



NCC

低功率射頻電機型式試驗報告

產品名稱 : ACCESS POINT
型號 : APIN0318
廠牌 : 
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
測試日期 : 2017.08.05 ~ 2018.03.18
發行日期 : 2018.04.10

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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

報告編號	版本	描述	發行日期
1710TW0107-T3	1.0	Original Report	2018-04-10

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1. 一般資訊

申請者	慧興科技股份有限公司
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	3000 Hanover St. Palo Alto, CA 94304, USA
認證實驗室	台灣曼瑞檢測科技有限公司
實驗室地址	臺灣桃園市龜山區復興二路 38 號
測試設備序列號	傳導樣品序列號: CNDNK7Y002, 輻射樣品序列號: CNDJK8001M

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Fuxing Rd., Taoyuan, Taiwan (R.O.C)

- MRT facility is a FCC registered (MRT Reg. No. 153292) test facility with the site description report on file and is designated by the FCC as an Accredited Test Film.
- MRT facility is an IC registered (MRT Reg. No. 21723-1) test laboratory with the site description on file at Industry Canada.
- 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.

2. 產品資訊

2.1. 待測物裝置資料

產品名稱	ACCESS POINT
產品型號	APIN0318
天線樣式	Refer to the table "Antenna List"
天線規格	Refer to the table "Antenna List"
待測物額定電壓	POE input
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 600Mbps 802.11ac: up to 1733.2Mbps
頻道控制	Auto

Note 1: The applicant provide one POE adapter (Manufacturer: MICROSEMI & Model: PD-9001GR/AT/AC) for approval testing, it is not for sale.

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	120	5600 MHz	124	5620 MHz
128	5640 MHz	132	5660 MHz	136	5680 MHz
140	5700 MHz	144	5720 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
118	5590 MHz	126	5630 MHz	134	5670 MHz
142	5710 MHz	151	5755 MHz	159	5795 MHz

802.11ac-VHT80/ ac-VHT80+80 (Non-contiguous)

Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz	106	5530 MHz
122	5610 MHz	138	5690 MHz	155	5775 MHz

Note: For 802.11ac-VHT80+80 mode, Ant 0 & Ant 1 port work on one frequency of the above table, Ant 2 & Ant 3 port work on another frequency of the above table. E.g, channel 42 + 155 group, channel 42 will transmit by Ant 0+1 port and channel 155 will transmit by Ant 2+3 port.

802.11ac-VHT80+80 (Contiguous)

Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz	--	--
106	5530 MHz	122	5610 MHz	--	--

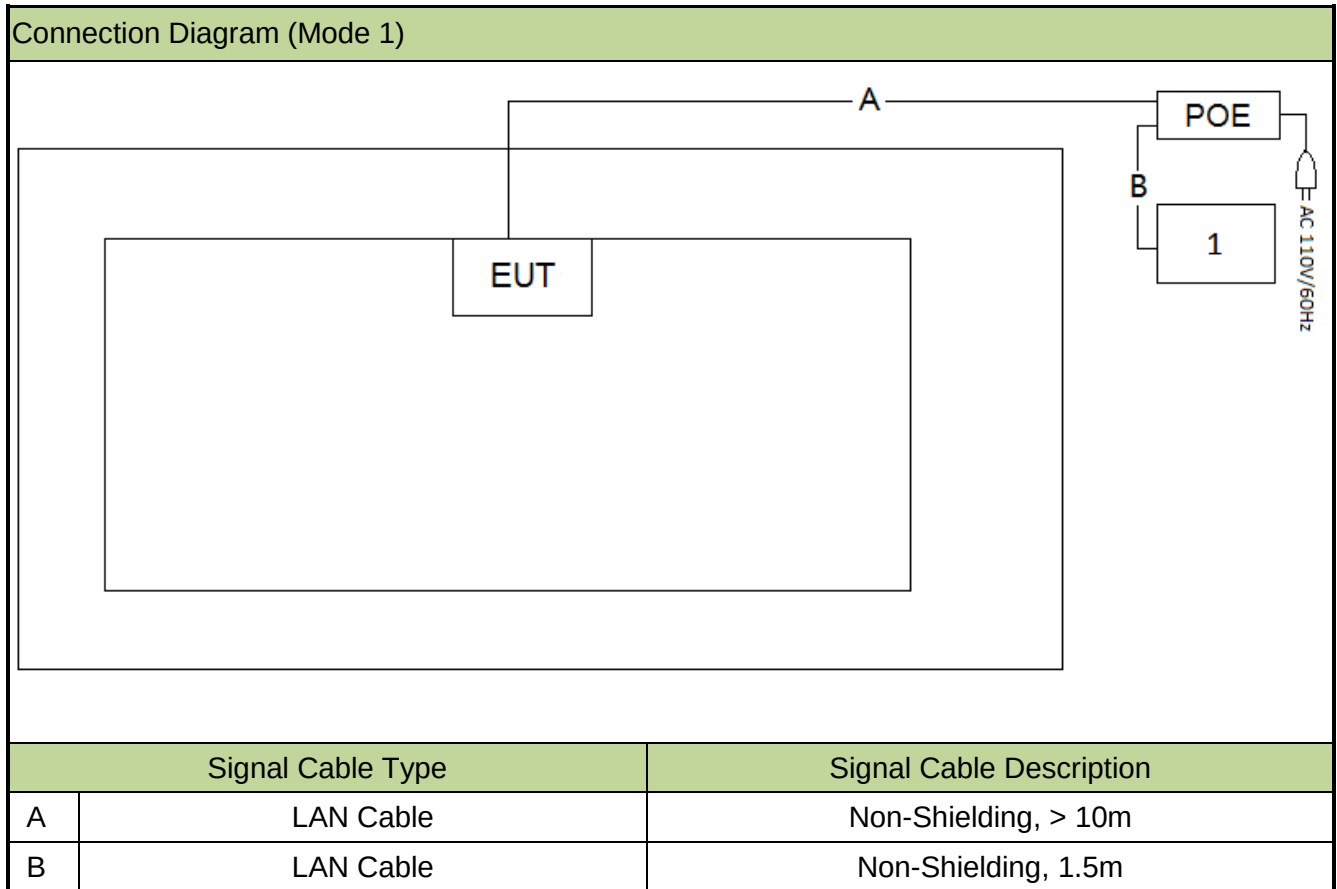
Note: For example, Ant 0 & 1 ports operate on one 80MHz channel 42, while Ant 2 & 3 ports operate on the adjacent 80MHz channel 58.

2.3. 測試模式

Mode 1: 發射器 802.11a (6Mbps)
Mode 2: 發射器 802.11n-HT20 (MCS0)
Mode 3: 發射器 802.11n-HT40 (MCS0)
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)
Mode 7: 發射器 802.11ac-VHT80+80 Non-contiguous (MCS0)
Mode 8: 發射器 802.11ac-VHT80+80 Contiguous (MCS0)

5GHz Test Mode	Ant 0 + 1 + 2 + 3	
	CDD	Beam-Forming
802.11a	√	×
802.11n-HT20	√	√
802.11n-HT40	√	√
802.11ac-VHT20	√	√
802.11ac-VHT40	√	√
802.11ac-VHT80	√	√
802.11ac-VHT80+80 (Non-Contiguous)	√	√
802.11ac-VHT80+80 (Contiguous)	√	×

2.4. 測試系統組合圖



2.5. 測試周邊

Item	Product	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 "QCARCT" program.
4.	Configure the test channel and the data rate.
5.	Start test.

3. 量測不確定度

AC Conducted Emission Measurement - SR2
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 150kHz~30MHz: 3.46dB
Radiated Emission Measurement - AC1
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 25GHz: 4.76dB
Spurious Emissions, Conducted - SR1
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 0.78dB
Output Power - SR1
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 1.13dB
Power Spectrum Density - SR1
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 1.15dB
Occupied Bandwidth - 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

Conducted Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTTWA00045	1 year	2018/5/9
Two-Line V-Network	R&S	ENV216	MRTTWA00019	1 year	2019/3/20
Two-Line V-Network	R&S	ENV216	MRTTWA00020	1 year	2018/4/18
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2018/06/08

Radiated Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Signal Analyzer	R&S	FSV40	MRTTWA00007	1 year	2019/3/20
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2019/3/19
Broadband Preamplifier	SCHWARZBECK	BBV 9718	MRTTWA00005	1 year	2018/4/19
Broadband Amplifier	SCHWARZBECK	BBV 9721	MRTTWA00006	1 year	2018/04/24
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	MRTTWA00002	1 year	2018/04/13
Broadband TRILOG Antenna	SCHWARZBECK	VULB 9162	MRTTWA00001	1 year	2018/05/14
Broadband Hornantenna	SCHWARZBECK	BBHA 9120D	MRTTWA00003	1 year	2018/04/17
Breitband Hornantenna	SCHWARZBECK	BBHA 9170	MRTTWA00004	1 year	2018/04/24
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2018/06/08

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2018/7/24
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00014	1 year	2018/4/19
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00015	1 year	2019/3/20
Programmable Temperature & Humidity Chamber	TEN BILLION	TTH-B3UP	MRTTWA00036	1 year	2018/05/10
Temperature/Humidity Meter	TFA	35.1078.10.IT	MRTTWA00033	1 year	2018/06/08

Test software

Software	Version	Function
e3	V 8.3.5	EMI Test Software
EMI	Quietek	V3

5. 測試結果

產品名稱 ACCESS POINT
型號 APIN0318

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
4.7.7	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

