

NCC

低功率射頻電機型式試驗報告

產品名稱 : 802.11ac Dual Band Module
主型號 : WLE600VX
系列型號 : WLE600VX-I
廠牌 : COMPEX
申請者 : Compex Systems Pte Ltd
申請者地址 : No:9 Harrison Road, Harrison Industrial Building,
#05-01, Singapore 369651
測試標準 : LP0002 (107 年版) 3.10 章節
參考法規 : ANSI C63.10-2013
測試結果 : 符合
測試日期 : 2018/9/25 ~ 2018/10/15

測試工程師 :



(柯文凱)

報告審核人 :



(陳柏均)

報告簽屬人 :



(柯承志)



修訂紀錄

報告編號	版本	描述	發行日期
1810TW0105-T1	1.0	Original Report	2018-10-16

CONTENTS

Description	Page
1. 一般資訊	5
2. 產品資訊	6
2.1. 待測物裝置資料	6
2.2. 系列差異說明	6
2.3. 通道清單	7
2.4. 測試模式	8
2.5. 操作程式	8
2.6. 測試軟體描述	9
3. 量測不確定度	10
4. 測試設備明細	11
5. 測試結果	13
5.1. 電源端點干擾測試	14
5.1.1. 適用標準	14
5.1.2. 量測方法	14
5.1.3. 測試架構圖	14
5.1.4. 電源端點測試結果	15
5.2. 峰值傳導輸出功率	17
5.2.1. 適用標準	17
5.2.2. 量測方法	17
5.2.3. 測試架構圖	17
5.2.4. 峰值傳導輸出功率測試結果	18
5.3. 天線之要求	20
5.3.1. 適用標準	20
5.3.2. 天線樣式	20
5.4. 輻射干擾測試	21
5.4.1. 適用標準	21
5.4.2. 量測方法	21
5.4.3. 測試架構圖	22
5.4.4. 輻射干擾測試結果	24
5.5. 混附發射之 RF 傳導發射	44
5.5.1. 適用標準	44
5.5.2. 量測方法	44
5.5.3. 測試架構圖	44

5.5.4.	混附發射之 RF 傳導發射測試結果.....	45
5.6.	開放頻帶邊緣之不必要幅射要求.....	59
5.6.1.	適用標準.....	59
5.6.2.	量測方法.....	59
5.6.3.	測試架構圖.....	60
5.6.4.	測試結果.....	61
5.7.	佔用頻道寬度.....	109
5.7.1.	適用標準.....	109
5.7.2.	量測方法.....	109
5.7.3.	測試架構圖.....	109
5.7.4.	佔用頻帶寬度測試結果.....	110
5.8.	發射電功率密度.....	118
5.8.1.	適用標準.....	118
5.8.2.	量測方法.....	118
5.8.3.	測試架構圖.....	118
5.8.4.	功率密度量測結果.....	119

1. 一般資訊

申請者	Compex Systems Pte Ltd
申請者地址	No:9 Harrison Road, Harrison Industrial Building, #05-01, Singapore 369651
製造商	Compex Systems Pte Ltd
製造商地址	No:9 Harrison Road, Harrison Industrial Building, #05-01, Singapore 369651
實驗室	台灣曼瑞檢測科技有限公司
實驗室地址	33377 台灣桃園市龜山區復興二路 38 號
實驗室資訊	1. MRT facility is a FCC registered (Reg. No. 291082) test facility with the site description report on file and is designated by the FCC as an Accredited Test Film. 2. MRT facility is an IC registered (MRT Reg. No. 21723-1) test laboratory with the site description on file at Industry Canada. 3. MRT Lab is accredited to ISO 17025 by the Taiwan Accreditation Foundation (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC (Designation Number: TW3261), Industry Taiwan, EU and TELEC Rules.
實驗室測試環境條件	溫度 (°C) : 20-35 / 濕度 (%RH) : 30-65

2. 產品資訊

2.1. 待測物裝置資料

產品名稱	802.11ac Dual Band Module
主型號	WLE600VX
系列型號	WLE600VX-I
廠牌	COMPEX
天線樣式	Refer to the table "Antenna List"
天線規格	Refer to the table "Antenna List"
調變模式	DSSS (CCK, DQPSK, DBPSK) for IEEE 802.11 b, OFDM (BPSK, QPSK, 16QAM, 64QAM) for IEEE 802.11g/n
傳輸速率	802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps

2.2. 系列差異說明

系列型號與主型號差異僅做為市場行銷管理區隔，其硬體電路及軟體與主型號相同。該產品亦符合同系列產品技術規格及射頻性能相同。

2.3. 通道清單

802.11b/g/n-HT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz
04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz
10	2457 MHz	11	2462 MHz	--	--

802.11n-HT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
03	2422 MHz	04	2427 MHz	05	2432 MHz
06	2437 MHz	07	2442 MHz	08	2447 MHz
09	2452 MHz	--	--	--	--

2. 4. 測試模式

Test Mode	Mode 1: Transmit by 802.11b
	Mode 2: Transmit by 802.11g
	Mode 3: Transmit by 802.11n-HT20
	Mode 4: Transmit by 802.11n-HT40

2.4GHz Test Mode	Antenna		
	Ant 0	Ant 1	Ant 0+1
802.11b	√	√	×
802.11g	√	√	×
802.11n-HT20	×	×	√
802.11n-HT40	×	×	√

2. 5. 操作程式

1.	Turn on the power of all equipment.
2.	Execute “artgui.exe Version 2.3” software in the notebook to control the EUT by LAN cable.
3.	Configure the test channel and the data rate.
4.	Start test.

2. 6. 測試軟體描述

The test utility software used during testing was “artgui.exe”, and the version was “2.3”.

Test Mode	Channel No.	Frequency (MHz)	Power Parameter Value		
			Ant 0	Ant 1	Ant 0+1
802.11b	01	2412	20	20	--
	06	2437	20	20	--
	11	2462	20	20	--
802.11g	01	2412	17	16.5	--
	06	2437	20	20	--
	11	2462	16.5	17	--
802.11n-HT20	01	2412	--	--	15
	06	2437	--	--	20
	11	2462	--	--	15.5
802.11n-HT40	01	2422	--	--	13
	06	2437	--	--	20
	11	2452	--	--	10

3. 量測不確定度

電源端點干擾量測 - SR2
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 150kHz~30MHz: 3.46dB
輻射干擾量測 - AC1
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 25GHz: 4.76dB
混附發射之 RF 傳導發射量測 - SR1
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 0.78dB
峰值傳導輸出功率量測 - SR1
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 1.13dB
發射電功率密度量測 - SR1
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 1.15dB
佔用頻道寬度量測 - SR1
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 0.28%

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

4. 測試設備明細

電源傳導 - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTTWA00045	1 year	2019/03/16
Two-Line V-Network	R&S	ENV216	MRTTWA00019	1 year	2019/03/23
Two-Line V-Network	R&S	ENV216	MRTTWA00020	1 year	2019/03/23
Conducted Cable	Rosnol	N1C50-RG400-B1C50-500CM	MRTTWE00013	1 year	2019/05/20

輻射干擾 - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Signal Analyzer	R&S	FSV40	MRTTWA00007	1 year	2019/03/02
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2019/03/16
Broadband Preamplifier	SCHWARZBECK	BBV 9718	MRTTWA00005	1 year	2019/04/06
Broadband Amplifier	SCHWARZBECK	BBV 9721	MRTTWA00006	1 year	2019/04/06
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	MRTTWA00002	1 year	2019/04/06
Broadband TRILOG Antenna	SCHWARZBECK	VULB 9162	MRTTWA00001	1 year	2019/04/06
Broadband Hornantenna	SCHWARZBECK	BBHA 9120D	MRTTWA00003	1 year	2019/04/06
Breitband Hornantenna	SCHWARZBECK	BBHA 9170	MRTTWA00004	1 year	2019/04/06
Antenna Cable	HUBERSUHNER	SF106	MRTTWE00010	1 year	2019/05/20
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2019/06/08

傳導量測 - SR1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2019/07/11
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00014	1 year	2019/03/18
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00015	1 year	2019/03/18
Programmable Temperature & Humidity Chamber	TEN BILLION	TTH-B3UP	MRTTWA00036	1 year	2019/03/16
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2019/06/08

測試軟體

Software	Version	Function
e3	Audix	9.160520a
EMI	Quietek	V3

5. 測試結果

產品名稱 802.11ac Dual Band Module
型號 WLE600VX

章節	量測項目	限制值	測試結果	測試數據
2.3	電源傳導	低功率射頻電機技術規範 2.3 節	符合	第 5.1 章節
3.10.1.2	峰值傳導輸出功率	$\leq 30.00\text{dBm}$	符合	第 5.2 章節
3.10.1.3	天線之要求	低功率射頻電機技術規範 3.10.1.3 節	符合	第 5.3 章節
3.10.1.5	帶外發射限制	$\leq 30\text{dBc(Average)}$	符合	第 5.4 章節
2.7	輻射電場強度	低功率射頻電機技術規範 2.8 節	符合	第 5.5 章節
2.7	頻帶邊緣	$\leq 74\text{dBuV/m(Peak)}$ $\leq 54\text{dBuV/m(Average)}$	符合	第 5.6 章節
3.10.1.6(2)(A)	佔用頻寬	$\geq 500\text{kHz}$	符合	第 5.7 章節
3.10.1.6(2)(B)	功率頻譜密度	$\leq 8\text{dBm/3kHz}$	符合	第 5.8 章節

5.1. 電源端點干擾測試

5.1.1. 適用標準

依據國家通訊傳播委員會低功率射頻電機技術規範之第 2.3 節，以市電為電源之低功率射頻電機，其傳導回電源線上頻率自 150kHz 至 30MHz 之射頻電壓(在電源端子每一電源線對接地點)應小於或等於下表所列之限值。測量時應經過 50 微亨利(μH)及 50 歐姆(Ω)之電源線阻抗模擬網路(LISN)。頻率重疊處，以較低限值為準。

Frequency 頻率範圍 MHz	傳導限制值(dBuV)	
	準尖峰值	平均值
0.15 - 0.50	66 - 56 _(註)	56 - 46 _(註)
0.50 - 5.0	56	46
5.0 - 30	60	50

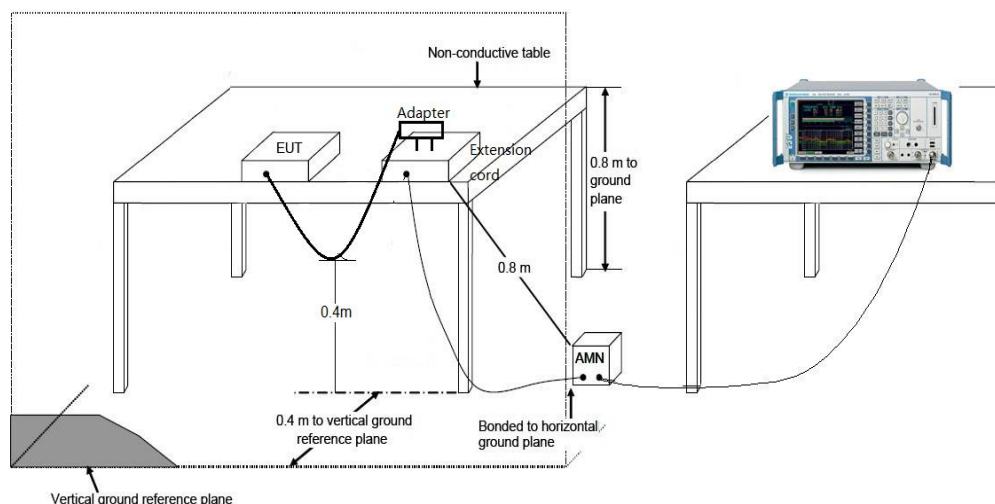
註:隨頻率之對數遞減

5.1.2. 量測方法

待測物置於高 80 公分之非導體桌面（落地型產品置於地上），將待測物之電源線接至電源阻抗網路器(LISN)，同時保持待測物至 LISN 距 80 公分，並將電源線多餘部份以 30 至 40 公分之八字形捆綁於電源線中央並離地 40cm，於在正常工作狀態下，執行待測物之火線(Line)及地線(neutral)各一次量測。電源端點場強之測量範圍由 0.15MHz - 30MHz，所量測之讀值皆為準尖峰值(Quasi-Peak Value)及平均值(Average Value)。場強接收機之解析頻寬為 9kHz。

