

低功率射頻電機測試報告

報告編號:

RT191004C17

申請者

Barco NV

產品名稱

ClickShare

型號

C 3010S

製造廠商

Barco NV

商標或廠牌

BARCO

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

107 年 1 月修訂

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

日期 108 年 10 月 28 日

報告簽署人簽章:



目 錄

報告發行紀錄	7
證 明 書	8
1 低功率射頻電機量測記錄表	9
2 一般敘述	12
2.1 待測設備	12
2.2 測試架構圖	21
3 適用規範	22
3.1 規範要求	22
3.2 限制使用之頻帶	32
2.4 GHz 頻段測試紀錄結果	33
4 帶外發射之量測	33
4.1 適用標準	33
4.2 量測方法	33
4.3 量測儀器	34
4.4 測試配置	36
4.5 場強度之計算	37
4.6 量測結果	38
4.6.1 發射諧波	38
4.6.2 接收諧波	62
4.6.3 其它不必要之訊號	64
4.7 量測結果判定	65
5 6 dB 頻寬之要求	66
5.1 適用標準	66
5.2 量測方法	66
5.3 量測儀器	66
5.4 測試配置	66
5.5 量測結果	67
5.6 量測結果判定	68
6 峰值傳導輸出功率之量測	69
6.1 適用標準	69
6.2 量測方法	69
6.3 量測儀器	69
6.4 測試配置	69
6.5 量測結果	70
6.6 量測結果判定	70
7 功率頻譜密度之量測	71
7.1 適用標準	71
7.2 量測方法	71
7.3 量測儀器	71
7.4 測試配置	71
7.5 量測結果	72
7.6 量測結果判定	73
U-NII 頻段測試紀錄結果	74
8 帶外發射之量測	74

8.1 適用標準.....	74
8.2 量測方法.....	74
8.3 量測儀器.....	74
8.4 測試配置.....	74
8.5 場強度之計算.....	75
8.6 量測結果.....	76
8.6.1 發射諧波.....	76
8.6.2 接收諧波.....	165
8.6.3 其它不必要之訊號.....	167
8.7 量測結果判定.....	168
9 峰值傳導輸出功率量測及發射頻寬之要求.....	169
9.1 適用標準.....	169
9.2 量測方法.....	169
9.3 量測儀器.....	170
9.4 測試配置.....	170
9.5 量測結果.....	171
9.6 量測結果判定.....	177
10 功率頻譜密度之量測.....	178
10.1 適用標準.....	178
10.2 量測方法.....	178
10.3 量測儀器.....	178
10.4 測試配置.....	178
10.5 量測結果.....	179
10.6 量測結果判定.....	185
11 6 dB 頻寬之要求.....	186
11.1 適用標準.....	186
11.2 量測方法.....	186
11.3 量測儀器.....	186
11.4 測試配置.....	186
11.5 量測結果.....	187
11.6 量測結果判定.....	188
Bluetooth EDR 頻段測試紀錄結果.....	189
12 帶外發射之量測.....	189
12.1 適用標準.....	189
12.2 量測方法.....	189
12.3 量測儀器.....	189
12.4 測試配置.....	189
12.5 場強度之計算.....	189
12.6 量測結果.....	190
12.6.1 發射諧波.....	190
12.6.2 接收諧波.....	202
12.6.3 其它不必要之訊號.....	204
12.7 量測結果判定.....	205
13 20 dB 頻寬之要求.....	206
13.1 適用標準.....	206
13.2 量測方法.....	206
13.3 量測儀器.....	206
13.4 測試配置.....	206

13.5 量測結果.....	207
13.6 量測結果判定	207
14 峰值傳導輸出功率之量測.....	208
14.1 適用標準.....	208
14.2 量測方法.....	208
14.3 量測儀器.....	208
14.4 測試配置.....	208
14.5 量測結果.....	209
14.6 量測結果判定	209
15 跳頻頻道數之量測.....	210
15.1 適用標準.....	210
15.2 量測方法.....	210
15.3 量測儀器.....	210
15.4 測試配置.....	210
15.5 量測結果.....	211
15.6 量測結果判定	211
16 跳頻頻道間隔之量測	212
16.1 適用標準.....	212
16.2 量測方法.....	212
16.3 量測場強輻射之儀器.....	212
16.4 測試配置.....	212
16.5 量測結果.....	213
16.6 量測結果判定	214
17 每一頻道停留時間之量測.....	215
17.1 適用標準.....	215
17.2 量測方法.....	215
17.3 量測儀器.....	215
17.4 測試配置.....	215
17.5 量測結果.....	216
17.6 量測結果判定	218
Bluetooth LE 頻段測試紀錄結果.....	219
18 帶外發射之量測	219
18.1 適用標準.....	219
18.2 量測方法.....	219
18.3 量測儀器.....	219
18.4 測試配置.....	219
18.5 場強度之計算	219
18.6 量測結果.....	220
18.6.1 發射諧波	220
18.6.2 接收諧波	226
18.6.3 其它不必要之訊號.....	228
18.7 量測結果判定	229
19 6 dB 頻寬之要求.....	230
19.1 適用標準.....	230
19.2 量測方法.....	230
19.3 量測儀器.....	230
19.4 測試配置.....	230

19.5 量測結果.....	231
19.6 量測結果判定	231
20 峰值傳導輸出功率之量測.....	232
20.1 適用標準.....	232
20.2 量測方法.....	232
20.3 量測儀器.....	232
20.4 測試配置.....	232
20.5 量測結果.....	233
20.6 量測結果判定	233
21 功率頻譜密度之量測	234
21.1 適用標準.....	234
21.2 量測方法.....	234
21.3 量測儀器.....	234
21.4 測試配置.....	234
21.5 量測結果.....	235
21.6 量測結果判定	235
22 電源線傳導干擾之量測.....	236
22.1 適用標準.....	236
22.2 量測方法.....	236
22.3 量測儀器.....	236
22.4 測試配置.....	237
22.5 干擾值之計算	237
22.6 量測結果.....	238
22.7 量測結果判定	239
23 電波暴露量之評估.....	240
23.1 適用標準.....	240
23.2 評估方法.....	240
23.3 評估結果.....	240
24 待測物照片	241
附錄：動態頻率選擇	242
1 EUT Information.....	242
1.1 Operating Frequency Bands and Mode of EUT	242
1.2 EUT Software and Firmware Version	242
1.3 Description of Available Antennas to the EUT	242
1.4 EUT Maximum Conducted Power	243
1.5 EUT Maximum E.I.R.P. Power	244
1.6 Transmit Power Control (TPC).....	245
1.7 Statement of Manufacturer	245
2 U-NII DFS Rule Requirements	246
2.1 Working Modes and Required Test Items.....	246
2.2 Test Limits and Radar Signal Parameters	247
3 Test & Support Equipment List.....	250
3.1 Test Instruments.....	250
3.2 Description of Support Units	250
4 Test Procedure.....	251
4.1 ADT DFS Measurement System	251

4.2	Calibration of DFS Detection Threshold Level.....	252
4.3	Deviation from Test Standard.....	253
4.4	Radiated Test Setup Configuration	253
4.4.1	Client without Radar Detection Mode	253
5	Test Results.....	254
5.1	Summary of Test Results	254
5.2	Test Results	255
5.2.1	Test Mode: Device operating in Client without Radar Detection Mode	255
5.2.2	Channel Closing Transmission and Channel Move Time.....	256
5.2.3	Non-Occupancy Period	259
5.2.4	Non-associated test.....	261
5.2.5	Non- Co-Channel Test	261
5.2.6	Test Setup photo.....	261
6	檢測實驗室基本資料	262

報告發行紀錄

Issue No.	Description	Date Issued
RT191004C17	Original release	108 年 10 月 28 日

證 明 書

發行日期：108 年 10 月 28 日

產 品 名 稱：ClickShare

商 標：BARCO

型 號：C 3010S

申 請 者：Barco NV

量 測 規 範：低功率射頻電機技術規範 LP0002 修訂日期：107 年 1 月 10 日
ANSI C63.10-2013

香港商立德國際商品試驗有限公司桃園分公司在此證明上述待測設備樣品一組(型號：C 3010S)，收件日期 108 年 10 月 04 日，於 108 年 10 月 12 日至 108 年 10 月 20 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：



陳美如 / 專員

， 日 期：108 年 10 月 28 日

審 核 者：



邱碧民 / 專案工程師

， 日 期：108 年 10 月 28 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: Barco NV

製造廠商: Barco NV

申請廠商地址: President Kennedypark 35 8500 Kortrijk Belgium

產品名稱: ClickShare

廠牌: BARCO

型號: C 3010S

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 修訂日期: 107 年 1 月 10 日

ANSI C63.10-2013

KDB 558074

KDB 662911

KDB 789033

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	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

WLAN 5.150~5.250 GHz 頻段概要

項次	量測項目	規 範	量測結果判定
1	電源線傳導干擾	低功率射頻電機技術規範 2.3 節	合格
2	帶外發射	低功率射頻電機技術規範 4.7.4 節	合格
3	最大傳導輸出功率	低功率射頻電機技術規範 4.7.3.1 節	合格
4	最大功率頻譜密度	低功率射頻電機技術規範 4.7.3.1 節	合格

WLAN 5.250~5.350 GHz 頻段概要

項次	量測項目	規 範	量測結果判定
1	電源線傳導干擾	低功率射頻電機技術規範2.3節	合格
2	帶外發射	低功率射頻電機技術規範4.7.4節	合格
3	最大傳導輸出功率	低功率射頻電機技術規範4.7.3.2節	合格
4	最大功率頻譜密度	低功率射頻電機技術規範4.7.3.2節	合格
5	發射功率控制(TPC)及動態頻率選擇(DFS)	低功率射頻電機技術規範4.7.7.1及4.7.7.2 節	合格

WLAN 5.470~5.725 GHz 頻段概要

項次	量測項目	規 範	量測結果判定
1	電源線傳導干擾	低功率射頻電機技術規範2.3節	合格
2	帶外發射	低功率射頻電機技術規範4.7.4節	合格
3	最大傳導輸出功率	低功率射頻電機技術規範4.7.3.2節	合格
4	最大功率頻譜密度	低功率射頻電機技術規範4.7.3.2節	合格
5	發射功率控制(TPC)及動態頻率選擇(DFS)	低功率射頻電機技術規範4.7.7.1及4.7.7.2 節	合格

WLAN 5.725~5.850 GHz 頻段概要

項次	量測項目	規 範	量測結果判定
1	電源線傳導干擾	低功率射頻電機技術規範2.3節	合格
2	帶外發射	低功率射頻電機技術規範4.7.4節	合格
3	最大傳導輸出功率	低功率射頻電機技術規範4.7.3.3節	合格
4	最大功率頻譜密度	低功率射頻電機技術規範4.7.3.3節	合格
5	6 dB 頻寬	低功率射頻電機技術規範4.7.5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 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	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

最大暴露允許值(Maximum Permissible Exposure, MPE)

項次	量測項目	規 範	量測結果判定
1	電波暴露量	低功率射頻電機技術規範第 5.20.2 節	合格

備註：量測結果之判定不考慮量測不確定度的貢獻。

2 一般敘述

2.1 待測設備

產品名稱：	ClickShare	
型號：	C 3010S	
額定電源：	12.0 Vdc (Adapter)	
調變方式：	Wireless LAN	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
	Bluetooth EDR	GFSK, $\pi/4$ -DQPSK, 8DPSK
	Bluetooth LE	GFSK
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 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0 Mbps 802.11n: up to 400.0 Mbps 802.11ac: up to 866.7 Mbps
	Bluetooth EDR	1/ 2/ 3 Mbps
	Bluetooth LE	1 Mbps
載波頻率：	Wireless LAN	2.4 GHz: 2412 ~ 2462 MHz 5.0 GHz: 5180 ~ 5240 MHz, 5260 ~ 5320 MHz, 5500 ~ 5710 MHz, 5745 ~ 5825 MHz
	Bluetooth EDR	2402 ~ 2480 MHz
	Bluetooth LE	2402 ~ 2480 MHz
頻道數：	Wireless LAN	2.4 GHz: 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7 5.0 GHz: 5180 ~ 5240 MHz 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5260 ~ 5320 MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5500 ~ 5710 MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 11 802.11n (HT40), 802.11ac (VHT40): 6 802.11ac (VHT80): 3 5745 ~ 5825 MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 5 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1
	Bluetooth EDR	79
	Bluetooth LE	40

發射功率：	Wireless LAN	2.4 GHz: 802.11b: 25.83 dBm 802.11g: 27.51 dBm 802.11n (HT20): 28.02 dBm 802.11n (HT40): 23.05 dBm 5.0 GHz: 5180 ~ 5240 MHz: 802.11a: 16.72 dBm 802.11n (HT20): 17.37 dBm 802.11n (HT40): 15.95 dBm 802.11ac (VHT80): 11.09 dBm 5260 ~ 5320 MHz: 802.11a: 17.34 dBm 802.11n (HT20): 16.37 dBm 802.11n (HT40): 16.18 dBm 802.11ac (VHT80): 13.20 dBm 5500 ~ 5710 MHz: 802.11a: 18.08 dBm 802.11n (HT20): 17.12 dBm 802.11n (HT40): 16.53 dBm 802.11ac (VHT80): 13.91 dBm 5745 ~ 5825 MHz: 802.11a: 17.01 dBm 802.11n (HT20): 16.00 dBm 802.11n (HT40): 13.86 dBm 802.11ac (VHT80): 12.96 dBm
		Bluetooth EDR
		Bluetooth LE
		6.44 dBm 1.77 dBm
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2Tx / 2Rx之組合。

Modulation Mode	Tx Function	
	WLAN 2.4GHz	WLAN 5GHz
802.11b	2TX	-
802.11g	2TX	-
802.11n (HT20)	2TX	-
802.11n (HT40)	2TX	-
VHT20	2TX	-
VHT40	2TX	-
802.11a	-	2TX
802.11n (HT20)	-	2TX
802.11n (HT40)	-	2TX
802.11ac (VHT20)	-	2TX
802.11ac (VHT40)	-	2TX
802.11ac (VHT80)	-	2TX

* The modulation and bandwidth are similar for 802.11n mode for HT20 / HT40 and 802.11ac mode for VHT20 / VHT40, therefore investigated worst case to representative mode in test report. (最終測試模式請見註4)

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)	
						Main	Aux.
WLAN	2412 ~ 2462	PIFA	Main Antenna: MS-5777-MAIN Aux. Antenna: MS-5777-AUX	VSO ELECTRONICS CO., LTD.	I-PEX	2.76	2.67
	5180 ~ 5240					1.34	1.71
	5260 ~ 5320					2.06	3.53
	5500 ~ 5710					3.61	3.78
	5745 ~ 5825					3.06	3.43
Bluetooth	2402 ~ 2480					-	2.67

3. 待測設備主要內裝元件及配件如下。

配件	廠牌	型號	規格
Adapter	Asian Power Devices Inc.	WB-24J12R	I/P: 100-240 Vac, 50-60 Hz, 0.7 A O/P: 12 Vdc, 2 A 1.46 m with one core
USB Type-C Button	BARCO	R9861600D01C	--

4. 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 ~ 2462 MHz		
1 GHz 以上量測	802.11b: Ch 1, 6, 11 802.11g: Ch 1, 6, 11 802.11n (HT20): Ch 1, 6, 11 802.11n (HT40): Ch 3, 6, 9	802.11n (HT40): Ch 3
其它不必要之訊號	802.11n (HT40): Ch 3	802.11n (HT40): Ch 3
5180 ~ 5240 MHz, 5260 ~ 5320 MHz, 5500 ~ 5710 MHz & 5745 ~ 5825 MHz		
1 GHz 以上量測	802.11a: Ch 36, 40, 48, 52, 60, 64, 100, 116, 140, 149, 157, 165 802.11n (HT20): Ch 36, 40, 48, 52, 60, 64, 100, 116, 140, 149, 157, 165 802.11n (HT40): Ch 38, 46, 54, 62, 102, 110, 134, 142, 151, 159 802.11ac (VHT80): Ch 42, 58, 106, 122, 138, 155	802.11a: Ch 140
其它不必要之訊號	802.11a: Ch 140	802.11a: Ch 140
2402 ~ 2480 MHz (Bluetooth EDR)		
1 GHz 以上量測	GFSK: Ch 0, 39, 78 8DPSK: Ch 0, 39, 78	GFSK: Ch 78
其它不必要之訊號	GFSK: Ch 78	GFSK: Ch 78
2402 ~ 2480 MHz (Bluetooth LE)		
1 GHz 以上量測	Ch 0, 19, 39	Ch 0
其它不必要之訊號	Ch 0	Ch 0

5. 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。

6. 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。

7. 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2具有較大干擾值，故以其模式進行最終測試。
- (2) 場強輻射量測以模式1~4評估完整測試。

模式	測試狀態
1	BT LE + Adapter
2	BT EDR + Adapter
3	WLAN 2.4GHz + Adapter
4	WLAN 5GHz + Adapter

8. 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	5180~5240 MHz	5260~5320 MHz & 5500~5710 MHz	5745~5825 MHz	Bluetooth EDR	Bluetooth LE
擺放方式	垂直	垂直	垂直	垂直	垂直	垂直

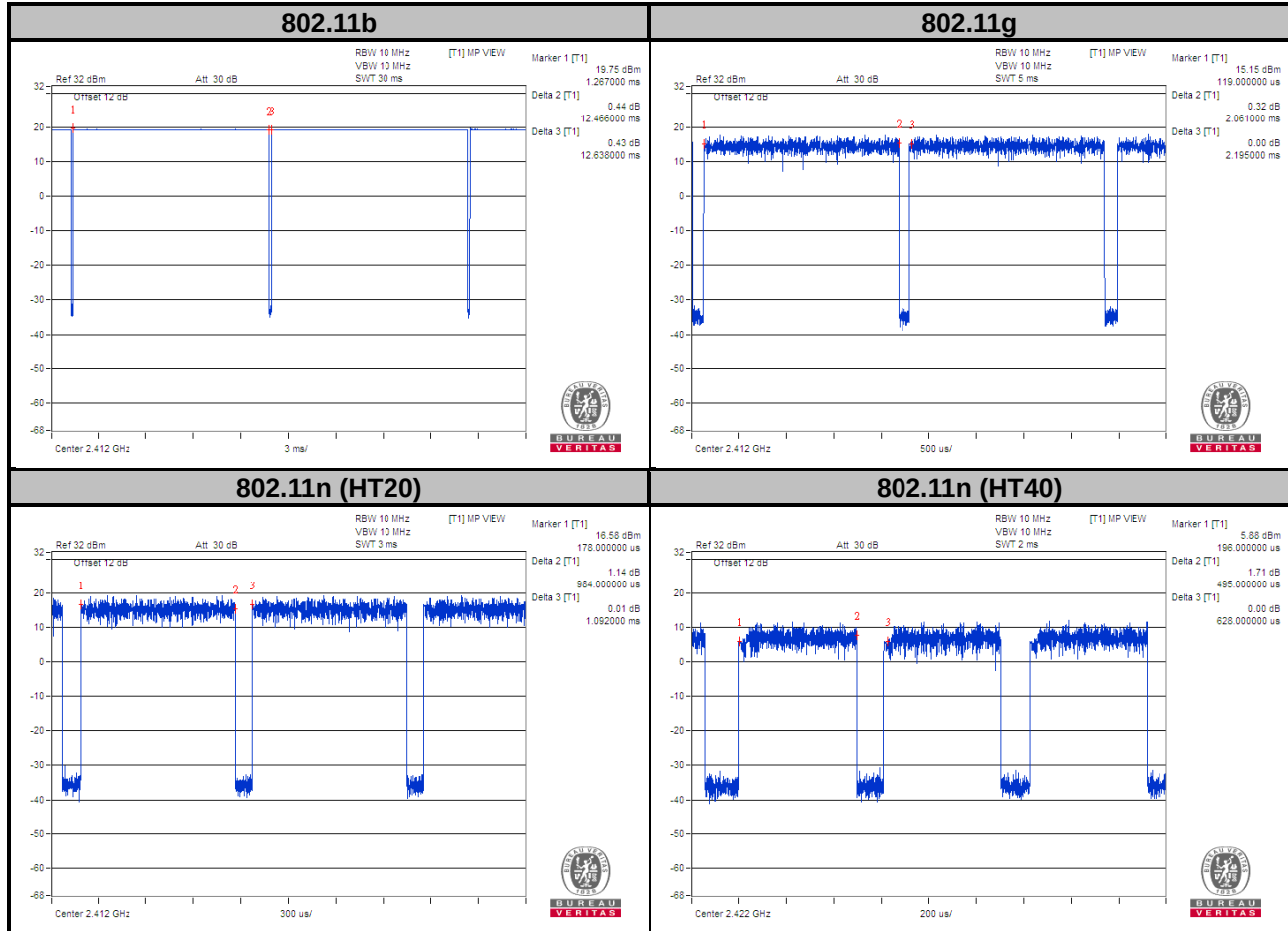
9. Duty cycle of test signal.

802.11b: Duty cycle of test signal is $\geq 98\%$, duty factor is not required.

802.11g: Duty cycle = $2.061/2.195 = 0.939$, Duty factor = $10 * \log(1/0.939) = 0.27$

802.11n (HT20): Duty cycle = $0.984/1.092 = 0.901$, Duty factor = $10 * \log(1/0.901) = 0.45$

802.11n (HT40): Duty cycle = $0.495/0.628 = 0.788$, Duty factor = $10 * \log(1/0.788) = 1.03$



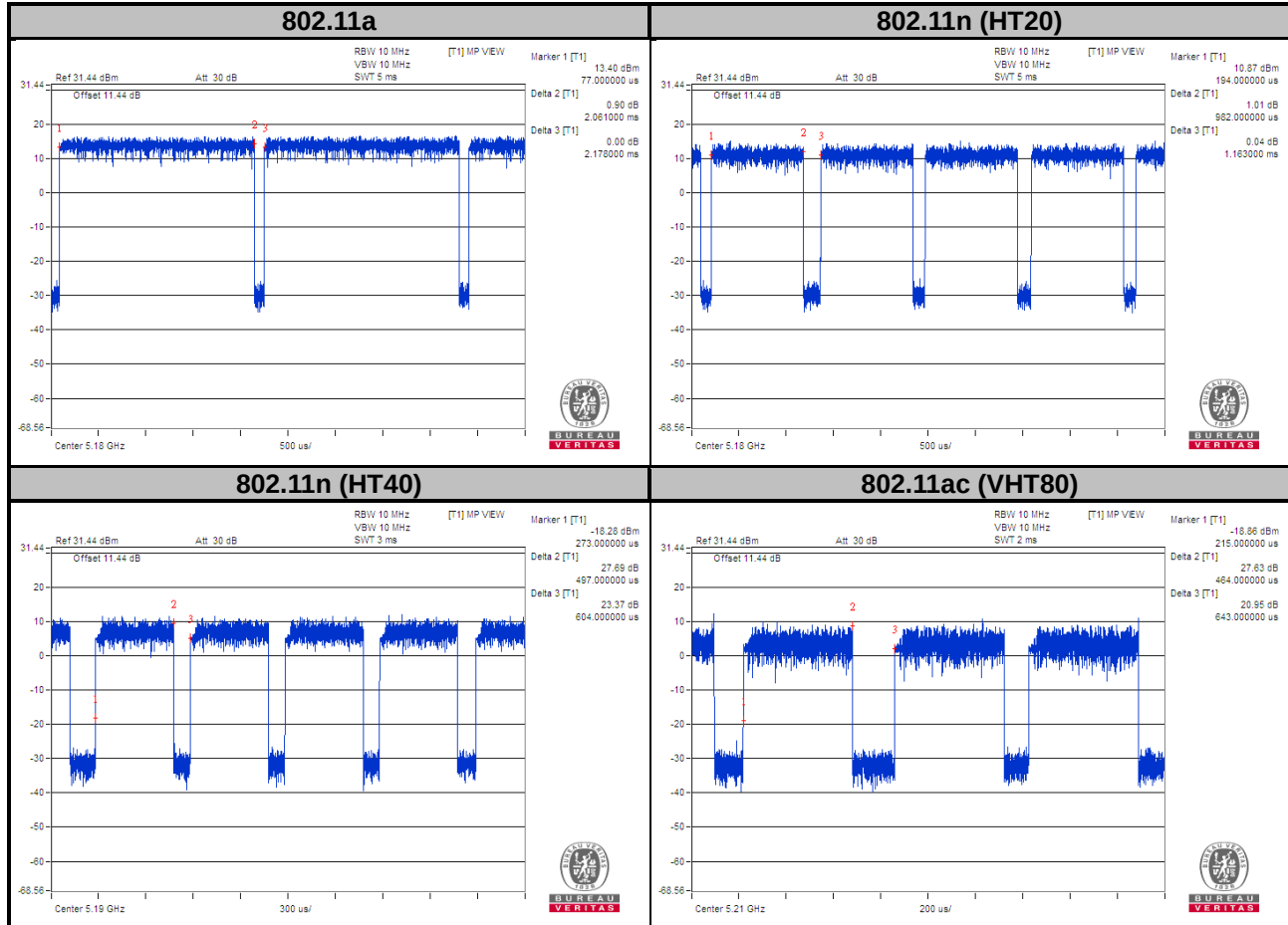
5 GHz频段

802.11a: Duty cycle = $2.061/2.178 = 0.946$, Duty factor = $10 * \log(1/0.946) = 0.24$

802.11n (HT20): Duty cycle = $0.982/1.163 = 0.844$, Duty factor = $10 * \log(1/0.844) = 0.73$

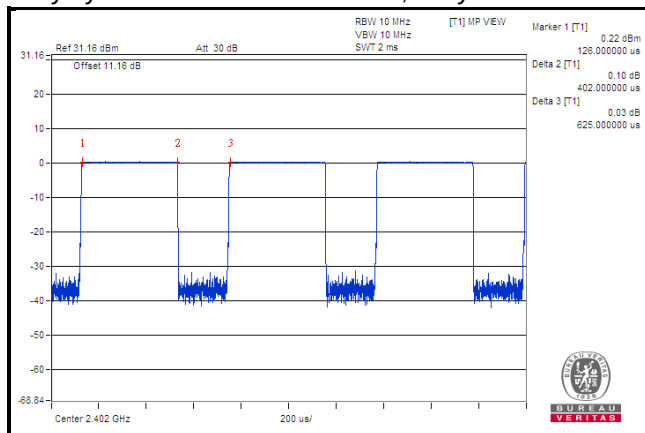
802.11n (HT40): Duty cycle = $0.497/0.604 = 0.823$, Duty factor = $10 * \log(1/0.823) = 0.85$

802.11ac (VHT80): Duty cycle = $0.464/0.643 = 0.722$, Duty factor = $10 * \log(1/0.722) = 1.42$



BT LE频段

Duty cycle = $0.402/0.625 = 0.643$, Duty factor = $10 * \log(1/0.643) = 1.92$



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), VHT20:

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

802.11n (HT40), VHT40:

頻道	對應頻率 (MHz)	頻道	對應頻率 (MHz)
03	2422	07	2442
04	2427	08	2447
05	2432	09	2452
06	2437		

5 GHz 頻段:

802.11a, 802.11n (HT20), 802.11ac (VHT20):

頻道	對應頻率 (MHz)	頻道	對應頻率 (MHz)
36	5180	116	5580
40	5200	120	5600
44	5220	124	5620
48	5240	128	5640
52	5260	132	5660
56	5280	136	5680
60	5300	140	5700
64	5320	149	5745
100	5500	153	5765
104	5520	157	5785
108	5540	161	5805
112	5560	165	5825

802.11n (HT40), 802.11ac (VHT40):

頻道	對應頻率 (MHz)	頻道	對應頻率 (MHz)
38	5190	118	5590
46	5230	126	5630
54	5270	134	5670
62	5310	142	5710
102	5510	151	5755
110	5550	159	5795

802.11ac (VHT80):

頻道	對應頻率 (MHz)	頻道	對應頻率 (MHz)
42	5210	122	5610
58	5290	138	5690
106	5530	155	5775

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		

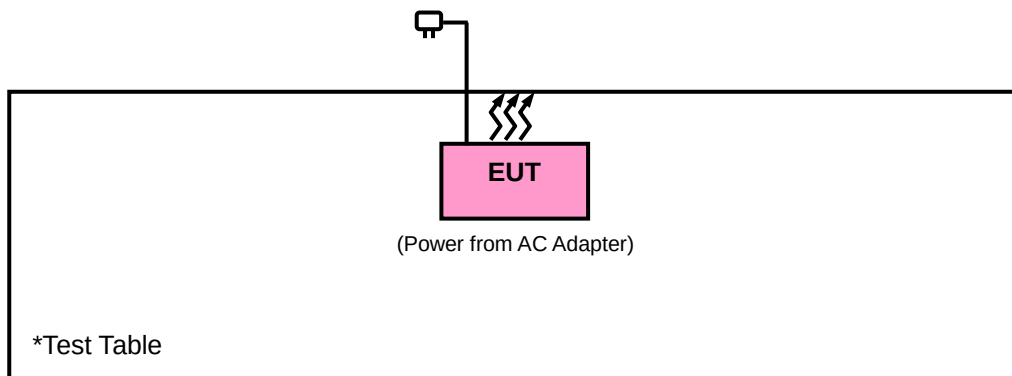
Bluetooth LE 頻段:

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

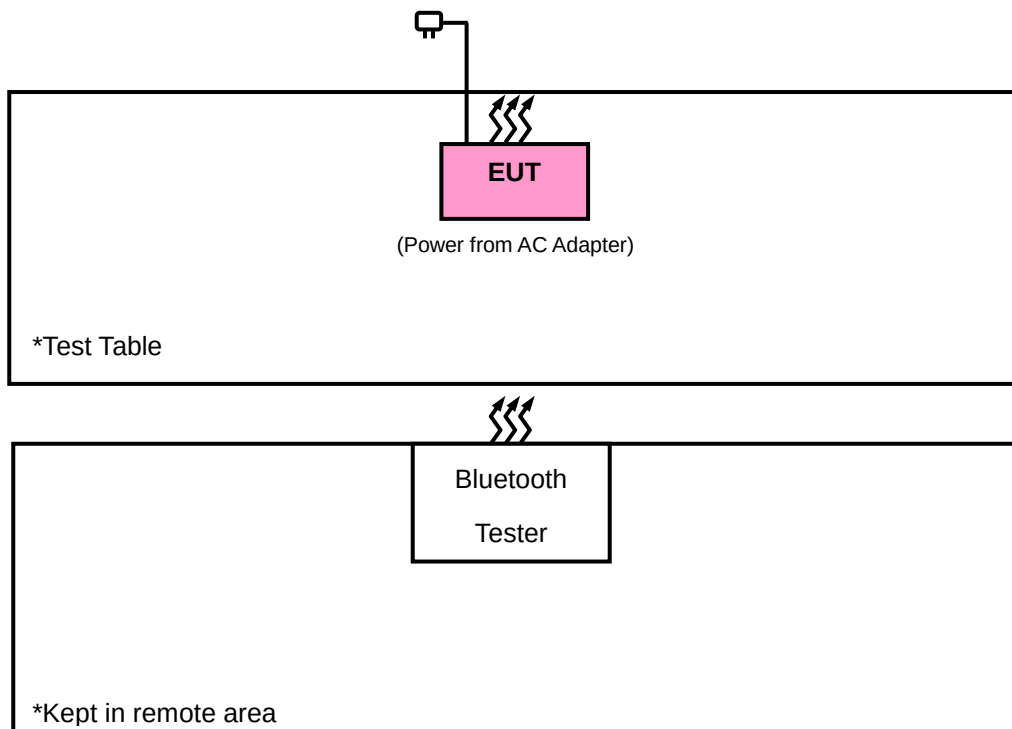
詳細之規格請參考使用說明書。

2.2 測試架構圖

<WLAN & Bluetooth LE>



<Bluetooth EDR>



3 適用規範

3.1 規範要求

► Bluetooth 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) 峰值傳導輸出功率之要求

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) 功率頻譜密度之要求

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。

(8) 電波暴露量之評估

依據國家通訊傳播委員會低功率射頻電機技術規範 5.20.2 節之規定，若受測物於正常操作模式下，其發射機距離人體 20 公分以上者，可測試最大暴露允許值(Maximum Permissible Exposure, MPE)以證明其符合電波暴露量之要求。

限制值如下：

(1) 職業性/可控制之暴露

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

註 1：標記*表平面波等效功率密度。

註 2：f 表測試頻率，單位：MHz。

(2) 一般人/不可控制之暴露

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

註 1：標記*表平面波等效功率密度。

註 2：f 表測試頻率，單位：MHz。

►WLAN 頻段部分:

(9) 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。

(10) 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。

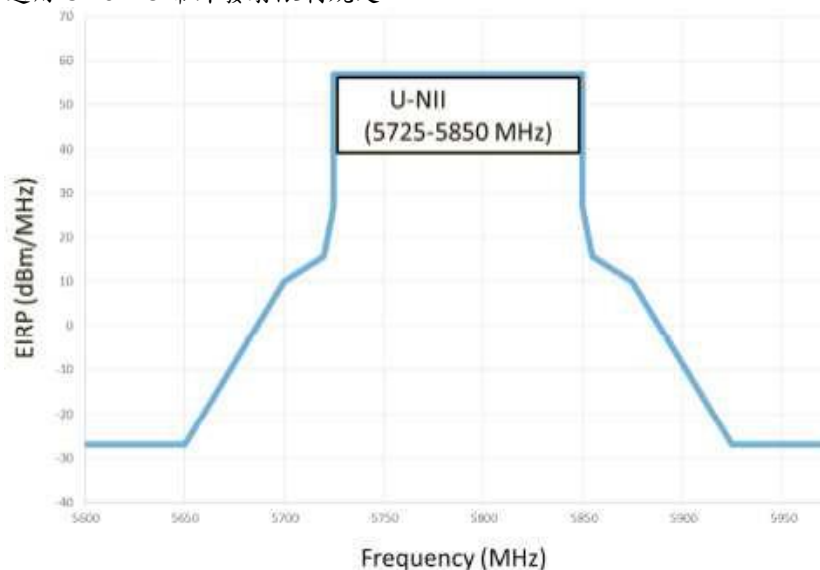


圖 1

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

(11) 天線之規定

天線規格不受第 2.2 節規定之限制。

(12) 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。

(13) 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。

(14) 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。

(15) 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。

(16) 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。

(17) 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。

(18) 依據國家通訊傳播委員會低功率射頻電機技術規範 4.7.7.4 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。

(19) 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。

(20) 電波暴露量之評估

依據國家通訊傳播委員會低功率射頻電機技術規範 5.20.2 節之規定，若受測物於正常操作模式下，其發射機距離人體 20 公分以上者，可測試最大暴露允許值(Maximum Permissible Exposure, MPE)以證明其符電波暴露量之要求。

限制值如下：

(1) 職業性/可控制之暴露

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

註 1：標記*表平面波等效功率密度。

註 2：f 表測試頻率，單位：百萬赫(MHz)。

(2) 一般人/不可控制之暴露

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

註 1：標記*表平面波等效功率密度。

註 2：f 表測試頻率，單位：百萬赫(MHz)。

► Bluetooth EDR 頻段部分：

(21) 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。

(22) 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

(23) 天線之規定

天線規格不受第 2.2 節規定之限制。

(24) 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。

(25) 峰值傳導輸出功率之要求

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。

(26) 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。

(27) 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。

(28) 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。

(29) 電波暴露量之評估

依據國家通訊傳播委員會低功率射頻電機技術規範 5.20.2 節之規定，若受測物於正常操作模式下，其發射機距離人體 20 公分以上者，可測試最大暴露允許值(Maximum Permissible Exposure, MPE)以證明其符合電波暴露量之要求。

限制值如下：

(1) 職業性/可控制之暴露

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

註 1：標記*表平面波等效功率密度。

註 2：f 表測試頻率，單位：MHz。

(2) 一般人/不可控制之暴露

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

註 1：標記*表平面波等效功率密度。

註 2：f 表測試頻率，單位：MHz。

3.2 限制使用之頻帶

除本規範另有規定外，任何低功率射頻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	1660.0~1785.0	14470~14500
19.965~20.020	1805.0~1880.0	15350~16200
25.500~25.700	1885.0~1900.0	17700~21400
37.475~38.275	1905.0~1985.0	22010~23120
73.500~75.400	2010.0~2025.0	23600~24000
108.00~138.00	2110.0~2170.0	31200~31800
149.90~150.05	2200.0~2300.0	36430~36500
156.70~156.90	2310.0~2390.0	38600 以上
162.01~167.17	2483.5~2900.0	
167.72~173.20	3260.0~3267.0	

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(10)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 = 100 Hz

802.11g 為 RBW = 1 MHz, VBW = 1 kHz

802.11n (HT20) 為 RBW = 1 MHz, VBW = 3 kHz

802.11n (HT40) 為 RBW = 1 MHz, VBW = 3 kHz

接收諧波：

Below 1 GHz

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

Above 1 GHz:

Peak 為 RBW = 1 MHz, VBW = 3 MHz ; Average 為 RBW = 1 MHz, VBW = 3 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	Mar. 18, 2019	Mar. 17, 2020
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 13, 2018	Dec. 12, 2019
Broadband Horn Antenna SCHWARZBECK	BBHA 9170	148	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 25, 2018	Nov. 24, 2019
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Nov. 23, 2018	Nov. 22, 2019
Fixed Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	Apr. 15, 2019	Apr. 14, 2020
Loop Antenna	HLA 6121	45745	Jul. 01, 2019	Jun. 30, 2020
Preamplifier EMCI	EMC001340	980269	Jun. 17, 2019	Jun. 16, 2020
Bluetooth Tester	CBT	100946	Aug. 09, 2018	Aug. 08, 2020
Preamplifier EMCI	EMC 012645	980115	Oct. 08, 2019	Oct. 07, 2020
Preamplifier EMCI	EMC 184045	980116	Oct. 08, 2019	Oct. 07, 2020
Preamplifier EMCI	EMC 330H	980112	Oct. 08, 2019	Oct. 07, 2020
RF Coaxial Cable HUBER+SUHNNER	EMC104-SM-SM-800 0&3000	140811+170717	Oct. 08, 2019	Oct. 07, 2020
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1 000(140807)	Oct. 08, 2019	Oct. 07, 2020
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 08, 2019	Oct. 07, 2020
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
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:

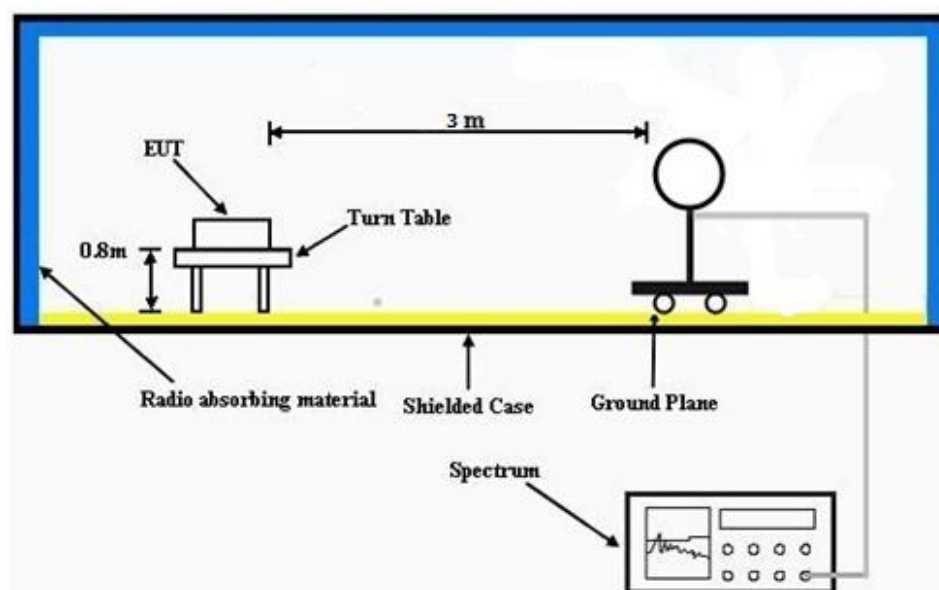
1. The calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 10.
3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.

5. 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.

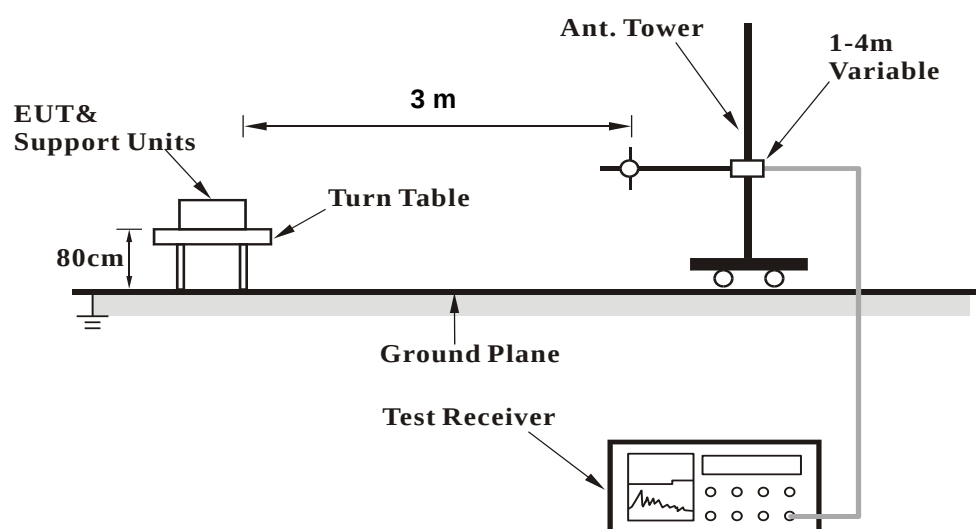
Measurement	Frequency	Uncertainty
Radiated emissions	9 kHz ~ 30 MHz	3.04 dB
	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~1000 MHz	2.95 dB
	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

4.4 測試配置

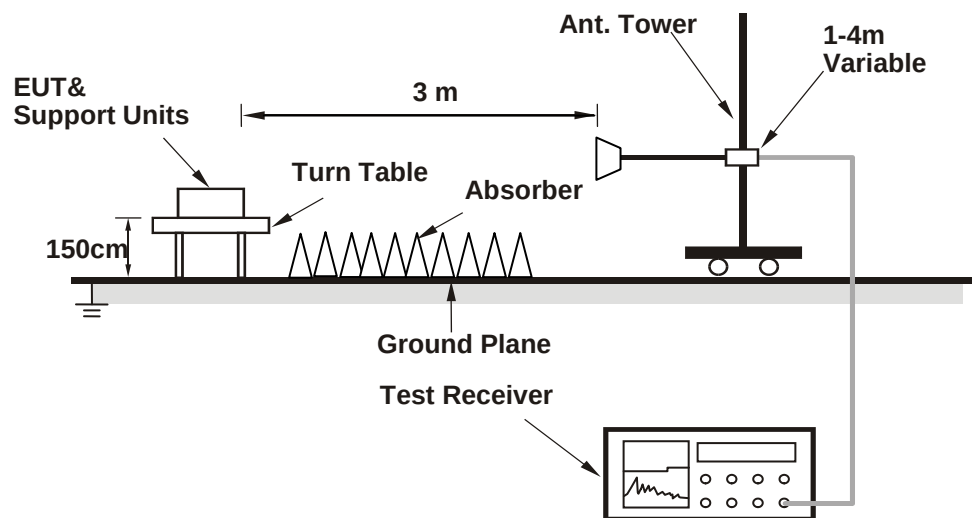
<Frequency Range 9 kHz ~ 30 MHz>



<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。

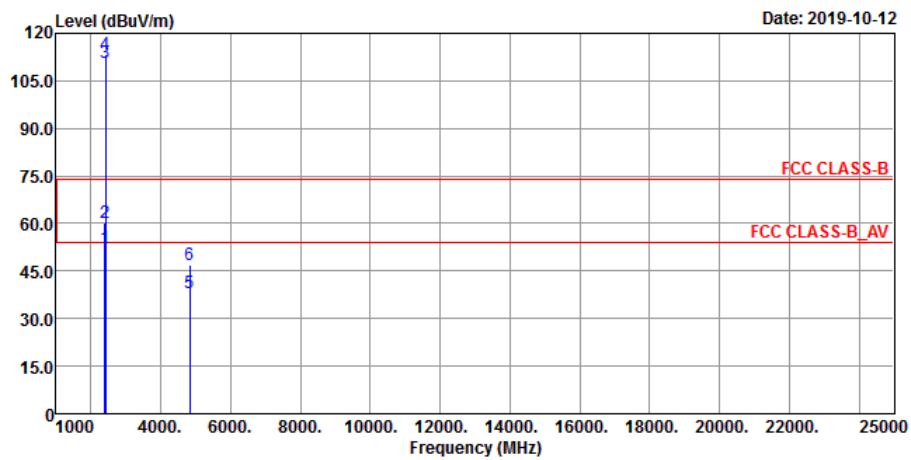
4.6 量測結果

4.6.1 發射諧波

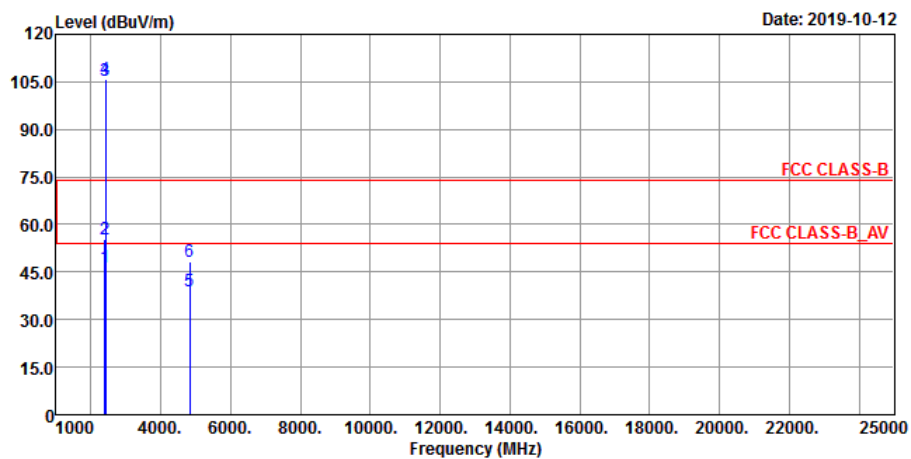
802.11b

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	Tim Chen

Horizontal



Vertical



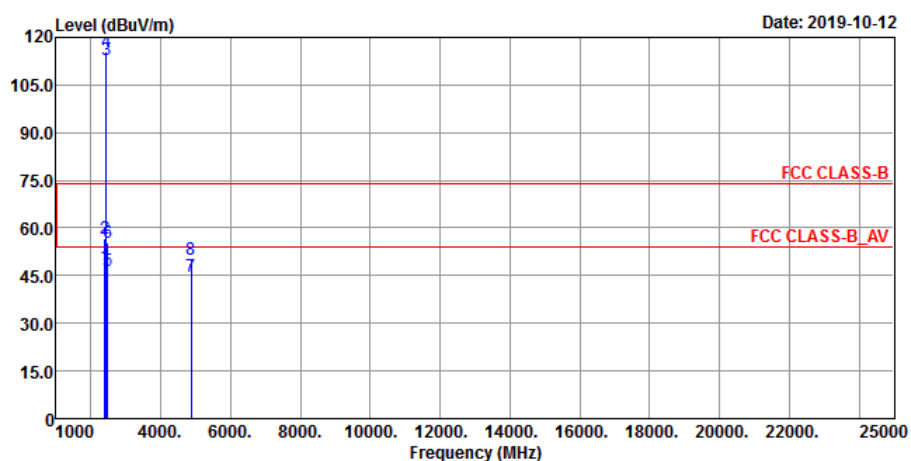
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2385.32	52.27	57.16	-4.89	54	-1.73	245	309	Average
2385.32	60.21	65.1	-4.89	74	-13.79	245	309	Peak
2412	110.66	115.67	-5.01			245	309	Average
2412	113.35	118.36	-5.01			245	309	Peak
4824	37.97	52.35	-14.38	54	-16.03	153	211	Average
4824	46.85	61.23	-14.38	74	-27.15	153	211	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	46.39	51.39	-5	54	-7.61	133	289	Average
2390	55.4	60.4	-5	74	-18.6	133	289	Peak
2412	105.48	110.49	-5.01			133	289	Average
2412	106	111.01	-5.01			133	289	Peak
4824	39	53.38	-14.38	54	-15	196	307	Average
4824	48.43	62.81	-14.38	74	-25.57	196	307	Peak

Remarks:

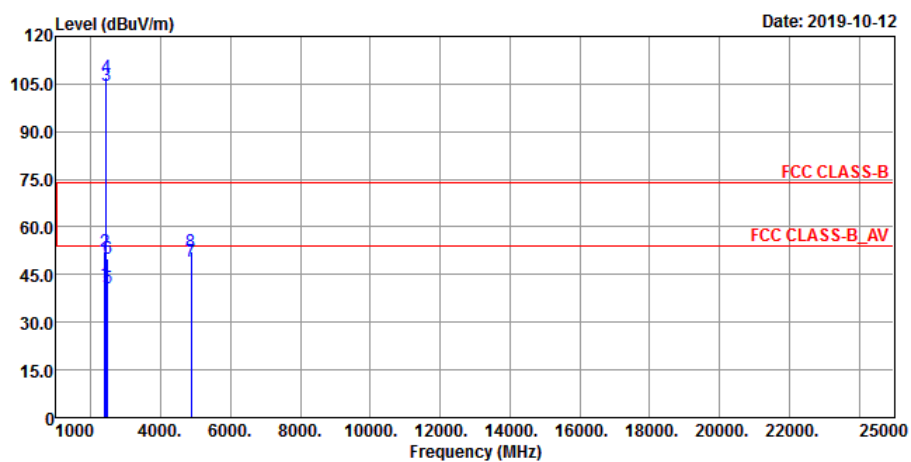
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2412 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

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	Tim Chen

Horizontal



Vertical



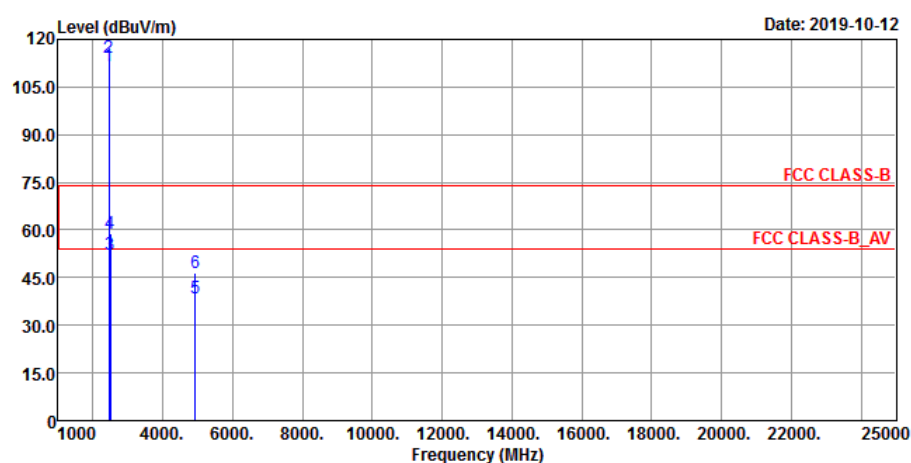
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	47.85	52.85	-5	54	-6.15	244	310	Average
2390	56.88	61.88	-5	74	-17.12	244	310	Peak
2437	112.99	117.97	-4.98			244	310	Average
2437	115.41	120.39	-4.98			244	310	Peak
2483.5	46.3	51.15	-4.85	54	-7.7	244	310	Average
2483.5	55.34	60.19	-4.85	74	-18.66	244	310	Peak
4874	44.74	58.82	-14.08	54	-9.26	240	252	Average
4874	49.93	64.01	-14.08	74	-24.07	240	252	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	42.25	47.25	-5	54	-11.75	124	262	Average
2390	52.12	57.12	-5	74	-21.88	124	262	Peak
2437	104.54	109.52	-4.98			124	262	Average
2437	107	111.98	-4.98			124	262	Peak
2483.5	40.64	45.49	-4.85	54	-13.36	124	262	Average
2483.5	50.18	55.03	-4.85	74	-23.82	124	262	Peak
4874	49	63.08	-14.08	54	-5	156	15	Average
4874	52.31	66.39	-14.08	74	-21.69	156	15	Peak

Remarks:

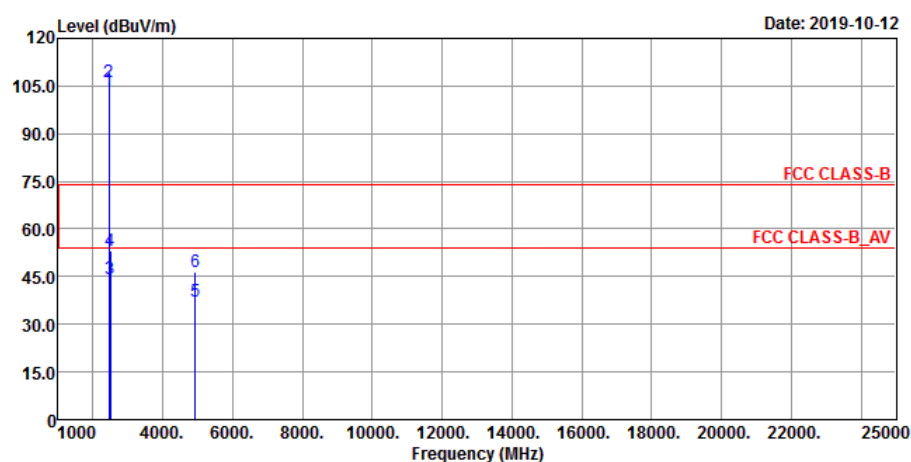
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2437 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

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	Tim Chen

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	111.57	116.48	-4.91			259	313	Average
2462	114.16	119.07	-4.91			259	313	Peak
2487.4	52.22	57.07	-4.85	54	-1.78	259	313	Average
2487.4	58.74	63.59	-4.85	74	-15.26	259	313	Peak
4924	38.6	52.56	-13.96	54	-15.4	201	119	Average
4924	46.6	60.56	-13.96	74	-27.4	201	119	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	103.67	108.58	-4.91			149	284	Average
2462	106.06	110.97	-4.91			149	284	Peak
2486.96	44.2	49.05	-4.85	54	-9.8	149	284	Average
2486.96	53	57.85	-4.85	74	-21	149	284	Peak
4924	37.3	51.26	-13.96	54	-16.7	126	78	Average
4924	46.58	60.54	-13.96	74	-27.42	126	78	Peak