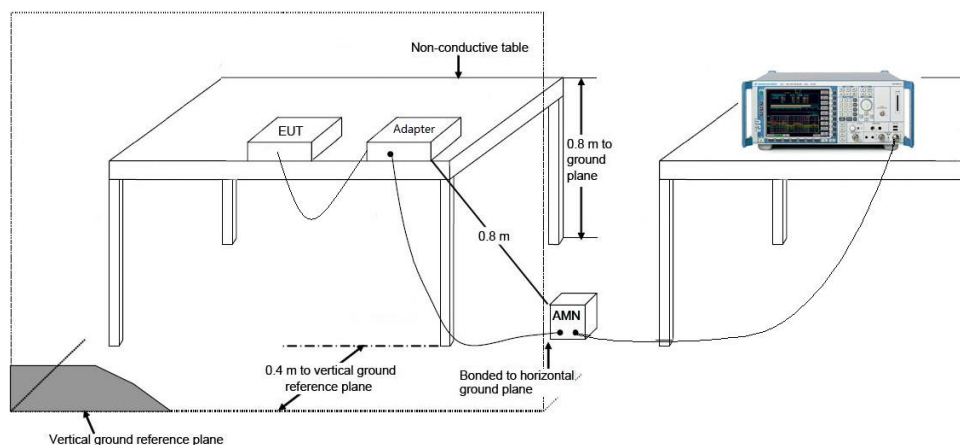
註:隨頻率之對數遞減

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。

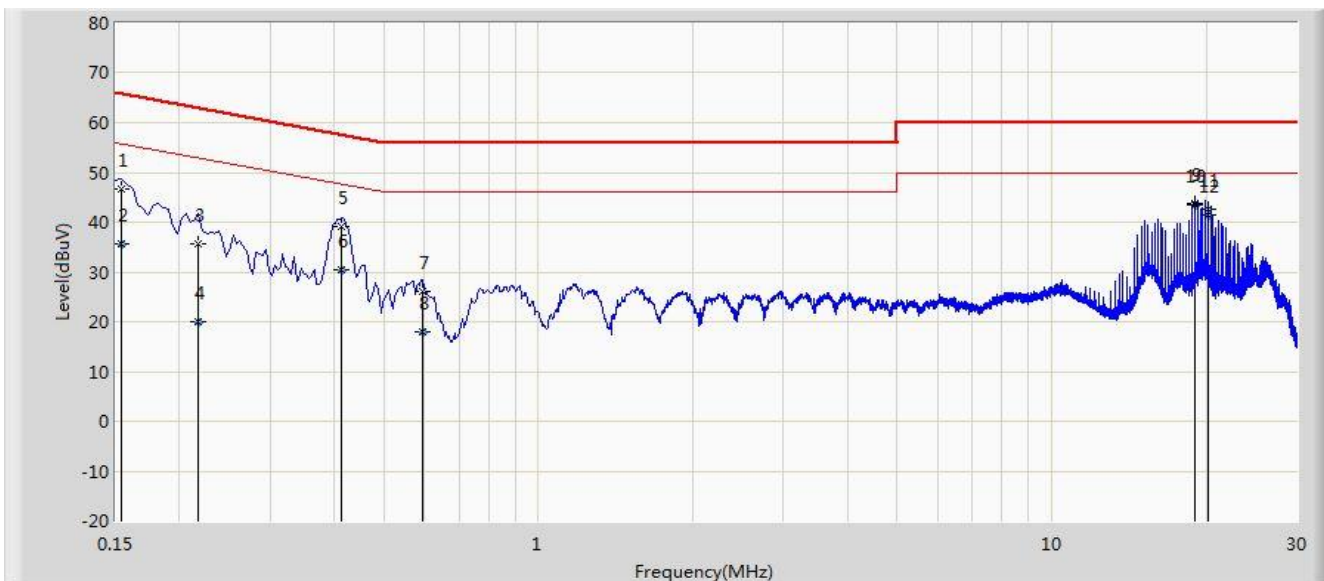
備 註: 經初測驗證過，電源端點干擾測試對測試頻道數並無差異，因此檢附其中一個測試頻道之測試數。

5.1.3. 測試架構圖



5.1.4. 電源端點測試結果

Site: SR2	Time: 2018/03/08 - 16:32
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: Mode 1	

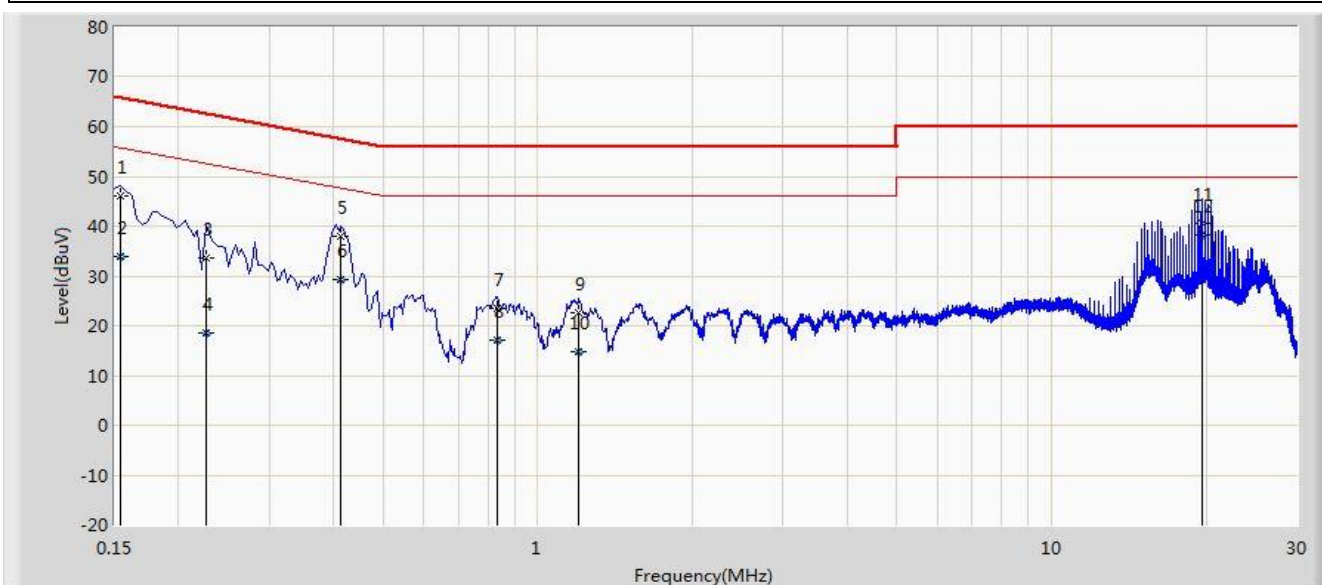


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.154	46.785	36.045	-18.997	65.781	10.740	QP
2			0.154	35.520	24.780	-20.261	55.781	10.740	AV
3			0.218	35.653	25.708	-27.242	62.895	9.945	QP
4			0.218	19.988	10.044	-32.906	52.895	9.945	AV
5			0.414	39.275	29.178	-18.293	57.568	10.097	QP
6			0.414	30.446	20.349	-17.122	47.568	10.097	AV
7			0.594	26.031	15.913	-29.969	56.000	10.118	QP
8			0.594	17.902	7.784	-28.098	46.000	10.118	AV
9			18.970	43.766	33.652	-16.234	60.000	10.113	QP
10		*	18.970	43.433	33.320	-6.567	50.000	10.113	AV
11			20.158	42.574	32.435	-17.426	60.000	10.139	QP
12			20.158	41.461	31.322	-8.539	50.000	10.139	AV

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

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

Site: SR2	Time: 2018/03/08 - 16:38
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: Mode 1	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.154	46.171	35.455	-19.611	65.781	10.716	QP
2			0.154	34.040	23.324	-21.741	55.781	10.716	AV
3			0.226	33.574	23.591	-29.022	62.595	9.982	QP
4			0.226	18.559	8.577	-34.036	52.595	9.982	AV
5			0.414	38.108	27.985	-19.459	57.568	10.123	QP
6			0.414	29.242	19.120	-18.325	47.568	10.123	AV
7			0.834	23.463	13.463	-32.537	56.000	10.001	QP
8			0.834	17.020	7.019	-28.980	46.000	10.001	AV
9			1.202	22.525	12.623	-33.475	56.000	9.902	QP
10			1.202	14.872	4.970	-31.128	46.000	9.902	AV
11			19.686	40.695	30.546	-19.305	60.000	10.149	QP
12		*	19.686	38.269	28.119	-11.731	50.000	10.149	AV

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

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

5.2. 天線之要求

5.2.1. 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。

5.2.2. 天線樣式

Antenna No.	Polarization	Frequency Band (GHz)	Model No.	Max Peak Gain (dBi)	BF Gain (dBi)	CDD Directional 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	3.01	4.0	7.01
		5		5.0	6.02	5.0	11.02
2	Omni	2.4	AP-ANT-19	3.0	3.01	3.0	6.01
		5		6.0	6.02	6.0	12.02
3	Omni	2.4	AP-ANT-1W	3.8	3.01	3.8	6.81
		5		5.8	6.02	5.8	11.82
4	Omni	2.4	AP-ANT-13B	2.3	3.01	2.3	5.31
		5		4.0	6.02	4.0	10.02
5	Omni	2.4	AP-ANT-20W	2.0	3.01	2.0	5.01
		5		2.0	6.02	2.0	8.02
6	Omni	2.4	AP-ANT-22	2.0	3.01	2.0	5.01
		5		4.0	6.02	4.0	10.02
7 (Note 3)	Directional	2.4	AP-ANT-45	4.5	0.0	4.5	4.50
		5		5.5	3.01	5.5	8.51
8 (Note 3)	Directional	2.4	AP-ANT-48	8.5	0.0	8.5	8.5
		5		8.5	3.01	8.5	11.51
9 (Note 3)	Directional	2.4	ANT-2x2-2314	14.0	0.0	14.0	14.0
10 (Note 3)	Directional	5	ANT-4x4-5314	14.0	3.01	14.0	17.01
11 (Note 3)	Directional	5	ANT-3x3-5712	11.5	3.01	11.5	14.51
12 (Note 3)	Directional	2.4	AP-ANT-25A	5.0	0.0	5.0	5.0
		5		5.0	3.01	5.0	8.01
13 (Note 3)	Directional	2.4	AP-ANT-28	7.5	0.0	7.5	7.5
		5		7.5	3.01	7.5	10.51
14	Omni	2.4	AP-ANT-16	3.9	3.01	3.9	6.91
		5		4.7	6.02	4.7	10.72
Bluetooth Internal Antenna							
PCB		2.4		6.8			

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,
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 $N_{ANT} \leq 4$;
2. The EUT also supports Beam Forming mode, and the Beam Forming support 802.11n/ac, 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, the detail see the antenna specification.
4. We selected the Omni antenna 5# (minimum antenna gain, in order to obtain the max power value shown in the grant) & Omni antenna 2# (maximum antenna gain) & Directional antenna 10# (maximum antenna gain) to perform 5GHz RF testing.

