

低功率射頻器材技術規範測試報告

Bluetooth-LE (DTS)

報告編號	RTBHSK-WTW-P21040772-1
申請者	Silicon Laboratories Finland Oy
產品名稱	Bluetooth Low Energy wireless radio module
型號	BGM210P32A
製造廠商	Silicon Laboratories Finland Oy
商標或廠牌	Silicon Labs
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 110 年 05 月 18 日

報告簽署人簽章:

陳志偉



目 錄

報告發行紀錄	4
1 低功率射頻器材量測記錄表	6
2 一般敘述	7
2.1 待測設備	7
2.2 輔助測試之週邊設備描述	10
2.3 測試架構圖	10
3 適用規範	11
3.1 規範要求和參考	11
3.2 限制使用之頻帶	13
4 帶外發射之量測	14
4.1 適用標準	14
4.2 量測方法	14
4.3 量測儀器	15
4.4 測試配置	16
4.5 場強度之計算	17
4.6 量測結果	18
4.6.1 發射諧波	18
4.6.2 接收諧波	32
4.6.3 其它不必要之訊號	34
4.7 配置照片	35
4.8 帶外發射之量測 (傳導)	36
4.9 量測結果判定	39
5 電源線傳導干擾之量測	40
5.1 適用標準	40
5.2 量測方法	40
5.3 量測儀器	40
5.4 測試配置	41
5.5 干擾值之計算	41
5.6 量測結果	42
5.7 量測結果判定	43
5.8 配置照片	43
6 發射(6 dB)頻寬之要求	44
6.1 適用標準	44
6.2 量測方法	44
6.3 量測儀器	44
6.4 測試配置	44
6.5 量測結果	45
6.6 量測結果判定	46
7 峰值傳導輸出功率之量測	47
7.1 適用標準	47
7.2 量測方法	47
7.3 量測儀器	47
7.4 測試配置	47
7.5 量測結果	48
7.6 量測結果判定	48

8	功率頻譜密度之量測	49
8.1	適用標準	49
8.2	量測方法	49
8.3	量測儀器	49
8.4	測試配置	49
8.5	量測結果	50
8.6	量測結果判定	51
9	檢測實驗室基本資料	52
附錄 A: EUT + Dipole antenna 量測		53

報告發行紀錄

Issue No.	Description	Date Issued
RTBHSK-WTW-P21040772-1	Original release	110 年 05 月 18 日

證 明 書

發行日期：110 年 05 月 18 日

產 品 名 稱：Bluetooth Low Energy wireless radio module
商 標：Silicon Labs
型 號：BGM210P32A
申 請 者：Silicon Laboratories Finland Oy
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：BGM210P32A)，收件日期 108 年 04 月 08 日，於 108 年 04 月 13 日至 108 年 09 月 17 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 ！

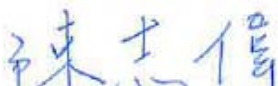
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簡 佳 琪 / 專 員

， 日 期：

110 年 05 月 18 日

審 核 者：


陳 志 偉 / 高 級 專 案 工 程 師

， 日 期：

110 年 05 月 18 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: Silicon Laboratories Finland Oy

製造廠商: Silicon Laboratories Finland Oy

申請廠商地址: Alberga Business Park - Bldg D/Floor 5, Bertel Jungin aukio 3, 02600 ESPOO, FINLAND

廠牌: Silicon Labs

產品名稱: Bluetooth Low Energy wireless radio module

型號: BGM210P32A

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
6	電波暴露量	低功率射頻器材技術規範 6.20.2 節	合格(註 2)

備註:

- 量測結果之判定不考慮量測不確定度的貢獻。
- 電波暴露量量測結果請參照 BV 報告編號: RTBHSK-WTW-P21040772

2 一般敘述

2.1 待測設備

產品名稱：	Bluetooth Low Energy wireless radio module
型號：	BGM210P32A
額定電源：	3.3Vdc from host equipment
調變方式：	GFSK
傳輸速率：	Bluetooth 1M Bluetooth 2M
載波頻率：	Bluetooth 1M: 2402 ~ 2480MHz Bluetooth 2M: 2404 ~ 2478MHz
頻道數：	Bluetooth 1M: 40 Bluetooth 2M: 38
發射功率 (Peak power):	Bluetooth 1M: 19.77dBm Bluetooth 2M: 19.96dBm
天線種類：	見註 1
電源線類別：	NA
信號線類別：	見註 2
配件：	見註 2

註1: 待測設備搭配測試的天線如下。

Ant. Connector	Chip antenna: NA Dipole antenna: SMA (Male)	
Brand	Chip antenna: AMOTECH Co., Ltd. Dipole antenna: Pulse Electronics	
Model	Chip antenna: AMAN301512ST01 Dipole antenna: W1030	
Ant. Type	Dipole antenna with the theoretical	On board ceramic chip antenna
Peak Gain (dBi)	2.14	1.86

*Dipole antenna 為測試周邊，其目的為驗證External function，測試結果於附錄A紀錄。

*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2: 待測設備使用以下配件。

*本案器材申請者切結不提供隨貨配件，配件由實驗室及申請者提供的非隨貨配件併同檢測。產品之照片請參照BV CPS報告編號：BHSK-WTW-P21040772，非隨貨配件之照片請參照BV CPS報告編號：BHSK-WTW-P21040772_SU，測試設置照片請參照BV CPS報告編號：BHSK-WTW-P21040772_TSup。

非隨貨配件				
配件	廠牌	型號	規格	備註
Generic USB Cable	Generic	Unknown	0.95m	申請者提供
Silicon Lab's Evaluation Board	Silicon Lab	BRD4001A	-	申請者提供
RF cable	Silicon Lab	Unknown	0.15m	申請者提供
Dipole Antenna	Pulse Electronics	W1030	-	申請者提供

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	Bluetooth 1M: Ch 0, 19, 38, 39 Bluetooth 2M: Ch 1, 19, 38	Bluetooth 2M: Ch 1
	其它不必要之訊號	Bluetooth 2M: Ch 1	
電源線傳導干擾		Bluetooth 2M: Ch 1	

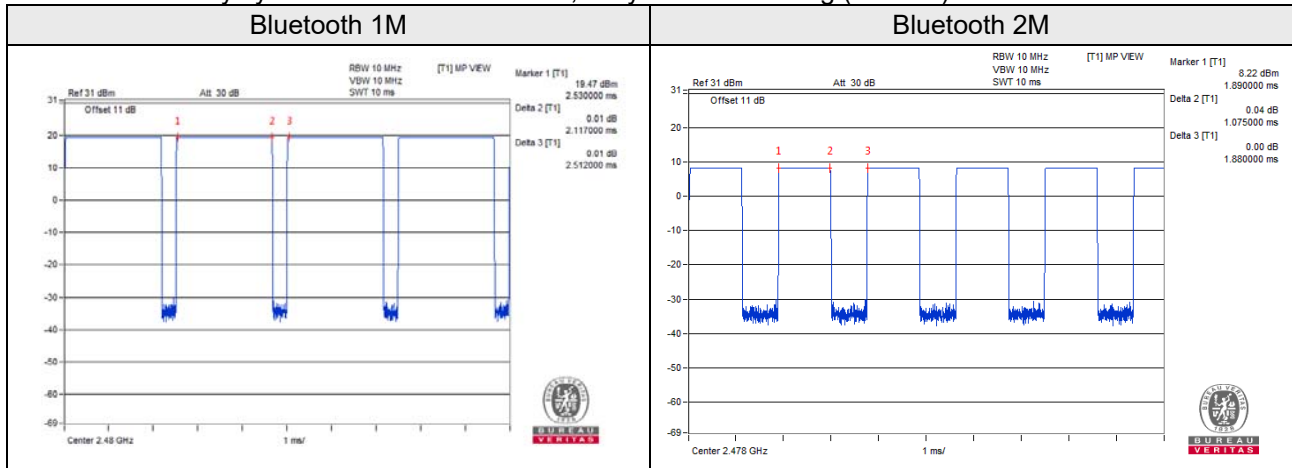
註4: 此待測設備，經評估三個正交軸方位評估測試擺設方式：平躺、側放、垂直，以垂直為最大干擾值之位置，故以此最大干擾值之擺放方式進行最終量測，並將測試結果紀錄。

註5: Duty cycle of test signal.

Duty cycle of test signal is < 98 %, duty factor shall be considered.

Bluetooth 1M: Duty cycle = $2.117/2.512 = 0.843$, Duty factor = $10 * \log(1/0.843) = 0.74$

Bluetooth 2M: Duty cycle = $1.075/1.880 = 0.572$, Duty factor = $10 * \log(1/0.572) = 2.43$



此裝置各頻道的中心頻率如下：

Bluetooth 1M 頻段：

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (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

* That the channels 2402MHz, 2426MHz, and 2480MHz are used for primary advertising only, and these advertisement packets are never being sent over the 2M PHY, meaning that when testing band edges the 2M PHY should not be taken into account with the upper and lower channels.

Bluetooth 2M 頻段：

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
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		
10	2422	20	2442	30	2462		

*That the channels 2402MHz, 2426MHz, and 2480MHz are used for primary advertising only, and these advertisement packets are never being sent over the 2M PHY, meaning that when testing band edges the 2M PHY should not be taken into account with the upper and lower channels.

詳細之規格請參考使用說明書。

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。

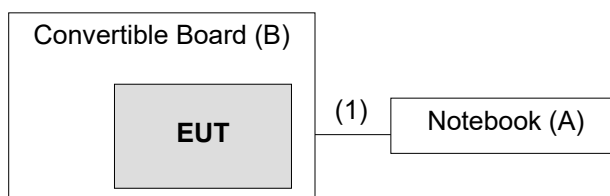
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	Lenovo	81A4	YD02TWF5	FCC DoC Approved	-
B.	Convertible Board	NA	NA	NA	NA	Provided by client
C.	Dipole Antenna	Pulse Electronics	W1030	NA	NA	Provided by client

Note:

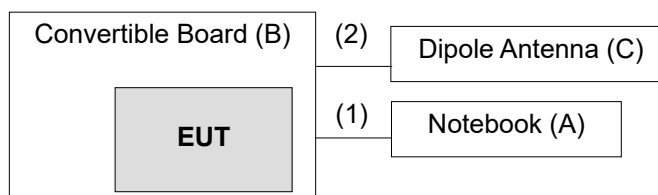
1. All power cords of the above support units are non-shielded (1.8m).
2. Items A acted as a communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Generic USB Cable	1	1	Y	0	-
2.	RF cable	1	0.15	-	0	Provided by client

2.3 測試架構圖



附錄 A



3 適用規範

3.1 規範要求和參考

(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 - 1.34	614	1.63	*100	30
1.34 - 30	824/f	2.19/f	*180/f ²	30
30 - 300	27.5	0.073	0.2	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。

4.3 量測儀器

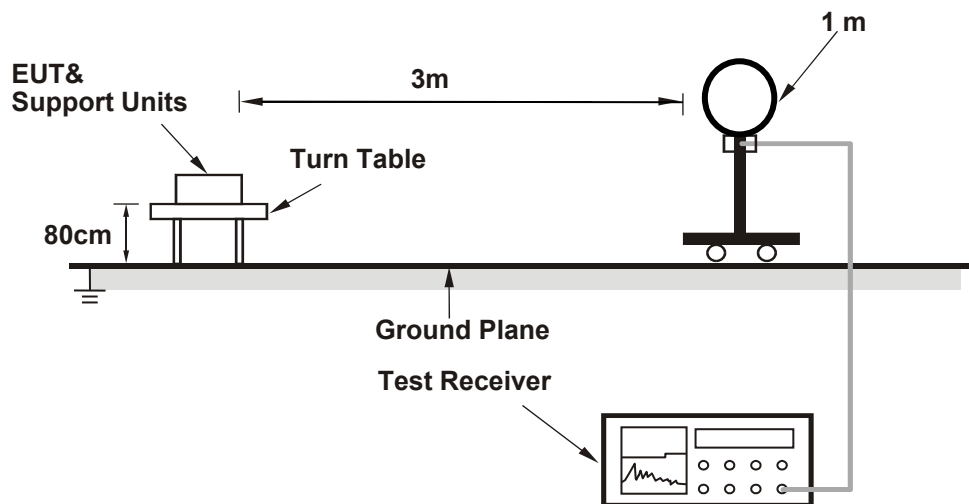
儀器名稱 (廠牌/製造商)	型號	序號	校正日期	下次校正日期
Test Receiver KEYSIGHT	N9038A	MY51210203	Mar. 18, 2019	Mar. 17, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 25, 2018	Sep. 24, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 21, 2018	Nov. 20, 2019
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 25, 2018	Nov. 24, 2019
Loop Antenna EMCI	EM-6879	269	Sep. 07, 2018	Sep. 06, 2019
	HLA 6121	45745	Jul. 01, 2019	Jun. 30, 2020
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Aug. 08, 2018	Aug. 07, 2019
			Jul. 11, 2019	Jul. 10, 2020
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Feb. 19, 2019	Feb. 18, 2020
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM80 00	CABLE-CH9-02 (248780+171006)	Jan. 19, 2019	Jan. 18, 2020
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Aug. 08, 2018	Aug. 07, 2019
			Jul. 11, 2019	Jul. 10, 2020
RF signal cable Woken	8D-FB	Cable-CH9-01	Jul. 31, 2018	Jul. 30, 2019
			Jul. 30, 2019	Jul. 29, 2020
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	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 Chamber 9.
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 $k=2$.

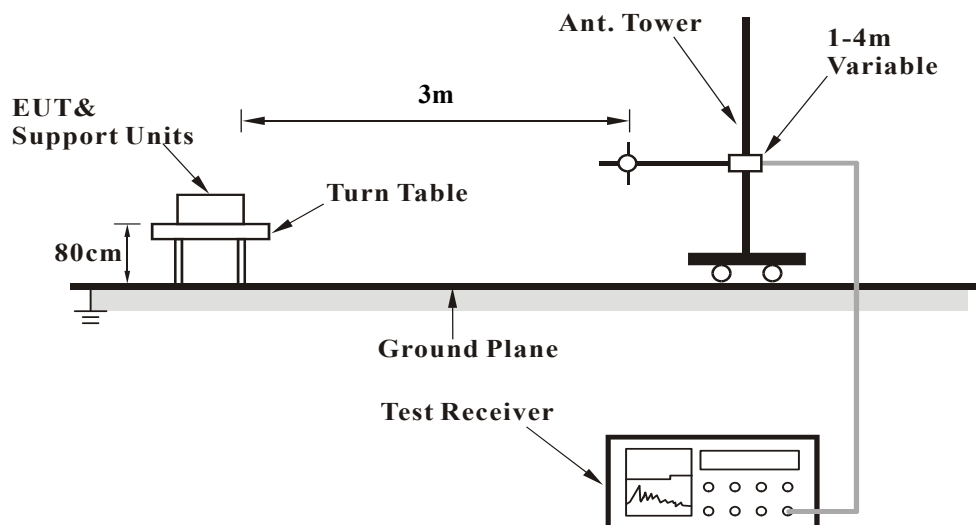
Measurement	Frequency	Uncertainty
Radiated emissions	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.59 dB
	200MHz ~ 1000MHz	3.60 dB
	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

4.4 測試配置

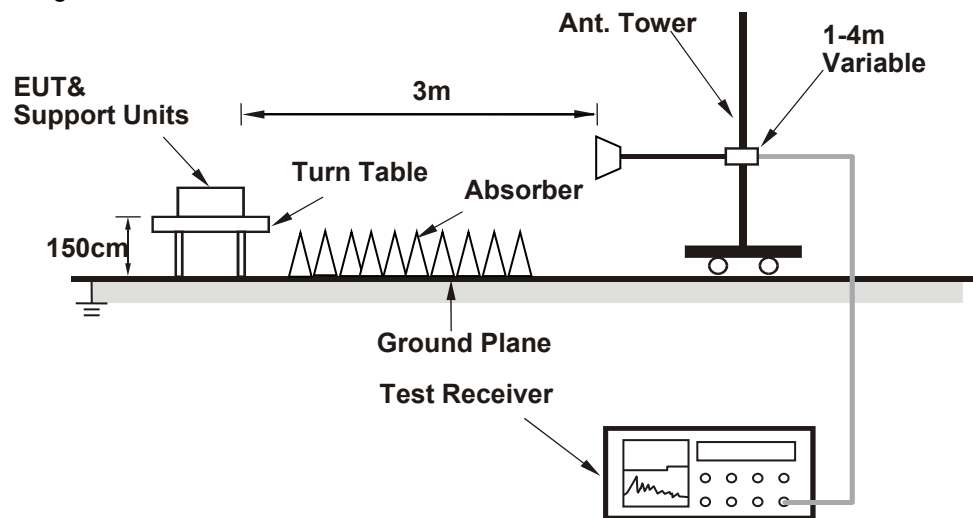
<Frequency Range below 30MHz>



<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

Bluetooth 1M

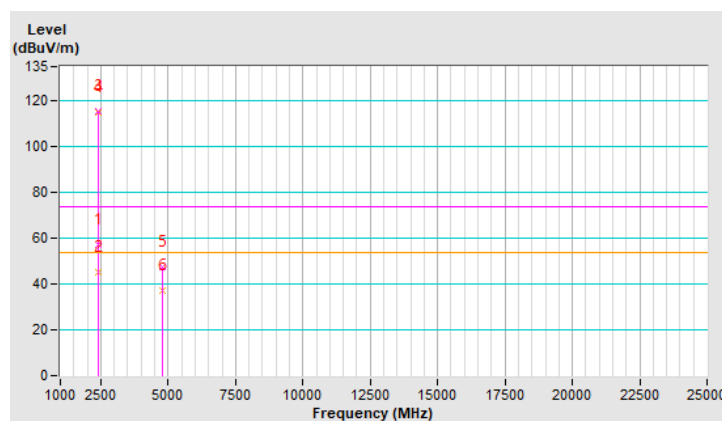
操作模式：	發射	調變技術：	GFSK
基本波頻率：	CH 0：2402 MHz	測試儀器：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量測場地溫度：	22°C	量測場地濕度：	68%RH
測試日期：	108 年 04 月 16 日	測試者：	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.1 PK	74.0	-16.9	1.68 H	348	25.3	31.8
2	2390.00	45.3 AV	54.0	-8.7	1.68 H	348	13.5	31.8
3	*2402.00	115.8 PK			1.60 H	340	84.0	31.8
4	*2402.00	115.0 AV			1.60 H	340	83.2	31.8
5	4804.00	47.2 PK	74.0	-26.8	1.80 H	332	43.5	3.7
6	4804.00	37.2 AV	54.0	-16.8	1.80 H	332	33.5	3.7
	7206.00	-	-	-	-	-	-	-
	9608.00	-	-	-	-	-	-	-
	12010.00	-	-	-	-	-	-	-
	14412.00	-	-	-	-	-	-	-
	16814.00	-	-	-	-	-	-	-
	19216.00	-	-	-	-	-	-	-
	21618.00	-	-	-	-	-	-	-
	24020.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

