

NCC

低功率射頻電機型式試驗報告

產品名稱: ACCESS POINT
型號: APIN0518
廠牌: aruba / Hewlett Packard Enterprise
商標:  
申請者: 慧與科技股份有限公司
申請者地址: 臺北市南港區經貿二路 66 號 10 樓之 1
測試標準: LP0002 (107 年版)
參考法規: ANSI C63.10-2013
測試結果: 符合
接收日期: 2019.12.23
測試日期: 2019.12.25 ~ 2020.07.01

測試工程師:



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報告簽屬人:



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本測試報告僅對實驗室所受測之樣品負責

本測試報告非經本公司同意不可局部複製使用

修訂紀錄

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1. 一般資訊

申請者	慧與科技股份有限公司
申請者地址	臺北市南港區經貿二路 66 號 10 樓之 1
製造商	Hewlett Packard Enterprise Company
製造商地址	3333 Scott Blvd, Santa Clara, CA 94089, USA
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 Firm. 2. MRT facility is an IC registered (MRT Reg. No. 21723) 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, 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
Test Device Serial No.:	Radiated sample S/N: DE29AO005B, Conducted sample S/N: DE29AO005B

2. 產品描述

2.1. 產品資訊

產品名稱	ACCESS POINT
產品型號	APIN0518
Wi-Fi 規格	802.11a/b/g/n/ac/ax
藍牙版本	v5.0 single mode
Zigbee 規格	802.15.4
軟件版本	V1.00
工作溫度	-40 ~ 65 °C
待測物額定電壓	PoE input

Note:

1. 系列差異說明：系列型號與主型號差異為廠牌不同,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.The applicant provided one PoE adapter (Manufacturer: MICROSEMI & Model: PD-9001GR/AT/AC) for approval testing, it is not for sale.

2.2. 產品規格

頻率範圍	2405 ~ 2480 MHz
信道數量	16
調變模式	O-QPSK

2.3. 通道清單

ZigBee

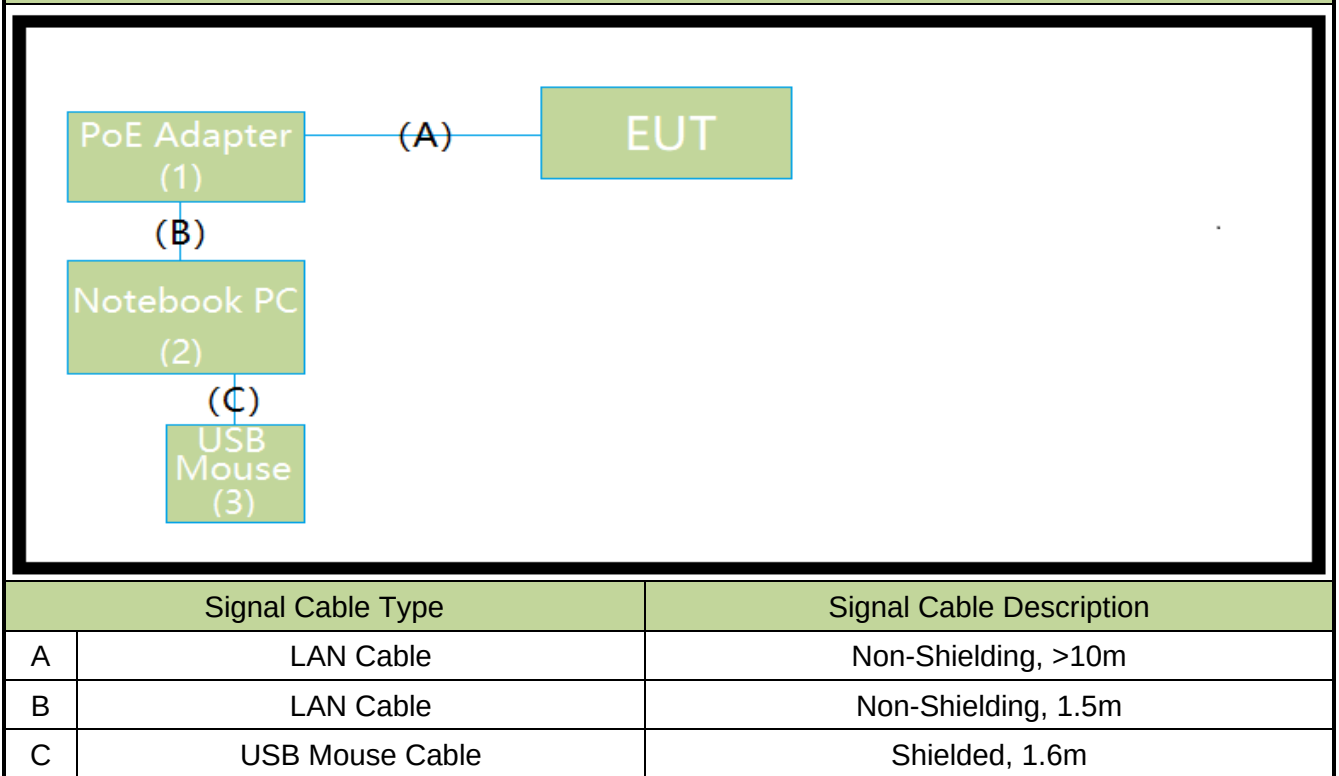
Channel	Frequency	Channel	Frequency	Channel	Frequency
11	2405 MHz	12	2410 MHz	13	2415 MHz
14	2420 MHz	15	2425 MHz	16	2430 MHz
17	2435 MHz	18	2440 MHz	19	2445 MHz
20	2450 MHz	21	2455 MHz	22	2460 MHz
23	2465 MHz	24	2470 MHz	25	2475 MHz
26	2480 MHz	--	--	--	--

2.4. 測試模式

Test Mode	Mode 1: 發射器 - ZigBee
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2.5. 測試系統組合圖

待測物測試配置圖 (Mode 1)



2.6. 測試周邊

待測裝置測試時，其搭配系統測試時之週邊裝置包括如下：

No.	周邊名稱	廠牌	型號	序號	檢磁	電源線
1	PoE Adapter	MICROSEMI	PD-9001GR/AT/AC	N/A	N/A	N/A
2	Notebook PC	Lenovo	X230i	N/A	N/A	Non-Shielded, 1.8m
3	USB Mouse	Dell	MS111-L	N/A	N/A	N/A

2.7. 待測裝置測試時之典型操作程式

1.	Turn on the power of all equipment.
2.	Mode 1: Make the EUT powered by POE Adapter on E1 port, communicate with PC and make the PC execute "telnet.exe" program, configure the test channel and the data rate.
3.	Start to test.

3. 測試設備明細

電源端及電信端傳導干擾量測設備 / Conducted Emissions and Impedance Stabilization Network - SR2 :

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Two-Line V-Network	R&S	ENV216	MRTTWA00019	1 year	2021/3/26
Two-Line V-Network	R&S	ENV216	MRTTWA00020	1 year	2021/4/24
8-Wire ISN (T8-Cat6)	R&S	ENY81 CA6	MRTTWA00017	1 year	2021/5/25
8-Wire ISN (T8)	R&S	ENY81	MRTTWA00018	1 year	2021/5/25
EMI Test Receiver	R&S	ESR3	MRTTWA00045	1 year	2021/5/26
Conducted Cable	Rosnol	N1C50-RG400-B1C50-500CM	MRTTWE00013	1 year	2021/6/21
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2021/5/28

輻射干擾測設備 / Radiated Disturbance - AC1 :

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Broadband TRILOG Antenna	SCHWARZBECK	VULB 9162	MRTTWA00001	1 year	2020/9/4
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	MRTTWA00002	1 year	2021/4/27
Broadband Hornantenna	SCHWARZBECK	BBHA 9120D	MRTTWA00003	1 year	2021/4/24
Breitband Hornantenna	SCHWARZBECK	BBHA 9170	MRTTWA00004	1 year	2021/4/24
Broadband Preamplifier	SCHWARZBECK	BBV 9718	MRTTWA00005	1 year	2021/4/24
Broadband Amplifier	SCHWARZBECK	BBV 9721	MRTTWA00006	1 year	2021/4/24
Signal Analyzer	R&S	FSV40	MRTTWA00007	1 year	2021/3/24
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2021/3/25
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2020/10/2
EXA Signal Analyzer	KEYSIGHT	N9010B	MRTTWA00074	1 year	2021/7/14
Antenna Cable	HUBERSUHNER	SF106	MRTTWE00010	1 year	2021/6/16
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00032	1 year	2021/5/29
Cable	Rosnol	K1K50-UP026 4-K1K50-4M	MRTTWE00012	1 year	2021/6/20

RF 傳導量測設備：

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00014	1 year	2021/4/24
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00015	1 year	2021/3/26
Wideband Radio Communication Taster	R&S	CMW 500	MRTTWA00041	1 year	2021/1/7
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2020/10/2
EXA Signal Analyzer	KEYSIGHT	N9010B	MRTTWA00074	1 year	2021/7/14
Signal Analyzer	R&S	FSV40	MRTTWA00007	1 year	2021/3/24
Temperature & Humidity Chamber	TEN BILLION	TTH-B3UP	MRTTWA00036	1 year	2021/6/09
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2021/5/28

測試軟體 / Test Software:

Software	Version	Function
e3	9.160520a	EMI Test Software
EMI	V 3	EMI Test Software

4. 量測不確定度

電源傳導量測-電源線 (Conducted Emission- Power Line)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 0.15MHz~30MHz: $\pm 2.53\text{dB}$
輻射干擾量測 (Radiated Spurious Emission)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 9kHz~30MHz: $\pm 3.92\text{dB}$ 30MHz~1GHz: $\pm 4.25\text{dB}$ 1GHz~18GHz: $\pm 4.40\text{dB}$ 18GHz~40GHz: $\pm 4.45\text{dB}$
頻率誤差量測 (Frequency Error)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): $\pm 78.4\text{Hz}$
傳導功率量測 (Conducted Power)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): $\pm 0.84\text{dB}$
傳導干擾量測 (Conducted Spurious Emission)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): $\pm 2.65\text{ dB}$
佔用頻寬量測 (Occupied Bandwidth)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 3.3%
溫度 / 濕度 (Temp. / Humidity)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): $\pm 0.82^\circ\text{C} / \pm 3\%$
直流電源 (DC Voltage)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): $\pm 0.3\%$

5. 測試結果

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	$\leq 20\text{dBc (Peak)}$	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

備註：符合性的判定是基於測試結果符合規範的限制值或客戶的宣告要求，測試結果的判定是不考慮測量不確定度的值。

5.1. 電源傳導測試

5.1.1. 量測方法

待測物放置於1m*2m*0.8m之非導體桌面並離垂直牆面40cm（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。