5.3. 功率限制值

5.3.1. 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，供室內操作使用，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。

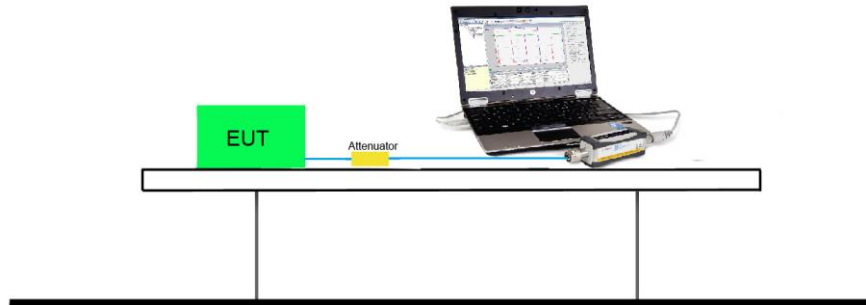
使用頻率於 5.725 GHz~5.850 GHz 頻段，最大傳導輸出功率應小於或等於 1 W。

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。

5.3.2. 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。

5.3.3. 測試架構圖



5.3.4. 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 (gray marker) for final test of each channel.

For Ant 0 / Ant 0 + 1 + 2 + 3 port of Omni Antenna (AP-ANT-20W) / CDD Mode:

Test Mode	Bandwidth	Channel	Frequency (MHz)	Data Rate/ MCS	Average Power (dBm)
802.11a	20	36	5180	6Mbps	19.40
				24Mbps	19.18
				54Mbps	18.96
802.11ac	20	36	5180	MCS0	20.13
				MCS4	19.91
				MCS8	19.75
802.11ac	40	38	5190	MCS0	14.73
				MCS4	14.52
				MCS9	14.31
802.11ac	80	42	5210	MCS0	11.88
				MCS4	11.62
				MCS9	11.43
802.11ac	80+80 Non-contiguous	42	5210	MCS0	14.71
				MCS4	14.57
				MCS9	14.38
802.11ac	80+80 Contiguous	42	5210	MCS0	15.17
				MCS4	14.97
				MCS9	14.75

Product	ACCESS POINT	Temperature	24°C
Test Engineer	Kevin Ker	Relative Humidity	59%
Test Site	SR2	Test Date	2018/01/30
Antenna Type	Omni Antenna (AP-ANT-20W)	Test Item	Output Power

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 0 + 1 + 2 + 3 (CDD Mode)										
11a	6Mbps	36	5180	19.40	18.95	19.01	19.02	25.12	≤ 30.00	Pass
11a	6Mbps	44	5220	19.94	19.46	19.70	19.57	25.69	≤ 30.00	Pass
11a	6Mbps	48	5240	20.01	19.52	19.52	19.54	25.67	≤ 30.00	Pass
11a	6Mbps	52	5260	13.97	13.60	13.41	13.58	19.67	≤ 23.89	Pass
11a	6Mbps	60	5300	14.26	13.96	13.71	14.06	20.02	≤ 23.89	Pass
11a	6Mbps	64	5320	14.40	13.79	13.62	13.56	19.88	≤ 23.89	Pass
11a	6Mbps	100	5500	13.22	12.72	12.64	12.88	18.89	≤ 23.89	Pass
11a	6Mbps	120	5600	13.20	12.70	12.75	13.02	18.94	≤ 23.89	Pass
11a	6Mbps	140	5700	13.40	12.54	12.82	13.17	19.02	≤ 23.89	Pass
11a	6Mbps	144	5720	13.90	13.13	13.30	13.65	19.53	≤ 23.89	Pass
11a	6Mbps	149	5745	22.30	21.54	22.06	22.04	28.01	≤ 30.00	Pass
11a	6Mbps	157	5785	22.39	21.73	22.02	22.10	28.09	≤ 30.00	Pass
11a	6Mbps	165	5825	22.38	21.78	22.00	21.97	28.06	≤ 30.00	Pass
11ac-VHT20	MCS0	36	5180	20.13	19.83	20.12	20.15	26.08	≤ 30.00	Pass
11ac-VHT20	MCS0	44	5220	20.29	19.80	20.02	20.06	26.07	≤ 30.00	Pass
11ac-VHT20	MCS0	48	5240	20.31	19.91	19.94	20.02	26.07	≤ 30.00	Pass
11ac-VHT20	MCS0	52	5260	14.17	13.89	13.78	14.09	20.01	≤ 23.89	Pass
11ac-VHT20	MCS0	60	5300	14.46	14.43	14.06	13.59	20.17	≤ 23.89	Pass
11ac-VHT20	MCS0	64	5320	14.66	14.23	14.07	14.15	20.30	≤ 23.89	Pass
11ac-VHT20	MCS0	100	5500	13.40	13.10	12.91	13.42	19.23	≤ 23.89	Pass
11ac-VHT20	MCS0	120	5600	13.51	13.03	13.06	13.42	19.28	≤ 23.89	Pass
11ac-VHT20	MCS0	140	5700	13.82	13.06	13.22	13.71	19.48	≤ 23.89	Pass
11ac-VHT20	MCS0	144	5720	13.72	13.09	13.20	13.62	19.44	≤ 23.89	Pass
11ac-VHT20	MCS0	149	5745	22.11	21.47	21.91	21.95	27.89	≤ 30.00	Pass
11ac-VHT20	MCS0	157	5785	22.24	21.63	21.90	22.01	27.97	≤ 30.00	Pass
11ac-VHT20	MCS0	165	5825	22.22	21.64	21.88	21.85	27.92	≤ 30.00	Pass

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 0 + 1 + 2 + 3 (CDD Mode)										
11ac-VHT40	MCS0	38	5190	14.73	14.37	14.03	14.54	20.45	≤ 30.00	Pass
11ac-VHT40	MCS0	46	5230	22.12	21.53	21.65	21.56	27.74	≤ 30.00	Pass
11ac-VHT40	MCS0	54	5270	16.81	16.54	16.43	16.41	22.57	≤ 23.98	Pass
11ac-VHT40	MCS0	62	5310	16.55	16.37	16.09	16.36	22.37	≤ 23.98	Pass
11ac-VHT40	MCS0	102	5510	16.89	16.13	16.14	16.32	22.40	≤ 23.98	Pass
11ac-VHT40	MCS0	118	5590	16.41	15.63	15.70	15.95	21.95	≤ 23.98	Pass
11ac-VHT40	MCS0	134	5670	16.54	15.60	15.91	15.77	21.99	≤ 23.98	Pass
11ac-VHT40	MCS0	142	5710	16.79	15.83	15.97	16.52	22.32	≤ 23.98	Pass
11ac-VHT40	MCS0	151	5755	22.13	21.35	21.74	21.92	27.81	≤ 30.00	Pass
11ac-VHT40	MCS0	159	5795	22.20	21.59	21.74	22.01	27.91	≤ 30.00	Pass
11ac-VHT80	MCS0	42	5210	11.88	11.26	11.16	11.80	17.56	≤ 30.00	Pass
11ac-VHT80	MCS0	58	5290	15.38	15.20	14.94	15.27	21.22	≤ 23.98	Pass
11ac-VHT80	MCS0	106	5530	13.93	13.54	13.68	13.47	19.68	≤ 23.98	Pass
11ac-VHT80	MCS0	122	5610	17.90	17.23	17.51	17.54	23.57	≤ 23.98	Pass
11ac-VHT80	MCS0	138	5690	18.10	17.19	17.67	17.54	23.66	≤ 23.98	Pass
11ac-VHT80	MCS0	155	5775	19.82	19.01	19.45	18.75	25.30	≤ 30.00	Pass
Non-contiguous 80+80 MHz mode fall within different UNII band										
11ac-VHT80+80	MCS0	42	5210	14.71	14.27	--	--	17.51	≤ 30.00	Pass
11ac-VHT80+80	MCS0	42	5210	--	--	13.75	14.66	17.24	≤ 30.00	Pass
11ac-VHT80+80	MCS0	58	5290	18.43	18.15	--	--	21.30	≤ 23.98	Pass
11ac-VHT80+80	MCS0	58	5290	--	--	17.94	18.32	21.14	≤ 23.98	Pass
11ac-VHT80+80	MCS0	106	5530	15.84	15.33	--	--	18.60	≤ 23.98	Pass
11ac-VHT80+80	MCS0	106	5530	--	--	15.43	15.60	18.53	≤ 23.98	Pass
11ac-VHT80+80	MCS0	122	5610	20.65	20.37	--	--	23.52	≤ 23.98	Pass
11ac-VHT80+80	MCS0	122	5610	--	--	20.31	20.62	23.48	≤ 23.98	Pass
11ac-VHT80+80	MCS0	138	5690	20.84	20.31	--	--	23.59	≤ 23.98	Pass
11ac-VHT80+80	MCS0	138	5690	--	--	20.35	20.64	23.51	≤ 23.98	Pass
11ac-VHT80+80	MCS0	155	5775	21.18	20.53	--	--	23.88	≤ 30.00	Pass
11ac-VHT80+80	MCS0	155	5775	--	--	21.01	21.30	24.17	≤ 30.00	Pass

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Non-contiguous 80+80MHz mode fall within same UNII band										
11ac-VHT80+80	MCS0	106	5530	16.43	15.80	--	--	22.17	≤ 23.98	Pass
11ac-VHT80+80	MCS0	138	5690	--	--	15.97	16.35			
11ac-VHT80+80	MCS0	106	5530	--	--	17.44	17.72	23.63	≤ 23.98	Pass
11ac-VHT80+80	MCS0	138	5690	17.94	17.32	--	--			
11ac-VHT80+80 (Contiguous 80+80 MHz mode)										
11ac-VHT80+80	MCS0	42	5210	15.17	14.61	--	--	17.91	≤ 30.00	Pass
	MCS0	58	5290	--	--	14.53	14.73	17.64	≤ 23.98	Pass
11ac-VHT80+80	MCS0	106	5530	18.05	17.12	--	--	23.56	≤ 23.98	Pass
	MCS0	122	5610	--	--	17.46	17.49			

Note 1: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 2: For 802.11ac-VHT80+80 mode fall within different UNII band:

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

Ant 2 & Ant 3: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$ (dBm)

For 802.11ac-VHT80+80 mode fall within same UNII band:

Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 3: For 802.11ac-VHT80+80 Contiguous Mode:

5210MHz fall within UNII-1: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)}\}$.

