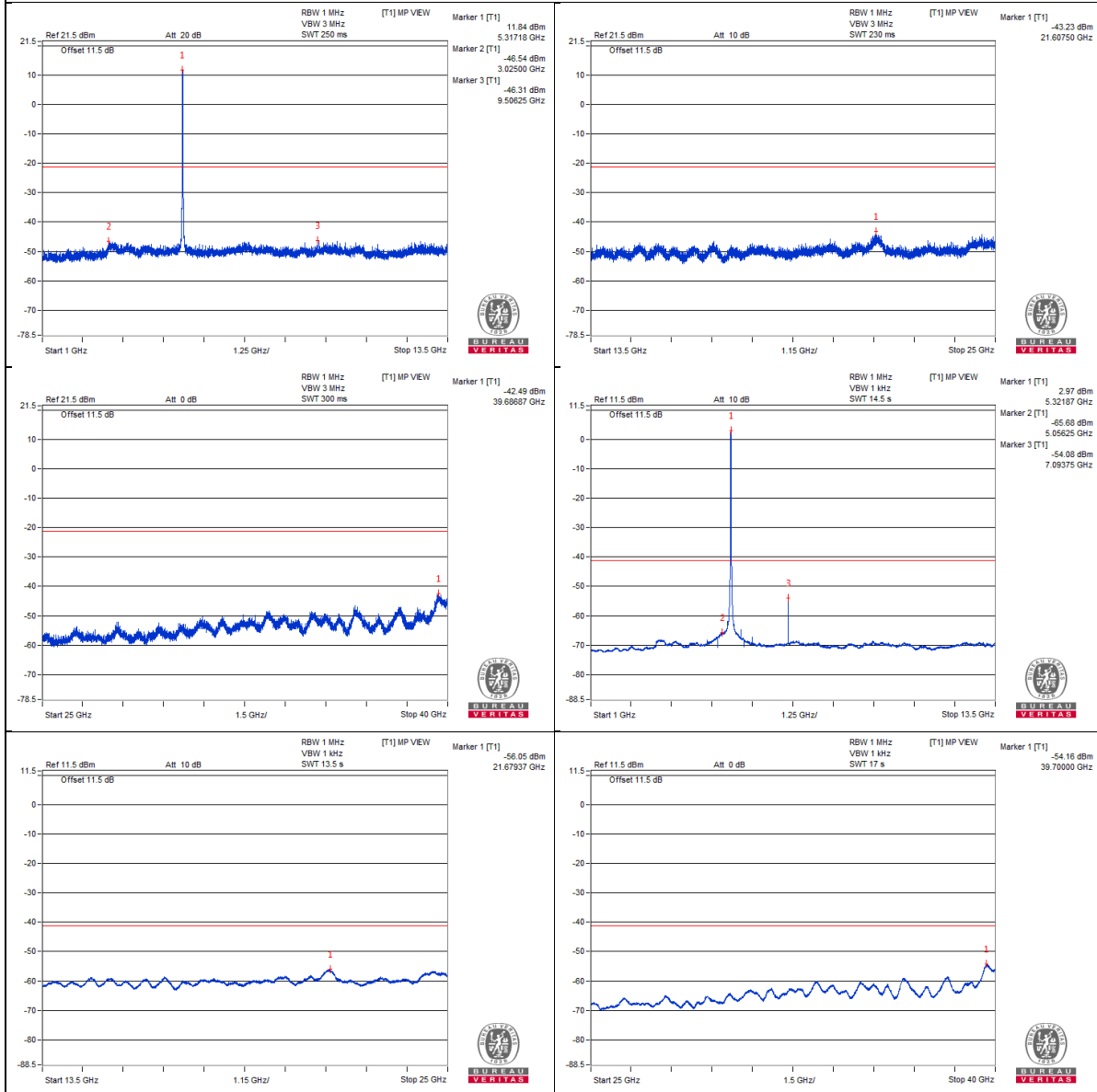
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3531.25 PK	58.42	74	-15.58	-48.59	-47.59	8.21	-36.84
2	3560.93 AV	37.66	54	-16.34	-68.75	-68.9	8.21	-57.6
3	7093.75 PK	58.73	68.2	-9.47	-47.52	-47.99	8.21	-36.53
4	10643.75 PK	57.78	74	-16.22	-48.8	-48.61	8.21	-37.48
5	10640.62 AV	36.91	54	-17.09	-69.81	-69.34	8.21	-58.35
6	15946.62 PK	56.64	74	-17.36	-48.65	-51.5	8.21	-38.62
7	15940.87 AV	45.62	54	-8.38	-60.88	-60.85	8.21	-49.64

Note :

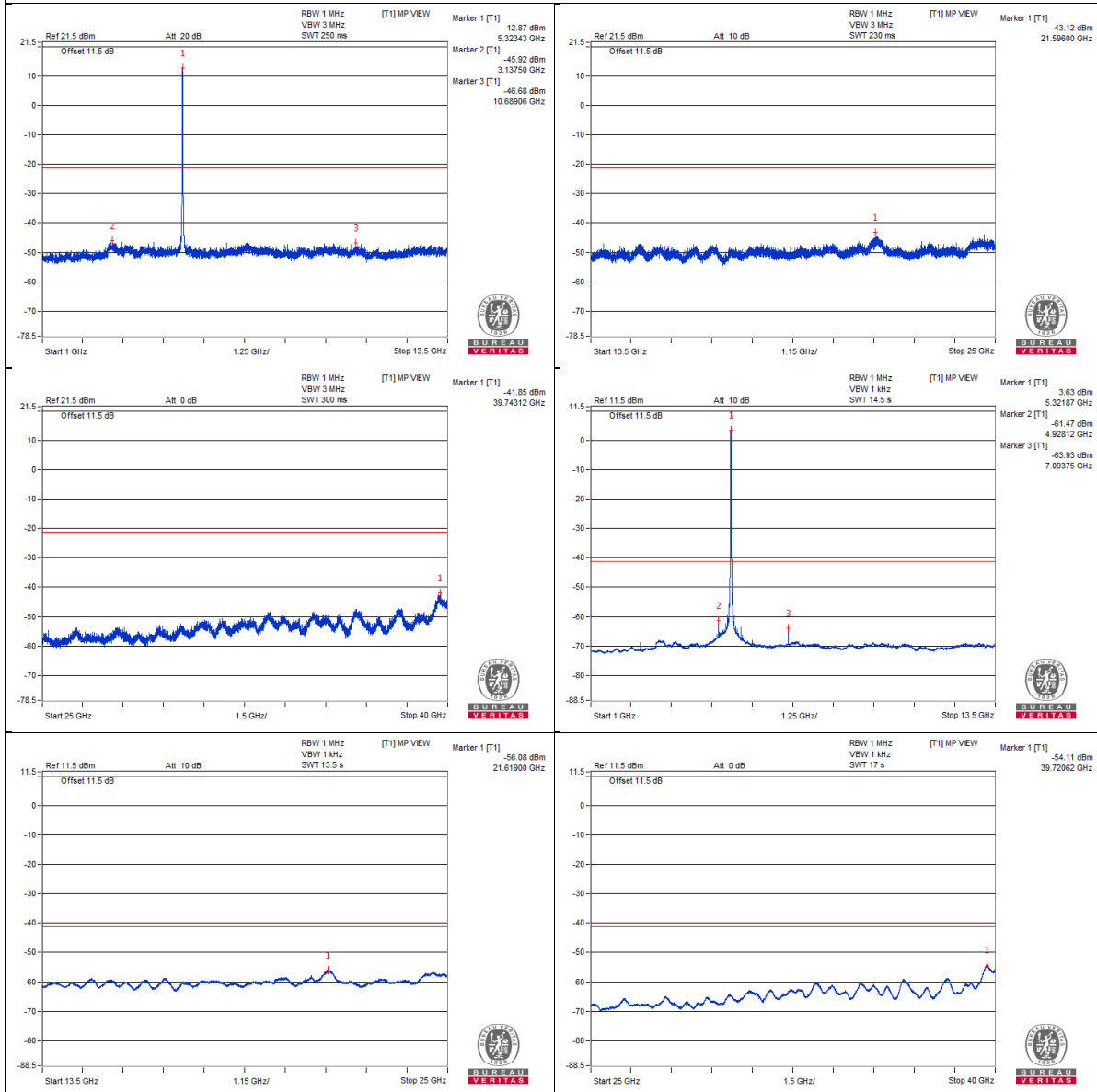
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

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	5350.4 PK	65.27	74	-8.73	-44.36	-39.4	8.21	-29.99
2	5368.02 AV	55.23	54	* 1.23	-57.74	-48.76	8.21	-40.03

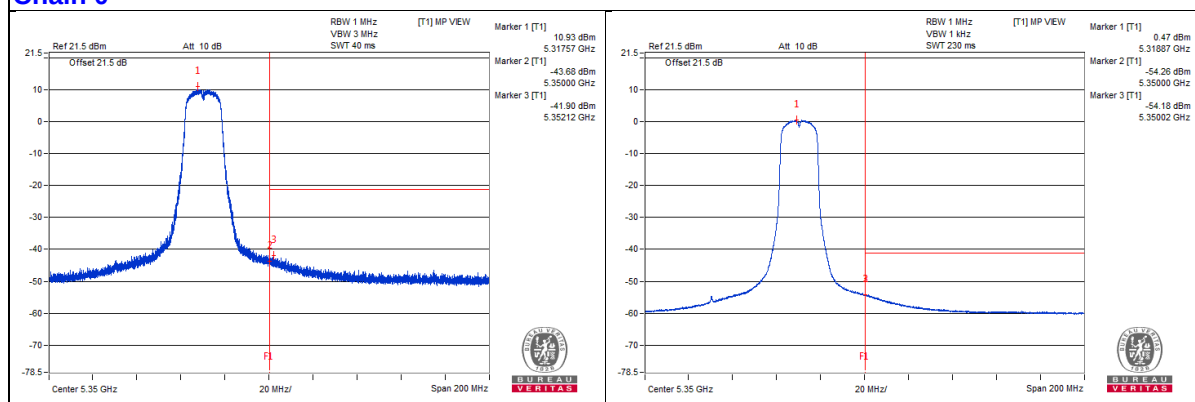
Note :

Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

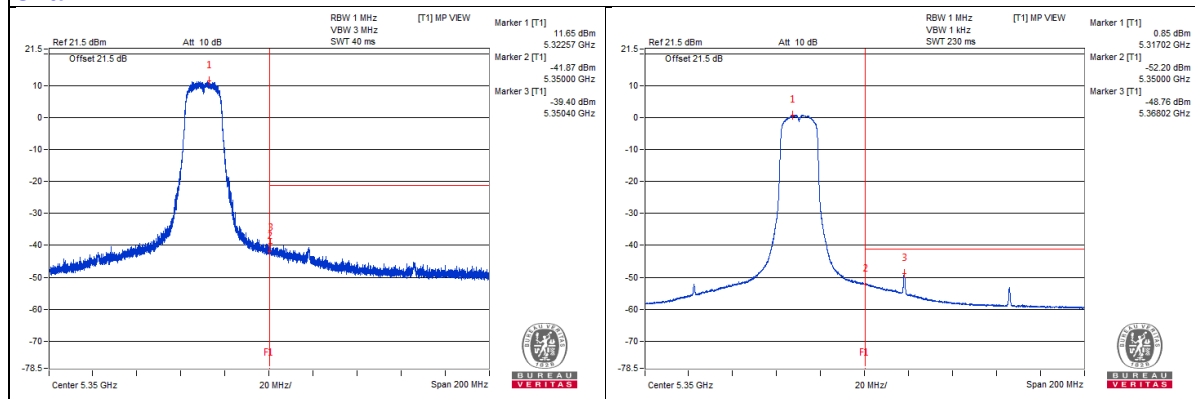
d = measurement distance in 3 meters.

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

Chain 0



Chain 1



802.11a - Channel 100

Conducted spurious emission table

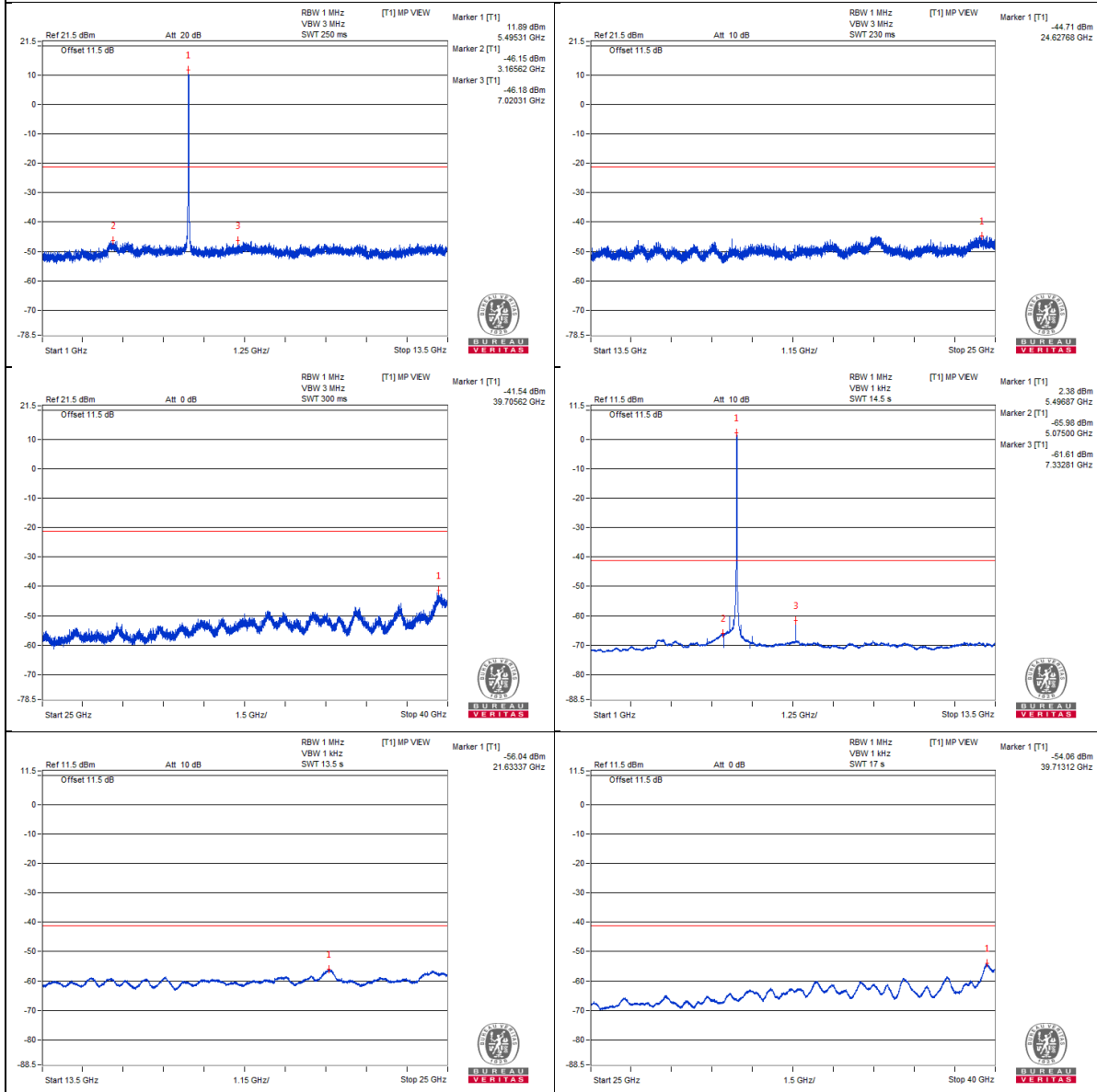
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3671.87 PK	58.86	74	-15.14	-47.46	-49.15	8.81	-36.4
2	3654.68 AV	38.02	54	-15.98	-69.04	-69.08	8.81	-57.24
3	7339.06 PK	59.45	74	-14.55	-47.94	-47.35	8.81	-35.81
4	7332.81 AV	43.35	54	-10.65	-61.61	-68.03	8.81	-51.91
5	10993.75 PK	57.75	74	-16.25	-48.14	-50.99	8.81	-37.51
6	11000 AV	36.65	54	-17.35	-70.68	-70.19	8.81	-58.61
7	16494.31 PK	57.86	68.2	-10.34	-49.71	-48.78	8.81	-37.4

Note :

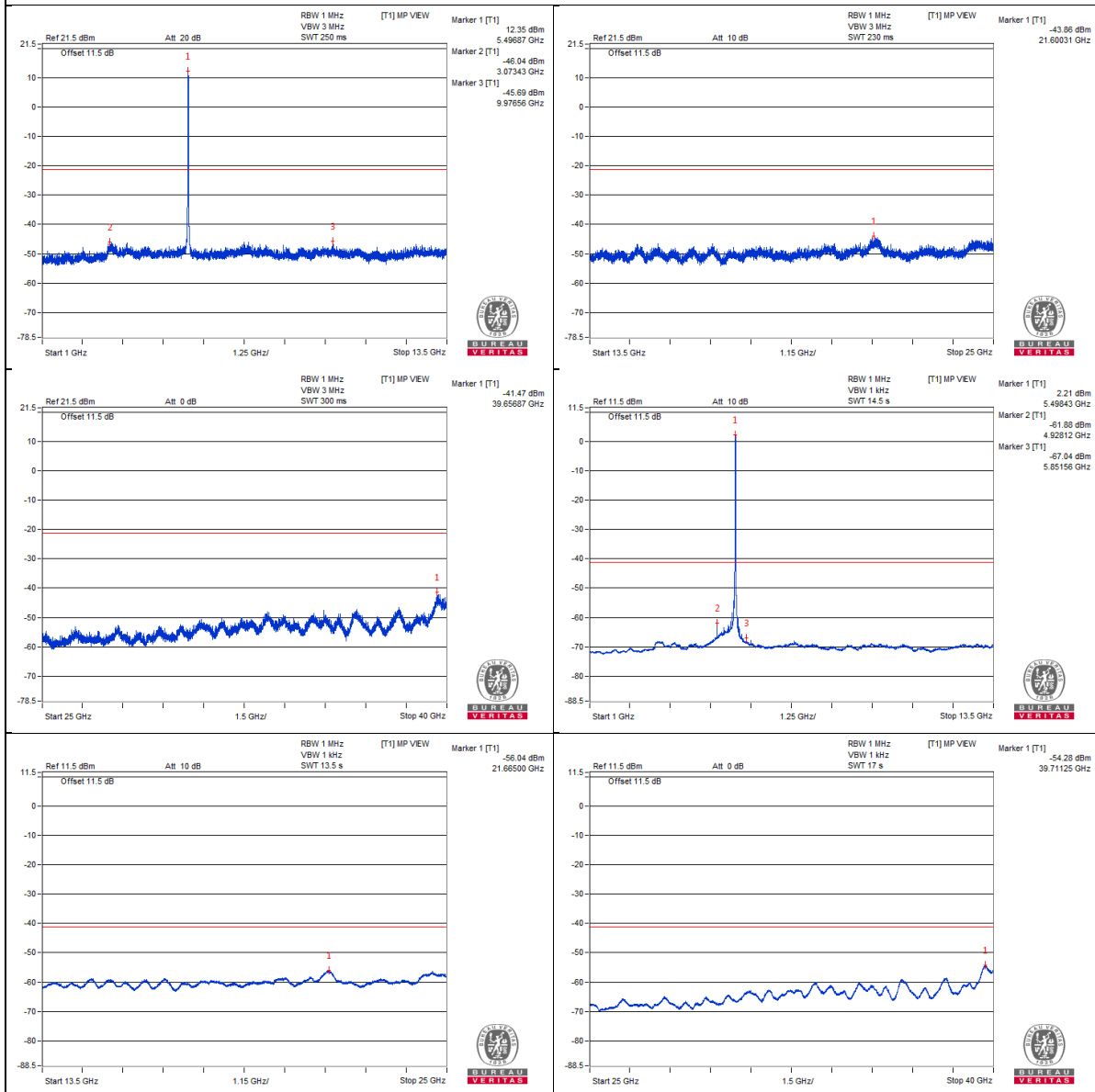
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

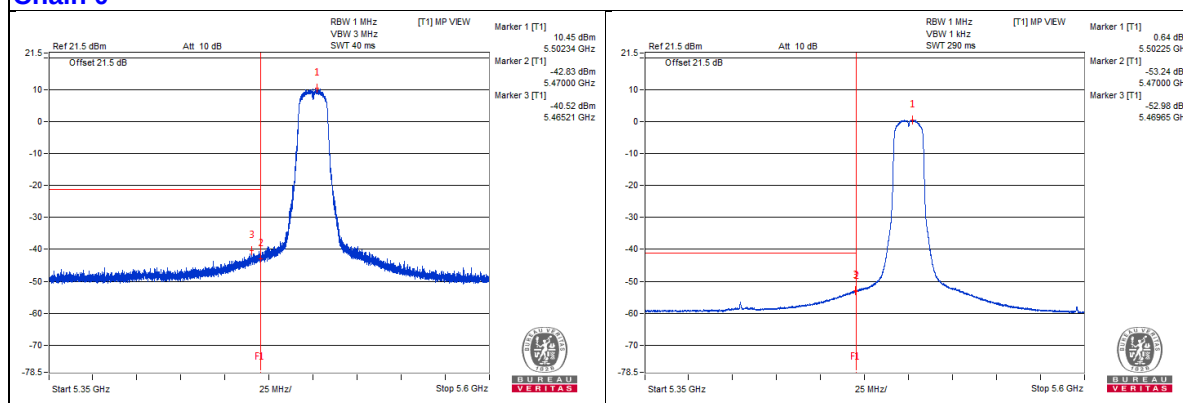
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5459.84 PK	64.46	74	-9.54	-43.61	-41.82	8.81	-30.8
2	5451.93 AV	53.09	54	-0.91	-56.41	-52.45	8.81	-42.17
3	5469 PK	65.83	68.2	-2.37	-40.52	-42.12	8.81	-29.43

Note :

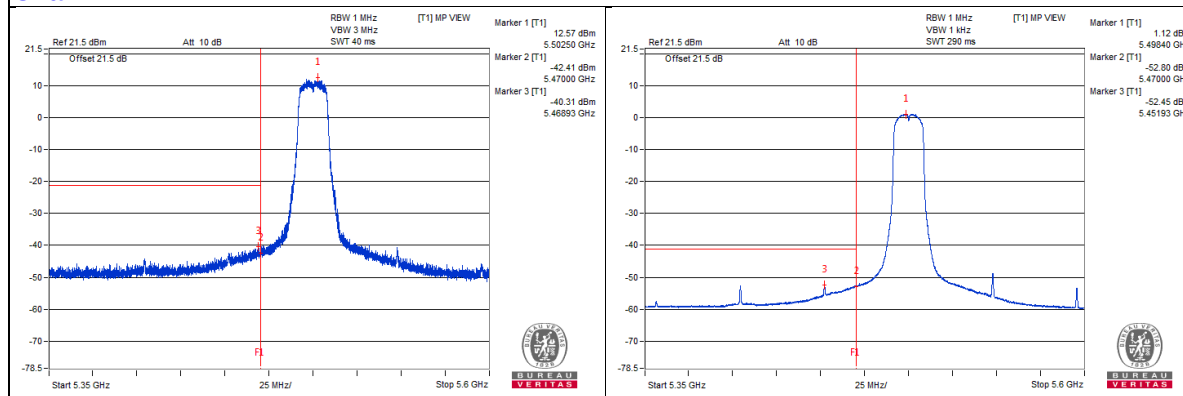
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11a - Channel 116

Conducted spurious emission table

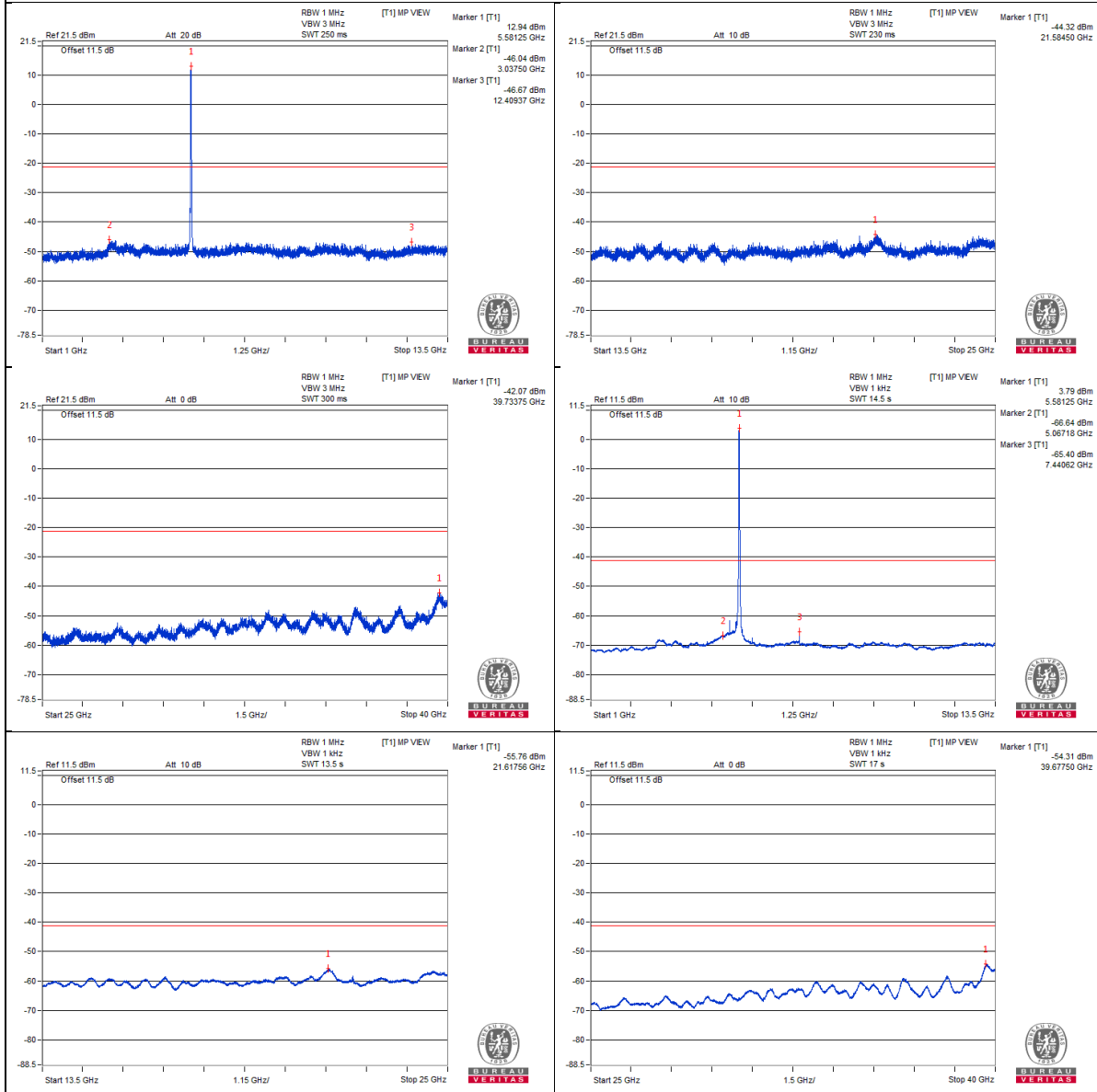
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3732.81 PK	58.48	74	-15.52	-49.78	-47.68	8.81	-36.78
2	3720.31 AV	37.76	54	-16.24	-69.2	-69.44	8.81	-57.5
3	7448.43 PK	58.73	74	-15.27	-47.55	-49.32	8.81	-36.53
4	7440.62 AV	40.22	54	-13.78	-65.4	-69.08	8.81	-55.04
5	11175 PK	57.24	74	-16.76	-49.68	-50.01	8.81	-38.02
6	11160.93 AV	37.05	54	-16.95	-70.7	-69.45	8.81	-58.21
7	16740.12 PK	56.99	68.2	-11.21	-50.96	-49.37	8.81	-38.27

Note :

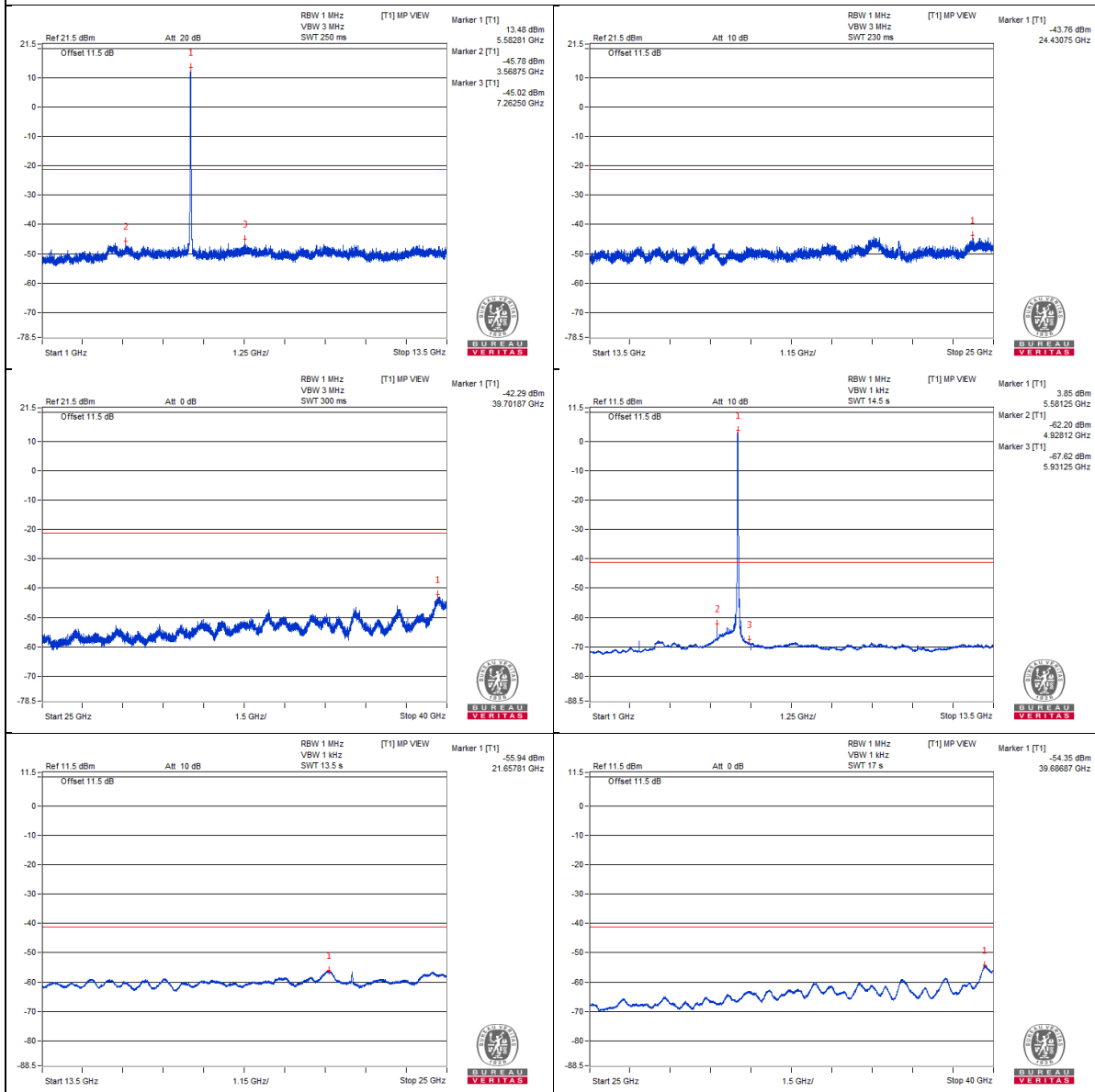
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