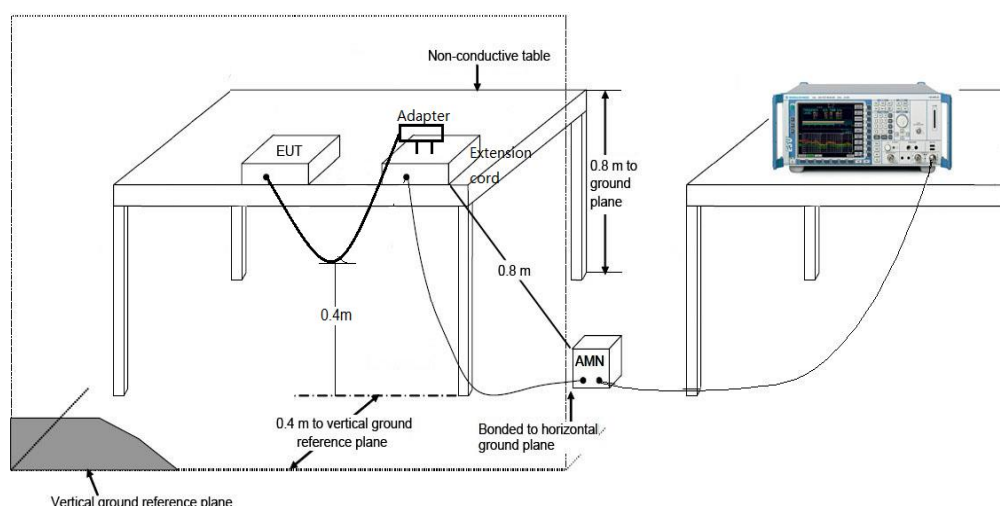
5.1.2. 限制要求

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

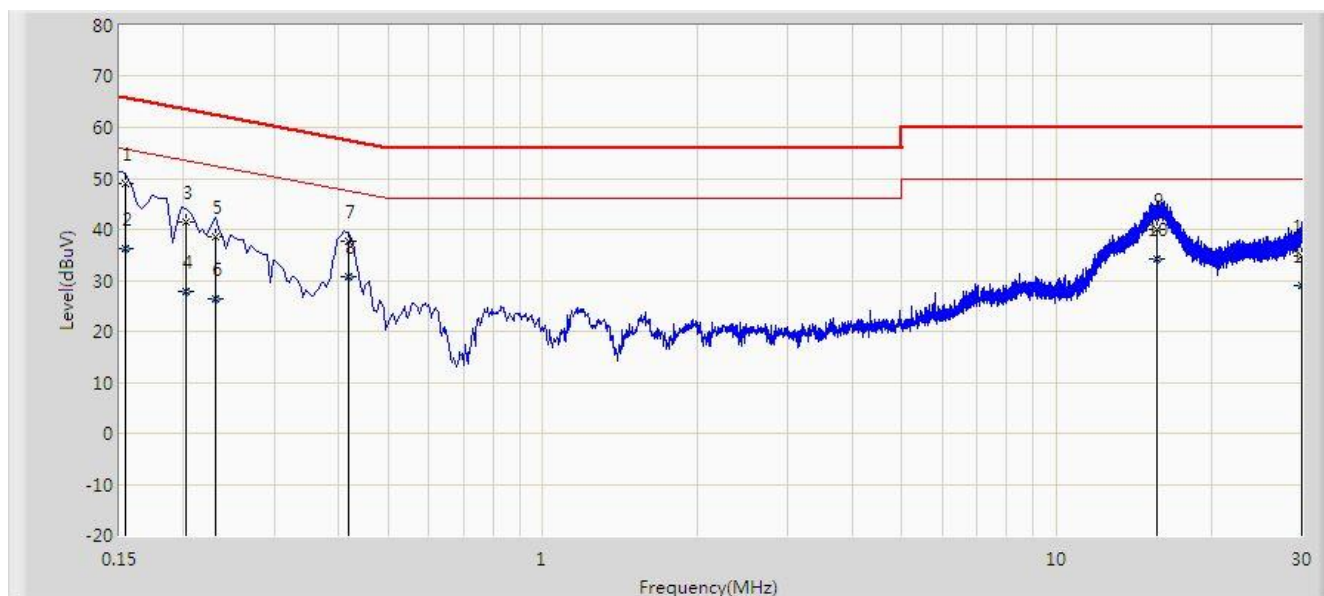
註：隨頻率之對數遞減

5.1.3. 測試架構圖



5.1.4. 電源端點測試結果

Site: SR2	Time: 2020/05/18 - 14:07
Limit: NCC LP0002_CE_0.15MHz-30MHz	Engineer: Kevin Ker
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: ACCESS POINT	Power: AC 110V/60Hz
Test Mode 1	

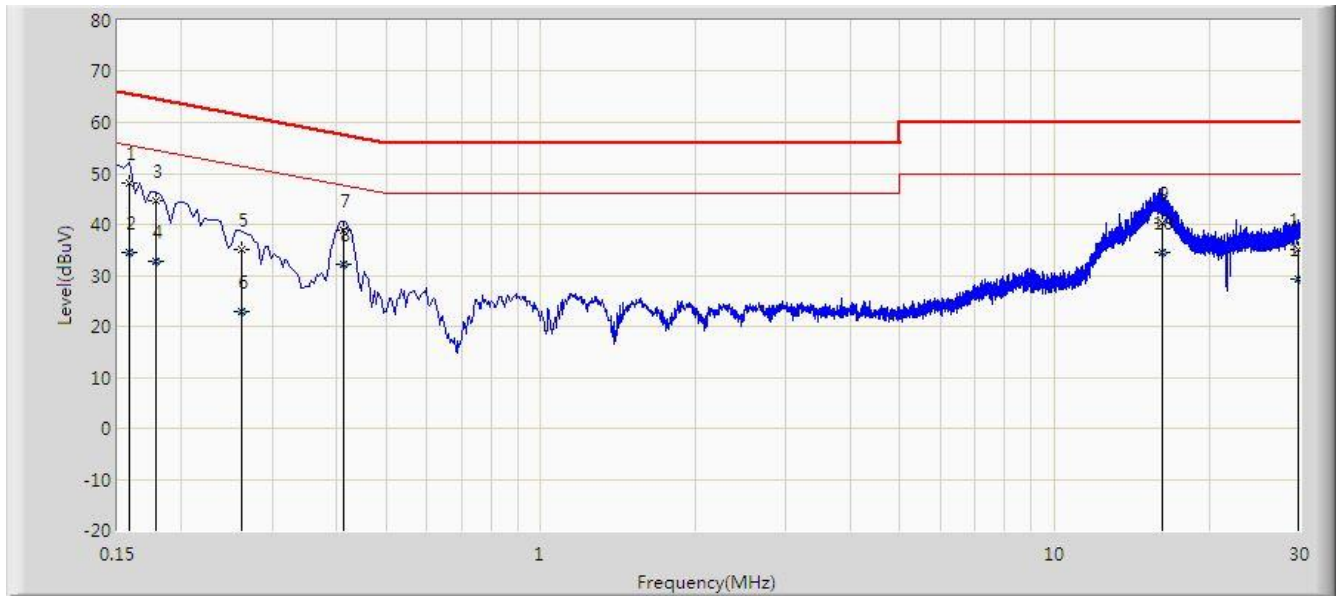


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.154	49.100	39.455	-16.682	65.781	9.645	QP
2			0.154	36.280	26.635	-19.502	55.781	9.645	AV
3			0.202	41.537	31.876	-21.991	63.528	9.661	QP
4			0.202	27.873	18.211	-25.655	53.528	9.661	AV
5			0.230	38.428	28.764	-24.022	62.450	9.663	QP
6			0.230	26.268	16.604	-26.182	52.450	9.663	AV
7			0.418	37.677	27.958	-19.811	57.488	9.720	QP
8			0.418	30.614	20.895	-16.874	47.488	9.720	AV
9			15.642	40.031	29.728	-19.969	60.000	10.304	QP
10		*	15.642	34.184	23.880	-15.816	50.000	10.304	AV
11			29.930	34.786	24.216	-25.214	60.000	10.569	QP
12			29.930	28.970	18.401	-21.030	50.000	10.569	AV

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

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

Site: SR2	Time: 2020/05/18 - 14:15
Limit: NCC LP0002_CE_0.15MHz-30MHz	Engineer: Kevin Ker
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: ACCESS POINT	Power: AC 110V/60Hz
Test Mode 1	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.158	48.238	38.631	-17.331	65.568	9.606	QP
2			0.158	34.470	24.863	-21.099	55.568	9.606	AV
3			0.178	44.588	34.973	-19.991	64.578	9.615	QP
4			0.178	32.663	23.048	-21.916	54.578	9.615	AV
5			0.262	35.035	25.402	-26.332	61.368	9.634	QP
6			0.262	23.013	13.380	-28.354	51.368	9.634	AV
7			0.414	38.760	29.121	-18.808	57.568	9.639	QP
8		*	0.414	32.128	22.489	-15.440	47.568	9.639	AV
9			16.250	40.361	30.154	-19.639	60.000	10.207	QP
10			16.250	34.417	24.210	-15.583	50.000	10.207	AV
11			29.814	35.060	24.492	-24.940	60.000	10.568	QP
12			29.814	29.296	18.729	-20.704	50.000	10.568	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. 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。除使用上述測量方式外，並得使用以最大傳導輸出功率作為測量方式。

5.2.2. 限制要求

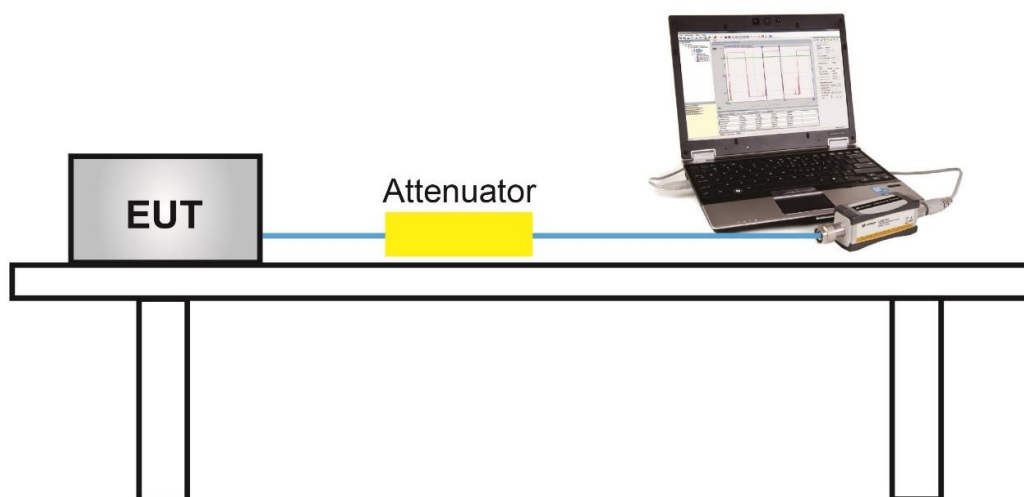
國家通訊傳播委員會低功率射頻電機技術規範之第3.10.1.2節，峰值傳導輸出功率：

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。

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	ACCESS POINT	測試日期	2020/01/18
待測物型號	APIN0518	溫度 / 濕度	25°C / 54%
測試場地	SR2	測試工程師	Kevin Ker

Test Result of Peak Output Power

Test Mode	Modulation Mode	Channel No.	Freq. (MHz)	Peak Power (dBm)	Limit (dBm)	Result
802.15.4	O-QPSK	11	2405	7.38	≤ 30.00	Pass
802.15.4	O-QPSK	18	2440	7.63	≤ 30.00	Pass
802.15.4	O-QPSK	26	2480	7.20	≤ 30.00	Pass

Note: E.I.R.P (dBm) = Max Peak Power (dBm) + Antenna Gain (dBi) = 7.63 dBm + 4.20 dBi = 11.83 dBm.

Test Result of Average Output Power (Reporting Only)

Test Mode	Modulation Mode	Channel No.	Freq. (MHz)	Average Power (dBm)	Limit (dBm)	Result
802.15.4	O-QPSK	11	2405	7.29	≤ 30.00	Pass
802.15.4	O-QPSK	18	2440	7.54	≤ 30.00	Pass
802.15.4	O-QPSK	26	2480	7.11	≤ 30.00	Pass

Note: E.I.R.P (dBm) = Max Average Power (dBm) + Antenna Gain (dBi) = 7.54 dBm + 4.20 dBi = 11.74 dBm.

5.3. 天線之要求

5.3.1. 限制要求

依據國家通訊傳播委員會低功率射頻電機技術規範之第3.10.1.4節規定，天線之規格可不受下述規定之限制。

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

Antenna No.	Antenna Type	Frequency Band (GHz)	Model No.	Max Peak Gain (dBi)	BF Dir Gain (dBi)	CDD Dir Gain (dBi)	
						For Power	For PSD
Wi-Fi External Antenna List (2.4GHz 2*2 MIMO, 5GHz 4*4 MIMO)							
1	Omni	2.4	AP-ANT-40	4.0	7.01	4.0	7.01
		5		5.0	11.02	5.0	11.02
2	Omni	2.4	AP-ANT-19	3.0	6.01	3.0	6.01
		5		6.0	12.02	6.0	12.02
3	Omni	2.4	AP-ANT-1W	3.8	6.81	3.8	6.81
		5		5.8	11.82	5.8	11.82
4	Omni	2.4	AP-ANT-13B	2.3	5.31	2.3	5.31
		5		4.0	10.02	4.0	10.02
5	Omni	2.4	AP-ANT-20W	2.0	5.01	2.0	5.01
		5		2.0	8.02	2.0	8.02
6	Omni	2.4	AP-ANT-22	2.0	5.01	2.0	5.01
		5		4.0	10.02	4.0	10.02
7	Omni	2.4	AP-ANT-16	3.9	6.91	3.9	6.91
		5		4.7	10.72	4.7	10.72
8 (Note 3)	Directional	2.4	AP-ANT-45	4.5	4.5	4.5	4.5
		5		5.5	8.51	5.5	8.51
9 (Note 3)	Directional	2.4	AP-ANT-48	8.5	8.5	8.5	8.5
		5		8.5	11.51	8.5	11.51
10 (Note 3)	Directional	2.4	ANT-2x2-2314	14.0	14.0	14.0	14.0
11 (Note 3)	Directional	5	ANT-4x4-5314	14.0	17.01	14.0	17.01
12 (Note 3)	Directional	5	ANT-3x3-5712	11.5	14.51	11.5	14.51
13 (Note 3)	Directional	2.4	AP-ANT-25A	5.0	5.0	5.0	5.0
		5		5.0	8.01	5.0	8.01
14 (Note 3)	Directional	2.4	AP-ANT-28	7.5	7.5	7.5	7.5
		5		7.5	10.51	7.5	10.51
Bluetooth / ZigBee Internal Antenna(ANT-518)							
PCB		2.4		4.2			

Note:

1. The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

For CDD transmissions, directional gain is calculated as follows, $N_{ANT} = 2$, $N_{SS} = 1$.