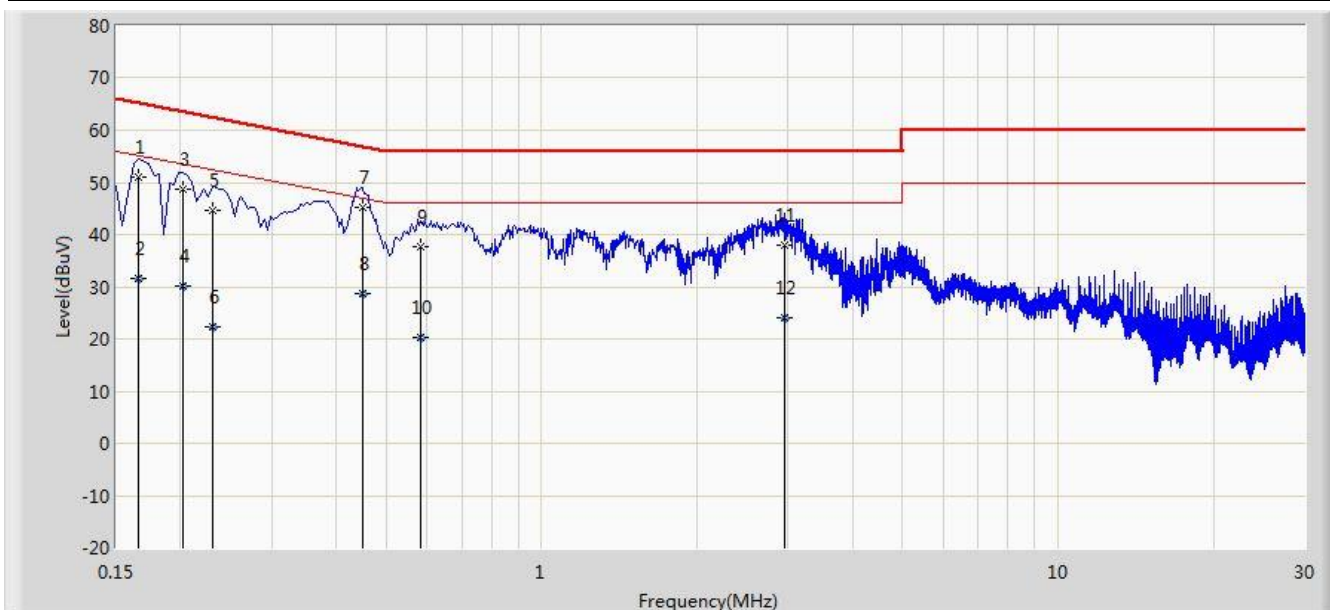
備 註: 經初測驗證過，電源端點干擾測試對測試頻道數並無差異，因此檢附其中一個測試頻道之測試數。

5.1.3. 測試架構圖



5.1.4. 電源端點測試結果

Site: SR2	Time: 2018/10/09 - 09:28
Limit: NCC LP0002_CE_0.15MHz-30MHz	Engineer: Kevin
Probe: CE_ENV216-L1 (Filter ON)	Polarity: Line
EUT: 802.11ac Dual Band Module	Power: AC 110V/60Hz
Test Mode 1	

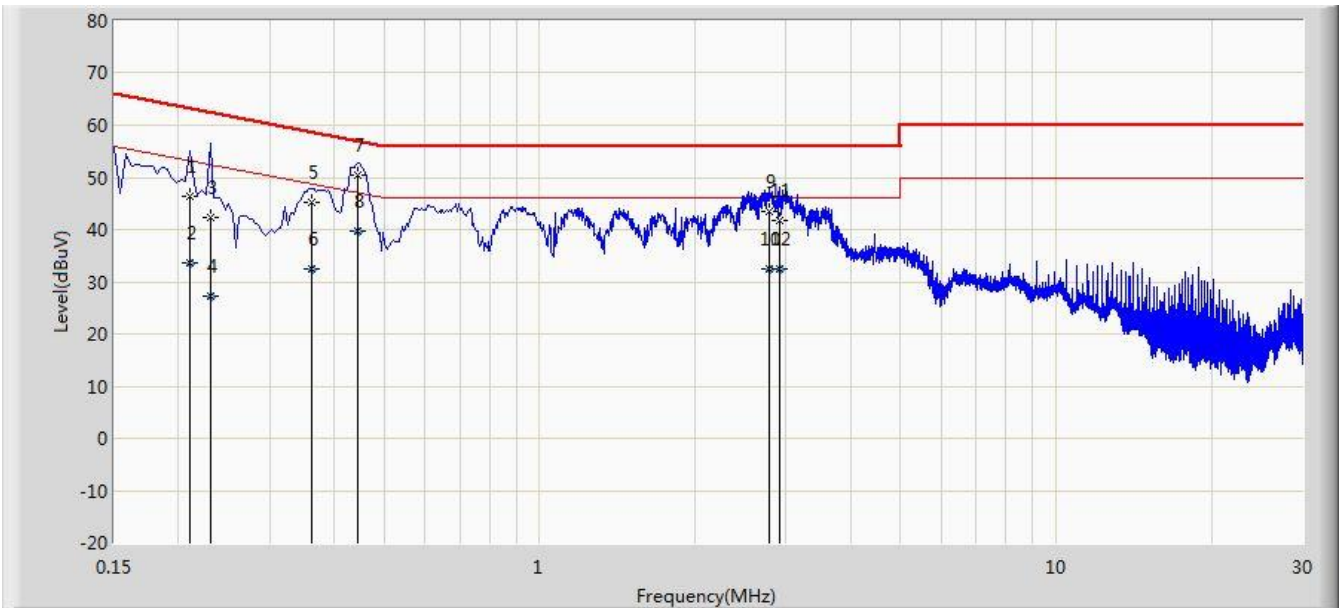


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.166	51.068	40.980	-14.090	65.158	10.087	QP
2			0.166	31.660	21.572	-23.499	55.158	10.087	AV
3			0.202	48.678	38.685	-14.850	63.528	9.993	QP
4		*	0.202	30.081	20.089	-23.446	53.528	9.993	AV
5			0.230	44.586	34.638	-17.864	62.450	9.947	QP
6			0.230	22.430	12.483	-30.020	52.450	9.947	AV
7			0.450	45.098	34.971	-11.778	56.875	10.126	QP
8			0.450	28.653	18.527	-18.222	46.875	10.126	AV
9			0.582	37.792	27.668	-18.208	56.000	10.124	QP
10			0.582	20.377	10.253	-25.623	46.000	10.124	AV
11			2.946	37.920	28.064	-18.080	56.000	9.856	QP
12			2.946	24.193	14.338	-21.807	46.000	9.856	AV

Note: Measure Level (dBuV) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Site: SR2	Time: 2018/10/09 - 10:04
Limit: NCC LP0002_CE_0.15MHz-30MHz	Engineer: Kevin
Probe: CE_ENV216-L1 (Filter ON)	Polarity: Neutral
EUT: 802.11ac Dual Band Module	Power: AC 110V/60Hz
Test Mode 1	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.210	46.255	36.260	-16.950	63.205	9.995	QP
2			0.210	33.699	23.704	-19.506	53.205	9.995	AV
3			0.230	42.432	32.447	-20.017	62.450	9.985	QP
4			0.230	27.287	17.301	-25.163	52.450	9.985	AV
5			0.362	45.127	35.043	-13.556	58.682	10.084	QP
6		*	0.362	32.582	22.498	-16.100	48.682	10.084	AV
7			0.444	50.345	40.200	-6.641	56.987	10.145	QP
8			0.444	39.745	29.600	-7.241	46.987	10.145	AV
9			2.782	43.448	33.596	-12.552	56.000	9.852	QP
10			2.782	32.380	22.528	-13.620	46.000	9.852	AV
11			2.914	41.727	31.870	-14.273	56.000	9.856	QP
12			2.914	32.354	22.497	-13.646	46.000	9.856	AV

Note: Measure Level (dBuV) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

5.2. 峰值傳導輸出功率

5.2.1. 適用標準

依據國家通訊傳播委員會低功率射頻電機技術規範之第 3.10.1.2(1)(C)節，操作於 2400 - 2483.5 MHz 之數位調變的發射器材：1 瓦(W)(含)以下。

依據國家通訊傳播委員會低功率射頻電機技術規範之第 3.10.1.3 節，天線增益限制如下：

(1) 操作於 2400 MHz - 2483.5 MHz 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。

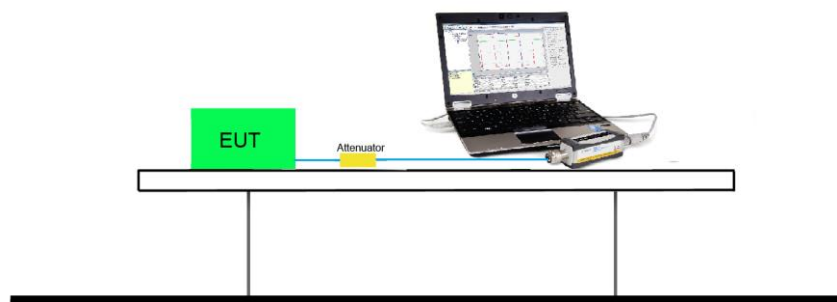
(2) 除(1)及(2)外，使用超過 6 dBi 方向增益之發射天線時，應依超過 6 dBi 天線方向增益的 dBi 總量，等量減少最大傳導輸出功率限制值。

(3) 除使用峰值輸出功率測量方式外，可使用以最大傳導輸出功率(Maximum Conducted Output Power)作為測量方式。

5.2.2. 量測方法

待測物之天線埠經由適當之衰減直接連至頻譜分析儀 RF 輸入端，設定頻譜分析儀之解析度頻寬大於 6dB 發射頻寬或使用峰值功率表，當使用最大傳導輸出功率量測時，可連接至平均值功率表量測。

5.2.3. 測試架構圖



5.2.4. 峰值傳導輸出功率測試結果

待測物名稱	802.11ac Dual Band Module	溫度	24°C
測試工程師	Kevin Ker	濕度	58%
測試場地	SR1	測試日期	2018/09/27

Output power at various data rates:

Test Mode	Bandwidth (MHz)	Tx Path	Channel No.	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)
802.11b	20	1	6	2437	1	20.60
					5.5	20.53
					11	20.48
802.11g	20	1	6	2437	6	20.70
					24	20.67
					54	20.61
802.11n	20	2	6	2437	MCS0	20.85
					MCS4	20.78
					MCS7	20.72
802.11n	40	2	6	2437	MCS0	19.84
					MCS4	19.75
					MCS7	19.68

Test Result of Average Output Power

1Tx – Ant 0 & Ant 1							
Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Limit (dBm)	Result
11b	1	1	2412	20.83	20.71	≤ 30.00	Pass
11b	1	6	2437	20.60	20.82	≤ 30.00	Pass
11b	1	11	2462	20.42	20.55	≤ 30.00	Pass
11g	6	1	2412	17.45	17.37	≤ 30.00	Pass
11g	6	6	2437	20.70	20.53	≤ 30.00	Pass
11g	6	11	2462	16.86	17.42	≤ 30.00	Pass

2Tx – Ant 0 + 1								
Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power (dBm)	Limit (dBm)	Result
11n-HT20	MCS0	1	2412	15.58	15.84	18.72	≤ 30.00	Pass
11n-HT20	MCS0	6	2437	20.85	20.70	23.79	≤ 30.00	Pass
11n-HT20	MCS0	11	2462	15.87	15.97	18.93	≤ 30.00	Pass
11n-HT40	MCS0	3	2422	13.02	13.34	16.19	≤ 30.00	Pass
11n-HT40	MCS0	6	2437	19.84	19.97	22.92	≤ 30.00	Pass
11n-HT40	MCS0	9	2452	9.96	9.91	12.95	≤ 30.00	Pass

Note: 1.Total Average Power (dBm) = $10 \cdot \log\{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)}\}$ (dBm).

