

功率射頻電機試驗報告

申請廠商	Barco NV Barco NV President Kennedypark(Kor)35, 8500 Courtrai, Belgium
製造廠商	Barco NV
產品名稱	ClickShare Button
廠牌	Barco
型號	R9861500D01
系列型號	R9861500D01C
發射功率	請見本報告第1.1章節產品描述
工作頻率	請見本報告第1.1章節產品描述
調變方式	OFDM
使用規範	LP0002 4.7節

實驗室資訊

台灣檢驗科技股份有限公司 電子通訊實驗室
新北市新北產業園區五工路134號
認證有效期間：107年06月14日起至110年06月13日止
受理日期 民國108年05月20日
完成日期 民國108年10月18日

陳俊傑



報告簽署人
陳俊傑簽章

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Revision History			
Revision	Description	Issue Date	Remark
Rev.00	Original.	Oct. 18, 2019	Revised By: Karen Huang

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測試標準

國家通訊傳播委員會低功率射頻電機技術規範

民國 107 年 1 月 10 日版本

待測裝置已於台灣檢驗科技股份有限公司電子通訊實驗室，依據國家通訊傳播委員會於中華民國一百零七年一月頒佈之低功率射頻電機技術規範測試。

台灣檢驗科技股份有限公司根據此條文規範項目測試，測試各項數據皆能符合此規範規定之限度值。

台灣檢驗科技股份有限公司依低功率射頻電機技術規範審驗要點規範製作測試結果報告，測試結果評判為合格。

備註：

1. 報告中所描述之測試結果和待測設備的架構組合，均根據實際量測情況作詳實的記錄，且本測試報告僅對上述待測設備樣品負責。
2. 此份報告未經本公司同意，不得部份摘錄複製使用。
3. 系列申請，主型號: R9861500D01 與系列型號: R9861500D01C，除型號差異，產品名稱及傳輸線所接連接器不同，其餘產品基本結構相同，詳見差異說明書，特此說明。

報告審核：

陳俊傑

日期：

10/18/2019

陳俊傑 / 副主任

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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 0513, 認可頻率範圍9kHz ~ 40GHz

認證有效期間 : 107年06月14日起至110年06月13日止

測試場地 : 新北市新北產業園區五工路134號

實驗室名稱 : 台灣檢驗科技股份有限公司
電子通訊實驗室

實驗室地址 : 新北市新北產業園區五工路134號

電話 : 886-2-22993939

傳真 : 886-2-22982698

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實驗室之量測不確定度

量測項目	量測不確定度 (擴充不確定度)
TPC and DFS Measurement	+/- 123.36 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC= +/- 0.2%

附註: 1. K=2 即代表測試結果具有95%的量測可信度。

2. 本報告中的符合性判定僅依據試驗結果，不考慮其試驗結果的量測不確定度。

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1 一般資料

1.1 產品描述

產品名稱	ClickShare Button
產品型號	R9861500D01
系列型號	R9861500D01C
產品商標	Barco
SW version:	N/A
HW version:	N/A
使用電源	5Vdc from USB port

調變	發射頻帶 (MHz)		輸出功率 (dBm)	頻道數 (Channels)
802.11 a mode	5250 ~5350		10.09	4
	5470 ~5725		10.14	11
802.11n HT20 mode	HT20:	5250 ~5350	9.86	4
	HT20:	5470 ~5725	10.08	11
調變方式	64QAM, 16QAM, QPSK, BPSK for OFDM			

天線型式/天線增益

天線型式	Supplier	Model No.	發射頻帶(MHz)	天線增益(dBi)
Chip	FRACTUS ANTENNAS, S.L.	FR05-S1-NO-1-004	5250~5350	4.9
			5470~5725	4.9

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1.2 產品特性

此裝置符合IEEE Std 802.11a/ac/n 標準。其發射頻率落於5250MHz至5350MHz及5470MHz至5725MHz。

802.11a/n/ac mode 採用正交分頻多工OFDM調變技術之發射頻率全段：落於5250-5350 MHz共有4個頻道及5350MHz及5470MHz共有11個頻道。

Operated band in 5250 MHz ~5350 MHz:

802.11a / n HT20 Mode, 802.11ac VHT20 Mode	
channel	Frequency
52	5260
56	5280
60	5300
64	5320

Channel	Frequency
100	5500
104	5520
108	5540
112	5560
116	5580
120	5600
124	5620
128	5640
132	5660
136	5680
140	5700

channel	Frequency
102	5510
110	5550
118	5590
126	5630
134	5670

channel	Frequency
106	5530
122	5610

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1.3 測試方法之依據

本測試報告之所有項目皆依據國家通訊傳播委員會低功率射頻電機技術規範(LP0002, 107.1.10 版本) 如無國家標準可適用者, 得依美國 EIA、IEEE ANSI 檢驗法檢驗, 及美國 FCC 47 CFR Part 2 有關檢驗之規定及參考 ANSI 63.10:2013、FCC CFR 47 15.407、FCC 14-30、KDB 789033D02 之檢驗法。

低功率射頻電機技術規範4.7節及FCC Part 15.407

項次	測試項目	適用規範	測試結果	量測設備	備註
1	發射功率控制(TPC)及動態頻率選擇(DFS)	低功率射頻電機技術規範4.7.7	請參閱11.6節	請參閱11.4節	合格

1.4 技術判定宣告

型號差異資訊由報告申請者提供, 報告內測試結果僅代表實際收取的樣品。
經評估, 不同型號的樣品, 其硬體結構和軟體設定完全相同, 此報告內測試結果涵蓋所有不同型號的樣品, 毋須另外驗證。