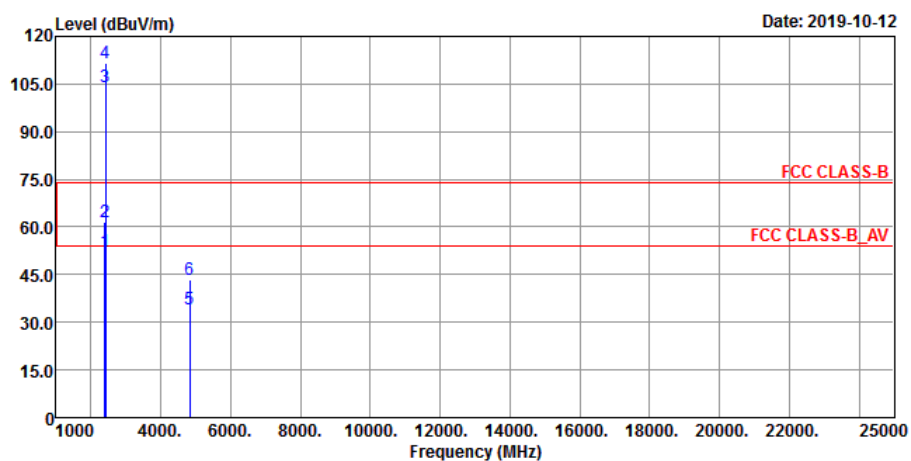
Remarks:

1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2462 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

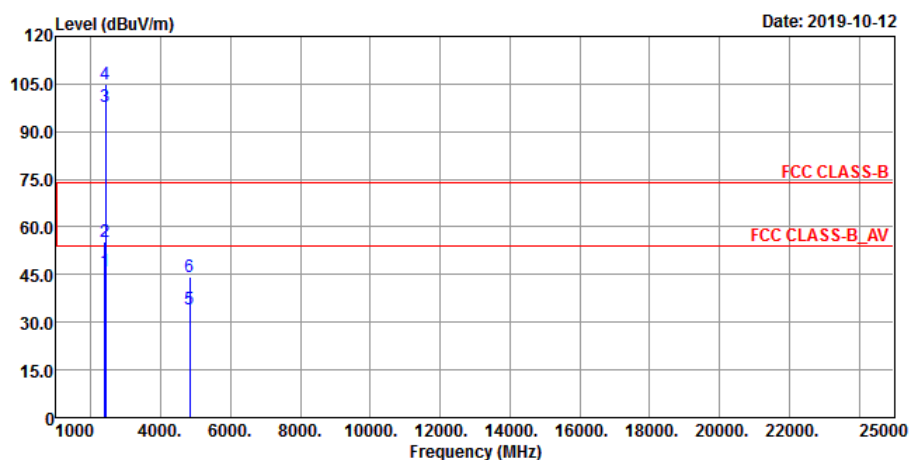
802.11g

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	Tim Chen

Horizontal



Vertical



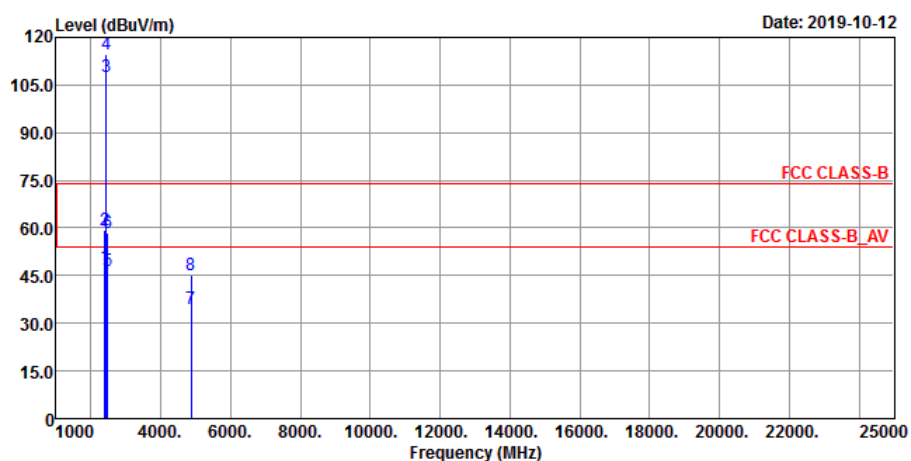
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	52.44	57.44	-5	54	-1.56	246	311	Average
2390	61.61	66.61	-5	74	-12.39	246	311	Peak
2412	104.09	109.1	-5.01			246	311	Average
2412	111.7	116.71	-5.01			246	311	Peak
4824	33.9	48.28	-14.38	54	-20.1	179	321	Average
4824	43.28	57.66	-14.38	74	-30.72	179	321	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	46	51	-5	54	-8	129	288	Average
2390	55.36	60.36	-5	74	-18.64	129	288	Peak
2412	97.87	102.88	-5.01			129	288	Average
2412	105.01	110.02	-5.01			129	288	Peak
4824	34.05	48.43	-14.38	54	-19.95	124	89	Average
4824	44.24	58.62	-14.38	74	-29.76	124	89	Peak

Remarks:

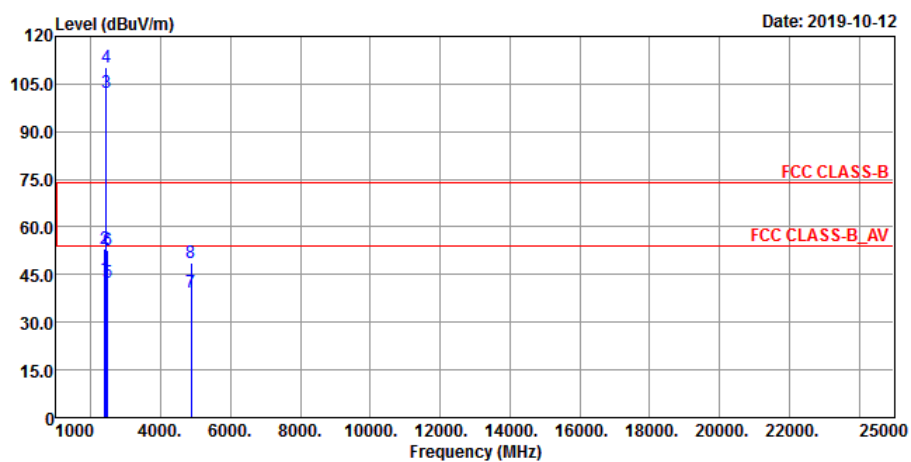
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2412 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

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	Tim Chen

Horizontal



Vertical



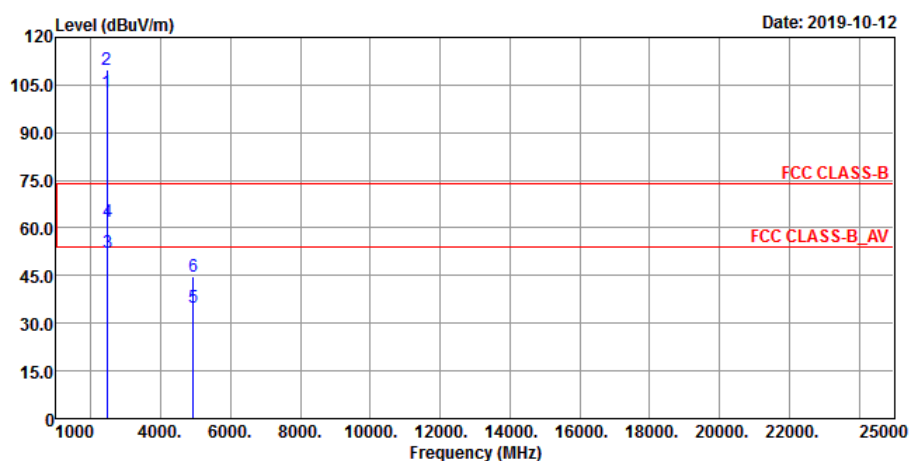
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	47.62	52.62	-5	54	-6.38	237	309	Average
2390	59.32	64.32	-5	74	-14.68	237	309	Peak
2437	107.7	113.38	-5.68			237	309	Average
2437	114.71	120.39	-5.68			237	309	Peak
2483.5	46.32	51.17	-4.85	54	-7.68	237	309	Average
2483.5	58.31	63.16	-4.85	74	-15.69	237	309	Peak
4874	34.56	48.64	-14.08	54	-19.44	187	224	Average
4874	45.38	59.46	-14.08	74	-28.62	187	224	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	43.92	48.92	-5	54	-10.08	148	265	Average
2390	52.94	57.94	-5	74	-21.06	148	265	Peak
2437	102.15	107.13	-4.98			148	265	Average
2437	110.17	115.15	-4.98			148	265	Peak
2483.5	42.4	47.25	-4.85	54	-11.6	148	265	Average
2483.5	52.81	57.66	-4.85	74	-21.19	148	265	Peak
4874	39.33	53.41	-14.08	54	-14.67	109	277	Average
4874	48.77	62.85	-14.08	74	-25.23	109	277	Peak

Remarks:

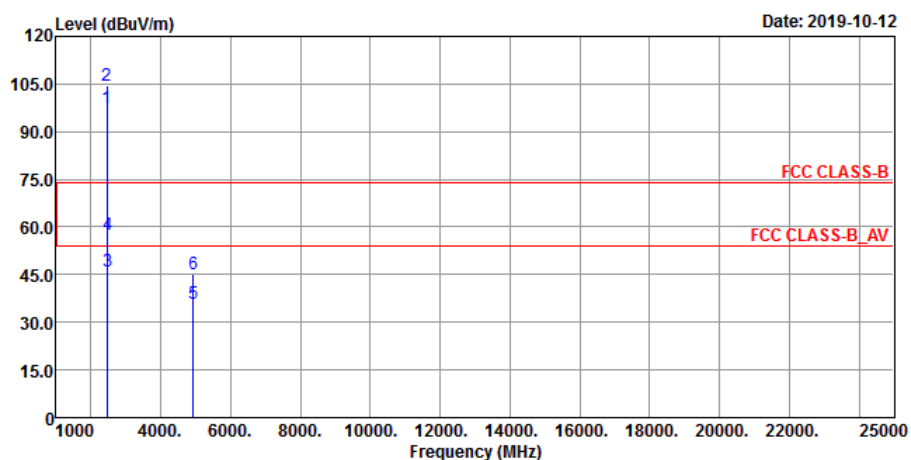
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2437 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

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	Tim Chen

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	102.69	107.6	-4.91			245	309	Average
2462	109.75	114.66	-4.91			245	309	Peak
2483.5	52.34	57.19	-4.85	54	-1.66	245	309	Average
2483.5	62.08	66.93	-4.85	74	-11.92	245	309	Peak
4924	35.05	49.01	-13.96	54	-18.95	191	285	Average
4924	44.71	58.67	-13.96	74	-29.29	191	285	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	97.3	102.21	-4.91			152	293	Average
2462	104.36	109.27	-4.91			152	293	Peak
2483.5	46.22	51.07	-4.85	54	-7.78	152	293	Average
2483.5	57.57	62.42	-4.85	74	-16.43	152	293	Peak
4924	35.82	49.78	-13.96	54	-18.18	112	303	Average
4924	45.31	59.27	-13.96	74	-28.69	112	303	Peak

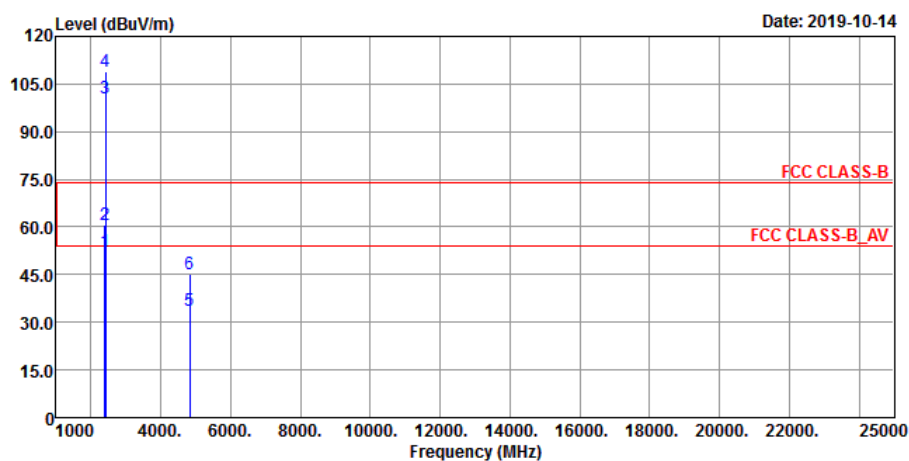
Remarks:

1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2462 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

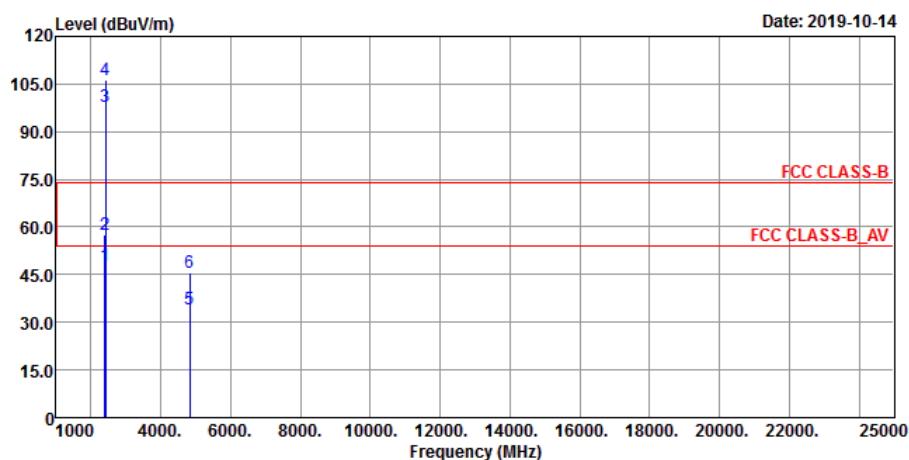
802.11n (HT20)

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	Tim Chen

Horizontal



Vertical



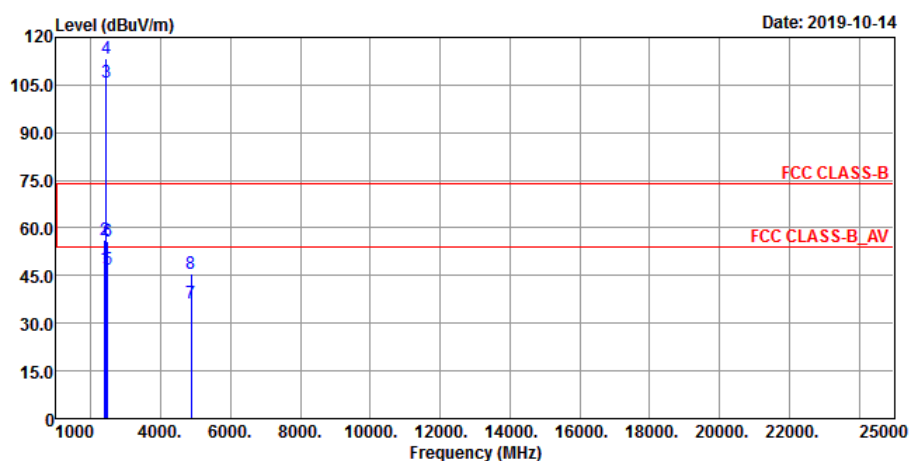
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	52.2	57.2	-5	54	-1.8	287	302	Average
2390	60.5	65.5	-5	74	-13.5	287	302	Peak
2412	100.72	105.73	-5.01			287	302	Average
2412	108.83	113.84	-5.01			287	302	Peak
4824	33.8	48.18	-14.38	54	-20.2	167	255	Average
4824	44.96	59.34	-14.38	74	-29.04	167	255	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	47.86	52.86	-5	54	-6.14	162	261	Average
2390	57.4	62.4	-5	74	-16.6	162	261	Peak
2412	97.93	102.94	-5.01			162	261	Average
2412	106.2	111.21	-5.01			162	261	Peak
4824	33.89	48.27	-14.38	54	-20.11	112	174	Average
4824	45.41	59.79	-14.38	74	-28.59	112	174	Peak

Remarks:

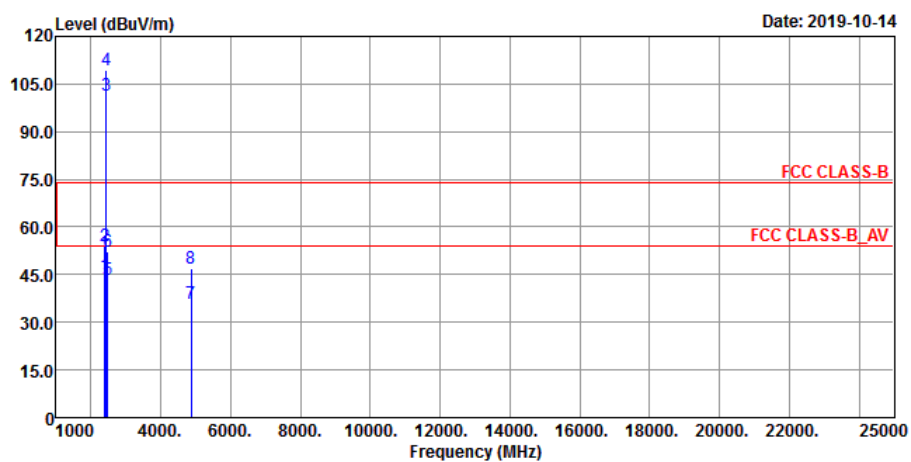
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2412 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

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	Tim Chen

Horizontal



Vertical



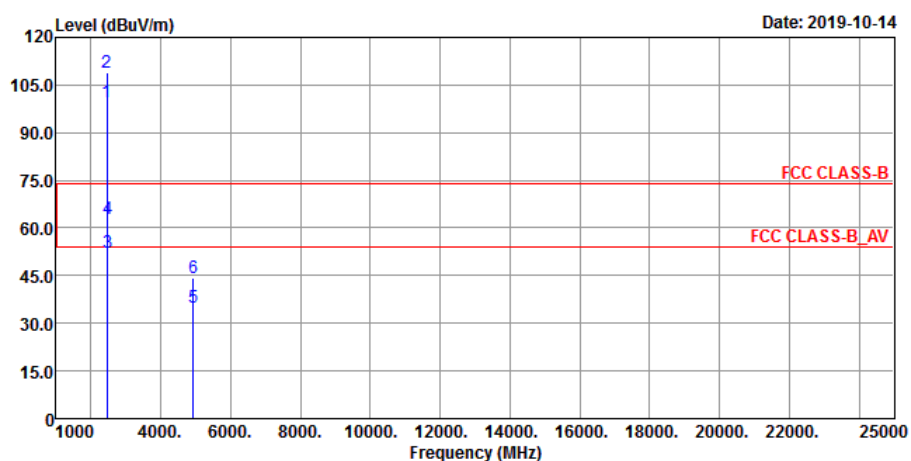
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	47.6	52.6	-5	54	-6.4	279	302	Average
2390	56.16	61.16	-5	74	-17.84	279	302	Peak
2437	105.8	111.48	-5.68			279	302	Average
2437	113.39	119.07	-5.68			279	302	Peak
2483.5	46.95	51.8	-4.85	54	-7.05	279	302	Average
2483.5	55.89	60.74	-4.85	74	-18.11	279	302	Peak
4874	36.14	50.22	-14.08	54	-17.86	179	305	Average
4874	45.59	59.67	-14.08	74	-28.41	179	305	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	44.77	49.77	-5	54	-9.23	166	276	Average
2390	54.01	59.01	-5	74	-19.99	166	276	Peak
2437	101.32	106.3	-4.98			166	276	Average
2437	109.5	114.48	-4.98			166	276	Peak
2483.5	43.47	48.32	-4.85	54	-10.53	166	276	Average
2483.5	52.25	57.1	-4.85	74	-21.75	166	276	Peak
4874	35.72	49.8	-14.08	54	-18.28	136	207	Average
4874	46.83	60.91	-14.08	74	-27.17	136	207	Peak

Remarks:

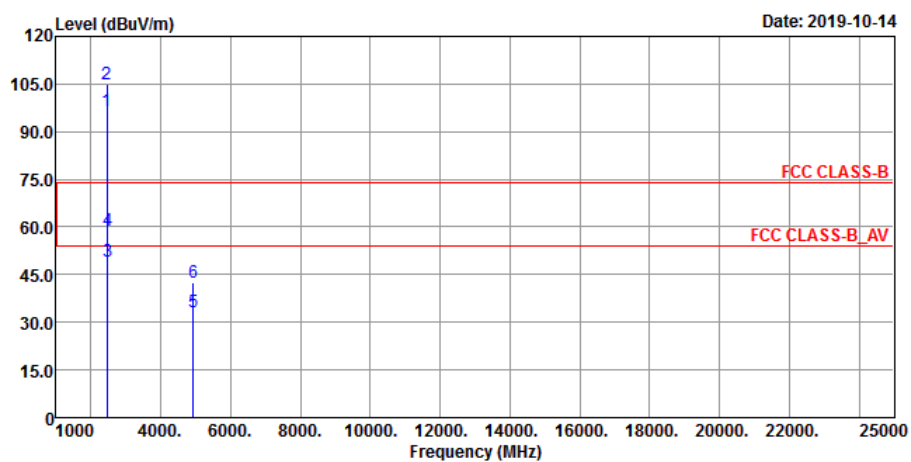
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2437 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

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	Tim Chen

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	99.74	104.65	-4.91			273	301	Average
2462	108.79	113.7	-4.91			273	301	Peak
2483.5	52.24	57.09	-4.85	54	-1.76	273	301	Average
2483.5	62.67	67.52	-4.85	74	-11.33	273	301	Peak
4924	35.01	48.97	-13.96	54	-18.99	112	164	Average
4924	44.5	58.46	-13.96	74	-29.5	112	164	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	96.67	101.58	-4.91			160	274	Average
2462	105.05	109.96	-4.91			160	274	Peak
2483.5	49.29	54.14	-4.85	54	-4.71	160	274	Average
2483.5	58.85	63.7	-4.85	74	-15.15	160	274	Peak
4924	33.26	47.22	-13.96	54	-20.74	169	298	Average
4924	42.47	56.43	-13.96	74	-31.53	169	298	Peak

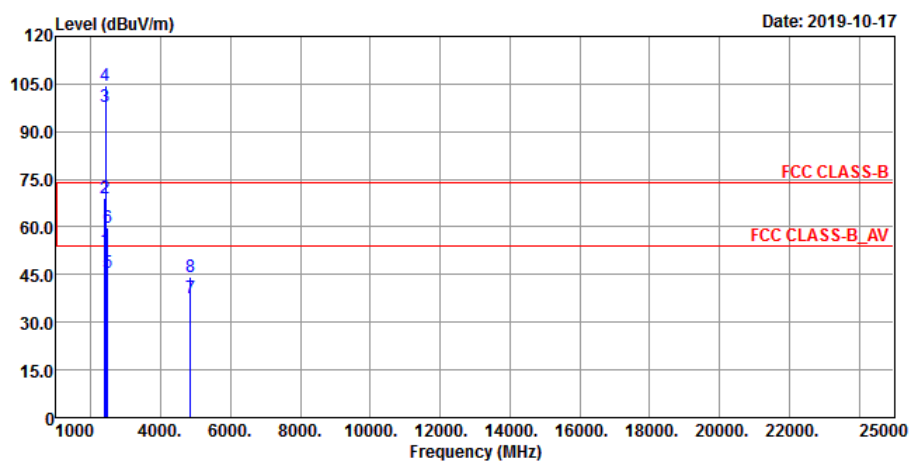
Remarks:

1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2462 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

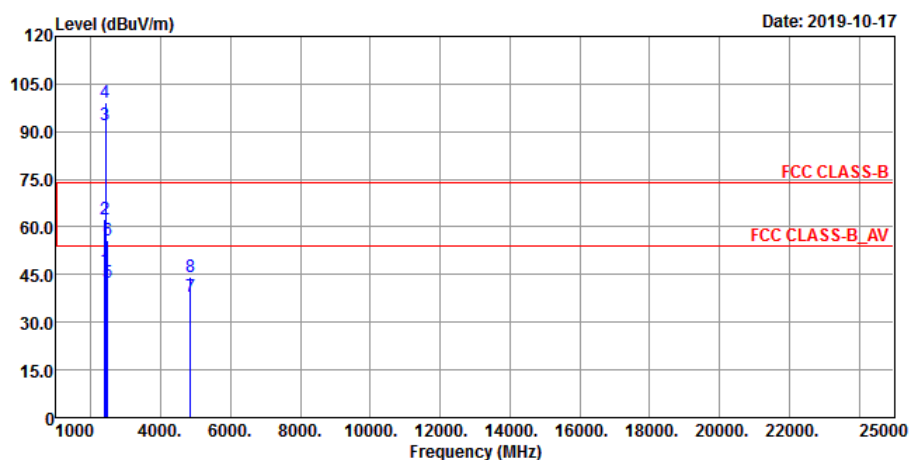
802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 3	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	Tim Chen

Horizontal



Vertical



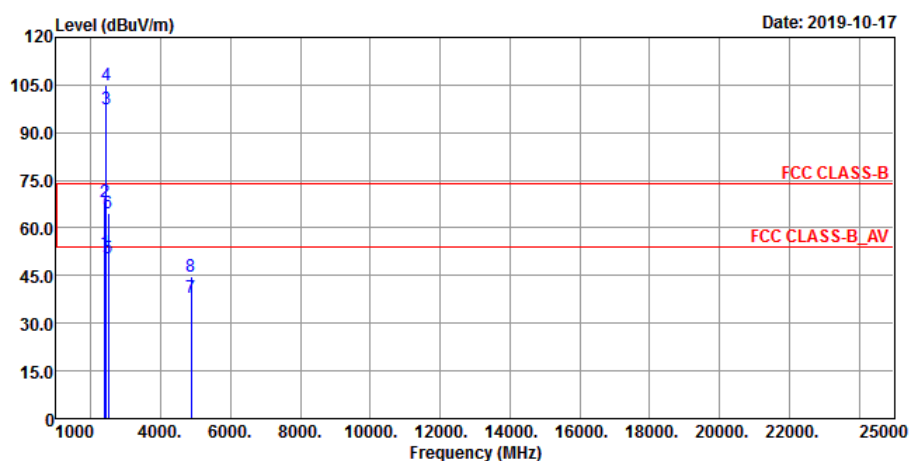
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2387.7	52.49	57.47	-4.98	54	-1.51	275	315	Average
2387.7	69.22	74.2	-4.98	74	-4.78	275	315	Peak
2422	97.76	102.73	-4.97			275	315	Average
2422	104.46	109.43	-4.97			275	315	Peak
2483.5	45.74	50.59	-4.85	54	-8.26	275	315	Average
2483.5	59.91	64.76	-4.85	74	-14.09	275	315	Peak
4844	37.71	51.98	-14.27	54	-16.29	174	269	Average
4844	44.5	58.77	-14.27	74	-29.5	174	269	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	46.71	51.71	-5	54	-7.29	105	294	Average
2390	62.62	67.62	-5	74	-11.38	105	294	Peak
2422	92.14	97.11	-4.97			105	294	Average
2422	99.18	104.15	-4.97			105	294	Peak
2483.5	42.62	47.47	-4.85	54	-11.38	105	294	Average
2483.5	55.74	60.59	-4.85	74	-18.26	105	294	Peak
4844	37.92	52.19	-14.27	54	-16.08	132	158	Average
4844	44.06	58.33	-14.27	74	-29.94	132	158	Peak

Remarks:

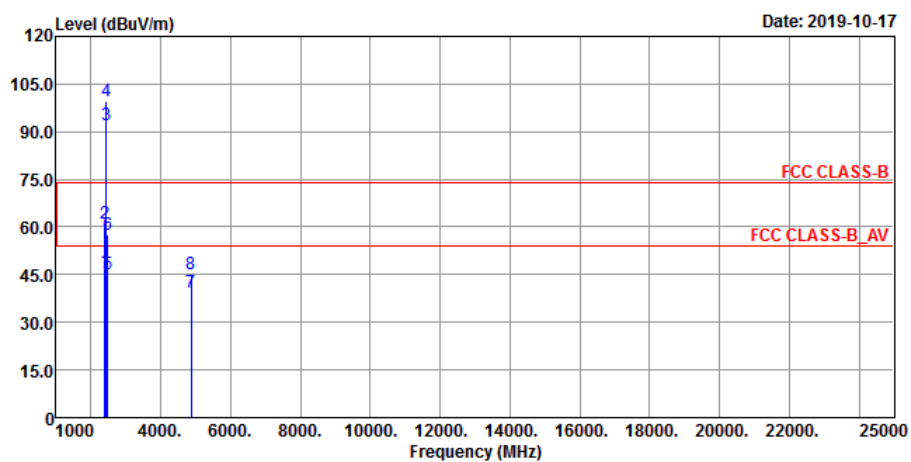
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2422 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

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	Tim Chen

Horizontal



Vertical



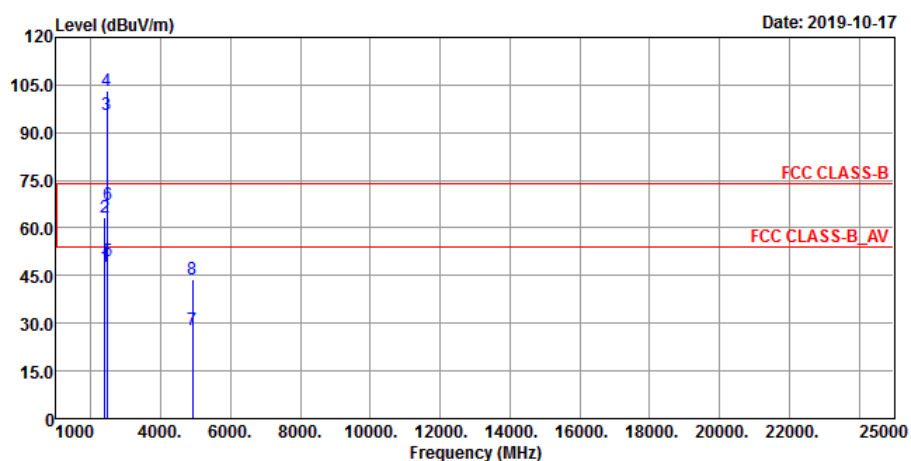
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	52.3	57.3	-5	54	-1.7	277	313	Average
2390	67.97	72.97	-5	74	-6.03	277	313	Peak
2437	97.27	102.25	-4.98			277	313	Average
2437	105.15	110.13	-4.98			277	313	Peak
2484.88	50.26	55.11	-4.85	54	-3.74	277	313	Average
2484.88	64.55	69.4	-4.85	74	-9.45	277	313	Peak
4874	38.26	52.34	-14.08	54	-15.74	155	132	Average
4874	44.74	58.82	-14.08	74	-29.26	155	132	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	45.97	50.97	-5	54	-8.03	106	293	Average
2390	61.11	66.11	-5	74	-12.89	106	293	Peak
2437	92.01	96.99	-4.98			106	293	Average
2437	99.65	104.63	-4.98			106	293	Peak
2483.5	45.24	50.09	-4.85	54	-8.76	106	293	Average
2483.5	57.76	62.61	-4.85	74	-16.24	106	293	Peak
4874	39.33	53.41	-14.08	54	-14.67	108	23	Average
4874	45.21	59.29	-14.08	74	-28.79	108	23	Peak

Remarks:

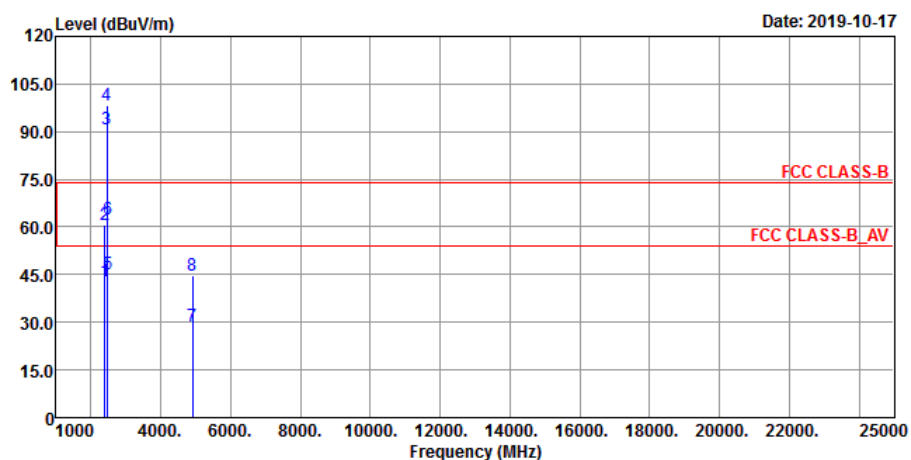
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2437 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 9	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	Tim Chen

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	47.99	52.99	-5	54	-6.01	299	311	Average
2390	63.21	68.21	-5	74	-10.79	299	311	Peak
2452	95.77	100.68	-4.91			299	311	Average
2452	103.24	108.15	-4.91			299	311	Peak
2483.5	49.77	54.62	-4.85	54	-4.23	299	311	Average
2483.5	67.3	72.15	-4.85	74	-6.7	299	311	Peak
4904	27.75	41.73	-13.98	54	-26.25	193	211	Average
4904	43.75	57.73	-13.98	74	-30.25	193	211	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	43.09	48.09	-5	54	-10.91	127	292	Average
2390	60.86	65.86	-5	74	-13.14	127	292	Peak
2452	90.65	95.56	-4.91			127	292	Average
2452	98.52	103.43	-4.91			127	292	Peak
2483.5	45.05	49.9	-4.85	54	-8.95	127	292	Average
2483.5	62.52	67.37	-4.85	74	-11.48	127	292	Peak
4904	28.82	42.8	-13.98	54	-25.18	112	307	Average
4904	44.55	58.53	-13.98	74	-29.45	112	307	Peak

Remarks:

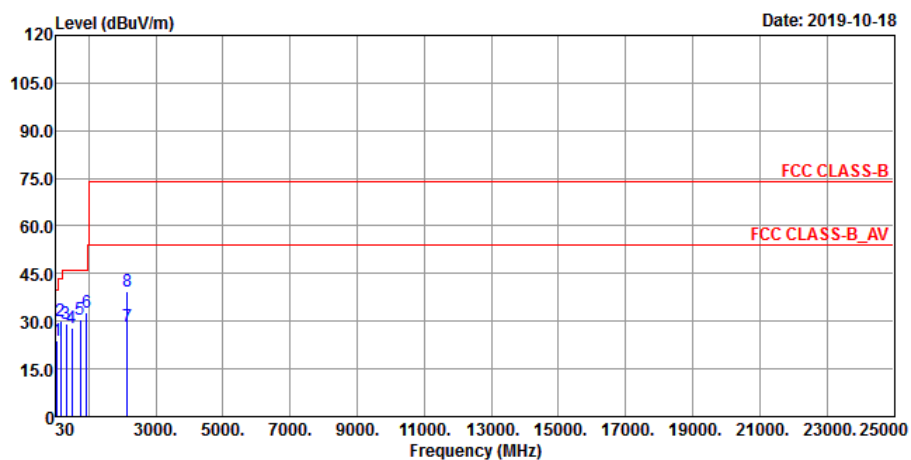
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2452 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

4.6.2 接收諧波

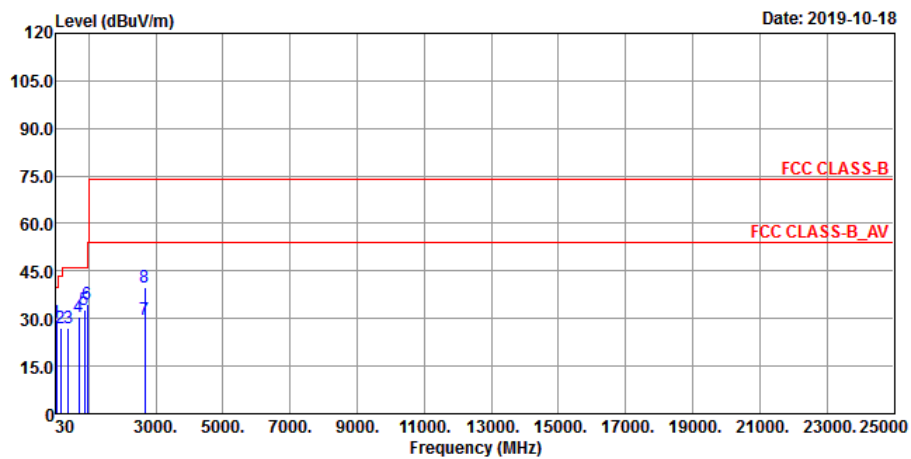
802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 3	Frequency Range	30 MHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Above 1 GHz: Peak (PK) & Average (AV) Below 1 GHz: Peak (PK) or Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Tim Chen

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
56.43	23.77	41.44	-17.67	40	-16.23	193	162	Peak
162.45	30	46.85	-16.85	43.5	-13.5	204	157	Peak
322.18	29.35	45.46	-16.11	46	-16.65	203	264	Peak
492.34	27.72	38.43	-10.71	46	-18.28	194	118	Peak
739.2	30.7	36.35	-5.65	46	-15.3	176	53	Peak
940.66	32.62	35.36	-2.74	46	-13.38	201	307	Peak
2139.27	28.19	49.44	-21.25	54	-25.81	131	163	Average
2139.27	39.31	60.56	-21.25	74	-34.69	131	163	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
38.39	28.89	45.6	-16.71	40	-11.11	102	188	Peak
162.92	26.89	44.31	-17.42	43.5	-16.61	137	66	Peak
398.65	26.88	36.8	-9.92	46	-19.12	108	201	Peak
702.13	30.36	34.83	-4.47	46	-15.64	122	338	Peak
864.13	32.71	37.04	-4.33	46	-13.29	125	299	Peak
946.57	34.45	37.18	-2.73	46	-11.55	104	148	Peak
2674.38	29.61	50.03	-20.42	54	-24.39	166	137	Average
2674.38	39.74	60.16	-20.42	74	-34.26	166	137	Peak

Remarks:

1. Emission Level = Read Level + 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:

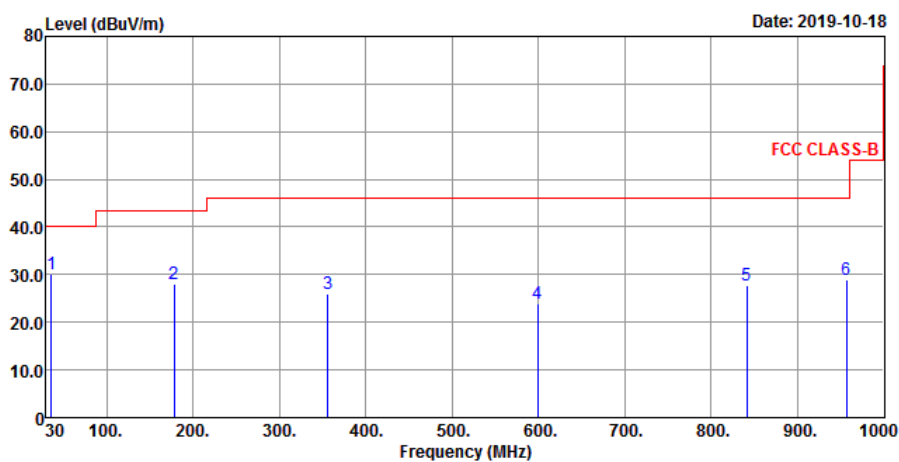
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Data:

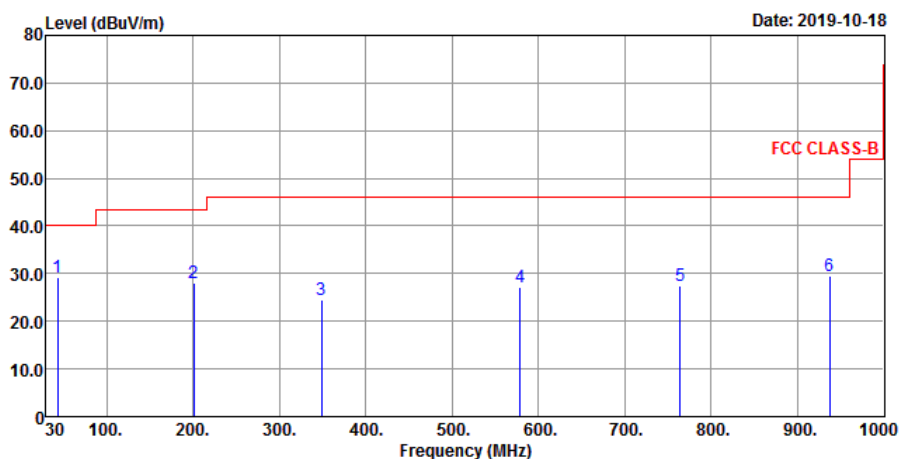
802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 3	Frequency Range	30 MHz ~ 1 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) or Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Tim Chen

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
35.82	30.14	47.31	-17.17	40	-9.86	136	118	Peak
178.41	27.95	46.21	-18.26	43.5	-15.55	142	215	Peak
355.92	25.92	40.69	-14.77	46	-20.08	133	337	Peak
599.39	23.78	32.09	-8.31	46	-22.22	128	22	Peak
840.92	27.66	31.89	-4.23	46	-18.34	117	315	Peak
956.35	29	32.1	-3.1	46	-17	102	88	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
43.58	29.17	46.12	-16.95	40	-10.83	107	155	Peak
200.72	28.14	47.94	-19.8	43.5	-15.36	131	226	Peak
349.13	24.45	39.28	-14.83	46	-21.55	148	46	Peak
579.02	27.17	36.5	-9.33	46	-18.83	102	73	Peak
764.29	27.4	32.09	-4.69	46	-18.6	123	194	Peak
936.95	29.52	32.31	-2.79	46	-16.48	156	264	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 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。

5 6 dB 頻寬之要求

5.1 適用標準

請見本報告 3.1 節第(13)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。

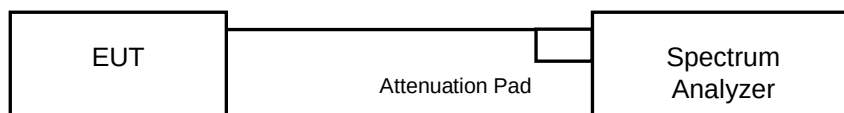
5.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020

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	108 年 10 月 17 日
量測場地溫度	25 °C	量測場地濕度	60 % RH
測試者	吳俊樺		

802.11b

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	8.15	8.10	0.5	Pass
6	2437	8.12	8.12	0.5	Pass
11	2462	8.14	9.11	0.5	Pass

802.11g

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.57	15.18	0.5	Pass
6	2437	15.37	15.19	0.5	Pass
11	2462	15.19	15.18	0.5	Pass

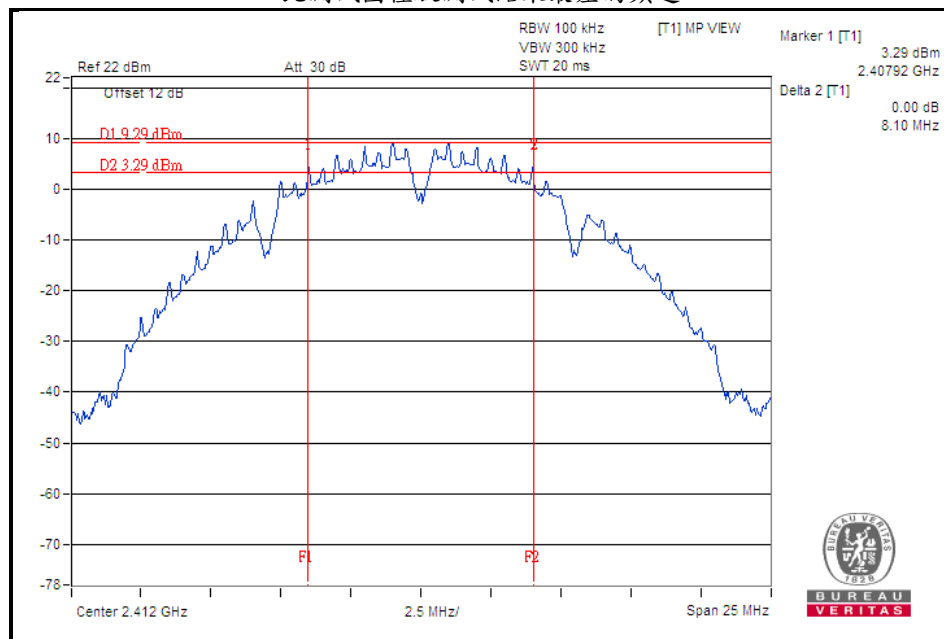
802.11n (HT20)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.16	15.73	0.5	Pass
6	2437	15.18	15.73	0.5	Pass
11	2462	15.21	16.29	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.16	35.15	0.5	Pass
6	2437	35.23	35.16	0.5	Pass
9	2452	35.21	35.20	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(12)及(14)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。

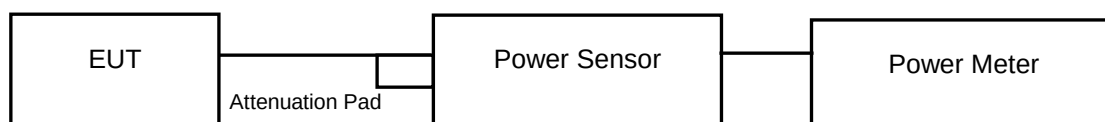
6.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Power Meter Anritsu	ML2495A	1232002	Dec. 17, 2018	Dec. 16, 2019
Power Sensor Anritsu	MA2411B	1207325	Dec. 17, 2018	Dec. 16, 2019

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 160 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	108 年 10 月 17 日
量測場地溫度	25 °C	量測場地濕度	60 % RH
測試者	吳俊樺		

802.11b

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.07	19.96	179.807	22.55	30	Pass
6	2437	21.60	23.77	382.776	25.83	30	Pass
11	2462	20.91	22.17	288.126	24.60	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.12	20.36	190.301	22.79	30	Pass
6	2437	23.14	25.54	564.159	27.51	30	Pass
11	2462	19.07	20.39	190.12	22.79	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.57	21.49	254.954	24.06	30	Pass
6	2437	23.67	26.03	633.676	28.02	30	Pass
11	2462	20.25	21.58	249.805	23.98	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	16.59	17.44	101.067	20.05	30	Pass
6	2437	19.31	20.66	201.723	23.05	30	Pass
9	2452	16.98	20.08	151.747	21.81	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(15)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。

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	Apr. 15, 2019	Apr. 14, 2020

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	108 年 10 月 17 日
量測場地溫度	25 °C	量測場地濕度	60 % RH
測試者	吳俊樺		

802.11b

TX Chain	Channel	Freq. (MHz)	PSD (dBm/3 kHz)	10 log (N=2) dB	Total PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	1	2412	-9.62	3.01	-6.61	8	Pass
	6	2437	-7.35	3.01	-4.34	8	Pass
	11	2462	-8.06	3.01	-5.05	8	Pass
1	1	2412	-8.81	3.01	-5.80	8	Pass
	6	2437	-6.34	3.01	-3.33	8	Pass
	11	2462	-7.62	3.01	-4.61	8	Pass

NOTE: Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.73 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.

802.11g

TX Chain	Channel	Freq. (MHz)	PSD (dBm/3 kHz)	10 log (N=2) dB	Total PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	1	2412	-11.33	3.01	-8.32	8	Pass
	6	2437	-8.47	3.01	-5.46	8	Pass
	11	2462	-13.26	3.01	-10.25	8	Pass
1	1	2412	-10.49	3.01	-7.48	8	Pass
	6	2437	-6.75	3.01	-3.74	8	Pass
	11	2462	-11.23	3.01	-8.22	8	Pass

NOTE: Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.73 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.

802.11n (HT20)

TX Chain	Channel	Freq. (MHz)	PSD (dBm/3 kHz)	10 log (N=2) dB	Total PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	1	2412	-12.83	3.01	-9.82	8	Pass
	6	2437	-8.14	3.01	-5.13	8	Pass
	11	2462	-13.05	3.01	-10.04	8	Pass
1	1	2412	-11.57	3.01	-8.56	8	Pass
	6	2437	-5.41	3.01	-2.40	8	Pass
	11	2462	-10.81	3.01	-7.80	8	Pass

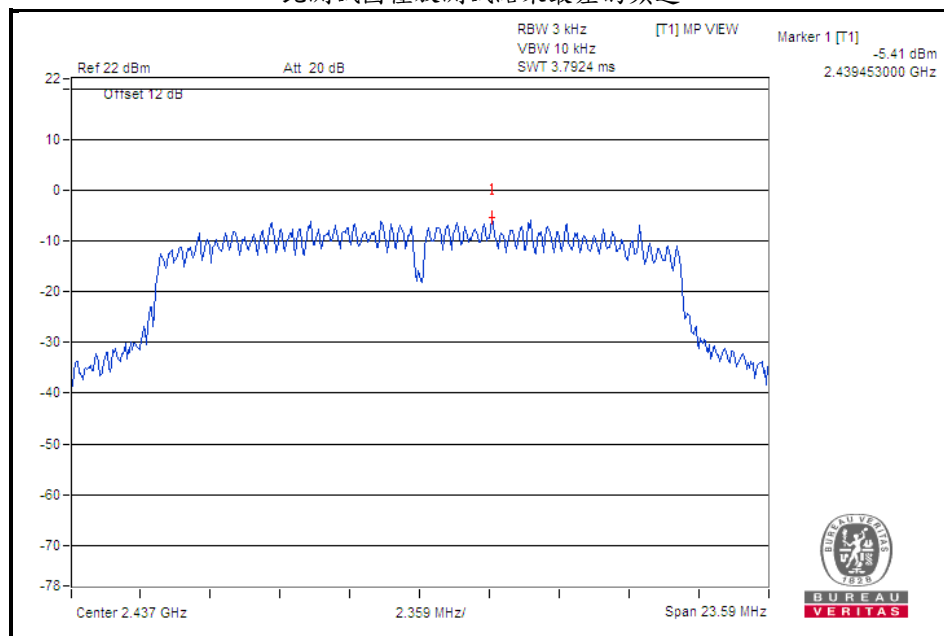
NOTE: Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.73 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.

802.11n (HT40)

TX Chain	Channel	Freq. (MHz)	PSD (dBm/3 kHz)	10 log (N=2) dB	Total PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	3	2422	-19.08	3.01	-16.07	8	Pass
	6	2437	-16.55	3.01	-13.54	8	Pass
	9	2452	-17.85	3.01	-14.84	8	Pass
1	3	2422	-17.78	3.01	-14.77	8	Pass
	6	2437	-15.08	3.01	-12.07	8	Pass
	9	2452	-15.61	3.01	-12.60	8	Pass

NOTE: Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.73 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.

**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。

U-NII 頻段測試紀錄結果

8 帶外發射之量測

8.1 適用標準

待測物操作頻帶	適用標準
☒ 5.15 GHz~5.25 GHz	請見本報告 3.1 節第(10)項(2)的規定
☒ 5.25 GHz~5.35 GHz	請見本報告 3.1 節第(10)項(2)的規定
☒ 5.470 GHz~5.725 GHz	請見本報告 3.1 節第(10)項(2)的規定
☒ 5.725 GHz~5.850 GHz	請見本報告 3.1 節第(10)項(3)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

802.11a 為 RBW = 1 MHz, VBW = 1 kHz

802.11n (HT20) 為 RBW = 1 MHz, VBW = 3 kHz

802.11n (HT40) 為 RBW = 1 MHz, VBW = 3 kHz

802.11ac (VHT80) 為 RBW = 1 MHz, VBW = 3 kHz

接收諧波：

Below 1 GHz

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

Above 1 GHz:

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

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)

*有效等向輻射功率限制值轉換場強值如下：

Applicable To			Limit	
789033 D02 General UNII Test Procedure New Rules v02r01			Field Strength at 3 m	
			PK: 74 (dBμV/m)	AV: 54 (dBμV/m)
操作頻帶	Applicable To		EIRP Limit	Equivalent Field Strength at 3 m
5150~5250 MHz	技術規範 4.7.4.1 節		PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m)
5250~5350 MHz	技術規範 4.7.4.1 節			
5470~5725 MHz	技術規範 4.7.4.1 節			
5725~5850 MHz	☒	技術規範 4.7.4.2 節	PK: -27 (dBm/MHz) ^{*1} PK: 10 (dBm/MHz) ^{*2} PK: 15.6 (dBm/MHz) ^{*3} PK: 27 (dBm/MHz) ^{*4}	PK: 68.2 (dBμV/m) ^{*1} PK: 105.2 (dBμV/m) ^{*2} PK: 110.8 (dBμV/m) ^{*3} PK: 122.2 (dBμV/m) ^{*4}
	☐	技術規範 4.7.4.7 節	適用 3.10.1.5 節帶外發射限制	
^{*1} beyond 75 MHz or more above of the band edge.				
^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.				
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.				
^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.				

