

802.11ac (VHT40) - Channel 134

Conducted spurious emission table

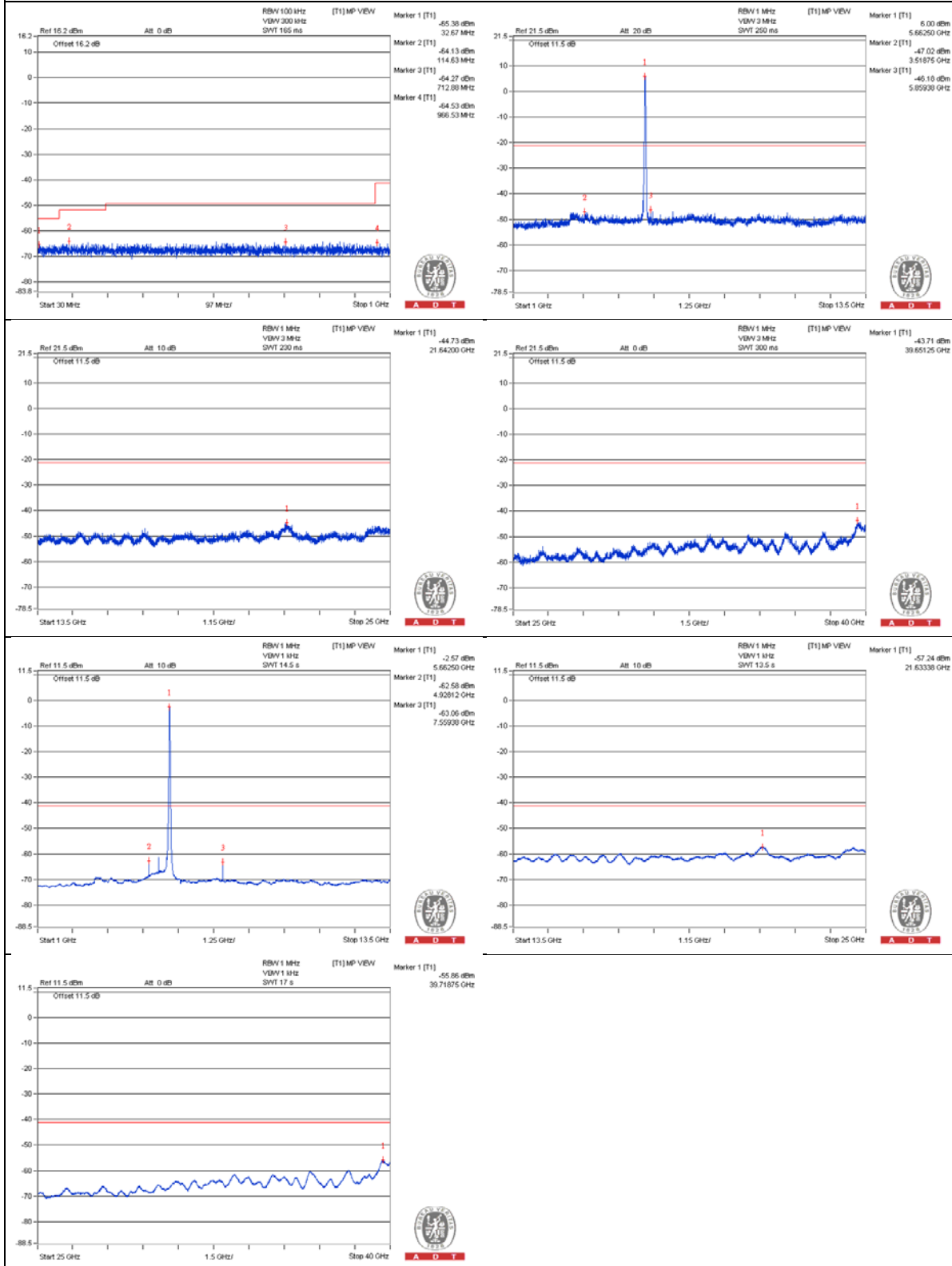
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3768.75 PK	56.94	74	-17.06	-48	-50.58	7.77	-38.32
2	3765.625 AV	35.65	54	-18.35	-70.13	-70.67	7.77	-59.61
3	7550 PK	56.78	74	-17.22	-48.78	-49.8	7.77	-38.48
4	7559.375 AV	40.68	54	-13.32	-63.06	-70.56	7.77	-54.58
5	11328.125 PK	55.84	74	-18.16	-51.21	-49.38	7.77	-39.42
6	11325 AV	34.67	54	-19.33	-71.15	-71.6	7.77	-60.59
7	16993.125 PK	56.75	74	-17.25	-48.45	-50.34	7.77	-38.51
8	16990.25 AV	45.97	54	-8.03	-59.8	-60.36	7.77	-49.29

Note :

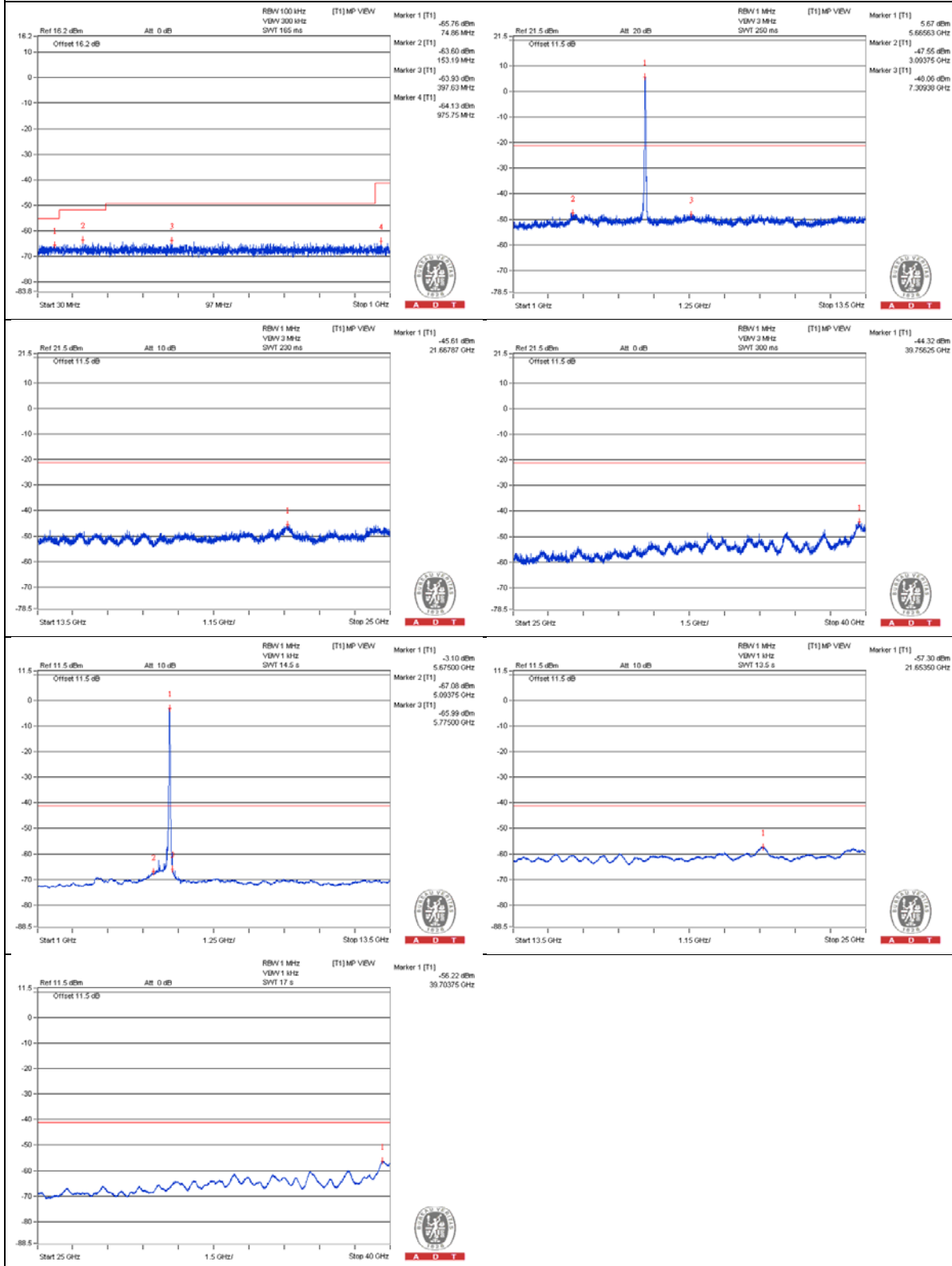
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

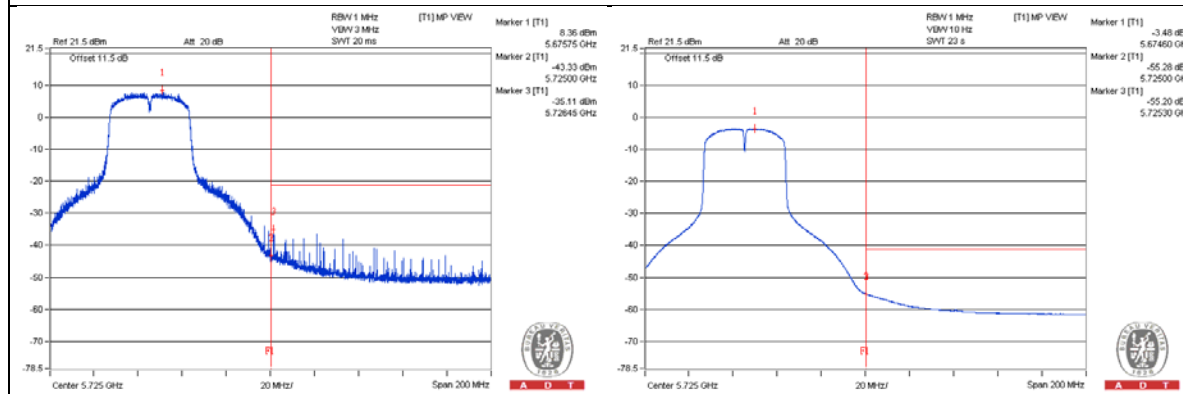
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5726.45 PK	68.5	74	-5.5	-35.11	-43.56	7.77	-26.76
2	5725.05 AV	50.74	54	-3.26	-55.27	-55.34	7.77	-44.52

Note :

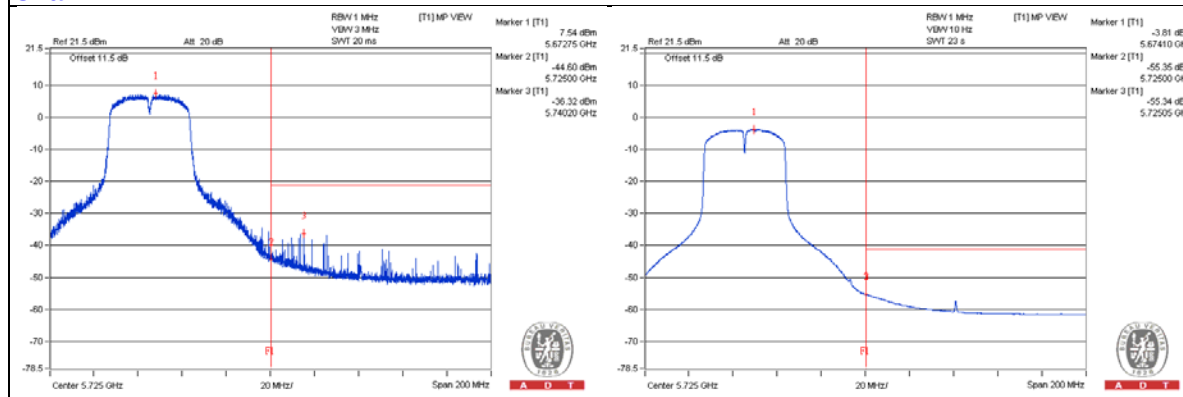
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ac (VHT40) - Channel 142

