

NCC 低功率射頻器材型式試驗報告

報告編號: WD-RN-R-210004-A0

產品名稱 : 雙聲道真無線藍牙入耳式耳機
型號 : MW07GO 2020
申請者 : New Audio LLC
收件日期 : 109 年 12 月 24 日
測試日期 : 109 年 12 月 29 日 ~ 110 年 01 月 08 日
法規 : 低功率射頻器材技術規範(LP0002) 109 年 7 月 1 日



穩得實業股份有限公司 穩得電磁相容及無線射頻實驗室

注意:

本測試報告只針對待測設備樣品有效。報告中所描述之測試結果和待測設備的架構組合，均根據樣品實際的量測情況作詳實的記錄。

本測試報告內之測試結果可藉由測試儀器設備之校正報告與本報告內所評估量測不確定度追溯至國家或國際標準。

本實驗室依據測試標準規定進行測試，在進行符合性分析時，不考慮量測不確定度的貢獻，依此判定規則出具測試報告。

本測試報告非經穩得電磁相容及無線射頻實驗室同意不可複製使用，但全份複製除外。

低功率射頻器材型式試驗報告

報告發行日期: 110年01月08日

案件編號: 20Q122405

產品名稱	雙聲道真無線藍牙入耳式耳機
廠牌	Master & Dynamic
型號	MW07GO 2020
申請者	New Audio LLC
製造商	New Audio LLC
待測物額定電壓	Battery 4.2V
待測物測試電壓	Battery 4.2V
待測物支援無線應用	Bluetooth BR/EDR
適用法規	低功率射頻器材技術規範(LP0002) 109 年 7 月 1 日
發射功率(電場強度)	81.18 dBuV/m
測試結果	合格

報告製作

(專員 / 呂月蟬)

測試工程師

(高級工程師 / 謝岱宗)

報告簽署人

(專案經理 / 吳明政)

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文件修改歷程

報告編號	發行日期	描述
WD-RN-R-210004-A0	110年01月08日	初始報告

測試結果總結

參考法規章節	測試項目	測試結果
LP0002 3.2	天線要求	合格
LP0002 3.3	電源線傳導干擾	合格
LP0002 4.10.2.2	場強輻射	合格

1 待測物相關資訊

1.1 申請者資訊

New Audio LLC
276 5TH AVE RM 902 NEW YORK, NY 10001 U.S.A

1.2 製造商資訊

New Audio LLC
276 5TH AVE RM 902 NEW YORK, NY 10001 U.S.A

1.3 待測物基本資訊

產品名稱	雙聲道真無線藍牙入耳式耳機
型號	MW07GO 2020
操作頻率範圍	2402 ~ 2480 MHz
頻道數	79
調變方式	FHSS: GFSK(1Mbps) / π /4DQPSK(2Mbps) / 8DPSK(3Mbps)
天線資訊	Refer to the table “Antenna List”
待測物支援無線應用	Bluetooth BR/EDR
待測物額定電壓	Battery 4.2V
待測物測試電壓	Battery 4.2V

Antenna List

No.	Manufacturer	Model No.	Antenna Type	Peak Gain
1	ASECL	SCLCT02M04	Chip Antenna	-0.31 dBi for 2.4 GHz

Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2422	40	2442	60	2462
01	2403	21	2423	41	2443	61	2463
02	2404	22	2424	42	2444	62	2464
03	2405	23	2425	43	2445	63	2465
04	2406	24	2426	44	2446	64	2466
05	2407	25	2427	45	2447	65	2467
06	2408	26	2428	46	2448	66	2468
07	2409	27	2429	47	2449	67	2469
08	2410	28	2430	48	2450	68	2470
09	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	--	--

Pretest Mode

Mode 1	Transmit BT-BR(1Mbps)
Mode 2	Transmit BT-ERD(2Mbps)
Mode 3	Transmit BT-EDR(3Mbps)
Mode 4	Receiver BT-BR(1Mbps)
Mode 5	Charging Link

Worst Mode

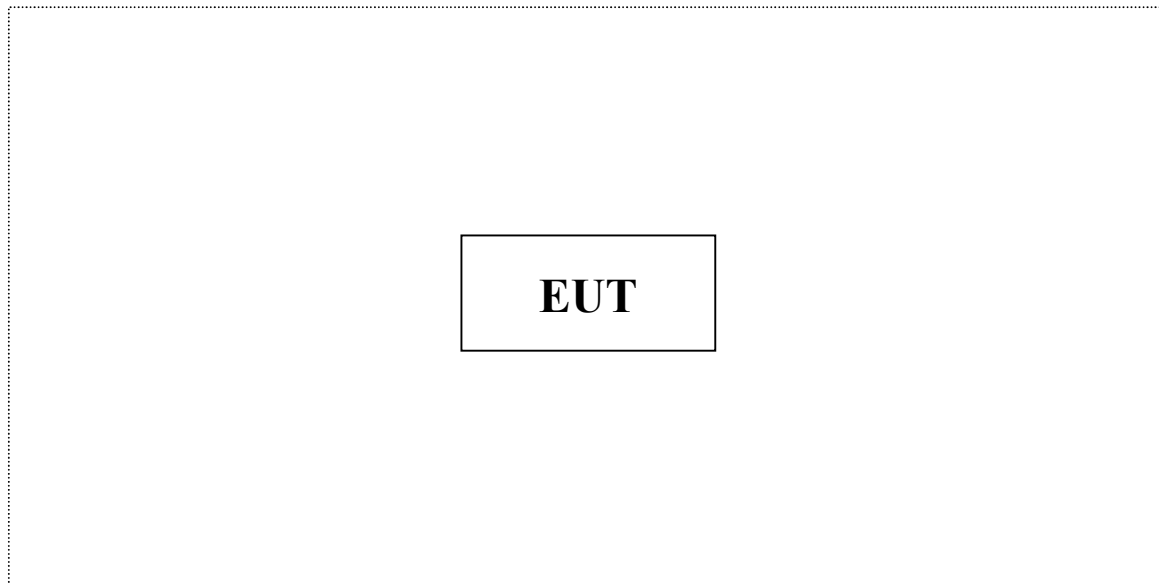
Mode 1	Transmit BT-BR(1Mbps)
Mode 3	Transmit BT-EDR(3Mbps)
Mode 4	Receiver BT-BR(1Mbps)
Mode 5	Charging Link

備註:

1. 這些測試是在設備樣本上進行，目的是證明符合 LP0002 4.10.2 章節。
2. 選擇低、中和最高操作頻率來執行測試。
3. 輻射測量在 X，Y，Z 軸定位中進行，只有最差(X 軸)的情況才會顯示在報告中。

1.4 待測物架構

輻射干擾測試



Test Table

電源傳導測試



Test Table

1.5 待測物軟體設定

1. 測試配置如上圖 1.4 所示
2. 測試使用測試軟體或工程模式：由申請廠商提供工程模式做測試。控制功能有(CH 頻率、速率變更) TX On / Tx Off 控制發射模式
3. 確認頻率及訊號正確
4. 功能無誤後開始測試

1.6 周邊列表

測試中使用的所有周邊、電纜（包括插入的卡）的描述如下					
No.	Product	Trademark	Model No.	Serial No.	Power Cord
1	Adapter	XIAOMI	AD16TW	N/A	N/A
2	USB type-A adapter	Master & Dynamic	MW07GO 2020	N/A	N/A
3	Charging case	Master & Dynamic	MW07GO 2020	N/A	N/A
A	USB Cable	Master & Dynamic	MW07GO 2020	N/A	Non-shielded, Non-Core, 1m
產品隨貨配件描述如下					
No.	Product	Trademark	Model No.	Serial No.	Power Cord
2	USB type-A adapter	Master & Dynamic	MW07GO 2020	N/A	N/A
3	Charging case	Master & Dynamic	MW07GO 2020	N/A	N/A
A	USB Cable	Master & Dynamic	MW07GO 2020	N/A	Non-shielded, Non-Core, 1m

本案經申請者切結器材不提供隨貨配件 Adapter，配件由實驗室提供併同檢驗。

1.7 試驗單位與測試環境

實驗室環境:

項目	實際測試條件
溫度 (°C)	20~25
濕度 (% RH)	45~55
大氣壓力 (mbar)	990~1020

財團法人全國認證基金會 認證

認證編號: 2965

機構名稱: 穩得實業股份有限公司

機構地址: 新北市新店區寶橋路 188 號 6 樓/ 6F-1 號

實驗室名稱: 穩得電磁相容及無線射頻實驗室

實驗室地址: 新北市五股區五工三路 119 號

1.8 測量不確定度

ISO / IEC 17025 要求在報告中，包含排放測試結果相關測量不確定度的估算值。

下面給出的測量不確定度基於 95% 信賴水準，覆蓋因子 $K = 2$ 。

Measurement Project	Condition	Expended Uncertainty
AC Conducted Emission	0.150 ~ 30 MHz	2.64 dB
Radiated Emission	0.009 ~ 30 MHz	± 4.2 dB
	30 ~ 1000 MHz	± 3.9 dB
	1000 ~ 18000 MHz	± 4.1 dB
	18000 ~ 40000 MHz	± 3.9 dB
RF Power, Conducted	Conducted Measuring	± 0.51 dB
Occupied Bandwidth	Conducted Measuring	± 2.4 %
Power Density	Conducted Measuring	± 1.7 dB
Duty Cycle and Dwell Time	Conducted Measuring	± 1.3 %
Conducted Unwanted Emission Strength	Conducted Measuring	± 1.8 dB
Frequency Stability	Conducted Measuring	± 0.063 ppm
DC Power Supply	--	± 3.2 %
Temperature	--	± 1.1 °C
Humidity	--	± 3.4 %

備註：本實驗室依據測試標準規定進行測試，在進行符合性分析時，不考慮量測不確定度的貢獻，依此判定規則出具測試報告。

1.9 測試設備清單

For AC Conduction measurements / W08-CE

	Equipment	Trademark	Model No.	Serial No.	Cal. Date	Due Date
✓	EMI Test Receiver	R&S	ESR3	102309	2020/5/21	2021/5/20
✓	2-Line V-Network LISN	R&S	ENV216	101185	2020/5/27	2021/5/26
✓	LISN	SCHWARZBECK	NSLK 8127RC	05028	2020/5/27	2021/5/26
✓	Transient Limiter	EM Electronics Corporation	EM-7600	857	2020/5/25	2021/5/24
✓	50ohm Cable	EMCI	EMCCFD300-BM-BM-5000	170612	2020/5/25	2021/5/24
✓	50 ohm terminal impedance	HUBER+SUHNER	50 ohm terminal impedance	CT-1-109-1	2020/5/26	2021/5/25