5.3. 天線之要求

5.3.1. 適用標準

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

5.3.2. 天線樣式

Frequency Band (MHz)	Antennal Type	Manufacturer	Model	Max Antenna Gain (dBi)
2400 ~ 2483	Omni	Smart Ant Inc	SAA04-22008A	4.5
5150 ~ 5875				7.0

5.4. 輻射干擾測試

5.4.1. 適用標準

依據國家通訊傳播委員會低功率射頻電機技術規範之第 3.10.1.5 節，使用頻帶範圍外之任意 100 千赫 (kHz)內，發射器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 千赫 (kHz)內的射頻功率，衰減值限制如下：

(1)輸出功率以低功率射頻電機技術規範附件二之峰值輸出功率方式量測者，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，落於第 2.7 節禁用頻段之輻射發射，應符合第 2.8 節之規定。

依據國家通訊傳播委員會低功率射頻電機技術規範之第 2.8 節，低功率射頻電機，除本規範各章節另有放寬規定者外，其電場強度不得超過下表之限值，且其不必要之發射皆不得大於主波發射強度。各頻段重疊處，以較嚴格之限制值為準。

頻 率(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

上表規定之電場強度，頻率在 9 - 90kHz 千赫(kHz)、110 - 490 千赫(kHz)以及 1000 兆赫(MHz)以上之發射，其量測以平均值檢波器為基準，且須符合第 5.15.2 節之規定；其他發射頻率，應以國際無線電干擾特別委員會 (INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE, CISPR)準峰值檢波器(quasi-peak detector)測量；非以上表所指定之距離測量時，應符合 5.5 之規定，輻射發射之量測頻率範圍應符合 5.14 之規定。

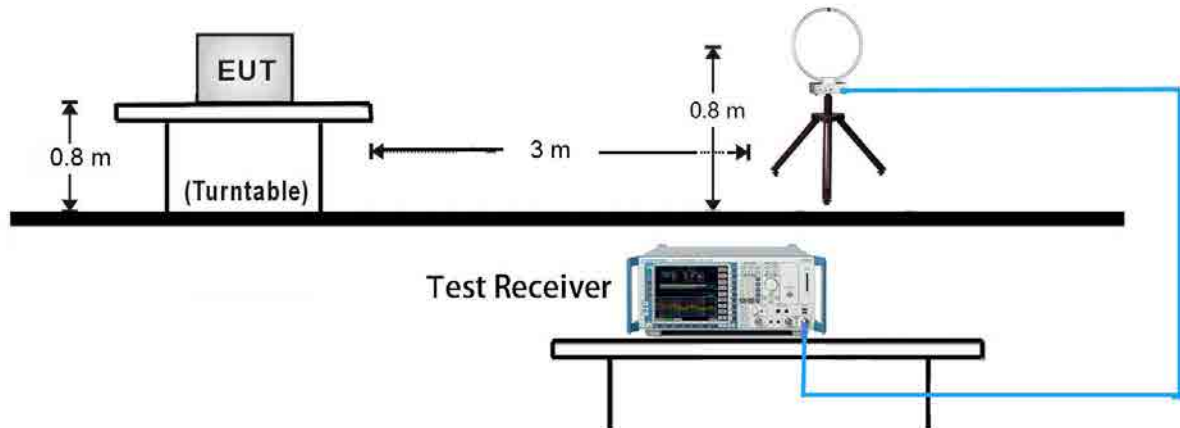
5.4.2. 量測方法

低頻待測物置於高 80 公分之非導體桌面（落地型產品置於地上），高頻待測物置於高 150 公分之非導體桌面，受測物與配件設備之電源線無須束綁，桌面上受測設備的所有電源線由桌子的後緣垂下沿旋轉桌表面接至交流插座。落地型設備的交流電源線可以方便的型態走線。桌面可 360 度旋轉，接收天線置於距待測物 3m 距離，高度可在 1 至 4 公尺間變動，以量測待測物之最大輻射電場強度。接收天線並應於水準及垂直極化方向各量測一次。

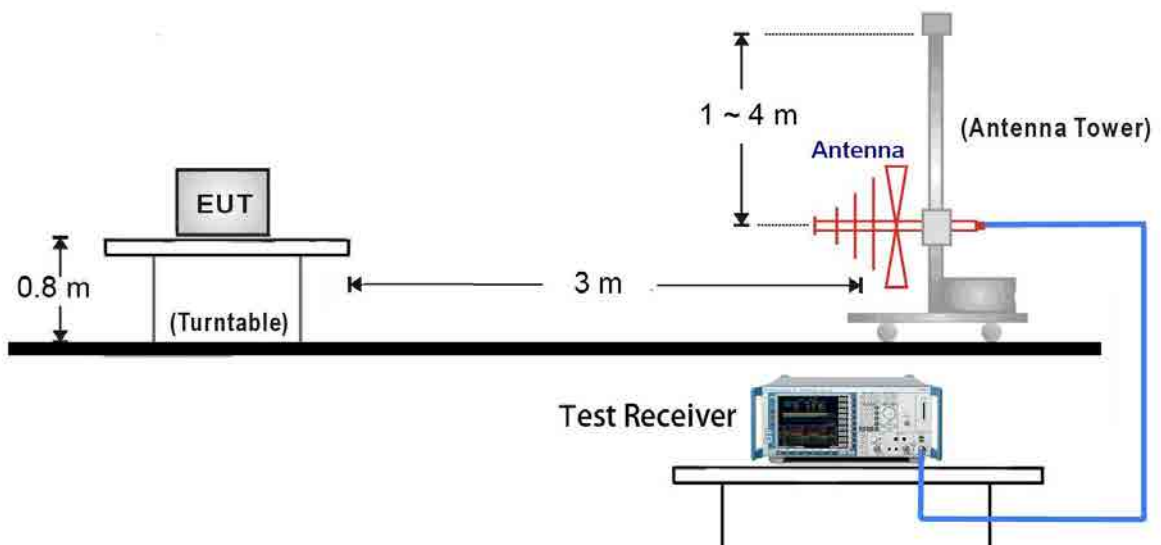
P.S 若為手持式或穿戴式之裝置，需對其三個正交軸的方位評估測試，並記錄最差的數值。

5.4.3. 測試架構圖

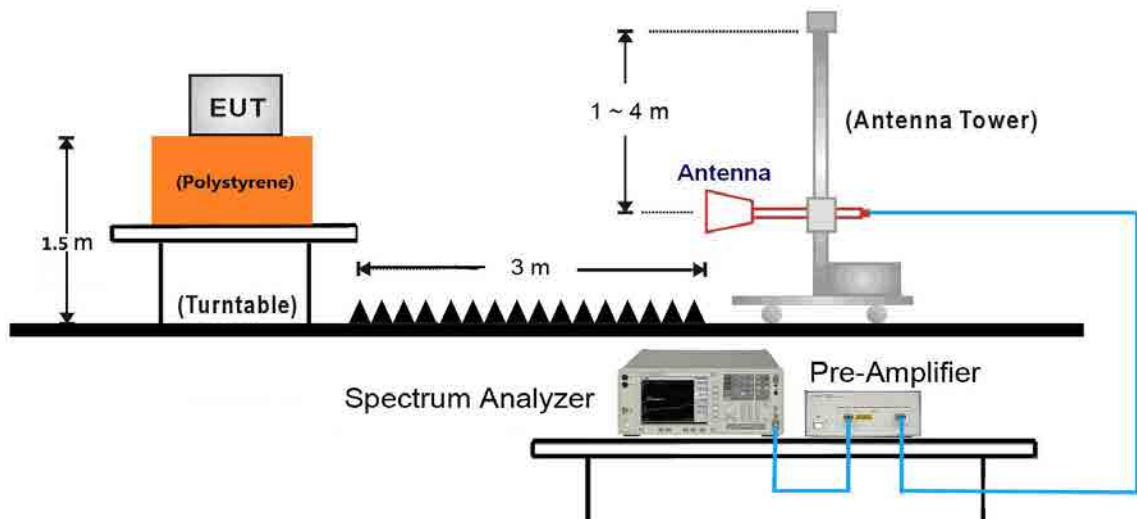
9kHz ~ 30MHz Test Setup:



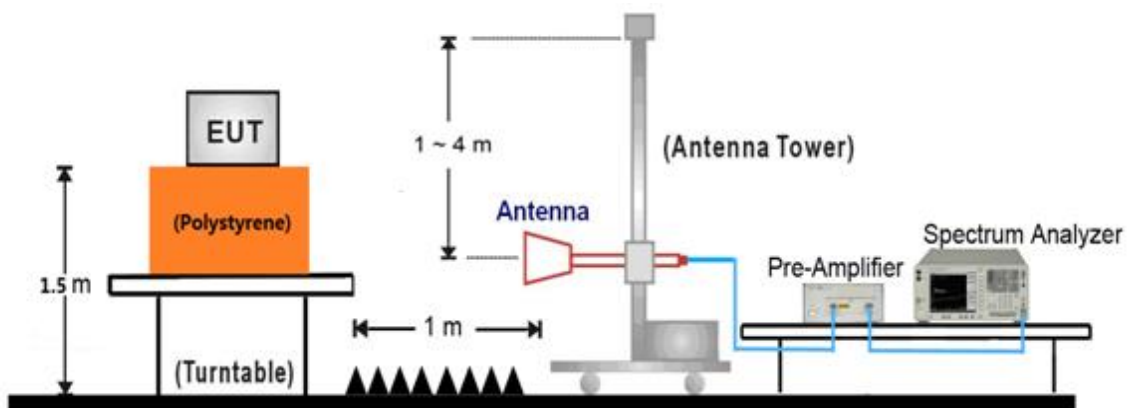
30MHz ~ 1GHz Test Setup:



1GHz ~ 18GHz Test Setup:



18GHz ~25GHz Test Setup:



Note: This item was performed with the WIFI antenna connected.