1.5 免責聲明

型號差異性資訊由報告申請人提供, 此報告之測試結果僅適用實際收取的樣品。

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2 適用規範

依據 NCC 低功率射頻電機技術規範 4.7.7 節之要求，發射功率控制(TPC)及動態頻率選擇

發射功率控制(TPC)：操作於5.25 GHz~5.35 GHz 與5.470 GHz~5.725 GHz 頻段的設備，應具備發射功率控制功能。設備必須至少具有6 dB低於平均EIRP 30 dBm的能力。EIRP 低於500 mW 之系統不須具備TPC 功能。

動態頻率選擇(DFS):操作於5.25 GHz~5.35 GHz與5.470 GHz~5.725 GHz頻段之設備應具備動態頻率選擇雷達偵測功能並啟動之，以完整偵測使用頻帶內之雷達訊號，避免與雷達系統同頻道操作。相關規定如下：

(1) 最低動態頻率選擇的偵測門檻

(A) 最大EIRP 為200 mW~1 W之設備，其最低動態頻率選擇的偵測門檻值為-64dBm。

(B) 最大EIRP 低於200 mW，且功率頻譜密度小於10 dBm/MHz 之設備，其最低動態頻率選擇的偵測門檻值為-62 dBm。

(C) 最大EIRP 低於200 mW，且功率頻譜密度大於或等於10 dBm/MHz 之設備，其最低動態頻率選擇的偵測門檻值為-64 dBm。

(D) 此偵測門檻值為1 微秒內之平均接收功率，並以0 dBi 天線為參考基準。頻道初始設定得由系統隨機選取或使用者手動選取。

(2) 操作模式：動態頻率選擇之規定適用於以下之操作模式：

(A) 頻道可用性檢查時間之規定，適用於主控運作模式。

(B) 頻道移動時間之規定，適用於主控及受控運作模式。

(3) 頻道可用性檢查時間：設備必須檢查其可在某一頻道上起始傳送之前是否有雷達系統已經操作在該頻道上，以及何時其必須移動到另一新的頻道，在60 秒內若沒有偵測到功率位準大過上述之干擾門檻值的雷達訊號時，設備才可開始使用該頻道。

(4) 頻道移動時間：在偵測到雷達的存在後，所有在該操作頻道上的所有傳輸須在10秒內停止，在偵測到雷達訊號後，該期間內的傳輸應維持最多200 毫秒的正常通訊。

另外，間歇性的管理與控制訊號可在剩餘的時間中傳送，以便撤離該操作頻道。

(5) 不可佔用期間：某一頻道已被頻道可用性檢查或"服務中"監視顯示含有雷達系統，至少須有30 分鐘的不可佔用期間。不可佔用期間起始於偵測到雷達系統的當時。

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3 受測裝置之系統說明

裝置名稱	製造者/申請者	型號	纜線說明
* ClickShare Button	Barco NV / Barco NV	R9861500D01, R9861500D01C	無纜線

標記：“*”表欲申請之受測物。

3.1 待測物與測試設備系統圖

3.1.1 量測配置圖

Conducted (Antenna Port) Emission



Conduction (AC Power Line) Emission



Radiated Emission



3.2 輔助測試週邊設備名稱描述

編號	產品別	商標	型號	序號	信號線線長(米)	電源線線長(米)
1.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A
2.	Notebook	Lenovo	L440	P0000367	N/A	N/A

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4 功率控制與動態頻率選擇

4.1 適用標準

發射功率控制(TPC):操作於5.25 GHz~5.35 GHz 與5.470 GHz~5.725 GHz 頻段的設備,應具備發射功率控制功能。設備必須至少具有6 dB低於平均EIRP 30 dBm的能力。EIRP 低於500 mW 之系統不須具備TPC 功能。

動態頻率選擇(DFS):操作於5.25 GHz~5.35 GHz與5.470 GHz~5.725 GHz頻段之設備應具備動態頻率選擇雷達偵測功能並啟動之,以完整偵測使用頻帶內之雷達訊號,避免與雷達系統同頻道操作。相關規定如下:

(1) 最低動態頻率選擇的偵測門檻

- (A) 最大EIRP 為200 mW~1 W之設備,其最低動態頻率選擇的偵測門檻值為-64dBm。
- (B) 最大EIRP 低於200 mW,且功率頻譜密度小於10 dBm/MHz 之設備,其最低動態頻率選擇的偵測門檻值為-62 dBm。
- (C) 最大EIRP 低於200 mW,且功率頻譜密度大於或等於10 dBm/MHz 之設備,其最低動態頻率選擇的偵測門檻值為-64 dBm。
- (D) 此偵測門檻值為1 微秒內之平均接收功率,並以0 dBi 天線為參考基準。頻道初始設定得由系統隨機選取或使用使用者手動選取。

(2) 操作模式:動態頻率選擇之規定適用於以下之操作模式:

- (A) 頻道可用性檢查時間之規定,適用於主控運作模式。
- (B) 頻道移動時間之規定,適用於主控及受控運作模式。

(3) 頻道可用性檢查時間:設備必須檢查其可在某一頻道上起始傳送之前是否有雷達系統已經操作在該頻道上,以及何時其必須移動到另一新的頻道,在60 秒內若沒有偵測到功率位準大過上述之干擾門檻值的雷達訊號時,設備才可開始使用該頻道。

(4) 頻道移動時間:在偵測到雷達的存在後,所有在該操作頻道上的所有傳輸須在10秒內停止,在偵測到雷達訊號後,該期間內的傳輸應維持最多200 毫秒的正常通訊。 另外,間歇性的管理與控制訊號可在剩餘的時間中傳送,以便撤離該操作頻道。