If all antennas have the same gain, G_{ANT} , Directional gain = $G_{ANT} + \text{Array Gain}$, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,

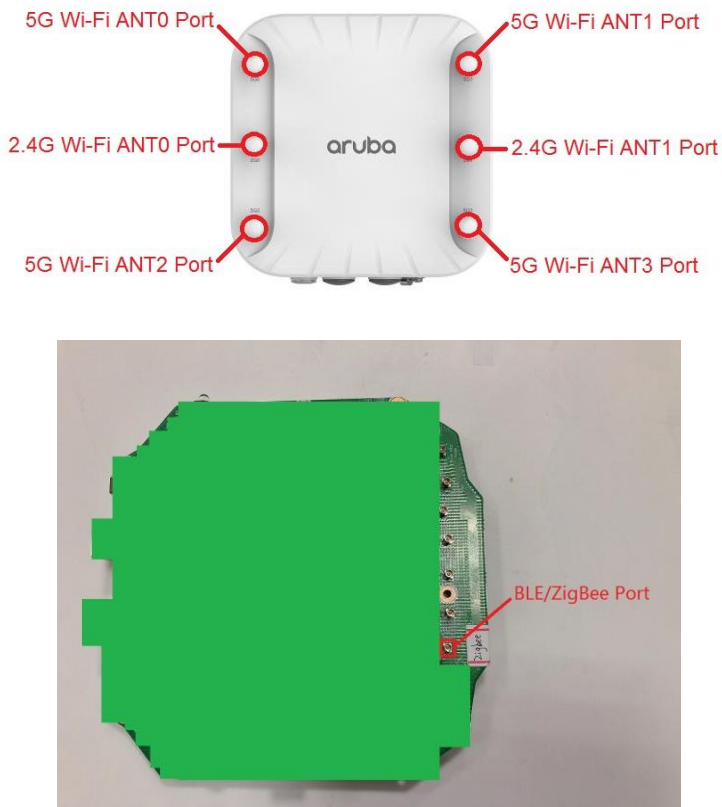
$$\text{Array Gain} = 10 \log (N_{ANT} / N_{SS}) \text{ dB} = 3.01;$$

- For power measurements on IEEE 802.11 devices,

$$\text{Array Gain} = 0 \text{ dB for } N_{ANT} \leq 4;$$

2. The EUT also supports Beam Forming mode, and the Beam Forming support 802.11n/ac/ax, not include 802.11a/b/g. Directional gain = $G_{ANT} + \text{BF Gain}$, BF Gain was declared by the applicant.
3. These antennas have Cross-Polarized design, only each two outputs driving a pair of antennas that are cross-polarized, the detail see the antenna specification.
4. Low gain antenna (AP-ANT-20W) was selected to perform all RF testing that can got maximum power setting, high gain directional antenna (ANT-2x2-2314 & ANT-4x4-5314) were selected to perform radiated spurious emission and band edge testing. High gain antenna power setting will be reduced according to difference value of antenna gain declared by applicant.

5.3.3. 天線端口描述

Antenna RF Port						
--	2.4GHz RF Port		5GHz RF Port			
Software Control Port	Ant 0	Ant 1	Ant 0	Ant 1	Ant 2	Ant 3
 The diagram shows the physical layout of the antenna ports on an Aruba device. The top part is a photograph of the device with red circles and labels identifying the ports: 5G Wi-Fi ANT0 Port, 2.4G Wi-Fi ANT0 Port, 5G Wi-Fi ANT2 Port, 5G Wi-Fi ANT1 Port, 2.4G Wi-Fi ANT1 Port, and 5G Wi-Fi ANT3 Port. The bottom part is a photograph of the internal circuitry, with a green box obscuring most of it and a red circle and label identifying the BLE/ZigBee Port.						

5.4. 帶外發射限制

5.4.1. 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，

- (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 100 kHz，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。

備註

解析頻寬設置為 1.3 MHz 是為了提供量測速度。

使用限值還是法規定義的基於解析頻寬 100 kHz 情形下主波下降 20dB,如果量測波形接近限值，我們會使用降低解析頻寬方式作驗證。

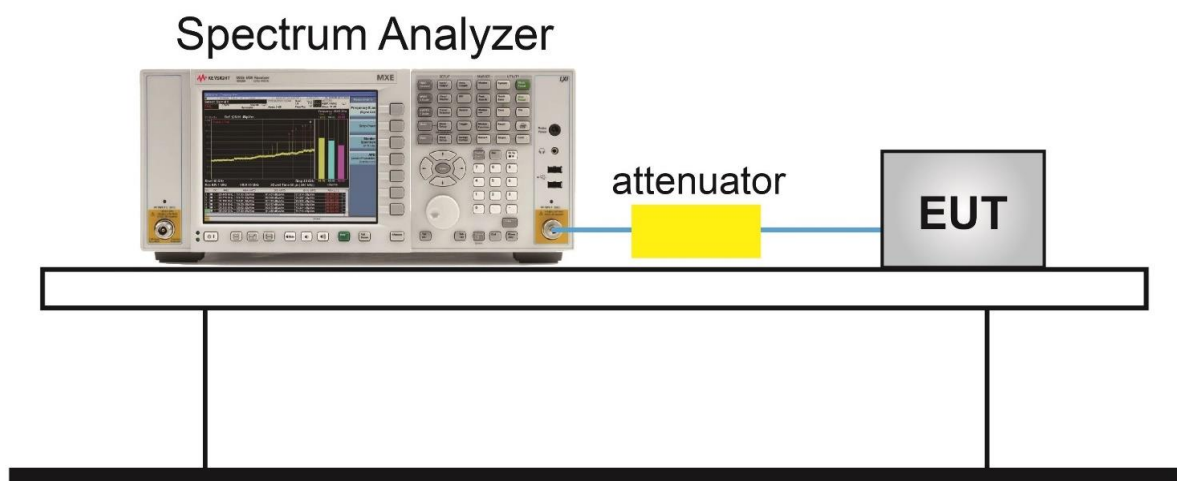
5.4.2. 限制要求

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 節規定。

帶外發射限制：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。

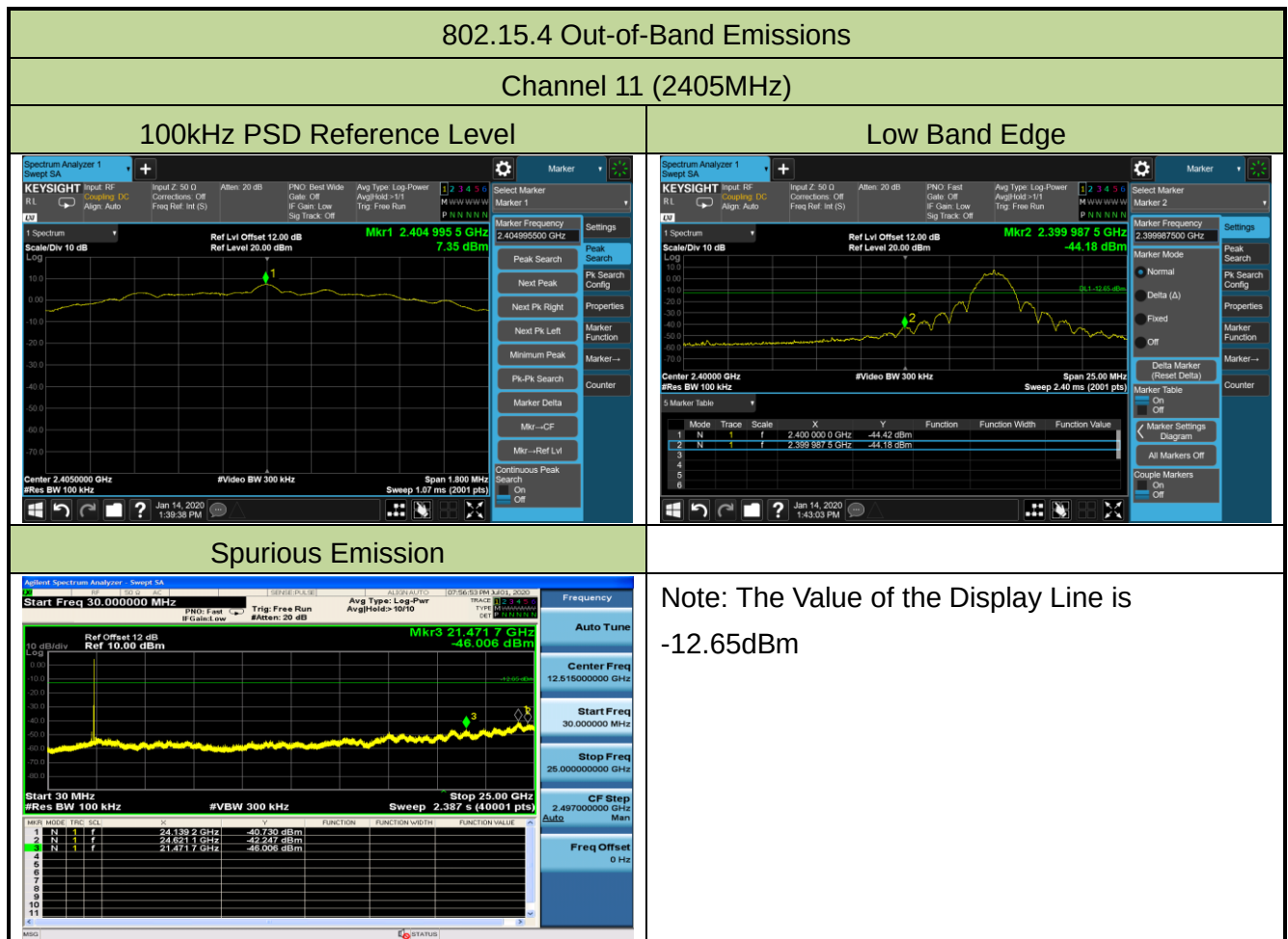
5.4.3. 測試架構圖



5.4.4. 帶外輻射測試結果

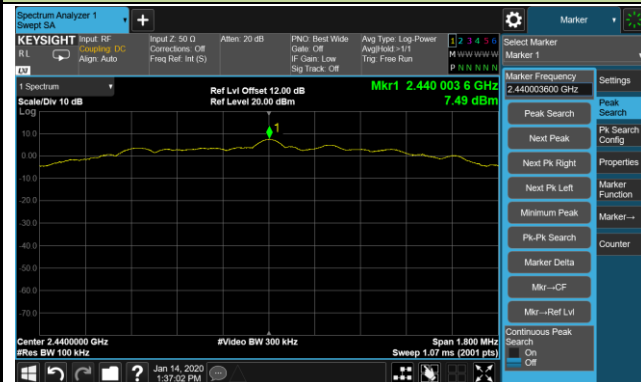
待測物名稱	ACCESS POINT	測試日期	2020/01/14
待測物型號	APIN0518	溫度 / 濕度	25°C / 54%
測試場地	SR2	測試工程師	Kevin Ker

Test Mode	Modulation Mode	Channel No.	Frequency (MHz)	Limit	Result
802.15.4	O-QPSK	11	2405	20dBc	Pass
802.15.4	O-QPSK	18	2440	20dBc	Pass
802.15.4	O-QPSK	26	2480	20dBc	Pass

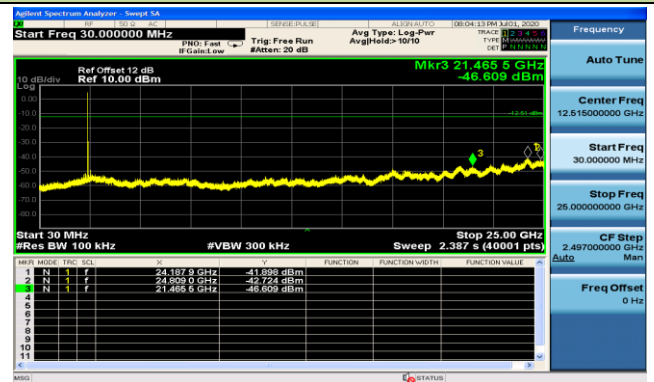


Channel 18 (2440MHz)

100kHz PSD Reference Level



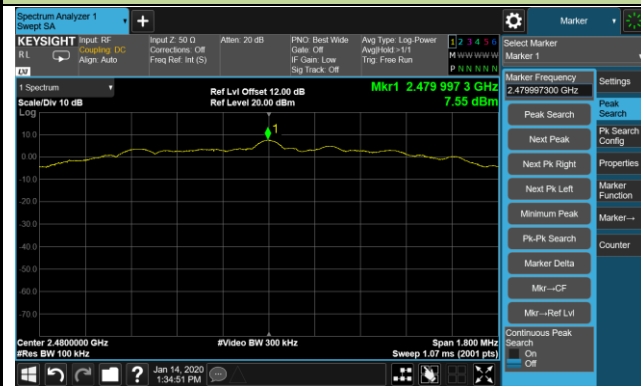
Spurious Emission



Note: The Value of the Display Line is -12.51dBm

Channel 26 (2480MHz)

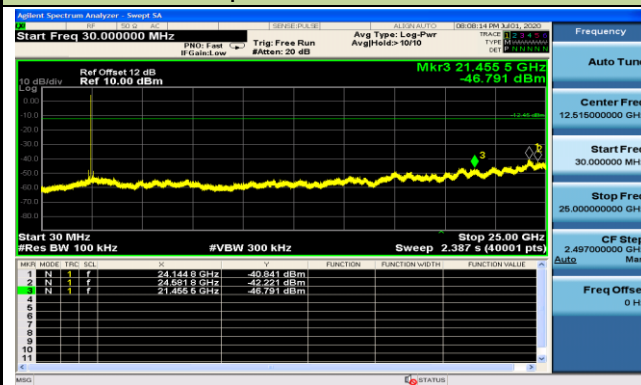
100kHz PSD Reference Level



High Band Edge



Spurious Emission



Note: The Value of the Display Line is -12.45dBm

5.5. 輻射電場強度

5.5.1. 量測方法

待測物置於非導體桌面（落地型產品置於地上），受測物使用交流電源時，將其與任何配件設備之電源線連接至位於旋轉桌的交流電源。受測物使用電池時，測試時應裝置新電池或充電完全的電池。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。（待測物擺設方式根據 ANSI C63.10-2013 版本，待測物放置桌中心，1G 以下擺設高度為 80cm/1G 以上擺設高度為 150cm）

