

NCC 低功率射頻器材型式試驗報告

報告編號: WD-RN-R-210384-A0

產品名稱 : WIFI/BT MODULE
型號 : CDW-G47663U-00
申請者 : 廣東長虹電子有限公司
收件日期 : 110 年 11 月 25 日
測試日期 : 110 年 12 月 10 日 ~ 110 年 12 月 27 日
法規 : 低功率射頻器材技術規範(LP0002) 109 年 7 月 1 日



穩得實業股份有限公司 穩得電磁相容及無線射頻實驗室

注意:

本測試報告只針對待測設備樣品有效。報告中所描述之測試結果和待測設備的架構組合，均根據樣品實際的量測情況作詳實的記錄。

本測試報告內之測試結果可藉由測試儀器設備之校正報告與本報告內所評估量測不確定度追溯至國家或國際標準。

本實驗室依據測試標準規定進行測試，在進行符合性分析時，不考慮量測不確定度的貢獻，依此判定規則出具測試報告。

本測試報告非經穩得電磁相容及無線射頻實驗室同意不可複製使用，但全份複製除外。

低功率射頻器材型式試驗報告

報告發行日期: 110年12月27日

案件編號: 21Q112502

產品名稱	WIFI/BT MODULE
廠牌	CHi Q
型號	CDW-G47663U-00
申請者	廣東長虹電子有限公司
製造商	廣東長虹電子有限公司
待測物額定電壓	5V
待測物測試電壓	USB 5V
待測物支援無線應用	WLAN 802.11a/b/g WLAN 802.11n/ac (HT20 and HT40/VHT20 and VHT40) WLAN 802.11ac(VHT80) Bluetooth BR/EDR/LE
適用法規	低功率射頻器材技術規範(LP0002) 109 年 7 月 1 日
輸出功率	14.64 dBm
電磁波暴露量	0.03595 mW/cm ²
測試結果	合格

報告製作

測試工程師

報告簽署人



(專員 / 呂月蟬)



(高級工程師 / 謝岱宗)



(專案經理 / 吳明政)

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文件修改歷程

報告編號	發行日期	描述
WD-RN-R-210384-A0	110年12月27日	初始報告

測試結果總結

參考法規章節	測試項目	測試結果
LP0002 4.10.1.3	天線要求	合格
LP0002 4.10.1.2	峰值傳導輸出功率	合格
LP0002 4.10.1.6	跳頻頻道數	合格
LP0002 4.10.1.6	頻道占用時間	合格
LP0002 4.10.1.6	20 dB 頻寬	合格
LP0002 4.10.1.5	帶外發射限制	合格
LP0002 3.3	電源線傳導干擾	合格
LP0002 6.20	電波暴露量之評估	合格

1 待測物相關資訊

1.1 申請者資訊

廣東長虹電子有限公司
廣東省中山市南頭鎮興業北路 1 號

1.2 製造商資訊

廣東長虹電子有限公司
廣東省中山市南頭鎮興業北路 1 號

1.3 待測物基本資訊

產品名稱	WIFI/BT MODULE
型號	CDW-G47663U-00
操作頻率範圍	2402 ~ 2480 MHz
頻道數	79
調變方式	FHSS: GFSK(1Mbps) / π /4DQPSK(2Mbps) / 8DPSK(3Mbps)
天線資訊	Refer to the table “Antenna List”
待測物支援無線應用	WLAN 802.11a/b/g WLAN 802.11n/ac (HT20 and HT40/VHT20 and VHT40) WLAN 802.11ac(VHT80) Bluetooth BR/EDR/LE
待測物額定電壓	5V
待測物測試電壓	USB 5V

Antenna List

No.	Manufacturer	Model No.	Antenna Type	Peak Gain
1	深圳市億聖邦科技有限公司	TX-DM300BD113Y63M	PIFA Antenna	5.20 dBi for 2.4 GHz
2	深圳市億聖邦科技有限公司	TX-DM150BD113Y63M	PIFA Antenna	3.93 dBi for 2.4 GHz
3	深圳市億聖邦科技有限公司	TX-DM200BD113Y63M	PIFA Antenna	4.29 dBi for 2.4 GHz
4	深圳市億聖邦科技有限公司	TX-DM270BD113Y63M	PIFA Antenna	4.32 dBi for 2.4 GHz
5	深圳市億聖邦科技有限公司	TX-DM350BD113Y63M	PIFA Antenna	3.12 dBi for 2.4 GHz
6	深圳市億聖邦科技有限公司	TX-DM450BD113Y63M	PIFA Antenna	2.7 dBi for 2.4 GHz
7	中山市博安通通信技術有限公司	TX-DM150BD113B63M	PIFA Antenna	2.32 dBi for 2.4 GHz
8	中山市博安通通信技術有限公司	TX-DM200BD113B63M	PIFA Antenna	2.18 dBi for 2.4 GHz
9	中山市博安通通信技術有限公司	TX-DM270BD113B63M	PIFA Antenna	2.18 dBi for 2.4 GHz
10	中山市博安通通信技術有限公司	TX-DM300BD113B63M	PIFA Antenna	1.69 dBi for 2.4 GHz
11	中山市博安通通信技術有限公司	TX-DM350BD113B63M	PIFA Antenna	0.64 dBi for 2.4 GHz
12	中山市博安通通信技術有限公司	TX-DM450BD113B63M	PIFA Antenna	0.32 dBi for 2.4 GHz

Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2422	40	2442	60	2462
01	2403	21	2423	41	2443	61	2463
02	2404	22	2424	42	2444	62	2464
03	2405	23	2425	43	2445	63	2465
04	2406	24	2426	44	2446	64	2466
05	2407	25	2427	45	2447	65	2467
06	2408	26	2428	46	2448	66	2468
07	2409	27	2429	47	2449	67	2469
08	2410	28	2430	48	2450	68	2470
09	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	--	--

Pretest Mode

Mode 1 : Transmit BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna
Mode 2 : Transmit BT-EDR(2Mbps) by TX-DM300BD113Y63M Antenna
Mode 3 : Transmit BT-EDR(3Mbps) by TX-DM300BD113Y63M Antenna
Mode 4 : Receiver BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna

AC Conduction 測試 Mode 1
Test Mode

Mode 1 : Transmit BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna
Mode 3 : Transmit BT-EDR(3Mbps) by TX-DM300BD113Y63M Antenna
Mode 4 : Receiver BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna

AC Conduction 測試 Mode 1
備註:

1. 這些測試是在設備樣本上進行，目的是證明符合 LP0002 4.10.1 章節。
2. 選擇低、中和最高操作頻率來執行測試。
3. 測試搭配天線增益最大的 TX-DM300BD113Y63M 來執行測試。
4. 輻射測量在 X，Y，Z 軸定位中進行，只有最差(X 軸)的情況才會顯示在報告中。

測試軟體

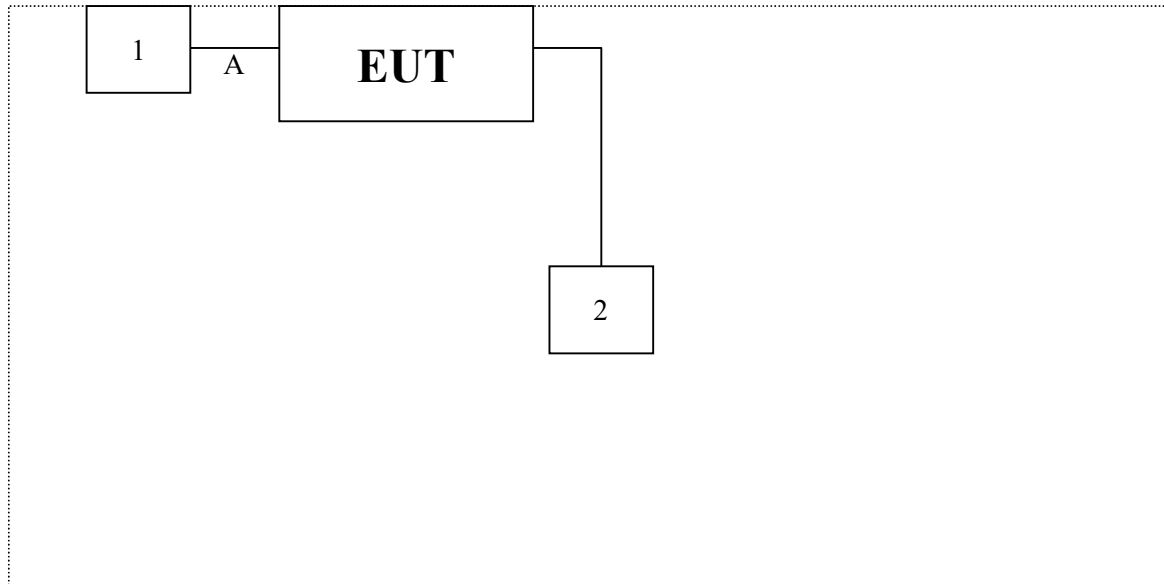
1	產品名稱	WIFI/BT MODULE
2	型號	CDW-G47663U-00
3	測試軟體版本	WCN Combo Tool Version:W1747
4	測試軟體射頻功率設置	☐ 測試期間射頻功率設置無法更改 ☒ 測試期間射頻功率設置可以更改。(見下表)

測試軟體設置參數

Type of Modulation	Channel	Frequency (MHz)	Set Value
GFSK (1Mbps)	00	2402	7
	39	2441	7
	78	2480	7
$\pi/4$ -DQPSK (2 Mbps)	00	2402	7
	39	2441	7
	78	2480	7
8DPSK (3 Mbps)	00	2402	7
	39	2441	7
	78	2480	7

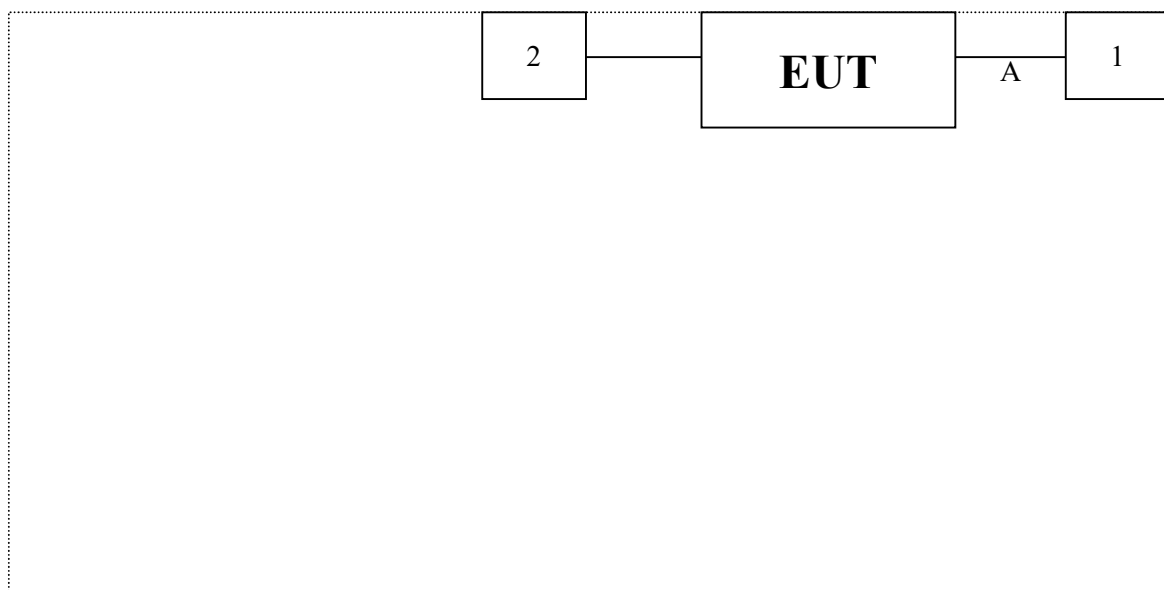
1.4 待測物架構

輻射干擾測試



Test Table

電源傳導測試



Test Table

1.5 待測物軟體設定

1. 測試配置如上圖 1.4 所示
2. 開啟定頻程式 “WCN Combo Tool Version:W1747”.
3. 確認頻率及訊號正確
4. 功能無誤後開始測試

1.6 周邊列表

測試中使用的所有周邊、電纜（包括插入的卡）的描述如下						
No.	Product	Trademark	Model No.	Serial No.	Power Cord	Remarks
1	Notebook PC	acer	N16Q1	NXVF4TA023742254147600	Non-shielded, 1 Core, 0.8m	實驗室提供
2	Bluetooth Antenna	深圳市億聖邦科技有限公司	TX-DM300BD113Y63M	N/A	Shielded, Non-Core, 0.35m	申請者提供
A	USB2.0 數據線	深圳市佳仕通科技有限公司	USB2.0 CABLE	N/A	Shielded, Non-Core, 0.1m	申請者提供

產品隨貨配件描述如下				
No.	Product	Trademark	Model No.	Remark
2	深圳市億聖邦科技有限公司	TX-DM300BD113Y63M	PIFA Antenna	申請者提供
--	深圳市億聖邦科技有限公司	TX-DM150BD113Y63M	PIFA Antenna	申請者提供
--	深圳市億聖邦科技有限公司	TX-DM200BD113Y63M	PIFA Antenna	申請者提供
--	深圳市億聖邦科技有限公司	TX-DM270BD113Y63M	PIFA Antenna	申請者提供
--	深圳市億聖邦科技有限公司	TX-DM350BD113Y63M	PIFA Antenna	申請者提供
--	深圳市億聖邦科技有限公司	TX-DM450BD113Y63M	PIFA Antenna	申請者提供
--	中山市博安通通信技術有限公司	TX-DM150BD113B63M	PIFA Antenna	申請者提供
--	中山市博安通通信技術有限公司	TX-DM200BD113B63M	PIFA Antenna	申請者提供
--	中山市博安通通信技術有限公司	TX-DM270BD113B63M	PIFA Antenna	申請者提供
--	中山市博安通通信技術有限公司	TX-DM300BD113B63M	PIFA Antenna	申請者提供
--	中山市博安通通信技術有限公司	TX-DM350BD113B63M	PIFA Antenna	申請者提供
--	中山市博安通通信技術有限公司	TX-DM450BD113B63M	PIFA Antenna	申請者提供

1.7 試驗單位與測試環境

實驗室環境:

項目	實際測試條件
溫度 (°C)	20~25
濕度 (% RH)	45~55
大氣壓力 (mbar)	990~1020

財團法人全國認證基金會 認證

認證編號: 2965

機構名稱: 穩得實業股份有限公司

機構地址: 新北市新店區寶橋路 188 號 6 樓/ 6F-1 號

實驗室名稱: 穩得電磁相容及無線射頻實驗室

實驗室地址: 新北市五股區五工三路 119 號

1.8 測量不確定度

ISO / IEC 17025 要求在報告中，包含排放測試結果相關測量不確定度的估算值。

下面給出的測量不確定度基於 95%信賴水準，覆蓋因子 $K = 2$ 。

Measurement Project	Condition	Expended Uncertainty
AC Conducted Emission	0.150 ~ 30 MHz	2.64 dB
Radiated Emission	0.009 ~ 30 MHz	± 4.2 dB
	30 ~ 1000 MHz	± 3.9 dB
	1000 ~ 18000 MHz	± 4.1 dB
	18000 ~ 40000 MHz	± 3.9 dB
RF Power, Conducted	Conducted Measuring	± 0.51 dB
Occupied Bandwidth	Conducted Measuring	± 2.4 %
Power Density	Conducted Measuring	± 1.7 dB
Duty Cycle and Dwell Time	Conducted Measuring	± 1.3 %
Conducted Unwanted Emission Strength	Conducted Measuring	± 1.8 dB
Frequency Stability	Conducted Measuring	± 0.063 ppm
DC Power Supply	--	± 3.2 %
Temperature	--	± 1.1 °C
Humidity	--	± 3.4 %

備註：本實驗室依據測試標準規定進行測試，在進行符合性分析時，不考慮量測不確定度的貢獻，依此判定規則出具測試報告。

1.9 測試設備清單

For Conducted measurements / W08-Conducted Measurement

	Equipment	Trademark	Model No.	Serial No.	Cal. Date	Due Date
✓	Spectrum analyzer	Keysight	N9010A	SG50420005	2021/08/09	2022/08/08
✓	Wideband Peak Power Meter	Anritsu	ML2495A	1733007	2021/09/07	2022/09/06
✓	Pulse Power Sensor + Precision Adaptor	Anritsu	MA2411B	1726022	2021/09/07	2022/09/06
	Temperature Chamber	TAICHY	MHK-225LK	1061121	2021/4/27	2022/4/26
	Wireless Connectivity Tester	R&S	CMW270	101307	2021/5/24	2022/5/23
✓	Attenuator	MVE	MVE2211-10	CT-9-056	2021/08/18	2022/08/17
	Attenuator	MVE	MVE2211-20	CT-9-057	2021/08/18	2022/08/17
	Attenuator	MVE	MVE2211-30	CT-9-058	2021/08/18	2022/08/17
	Power Divider	MVE	MVE8546	170826003	2021/08/18	2022/08/17
	Power Splitter	MVE	MVE8547	170302047	2021/08/18	2022/08/17
	DC Power Supply	GW INSTEK	GPC-3060D	GER817636	2021/08/19	2022/08/18

Remark:

1. All equipments are calibrated every one year.
2. The test instruments marked with “✓” are used to measure the final test results.