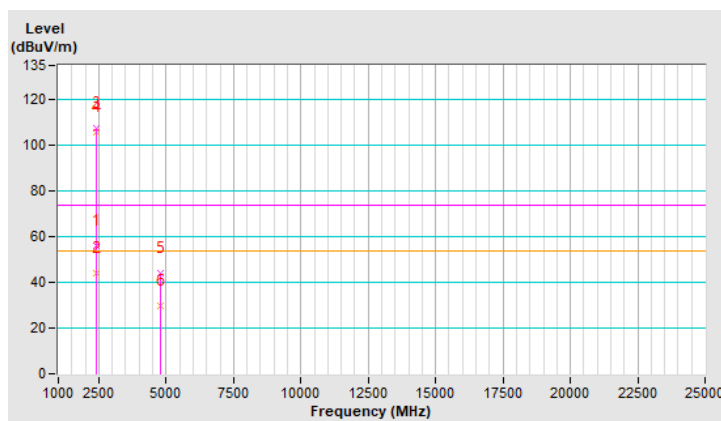


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 0 : 2402 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 04 月 16 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.3 PK	74.0	-17.7	1.10 V	260	24.5	31.8
2	2390.00	44.3 AV	54.0	-9.7	1.10 V	260	12.5	31.8
3	*2402.00	107.3 PK			1.10 V	260	75.5	31.8
4	*2402.00	105.8 AV			1.10 V	260	74.0	31.8
5	4804.00	44.1 PK	74.0	-29.9	2.21 V	160	40.4	3.7
6	4804.00	30.0 AV	54.0	-24.0	2.21 V	160	26.3	3.7
	7206.00	-	-	-	-	-	-	-
	9608.00	-	-	-	-	-	-	-
	12010.00	-	-	-	-	-	-	-
	14412.00	-	-	-	-	-	-	-
	16814.00	-	-	-	-	-	-	-
	19216.00	-	-	-	-	-	-	-
	21618.00	-	-	-	-	-	-	-
	24020.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

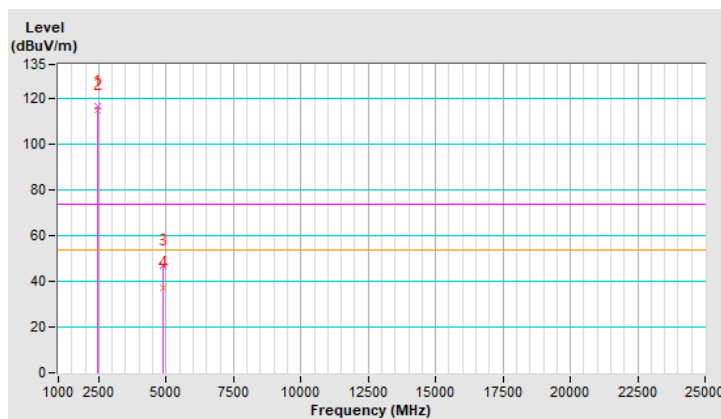


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 19 : 2440 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 04 月 16 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	116.6 PK			1.78 H	338	84.8	31.8
2	*2440.00	115.1 AV			1.78 H	338	83.3	31.8
3	4880.00	47.1 PK	74.0	-26.9	1.90 H	16	43.6	3.5
4	4880.00	37.3 AV	54.0	-16.7	1.90 H	16	33.8	3.5
	7320.00	-	-	-	-	-	-	-
	9760.00	-	-	-	-	-	-	-
	12200.00	-	-	-	-	-	-	-
	14640.00	-	-	-	-	-	-	-
	17080.00	-	-	-	-	-	-	-
	19520.00	-	-	-	-	-	-	-
	21960.00	-	-	-	-	-	-	-
	24400.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

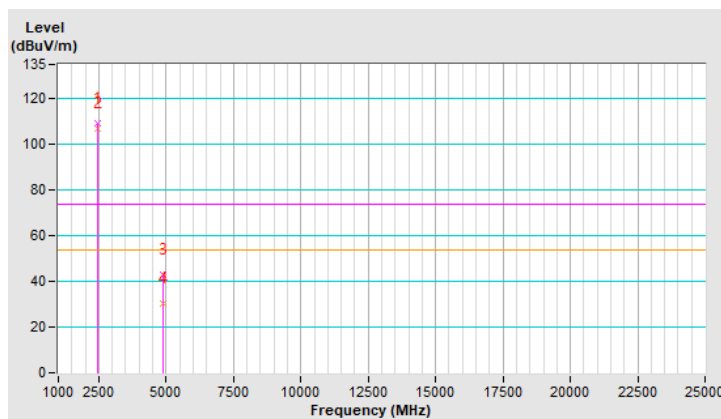


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 19 : 2440 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 04 月 16 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	109.0 PK			1.08 V	263	77.2	31.8
2	*2440.00	107.2 AV			1.08 V	263	75.4	31.8
3	4880.00	43.1 PK	74.0	-30.9	2.58 V	175	39.6	3.5
4	4880.00	30.4 AV	54.0	-23.6	2.58 V	175	26.9	3.5
	7320.00	-	-	-	-	-	-	-
	9760.00	-	-	-	-	-	-	-
	12200.00	-	-	-	-	-	-	-
	14640.00	-	-	-	-	-	-	-
	17080.00	-	-	-	-	-	-	-
	19520.00	-	-	-	-	-	-	-
	21960.00	-	-	-	-	-	-	-
	24400.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.



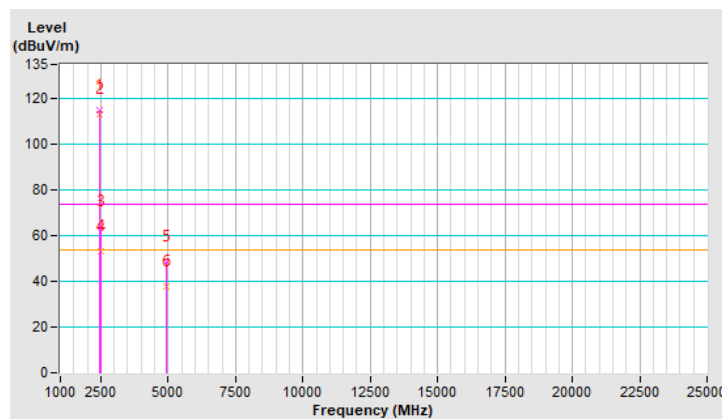
操作模式：	發射	調變技術：	GFSK
基本波頻率：	CH 38：2478 MHz	測試儀器：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量測場地溫度：	22°C	量測場地濕度：	68%RH
測試日期：	108 年 05 月 10 日	測試者：	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2478.00	114.8 PK			1.43 H	13	83.0	31.8
2	*2478.00	113.3 AV			1.43 H	13	81.5	31.8
3	2483.50	63.8 PK	74.0	-10.2	1.40 H	13	32.0	31.8
4	2483.50	53.3 AV	54.0	-0.7	1.40 H	13	21.5	31.8
5	4956.00	48.6 PK	74.0	-25.4	1.94 H	355	44.8	3.8
6	4956.00	37.7 AV	54.0	-16.3	1.94 H	355	33.9	3.8
	7434.00	-	-	-	-	-	-	-
	9912.00	-	-	-	-	-	-	-
	12390.00	-	-	-	-	-	-	-
	14868.00	-	-	-	-	-	-	-
	17346.00	-	-	-	-	-	-	-
	19824.00	-	-	-	-	-	-	-
	22302.00	-	-	-	-	-	-	-
	24780.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

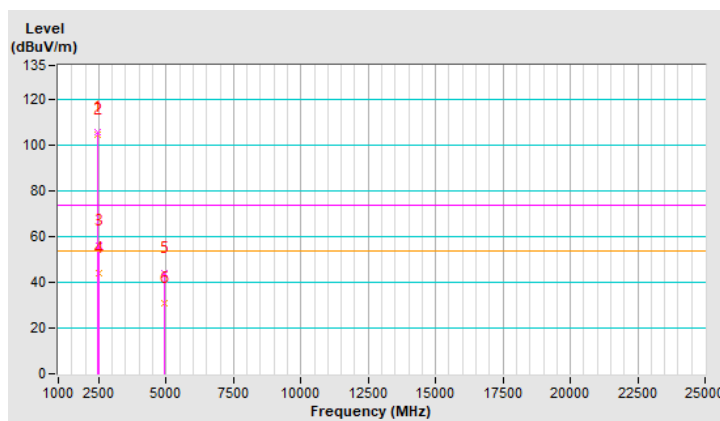


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 38 : 2478 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 05 月 10 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2478.00	106.1 PK			1.69 V	349	74.3	31.8
2	*2478.00	104.9 AV			1.69 V	349	73.1	31.8
3	2483.50	55.8 PK	74.0	-18.2	1.68 V	344	24.0	31.8
4	2483.50	44.0 AV	54.0	-10.0	1.68 V	344	12.2	31.8
5	4956.00	44.2 PK	74.0	-29.8	2.98 V	177	40.4	3.8
6	4956.00	31.0 AV	54.0	-23.0	2.98 V	177	27.2	3.8
	7434.00	-	-	-	-	-	-	-
	9912.00	-	-	-	-	-	-	-
	12390.00	-	-	-	-	-	-	-
	14868.00	-	-	-	-	-	-	-
	17346.00	-	-	-	-	-	-	-
	19824.00	-	-	-	-	-	-	-
	22302.00	-	-	-	-	-	-	-
	24780.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

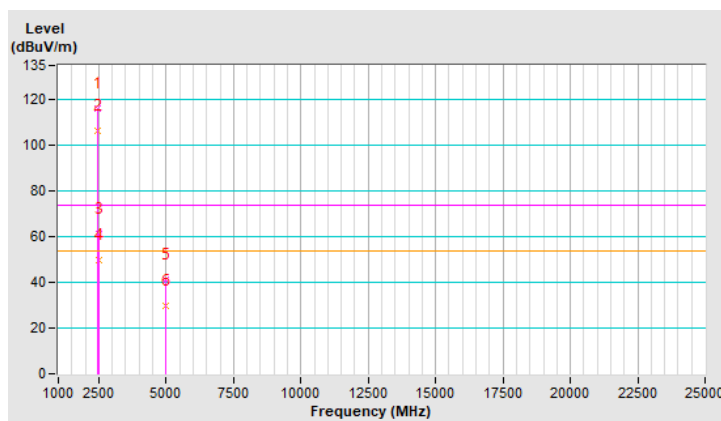


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 39 : 2480 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 04 月 16 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	116.0 PK			1.70 H	345	84.2	31.8
2	*2480.00	106.5 AV			1.70 H	345	74.7	31.8
3	2483.50	61.3 PK	74.0	-12.7	1.70 H	340	29.5	31.8
4	2483.50	49.6 AV	54.0	-4.4	1.70 H	340	17.8	31.8
5	4960.00	41.2 PK	74.0	-32.8	1.88 H	12	37.4	3.8
6	4960.00	29.5 AV	54.0	-24.5	1.88 H	12	25.7	3.8
	7440.00	-	-	-	-	-	-	-
	9920.00	-	-	-	-	-	-	-
	12400.00	-	-	-	-	-	-	-
	14880.00	-	-	-	-	-	-	-
	17360.00	-	-	-	-	-	-	-
	19840.00	-	-	-	-	-	-	-
	22320.00	-	-	-	-	-	-	-
	24800.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

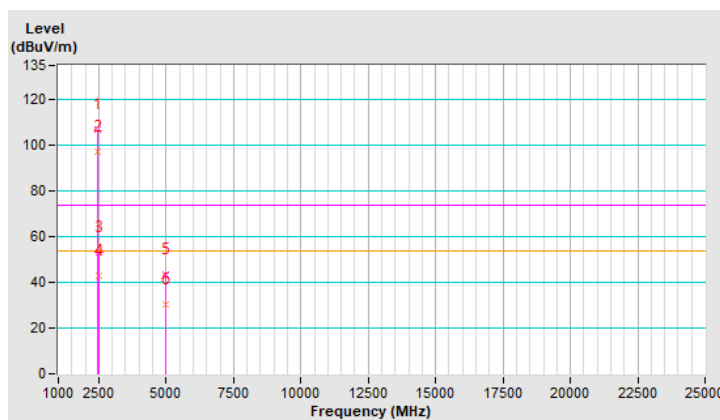


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 39 : 2480 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 05 月 29 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	106.8 PK			1.19 V	266	75.0	31.8
2	*2480.00	97.3 AV			1.19 V	266	65.5	31.8
3	2483.50	53.1 PK	74.0	-20.9	1.09 V	260	21.3	31.8
4	2483.50	43.0 AV	54.0	-11.0	1.09 V	260	11.2	31.8
5	4960.00	43.5 PK	74.0	-30.5	2.37 V	161	39.7	3.8
6	4960.00	30.1 AV	54.0	-23.9	2.37 V	161	26.3	3.8
	7440.00	-	-	-	-	-	-	-
	9920.00	-	-	-	-	-	-	-
	12400.00	-	-	-	-	-	-	-
	14880.00	-	-	-	-	-	-	-
	17360.00	-	-	-	-	-	-	-
	19840.00	-	-	-	-	-	-	-
	22320.00	-	-	-	-	-	-	-
	24800.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.