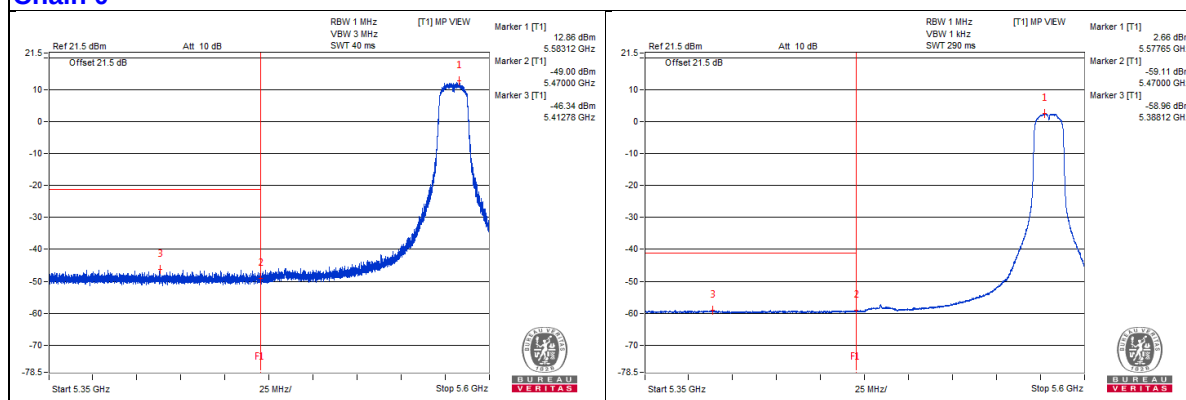
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5458.87 PK	60.01	74	-13.99	-46.58	-47.63	8.81	-35.25
2	5387.93 AV	48.6	54	-5.4	-59.11	-57.93	8.81	-46.66
3	5465.28 PK	59.7	68.2	-8.5	-46.77	-48.09	8.81	-35.56

Note :

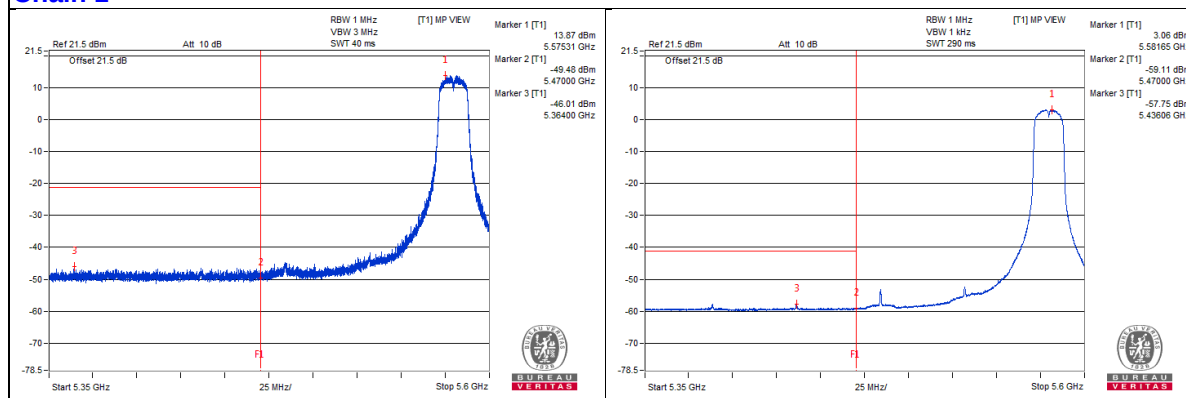
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11a - Channel 140

Conducted spurious emission table

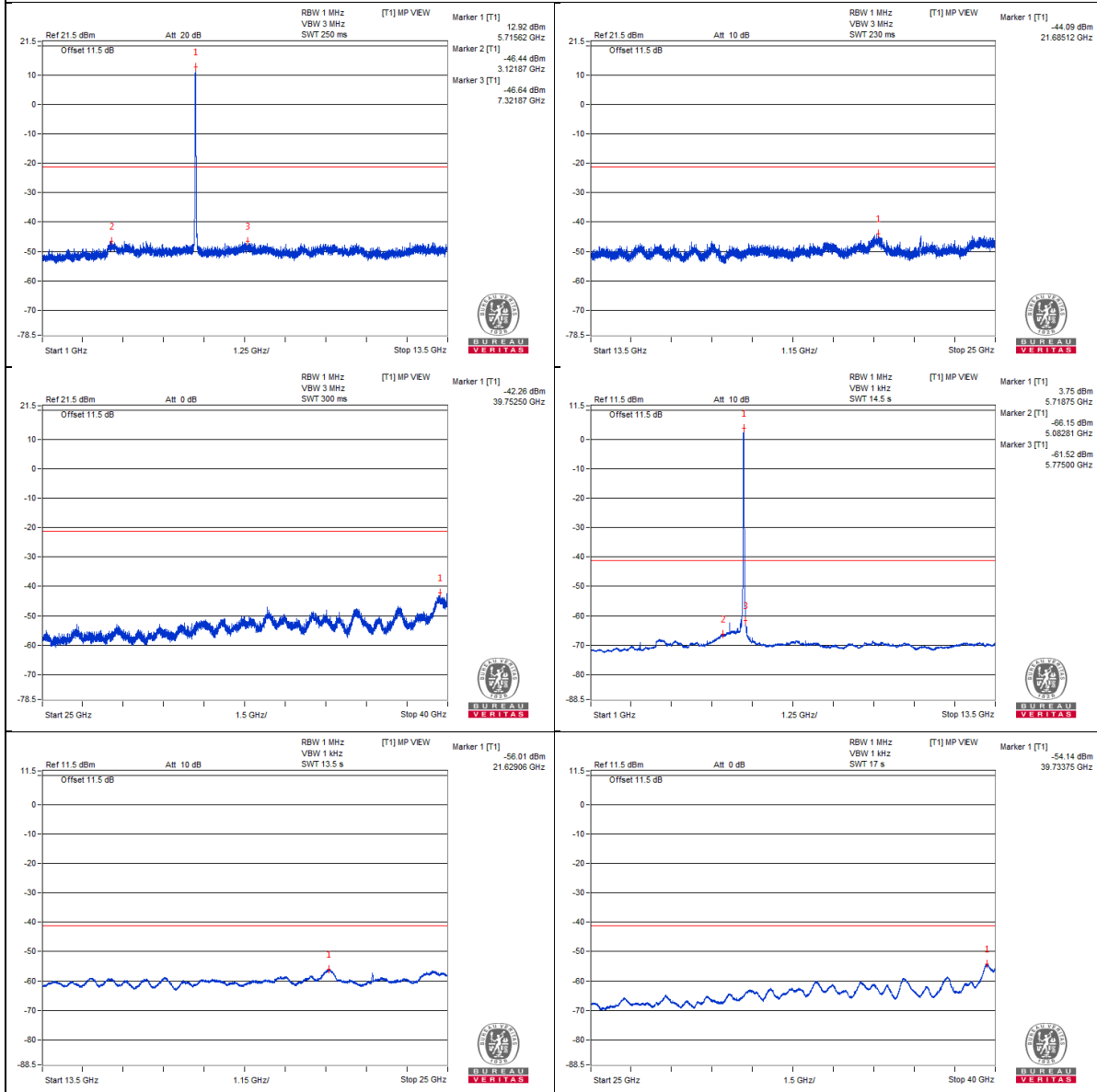
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3787.5 PK	58.42	74	-15.58	-48.79	-48.53	8.81	-36.84
2	3781.25 AV	37.36	54	-16.64	-69.55	-69.9	8.81	-57.9
3	7585.93 PK	58.86	74	-15.14	-48.45	-48	8.81	-36.4
4	7600 AV	38.37	54	-15.63	-67.88	-69.75	8.81	-56.89
5	11389.06 PK	57.07	74	-16.93	-49.63	-50.43	8.81	-38.19
6	11401.56 AV	36.82	54	-17.18	-70.73	-69.84	8.81	-58.44
7	17090.87 PK	57.89	68.2	-10.31	-49.24	-49.15	8.81	-37.37

Note :

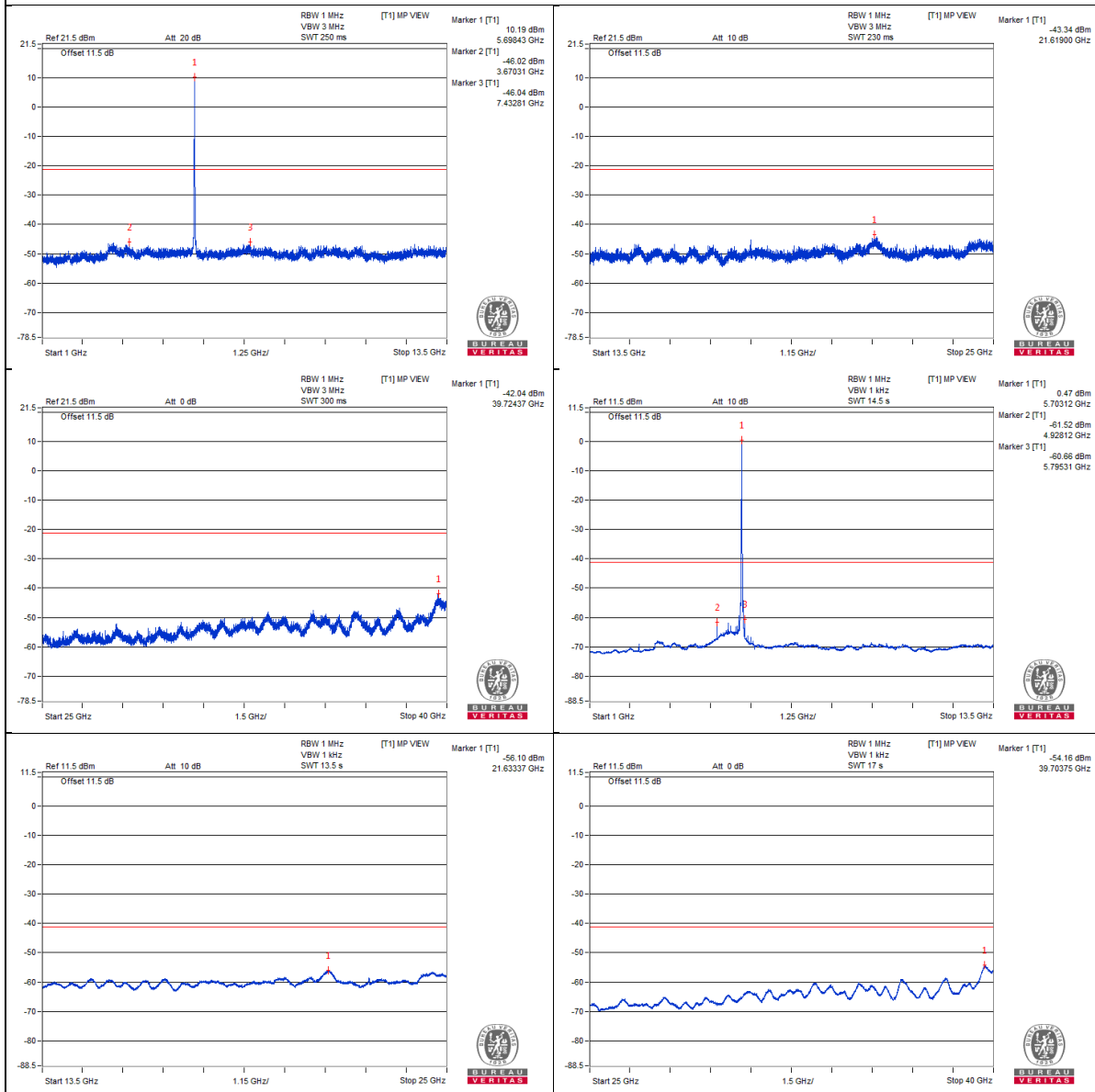
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

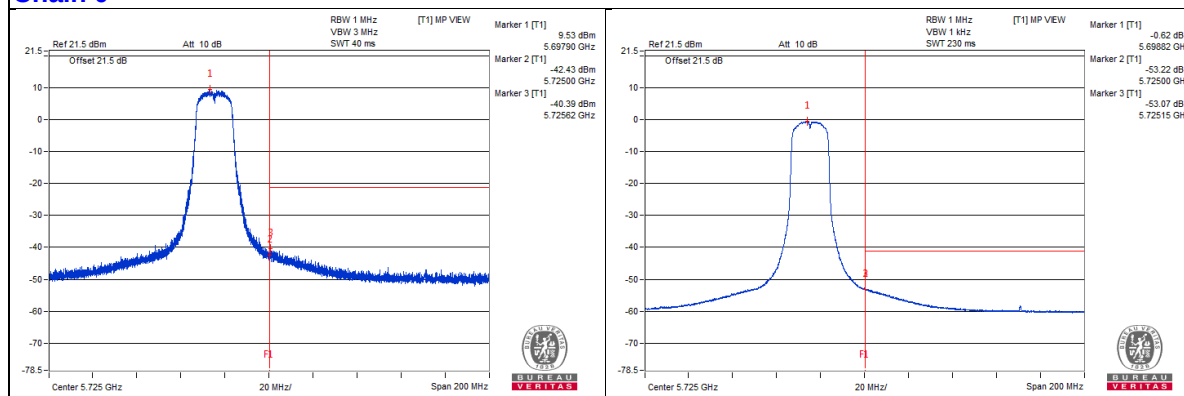
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5725.62 PK	66.38	68.2	-1.82	-40.39	-41.03	8.81	-28.88

Note :

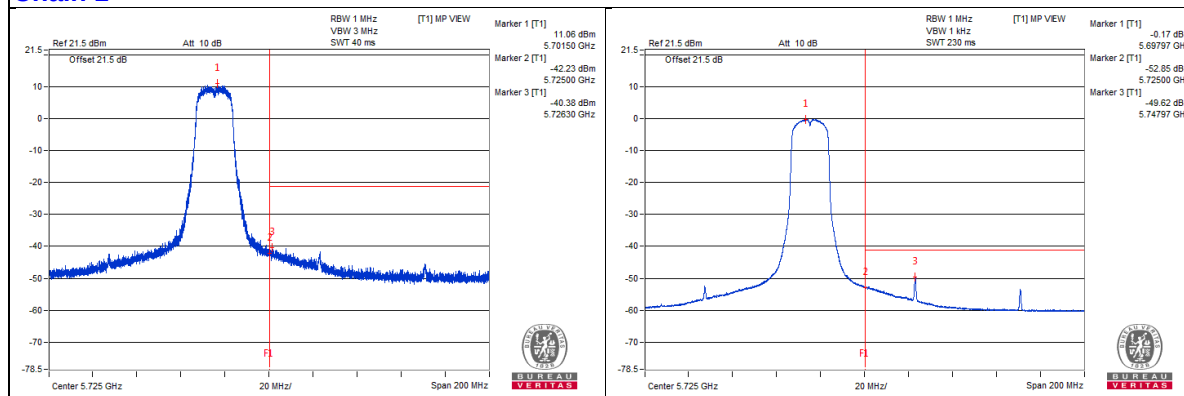
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11a - Channel 144

Conducted spurious emission table

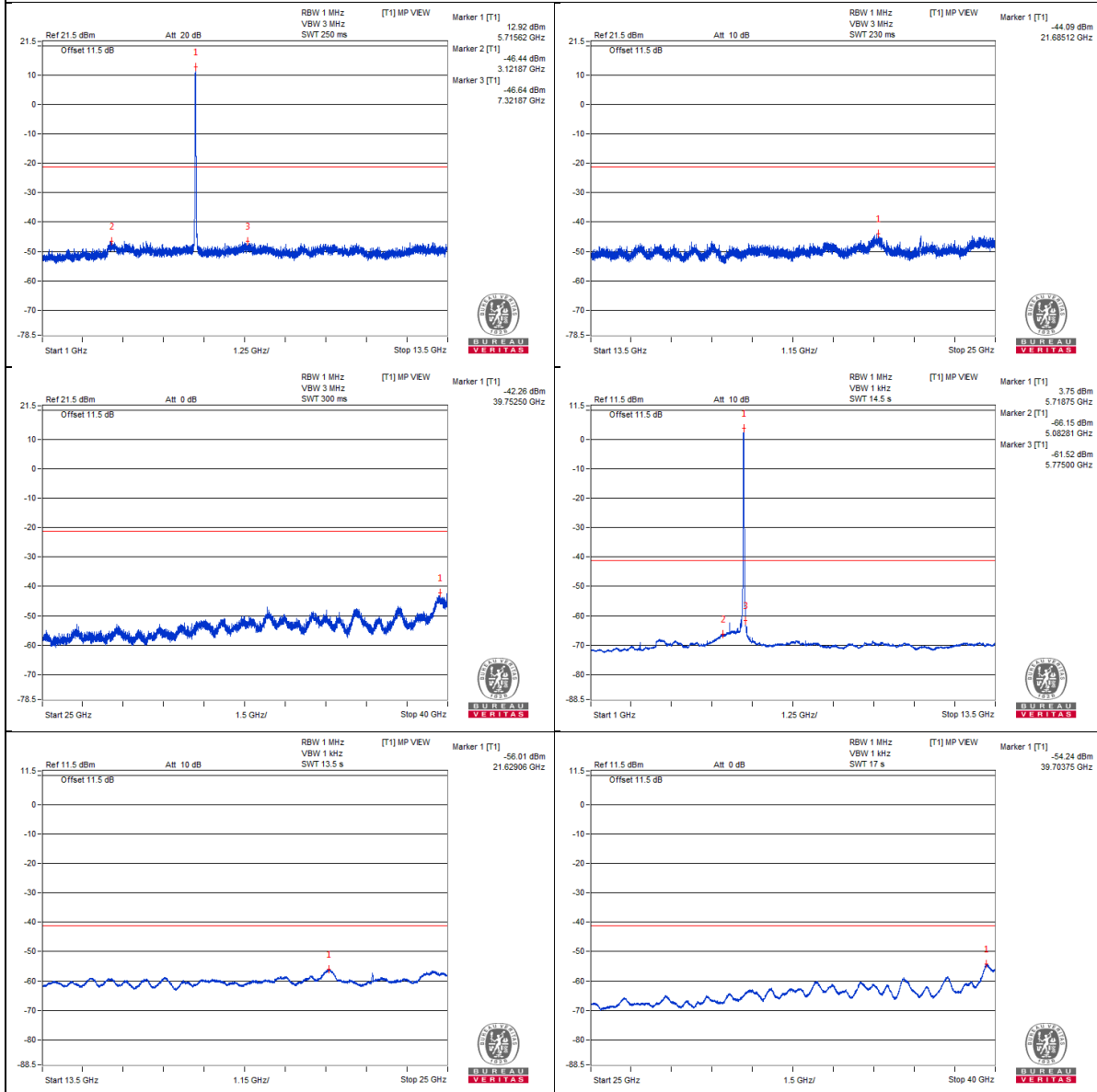
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3798.43 PK	57.56	74	-16.44	-48.88	-50.28	8.81	-37.7
2	3793.75 AV	37.18	54	-16.82	-69.82	-69.99	8.81	-58.08
3	7628.12 PK	58.08	74	-15.92	-49.69	-48.4	8.81	-37.18
4	7626.56 AV	37.94	54	-16.06	-68.53	-69.84	8.81	-57.32
5	11440.62 PK	57.11	74	-16.89	-49.52	-50.47	8.81	-38.15
6	11442.18 AV	37.22	54	-16.78	-70.62	-69.22	8.81	-58.04
7	17145.5 PK	56.81	68.2	-11.39	-49.54	-51.14	8.81	-38.45

Note :

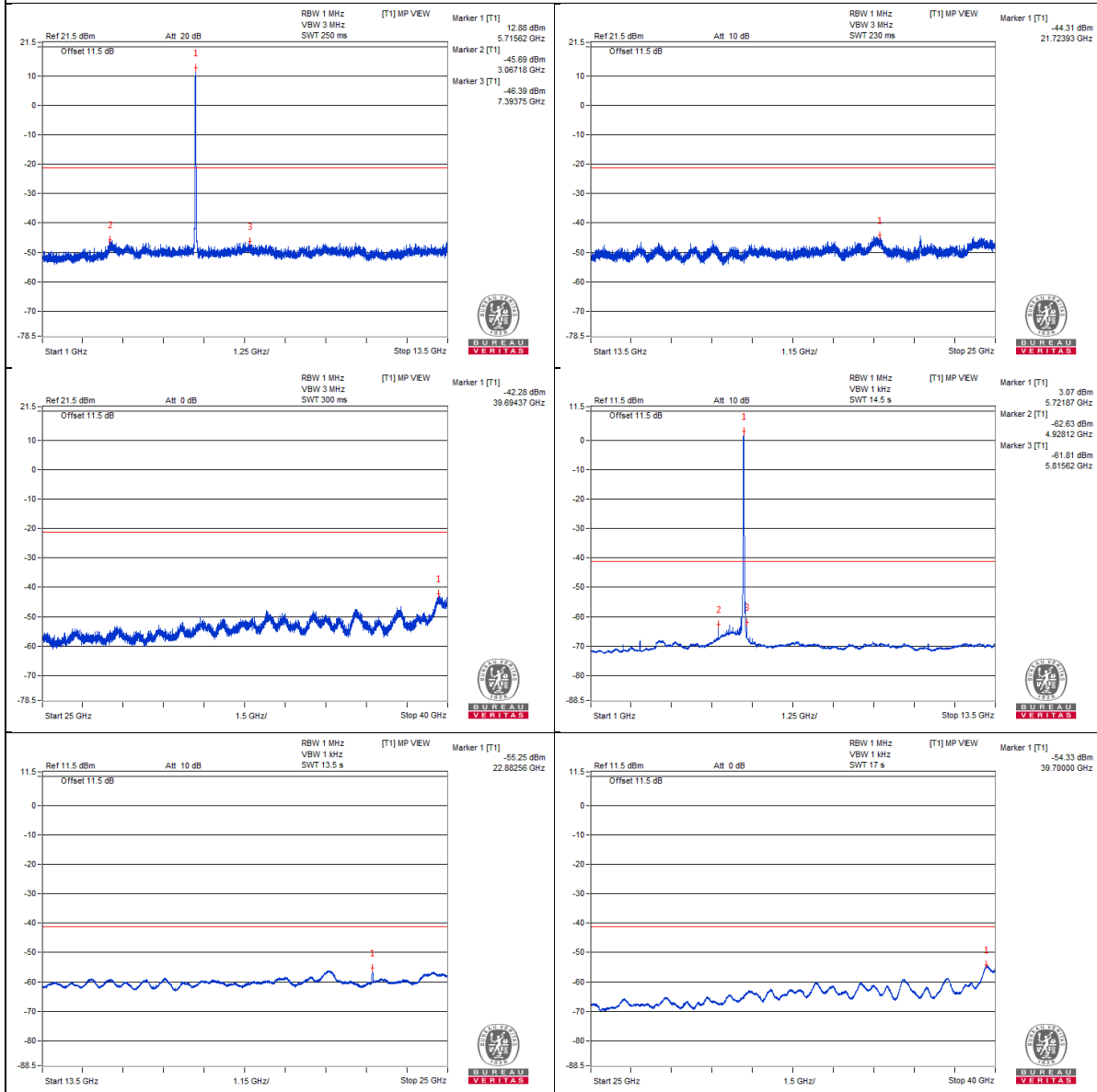
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

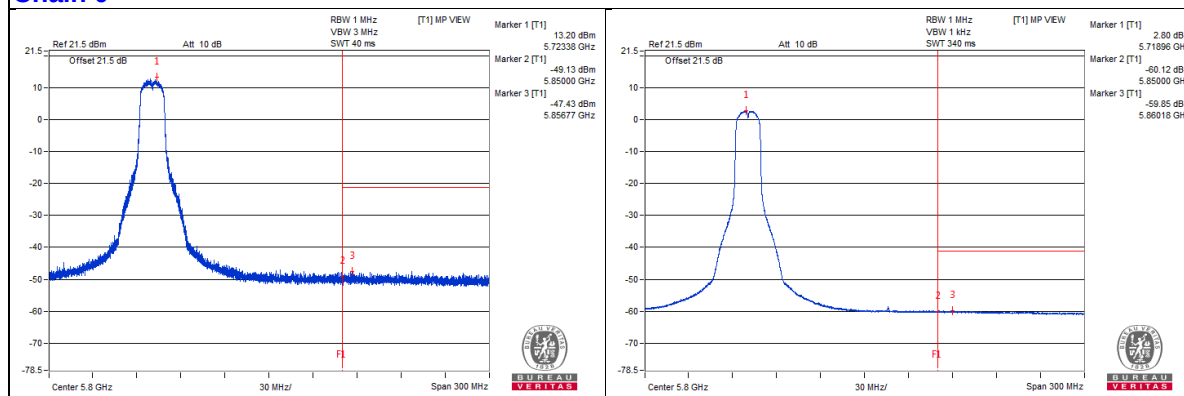
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5829.73 PK	59.4	68.2	-8.8	-48.33	-47.12	8.81	-35.86

Note :

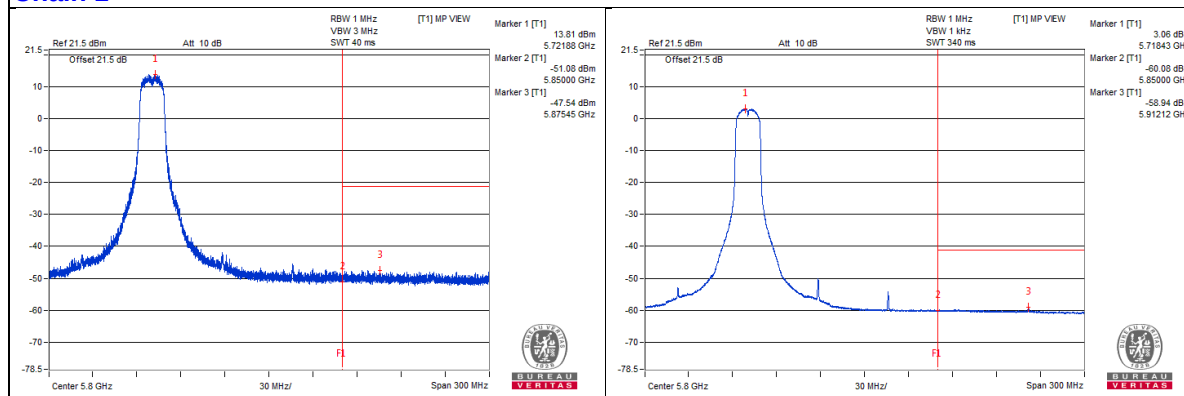
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11a - Channel 149

Conducted spurious emission table

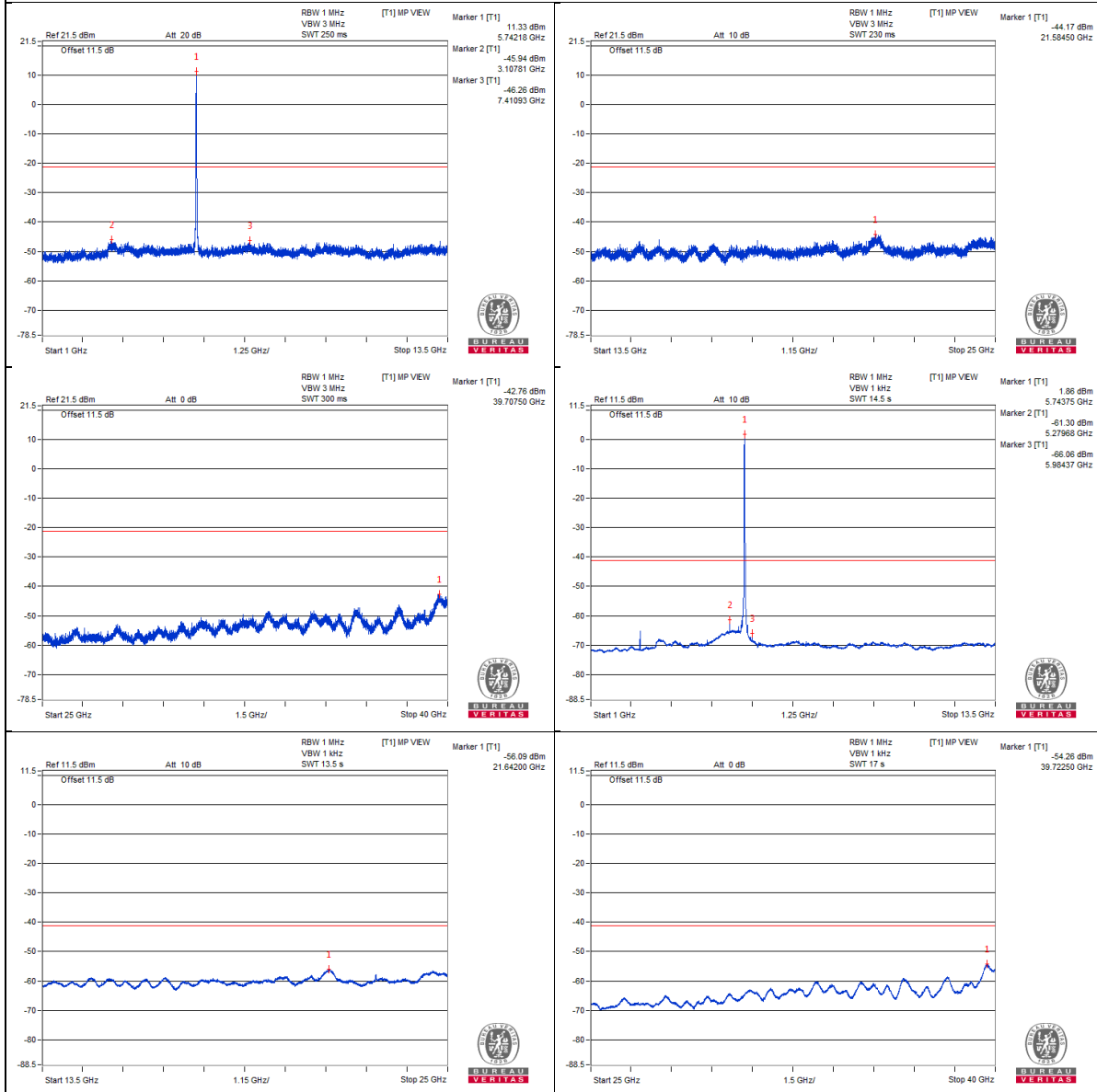
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3815.62 PK	57.87	74	-16.13	-49.07	-49.36	8.81	-37.39
2	3812.5 AV	36.92	54	-17.08	-70.07	-70.26	8.81	-58.34
3	7646.87 PK	57.72	74	-16.28	-49.32	-49.4	8.81	-37.54
4	7660.93 AV	37.76	54	-16.24	-68.93	-69.75	8.81	-57.5
5	11471.87 PK	57.18	74	-16.82	-49.39	-50.48	8.81	-38.08
6	11492.18 AV	37.11	54	-16.89	-70.67	-69.36	8.81	-58.15
7	17237.5 PK	55.74	68.2	-12.46	-49.85	-53.64	8.81	-39.52

Note :

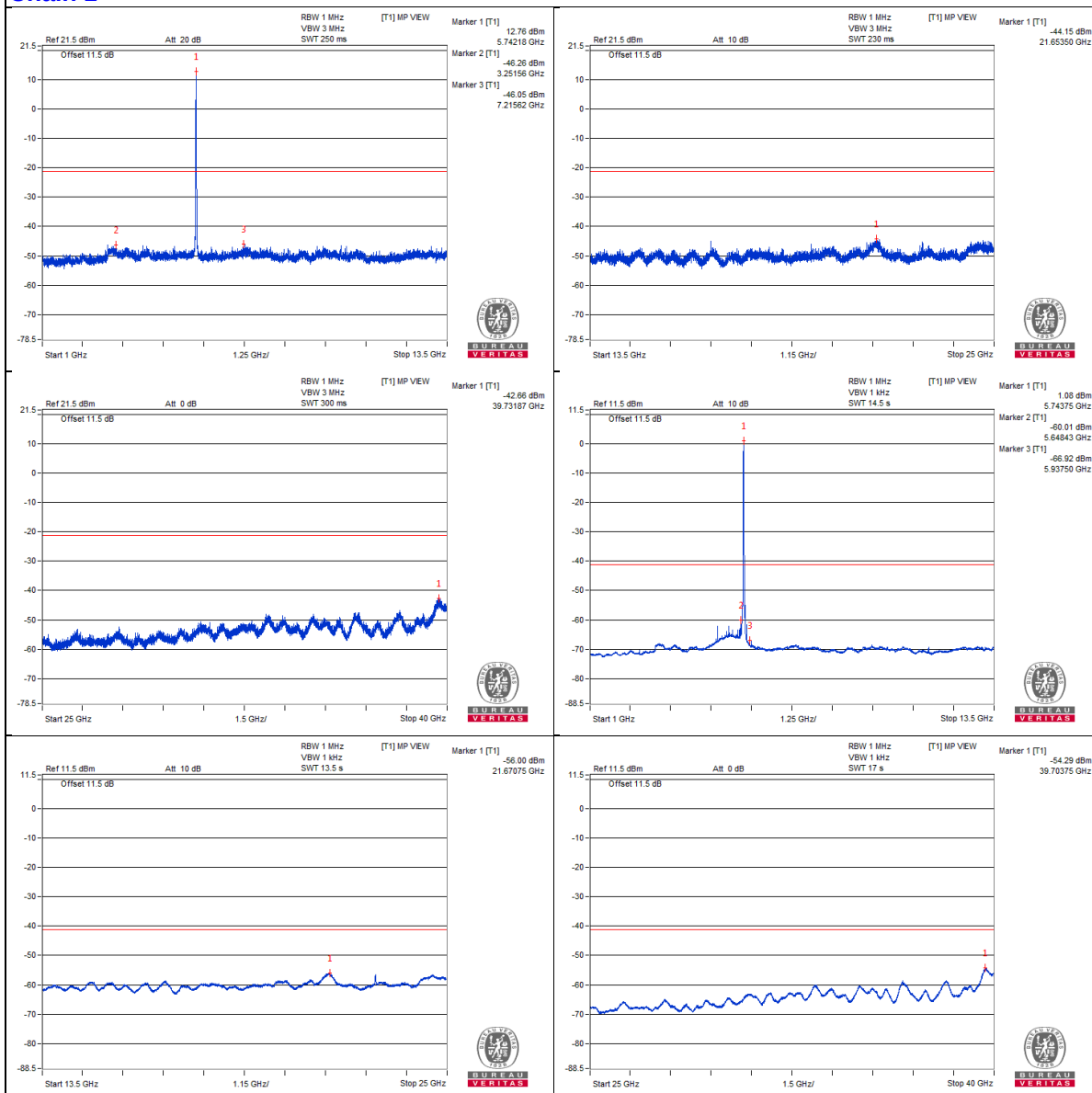
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0

