

低功率射頻電機測試報告

報告編號:

RT170327C11

申請者

香港商富思股份有限公司 台灣分公司

產品名稱

Smart Watch/智慧型手錶

型號

DW5A

製造廠商

Fossil Group, Inc.

商標或廠牌

FOSSIL

該產品樣品試驗

國家通訊傳播委員會低功率射頻電機技術規範

依據之試驗標準

105 年 8 月 23 日修訂

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

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報告簽署人簽章:

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目 錄

報告發行紀錄	6
證 明 書	7
1 低功率射頻電機量測記錄表	8
2 一般敘述	10
2.1 待測設備	10
2.2 輔助測試之週邊設備描述	16
2.3 測試架構圖	16
3 適用規範	17
3.1 規範要求	17
3.2 限制使用之頻帶	26
2.4 GHz 頻段測試紀錄結果	27
4 帶外發射之量測	27
4.1 適用標準	27
4.2 量測方法	27
4.3 量測儀器	28
4.4 測試配置	29
4.5 場強度之計算	30
4.6 量測結果	31
4.6.1 發射諧波	31
4.6.2 接收諧波	63
4.6.3 其它不必要之訊號	67
4.7 量測結果判定	70
4.8 配置照片	71
5 6 dB 頻寬之要求	75
5.1 適用標準	75
5.2 量測方法	75
5.3 量測儀器	75
5.4 測試配置	75
5.5 量測結果	76
5.6 量測結果判定	77
6 峰值傳導輸出功率之量測	78
6.1 適用標準	78
6.2 量測方法	78
6.3 量測儀器	78
6.4 測試配置	78
6.5 量測結果	79
6.6 量測結果判定	79
7 功率頻譜密度之量測	80
7.1 適用標準	80
7.2 量測方法	80
7.3 量測儀器	80
7.4 測試配置	80
7.5 量測結果	81
7.6 量測結果判定	82

Bluetooth EDR 頻段測試紀錄結果.....	83
8 帶外發射之量測	83
8.1 適用標準.....	83
8.2 量測方法.....	83
8.3 量測儀器.....	83
8.4 測試配置.....	83
8.5 場強度之計算	83
8.6 量測結果.....	84
8.6.1 發射諧波	84
8.6.2 其它不必要之訊號.....	92
8.7 量測結果判定	95
8.8 配置照片.....	96
9 20 dB 頻寬之要求.....	100
9.1 適用標準.....	100
9.2 量測方法.....	100
9.3 量測儀器.....	100
9.4 測試配置.....	100
9.5 量測結果.....	101
9.6 量測結果判定	101
10 輸出峰值功率之量測	102
10.1 適用標準.....	102
10.2 量測方法.....	102
10.3 量測儀器.....	102
10.4 測試配置.....	102
10.5 量測結果.....	103
10.6 量測結果判定	103
11 跳頻頻道數之量測.....	104
11.1 適用標準.....	104
11.2 量測方法.....	104
11.3 量測儀器.....	104
11.4 測試配置.....	104
11.5 量測結果.....	105
11.6 量測結果判定	105
12 跳頻頻道間隔之量測	106
12.1 適用標準.....	106
12.2 量測方法.....	106
12.3 量測場強輻射之儀器.....	106
12.4 測試配置.....	106
12.5 量測結果.....	107
12.6 量測結果判定	108
13 每一頻道停留時間之量測.....	109
13.1 適用標準.....	109
13.2 量測方法.....	109
13.3 量測儀器.....	109
13.4 測試配置.....	109
13.5 量測結果.....	110
13.6 量測結果判定	113

Bluetooth LE 4.1 頻段測試紀錄結果	114
14 帶外發射之量測	114
14.1 適用標準	114
14.2 量測方法	114
14.3 量測儀器	114
14.4 測試配置	114
14.5 場強度之計算	114
14.6 量測結果	115
14.6.1 發射諧波	115
14.6.2 接收諧波	123
14.6.3 其它不必要之訊號	127
14.7 量測結果判定	130
14.8 配置照片	131
15 6 dB 頻寬之要求	135
15.1 適用標準	135
15.2 量測方法	135
15.3 量測儀器	135
15.4 測試配置	135
15.5 量測結果	136
15.6 量測結果判定	136
16 輸出峰值功率之量測	137
16.1 適用標準	137
16.2 量測方法	137
16.3 量測儀器	137
16.4 測試配置	137
16.5 量測結果	138
16.6 量測結果判定	138
17 功率密度之量測	139
17.1 適用標準	139
17.2 量測方法	139
17.3 量測儀器	139
17.4 測試配置	139
17.5 量測結果	140
17.6 量測結果判定	140
Wireless Charger (150 kHz) 測試紀錄結果	141
18 場強輻射及開放頻帶邊緣之量測	141
18.1 適用標準	141
18.2 量測方法	141
18.3 量測儀器	141
18.4 測試配置	142
18.5 場強度之計算	142
18.6 量測結果	143
18.6.1 發射諧波	143
18.6.2 接收諧波	147
18.6.3 其它不必要之訊號	151
18.7 量測結果判定	158
18.8 配置照片	159
19 電源線傳導干擾之量測	161

19.1 適用標準.....	161
19.2 量測方法.....	161
19.3 量測儀器.....	161
19.4 測試配置.....	162
19.5 干擾值之計算	162
19.6 量測結果.....	163
19.7 量測結果判定	164
19.8 配置照片	165
20 待測物照片	166
21 檢測實驗室基本資料	167

報告發行紀錄

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RT170327C11	Original release	106 年 06 月 14 日

證 明 書

發行日期：106 年 06 月 14 日

產 品 名 稱：Smart Watch/智慧型手錶
商 標：FOSSIL
型 號：DW5A
申 請 者：香港商富思股份有限公司 台灣分公司
量 測 規 範：低功率射頻電機技術規範 LP0002
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：DW5A)，收件日期 106 年 03 月 27 日，於 106 年 04 月 05 日至 106 年 06 月 08 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“低功率射頻電機技術規範”、“低功率電波輻射性電機管理辦法”及“電信管制射頻器材審驗辦法”製作測試結果報告。

特 此 證 明 ！

報告製作者：



吳宜芳 / 主任

， 日 期：

106 年 06 月 14 日

審 核 者：



黃群育 / 專案工程師

， 日 期：

106 年 06 月 14 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 低功率射頻電機量測記錄表

申請廠商：香港商富思股份有限公司 台灣分公司

製造廠商：Fossil Group, Inc.

申請廠商地址：臺北市大安區忠孝東路 4 段 219 號 5 樓

產品名稱：Smart Watch/智慧型手錶

廠牌：FOSSIL

型號：DW5A

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 (9 kHz ~ 40 GHz)

量測規範：低功率射頻電機技術規範 LP0002

ANSI C63.10-2013

KDB 558074

WLAN 2.4 GHz 頻段概要

項次	量測項目	規 範	量測結果判定
1	帶外發射	低功率射頻電機技術規範 3.10.1.5 節	合格
2	電源線傳導干擾	低功率射頻電機技術規範 2.3 節	合格
3	6 dB 頻寬	低功率射頻電機技術規範 3.10.1.6 節	合格
4	輸出峰值功率	低功率射頻電機技術規範 3.10.1.2 節	合格
5	功率頻譜密度	低功率射頻電機技術規範 3.10.1.6 節	合格

Bluetooth EDR 頻段概要

項次	量測項目	規 範	量測結果判定
1	帶外發射	低功率射頻電機技術規範 3.10.1.5	合格
2	電源線傳導干擾	低功率射頻電機技術規範 2.3 節	合格
3	20 dB 頻寬	低功率射頻電機技術規範 3.10.1.6 節	Note
4	峰值傳導輸出功率	低功率射頻電機技術規範 3.10.1.2 節	合格
5	跳頻頻道數之量測	低功率射頻電機技術規範 3.10.1.6 節	合格
6	跳頻頻道間隔之量測	低功率射頻電機技術規範 3.10.1.6 節	合格
7	每一頻道停留時間之量測	低功率射頻電機技術規範 3.10.1.6 節	合格

Note：此頻寬測試值為跳頻頻道間隔之量測參考值。

Bluetooth LE 频段概要

項次	量測項目	規 範	量測結果判定
1	帶外發射	低功率射頻電機技術規範 3.10.1.5 節	合格
2	電源線傳導干擾	低功率射頻電機技術規範 2.3 節	合格
3	6 dB 頻寬	低功率射頻電機技術規範 3.10.1.6 節	合格
4	峰值傳導輸出功率	低功率射頻電機技術規範 3.10.1.2 節	合格
5	功率頻譜密度	低功率射頻電機技術規範 3.10.1.6 節	合格

Wireless Charger (150 kHz)概要

項次	量測項目	規 範	量測結果判定
1	場強輻射	低功率射頻電機技術規範 2.8 節	合格
2	電源線傳導干擾	低功率射頻電機技術規範 2.3 節	合格
3	天線之要求	低功率射頻電機技術規範 2.2 節	合格

2 一般敘述

2.1 待測設備

產品名稱：	Smart Watch/智慧型手錶	
型號：	DW5A	
額定電源：	5 Vdc (from wireless charger) 3.8 Vdc (battery)	
調變方式：	Wireless LAN	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
	Bluetooth EDR	GFSK, $\pi/4$ -DQPSK, 8DPSK
	Bluetooth LE 4.1	GFSK
	Wireless Charger	AM
傳輸速率：	Wireless LAN	802.11b: 11.0/ 5.5/ 2.0/ 1.0 Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0 Mbps 802.11n: up to MCS7
	Bluetooth EDR	1/ 2/ 3 Mbps
	Bluetooth LE 4.1	1 Mbps
載波頻率：	Wireless LAN	2.4 GHz: 2412 ~ 2472 MHz
	Bluetooth EDR	2402 ~ 2480 MHz
	Bluetooth LE 4.1	2402 ~ 2480 MHz
	Wireless Charger	150 kHz
頻道數：	Wireless LAN	802.11b, 802.11g, 802.11n (HT20): 13
	Bluetooth EDR	79
	Bluetooth LE 4.1	40
	Wireless Charger	N/A
發射功率：	Wireless LAN	2.4 GHz: 802.11b: 18.28 dBm 802.11g: 18.72 dBm 802.11n (HT20): 18.69 dBm
	Bluetooth EDR	12.59 dBm
	Bluetooth LE 4.1	3.85 dBm
發射功率 (電場強度)：	Wireless Charger	74.81 dBuV/m
天線種類：	見註 2	
電源線類別：	N/A	
信號線類別：	見註 3	
配件：	見註 3	

註：

1. 此待測物之技術的種類為1Tx / 1Rx之組合。

Modulation Mode	Tx Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	1TX

2. 此待測設備搭配測試的天線，其資料如下：

	頻帶 (MHz)	天線型式	天線型號	商標	接頭型式	增益 (dBi)
WLAN	2412 ~ 2472	Loop	DW5A	N/A	N/A	-3.75 / -2.55
Bluetooth	2402 ~ 2480				N/A	-3.75 / -2.55
Wireless Charger	150 kHz	Loop	DW5A	N/A	N/A	-

3. 此待測設備搭配使用之配件請參閱產品照編號: 170327C11

4. 待測設備的測試模式如下：

Sample	Antenna Gain (dBi)	差異描述
A	-3.75	其差異為外觀及天線增益
B	-2.55	

5. 此報告中，場強輻射量測經過評估後以下列測試模式進行最終量測。

量測項目	發射	接收
2412 ~ 2472 MHz		
1 GHz 以上量測	802.11b: Ch 1, 6, 11, 12, 13 802.11g: Ch 1, 6, 11, 12, 13 802.11n (HT20): Ch 1, 6, 11, 12, 13	802.11n (HT20): Ch 13
其它不必要之訊號	802.11n (HT20): Ch 13	802.11n (HT20): Ch 13
2402 ~ 2480 MHz (Bluetooth EDR)		
1 GHz 以上量測	8DPSK: Ch 0, 39, 78	-
其它不必要之訊號	8DPSK: Ch 78	-
2402 ~ 2480 MHz (Bluetooth LE 4.1)		
1 GHz 以上量測	Ch 0, 19, 39	Ch 39
其它不必要之訊號	Ch 39	Ch 39

6. 此報告中傳輸模式，場強輻射量測及電源線傳導干擾量測之外的測試項目，以DSSS調變技術和OFDM調變技術分別進行測試並記錄最終量測結果於報告中。(WLAN)

7. Bluetooth EDR傳輸模式DH1、DH3及DH5皆經過預測試，其中以DH5的傳輸模式具有較大干擾雜訊，因此僅以此傳輸模式進行最終量測。(BT)

8. Bluetooth LE傳輸模式，場強輻射量測及電源線傳導干擾量測之外的測試項目，以GFSK調變技術進行測試並記錄最終量測結果於報告中。(LE)

9. 此報告中，測試模式評估如下

(1) 電源線傳導干擾量測經預掃後以模式4具有較大干擾值，故以其模式進行最終測試。

(2) 經預掃評估後，場強輻射量測以模式1~14進行測試；並以模式1~7進行完整測試，模式8~14驗證worst case。

模式	Sample	測試狀態
1	B	BT Tx + USB Cable + Adapter + Wireless Charger
2	B	BT LE Tx + USB Cable + Adapter + Wireless Charger
3	B	WLAN Tx + USB Cable + Adapter + Wireless Charger
4	B	USB Cable + Adapter + Wireless Charger
5	B	BT Rx + USB Cable + Adapter + Wireless Charger
6	B	BT LE Rx + USB Cable + Adapter + Wireless Charger
7	B	WLAN Rx + USB Cable + Adapter + Wireless Charger
8	A	BT Tx + USB Cable + Adapter + Wireless Charger
9	A	BT LE Tx + USB Cable + Adapter + Wireless Charger
10	A	WLAN Tx + USB Cable + Adapter + Wireless Charger
11	A	USB Cable + Adapter + Wireless Charger
12	A	BT Rx + USB Cable + Adapter + Wireless Charger
13	A	BT LE Rx + USB Cable + Adapter + Wireless Charger
14	A	WLAN Rx + USB Cable + Adapter + Wireless Charger
15	B	BT Tx + USB Cable + NB + Wireless Charger
16	B	BT LE Tx + USB Cable + NB + Wireless Charger
17	B	WLAN Tx + USB Cable + NB + Wireless Charger
18	B	USB Cable + NB + Wireless Charger
19	B	BT Rx + USB Cable + NB + Wireless Charger
20	B	BT LE Rx + USB Cable + NB + Wireless Charger
21	B	WLAN Rx + USB Cable + NB + Wireless Charger
22	A	BT Tx + USB Cable + NB + Wireless Charger
23	A	BT LE Tx + USB Cable + NB + Wireless Charger
24	A	WLAN Tx + USB Cable + NB + Wireless Charger
25	A	USB Cable + NB + Wireless Charger
26	A	BT Rx + USB Cable + NB + Wireless Charger
27	A	BT LE Rx + USB Cable + NB + Wireless Charger
28	A	WLAN Rx + USB Cable + NB + Wireless Charger

10. 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、垂直、側放，其各擺放最大干擾值之位置如下表，故以此擺放方式進行最終量測，並將測試結果紀錄。

	WLAN 2.4 GHz	Bluetooth EDR	Bluetooth LE 4.1	Wireless Charger
擺放方式	垂直	垂直	垂直	垂直

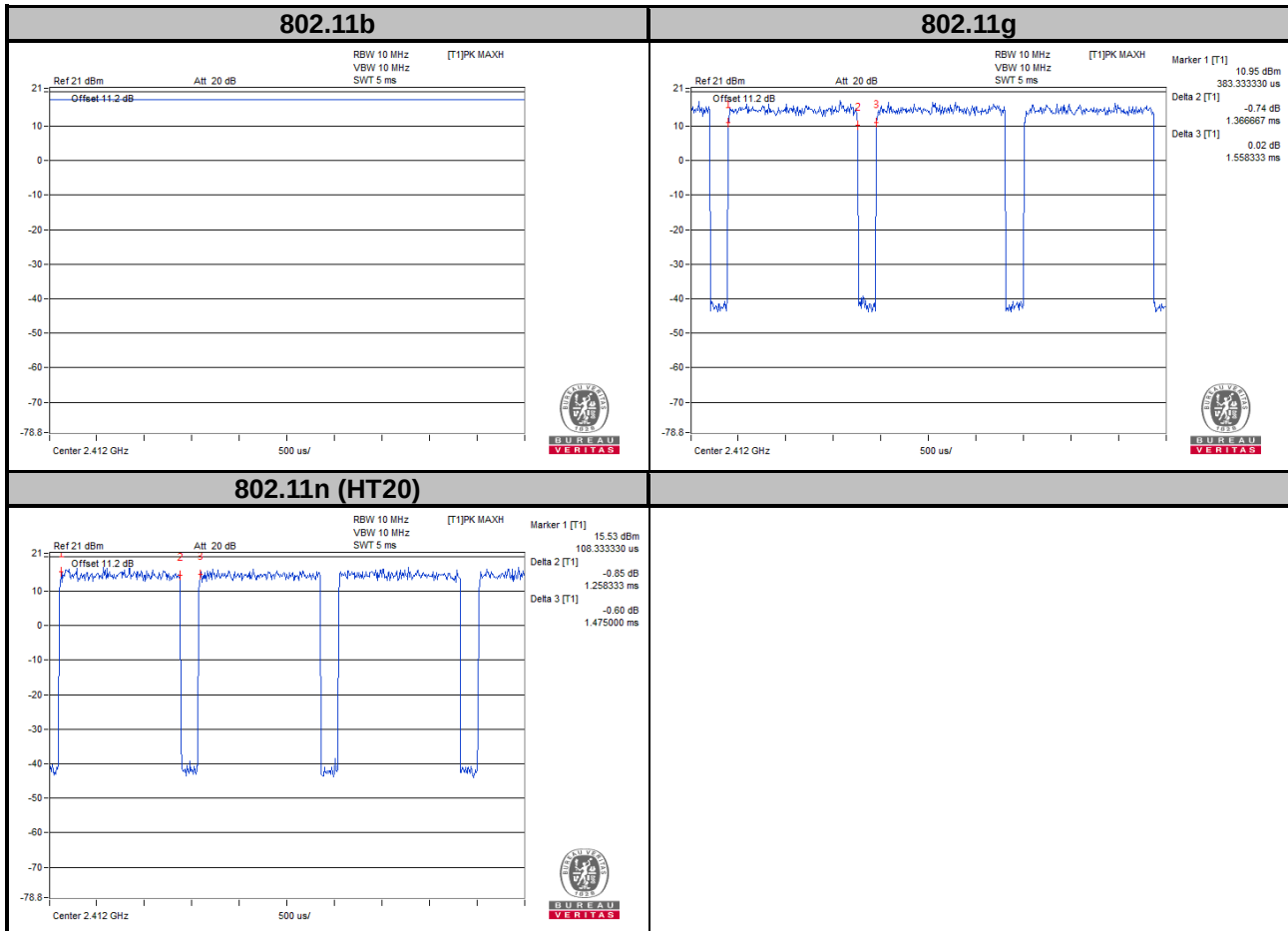
11. Duty cycle of test signal.

2.4 GHz 频段

802.11b: Duty cycle of test signal is 100 %

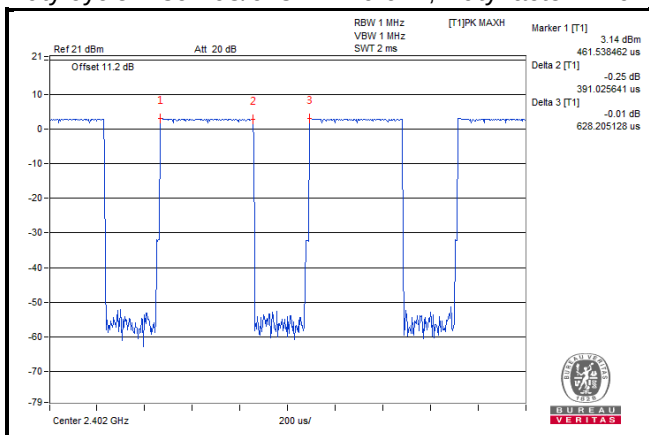
802.11g: Duty cycle = $1.367/1.558 = 0.877$, Duty factor = $10 * \log(1/0.877) = 0.57$

802.11n (HT20): Duty cycle = $1.258/1.475 = 0.853$, Duty factor = $10 * \log(1/0.853) = 0.69$



BT LE 频段

Duty cycle = $391.03/628.21 = 0.622$, Duty factor = $10 * \log(1/0.622) = 2.06$



此裝置各頻道的中心頻率如下：

2.4 GHz 頻段：

802.11b, 802.11g, 802.11n (HT20):

頻道	對應頻率 (MHz)	頻道	對應頻率 (MHz)
01	2412	08	2447
02	2417	09	2452
03	2422	10	2457
04	2427	11	2462
05	2432	12	2467
06	2437	13	2472
07	2442		

Bluetooth EDR 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)	頻道	對應頻率 (MHz)
0	2402	17	2419	34	2436	51	2453	68	2470
1	2403	18	2420	35	2437	52	2454	69	2471
2	2404	19	2421	36	2438	53	2455	70	2472
3	2405	20	2422	37	2439	54	2456	71	2473
4	2406	21	2423	38	2440	55	2457	72	2474
5	2407	22	2424	39	2441	56	2458	73	2475
6	2408	23	2425	40	2442	57	2459	74	2476
7	2409	24	2426	41	2443	58	2460	75	2477
8	2410	25	2427	42	2444	59	2461	76	2478
9	2411	26	2428	43	2445	60	2462	77	2479
10	2412	27	2429	44	2446	61	2463	78	2480
11	2413	28	2430	45	2447	62	2464		
12	2414	29	2431	46	2448	63	2465		
13	2415	30	2432	47	2449	64	2466		
14	2416	31	2433	48	2450	65	2467		
15	2417	32	2434	49	2451	66	2468		
16	2418	33	2435	50	2452	67	2469		

Bluetooth LE 4.1 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)	頻道	對應頻率 (MHz)
0	2402	8	2418	16	2434	24	2450	32	2466
1	2404	9	2420	17	2436	25	2452	33	2468
2	2406	10	2422	18	2438	26	2454	34	2470
3	2408	11	2424	19	2440	27	2456	35	2472
4	2410	12	2426	20	2442	28	2458	36	2474
5	2412	13	2428	21	2444	29	2460	37	2476
6	2414	14	2430	22	2446	30	2462	38	2478
7	2416	15	2432	23	2448	31	2464	39	2480

詳細之規格請參考使用說明書。

3 適用規範

3.1 規範要求

► Bluetooth 4.1 LE 頻段部分：

(1) 傳導之規定

依據國家通訊傳播委員會低功率射頻電機技術規範之 2.3 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電機技術規範 3.10.1.5 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 3.10.1.2(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 2.7 禁用頻段之輻射發射，應符合 2.8 之規定。

頻率(兆赫)	電場強度(微伏/公尺)	測距(公尺)
0.009 - 0.490 (含)	2,400/頻率(千赫)	300
0.490 (不含) - 1.705 (含)	24,000/頻率(千赫)	30
1.705 (不含) - 30 (不含)	30	30
30 (含) - 88 (含)	100	3
88 (不含) - 216 (含)	150	3
216 (不含) - 960 (含)	200	3
960 (不含)以上	500	3

(3) 天線之規定

天線規格不受第 2.2 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電機技術規範 3.10.1 節(3)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 3.10.1.2 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) 6 dB 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電機技術規範 3.10.1.6 節之規定，6 dB 頻寬至少應有 500 kHz。

(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電機技術規範 3.10.1.2 節之規定：

數位調變技術系統：1 W(含)以下。

(7) 功率密度之要求

依據國家通訊傳播委員會低功率射頻電機技術規範 3.10.1.6 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 3.10.1.3 之方式降低功率頻譜密度限制值。

►WLAN 頻段部分:

(8) 傳導之規定

依據國家通訊傳播委員會低功率射頻電機技術規範之 2.3 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。

(9) 帶外發射之規定

(1) 操作於 2.4000~2.4835 GHz band:

依據國家通訊傳播委員會低功率射頻電機技術規範 3.10.1.5 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 3.10.1.2(1)(C)之最大傳導輸出功率測量方式者，至少須衰減 30 dB。

(2) 操作於 5.15~5.35 GHz 及 5.470~5.725 GHz 頻段:

依據國家通訊傳播委員會低功率射頻電機技術規範 4.7.4.1 節之要求，帶外發射之有效等向輻射功率 (EIRP) $\leq$ -27 dBm/MHz。

(3) 操作於 5.725~5.850 GHz 頻段:

依據國家通訊傳播委員會低功率射頻電機技術規範 4.7.4.2 節之要求，所有頻帶邊緣向外 5 MHz 內頻率之發射，有效等向輻射功率 (EIRP) $\leq$ 27 dBm/MHz~-15.6 dBm/MHz (以線性法計算對應之限制值)；所有頻帶邊緣向外 5 MHz~25 MHz，有效等向輻射功率 35 (EIRP) $\leq$ 15.6 dBm/MHz~-10 dBm/MHz (以線性法計算對應之限制值)；所有頻帶邊緣外 25 MHz~75 MHz，有效等向輻射功率 (EIRP) $\leq$ 10 dBm/MHz~-27 dBm/MHz (以線性法計算對應之限制值)；所有頻帶邊緣外 $\geq$ 75 MHz 的頻率之發射，有效等向輻射功率 (EIRP) $\leq$ -27 dBm/MHz；有關遮罩限制值詳圖 1。

在 5.725~5.850 GHz 頻段操作且天線增益大於 10 dBi 之設備於 106 年 3 月 2 日前得適用 3.10.1.5 帶外發射限制；在 5.725~5.850 GHz 頻段操作且天線增益小於等於 10 dBi 之設備於 107 年 3 月 2 日前得適用 3.10.1.5 帶外發射限制規定。

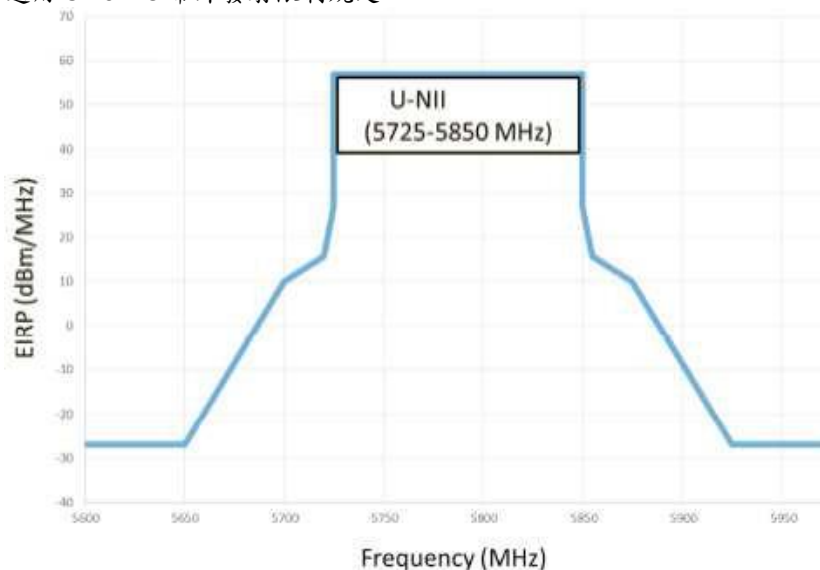


圖 1

在 1 GHz 以下不必要之發射，應符合 2.8 之規定。此外，落於 2.7 禁用頻段之輻射發射，應符合 2.8 之規定。

頻率(兆赫)	電場強度(微伏/公尺)	測距(公尺)
0.009 - 0.490 (含)	2,400/頻率(千赫)	300
0.490 (不含) - 1.705 (含)	24,000/頻率(千赫)	30
1.705 (不含) - 30 (不含)	30	30
30 (含) - 88 (含)	100	3
88 (不含)- 216 (含)	150	3
216 (不含)- 960 (含)	200	3
960 (不含)以上	500	3

(10) 天線之規定

天線規格不受第 2.2 節規定之限制。

(11) 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電機技術規範 3.10.1.3 節及 4.7.3 節之規定如下：

(1) 操作於 2.400~2.4835 GHz 頻段：

- (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 3.10.1.2 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。

(2) 操作於 5.15~5.25 GHz 頻段：

- (A) 供戶外操作使用：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及最大功率頻譜密度。在水平面仰角超過 30 度時，其最大 EIRP 應小於或等於 21 dBm。
- (B) 供室內操作使用：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及最大功率頻譜密度。
- (C) 供固定式點對點操作使用：使用超過 23 dBi 方向增益之指向性天線時，應依超過 23 dBi 天線方向增益的 dBi 總量，等量減少最大傳導輸出功率及最大功率頻譜密度。固定式點對點操作，不包括點對多點系統、全方向性應用及多台共站發射機傳送相同資訊。
- (D) 供用戶端裝置(Client Device)操作使用：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及最大功率頻譜密度。

(3) 操作於 5.25~5.35 GHz 與 5.470~5.725 GHz 頻段：

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及最大功率頻譜密度。

(4) 操作於 5.725~5.850 GHz 頻段：

- (A) 供固定式點對點操作時，使用方向增益超過 6 dBi 之發射天線，可不需對應減少發射器之傳導輸出功率限制值。
- (B) 除(A)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及最大功率頻譜密度。

(12) 6 dB 頻寬之要求

(1) 操作於 2.400~2.4835 GHz 頻段：

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電機技術規範 3.10.1.6 節之規定，6 dB 頻寬至少應有 500 kHz。

(2) 操作於 5.725~5.850 GHz 頻段：

依據國家通訊傳播委員會低功率射頻電機技術規範 4.7.5 節之規定，其 6 dB 頻寬至少應有 500 kHz。

(13) 傳導輸出功率之要求

(1) 操作於 2.4000~2.4835 GHz band:

依據國家通訊傳播委員會低功率射頻電機技術規範 3.10.1.2 節之規定：

數位調變技術系統：1 W(含)以下。

(2) 操作於 5.15~5.25 GHz 頻段:

依據國家通訊傳播委員會低功率射頻電機技術規範 4.7.3.1 節之要求:

(A) 供戶外操作使用/供室內操作使用/供固定式點對點操作使用：最大傳導輸出功率應小於或等於 1 W。

(B) 供用戶端裝置(Client Device)操作使用：最大傳導輸出功率應小於或等於 250 mW。

(3) 操作於 5.25~5.35 GHz 及 5.470~5.725 GHz 頻段:

依據國家通訊傳播委員會低功率射頻電機技術規範 4.7.3.2 節之規定，最大傳導輸出功率應小於或等於 250 mW 或 11 dBm+10log B (B 是 26 dB 發射頻寬，單位 MHz)之較小者。

(4) 操作於 5.725~5.850 GHz 頻段:

依據國家通訊傳播委員會低功率射頻電機技術規範 4.7.3.3 節之規定，最大傳導輸出功率應小於或等於 1 W。

(14) 功率頻譜密度之要求

(1) 操作於 2.4000~2.4835 GHz band:

依據國家通訊傳播委員會低功率射頻電機技術規範 3.10.1.6 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 3.10.1.3 之方式降低功率頻譜密度限制值。

(2) 操作於 5.15~5.25 GHz 頻段:

依據國家通訊傳播委員會低功率射頻電機技術規範 4.7.3.1 節之要求:

(A) 供戶外操作使用/供室內操作使用/供固定式點對點操作使用：在任何 1 MHz 頻帶中最大功率頻譜密度應小於或等於 17 dBm。

(B) 供用戶端裝置(Client Device)操作使用：在任何 1 MHz 頻帶中最大功率頻譜密度應小於或等於 11 dBm。

(3) 操作於 5.25~5.35 GHz 及 5.470~5.725 GHz 頻段:

依據國家通訊傳播委員會低功率射頻電機技術規範 4.7.3.2 節之規定，最大功率頻譜密度在任何 1 MHz 頻帶中應小於或等於 11 dBm。

(4) 操作於 5.725 GHz~5.850 GHz 頻段:

依據國家通訊傳播委員會低功率射頻電機技術規範 4.7.3.3 節之規定，在任何 500 kHz 頻帶中最大功率頻譜密度應小於或等於 30 dBm。

(15) 發射功率控制(TPC)及動態頻率選擇(DFS)之要求

依據國家通訊傳播委員會低功率射頻電機技術規範 4.7.7.1 及 4.7.7.2 節之規定。

發射功率控制(TPC):操作於 5.25~5.35 GHz 與 5.470~5.725 GHz 頻段的設備，應具備發射功率控制功能。

設備必須至少具有 6 dB 低於平均 EIRP 30 dBm 的能力。EIRP 低於 500 mW 之系統不須具備 TPC 功能。

動態頻率選擇(DFS)：操作於 5.25~5.35 GHz 與 5.470~5.725 GHz 頻段之設備應具備動態頻率選擇雷達偵測功能並啟動之，以完整偵測使用頻帶內之雷達訊號，避免與雷達系統同頻道操作。相關規定如下：

(1) 最低動態頻率選擇的偵測門檻

- (A) 最大 EIRP 為 200 mW~1 W 之設備，其最低動態頻率選擇的偵測門檻值為-64 dBm。
- (B) 最大 EIRP 低於 200 mW，且功率頻譜密度小於 10 dBm/MHz 之設備，其最低動態頻率選擇的偵測門檻值為-62 dBm。
- (C) 最大 EIRP 低於 200 mW，且功率頻譜密度大於或等於 10 dBm/MHz 之設備，其最低動態頻率選擇的偵測門檻值為-64 dBm。
- (D) 此偵測門檻值為 1 微秒內之平均接收功率，並以 0 dBi 天線為參考基準。頻道初始設定得由系統隨機選取或使用者手動選取。

(2) 操作模式：動態頻率選擇之規定適用於以下之操作模式：

- (A) 頻道可用性檢查時間之規定，適用於主控運作模式。
- (B) 頻道移動時間之規定，適用於主控及受控運作模式。

(3) 頻道可用性檢查時間：設備必須檢查其可在某一頻道上起始傳送之前是否有雷達系統已經操作在該頻道上，以及何時其必須移動到另一新的頻道，在 60 秒內若沒有偵測到功率位準大過上述之干擾門檻值的雷達訊號時，設備才可開始使用該頻道。

(4) 頻道移動時間：在偵測到雷達的存在後，所有在該操作頻道上的所有傳輸須在 10 秒內停止，在偵測到雷達訊號後，該期間內的傳輸應維持最多 200 毫秒的正常通訊。另外，間歇性的管理與控制訊號可在剩餘的時間中傳送，以便撤離該操作頻道。

(5) 不可佔用期間：某一頻道已被頻道可用性檢查或"服務中"監視顯示含有雷達系統，至少須有 30 分鐘的不可佔用期間。不可佔用期間起始於偵測到雷達系統的當時。

(16) 無線資訊傳輸設備必須擁有安全功能之要求

依據國家通訊傳播委員會低功率射頻電機技術規範 4.7.7.3 節之規定，無線資訊傳輸設備必須擁有安全功能，以保護未經授權之一方更改軟體。製造商應提出符合本節規定之相關證明文件或符合性聲明。

(17) 依據國家通訊傳播委員會低功率射頻電機技術規範 4.7.7.4 節之規定，製造商必須在操作於 U-NII 頻段上之數位調變系統中提供安全功能，使第三方團體無法重寫程式，使其操作於非經認證之設定。該軟體必須避免發射機操作於非經認證之頻率、輸出功率、調變形式或其他射頻參數。製造商可使用私有網路，只有經授權的用戶能下載軟體、進行軟體式電子簽章或硬體式的韌體更新，新的軟體可以被合法的載入到設備中，同時又能符合上述事項，並於應用程式中描述設備授權的方法。

(18) 依據國家通訊傳播委員會低功率射頻電機技術規範 4.7.7.5 節之規定，製造商必須確保 DFS 功能無法被無線資訊傳輸設備之操作者取消。

► Bluetooth EDR 頻段部分：

(19) 傳導之規定

依據國家通訊傳播委員會低功率射頻電機技術規範之 2.3 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。

