

NCC

低功率射頻電機型式試驗報告

產品名稱: AC1300 迷你無線 MU-MIMO USB 網路卡
型號: Archer T3U
廠牌: tp-link
申請者: 聯洲國際有限公司
申請者地址: 新北市板橋區中山路一段 156 號 13 樓
測試標準: LP0002 (107 年版) 4.7 章節
參考法規: ANSI C63.10-2013
測試結果: 符合
測試日期: 2018.10.26 ~ 2019.03.10
發行日期: 2019.03.11

測試工程師:

柯文凱

(柯文凱)

報告審核人:

陳柏均

(陳柏均)

報告簽屬人:

柯承志

(柯承志)



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

報告編號	版本	描述	發行日期
1812TW0101-T2	1.0	Original Report	2019-03-11

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. 通道清單	7
2.3. 測試模式	7
2.4. 測試系統組合圖	8
2.5. 測試周邊	8
2.6. 待測裝置測試時之典型操作程式	8
3. 量測不確定度	9
4. 測試設備明細	10
5. 測試結果	11
5.1. 電源端點干擾測試	12
5.1.1. 適用標準	12
5.1.2. 量測方法	12
5.1.3. 測試架構圖	12
5.1.4. 電源端點測試結果	13
5.2. 功率限制值	15
5.2.1. 適用標準	15
5.2.2. 量測方法	15
5.2.3. 測試架構圖	15
5.2.4. 功率限制值測試結果	16
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. 26dB 佔用頻寬	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	21
5.4.4. 26dB 佔用頻寬測試結果	22
5.5. 6dB 佔用頻寬	35
5.5.1. 適用標準	35
5.5.2. 量測方法	35
5.5.3. 測試架構圖	35
5.5.4. 6dB 佔用頻寬測試結果	36

5.6.	最大功率頻譜密度	41
5.6.1.	適用標準	41
5.6.2.	量測方法	41
5.6.3.	測試架構圖	41
5.6.4.	峰值功率頻譜密度測試結果	42
5.7.	操作頻帶外的峰值發射	65
5.7.1.	適用標準	65
5.7.2.	量測方法	66
5.7.3.	測試架構圖	66
5.7.4.	操作頻帶外的峰值發射測試結果	67
5.8.	不必要之發射	181
5.8.1.	適用標準	181
5.8.2.	量測方法	181
5.8.3.	測試架構圖	182
5.8.4.	不必要之發射測試結果	183
5.9.	發射功率控制	243
5.9.1.	適用標準	243
5.9.2.	量測方法	243
5.9.3.	測試架構圖	243
5.9.4.	發射功率控制測試結果	243
5.10.	頻率穩定性	244
5.10.1.	適用標準	244
5.10.2.	量測方法	244
5.10.3.	測試架構圖	245
5.10.4.	頻率穩定性測試結果	246

1. 一般資訊

申請者	聯洲國際有限公司
申請者地址	新北市板橋區中山路一段 156 號 13 樓
製造商	普聯技術有限公司
製造商地址	深圳市南山區深南路科技園工業廠房 24 棟南段 1 層、3-5 層、28 棟北段 1-4 層
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

2. 產品資訊

2.1. 待測物裝置資料

產品名稱	AC1300 迷你無線 MU-MIMO USB 網路卡
產品型號	Archer T3U
無線規格	802.11a/n/ac
頻率範圍	For 802.11a/n-HT20/ac-VHT20: 5180~5240MHz, 5260~5320MHz, 5500~5580MHz, 5660~5700MHz 5745~5825MHz For 802.11n-HT40/ac-VHT40: 5190~5230MHz, 5270~5310MHz, 5510MHz, 5550MHz, 5670MHz 5755~5795MHz For 802.11ac-VHT80: 5210MHz, 5290MHz, 5530MHz, 5775MHz
調變模式	802.11a/n/ac: OFDM
傳輸速率	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.6Mbps
頻道控制	Auto

2.2. 通道清單

802.11a/n-HT20/ac-VHT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz
48	5240 MHz	52	5260 MHz	56	5280 MHz
60	5300 MHz	64	5320 MHz	100	5500 MHz
104	5520 MHz	108	5540 MHz	112	5560 MHz
116	5580 MHz	132	5660 MHz	136	5680 MHz
140	5700 MHz	149	5745 MHz	153	5765 MHz
157	5785 MHz	161	5805 MHz	165	5825 MHz

802.11n-HT40/ac-VHT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	54	5270 MHz
62	5310 MHz	102	5510 MHz	110	5550 MHz
134	5670 MHz	151	5755 MHz	159	5795 MHz

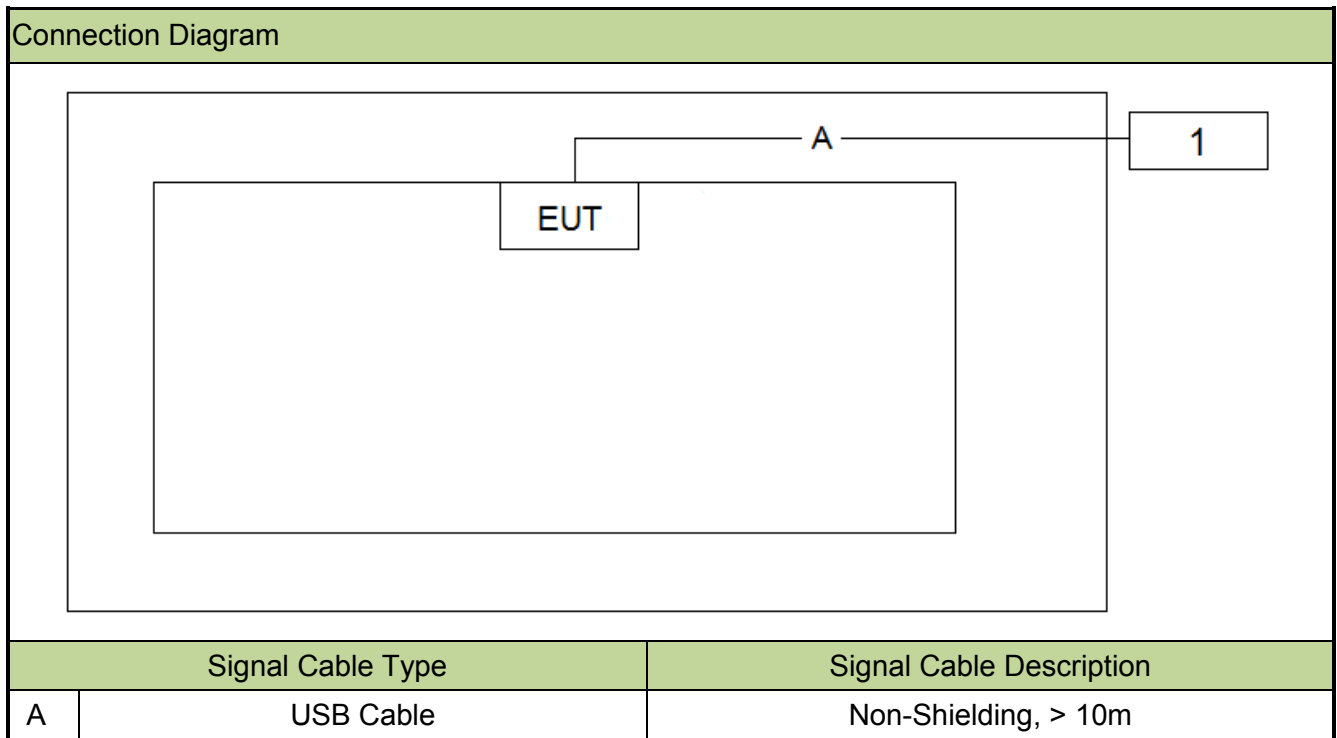
802.11ac-VHT80

Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz	106	5530 MHz
155	5775 MHz	--	--	--	--

2.3. 測試模式

Mode 1: 發射器 802.11a (6Mbps)
Mode 2: 發射器 802.11n-HT20 (MCS8)
Mode 3: 發射器 802.11n-HT40 (MCS8)
Mode 4: 發射器 802.11ac-VHT20 (MCS0)
Mode 5: 發射器 802.11ac-VHT40 (MCS0)
Mode 6: 發射器 802.11ac-VHT80 (MCS0)

2.4. 測試系統組合圖



2.5. 測試周邊

Item	待測物名稱	Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	Lenovo	E430c	N/A	Non-Shielded, 1.8m

2.6. 待測裝置測試時之典型操作程式

1.	Setup the EUT and simulators as shown on 2.4
2.	Turn on the power of all equipment.
3.	Execute "REALTEK 11ac 8822BU_USB v5.05" program.
4.	Configure the test channel and the data rate.
5.	Start test.