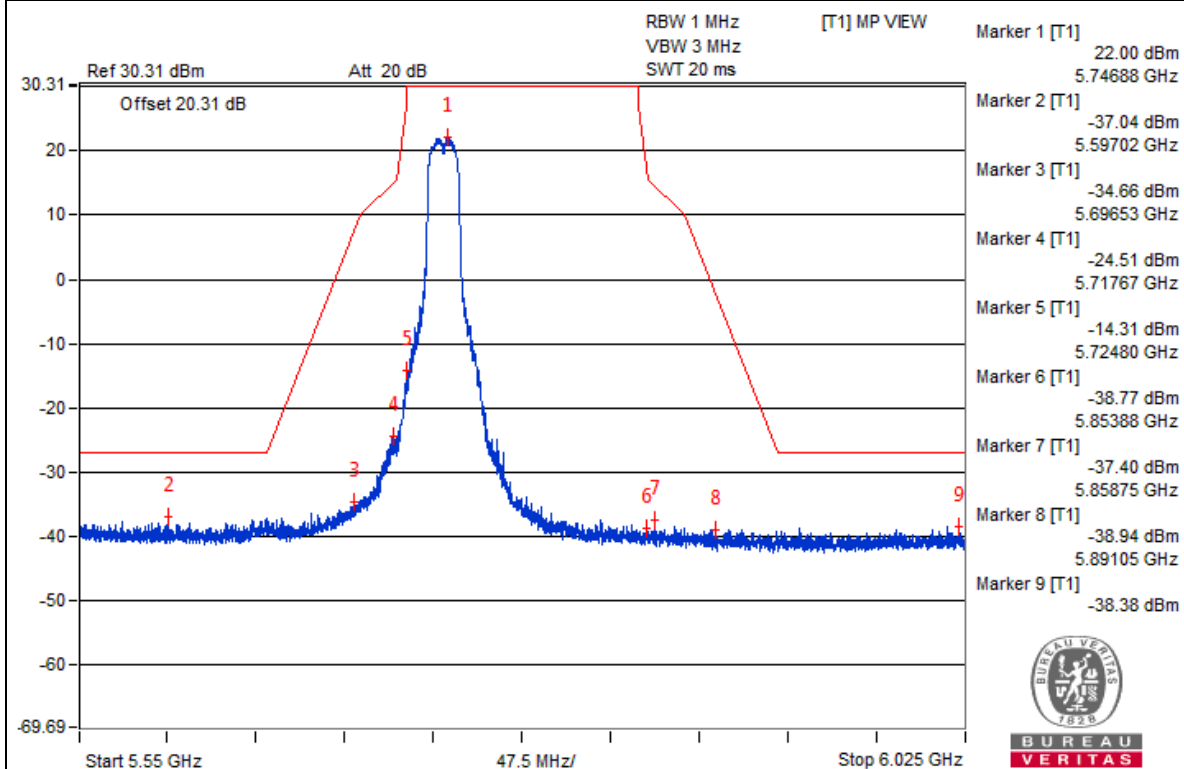


Chain 1

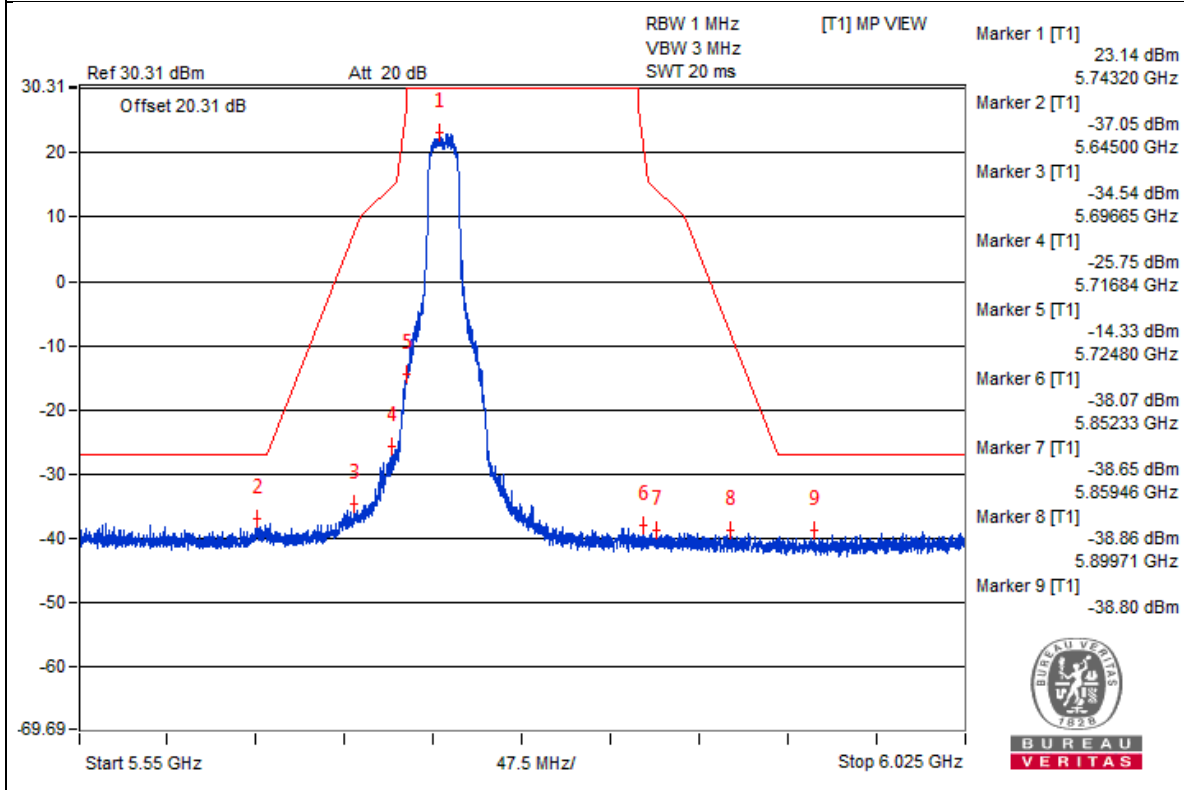


Bandedge table

Chain 0



Chain 1



802.11a - Channel 157

Conducted spurious emission table

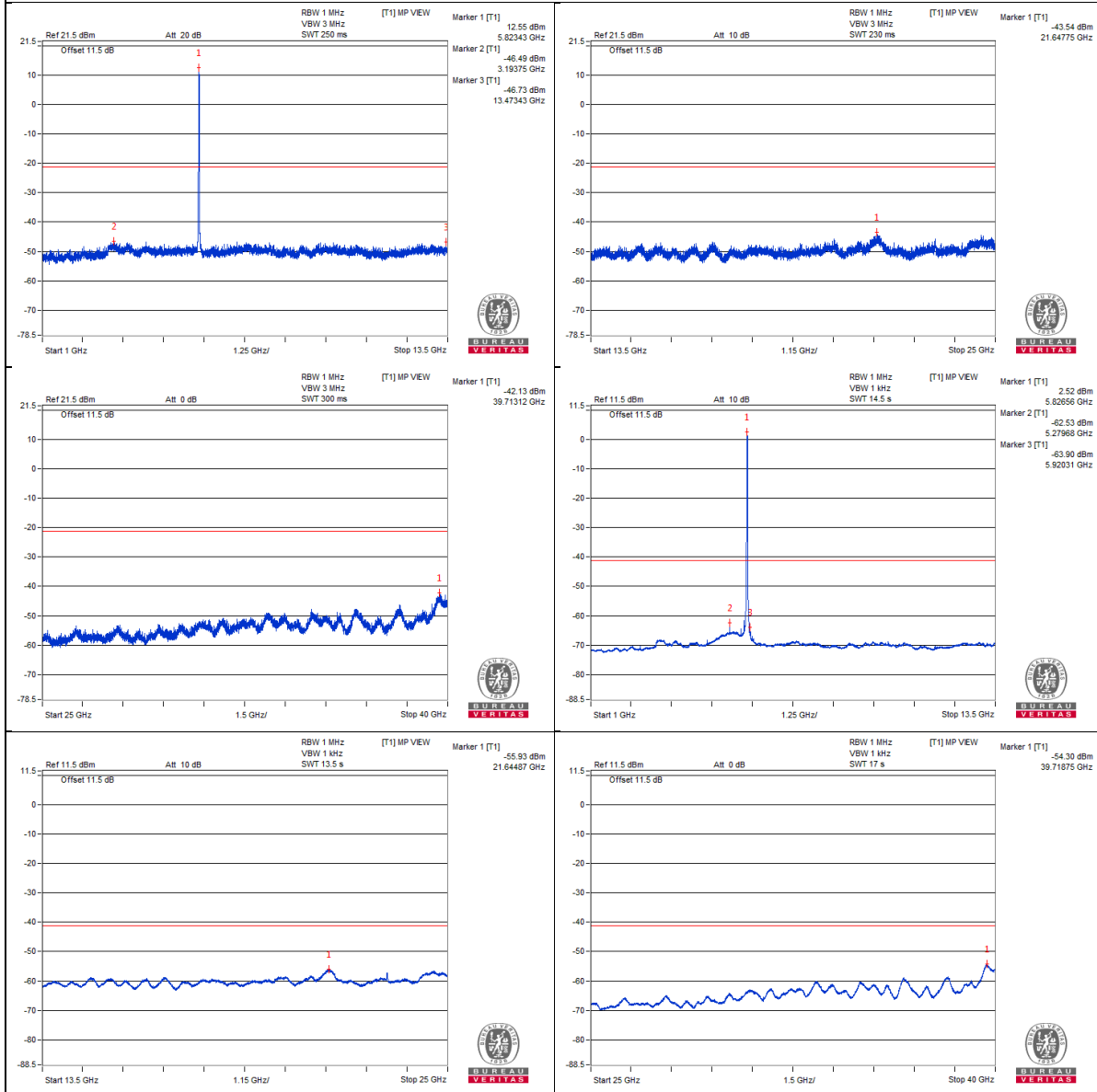
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3859.37 PK	57.73	74	-16.27	-49.66	-49.07	8.81	-37.53
2	3862.5 AV	36.82	54	-17.18	-70.21	-70.32	8.81	-58.44
3	7706.25 PK	58.04	74	-15.96	-48.84	-49.25	8.81	-37.22
4	7720.31 AV	37.6	54	-16.4	-69.58	-69.38	8.81	-57.66
5	11551.56 PK	56.11	74	-17.89	-50.93	-51.02	8.81	-39.15
6	11570.31 AV	37.1	54	-16.9	-70.75	-69.33	8.81	-58.16
7	17345.31 PK	56.68	68.2	-11.52	-50.38	-50.43	8.81	-38.58

Note :

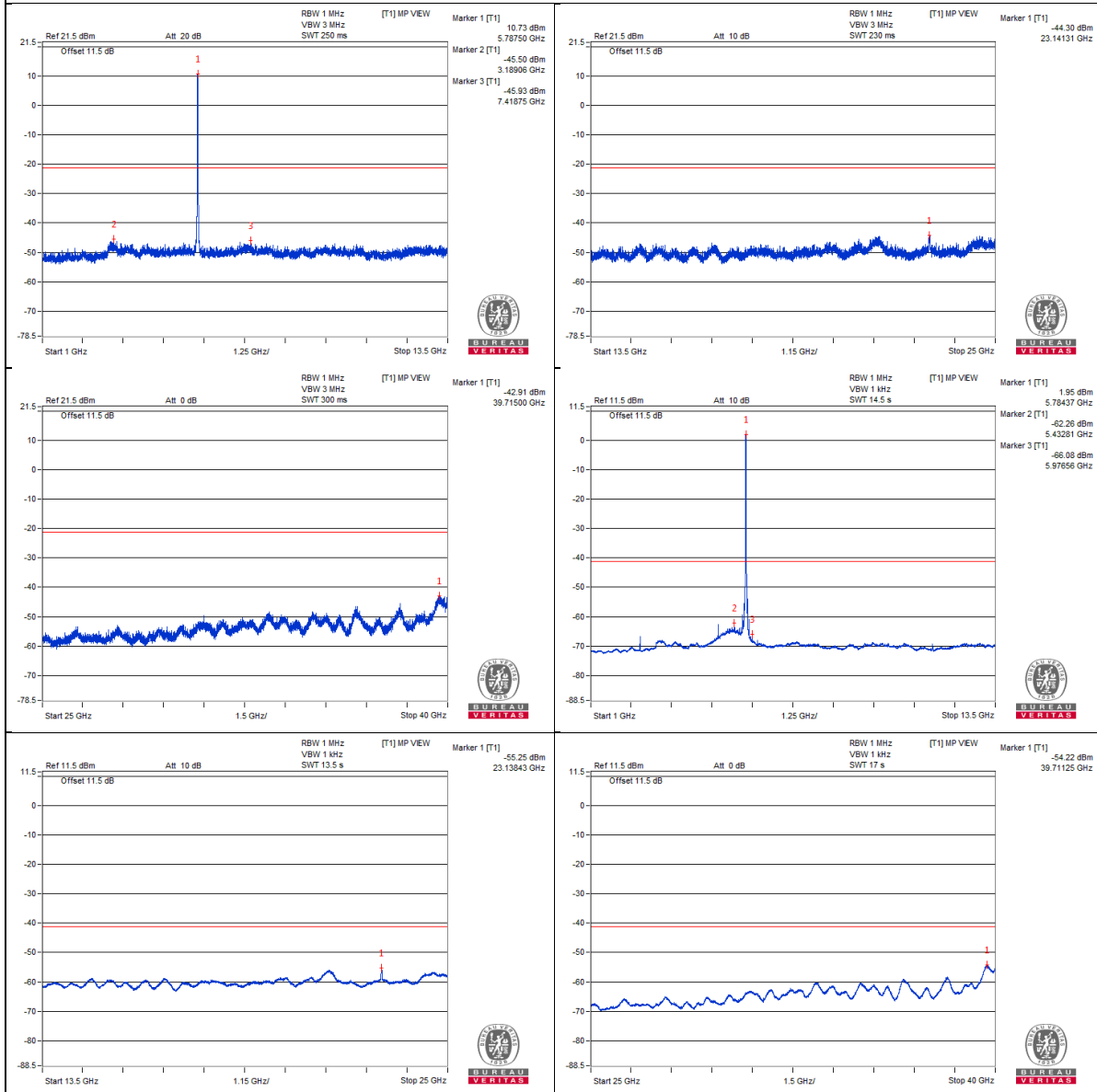
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0

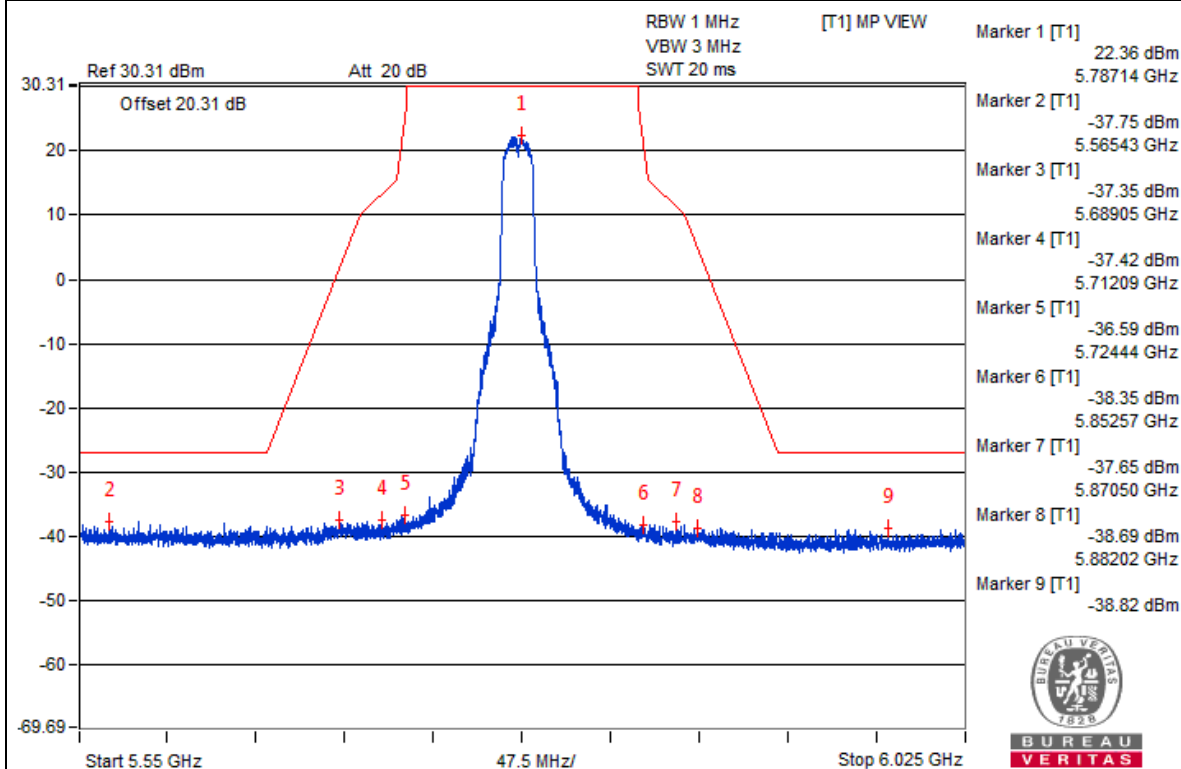


Chain 1

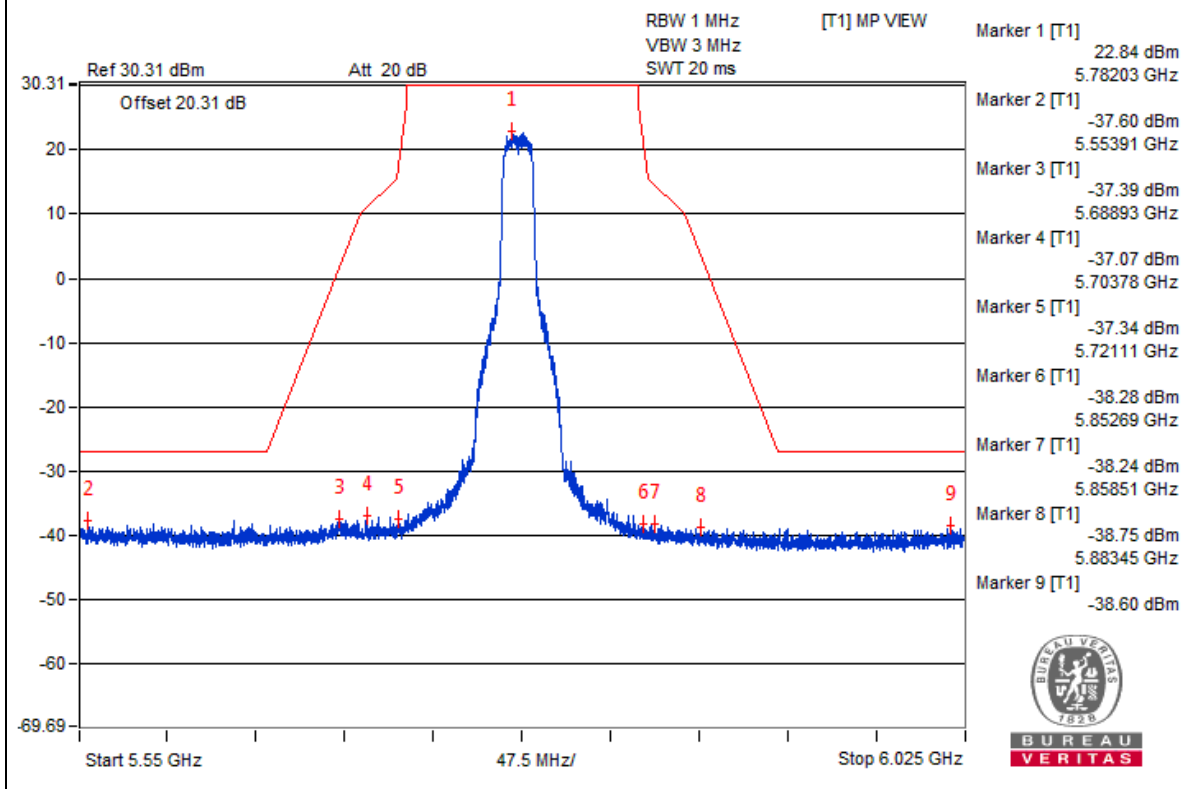


Bandedge table

Chain 0



Chain 1



802.11a - Channel 165

Conducted spurious emission table

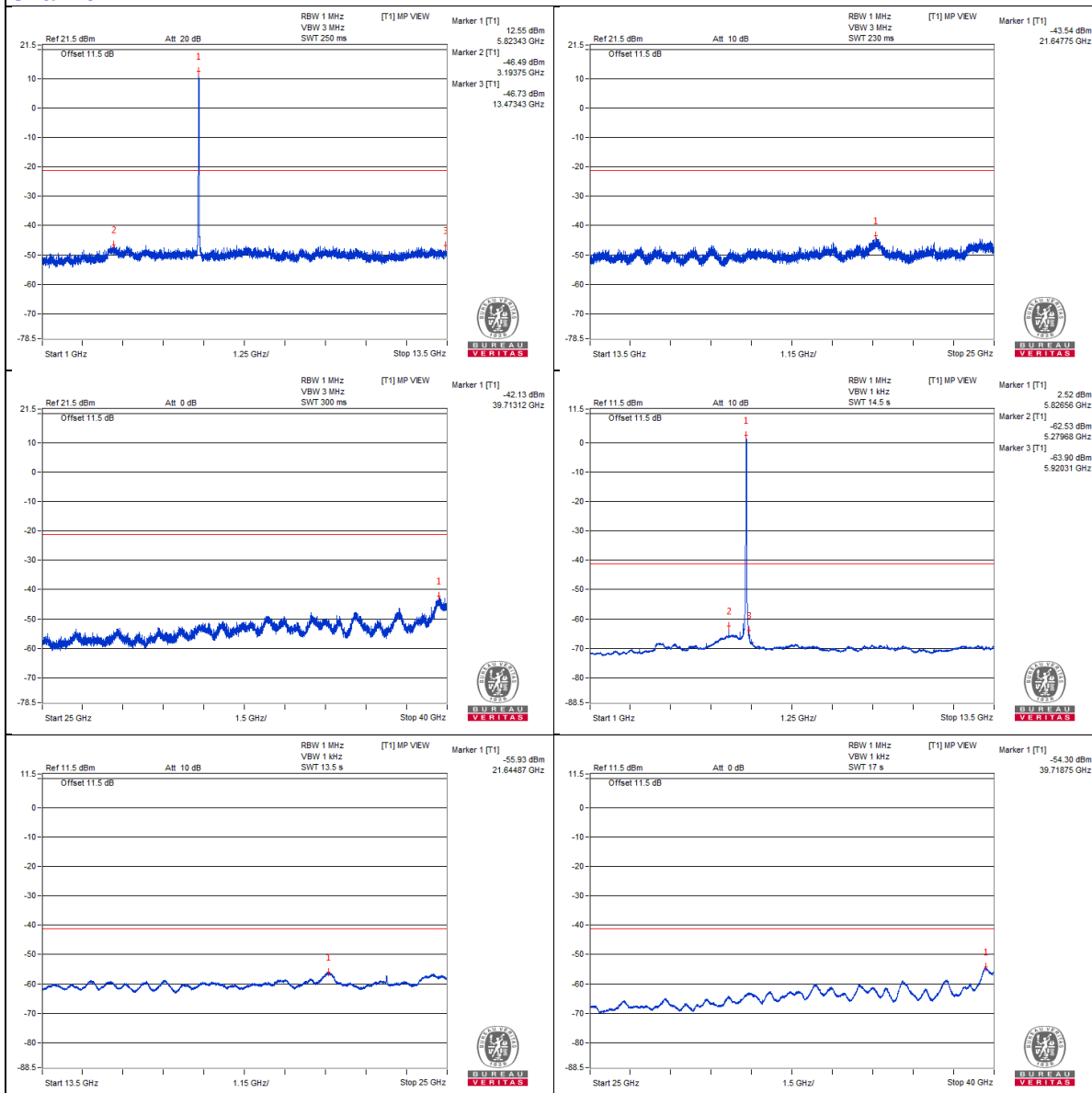
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3896.87 PK	57.14	74	-16.86	-50.06	-49.82	8.81	-38.12
2	3882.81 AV	36.79	54	-17.21	-70.16	-70.43	8.81	-58.47
3	7754.68 PK	58.08	68.2	-10.12	-48.33	-49.8	8.81	-37.18
4	11667.18 PK	56.4	74	-17.6	-50.99	-50.4	8.81	-38.86
5	11650 AV	37.42	54	-16.58	-70.57	-68.91	8.81	-57.84
6	17484.75 PK	58.17	68.2	-10.03	-47.95	-50.14	8.81	-37.09

Note :

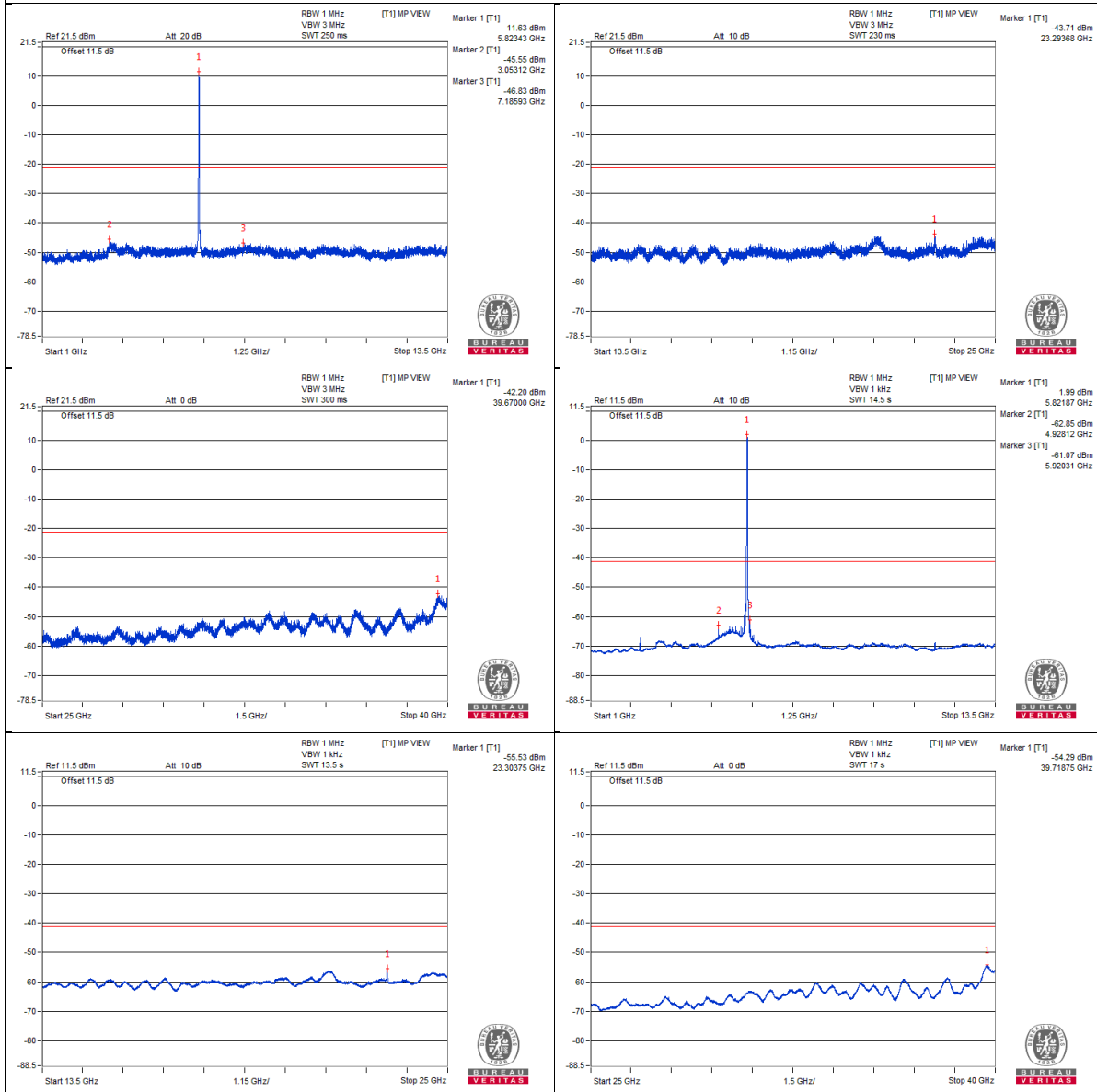
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0