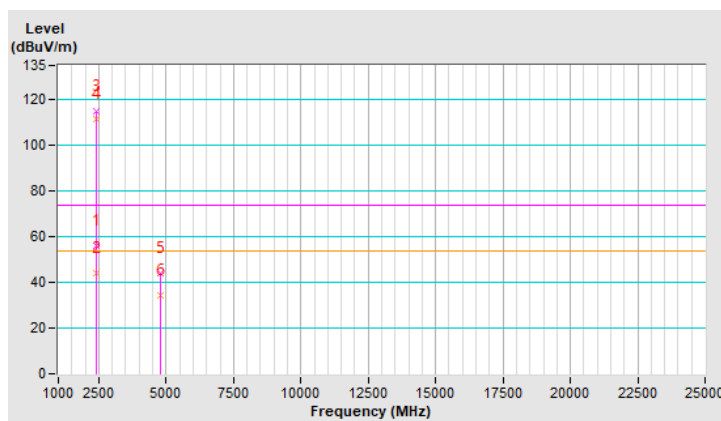
Bluetooth 2M

操作模式：	發射	調變技術：	GFSK
基本波頻率：	CH 1：2404 MHz	測試儀器：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量測場地溫度：	22°C	量測場地濕度：	68%RH
測試日期：	108 年 05 月 10 日	測試者：	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.0 PK	74.0	-18.0	1.35 H	344	24.2	31.8
2	2390.00	44.1 AV	54.0	-9.9	1.35 H	344	12.3	31.8
3	*2404.00	115.1 PK			1.40 H	350	83.3	31.8
4	*2404.00	111.5 AV			1.40 H	350	79.7	31.8
5	4808.00	44.3 PK	74.0	-29.7	2.08 H	300	40.6	3.7
6	4808.00	34.2 AV	54.0	-19.8	2.08 H	300	30.5	3.7
	7212.00	-	-	-	-	-	-	-
	9616.00	-	-	-	-	-	-	-
	12020.00	-	-	-	-	-	-	-
	14424.00	-	-	-	-	-	-	-
	16828.00	-	-	-	-	-	-	-
	19232.00	-	-	-	-	-	-	-
	21636.00	-	-	-	-	-	-	-
	24040.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

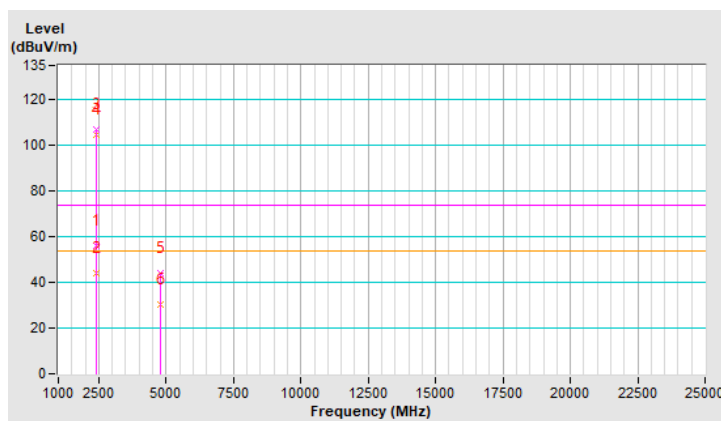


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 1 : 2404 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 05 月 10 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.1 PK	74.0	-17.9	1.19 V	258	24.3	31.8
2	2390.00	44.0 AV	54.0	-10.0	1.19 V	258	12.2	31.8
3	*2404.00	107.0 PK			1.28 V	255	75.2	31.8
4	*2404.00	104.4 AV			1.28 V	255	72.6	31.8
5	4808.00	44.0 PK	74.0	-30.0	2.88 V	169	40.3	3.7
6	4808.00	30.1 AV	54.0	-23.9	2.88 V	169	26.4	3.7
	7212.00	-	-	-	-	-	-	-
	9616.00	-	-	-	-	-	-	-
	12020.00	-	-	-	-	-	-	-
	14424.00	-	-	-	-	-	-	-
	16828.00	-	-	-	-	-	-	-
	19232.00	-	-	-	-	-	-	-
	21636.00	-	-	-	-	-	-	-
	24040.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

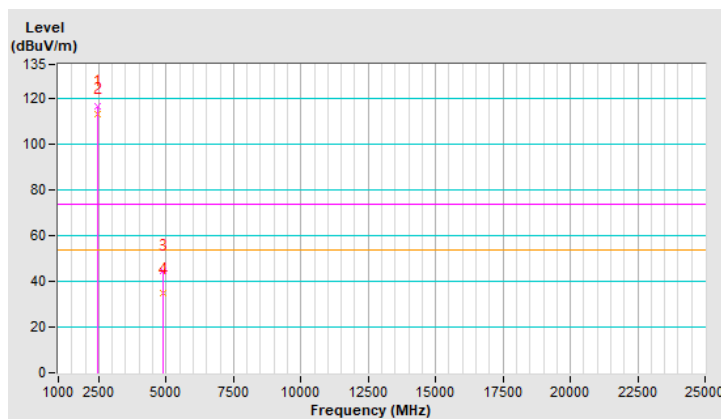


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 19 : 2440 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 04 月 16 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	116.5 PK			1.70 H	19	84.7	31.8
2	*2440.00	113.1 AV			1.70 H	19	81.3	31.8
3	4880.00	44.5 PK	74.0	-29.5	2.21 H	330	41.0	3.5
4	4880.00	34.6 AV	54.0	-19.4	2.21 H	330	31.1	3.5
	7320.00	-	-	-	-	-	-	-
	9760.00	-	-	-	-	-	-	-
	12200.00	-	-	-	-	-	-	-
	14640.00	-	-	-	-	-	-	-
	17080.00	-	-	-	-	-	-	-
	19520.00	-	-	-	-	-	-	-
	21960.00	-	-	-	-	-	-	-
	24400.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

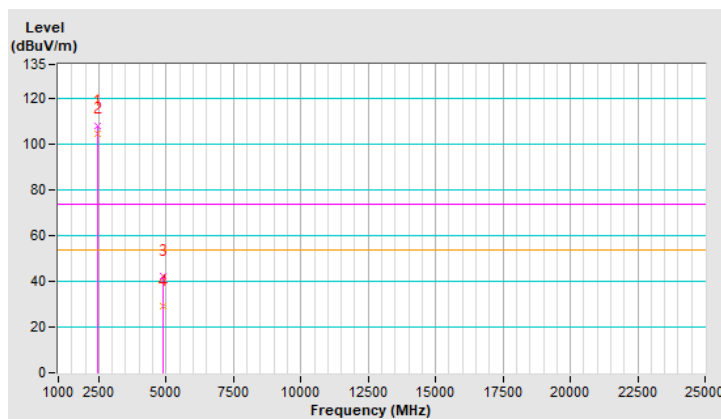


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 19 : 2440 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 04 月 16 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	108.0 PK			1.29 V	204	76.2	31.8
2	*2440.00	104.5 AV			1.29 V	204	72.7	31.8
3	4880.00	42.5 PK	74.0	-31.5	2.82 V	169	39.0	3.5
4	4880.00	29.4 AV	54.0	-24.6	2.82 V	169	25.9	3.5
	7320.00	-	-	-	-	-	-	-
	9760.00	-	-	-	-	-	-	-
	12200.00	-	-	-	-	-	-	-
	14640.00	-	-	-	-	-	-	-
	17080.00	-	-	-	-	-	-	-
	19520.00	-	-	-	-	-	-	-
	21960.00	-	-	-	-	-	-	-
	24400.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.



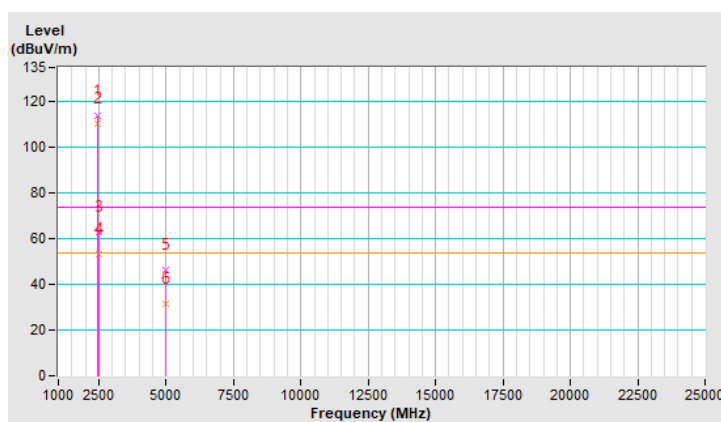
操作模式：	發射	調變技術：	GFSK
基本波頻率：	CH 38：2478 MHz	測試儀器：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量測場地溫度：	22°C	量測場地濕度：	68%RH
測試日期：	108 年 06 月 17 日	測試者：	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2478.00	114.1 PK			1.69 H	358	82.3	31.8
2	*2478.00	110.5 AV			1.69 H	358	78.7	31.8
3	2483.50	63.0 PK	74.0	-11.0	1.97 H	340	31.2	31.8
4	2483.50	53.0 AV	54.0	-1.0	1.97 H	340	21.2	31.8
5	4976.00	46.1 PK	74.0	-27.9	1.90 H	300	42.3	3.8
6	4976.00	31.7 AV	54.0	-22.3	1.90 H	300	27.9	3.8
	7434.00	-	-	-	-	-	-	-
	9912.00	-	-	-	-	-	-	-
	12390.00	-	-	-	-	-	-	-
	14868.00	-	-	-	-	-	-	-
	17346.00	-	-	-	-	-	-	-
	19824.00	-	-	-	-	-	-	-
	22302.00	-	-	-	-	-	-	-
	24780.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

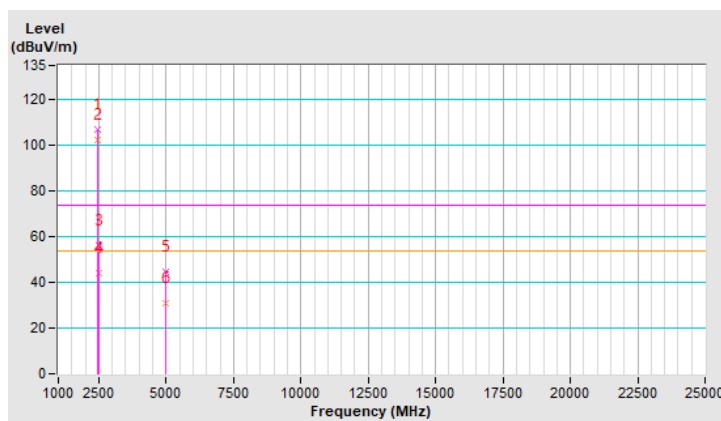


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 38 : 2478 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 06 月 17 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2478.00	107.0 PK			1.71 V	5	75.2	31.8
2	*2478.00	102.6 AV			1.71 V	5	70.8	31.8
3	2483.50	56.0 PK	74.0	-18.0	1.19 V	0	24.2	31.8
4	2483.50	44.0 AV	54.0	-10.0	1.19 V	0	12.2	31.8
5	4976.00	44.5 PK	74.0	-29.5	3.02 V	178	40.7	3.8
6	4976.00	31.1 AV	54.0	-22.9	3.02 V	178	27.3	3.8
	7434.00	-	-	-	-	-	-	-
	9912.00	-	-	-	-	-	-	-
	12390.00	-	-	-	-	-	-	-
	14868.00	-	-	-	-	-	-	-
	17346.00	-	-	-	-	-	-	-
	19824.00	-	-	-	-	-	-	-
	22302.00	-	-	-	-	-	-	-
	24780.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.



4.6.2 接收諧波

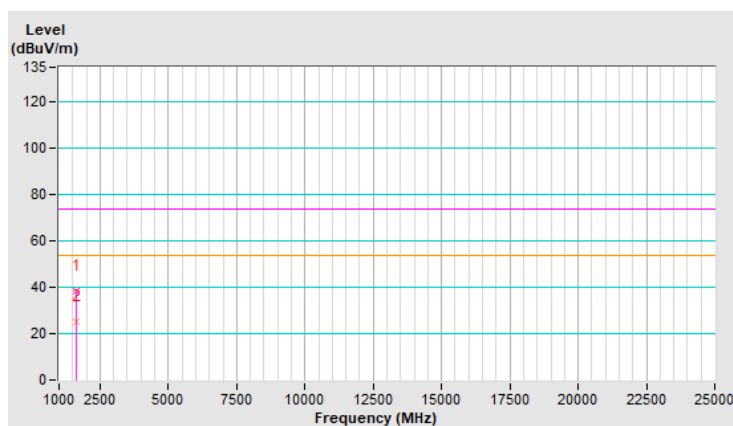
Bluetooth 2M

操作模式：	接收	調變技術：	GFSK
基本波頻率：	CH 1：2404 MHz	測試儀器：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz (RMS)
量測場地溫度：	22℃	量測場地濕度：	68%RH
測試日期：	108 年 09 月 17 日	測試者：	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1626.00	38.3 PK	74.0	-35.7	1.70 H	352	43.3	-5.0
2	1626.00	25.3 AV	54.0	-28.7	1.70 H	352	30.3	-5.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value



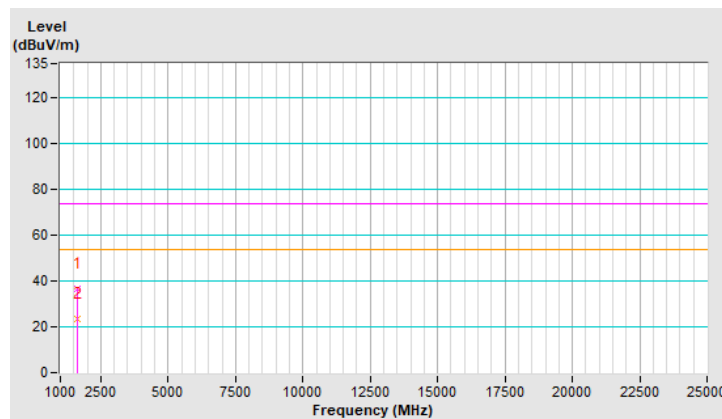
操作模式：	接收	調變技術：	GFSK
基本波頻率：	CH 1：2404 MHz	測試儀器：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz (RMS)
量測場地溫度：	22°C	量測場地濕度：	68%RH
測試日期：	108 年 09 月 17 日	測試者：	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1626.00	36.5 PK	74.0	-37.5	1.20 V	250	41.5	-5.0
2	1626.00	23.6 AV	54.0	-30.4	1.20 V	250	28.6	-5.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value



4.6.3 其它不必要之訊號

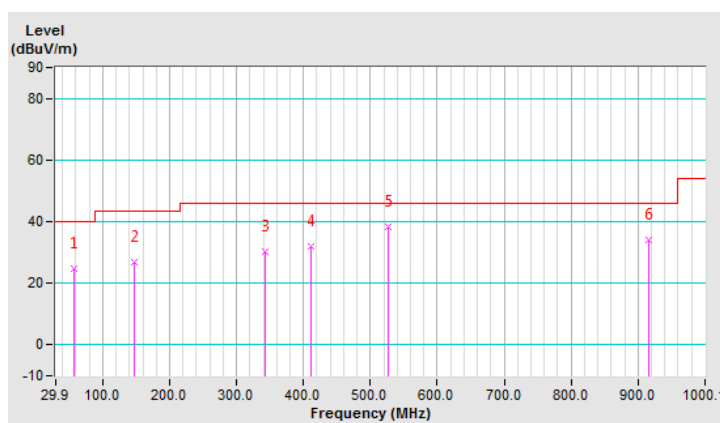
Bluetooth 2M

操作模式：	發射/接收	調變技術：	GFSK
基本波頻率：	CH 1：2404 MHz	測試儀器：	(QP) RB=VB=120kHz
量測場地溫度：	22°C	量測場地濕度：	68%RH
測試日期：	108 年 09 月 17 日	測試者：	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	57.07	24.8 QP	40.0	-15.2	1.50 H	94	39.1	-14.3
2	146.32	26.8 QP	43.5	-16.7	1.50 H	285	40.7	-13.9
3	342.30	30.4 QP	46.0	-15.6	1.01 H	21	41.7	-11.3
4	412.16	32.1 QP	46.0	-13.9	1.01 H	112	41.9	-9.8
5	526.64	38.3 QP	46.0	-7.7	1.50 H	327	45.6	-7.3
6	916.66	34.1 QP	46.0	-11.9	1.50 H	115	31.9	2.2

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report

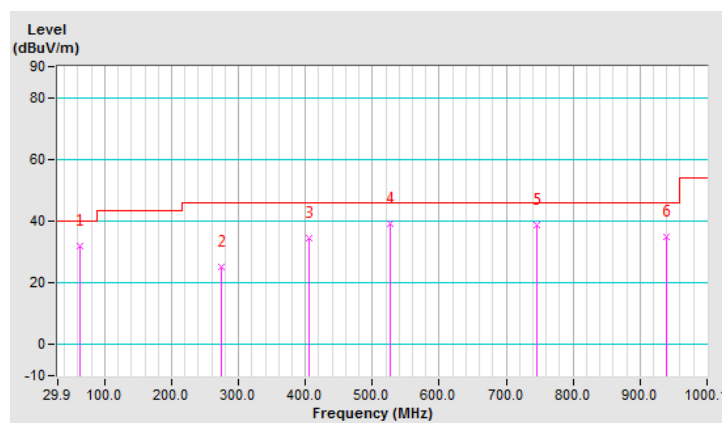


操作模式：	發射/接收	調變技術：	GFSK
基本波頻率：	CH 1：2404 MHz	測試儀器：	(QP) RB=VB=120kHz
量測場地溫度：	22°C	量測場地濕度：	68%RH
測試日期：	108 年 09 月 17 日	測試者：	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	62.89	32.1 QP	40.0	-7.9	1.49 V	126	46.9	-14.8
2	274.39	25.1 QP	46.0	-20.9	1.49 V	225	38.2	-13.1
3	406.34	34.5 QP	46.0	-11.5	1.00 V	9	44.4	-9.9
4	526.64	39.0 QP	46.0	-7.0	1.00 V	331	46.3	-7.3
5	745.91	38.7 QP	46.0	-7.3	1.49 V	285	40.1	-1.4
6	939.95	35.1 QP	46.0	-10.9	1.00 V	102	32.5	2.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report

