

低功率射頻器材技術規範測試報告

報告編號	RTBAYS-WTW-P20110319-2
申請者	捷佳科技股份有限公司
產品名稱	11ac 2T2R WIFI & BT Module
型號	WMU6202, WMU6206
系列型號	WMU6203, WMU6204, WMU6205, WMU6207
製造廠商	捷佳科技股份有限公司
商標或廠牌	jjPlus
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 109 年 7 月 1 日訂定
試驗結果	合格

香港商立德國際商品試驗有限公司桃園分公司林口實驗室

日期 109 年 12 月 03 日

報告簽署人簽章:

陳志偉



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報告發行紀錄

Issue No.	Description	Date Issued
RTBAYS-WTW-P20110319-2	Original release	109 年 12 月 03 日

證 明 書

發行日期：109 年 12 月 03 日

產 品 名 稱：11ac 2T2R WIFI & BT Module
商 標：jjPlus
型 號：WMU6202, WMU6206
系 列 型 號：WMU6203, WMU6204, WMU6205, WMU6207
申 請 者：捷佳科技股份有限公司
量 測 規 範：低功率射頻器材技術規範 LP0002 (訂定日期：109 年 7 月 1 日)
ANSI C63.10-2013

香港商立德國際商品試驗有限公司桃園分公司在此證明上述待測設備樣品一組(型號：WMU6202, WMU6206)，收件日期 107 年 11 月 27 日，於 108 年 01 月 14 日至 109 年 11 月 26 日，已在本公司的標準測試場地完成量測。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。

立德桃園分公司依“低功率射頻器材技術規範”及“電信管制射頻器材審驗管理辦法”製作測試結果報告。

特 此 證 明 ！

報告製作者：

簡佳琪

簡佳琪 / 專員

， 日 期：

109 年 12 月 03 日

審 核 者：

陳志偉

陳志偉 / 高級專案工程師

， 日 期：

109 年 12 月 03 日

香港商立德國際商品試驗有限公司桃園分公司

實驗室地址：新北市林口區嘉寶里 14 鄰 47-2 號

此份報告不得摘錄複製，除全份複製外，需經實驗室書面同意。



1 低功率射頻器材量測記錄表

申請廠商：捷佳科技股份有限公司

製造廠商：捷佳科技股份有限公司

申請廠商地址：新北市中和區建八路 2 號 15 樓之 7

廠牌：jjPlus

產品名稱：11ac 2T2R WIFI & BT Module

型號：WMU6202, WMU6206

系列型號：WMU6203, WMU6204, WMU6205, WMU6207

量測單位名稱：香港商立德國際商品試驗有限公司桃園分公司

林口實驗室華亞檢測部

量測單位地址：桃園市龜山區文化里華亞二路 19 號

量測單位認可編號：TAF 2021 (9kHz~40GHz)

量測規範：低功率射頻器材技術規範 LP0002 (訂定日期：109 年 7 月 1 日)

ANSI C63.10-2013

Bluetooth LE 頻段概要

項次	量測項目	規 範	量測結果判定
1	帶外發射	低功率射頻器材技術規範 4.10.1.5 節	合格
2	電源線傳導干擾	低功率射頻器材技術規範 3.3 節	合格
3	6 dB 頻寬	低功率射頻器材技術規範 4.10.1.6 節	合格
4	峰值傳導輸出功率	低功率射頻器材技術規範 4.10.1.2 節	合格
5	功率頻譜密度	低功率射頻器材技術規範 4.10.1.6 節	合格

備註：量測結果之判定不考慮量測不確定度的貢獻。

2 一般敘述

2.1 待測設備

產品名稱：	11ac 2T2R WIFI & BT Module
型號：	WMU6202, WMU6206
系列型號：	WMU6203, WMU6204, WMU6205, WMU6207
額定電源：	Model: 6202, 6203: 3.3Vdc (power from host equipment) Model: 6204, 6205, 6206, 6207: 5Vdc (power from host equipment)
調變方式：	GFSK
傳輸速率：	1Mbps
載波頻率：	2402 ~ 2480MHz
頻道數：	40
發射功率：	4.20dBm
天線種類：	見註 2
電源線類別：	NA
信號線類別：	NA
配件：	NA

註1： 所有型號與型號差異詳列如下。

Test Mode	Model	RF Chip	RF Design	Interface	Antenna type	Antenna connector
v	WMU6202	RTL8822BU	The Same	mPCIe	Dipole	U.FLx2
	WMU6203			M.2		MHF4
	WMU6204			USB Type-A		U.FLx2
	WMU6205			4Pin Wafer		U.FLx2
v	WMU6206			USB Type-A	PCB Antenna	none (like solder)
	WMU6207			4Pin Wafer	x2	none (like solder)

*The difference Models are pre-tested, because the connector and interface are difference with difference Model, and selected the worst Model for testing.

*Model WMU6202, WMU6203, WMU6204 and WMU6205 the difference doesn't affect the test result, only WMU6202 was chosen for the final test.

*Model WMU6206 and WMU6207 the difference doesn't affect the test result, only WMU6206 was chosen for the final test.

註2： 此待測設備搭配測試的天線，其資料如下：

Antenna Type	Brand	Model	Antenna Gain (dBi)		
			BT	2.4G	5G
Dipole	LYNwave	AOA160-221020-000000	3.0	3.0	2.0
	LYNwave	AOA160-221034-000000	3.0	3.0	3.0
	LYNwave	AOA160-221050-000000	5.0	5.0	5.0
PCB	N/A	N/A	3.6	3.6	5.3
	N/A	N/A	3.6	3.6	4.7

*上述天線的規格資訊由申請者聲明，實驗室不承擔任何責任。

註3: 此報告中，場強輻射量經過評估後以下列測試模式進行最終量測。

載波頻率	量測項目	發射	接收
場強輻射量測	1GHz 以上量測	Ch 0, 19, 39	Ch 0
	其它不必要之訊號	Ch 0	
電源線傳導干擾		Ch 0	

註4: 其測試模式如下。

測試模式	測試狀態
A	Model: WMU6202
B	Model: WMU6206

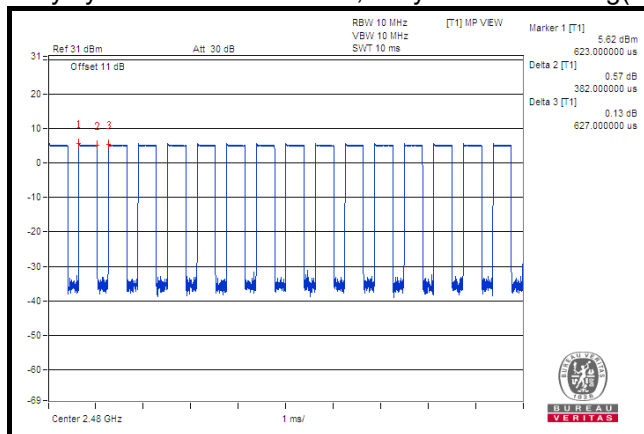
*電源線傳導干擾量測和場強輻射量測進行上述兩種測試模式，但其它測試項目以測試模式 A 具有較大干擾雜訊，因此僅此模式記錄在報告中。

註5: The BT could transmit simultaneously either with WLAN 2.4GHz or 5GHz at the same time.

註6: 待測設備經評估三個正交軸方位評估測試擺設方式：平躺、側放、垂直，其中測試模式A以垂直擺放擁有最大干擾值，測試模式B以平躺擺放擁有最大干擾值，故以上述擺設方式進行最終量測並記錄於報告中。

註7: Duty cycle of test signal.

Duty cycle = $382/627 = 0.609$, Duty factor = $10 * \log(1/0.609) = 2.15$



此裝置各頻道的中心頻率如下：

Bluetooth LE 頻段：

頻道	對應頻率 (MHz)	頻道	對應頻率 (MHz)	頻道	對應頻率 (MHz)	頻道	對應頻率 (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

詳細之規格請參考使用說明書，產品的照片請參照BV CPS報告編號: BAYS-WTW-P20110319。

2.2 輔助測試之週邊設備描述

待測設備於受測時均接上其所屬的配件或一般用途之相關設備；下列輔助設備或配件測試中所使用的配備，以形成一個代表待測物實際運作的受測系統。

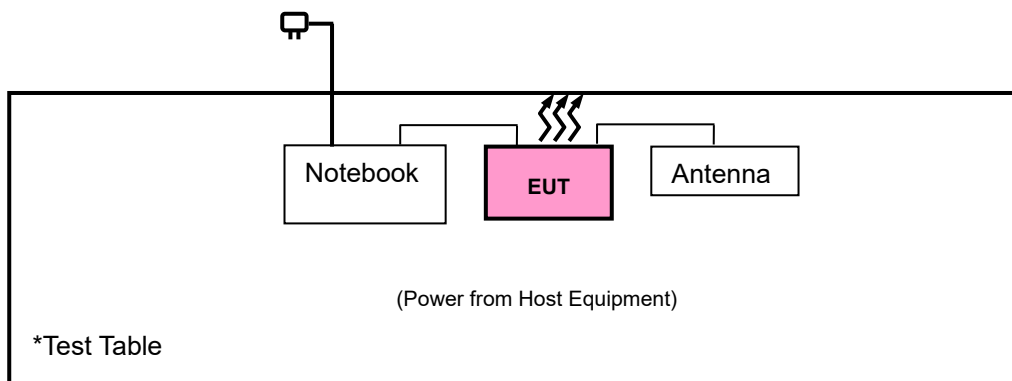
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E6420	D3T96R1	FCC DoC Approved	-

Note:

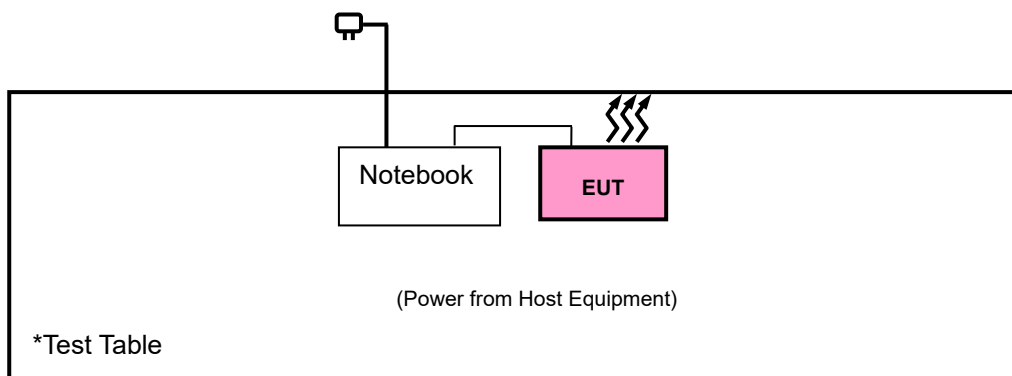
1. All power cords of the above support units are non-shielded (1.8m).
2. 本案器材申請者切結不提供隨貨配件，配件由實驗室提供併同檢測。

2.3 測試架構圖

測試模式 A



測試模式 B



3 適用規範

3.1 規範要求

(1) 傳導之規定

依據國家通訊傳播委員會低功率射頻器材技術規範之 3.3 節，電源傳導干擾之限制要求如下：

頻率(MHz)	傳導限制值 (dBuV)	
	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

(註)：隨頻率之對數遞減。

(2) 帶外發射之規定

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，操作頻帶範圍外之任意 100 kHz 內，發射機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 kHz 內的射頻功率，其衰減值限制如下：(1) 輸出功率以附件二之峰值輸出功率方式測量者，至少須衰減 20 dB，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，至少須衰減 30 dB。此外，落於 3.5 禁用頻段之輻射發射，應符合 3.6 之規定。

頻率(MHz)	電場強度(微伏特/公尺, uV/m)	測距(公尺)
$0.009 \leq f \leq 0.490$	$2,400/f(\text{kHz})$	300
$0.490 < f \leq 1.705$	$24,000/f(\text{kHz})$	30
$1.705 < f < 30$	30	30
$30 \leq f \leq 88$	100	3
$88 < f \leq 216$	150	3
$216 < f \leq 960$	200	3
$960 < f$	500	3

(3) 天線之規定

天線規格不受第 3.2 節規定之限制。

(4) 天線增益之要求

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 4.10.1.3 節之規定如下：

- (A) 進行固定式點對點操作時，其發射天線之方向性增益超過 6 dBi，每超過 3 dBi，最大傳導輸出功率限制值應降低 1 dB。
- (B) 天線以多向波束發射方式(含同時發射或循序發射)將訊號導向多個接收機或接收機群組時，應符合下列規定：
 - (a) 非同時發射多向波束者，所有載波或頻道傳輸至所有天線陣列或陣列群之總和傳導輸出功率應符合 4.10.1.2 之功率限制值。如天線/天線陣列群之方向性增益超過 6 dBi，每超過 3 dBi，總和傳導輸出功率限制值應降低 1 dB。方向性增益值應計算如下：
 - (i) 方向性增益值 = $10\log(\text{天線陣列之單元數目}) + \text{各單元中最高之方向性增益值}$ 。
 - (ii) 天線陣列間之遮蔽效應或波束干涉損失能充分佐證時，方向性增益得低於(i)計算數值。
 - (b) 同時發射多向波束於相同或不同頻道者，其每一波束功率應符合(a)之功率限制值。如發射波束有重疊現象，功率應降低，以確保總和傳導輸出功率符合(a)之限制值。同時發射的所有波束總和傳導輸出功率不大於(a) 總和傳導輸出功率限制值加 8 dB。方向性增益值計算同(a)。
 - (c) 發射機之天線具備單向波束功能者，應符合(1)(A)及(3)後段之規定。