- (1) 任一頻率小於或等於 1000 MHz 之訊號,使用 CISPR 準峰值檢波器
- (2) 任一頻率大於 1000 MHz 之訊號，使用平均值檢波器測量，當規定之發射限制值為平均值時(含 1000 MHz 以下)，受測訊號藉由峰值檢波器(RBW:1MHz,VBW:3MHz)所測量之峰值，亦須符合峰值發射限制值，其峰值發射限制值為最大容許平均值加 20 dB。

5.5.2. 限制要求

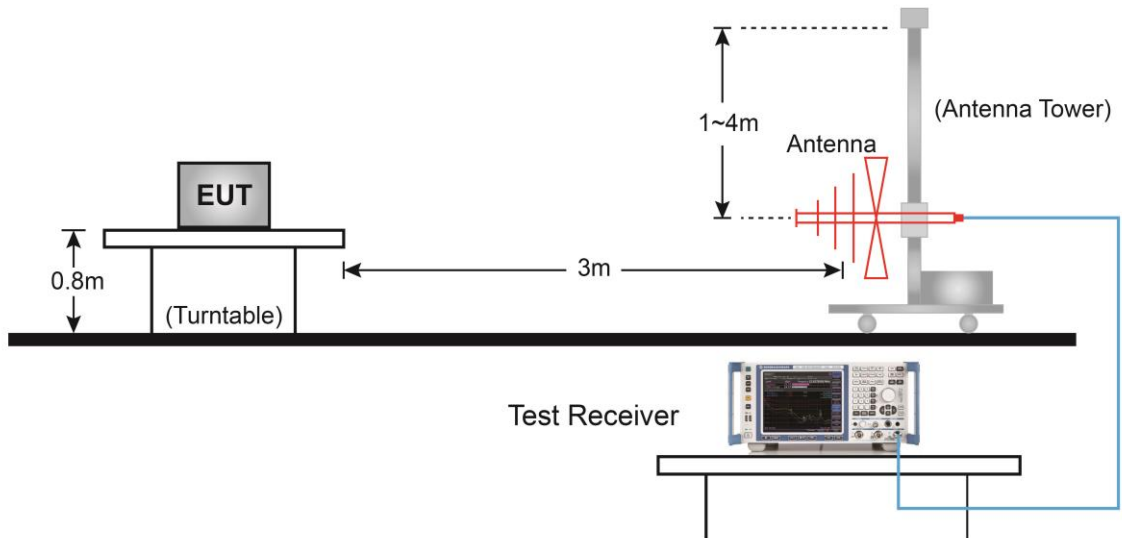
其電場強度不得超過下表之限值，且其不必要之發射皆不得大於主波發射強度。各頻段重疊處，以較嚴格之限制值為準。

頻 率 (MHz)	電場強度(uV/m)	測距(m)
0.009 - 0.490(含)	2,400/f(KHz)	300
0.490 (不含) - 1.705 (含)	24,000/f(KHz)	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

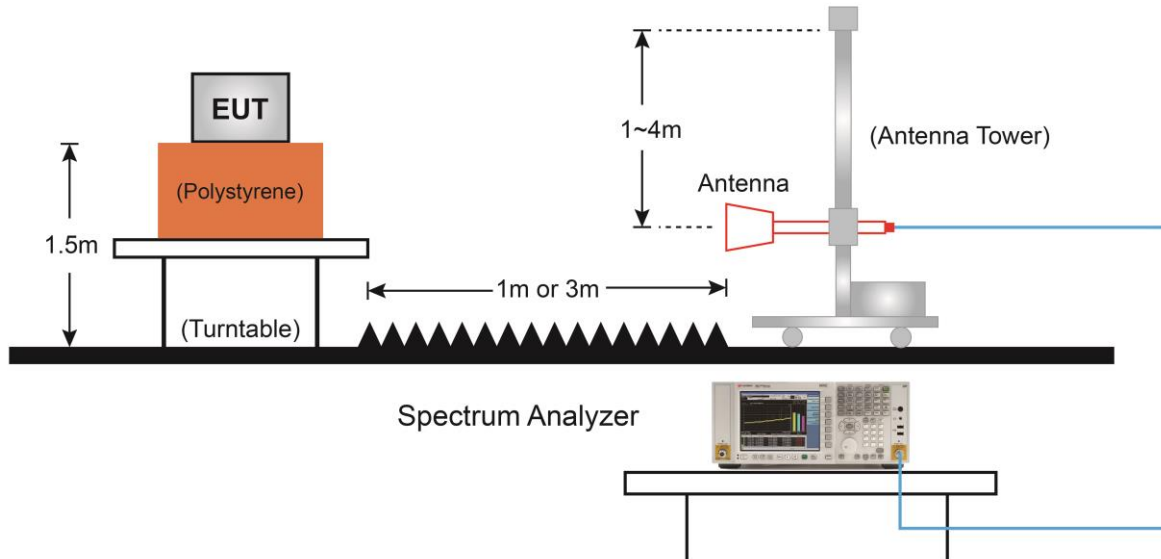
上表規定之電場強度，頻率在 9-90kHz 千赫(kHz)、110-490 千赫(kHz)以及 1000 兆赫(MHz)以上之發射，其量測以平均值檢波器為基準，且須符合低功率射頻電機技術規範第 5.15.2 節之規定；其他頻率之發射，應以 CISPR 準峰值(quasi-peak) 檢波器測量；非以上表所指定之距離測量時須符合低功率射頻電機技術規範第 5.5 節之規定，而輻射發射之量測頻率範圍須符合低功率射頻電機技術規範第 5.14 節之規定。

5.5.3. 測試架構圖

Below 1GHz Test Setup:



Above 1GHz Test Setup:



5.5.4. 輻射電場強度測試結果

Product	ACCESS POINT	Temperature	26°C
Test Engineer	Kevin Ker	Relative Humidity	56%
Test Site	AC1	Test Date	2020/03/05
Model No.	APIN0518	Test Channel	11
Remark	1. Average measurement was not performed if peak level lower than average limit. So the margin was calculated using the average limit for emissions fall within the restricted bands. 2. Other frequency was 20dB below limit line within 1-18GHz, 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
	3941.0	42.0	-0.1	41.9	54.0	-12.1	Peak	Horizontal
	4961.0	41.5	3.5	45.0	54.0	-9.0	Peak	Horizontal
*	5573.0	41.9	4.2	46.1	78.5	-32.4	Peak	Horizontal
*	6907.5	38.5	10.1	48.6	78.5	-29.9	Peak	Horizontal
	4060.0	41.9	0.4	42.3	54.0	-11.7	Peak	Vertical
	4927.0	40.2	3.4	43.6	54.0	-10.4	Peak	Vertical
*	6338.0	39.0	7.1	46.1	78.5	-32.4	Peak	Vertical
*	6941.5	37.7	10.3	48.0	78.5	-30.5	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (98.5dBμV/m) or LP0002 clause 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)

Product	ACCESS POINT	Temperature	26°C
Test Engineer	Kevin Ker	Relative Humidity	56%
Test Site	AC1	Test Date	2020/03/05
Model No.	APIN0518	Test Channel	18
Remark	1. Average measurement was not performed if peak level lower than average limit. So the margin was calculated using the average limit for emissions fall within the restricted bands. 2. Other frequency was 20dB below limit line within 1-18GHz, 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
	4230.0	42.0	1.2	43.2	54.0	-10.8	Peak	Horizontal
	4961.0	41.4	3.5	44.9	54.0	-9.1	Peak	Horizontal
*	5819.5	40.1	5.1	45.2	77.3	-32.1	Peak	Horizontal
*	6525.0	37.6	7.8	45.4	77.3	-31.9	Peak	Horizontal
	4060.0	43.0	0.4	43.4	54.0	-10.6	Peak	Vertical
	4969.5	41.8	3.5	45.3	54.0	-8.7	Peak	Vertical
*	5870.5	39.6	5.3	44.9	77.3	-32.4	Peak	Vertical
*	6593.0	39.6	8.2	47.8	77.3	-29.5	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (97.3dBμV/m) or LP0002 clause 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)

Product	ACCESS POINT	Temperature	26°C
Test Engineer	Kevin Ker	Relative Humidity	56%
Test Site	AC1	Test Date	2020/03/05
Model No.	APIN0518	Test Channel	26
Remark	1. Average measurement was not performed if peak level lower than average limit. So the margin was calculated using the average limit for emissions fall within the restricted bands. 2. Other frequency was 20dB below limit line within 1-18GHz, 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
	4247.0	42.4	1.3	43.7	54.0	-10.3	Peak	Horizontal
	4757.0	40.6	3.1	43.7	54.0	-10.3	Peak	Horizontal
*	5751.5	40.7	4.8	45.5	76.9	-31.4	Peak	Horizontal
*	6941.5	38.1	10.3	48.4	76.9	-28.5	Peak	Horizontal
	4196.0	42.5	1.0	43.5	54.0	-10.5	Peak	Vertical
	5020.5	41.6	3.6	45.2	54.0	-8.8	Peak	Vertical
*	5768.5	41.0	4.9	45.9	76.9	-31.0	Peak	Vertical
*	7018.0	38.2	10.6	48.8	76.9	-28.1	Peak	Vertical

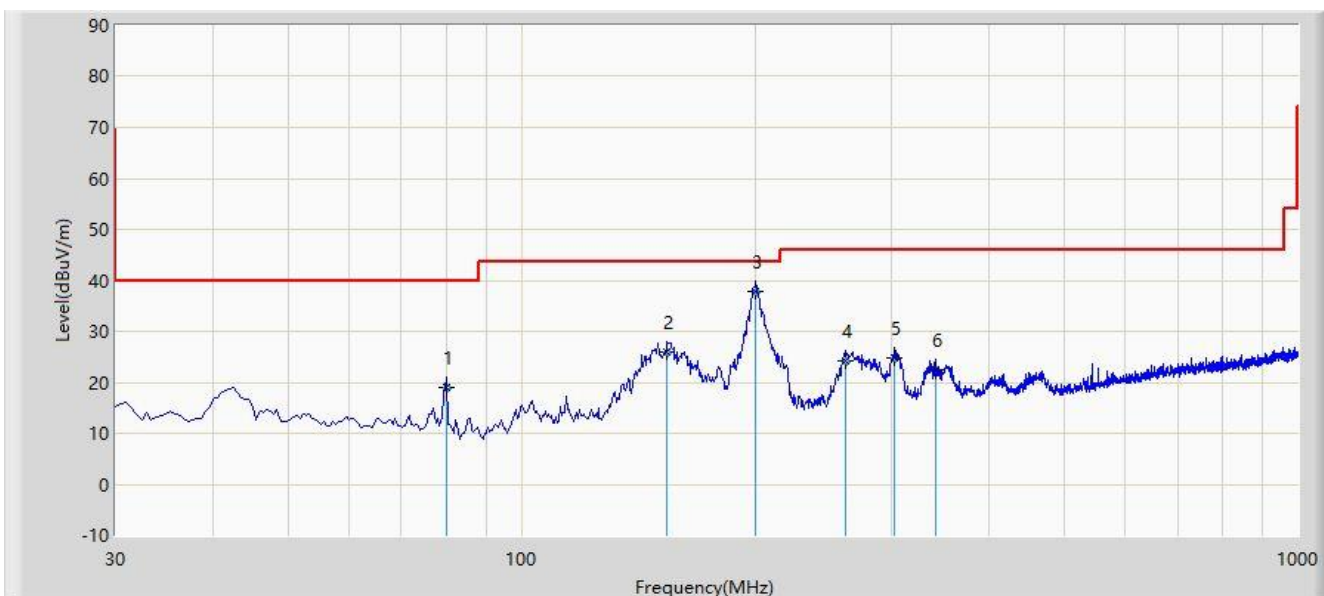
Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (96.9dBμV/m) or LP0002 clause 2.8 which is higher.