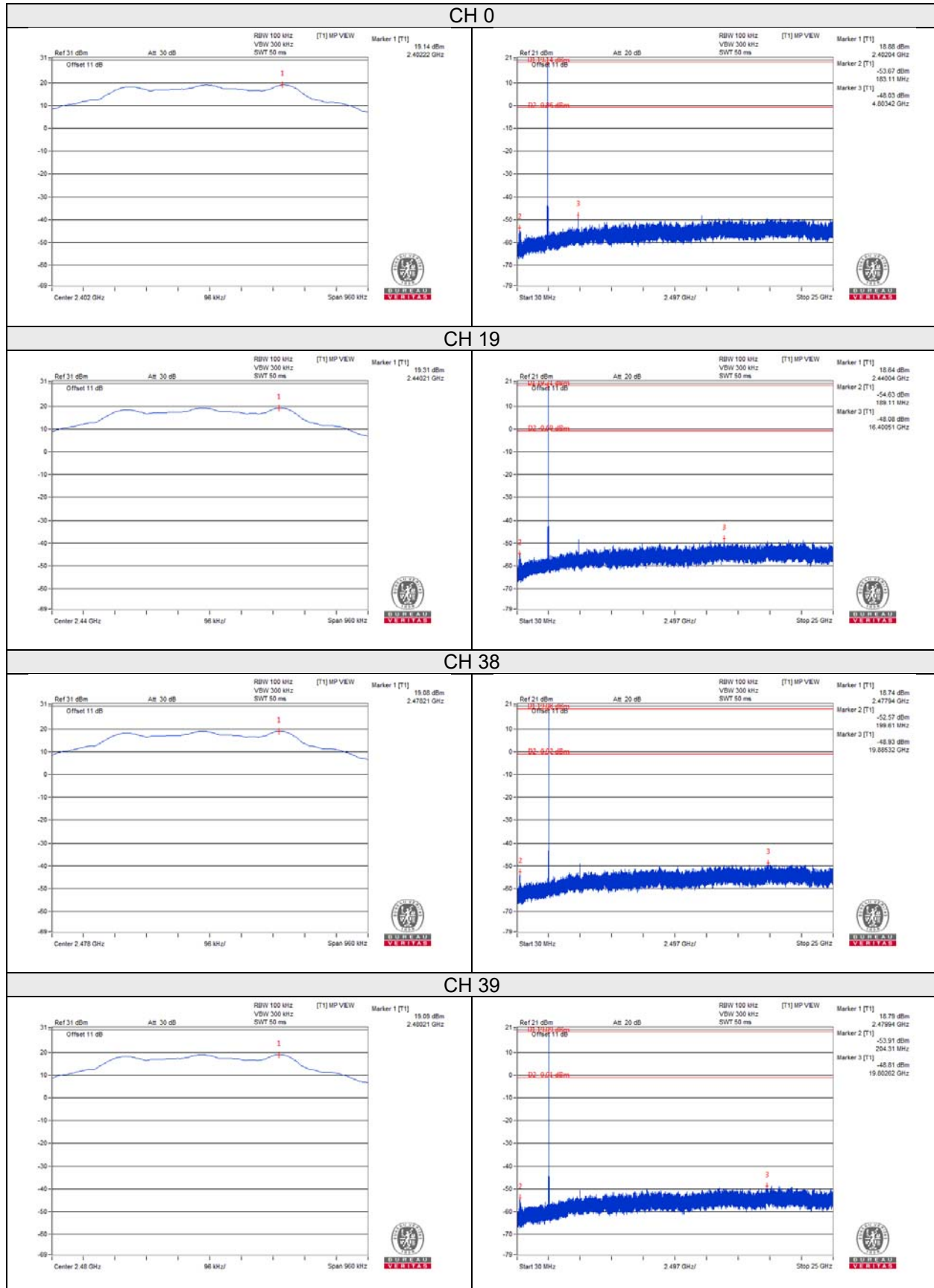


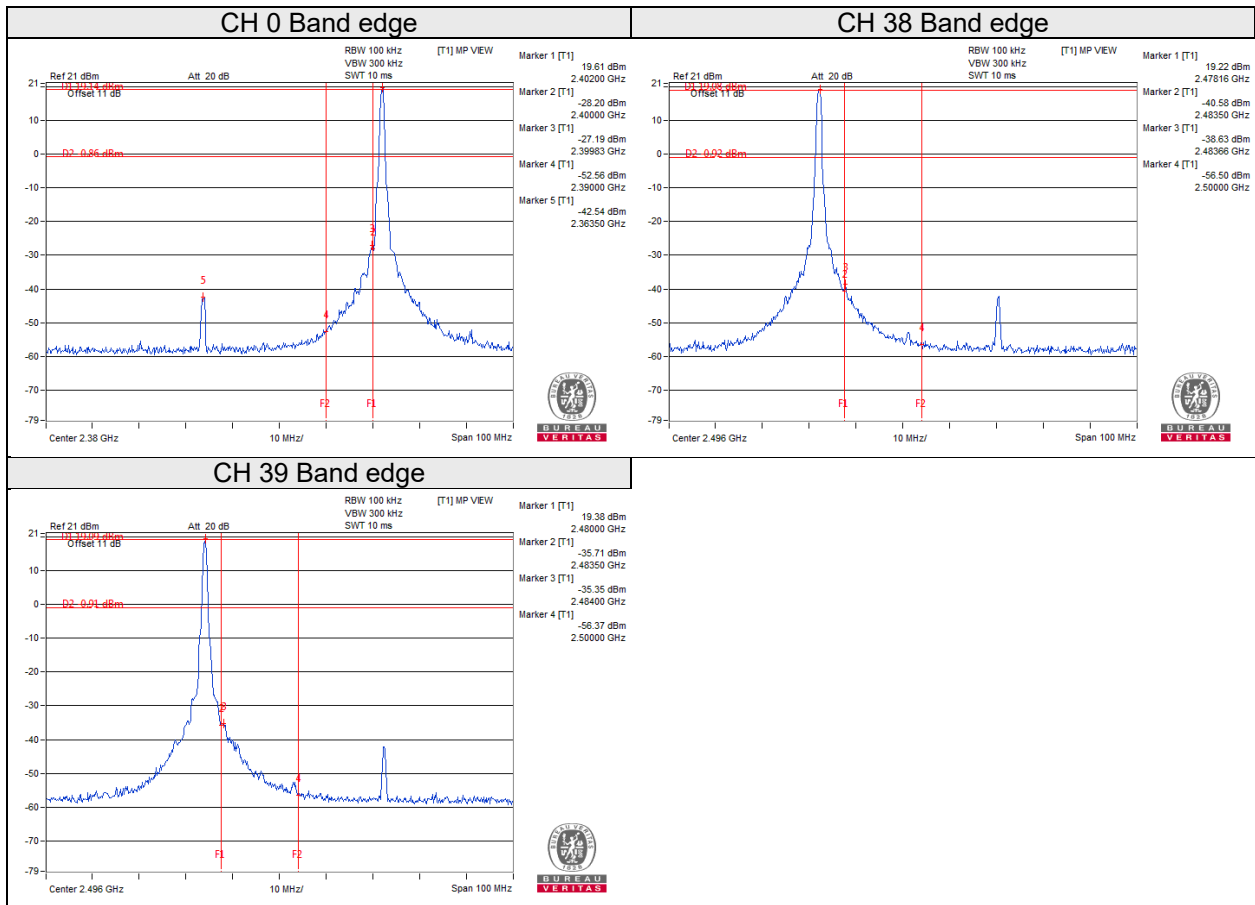
4.7 配置照片

請參閱附件測試設置照片(BV CPS 報告編號：BHSK-WTW-P21040772_TSup)。

4.8 帶外發射之量測 (傳導)

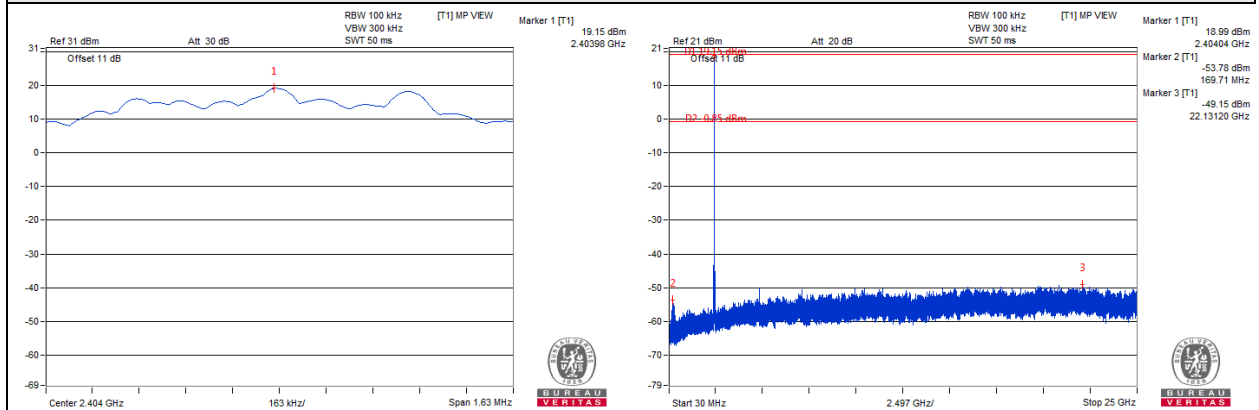
Bluetooth 1M



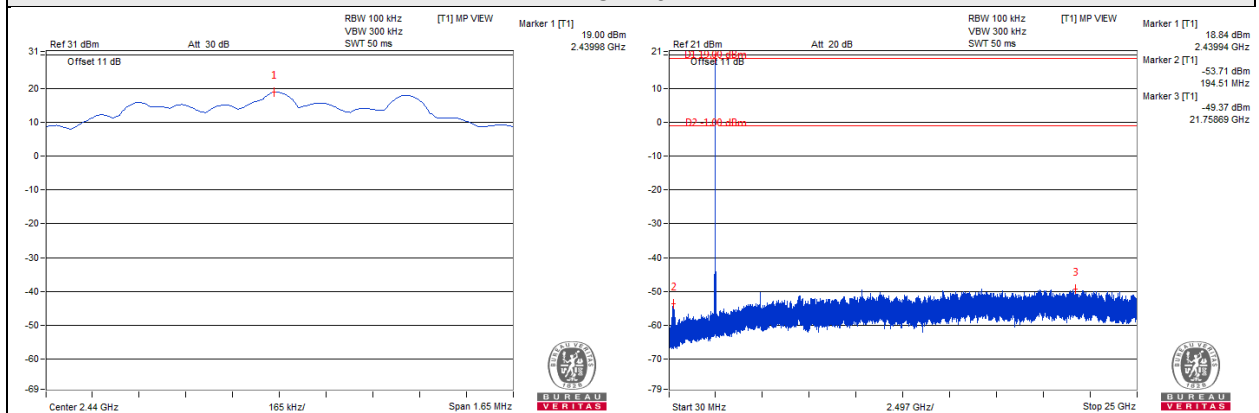


Bluetooth 2M

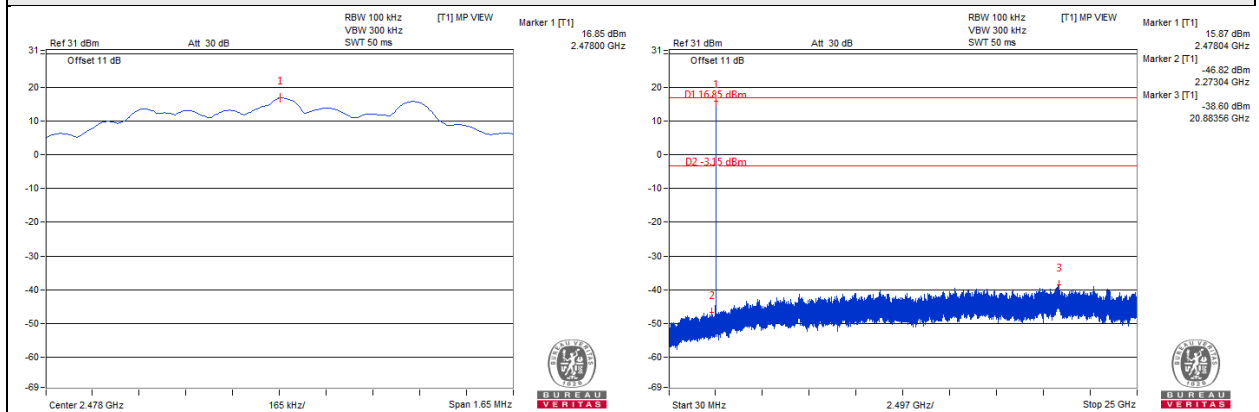
CH 1



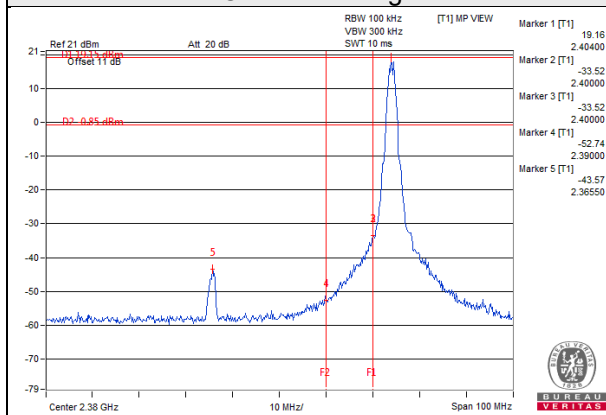
CH 19



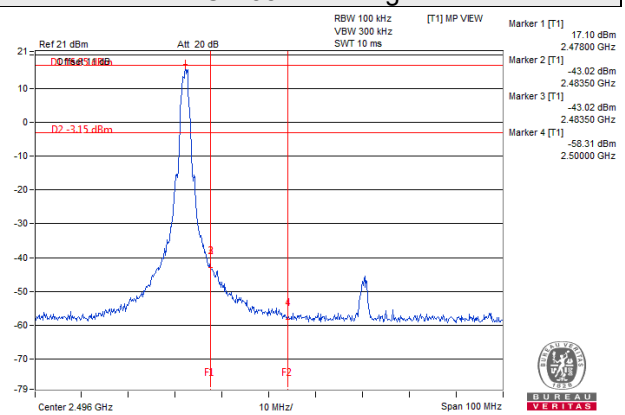
CH 38



CH 1 Band edge



CH 38 Band edge



4.9 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 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

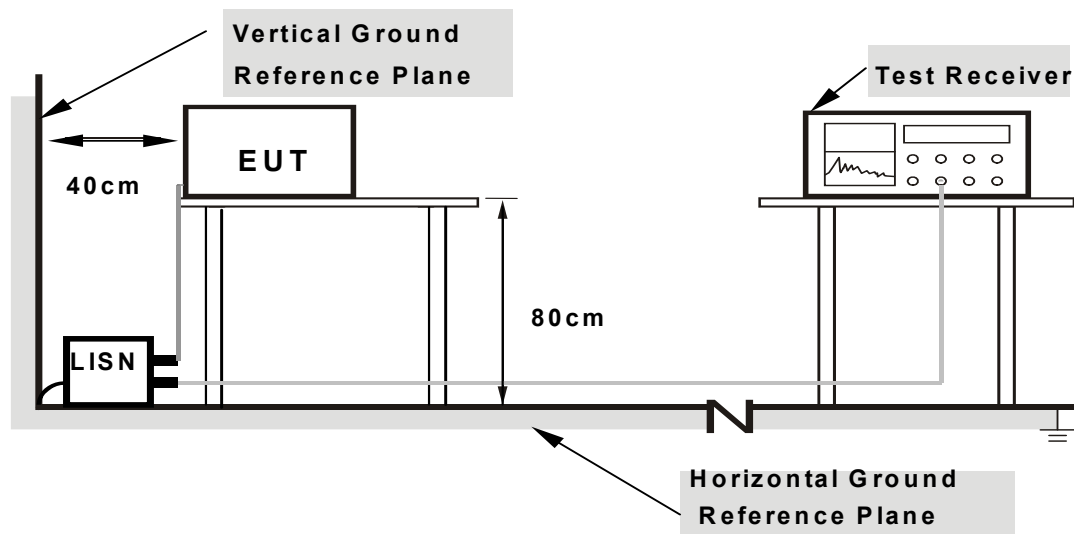
將待測物置於0.8米高的非金屬桌面，使其操作在工作狀態，待測物電源線接至電源線阻抗穩定網路上，從測試接收機記錄頻率由0.15MHz至30MHz之間之電源線傳導放射強度。

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 (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Sep. 05, 2019	Sep. 04, 2020
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 21, 2019	Feb. 20, 2020
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 22, 2019	Aug. 21, 2020
Software ADT	BV ADT_Cond_ 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 2.
 3. The VCCI Site Registration No. is C-12047.
 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 cm 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

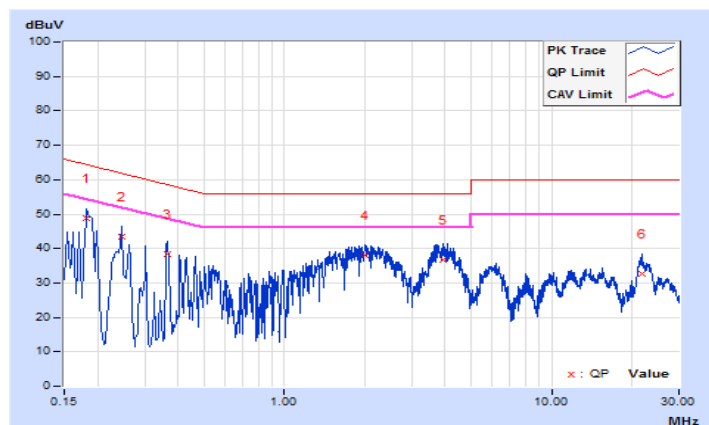
Bluetooth 2M

操作模式	發射/接收	測試日期	108 年 09 月 16 日
基本波頻率	CH 1 : 2404 MHz	量測場地溫度	25°C
調變技術	GFSK	量測場地濕度	75%RH
測試者	張睿晉		

輻射頻率 [MHz]	校正因子 [dB]	6 dB Bandwidth: 9kHz				PHASE: LINE (L)			
		儀器讀值		結果值		限制值		餘裕度	
		[dB (uV)]		[dB (uV)]		[dB (uV)]		[dB]	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.18228	10.20	38.49	23.09	48.69	33.29	64.38	54.38	-15.69	-21.09
0.24600	10.23	33.13	19.19	43.36	29.42	61.89	51.89	-18.53	-22.47
0.36544	10.27	28.13	16.11	38.40	26.38	58.60	48.60	-20.20	-22.22
2.00427	10.44	27.69	16.98	38.13	27.42	56.00	46.00	-17.87	-18.58
3.95000	10.56	25.98	17.32	36.54	27.88	56.00	46.00	-19.46	-18.12
21.82600	10.92	21.58	16.11	32.50	27.03	60.00	50.00	-27.50	-22.97

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.