除(A)及(B)外，使用超過 6 dBi 方向增益之發射天線時，應依超過 6 dBi 天線方向增益的 dBi 總量，等量減少最大傳導輸出功率限制值。

(5) 6dB 頻寬之要求

對使用數位調變技術(digital modulation techniques)系統之低功率發射機，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 節之規定，6dB 頻寬至少應有 500kHz。

(6)峰值輸出功率之要求

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 節之規定：

數位調變技術系統：1 W(含)以下。

(7)功率頻譜密度之要求

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 節之規定，在使用頻率範圍之任一 3 kHz 頻寬內，由發射機傳導至天線之功率頻譜密度在任意傳輸期間內，皆小於或等於 8 毫分貝(dBm)，且應依 4.10.1.3 之方式降低功率頻譜密度限制值。

(8)電波暴露量之評估

依據國家通訊傳播委員會低功率射頻器材技術規範 6.20.2 節之規定，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)以證明其符合電波暴露量之要求。

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：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：MHz。

3.2 限制使用之頻帶

除本規範另有規定外，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(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	

4 帶外發射之量測

4.1 適用標準

請見本報告3.1節第2項的規定。

4.2 量測方法

在電波暗室，將待測物置於0.8米高的非金屬桌面，使其操作在工作狀態。接收天線置於3米距離。桌面要360度旋轉，另外接收天線從離地1米至4米升降變化，以找出最大的輻射電場強度，接收天線分別置於水平、垂直極化各執行測試一次。

Note: 對於 1GHz 以上場強輻射的測試，待測物則置於1.5米高的非金屬桌面。

發射諧波：

Peak 為 RBW = 1 MHz, VBW = 3 MHz ;

Average 為 RBW = 1 MHz, VBW = 3 kHz

接收諧波：

Below 1 GHz

Peak 為 RBW = 120 kHz, VBW = 360 kHz ; Quasi-Peak 為 RBW = 120 kHz, VBW = 120 kHz

Above 1 GHz:

Peak 為 RBW = 1 MHz, VBW = 3 MHz ; Average 為 RBW = 1 MHz, VBW = 3MHz (RMS) ; Detector: RMS ;

Sweep time: Auto ; Trace count: trace average of at least 100 traces.

其它不必要之訊號

Peak 為 RBW = 120 kHz, VBW = 360 kHz ; Quasi-Peak 為 RBW = 120 kHz, VBW = 120 kHz

4.3 量測儀器

測試日期: 108 年 01 月 14 日至 109 年 01 月 18 日

儀器名稱 (廠牌/製造商)	型號	序號	校正日期	下次校正日期
Test Receiver Agilent Technologies	N9038A	MY52260177	Aug. 20, 2018	Aug. 19, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSV40	100980	Apr. 17, 2018	Apr. 16, 2019
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 25, 2018	Nov. 24, 2019
BILOG Antenna SCHWARZBECK	VULB 9168	9168-616	Nov. 27, 2018	Nov. 26, 2019
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Nov. 25, 2018	Nov. 24, 2019
Fixed Attenuator Woken	00801A1GGAM02Y	NA	May 17, 2018	May 16, 2019
Bluetooth Tester	CBT	100980	Jun. 28, 2017	Jun. 27, 2019
Loop Antenna	EM-6879	269	Sep. 07, 2018	Sep. 06, 2019
Preamplifier Agilent	310N	187226	Jun. 19, 2018	Jun. 18, 2019
Preamplifier Agilent	83017A	MY39501357	Jun. 19, 2018	Jun. 18, 2019
Preamplifier EMCI	EMC 184045	980116	Oct. 12, 2018	Oct. 11, 2019
Power Meter Anritsu	ML2495A	1012010	Sep. 05, 2018	Sep. 04, 2019
Power Sensor Anritsu	MA2411B	1315050	Sep. 04, 2018	Sep. 03, 2019
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC -SMS-100-SMS-12 0+RFC-SMS-100-S MS-400)	Jun. 19, 2018	Jun. 18, 2019
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC -SMS-100-SMS-24)	Jun. 19, 2018	Jun. 18, 2019
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA

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

2. The test was performed in HsinTien Chamber 1.

3. The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Frequency	Uncertainty
Radiated emissions	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	2.0153 dB
	200MHz ~ 1000MHz	2.0224 dB
	1GHz ~ 18GHz	1.0121 dB
	18GHz ~ 40GHz	1.94 dB

測試日期: 109 年 11 月 26 日

儀器名稱 (廠牌/製造商)	型號	序號	校正日期	下次校正日期
Test Receiver Agilent Technologies	N9038A	MY52260177	Aug. 24, 2020	Aug. 23, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 16, 2020	Apr. 15, 2021
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 22, 2020	Nov. 21, 2021
BILOG Antenna SCHWARZBECK	VULB 9168	9168-616	Nov. 09, 2020	Nov. 08, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Nov. 22, 2020	Nov. 21, 2021
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
Preamplifier Agilent	310N	187226	Jun. 17, 2020	Jun. 16, 2021
Preamplifier Agilent	83017A	MY39501357	Jun. 17, 2020	Jun. 16, 2021
Preamplifier EMCI	EMC 184045	980116	Oct. 07, 2020	Oct. 06, 2021
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SM S-100-SMS-120+RFC-S MS-100-SMS-400)	Jun. 17, 2020	Jun. 16, 2021
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SM S-100-SMS-24)	Jun. 17, 2020	Jun. 17, 2021
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA

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

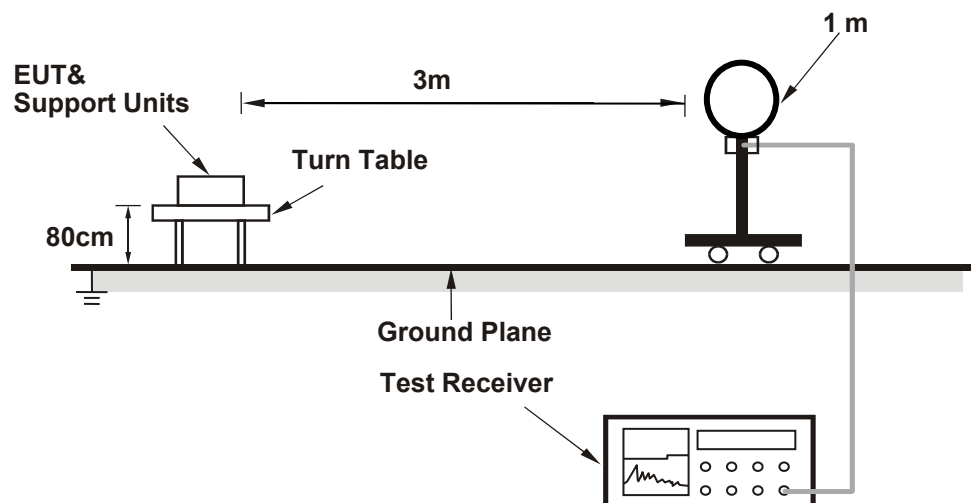
2. The test was performed in HsinTien Chamber 1.

3. The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

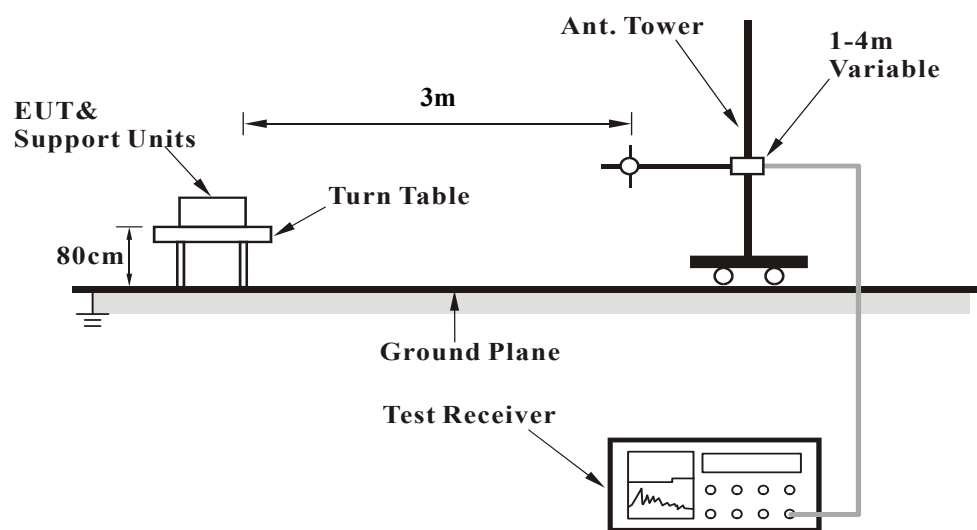
Measurement	Frequency	Uncertainty
Radiated emissions	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	2.0153 dB
	200MHz ~ 1000MHz	2.0224 dB
	1GHz ~ 18GHz	1.0121 dB
	18GHz ~ 40GHz	1.94 dB

4.4 測試配置

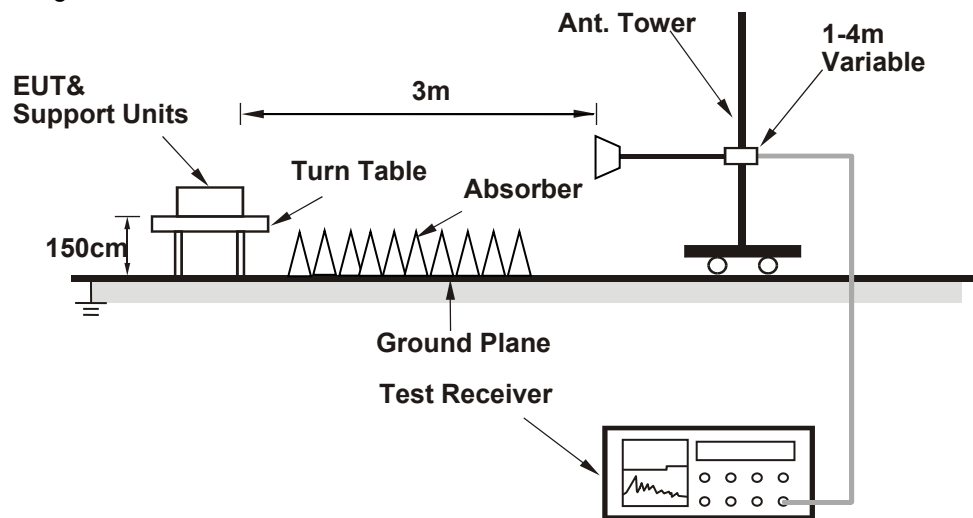
<Frequency Range below 30MHz>



<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



4.5 場強度之計算

場強之計算公式如下：

結果值 Emission level (dBuV/m) = 機器讀值 Raw Value (dBuV) + 校正因子 Correction Factor (dB/m)

餘裕度 Margin (dB) = 結果值 Emission level (dBuV/m) - 限制值 Limit value (dBuV/m)