For AC Conduction measurements / W08-CE

	Equipment	Trademark	Model No.	Serial No.	Cal. Date	Due Date
✓	EMI Test Receiver	R&S	ESR3	102309	2021/6/8	2022/6/7
✓	2-Line V-Network LISN	R&S	ENV216	101185	2021/6/11	2022/6/10
✓	LISN	SCHWARZBECK	NSLK 8127RC	05028	2021/6/11	2022/6/10
✓	Transient Limiter	EM Electronics Corporation	EM-7600	857	2021/6/10	2022/6/9
✓	50ohm Cable	EMCI	EMCCFD300-BM-BM-5000	170612	2021/6/10	2022/6/9
✓	50 ohm terminal impedance	HUBER+SUHNER	50 ohm terminal impedance	CT-1-109-1	2021/6/11	2022/6/10

Remark:

1. All equipments are calibrated every one year.
2. The test instruments marked with “✓” are used to measure the final test results.
3. Test Software version: FARAD EZ-EMC Ver.EMC-CON 3A1

For Radiated measurements / W08-996-2

	Equipment	Trademark	Model No.	Serial No.	Cal. Date	Due Date
✓	EMI Receiver	Keysight	N9038A	MY51210173	2021/08/20	2022/08/19
✓	Spectrum Analyzer	Keysight	N9010A	MY52220228	2021/08/24	2022/08/23
✓	Loop Antenna	EMCI	LPA600	277	2021/09/02	2022/09/01
✓	TRILOG super broad Antenna	Schwarzbeck	VULB 9168	VULB 9168-700 & 1421	2021/08/11	2022/08/10
✓	Horn Antenna	Schwarzbeck	BBHA 9120D	01767	2021/08/11	2022/08/10
✓	Horn Antenna	Schwarzbeck	BBHA 9170	703	2021/12/17	2022/12/16
✓	Pre-Amplifier	EM	EMC330	060774	2021/08/24	2022/08/23
✓	Pre-Amplifier	EMEC	EM01G18G	060648	2021/08/24	2022/08/23
✓	Pre-Amplifier	JPT	JPA0118-55-303K	1910001800055003	2021/08/25	2022/08/24
✓	Pre-Amplifier	EMCI	EMC184045SE	980515	2021/08/24	2022/08/23
✓	Cable	EMEC	EM-CB400	105060103	2021/08/24	2022/08/23
✓	Cable	EMEC	EM-CB400	105060102	2021/08/24	2022/08/23
✓	Cable	EMEC	EM-CB400	105060101	2021/08/24	2022/08/23
✓	RF Cable	HUBER+SUHNER	SF102	MY2752/2	2021/08/24	2022/08/23
✓	Cable	MVE	280280.LL266.1200	B60028C	2021/08/24	2022/08/23
✓	RF Cable	HUBER+SUHNER	SF102	MY2751/2	2021/08/24	2022/08/23
✓	Cable	MVE	140140.LL404.300	B90006C	2021/10/04	2022/10/03
✓	RF Filter	EMEC	BRF-2400-2500	002	2021/08/26	2022/08/25
	RF Filter	EMEC	BRF-5150-5350	104	2021/08/26	2022/08/25
	RF Filter	EMEC	BRF-5470-5725	092	2021/08/26	2022/08/25
	RF Filter	EMEC	BRF-5725-5875	091	2021/08/26	2022/08/25
✓	RF Filter	EMEC	HPF-2800	002	2021/08/26	2022/08/25
	RF Filter	EMEC	HPF-5850	059	2021/08/26	2022/08/25
	SMA Notch Filter	MVE	MFN-902.928.S1	190604001	2021/09/02	2022/09/01

Remark:

1. All equipments are calibrated every one year.
2. The test instruments marked with “✓” are used to measure the final test results.
3. Test Software version: FARAD EZ-EMC Ver.WD-03A1-1

2 各測試項目測試結果

2.1 天線要求

2.1.1 天線增益限制

1. 操作於 2400 MHz~2483.5 MHz 頻段：
 - (A) 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。
 - (B) 天線以多向波束發射方式(含同時發射或循序發射)將訊號導向多個接收機或接收機群組時，應符合下列規定：
 - (a) 非同時發射多向波束者，所有載波或頻道傳輸至所有天線陣列或陣列群之總和傳導輸出功率應符合 4.10.1.2 之功率限制值。如天線/天線陣列群之方向性增益超過 6 dBi，每超過 3 dBi，總和傳導輸出功率限制值應降低 1 dB。方向性增益值應計算如下：
 - (I). 方向性增益值 = $10\log(\text{天線陣列之單元數目}) + \text{各單元中最高之方向性增益值}$ 。
 - (II). 天線陣列間之遮蔽效應或波束干涉損失能充分佐證時，方向性增益得低於(I)計算數值。
 - (b) 同時發射多向波束於相同或不同頻道者，其每一波束功率應符合(a)之功率限制值。如發射波束有重疊現象，功率應降低，以確保總和傳導輸出功率符合(a)之限制值。同時發射的所有波束總和傳導輸出功率不大於(a) 總和傳導輸出功率限制值加 8 dB。方向性增益值計算同(a)。
 - (c) 發射機之天線具備單向波束功能者，應符合 1(A)及 3 後段之規定。
2. 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。
3. 除 1 及 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。

2.1.2 天線規格

天線之規格不受 3.2 規定之限制。

2.1.3 測試結果

No.	Manufacturer	Model No.	Antenna Type	Peak Gain
1	深圳市億聖邦科技有限公司	TX-DM300BD113Y63M	PIFA Antenna	5.20 dBi for 2.4 GHz
2	深圳市億聖邦科技有限公司	TX-DM150BD113Y63M	PIFA Antenna	3.93 dBi for 2.4 GHz
3	深圳市億聖邦科技有限公司	TX-DM200BD113Y63M	PIFA Antenna	4.29 dBi for 2.4 GHz
4	深圳市億聖邦科技有限公司	TX-DM270BD113Y63M	PIFA Antenna	4.32 dBi for 2.4 GHz
5	深圳市億聖邦科技有限公司	TX-DM350BD113Y63M	PIFA Antenna	3.12 dBi for 2.4 GHz
6	深圳市億聖邦科技有限公司	TX-DM450BD113Y63M	PIFA Antenna	2.7 dBi for 2.4 GHz
7	中山市博安通通信技術有限公司	TX-DM150BD113B63M	PIFA Antenna	2.32 dBi for 2.4 GHz
8	中山市博安通通信技術有限公司	TX-DM200BD113B63M	PIFA Antenna	2.18 dBi for 2.4 GHz
9	中山市博安通通信技術有限公司	TX-DM270BD113B63M	PIFA Antenna	2.18 dBi for 2.4 GHz
10	中山市博安通通信技術有限公司	TX-DM300BD113B63M	PIFA Antenna	1.69 dBi for 2.4 GHz
11	中山市博安通通信技術有限公司	TX-DM350BD113B63M	PIFA Antenna	0.64 dBi for 2.4 GHz
12	中山市博安通通信技術有限公司	TX-DM450BD113B63M	PIFA Antenna	0.32 dBi for 2.4 GHz

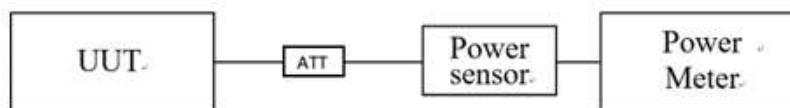
2.2 峰值傳導輸出功率

2.2.1 限制值

- (1) 操作於 2400 MHz~2483.5 MHz 者
 - (A) 至少使用 75 個跳頻頻道之跳頻系統：1 W(含)以下。
 - (B) 除(A)外，依 4.10.1.6 (1)(A)(a)之跳頻系統：0.125 W(含)以下。
 - (C) 數位調變技術系統：1 W(含) 以下。
- (2) 操作於 5725 MHz~5850 MHz 之所有跳頻系統：1 W(含)以下。
- (3) 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。

除使用附件二之峰值輸出功率測量方式外，並得使用以最大傳導輸出功率(Maximum Conducted Output Power)作為測量方式，且應依 4.10.1.3 之方式降低功率限制值。

2.2.2 測試架構



2.2.3 測試流程

待測物之天線埠經由適當之衰減直接連至 Power Meter RF 輸入端。

2.2.4 測試結果

Data Rate	Channel	Frequency (MHz)	Packet Type	Peak Power (dBm)	Power Limit (dBm)	Result
1 Mbps (GFSK)	00	2402	DH1	14.34	≤ 21	Pass
			DH3	14.49	≤ 21	Pass
			DH5	14.63	≤ 21	Pass
	39	2441	DH1	14.38	≤ 21	Pass
			DH3	14.51	≤ 21	Pass
			DH5	14.64	≤ 21	Pass
	78	2480	DH1	14.21	≤ 21	Pass
			DH3	14.35	≤ 21	Pass
			DH5	14.47	≤ 21	Pass
2 Mbps ($\pi/4$ -DQPSK)	00	2402	DH1	14.19	≤ 21	Pass
			DH3	14.31	≤ 21	Pass
			DH5	14.45	≤ 21	Pass
	39	2441	DH1	13.84	≤ 21	Pass
			DH3	13.97	≤ 21	Pass
			DH5	14.11	≤ 21	Pass
	78	2480	DH1	13.68	≤ 21	Pass
			DH3	13.80	≤ 21	Pass
			DH5	13.95	≤ 21	Pass
3 Mbps (8DPSK)	00	2402	DH1	14.29	≤ 21	Pass
			DH3	14.43	≤ 21	Pass
			DH5	14.55	≤ 21	Pass
	39	2441	DH1	14.16	≤ 21	Pass
			DH3	14.29	≤ 21	Pass
			DH5	14.44	≤ 21	Pass
	78	2480	DH1	14.01	≤ 21	Pass
			DH3	14.15	≤ 21	Pass
			DH5	14.29	≤ 21	Pass

備註:

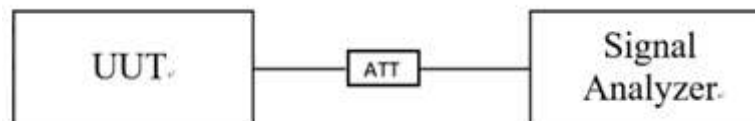
1. Peak Power = Reading value on power meter + cable loss
2. $10 \log(X/\text{mW}) = \text{dBm}$, $X=0.125 \text{ watt}$ (Limit)
 $0.125 \text{ watt} = 21 \text{ dBm}$

2.3 跳頻頻道數

2.3.1 限制值

操作於 2400 MHz~2483.5 MHz 之展頻跳頻系統，須使用至少 15 個無重疊的頻道

2.3.2 測試架構

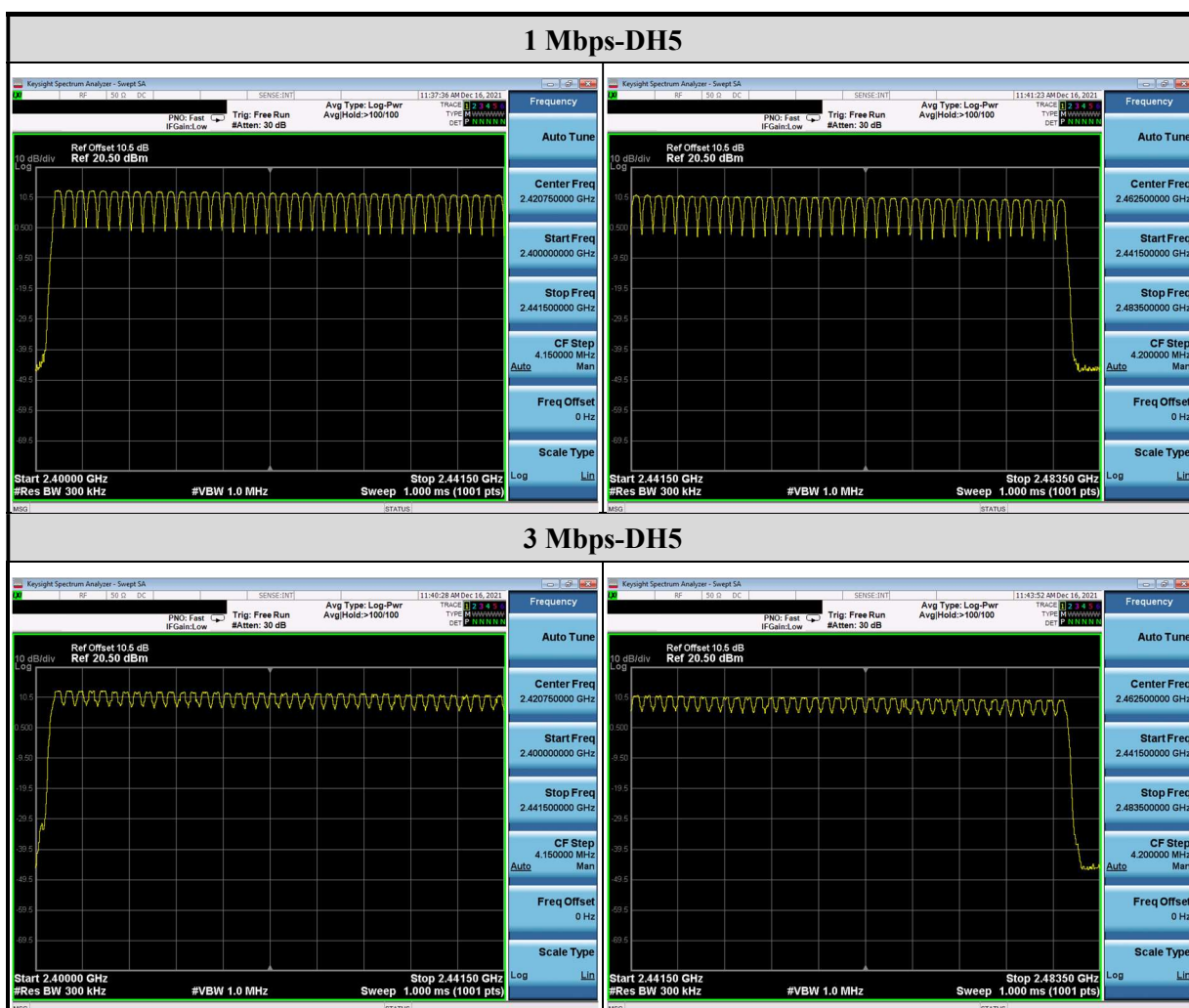


2.3.3 測試流程

1. Enable the EUT transmit continuously.
2. Spectrum analyzer set:
 - a) Span = the frequency band of operation
 - b) RBW = (RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller)
 - c) VBW $\geq$ RBW
 - d) Sweep = auto
 - e) Detector function = peak
 - f) Trace = max hold.
3. The number of hopping frequency used is defined as the number of total channel.

2.3.4 測試結果

Frequency (MHz)	Data Rate (Mbps)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	1	79	≥ 15	Pass
2402 ~ 2480	3	79	≥ 15	Pass

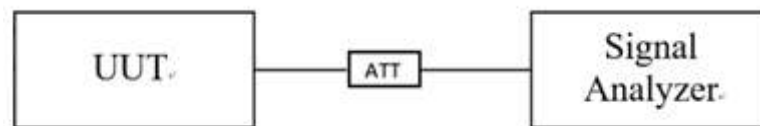


2.4 跳頻系統之載波頻率頻道間隔

2.4.1 限制值

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。

2.4.2 測試架構



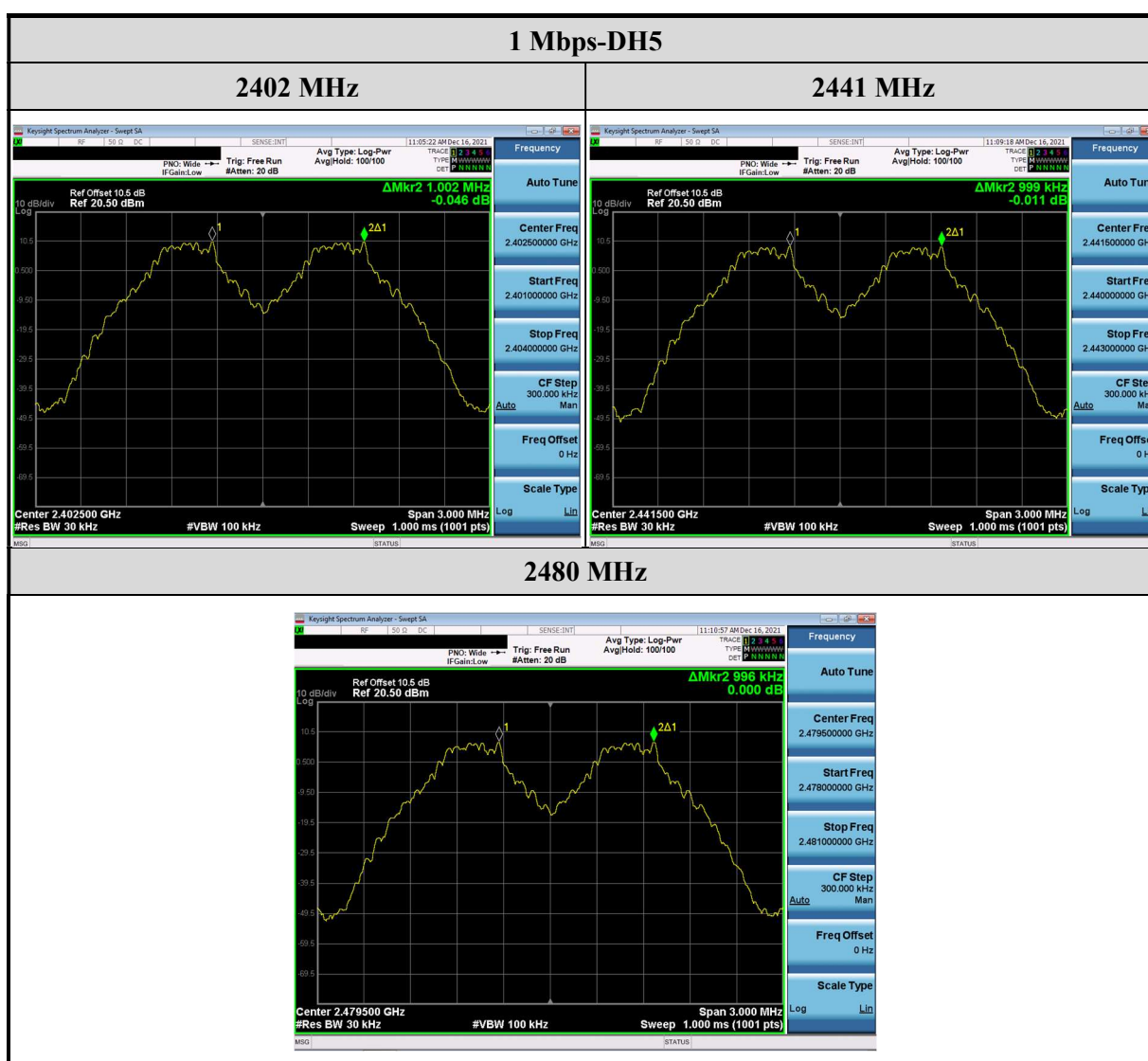
2.4.3 測試流程

1. Enable the EUT transmit continuously.
2. Spectrum analyzer set:
 - a) Span = wide enough to capture the peaks of two adjacent channels
 - b) RBW set to approximately 30% of the channel spacing
 - c) VBW $\geq$ RBW
 - d) Sweep = auto
 - e) Detector function = peak
 - f) Trace = max hold.