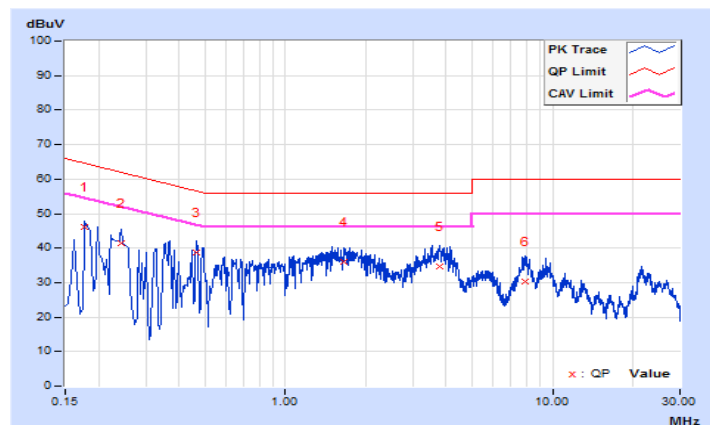


操作模式	發射/接收	測試日期	108 年 09 月 16 日
基本波頻率	CH 1 : 2404 MHz	量測場地溫度	25°C
調變技術	GFSK	量測場地濕度	75%RH
測試者	張睿晉		

		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.
0.17801	10.26	35.70	11.90	45.96	22.16	64.58	54.58	-18.62	-32.42
0.24200	10.31	31.16	16.88	41.47	27.19	62.03	52.03	-20.56	-24.84
0.46200	10.35	28.34	12.49	38.69	22.84	56.66	46.66	-17.97	-23.82
1.65796	10.49	25.42	16.85	35.91	27.34	56.00	46.00	-20.09	-18.66
3.79000	10.64	24.04	16.59	34.68	27.23	56.00	46.00	-21.32	-18.77
7.91400	10.75	19.61	13.61	30.36	24.36	60.00	50.00	-29.64	-25.64

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：BHSK-WTW-P21040772_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

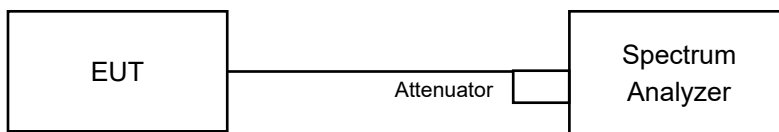
- 將待測物輸出經由衰减器接到頻譜分析儀上。
- 設定待測物處於連續發射狀態。
- 計算由最大輸出功率峰值減6dB的最大頻率範圍。

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	FSP40	100040	Sep. 25, 2018	Sep. 24, 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



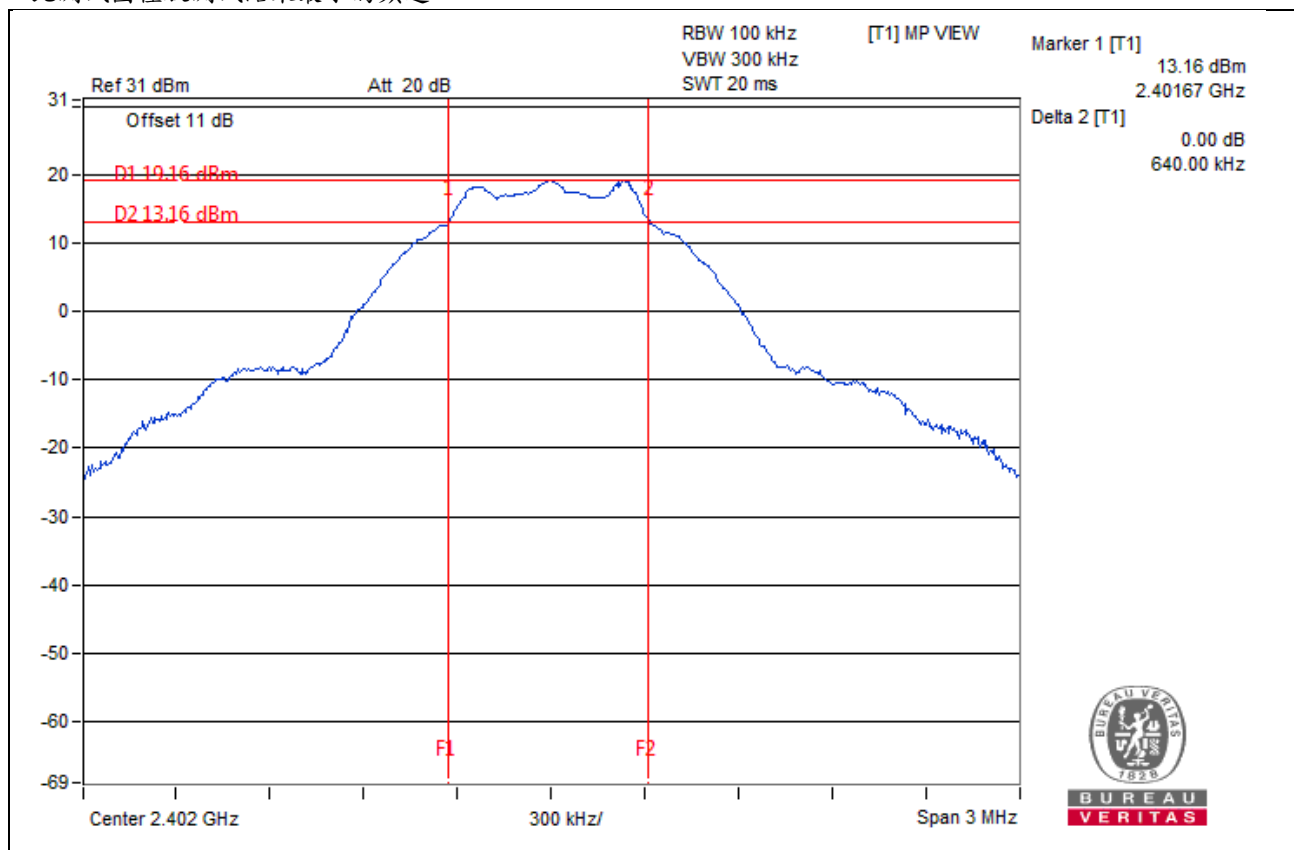
6.5 量測結果

操作模式	發射	測試日期	108 年 06 月 12 日
量測場地溫度	25°C	量測場地濕度	60%RH
測試者	吳佳衡		

Bluetooth 1M

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	0.64	0.5	Pass
19	2440	0.64	0.5	Pass
38	2478	0.64	0.5	Pass
39	2480	0.64	0.5	Pass

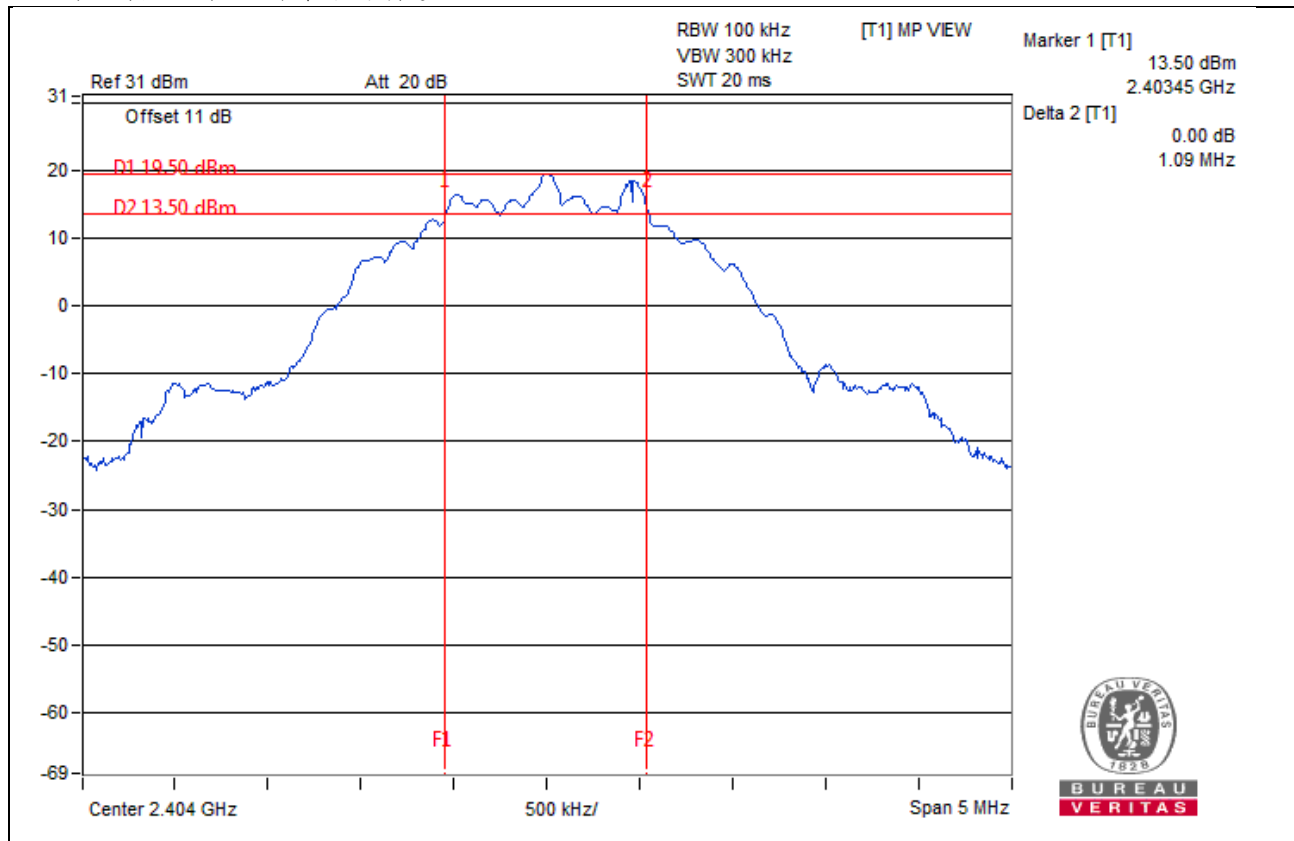
**此測試圖僅放測試結果最小的頻道。



Bluetooth 2M

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2404	1.09	0.5	Pass
19	2440	1.10	0.5	Pass
38	2478	1.10	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。

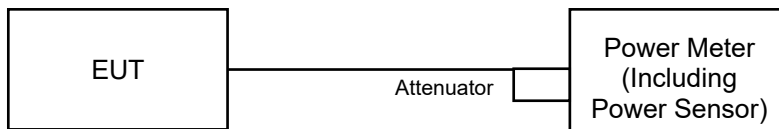
7.3 量測儀器

儀器名稱 (廠牌/製造商)	型號	序號	校正日期	下次校正日期
USB Wideband Power Meter KEYSIGHT	U2021XA	MY55050005/MY55190004/MY55210005	Jul. 17, 2018	Jul. 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.
- Measurement Bandwidth of U2021XA is 160MHz greater than 6dB bandwidth of emission.

7.4 測試配置



7.5 量測結果

操作模式	發射	測試日期	108 年 06 月 12 日
量測場地溫度	25°C	量測場地濕度	60%RH
測試者	吳佳衡		

Bluetooth 1M

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	94.842	19.77	30	Pass
19	2440	92.045	19.64	30	Pass
38	2478	90.782	19.58	30	Pass
39	2480	81.283	19.10	30	Pass

Bluetooth 2M

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2404	99.083	19.96	30	Pass
19	2440	95.499	19.80	30	Pass
38	2478	48.529	16.86	30	Pass

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

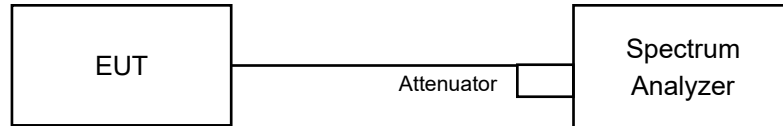
- 將待測物之天線埠經由適當之衰減直接連至測試儀器。
- 設定解析頻寬為3kHz，視訊頻寬為10kHz，掃描時間為auto。
- 掃描頻寬設於足夠觀察發射機所產生的主頻信號，並找到最大的峰值準位。
- 校正後的值，其峰值位準必須不大於8dBm / per 3kHz。

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	FSP40	100040	Sep. 25, 2018	Sep. 24, 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



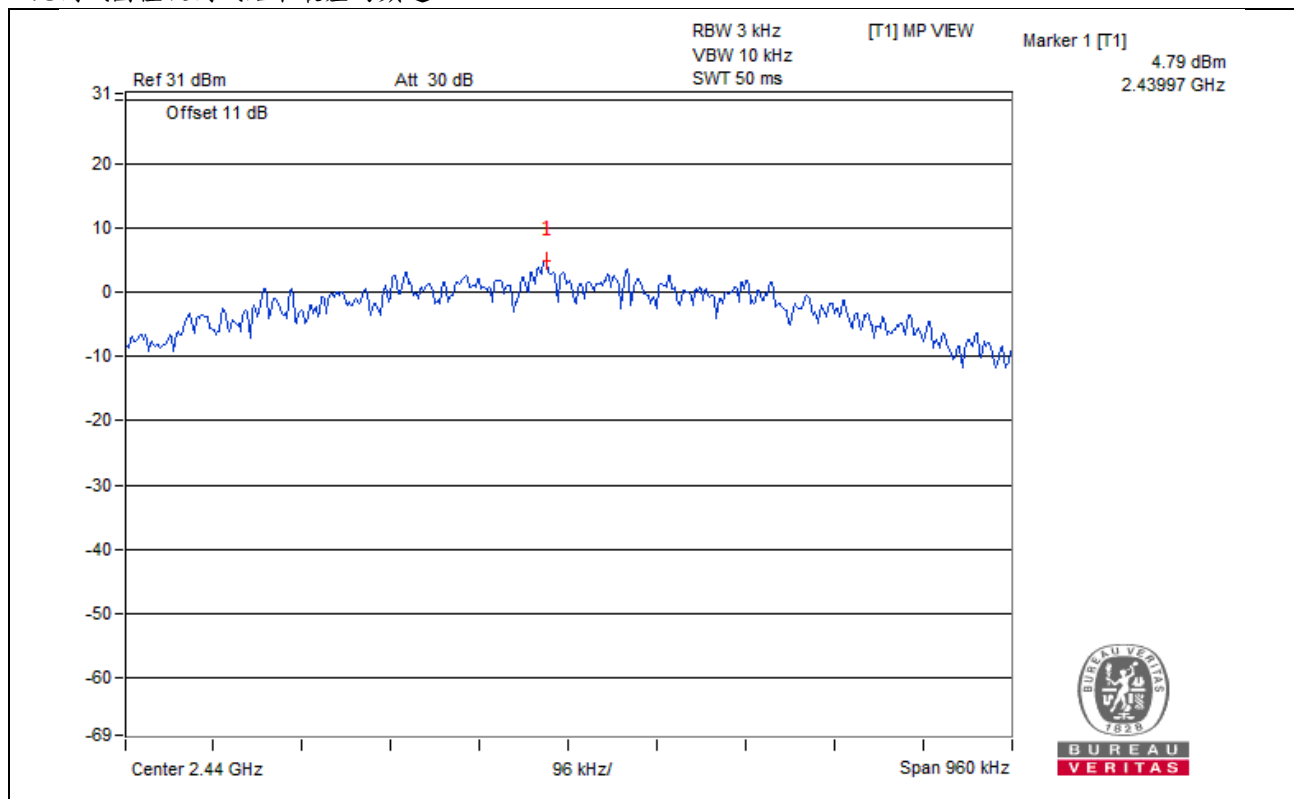
8.5 量測結果

操作模式	發射	測試日期	108 年 06 月 12 日
量測場地溫度	25°C	量測場地濕度	60%RH
測試者	吳佳衡		

Bluetooth 1M

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	2402	4.55	8.00	Pass
19	2440	4.79	8.00	Pass
38	2478	4.53	8.00	Pass
39	2480	4.54	8.00	Pass

