

低功率射頻電機試驗報告

產品名稱	For 主型號: 907X 50C; For 系列型號: CFV II 50C
產品類型	Camera
申請廠商	Victor Hasselblad Aktiebolag
製造商	Victor Hasselblad Aktiebolag
廠牌	HASSELBLAD
主型號	CFV II-2
系列型號	CFV II 50C
操作頻率	Wi-Fi 2.4G: 2412 - 2462 MHz BLE: 2402 - 2480 MHz
該產品樣品試驗依據之試驗標準	低功率射頻電機技術規範 (低功率 0002 (LP0002) 107.01.10 版本)
試驗結果	合格

試驗機構: 倍科檢驗科技有限公司(林口實驗室)

機構地址: 桃園市龜山區文德二路 6 號

案件受理日期: 109 年 06 月 10 日

報告發行日期: 109 年 07 月 13 日

報告編號: RDG200610004-07A

附註:

1. 未經本實驗室書面許可, 不得部份複製本報告內容。
2. 本報告僅對檢送樣品負責, 且分離使用無效。
3. 本報告需加本所負責人簽名始生效。

陳園儒

陳園儒 簽章

報告發行紀錄:

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1.0	RDG200610004-07A	2020/07/13	報告發行

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1. 一般描述

1.1 待測設備樣品/特性

產品名稱	For 主型號: 907X 50C; For 系列型號: CFV II 50C
產品型號	CFV II-2
系列型號	CFV II 50C
系列差異	Product name, model name and CFV II 50C is the digital back of CFV II, only removed camera body
廠 牌	HASSELBLAD
申 請 者	Victor Hasselblad Aktiebolag
地 址	Utvecklingsgatan 2, 41756 Goteborg, Sweden
製造廠商	Victor Hasselblad Aktiebolag
使用頻率	IEEE 802.11b/g/n HT20/HT40: 2412 - 2462 MHz IEEE 802.11n HT40: 2422 - 2452 MHz BLE 1Mbps: 2402 - 2480 MHz
使用頻道數	IEEE 802.11b/g/n HT20: 11 Channels; BLE 1Mbps: 40 Channels
頻道間隔	IEEE 802.11b/g/n HT20: 5 MHz; BLE 1Mbps: 2MHz
發射頻寬	IEEE 802.11b Mode: 8.16 MHz; IEEE 802.11g Mode: 16.48 MHz IEEE 802.11n HT20 Mode: 17.20 MHz; Bluetooth LE Mode: 0.676 MHz
輸出功率	IEEE 802.11b Mode: 16.07 dBm; IEEE 802.11g Mode: 16.12 dBm IEEE 802.11n HT20 Mode: 16.05 dBm; Bluetooth LE Mode: -5.07dBm
傳輸速率	IEEE 802.11b Mode: 1 - 11 Mbps; IEEE 802.11g Mode: 6 - 54Mbps IEEE 802.11n HT20/HT40 mode: MCS0-MCS7; BLE: 1Mbps
調變方式	IEEE 802.11b Mode: DSSS; IEEE 802.11g Mode: OFDM IEEE 802.11n HT20 Mode: OFDM; Bluetooth LE Mode: GFSK
測試日期	109年06月15日至109年07月06日。
供應電源	DC 7.27Vdc

1.2 測試實驗室資料

實驗室認可登錄	中華民國實驗室認證體系 認可編號：TAF: 3546 認證有效期間：108年05月03日至111年05月02日止 認可頻率範圍9kHz ~ 40GHz。
實驗室地址/測試場地	桃園市龜山區文德二路6號
實驗室名稱	倍科檢驗科技有限公司(林口實驗室)
電話/傳真	03-397-1072/03-397-1027

1.3 試驗室之測試不確定度

Parameter	Expanded Measurement uncertainty
RF output power with Power Meter	± 1.488 dB
Occupied Channel Bandwidth	± 453.927 Hz
RF Conducted test with Spectrum	± 2.77 dB
AC Power Line Conducted Emission	± 2.66 dB
Radiated Below 1G (966B)	± 3.78 dB
Radiated Above 1G (966B)	± 4.29 dB

The test results with statement of conformity, the decision rules are based on the specifications and standards. The test results will not take the measurement uncertainty into account.

1.4 測試資訊與環境

Test Site	Test Date	Temperature (°C)	Relative Humidity (%)	Test Engineer
Conduction (Con-01)	2020-07-05	24.3	49	Blake Wang
Radiated (966B)	2020-07-01 – 2020-07-06	22.6-25.1	55-57	Leo Cheng
Conducted (TH-02)	2020-06-15	23.2	60	Blake Wang

2. 測試規範

2.1 適用規範及條文

項次	測試項目	適用規範	測試結果	量測設備
1.	電源線傳導干擾	低功率射頻電機技術規範2.3節	請參閱5.4節	請參閱4節
2.	場強輻射	低功率射頻電機技術規範2.8節 低功率射頻電機技術規範2.7節	請參閱6.4節	請參閱4節
3.	天線增益之要求	低功率射頻電機技術規範3.10.1.3	請參閱7.2節	-----
4.	發射頻寬	低功率射頻電機技術規範3.10.1.6	請參閱8.4節	請參閱4節
5.	輸出峰值功率	低功率射頻電機技術規範3.10.1.2	請參閱9.4節	請參閱4節
6.	開放頻帶邊緣之發射	低功率射頻電機技術規範3.10.1.5	請參閱10.4節	請參閱4節
7.	功率密度	低功率射頻電機技術規範3.10.1.6(2)(B)	請參閱11.4節	請參閱4節
8.	電波暴露量之評估	低功率射頻電機技術規範5.20.2.2節	請參閱12.2節	-----

2.2 限制使用之頻帶

根據<國家通訊傳播委員會低功率射頻電機技術規範>第二章第 2.7 節(一般規定)，任何低功率射頻電機之主波皆不得使用下表所列各頻帶內之頻率；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第 2.8 節的限制規定。

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

3. 受測裝置之系統說明

3.1 待測物與測試設備系統圖

EUT & peripherals setup diagram is shown in appendix setup photos.

3.2 輔助測試週邊設備名稱描述

輔助測試週邊: 未隨貨附賣, 由實驗室或廠商自行提供併同測試

No.	Description	Brand	Model Number
1.	Notebook	DELL	10912240367
2	TF Card	Kingston	N/A
3	Microphone	BACL	N/A
4	Camera Flash*2	GoDox	V860 II
5	ELX Cable	BACL	N/A

隨貨附賣週邊

No.	Description	Brand	Model Number
1.	Adapter	HASSELBLAD	QC24-KR
2	USB Cable	HASSELBLAD	1.13 m

3.3 占空比評估

	802.11b	802.11g	802.11n HT20	BLE-1Mbps
Duty cycle (%)	1	97.06	95.35	70.57
Duty factor (dB)	0	-0.13	-0.21	-1.51

$Duty\ cycle\ (D) = Tx\ on(ms) / (Tx\ on + off(ms))$, $Duty\ factor = 10 * \log(1/D)$

3.4 測試模式與測試描述

1. 樣品設定 Low, Middle 與 High 三個 Channel, ;執行法規規定之測試項目.
2. 輻射低頻會測試 Worst Power 的模式.
3. Pre-scan with three orthogonal axis, and worse case as X axis

4. 量測儀器一覽表

儀器名稱	廠商	型號	序號	校驗日期	下次校驗日期
AC Line Conduction Room (CON-01)					
LISN	Rohde & Schwarz	ENV216	100010	2019/09/02	2020/09/01
EMI Test Receiver	Rohde & Schwarz	ESR3	1002430	2020/05/07	2021/05/06
Pulse Limiter	SCHWARZBECK	VSTD 9561-F	00432	2019/08/28	2020/08/27
RF Cable	EMCI	EMCCFD300-BM-BM-8000	180526	2019/08/08	2020/08/07
Software	Audix	e3 v9	E3LK-03	N.C.R	N.C.R
Radiation 3M Room (966)					
Active Loop	EMCO	6502	0001-3322	2020/03/16	2021/03/15
Bilog Antenna/6 dB Attenuator	SUNOL SCIENCES & EMEC /EMCI	JB3/N-6-06	A111513/AT-N0668	2020/03/19	2021/03/18
Horn Antenna	ETS-Lindgren	3115	00085775	2019/09/11	2020/09/10
Horn Antenna	ETS-Lindgren	3160-09	00123853	2019/09/12	2020/09/11
Preamplifier	A.H. Systems	PAM-0118	470	2020/03/16	2021/03/15
Preamplifier	A.H. Systems	PAM-1840VH	174	2020/03/25	2021/03/24
Signal and Spectrum Analyzer	Rohde & Schwarz	FSV40	101456	2019/07/12	2020/07/11
Microflex Cable (1m)	EMCI	EMC106-SM-SM-2000	180515	2019/08/07	2020/08/06
Microflex Cable (2m)	MTJ	H0919	00000-MT28A-100	2019/08/07	2020/08/06
Microflex Cable (8m)	UTIFLEX	UFA210A-1-3149-300300	MFR 64639 232490-001	2019/08/07	2020/08/06
Turn Table	Chaintek	T-200-S-1	003501	N.C.R	N.C.R
Antenna Tower	Chaintek	MBD-400-1	003504	N.C.R	N.C.R
Controller	Chaintek	3000-1	003507	N.C.R	N.C.R
Software	Audix	e3 v9	E3LK-01	N.C.R	N.C.R
Conducted Room(TH-02)					
Spectrum Analyzer	Rohde & Schwarz	FSU26	100406	2020/03/11	2021/03/10
USB Wideband Power Sensor	Agilent	U2021XA	MY56120026	2019/09/06	2020/09/05

***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

5. 電源線傳導干擾之量測

5.1 適用標準

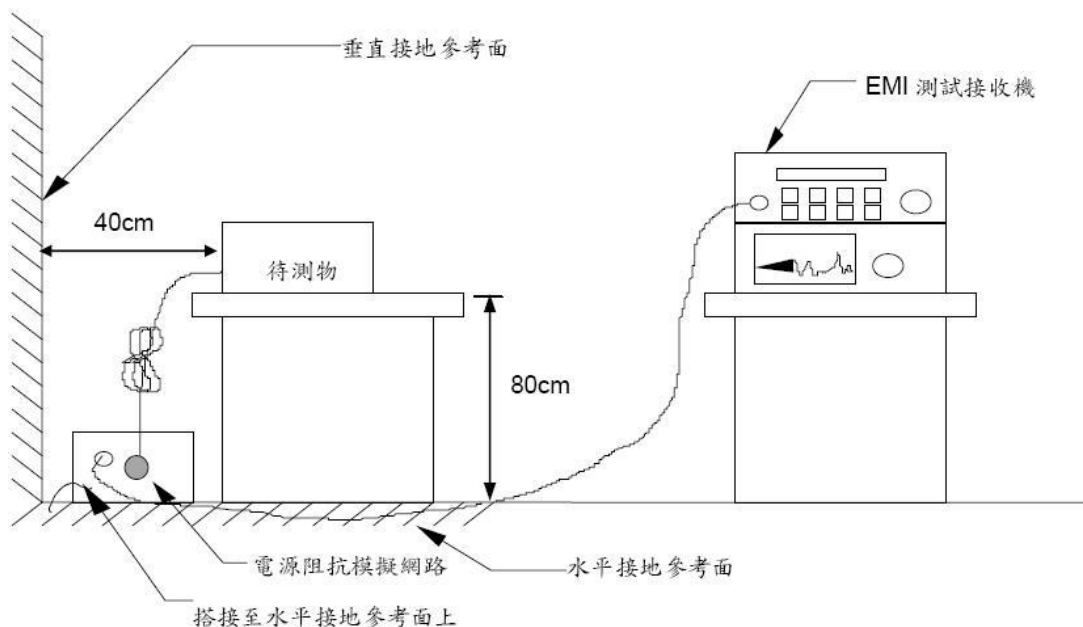
依據國家通訊傳播委員會低功率射頻電機技術規範之2.3節，電源傳導干擾之限制要求如下：

頻率 (MHz)	傳導限制值 (dB μ V)	
	準峰值 (Quasi – peak)	平均值 (Average)
0.15 – 0.5	66 – 56	56 – 46
0.5 – 5	56	46
5 – 30	60	50

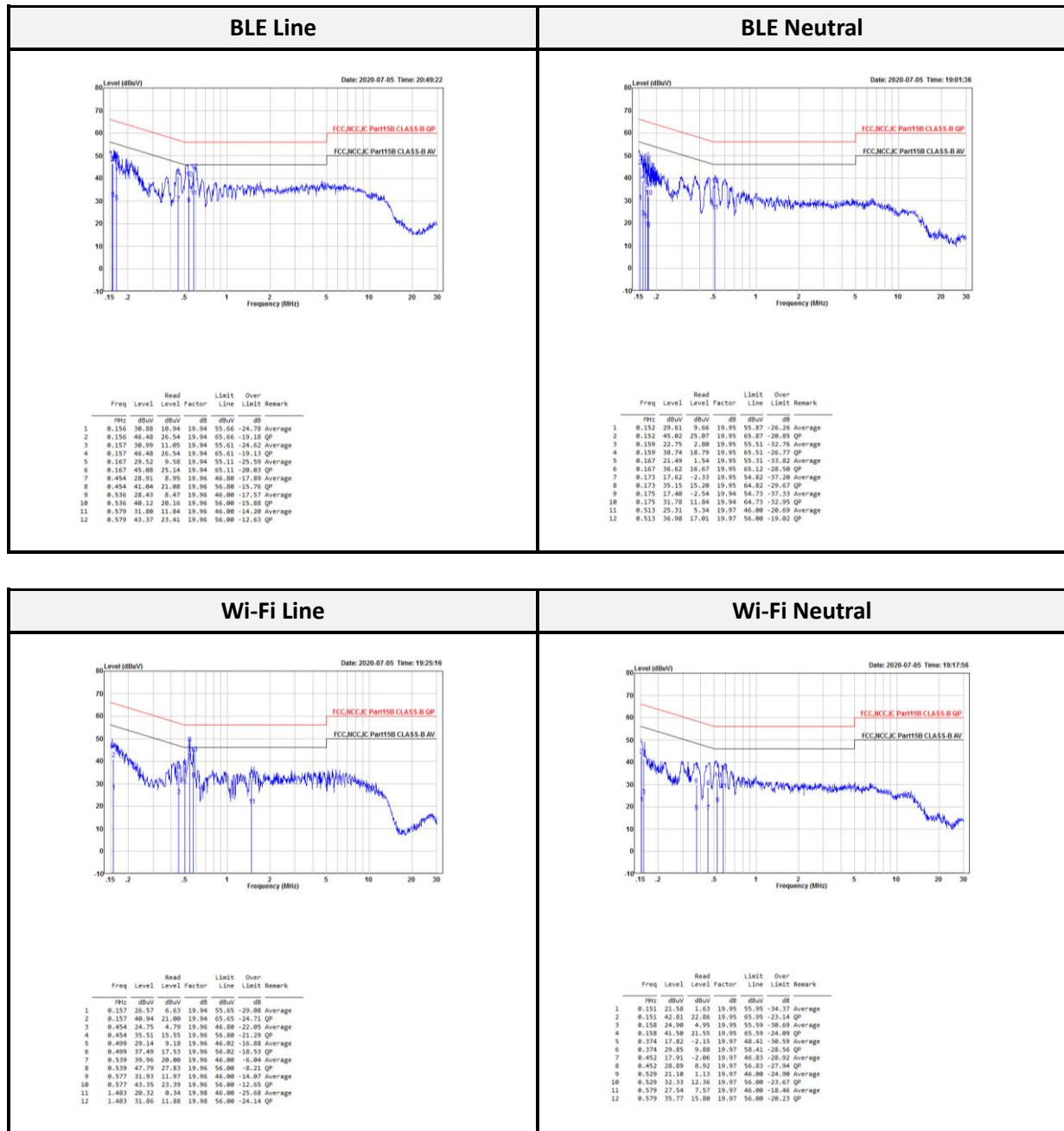
5.2 測試方法

將待測物置於0.8米高的非金屬桌面，使其在工作狀態，待測物電源線接至電源線阻抗穩定網路上，從測試接收機記錄頻率由 0.15MHz 至 30MHz 之間之電源線傳導放射強度。

5.3 測試配置



5.4 傳導干擾之量測結果



Note:

Level = Read Level + Factor

Over Limit = Level – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

6. 場強輻射之量測

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2.8之要求，其他開放頻帶外不必要之輻射干擾需符合2.8節之一般限制要求。

頻率 (MHz)	測試距離 (m)	干擾限制 ($\mu\text{V}/\text{m}$)	干擾限制 (dB $\mu\text{V}/\text{m}$)
0.009 – 0.490 (含)	300	2,400/頻率(千赫)	(註1)
0.490 (不含) – 1.705 (含)	30	24,000 / 頻率 (千赫)	(註1)
1.705 (不含) – 30 (不含)	30	30	29.5
30 (含) – 88 (含)	3	100	40.0
88 (不含) – 216 (含)	3	150	43.5
216 (不含) – 960 (含)	3	200	46.0
960 (不含)以上	3	500	54.0

註 1: 其干擾限制值 = $20 \cdot \text{LOG}(2400/F) + 40 \cdot \text{LOG}(300/\text{量測距離})$