3. 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% ($U=2U_c(y)$): 2.53dB
電源傳導量測-通訊埠 (Conducted Emission- Impedance Stabilization Network Measurement)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 3.96dB
輻射干擾量測 (Radiated Spurious Emission)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 3.92dB (Below 30M)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 4.25dB (30M~1G)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 4.40dB (1G~18G)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 4.45dB (18G~40G)
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% ($U=2U_c(y)$): $\pm 0.3\%$

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

Conducted Emissions - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Two-Line V-Network	R&S	ENV216	MRTTWA00019	1 year	2019/3/20
Two-Line V-Network	R&S	ENV216	MRTTWA00020	1 year	2019/3/20
8-Wire ISN (T8)	R&S	ENY81	MRTTWA00018	1 year	2019/4/24
EMI Test Receiver	R&S	ESR3	MRTTWA00045	1 year	2019/5/14
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2019/5/21

Radiated Emissions - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	MRTTWA00002	1 year	2019/4/24
Broadband TRILOG Antenna	SCHWARZBECK	VULB 9162	MRTTWA00001	1 year	2019/5/22
Broadband Hornantenna	SCHWARZBECK	BBHA 9120D	MRTTWA00003	1 year	2019/4/24
Breitband Hornantenna	SCHWARZBECK	BBHA 9170	MRTTWA00004	1 year	2019/4/23
Broadband Preamplifier	SCHWARZBECK	BBV 9718	MRTTWA00005	1 year	2019/4/23
Broadband Amplifier	SCHWARZBECK	BBV 9721	MRTTWA00006	1 year	2019/4/23
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2019/3/19
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2019/7/30
Antenna Cable	HUBERSUHNER	SF106	MRTTWE00010	1 year	2019/5/18
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00032	1 year	2019/5/21

Conducted Test Equipment - SR1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2019/7/30
EXA Signal Analyzer	KEYSIGHT	N9010B	MRTSUE06457	1 year	2019/7/19
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00014	1 year	2019/4/24
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00032	1 year	2019/5/21

Software	Version	Function
e3	9.160520a	EMI Test Software
EMI	Quietek	V3

5. 測試結果

產品名稱 AC1300 迷你無線 MU-MIMO USB 網路卡
型號 Archer T3U

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
4.7.2(1)(2)(3)	峰值傳導輸出功率	參考第 5.2 章節	符合	第 5.2 章節
2.2 及 4.7.8	天線之要求	低功率射頻電機技術規範 2.2 節及 4.7.8 節	符合	第 5.3 章節
4.7.3	操作頻帶外的峰值發射	低功率射頻電機技術規範 4.7.3 節	符合	第 5.4 章節
2.8 及 4.7.3	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
4.7.5	26dB 佔用頻寬	N/A	符合	第 5.6 章節
4.7.5	6dB 佔用頻寬	$\geq 500\text{KHz}$	符合	第 5.7 章節
4.7.2(1)(2)(3)	功率頻譜密度	參考第 5.8 章節	符合	第 5.8 章節
4.7.4	發射功率控制	至少具有 6dB 低於平均 EIRP 值 30dBm 的能力	符合	第 5.9 章節
N/A	頻率穩定性	操作頻帶	符合	第 5.10 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

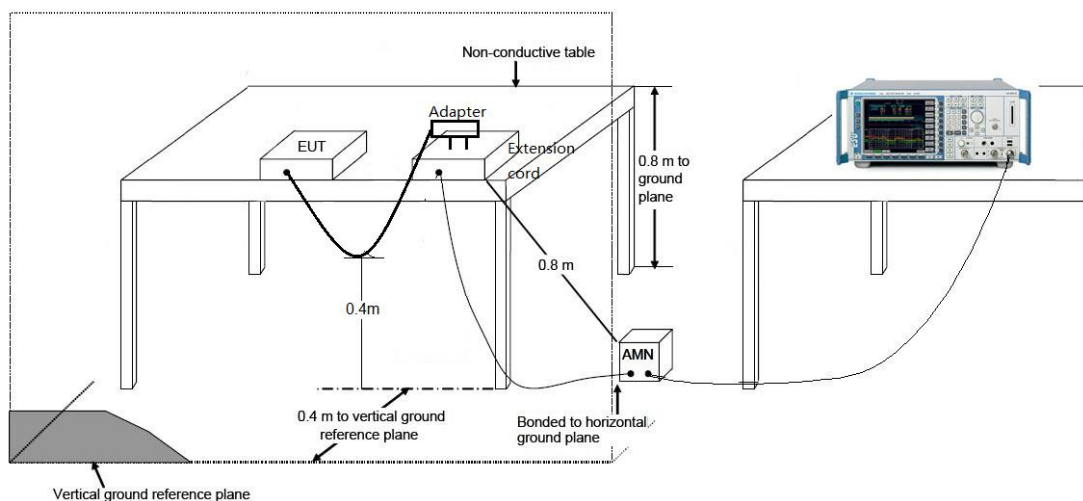
註:隨頻率之對數遞減

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。

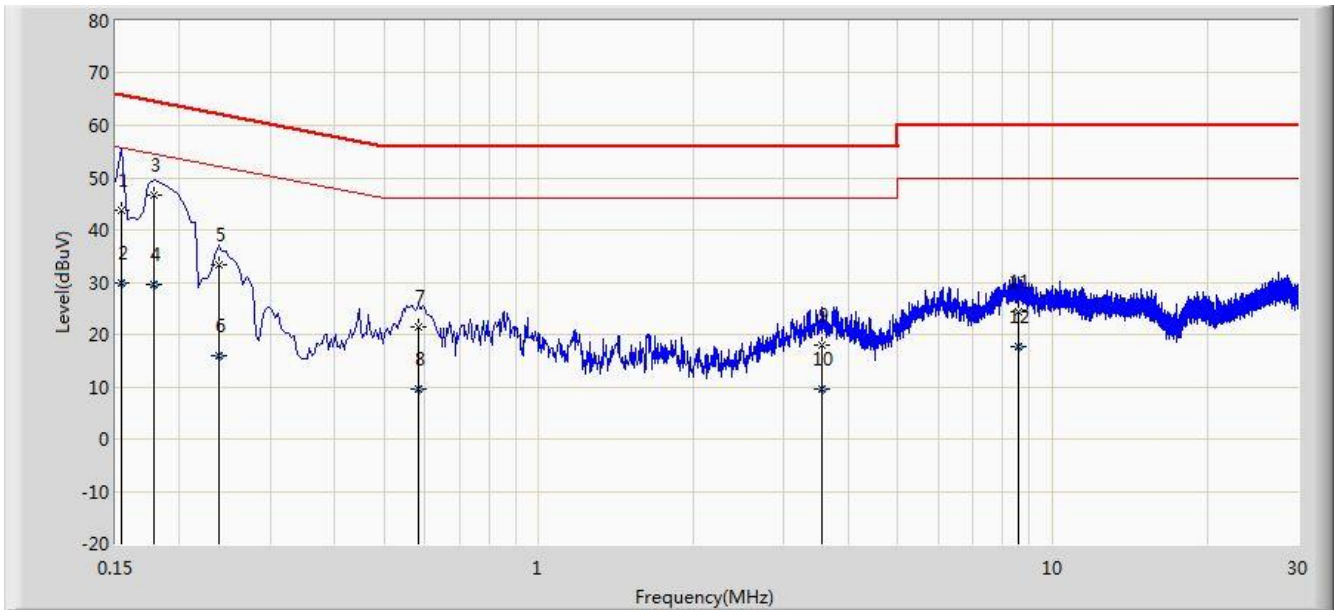
備 註: 經初測驗證過，電源端點干擾測試對測試頻道數並無差異，因此檢附其中一個測試頻道之測試數。

5.1.3. 測試架構圖



5.1.4. 電源端點測試結果

Site: SR2	Time: 2019/03/08 - 07:39
Limit: NCC LP0002_CE_0.15MHz-30MHz	Engineer: Kevin Ker
Probe: ENV216_Filter On	Polarity: Line
EUT: AC1300 迷你無線 MU-MIMO USB 網路卡	Power: AC 110V/60Hz
Test Mode: Worst Case Mode	

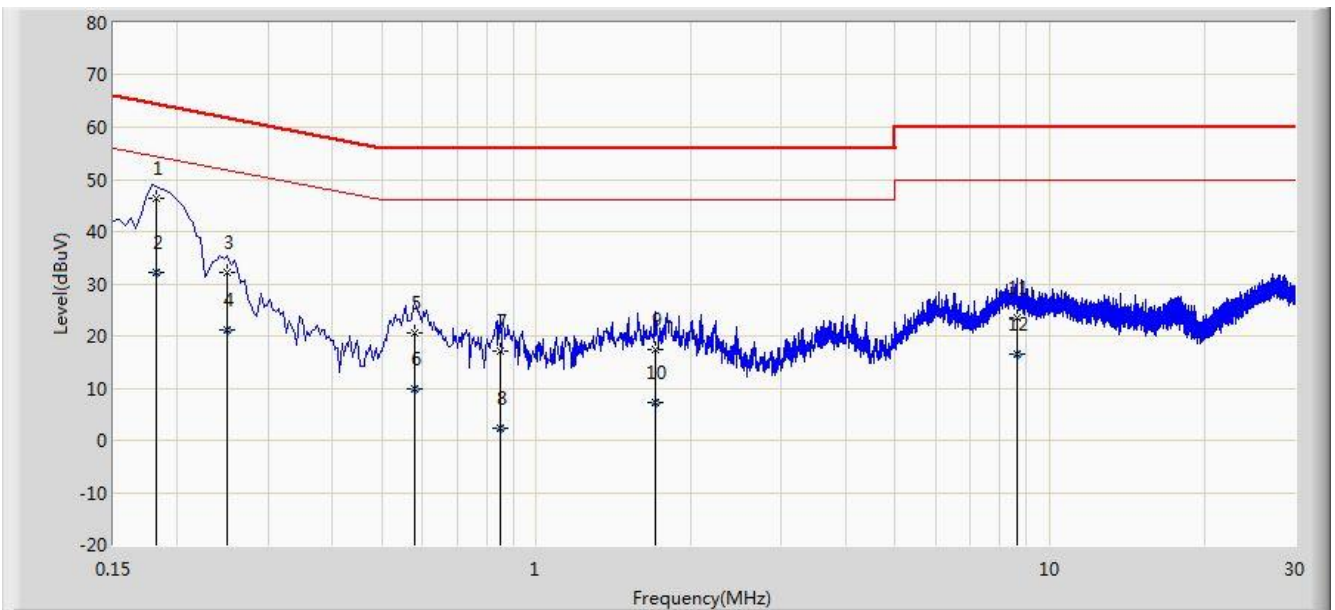


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.154	43.786	33.046	-21.995	65.781	10.740	QP
2			0.154	29.800	19.061	-25.981	55.781	10.740	AV
3		*	0.178	46.566	36.508	-18.013	64.578	10.058	QP
4			0.178	29.485	19.427	-25.094	54.578	10.058	AV
5			0.238	33.396	23.442	-28.770	62.166	9.954	QP
6			0.238	15.817	5.863	-36.349	52.166	9.954	AV
7			0.582	21.484	11.360	-34.516	56.000	10.124	QP
8			0.582	9.536	-0.588	-36.464	46.000	10.124	AV
9			3.558	17.832	7.918	-38.168	56.000	9.913	QP
10			3.558	9.450	-0.463	-36.550	46.000	9.913	AV
11			8.562	24.356	14.171	-35.644	60.000	10.186	QP
12			8.562	17.572	7.387	-32.428	50.000	10.186	AV