Conducted spurious emission table

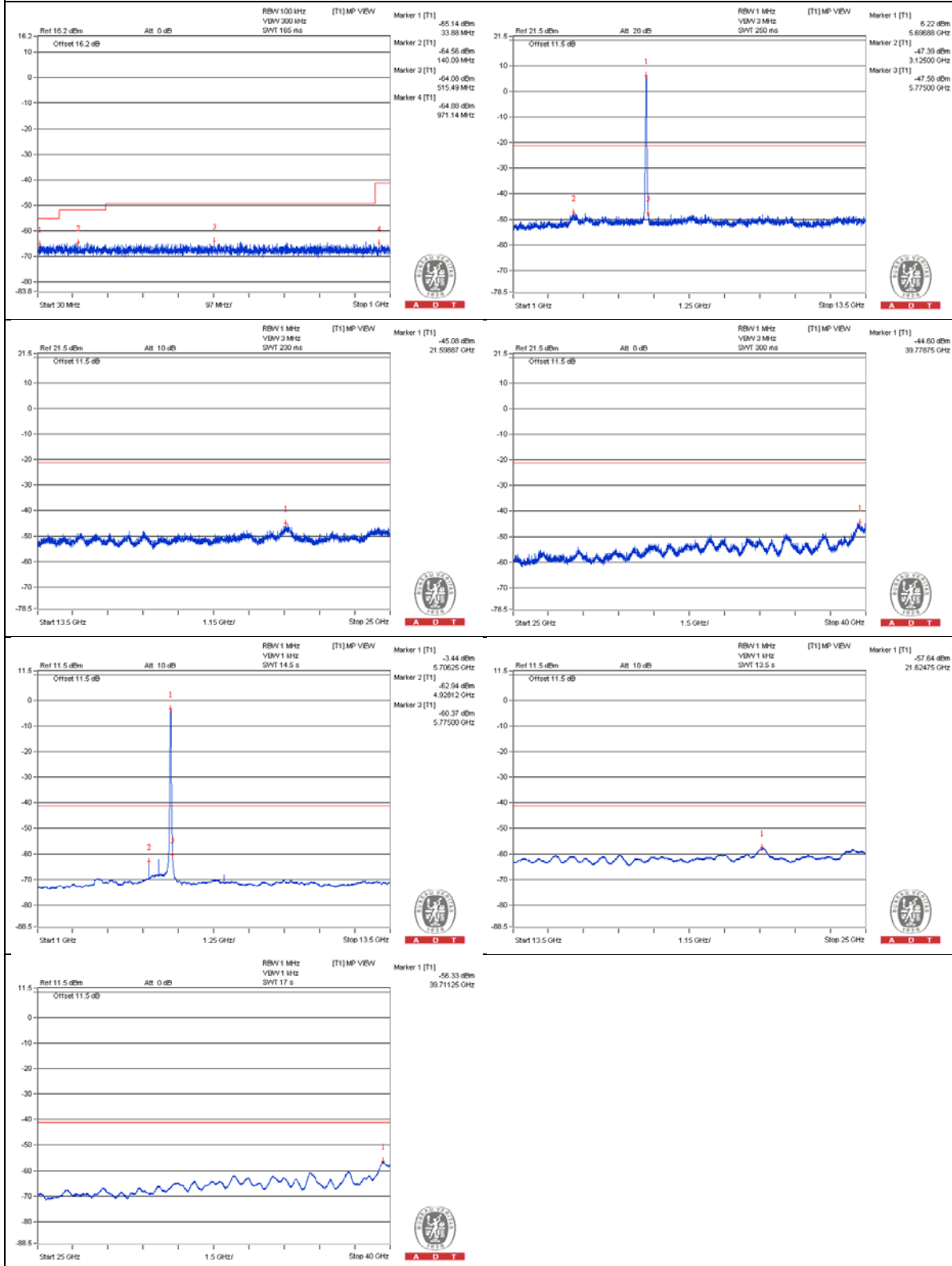
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3796.875 PK	55.67	74	-18.33	-51.47	-49.5	7.77	-39.59
2	3790.625 AV	34.76	54	-19.24	-71.44	-71.13	7.77	-60.5
3	7596.875 PK	56.65	74	-17.35	-50.62	-48.44	7.77	-38.61
4	7612.5 AV	36.42	54	-17.58	-68.38	-71.35	7.77	-58.84
5	11409.375 PK	54.38	74	-19.62	-52.22	-51.17	7.77	-40.88
6	11412.5 AV	33.75	54	-20.25	-72.24	-72.34	7.77	-61.51
7	17128.25 PK	55.03	74	-18.97	-51.93	-50.26	7.77	-40.23
8	17116.75 AV	43.76	54	-10.24	-62.29	-62.28	7.77	-51.5

Note :

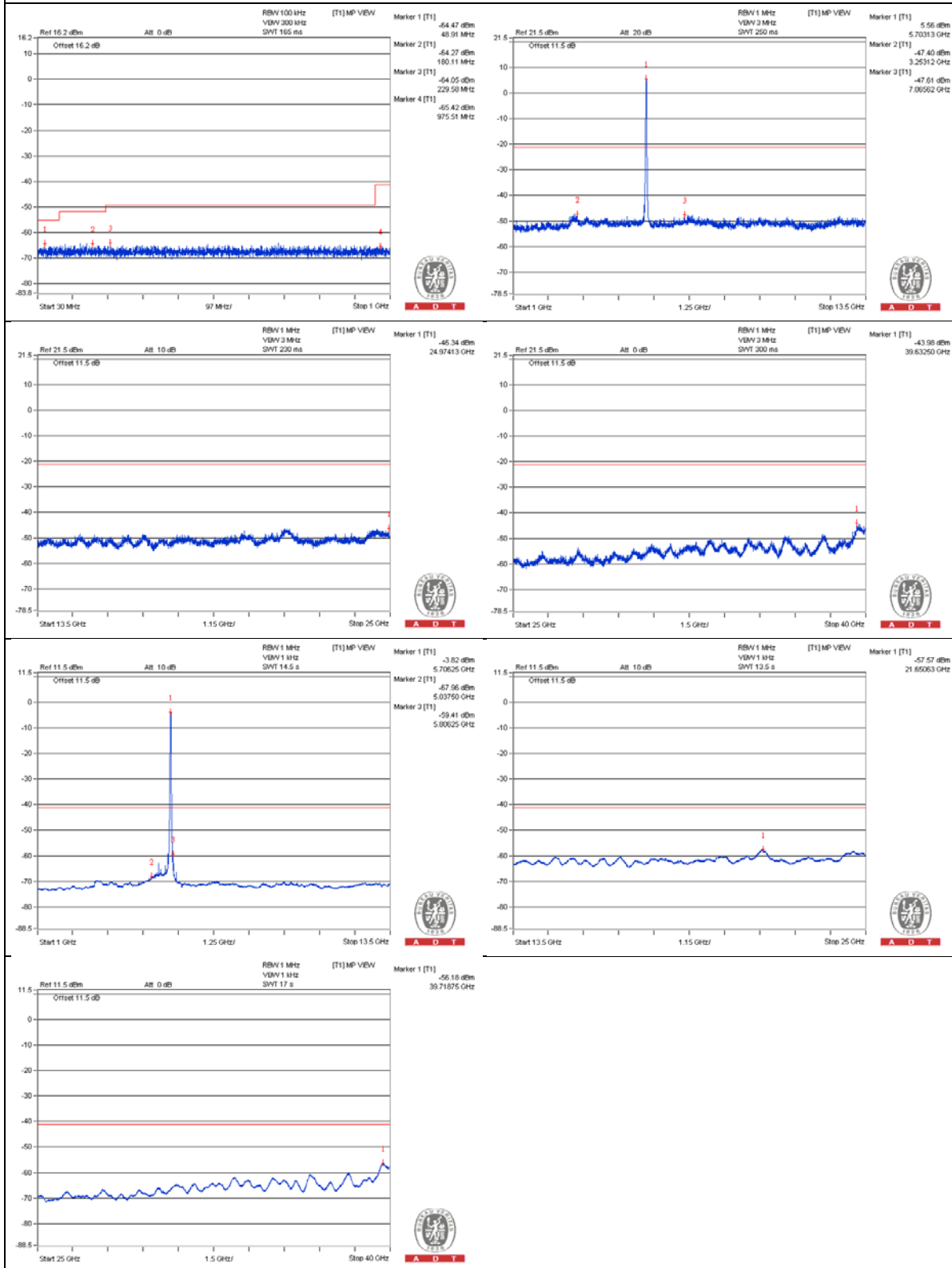
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

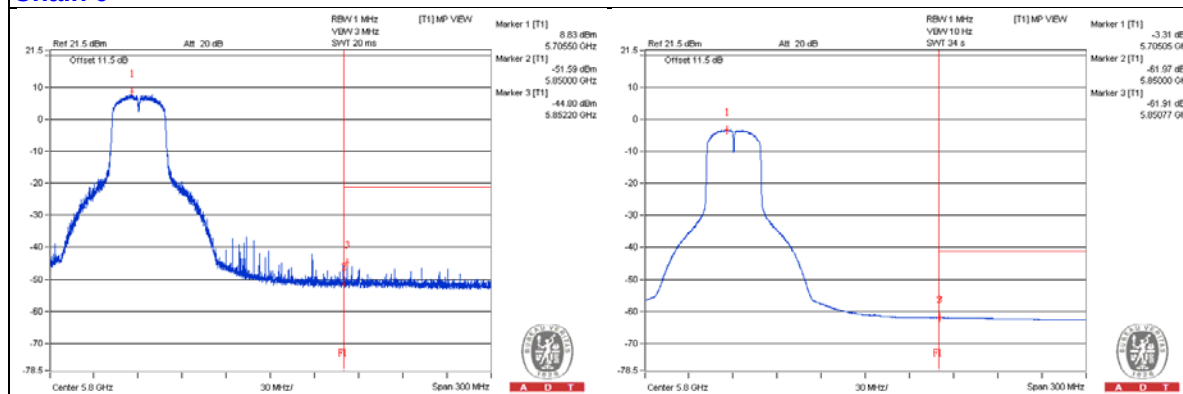
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5828.125 PK	61.44	74	-12.56	-42.13	-50.89	7.77	-33.82
2	5825.35 AV	44.23	54	-9.77	-61.84	-61.78	7.77	-51.03

Note :

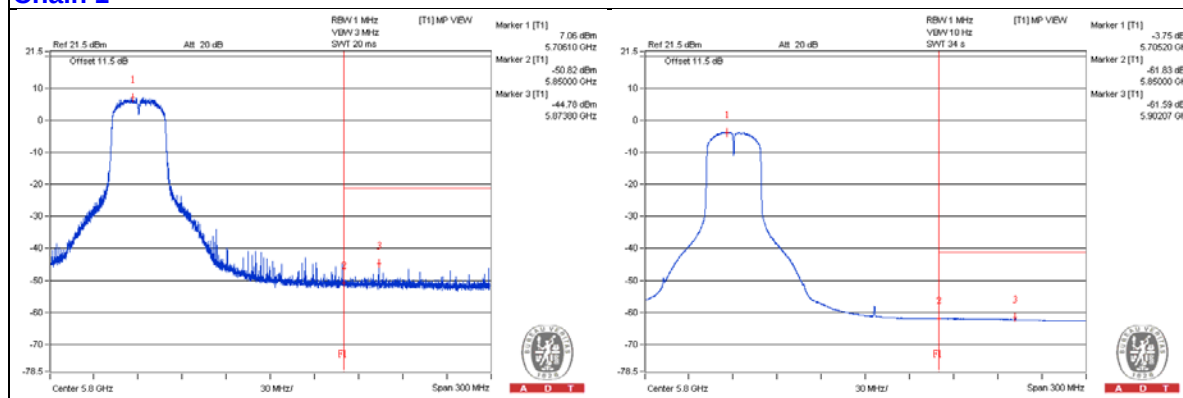
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ac (VHT80) - Channel 42