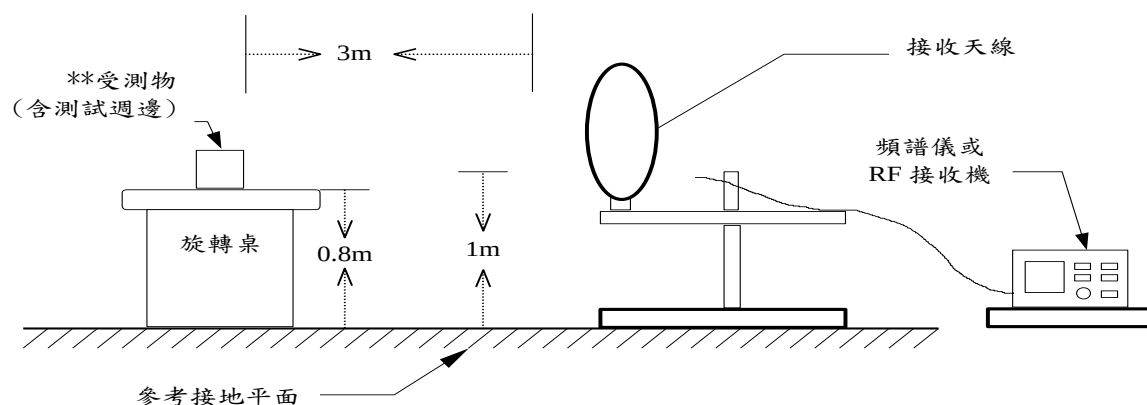
6.2 測試方法

將待測物置於 0.8 or 1.5 米高的非金屬桌面，使其在工作狀態，接收天線置於 3 米外相同的高度。
待測物分別要垂直或水平放置，而且桌面要 360 度旋轉，另外接收天線也要從 1.0 米至 4.0 米升降變化，以找出最大的輻射電場強度，接收天線置於水平、垂直極向各執行測試一次。若量測頻率低於30兆赫(MHz)時，得於所規定距離以內進行測試，但應盡量避免於近場做測試。當測試距離較規定距離為近時，測試結果應以插補系數換算至規定距離之值：對同一輻射方向最少兩個距離作量測以決定適當的插補系數或線性距離平方反比(40dB/10倍距離)。

6.3 測試擺設圖

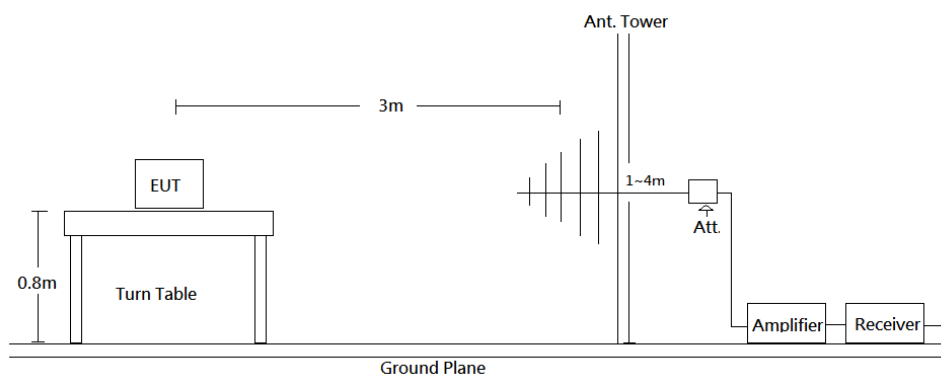
輻射架構圖

圖 1: 量測頻率9kHz ~ 30MHz之測試配置



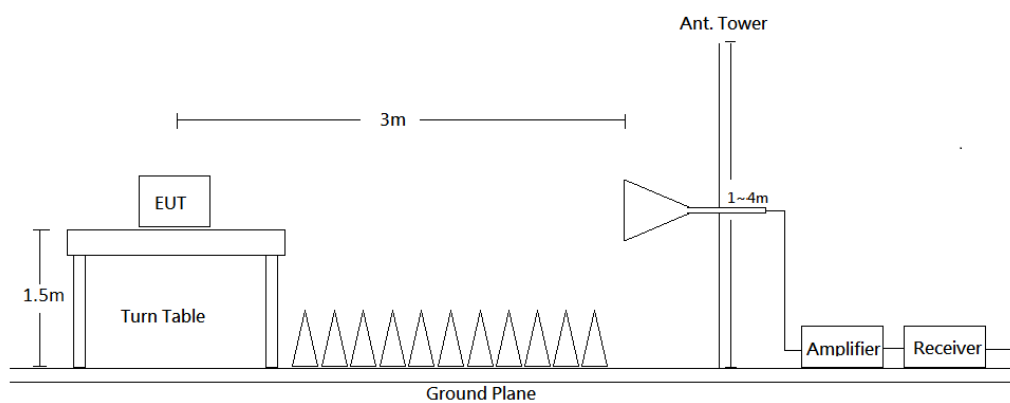
註: **請參照3.2節

圖 2:量測頻率30MHz~1GHz之測試配置



註:**請參照3.2節

圖 3:量測頻率1GHz以上之測試配置

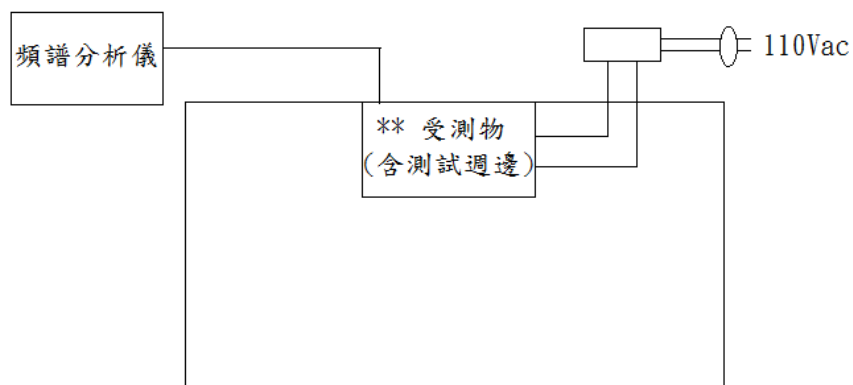


註:**請

參照3.2節

量測參閱 ANSI C63.4:2014.ANSI C63.10:2013.

直量架構圖



6.4 量測設定

1GHz以下:

頻譜分析儀設定: Quasi-Peak: RBW = VBW: 120kHz

1GHz以上:

頻譜分析儀設定: Peak: RBW: 1MHz; VBW: 1MHz / Average: RBW: 1MHz; VBW: 10Hz

6.5 場強輻射之量測結果

發射機 / 接收機 其它不必要之訊號 (9kHz ~ 30MHz)

此頻率之干擾值低於限制值20dB以下，被考量為背景雜訊值並不予記錄。

發射機 / 接收機 其它不必要之訊號 (30MHz ~ 1GHz)

此案件測試模為 Worst Power

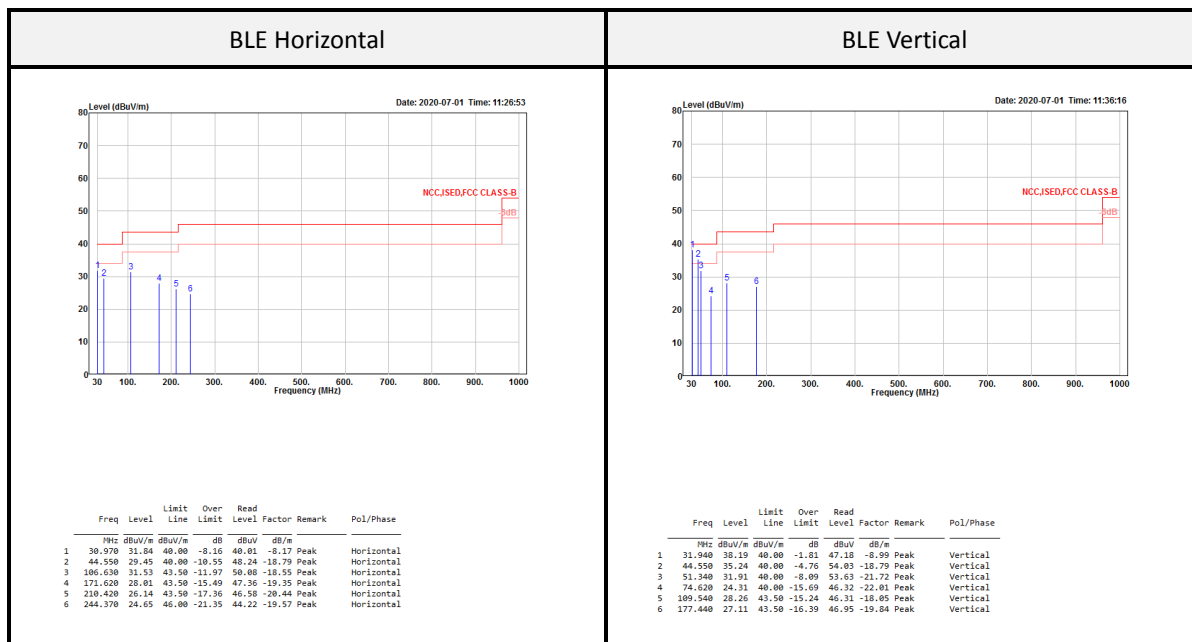
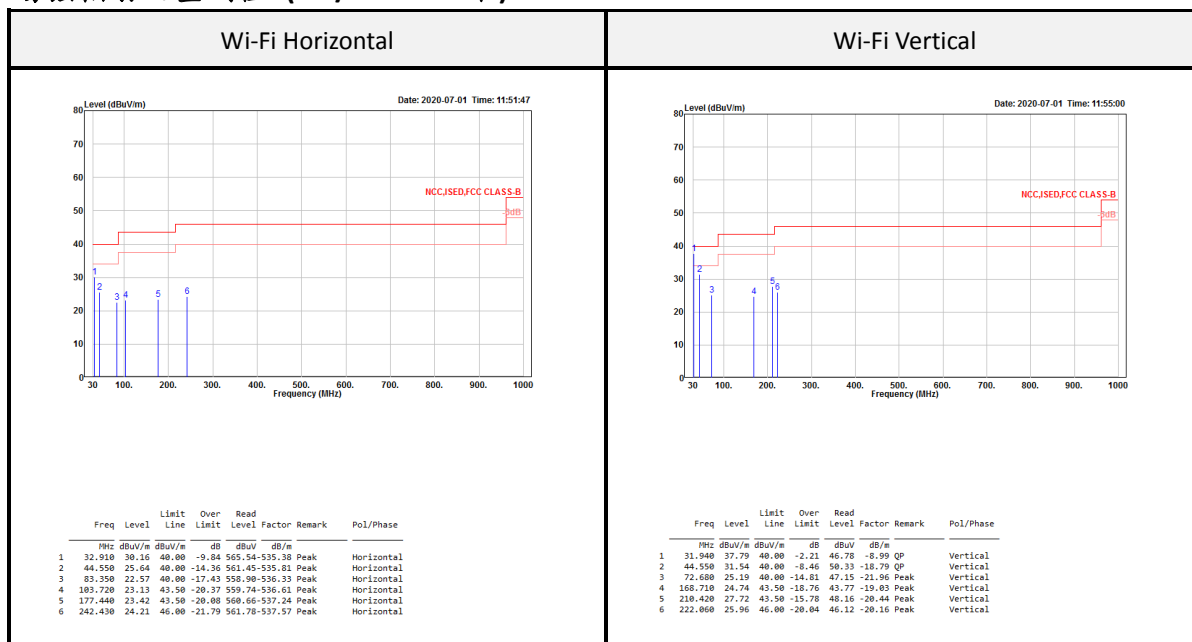
發射機 其它不必要之訊號 (1GHz ~ 26.5GHz)

此案件測試模式分別為Low、Mid、High CH.

接收機 其它不必要之訊號 (1GHz ~ 26.5GHz)

此案件測試模式分別為 Receiver 模式.

場強輻射之量測值 (TX / 1GHz 以下)

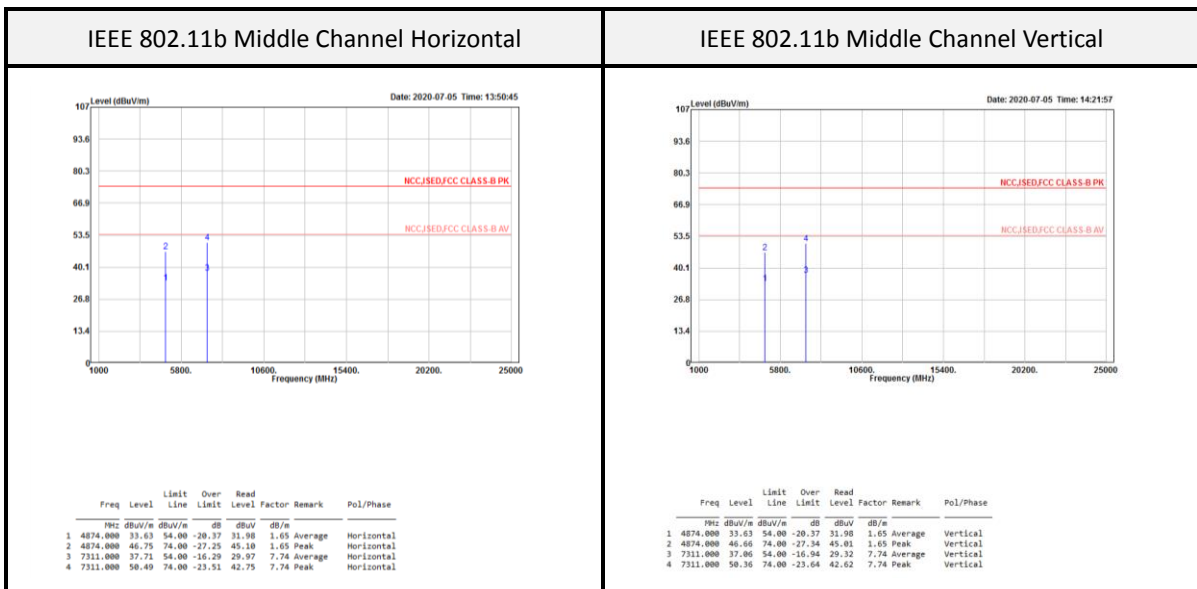
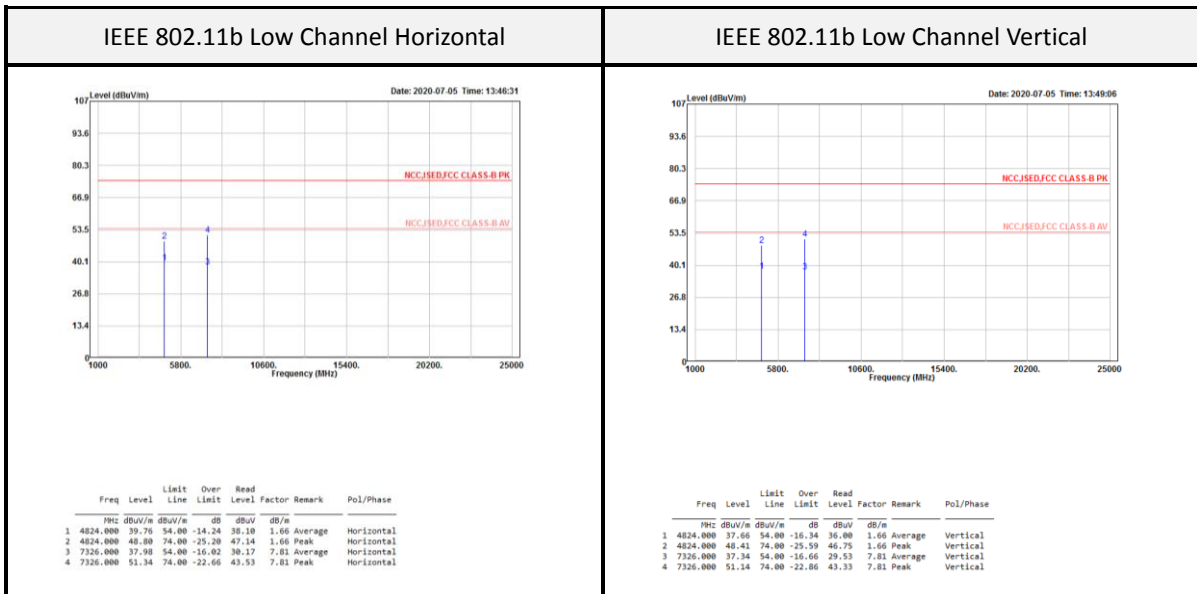


Note: Result = Reading + Correct Factor

Margin = Result - Limit

Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain

發射機其它不必要之訊號 (TX / 1GHz 以上)



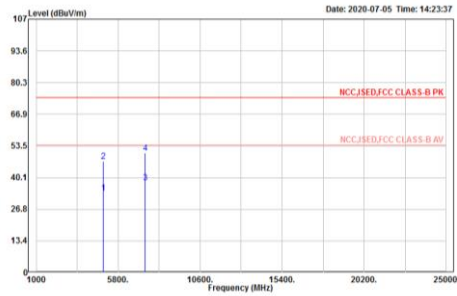
Note:

Result = Reading + Correct Factor

Margin = Result – Limit

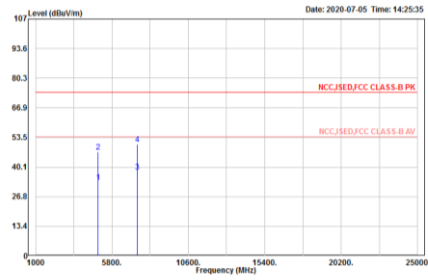
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