(5) 不可佔用期間:某一頻道已被頻道可用性檢查或"服務中"監視顯示含有雷達系統,至少須有30 分鐘的不可佔用期間。不可佔用期間起始於偵測到雷達系統的當時。

4.2 測試方式

將發射機之天線埠經由適當之衰減直接連至測試儀器。設定於待測物正常使用頻將功率設置於最小位準,將其紀錄

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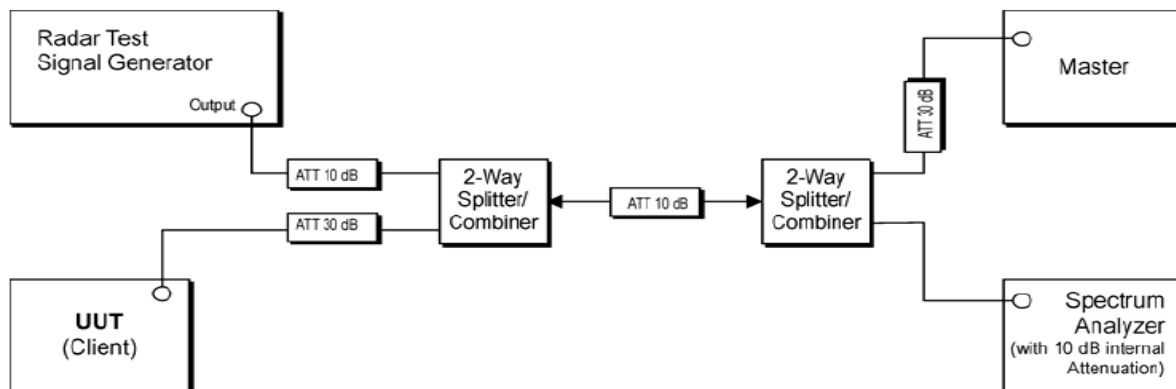
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4.3 測試配置

裝置為 slave 無雷達偵測功能



4.4 測試設備

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Signal Generator	Agilent	N5172B	MY53050661	04/01/2019	03/31/2020
Power Splitter	Agilent	11636B	56355	01/02/2019	01/01/2020
Power Splitter	Agilent	11636B	59355	01/02/2019	01/01/2020
EMI Receiver	KEYSIGHT	N9038A	MY52260216	11/20/2018	11/19/2019
Attenuator	Woken	WRF53AYM2B7	RF41	12/25/2018	12/24/2019
Splitter	Woken	DOM35LW1A2	RF36	02/26/2019	02/25/2020

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4.5 動態頻率測試限制

1. 操作模式，動態頻率選擇的規定適用於以下之操作模式：

(I)頻道可用性檢查時間的規定，適用於主控運作模式。

(II)頻道移動時間的規定，適用於主控及受控運作模式。

2. 頻道可用性檢查時間：設備必須檢查其可在某一頻道上起始傳送之前是否有雷達系統已經操作在該頻道上，以及何時其必須移動到另一新的頻道，在 60 秒內若沒有偵測到功率位準大過上述之干擾門檻值的雷達信號時，設備才可開始使用該頻道。

3. 頻道移動時間：在偵測到雷達的存在後，所有在該操作頻道上的所有傳輸須在 10 秒內停止，在偵測到雷達信號後，該期間內的傳輸應維持最多 200 毫秒的正常通訊。另外，間歇性的管理與控制信號可在剩餘的時間中傳送，以便撤離該操作頻道。

