



低功率射頻器材測試報告

申請廠商	: 惠州高盛達科技有限公司
地址	: 惠州市惠澳大道惠南高新科技產業園金達路 2 號
製造廠商	: 惠州高盛達科技有限公司
地址	: 惠州市惠澳大道惠南高新科技產業園金達路 2 號
產品名稱	: WIFI+BT Module
產品型號	: WT54M2001
廠牌	: GSD
受理日期	: 110 年 01 月 22 日
完成日期	: 110 年 03 月 10 日

實驗室名稱：世騰電子科技股份有限公司測試實驗室

實驗室地址：桃園市蘆竹區聯福街 2 巷 10 號

實驗室認可證書有效期限：112 年 07 月 08 日

實驗室認可編號及範圍：1439 (9 kHz to 40 GHz)

實驗室認證資格





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修訂記錄

報告號碼.	發行日期	描述
21010241-TRNCC02	Mar. 10, 2021	Original

報告形式		說明
☒	Original report	NA
☐	Derivative Report	NA



證 明 書

申請廠商	:	惠州高盛達科技有限公司
地址	:	惠州市惠澳大道惠南高新科技產業園金達路 2 號
製造廠商	:	惠州高盛達科技有限公司
地址	:	惠州市惠澳大道惠南高新科技產業園金達路 2 號
產品名稱	:	WIFI+BT Module
產品型號	:	WT54M2001
廠牌	:	GSD
該產品樣品試驗 依據之試驗標準	:	國家通訊傳播委員會低功率射頻器材技術規範(LP0002)。 規範修訂日期 109 年 07 月 01 日。
發射功率 (電場強度)	:	23.53dBm

茲在此鄭重聲明：

本試驗報告所列之待測設備樣品於民國 110 年 03 月 05 日在本公司的標準測試場地
完成詳細及完整之量測。本試驗報告所列之量測皆依據低功率射頻器材技術規範之規
定來執行。並判斷此待測設備樣品確實符合低功率射頻器材技術規範規定。

備註：本測試報告僅對受測之樣品負責。非經本公司同意，測試報告不得摘錄複印使
用。(全部複製除外)。

項次	測試項目	低功率射頻器材技術 規範	量測設備	測試結果	結果判定
1	天線增益之要求	4.10.1.3 節	---	請參閱 2.2 節	---
2	電源線傳導干擾之要求	3.3 節	請參閱 2 章	請參閱 4.4 節	合格
3	場強輻射之要求	4.10.1.5 節	請參閱 2 章	請參閱 5.4 節 及 5.5 節	合格
4	發射頻寬之要求	4.10.1.6 節(2).(A)	請參閱 2 章	請參閱 6.4 節	合格
5	峰值輸出功率之要求	4.10.1.2 節(1)(C)	請參閱 2 章	請參閱 7.4 節	合格
6	混附波發射限制之要求	4.10.1.5 節	請參閱 2 章	請參閱 8.4 節	合格
7	功率密度之要求	4.10.1.6 節(2)(B)	請參閱 2 章	請參閱 9.4 節	合格

本實驗室已依據合約內的標準，降低儀器、環境、人員等不確定因素。因此測試結果將直
接依照標準要求判定之。

報告簽署人：



1. 一般描述

Main Chip	MT7638BU
Host Interface	USB 2.0
IEEE Standards	IEEE 802.11a/b/g/n+ BT
Operating Frequencies	2.4GHz~2.4835GHz /5.150~5.850GHz
Modulation	BT: GFSK, $\pi/4$ -DQPSK, 8DPSK BLE: GFSK 802.11b: CCK, DQPSK, DBPSK 802.11a/g: 64-QAM,16-QAM, QPSK, BPSK 802.11n: 64-QAM,16-QAM, QPSK, BPSK (註: 802.11n 可以支持 1TX,2TX 兩種模式)
Wireless Data Rate	BT: GFSK:1Mbps, $\pi/4$ -DQPSK: 2Mbps, 8DPSK:3Mbps BLE: GFSK: 1Mbps&2Mbps WIFI 2.4G: 802.11b: 1, 2 ,5.5,11Mbps 802.11g: 6,9,12,18,24,36,48,54Mbps 802.11n: HT20 reach up to144.4Mbps, HT40 reach up to300Mbps WIFI 5G: 802.11a: 6,9,12,18,24,36,48,54Mbps 802.11n: HT20 reach up to144.4Mbps, HT40 reach up to300Mbps
Antenna Type	FPC Antenna
Power Supply	3.3V
Working Temperature	-10 °C to +70 °C
Storage Temperature	-40 °C to +80 °C

Note: For more details, please refer to the User's manual of the EUT.

1.1. 差異說明

無。



1.2. 無線界面規格及頻道對應頻率

802.11b, 802.11g, 802.11n HT20

Channel	Frequency(MHz)	Channel	Frequency(MHz)
*01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	*11	2462
*06	2437	---	---

*為量測之頻率

802.11n HT40(2422MHz~2452MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
---	---	07	2442
---	---	08	2447
*03	2422	*09	2452
04	2427	---	---
05	2432	---	---
*06	2437	---	---

*為量測之頻率



1.3. 測試模式之描述

- 電源傳導及輻射測試之測試軟體如下:
 1. 將量測系統之全部電源打開。
 2. EUT 連接治具，治具再連接電腦，電腦於 Win 7 作業系統下，EUT 進入“QATool_Dbg.exe”來發射與接收訊號。
(測試軟體版本: 0.0.1.98.)

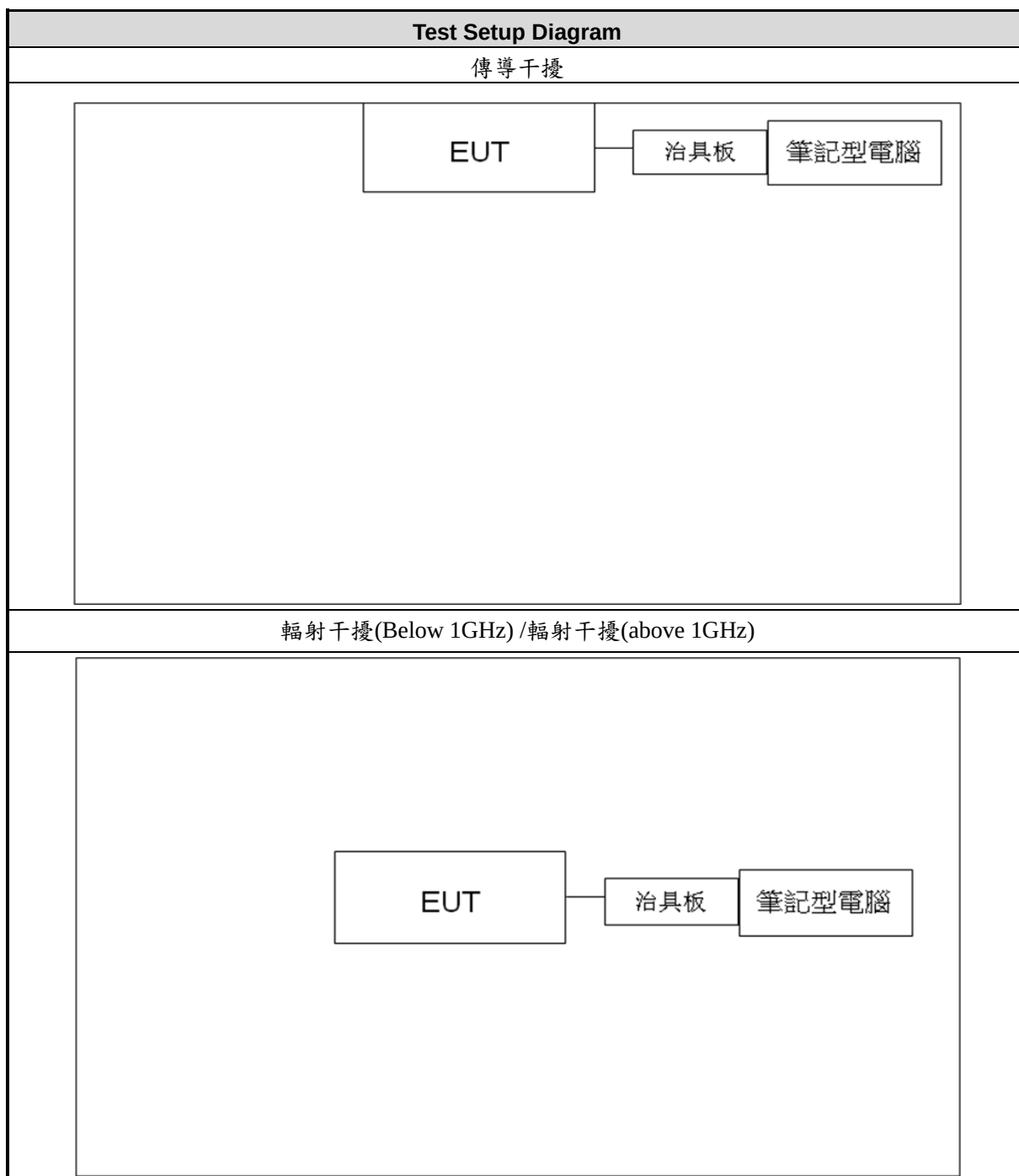
- 執行以下測試模式如下：

傳導干擾-TX&RX	
Test Mode	Operating Description
1	802.11b
2	802.11g
3	802.11n HT20
4	802.11n HT40
以 Test Mode 1 之測試結果為最差，故以此作為發報告之依據	
輻射干擾 (below 1GHz TX&RX)	
1	802.11b
2	802.11g
3	802.11n HT20
4	802.11n HT40
以 Test Mode 1 之測試結果為最差，故以此作為發報告之依據	
輻射干擾 (above 1GHz For 1TX)	
Test Mode	Operating Description
1	802.11b (1 Mbps)
2	802.11g (6 Mbps)
3	802.11n HT20 (6.5 Mbps)
4	802.11n HT40 (13.5 Mbps)
以 Test Mode 1~Mode 4 之測試結果為最差，故以此作為發報告之依據	
輻射干擾 (above 1GHz For 2TX)	
1	802.11n HT20 (13 Mbps)
2	802.11n HT40 (27 Mbps)
以 Test Mode 1~Mode 2 之測試結果為最差，故以此作為發報告之依據	
輻射干擾 (above 1GHz For RX)	
Test Mode	Operating Description
1	802.11b
2	802.11g
3	802.11n HT20
4	802.11n HT40
以 Test Mode 1 之測試結果為最差，故以此作為發報告之依據	
直量量測 (For 1TX)	
Test Mode	Operating Description
1	802.11b (1 Mbps)
2	802.11g (6 Mbps)
3	802.11n HT20 (6.5 Mbps)
4	802.11n HT40 (13.5 Mbps)
以 Test Mode 1~ Mode 4 之測試結果為最差，故以此作為發報告之依據	
直量量測 (For 2TX)	
1	802.11n HT20 (13Mbps)
2	802.11n HT40 (27 Mbps)
以 Test Mode 1~ Mode 2 之測試結果為最差，故以此作為發報告之依據	

注：經驗證 1TX 最差數據為 Ant1 測試資料。



1.4. 受測裝置之系統說明



[本案經申請者切結器材不提供隨貨配件，配件由實驗室提供併同檢驗]，及其廠牌型號資訊如下：

傳導干擾/輻射干擾(Below 1GHz)

設備	廠牌	型號	長度/訊號線類別	長度/電源線類別
筆記型電腦	Dell	P86F	N/A	非隔離/1.8m
治具板	GSD	GSD-12	N/A	N/A



1.5. 測試場地

測試場地：	世騰電子科技股份有限公司測試實驗室 338 桃園市蘆竹區聯福街 2 巷 10 號
測試電壓：	AC 110V / 60Hz
適用規範：	本測試報告之所有項目皆依據國家通訊傳播委員會低功率射頻器材技術規範以及參考 ANSI、FCC/47CFR/2.1046、2.1047、2.1049、2.1051、2.1053 及 2.1055 之檢驗法。
測試頻率：	電源傳導：從 150 kHz 到 30 MHz。 場強輻射：從 30 MHz 到 25000 MHz。
測試天線的距離：	場強輻射之測試距離為 3 M。

Test Item	Test Site	Test Period	Environmental Conditions	Tested By
RF Conducted	RFCON01-NK	2021/01/22~2021/03/05	20°C/55%~20°C/55%	Nick Guan
Radiated Emissions	3M01-NK	2021/01/22~2021/03/05	22°C/53%~20°C/55%	Nick Guan
RF Conduction	CON02-NK	2021/01/22~2021/03/05	21°C/43%~20°C/55%	Nick Guan

1.6. 量測不確定度

量測項目	不確定度
AC Power Line Conduction(150K~30MHz)	±1.90dB
Radiated Spurious Emission(9KHz~30MHz)	±3.405dB
Radiated Spurious Emission(30MHz~1GHz)	±5.636dB
Radiated Spurious Emission(1GHz~25GHz)	±6.621dB
Conducted Spurious Emission	±2.022dB
6dB Bandwidth	±4.482%
20dB Bandwidth	±4.40%
Occupied Bandwidth	±4.40%
Peak Output Power(Conducted Power Meter)	±1.02dB
Dwell Time	±3.49%
Power Spectral Density	±1.963dB
Duty Cycle	±3.47%



2. 測試儀器

Test Item	Radiated Emissions				
Test Site	Semi Anechoic Room(3M01-NK)				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
Bilog Antenna	Sunol	JB1	A051717	2020/06/10	2021/06/09
Active Loop Antenna	EMCO	6507	40855	2020/05/21	2021/05/20
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1785	2020/10/16	2021/10/15
Horn Antenna	EMCO	3116	31974	2020/03/26	2021/03/25
EMI Receiver	ROHDE & SCHWARZ	ESR 7	101906	2020/05/26	2021/05/25
Spectrum Analyzer	ROHDE & SCHWARZ	FSV 40-N	102151	2020/08/03	2021/08/02
Preamplifier	EM Electronics corp.	EM330	60644	2020/03/16	2021/03/15
Preamplifier	EM Electronics corp.	EM01G18G	60700	2020/08/24	2021/08/23
Preamplifier	EMC INSTRUMENTS	EMC184045	980065	2020/11/06	2021/11/05
Bluetooth Tester	ROHDE & SCHWARZ	CBT	101133	2020/04/07	2021/04/06
Cable-0.5m(1G-40G)	HUBER SUHNER	SF102	MY4569/2	2020/08/25	2021/08/24
Cable-1m(1G-40G)	HUBER SUHNER	SF102	MY5739/2	2020/08/25	2021/08/24
Cable-6m(1G-40G)	HUBER SUHNER	SF102	MY5740/2	2020/08/25	2021/08/24
Cable-0.5m(30M-1G)	HUBER SUHNER	RG-214	Cable-08	2020/03/12	2021/03/11
Cable-1m(30M-1G)	HUBER SUHNER	RG-214	Cable-09	2020/03/12	2021/03/11
Cable-6m(30M-1G)	HUBER SUHNER	RG-214	Cable-10	2020/03/12	2021/03/11
Cable-6m(9k~300M)	NA	EMC5D-BM-BM-6	130606	2020/3/11	2021/3/10
E3	AUDIX	v8.2014-8-6	RK-000533	NA	NA

Test Item	RF Conducted				
Test Site	RFCON01-NK				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
Spectrum Analyzer	KEYSIGHT	N9010A	MY5420020 7	2020/04/14	2021/04/13
Bluetooth Tester	ROHDE & SCHWARZ	CBT	101133	2020/04/07	2021/04/06
CAX Signal Analyzer	KEYSIGHT	N9000B	MY5710033 9	2020/11/10	2021/11/09
Attenuator	KEYSIGHT	8491B	MY3925070 3	2020/04/17	2021/04/16
TEMP & HUMI CHAMBER	T-MACHINE	TMJ-9712	T-12-040111	2020/08/25	2021/08/24
Power Meter	Anritsu	ML2495A	1224005	2020/04/17	2021/04/16
Power Sensor	Anritsu	MA2411B	1207295	2020/04/17	2021/04/16



Test Item	AC Power Line Conducted Emission				
Test Site	CON02-NK				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
EMI Receiver	ROHDE & SCHWARZ	ESCI	100443	2020/05/25	2021/05/24
Line Impedance Stabilization Network	Schwarzbeck	NSLK 8127	8127-740	2020/06/05	2021/06/04
TWO-LINE V-NETWORK	ROHDE & SCHWARZ	ENV216	102185	2020/07/30	2021/07/29
Cable-6m(9k~300M)	NA	CFD300-NL	NA	2020/03/11	2021/03/10
E3	AUDIX	v8.2014-8-6	RK-000536	NA	NA



3. 天線增益之要求

天線規格不受國家通訊傳播委員會低功率射頻器材技術規範(3.2)節規定之限制，其發射天線之方向性增益超過 6dBi 時，應依其所超過之 dB 數等量降低峰值輸出功率。如用於固定式點對點操作時，應符合下列情形之一：

操作於 2400-2483.5 兆赫(MHz)者，其發射天線之方向性增益超過 6dBi，應於每超過 3dB 降低 1dB 之峰值輸出功率。

操作於 5725-5850 兆赫(MHz)者，其發射天線之方向性增益超過 6dBi，不需降低峰值輸出功率。

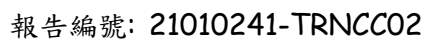
3.1. 天線型式及其增益

- 1.1 Brand : 惠州高盛達科技有限公司
- 1.2 Model : WC0D-60
- 1.3 Antenna type : PIFA Antenna
- 1.4 Frequency Rang : 2400-2500MHz
- 1.5 Gain(peak) : 1.72dBi (Two antennas have the same gain.)

(參照天線規格資料)

3.2. 結果判定

其發射天線之方向性增益低於 6dBi，因此無需降低峰值輸出功率。

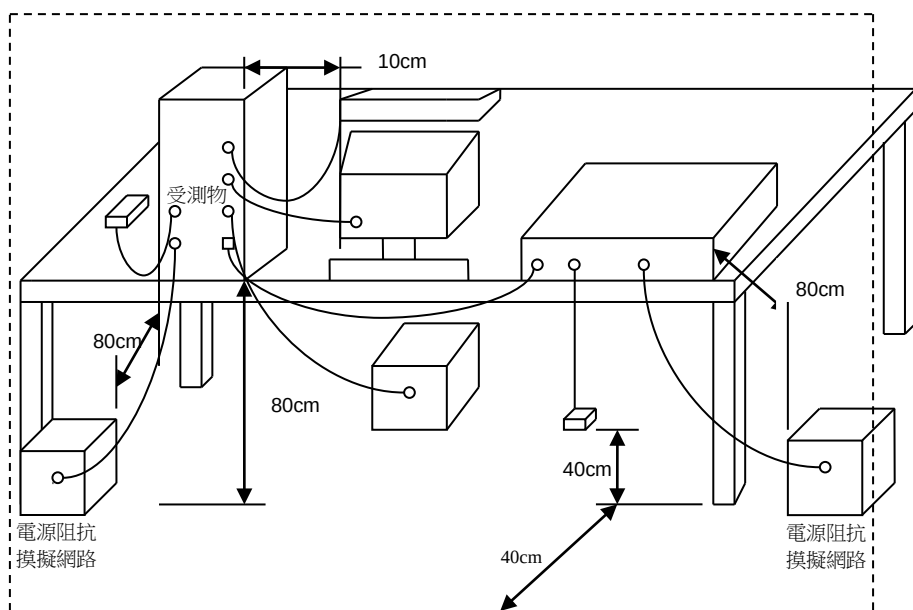


4.1. 適用標準

頻率範圍(MHz)	傳導限制值 (dB μ V)	
	準峰值(Quasi-peak)	平均值(Average)
0.15 ~ 0.5	66-56 (註)	56-46 (註)
0.5 ~ 5	56	46
5 ~ 30	60	50

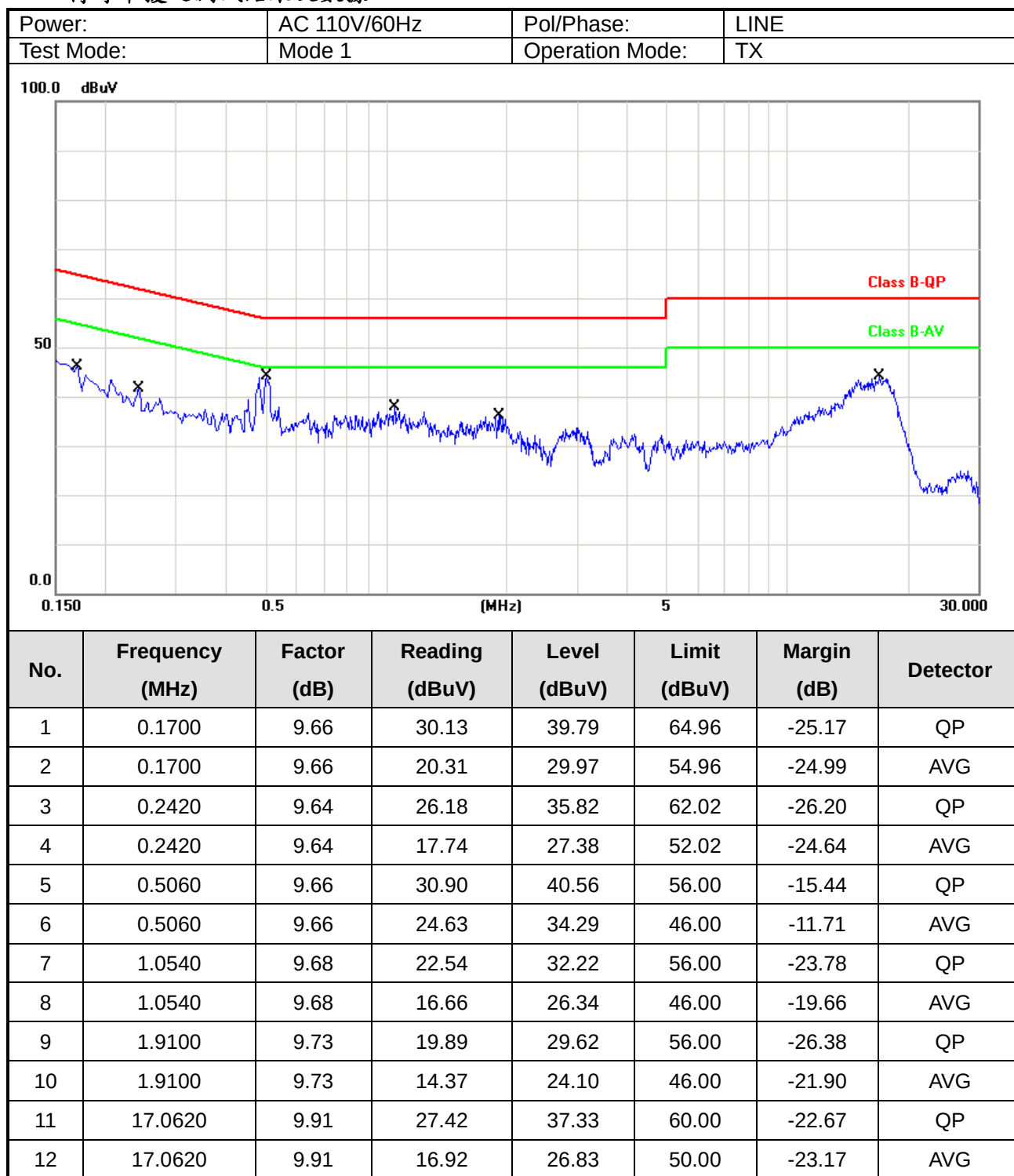
4.2. 測試方法

4.3. 傳導干擾之擺設

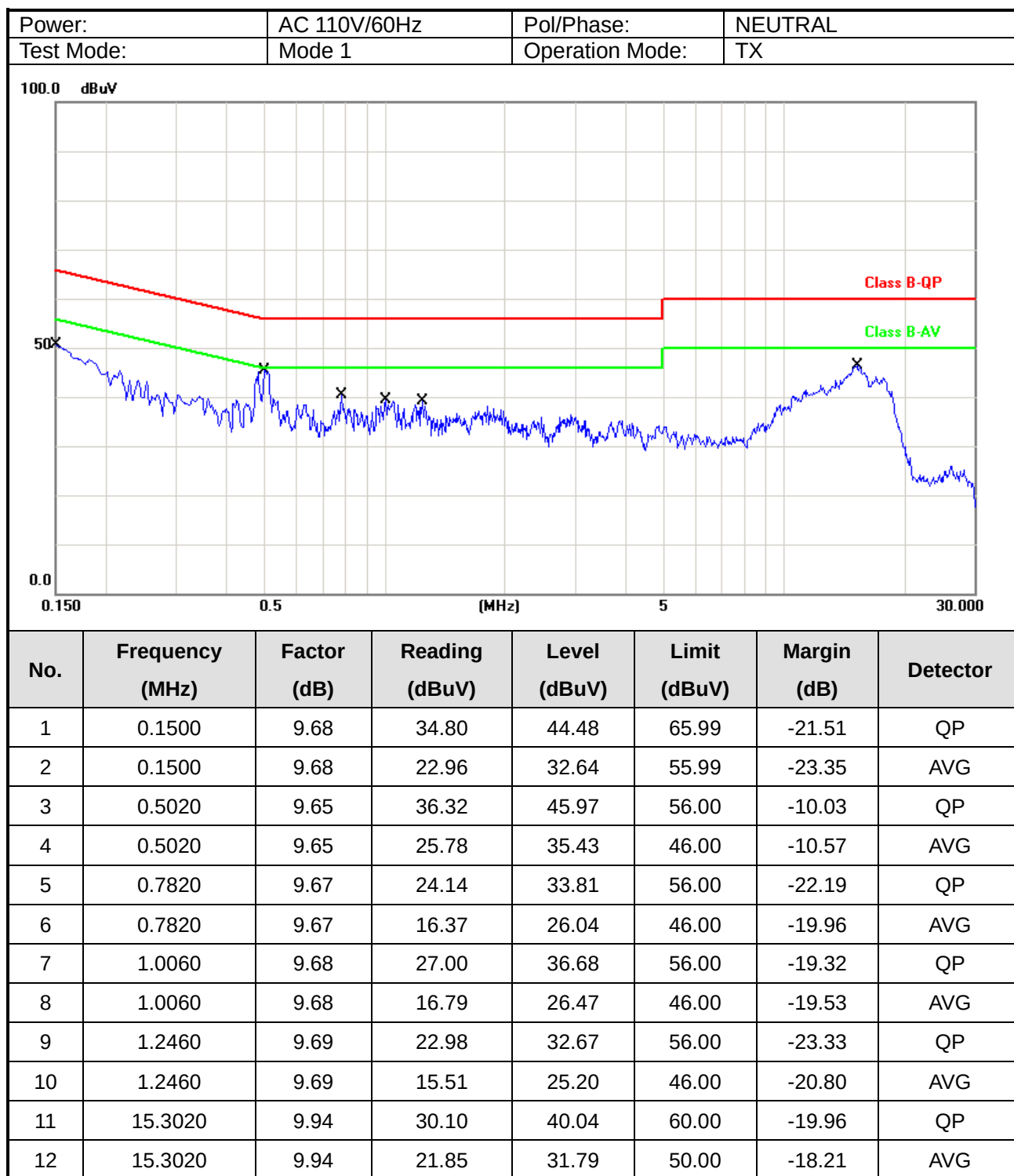




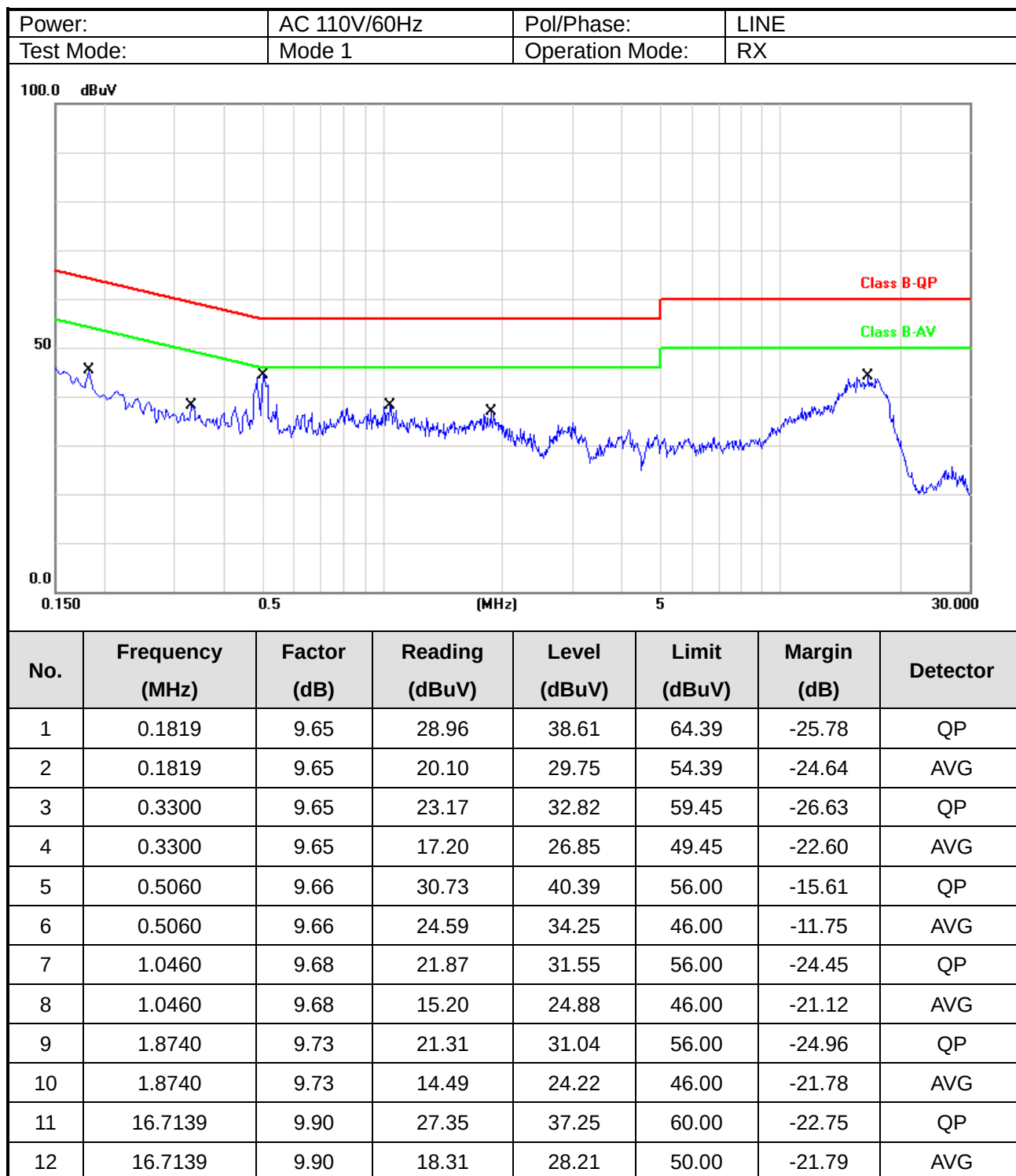
4.4. 傳導干擾之測試結果及數據



Note: Level = Reading + Factor
Margin = Level – Limit

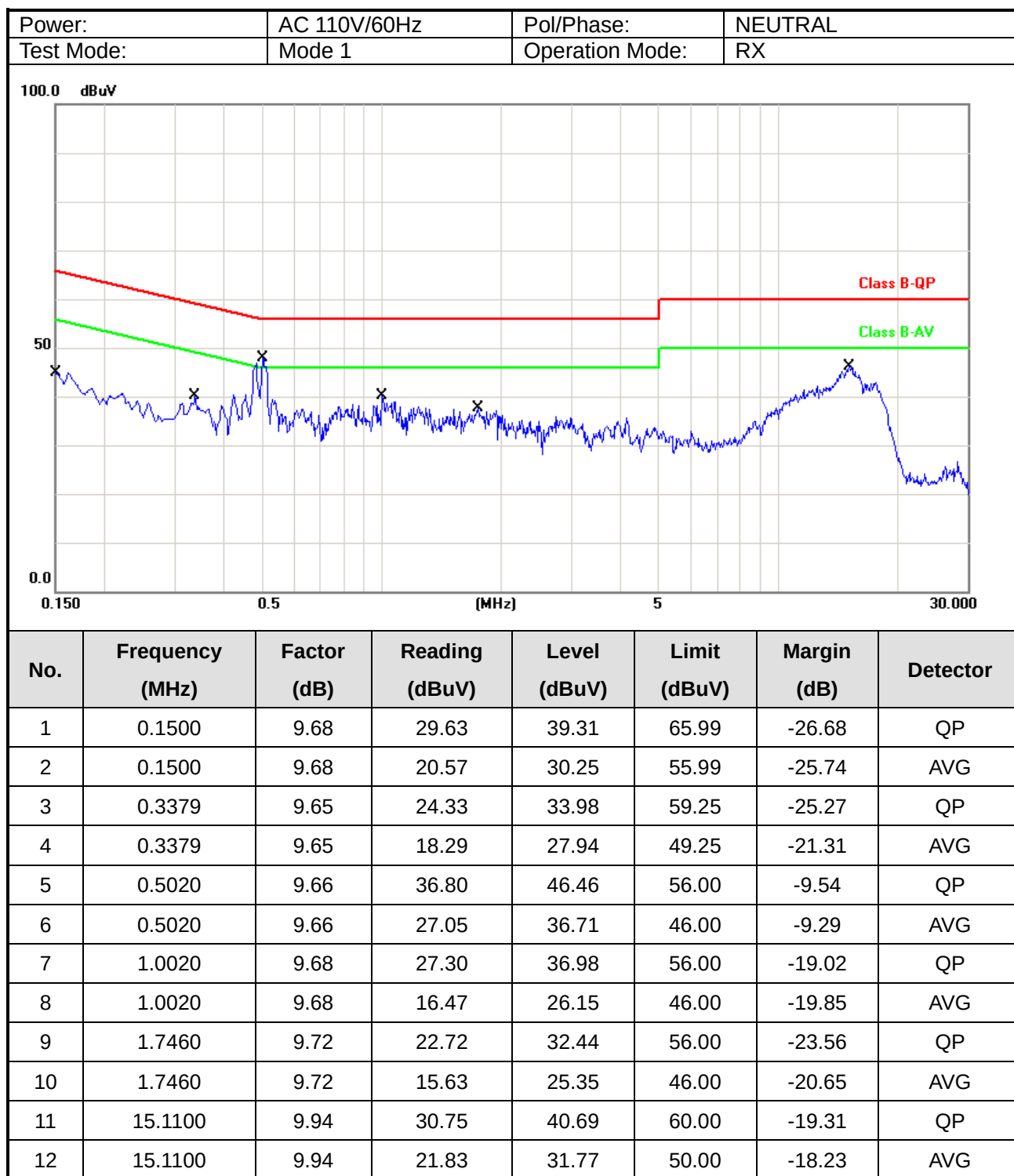


Note: Level = Reading + Factor
Margin = Level – Limit



Note: Level = Reading + Factor

Margin = Level – Limit



Note: Level = Reading + Factor
Margin = Level – Limit

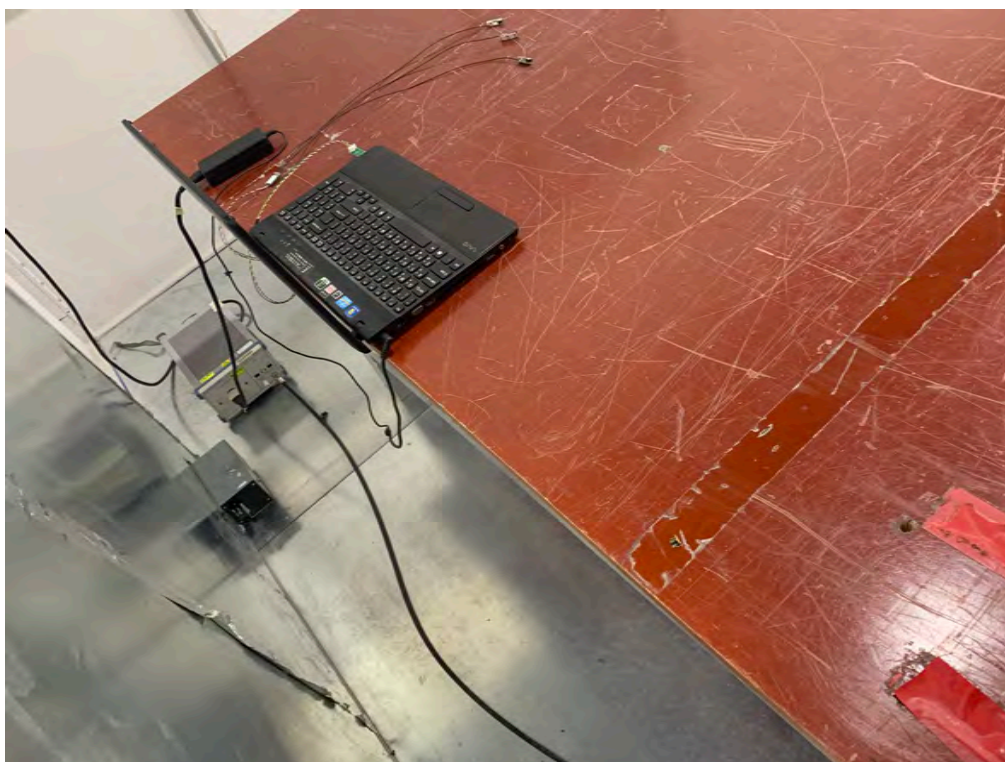


4.5. 傳導量測之配置照片

正面照



側面照





5. 輻射之量測規定

5.1. 適用標準

依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.5 節之要求，落於 3.5 節禁用頻段之輻射干擾需符合 3.6 節之一般限制要求：

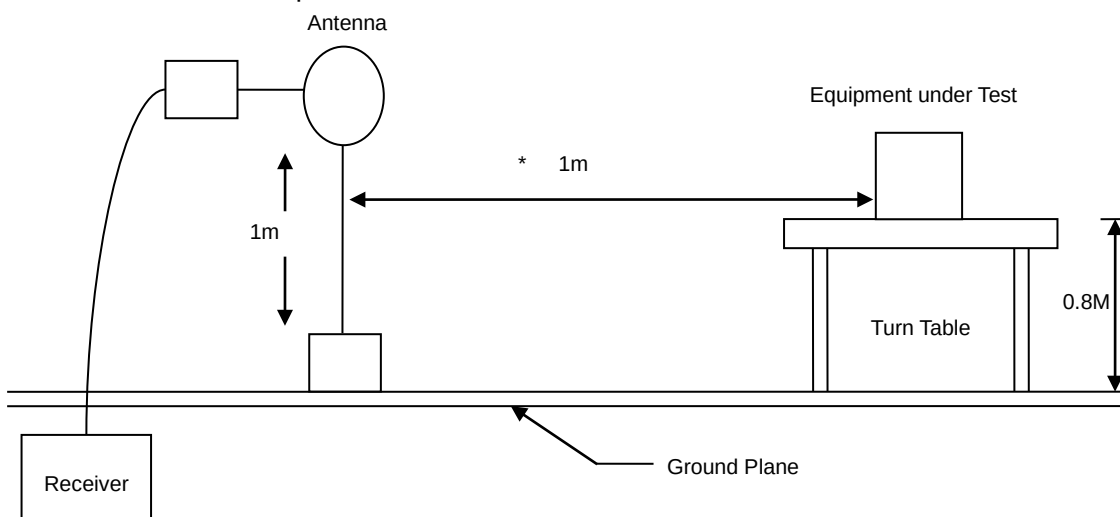
頻率(MHz)	測試距離(m)	限制值(dB μ V)	限制值(μ V/m)
0.009 – 0.490 (含)	300	67.6 / f(kHz)	2400 / f(kHz)
0.490 (不含) – 1.705 (含)	30	87.6 / f(kHz)	24000 / f(kHz)
1.705(不含) – 30(不含)	30	29.5	30
30 (含) – 88 (含)	3	40.0	100
88(不含) – 216 (含)	3	43.5	150
216(不含) – 960 (含)	3	46.0	200
960(不含)以上	3	54.0	500

5.2. 測試方法

將待測物置於 0.8 米(Below 1G) & 1.5 米(Above 1G)高的非金屬桌面，使其在測試模式狀態，且設定為高、中、低各頻道產生最高峰值輸出功率的傳輸速率，接收天線置於 3 米外，且桌面要 360 度旋轉，另外接收天線也要從 1 米至 4 米升降變化，接收天線置於水平、垂直極向各執行測試一次。如待測物可以三軸相放置，並分別測試以找出最大輻射電場強度(最差的結果為 X 軸)。

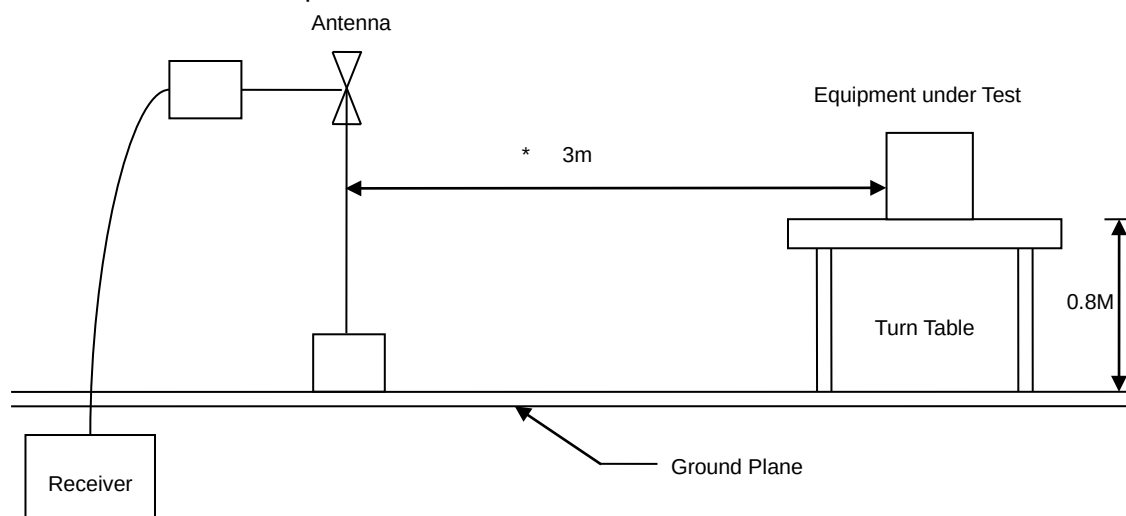
5.3. 輻射場地之擺設

Below 30MHz test setup

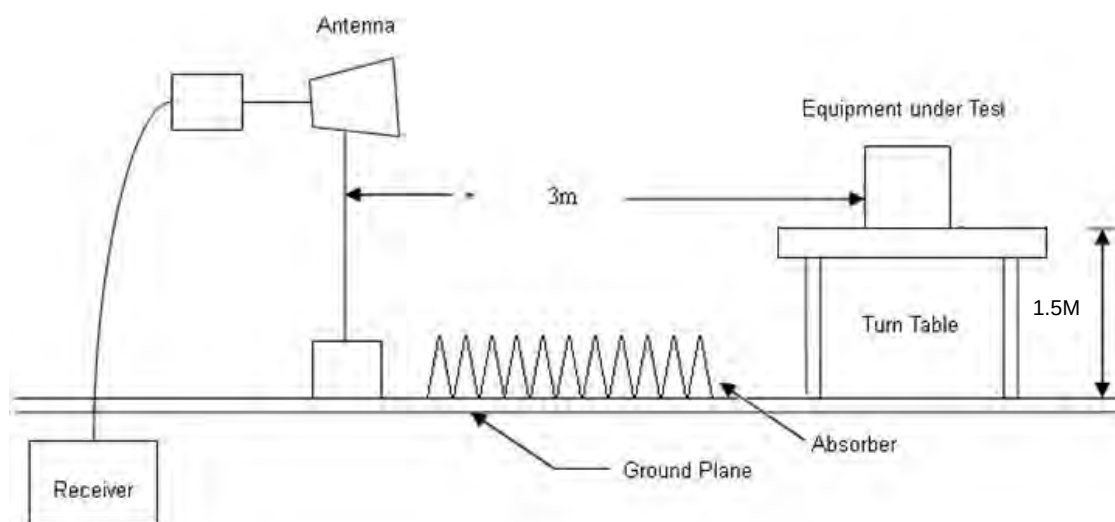




30MHz- 1GHz Test Setup



Above 1GHz Test Setup

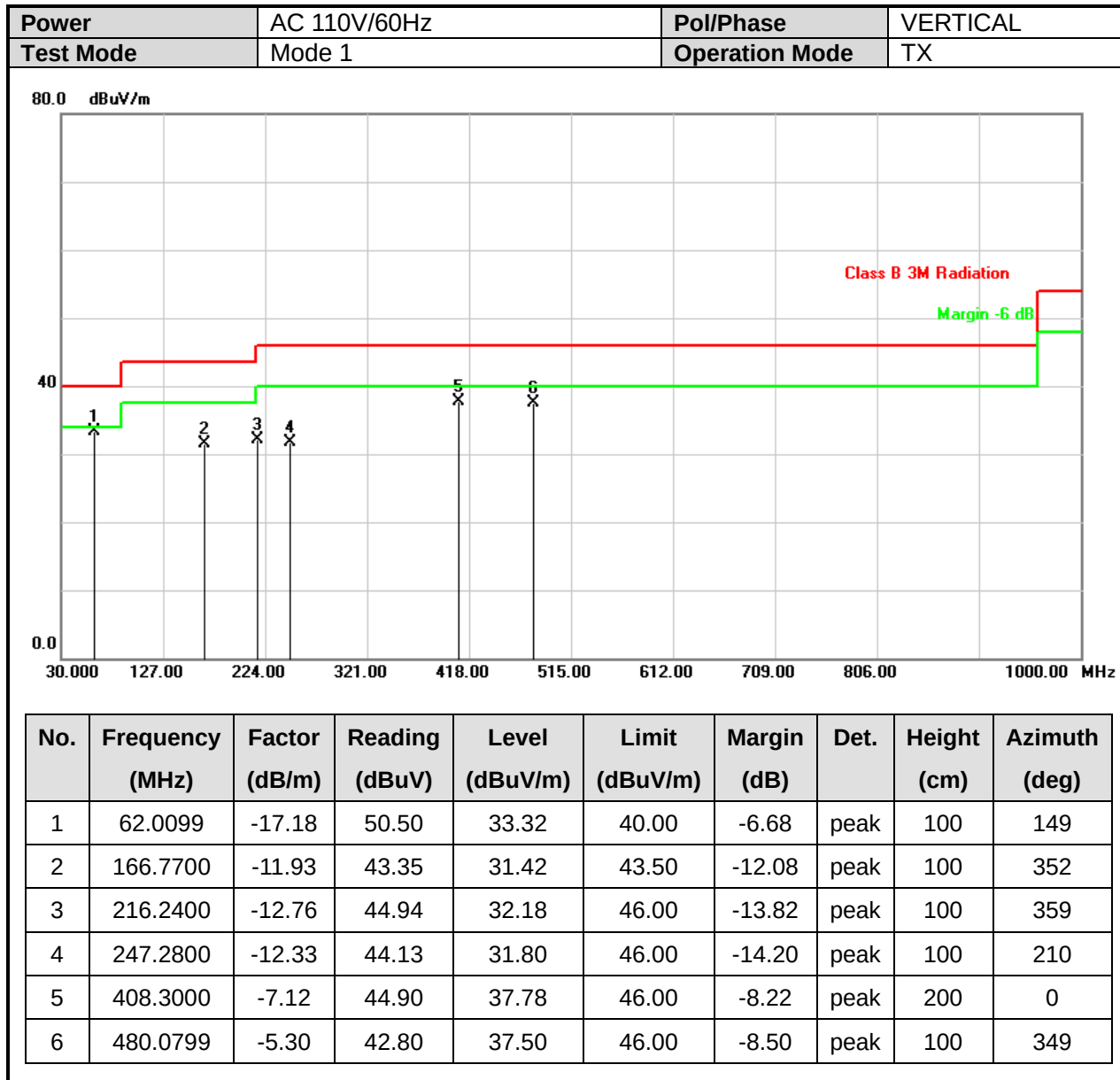




5.4. 輻射之測試結果及數據 (9kHz ~ 30MHz)

The 9kHz - 30MHz spurious emission is under limit 20dB more.