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

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

Site: SR2	Time: 2019/03/08 - 07:44
Limit: NCC LP0002_CE_0.15MHz-30MHz	Engineer: Kevin Ker
Probe: ENV216_Filter On	Polarity: Neutral
EUT: AC1300 迷你無線 MU-MIMO USB 網路卡	Power: AC 110V/60Hz
Test Mode: Worst Case Mode	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		*	0.182	46.509	36.467	-17.885	64.394	10.042	QP
2			0.182	32.264	22.222	-22.129	54.394	10.042	AV
3			0.250	32.122	22.121	-29.635	61.757	10.001	QP
4			0.250	21.042	11.041	-30.716	51.757	10.001	AV
5			0.578	20.511	10.368	-35.489	56.000	10.143	QP
6			0.578	9.803	-0.340	-36.197	46.000	10.143	AV
7			0.850	17.114	7.122	-38.886	56.000	9.992	QP
8			0.850	2.395	-7.597	-43.605	46.000	9.992	AV
9			1.706	17.267	7.385	-38.733	56.000	9.882	QP
10			1.706	7.243	-2.639	-38.757	46.000	9.882	AV
11			8.618	23.432	13.233	-36.568	60.000	10.200	QP
12			8.618	16.666	6.466	-33.334	50.000	10.200	AV

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

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

5.2. 功率限制值

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 4.7.3 節：

使用於 5.15 GHz~5.25 GHz 頻段，供室外操作使用，最大傳導輸出功率應小於或等於 1 W。

使用頻率於 5.25 GHz~5.35 GHz 與 5.470 GHz~5.725 GHz 頻段，最大傳導輸出功率應小於或等於 250 mW 或 $11\text{dBm} + 10\log B$ (B 是 26 dB 發射頻寬，單位 MHz) 之較小者。

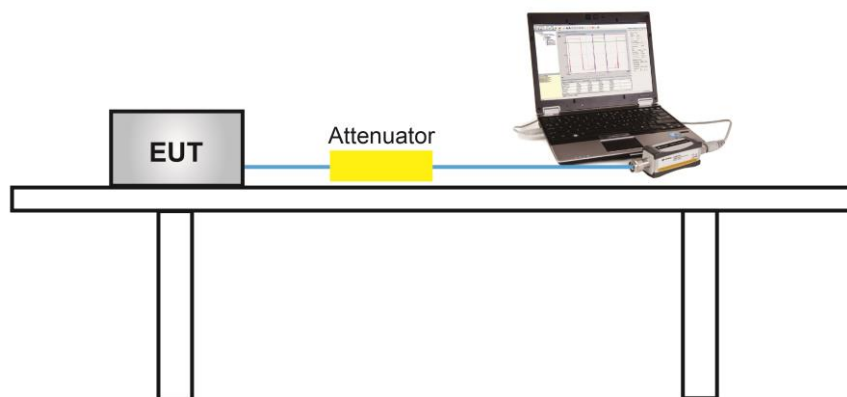
使用頻率於 5.725 GHz~5.850 GHz 頻段，最大傳導輸出功率應小於或等於 1 W。

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。

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，峰值發射功率必須使用依據均方根等效電壓校準之儀器量測於任何連續傳輸之時段，量測結果須依儀器限制(如偵測器反應時間、相較於發射頻寬有限之解析頻寬能力，靈敏度等)調整得出正確之峰值量測或使用峰值功率表。

5.2.3. 測試架構圖



5.2.4. 功率限制值測試結果

Power output test was verified over all data rates of each mode shown as below table, and then choose the maximum power output (grey marker) for final test of each channel.

For Ant 0 port:

Test Mode	Bandwidth	Channel	Frequency (MHz)	Data Rate/ MCS	Average Power (dBm)
802.11a	20	36	5180	6Mbps	17.97
				24Mbps	17.72
				54Mbps	17.48
802.11n	20	36	5180	MCS8	12.93
				MCS11	12.58
				MCS15	12.32
802.11n	40	38	5190	MCS8	15.57
				MCS11	15.30
				MCS15	15.03
802.11ac	20	36	5180	MCS0	15.95
				MCS4	15.71
				MCS8	15.53
802.11ac	40	38	5190	MCS0	15.05
				MCS4	14.85
				MCS9	14.59
802.11ac	80	42	5210	MCS0	15.31
				MCS4	15.07
				MCS9	14.84

待測物名稱	AC1300 迷你無線 MU-MIMO USB 網路卡	溫度	25°C
測試工程師	Kevin Ker	濕度	56%
測試場地	SR1	測試日期	2018/11/20

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
11a	6Mbps	36	5180	15.88	--	15.88	≤ 23.98	Pass
11a	6Mbps	44	5220	15.77	--	15.77	≤ 23.98	Pass
11a	6Mbps	48	5240	15.45	--	15.45	≤ 23.98	Pass
11a	6Mbps	52	5260	15.83	--	15.83	≤ 23.98	Pass
11a	6Mbps	60	5300	15.55	--	15.55	≤ 23.98	Pass
11a	6Mbps	64	5320	15.45	--	15.45	≤ 23.98	Pass
11a	6Mbps	100	5500	15.54	--	15.54	≤ 23.98	Pass
11a	6Mbps	116	5580	15.71	--	15.71	≤ 23.98	Pass
11a	6Mbps	140	5700	14.45	--	14.45	≤ 23.98	Pass
11a	6Mbps	149	5745	16.16	--	16.16	≤ 30.00	Pass
11a	6Mbps	157	5785	16.03	--	16.03	≤ 30.00	Pass
11a	6Mbps	165	5825	15.97	--	15.97	≤ 30.00	Pass
11n-HT20	MCS8	36	5180	12.93	12.78	15.87	≤ 23.98	Pass
11n-HT20	MCS8	40	5220	12.96	13.02	16.00	≤ 23.98	Pass
11n-HT20	MCS8	48	5240	12.71	12.64	15.69	≤ 23.98	Pass
11n-HT20	MCS8	52	5260	16.01	15.77	18.90	≤ 23.98	Pass
11n-HT20	MCS8	60	5300	16.05	15.80	18.94	≤ 23.98	Pass
11n-HT20	MCS8	64	5320	15.78	15.81	18.81	≤ 23.98	Pass
11n-HT20	MCS8	100	5500	16.28	16.37	19.34	≤ 23.98	Pass
11n-HT20	MCS8	116	5580	16.45	16.26	19.37	≤ 23.98	Pass
11n-HT20	MCS8	140	5700	16.39	16.02	19.22	≤ 23.98	Pass
11n-HT20	MCS8	149	5745	16.13	15.98	19.07	≤ 30.00	Pass
11n-HT20	MCS8	157	5785	16.40	16.22	19.32	≤ 30.00	Pass
11n-HT20	MCS8	165	5825	16.15	15.93	19.05	≤ 30.00	Pass

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
11n-HT40	MCS8	38	5190	15.57	15.30	18.45	≤ 23.98	Pass
11n-HT40	MCS8	46	5230	15.71	15.74	18.74	≤ 23.98	Pass
11n-HT40	MCS8	54	5270	15.69	15.83	18.77	≤ 23.98	Pass
11n-HT40	MCS8	62	5310	14.98	15.01	18.01	≤ 23.98	Pass
11n-HT40	MCS8	102	5510	16.02	16.10	19.07	≤ 23.98	Pass
11n-HT40	MCS8	110	5550	16.33	16.35	19.35	≤ 23.98	Pass
11n-HT40	MCS8	134	5670	16.09	16.26	19.19	≤ 23.98	Pass
11n-HT40	MCS8	151	5755	16.03	16.24	19.15	≤ 30.00	Pass
11n-HT40	MCS8	159	5795	16.28	16.04	19.17	≤ 30.00	Pass
11ac-VHT20	MCS0	36	5180	12.88	12.91	15.91	≤ 23.98	Pass
11ac-VHT20	MCS0	40	5220	12.56	12.84	15.71	≤ 23.98	Pass
11ac-VHT20	MCS0	48	5240	12.87	12.72	15.81	≤ 23.98	Pass
11ac-VHT20	MCS0	52	5260	15.66	15.76	18.72	≤ 23.98	Pass
11ac-VHT20	MCS0	60	5300	15.68	15.81	18.76	≤ 23.98	Pass
11ac-VHT20	MCS0	64	5320	15.79	15.80	18.81	≤ 23.98	Pass
11ac-VHT20	MCS0	100	5500	16.33	16.31	19.33	≤ 23.98	Pass
11ac-VHT20	MCS0	116	5580	16.28	16.09	19.20	≤ 23.98	Pass
11ac-VHT20	MCS0	140	5700	16.16	16.18	19.18	≤ 23.98	Pass
11ac-VHT20	MCS0	149	5745	16.05	16.14	19.11	≤ 30.00	Pass
11ac-VHT20	MCS0	157	5785	16.01	16.39	19.21	≤ 30.00	Pass
11ac-VHT20	MCS0	165	5825	16.47	16.28	19.39	≤ 30.00	Pass
11ac-VHT40	MCS0	38	5190	15.05	14.85	17.96	≤ 23.98	Pass
11ac-VHT40	MCS0	46	5230	15.68	15.76	18.73	≤ 23.98	Pass
11ac-VHT40	MCS0	54	5270	15.78	15.71	18.76	≤ 23.98	Pass
11ac-VHT40	MCS0	62	5310	15.11	14.89	18.01	≤ 23.98	Pass
11ac-VHT40	MCS0	102	5510	16.15	15.96	19.07	≤ 23.98	Pass
11ac-VHT40	MCS0	110	5550	16.11	16.12	19.13	≤ 23.98	Pass
11ac-VHT40	MCS0	134	5670	16.15	16.15	19.16	≤ 23.98	Pass
11ac-VHT40	MCS0	151	5755	16.28	16.03	19.17	≤ 30.00	Pass
11ac-VHT40	MCS0	159	5795	16.23	16.10	19.18	≤ 30.00	Pass
11ac-VHT80	MCS0	42	5210	15.31	15.26	18.30	≤ 23.98	Pass
11ac-VHT80	MCS0	58	5290	13.50	13.90	16.71	≤ 23.98	Pass
11ac-VHT80	MCS0	106	5530	15.72	15.66	18.70	≤ 23.98	Pass
11ac-VHT80	MCS0	155	5775	16.18	16.29	19.25	≤ 30.00	Pass

Note 1:

For 802.11a

The Total Average Power (dBm) = Ant 0 Average Power (dBm),

For 802.11n-HT20/n-HT40/ac-VHT20/ac-VHT40/ac-VHT80

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

Note 2:

For 5150 - 5350MHz and 5470 - 5725MHz Bands: Average Power Limit (dBm) = 23.98 dBm.