2.4.4 測試結果

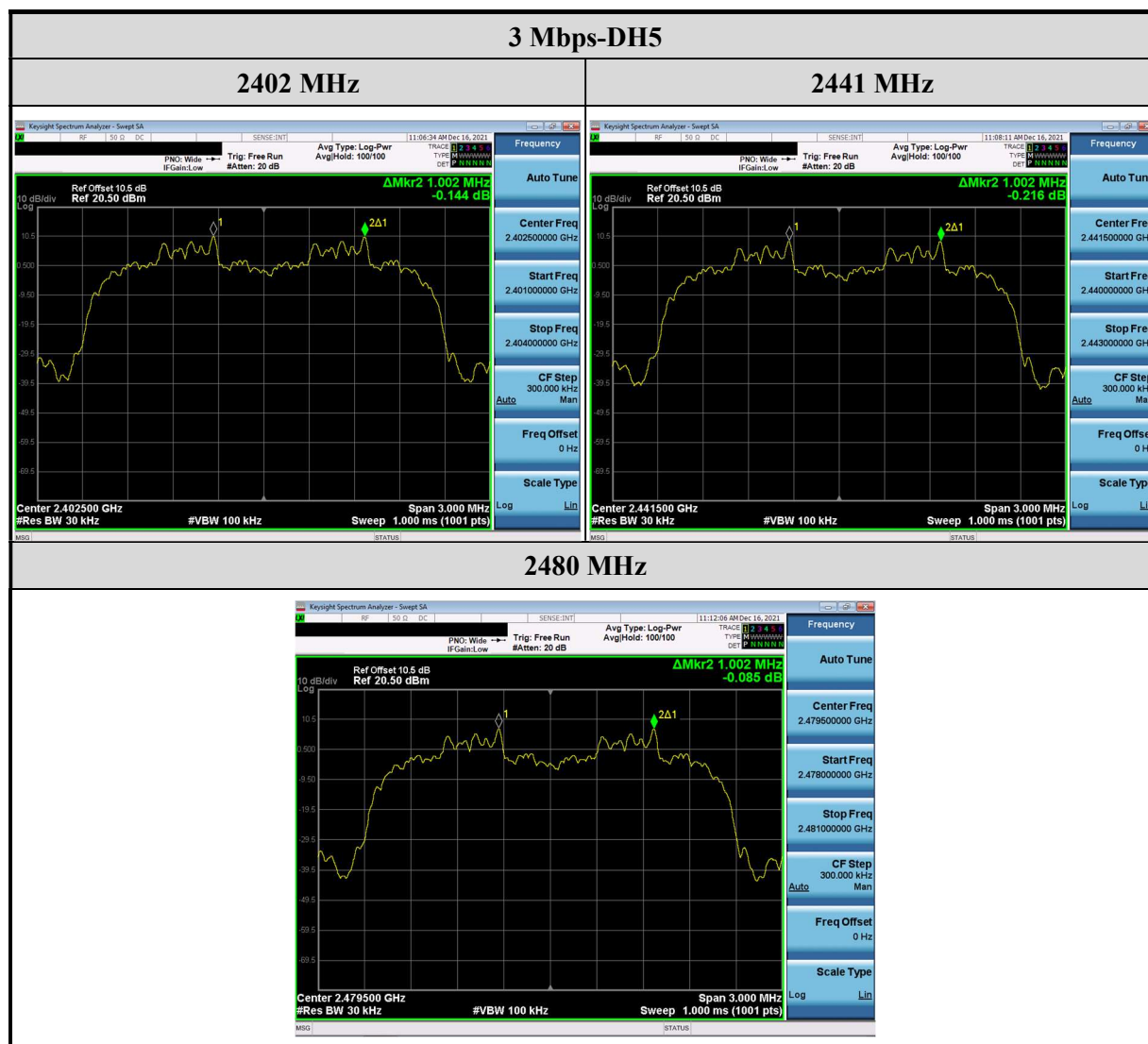
Channel	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (MHz)	Limit of (2/3)*20dB (MHz)	Result
00	2402	1	1.002	≥ 0.575	Pass
39	2441	1	0.999	≥ 0.574	Pass
78	2480	1	0.996	≥ 0.575	Pass

備註: $25\text{kHz} < (2/3) * 20\text{ dB}$ 頻寬，以 $(2/3) * 20\text{ dB}$ 頻寬為準。



Channel	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (MHz)	Limit of (2/3)*20dB (MHz)	Result
00	2402	3	1.002	≥ 0.835	Pass
39	2441	3	1.002	≥ 0.836	Pass
78	2480	3	1.002	≥ 0.833	Pass

備註: 25kHz < (2/3)*20 dB 頻寬 , 以(2/3)*20 dB 頻寬為準。



2.5 頻道占用時間

2.5.1 限制值

操作於 2400 MHz~2483.5 MHz 之展頻跳頻系統，須使用至少 15 個無重疊的頻道，在 0.4 秒乘以跳頻頻道數之週期內，任一頻率占用之平均時間應小於或等於 0.4 秒。應使用智慧型跳頻技術，以避免占用於特定跳頻頻道。

2.5.2 測試架構



2.5.3 測試流程

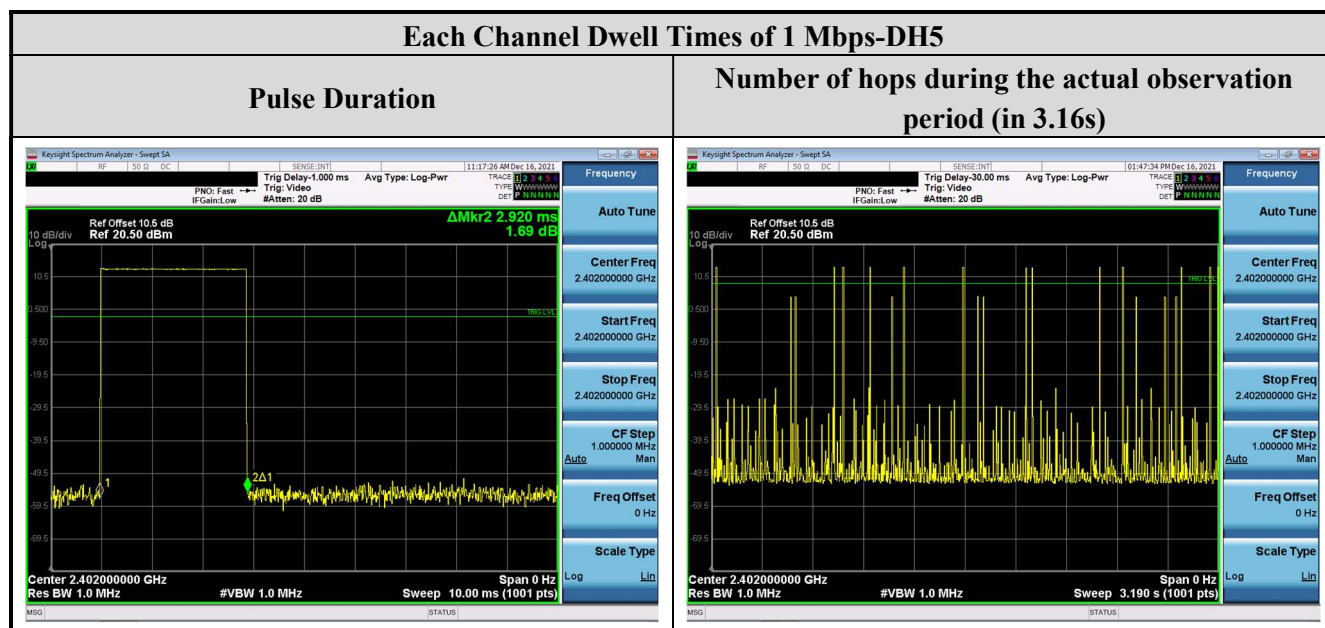
1. Enable the EUT transmit continuously.
2. Spectrum analyzer set:
 - a) Span = zero span, centered on a hopping channel
 - b) RBW should be set $\gg 1 / T$, where T is the expected dwell time per channel
 - c) VBW $\geq$ RBW
 - d) Sweep = as necessary to capture the entire dwell time per hopping channel
 - e) Detector function = peak
 - f) Trace = max hold.

2.5.4 測試結果

Data Rate (Mbps)	Data Packet	Pulse Duration (ms)	Number of hops during the actual observation period (in 3.16s)	Average time of occupancy (s)	Limit (s)	Result
1	DH1	0.410	32	0.1312	≤ 0.4	Pass
1	DH3	1.650	19	0.3135	≤ 0.4	Pass
1	DH5	2.920	12	0.3504	≤ 0.4	Pass

Remark:

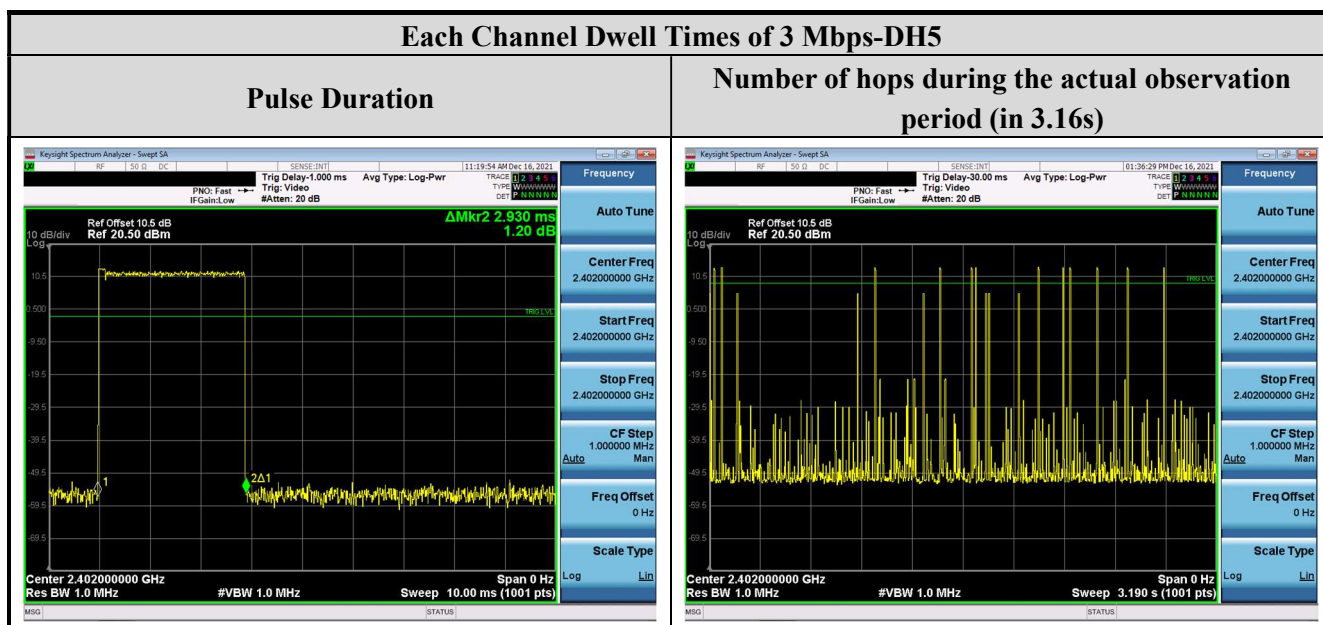
1. Number of frequency hopping = 79
2. Standard observation period = 31.6 s
3. Average time of occupancy = Pulse Duration × (Standard Observation period / Number of hops during the actual observation period (in 3.16s))



Data Rate (Mbps)	Data Packet	Pulse Duration (ms)	Number of hops during the actual observation period (in 3.16s)	Average time of occupancy (s)	Limit (s)	Result
3	DH1	0.420	32	0.1344	≤ 0.4	Pass
3	DH3	1.680	18	0.3024	≤ 0.4	Pass
3	DH5	2.930	12	0.3516	≤ 0.4	Pass

Remark:

1. Number of frequency hopping = 79
2. Standard observation period = 31.6 s
3. Average time of occupancy = Pulse Duration × (Standard Observation period / Number of hops during the actual observation period (in 3.16s))