IEEE 802.11b High Channel Horizontal



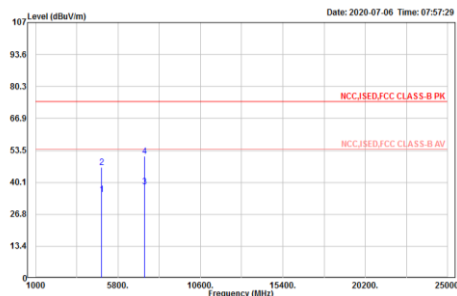
Freq	Level	Limit	Over	Read	Level	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m			
1 4924.000	35.54	54.00	-20.46	31.05	1.69	Average	Horizontal	
2 4924.000	47.85	74.00	-26.95	45.36	1.69	Peak	Horizontal	
3 7386.000	38.88	54.00	-15.92	30.89	7.99	Average	Horizontal	
4 7386.000	50.55	74.00	-23.45	42.56	7.99	Peak	Horizontal	

IEEE 802.11b High Channel Vertical



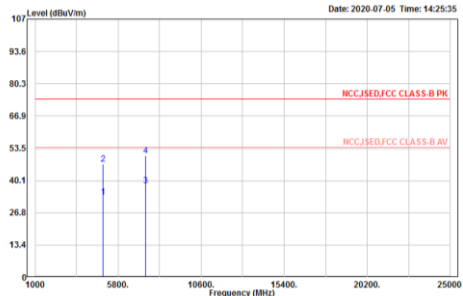
Freq	Level	Limit	Over	Read	Level	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m			
1 4924.000	35.29	54.00	-20.71	31.68	1.69	Average	Vertical	
2 4924.000	46.91	74.00	-27.09	45.22	1.69	Peak	Vertical	
3 7386.000	38.82	54.00	-15.98	30.83	7.99	Average	Vertical	
4 7386.000	50.44	74.00	-23.56	42.45	7.99	Peak	Vertical	

IEEE 802.11g Low Channel Horizontal



Freq	Level	Limit	Over	Read	Level	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m			
1 4924.000	34.96	54.00	-19.04	33.30	1.66	Average	Horizontal	
2 4924.000	46.39	74.00	-27.70	44.64	1.66	Peak	Horizontal	
3 7326.000	38.34	54.00	-15.66	30.53	7.81	Average	Horizontal	
4 7326.000	50.97	74.00	-23.03	43.16	7.81	Peak	Horizontal	

IEEE 802.11g Low Channel Vertical



Freq	Level	Limit	Over	Read	Level	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m			
1 4924.000	33.29	54.00	-20.71	31.68	1.69	Average	Vertical	
2 4924.000	46.91	74.00	-27.09	45.22	1.69	Peak	Vertical	
3 7326.000	38.82	54.00	-15.98	30.83	7.99	Average	Vertical	
4 7326.000	50.44	74.00	-23.56	42.45	7.99	Peak	Vertical	

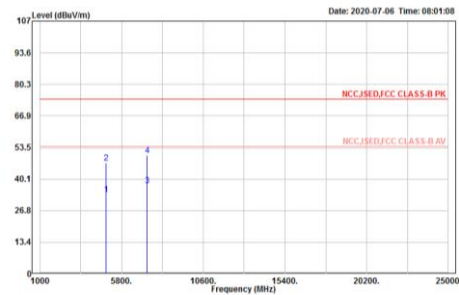
Note:

Result = Reading + Correct Factor

Margin = Result – Limit

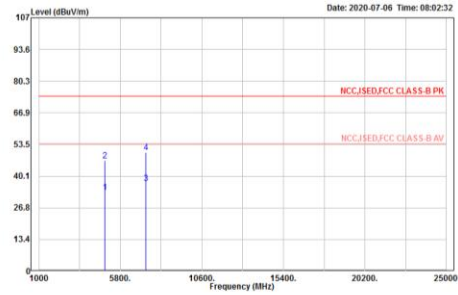
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

IEEE 802.11g Middle Channel Horizontal



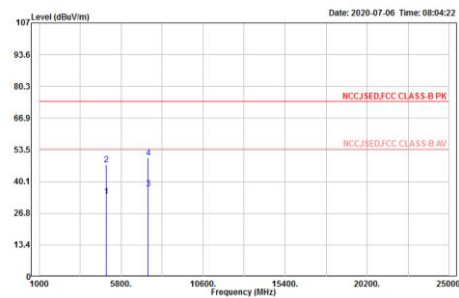
	Freq	Level	Limit	Over	Read			
	MHz	dBuV/m	Line	Line	Level	Factor	Remark	Pol/Phase
1	4874.000	33.65	54.00	-20.35	32.00	1.65	Average	Horizontal
2	4874.000	46.98	74.00	-27.02	45.33	1.65	Peak	Horizontal
3	7311.000	37.42	54.00	-16.58	29.68	7.74	Average	Horizontal
4	7311.000	50.23	74.00	-23.77	42.49	7.74	Peak	Horizontal

IEEE 802.11g Middle Channel Vertical



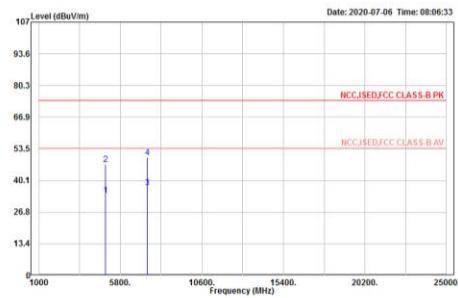
	Freq	Level	Limit	Over	Read			
	MHz	dBuV/m	Line	Line	Level	Factor	Remark	Pol/Phase
1	4874.000	33.44	54.00	-20.56	31.79	1.65	Average	Vertical
2	4874.000	46.78	74.00	-27.22	45.13	1.65	Peak	Vertical
3	7311.000	37.28	54.00	-16.74	29.52	7.74	Average	Vertical
4	7311.000	50.06	74.00	-23.94	42.32	7.74	Peak	Vertical

IEEE 802.11g High Channel Horizontal



	Freq	Level	Limit	Over	Read			
	MHz	dBuV/m	Line	Line	Level	Factor	Remark	Pol/Phase
1	4924.000	33.89	54.00	-20.11	32.20	1.69	Average	Horizontal
2	4924.000	47.18	74.00	-26.82	45.49	1.69	Peak	Horizontal
3	7386.000	37.16	54.00	-16.84	29.17	7.99	Average	Horizontal
4	7386.000	50.04	74.00	-23.96	42.05	7.99	Peak	Horizontal

IEEE 802.11g High Channel Vertical



	Freq	Level	Limit	Over	Read			
	MHz	dBuV/m	Line	Line	Level	Factor	Remark	Pol/Phase
1	4924.000	33.79	54.00	-20.21	32.10	1.69	Average	Vertical
2	4924.000	47.00	74.00	-27.00	45.31	1.69	Peak	Vertical
3	7386.000	37.09	54.00	-16.95	29.06	7.99	Average	Vertical
4	7386.000	49.94	74.00	-24.06	41.95	7.99	Peak	Vertical

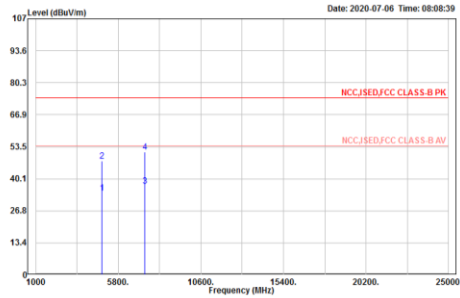
Note:

Result = Reading + Correct Factor

Margin = Result – Limit

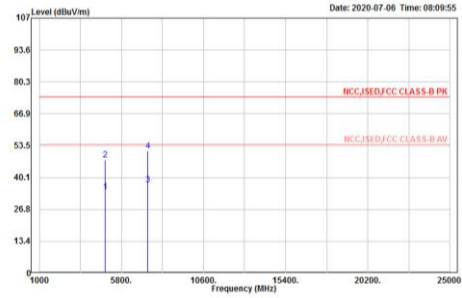
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

IEEE 802.11n HT20 Low Channel Horizontal



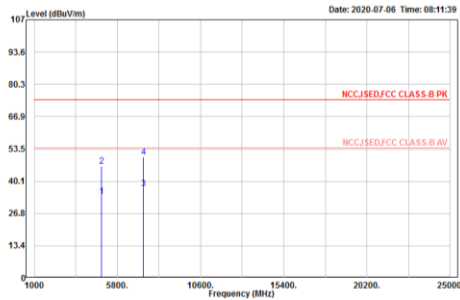
Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
	Hz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4824.000	34.36	54.00	-19.64	32.70	1.66 Average	Horizontal
2	4874.000	47.66	74.00	-26.34	46.00	1.66 Peak	Horizontal
3	7326.000	57.17	54.00	-16.83	29.36	7.81 Average	Horizontal
4	7326.000	51.47	74.00	-22.53	43.66	7.81 Peak	Horizontal

IEEE 802.11n HT20 Low Channel Vertical



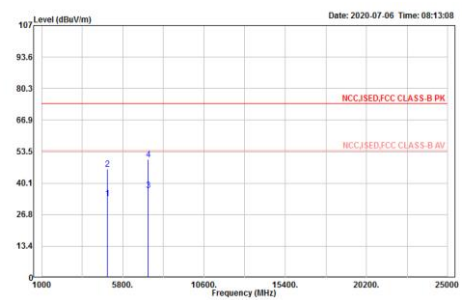
Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
	Hz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4824.000	34.36	54.00	-19.64	32.70	1.66 Average	Vertical
2	4874.000	47.66	74.00	-26.34	46.00	1.66 Peak	Vertical
3	7326.000	57.17	54.00	-16.83	29.36	7.81 Average	Vertical
4	7326.000	51.47	74.00	-22.53	43.66	7.81 Peak	Vertical

IEEE 802.11n HT20 Middle Channel Horizontal



Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
	Hz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4874.000	34.86	54.00	-19.14	32.43	1.65 Average	Horizontal
2	4874.000	46.29	74.00	-27.71	44.64	1.65 Peak	Horizontal
3	7311.000	37.89	54.00	-16.11	29.35	7.74 Average	Horizontal
4	7311.000	50.18	74.00	-23.82	42.44	7.74 Peak	Horizontal

IEEE 802.11n HT20 Middle Channel Vertical



Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
	Hz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4874.000	33.78	54.00	-20.22	32.13	1.65 Average	Vertical
2	4874.000	46.11	74.00	-27.89	44.46	1.65 Peak	Vertical
3	7311.000	37.04	54.00	-16.96	29.30	7.76 Average	Vertical
4	7311.000	50.15	74.00	-23.85	42.41	7.74 Peak	Vertical

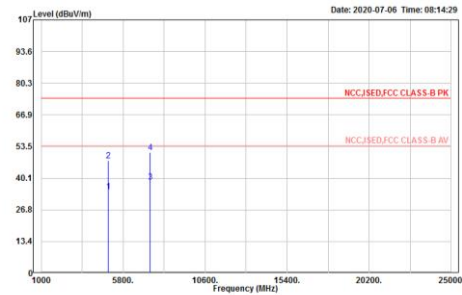
Note:

Result = Reading + Correct Factor

Margin = Result – Limit

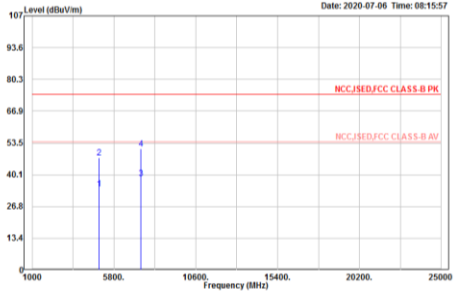
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

IEEE 802.11n HT20 High Channel Horizontal



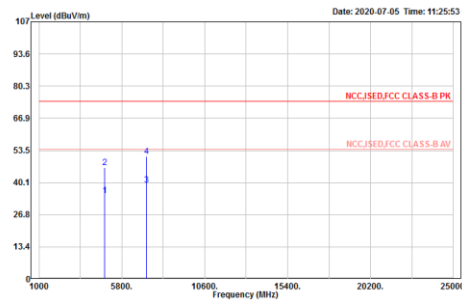
Freq	Level	Limit	Over	Read					
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m				Pol/Phase
1 4924.000	34.45	54.00	-19.55	32.76	1.69	Average			Horizontal
2 4924.000	47.57	74.00	-26.43	45.88	1.69	Peak			Horizontal
3 7386.000	38.52	54.00	-15.38	38.63	7.99	Average			Horizontal
4 7386.000	51.16	74.00	-22.84	43.17	7.99	Peak			Horizontal

IEEE 802.11n HT20 High Channel Vertical



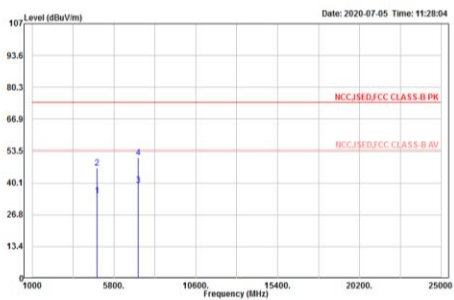
Freq	Level	Limit	Over	Read					
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m				Pol/Phase
1 4924.000	34.19	54.00	-19.81	32.50	1.69	Average			Vertical
2 4924.000	47.22	74.00	-26.78	45.53	1.69	Peak			Vertical
3 7386.000	35.58	54.00	-18.50	38.51	7.99	Average			Vertical
4 7386.000	51.04	74.00	-22.96	43.85	7.99	Peak			Vertical

BLE-1Mbps Low Channel Horizontal



Freq	Level	Limit	Over	Read					
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m				Pol/Phase
1 4884.000	34.30	54.00	-19.70	33.26	1.64	Average			Horizontal
2 4884.000	46.52	74.00	-27.48	44.88	1.64	Peak			Horizontal
3 7286.000	39.22	54.00	-14.78	31.68	7.54	Average			Horizontal
4 7286.000	50.38	74.00	-23.62	43.44	7.54	Peak			Horizontal

BLE-1Mbps Low Channel Vertical



Freq	Level	Limit	Over	Read					
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m				Pol/Phase
1 4884.000	34.67	54.00	-19.33	33.93	1.64	Average			Vertical
2 4884.000	46.49	74.00	-27.51	44.85	1.64	Peak			Vertical
3 7286.000	39.07	54.00	-14.93	31.53	7.54	Average			Vertical
4 7286.000	50.85	74.00	-23.15	43.31	7.54	Peak			Vertical

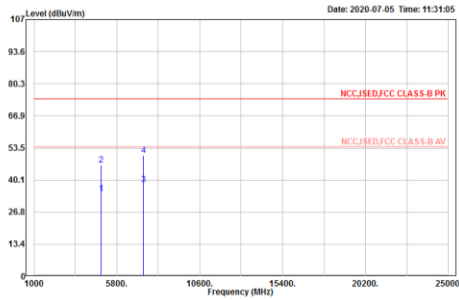
Note:

Result = Reading + Correct Factor

Margin = Result – Limit

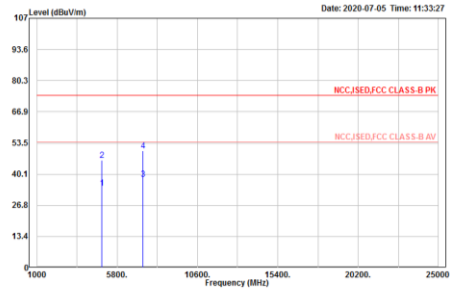
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

BLE-1Mbps Middle Channel Horizontal



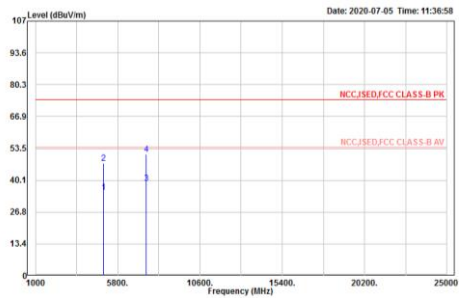
Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 4889.000	34.52	54.00	-19.48	32.87	1.65	Average	Horizontal
2 4889.000	46.54	74.00	-27.46	44.89	1.65	Peak	Horizontal
3 7328.000	38.14	54.00	-15.86	30.36	7.78	Average	Horizontal
4 7328.000	50.37	74.00	-23.63	42.59	7.78	Peak	Horizontal

BLE-1Mbps Middle Channel Vertical



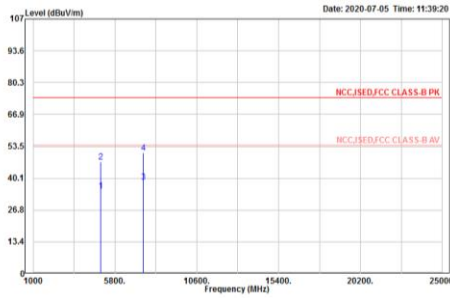
Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 4889.000	34.28	54.00	-19.72	32.63	1.65	Average	Vertical
2 4889.000	46.25	74.00	-27.75	44.60	1.65	Peak	Vertical
3 7328.000	38.87	54.00	-15.93	30.29	7.78	Average	Vertical
4 7328.000	50.22	74.00	-23.78	42.44	7.78	Peak	Vertical

BLE-1Mbps High Channel Horizontal



Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 4968.000	35.95	54.00	-18.95	33.25	1.80	Average	Horizontal
2 4968.000	47.29	74.00	-26.71	45.49	1.80	Peak	Horizontal
3 7440.000	30.78	54.00	-23.22	30.79	7.99	Average	Horizontal
4 7440.000	51.09	74.00	-22.91	43.10	7.99	Peak	Horizontal

BLE-1Mbps High Channel Vertical



Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 4968.000	34.87	54.00	-19.13	33.07	1.80	Average	Vertical
2 4968.000	47.04	74.00	-26.96	45.24	1.80	Peak	Vertical
3 7440.000	30.57	54.00	-23.43	30.58	7.99	Average	Vertical
4 7440.000	50.83	74.00	-23.17	42.84	7.99	Peak	Vertical

Note:

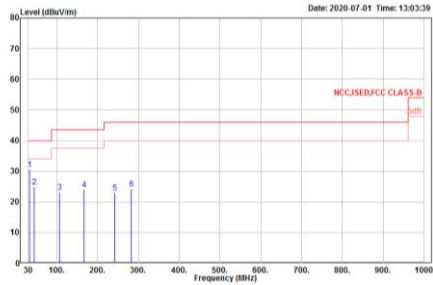
Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

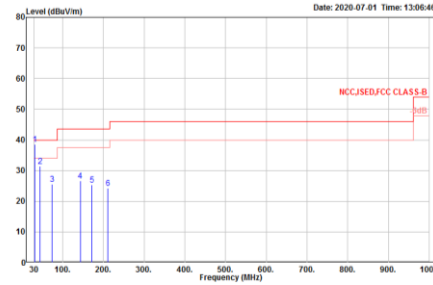
接收機其它不必要之訊號 (RX)

Wi-Fi Receiver Mode Horizontal (30 MHz – 1GHz)



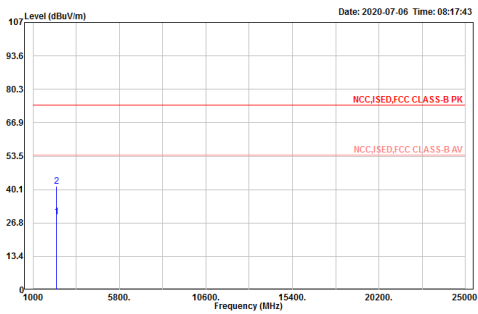
Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1	32.010	30.54	40.00	-9.46	40.35	-9.81 Peak	Horizontal
2	44.550	24.04	40.00	-15.00	43.73	-10.79 Peak	Horizontal
3	106.630	23.20	43.50	-20.30	41.75	-18.55 Peak	Horizontal
4	166.770	24.15	43.50	-19.35	43.00	-18.85 Peak	Horizontal
5	242.430	23.04	46.00	-22.96	42.61	-19.57 Peak	Horizontal
6	282.200	24.31	46.00	-21.69	42.50	-18.19 Peak	Horizontal

Wi-Fi Receiver Mode Vertical (30 MHz – 1GHz)



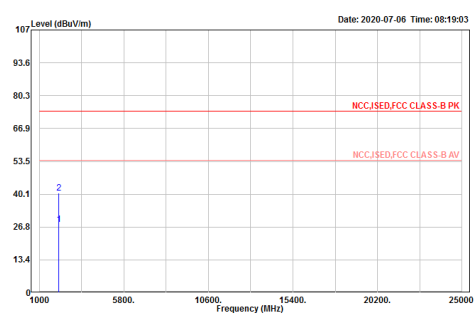
Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1	31.940	30.49	40.00	-1.51	47.48	-8.99 GP	Vertical
2	44.550	31.34	40.00	-8.66	50.13	-18.78 GP	Vertical
3	74.620	25.52	40.00	-14.48	47.53	-22.81 Peak	Vertical
4	143.400	26.04	43.50	-16.86	44.59	-17.95 Peak	Vertical
5	171.620	25.33	43.50	-18.17	44.68	-19.35 Peak	Vertical
6	210.420	24.19	43.50	-19.31	44.63	-20.44 Peak	Vertical

Wi-Fi Receiver Mode Horizontal (1GHz – 26.5GHz)



Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1	2310.000	29.32	54.00	-24.68	35.50	-6.18 Average	Horizontal
2	2310.000	41.42	74.00	-32.58	47.60	-6.18 Peak	Horizontal

Wi-Fi Receiver Mode Vertical (1GHz – 26.5GHz)



Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1	2100.000	27.94	54.00	-26.06	32.99	-5.05 Average	Vertical
2	2100.000	40.69	74.00	-33.31	45.74	-5.05 Peak	Vertical

Note:

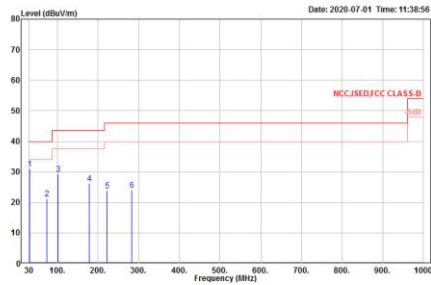
Result = Reading + Correct Factor

Margin = Result – Limit

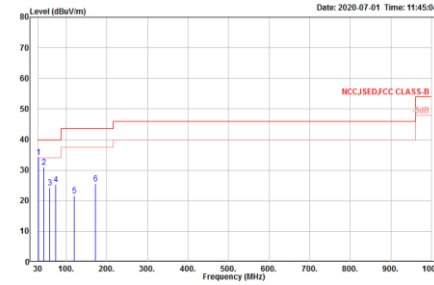
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

接收機其它不必要之訊號 (RX)

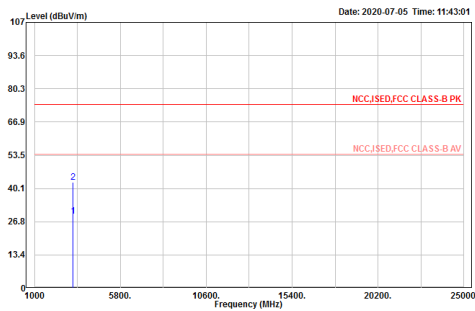
BLE Receiver Mode Horizontal (30 MHz – 1GHz)



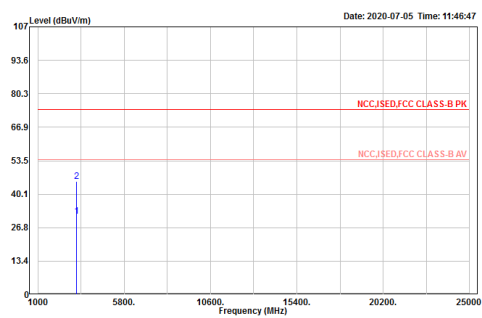
BLE Receiver Mode Vertical (30 MHz – 1GHz)



BLE Receiver Mode Horizontal (1GHz – 26.5GHz)



BLE Receiver Mode Vertical (1GHz – 26.5GHz)



Note:

Result = Reading + Correct Factor

Margin = Result – Limit

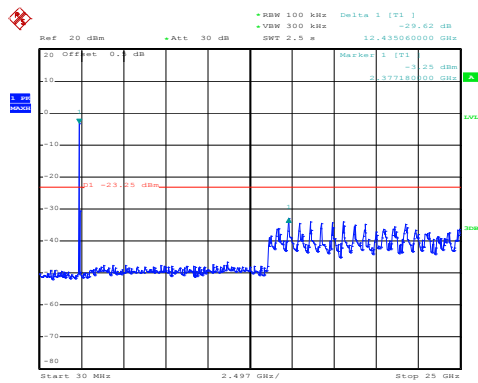
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Conducted Spurious Emissions:

Configuration	Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)		Limit (dBc)	Result
			Chain 0	Chain 1		
IEEE 802.11b	Low	2412	32.88	32.08	≥ 20	PASS
	Mid	2437	32.86	32.88	≥ 20	PASS
	High	2462	33.54	32.17	≥ 20	PASS
IEEE 802.11g	Low	2412	29.62	32.23	≥ 20	PASS
	Mid	2437	30.81	31.12	≥ 20	PASS
	High	2462	28.25	32.14	≥ 20	PASS
IEEE 802.11n HT20	Low	2412	30.13	32.04	≥ 20	PASS
	Mid	2437	29.79	31.72	≥ 20	PASS
	High	2462	29.34	31.32	≥ 20	PASS
BLE-1Mbps	Low	2402	32.47	-	≥ 20	PASS
	Mid	2440	33.08	-	≥ 20	PASS
	High	2480	33.06	-	≥ 20	PASS

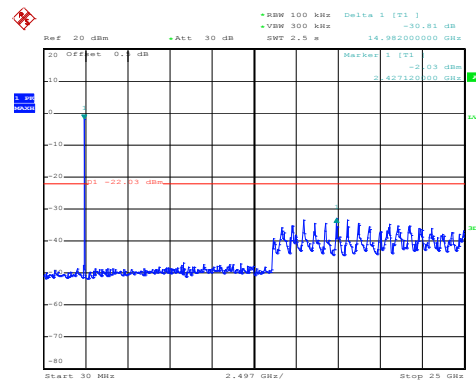


IEEE 802.11g Low Channel Chain 0



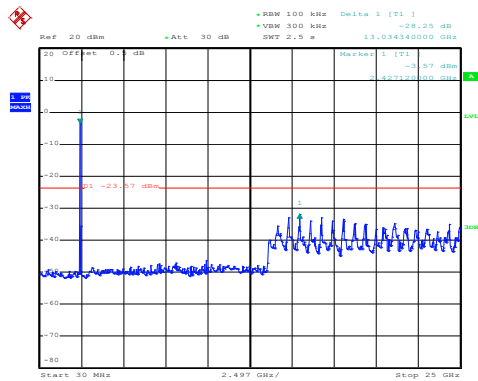
Date: 15.JUN.2020 15:33:53

IEEE 802.11g Middle Channel Chain 0



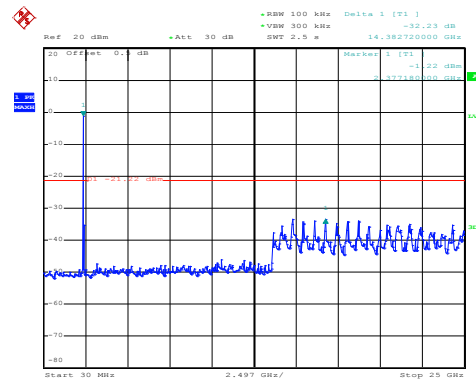
Date: 15.JUN.2020 15:36:13

IEEE 802.11g High Channel Chain 0



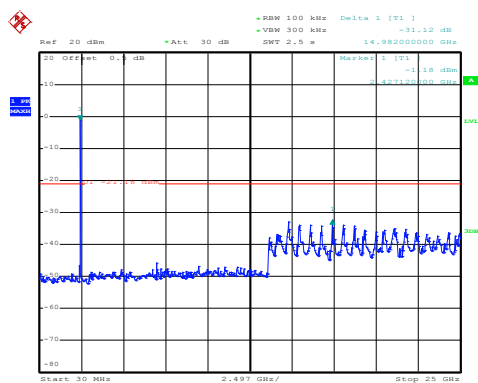
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IEEE 802.11g Low Channel Chain 1



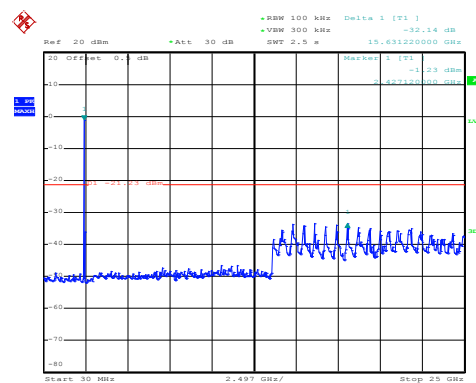
Date: 15.JUN.2020 16:14:51

IEEE 802.11g Middle Channel Chain 1



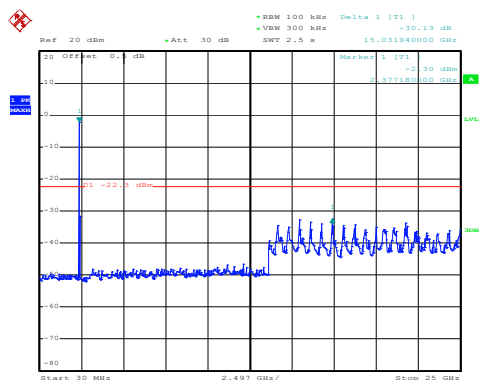
Date: 15.JUN.2020 16:16:39

IEEE 802.11g High Channel Chain 1



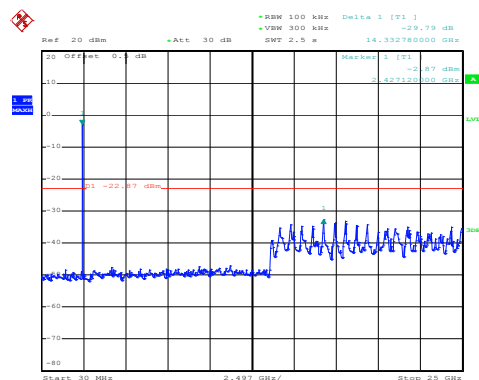
Date: 15.JUN.2020 16:21:30

IEEE 802.11n HT20 Low Channel Chain 0



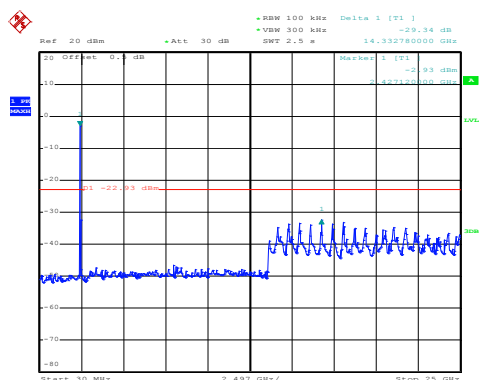
Date: 15.JUN.2020 15:40:38

IEEE 802.11n HT20 Middle Channel Chain 0



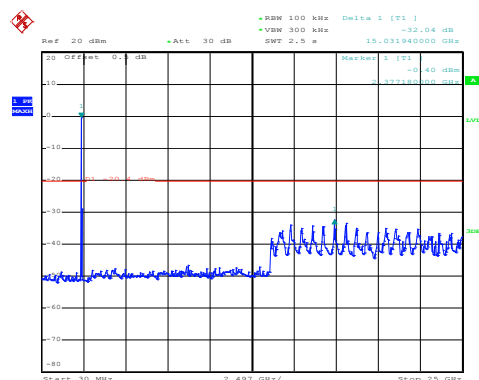
Date: 15.JUN.2020 15:42:25

IEEE 802.11n HT20 High Channel Chain 0



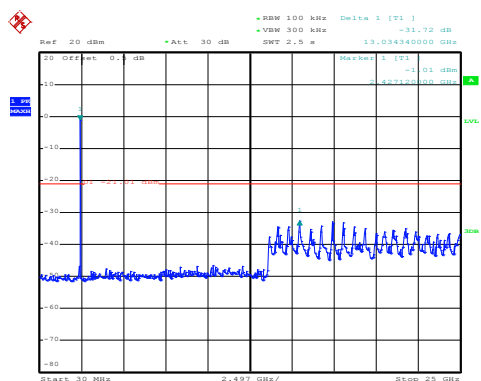
Date: 15.JUN.2020 15:44:07

IEEE 802.11n HT20 Low Channel Chain 1



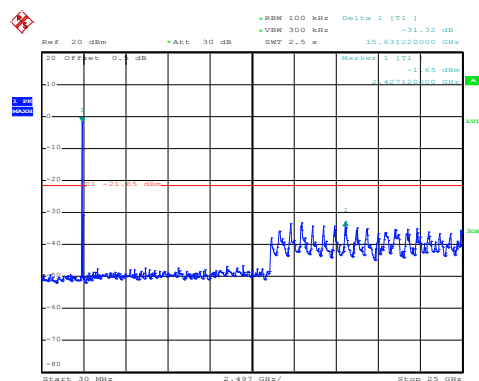
Date: 15.JUN.2020 16:24:48

IEEE 802.11n HT20 Middle Channel Chain 1

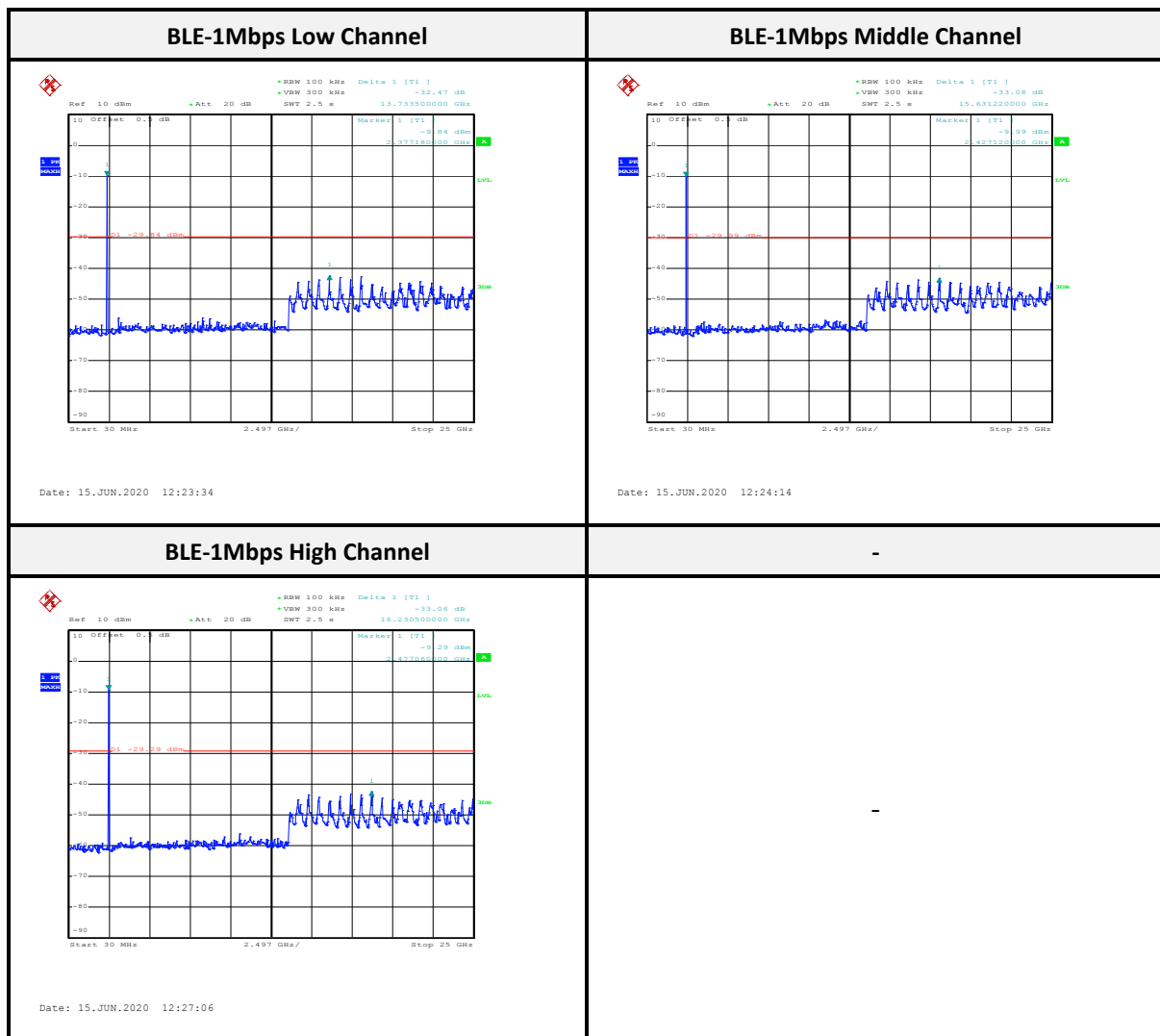


Date: 15.JUN.2020 16:27:35

IEEE 802.11n HT20 High Channel Chain 1



Date: 15.JUN.2020 16:29:13



7. 天線增益之要求

7.1 適用標準

低功率發射機，依據國家通訊傳播委員會低功率射頻電機技術規範3.10.1.3節之規定，應符合下列情現之一：

依據國家通訊傳播委員會低功率射頻電機技術規範3.10.1.3節(1)之規定，進行固定式點對點操作時，其發射天線之方向性增益超過6 dBi，每超過3 dBi，最大傳導輸出功率限制值應降低1 dB。