備註：有效等向輻射功率限制值轉換場強之公式如下：

$$E = (30PG)^{1/2} / d$$

E: 以最寬解析頻寬所測得之最大場強值，單位：V/m。

G: 發射天線相對於全向性輻射器之數值增益。

d: 測試場強的距離，單位：m。

P: 求得之功率，單位：W。

量測結果請見下頁。

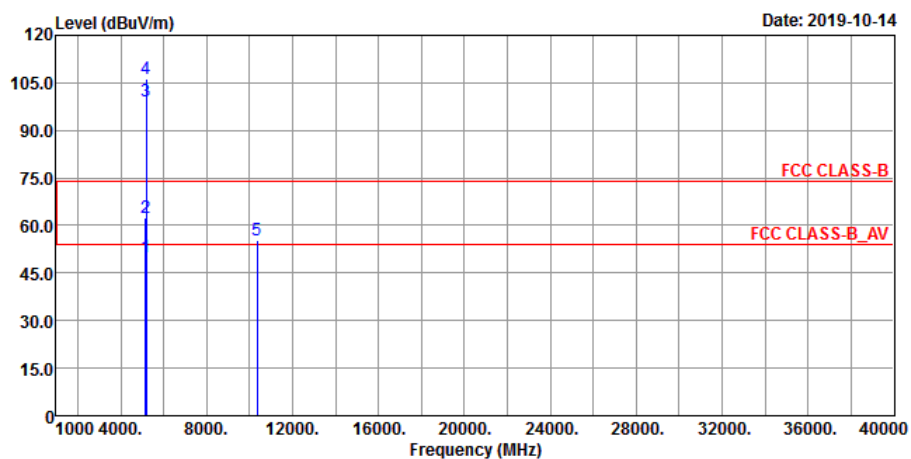
8.6 量測結果

8.6.1 發射諧波

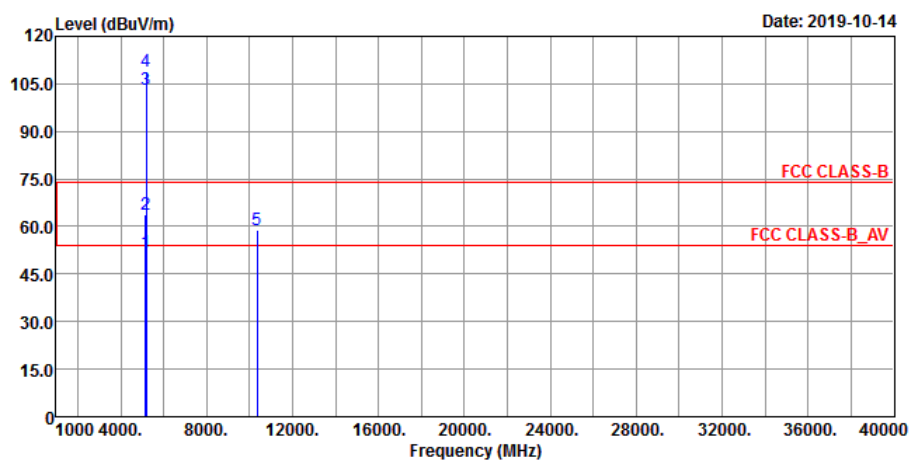
802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 36	Frequency Range	1 GHz ~ 40 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



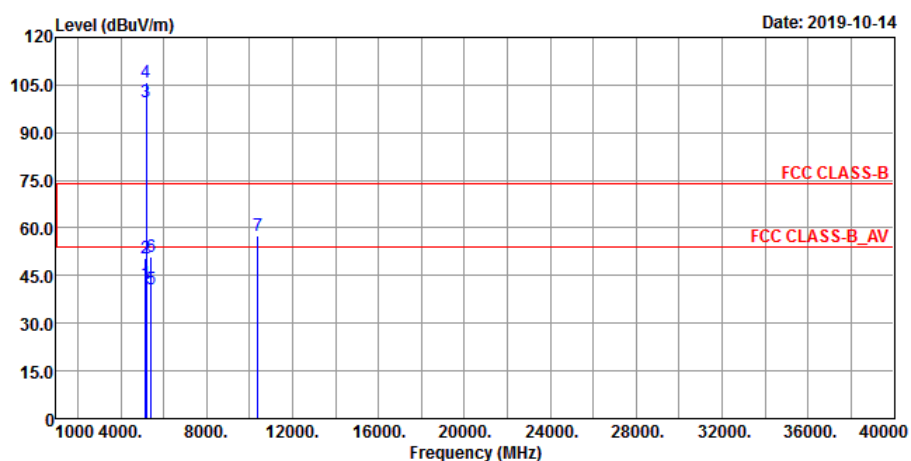
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.94	50.17	48.64	1.53	54	-3.83	186	79	Average
5149.94	62.61	61.08	1.53	74	-11.39	186	79	Peak
5180	99.38	97.85	1.53			186	79	Average
5180	106.12	104.59	1.53			186	79	Peak
*10360	55.56	58.4	-2.84	68.2	-12.64	198	225	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.58	51.92	50.39	1.53	54	-2.08	201	339	Average
5149.58	63.67	62.14	1.53	74	-10.33	201	339	Peak
5180	102.98	101.45	1.53			201	339	Average
5180	108.87	107.34	1.53			201	339	Peak
*10360	58.85	61.69	-2.84	68.2	-9.35	100	12	Peak

Remarks:

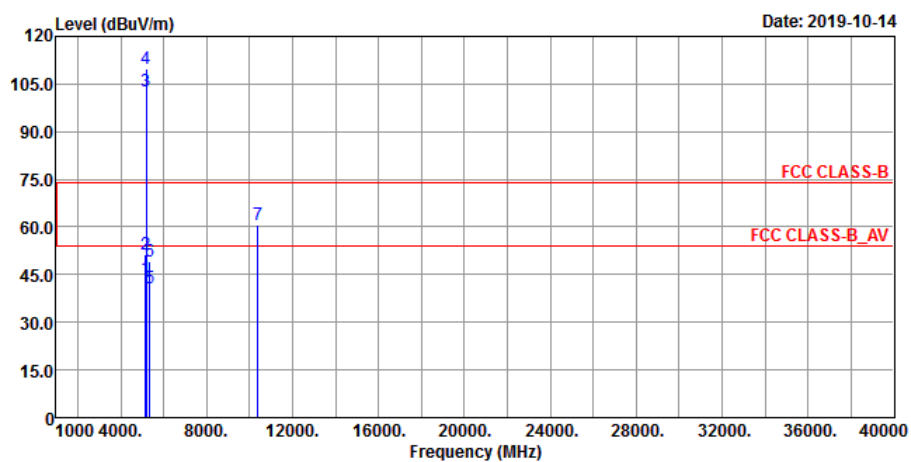
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5180 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 40	Frequency Range	1 GHz ~ 40 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



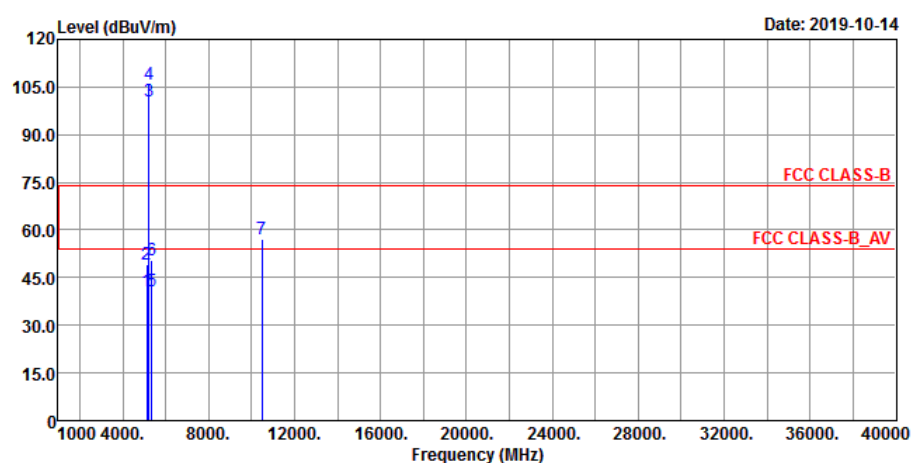
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.86	42.47	40.94	1.53	54	-11.53	200	89	Average
5148.86	50.37	48.84	1.53	74	-23.63	200	89	Peak
5200	99.44	97.91	1.53			200	89	Average
5200	105.83	104.3	1.53			200	89	Peak
5405.66	40.66	38.99	1.67	54	-13.34	186	79	Average
5405.66	50.99	49.32	1.67	74	-23.01	186	79	Peak
*10400	57.38	60.27	-2.89	68.2	-10.82	195	238	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.76	44.03	42.5	1.53	54	-9.97	199	339	Average
5149.76	51.47	49.94	1.53	74	-22.53	199	339	Peak
5200	102.9	101.37	1.53			199	339	Average
5200	110	108.47	1.53			199	339	Peak
5351.21	40.79	39.33	1.46	54	-13.21	199	339	Average
5351.21	49.36	47.9	1.46	74	-24.64	199	339	Peak
*10400	60.87	63.76	-2.89	68.2	-7.33	101	12	Peak

Remarks:

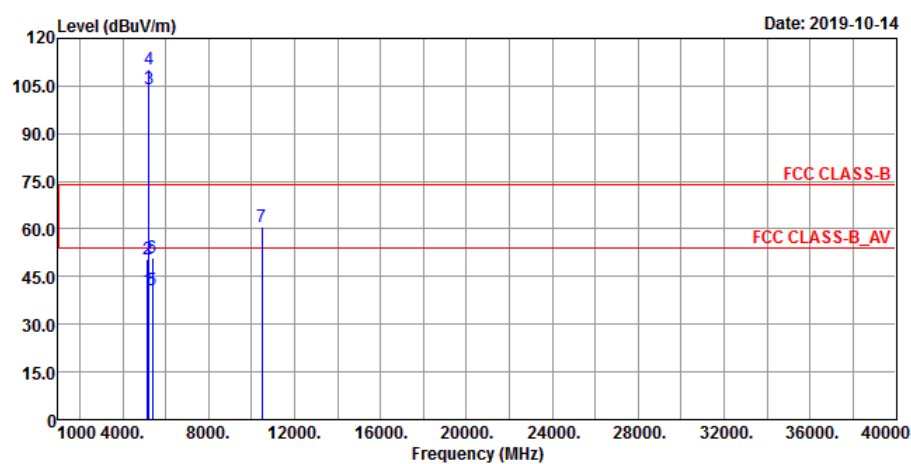
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5200 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 48	Frequency Range	1 GHz ~ 40 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



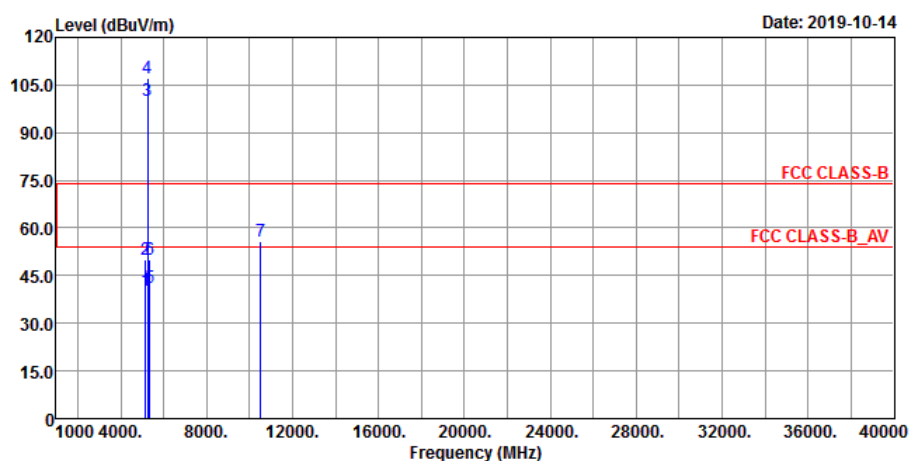
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5128.7	40.6	39.11	1.49	54	-13.4	187	90	Average
5128.7	49.24	47.75	1.49	74	-24.76	187	90	Peak
5240	100.4	99.02	1.38			187	90	Average
5240	105.82	104.44	1.38			187	90	Peak
5371.01	40.85	39.32	1.53	54	-13.15	187	90	Average
5371.01	50.56	49.03	1.53	74	-23.44	187	90	Peak
*10480	57.34	60.07	-2.73	68.2	-10.86	197	238	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5143.82	40.86	39.33	1.53	54	-13.14	199	335	Average
5143.82	50.26	48.73	1.53	74	-23.74	199	335	Peak
5240	104.07	102.69	1.38			199	335	Average
5240	110.11	108.73	1.38			199	335	Peak
5399.83	40.87	39.2	1.67	54	-13.13	199	335	Average
5399.83	50.94	49.27	1.67	74	-23.06	199	335	Peak
*10480	60.82	63.55	-2.73	68.2	-7.38	112	12	Peak

Remarks:

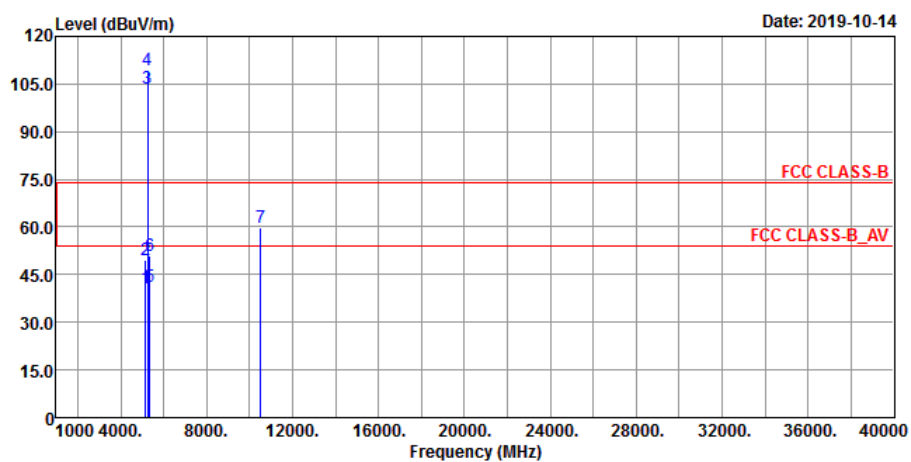
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5240 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 52	Frequency Range	1 GHz ~ 40 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



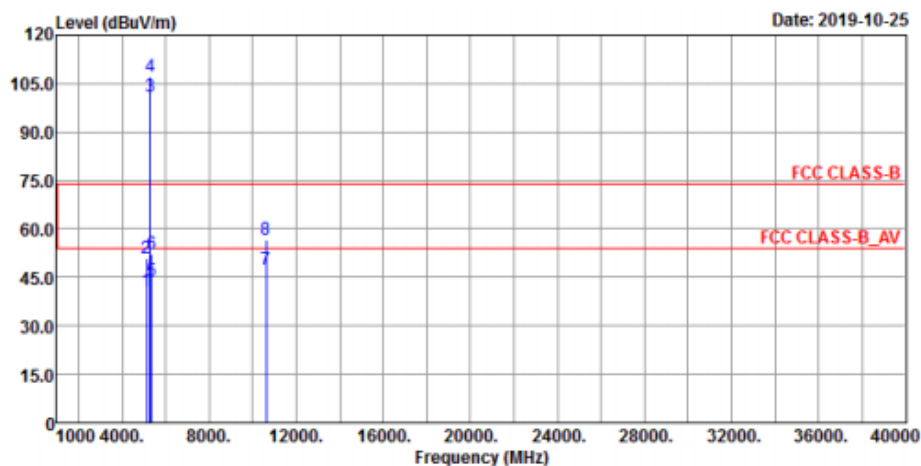
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.94	40.45	38.92	1.53	54	-13.55	187	90	Average
5149.94	49.9	48.37	1.53	74	-24.1	187	90	Peak
5260	100.09	98.78	1.31			187	90	Average
5260	107.07	105.76	1.31			187	90	Peak
5358.47	41.04	39.58	1.46	54	-12.96	187	90	Average
5358.47	50.17	48.71	1.46	74	-23.83	187	90	Peak
*10520	55.94	58.66	-2.72	68.2	-12.26	195	244	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5147.06	40.7	39.17	1.53	54	-13.3	200	335	Average
5147.06	49.77	48.24	1.53	74	-24.23	200	335	Peak
5260	103.84	102.53	1.31			200	335	Average
5260	109.58	108.27	1.31			200	335	Peak
5355.72	41.12	39.66	1.46	54	-12.88	200	335	Average
5355.72	50.94	49.48	1.46	74	-23.06	200	335	Peak
*10520	59.73	62.45	-2.72	68.2	-8.47	101	13	Peak

Remarks:

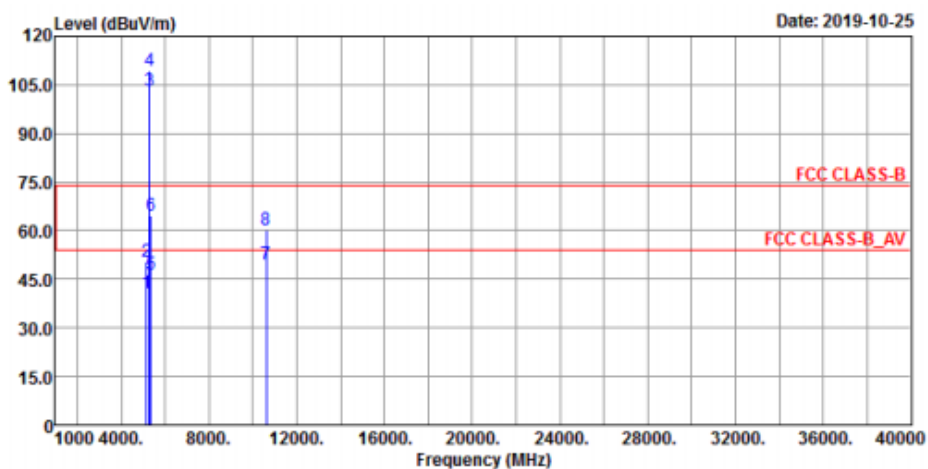
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5260 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 60	Frequency Range	1 GHz ~ 40 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



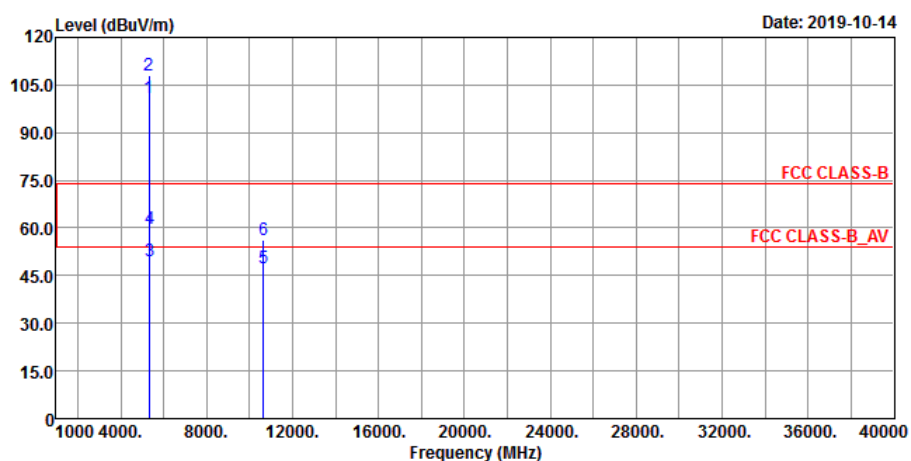
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5139.86	40.59	39.04	1.55	54	-13.41	181	89	Average
5139.86	50.75	49.2	1.55	74	-23.25	181	89	Peak
5300	101.11	99.8	1.31			181	89	Average
5300	107.21	105.9	1.31			181	89	Peak
5350.66	43.93	42.47	1.46	54	-10.07	181	89	Average
5350.66	52.11	50.65	1.46	74	-21.89	181	89	Peak
10600	47.43	50.34	-2.91	54	-6.57	187	244	Average
10600	56.56	59.47	-2.91	74	-17.44	187	244	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.5	40.69	39.16	1.53	54	-13.31	197	339	Average
5148.5	50.33	48.8	1.53	74	-23.67	197	339	Peak
5300	103.34	102.03	1.31			197	339	Average
5300	109.52	108.21	1.31			197	339	Peak
5350	46.69	45.23	1.46	54	-7.31	197	339	Average
5350	64.71	63.25	1.46	74	-9.29	197	339	Peak
10600	49.75	52.66	-2.91	54	-4.25	101	15	Average
10600	60.07	62.98	-2.91	74	-13.93	101	15	Peak

Remarks:

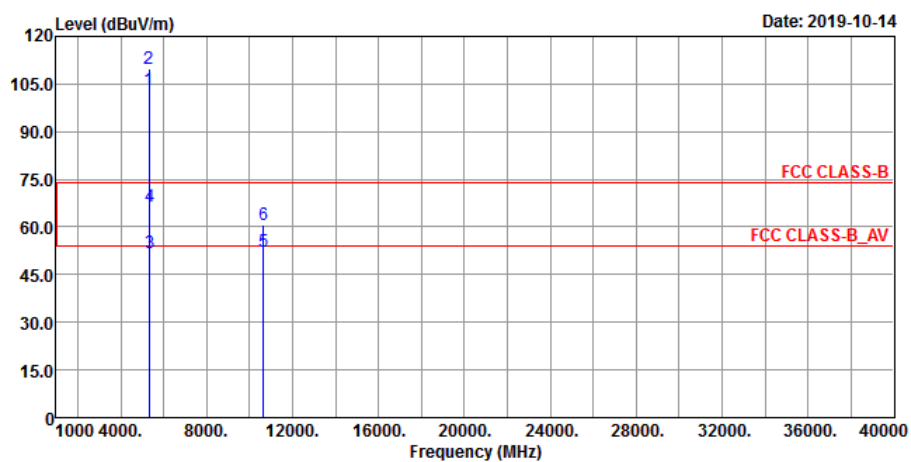
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5300 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 64	Frequency Range	1 GHz ~ 40 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



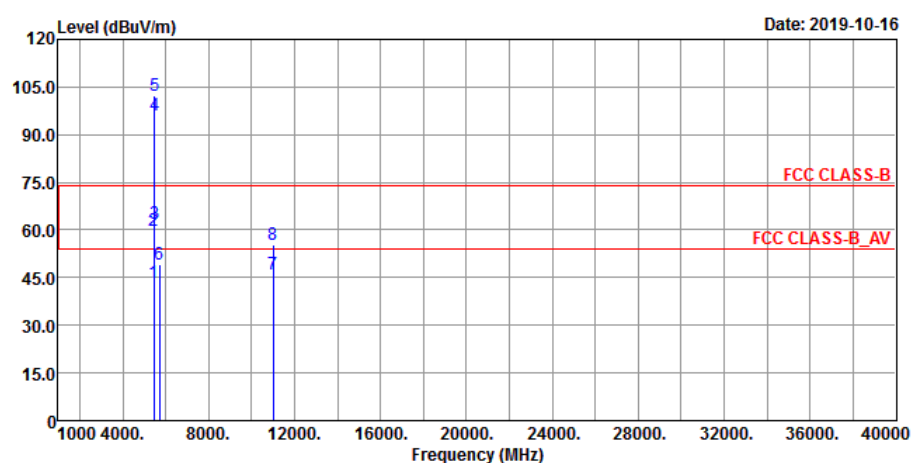
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5320	101.13	99.77	1.36			168	89	Average
5320	107.84	106.48	1.36			168	89	Peak
5350.22	49.62	48.16	1.46	54	-4.38	168	89	Average
5350.22	59.76	58.3	1.46	74	-14.24	168	89	Peak
10640	47.49	50.38	-2.89	54	-6.51	154	256	Average
10640	56.4	59.29	-2.89	74	-17.6	154	256	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5320	103.3	101.94	1.36			198	336	Average
5320	109.97	108.61	1.36			198	336	Peak
5350.11	51.84	50.38	1.46	54	-2.16	198	336	Average
5350.11	66.4	64.94	1.46	74	-7.6	198	336	Peak
10640	52.33	55.22	-2.89	54	-1.67	100	11	Average
10640	60.75	63.64	-2.89	74	-13.25	100	11	Peak

Remarks:

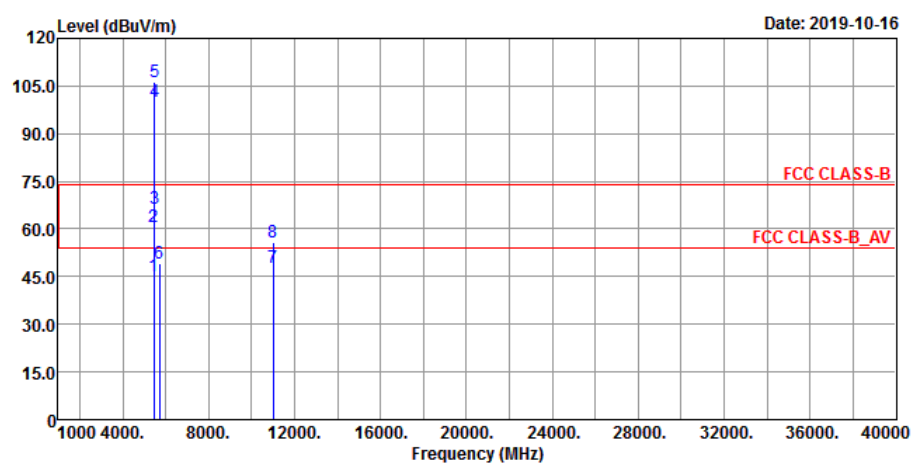
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5320 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 100	Frequency Range	1 GHz ~ 40 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



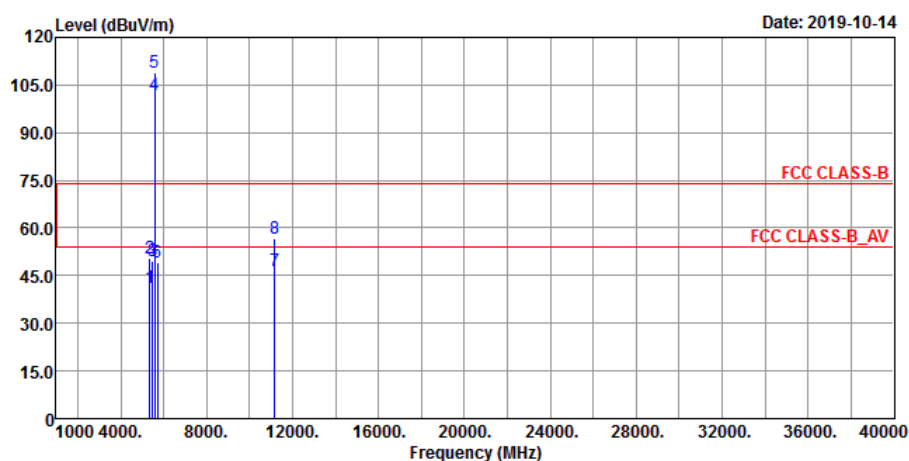
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5459.6	43.32	41.45	1.87	54	-10.68	197	84	Average
5459.6	59.86	57.99	1.87	74	-14.14	197	84	Peak
*5470	62.17	60.31	1.86	68.2	-6.03	197	84	Peak
5500	96.02	94.15	1.87			197	84	Average
5500	102.16	100.29	1.87			197	84	Peak
*5725	49.28	47.52	1.76	68.2	-18.92	197	84	Peak
11000	46.25	48.56	-2.31	54	-7.75	100	12	Average
11000	55.32	57.63	-2.31	74	-18.68	100	12	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5459.28	45.35	43.48	1.87	54	-8.65	190	336	Average
5459.28	60.8	58.93	1.87	74	-13.2	190	336	Peak
*5470	66.43	64.57	1.86	68.2	-1.77	190	336	Peak
5500	100	98.13	1.87			190	336	Average
5500	106.21	104.34	1.87			190	336	Peak
*5725	49.37	47.61	1.76	68.2	-18.83	190	336	Peak
11000	47.92	50.23	-2.31	54	-6.08	176	0	Average
11000	55.96	58.27	-2.31	74	-18.04	176	0	Peak

Remarks:

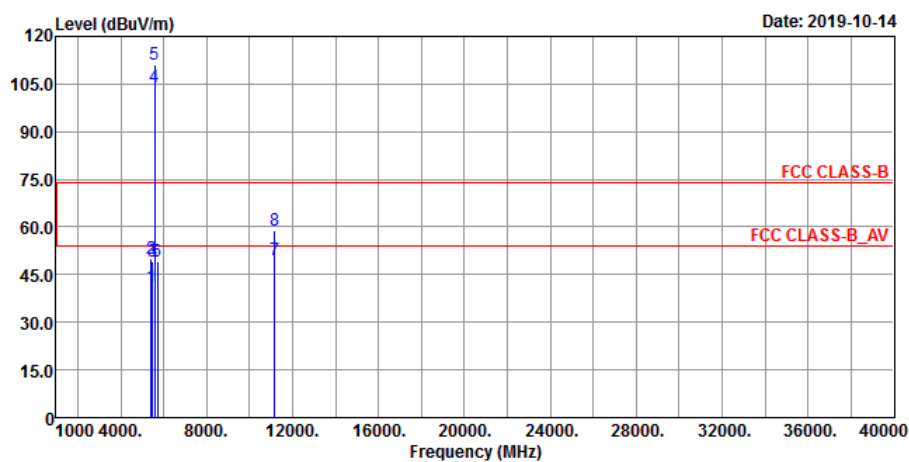
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5500 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 116	Frequency Range	1 GHz ~ 40 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



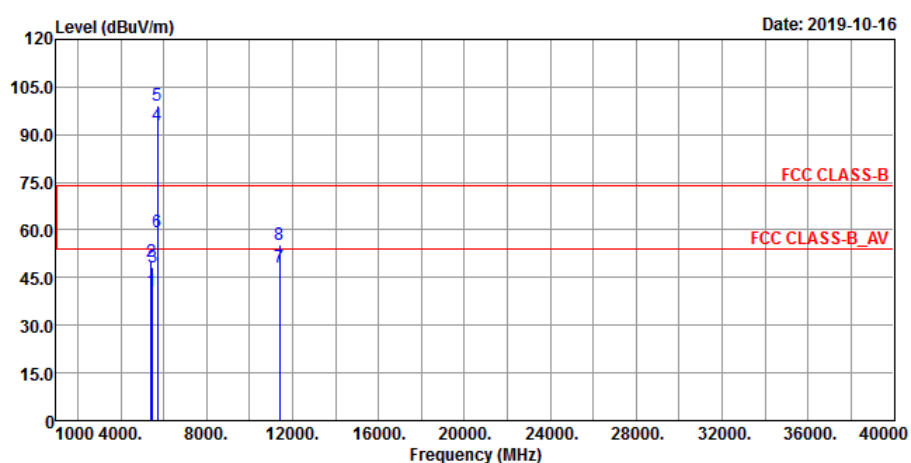
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5367.28	41.05	39.52	1.53	54	-12.95	194	98	Average
5367.28	50.4	48.87	1.53	74	-23.6	194	98	Peak
*5470	49.68	47.82	1.86	68.2	-18.52	194	98	Peak
5580	101.97	100.15	1.82			194	98	Average
5580	108.79	106.97	1.82			194	98	Peak
*5725	49.31	47.55	1.76	68.2	-18.89	194	98	Peak
11160	46.61	49.16	-2.55	54	-7.39	189	235	Average
11160	56.83	59.38	-2.55	74	-17.17	189	235	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5431.76	41.06	39.28	1.78	54	-12.94	186	341	Average
5431.76	50.14	48.36	1.78	74	-23.86	186	341	Peak
*5470	49.32	47.46	1.86	68.2	-18.88	186	341	Peak
5580	103.88	102.06	1.82			186	341	Average
5580	111	109.18	1.82			186	341	Peak
*5725	49.3	47.54	1.76	68.2	-18.9	186	341	Peak
11160	49.44	51.99	-2.55	54	-4.56	194	19	Average
11160	58.79	61.34	-2.55	74	-15.21	194	19	Peak

Remarks:

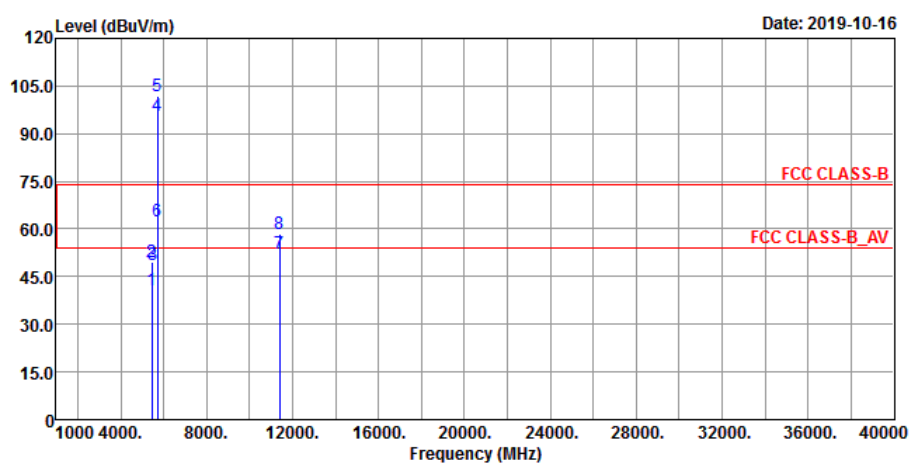
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5580 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 140	Frequency Range	1 GHz ~ 40 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



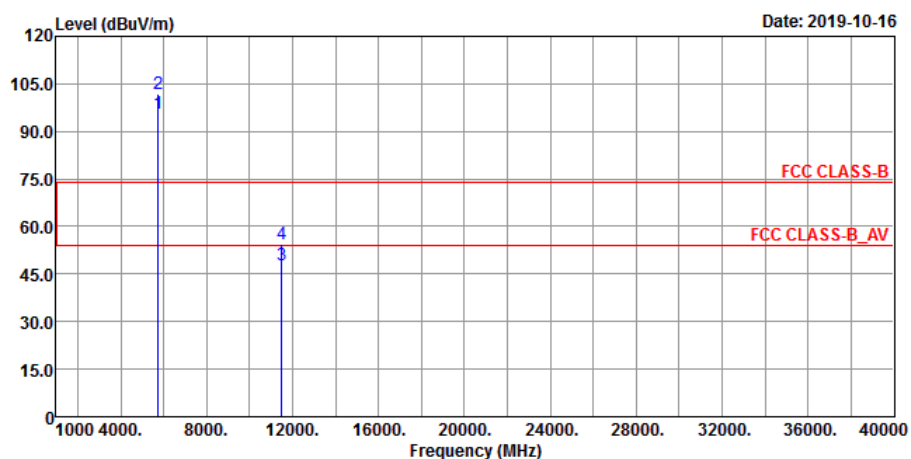
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5434.64	40.6	38.82	1.78	54	-13.4	187	79	Average
5434.64	50.11	48.33	1.78	74	-23.89	187	79	Peak
*5470	48.47	46.61	1.86	68.2	-19.73	187	79	Peak
5700	92.8	91.21	1.59			187	79	Average
5700	99.1	97.51	1.59			187	79	Peak
*5725	59.31	57.55	1.76	68.2	-8.89	187	79	Peak
11400	48.12	50.35	-2.23	54	-5.88	157	27	Average
11400	55.17	57.4	-2.23	74	-18.83	157	27	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5439.76	40.84	39.06	1.78	54	-13.16	186	330	Average
5439.76	49.59	47.81	1.78	74	-24.41	186	330	Peak
*5470	48.79	46.93	1.86	68.2	-19.41	186	330	Peak
5700	95.58	93.99	1.59			186	330	Average
5700	101.66	100.07	1.59			186	330	Peak
*5725	62.55	60.79	1.76	68.2	-5.65	186	330	Peak
11400	52.47	54.7	-2.23	54	-1.53	200	360	Average
11400	58.29	60.52	-2.23	74	-15.71	200	360	Peak

Remarks:

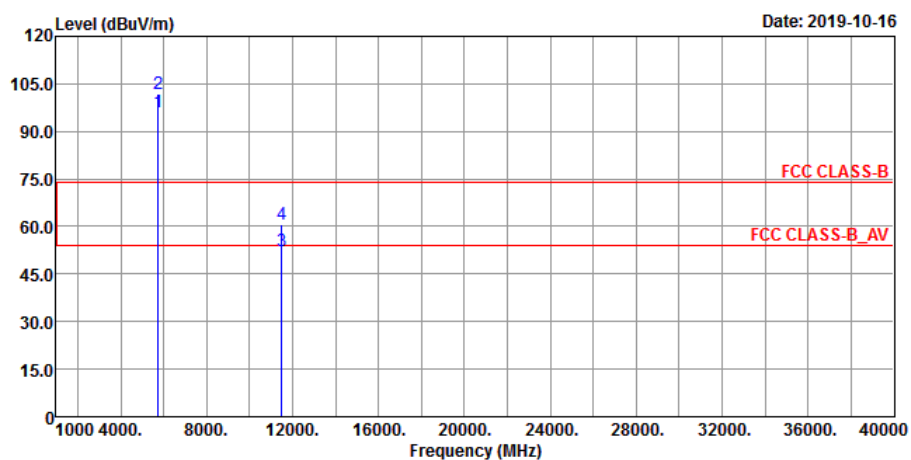
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5700 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 149	Frequency Range	1 GHz ~ 40 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

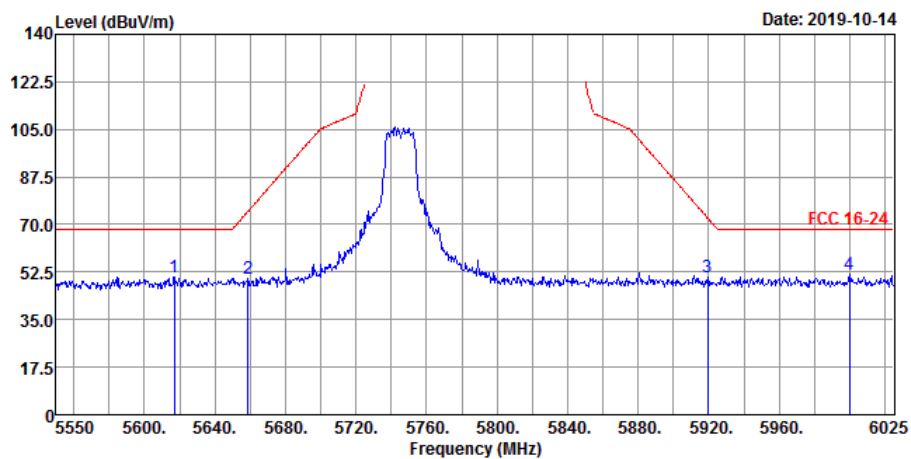
<Spurious Emission> Horizontal



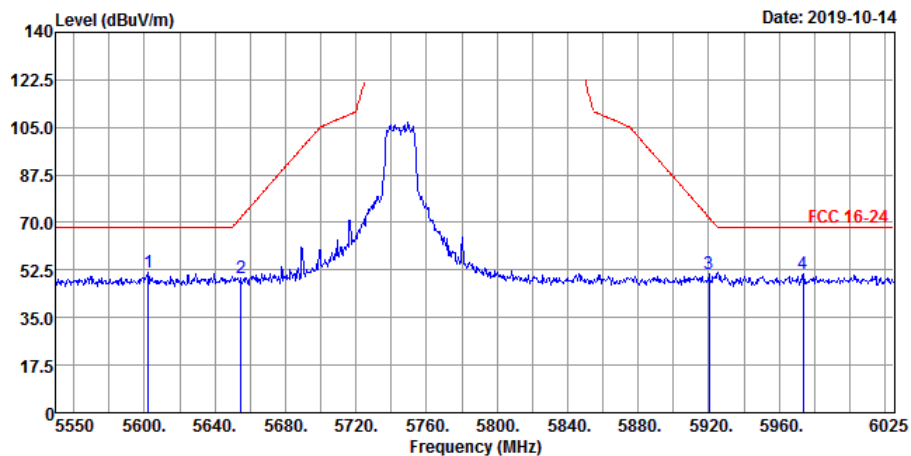
Vertical



<Out of Band Emission (OOBE)> Horizontal



Vertical



<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	95.44	93.62	1.82			176	123	Average
5745	101.68	99.86	1.82			176	123	Peak
11490	47.91	50.11	-2.2	54	-6.09	160	23	Average
11490	54.47	56.67	-2.2	74	-19.53	160	23	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	96.3	94.48	1.82			172	340	Average
5745	102.07	100.25	1.82			172	340	Peak
11490	52.4	54.6	-2.2	54	-1.6	200	360	Average
11490	60.58	62.78	-2.2	74	-13.42	200	360	Peak

<Out of Band Emission (OOBE)>

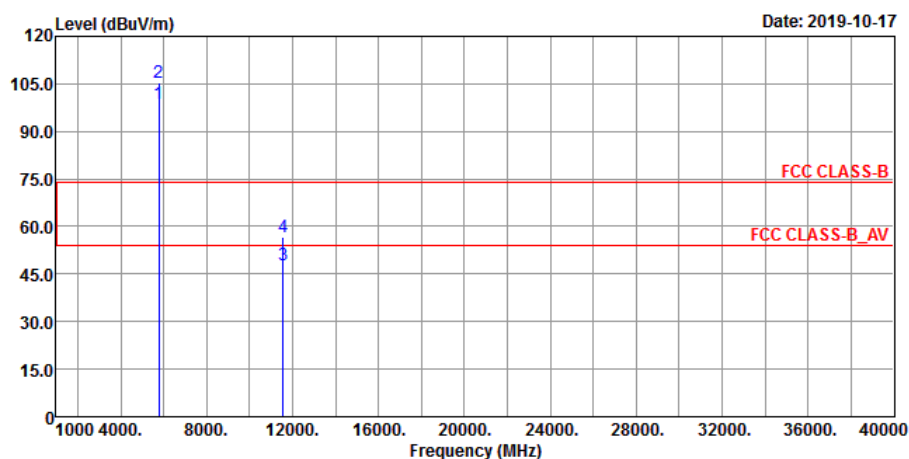
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5616.975	50.78	48.88	1.9	68.2	-17.42	176	123	Peak
5658.775	50.13	48.28	1.85	74.72	-24.59	176	123	Peak
5919.55	50.53	48.22	2.31	72.22	-21.69	176	123	Peak
5999.825	51.54	49.18	2.36	68.2	-16.66	176	123	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5602.25	51.64	49.71	1.93	68.2	-16.56	172	340	Peak
5654.975	49.71	47.86	1.85	71.9	-22.19	172	340	Peak
5920.025	50.95	48.64	2.31	71.87	-20.92	172	340	Peak
5973.7	50.89	48.56	2.33	68.2	-17.31	172	340	Peak

Remarks:

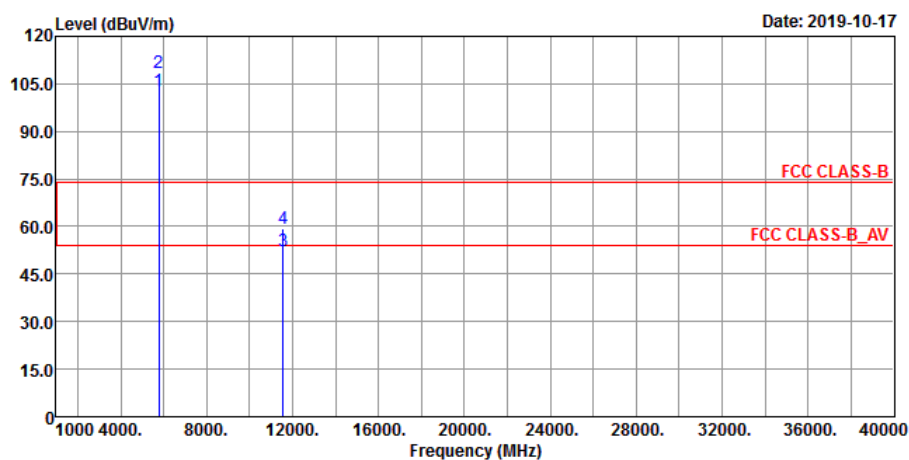
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5745 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 157	Frequency Range	1 GHz ~ 40 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

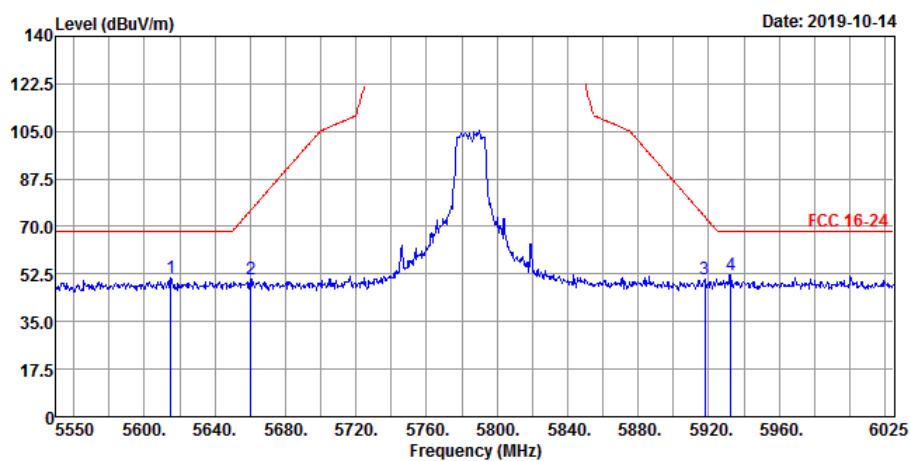
<Spurious Emission> Horizontal



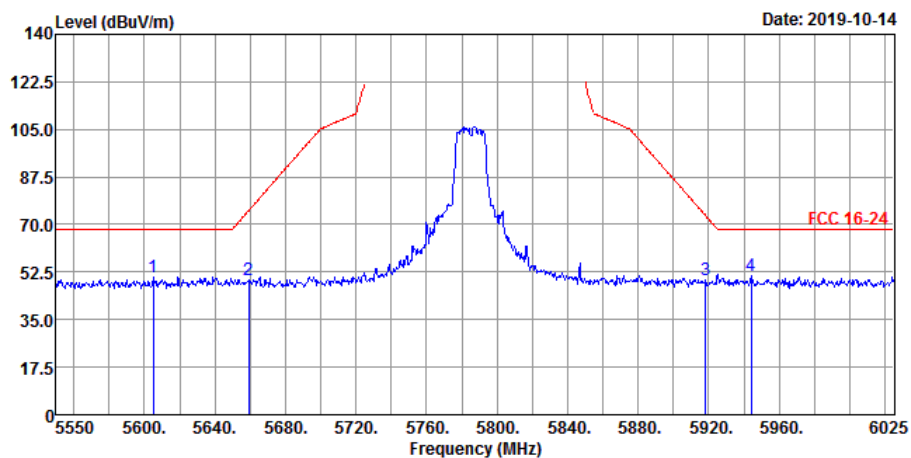
Vertical



<Out of Band Emission (OOBE)> Horizontal



Vertical



<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	98.95	97.03	1.92			175	120	Average
5785	105.49	103.57	1.92			175	120	Peak
11570	47.93	50.13	-2.2	54	-6.07	133	26	Average
11570	56.82	59.02	-2.2	74	-17.18	133	26	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	102.55	100.63	1.92			170	336	Average
5785	108.7	106.78	1.92			170	336	Peak
11570	52.46	54.66	-2.2	54	-1.54	200	360	Average
11570	59.33	61.53	-2.2	74	-14.67	200	360	Peak

<Out of Band Emission (OOBE)>

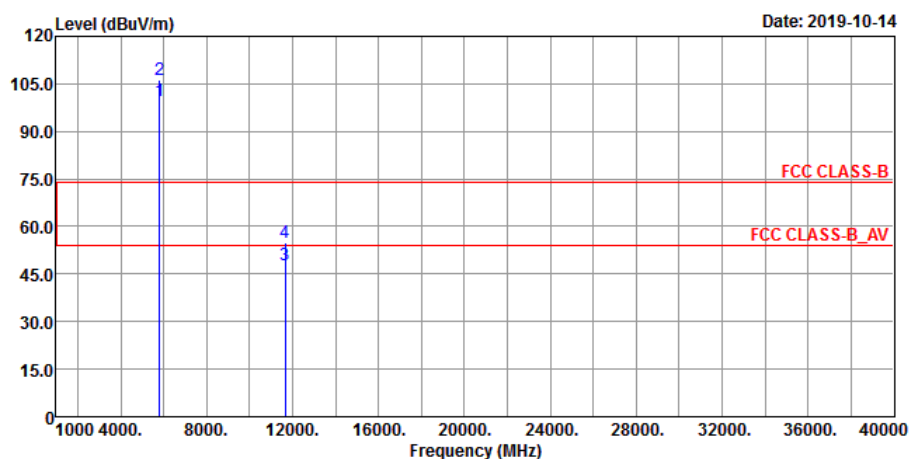
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5615.075	51.11	49.24	1.87	68.2	-17.09	175	120	Peak
5660.2	50.6	48.75	1.85	75.77	-25.17	175	120	Peak
5917.65	50.61	48.3	2.31	73.62	-23.01	175	120	Peak
5932.375	52.02	49.72	2.3	68.2	-16.18	175	120	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5605.1	50.79	48.92	1.87	68.2	-17.41	170	336	Peak
5659.25	49.65	47.8	1.85	75.07	-25.42	170	336	Peak
5918.125	49.84	47.53	2.31	73.27	-23.43	170	336	Peak
5944.25	51.25	48.96	2.29	68.2	-16.95	170	336	Peak

Remarks:

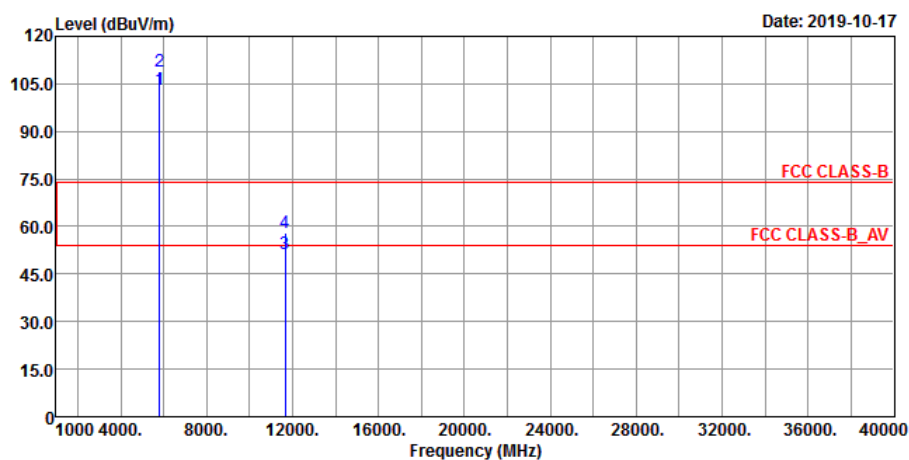
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5785 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 165	Frequency Range	1 GHz ~ 40 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

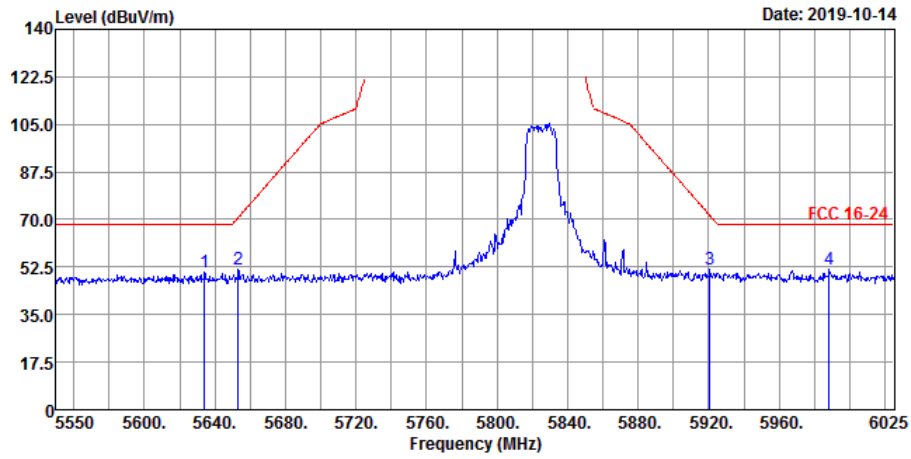
<Spurious Emission> Horizontal



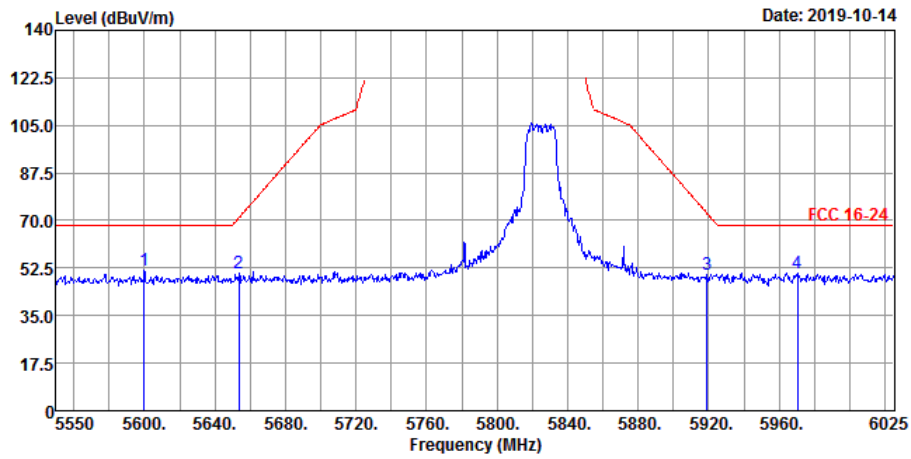
Vertical



<Out of Band Emission (OOBE)> Horizontal



Vertical



<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	99.78	97.7	2.08			174	120	Average
5825	106.35	104.27	2.08			174	120	Peak
11650	47.81	50.2	-2.39	54	-6.19	195	241	Average
11650	54.85	57.24	-2.39	74	-19.15	195	241	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	102.96	100.88	2.08			150	351	Average
5825	108.74	106.66	2.08			150	351	Peak
11650	51.51	53.9	-2.39	54	-2.49	200	11	Average
11650	57.99	60.38	-2.39	74	-16.01	200	11	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5634.075	50.4	48.52	1.88	68.2	-17.8	174	120	Peak
5653.075	51.63	49.72	1.91	70.49	-18.86	174	120	Peak
5920.5	51.57	49.26	2.31	71.52	-19.95	174	120	Peak
5988.425	51.47	49.14	2.33	68.2	-16.73	174	120	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5599.875	51.53	49.6	1.93	68.2	-16.67	150	351	Peak
5653.55	50.55	48.64	1.91	70.84	-20.29	150	351	Peak
5919.075	50.31	48	2.31	72.57	-22.26	150	351	Peak
5970.375	50.41	48.11	2.3	68.2	-17.79	150	351	Peak

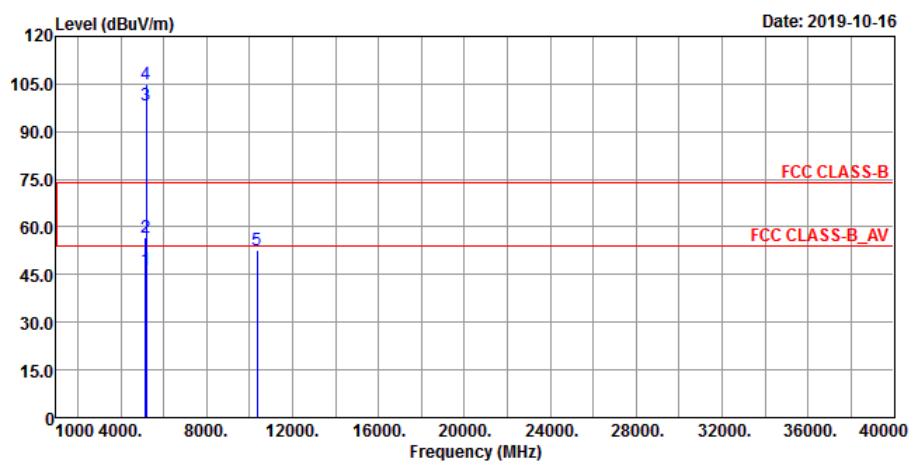
Remarks:

1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

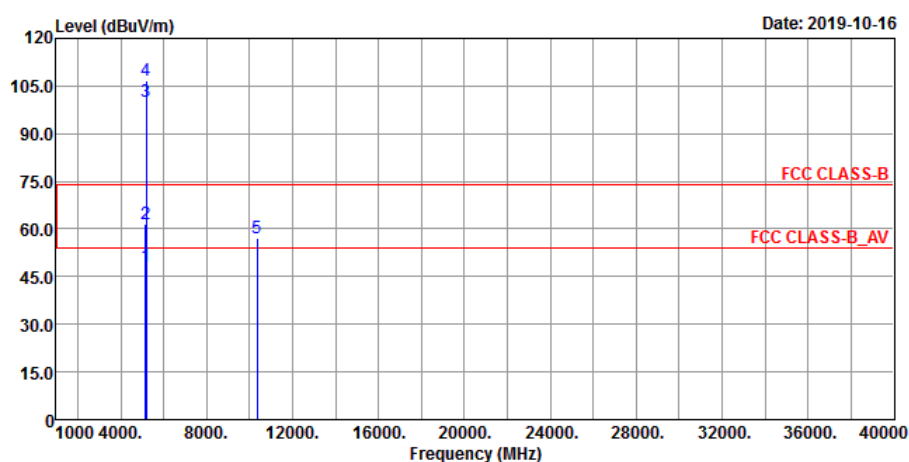
802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 36	Frequency Range	1 GHz ~ 40 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