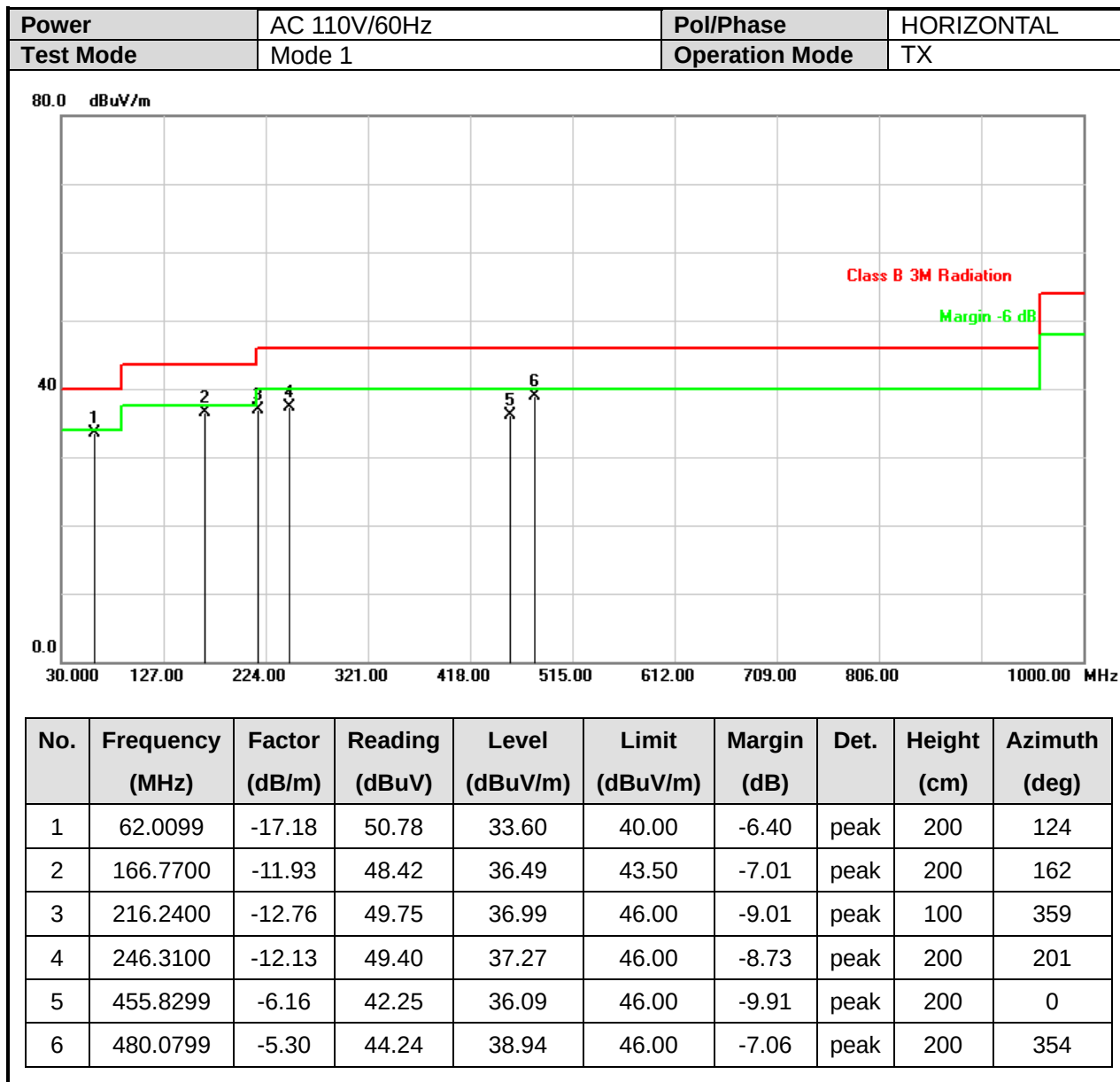
5.5. 輻射之測試結果及數據 (30MHz ~ 1GHz)



Note: Level = Reading + Factor

Margin = Level – Limit

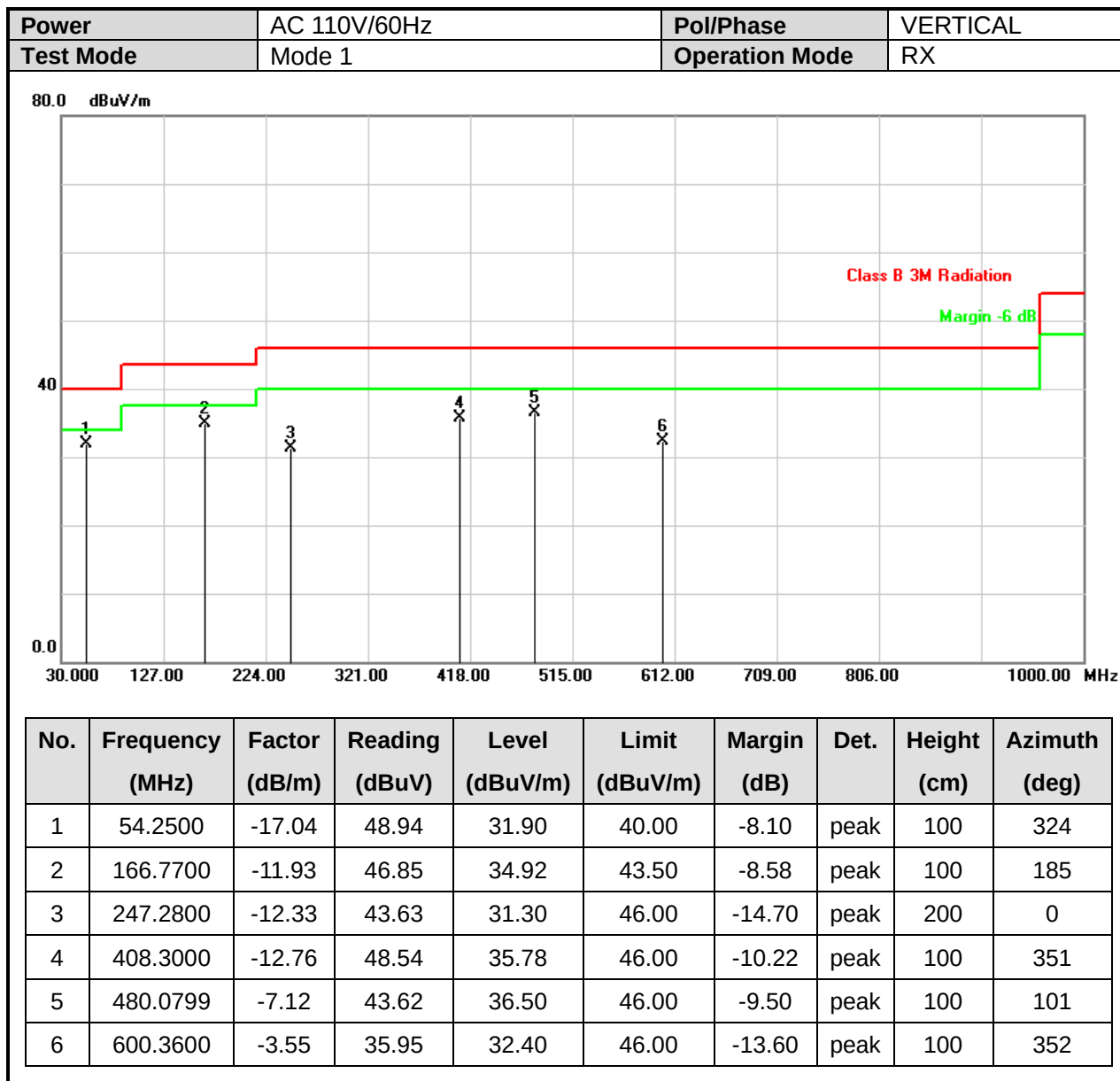
Factor = Antenna Factor + Cable Loss – Amplifier Factor



Note: Level = Reading + Factor

Margin = Level – Limit

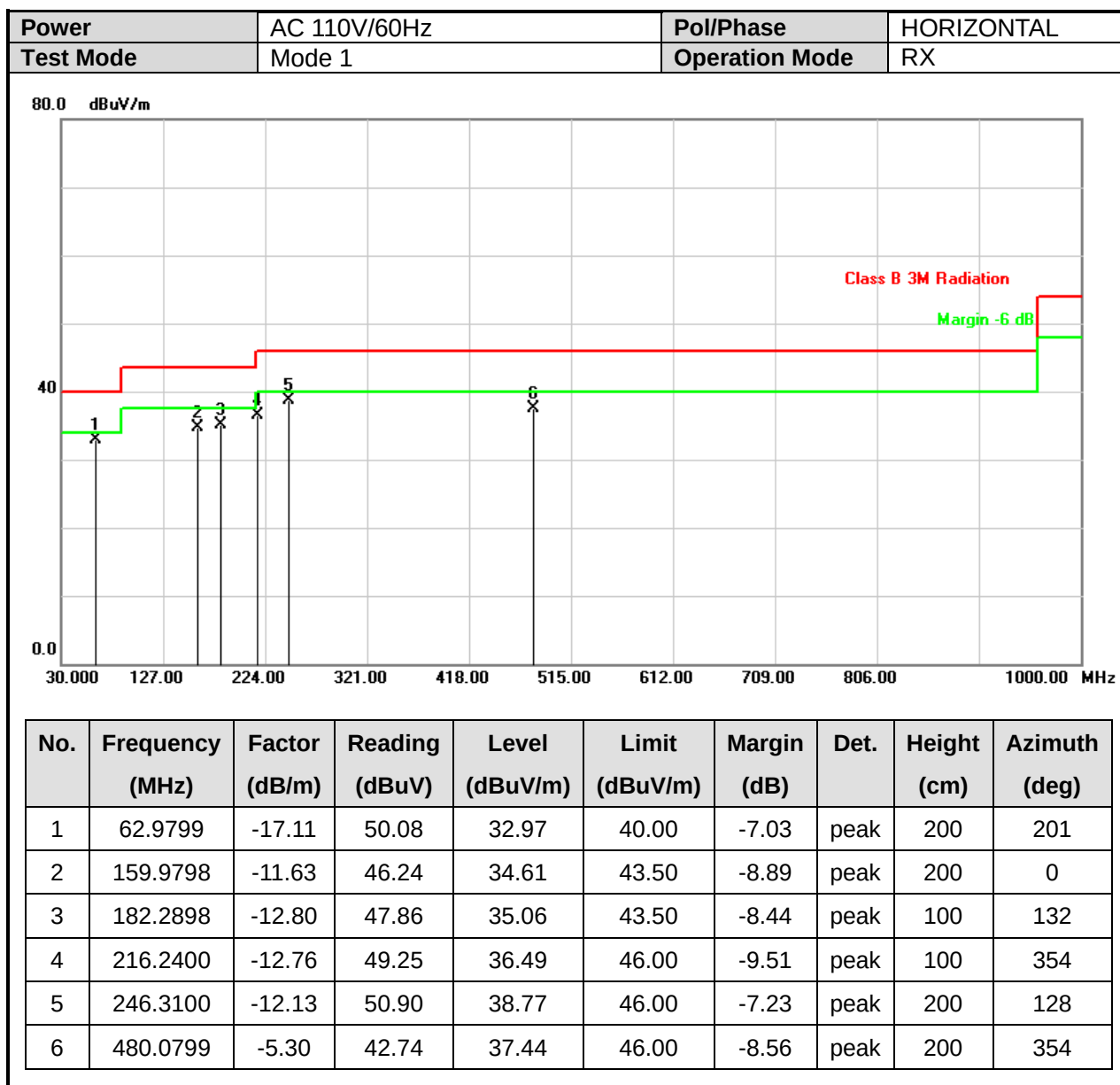
Factor = Antenna Factor + Cable Loss – Amplifier Factor



Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor



Note: Level = Reading + Factor

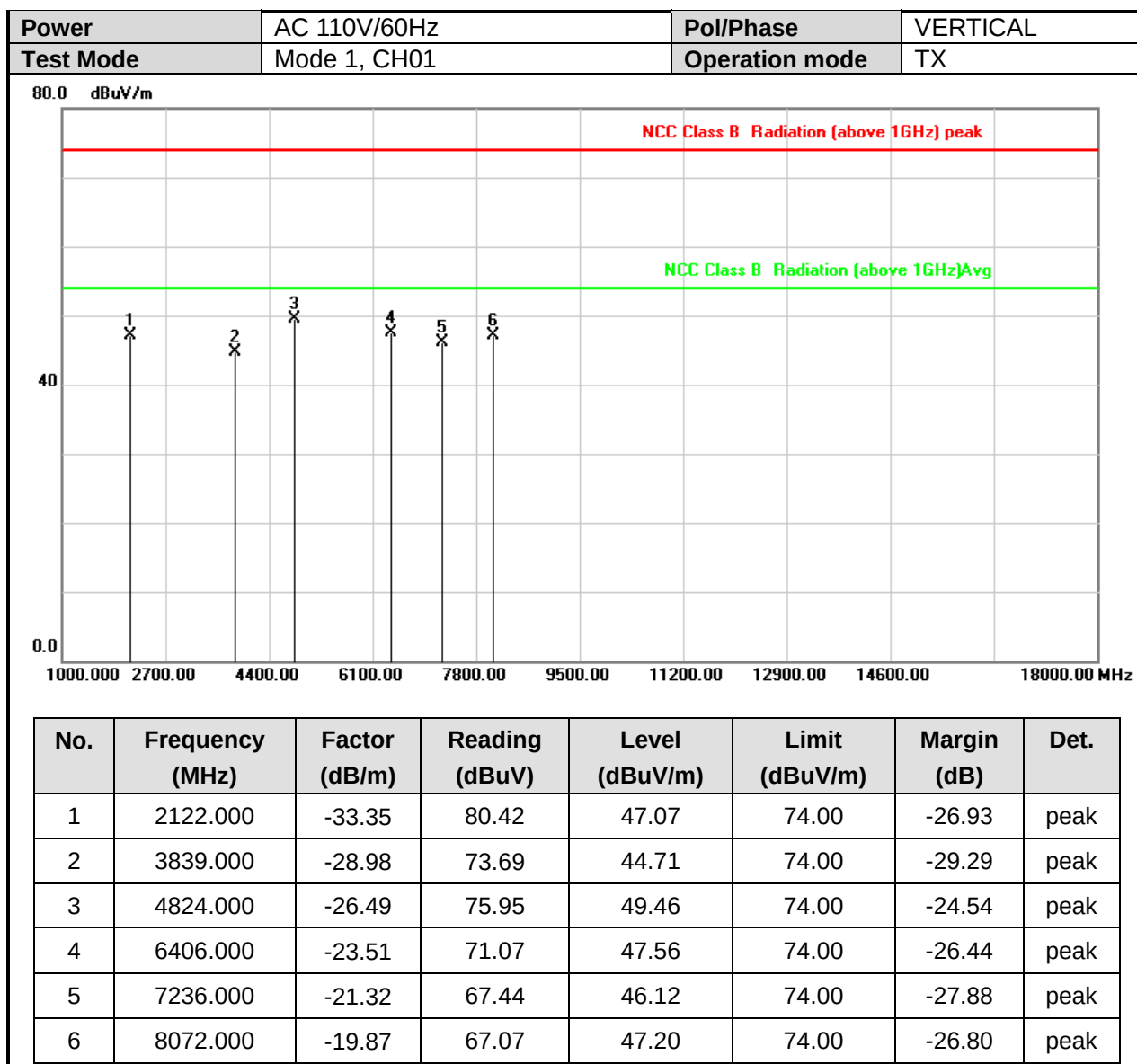
Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor



5.6. 輻射之測試結果及數據 (1GHz ~ 25GHz)