量測結果請見下頁。

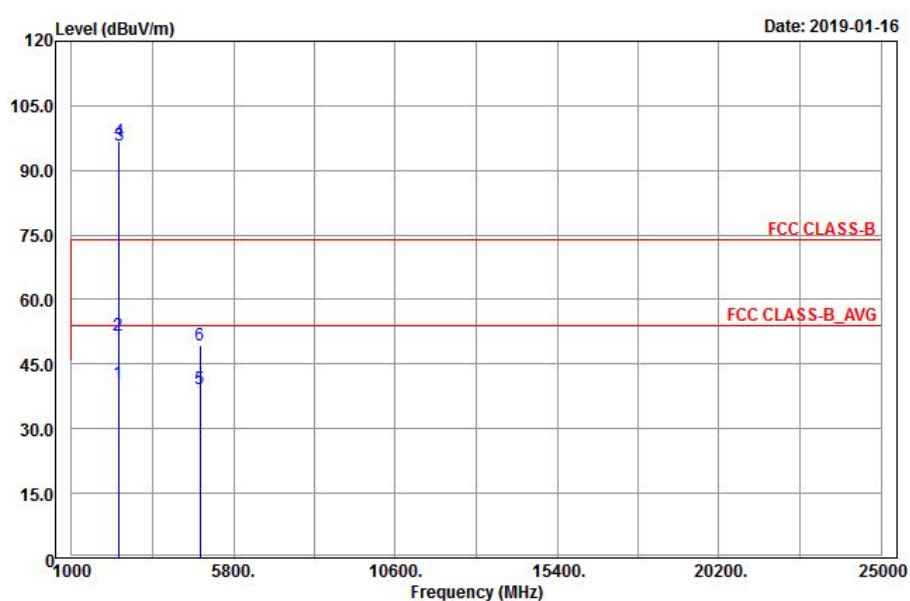
4.6 量測結果

4.6.1 發射諧波

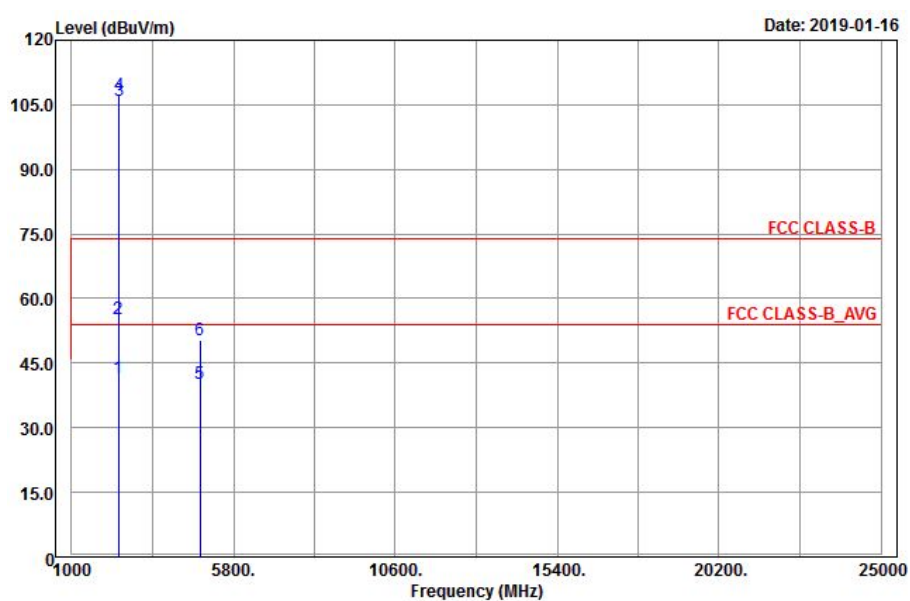
測試模式 A

EUT Test Condition		Measurement Detail	
Channel	Channel 0	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz (System)	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

Horizontal



Vertical



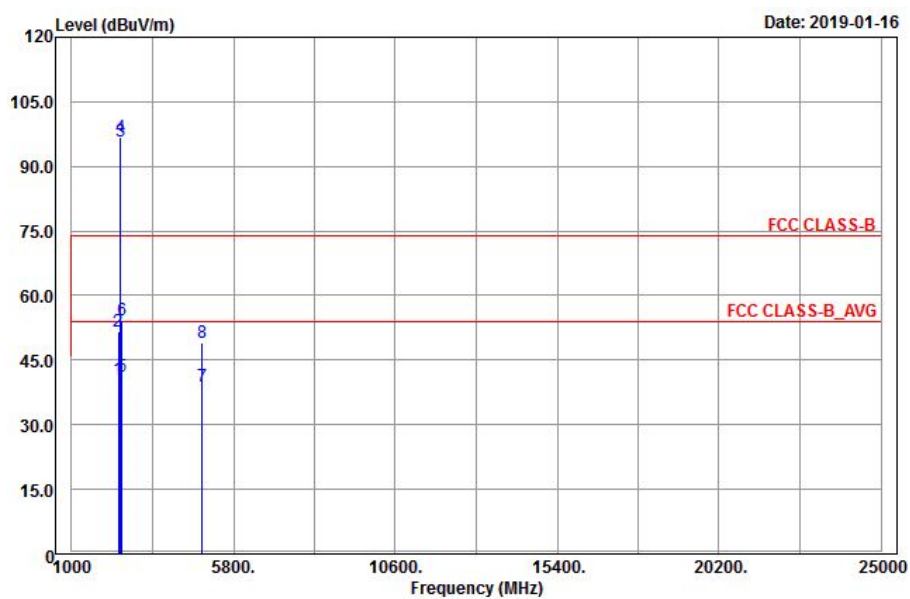
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2382.99	40.5	34.08	54	-13.5	31.78	5.4	30.76	107	360	Average
2382.99	51.58	45.16	74	-22.42	31.78	5.4	30.76	107	360	Peak
2402	95.7	89.23			31.8	5.4	30.73	107	360	Average
2402	96.67	90.2			31.8	5.4	30.73	107	360	Peak
4804	39.12	26.7	54	-14.88	33.96	8.25	29.79	185	39	Average
4804	49.37	36.95	74	-24.63	33.96	8.25	29.79	185	39	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2381.73	41.39	34.97	54	-12.61	31.78	5.4	30.76	161	300	Average
2381.73	55.16	48.74	74	-18.84	31.78	5.4	30.76	161	300	Peak
2402	106.09	99.62			31.8	5.4	30.73	161	300	Average
2402	107.09	100.62			31.8	5.4	30.73	161	300	Peak
4804	40.21	27.79	54	-13.79	33.96	8.25	29.79	129	288	Average
4804	50.31	37.89	74	-23.69	33.96	8.25	29.79	129	288	Peak

Remarks:

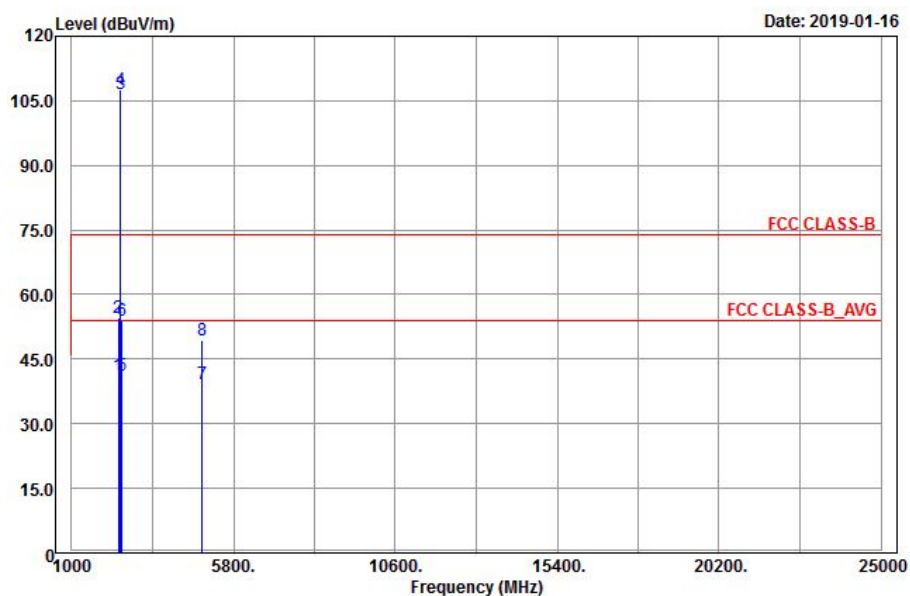
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 2402 MHz: Fundamental Frequency
3. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 19	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz (System)	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

Horizontal



Vertical



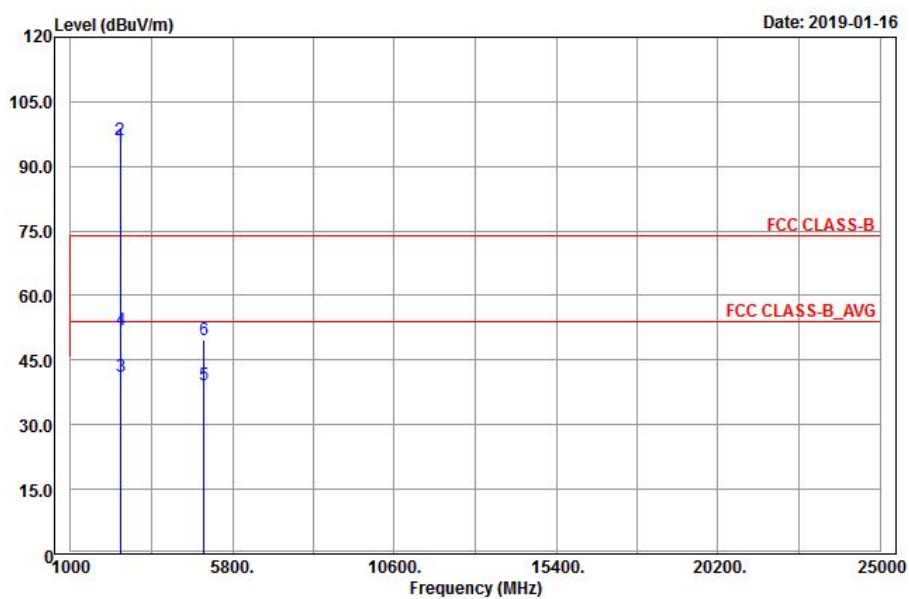
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2388.03	40.4	33.96	54	-13.6	31.8	5.4	30.76	107	360	Average
2388.03	51.63	45.19	74	-22.37	31.8	5.4	30.76	107	360	Peak
2440	95.88	89.26			31.85	5.46	30.69	107	360	Average
2440	96.92	90.3			31.85	5.46	30.69	107	360	Peak
2494.68	41.2	34.35	54	-12.8	31.9	5.53	30.58	107	360	Average
2494.68	54.17	47.32	74	-19.83	31.9	5.53	30.58	107	360	Peak
4880	39.03	26.54	54	-14.97	33.98	8.27	29.76	191	236	Average
4880	49.18	36.69	74	-24.82	33.98	8.27	29.76	191	236	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2383.53	41.12	34.7	54	-12.88	31.78	5.4	30.76	161	300	Average
2383.53	54.62	48.2	74	-19.38	31.78	5.4	30.76	161	300	Peak
2440	106.44	99.82			31.85	5.46	30.69	161	300	Average
2440	107.46	100.84			31.85	5.46	30.69	161	300	Peak
2483.56	41.25	34.49	54	-12.75	31.88	5.5	30.62	161	300	Average
2483.56	53.8	47.04	74	-20.2	31.88	5.5	30.62	161	300	Peak
4880	39.27	26.78	54	-14.73	33.98	8.27	29.76	103	96	Average
4880	49.35	36.86	74	-24.65	33.98	8.27	29.76	103	96	Peak

Remarks:

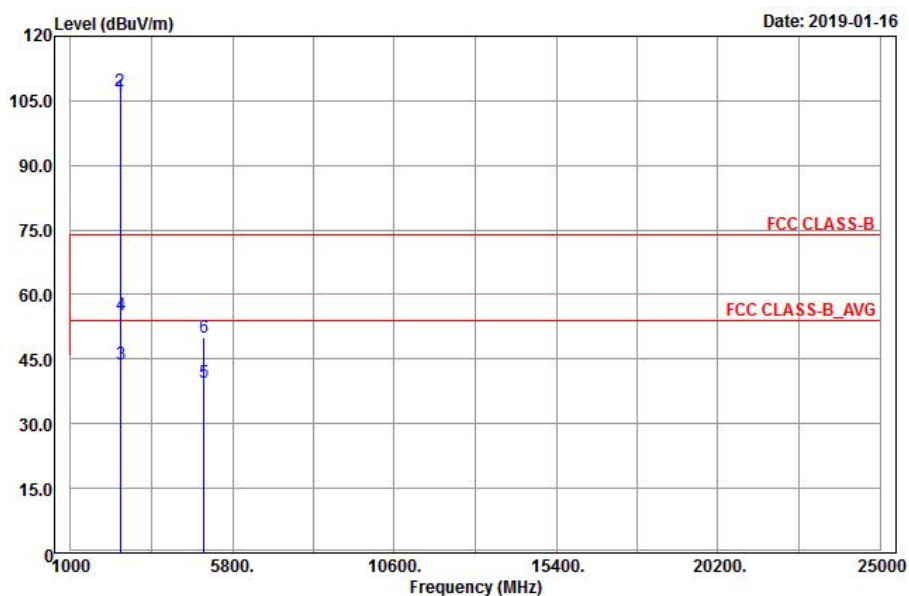
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 2440 MHz: Fundamental Frequency
3. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 39	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz (System)	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

Horizontal



Vertical



Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	94.94	88.18			31.88	5.5	30.62	107	360	Average
2480	96.17	89.41			31.88	5.5	30.62	107	360	Peak
2486.16	41.07	34.28	54	-12.93	31.88	5.53	30.62	107	360	Average
2486.16	52.05	45.26	74	-21.95	31.88	5.53	30.62	107	360	Peak
4960	39.24	26.68	54	-14.76	33.99	8.29	29.72	154	168	Average
4960	49.55	36.99	74	-24.45	33.99	8.29	29.72	154	168	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	106.05	99.29			31.88	5.5	30.62	161	300	Average
2480	107.23	100.47			31.88	5.5	30.62	161	300	Peak
2483.56	43.87	37.11	54	-10.13	31.88	5.5	30.62	161	300	Average
2483.56	55.13	48.37	74	-18.87	31.88	5.5	30.62	161	300	Peak
4960	39.52	26.96	54	-14.48	33.99	8.29	29.72	146	113	Average
4960	49.87	37.31	74	-24.13	33.99	8.29	29.72	146	113	Peak