(20) 帶外發射之規定

依據國家通訊傳播委員會低功率射頻電機技術規範 3.10.1.5 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 3.10.1.2(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 2.7 禁用頻段之輻射發射，應符合 2.8 之規定。

頻率(兆赫)	電場強度(微伏/公尺)	測距(公尺)
0.009 - 0.490 (含)	2,400/頻率(千赫)	300
0.490 (不含) - 1.705 (含)	24,000/頻率(千赫)	30
1.705 (不含) - 30 (不含)	30	30
30 (含) - 88 (含)	100	3
88 (不含)- 216 (含)	150	3
216 (不含)- 960 (含)	200	3
960 (不含)以上	500	3

(21) 天線之規定

天線規格不受第 2.2 節規定之限制。

(22) 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電機技術規範 3.10.1.3 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 3.10.1.2 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。

(23) 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電機技術規範 3.10.1.2 節之規定：

操作於 2400 MHz~2483.5 MHz 者

(a) 至少使用 75 個跳頻頻道之跳頻系統：1 W(含)以下。

(b) 除(a)外，依 3.10.1.6 (1)(A)(a)之跳頻系統：0.125 W(含)以下。

(c) 數位調變技術系統：1 W(含)以下。

除使用附件二之峰值輸出功率測量方式外，並得使用以最大傳導輸出功率(Maximum Conducted Output Power)作為測量方式。

(24) 跳頻頻道數之量測

依據國家通訊傳播委員會低功率射頻電機技術規範 3.10.1.6 節之規定，操作於 2400-2483.5 MHz 之展頻跳頻系統，須使用至少 15 個無重疊的頻道。應使用智慧型跳頻技術，以避免占用於特定跳頻頻道。

(25) 跳頻頻道間隔之量測

依據國家通訊傳播委員會低功率射頻電機技術規範 3.10.1.6 節之規定，跳頻系統之載波頻率頻道間隔應大於或等於 25 kHz 或跳頻頻道之 20 dB 頻寬，兩者取較寬者。但操作頻率為 2400 MHz~2483.5 MHz 頻段且輸出功率應小於或等於 125 mW 跳頻系統，其載波頻率頻道間隔不得小於 25 kHz 或跳頻頻道 20 dB 頻寬之三分之二，兩者取較寬者。系統之跳頻頻道應依虛擬亂數排列，在各頻率之跳頻頻道上跳躍。每一發射機必須均等的使用每一頻率。系統接收機應具有與發射機跳躍頻道頻寬相匹配之輸入頻寬，且應隨所發射之訊號同步偏移接收頻率。

(26) 每一頻道停留時間之量測

依據國家通訊傳播委員會低功率射頻電機技術規範 3.10.1.6 節之規定，操作於 2400 MHz~2483.5 MHz 之展頻跳頻系統，須使用至少 15 個無重疊的頻道，在 0.4 秒乘以跳頻頻道數之週期內，任一頻率占用之平均時間應小於或等於 0.4 秒。應使用智慧型跳頻技術，以避免占用於特定跳頻頻道。

► Wireless Charger (150 kHz)頻段部分：

(27) 傳導之規定

依據國家通訊傳播委員會低功率射頻電機技術規範之 2.3 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。

(28) 輻射之規定

依據國家通訊傳播委員會低功率射頻電機技術規範 2.11 節之要求：

低功率射頻電機之收、發信機為成套銷售者，收、發信機應一併送審或提供經型式認證合格之對應收、發信機之送審資料；收信機之輻射電場強度不得超過 2.8 節之發射規定，且不得調節第 2.7 節所列之頻率。國家通訊傳播委員會低功率射頻電機技術規範 2.8 節之要求，除低功率射頻電機規範各章節另有放寬規定者外，其電場強度不得超過下表之限制，且其不必要之發射皆不得大於主波發射強度。各頻段重疊處，以較嚴格之限制值為準。

頻率(兆赫)	電場強度(微伏/公尺)	測距(公尺)
0.009 - 0.490 (含)	2,400/頻率(千赫)	300
0.490 (不含) - 1.705 (含)	24,000/頻率(千赫)	30
1.705 (不含) - 30 (不含)	30	30
30 (含) - 88 (含)	100	3
88 (不含) - 216 (含)	150	3
216 (不含) - 960 (含)	200	3
960 (不含)以上	500	3

國家通訊傳播委員會低功率射頻電機技術規範 2.9 節之要求，上表規定之電場強度，發射頻率在 9-90 千赫(kHz)、110-490 千赫(kHz)以及 1000 兆赫(MHz)以上者，其量測應以平均值檢波器為基準，且應符合第 5.15.2 節之規定；其他發射頻率，應以國際無線電干擾特別委員會(International Special Committee on Radio Interference, CISPR)準峰值(quasi-peak)檢波器測量；非以上表所指定之距離測量時，應符合第 5.5 節之規定，輻射發射之量測頻率範圍應符合第 5.14 節之規定。

(29) 天線之規定

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

3.2 限制使用之頻帶

除本規範另有規定外，任何低功率射頻電機之主波皆不得使用下表所列各頻段之頻率；低功率射頻電機落於下表所列頻段之混附發射，其電場強度必須符合 2.8 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	1660.0~1770.0	14470~14500
19.965~20.020	1805.0~1865.0	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	2015.0~2025.0	23600~24000
108.00~138.00	2125.0~2165.0	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	

2.4 GHz 頻段測試紀錄結果

4 帶外發射之量測

4.1 適用標準

請見本報告 3.1 節第(9)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 1 GHz 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

802.11b 為 RBW = 1 MHz, VBW = 10 Hz

802.11g 為 RBW = 1 MHz, VBW = 1 kHz

802.11n (HT20) 為 RBW = 1 MHz, VBW = 1 kHz

接收諧波：

Peak 為 RBW = 1 MHz, VBW = 3 MHz；Average 為 RBW = 1 MHz, VBW = 10 Hz

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

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

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver Agilent	N9038A	MY51210203	Feb. 17, 2017	Feb. 16, 2018
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 16, 2016	Dec. 15, 2017
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 26, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Dec. 12, 2016	Dec. 13, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 14, 2016	Dec. 13, 2017
Fixed Attenuator Mini-Circuits	BW-N10W5+	NA	Jul. 08, 2016	Jul. 07, 2017
Loop Antenna	EM-6879	269	Aug. 11, 2016	Aug. 10, 2017
Bluetooth Tester	CBT	100946	Jul. 29, 2016	Jul. 28, 2018
Preamplifier EMCI	EMC 012645	980115	Oct. 21, 2016	Oct. 20, 2017
Preamplifier EMCI	EMC 184045	980116	Oct. 21, 2016	Oct. 20, 2017
Preamplifier EMCI	EMC 330H	980112	Oct. 21, 2016	Oct. 20, 2017
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 21, 2016	Oct. 20, 2017
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 21, 2016	Oct. 20, 2017
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 21, 2016	Oct. 20, 2017
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	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 or 24 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 10.

3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.

4. The FCC Site Registration No. is 690701.

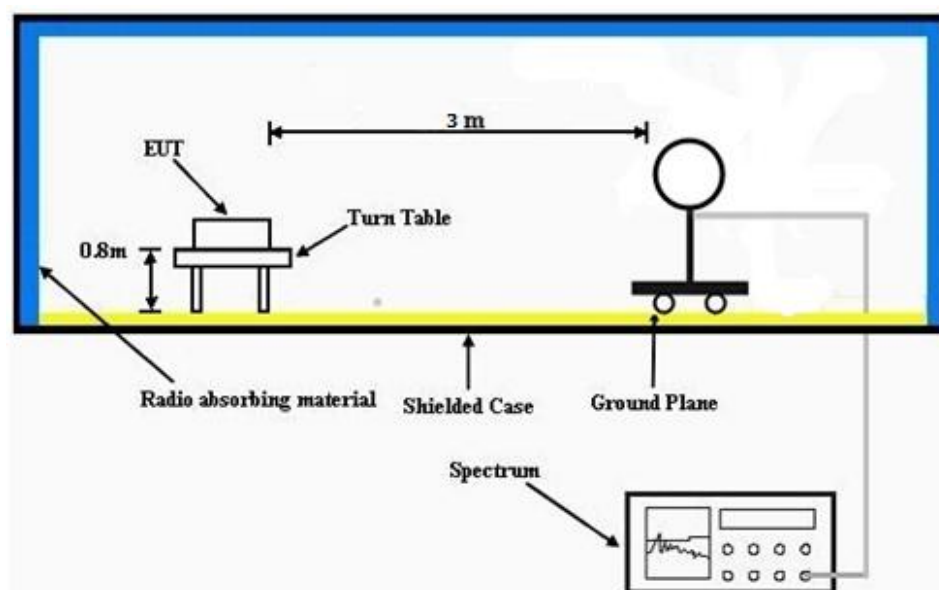
5. The IC Site Registration No. is IC7450F-10.

6. 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.

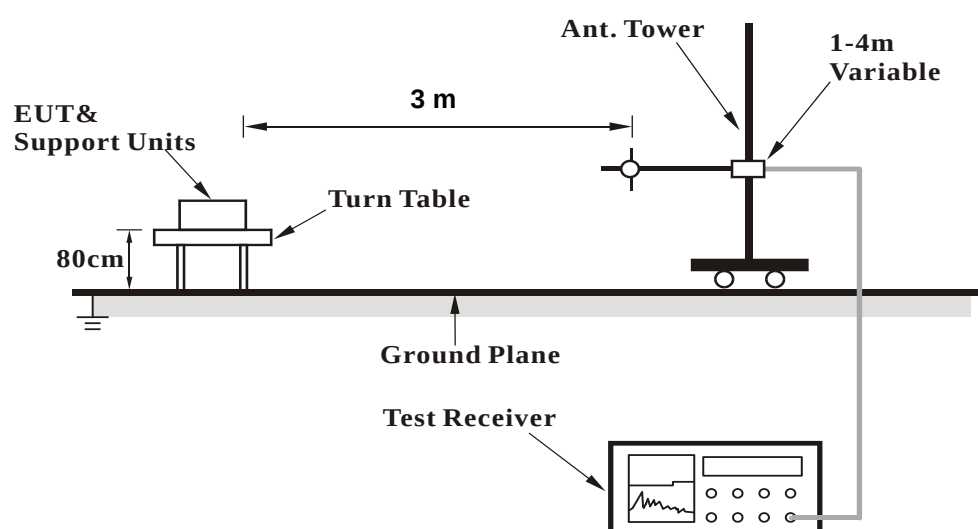
Measurement	Frequency	Uncertainty
Radiated emissions	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~1000 MHz	2.95 dB
	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

4.4 測試配置

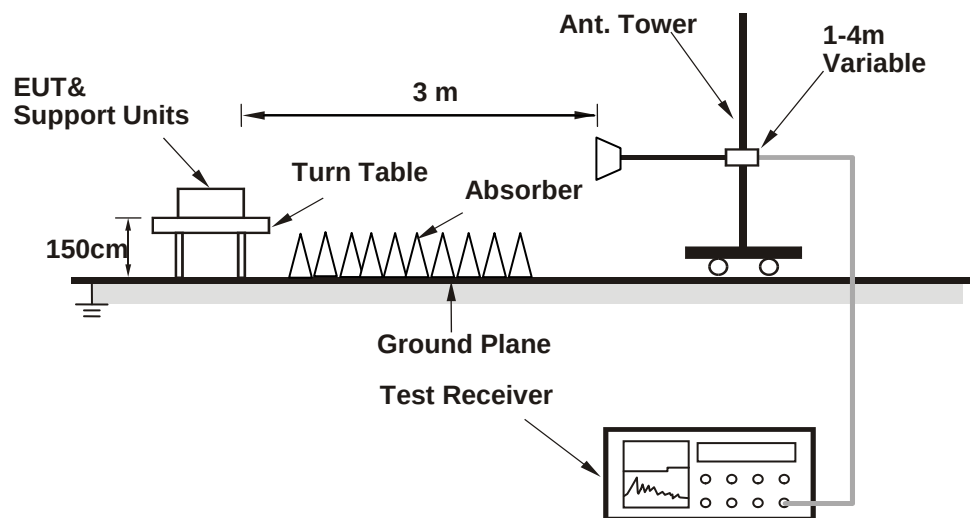
<Frequency Range 9 kHz ~ 30 MHz>



<Frequency Range below 1 GHz>



<Frequency Range above 1 GHz>



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

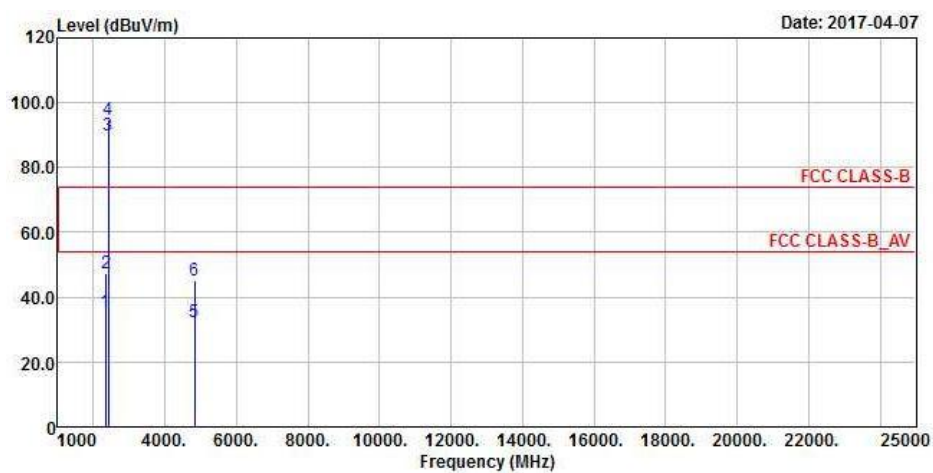
4.6.1 發射諧波

Sample B

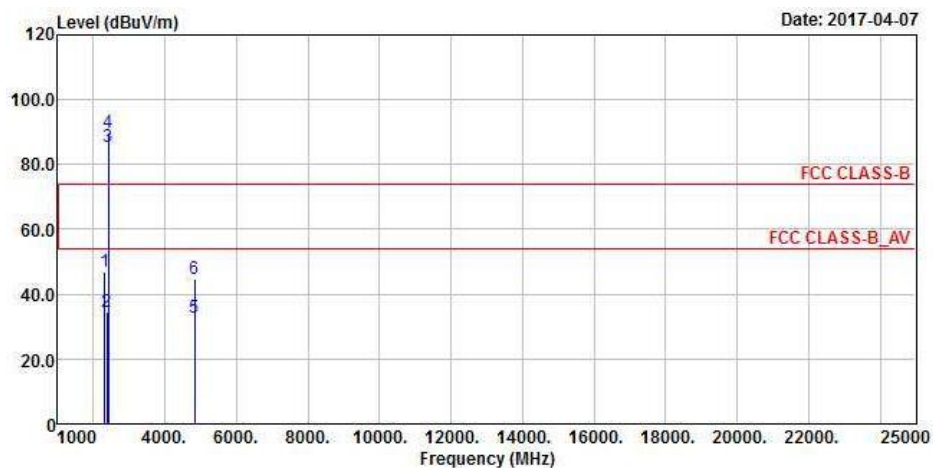
802.11b

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

Horizontal



Vertical



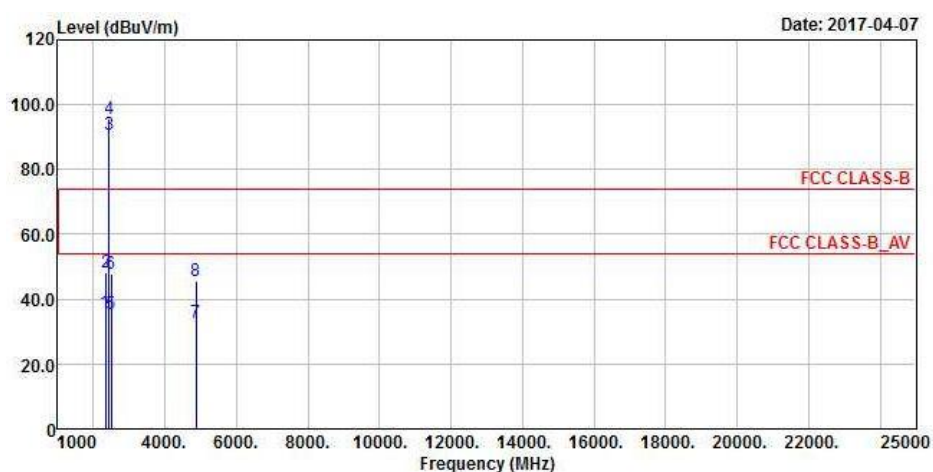
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2339.07	35.46	42.14	54	-18.54	26.77	4.04	37.49	203	9	Average
2353.47	47.45	54.08	74	-26.55	26.81	4.05	37.49	203	9	Peak
2412	89.97	96.44			26.96	4.09	37.52	203	9	Average
2412	94.77	101.24			26.96	4.09	37.52	203	9	Peak
4824	32.31	47.61	54	-21.69	30.99	6.79	53.08	121	38	Average
4824	45.1	60.4	74	-28.9	30.99	6.79	53.08	121	38	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
2318.19	46.88	53.6	74	-27.12	26.72	4.03	37.47	192	3	Peak
2366.25	34.53	41.15	54	-19.47	26.81	4.07	37.5	192	3	Average
2412	85.48	91.95			26.96	4.09	37.52	192	3	Average
2412	90.02	96.49			26.96	4.09	37.52	192	3	Peak
4824	32.55	47.85	54	-21.45	30.99	6.79	53.08	177	210	Average
4824	44.9	60.2	74	-29.1	30.99	6.79	53.08	177	210	Peak

Remarks:

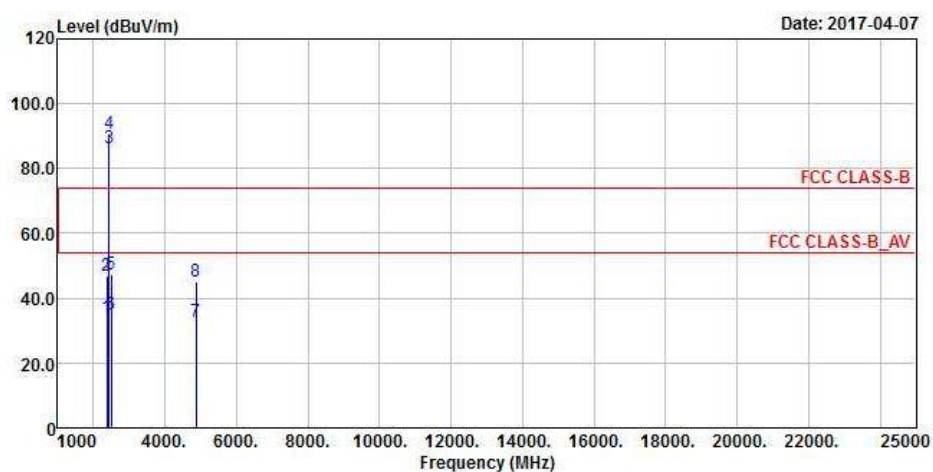
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2412 MHz: Fundamental Frequency.
- The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



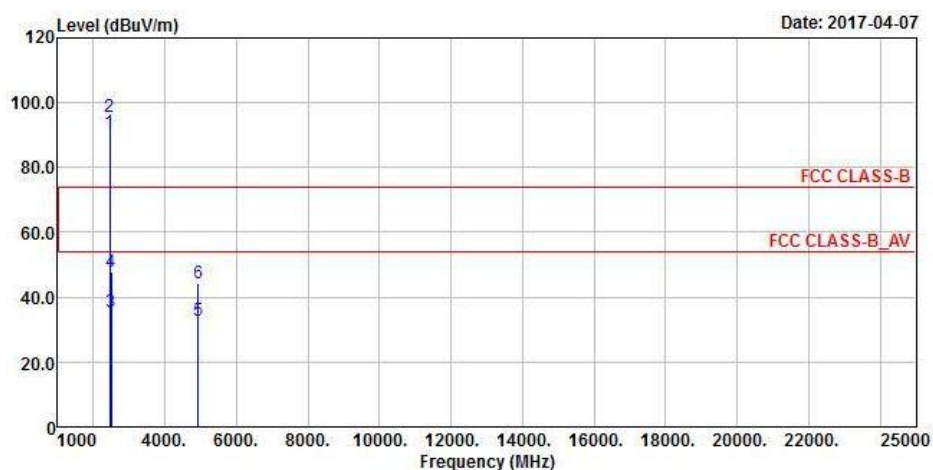
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2339.16	35.98	42.66	54	-18.02	26.77	4.04	37.49	203	3	Average
2352.93	48.33	54.96	74	-25.67	26.81	4.05	37.49	203	3	Peak
2437	90.87	97.15			27.06	4.12	37.46	203	3	Average
2437	95.61	101.89			27.06	4.12	37.46	203	3	Peak
2494.92	35.6	41.49	54	-18.4	27.2	4.16	37.25	203	3	Average
2495.04	47.84	53.73	74	-26.16	27.2	4.16	37.25	203	3	Peak
4874	32.61	47.75	54	-21.39	31.06	6.85	53.05	119	41	Average
4874	45.42	60.56	74	-28.58	31.06	6.85	53.05	119	41	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
2372.82	34.26	40.83	54	-19.74	26.86	4.07	37.5	191	7	Average
2372.82	46.98	53.55	74	-27.02	26.86	4.07	37.5	191	7	Peak
2437	86.39	92.67			27.06	4.12	37.46	191	7	Average
2437	90.91	97.19			27.06	4.12	37.46	191	7	Peak
2487.08	47.35	53.37	74	-26.65	27.15	4.15	37.32	191	7	Peak
2494.16	34.83	40.72	54	-19.17	27.2	4.16	37.25	191	7	Average
4874	32.71	47.85	54	-21.29	31.06	6.85	53.05	172	221	Average
4874	45.36	60.5	74	-28.64	31.06	6.85	53.05	172	221	Peak

Remarks:

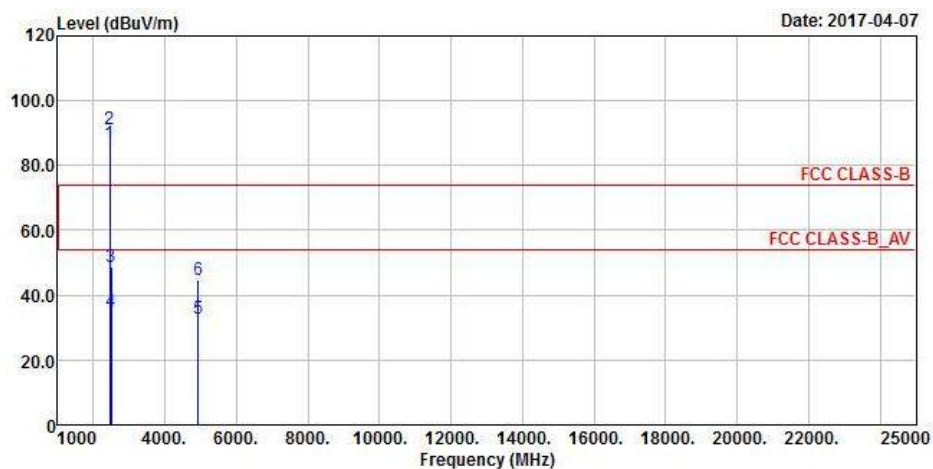
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 2437 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



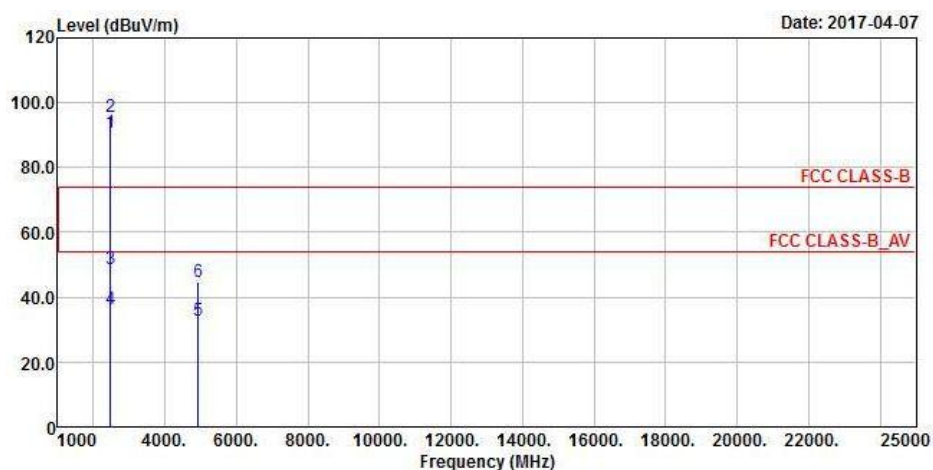
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	90.6	96.76			27.1	4.13	37.39	204	7	Average
2462	95.48	101.64			27.1	4.13	37.39	204	7	Peak
2488.24	35.56	41.52	54	-18.44	27.2	4.16	37.32	204	7	Average
2489.08	47.86	53.82	74	-26.14	27.2	4.16	37.32	204	7	Peak
4924	32.84	47.87	54	-21.16	31.12	6.88	53.03	125	46	Average
4924	44.11	59.14	74	-29.89	31.12	6.88	53.03	125	46	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
2462	86.63	92.79			27.1	4.13	37.39	190	6	Average
2462	91.21	97.37			27.1	4.13	37.39	190	6	Peak
2487	48.49	54.51	74	-25.51	27.15	4.15	37.32	190	6	Peak
2487.76	34.84	40.8	54	-19.16	27.2	4.16	37.32	190	6	Average
4924	32.97	48	54	-21.03	31.12	6.88	53.03	176	208	Average
4924	44.72	59.75	74	-29.28	31.12	6.88	53.03	176	208	Peak

Remarks:

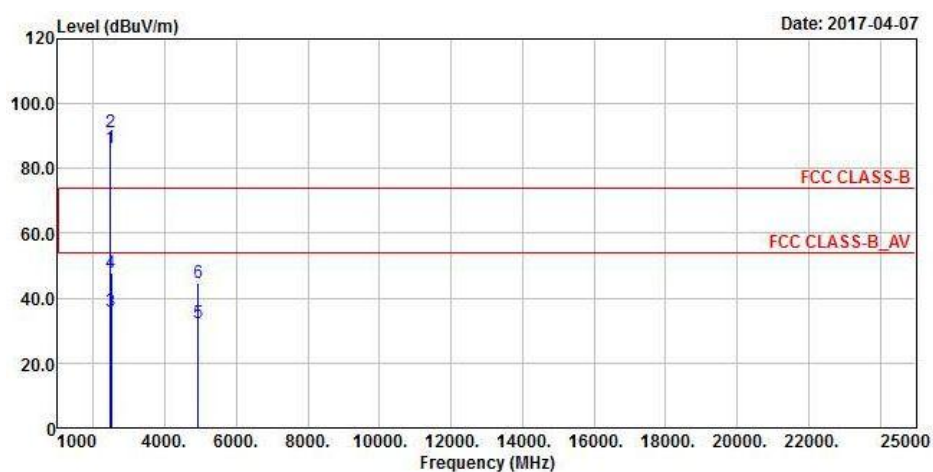
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2462 MHz: Fundamental Frequency.
- The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



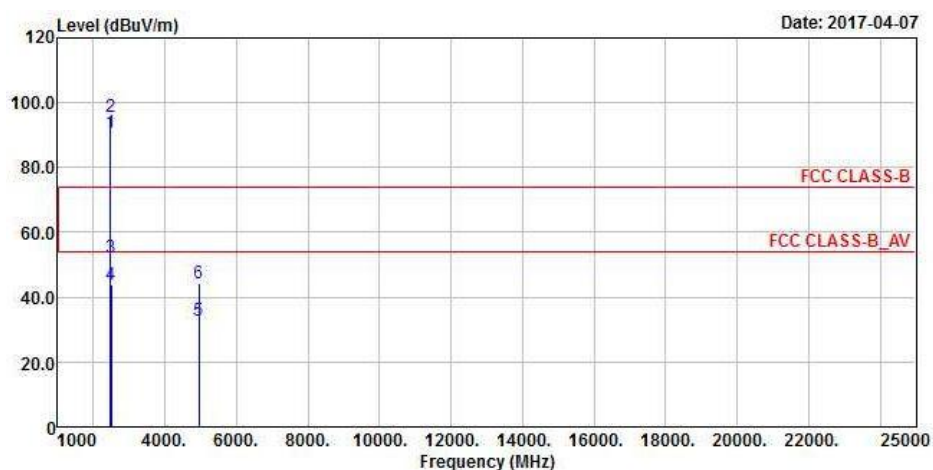
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2467	90.86	96.95			27.1	4.13	37.32	202	8	Average
2467	95.57	101.66			27.1	4.13	37.32	202	8	Peak
2483.6	48.54	54.56	74	-25.46	27.15	4.15	37.32	202	8	Peak
2484	36.35	42.37	54	-17.65	27.15	4.15	37.32	202	8	Average
4934	32.71	47.74	54	-21.29	31.12	6.88	53.03	133	46	Average
4934	44.55	59.58	74	-29.45	31.12	6.88	53.03	133	46	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
2467	86.36	92.45			27.1	4.13	37.32	188	13	Average
2467	91	97.09			27.1	4.13	37.32	188	13	Peak
2483.6	35.66	41.68	54	-18.34	27.15	4.15	37.32	188	13	Average
2487.4	47.79	53.8	74	-26.21	27.15	4.16	37.32	188	13	Peak
4934	32.31	47.34	54	-21.69	31.12	6.88	53.03	181	221	Average
4934	44.9	59.93	74	-29.1	31.12	6.88	53.03	181	221	Peak

Remarks:

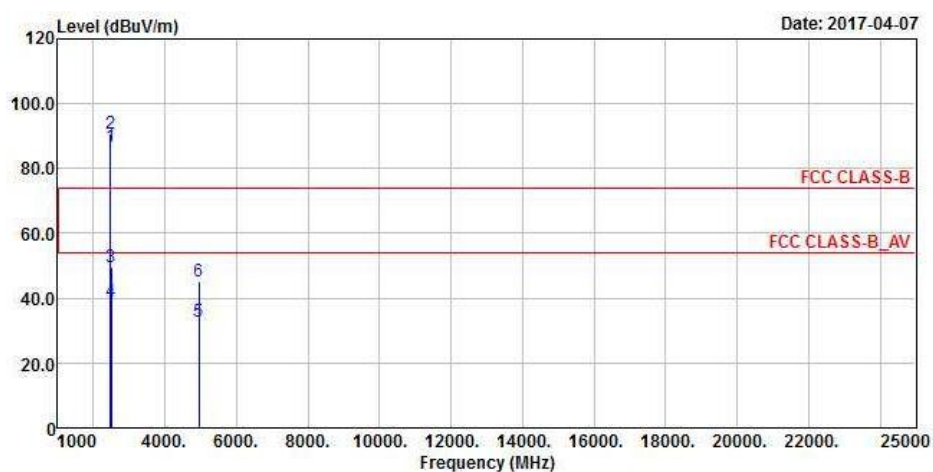
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2467 MHz: Fundamental Frequency.
- The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
2472	90.8	96.82			27.15	4.15	37.32	204	7	Average
2472	95.58	101.6			27.15	4.15	37.32	204	7	Peak
2483.56	52.25	58.27	74	-21.75	27.15	4.15	37.32	204	7	Peak
2485.84	43.73	49.75	54	-10.27	27.15	4.15	37.32	204	7	Average
4944	32.76	47.75	54	-21.24	31.14	6.91	53.04	123	56	Average
4944	44.34	59.33	74	-29.66	31.14	6.91	53.04	123	56	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
2472	86.67	92.69			27.15	4.15	37.32	191	9	Average
2472	90.92	96.94			27.15	4.15	37.32	191	9	Peak
2484.08	49.57	55.59	74	-24.43	27.15	4.15	37.32	191	9	Peak
2485.84	39.02	45.04	54	-14.98	27.15	4.15	37.32	191	9	Average
4944	32.89	47.88	54	-21.11	31.14	6.91	53.04	179	206	Average
4944	45.35	60.34	74	-28.65	31.14	6.91	53.04	179	206	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2472 MHz: Fundamental Frequency.
- The other emission levels were very low against the limit.