Remark:

1. All equipments are calibrated every one year.
2. The test instruments marked with “✓” are used to measure the final test results.
3. Test Software version: FARAD EZ-EMC Ver.EMC-CON 3A1

For Radiated measurements / W08-996-2

	Equipment	Trademark	Model No.	Serial No.	Cal. Date	Due Date
✓	Spectrum Analyzer	Keysight	N9010A	MY52220228	2020/4/21	2021/4/20
✓	EMI Receiver	Keysight	N9038A	MY51210173	2020/9/4	2021/9/3
✓	Loop Antenna	EMCI	LPA600	277	2020/9/2	2021/9/1
✓	TRILOG super broad Antenna	Schwarzbeck	VULB 9168	VULB 9168-700 & 1421	2020/4/28	2021/4/27
✓	Horn Antenna	Schwarzbeck	BBHA 9120D	01767	2020/5/5	2021/5/4
✓	Horn Antenna	Schwarzbeck	BBHA 9170	703	2020/12/3	2021/12/2
✓	Pre-Amplifier	EM	EMC330	060668	2020/9/4	2021/9/3
✓	Pre-Amplifier	EMEC	EM01G18G	060648	2020/9/4	2021/9/3
✓	Pre-Amplifier	JPT	JPA0118-55-303K	1910001800055003	2020/4/21	2021/4/20
✓	Pre-Amplifier	EMCI	EMC184045SE	980515	2020/9/4	2021/9/3
✓	Cable	EMEC	EM-CB400	105060103	2020/9/3	2021/9/2
✓	Cable	EMEC	EM-CB400	105060102	2020/9/3	2021/9/2
✓	Cable	EMEC	EM-CB400	105060101	2020/9/3	2021/9/2
✓	RF Cable	HUBER+SUHNER	SF102	MY2752/2	2020/9/3	2021/9/2
✓	RF Cable	MEV	280280.LL266.1200	A40100C	2020/4/21	2021/4/20
✓	RF Cable	HUBER+SUHNER	SF102	MY2751/2	2020/9/3	2021/9/2
✓	RF Cable	EMCI	EMC102-KM-KM-3000	170636	2020/9/3	2021/9/2
✓	RF Filter	EMEC	BRF-2400-2500	002	2020/9/3	2021/9/2
	RF Filter	EMEC	BRF-5150-5350	104	2020/9/3	2021/9/2
	RF Filter	EMEC	BRF-5470-5725	092	2020/9/3	2021/9/2
	RF Filter	EMEC	BRF-5725-5875	091	2020/9/3	2021/9/2
✓	RF Filter	EMEC	HPF-2800	002	2020/9/3	2021/9/2
	RF Filter	EMEC	HPF-5850	059	2020/9/3	2021/9/2
	SMA Notch Filter	MVE	MFN-902.928.S1	190604001	2020/9/3	2021/9/2
✓	Wireless Connectivity Tester	R&S	CMW270	101307	2020/5/19	2021/5/18

Remark:

1. All equipments are calibrated every one year.
2. The test instruments marked with “✓” are used to measure the final test results.
3. Test Software version: FARAD EZ-EMC Ver.WD-03A1-1

2 各測試項目測試結果

2.1 天線要求

2.1.1 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之第 3.2 節：

低功率射頻器材之發射機或收發信機所使用之天線，除本規範章節中另有規定外，應為全固定、半固定式或以獨特之耦合(unique coupling)方式連接機體。製造者可設計供使用者因損壞而替換之天線，但不得設計或使用原認證以外之天線或可供引接各類電纜之標準天線插座或電氣連接頭，如：BNC、F type、N type、M type、UG type、RCA、SMA、SMB...等及其他各類工業或通訊標準接頭。

2.1.2 天線樣式

No.	Manufacturer	Model No.	Antenna Type	Peak Gain
1	ASECL	SCLCT02M04	Chip Antenna	-0.31 dBi for 2.4 GHz

2.1.3 測試結果

符合低功率射頻器材技術規範之要求。

2.2 場強輻射

2.2.1 限制值

- 依據國家通訊傳播委員會低功率射頻器材技術規範之 4.10.2.2 節及 4.10.2.4 節，主波發射：發射電場強度應小於或等於下表限制值，除諧波外，指定頻帶外之發射應比主波低 50 dB 以上或依 3.6 之發射限制，兩者取其較鬆者。

主波頻率 (MHz)	主波電場強度 (mV/m)	諧波電場強度 (μV/m)
2400 ~ 2483.5	50	500
5725 ~ 5875	50	500
24000 ~ 24250	250	2500

備註：

- (1) 電場強度指距器材 3 公尺處所測量之值，且以平均值檢波器測量，同時須符合國家通訊傳播委員會低功率射頻器材技術規範之 6.15.2 之峰值規定。
 - (2) 電場強度 (dBμV/m) = 20 log 電場強度(μV/m)。
 - (3) 距離是指測量儀器天線與設備之間的距離。
- 依據 NCC 低功率射頻器材技術規範第 3.6 節之規定，除本規範各章節另有放寬規定者外，其電場強度不得超過下表之限值，且其不必要之發射皆不得大於主波發射強度。各頻段重疊處，以較嚴格之限制值為準。

頻率(f) (MHz)	電場強度 (微伏特/公尺, μV/m)	量測距離 (公尺)
0.009 ~ 0.490	2400 / f(kHz)	300
0.490 ~ 1.705	24000 / f(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

備註：

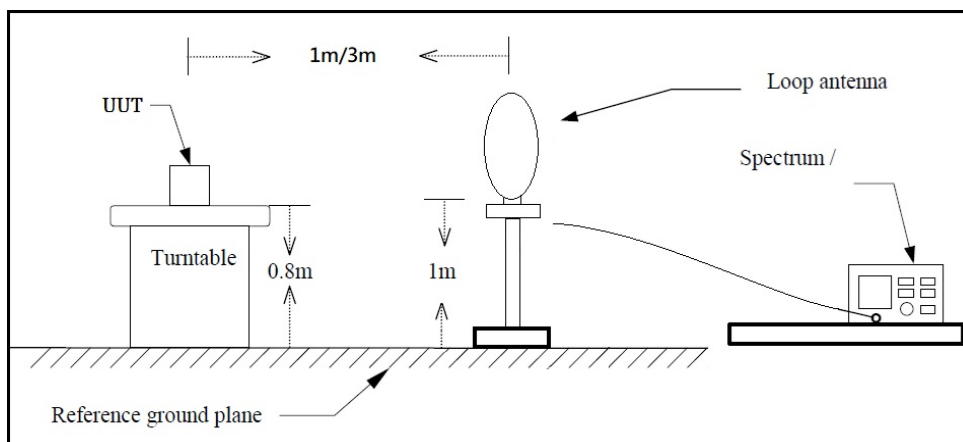
- (1) 電場強度 (dBμV/m) = 20 log 電場強度(μV/m)。
- (2) 距離是指測量儀器天線與設備之間的距離。
- (3) 上表規定之電場強度，發射頻率在 9 kHz~90 kHz、110 kHz~490 kHz 及 1000 MHz 以上者，其量測應以平均值檢波器為基準，且應符合 NCC 低功率射頻器材技術規範第 6.15.2 節之規定；其他發射頻率，應以國際無線電干擾特別委員會準峰值檢波器 (quasi-peak detector) 測量；非以上表所指定之距離測量時，應符合 NCC 低功率射頻器材技術規範第 6.5 節之規定，輻射發射之量測頻率範圍應符合 NCC 低功率射頻器材技術規範第 6.14 節之規定。

3. 依據 NCC 低功率射頻器材技術規範第 3.5 節之規定，任何低功率射頻器材之主波皆不得使用下表所列各頻段之頻率；低功率射頻器材落於下表所列頻段之混附發射，其電場強度必須符合 3.6 之限制規定。

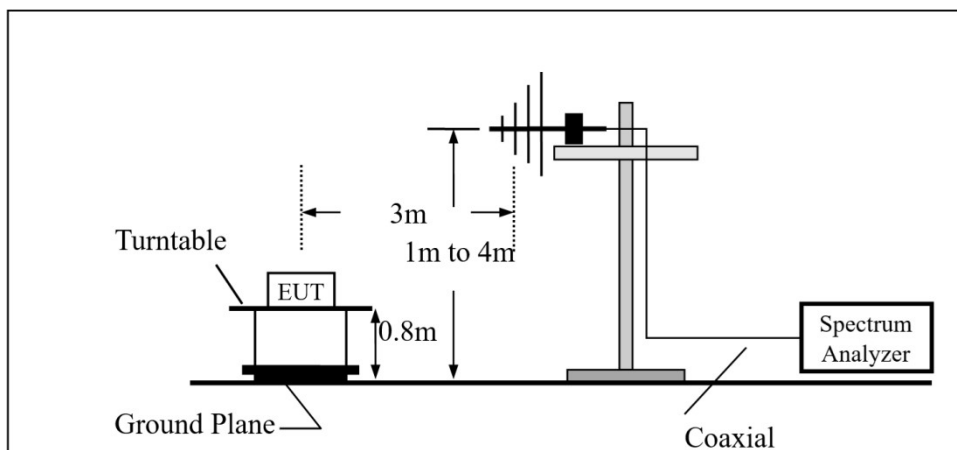
頻率 (MHz)	頻率 (MHz)	頻率 (MHz)	頻率 (MHz)
0.090~0.110	12.265~12.600	703.00~748.00	3500.0~4400.0
0.490~0.510	13.340~13.430	758.00~803.00	4500.0~5250.0
2.172~2.198	14.965~15.020	825.00~915.00	5350.0~5460.0
3.013~3.033	16.700~16.755	930.00~1240.0	7250.0~7750.0
4.115~4.198	19.965~20.020	1300.0~1427.0	8025.0~8500.0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