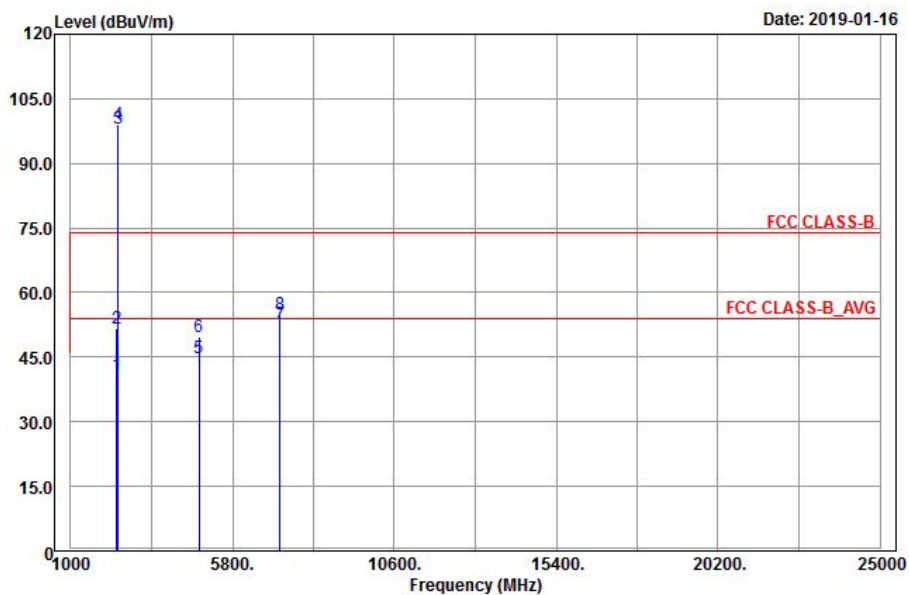
Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 2480 MHz: Fundamental Frequency
3. The other emission levels were very low against the limit.

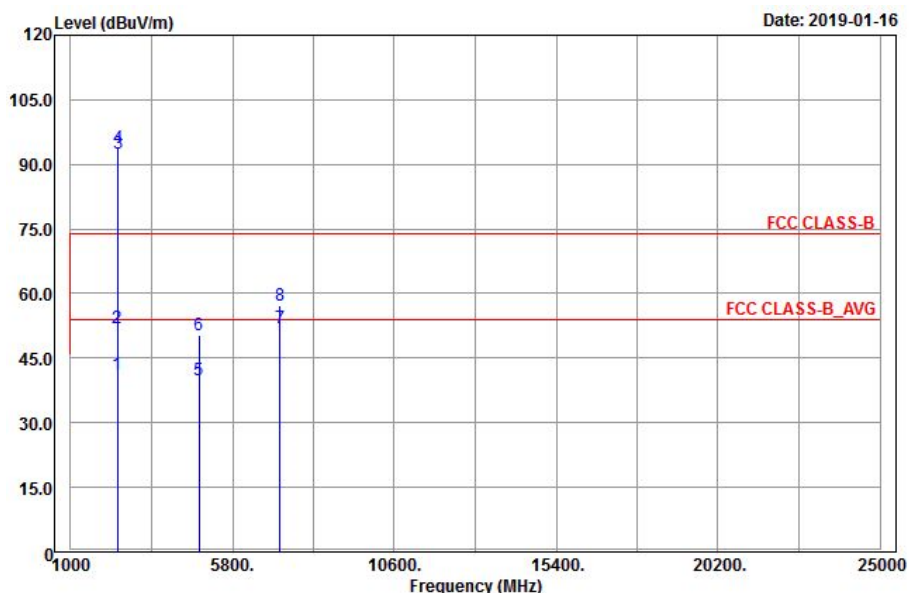
測試模式 B

EUT Test Condition		Measurement Detail	
Channel	Channel 0	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz (System)	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Horizontal



Vertical



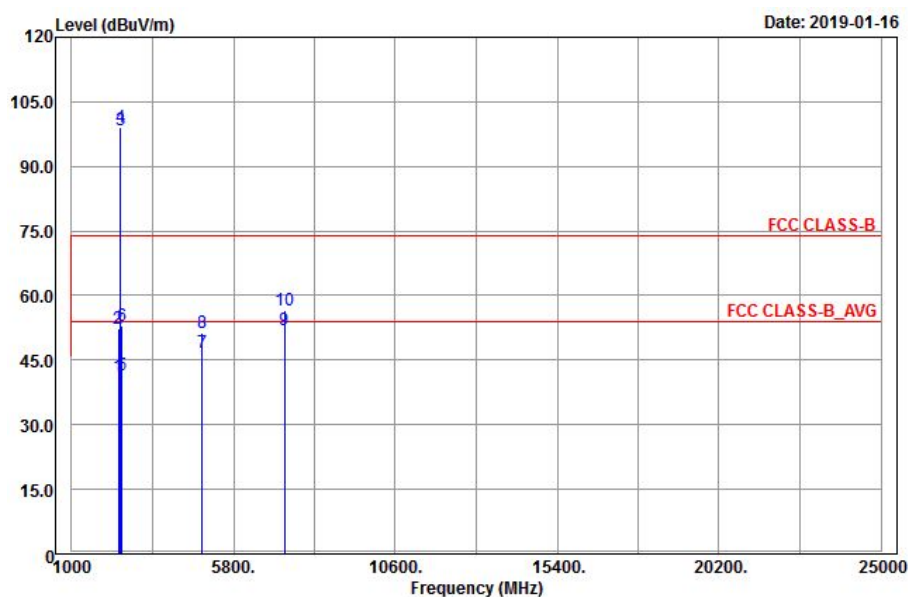
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2374.8	40.83	34.44	54	-13.17	31.78	5.37	30.76	100	204	Average
2374.8	51.65	45.26	74	-22.35	31.78	5.37	30.76	100	204	Peak
2402	98.2	91.73			31.8	5.4	30.73	100	204	Average
2402	99.14	92.67			31.8	5.4	30.73	100	204	Peak
4804	44.72	32.3	54	-9.28	33.96	8.25	29.79	100	124	Average
4804	49.73	37.31	74	-24.27	33.96	8.25	29.79	100	124	Peak
7206	52.73	38.26	54	-1.27	35.56	9.94	31.03	116	202	Average
7206	55.09	40.62	74	-18.91	35.56	9.94	31.03	116	202	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2382.27	41.04	34.62	54	-12.96	31.78	5.4	30.76	100	258	Average
2382.27	52.08	45.66	74	-21.92	31.78	5.4	30.76	100	258	Peak
2402	92.57	86.1			31.8	5.4	30.73	100	258	Average
2402	93.7	87.23			31.8	5.4	30.73	100	258	Peak
4804	39.76	27.34	54	-14.24	33.96	8.25	29.79	100	299	Average
4804	50.33	37.91	74	-23.67	33.96	8.25	29.79	100	299	Peak
7206	52.07	37.6	54	-1.93	35.56	9.94	31.03	100	302	Average
7206	57.18	42.71	74	-16.82	35.56	9.94	31.03	100	302	Peak

Remarks:

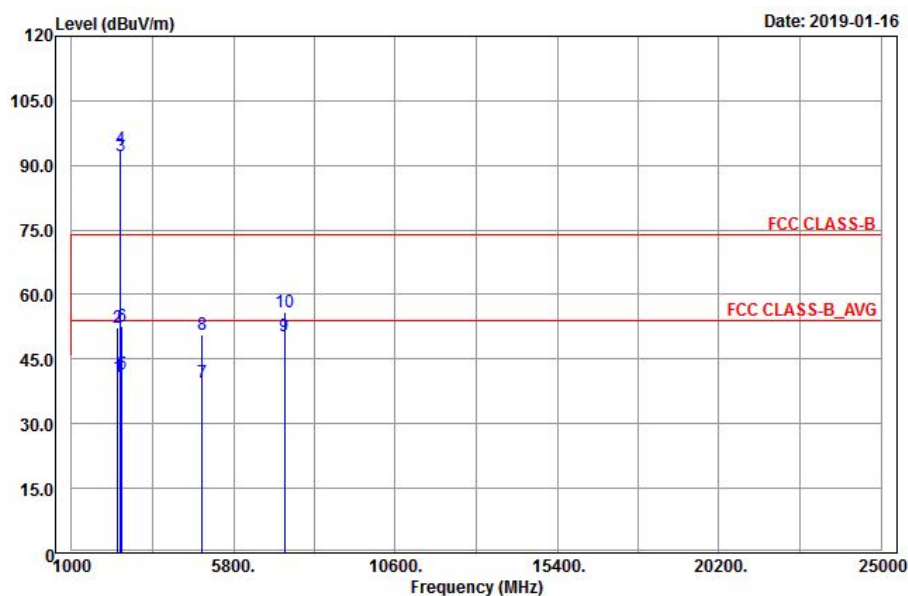
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 2402 MHz: Fundamental Frequency
3. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 19	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz (System)	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Horizontal



Vertical



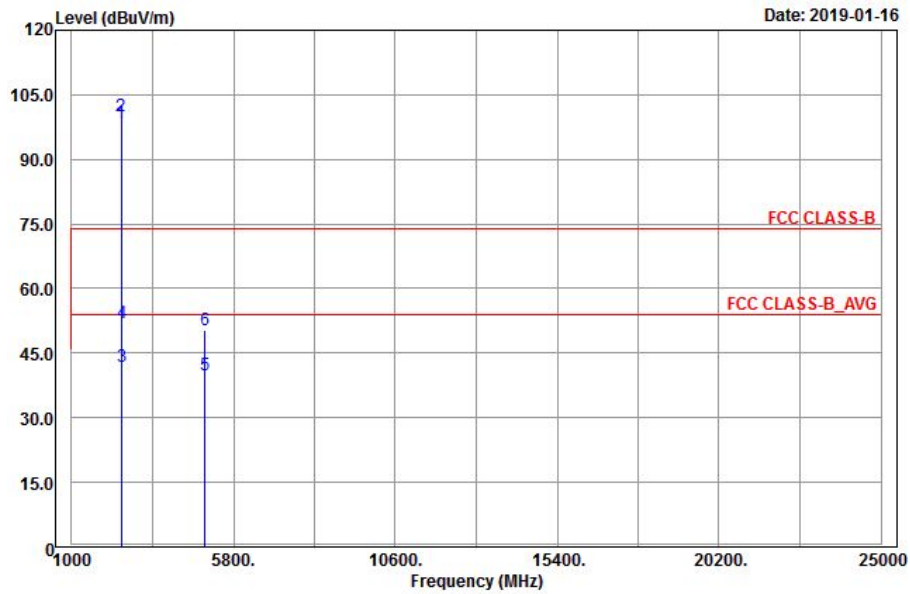
Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.2	41.14	34.7	54	-12.86	31.8	5.4	30.76	100	204	Average
2389.2	52.34	45.9	74	-21.66	31.8	5.4	30.76	100	204	Peak
2440	98.53	91.91			31.85	5.46	30.69	100	204	Average
2440	99.06	92.44			31.85	5.46	30.69	100	204	Peak
2494.52	41.5	34.65	54	-12.5	31.9	5.53	30.58	100	204	Average
2494.52	53	46.15	74	-21	31.9	5.53	30.58	100	204	Peak
4880	46.63	34.14	54	-7.37	33.98	8.27	29.76	100	120	Average
4880	51.49	39	74	-22.51	33.98	8.27	29.76	100	120	Peak
7320	52.12	37.8	54	-1.88	35.53	9.95	31.16	100	208	Average
7320	56.72	42.4	74	-17.28	35.53	9.95	31.16	100	208	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2363.73	40.82	34.49	54	-13.18	31.76	5.37	30.8	100	258	Average
2363.73	52.22	45.89	74	-21.78	31.76	5.37	30.8	100	258	Peak
2440	92.22	85.6			31.85	5.46	30.69	100	258	Average
2440	93.71	87.09			31.85	5.46	30.69	100	258	Peak
2486.56	41.59	34.8	54	-12.41	31.88	5.53	30.62	100	258	Average
2486.56	52.58	45.79	74	-21.42	31.88	5.53	30.62	100	258	Peak
4880	39.71	27.22	54	-14.29	33.98	8.27	29.76	100	302	Average
4880	50.52	38.03	74	-23.48	33.98	8.27	29.76	100	302	Peak
7320	50.32	36	54	-3.68	35.53	9.95	31.16	100	302	Average
7320	55.93	41.61	74	-18.07	35.53	9.95	31.16	100	300	Peak