依據國家通訊傳播委員會低功率射頻電機技術規範3.10.1.3節(2)之規定，操作頻率為5725 MHz～5850 MHz 且進行固定式點對點操作時，其發射天線之方向性增益超過6 dBi，不需降低最大傳導輸出功率。

依據國家通訊傳播委員會低功率射頻電機技術規範3.10.1.3節(3)之規定，除(1)(2)外，使用超過6 dBi 方向增益之發射天線時，應依超過6 dBi 天線方向增益的dBi 總量，等量減少最大傳導輸出功率限制值。

7.2 天線增益

此裝置使用的天線明細如下：

天線型態	廠牌	型號	Gain
PCB Antenna	DJI	EC1702Wi-Fi/BTAnt	0dBi

** 其詳細規格資料，請參見：天線規格。

判定結果：符合規範

8. 發射頻寬之要求

8.1 適用標準

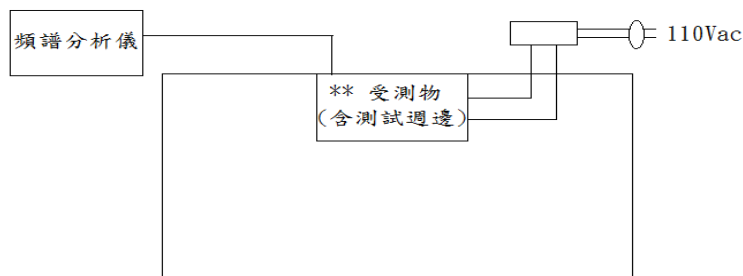
對使用跳頻系統之低功率發射機依據國家通訊傳播委員會低功率射頻電機技術規範3.10.1.6節(1)(A)之規定，跳頻系統之載波頻率頻道間隔應大於或等於25 kHz 或跳頻頻道之20 dB頻寬，兩者取較寬者。但操作頻率為2400 MHz～2483.5 MHz 頻段且輸出功率應小於或等於125 mW 跳頻系統，其載波頻率頻道間隔不得小於25 kHz 或跳頻頻道20 dB頻寬之三分之二，兩者取較寬者。系統之跳頻頻道應依虛擬亂數排列，在各頻率之跳頻頻道上跳躍。每一發射機必須均等的使用每一頻率。系統接收機應具有與發射機跳躍頻道頻寬相匹配之輸入頻寬，且應隨所發射之訊號同步偏移接收頻率。

對使用數位調變技術之低功率發射機，依據國家通訊傳播委員會低功率射頻電機技術規範3.10.1.6節(2)(A)之規定，6dB之頻寬至少應有500kHz。

8.2 測試方法

測量時，頻譜分析儀之解析頻寬為100kHz，視訊頻寬不小於解析頻寬。為求得精確測量，頻率掃描範圍(Span)遠大於解析頻寬。

8.3 測試配置

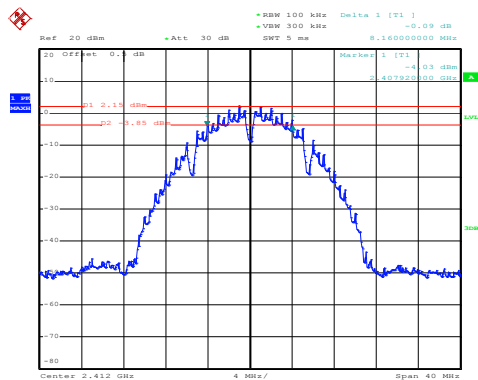


註: **請參照 3.2 節

8.4 發射頻寬之量測結果

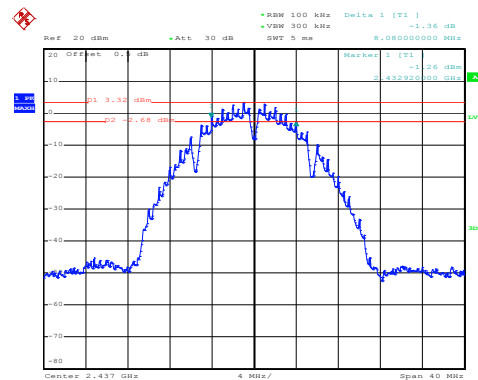
Configuration	Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)		Limit (kHz)	Result
			Chain 0	Chain 1		
IEEE 802.11b	Low	2412	8.160	8.000	>500	PASS
	Mid	2437	8.080	8.080		PASS
	High	2462	8.000	7.200		PASS
IEEE 802.11g	Low	2412	16.320	16.480	>500	PASS
	Mid	2437	15.600	15.680		PASS
	High	2462	15.440	15.440		PASS
IEEE 802.11n HT20	Low	2412	16.880	17.200	>500	PASS
	Mid	2437	16.400	16.000		PASS
	High	2462	15.120	15.680		PASS
BLE-1Mbps	Low	2402	0.676	-	>500	PASS
	Mid	2440	0.668	-		PASS
	High	2480	0.664	-		PASS

IEEE 802.11b Low Channel Chain 0



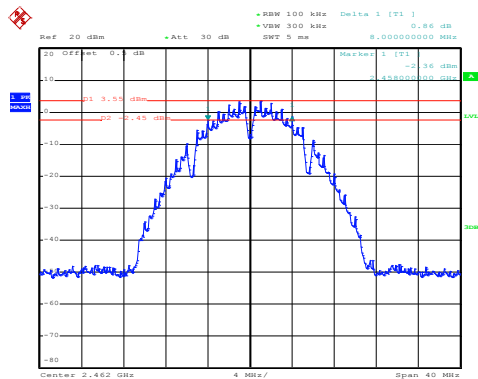
Date: 15.JUN.2020 15:25:38

IEEE 802.11b Middle Channel Chain 0



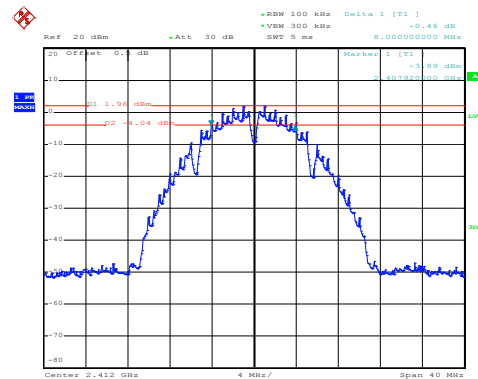
Date: 15.JUN.2020 15:27:15

IEEE 802.11b High Channel Chain 0



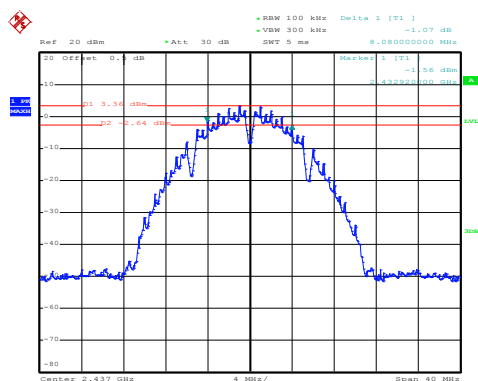
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IEEE 802.11b Low Channel Chain 1



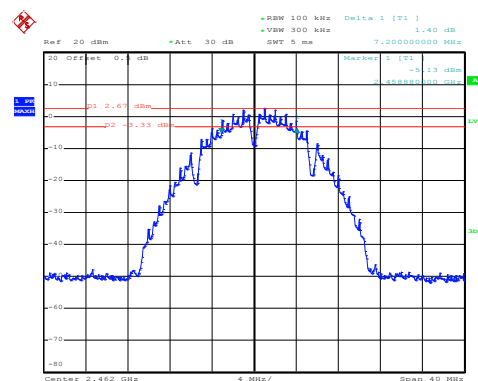
Date: 15.JUN.2020 15:54:15

IEEE 802.11b Middle Channel Chain 1



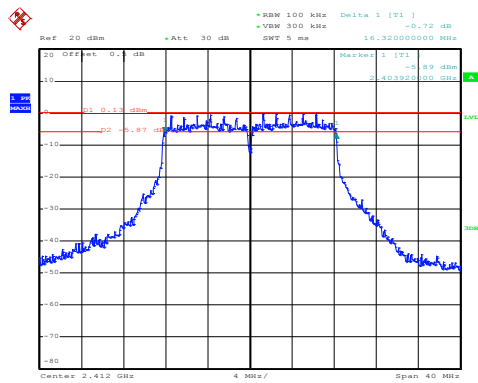
Date: 15.JUN.2020 15:55:54

IEEE 802.11b High Channel Chain 1



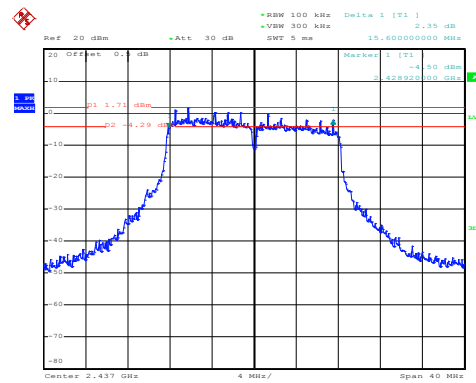
Date: 15.JUN.2020 15:57:32

IEEE 802.11g Low Channel Chain 0



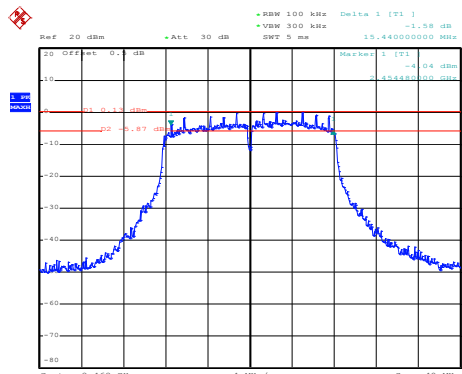
Date: 15.JUN.2020 15:32:51

IEEE 802.11g Middle Channel Chain 0



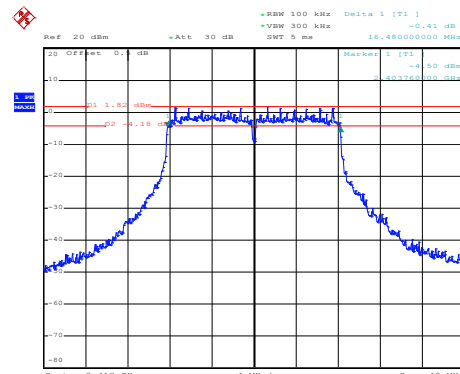
Date: 15.JUN.2020 15:34:54

IEEE 802.11g High Channel Chain 0



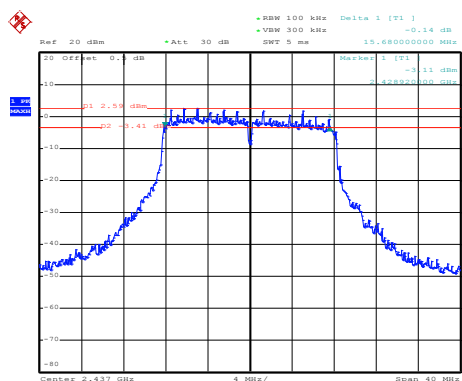
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IEEE 802.11g Low Channel Chain 1



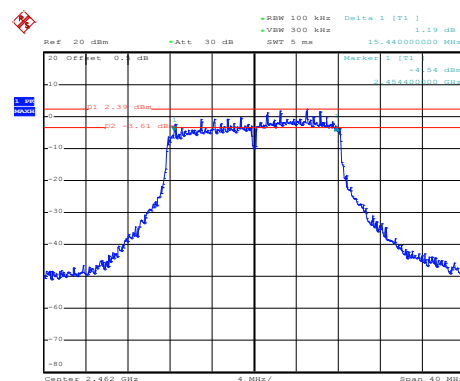
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IEEE 802.11g Middle Channel Chain 1



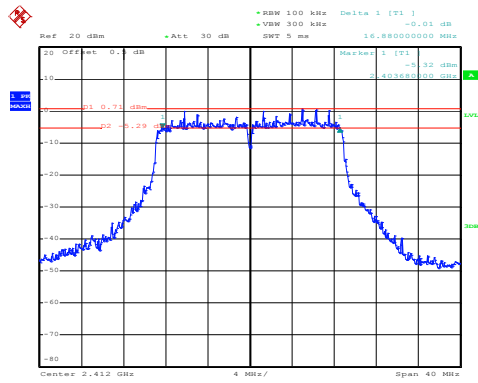
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IEEE 802.11g High Channel Chain 1



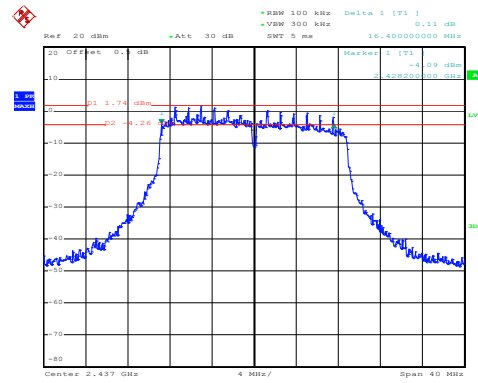
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IEEE 802.11n HT20 Low Channel Chain 0