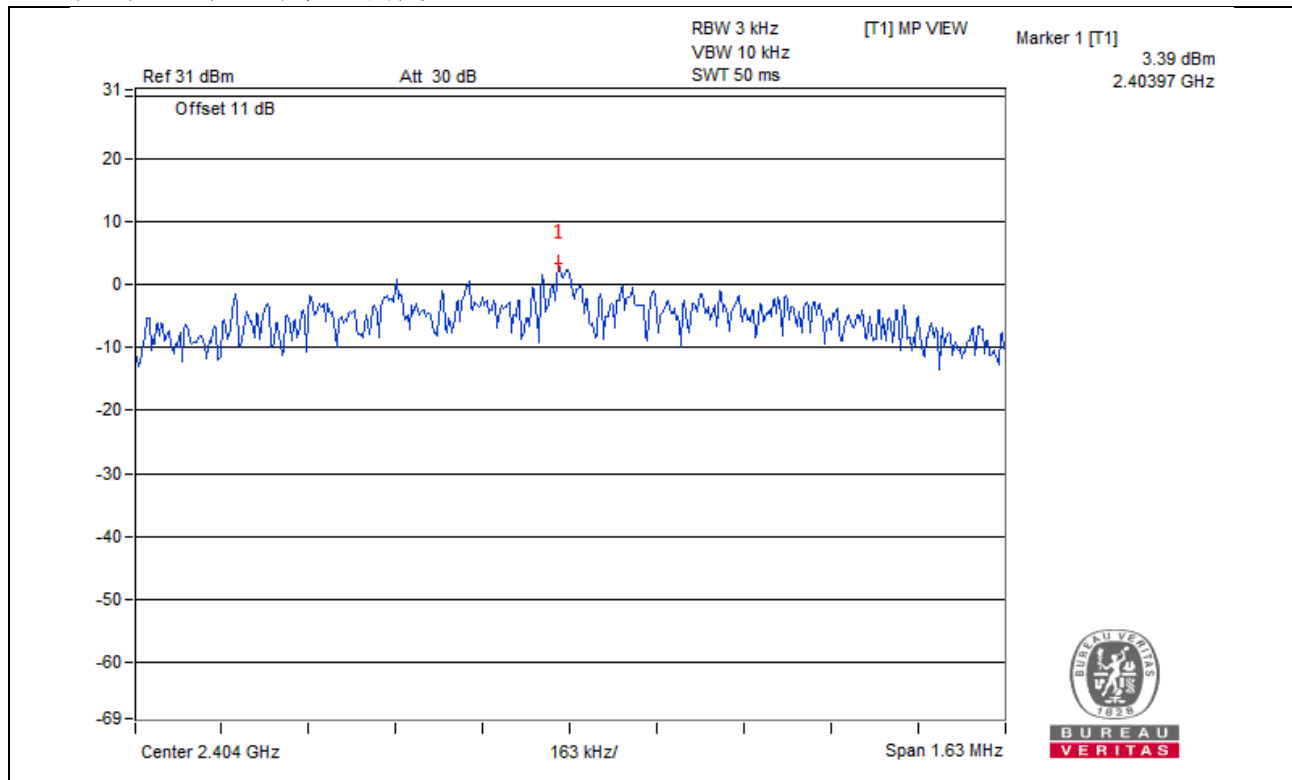
**此測試圖僅放測試結果最差的頻道。



Bluetooth 2M

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2404	3.39	8.00	Pass
19	2440	3.21	8.00	Pass
38	2478	0.85	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。

---END---

附錄 A: EUT + Dipole antenna 量測

1 帶外發射之量測

1.1 適用標準

請見本報告3.1節第2項的規定。

1.2 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。

1.3 量測儀器

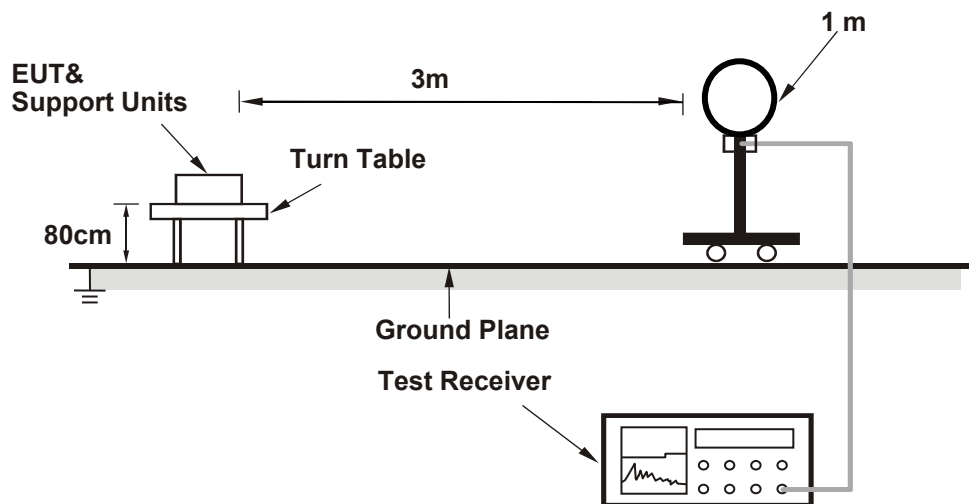
儀器名稱 (廠牌/製造商)	型號	序號	校正日期	下次校正日期
Test Receiver KEYSIGHT	N9038A	MY51210203	Mar. 18, 2019	Mar. 17, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 25, 2018	Sep. 24, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 21, 2018	Nov. 20, 2019
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 25, 2018	Nov. 24, 2019
Loop Antenna EMCI	EM-6879	269	Sep. 07, 2018	Sep. 06, 2019
	HLA 6121	45745	Jul. 01, 2019	Jun. 30, 2020
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Aug. 08, 2018	Aug. 07, 2019
			Jul. 11, 2019	Jul. 10, 2020
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Feb. 19, 2019	Feb. 18, 2020
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM80 00	CABLE-CH9-02 (248780+171006)	Jan. 19, 2019	Jan. 18, 2020
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Aug. 08, 2018	Aug. 07, 2019
			Jul. 11, 2019	Jul. 10, 2020
RF signal cable Woken	8D-FB	Cable-CH9-01	Jul. 31, 2018	Jul. 30, 2019
			Jul. 30, 2019	Jul. 29, 2020
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	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 Chamber 9.
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 $k=2$.

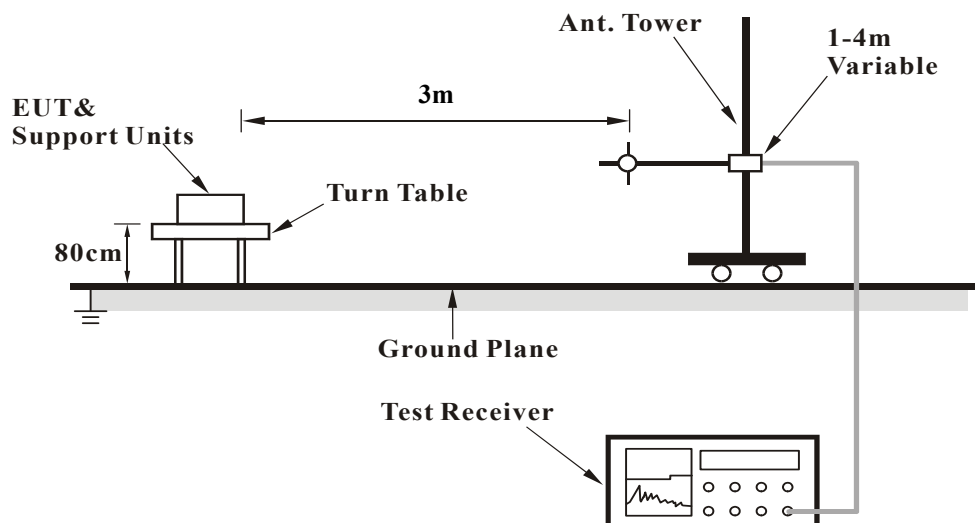
Measurement	Frequency	Uncertainty
Radiated emissions	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.59 dB
	200MHz ~ 1000MHz	3.60 dB
	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

1.4 測試配置

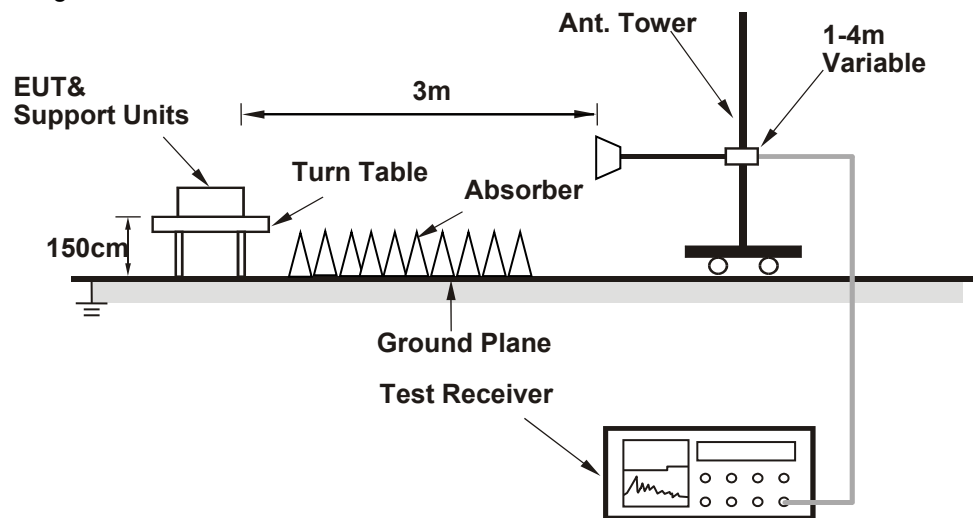
<Frequency Range below 30MHz>



<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



1.5 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。

1.6 量測結果

1.6.1 發射諧波

Bluetooth 1M

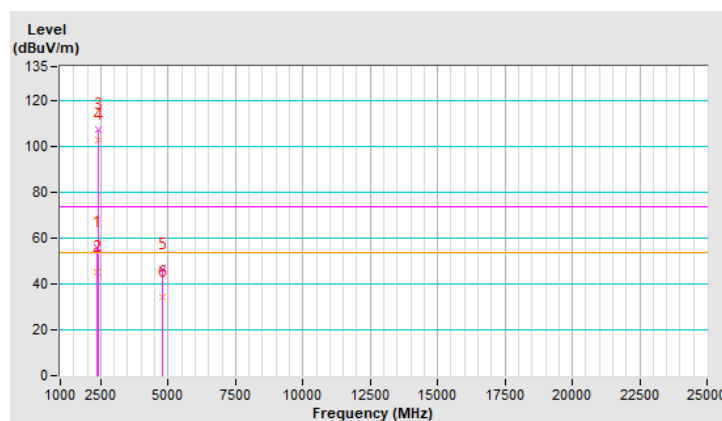
操作模式：	發射	調變技術：	GFSK
基本波頻率：	CH 0：2402 MHz	測試儀器：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量測場地溫度：	22°C	量測場地濕度：	68%RH
測試日期：	108 年 04 月 13 日	測試者：	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2363.60	56.1 PK	74.0	-17.9	1.41 H	146	24.2	31.9
2	2363.60	45.1 AV	54.0	-8.9	1.41 H	146	13.2	31.9
3	*2402.00	107.5 PK			1.42 H	139	75.7	31.8
4	*2402.00	103.1 AV			1.42 H	139	71.3	31.8
5	4804.00	46.6 PK	74.0	-27.4	1.23 H	354	42.9	3.7
6	4804.00	34.2 AV	54.0	-19.8	1.23 H	354	30.5	3.7
	7206.00	-	-	-	-	-	-	-
	9608.00	-	-	-	-	-	-	-
	12010.00	-	-	-	-	-	-	-
	14412.00	-	-	-	-	-	-	-
	16814.00	-	-	-	-	-	-	-
	19216.00	-	-	-	-	-	-	-
	21618.00	-	-	-	-	-	-	-
	24020.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

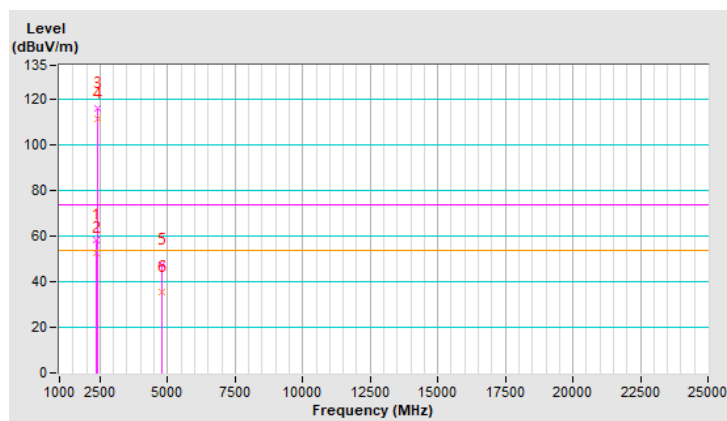


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 0 : 2402 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 04 月 13 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2363.60	58.2 PK	74.0	-15.8	1.49 V	222	26.3	31.9
2	2363.60	52.5 AV	54.0	-1.5	1.49 V	222	20.6	31.9
3	*2402.00	116.4 PK			1.49 V	249	84.6	31.8
4	*2402.00	111.5 AV			1.49 V	249	79.7	31.8
5	4804.00	47.5 PK	74.0	-26.5	1.11 V	181	43.8	3.7
6	4804.00	35.5 AV	54.0	-18.5	1.11 V	181	31.8	3.7
	7206.00	-	-	-	-	-	-	-
	9608.00	-	-	-	-	-	-	-
	12010.00	-	-	-	-	-	-	-
	14412.00	-	-	-	-	-	-	-
	16814.00	-	-	-	-	-	-	-
	19216.00	-	-	-	-	-	-	-
	21618.00	-	-	-	-	-	-	-
	24020.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

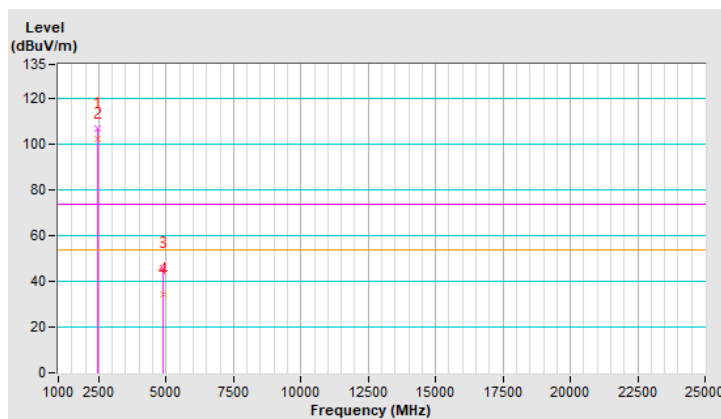


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 19 : 2440 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 04 月 13 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	107.2 PK			1.44 H	150	75.4	31.8
2	*2440.00	102.2 AV			1.44 H	150	70.4	31.8
3	4880.00	45.8 PK	74.0	-28.2	1.09 H	320	42.3	3.5
4	4880.00	34.1 AV	54.0	-19.9	1.09 H	320	30.6	3.5
	7320.00	-	-	-	-	-	-	-
	9760.00	-	-	-	-	-	-	-
	12200.00	-	-	-	-	-	-	-
	14640.00	-	-	-	-	-	-	-
	17080.00	-	-	-	-	-	-	-
	19520.00	-	-	-	-	-	-	-
	21960.00	-	-	-	-	-	-	-
	24400.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

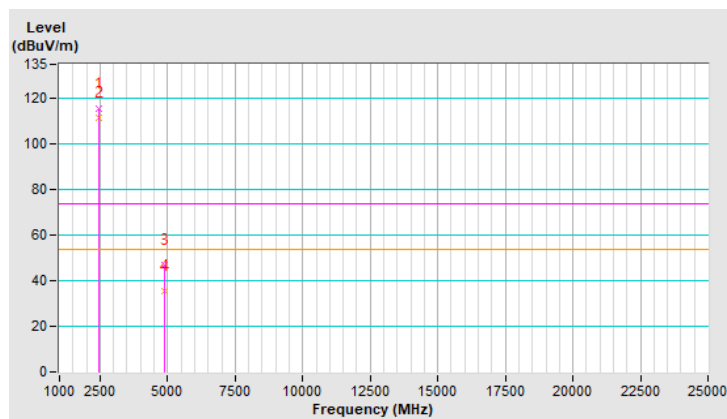


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 19 : 2440 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 04 月 13 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	115.8 PK			1.25 V	249	84.0	31.8
2	*2440.00	111.4 AV			1.25 V	249	79.6	31.8
3	4880.00	47.1 PK	74.0	-26.9	1.11 V	160	43.6	3.5
4	4880.00	35.5 AV	54.0	-18.5	1.11 V	160	32.0	3.5
	7320.00	-	-	-	-	-	-	-
	9760.00	-	-	-	-	-	-	-
	12200.00	-	-	-	-	-	-	-
	14640.00	-	-	-	-	-	-	-
	17080.00	-	-	-	-	-	-	-
	19520.00	-	-	-	-	-	-	-
	21960.00	-	-	-	-	-	-	-
	24400.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.