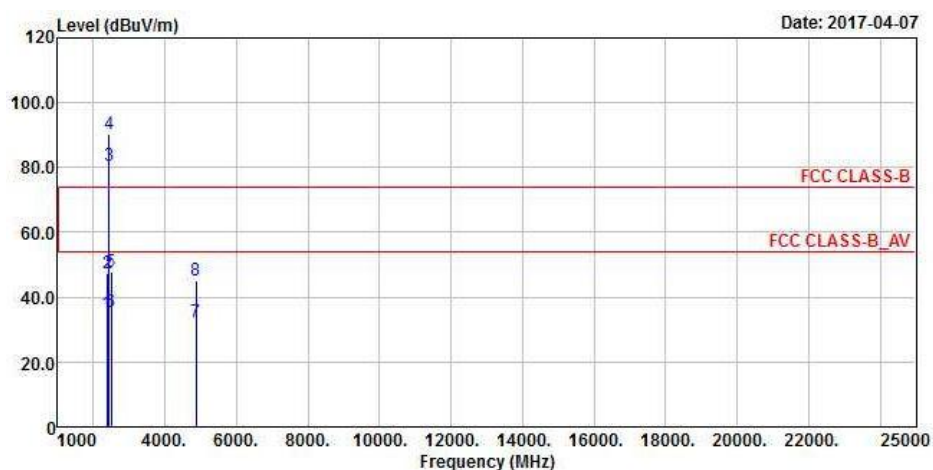
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2343.39	47.1	53.78	74	-26.9	26.77	4.04	37.49	207	3	Peak
2359.59	35.4	42.03	54	-18.6	26.81	4.05	37.49	207	3	Average
2412	80.2	86.67			26.96	4.09	37.52	207	3	Average
2412	89.87	96.34			26.96	4.09	37.52	207	3	Peak
4824	32.45	47.75	54	-21.55	30.99	6.79	53.08	122	45	Average
4824	45.35	60.65	74	-28.65	30.99	6.79	53.08	122	45	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
2336.01	47.58	54.24	74	-26.42	26.77	4.04	37.47	192	12	Peak
2380.29	34.18	40.74	54	-19.82	26.86	4.08	37.5	192	12	Average
2412	75.76	82.23			26.96	4.09	37.52	192	12	Average
2412	85.42	91.89			26.96	4.09	37.52	192	12	Peak
4824	32.24	47.54	54	-21.76	30.99	6.79	53.08	174	231	Average
4824	44.71	60.01	74	-29.29	30.99	6.79	53.08	174	231	Peak

Remarks:

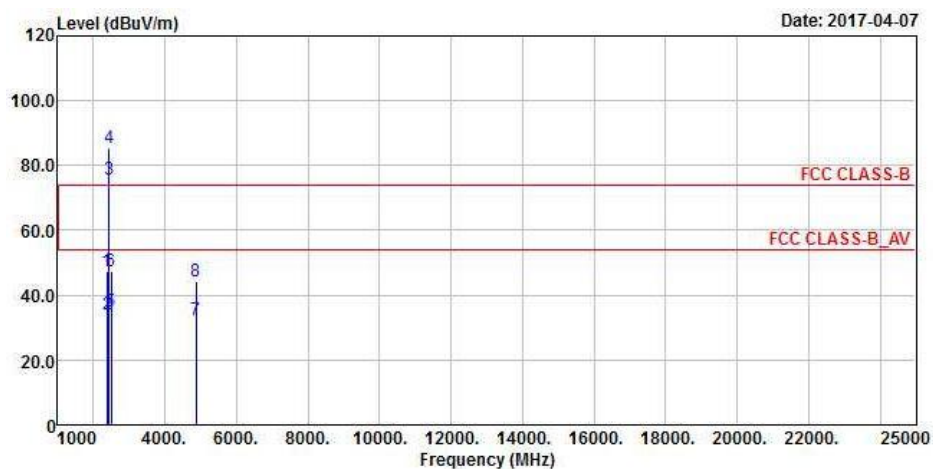
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2412 MHz: Fundamental Frequency.
- The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



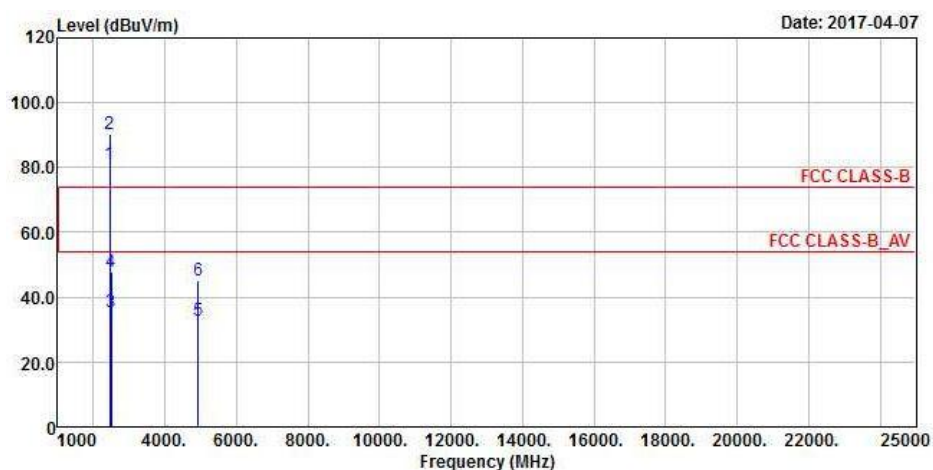
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2379.84	35.09	41.65	54	-18.91	26.86	4.08	37.5	205	1	Average
2389.38	47.31	53.82	74	-26.69	26.91	4.08	37.5	205	1	Peak
2437	80.57	86.85			27.06	4.12	37.46	205	1	Average
2437	90.19	96.47			27.06	4.12	37.46	205	1	Peak
2487.04	47.76	53.78	74	-26.24	27.15	4.15	37.32	205	1	Peak
2488.56	35.4	41.36	54	-18.6	27.2	4.16	37.32	205	1	Average
4874	32.28	47.42	54	-21.72	31.06	6.85	53.05	125	46	Average
4874	44.98	60.12	74	-29.02	31.06	6.85	53.05	125	46	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
2367.33	47.21	53.83	74	-26.79	26.81	4.07	37.5	192	8	Peak
2386.77	34.21	40.72	54	-19.79	26.91	4.08	37.5	192	8	Average
2437	75.91	82.19			27.06	4.12	37.46	192	8	Average
2437	85.59	91.87			27.06	4.12	37.46	192	8	Peak
2490.08	34.92	40.88	54	-19.08	27.2	4.16	37.32	192	8	Average
2499.92	47.58	53.47	74	-26.42	27.2	4.16	37.25	192	8	Peak
4874	32.11	47.25	54	-21.89	31.06	6.85	53.05	175	233	Average
4874	44.31	59.45	74	-29.69	31.06	6.85	53.05	175	233	Peak

Remarks:

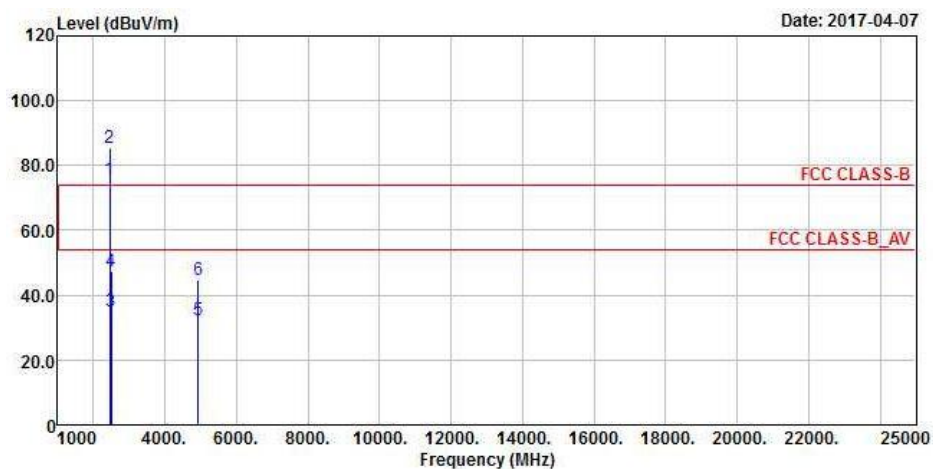
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 2437 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



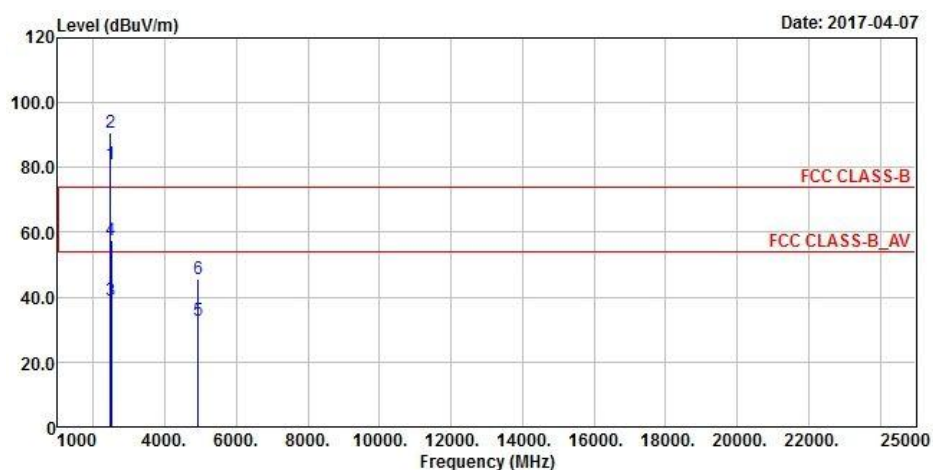
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	80.96	87.12			27.1	4.13	37.39	202	4	Average
2462	90.53	96.69			27.1	4.13	37.39	202	4	Peak
2488.44	35.54	41.5	54	-18.46	27.2	4.16	37.32	202	4	Average
2488.8	47.91	53.87	74	-26.09	27.2	4.16	37.32	202	4	Peak
4924	32.57	47.6	54	-21.43	31.12	6.88	53.03	134	47	Average
4924	45.11	60.14	74	-28.89	31.12	6.88	53.03	134	47	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
2462	75.92	82.08			27.1	4.13	37.39	192	10	Average
2462	85.68	91.84			27.1	4.13	37.39	192	10	Peak
2483.52	34.93	40.95	54	-19.07	27.15	4.15	37.32	192	10	Average
2492	47.49	53.38	74	-26.51	27.2	4.16	37.25	192	10	Peak
4924	32.32	47.35	54	-21.68	31.12	6.88	53.03	178	226	Average
4924	44.65	59.68	74	-29.35	31.12	6.88	53.03	178	226	Peak

Remarks:

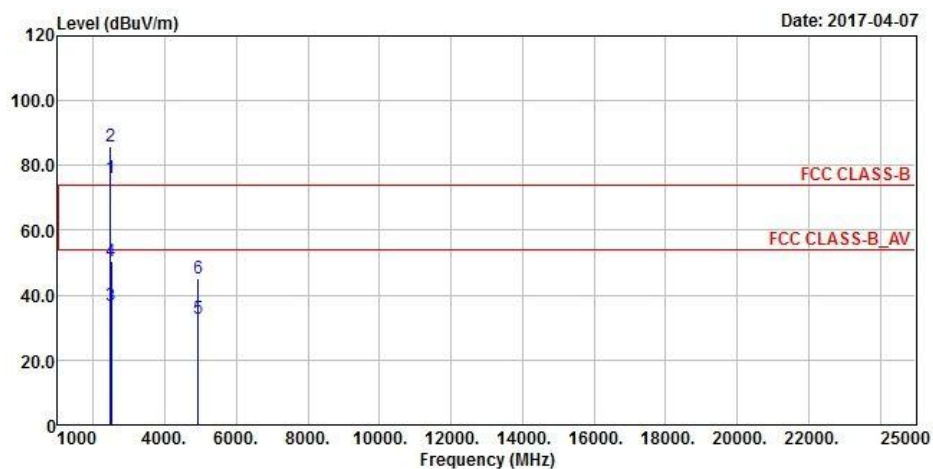
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2462 MHz: Fundamental Frequency.
- The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



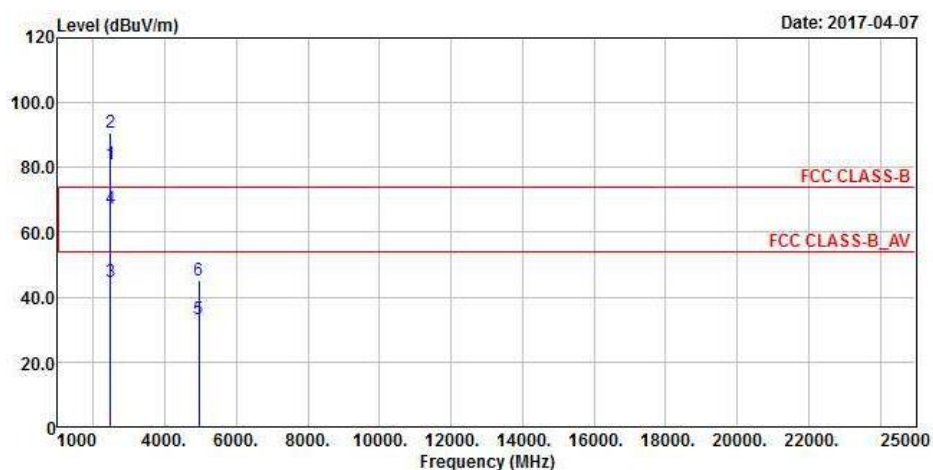
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2467	81.19	87.28			27.1	4.13	37.32	203	6	Average
2467	90.99	97.08			27.1	4.13	37.32	203	6	Peak
2483.64	39.15	45.17	54	-14.85	27.15	4.15	37.32	203	6	Average
2484.4	57.5	63.52	74	-16.5	27.15	4.15	37.32	203	6	Peak
4934	32.74	47.77	54	-21.26	31.12	6.88	53.03	1223	33	Average
4934	45.8	60.83	74	-28.2	31.12	6.88	53.03	1223	33	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
2467	75.97	82.06			27.1	4.13	37.32	191	13	Average
2467	85.73	91.82			27.1	4.13	37.32	191	13	Peak
2483.6	36.75	42.77	54	-17.25	27.15	4.15	37.32	191	13	Average
2484.08	50.44	56.46	74	-23.56	27.15	4.15	37.32	191	13	Peak
4934	32.96	47.99	54	-21.04	31.12	6.88	53.03	178	222	Average
4934	45.04	60.07	74	-28.96	31.12	6.88	53.03	178	222	Peak

Remarks:

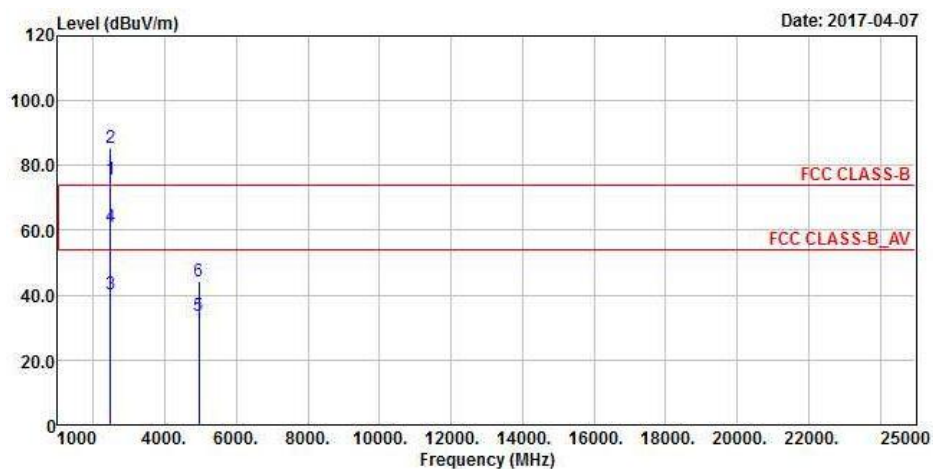
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2467 MHz: Fundamental Frequency.
- The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
2472	81.13	87.15			27.15	4.15	37.32	204	8	Average
2472	90.71	96.73			27.15	4.15	37.32	204	8	Peak
2483.52	44.7	50.72	54	-9.3	27.15	4.15	37.32	204	8	Average
2483.56	67.32	73.34	74	-6.68	27.15	4.15	37.32	204	8	Peak
4944	33.36	48.35	54	-20.64	31.14	6.91	53.04	123	44	Average
4944	45.2	60.19	74	-28.8	31.14	6.91	53.04	123	44	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
2472	75.89	81.91			27.15	4.15	37.32	192	9	Average
2472	85.6	91.62			27.15	4.15	37.32	192	9	Peak
2483.52	40.45	46.47	54	-13.55	27.15	4.15	37.32	192	9	Average
2483.6	61.09	67.11	74	-12.91	27.15	4.15	37.32	192	9	Peak
4944	33.46	48.45	54	-20.54	31.14	6.91	53.04	178	225	Average
4944	44.4	59.39	74	-29.6	31.14	6.91	53.04	178	225	Peak

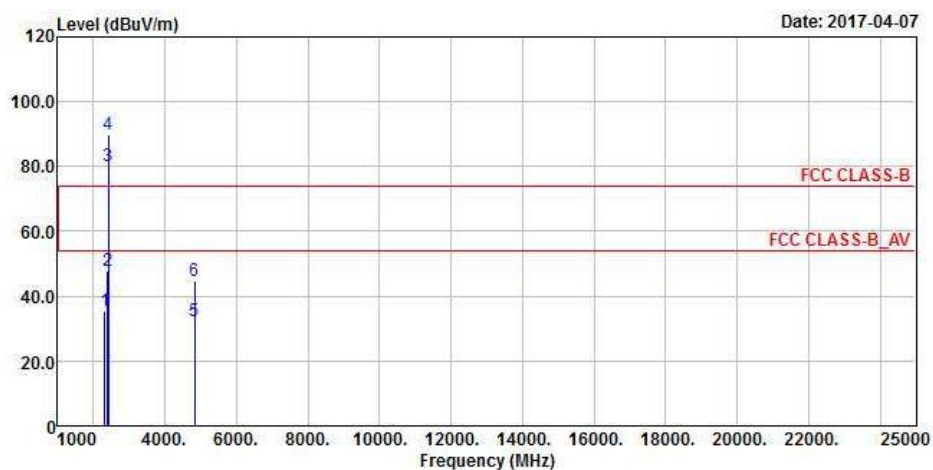
Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2472 MHz: Fundamental Frequency.
- The other emission levels were very low against the limit.

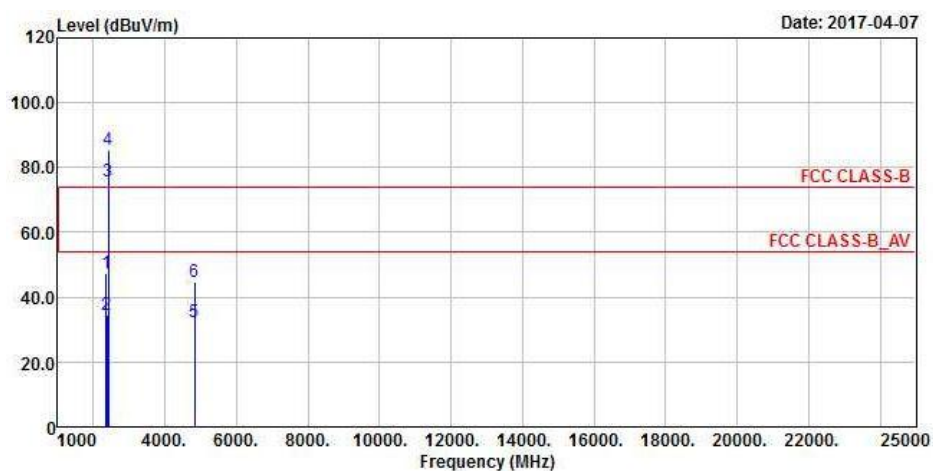
802.11n (HT20)

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

Horizontal



Vertical



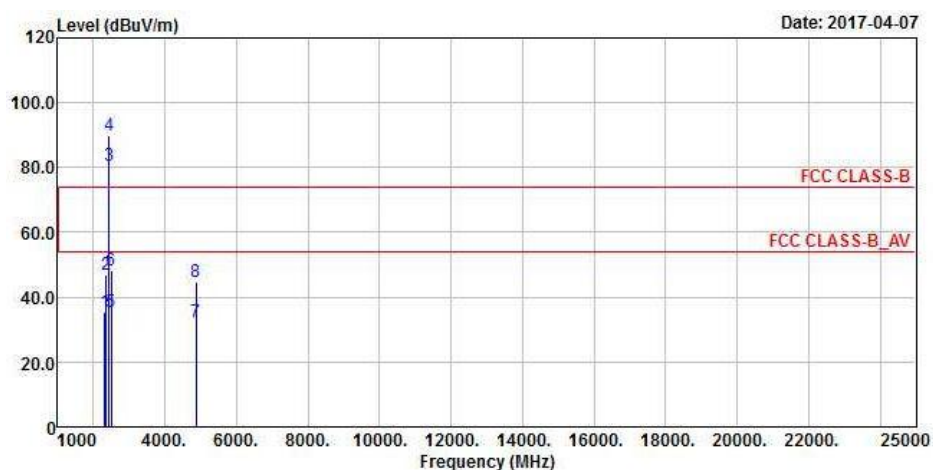
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2318.82	35.58	42.3	54	-18.42	26.72	4.03	37.47	205	5	Average
2389.65	47.9	54.41	74	-26.1	26.91	4.08	37.5	205	5	Peak
2412	80.24	86.71			26.96	4.09	37.52	205	5	Average
2412	90.06	96.53			26.96	4.09	37.52	205	5	Peak
4824	32.12	47.42	54	-21.88	30.99	6.79	53.08	126	45	Average
4824	44.78	60.08	74	-29.22	30.99	6.79	53.08	126	45	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
2352.03	47.54	54.17	74	-26.46	26.81	4.05	37.49	194	6	Peak
2379.48	34.4	40.97	54	-19.6	26.86	4.07	37.5	194	6	Average
2412	75.64	82.11			26.96	4.09	37.52	194	6	Average
2412	85.38	91.85			26.96	4.09	37.52	194	6	Peak
4824	32.35	47.65	54	-21.65	30.99	6.79	53.08	174	231	Average
4824	44.73	60.03	74	-29.27	30.99	6.79	53.08	174	231	Peak

Remarks:

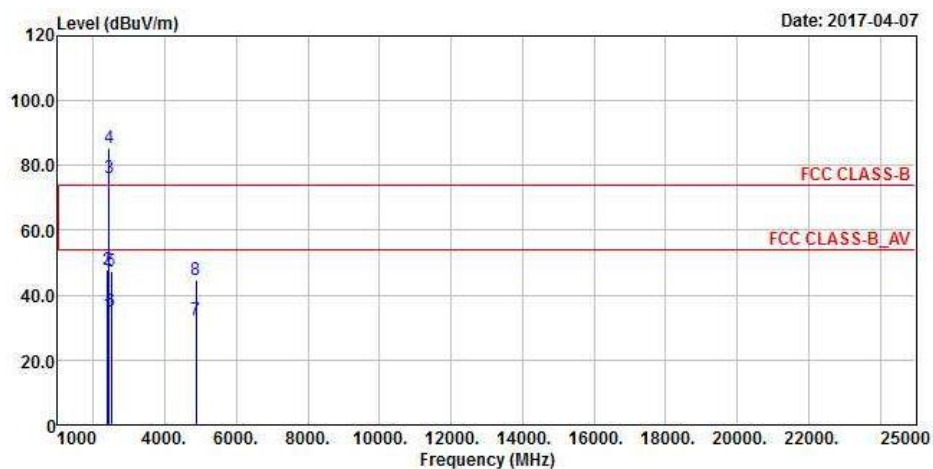
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2412 MHz: Fundamental Frequency.
- The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



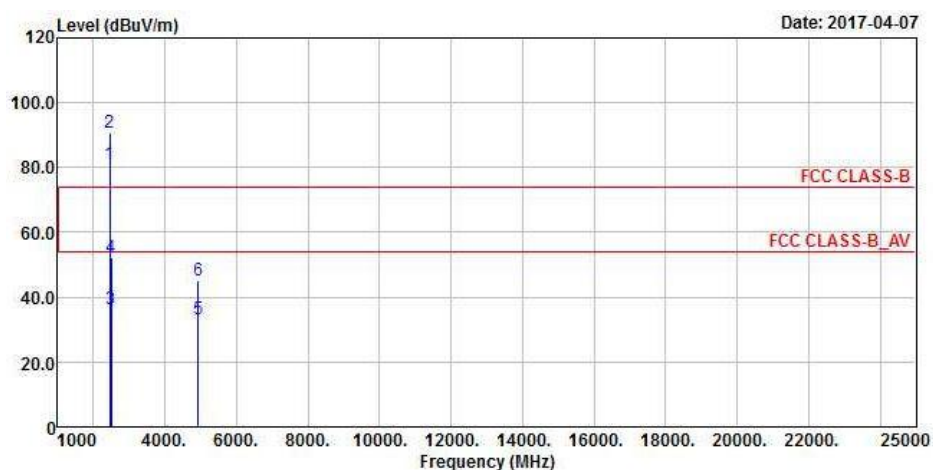
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2318.73	35.53	42.25	54	-18.47	26.72	4.03	37.47	204	10	Average
2350.95	47.13	53.8	74	-26.87	26.77	4.05	37.49	204	10	Peak
2437	80.69	86.97			27.06	4.12	37.46	204	10	Average
2437	90.11	96.39			27.06	4.12	37.46	204	10	Peak
2488.28	35.57	41.53	54	-18.43	27.2	4.16	37.32	204	10	Average
2491.84	48.13	54.02	74	-25.87	27.2	4.16	37.25	204	10	Peak
4874	32.27	47.41	54	-21.73	31.06	6.85	53.05	118	35	Average
4874	44.69	59.83	74	-29.31	31.06	6.85	53.05	118	35	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
2385.87	34.3	40.81	54	-19.7	26.91	4.08	37.5	192	15	Average
2389.74	47.69	54.2	74	-26.31	26.91	4.08	37.5	192	15	Peak
2437	75.99	82.27			27.06	4.12	37.46	192	15	Average
2437	85.42	91.7			27.06	4.12	37.46	192	15	Peak
2487.48	47.4	53.41	74	-26.6	27.15	4.16	37.32	192	15	Peak
2489.56	34.88	40.84	54	-19.12	27.2	4.16	37.32	192	15	Average
4874	32.28	47.42	54	-21.72	31.06	6.85	53.05	171	231	Average
4874	44.66	59.8	74	-29.34	31.06	6.85	53.05	171	231	Peak

Remarks:

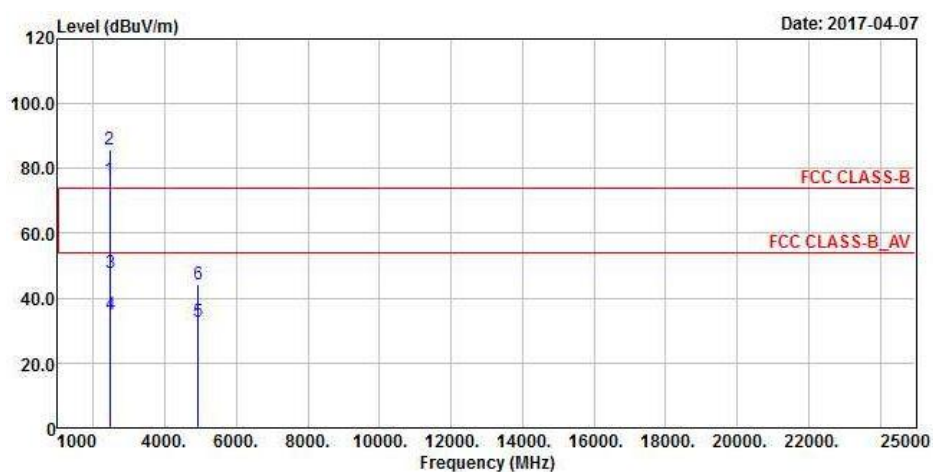
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 2437 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



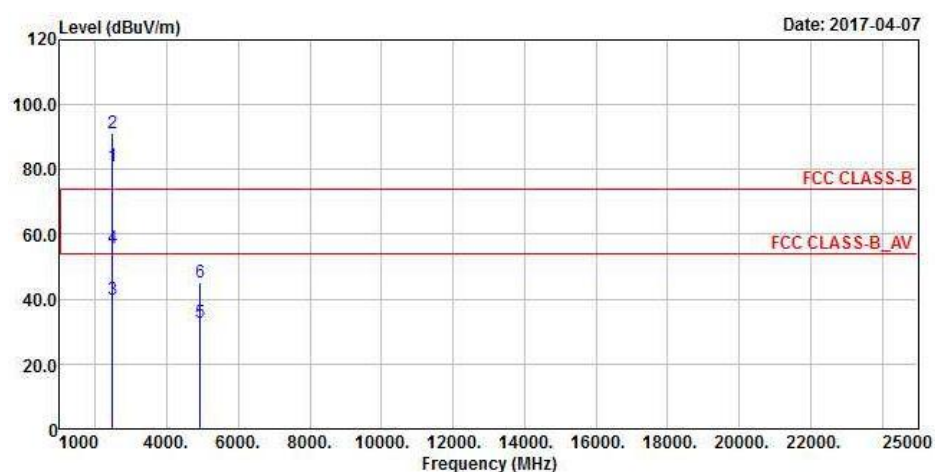
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	81.13	87.29			27.1	4.13	37.39	201	358	Average
2462	90.94	97.1			27.1	4.13	37.39	201	358	Peak
2483.88	36.51	42.53	54	-17.49	27.15	4.15	37.32	201	358	Average
2484.04	52.37	58.39	74	-21.63	27.15	4.15	37.32	201	358	Peak
4924	33.09	48.12	54	-20.91	31.12	6.88	53.03	124	61	Average
4924	45.01	60.04	74	-28.99	31.12	6.88	53.03	124	61	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
2462	76.39	82.55			27.1	4.13	37.39	194	14	Average
2462	86.06	92.22			27.1	4.13	37.39	194	14	Peak
2483.72	47.7	53.72	74	-26.3	27.15	4.15	37.32	194	14	Peak
2483.96	35.12	41.14	54	-18.88	27.15	4.15	37.32	194	14	Average
4924	32.72	47.75	54	-21.28	31.12	6.88	53.03	176	205	Average
4924	44.45	59.48	74	-29.55	31.12	6.88	53.03	176	205	Peak

Remarks:

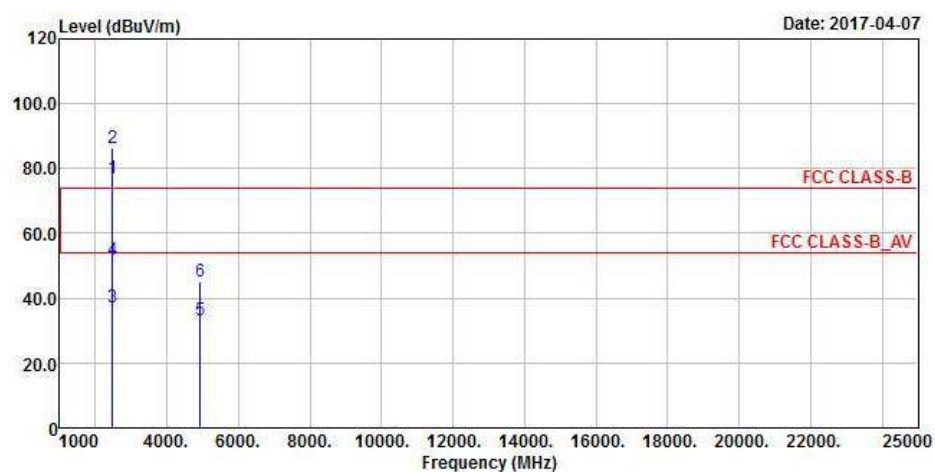
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2462 MHz: Fundamental Frequency.
- The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



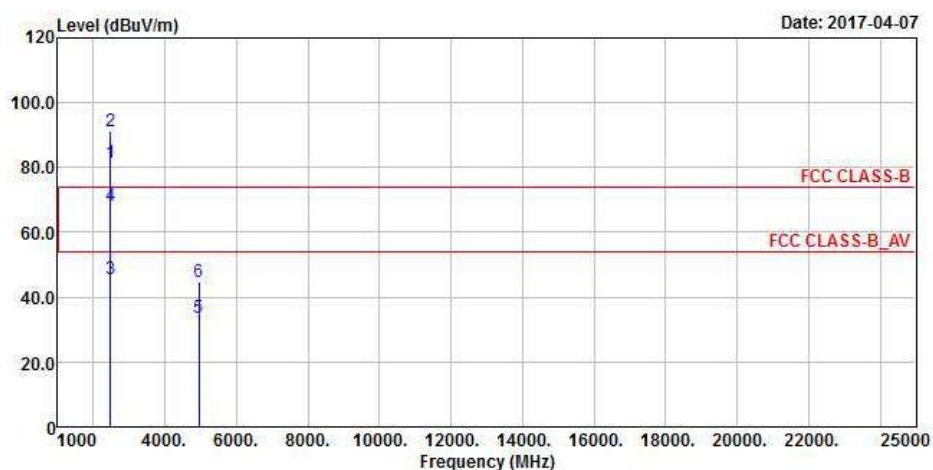
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2467	81.16	87.25			27.1	4.13	37.32	203	359	Average
2467	91.1	97.19			27.1	4.13	37.32	203	359	Peak
2483.56	39.72	45.74	54	-14.28	27.15	4.15	37.32	203	359	Average
2483.68	55.81	61.83	74	-18.19	27.15	4.15	37.32	203	359	Peak
4934	32.83	47.86	54	-21.17	31.12	6.88	53.03	132	46	Average
4934	44.98	60.01	74	-29.02	31.12	6.88	53.03	132	46	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
2467	76.89	82.98			27.1	4.13	37.32	188	8	Average
2467	86.54	92.63			27.1	4.13	37.32	188	8	Peak
2483.56	37.17	43.19	54	-16.83	27.15	4.15	37.32	188	8	Average
2483.6	51.79	57.81	74	-22.21	27.15	4.15	37.32	188	8	Peak
4934	33.29	48.32	54	-20.71	31.12	6.88	53.03	178	231	Average
4934	45.13	60.16	74	-28.87	31.12	6.88	53.03	178	231	Peak

Remarks:

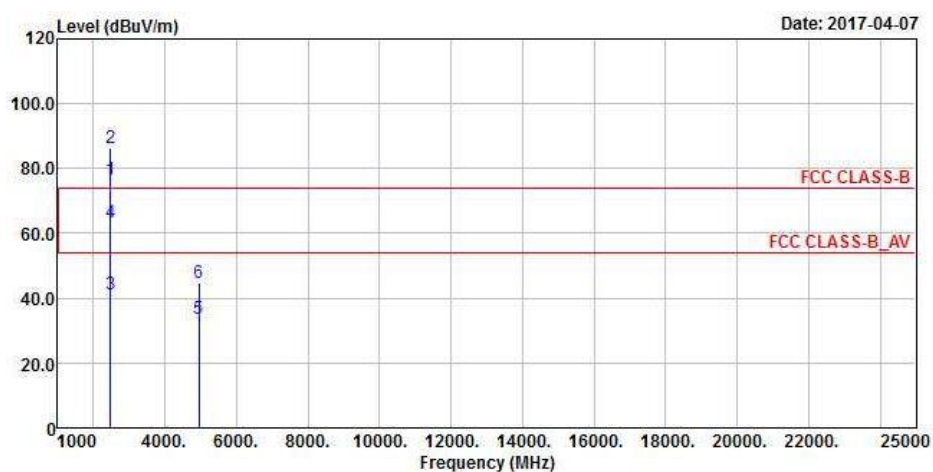
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2467 MHz: Fundamental Frequency.
- The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
2472	81.31	87.33			27.15	4.15	37.32	200	2	Average
2472	91.03	97.05			27.15	4.15	37.32	200	2	Peak
2483.56	45.62	51.64	54	-8.38	27.15	4.15	37.32	200	2	Average
2483.56	68.04	74.06	74	-5.96	27.15	4.15	37.32	200	2	Peak
4944	33.76	48.75	54	-20.24	31.14	6.91	53.04	120	40	Average
4944	44.75	59.74	74	-29.25	31.14	6.91	53.04	120	40	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
2472	76.67	82.69			27.15	4.15	37.32	190	11	Average
2472	86.41	92.43			27.15	4.15	37.32	190	11	Peak
2483.52	41.26	47.28	54	-12.74	27.15	4.15	37.32	190	11	Average
2483.68	63.26	69.28	74	-10.74	27.15	4.15	37.32	190	11	Peak
4944	33.74	48.73	54	-20.26	31.14	6.91	53.04	175	219	Average
4944	44.68	59.67	74	-29.32	31.14	6.91	53.04	175	219	Peak

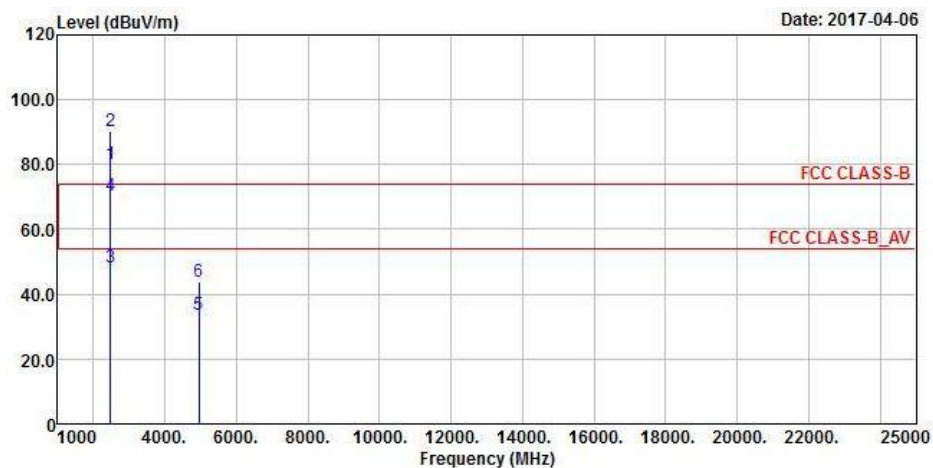
Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2472 MHz: Fundamental Frequency.
- The other emission levels were very low against the limit.