4. 不可佔用期間：某一頻道已被頻道可用性檢查或"服務中"監視顯示含有雷達系統，至少須有 30 分鐘的不可佔用期間。不可佔用期間起始於偵測到雷達系統的當時。

4.6 功率控制與動態頻率選擇量測結果

4.6.1 功率小於 500mW 不需有功率控制功能

4.6.2 動態頻率選擇測試結果

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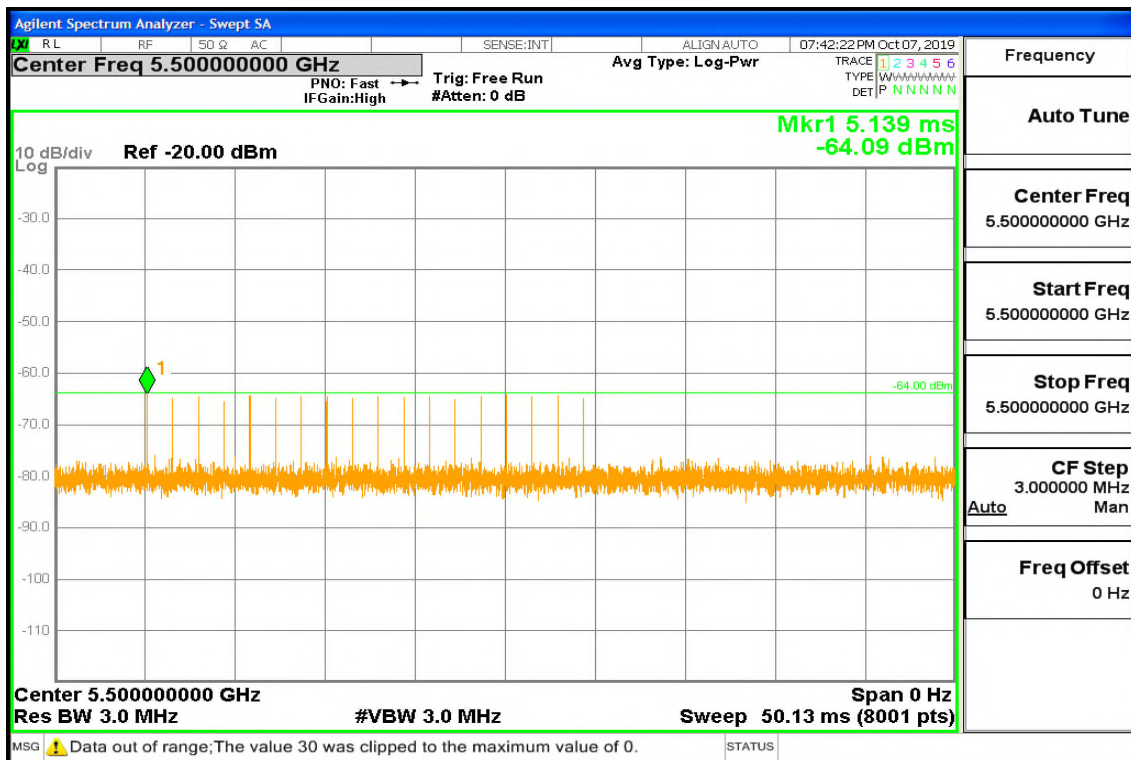
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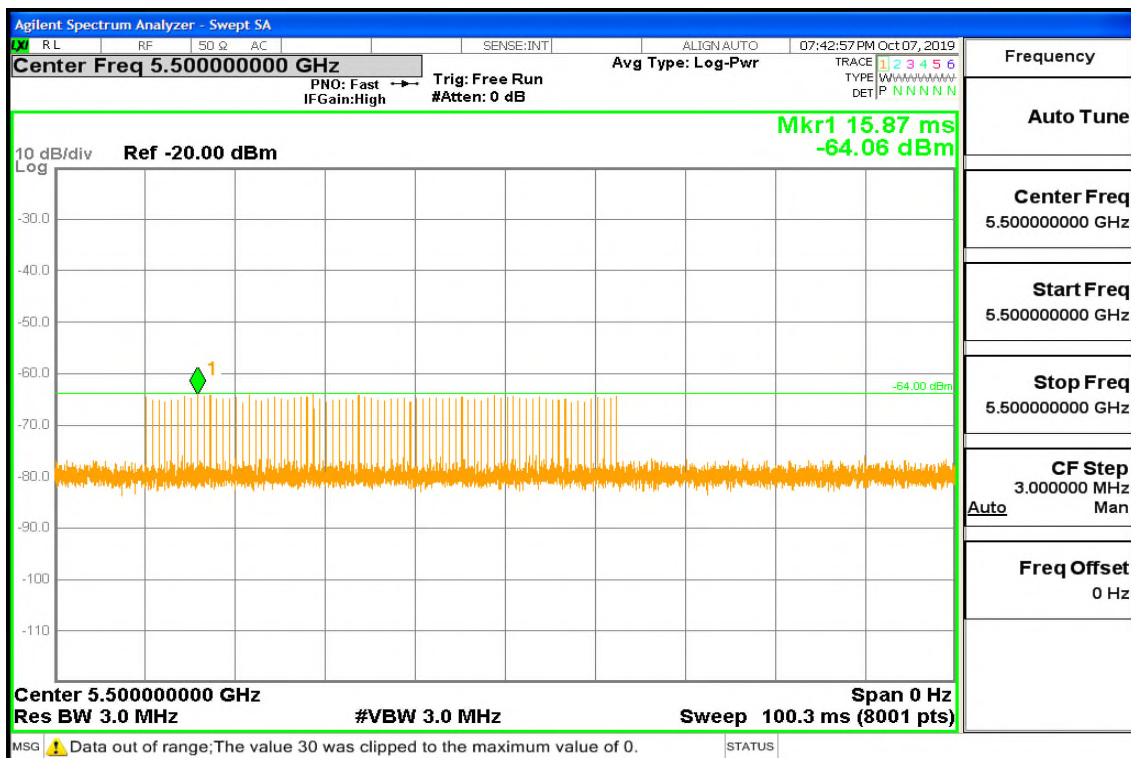
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Radar type 0 雷達波校正強度