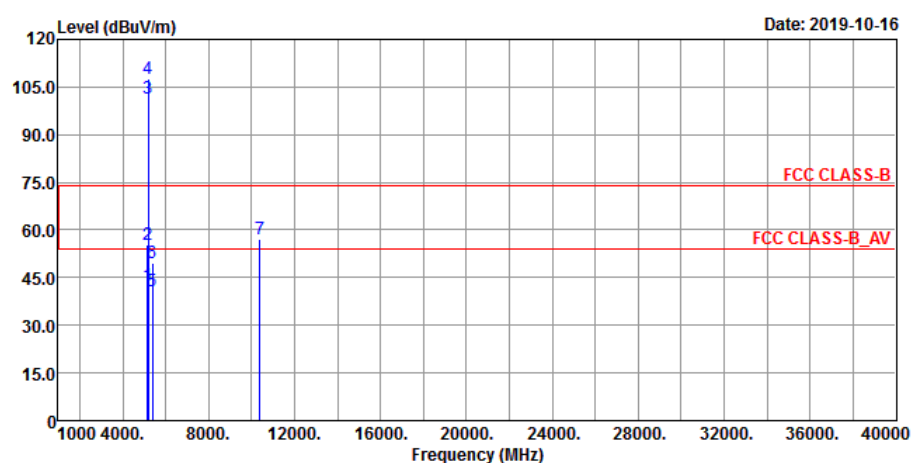
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.68	46.69	45.16	1.53	54	-7.31	151	97	Average
5148.68	56.52	54.99	1.53	74	-17.48	151	97	Peak
5180	98.17	96.64	1.53			151	97	Average
5180	104.8	103.27	1.53			151	97	Peak
*10360	52.87	55.71	-2.84	68.2	-15.33	100	33	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.32	48.34	46.81	1.53	54	-5.66	197	344	Average
5148.32	61.65	60.12	1.53	74	-12.35	197	344	Peak
5180	100.06	98.53	1.53			197	344	Average
5180	106.81	105.28	1.53			197	344	Peak
*10360	57.16	60	-2.84	68.2	-11.04	110	0	Peak

Remarks:

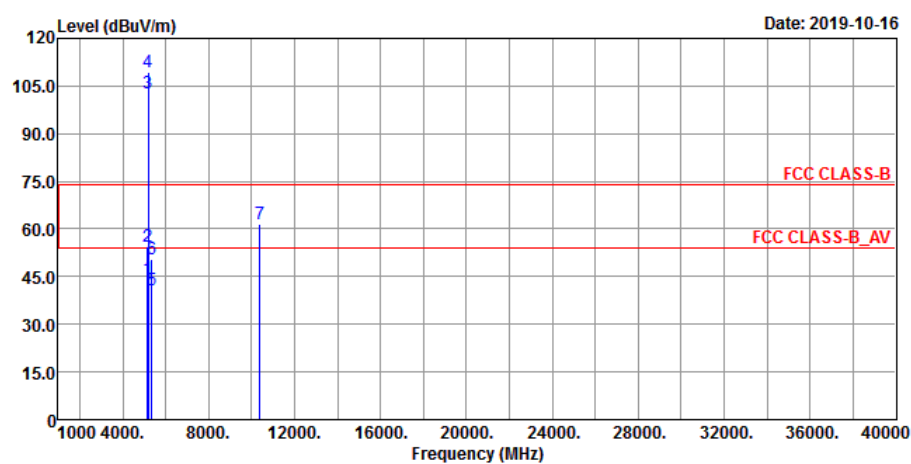
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5180 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 40	Frequency Range	1 GHz ~ 40 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



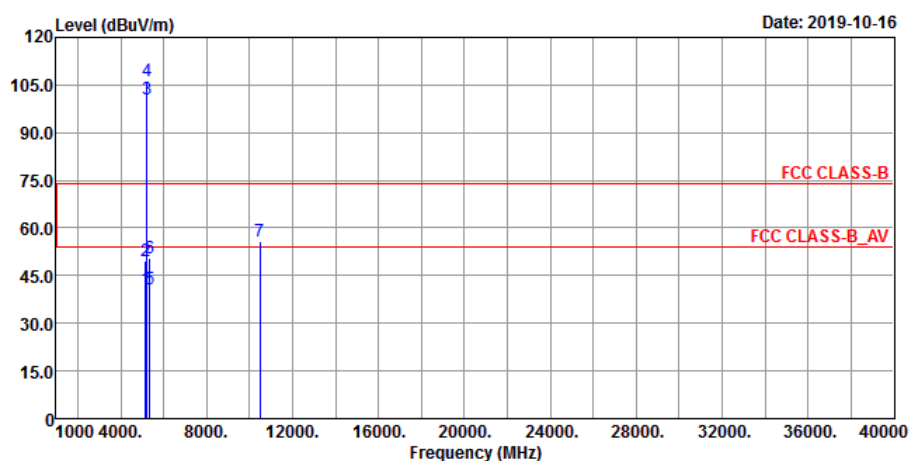
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.58	42.35	40.82	1.53	54	-11.65	145	99	Average
5149.58	55.2	53.67	1.53	74	-18.8	145	99	Peak
5200	101.51	99.98	1.53			145	99	Average
5200	107.67	106.14	1.53			145	99	Peak
5382.23	40.6	39	1.6	54	-13.4	145	99	Average
5382.23	49.55	47.95	1.6	74	-24.45	145	99	Peak
*10400	57.03	59.92	-2.89	68.2	-11.17	100	28	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.86	44.07	42.54	1.53	54	-9.93	188	346	Average
5148.86	54.49	52.96	1.53	74	-19.51	188	346	Peak
5200	102.63	101.1	1.53			188	346	Average
5200	109.24	107.71	1.53			188	346	Peak
5352.97	40.66	39.2	1.46	54	-13.34	188	346	Average
5352.97	50.29	48.83	1.46	74	-23.71	188	346	Peak
*10400	61.69	64.58	-2.89	68.2	-6.51	110	360	Peak

Remarks:

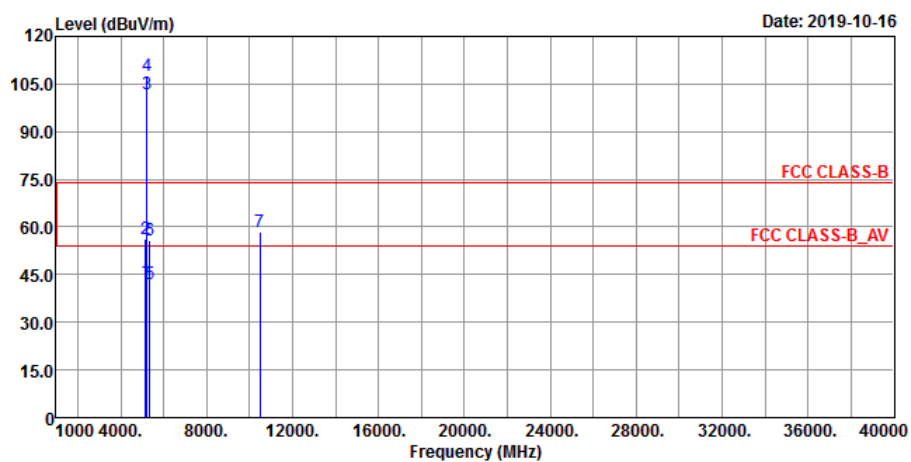
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5200 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 48	Frequency Range	1 GHz ~ 40 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



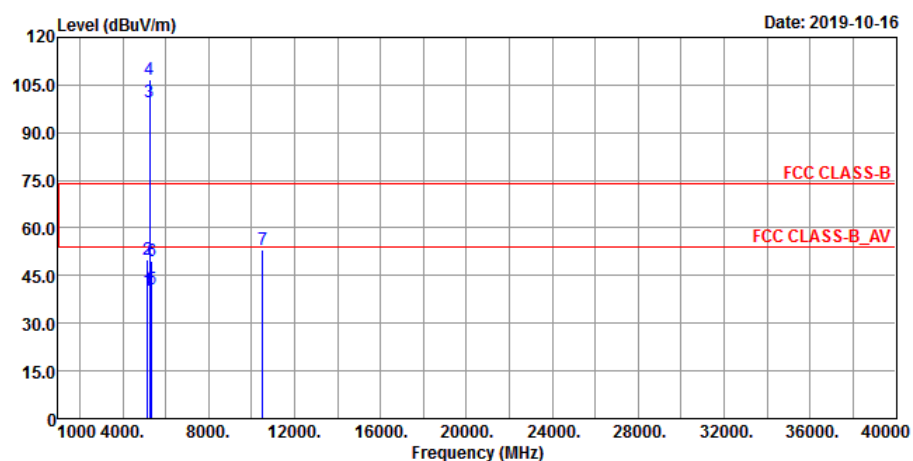
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5143.82	40.59	39.06	1.53	54	-13.41	144	84	Average
5143.82	49.41	47.88	1.53	74	-24.59	144	84	Peak
5240	100.44	99.06	1.38			144	84	Average
5240	106.07	104.69	1.38			144	84	Peak
5369.91	40.57	39.04	1.53	54	-13.43	144	84	Average
5369.91	50.47	48.94	1.53	74	-23.53	144	84	Peak
*10480	55.72	58.45	-2.73	68.2	-12.48	100	30	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.58	42.85	41.32	1.53	54	-11.15	177	342	Average
5149.58	56.08	54.55	1.53	74	-17.92	177	342	Peak
5240	101.93	100.55	1.38			177	342	Average
5240	107.76	106.38	1.38			177	342	Peak
5351.1	42.2	40.74	1.46	54	-11.8	177	342	Average
5351.1	55.77	54.31	1.46	74	-18.23	177	342	Peak
*10480	58.31	61.04	-2.73	68.2	-9.89	100	0	Peak

Remarks:

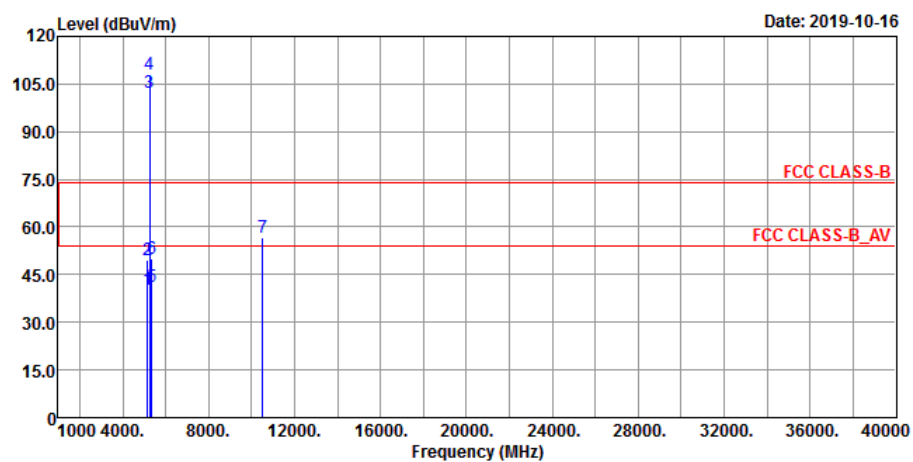
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5240 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 52	Frequency Range	1 GHz ~ 40 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



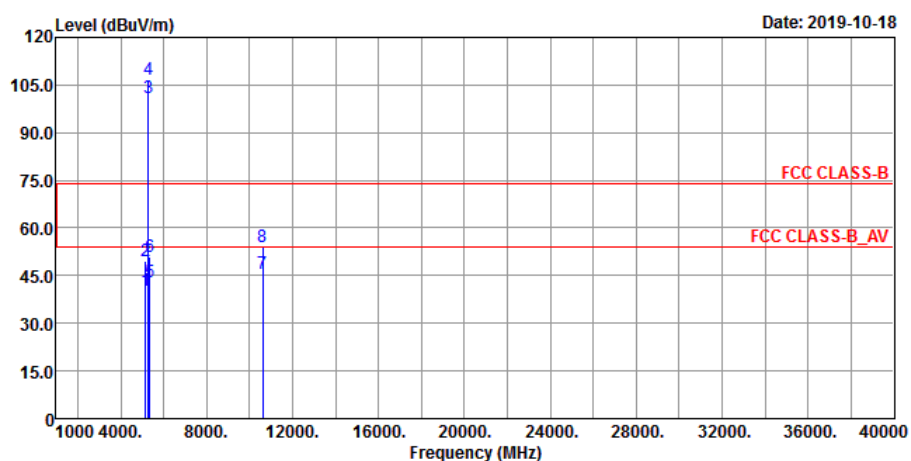
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5146.7	40.41	38.88	1.53	54	-13.59	148	94	Average
5146.7	50.09	48.56	1.53	74	-23.91	148	94	Peak
5260	99.5	98.19	1.31			148	94	Average
5260	106.88	105.57	1.31			148	94	Peak
5355.72	40.75	39.29	1.46	54	-13.25	148	94	Average
5355.72	49.79	48.33	1.46	74	-24.21	148	94	Peak
*10520	53.34	56.06	-2.72	68.2	-14.86	100	35	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.86	40.48	38.95	1.53	54	-13.52	192	343	Average
5148.86	49.38	47.85	1.53	74	-24.62	192	343	Peak
5260	102.1	100.79	1.31			192	343	Average
5260	108.01	106.7	1.31			192	343	Peak
5355.94	41.28	39.82	1.46	54	-12.72	192	343	Average
5355.94	50.22	48.76	1.46	74	-23.78	192	343	Peak
*10520	56.64	59.36	-2.72	68.2	-11.56	110	360	Peak

Remarks:

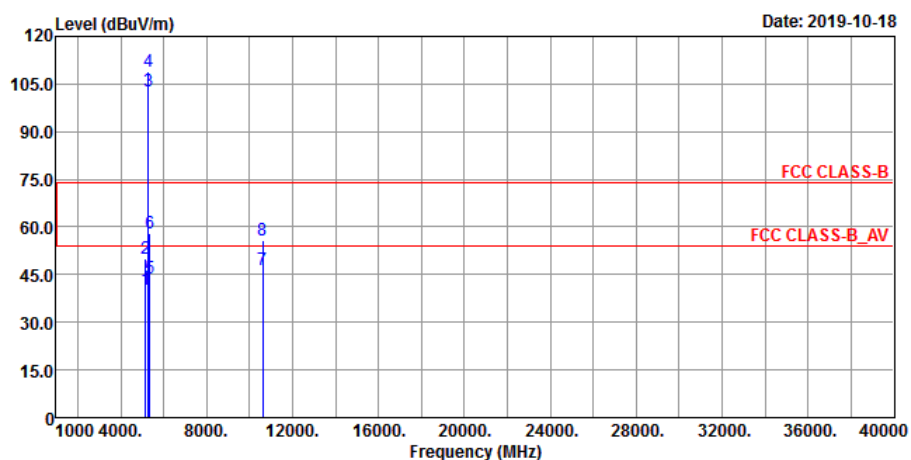
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5260 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 60	Frequency Range	1 GHz ~ 40 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



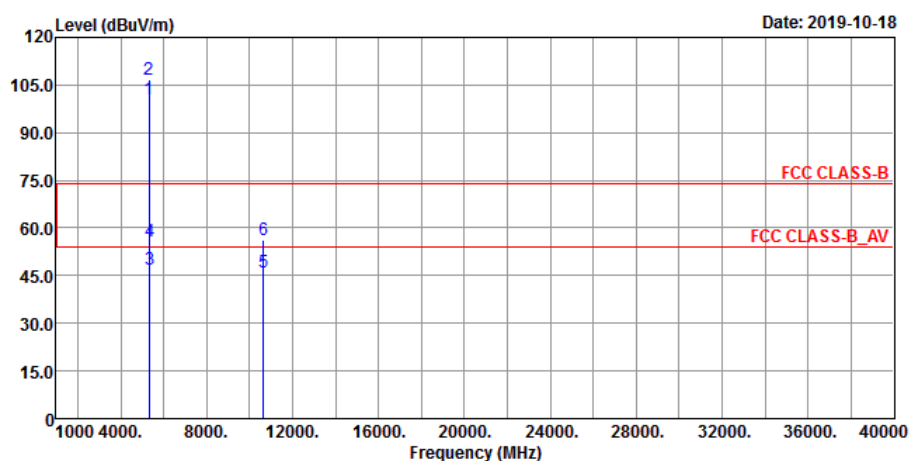
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5147.42	40.42	38.89	1.53	54	-13.58	137	87	Average
5147.42	49.53	48	1.53	74	-24.47	137	87	Peak
5300	101.16	99.85	1.31			137	87	Average
5300	106.64	105.33	1.31			137	87	Peak
5350	43.04	41.58	1.46	54	-10.96	137	87	Average
5350	50.99	49.53	1.46	74	-23.01	137	87	Peak
10600	45.41	48.32	-2.91	54	-8.59	101	33	Average
10600	54.09	57	-2.91	74	-19.91	101	33	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.58	40.5	38.97	1.53	54	-13.5	194	345	Average
5149.58	50.13	48.6	1.53	74	-23.87	194	345	Peak
5300	102.92	101.61	1.31			194	345	Average
5300	108.89	107.58	1.31			194	345	Peak
5350	43.92	42.46	1.46	54	-10.08	194	345	Average
5350	58.08	56.62	1.46	74	-15.92	194	345	Peak
10600	46.64	49.55	-2.91	54	-7.36	108	359	Average
10600	55.6	58.51	-2.91	74	-18.4	108	359	Peak

Remarks:

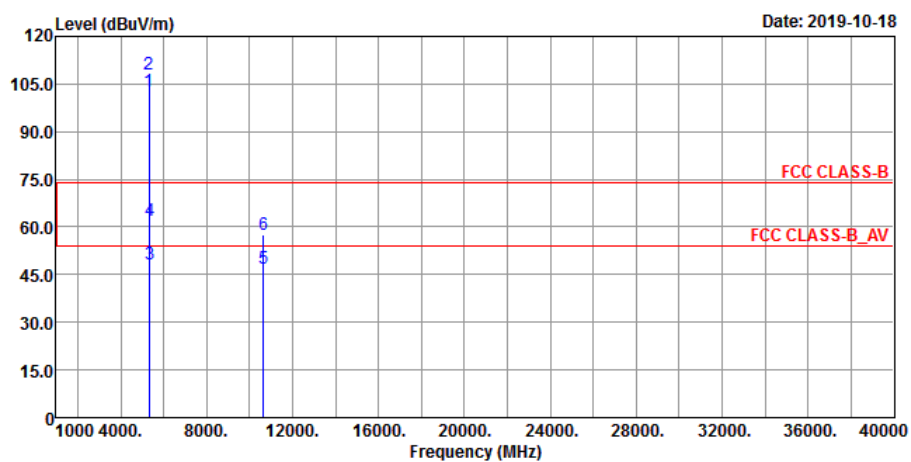
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5300 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 64	Frequency Range	1 GHz ~ 40 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



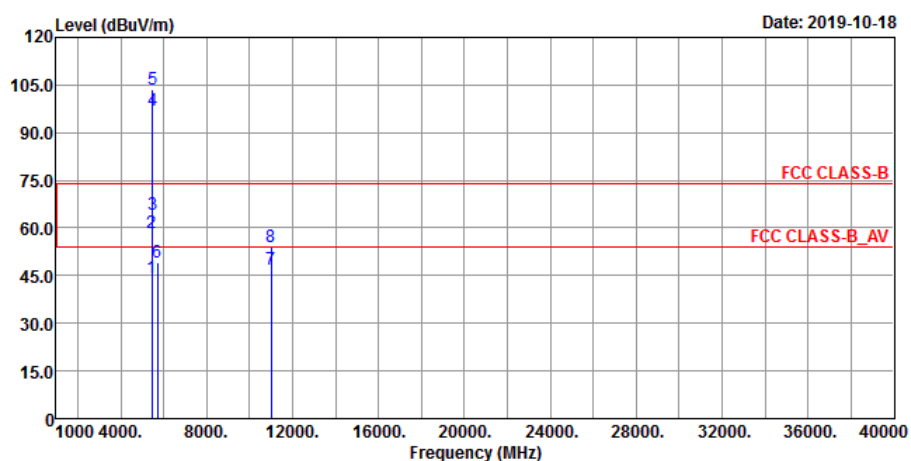
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5320	100.55	99.19	1.36			137	70	Average
5320	106.68	105.32	1.36			137	70	Peak
5351.65	47.05	45.59	1.46	54	-6.95	137	70	Average
5351.65	55.95	54.49	1.46	74	-18.05	137	70	Peak
10640	45.86	48.75	-2.89	54	-8.14	122	22	Average
10640	56.39	59.28	-2.89	74	-17.61	122	22	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5320	102.56	101.2	1.36			170	343	Average
5320	108.22	106.86	1.36			170	343	Peak
5350.22	48.34	46.88	1.46	54	-5.66	170	343	Average
5350.22	61.92	60.46	1.46	74	-12.08	170	343	Peak
10640	47.13	50.02	-2.89	54	-6.87	200	0	Average
10640	57.76	60.65	-2.89	74	-16.24	200	0	Peak

Remarks:

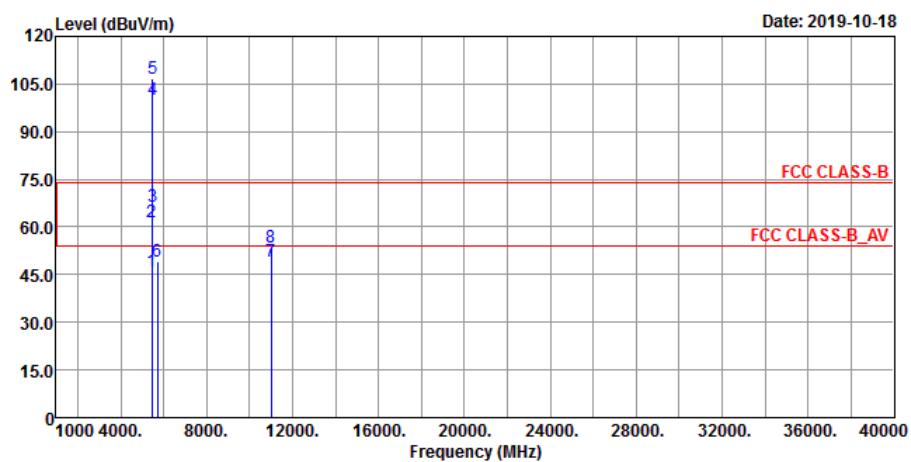
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5320 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 100	Frequency Range	1 GHz ~ 40 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



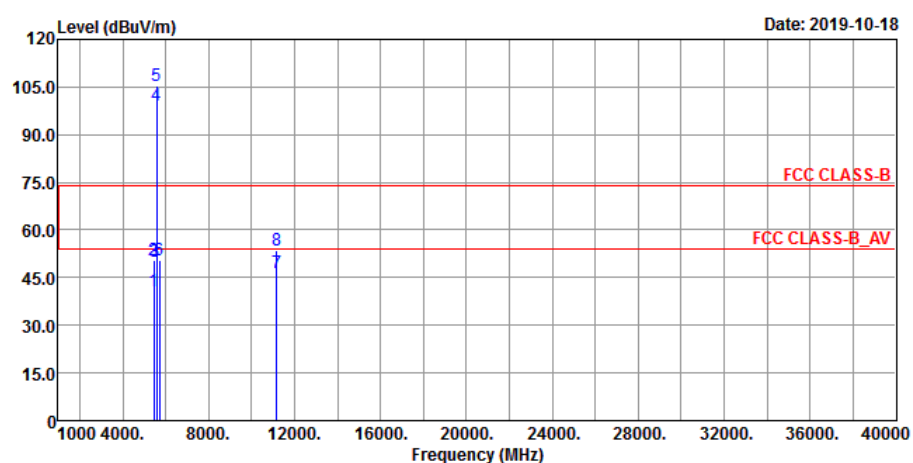
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5459.92	44.38	42.51	1.87	54	-9.62	180	84	Average
5459.92	58.31	56.44	1.87	74	-15.69	180	84	Peak
*5470	64.38	62.52	1.86	68.2	-3.82	180	84	Peak
5500	96.85	94.98	1.87			180	84	Average
5500	103.77	101.9	1.87			180	84	Peak
*5725	49.2	47.44	1.76	68.2	-19	180	84	Peak
11000	46.94	49.25	-2.31	54	-7.06	132	29	Average
11000	54.15	56.46	-2.31	74	-19.85	132	29	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5458.32	45.98	44.11	1.87	54	-8.02	188	339	Average
5458.32	61.56	59.69	1.87	74	-12.44	188	339	Peak
*5470	66.64	64.78	1.86	68.2	-1.56	188	339	Peak
5500	100.06	98.19	1.87			188	339	Average
5500	106.72	104.85	1.87			188	339	Peak
*5725	49.05	47.29	1.76	68.2	-19.15	188	339	Peak
11000	49.05	51.36	-2.31	54	-4.95	200	0	Average
11000	53.78	56.09	-2.31	74	-20.22	200	0	Peak

Remarks:

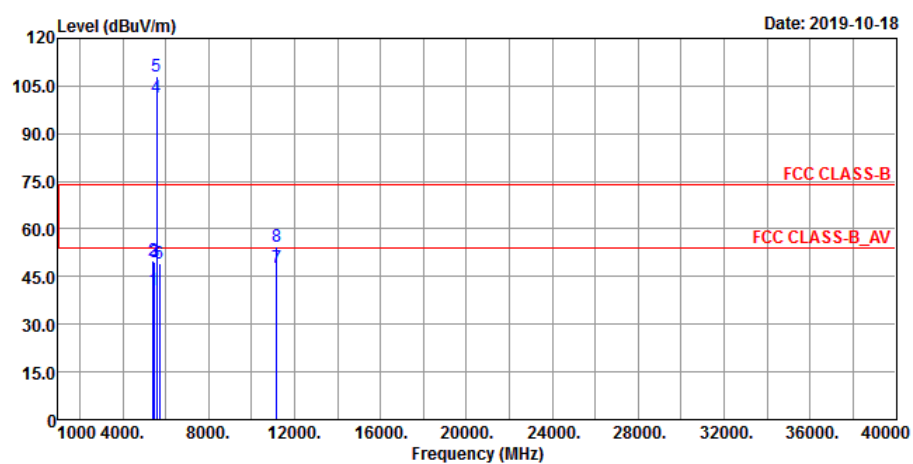
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5500 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 116	Frequency Range	1 GHz ~ 40 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



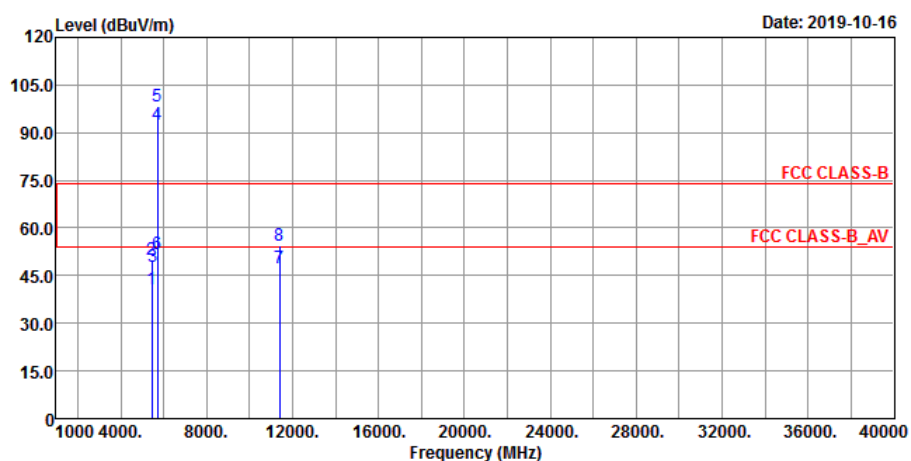
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5442.32	40.71	38.93	1.78	54	-13.29	160	67	Average
5442.32	50.45	48.67	1.78	74	-23.55	160	67	Peak
*5470	49.97	48.11	1.86	68.2	-18.23	160	67	Peak
5580	99.3	97.48	1.82			160	67	Average
5580	105.55	103.73	1.82			160	67	Peak
*5725	50.64	48.88	1.76	68.2	-17.56	160	67	Peak
11160	46.3	48.85	-2.55	54	-7.7	121	11	Average
11160	53.41	55.96	-2.55	74	-20.59	121	11	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5436.4	40.91	39.13	1.78	54	-13.09	188	340	Average
5436.4	49.85	48.07	1.78	74	-24.15	188	340	Peak
*5470	49.69	47.83	1.86	68.2	-18.51	188	340	Peak
5580	101.51	99.69	1.82			188	340	Average
5580	107.85	106.03	1.82			188	340	Peak
*5725	49.15	47.39	1.76	68.2	-19.05	188	340	Peak
11160	47.68	50.23	-2.55	54	-6.32	200	1	Average
11160	54.68	57.23	-2.55	74	-19.32	200	1	Peak

Remarks:

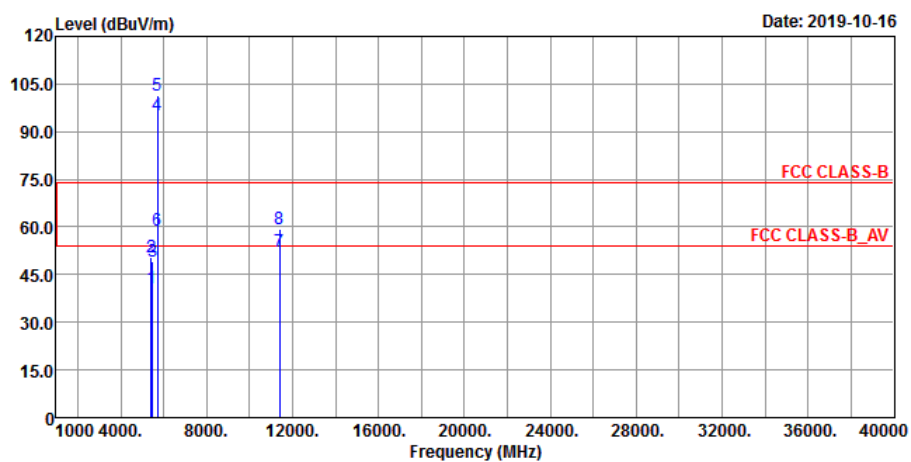
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5580 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 140	Frequency Range	1 GHz ~ 40 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



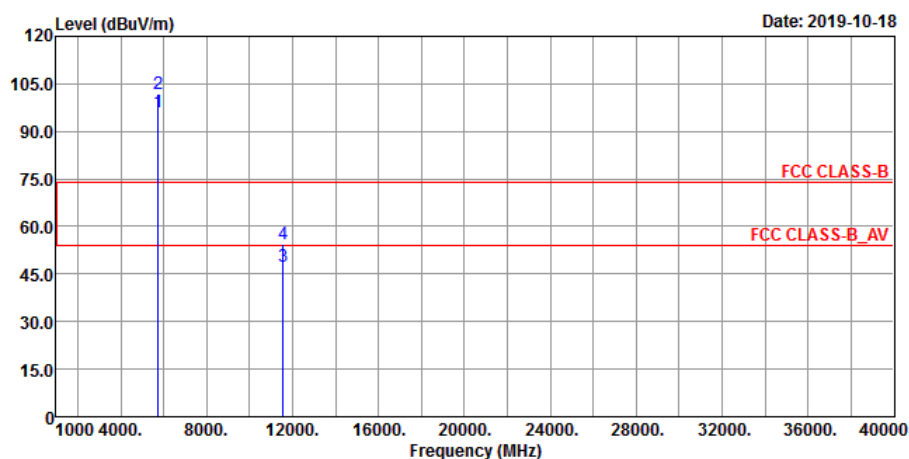
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5452.72	40.64	38.77	1.87	54	-13.36	192	78	Average
5452.72	50.1	48.23	1.87	74	-23.9	192	78	Peak
*5470	47.95	46.09	1.86	68.2	-20.25	192	78	Peak
5700	92.61	91.02	1.59			192	78	Average
5700	98.29	96.7	1.59			192	78	Peak
*5725	51.65	49.89	1.76	68.2	-16.55	192	78	Peak
11400	47.36	49.59	-2.23	54	-6.64	155	30	Average
11400	54.57	56.8	-2.23	74	-19.43	155	30	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5419.12	40.64	38.93	1.71	54	-13.36	188	340	Average
5419.12	50.61	48.9	1.71	74	-23.39	188	340	Peak
*5470	49.22	47.36	1.86	68.2	-18.98	188	340	Peak
5700	95.35	93.76	1.59			188	340	Average
5700	101.61	100.02	1.59			188	340	Peak
*5725	58.98	57.22	1.76	68.2	-9.22	188	340	Peak
11400	52.22	54.45	-2.23	54	-1.78	200	360	Average
11400	59.32	61.55	-2.23	74	-14.68	200	360	Peak

Remarks:

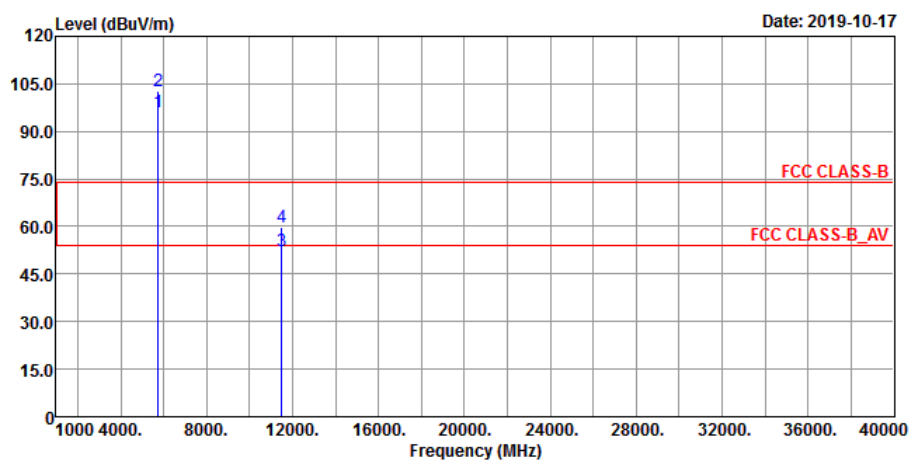
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5700 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 149	Frequency Range	1 GHz ~ 40 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

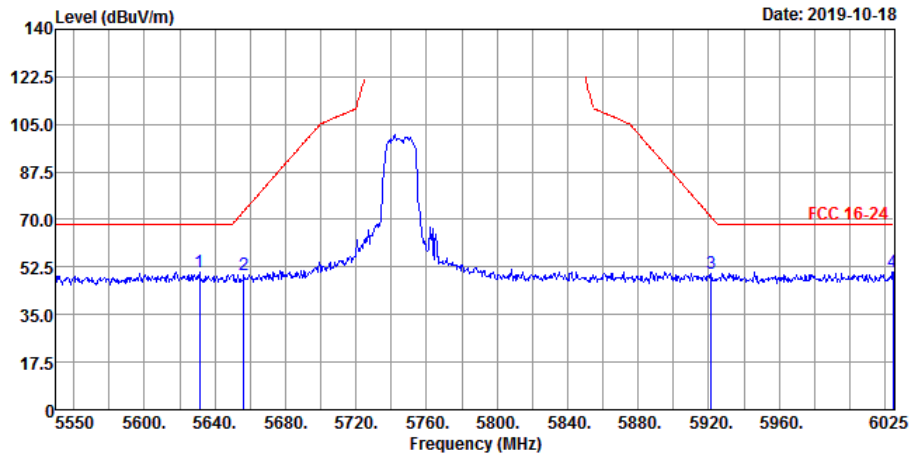
<Spurious Emission> Horizontal



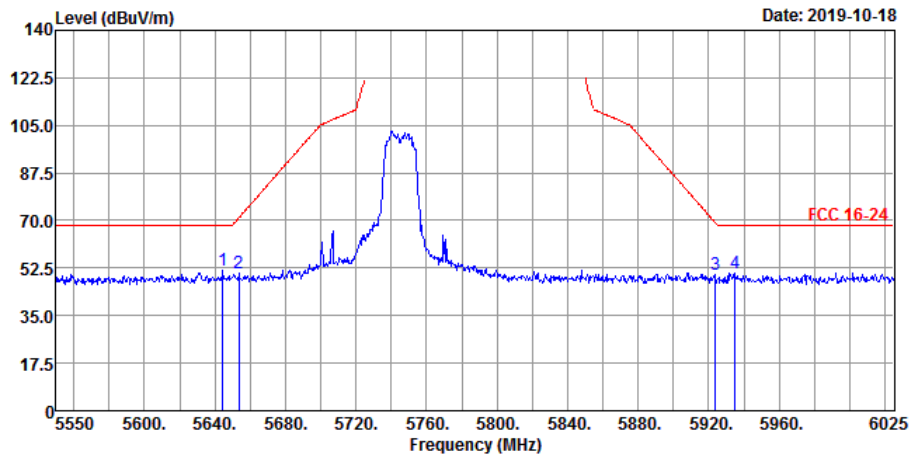
Vertical



<Out of Band Emission (OOBE)> Horizontal



Vertical



<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	95.95	94.13	1.82			180	84	Average
5745	101.84	100.02	1.82			180	84	Peak
11570	47.35	49.55	-2.2	54	-6.65	125	21	Average
11570	54.59	56.79	-2.2	74	-19.41	125	21	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	96.13	94.31	1.82			188	333	Average
5745	102.53	100.71	1.82			188	333	Peak
11490	52.43	54.63	-2.2	54	-1.57	200	0	Average
11490	59.82	62.02	-2.2	74	-14.18	200	0	Peak

<Out of Band Emission (OOBE)>

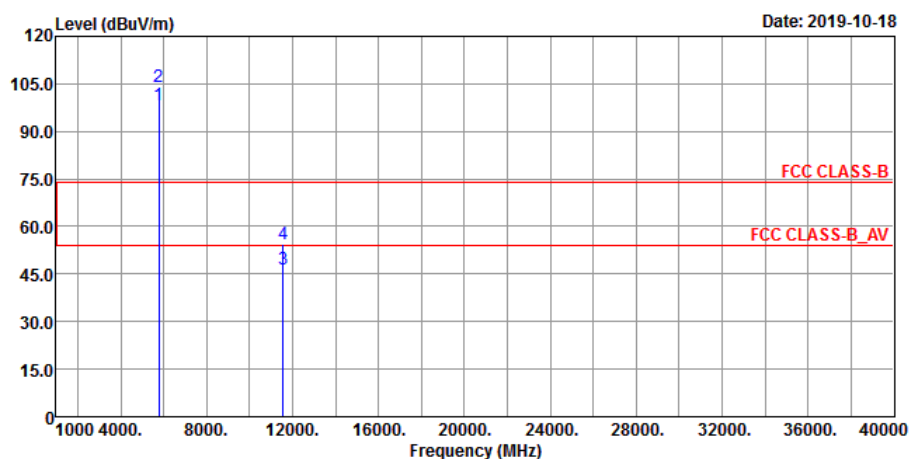
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5631.225	50.72	48.88	1.84	68.2	-17.48	180	84	Peak
5656.4	49.58	47.73	1.85	72.95	-23.37	180	84	Peak
5921.45	50.04	47.73	2.31	70.82	-20.78	180	84	Peak
6024.525	50.47	48.06	2.41	68.2	-17.73	180	84	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5644.525	51.46	49.58	1.88	68.2	-16.74	188	333	Peak
5653.55	50.85	48.94	1.91	70.84	-19.99	188	333	Peak
5923.825	50.19	47.89	2.3	69.07	-18.88	188	333	Peak
5934.75	50.67	48.37	2.3	68.2	-17.53	188	333	Peak

Remarks:

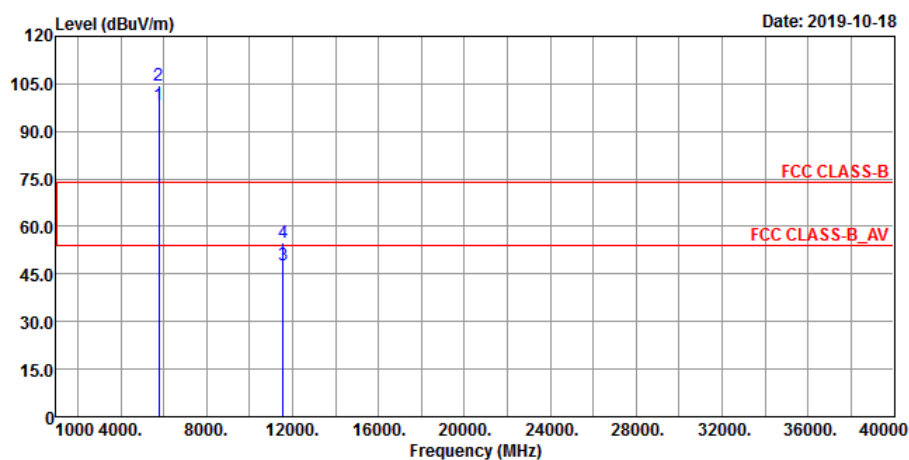
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5745 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 157	Frequency Range	1 GHz ~ 40 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

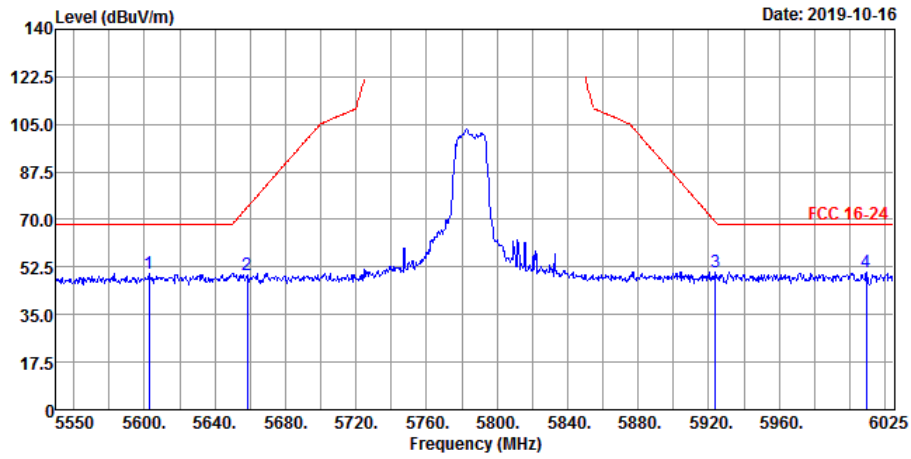
<Spurious Emission> Horizontal



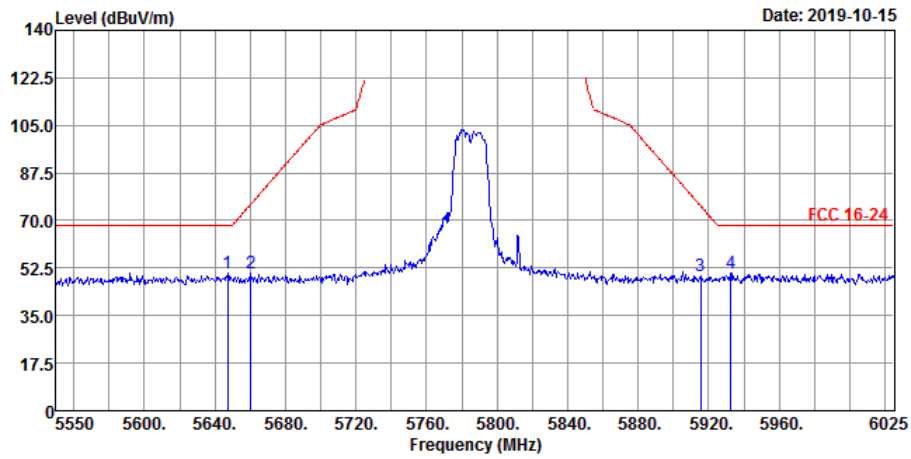
Vertical



<Out of Band Emission (OOBE)> Horizontal



Vertical



<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	98.1	96.18	1.92			176	87	Average
5785	103.97	102.05	1.92			176	87	Peak
11570	46.35	48.55	-2.2	54	-7.65	121	19	Average
11570	54.59	56.79	-2.2	74	-19.41	121	19	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	98.51	96.59	1.92			182	334	Average
5785	104.41	102.49	1.92			182	334	Peak
11570	48.02	50.22	-2.2	54	-5.98	200	0	Average
11570	55.11	57.31	-2.2	74	-18.89	200	0	Peak

<Out of Band Emission (OOBE)>

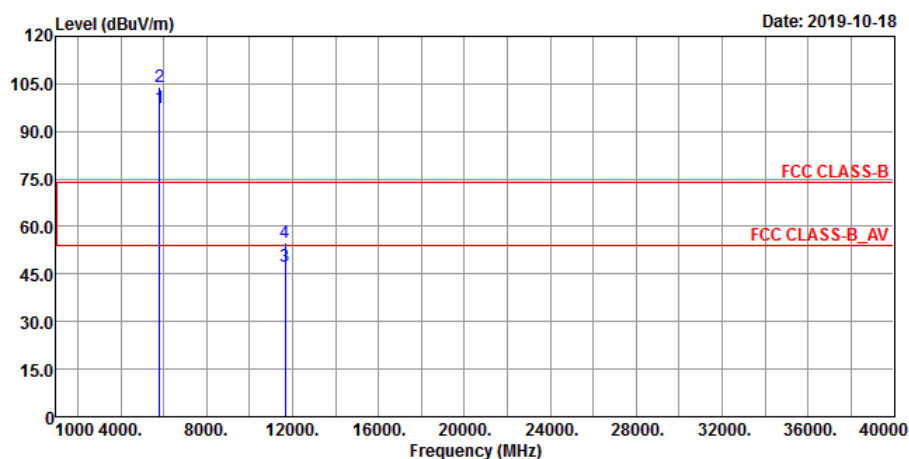
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5602.725	50.14	48.21	1.93	68.2	-18.06	176	87	Peak
5658.3	49.47	47.62	1.85	74.36	-24.89	176	87	Peak
5923.825	50.4	48.1	2.3	69.07	-18.67	176	87	Peak
6009.325	50.84	48.45	2.39	68.2	-17.36	176	87	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5647.375	50.44	48.56	1.88	68.2	-17.76	182	334	Peak
5660.2	50.83	48.98	1.85	75.77	-24.94	182	334	Peak
5915.275	49.59	47.28	2.31	75.37	-25.78	182	334	Peak
5932.375	50.56	48.26	2.3	68.2	-17.64	182	334	Peak

Remarks:

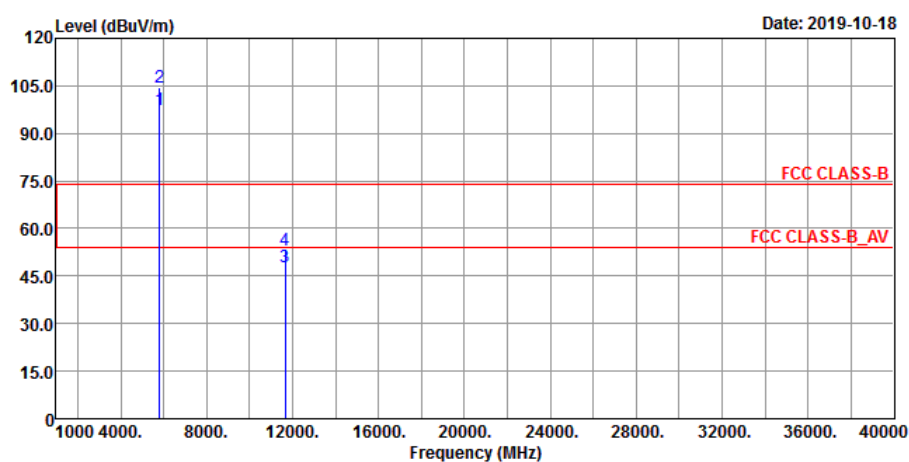
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 5785 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 165	Frequency Range	1 GHz ~ 40 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

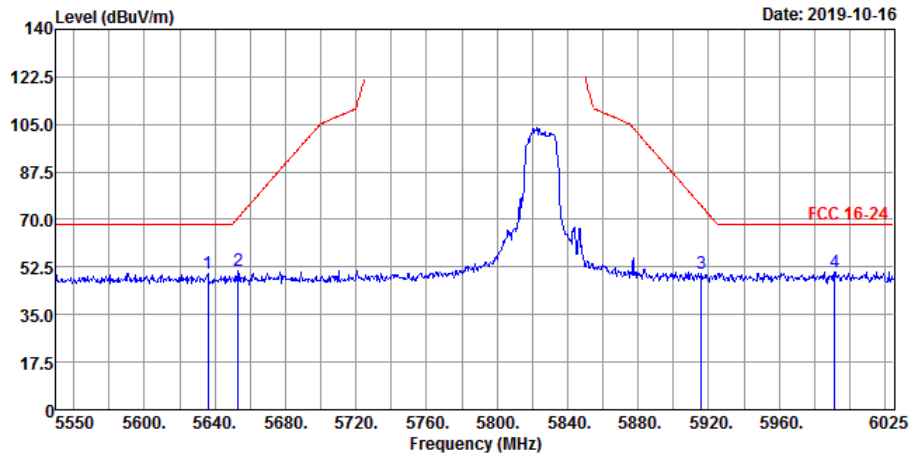
<Spurious Emission> Horizontal



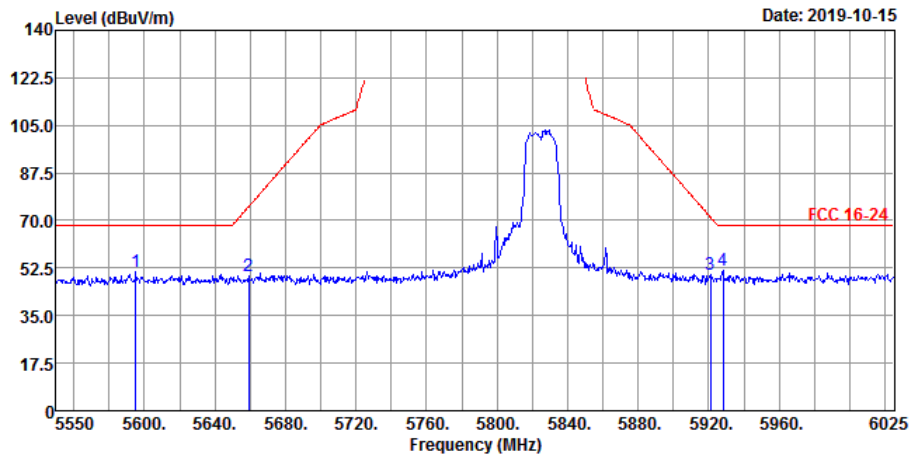
Vertical



<Out of Band Emission (OOBE)> Horizontal



Vertical



<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	97.6	95.52	2.08			181	101	Average
5825	104.26	102.18	2.08			181	101	Peak
11650	47.46	49.85	-2.39	54	-6.54	122	20	Average
11650	54.97	57.36	-2.39	74	-19.03	122	20	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	97.47	95.39	2.08			190	325	Average
5825	104.41	102.33	2.08			190	325	Peak
11650	47.82	50.21	-2.39	54	-6.18	200	360	Average
11650	53.33	55.72	-2.39	74	-20.67	200	360	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5635.975	50.35	48.47	1.88	68.2	-17.85	181	101	Peak
5653.075	51.29	49.38	1.91	70.49	-19.2	181	101	Peak
5915.75	50.07	47.76	2.31	75.02	-24.95	181	101	Peak
5991.275	50.81	48.45	2.36	68.2	-17.39	181	101	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5595.125	50.91	49.04	1.87	68.2	-17.29	190	325	Peak
5659.25	49.66	47.81	1.85	75.07	-25.41	190	325	Peak
5920.975	50.21	47.9	2.31	71.17	-20.96	190	325	Peak
5928.1	51.6	49.3	2.3	68.2	-16.6	190	325	Peak

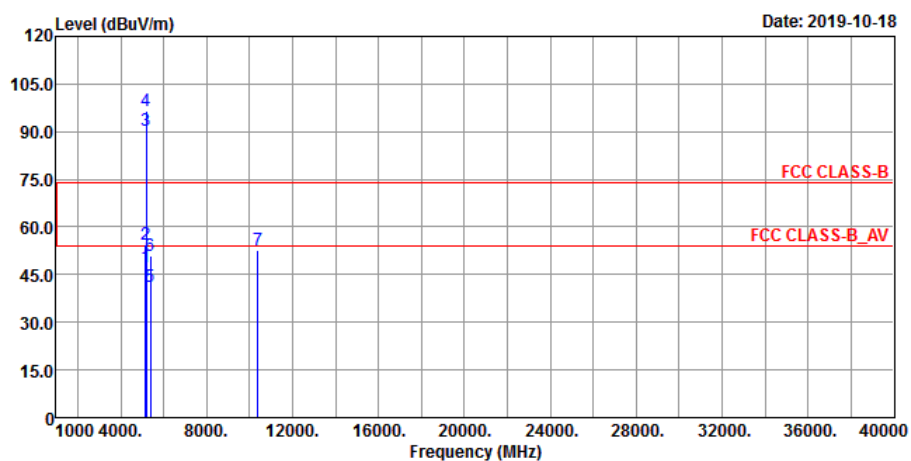
Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

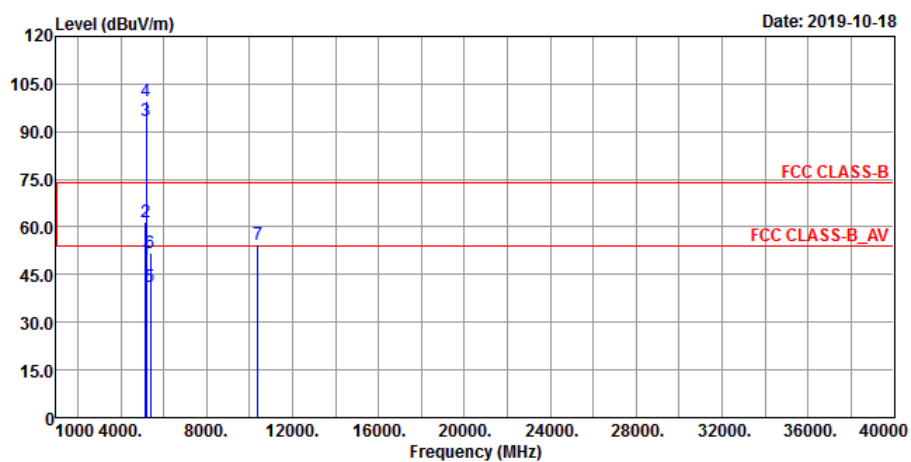
802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 38	Frequency Range	1 GHz ~ 40 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