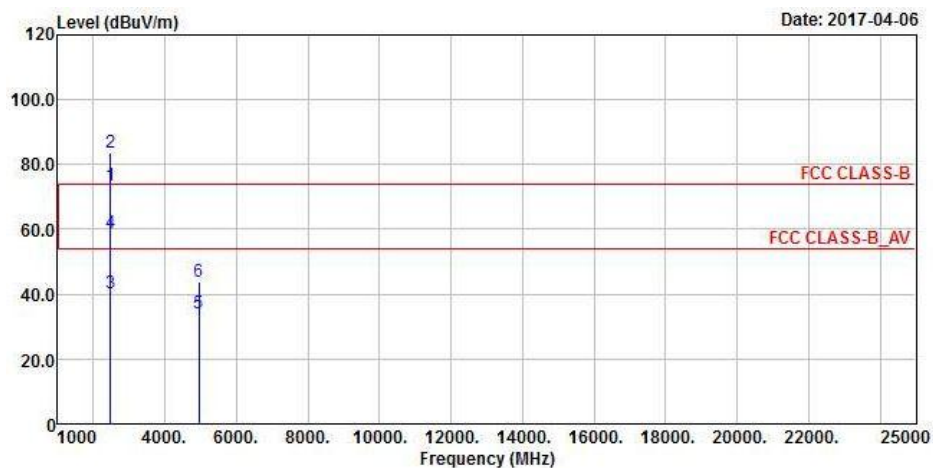
Sample A
802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
2472	80.32	86.34			27.15	4.15	37.32	222	7	Average
2472	90.31	96.33			27.15	4.15	37.32	222	7	Peak
2483.56	48.49	54.51	54	-5.51	27.15	4.15	37.32	222	7	Average
2483.56	70.38	76.4	74	-3.62	27.15	4.15	37.32	222	7	Peak
4944	33.72	48.71	54	-20.28	31.14	6.91	53.04	204	71	Average
4944	43.94	58.93	74	-30.06	31.14	6.91	53.04	204	71	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
2472	73.64	79.66			27.15	4.15	37.32	221	108	Average
2472	83.51	89.53			27.15	4.15	37.32	221	108	Peak
2483.52	40.38	46.4	54	-13.62	27.15	4.15	37.32	221	108	Average
2483.6	59.11	65.13	74	-14.89	27.15	4.15	37.32	221	108	Peak
4944	33.96	48.95	54	-20.04	31.14	6.91	53.04	186	290	Average
4944	43.82	58.81	74	-30.18	31.14	6.91	53.04	186	290	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2472 MHz: Fundamental Frequency.
- The other emission levels were very low against the limit.

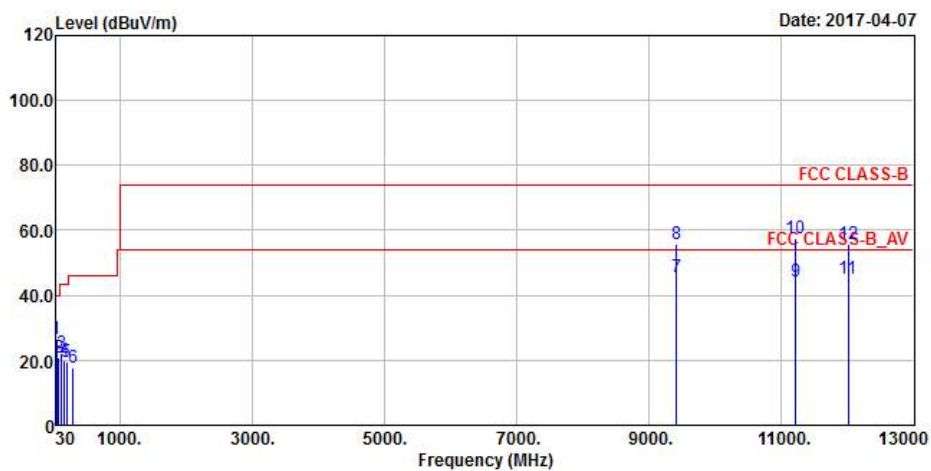
4.6.2 接收諧波

Sample B

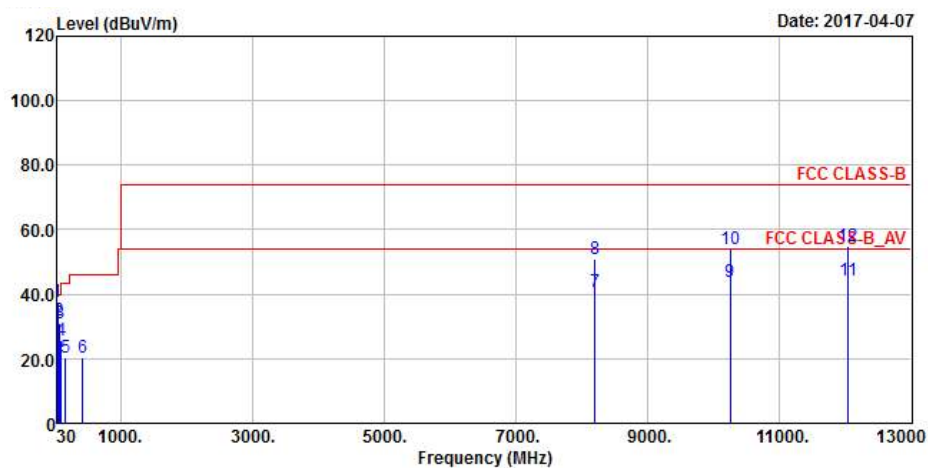
802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	30 MHz ~ 13 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV) Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
30.97	26.71	45.1	40	-13.29	12.14	0.59	31.12	140	217	Peak
66.86	20.76	40.47	40	-19.24	11.12	0.85	31.68	106	222	Peak
107.6	22.17	43.13	43.5	-21.33	9.81	1.09	31.86	135	285	Peak
157.07	19.82	37.77	43.5	-23.68	12.72	1.13	31.8	130	351	Peak
182.29	19.57	39.56	43.5	-23.93	10.6	1.22	31.81	104	224	Peak
288.02	17.89	35.39	46	-28.11	12.6	1.6	31.7	117	57	Peak
9409	45.68	49.35	54	-8.32	38.04	8.98	50.69	131	222	Average
9409	55.63	59.3	74	-18.37	38.04	8.98	50.69	131	222	Peak
11215	44.48	47.75	54	-9.52	40.07	9.69	53.03	101	28	Average
11215	57.5	60.77	74	-16.5	40.07	9.69	53.03	101	28	Peak
12013	45.3	48.13	54	-8.7	38.98	10.39	52.2	109	330	Average
12013	55.84	58.67	74	-18.16	38.98	10.39	52.2	109	330	Peak
Antenna 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
32.91	37.81	55.83	40	-2.19	12.47	0.6	31.09	110	326	Peak
39.7	32	48.81	40	-8	13.54	0.64	30.99	133	180	Peak
65.89	30.86	50.41	40	-9.14	11.24	0.85	31.64	102	76	Peak
91.11	25.53	48.14	43.5	-17.97	8.38	0.97	31.96	116	157	Peak
158.04	20.35	38.32	43.5	-23.15	12.73	1.13	31.83	103	199	Peak
414.12	20.23	34.68	46	-25.77	15.62	1.94	32.01	135	92	Peak
8198	40.74	46.75	54	-13.26	36.69	8.79	51.49	109	68	Average
8198	50.82	56.83	74	-23.18	36.69	8.79	51.49	109	68	Peak
10249	44.03	47.68	54	-9.97	39	8.99	51.64	123	138	Average
10249	54.23	57.88	74	-19.77	39	8.99	51.64	123	138	Peak
12041	44.39	47.35	54	-9.61	38.97	10.39	52.32	137	17	Average
12041	54.84	57.8	74	-19.16	38.97	10.39	52.32	137	17	Peak

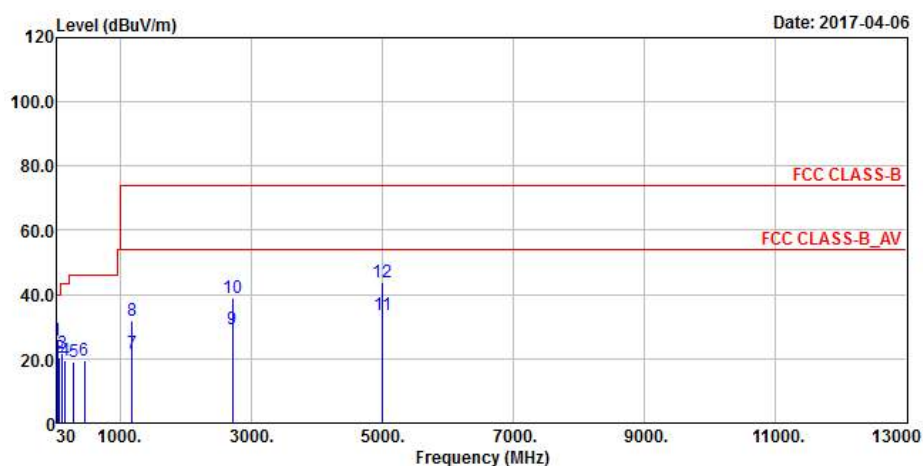
Remarks:

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.

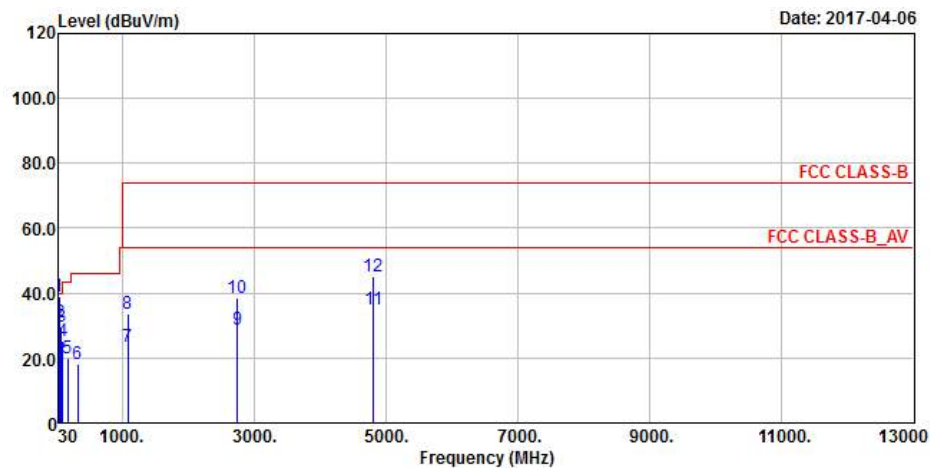
Sample A
802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	30 MHz ~ 13 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV) Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
32.91	25.52	43.54	40	-14.48	12.47	0.6	31.09	108	170	Peak
66.86	20.3	40.01	40	-19.7	11.12	0.85	31.68	116	5	Peak
108.57	21.66	42.51	43.5	-21.84	9.9	1.1	31.85	131	1	Peak
158.04	19.69	37.66	43.5	-23.81	12.73	1.13	31.83	103	73	Peak
288.02	18.88	36.38	46	-27.12	12.6	1.6	31.7	126	129	Peak
445.16	19.61	33.39	46	-26.39	16.23	1.98	31.99	104	218	Peak
1175	21.78	46.86	54	-32.22	25.08	3.17	53.33	109	351	Average
1175	31.83	56.91	74	-42.17	25.08	3.17	53.33	109	351	Peak
2705	29.31	50.23	54	-24.69	27.72	4.85	53.49	104	279	Average
2705	39.1	60.02	74	-34.9	27.72	4.85	53.49	104	279	Peak
5000	33.83	48.75	54	-20.17	31.2	6.93	53.05	110	14	Average
5000	43.98	58.9	74	-30.02	31.2	6.93	53.05	110	14	Peak
Antenna 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
32.91	38.79	56.81	40	-1.21	12.47	0.6	31.09	113	41	Peak
39.7	31.06	47.87	40	-8.94	13.54	0.64	30.99	102	130	Peak
66.86	29.76	49.47	40	-10.24	11.12	0.85	31.68	105	313	Peak
90.14	25.23	47.92	43.5	-18.27	8.3	0.97	31.96	133	81	Peak
159.01	19.95	37.93	43.5	-23.55	12.73	1.14	31.85	131	1	Peak
314.21	18.33	35.3	46	-27.67	13.29	1.67	31.93	128	302	Peak
1080	23.65	48.77	54	-30.35	24.94	3.03	53.09	110	273	Average
1080	33.67	58.79	74	-40.33	24.94	3.03	53.09	110	273	Peak
2740	28.91	49.76	54	-25.09	27.81	4.88	53.54	119	309	Average
2740	38.65	59.5	74	-35.35	27.81	4.88	53.54	119	309	Peak
4805	35.01	50.35	54	-18.99	30.97	6.79	53.1	137	338	Average
4805	45.03	60.37	74	-28.97	30.97	6.79	53.1	137	338	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.

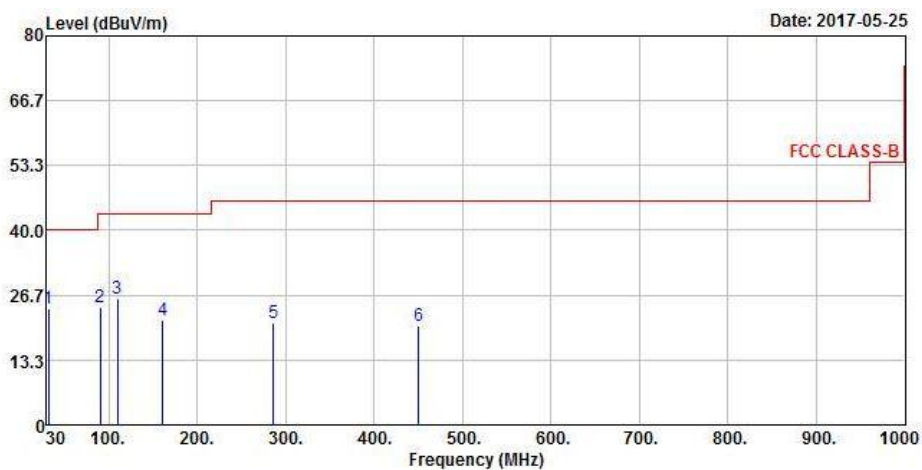
30 MHz ~ 1 GHz Data:

Sample B

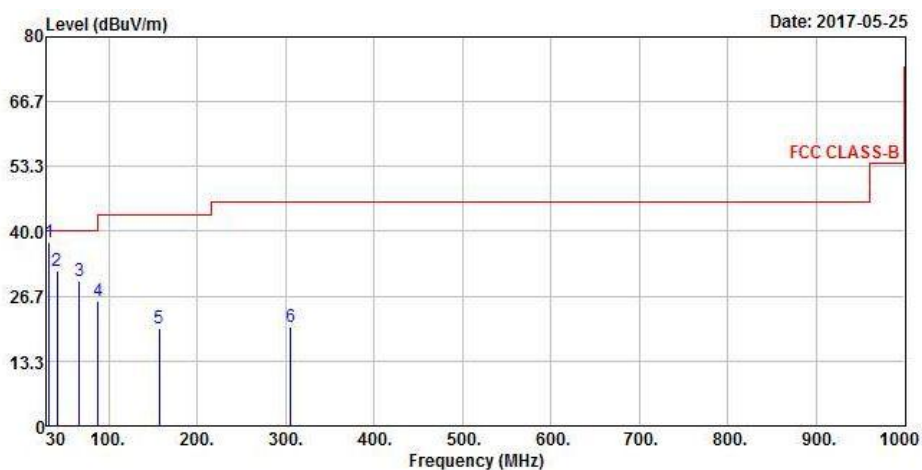
802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	30 MHz ~ 1 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
31.94	24.01	42.23	40	-15.99	12.3	0.59	31.11	112	109	Peak
90.14	24.13	46.82	43.5	-19.37	8.3	0.97	31.96	122	352	Peak
109.54	26.09	46.84	43.5	-17.41	9.99	1.1	31.84	127	194	Peak
160.95	21.51	39.59	43.5	-21.99	12.63	1.15	31.86	135	167	Peak
286.08	20.93	38.53	46	-25.07	12.54	1.59	31.73	127	293	Peak
450.01	20.34	34	46	-25.66	16.33	1.99	31.98	130	198	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
32.91	37.68	55.7	40	-2.32	12.47	0.6	31.09	115	217	Peak
41.64	31.97	48.8	40	-8.03	13.56	0.66	31.05	121	241	Peak
66.86	29.9	49.61	40	-10.1	11.12	0.85	31.68	130	336	Peak
88.2	25.77	48.42	43.5	-17.73	8.27	0.95	31.87	128	261	Peak
157.07	19.97	37.92	43.5	-23.53	12.72	1.13	31.8	129	270	Peak
305.48	20.27	37.44	46	-25.73	13.08	1.65	31.9	124	153	Peak

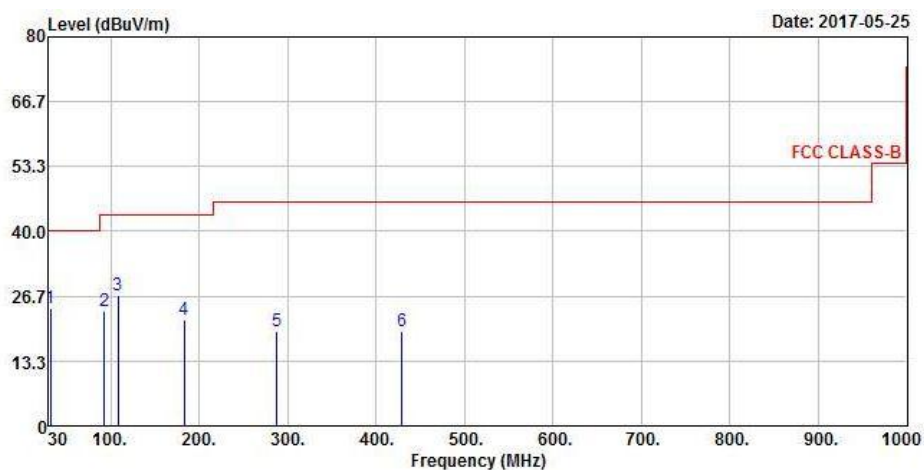
Remarks:

- 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.

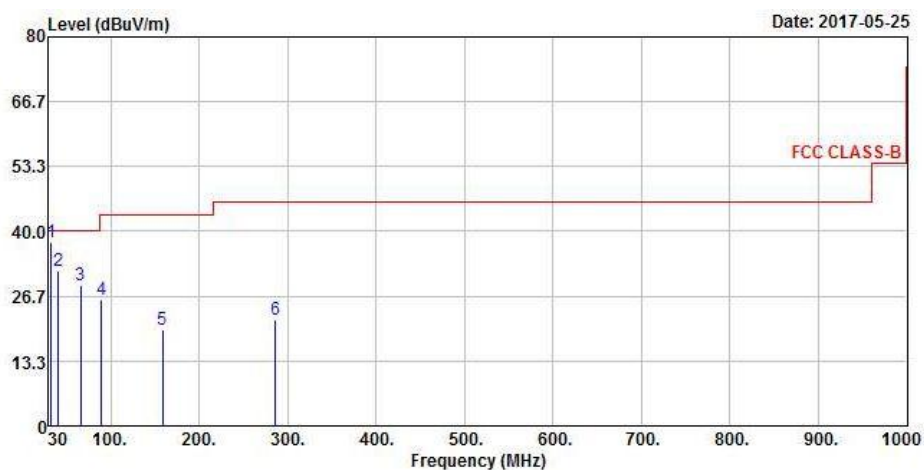
Sample A
802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	30 MHz ~ 1 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
31.94	24.17	42.39	40	-15.83	12.3	0.59	31.11	129	95	Peak
93.05	23.56	46	43.5	-19.94	8.53	0.99	31.96	126	277	Peak
108.57	26.95	47.8	43.5	-16.55	9.9	1.1	31.85	103	194	Peak
183.26	21.97	42	43.5	-21.53	10.53	1.23	31.79	126	36	Peak
288.02	19.4	36.9	46	-26.6	12.6	1.6	31.7	128	92	Peak
429.64	19.49	33.62	46	-26.51	15.93	1.95	32.01	118	29	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
32.91	37.73	55.75	40	-2.27	12.47	0.6	31.09	120	178	Peak
40.67	31.87	48.69	40	-8.13	13.55	0.65	31.02	101	229	Peak
65.89	29.02	48.57	40	-10.98	11.24	0.85	31.64	130	310	Peak
89.17	26.1	48.77	43.5	-17.4	8.28	0.96	31.91	126	131	Peak
159.01	19.72	37.7	43.5	-23.78	12.73	1.14	31.85	103	222	Peak
286.08	21.9	39.5	46	-24.1	12.54	1.59	31.73	109	129	Peak

Remarks:

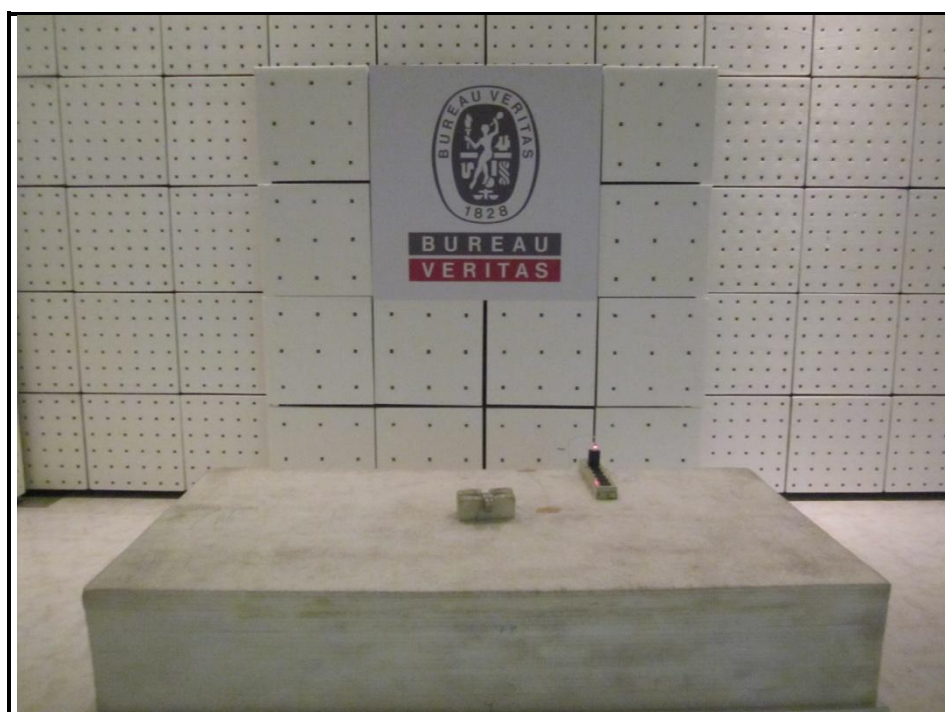
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- The other emission levels were very low against the limit.

4.7 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

4.8 配置照片

Sample B
<Below 1 GHz>



<Above 1 GHz>



Sample A

<Below 1 GHz>



<Above 1 GHz>



5 6 dB 頻寬之要求

5.1 適用標準

請見本報告 3.1 節第(12)項的規定。

5.2 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。
- 計算最大輸出功率峰值減 6 dB 的最大頻率範圍。

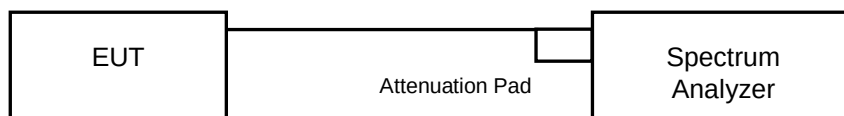
5.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017

Note:

- 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 207 Hz, 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 $k=2$.

5.4 測試配置



5.5 量測結果

操作模式	發射	測試日期	106 年 04 月 17 日
量測場地溫度	25 °C	量測場地濕度	65 % RH
測試者	Wayne Lin		

802.11b

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	8.03	0.5	Pass
6	2437	7.13	0.5	Pass
11	2462	7.14	0.5	Pass
12	2467	7.11	0.5	Pass
13	2472	8.03	0.5	Pass

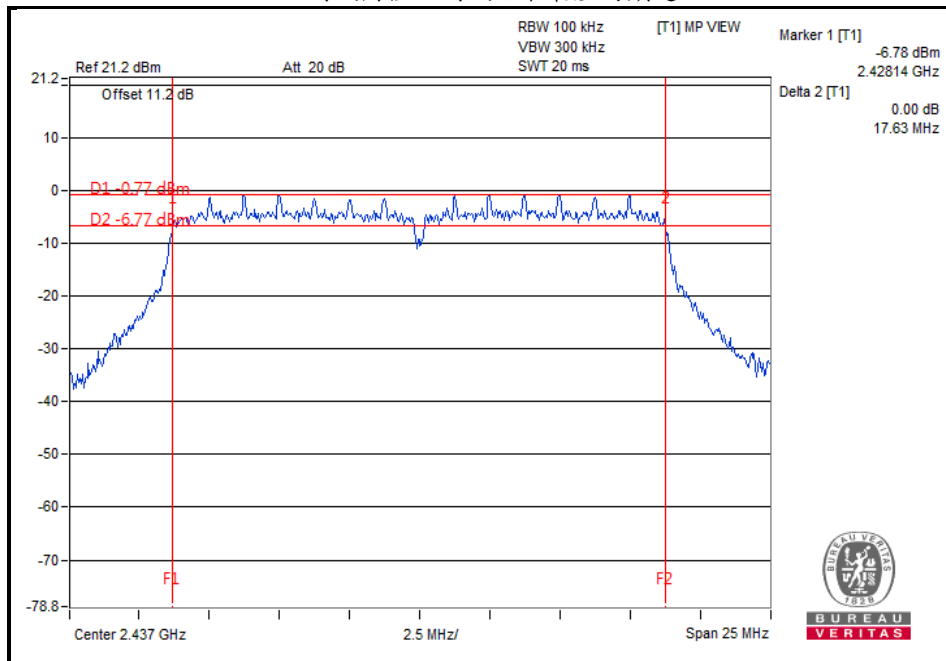
802.11g

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.37	0.5	Pass
6	2437	16.41	0.5	Pass
11	2462	16.40	0.5	Pass
12	2467	16.42	0.5	Pass
13	2472	16.42	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.60	0.5	Pass
6	2437	17.63	0.5	Pass
11	2462	17.63	0.5	Pass
12	2467	17.62	0.5	Pass
13	2472	17.62	0.5	Pass

**此測試圖僅放測試結果最差的頻道。



5.6 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

6 峰值傳導輸出功率之量測

6.1 適用標準

請見本報告 3.1 節第(11)及(13)項的規定。

6.2 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。

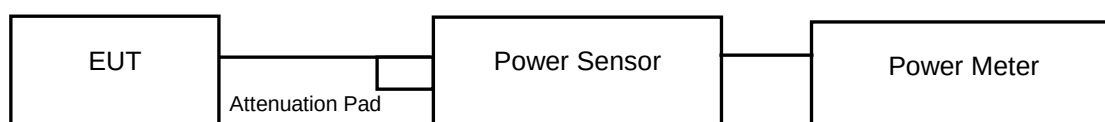
6.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Power Meter Anritsu	ML2495A	1232002	Sep. 08, 2016	Sep. 07, 2017
Power Sensor Anritsu	MA2411B	1207325	Sep. 08, 2016	Sep. 07, 2017

Note:

- 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 1.393 dB, 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 ML2495A is 65 MHz greater than 6 dB bandwidth of emission.

6.4 測試配置



6.5 量測結果

操作模式	發射	測試日期	106 年 04 月 17 日
量測場地溫度	25 °C	量測場地濕度	65 % RH
測試者	Wayne Lin		

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	63.826	18.05	30	Pass
6	2437	67.298	18.28	30	Pass
11	2462	55.335	17.43	30	Pass
12	2467	55.976	17.48	30	Pass
13	2472	59.429	17.74	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	70.307	18.47	30	Pass
6	2437	73.79	18.68	30	Pass
11	2462	74.473	18.72	30	Pass
12	2467	68.391	18.35	30	Pass
13	2472	65.013	18.13	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	66.988	18.26	30	Pass
6	2437	71.285	18.53	30	Pass
11	2462	73.961	18.69	30	Pass
12	2467	73.282	18.65	30	Pass
13	2472	69.984	18.45	30	Pass

6.6 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

7 功率頻譜密度之量測

7.1 適用標準

請見本報告 3.1 節第(14)項的規定。

7.2 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 3 kHz，視訊頻寬為 10 kHz，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。
- 其峰值位準必須不大於+8 dBm。

7.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017

Note:

- 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 207 Hz, 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	106 年 04 月 17 日
量測場地溫度	25 °C	量測場地濕度	65 % RH
測試者	Wayne Lin		

802.11b

Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
1	2412	-6.76	8	Pass
6	2437	-6.87	8	Pass
11	2462	-7.21	8	Pass
12	2467	-7.13	8	Pass
13	2472	-6.99	8	Pass

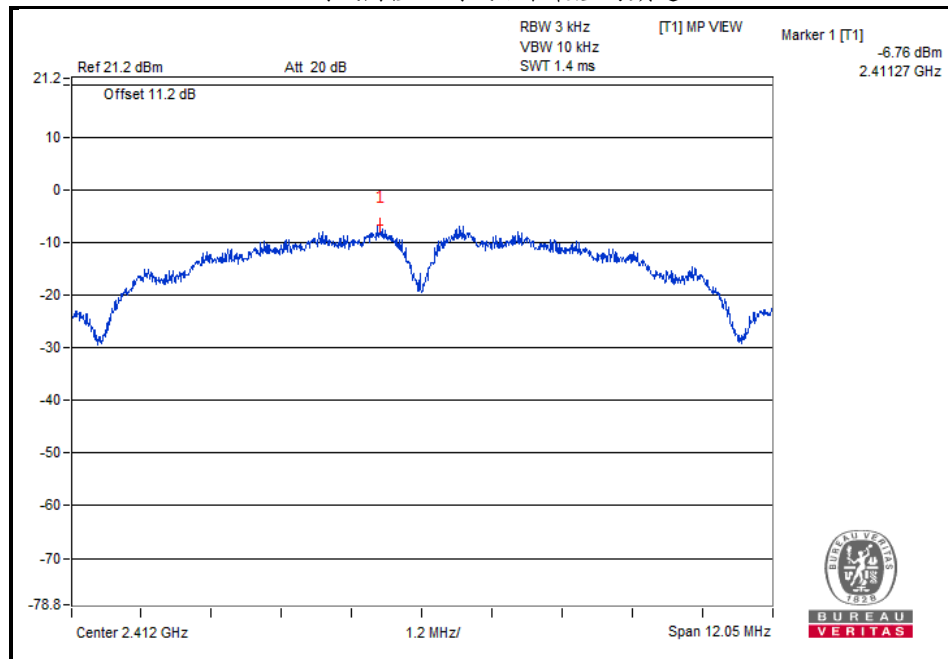
802.11g

Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
1	2412	-6.76	8	Pass
6	2437	-6.87	8	Pass
11	2462	-7.21	8	Pass
12	2467	-7.13	8	Pass
13	2472	-6.99	8	Pass

802.11n (HT20)

Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
1	2412	-15.55	8	Pass
6	2437	-15.04	8	Pass
11	2462	-15.06	8	Pass
12	2467	-15.21	8	Pass
13	2472	-15.30	8	Pass

**此測試圖僅放測試結果最差的頻道。



7.6 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

BLUETOOTH EDR 頻段測試紀錄結果

8 帶外發射之量測

8.1 適用標準

請見本報告 3.1 節第(20)項的規定。

8.2 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 1 GHz 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 = 10 Hz

接收諧波：

Peak 為 RBW = 1 MHz, VBW = 3 MHz；Average 為 RBW = 1 MHz, VBW = 10 Hz

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

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

8.3 量測儀器

同 4.3 節

8.4 測試配置

同 4.4 節

8.5 場強度之計算

同 4.5 節

量測結果請見下頁。

8.6 量測結果

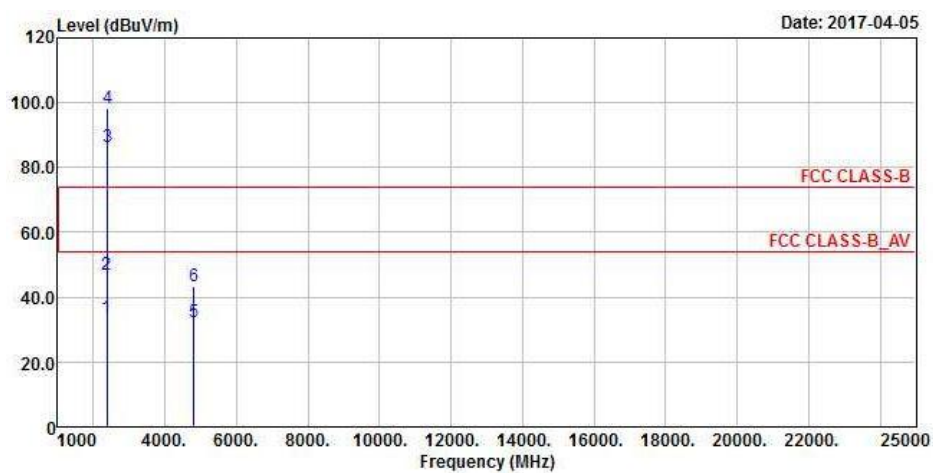
8.6.1 發射諧波

8DPSK

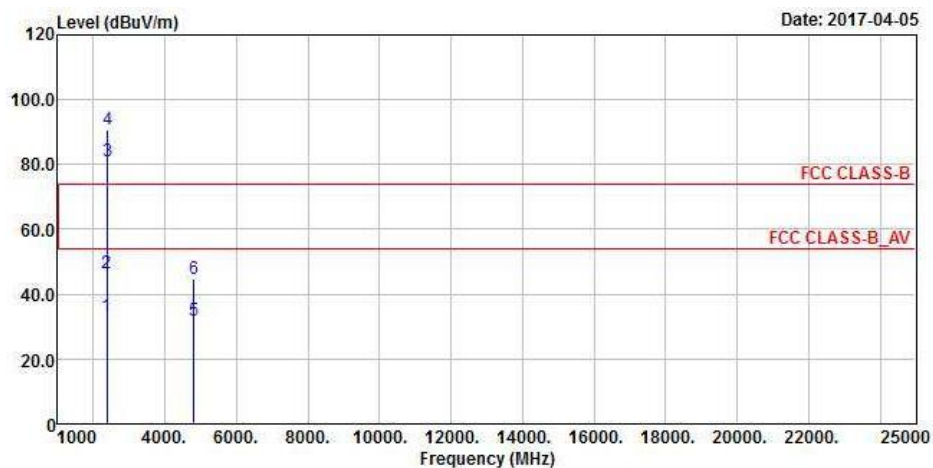
Sample B

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

Horizontal



Vertical



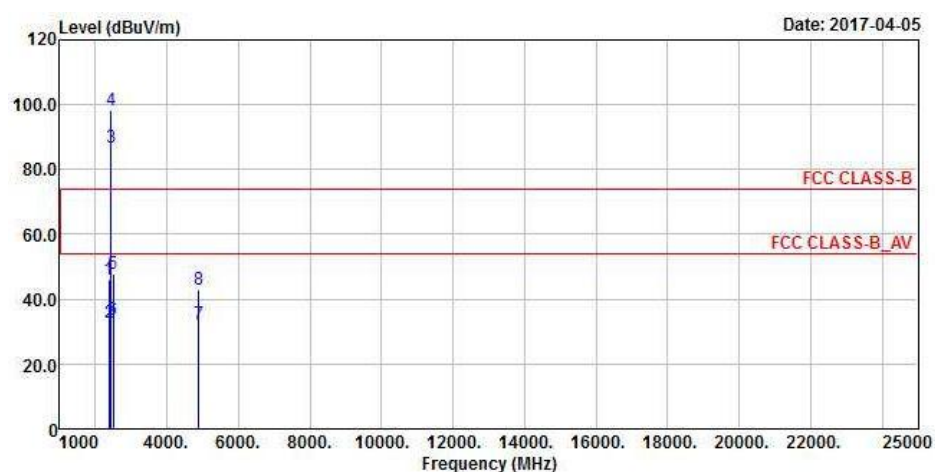
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2381.73	33.57	40.13	54	-20.43	26.86	4.08	37.5	214	40	Average
2382.45	46.89	53.45	74	-27.11	26.86	4.08	37.5	214	40	Peak
2402	86.37	92.89			26.91	4.09	37.52	214	40	Average
2402	98.1	104.62			26.91	4.09	37.52	214	40	Peak
4804	32.35	47.69	54	-21.65	30.97	6.79	53.1	171	158	Average
4804	43.22	58.56	74	-30.78	30.97	6.79	53.1	171	158	Peak
Antenna 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
2366.16	33.03	39.65	54	-20.97	26.81	4.07	37.5	166	353	Average
2379.3	46.56	53.13	74	-27.44	26.86	4.07	37.5	166	353	Peak
2402	80.91	87.43			26.91	4.09	37.52	166	353	Average
2402	90.84	97.36			26.91	4.09	37.52	166	353	Peak
4804	31.84	47.18	54	-22.16	30.97	6.79	53.1	107	222	Average
4804	44.57	59.91	74	-29.43	30.97	6.79	53.1	107	222	Peak

Remarks:

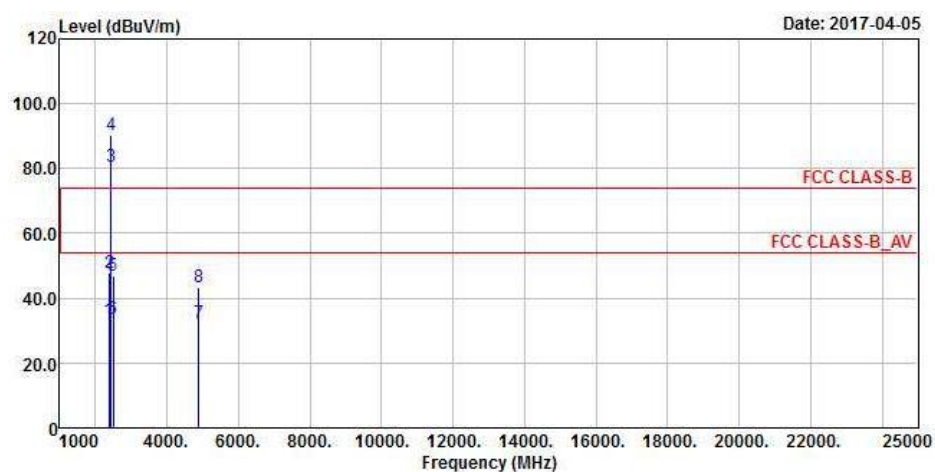
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 2402 MHz: Fundamental Frequency
3. The other emission levels were very low against the limit.