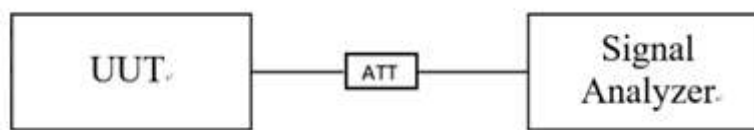


2.6 20 dB 頻寬

2.6.1 限制值

None °

2.6.2 測試架構

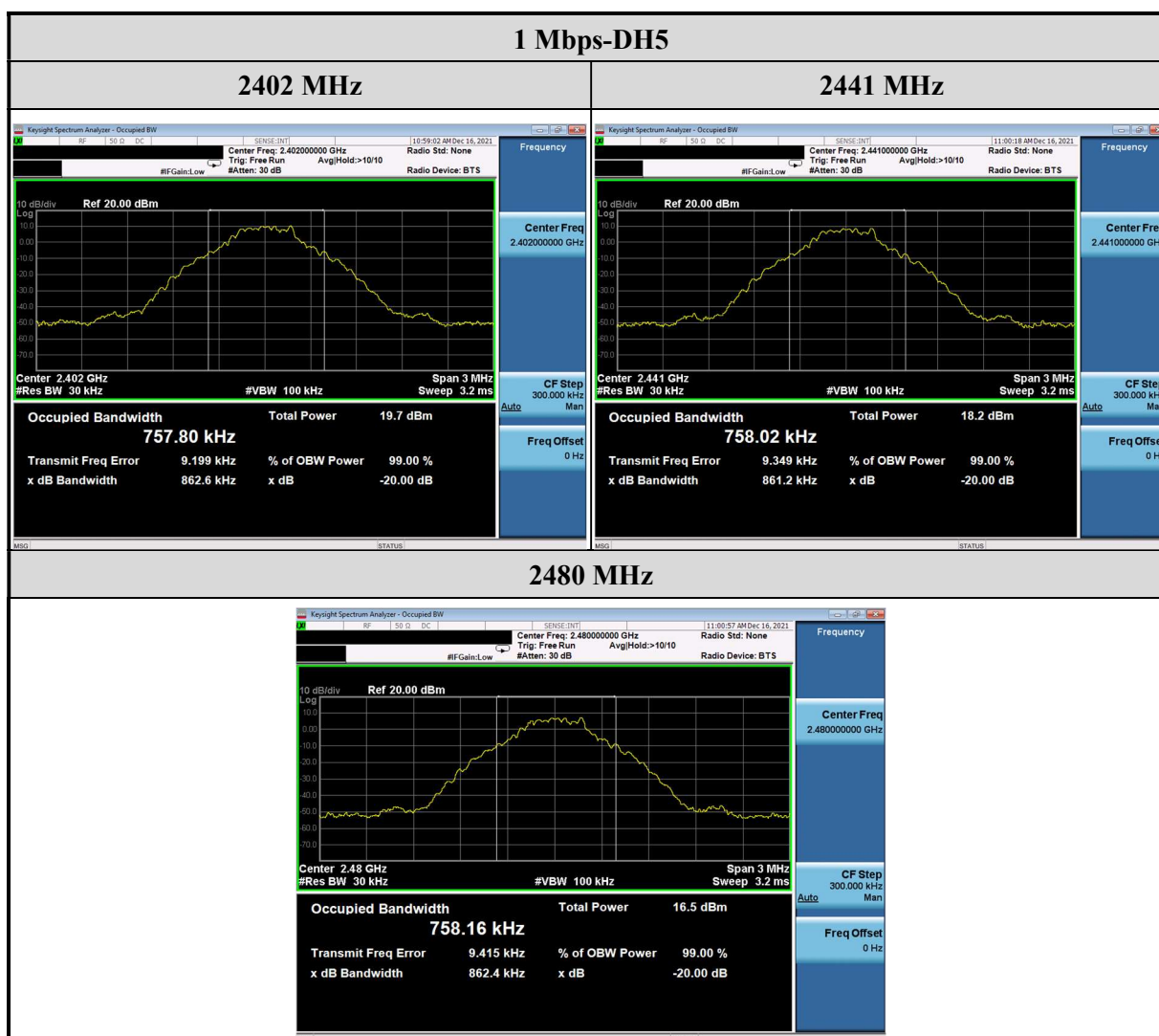


2.6.3 測試流程

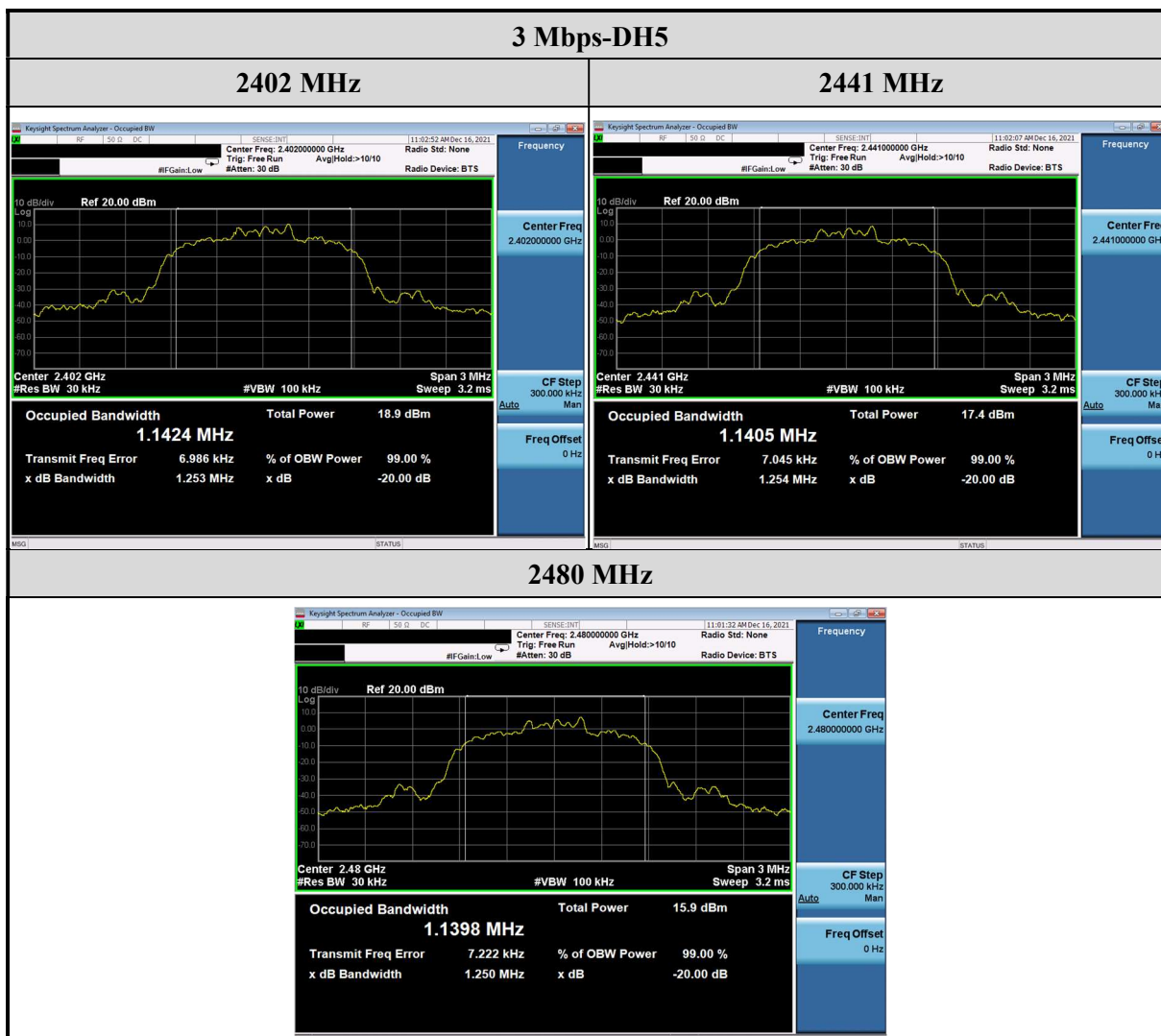
1. Enable the EUT transmit continuously.
2. Spectrum analyzer set:
 - a) approximately 2 to 5 times the 20 dB bandwidth, centered on a hopping channel
 - b) RBW shall be in the range of 1% to 5% of the OBW
 - c) VBW shall be approximately three times RBW
 - d) Sweep time = auto
 - e) Detector function = peak
 - f) Trace mode = max hold.

2.6.4 測試結果

Channel	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (MHz)	Required Limit (MHz)	Result
00	2402	1	0.863	None	N/A
39	2441	1	0.861	None	N/A
78	2480	1	0.862	None	N/A



Channel	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (MHz)	Required Limit (MHz)	Result
00	2402	3	1.253	None	N/A
39	2441	3	1.254	None	N/A
78	2480	3	1.250	None	N/A



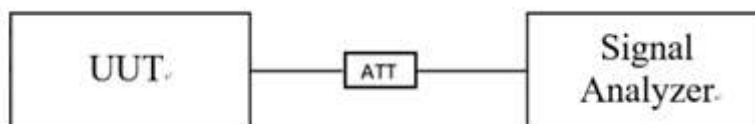
2.7 帶外傳導發射限制

2.7.1 限制值

操作頻帶範圍外之任意 100 kHz 內，發射機所產生的射頻功率相較於使用頻帶範圍中包含最高所需功率之 100 kHz 內的射頻功率，其衰減值限制如下：

1. 輸出功率以附件二之峰值輸出功率方式測量者，至少須衰減 20 dB，可使用射頻傳導或輻射方式測量。
2. 輸出功率以 4.10.1.2(1)(C)之最大傳導輸出功率測量方式者，至少須衰減 30 dB。

2.7.2 測試架構

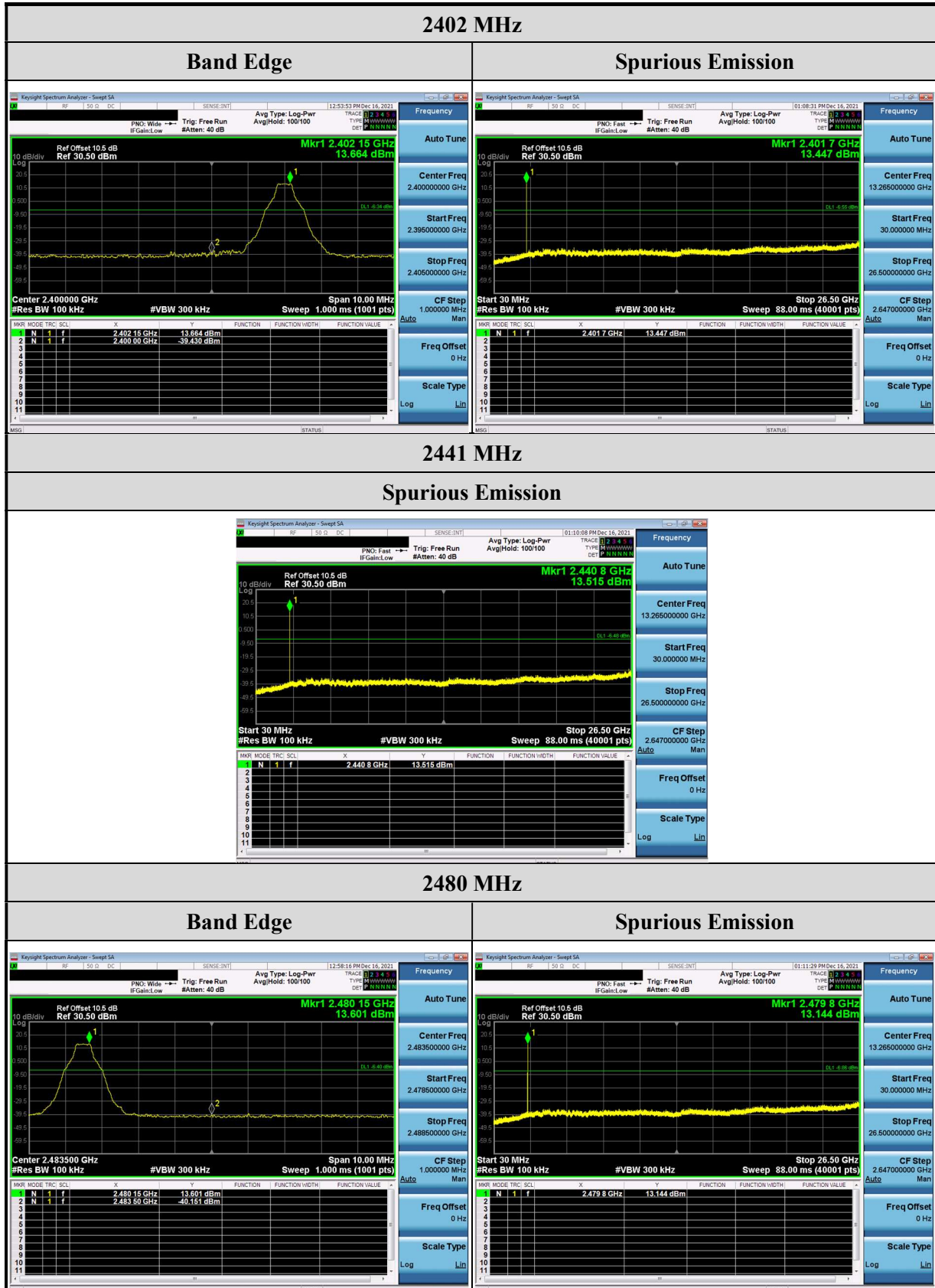


2.7.3 測試流程

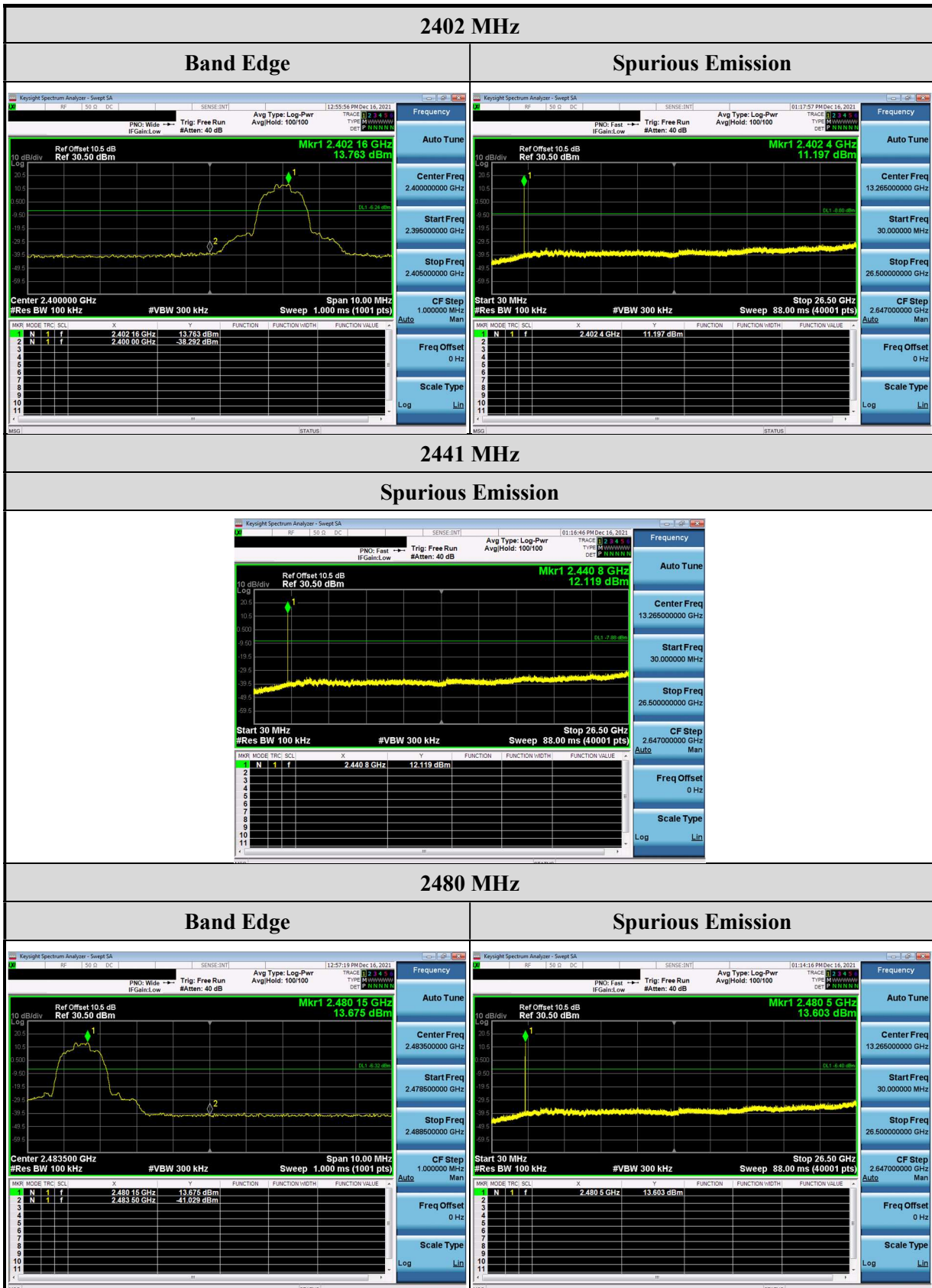
1. Enable the EUT transmit continuously.
2. Spectrum analyzer set :
 - a) RBW = 100 kHz
 - b) VBW $\geq$ 3 RBW
 - c) Detector = peak
 - d) Sweep time = auto couple
 - e) Trace mode = max hold.

2.7.4 測試結果

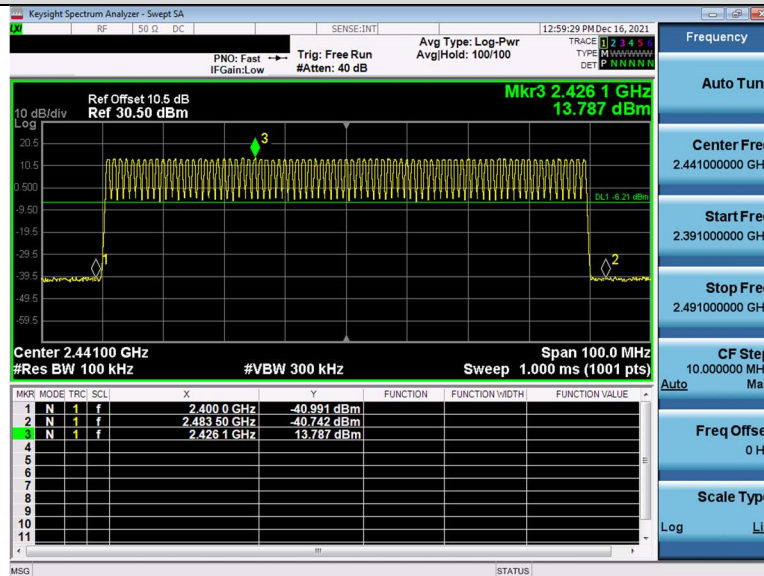
1 Mbps-DH5



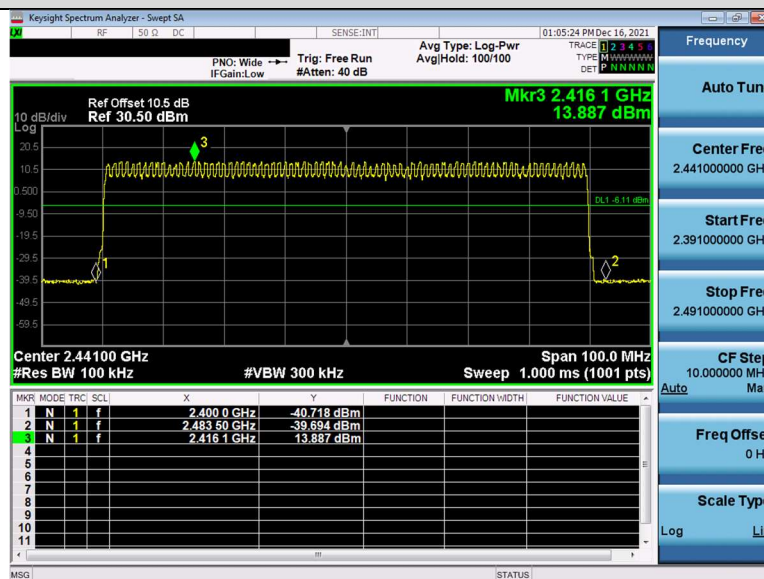
3 Mbps-DH5



1 Mbps-DH5 Hopping Band Edge



3 Mbps-DH5 Hopping Band Edge



2.8 不必要之發射

2.8.1 限制值

- 操作頻帶範圍外之任意 100 kHz 內，發射機所產生的射頻功率相較於使用頻帶範圍中包含最高所需功率之 100 kHz 內的射頻功率，其衰減值限制如下：
 - 輸出功率以附件二之峰值輸出功率方式測量者，至少須衰減 20 dB，可使用射頻傳導或輻射方式測量。
 - 輸出功率以 4.10.1.2(1)(C)之最大傳導輸出功率測量方式者，至少須衰減 30 dB。
- 依據NCC低功率射頻器材技術規範第3.6節之規定,除本規範各章節另有放寬規定者外，其電場強度不得超過下表之限值，且其不必要之發射皆不得大於主波發射強度。各頻段重疊處，以較嚴格之限制值為準。

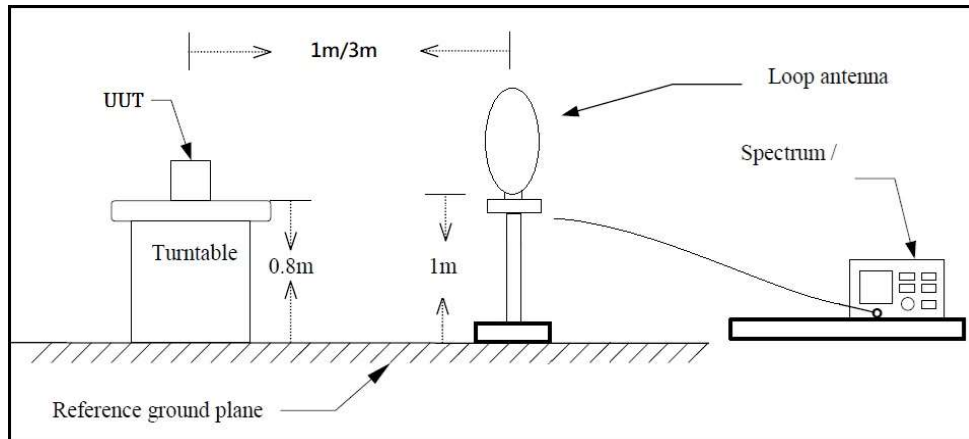
頻率(f) (MHz)	電場強度 (微伏特/公尺, $\mu\text{V/m}$)	量測距離 (公尺)
0.009 ~ 0.490	2400 / f(kHz)	300
0.490 ~ 1.705	24000 / f(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