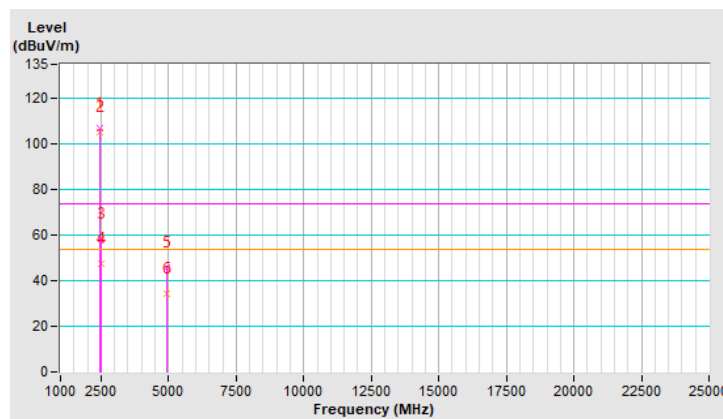
操作模式：	發射	調變技術：	GFSK
基本波頻率：	CH 38：2478 MHz	測試儀器：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量測場地溫度：	22°C	量測場地濕度：	68%RH
測試日期：	108 年 04 月 13 日	測試者：	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2478.00	106.8 PK			1.43 H	135	75.0	31.8
2	*2478.00	105.5 AV			1.43 H	135	73.7	31.8
3	2483.50	58.1 PK	74.0	-15.9	1.43 H	133	26.3	31.8
4	2483.50	47.3 AV	54.0	-6.7	1.43 H	133	15.5	31.8
5	4956.00	46.0 PK	74.0	-28.0	1.22 H	320	42.2	3.8
6	4956.00	34.3 AV	54.0	-19.7	1.22 H	320	30.5	3.8
	7434.00	-	-	-	-	-	-	-
	9912.00	-	-	-	-	-	-	-
	12390.00	-	-	-	-	-	-	-
	14868.00	-	-	-	-	-	-	-
	17346.00	-	-	-	-	-	-	-
	19824.00	-	-	-	-	-	-	-
	22302.00	-	-	-	-	-	-	-
	24780.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

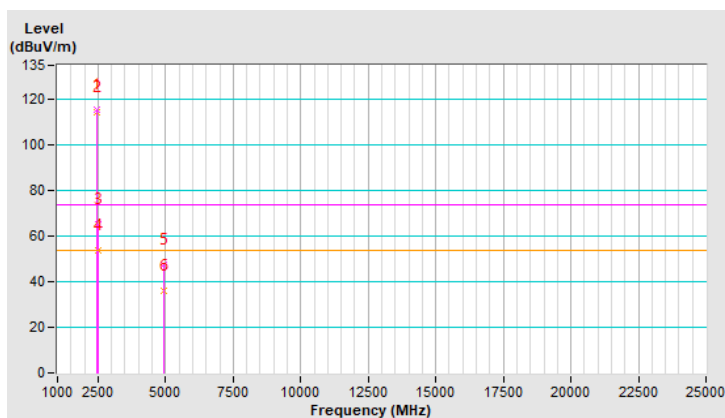


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 38 : 2478 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 04 月 13 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2478.00	115.3 PK			1.44 V	246	83.5	31.8
2	*2478.00	114.2 AV			1.44 V	246	82.4	31.8
3	2483.50	65.0 PK	74.0	-9.0	1.40 V	240	33.2	31.8
4	2483.50	53.6 AV	54.0	-0.4	1.40 V	240	21.8	31.8
5	4956.00	47.5 PK	74.0	-26.5	1.12 V	189	43.7	3.8
6	4956.00	36.3 AV	54.0	-17.7	1.12 V	189	32.5	3.8
	7434.00	-	-	-	-	-	-	-
	9912.00	-	-	-	-	-	-	-
	12390.00	-	-	-	-	-	-	-
	14868.00	-	-	-	-	-	-	-
	17346.00	-	-	-	-	-	-	-
	19824.00	-	-	-	-	-	-	-
	22302.00	-	-	-	-	-	-	-
	24780.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

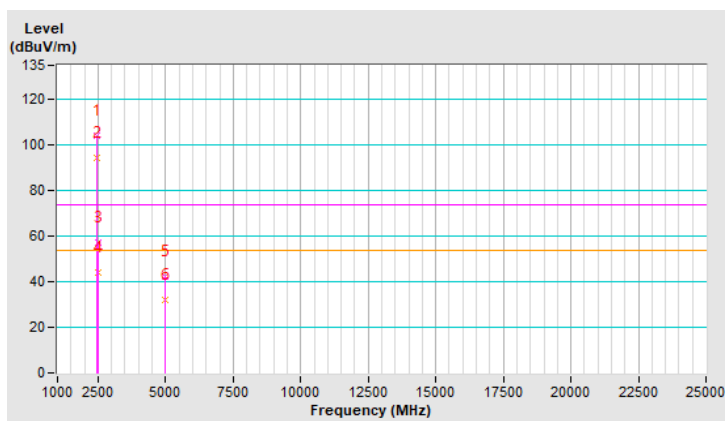


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 39 : 2480 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 05 月 29 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	104.1 PK			1.55 H	135	72.3	31.8
2	*2480.00	94.3 AV			1.55 H	135	62.5	31.8
3	2483.50	57.2 PK	74.0	-16.8	1.49 H	139	25.4	31.8
4	2483.50	44.2 AV	54.0	-9.8	1.49 H	139	12.4	31.8
5	4960.00	42.2 PK	74.0	-31.8	1.13 H	344	38.4	3.8
6	4960.00	32.1 AV	54.0	-21.9	1.13 H	344	28.3	3.8
	7440.00	-	-	-	-	-	-	-
	9920.00	-	-	-	-	-	-	-
	12400.00	-	-	-	-	-	-	-
	14880.00	-	-	-	-	-	-	-
	17360.00	-	-	-	-	-	-	-
	19840.00	-	-	-	-	-	-	-
	22320.00	-	-	-	-	-	-	-
	24800.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

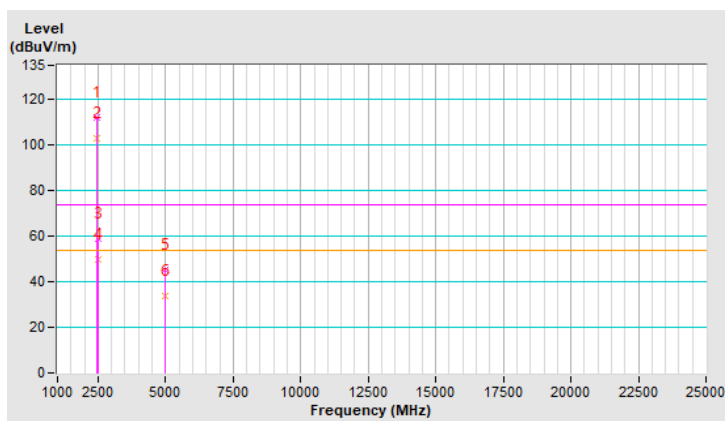


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 39 : 2480 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 05 月 29 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	112.3 PK			1.46 V	222	80.5	31.8
2	*2480.00	103.1 AV			1.46 V	222	71.3	31.8
3	2483.50	59.2 PK	74.0	-14.8	1.40 V	222	27.4	31.8
4	2483.50	50.0 AV	54.0	-4.0	1.40 V	222	18.2	31.8
5	4960.00	45.0 PK	74.0	-29.0	1.38 V	179	41.2	3.8
6	4960.00	33.9 AV	54.0	-20.1	1.38 V	179	30.1	3.8
	7440.00	-	-	-	-	-	-	-
	9920.00	-	-	-	-	-	-	-
	12400.00	-	-	-	-	-	-	-
	14880.00	-	-	-	-	-	-	-
	17360.00	-	-	-	-	-	-	-
	19840.00	-	-	-	-	-	-	-
	22320.00	-	-	-	-	-	-	-
	24800.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.



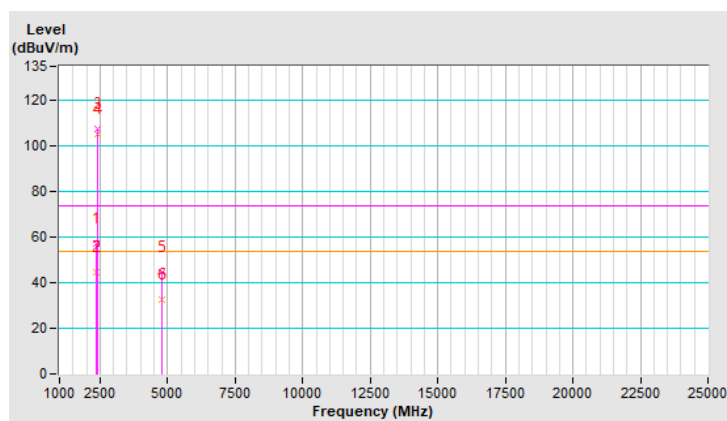
Bluetooth 2M

操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 1 : 2404 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 05 月 10 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2365.70	57.0 PK	74.0	-17.0	1.28 H	149	25.1	31.9
2	2365.70	44.8 AV	54.0	-9.2	1.28 H	149	12.9	31.9
3	*2404.00	107.3 PK			1.29 H	144	75.5	31.8
4	*2404.00	105.0 AV			1.29 H	144	73.2	31.8
5	4808.00	44.6 PK	74.0	-29.4	1.11 H	301	40.9	3.7
6	4808.00	32.6 AV	54.0	-21.4	1.11 H	301	28.9	3.7
	7212.00	-	-	-	-	-	-	-
	9616.00	-	-	-	-	-	-	-
	12020.00	-	-	-	-	-	-	-
	14424.00	-	-	-	-	-	-	-
	16828.00	-	-	-	-	-	-	-
	19232.00	-	-	-	-	-	-	-
	21636.00	-	-	-	-	-	-	-
	24040.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

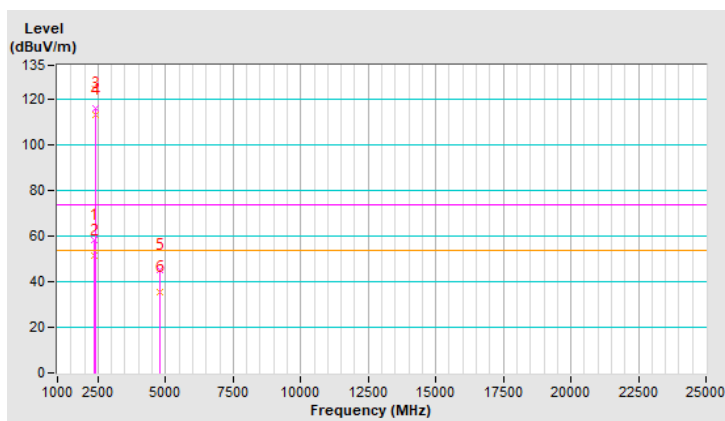


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 1 : 2404 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 05 月 10 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2365.70	58.2 PK	74.0	-15.8	1.09 V	21	26.3	31.9
2	2365.70	51.3 AV	54.0	-2.7	1.09 V	21	19.4	31.9
3	*2404.00	116.0 PK			1.08 V	21	84.2	31.8
4	*2404.00	113.0 AV			1.09 V	21	81.2	31.8
5	4808.00	45.2 PK	74.0	-28.8	1.01 V	272	42.1	3.1
6	4808.00	35.2 AV	54.0	-18.8	1.01 V	272	32.1	3.1
	7212.00	-	-	-	-	-	-	-
	9616.00	-	-	-	-	-	-	-
	12020.00	-	-	-	-	-	-	-
	14424.00	-	-	-	-	-	-	-
	16828.00	-	-	-	-	-	-	-
	19232.00	-	-	-	-	-	-	-
	21636.00	-	-	-	-	-	-	-
	24040.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

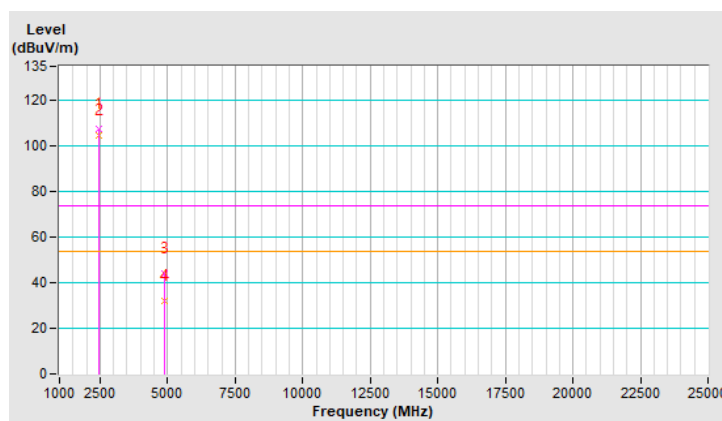


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 19 : 2440 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 04 月 15 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	107.3 PK			1.23 H	151	75.5	31.8
2	*2440.00	104.9 AV			1.23 H	151	73.1	31.8
3	4880.00	44.2 PK	74.0	-29.8	1.19 H	329	40.7	3.5
4	4880.00	32.3 AV	54.0	-21.7	1.19 H	329	28.8	3.5
	7320.00	-	-	-	-	-	-	-
	9760.00	-	-	-	-	-	-	-
	12200.00	-	-	-	-	-	-	-
	14640.00	-	-	-	-	-	-	-
	17080.00	-	-	-	-	-	-	-
	19520.00	-	-	-	-	-	-	-
	21960.00	-	-	-	-	-	-	-
	24400.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

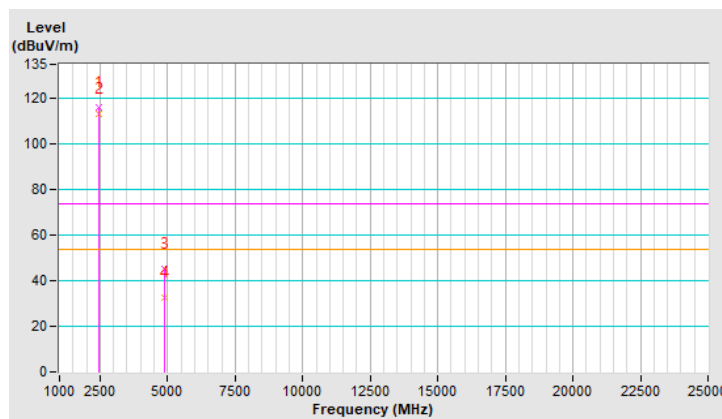


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 19 : 2440 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 04 月 15 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	116.2 PK			1.09 V	93	84.4	31.8
2	*2440.00	113.5 AV			1.09 V	93	81.7	31.8
3	4880.00	45.1 PK	74.0	-28.9	1.22 V	277	41.6	3.5
4	4880.00	32.5 AV	54.0	-21.5	1.22 V	277	29.0	3.5
	7320.00	-	-	-	-	-	-	-
	9760.00	-	-	-	-	-	-	-
	12200.00	-	-	-	-	-	-	-
	14640.00	-	-	-	-	-	-	-
	17080.00	-	-	-	-	-	-	-
	19520.00	-	-	-	-	-	-	-
	21960.00	-	-	-	-	-	-	-
	24400.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.



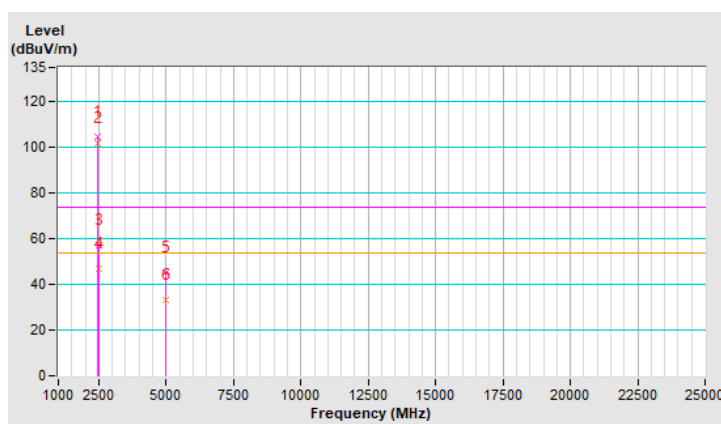
操作模式：	發射	調變技術：	GFSK
基本波頻率：	CH 38：2478 MHz	測試儀器：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量測場地溫度：	22°C	量測場地濕度：	68%RH
測試日期：	108 年 06 月 17 日	測試者：	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2478.00	104.7 PK			1.33 H	166	72.9	31.8
2	*2478.00	102.1 AV			1.33 H	166	70.3	31.8
3	2483.50	57.3 PK	74.0	-16.7	1.32 H	165	25.5	31.8
4	2483.50	47.0 AV	54.0	-7.0	1.32 H	165	15.2	31.8
5	4976.00	45.0 PK	74.0	-29.0	1.19 H	320	41.2	3.8
6	4976.00	33.2 AV	54.0	-20.8	1.19 H	320	29.4	3.8
	7434.00	-	-	-	-	-	-	-
	9912.00	-	-	-	-	-	-	-
	12390.00	-	-	-	-	-	-	-
	14868.00	-	-	-	-	-	-	-
	17346.00	-	-	-	-	-	-	-
	19824.00	-	-	-	-	-	-	-
	22302.00	-	-	-	-	-	-	-
	24780.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.