For 5725 - 5850MHz Bands: Average Power Limit (dBm) = 30 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

此AC1300迷你無線MU-MIMO USB網路卡其天線為固定式PIFA Antenna (檢附天線規格書)

Antenna Type	Frequency Band (MHz)	TX Paths	Max Antenna Gain (dBi)		Directional Gain (dBi)	
			Ant 0	Ant 1	For Power	For PSD
PIFA Antenna	2400 ~ 2500	2	1.94	1.76	1.94	4.95
	5150 ~ 5850	2	1.99	1.93	1.99	5.00

Note:

- 802.11a, 802.11b, 802.11g support single transmission at Ant 0 port only.
- 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,
Array Gain = $10 \log (N_{ANT} / N_{SS}) \text{ dB} = 3.01$;
- For power measurements on IEEE 802.11 devices,
Array Gain = 0 dB for $N_{ANT} \leq 4$;

If antenna gains are not equal and each transmit antenna is driven by only one spatial stream,

Directional gain = $G_{ANT} + \text{Array Gain}$,

- For power spectral density (PSD) measurements on all devices,
Array Gain = $10 \log (N_{ANT} / N_{SS}) \text{ dB} = 3.01$;
- For power measurements on IEEE 802.11 devices,
Array Gain = 0 dB for $N_{ANT} \leq 4$;

5.4. 26dB 佔用頻寬

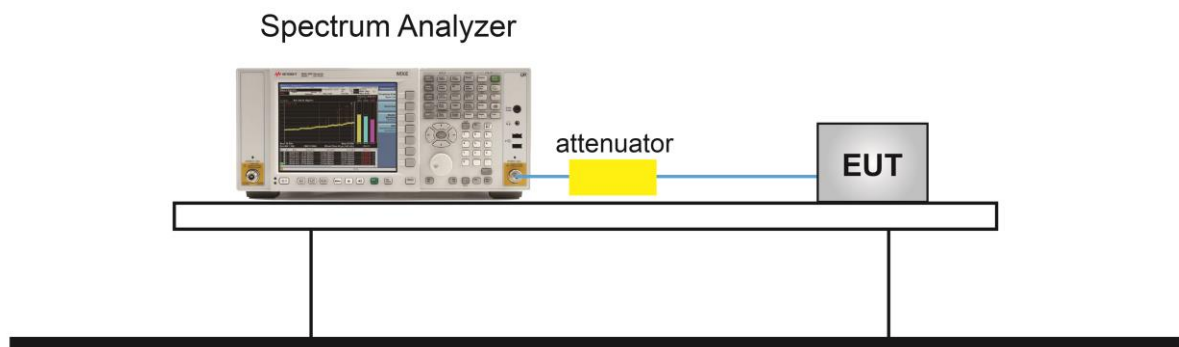
5.4.1. 適用標準

N/A

5.4.2. 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，峰值發射功率必須使用依據均方根等效電壓校準之儀器量測於任何連續傳輸之時段，量測結果須依儀器限制(如偵測器反應時間、相較於發射頻寬有限之解析頻寬能力，靈敏度等)調整得出正確之峰值量測或使用峰值功率表。

5.4.3. 測試架構圖



5. 4. 4. 26dB 佔用頻寬測試結果

待測物名稱	AC1300 迷你無線 MU-MIMO USB 網路卡	溫度	24°C
測試工程師	Kevin Ker	濕度	56%
測試場地	SR2	測試日期	2018/11/20

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
802.11a	6Mbps	36	5180	21.32	16.66
802.11a	6Mbps	44	5220	21.20	16.64
802.11a	6Mbps	48	5240	21.06	16.63
802.11a	6Mbps	52	5260	20.84	16.63
802.11a	6Mbps	60	5300	23.10	16.64
802.11a	6Mbps	64	5320	21.13	16.64
802.11a	6Mbps	100	5500	20.83	16.61
802.11a	6Mbps	116	5580	21.06	16.61
802.11a	6Mbps	140	5700	20.95	16.60
802.11a	6Mbps	149	5745	20.78	16.63
802.11a	6Mbps	157	5785	21.57	16.63
802.11a	6Mbps	165	5825	21.67	16.63
802.11n-HT20	MCS8	36	5180	20.99	17.66
802.11n-HT20	MCS8	44	5220	20.94	17.67
802.11n-HT20	MCS8	48	5240	21.62	17.70
802.11n-HT20	MCS8	52	5260	21.04	17.68
802.11n-HT20	MCS8	60	5300	21.66	17.69
802.11n-HT20	MCS8	64	5320	20.97	17.68
802.11n-HT20	MCS8	100	5500	20.91	17.66
802.11n-HT20	MCS8	116	5580	20.78	17.66
802.11n-HT20	MCS8	140	5700	21.08	17.66
802.11n-HT20	MCS8	149	5745	20.88	17.65
802.11n-HT20	MCS8	157	5785	20.96	17.70
802.11n-HT20	MCS8	165	5825	21.66	17.69

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
802.11n-HT40	MCS8	38	5190	43.89	36.64
802.11n-HT40	MCS8	46	5230	43.81	36.63
802.11n-HT40	MCS8	54	5270	43.31	36.61
802.11n-HT40	MCS8	62	5310	43.72	36.53
802.11n-HT40	MCS8	102	5510	43.47	36.59
802.11n-HT40	MCS8	110	5550	43.51	36.58
802.11n-HT40	MCS8	134	5670	43.70	36.68
802.11n-HT40	MCS8	151	5755	46.74	36.67
802.11n-HT40	MCS8	159	5795	43.38	36.66
802.11ac-VHT20	MCS0	36	5180	21.31	17.69
802.11ac-VHT20	MCS0	44	5220	20.95	17.68
802.11ac-VHT20	MCS0	48	5240	21.18	17.71
802.11ac-VHT20	MCS0	52	5260	21.13	17.69
802.11ac-VHT20	MCS0	60	5300	21.27	17.68
802.11ac-VHT20	MCS0	64	5320	21.66	17.70
802.11ac-VHT20	MCS0	100	5500	20.74	17.68
802.11ac-VHT20	MCS0	116	5580	20.91	17.67
802.11ac-VHT20	MCS0	140	5700	20.73	17.66
802.11ac-VHT20	MCS0	149	5745	20.99	17.73
802.11ac-VHT20	MCS0	157	5785	21.47	17.74
802.11ac-VHT20	MCS0	165	5825	20.88	17.69
802.11ac-VHT40	MCS0	38	5190	42.65	36.62
802.11ac-VHT40	MCS0	46	5230	42.87	36.55
802.11ac-VHT40	MCS0	54	5270	43.19	36.56
802.11ac-VHT40	MCS0	62	5310	43.18	36.48
802.11ac-VHT40	MCS0	102	5510	42.69	36.51
802.11ac-VHT40	MCS0	110	5550	43.08	36.57
802.11ac-VHT40	MCS0	134	5670	42.99	36.54
802.11ac-VHT40	MCS0	151	5755	42.90	36.56
802.11ac-VHT40	MCS0	159	5795	43.75	36.61
802.11ac-VHT80	MCS0	42	5210	83.81	75.81
802.11ac-VHT80	MCS0	58	5290	83.34	75.75
802.11ac-VHT80	MCS0	106	5530	82.98	75.77
802.11ac-VHT80	MCS0	155	5775	83.59	75.76

802.11a 26dB Bandwidth & 99% Bandwidth - Ant 0

Channel 36 (5180MHz)



Channel 44 (5220MHz)



Channel 48 (5240MHz)



Channel 52 (5260MHz)



Channel 60 (5300MHz)



Channel 64 (5320MHz)



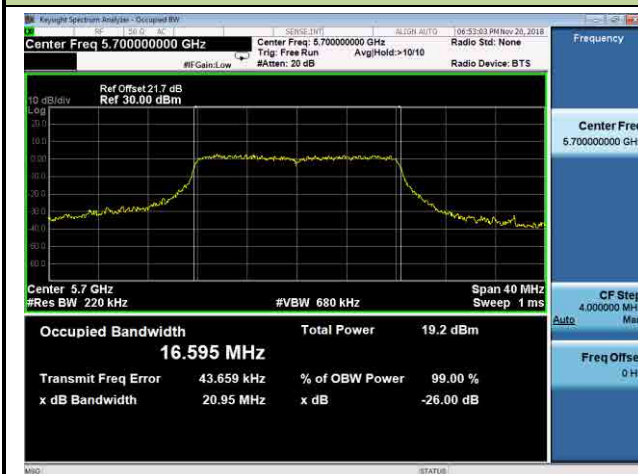
Channel 100 (5500MHz)