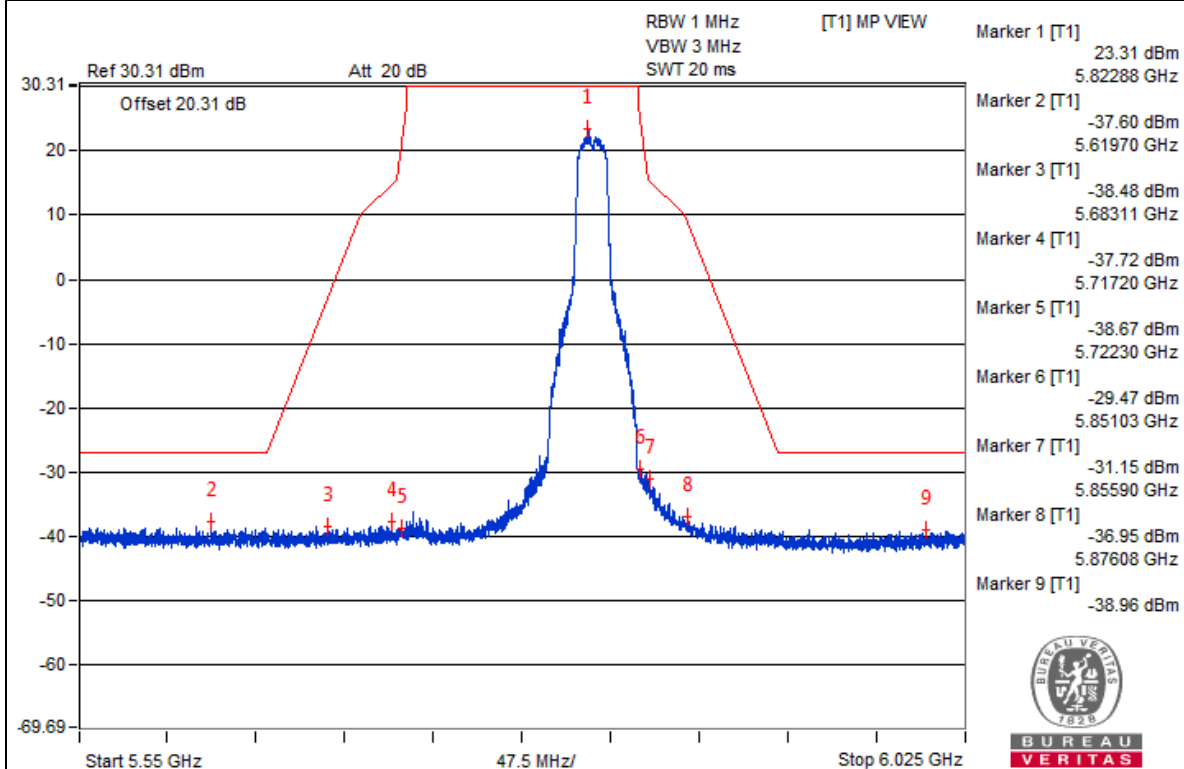


Chain 1

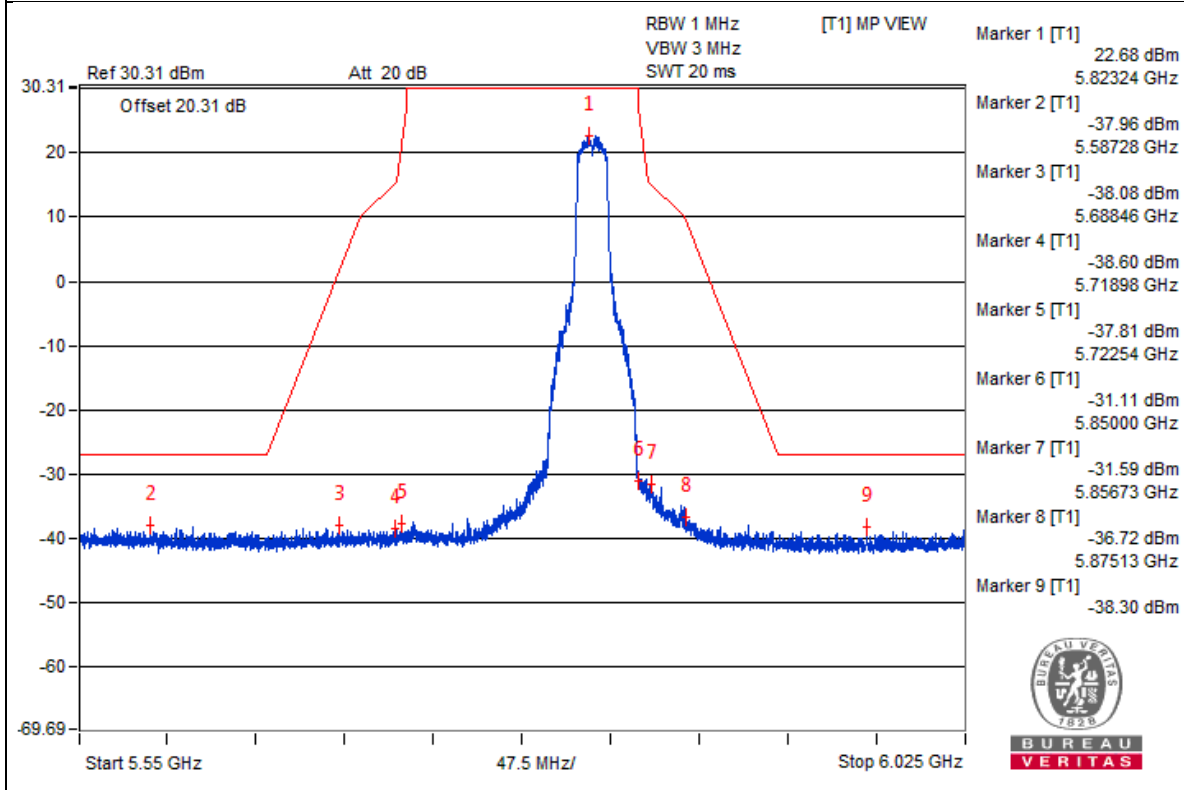


Bandedge table

Chain 0



Chain 1



802.11ac (VHT20) - Channel 36

Conducted spurious emission table

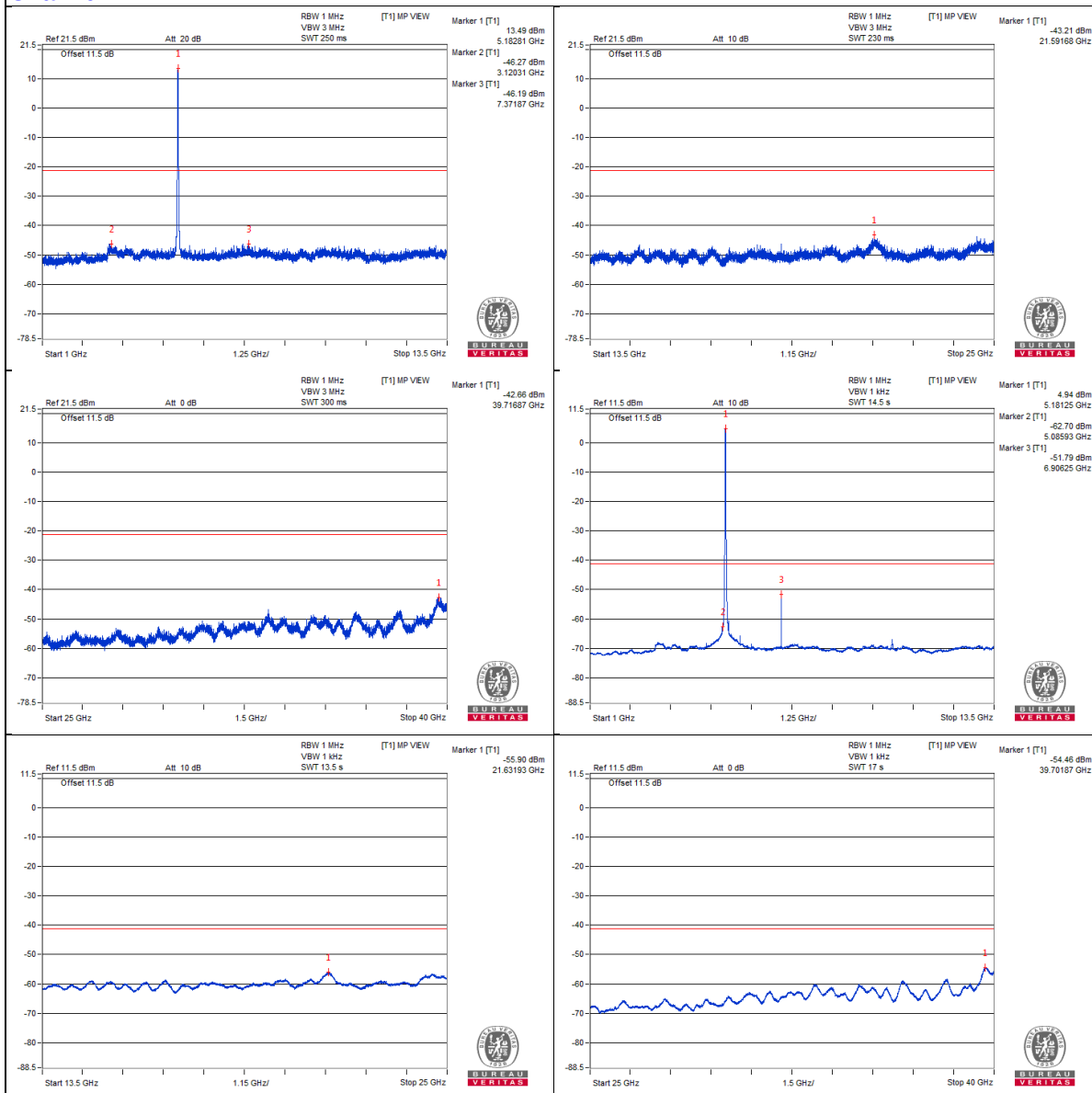
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3446.87 PK	57.73	68.2	-10.47	-48.47	-49.04	8.21	-37.53
2	6906.25 PK	59.55	68.2	-8.65	-46.8	-47.07	8.21	-35.71
3	10357.81 PK	57.63	68.2	-10.57	-48.29	-49.5	8.21	-37.63
4	15526.87 PK	57.24	74	-16.76	-48.63	-49.96	8.21	-38.02
5	15521.12 AV	46.47	54	-7.53	-60.18	-59.85	8.21	-48.79

Note :

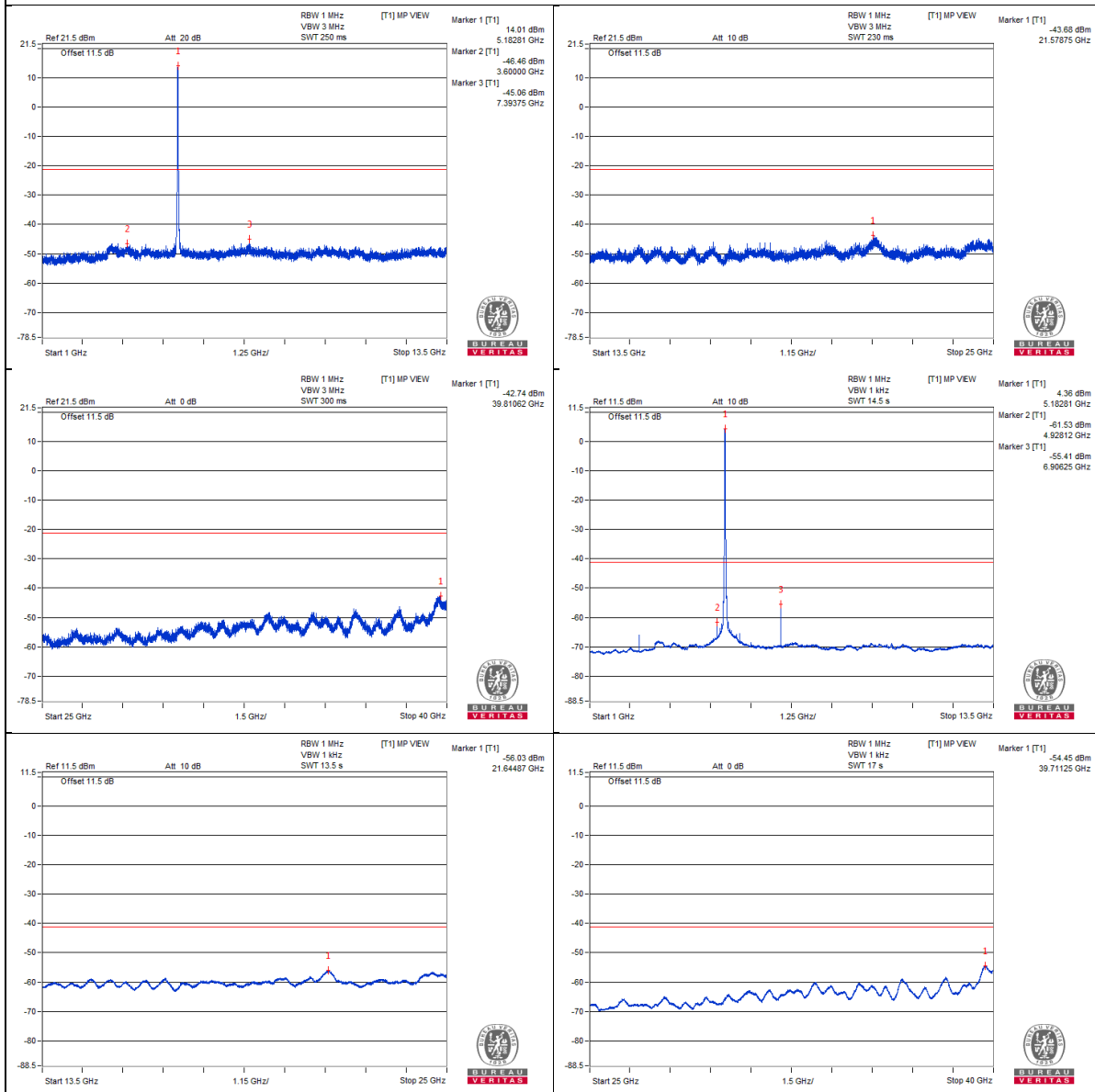
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

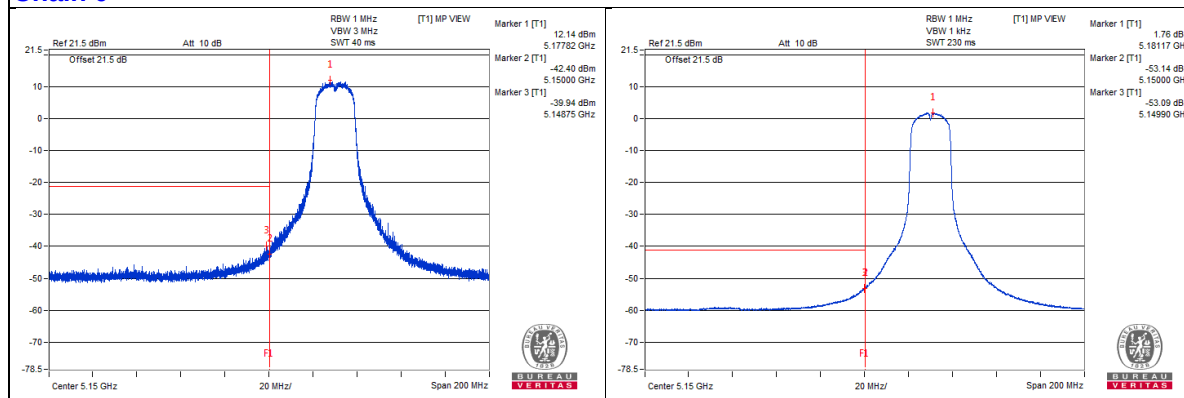
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5149.8 PK	66.83	74	-7.17	-41.85	-38.2	8.21	-28.43
2	5149.9 AV	53.45	54	-0.55	-53.09	-52.97	8.21	-41.81

Note :

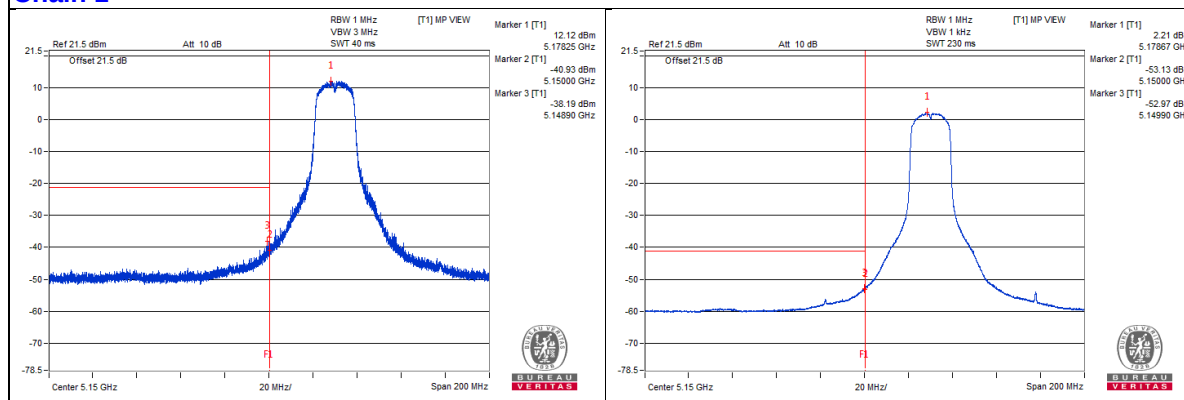
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ac (VHT20) - Channel 40

Conducted spurious emission table

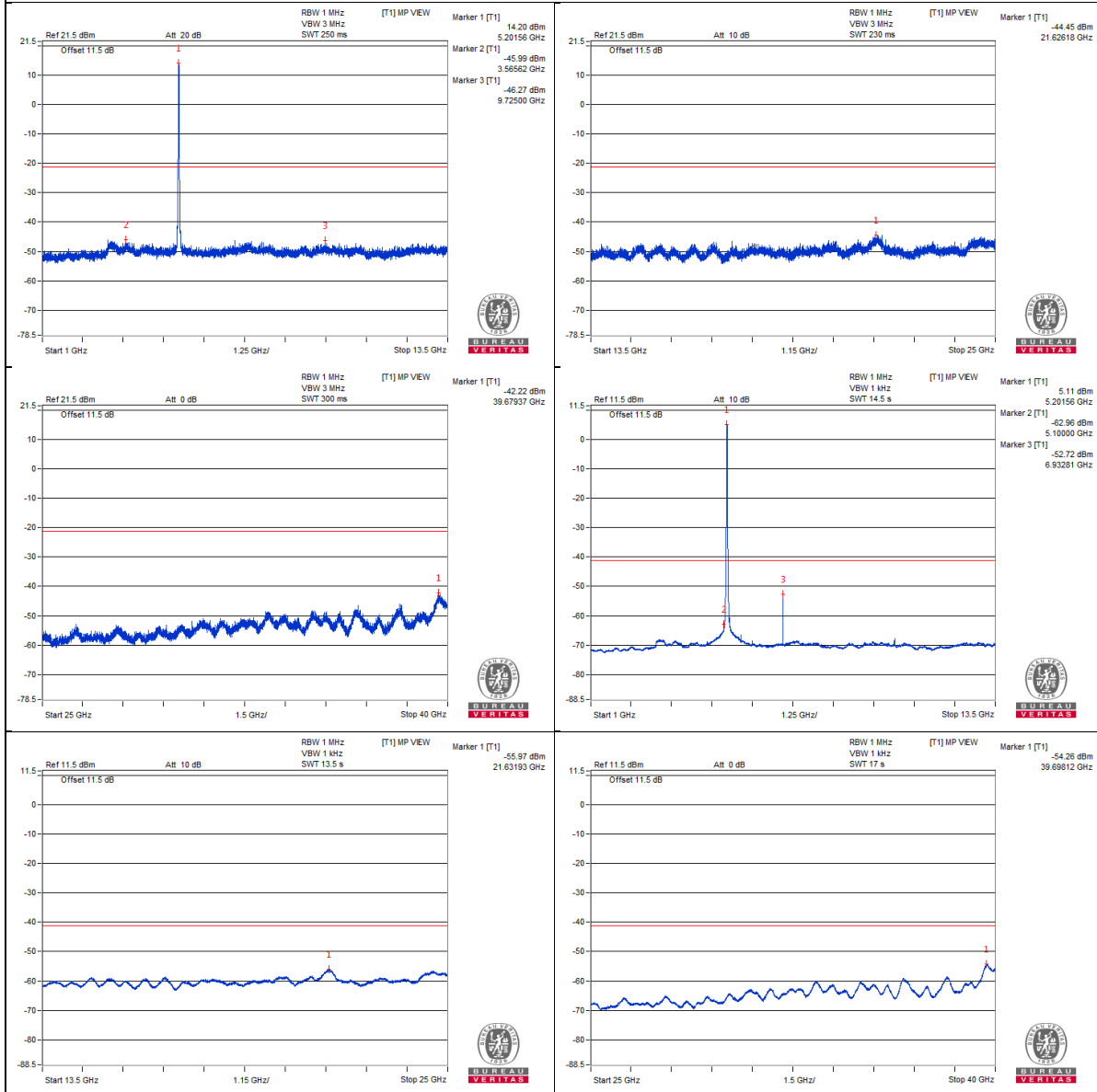
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3465.62 PK	57.99	68.2	-10.21	-47.24	-50.25	8.21	-37.27
2	6932.81 PK	59.24	68.2	-8.96	-46.4	-48.29	8.21	-36.02
3	10406.25 PK	57.46	68.2	-10.74	-47.9	-50.52	8.21	-37.8
4	15590.12 PK	56.8	74	-17.2	-49.15	-50.28	8.21	-38.46
5	15601.62 AV	45.5	54	-8.5	-60.92	-61.05	8.21	-49.76

Note :

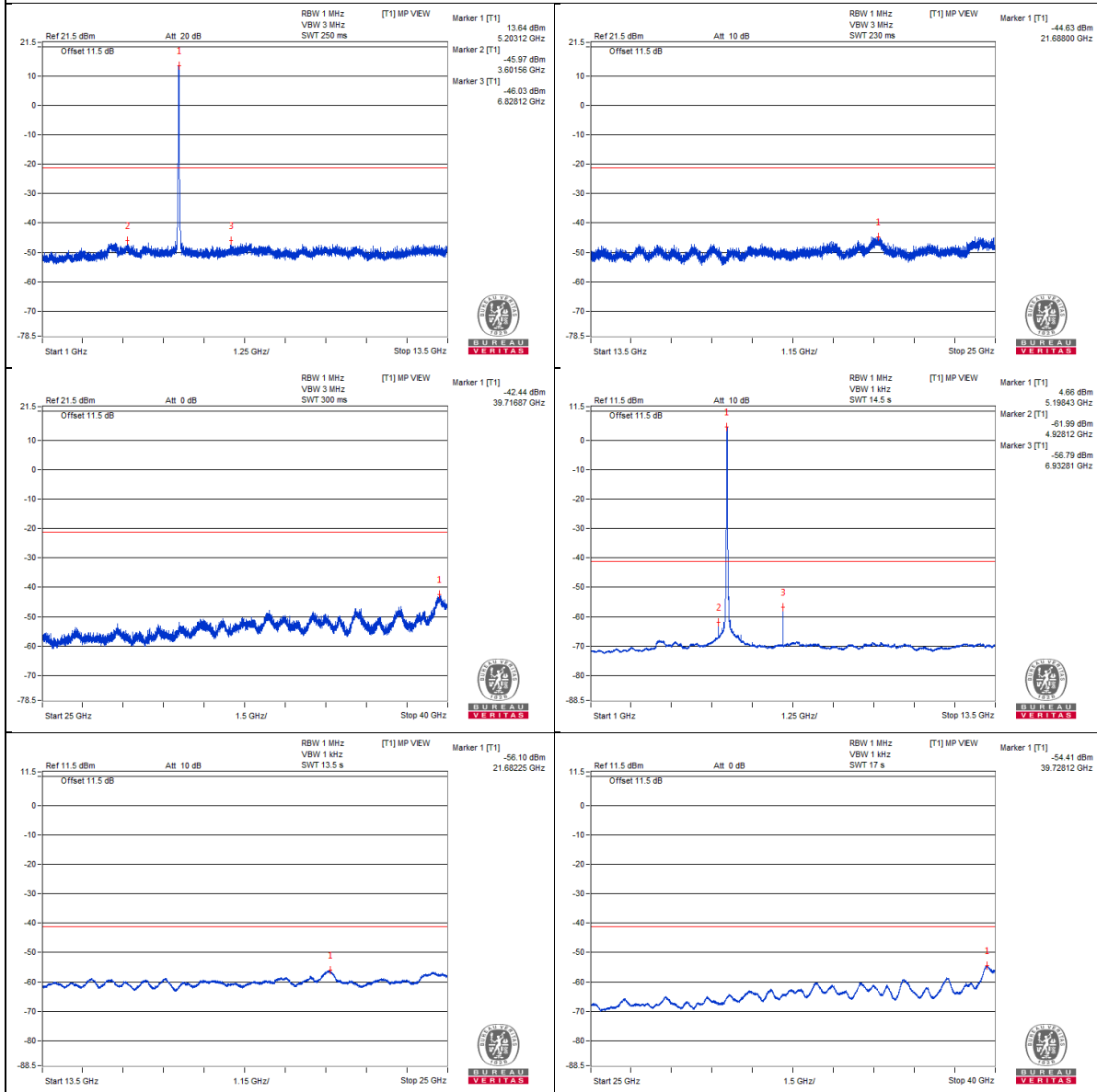
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

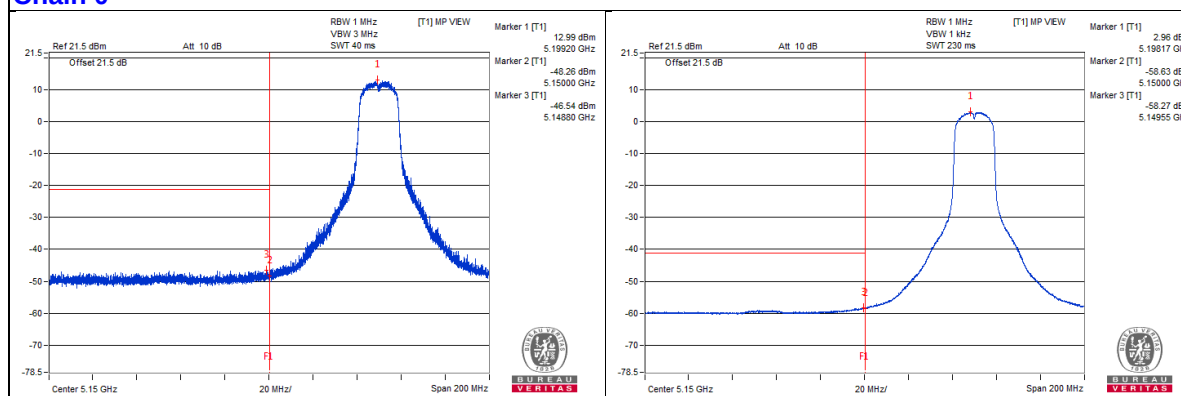
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5147.97 PK	59.78	74	-14.22	-47.51	-46.01	8.21	-35.48
2	5149.5 AV	48.32	54	-5.68	-58.28	-58.05	8.21	-46.94

Note :

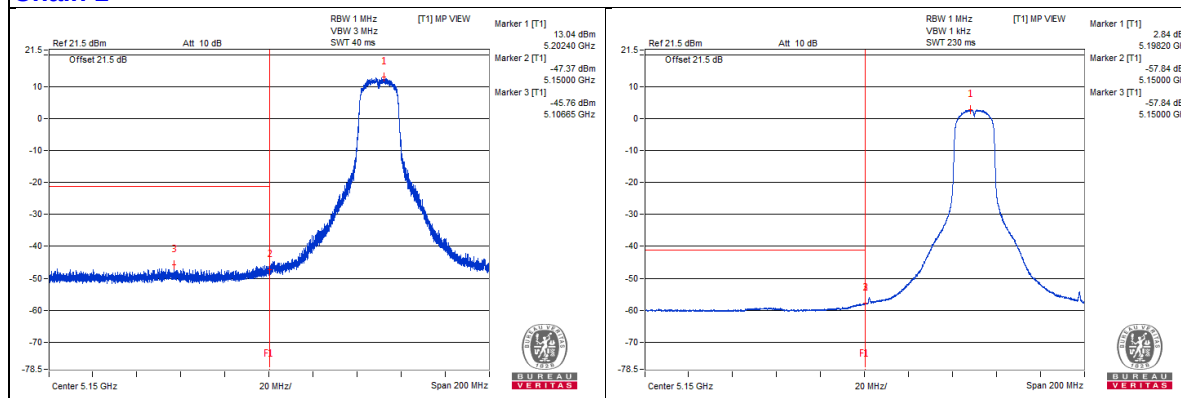
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ac (VHT20) - Channel 48

Conducted spurious emission table

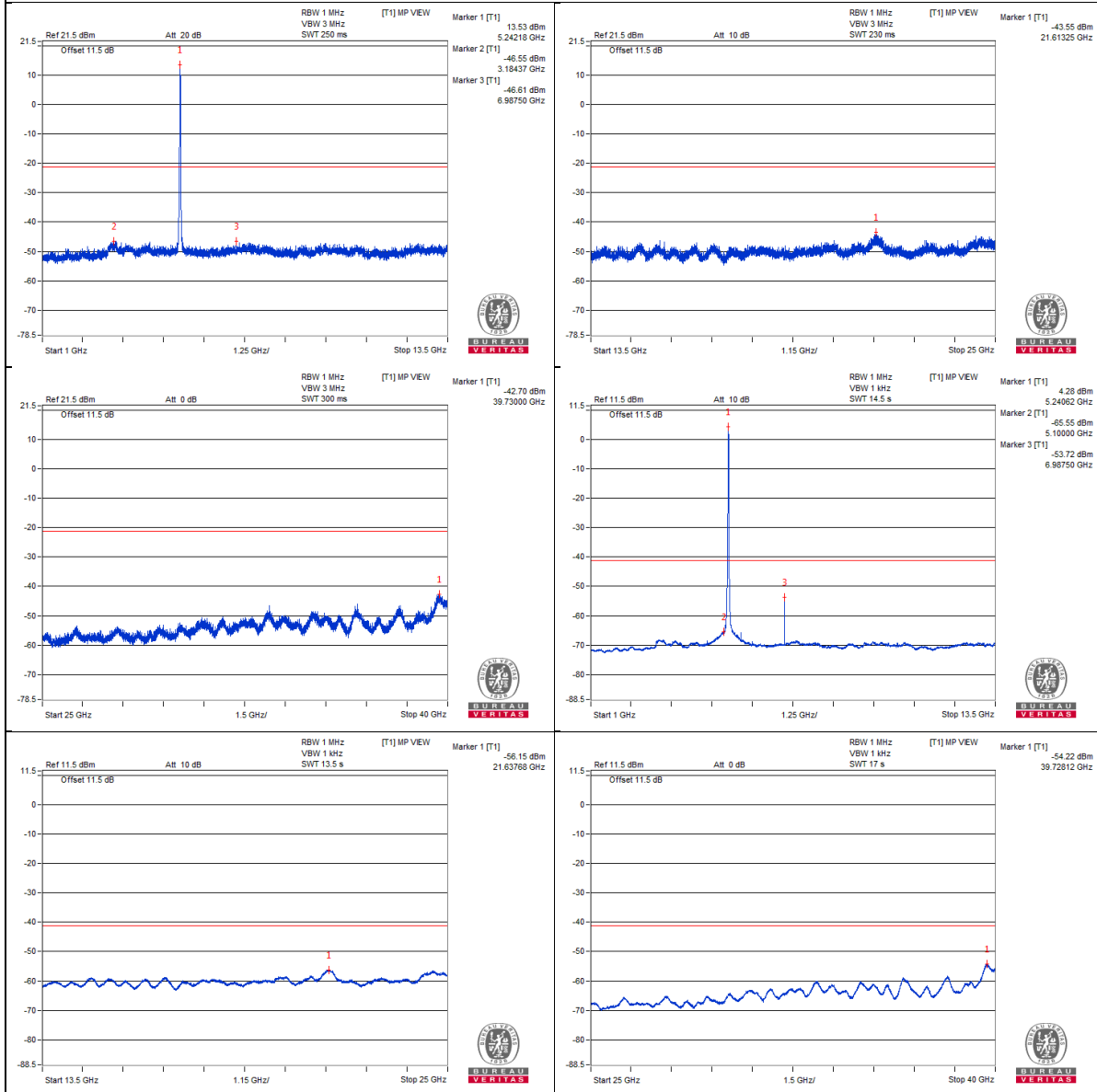
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3501.56 PK	57.82	74	-16.18	-48.63	-48.69	8.21	-37.44
2	3501.56 AV	37	54	-17	-69.59	-69.38	8.21	-58.26
3	6985.93 PK	58.87	68.2	-9.33	-47.22	-48.03	8.21	-36.39
4	10487.5 PK	56.88	68.2	-11.32	-48.7	-50.74	8.21	-38.38
5	15726.68 PK	55.43	74	-18.57	-51.6	-50.56	8.21	-39.83
6	15726.68 AV	45.42	54	-8.58	-60.88	-61.25	8.21	-49.84

Note :