5290MHz fall within UNII-2A: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

5530MHz & 5610MHz Fall within UNII-2C: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 4: Average Power Limit Calculation as below:

For 5150-5250MHz & 5725-5850MHz: Limit (dBm) = 30.00dBm.

For 5250-5350MHz & 5470-5725MHz:

802.11a/VHT 20: Limit (dBm) = $11 + 10 \cdot \log (19.47\text{MHz}) = 23.89\text{dBm}$

802.11ac(VHT 40/80/80+80) : Limit (dBm) = 23.98dBm.

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 0 + 1 + 2 + 3 (Beam-Forming Mode)										
11ac-VHT20	MCS0	36	5180	20.13	19.83	20.12	20.15	26.08	≤ 27.98	Pass
11ac-VHT20	MCS0	44	5220	20.29	19.80	20.02	20.06	26.07	≤ 27.98	Pass
11ac-VHT20	MCS0	48	5240	20.31	19.91	19.94	20.02	26.07	≤ 27.98	Pass
11ac-VHT20	MCS0	52	5260	14.17	13.89	13.78	14.09	20.01	≤ 21.96	Pass
11ac-VHT20	MCS0	60	5300	14.46	14.43	14.06	13.59	20.17	≤ 21.96	Pass
11ac-VHT20	MCS0	64	5320	14.66	14.23	14.07	14.15	20.30	≤ 21.96	Pass
11ac-VHT20	MCS0	100	5500	13.40	13.10	12.91	13.42	19.23	≤ 21.96	Pass
11ac-VHT20	MCS0	120	5600	13.51	13.03	13.06	13.42	19.28	≤ 21.96	Pass
11ac-VHT20	MCS0	140	5700	13.82	13.06	13.22	13.71	19.48	≤ 21.96	Pass
11ac-VHT20	MCS0	144	5720	13.72	13.09	13.20	13.62	19.44	≤ 21.96	Pass
11ac-VHT20	MCS0	149	5745	21.63	21.12	21.35	21.59	27.45	≤ 27.98	Pass
11ac-VHT20	MCS0	157	5785	21.70	21.16	21.37	21.68	27.50	≤ 27.98	Pass
11ac-VHT20	MCS0	165	5825	21.71	21.21	21.36	21.55	27.48	≤ 27.98	Pass
11ac-VHT40	MCS0	38	5190	21.10	20.82	21.03	20.78	26.96	≤ 27.98	Pass
11ac-VHT40	MCS0	46	5230	22.05	21.66	21.60	21.68	27.77	≤ 27.98	Pass
11ac-VHT40	MCS0	54	5270	15.87	15.62	15.42	15.67	21.67	≤ 21.96	Pass
11ac-VHT40	MCS0	62	5310	15.67	15.59	15.23	15.57	21.54	≤ 21.96	Pass
11ac-VHT40	MCS0	102	5510	15.87	15.31	15.21	15.52	21.51	≤ 21.96	Pass
11ac-VHT40	MCS0	118	5590	15.89	15.34	15.32	15.58	21.56	≤ 21.96	Pass
11ac-VHT40	MCS0	134	5670	15.94	15.24	15.54	15.48	21.58	≤ 21.96	Pass
11ac-VHT40	MCS0	142	5710	15.80	15.32	15.15	15.73	21.53	≤ 21.96	Pass
11ac-VHT40	MCS0	151	5755	21.70	21.13	21.19	21.62	27.44	≤ 27.98	Pass
11ac-VHT40	MCS0	159	5795	21.77	21.26	21.24	21.68	27.51	≤ 27.98	Pass
11ac-VHT80	MCS0	42	5210	18.76	18.57	18.66	18.29	24.59	≤ 27.98	Pass
11ac-VHT80	MCS0	58	5290	15.98	15.72	15.51	15.72	21.76	≤ 21.96	Pass
11ac-VHT80	MCS0	106	5530	16.06	15.50	15.42	15.64	21.68	≤ 21.96	Pass
11ac-VHT80	MCS0	122	5610	15.91	15.42	15.45	15.56	21.61	≤ 21.96	Pass
11ac-VHT80	MCS0	138	5690	16.08	15.33	15.60	15.51	21.66	≤ 21.96	Pass
11ac-VHT80	MCS0	155	5775	21.61	21.21	21.34	21.57	27.46	≤ 27.98	Pass

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Non-contiguous 80+80 MHz mode fall within different UNII band										
11ac-VHT80+80	MCS0	42	5210	20.65	20.24	--	--	23.46	≤ 30.00	Pass
11ac-VHT80+80	MCS0	42	5210	--	--	22.33	22.10	25.23	≤ 30.00	Pass
11ac-VHT80+80	MCS0	58	5290	18.81	18.58	--	--	21.71	≤ 23.98	Pass
11ac-VHT80+80	MCS0	58	5290	--	--	18.45	18.70	21.59	≤ 23.98	Pass
11ac-VHT80+80	MCS0	106	5530	18.78	18.21	--	--	21.51	≤ 23.98	Pass
11ac-VHT80+80	MCS0	106	5530	--	--	18.28	18.60	21.45	≤ 23.98	Pass
11ac-VHT80+80	MCS0	122	5610	18.62	18.23	--	--	21.44	≤ 23.98	Pass
11ac-VHT80+80	MCS0	122	5610	--	--	18.34	18.54	21.45	≤ 23.98	Pass
11ac-VHT80+80	MCS0	138	5690	18.86	18.18	--	--	21.54	≤ 23.98	Pass
11ac-VHT80+80	MCS0	138	5690	--	--	18.46	18.52	21.50	≤ 23.98	Pass
11ac-VHT80+80	MCS0	155	5775	22.20	21.66	--	--	24.95	≤ 30.00	Pass
11ac-VHT80+80	MCS0	155	5775	--	--	22.04	22.20	25.13	≤ 30.00	Pass
Non-contiguous 80+80 MHz mode fall within same UNII band										
11ac-VHT80+80	MCS0	106	5530	15.90	15.49	--	--	21.67	≤ 23.98	Pass
11ac-VHT80+80	MCS0	138	5690	--	--	15.60	15.60			
11ac-VHT80+80	MCS0	106	5530	--	--	15.35	15.61	21.59	≤ 23.98	Pass
11ac-VHT80+80	MCS0	138	5690	15.94	15.33	--	--			

Note 1: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 2: For 802.11ac-VHT80+80 mode fall within different UNII band:

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

Ant 2 & Ant 3: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$ (dBm)

For 802.11ac-VHT80+80 mode fall within same UNII band:

Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 3: Average Power Limit Calculation as below:

For 5150-5250MHz & 5725-5850MHz:

802.11ac-VHT20/ac-VHT40/ac-VHT80: Limit (dBm) = 30dBm - (2dBi + 6.02dBi - 6dBi) = 27.98 dBm

802.11ac-VHT80+80: Limit (dBm) = 30.00 dBm (2+3.01<6dBi)

For 5250-5350MHz & 5470-5725MHz:

802.11ac-VHT20/ac-VHT40/ac-VHT80: Limit (dBm) = 23.98dBm - (2dBi + 6.02dBi - 6dBi) = 21.96 dBm.

802.11ac-VHT80+80: Limit (dBm) = 23.98 dBm (2+3.01<6dBi).

Product	ACCESS POINT	Temperature	24°C
Test Engineer	Kevin Ker	Relative Humidity	59%
Test Site	SR2	Test Date	2017/08/15
Antenna Type	Omni Antenna (AP-ANT-19)	Test Item	Output Power

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 0 + 1 + 2 + 3 (CDD Mode)										
11a	6Mbps	36	5180	15.55	15.62	15.14	14.94	21.34	≤ 30.00	Pass
11a	6Mbps	44	5220	15.97	15.75	15.44	15.36	21.66	≤ 30.00	Pass
11a	6Mbps	48	5240	16.11	15.94	15.15	15.07	21.61	≤ 30.00	Pass
11a	6Mbps	149	5745	21.78	20.97	20.13	20.51	26.91	≤ 30.00	Pass
11a	6Mbps	157	5785	22.77	22.15	21.61	22.15	28.21	≤ 30.00	Pass
11a	6Mbps	165	5825	21.46	21.23	21.13	21.42	27.33	≤ 30.00	Pass
11n-HT20	MCS0	36	5180	17.61	17.02	15.77	16.03	22.69	≤ 30.00	Pass
11n-HT20	MCS0	44	5220	16.05	15.83	15.22	15.21	21.61	≤ 30.00	Pass
11n-HT20	MCS0	48	5240	17.13	16.92	15.62	15.57	22.39	≤ 30.00	Pass
11n-HT20	MCS0	149	5745	22.14	21.65	20.64	21.27	27.48	≤ 30.00	Pass
11n-HT20	MCS0	157	5785	23.11	22.68	22.06	22.40	28.60	≤ 30.00	Pass
11n-HT20	MCS0	165	5825	21.89	21.09	21.16	21.36	27.41	≤ 30.00	Pass
11n-HT40	MCS0	38	5190	15.70	15.53	14.96	15.04	21.34	≤ 30.00	Pass
11n-HT40	MCS0	46	5230	18.60	18.48	17.66	17.78	24.17	≤ 30.00	Pass
11n-HT40	MCS0	151	5755	21.93	21.17	20.51	20.83	27.16	≤ 30.00	Pass
11n-HT40	MCS0	159	5795	22.28	21.57	21.28	21.56	27.71	≤ 30.00	Pass
11ac-VHT20	MCS0	36	5180	16.61	16.53	15.94	16.04	22.31	≤ 30.00	Pass
11ac-VHT20	MCS0	44	5220	16.68	16.43	16.14	15.34	22.20	≤ 30.00	Pass
11ac-VHT20	MCS0	48	5240	16.39	16.27	15.67	15.78	22.06	≤ 30.00	Pass
11ac-VHT20	MCS0	149	5745	22.14	21.51	20.32	20.84	27.28	≤ 30.00	Pass
11ac-VHT20	MCS0	157	5785	23.31	22.66	22.11	22.53	28.69	≤ 30.00	Pass
11ac-VHT20	MCS0	165	5825	22.13	21.14	21.35	21.62	27.60	≤ 30.00	Pass
11ac-VHT40	MCS0	38	5190	16.12	15.77	15.46	15.39	21.72	≤ 30.00	Pass
11ac-VHT40	MCS0	46	5230	18.92	18.37	17.88	18.04	24.34	≤ 30.00	Pass
11ac-VHT40	MCS0	151	5755	22.28	21.36	20.58	20.96	27.36	≤ 30.00	Pass
11ac-VHT40	MCS0	159	5795	22.28	21.53	21.26	21.63	27.71	≤ 30.00	Pass