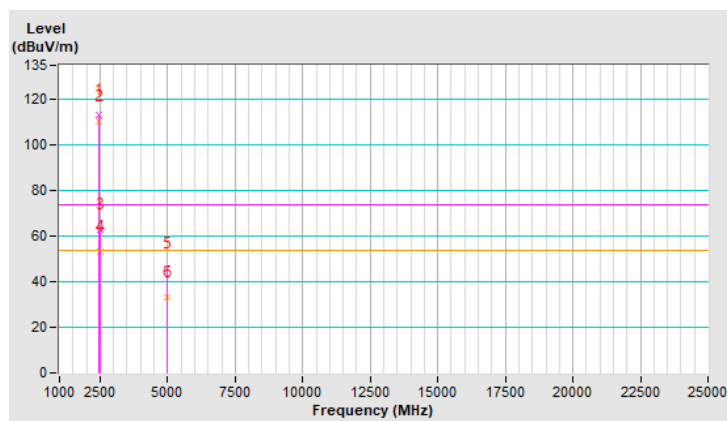


操 作 模 式 :	發射	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 38 : 2478 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=1kHz
量 測 場 地 溫 度 :	22°C	量 測 場 地 濕 度 :	68%RH
測 試 日 期 :	108 年 05 月 10 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2478.00	113.3 PK			1.11 V	79	81.5	31.8
2	*2478.00	110.4 AV			1.11 V	79	78.6	31.8
3	2483.50	63.0 PK	74.0	-11.0	1.09 V	78	31.2	31.8
4	2483.50	53.1 AV	54.0	-0.9	1.09 V	78	21.3	31.8
5	4976.00	45.6 PK	74.0	-28.4	1.16 V	288	41.8	3.8
6	4976.00	33.0 AV	54.0	-21.0	1.16 V	288	29.2	3.8
	7434.00	-	-	-	-	-	-	-
	9912.00	-	-	-	-	-	-	-
	12390.00	-	-	-	-	-	-	-
	14868.00	-	-	-	-	-	-	-
	17346.00	-	-	-	-	-	-	-
	19824.00	-	-	-	-	-	-	-
	22302.00	-	-	-	-	-	-	-
	24780.00	-	-	-	-	-	-	-

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency (主頻)
6. " - ": The emission levels were too low to be detected
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power.



1.6.2 接收諧波

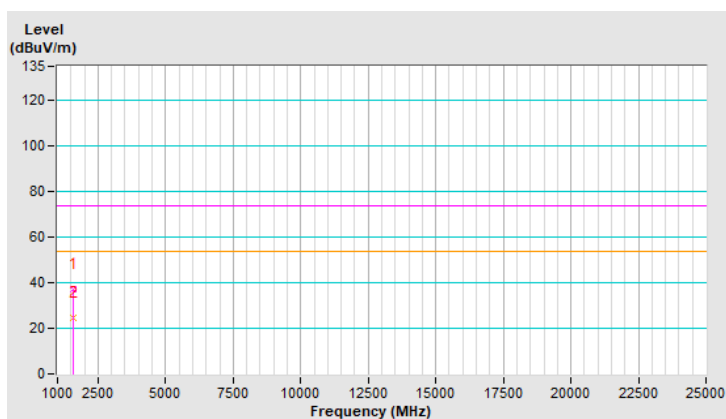
Bluetooth 2M

操作模式：	接收	調變技術：	GFSK
基本波頻率：	CH 1：2404 MHz	測試儀器：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz (RMS)
量測場地溫度：	22°C	量測場地濕度：	68%RH
測試日期：	108 年 09 月 17 日	測試者：	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1601.00	37.4 PK	74.0	-36.6	1.48 H	142	42.2	-4.8
2	1601.00	24.7 AV	54.0	-29.3	1.48 H	142	29.5	-4.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value

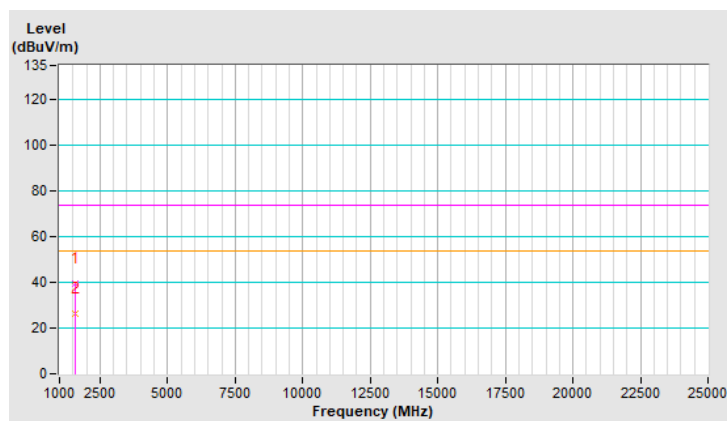


操 作 模 式 :	接收	調 變 技 術 :	GFSK
基 本 波 頻 率 :	CH 1 : 2404 MHz	測 試 儀 器 :	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz (RMS)
量測場地溫度 :	22°C	量測場地濕度 :	68%RH
測 試 日 期 :	108 年 09 月 17 日	測 試 者 :	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1601.00	39.4 PK	74.0	-34.6	1.78 V	22	44.2	-4.8
2	1601.00	26.5 AV	54.0	-27.5	1.78 V	22	31.3	-4.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value



1.6.3 其它不必要之訊號

Bluetooth 2M

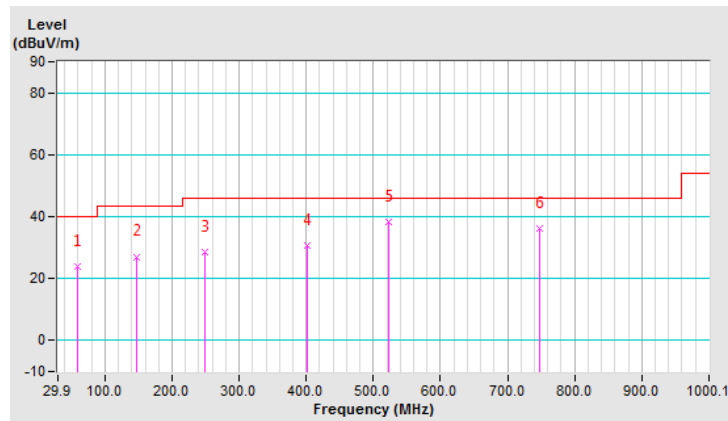
操 作 模 式：	發射/接收	調 變 技 術：	GFSK
基 本 波 頻 率：	CH1：2404 MHz	測 試 儀 器：	(QP) RB=VB=120kHz
量 測 場 地 溫 度：	22°C	量 測 場 地 濕 度：	68%RH
測 試 日 期：	108 年 09 月 17 日	測 試 者：	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	59.01	24.1 QP	40.0	-15.9	1.50 H	48	38.6	-14.5
2	146.32	27.1 QP	43.5	-16.4	1.00 H	273	41.0	-13.9
3	249.17	28.4 QP	46.0	-17.6	1.00 H	173	42.6	-14.2
4	402.46	30.6 QP	46.0	-15.4	1.00 H	80	40.6	-10.0
5	522.76	38.3 QP	46.0	-7.7	1.50 H	333	45.5	-7.2
6	747.85	36.2 QP	46.0	-9.8	1.00 H	79	37.5	-1.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report

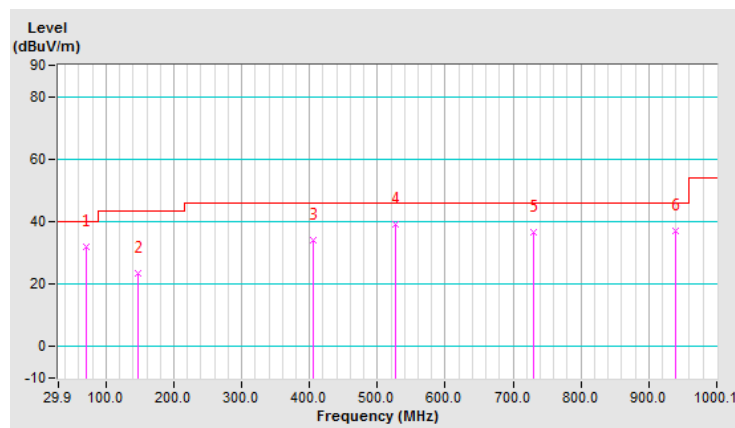


操作模式：	發射/接收	調變技術：	GFSK
基本波頻率：	CH1：2404 MHz	測試儀器：	(QP) RB=VB=120kHz
量測場地溫度：	22°C	量測場地濕度：	68%RH
測試日期：	108 年 09 月 17 日	測試者：	吳俊翰

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	70.65	31.8 QP	40.0	-8.2	1.01 V	70	47.9	-16.1
2	146.32	23.5 QP	43.5	-20.0	1.01 V	52	37.4	-13.9
3	406.34	34.0 QP	46.0	-12.0	1.01 V	11	43.9	-9.9
4	526.64	39.3 QP	46.0	-6.7	1.01 V	251	46.6	-7.3
5	730.38	36.5 QP	46.0	-9.5	1.49 V	54	38.5	-2.0
6	939.95	36.9 QP	46.0	-9.1	1.49 V	62	34.3	2.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report



1.7 配置照片

請參閱附件測試設置照片(BV CPS 報告編號：BHSK-WTW-P21040772_TSup)。

2 電源線傳導干擾之量測

2.1 適用標準

請見本報告3.1節第1項的規定。

2.2 量測方法

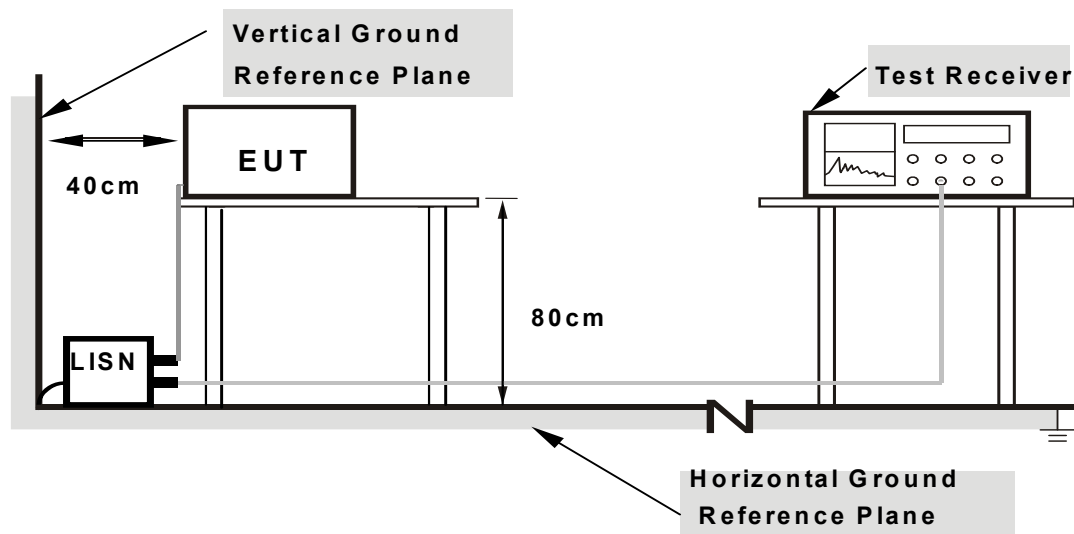
將待測物置於0.8米高的非金屬桌面，使其操作在工作狀態，待測物電源線接至電源線阻抗穩定網路上，從測試接收機記錄頻率由0.15MHz至30MHz之間之電源線傳導放射強度。

2.3 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 (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Sep. 05, 2019	Sep. 04, 2020
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 21, 2019	Feb. 20, 2020
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 22, 2019	Aug. 21, 2020
Software ADT	BV ADT_Cond_ 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 2.
 3. The VCCI Site Registration No. is C-12047.
 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.

2.4 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 cm from other units and other metal planes

2.5 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

2.6 量測結果

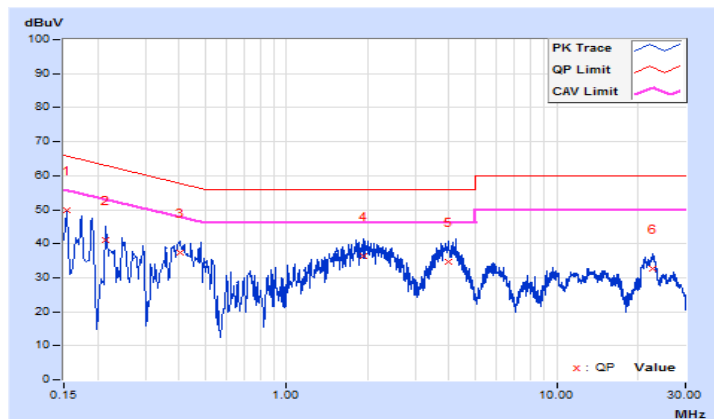
Bluetooth 2M

操作模式	發射/接收	測試日期	108 年 09 月 16 日
基本波頻率	CH 1 : 2404 MHz	量測場地溫度	25°C
調變技術	GFSK	量測場地濕度	75%RH
測試者	張睿晉		

輻射頻率 [MHz]	校正因子 [dB]	6 dB Bandwidth: 9kHz				PHASE: LINE (L)			
		儀器讀值		結果值		限制值		餘裕度	
		[dB (uV)]		[dB (uV)]		[dB (uV)]		[dB]	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.15400	10.16	39.52	20.58	49.68	30.74	65.78	55.78	-16.10	-25.04
0.21406	10.22	30.94	18.72	41.16	28.94	63.05	53.05	-21.89	-24.11
0.40179	10.28	27.03	10.28	37.31	20.56	57.82	47.82	-20.51	-27.26
1.92600	10.44	25.79	17.49	36.23	27.93	56.00	46.00	-19.77	-18.07
3.95800	10.56	24.28	16.98	34.84	27.54	56.00	46.00	-21.16	-18.46
22.63000	10.91	21.65	16.36	32.56	27.27	60.00	50.00	-27.44	-22.73

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.

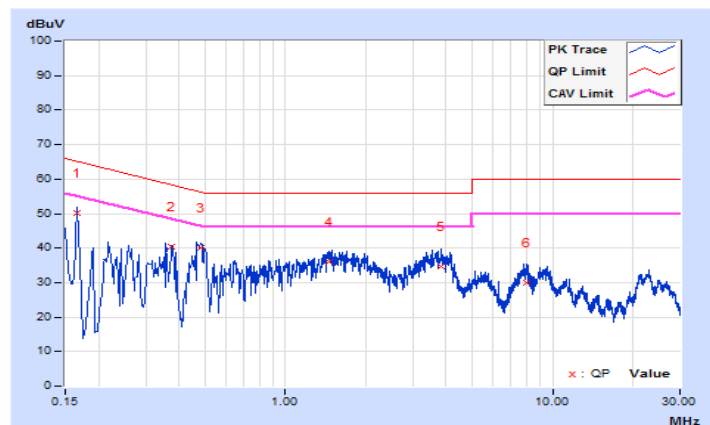


操作模式	發射/接收	測試日期	108 年 09 月 16 日
基本波頻率	CH 1 : 2404 MHz	量測場地溫度	25°C
調變技術	GFSK	量測場地濕度	75%RH
測試者	張睿晉		

		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.
0.16623	10.23	40.06	24.48	50.29	34.71	65.15	55.15	-14.86	-20.44
0.37421	10.33	29.93	20.48	40.26	30.81	58.41	48.41	-18.15	-17.60
0.48190	10.36	29.61	19.75	39.97	30.11	56.31	46.31	-16.34	-16.20
1.45400	10.48	25.48	16.83	35.96	27.31	56.00	46.00	-20.04	-18.69
3.81800	10.64	23.96	16.49	34.60	27.13	56.00	46.00	-21.40	-18.87
7.98200	10.75	19.32	13.47	30.07	24.22	60.00	50.00	-29.93	-25.78

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.



2.7 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。

2.8 配置照片

請參閱附件測試設置照片(BV CPS 報告編號：BHSK-WTW-P21040772_TSup)。

3 峰值傳導輸出功率之量測

3.1 適用標準

請見本報告3.1節第6項的規定。

3.2 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。

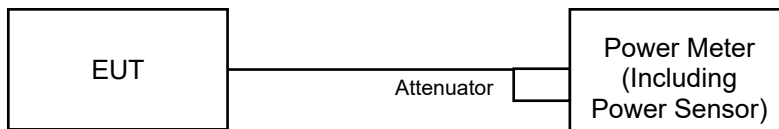
3.3 量測儀器

儀器名稱 (廠牌/製造商)	型號	序號	校正日期	下次校正日期
USB Wideband Power Meter KEYSIGHT	U2021XA	MY55050005/MY55190004/MY55190007/MY55210005	Jul. 17, 2018	Jul. 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.
- Measurement Bandwidth of U2021XA is 160MHz greater than 6dB bandwidth of emission.

3.4 測試配置



3.5 量測結果

操作模式	發射	測試日期	108 年 06 月 12 日
量測場地溫度	25°C	量測場地濕度	60%RH
測試者	吳佳衡		

Bluetooth 1M

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	86.896	19.39	30	Pass
19	2440	90.365	19.56	30	Pass
38	2478	86.099	19.35	30	Pass
39	2480	80.910	19.08	30	Pass

Bluetooth 2M

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2404	87.297	19.41	30	Pass
19	2440	84.918	19.29	30	Pass
38	2478	49.431	16.94	30	Pass

3.6 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。