For 1TX

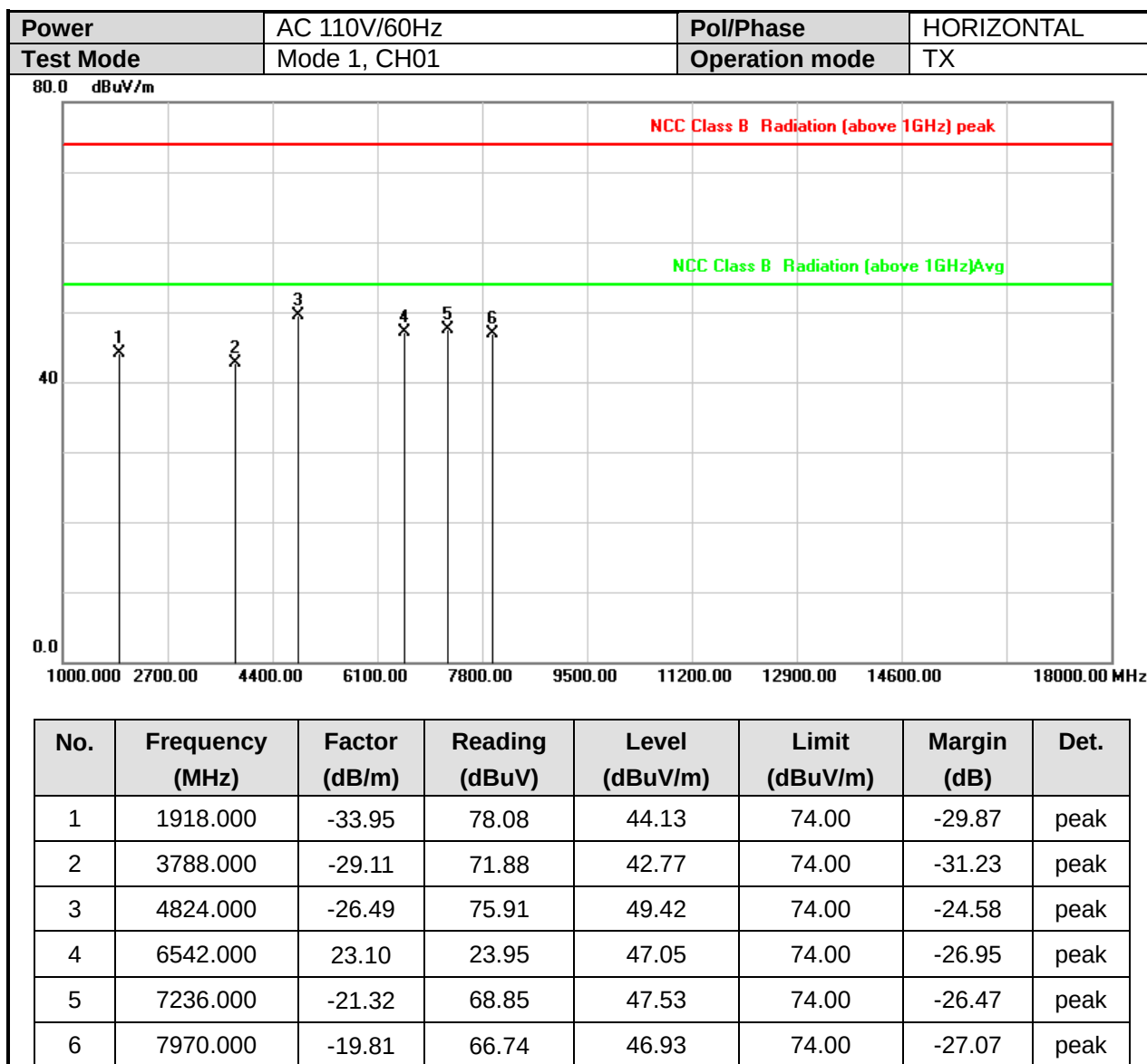


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

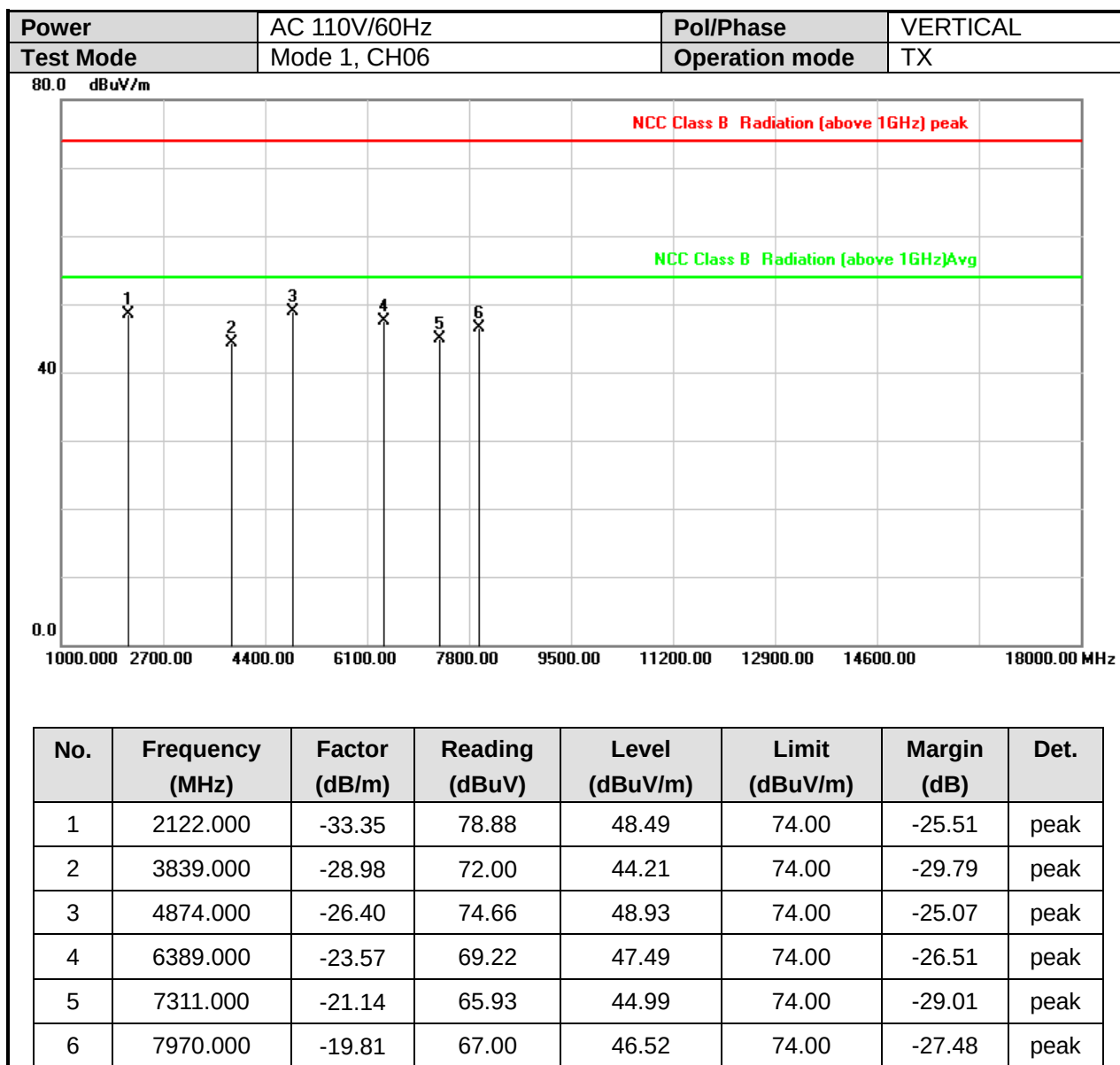


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

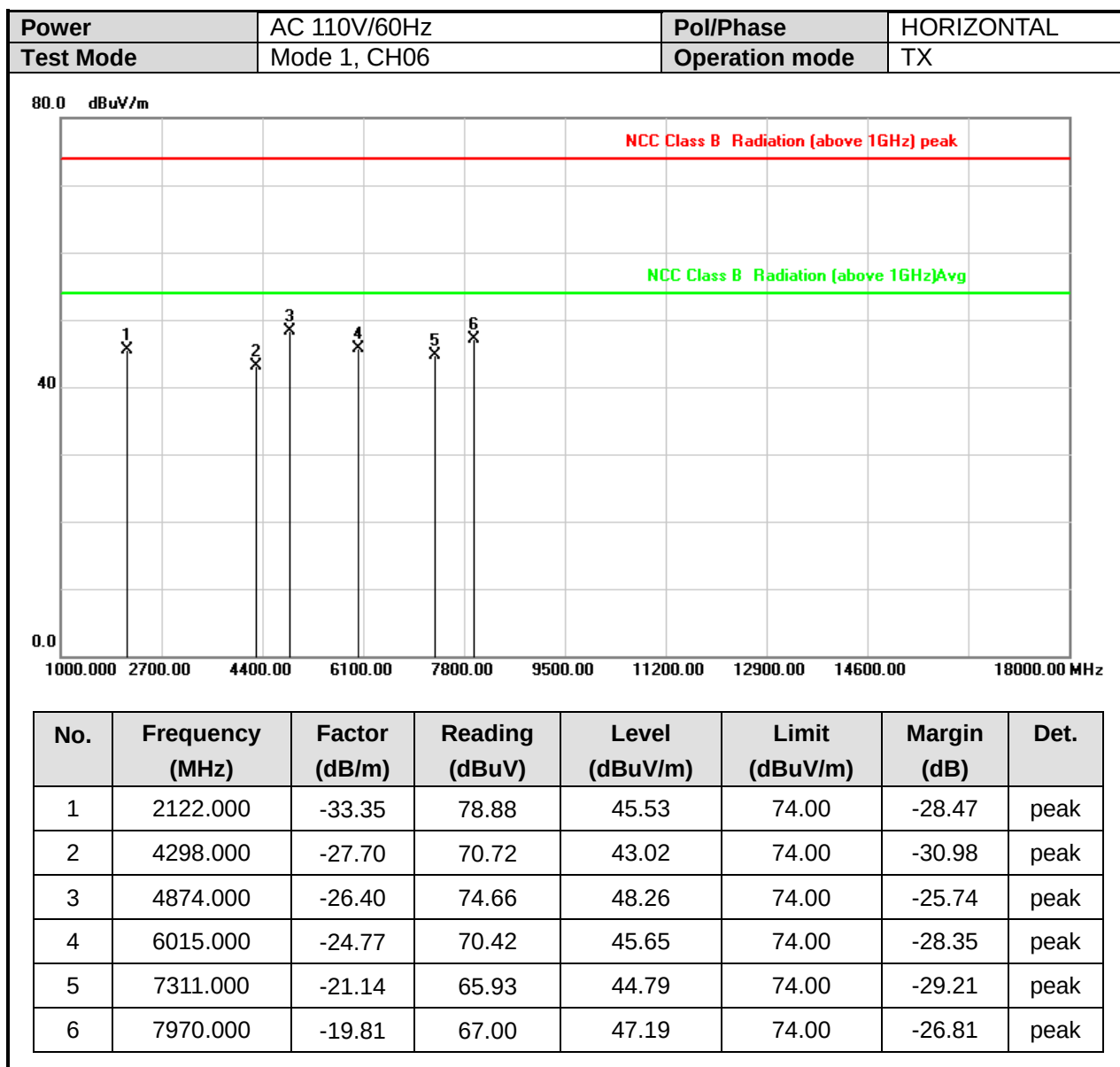


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

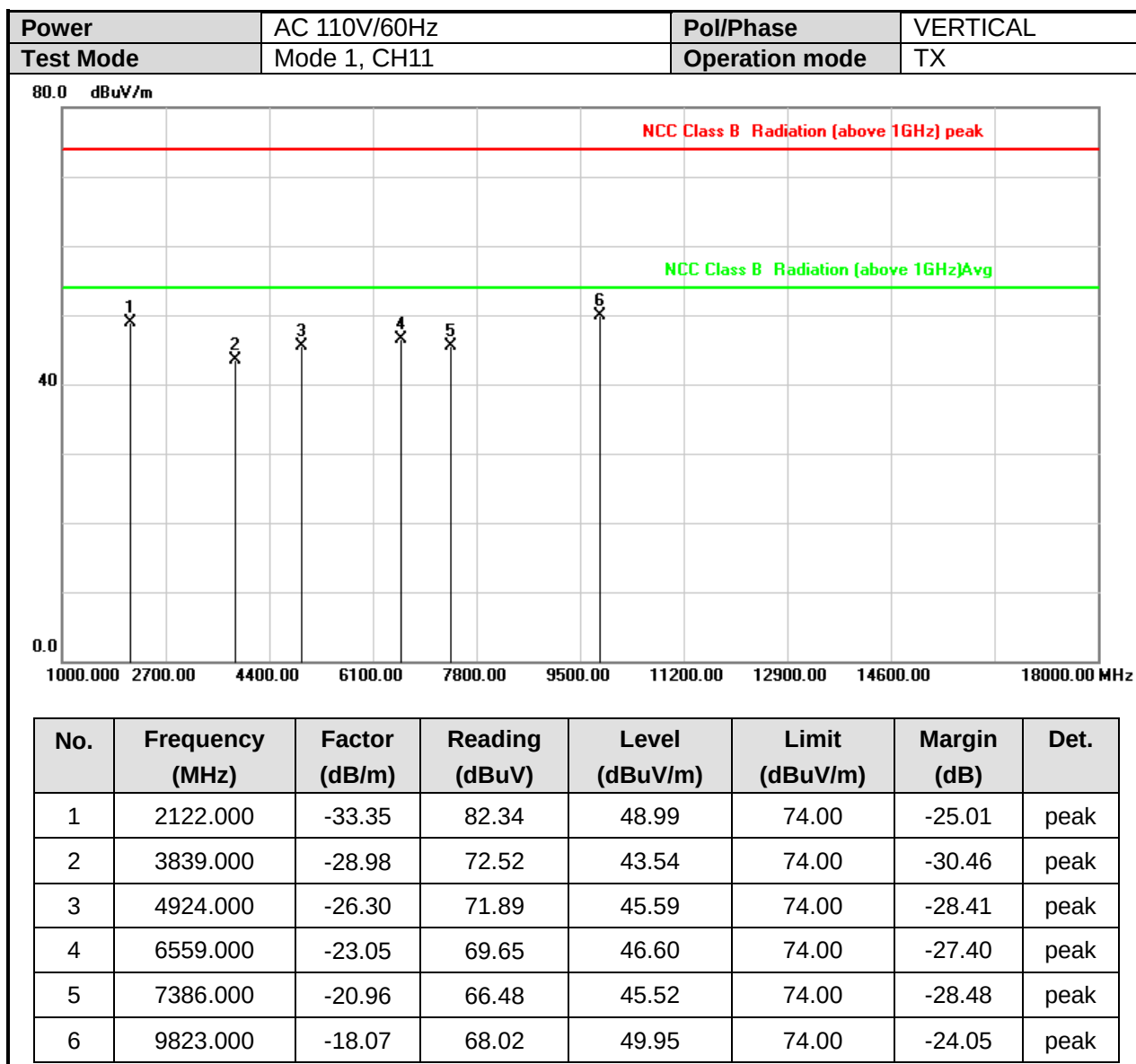


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

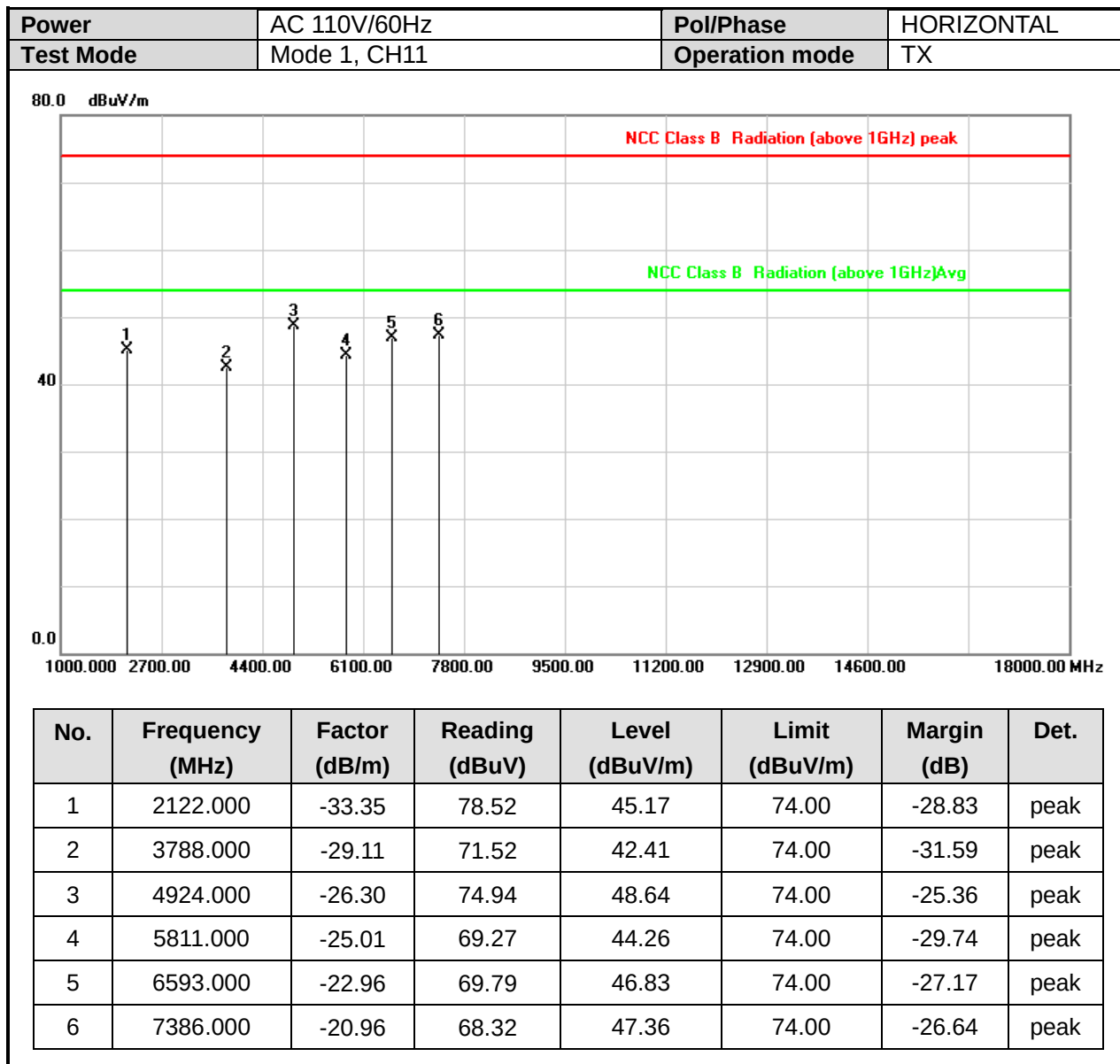


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

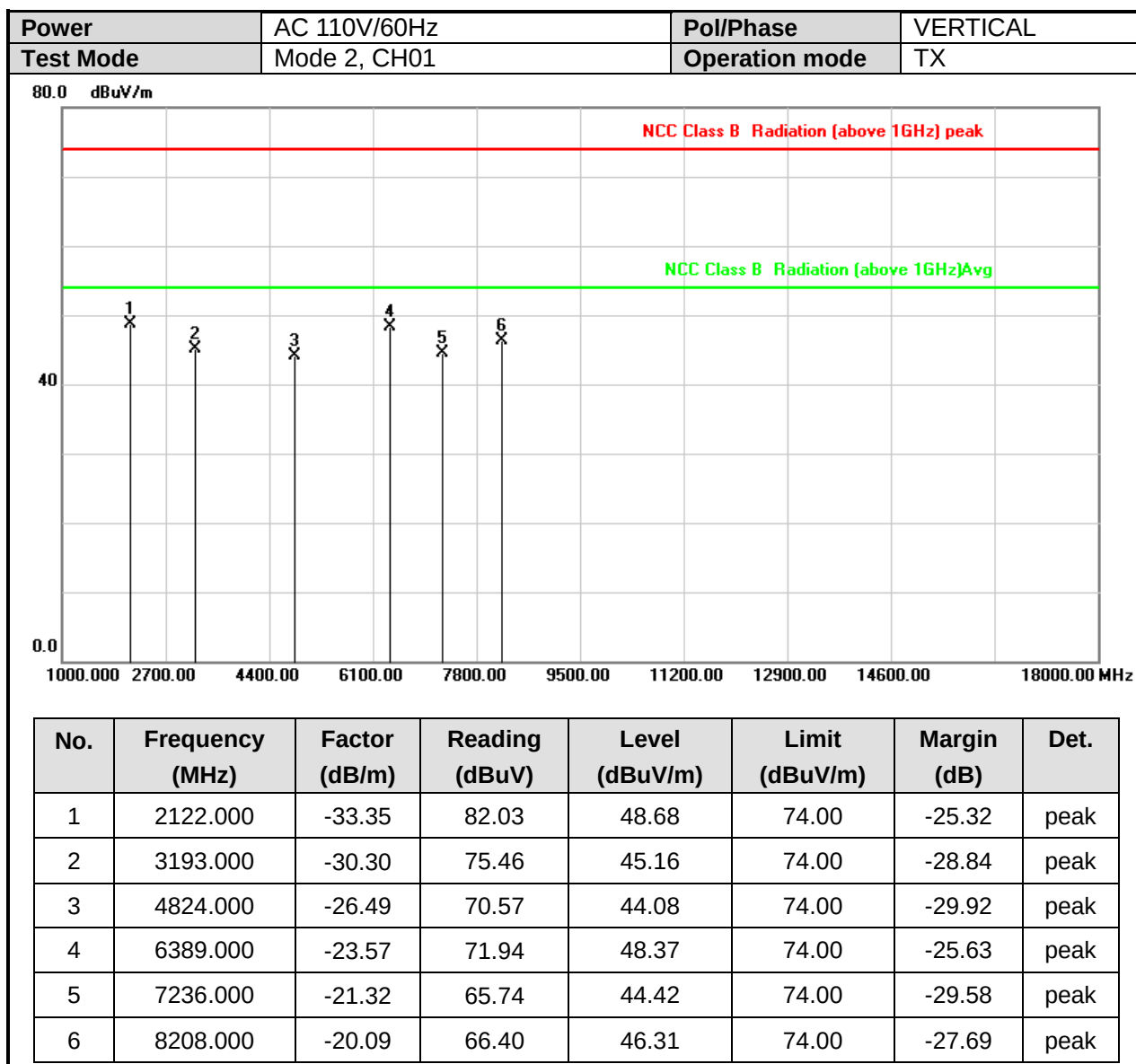


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

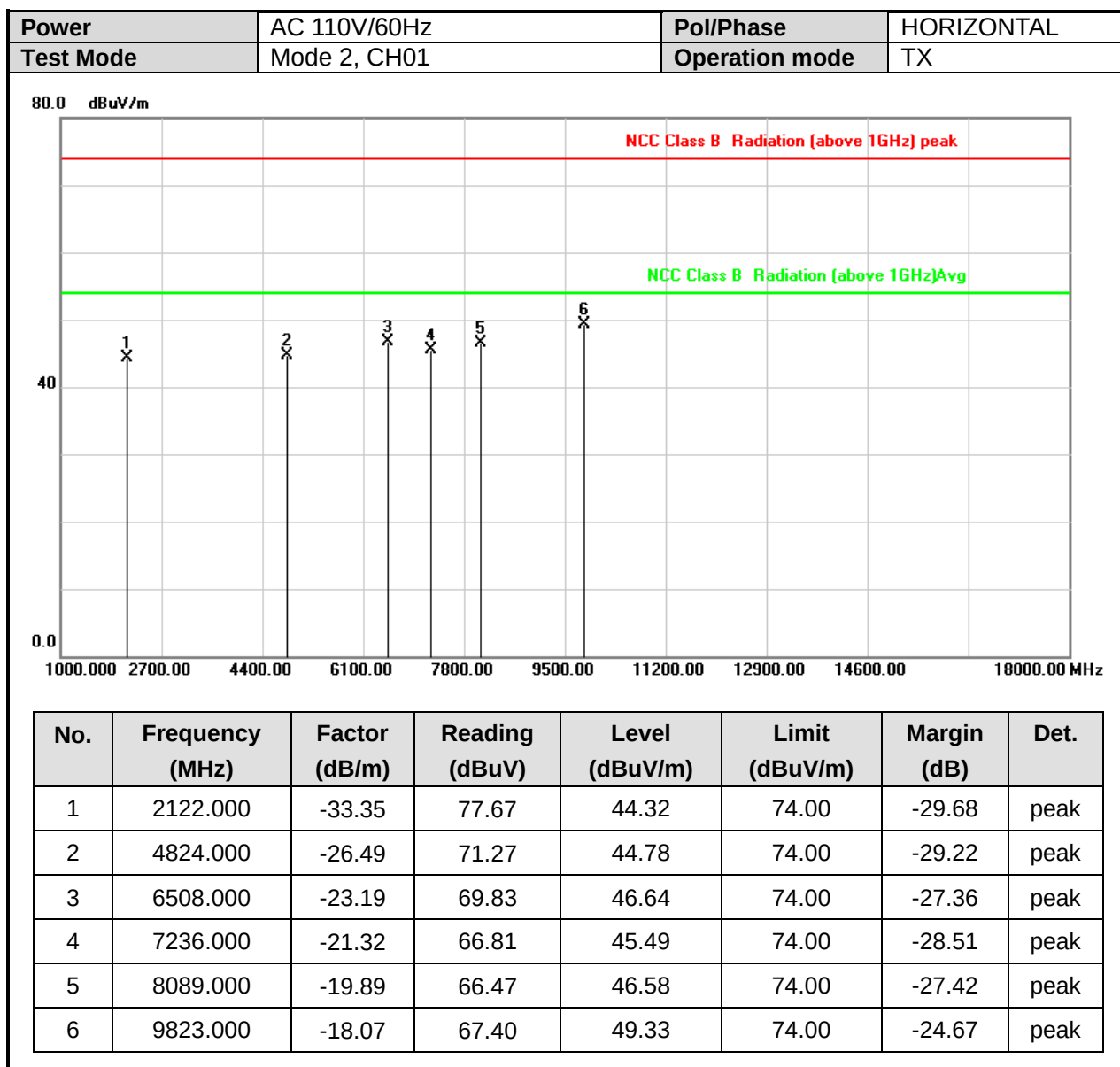


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

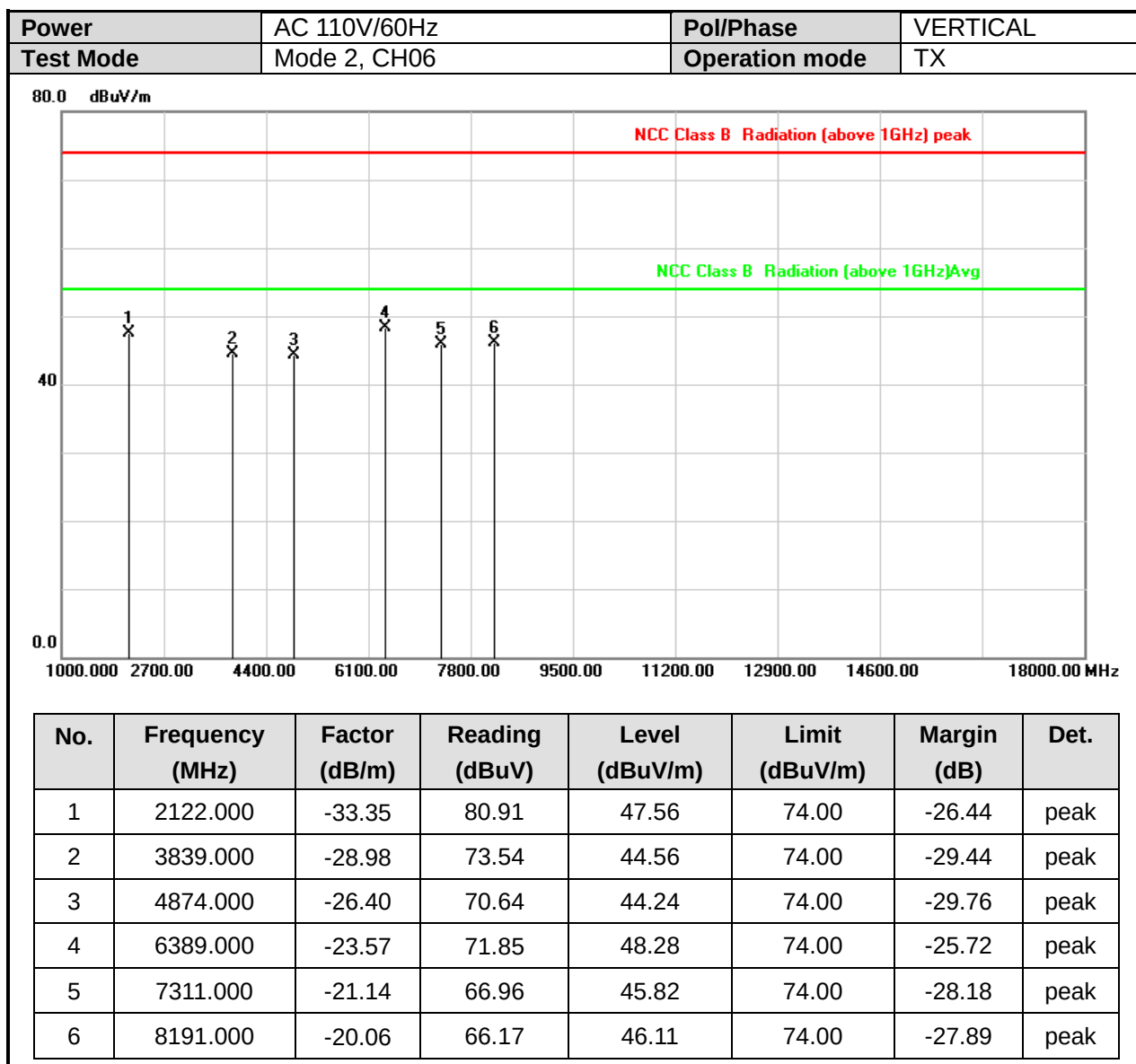


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

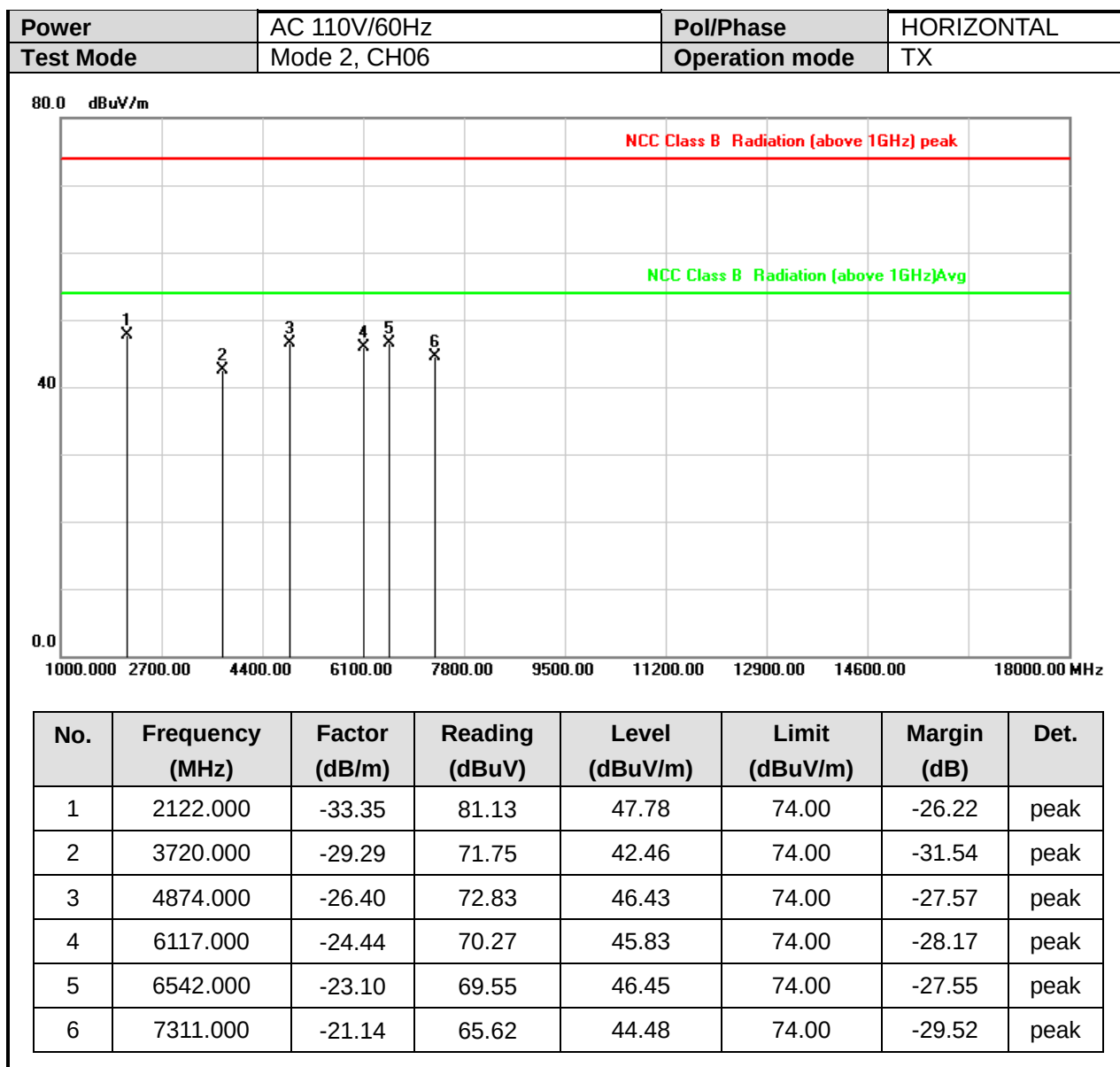


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

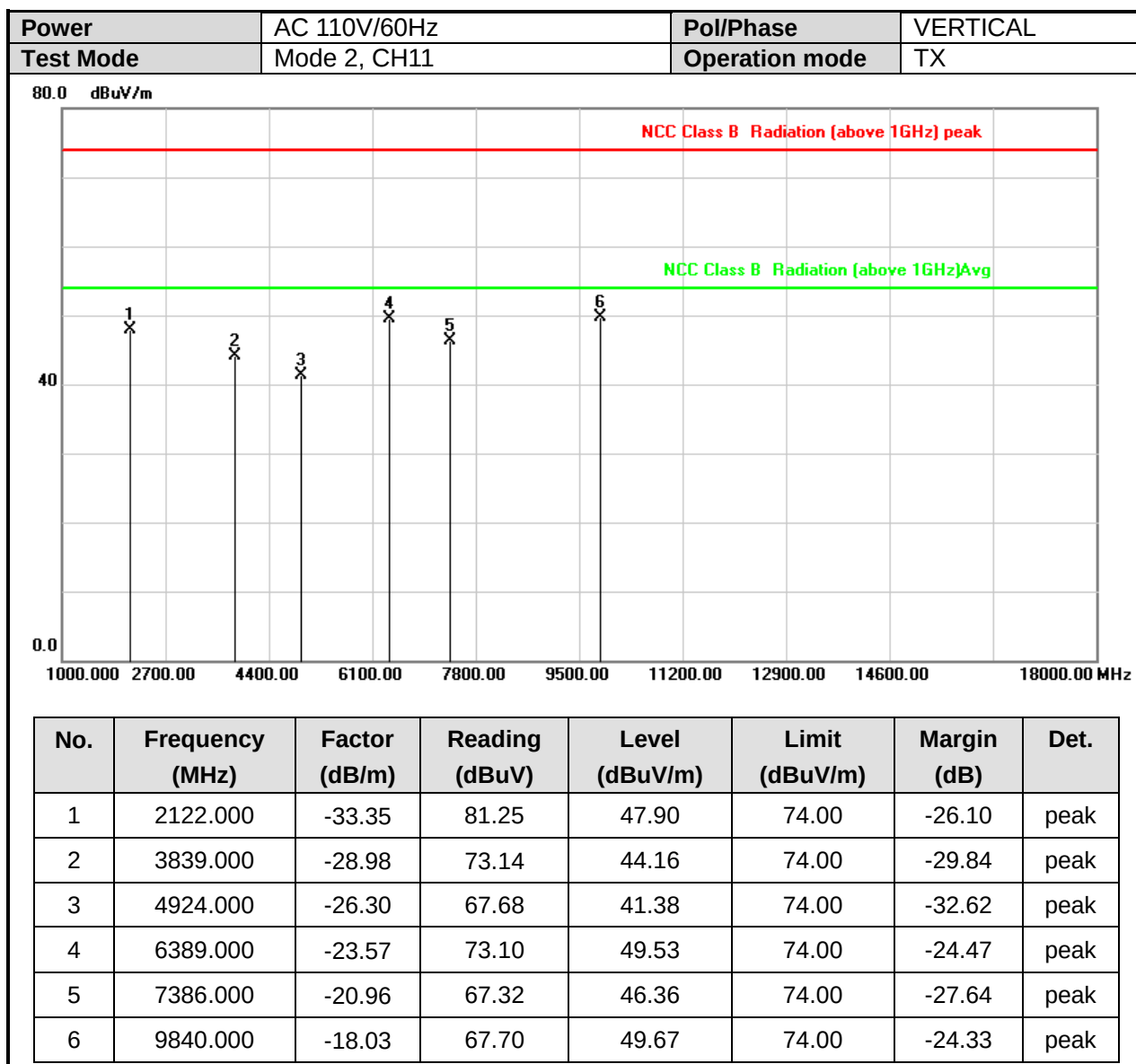


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

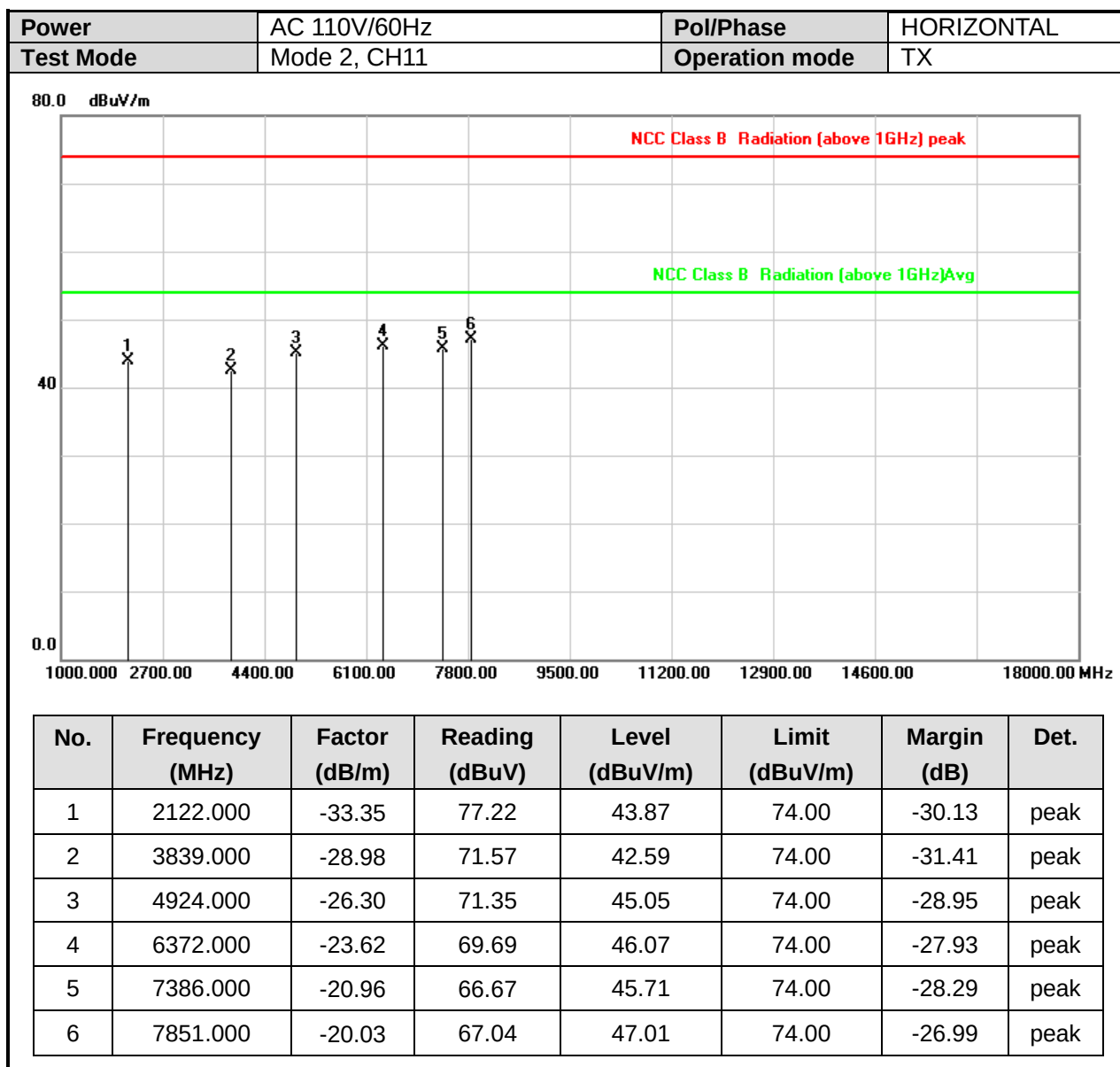


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

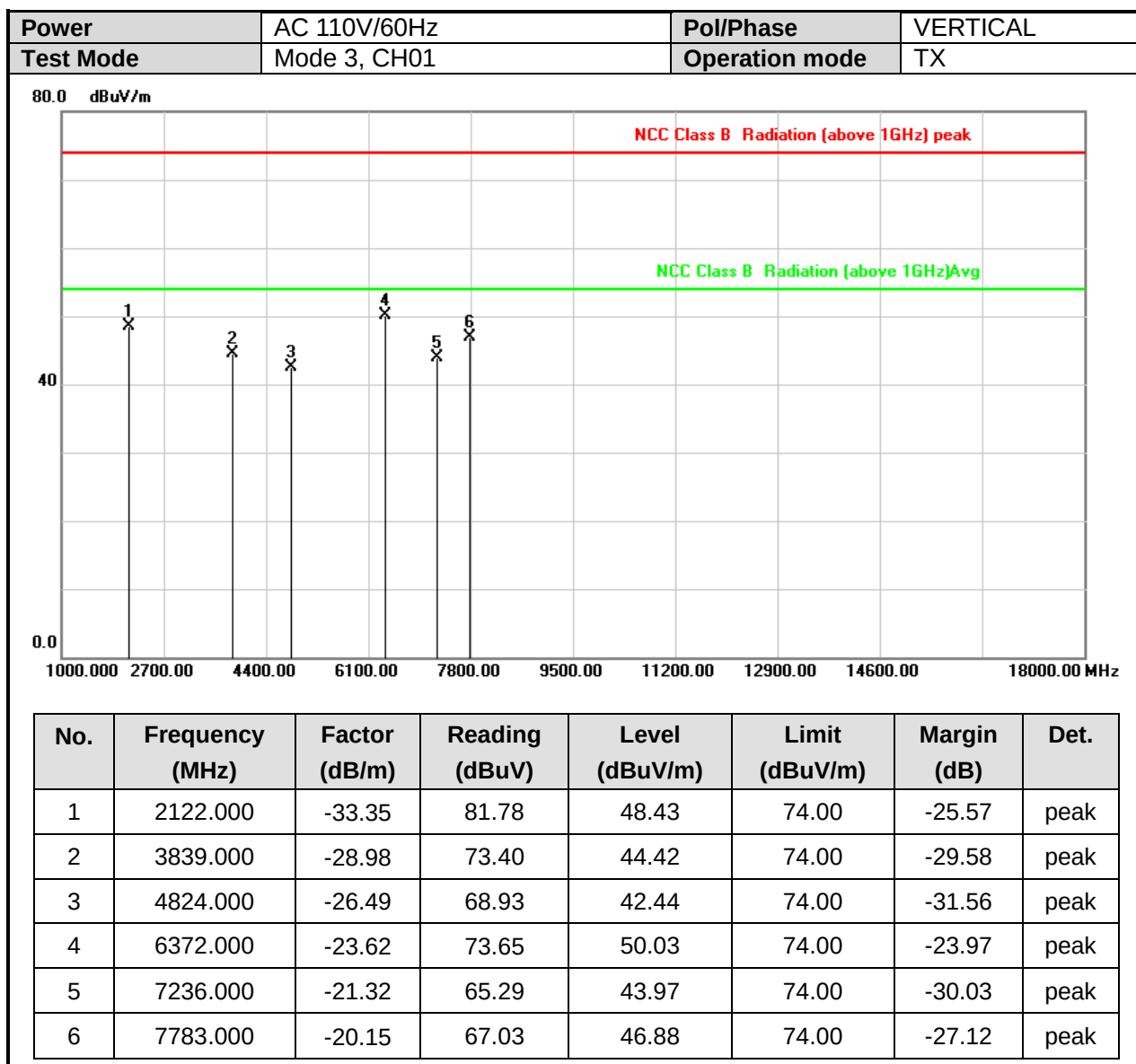


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

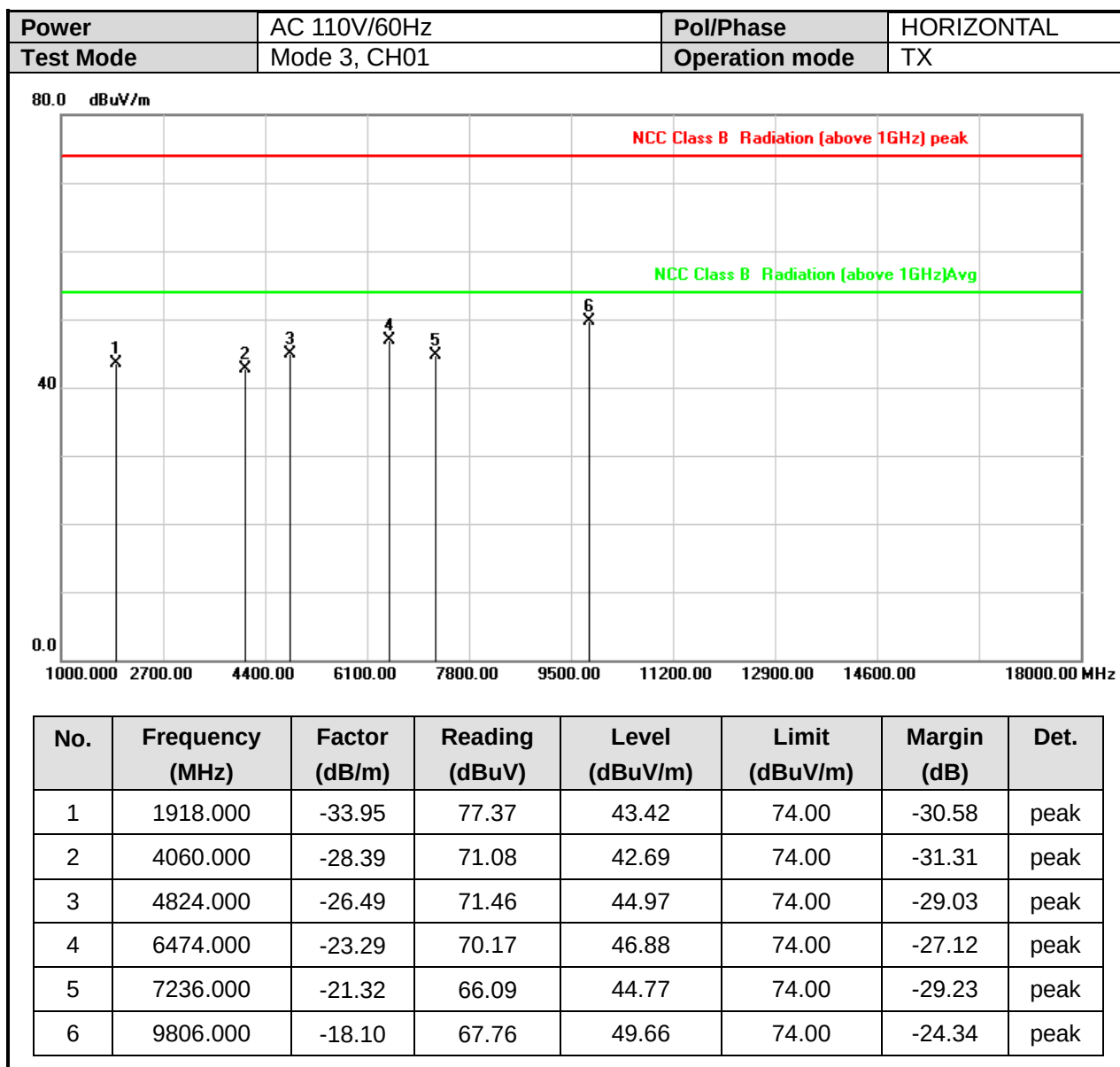


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

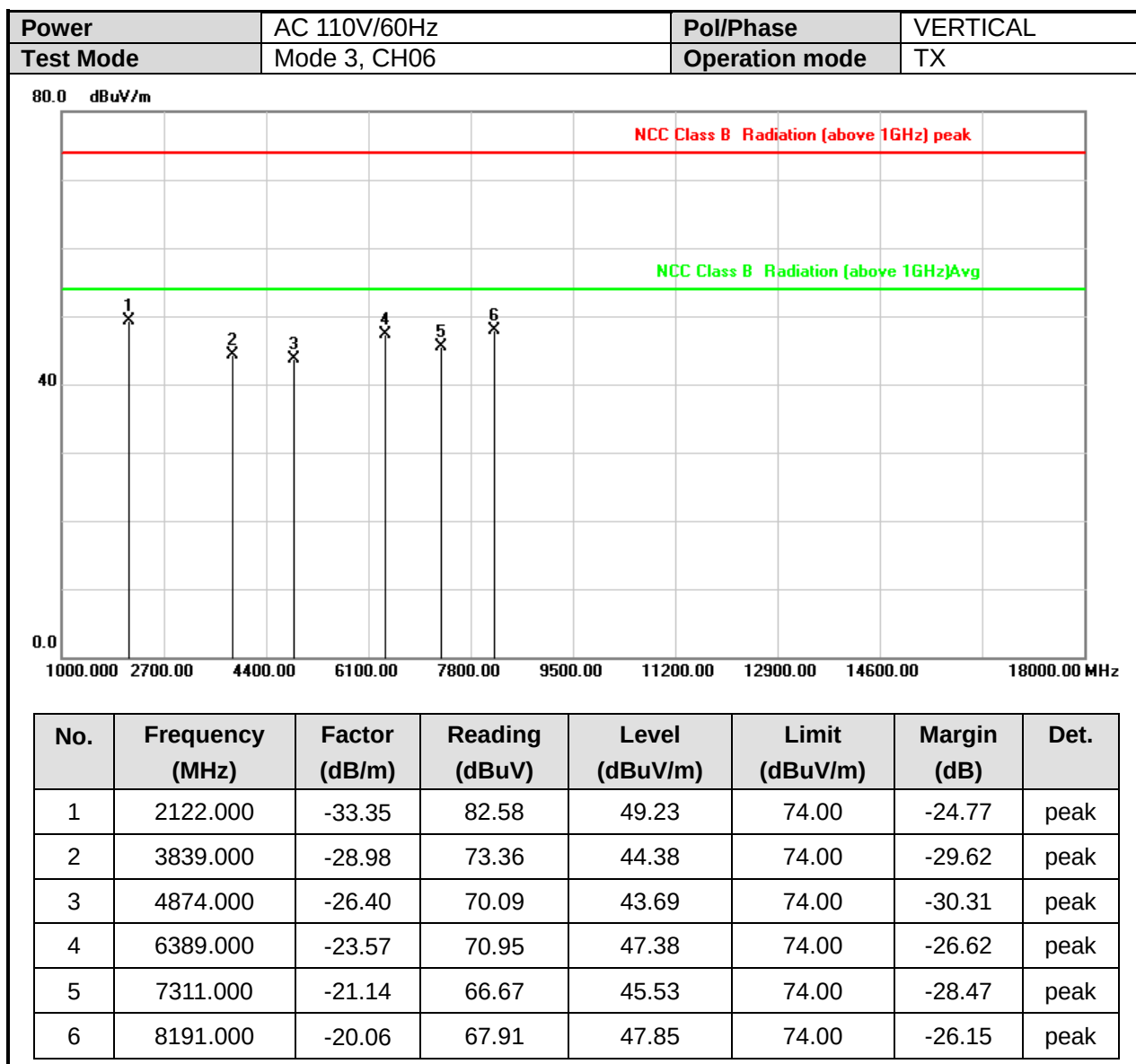


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

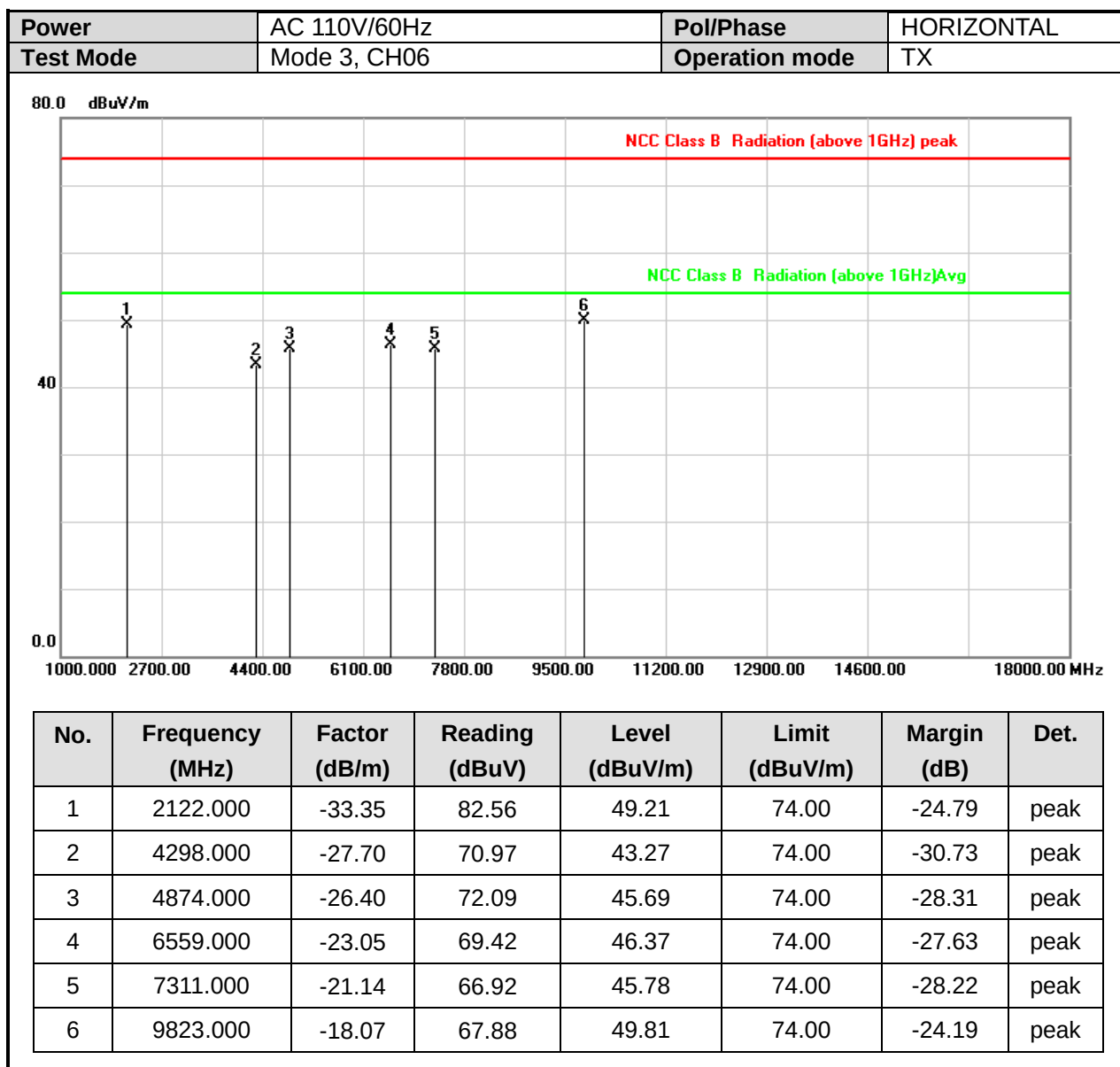


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

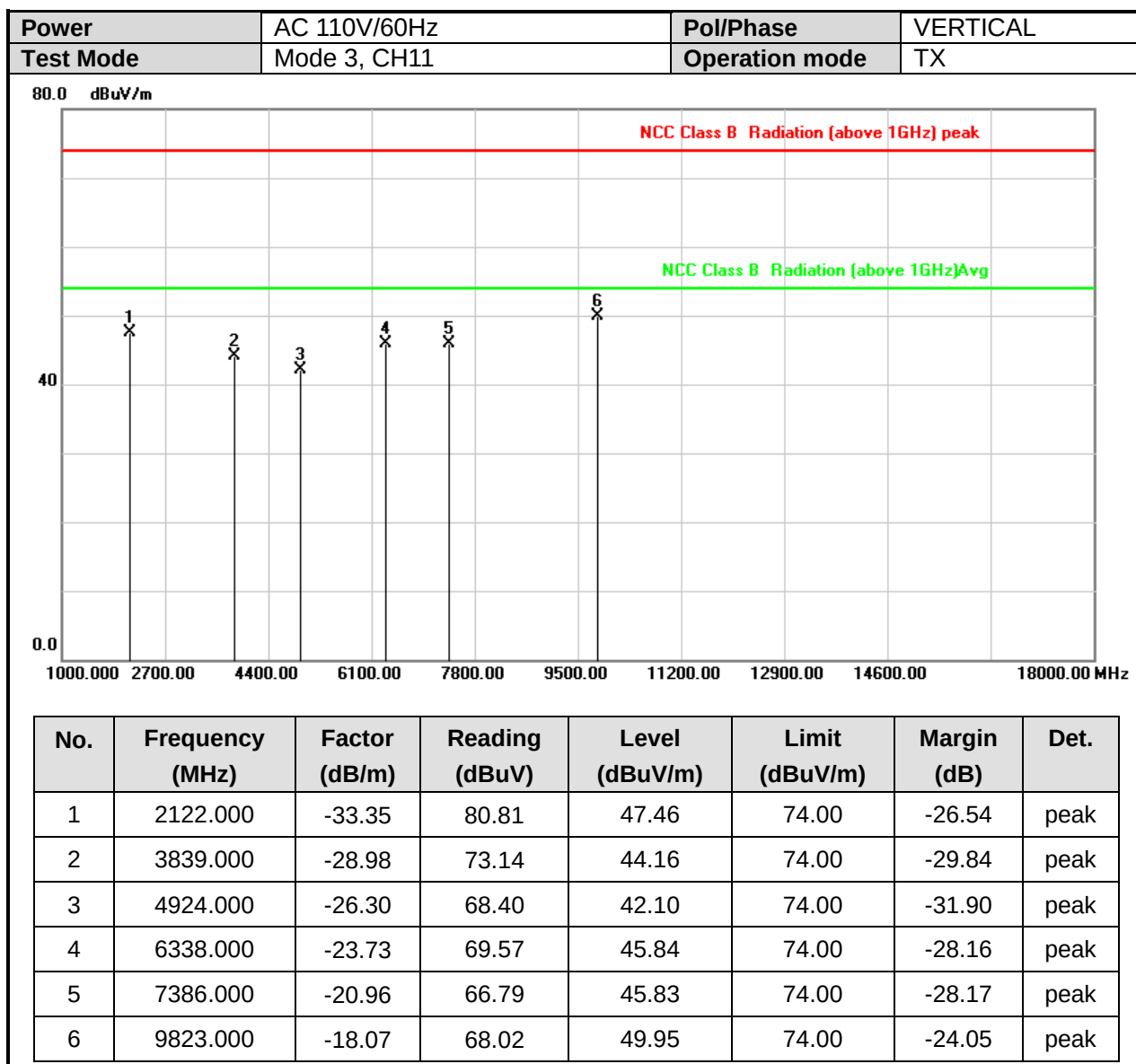


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

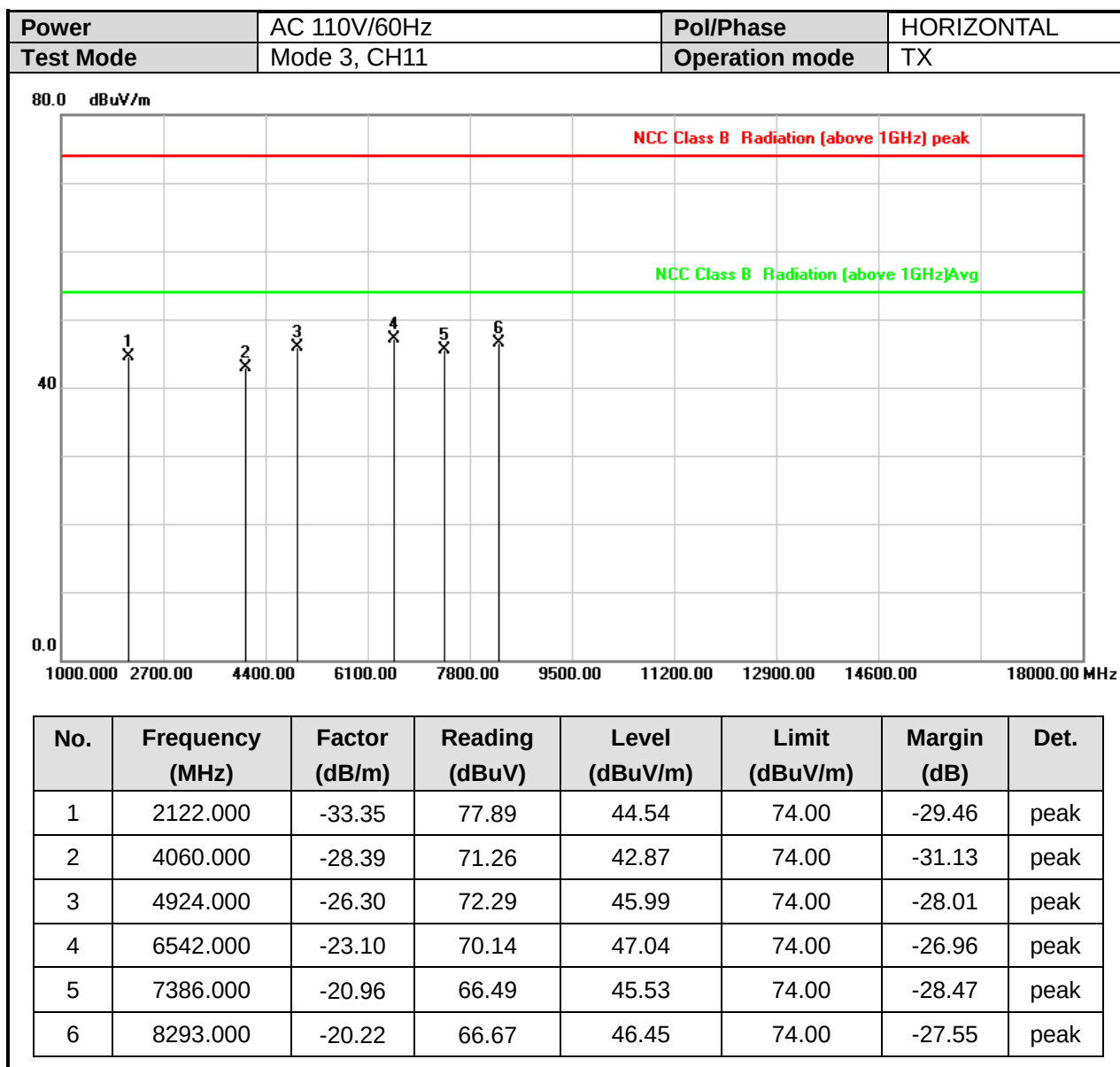


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

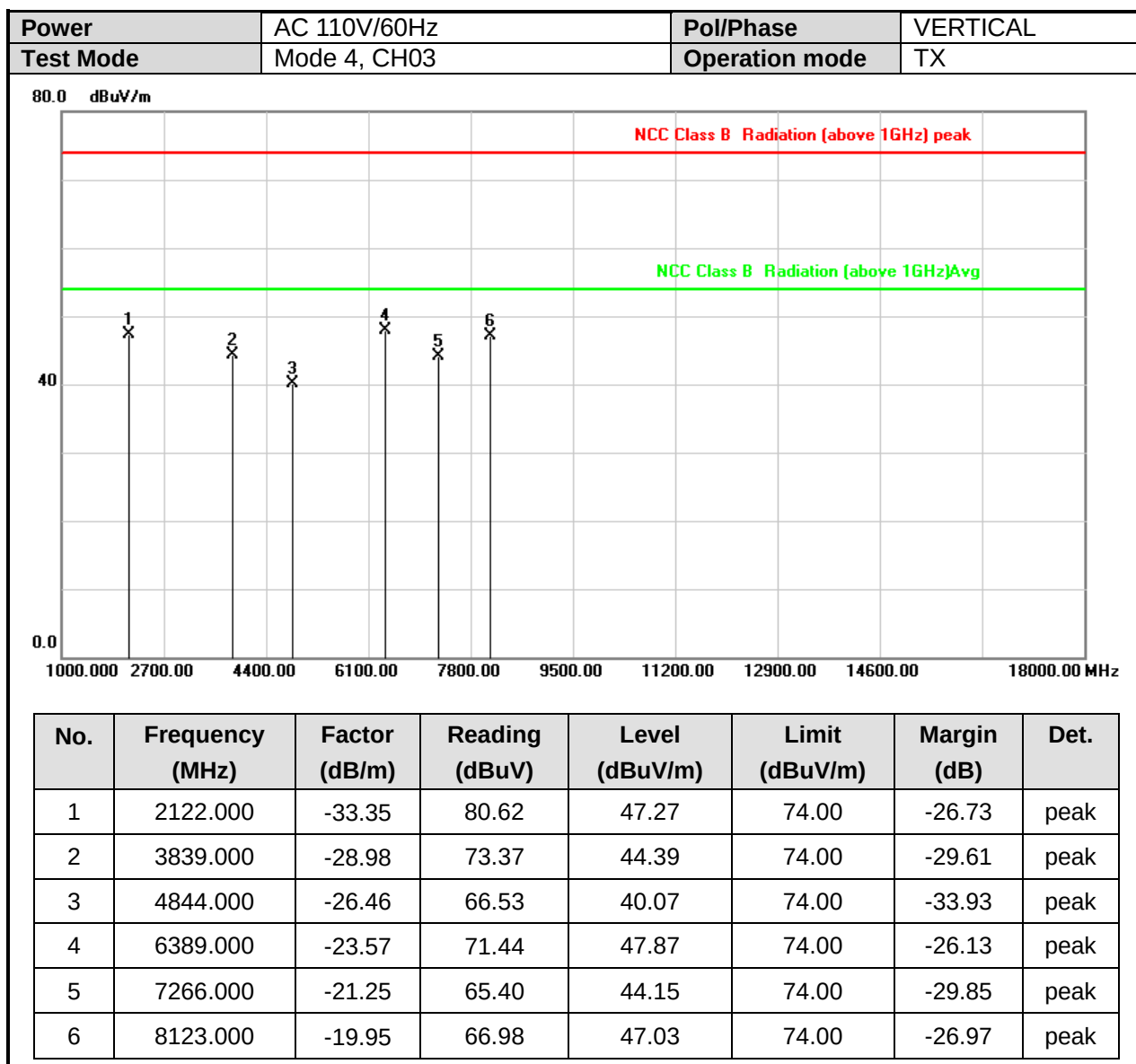


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

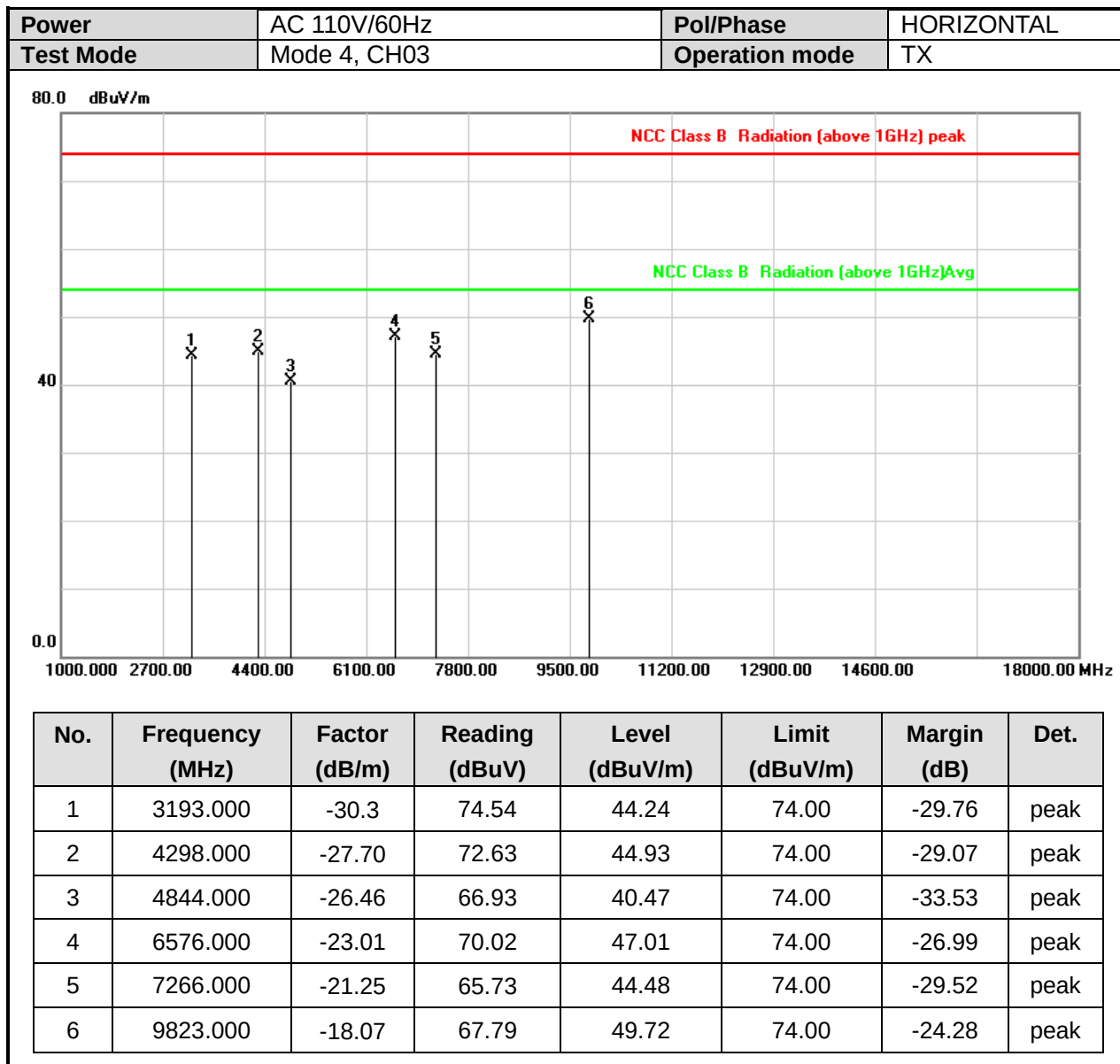


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

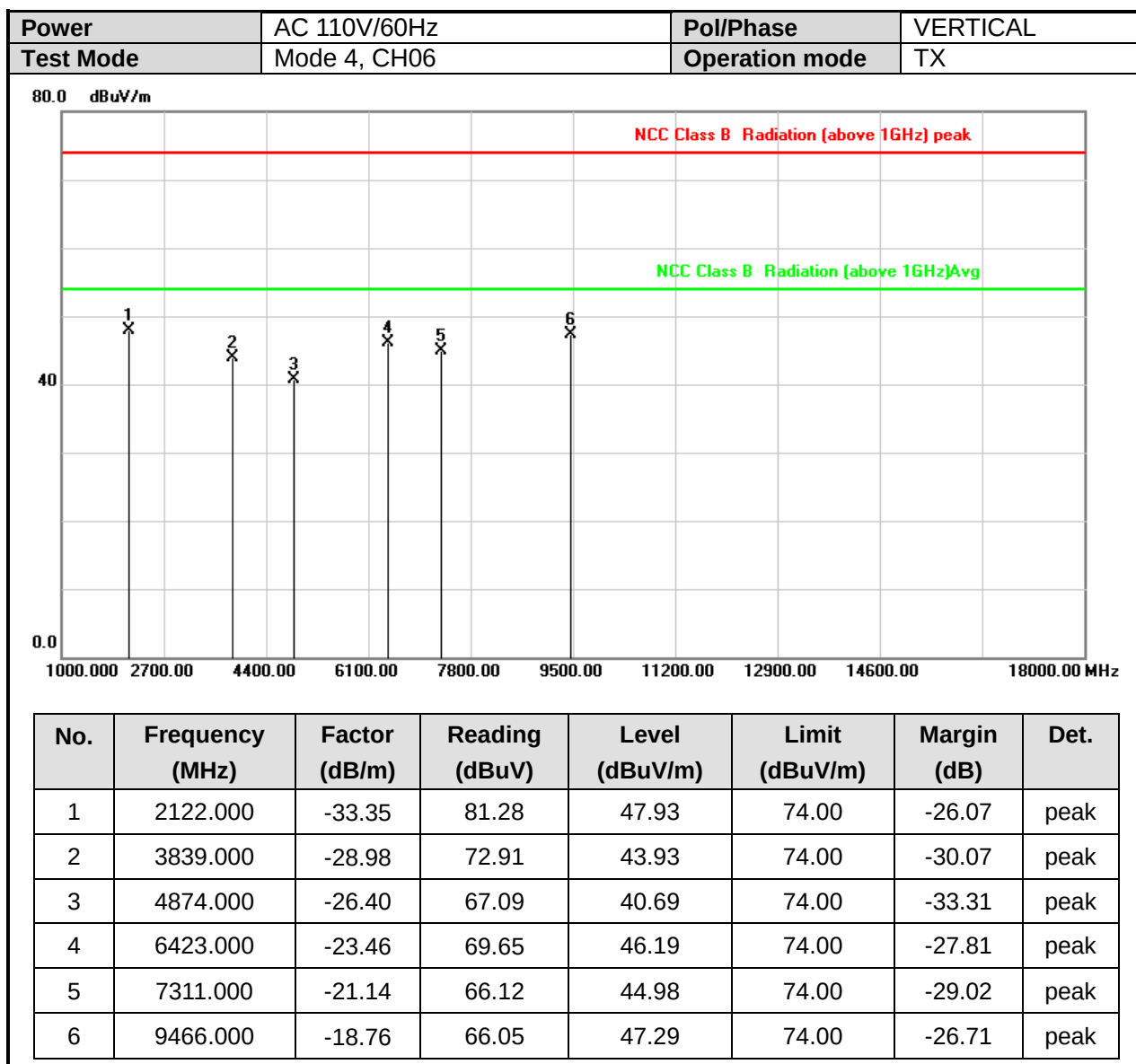


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

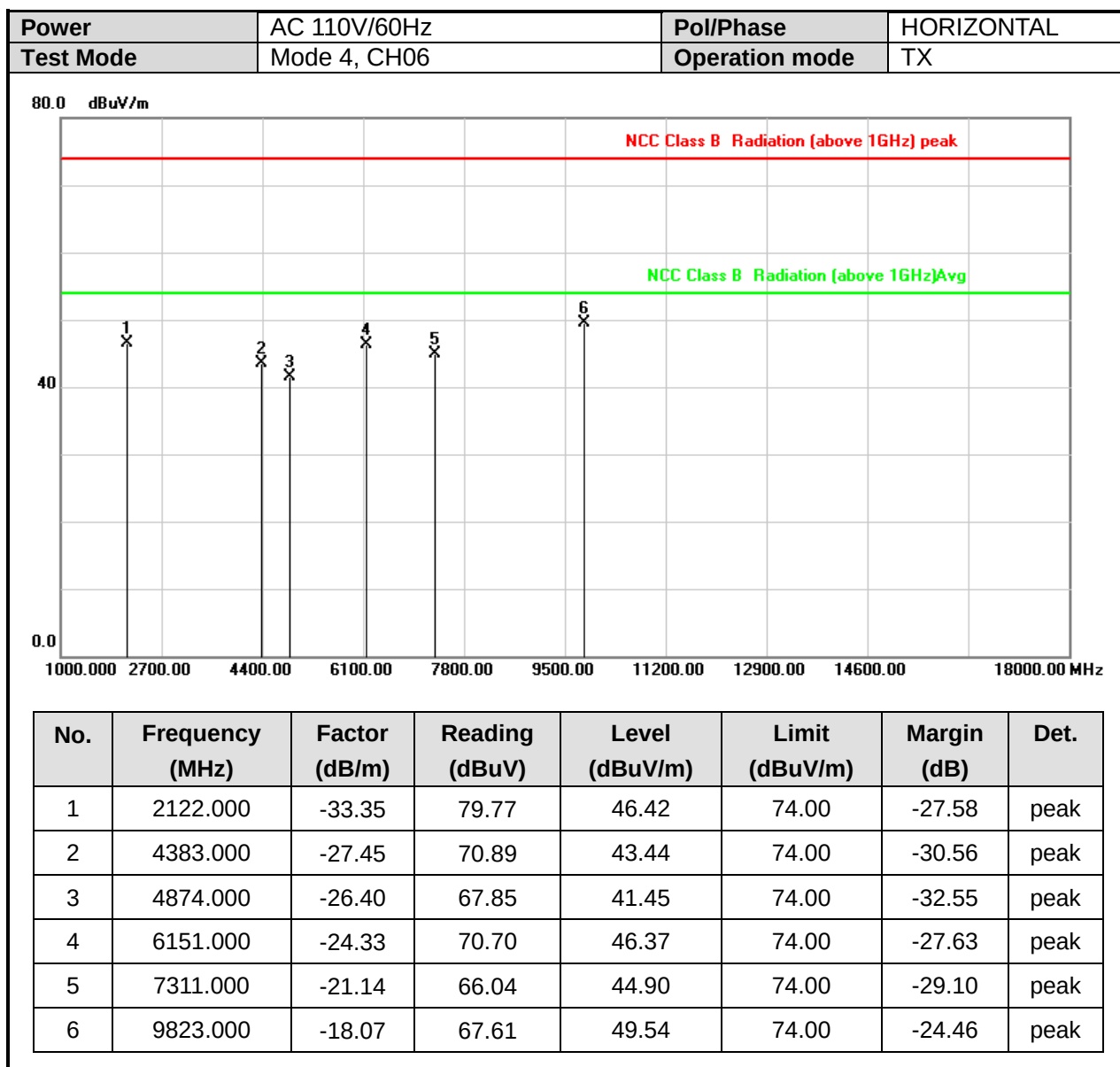


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

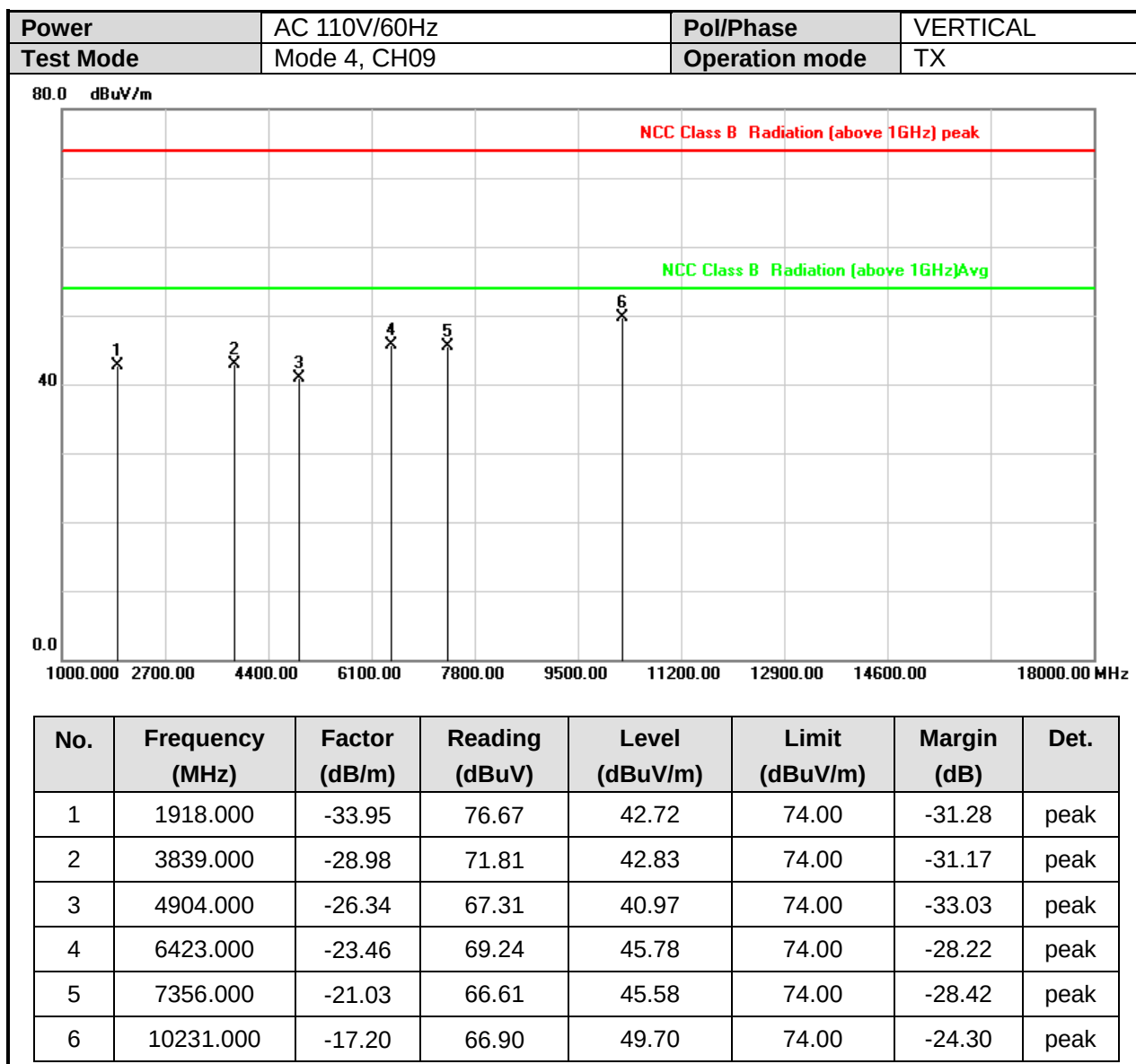


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

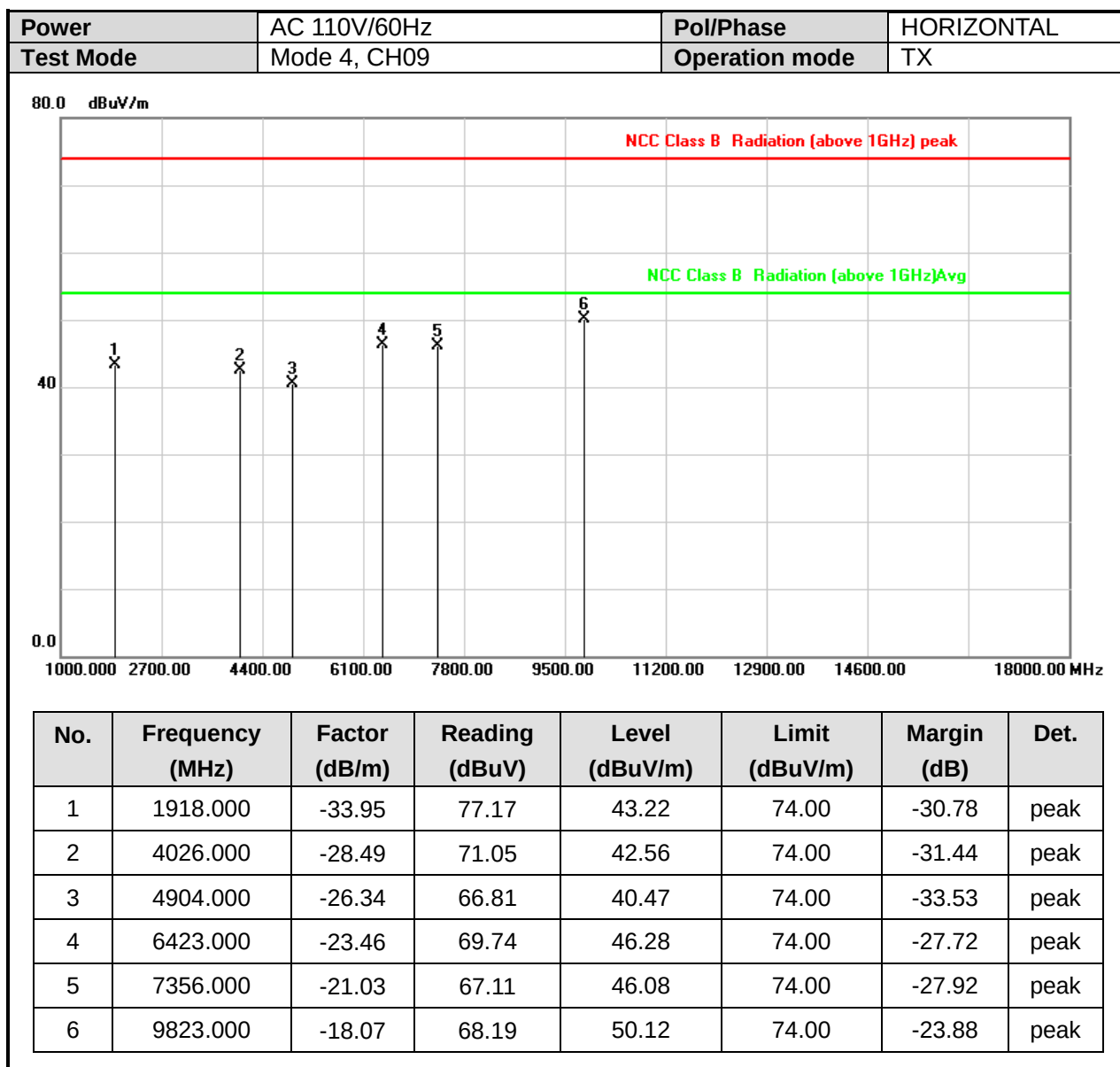


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



Note: Level = Reading + Factor

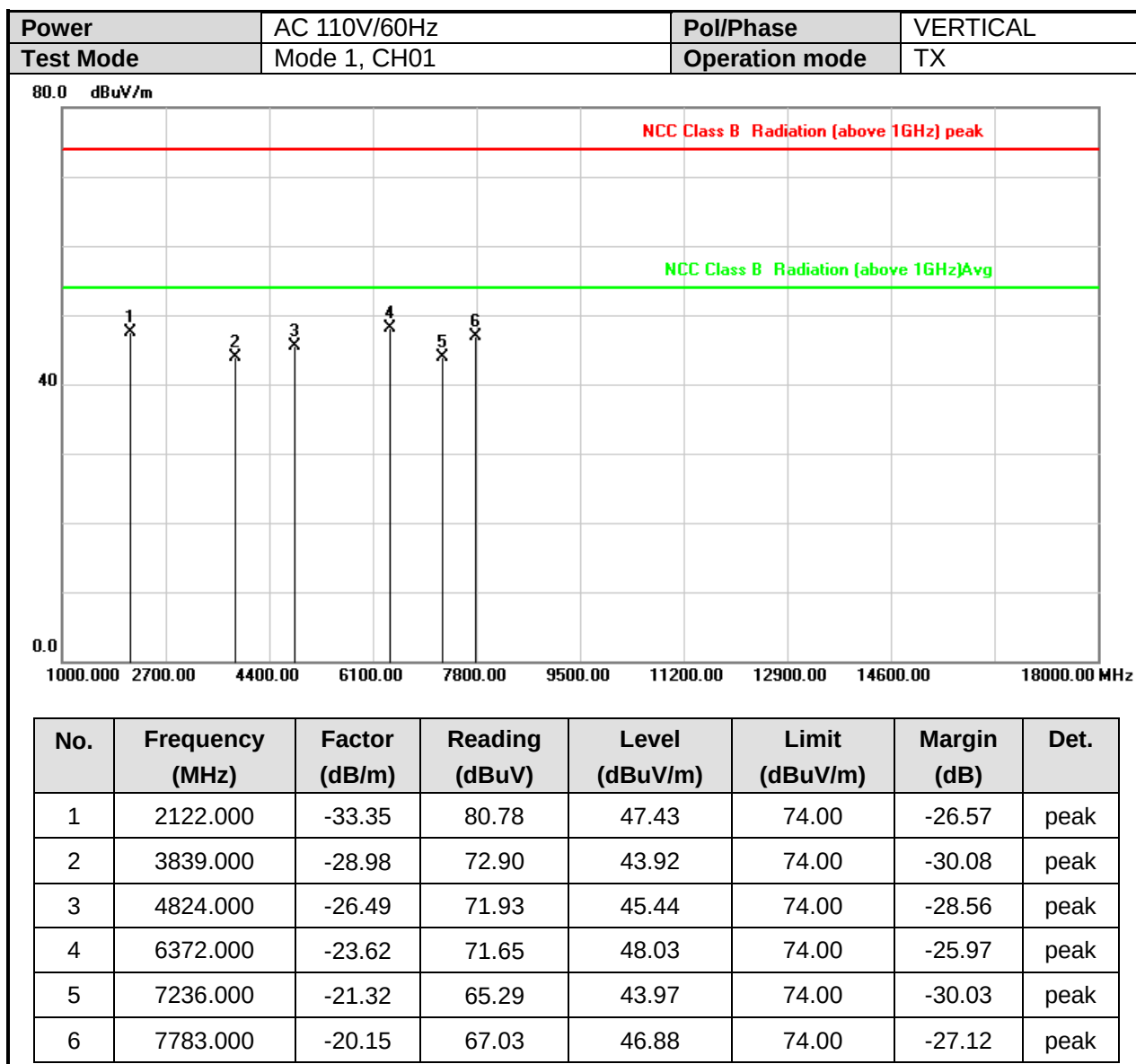
Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