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
11ac-VHT80	MCS0	42	5210	14.54	14.21	13.69	12.90	19.90	≤ 30.00	Pass
11ac-VHT80	MCS0	155	5775	20.78	19.89	19.68	19.61	26.04	≤ 30.00	Pass
11ac-VHT80+80	MCS0	42	5210	15.73	14.31	--	--	18.09	≤ 30.00	Pass
11ac-VHT80+80	MCS0	42	5210	--	--	14.32	14.67	17.51	≤ 30.00	Pass
11ac-VHT80+80	MCS0	155	5775	22.04	21.27	--	--	24.68	≤ 30.00	Pass
11ac-VHT80+80	MCS0	155	5775	--	--	22.15	21.59	24.89	≤ 30.00	Pass

Note 1: The Total Average Power (dBm) = $10 \cdot \log\{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 2: For 802.11ac-VHT80+80:

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

Ant 2 & Ant 3: The Total Average Power (dBm) = $10 \cdot \log\{10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$ (dBm)

Note 3: Average Power Limit (dBm) = 30.00dBm.

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 0 + 1 + 2 + 3 (Beam-Forming Mode)										
11n-HT20	MCS0	36	5180	17.61	17.02	15.77	16.03	22.69	≤ 23.98	Pass
11n-HT20	MCS0	44	5220	16.05	15.83	15.22	15.21	21.61	≤ 23.98	Pass
11n-HT20	MCS0	48	5240	17.13	16.92	15.62	15.57	22.39	≤ 23.98	Pass
11n-HT20	MCS0	149	5745	18.61	17.85	16.83	17.35	23.73	≤ 23.98	Pass
11n-HT20	MCS0	157	5785	18.29	17.62	17.60	17.44	23.77	≤ 23.98	Pass
11n-HT20	MCS0	165	5825	17.86	17.31	17.15	17.56	23.50	≤ 23.98	Pass
11n-HT40	MCS0	38	5190	17.88	17.71	17.22	17.21	23.54	≤ 23.98	Pass
11n-HT40	MCS0	46	5230	17.83	17.46	16.84	17.16	23.36	≤ 23.98	Pass
11n-HT40	MCS0	151	5755	18.47	17.87	16.63	17.36	23.66	≤ 23.98	Pass
11n-HT40	MCS0	159	5795	18.34	17.55	17.25	17.42	23.68	≤ 23.98	Pass
11ac-VHT20	MCS0	36	5180	16.61	16.53	15.94	16.04	22.31	≤ 23.98	Pass
11ac-VHT20	MCS0	44	5220	16.68	16.43	16.14	15.34	22.20	≤ 23.98	Pass
11ac-VHT20	MCS0	48	5240	16.39	16.27	15.67	14.78	21.84	≤ 23.98	Pass
11ac-VHT20	MCS0	149	5745	18.66	17.78	16.76	17.35	23.71	≤ 23.98	Pass
11ac-VHT20	MCS0	157	5785	18.11	17.46	16.84	17.56	23.54	≤ 23.98	Pass
11ac-VHT20	MCS0	165	5825	18.14	17.51	17.79	17.85	23.85	≤ 23.98	Pass
11ac-VHT40	MCS0	38	5190	18.06	17.72	17.45	17.26	23.65	≤ 23.98	Pass
11ac-VHT40	MCS0	46	5230	18.49	17.74	17.69	17.16	23.82	≤ 23.98	Pass
11ac-VHT40	MCS0	151	5755	18.39	17.61	16.91	17.08	23.56	≤ 23.98	Pass
11ac-VHT40	MCS0	159	5795	18.24	17.14	17.20	17.13	23.47	≤ 23.98	Pass
11ac-VHT80	MCS0	42	5210	18.03	17.83	17.50	17.69	23.79	≤ 23.98	Pass
11ac-VHT80	MCS0	155	5775	18.23	17.39	16.84	17.01	23.42	≤ 23.98	Pass
11ac-VHT80+80	MCS0	42	5210	15.84	14.93	--	--	18.42	≤ 26.99	Pass
11ac-VHT80+80	MCS0	42	5210	--	--	14.78	14.82	17.81	≤ 26.99	Pass
11ac-VHT80+80	MCS0	155	5775	22.06	21.24	--	--	24.68	≤ 26.99	Pass
11ac-VHT80+80	MCS0	155	5775	--	--	22.13	21.62	24.89	≤ 26.99	Pass

Note 1: The Total Average Power (dBm) = $10 \cdot \log\{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 2: For 802.11ac-VHT80+80:

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

Ant 2 & Ant 3: The Total Average Power (dBm) = $10 \cdot \log\{10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$ (dBm)

Note 3: Average Power Limit (dBm) = 30dBm - (6.00dBi - 6.02dBi - 6.00dBi) = 23.98dBm.

For 802.11ac-VHT80+80: Average Power Limit (dBm) = 30dBm - (6.00dBi + 3.01dBi - 6.00dBi) = 26.99dBm.

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 0 + 1 + 2 + 3 (CDD Mode)										
11a	6Mbps	52	5260	10.16	9.92	8.81	9.07	15.55	≤ 23.98	Pass
11a	6Mbps	60	5300	10.18	10.02	9.28	9.76	15.84	≤ 23.98	Pass
11a	6Mbps	64	5320	10.18	9.80	9.37	9.64	15.78	≤ 23.98	Pass
11a	6Mbps	100	5500	9.81	9.78	9.25	9.72	15.67	≤ 23.98	Pass
11a	6Mbps	120	5600	9.52	9.27	9.88	9.67	15.61	≤ 23.98	Pass
11a	6Mbps	140	5700	10.74	9.84	8.83	9.38	15.78	≤ 23.98	Pass
11a	6Mbps	144	5720	10.05	9.29	8.30	8.84	15.19	≤ 23.98	Pass
11n-HT20	MCS0	52	5260	11.02	10.49	9.48	9.62	16.22	≤ 23.98	Pass
11n-HT20	MCS0	60	5300	11.06	10.44	9.57	9.82	16.28	≤ 23.98	Pass
11n-HT20	MCS0	64	5320	11.56	10.85	10.05	10.22	16.73	≤ 23.98	Pass
11n-HT20	MCS0	100	5500	11.16	10.43	10.35	10.04	16.54	≤ 23.98	Pass
11n-HT20	MCS0	120	5600	11.18	10.46	10.12	10.22	16.54	≤ 23.98	Pass
11n-HT20	MCS0	140	5700	10.38	9.44	8.97	8.91	15.49	≤ 23.98	Pass
11n-HT20	MCS0	144	5720	10.53	9.51	8.63	9.05	15.51	≤ 23.98	Pass
11n-HT40	MCS0	54	5270	13.10	13.15	12.35	11.86	18.67	≤ 23.98	Pass
11n-HT40	MCS0	62	5310	13.40	13.21	12.67	12.40	18.96	≤ 23.98	Pass
11n-HT40	MCS0	102	5510	11.69	11.66	11.87	11.69	17.75	≤ 23.98	Pass
11n-HT40	MCS0	118	5590	12.43	12.23	13.23	12.01	18.52	≤ 23.98	Pass
11n-HT40	MCS0	134	5670	13.04	12.45	12.38	12.20	18.55	≤ 23.98	Pass
11n-HT40	MCS0	142	5710	13.49	12.72	11.85	12.15	18.62	≤ 23.98	Pass
11ac-VHT20	MCS0	52	5260	10.52	10.30	9.71	8.87	15.92	≤ 23.98	Pass
11ac-VHT20	MCS0	60	5300	10.29	10.27	9.60	9.75	16.01	≤ 23.98	Pass
11ac-VHT20	MCS0	64	5320	10.18	9.86	9.93	10.03	16.02	≤ 23.98	Pass
11ac-VHT20	MCS0	100	5500	9.63	9.51	10.33	9.26	15.72	≤ 23.98	Pass
11ac-VHT20	MCS0	120	5600	9.62	9.43	10.20	10.13	15.88	≤ 23.98	Pass
11ac-VHT20	MCS0	140	5700	10.54	9.77	8.90	9.41	15.72	≤ 23.98	Pass
11ac-VHT20	MCS0	144	5720	10.66	9.84	8.84	9.16	15.70	≤ 23.98	Pass