Channel 116 (5580MHz)



Channel 140 (5700MHz)



Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)



802.11n-HT20 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1

Channel 36 (5180MHz)



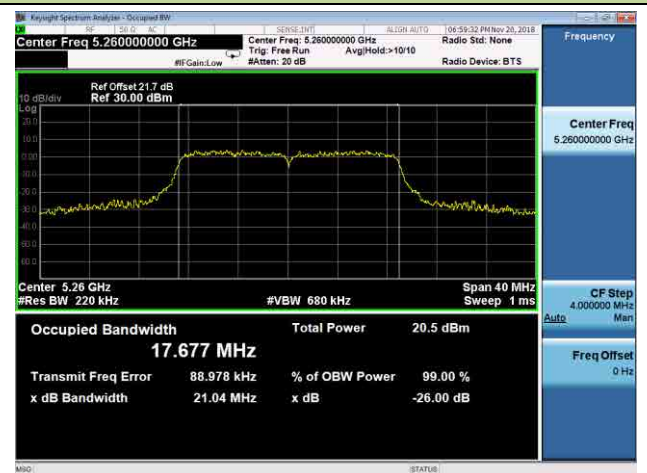
Channel 44 (5220MHz)



Channel 48 (5240MHz)



Channel 52 (5260MHz)

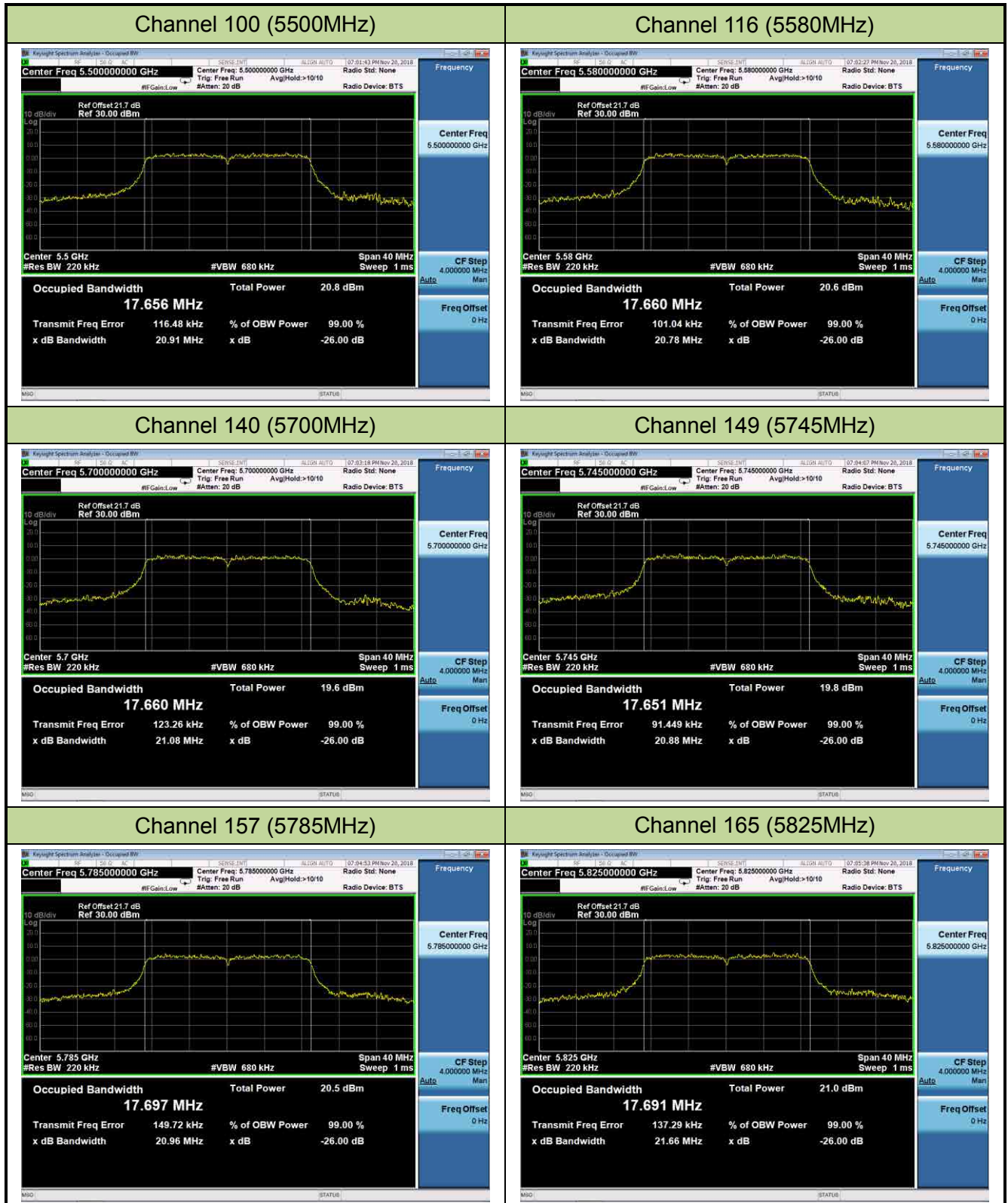


Channel 60 (5300MHz)



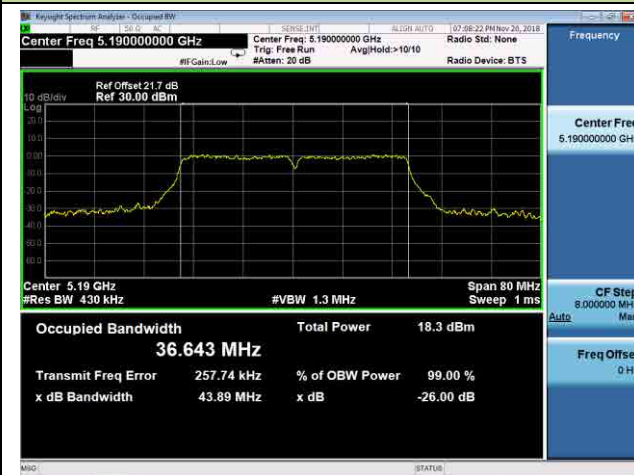
Channel 64 (5320MHz)





802.11n-HT40 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1

Channel 38 (5190MHz)



Channel 46 (5230MHz)



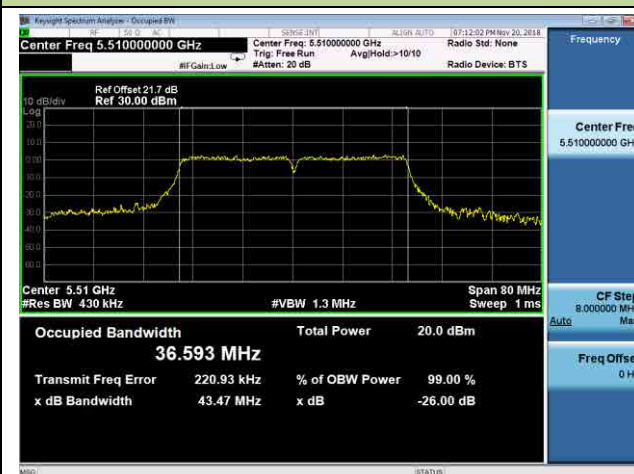
Channel 54 (5270MHz)



Channel 62 (5310MHz)



Channel 102 (5510MHz)



Channel 110 (5550MHz)



Channel 134 (5670MHz)



Channel 151 (5755MHz)



Channel 159 (5795MHz)



802.11ac-VHT20 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1

Channel 36 (5180MHz)



Channel 44 (5220MHz)



Channel 48 (5240MHz)



Channel 52 (5260MHz)