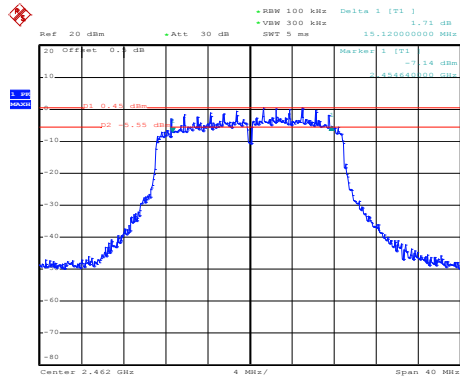
Date: 15.JUN.2020 15:39:21

IEEE 802.11n HT20 Middle Channel Chain 0



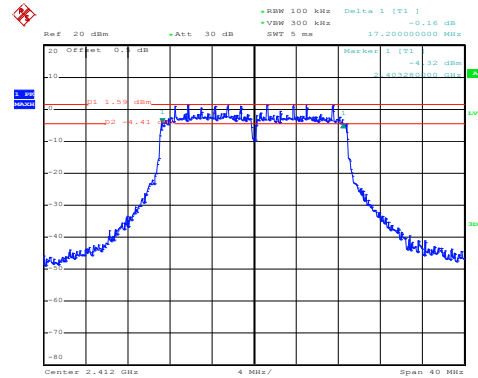
Date: 15.JUN.2020 15:41:17

IEEE 802.11n HT20 High Channel Chain 0



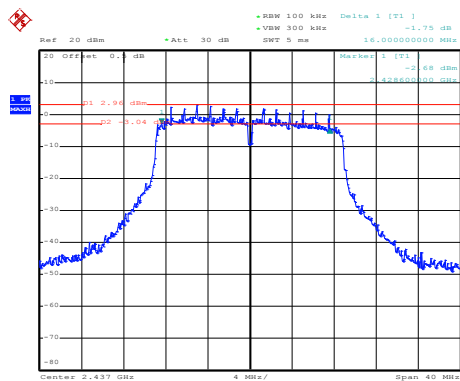
Date: 15.JUN.2020 15:42:54

IEEE 802.11n HT20 Low Channel Chain 1



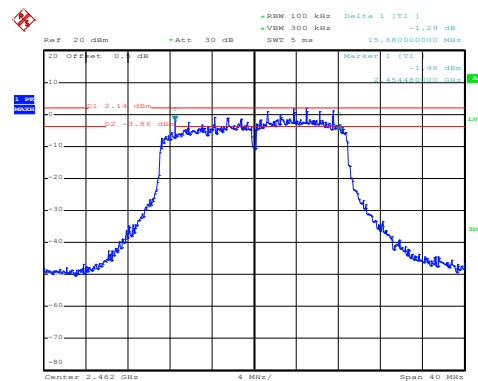
Date: 15.JUN.2020 16:23:42

IEEE 802.11n HT20 Middle Channel Chain 1

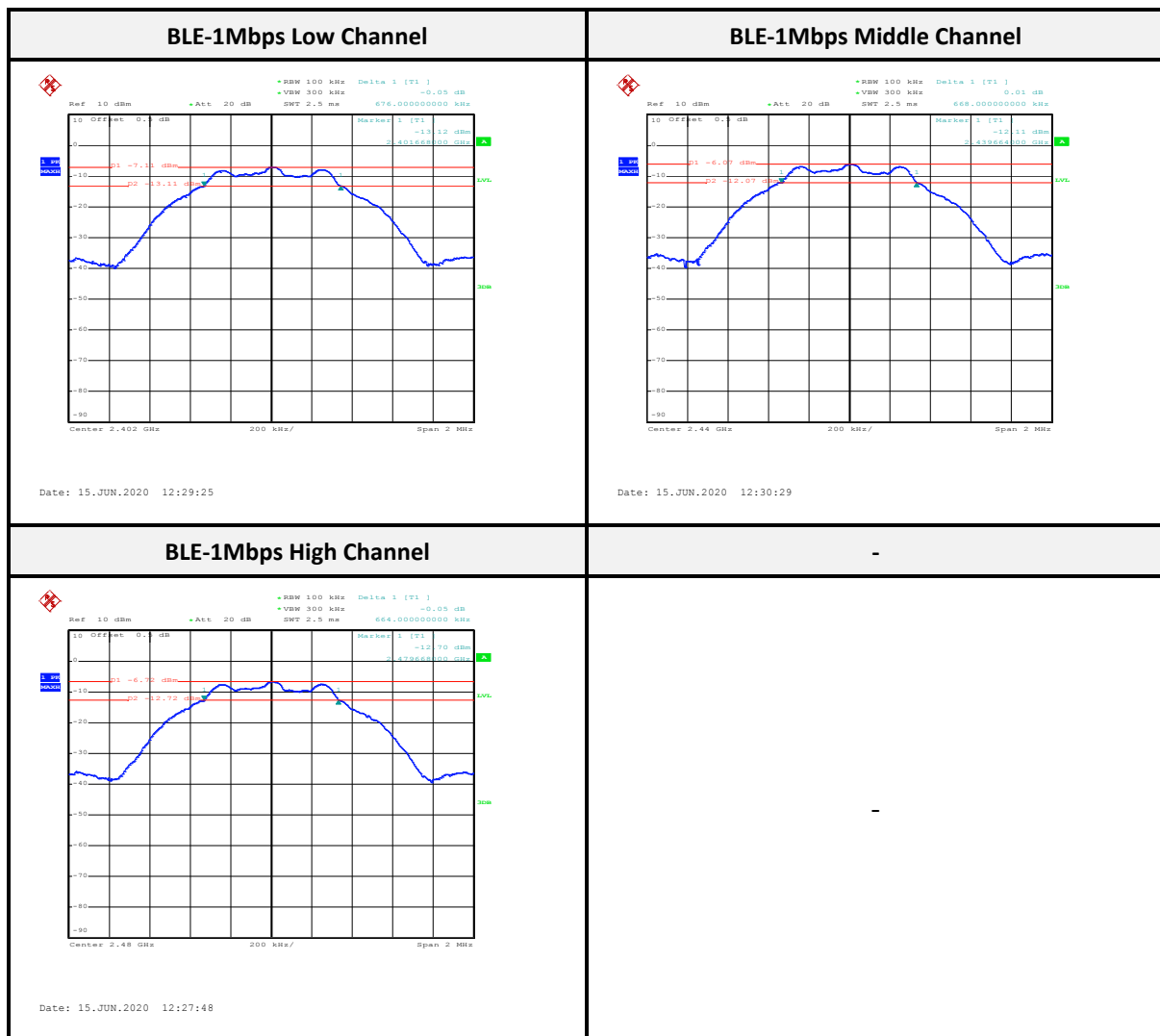


Date: 15.JUN.2020 16:26:32

IEEE 802.11n HT20 High Channel Chain 1



Date: 15.JUN.2020 16:28:07



9. 輸出峰值功率之量測

9.1 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 3.10.1.2 節(1)(A)之規定，跳頻系統至少使用 75 個跳頻頻道：1 W(含) 以下。

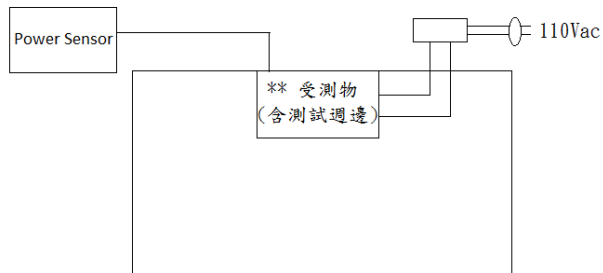
依據國家通訊傳播委員會低功率射頻電機技術規範 3.10.1.2 節(1)(B)之規定，跳頻系統除 3.10.1.2 節(1)(A)外，依 3.10.1.6(1)(A)(a)：0.125 W(含) 以下。

依據國家通訊傳播委員會低功率射頻電機技術規範 3.10.1.2 節(1)(C)之規定，數位調變技術系統：1 W(含) 以下。

9.2 測試方法

1. 將受測物的 RF 埠經由一條 50 歐姆纜線連接至功率分析儀。
 2. 設定量測頻率為量測頻道。
 3. 紀錄最大峰值輸出功率。
- 上述之測試步驟應注意外接之衰減與纜線損失。

9.3 測試配置



註: **請參照 3.2 節

9.4 輸出功率之量測結果

Configuration	Channel	Frequency (MHz)	Output Power (dBm)			Limit (dBm)
			China0	China1	Total	
IEEE 802.11b	Low	2412	12.75	13.27	16.03	30.00
	Mid	2437	12.89	13.22	16.07	30.00
	High	2462	12.94	13.12	16.04	30.00
IEEE 802.11g	Low	2412	12.83	13.01	15.93	30.00
	Mid	2437	12.95	13.27	16.12	30.00
	High	2462	12.55	12.94	15.76	30.00
IEEE 802.11n HT20	Low	2412	12.75	13.07	15.92	30.00
	Mid	2437	12.82	13.24	16.05	30.00
	High	2462	12.61	13.21	15.93	30.00
BLE-1Mbps	Low	2402	-6.17	-	-	30.00
	Mid	2440	-5.07	-	-	30.00
	High	2480	-5.62	-	-	30.00

10. 開放頻帶邊緣 100kHz 頻寬內之限制

10.1 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3.10.1.5節之規定，使用頻帶範圍外之任意100kHz 內，發射器所產生的射頻功率相較於使用頻帶範圍中包含最高所需功率之100kHz 內的射頻功率，峰值輸出功率方式測量者須衰減20分貝 (dB)，以射頻傳導或輻射方式測量。最大傳導輸出功率測量方式者，至少須衰減30 dB。此外，落於第2.7節禁用頻段之輻射發射，應符合第2.8節之規定。

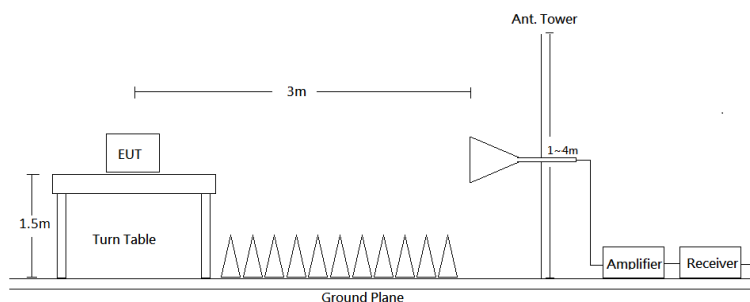
10.2 測試方法

- 1 頻率掃描範圍足以涵蓋操作在最靠近頻帶邊緣之頻道的發射波峰位準以及任何落於許可頻帶外之調變產物。
- 2 解析頻寬大於1%頻率掃描範圍寬度，視訊頻寬不小於解析頻寬。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)。
- 3 將標記設定於在頻帶邊緣上的發射，或將標記設定於最大之頻帶外調變產物上若其位準大於頻帶邊緣上的發射。啟動標記差值之功能，利用標記至波峰功能(Marker to Peak)功能以標記頻帶內發射之波峰，所顯示之標記差值必須符合指定之限制值。

以上述相同的步驟決定由跳頻功能所產生的任何混附波是否亦符合規定之限制值。

10.3 測試配置

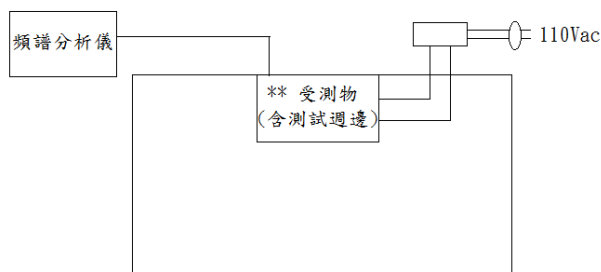
輻射配置圖



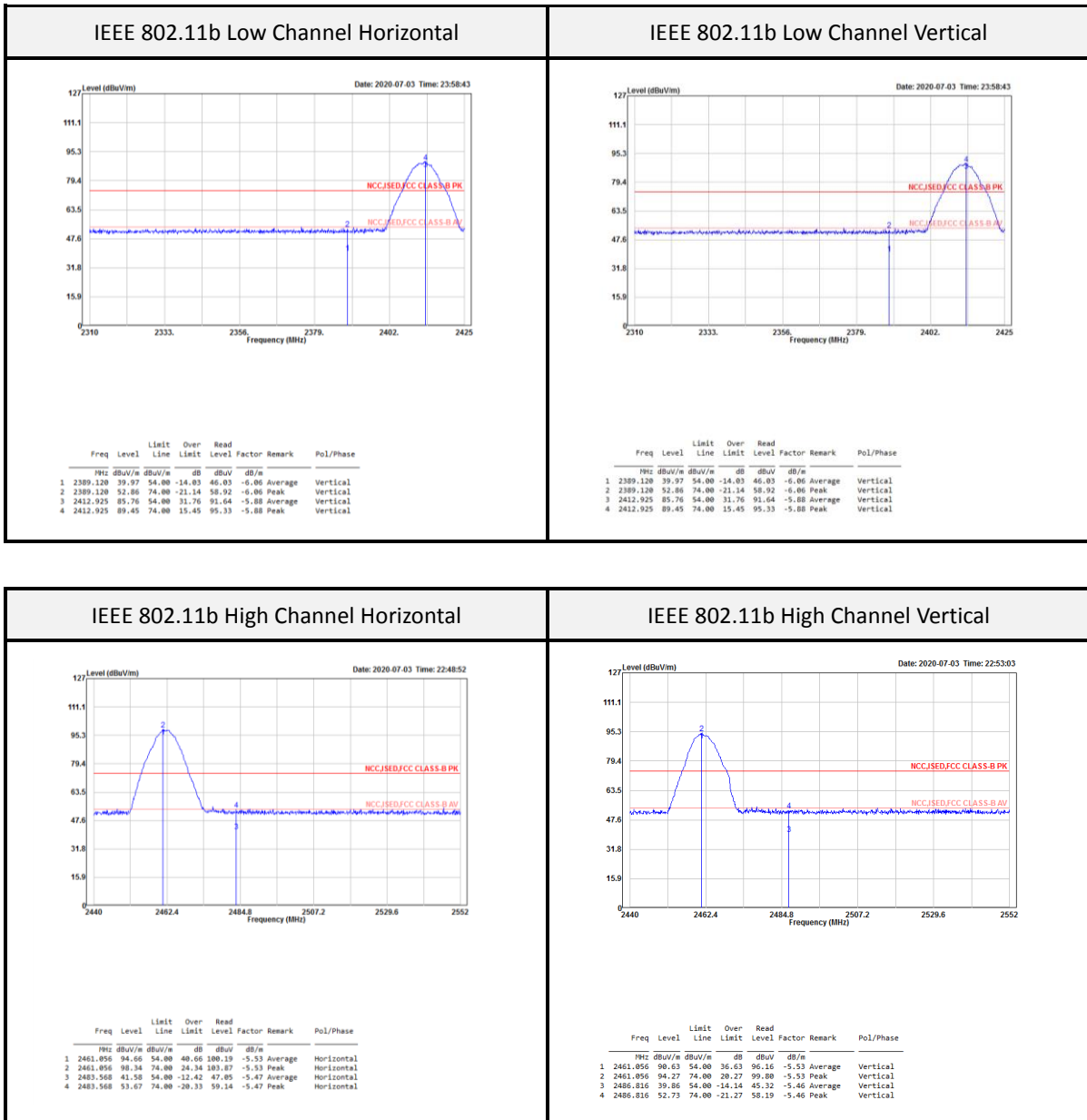
註: **請參照 3.2 節

依據 ANSI C63.10:2013 架設

直量配置圖



10.4 開放頻帶邊緣之量測結果



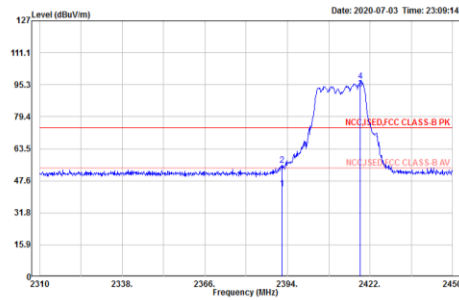
Note:

Result = Reading + Correct Factor

Margin = Result – Limit

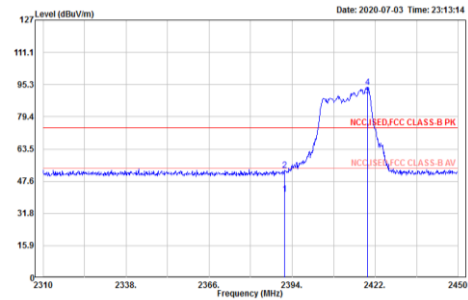
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

IEEE 802.11g Low Channel Horizontal



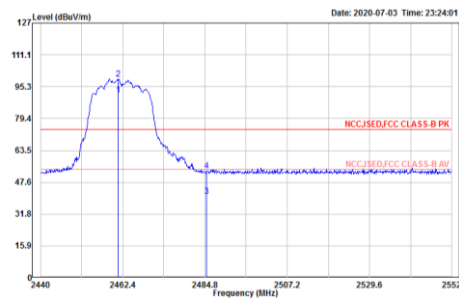
Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 2392.180	43.58	54.00	-10.42	49.63	-6.05	Average	Horizontal
2 2392.180	55.25	74.00	-18.75	61.30	-6.05	Peak	Horizontal
3 2419.780	95.24	54.00	39.24	99.07	-5.83	Average	Horizontal
4 2419.780	96.93	74.00	22.93	102.76	-5.83	Peak	Horizontal

IEEE 802.11g Low Channel Vertical



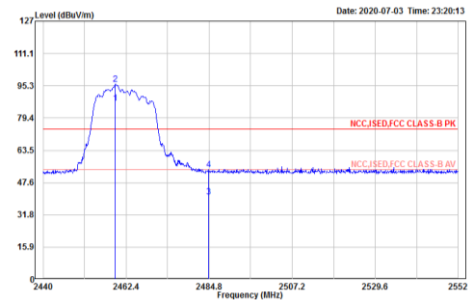
Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 2392.180	41.22	54.00	-12.78	47.27	-6.05	Average	Vertical
2 2392.180	53.80	74.00	-20.92	59.13	-6.05	Peak	Vertical
3 2419.400	89.96	54.00	35.96	95.78	-5.82	Average	Vertical
4 2419.400	93.85	74.00	19.85	99.67	-5.82	Peak	Vertical

IEEE 802.11g High Channel Horizontal



Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 2461.160	91.26	54.00	37.26	96.79	-5.53	Average	Horizontal
2 2461.160	99.04	74.00	25.04	104.57	-5.53	Peak	Horizontal
3 2485.240	40.56	54.00	-13.44	46.03	-5.47	Average	Horizontal
4 2485.240	53.31	74.00	-20.69	58.78	-5.47	Peak	Horizontal

IEEE 802.11g High Channel Vertical



Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 2459.480	86.78	54.00	32.78	92.12	-5.54	Average	Vertical
2 2459.480	95.92	74.00	21.92	101.46	-5.54	Peak	Vertical
3 2484.680	40.78	54.00	-13.22	46.25	-5.47	Average	Vertical
4 2484.680	53.92	74.00	-20.08	59.39	-5.47	Peak	Vertical

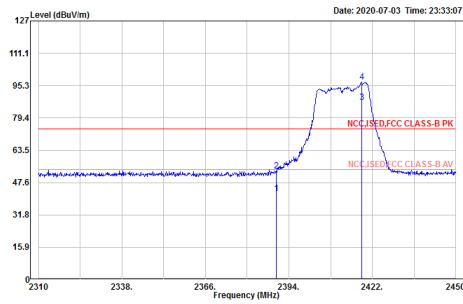
Note:

Result = Reading + Correct Factor

Margin = Result – Limit

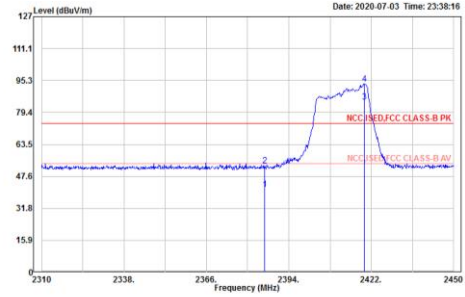
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