備註：

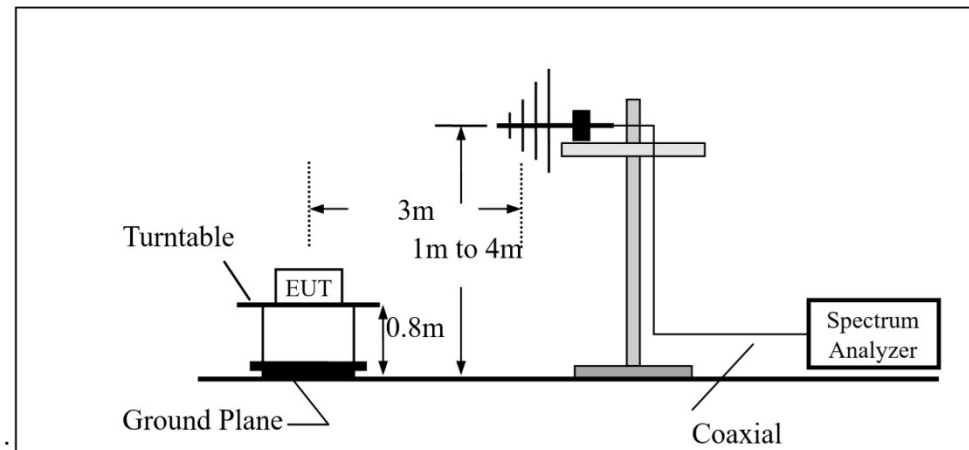
- 電場強度 ($\text{dB}\mu\text{V/m}$) = $20 \log$ 電場強度($\mu\text{V/m}$)。
- 距離是指測量儀器天線與設備之間的距離。
- 上表規定之電場強度，發射頻率在 9 kHz~90 kHz、110 kHz~490 kHz 及 1000 MHz 以上者，其量測應以平均值檢波器為基準，且應符合 NCC 低功率射頻器材技術規範第 6.15.2 節之規定；其他發射頻率，應以國際無線電干擾特別委員會 (INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE, CISPR) 準峰值檢波器(quasi-peak detector)測量；非以上表所指定之距離測量時，應符合 NCC 低功率射頻器材技術規範第 6.5 節之規定，輻射發射之量測頻率範圍應符合 NCC 低功率射頻器材技術規範第 6.14 節之規定。

2.8.2 測試架構

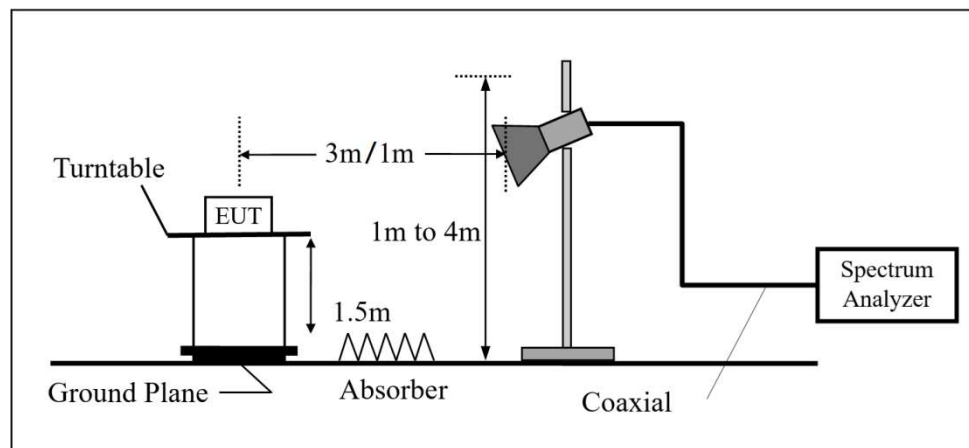
Below 30 MHz:



30 MHz ~ 1 GHz:



Above 1GHz:



2.8.3 測試流程

低於 30MHz 的輻射發射

- (1) 將 EUT 放置在距離地面 0.8 米的非導體桌面的 3 米室內。將桌子旋轉 360 度以確定最高輻射的位置。
- (2) EUT 設置在離接收天線 3 米遠處，干擾接收天線安裝在可變高度天線塔的頂部。
- (3) 設置天線的平行、垂直方向以進行測量。
- (4) 將測試接收機系統設置為準峰值檢測功能和具有最大保持模式的指定帶寬。

30MHz 以上的輻射發射

- (1) 將 EUT 放置在距離地面 0.8 米（低於 1GHz）/1.5 米（高於 1GHz）的非導體桌面的 3 米室內。將桌子旋轉 360 度以確定最高輻射的位置。
- (2) EUT 設置在離接收天線 3 米處，天線的高度在離地面 1 米到 4 米之間變化，以確定場強的最大值。
- (3) 設置天線的平行、垂直方向以進行測量。
- (4) 當測試頻率低於 1GHz 時，測試接收機系統被設置為準峰值檢測功能和具有最大保持模式的指定帶寬。
- (5) 當測試頻率高於 1 GHz 時，測試接收機系統設置為峰值和平均檢測功能以及具有最大保持模式的指定帶寬。如果峰值讀數值也滿足平均限值，則不需要使用平均值檢測器進行測量。

2.8.4 工作週期

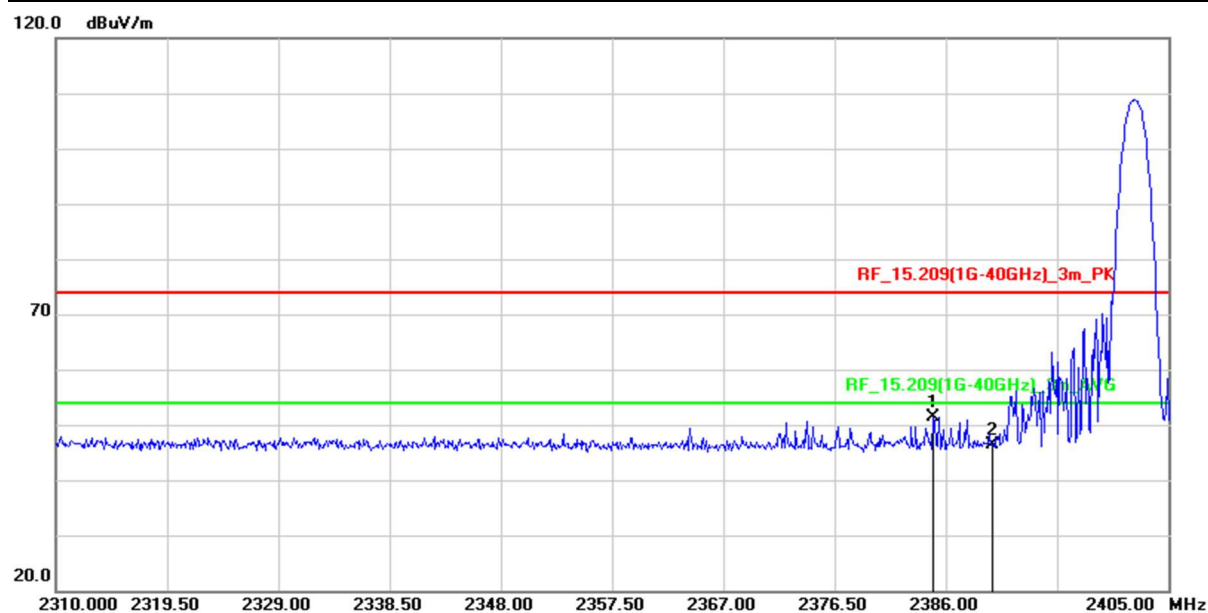
Mode	Data Rate (Mbps)	on time (ms)	on+off time (ms)	Duty cycle	Duty Factor (dB)	1/T Minimum VBW (kHz)
BT	1	2.925	5.010	0.584	2.337	0.342
	3	2.925	4.995	0.586	2.324	0.342

2.8.5 輻射頻帶邊緣測試

下表為輻射測量，在X、Y、Z三個軸向中預掃描。本報告中記錄了最差情況（X軸向）。

Test Frequency	
RF	BT 1 Mbps / 3 Mbps
Tx	CH00 (2402 MHz)
	CH78 (2480 MHz)

Test Mode :	Mode 1 : Transmit BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH00 (2402 MHz)	Temperature :	25.2 °C
Polarization :	Horizontal	Relative Humidity :	40 %

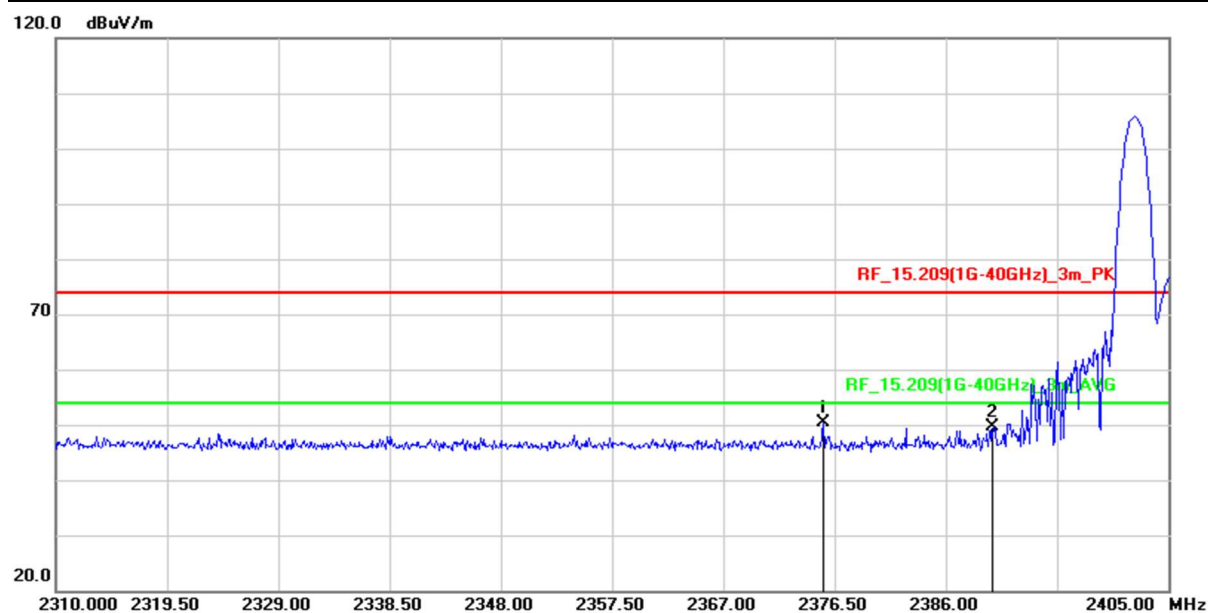


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2384.955	58.16	-6.70	51.46	74.00	-22.54	peak
2	2390.000	53.19	-6.69	46.50	74.00	-27.50	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 : Transmit BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH00 (2402 MHz)	Temperature :	25.2 °C
Polarization :	Vertical	Relative Humidity :	40 %

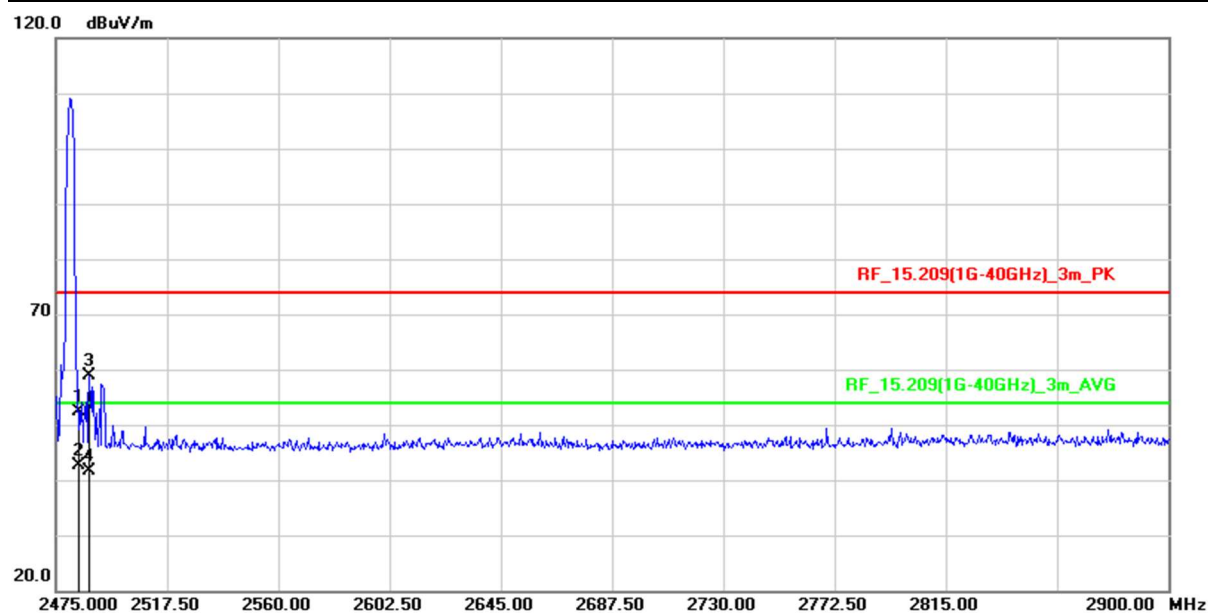


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2375.550	57.06	-6.72	50.34	74.00	-23.66	peak
2	2390.000	56.28	-6.69	49.59	74.00	-24.41	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 : Transmit BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH78 (2480 MHz)	Temperature :	25.2 °C
Polarization :	Horizontal	Relative Humidity :	40 %

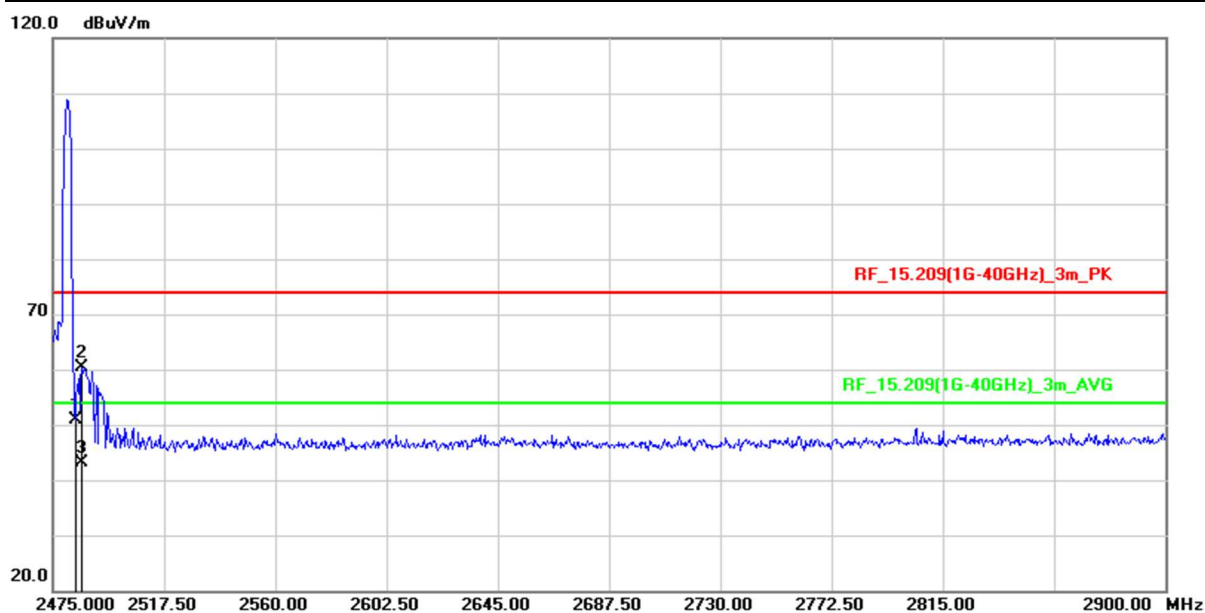


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	59.00	-6.61	52.39	74.00	-21.61	peak
2	2483.500	49.31	-6.61	42.70	54.00	-11.30	AVG
3	2487.750	65.38	-6.60	58.78	74.00	-15.22	peak
4	2487.750	48.19	-6.60	41.59	54.00	-12.41	AVG

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 : Transmit BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH78 (2480 MHz)	Temperature :	25.2 °C
Polarization :	Vertical	Relative Humidity :	40 %

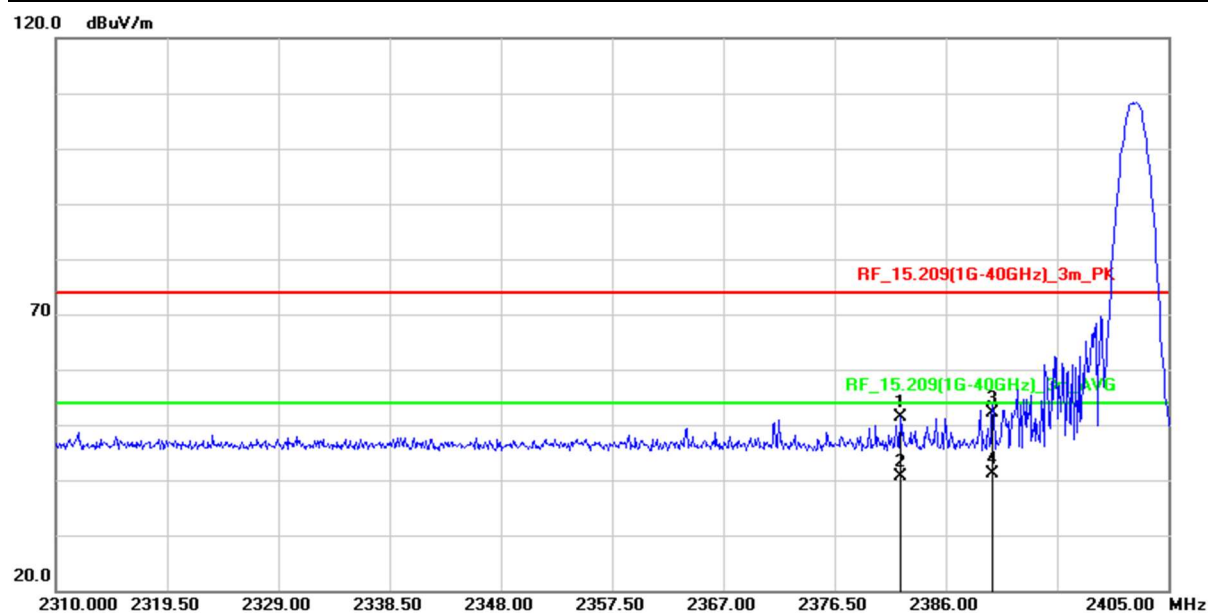


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	57.42	-6.61	50.81	74.00	-23.19	peak
2	2486.050	66.94	-6.60	60.34	74.00	-13.66	peak
3	2486.050	49.69	-6.60	43.09	54.00	-10.91	AVG