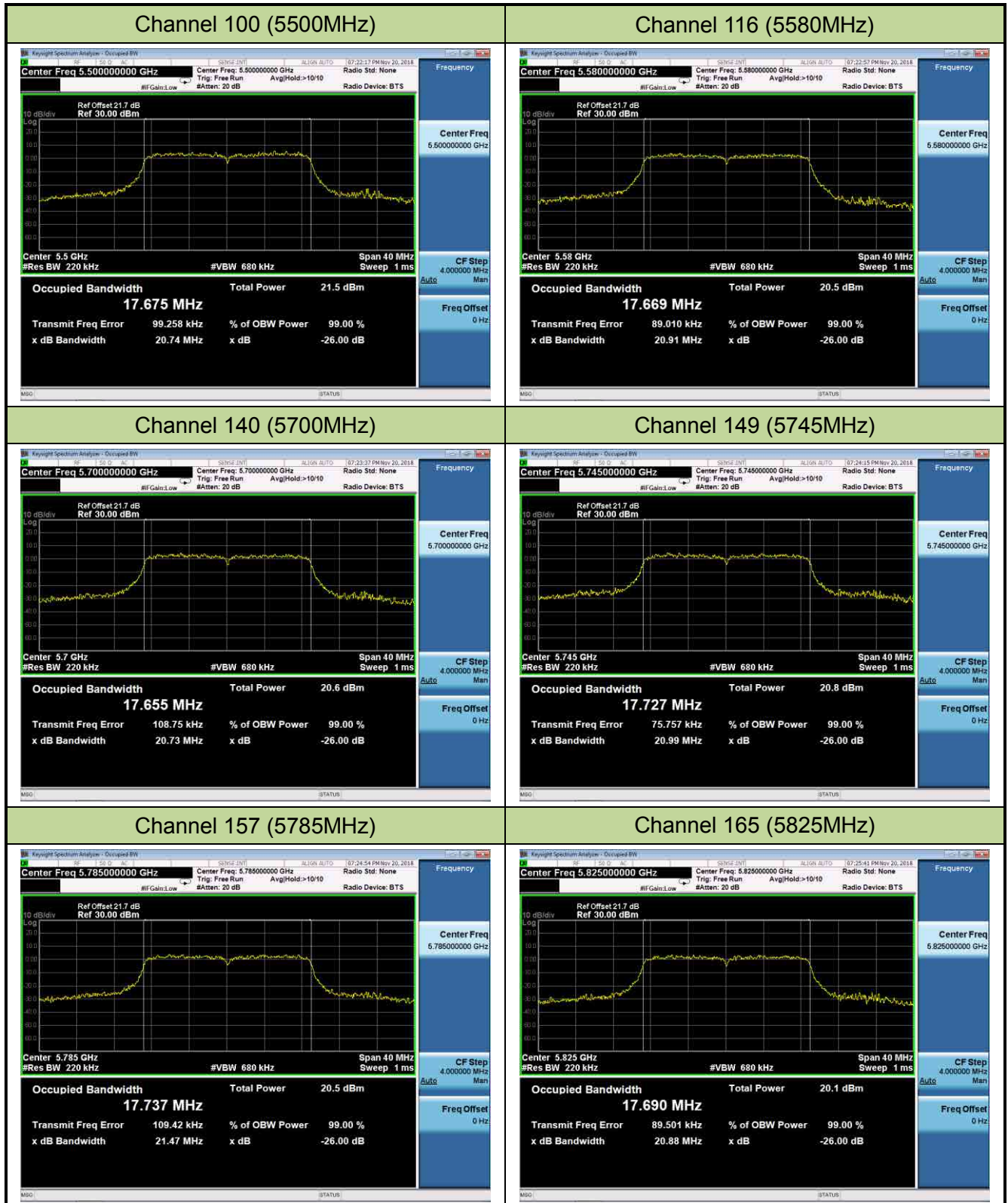


Channel 60 (5300MHz)



Channel 64 (5320MHz)





802.11ac-VHT40 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1

Channel 38 (5190MHz)



Channel 46 (5230MHz)



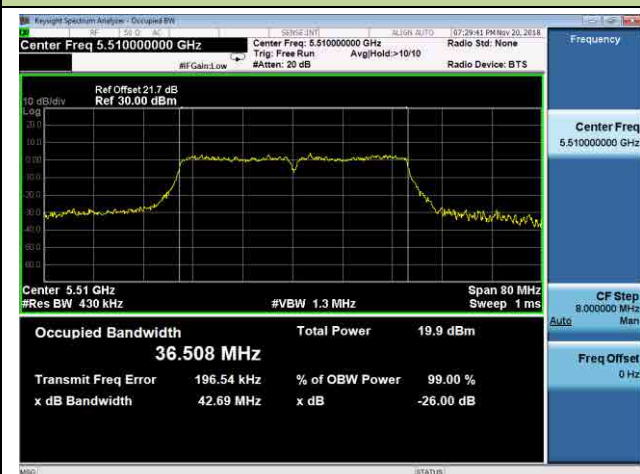
Channel 54 (5270MHz)



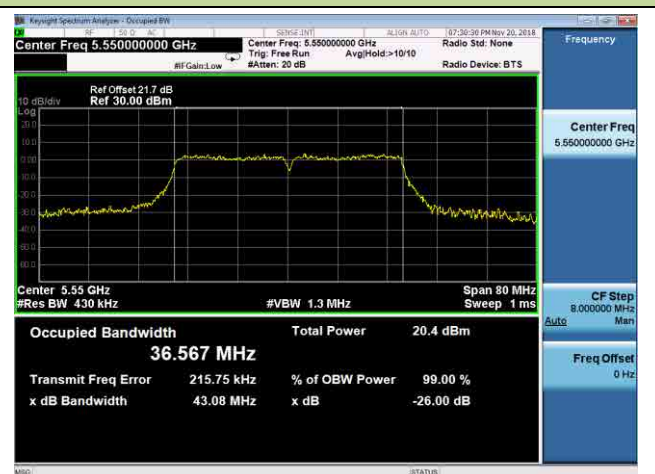
Channel 62 (5310MHz)



Channel 102 (5510MHz)



Channel 110 (5550MHz)



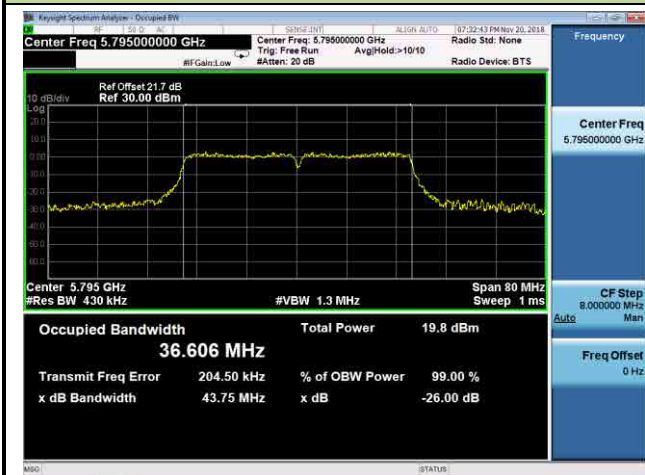
Channel 134 (5670MHz)



Channel 151 (5755MHz)



Channel 159 (5795MHz)



802.11ac-VHT80 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1

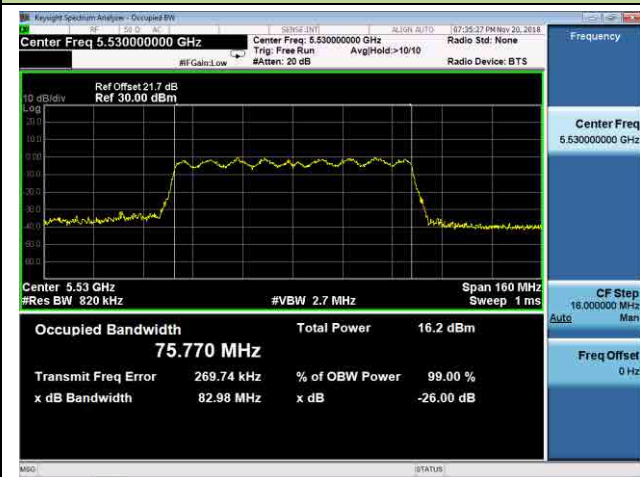
Channel 42 (5210MHz)



Channel 58 (5290MHz)



Channel 106 (5530MHz)



Channel 155 (5775MHz)



5.5. 6dB 佔用頻寬

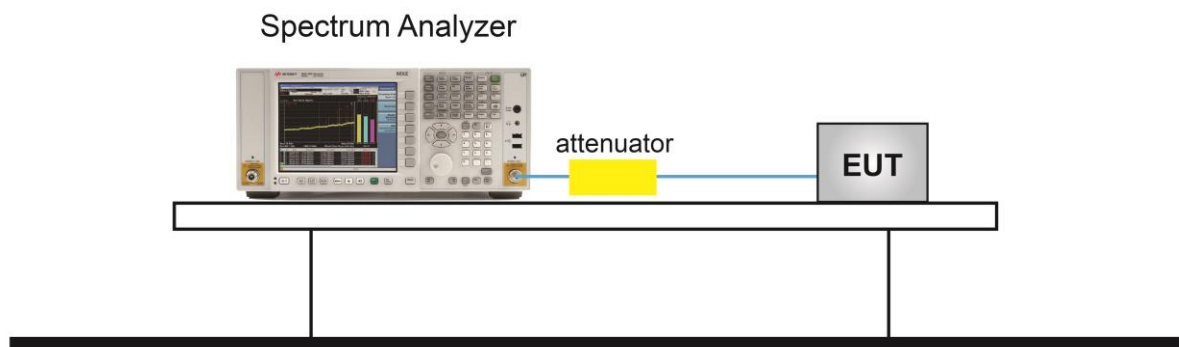
5.5.1. 適用標準

在 5.725 GHz~5.850 GHz 頻段操作之設備，其 6 dB 頻寬至少應有 500 kHz。

5.5.2. 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，峰值發射功率必須使用依據均方根等效電壓校準之儀器量測於任何連續傳輸之時段，量測結果須依儀器限制(如偵測器反應時間、相較於發射頻寬有限之解析頻寬能力，靈敏度等)調整得出正確之峰值量測或使用峰值功率表。

5.5.3. 測試架構圖



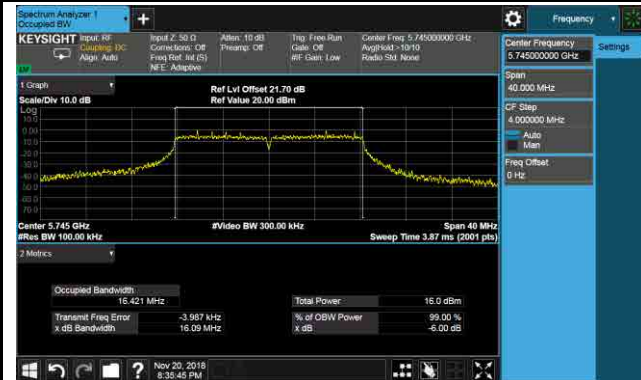
5.5.4. 6dB 佔用頻寬測試結果

待測物名稱	AC1300 迷你無線 MU-MIMO USB 網路卡	溫度	24°C
測試工程師	Kevin Ker	濕度	56%
測試場地	SR2	測試日期	2018/11/20