For 2TX

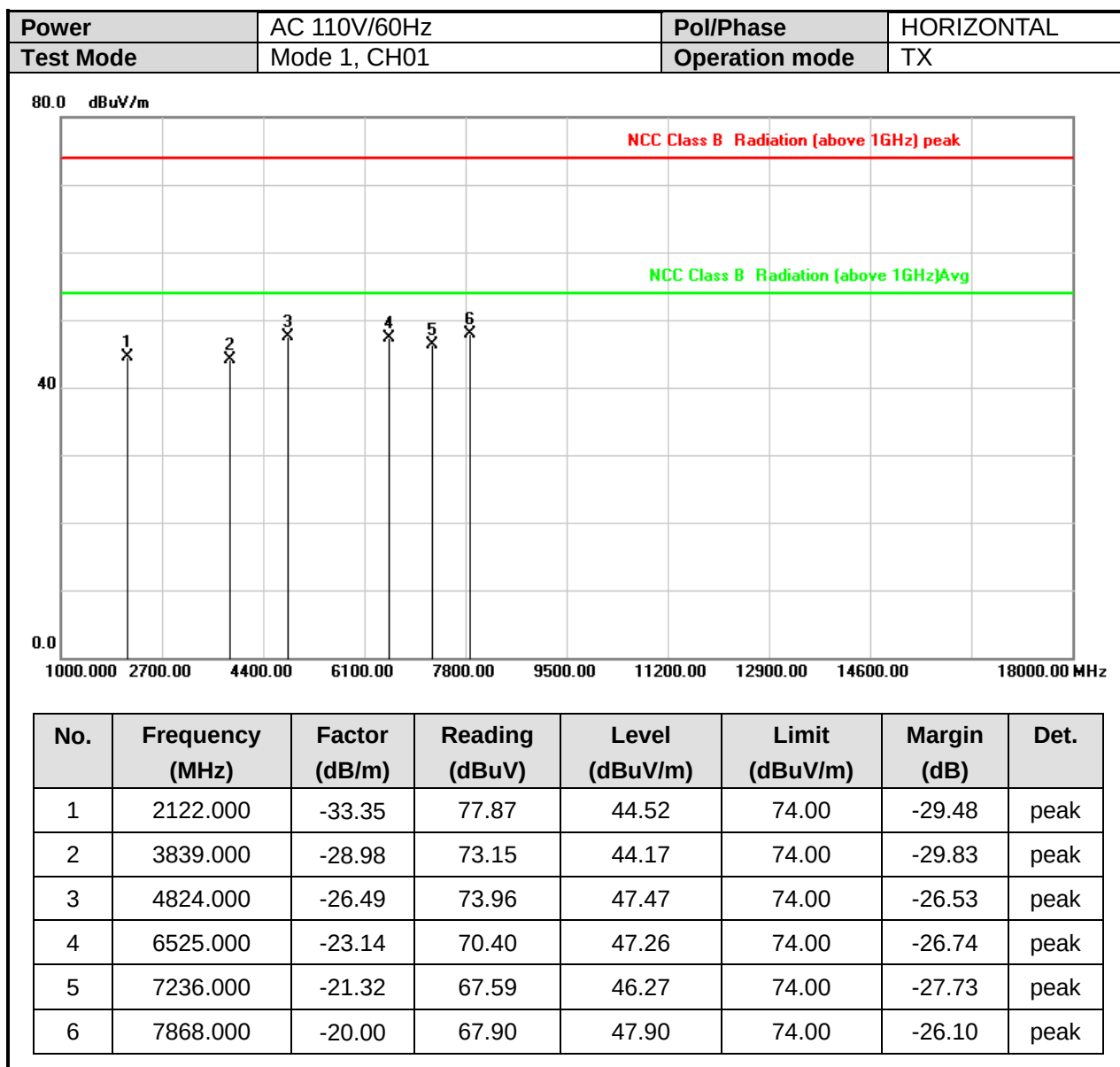


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

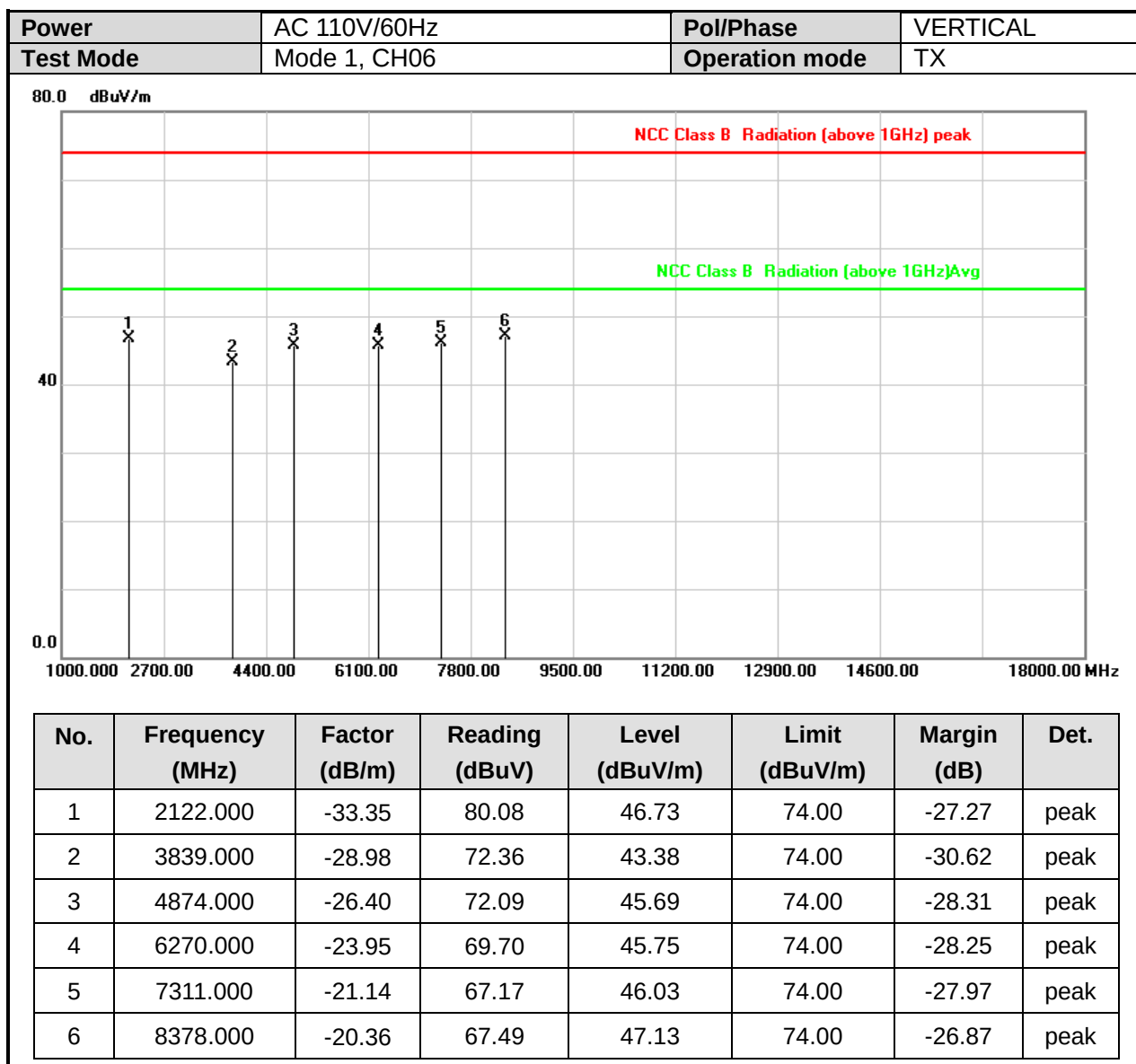


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

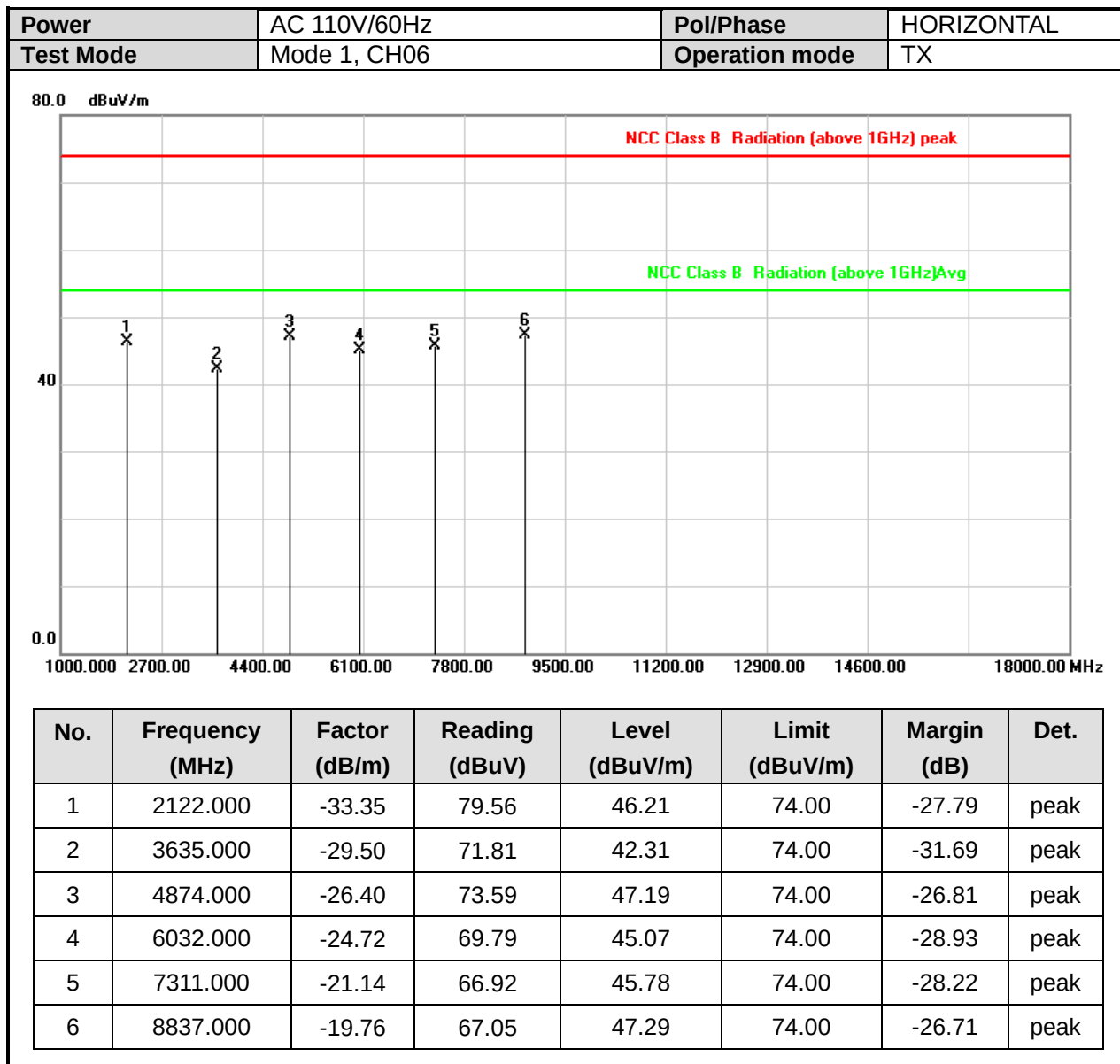


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

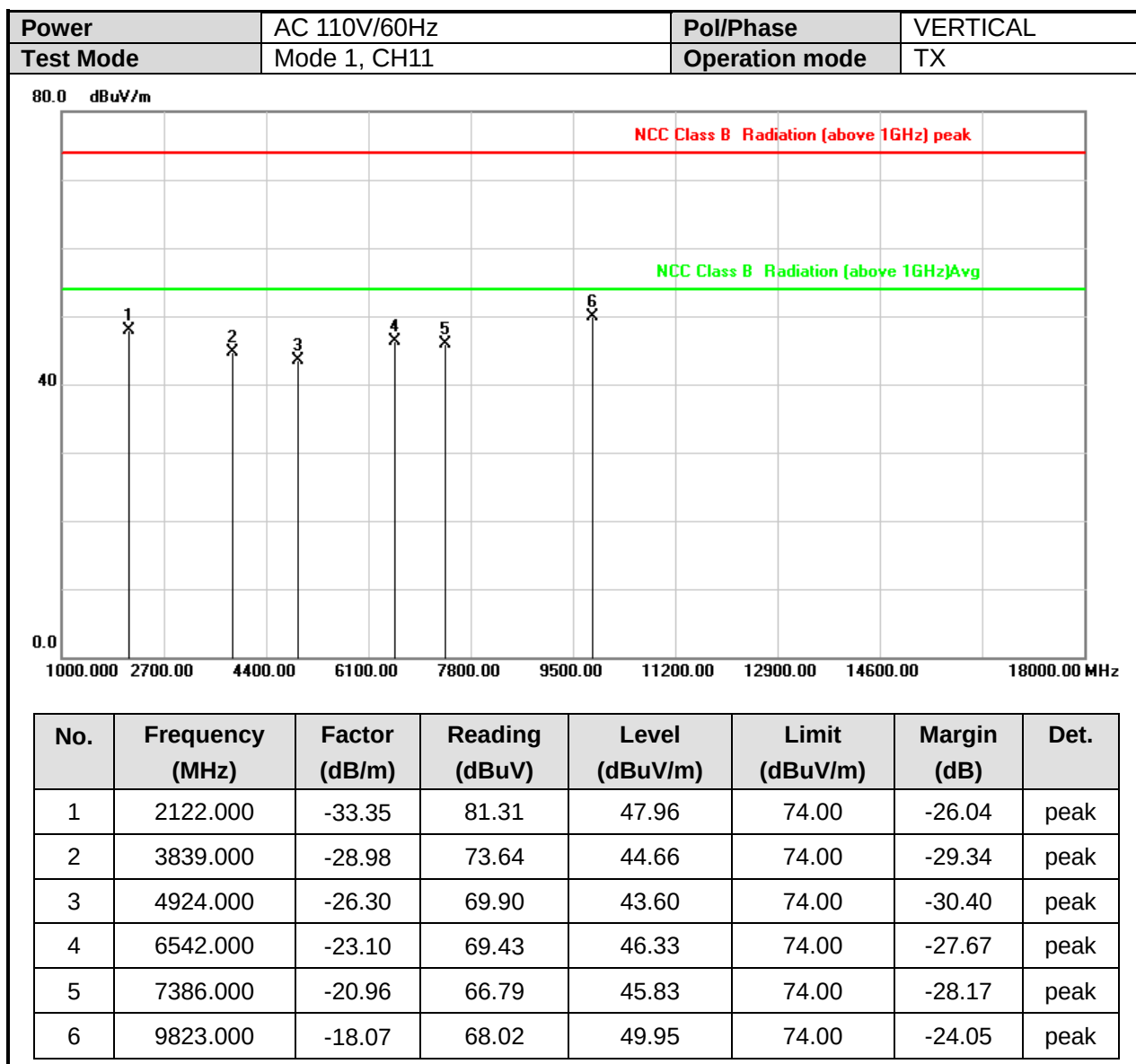


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

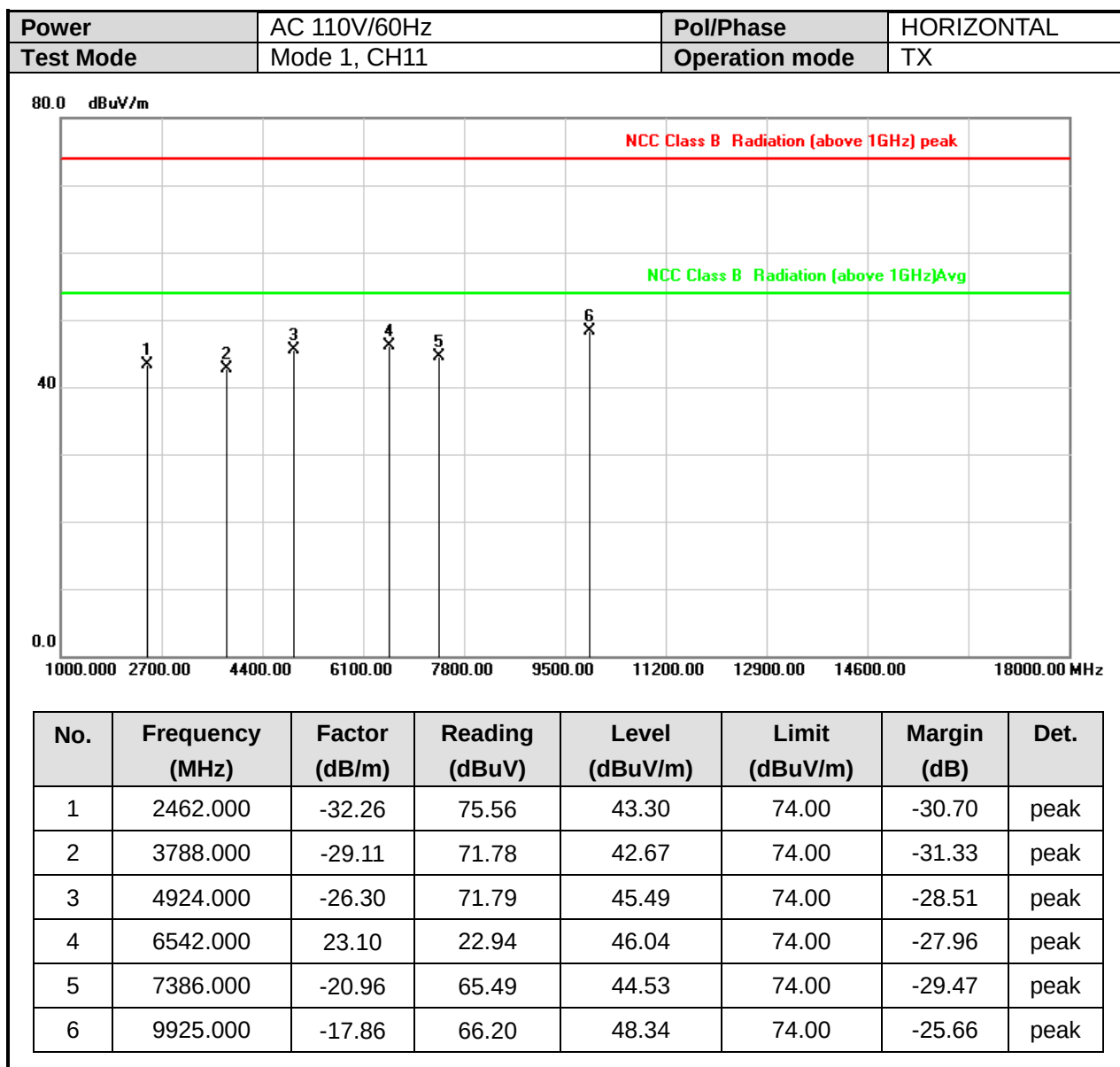


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

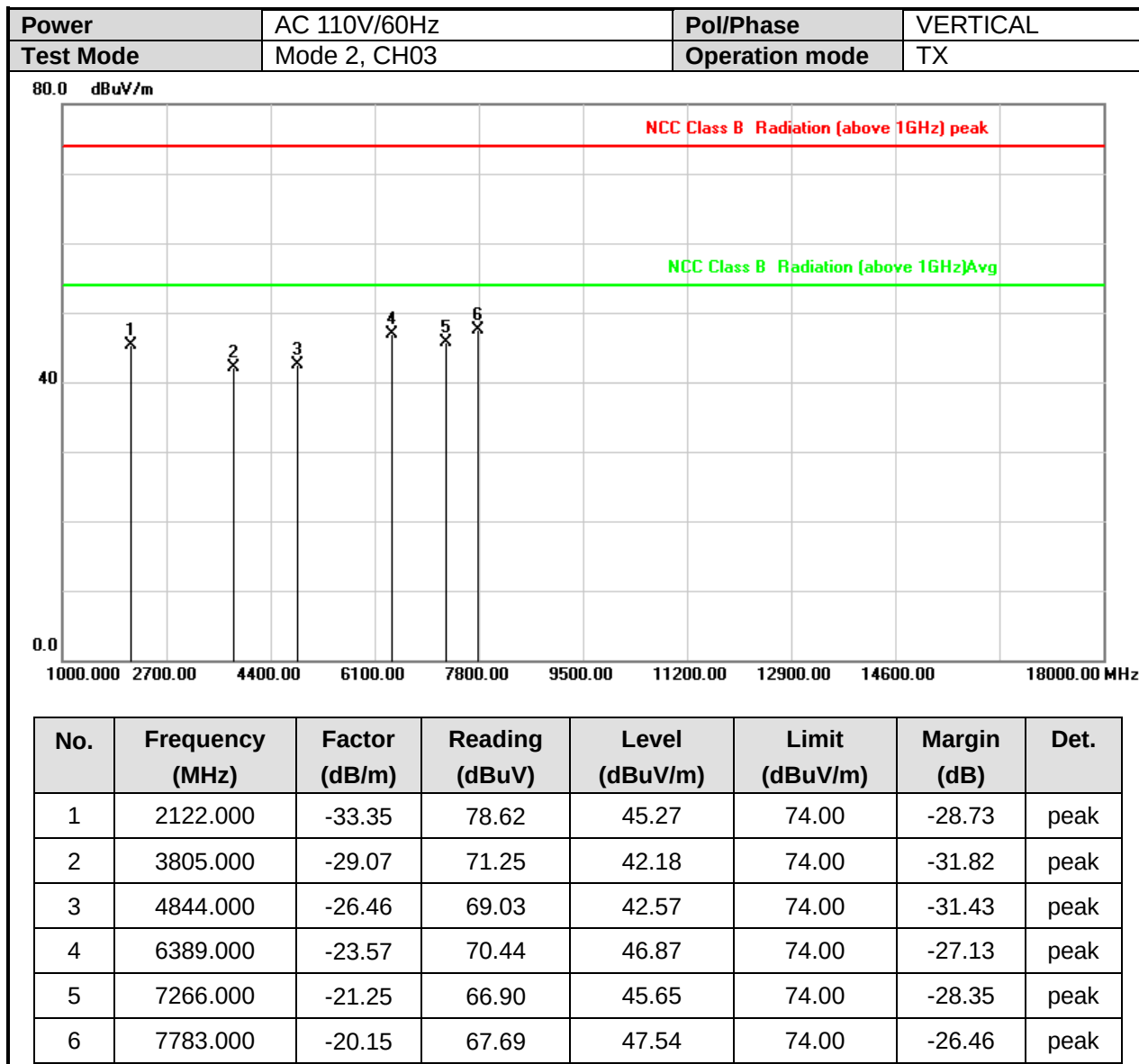


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

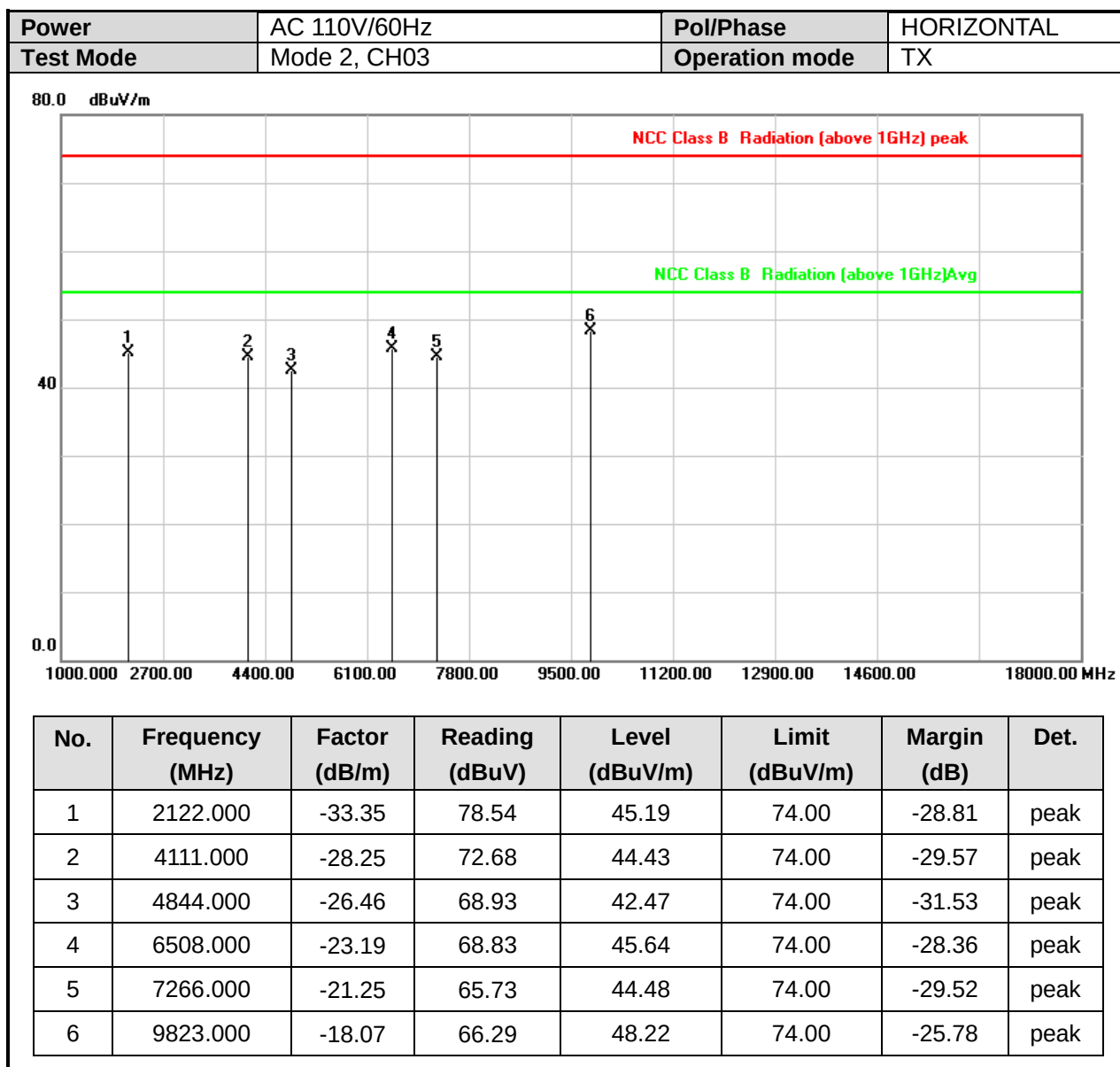


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

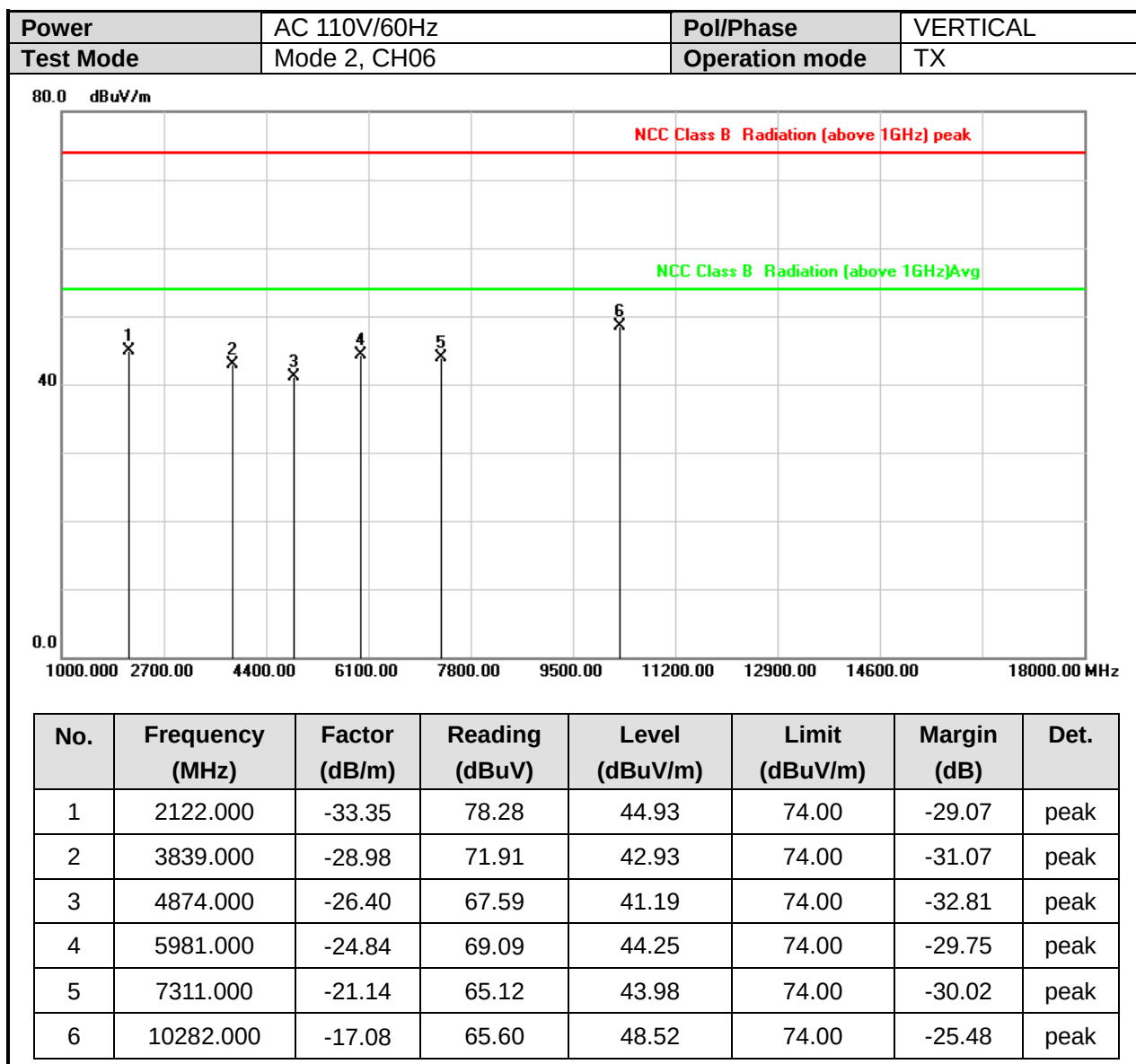


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

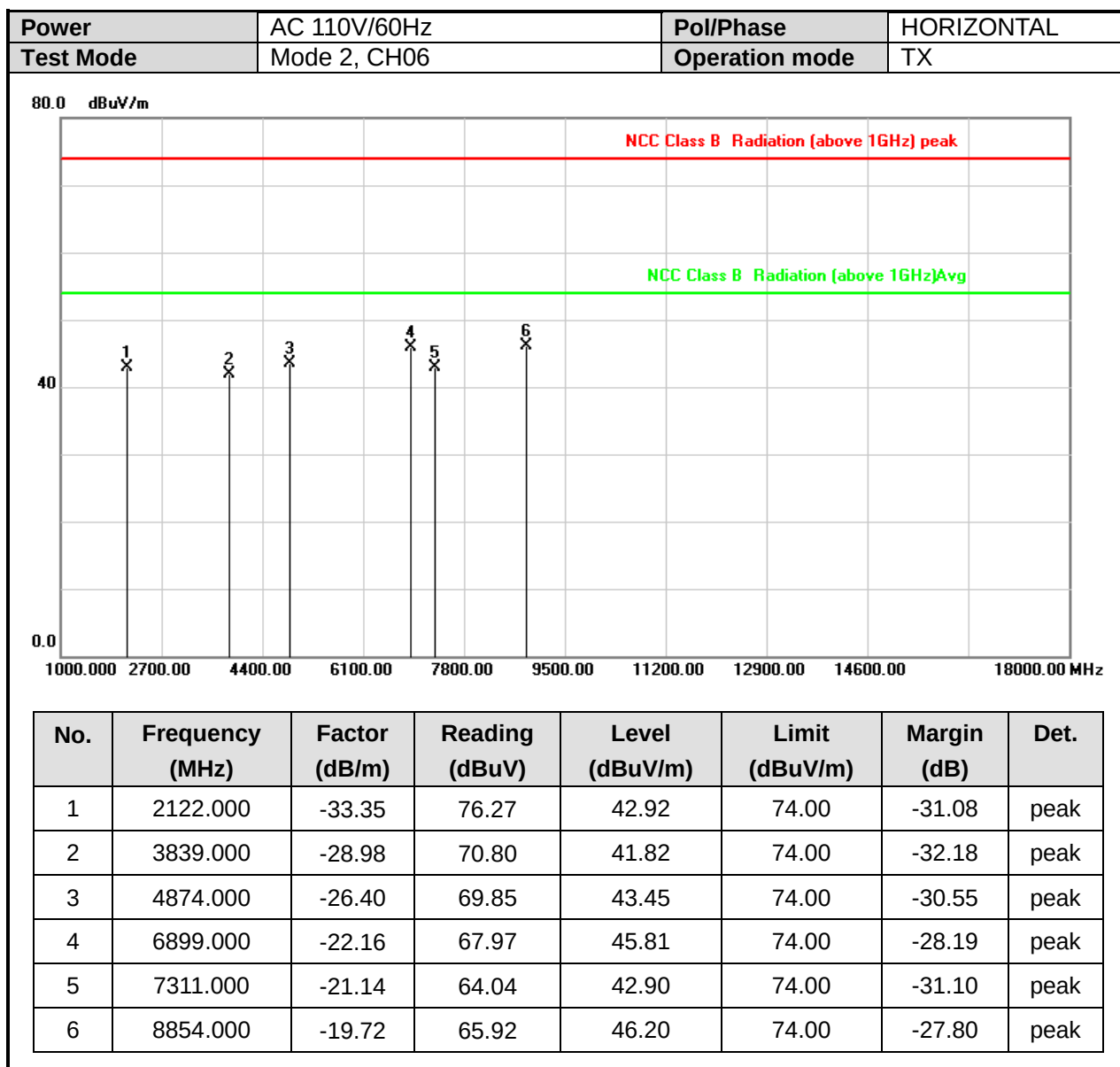


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

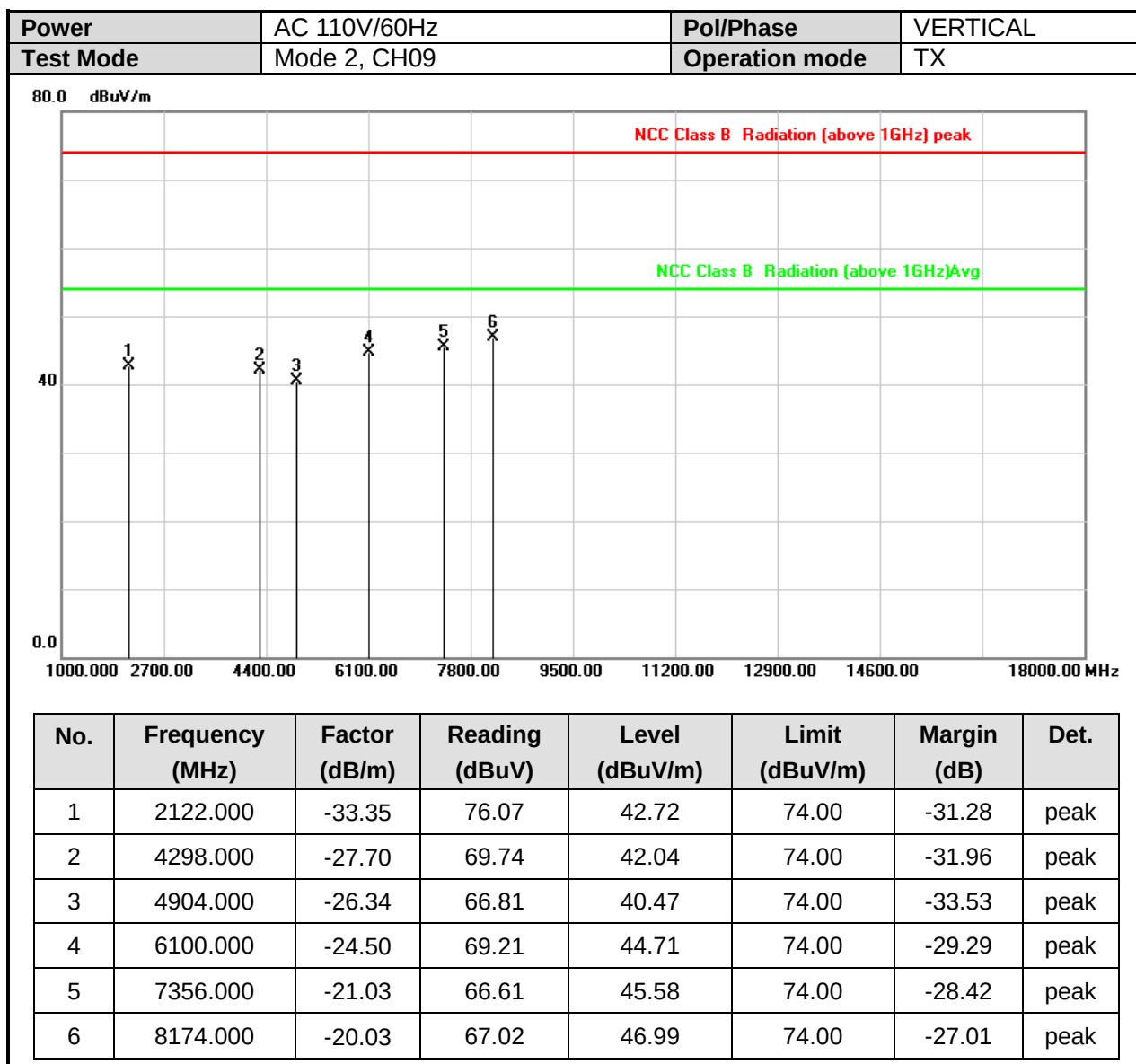


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

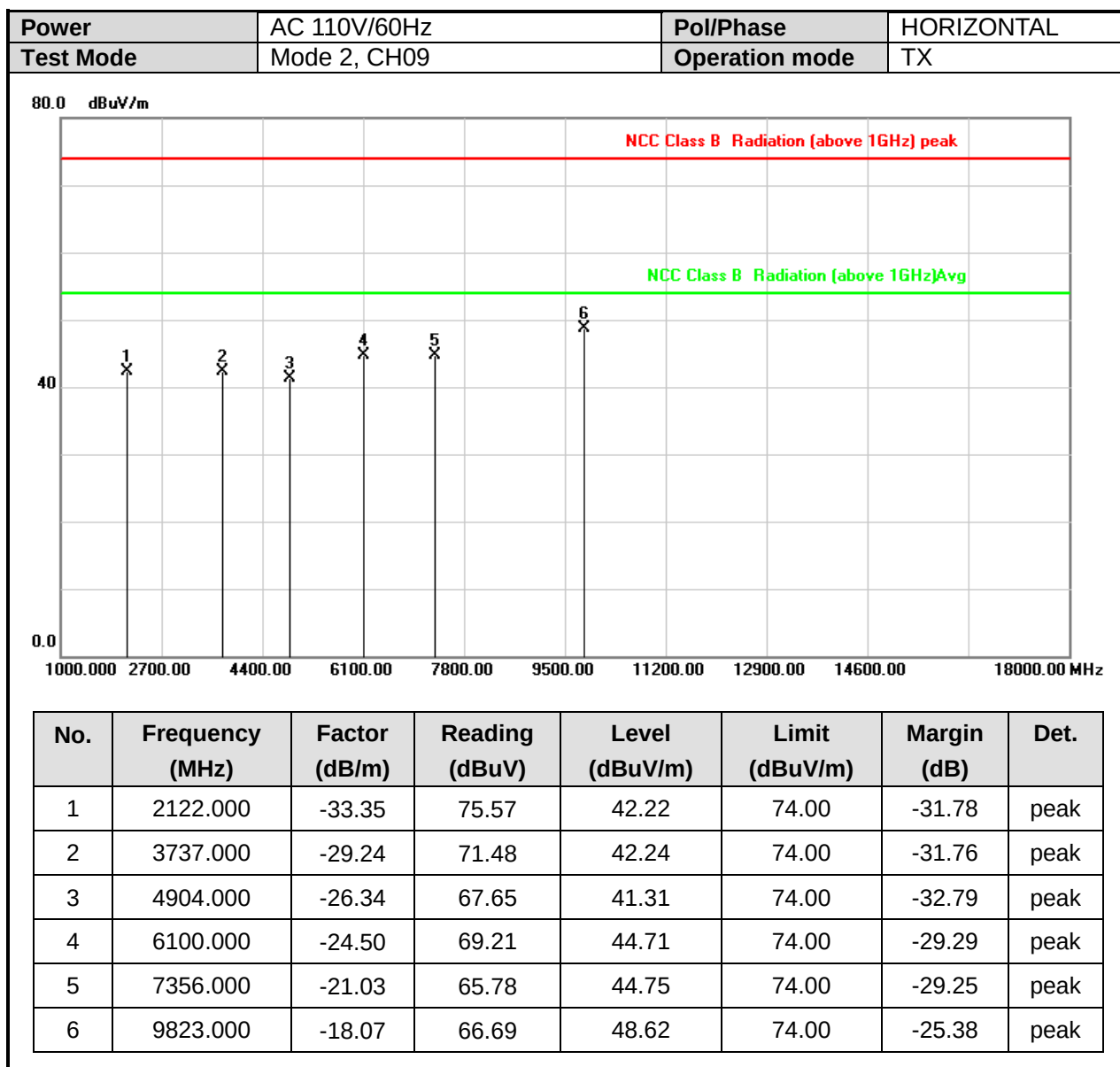


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

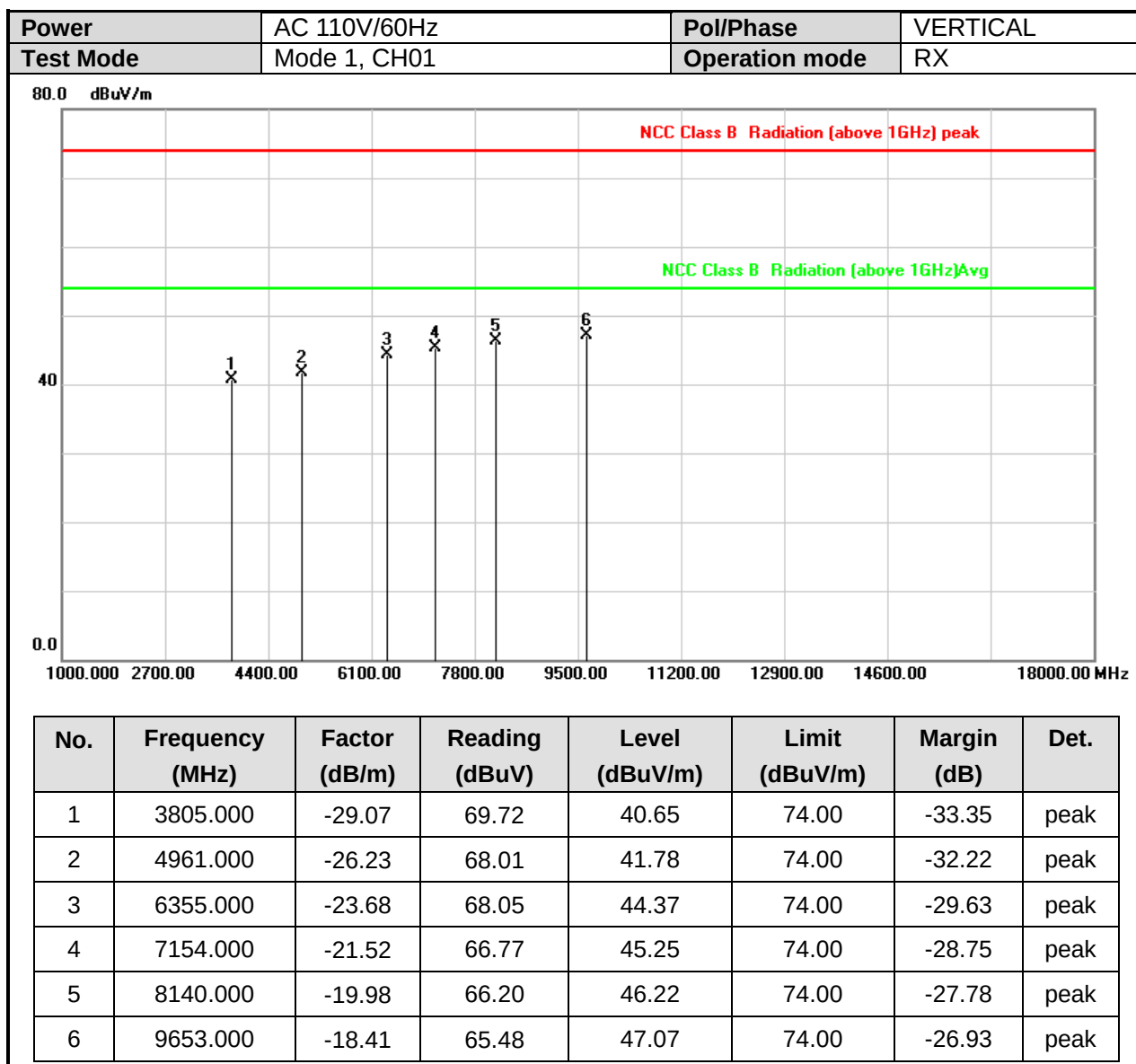


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

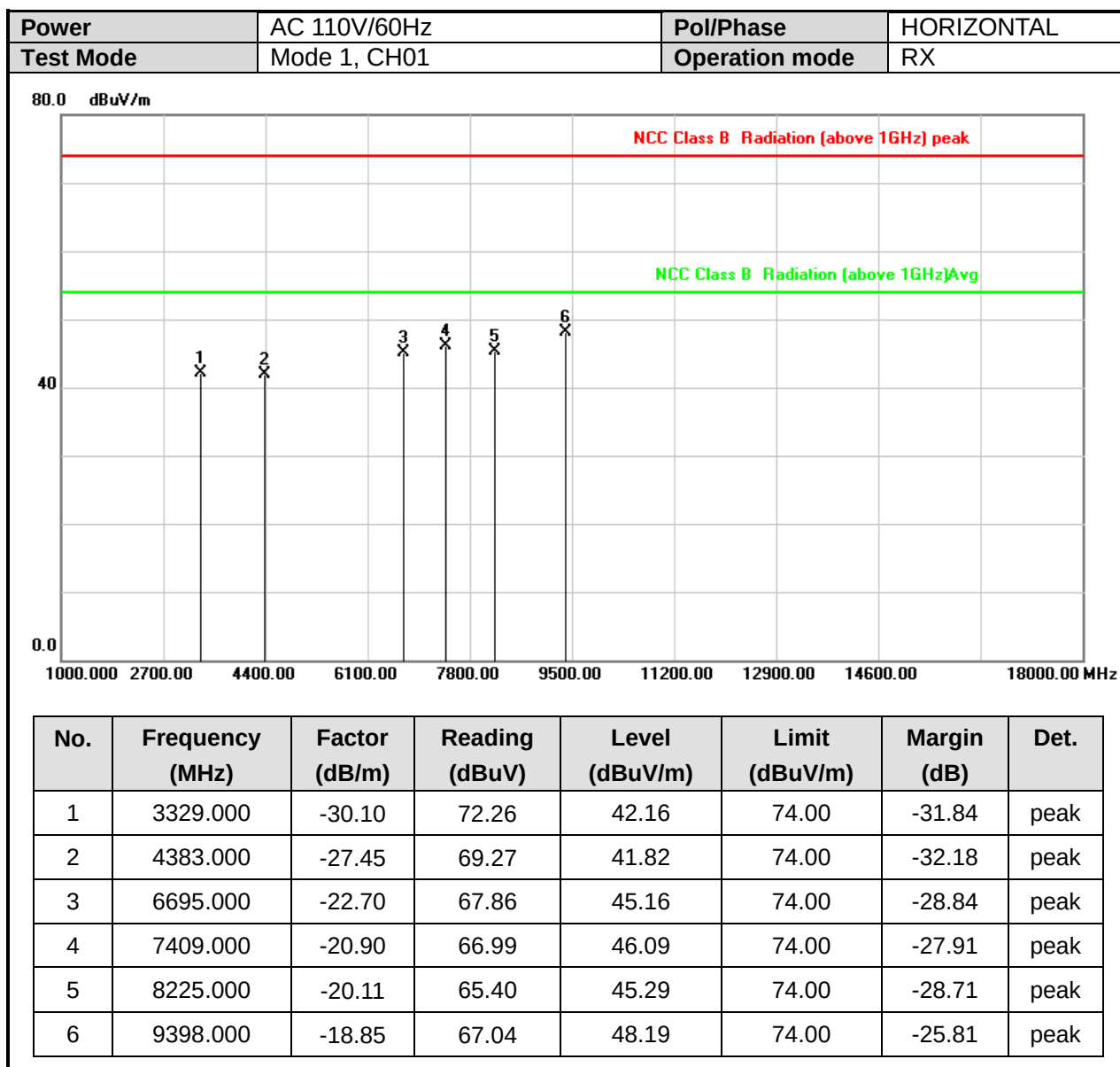


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

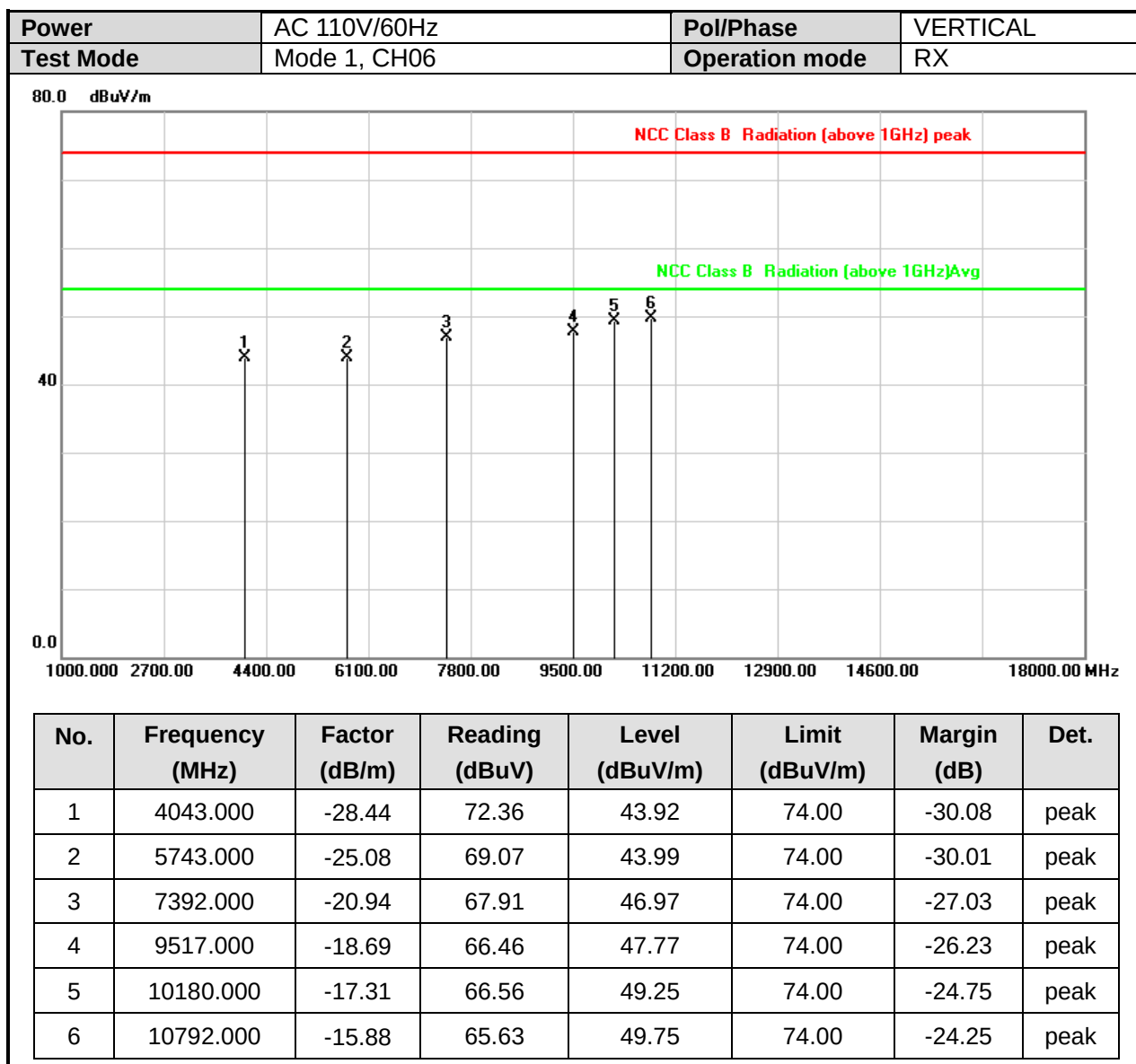


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

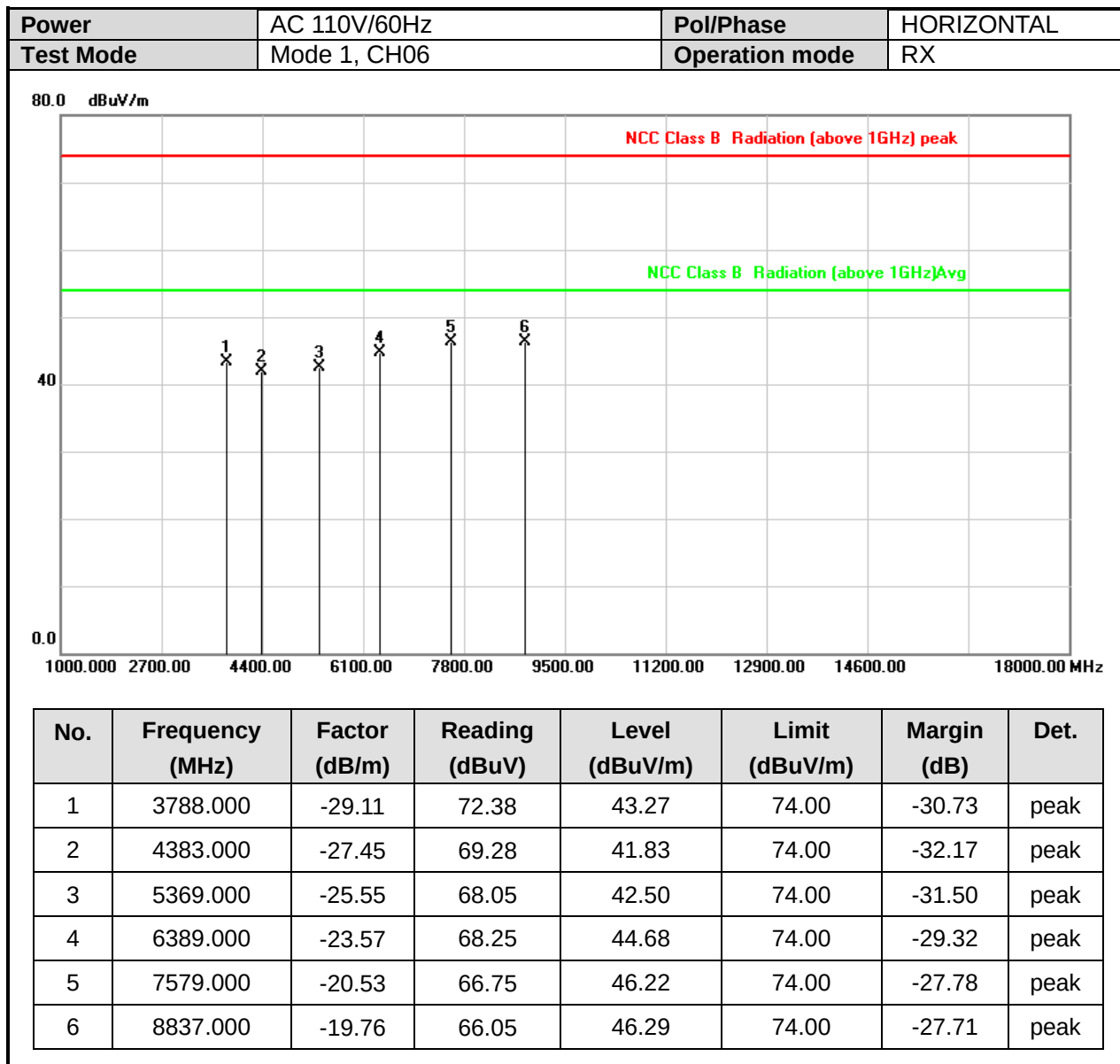