Radar type 1-A 雷達波校正強度

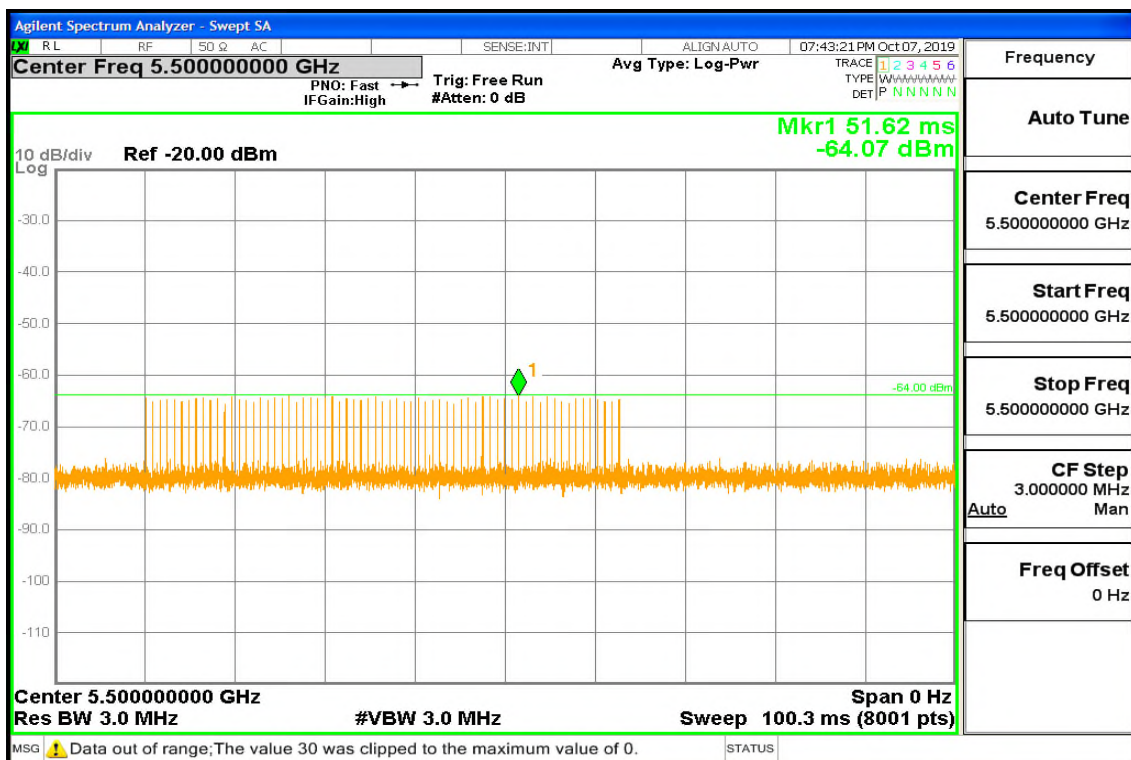


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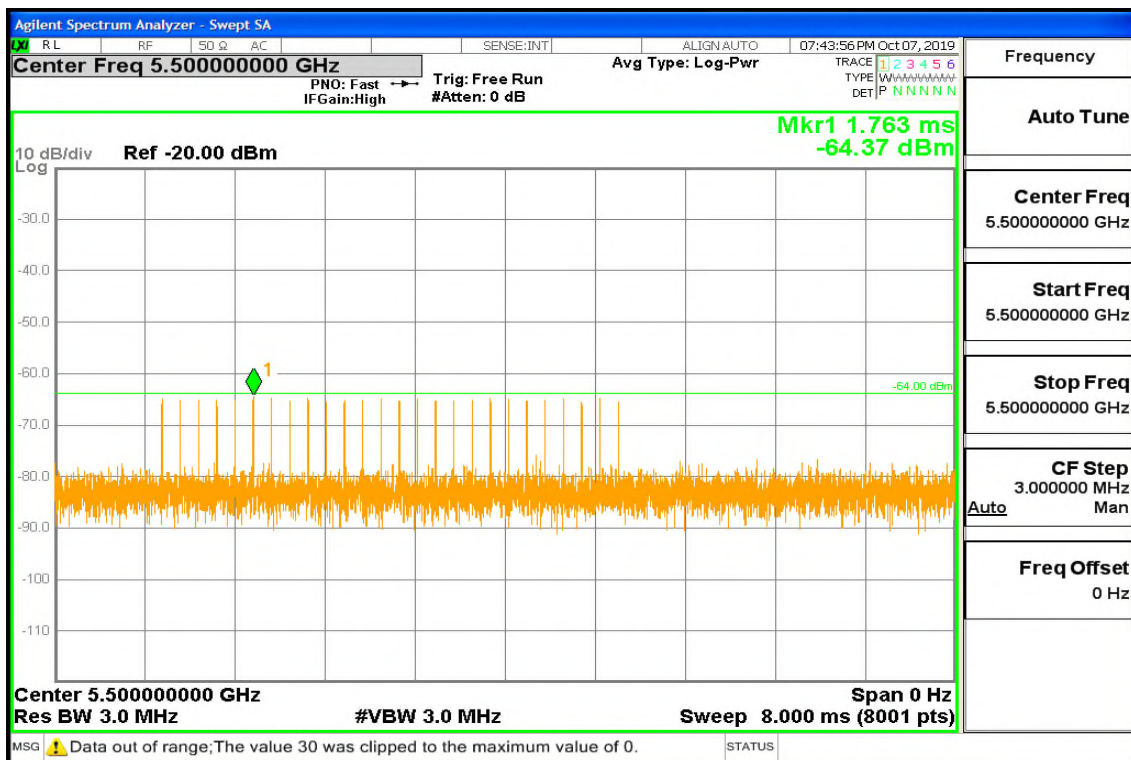
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Radar type 1-B 雷達波校正強度