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
802.11a	6Mbps	149	5745	16.09	≥ 0.5	Pass
802.11a	6Mbps	157	5785	16.33	≥ 0.5	Pass
802.11a	6Mbps	165	5825	16.38	≥ 0.5	Pass
802.11n-HT20	MCS8	149	5745	16.95	≥ 0.5	Pass
802.11n-HT20	MCS8	157	5785	17.60	≥ 0.5	Pass
802.11n-HT20	MCS8	165	5825	16.94	≥ 0.5	Pass
802.11n-HT40	MCS8	151	5755	35.55	≥ 0.5	Pass
802.11n-HT40	MCS8	159	5795	36.31	≥ 0.5	Pass
802.11ac-VHT20	MCS0	149	5745	17.56	≥ 0.5	Pass
802.11ac-VHT20	MCS0	157	5785	17.56	≥ 0.5	Pass
802.11ac-VHT20	MCS0	165	5825	16.98	≥ 0.5	Pass
802.11ac-VHT40	MCS0	151	5755	35.93	≥ 0.5	Pass
802.11ac-VHT40	MCS0	159	5795	36.05	≥ 0.5	Pass
802.11ac-VHT80	MCS0	155	5775	75.24	≥ 0.5	Pass

802.11a 6dB Bandwidth - Ant 0

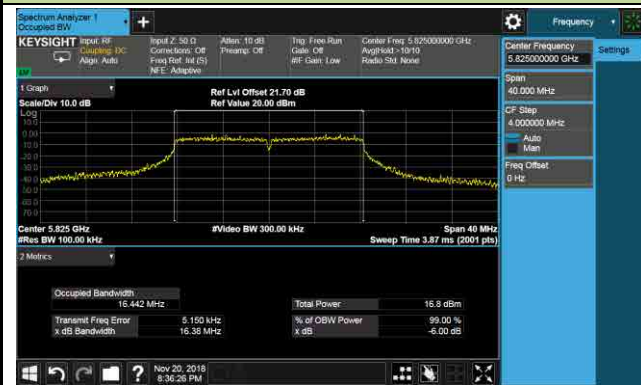
Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)



802.11n-HT20 6dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 149 (5745MHz)



Channel 157 (5785MHz)

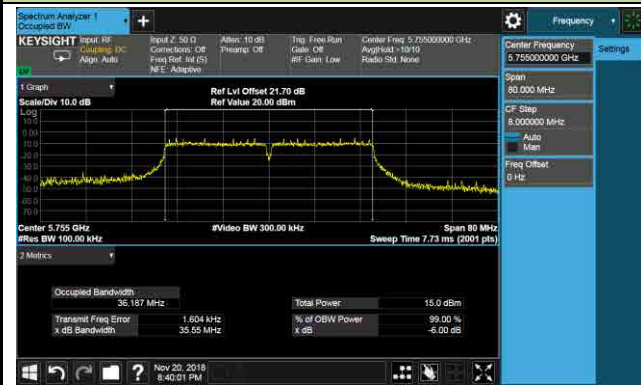


Channel 165 (5825MHz)



802.11n-HT40 6dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 149 (5755MHz)



Channel 157 (5795MHz)



802.11ac-VHT20 6dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)



802.11ac-VHT40 6dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 151 (5755MHz)



Channel 159 (5795MHz)



802.11ac-VHT80 6dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 155 (5775MHz)



5.6. 最大功率頻譜密度

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4.7.2(1)(2)(3)節

使用於5.15 GHz~5.25 GHz 頻段，供室內操作使用，在任何1 MHz 頻帶中最大功率頻譜密度應小於或等於17 dBm。

使用頻率於5.25 GHz~5.35 GHz 與5.470 GHz~5.725 GHz 頻段，最大功率頻譜密度在任何1 MHz 頻帶中應小於或等於11 dBm。

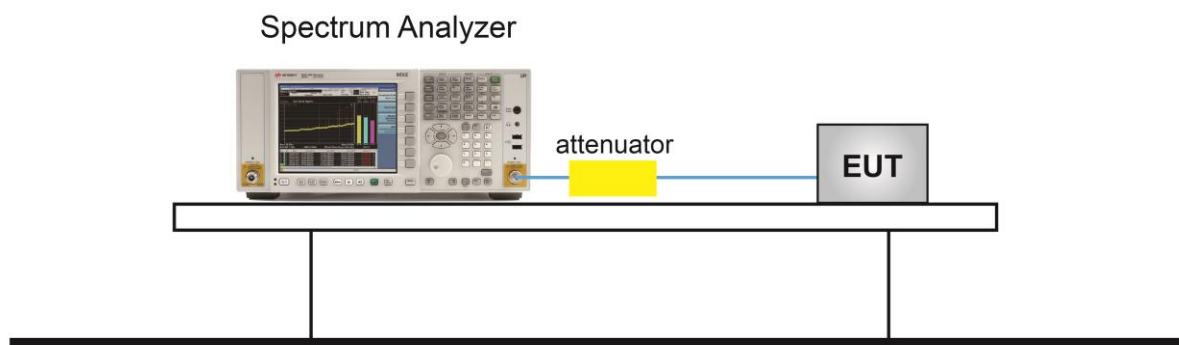
使用頻率於5.725 GHz~5.850 GHz 頻段，在任何500 kHz 頻帶中最大功率頻譜密度應小於或等於30 dBm。

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，等量減少最大功率頻譜密度。

5.6.2. 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，量測定於1MHz/500kHz頻寬。

5.6.3. 測試架構圖



5.6.4. 峰值功率頻譜密度測試結果

待測物名稱	AC1300 迷你無線 MU-MIMO USB 網路卡	溫度	24°C
測試工程師	Kevin Ker	濕度	56%
測試場地	SR2	測試日期	2018/11/20

Test Mode	Data Rate /MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/MHz)	Ant 1 PSD (dBm/MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/MHz)	Result
11a	6Mbps	36	5180	4.74	--	96.24	4.91	≤ 11.00	Pass
11a	6Mbps	44	5220	4.55	--	96.24	4.72	≤ 11.00	Pass
11a	6Mbps	48	5240	4.81	--	96.24	4.98	≤ 11.00	Pass
11a	6Mbps	52	5260	4.94	--	96.24	5.11	≤ 11.00	Pass
11a	6Mbps	60	5300	4.87	--	96.24	5.04	≤ 11.00	Pass
11a	6Mbps	64	5320	4.72	--	96.24	4.89	≤ 11.00	Pass
11a	6Mbps	100	5500	5.13	--	96.24	5.30	≤ 11.00	Pass
11a	6Mbps	116	5580	5.10	--	96.24	5.27	≤ 11.00	Pass
11a	6Mbps	140	5700	4.85	--	96.24	5.02	≤ 11.00	Pass
11n-HT20	MCS8	36	5180	1.83	1.64	96.00	4.92	≤ 11.00	Pass
11n-HT20	MCS8	44	5220	1.59	1.66	96.00	4.81	≤ 11.00	Pass
11n-HT20	MCS8	48	5240	1.92	1.45	96.00	4.88	≤ 11.00	Pass
11n-HT20	MCS8	52	5260	4.04	5.22	96.00	7.86	≤ 11.00	Pass
11n-HT20	MCS8	60	5300	4.58	4.93	96.00	7.95	≤ 11.00	Pass
11n-HT20	MCS8	64	5320	4.27	5.48	96.00	8.10	≤ 11.00	Pass
11n-HT20	MCS8	100	5500	4.50	5.99	96.00	8.50	≤ 11.00	Pass
11n-HT20	MCS8	118	5580	3.91	5.56	96.00	8.00	≤ 11.00	Pass
11n-HT20	MCS8	140	5700	4.09	4.72	96.00	7.60	≤ 11.00	Pass

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/MHz)	Ant 1 PSD (dBm/MHz)	Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/MHz)	Result
11n-HT40	MCS8	38	5190	-0.02	0.87	92.17	3.81	≤ 11.00	Pass
11n-HT40	MCS8	46	5230	0.94	1.91	92.17	4.82	≤ 11.00	Pass
11n-HT40	MCS8	54	5270	1.14	2.05	92.17	4.98	≤ 11.00	Pass
11n-HT40	MCS8	62	5310	-0.11	0.40	92.17	3.52	≤ 11.00	Pass
11n-HT40	MCS8	102	5510	1.96	2.21	92.17	5.45	≤ 11.00	Pass
11n-HT40	MCS8	110	5550	1.75	2.94	92.17	5.75	≤ 11.00	Pass
11n-HT40	MCS8	134	5670	1.75	1.90	92.17	5.19	≤ 11.00	Pass
11ac-VHT20	MCS0	36	5180	1.63	1.69	96.02	4.85	≤ 11.00	Pass
11ac-VHT20	MCS0	44	5220	1.75	1.84	96.02	4.98	≤ 11.00	Pass
11ac-VHT20	MCS0	48	5240	1.89	1.6	96.02	4.93	≤ 11.00	Pass
11ac-VHT20	MCS0	52	5260	3.79	4.89	96.02	7.56	≤ 11.00	Pass
11ac-VHT20	MCS0	60	5300	4.04	4.90	96.02	7.68	≤ 11.00	Pass
11ac-VHT20	MCS0	64	5320	4.37	5.55	96.02	8.19	≤ 11.00	Pass
11ac-VHT20	MCS0	100	5500	5.47	5.93	96.02	8.89	≤ 11.00	Pass
11ac-VHT20	MCS0	116	5580	5.09	5.48	96.02	8.48	≤ 11.00	Pass
11ac-VHT20	MCS0	140	5700	5.19	5.87	96.02	8.73	≤ 11.00	Pass
11ac-VHT40	MCS0	38	5190	-0.27	-0.12	92.42	3.16	≤ 11.00	Pass
11ac-VHT40	MCS0	46	5230	1.11	1.11	92.42	4.46	≤ 11.00	Pass
11ac-VHT40	MCS0	54	5270	1.40	1.62	92.42	4.86	≤ 11.00	Pass
11ac-VHT40	MCS0	62	5310	0.12	0.66	92.42	3.75	≤ 11.00	Pass
11ac-VHT40	MCS0	102	5510	1.98	1.88	92.42	5.28	≤ 11.00	Pass
11ac-VHT40	MCS0	110	5550	2.08	2.16	92.42	5.47	≤ 11.00	Pass
11ac-VHT40	MCS0	134	5670	1.59	2.23	92.42	5.27	≤ 11.00	Pass
11ac-VHT80	MCS0	42	5210	-2.22	-2.27	85.50	1.45	≤ 11.00	Pass
11ac-VHT80	MCS0	58	5290	-3.95	-4.20	85.50	-0.38	≤ 11.00	Pass
11ac-VHT80	MCS0	106	5530	-1.97	-2.10	85.50	1.66	≤ 11.00	Pass

Note 1:

For 802.11a

When EUT duty cycle ≥ 98%, the total PSD (dBm/MHz) = Ant 0 PSD (dBm/MHz).