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

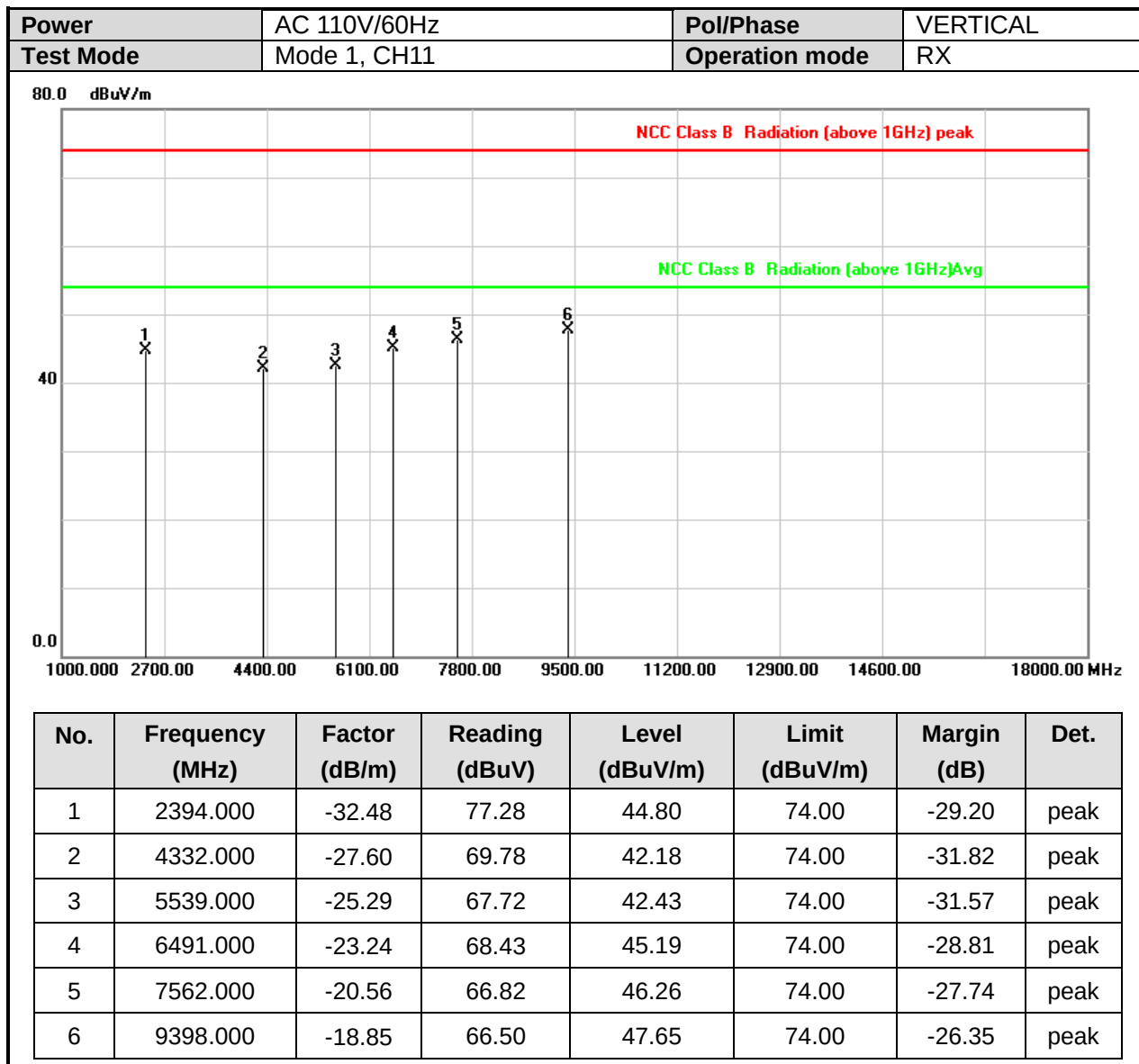


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.

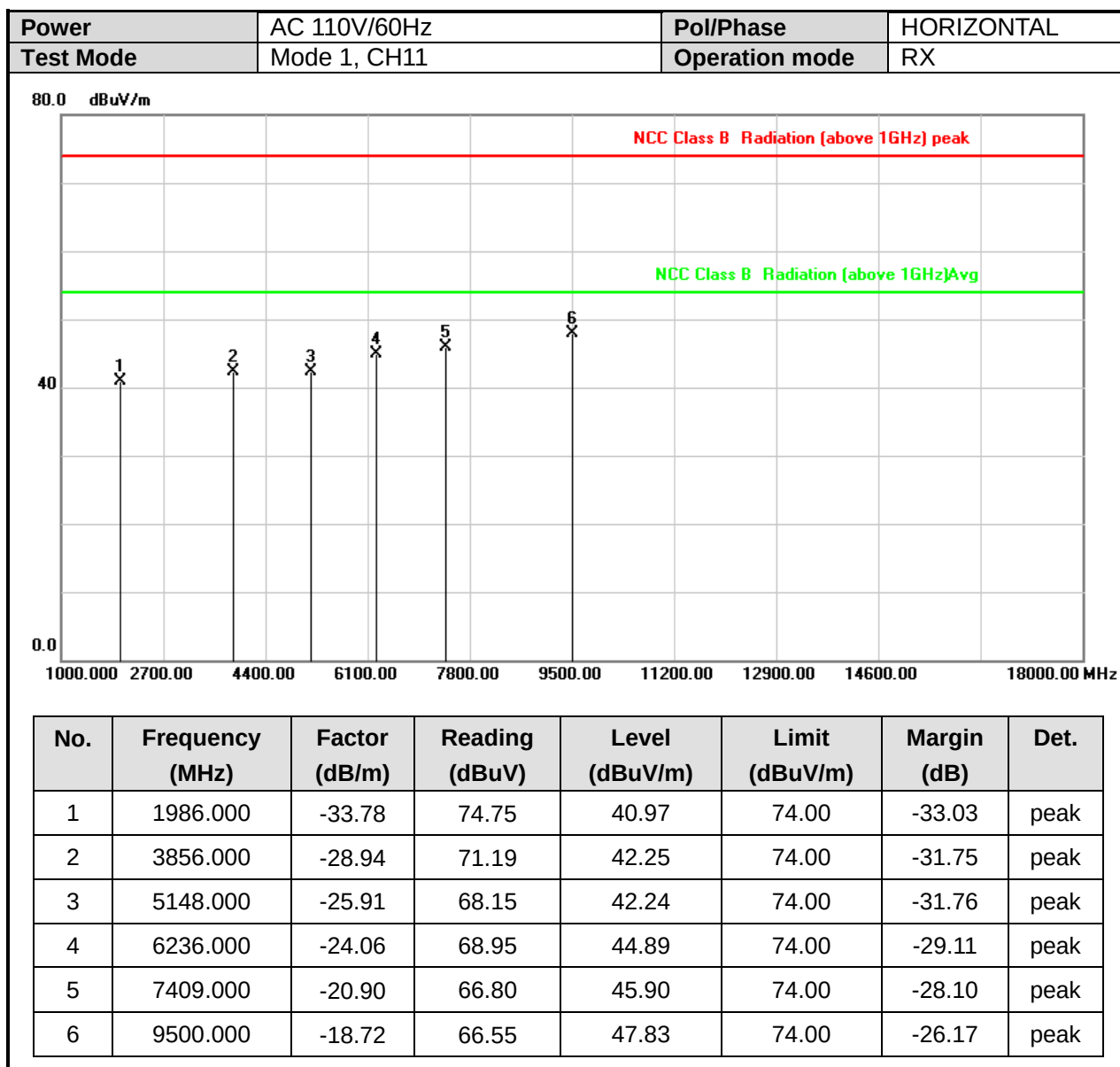


Note: Level = Reading + Factor

Margin = Level – Limit

Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



Note: Level = Reading + Factor

Margin = Level – Limit

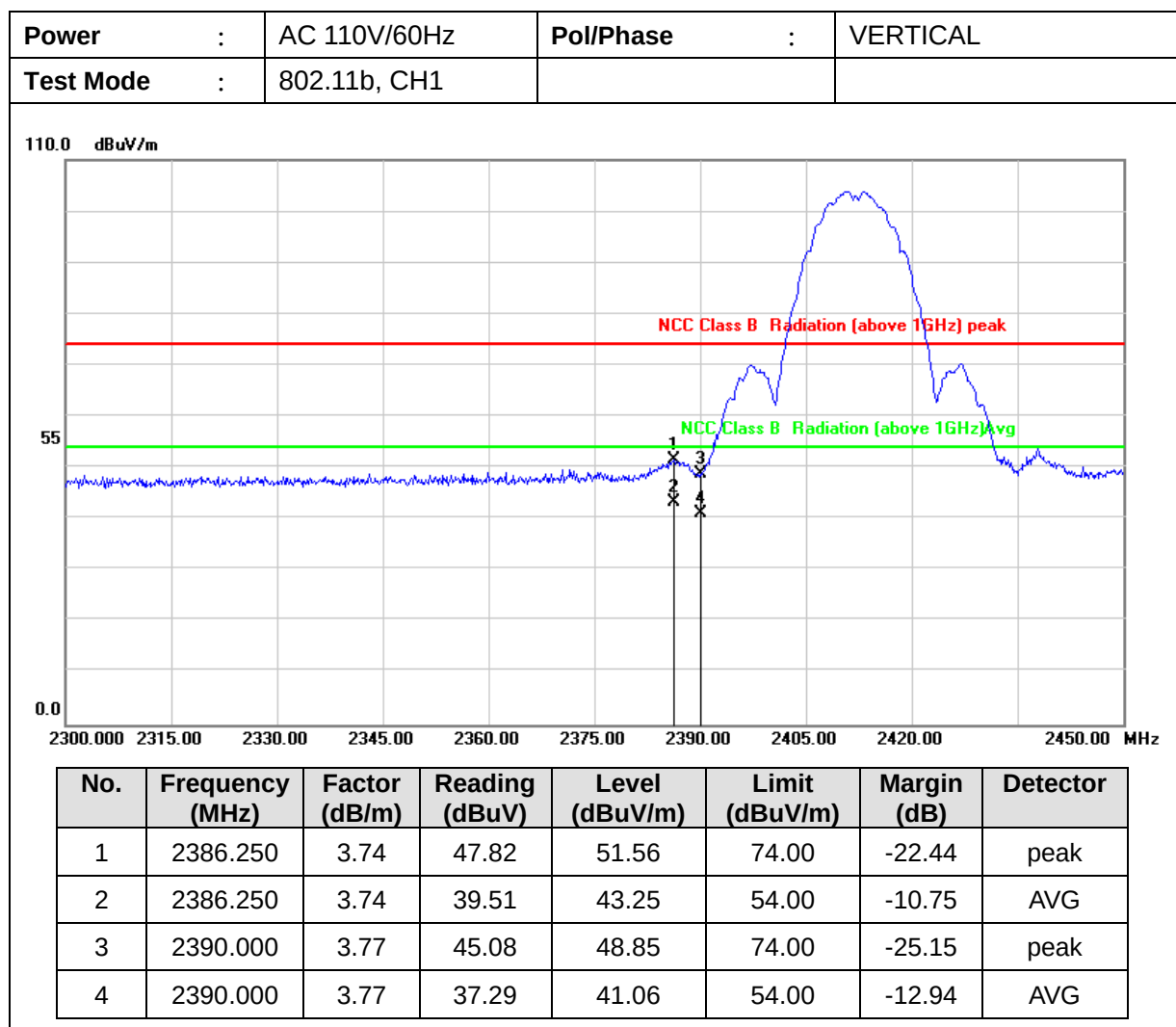
Factor = Antenna Factor + Cable Loss – Amplifier Factor

The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



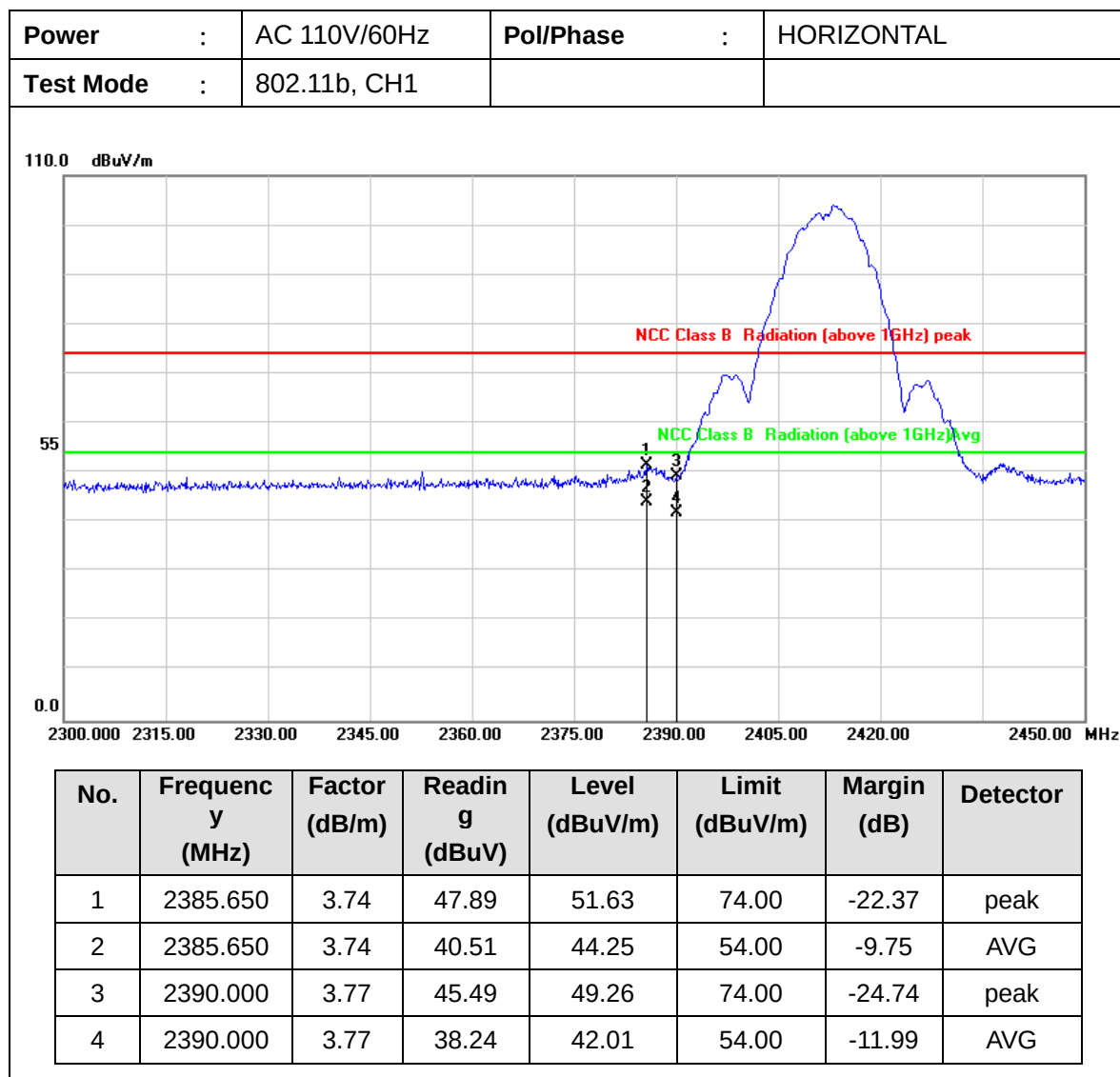
5.7. 禁用頻段內輻射場強之量測結果及數據

For 1TX



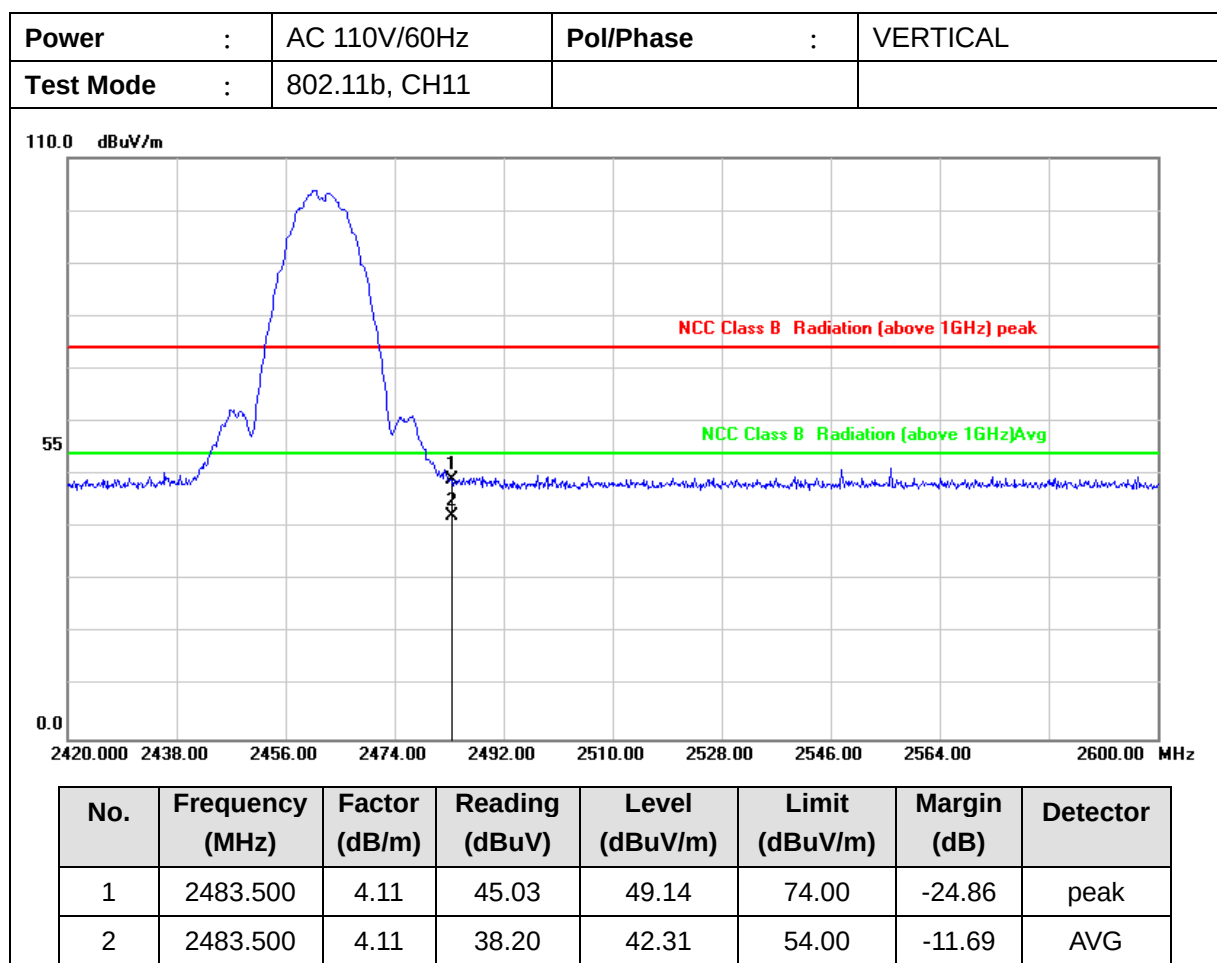
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



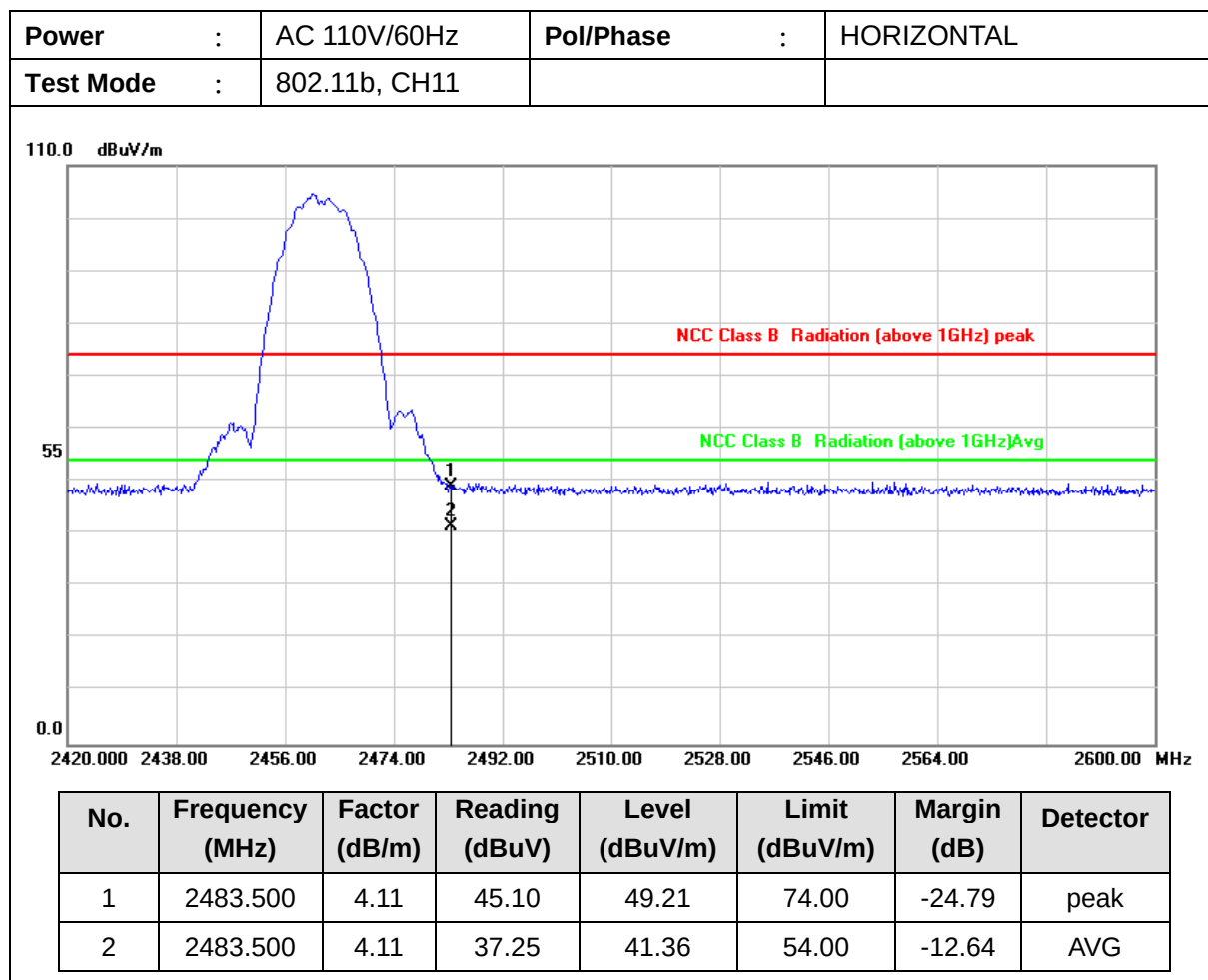
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



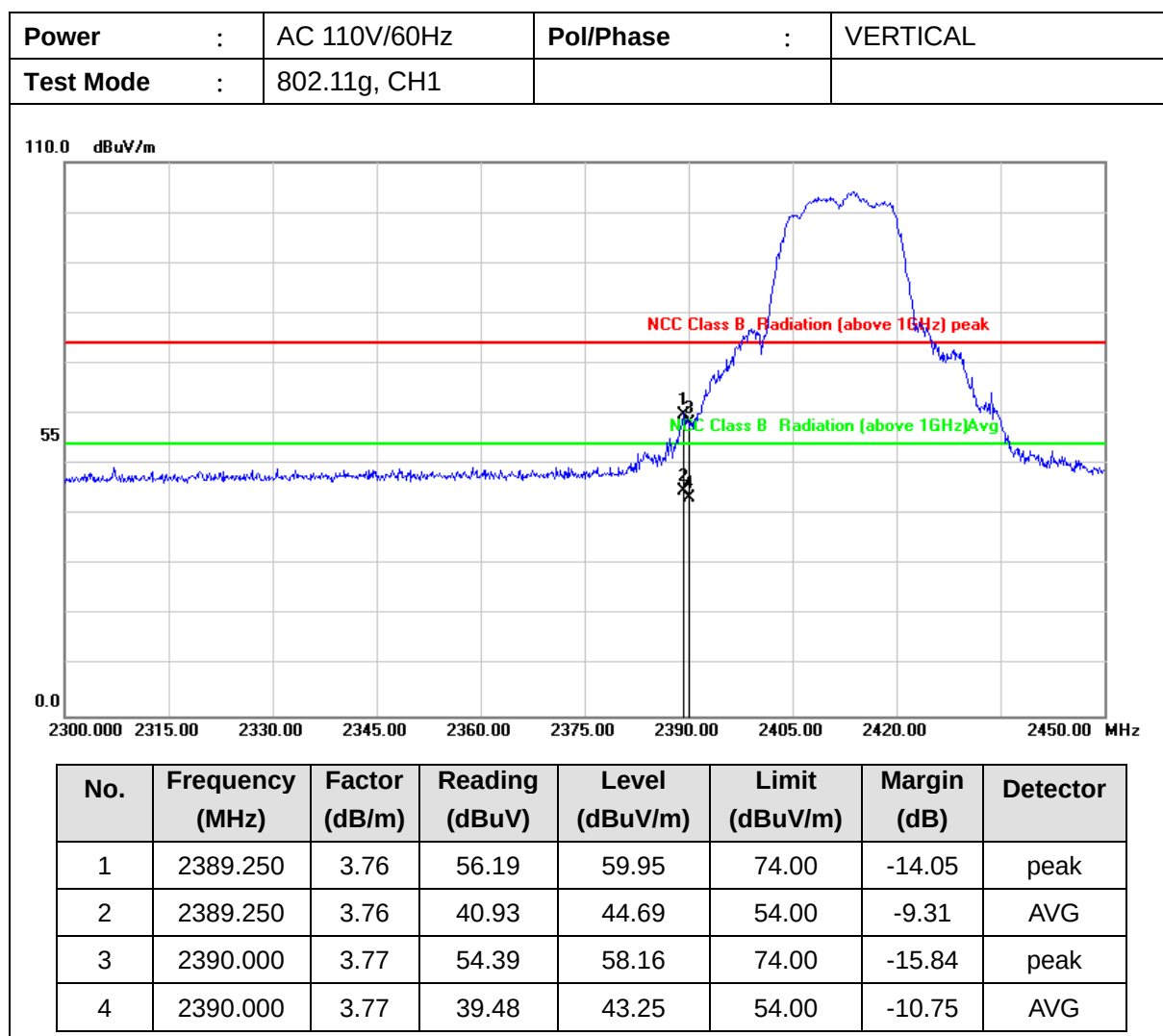
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



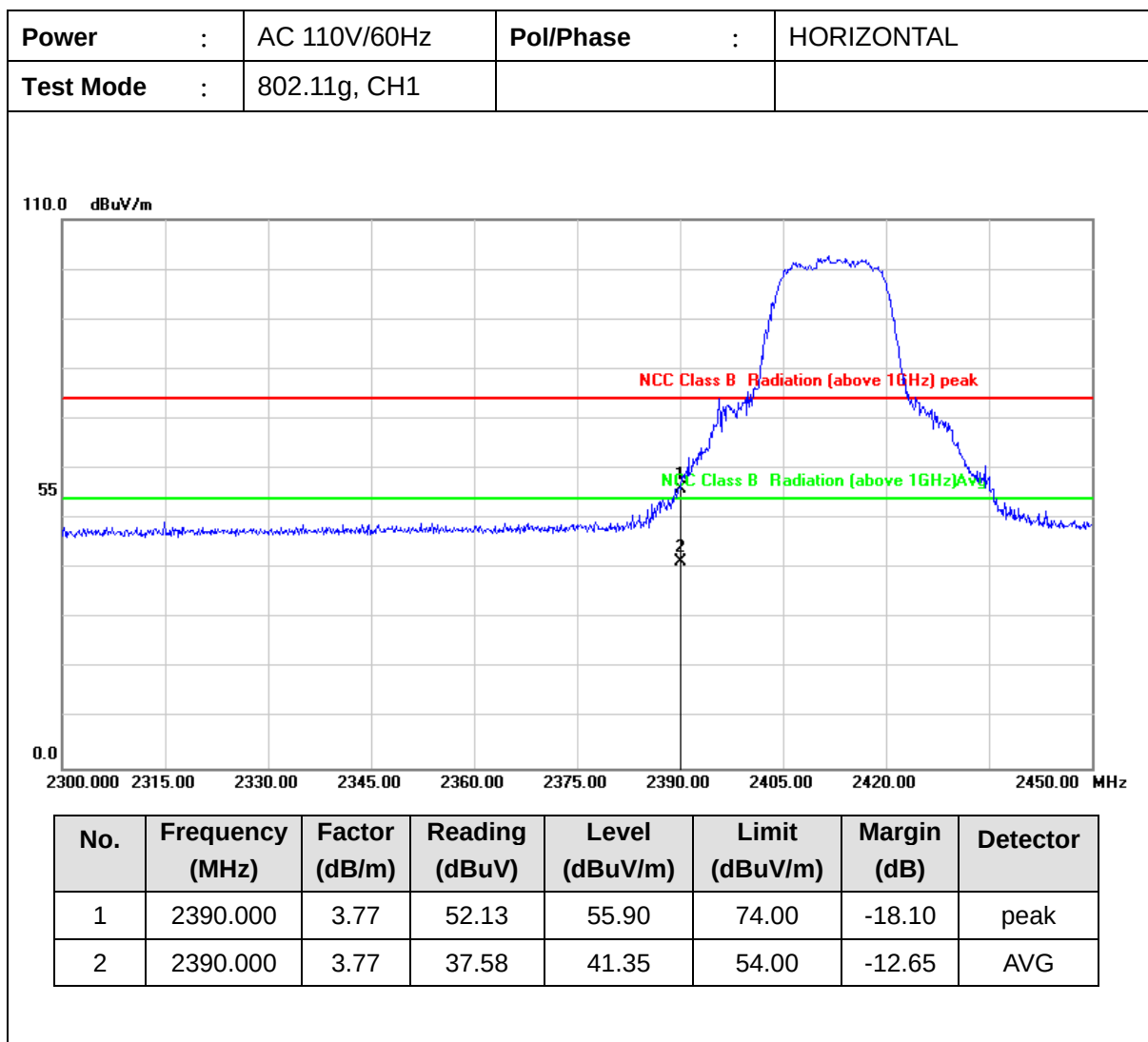
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



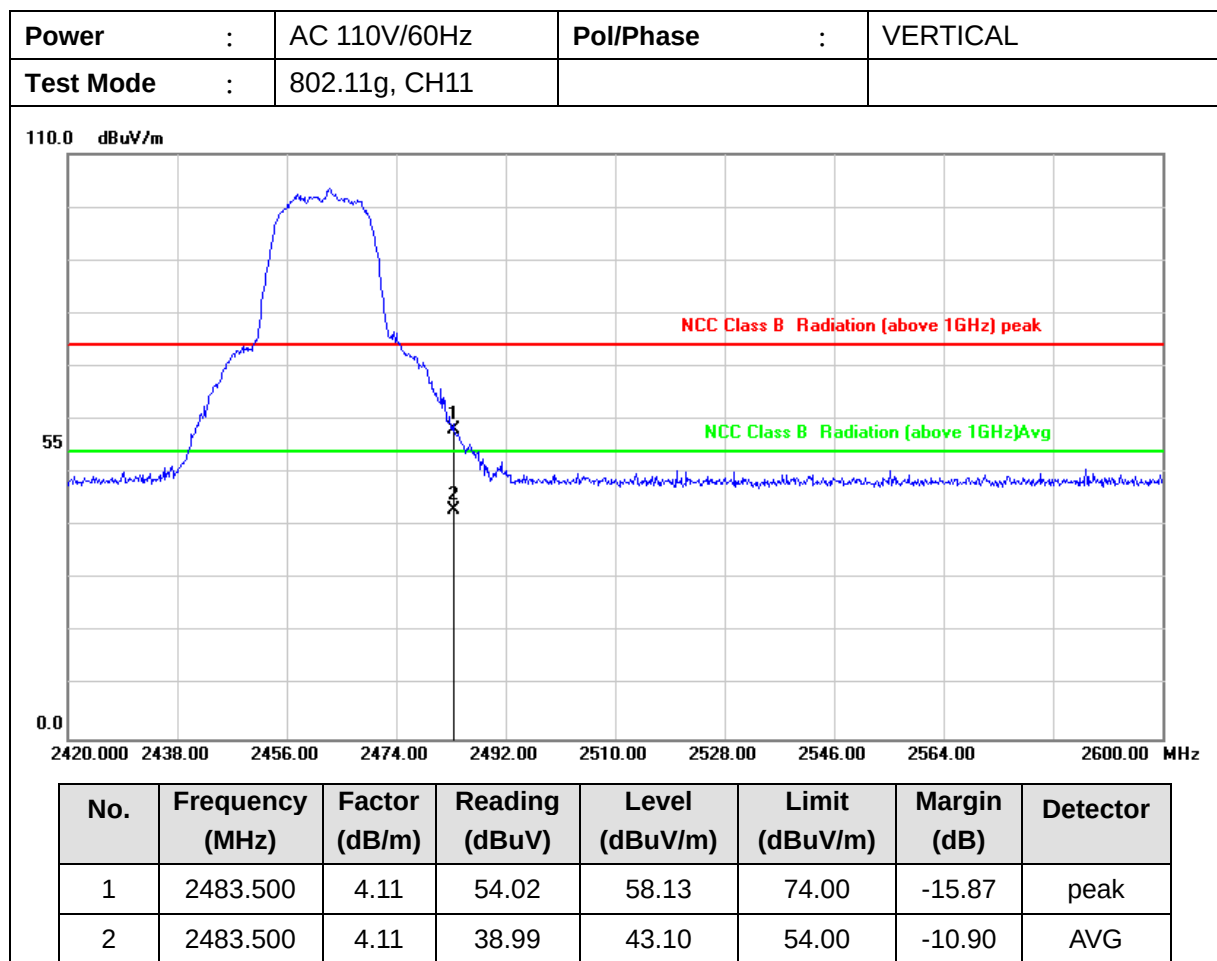
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



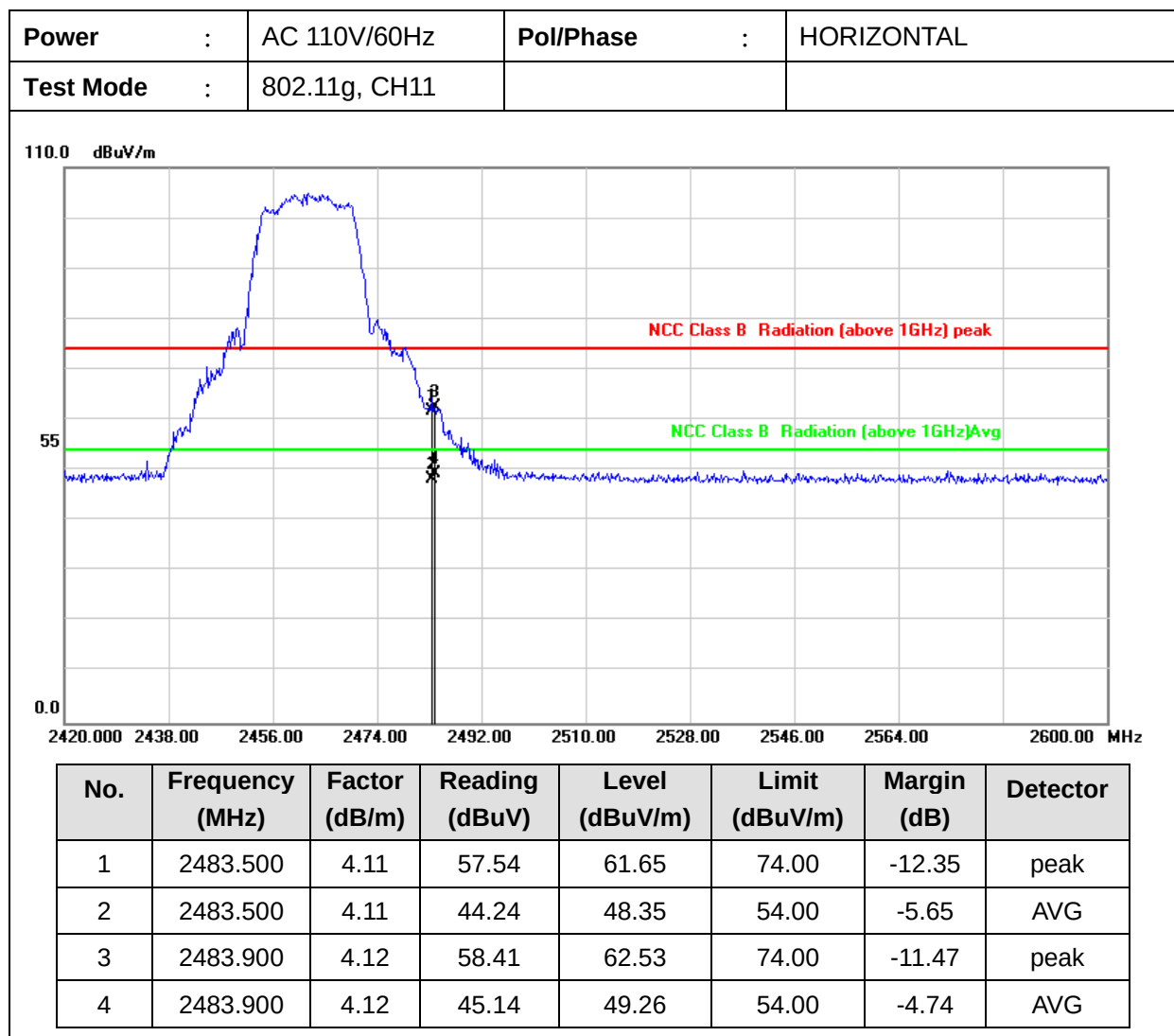
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



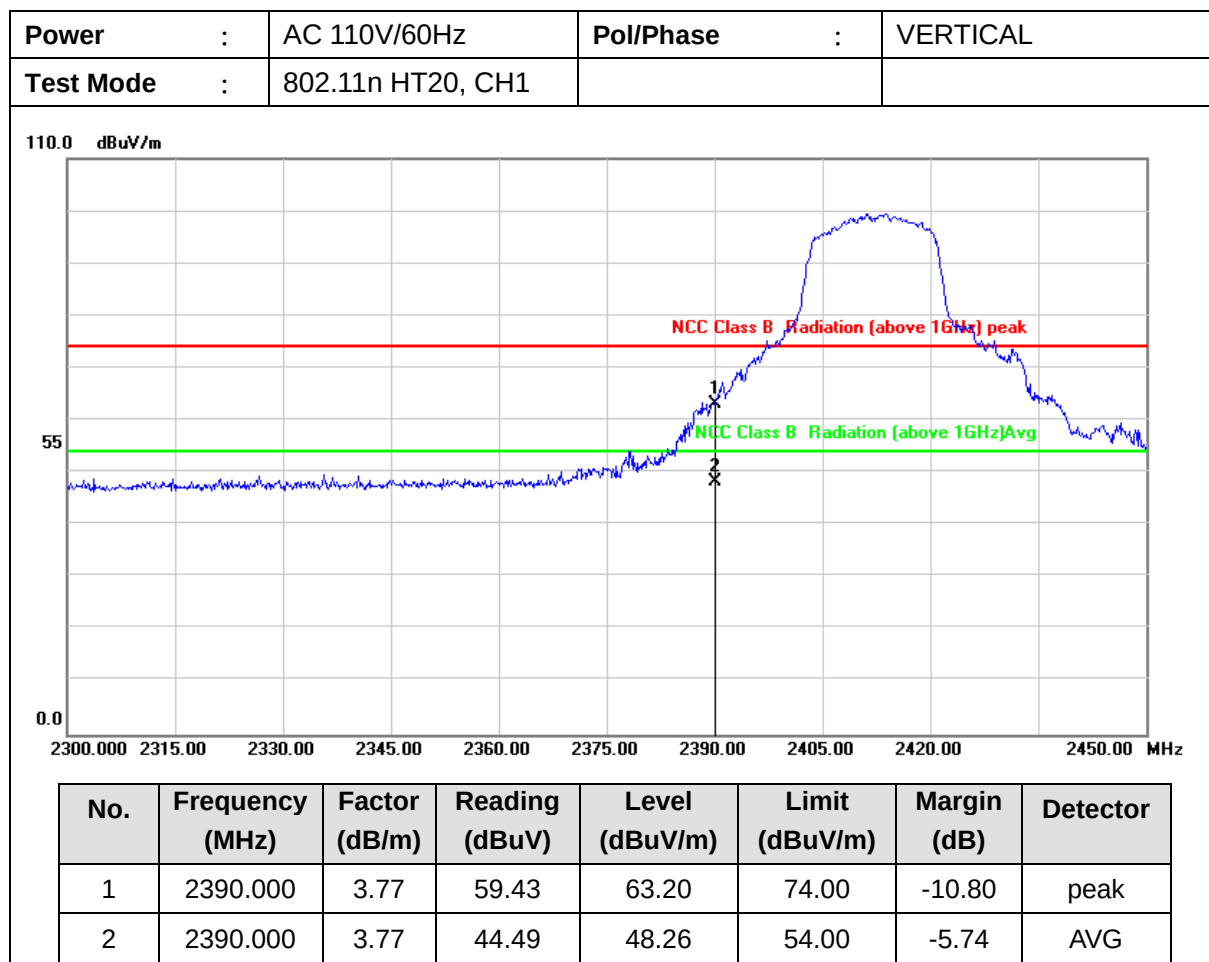
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



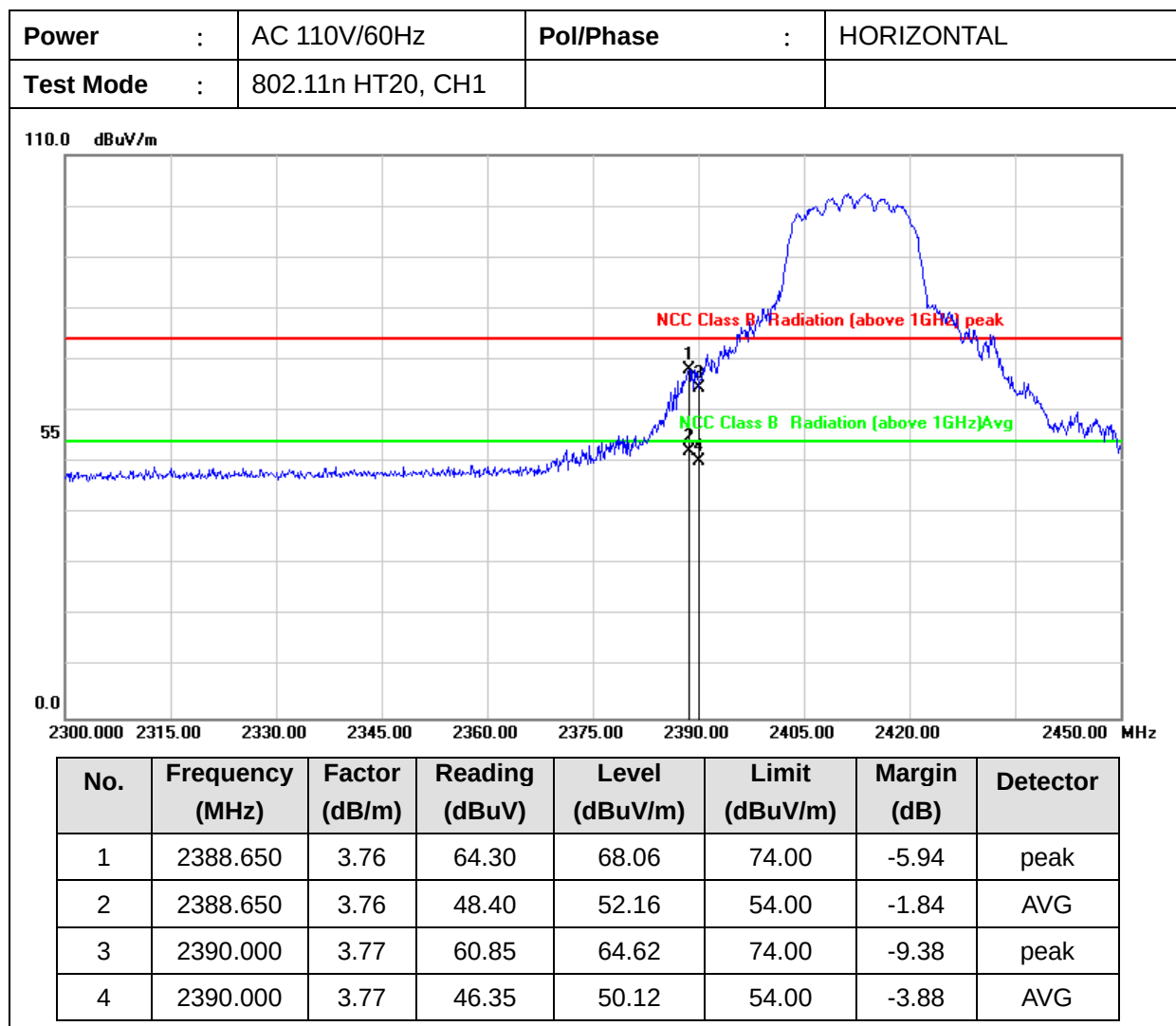
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