2.2.2 測試架構

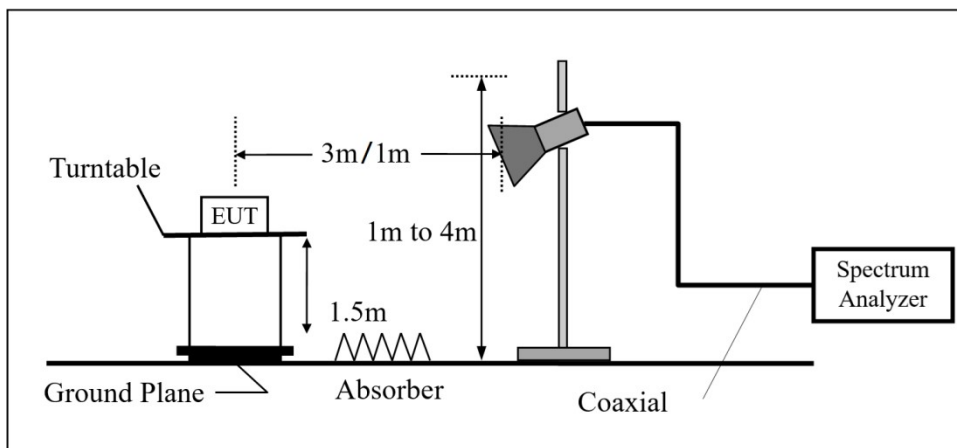
Below 30 MHz



30 MHz ~ 1 GHz



Above 1GHz



2.2.3 測試流程

低於 30MHz 的輻射發射

- (1) 將 EUT 放置在距離地面 0.8 米的非導體桌面的 3 米室內。將桌子旋轉 360 度以確定最高輻射的位置。
- (2) EUT 設置在離接收天線 3 米遠處，干擾接收天線安裝在可變高度天線塔的頂部。
- (3) 設置天線的平行、垂直方向以進行測量。
- (4) 將測試接收機系統設置為準峰值檢測功能和具有最大保持模式的指定帶寬。

30MHz 以上的輻射發射

- (1) 將 EUT 放置在距離地面 0.8 米（低於 1GHz）/1.5 米（高於 1GHz）的非導體桌面的 3 米室內。將桌子旋轉 360 度以確定最高輻射的位置。
- (2) EUT 設置在離接收天線 3 米處，天線的高度在離地面 1 米到 4 米之間變化，以確定場強的最大值。
- (3) 設置天線的平行、垂直方向以進行測量。
- (4) 當測試頻率低於 1GHz 時，測試接收機系統被設置為準峰值檢測功能和具有最大保持模式的指定帶寬。
- (5) 當測試頻率高於 1 GHz 時，測試接收機系統設置為峰值和平均檢測功能以及具有最大保持模式的指定帶寬。如果峰值讀數值也滿足平均限值，則不需要使用平均值檢測器進行測量。

2.2.4 場強輻射(主波) 測試結果

下表為輻射測量，在X、Y、Z三個軸向中預掃描。本報告中記錄了最差情況（X軸向）。

Test Frequency	
RF	BT
Tx	CH00 (2402 MHz)
	CH39 (2441 MHz)
	CH78 (2480 MHz)

Test Mode :	Mode 1 ; Transmit BT-BR(1Mbps)	Test Data :	110 年 01 月 07 日
Test Channel :	Channel 00 、 39 、 78	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2402.000	82.44	-6.75	75.69	114.00	-38.31	peak
2	2441.000	83.71	-6.76	76.95	114.00	-37.05	peak
3	2480.000	80.39	-6.75	73.64	114.00	-40.36	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 ; Transmit BT-BR(1Mbps)	Test Data :	110 年 01 月 07 日
Test Channel :	Channel 00 、 39 、 78	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2402.000	82.21	-6.75	75.46	114.00	-38.54	peak
2	2441.000	83.48	-6.76	76.72	114.00	-37.28	peak
3	2480.000	80.14	-6.75	73.39	114.00	-40.61	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 ; Transmit BT-EDR(3Mbps)	Test Data :	110 年 01 月 07 日
Test Channel :	Channel 00 、 39 、 78	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2402.000	85.80	-6.75	79.05	114.00	-34.95	peak
2	2441.000	87.94	-6.76	81.18	114.00	-32.82	peak
3	2480.000	85.81	-6.75	79.06	114.00	-34.94	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 ; Transmit BT-EDR(3Mbps)	Test Data :	110 年 01 月 07 日
Test Channel :	Channel 00 、 39 、 78	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2402.000	84.42	-6.75	77.67	114.00	-36.33	peak
2	2441.000	86.29	-6.76	79.53	114.00	-34.47	peak
3	2480.000	85.34	-6.75	78.59	114.00	-35.41	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

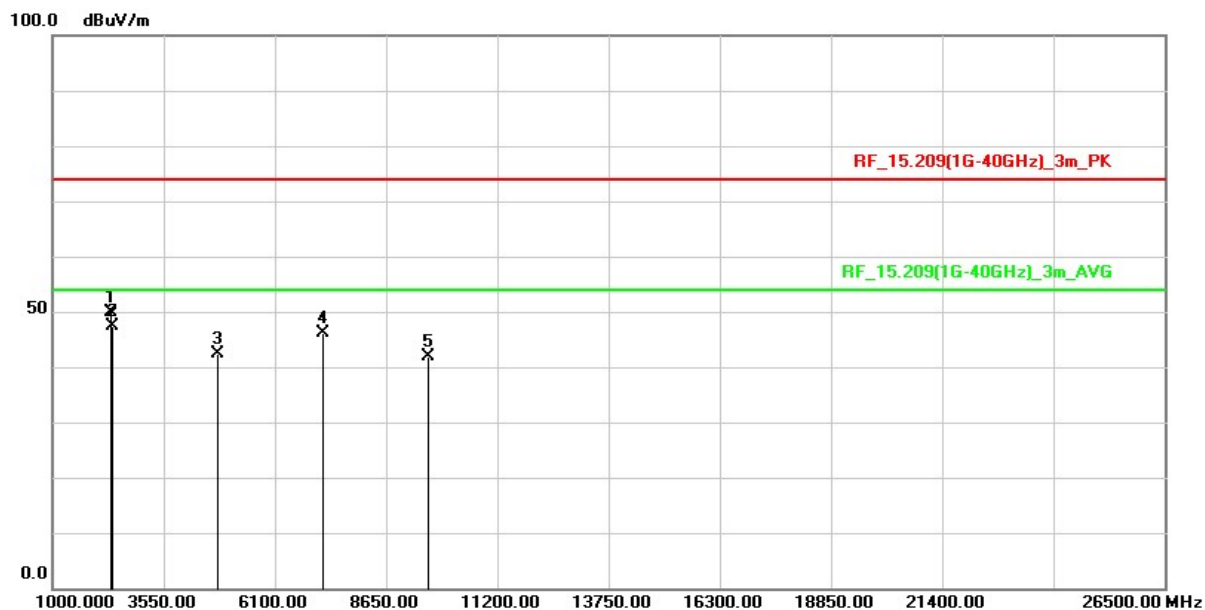
2.2.5 場強輻射(不必要之發射、輻射頻帶邊緣)測試結果

- (1) 輻射量測頻率 9kHz ~ 30MHz，此頻率範圍之干擾值低於限制值 20dB 以下，被考量為背景雜訊值並不予紀錄。
- (2) 下表為輻射測量頻率 30MHz ~ 26.5GHz，在 X、Y、Z 三個軸向中預掃描。本報告中記錄了最壞情況（X 軸向）。

Test Frequency	
RF	BT
Tx	CH00 (2402 MHz)
	CH39 (2441 MHz)
	CH78 (2480 MHz)
Rx	CH39 (2441 MHz)

Above 1GHz Data

Test Mode :	Mode 1 ; Transmit BT-BR(1Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH00 (2402 MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %

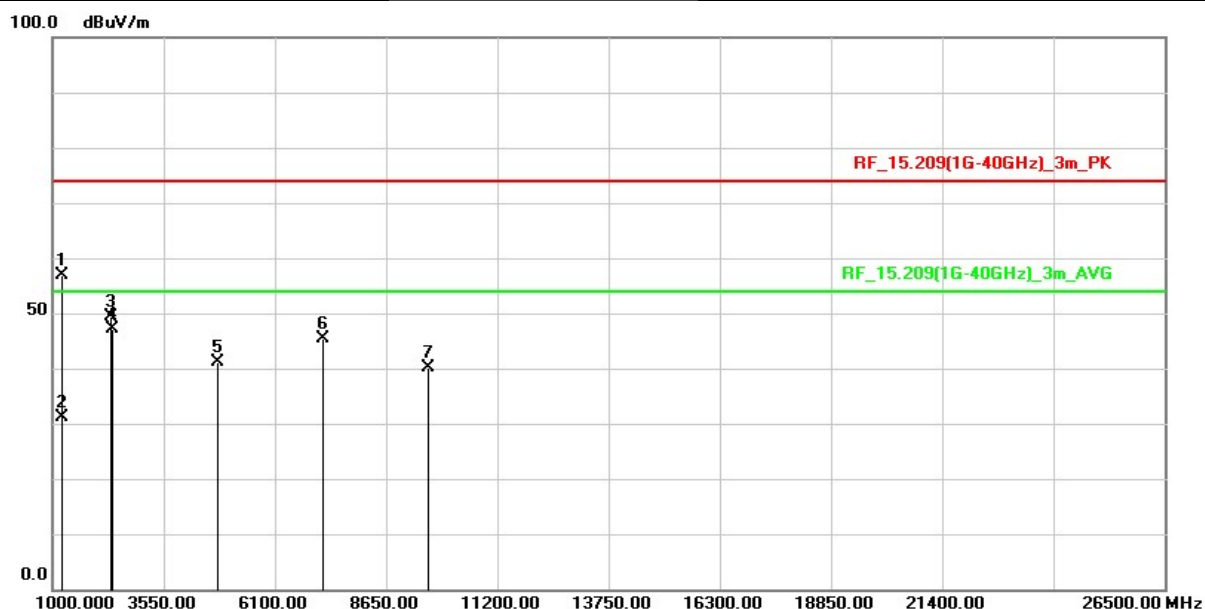


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2342.120	53.48	-3.52	49.96	74.00	-24.04	peak
2	2390.000	51.04	-3.78	47.26	74.00	-26.74	peak
3	4804.000	62.70	-20.24	42.46	74.00	-31.54	peak
4	7206.000	60.77	-14.66	46.11	74.00	-27.89	peak
5	9608.000	52.26	-10.50	41.76	74.00	-32.24	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 ; Transmit BT-BR(1Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH00 (2402 MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %

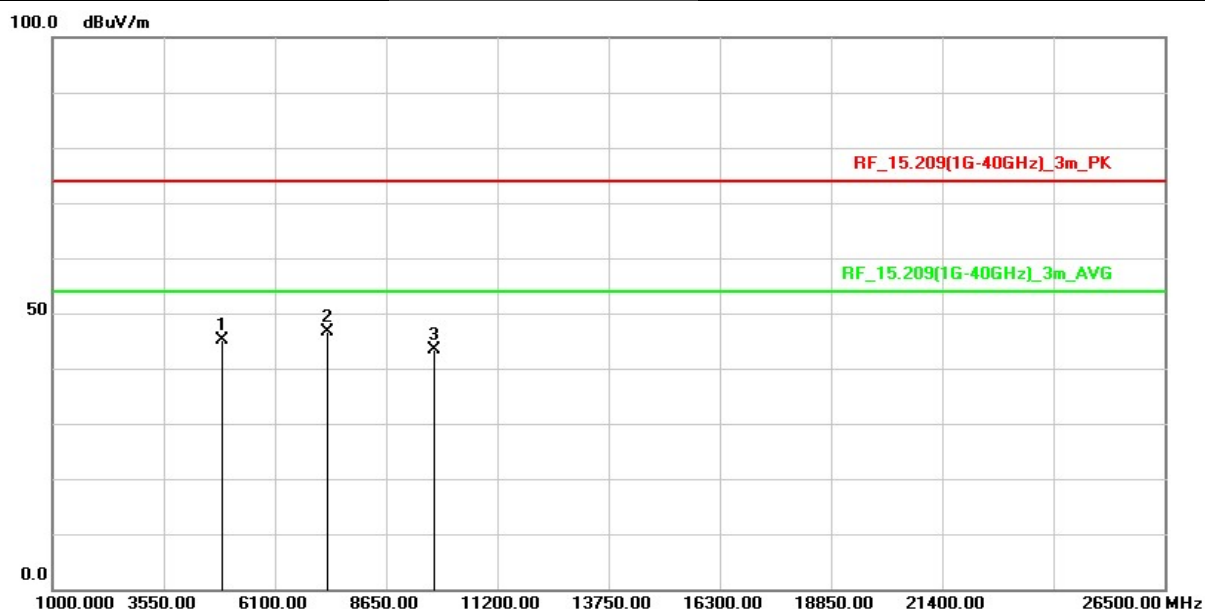


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1200.000	87.89	-31.09	56.80	74.00	-17.20	peak
2	1200.000	62.31	-31.09	31.22	54.00	-22.78	AVG
3	2320.230	52.67	-3.40	49.27	74.00	-24.73	peak
4	2390.000	50.89	-3.78	47.11	74.00	-26.89	peak
5	4804.000	61.32	-20.24	41.08	74.00	-32.92	peak
6	7206.000	59.98	-14.66	45.32	74.00	-28.68	peak
7	9608.000	50.70	-10.50	40.20	74.00	-33.80	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 ; Transmit BT-BR(1Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH39 (2441 MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %

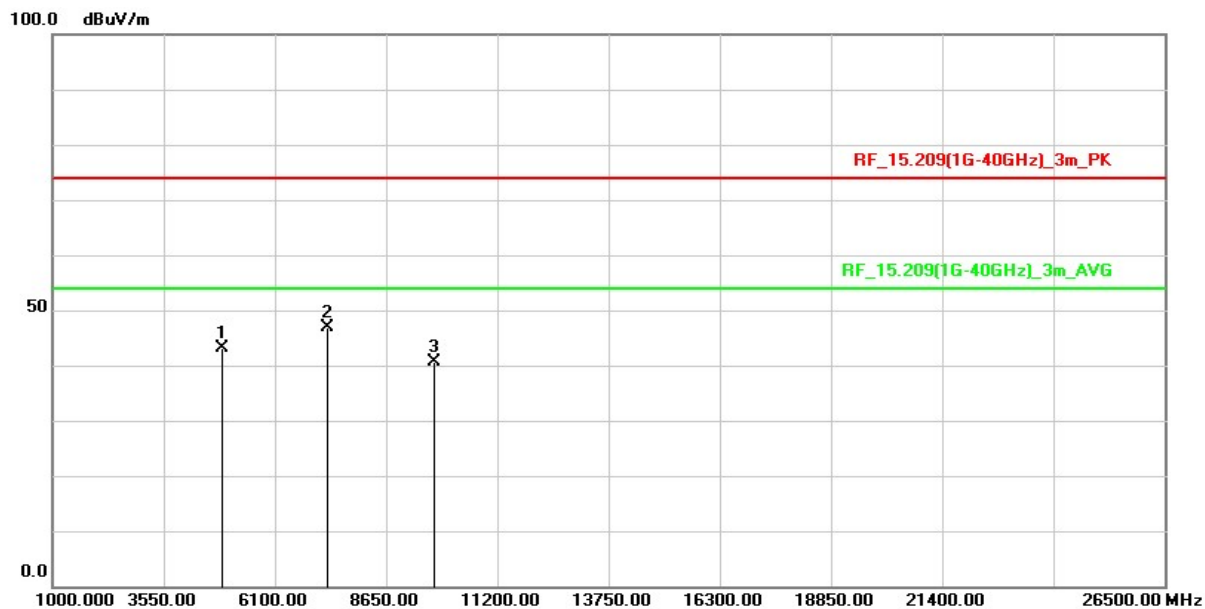


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882.000	65.33	-20.28	45.05	74.00	-28.95	peak
2	7323.000	60.69	-14.10	46.59	74.00	-27.41	peak
3	9764.000	53.53	-10.25	43.28	74.00	-30.72	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 ; Transmit BT-BR(1Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH39 (2441 MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %

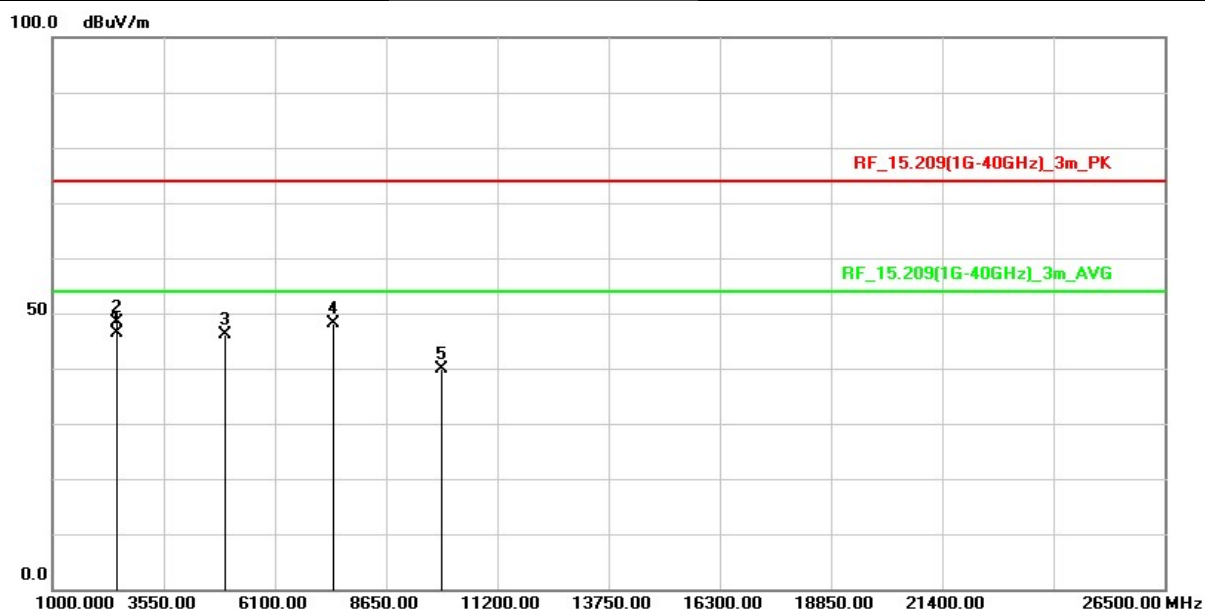


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882.000	63.41	-20.28	43.13	74.00	-30.87	peak
2	7323.000	60.87	-14.10	46.77	74.00	-27.23	peak
3	9764.000	50.98	-10.25	40.73	74.00	-33.27	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 ; Transmit BT-BR(1Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH78 (2480 MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %

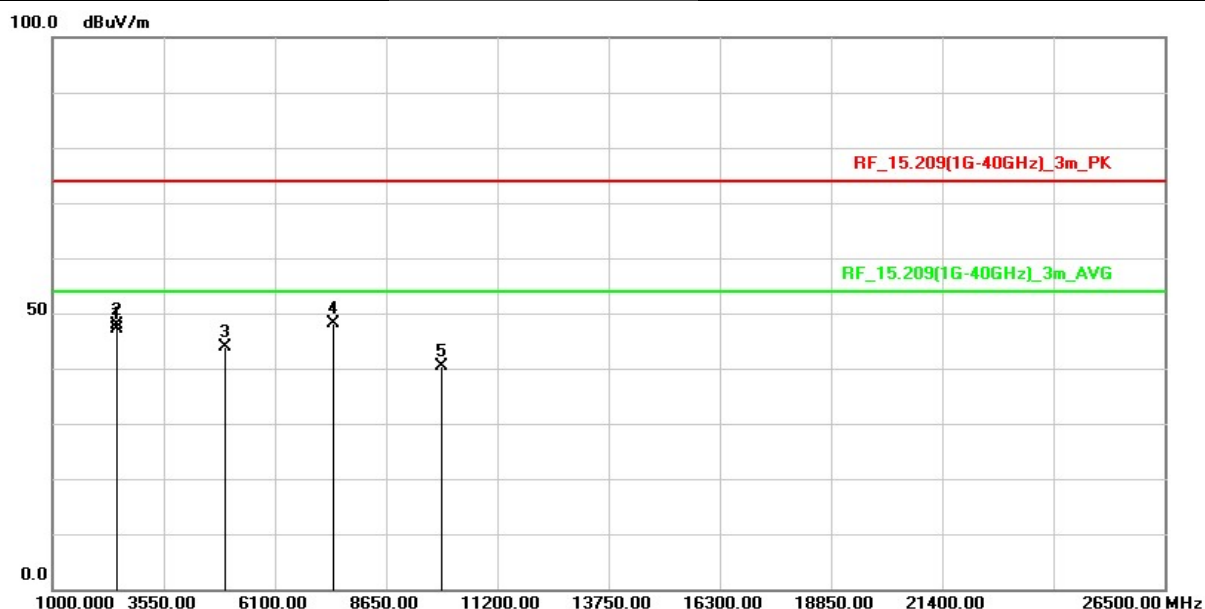


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	50.64	-4.14	46.50	74.00	-27.50	peak
2	2491.450	52.45	-4.16	48.29	74.00	-25.71	peak
3	4960.000	66.47	-20.27	46.20	74.00	-27.80	peak
4	7440.000	62.04	-13.95	48.09	74.00	-25.91	peak
5	9920.000	50.30	-10.32	39.98	74.00	-34.02	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 ; Transmit BT-BR(1Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH78 (2480 MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %

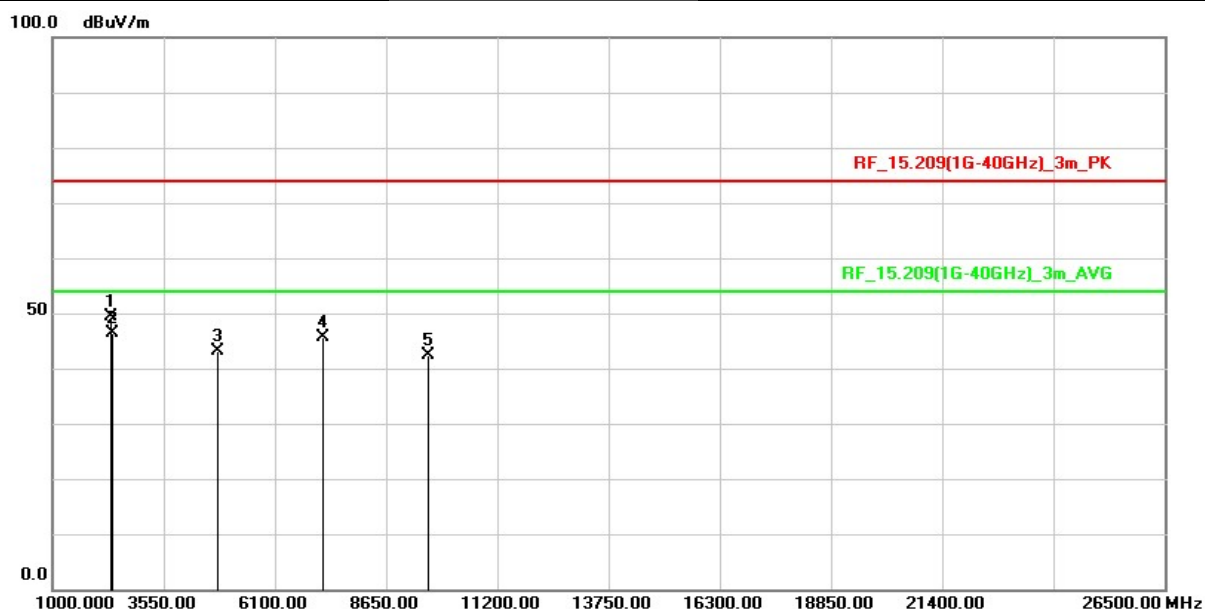


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	51.21	-4.14	47.07	74.00	-26.93	peak
2	2495.575	52.06	-4.17	47.89	74.00	-26.11	peak
3	4960.000	64.10	-20.27	43.83	74.00	-30.17	peak
4	7440.000	62.18	-13.95	48.23	74.00	-25.77	peak
5	9920.000	50.74	-10.32	40.42	74.00	-33.58	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 ; Transmit BT-EDR(3Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH00 (2402 MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %

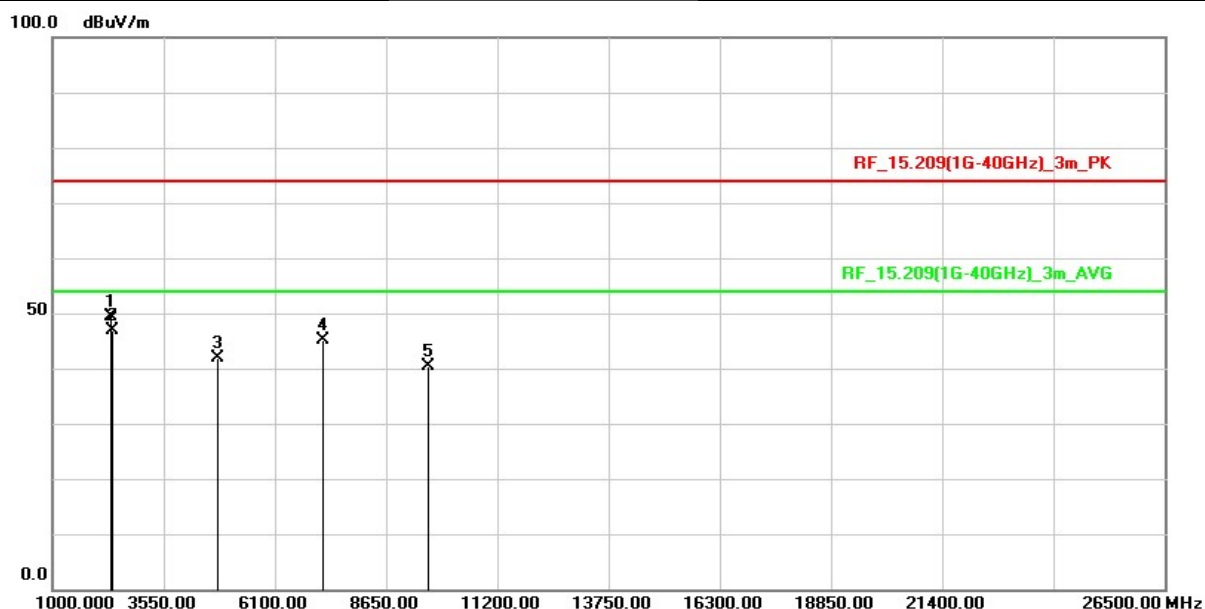


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2348.940	52.83	-3.57	49.26	74.00	-24.74	peak
2	2390.000	50.27	-3.78	46.49	74.00	-27.51	peak
3	4804.000	63.33	-20.24	43.09	74.00	-30.91	peak
4	7206.000	60.19	-14.66	45.53	74.00	-28.47	peak
5	9608.000	52.94	-10.50	42.44	74.00	-31.56	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 ; Transmit BT-EDR(3Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH00 (2402 MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %

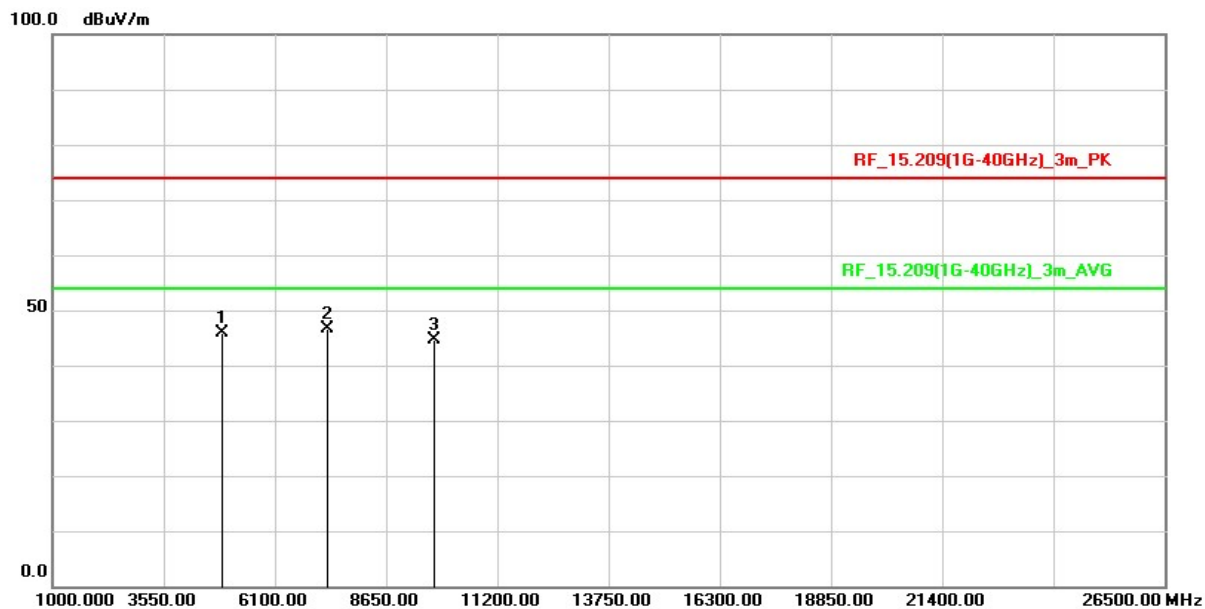


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2334.970	52.86	-3.49	49.37	74.00	-24.63	peak
2	2390.000	50.57	-3.78	46.79	74.00	-27.21	peak
3	4804.000	62.03	-20.24	41.79	74.00	-32.21	peak
4	7206.000	59.87	-14.66	45.21	74.00	-28.79	peak
5	9608.000	50.82	-10.50	40.32	74.00	-33.68	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 ; Transmit BT-EDR(3Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH39 (2441 MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %

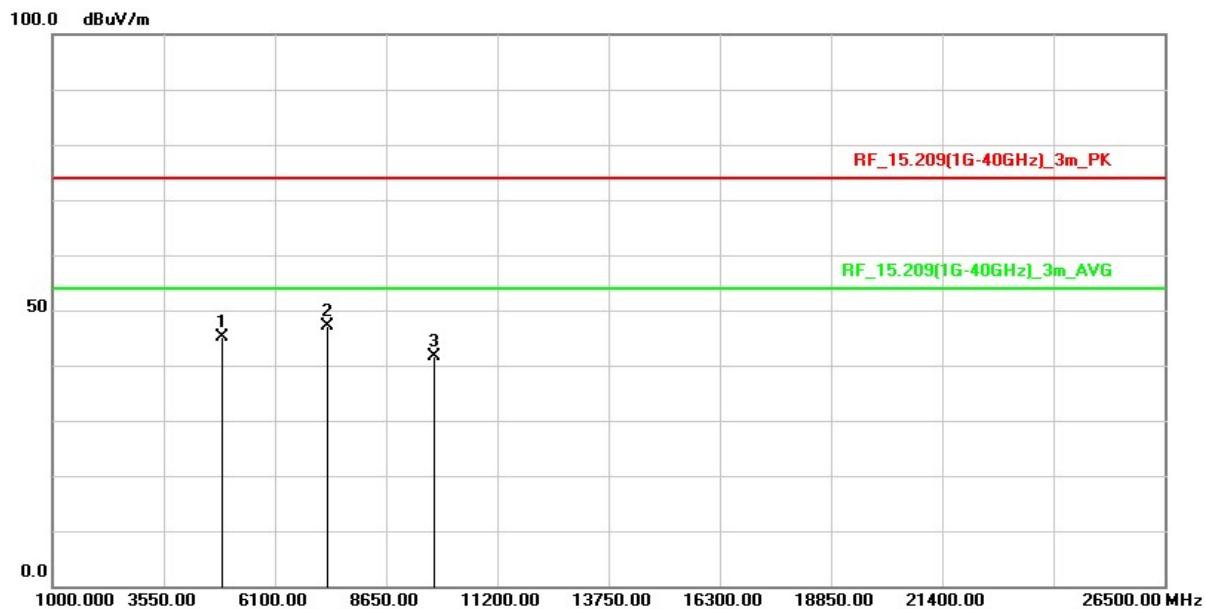


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882.000	66.10	-20.28	45.82	74.00	-28.18	peak
2	7323.000	60.62	-14.10	46.52	74.00	-27.48	peak
3	9764.000	54.85	-10.25	44.60	74.00	-29.40	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 ; Transmit BT-EDR(3Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH39 (2441 MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %

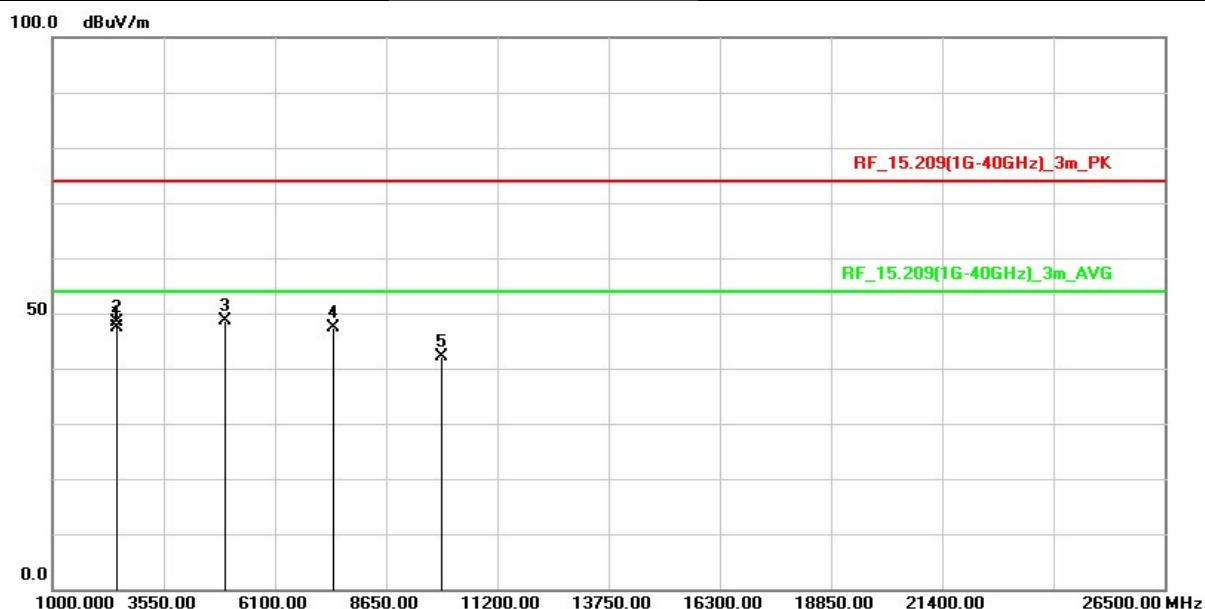


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882.000	65.40	-20.28	45.12	74.00	-28.88	peak
2	7323.000	61.30	-14.10	47.20	74.00	-26.80	peak
3	9764.000	51.79	-10.25	41.54	74.00	-32.46	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 ; Transmit BT-EDR(3Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH78 (2480 MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %

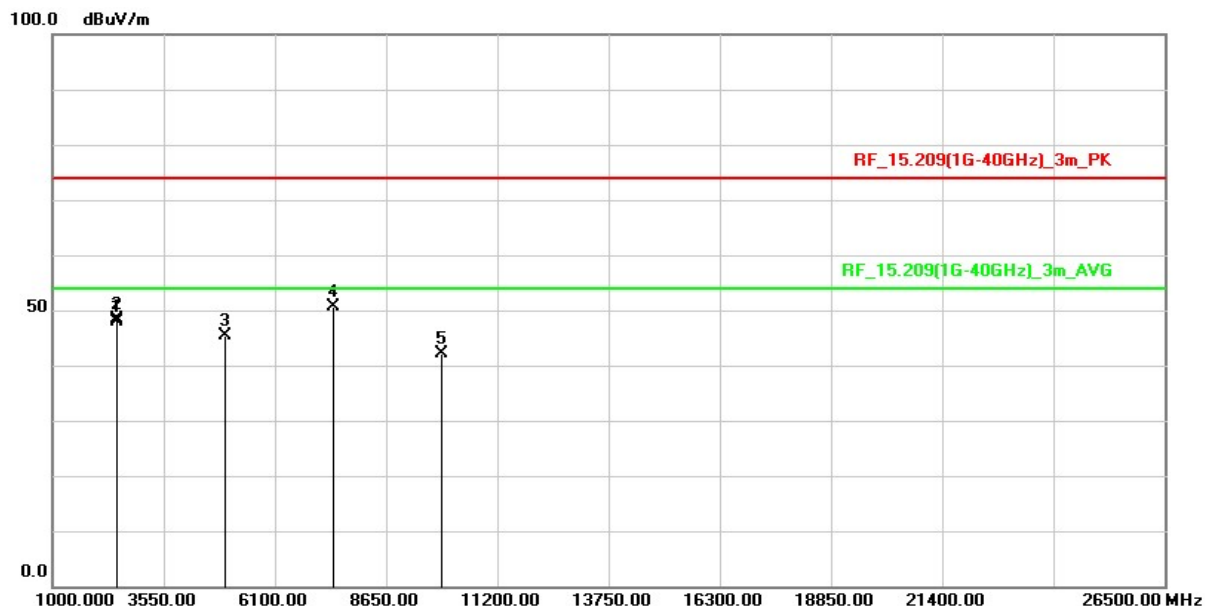


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	51.62	-4.14	47.48	74.00	-26.52	peak
2	2487.000	52.41	-4.14	48.27	74.00	-25.73	peak
3	4960.000	68.92	-20.27	48.65	74.00	-25.35	peak
4	7440.000	61.21	-13.95	47.26	74.00	-26.74	peak
5	9920.000	52.48	-10.32	42.16	74.00	-31.84	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 ; Transmit BT-EDR(3Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH78 (2480 MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %

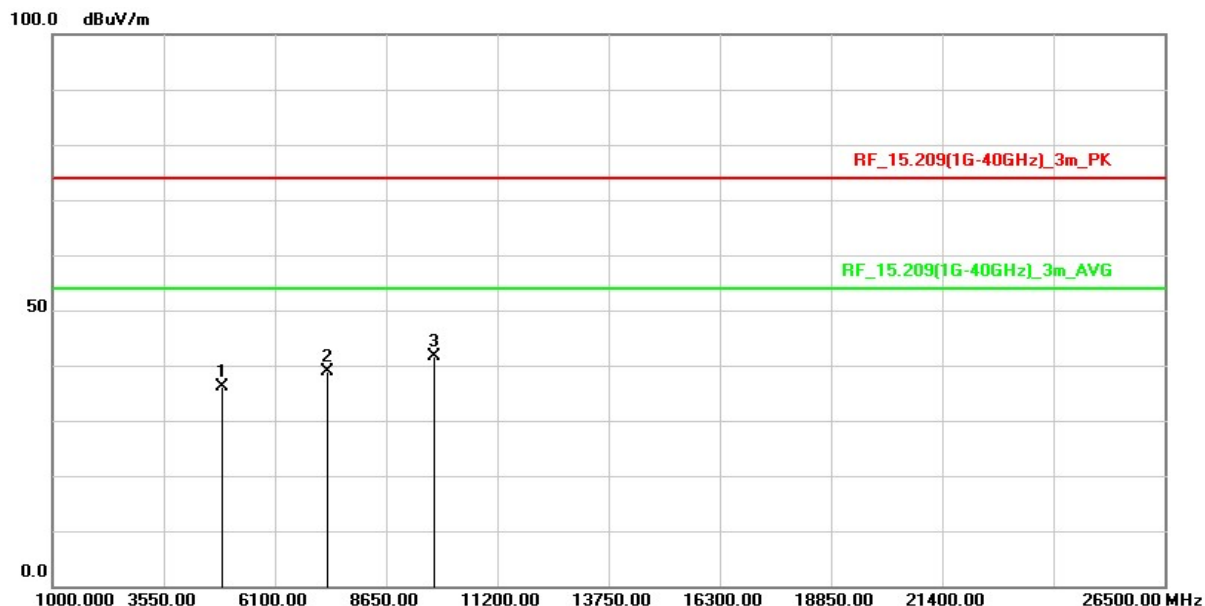


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	52.07	-4.14	47.93	74.00	-26.07	peak
2	2491.800	52.54	-4.16	48.38	74.00	-25.62	peak
3	4960.000	65.77	-20.27	45.50	74.00	-28.50	peak
4	7440.000	64.56	-13.95	50.61	74.00	-23.39	peak
5	9920.000	52.42	-10.32	42.10	74.00	-31.90	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 4 ; Receiver BT-BR(1Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH39 (2441 MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %

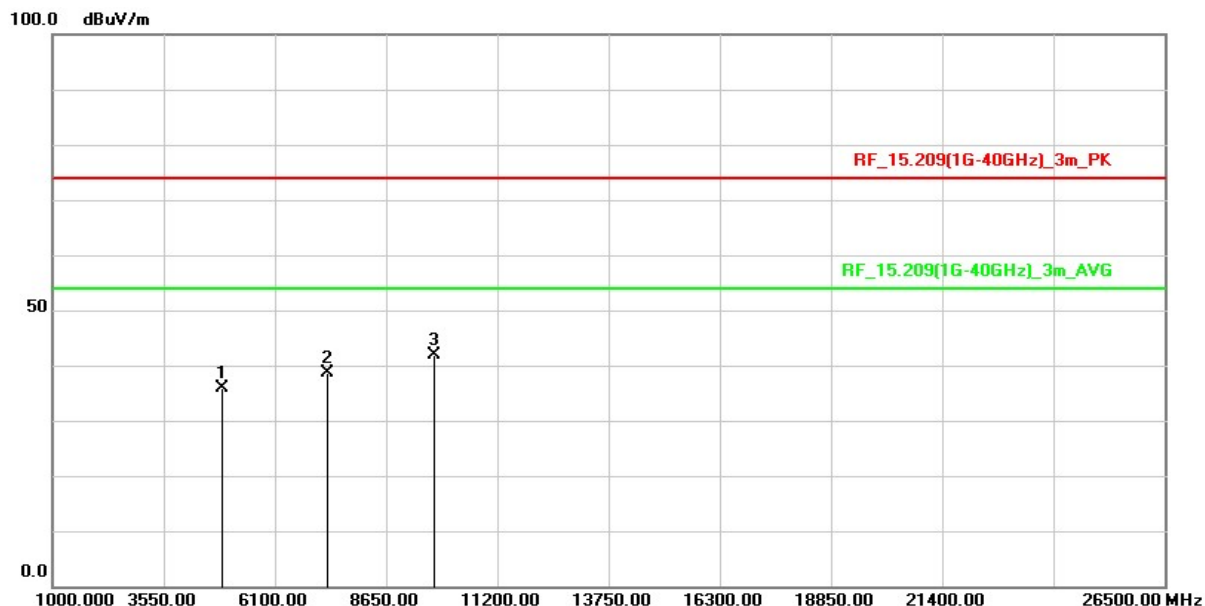


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882.000	56.50	-20.28	36.22	74.00	-37.78	peak
2	7323.000	53.02	-14.10	38.92	74.00	-35.08	peak
3	9764.000	51.88	-10.25	41.63	74.00	-32.37	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 4 ; Receiver BT-BR(1Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH39 (2441 MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882.000	56.20	-20.28	35.92	74.00	-38.08	peak
2	7323.000	52.63	-14.10	38.53	74.00	-35.47	peak
3	9764.000	52.13	-10.25	41.88	74.00	-32.12	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Below 1GHz Data

Test Mode :	Mode 1 ; Transmit BT-BR(1Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH39 (2441 MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %

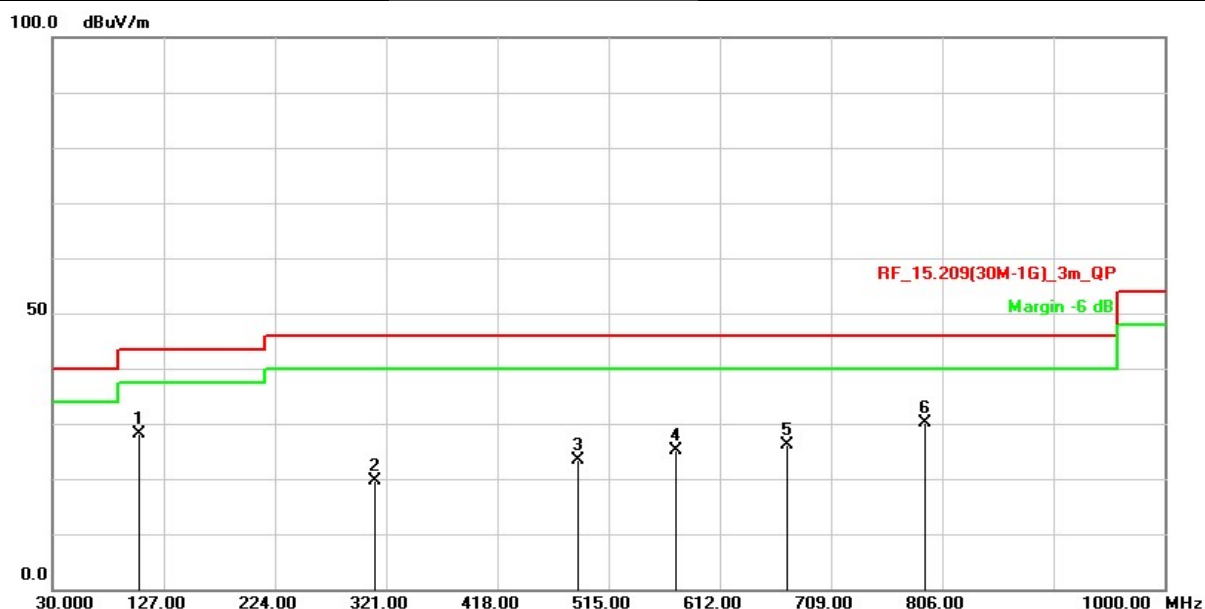


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	149.3100	29.32	-11.06	18.26	43.50	-25.24	QP
2	243.4000	29.57	-12.27	17.30	46.00	-28.70	QP
3	396.6600	28.38	-7.72	20.66	46.00	-25.34	QP
4	480.0800	28.19	-5.88	22.31	46.00	-23.69	QP
5	606.1800	29.23	-2.90	26.33	46.00	-19.67	QP
6	797.2700	28.81	-0.12	28.69	46.00	-17.31	QP

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 ; Transmit BT-BR(1Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH39 (2441 MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %

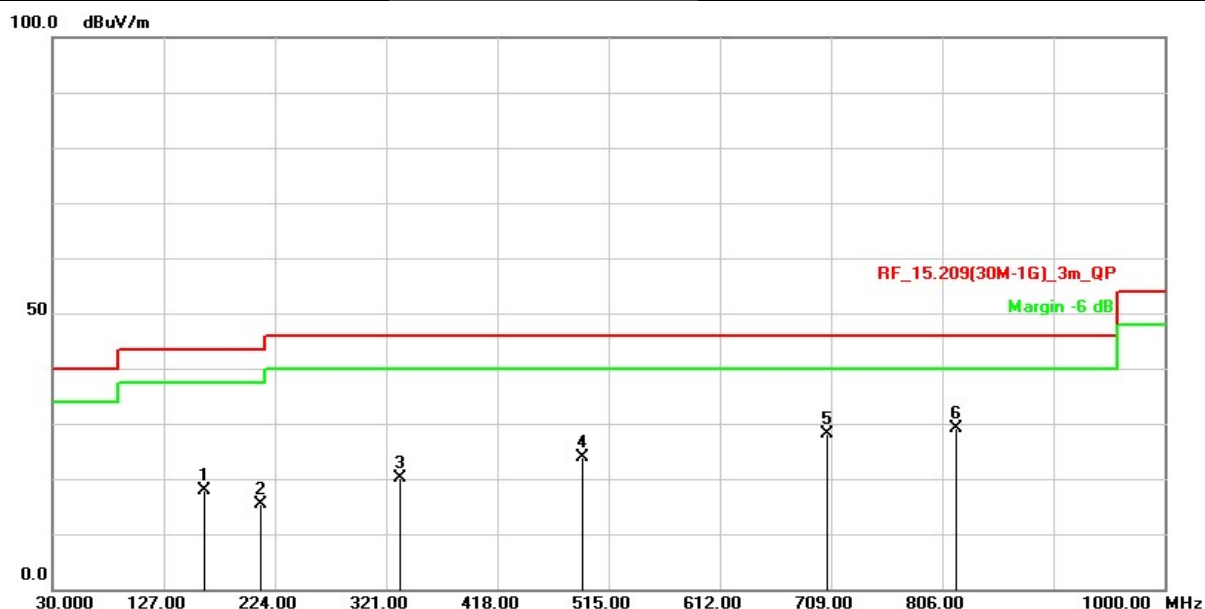


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	105.6600	42.95	-14.79	28.16	43.50	-15.34	QP
2	311.3000	29.77	-10.12	19.65	46.00	-26.35	QP
3	488.8100	29.20	-5.75	23.45	46.00	-22.55	QP
4	573.2000	28.97	-3.84	25.13	46.00	-20.87	QP
5	671.1700	28.69	-2.45	26.24	46.00	-19.76	QP
6	791.4500	30.25	-0.09	30.16	46.00	-15.84	QP

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 4 ; Receiver BT-BR(1Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH39 (2441 MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	162.8900	28.90	-10.93	17.97	43.50	-25.53	QP
2	211.3900	29.01	-13.64	15.37	43.50	-28.13	QP
3	332.6400	29.40	-9.38	20.02	46.00	-25.98	QP
4	491.7200	29.46	-5.70	23.76	46.00	-22.24	QP
5	706.0900	29.90	-1.76	28.14	46.00	-17.86	QP
6	818.6100	28.96	0.19	29.15	46.00	-16.85	QP

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 4 ; Receiver BT-BR(1Mbps)	Test Data :	110 年 01 月 07 日
Test Channel	CH39 (2441 MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	105.6600	41.23	-14.79	26.44	43.50	-17.06	QP
2	428.6700	29.78	-6.86	22.92	46.00	-23.08	QP
3	603.2700	29.70	-2.98	26.72	46.00	-19.28	QP
4	764.2900	29.36	-0.51	28.85	46.00	-17.15	QP
5	855.4700	28.59	0.59	29.18	46.00	-16.82	QP
6	964.1100	28.36	2.32	30.68	53.90	-23.22	QP