5.4.4. 輻射干擾測試結果

Test Mode:	Mode 1: 802.11b - Ant 0	Test Site:	AC1
Test Channel:	01	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4825.0	40.1	3.7	43.8	74.0	-30.2	Peak	Horizontal
	4824.3	39.0	3.7	42.7	54.0	-11.3	Average	Horizontal
*	7239.0	41.1	12.2	53.3	80.2	-26.9	Peak	Horizontal
	8165.5	35.1	12.1	47.2	74.0	-26.8	Peak	Horizontal
*	10010.0	33.5	15.4	48.9	80.2	-31.3	Peak	Horizontal
	4825.0	44.9	3.7	48.6	74.0	-25.4	Peak	Vertical
	4824.4	42.7	3.7	46.4	54.0	-7.6	Average	Vertical
*	7239.0	41.3	12.2	53.5	80.2	-26.7	Peak	Vertical
	8148.5	35.4	12.1	47.5	74.0	-26.5	Peak	Vertical
*	8692.5	32.7	13.7	46.4	80.2	-33.8	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (110.2dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 1: 802.11b - Ant 0	Test Site:	AC1
Test Channel:	06	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4876.0	39.7	3.7	43.4	74.0	-30.6	Peak	Horizontal
*	6533.5	35.5	8.5	44.0	80.3	-36.3	Peak	Horizontal
	7312.4	35.7	12.3	48.0	54.0	-6.0	Average	Horizontal
	7315.5	39.0	12.3	51.3	74.0	-22.7	Peak	Horizontal
*	8709.5	33.3	13.8	47.1	80.3	-33.2	Peak	Horizontal
	4876.0	44.5	3.7	48.2	74.0	-25.8	Peak	Vertical
	4876.3	42.4	3.7	46.1	54.0	-7.9	Average	Vertical
*	6049.0	35.1	6.2	41.3	80.3	-39.0	Peak	Vertical
	7307.0	40.9	12.3	53.2	74.0	-20.8	Peak	Vertical
	7308.4	37.7	12.3	50.0	54.0	-4.0	Average	Vertical
*	8675.5	33.1	13.7	46.8	80.3	-33.5	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (110.2dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 1: 802.11b - Ant 0	Test Site:	AC1
Test Channel:	11	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4927.0	39.1	3.7	42.8	74.0	-31.2	Peak	Horizontal
*	6193.5	37.7	6.8	44.5	80.4	-35.9	Peak	Horizontal
	7383.5	37.2	12.5	49.7	74.0	-24.3	Peak	Horizontal
*	8701.0	33.5	13.8	47.3	80.4	-33.1	Peak	Horizontal
	4927.0	46.4	3.7	50.1	74.0	-23.9	Peak	Vertical
	4927.3	43.3	3.7	47.0	54.0	-7.0	Average	Vertical
*	6661.0	36.6	8.7	45.3	80.4	-35.1	Peak	Vertical
	7392.0	39.7	12.6	52.3	74.0	-21.7	Peak	Vertical
	7392.7	36.3	12.6	48.9	54.0	-5.1	Average	Vertical
*	8692.5	33.5	13.7	47.2	80.4	-33.2	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (110.4dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 2: 802.11g - Ant 0	Test Site:	AC1
Test Channel:	01	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	5114.0	37.5	4.2	41.7	74.0	-32.3	Peak	Horizontal
*	6057.5	36.1	6.3	42.4	78.4	-36.0	Peak	Horizontal
	7451.5	33.2	12.8	46.0	74.0	-28.0	Peak	Horizontal
*	8811.5	29.8	14.0	43.8	78.4	-34.6	Peak	Horizontal
	4816.5	38.8	3.7	42.5	74.0	-31.5	Peak	Vertical
*	6117.0	37.3	6.5	43.8	78.4	-34.6	Peak	Vertical
	8463.0	34.0	12.6	46.6	74.0	-27.4	Peak	Vertical
*	10010.0	34.3	15.4	49.7	78.4	-28.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (108.4dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 2: 802.11g - Ant 0	Test Site:	AC1
Test Channel:	06	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	5037.5	37.4	4.0	41.4	74.0	-32.6	Peak	Horizontal
*	6142.5	36.0	6.6	42.6	80.2	-37.6	Peak	Horizontal
	7298.4	34.3	12.3	46.6	54.0	-7.4	Average	Horizontal
	7298.5	38.4	12.3	50.7	74.0	-23.3	Peak	Horizontal
*	8930.5	32.8	14.0	46.8	80.2	-33.4	Peak	Horizontal
	4876.0	41.5	3.7	45.2	74.0	-28.8	Peak	Vertical
*	6712.0	36.5	8.7	45.2	80.2	-35.0	Peak	Vertical
	7307.0	38.5	12.3	50.8	74.0	-23.2	Peak	Vertical
	7308.3	34.7	12.3	47.0	54.0	-7.0	Average	Vertical
*	8692.5	32.1	13.7	45.8	80.2	-34.4	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (110.2dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 2: 802.11g - Ant 0	Test Site:	AC1
Test Channel:	11	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	5097.0	37.6	4.2	41.8	74.0	-32.2	Peak	Horizontal
*	6457.0	35.6	8.1	43.7	78.7	-35.0	Peak	Horizontal
	7536.5	34.2	12.8	47.0	74.0	-27.0	Peak	Horizontal
*	10299.0	34.3	16.6	50.9	78.7	-27.8	Peak	Horizontal
	4927.0	41.7	3.7	45.4	74.0	-28.6	Peak	Vertical
*	6117.0	36.5	6.5	43.0	78.7	-35.7	Peak	Vertical
	7494.0	32.5	12.8	45.3	74.0	-28.7	Peak	Vertical
*	8675.5	33.9	13.7	47.6	78.7	-31.1	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (108.7dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 1: 802.11b - Ant 1	Test Site:	AC1
Test Channel:	01	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4825.0	39.3	3.7	43.0	74.0	-31.0	Peak	Horizontal
*	7239.0	36.0	12.2	48.2	77.4	-29.2	Peak	Horizontal
	8412.0	34.5	12.3	46.8	74.0	-27.2	Peak	Horizontal
*	9755.0	35.9	14.8	50.7	77.4	-26.7	Peak	Horizontal
	4825.0	45.1	3.7	48.8	74.0	-25.2	Peak	Vertical
	4826.4	41.3	3.7	45.0	54.0	-9.0	Average	Vertical
*	7239.0	39.8	12.2	52.0	77.4	-25.4	Peak	Vertical
	8335.5	34.1	11.9	46.0	74.0	-28.0	Peak	Vertical
*	9993.0	34.6	15.4	50.0	77.4	-27.4	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (107.4dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 1: 802.11b - Ant 1	Test Site:	AC1
Test Channel:	06	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4604.0	38.2	3.2	41.4	74.0	-32.6	Peak	Horizontal
*	6465.5	36.6	8.1	44.7	77.9	-33.2	Peak	Horizontal
	7613.0	35.9	12.6	48.5	74.0	-25.5	Peak	Horizontal
*	9857.0	31.1	16.2	47.3	77.9	-30.6	Peak	Horizontal
	4876.0	44.8	3.7	48.5	74.0	-25.5	Peak	Vertical
	4876.3	41.3	3.7	45.0	54.0	-9.0	Average	Vertical
*	6202.0	36.3	6.8	43.1	77.9	-34.8	Peak	Vertical
	7324.0	38.1	12.4	50.5	74.0	-23.5	Peak	Vertical
	7325.4	34.3	12.4	46.7	54.0	-7.3	Average	Vertical
*	10120.5	34.3	15.8	50.1	77.9	-27.8	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (107.9dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 1: 802.11b - Ant 1	Test Site:	AC1
Test Channel:	11	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4927.0	40.2	3.7	43.9	74.0	-30.1	Peak	Horizontal
*	6882.0	36.4	9.7	46.1	78.1	-32.0	Peak	Horizontal
	7434.5	35.0	12.7	47.7	74.0	-26.3	Peak	Horizontal
*	9976.0	33.5	15.3	48.8	78.1	-29.3	Peak	Horizontal
	4927.0	51.5	3.7	55.2	74.0	-18.8	Peak	Vertical
	4928.4	49.0	3.7	52.7	54.0	-1.3	Average	Vertical
*	6380.5	33.1	7.6	40.7	78.1	-37.4	Peak	Vertical
	7570.5	31.6	12.8	44.4	74.0	-29.6	Peak	Vertical
*	10494.5	33.1	17.2	50.3	78.1	-27.8	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (108.1dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 2: 802.11g - Ant 1	Test Site:	AC1
Test Channel:	01	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4876.0	37.8	3.7	41.5	74.0	-32.5	Peak	Horizontal
*	6100.0	36.5	6.4	42.9	76.3	-33.4	Peak	Horizontal
	7562.0	34.4	12.8	47.2	74.0	-26.8	Peak	Horizontal
*	8718.0	33.2	13.8	47.0	76.3	-29.3	Peak	Horizontal
	4833.5	40.3	3.7	44.0	74.0	-30.0	Peak	Vertical
*	6465.5	35.8	8.1	43.9	76.3	-32.4	Peak	Vertical
	7630.0	34.5	12.6	47.1	74.0	-26.9	Peak	Vertical
*	10035.5	34.5	15.5	50.0	76.3	-26.3	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (106.3dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 2: 802.11g - Ant 1	Test Site:	AC1
Test Channel:	06	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4833.5	36.9	3.7	40.6	74.0	-33.4	Peak	Horizontal
*	6593.0	35.8	8.7	44.5	78.5	-34.0	Peak	Horizontal
	7587.5	33.9	12.7	46.6	74.0	-27.4	Peak	Horizontal
*	10290.5	33.4	16.6	50.0	78.5	-28.5	Peak	Horizontal
	4876.0	44.6	3.7	48.3	74.0	-25.7	Peak	Vertical
	4876.4	41.3	3.7	45.0	54.0	-9.0	Average	Vertical
*	6678.0	35.2	8.7	43.9	78.5	-34.6	Peak	Vertical
	7315.5	36.8	12.3	49.1	74.0	-24.9	Peak	Vertical
*	10103.5	34.1	15.7	49.8	78.5	-28.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (108.5dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 2: 802.11g - Ant 1	Test Site:	AC1
Test Channel:	11	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	5114.0	38.3	4.2	42.5	74.0	-31.5	Peak	Horizontal
*	6635.5	35.5	8.7	44.2	77.9	-33.7	Peak	Horizontal
	7536.5	33.1	12.8	45.9	74.0	-28.1	Peak	Horizontal
*	9891.0	33.9	15.5	49.4	77.9	-28.5	Peak	Horizontal
	4918.4	41.3	3.7	45.0	54.0	-9.0	Average	Vertical
	4918.5	46.0	3.7	49.7	74.0	-24.3	Peak	Vertical
*	6839.5	35.5	9.3	44.8	77.9	-33.1	Peak	Vertical
	7511.0	34.0	12.8	46.8	74.0	-27.2	Peak	Vertical
*	10035.5	34.0	15.5	49.5	77.9	-28.4	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (107.9dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 3: 802.11n-HT20 - Ant 0+1	Test Site:	AC1
Test Channel:	01	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4833.5	37.4	3.7	41.1	74.0	-32.9	Peak	Horizontal
*	6533.5	35.7	8.5	44.2	81.3	-37.1	Peak	Horizontal
	7536.5	32.9	12.8	45.7	74.0	-28.3	Peak	Horizontal
*	10341.5	34.8	16.7	51.5	81.3	-29.8	Peak	Horizontal
	4825.0	41.7	3.7	45.4	74.0	-28.6	Peak	Vertical
*	6695.0	36.2	8.7	44.9	81.3	-36.4	Peak	Vertical
	7596.0	34.0	12.7	46.7	74.0	-27.3	Peak	Vertical
*	10027.0	34.8	15.4	50.2	81.3	-31.1	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (111.3dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 3: 802.11n-HT20 - Ant 0+1	Test Site:	AC1
Test Channel:	06	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4876.0	37.4	3.7	41.1	74.0	-32.9	Peak	Horizontal
*	6440.0	37.0	8.0	45.0	84.2	-39.2	Peak	Horizontal
	7315.5	39.7	12.3	52.0	74.0	-22.0	Peak	Horizontal
	7316.3	27.7	12.3	40.0	54.0	-14.0	Average	Horizontal
*	10027.0	34.4	15.4	49.8	84.2	-34.4	Peak	Horizontal
	4876.0	46.2	3.7	49.9	74.0	-24.1	Peak	Vertical
	4879.4	41.4	3.7	45.1	54.0	-8.9	Average	Vertical
*	6482.5	35.8	8.3	44.1	84.2	-40.1	Peak	Vertical
	7324.0	40.0	12.4	52.4	74.0	-21.6	Peak	Vertical
	7324.7	34.7	12.4	47.1	54.0	-6.9	Average	Vertical
*	9746.5	34.3	14.8	49.1	84.2	-35.1	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (114.2dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 3: 802.11n-HT20 - Ant 0+1	Test Site:	AC1
Test Channel:	11	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	5105.5	38.5	4.2	42.7	74.0	-31.3	Peak	Horizontal
*	6363.5	36.3	7.5	43.8	83.0	-39.2	Peak	Horizontal
	7519.5	34.3	12.8	47.1	74.0	-26.9	Peak	Horizontal
*	10112.0	33.7	15.8	49.5	83.0	-33.5	Peak	Horizontal
	4918.5	46.3	3.7	50.0	74.0	-24.0	Peak	Vertical
	4918.7	41.3	3.7	45.0	54.0	-9.0	Average	Vertical
*	6567.5	35.6	8.6	44.2	83.0	-38.8	Peak	Vertical
	7519.5	34.3	12.8	47.1	74.0	-26.9	Peak	Vertical
*	10120.5	33.9	15.8	49.7	83.0	-33.3	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (113.0dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 4: 802.11n-HT40 - Ant 0+1	Test Site:	AC1
Test Channel:	03	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	5088.5	38.0	4.1	42.1	74.0	-31.9	Peak	Horizontal
*	6210.5	36.5	6.9	43.4	77.6	-34.2	Peak	Horizontal
	7536.5	34.3	12.8	47.1	74.0	-26.9	Peak	Horizontal
*	9942.0	33.9	15.3	49.2	77.6	-28.4	Peak	Horizontal
	4859.0	37.7	3.7	41.4	74.0	-32.6	Peak	Vertical
*	6108.5	35.8	6.5	42.3	77.6	-35.3	Peak	Vertical
	7630.0	34.9	12.6	47.5	74.0	-26.5	Peak	Vertical
*	9814.5	32.1	15.4	47.5	77.6	-30.1	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (107.6dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 4: 802.11n-HT40 - Ant 0+1	Test Site:	AC1
Test Channel:	06	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	5063.0	38.1	4.0	42.1	74.0	-31.9	Peak	Horizontal
*	7103.0	35.2	11.5	46.7	80.8	-34.1	Peak	Horizontal
	8276.0	32.7	11.9	44.6	74.0	-29.4	Peak	Horizontal
*	9916.5	32.0	15.3	47.3	80.8	-33.5	Peak	Horizontal
	4884.5	43.7	3.7	47.4	74.0	-26.6	Peak	Vertical
	4885.4	41.0	3.7	44.7	54.0	-9.3	Average	Vertical
*	5887.5	35.9	5.9	41.8	80.8	-39.0	Peak	Vertical
	7324.0	37.6	12.4	50.0	74.0	-24.0	Peak	Vertical
*	10001.5	33.1	15.4	48.5	80.8	-32.3	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (110.8dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	Mode 4: 802.11n-HT40 - Ant 0+1	Test Site:	AC1
Test Channel:	09	Test Engineer:	Kevin Ker
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-25GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	5122.5	37.6	4.2	41.8	74.0	-32.2	Peak	Horizontal
*	6338.0	36.5	7.4	43.9	75.5	-31.6	Peak	Horizontal
	7434.5	34.4	12.7	47.1	74.0	-26.9	Peak	Horizontal
*	9746.5	34.4	14.8	49.2	75.5	-26.3	Peak	Horizontal
	5071.5	37.6	4.1	41.7	74.0	-32.3	Peak	Vertical
*	6193.5	36.8	6.8	43.6	75.5	-31.9	Peak	Vertical
	7630.0	35.8	12.6	48.4	74.0	-25.6	Peak	Vertical
*	9772.0	33.3	14.9	48.2	75.5	-27.3	Peak	Vertical

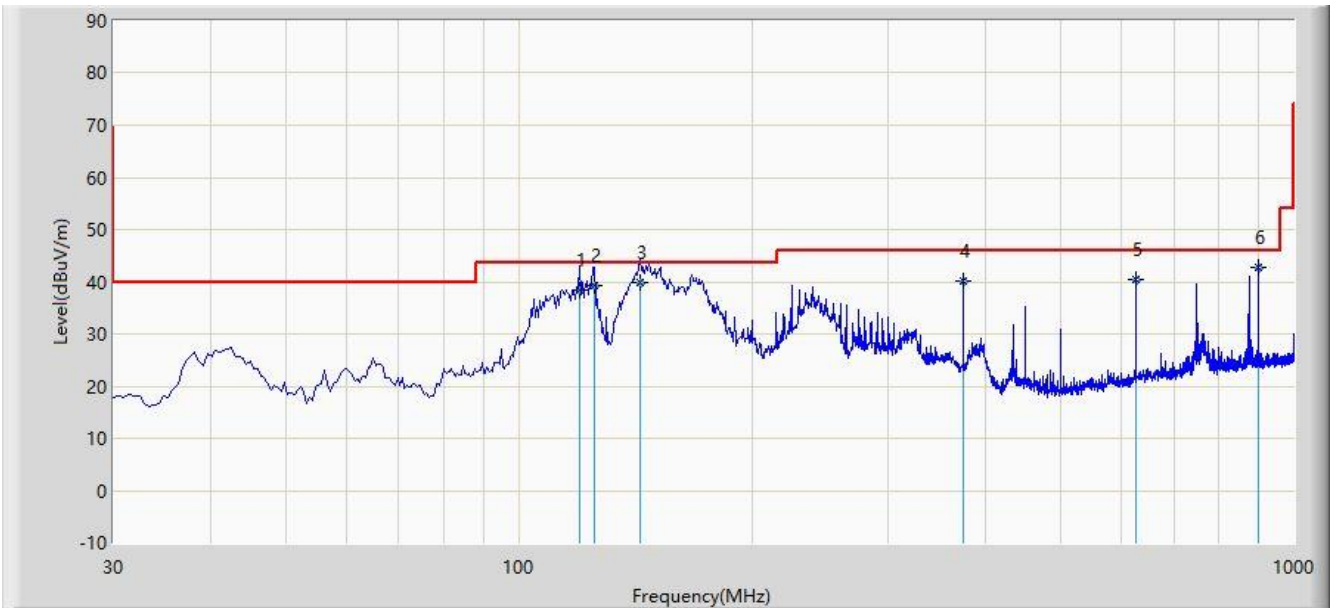
Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (105.5dBμV/m) or LP0002 section 2.8 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