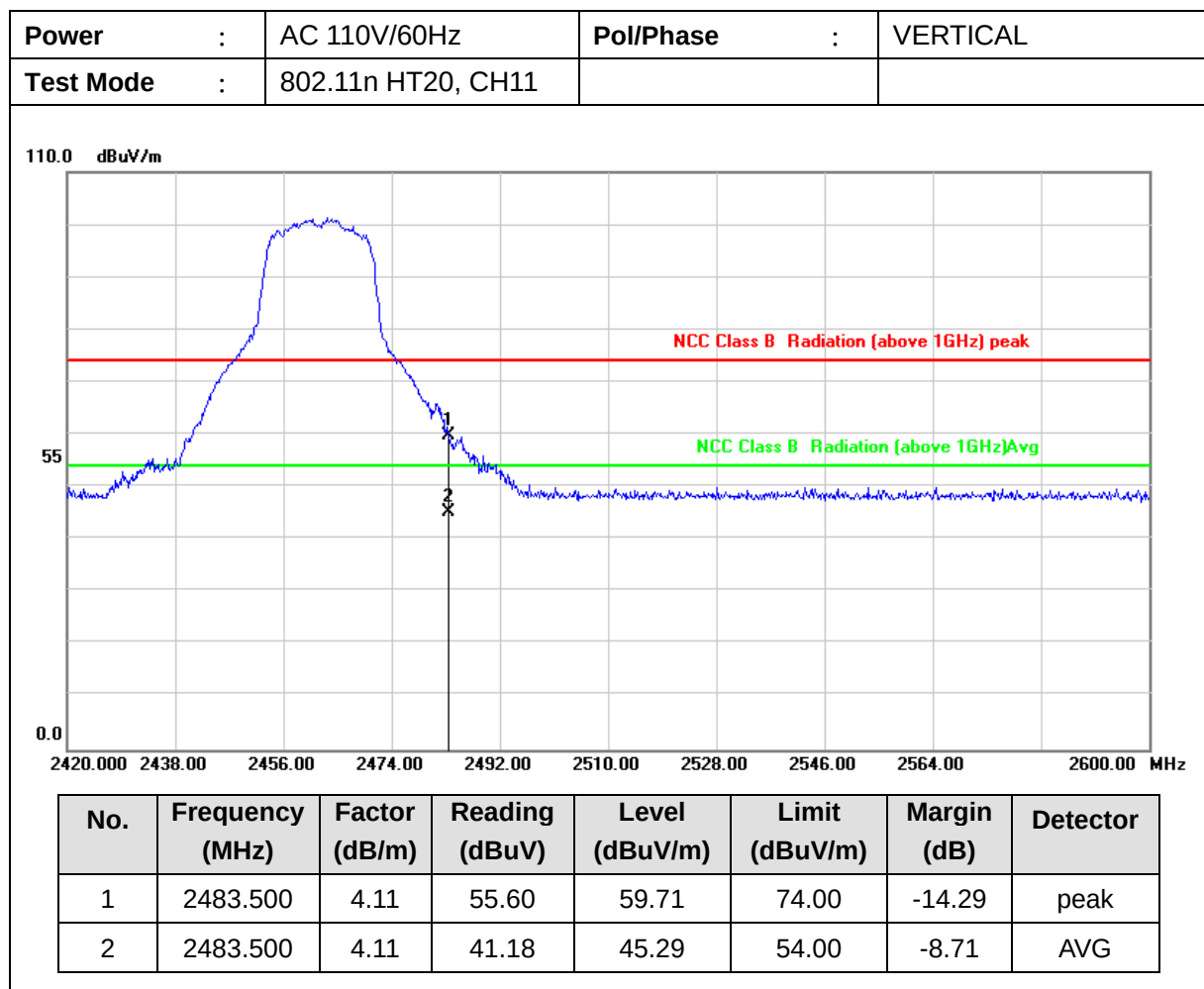
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



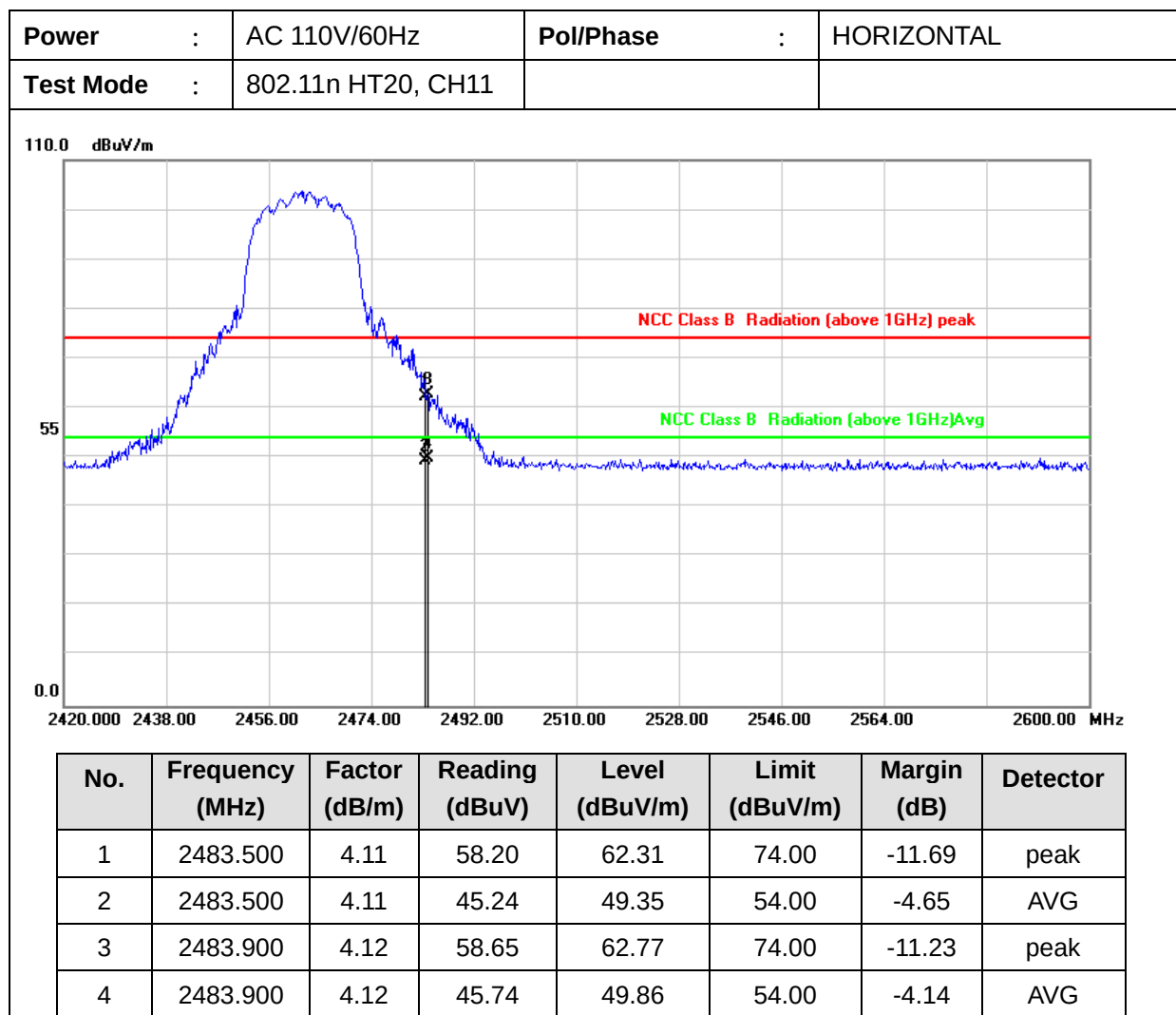
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



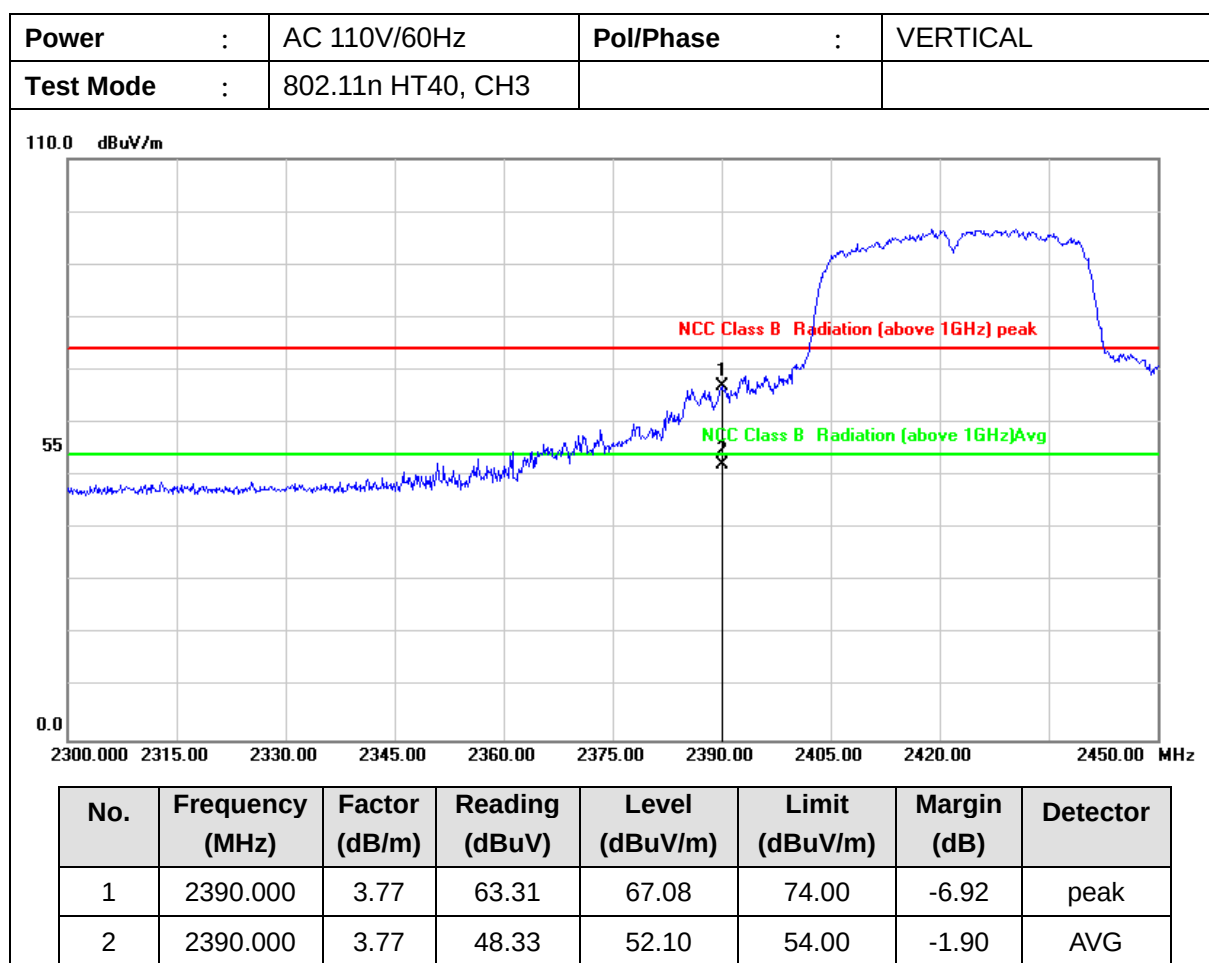
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



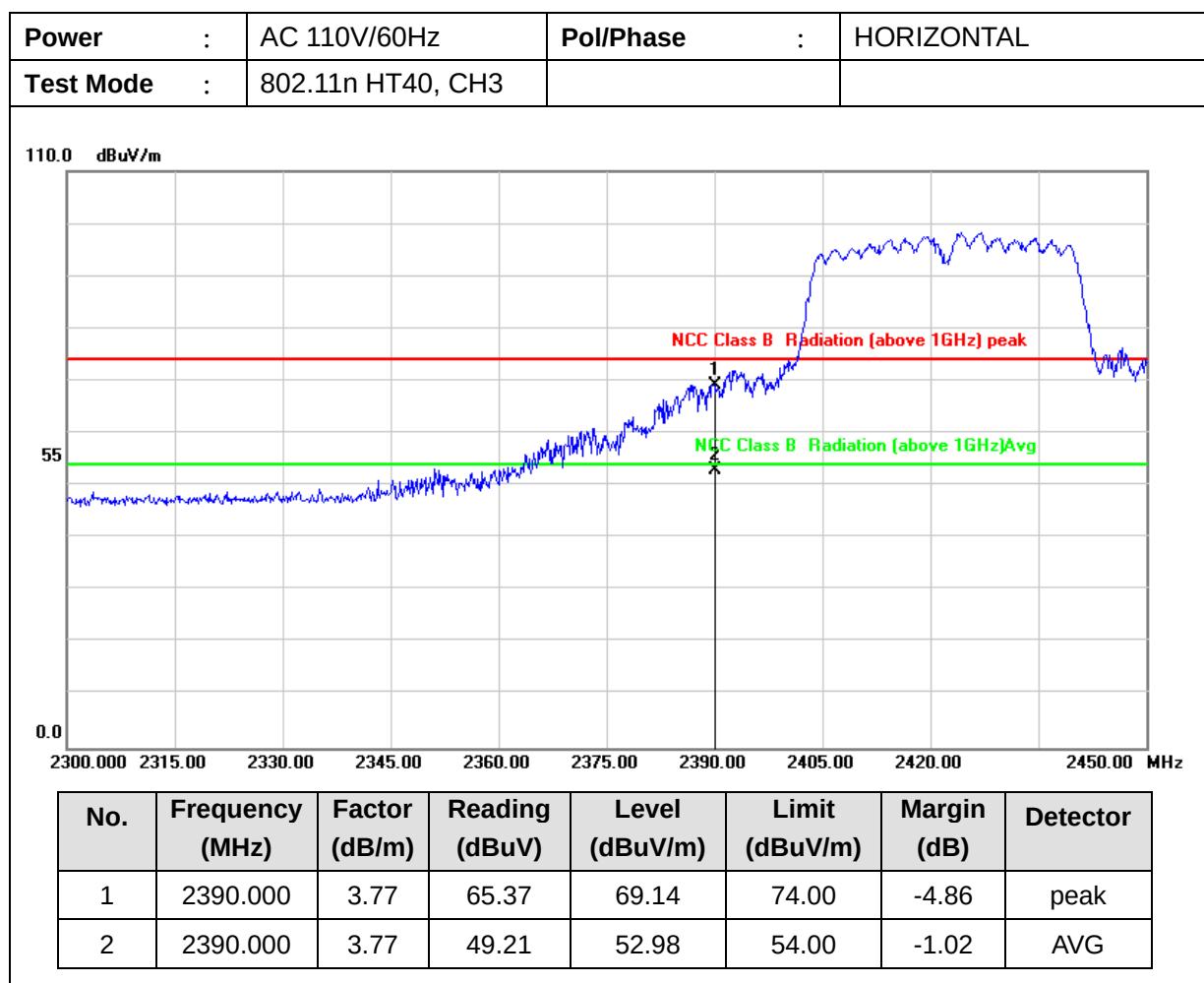
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



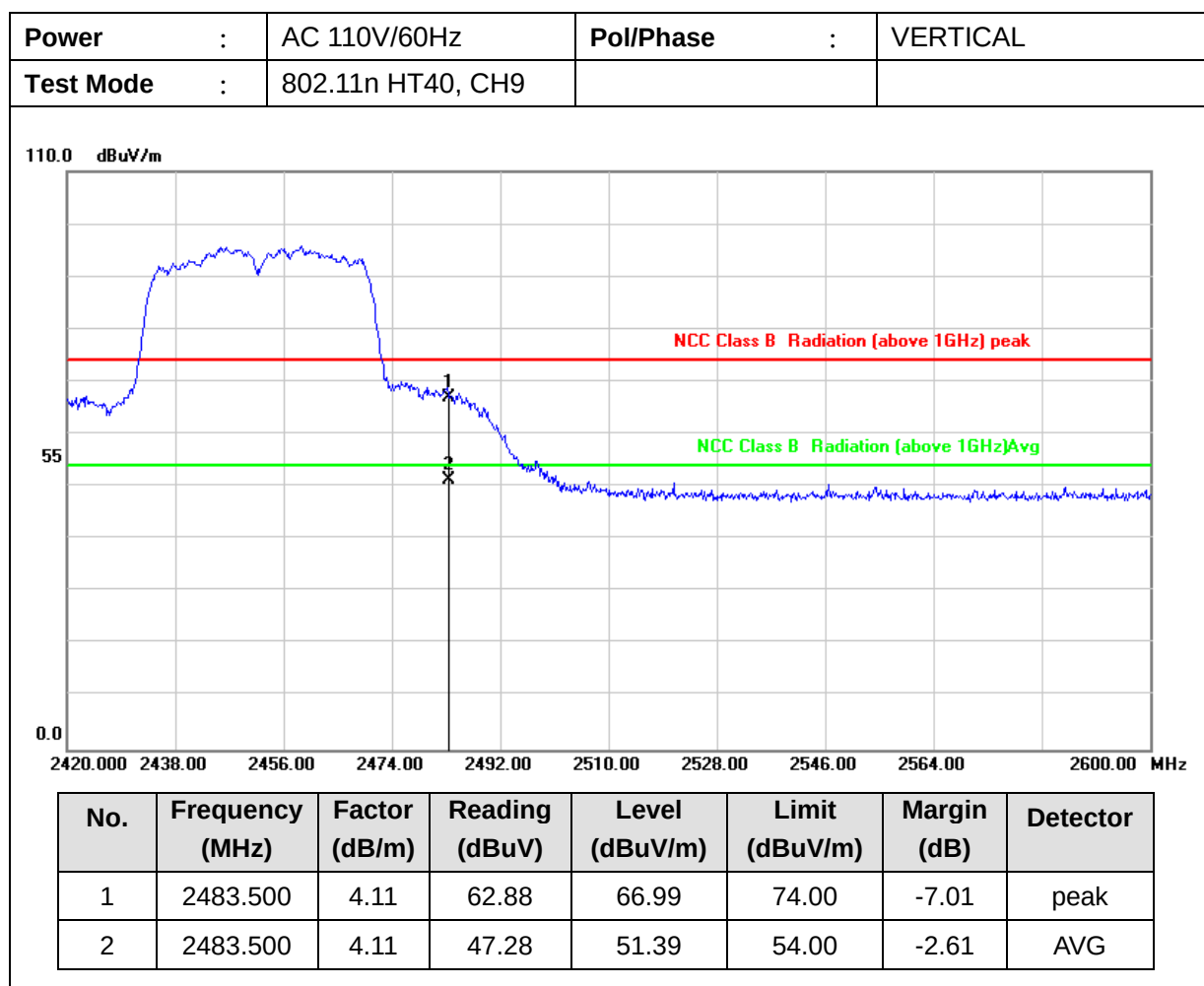
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



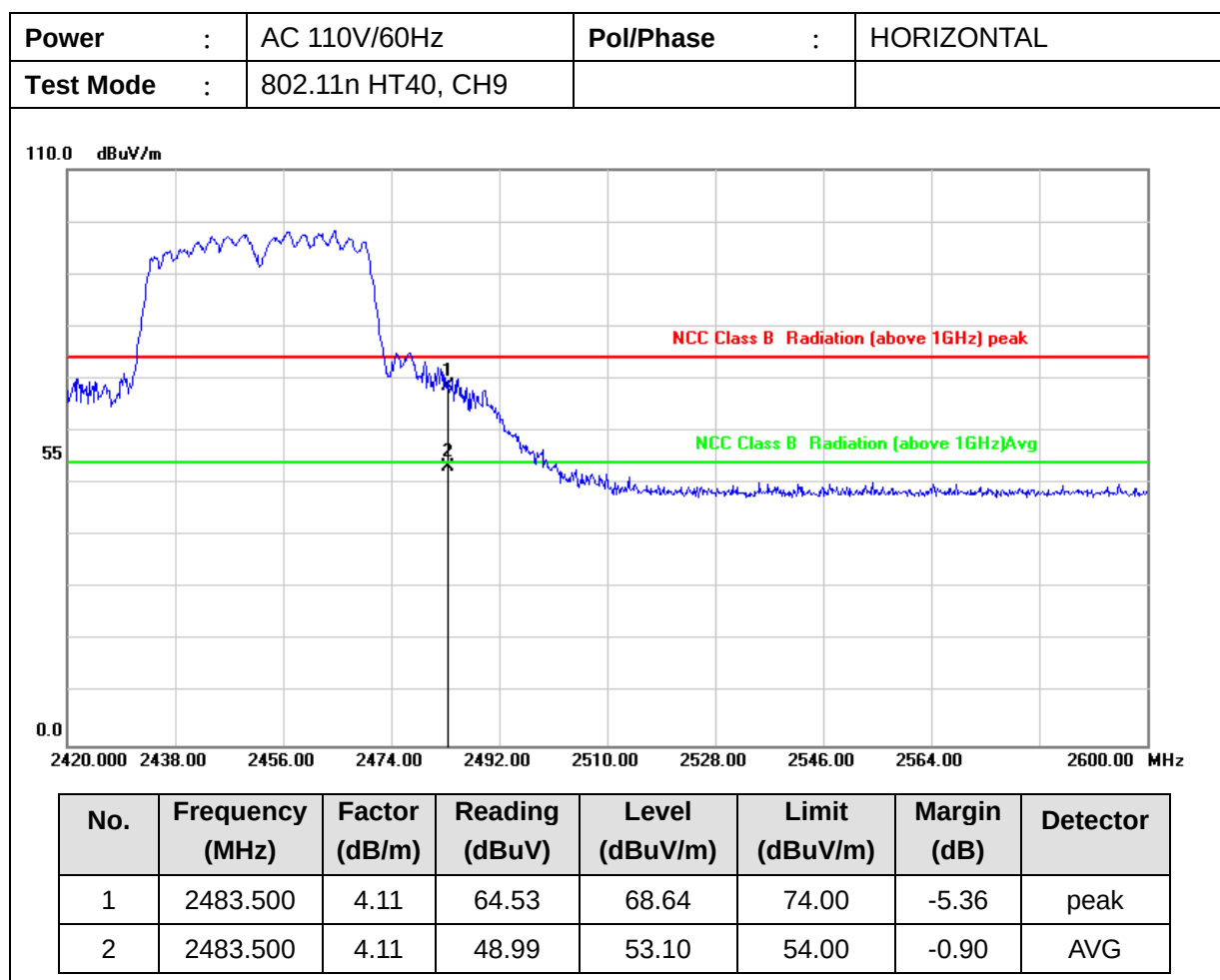
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

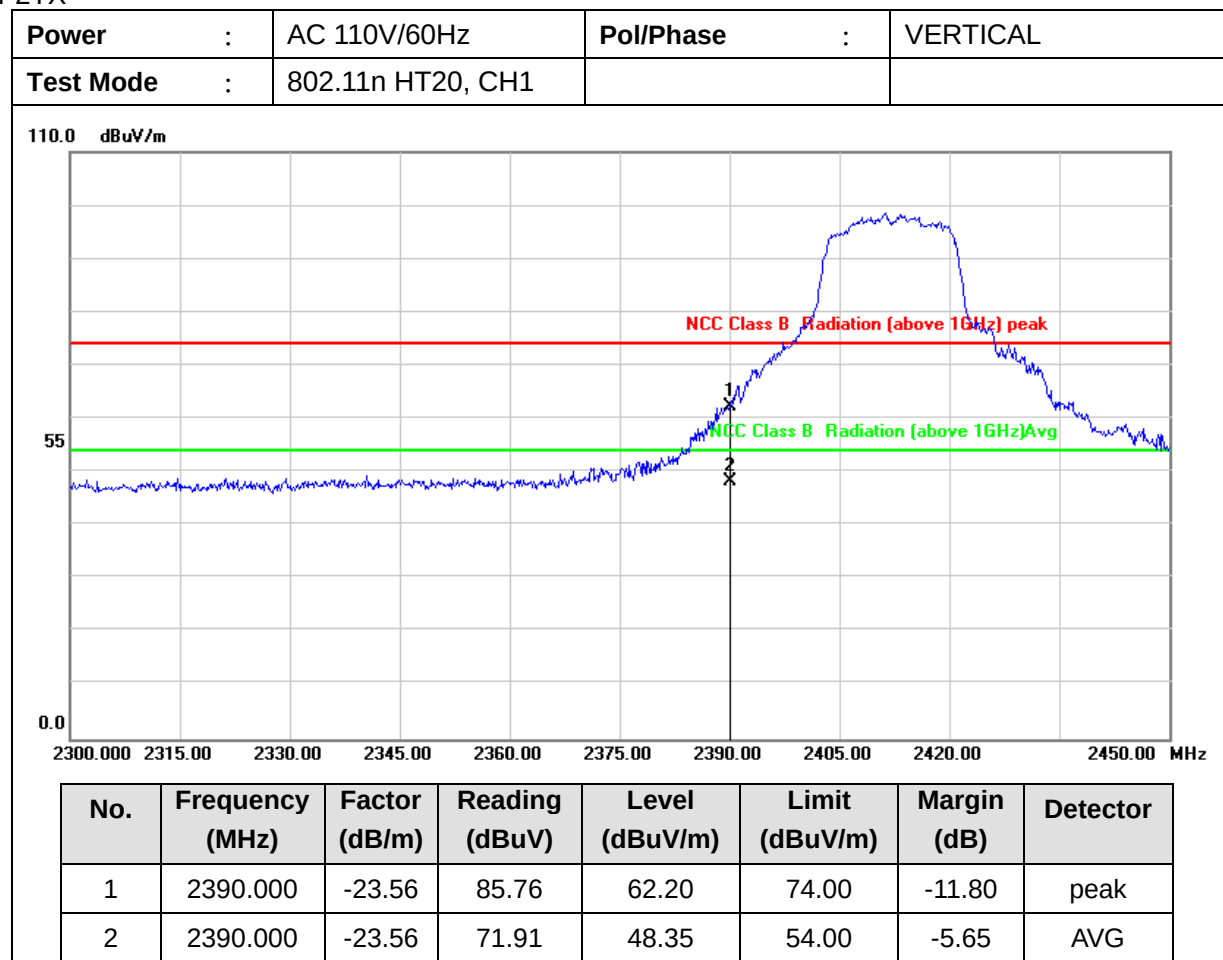


Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

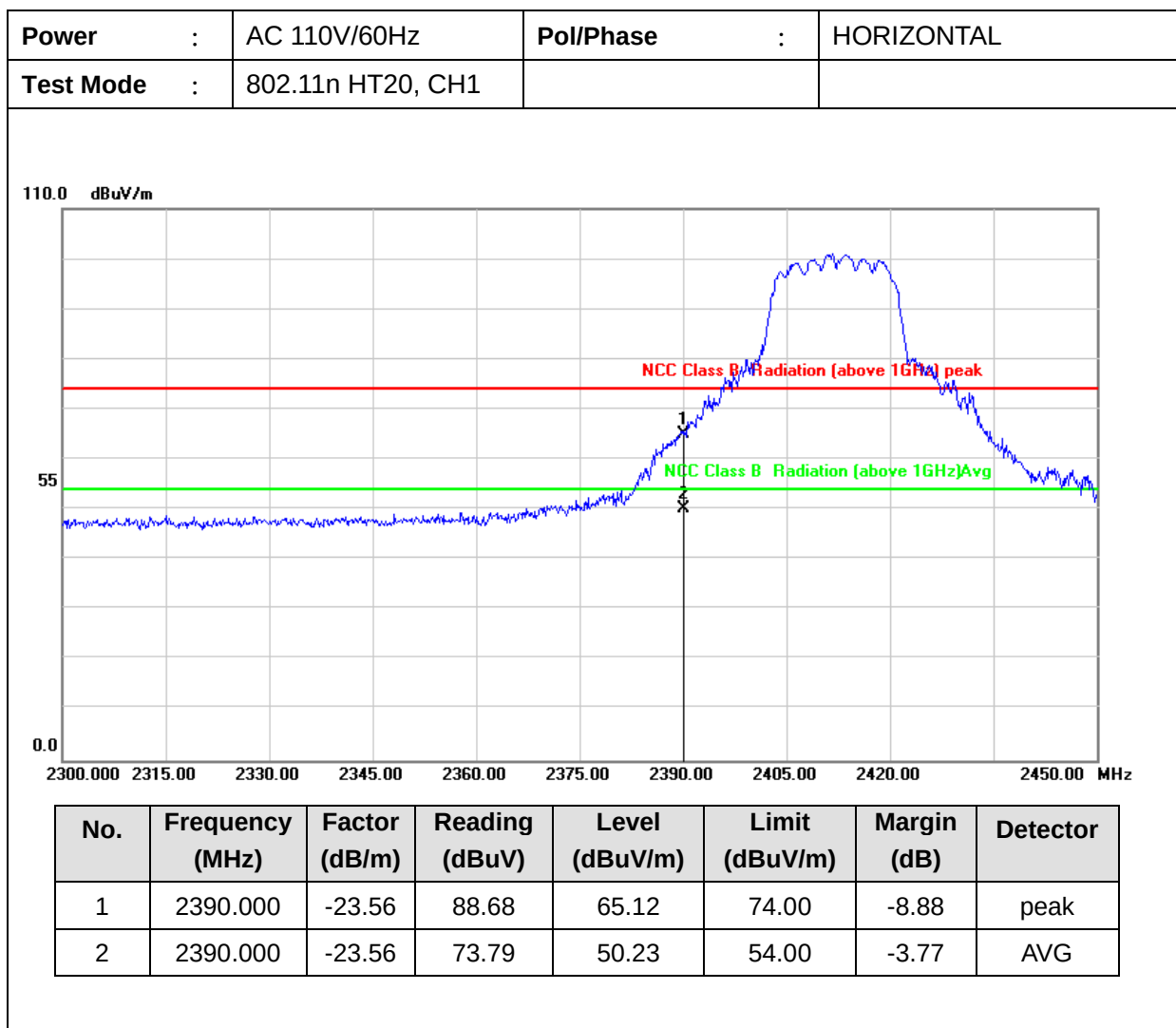


For 2TX



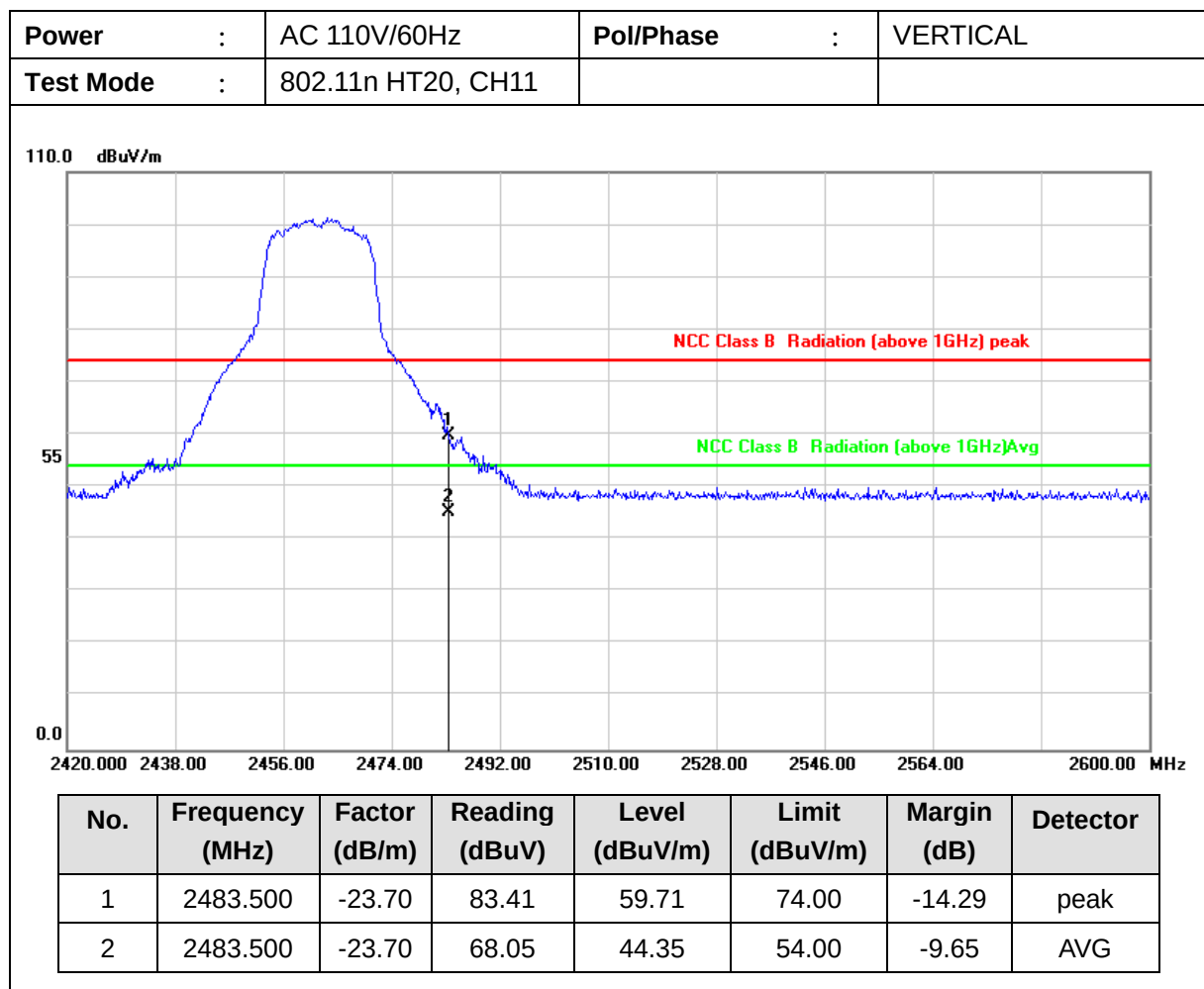
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



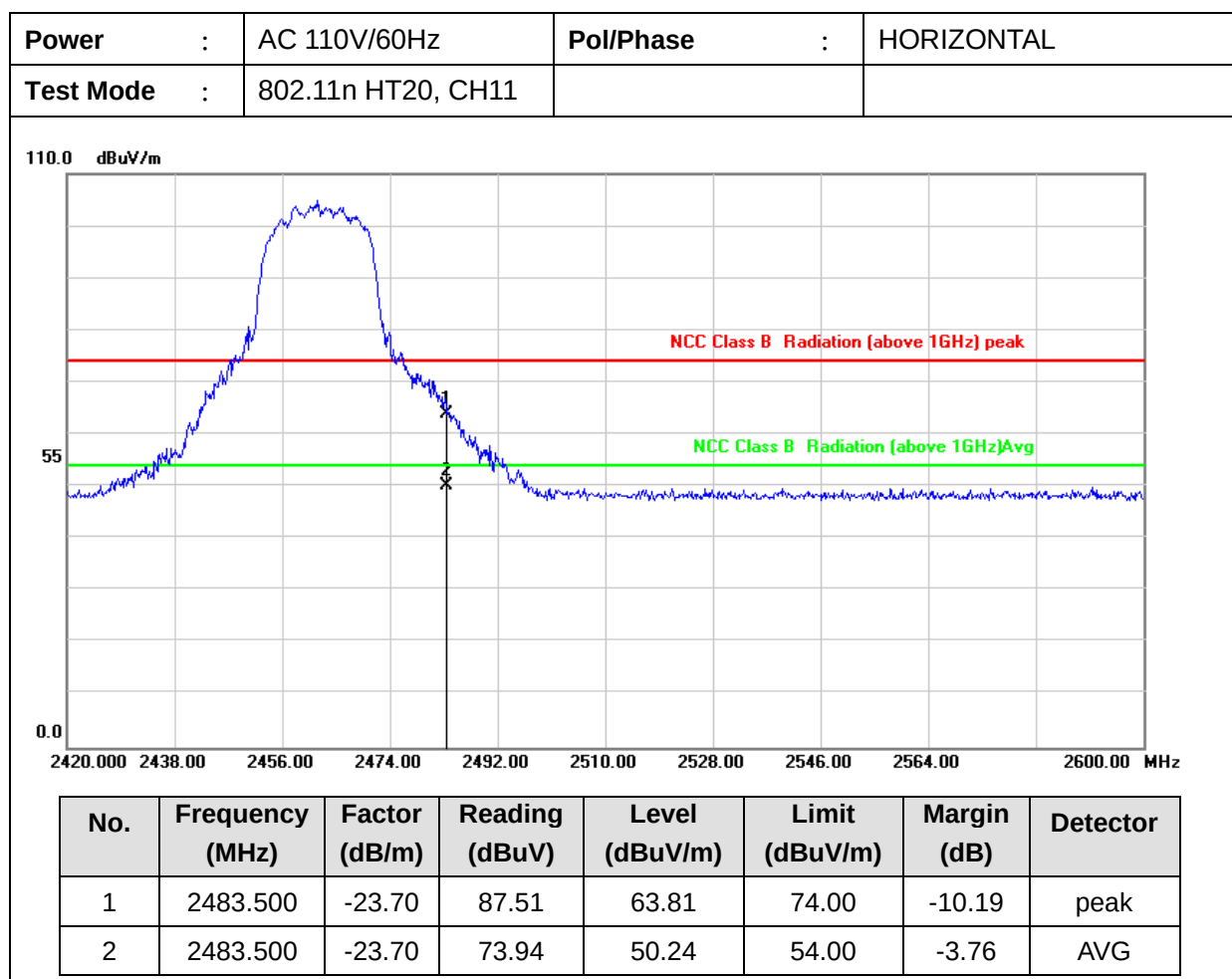
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



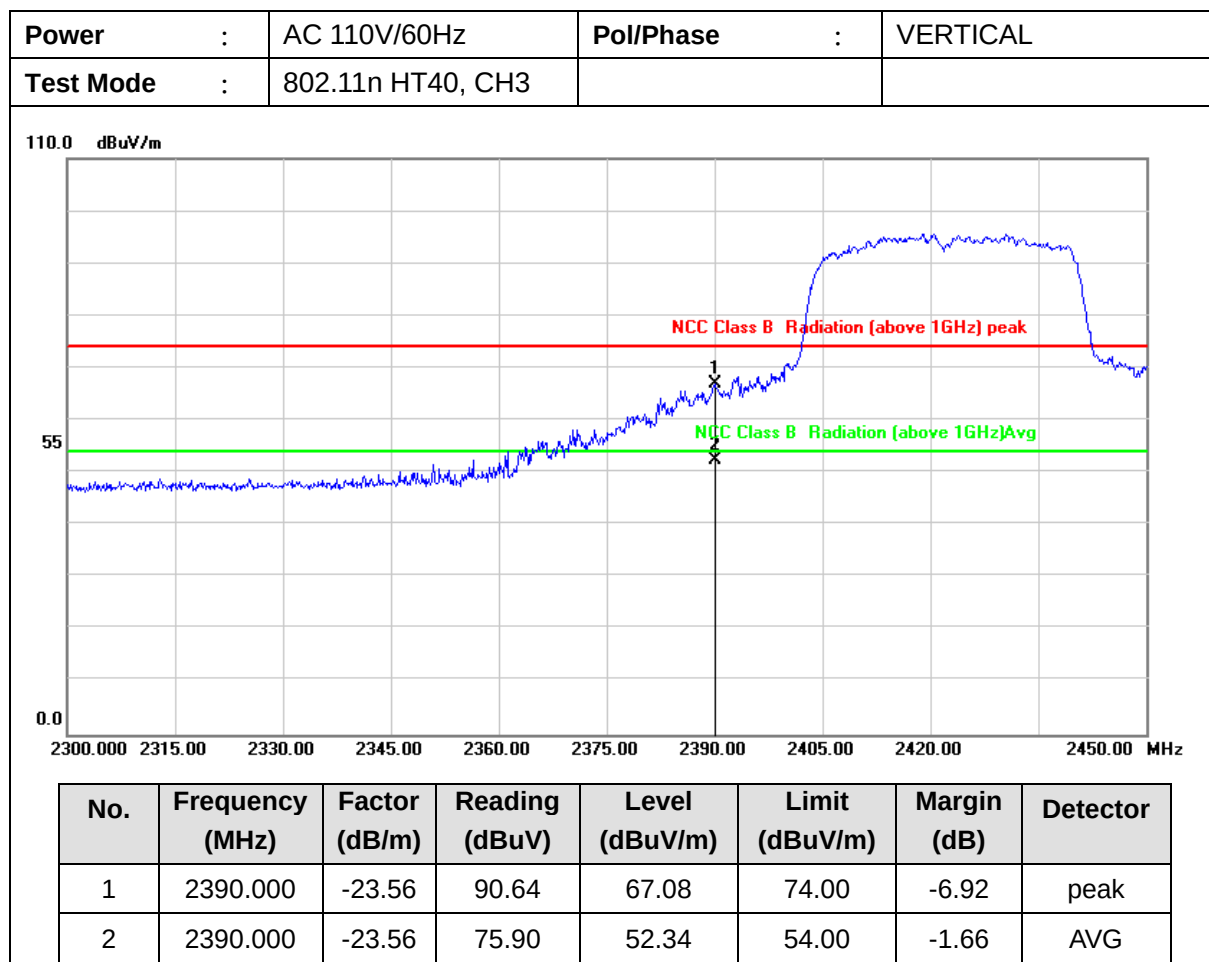
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



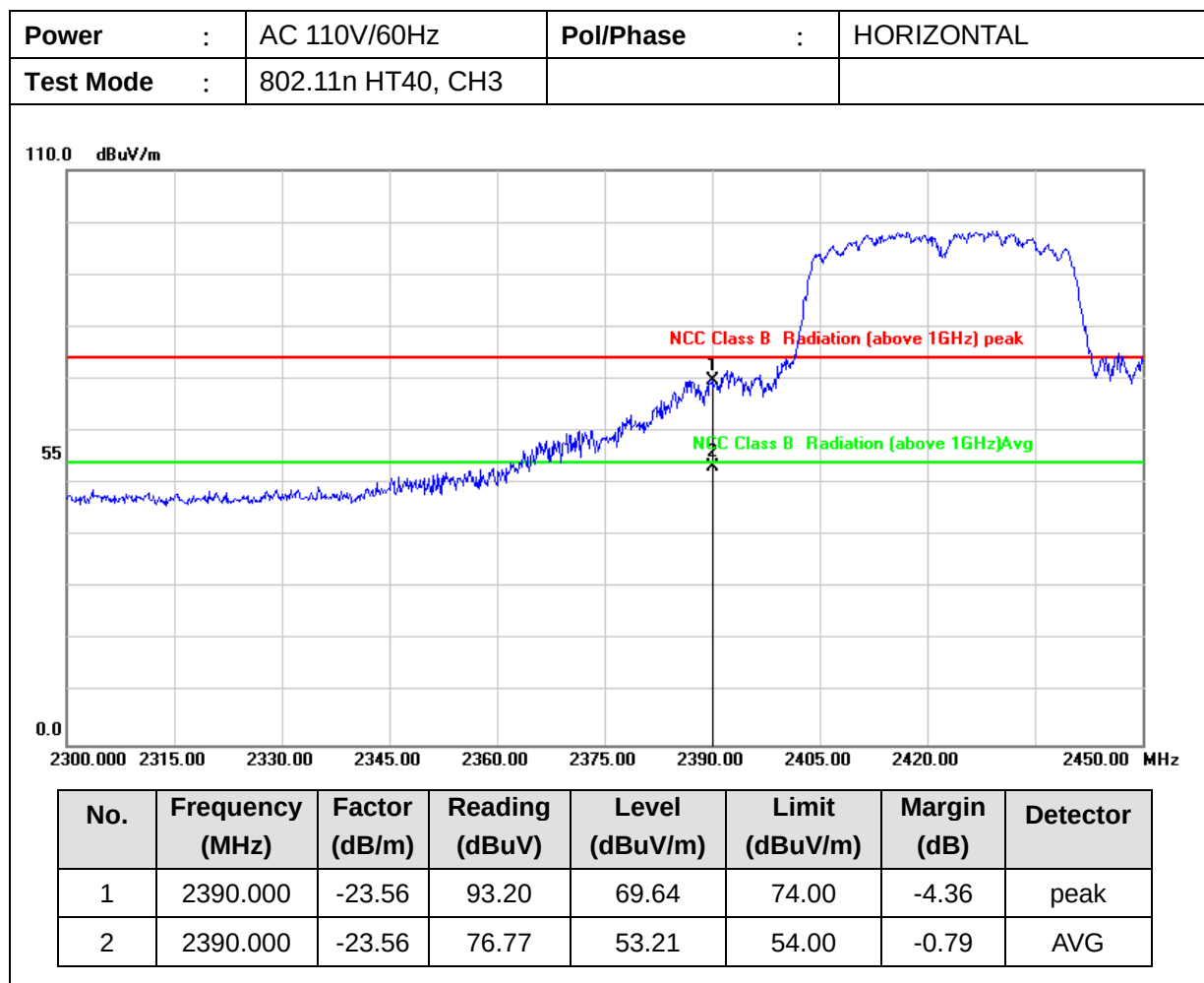
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



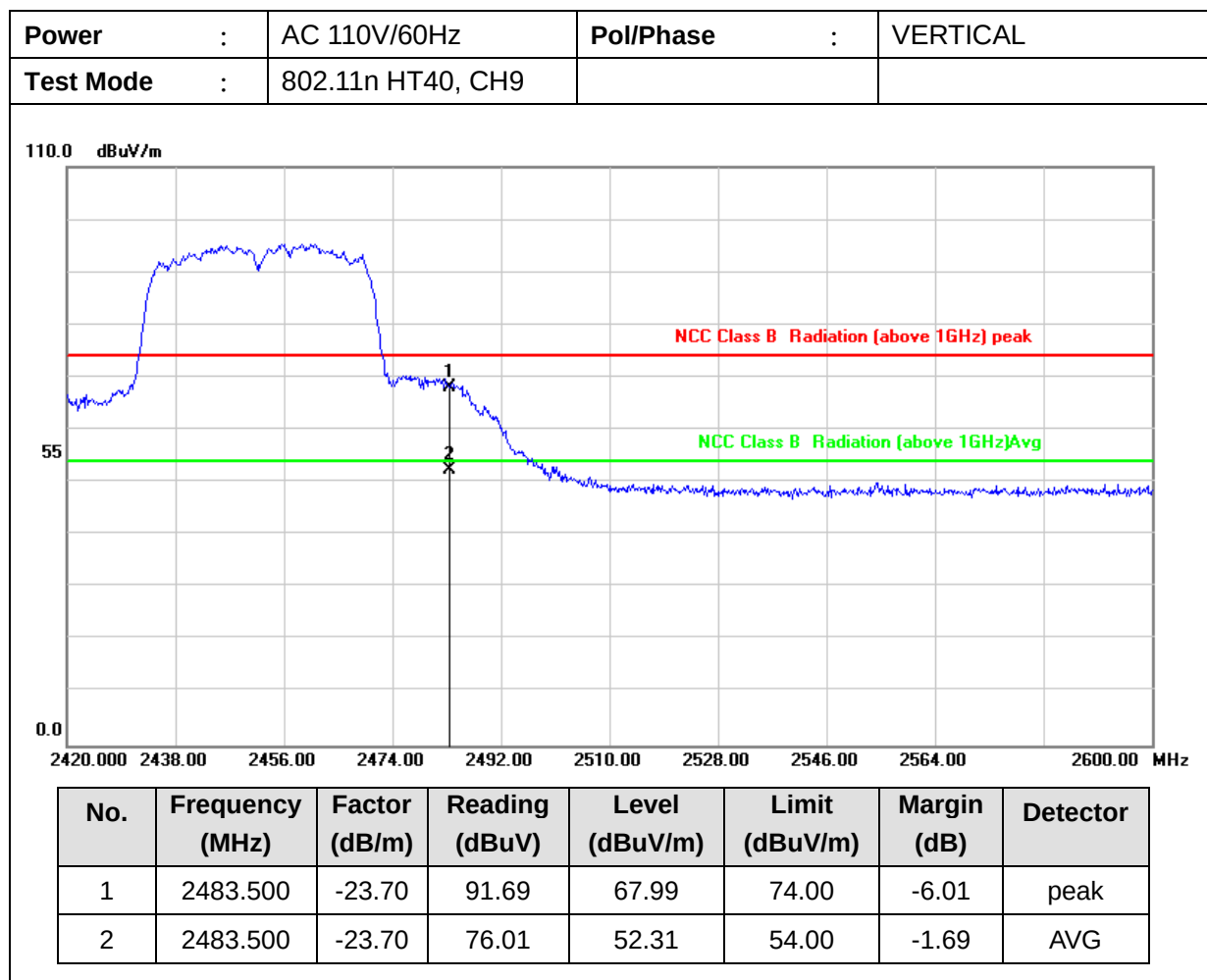
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



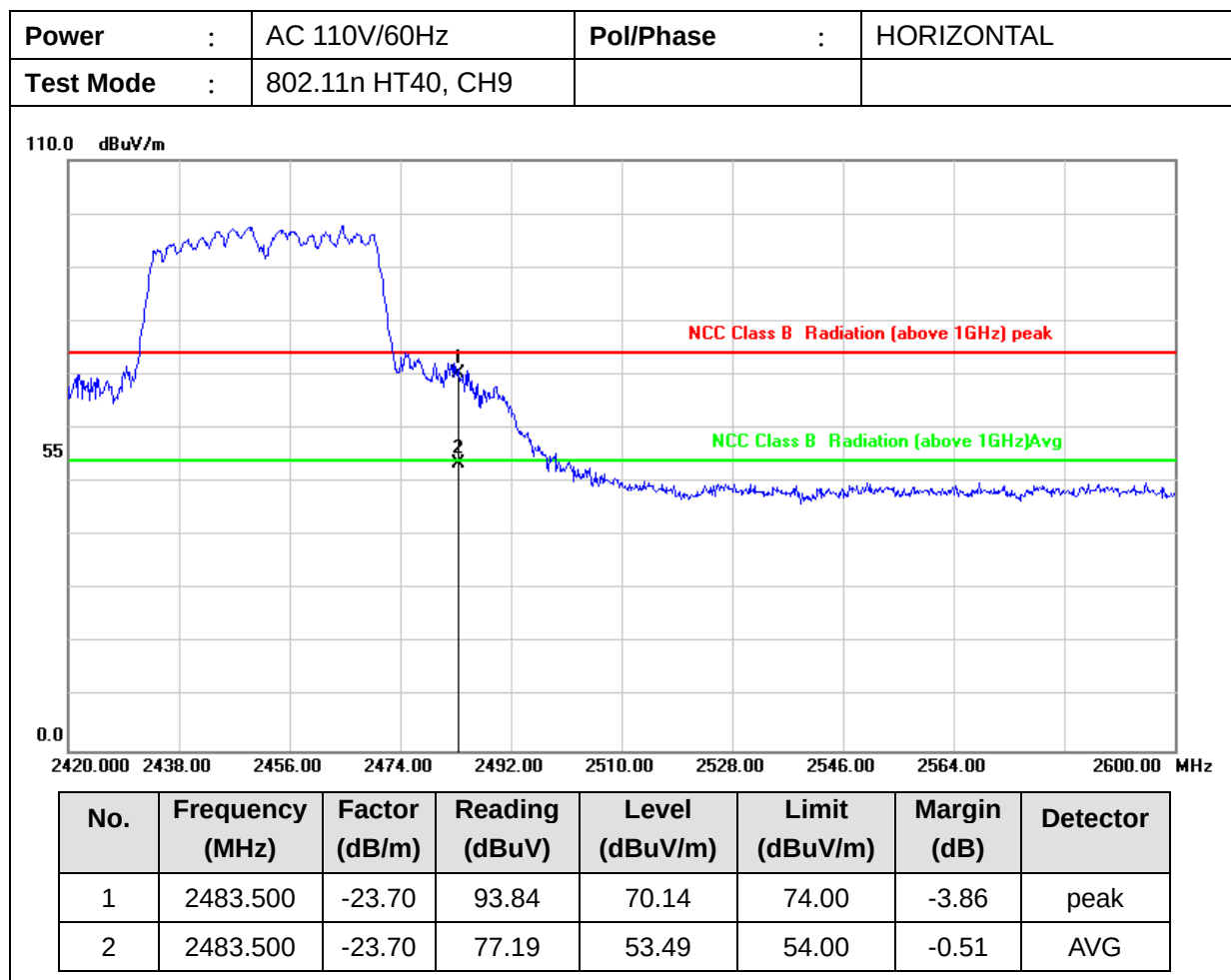
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor

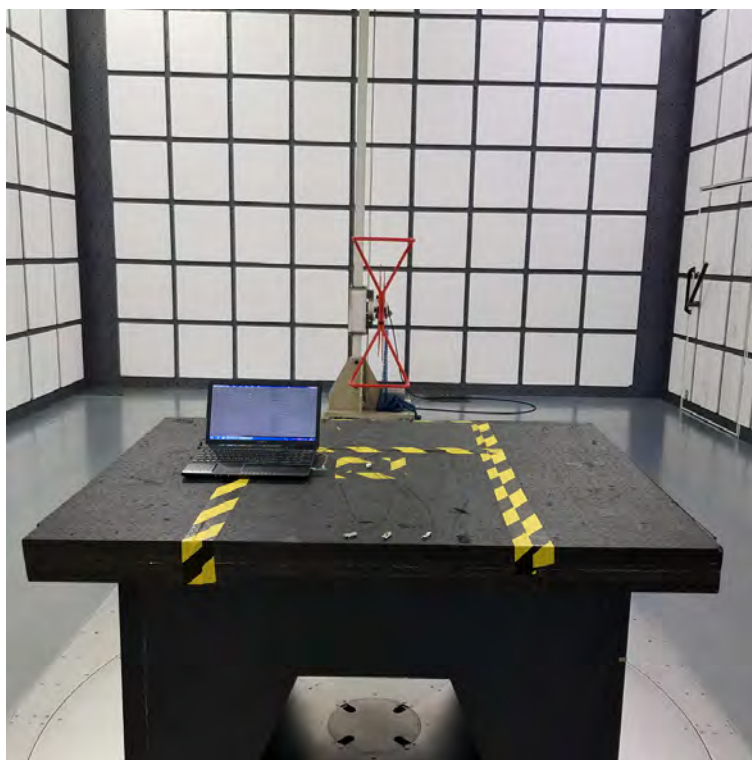


Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



5.8. 輻射量測之配置照片(30MHz ~ 1GHz)





5.9. 輻射量測之配置照片 (1GHz ~ 25GHz)





6. On Time, Duty Cycle and Measurement methods

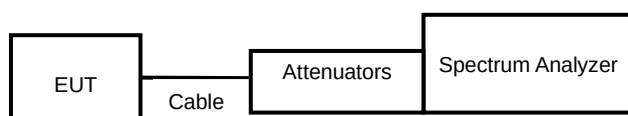
6.1. 適用標準

None; for reporting purposes only.