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

Horizontal



Vertical



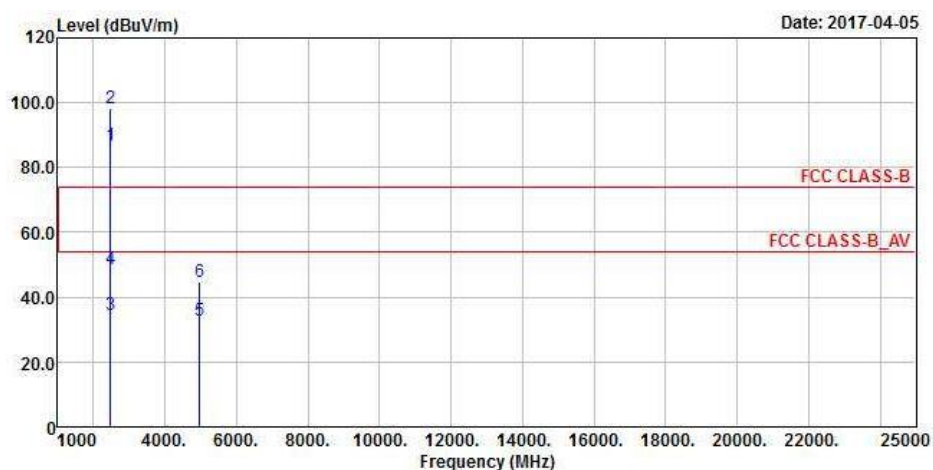
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2369.31	46.17	52.74	74	-27.83	26.86	4.07	37.5	167	31	Peak
2387.58	32.95	39.46	54	-21.05	26.91	4.08	37.5	167	31	Average
2441	86.77	92.98			27.06	4.12	37.39	167	31	Average
2441	98.16	104.37			27.06	4.12	37.39	167	31	Peak
2487.6	47.99	53.95	74	-26.01	27.2	4.16	37.32	167	31	Peak
2499.52	33.52	39.41	54	-20.48	27.2	4.16	37.25	167	31	Average
4882	32.24	47.38	54	-21.76	31.06	6.85	53.05	169	149	Average
4882	42.86	58	74	-31.14	31.06	6.85	53.05	169	149	Peak
Antenna 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
2373.27	33	39.57	54	-21	26.86	4.07	37.5	184	350	Average
2387.04	47.91	54.42	74	-26.09	26.91	4.08	37.5	184	350	Peak
2441	80.67	86.88			27.06	4.12	37.39	184	350	Average
2441	90.42	96.63			27.06	4.12	37.39	184	350	Peak
2492.2	47.11	53	74	-26.89	27.2	4.16	37.25	184	350	Peak
2498.32	33.48	39.37	54	-20.52	27.2	4.16	37.25	184	350	Average
4882	32.14	47.28	54	-21.86	31.06	6.85	53.05	112	231	Average
4882	43.2	58.34	74	-30.8	31.06	6.85	53.05	112	231	Peak

Remarks:

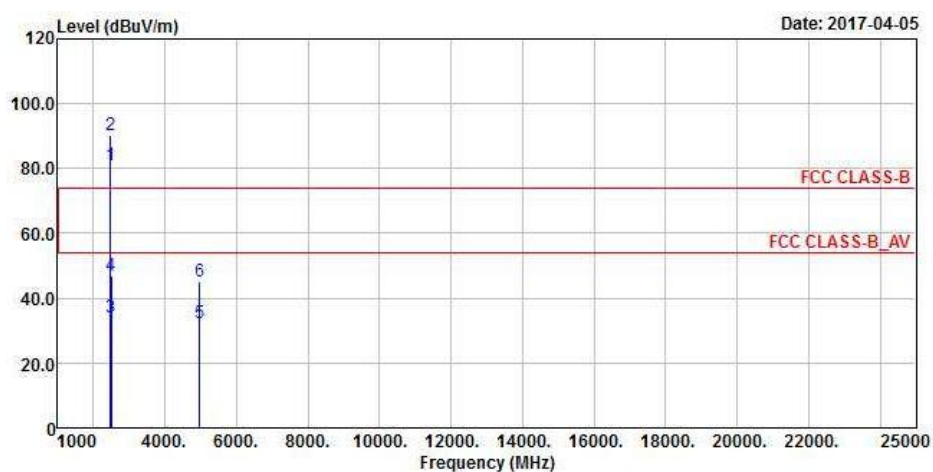
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 2441 MHz: Fundamental Frequency
3. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 78	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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	86.77	92.79			27.15	4.15	37.32	164	29	Average
2480	98.13	104.15			27.15	4.15	37.32	164	29	Peak
2483.52	34.63	40.65	54	-19.37	27.15	4.15	37.32	164	29	Average
2483.6	48.57	54.59	74	-25.43	27.15	4.15	37.32	164	29	Peak
4960	32.65	47.62	54	-21.35	31.16	6.91	53.04	167	153	Average
4960	44.69	59.66	74	-29.31	31.16	6.91	53.04	167	153	Peak
Antenna 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	80.93	86.95			27.15	4.15	37.32	180	352	Average
2480	90.55	96.57			27.15	4.15	37.32	180	352	Peak
2486.68	33.94	39.96	54	-20.06	27.15	4.15	37.32	180	352	Average
2491.92	46.8	52.69	74	-27.2	27.2	4.16	37.25	180	352	Peak
4960	32.24	47.21	54	-21.76	31.16	6.91	53.04	105	229	Average
4960	45.02	59.99	74	-28.98	31.16	6.91	53.04	105	229	Peak

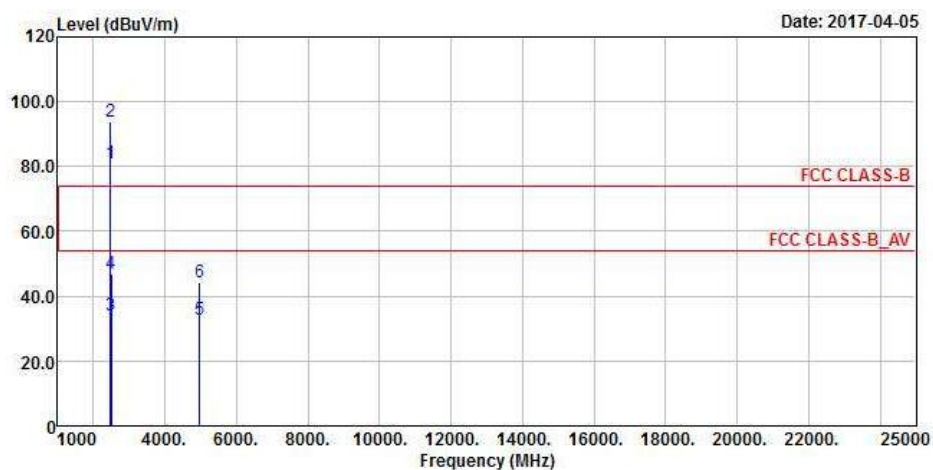
Remarks:

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

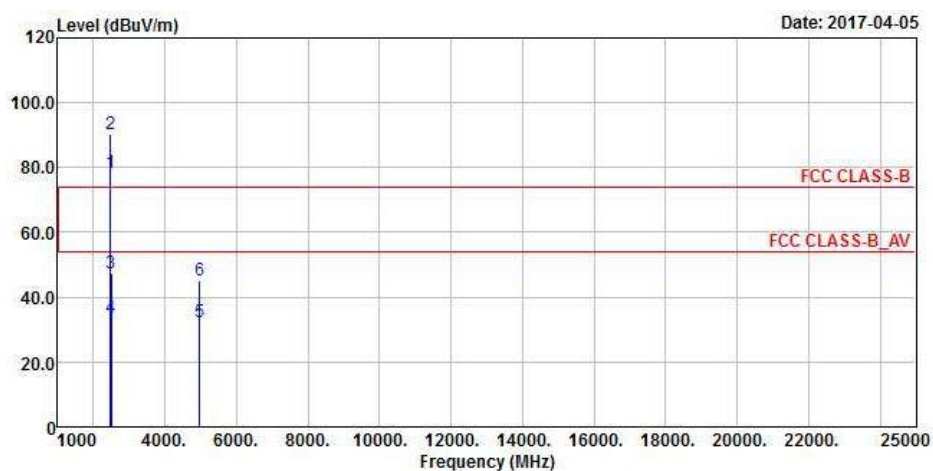
Sample A

EUT Test Condition		Measurement Detail	
Channel	Channel 78	Frequency Range	1 GHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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	80.86	86.88			27.15	4.15	37.32	149	188	Average
2480	93.82	99.84			27.15	4.15	37.32	149	188	Peak
2493.4	33.99	39.88	54	-20.01	27.2	4.16	37.25	149	188	Average
2494	46.94	52.83	74	-27.06	27.2	4.16	37.25	149	188	Peak
4960	32.74	47.71	54	-21.26	31.16	6.91	53.04	133	176	Average
4960	44.44	59.41	74	-29.56	31.16	6.91	53.04	133	176	Peak
Antenna 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	78.36	84.38			27.15	4.15	37.32	143	87	Average
2480	90.42	96.44			27.15	4.15	37.32	143	87	Peak
2485.8	47.4	53.42	74	-26.6	27.15	4.15	37.32	143	87	Peak
2486.6	33.82	39.84	54	-20.18	27.15	4.15	37.32	143	87	Average
4960	32.31	47.28	54	-21.69	31.16	6.91	53.04	125	243	Average
4960	45.17	60.14	74	-28.83	31.16	6.91	53.04	125	243	Peak

Remarks:

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

8.6.2 其它不必要之讯号

9 kHz ~ 30 MHz Data:

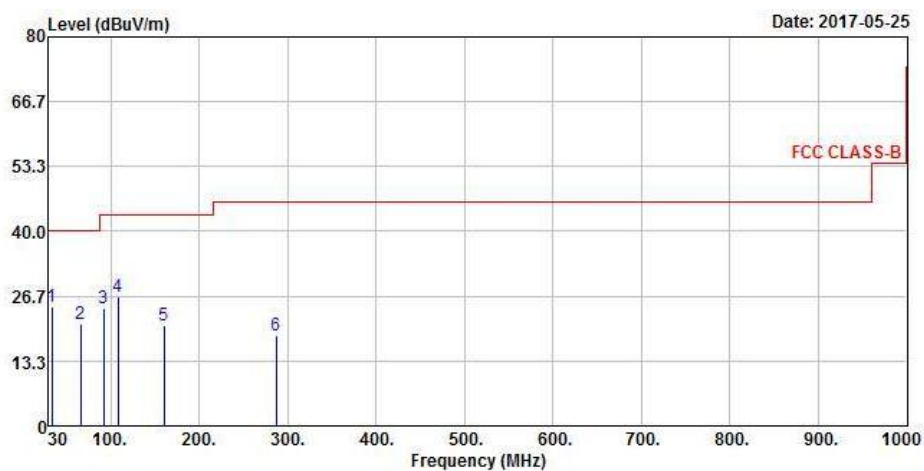
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Data:

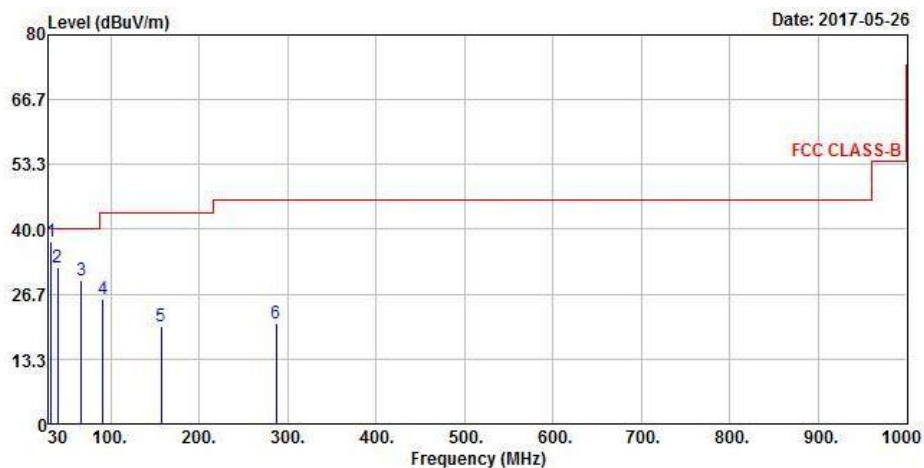
Sample B

EUT Test Condition		Measurement Detail	
Channel	Channel 78	Frequency Range	30 MHz ~ 1 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Quask-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
33.88	24.63	42.48	40	-15.37	12.63	0.6	31.08	111	126	Peak
65.89	20.91	40.46	40	-19.09	11.24	0.85	31.64	137	150	Peak
92.08	24.16	46.68	43.5	-19.34	8.45	0.99	31.96	102	259	Peak
108.57	26.69	47.54	43.5	-16.81	9.9	1.1	31.85	106	187	Peak
159.98	20.63	38.63	43.5	-22.87	12.73	1.15	31.88	132	256	Peak
287.05	18.61	36.16	46	-27.39	12.57	1.6	31.72	134	347	Peak
Antenna 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
32.91	37.59	55.61	40	-2.41	12.47	0.6	31.09	123	227	Peak
39.7	32.12	48.93	40	-7.88	13.54	0.64	30.99	105	137	Peak
66.86	29.58	49.29	40	-10.42	11.12	0.85	31.68	134	186	Peak
91.11	25.6	48.21	43.5	-17.9	8.38	0.97	31.96	126	105	Peak
157.07	20.09	38.04	43.5	-23.41	12.72	1.13	31.8	139	113	Peak
287.05	20.65	38.2	46	-25.35	12.57	1.6	31.72	121	92	Peak

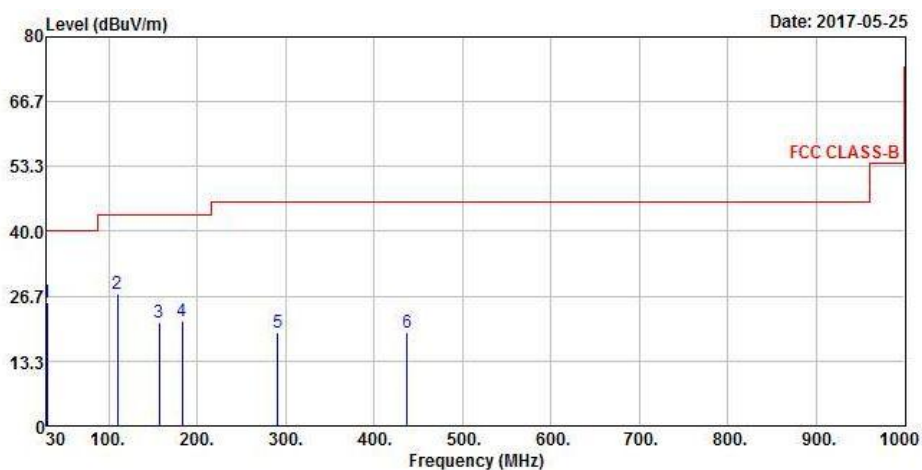
Remarks:

- 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.

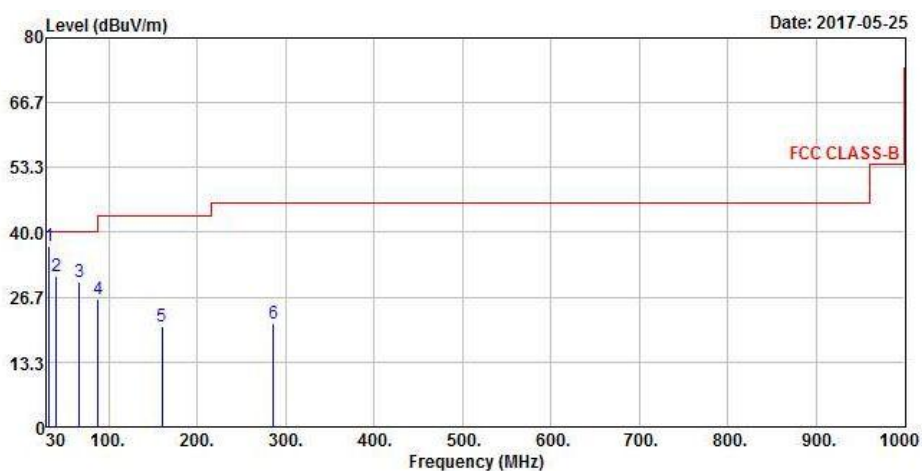
Sample A

EUT Test Condition		Measurement Detail	
Channel	Channel 78	Frequency Range	30 MHz ~ 1 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Quask-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
30	25.43	44.01	40	-14.57	11.98	0.58	31.14	114	238	Peak
109.54	27.06	47.81	43.5	-16.44	9.99	1.1	31.84	139	44	Peak
157.07	21.13	39.08	43.5	-22.37	12.72	1.13	31.8	138	261	Peak
183.26	21.62	41.65	43.5	-21.88	10.53	1.23	31.79	119	13	Peak
290.93	19.23	36.63	46	-26.77	12.68	1.61	31.69	114	10	Peak
437.4	19.33	33.28	46	-26.67	16.08	1.97	32	108	113	Peak
Antenna 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
32.91	37.1	55.12	40	-2.9	12.47	0.6	31.09	122	307	Peak
40.67	31.02	47.84	40	-8.98	13.55	0.65	31.02	121	119	Peak
66.86	29.73	49.44	40	-10.27	11.12	0.85	31.68	120	96	Peak
88.2	26.37	49.02	43.5	-17.13	8.27	0.95	31.87	124	62	Peak
159.98	20.75	38.75	43.5	-22.75	12.73	1.15	31.88	126	139	Peak
286.08	21.11	38.71	46	-24.89	12.54	1.59	31.73	118	66	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.

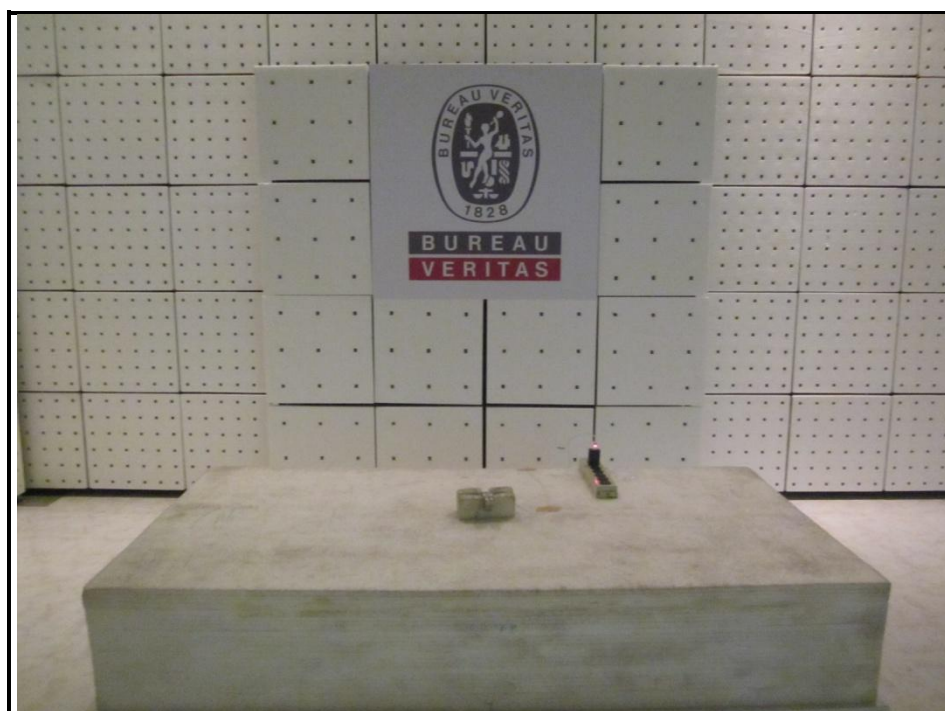
8.7 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

8.8 配置照片

Sample B

<Below 1 GHz>



<Above 1 GHz>



Sample A

<Below 1 GHz>



<Above 1 GHz>



9 20 dB 頻寬之要求

9.1 適用標準

請見本報告 3.1 節第(25)項的規定。

9.2 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 20 dB 的最大頻率範圍。

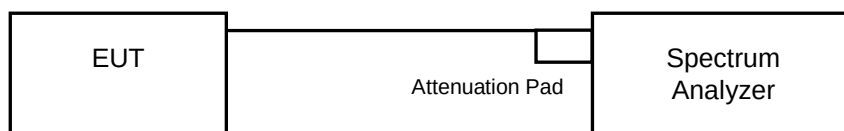
9.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017

Note:

- 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 207 Hz, 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.

9.4 測試配置



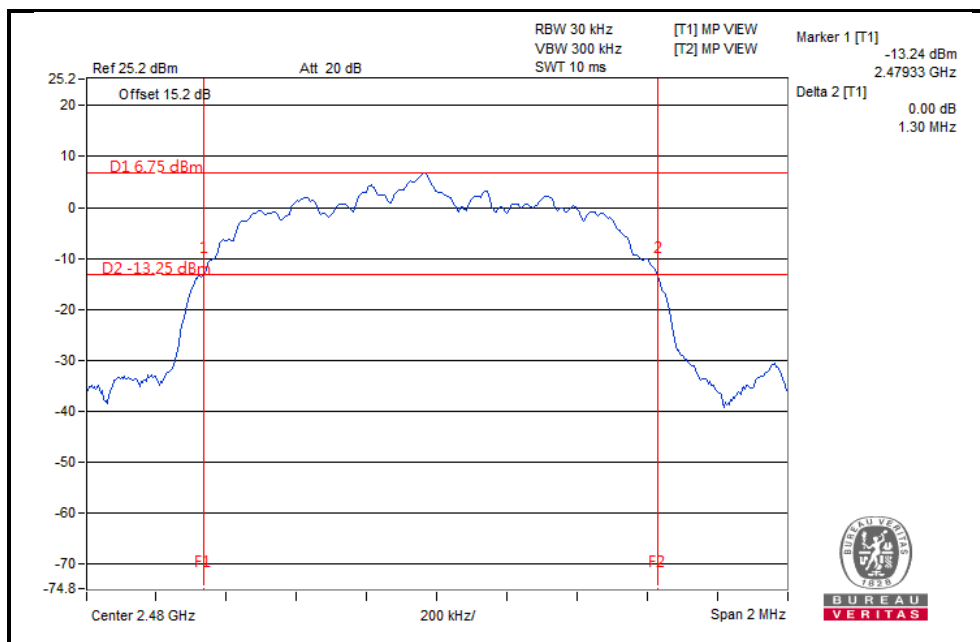
9.5 量測結果

操作模式	發射	測試日期	106 年 04 月 17 日
量測場地溫度	25 °C	量測場地濕度	65 % RH
測試者	Wayne Lin		

Channel	Channel Frequency (MHz)	20 dB Bandwidth (MHz)			>= 25 kHz
		GFSK	$\pi/4$ -DQPSK	8DPSK	
0	2402	0.89	1.28	1.24	Yes
39	2441	0.94	1.30	1.24	Yes
78	2480	0.94	1.30	1.24	Yes

註：對操作於 2400~2483.5 MHz 頻段的跳頻系統技術之低功率發射機，依據國家通訊傳播委員會低功率射頻電機技術規範 3.10.1.6 節之(1)(A)條規定，跳頻系統之載波頻率頻道間隔應至少 25 千赫(kHz)或跳頻頻道之 20 dB 頻寬之三分之二，兩者取較寬者。依據上述條文之規定，對操作於 2400~2483.5 MHz 頻段的跳頻產品之頻寬乃為該產品載波頻率頻道間隔的判定限制之一。

**此測試圖僅放測試結果最差的頻道。



9.6 量測結果判定

依據測試數據結果，三分之二 20 dB 頻寬值乃為此產品之載波頻率頻道間隔的判定限制值。

10 輸出峰值功率之量測

10.1 適用標準

請見本報告 3.1 節第(23)項的規定。

10.2 量測方法

- 將待測物輸出接到頻譜分析儀上。
- 設定待測物處於連續發射狀態。
- 量測待測物輸出功率峰值。

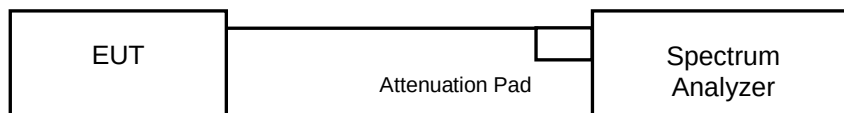
10.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017

Note:

- 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 207 Hz, 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.

10.4 測試配置

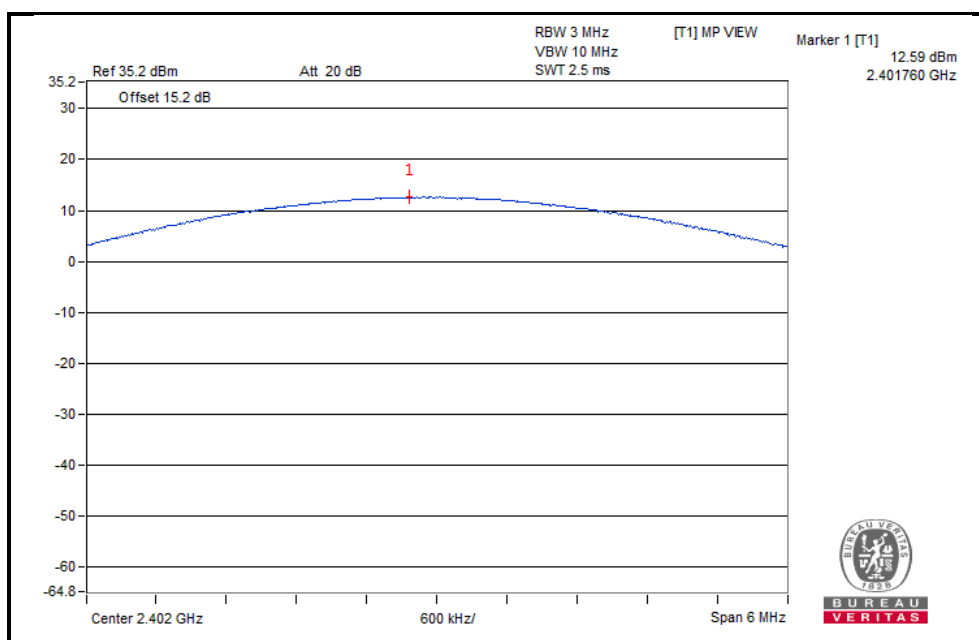


10.5 量測結果

操作模式	發射	測試日期	106 年 04 月 17 日
量測場地溫度	25 °C	量測場地濕度	65 % RH
測試者	Wayne Lin		

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)			Peak Power Limit (dBm)	Pass / Fail
		GFSK	$\pi/4$ -DQPSK	8DPSK		
0	2402	12.42	12.27	12.59	30	Pass
39	2441	12.33	12.21	12.50	30	Pass
78	2480	12.27	12.13	12.44	30	Pass

**此測試圖僅放測試結果最差的頻道。



10.6 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

11 跳頻頻道數之量測

11.1 適用標準

請見本報告 3.1 節第(24)項的規定。

11.2 量測方法

- 將待測物輸出接到頻譜分析儀上。
- 設定待測物處於正常傳輸跳頻模式下。
- 設定 RBW = 300 kHz，VBW = 300 kHz，量測跳頻頻道數。

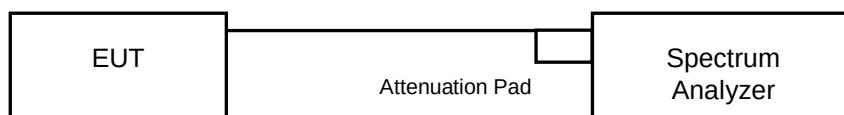
11.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017

Note:

- 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 207 Hz, 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.

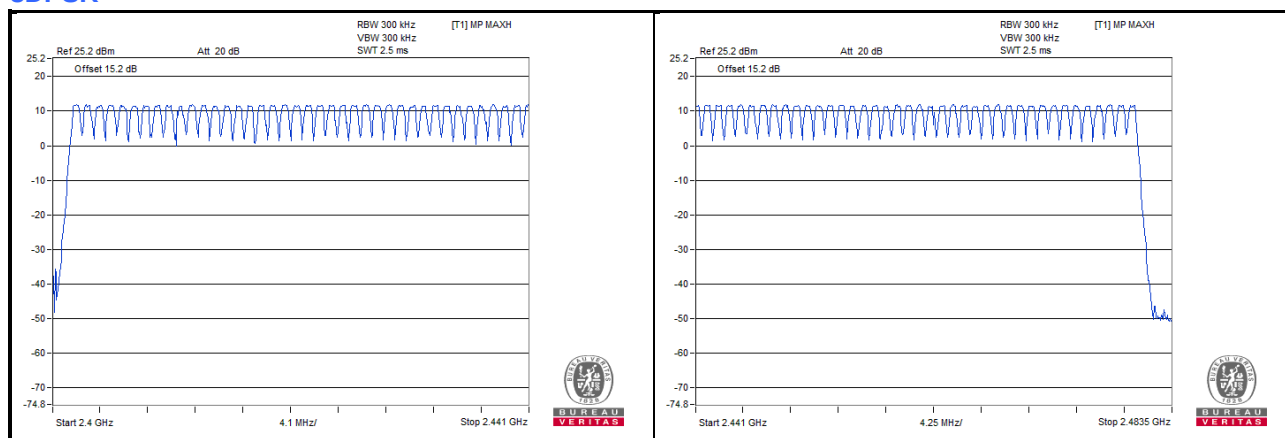
11.4 測試配置



11.5 量測結果

其掃描圖請參閱下圖。跳頻頻道數共有 79 個，符合至少 15 個的規定。

8DPSK



11.6 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

12 跳頻頻道間隔之量測

12.1 適用標準

請見本報告 3.1 節第(24)項規定。

12.2 量測方法

- 將待測物輸出接到頻譜分析儀上。
- 設定待測物處於連續發射狀態。
- 設定 RBW = 300 kHz, VBW = 1 MHz, 量測相鄰兩個頻道間的間隔。

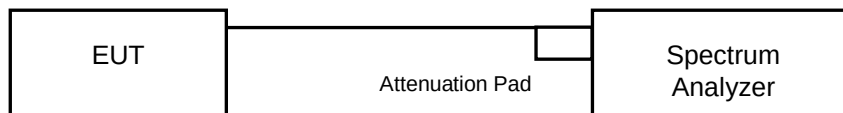
12.3 量測場強輻射之儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017

Note:

- 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 207 Hz, 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.

12.4 測試配置



12.5 量測結果

操作模式	發射	測試日期	106 年 04 月 17 日
量測場地溫度	25 °C	量測場地濕度	65 % RH
測試者	Wayne Lin		

GFSK

Channel	Frequency (MHz)	Adjacent Channel Separation (MHz)	20 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	1.00	0.89	0.6	Pass
39	2441	1.00	0.94	0.63	Pass
78	2480	1.00	0.94	0.63	Pass

$\pi/4$ -DQPSK

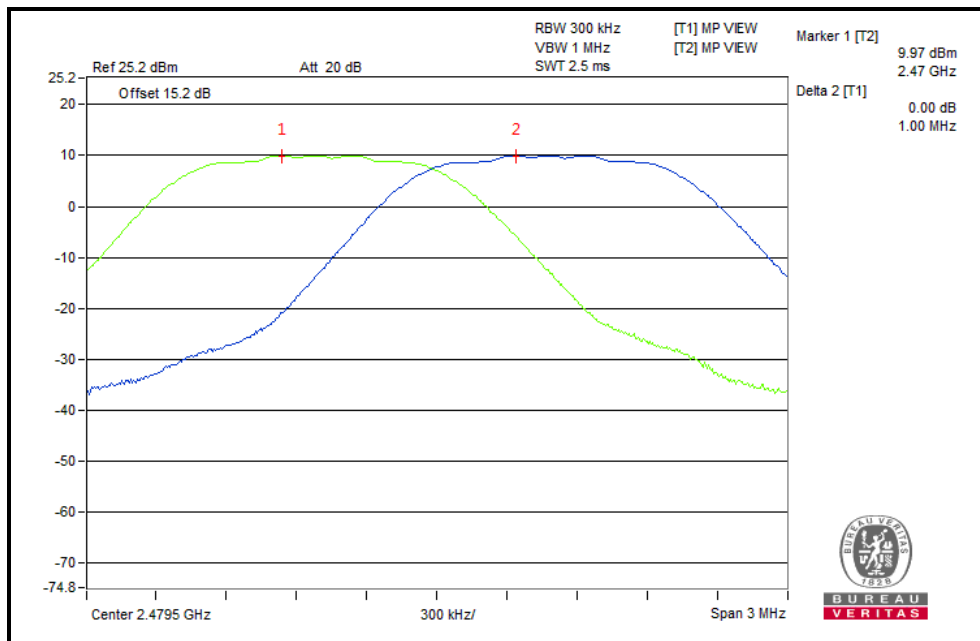
Channel	Frequency (MHz)	Adjacent Channel Separation (MHz)	20 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	1.00	1.28	0.86	Pass
39	2441	1.00	1.30	0.87	Pass
78	2480	1.00	1.30	0.87	Pass

8DPSK

Channel	Frequency (MHz)	Adjacent Channel Separation (MHz)	20 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	1.00	1.24	0.83	Pass
39	2441	1.00	1.24	0.83	Pass
78	2480	1.00	1.24	0.83	Pass

本項測試的 limit 為至少為三分之二 20 dB 頻寬。

**此測試圖僅放測試結果最差的頻道。



12.6 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

13 每一頻道停留時間之量測

13.1 適用標準

請見本報告 3.1 節第(26)項的規定。

13.2 量測方法

- 將待測物輸出接到頻譜分析儀上。
- 設定待測物處於正常傳輸跳頻模式下。
- 設定 RBW = 1 MHz，VBW = 3 MHz，量測在不同傳輸模式下的頻道停留時間。

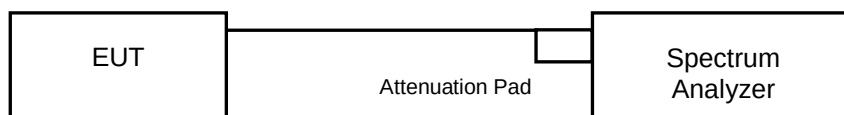
13.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017

Note:

- 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 207 Hz, 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.