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 : Transmit BT-EDR(3Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH00 (2402 MHz)	Temperature :	25.2 °C
Polarization :	Horizontal	Relative Humidity :	40 %

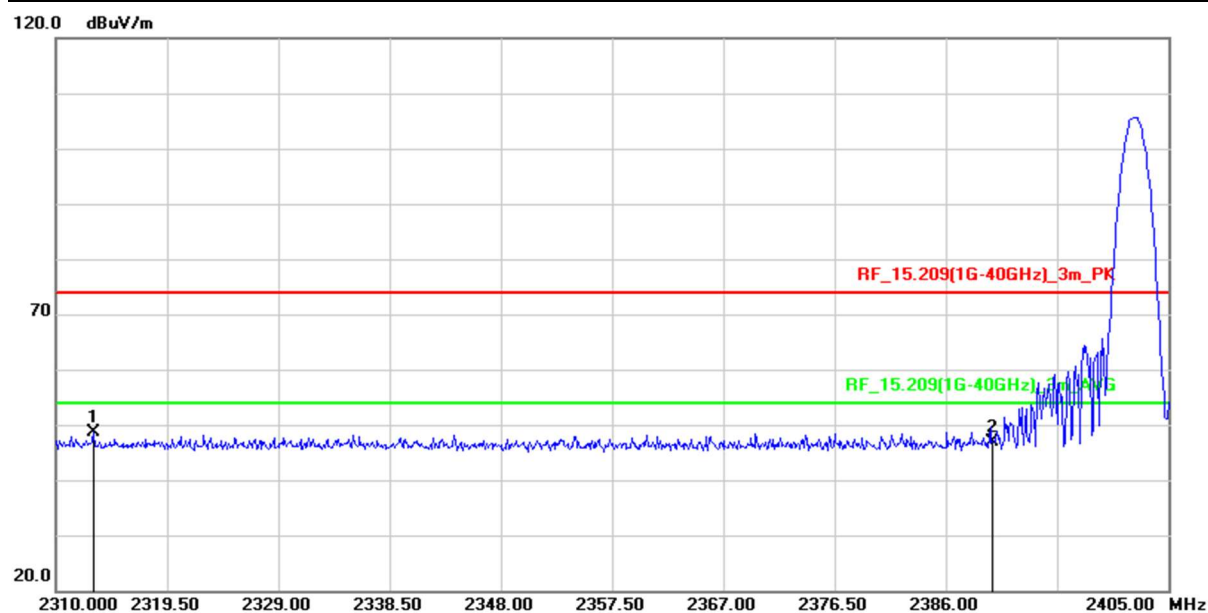


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2382.105	58.20	-6.70	51.50	74.00	-22.50	peak
2	2382.105	47.22	-6.70	40.52	54.00	-13.48	AVG
3	2390.000	58.73	-6.69	52.04	74.00	-21.96	peak
4	2390.000	47.75	-6.69	41.06	54.00	-12.94	AVG

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 : Transmit BT-EDR(3Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH00 (2402 MHz)	Temperature :	25.2 °C
Polarization :	Vertical	Relative Humidity :	40 %

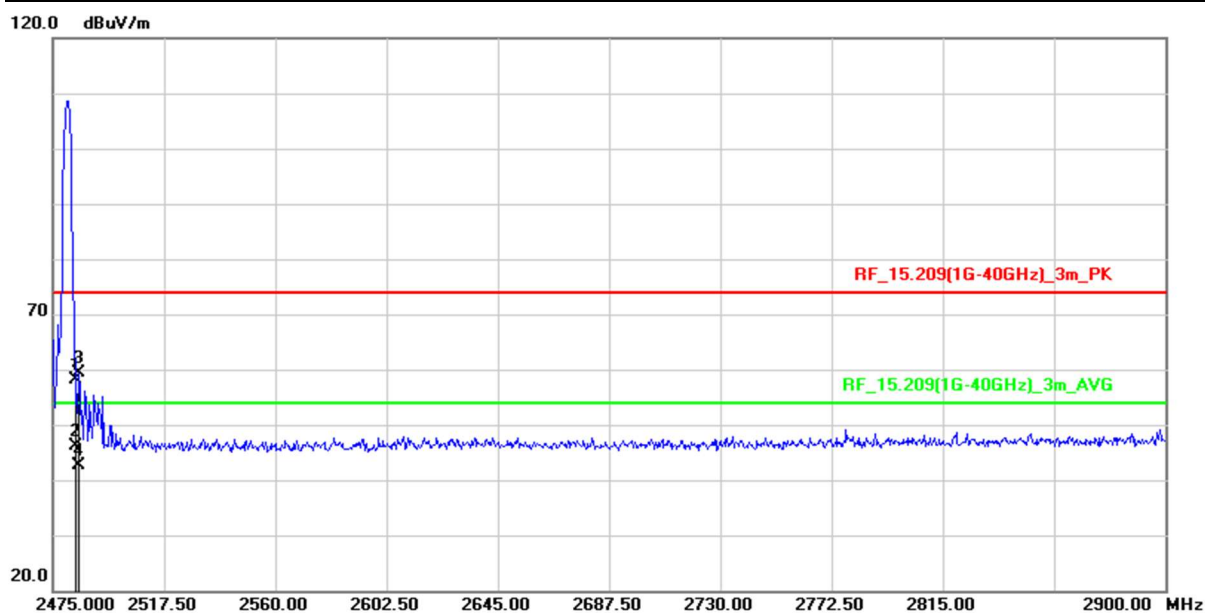


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2313.230	55.29	-6.62	48.67	74.00	-25.33	peak
2	2390.000	53.69	-6.69	47.00	74.00	-27.00	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 : Transmit BT-EDR(3Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH78 (2480 MHz)	Temperature :	25.2 °C
Polarization :	Horizontal	Relative Humidity :	40 %

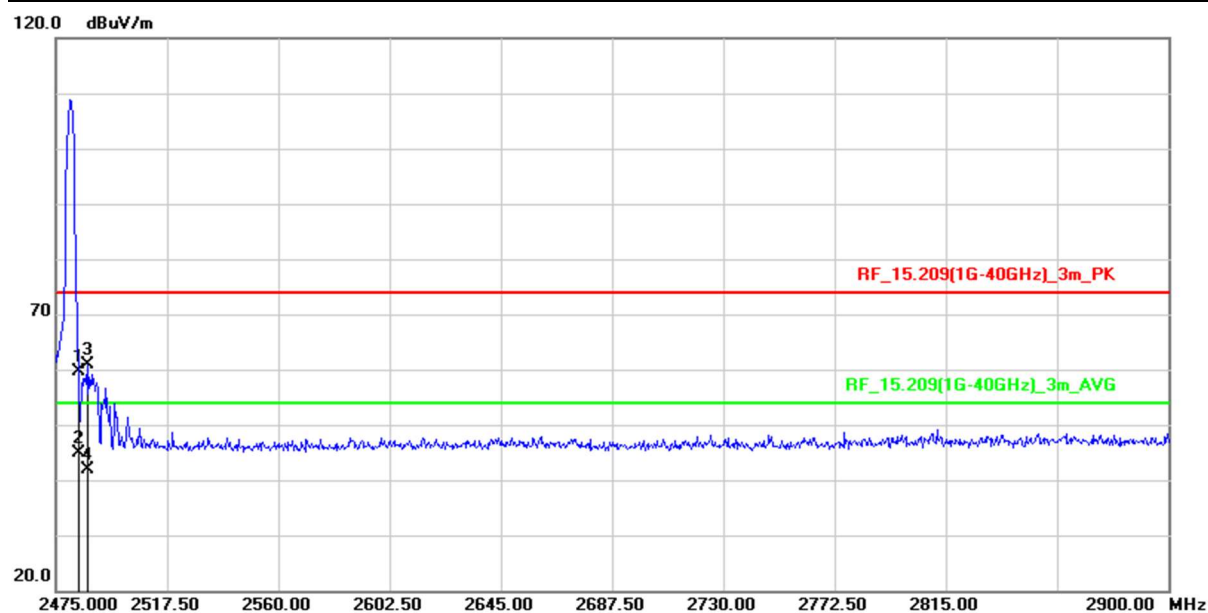


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	64.85	-6.61	58.24	74.00	-15.76	peak
2	2483.500	52.69	-6.61	46.08	54.00	-7.92	AVG
3	2484.775	66.09	-6.61	59.48	74.00	-14.52	peak
4	2484.775	49.24	-6.61	42.63	54.00	-11.37	AVG

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 : Transmit BT-EDR(3Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH78 (2480 MHz)	Temperature :	25.2 °C
Polarization :	Vertical	Relative Humidity :	40 %



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	66.14	-6.61	59.53	74.00	-14.47	peak
2	2483.500	51.44	-6.61	44.83	54.00	-9.17	AVG
3	2487.325	67.44	-6.60	60.84	74.00	-13.16	peak
4	2487.325	48.49	-6.60	41.89	54.00	-12.11	AVG

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

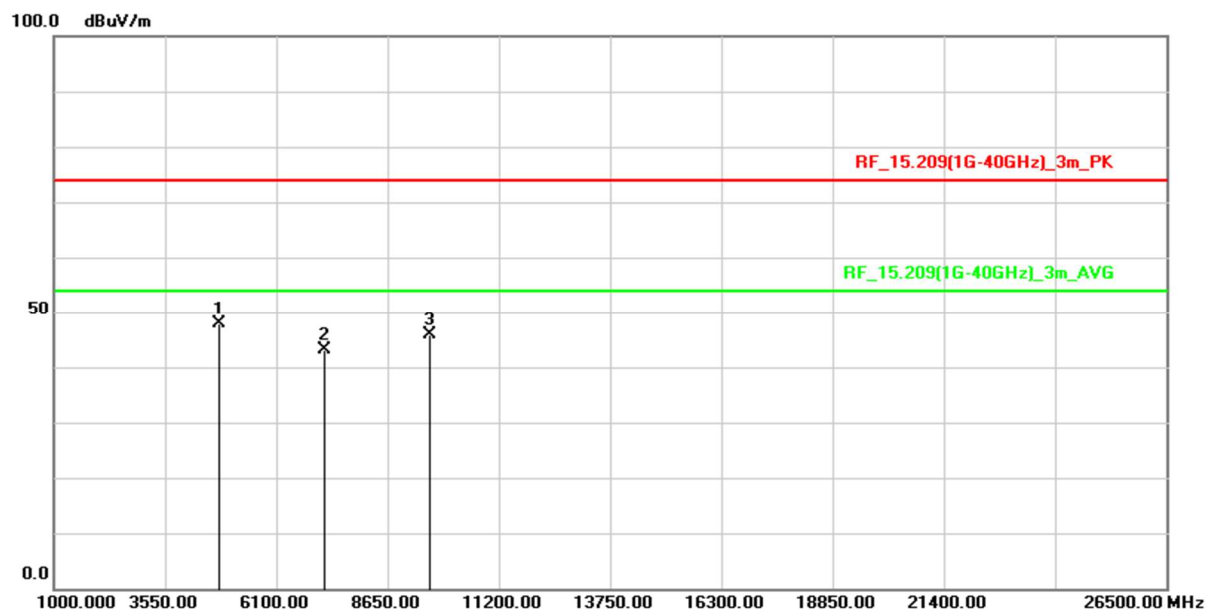
2.8.6 輻射雜散發射測試

- (1) 輻射量測頻率 9kHz ~ 30MHz，此頻率範圍之干擾值低於限制值 20dB 以下，被考量為背景雜訊值並不予紀錄。
- (2) 下表為輻射測量頻率 30MHz ~ 26.5GHz，在 X、Y、Z 三個軸向中預掃描。本報告中記錄了最壞情況（X 軸向）。

Test Frequency	
RF	BT
Tx	CH00 (2402 MHz)
	CH39 (2441 MHz)
	CH78 (2480 MHz)
Rx	CH39 (2441 MHz)

Above 1GHz Data

Test Mode :	Mode 1 : Transmit BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH00 (2402 MHz)	Temperature :	25.2 °C
Polarization :	Horizontal	Relative Humidity :	40 %

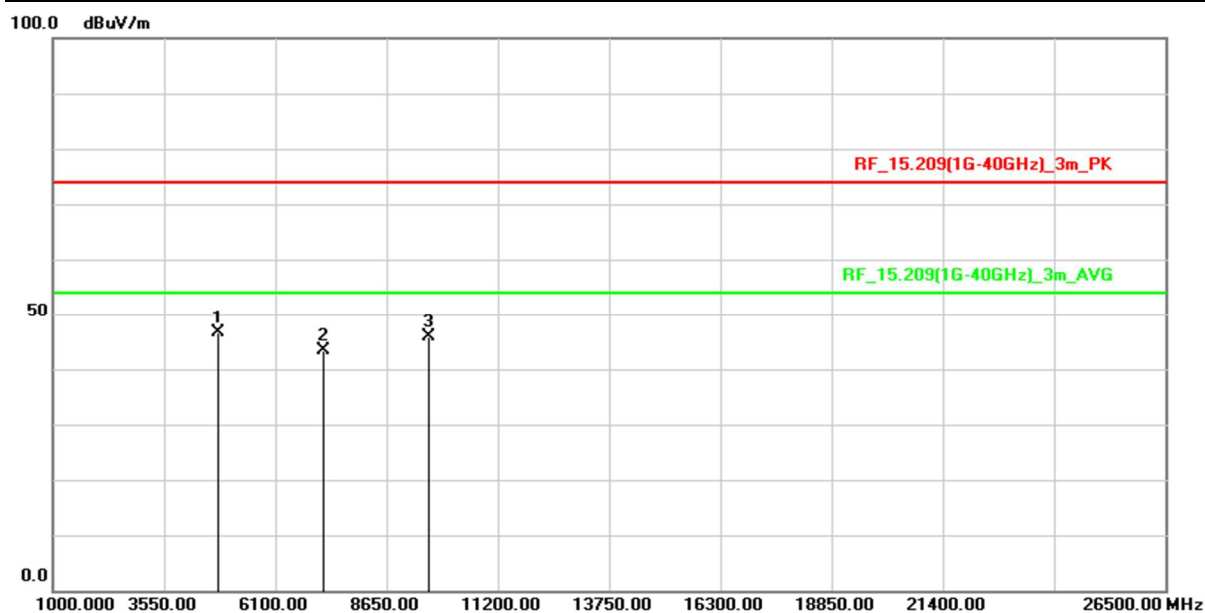


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4804.000	68.57	-20.63	47.94	74.00	-26.06	peak
2	7206.000	58.10	-14.88	43.22	74.00	-30.78	peak
3	9608.000	56.80	-10.94	45.86	74.00	-28.14	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 : Transmit BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH00 (2402 MHz)	Temperature :	25.2 °C
Polarization :	Vertical	Relative Humidity :	40 %

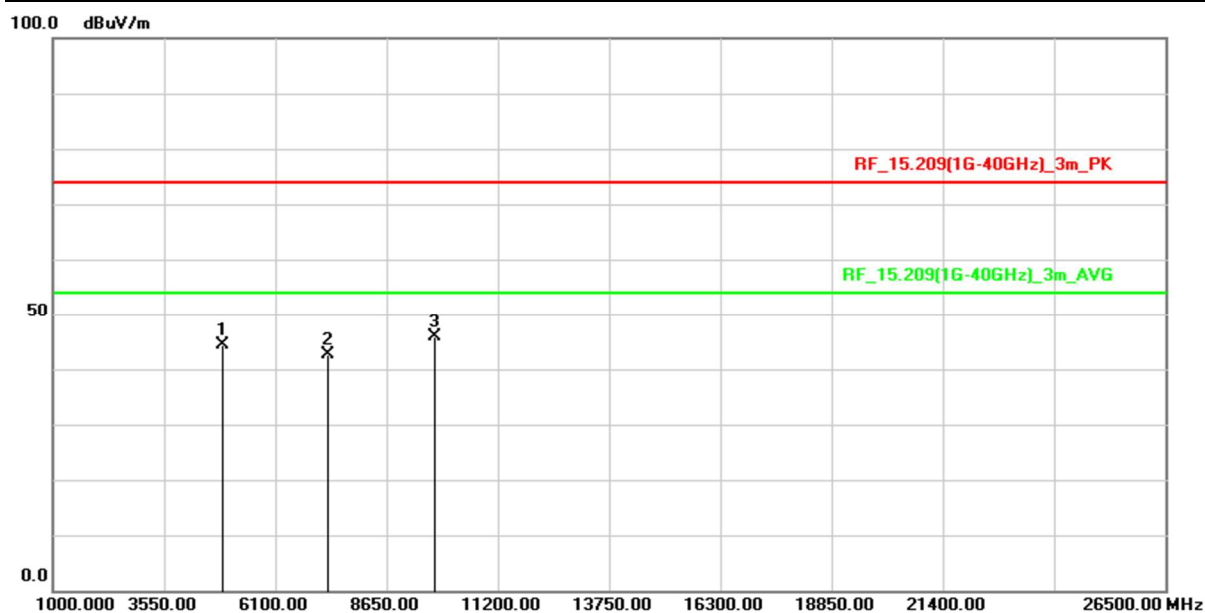


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4804.000	67.19	-20.63	46.56	74.00	-27.44	peak
2	7206.000	58.37	-14.88	43.49	74.00	-30.51	peak
3	9608.000	56.79	-10.94	45.85	74.00	-28.15	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 : Transmit BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH39 (2441 MHz)	Temperature :	25.2 °C
Polarization :	Horizontal	Relative Humidity :	40 %