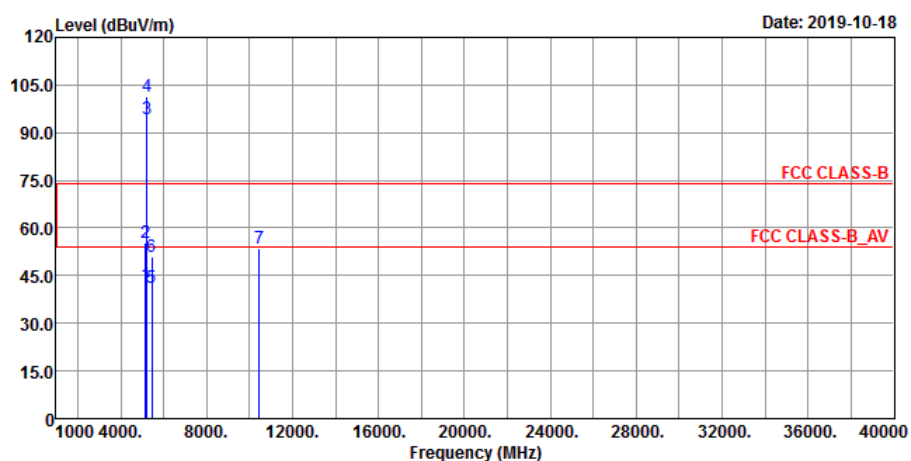
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.94	47.39	45.86	1.53	54	-6.61	200	102	Average
5149.94	54.61	53.08	1.53	74	-19.39	200	102	Peak
5190	90.51	88.98	1.53			200	102	Average
5190	96.65	95.12	1.53			200	102	Peak
5380.25	40.98	39.38	1.6	54	-13.02	200	102	Average
5380.25	50.81	49.21	1.6	74	-23.19	200	102	Peak
*10380	52.56	55.43	-2.87	68.2	-15.64	122	21	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.94	49.76	48.23	1.53	54	-4.24	200	344	Average
5149.94	61.34	59.81	1.53	74	-12.66	200	344	Peak
5190	93.44	91.91	1.53			200	344	Average
5190	99.54	98.01	1.53			200	344	Peak
5388.61	40.98	39.38	1.6	54	-13.02	200	344	Average
5388.61	51.62	50.02	1.6	74	-22.38	200	344	Peak
*10380	54.38	57.25	-2.87	68.2	-13.82	200	0	Peak

Remarks:

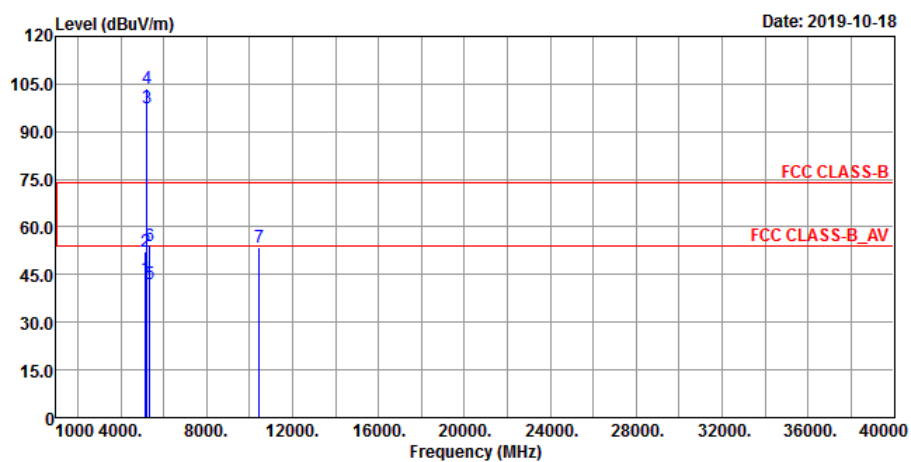
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5190 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 46	Frequency Range	1 GHz ~ 40 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



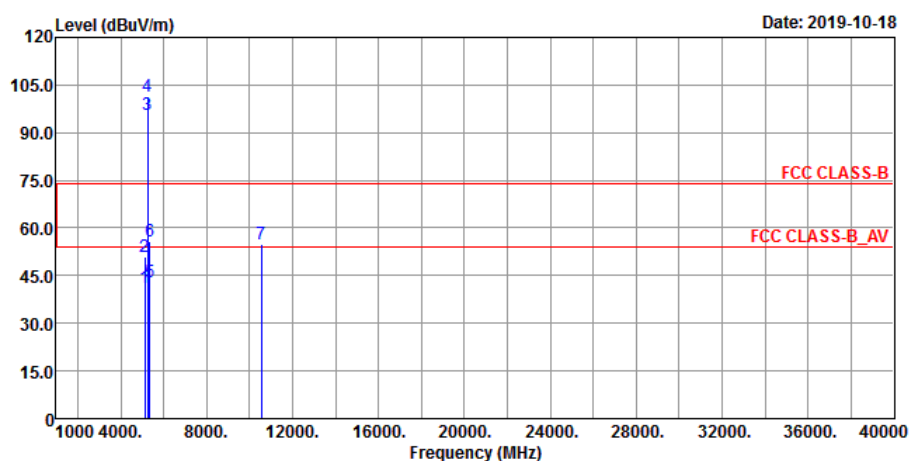
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5145.62	42.27	40.74	1.53	54	-11.73	200	105	Average
5145.62	55.41	53.88	1.53	74	-18.59	200	105	Peak
5230	94.53	93.15	1.38			200	105	Average
5230	101.3	99.92	1.38			200	105	Peak
5439.54	41.04	39.26	1.78	54	-12.96	200	105	Average
5439.54	51	49.22	1.78	74	-23	200	105	Peak
*10460	53.49	56.28	-2.79	68.2	-14.71	122	25	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.68	44.01	42.48	1.53	54	-9.99	203	346	Average
5148.68	52.23	50.7	1.53	74	-21.77	203	346	Peak
5230	97.51	96.13	1.38			203	346	Average
5230	103.64	102.26	1.38			203	346	Peak
5360.23	42.22	40.76	1.46	54	-11.78	203	346	Average
5360.23	53.84	52.38	1.46	74	-20.16	203	346	Peak
*10460	53.53	56.32	-2.79	68.2	-14.67	200	0	Peak

Remarks:

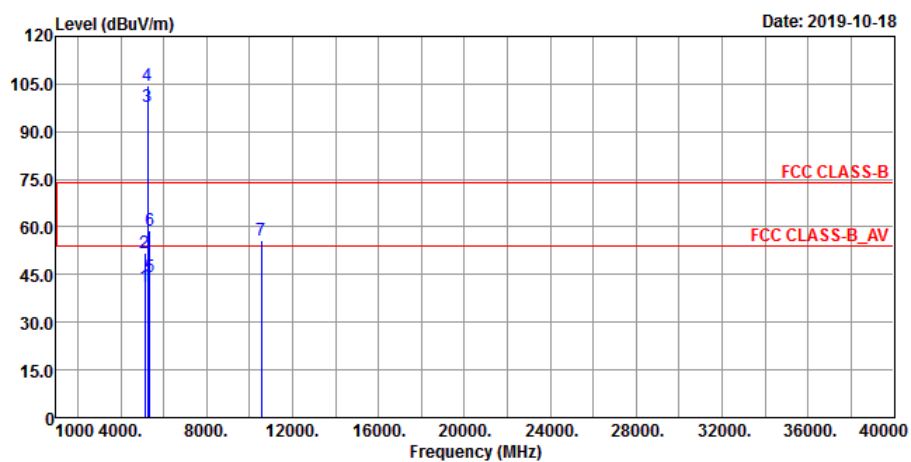
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5230 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 54	Frequency Range	1 GHz ~ 40 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



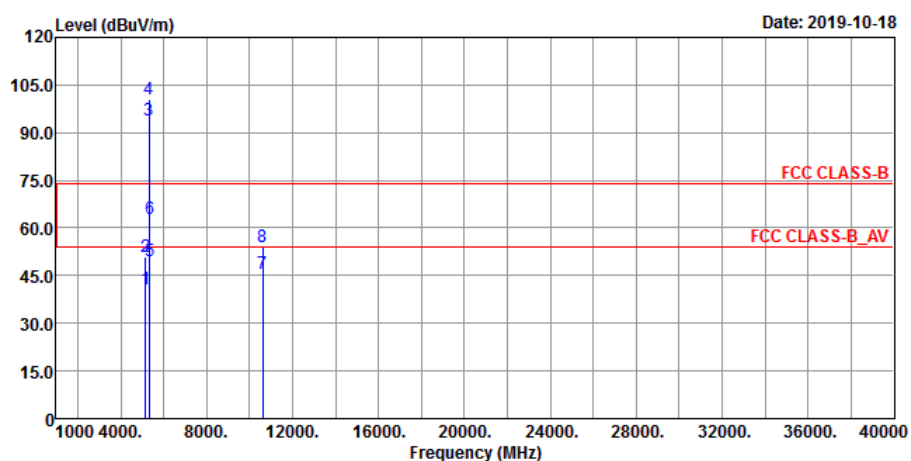
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5141.84	41.22	39.67	1.55	54	-12.78	181	103	Average
5141.84	50.92	49.37	1.55	74	-23.08	181	103	Peak
5270	95.45	94.14	1.31			181	103	Average
5270	101.42	100.11	1.31			181	103	Peak
5363.97	42.73	41.2	1.53	54	-11.27	181	103	Average
5363.97	55.91	54.38	1.53	74	-18.09	181	103	Peak
*10540	55.07	57.84	-2.77	68.2	-13.13	123	37	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5142.38	41.16	39.61	1.55	54	-12.84	188	348	Average
5142.38	51.94	50.39	1.55	74	-22.06	188	348	Peak
5270	97.82	96.51	1.31			188	348	Average
5270	104.4	103.09	1.31			188	348	Peak
5351.87	44.21	42.75	1.46	54	-9.79	188	348	Average
5351.87	58.75	57.29	1.46	74	-15.25	188	348	Peak
*10540	55.66	58.43	-2.77	68.2	-12.54	201	1	Peak

Remarks:

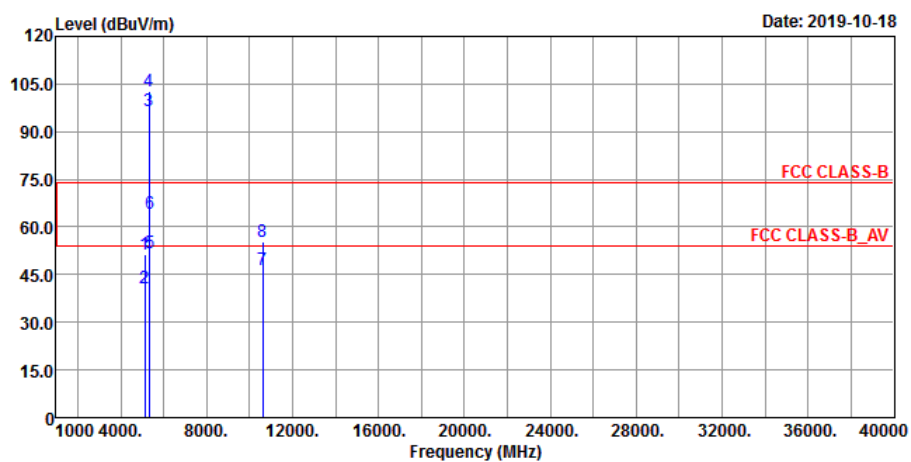
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5270 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 62	Frequency Range	1 GHz ~ 40 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



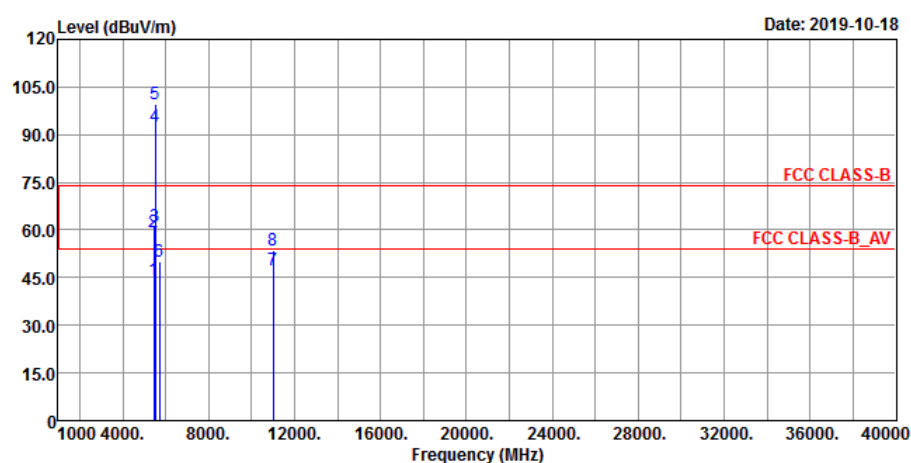
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5144.54	40.78	39.25	1.53	54	-13.22	175	101	Average
5144.54	51.07	49.54	1.53	74	-22.93	175	101	Peak
5310	93.95	92.59	1.36			175	101	Average
5310	100.35	98.99	1.36			175	101	Peak
5350.11	49.72	48.26	1.46	54	-4.28	175	101	Average
5350.11	63.1	61.64	1.46	74	-10.9	175	101	Peak
10620	45.46	48.35	-2.89	54	-8.54	111	36	Average
10620	54.15	57.04	-2.89	74	-19.85	111	36	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5131.22	51.53	50.04	1.49	74	-22.47	181	346	Peak
5131.22	40.94	39.45	1.49	54	-13.06	181	346	Average
5310	96.58	95.22	1.36			181	346	Average
5310	102.73	101.37	1.36			181	346	Peak
5355.5	51.63	50.17	1.46	54	-2.37	181	346	Average
5355.5	64.42	62.96	1.46	74	-9.58	181	346	Peak
10620	46.46	49.35	-2.89	54	-7.54	200	0	Average
10620	55.19	58.08	-2.89	74	-18.81	200	0	Peak

Remarks:

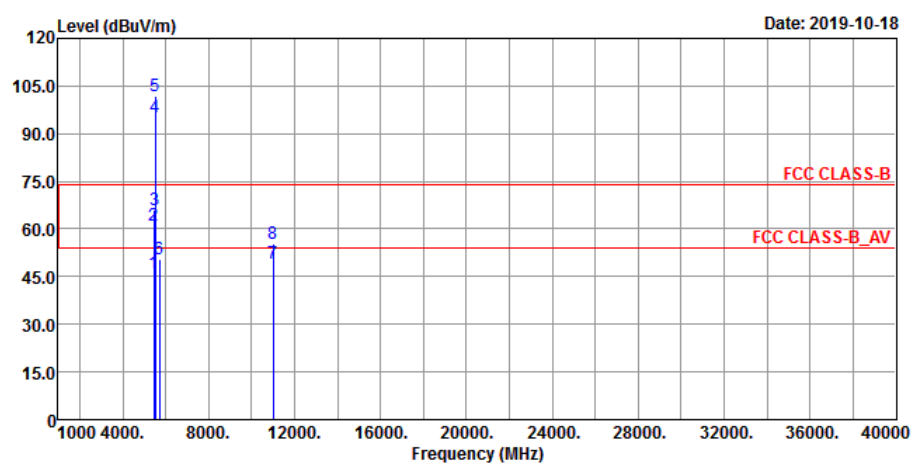
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5310 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 102	Frequency Range	1 GHz ~ 40 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



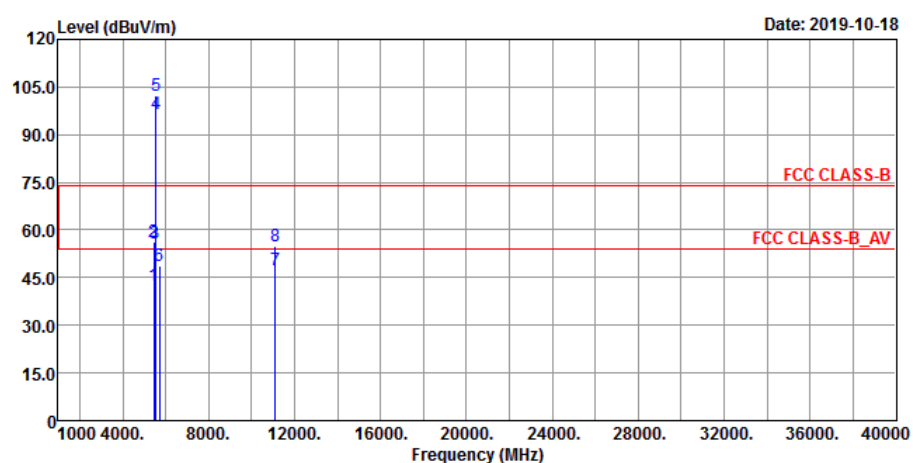
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5458.96	44.4	42.53	1.87	54	-9.6	177	98	Average
5458.96	59.18	57.31	1.87	74	-14.82	177	98	Peak
*5470	61.23	59.37	1.86	68.2	-6.97	177	98	Peak
5510	92.6	90.76	1.84			177	98	Average
5510	99.72	97.88	1.84			177	98	Peak
*5725	50.05	48.29	1.76	68.2	-18.15	177	98	Peak
11020	47.21	49.55	-2.34	54	-6.79	123	23	Average
11020	53.38	55.72	-2.34	74	-20.62	123	23	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5458.8	45.97	44.1	1.87	54	-8.03	182	344	Average
5458.8	61.1	59.23	1.87	74	-12.9	182	344	Peak
*5470	66.01	64.15	1.86	68.2	-2.19	182	344	Peak
5510	95.33	93.49	1.84			182	344	Average
5510	101.66	99.82	1.84			182	344	Peak
*5725	50.36	48.6	1.76	68.2	-17.84	182	344	Peak
11020	49.02	51.36	-2.34	54	-4.98	199	360	Average
11020	55.43	57.77	-2.34	74	-18.57	199	360	Peak

Remarks:

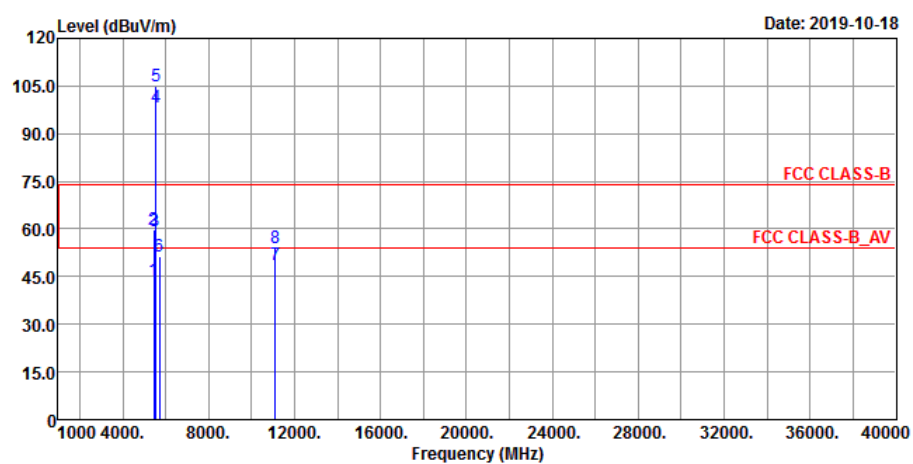
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5510 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 110	Frequency Range	1 GHz ~ 40 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



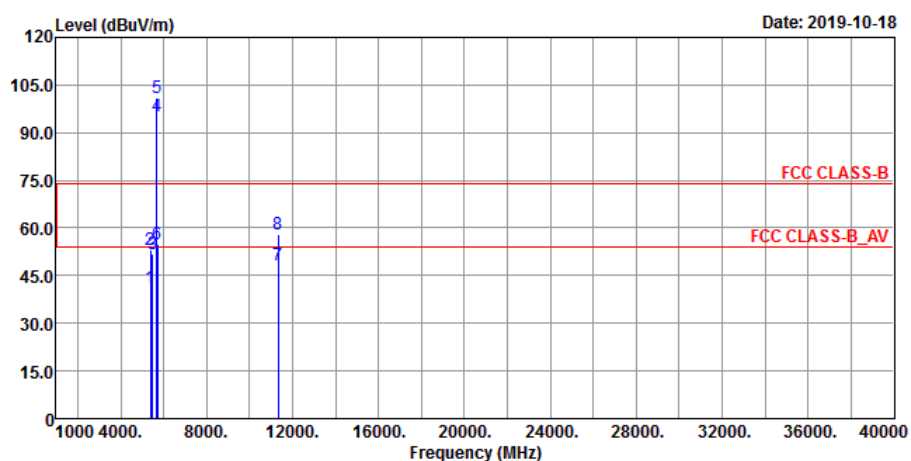
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5453.68	42.47	40.6	1.87	54	-11.53	187	105	Average
5453.68	56.18	54.31	1.87	74	-17.82	187	105	Peak
*5470	55.81	53.95	1.86	68.2	-12.39	187	105	Peak
5550	96.32	94.49	1.83			187	105	Average
5550	102.14	100.31	1.83			187	105	Peak
*5725	48.78	47.02	1.76	68.2	-19.42	187	105	Peak
11100	47.18	49.64	-2.46	54	-6.82	125	28	Average
11100	54.87	57.33	-2.46	74	-19.13	125	28	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5458.48	43.81	41.94	1.87	54	-10.19	190	345	Average
5458.48	59.6	57.73	1.87	74	-14.4	190	345	Peak
*5470	59.54	57.68	1.86	68.2	-8.66	190	345	Peak
5550	98.5	96.67	1.83			190	345	Average
5550	105.01	103.18	1.83			190	345	Peak
*5725	51.26	49.5	1.76	68.2	-16.94	190	345	Peak
11100	48.49	50.95	-2.46	54	-5.51	200	0	Average
11100	53.87	56.33	-2.46	74	-20.13	200	0	Peak

Remarks:

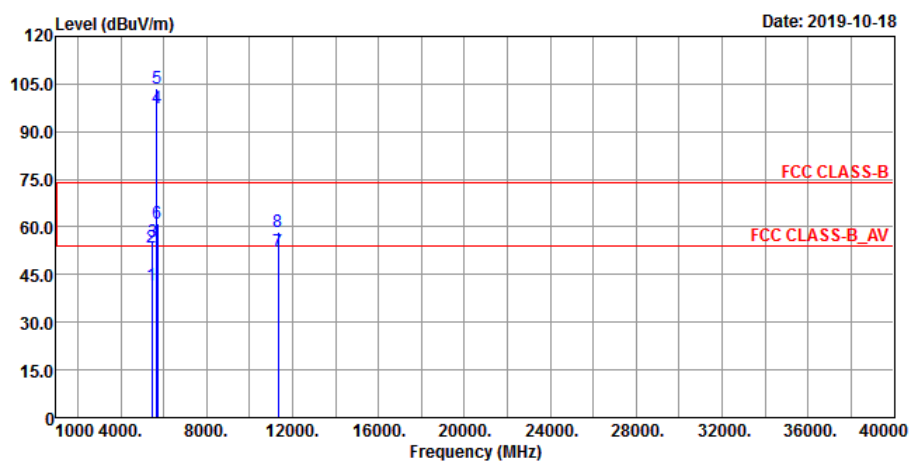
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5550 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 134	Frequency Range	1 GHz ~ 40 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



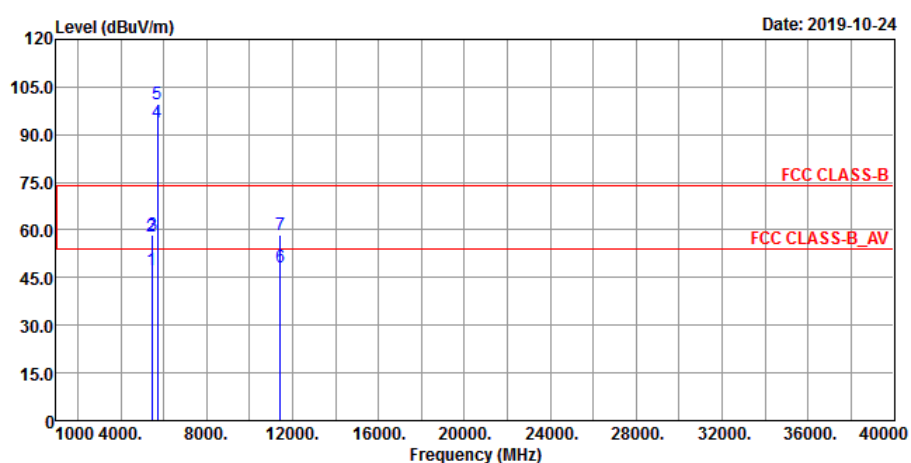
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5372.88	41.03	39.5	1.53	54	-12.97	173	98	Average
5372.88	53.08	51.55	1.53	74	-20.92	173	98	Peak
*5470	51.71	49.85	1.86	68.2	-16.49	173	98	Peak
5670	95.37	93.61	1.76			173	98	Average
5670	100.89	99.13	1.76			173	98	Peak
*5725	54.73	52.97	1.76	68.2	-13.47	173	98	Peak
11340	48.47	50.83	-2.36	54	-5.53	120	34	Average
11340	58.07	60.43	-2.36	74	-15.93	120	34	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5451.28	41.67	39.8	1.87	54	-12.33	184	327	Average
5451.28	53.53	51.66	1.87	74	-20.47	184	327	Peak
*5470	55.41	53.55	1.86	68.2	-12.79	184	327	Peak
5670	97.34	95.58	1.76			184	327	Average
5670	103.8	102.04	1.76			184	327	Peak
*5725	61.15	59.39	1.76	68.2	-7.05	184	327	Peak
11340	52.46	54.82	-2.36	54	-1.54	200	0	Average
11340	58.4	60.76	-2.36	74	-15.6	200	0	Peak

Remarks:

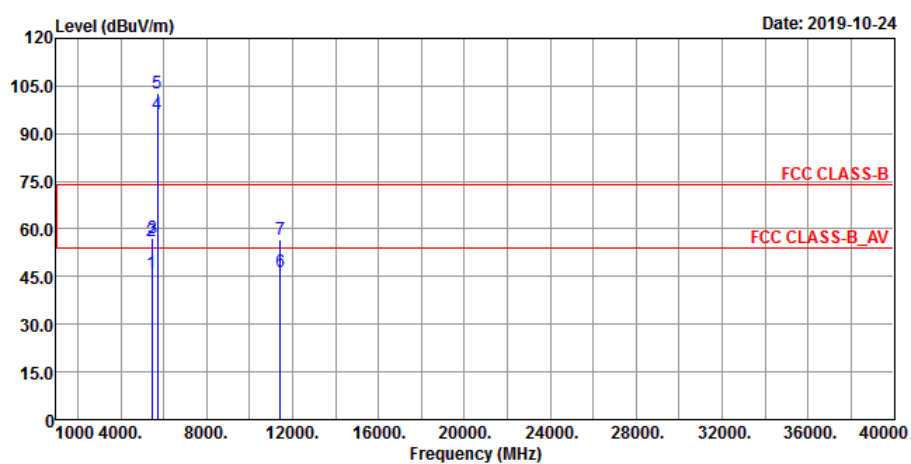
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5670 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 142	Frequency Range	1 GHz ~ 40 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



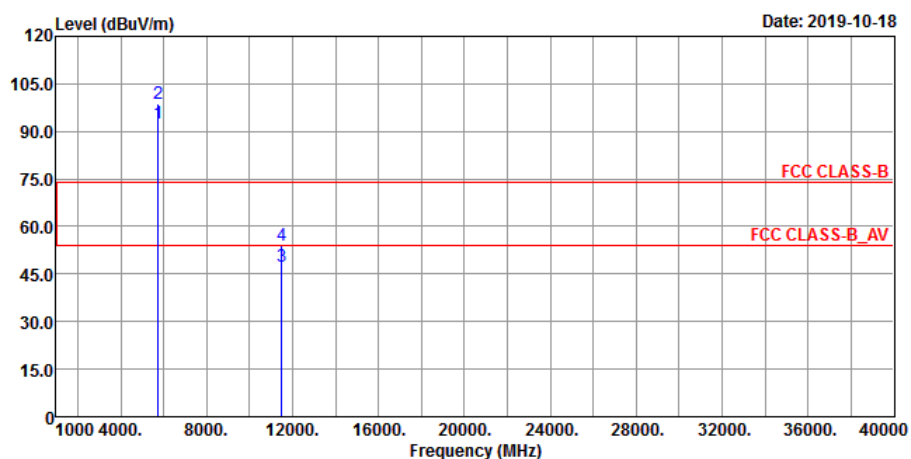
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	47.57	45.7	1.87	54	-6.43	119	41	Average
5460	57.92	56.05	1.87	74	-16.08	119	41	Peak
*5470	58.29	56.43	1.86	68.2	-9.91	119	41	Peak
5710	93.84	92.18	1.66			119	41	Average
5710	99.59	97.93	1.66			119	41	Peak
11420	48.43	50.67	-2.24	54	-5.57	147	195	Average
11420	58.39	60.63	-2.24	74	-15.61	147	195	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	45.87	44	1.87	54	-8.13	128	301	Average
5460	56.4	54.53	1.87	74	-17.6	128	301	Peak
*5470	56.99	55.13	1.86	68.2	-11.21	128	301	Peak
5710	96.27	94.61	1.66			128	300	Average
5710	102.59	100.93	1.66			128	300	Peak
11420	46.66	48.9	-2.24	54	-7.34	164	257	Average
11420	56.51	58.75	-2.24	74	-17.49	164	257	Peak

Remarks:

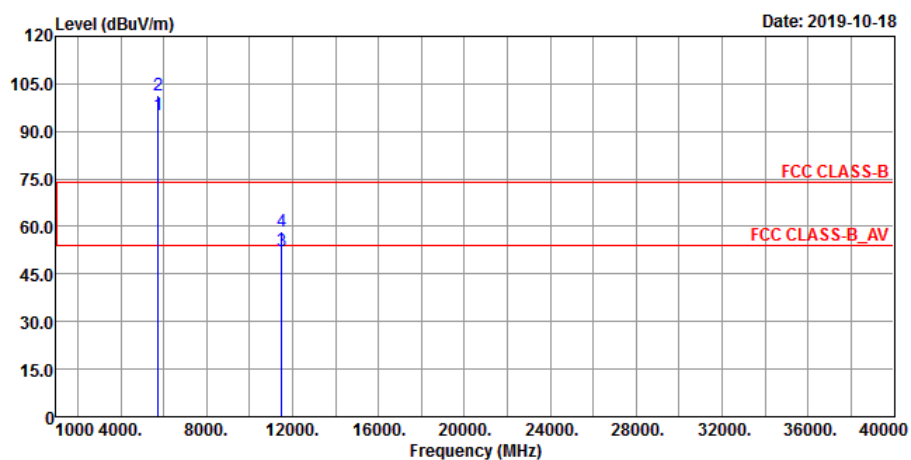
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5710 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 151	Frequency Range	1 GHz ~ 40 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

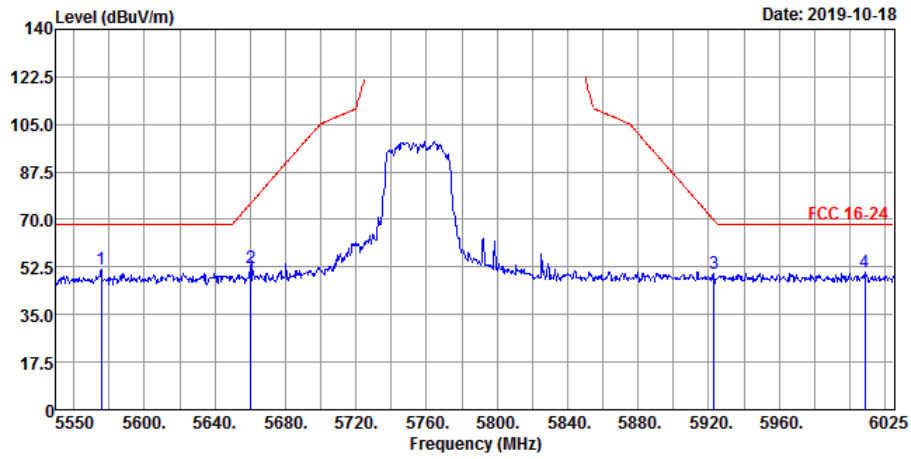
<Spurious Emission> Horizontal



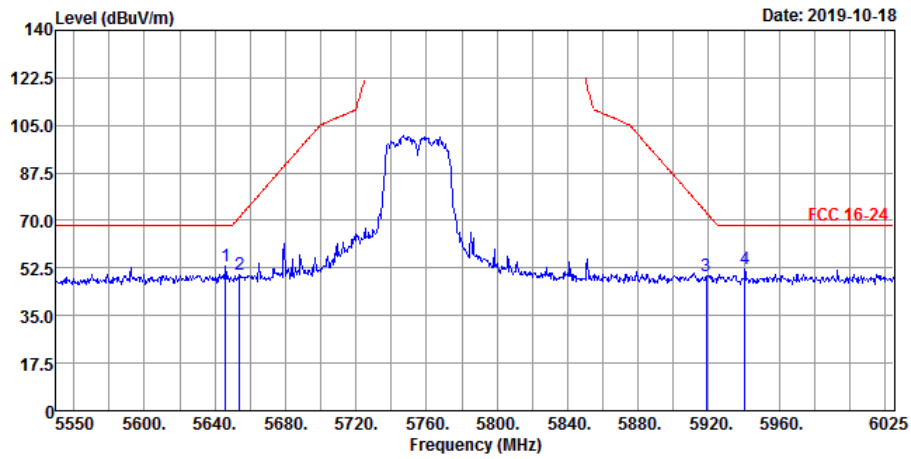
Vertical



<Out of Band Emission (OOBE)> Horizontal



Vertical



<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5755	92.59	90.69	1.9			140	108	Average
5755	98.82	96.92	1.9			140	108	Peak
11510	47.2	49.41	-2.21	54	-6.8	160	25	Average
11510	54.23	56.44	-2.21	74	-19.77	160	25	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5755	95.06	93.16	1.9			108	299	Average
5755	101.31	99.41	1.9			108	299	Peak
11510	52.05	54.26	-2.21	54	-1.95	200	0	Average
11510	58.41	60.62	-2.21	74	-15.59	200	0	Peak

<Out of Band Emission (OOBE)>

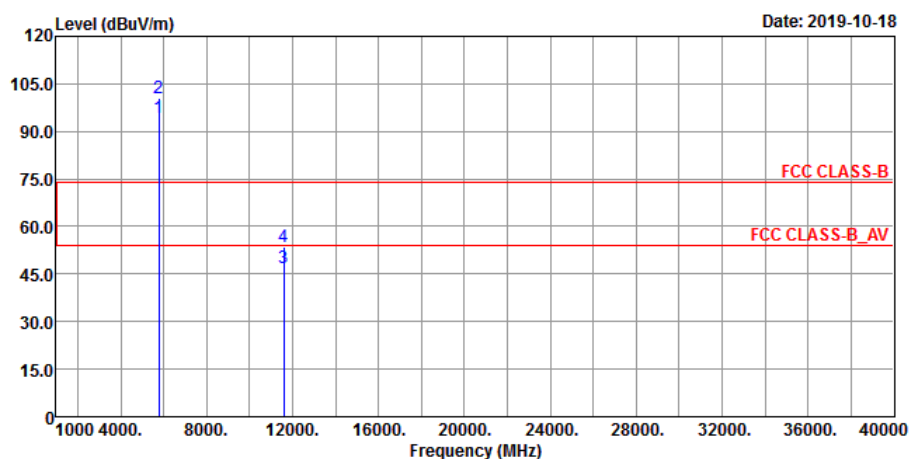
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5575.65	51.73	49.87	1.86	68.2	-16.47	140	108	Peak
5660.2	52.13	50.28	1.85	75.77	-23.64	140	108	Peak
5922.875	49.99	47.69	2.3	69.77	-19.78	140	108	Peak
6008.375	50.49	48.1	2.39	68.2	-17.71	140	108	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5645.95	53.01	51.13	1.88	68.2	-15.19	108	299	Peak
5654.025	50.28	48.43	1.85	71.19	-20.91	108	299	Peak
5918.6	49.78	47.47	2.31	72.92	-23.14	108	299	Peak
5940.45	52.01	49.72	2.29	68.2	-16.19	108	299	Peak

Remarks:

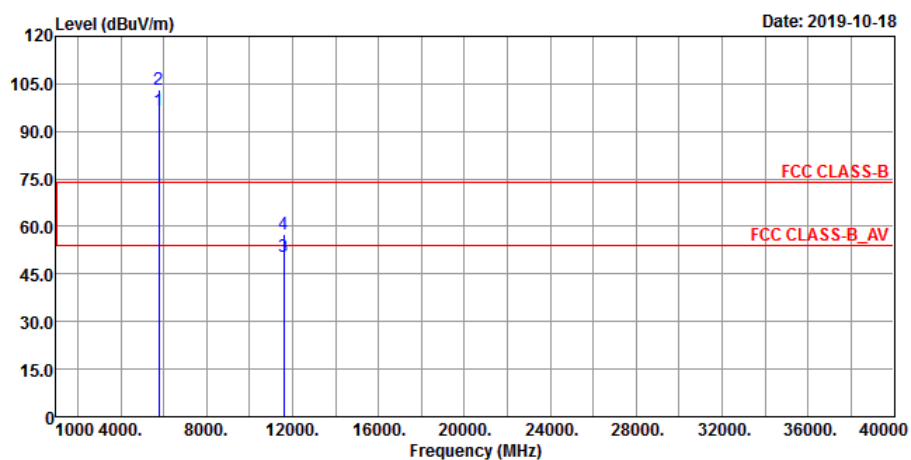
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
- 5755 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 159	Frequency Range	1 GHz ~ 40 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

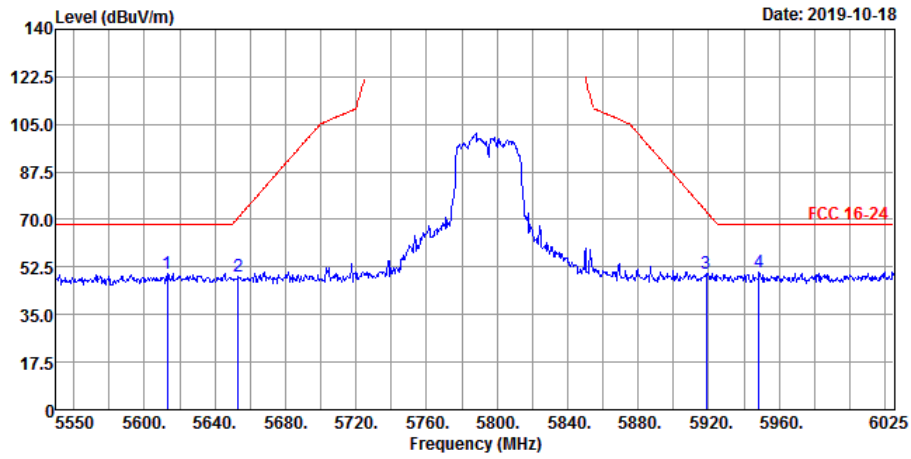
<Spurious Emission> Horizontal



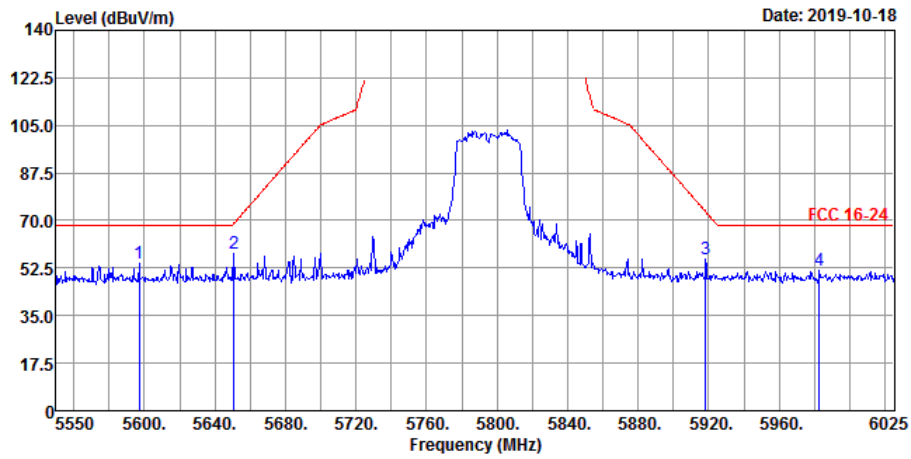
Vertical



<Out of Band Emission (OOBE)> Horizontal



Vertical



<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5795	94.29	92.29	2			129	108	Average
5795	100.49	98.49	2			129	108	Peak
11590	47.01	49.2	-2.19	54	-6.99	156	24	Average
11590	53.44	55.63	-2.19	74	-20.56	156	24	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5795	96.59	94.59	2			131	300	Average
5795	103.15	101.15	2			131	300	Peak
11590	50.67	52.86	-2.19	54	-3.33	200	0	Average
11590	57.65	59.84	-2.19	74	-16.35	200	0	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5613.175	50.26	48.39	1.87	68.2	-17.94	129	108	Peak
5653.075	48.85	46.94	1.91	70.49	-21.64	129	108	Peak
5918.6	50.15	47.84	2.31	72.92	-22.77	129	108	Peak
5948.525	50.83	48.54	2.29	68.2	-17.37	129	108	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5597.025	54.11	52.24	1.87	68.2	-14.09	131	300	Peak
5650.7	57.75	55.84	1.91	68.72	-10.97	131	300	Peak
5918.125	55.77	53.46	2.31	73.27	-17.5	131	300	Peak
5982.725	51.56	49.23	2.33	68.2	-16.64	131	300	Peak

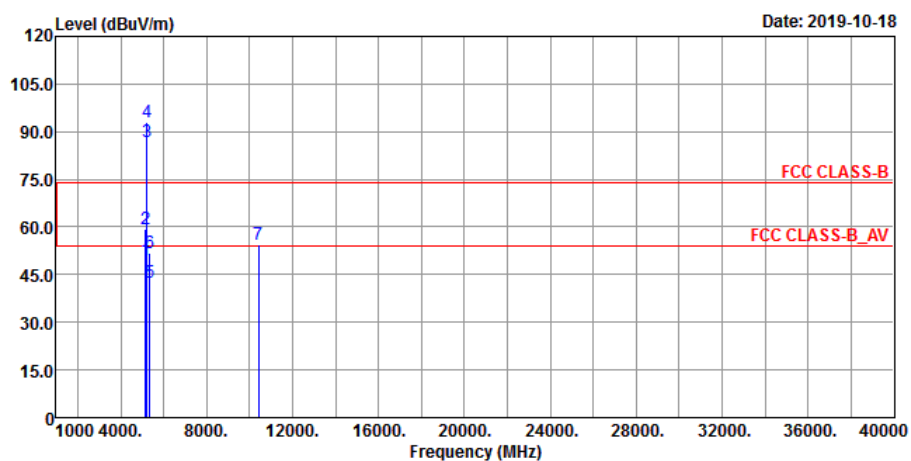
Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 5795 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

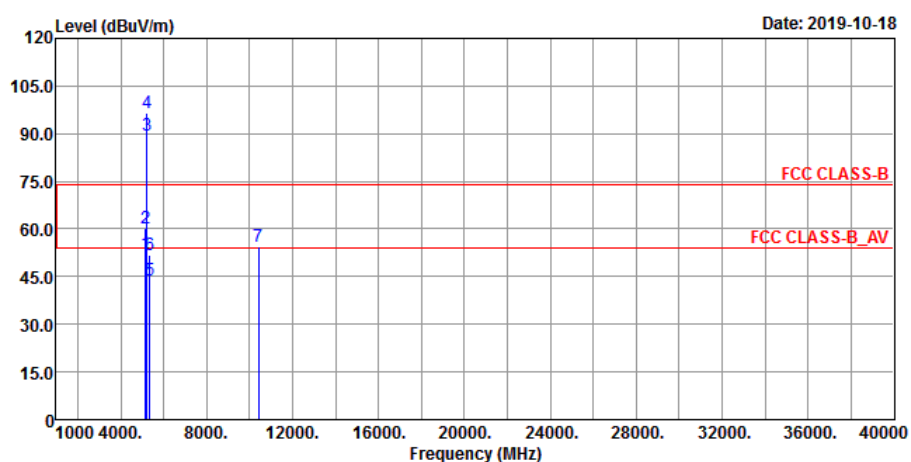
802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 42	Frequency Range	1 GHz ~ 40 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



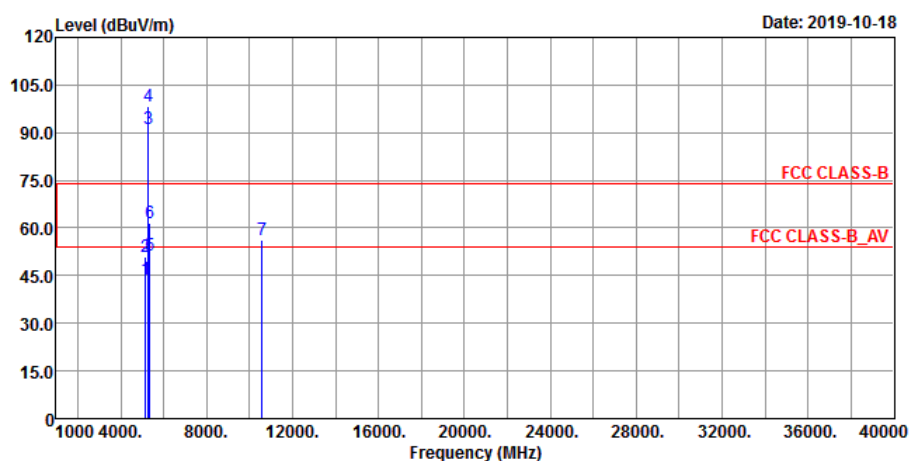
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	49.81	48.28	1.53	54	-4.19	100	94	Average
5150	59.26	57.73	1.53	74	-14.74	100	94	Peak
5210	86.98	85.54	1.44			100	94	Average
5210	92.98	91.54	1.44			100	94	Peak
5350	42.67	41.21	1.46	54	-11.33	100	94	Average
5350	51.67	50.21	1.46	74	-22.33	100	94	Peak
*10420	54.61	57.46	-2.85	68.2	-13.59	100	72	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	52.46	50.93	1.53	54	-1.54	237	347	Average
5150	60.14	58.61	1.53	74	-13.86	237	347	Peak
5210	89.54	88.1	1.44			237	347	Average
5210	96.58	95.14	1.44			237	347	Peak
5350	43.97	42.51	1.46	54	-10.03	237	347	Average
5350	51.89	50.43	1.46	74	-22.11	237	347	Peak
*10420	54.3	57.15	-2.85	68.2	-13.9	168	122	Peak

Remarks:

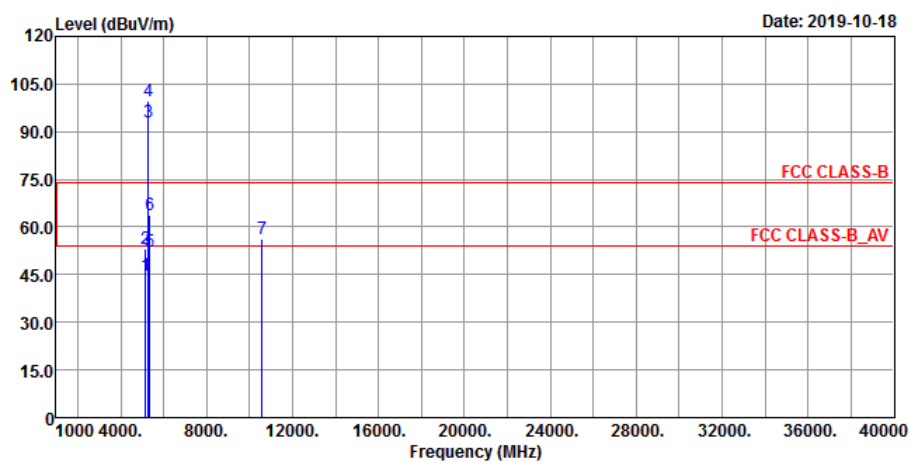
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5210 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 58	Frequency Range	1 GHz ~ 40 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



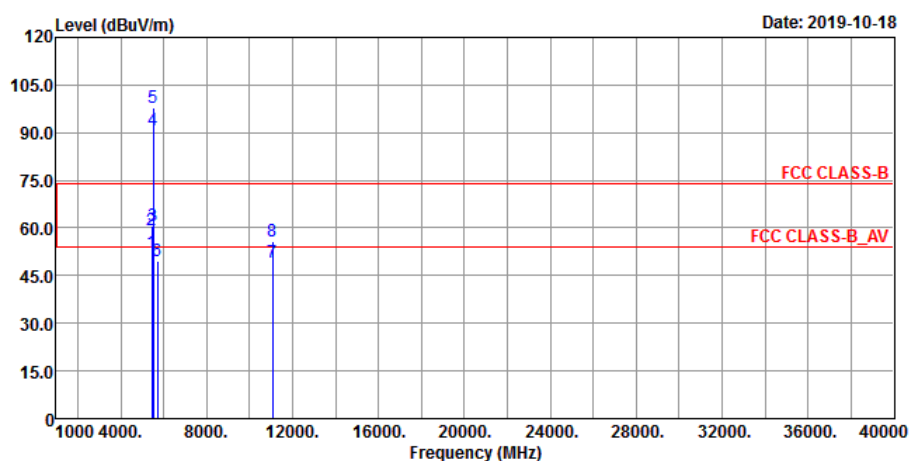
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	43.7	42.17	1.53	54	-10.3	100	78	Average
5150	50.93	49.4	1.53	74	-23.07	100	78	Peak
5290	91.31	90	1.31			100	78	Average
5290	98.16	96.85	1.31			100	78	Peak
5350	51.48	50.02	1.46	54	-2.52	100	78	Average
5350	61.42	59.96	1.46	74	-12.58	100	78	Peak
*10580	56.02	58.9	-2.88	68.2	-12.18	136	127	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	44.91	43.38	1.53	54	-9.09	244	348	Average
5150	53.2	51.67	1.53	74	-20.8	244	348	Peak
5290	93.01	91.7	1.31			244	348	Average
5290	99.84	98.53	1.31			244	348	Peak
5350	52.47	51.01	1.46	54	-1.53	244	348	Average
5350	63.97	62.51	1.46	74	-10.03	244	348	Peak
*10580	56.3	59.18	-2.88	68.2	-11.9	103	334	Peak

Remarks:

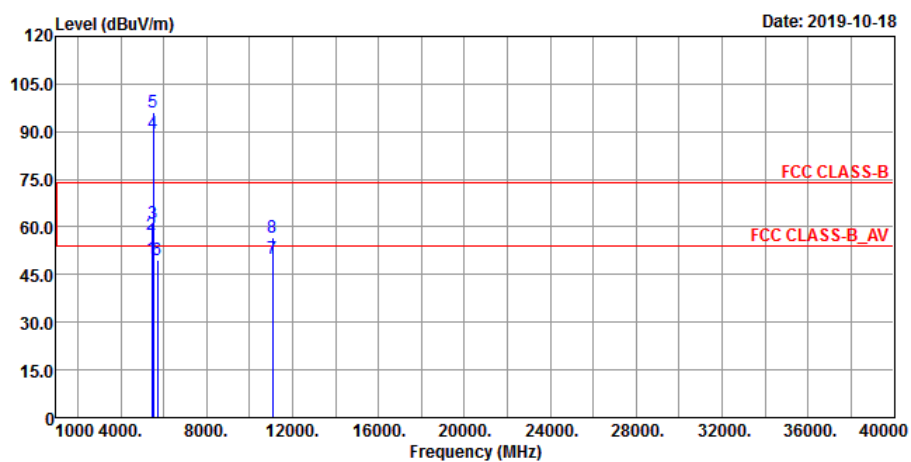
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5290 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 106	Frequency Range	1 GHz ~ 40 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



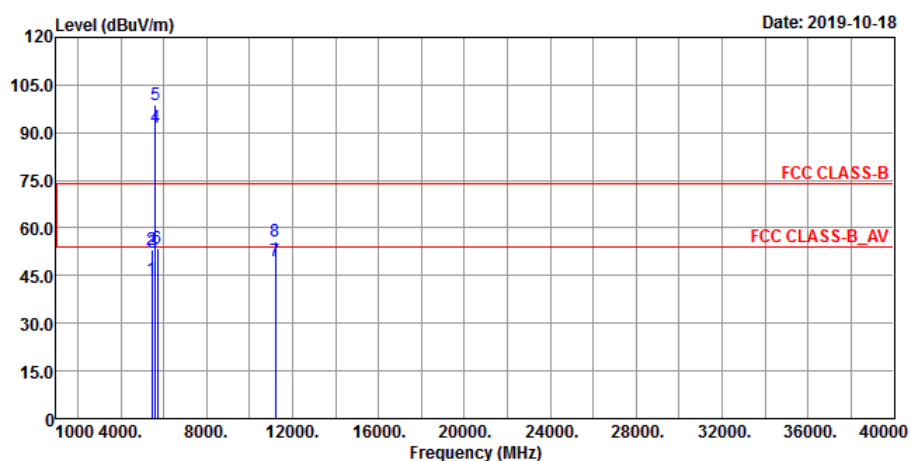
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	52.15	50.28	1.87	54	-1.85	250	358	Average
5460	59.27	57.4	1.87	74	-14.73	250	358	Peak
*5470	60.66	58.8	1.86	68.2	-7.54	250	358	Peak
5530	90.6	88.79	1.81			250	358	Average
5530	97.72	95.91	1.81			250	358	Peak
*5725	49.41	47.65	1.76	68.2	-18.79	250	358	Peak
11060	49.32	51.74	-2.42	54	-4.68	132	72	Average
11060	55.74	58.16	-2.42	74	-18.26	132	72	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	49.97	48.1	1.87	54	-4.03	100	68	Average
5460	57.48	55.61	1.87	74	-16.52	100	68	Peak
*5470	60.97	59.11	1.86	68.2	-7.23	100	68	Peak
5530	89.33	87.52	1.81			100	68	Average
5530	96.07	94.26	1.81			100	68	Peak
*5725	49.78	48.02	1.76	68.2	-18.42	100	68	Peak
11060	49.94	52.36	-2.42	54	-4.06	142	306	Average
11060	56.89	59.31	-2.42	74	-17.11	142	306	Peak

Remarks:

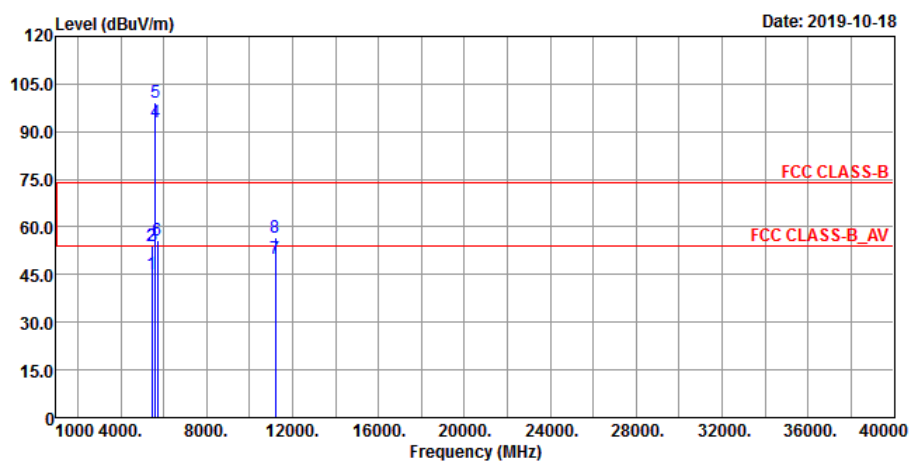
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5530 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 122	Frequency Range	1 GHz ~ 40 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



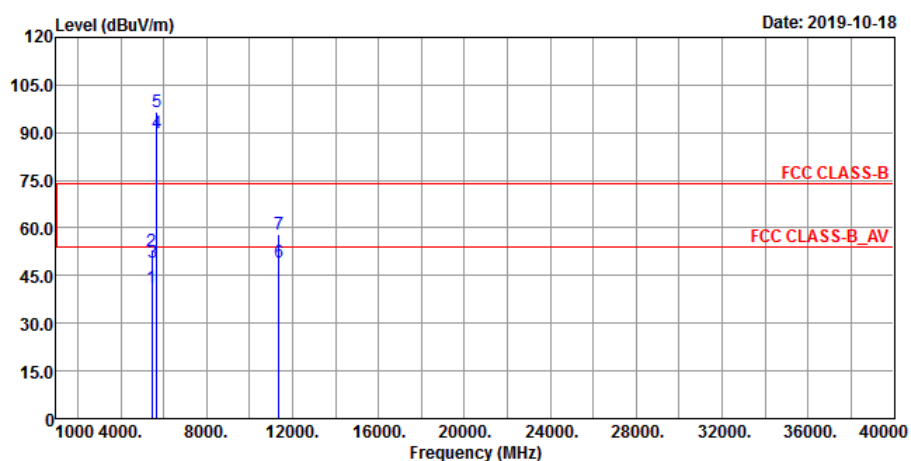
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	43.8	41.93	1.87	54	-10.2	100	65	Average
5460	52.93	51.06	1.87	74	-21.07	100	65	Peak
*5470	52.14	50.28	1.86	68.2	-16.06	100	65	Peak
5610	91.58	89.71	1.87			100	65	Average
5610	98.94	97.07	1.87			100	65	Peak
*5725	53.39	51.63	1.76	68.2	-14.81	100	65	Peak
11220	49.55	52.07	-2.52	54	-4.45	127	259	Average
11220	55.6	58.12	-2.52	74	-18.4	127	259	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	45.08	43.21	1.87	54	-8.92	126	359	Average
5460	54.07	52.2	1.87	74	-19.93	126	359	Peak
*5470	53.98	52.12	1.86	68.2	-14.22	126	359	Peak
5610	92.77	90.9	1.87			126	359	Average
5610	99.33	97.46	1.87			126	359	Peak
*5725	55.87	54.11	1.76	68.2	-12.33	126	359	Peak
11220	50.1	52.62	-2.52	54	-3.9	109	177	Average
11220	56.7	59.22	-2.52	74	-17.3	109	177	Peak

Remarks:

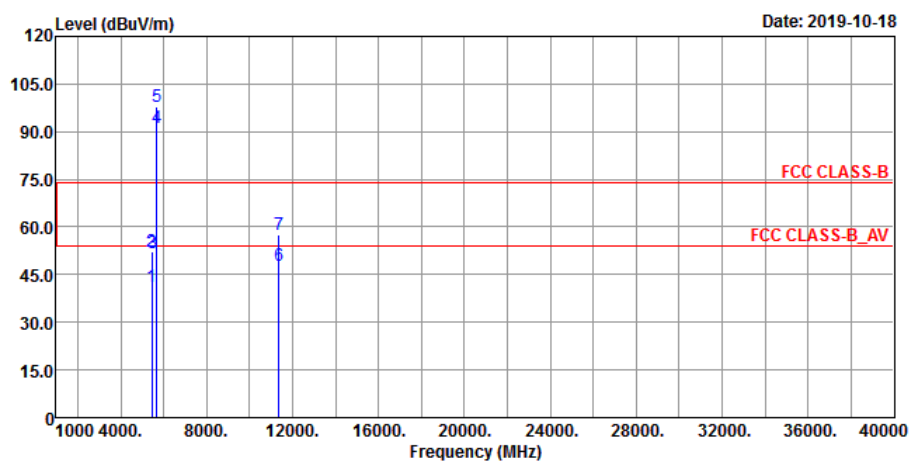
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5610 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 138	Frequency Range	1 GHz ~ 40 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



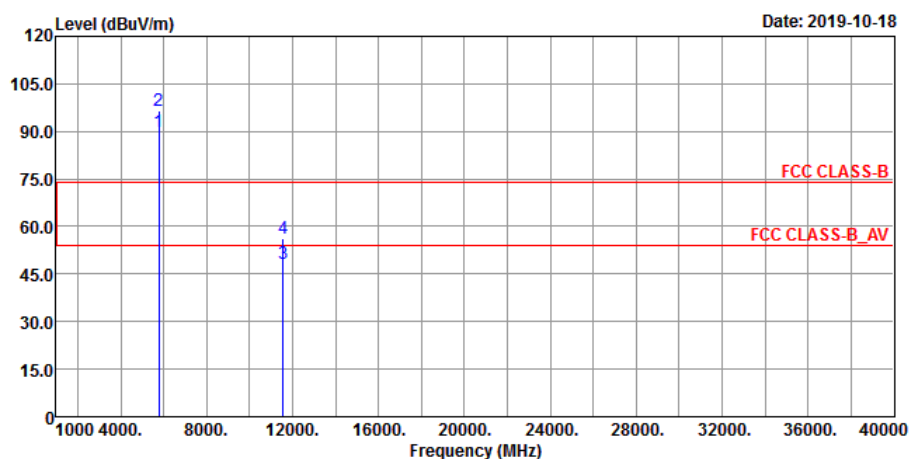
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	41.06	39.19	1.87	54	-12.94	100	64	Average
5460	52.76	50.89	1.87	74	-21.24	100	64	Peak
*5470	48.93	47.07	1.86	68.2	-19.27	100	64	Peak
5690	89.86	88.27	1.59			100	64	Average
5690	96.38	94.79	1.59			100	64	Peak
11380	49.07	51.33	-2.26	54	-4.93	172	209	Average
11380	57.98	60.24	-2.26	74	-16.02	172	209	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	41.11	39.24	1.87	54	-12.89	122	357	Average
5460	52.09	50.22	1.87	74	-21.91	122	357	Peak
*5470	51.73	49.87	1.86	68.2	-16.47	122	357	Peak
5690	91.08	89.49	1.59			122	357	Average
5690	98.01	96.42	1.59			122	357	Peak
11380	47.77	50.03	-2.26	54	-6.23	100	98	Average
11380	57.57	59.83	-2.26	74	-16.43	100	98	Peak

Remarks:

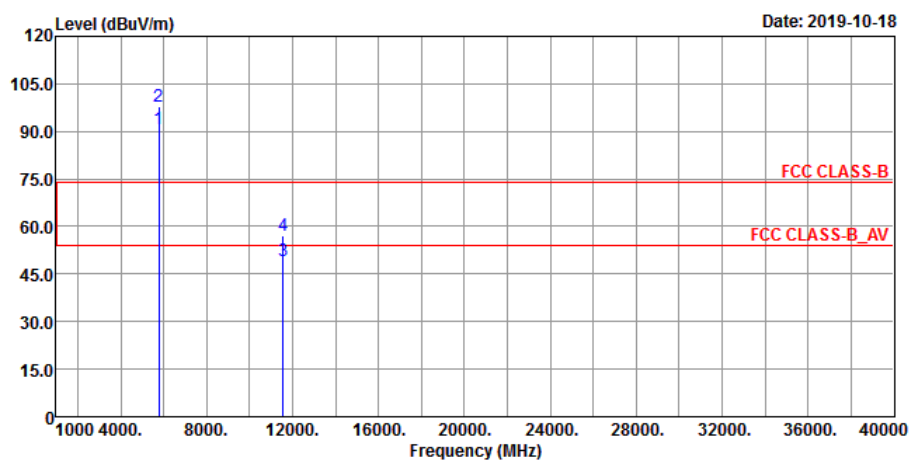
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 5690 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 155	Frequency Range	1 GHz ~ 40 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

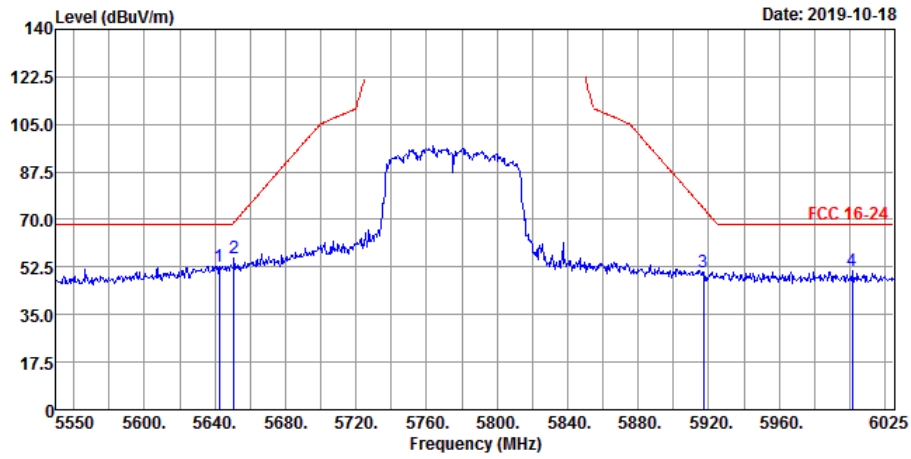
<Spurious Emission> Horizontal



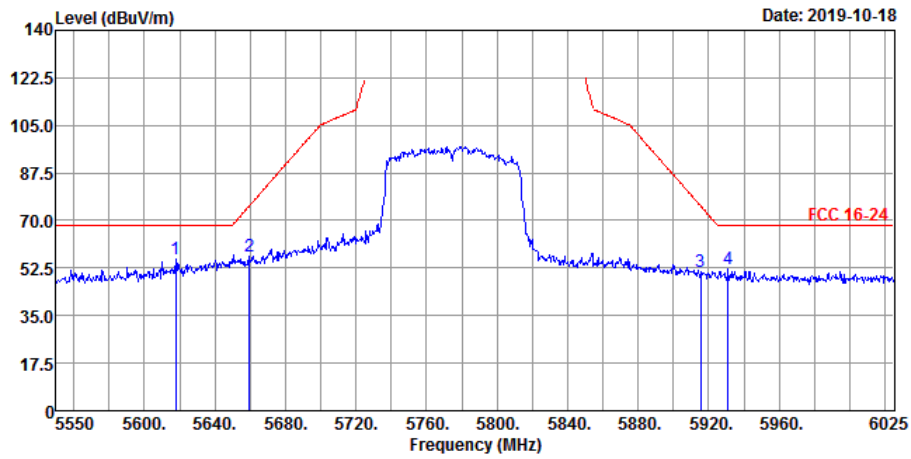
Vertical



<Out of Band Emission (OOBE)> Horizontal



Vertical



<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5775	89.9	87.94	1.96			100	85	Average
5775	96.66	94.7	1.96			100	85	Peak
11550	48.17	50.37	-2.2	54	-5.83	162	333	Average
11550	56.04	58.24	-2.2	74	-17.96	162	333	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5775	90.62	88.66	1.96			103	358	Average
5775	97.75	95.79	1.96			103	358	Peak
11550	49.14	51.34	-2.2	54	-4.86	103	101	Average
11550	57.32	59.52	-2.2	74	-16.68	103	101	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5642.625	52.93	51.05	1.88	68.2	-15.27	100	85	Peak
5650.7	55.54	53.63	1.91	68.72	-13.18	100	85	Peak
5917.175	50.5	48.19	2.31	73.97	-23.47	100	85	Peak
6001.25	51.08	48.72	2.36	68.2	-17.12	100	85	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5617.925	55.95	54.05	1.9	68.2	-12.25	103	358	Peak
5659.725	56.64	54.79	1.85	75.42	-18.78	103	358	Peak
5915.275	51.02	48.71	2.31	75.37	-24.35	103	358	Peak
5930.95	52.09	49.79	2.3	68.2	-16.11	103	358	Peak

Remarks:

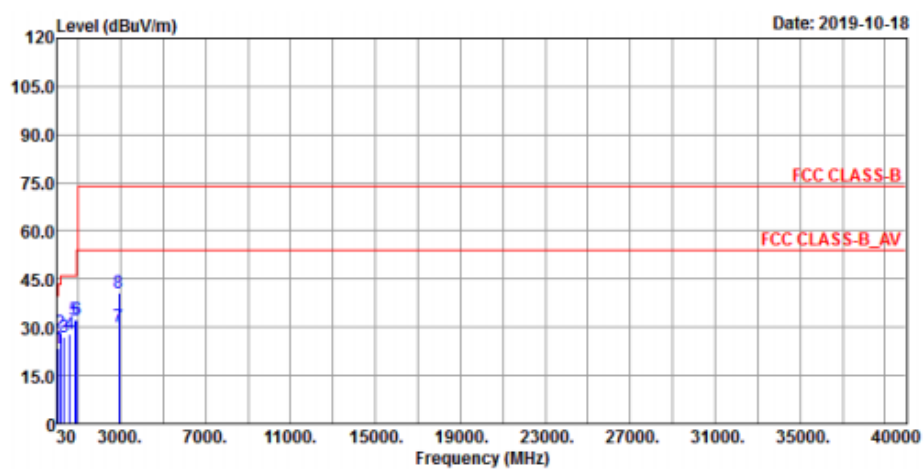
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin Value = Emission Level – Limit value
2. 5775 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The other emission levels were very low against the limit.

8.6.2 接收諧波

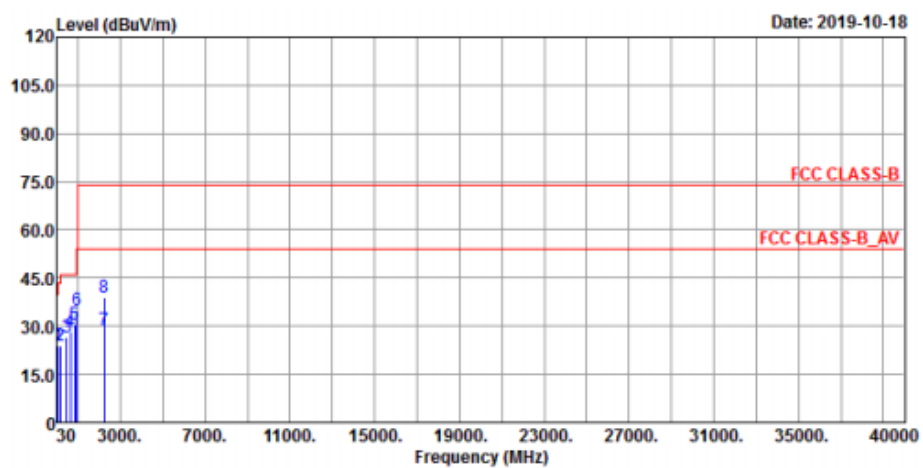
802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 140	Frequency Range	30 MHz ~ 40 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Above 1 GHz: Peak (PK) & Average (AV) Below 1 GHz: Peak (PK) or Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Getaz Yang

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
63.46	23.43	41.84	-18.41	40	-16.57	193	162	Peak
181.54	28.38	46.97	-18.59	43.5	-15.12	174	124	Peak
334.16	26.85	41.87	-15.02	46	-19.15	196	234	Peak
618.54	27.7	36.07	-8.37	46	-18.3	157	202	Peak
831.92	32.42	36.9	-4.48	46	-13.58	199	364	Peak
934.25	32.24	35.04	-2.8	46	-13.76	145	229	Peak
2924.33	30.27	49.67	-19.4	54	-23.73	164	219	Average
2924.33	40.63	60.03	-19.4	74	-33.37	164	219	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
71.29	24.12	43.75	-19.63	40	-15.88	118	277	Peak
184.37	23.76	42.67	-18.91	43.5	-19.74	137	145	Peak
466.52	26.6	38.88	-12.28	46	-19.4	122	159	Peak
639.21	28.13	36.64	-8.51	46	-17.87	108	299	Peak
833.59	30.48	34.93	-4.45	46	-15.52	104	172	Peak
954.26	35.1	38.18	-3.08	46	-10.9	101	99	Peak
2263.37	28.71	48.84	-20.13	54	-25.29	158	224	Average
2263.37	39.1	59.23	-20.13	74	-34.9	158	224	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.

8.6.3 其它不必要之訊號

9 kHz ~ 30 MHz Data:

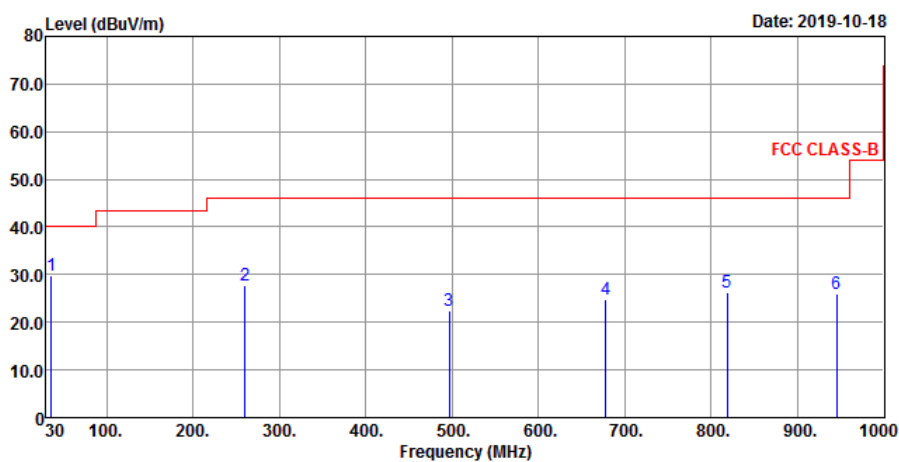
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Data:

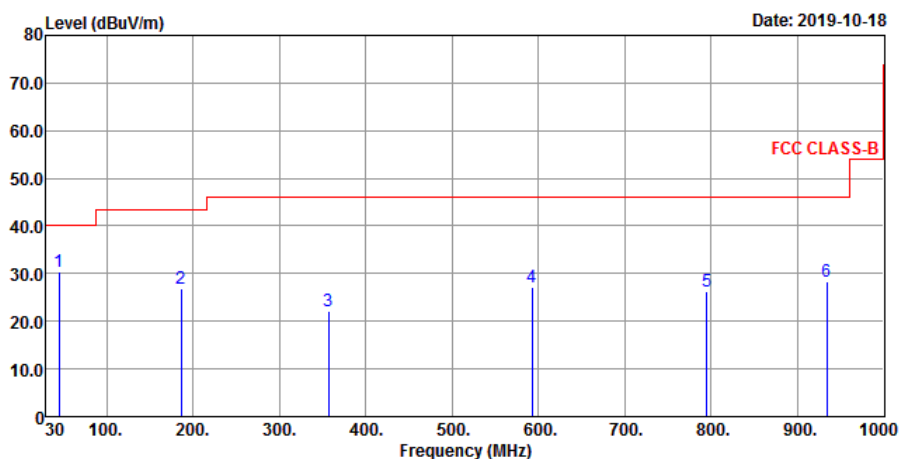
802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 140	Frequency Range	30 MHz ~ 1 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Peak (PK) or 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)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
35.82	29.83	47	-17.17	40	-10.17	162	141	Peak
259.89	27.66	45.02	-17.36	46	-18.34	159	73	Peak
496.57	22.48	33.25	-10.77	46	-23.52	126	124	Peak
677.96	24.66	31.71	-7.05	46	-21.34	102	222	Peak
818.61	26.22	31.2	-4.98	46	-19.78	117	69	Peak
945.68	26.07	28.82	-2.75	46	-19.93	107	229	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
44.55	30.3	47.31	-17.01	40	-9.7	189	37	Peak
186.17	26.78	45.88	-19.1	43.5	-16.72	210	102	Peak
356.89	22.04	36.79	-14.75	46	-23.96	166	312	Peak
592.6	27.3	35.77	-8.47	46	-18.7	122	114	Peak
795.33	26.35	31.4	-5.05	46	-19.65	136	298	Peak
934.04	28.33	31.13	-2.8	46	-17.67	102	125	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 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。

9 峰值傳導輸出功率量測及發射頻寬之要求

9.1 適用標準

待測物操作頻帶	適用標準
☒ 5.15 GHz~5.25 GHz	請見本報告 3.1 節第(12)項(2)及(14)項(2)的規定
☒ 5.25 GHz~5.35 GHz	請見本報告 3.1 節第(12)項(3)及(14)項(3)的規定
☒ 5.470 GHz~5.725 GHz	請見本報告 3.1 節第(12)項(3)及(14)項(3)的規定
☒ 5.725 GHz~5.850 GHz	請見本報告 3.1 節第(12)項(4)及(14)項(4)的規定

9.2 量測方法

輸出峰值功率量測方法：

- 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，設置功率計的 gate 功能確保量測功率皆為 Burst on 的功率。
- 計算其輸出功率峰值。

For transmission above 5.725 GHz where the EBW crosses 5.725 GHz

- 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。
- 設定頻譜掃瞄寬為 26 dB occupied bandwidth。
- 設置解析頻寬為 1 MHz，視訊頻寬為 3 倍的解析頻寬。
- 設置測試掃瞄點數要大於 2 倍的(span/RBW)。
- 設置檢波器為 RMS。
- 設置掃瞄時間為 auto。
- 設置 Trigger 模式為 free run (當 Duty cycle 大於 98 %)；設置 Trigger 模式為 Video trigger (當 Duty cycle 小於 98 %)。
- 設置 Trace mode 為 average 至少 100 次。
- 待掃描結果穩定。
- 使用頻譜的內建 band power 功能，量測 26 dB bandwidth 內最大功率值。

發射頻寬量測方法：

- 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。
- 最大輸出功率峰值減 26 dB 的最大頻率範圍。

9.3 量測儀器

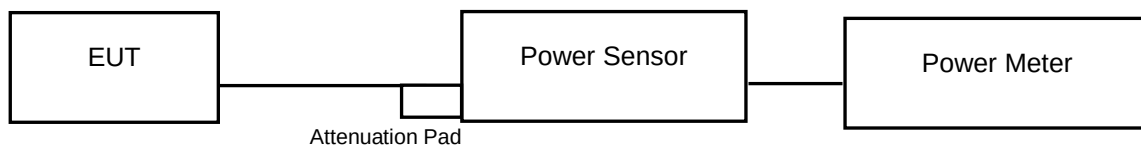
Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Power Meter	ML2495A	1232002	Dec. 17, 2018	Dec. 16, 2019
Power Sensor	MA2411B	1207325	Dec. 17, 2018	Dec. 16, 2019
Spectrum Analyzer R&S	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020

Note:

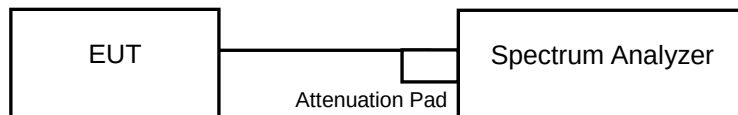
- The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
- The measurement uncertainty is 207 Hz, which is calculated as per the document ETSI TR 100 028. This uncertainty represents an expanded uncertainty expressed at approximately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

9.4 測試配置

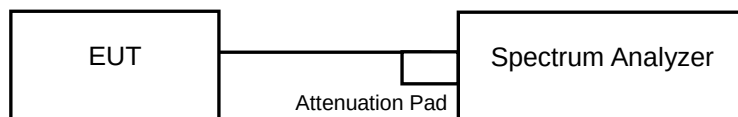
輸出峰值功率測試配置:



or



發射頻寬之測試配置:



9.5 量測結果

操作模式	發射	測試日期	108 年 10 月 17 日
量測場地溫度	25 °C	量測場地濕度	60 % RH
測試者	林冠澤		

802.11a

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	12.13	14.64	45.438	16.57	24	Pass
40	5200	11.89	14.99	47.003	16.72	24	Pass
48	5240	11.32	15.11	45.986	16.63	24	Pass
52	5260	12.08	15.81	54.251	17.34	23.92	Pass
60	5300	11.33	15.08	45.794	16.61	23.86	Pass
64	5320	11.31	14.95	44.782	16.51	23.86	Pass
100	5500	9.43	11.27	22.167	13.46	23.78	Pass
116	5580	13.45	16.25	64.301	18.08	23.84	Pass
140	5700	7.26	8.79	12.889	11.10	23.79	Pass
149	5745	7.73	9.83	15.545	11.92	30	Pass
157	5785	12.65	15.02	50.177	17.01	30	Pass
165	5825	12.59	14.98	49.632	16.96	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

Chain 0

1. $11 \text{ dBm} + 10\log(19.59) = 23.92 \text{ dBm} < 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(19.34) = 23.86 \text{ dBm} < 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(19.35) = 23.86 \text{ dBm} < 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(19.10) = 23.81 \text{ dBm} < 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(19.24) = 23.84 \text{ dBm} < 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log(19.14) = 23.81 \text{ dBm} < 24 \text{ dBm}$.

Chain 1

1. $11 \text{ dBm} + 10\log(35.52) = 26.50 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(22.92) = 24.60 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(21.12) = 24.24 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(19.01) = 23.78 \text{ dBm} < 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(34.53) = 26.38 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log(19.02) = 23.79 \text{ dBm} < 24 \text{ dBm}$.

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	9.31	12.21	25.165	14.01	24	Pass
40	5200	12.69	15.56	54.553	17.37	24	Pass
48	5240	10.32	14.14	36.707	15.65	24	Pass
52	5260	11.06	14.85	43.313	16.37	24	Pass
60	5300	10.30	13.89	35.206	15.47	24	Pass
64	5320	10.12	13.80	34.268	15.35	24	Pass
100	5500	9.25	11.67	23.103	13.64	24	Pass
116	5580	12.57	15.24	51.492	17.12	24	Pass
140	5700	6.94	9.51	13.876	11.42	24	Pass
149	5745	8.24	10.32	17.433	12.41	30	Pass
157	5785	11.77	13.94	39.805	16.00	30	Pass
165	5825	11.58	13.95	39.219	15.93	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

Chain 0

1. $11 \text{ dBm} + 10\log(20.44) = 24.10 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(20.26) = 24.06 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(20.65) = 24.14 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(20.36) = 24.08 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(20.75) = 24.17 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log(20.58) = 24.13 \text{ dBm} > 24 \text{ dBm}$.

Chain 1

1. $11 \text{ dBm} + 10\log(21.98) = 24.42 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(20.13) = 24.03 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(20.37) = 24.08 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(20.16) = 24.04 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(20.94) = 24.20 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log(19.96) = 24.00 \text{ dBm} > 24 \text{ dBm}$.

802.11n (HT40)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	8.67	11.72	22.221	13.47	24	Pass
46	5230	10.79	14.37	39.348	15.95	24	Pass
54	5270	10.82	14.69	41.522	16.18	24	Pass
62	5310	10.23	13.93	35.261	15.47	24	Pass
102	5510	7.84	9.89	15.831	12.00	24	Pass
110	5550	11.69	14.12	40.58	16.08	24	Pass
134	5670	11.59	14.85	44.97	16.53	24	Pass
142	5710 (U-NII-2C)	10.53	13.41	33.226	15.21	24	Pass
142	5710 (U-NII-3)	3.18	5.88	5.953	7.75	30	Pass
151	5755	9.10	11.23	24.33	13.86	30	Pass
159	5795	11.96	14.19	8.127	9.10	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

Chain 0

1. $11 \text{ dBm} + 10\log (46.08) = 27.63 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log (45.46) = 27.57 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log (46.58) = 27.68 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log (46.03) = 27.63 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log (44.70) = 27.50 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log (5725.00 - 5683.61) = 27.16 \text{ dBm} > 24 \text{ dBm}$.

Chain 1

1. $11 \text{ dBm} + 10\log (57.67) = 28.60 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log (46.32) = 27.65 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log (52.50) = 28.20 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log (51.94) = 28.15 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log (53.87) = 28.31 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log (5725.00 - 5681.73) = 27.36 \text{ dBm} > 24 \text{ dBm}$.

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	6.31	9.34	12.866	11.09	24	Pass
58	5290	7.90	11.68	20.889	13.20	24	Pass
106	5530	8.31	9.84	16.414	12.15	24	Pass
122	5610	9.35	12.04	24.606	13.91	24	Pass
138	5690 (U-NII-2C)	9.35	12.04	24.606	13.91	24	Pass
138	5690 (U-NII-3)	7.96	10.59	17.707	12.48	30	Pass
155	5775	8.64	10.95	19.756	12.96	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

Chain 0

1. $11 \text{ dBm} + 10\log(82.48) = 30.16 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(81.61) = 30.11 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(83.49) = 30.21 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(5725.00 - 5648.83) = 29.81 \text{ dBm} > 24 \text{ dBm}$.

Chain 1

1. $11 \text{ dBm} + 10\log(82.45) = 30.16 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(82.73) = 30.17 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(81.87) = 30.13 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(5725.00 - 5649.41) = 29.78 \text{ dBm} > 24 \text{ dBm}$.

26 dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	19.49	34.25
40	5200	19.66	34.09
48	5240	19.25	28.42
52	5260	19.59	35.52
60	5300	19.34	22.92
64	5320	19.35	21.12
100	5500	19.10	19.01
116	5580	19.24	34.53
140	5700	19.14	19.02

802.11n (HT20)

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	20.47	20.66
40	5200	20.91	36.21
48	5240	20.27	20.62
52	5260	20.44	21.98
60	5300	20.26	20.13
64	5320	20.65	20.37
100	5500	20.36	20.16
116	5580	20.75	20.94
140	5700	20.58	19.96

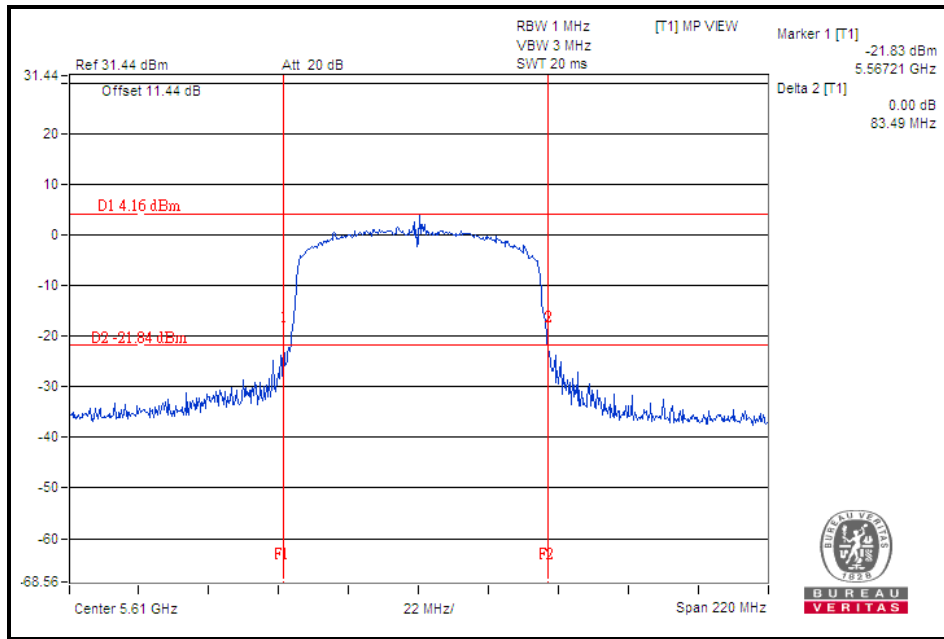
802.11n (HT40)

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	46.69	49.00
46	5230	46.13	49.97
54	5270	46.08	57.67
62	5310	45.46	46.32
102	5510	46.58	52.50
110	5550	46.03	51.94
134	5670	44.70	53.87
142	5710 (U-NII-2C)	41.39	43.27
142	5710 (U-NII-3)	7.62	7.64

802.11ac (VHT80)

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	81.17	83.06
58	5290	82.48	82.45
106	5530	81.61	82.73
122	5610	83.49	81.87
138	5690 (U-NII-2C)	76.17	75.59
138	5690 (U-NII-3)	5.98	5.18

**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，符合低功率射頻電機技術規範之要求。

10 功率頻譜密度之量測

10.1 適用標準

待測物操作頻帶	適用標準
☒ 5.15 GHz~5.25 GHz	請見本報告 3.1 節第(12)項(2)及(15)項(2)的規定
☒ 5.25 GHz~5.35 GHz	請見本報告 3.1 節第(12)項(3)及(15)項(3)的規定
☒ 5.470 GHz~5.725 GHz	請見本報告 3.1 節第(12)項(3)及(15)項(3)的規定
☒ 5.725 GHz~5.850 GHz	請見本報告 3.1 節第(12)項(4)及(15)項(4)的規定

10.2 量測方法

For U-NII-1, U-NII-2A, U-NII-2C band:

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW $\geq$ 3 RBW, Detector = RMS
3. Sweep time = auto, trigger set to "free run".
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value and add 10 log (1/duty cycle)

※For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW $\geq$ 1 RBW, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz}/300 \text{ kHz})$
5. Sweep time = auto, trigger set to "free run".
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value and add 10 log (1/duty cycle)

10.3 量測儀器

同 7.3 節。

10.4 測試配置

同 7.4 節

10.5 量測結果

操作模式	發射	測試日期	108 年 10 月 17 日
量測場地溫度	25 °C	量測場地濕度	60 % RH
測試者	林冠澤		

For U-NII-1, U-NII-2A, U-NII-2C Band

802.11a

Channel	Frequency (MHz)	PSD (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	-1.10	2.01	0.24	3.98	11	Pass
40	5200	-1.08	1.97	0.24	3.96	11	Pass
48	5240	-2.36	2.33	0.24	3.84	11	Pass
52	5260	-1.37	2.50	0.24	4.23	11	Pass
60	5300	-1.61	1.95	0.24	3.78	11	Pass
64	5320	-1.63	1.91	0.24	3.74	11	Pass
100	5500	-3.54	-1.12	0.24	1.09	10.29	Pass
116	5580	0.86	3.13	0.24	5.39	10.29	Pass
140	5700	-5.38	-3.40	0.24	-1.03	10.29	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. For U-NII-1 Band:

Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 4.54 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.

For U-NII-2A Band:

Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.84 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.

For U-NII-2C Band:

Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.71 \text{ dBi} > 6 \text{ dB}$, so the power density limit shall be reduced to $11 - (6.71 - 6) = 10.29 \text{ dBm}$.

3. Refer to section 2.1註9 for duty cycle spectrum plot.

802.11n (HT20)

Channel	Frequency (MHz)	PSD (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	-3.91	-0.99	0.73	1.53	11	Pass
40	5200	-0.83	1.99	0.73	4.55	11	Pass
48	5240	-3.17	0.44	0.73	2.74	11	Pass
52	5260	-2.47	1.15	0.73	3.45	11	Pass
60	5300	-3.23	0.16	0.73	2.53	11	Pass
64	5320	-3.24	0.38	0.73	2.68	11	Pass
100	5500	-3.65	-1.96	0.73	1.02	10.29	Pass
116	5580	-0.58	1.54	0.73	4.35	10.29	Pass
140	5700	-6.73	-4.39	0.73	-1.66	10.29	Pass

Note:

- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- For U-NII-1 Band:**

$$\text{Directional gain} = 10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 4.54 \text{ dBi} < 6 \text{ dBi}$$
 so the limit no need to be reduced.
For U-NII-2A Band:

$$\text{Directional gain} = 10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.84 \text{ dBi} < 6 \text{ dBi}$$
 so the limit no need to be reduced.
For U-NII-2C Band:

$$\text{Directional gain} = 10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.71 \text{ dBi} > 6 \text{ dB}$$
 so the power density limit shall be reduced to $11 - (6.71 - 6) = 10.29 \text{ dBm}$.
- Refer to section 2.1註9 for duty cycle spectrum plot.

802.11n (HT40)

Channel	Frequency (MHz)	PSD (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	-8.23	-5.32	0.85	-2.68	11	Pass
46	5230	-6.11	-2.97	0.85	-0.40	11	Pass
54	5270	-6.02	-2.34	0.85	0.06	11	Pass
62	5310	-6.75	-3.55	0.85	-1.00	11	Pass
102	5510	-9.21	-7.03	0.85	-4.12	10.29	Pass
110	5550	-5.50	-3.64	0.85	-0.61	10.29	Pass
134	5670	-5.06	-2.44	0.85	0.31	10.29	Pass
142	5710 (U-NII-2C)	-5.74	-2.74	0.85	-0.13	10.29	Pass

Note:

- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- For U-NII-1 Band:**
Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 4.54 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.
For U-NII-2A Band:
Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.84 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.
For U-NII-2C Band:
Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.71 \text{ dBi} > 6 \text{ dB}$, so the power density limit shall be reduced to $11 - (6.71 - 6) = 10.29 \text{ dBm}$.
- Refer to section 2.1註9 for duty cycle spectrum plot.

802.11ac (VHT80)

Channel	Frequency (MHz)	PSD (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-13.53	-10.86	1.42	-7.56	11	Pass
58	5290	-12.13	-8.22	1.42	-5.32	11	Pass
106	5530	-12.45	-10.50	1.42	-6.94	10.29	Pass
122	5610	-10.09	-8.19	1.42	-4.61	10.29	Pass
138	5690 (U-NII-2C)	-11.98	-8.93	1.42	-5.76	10.29	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. For U-NII-1 Band:

Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 4.54 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.

For U-NII-2A Band:

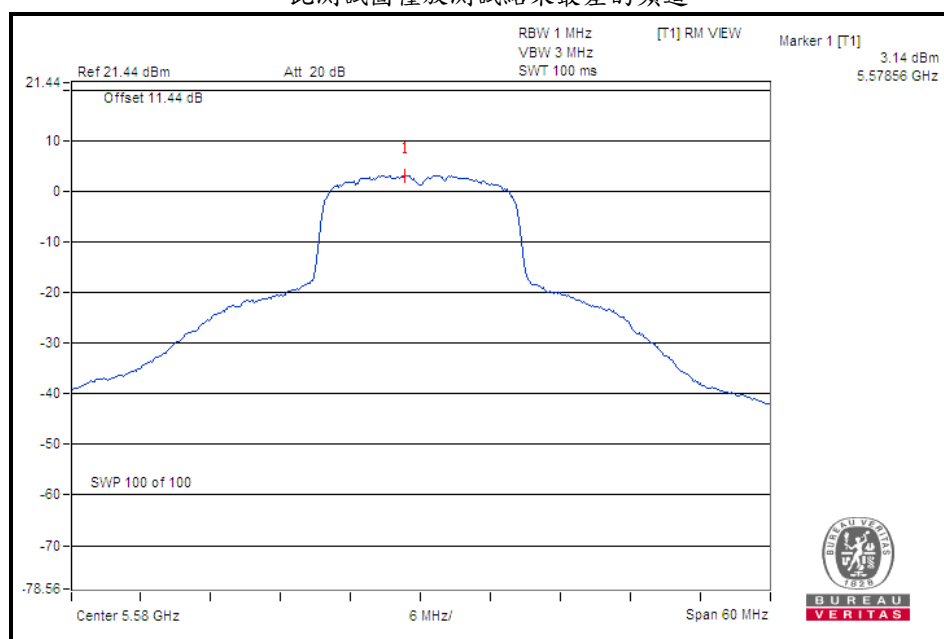
Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.84 \text{ dBi} < 6 \text{ dBi}$, so the limit no need to be reduced.

For U-NII-2C Band:

Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.71 \text{ dBi} > 6 \text{ dB}$, so the power density limit shall be reduced to $11 - (6.71 - 6) = 10.29 \text{ dBm}$.

3. Refer to section 2.1註9 for duty cycle spectrum plot.

**此測試圖僅放測試結果最差的頻道。



For U-NII-3 Band

802.11a

TX Chain	Channel	Frequency (MHz)	PSD w/o Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300 kHz)	(dBm/500 kHz)					
0	149	5745	-12.24	-10.02	3.01	0.24	-6.77	29.74	Pass
	157	5785	-8.81	-6.59	3.01	0.24	-3.34	29.74	Pass
	165	5825	-8.88	-6.66	3.01	0.24	-3.41	29.74	Pass
1	149	5745	-10.26	-8.04	3.01	0.24	-4.79	29.74	Pass
	157	5785	-6.19	-3.97	3.01	0.24	-0.72	29.74	Pass
	165	5825	-6.25	-4.03	3.01	0.24	-0.78	29.74	Pass

NOTE:

- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.26 > 6 \text{ dBi}$, so the power density limit shall be reduced to $30 - (6.26 - 6) = 29.74 \text{ dBm}$.
- Refer to section 2.1 註 9 for duty cycle spectrum plot.

802.11n (HT20)

TX Chain	Channel	Frequency (MHz)	PSD		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300 kHz)	(dBm/500 kHz)					
0	149	5745	-13.44	-11.22	3.01	0.73	-7.48	29.74	Pass
	157	5785	-10.11	-7.89	3.01	0.73	-4.15	29.74	Pass
	165	5825	-10.25	-8.03	3.01	0.73	-4.29	29.74	Pass
1	149	5745	-11.31	-9.09	3.01	0.73	-5.35	29.74	Pass
	157	5785	-7.85	-5.63	3.01	0.73	-1.89	29.74	Pass
	165	5825	-8.10	-5.88	3.01	0.73	-2.14	29.74	Pass

NOTE:

- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.26 > 6 \text{ dBi}$, so the power density limit shall be reduced to $30 - (6.26 - 6) = 29.74 \text{ dBm}$.
- Refer to section 2.1 註 9 for duty cycle spectrum plot.

802.11n (HT40)

TX Chain	Channel	Frequency (MHz)	PSD		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300 kHz)	(dBm/500 kHz)					
0	142	5710 (U-NII-3)	-17.79	-15.57	3.01	0.85	-11.71	29.74	Pass
	151	5755	-16.83	-14.61	3.01	0.85	-10.75	29.74	Pass
	159	5795	-14.04	-11.82	3.01	0.85	-7.96	29.74	Pass
1	142	5710 (U-NII-3)	-13.92	-11.70	3.01	0.85	-7.84	29.74	Pass
	151	5755	-14.32	-12.10	3.01	0.85	-8.24	29.74	Pass
	159	5795	-11.43	-9.21	3.01	0.85	-5.35	29.74	Pass

NOTE:

- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.26 > 6$ dBi, so the power density limit shall be reduced to $30 - (6.26 - 6) = 29.74$ dBm.
- Refer to section 2.1 註 9 for duty cycle spectrum plot.

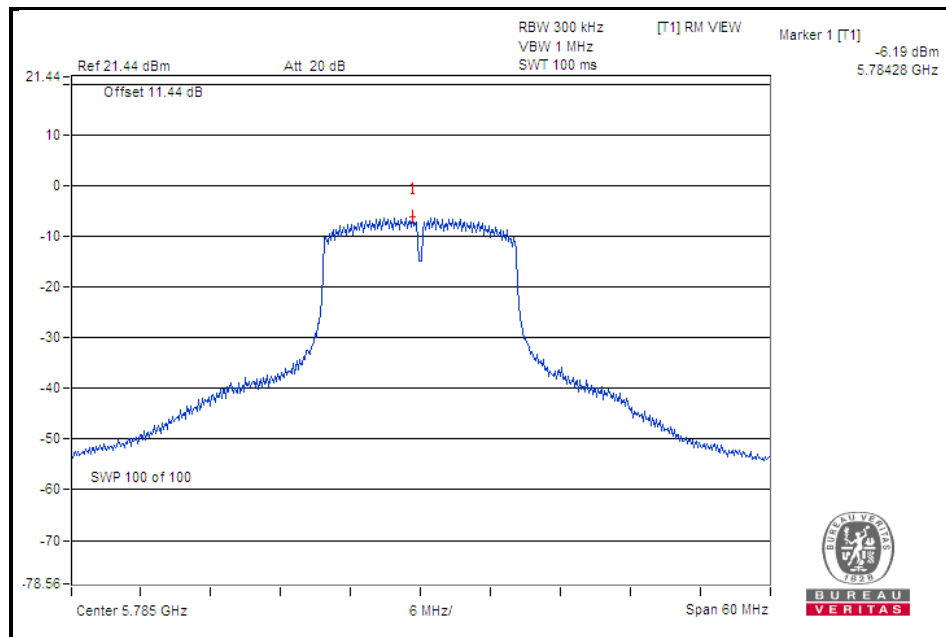
802.11ac (VHT80)

TX Chain	Channel	Frequency (MHz)	PSD		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300 kHz)	(dBm/500 kHz)					
0	138	5690 (U-NII-3)	-25.58	-23.36	3.01	1.42	-18.93	29.74	Pass
	155	5775	-20.43	-18.21	3.01	1.42	-13.78	29.74	Pass
1	138	5690 (U-NII-3)	-22.12	-19.90	3.01	1.42	-15.47	29.74	Pass
	155	5775	-18.25	-16.03	3.01	1.42	-11.60	29.74	Pass

NOTE:

- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.26 > 6$ dBi, so the power density limit shall be reduced to $30 - (6.26 - 6) = 29.74$ dBm.
- Refer to section 2.1 註 9 for duty cycle spectrum plot.

**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 6 dB 頻寬之要求

11.1 適用標準

待測物操作頻帶	適用標準
☒ 5.725 GHz ~ 5.850 GHz	請見本報告 3.1 節第(13)項(2)的規定

11.2 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。

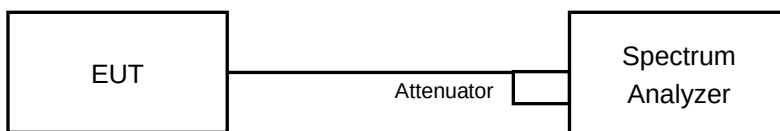
11.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Spectrum Analyzer R&S	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020

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

操作模式	發射	測試日期	108 年 10 月 17 日
量測場地溫度	25 °C	量測場地濕度	60 % RH
測試者	林冠澤		

802.11a

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.15	15.14	0.5	Pass
157	5785	15.18	15.14	0.5	Pass
165	5825	15.18	15.18	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.15	15.69	0.5	Pass
157	5785	15.18	15.74	0.5	Pass
165	5825	15.18	15.75	0.5	Pass

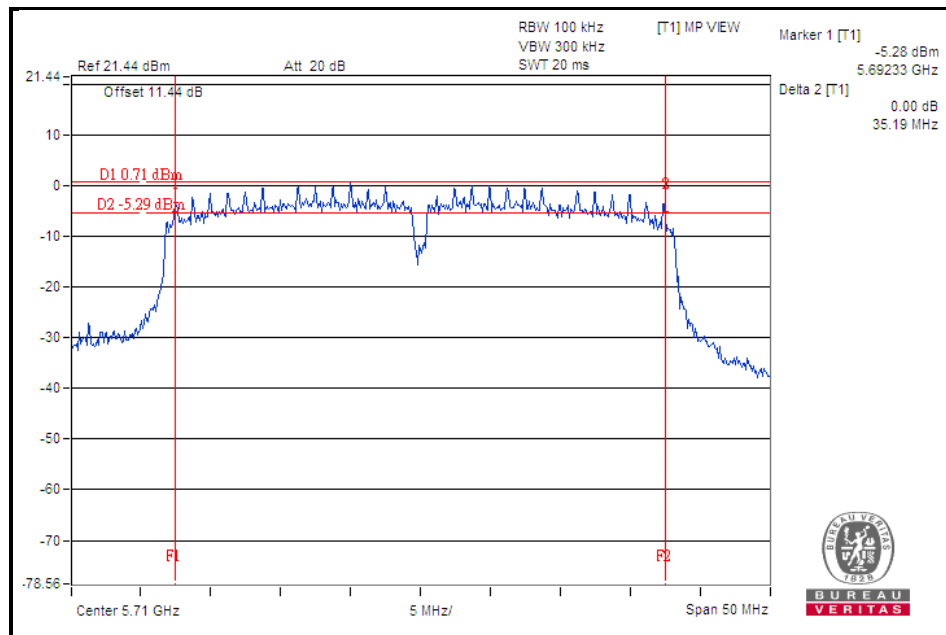
802.11n (HT40)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
142	5710 (U-NII-3)	2.53	2.52	0.5	Pass
151	5755	35.17	35.16	0.5	Pass
159	5795	35.17	35.18	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
138	5690 (U-NII-3)	2.61	2.62	0.5	Pass
155	5775	75.27	75.29	0.5	Pass

**此測試圖僅放測試結果最差的頻道。



Note: For CH142 (UNII-3 Band): The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

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。

BLUETOOTH EDR 頻段測試紀錄結果

12 帶外發射之量測

12.1 適用標準

請見本報告 3.1 節第(22)項的規定。

12.2 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 = 1 kHz

接收諧波：

Below 1 GHz

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

Above 1 GHz:

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

12.3 量測儀器

同 4.3 節

12.4 測試配置

同 4.4 節

12.5 場強度之計算

同 4.5 節

量測結果請見下頁。

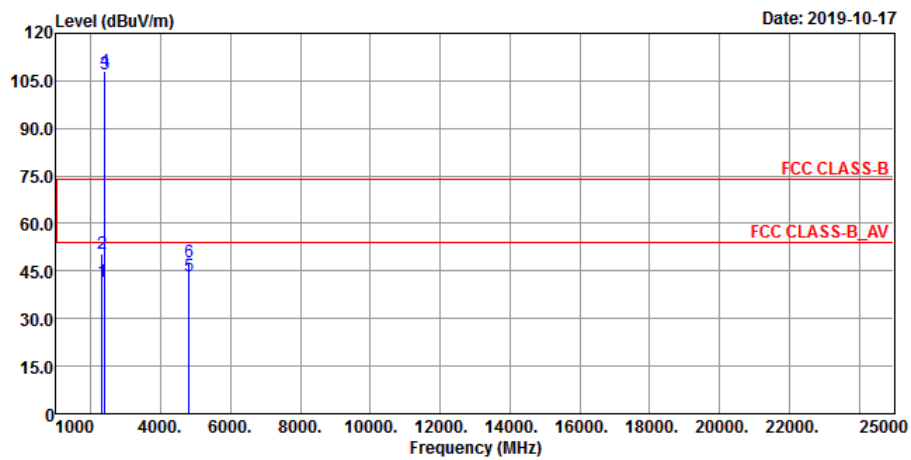
12.6 量測結果

12.6.1 發射諧波

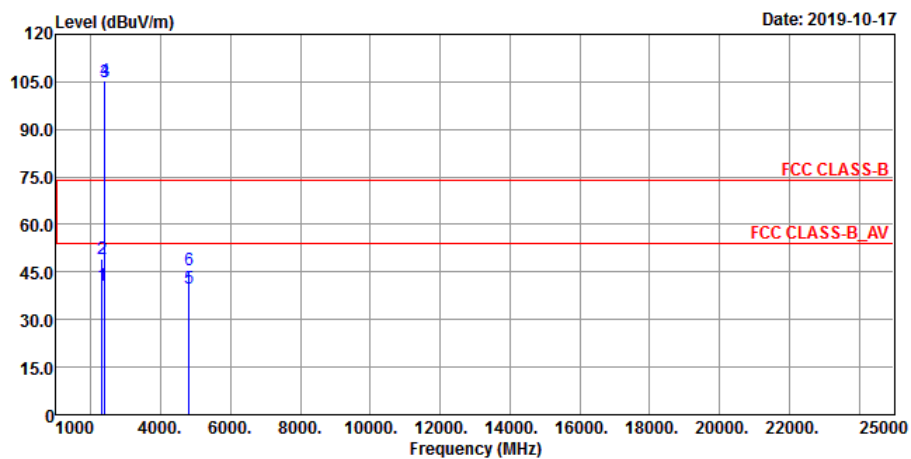
GFSK

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	Tim Chen

Horizontal



Vertical



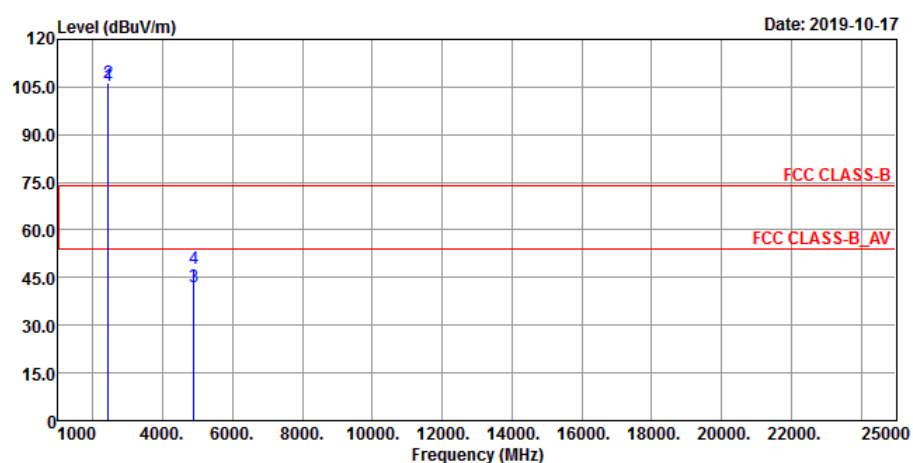
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2313.92	41.67	46.15	-4.48	54	-12.33	274	292	Average
2313.92	50.66	55.14	-4.48	74	-23.34	274	292	Peak
2402	107.27	112.27	-5			274	292	Average
2402	107.92	112.92	-5			274	292	Peak
4804	43.28	57.75	-14.47	54	-10.72	100	75	Average
4804	47.92	62.39	-14.47	74	-26.08	100	75	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2314.06	40.76	45.24	-4.48	54	-13.24	100	295	Average
2314.06	49.13	53.61	-4.48	74	-24.87	100	295	Peak
2402	104.94	109.94	-5			100	295	Average
2402	105.43	110.43	-5			100	295	Peak
4804	39.76	54.23	-14.47	54	-14.24	198	106	Average
4804	45.6	60.07	-14.47	74	-28.4	198	106	Peak

Remarks:

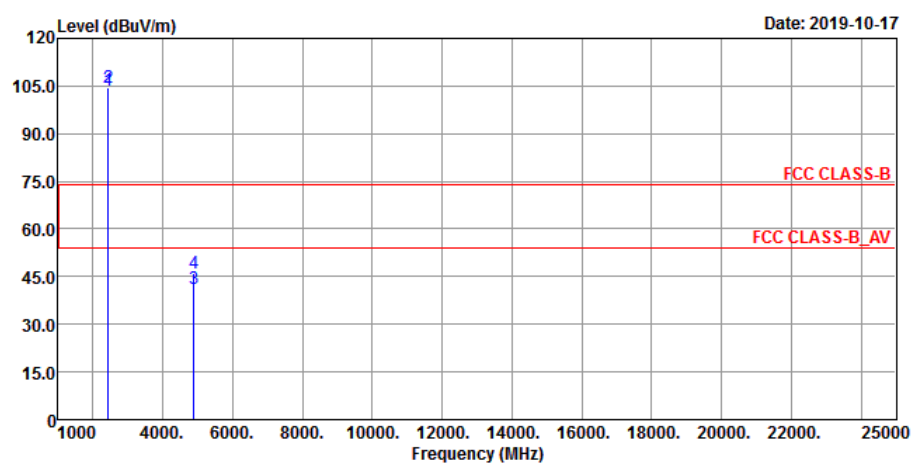
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2402 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

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	Tim Chen

Horizontal



Vertical



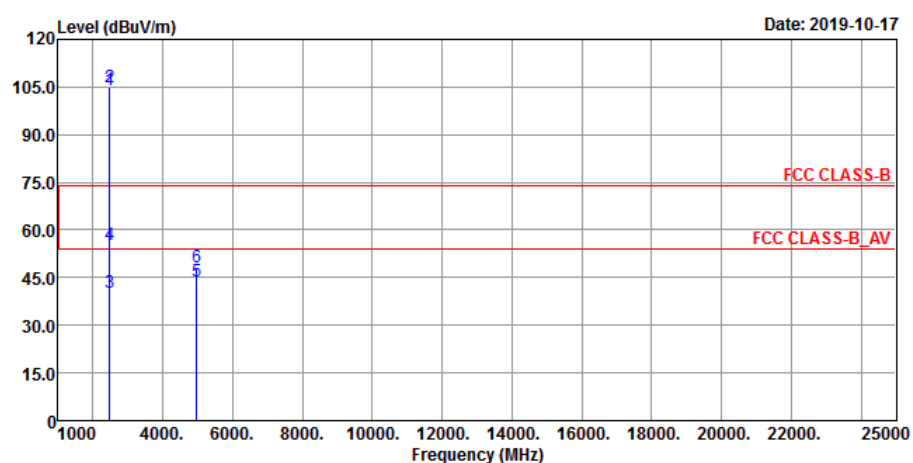
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2441	105.48	110.39	-4.91			292	311	Average
2441	106.06	110.97	-4.91			292	311	Peak
4882	42.16	56.24	-14.08	54	-11.84	102	69	Average
4882	47.63	61.71	-14.08	74	-26.37	102	69	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2441	103.71	108.62	-4.91			122	281	Average
2441	104.33	109.24	-4.91			122	281	Peak
4882	41.13	55.21	-14.08	54	-12.87	113	262	Average
4882	45.99	60.07	-14.08	74	-28.01	113	262	Peak

Remarks:

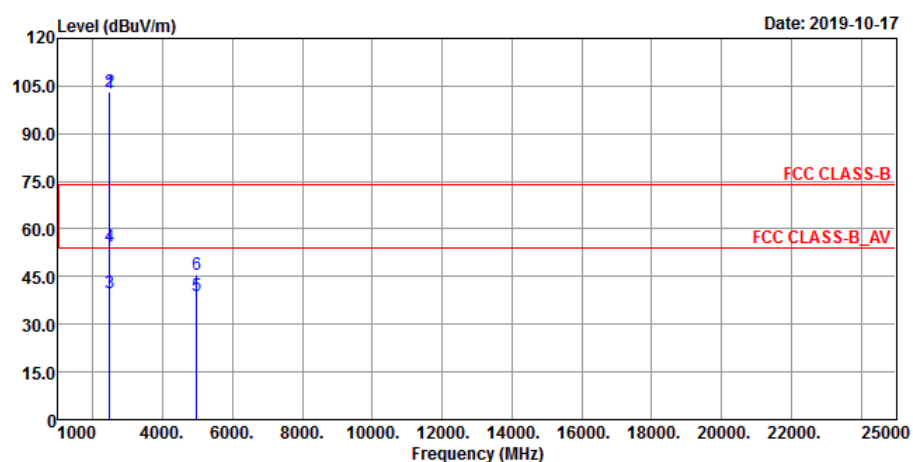
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2441 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

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	Tim Chen

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	104.25	109.1	-4.85			275	306	Average
2480	104.76	109.61	-4.85			275	306	Peak
2483.5	40.43	45.28	-4.85	54	-13.57	275	306	Average
2483.5	55.39	60.24	-4.85	74	-18.61	275	306	Peak
4960	43.67	57.56	-13.89	54	-10.33	100	77	Average
4960	48.27	62.16	-13.89	74	-25.73	100	77	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	102.76	107.61	-4.85			119	281	Average
2480	103.29	108.14	-4.85			119	281	Peak
2483.5	39.82	44.67	-4.85	54	-14.18	119	281	Average
2483.5	54.57	59.42	-4.85	74	-19.43	119	281	Peak
4960	38.83	52.72	-13.89	54	-15.17	103	241	Average
4960	45.47	59.36	-13.89	74	-28.53	103	241	Peak

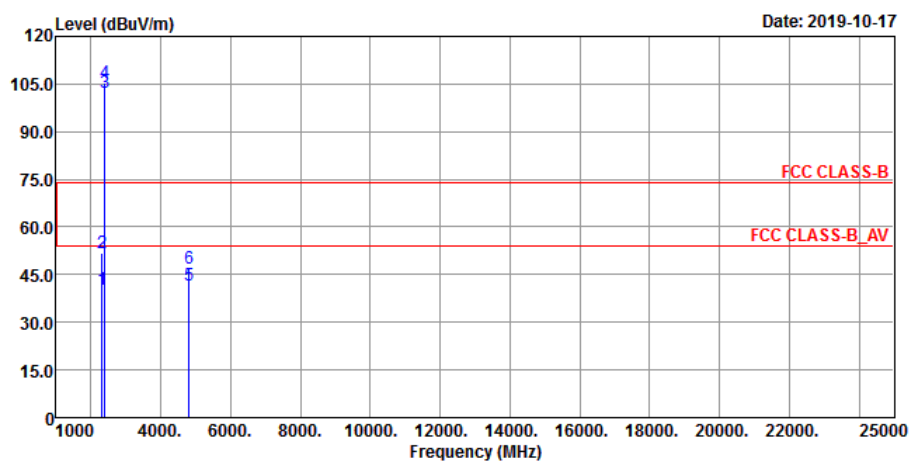
Remarks:

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

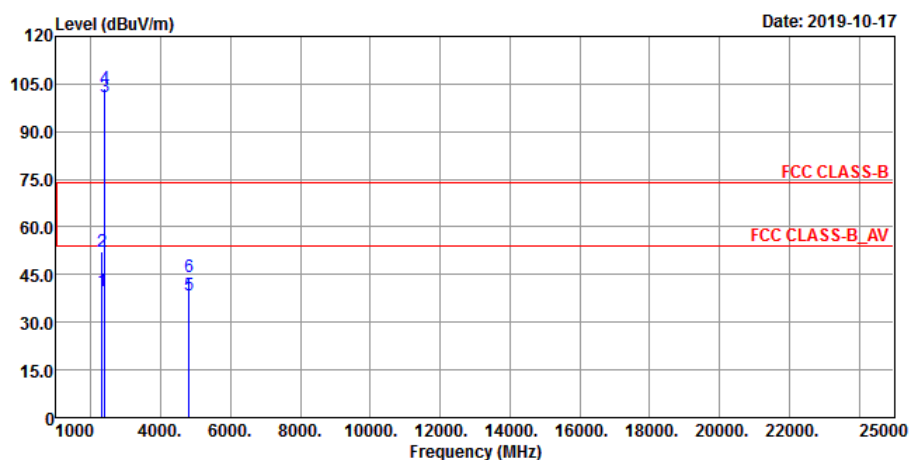
8DPSK

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	Tim Chen

Horizontal



Vertical



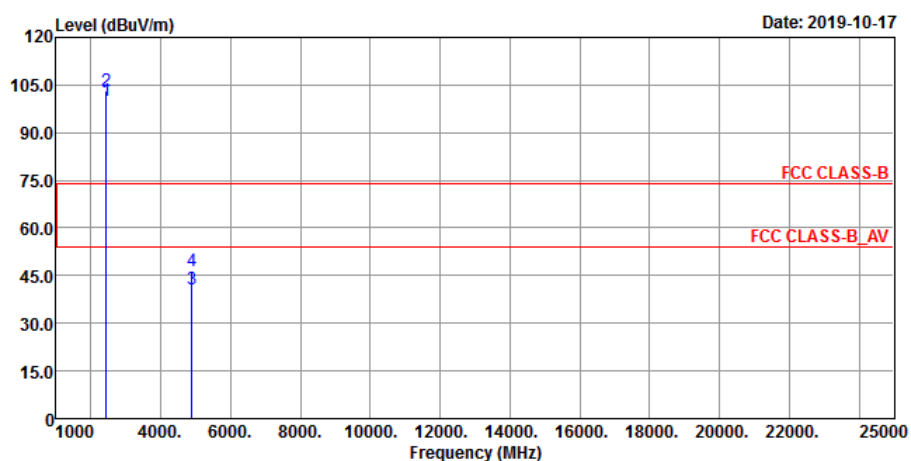
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2314.06	40.16	44.64	-4.48	54	-13.84	292	312	Average
2314.06	51.92	56.4	-4.48	74	-22.08	292	312	Peak
2402	102.37	107.37	-5			292	312	Average
2402	105.36	110.36	-5			292	312	Peak
4804	41.76	56.23	-14.47	54	-12.24	100	133	Average
4804	46.93	61.4	-14.47	74	-27.07	100	133	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2314.06	39.87	44.35	-4.48	54	-14.13	102	294	Average
2314.06	52.04	56.52	-4.48	74	-21.96	102	294	Peak
2402	100.82	105.82	-5			102	294	Average
2402	103.82	108.82	-5			102	294	Peak
4804	38.41	52.88	-14.47	54	-15.59	103	177	Average
4804	44.06	58.53	-14.47	74	-29.94	103	177	Peak

Remarks:

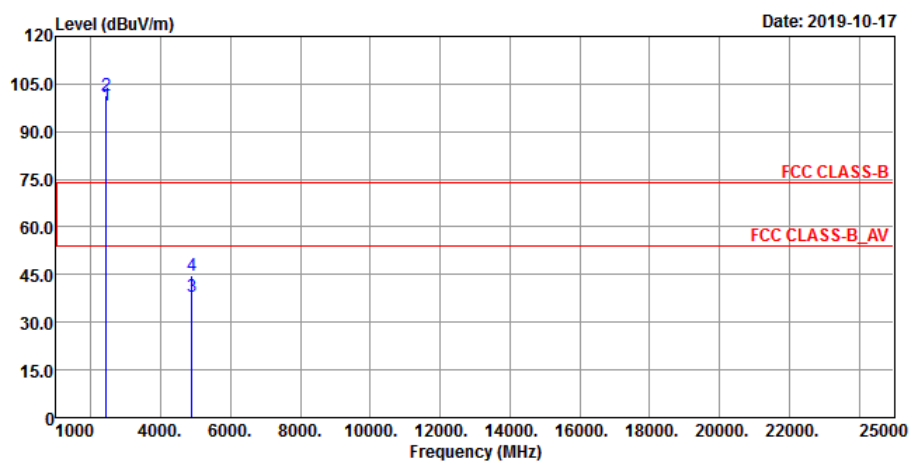
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2402 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

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	Tim Chen

Horizontal



Vertical



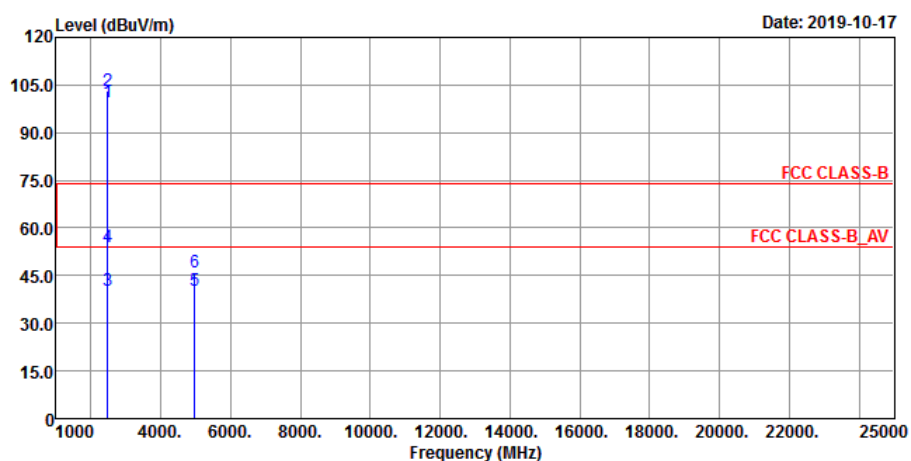
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2441	100.12	105.03	-4.91			291	311	Average
2441	103.36	108.27	-4.91			291	311	Peak
4882	40.95	55.03	-14.08	54	-13.05	102	68	Average
4882	46.68	60.76	-14.08	74	-27.32	102	68	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2441	98.48	103.39	-4.91			121	280	Average
2441	101.38	106.29	-4.91			121	280	Peak
4882	37.93	52.01	-14.08	54	-16.07	132	114	Average
4882	44.54	58.62	-14.08	74	-29.46	132	114	Peak

Remarks:

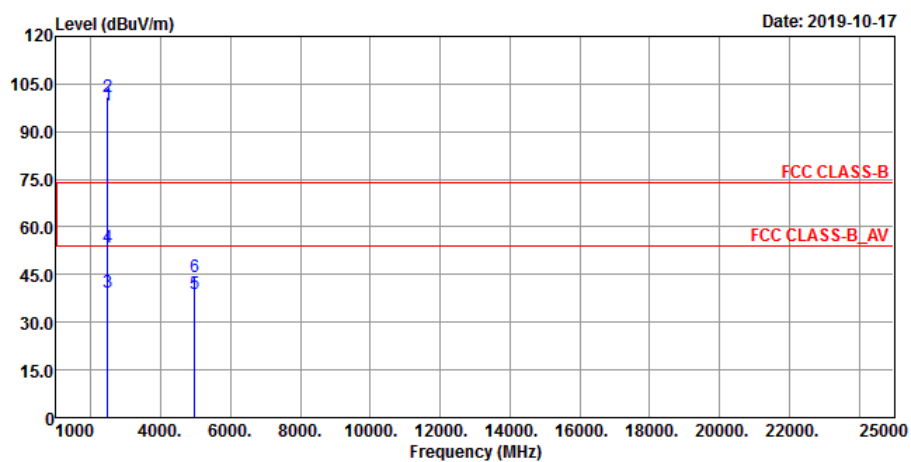
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2441 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

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	Tim Chen

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	99.81	104.66	-4.85			274	306	Average
2480	103.09	107.94	-4.85			274	306	Peak
2483.5	40.37	45.22	-4.85	54	-13.63	274	306	Average
2483.5	53.89	58.74	-4.85	74	-20.11	274	306	Peak
4960	40.32	54.21	-13.89	54	-13.68	102	72	Average
4960	45.97	59.86	-13.89	74	-28.03	102	72	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	98.35	103.2	-4.85			120	279	Average
2480	101.16	106.01	-4.85			120	279	Peak
2483.5	39.45	44.3	-4.85	54	-14.55	120	279	Average
2483.5	53.61	58.46	-4.85	74	-20.39	120	279	Peak
4960	38.78	52.67	-13.89	54	-15.22	103	125	Average
4960	44.18	58.07	-13.89	74	-29.82	103	125	Peak

Remarks:

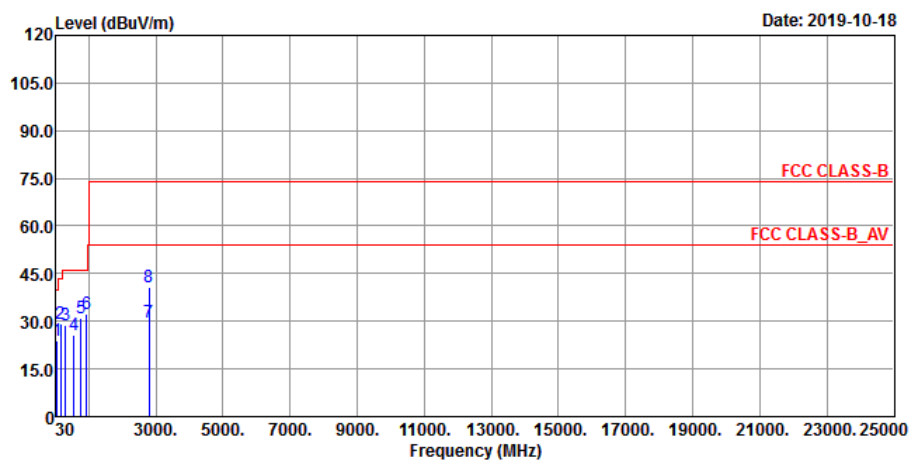
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2480 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

12.6.2 接收諧波

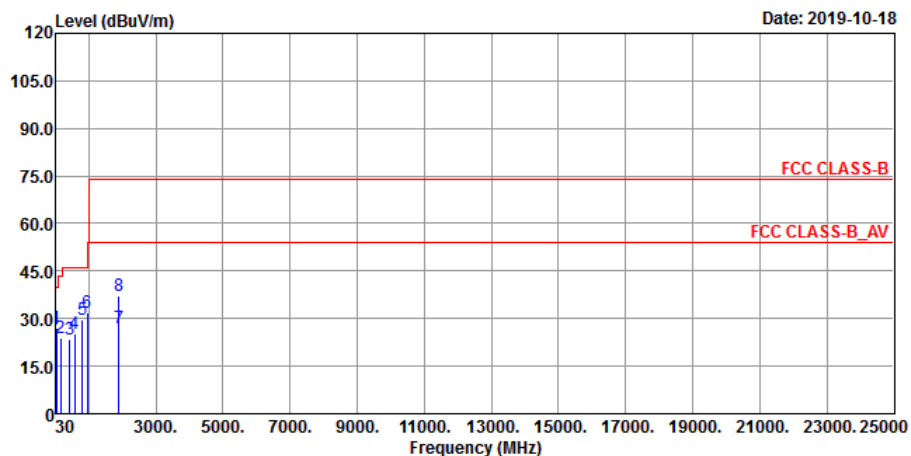
GFSK

EUT Test Condition		Measurement Detail	
Channel	Channel 78	Frequency Range	30 MHz ~ 25 GHz
Input Power	110 Vac, 60 Hz	Detector Function	Above 1 GHz: Peak (PK) & Average (AV) Below 1 GHz: Peak (PK) or Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Tim Chen

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
51.78	23.87	41.41	-17.54	40	-16.13	201	166	Peak
166.77	29.17	46.54	-17.37	43.5	-14.33	194	306	Peak
313.24	28.72	44.83	-16.11	46	-17.28	186	277	Peak
569.32	25.73	35.87	-10.14	46	-20.27	174	233	Peak
772.05	30.79	35.27	-4.48	46	-15.21	191	147	Peak
942.77	32.53	35.27	-2.74	46	-13.47	155	223	Peak
2791.13	29.75	49.14	-19.39	54	-24.25	167	324	Average
2791.13	40.57	59.96	-19.39	74	-33.43	167	324	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
38.164	27.09	44.23	-17.14	40	-12.91	102	154	Peak
161.92	24.1	41.22	-17.12	43.5	-19.4	144	196	Peak
427.7	23.54	35.93	-12.39	46	-22.46	121	56	Peak
575.14	25.02	34.71	-9.69	46	-20.98	103	179	Peak
820.55	29.88	34.81	-4.93	46	-16.12	101	162	Peak
953.44	32.05	35.05	-3	46	-13.95	113	145	Peak
1894.567	26.86	50.04	-23.18	54	-27.14	174	223	Average
1894.567	37.09	60.27	-23.18	74	-36.91	174	223	Peak

Remarks:

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

12.6.3 其它不必要之訊號

9 kHz ~ 30 MHz Data:

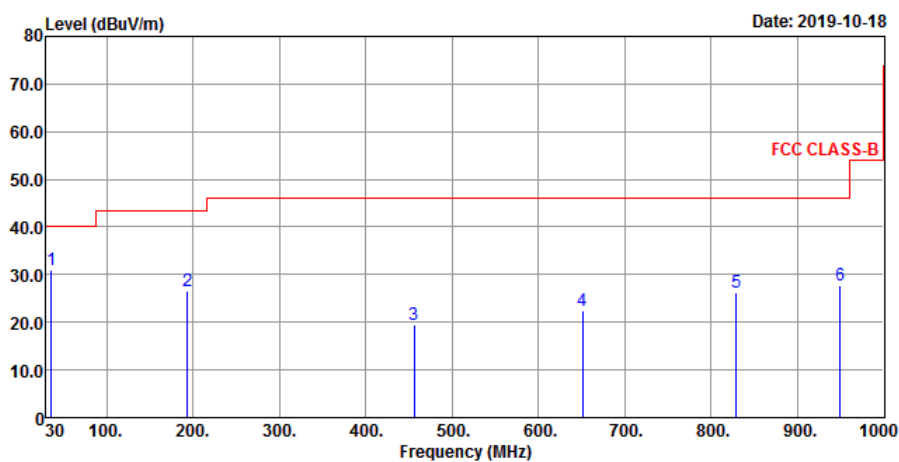
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Data:

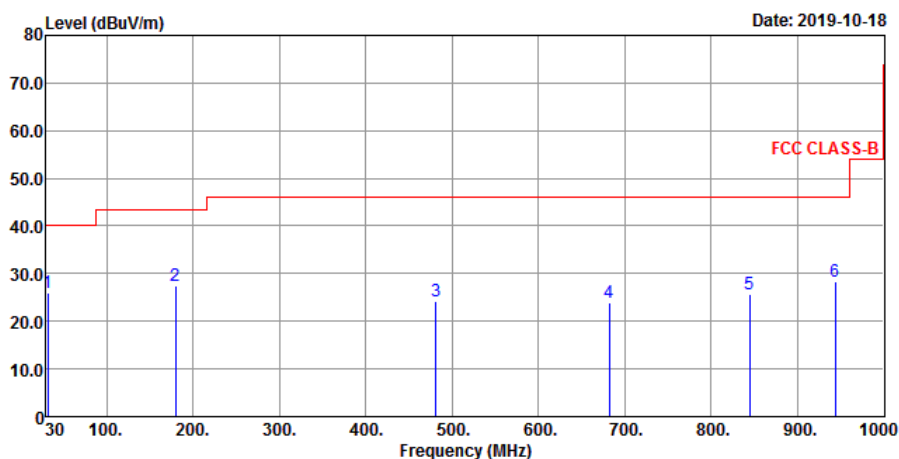
GFSK

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

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
35.82	30.89	48.06	-17.17	40	-9.11	108	322	Peak
193.93	26.71	46.32	-19.61	43.5	-16.79	142	206	Peak
455.83	19.6	31.94	-12.34	46	-26.4	111	33	Peak
650.8	22.51	30.66	-8.15	46	-23.49	169	81	Peak
829.28	26.25	30.88	-4.63	46	-19.75	109	153	Peak
949.56	27.84	30.71	-2.87	46	-18.16	112	202	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
31.94	25.84	43.05	-17.21	40	-14.16	188	264	Peak
179.38	27.47	45.86	-18.39	43.5	-16.03	203	167	Peak
481.05	24.15	35.97	-11.82	46	-21.85	104	55	Peak
681.84	23.86	30.84	-6.98	46	-22.14	131	176	Peak
844.8	25.6	29.81	-4.21	46	-20.4	114	222	Peak
943.74	28.3	31.03	-2.73	46	-17.7	192	314	Peak

Remarks:

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

12.7 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。

13 20 dB 頻寬之要求

13.1 適用標準

請見本報告 3.1 節第(27)項的規定。

13.2 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。

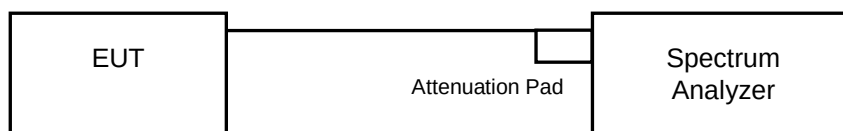
13.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020

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



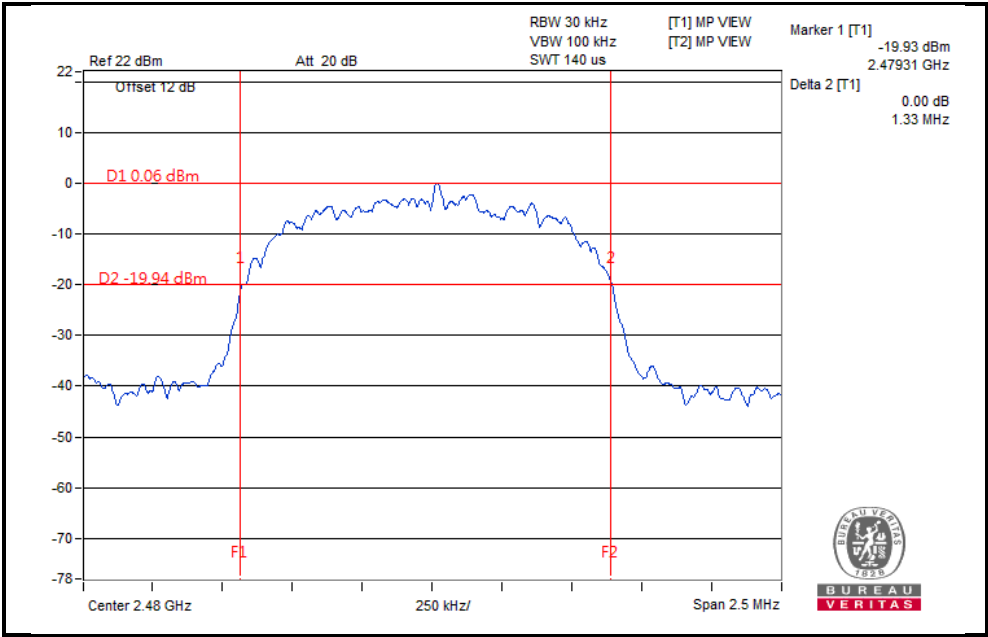
13.5 量測結果

操作模式	發射	測試日期	108 年 10 月 17 日
量測場地溫度	25 °C	量測場地濕度	60 % RH
測試者	吳俊樺		

Channel	Channel Frequency (MHz)	20 dB Bandwidth (MHz)		>= 25 kHz
		GFSK	8DPSK	
0	2402	1.04	1.31	Yes
39	2441	1.04	1.31	Yes
78	2480	1.04	1.33	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。



13.6 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。

14 峰值傳導輸出功率之量測

14.1 適用標準

請見本報告 3.1 節第(25)項的規定。

14.2 量測方法

- 將待測物輸出接到功率計上。
- 設定待測物處於連續發射狀態。
- 量測待測物輸出功率峰值。

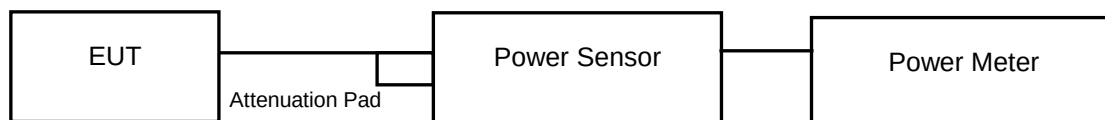
14.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Power Meter Anritsu	ML2495A	1232002	Dec. 17, 2018	Dec. 16, 2019
Power Sensor Anritsu	MA2411B	1207325	Dec. 17, 2018	Dec. 16, 2019

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.

14.4 測試配置



14.5 量測結果

操作模式	發射	測試日期	108 年 10 月 17 日
量測場地溫度	25 °C	量測場地濕度	60 % RH
測試者	吳俊樺		

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)		Peak Power Limit (dBm)	Pass / Fail
		GFSK	8DPSK		
0	2402	0.75	4.81	21	Pass
39	2441	1.48	5.84	21	Pass
78	2480	1.86	6.44	21	Pass

14.6 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。

15 跳頻頻道數之量測

15.1 適用標準

請見本報告 3.1 節第(26)項的規定。

15.2 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 = 100 kHz，VBW = 300 kHz，量測跳頻頻道數。

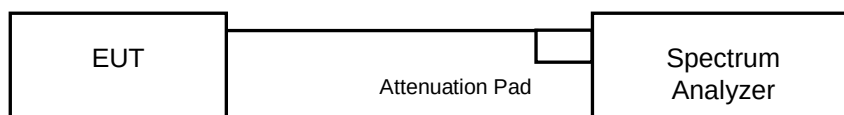
15.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020

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.

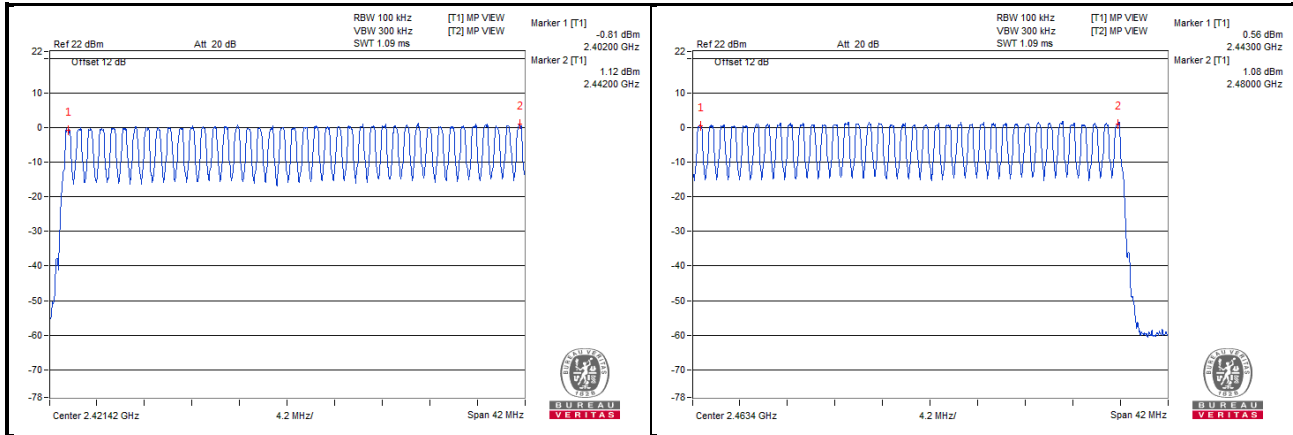
15.4 測試配置



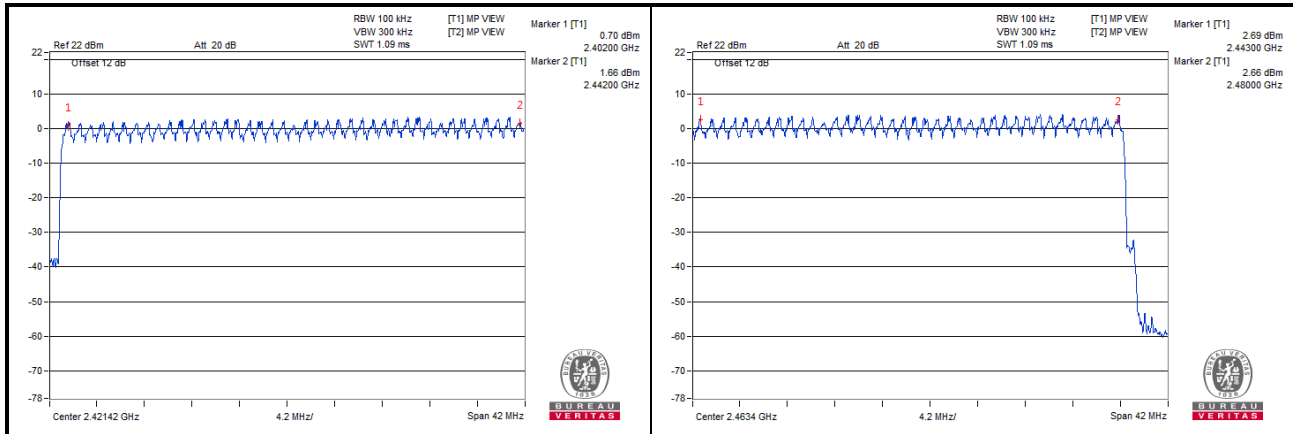
15.5 量測結果

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。

GFSK



8DPSK



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 跳頻頻道間隔之量測

16.1 適用標準

請見本報告 3.1 節第(26)項規定。

16.2 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 = 30 kHz，VBW = 100 kHz，量測相鄰兩個頻道間的間隔。

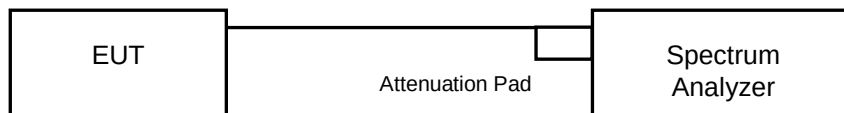
16.3 量測場強輻射之儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020

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.

16.4 測試配置



16.5 量測結果

操作模式	發射	測試日期	108 年 10 月 17 日
量測場地溫度	25 °C	量測場地濕度	60 % RH
測試者	吳俊樺		

GFSK

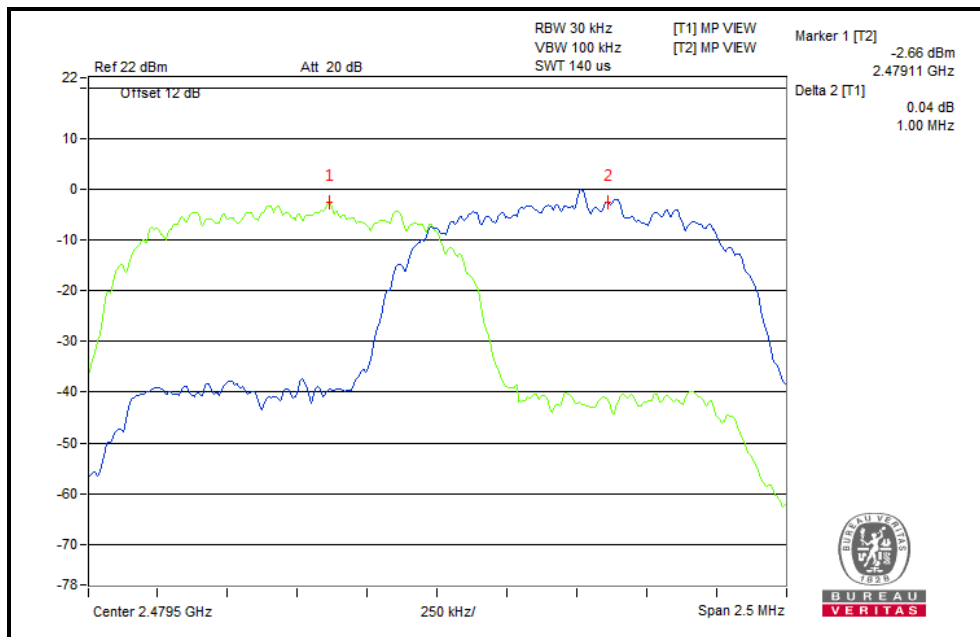
Channel	Frequency (MHz)	Adjacent Channel Separation (MHz)	20 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	1.00	1.04	0.70	Pass
39	2441	1.00	1.04	0.70	Pass
78	2480	1.00	1.04	0.70	Pass

8DPSK

Channel	Frequency (MHz)	Adjacent Channel Separation (MHz)	20 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	1.00	1.31	0.88	Pass
39	2441	1.00	1.31	0.88	Pass
78	2480	1.00	1.33	0.89	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。



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 每一頻道停留時間之量測

17.1 適用標準

請見本報告 3.1 節第(28)項的規定。

17.2 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 = 100 kHz, VBW = 300 kHz, 量測在不同傳輸模式下的頻道停留時間。

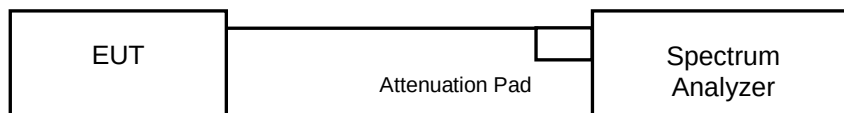
17.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020

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

GFSK

Mode	Number of transmission in a 31.6 (79 Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (sec)
DH1	50 (times / 5 sec) * 6.32 = 316 times	0.444	140.30	0.4
DH3	25 (times / 5 sec) * 6.32 = 158 times	1.7	268.60	0.4
DH5	17 (times / 5 sec) * 6.32 = 107.44 times	2.976	319.74	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	0.45	142.20	0.4
3DH3	27 (times / 5 sec) * 6.32 = 170.64 times	1.72	293.50	0.4
3DH5	18 (times / 5 sec) * 6.32 = 113.76 times	3.008	342.19	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



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。

BLUETOOTH LE 頻段測試紀錄結果

18 帶外發射之量測

18.1 適用標準

請見本報告 3.1 節第(2)項的規定。

18.2 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：

Below 1 GHz

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

Above 1 GHz:

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

18.3 量測儀器

同 4.3 節

18.4 測試配置

同 4.4 節

18.5 場強度之計算

同 4.5 節

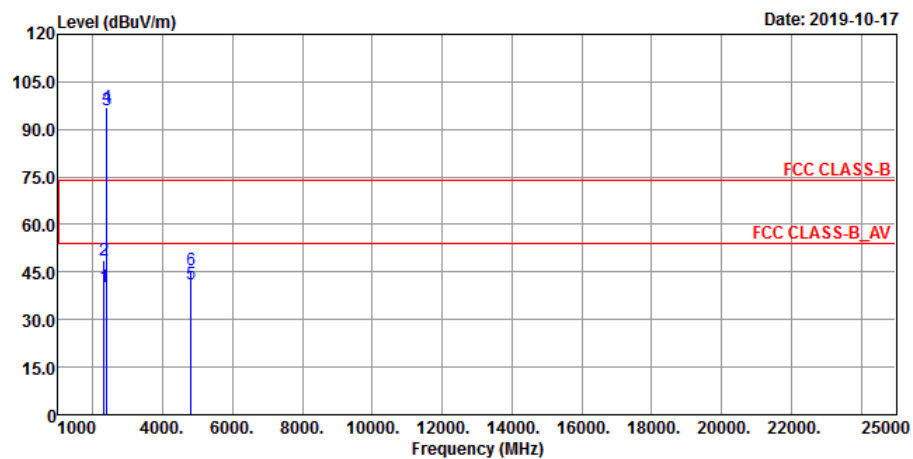
量測結果請見下頁。

18.6 量測結果

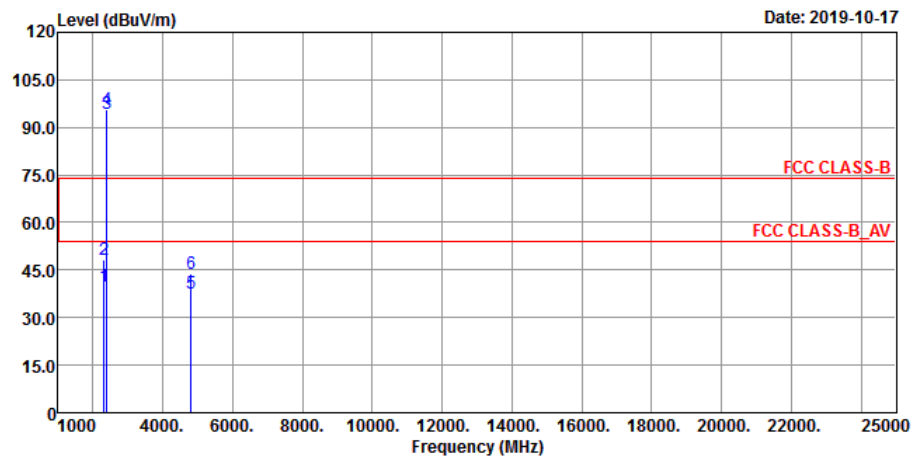
18.6.1 發射諧波

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	Tim Chen

Horizontal



Vertical



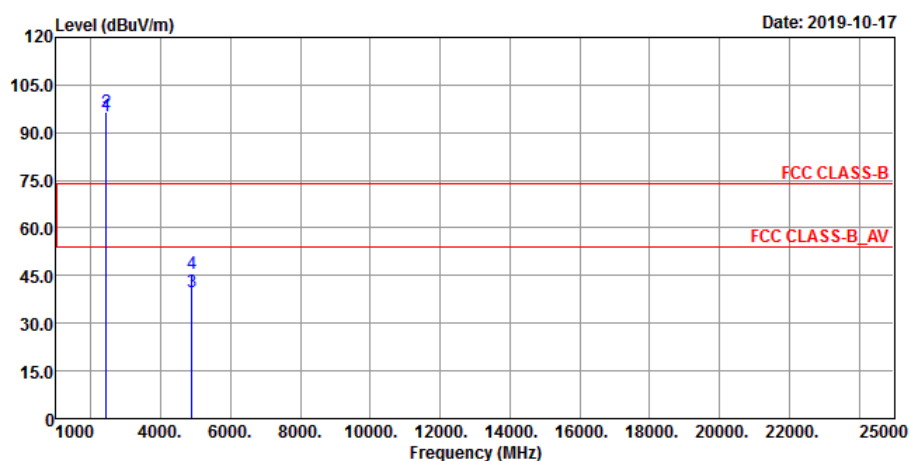
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2313.78	40.27	44.75	-4.48	54	-13.73	288	312	Average
2313.78	48.51	52.99	-4.48	74	-25.49	288	312	Peak
2402	95.92	100.92	-5			288	312	Average
2402	96.97	101.97	-5			288	312	Peak
4804	40.98	55.45	-14.47	54	-13.02	100	79	Average
4804	45.75	60.22	-14.47	74	-28.25	100	79	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2313.78	39.96	44.44	-4.48	54	-14.04	103	294	Average
2313.78	48.3	52.78	-4.48	74	-25.7	103	294	Peak
2402	94.26	99.26	-5			103	294	Average
2402	95.45	100.45	-5			103	294	Peak
4804	37.61	52.08	-14.47	54	-16.39	136	208	Average
4804	43.65	58.12	-14.47	74	-30.35	136	208	Peak

Remarks:

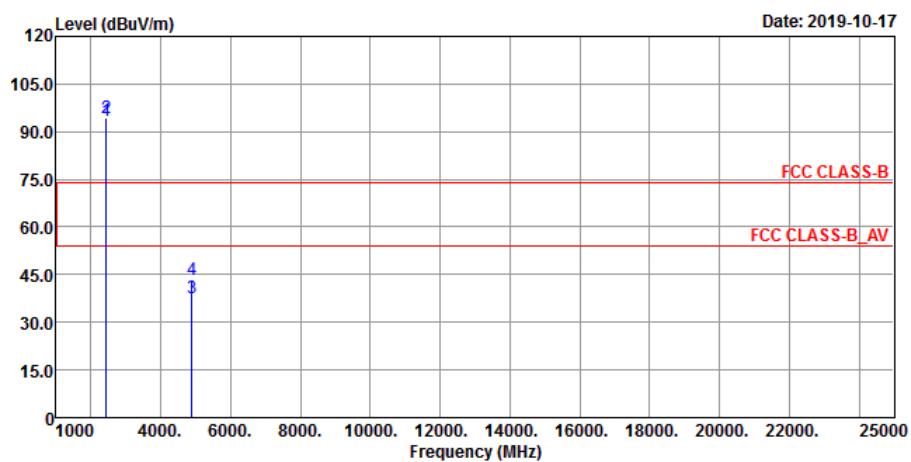
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2402 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

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

Horizontal



Vertical



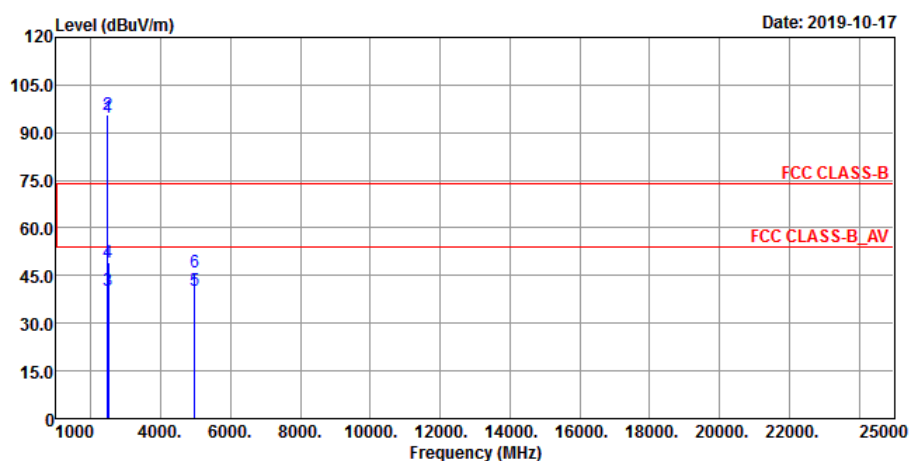
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2440	95.34	100.32	-4.98			290	311	Average
2440	96.41	101.39	-4.98			290	311	Peak
4880	39.95	54.03	-14.08	54	-14.05	100	61	Average
4880	45.64	59.72	-14.08	74	-28.36	100	61	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2440	93.39	98.37	-4.98			100	290	Average
2440	94.45	99.43	-4.98			100	290	Peak
4880	37.6	51.68	-14.08	54	-16.4	143	255	Average
4880	43.35	57.43	-14.08	74	-30.65	143	255	Peak

Remarks:

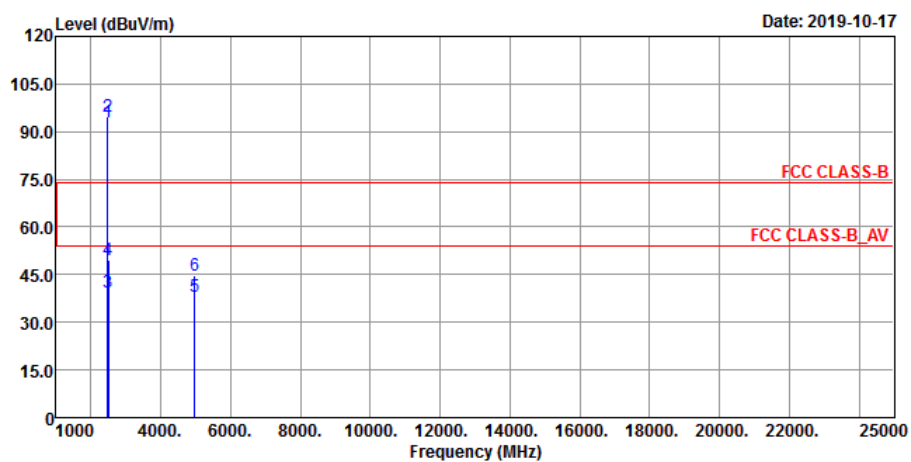
1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 2440 MHz: Fundamental Frequency.
3. The other emission levels were very low against the limit.

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	Tim Chen

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	94.66	99.51	-4.85			289	306	Average
2480	95.82	100.67	-4.85			289	306	Peak
2496.04	40.1	44.88	-4.78	54	-13.9	289	306	Average
2496.04	49.2	53.98	-4.78	74	-24.8	289	306	Peak
4960	40.33	54.22	-13.89	54	-13.67	100	66	Average
4960	46.07	59.96	-13.89	74	-27.93	100	66	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2480	93.1	97.95	-4.85			121	283	Average
2480	94.65	99.5	-4.85			121	283	Peak
2499.88	39.6	44.38	-4.78	54	-14.4	121	283	Average
2499.88	49.48	54.26	-4.78	74	-24.52	121	283	Peak
4960	38.18	52.07	-13.89	54	-15.82	144	219	Average
4960	44.54	58.43	-13.89	74	-29.46	144	219	Peak

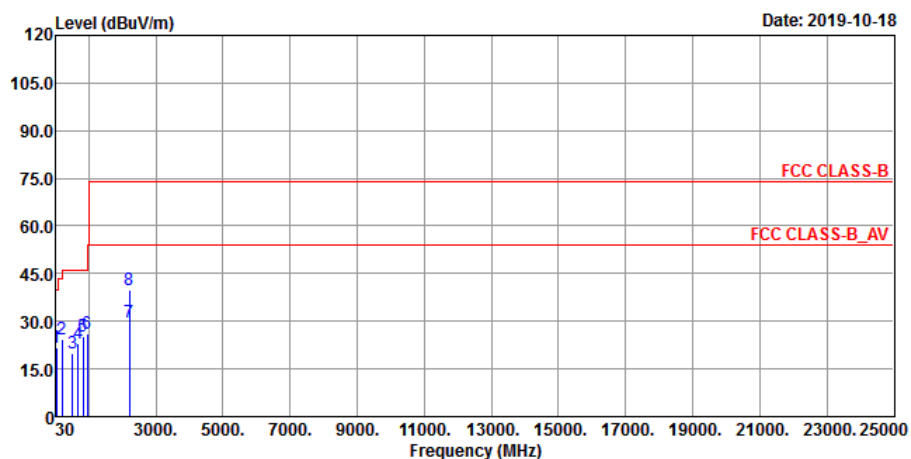
Remarks:

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

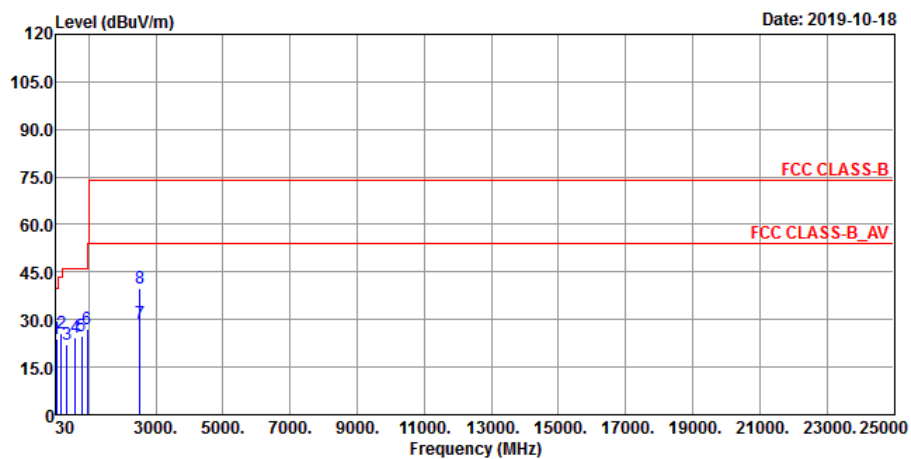
18.6.2 接收諧波

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

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
35.82	31.14	48.31	-17.17	40	-8.86	125	147	Peak
177.44	31.92	50.14	-18.22	43.5	-11.58	133	331	Peak
289.96	30.31	47.1	-16.79	46	-15.69	192	256	Peak
503.36	27.31	37.65	-10.34	46	-18.69	198	67	Peak
765.26	29.12	33.79	-4.67	46	-16.88	208	115	Peak
932.1	30.12	32.95	-2.83	46	-15.88	201	100	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
43.58	32.95	49.9	-16.95	40	-7.05	103	212	Peak
194.9	31.25	50.89	-19.64	43.5	-12.25	144	59	Peak
481.05	27	38.82	-11.82	46	-19	136	229	Peak
655.65	25.94	33.79	-7.85	46	-20.06	108	171	Peak
797.27	28.36	33.5	-5.14	46	-17.64	103	303	Peak
935.01	30.97	33.77	-2.8	46	-15.03	111	13	Peak

Remarks:

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

18.6.3 其它不必要之訊號

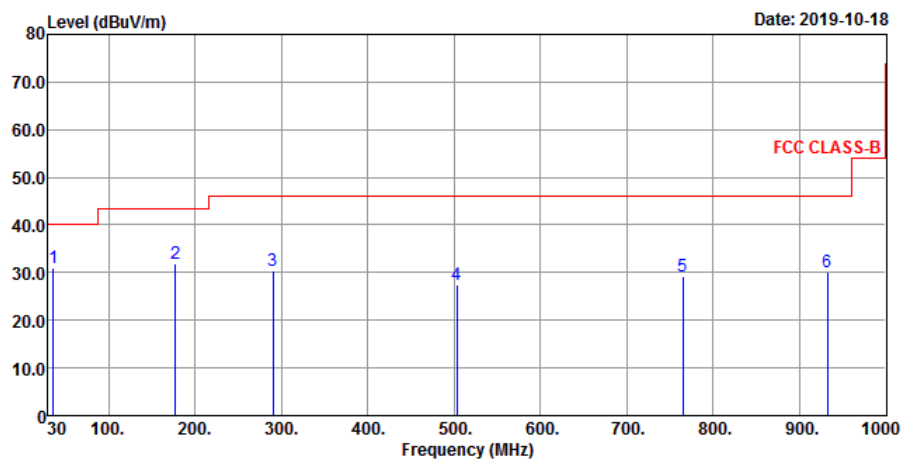
9 kHz ~ 30 MHz Data:

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

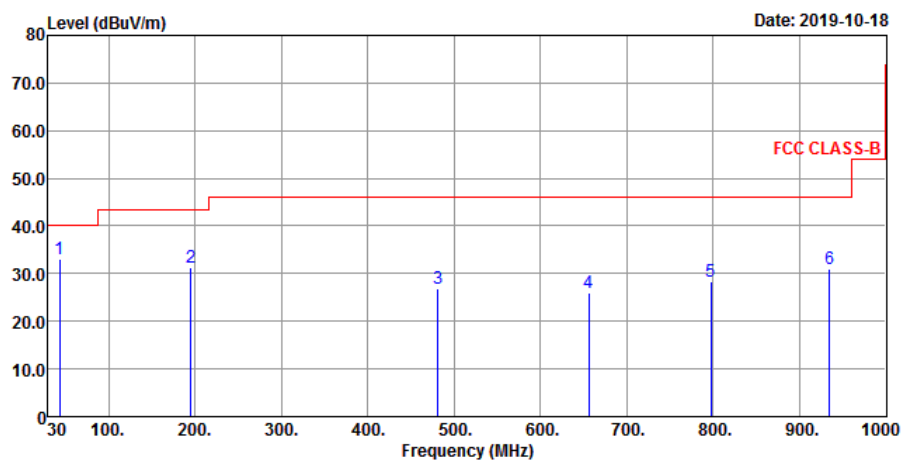
30 MHz ~ 1 GHz Data:

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

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
35.82	31.14	48.31	-17.17	40	-8.86	125	147	Peak
177.44	31.92	50.14	-18.22	43.5	-11.58	133	331	Peak
289.96	30.31	47.1	-16.79	46	-15.69	192	256	Peak
503.36	27.31	37.65	-10.34	46	-18.69	198	67	Peak
765.26	29.12	33.79	-4.67	46	-16.88	208	115	Peak
932.1	30.12	32.95	-2.83	46	-15.88	201	100	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
43.58	32.95	49.9	-16.95	40	-7.05	103	212	Peak
194.9	31.25	50.89	-19.64	43.5	-12.25	144	59	Peak
481.05	27	38.82	-11.82	46	-19	136	229	Peak
655.65	25.94	33.79	-7.85	46	-20.06	108	171	Peak
797.27	28.36	33.5	-5.14	46	-17.64	103	303	Peak
935.01	30.97	33.77	-2.8	46	-15.03	111	13	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin Value = Emission Level – Limit value
2. 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。

19 6 dB 頻寬之要求

19.1 適用標準

請見本報告 3.1 節第(5)項的規定。

19.2 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。

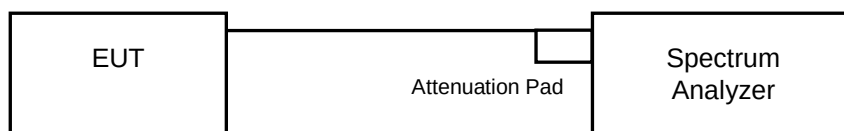
19.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020

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.