13.4 測試配置



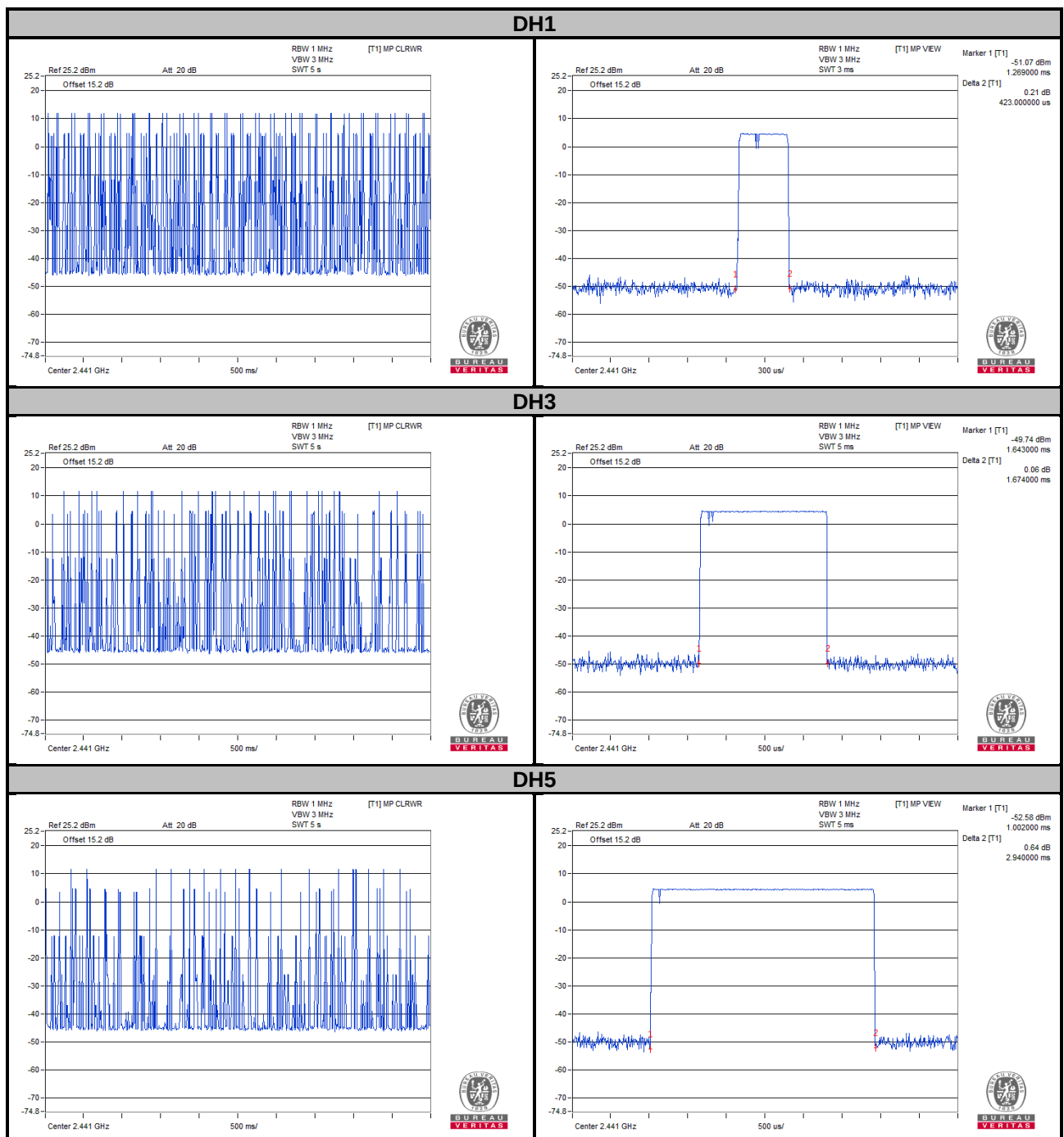
13.5 量測結果

GFSK

Mode	Number of transmission in a 31.6 (79 Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (sec)
DH1	51 (times / 5 sec) * 6.32 = 322.32 times	0.423	136.34	0.4
DH3	26 (times / 5 sec) * 6.32 = 164.32 times	1.674	275.07	0.4
DH5	17 (times / 5 sec) * 6.32 = 107.44 times	2.94	315.87	0.4

註:因為 Bluetooth 每秒跳 1600 次, 會平均落在每個頻道, 所以僅測試 Ch 39 作為代表。

其掃描圖請參閱下方

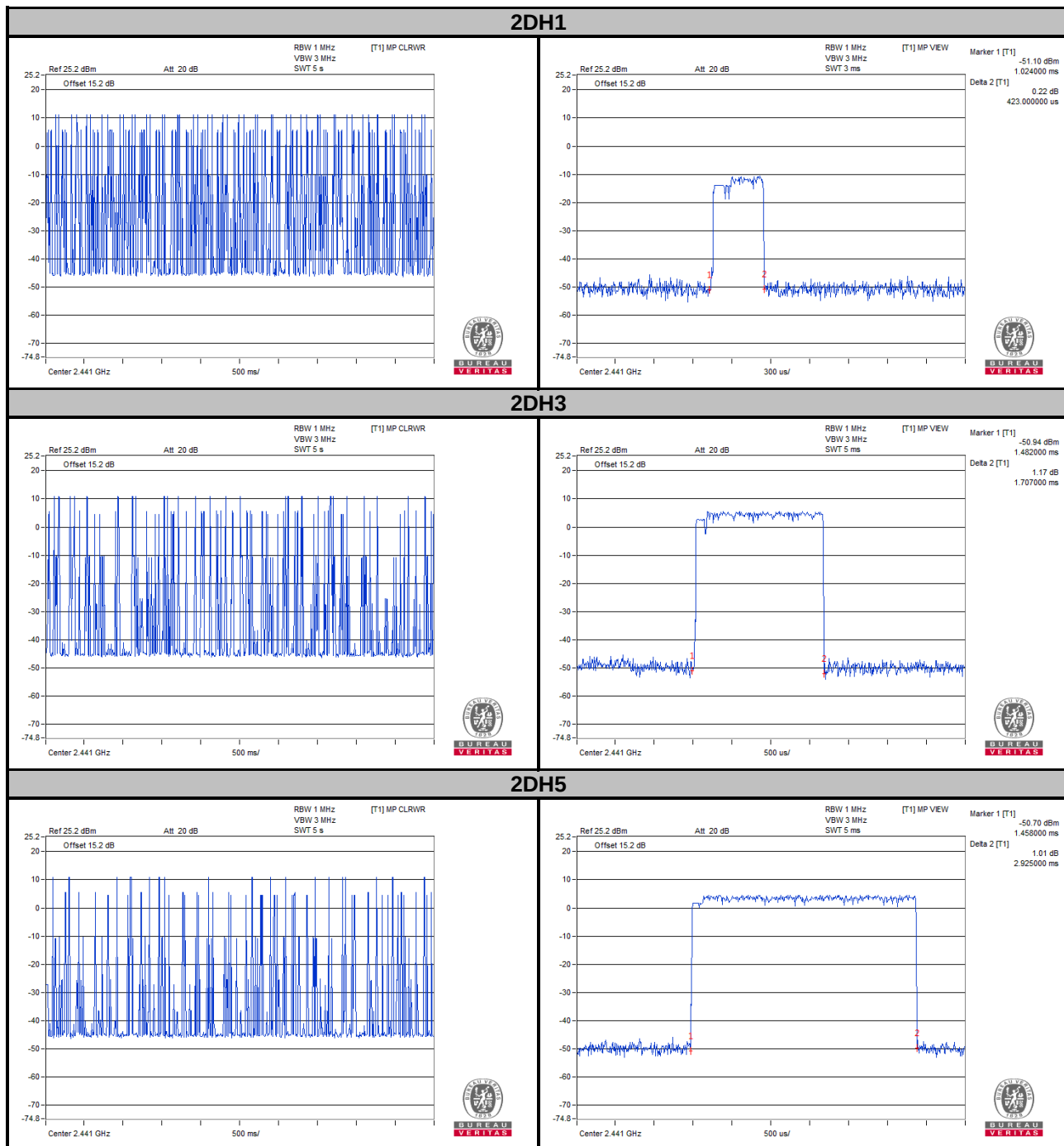


Π/4-DQPSK

Mode	Number of transmission in a 31.6 (79 Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (sec)
2DH1	50 (times / 5 sec) * 6.32 = 316 times	0.423	133.67	0.4
2DH3	27 (times / 5 sec) * 6.32 = 170.64 times	1.707	291.28	0.4
2DH5	18 (times / 5 sec) * 6.32 = 113.76 times	2.925	332.75	0.4

註:因為 Bluetooth 每秒跳 1600 次，會平均落在每個頻道，所以僅測試 Ch 39 作為代表。

其掃描圖請參閱下方



8DPSK

Mode	Number of transmission in a 31.6 (79 Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (sec)
3DH1	50 (times / 5 sec) * 6.32 = 316 times	0.437	138.09	0.4
3DH3	27 (times / 5 sec) * 6.32 = 170.64 times	1.682	287.02	0.4
3DH5	18 (times / 5 sec) * 6.32 = 113.76 times	2.932	333.54	0.4

註:因為 Bluetooth 每秒跳 1600 次，會平均落在每個頻道，所以僅測試 Ch 39 作為代表。

其掃描圖請參閱下方



13.6 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

BLUETOOTH LE 4.1 頻段測試紀錄結果

14 帶外發射之量測

14.1 適用標準

請見本報告 3.1 節第(2)項的規定。

14.2 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 1 GHz 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：

Peak 為 RBW = 1 MHz, VBW = 3 MHz；Average 為 RBW = 1 MHz, VBW = 10 Hz

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

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

14.3 量測儀器

同 4.3 節

14.4 測試配置

同 4.4 節

14.5 場強度之計算

同 4.5 節

量測結果請見下頁。

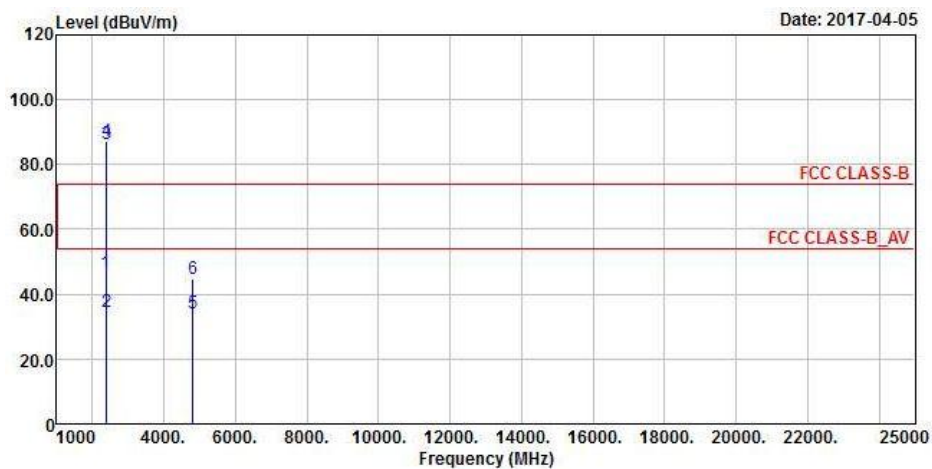
14.6 量測結果

14.6.1 發射諧波

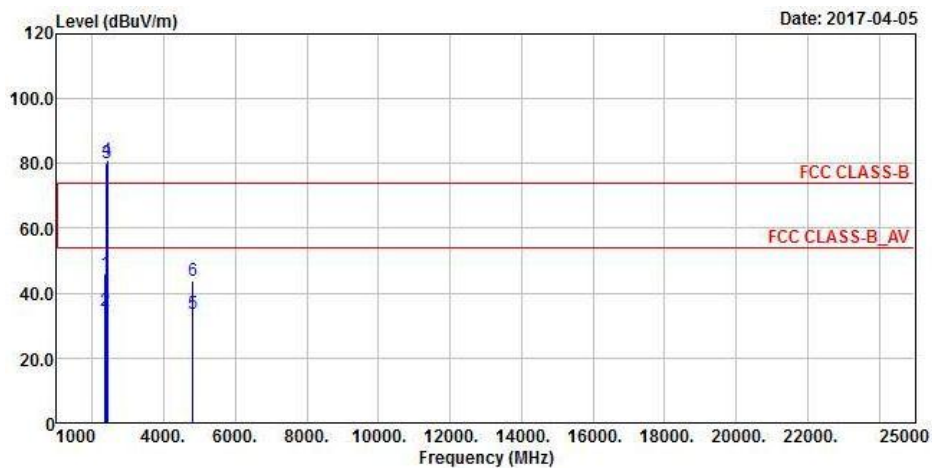
Sample B

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

Horizontal



Vertical



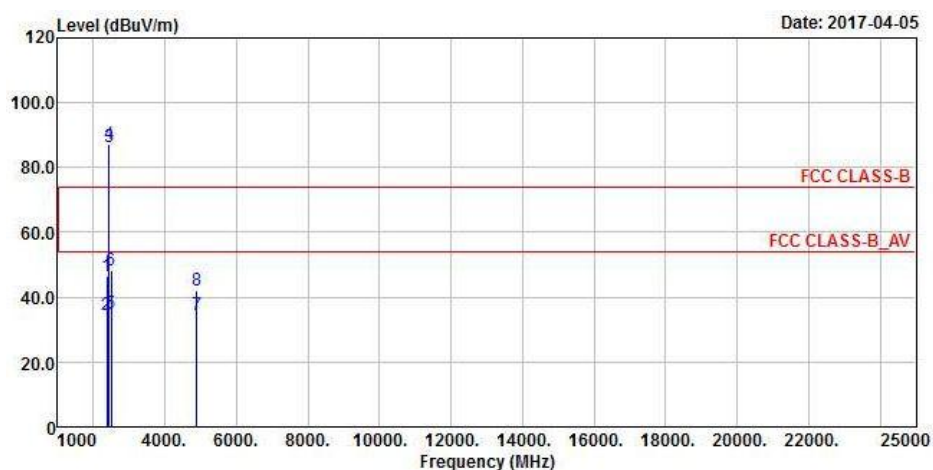
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2374.17	46.6	53.17	74	-27.4	26.86	4.07	37.5	154	32	Peak
2386.86	34.71	41.22	54	-19.29	26.91	4.08	37.5	154	32	Average
2402	86.42	92.94			26.91	4.09	37.52	154	32	Average
2402	87.17	93.69			26.91	4.09	37.52	154	32	Peak
4804	34.29	49.63	54	-19.71	30.97	6.79	53.1	148	176	Average
4804	44.89	60.23	74	-29.11	30.97	6.79	53.1	148	176	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
2360.22	46.15	52.78	74	-27.85	26.81	4.05	37.49	200	282	Peak
2380.02	34.64	41.2	54	-19.36	26.86	4.08	37.5	200	282	Average
2402	80.22	86.74			26.91	4.09	37.52	200	282	Average
2404	81.16	87.63			26.96	4.09	37.52	200	282	Peak
4804	33.85	49.19	54	-20.15	30.97	6.79	53.1	129	111	Average
4804	43.88	59.22	74	-30.12	30.97	6.79	53.1	129	111	Peak

Remarks:

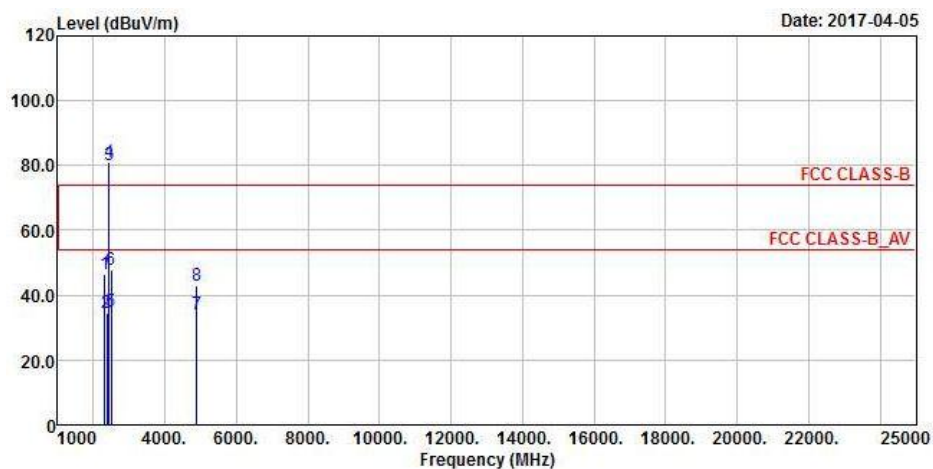
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2402 MHz: Fundamental Frequency
- The other emission levels were very low against the limit.

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

Horizontal



Vertical



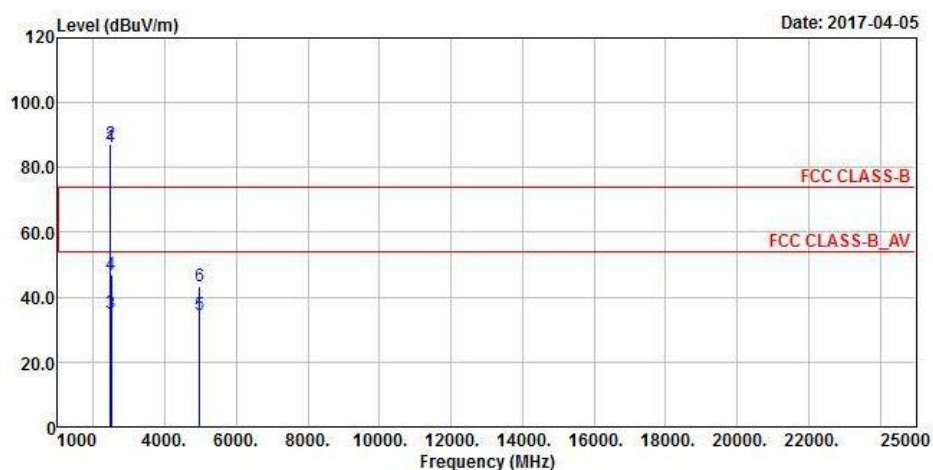
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2370.21	46.34	52.91	74	-27.66	26.86	4.07	37.5	221	196	Peak
2379.66	34.66	41.22	54	-19.34	26.86	4.08	37.5	221	196	Average
2440	86.32	92.6			27.06	4.12	37.46	221	196	Average
2440	87.09	93.37			27.06	4.12	37.46	221	196	Peak
2485.08	35.09	41.11	54	-18.91	27.15	4.15	37.32	221	196	Average
2490.52	48.19	54.15	74	-25.81	27.2	4.16	37.32	221	196	Peak
4880	34.36	49.5	54	-19.64	31.06	6.85	53.05	142	178	Average
4880	42.26	57.4	74	-31.74	31.06	6.85	53.05	142	178	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
2313.78	46.71	53.48	74	-27.29	26.67	4.03	37.47	234	348	Peak
2377.77	34.57	41.14	54	-19.43	26.86	4.07	37.5	234	348	Average
2440	80.08	86.36			27.06	4.12	37.46	234	348	Average
2440	80.96	87.24			27.06	4.12	37.46	234	348	Peak
2496.84	35.16	41.05	54	-18.84	27.2	4.16	37.25	234	348	Average
2497.48	47.65	53.54	74	-26.35	27.2	4.16	37.25	234	348	Peak
4880	33.94	49.08	54	-20.06	31.06	6.85	53.05	124	106	Average
4880	42.77	57.91	74	-31.23	31.06	6.85	53.05	124	106	Peak

Remarks:

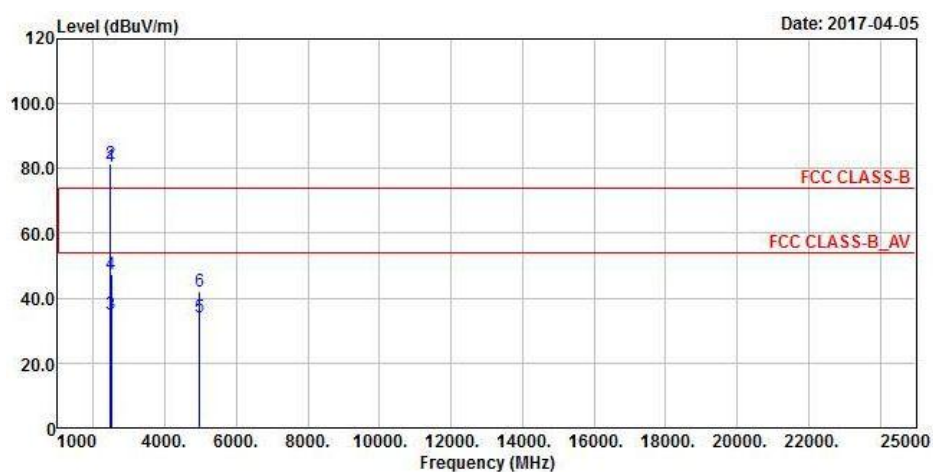
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 2440 MHz: Fundamental Frequency
3. The other emission levels were very low against the limit.

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

Horizontal



Vertical



Antenna 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	86.19	92.21			27.15	4.15	37.32	215	198	Average
2480	87.04	93.06			27.15	4.15	37.32	215	198	Peak
2489.64	35.11	41.07	54	-18.89	27.2	4.16	37.32	215	198	Average
2490.8	47.09	53.05	74	-26.91	27.2	4.16	37.32	215	198	Peak
4960	34.62	49.59	54	-19.38	31.16	6.91	53.04	139	167	Average
4960	43.34	58.31	74	-30.66	31.16	6.91	53.04	139	167	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	80.42	86.44			27.15	4.15	37.32	230	349	Average
2480	81.31	87.33			27.15	4.15	37.32	230	349	Peak
2487.08	35.2	41.22	54	-18.8	27.15	4.15	37.32	230	349	Average
2495.2	47.28	53.17	74	-26.72	27.2	4.16	37.25	230	349	Peak
4960	34.07	49.04	54	-19.93	31.16	6.91	53.04	127	117	Average
4960	42.2	57.17	74	-31.8	31.16	6.91	53.04	127	117	Peak

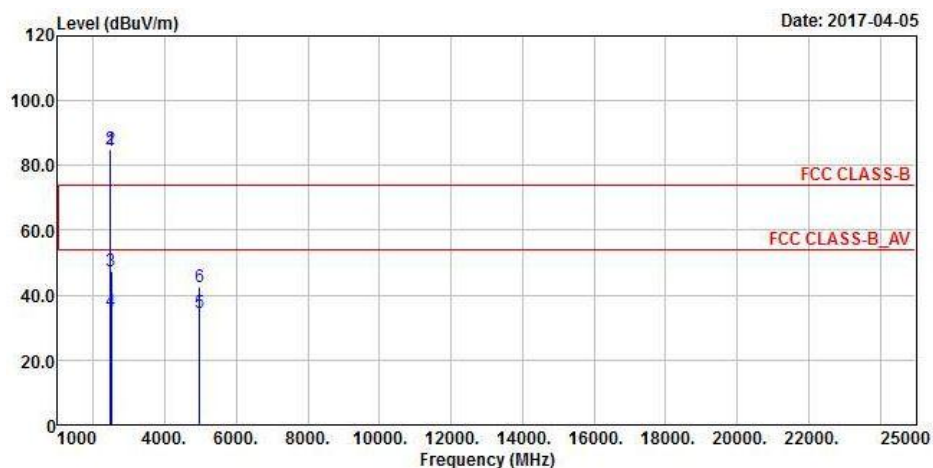
Remarks:

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

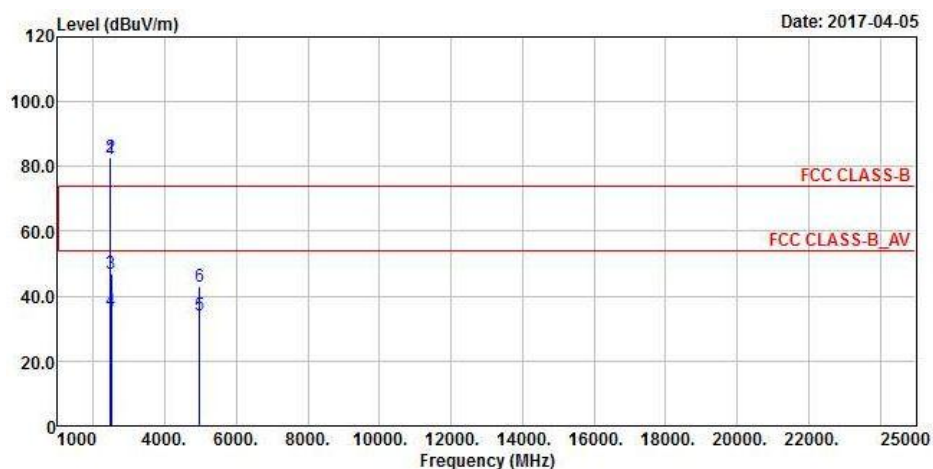
Sample A

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

Horizontal



Vertical



Antenna 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	84.36	90.38			27.15	4.15	37.32	203	193	Average
2480	85.19	91.21			27.15	4.15	37.32	203	193	Peak
2490.96	47.5	53.46	74	-26.5	27.2	4.16	37.32	203	193	Peak
2497.96	35.06	40.95	54	-18.94	27.2	4.16	37.25	203	193	Average
4960	34.41	49.38	54	-19.59	31.16	6.91	53.04	147	198	Average
4960	42.52	57.49	74	-31.48	31.16	6.91	53.04	147	198	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	82.34	88.36			27.15	4.15	37.32	148	61	Average
2480	82.89	88.91			27.15	4.15	37.32	148	61	Peak
2489.36	46.86	52.82	74	-27.14	27.2	4.16	37.32	148	61	Peak
2496	35.27	41.16	54	-18.73	27.2	4.16	37.25	148	61	Average
4960	34.08	49.05	54	-19.92	31.16	6.91	53.04	126	85	Average
4960	42.78	57.75	74	-31.22	31.16	6.91	53.04	126	85	Peak

Remarks:

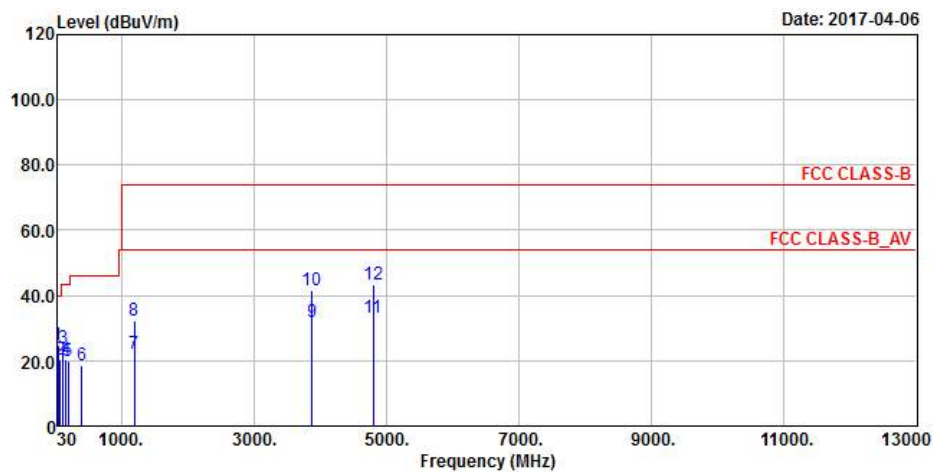
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 2480 MHz: Fundamental Frequency
- The other emission levels were very low against the limit.

14.6.2 接收諧波

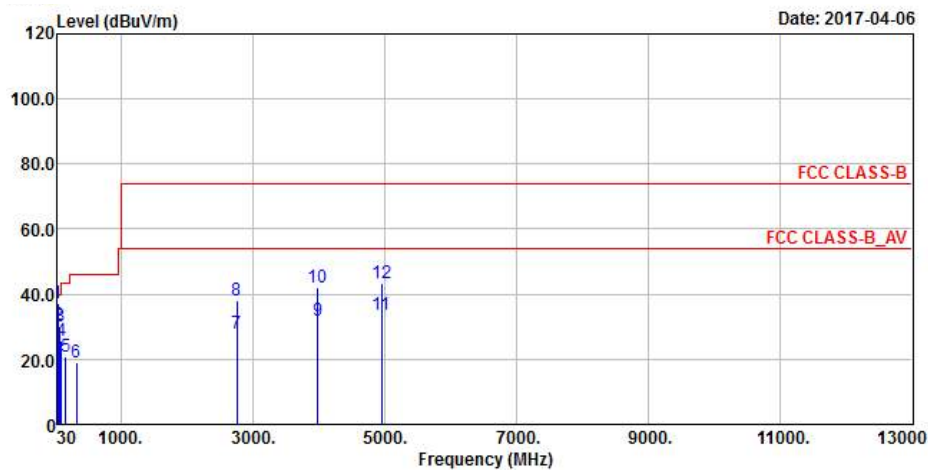
Sample B

EUT Test Condition		Measurement Detail	
Channel	Channel 39	Frequency Range	30 MHz ~ 13 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV) Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
33.88	24.76	42.61	40	-15.24	12.63	0.6	31.08	102	299	Peak
65.89	20.16	39.71	40	-19.84	11.24	0.85	31.64	101	166	Peak
109.54	23.84	44.59	43.5	-19.66	9.99	1.1	31.84	108	188	Peak
158.04	20.2	38.17	43.5	-23.3	12.73	1.13	31.83	110	349	Peak
180.35	19.95	39.83	43.5	-23.55	10.74	1.22	31.84	123	310	Peak
392.78	18.39	33.4	46	-27.61	15.17	1.89	32.07	136	186	Peak
1190	22.11	47.14	54	-31.89	25.1	3.2	53.33	134	270	Average
1190	32.36	57.39	74	-41.64	25.1	3.2	53.33	134	270	Peak
3870	31.69	49.89	54	-22.31	29.41	6.04	53.65	125	235	Average
3870	41.67	59.87	74	-32.33	29.41	6.04	53.65	125	235	Peak
4790	33.38	48.77	54	-20.62	30.95	6.76	53.1	118	316	Average
4790	43.36	58.75	74	-30.64	30.95	6.76	53.1	118	316	Peak
Antenna 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
32.91	37.22	55.24	40	-2.78	12.47	0.6	31.09	102	327	Peak
39.7	30.74	47.55	40	-9.26	13.54	0.64	30.99	130	288	Peak
66.86	29.92	49.63	40	-10.08	11.12	0.85	31.68	122	72	Peak
90.14	25.65	48.34	43.5	-17.85	8.3	0.97	31.96	129	358	Peak
158.04	20.76	38.73	43.5	-22.74	12.73	1.13	31.83	109	290	Peak
321	19.05	35.79	46	-26.95	13.45	1.69	31.88	123	199	Peak
2755	27.9	48.77	54	-26.1	27.85	4.88	53.6	123	334	Average
2755	38	58.87	74	-36	27.85	4.88	53.6	123	334	Peak
3980	32.1	49.85	54	-21.9	29.57	6.19	53.51	112	322	Average
3980	42	59.75	74	-32	29.57	6.19	53.51	112	322	Peak
4950	33.77	48.76	54	-20.23	31.14	6.91	53.04	128	167	Average
4950	43.6	58.59	74	-30.4	31.14	6.91	53.04	128	167	Peak

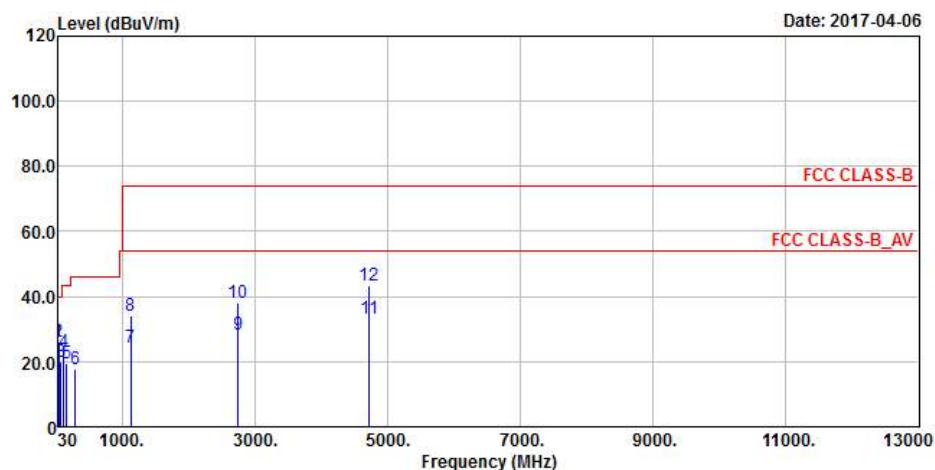
Remarks:

- 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.

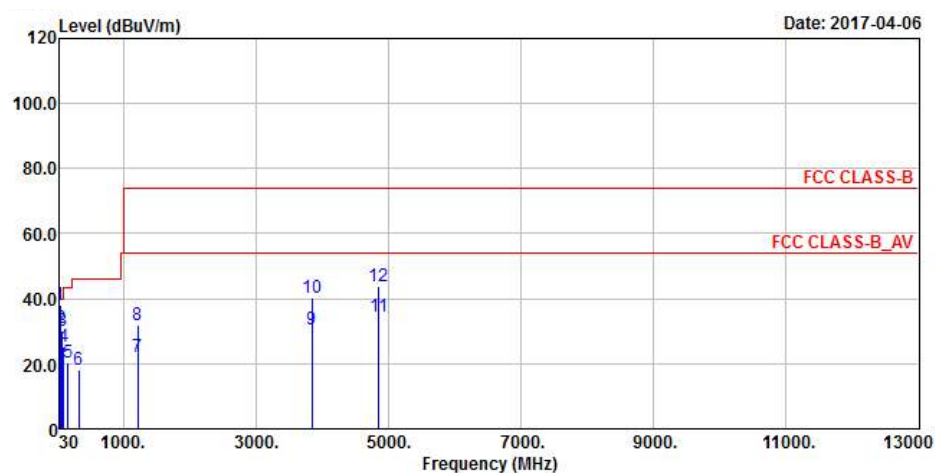
Sample A

EUT Test Condition		Measurement Detail	
Channel	Channel 39	Frequency Range	30 MHz ~ 13 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV) Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
31.94	25.97	44.19	40	-14.03	12.3	0.59	31.11	116	294	Peak
31.94	25.97	44.19	40	-14.03	12.3	0.59	31.11	112	348	Peak
64.92	20.11	39.51	40	-19.89	11.35	0.84	31.59	139	158	Peak
109.54	23.19	43.94	43.5	-20.31	9.99	1.1	31.84	102	197	Peak
157.07	19.54	37.49	43.5	-23.96	12.72	1.13	31.8	116	229	Peak
285.11	17.81	35.45	46	-28.19	12.51	1.59	31.74	114	311	Peak
1125	24.17	49.26	54	-29.83	24.99	3.1	53.18	114	168	Average
1125	34.19	59.28	74	-39.81	24.99	3.1	53.18	114	168	Peak
2735	28.2	49.07	54	-25.8	27.81	4.86	53.54	114	94	Average
2735	38.21	59.08	74	-35.79	27.81	4.86	53.54	114	94	Peak
4715	33.25	48.89	54	-20.75	30.87	6.7	53.21	123	272	Average
4715	43.22	58.86	74	-30.78	30.87	6.7	53.21	123	272	Peak
Antenna 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
31.94	38.02	56.24	40	-1.98	12.3	0.59	31.11	115	58	Peak
41.64	31.02	47.85	40	-8.98	13.56	0.66	31.05	104	79	Peak
66.86	30.06	49.77	40	-9.94	11.12	0.85	31.68	121	105	Peak
91.11	25.09	47.7	43.5	-18.41	8.38	0.97	31.96	128	224	Peak
158.04	20.15	38.12	43.5	-23.35	12.73	1.13	31.83	124	314	Peak
314.21	17.99	34.96	46	-28.01	13.29	1.67	31.93	127	229	Peak
1205	21.97	47.03	54	-32.03	25.13	3.21	53.4	114	300	Average
1205	32.03	57.09	74	-41.97	25.13	3.21	53.4	114	300	Peak
3840	30.37	48.77	54	-23.63	29.35	6.01	53.76	127	357	Average
3840	40.36	58.76	74	-33.64	29.35	6.01	53.76	127	357	Peak
4850	34.53	49.76	54	-19.47	31.01	6.82	53.06	110	75	Average
4850	43.95	59.18	74	-30.05	31.01	6.82	53.06	110	75	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.