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 0 + 1 + 2 + 3 (CDD Mode)										
11ac-VHT40	MCS0	54	5270	13.54	13.24	12.68	12.19	18.96	≤ 23.98	Pass
11ac-VHT40	MCS0	62	5310	13.39	13.39	12.51	12.30	18.95	≤ 23.98	Pass
11ac-VHT40	MCS0	102	5510	12.46	12.49	12.75	12.38	18.54	≤ 23.98	Pass
11ac-VHT40	MCS0	118	5590	11.21	11.33	12.27	11.59	17.64	≤ 23.98	Pass
11ac-VHT40	MCS0	134	5670	13.33	12.68	12.56	12.30	18.75	≤ 23.98	Pass
11ac-VHT40	MCS0	142	5710	13.44	12.24	12.21	12.51	18.65	≤ 23.98	Pass
11ac-VHT80	MCS0	58	5290	16.28	16.13	15.61	15.71	21.96	≤ 30.00	Pass
11ac-VHT80	MCS0	106	5530	15.89	15.89	16.09	16.18	22.03	≤ 23.98	Pass
11ac-VHT80	MCS0	122	5610	15.32	14.93	15.91	15.26	21.39	≤ 23.98	Pass
11ac-VHT80	MCS0	138	5690	16.20	15.54	15.12	14.99	21.51	≤ 23.98	Pass
Non-contiguous 80+80 MHz mode fall within different UNII band										
11ac-VHT80+80	MCS0	58	5290	17.40	16.85	--	--	20.14	≤ 23.98	Pass
11ac-VHT80+80	MCS0	58	5290	--	--	16.87	16.94	19.92	≤ 23.98	Pass
11ac-VHT80+80	MCS0	106	5530	17.43	16.82	--	--	20.15	≤ 23.98	Pass
11ac-VHT80+80	MCS0	106	5530	--	--	16.54	16.63	19.60	≤ 23.98	Pass
11ac-VHT80+80	MCS0	122	5610	20.19	20.11	--	--	23.16	≤ 23.98	Pass
11ac-VHT80+80	MCS0	122	5610	--	--	19.86	19.97	22.93	≤ 23.98	Pass
11ac-VHT80+80	MCS0	138	5690	20.68	20.67	--	--	23.69	≤ 23.98	Pass
11ac-VHT80+80	MCS0	138	5690	--	--	20.91	20.72	23.83	≤ 23.98	Pass
Non-contiguous 80+80 MHz mode fall within same UNII band										
11ac-VHT80+80	MCS0	106	5530	17.46	17.39	--	--	23.58	≤ 23.98	Pass
11ac-VHT80+80	MCS0	138	5690	--	--	17.54	17.83			
11ac-VHT80+80	MCS0	106	5530	--	--	17.31	17.44	23.40	≤ 23.98	Pass
11ac-VHT80+80	MCS0	138	5690	17.52	17.26	--	--			

Mode	Ch. No.	Test Frequency (MHz)	Data Rate/ MCS	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
11ac-VHT80+80 (Contiguous 80+80 MHz mode)										
11ac-VHT 80+80	42	5210	MCS0	16.00	16.10	--	--	19.06	≤ 30.00	Pass
	58	5290	MCS0	--	--	16.01	16.01	19.02	≤ 23.98	Pass
11ac-VHT 80+80	106	5530	MCS0	15.57	15.45	--	--	21.48	≤ 23.98	Pass
	122	5610	MCS0	--	--	15.31	15.49			

Note 1: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 2: For 802.11ac-VHT80+80 mode fall within different UNII band:

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

Ant 2 & Ant 3: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$ (dBm)

For 802.11ac-VHT80+80 mode fall within same UNII band:

Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 3: For 802.11ac-VHT80+80 Contiguous Mode

5210MHz Fall within UNII-1: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)}\}$.

5290MHz Fall within UNII-2A: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

5530MHz & 5610MHz Fall within UNII-2C: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 4: Average Power Limit Calculation as below:

For 5150 - 5250 MHz, Limit = 30.00 dBm.

For 5250 - 5350MHz, 5470 - 5725MHz, Limit = 23.98dBm.

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 0 + 1 + 2 + 3 (Beam-Forming Mode)										
11n-HT20	MCS0	52	5260	11.02	10.49	9.48	9.62	16.22	≤ 17.98	Pass
11n-HT20	MCS0	60	5300	11.06	10.44	9.57	9.82	16.28	≤ 17.98	Pass
11n-HT20	MCS0	64	5320	11.56	10.85	10.05	10.22	16.73	≤ 17.98	Pass
11n-HT20	MCS0	100	5500	11.16	10.43	10.35	10.04	16.54	≤ 17.98	Pass
11n-HT20	MCS0	120	5600	11.18	10.46	10.12	10.22	16.54	≤ 17.98	Pass
11n-HT20	MCS0	140	5700	10.38	9.44	8.97	8.91	15.49	≤ 17.98	Pass
11n-HT20	MCS0	144	5720	10.53	9.51	8.63	9.05	15.51	≤ 17.98	Pass
11n-HT40	MCS0	54	5270	12.19	12.23	11.32	11.34	17.81	≤ 17.98	Pass
11n-HT40	MCS0	62	5310	12.05	12.02	11.17	11.37	17.69	≤ 17.98	Pass
11n-HT40	MCS0	102	5510	11.69	11.66	11.87	11.69	17.75	≤ 17.98	Pass
11n-HT40	MCS0	118	5590	11.52	11.47	12.15	11.81	17.77	≤ 17.98	Pass
11n-HT40	MCS0	134	5670	12.08	11.51	11.27	11.22	17.55	≤ 17.98	Pass
11n-HT40	MCS0	142	5710	12.57	11.69	10.68	11.05	17.58	≤ 17.98	Pass
11ac-VHT20	MCS0	52	5260	10.52	10.30	9.71	8.87	15.92	≤ 17.98	Pass
11ac-VHT20	MCS0	60	5300	10.29	10.27	9.60	9.75	16.01	≤ 17.98	Pass
11ac-VHT20	MCS0	64	5320	10.18	9.86	9.93	10.03	16.02	≤ 17.98	Pass
11ac-VHT20	MCS0	100	5500	9.63	9.51	10.33	9.26	15.72	≤ 17.98	Pass
11ac-VHT20	MCS0	120	5600	9.62	9.43	10.20	10.13	15.88	≤ 17.98	Pass
11ac-VHT20	MCS0	140	5700	10.54	9.77	8.90	9.41	15.72	≤ 17.98	Pass
11ac-VHT20	MCS0	144	5720	10.66	9.84	8.84	9.16	15.70	≤ 17.98	Pass
11ac-VHT40	MCS0	54	5270	12.21	12.11	11.30	11.34	17.78	≤ 17.98	Pass
11ac-VHT40	MCS0	62	5310	11.84	12.01	11.33	11.27	17.64	≤ 17.98	Pass
11ac-VHT40	MCS0	102	5510	11.46	11.42	11.92	11.58	17.62	≤ 17.98	Pass
11ac-VHT40	MCS0	118	5590	11.21	11.33	12.27	11.59	17.64	≤ 17.98	Pass
11ac-VHT40	MCS0	134	5670	11.85	11.31	11.54	11.24	17.51	≤ 17.98	Pass
11ac-VHT40	MCS0	142	5710	12.34	11.39	11.10	11.06	17.52	≤ 17.98	Pass
11ac-VHT80	MCS0	58	5290	12.16	11.91	11.20	11.37	17.70	≤ 24.00	Pass
11ac-VHT80	MCS0	106	5530	11.62	11.56	12.16	11.49	17.74	≤ 17.98	Pass
11ac-VHT80	MCS0	122	5610	11.41	11.02	11.82	11.68	17.51	≤ 17.98	Pass
11ac-VHT80	MCS0	138	5690	12.38	11.49	11.31	10.88	17.57	≤ 17.98	Pass

Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 0 + 1 + 2 + 3 (Beam-Forming Mode)										
Non-contiguous 80+80 MHz mode fall within different UNII band										
11ac-VHT80+80	MCS0	58	5290	17.60	17.45	--	--	20.54	≤ 20.98	Pass
11ac-VHT80+80	MCS0	58	5290	--	--	17.81	17.23	20.54	≤ 20.98	Pass
11ac-VHT80+80	MCS0	106	5530	17.74	17.25	--	--	20.51	≤ 20.98	Pass
11ac-VHT80+80	MCS0	106	5530	--	--	18.08	17.57	20.84	≤ 20.98	Pass
11ac-VHT80+80	MCS0	122	5610	17.68	17.50	--	--	20.60	≤ 20.98	Pass
11ac-VHT80+80	MCS0	122	5610	--	--	18.10	17.56	20.85	≤ 20.98	Pass
11ac-VHT80+80	MCS0	138	5690	17.71	17.49	--	--	20.61	≤ 20.98	Pass
11ac-VHT80+80	MCS0	138	5690	--	--	18.21	17.51	20.88	≤ 20.98	Pass
Non-contiguous 80+80 MHz mode fall within same UNII band										
11ac-VHT80+80	MCS0	106	5530	14.57	14.46	--	--	20.63	≤ 20.98	Pass
11ac-VHT80+80	MCS0	138	5690	--	--	14.54	14.84			
11ac-VHT80+80	MCS0	106	5530	--	--	14.24	14.38	20.38	≤ 20.98	Pass
11ac-VHT80+80	MCS0	138	5690	14.39	14.41	--	--			

Note 1: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 2: For 802.11ac-VHT80+80 mode fall within different UNII band:

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

Ant 2 & Ant 3: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$ (dBm)

For 802.11ac-VHT80+80 mode fall within same UNII band:

Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 3: Average Power Limit Calculation as below:

For 5250 - 5350MHz, 5470 - 5725MHz:

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

Limit = 23.98dBm - (6dBi + 6dBi - 6dBi) = **17.98dBm**

802.11ac-VHT80+80:

Limit = 23.98dBm - (6dBi + 3dBi - 6dBi) = **20.98dBm**.

Product	ACCESS POINT	Temperature	24°C
Test Engineer	Kevin Ker	Relative Humidity	59%
Test Site	SR2	Test Date	2018/01/31
Antenna Type	Directional Antenna (ANT-4x4-5314)	Test Item	Output Power

Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 0 + 1 + 2 + 3 (CDD Mode)										
11a	6Mbps	36	5180	11.29	10.75	10.96	10.83	16.98	≤ 22.00	Pass
11a	6Mbps	44	5220	11.35	10.82	10.97	10.85	17.02	≤ 22.00	Pass
11a	6Mbps	48	5240	11.23	10.87	10.78	10.85	16.96	≤ 22.00	Pass
11a	6Mbps	52	5260	4.58	4.34	4.06	4.09	10.29	≤ 15.89	Pass
11a	6Mbps	60	5300	4.29	4.19	3.76	4.05	10.10	≤ 15.89	Pass
11a	6Mbps	64	5320	4.75	4.47	4.18	4.37	10.47	≤ 15.89	Pass
11a	6Mbps	100	5500	4.13	3.83	3.60	4.01	9.92	≤ 15.89	Pass
11a	6Mbps	120	5600	4.18	3.86	3.44	4.02	9.90	≤ 15.89	Pass
11a	6Mbps	140	5700	4.83	4.22	4.20	4.46	10.46	≤ 15.89	Pass
11a	6Mbps	144	5720	5.23	4.70	4.70	4.87	10.90	≤ 15.89	Pass
11a	6Mbps	149	5745	15.78	15.53	15.36	15.57	21.58	≤ 22.00	Pass
11a	6Mbps	157	5785	15.74	15.38	15.42	15.61	21.56	≤ 22.00	Pass
11a	6Mbps	165	5825	14.75	14.23	14.31	14.31	20.43	≤ 22.00	Pass
11ac-VHT20	MCS0	36	5180	11.48	10.85	11.20	11.03	17.17	≤ 22.00	Pass
11ac-VHT20	MCS0	44	5220	11.02	10.47	10.76	10.65	16.75	≤ 22.00	Pass
11ac-VHT20	MCS0	48	5240	10.92	10.49	10.49	10.63	16.66	≤ 22.00	Pass
11ac-VHT20	MCS0	52	5260	4.91	4.45	4.38	4.40	10.56	≤ 15.98	Pass
11ac-VHT20	MCS0	60	5300	4.71	4.46	4.08	4.43	10.45	≤ 15.98	Pass
11ac-VHT20	MCS0	64	5320	5.06	4.80	4.37	4.66	10.75	≤ 15.98	Pass
11ac-VHT20	MCS0	100	5500	4.43	4.04	3.87	4.24	10.17	≤ 15.98	Pass
11ac-VHT20	MCS0	120	5600	4.48	4.06	3.65	4.29	10.15	≤ 15.98	Pass
11ac-VHT20	MCS0	140	5700	5.21	4.25	4.45	4.80	10.71	≤ 15.98	Pass
11ac-VHT20	MCS0	144	5720	5.13	4.47	4.52	4.68	10.73	≤ 15.98	Pass
11ac-VHT20	MCS0	149	5745	16.03	15.67	15.65	15.87	21.83	≤ 22.00	Pass
11ac-VHT20	MCS0	157	5785	15.92	15.48	15.64	15.90	21.76	≤ 22.00	Pass
11ac-VHT20	MCS0	165	5825	14.58	14.08	14.18	14.21	20.29	≤ 22.00	Pass

Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 0 + 1 + 2 + 3 (CDD Mode)										
11ac-VHT40	MCS0	38	5190	11.96	11.48	11.65	11.61	17.70	≤ 22.00	Pass
11ac-VHT40	MCS0	46	5230	13.59	13.87	13.12	13.23	19.48	≤ 22.00	Pass
11ac-VHT40	MCS0	54	5270	7.21	7.19	6.87	6.96	13.08	≤ 15.98	Pass
11ac-VHT40	MCS0	62	5310	7.15	7.16	6.61	6.91	12.98	≤ 15.98	Pass
11ac-VHT40	MCS0	102	5510	7.03	6.74	6.48	6.63	12.75	≤ 15.98	Pass
11ac-VHT40	MCS0	118	5590	7.17	6.67	6.52	6.84	12.83	≤ 15.98	Pass
11ac-VHT40	MCS0	134	5670	7.82	7.19	7.16	7.28	13.39	≤ 15.98	Pass
11ac-VHT40	MCS0	142	5710	7.63	7.01	7.10	7.22	13.27	≤ 15.98	Pass
11ac-VHT40	MCS0	151	5755	16.03	15.48	15.58	15.81	21.75	≤ 22.00	Pass
11ac-VHT40	MCS0	159	5795	16.08	15.55	15.72	15.79	21.81	≤ 22.00	Pass
11ac-VHT80	MCS0	42	5210	9.04	8.61	8.69	8.47	14.73	≤ 22.00	Pass
11ac-VHT80	MCS0	58	5290	10.01	9.65	9.48	9.65	15.72	≤ 15.98	Pass
11ac-VHT80	MCS0	106	5530	9.92	9.63	9.26	9.54	15.61	≤ 15.98	Pass
11ac-VHT80	MCS0	122	5610	10.02	9.72	9.12	9.57	15.64	≤ 15.98	Pass
11ac-VHT80	MCS0	138	5690	10.17	9.53	9.40	9.39	15.66	≤ 15.98	Pass
11ac-VHT80	MCS0	155	5775	15.05	14.62	14.74	14.66	20.79	≤ 22.00	Pass
Non-contiguous 80+80 MHz mode fall within different UNII band										
11ac-VHT80+80	MCS0	42	5210	12.98	12.42	--	--	15.72	≤ 22.00	Pass
11ac-VHT80+80	MCS0	42	5210	--	--	13.50	12.64	16.10	≤ 22.00	Pass
11ac-VHT80+80	MCS0	58	5290	13.09	12.49	--	--	15.81	≤ 15.98	Pass
11ac-VHT80+80	MCS0	58	5290	--	--	12.38	12.85	15.63	≤ 15.98	Pass
11ac-VHT80+80	MCS0	106	5530	12.93	12.39	--	--	15.68	≤ 15.98	Pass
11ac-VHT80+80	MCS0	106	5530	--	--	12.22	12.57	15.41	≤ 15.98	Pass
11ac-VHT80+80	MCS0	122	5610	12.80	12.48	--	--	15.65	≤ 15.98	Pass
11ac-VHT80+80	MCS0	122	5610	--	--	12.19	12.57	15.39	≤ 15.98	Pass
11ac-VHT80+80	MCS0	138	5690	12.97	12.35	--	--	15.68	≤ 15.98	Pass
11ac-VHT80+80	MCS0	138	5690	--	--	12.54	12.41	15.49	≤ 15.98	Pass
11ac-VHT80+80	MCS0	155	5775	17.80	17.32	--	--	20.58	≤ 22.00	Pass
11ac-VHT80+80	MCS0	155	5775	--	--	18.78	18.77	21.79	≤ 22.00	Pass

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Non-contiguous 80+80 MHz mode fall within same UNII band										
11ac-VHT80+80	MCS0	106	5530	9.87	9.33	--	--	15.48	≤ 15.98	Pass
11ac-VHT80+80	MCS0	138	5690	--	--	9.35	9.28			
11ac-VHT80+80	MCS0	106	5530	--	--	9.17	9.42	15.50	≤ 15.98	Pass
11ac-VHT80+80	MCS0	138	5690	9.98	9.32	--	--			
11ac-VHT80+80 (Contiguous 80+80 MHz mode)										
11ac-VHT80+80	MCS0	42	5210	11.26	10.54	--	--	13.93	≤ 22.00	Pass
	MCS0	58	5290	--	--	10.32	10.72	13.53	≤ 15.98	Pass
11ac-VHT80+80	MCS0	106	5530	9.75	9.36	--	--	15.40	≤ 15.98	Pass
	MCS0	122	5610	--	--	8.97	9.39			

Note 1: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 2: For 802.11ac-VHT80+80 mode fall within different UNII band:

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

Ant 2 & Ant 3: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$ (dBm)

For 802.11ac-VHT80+80 mode fall within same UNII band:

Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 3: For 802.11ac-VHT80+80 Contiguous Mode:

5210MHz fall within UNII-1: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)}\}$.

5290MHz fall within UNII-2A: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

5530MHz & 5610MHz Fall within UNII-2C: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 4: Average Power Limit Calculation as below:

For 5150-5250MHz & 5725-5850MHz: Limit (dBm) = 30.00dBm - (14dBi - 6dBi) = 22.00 dBm.

For 5250-5350MHz & 5470-5725MHz:

802.11a: Limit (dBm) = $[11 + 10 \cdot \log (19.47\text{MHz})] - (14\text{dBi} - 6\text{dBi}) = 15.89\text{dBm}$

802.11ac: Limit (dBm) = 23.98dBm - (14dBi - 6dBi) = 15.98dBm.

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Ant 0 + 1 + 2 + 3 (Beam-Forming Mode)										
11ac-VHT20	MCS0	36	5180	11.48	10.85	11.20	11.03	17.17	≤ 18.99	Pass
11ac-VHT20	MCS0	44	5220	11.02	10.47	10.76	10.65	16.75	≤ 18.99	Pass
11ac-VHT20	MCS0	48	5240	10.92	10.49	10.49	10.63	16.66	≤ 18.99	Pass
11ac-VHT20	MCS0	52	5260	4.91	4.45	4.38	4.40	10.56	≤ 12.97	Pass
11ac-VHT20	MCS0	60	5300	4.71	4.46	4.08	4.43	10.45	≤ 12.97	Pass
11ac-VHT20	MCS0	64	5320	5.06	4.80	4.37	4.66	10.75	≤ 12.97	Pass
11ac-VHT20	MCS0	100	5500	4.43	4.04	3.87	4.24	10.17	≤ 12.97	Pass
11ac-VHT20	MCS0	120	5600	4.48	4.06	3.65	4.29	10.15	≤ 12.97	Pass
11ac-VHT20	MCS0	140	5700	5.21	4.25	4.45	4.80	10.71	≤ 12.97	Pass
11ac-VHT20	MCS0	144	5720	5.13	4.47	4.52	4.68	10.73	≤ 12.97	Pass
11ac-VHT20	MCS0	149	5745	12.69	12.13	12.36	12.42	18.43	≤ 18.99	Pass
11ac-VHT20	MCS0	157	5785	12.60	12.23	12.35	12.53	18.45	≤ 18.99	Pass
11ac-VHT20	MCS0	165	5825	12.71	12.17	12.40	12.46	18.46	≤ 18.99	Pass
11ac-VHT40	MCS0	38	5190	11.96	11.48	11.65	11.61	17.70	≤ 18.99	Pass
11ac-VHT40	MCS0	46	5230	13.04	13.32	12.60	12.68	18.94	≤ 18.99	Pass
11ac-VHT40	MCS0	54	5270	7.13	7.15	6.61	6.73	12.93	≤ 12.97	Pass
11ac-VHT40	MCS0	62	5310	7.11	7.13	6.63	6.81	12.95	≤ 12.97	Pass
11ac-VHT40	MCS0	102	5510	7.03	6.74	6.48	6.63	12.75	≤ 12.97	Pass
11ac-VHT40	MCS0	118	5590	7.17	6.67	6.52	6.84	12.83	≤ 12.97	Pass
11ac-VHT40	MCS0	134	5670	7.31	6.63	6.58	6.68	12.83	≤ 12.97	Pass
11ac-VHT40	MCS0	142	5710	7.12	6.47	6.54	6.71	12.74	≤ 12.97	Pass
11ac-VHT40	MCS0	151	5755	13.21	12.64	12.70	12.89	18.89	≤ 18.99	Pass
11ac-VHT40	MCS0	159	5795	12.73	12.22	12.26	12.45	18.44	≤ 18.99	Pass
11ac-VHT80	MCS0	42	5210	12.98	12.44	12.48	12.54	18.64	≤ 18.99	Pass
11ac-VHT80	MCS0	58	5290	6.72	6.31	6.18	6.24	12.39	≤ 12.97	Pass
11ac-VHT80	MCS0	106	5530	7.05	6.50	6.26	6.55	12.62	≤ 12.97	Pass
11ac-VHT80	MCS0	122	5610	6.94	6.52	6.10	6.62	12.58	≤ 12.97	Pass
11ac-VHT80	MCS0	138	5690	7.15	6.42	6.32	6.43	12.61	≤ 12.97	Pass
11ac-VHT80	MCS0	155	5775	12.83	12.46	12.48	12.53	18.60	≤ 18.99	Pass