Radar type 2

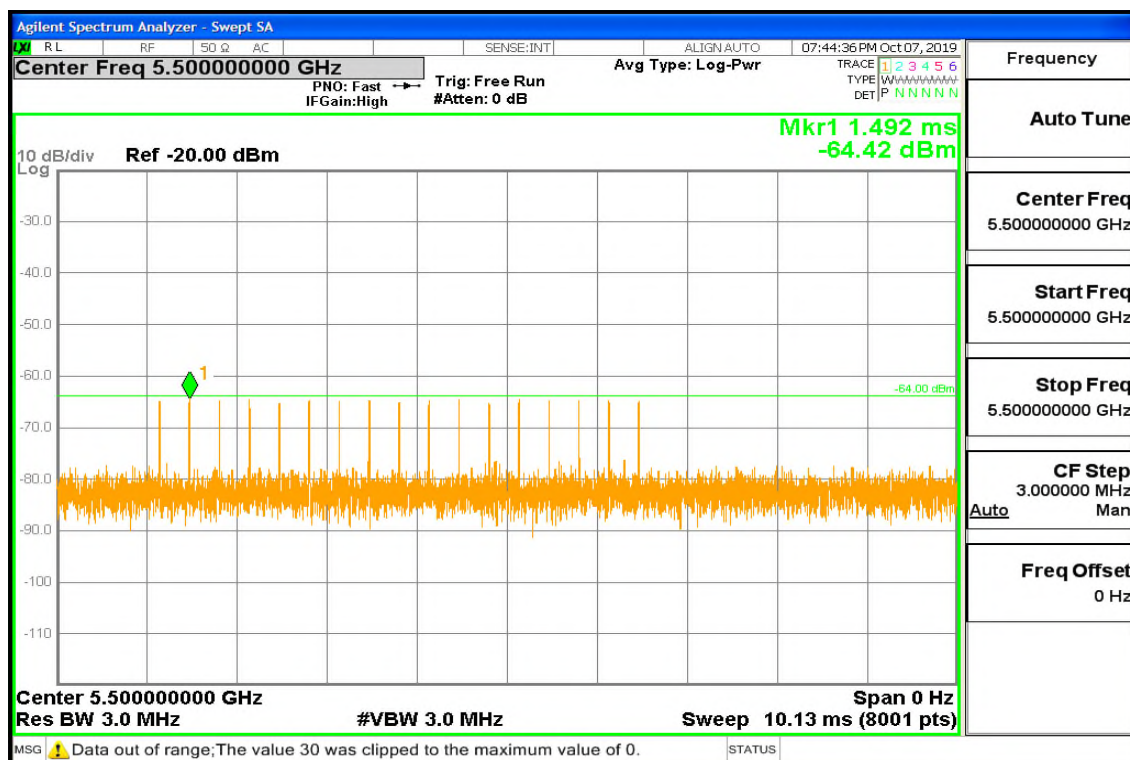


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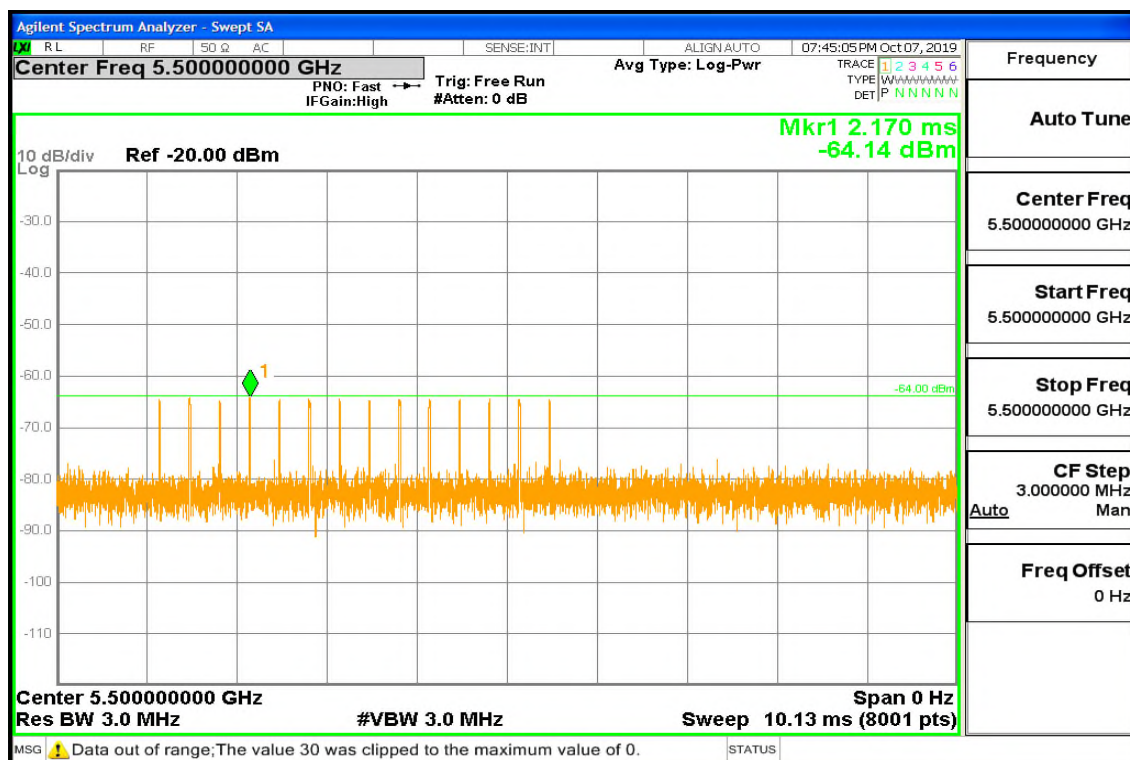
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Radar type 3