14.6.3 其它不必要之讯号

9 kHz ~ 30 MHz Data:

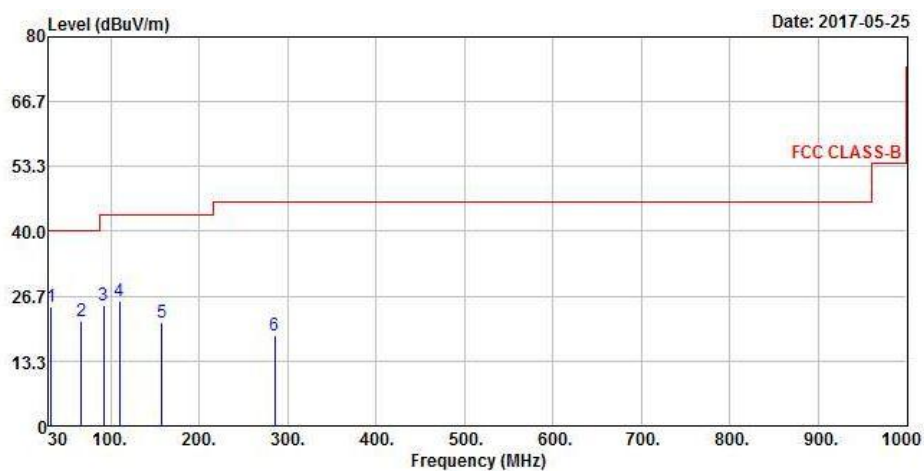
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Data:

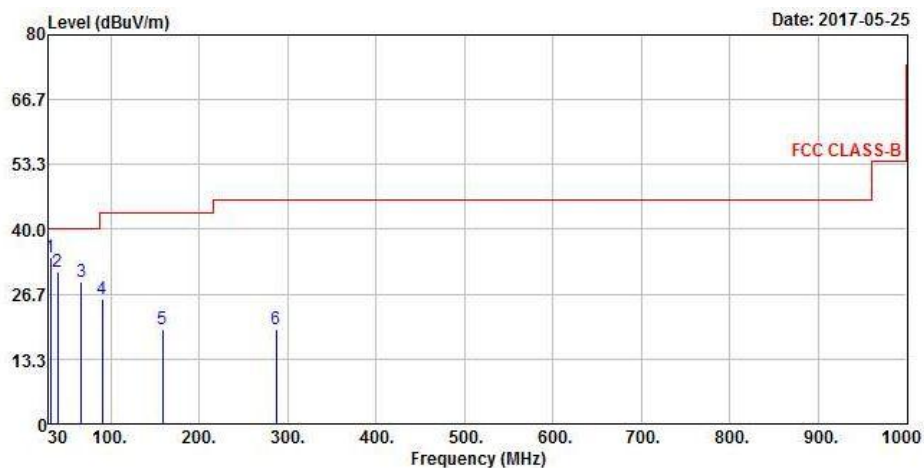
Sample B

EUT Test Condition		Measurement Detail	
Channel	Channel 39	Frequency Range	30 MHz ~ 1 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
32.91	24.37	42.39	40	-15.63	12.47	0.6	31.09	104	35	Peak
66.86	21.52	41.23	40	-18.48	11.12	0.85	31.68	118	208	Peak
92.08	24.81	47.33	43.5	-18.69	8.45	0.99	31.96	132	102	Peak
109.54	25.82	46.57	43.5	-17.68	9.99	1.1	31.84	139	200	Peak
158.04	21.27	39.24	43.5	-22.23	12.73	1.13	31.83	126	308	Peak
285.11	18.67	36.31	46	-27.33	12.51	1.59	31.74	123	246	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
31.94	34.34	52.56	40	-5.66	12.3	0.59	31.11	101	315	Peak
39.7	31.33	48.14	40	-8.67	13.54	0.64	30.99	137	47	Peak
66.86	29.23	48.94	40	-10.77	11.12	0.85	31.68	124	323	Peak
90.14	25.57	48.26	43.5	-17.93	8.3	0.97	31.96	113	232	Peak
159.01	19.58	37.56	43.5	-23.92	12.73	1.14	31.85	140	162	Peak
287.05	19.46	37.01	46	-26.54	12.57	1.6	31.72	120	152	Peak

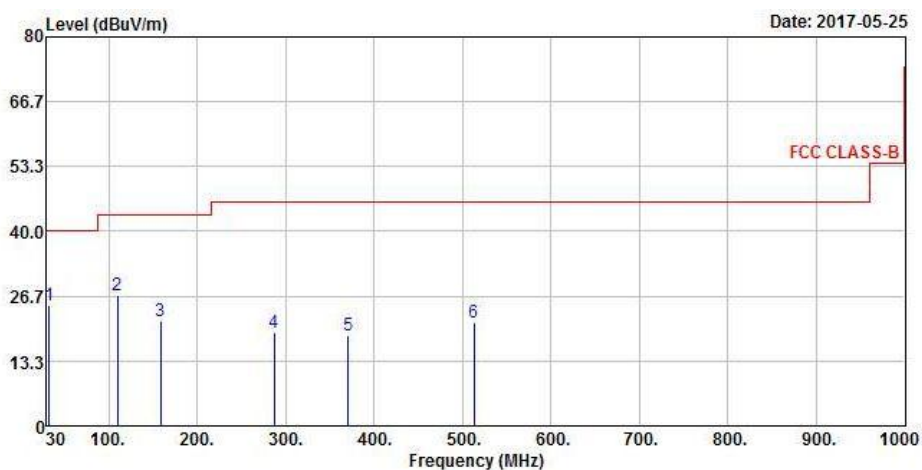
Remarks:

- 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.

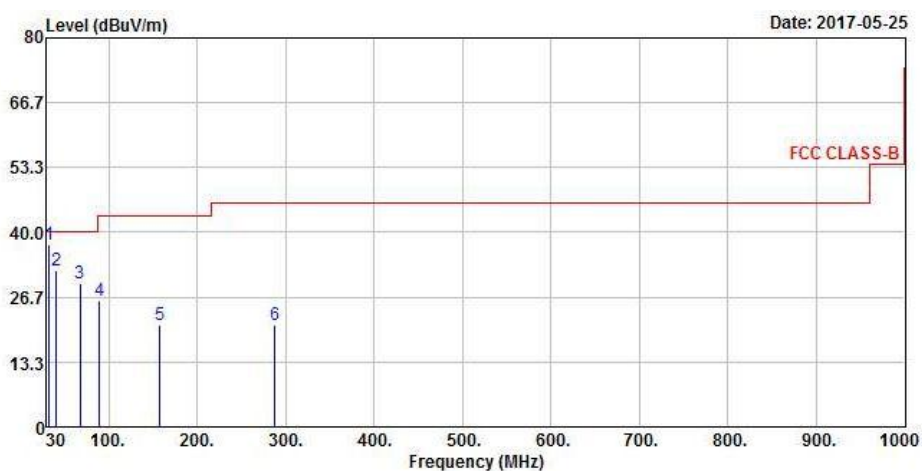
Sample A

EUT Test Condition		Measurement Detail	
Channel	Channel 39	Frequency Range	30 MHz ~ 1 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
32.91	24.94	42.96	40	-15.06	12.47	0.6	31.09	103	342	Peak
109.54	26.79	47.54	43.5	-16.71	9.99	1.1	31.84	102	67	Peak
159.01	21.69	39.67	43.5	-21.81	12.73	1.14	31.85	120	233	Peak
287.05	19.14	36.69	46	-26.86	12.57	1.6	31.72	113	43	Peak
370.47	18.56	34.03	46	-27.44	14.63	1.82	31.92	131	216	Peak
513.06	21.3	33.14	46	-24.7	17.62	2.12	31.58	128	186	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
32.91	37.42	55.44	40	-2.58	12.47	0.6	31.09	118	117	Peak
40.67	32.09	48.91	40	-7.91	13.55	0.65	31.02	137	355	Peak
67.83	29.48	49.36	40	-10.52	11	0.85	31.73	112	316	Peak
89.17	26.01	48.68	43.5	-17.49	8.28	0.96	31.91	140	252	Peak
158.04	21.06	39.03	43.5	-22.44	12.73	1.13	31.83	110	74	Peak
288.02	20.92	38.42	46	-25.08	12.6	1.6	31.7	106	284	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.

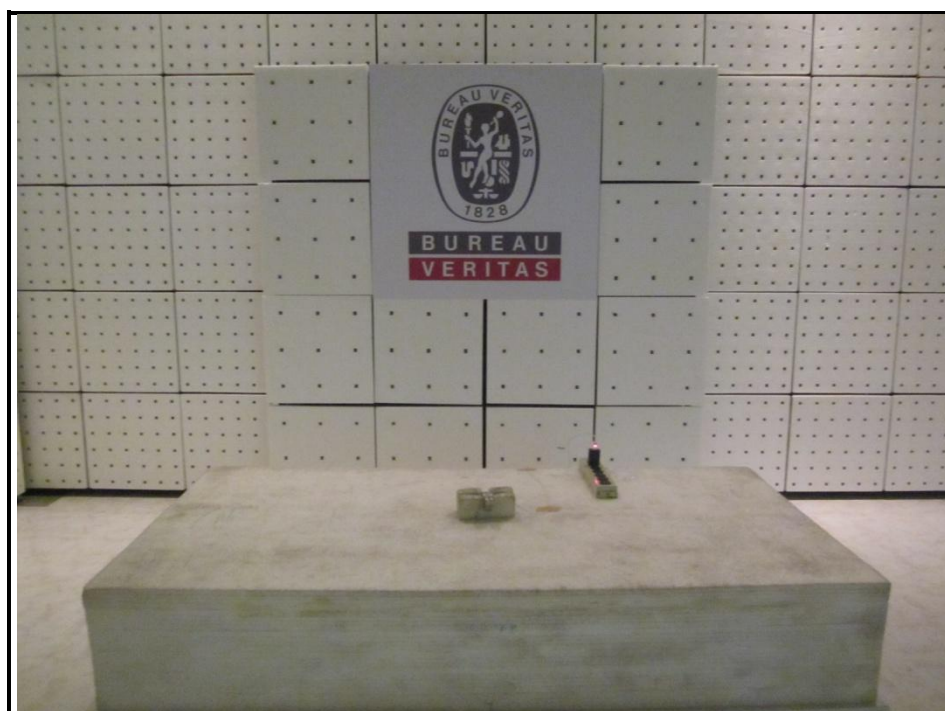
14.7 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

14.8 配置照片

Sample B

<Below 1 GHz>



<Above 1 GHz>



Sample A

<Below 1 GHz>



<Above 1 GHz>



15 6 dB 頻寬之要求

15.1 適用標準

請見本報告 3.1 節第(5)項的規定。

15.2 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 6 dB 的最大頻率範圍。

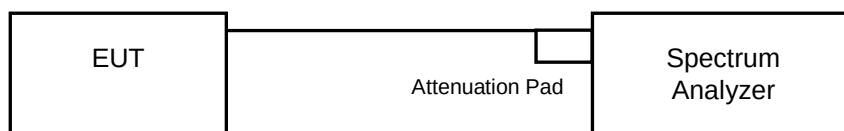
15.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017

Note:

- 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 207 Hz, 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.

15.4 測試配置

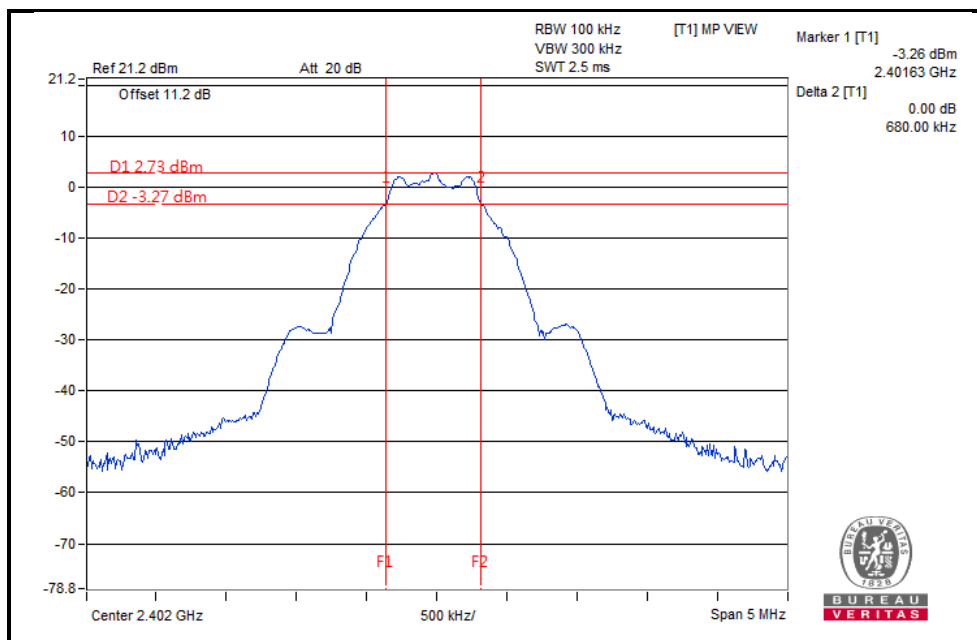


15.5 量測結果

操作模式	發射	測試日期	106 年 04 月 17 日
量測場地溫度	25 °C	量測場地濕度	65 % RH
測試者	Wayne Lin		

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	0.68	0.5	Pass
19	2440	0.68	0.5	Pass
39	2480	0.67	0.5	Pass

**此測試圖僅放測試結果最差的頻道。



15.6 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

16 輸出峰值功率之量測

16.1 適用標準

請見本報告 3.1 節第(4)及(6)項的規定。

16.2 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。

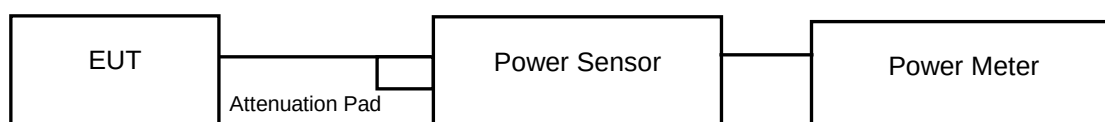
16.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Power Meter Anritsu	ML2495A	1232002	Sep. 08, 2016	Sep. 07, 2017
Power Sensor Anritsu	MA2411B	1207325	Sep. 08, 2016	Sep. 07, 2017

Note:

- 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 1.393 dB, 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 ML2495A is 65 MHz greater than 6 dB bandwidth of emission.

16.4 測試配置



16.5 量測結果

操作模式	發射	測試日期	106 年 04 月 17 日
量測場地溫度	25 °C	量測場地濕度	65 % RH
測試者	Wayne Lin		

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
0	2402	2.427	3.85	30	Pass
19	2440	2.36	3.73	30	Pass
39	2480	2.275	3.57	30	Pass

16.6 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

17 功率密度之量測

17.1 適用標準

請見本報告 3.1 節第(7)項的規定。

17.2 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 3 kHz，視訊頻寬為 10 kHz，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。
- 其峰值位準必須不大於+8 dBm。

17.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017

Note:

- 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 207 Hz, 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.

17.4 測試配置

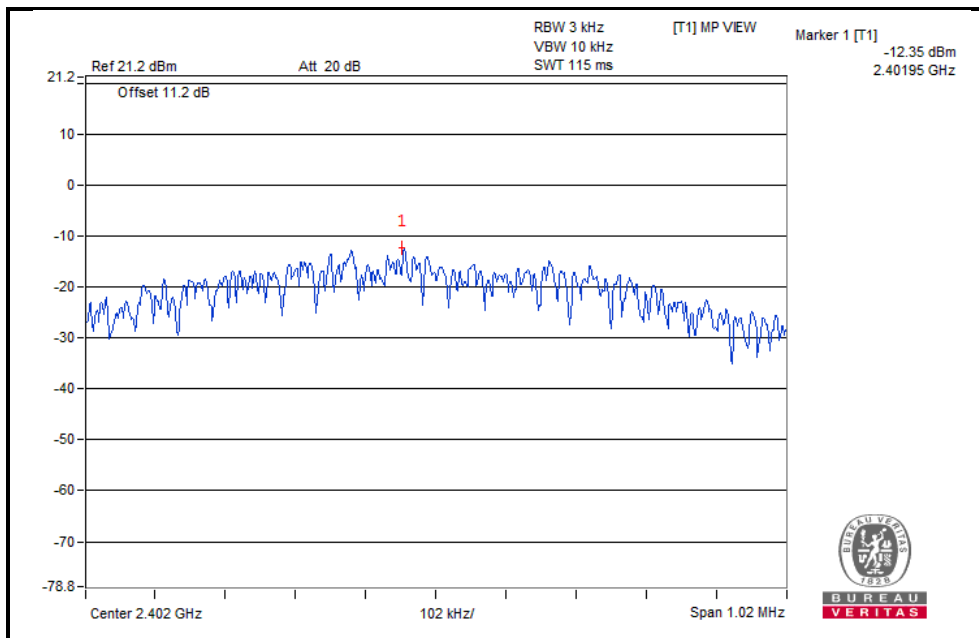


17.5 量測結果

操作模式	發射	測試日期	106 年 04 月 17 日
量測場地溫度	25 °C	量測場地濕度	65 % RH
測試者	Wayne Lin		

Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	2402	-12.35	8	Pass
19	2440	-12.45	8	Pass
39	2480	-12.61	8	Pass

**此測試圖僅放測試結果最差的頻道。



17.6 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

Wireless Charger (150 kHz) 測試紀錄結果

18 場強輻射及開放頻帶邊緣之量測

18.1 適用標準

請見本報告 3.1 節第(28)項規定。

18.2 量測方法

9 kHz ~ 30 MHz 量測：

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，另外接收天線分別置於 OPEN、CLOSE 極化各執行測試一次，以紀錄最大場強值。

30 MHz ~ 1 GHz 量測：

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。

Measurement Instrument Setting

The following table is the setting of receiver

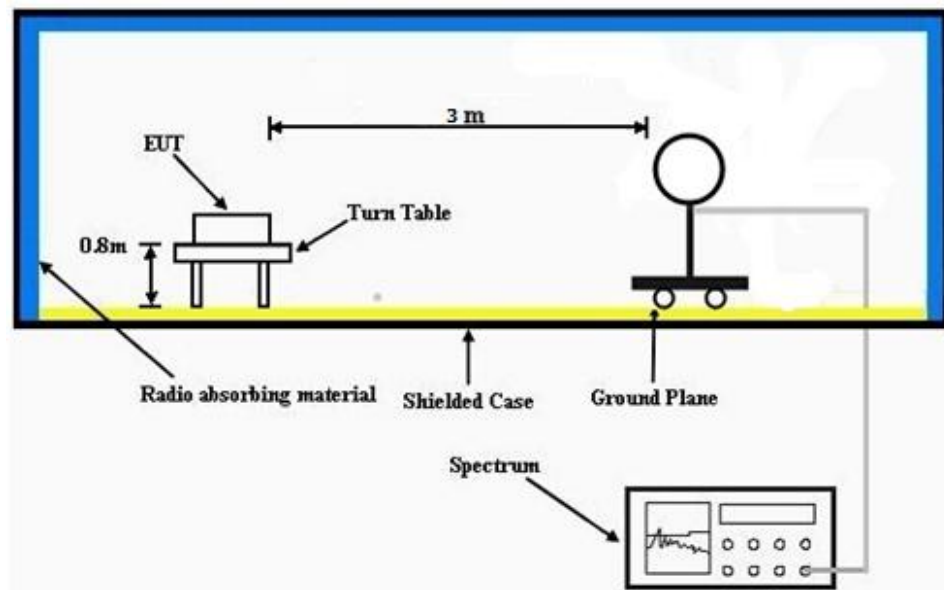
Frequency Range	Setting
9 kHz ~ 150 kHz	Quasi-Peak: RBW = 200 Hz
150 kHz ~ 30 MHz	Quasi-Peak: RBW = 9 kHz
30 MHz ~ 1000 MHz	Peak: RBW = 120 kHz; Quasi-Peak: RBW = 120 kHz

Note: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

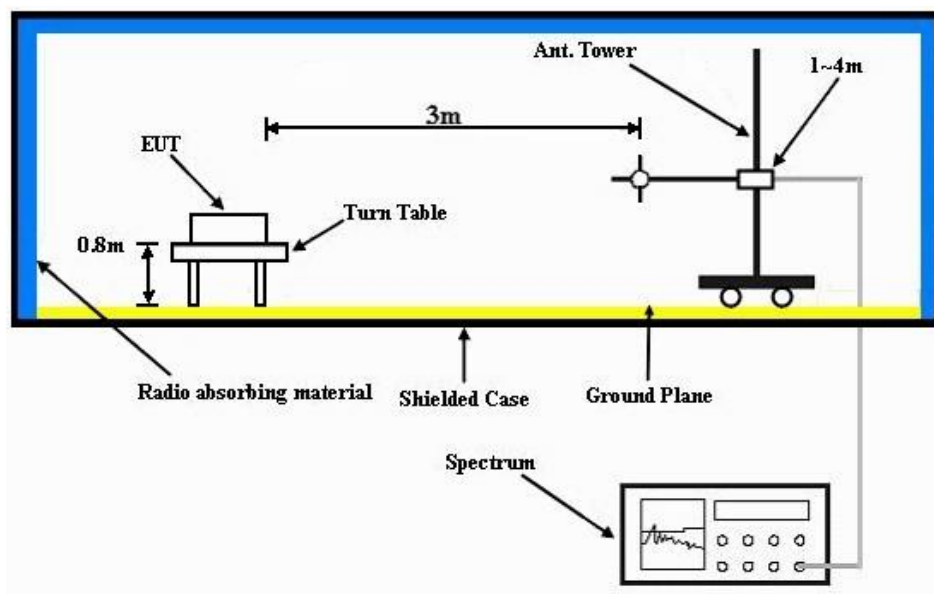
18.3 量測儀器

同 4.3 節

18.4 測試配置



9 kHz ~ 30 MHz



30 MHz ~ 1 GHz

18.5 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)

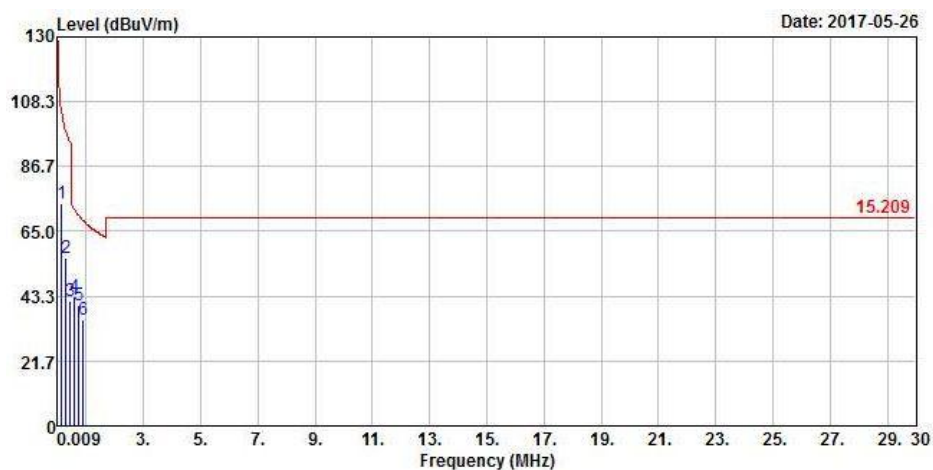
量測結果請見下頁。

18.6 量測結果

18.6.1 發射諧波

Sample B

EUT Test Condition		Measurement Detail	
Input Power	110 Vac, 60 Hz	Frequency Range	0.009 ~ 30 MHz
Environmental Conditions	25 deg. C, 65 % RH	Detector Function	Quasi-Peak (QP) Average (AV)
Tested By	Getaz Yang		



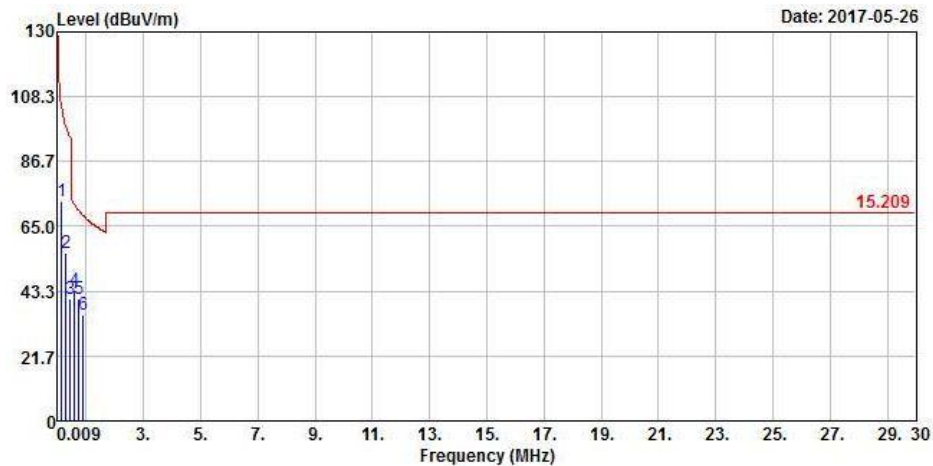
Antenna Polarity & Test Distance: Loop Antenna Open at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
0.15	74.54	60.99	104.08	-29.54	54.49	0.02	40.96	100	360	Average
0.3	56.36	48.43	98.06	-41.7	48.7	0.02	40.79	100	360	Average
0.45	41.56	36.42	94.54	-52.98	45.77	0.05	40.68	100	360	Average
0.6	43.31	40.1	72.04	-28.73	43.8	0.08	40.67	100	360	QP
0.75	40.07	38.17	70.1	-30.03	42.5	0.1	40.7	100	360	QP
0.9	35.53	34.64	68.52	-32.99	41.5	0.12	40.73	100	360	QP

Note:

- Emission level (dBuV/m) = Read Level (dBuV) + Correction Factor (dB/m)
- Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Preamp Factor (dB)
- The other emission levels were very low against the limit.
- Margin value = Emission level - Limit value
- 當測試距離較規定距離為近時，測試結果應以插補係數換算至規定距離之值

$$\text{Limit @ 3 m} = \text{Limit @ 30 m} + 40\log(30 / 3) = \text{Limit @ 30 m} + 40$$
- Open: loop antenna 面向 EUT
Close: loop antenna 與 EUT 垂直

EUT Test Condition		Measurement Detail	
Input Power	110 Vac, 60 Hz	Frequency Range	0.009 ~ 30 MHz
Environmental Conditions	25 deg. C, 65 % RH	Detector Function	Quasi-Peak (QP) Average (AV)
Tested By	Getaz Yang		



Antenna Polarity & Test Distance: Loop Antenna Close 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
0.15	73.62	60.07	104.08	-30.46	54.49	0.02	40.96	100	0	Average
0.3	56.27	48.34	98.06	-41.79	48.7	0.02	40.79	100	0	Average
0.45	40.9	35.76	94.54	-53.64	45.77	0.05	40.68	100	0	Average
0.6	43.66	40.45	72.04	-28.38	43.8	0.08	40.67	100	0	QP
0.75	40.77	38.87	70.1	-29.33	42.5	0.1	40.7	100	0	QP
0.9	35.41	34.52	68.52	-33.11	41.5	0.12	40.73	100	0	QP

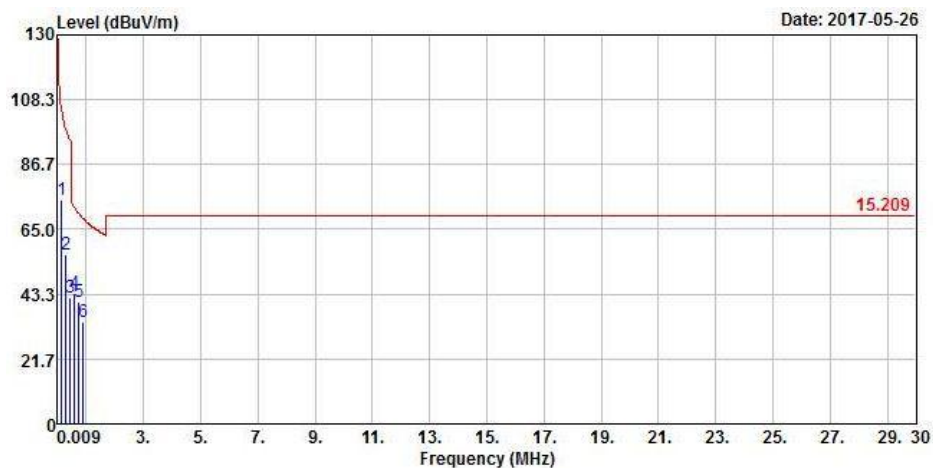
Note:

- Emission level (dBuV/m) = Read Level (dBuV) + Correction Factor (dB/m)
- Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Preamp Factor (dB)
- The other emission levels were very low against the limit.
- Margin value = Emission level - Limit value
- 當測試距離較規定距離為近時，測試結果應以插補係數換算至規定距離之值

$$\text{Limit @ 3 m} = \text{Limit @ 30 m} + 40\log(30 / 3) = \text{Limit @ 30 m} + 40$$
- Open: loop antenna 面向 EUT
 Close: loop antenna 與 EUT 垂直

Sample A

EUT Test Condition		Measurement Detail	
Input Power	110 Vac, 60 Hz	Frequency Range	0.009 ~ 30 MHz
Environmental Conditions	25 deg. C, 65 % RH	Detector Function	Quasi-Peak (QP) Average (AV)
Tested By	Getaz Yang		



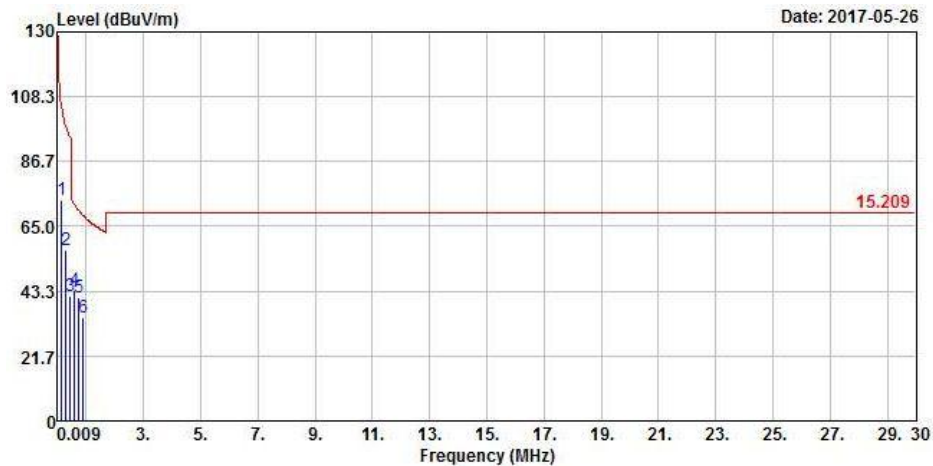
Antenna Polarity & Test Distance: Loop Antenna Open at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
0.15	74.81	61.26	104.08	-29.27	54.49	0.02	40.96	100	0	Average
0.3	56.59	48.66	98.06	-41.47	48.7	0.02	40.79	100	0	Average
0.45	42.14	37	94.54	-52.4	45.77	0.05	40.68	100	0	Average
0.6	43.61	40.4	72.04	-28.43	43.8	0.08	40.67	100	0	QP
0.75	40.87	38.97	70.1	-29.23	42.5	0.1	40.7	100	0	QP
0.9	34.12	33.23	68.52	-34.4	41.5	0.12	40.73	100	0	QP

Note:

- Emission level (dBuV/m) = Read Level (dBuV) + Correction Factor (dB/m)
- Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Preamp Factor (dB)
- The other emission levels were very low against the limit.
- Margin value = Emission level - Limit value
- 當測試距離較規定距離為近時，測試結果應以插補係數換算至規定距離之值

$$\text{Limit @ 3 m} = \text{Limit @ 30 m} + 40\log(30 / 3) = \text{Limit @ 30 m} + 40$$
- Open: loop antenna 面向 EUT
 Close: loop antenna 與 EUT 垂直

EUT Test Condition		Measurement Detail	
Input Power	110 Vac, 60 Hz	Frequency Range	0.009 ~ 30 MHz
Environmental Conditions	25 deg. C, 65 % RH	Detector Function	Quasi-Peak (QP) Average (AV)
Tested By	Getaz Yang		



Antenna Polarity & Test Distance: Loop Antenna Close 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
0.15	73.66	60.11	104.08	-30.42	54.49	0.02	40.96	100	360	Average
0.3	57.17	49.24	98.06	-40.89	48.7	0.02	40.79	100	360	Average
0.45	41.52	36.38	94.54	-53.02	45.77	0.05	40.68	100	360	Average
0.6	43.44	40.23	72.04	-28.6	43.8	0.08	40.67	100	360	QP
0.75	41.36	39.46	70.1	-28.74	42.5	0.1	40.7	100	360	QP
0.9	34.66	33.77	68.52	-33.86	41.5	0.12	40.73	100	360	QP

Note:

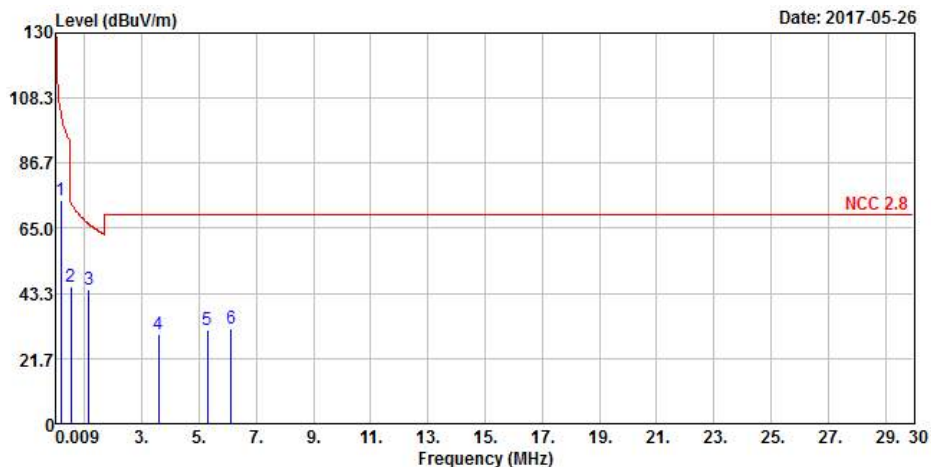
- Emission level (dBuV/m) = Read Level (dBuV) + Correction Factor (dB/m)
- Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Preamp Factor (dB)
- The other emission levels were very low against the limit.
- Margin value = Emission level - Limit value
- 當測試距離較規定距離為近時，測試結果應以插補係數換算至規定距離之值

$$\text{Limit @ 3 m} = \text{Limit @ 30 m} + 40\log(30 / 3) = \text{Limit @ 30 m} + 40$$
- Open: loop antenna 面向 EUT
 Close: loop antenna 與 EUT 垂直

18.6.2 接收諧波

Sample B

EUT Test Condition		Measurement Detail	
Input Power	110 Vac, 60 Hz	Frequency Range	0.009 ~ 30 MHz
Environmental Conditions	25 deg. C, 65 % RH	Detector Function	Quasi-Peak (QP) Average (AV)
Tested By	Getaz Yang		