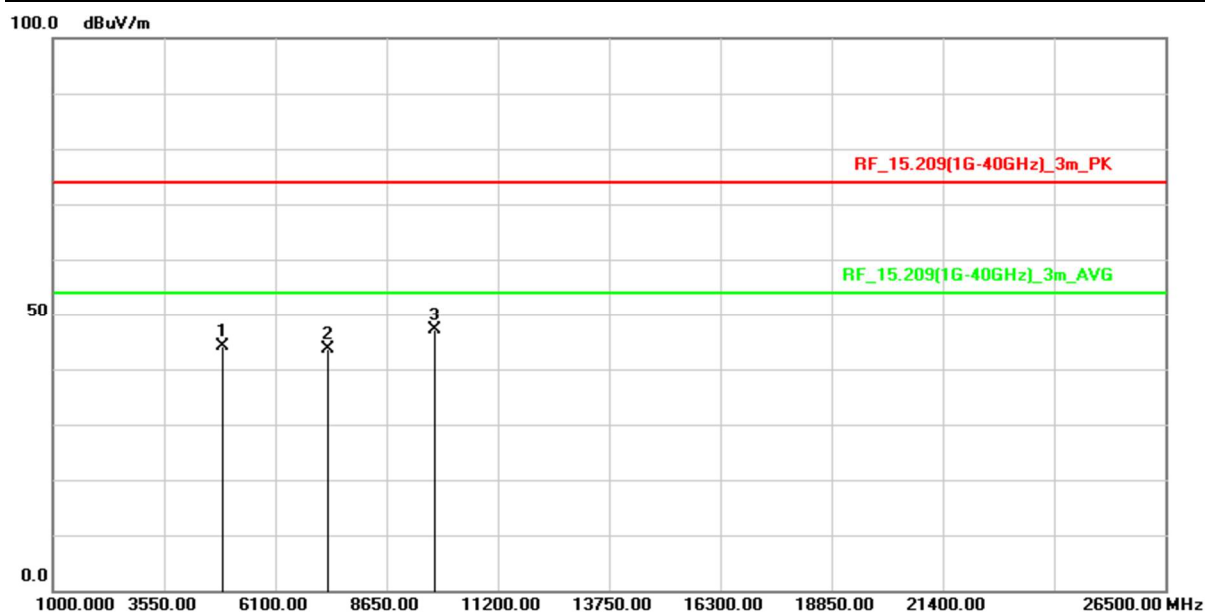


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882.000	65.06	-20.73	44.33	74.00	-29.67	peak
2	7323.000	57.62	-14.94	42.68	74.00	-31.32	peak
3	9764.000	56.58	-10.67	45.91	74.00	-28.09	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 : Transmit BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 14 日
Test Channel	CH39 (2441 MHz)	Temperature :	25.2 °C
Polarization :	Vertical	Relative Humidity :	40 %

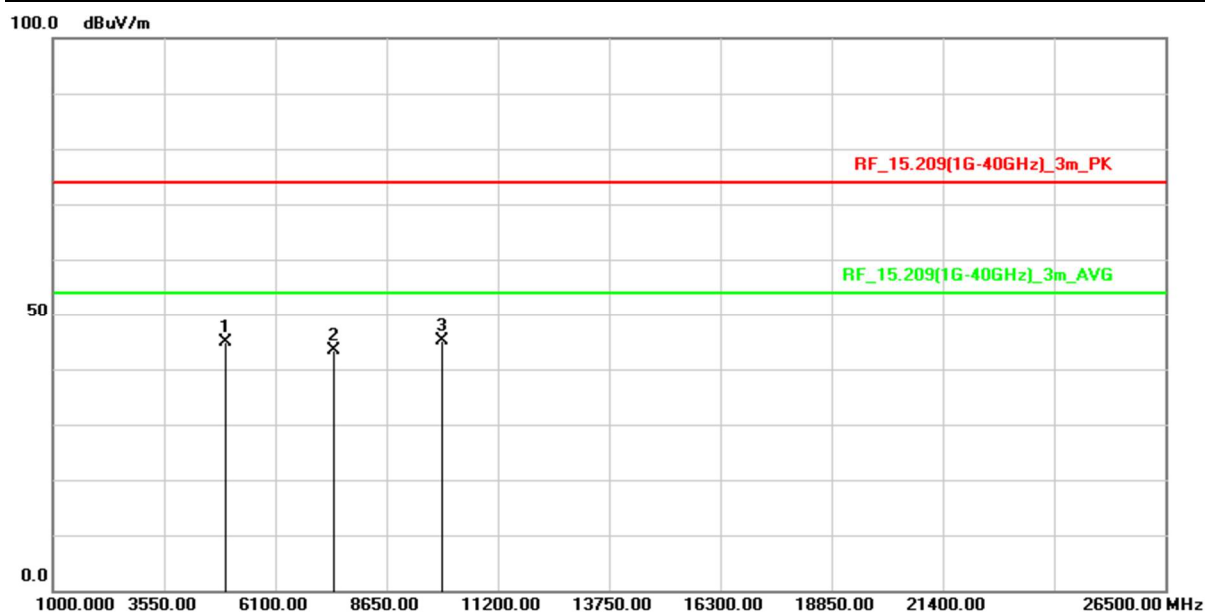


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882.000	64.74	-20.73	44.01	74.00	-29.99	peak
2	7323.000	58.63	-14.94	43.69	74.00	-30.31	peak
3	9764.000	57.76	-10.67	47.09	74.00	-26.91	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 : Transmit BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 14 日
Test Channel	CH78 (2480 MHz)	Temperature :	25.2 °C
Polarization :	Horizontal	Relative Humidity :	40 %

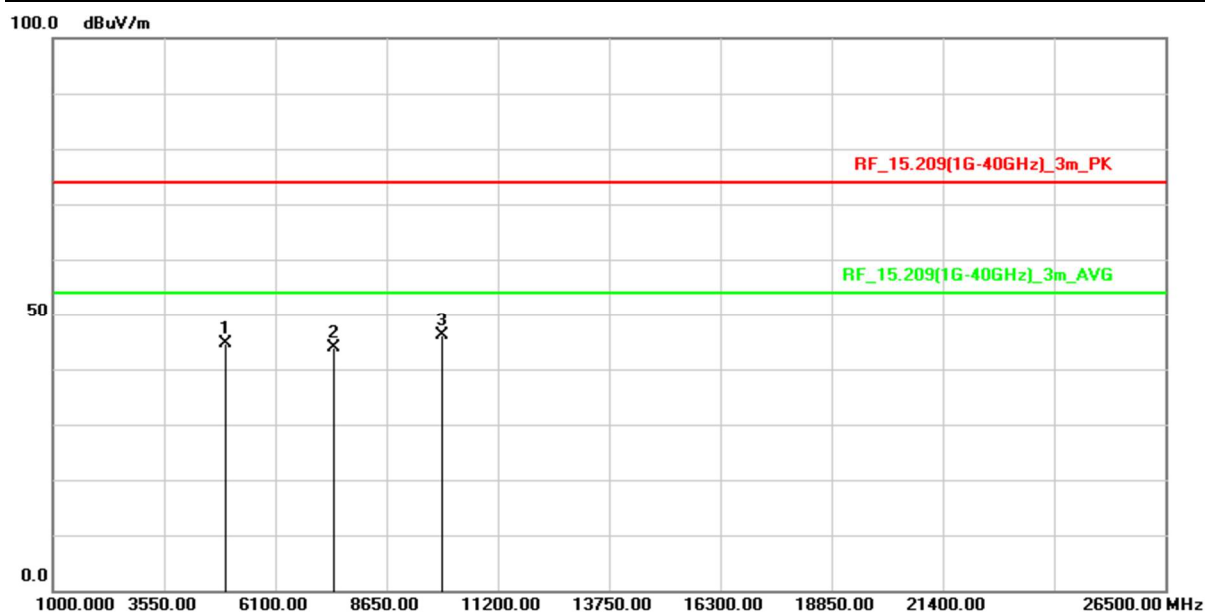


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4960.000	65.66	-20.68	44.98	74.00	-29.02	peak
2	7440.000	57.86	-14.50	43.36	74.00	-30.64	peak
3	9920.000	55.95	-10.88	45.07	74.00	-28.93	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 : Transmit BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 14 日
Test Channel	CH78 (2480 MHz)	Temperature :	25.2 °C
Polarization :	Vertical	Relative Humidity :	40 %

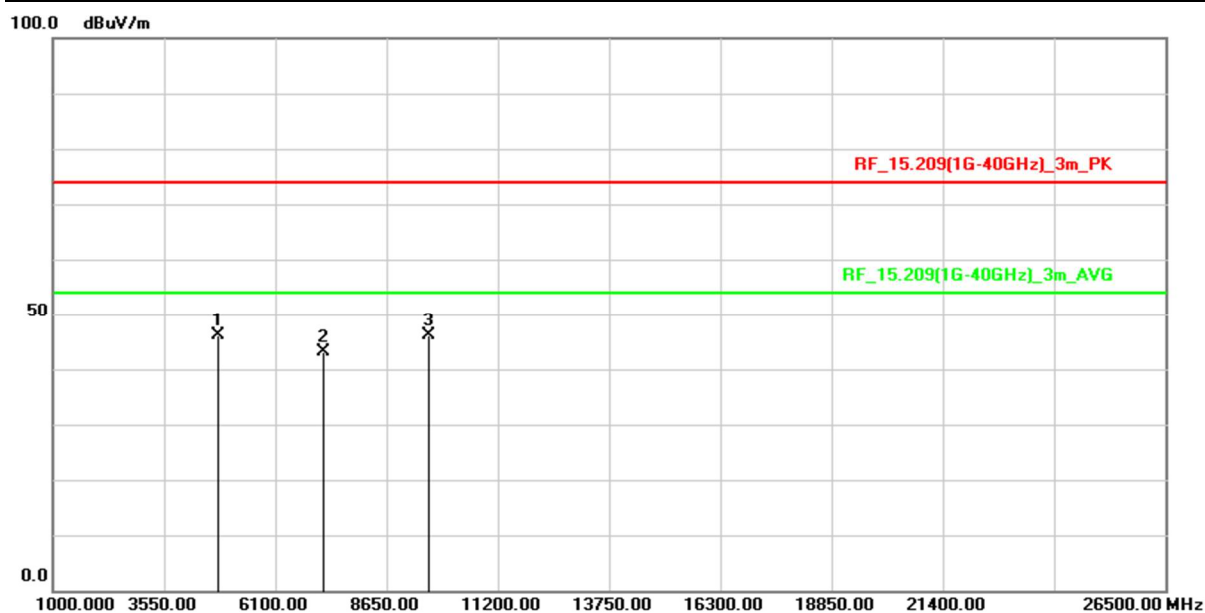


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4960.000	65.21	-20.68	44.53	74.00	-29.47	peak
2	7440.000	58.40	-14.50	43.90	74.00	-30.10	peak
3	9920.000	57.09	-10.88	46.21	74.00	-27.79	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 : Transmit BT-EDR(3Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 14 日
Test Channel	CH00 (2402 MHz)	Temperature :	25.2 °C
Polarization :	Horizontal	Relative Humidity :	40 %

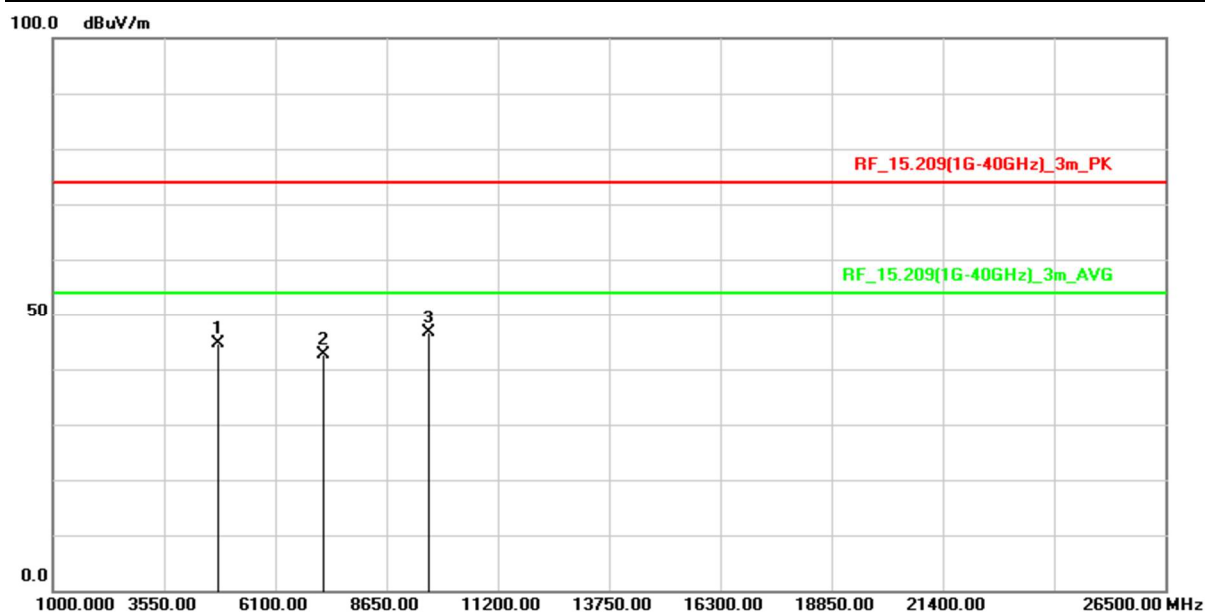


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4804.000	66.71	-20.63	46.08	74.00	-27.92	peak
2	7206.000	57.96	-14.88	43.08	74.00	-30.92	peak
3	9608.000	57.10	-10.94	46.16	74.00	-27.84	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 : Transmit BT-EDR(3Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 14 日
Test Channel	CH00 (2402 MHz)	Temperature :	25.2 °C
Polarization :	Vertical	Relative Humidity :	40 %

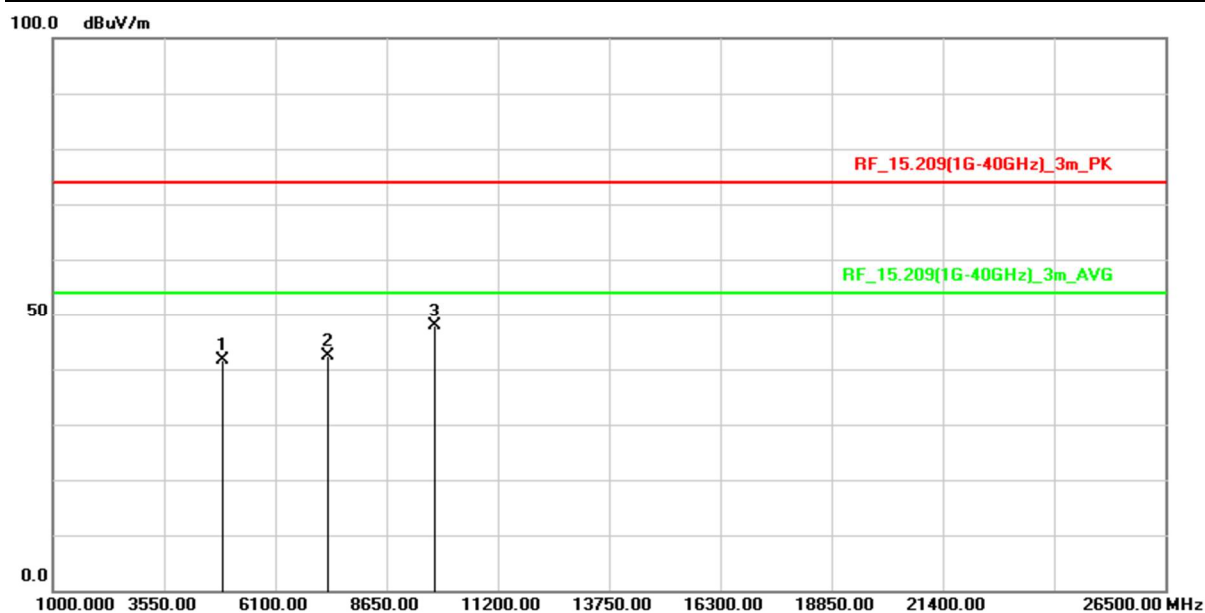


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4804.000	65.22	-20.63	44.59	74.00	-29.41	peak
2	7206.000	57.50	-14.88	42.62	74.00	-31.38	peak
3	9608.000	57.52	-10.94	46.58	74.00	-27.42	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 : Transmit BT-EDR(3Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 14 日
Test Channel	CH39 (2441 MHz)	Temperature :	25.2 °C
Polarization :	Horizontal	Relative Humidity :	40 %

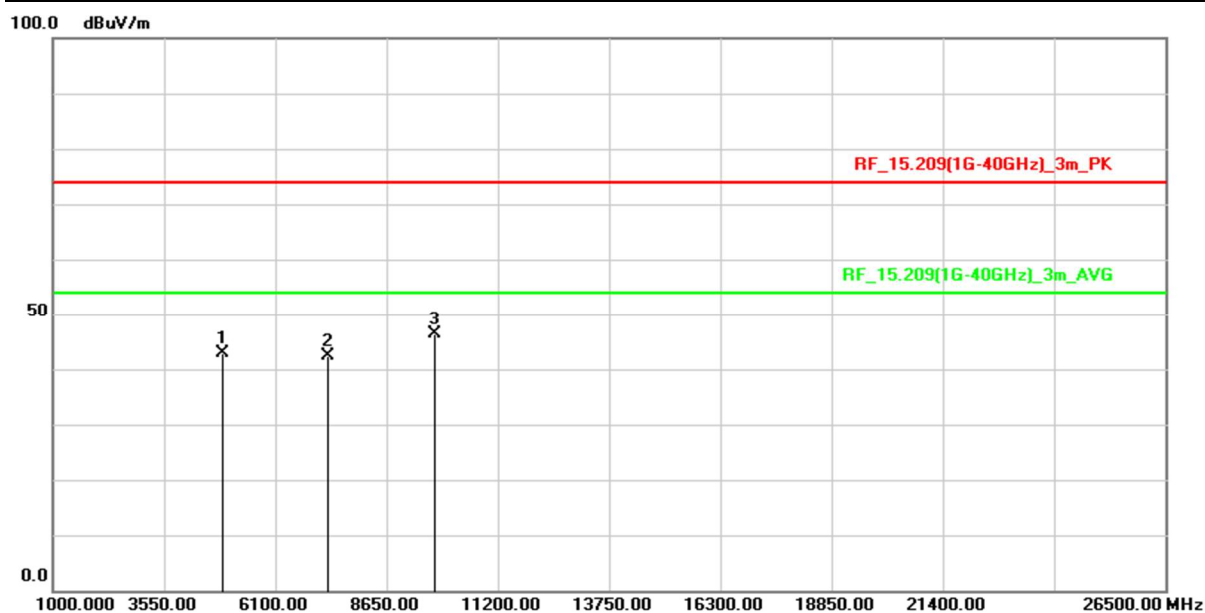


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882.000	62.40	-20.73	41.67	74.00	-32.33	peak
2	7323.000	57.23	-14.94	42.29	74.00	-31.71	peak
3	9764.000	58.45	-10.67	47.78	74.00	-26.22	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 : Transmit BT-EDR(3Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 14 日
Test Channel	CH39 (2441 MHz)	Temperature :	25.2 °C
Polarization :	Vertical	Relative Humidity :	40 %