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Total Average Power (dBm)	Average Power Limit (dBm)	Result
Non-contiguous 80+80 MHz mode fall within different UNII band										
11ac-VHT80+80	MCS0	42	5210	12.98	12.42	--	--	15.72	≤ 22.00	Pass
11ac-VHT80+80	MCS0	42	5210	--	--	13.50	12.64	16.10	≤ 22.00	Pass
11ac-VHT80+80	MCS0	58	5290	13.09	12.49	--	--	15.81	≤ 15.98	Pass
11ac-VHT80+80	MCS0	58	5290	--	--	12.38	12.85	15.63	≤ 15.98	Pass
11ac-VHT80+80	MCS0	106	5530	12.93	12.39	--	--	15.68	≤ 15.98	Pass
11ac-VHT80+80	MCS0	106	5530	--	--	12.22	12.57	15.41	≤ 15.98	Pass
11ac-VHT80+80	MCS0	122	5610	12.80	12.48	--	--	15.65	≤ 15.98	Pass
11ac-VHT80+80	MCS0	122	5610	--	--	12.19	12.57	15.39	≤ 15.98	Pass
11ac-VHT80+80	MCS0	138	5690	12.97	12.35	--	--	15.68	≤ 15.98	Pass
11ac-VHT80+80	MCS0	138	5690	--	--	12.54	12.41	15.49	≤ 15.98	Pass
11ac-VHT80+80	MCS0	155	5775	17.80	17.32	--	--	20.58	≤ 22.00	Pass
11ac-VHT80+80	MCS0	155	5775	--	--	18.78	18.77	21.79	≤ 22.00	Pass
Non-contiguous 80+80 MHz mode fall within same UNII band										
11ac-VHT80+80	MCS0	106	5530	9.87	9.33	--	--	15.48	≤ 15.98	Pass
11ac-VHT80+80	MCS0	138	5690	--	--	9.35	9.28			
11ac-VHT80+80	MCS0	106	5530	--	--	9.17	9.42	15.50	≤ 15.98	Pass
11ac-VHT80+80	MCS0	138	5690	9.98	9.32	--	--			

Note 1: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 2: For 802.11ac-VHT80+80 mode fall within different UNII band:

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

Ant 2 & Ant 3: Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$ (dBm)

For 802.11ac-VHT80+80 mode fall within same UNII band:

Total Average Power (dBm) = $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$.

Note 3: Average Power Limit Calculation as below:

For 5150-5250MHz, 5725-5850MHz:

802.11ac-VHT20/ac-VHT40/ac-VHT80: Limit (dBm) = 30dBm - (14dBi + 3.01dBi - 6dBi) = **18.99dBm**.

802.11ac-VHT80+80: Limit (dBm) = 30dBm - (14dBi - 6dBi) = **22.00dBm**.

For 5250-5350MHz, 5470-5725MHz:

802.11ac-VHT20/ac-VHT40/ac-VHT80: Limit (dBm) = 23.98dBm - (14dBi + 3.01dBi - 6dBi) = **12.97dBm**.

802.11ac-VHT80+80: Limit (dBm) = 23.98dBm - (14dBi - 6dBi) = **15.98dBm**.

5.4. 26dB 佔用頻寬

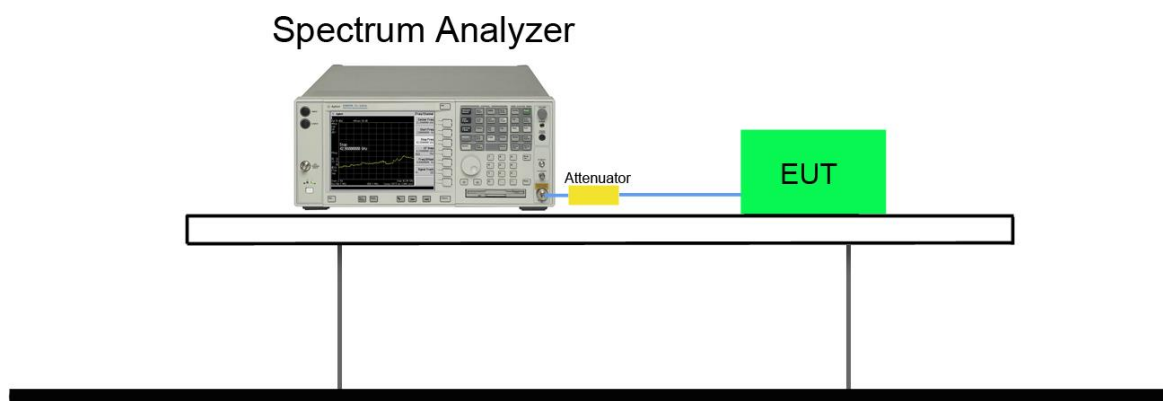
5.4.1. 適用標準

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

Product	ACCESS POINT	Temperature	24°C
Test Engineer	Kevin Ker	Relative Humidity	59%
Test Site	SR2	Test Date	2018/02/09
Antenna Type	Omin Antenna (AP-ANT-20W)		

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Ant 0 / Ant 0 + 1 + 2 + 3					
802.11a	6Mbps	36	5180	19.65	16.41
802.11a	6Mbps	44	5220	19.54	16.40
802.11a	6Mbps	48	5240	19.34	16.41
802.11a	6Mbps	52	5260	19.59	16.40
802.11a	6Mbps	60	5300	19.63	16.40
802.11a	6Mbps	64	5320	19.58	16.40
802.11a	6Mbps	100	5500	19.47	16.41
802.11a	6Mbps	120	5600	19.48	16.40
802.11a	6Mbps	140	5700	19.75	16.41
802.11a	6Mbps	144	5720	19.70	16.41
802.11a	6Mbps	149	5745	19.81	16.42
802.11a	6Mbps	157	5785	20.28	16.44
802.11a	6Mbps	165	5825	20.00	16.44
802.11ac-VHT20	MCS0	36	5180	20.21	17.58
802.11ac-VHT20	MCS0	44	5220	20.12	17.59
802.11ac-VHT20	MCS0	48	5240	20.25	17.59
802.11ac-VHT20	MCS0	52	5260	20.26	17.58
802.11ac-VHT20	MCS0	60	5300	20.22	17.59
802.11ac-VHT20	MCS0	64	5320	20.05	17.58
802.11ac-VHT20	MCS0	100	5500	20.44	17.60
802.11ac-VHT20	MCS0	120	5600	20.11	17.60
802.11ac-VHT20	MCS0	140	5700	20.25	17.60
802.11ac-VHT20	MCS0	144	5720	20.34	17.60
802.11ac-VHT20	MCS0	149	5745	20.68	17.61
802.11ac-VHT20	MCS0	157	5785	20.53	17.62
802.11ac-VHT20	MCS0	165	5825	20.76	17.61

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
802.11ac-VHT40	MCS0	38	5190	39.13	35.81
802.11ac-VHT40	MCS0	46	5230	39.42	35.86
802.11ac-VHT40	MCS0	54	5270	39.48	35.85
802.11ac-VHT40	MCS0	62	5310	39.82	35.82
802.11ac-VHT40	MCS0	102	5510	39.19	35.83
802.11ac-VHT40	MCS0	118	5590	39.75	35.85
802.11ac-VHT40	MCS0	134	5670	39.68	35.87
802.11ac-VHT40	MCS0	142	5710	39.59	35.85
802.11ac-VHT40	MCS0	151	5755	39.82	35.92
802.11ac-VHT40	MCS0	159	5795	39.93	35.93
802.11ac-VHT80	MCS0	42	5210	82.55	75.81
802.11ac-VHT80	MCS0	58	5290	82.06	75.81
802.11ac-VHT80	MCS0	106	5530	82.06	75.73
802.11ac-VHT80	MCS0	122	5610	82.99	75.70
802.11ac-VHT80	MCS0	138	5690	83.28	75.79
802.11ac-VHT80	MCS0	155	5775	82.37	75.79
Non-contiguous 80+80 MHz mode_Ant 0 / Ant 0 + 1 (Ant 0 + 1 + 2 + 3)					
802.11ac-VHT80+80	MCS0	42	5210	83.31	75.79
802.11ac-VHT80+80	MCS0	58	5290	83.49	75.72
802.11ac-VHT80+80	MCS0	106	5530	83.18	75.64
802.11ac-VHT80+80	MCS0	122	5610	83.78	75.76
802.11ac-VHT80+80	MCS0	138	5690	82.78	75.80
802.11ac-VHT80+80	MCS0	155	5775	84.19	75.79
Non-contiguous 80+80 MHz mode_Ant 3 / Ant 2 + 3 (Ant 0 + 1 + 2 + 3)					
802.11ac-VHT80+80	MCS0	42	5210	83.30	75.73
802.11ac-VHT80+80	MCS0	58	5290	83.39	75.77
802.11ac-VHT80+80	MCS0	106	5530	82.35	75.75
802.11ac-VHT80+80	MCS0	122	5610	82.00	75.50
802.11ac-VHT80+80	MCS0	138	5690	82.64	75.60
802.11ac-VHT80+80	MCS0	155	5775	83.80	75.75

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Contiguous 80+80 MHz mode_Ant 0 + 1 + 2 + 3					
802.11ac-VHT80+80 Contiguous	MCS0	42	5210	162.66	155.64
		58	5290		
802.11ac-VHT80+80 Contiguous	MCS0	106	5530	162.92	155.72
		122	5610		
Note: The detail calculation see page 43.					