Remarks:

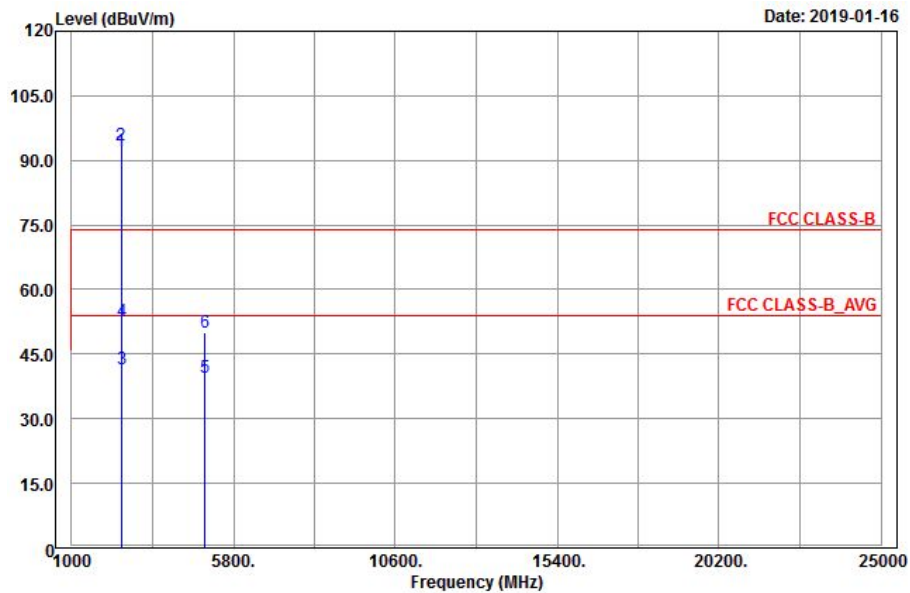
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 2440 MHz: Fundamental Frequency
3. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 39	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz (System)	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Horizontal



Vertical



Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	98.52	91.76			31.88	5.5	30.62	100	204	Average
2480	99.97	93.21			31.88	5.5	30.62	100	204	Peak
2498.6	41.8	34.95	54	-12.2	31.9	5.53	30.58	100	204	Average
2498.6	52.11	45.26	74	-21.89	31.9	5.53	30.58	100	204	Peak
4960	39.8	27.24	54	-14.2	33.99	8.29	29.72	100	100	Average
4960	50.49	37.93	74	-23.51	33.99	8.29	29.72	100	100	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	92.1	85.34			31.88	5.5	30.62	100	258	Average
2480	93.36	86.6			31.88	5.5	30.62	100	258	Peak
2496.6	41.44	34.59	54	-12.56	31.9	5.53	30.58	100	258	Average
2496.6	52.53	45.68	74	-21.47	31.9	5.53	30.58	100	258	Peak
4960	39.59	27.03	54	-14.41	33.99	8.29	29.72	134	222	Average
4960	50.06	37.5	74	-23.94	33.99	8.29	29.72	134	222	Peak

Remarks:

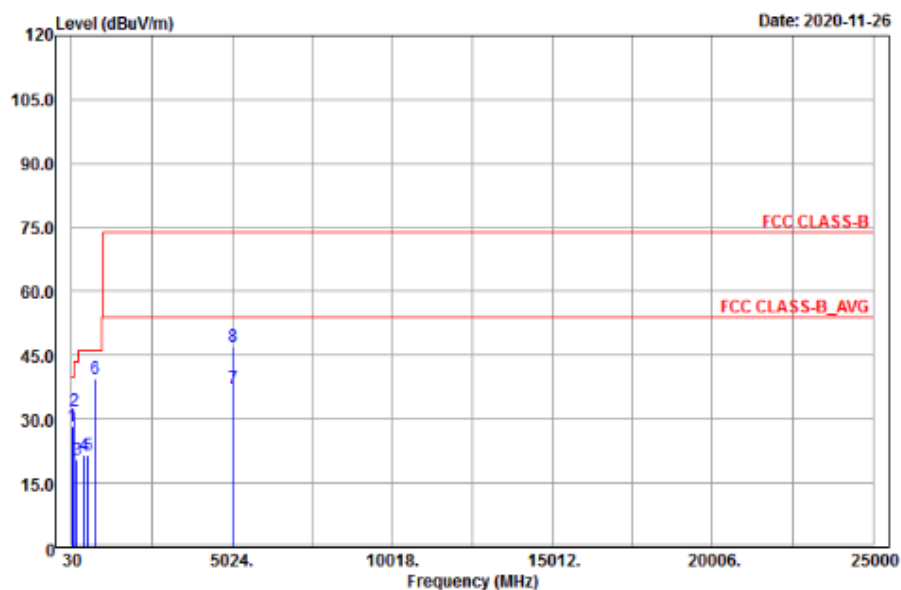
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 2480 MHz: Fundamental Frequency
3. The other emission levels were very low against the limit.

4.6.2 接收谐波

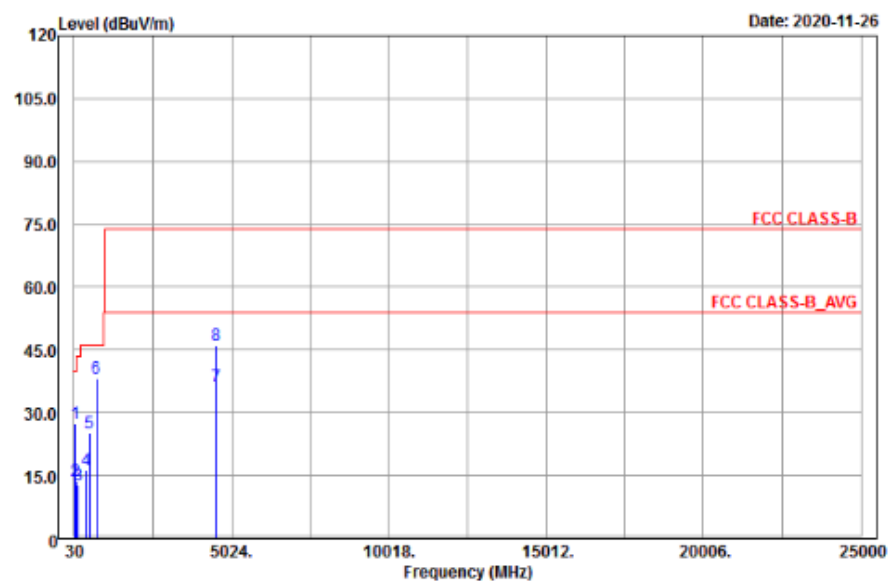
測試模式 A

EUT Test Condition		Measurement Detail	
Channel	Channel 0	Frequency Range	30 MHz ~ 25 GHz
Input Power	110 Vac, 60 Hz (System)	Detector Function	Above 1 GHz: Peak (PK) & Average (AV) Below 1 GHz: Peak (PK) or Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
36.08	28.46	44.56	-16.1	40	-11.54	124	198	QP
104.56	32.17	52.14	-19.97	43.5	-11.33	129	223	QP
182.09	20.57	39.54	-18.97	43.5	-22.93	164	354	QP
415.64	21.48	32.46	-10.98	46	-24.52	117	128	QP
531.29	21.59	29.59	-8	46	-24.41	112	187	QP
749.24	39.54	44.68	-5.14	46	-6.46	187	334	QP
5046.38	37.15	26.51	10.64	54	-16.85	145	88	Average
5046.38	47.15	36.51	10.64	74	-26.85	145	88	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
53.64	27.41	49.65	-22.24	40	-12.59	167	249	QP
90.27	13.57	34.12	-20.55	43.5	-29.93	166	74	QP
154.28	12.64	31.61	-18.97	43.5	-30.86	219	204	QP
406.94	16.22	27.12	-10.9	46	-29.78	147	239	QP
512.62	25.07	33.82	-8.75	46	-20.93	156	203	QP
725.36	38.14	43.02	-4.88	46	-7.86	253	183	QP
4534.82	36.25	26.22	10.03	54	-17.75	207	154	Average
4534.82	46.25	36.22	10.03	74	-27.75	207	154	Peak

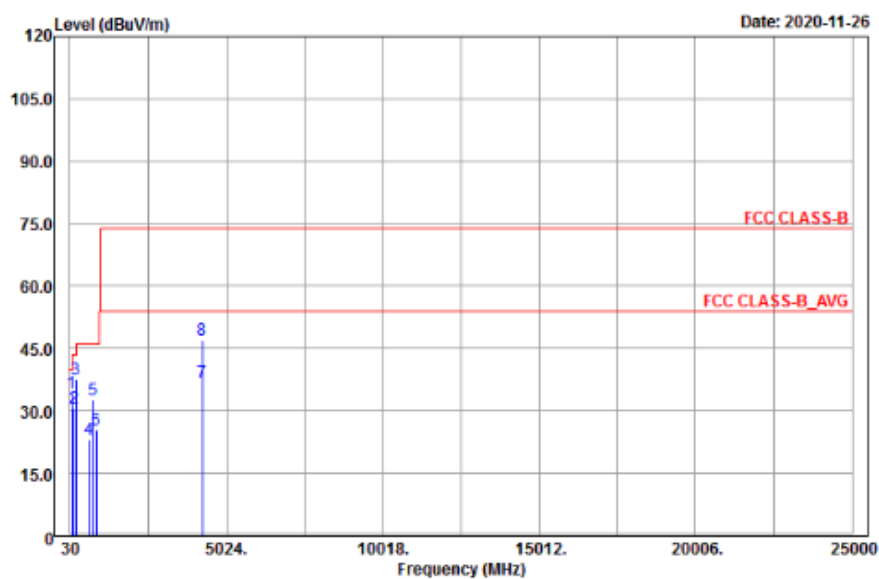
Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- The other emission levels were very low against the limit.

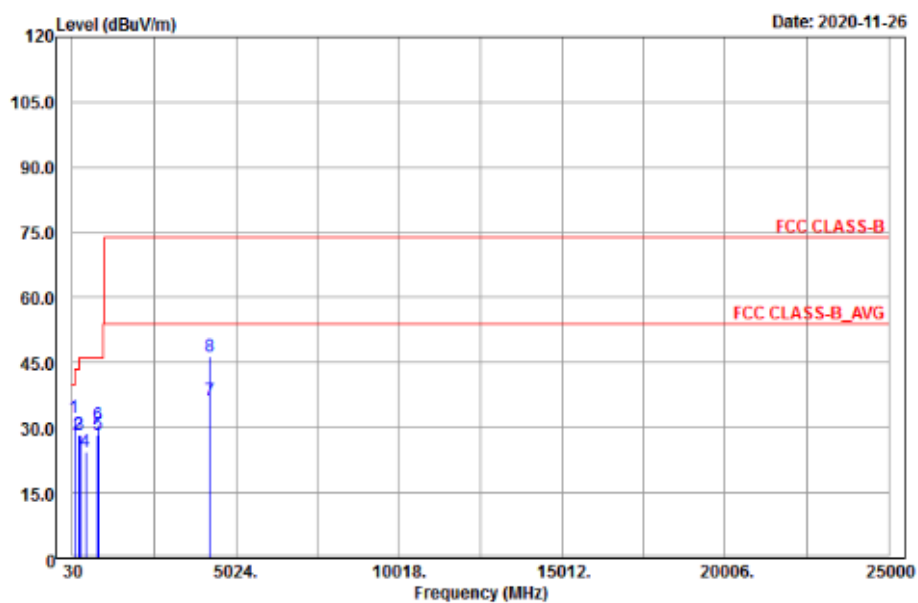
測試模式 B

EUT Test Condition		Measurement Detail	
Channel	Channel 0	Frequency Range	30 MHz ~ 25 GHz
Input Power	110 Vac, 60 Hz (System)	Detector Function	Above 1 GHz: Peak (PK) & Average (AV) Below 1 GHz: Peak (PK) or Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
82.46	34.29	55.24	-20.95	40	-5.71	194	214	QP
153.28	30.68	51.55	-20.87	43.5	-12.82	128	198	QP
211.36	37.58	55.69	-18.11	43.5	-5.92	108	57	QP
649.26	23.27	33.37	-10.1	46	-22.73	130	57	QP
763.06	32.58	40.83	-8.25	46	-13.42	126	279	QP
855.36	25.47	32.14	-6.67	46	-20.53	142	109	QP
4264	37.03	27.68	9.35	54	-16.97	149	228	Average
4264	47.03	37.68	9.35	74	-26.97	149	228	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
91.58	32.46	51.26	-18.8	43.5	-11.04	159	238	QP
214.05	28.33	46.35	-18.02	43.5	-15.17	167	204	QP
266.87	28.42	44.99	-16.57	46	-17.58	131	305	QP
434.87	24.56	38	-13.44	46	-21.44	126	276	QP
790.41	28.46	36.3	-7.84	46	-17.54	164	127	QP
827.47	30.69	37.86	-7.17	46	-15.31	247	136	QP
4240	36.29	26.99	9.3	54	-17.71	132	179	Average
4240	46.29	36.99	9.3	74	-27.71	132	179	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. The other emission levels were very low against the limit.