6.2. 測試方法

ANSI 63.10 第11.6節 Duty cycle zero-span mode Method.

6.3. 測試配置



6.4. 測試結果及數據

For 1TX

Modulation Type	On Time (msec)	Period Time (msec)	Duty Cycle (%)
802.11b	8.41	8.42	99.88%
802.11g	1.401	1.422	98.52%
802.11n HT20	1.305	1.335	97.75%
802.11n HT40	0.65	0.682	95.31%

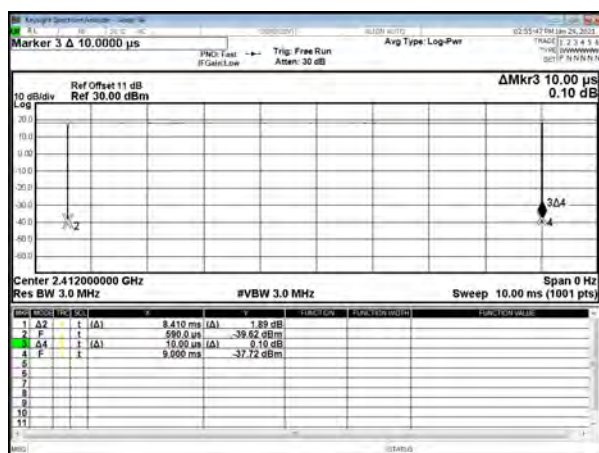
For 2TX

Modulation Type	On Time (msec)	Period Time (msec)	Duty Cycle (%)
802.11n HT20	0.684	0.711	96.20%
802.11n HT40	0.353	0.384	91.93%

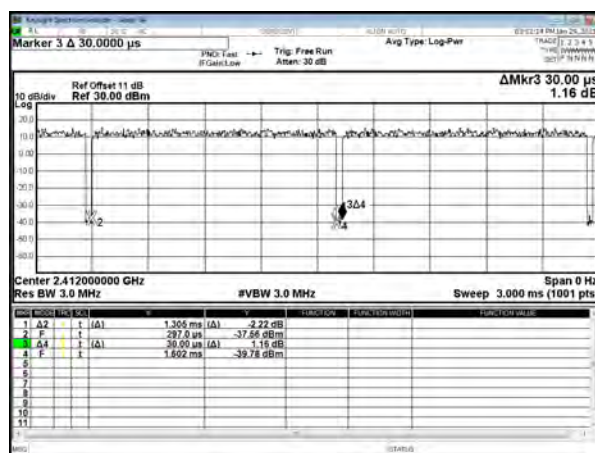


For 1TX

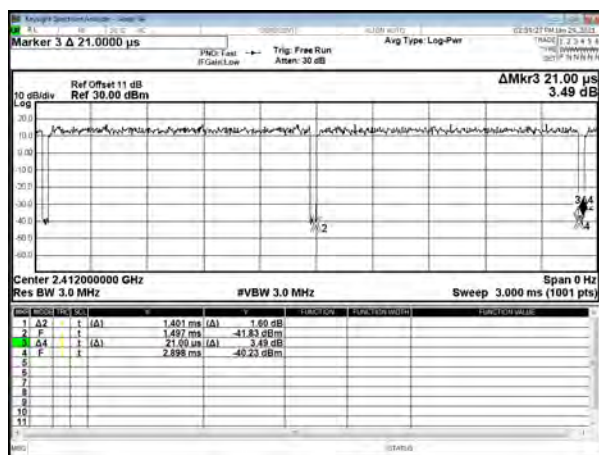
Modulation Type: 802.11b



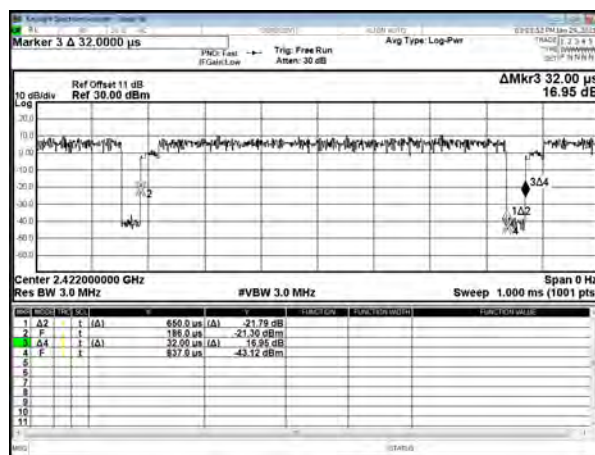
Modulation Type: 802.11n HT20



Modulation Type: 802.11g

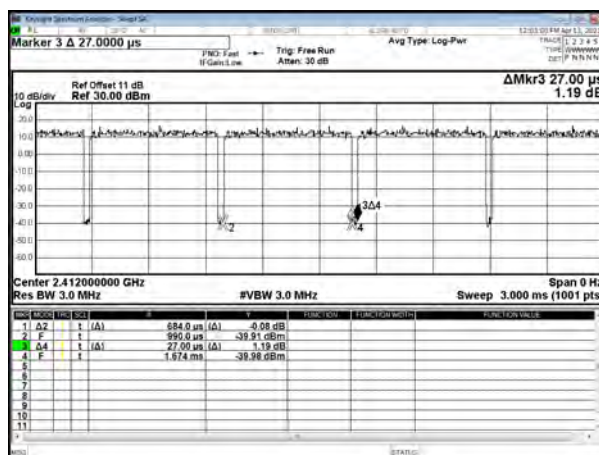


Modulation Type: 802.11n HT40

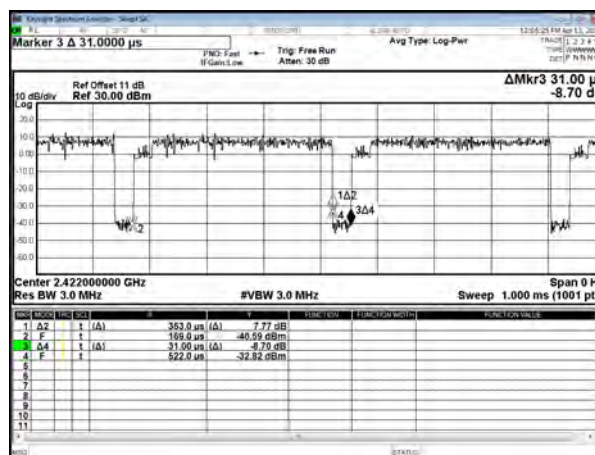


For 2TX

Modulation Type: 802.11n HT20



Modulation Type: 802.11n HT40





7. 6dB 頻寬之規定

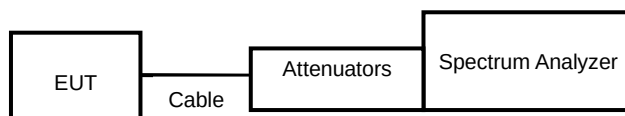
7.1. 適用標準

對使用數位調變技術之低功率發射機，依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.6 節之(2)(A)規定，6dB 頻寬至少應有 500 kHz。

7.2. 測試方法

- 將待測物和儀器相連接。
- 設定儀器解析頻寬 100KHz 和視訊頻寬為 300KHz。
- 量測峰值減去 6 dB 之頻寬並記錄於報告中。

7.3. 測試配置





7.4. 6dB 頻寬之測試結果及數據

For 1TX

Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth (MHz)
IEEE 802.11b	01	2412	9.13
	06	2437	9.12
	11	2462	9.12
IEEE 802.11g	01	2412	15.15
	06	2437	15.17
	11	2462	15.16
IEEE 802.11n HT20	01	2412	15.71
	06	2437	16.32
	11	2462	16.36
IEEE 802.11n HT40	03	2422	35.17
	06	2437	35.13
	09	2452	35.17

For 2TX

Chain 1

Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth (MHz)
IEEE 802.11n HT20	01	2412	15.17
	06	2437	15.17
	11	2462	15.17
IEEE 802.11n HT40	01	2412	35.16
	06	2437	35.16
	11	2462	35.16

Chain 2

Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth (MHz)
IEEE 802.11n HT20	01	2412	15.17
	06	2437	15.17
	11	2462	15.17
IEEE 802.11n HT40	01	2412	35.17
	06	2437	35.17
	11	2462	35.17

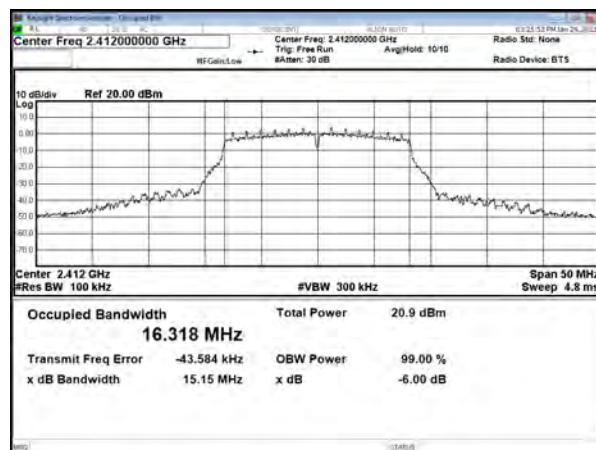
備註：繪圖資料請參考下頁。

7.5. 結果判定

高、中、低頻段的 6dB 頻寬皆大於 500 KHz，合乎標準規定。



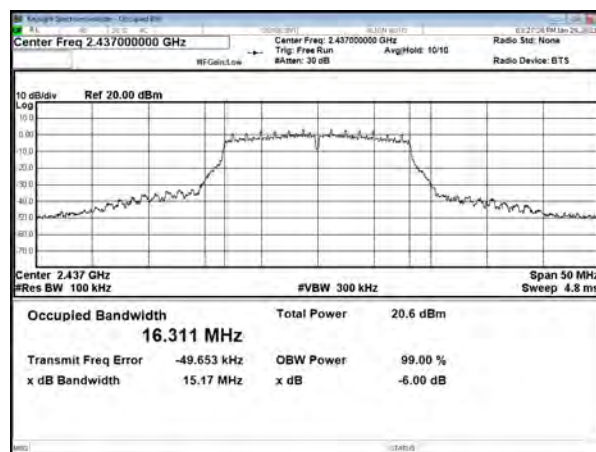
For 1TX

Modulation Type: 802.11b
CH01Modulation Type: 802.11g
CH01

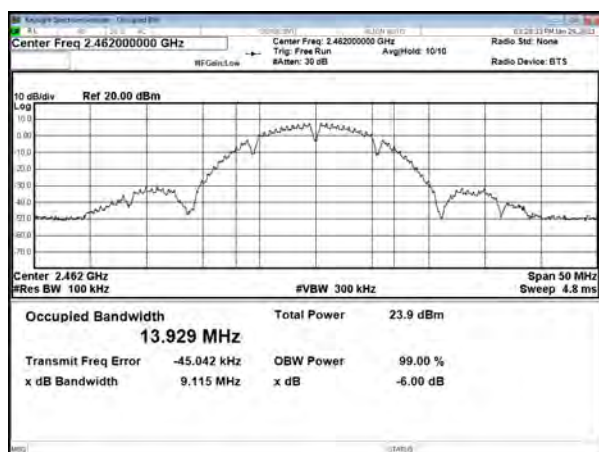
CH06



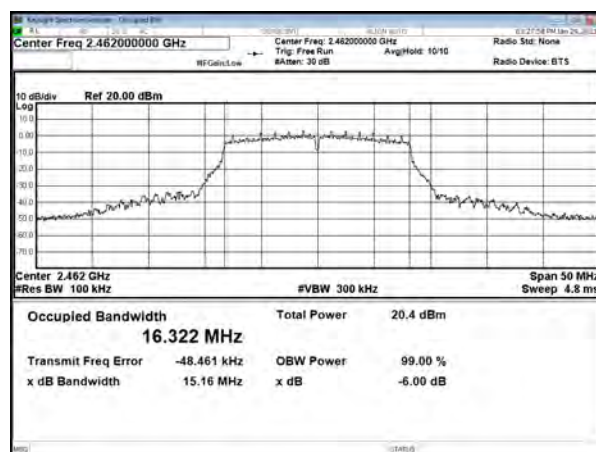
CH06

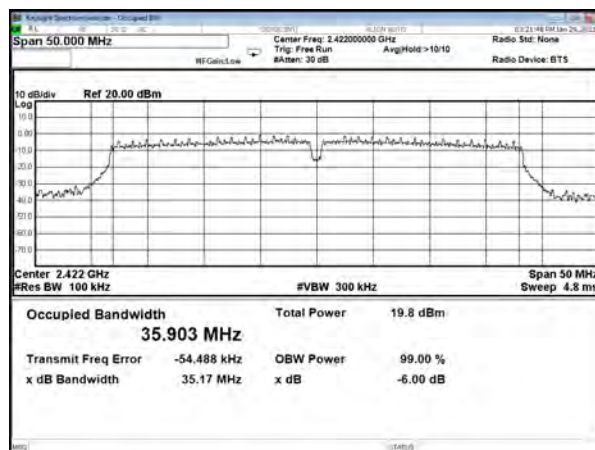


CH11

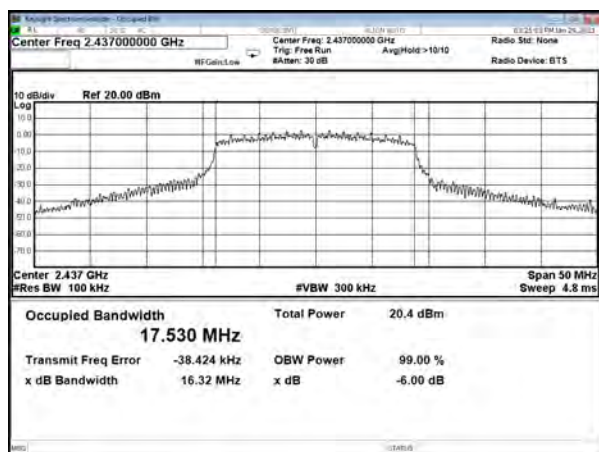


CH11

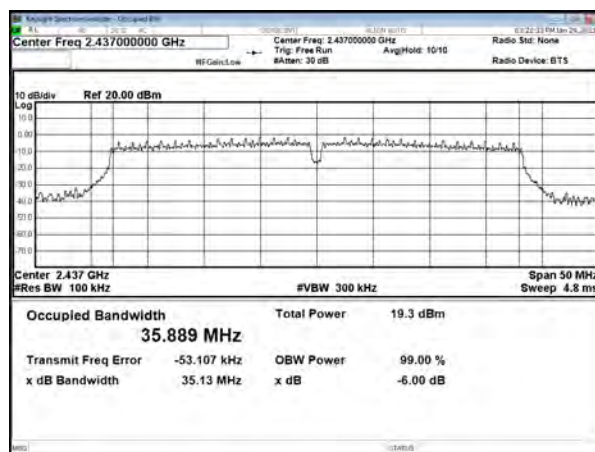


Modulation Type: 802.11n HT20
CH01Modulation Type: 802.11n HT40
CH03

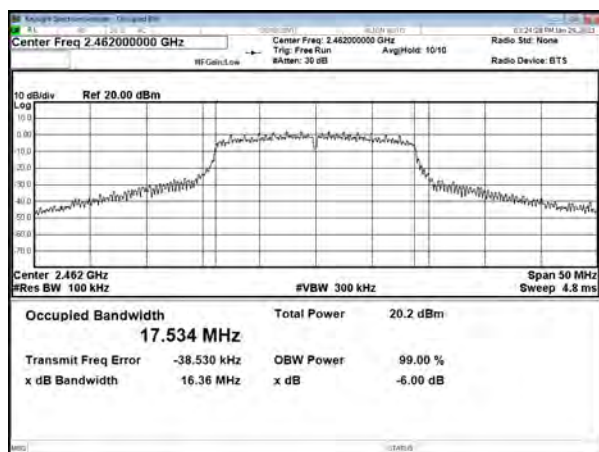
CH06



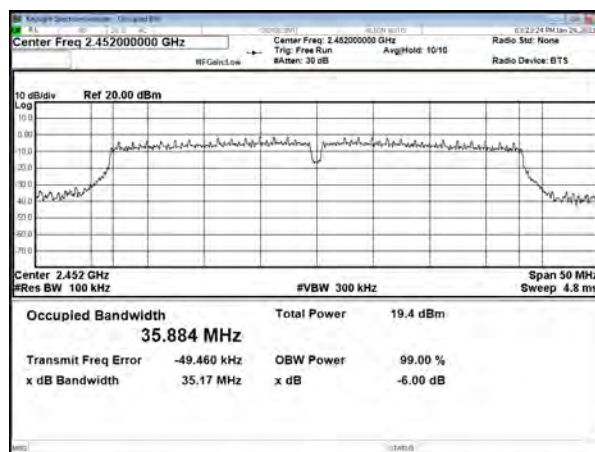
CH06

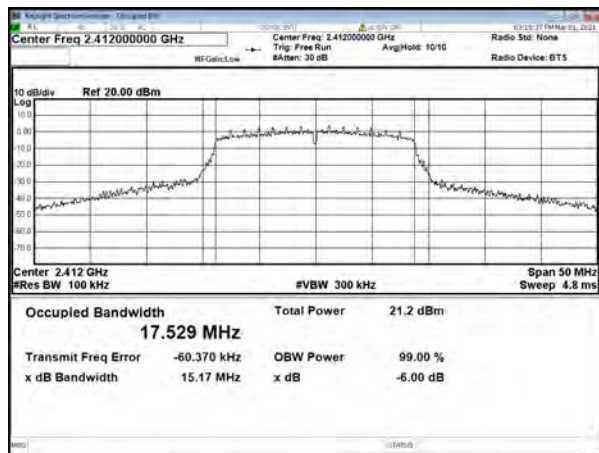


CH11

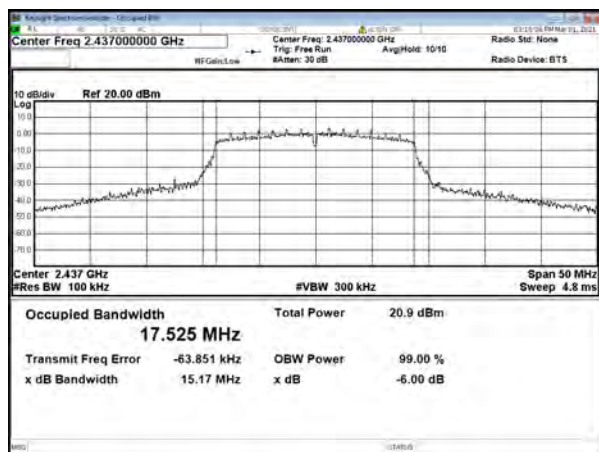


CH09

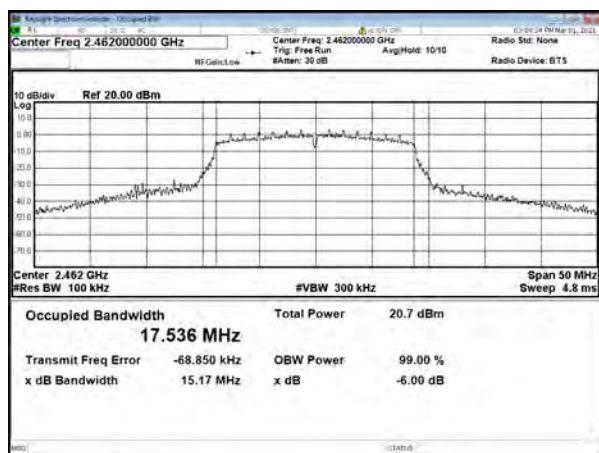
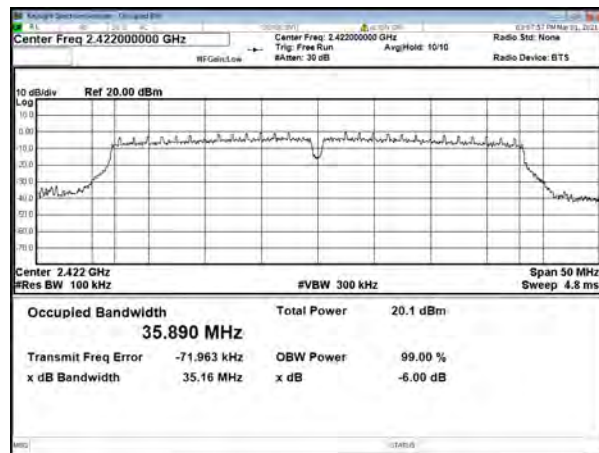


**For 2TX
Chain 1**Modulation Type: 802.11n HT20
CH01

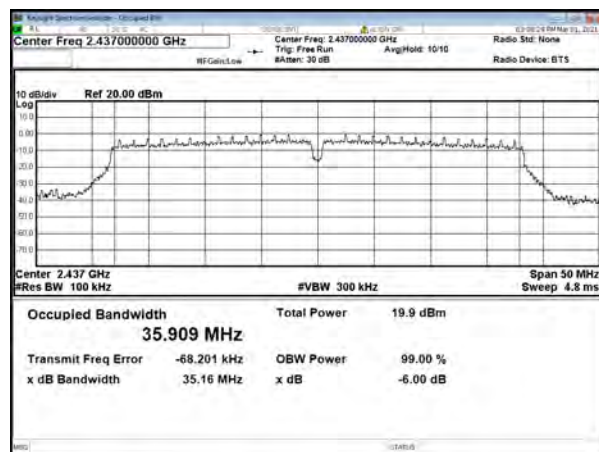
CH06



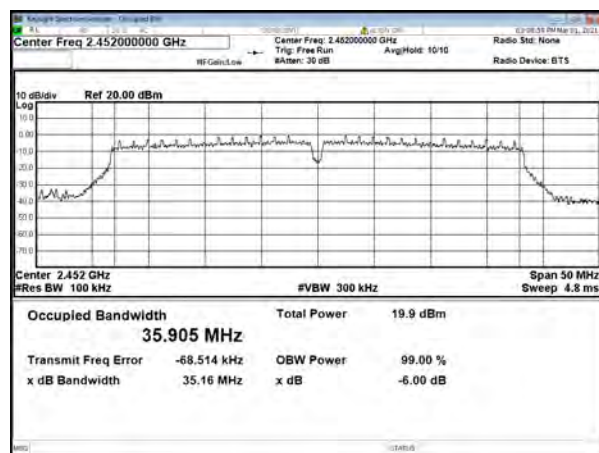
CH11

Modulation Type: 802.11n HT40
CH03

CH06

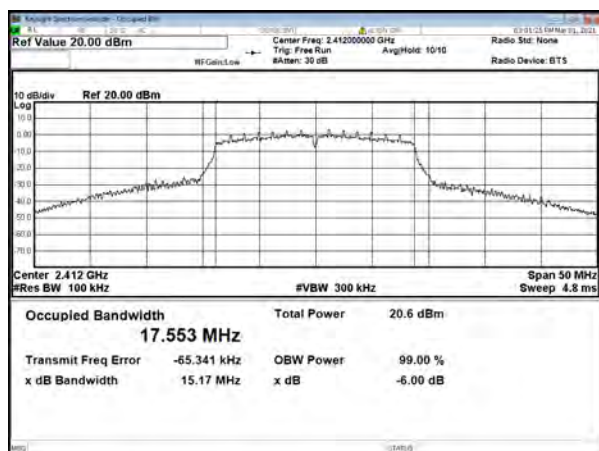
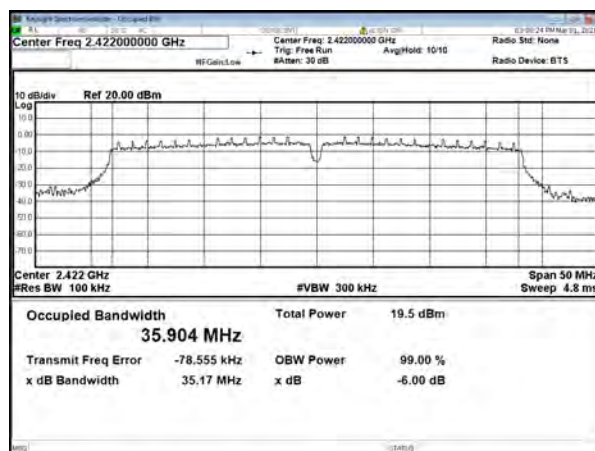


CH09

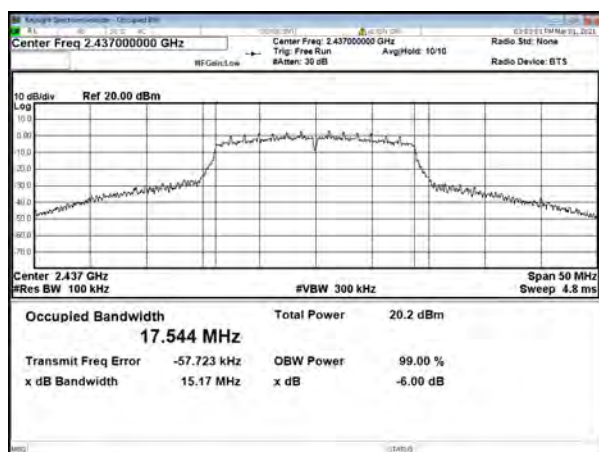




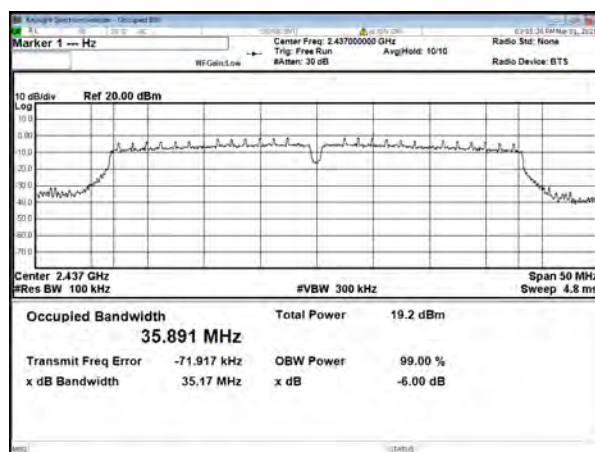
Chain 2

Modulation Type: 802.11n HT20
CH01Modulation Type: 802.11n HT40
CH03

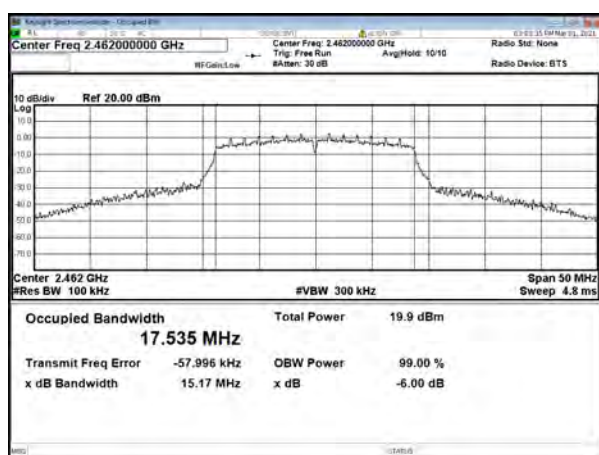
CH06



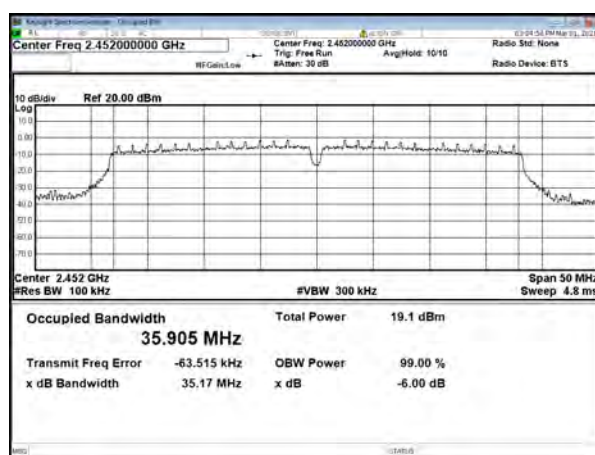
CH06



CH11



CH09





8. 峰值輸出功率之規定

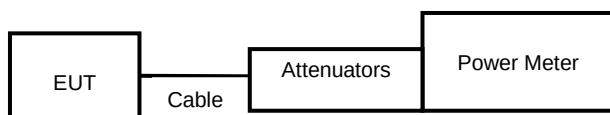
8.1. 適用標準

依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.2 節(1)(C)之規定，對使用數位調變技術之低功率發射機，其輸出峰值功率不得大於 1 Watt，且其所使用天線之增益不可大於 6dBi，若使用大於 6dBi 增益之天線，則其輸出峰值功率相對需衰減天線增益所增加之量(單位為 dB)。放寬之條件請參考天線增益之要求。

8.2. 測試方法

- a. 將待測物和儀器相連接。
- b. 量測輸出功率並記錄於報告中。

8.3. 測試配置





8.4. 峰值輸出功率之測試結果及數據

For 1TX

Modulation Type	Frequency (MHz)	Peak Power Output (dBm)		Peak Power Output (mW)		Power Limit (dBm)
		Chain 1	Chain 2	Chain 1	Chain 2	
IEEE 802.11b	2412	20.74	19.56	118.577	90.365	30.00
	2437	20.56	19.48	113.763	88.716	30.00
	2462	20.47	19.35	111.429	86.099	30.00
IEEE 802.11g	2412	22.65	21.53	184.077	142.233	30.00
	2437	22.53	21.42	179.061	138.676	30.00
	2462	22.42	21.39	174.582	137.721	30.00
IEEE 802.11n HT20	2412	22.34	21.21	171.396	132.130	30.00
	2437	22.12	21.06	162.930	127.644	30.00
	2462	22.20	21.12	165.959	129.420	30.00
IEEE 802.11n HT40	2422	21.49	20.33	140.929	107.895	30.00
	2437	21.52	20.42	141.906	110.154	30.00
	2452	21.37	20.29	137.088	106.905	30.00

For 2TX

Modulation Type	Frequency (MHz)	Peak Power Output (dBm)		Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
		Chain 1	Chain 2			
IEEE 802.11n HT20	2412	21.32	19.54	23.53	225.469	30.00
	2437	21.10	19.31	23.31	214.135	30.00
	2462	21.15	19.35	23.35	216.416	30.00
IEEE 802.11n HT40	2422	20.33	19.21	22.82	191.263	30.00
	2437	20.41	19.29	22.90	194.819	30.00
	2452	20.12	19.09	22.65	183.898	30.00

8.5. 結果判定

高、中、低頻段的峰值輸出功率皆低於 30 dBm，合乎標準規定。



9. 混附波發射限制之規定

9.1. 適用方法

依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.5 節之規定，使用頻帶範圍外之任意 100 千赫(kHz)內，發射器所產生的射頻功率相較於使用頻帶範圍中包含最高所需功率之 100 千赫(kHz)內的射頻功率，其衰減值限制如下：

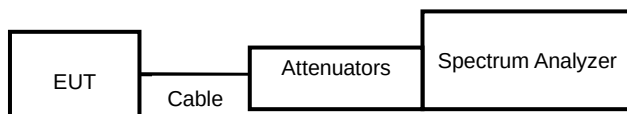
- (1) 輸出功率以峰值輸出功率方式量測者，至少需衰減 20dB，可使用射頻傳導或輻射方式測量。
- (2) 輸出功率以 4.10.1.2(1)(C)之最大傳導輸出功率測量方式者，至少需衰減 30dB，可使用射頻傳導或輻射方式測量。

此外，落於第 3.5 節禁用頻段之輻射發射，應符合第 3.6 節之規定。

9.2. 測試方法

1. 將待測物和儀器相連接。
2. 設定儀器解析頻寬為 100 kHz 和視訊頻寬為 300 kHz。
3. 將頻寬展開至 100 MHz。
4. 量測並記錄於報告中。

9.3. 測試配置



9.4. 結果判定

7.6.1 下邊緣頻帶：距下頻帶邊緣 40MHz 內最大混附波比主波低 20dB 以上，合乎標準規定。

7.6.2 上邊緣頻帶：距上頻帶邊緣 40MHz 內最大混附波比主波低 20dB 以上，合乎標準規定。

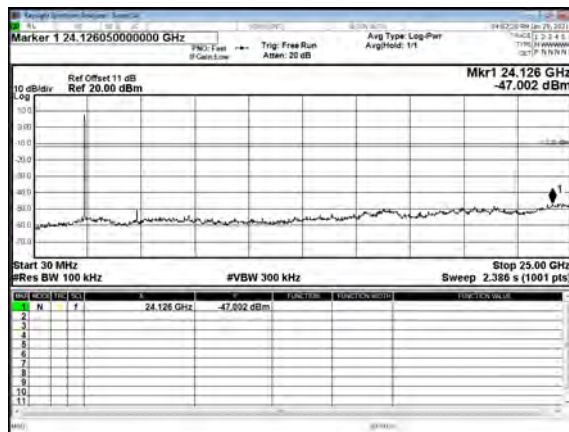
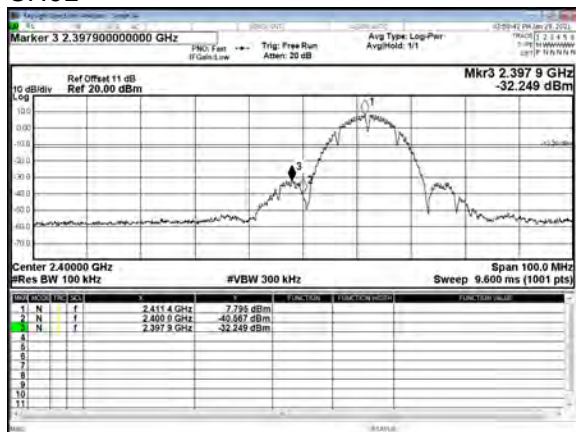
備註：繪圖資料請參考下頁。



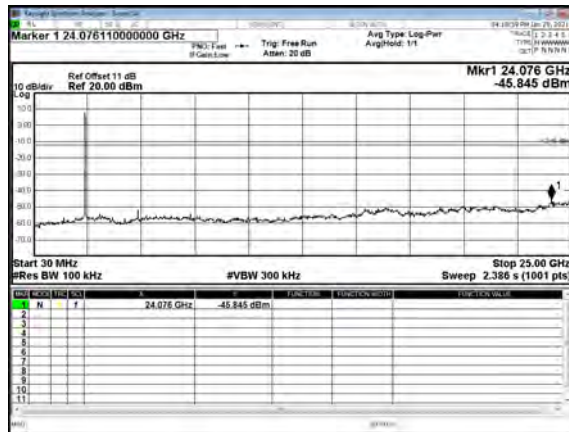
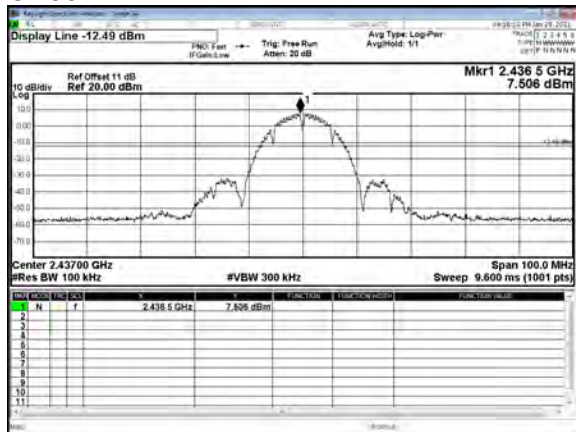
For 1TX

Modulation Type: 802.11b

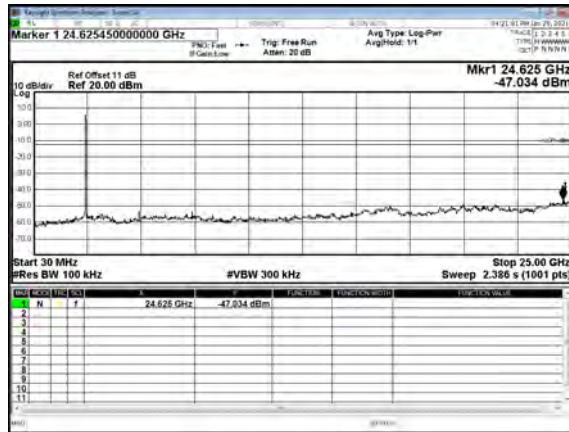
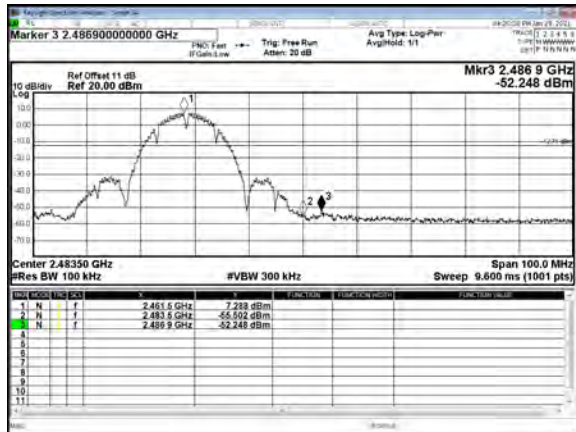
CH01

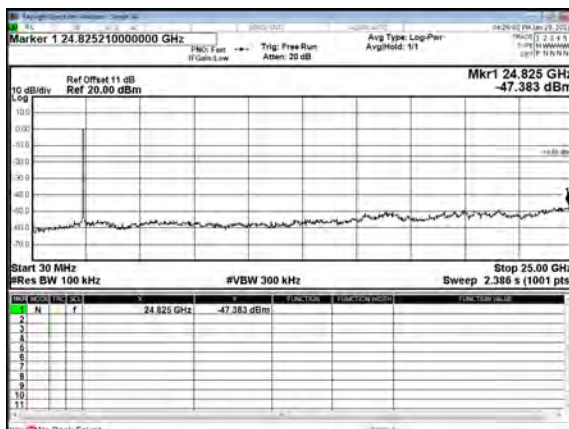
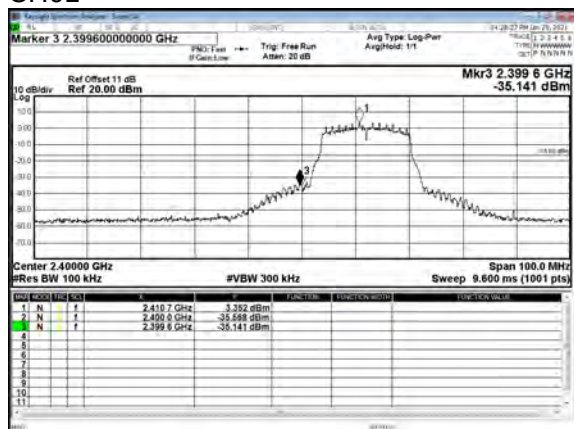


CH06

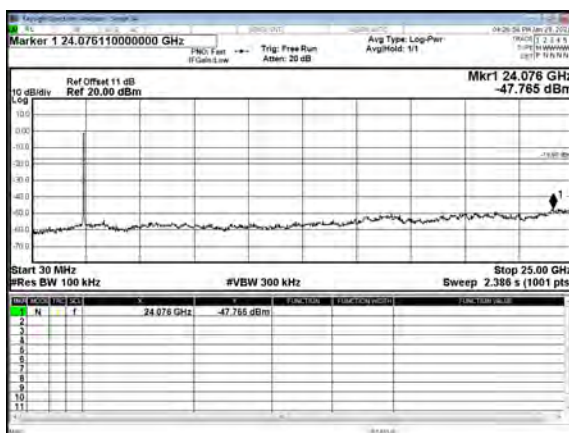
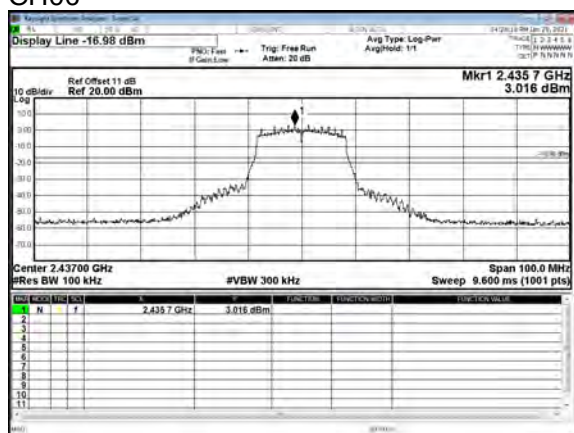


CH11

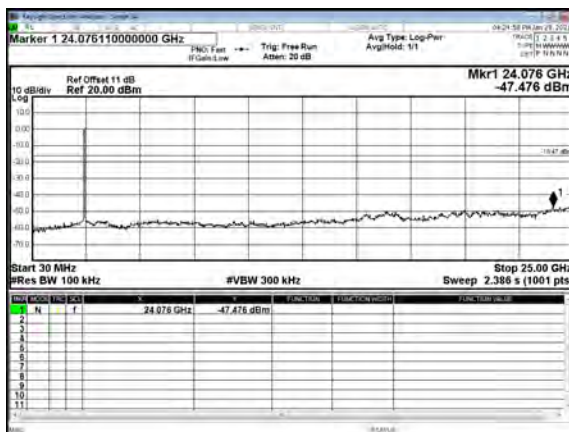
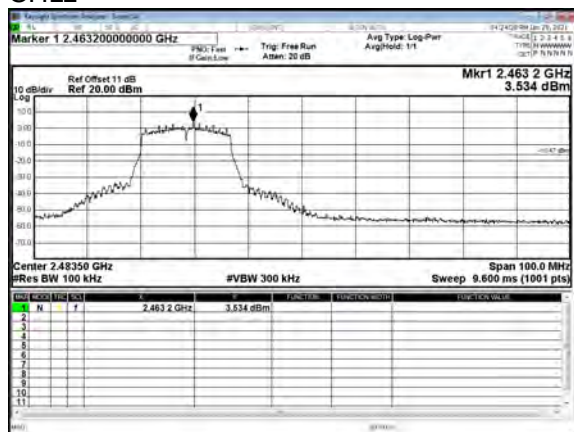


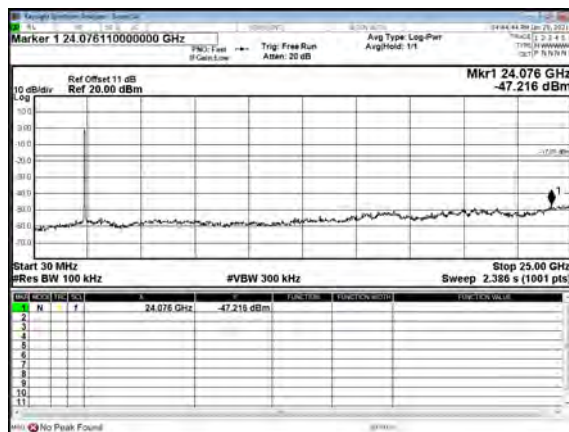
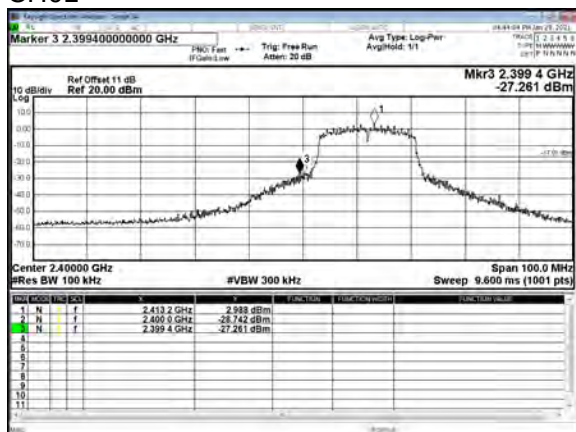
Modulation Type: 802.11g
CH01

CH06

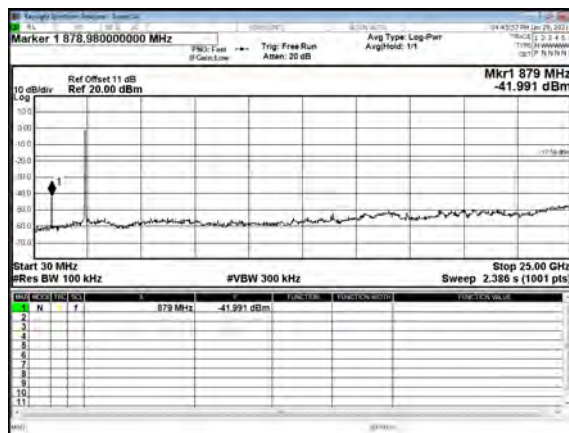
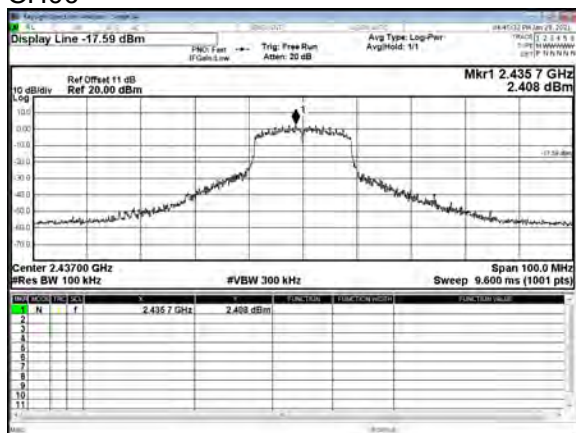