IEEE 802.11n HT20 Low Channel Horizontal



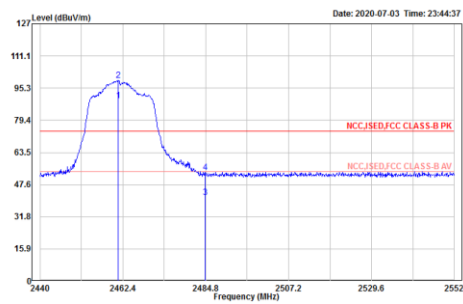
Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 2389.669	42.24	54.00	-11.66	46.40	-6.06	Average	Horizontal
2 2389.669	53.41	74.00	-20.59	59.47	-6.06	Peak	Horizontal
3 2418.360	87.11	54.00	33.11	92.95	-5.84	Average	Horizontal
4 2418.360	96.96	74.00	22.96	102.08	-5.84	Peak	Horizontal

IEEE 802.11n HT20 Low Channel Vertical



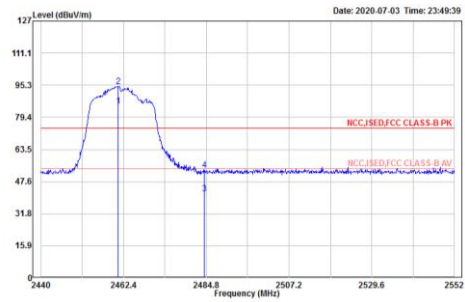
Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 2385.740	41.29	54.00	-12.71	47.38	-6.09	Average	Vertical
2 2385.740	53.04	74.00	-20.96	59.13	-6.09	Peak	Vertical
3 2419.620	84.65	54.00	30.65	90.47	-5.82	Average	Vertical
4 2419.620	93.72	74.00	19.72	99.54	-5.82	Peak	Vertical

IEEE 802.11n HT20 High Channel Horizontal



Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 2461.168	89.16	54.00	35.16	94.09	-5.53	Average	Horizontal
2 2461.168	99.85	74.00	25.85	104.58	-5.53	Peak	Horizontal
3 2484.688	41.37	54.00	-12.63	46.84	-5.47	Average	Horizontal
4 2484.688	53.75	74.00	-20.25	59.22	-5.47	Peak	Horizontal

IEEE 802.11n HT20 High Channel Vertical



Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 2460.944	84.85	54.00	30.85	90.38	-5.53	Average	Vertical
2 2460.944	94.60	74.00	20.60	100.13	-5.53	Peak	Vertical
3 2484.240	41.73	54.00	-12.27	47.20	-5.47	Average	Vertical
4 2484.240	53.24	74.00	-20.76	58.71	-5.47	Peak	Vertical

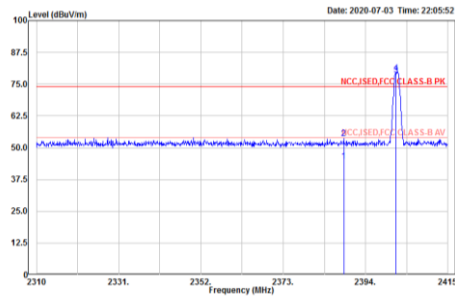
Note:

Result = Reading + Correct Factor

Margin = Result – Limit

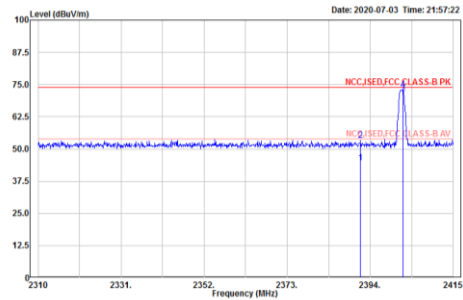
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

BLE Low Channel Horizontal



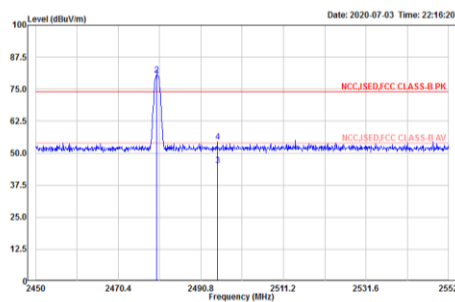
Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 2388.435	44.85	54.00	-9.15	50.93	-6.08	Average	Horizontal
2 2388.435	53.53	74.00	-20.47	59.61	-6.08	Peak	Horizontal
3 2401.770	78.46	54.00	24.46	84.45	-5.99	Average	Horizontal
4 2401.770	79.53	74.00	5.53	85.52	-5.99	Peak	Horizontal

BLE Low Channel Vertical



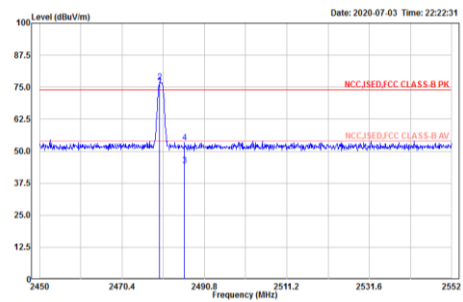
Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 2391.585	44.77	54.00	-9.23	50.82	-6.05	Average	Vertical
2 2391.585	53.28	74.00	-20.72	59.33	-6.05	Peak	Vertical
3 2402.295	71.68	54.00	17.68	77.66	-5.98	Average	Vertical
4 2402.295	73.11	74.00	-0.89	79.09	-5.98	Peak	Vertical

BLE High Channel Horizontal



Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 2479.784	79.17	54.00	25.17	84.06	-5.49	Average	Horizontal
2 2479.784	88.43	74.00	14.43	85.92	-5.49	Peak	Horizontal
3 2494.880	45.38	54.00	-8.62	50.82	-5.44	Average	Horizontal
4 2494.880	54.52	74.00	-19.48	59.96	-5.44	Peak	Horizontal

BLE High Channel Vertical



Freq	Level	Limit	Over	Read	Factor	Remark	Pol/Phase
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1 2479.682	75.62	54.00	21.62	81.11	-5.49	Average	Vertical
2 2479.682	76.98	74.00	2.98	82.47	-5.49	Peak	Vertical
3 2485.904	44.37	54.00	-9.63	49.83	-5.46	Average	Vertical
4 2485.904	53.29	74.00	-20.71	58.75	-5.46	Peak	Vertical

Note:

Result = Reading + Correct Factor

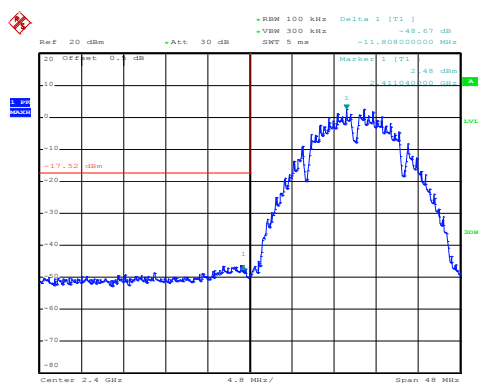
Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Conducted Band Edge

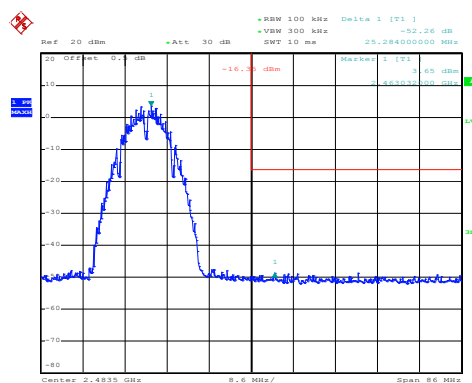
Configuration	Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)		Limit (dBc)	Result
			China0	China1		
IEEE 802.11b	Low	2412	48.67	50.43	≥ 20	PASS
	High	2462	52.26	50.90	≥ 20	PASS
IEEE 802.11g	Low	2412	35.40	36.96	≥ 20	PASS
	High	2462	48.41	48.40	≥ 20	PASS
IEEE 802.11n HT20	Low	2412	34.49	36.57	≥ 20	PASS
	High	2462	48.86	49.71	≥ 20	PASS
BLE-1Mbps	Low	2402	51.85	-	≥ 20	PASS
	High	2480	52.99	-	≥ 20	PASS

IEEE 802.11b Low Channel Chain 0



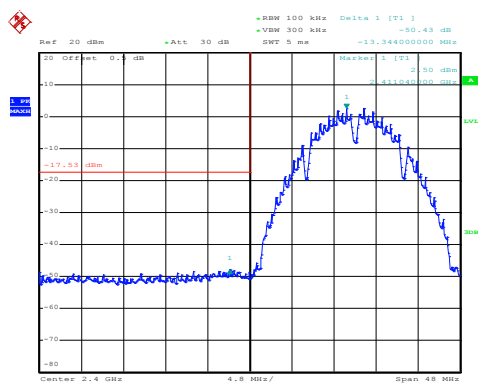
Date: 15 JUN 2020 15:26:46

IEEE 802.11b High Channel Chain 0



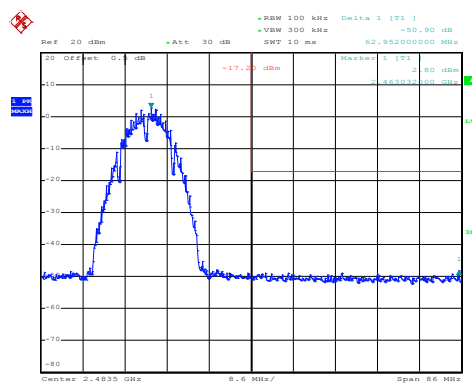
Date: 15 JUN 2020 15:31:10

IEEE 802.11b Low Channel Chain 1



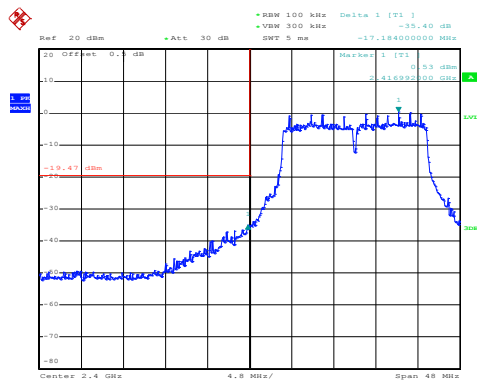
Date: 15 JUN 2020 15:55:22

IEEE 802.11b High Channel Chain 1



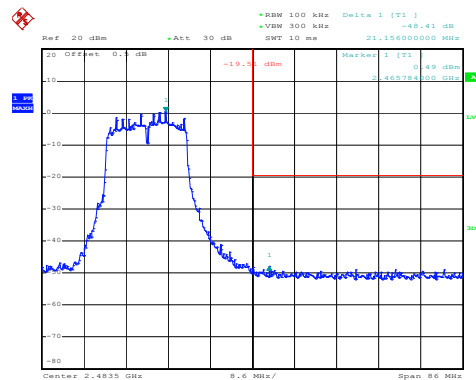
Date: 15 JUN 2020 15:58:39

IEEE 802.11g Low Channel Chain 0



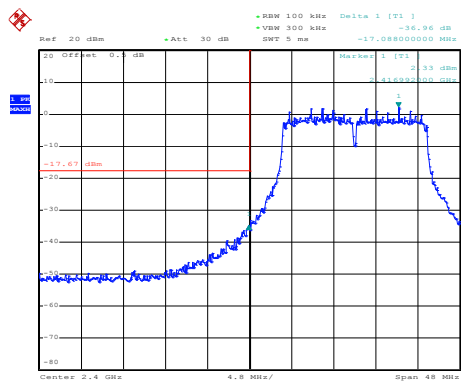
Date: 15 JUN 2020 15:34:06

IEEE 802.11g High Channel Chain 0



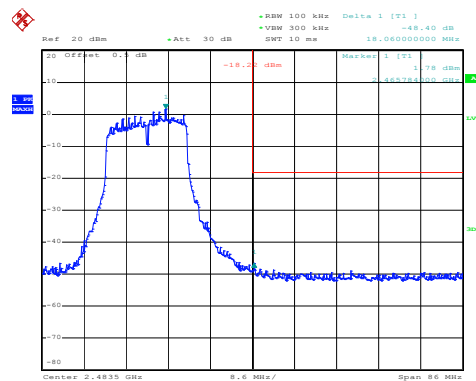
Date: 15 JUN 2020 15:37:50

IEEE 802.11g Low Channel Chain 1



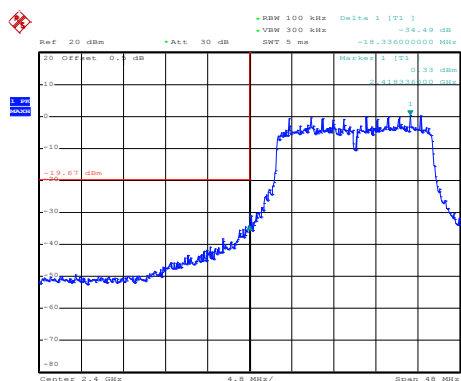
Date: 15 JUN 2020 16:15:04

IEEE 802.11g High Channel Chain 1



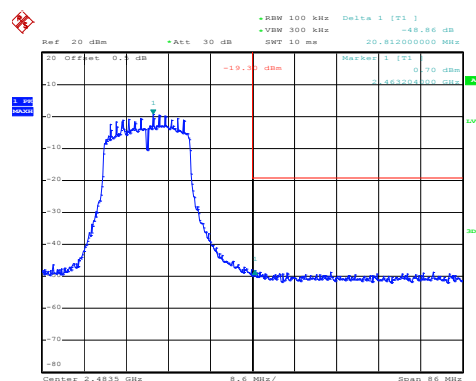
Date: 15 JUN 2020 16:21:42

IEEE 802.11n HT20 Low Channel Chain 0



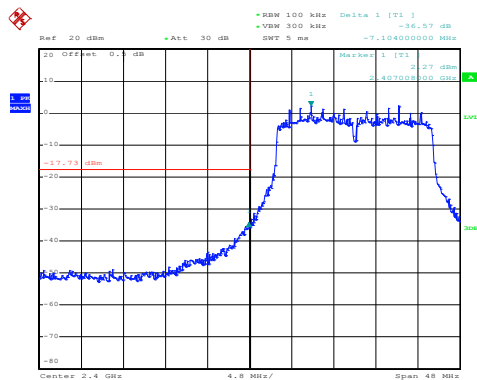
Date: 15 JUN 2020 15:40:54

IEEE 802.11n HT20 High Channel Chain 0



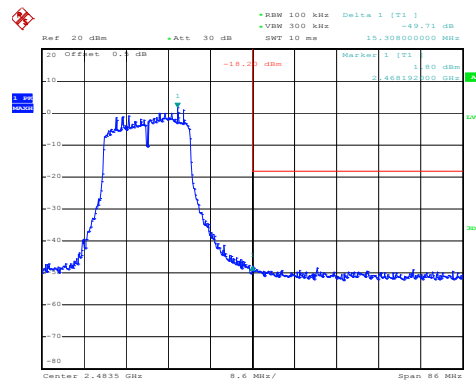
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IEEE 802.11n HT20 Low Channel Chain 1



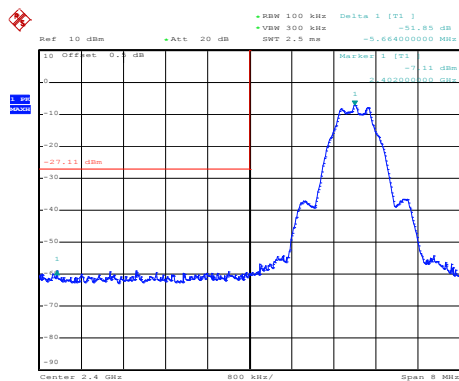
Date: 15.JUN.2020 16:25:01

IEEE 802.11n HT20 High Channel Chain 1



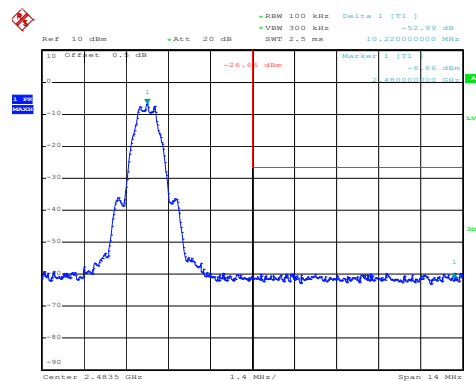
Date: 15.JUN.2020 16:29:26

BLE Low Channel



Date: 15.JUN.2020 12:29:58

BLE High Channel



Date: 15.JUN.2020 12:28:19

11. 功率密度之量測

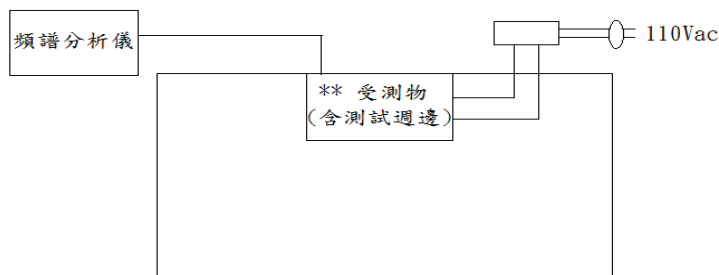
11.1 適用標準

依據國家通訊傳播委員會低功率射頻電機技術規範3.10.1.6節之(2)(B)條規定，在使用頻率範圍之任一3 kHz 頻寬內，由發射機傳導至天線之功率頻譜密度在任意傳輸期間內，皆小於或等於8 毫分貝 (dBm)，且應依3.10.1.3 之方式降低功率頻譜密度限制值。