Conducted spurious emission table

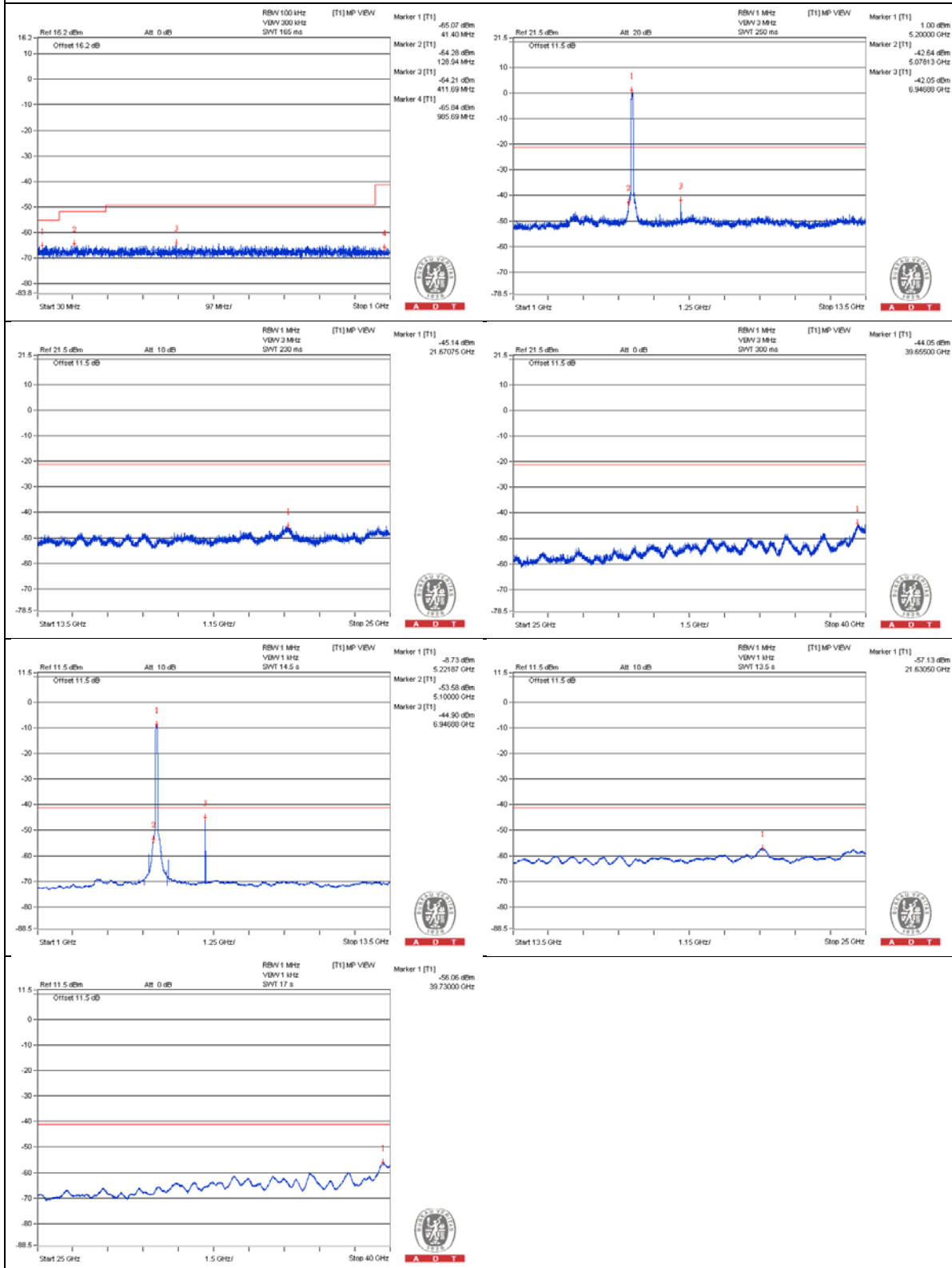
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3484.375 PK	55.15	74	-18.85	-48.12	-50.66	6.09	-40.11
2	3456.25 AV	33.52	54	-20.48	-70.86	-70.83	6.09	-61.74
3	6946.875 PK	61	68.2	-7.2	-42.05	-45.25	6.09	-34.26
4	10406.25 PK	54.61	74	-19.39	-49.82	-49.69	6.09	-40.65
5	10418.75 AV	33.27	54	-20.73	-70.89	-71.29	6.09	-61.99
6	15644.75 PK	52.97	74	-21.03	-50.76	-52.13	6.09	-42.29
7	15641.875 AV	41.85	54	-12.15	-62.46	-62.57	6.09	-53.41

Note :

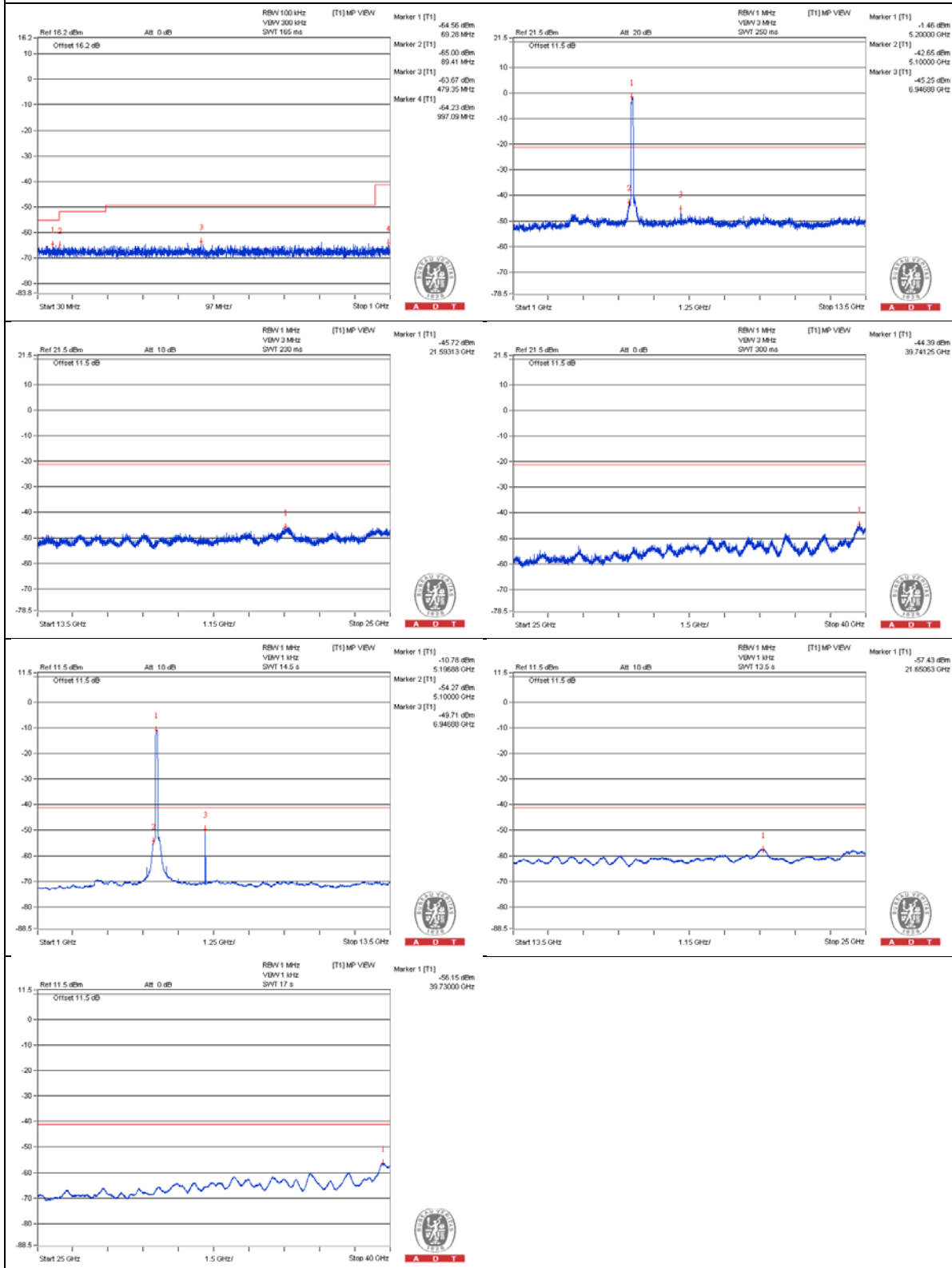
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

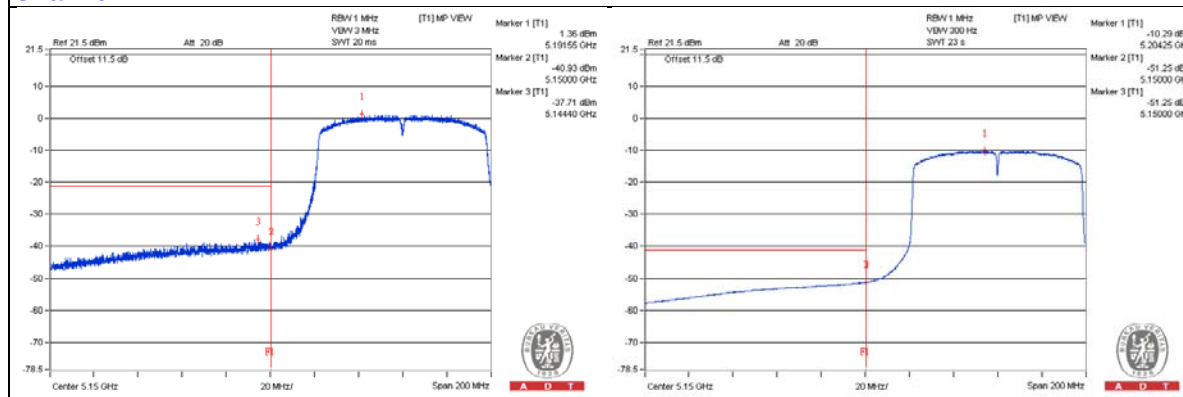
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5142.65 PK	64.86	74	-9.14	-37.72	-42.57	6.09	-30.4
2	5150 AV	51.95	54	-2.05	-51.25	-54.01	6.09	-43.31

Note :

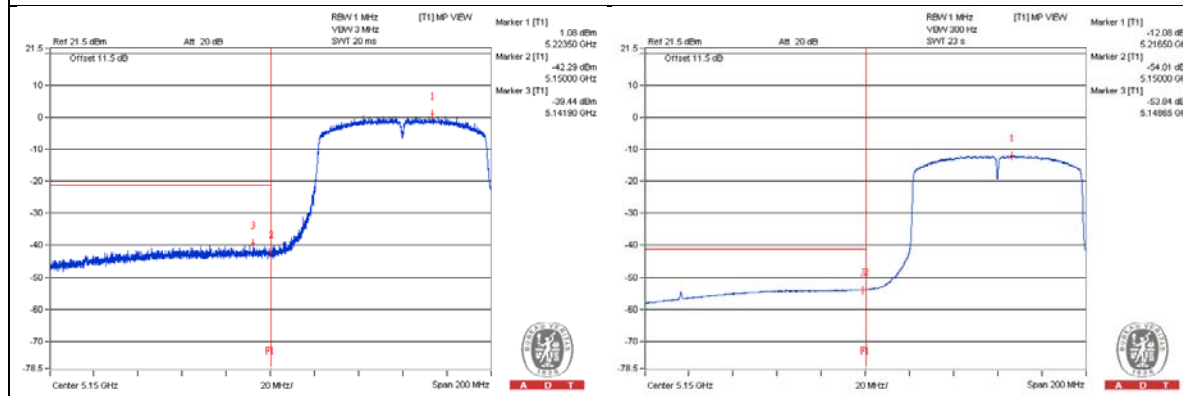
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ac (VHT80) - Channel 58