The worst case of Radiated Emission below 1GHz:

Site: AC1	Time: 2018/10/15 - 15:49
Limit: NCC LP0002_30MHz-1GHz	Engineer: Kevin Ker
Probe: VULB9162_0.03GHz_8GHz	Polarity: Horizontal
EUT: 802.11ac Dual Band Module	Power: AC 110V/60Hz
Worst Mode: Transmit by 802.11b at Channel 2412MHz	



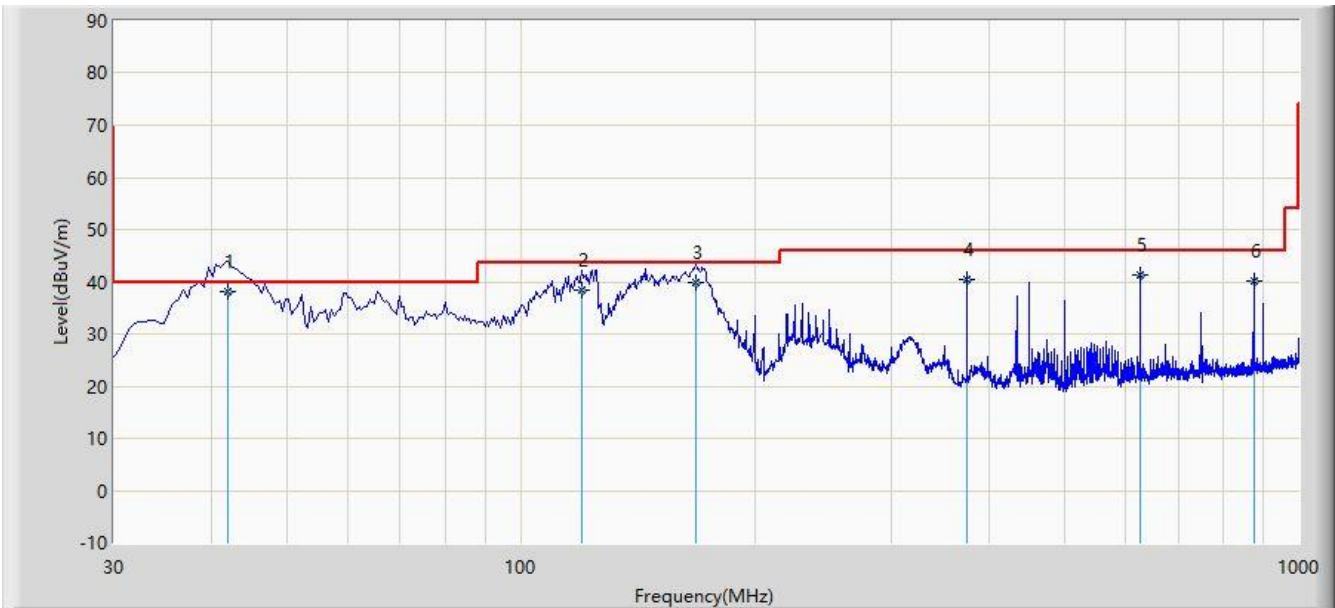
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	119.725	38.310	25.120	-5.190	43.500	13.190	QP
2			125.060	39.151	25.610	-4.349	43.500	13.541	QP
3			143.490	39.893	25.060	-3.607	43.500	14.833	QP
4			374.835	40.045	23.950	-5.955	46.000	16.094	QP
5			625.095	40.541	19.440	-5.459	46.000	21.101	QP
6			900.090	42.893	18.460	-3.107	46.000	24.433	QP

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

Site: AC1	Time: 2018/10/15 - 15:52
Limit: NCC LP0002_30MHz-1GHz	Engineer: Kevin Ker
Probe: VULB9162_0.03GHz_8GHz	Polarity: Vertical
EUT: 802.11ac Dual Band Module	Power: AC 110V/60Hz
Worst Mode: Transmit by 802.11b at Channel 2412MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			42.125	38.115	23.625	-1.885	40.000	14.490	QP
2			119.725	38.350	25.160	-5.150	43.500	13.190	QP
3		*	167.740	39.882	25.290	-3.618	43.500	14.592	QP
4			374.835	40.545	24.450	-5.455	46.000	16.094	QP
5			625.095	41.211	20.110	-4.789	46.000	21.101	QP
6			875.355	40.197	16.130	-5.803	46.000	24.067	QP

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

5.5. 混附發射之 RF 傳導發射

5.5.1. 適用標準

依據國家通訊傳播委員會低功率射頻電機技術規範之第 3.10.1.5 節，使用頻帶範圍外之任意 100 千赫 (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 千赫 (kHz) 內的射頻功率，至少須衰減 20 dB，以射頻傳導或輻射方式測量。如發射機以本節 3.10.1.2(1)(C) 之最大傳導輸出功率量測方式者，至少須衰減 30 dB。此外，落於第 2.7 節禁用頻段之輻射發射，應符合第 2.8 節之規定。

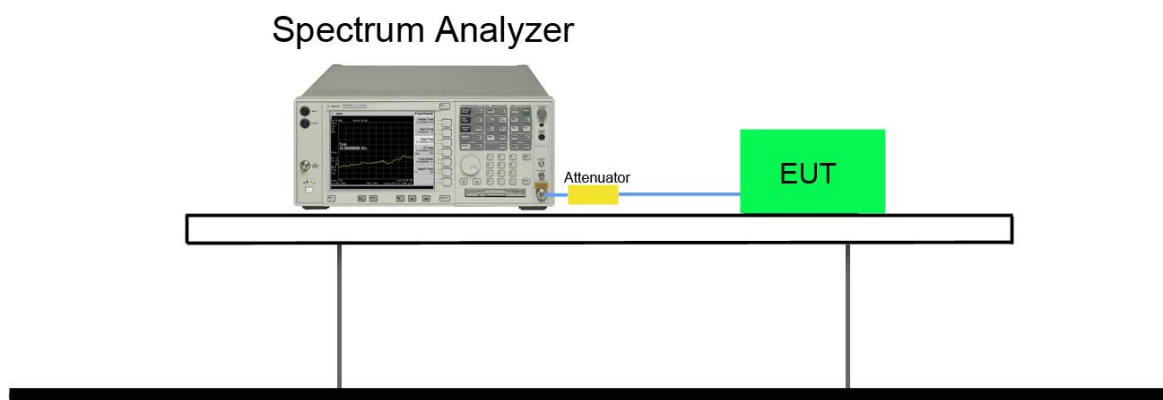
5.5.2. 量測方法

依據國家通訊傳播委員會低功率射頻電機技術規範之附件三，頻率跳頻展頻系統檢測之參考程式七 混附發射之 RF 傳導發射：

(一) 頻譜分析儀設定如下：

1. 頻率掃描範圍足以檢測頻帶內的發射波峰位準以及由受測物產生之最低頻率到第 10 次諧波的所有混附發射，通常需要分幾段以涵蓋全部頻率範圍。
2. 解析頻寬為 100kHz，視訊頻寬不小於解析頻寬。
3. 掃描時間為自動，檢波功能為峰值，訊號軌跡為最大保留(Max Hold)。
4. 將標記設定於任何欲紀錄之波峰上，所顯示之位準值必須符合指定之限制值。

5.5.3. 測試架構圖



5.5.4. 混附發射之 RF 傳導發射測試結果

待測物名稱	802.11ac Dual Band Module	溫度	24°C
測試工程師	Kevin Ker	濕度	58%
測試場地	SR1	測試日期	2018/09/28

Test Mode	Channel No.	Frequency (MHz)	Limit	Result
Ant 0				
802.11b	01	2412	30dBc	Pass
802.11b	06	2437	30dBc	Pass
802.11b	11	2462	30dBc	Pass
802.11g	01	2412	30dBc	Pass
802.11g	06	2437	30dBc	Pass
802.11g	11	2462	30dBc	Pass

Test Mode	Channel No.	Frequency (MHz)	Limit	Result
Ant 1				
802.11b	01	2412	30dBc	Pass
802.11b	06	2437	30dBc	Pass
802.11b	11	2462	30dBc	Pass
802.11g	01	2412	30dBc	Pass
802.11g	06	2437	30dBc	Pass
802.11g	11	2462	30dBc	Pass
Ant 1 / Ant 0+1				
802.11n-HT20	01	2412	30dBc	Pass
802.11n-HT20	06	2437	30dBc	Pass
802.11n-HT20	11	2462	30dBc	Pass
802.11n-HT40	03	2412	30dBc	Pass
802.11n-HT40	06	2437	30dBc	Pass
802.11n-HT40	09	2462	30dBc	Pass

802.11b Out-of-Band Emissions - Ant 0

Channel 01 (2412MHz)

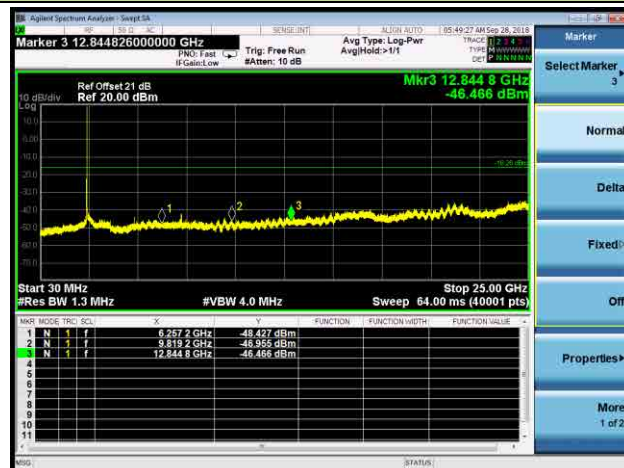
100kHz PSD Reference Level



Low Band Edge



Spurious Emission



Channel 06 (2437MHz)

100kHz PSD Reference Level



Spurious Emission

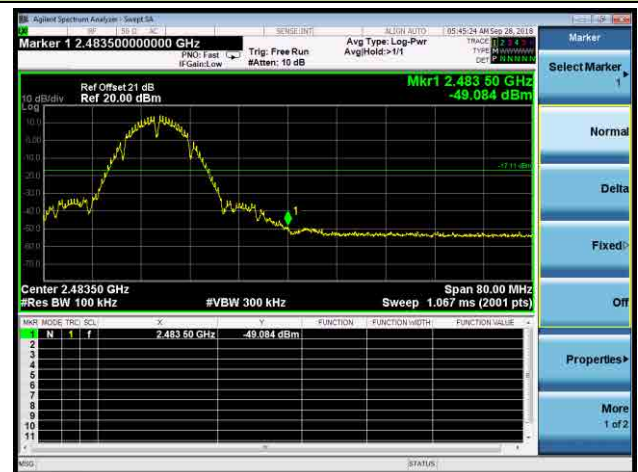


Channel 11 (2462MHz)