11.2 測試方法

1. 將發射機之天線埠經由適當之衰減直接連至測試儀器。找出發射峰值並擴展於通帶內，設定解析頻寬為3 kHz，視訊頻寬大於解析頻寬，掃描時間為頻率掃描範圍除以3 kHz。所測得之峰值位準必須應小於或等於8 dBm。
2. 若受測裝置之頻譜線間隔小於3 kHz，測量時應將解析頻寬降低以使頻譜線間隔大於3kHz，所測得之數據再藉加總3 kHz 頻帶內所有個別頻譜線之功率(即標準化至3 kHz)以決定是否符合規定。
3. 依據FCC 558074 D01 DTS Meas Guidance v04 之要求。

11.3 測試配置

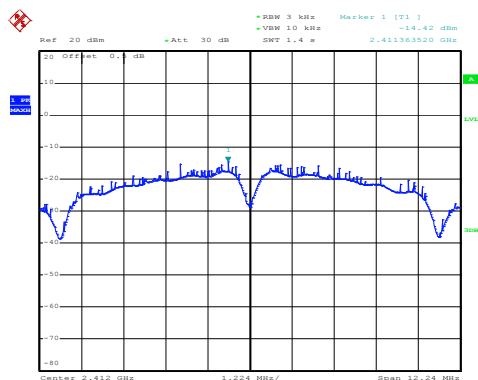


註: **請參照 3.2 節

11.4 功率密度之量測結果

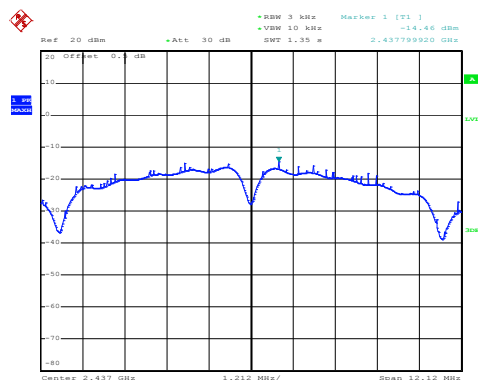
Configuration	Channel	Frequency (MHz)	PPSD (dBm/3kHz)			Limit (dBm/3kHz)	Result
			China0	China1	Total		
IEEE 802.11b	Low	2412	-14.42	-13.05	-10.67	8.00	PASS
	Mid	2437	-14.46	-14.25	-11.34		PASS
	High	2462	-13.36	-13.32	-10.33		PASS
IEEE 802.11g	Low	2412	-15.21	-13.82	-11.45	8.00	PASS
	Mid	2437	-14.39	-14.16	-11.26		PASS
	High	2462	-15.13	-13.34	-11.13		PASS
IEEE 802.11n HT20	Low	2412	-15.93	-14.16	-11.95	8.00	PASS
	Mid	2437	-15.32	-13.75	-11.45		PASS
	High	2462	-15.93	-14.80	-12.32		PASS
BLE-1Mbps	Low	2402	-21.16	-	-	8.00	PASS
	Mid	2440	-20.09	-	-		PASS
	High	2480	-20.64	-	-		PASS

IEEE 802.11b Low Channel Chain 0



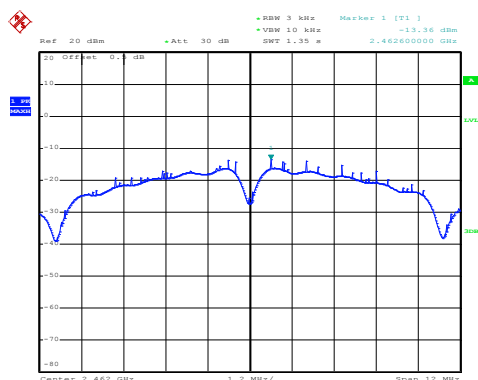
Date: 15.JUN.2020 15:26:06

IEEE 802.11b Middle Channel Chain 0



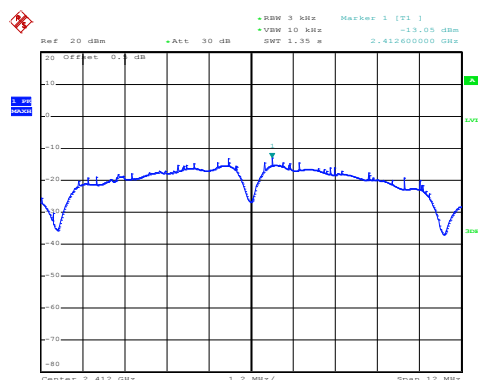
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IEEE 802.11b High Channel Chain 0



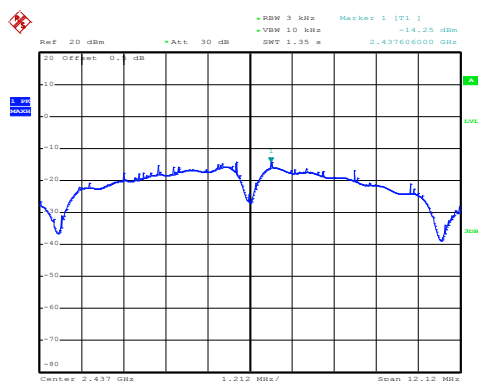
Date: 15.JUN.2020 15:31:39

IEEE 802.11b Low Channel Chain 1



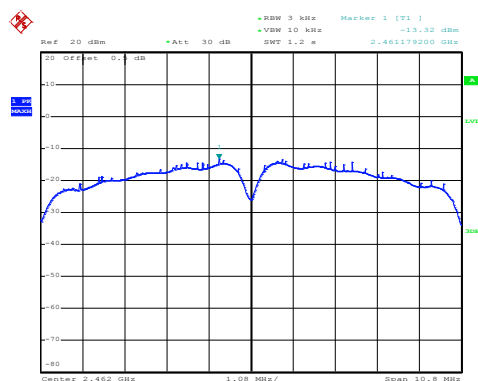
Date: 15.JUN.2020 16:11:56

IEEE 802.11b Middle Channel Chain 1



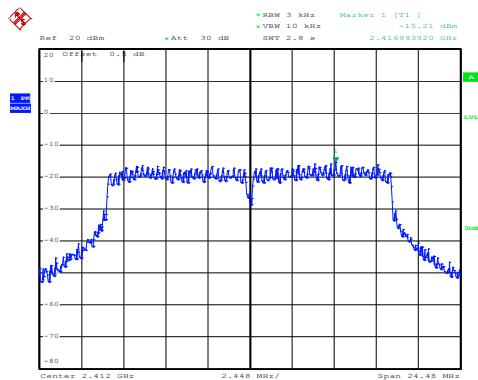
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IEEE 802.11b High Channel Chain 1



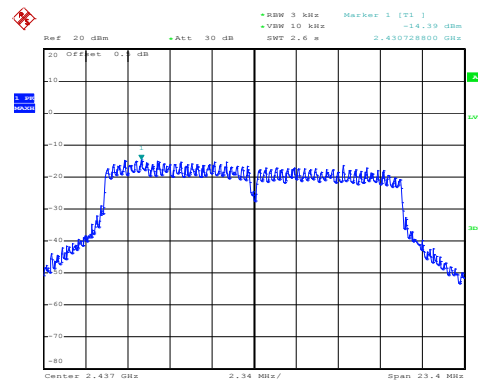
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IEEE 802.11g Low Channel Chain 0



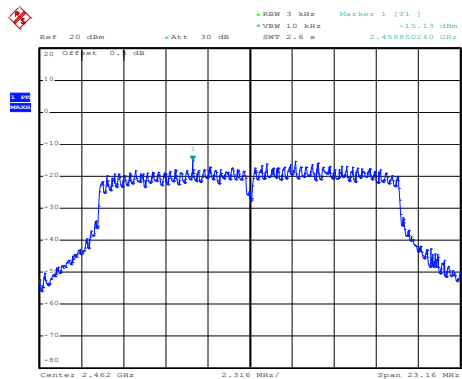
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IEEE 802.11g Middle Channel Chain 0



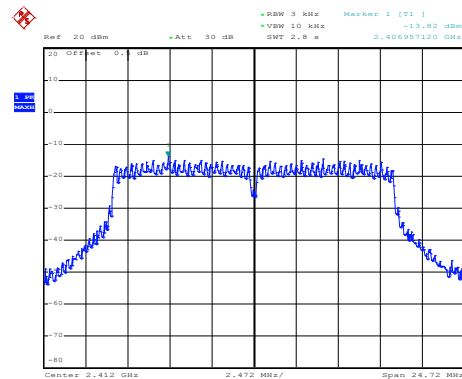
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IEEE 802.11g High Channel Chain 0



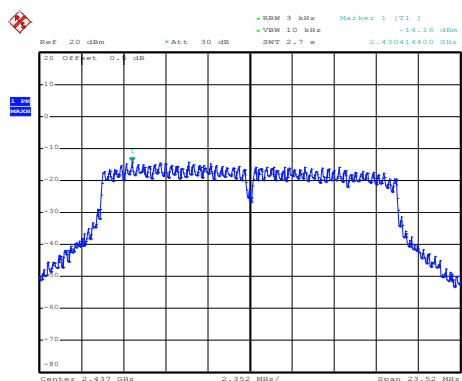
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IEEE 802.11g Low Channel Chain 1



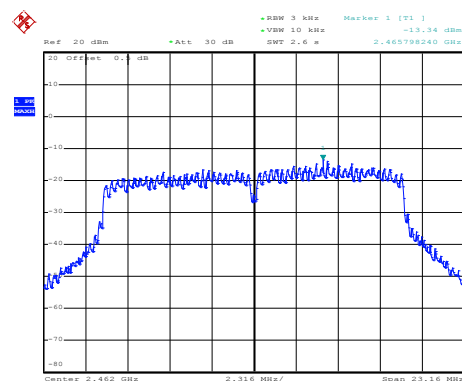
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IEEE 802.11g Middle Channel Chain 1



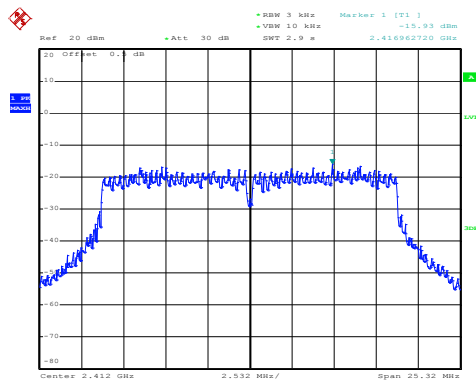
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IEEE 802.11g High Channel Chain 1



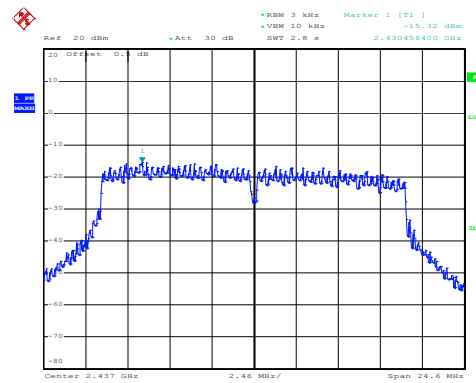
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IEEE 802.11n HT20 Low Channel Chain 0



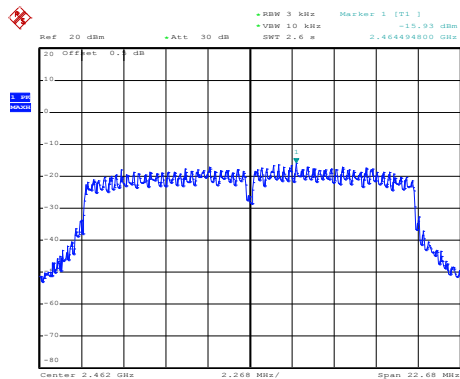
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IEEE 802.11n HT20 Middle Channel Chain 0



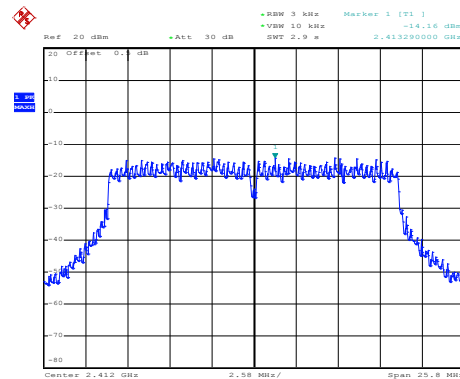
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IEEE 802.11n HT20 High Channel Chain 0



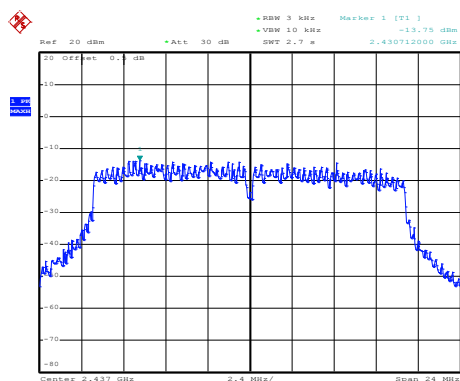
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IEEE 802.11n HT20 Low Channel Chain 1



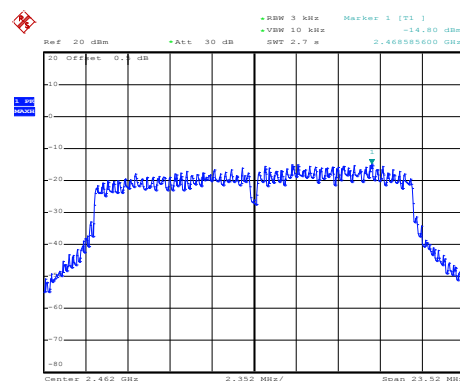
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IEEE 802.11n HT20 Middle Channel Chain 1



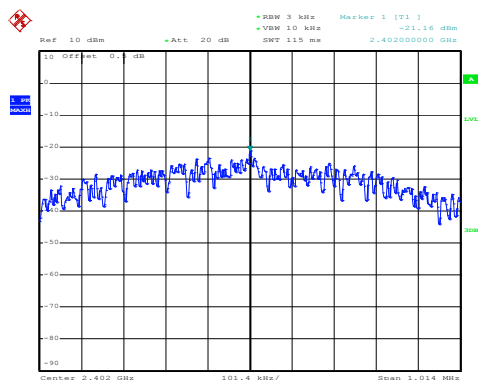
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IEEE 802.11n HT20 High Channel Chain 1



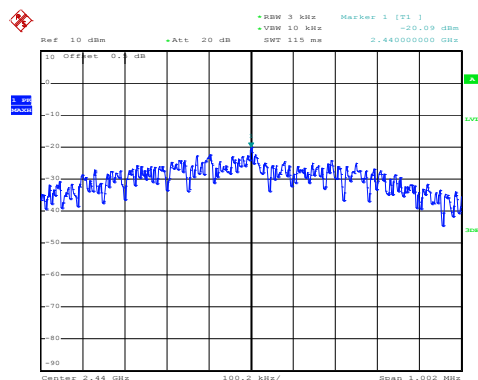
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BLE-1Mbps Low Channel



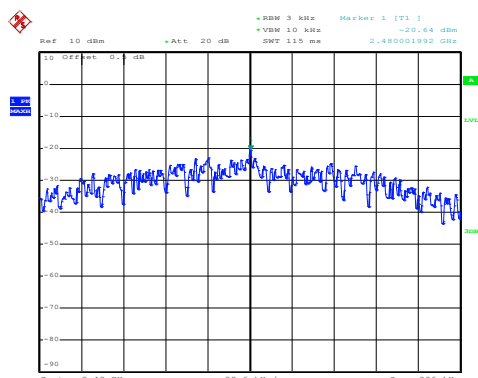
Date: 15.JUN.2020 12:29:46

BLE-1Mbps Middle Channel



Date: 15.JUN.2020 12:30:47

BLE-1Mbps High Channel



Date: 15.JUN.2020 12:28:06

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12. 電波暴露量

12.1 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5.20.2.2節之規定，若受測物於正常操作模式下，其發射機距人體 20 公分以上者，可測試最大暴露允許值(Maximum Permissible Exposure, MPE)以證明其符合電波暴露量之要求。(限制值如下)

Limits for General Population/Uncontrolled Exposure [Ⓢ]				
Frequency Range (MHz) [Ⓢ]	Electric Field Strength (V/m) [Ⓢ]	Magnetic Field Strength (A/m) [Ⓢ]	Power Density [Ⓢ] (mW/cm ²) [Ⓢ]	Averaging Time [Ⓢ] (minutes) [Ⓢ]
0.3–1.34 [Ⓢ]	614 [Ⓢ]	1.63 [Ⓢ]	*(100) [Ⓢ]	30 [Ⓢ]
1.34–30 [Ⓢ]	824/f [Ⓢ]	2.19/f [Ⓢ]	*(180/f ²) [Ⓢ]	30 [Ⓢ]
30–300 [Ⓢ]	27.5 [Ⓢ]	0.073 [Ⓢ]	0.2 [Ⓢ]	30 [Ⓢ]
300–1500 [Ⓢ]	/ [Ⓢ]	/ [Ⓢ]	f/1500 [Ⓢ]	30 [Ⓢ]
1500–100,000 [Ⓢ]	/ [Ⓢ]	/ [Ⓢ]	1.0 [Ⓢ]	30 [Ⓢ]

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

12.2 電波暴露量之評估

Mode	Frequency Range (MHz)	Antenna Gain		Target Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
Wi-Fi 2.4G	2412-2462	0.00	1.00	16.12	40.9261	20	0.0081	1

***** END OF REPORT *****