When EUT duty cycle < 98%, the total PSD (dBm/MHz) = Ant 0 PSD (dBm/MHz) + 10*log (1/Duty Cycle).

For 802.11n-HT20/n-HT40/ac-VHT20/ac-VHT40/ac-VHT80

When EUT duty cycle ≥ 98%, the total PSD (dBm/MHz) = 10*log {10^(Ant 0 PSD/10) + 10^(Ant 1 PSD/10)} (dBm/MHz).

When EUT duty cycle < 98%, the total PSD (dBm/MHz) = 10*log {10^(Ant 0 PSD/10) + 10^(Ant 1 PSD/10)} (dBm/MHz) + 10*log (1/Duty Cycle).

Note 2: PSD Limit (dBm/MHz) = 11dBm/MHz

待測物名稱	AC1300 迷你無線 MU-MIMO USB 網路卡	溫度	24°C
測試工程師	Kevin Ker	濕度	56%
測試場地	SR2	測試日期	2018/11/20

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm/ 100kHz)	Ant 1 PSD (dBm/ 100kHz)	Duty Cycle (%)	Constant Factor (dB)	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
11a	6Mbps	149	5745	-2.45	--	96.24	6.99	4.71	≤ 30.00	Pass
11a	6Mbps	157	5785	-2.13	--	96.24	6.99	5.03	≤ 30.00	Pass
11a	6Mbps	165	5825	-2.06	--	96.24	6.99	5.10	≤ 30.00	Pass
11n-HT20	MCS8	149	5745	-5.21	-4.41	96.00	6.99	5.39	≤ 30.00	Pass
11n-HT20	MCS8	157	5785	-4.57	-4.36	96.00	6.99	5.71	≤ 30.00	Pass
11n-HT20	MCS8	165	5825	-4.27	-4.81	96.00	6.99	5.65	≤ 30.00	Pass
11n-HT40	MCS8	151	5755	-7.52	-7.45	92.17	6.99	2.87	≤ 30.00	Pass
11n-HT40	MCS8	159	5795	-6.54	-7.47	92.17	6.99	3.37	≤ 30.00	Pass
11ac-VHT20	MCS0	149	5745	-4.63	-4.74	96.02	6.99	5.49	≤ 30.00	Pass
11ac-VHT20	MCS0	157	5785	-4.25	-5.52	96.02	6.99	5.34	≤ 30.00	Pass
11ac-VHT20	MCS0	165	5825	-4.99	-5.37	96.02	6.99	5.00	≤ 30.00	Pass
11ac-VHT40	MCS0	151	5755	-8.24	-8.81	92.42	6.99	1.83	≤ 30.00	Pass
11ac-VHT40	MCS0	159	5795	-8.01	-8.48	92.42	6.99	2.10	≤ 30.00	Pass
11ac-VHT80	MCS0	155	5775	-11.07	-10.93	85.50	6.99	-0.32	≤ 30.00	Pass

Note 1:

For 802.11a

When EUT duty cycle ≥ 98%, the total PSD (dBm/500kHz) = Ant 0 PSD (dBm/100kHz) + Constant Factor (dB).

When EUT duty cycle < 98%, the total PSD (dBm/500kHz) = Ant 0 PSD (dBm/100kHz) + Constant Factor (dB) + 10*log (1/Duty Cycle).

For 802.11n-HT20/n-HT40/ac-VHT20/ac-VHT40/ac-VHT80

When EUT duty cycle ≥ 98%, the total PSD (dBm/500kHz) = 10*log {10^(Ant 0 PSD/10) + 10^(Ant 1 PSD/10)} (dBm/100kHz) + Constant Factor (dB).

When EUT duty cycle < 98%, the total PSD (dBm/500kHz) = 10*log {10^(Ant 0 PSD/10) + 10^(Ant 1 PSD/10)} (dBm/100kHz) + Constant Factor (dB) + 10*log (1/Duty Cycle).

Note 2: PSD Limit (dBm/500kHz) = 30dBm/500kHz.

802.11a Power Spectral Density - Ant 0

Channel 36 (5180MHz)



Channel 44 (5220MHz)



Channel 48 (5240MHz)



Channel 52 (5260MHz)



Channel 60 (5300MHz)



Channel 64 (5320MHz)



Channel 100 (5500MHz)



Channel 116 (5580MHz)



Channel 140 (5700MHz)



Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)



802.11n-HT20 Power Spectral Density - Ant 0 / Ant 0 + 1

Channel 36 (5180MHz)



Channel 44 (5220MHz)



Channel 48 (5240MHz)



Channel 52 (5260MHz)



Channel 60 (5300MHz)



Channel 64 (5320MHz)



Channel 100 (5500MHz)



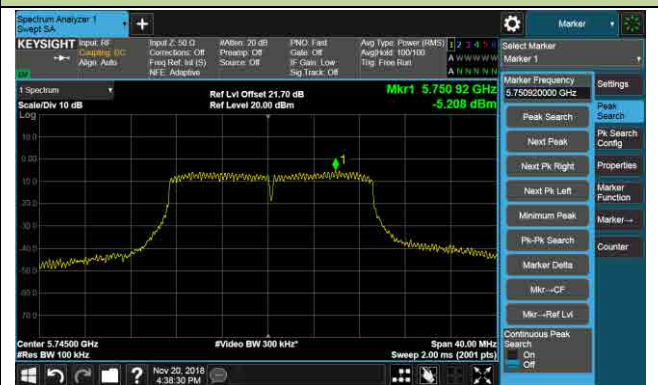
Channel 116 (5580MHz)



Channel 140 (5700MHz)



Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)



802.11n-HT40 Power Spectral Density - Ant 0 / Ant 0 + 1

Channel 38 (5190MHz)



Channel 46 (5230MHz)



Channel 54 (5270MHz)



Channel 62 (5310MHz)



Channel 102 (5510MHz)



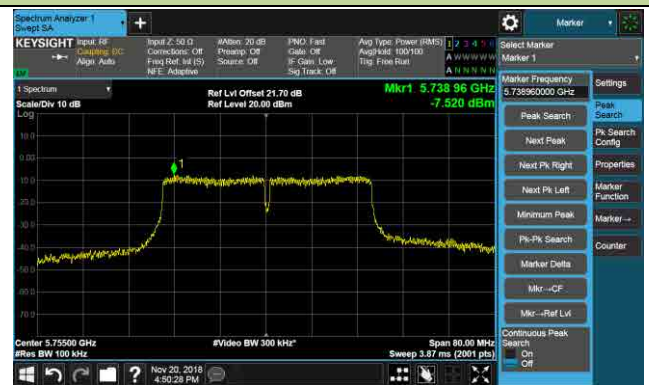
Channel 110 (5550MHz)



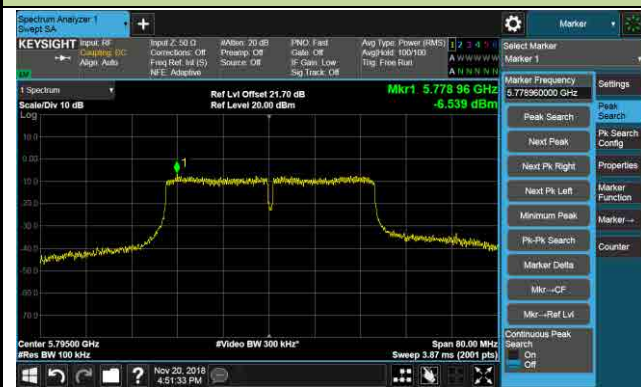
Channel 134 (5670MHz)



Channel 151 (5755MHz)



Channel 159 (5795MHz)



802.11ac-VHT20 Power Spectral Density - Ant 0 / Ant 0 + 1

Channel 36 (5180MHz)



Channel 44 (5220MHz)



Channel 48 (5240MHz)



Channel 52 (5260MHz)



Channel 60 (5300MHz)



Channel 64 (5320MHz)



Channel 100 (5500MHz)



Channel 116 (5580MHz)



Channel 140 (5700MHz)



Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)



802.11ac-VHT40 Power Spectral Density - Ant 0 / Ant 0 + 1

Channel 38 (5190MHz)



Channel 46 (5230MHz)



Channel 54 (5270MHz)



Channel 62 (5310MHz)



Channel 102 (5510MHz)



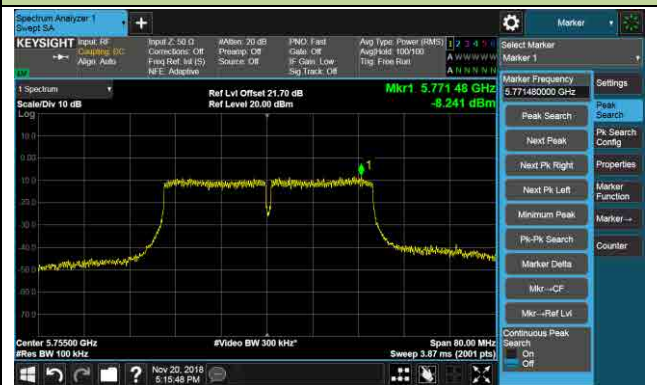
Channel 110 (5550MHz)



Channel 134 (5670MHz)



Channel 151 (5755MHz)



Channel 159 (5795MHz)