4.6.3 其它不必要之訊號

9 kHz ~ 30 MHz Data:

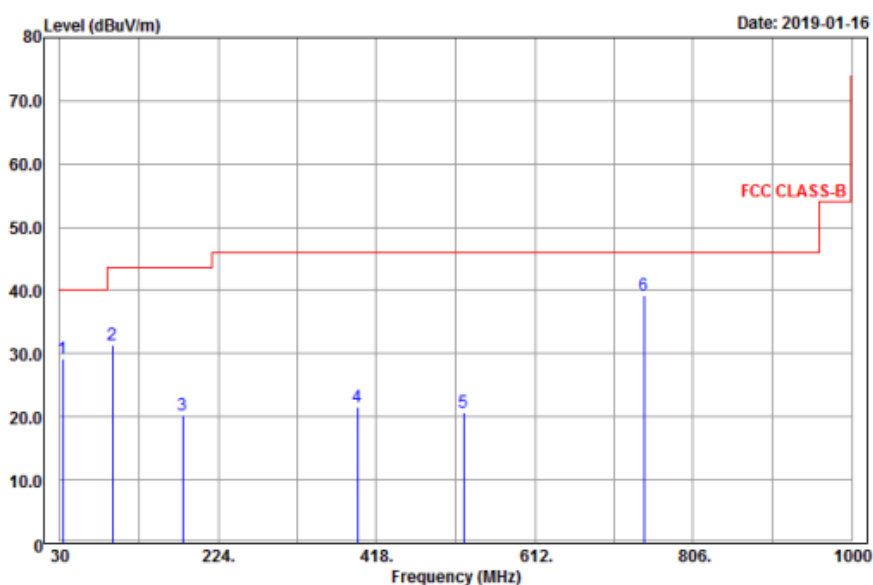
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

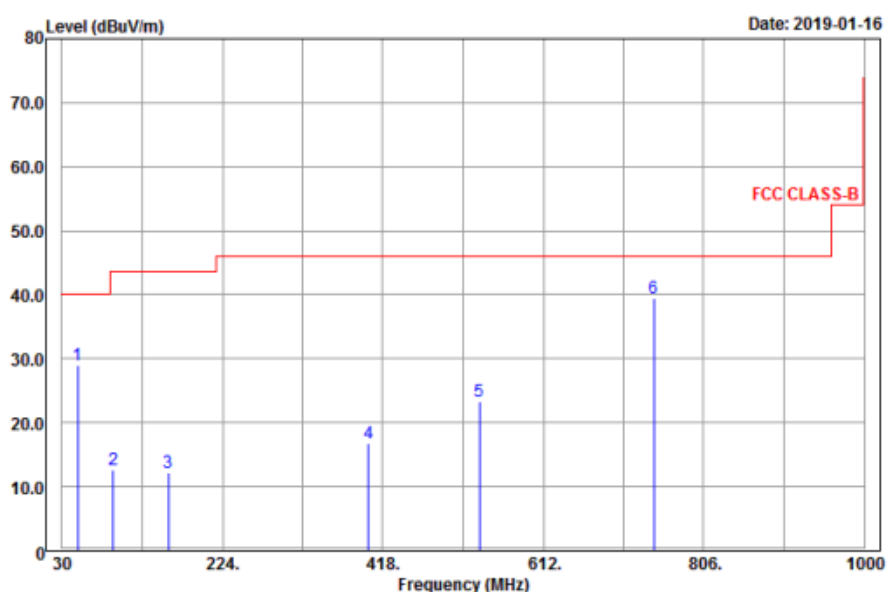
測試模式 A

EUT Test Condition		Measurement Detail	
Channel	Channel 0	Frequency Range	30 MHz ~ 1 GHz
Input Power	110 Vac, 60 Hz (System)	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Harry Hsueh

Horizontal



Vertical



Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
33.51	29.27	45.55	40	-10.73	15.22	0.74	32.24	136	215	QP
94.53	31.38	53	43.5	-12.12	9.26	1.11	31.99	155	141	QP
180.39	20.32	40.55	43.5	-23.18	10.4	1.61	32.24	101	147	QP
395.2	21.51	33.58	46	-24.49	17.8	2.34	32.21	136	165	QP
524.7	20.64	29.39	46	-25.36	20.7	2.7	32.15	159	198	QP
745.9	39.32	45.01	46	-6.68	23.23	3.22	32.14	104	114	QP
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
49.17	28.98	52.24	40	-11.02	8.06	0.9	32.22	121	133	QP
91.83	12.71	34.36	43.5	-30.79	9.06	1.11	31.82	155	187	QP
158.79	12.19	32.2	43.5	-31.31	10.74	1.52	32.27	111	101	QP
400.8	16.74	28.56	46	-29.26	18.06	2.34	32.22	102	321	QP
534.5	23.38	32.33	46	-22.62	20.52	2.7	32.17	126	152	QP
745.9	39.54	45.23	46	-6.46	23.23	3.22	32.14	100	125	QP

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

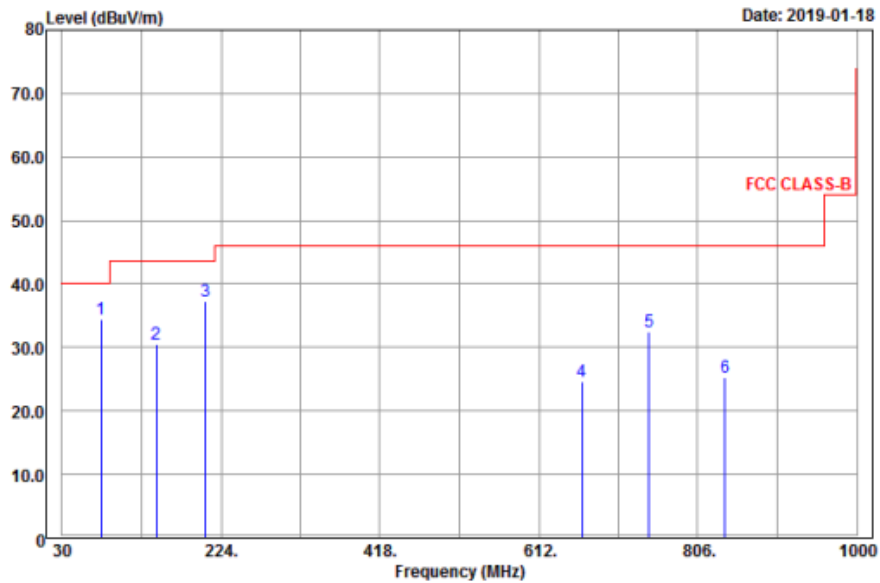
Margin value = Emission level – Limit value

2. The emission levels of other frequencies were very low against the limit.

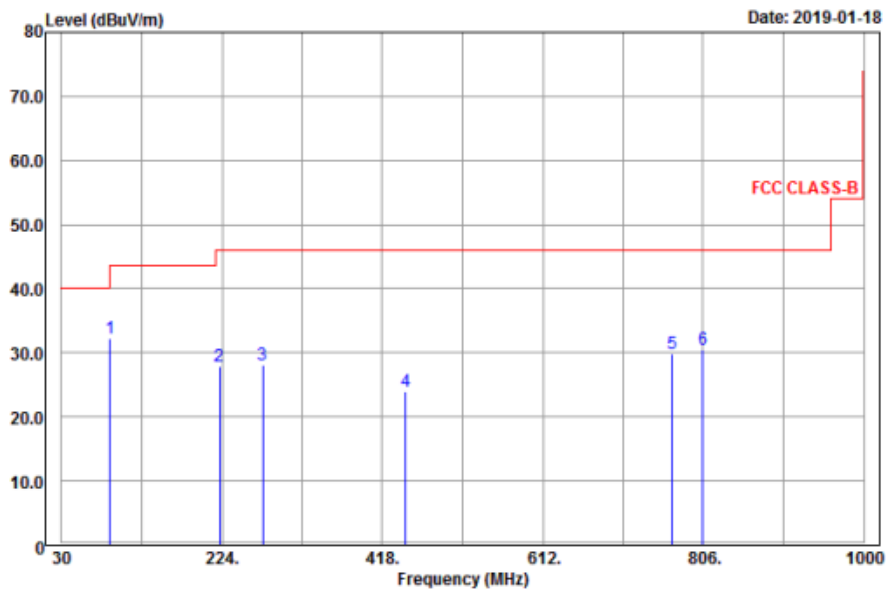
測試模式 B

EUT Test Condition		Measurement Detail	
Channel	Channel 0	Frequency Range	30 MHz ~ 1 GHz
Input Power	110 Vac, 60 Hz (System)	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

Horizontal



Vertical



Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
77.52	34.46	57.24	40	-5.54	8.33	1.11	32.22	200	200	QP
145.02	30.48	53	43.5	-13.02	8.37	1.38	32.27	134	304	QP
205.23	37.18	56.68	43.5	-6.32	11.12	1.65	32.27	112	26	QP
664.7	24.66	35.12	46	-21.34	18.68	2.99	32.13	124	119	QP
746.6	32.47	41.61	46	-13.53	19.78	3.22	32.14	197	205	QP
839.7	25.39	32.97	46	-20.61	20.89	3.38	31.85	139	3	QP
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
88.32	32.19	52.94	43.5	-11.31	9.95	1.11	31.81	124	16	QP
220.89	27.87	47.05	46	-18.13	11.38	1.65	32.21	120	259	QP
273	28.15	45.65	46	-17.85	12.67	1.94	32.11	128	273	QP
446.3	23.94	38.09	46	-22.06	15.51	2.49	32.15	144	219	QP
768.3	29.84	38.73	46	-16.16	20	3.22	32.11	132	200	QP
805.4	30.44	38.74	46	-15.56	20.41	3.32	32.03	180	25	QP

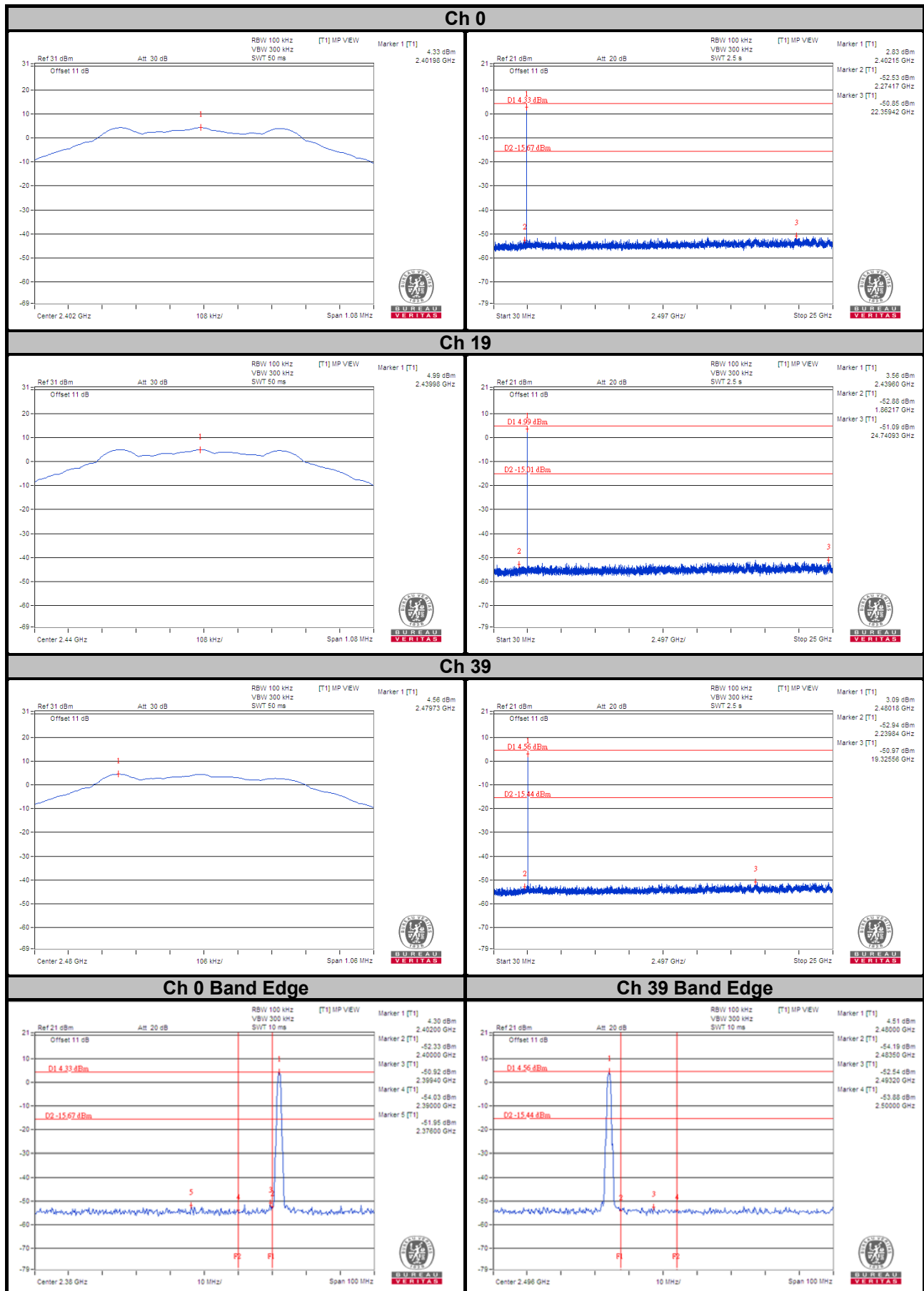
Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