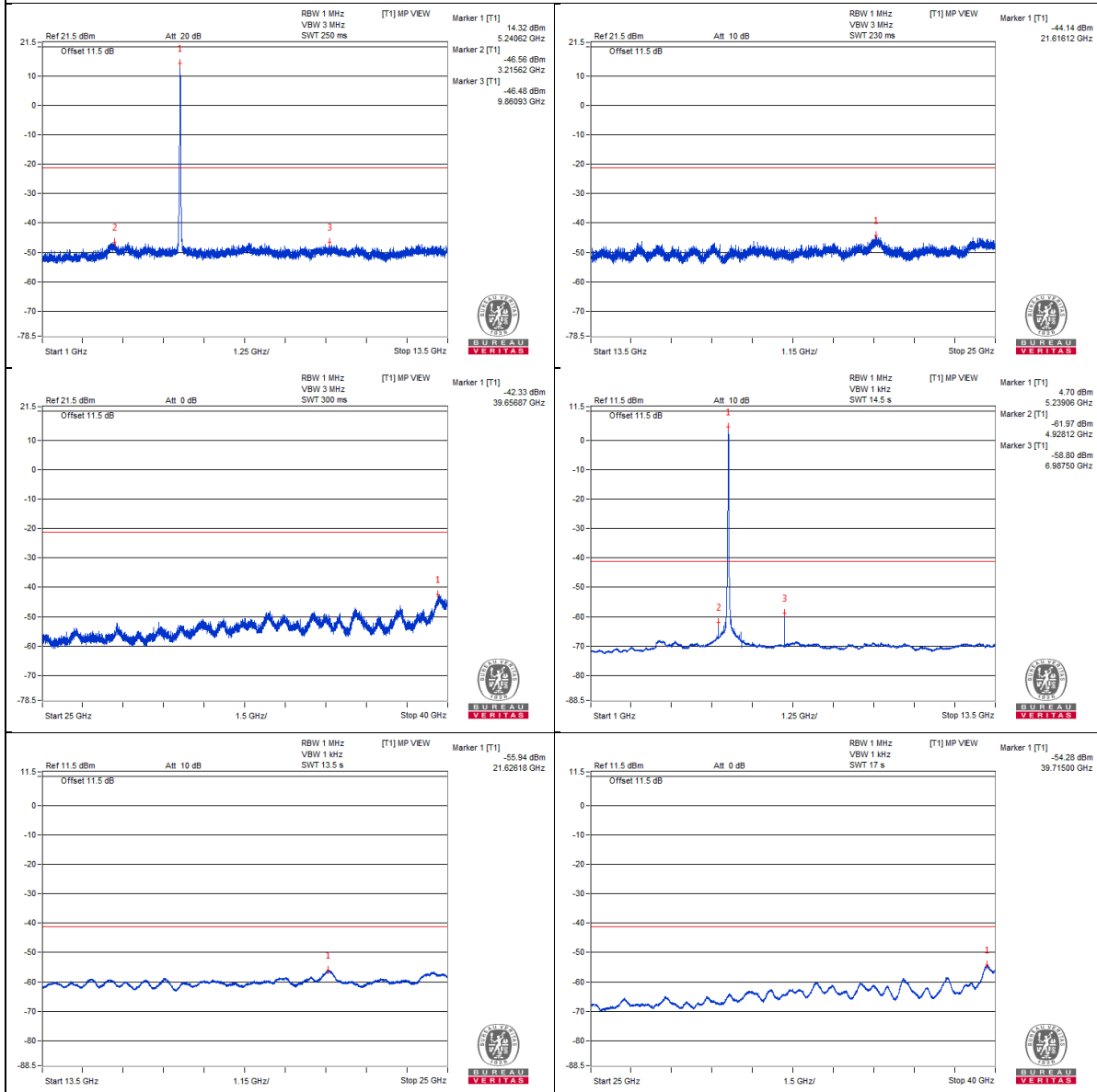
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

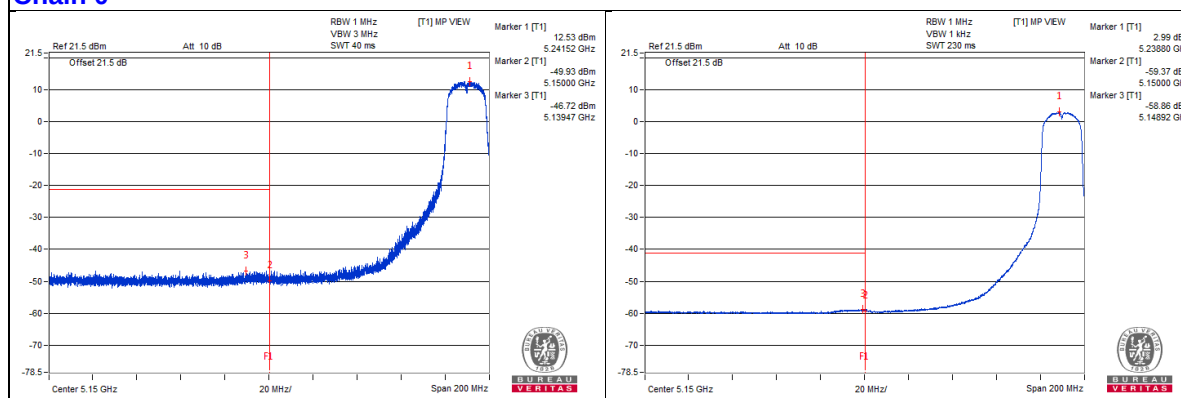
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5147.82 PK	59.2	74	-14.8	-48.41	-46.38	8.21	-36.06
2	5144.02 AV	47.41	54	-6.59	-58.95	-59.19	8.21	-47.85

Note :

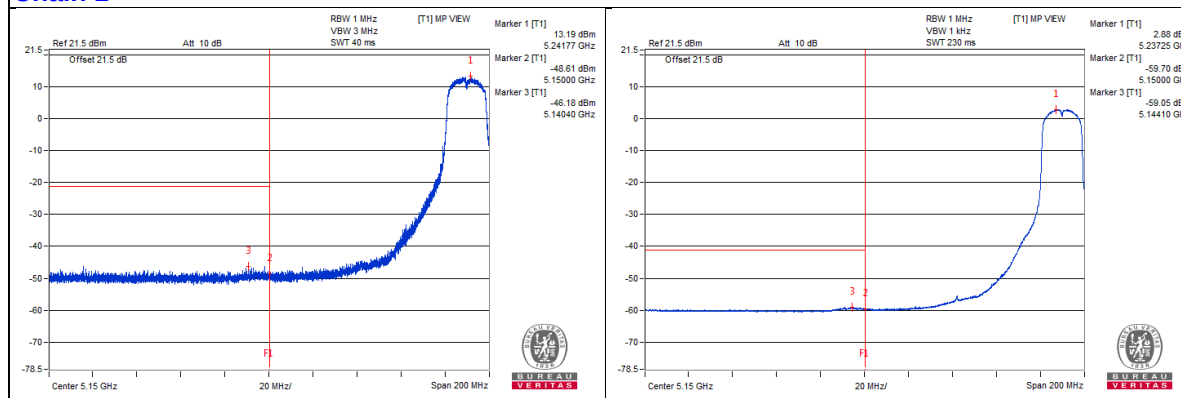
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ac (VHT20) - Channel 52

Conducted spurious emission table

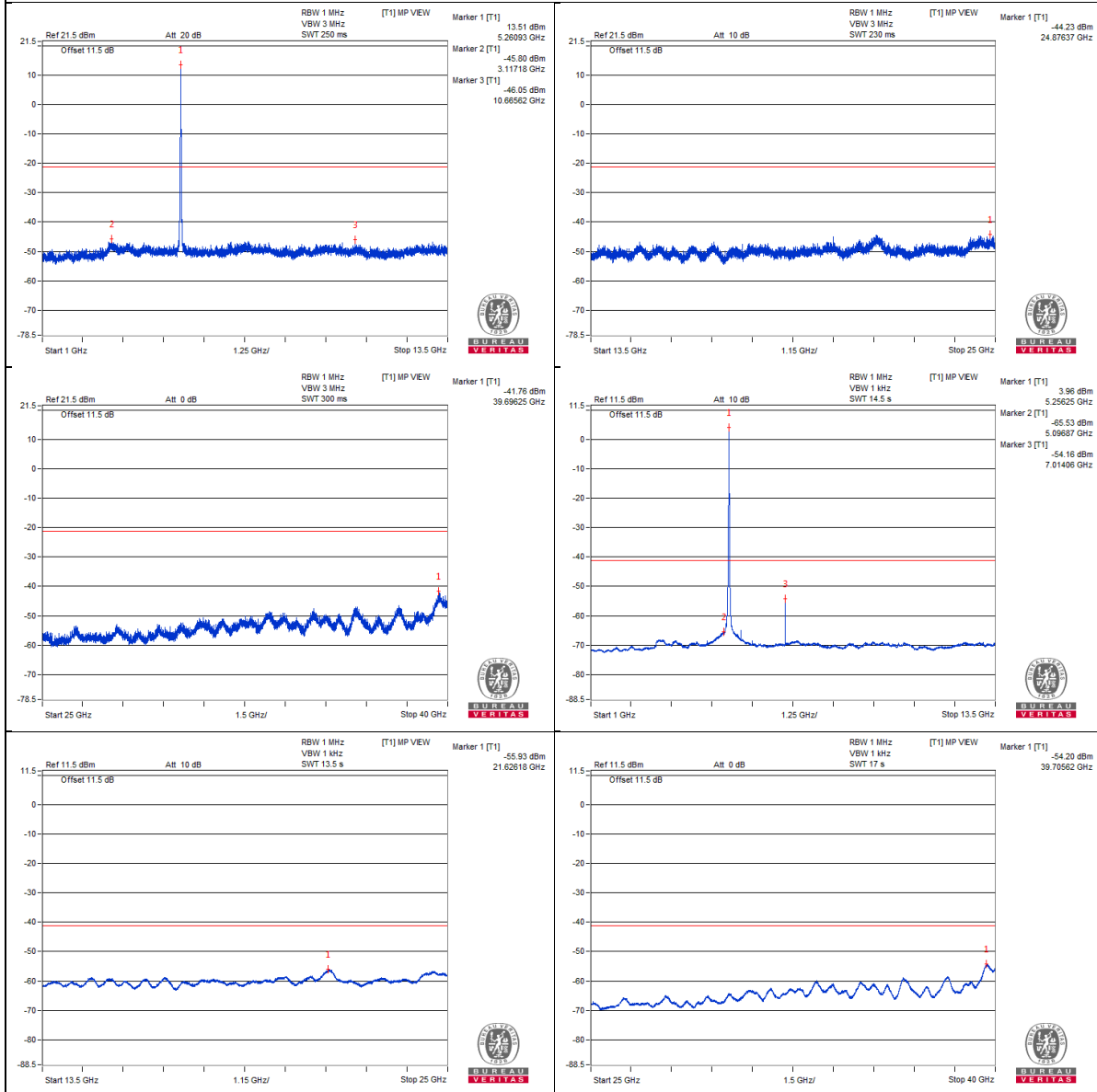
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3525 PK	57.68	74	-16.32	-48.94	-48.66	8.21	-37.58
2	3515.62 AV	37.27	54	-16.73	-69.13	-69.3	8.21	-57.99
3	7014.06 PK	58.54	68.2	-9.66	-47.38	-48.58	8.21	-36.72
4	10539.06 PK	57.22	68.2	-10.98	-49.02	-49.52	8.21	-38.04
5	15782.75 PK	57.13	74	-16.87	-49.21	-49.5	8.21	-38.13
6	15798.56 AV	46.26	54	-7.74	-60.36	-60.08	8.21	-49

Note :

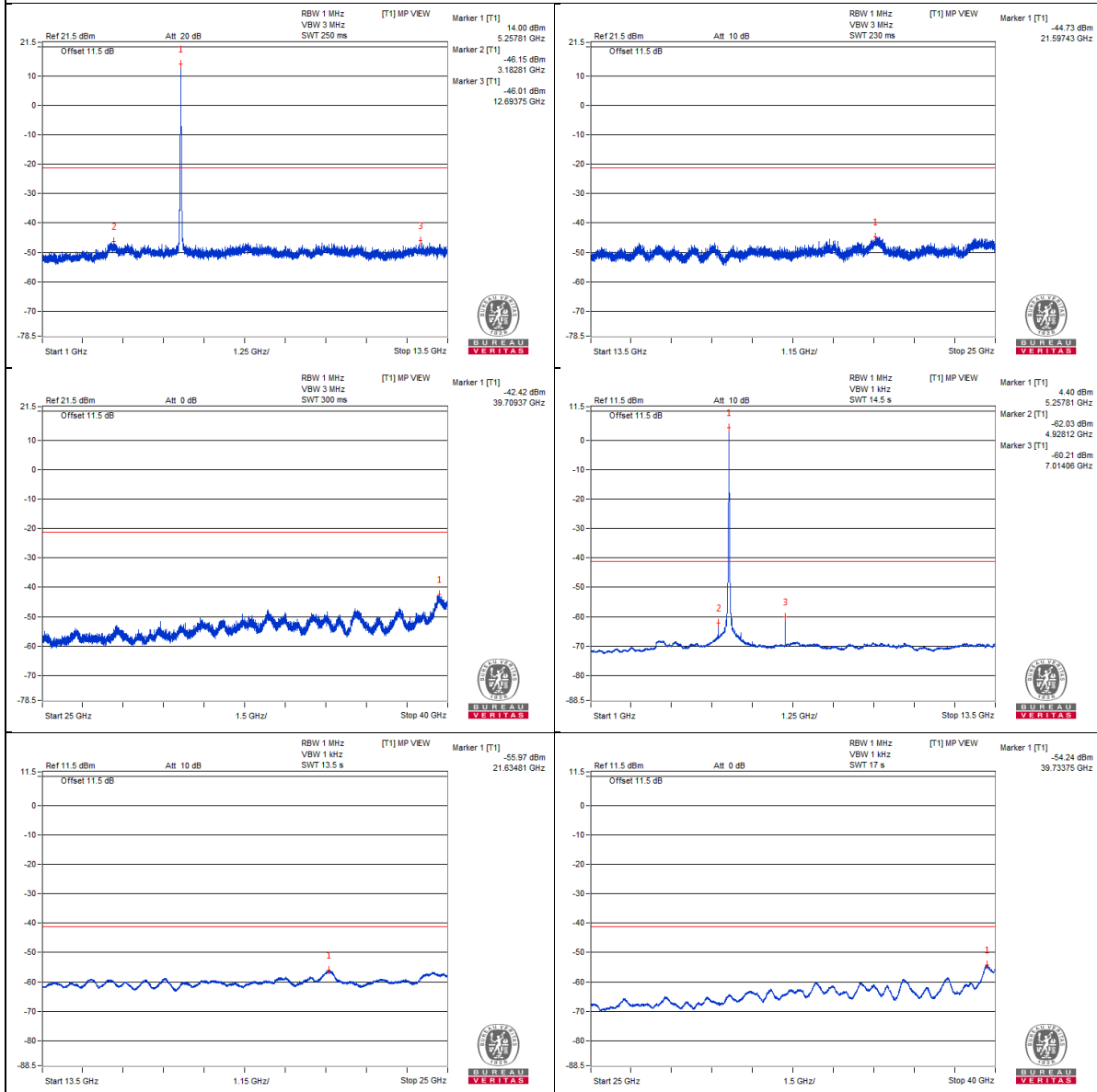
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

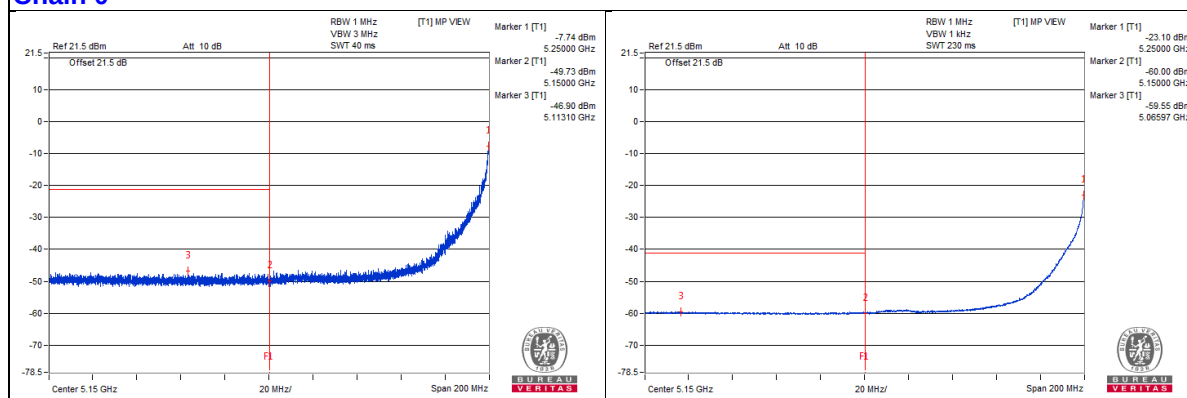
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5367.57 PK	59.07	74	-14.93	-48.28	-46.69	8.21	-36.19
2	5356.15 AV	47.31	54	-6.69	-59.49	-58.87	8.21	-47.95

Note :

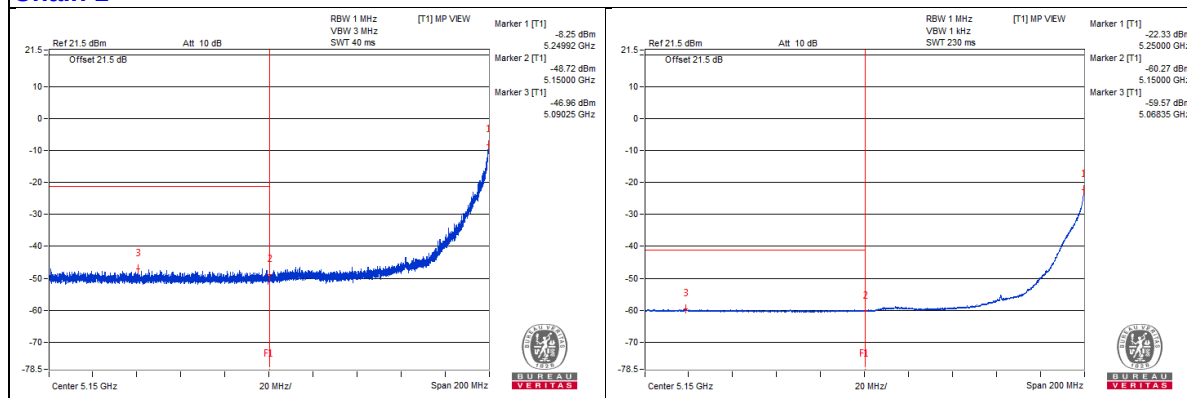
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ac (VHT20) - Channel 60

Conducted spurious emission table

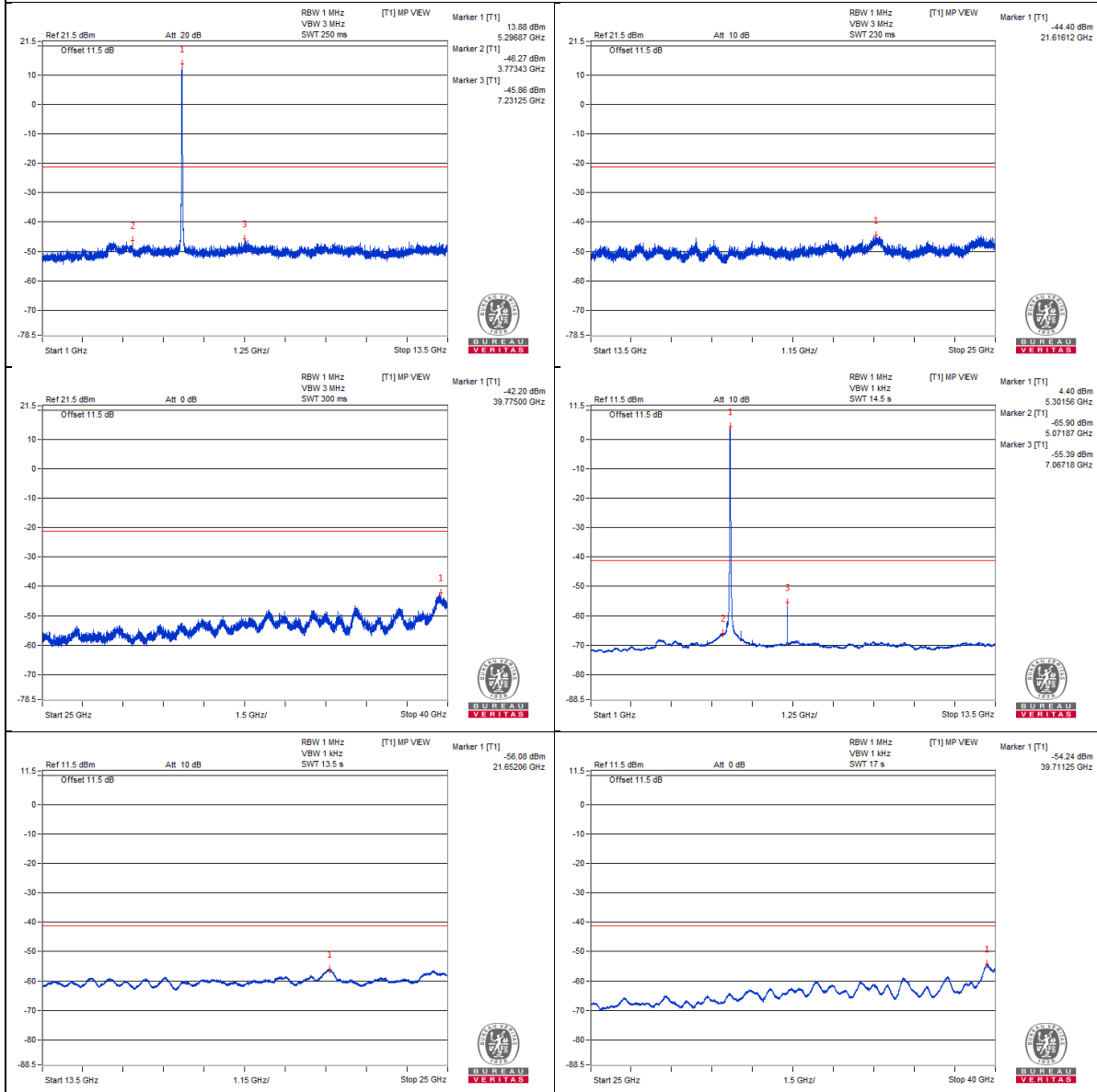
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3542.18 PK	57.84	74	-16.16	-48.25	-49.07	8.21	-37.42
2	3551.56 AV	37.53	54	-16.47	-68.92	-68.99	8.21	-57.73
3	7067.18 PK	58.64	68.2	-9.56	-46.93	-49	8.21	-36.62
4	10589.06 PK	57.72	68.2	-10.48	-48.1	-49.55	8.21	-37.54
5	10600 AV	36.92	54	-17.08	-69.72	-69.41	8.21	-58.34
6	15896.31 PK	57.04	74	-16.96	-48.8	-50.2	8.21	-38.22
7	15883.37 AV	46.21	54	-7.79	-60.33	-60.21	8.21	-49.05

Note :

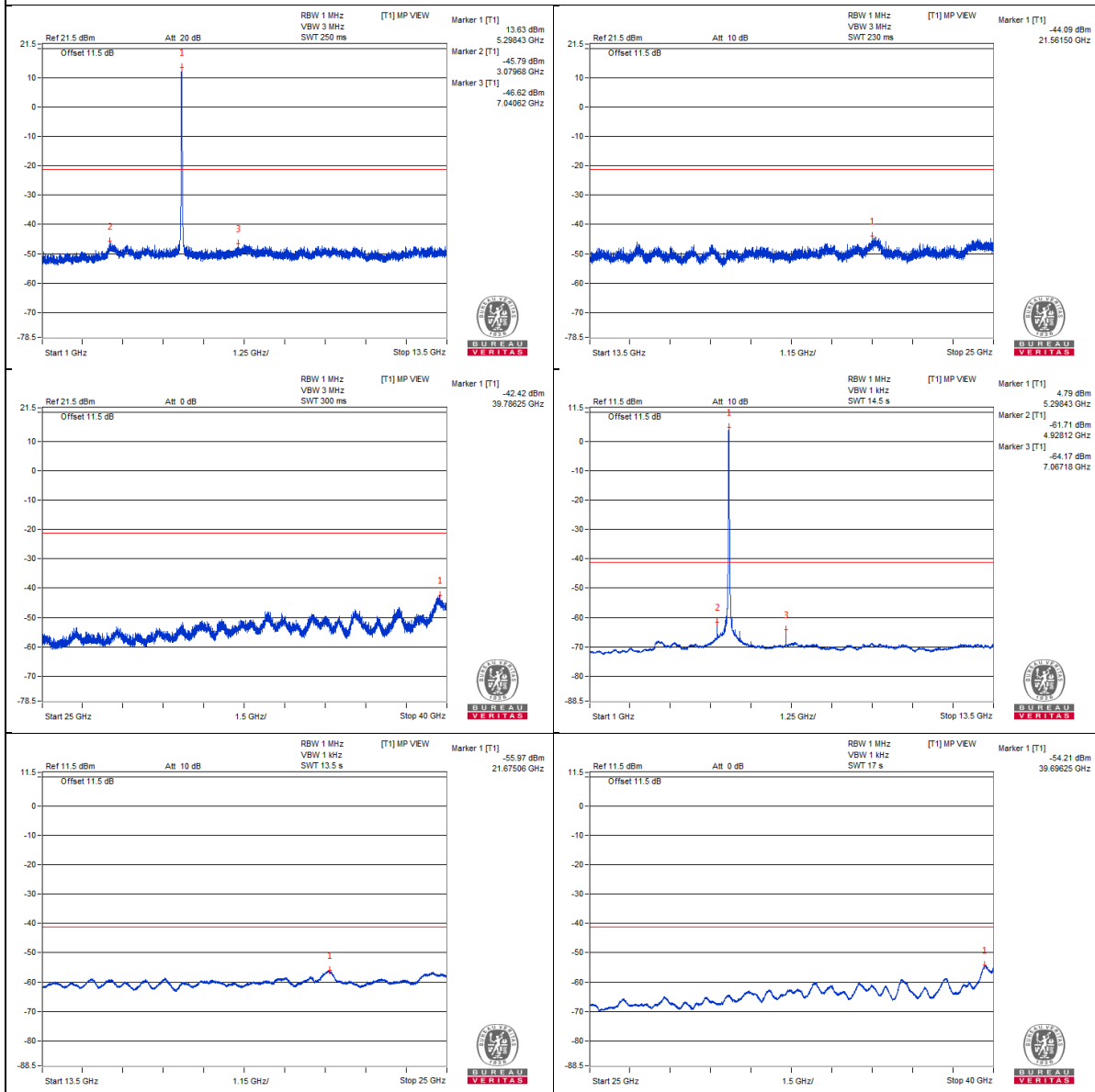
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

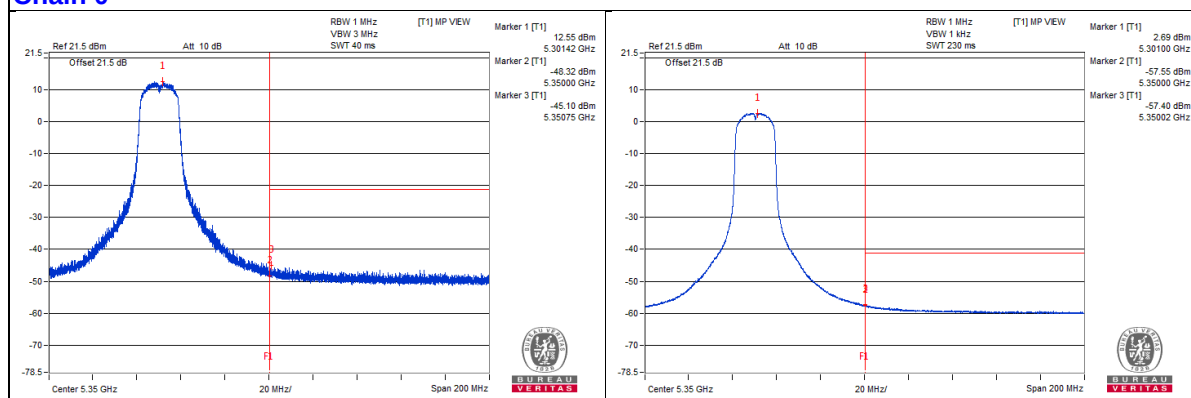
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5350.6 PK	60.81	74	-13.19	-46.97	-44.67	8.21	-34.45
2	5350.02 AV	49.44	54	-4.56	-57.4	-56.71	8.21	-45.82

Note :

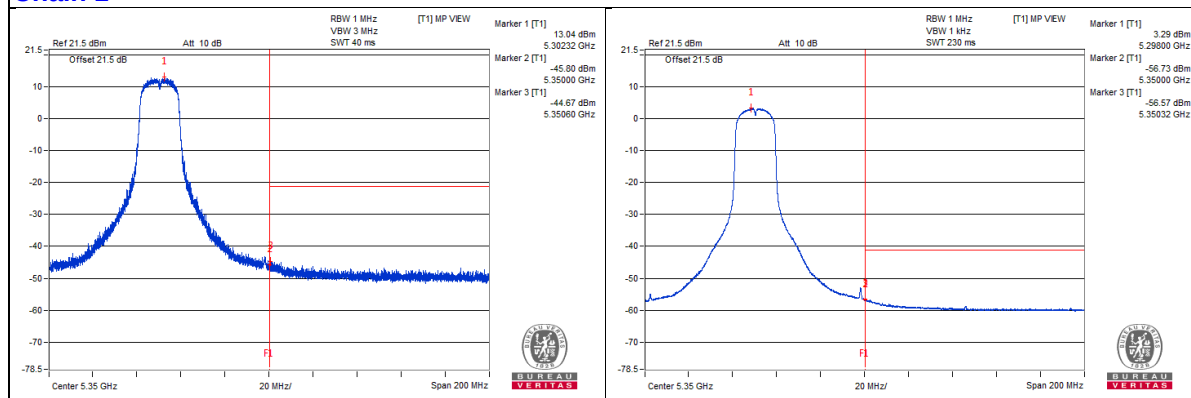
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ac (VHT20) - Channel 64

Conducted spurious emission table

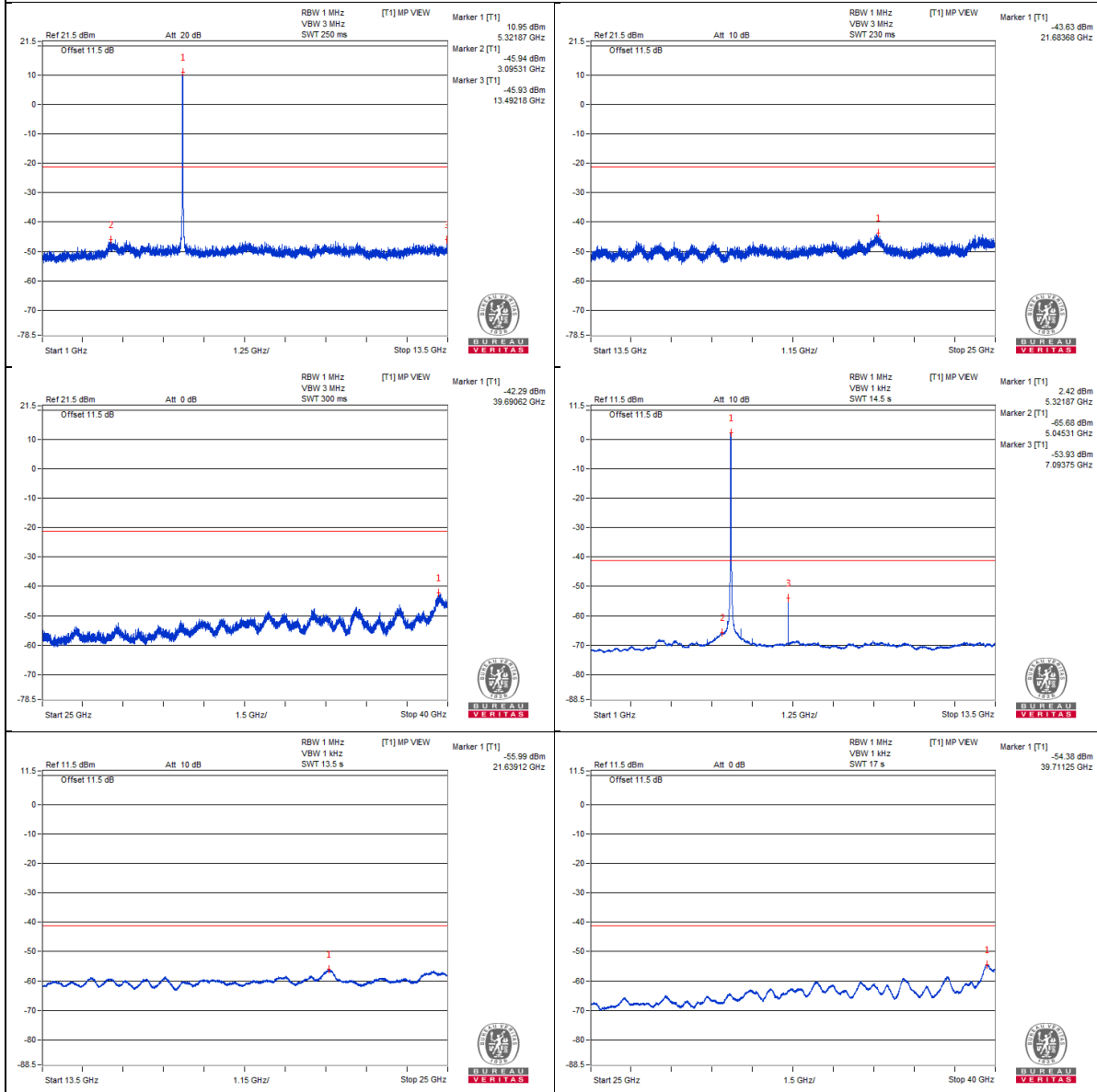
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3553.12 PK	58.8	74	-15.2	-47.07	-48.39	8.21	-36.46
2	3554.68 AV	37.55	54	-16.45	-69.13	-68.73	8.21	-57.71
3	7093.75 PK	58.54	68.2	-9.66	-46.96	-49.22	8.21	-36.72
4	10620.31 PK	58.36	74	-15.64	-48.99	-47.4	8.21	-36.9
5	10640.62 AV	36.93	54	-17.07	-69.69	-69.42	8.21	-58.33
6	15952.37 PK	56.77	74	-17.23	-49.37	-50.09	8.21	-38.49
7	15942.31 AV	45.64	54	-8.36	-60.81	-60.87	8.21	-49.62