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: 2020/05/10 - 14:53
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: VULB 9162 30MHz-8GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: By PoE Injector
Test Mode: There is the worst case within frequency range 30MHz~1GHz.	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			79.955	19.124	4.962	-20.876	40.000	14.162	QP
2			154.160	26.071	10.154	-17.429	43.500	15.917	QP
3		*	200.235	37.813	18.879	-5.687	43.500	18.934	QP
4			261.345	24.309	3.719	-21.691	46.000	20.590	QP
5			301.600	24.877	3.413	-21.123	46.000	21.464	QP
6			341.855	22.396	-0.703	-23.604	46.000	23.099	QP

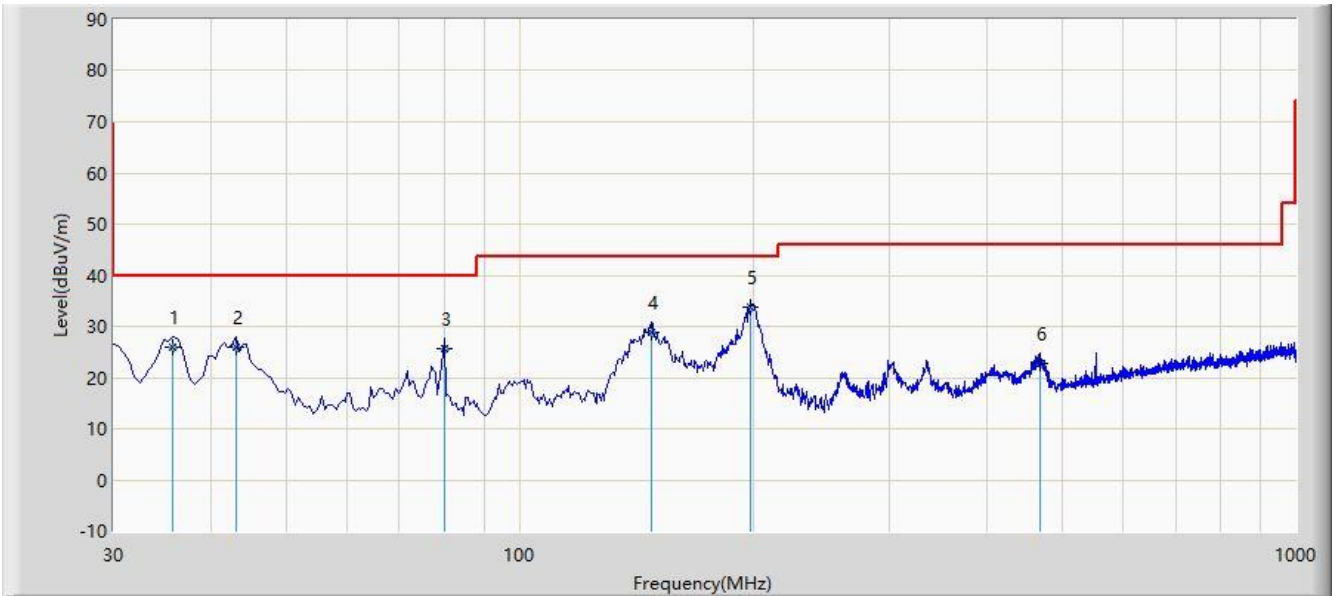
Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

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

Note 2: The amplitude of spurious emissions (frequency range 9kHz ~ 30MHz, 18GHz ~ 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report.

Note 3: 經初測驗證過，1GHz 以下輻射干擾測試對測試頻道數並無差異，故僅檢附最差狀況之測試頻道。

Site: AC1	Time: 2020/05/10 - 14:57
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: VULB 9162 30MHz-8GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: By PoE Injector
Test Mode: There is the worst case within frequency range 30MHz~1GHz.	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			35.820	25.963	6.674	-14.037	40.000	19.289	QP
2			43.095	25.987	4.869	-14.013	40.000	21.118	QP
3			79.955	25.723	11.561	-14.277	40.000	14.162	QP
4			147.855	28.741	13.041	-14.759	43.500	15.701	QP
5		*	198.780	33.773	14.851	-9.727	43.500	18.922	QP
6			469.410	22.671	-2.581	-23.329	46.000	25.252	QP

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

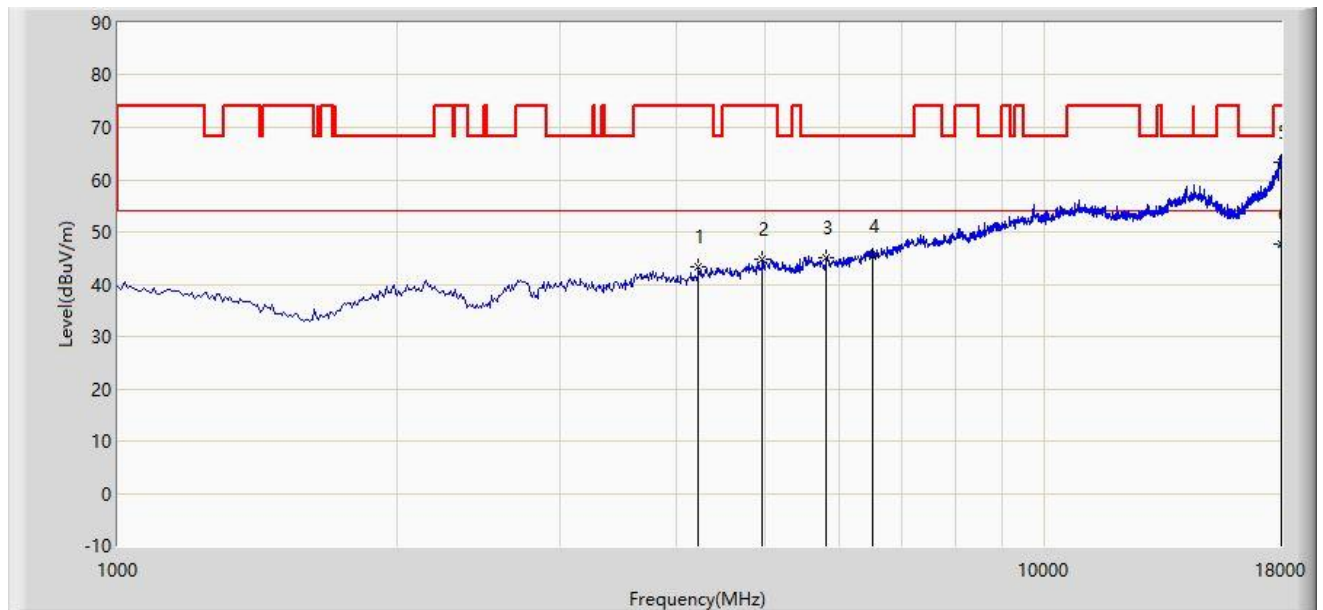
Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 2: The amplitude of spurious emissions (frequency range 9kHz ~ 30MHz, 18GHz ~ 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report.

Note 3: 經初測驗證過，1GHz 以下輻射干擾測試對測試頻道數並無差異，故僅檢附最差狀況之測試頻道。

The Worst Case of Radiated Emission above 1GHz:

Site: AC1	Time: 2020/03/05 - 02:06
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: By POE
Test Mode: Transmit by Zigbee at Channel 2440MHz	



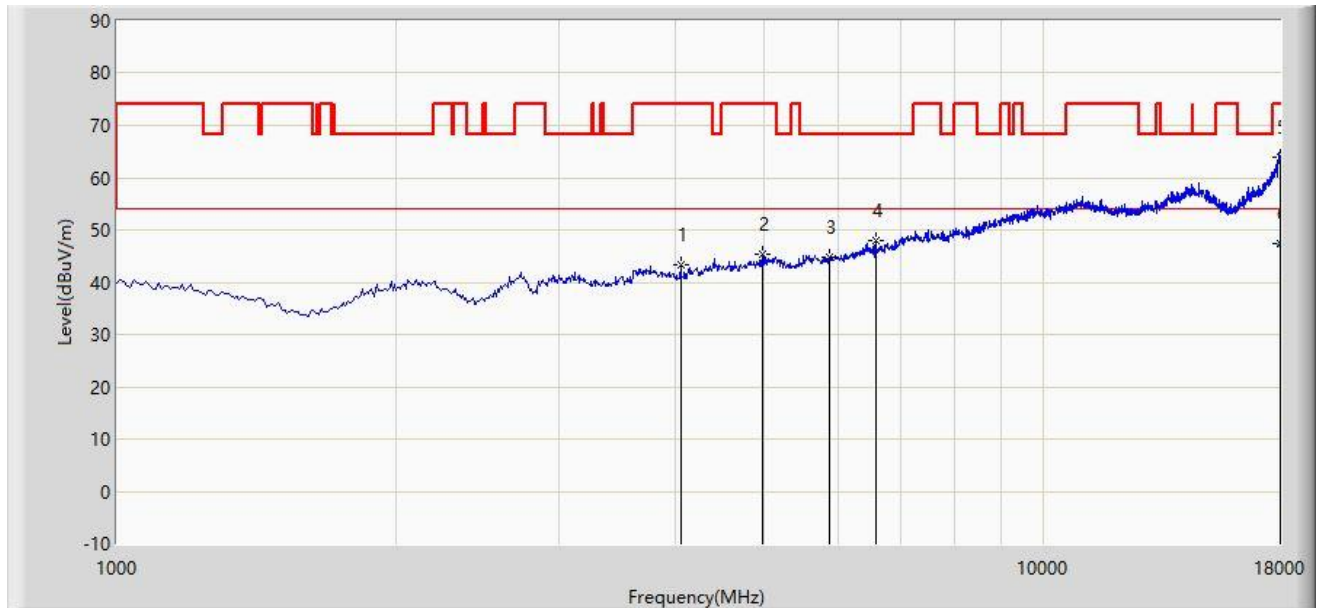
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			4230.000	43.213	41.997	-30.787	74.000	1.216	PK
2			4961.000	44.866	41.394	-29.134	74.000	3.472	PK
3			5819.500	45.210	40.113	-22.990	68.200	5.098	PK
4			6525.000	45.446	37.606	-22.754	68.200	7.840	PK
5			18000.000	63.455	31.985	-10.545	74.000	31.470	PK
6		*	18000.000	47.680	16.210	-6.320	54.000	31.470	AV

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

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

Note 2: The amplitude of spurious emissions (frequency range 9kHz ~ 30MHz, 18GHz ~ 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report.

Site: AC1	Time: 2020/03/05 - 02:06
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: By POE
Test Mode: Transmit by Zigbee at Channel 2440MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			4060.000	43.366	42.990	-30.634	74.000	0.376	PK
2			4969.500	45.273	41.784	-28.727	74.000	3.489	PK
3			5870.500	44.880	39.587	-23.320	68.200	5.293	PK
4			6593.000	47.884	39.649	-20.316	68.200	8.235	PK
5			18000.000	64.008	32.538	-9.992	74.000	31.470	PK
6		*	18000.000	47.490	16.020	-6.510	54.000	31.470	AV

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

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

Note 2: The amplitude of spurious emissions (frequency range 9kHz ~ 30MHz, 18GHz ~ 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report.

5.6. 頻帶邊緣

5.6.1. 量測方法

待測物置於非導體桌面（落地型產品置於地上），受測物使用交流電源時，將其與任何配件設備之電源線連接至位於旋轉桌的交流電源。受測物使用電池時，測試時應裝置新電池或充電完全的電池。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。（待測物擺設方式根據 ANSI C63.10-2013版，待測物放置桌中心，1G以下擺設高度為80cm/1G以上擺設高度為150cm）

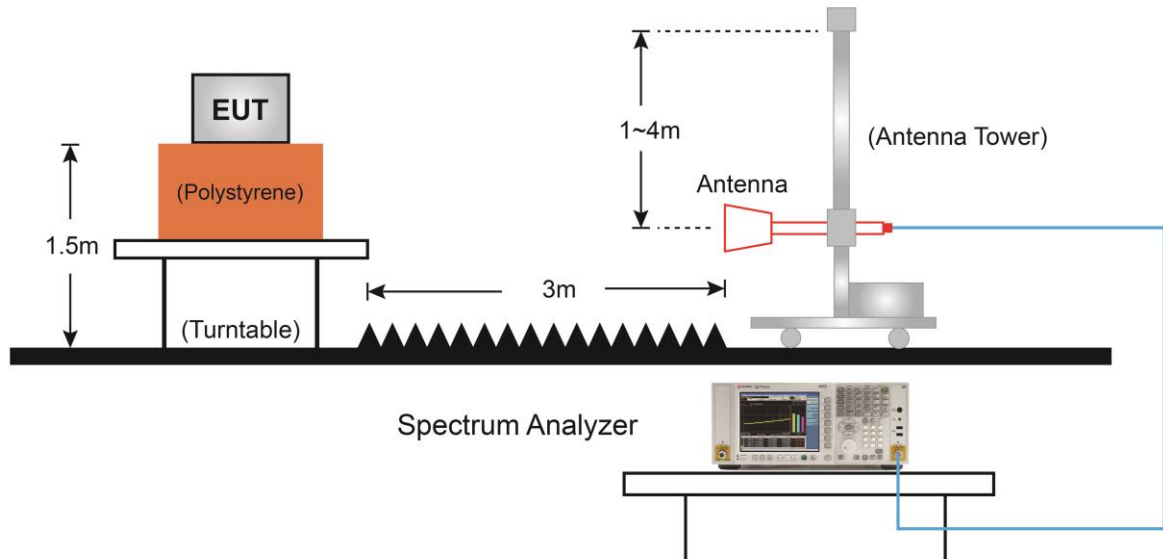
- (1) 任一頻率小於或等於1000 MHz 之訊號,使用CISPR準峰值檢波器
- (2) 任一頻率大於1000 MHz 之訊號，使用平均值檢波器測量，當規定之發射限制值為平均值時(含1000 MHz 以下)，受測訊號藉由峰值檢波器(RBW:1MHz,VBW:3MHz)所測量之峰值，亦須符合峰值發射限制值，其峰值發射限制值為最大容許平均值加20 dB。