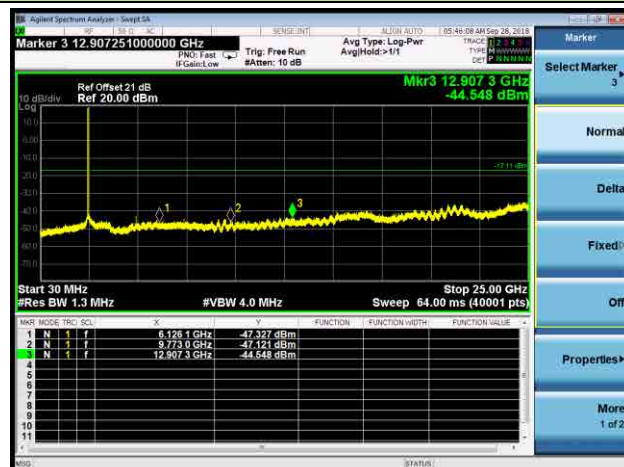
100kHz PSD Reference Level



High Band Edge



Spurious Emission



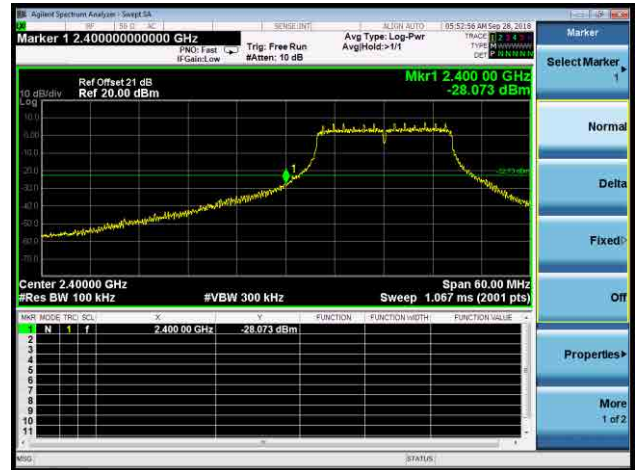
802.11g Out-of-Band Emissions - Ant 0

Channel 01 (2412MHz)

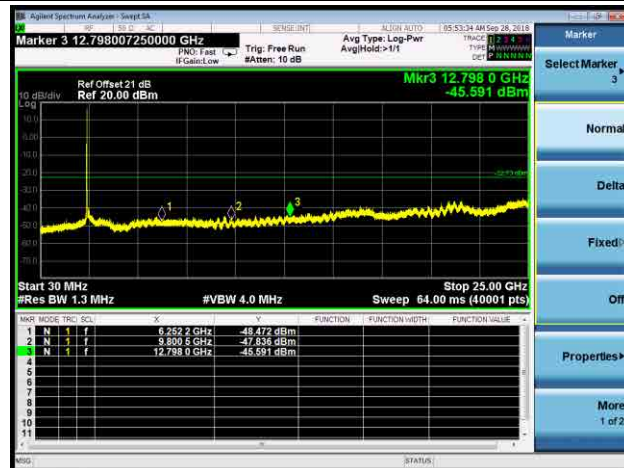
100kHz PSD Reference Level



Low Band Edge



Spurious Emission



Channel 06 (2437MHz)

100kHz PSD Reference Level



Spurious Emission



Channel 11 (2462MHz)

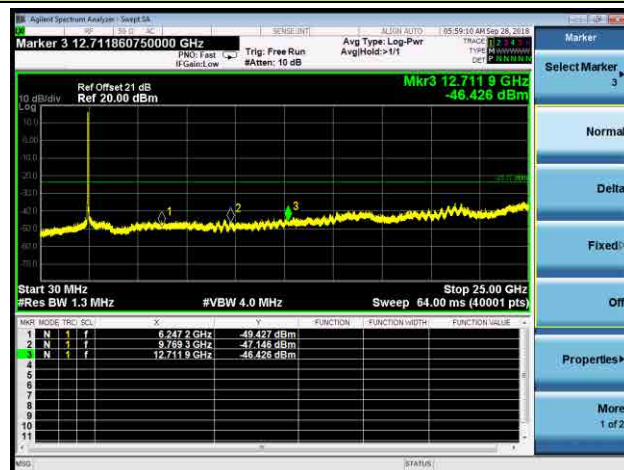
100kHz PSD Reference Level



High Band Edge



Spurious Emission



802.11b Out-of-Band Emissions - Ant 1

Channel 01 (2412MHz)

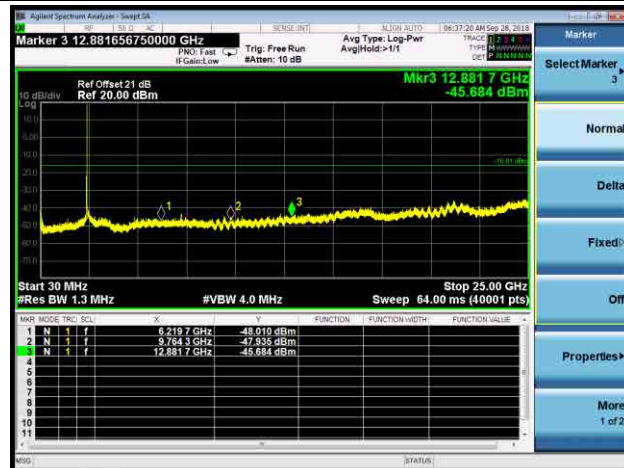
100kHz PSD Reference Level



Low Band Edge



Spurious Emission



Channel 06 (2437MHz)

100kHz PSD Reference Level



Spurious Emission

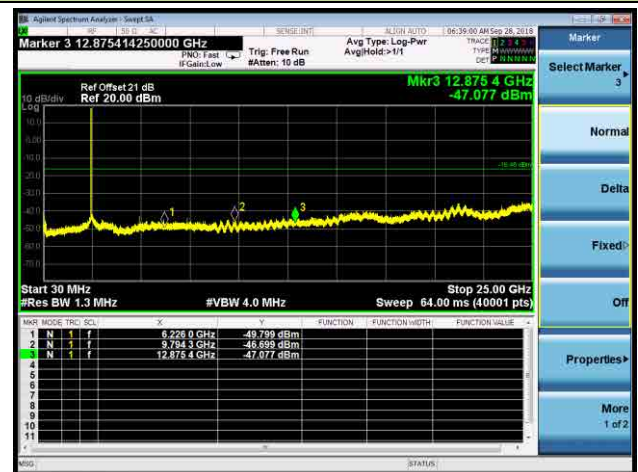


Channel 11 (2462MHz)

100kHz PSD Reference Level



High Band Edge



Spurious Emission



802.11g Out-of-Band Emissions - Ant 1

Channel 01 (2412MHz)

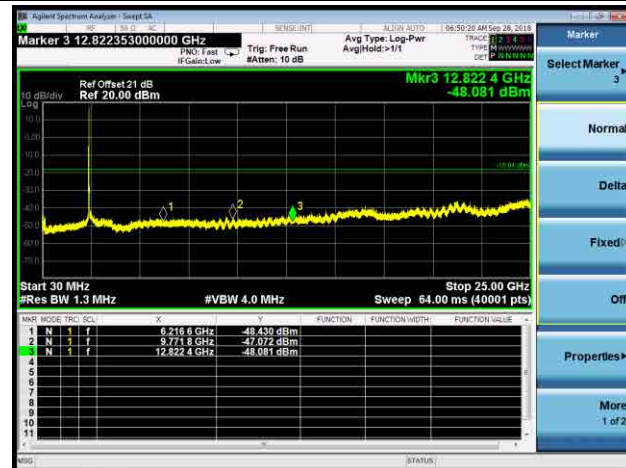
100kHz PSD Reference Level



Low Band Edge



Spurious Emission

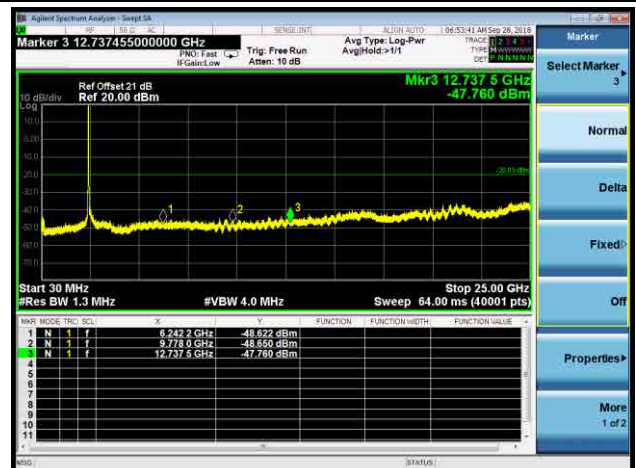


Channel 06 (2437MHz)

100kHz PSD Reference Level



Spurious Emission

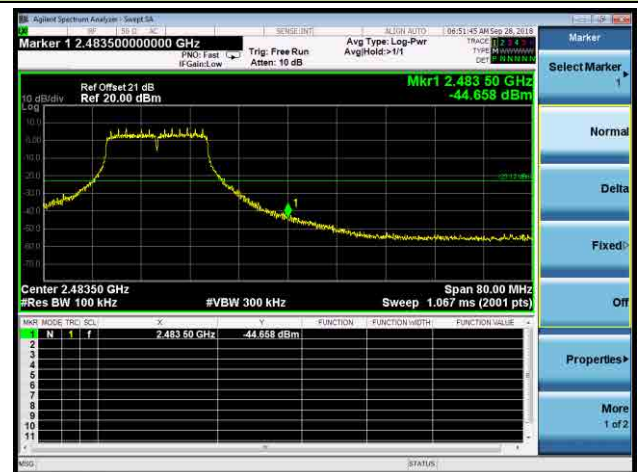


Channel 11 (2462MHz)

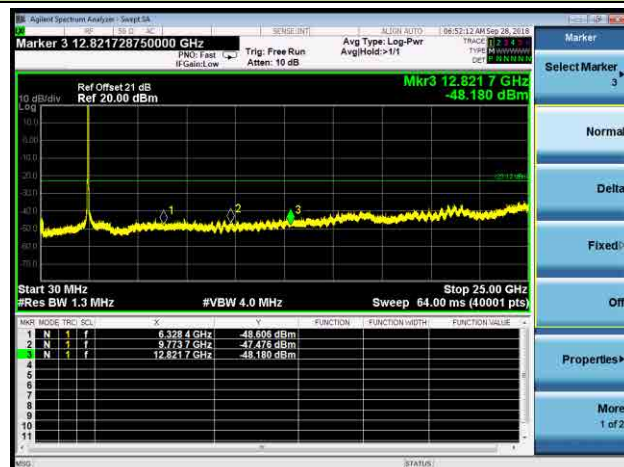
100kHz PSD Reference Level



High Band Edge



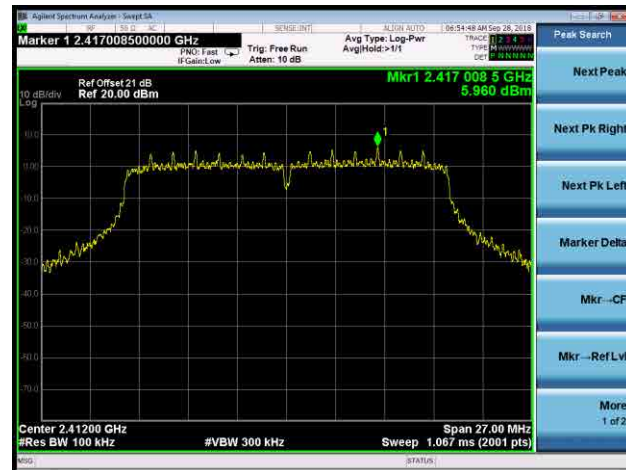
Spurious Emission



802.11n-HT20 Out-of-Band Emissions – Ant 1/Ant 0+1

Channel 01 (2412MHz)

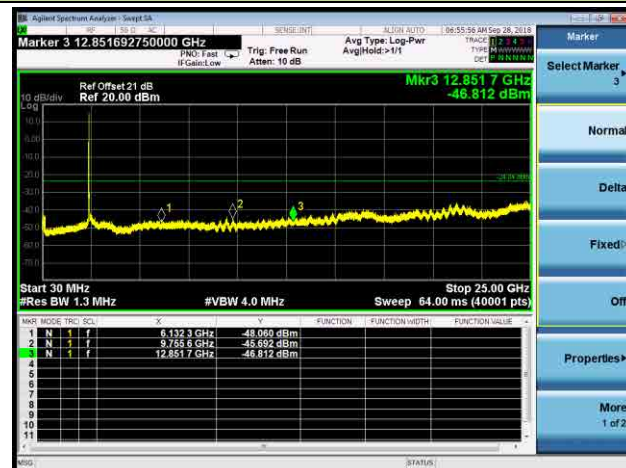
100kHz PSD Reference Level



Low Band Edge

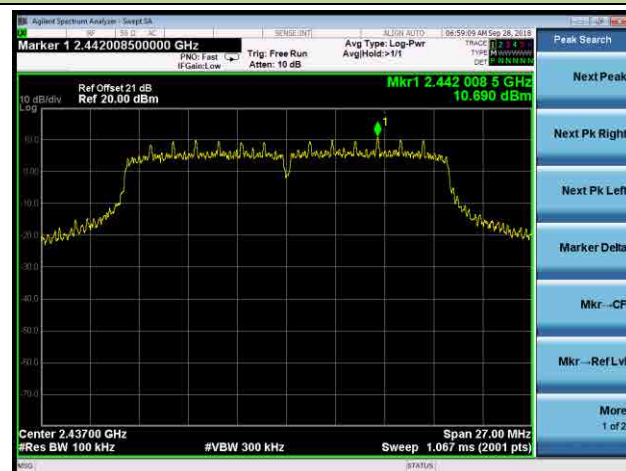


Spurious Emission



Channel 06 (2437MHz)