Conducted spurious emission table

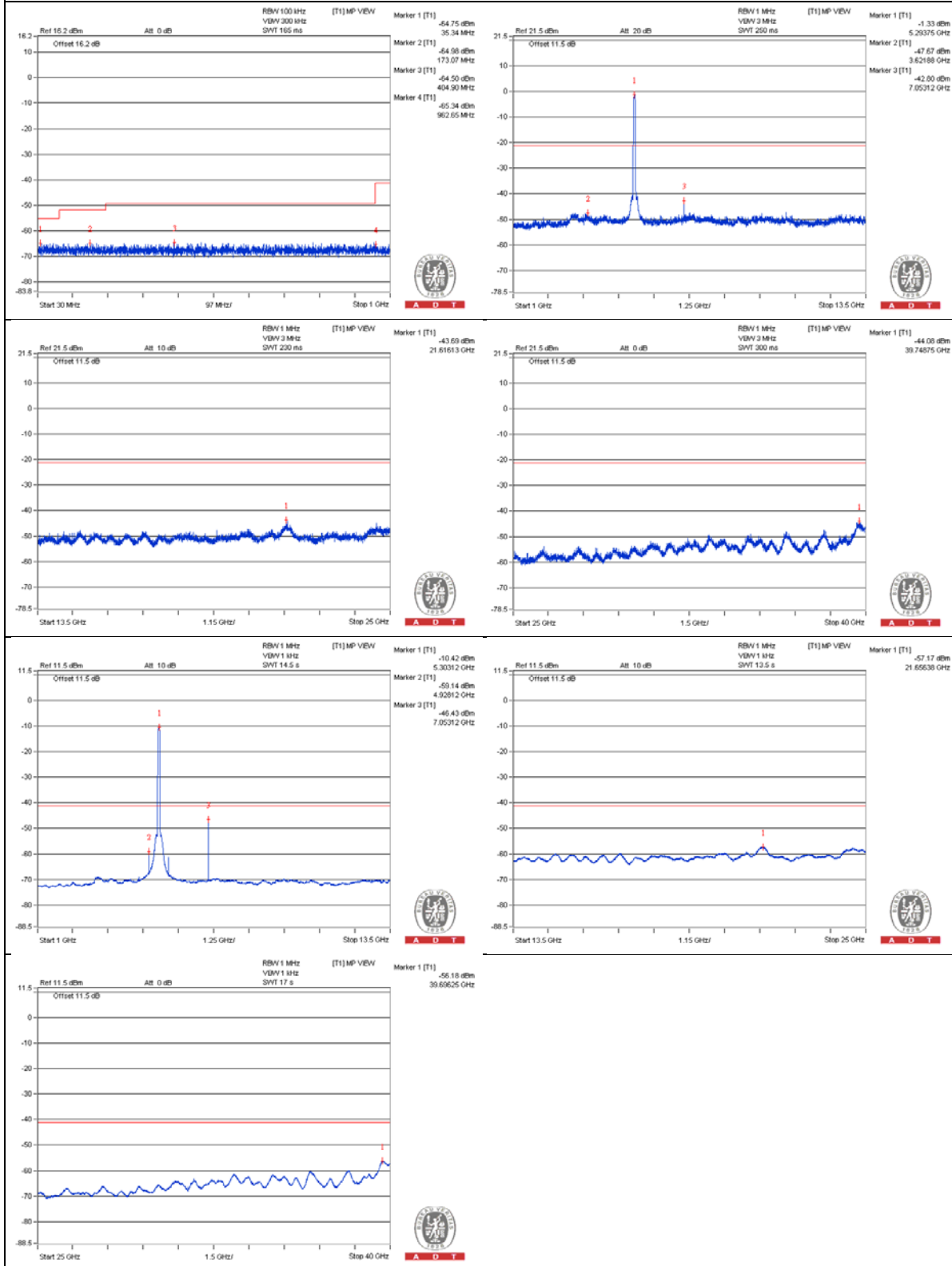
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3531.25 PK	56.02	74	-17.98	-47.92	-48.81	6.09	-39.24
2	3540.625 AV	34.32	54	-19.68	-69.95	-70.13	6.09	-60.94
3	7053.125 PK	60.09	68.2	-8.11	-42.8	-46.51	6.09	-35.17
4	10562.5 PK	54.44	74	-19.56	-50.04	-49.81	6.09	-40.82
5	10581.25 AV	33.39	54	-20.61	-71	-70.95	6.09	-61.87
6	15889.125 PK	54.39	74	-19.61	-49.93	-50.02	6.09	-40.87
7	15863.25 AV	43.14	54	-10.86	-61.3	-61.14	6.09	-52.12

Note :

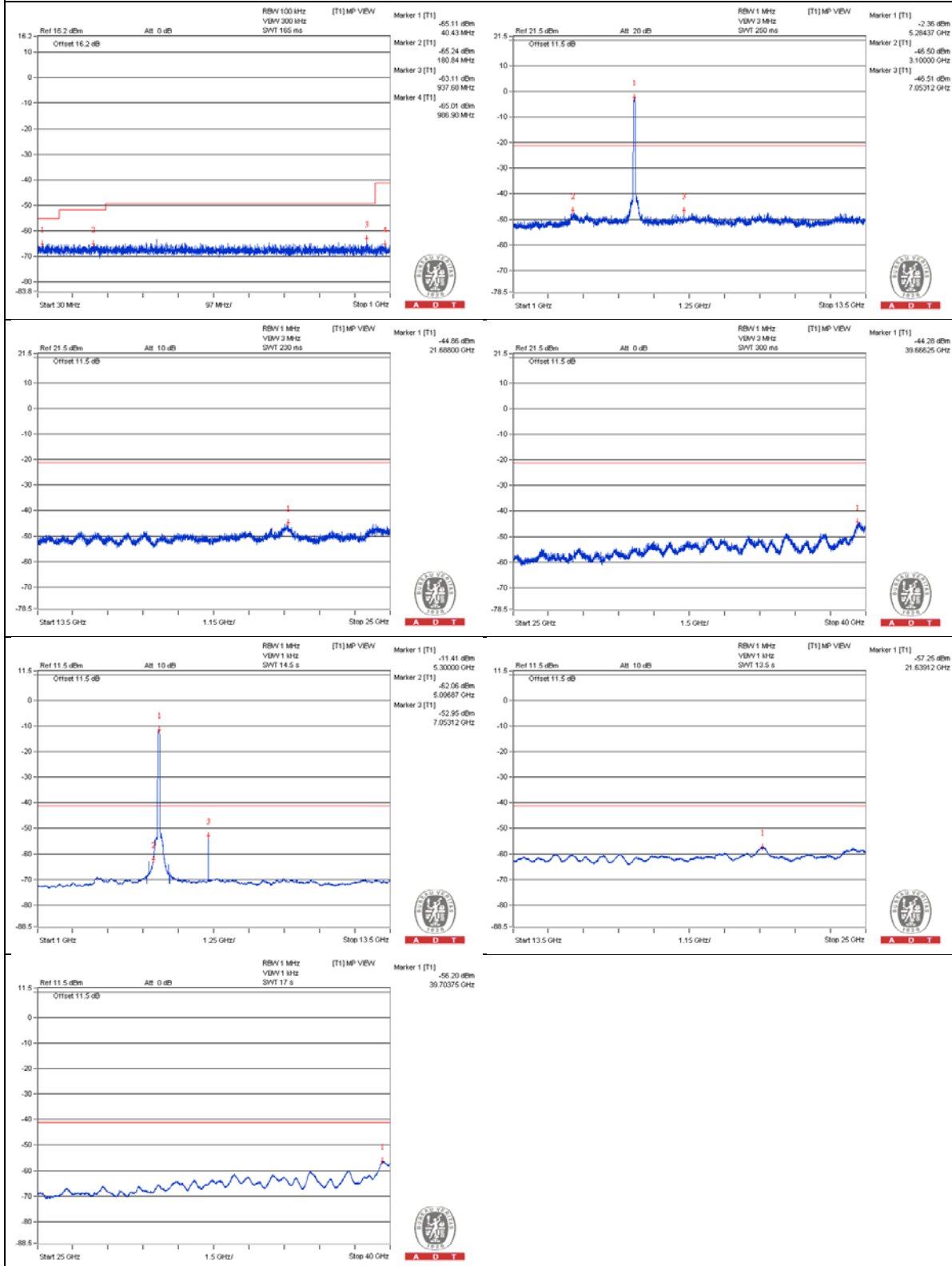
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

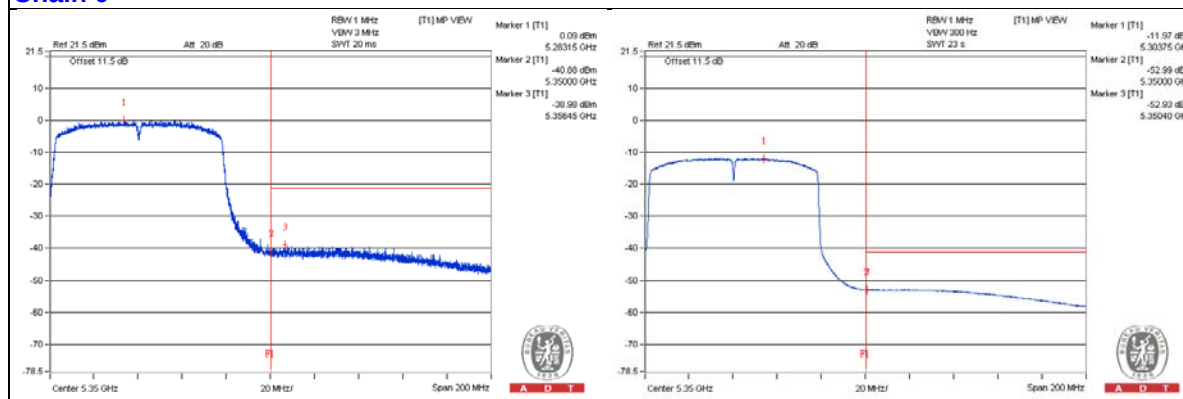
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5394.7 PK	64.24	74	-9.76	-39.74	-40.53	6.09	-31.02
2	5386 AV	51.83	54	-2.17	-53.22	-51.94	6.09	-43.43

Note :

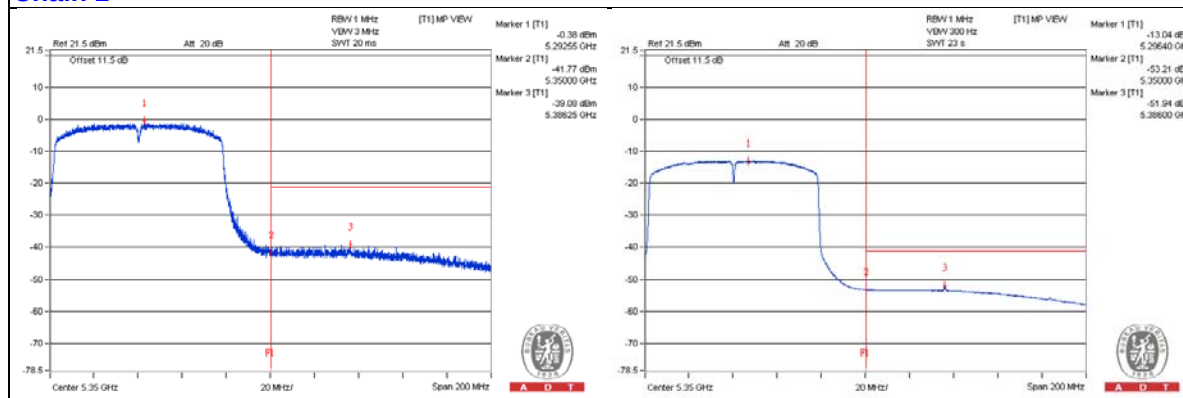
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ac (VHT80) - Channel 106

Conducted spurious emission table

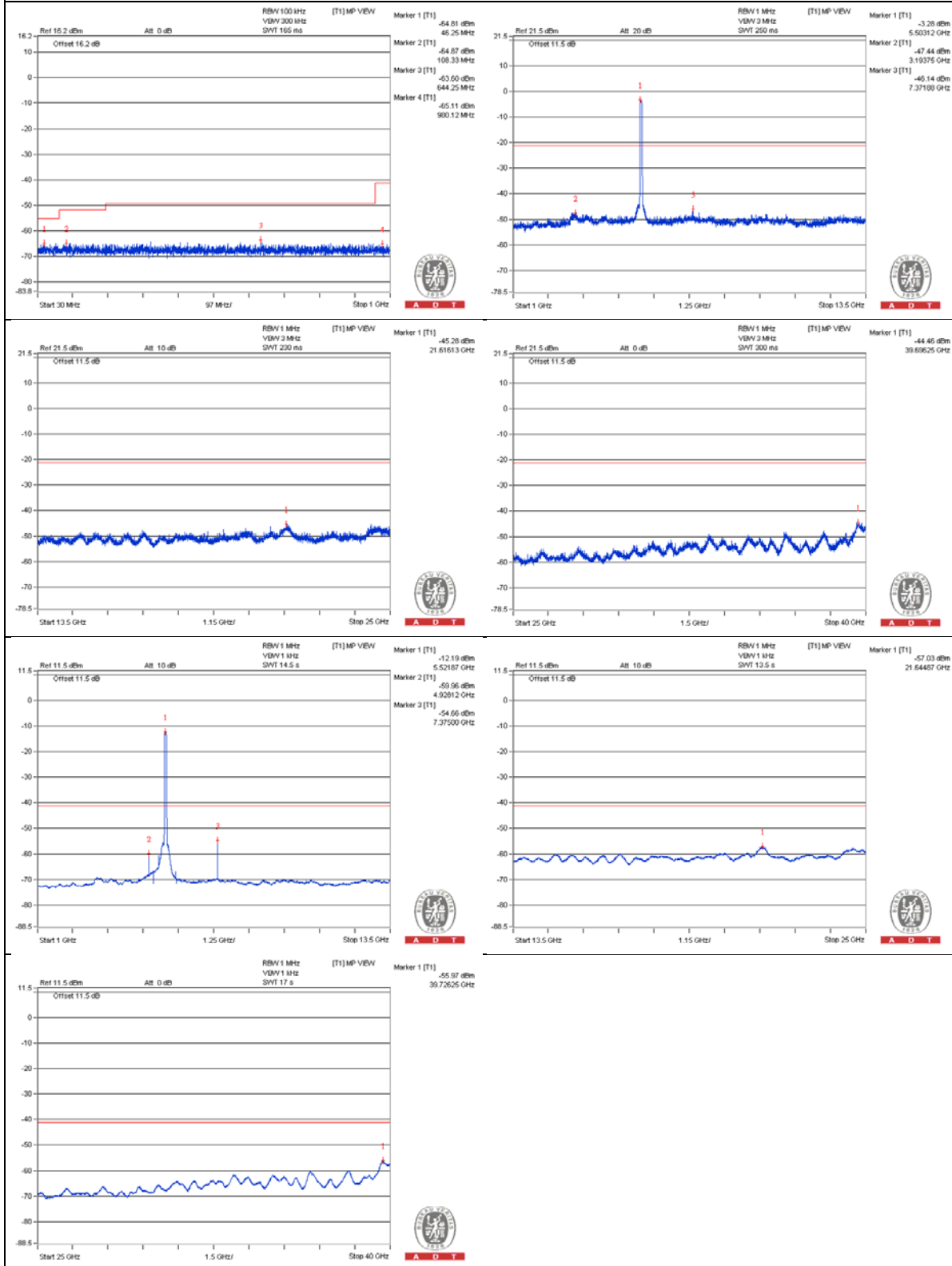
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3678.125 PK	56.87	74	-17.13	-49.7	-48.7	7.77	-38.39
2	3687.5 AV	35.61	54	-18.39	-70.27	-70.59	7.77	-59.65
3	7371.875 PK	58.4	74	-15.6	-46.14	-49.94	7.77	-36.86
4	7371.875 AV	48.5	54	-5.5	-54.67	-69.5	7.77	-46.76
5	11059.375 PK	55.25	74	-18.75	-51.14	-50.47	7.77	-40.01
6	11065.625 AV	33.93	54	-20.07	-71.96	-72.27	7.77	-61.33
7	16582 PK	54.47	74	-19.53	-52.72	-50.67	7.77	-40.79
8	16570.5 AV	43.24	54	-10.76	-62.64	-62.96	7.77	-52.02