5.6.2. 限制要求

除低功率射頻電機技術規範另有規定外，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帶內之混附發射，其電場強度必須符合低功率射頻電機技術規範之第2.8節限制規定

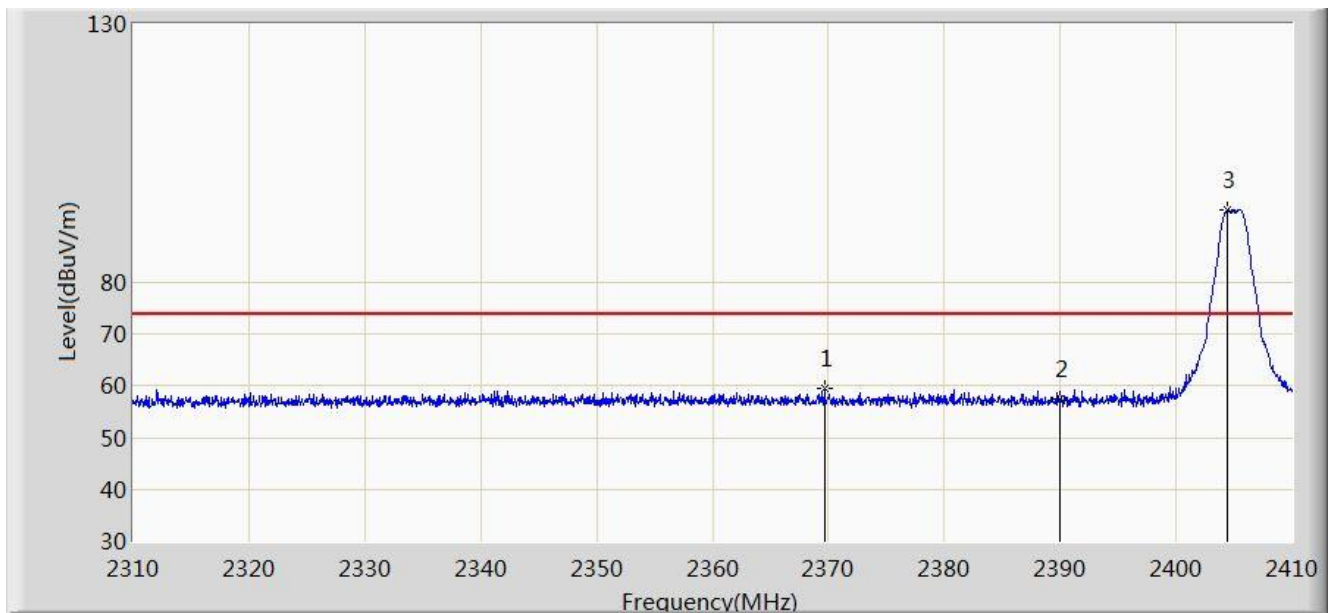
頻 率 (MHz)	頻 率 (MHz)	頻 率 (MHz)	頻 率 (MHz)	頻 率 (MHz)
0.090~0.110	25.500~25.700	703.00~748.00	2310.0~2390.0	13250~13400
0.490~0.510	37.475~38.275	758.00~803.00	2483.5~2900.0	14470~14500
2.172~2.198	73.500~75.400	825.00~915.00	3260.0~3267.0	15350~16200
3.013~3.033	108.00~138.00	930.00~1240.0	3332.0~3339.0	17700~21400
4.115~4.198	149.90~150.05	1300.0~1427.0	3345.8~3358.0	22010~23120
5.670~5.690	156.70~156.90	1435.0~1626.5	3500.0~4400.0	23600~24000
6.200~6.300	162.01~167.17	1660.0~1785.0	4500.0~5250.0	31200~31800
8.230~8.400	167.72~173.20	1805.0~1880.0	5350.0~5460.0	36430~36500
12.265~12.600	240.00~285.00	1885.0~1900.0	7250.0~7750.0	38600 以上
13.340~13.430	322.00~335.40	1905.0~1985.0	8025.0~8500.0	
14.965~15.020	399.90~410.00	2010.0~2025.0	9000.0~9200.0	
16.700~16.755	485.00~510.00	2110.0~2170.0	9300.0~9500.0	
19.965~20.020	608.00~614.00	2200.0~2300.0	10600~12700	

5.6.3. 測試架構圖



5.6.4. 頻帶邊緣測試結果

Site: AC1	Time: 2020/03/05 - 00:22
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: By PoE Injector
Test Mode: Transmit by 802.15.4 at Channel 2405MHz	

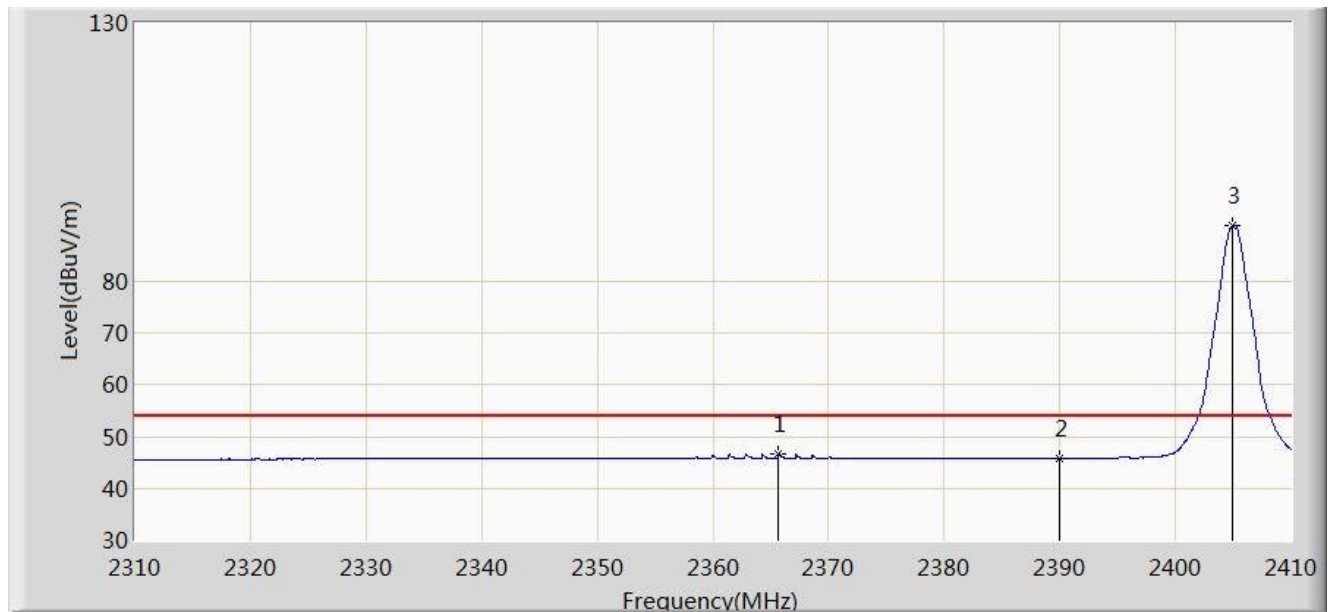


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2369.650	59.394	27.213	-14.606	74.000	32.181	PK
2			2390.000	57.420	25.146	-16.580	74.000	32.274	PK
3		*	2404.400	93.910	61.570	N/A	N/A	32.340	PK

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

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

Site: AC1	Time: 2020/03/05 - 00:31
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: By PoE Injector
Test Mode: Transmit by 802.15.4 at Channel 2405MHz	

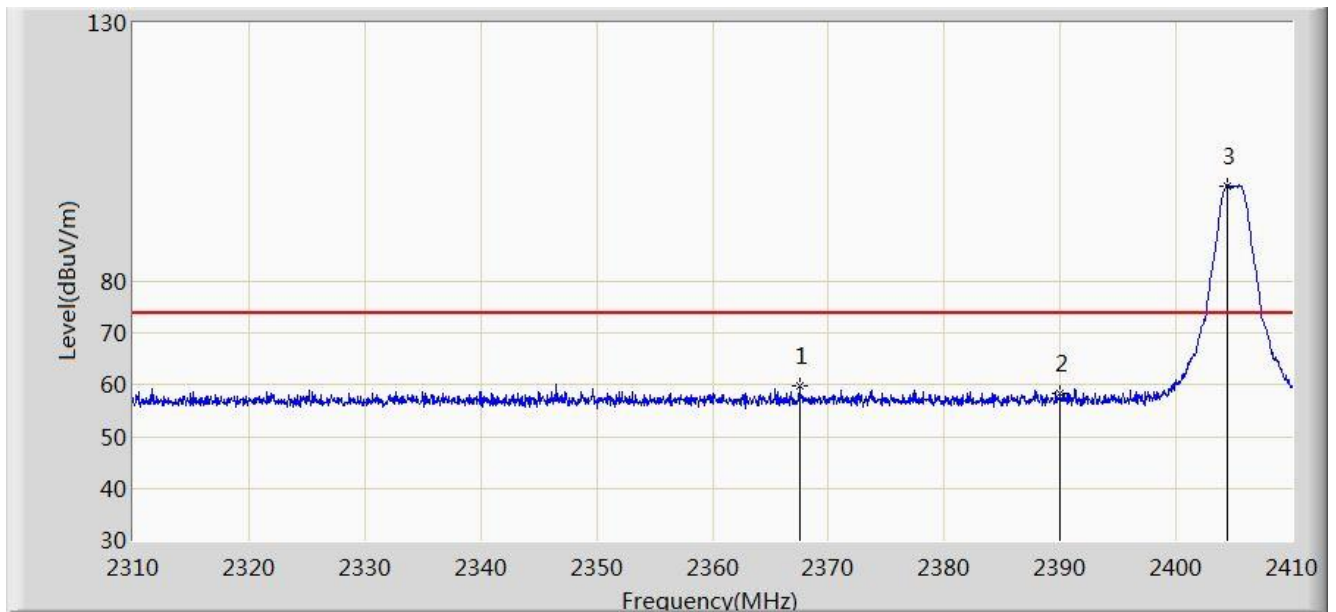


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2365.700	46.726	14.564	-7.274	54.000	32.162	AV
2			2390.000	45.774	13.500	-8.226	54.000	32.274	AV
3		*	2404.900	90.800	58.458	N/A	N/A	32.343	AV

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

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

Site: AC1	Time: 2020/03/05 - 00:33
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: By PoE Injector
Test Mode: Transmit by 802.15.4 at Channel 2405MHz	

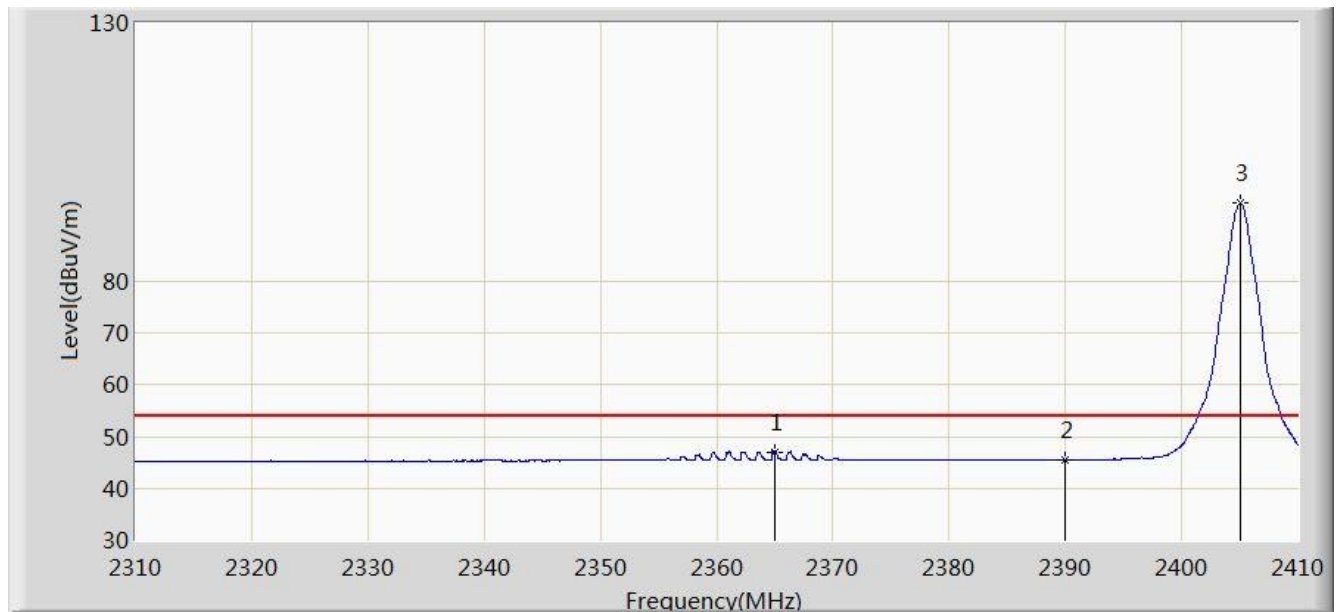


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2367.500	59.762	27.591	-14.238	74.000	32.171	PK
2			2390.000	58.336	26.062	-15.664	74.000	32.274	PK
3		*	2404.400	98.542	66.202	N/A	N/A	32.340	PK