Note :

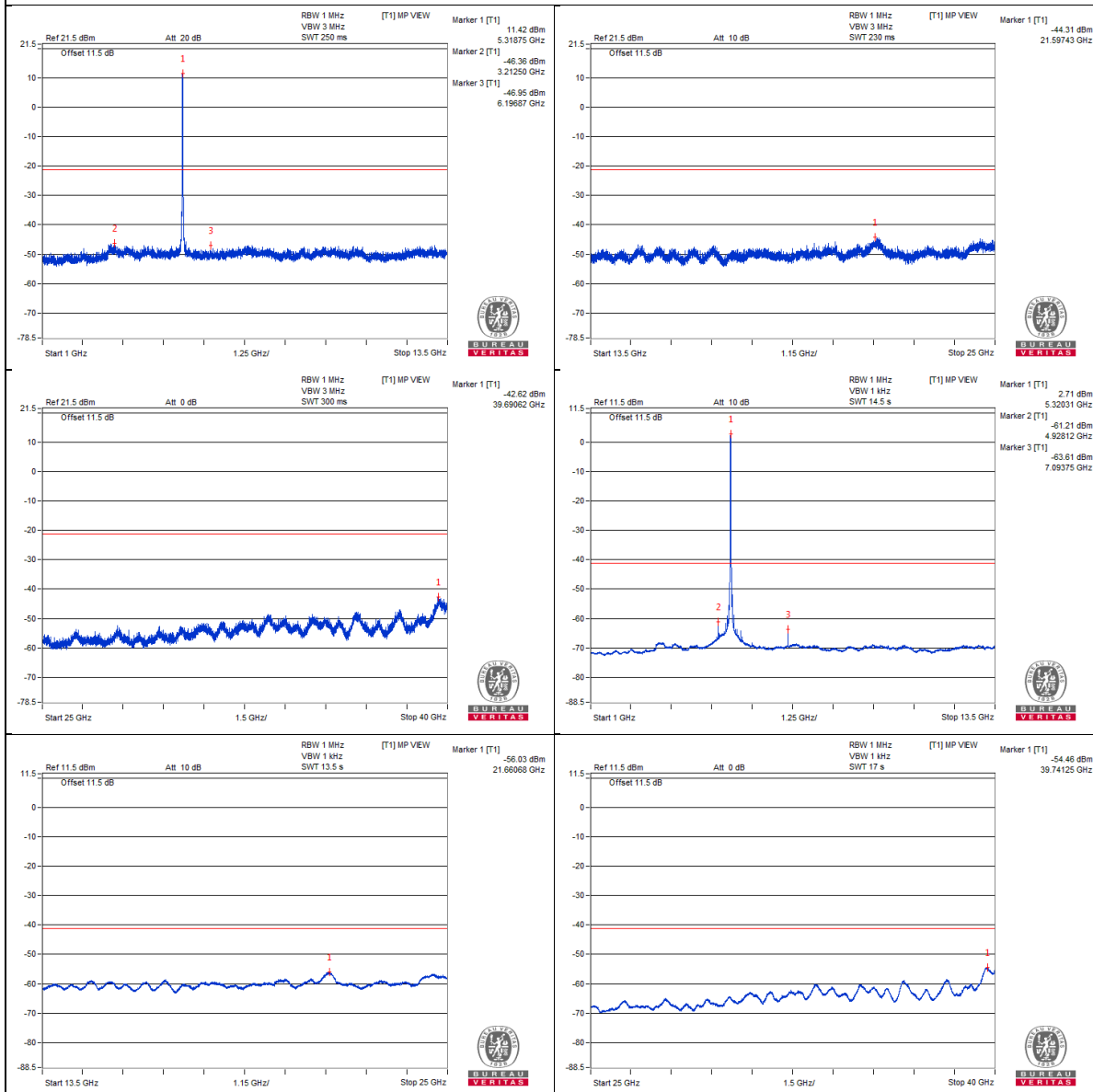
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

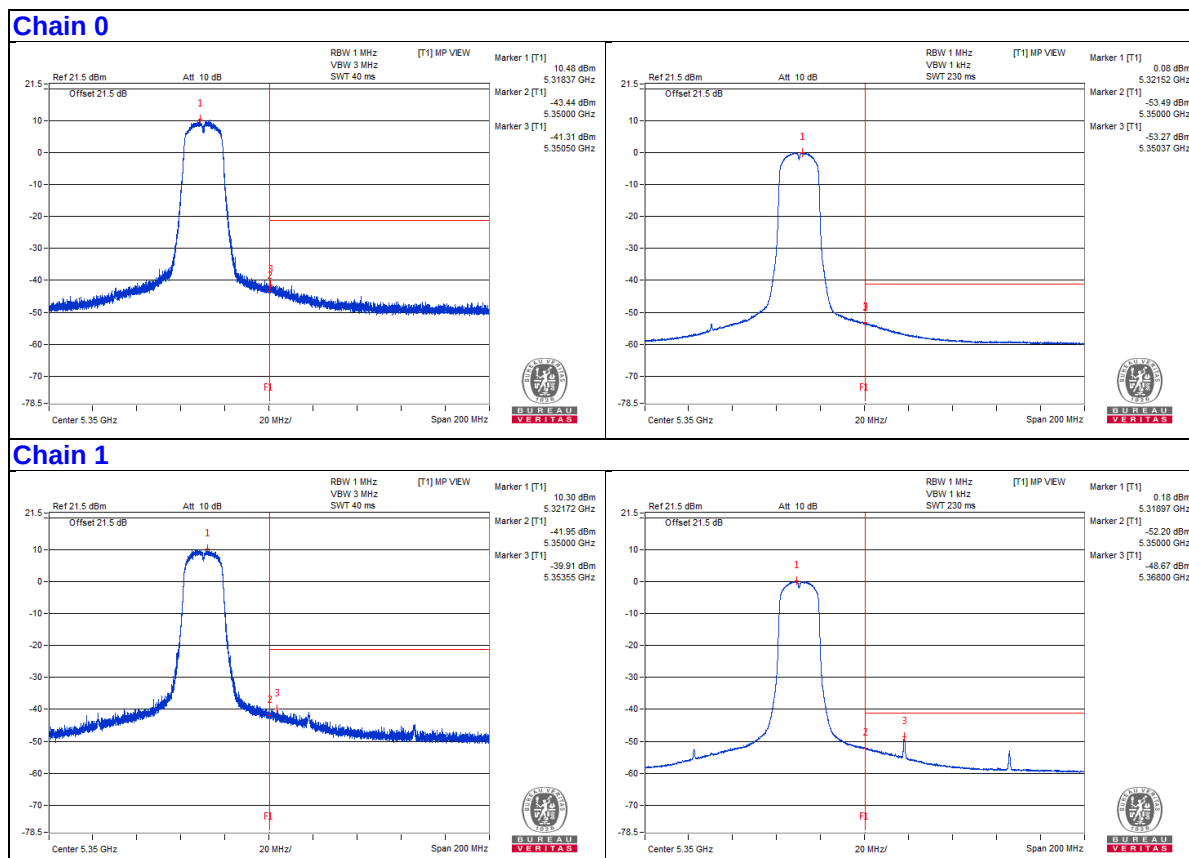
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5353.87 PK	65.34	74	-8.66	-42	-40.43	8.21	-29.92
2	5368 AV	55.38	54	* 1.38	-57.13	-48.67	8.21	-39.88

Note :

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)



802.11ac (VHT20) - Channel 100

Conducted spurious emission table

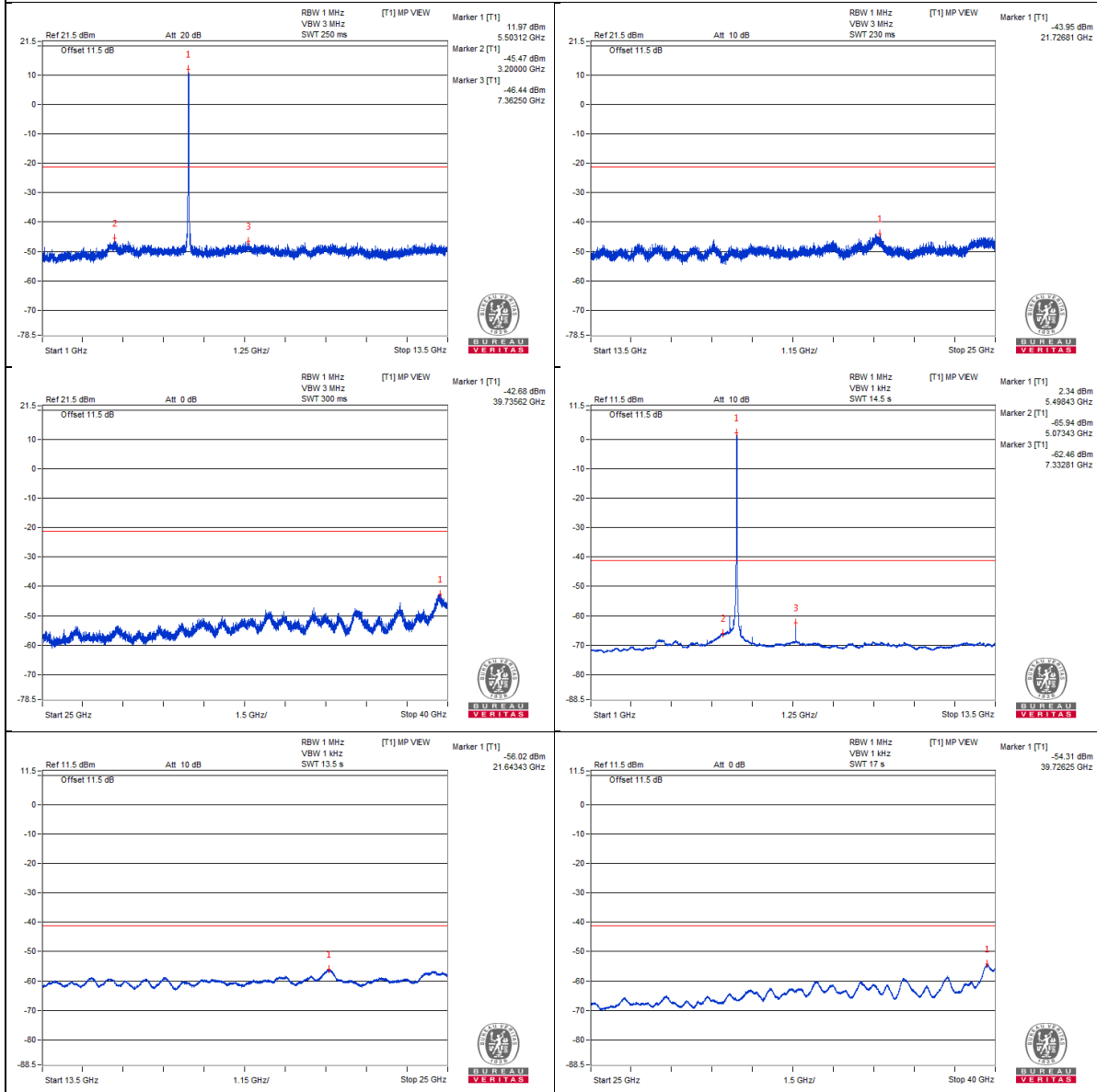
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3675 PK	59.2	74	-14.8	-47.15	-48.76	8.81	-36.06
2	3646.87 AV	38.04	54	-15.96	-69.03	-69.06	8.81	-57.22
3	7315.62 PK	59.41	74	-14.59	-47.09	-48.33	8.81	-35.85
4	7332.81 AV	42.62	54	-11.38	-62.46	-68.26	8.81	-52.64
5	10987.5 PK	56.59	74	-17.41	-50.84	-50.17	8.81	-38.67
6	11000 AV	36.86	54	-17.14	-70.57	-69.89	8.81	-58.4
7	16502.93 PK	58.26	68.2	-9.94	-48.58	-49.07	8.81	-37

Note :

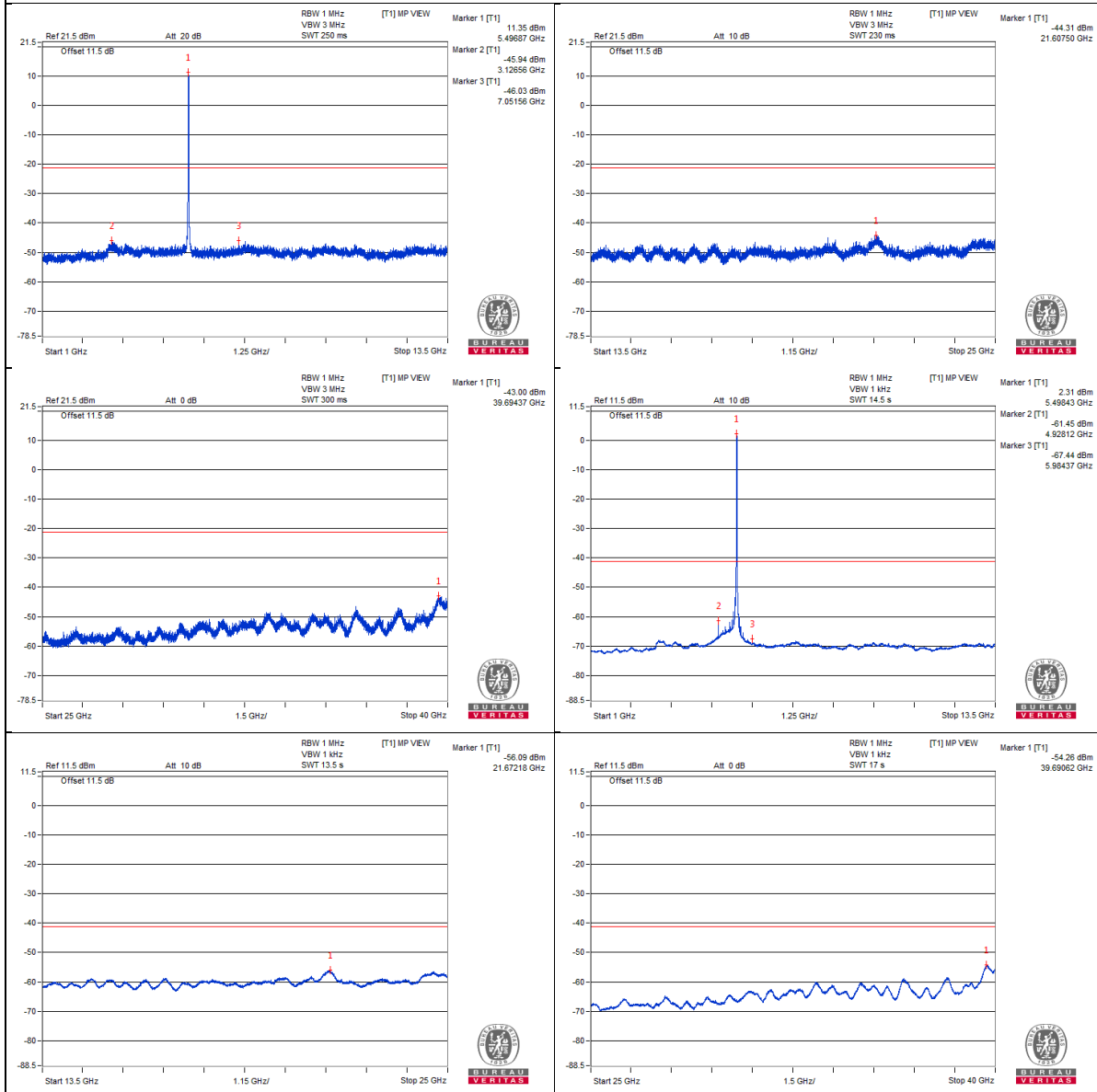
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

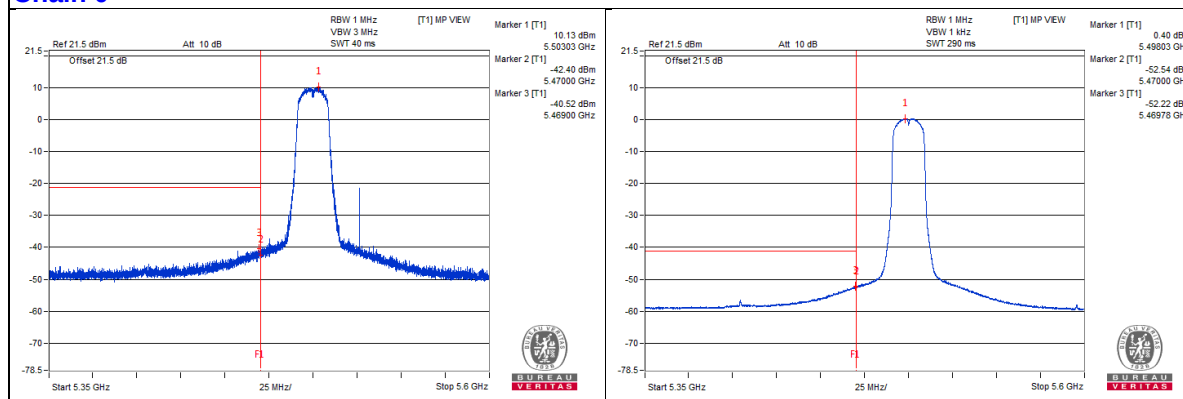
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5457.28 PK	64.48	74	-9.52	-41.23	-44.61	8.81	-30.78
2	5452.06 AV	53.66	54	-0.34	-55.65	-51.95	8.81	-41.6
3	5469 PK	66.13	68.2	-2.07	-40.52	-41.42	8.81	-29.13

Note :

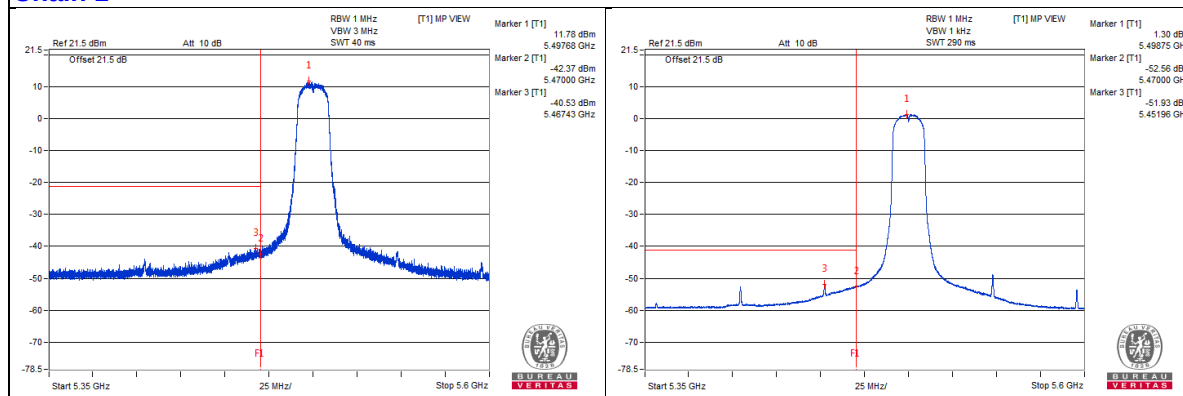
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ac (VHT20) - Channel 116

Conducted spurious emission table

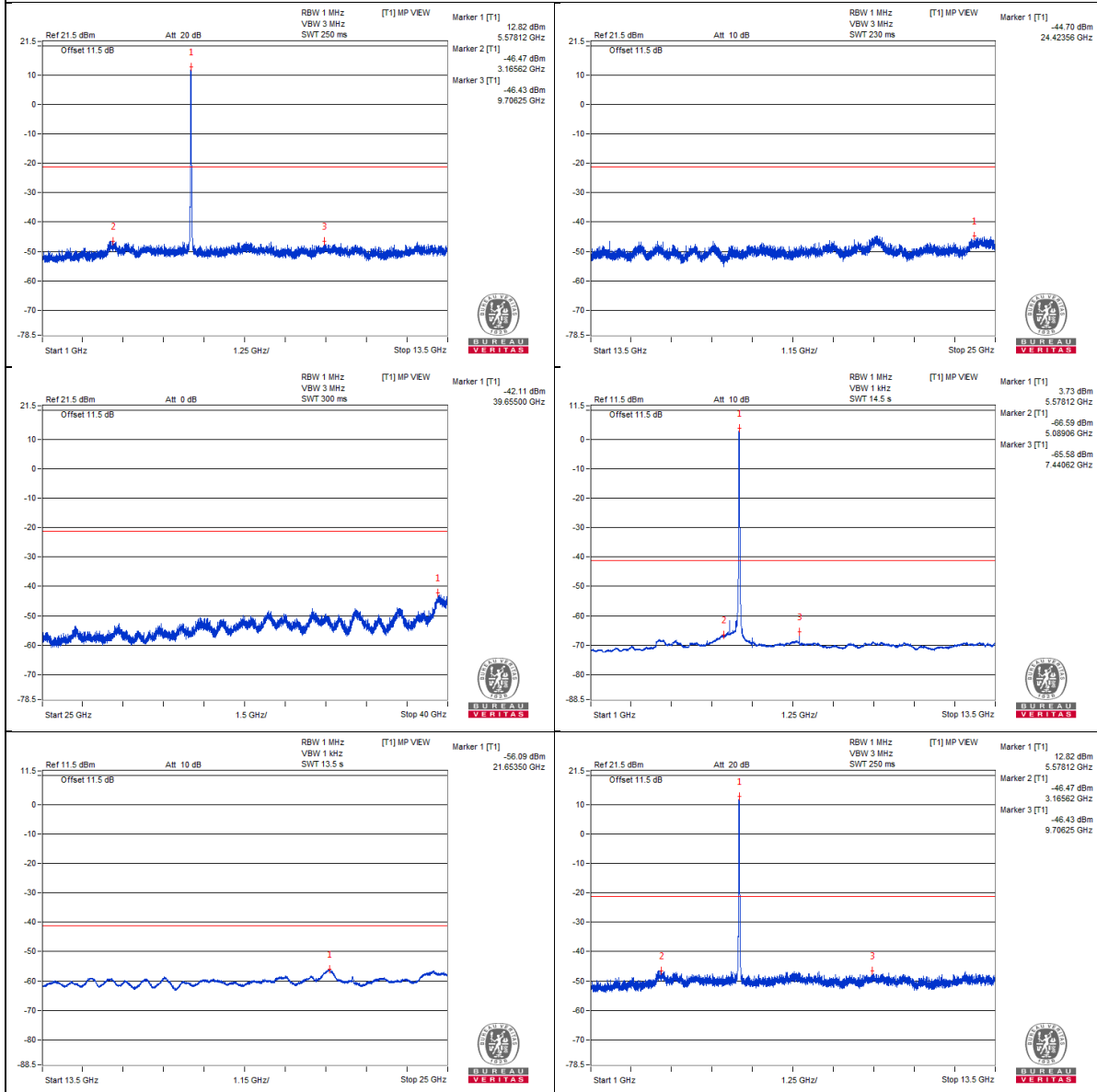
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3717.18 PK	58.35	74	-15.65	-48.35	-49.15	8.81	-36.91
2	3717.18 AV	37.68	54	-16.32	-69.39	-69.41	8.81	-57.58
3	7423.43 PK	59.74	74	-14.26	-48.13	-46.68	8.81	-35.52
4	7440.62 AV	40.09	54	-13.91	-65.58	-69.08	8.81	-55.17
5	11170.31 PK	57.28	74	-16.72	-49.09	-50.65	8.81	-37.98
6	11160.93 AV	36.86	54	-17.14	-70.74	-69.75	8.81	-58.4
7	16743 PK	56.97	68.2	-11.23	-48.82	-51.96	8.81	-38.29

Note :

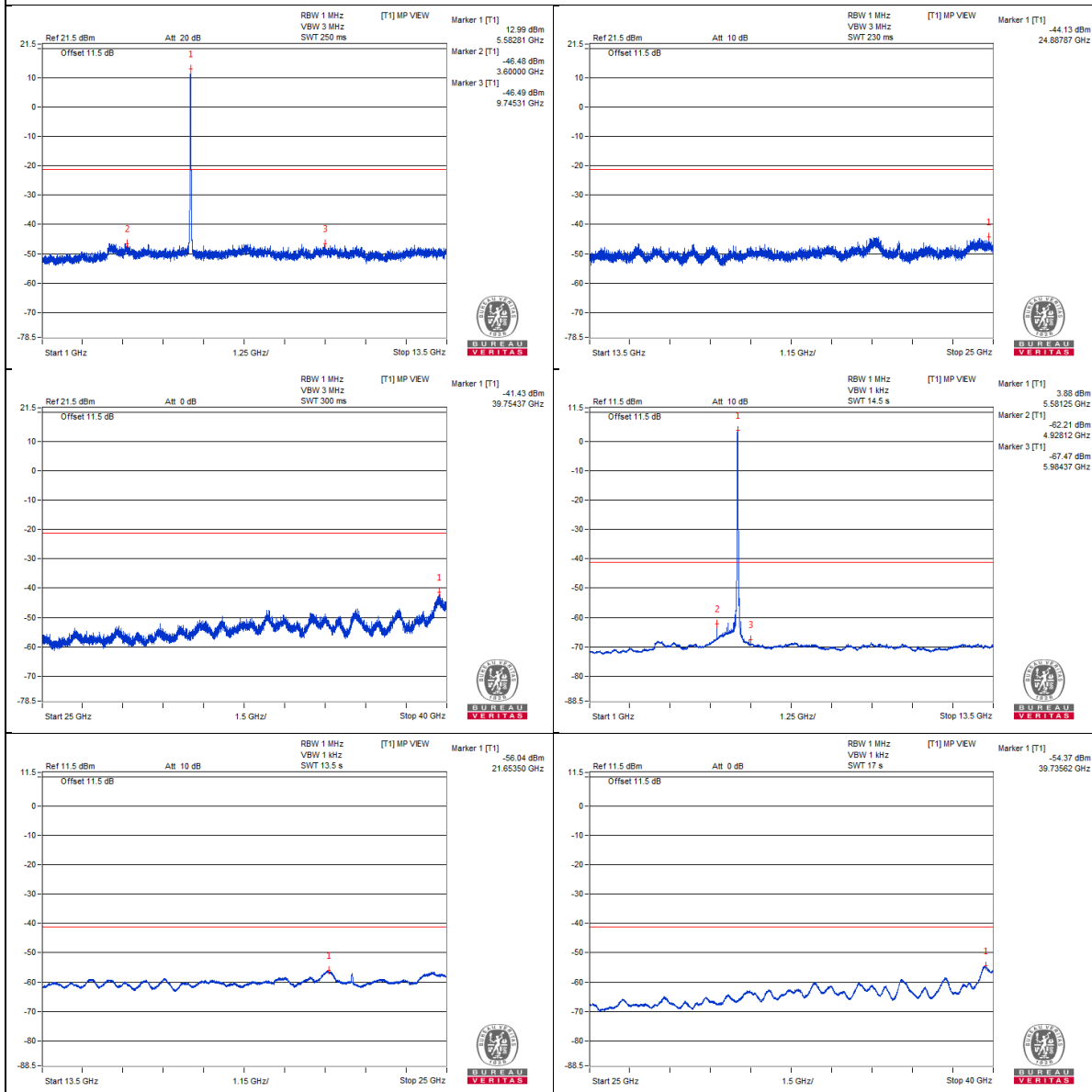
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

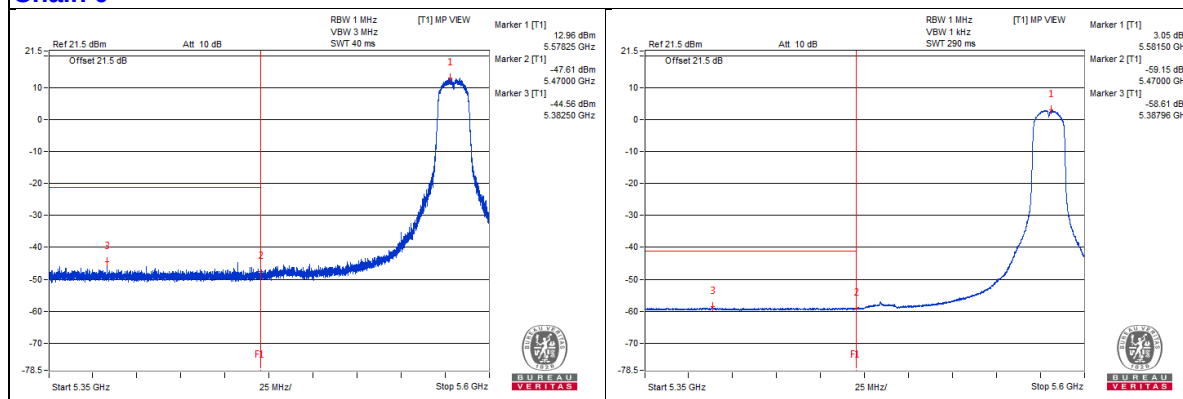
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5382.5 PK	60.97	74	-13.03	-44.56	-48.56	8.81	-34.29
2	5387.93 AV	48.95	54	-5.05	-58.68	-57.65	8.81	-46.31
3	5468.9 PK	59.67	68.2	-8.53	-46.83	-48.07	8.81	-35.59

Note :

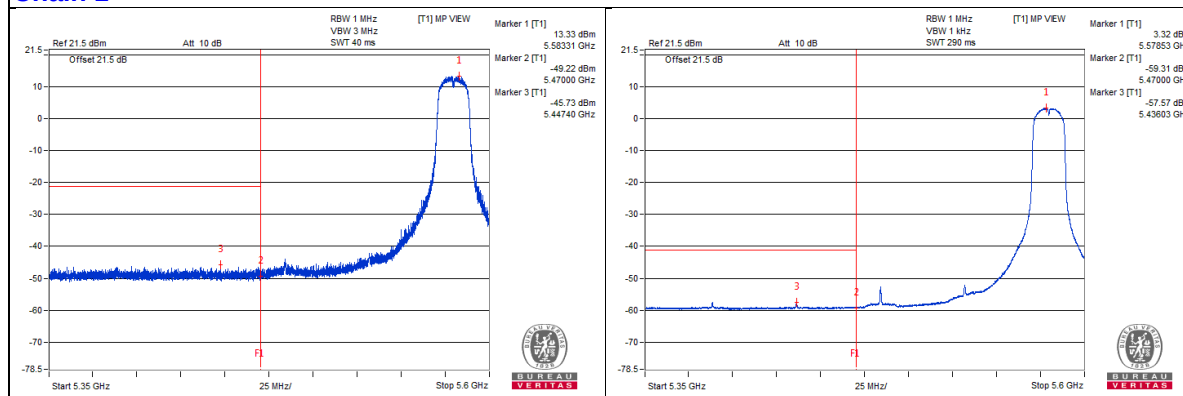
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ac (VHT20) - Channel 140