Note :

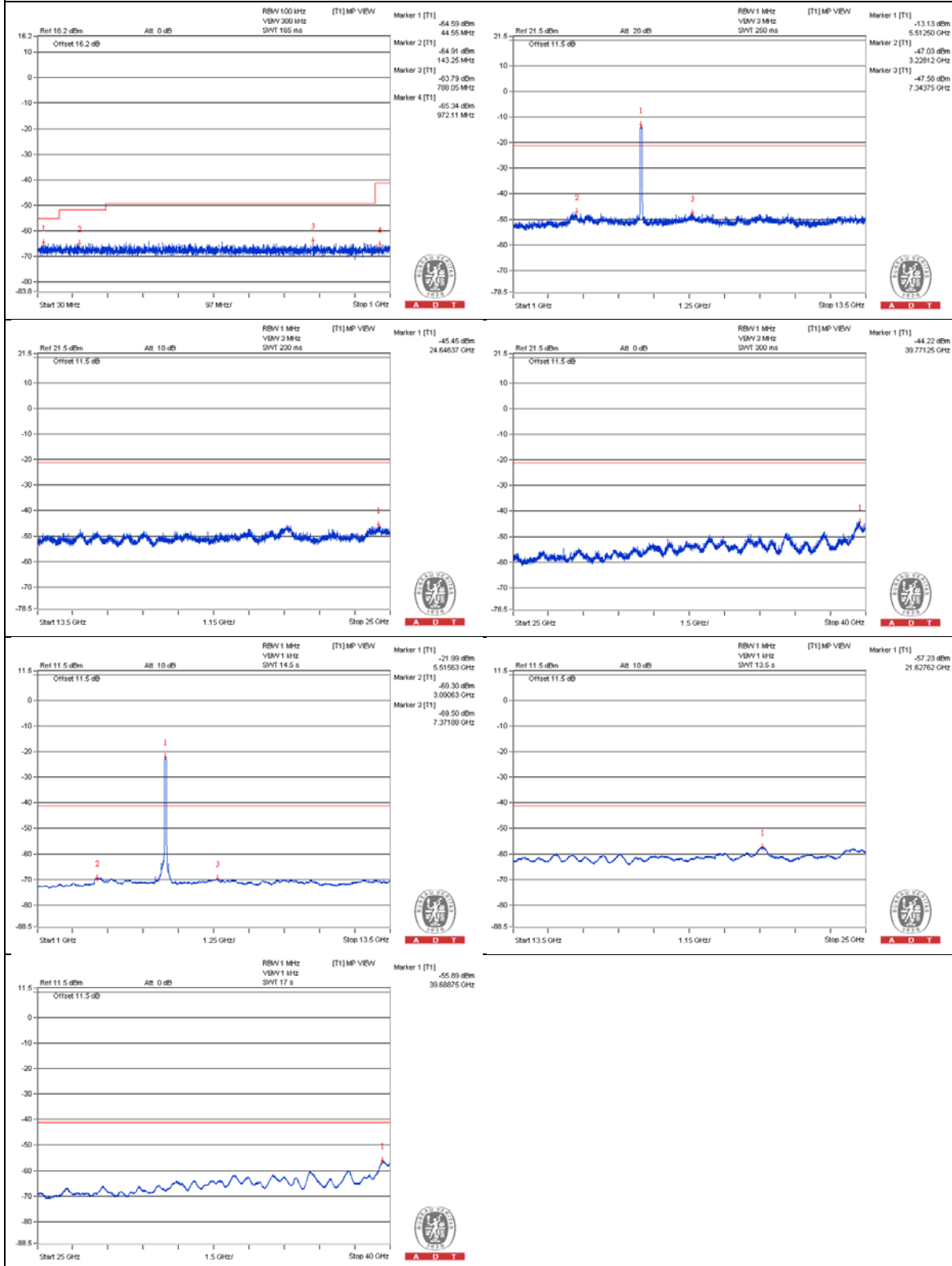
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

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	5465.6875 PK	71.01	74	-2.99	-44.44	-32.28	7.77	-24.25
2	5468.1875 AV	56.98	54	* 2.98	-55.79	-46.54	7.77	-38.28

Note :

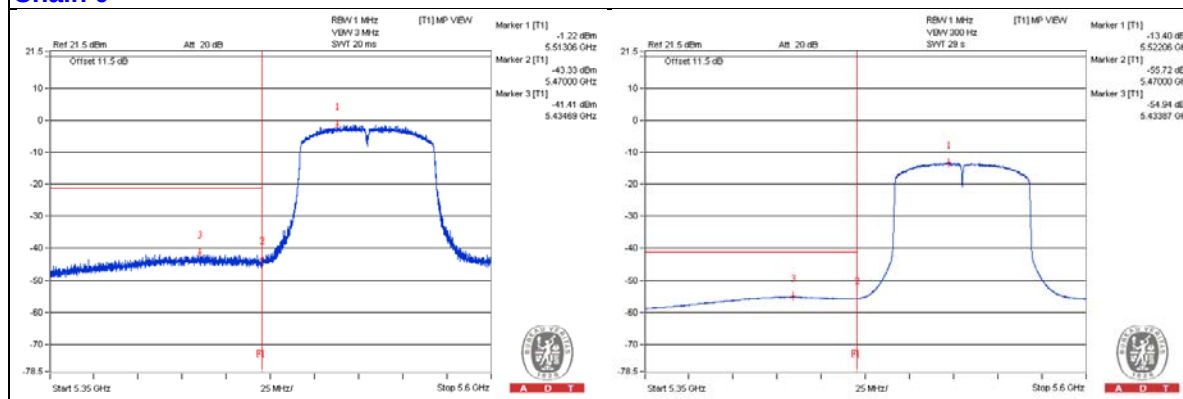
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

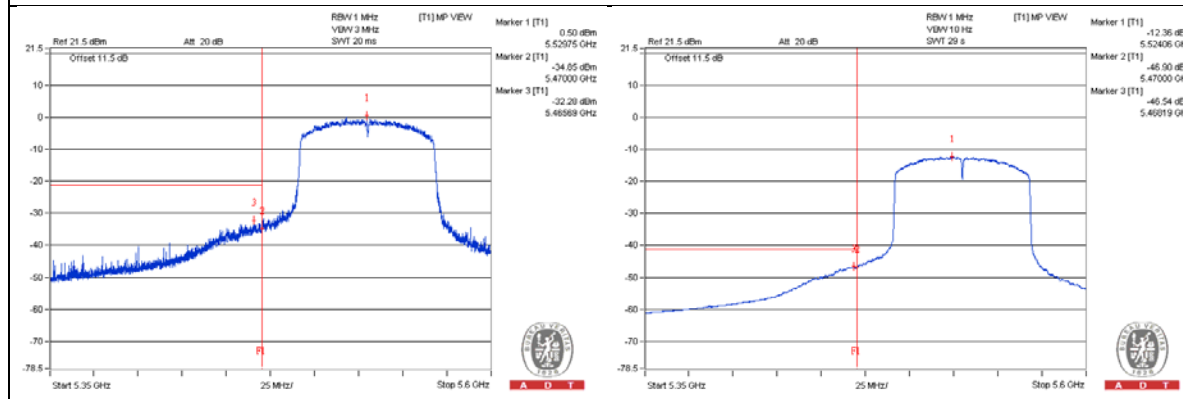
* The unwanted emission was verified and the test result was passed by radiated measurement.

(Please refer APPENDIX A)

Chain 0



Chain 1



802.11ac (VHT80) - Channel 122

Conducted spurious emission table

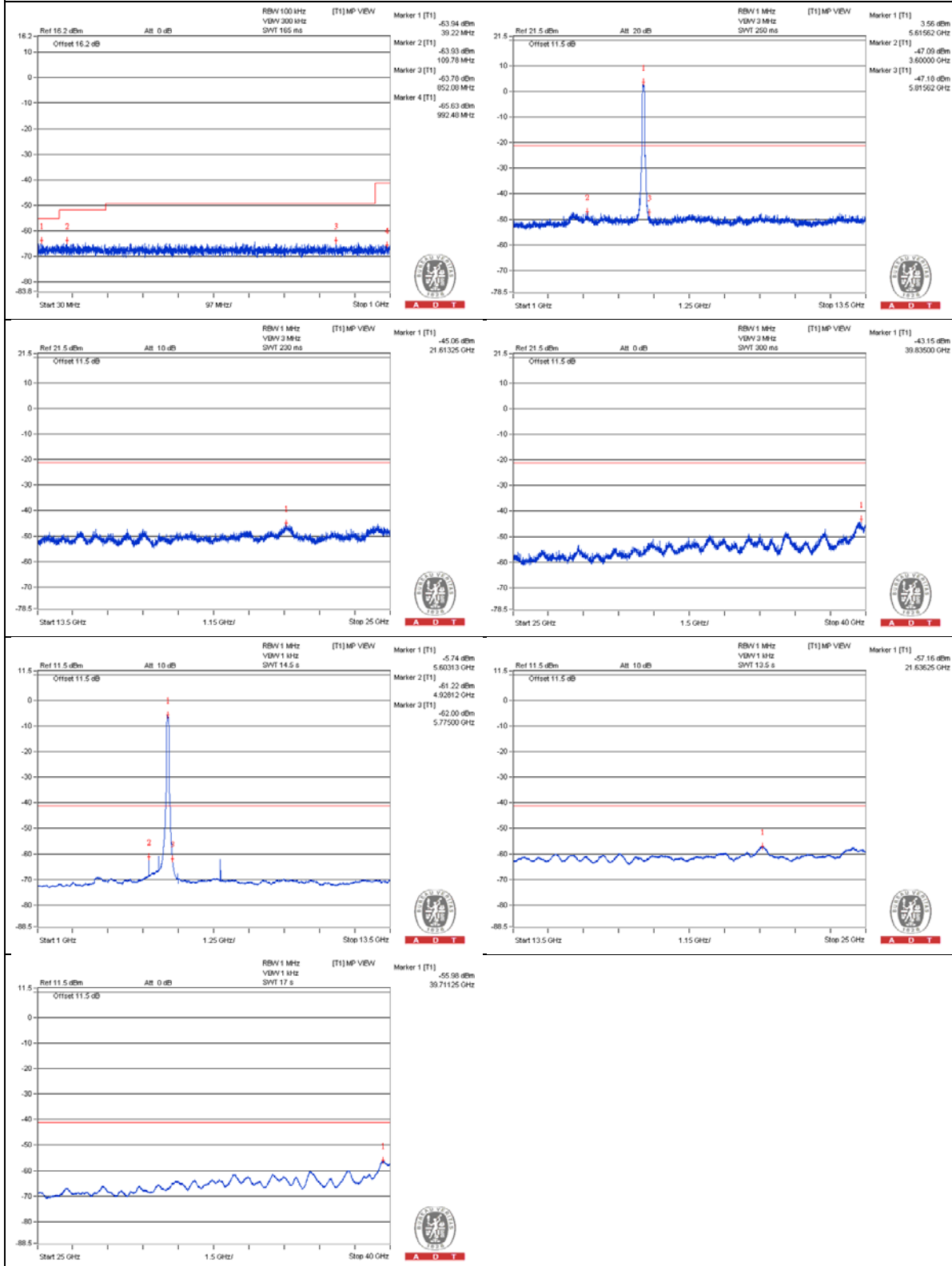
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3750 PK	56.5	74	-17.5	-49.02	-50.13	7.77	-38.76
2	3737.5 AV	35.69	54	-18.31	-70.17	-70.54	7.77	-59.57
3	7493.75 PK	56.52	74	-17.48	-48.74	-50.46	7.77	-38.74
4	7481.25 AV	41.56	54	-12.44	-62.05	-70.52	7.77	-53.7
5	11206.25 PK	55.52	74	-18.48	-50.07	-51.02	7.77	-39.74
6	11221.875 AV	34.58	54	-19.42	-71.52	-71.4	7.77	-60.68
7	16846.5 PK	56.53	74	-17.47	-48.66	-50.56	7.77	-38.73
8	16846.5 AV	44.7	54	-9.3	-61.2	-61.49	7.77	-50.56