Margin value = Emission level – Limit value

2. The emission levels of other frequencies were very low against the limit.

4.7 帶外發射之量測 (傳導)



4.8 量測結果判定

依據測試數據結果，符合低功率射頻器材技術規範之要求。

4.9 配置照片

請參閱附件測試設置照片(BV CPS 報告編號：BAYS-WTW-P20110319_TSup)。

5 電源線傳導干擾之量測

5.1 適用標準

請見本報告3.1節第1項的規定。

5.2 量測方法

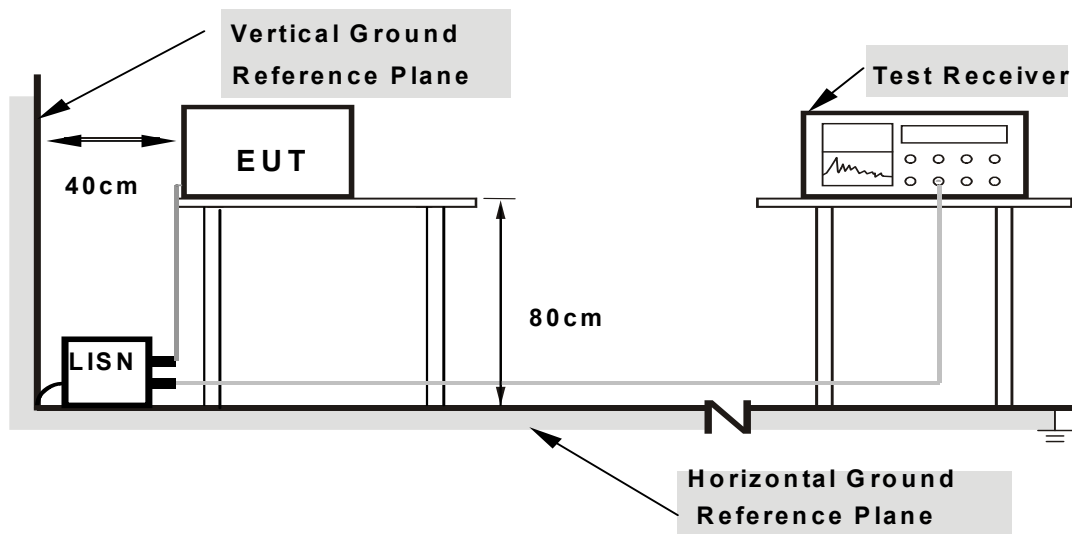
將待測物置於0.8米高的非金屬桌面，使其操作在工作狀態，待測物電源線接至電源線阻抗穩定網路上，從測試接收機記錄頻率由0.15MHz至30MHz之間之電源線傳導放射強度。

5.3 量測儀器

儀器名稱 (廠牌/製造商)	型號	序號	校正日期	下次校正日期
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 10, 2018	Dec. 09, 2019
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2018	Sep. 04, 2019
LISN/AMN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 26, 2018	Feb. 25, 2019
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 19, 2018	Aug. 18, 2019
Software ADT	BV ADT_Conf_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 1 (Conduction 1).
 3. The VCCI Site Registration No. is C-12040.
 4. The measurement uncertainty is 2.79 dB, which is calculated as per the document CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

5.4 測試配置



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

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

5.5 干擾值之計算

餘裕度Margin(dB)= 結果值Emission level (dBuV)-限制值Limit value (dBuV)

電源傳導干擾電壓之計算公式如下

結果值Emission level (dBuV)=校正因子Correction Factor (dB)+儀器讀值Reading value (dBuV)

其中校正因子Correction Factor (dB)為：

饋線損失+電源阻抗模擬網路損失

5.6 量測結果

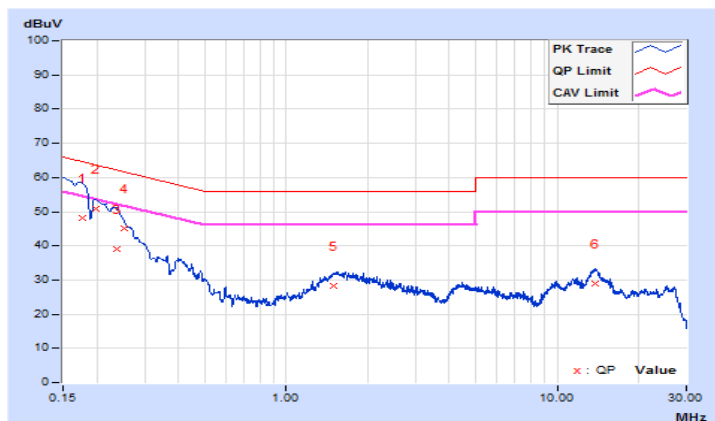
測試模式 A

操作模式	發射/接收	測試日期	108 年 01 月 18 日
基本波頻率	CH 0 : 2402 MHz	量測場地溫度	25°C
調變技術	GFSK	量測場地濕度	65%RH
測試者	王紀雄		

		6 dB Bandwidth: 9kHz				PHASE: LINE (L)			
輻射頻率	校正因子	儀器讀值		結果值		限制值		餘裕度	
[MHz]	[dB]	[dB (uV)]		[dB (uV)]		[dB (uV)]		[dB]	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.17700	10.06	37.97	13.05	48.03	23.11	64.63	54.63	-16.60	-31.52
0.19725	10.06	40.94	23.35	51.00	33.41	63.73	53.73	-12.73	-20.32
0.23550	10.06	29.16	11.72	39.22	21.78	62.25	52.25	-23.03	-30.47
0.25125	10.06	34.95	21.56	45.01	31.62	61.72	51.72	-16.71	-20.10
1.48643	10.07	18.28	4.98	28.35	15.05	56.00	46.00	-27.65	-30.95
13.79850	10.38	18.61	2.65	28.99	13.03	60.00	50.00	-31.01	-36.97

Note:

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

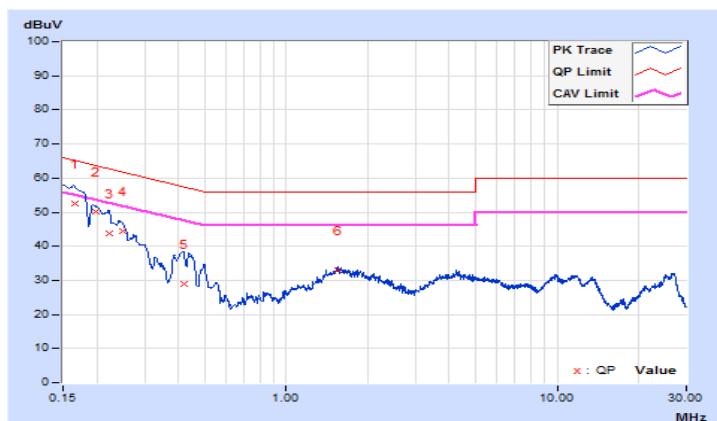


操作模式	發射/接收	測試日期	108 年 01 月 18 日
基本波頻率	CH 0 : 2402 MHz	量測場地溫度	25°C
調變技術	GFSK	量測場地濕度	65%RH
測試者	王紀雄		

		6 dB Bandwidth: 9kHz				PHASE: NEUTRAL (N)			
輻射頻率	校正因子	儀器讀值		結果值		限制值		餘裕度	
[MHz]	[dB]	[dB (uV)]		[dB (uV)]		[dB (uV)]		[dB]	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.16575	10.06	42.46	16.53	52.52	26.59	65.17	55.17	-12.65	-28.58
0.19725	10.07	39.97	24.43	50.04	34.50	63.73	53.73	-13.69	-19.23
0.22151	10.07	33.82	14.18	43.89	24.25	62.76	52.76	-18.87	-28.51
0.24900	10.07	34.24	22.39	44.31	32.46	61.79	51.79	-17.48	-19.33
0.41744	10.07	18.91	4.40	28.98	14.47	57.50	47.50	-28.52	-33.03
1.54725	10.09	22.86	5.19	32.95	15.28	56.00	46.00	-23.05	-30.72

Note:

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



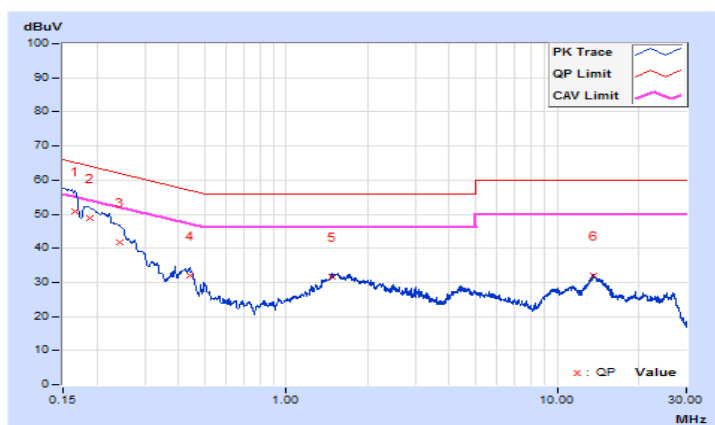
測試模式 B

操作模式	發射/接收	測試日期	108 年 01 月 18 日
基本波頻率	CH 0 : 2402 MHz	量測場地溫度	25°C
調變技術	GFSK	量測場地濕度	65%RH
測試者	王紀雄		

		6 dB Bandwidth: 9kHz				PHASE: LINE (L)			
輻射頻率	校正因子	儀器讀值		結果值		限制值		餘裕度	
[MHz]	[dB]	[dB (uV)]		[dB (uV)]		[dB (uV)]		[dB]	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.16567	10.05	40.85	15.11	50.90	25.16	65.17	55.17	-14.27	-30.01
0.18825	10.06	38.92	21.48	48.98	31.54	64.11	54.11	-15.13	-22.57
0.24225	10.06	31.61	15.52	41.67	25.58	62.02	52.02	-20.35	-26.44
0.44007	10.06	21.82	3.69	31.88	13.75	57.06	47.06	-25.18	-33.31
1.46850	10.07	21.43	5.19	31.50	15.26	56.00	46.00	-24.50	-30.74
13.61400	10.38	21.51	3.89	31.89	14.27	60.00	50.00	-28.11	-35.73

Note:

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

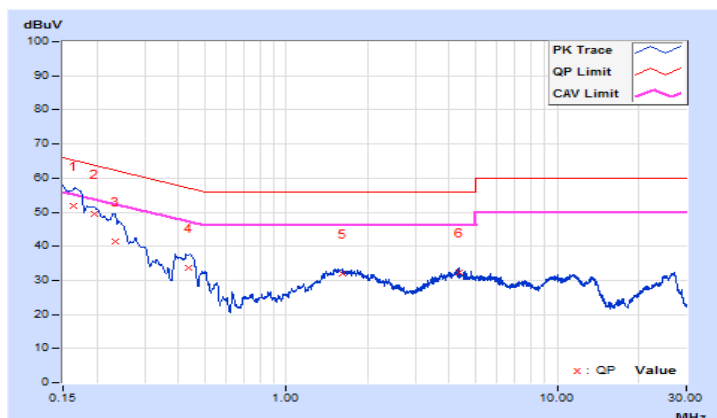


操作模式	發射/接收	測試日期	108 年 01 月 18 日
基本波頻率	CH 0 : 2402 MHz	量測場地溫度	25°C
調變技術	GFSK	量測場地濕度	65%RH
測試者	王紀雄		

		6 dB Bandwidth: 9kHz				PHASE: NEUTRAL (N)			
輻射頻率	校正因子	儀器讀值		結果值		限制值		餘裕度	
[MHz]	[dB]	[dB (uV)]		[dB (uV)]		[dB (uV)]		[dB]	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.16480	10.06	41.76	16.46	51.82	26.52	65.22	55.22	-13.40	-28.70
0.19500	10.07	39.26	22.91	49.33	32.98	63.82	53.82	-14.49	-20.84
0.23325	10.07	31.30	13.08	41.37	23.15	62.33	52.33	-20.96	-29.18
0.43350	10.07	23.52	10.57	33.59	20.64	57.19	47.19	-23.60	-26.55
1.60895	10.09	21.90	5.64	31.99	15.73	56.00	46.00	-24.01	-30.27
4.32600	10.18	21.98	5.34	32.16	15.52	56.00	46.00	-23.84	-30.48