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

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

Site: AC1	Time: 2020/03/05 - 00:36
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: By PoE Injector
Test Mode: Transmit by 802.15.4 at Channel 2405MHz	

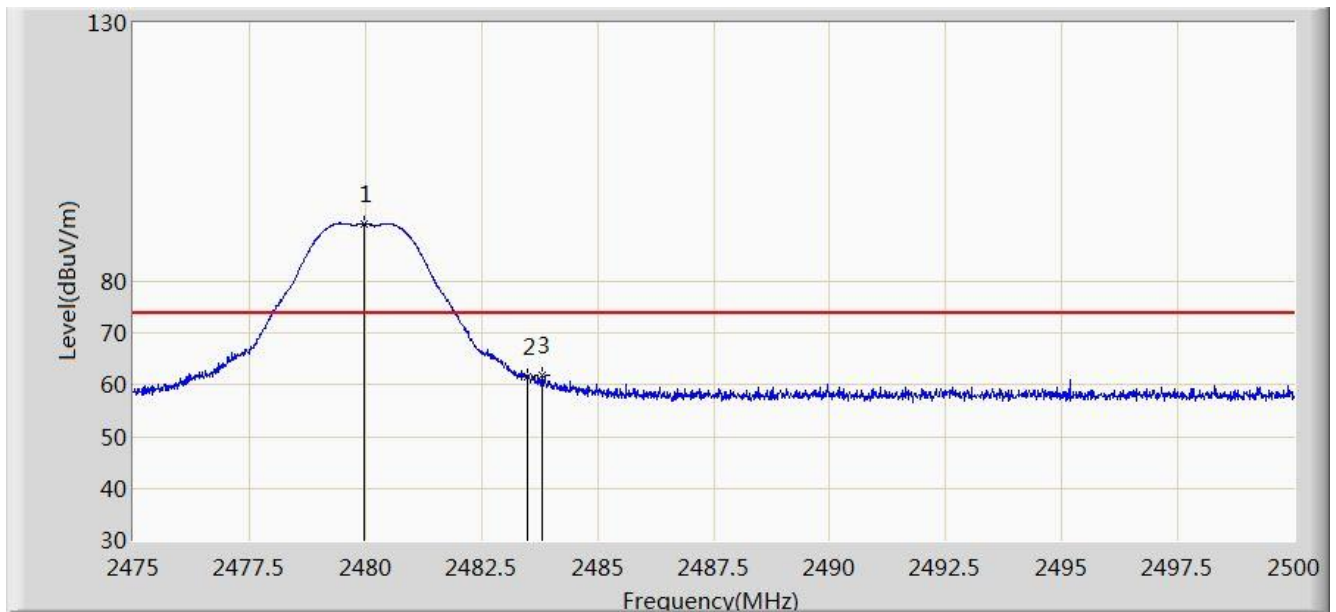


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2365.000	47.082	14.923	-6.918	54.000	32.159	AV
2			2390.000	45.526	13.252	-8.474	54.000	32.274	AV
3		*	2405.000	95.084	62.741	N/A	N/A	32.343	AV

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

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

Site: AC1	Time: 2020/03/05 - 00:52
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: By PoE Injector
Test Mode: Transmit by 802.15.4 at Channel 2480MHz	

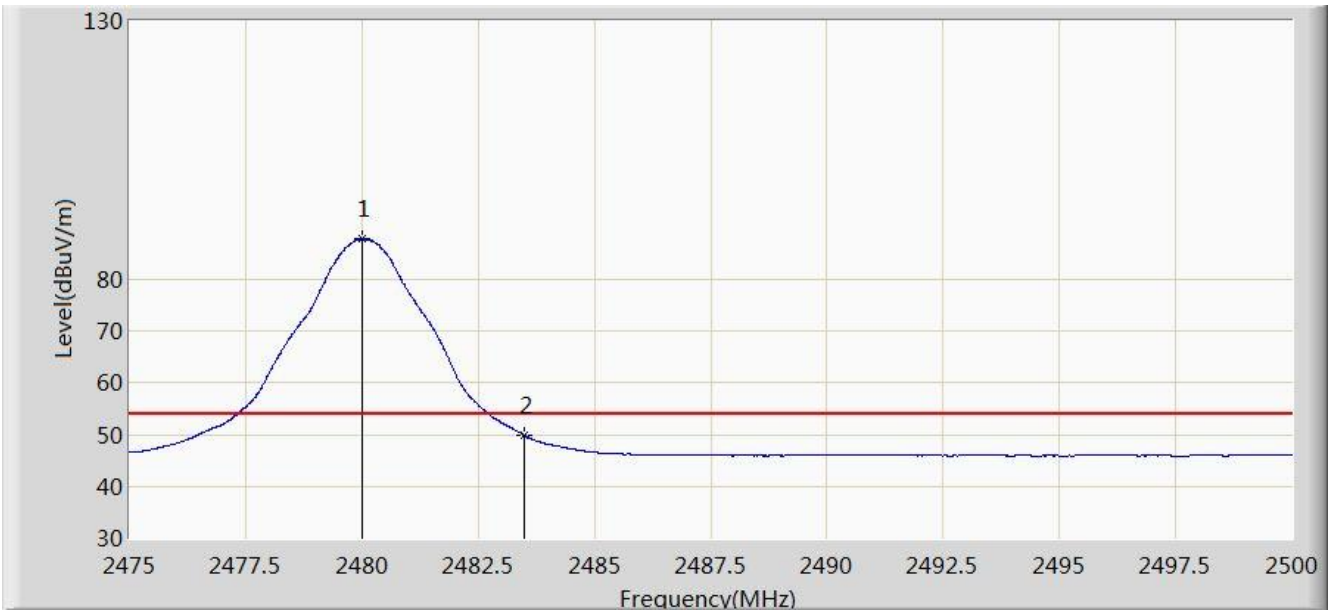


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2479.962	91.174	58.486	N/A	N/A	32.688	PK
2			2483.500	61.542	28.838	-12.458	74.000	32.704	PK
3			2483.812	61.955	29.249	-12.045	74.000	32.706	PK

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

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

Site: AC1	Time: 2020/03/05 - 00:55
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: By PoE Injector
Test Mode: Transmit by 802.15.4 at Channel 2480MHz	

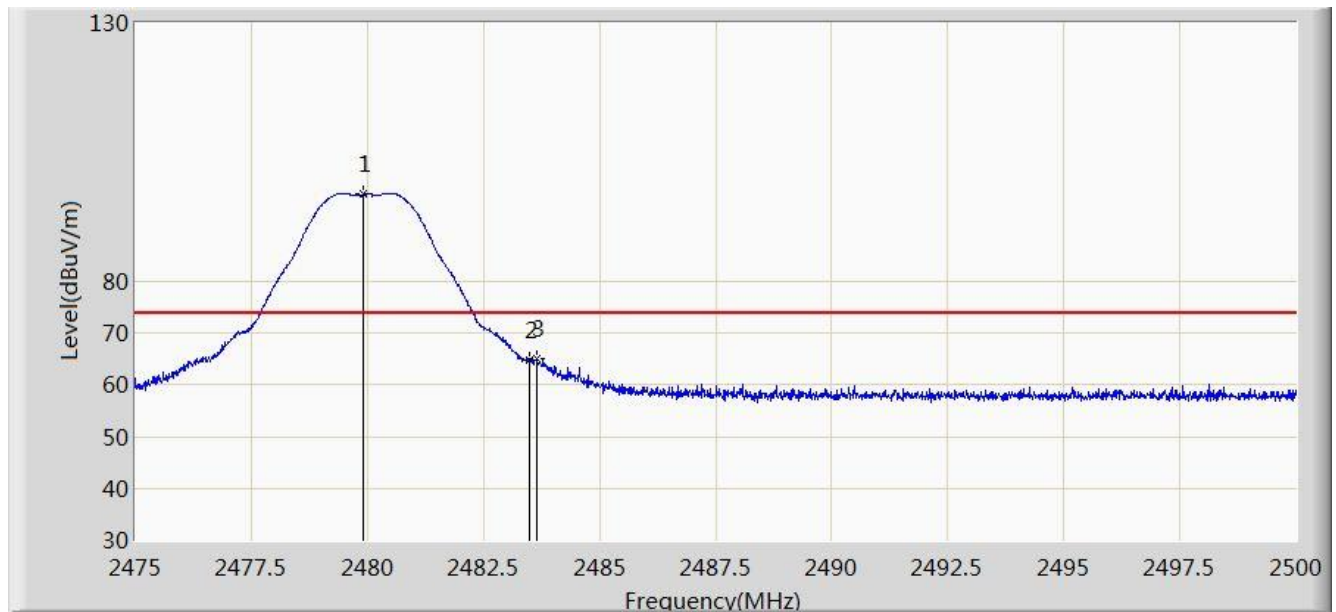


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.000	87.870	55.182	N/A	N/A	32.688	AV
2			2483.500	49.792	17.088	-4.208	54.000	32.704	AV

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

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

Site: AC1	Time: 2020/03/05 - 00:52
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: By PoE Injector
Test Mode: Transmit by 802.15.4 at Channel 2480MHz	

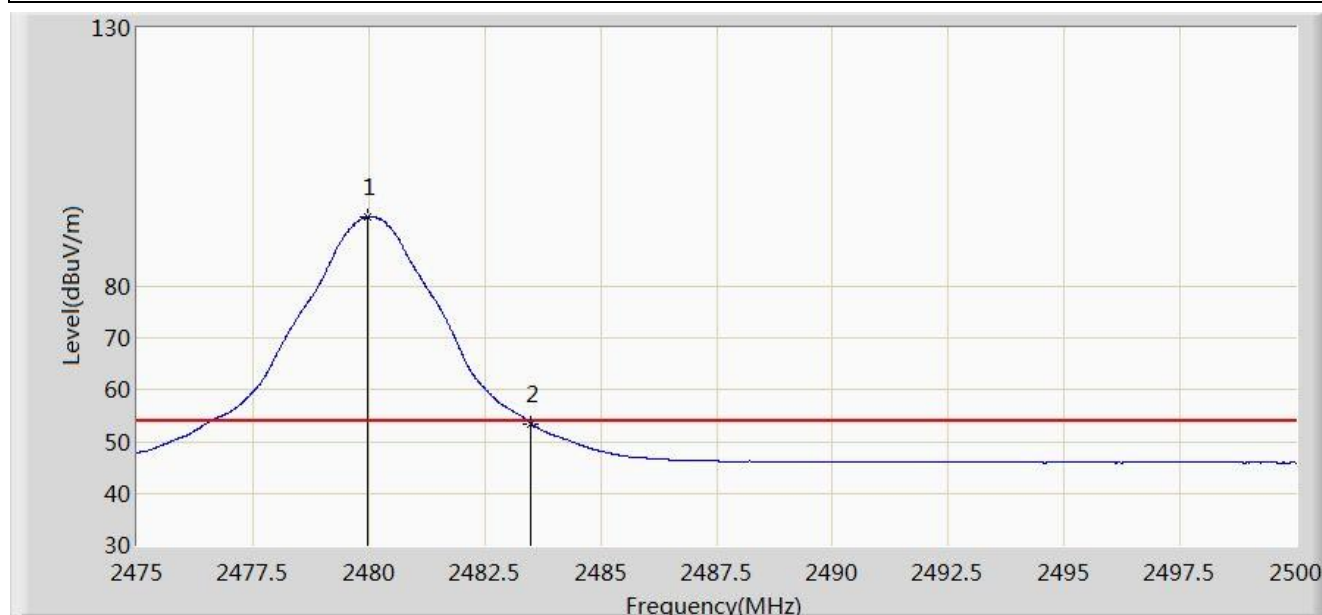


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2479.900	96.938	64.250	N/A	N/A	32.688	PK
2			2483.500	64.854	32.150	-9.146	74.000	32.704	PK
3			2483.637	65.043	32.338	-8.957	74.000	32.706	PK

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

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

Site: AC1	Time: 2020/03/05 - 00:51
Limit: NCC LP0002_1GHz-40GHz	Engineer: Kevin Ker
Probe: BBHA 9120D_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: By PoE Injector
Test Mode: Transmit by 802.15.4 at Channel 2480MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2479.975	93.538	60.850	N/A	N/A	32.688	AV
2			2483.500	53.538	20.834	-0.462	54.000	32.704	AV