Note :

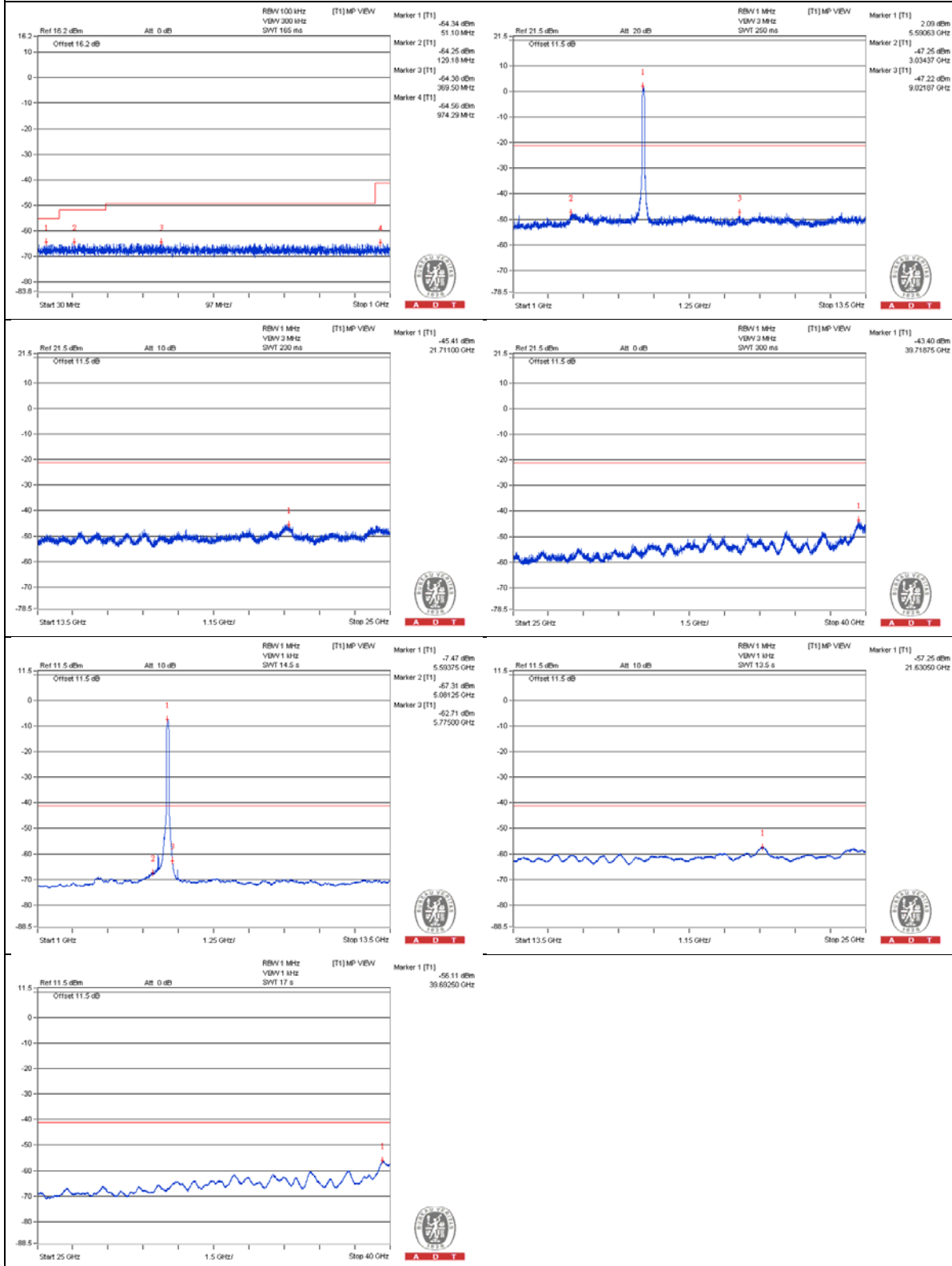
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

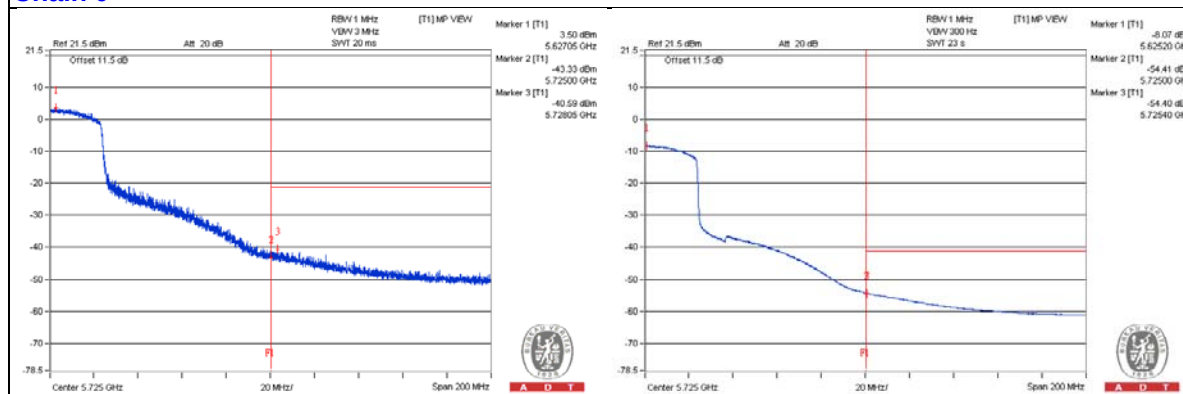
No.	Frequency (MHz)	Emission Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5730.15 PK	64.62	74	-9.38	-42.38	-40.64	7.77	-30.64
2	5725 AV	51.3	54	-2.7	-54.41	-55.1	7.77	-43.96

Note :

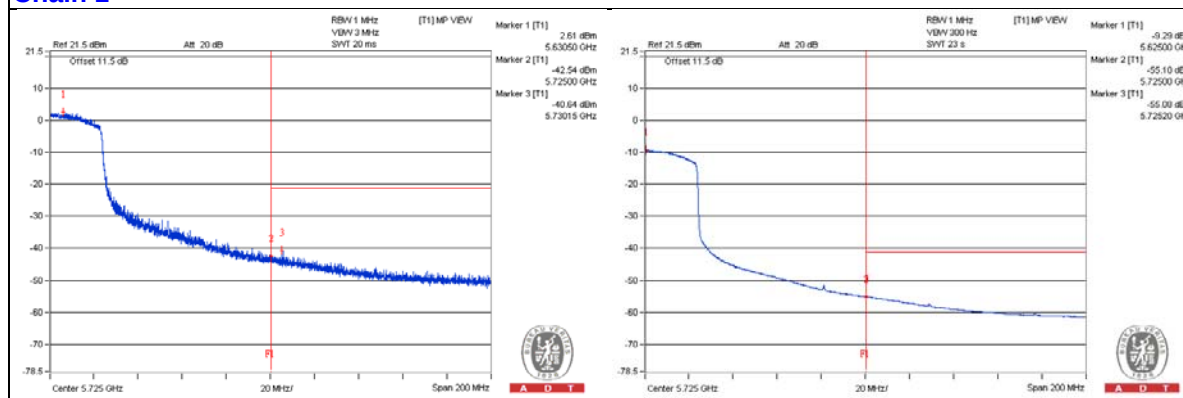
Emission Level (dBUV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



802.11ac (VHT80) - Channel 138

Conducted spurious emission table

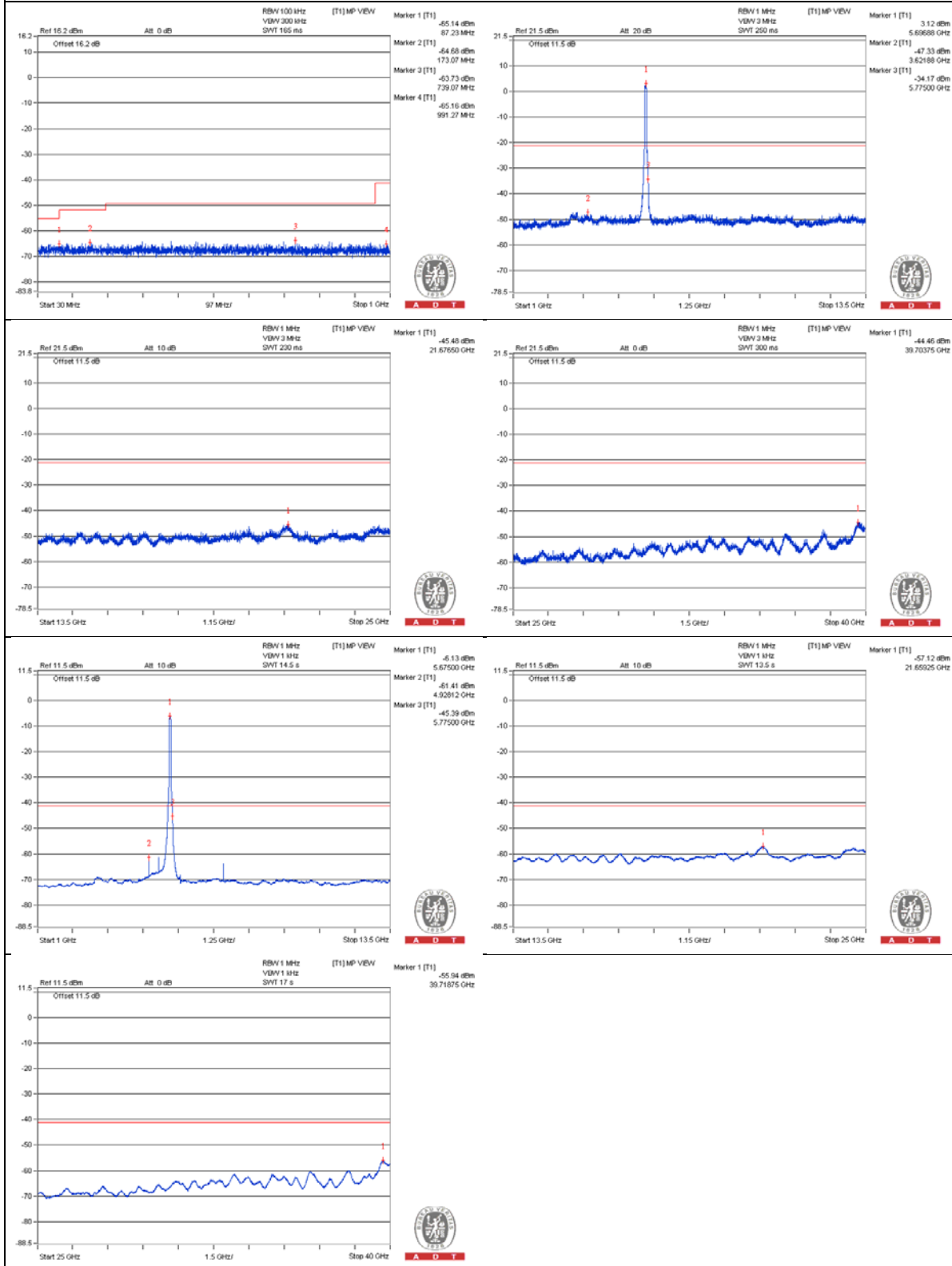
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	3784.375 PK	56.51	74	-17.49	-49.83	-49.25	7.77	-38.75
2	3775 AV	35.58	54	-18.42	-70.24	-70.7	7.77	-59.68
3	7606.25 PK	56.79	74	-17.21	-48.6	-50.01	7.77	-38.47
4	7587.5 AV	39.91	54	-14.09	-64	-70.51	7.77	-55.35
5	11375 PK	55.4	74	-18.6	-50.65	-50.63	7.77	-39.86
6	11378.125 AV	34.49	54	-19.51	-71.38	-71.73	7.77	-60.77
7	17070.75 PK	56.68	74	-17.32	-50.22	-48.65	7.77	-38.58
8	17062.125 AV	45.07	54	-8.93	-60.96	-60.99	7.77	-50.19