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

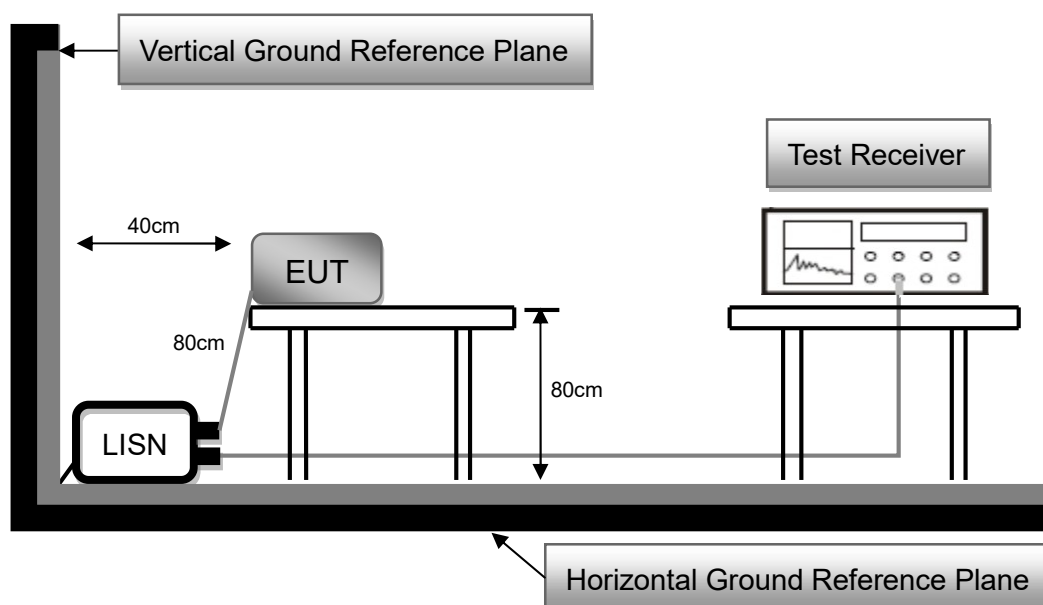
2.3 電源線傳導干擾

2.3.1 限制值

Frequency (MHz)	NCC LP0002 3.3 Limit	
	Quasi-peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.50 to 5.0	56	46
5.0 to 30.0	60	50

*隨頻率之對數遞減

2.3.2 測試架構

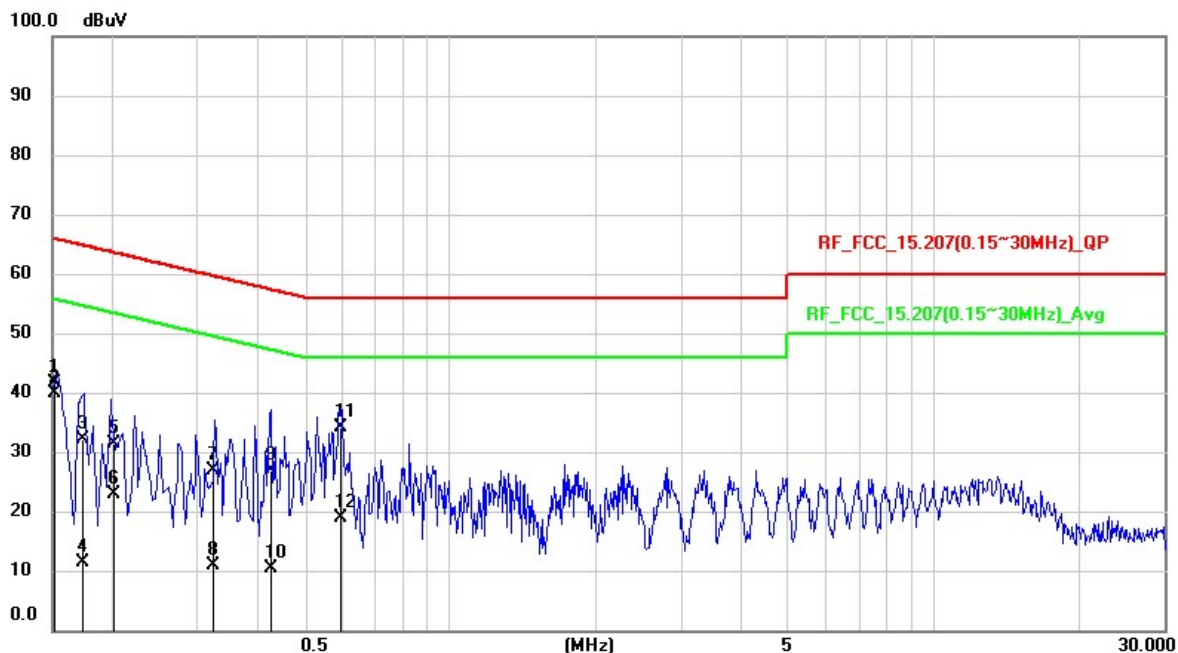


2.3.3 測試流程

1. 待測物從水平地平面放置 0.8 米高的木桌，待測物通過線路阻抗穩定網絡（LISN）連接到電源。 LISN 距離最近的待測物底盤至少 80 厘米。
2. 線路阻抗穩定網絡（LISN）為測量儀器提供 50 歐姆/ 50uH 的耦合阻抗。其他設備均由額外的 LISN 提供動力。
3. 懸掛在離地平面 40 厘米以內的相互關聯的電纜應在中心前後折疊形成一束。所有未連接到外圍設備的 I / O 電纜應在中心捆綁。如果需要，可以使用正確的終端阻抗終止電纜的末端。總長度不得超過 1 米。
4. EMI 測試接收器連接到 LISN 為待測物供電。實際測試配置請參考待測物測試照片。
5. 接收器在 150kHz 至 30MHz 範圍內掃描每種測試模式的發射。掃描兩條電源線，Line 和 Neutral，記錄至少六個最高排放。
6. 記錄上述最高排放水平的待測物和電纜配置。記錄了最差情況的測試數據。

2.3.4 測試結果

Test Voltage :	110Vac, 60Hz	Frequency Range:	0.15-30 MHz
Test Mode :	Mode 5 ; Charging Link	6dB Bandwidth :	9 kHz
Test Data :	109年12月30日	Phase :	L
Temperature :	25°C	Humidity :	65 %

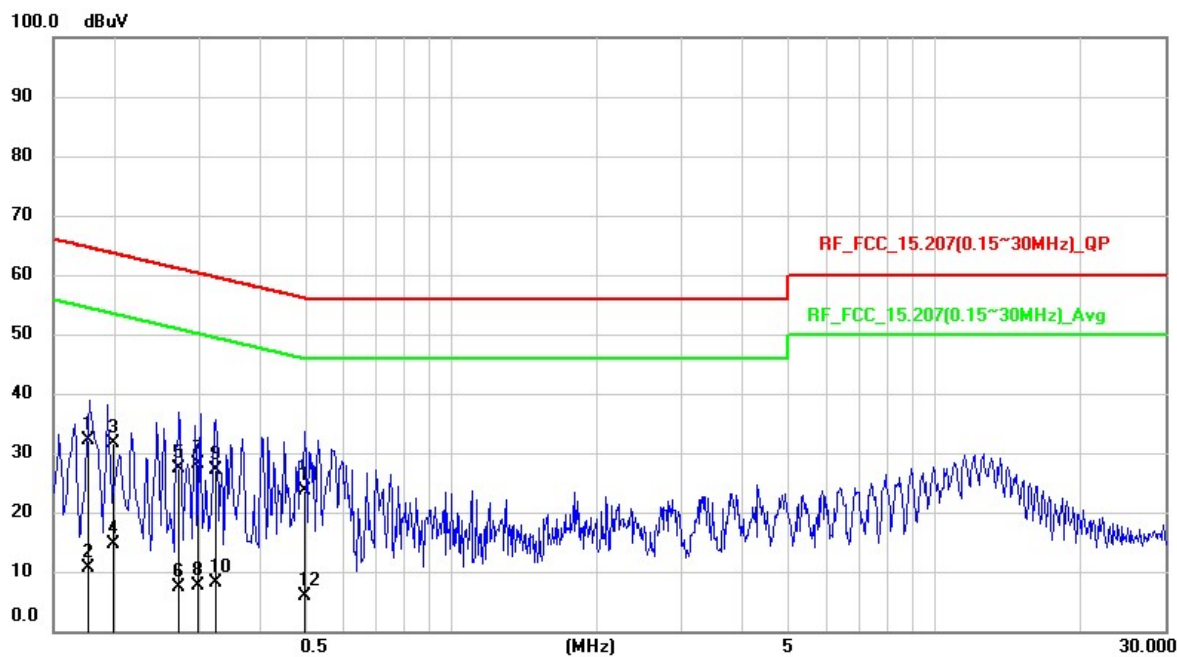


No.	Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1514	31.93	9.77	41.7	65.92	-24.22	QP
2	0.1514	30.2	9.77	39.97	55.92	-15.95	AVG
3	0.1725	22.24	9.77	32.01	64.84	-32.83	QP
4	0.1725	1.64	9.77	11.41	54.84	-43.43	AVG
5	0.2008	21.51	9.77	31.28	63.58	-32.3	QP
6	0.2008	13.19	9.77	22.96	53.58	-30.62	AVG
7	0.3234	17.14	9.77	26.91	59.62	-32.71	QP
8	0.3234	1.01	9.77	10.78	49.62	-38.84	AVG
9	0.4249	17.18	9.77	26.95	57.35	-30.4	QP
10	0.4249	0.71	9.77	10.48	47.35	-36.87	AVG
11	0.5932	24.4	9.77	34.17	56	-21.83	QP
12	0.5932	9.04	9.77	18.81	46	-27.19	AVG

Remark:

1. QP = Quasi Peak, AVG = Average
2. Correction Factor = Insertion loss of LISN + Cable loss
3. Measurement Value = Reading Level + Correct Factor
4. Margin Level = Measurement Value – Limit Value

Test Voltage :	110Vac, 60Hz	Frequency Range:	0.15-30 MHz
Test Mode :	Mode 5 ; Charging Link	6dB Bandwidth :	9 kHz
Test Data :	109年12月30日	Phase :	N
Temperature :	25°C	Humidity :	65 %



No.	Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1764	22.42	9.77	32.19	64.65	-32.46	QP
2	0.1764	0.9	9.77	10.67	54.65	-43.98	AVG
3	0.1986	21.81	9.77	31.58	63.67	-32.09	QP
4	0.1986	4.8	9.77	14.57	53.67	-39.1	AVG
5	0.273	17.59	9.77	27.36	61.03	-33.67	QP
6	0.273	-2.29	9.77	7.48	51.03	-43.55	AVG
7	0.2983	18.29	9.77	28.06	60.29	-32.23	QP
8	0.2983	-2.07	9.77	7.7	50.29	-42.59	AVG
9	0.3235	17.47	9.77	27.24	59.62	-32.38	QP
10	0.3235	-1.55	9.77	8.22	49.62	-41.4	AVG
11	0.4984	13.85	9.77	23.62	56.03	-32.41	QP
12	0.4984	-3.83	9.77	5.94	46.03	-40.09	AVG

Remark:

1. QP = Quasi Peak, AVG = Average
2. Correction Factor = Insertion loss of LISN + Cable loss
3. Measurement Value = Reading Level + Correct Factor
4. Margin Level = Measurement Value – Limit Value

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