Radar type 4



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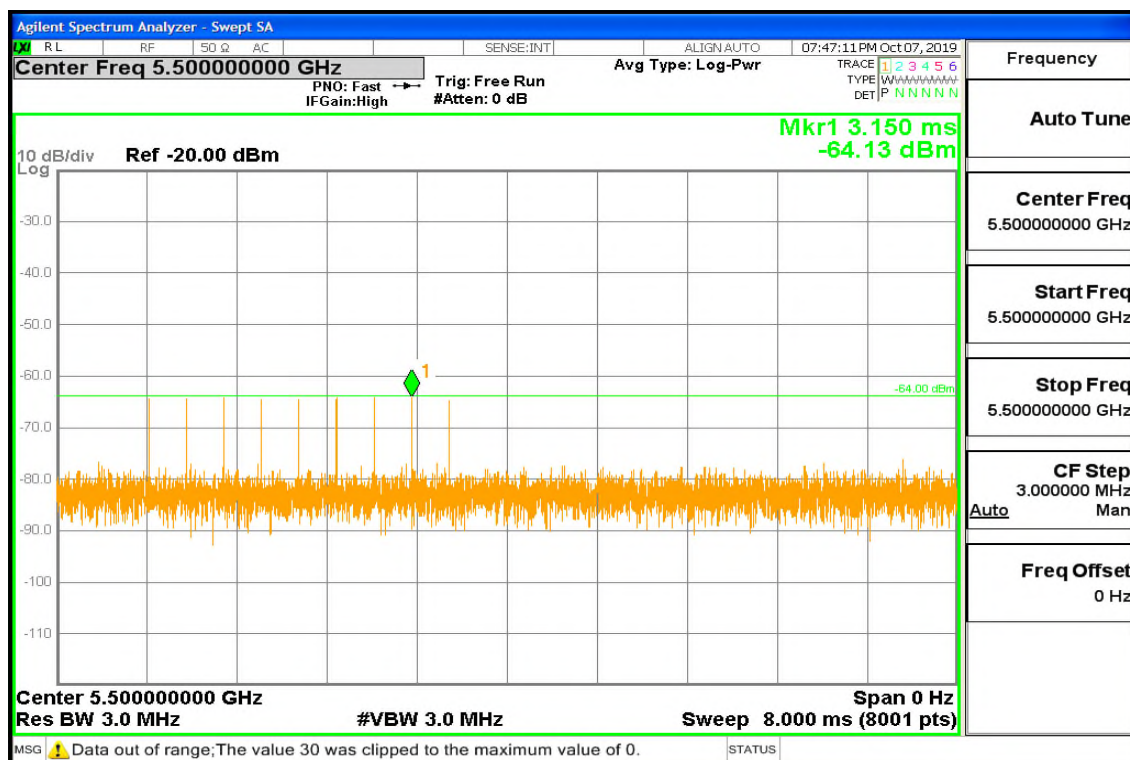
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Radar type 5



Radar type 6

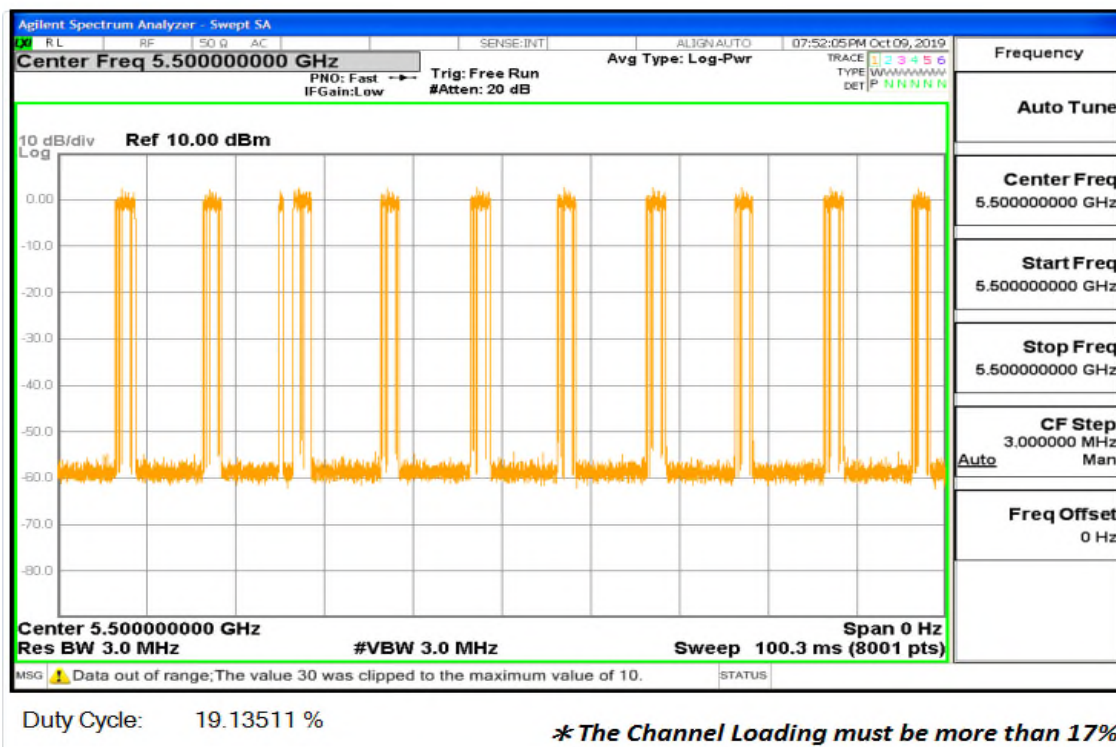


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802.11n HT20 Mode Test Data Plot WLAN traffic