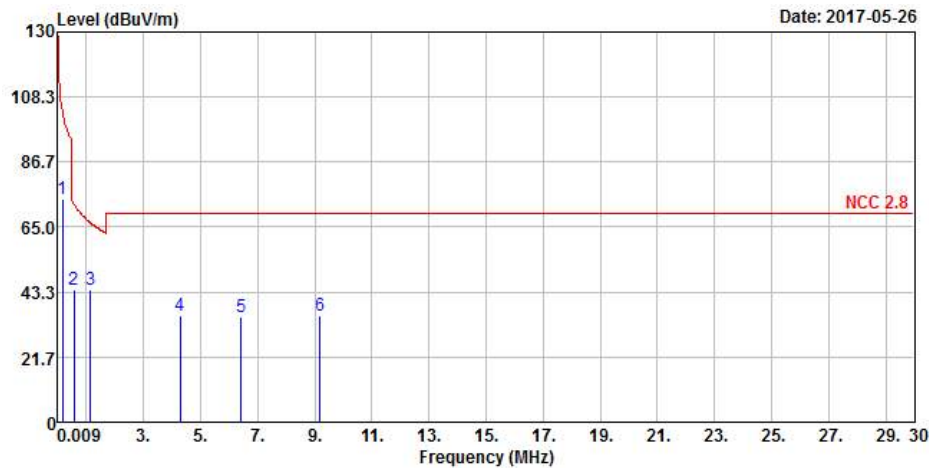
Antenna Polarity & Test Distance: Loop Antenna Open at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
0.15896	74.21	61.12	103.58	-29.37	54.01	0.02	40.94	100	0	Average
0.51885	45.42	41.2	73.3	-27.88	44.82	0.06	40.66	100	0	QP
1.149	44.61	44.48	66.4	-21.79	40.74	0.14	40.75	100	0	QP
3.578	29.71	32.48	69.54	-39.83	37.98	0.2	40.95	100	0	QP
5.287	31.04	33.99	69.54	-38.5	37.9	0.22	41.07	100	0	QP
6.127	31.6	34.61	69.54	-37.94	37.9	0.23	41.14	100	0	QP

Note:

- Emission level (dBuV/m) = Read Level (dBuV) + Correction Factor (dB/m)
- Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Preamplifier Factor (dB)
- The other emission levels were very low against the limit.
- Margin value = Emission level - Limit value
- 當測試距離較規定距離為近時，測試結果應以插補係數換算至規定距離之值

$$\text{Limit @ 3 m} = \text{Limit @ 30 m} + 40\log(30 / 3) = \text{Limit @ 30 m} + 40$$
- Open: loop antenna 面向 EUT
Close: loop antenna 與 EUT 垂直

EUT Test Condition		Measurement Detail	
Input Power	110 Vac, 60 Hz	Frequency Range	0.009 ~ 30 MHz
Environmental Conditions	25 deg. C, 65 % RH	Detector Function	Quasi-Peak (QP) Average (AV)
Tested By	Getaz Yang		



Antenna Polarity & Test Distance: Loop Antenna Close 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
0.15896	74.33	61.24	103.58	-29.25	54.01	0.02	40.94	100	360	Average
0.57883	44.07	40.59	72.35	-28.28	44.08	0.07	40.67	100	360	QP
1.149	44.04	43.91	66.4	-22.36	40.74	0.14	40.75	100	360	QP
4.298	35.26	38.16	69.54	-34.28	37.9	0.2	41	100	360	QP
6.427	35.01	38.04	69.54	-34.53	37.9	0.24	41.17	100	360	QP
9.186	35.41	38.63	69.54	-34.13	37.85	0.27	41.34	100	360	QP

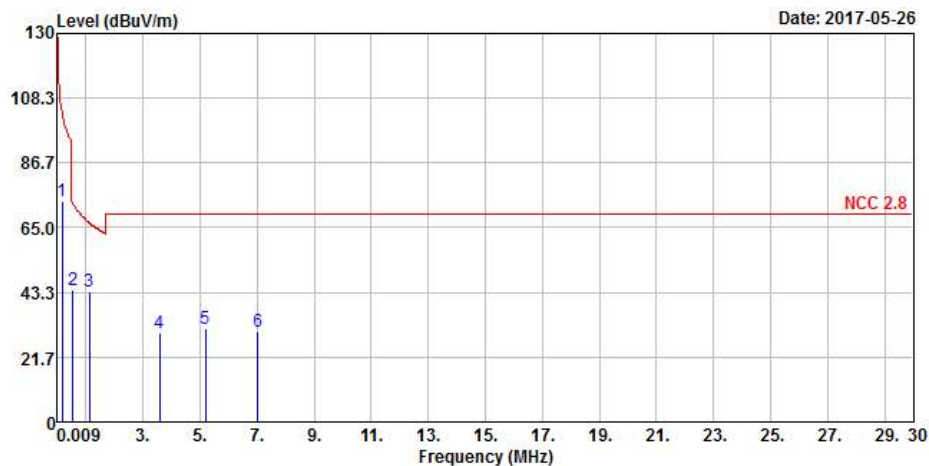
Note:

- Emission level (dBuV/m) = Read Level (dBuV) + Correction Factor (dB/m)
- Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Preamp Factor (dB)
- The other emission levels were very low against the limit.
- Margin value = Emission level - Limit value
- 當測試距離較規定距離為近時，測試結果應以插補係數換算至規定距離之值

$$\text{Limit @ 3 m} = \text{Limit @ 30 m} + 40\log(30 / 3) = \text{Limit @ 30 m} + 40$$
- Open: loop antenna 面向 EUT
Close: loop antenna 與 EUT 垂直

Sample A

EUT Test Condition		Measurement Detail	
Input Power	110 Vac, 60 Hz	Frequency Range	0.009 ~ 30 MHz
Environmental Conditions	25 deg. C, 65 % RH	Detector Function	Quasi-Peak (QP) Average (AV)
Tested By	Getaz Yang		



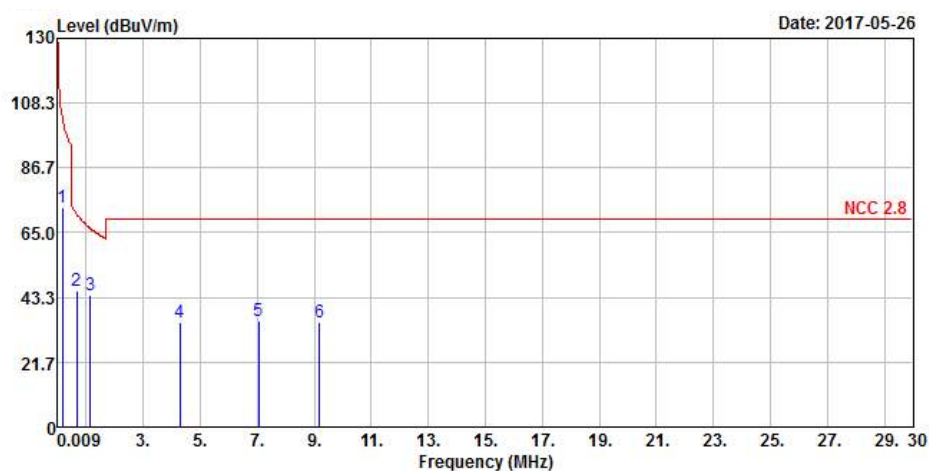
Antenna Polarity & Test Distance: Loop Antenna Open at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
0.15896	74.01	60.92	103.58	-29.57	54.01	0.02	40.94	100	360	Average
0.54884	44.32	40.49	72.82	-28.5	44.42	0.07	40.66	100	360	QP
1.119	43.65	43.44	66.63	-22.98	40.82	0.14	40.75	100	360	QP
3.578	29.79	32.56	69.54	-39.75	37.98	0.2	40.95	100	360	QP
5.197	31.08	34.03	69.54	-38.46	37.9	0.21	41.06	100	360	QP
7.027	30.26	33.33	69.54	-39.28	37.9	0.24	41.21	100	360	QP

Note:

- Emission level (dBuV/m) = Read Level (dBuV) + Correction Factor (dB/m)
- Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Preamp Factor (dB)
- The other emission levels were very low against the limit.
- Margin value = Emission level - Limit value
- 當測試距離較規定距離為近時，測試結果應以插補係數換算至規定距離之值

$$\text{Limit @ 3 m} = \text{Limit @ 30 m} + 40\log(30 / 3) = \text{Limit @ 30 m} + 40$$
- Open: loop antenna 面向 EUT
Close: loop antenna 與 EUT 垂直

EUT Test Condition		Measurement Detail	
Input Power	110 Vac, 60 Hz	Frequency Range	0.009 ~ 30 MHz
Environmental Conditions	25 deg. C, 65 % RH	Detector Function	Quasi-Peak (QP) Average (AV)
Tested By	Getaz Yang		



Antenna Polarity & Test Distance: Loop Antenna Close at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
0.15896	73.51	60.42	103.58	-30.07	54.01	0.02	40.94	100	0	Average
0.6688	45.52	42.94	71.1	-25.58	43.18	0.09	40.69	100	0	QP
1.149	44.31	44.18	66.4	-22.09	40.74	0.14	40.75	100	0	QP
4.298	35.02	37.92	69.54	-34.52	37.9	0.2	41	100	0	QP
7.057	35.66	38.73	69.54	-33.88	37.89	0.25	41.21	100	0	QP
9.186	35.15	38.37	69.54	-34.39	37.85	0.27	41.34	100	0	QP

Note:

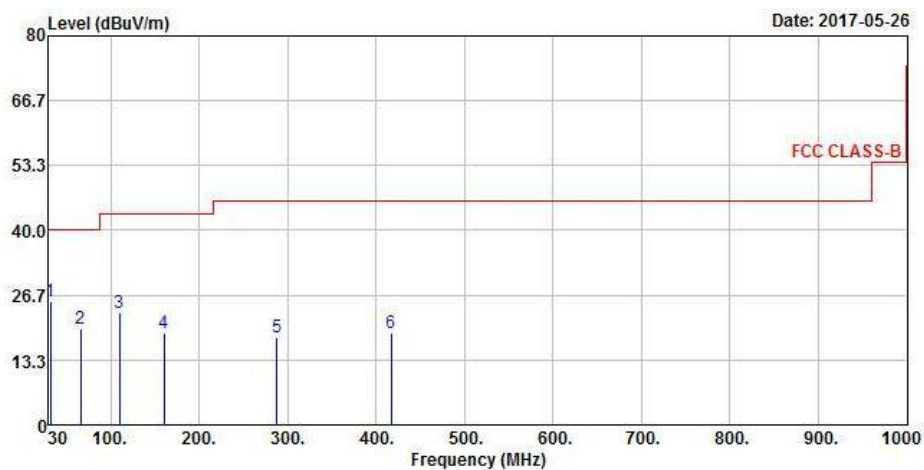
- Emission level (dBuV/m) = Read Level (dBuV) + Correction Factor (dB/m)
- Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Preamplifier Factor (dB)
- The other emission levels were very low against the limit.
- Margin value = Emission level - Limit value
- 當測試距離較規定距離為近時，測試結果應以插補係數換算至規定距離之值
Limit @ 3 m = Limit @ 30 m + 40log(30 / 3) = Limit @ 30 m + 40
- Open: loop antenna 面向 EUT
Close: loop antenna 與 EUT 垂直

18.6.3 其它不必要之讯号

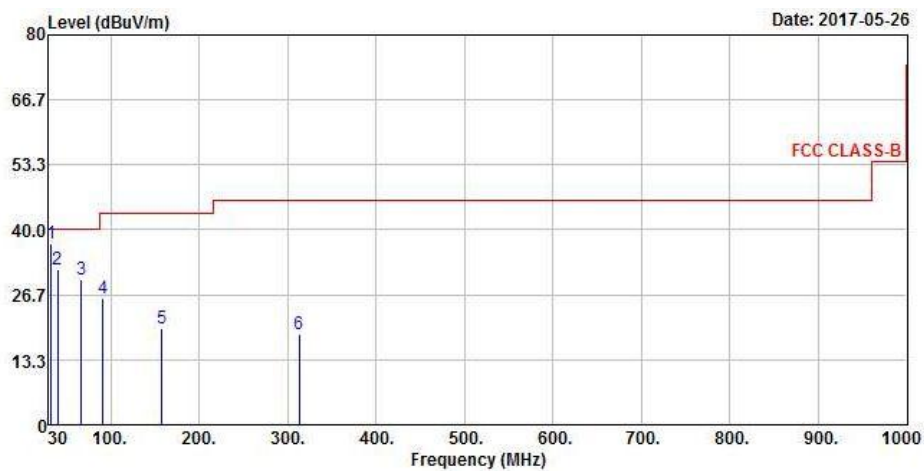
Sample B

EUT Test Condition		Measurement Detail	
Mode	Transmitter	Frequency Range	30 MHz ~ 1 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



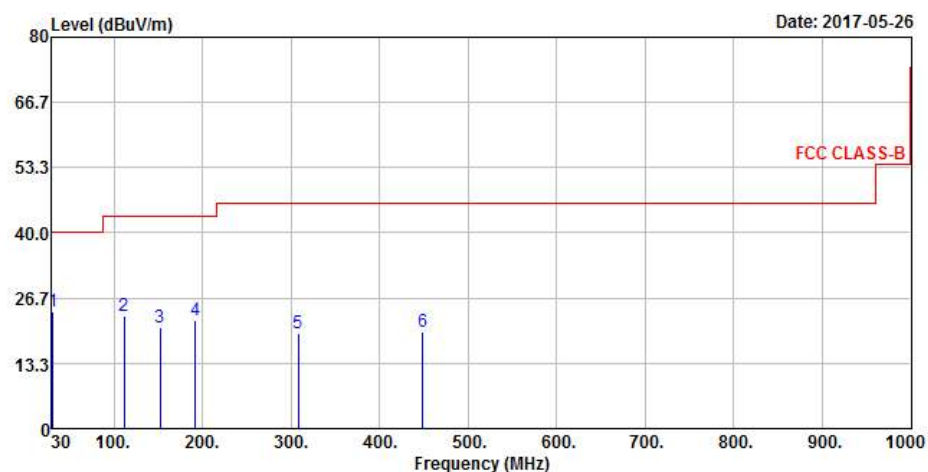
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
31.94	25.46	43.68	40	-14.54	12.3	0.59	31.11	104	319	Peak
65.89	19.7	39.25	40	-20.3	11.24	0.85	31.64	119	1	Peak
109.54	23.14	43.89	43.5	-20.36	9.99	1.1	31.84	106	62	Peak
159.98	18.9	36.9	43.5	-24.6	12.73	1.15	31.88	138	359	Peak
288.02	18.07	35.57	46	-27.93	12.6	1.6	31.7	120	174	Peak
417.03	19	33.41	46	-27	15.68	1.94	32.03	130	119	Peak
Antennal Polarity & Test Distance: Close 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
32.91	37.14	55.16	40	-2.86	12.47	0.6	31.09	109	98	Peak
39.7	31.81	48.62	40	-8.19	13.54	0.64	30.99	112	288	Peak
66.86	29.87	49.58	40	-10.13	11.12	0.85	31.68	106	324	Peak
91.11	25.86	48.47	43.5	-17.64	8.38	0.97	31.96	117	336	Peak
158.04	19.83	37.8	43.5	-23.67	12.73	1.13	31.83	106	115	Peak
313.24	18.58	35.58	46	-27.42	13.26	1.67	31.93	129	70	Peak

Remarks:

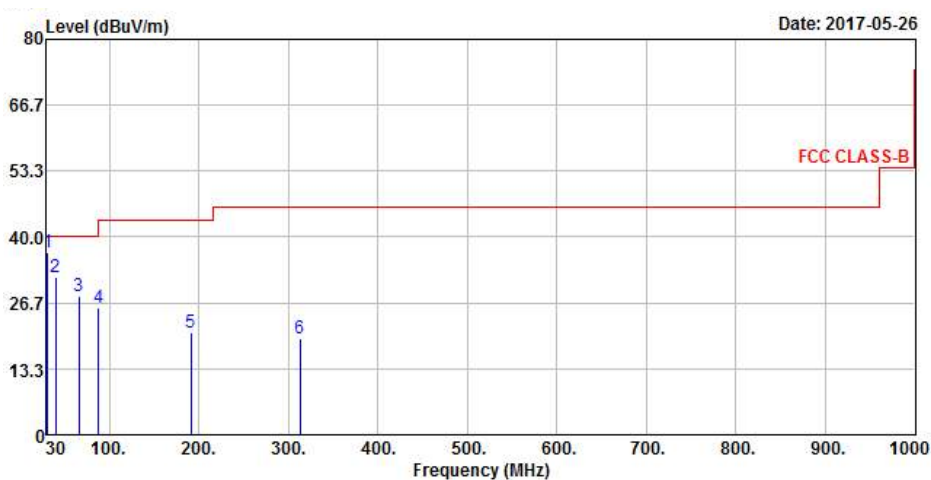
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Mode	Receiver	Frequency Range	30 MHz ~ 1 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
30.97	23.97	42.36	40	-16.03	12.14	0.59	31.12	131	232	Peak
111.48	22.94	43.5	43.5	-20.56	10.18	1.11	31.85	124	176	Peak
152.22	20.67	38.5	43.5	-22.83	12.71	1.12	31.66	128	254	Peak
191.99	22.23	42.74	43.5	-21.27	9.91	1.27	31.69	103	357	Peak
308.39	19.63	36.75	46	-26.37	13.15	1.66	31.93	111	227	Peak
449.04	19.92	33.61	46	-26.08	16.31	1.98	31.98	107	294	Peak
Antenna 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
30.97	37.01	55.4	40	-2.99	12.14	0.59	31.12	130	241	Peak
39.7	31.92	48.73	40	-8.08	13.54	0.64	30.99	100	146	Peak
65.89	27.91	47.46	40	-12.09	11.24	0.85	31.64	106	299	Peak
88.2	25.55	48.2	43.5	-17.95	8.27	0.95	31.87	117	158	Peak
191.02	20.64	41.07	43.5	-22.86	9.98	1.27	31.68	114	215	Peak
313.24	19.45	36.45	46	-26.55	13.26	1.67	31.93	131	289	Peak

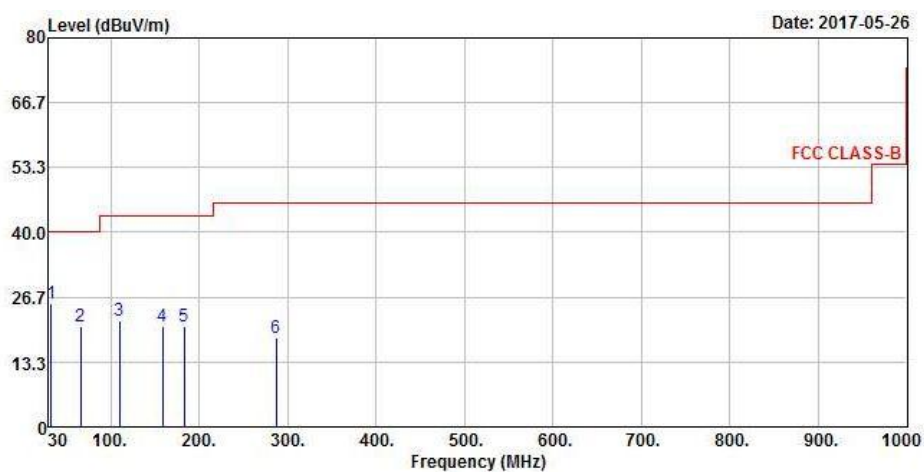
Remarks:

- 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.

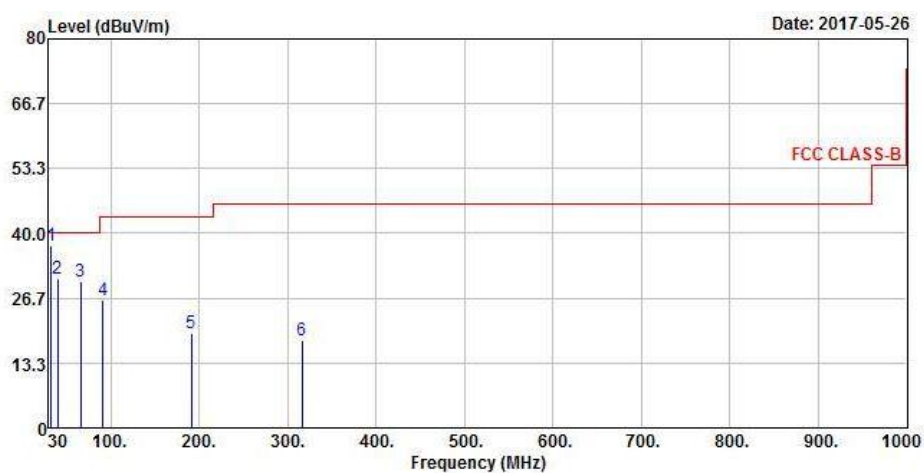
Sample A

EUT Test Condition		Measurement Detail	
Mode	Transmitter	Frequency Range	30 MHz ~ 1 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



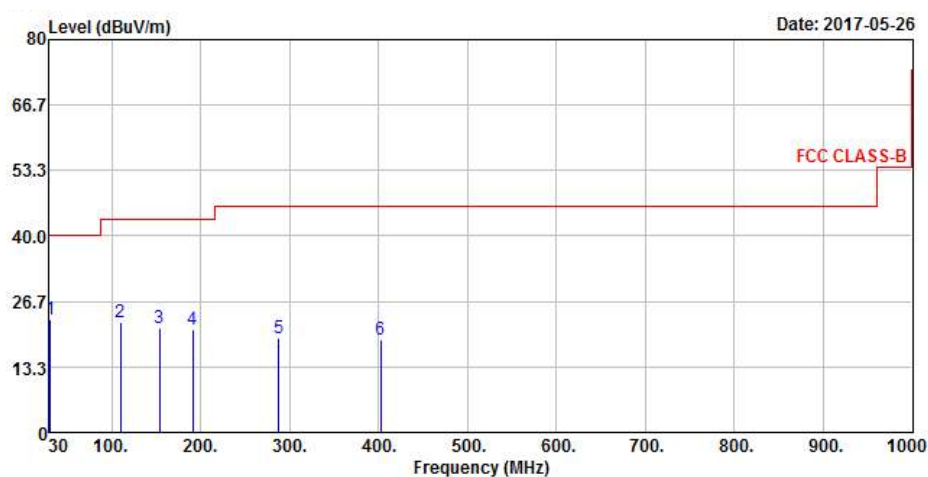
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
32.91	25.52	43.54	40	-14.48	12.47	0.6	31.09	127	155	Peak
65.89	20.73	40.28	40	-19.27	11.24	0.85	31.64	110	175	Peak
109.54	21.75	42.5	43.5	-21.75	9.99	1.1	31.84	119	9	Peak
159.01	20.71	38.69	43.5	-22.79	12.73	1.14	31.85	116	332	Peak
183.26	20.68	40.71	43.5	-22.82	10.53	1.23	31.79	103	259	Peak
287.05	18.26	35.81	46	-27.74	12.57	1.6	31.72	111	171	Peak
Antenna 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
32.91	37.61	55.63	40	-2.39	12.47	0.6	31.09	103	169	Peak
39.7	30.75	47.56	40	-9.25	13.54	0.64	30.99	116	181	Peak
65.89	29.98	49.53	40	-10.02	11.24	0.85	31.64	140	258	Peak
91.11	26.36	48.97	43.5	-17.14	8.38	0.97	31.96	129	295	Peak
191.02	19.63	40.06	43.5	-23.87	9.98	1.27	31.68	117	141	Peak
316.15	18.13	35.03	46	-27.87	13.33	1.68	31.91	114	246	Peak

Remarks:

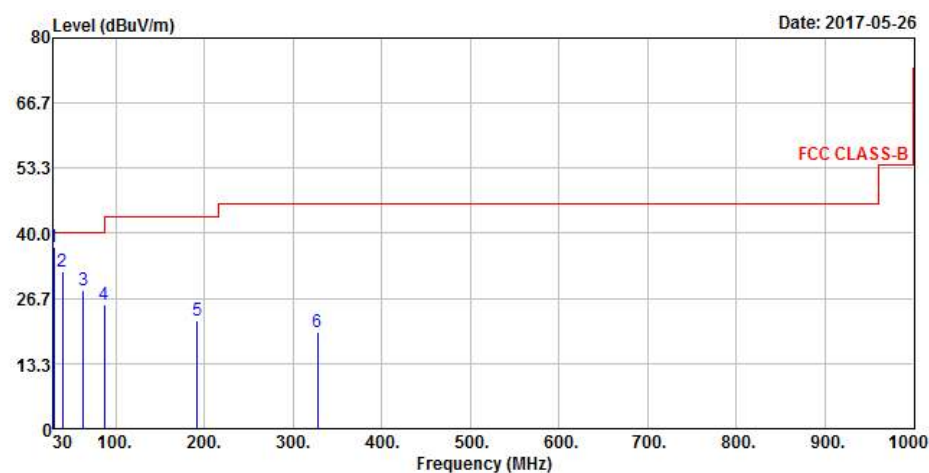
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Mode	Receiver	Frequency Range	30 MHz ~ 1 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna 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
30.97	23.17	41.56	40	-16.83	12.14	0.59	31.12	105	11	Peak
109.54	22.44	43.19	43.5	-21.06	9.99	1.1	31.84	133	348	Peak
154.16	21.11	39	43.5	-22.39	12.72	1.11	31.72	104	186	Peak
191.02	20.92	41.35	43.5	-22.58	9.98	1.27	31.68	140	50	Peak
288.02	19.17	36.67	46	-26.83	12.6	1.6	31.7	136	94	Peak
402.48	18.89	33.67	46	-27.11	15.39	1.92	32.09	112	263	Peak
Antenna 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
30	37.16	55.74	40	-2.84	11.98	0.58	31.14	116	202	Peak
39.7	32.17	48.98	40	-7.83	13.54	0.64	30.99	140	95	Peak
63.95	28.3	47.53	40	-11.7	11.47	0.84	31.54	109	307	Peak
87.23	25.35	47.97	40	-14.65	8.25	0.95	31.82	138	309	Peak
191.99	22.14	42.65	43.5	-21.36	9.91	1.27	31.69	104	195	Peak
327.79	19.77	36.28	46	-26.23	13.61	1.71	31.83	122	88	Peak

Remarks:

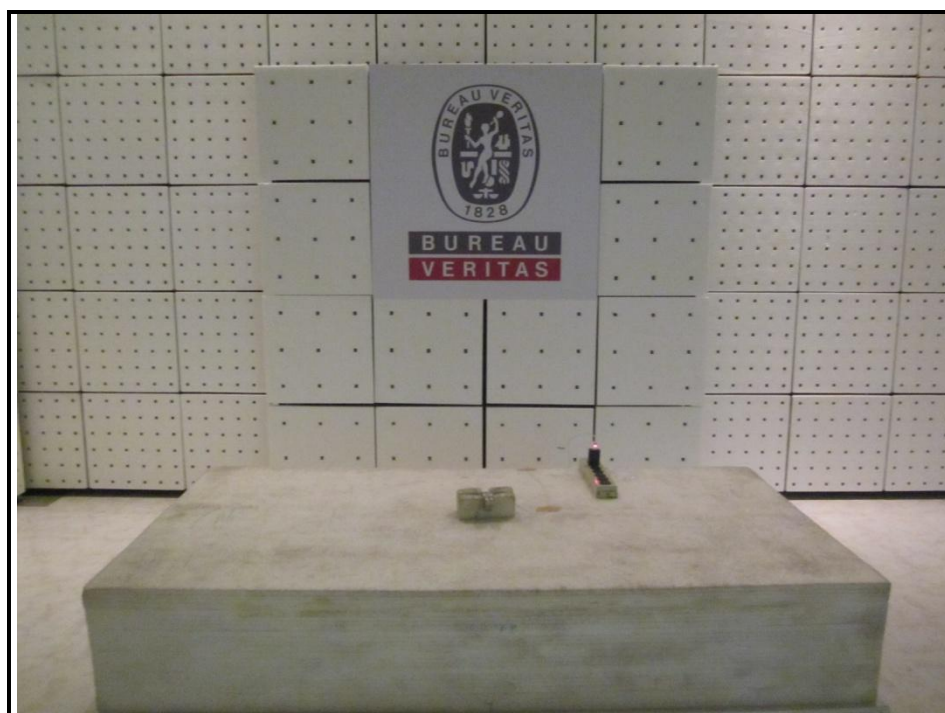
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- The other emission levels were very low against the limit.

18.7 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

18.8 配置照片

Sample B



Sample A



19 電源線傳導干擾之量測

19.1 適用標準

請見本報告 3.1 節第(1)項的規定。

19.2 量測方法

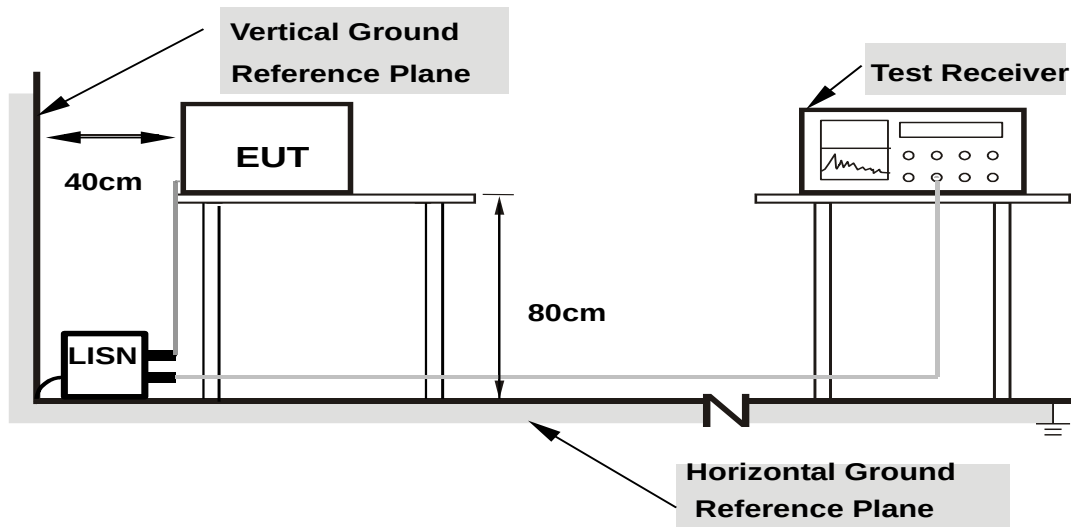
將待測物置於 0.8 米高的非金屬桌面，使其操作在工作狀態，待測物電源線接至電源線阻抗穩定網路上，從測試接收機記錄頻率由 0.15 MHz 至 30 MHz 之間之電源線傳導放射強度。

19.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 21, 2016	Nov. 20, 2017
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 22, 2016	Dec. 21, 2017
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 10, 2017	Mar. 09, 2018
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 28, 2016	Jul. 27, 2017
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 1.
 3. The VCCI Site Registration No. is C-2040.
 4. The measurement uncertainty is 2.44 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.

19.4 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

19.5 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

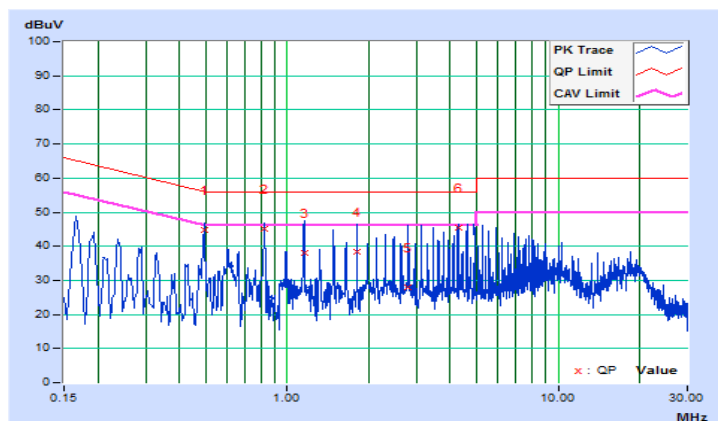
19.6 量測結果

量測頻率範圍	150kHz ~ 30MHz	檢測器與頻寬	準峰值 (QP) / 平均值 (AV), 9kHz
量測電壓值	110Vac, 60Hz	量測場地溫濕度	25°C, 65%RH
測試者	Getaz Yang	測試日期	2017/6/8
測試模式	Mode 4		

量測電源端點：火線 (L1)										
No	頻率 (MHz)	修正因子 (dB)	量測讀值 (dBuV)		干擾值 (dBuV)		限制值 (dBuV)		餘裕 (dB)	
			準峰值	平均值	準峰值	平均值	準峰值	平均值	準峰值	平均值
1	0.49400	10.40	34.23	30.12	44.63	40.52	56.10	46.10	-11.47	-5.58
2	0.82266	10.40	34.58	30.72	44.98	41.12	56.00	46.00	-11.02	-4.88
3	1.15400	10.41	27.64	23.72	38.05	34.13	56.00	46.00	-17.95	-11.87
4	1.81000	10.45	27.85	24.10	38.30	34.55	56.00	46.00	-17.70	-11.45
5	2.79800	10.50	17.57	12.70	28.07	23.20	56.00	46.00	-27.93	-22.80
6	4.28200	10.58	34.79	31.25	45.37	41.83	56.00	46.00	-10.63	-4.17

附註：

1. 其它頻率的干擾值對限制值而言非常低，所以未記錄。
2. 餘裕值(dB) = 干擾值(dBuV) - 限制值(dBuV)
3. 干擾值(dBuV) = 修正因子(dB) + 量測讀值(dBuV)

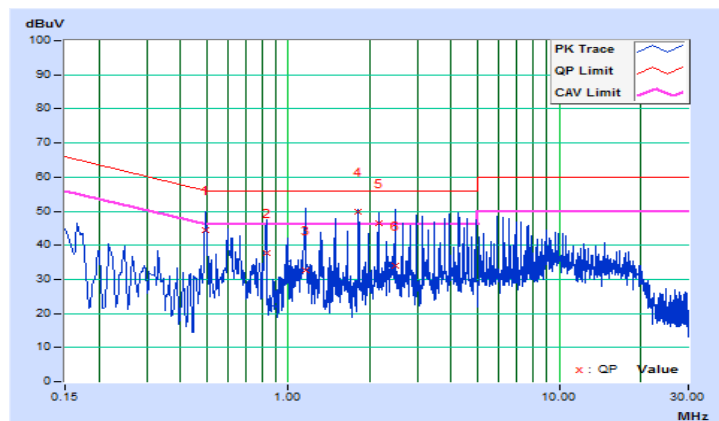


量測頻率範圍	150kHz ~ 30MHz	檢測器與頻寬	準峰值 (QP) / 平均值 (AV), 9kHz
量測電壓值	110Vac, 60Hz	量測場地溫濕度	25°C, 65%RH
測試者	Getaz Yang	測試日期	2017/6/8
測試模式	Mode 4		

量測電源端點：中性線 (N)										
No	頻率 (MHz)	修正 因子 (dB)	量測讀值 (dBuV)		干擾值 (dBuV)		限制值 (dBuV)		餘裕 (dB)	
			準峰值	平均值	準峰值	平均值	準峰值	平均值	準峰值	平均值
1	0.49476	10.16	34.40	30.41	44.56	40.57	56.09	46.09	-11.53	-5.52
2	0.83000	10.17	27.39	23.63	37.56	33.80	56.00	46.00	-18.44	-12.20
3	1.15800	10.18	22.43	15.86	32.61	26.04	56.00	46.00	-23.39	-19.96
4	1.81812	10.22	39.61	35.31	49.83	45.53	56.00	46.00	-6.17	-0.47
5	2.15000	10.24	36.38	27.45	46.62	37.69	56.00	46.00	-9.38	-8.31
6	2.47800	10.26	23.66	18.93	33.92	29.19	56.00	46.00	-22.08	-16.81

附註：

1. 其它頻率的干擾值對限制值而言非常低，所以未記錄。
2. 餘裕值(dB) = 干擾值(dBuV) - 限制值(dBuV)
3. 干擾值(dBuV) = 修正因子(dB) + 量測讀值(dBuV)



19.7 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

19.8 配置照片



20 待測物照片

請參照 BV ADT 報告編號：170327C11

21 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: 886-3-5935343

Fax: 886-3-5935342

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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