Note:

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



5.7 量測結果判定

依據測試數據結果，符合低功率射頻器材技術規範之要求。

5.8 配置照片

請參閱附件測試設置照片(BV CPS 報告編號：BAYS-WTW-P20110319_TSup)。

6 發射(6 dB)頻寬之要求

6.1 適用標準

請見本報告3.1節第5項的規定。

6.2 量測方法

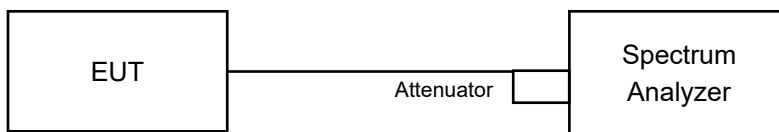
- 將待測物輸出經由衰減器接到頻譜分析儀上。
- 設定待測物處於連續發射狀態。
- 計算由最大輸出功率峰值減6dB的最大頻率範圍。

6.3 量測儀器

儀器名稱 (廠牌/製造商)	型號	序號	校正日期	下次校正日期
Spectrum Analyzer ROHDE & SCHWARZ	FSV40	100980	Apr. 17, 2018	Apr. 16, 2019

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The measurement uncertainty is 207Hz, which is calculated as per the document ETSI TR 100 028. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

6.4 測試配置

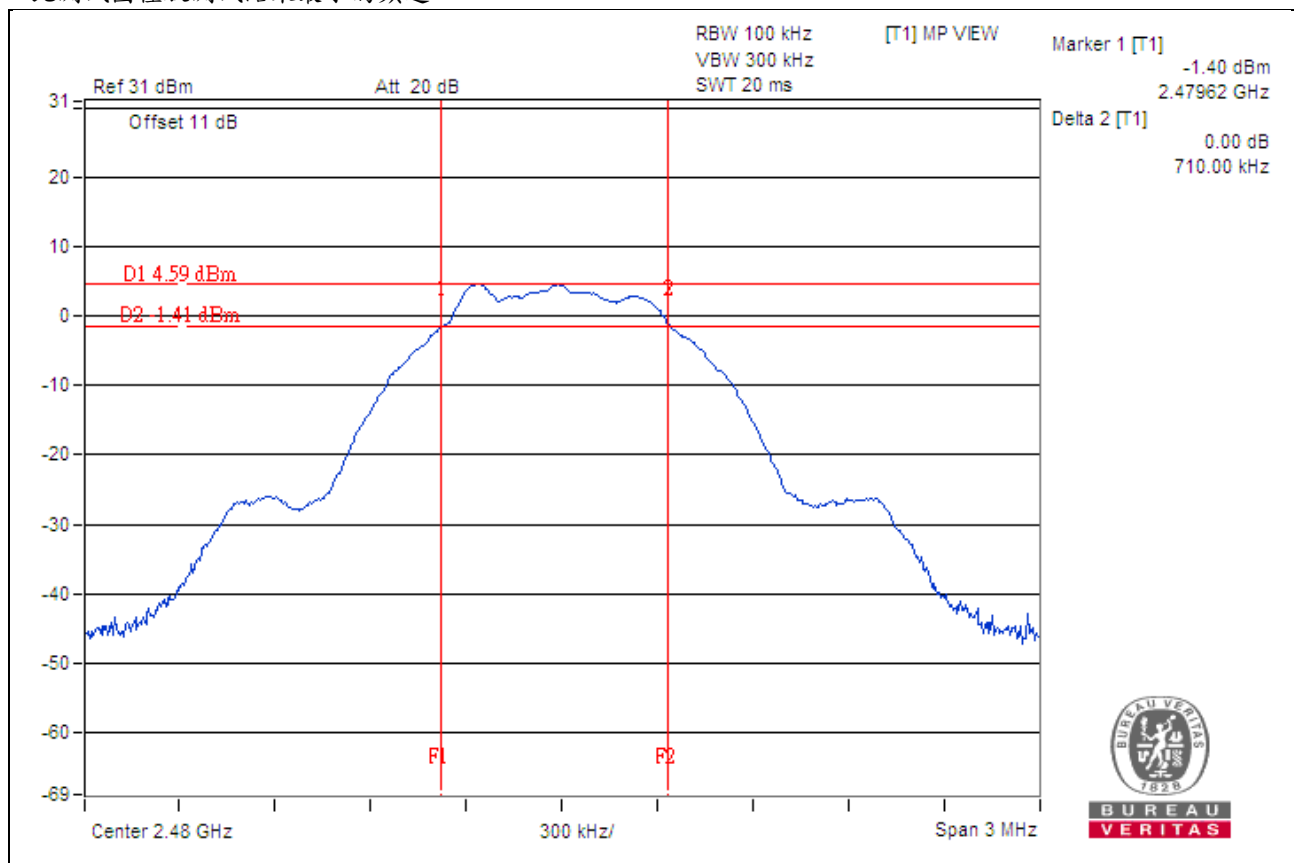


6.5 量測結果

操作模式	發射	測試日期	108 年 01 月 14 日
量測場地溫度	25°C	量測場地濕度	60%RH
測試者	吳俊樺		

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	0.72	0.5	Pass
19	2440	0.72	0.5	Pass
39	2480	0.71	0.5	Pass

**此測試圖僅放測試結果最小的頻道。



6.6 量測結果判定

依據測試數據結果，符合低功率射頻器材技術規範之要求。

7 峰值傳導輸出功率之量測

7.1 適用標準

請見本報告3.1節第6項的規定。

7.2 量測方法

- 將待測物輸出經由衰減器接到功率計上。
- 設定待測物處於連續發射狀態。
- 計算其輸出功率峰值。

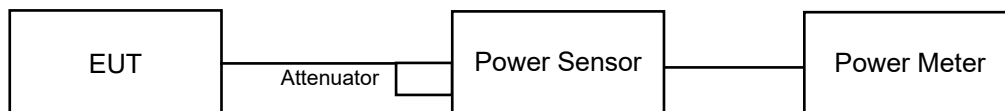
7.3 量測儀器

儀器名稱 (廠牌/製造商)	型號	序號	校正日期	下次校正日期
Power Meter Anritsu	ML2495A	1232002	Dec. 17, 2018	Dec. 16, 2019
Power Sensor Anritsu	MA2411B	1207325	Dec. 17, 2018	Dec. 16, 2019

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

- The measurement uncertainty is 1.393dB, which is calculated as per the document ETSI TR 100 028. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

7.4 測試配置



7.5 量測結果

操作模式	發射	測試日期	108 年 01 月 14 日
量測場地溫度	25°C	量測場地濕度	60%RH
測試者	吳俊樺		

For Peak Power

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	2.28	3.58	30.00	Pass
19	2440	2.63	4.20	30.00	Pass
39	2480	2.28	3.58	30.00	Pass

For Average Power

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	2.080	3.18
19	2440	2.443	3.88
39	2480	2.109	3.24

7.6 量測結果判定

依據測試數據結果，符合低功率射頻器材技術規範之要求。

8 功率頻譜密度之量測

8.1 適用標準

請見本報告3.1節第7項的規定。

8.2 量測方法

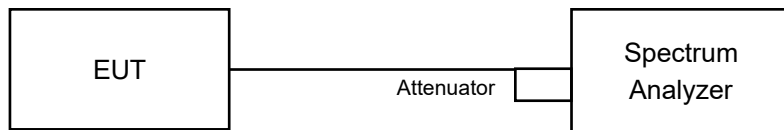
- 將待測物之天線埠經由適當之衰減直接連至測試儀器。
- 設定解析頻寬為3kHz，視訊頻寬為10kHz，掃描時間為auto。
- 掃描頻寬設於足夠觀察發射機所產生的主頻信號，並找到最大的峰值準位。
- 校正後的值，其峰值位準必須不大於8dBm / per 3kHz。

8.3 量測儀器

儀器名稱 (廠牌/製造商)	型號	序號	校正日期	下次校正日期
Spectrum Analyzer ROHDE & SCHWARZ	FSV40	100980	Apr. 17, 2018	Apr. 16, 2019

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The measurement uncertainty is 207Hz, which is calculated as per the document ETSI TR 100 028. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

8.4 測試配置

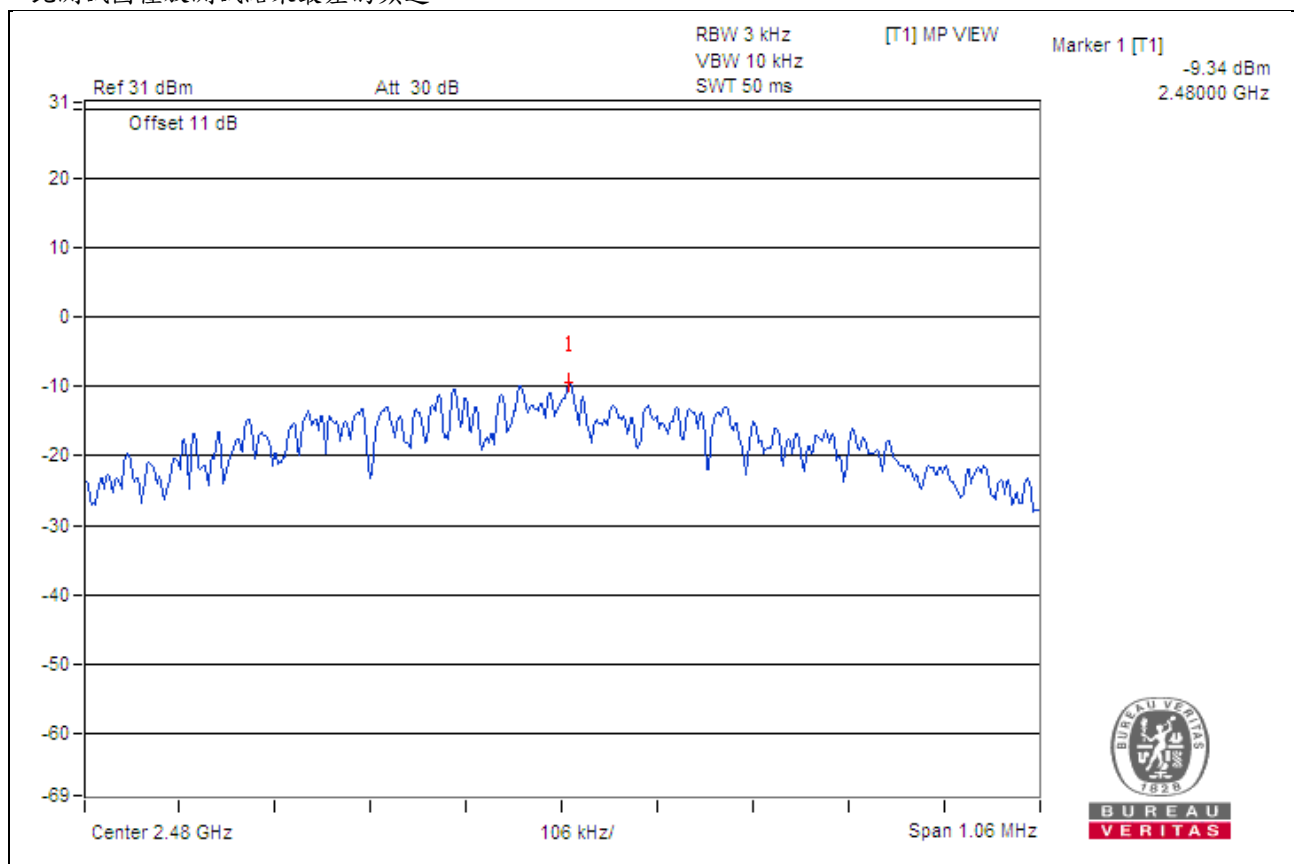


8.5 量測結果

操作模式	發射	測試日期	108 年 01 月 14 日
量測場地溫度	25°C	量測場地濕度	60%RH
測試者	吳俊樺		

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	2402	-9.86	8.00	Pass
19	2440	-10.38	8.00	Pass
39	2480	-9.34	8.00	Pass

**此測試圖僅放測試結果最差的頻道。



8.6 量測結果判定

依據測試數據結果，符合低功率射頻器材技術規範之要求。

9 檢測實驗室基本資料

立德國際商品試驗有限公司桃園分公司提供產業界最佳的檢測以及諮詢服務。
本公司為ISO/IEC 17025認可實驗室。

如您有任何問題或建議，請與下列實驗室聯絡：

林口 EMC / RF 實驗室：

Tel: 886-2-26052180

Fax: 886-2-26051924

新竹 EMC / RF 及通訊實驗室：

Tel: 886-3-6668565

Fax: 886-3-6668323

華亞 EMC / RF / Safety 實驗室：

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

您也可以在我们的網站內找到各實驗室的地圖。

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