Conducted spurious emission table

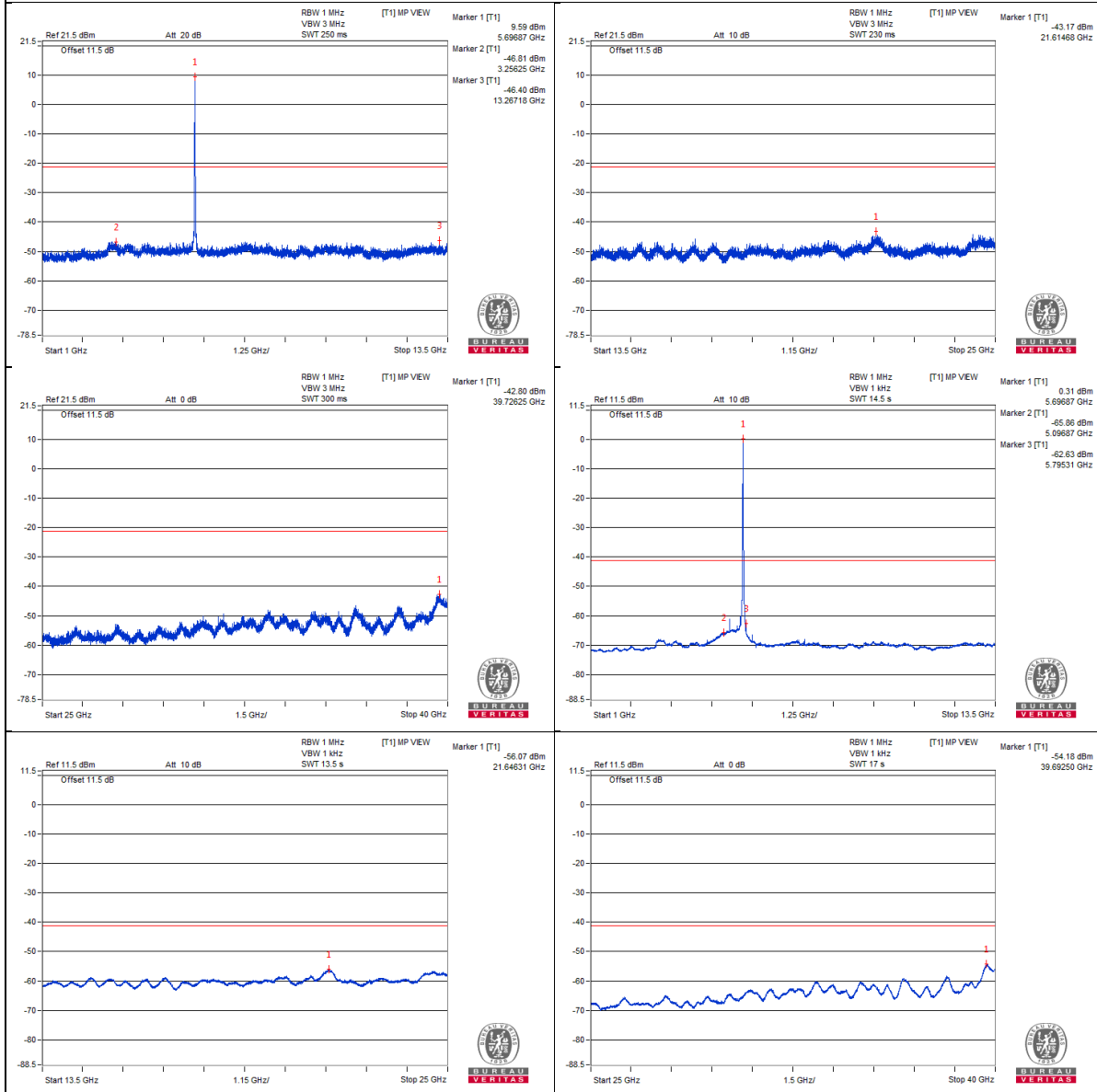
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3790.62 PK	58.59	74	-15.41	-48.3	-48.69	8.81	-36.67
2	3782.81 AV	37.36	54	-16.64	-69.68	-69.76	8.81	-57.9
3	7587.5 PK	58.38	74	-15.62	-48.61	-48.8	8.81	-36.88
4	7600 AV	38.29	54	-15.71	-68.04	-69.71	8.81	-56.97
5	11384.37 PK	57.55	74	-16.45	-49.85	-49.24	8.81	-37.71
6	11400 AV	36.65	54	-17.35	-70.91	-70	8.81	-58.61
7	17090.87 PK	58.08	68.2	-10.12	-51.28	-47.51	8.81	-37.18

Note :

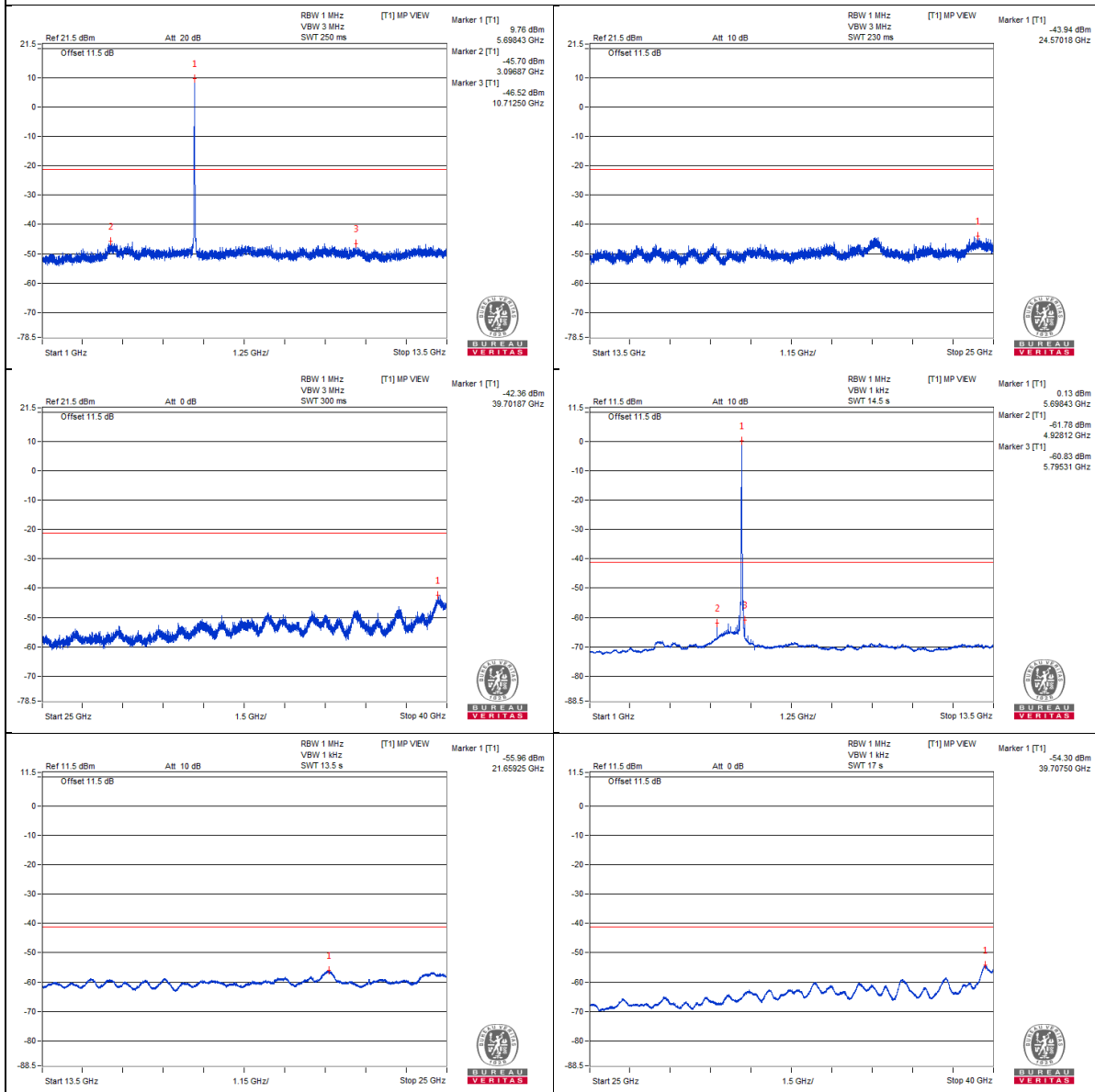
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

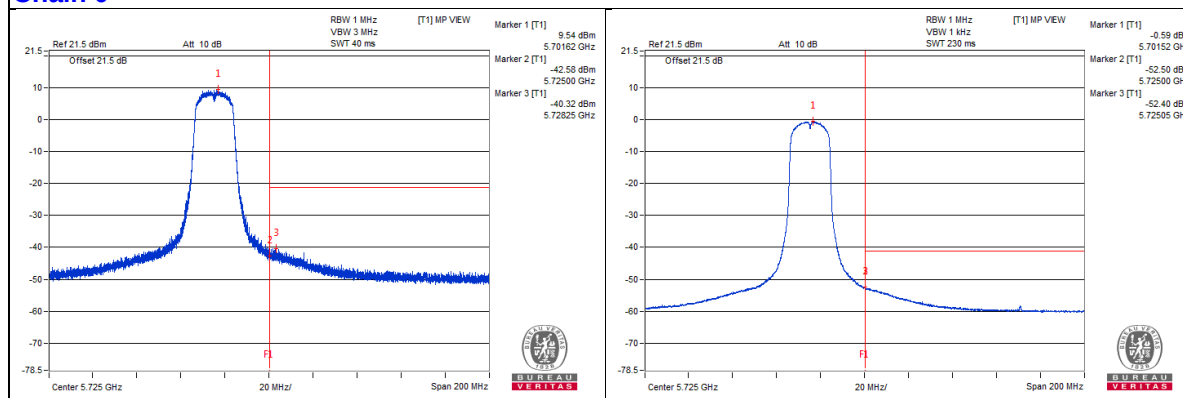
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5726.57 PK	66.36	68.2	-1.84	-42.68	-39.38	8.81	-28.9

Note :

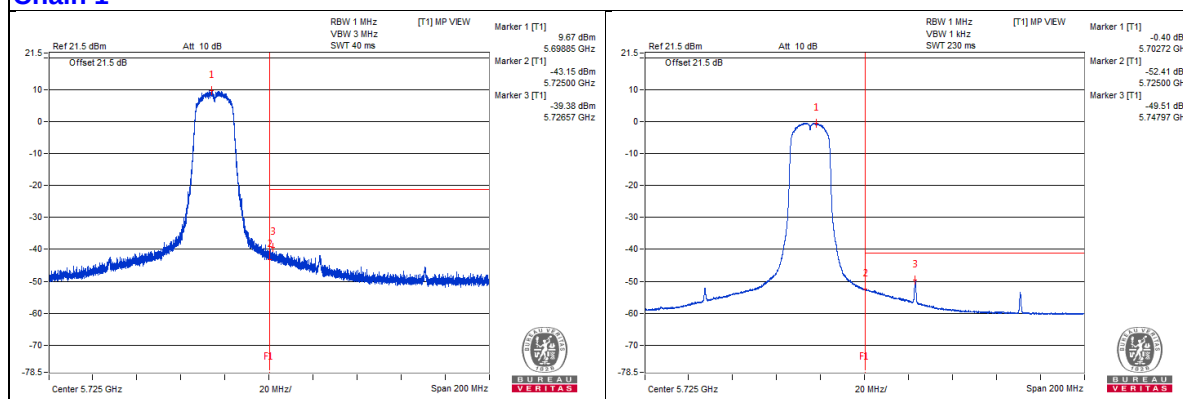
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ac (VHT20) - Channel 144

Conducted spurious emission table

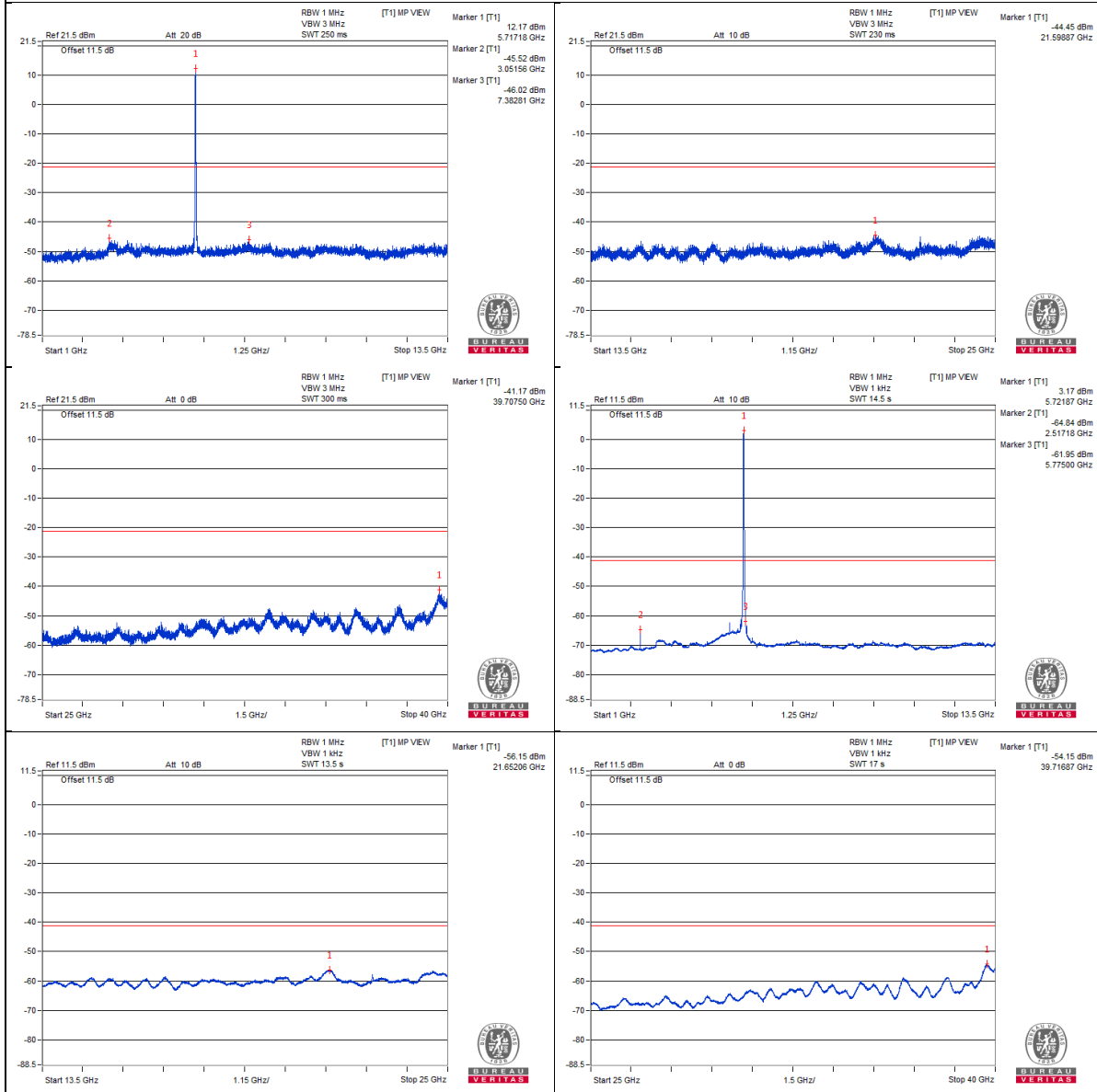
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3793.75 PK	58.17	74	-15.83	-48.41	-49.48	8.81	-37.09
2	3795.31 AV	37.13	54	-16.87	-69.88	-70.02	8.81	-58.13
3	7643.75 PK	58.59	74	-15.41	-49.36	-47.77	8.81	-36.67
4	7626.56 AV	37.8	54	-16.2	-68.84	-69.78	8.81	-57.46
5	11445.31 PK	57.09	74	-16.91	-49.8	-50.19	8.81	-38.17
6	11440.62 AV	37.19	54	-16.81	-70.73	-69.19	8.81	-58.07
7	17154.12 PK	58.1	68.2	-10.1	-48.78	-49.18	8.81	-37.16

Note :

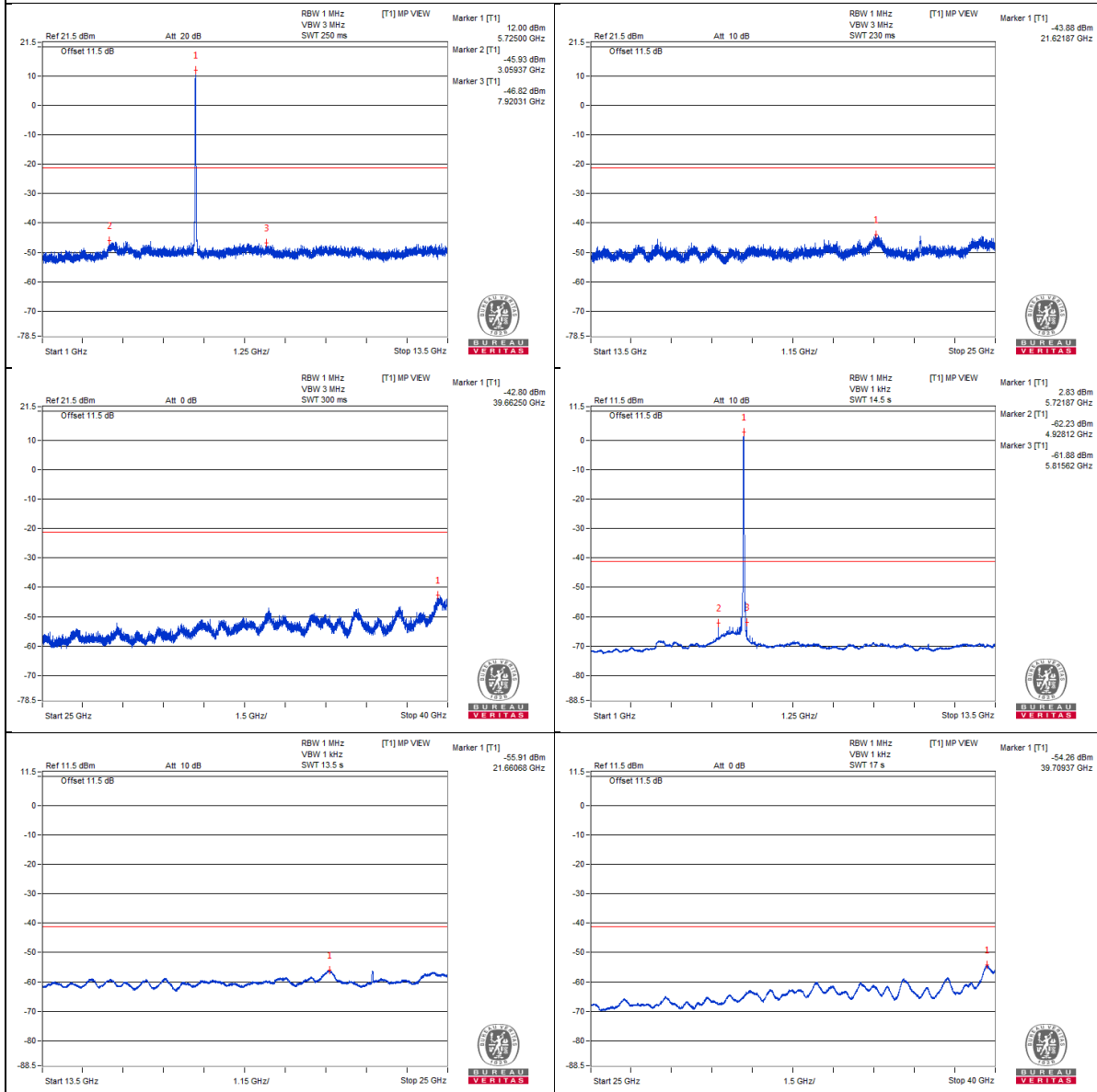
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

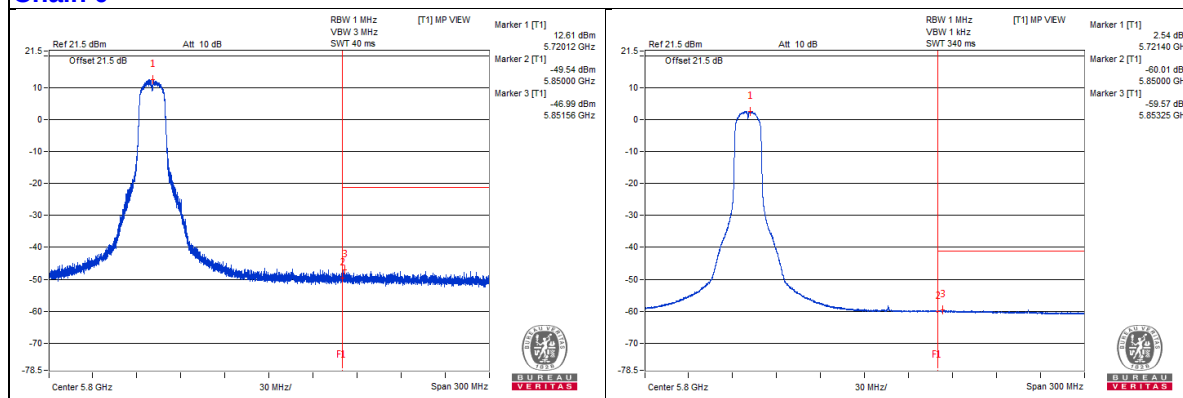
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5911.9 PK	59.13	68.2	-9.07	-48.24	-47.68	8.81	-36.13

Note :

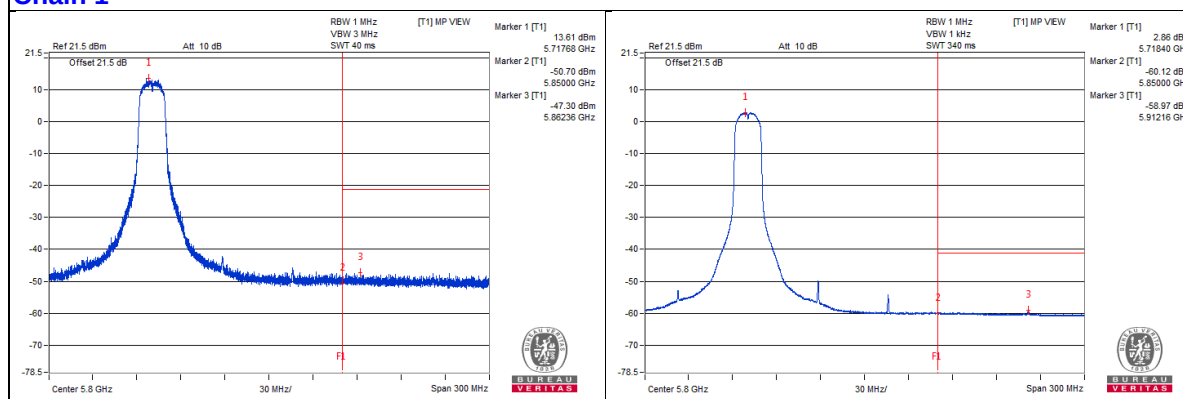
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ac (VHT20) - Channel 149

Conducted spurious emission table

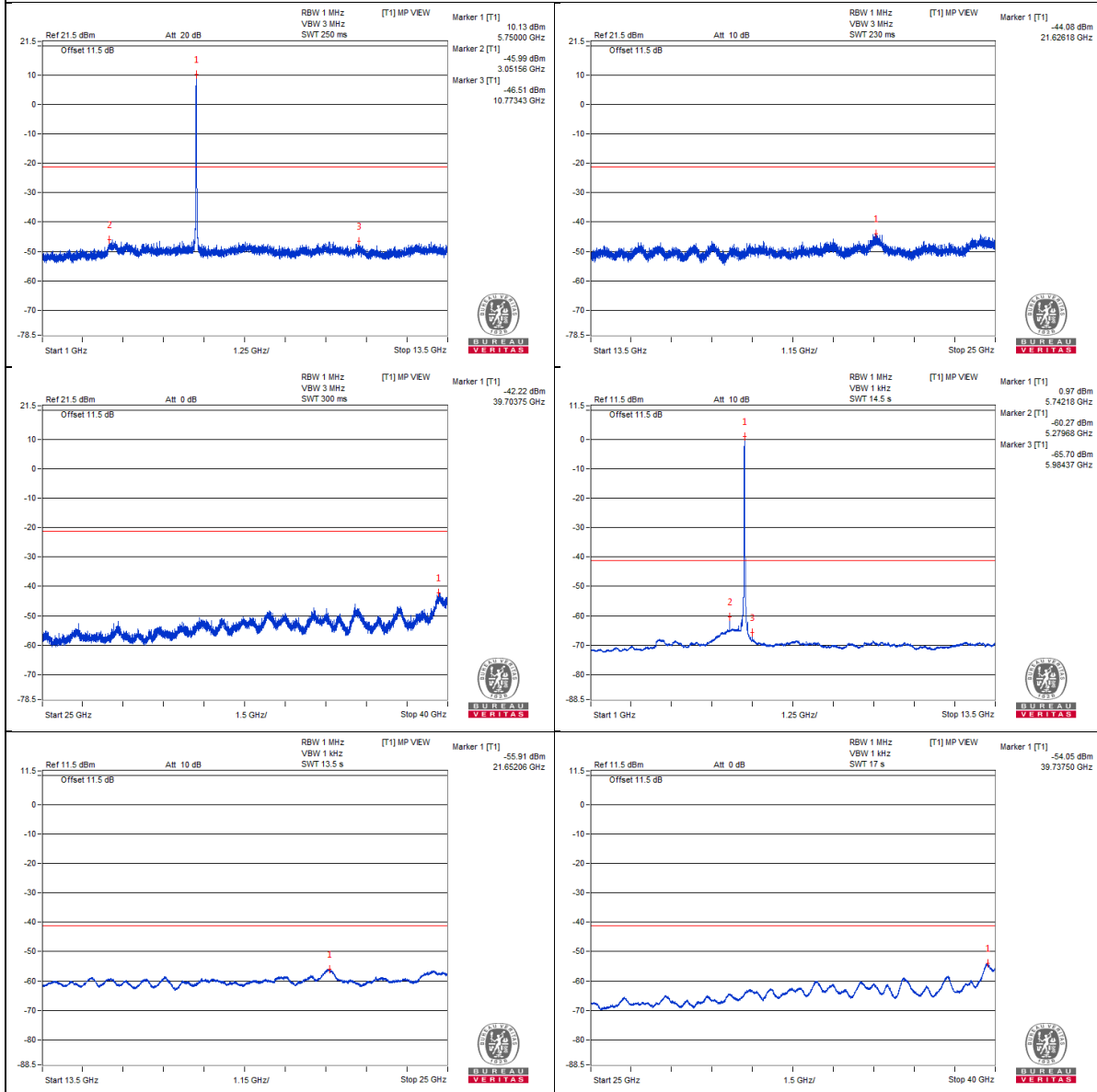
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3820.31 PK	58.14	74	-15.86	-49.59	-48.38	8.81	-37.12
2	3810.93 AV	36.81	54	-17.19	-70.37	-70.18	8.81	-58.45
3	7646.87 PK	58.37	74	-15.63	-48.13	-49.37	8.81	-36.89
4	7659.37 AV	37.75	54	-16.25	-68.89	-69.83	8.81	-57.51
5	11495.31 PK	57.34	74	-16.66	-50.35	-49.21	8.81	-37.92
6	11485.93 AV	36.95	54	-17.05	-70.81	-69.55	8.81	-58.31
7	17226 PK	56.48	68.2	-11.72	-50.61	-50.59	8.81	-38.78

Note :

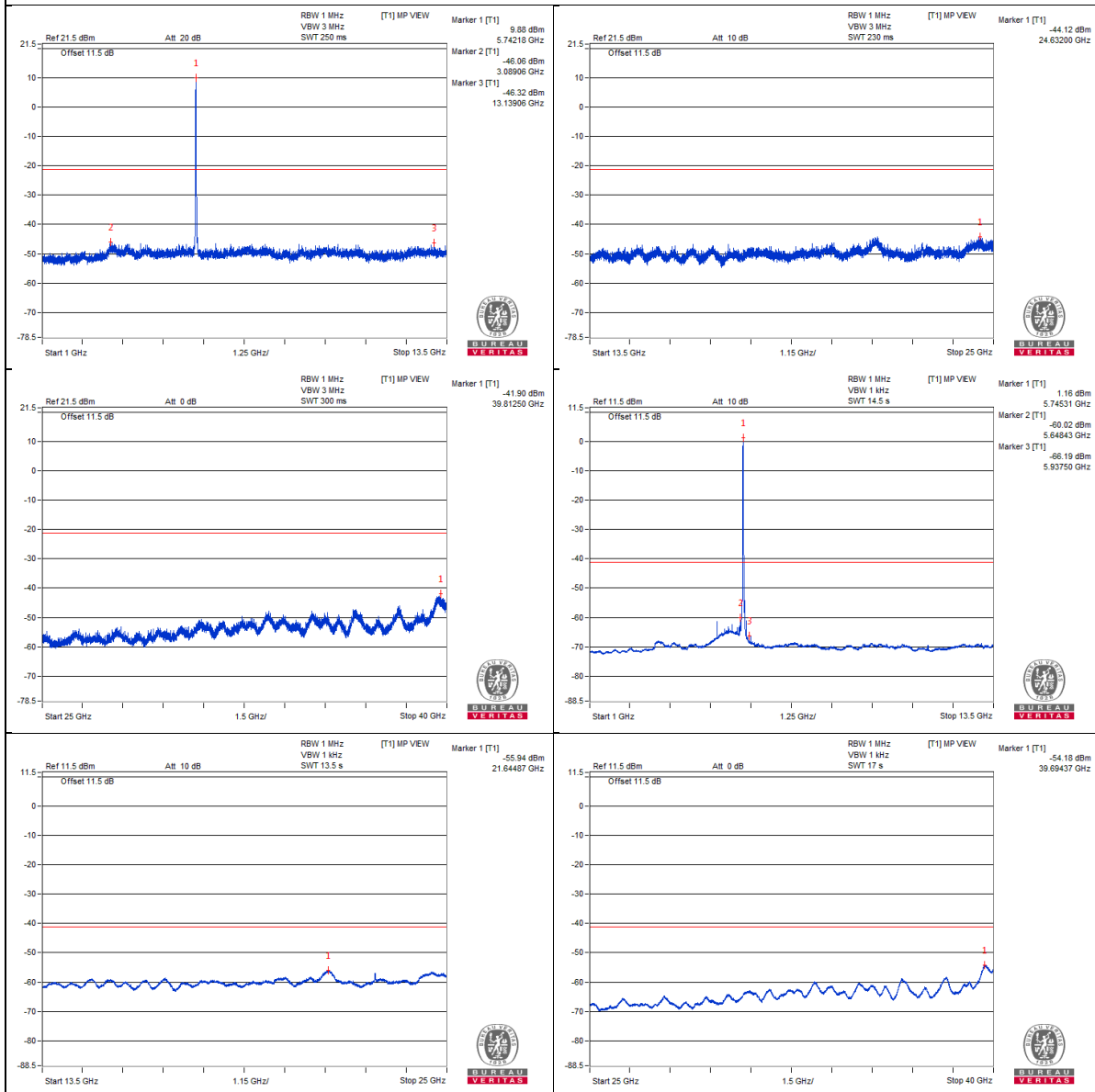
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0