Non-occupancy Period 不可佔用期間

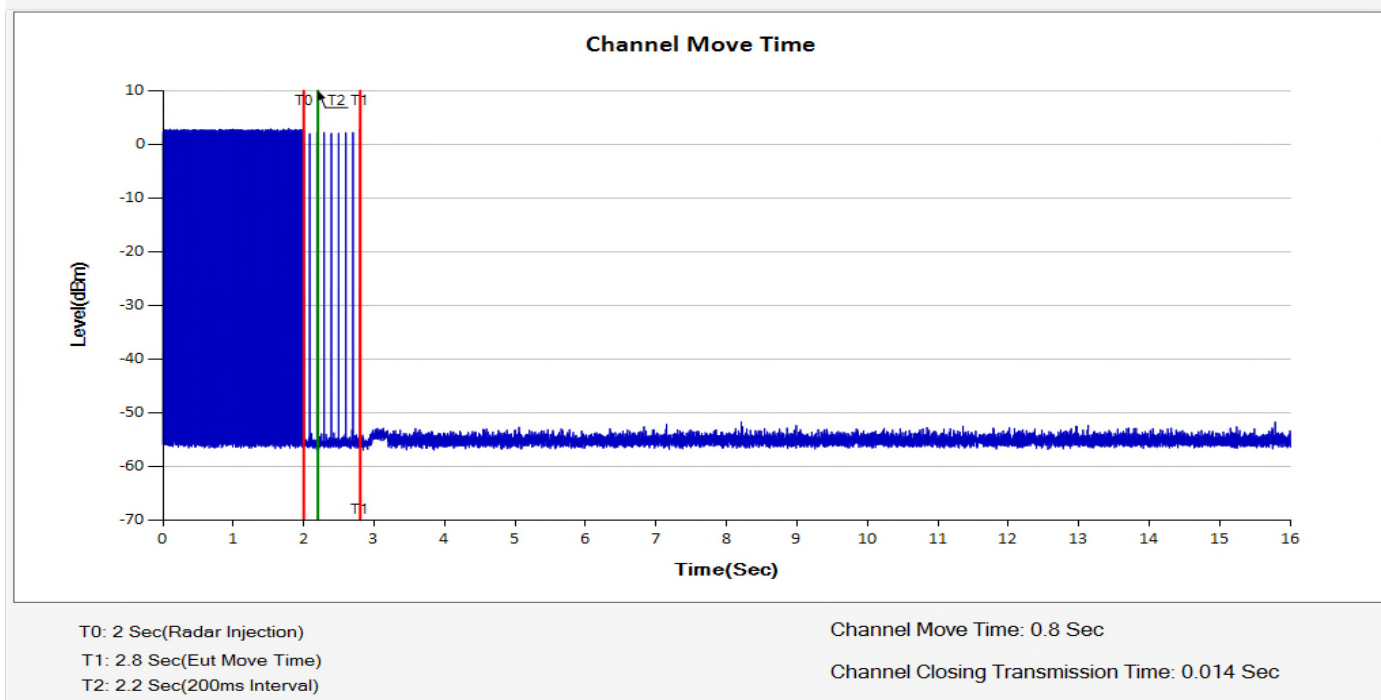


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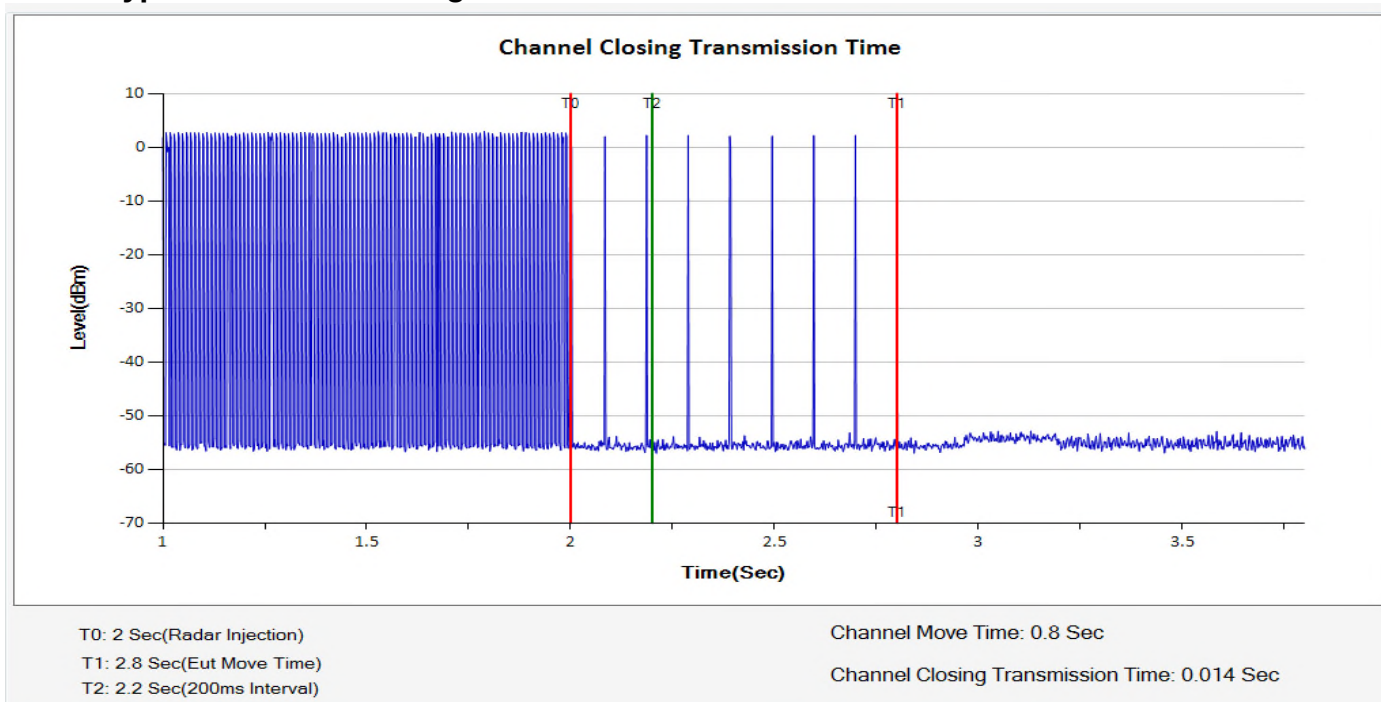
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Radar Type 1 Channel Move Transmission Time



Radar Type 1 Channel Closing Transmission Time



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4.6.3 功率控制與動態頻率選擇量測結果

測試項目	測試結果	測試日期	結果判定
頻道移動/結束時間	請參閱4.6節	2019/10/07	合格
不可佔用期間	請參閱4.6節	2019/10/07	合格
功率控制	EIRP值<500mW	N/A	不須具備TPC機能

~ End of Report ~

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