Note :

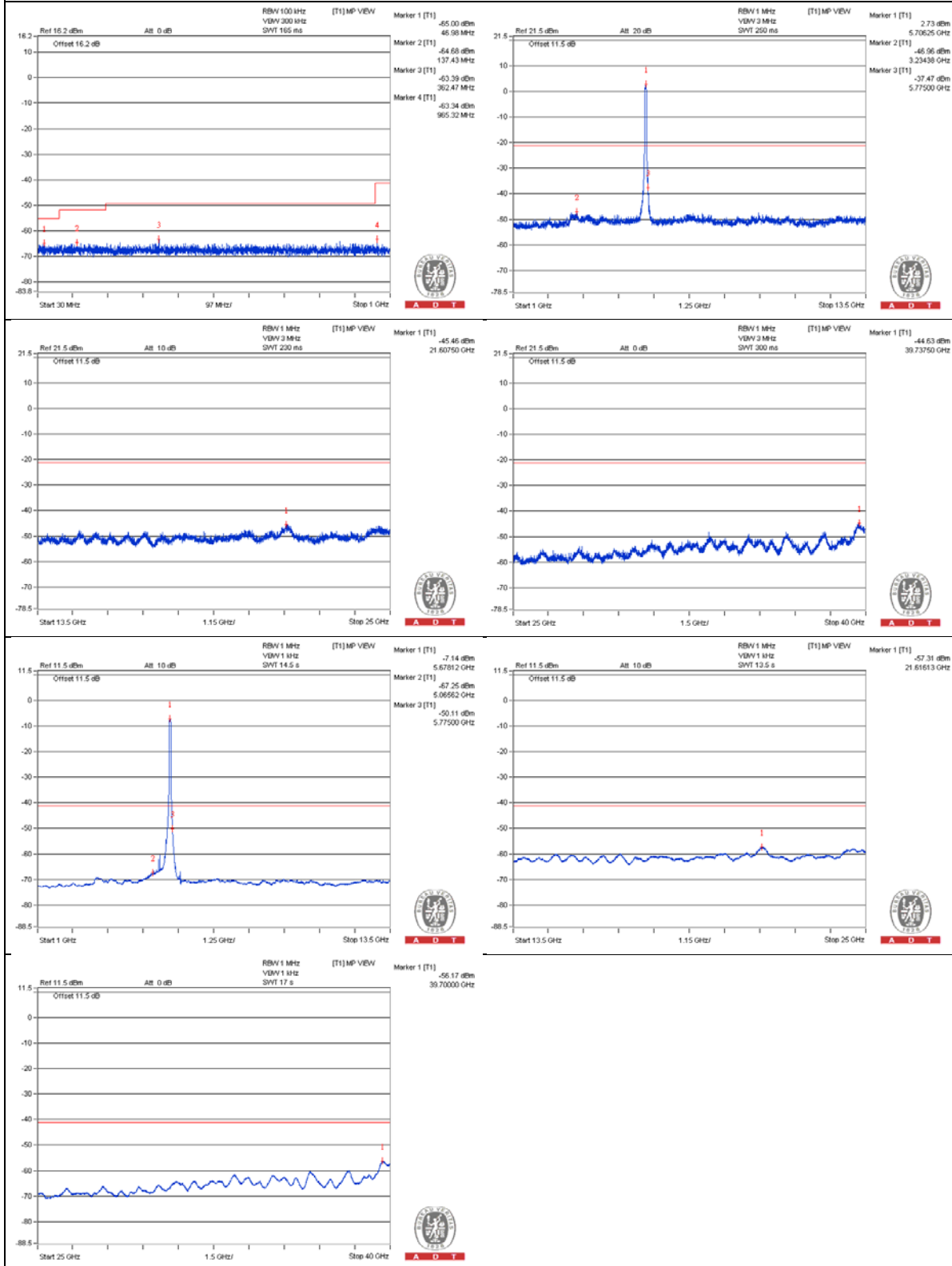
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Bandedge table

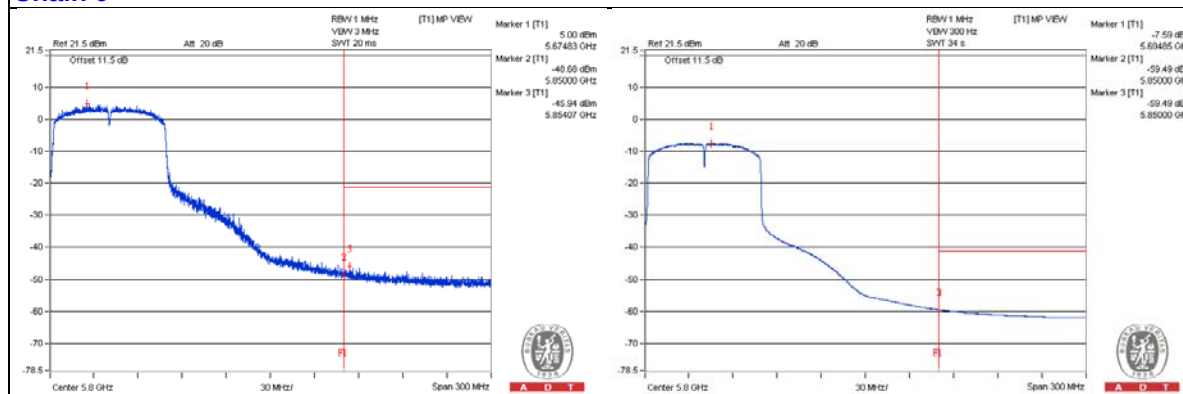
No.	Frequency (MHz)	Emission Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	5834.05 PK	60.61	74	-13.39	-46.36	-44.66	7.77	-34.65
2	5825.05 AV	48.29	54	-5.71	-57.57	-57.93	7.77	-46.97

Note :

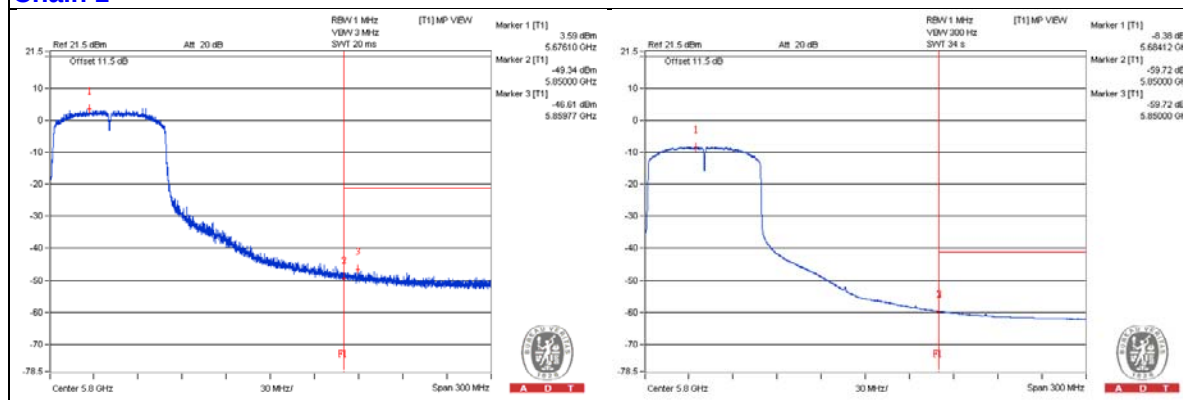
Emission Level (dBUV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1



Below 1GHz Data

802.11ac (VHT20) - Channel 60

Conducted spurious emission table

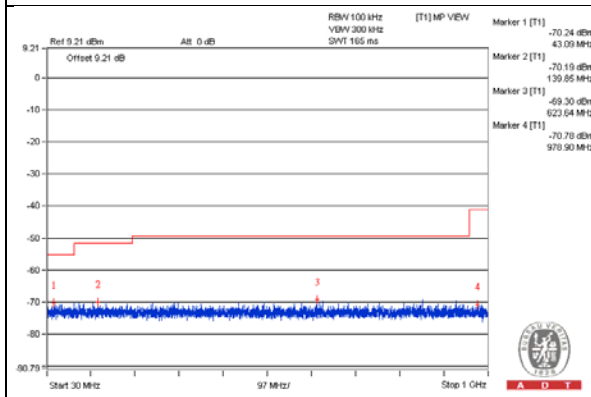
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value (dBm)		Correction Factor (dB)	EIRP Level (dBm)
					Chain0	Chain1		
1	55.705	35.29	40	-4.71	-72.93	-69.31	7.77	-59.97
2	139.8525	35.12	43.5	-8.38	-70.19	-71.8	7.77	-60.14
3	310.0875	35.26	46	-10.74	-70.45	-71.13	7.77	-60
4	505.0575	35.02	46	-10.98	-71.16	-70.88	7.77	-60.24
5	631.6425	35.33	46	-10.67	-71.82	-69.83	7.77	-59.93
6	857.1675	35.8	46	-10.2	-69.31	-71.42	7.77	-59.46

Note :

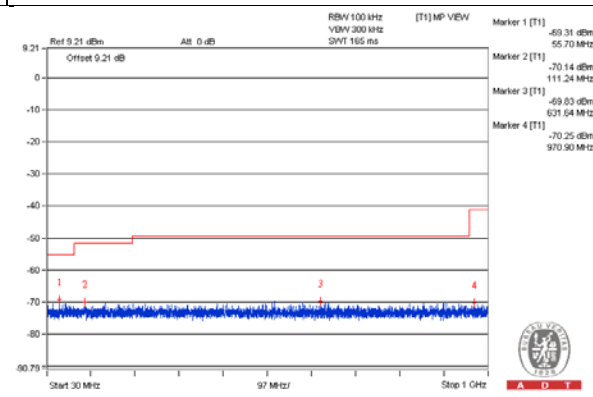
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8

d = measurement distance in 3 meters.