100kHz PSD Reference Level

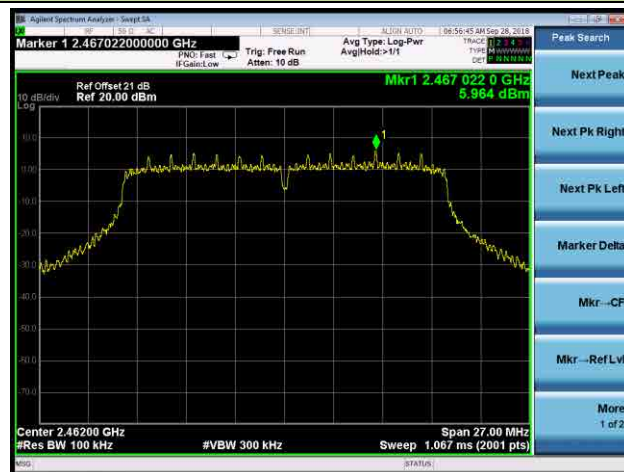


Spurious Emission



Channel 11 (2462MHz)

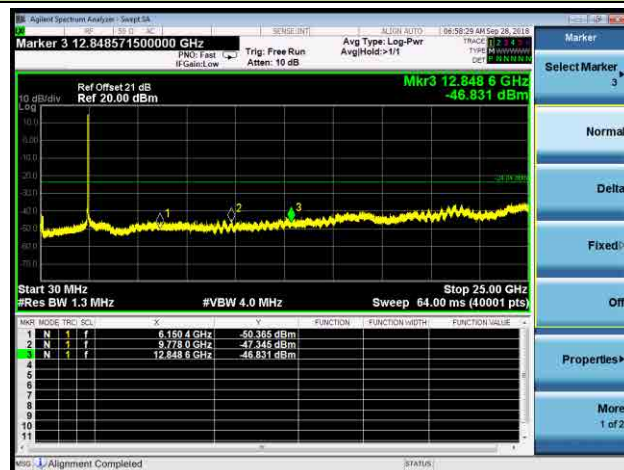
100kHz PSD Reference Level



High Band Edge



Spurious Emission



802.11n-HT40 Out-of-Band Emissions - Ant 1/Ant 0+1

Channel 03 (2422MHz)

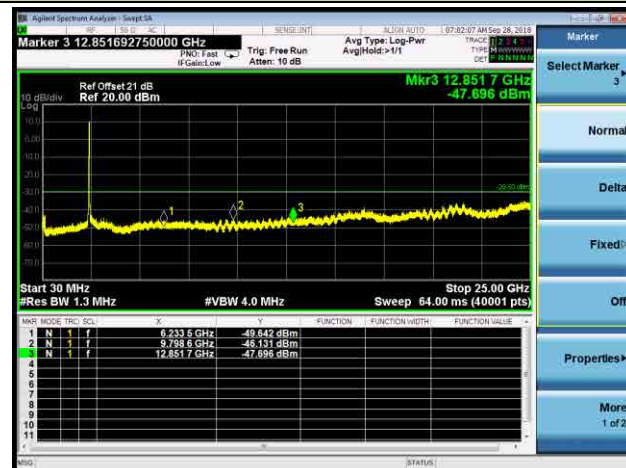
100kHz PSD Reference Level



Low Band Edge

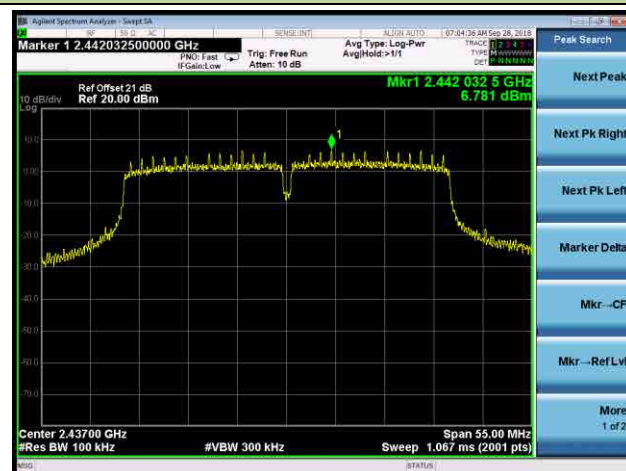


Spurious Emission

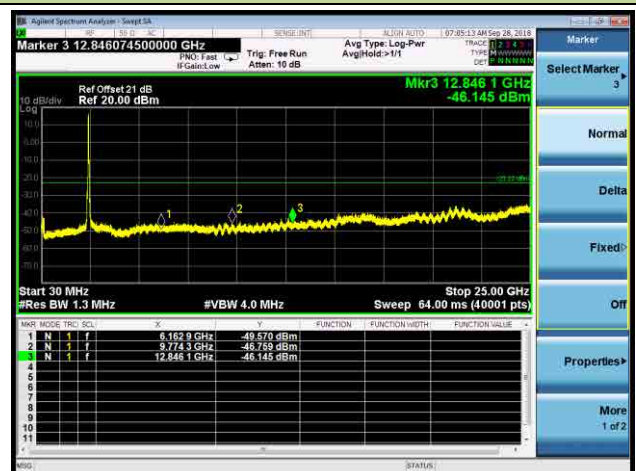


Channel 06 (2437MHz)

100kHz PSD Reference Level



Spurious Emission



Channel 09 (2452MHz)

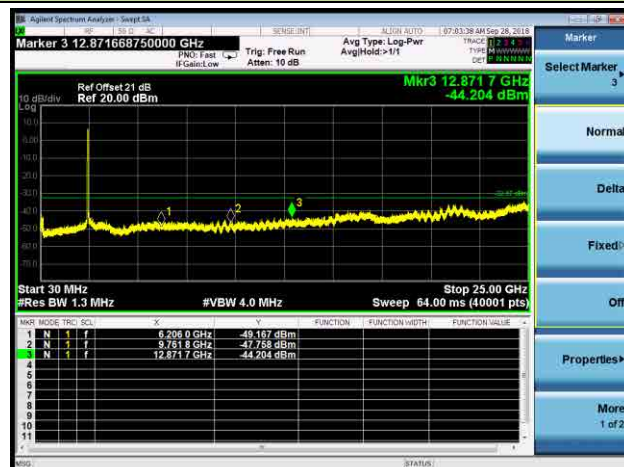
100kHz PSD Reference Level



High Band Edge



Spurious Emission



5.6. 開放頻帶邊緣之不必要幅射要求

5.6.1. 適用標準

依據國家通訊傳播委員會低功率射頻電機技術規範之第 3.10.1.5 節，使用頻帶範圍外之任意 100 千赫 (kHz)內，發射器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 千赫 (kHz)內的射頻功率，衰減值限制如下：

(1)輸出功率以低功率射頻電機技術規範附件二之峰值輸出功率方式量測者，至少須衰減 20 dB，可使用射頻傳導或輻射方式測量。

(2)輸出功率以低功率射頻電機技術規範 3.10.1.2(1)(C)之最大傳導輸出功率量測方式者，至少須衰減 30 dB。

此外，落於第 2.7 節禁用頻段之輻射發射，應符合第 2.8 節之規定(限制要求如下)：

發射依據國家通訊傳播委員會低功率射頻電機技術規範之第 2.8 節，低功率射頻電機，除本規範各章節另有放寬規定者外，其電場強度不得超過下表之限值，且其不必要之發射皆不得大於主波發射強度。各頻段重疊處，以較嚴格之限制值為準。

頻 率(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

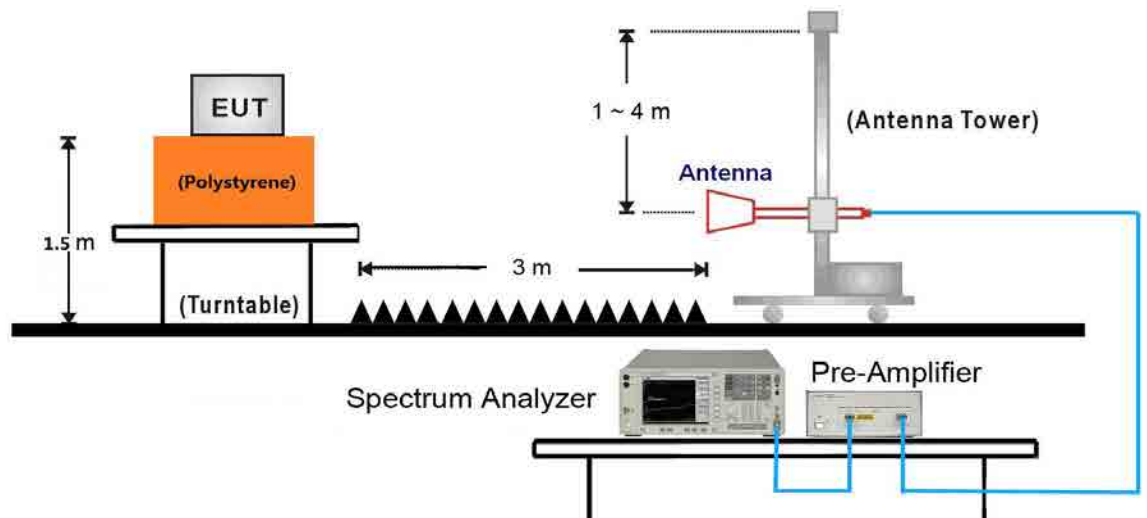
上表規定之電場強度，頻率在 9-90kHz 千赫(kHz)、110-490 千赫(kHz)以及 1000 兆赫(MHz)以上之發射，其量測以平均值檢波器為基準，且須符合第 5.15.2 節之規定；其他頻率之發射，應以 CISPR 準峰值(quasi-peak) 檢波器測量；非以上表所指定之距離測量時須符合第 5.5 節之規定，而輻射發射之量測頻率範圍須符合第 5.12 節之規定。

5.6.2. 量測方法

待測物置於高 150 公分之非導體桌面（落地型產品置於地上），受測物與配件設備之電源線無須束綁，桌面上受測設備的所有電源線由桌子的後緣垂下沿旋轉桌表面接至交流插座。落地型設備的交流電源線可以方便的型態走線。桌面可 360 度旋轉，接收天線置於距待測物 3m 距離，高度可在 1 至 4 公尺間變動，以量測待測物之最大輻射電場強度。接收天線並應於水準及垂直極化方向各量測一次。

P.S 若為手持式或穿戴式之裝置，需對其三個正交軸的方位評估測試，並記錄最差的數值。

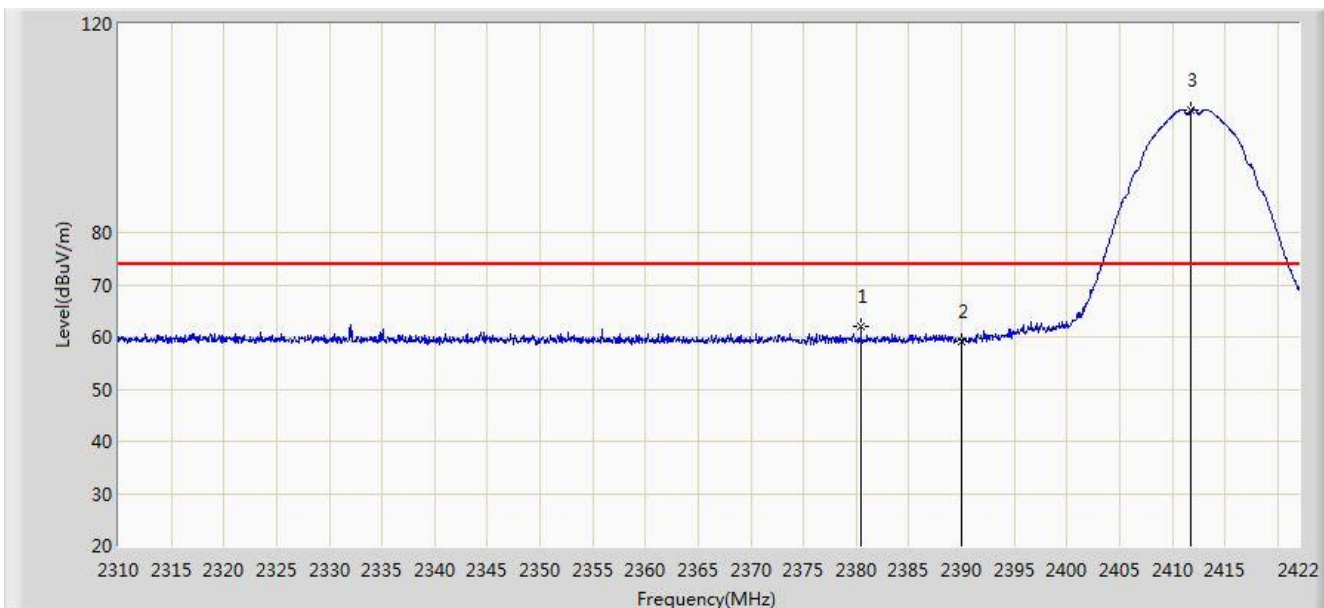
5.6.3. 測試架構圖



備註: 使用頻率範圍外之任意 100 千赫雜訊，使用輻射方式測量，6 dB 頻寬使用 1MHz 遠大於 100kHz 仍可 PASS，檢附其測試數據。

5.6.4. 測試結果

Site: AC1	Time: 2018/09/25 - 20:43
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Horizontal
EUT: 802.11ac Dual Band Module	Power: AC 110V/60Hz
Test mode: Transmit by 802.11b at channel 2412MHz Ant 0	