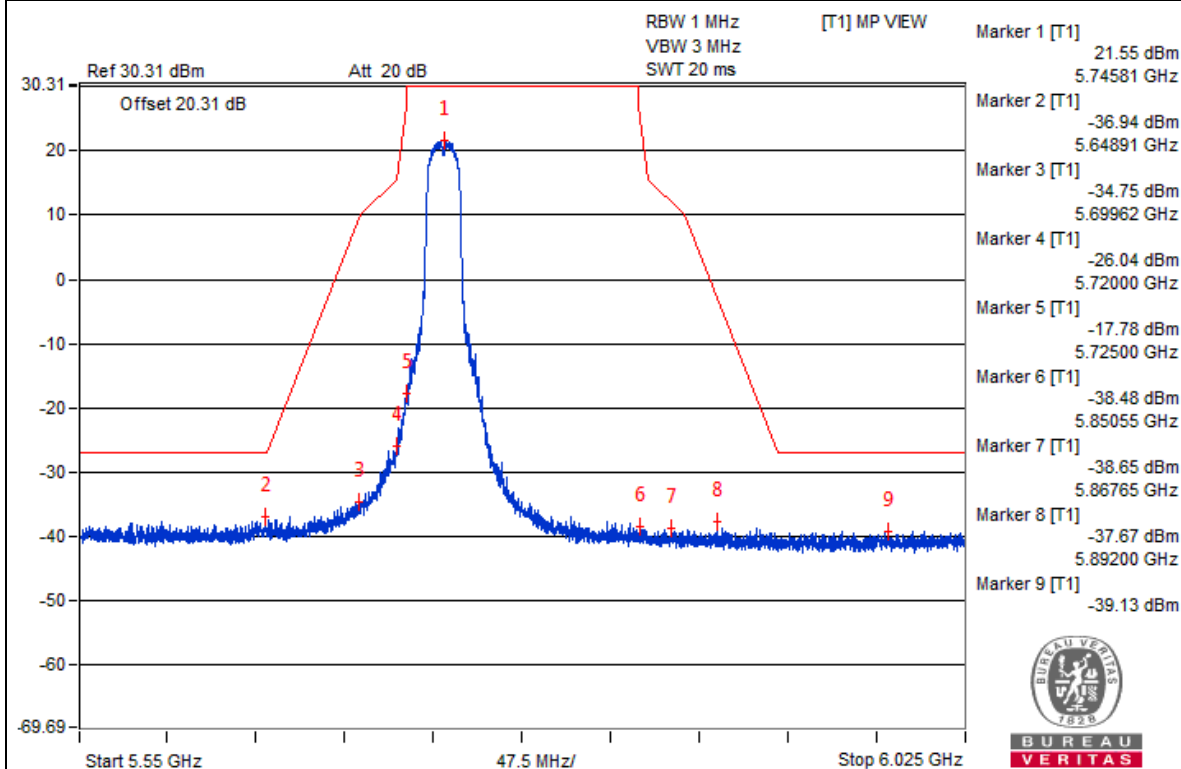


Chain 1

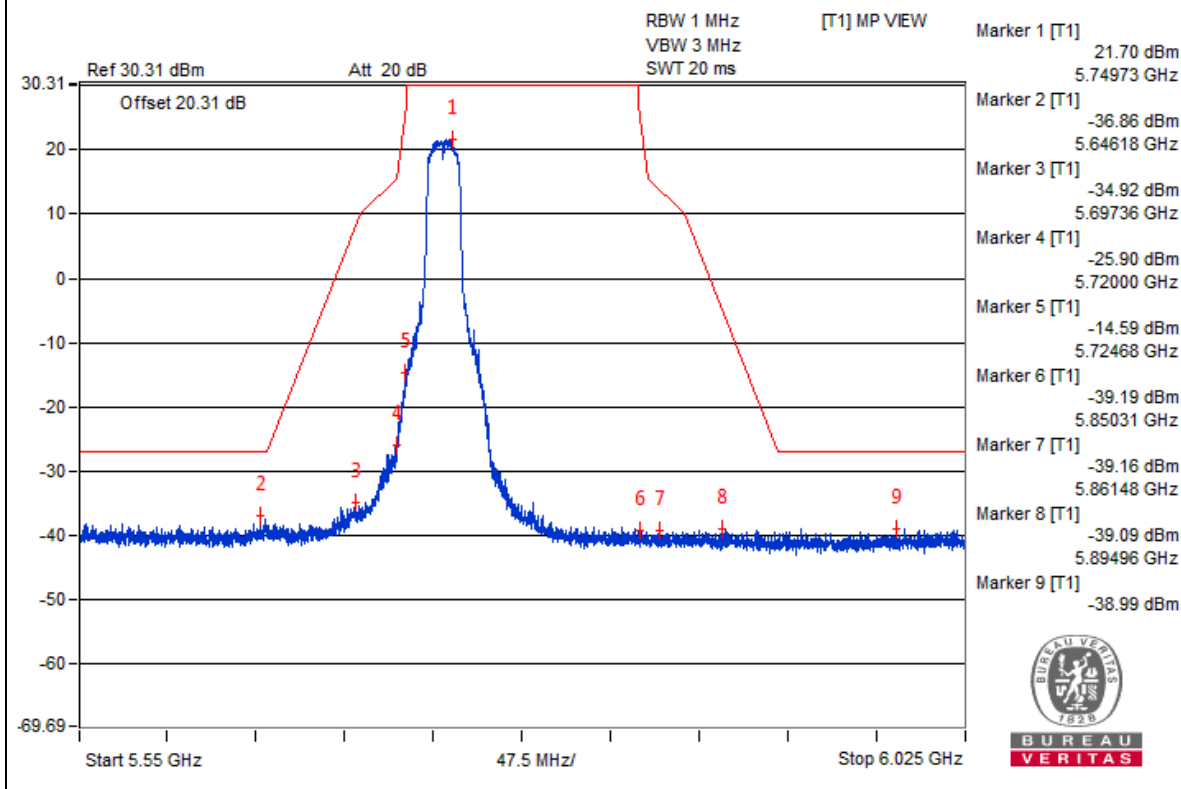


Bandedge table

Chain 0



Chain 1



802.11ac (VHT20) - Channel 157

Conducted spurious emission table

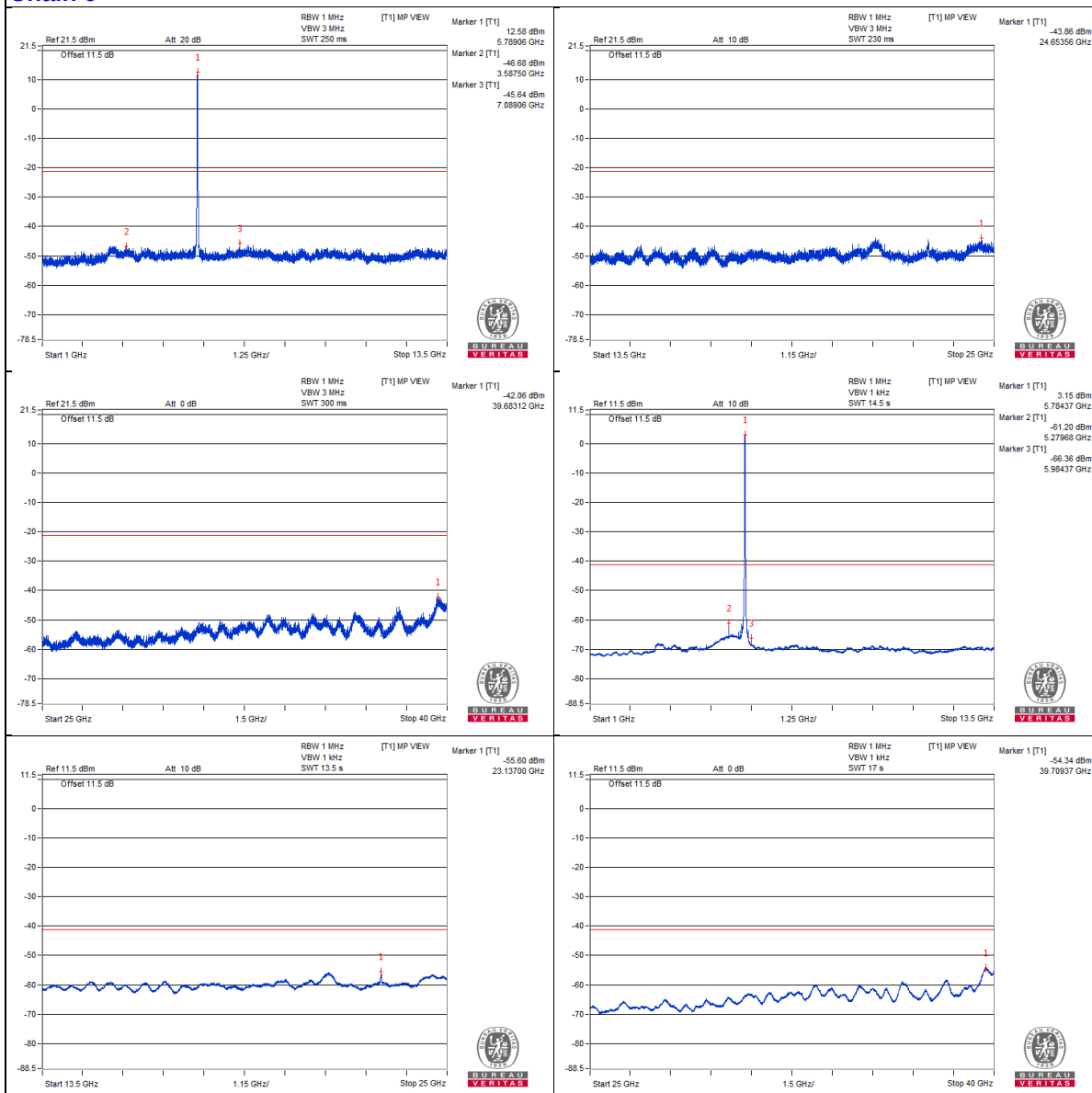
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3862.5 PK	58.1	74	-15.9	-48.4	-49.65	8.81	-37.16
2	3853.12 AV	36.78	54	-17.22	-70.18	-70.43	8.81	-58.48
3	7700 PK	58.76	74	-15.24	-48.17	-48.47	8.81	-36.5
4	7714.06 AV	37.96	54	-16.04	-68.85	-69.4	8.81	-57.3
5	11550 PK	56.35	74	-17.65	-50.98	-50.5	8.81	-38.91
6	11570.31 AV	37.47	54	-16.53	-70.61	-68.8	8.81	-57.79
7	17336.68 PK	56.02	68.2	-12.18	-50.94	-51.18	8.81	-39.24

Note :

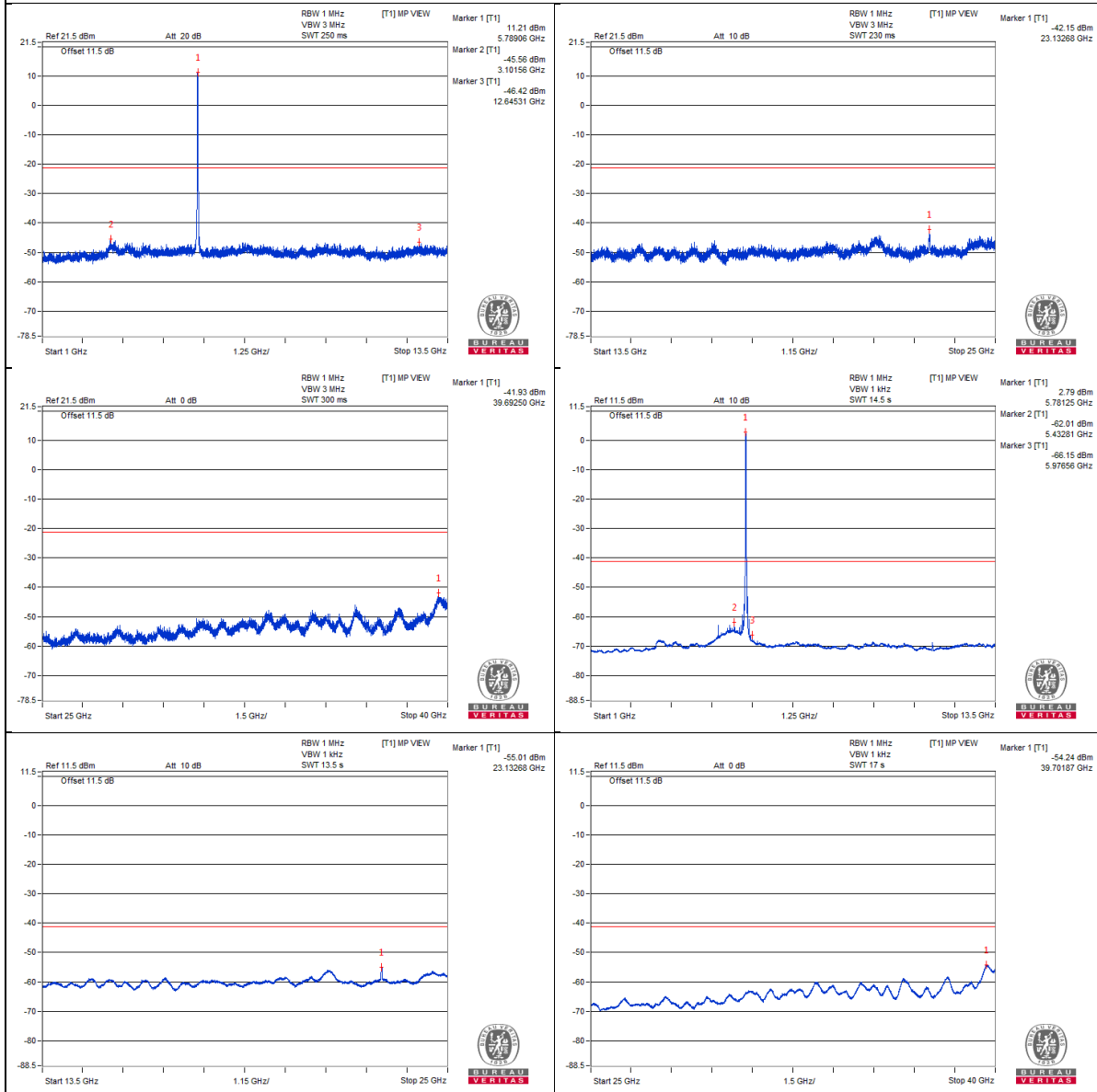
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0

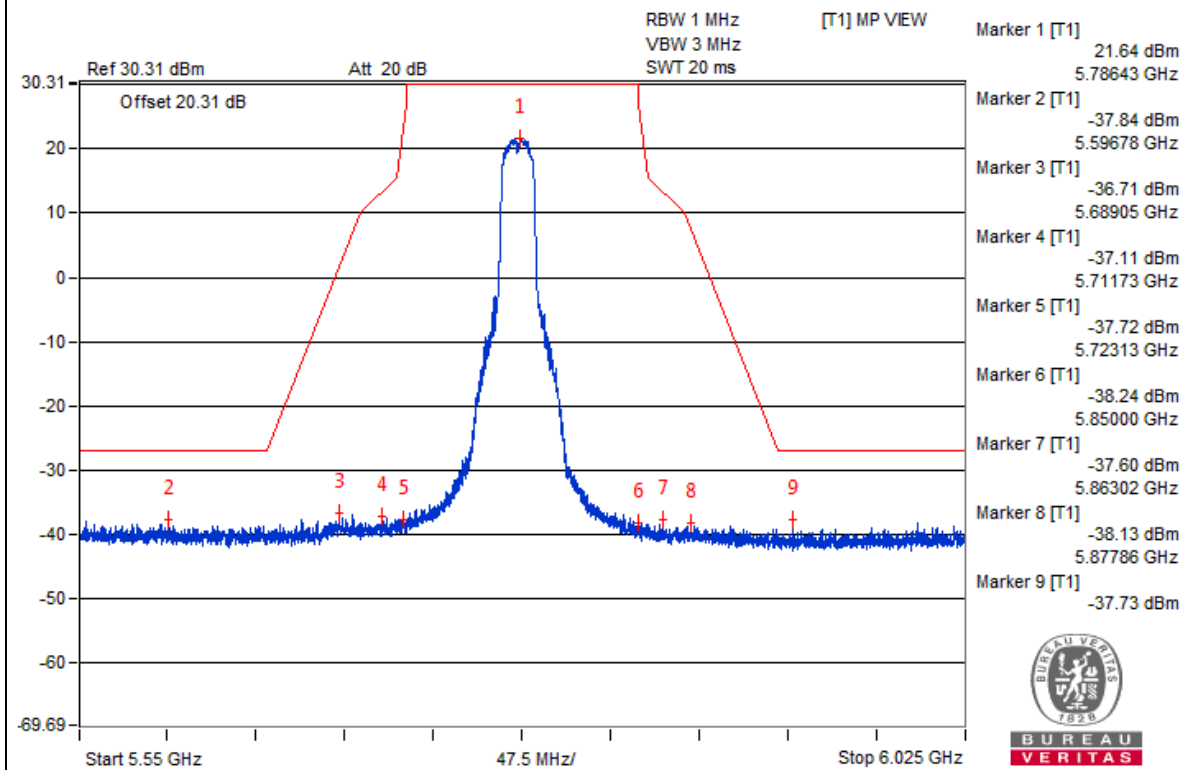


Chain 1

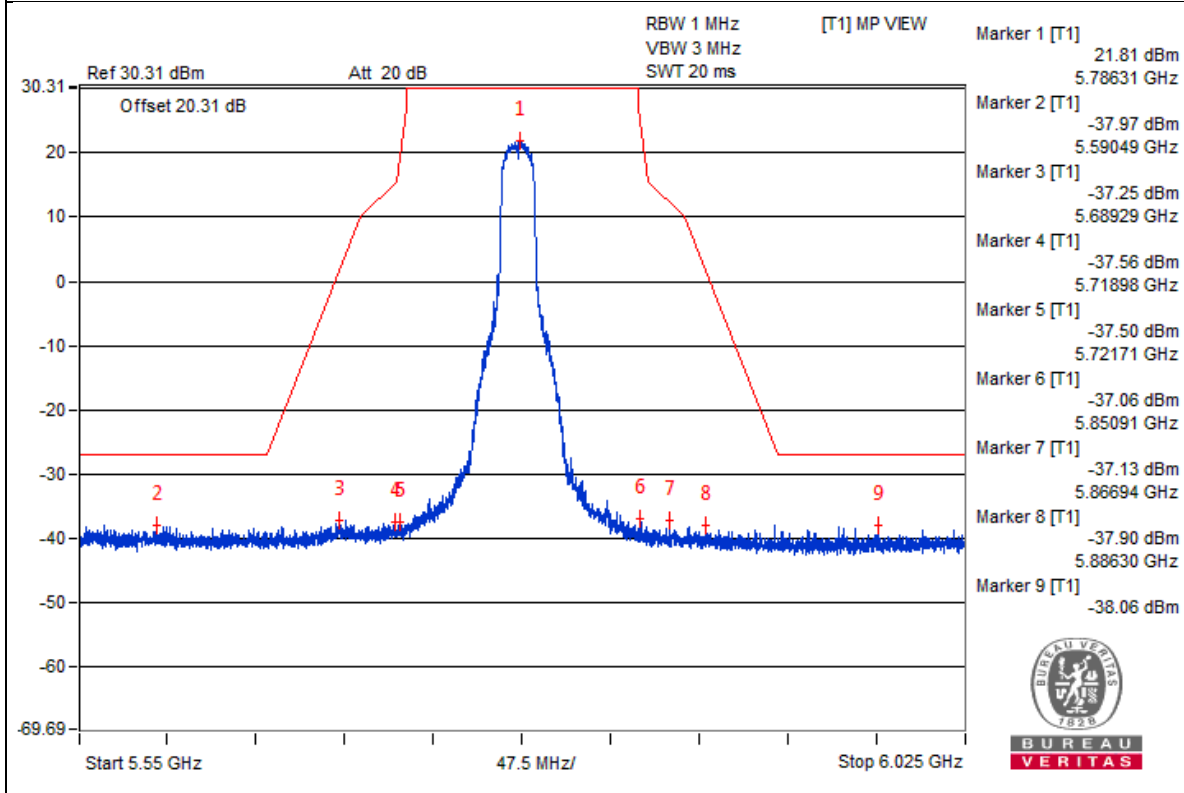


Bandedge table

Chain 0



Chain 1



802.11ac (VHT20) - Channel 165

Conducted spurious emission table

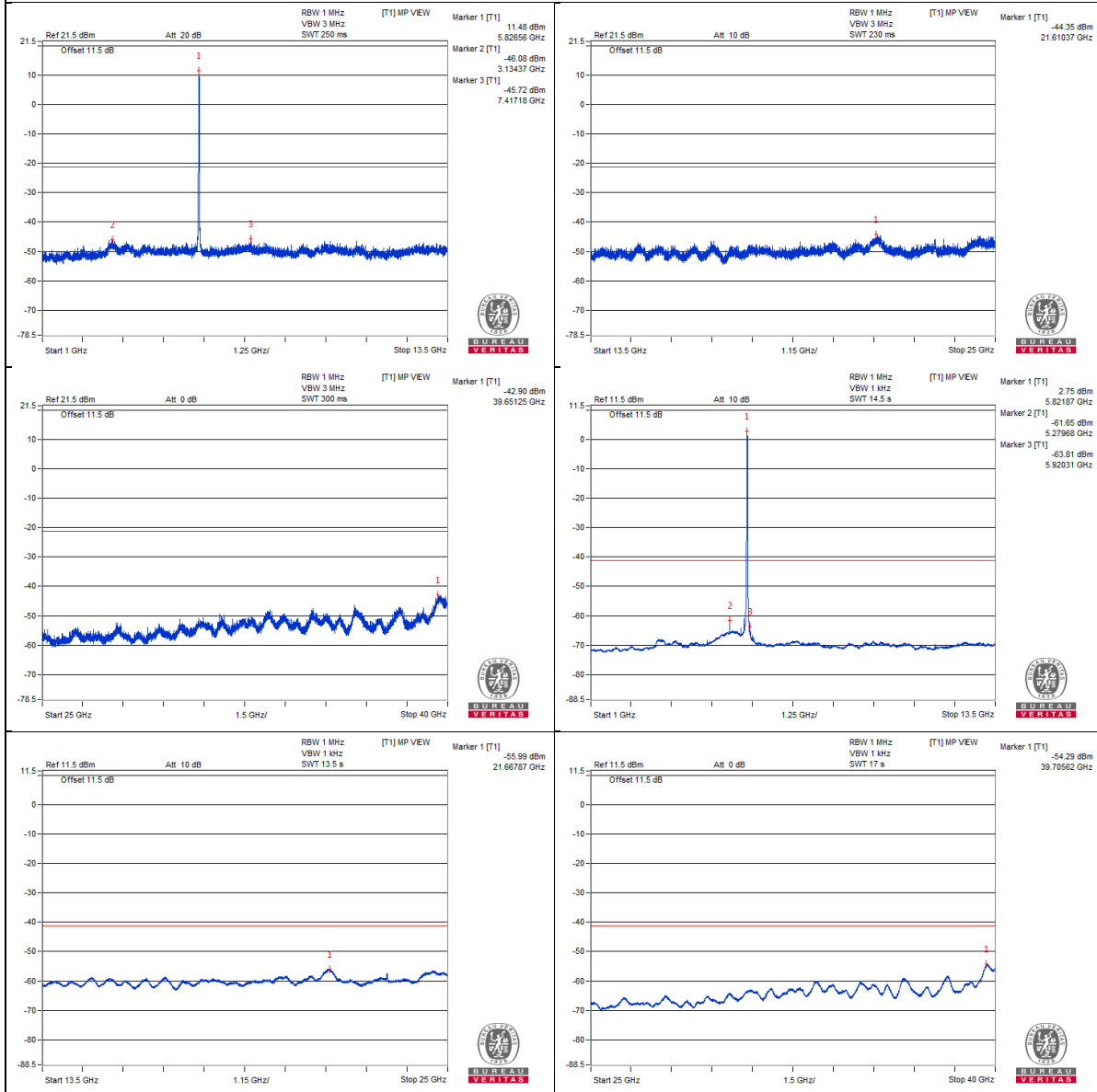
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3871.87 PK	57.32	74	-16.68	-49.82	-49.71	8.81	-37.94
2	3884.37 AV	36.9	54	-17.1	-69.78	-70.62	8.81	-58.36
3	7768.75 PK	58.94	68.2	-9.26	-48.94	-47.46	8.81	-36.32
4	11642.18 PK	56.9	74	-17.1	-49.8	-50.6	8.81	-38.36
5	11651.56 AV	38.06	54	-15.94	-69.88	-68.31	8.81	-57.2
6	17481.87 PK	58.69	68.2	-9.51	-48.09	-48.71	8.81	-36.57

Note :

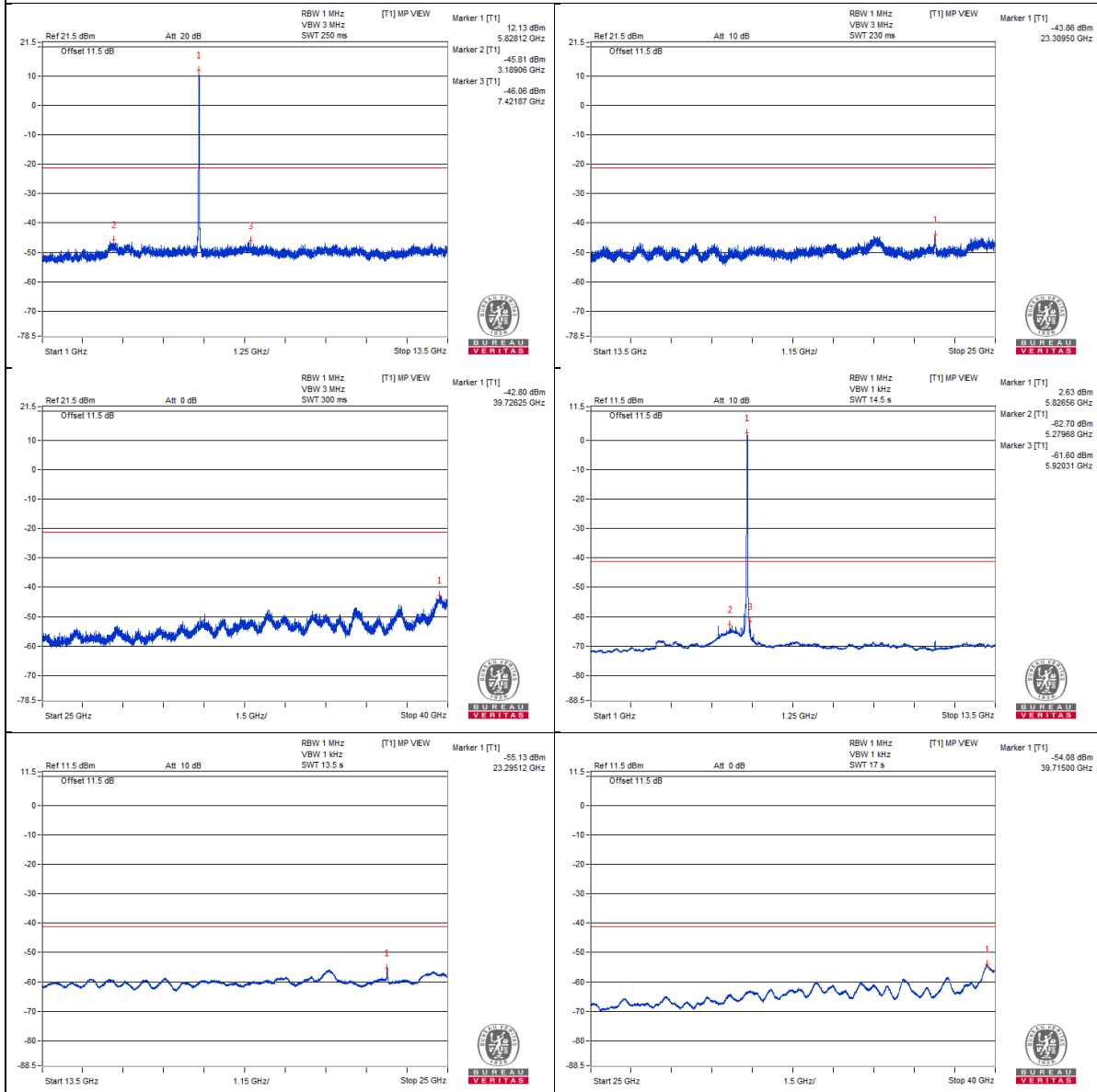
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0

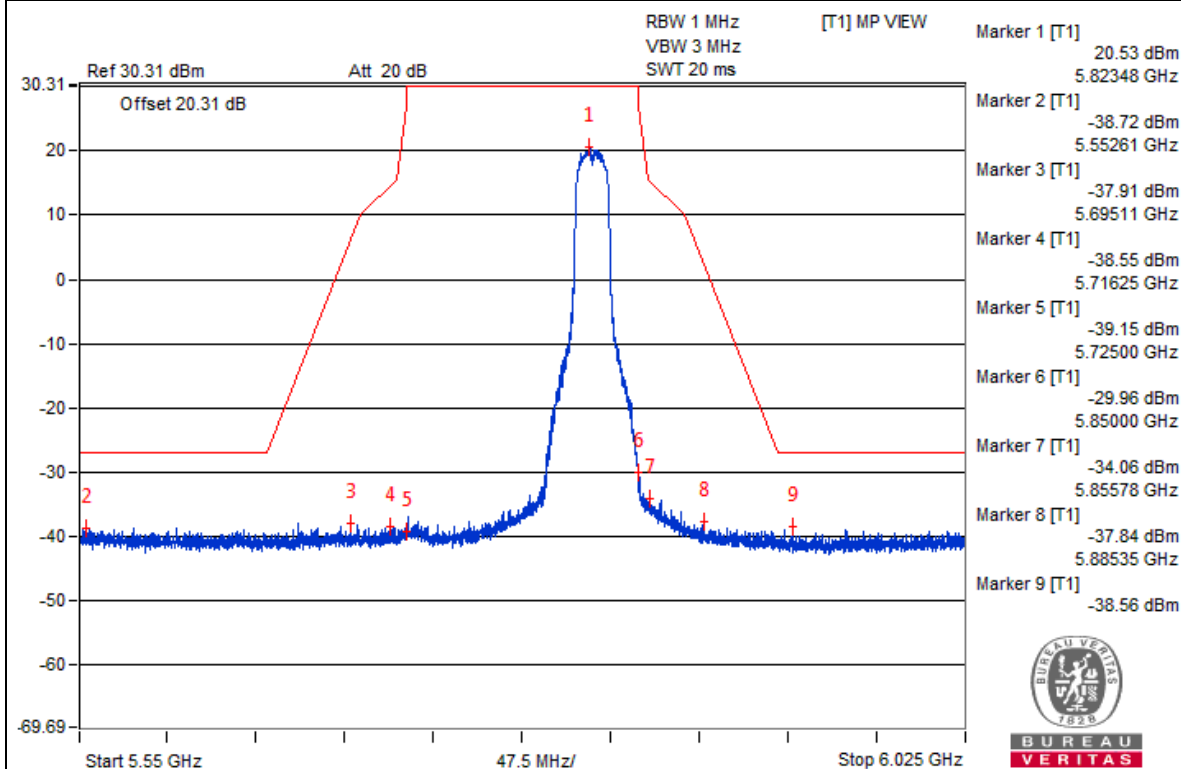


Chain 1

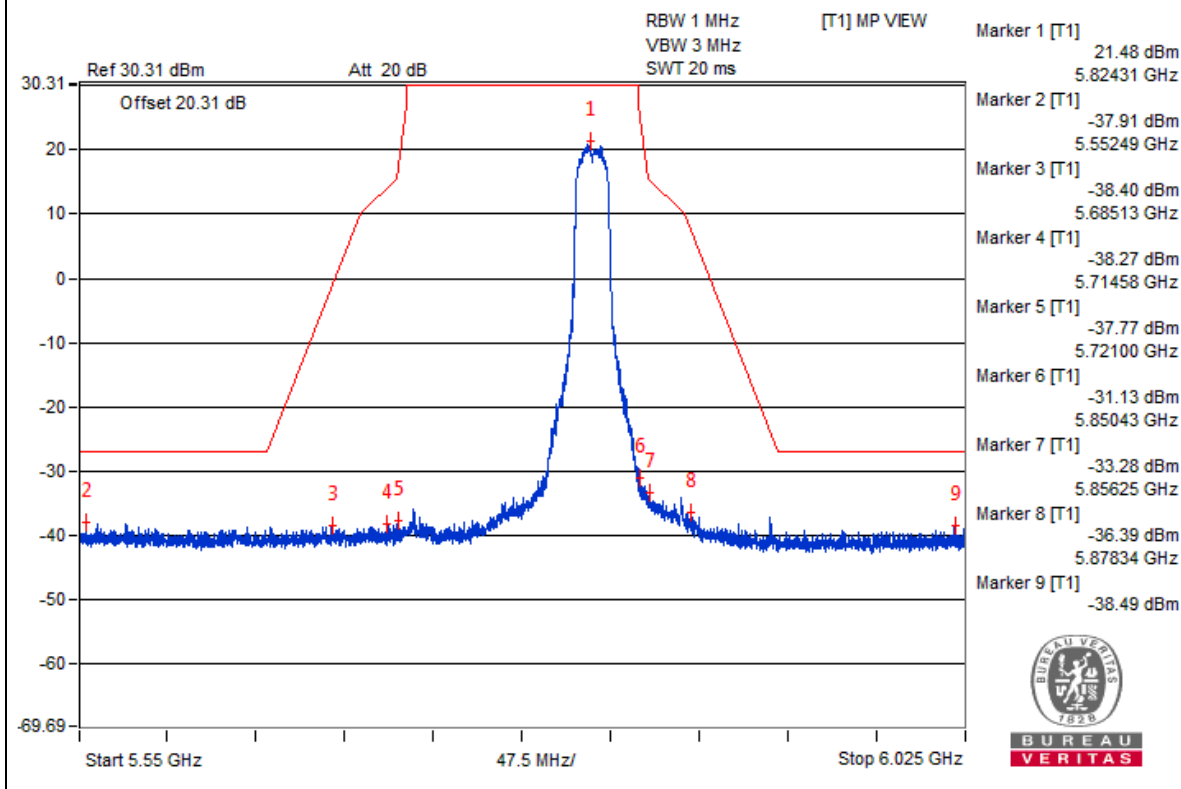


Bandedge table

Chain 0



Chain 1



802.11ac (VHT40) - 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	3445.31 PK	57.83	68.2	-10.37	-49.28	-48.1	8.21	-37.43
2	6920.31 PK	61.16	68.2	-7.04	-44.26	-46.73	8.21	-34.1
3	10371.87 PK	57.54	68.2	-10.66	-49.23	-48.67	8.21	-37.72
4	15568.56 PK	56.82	74	-17.18	-48.78	-50.77	8.21	-38.44
5	15561.37 AV	45.84	54	-8.16	-60.72	-60.57	8.21	-49.42

Note :

Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0