CH11

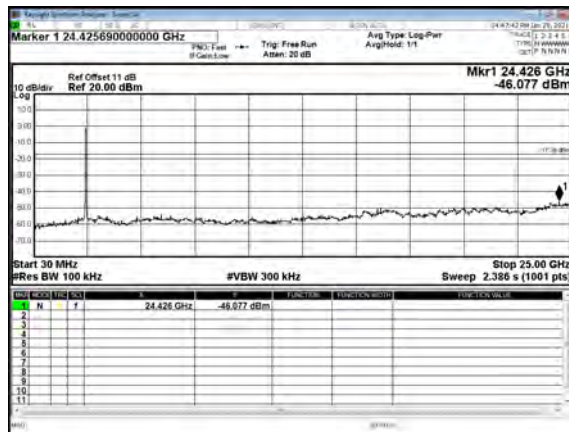
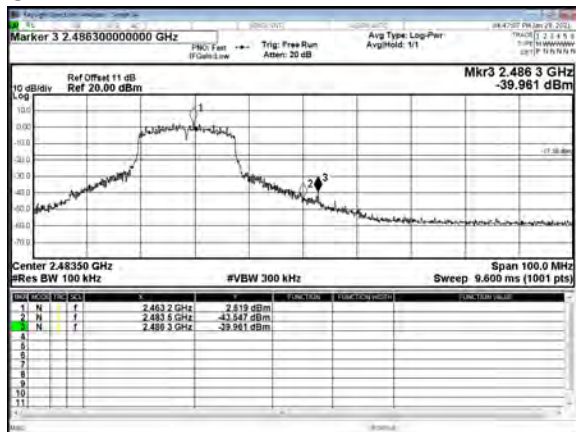


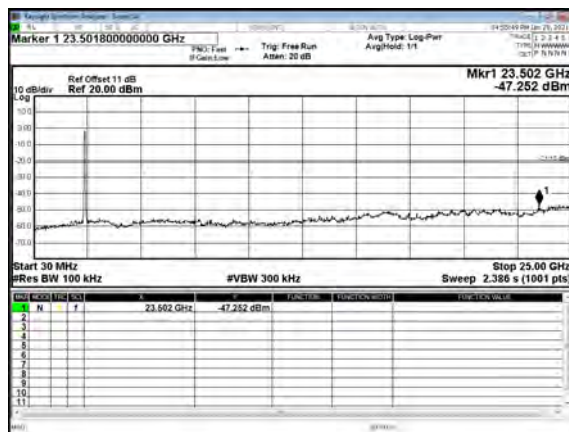
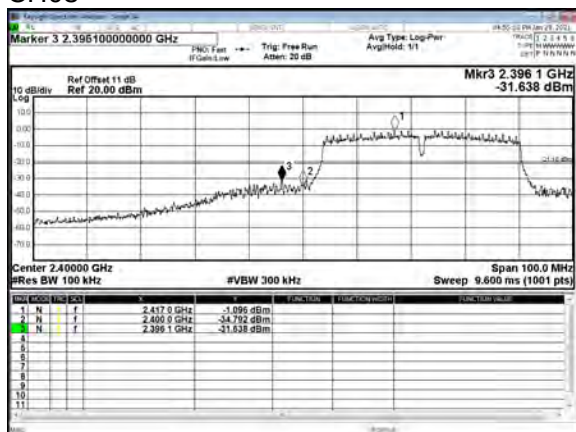
Modulation Type: 802.11n HT20
CH01

CH06

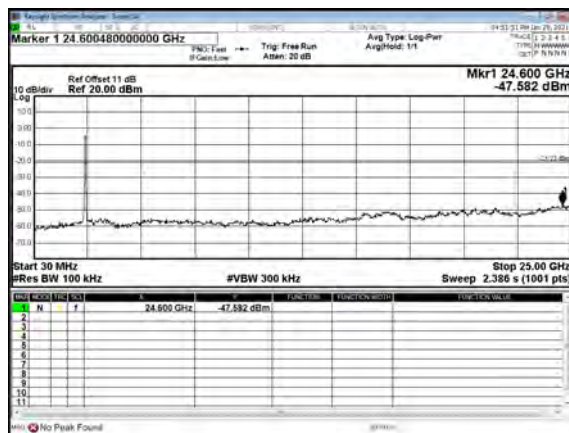
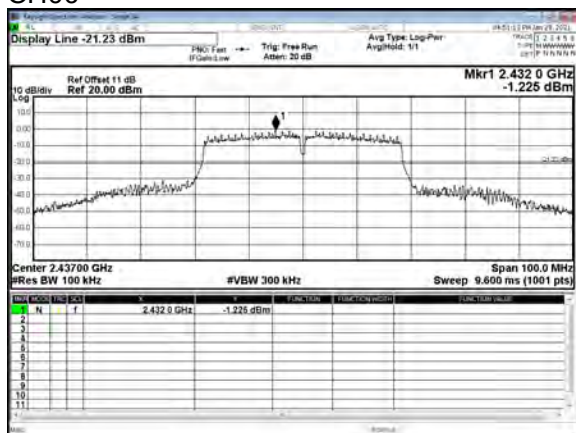


CH11

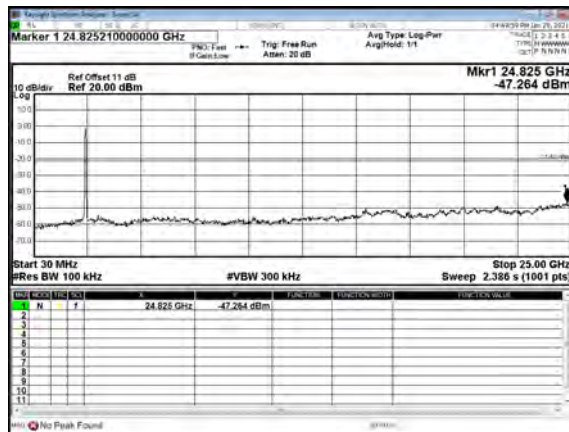
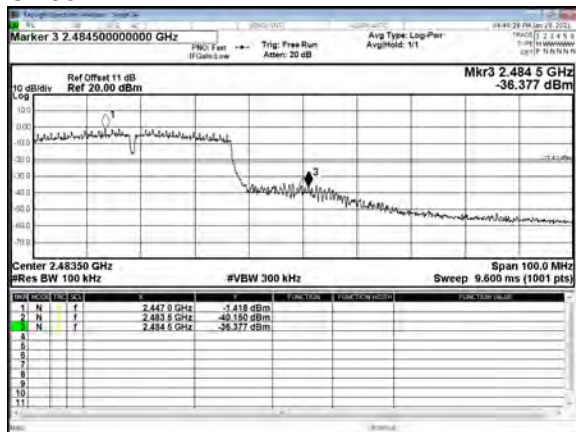


Modulation Type: 802.11n HT40
CH03

CH06

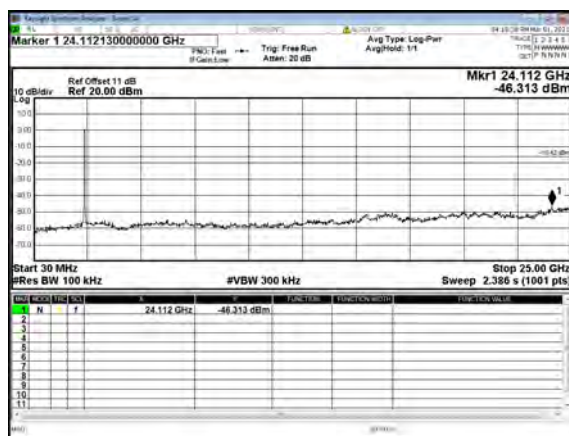
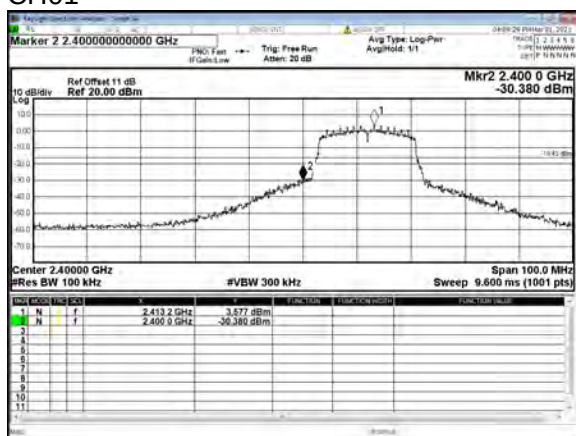


CH09

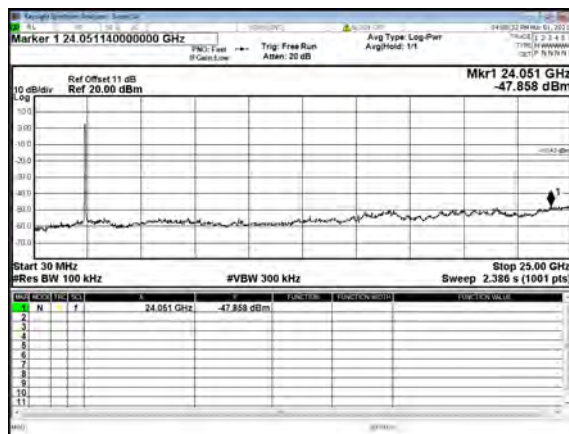
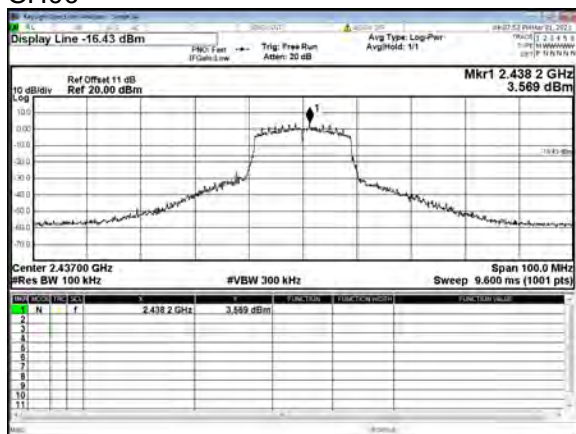




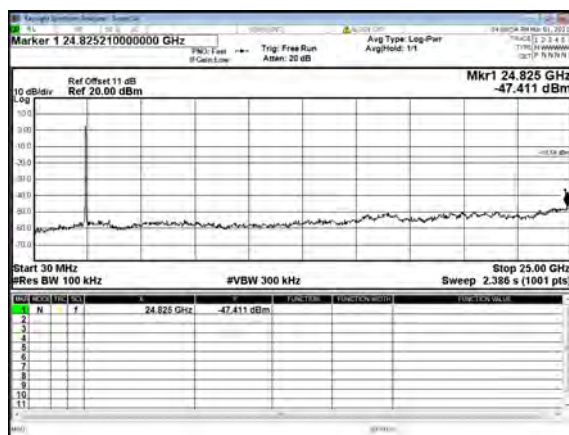
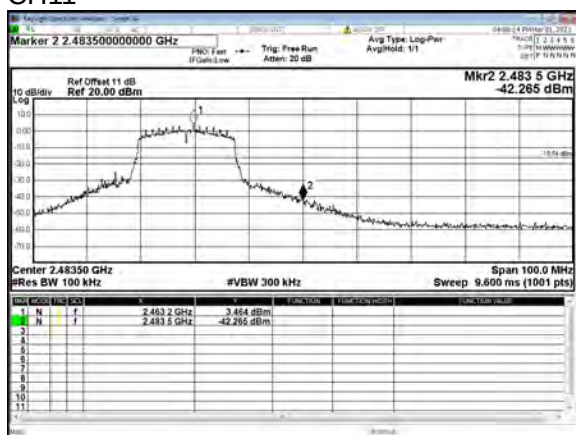
For 2TX
Chain 1
Modulation Type: 802.11n HT20
CH01

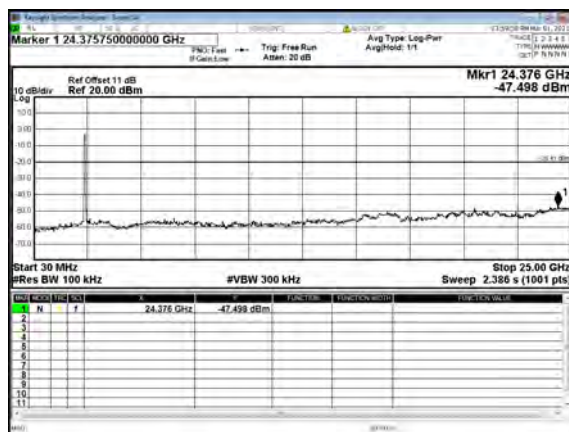
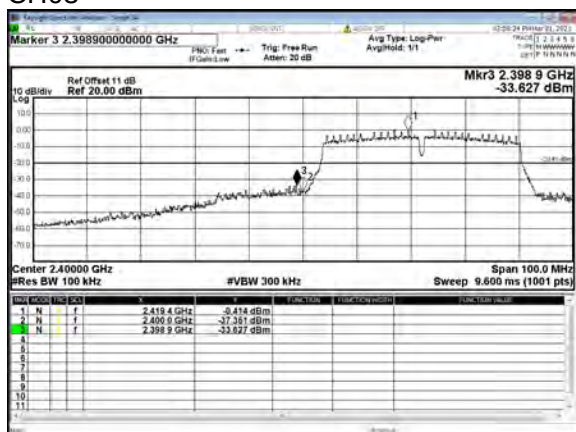


CH06

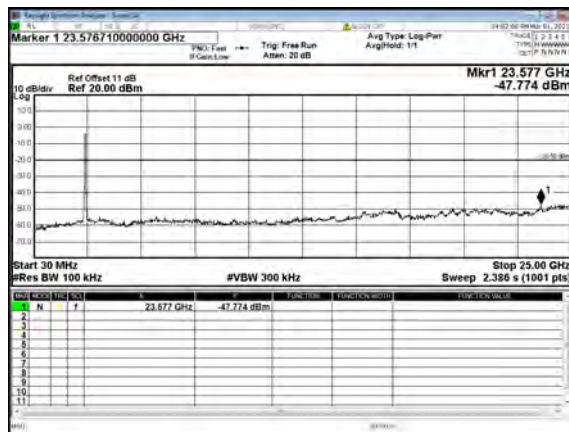
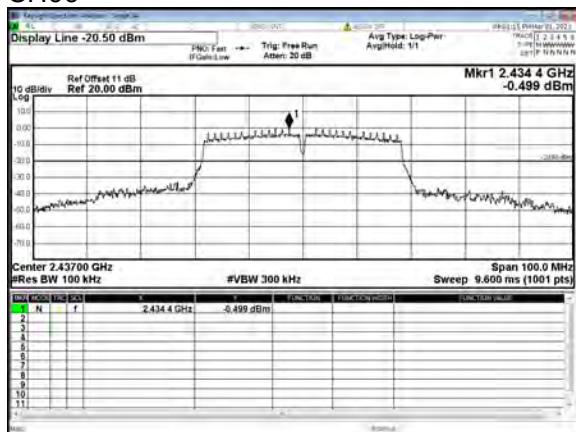


CH11

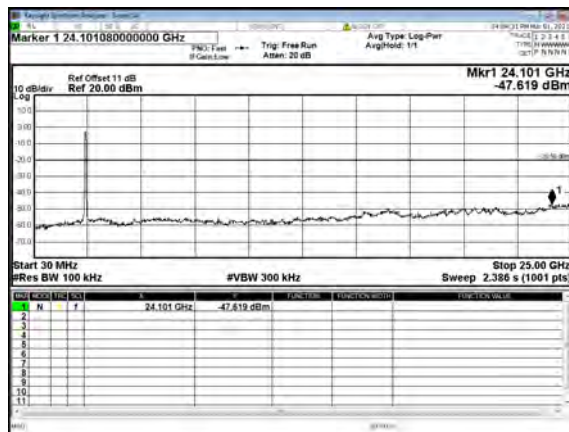
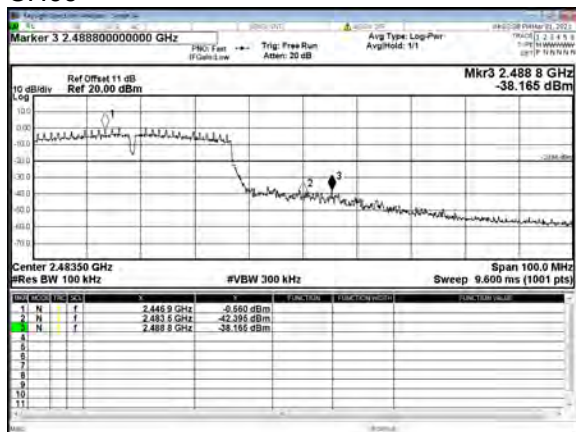


Modulation Type: 802.11n HT40
CH03

CH06

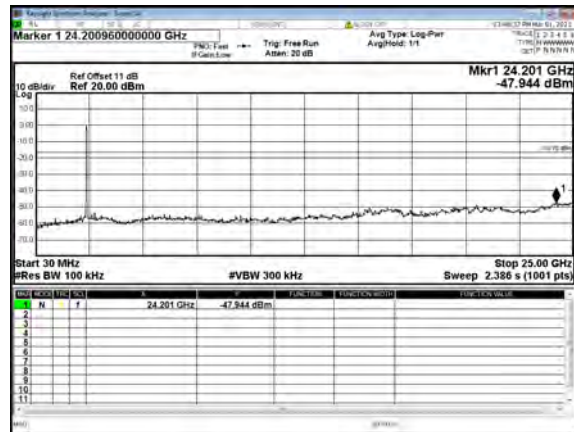
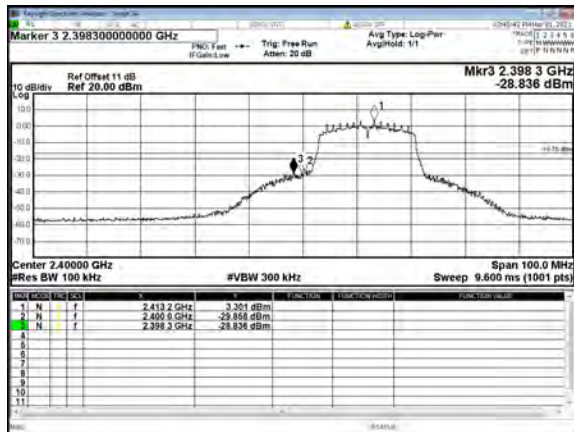


CH09

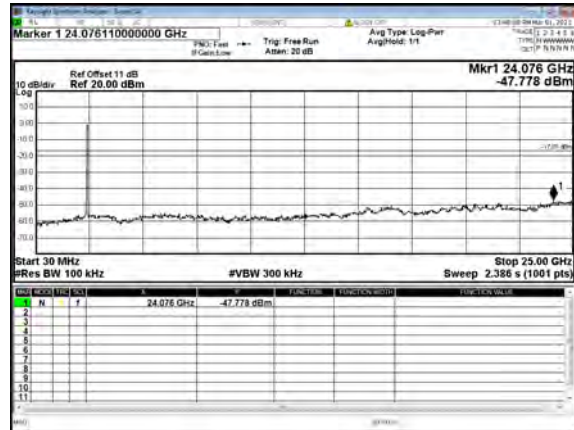
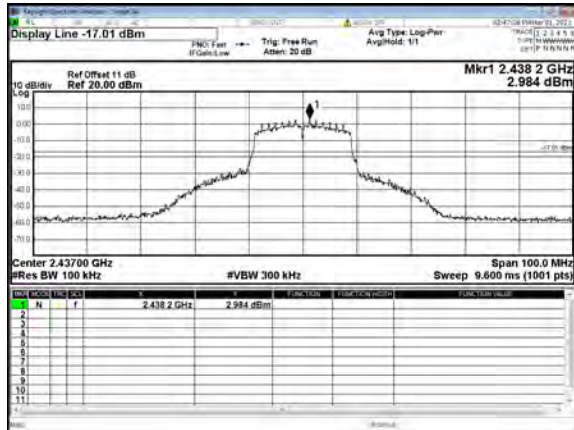




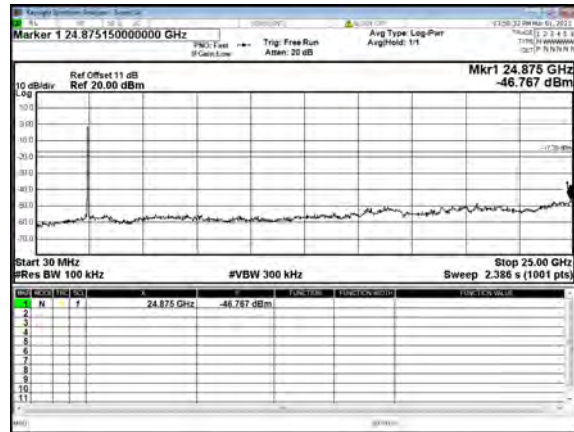
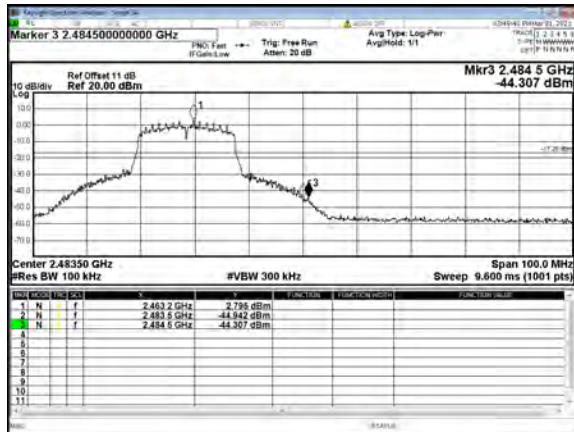
Chain 2
Modulation Type: 802.11n HT20
CH01

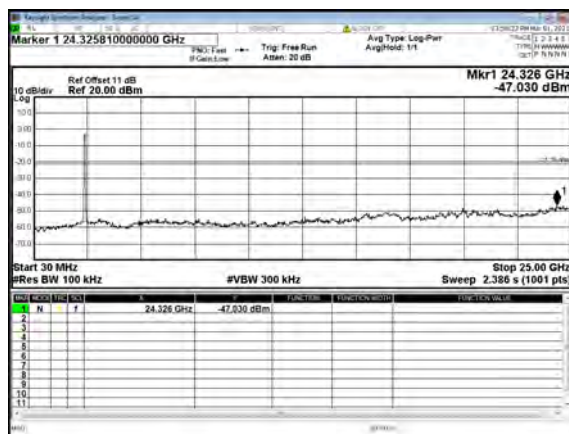
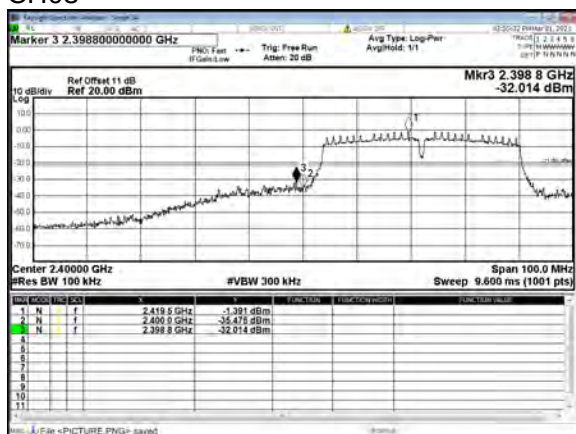


CH06

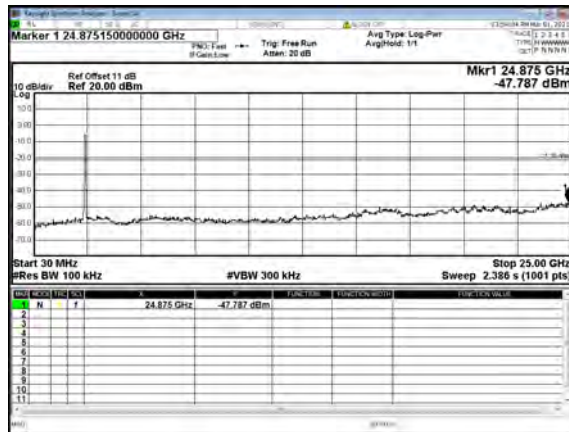
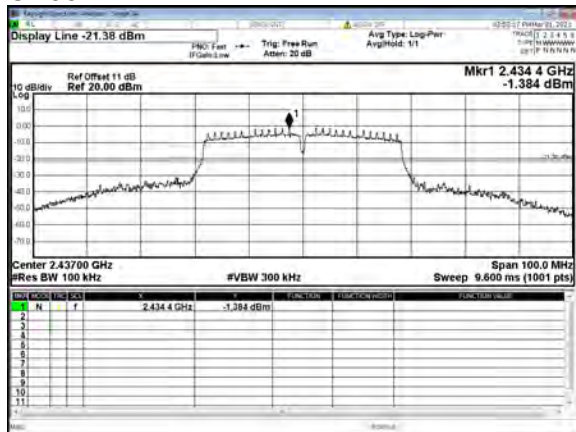


CH11

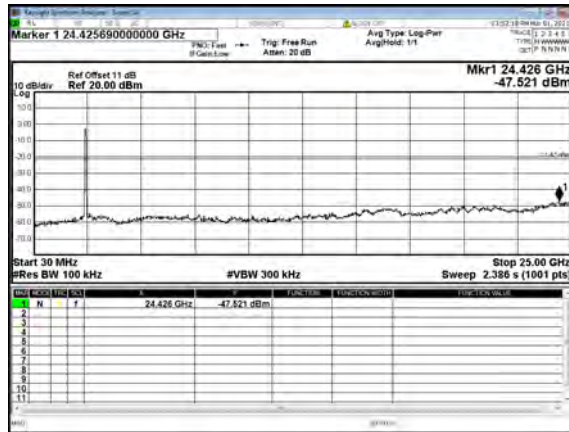
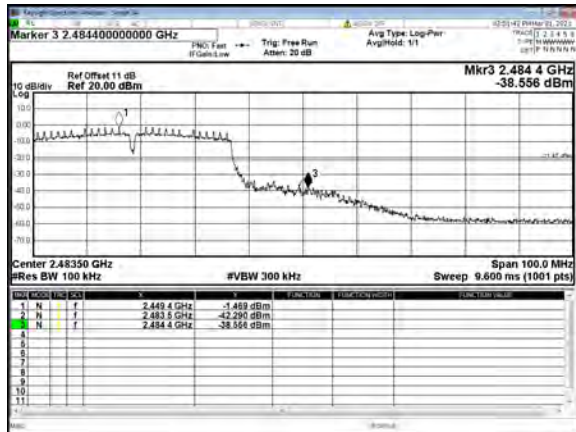


Modulation Type: 802.11n HT40
CH03

CH06



CH09





10. 功率密度之規定

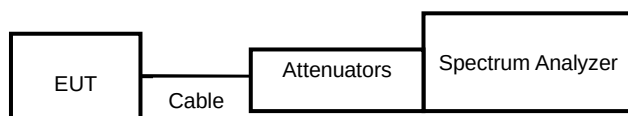
10.1. 適用標準

依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.6 節之(2)(B)規定，對數位調變技術系統，在使用任意 3 kHz 之頻寬內，由發射機傳導至天線之峰值發射電功率密度在任意期間內，皆不得大於 8dBm，且應依 4.10.1.3 之方式降低功率頻譜密度限制值。

10.2. 測試方法

1. 將待測物和儀器相連接。
2. 設定儀器解析頻寬為 3kHz、視訊頻寬為 10 kHz。
3. 量測並記錄於報告中。

10.3. 測試配置





10.4. 功率密度之量測結果及數據

For 1TX

Modulation Type	Frequency (MHz)	Power Spectral Density (dBm)
IEEE 802.11b	2412	-7.022
	2437	-10.425
	2462	-8.001
IEEE 802.11g	2412	-12.873
	2437	-12.531
	2462	-12.947
IEEE 802.11n HT20	2412	-13.205
	2437	-14.343
	2462	-11.424
IEEE 802.11n HT40	2422	-16.980
	2437	-17.410
	2452	-17.162

For 2TX

Modulation Type	Frequency (MHz)	Power Spectral Density (dBm)		
		Chain 1	Chain 2	Chain 1+2
IEEE 802.11n HT20	2412	-12.466	-12.815	-9.63
	2437	-12.177	-13.045	-9.58
	2462	-12.845	-14.345	-10.52
IEEE 802.11n HT40	2422	-14.925	-17.136	-12.88
	2437	-15.309	-17.444	-13.24
	2452	-15.107	-17.154	-13.00

備註：繪圖資料請參考下頁。

10.5. 結果判定

高、中、低頻段的 3 kHz 功率密度皆低於 8 dBm，合乎標準規定。



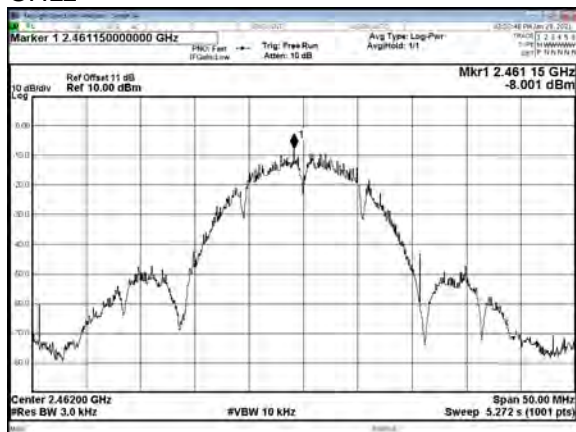
For 1TX
Modulation Type: 802.11b
CH01



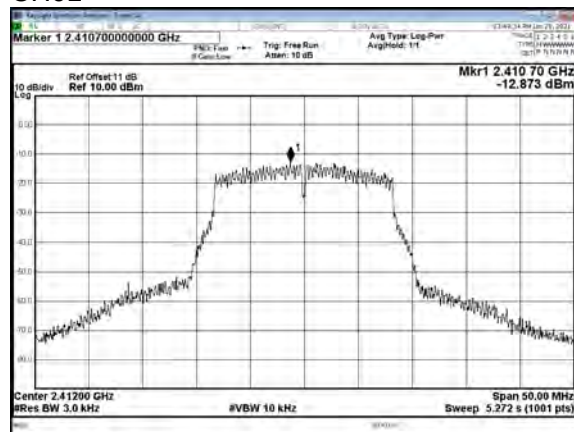
CH06



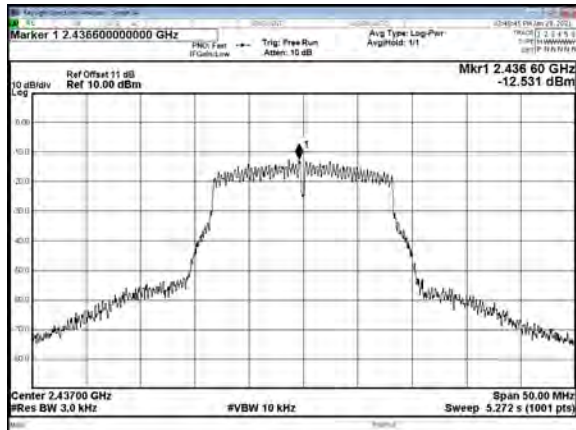
CH11



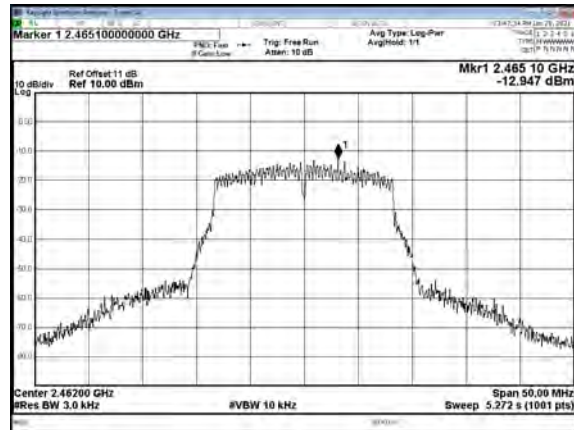
Modulation Type: 802.11g
CH01

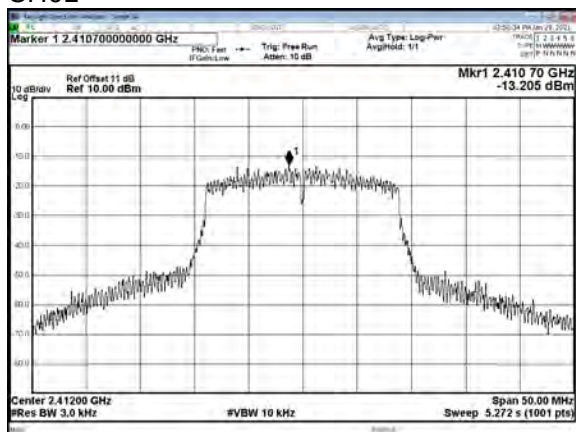


CH06

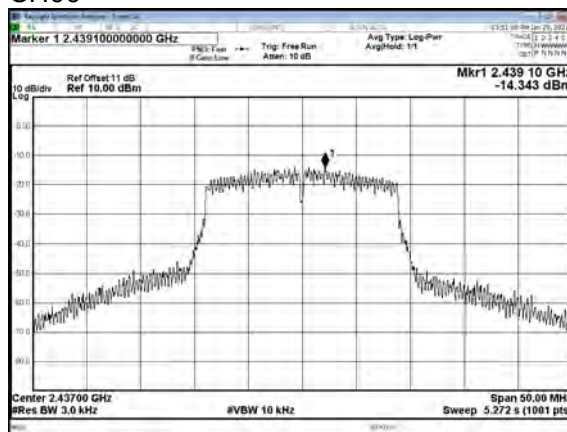


CH11

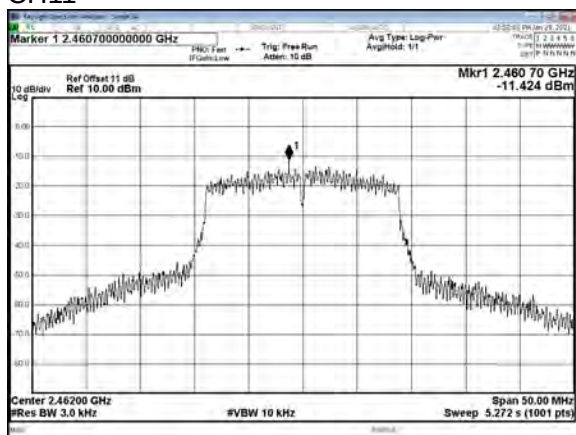
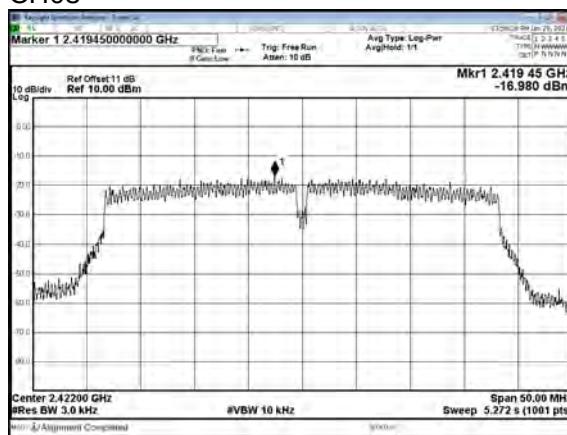


Modulation Type: 802.11n HT20
CH01

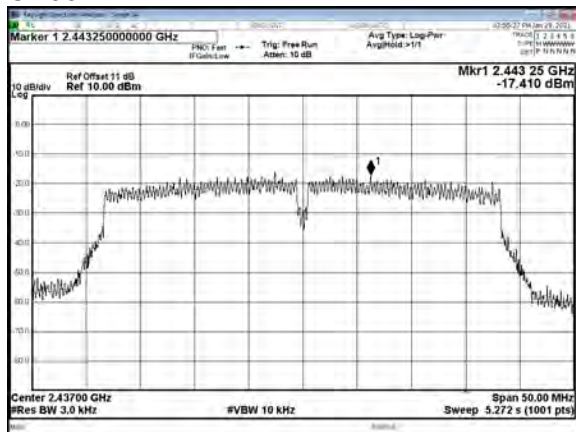
CH06



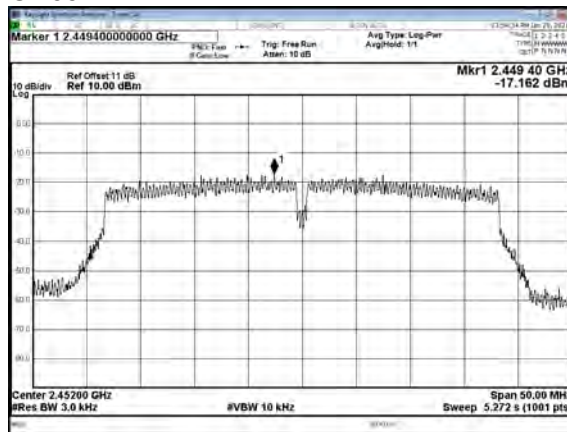
CH11

Modulation Type: 802.11n HT40
CH03

CH06

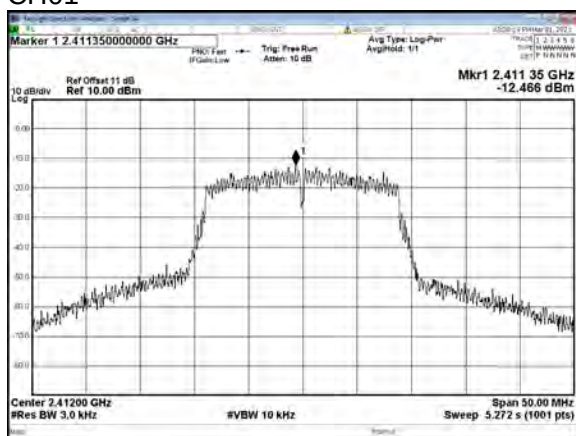


CH09

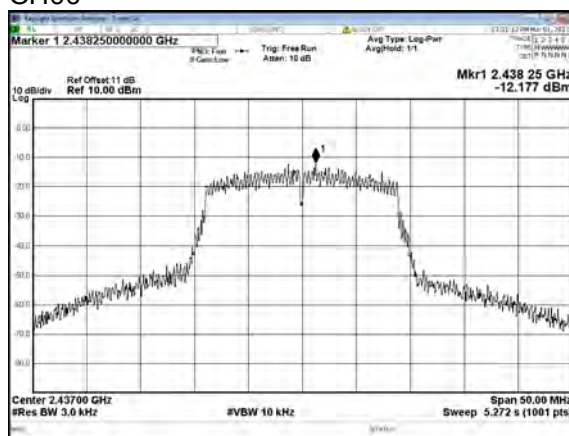




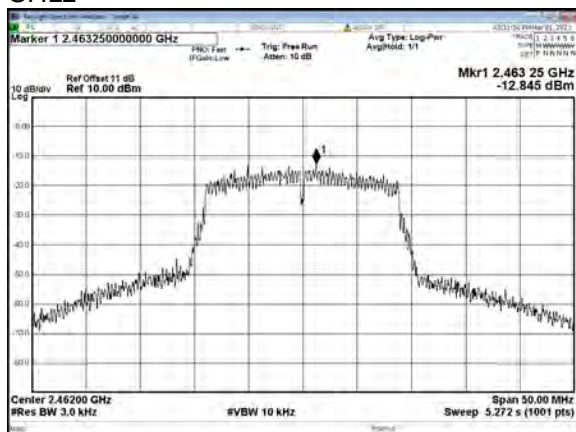
For 2TX
Chain 1
Modulation Type: 802.11n HT20
CH01



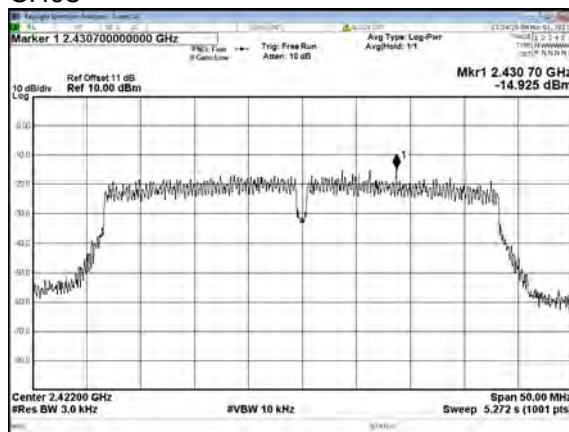
CH06



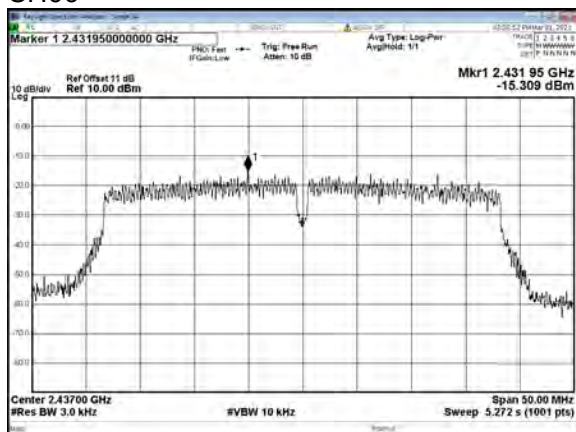
CH11



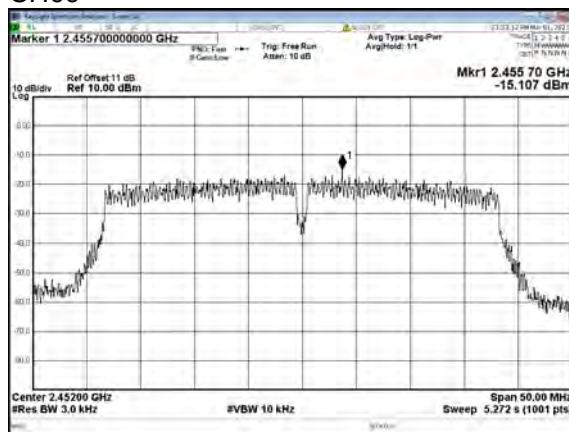
Modulation Type: 802.11n HT40
CH03



CH06

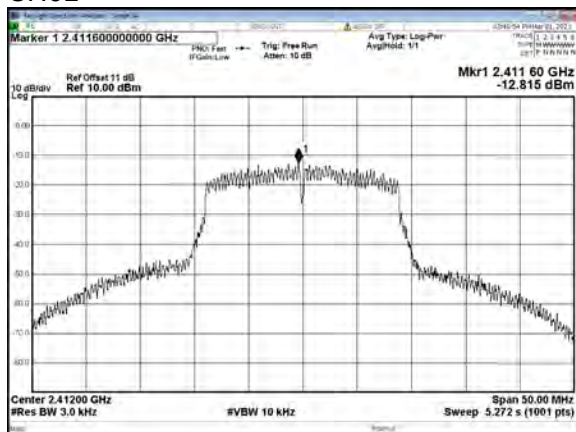


CH09





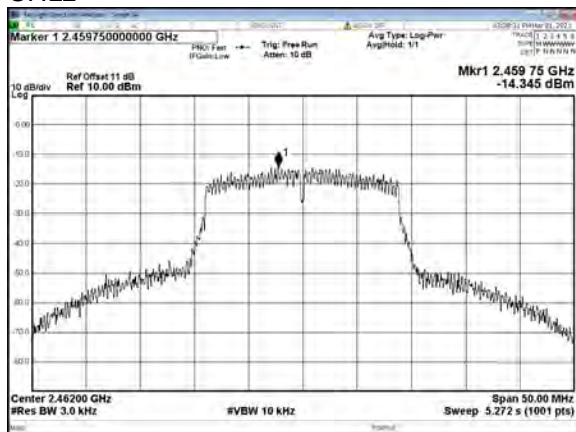
Chain 2
Modulation Type: 802.11n HT20
CH01



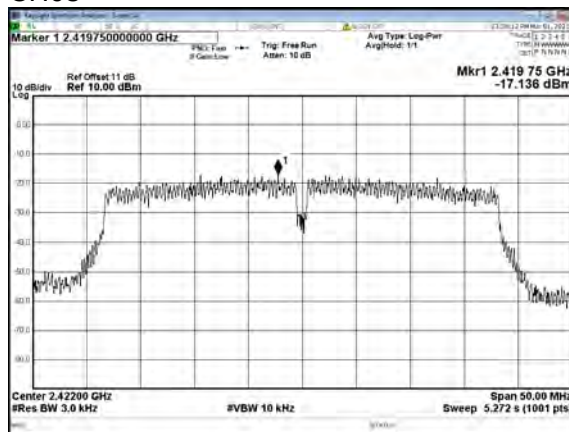
CH06



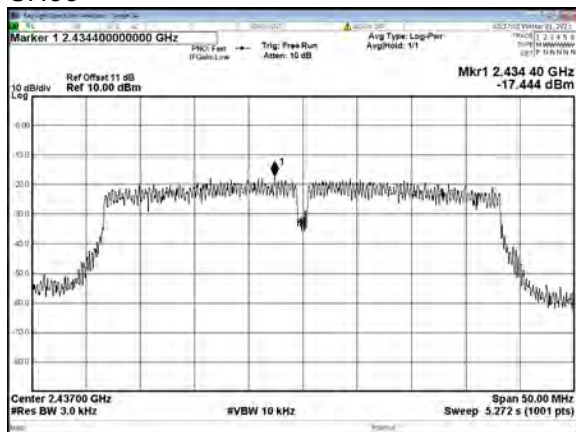
CH11



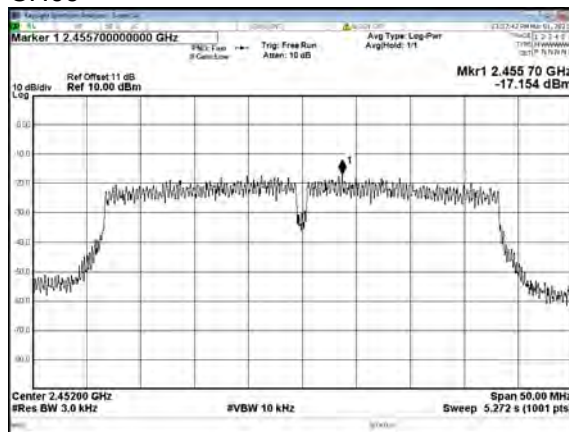
Modulation Type: 802.11n HT40
CH03



CH06



CH09





11. 電波暴露量之評估

11.1. 適用標準

依據國家通訊傳播委員會低功率射頻器材技術規範 6.20 節之(6.20.2)規定，若受測物於正常操作模式下，其發射機距離人體 20 公分以上者，可測試最大暴露允許值(Maximum Permissible Exposure, MPE)以證明其符電波暴露量之要求。限制值如下：

(1) 職業性/可控制之暴露

頻率範圍 (MHz)	電場強度 (V/m)	磁場強度 (A/m)	功率密度 (mW/cm ²)	平均時間 (minutes)
0.3-3.0	614	1.63	*100	6
3-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500	-----	-----	f/300	6
1,500-100,000	-----	-----	5.0	6

註 1：標記*表平面波等效功率密度。

註 2：f 表測試頻率，單位：百萬赫(MHz)。

(2) 一般人/不可控制之暴露

頻率範圍 (MHz)	電場強度 (V/m)	磁場強度 (A/m)	功率密度 (mW/cm ²)	平均時間 (minutes)
0.3-3.0	614	1.63	*100	30
3-30	1842/f	4.89/f	*180/f ²	30
30-300	27.5	0.073	1.0	30
300-1,500	-----	-----	f/1500	30
1,500-100,000	-----	-----	1.0	30

註 1：標記*表平面波等效功率密度。

註 2：f 表測試頻率，單位：百萬赫(MHz)。

11.2. 電波暴露量之評估結果及數據

For 1TX

Modulation Mode	Frequency band (MHz)	Peak output power(dBm)	Tune-up power(dBm)	MaxTune-up power(dBm)	MaxTune-up power(mW)	Antenna gain (Numeric)	Distance (cm)	Power density (mW/cm ²)	Limit (mW/cm ²)
802.11b	2412-2462	20.74	20.74±1	21.74	149.279441	1.49	20	0.044114314	1
802.11g	2412-2462	22.65	22.65±1	23.65	231.739465	1.49	20	0.068482488	1
802.11n HT20	2412-2462	22.34	22.34±1	23.34	215.7744409	1.49	20	0.063979279	1
802.11n HT40	2422-2452	21.52	21.52±1	22.52	178.6487575	1.49	20	0.052971143	1

For 2TX

Modulation Mode	Frequency band (MHz)	Peak output power(dBm)	Tune-up power(dBm)	MaxTune-up power(dBm)	MaxTune-up power(mW)	Antenna gain (Numeric)	Distance (cm)	Power density (mW/cm ²)	Limit (mW/cm ²)
802.11n HT20	2412-2462	23.53	23.53±1	24.53	283.7919028	1.49	20	0.084147137	1
802.11n HT40	2422-2452	22.90	22.90±1	23.90	245.4708916	1.49	20	0.072784574	1

11.3. 結果判定

高、中、低頻段的電波暴露量皆低於限制值，合乎標準規定。



12. 限制使用之頻帶

Only spurious emissions are permitted in any of the frequency bands listed below:

頻率(兆赫)	頻率(兆赫)	頻率(兆赫)
0.090 - 0.110	240.00 - 285.00	3332.0 - 3339.0
0.490 - 0.510	322.00 - 335.40	3345.8 - 3358.0
2.172 - 2.198	399.90 - 410.00	3500.0 - 4400.0
3.013 - 3.033	485.00 - 510.00	4500.0 - 5250.0
4.115 - 4.198	608.00 - 614.00	5350.0 - 5460.0
5.670 - 5.690	703.00 - 748.00	7250.0 - 7750.0
6.200 - 6.300	758.00 - 803.00	8025.0 - 8500.0
8.230 - 8.400	825.00 - 915.00	9000.0 - 9200.0
12.265 - 12.600	930.00 - 1240.0	9300.0 - 9500.0
13.340 - 13.430	1300.0 - 1427.0	10600- 12700
14.965 - 15.020	1435.0 - 1626.5	13250- 13400
16.700 - 16.755	1660.0 - 1785.0	14470- 14500
19.965 - 20.020	1805.0 - 1880.0	15350- 16200
25.500 - 25.700	1885.0 - 1900.0	17700- 21400
37.475 - 38.275	1905.0 - 1985.0	22010- 23120
73.500 - 75.400	2010.0 - 2025.0	23600- 24000
108.00 - 138.00	2110.0 - 2170.0	31200- 31800
149.90 - 150.05	2200.0 - 2300.0	36430- 36500
156.70 - 156.90	2310.0 - 2390.0	38600 以上
162.01 - 167.17	2483.5 - 2900.0	
167.72 - 173.20	3260.0 - 3267.0	

-----THE END OF REPORT-----