19.4 測試配置

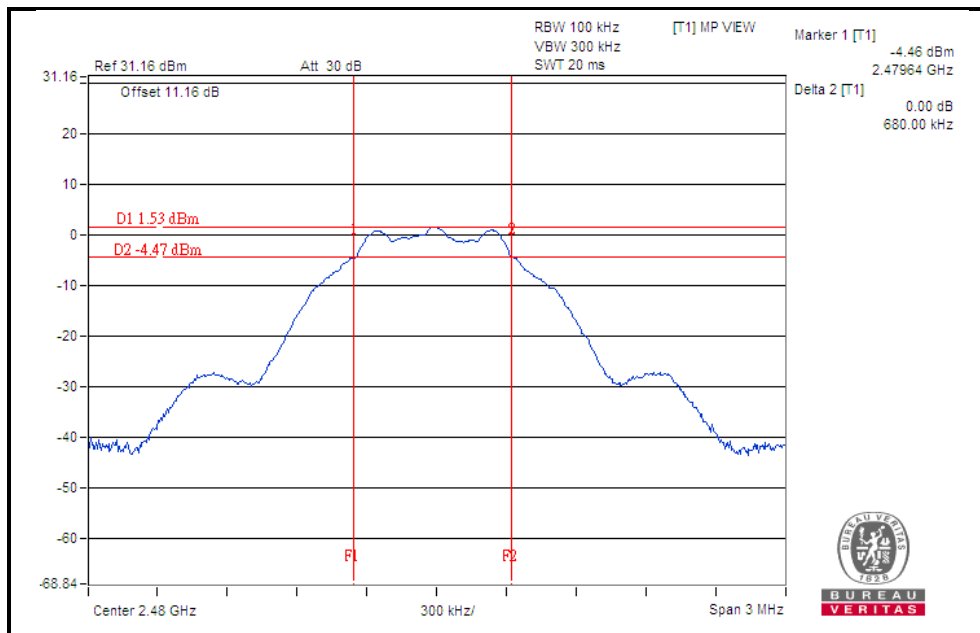


19.5 量測結果

操作模式	發射	測試日期	108 年 10 月 17 日
量測場地溫度	25 °C	量測場地濕度	60 % RH
測試者	吳俊樺		

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	0.69	0.5	Pass
19	2440	0.69	0.5	Pass
39	2480	0.68	0.5	Pass

**此測試圖僅放測試結果最差的頻道。



19.6 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。

20 峰值傳導輸出功率之量測

20.1 適用標準

請見本報告 3.1 節第(4)及(6)項的規定。

20.2 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。

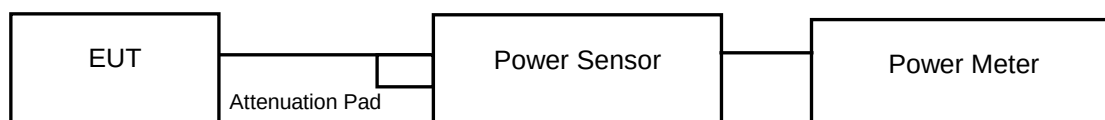
20.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Power Meter Anritsu	ML2495A	1232002	Dec. 17, 2018	Dec. 16, 2019
Power Sensor Anritsu	MA2411B	1207325	Dec. 17, 2018	Dec. 16, 2019

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.

20.4 測試配置



20.5 量測結果

操作模式	發射	測試日期	108 年 10 月 17 日
量測場地溫度	25 °C	量測場地濕度	60 % RH
測試者	吳俊樺		

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
0	2402	1.14	0.57	30	Pass
19	2440	1.349	1.30	30	Pass
39	2480	1.503	1.77	30	Pass

20.6 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。

21 功率頻譜密度之量測

21.1 適用標準

請見本報告 3.1 節第(7)項的規定。

21.2 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。

21.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer R&S	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020

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.

21.4 測試配置

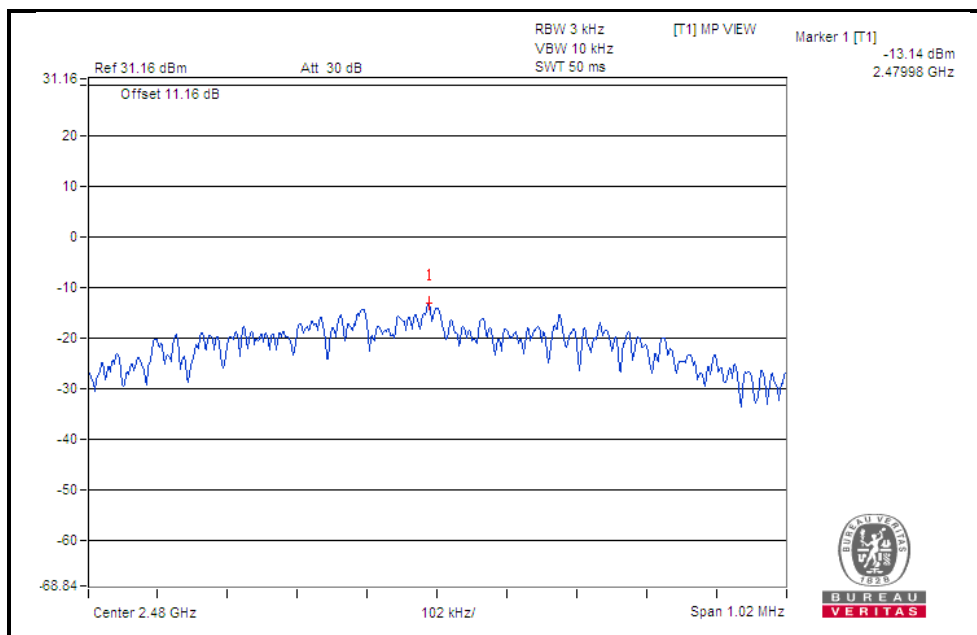


21.5 量測結果

操作模式	發射	測試日期	108 年 10 月 17 日
量測場地溫度	25 °C	量測場地濕度	60 % RH
測試者	吳俊樺		

Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	2402	-14.51	8	Pass
19	2440	-13.73	8	Pass
39	2480	-13.14	8	Pass

**此測試圖僅放測試結果最差的頻道。



21.6 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。

22 電源線傳導干擾之量測

22.1 適用標準

請見本報告 3.1 節第(1)項的規定。

22.2 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。

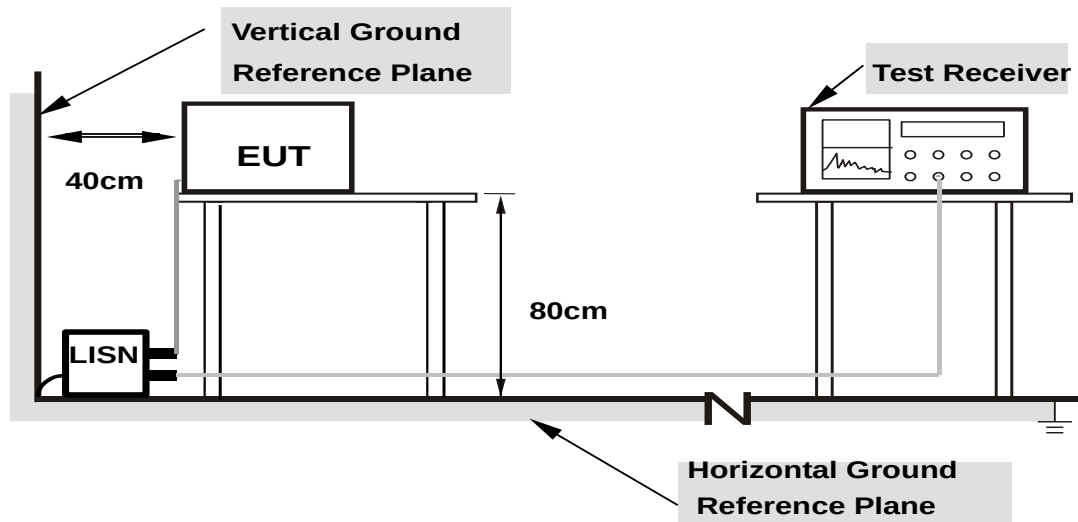
22.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 10, 2018	Dec. 09, 2019
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2019	Sep. 04, 2020
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 21, 2019	Feb. 20, 2020
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 22, 2019	Aug. 21, 2020
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-12040.
4. The measurement uncertainty is 2.94 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.

22.4 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

22.5 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

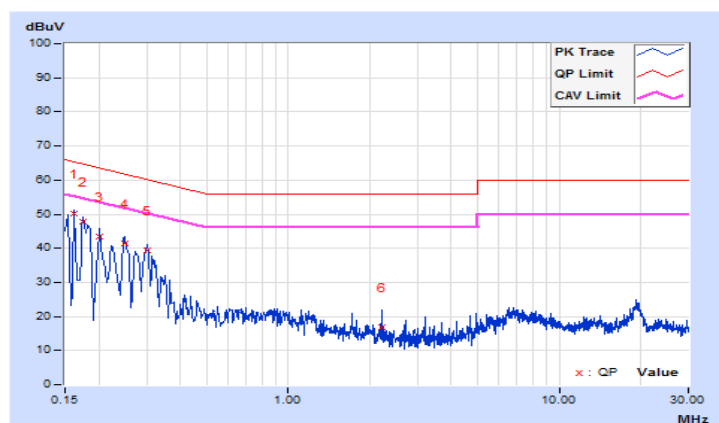
22.6 量測結果

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	王紀雄	測試日期	2019/10/20

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	0.16200	9.67	40.40	32.87	50.07	42.54	65.36	55.36	-15.29	-12.82
2	0.17400	9.67	38.01	30.12	47.68	39.79	64.77	54.77	-17.09	-14.98
3	0.20201	9.66	33.87	25.73	43.53	35.39	63.53	53.53	-20.00	-18.14
4	0.25006	9.67	31.79	23.09	41.46	32.76	61.76	51.76	-20.30	-19.00
5	0.30150	9.68	29.62	25.65	39.30	35.33	60.20	50.20	-20.90	-14.87
6	2.21000	9.79	7.19	5.59	16.98	15.38	56.00	46.00	-39.02	-30.62

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)

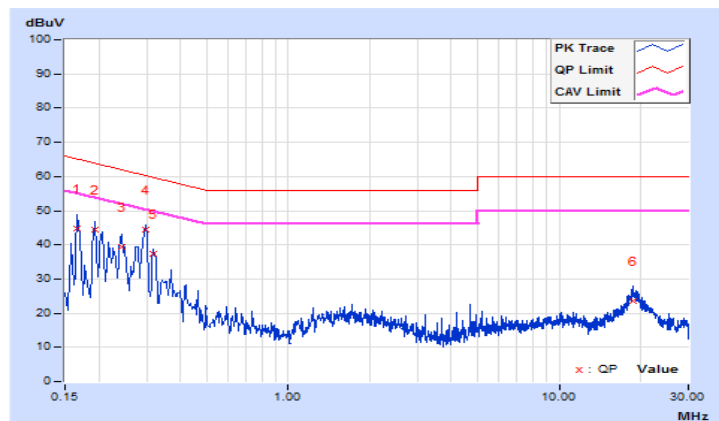


量測頻率範圍	150kHz ~ 30MHz	檢測器與頻寬	準峰值 (QP) / 平均值 (AV), 9kHz
量測電壓值	110Vac, 60Hz	量測場地溫濕度	25°C, 65%RH
測試者	王紀雄	測試日期	2019/10/20

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	0.16600	9.64	35.01	28.10	44.65	37.74	65.16	55.16	-20.51	-17.42
2	0.19400	9.64	34.89	29.67	44.53	39.31	63.86	53.86	-19.33	-14.55
3	0.24200	9.64	29.59	21.10	39.23	30.74	62.03	52.03	-22.80	-21.29
4	0.29800	9.65	34.88	32.71	44.53	42.36	60.30	50.30	-15.77	-7.94
5	0.31781	9.65	27.77	23.52	37.42	33.17	59.76	49.76	-22.34	-16.59
6	18.69000	10.03	13.64	6.36	23.67	16.39	60.00	50.00	-36.33	-33.61

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)



22.7 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。

23 電波暴露量之評估

23.1 適用標準

請見本報告 3.1 節第(8)&(20)&(29)項的規定。

23.2 評估方法

a) 以 6.5、9.5、14.5、20.5 節所測得的最大輸出功率值再加上待測物天線的增益值(Gain)帶入下面公式換算出待測物所輻射的功率密度。

$$b) P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

P_d = power density in mW/cm^2

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

23.3 評估結果

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Pass/Fail
WLAN 2412 ~ 2462	28.02	5.73	20	0.472	1	Pass
WLAN 5180 ~ 5240	17.37	4.54	20	0.031	1	Pass
WLAN 5260 ~ 5320	17.34	5.84	20	0.041	1	Pass
WLAN 5500 ~ 5710	18.08	6.71	20	0.060	1	Pass
WLAN 5745 ~ 5825	17.01	6.26	20	0.042	1	Pass
BT 2402 ~ 2480	6.44	2.76	20	0.002	1	Pass

Note:

For WLAN 2.4GHz: Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.73$ dBi

For U-NII-1 Band: Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 4.54$ dBi

For U-NII-2A Band: Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.84$ dBi

For U-NII-2C Band: Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.71$ dBi

For U-NII-3 Band: Directional gain = $10\log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.26$ dBi

24 待測物照片

請參照 BV CPS 報告編號：191004C17

附錄：動態頻率選擇

1 EUT Information

1.1 Operating Frequency Bands and Mode of EUT

Table 1: Operating frequency bands and mode of EUT

Operational Mode	Operating Frequency Range	
	5250 ~ 5350 MHz	5470 ~ 5725 MHz
Client without radar detection and ad hoc function	✓	✓

1.2 EUT Software and Firmware Version

Table 2: The EUT software/firmware version

No.	Product	Model No.	Software/Firmware Version
1	ClickShare	C 3010S	SW Version: 01.99.02.RD_qdart_andch-0005

1.3 Description of Available Antennas to the EUT

Table 3: Antenna list

Ant No.	Antenna Type	Operation Frequency Range (MHz)	Max. Gain (dBi)
1	PIFA	5250~5350	2.06
1	PIFA	5470~5725	3.61
2	PIFA	5250~5350	3.53
2	PIFA	5470~5725	3.78

1.4 EUT Maximum Conducted Power

Table 4: The measured conducted output power

802.11a

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	17.34	54.251
5470~5725	18.08	64.301

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	16.37	43.313
5470~5725	17.12	51.492

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	16.18	41.522
5470~5725	16.53	44.970

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	13.20	20.889
5470~5725	13.91	24.606

1.5 EUT Maximum E.I.R.P. Power

Table 5: The E.I.R.P output power list

802.11a

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	20.87	122.18
5470~5725	21.86	153.462

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	19.90	97.724
5470~5725	20.90	123.027

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	19.71	93.541
5470~5725	20.31	107.399

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (dBm)	Output Power (mW)
5250~5350	16.73	47.098
5470~5725	17.69	58.749

1.6 Transmit Power Control (TPC)

U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW. Maximum EIRP of this device is 153.462 mW which less than 500 mW, therefore it's not require TPC function.

1.7 Statement of Manufacturer

Manufacturer statement confirming that information regarding the parameters of the detected Radar Waveforms is not available to the end user. **And the device doesn't have Ad Hoc mode on DFS frequency band.**

2 U-NII DFS Rule Requirements

2.1 Working Modes and Required Test Items

The manufacturer shall state whether the UUT is capable of operating as a Master and/or a Client. If the UUT is capable of operating in more than one operating mode then each operating mode shall be tested separately. See tables 6 and 7 for the applicability of DFS requirements for each of the operational modes.

Table 6: Applicability of DFS Requirements Prior to Use a Channel

Requirement	Operational Mode		
	Master	Client without radar detection	Client with radar detection
Non-Occupancy Period	✓	Not required	✓
DFS Detection Threshold	✓	Not required	✓
Channel Availability Check Time	✓	Not required	Not required
U-NII Detection Bandwidth	✓	Not required	✓
Note: Per KDB 905462 D03 UNII Clients Without Radar Detection New Rules v01r02 section (b)(5/6), If the client moves with the master, the device is considered compliant if nothing appears in the client non-occupancy period test. For devices that shut down (rather than moving channels), no beacons should appear. An analyzer plot that contains a single 30-minute sweep on the original channel.			

Table 7: Applicability of DFS Requirements during Normal Operation

Requirement	Operational Mode	
	Master or Client with radar detection	Client without radar detection
DFS Detection Threshold	✓	Not required
Channel Closing Transmission Time	✓	✓
Channel Move Time	✓	✓
U-NII Detection Bandwidth	✓	Not required

Additional requirements for devices with multiple bandwidth modes	Master or Client with radar detection	Client without radar detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All Other Tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

2.2 Test Limits and Radar Signal Parameters

Detection Threshold Values

Table 8: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP $\geq$ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.

Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Note 3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.

Table 9: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second periods. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100 % of the U-NII 99 % transmission power bandwidth. See Note 3

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

Parameters of DFS Test Signals

Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Table 10: Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a. Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A.	Roundup $\left\lceil \frac{1}{360} \cdot \frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right\rceil$	60 %	30
2	1-5	150-230	23-29	60 %	30
3	6-10	200-500	16-18	60 %	30
4	11-20	200-500	12-16	60 %	30
Aggregate (Radar Types 1-4)				80 %	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

Table 11: Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80 %	30

Three subsets of trials will be performed with a minimum of ten trials per subset. The subset of trials differ in where the Long Pulse Type 5 Signal is tuned in frequency.

a) the Channel center frequency
b) tuned frequencies such that 90% of the Long Pulse Type 5 frequency modulation is within the low edge of the UUT Occupied Bandwidth
c) tuned frequencies such that 90% of the Long Pulse Type 5 frequency modulation is within the high edge of the UUT Occupied Bandwidth

It include 10 trails for every subset, the formula as below,

For subset case 1: the center frequency of the signal generator will remain fixed at the center of the UUT Channel.

For subset case 2: to retain 90% frequency overlap between the radar signal and the UUT Occupied Bandwidth, the center frequency of the signal generator will vary for each of the ten trials in subset case 2. The center frequency of the signal generator for each trial is calculated by:

$$FL + (0.4 * \text{Chirp Width [in MHz]})$$

For subset case 3: to retain 90% frequency overlap between the radar signal and the UUT Occupied Bandwidth, the center frequency of the signal generator will vary for each of the ten trials in subset case 3. The center frequency of the signal generator for each trial is calculated by:

$$FH - (0.4 * \text{Chirp Width [in MHz]})$$

Table 12: Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70 %	30

3 Test & Support Equipment List

3.1 Test Instruments

Table 1: Test Instruments List

Description & Manufacturer	Model No.	Brand	Date Of Calibration	Due Date Of Calibration
Spectrum analyzer	ESR	R&S	Mar. 06, 2019	Mar. 05, 2020
Signal generator	MXG	KEYSIGHT	Dec. 24, 2018	Dec. 23, 2019
Horn antenna	BBHA 9120 D	Schwarzbeck	Nov 25, 2018	Nov. 24, 2019
RF coaxial cable	SUCOFLEX 104	HUBER SUHNER	NA	NA

Note:

Calibrate the RF coaxial cable before each test and use the radiation or conducted method to calibrate the reference FCC KDB 412172 standard.

3.2 Description of Support Units

Table 2: Support Unit information

No.	Product	Brand	Model No.	ID	Spec.
1	Router	NETGEAR	R7800	PY315100319	5G Ant gain : 1.61dBi Maximum EIRP : 25.47dBm

NOTE: This device was functioned as a ☒ Master ☐ Slave device during the DFS test.

Table 3: Software/Firmware information

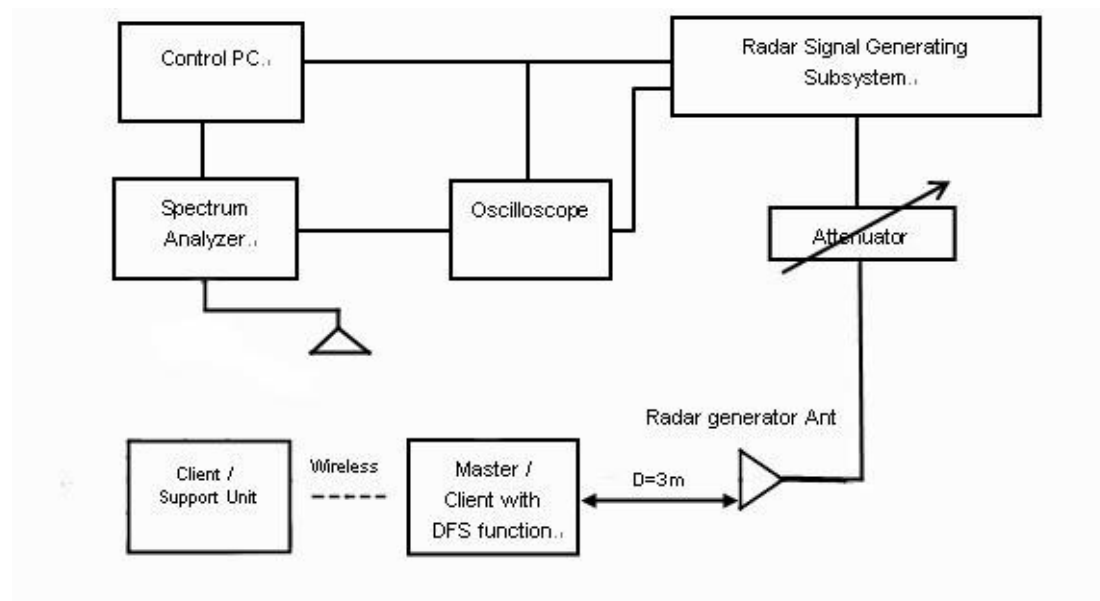
No.	Product	Model No.	Software/Firmware Version
1.	Router	R7800	V1.0.2.36

4 Test Procedure

4.1 ADT DFS Measurement System

A complete ADT DFS Measurement System consists of two subsystems: (1) the Radar Signal Generating Subsystem and (2) the Traffic Monitoring Subsystem. The control PC is necessary for generating the Radar waveforms in Table 10, 11 and 12. The traffic monitoring subsystem is specified to the type of unit under test (UUT).

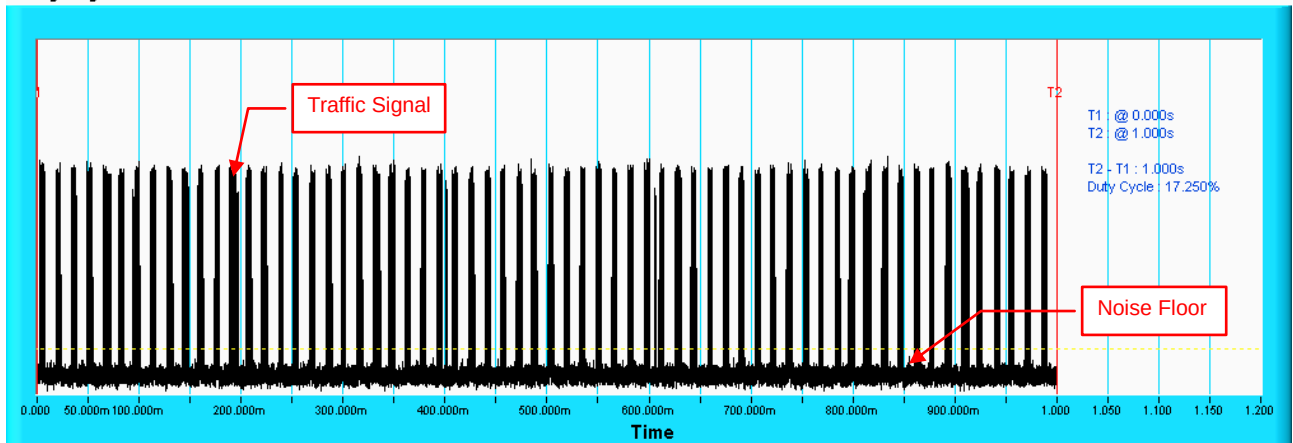
Radiated setup configuration of ADT DFS Measurement System



System testing will be performed with channel-loading using means appropriate to the data types that are used by the unlicensed device. The following requirements apply:

	a) The data file must be of a type that is typical for the device (i.e., MPEG-2, MPEG-4, WAV, MP3, MP4, AVI, etc.) and must generally be transmitting in a streaming mode.
	b) Software to ping the client is permitted to simulate data transfer but must have random ping intervals.
v	c) Timing plots are required with calculations demonstrating a minimum channel loading of approximately 17 % or greater.
	d) Unicast or Multicast protocols are preferable but other protocols may be used. The appropriate protocol used must be described in the test procedures.

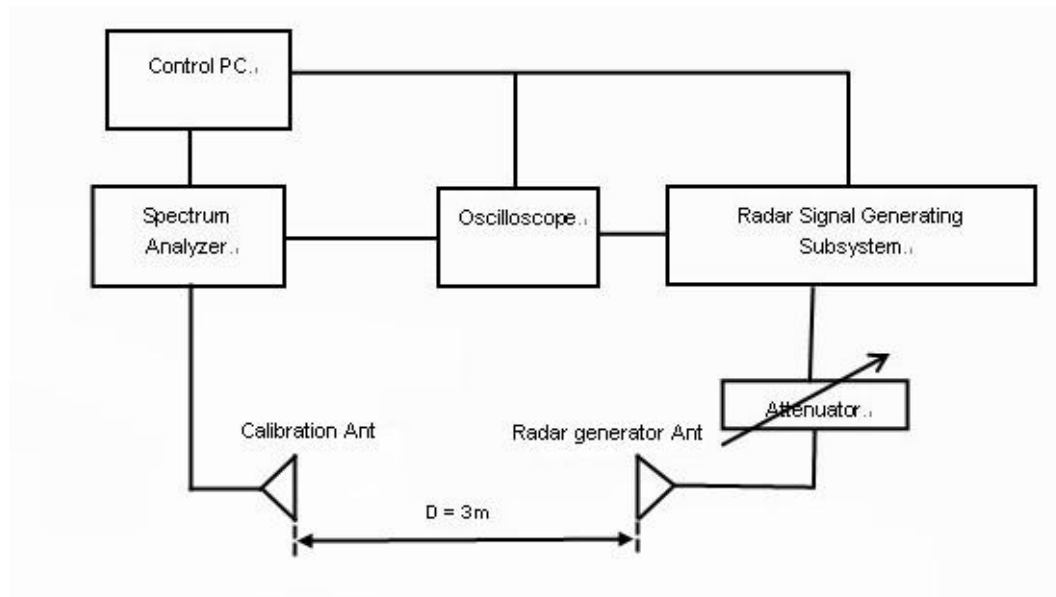
Wireless Traffic Loading Duty Cycle



4.2 Calibration of DFS Detection Threshold Level

The measured channel is 5500 MHz, 5510 MHz and 5530 MHz. The radar signal was the same as transmitted channels, and injected into the antenna of AP (master) or Client Device with Radar Detection, measured the channel closing transmission time and channel move time. The calibrated detection threshold level is set to -64 dBm. The tested level is lower than required level hence it provides margin to the limit.

Radiated setup configuration of Calibration of DFS Detection Threshold Level

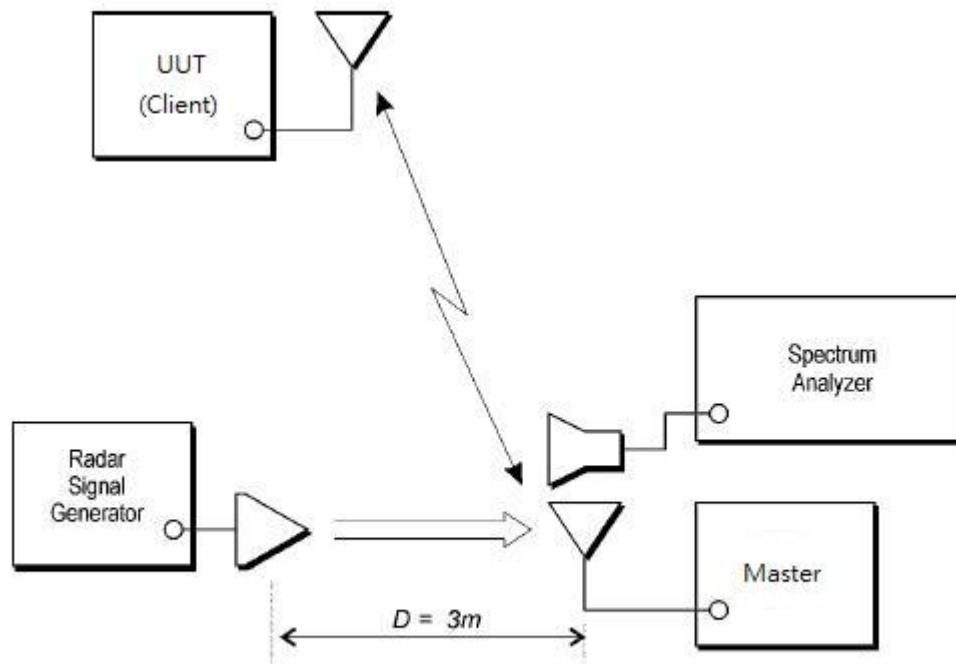


4.3 Deviation from Test Standard

No deviation.

4.4 Radiated Test Setup Configuration

4.4.1 Client without Radar Detection Mode



The UUT is a U-NII Device operating in Client mode without radar detection. The radar test signals are injected into the Master Device.

5 Test Results

5.1 Summary of Test Results

Clause	Test Parameter	Remarks	Pass / Fail
4.7.7	DFS Detection Threshold	Not Applicable	NA
4.7.7	Channel Availability Check Time	Not Applicable	NA
4.7.7	Channel Move Time	Applicable	Pass
4.7.7	Channel Closing Transmission Time	Applicable	Pass
4.7.7	Non- Occupancy Period	Applicable	Pass
4.7.7	Uniform Spreading	Not Applicable	NA
4.7.7	U-NII Detection Bandwidth	Not Applicable	NA
4.7.7	Non-associated test	Applicable	Pass
4.7.7	Non-Co-Channel test	Applicable	Pass

Note:

Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

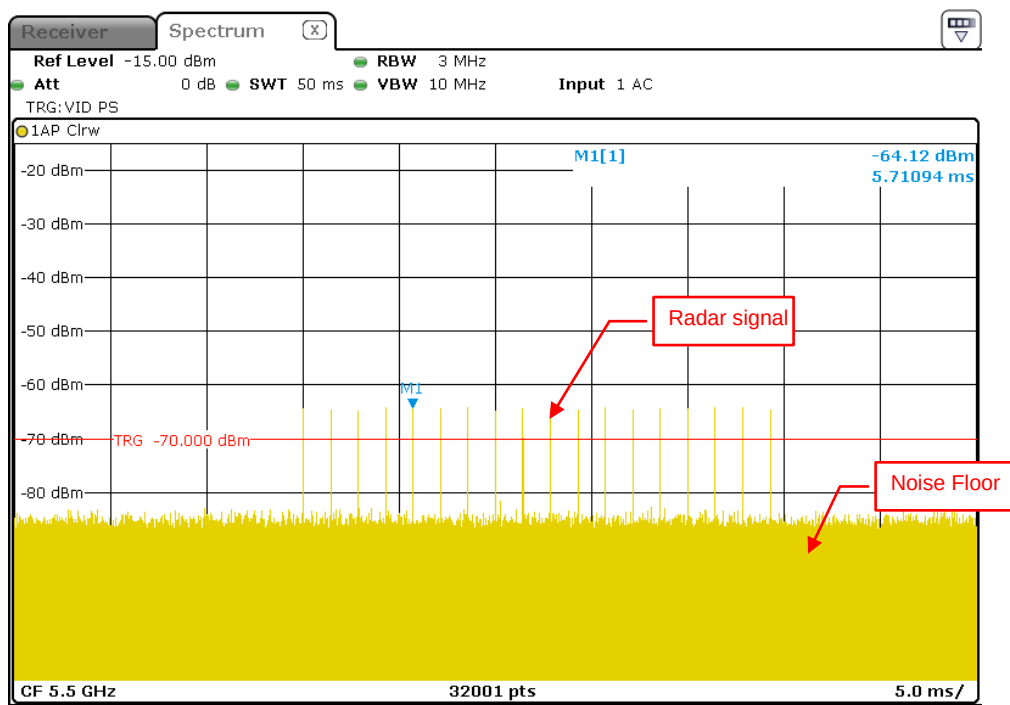
5.2 Test Results

5.2.1 Test Mode: Device operating in Client without Radar Detection Mode

Client with injection at the Master. (The radar test signals are injected into the Master Device)

DFS Detection Threshold

For a detection threshold level of -64 dBm, the required signal strength at AP antenna location is -64 dBm. The tested level is lower than required level hence it provides margin to the limit.



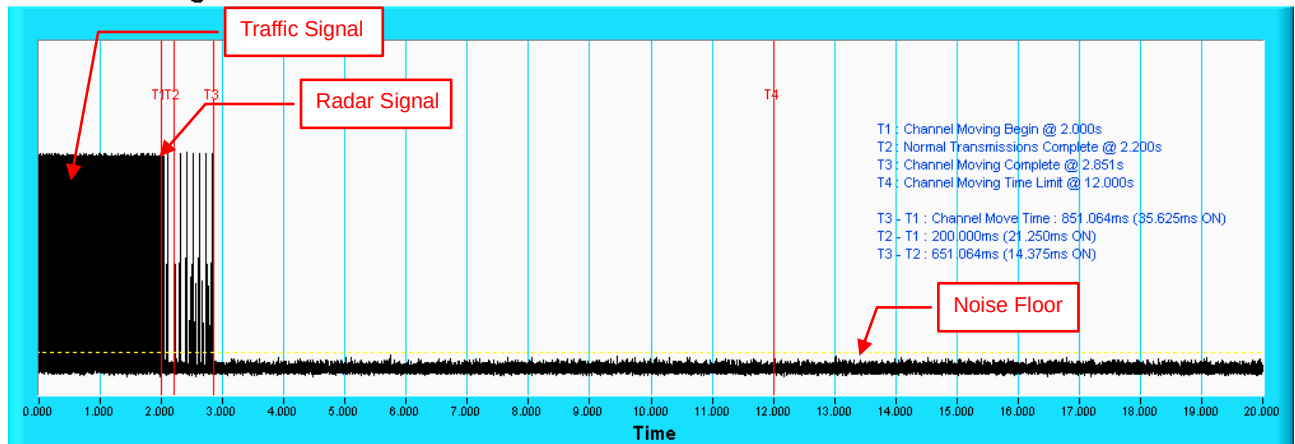
Radar Signal 0

5.2.2 Channel Closing Transmission and Channel Move Time

Radar Signal 0

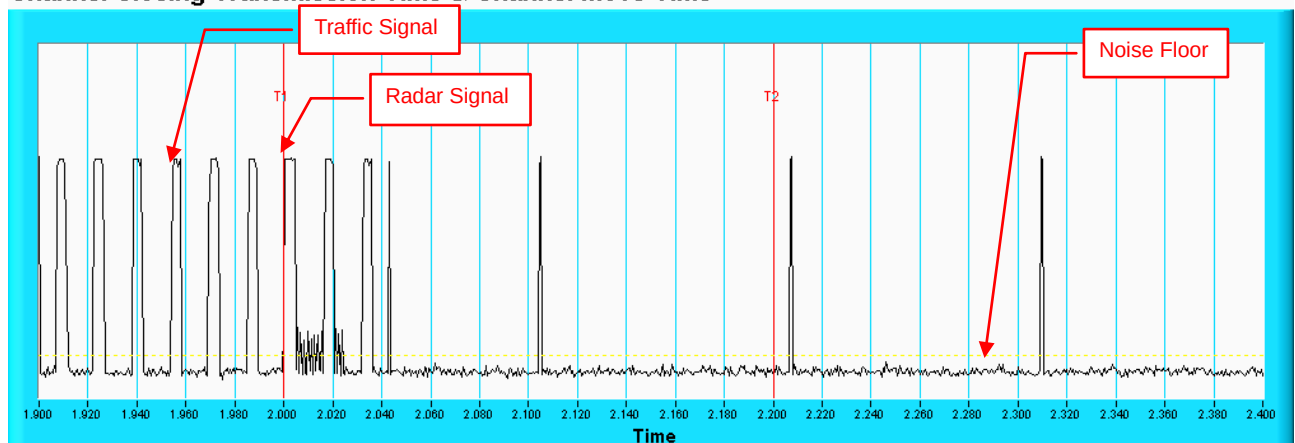
802.11n (HT20)

Channel Closing Transmission Time & Channel Move Time



NOTE: T1 denotes the start of Channel Move Time upon the end of the last Radar burst. T2 denotes the data transmission time of 200 ms from T1. T3 denotes the end of Channel Move Time. T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.

Channel Closing Transmission Time & Channel Move Time

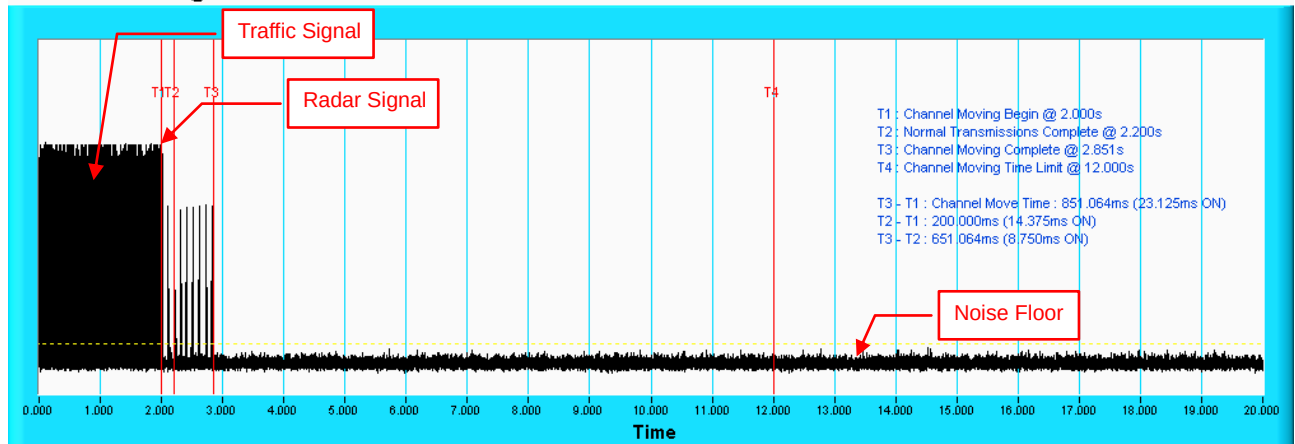


NOTE: An expanded plot for the device vacates the channel in the required 500 ms.

Radar signal 0

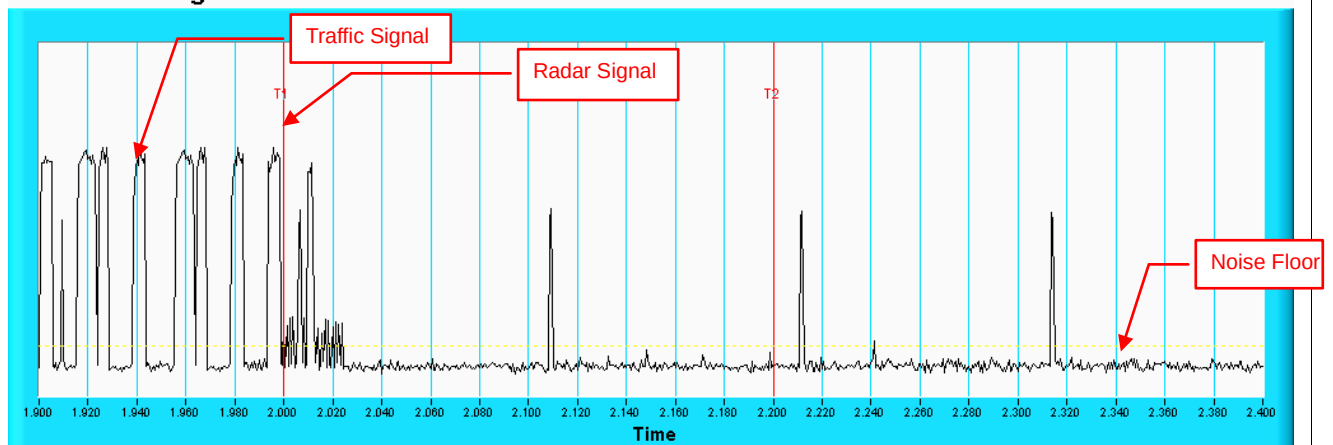
802.11n (HT40)

Channel Closing Transmission Time & Channel Move Time



NOTE: T1 denotes the start of Channel Move Time upon the end of the last Radar burst. T2 denotes the data transmission time of 200 ms from T1. T3 denotes the end of Channel Move Time. T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.

Channel Closing Transmission Time & Channel Move Time

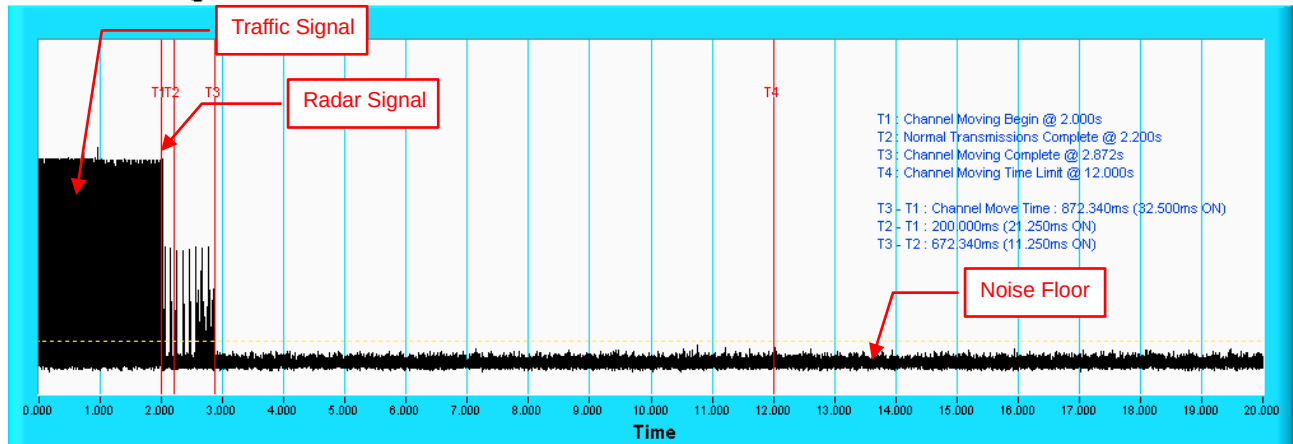


NOTE: An expanded plot for the device vacates the channel in the required 500 ms.

Radar signal 0

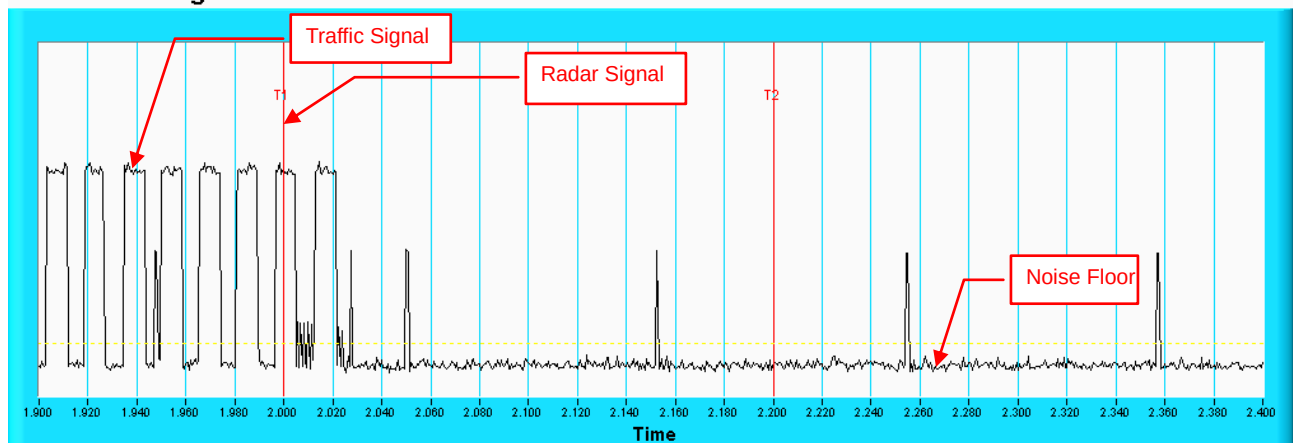
802.11ac (VHT80)

Channel Closing Transmission Time & Channel Move Time



NOTE: T1 denotes the start of Channel Move Time upon the end of the last Radar burst. T2 denotes the data transmission time of 200 ms from T1. T3 denotes the end of Channel Move Time. T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.

Channel Closing Transmission Time & Channel Move Time



NOTE: An expanded plot for the device vacates the channel in the required 500 ms.

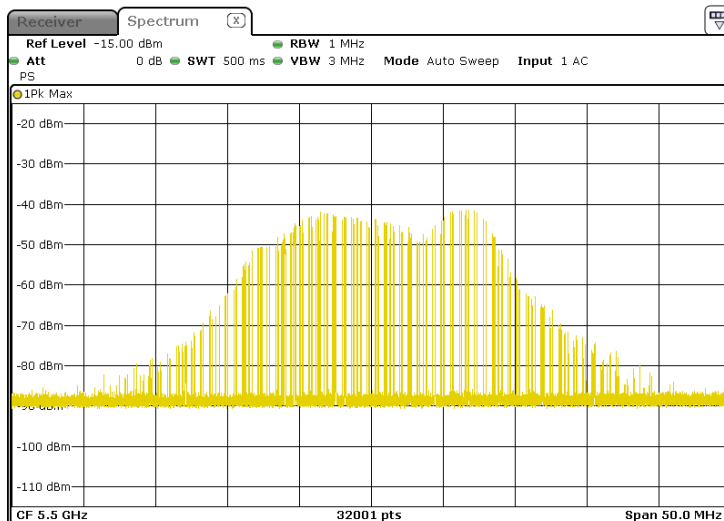
5.2.3 Non-Occupancy Period

Associate test:

During the 30 minutes observation time, UUT did not make any transmissions on a channel after a radar signal was detected on that channel by either the Channel Availability Check or the In-Service Monitoring.

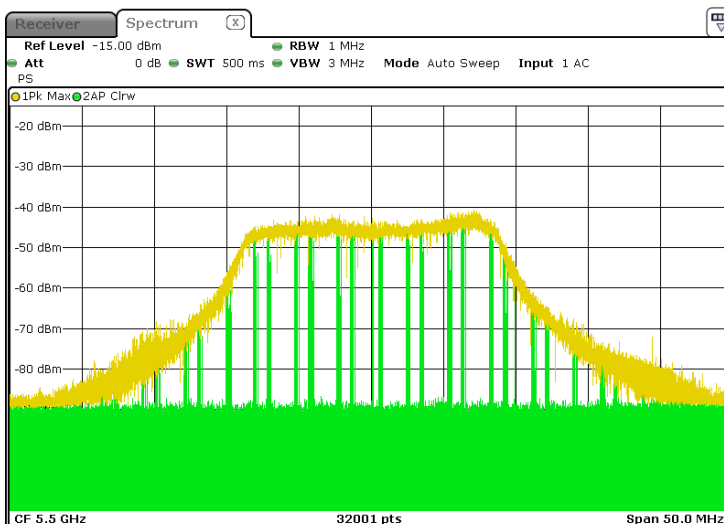
- 1) EUT (Client) links with master on 5500 MHz.

Waveform of EUT links up with Master

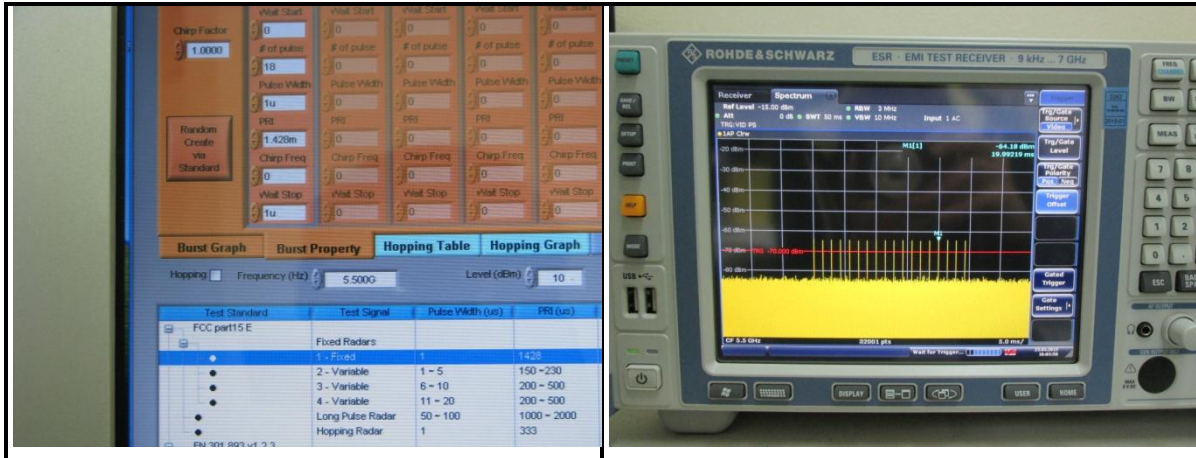


- 2) Client plays specified files via master.

Waveform of transmission



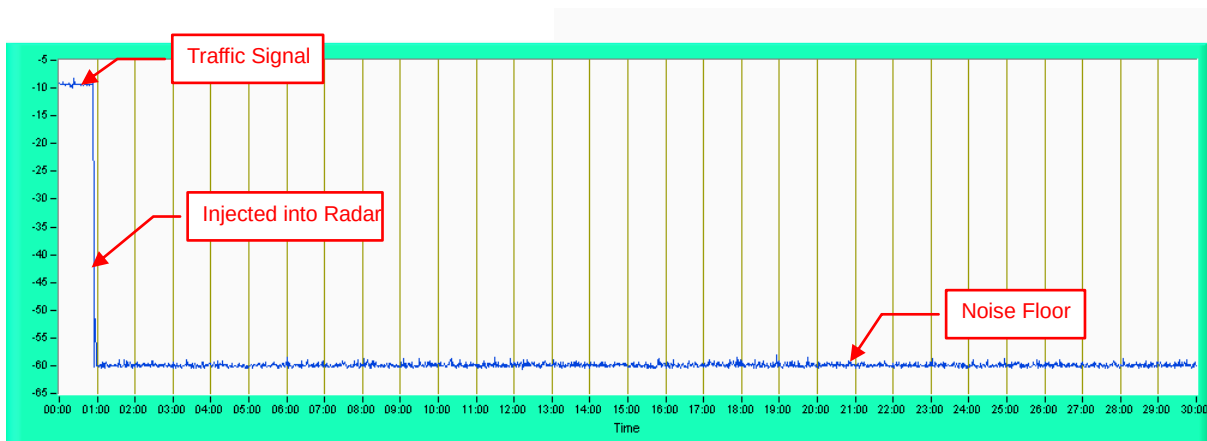
3) Radar signal 0 is applied to the Master device and WiFi traffic signal stop immediately.



4) 5500 MHz has been monitored in 30 minutes period. In this period, no any transmission occurs.

Plot of 30 minutes period

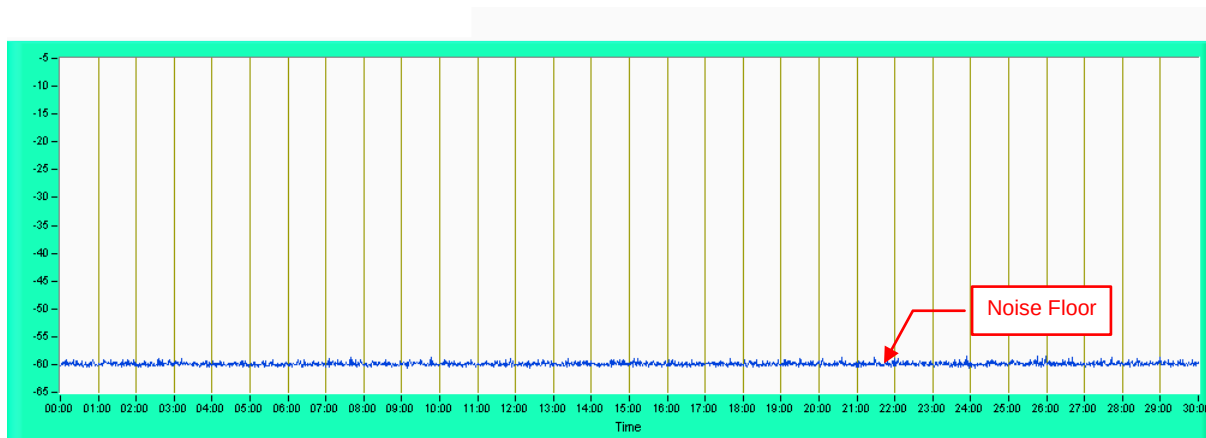
802.11n (HT20)



5.2.4 Non-associated test

Master was off.

During the 30 minutes observation time, the UUT did not make any transmissions in the DFS band after UUT power up.



5.2.5 Non- Co-Channel Test

The UUT was investigated after radar was detected the channel and made sure no co-channel operation with radars.

5.2.6 Test Setup photo

請參閱附件（測試設置照片）

6 檢測實驗室基本資料

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

如您有任何問題或建議，請與下列實驗室聯絡：

林口 EMC / RF 實驗室：

Tel: 886-2-26052180

Fax: 886-2-26051924

新竹 EMC / RF 及通訊實驗室：

Tel: 886-3-6668565

Fax: 886-3-6668323

華亞 EMC / RF / Safety 實驗室：

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

您也可以在我們的網站內找到各實驗室的地圖。

---END---