Chain 0



Chain 1

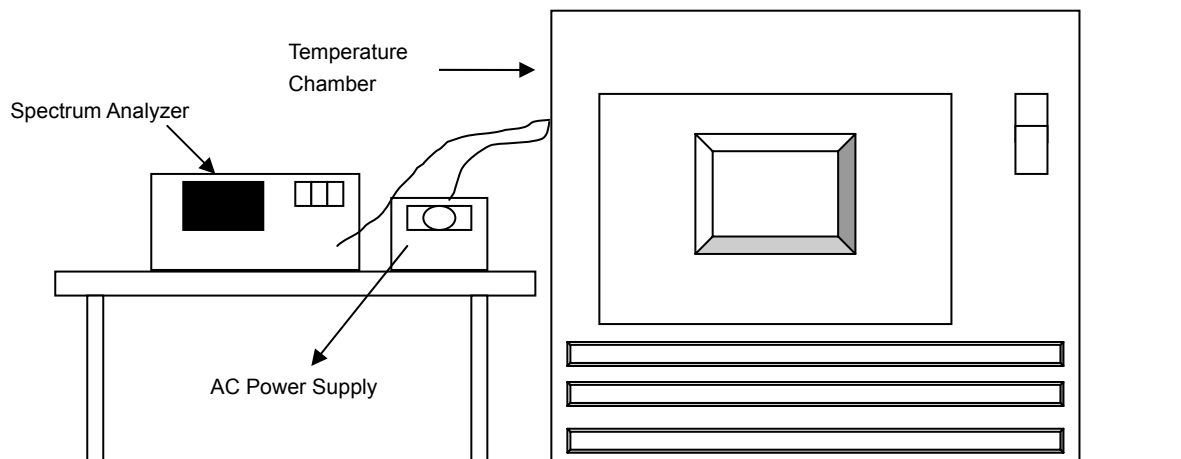


4.5 Frequency Stability Measurement

4.5.1 Limits of Frequency Stability Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 08, 2014	May 07, 2015
Temperature & Humidity Chamber GIANTFORCE	GTH-150-40-S P-AR	MAA0812-008	Jan. 12, 2015	Jan. 11, 2016

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. Tested date :Feb. 09, 2015

4.5.4 Test Procedures

- a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- b. Turn the EUT on and couple its output to a spectrum analyzer.
- c. Turn the EUT off and set the chamber to the highest temperature specified.
- d. 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.
- e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- f. 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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

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

4.5.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5320MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5319.988	-0.00023	5319.9873	-0.00024	5319.9847	-0.00029	5319.9838	-0.00030
40	120	5319.9931	-0.00013	5319.9917	-0.00016	5319.9935	-0.00012	5319.9952	-0.00009
30	120	5319.9796	-0.00038	5319.9797	-0.00038	5319.977	-0.00043	5319.9778	-0.00042
20	120	5319.9958	-0.00008	5319.9982	-0.00003	5320.0001	0.00000	5319.9964	-0.00007
10	120	5320.0208	0.00039	5320.0204	0.00038	5320.0197	0.00037	5320.0206	0.00039
0	120	5320.0152	0.00029	5320.0143	0.00027	5320.0167	0.00031	5320.0155	0.00029
-10	120	5320.017	0.00032	5320.0167	0.00031	5320.0173	0.00033	5320.0174	0.00033
-20	120	5320.0027	0.00005	5320.0055	0.00010	5320.0044	0.00008	5320.0041	0.00008
-30	120	5320.0018	0.00003	5320.0016	0.00003	5320.0001	0.00000	5319.9983	-0.00003

Frequency Stability Versus Temp.									
Operating Frequency: 5320MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5319.9959	-0.00008	5319.9988	-0.00002	5320.001	0.00002	5319.9954	-0.00009
	120	5319.9958	-0.00008	5319.9982	-0.00003	5320.0001	0.00000	5319.9964	-0.00007
	102	5319.9967	-0.00006	5319.9992	-0.00002	5320.0009	0.00002	5319.9954	-0.00009

4.6 Conducted Emission Measurement

4.6.1 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.

4.6.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	100375	Apr. 29, 2014	Apr. 28, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ENV216	100071	Nov. 10, 2014	Nov. 09, 2015
RF Cable (JYBAO)	5DFB	COCCAB-001	Mar. 10, 2014	Mar. 09, 2015
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software ADT	BV ADT_Cond_V7.3.7. 3	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 Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: Feb. 11, 2015

4.6.3 Test Procedures

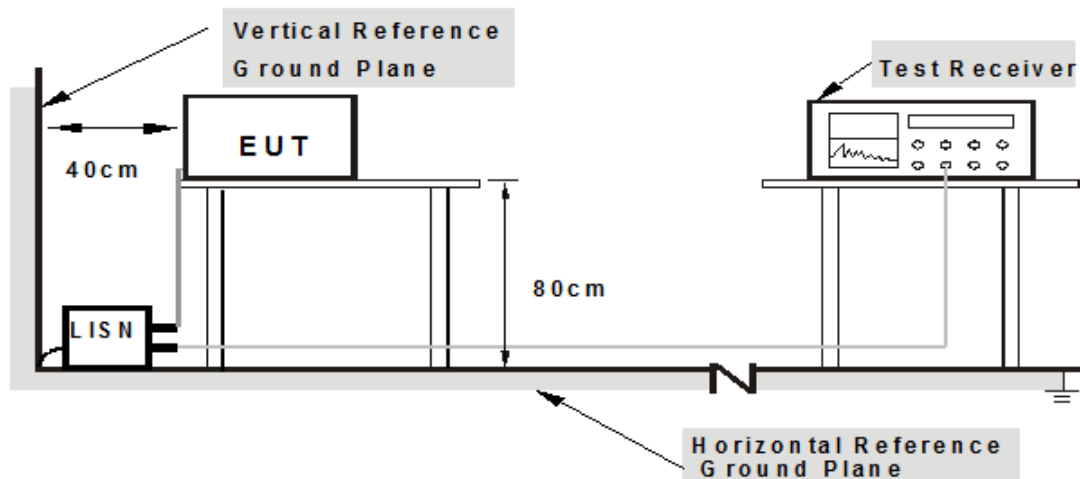
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

4.6.4 Deviation from Test Standard

No deviation.

4.6.5 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).

4.6.6 EUT Operating Conditions

Same as 4.4.6.

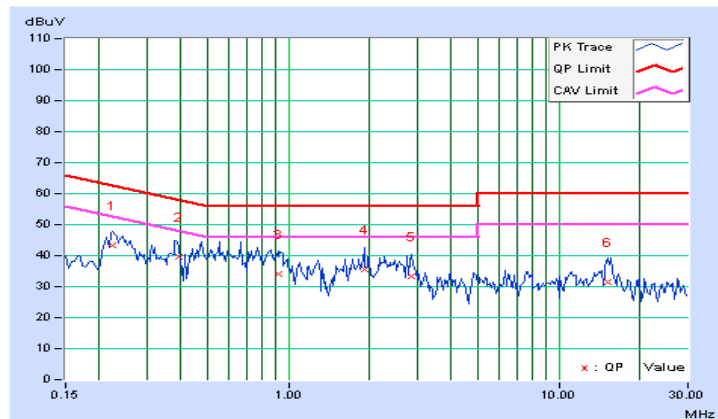
4.6.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.22422	0.07	43.24	32.40	43.31	32.47	62.66	52.66	-19.35	-20.19
2	0.39547	0.09	39.40	32.46	39.49	32.55	57.95	47.95	-18.46	-15.40
3	0.91563	0.12	33.84	24.72	33.96	24.84	56.00	46.00	-22.04	-21.16
4	1.90234	0.18	35.54	29.52	35.72	29.70	56.00	46.00	-20.28	-16.30
5	2.86328	0.21	33.04	25.08	33.25	25.29	56.00	46.00	-22.75	-20.71
6	15.15625	0.59	30.78	21.82	31.37	22.41	60.00	50.00	-28.63	-27.59

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

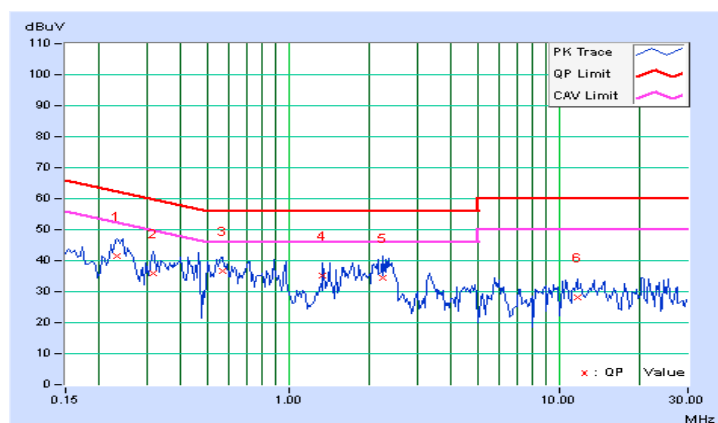


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.23203	0.06	41.52	31.68	41.58	31.74	62.38	52.38	-20.79	-20.63
2	0.31797	0.08	35.72	30.10	35.80	30.18	59.76	49.76	-23.96	-19.58
3	0.56797	0.10	36.52	27.00	36.62	27.10	56.00	46.00	-19.38	-18.90
4	1.34375	0.15	35.08	28.28	35.23	28.43	56.00	46.00	-20.77	-17.57
5	2.22266	0.19	34.08	28.10	34.27	28.29	56.00	46.00	-21.73	-17.71
6	11.66016	0.51	27.58	19.12	28.09	19.63	60.00	50.00	-31.91	-30.37

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



5 Pictures of Test Arrangements

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

6 Appendix A – Information on 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 accredited and approved according to ISO/IEC 17025.

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab/Telecom Lab

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety

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.

7 Appendix B – Radiated Emission Measurement

7.1.1 Limits of Radiated Emission 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	$2400/F(\text{kHz})$	300
0.490-1.705	$24000/F(\text{kHz})$	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.

7.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY51210105	July 21,2014	July 20,2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 26, 2014	Feb. 25, 2015
RF Cable	NA	CHGCAB_001	Oct. 04, 2014	Oct. 03, 2015
Horn_Antenna AISI	AIH.8018	0000320091110	Aug. 27, 2014	Aug. 26, 2015
Pre-Amplifier Agilent	8449B	3008A02578	June 24, 2014	June 23, 2015
RF Cable	NA	131205 131214 SNMY23684/4	Jan. 16, 2015	Jan. 15, 2016
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier EMCI	EMC184045	980143	Jan. 16, 2015	Jan. 15, 2016
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Aug. 26, 2014	Aug. 25, 2015
RF Cable	NA	RF104-121 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Antenna Tower & Turn Table CT	NA	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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. G.
4. The FCC Site Registration No. is 966073.
5. The VCCI Site Registration No. is G-137.
6. The CANADA Site Registration No. is IC 7450H-2.
7. Tested Date: Feb. 06, 2015

7.1.3 Test Procedures

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

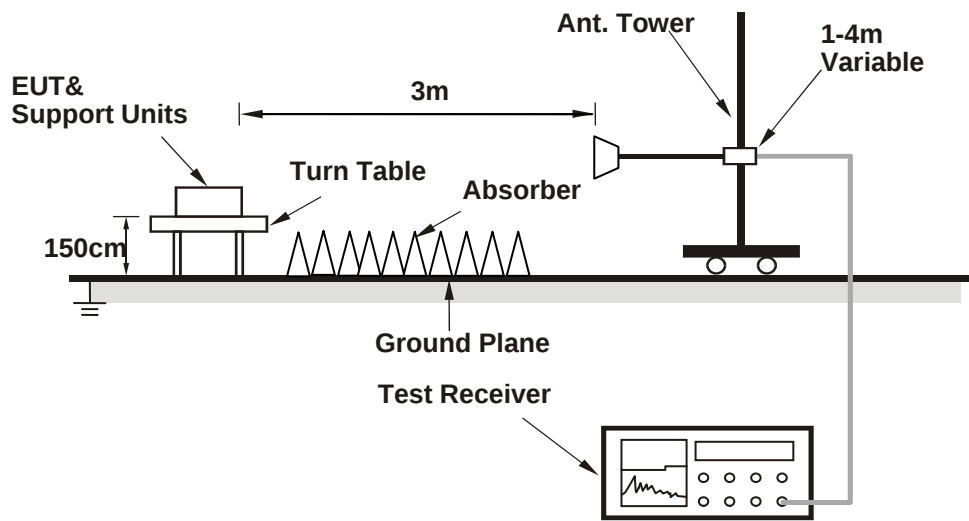
NOTE:

1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test
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 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. 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.
5. All modes of operation were investigated and the worst-case emissions are reported.

7.1.4 Deviation from Test Standard

No deviation

7.1.5 Test Setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.1.6 EUT Operating Conditions

Same as 4.4.6.

7.1.7 Test Results

The EUT's antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.

802.11ac (VHT40)

CHANNEL	TX Channel 102	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	63.2 PK	74.0	-10.8	1.02 H	311	55.27	7.93
2	#5470.00	48.4 AV	54.0	-5.6	1.02 H	311	40.47	7.93
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	64.9 PK	74.0	-9.1	1.05 V	85	56.97	7.93
2	#5470.00	51.0 AV	54.0	-3.0	1.05 V	85	43.07	7.93

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 radiated frequency is out of the restricted band.

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	59.6 PK	74.0	-14.4	1.10 H	141	54.67	4.93
2	#5715.00	50.9 AV	54.0	-3.1	1.10 H	141	45.97	4.93
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	58.8 PK	74.0	-15.2	1.10 V	122	53.87	4.93
2	#5715.00	50.8 AV	54.0	-3.2	1.10 V	122	45.87	4.93

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 radiated frequency is out of the restricted band.

802.11ac (VHT80)

CHANNEL	TX Channel 106	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	59.3 PK	74.0	-14.7	1.02 H	300	51.37	7.93
2	#5470.00	46.5 AV	54.0	-7.5	1.02 H	300	38.57	7.93
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	60.7 PK	74.0	-13.3	1.05 V	84	52.77	7.93
2	#5470.00	47.7 AV	54.0	-6.3	1.05 V	84	39.77	7.93

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 radiated frequency is out of the restricted band.

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