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

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

5.7. 6dB 佔用頻寬

5.7.1. 量測方法

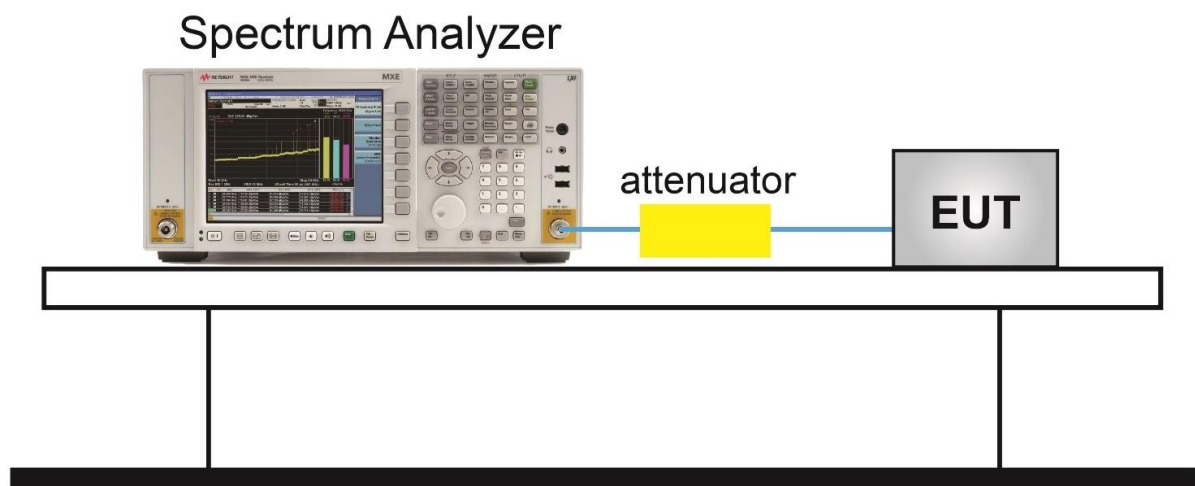
待測物之天線埠經由適當之衰減直接連至頻譜分析儀 RF 輸入端，設定頻譜分析儀之解析度頻寬為 100kHz，視訊頻寬不小於解析度頻寬，頻率掃描範圍(SPAN)遠大於解析度頻寬。

待測物應在正常發射狀態下量測。

5.7.2. 限制要求

依據國家通訊傳播委員會低功率射頻電機技術規範之第3.10.1.6(2)(A)節之要求，6dB頻寬至少應有 500kHz。

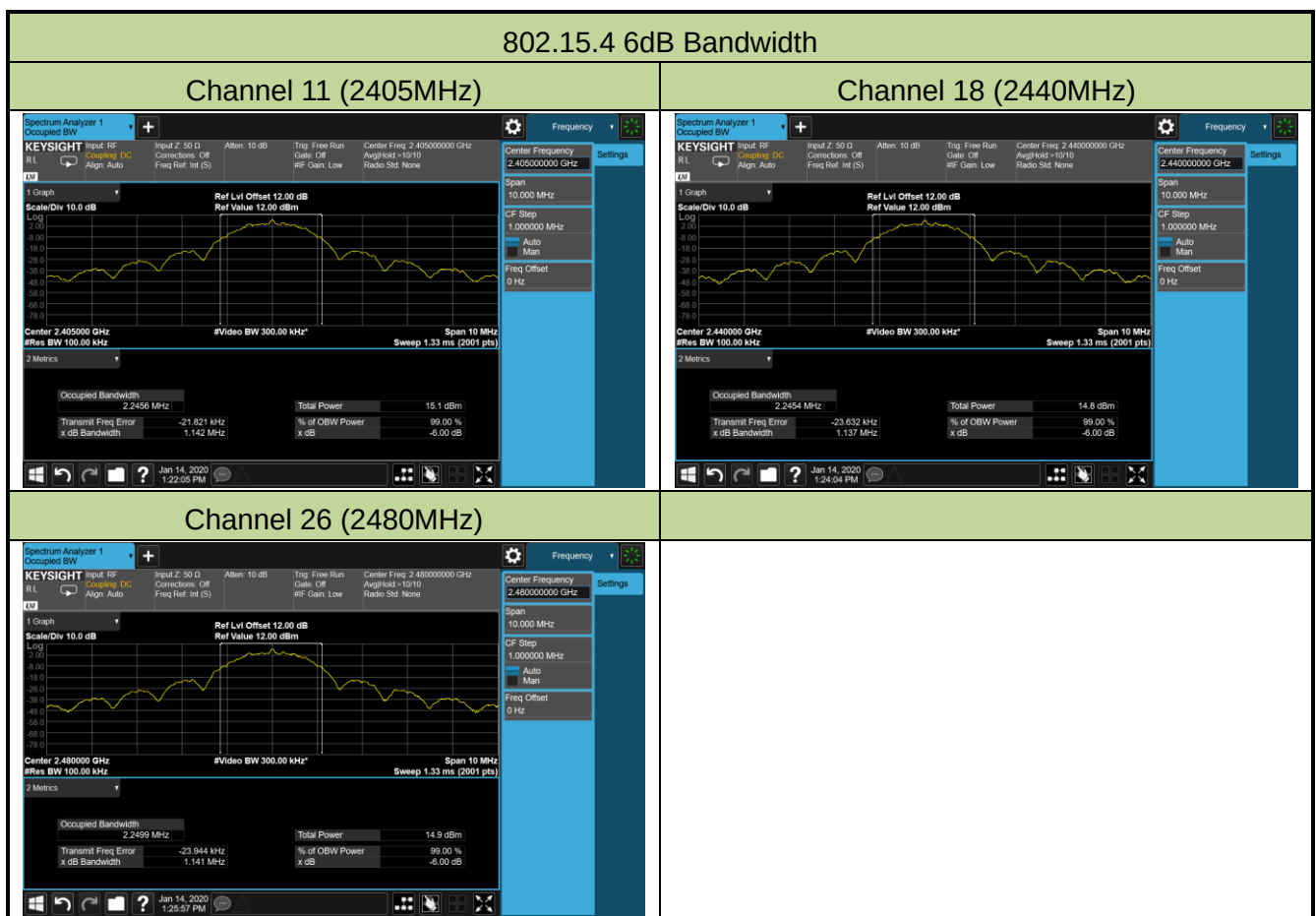
5.7.3. 測試架構圖



5.7.4. 佔用頻寬測試結果

待測物名稱	ACCESS POINT	測試日期	2020/01/14
待測物型號	APIN0518	溫度 / 濕度	25°C / 54%
測試場地	SR2	測試工程師	Kevin Ker

Test Mode	Modulation Mode	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
802.15.4	O-QPSK	11	2405	1.142	≥ 0.5	Pass
802.15.4	O-QPSK	18	2440	1.137	≥ 0.5	Pass
802.15.4	O-QPSK	26	2480	1.141	≥ 0.5	Pass



5.8. 發射電功率頻譜密度

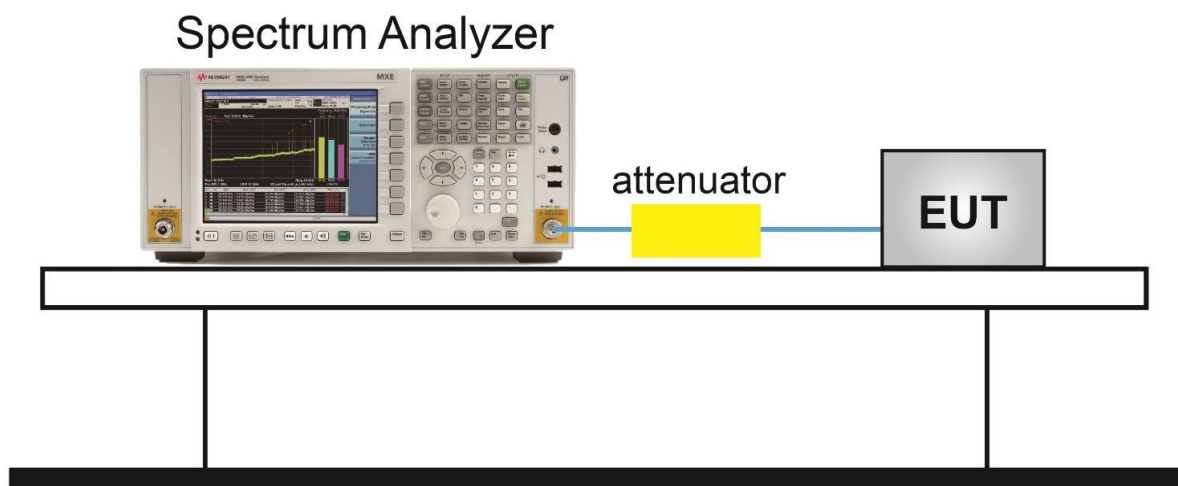
5.8.1. 量測方法

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。找出發射峰值並擴展於通帶內，設定頻譜分析儀之解析度頻寬為 3kHz，視訊頻寬大於解析度頻寬，掃瞄時間為頻率掃瞄範圍除以 3kHz。
($\text{SWEEP TIME} = \text{SPAN}/3\text{kHz}$)。

5.8.2. 限制要求

依據國家通訊傳播委員會低功率射頻電機技術規範之第 3.10.1.6(2)(B)節，在使用頻率範圍之任意 3 千赫(kHz)頻寬內，由發射機傳導至天線之峰值發射電功率密度在任意期間內，皆不得大於 8dBm。

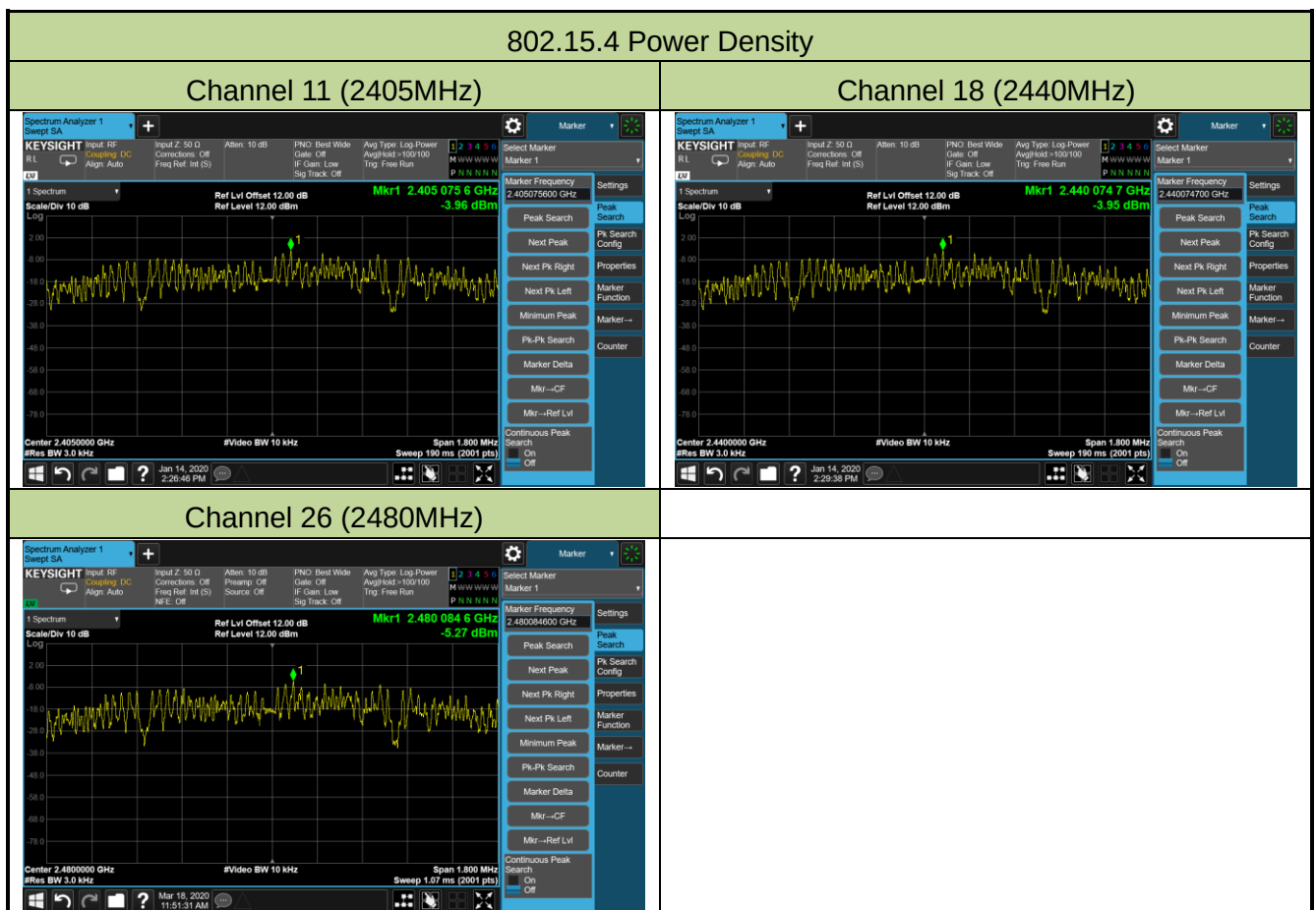
5.8.3. 測試架構圖



5.8.4. 功率頻譜密度量測結果

待測物名稱	ACCESS POINT	溫度	25°C
待測物型號	APIN0518	濕度	54%
測試場地	SR2	測試日期	2020/01/14
測試項目	Power Spectral Density	測試工程師	Kevin Ker

Test Mode	Modulation Mode	Channel No.	Frequency (MHz)	PK PSD (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
802.15.4	O-QPSK	11	2405	-3.96	≤ 8.00	Pass
802.15.4	O-QPSK	18	2440	-3.95	≤ 8.00	Pass
802.15.4	O-QPSK	26	2480	-5.27	≤ 8.00	Pass



The End