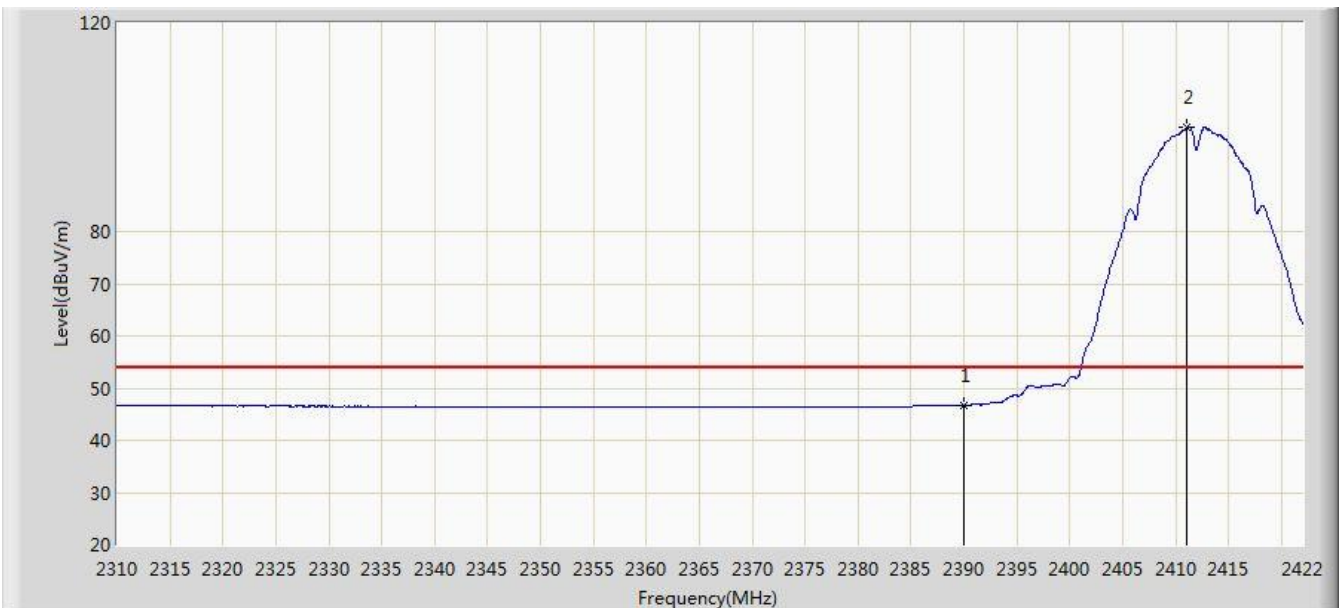


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2380.448	61.926	29.358	-12.074	74.000	32.567	PK
2			2390.000	59.179	26.625	-14.821	74.000	32.554	PK
3		*	2411.808	103.454	70.928	N/A	N/A	32.526	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2018/09/25 - 20:48
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Horizontal
EUT: 802.11ac Dual Band Module	Power: AC 110V/60Hz
Test mode: Transmit by 802.11b at channel 2412MHz Ant 0	

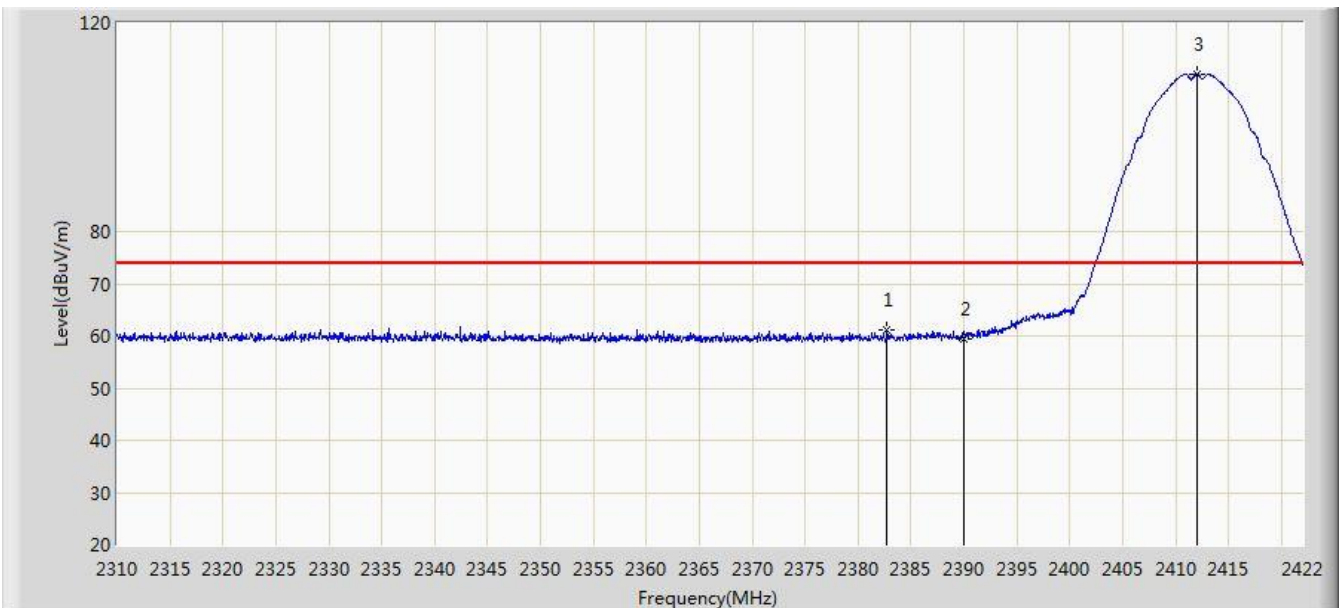


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.602	14.048	-7.398	54.000	32.554	AV
2		*	2411.080	100.072	67.545	N/A	N/A	32.527	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2018/09/25 - 20:53
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Vertical
EUT: 802.11ac Dual Band Module	Power: AC 110V/60Hz
Test mode: Transmit by 802.11b at channel 2412MHz Ant 0	

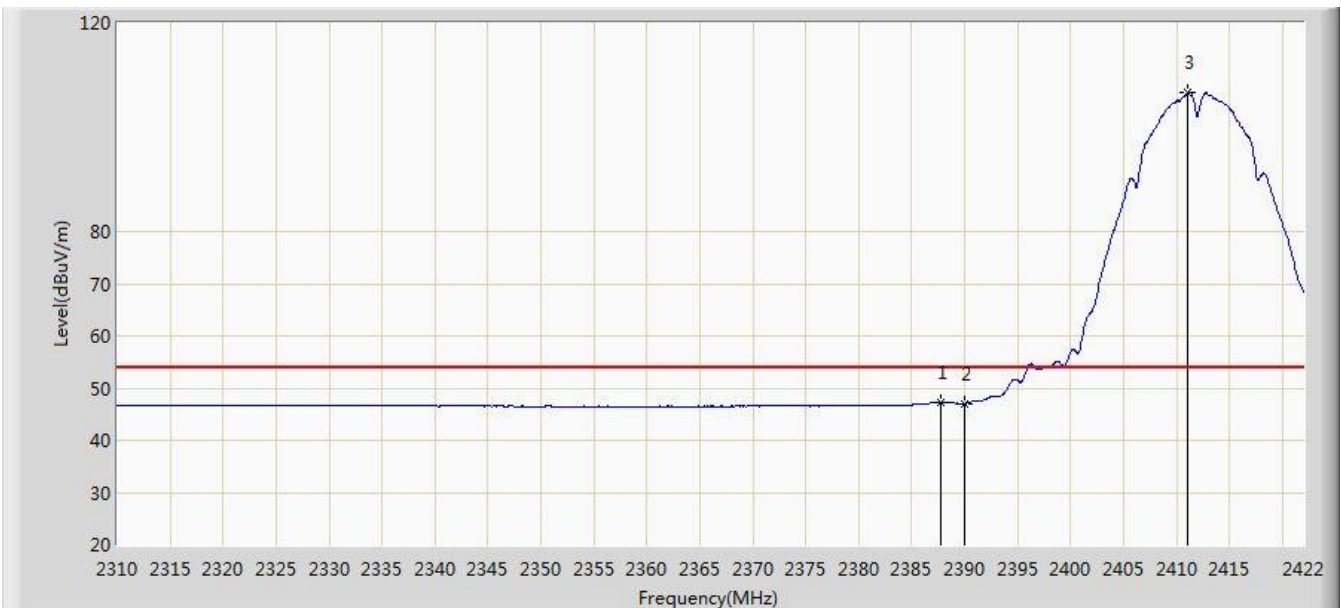


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2382.688	61.244	28.680	-12.756	74.000	32.564	PK
2			2390.000	59.543	26.989	-14.457	74.000	32.554	PK
3		*	2411.976	110.241	77.715	N/A	N/A	32.526	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2018/09/25 - 20:57
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Vertical
EUT: 802.11ac Dual Band Module	Power: AC 110V/60Hz
Test mode: Transmit by 802.11b at channel 2412MHz Ant 0	

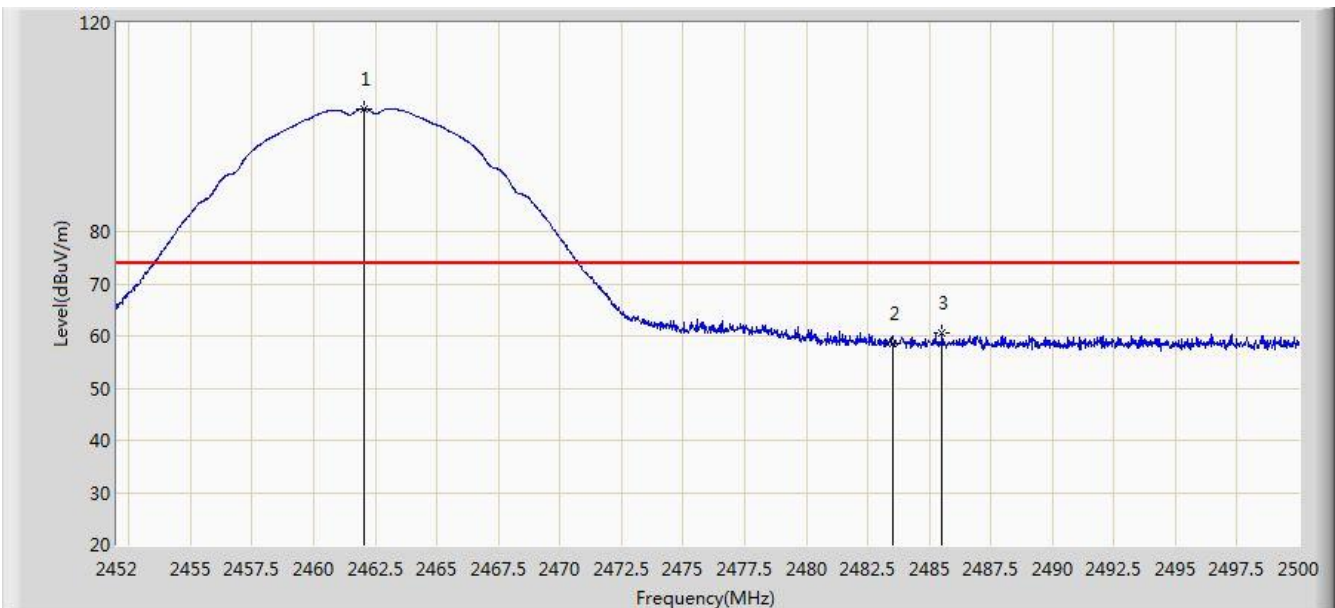


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2387.784	47.246	14.689	-6.754	54.000	32.557	AV
2			2390.000	47.003	14.449	-6.997	54.000	32.554	AV
3		*	2411.080	106.526	73.999	N/A	N/A	32.527	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2018/09/25 - 20:59
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Horizontal
EUT: 802.11ac Dual Band Module	Power: AC 110V/60Hz
Test mode: Transmit by 802.11b at channel 2462MHz Ant 0	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2462.056	103.549	71.033	N/A	N/A	32.516	PK
2			2483.500	58.457	25.876	-15.543	74.000	32.580	PK
3			2485.528	60.542	27.955	-13.458	74.000	32.587	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2018/09/25 - 21:00
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz_TW	Polarity: Horizontal
EUT: 802.11ac Dual Band Module	Power: AC 110V/60Hz
Test mode: Transmit by 802.11b at channel 2462MHz Ant 0	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2461.120	99.971	67.456	N/A	N/A	32.514	AV
2			2483.500	46.821	14.240	-7.179	54.000	32.580	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).