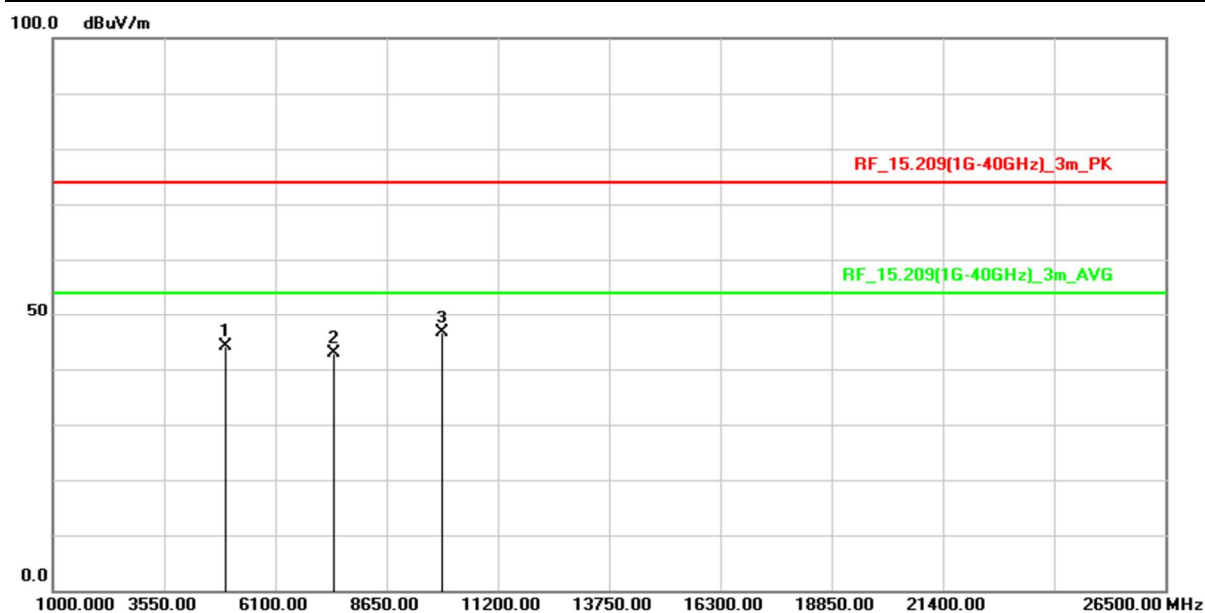


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882.000	63.71	-20.73	42.98	74.00	-31.02	peak
2	7323.000	57.43	-14.94	42.49	74.00	-31.51	peak
3	9764.000	57.02	-10.67	46.35	74.00	-27.65	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 : Transmit BT-EDR(3Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 14 日
Test Channel	CH78 (2480 MHz)	Temperature :	25.2 °C
Polarization :	Horizontal	Relative Humidity :	40 %

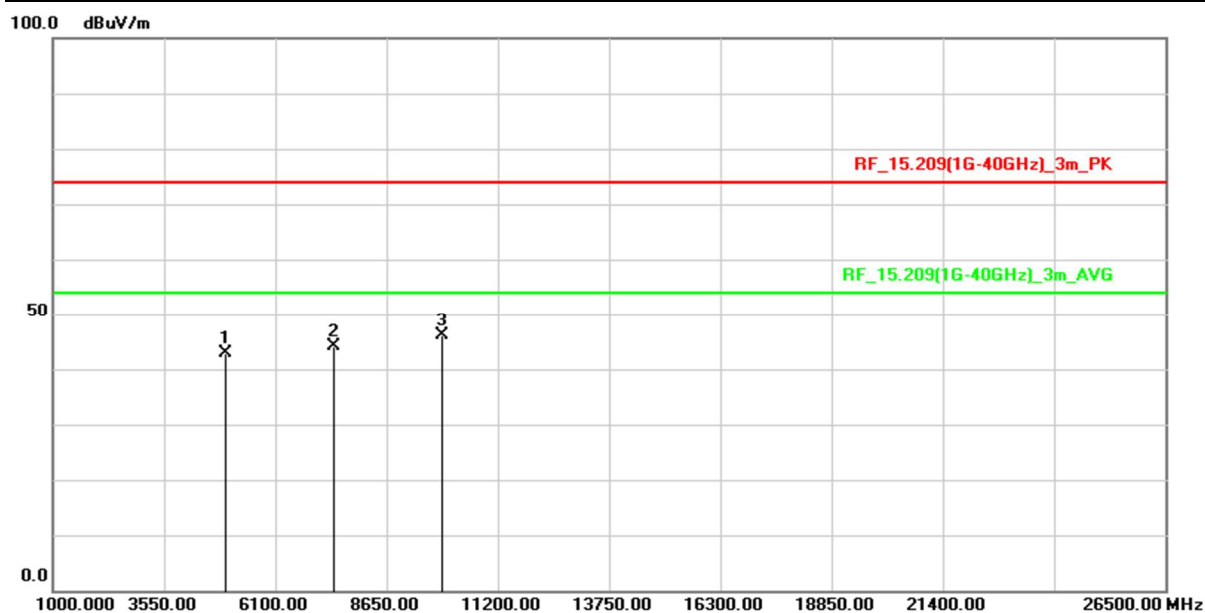


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4960.000	64.75	-20.68	44.07	74.00	-29.93	peak
2	7440.000	57.38	-14.50	42.88	74.00	-31.12	peak
3	9920.000	57.40	-10.88	46.52	74.00	-27.48	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 3 : Transmit BT-EDR(3Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 14 日
Test Channel	CH78 (2480 MHz)	Temperature :	25.2 °C
Polarization :	Vertical	Relative Humidity :	40 %

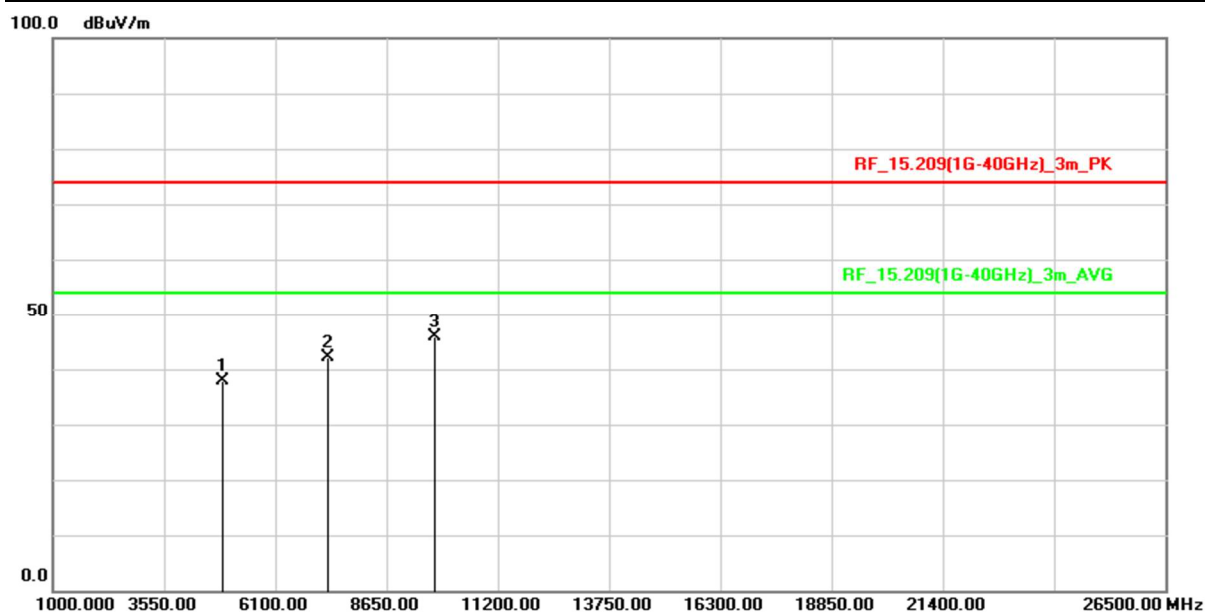


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4960.000	63.65	-20.68	42.97	74.00	-31.03	peak
2	7440.000	58.66	-14.50	44.16	74.00	-29.84	peak
3	9920.000	57.08	-10.88	46.20	74.00	-27.80	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 4 : Receiver BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 14 日
Test Channel	CH39 (2441 MHz)	Temperature :	25.2 °C
Polarization :	Horizontal	Relative Humidity :	40 %

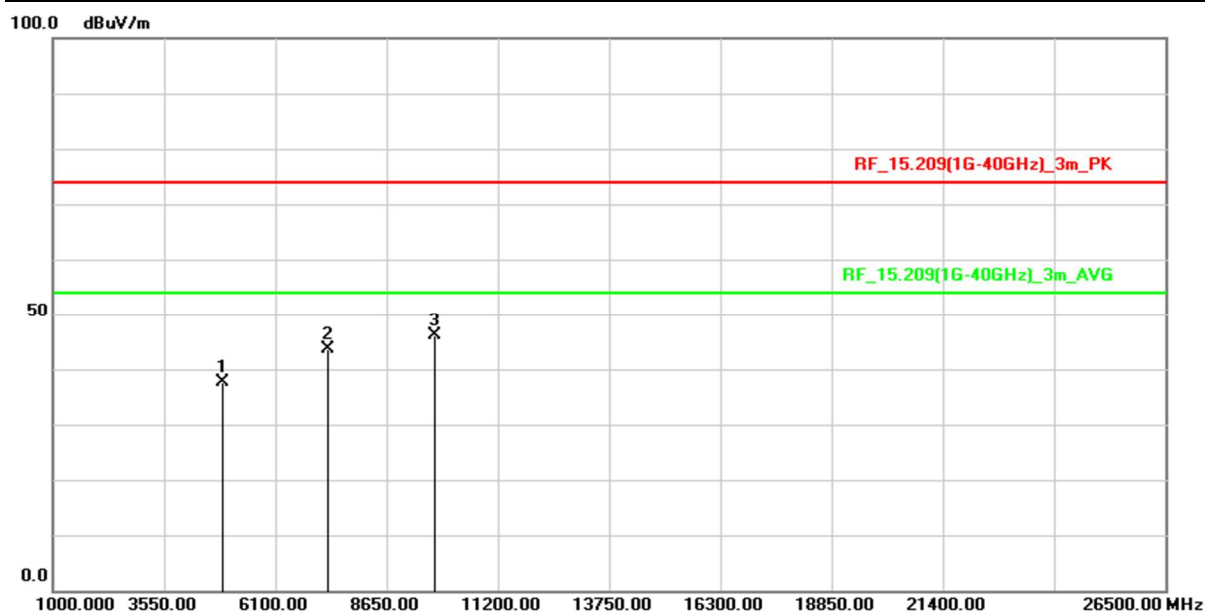


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882.000	58.72	-20.73	37.99	74.00	-36.01	peak
2	7323.000	57.03	-14.94	42.09	74.00	-31.91	peak
3	9764.000	56.67	-10.67	46.00	74.00	-28.00	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 4 : Receiver BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 14 日
Test Channel	CH39 (2441 MHz)	Temperature :	25.2 °C
Polarization :	Vertical	Relative Humidity :	40 %



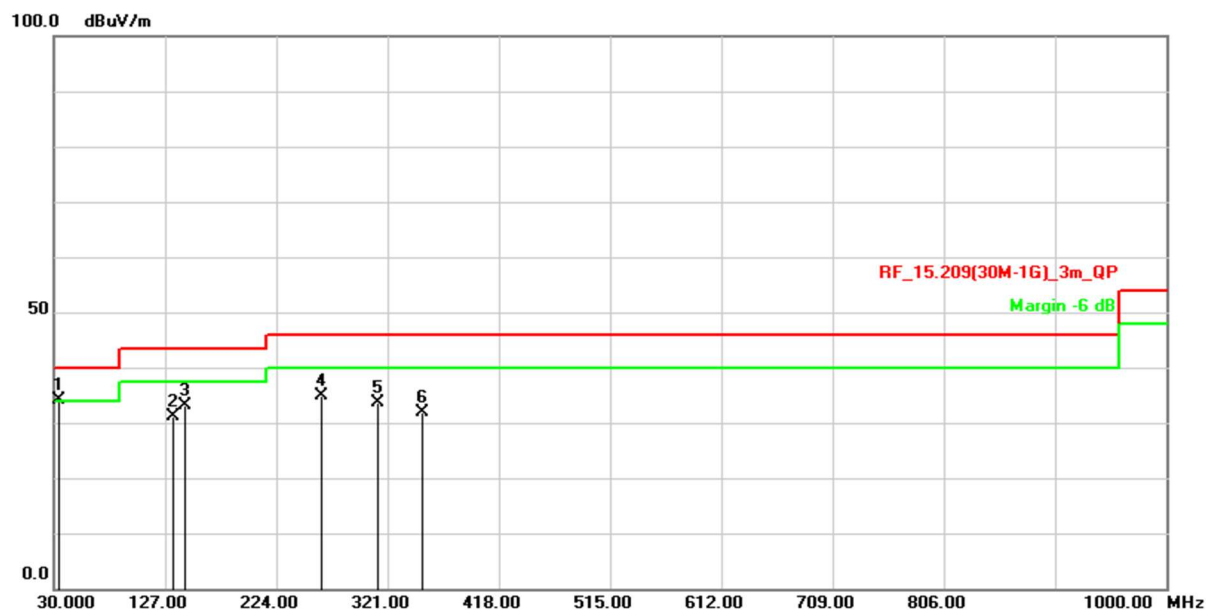
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882.000	58.45	-20.73	37.72	74.00	-36.28	peak
2	7323.000	58.65	-14.94	43.71	74.00	-30.29	peak
3	9764.000	56.72	-10.67	46.05	74.00	-27.95	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Below 1GHz Data

Test Mode :	Mode 1 : Transmit BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH39 (2441 MHz)	Temperature :	25.2 °C
Polarization :	Horizontal	Relative Humidity :	40 %

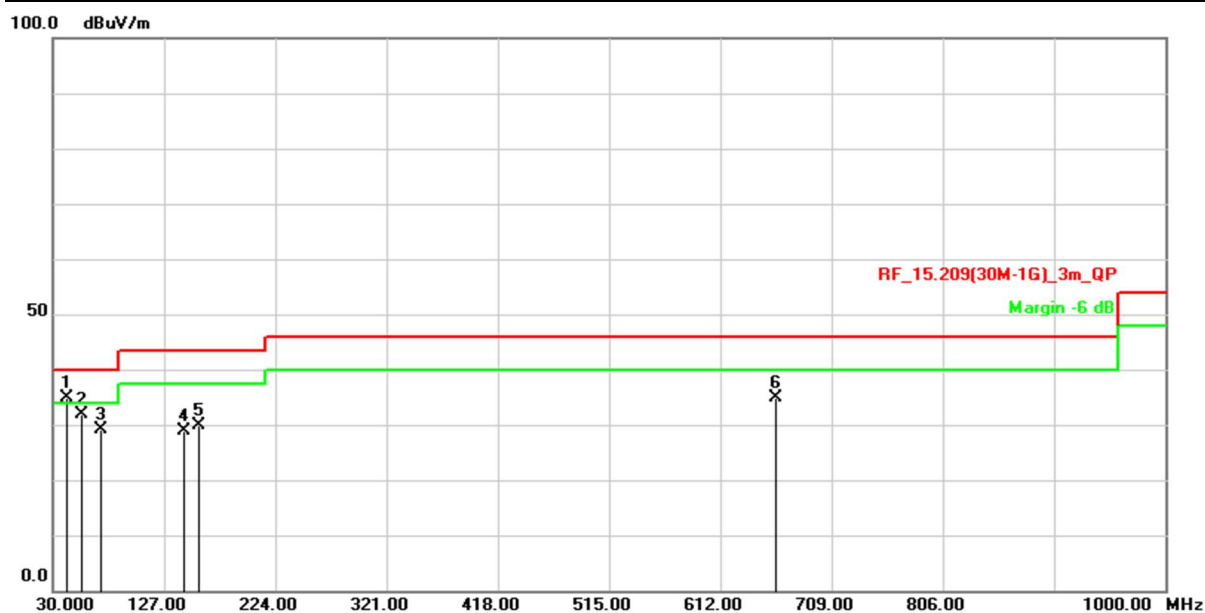


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	34.8500	46.62	-12.46	34.16	40.00	-5.84	QP
2	133.7900	43.32	-12.19	31.13	43.50	-12.37	QP
3	144.4600	44.73	-11.55	33.18	43.50	-10.32	QP
4	263.7700	46.84	-11.92	34.92	46.00	-11.08	QP
5	312.2700	43.63	-10.09	33.54	46.00	-12.46	QP
6	351.0700	41.12	-9.22	31.90	46.00	-14.10	QP

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 1 : Transmit BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH39 (2441 MHz)	Temperature :	25.2 °C
Polarization :	Vertical	Relative Humidity :	40 %

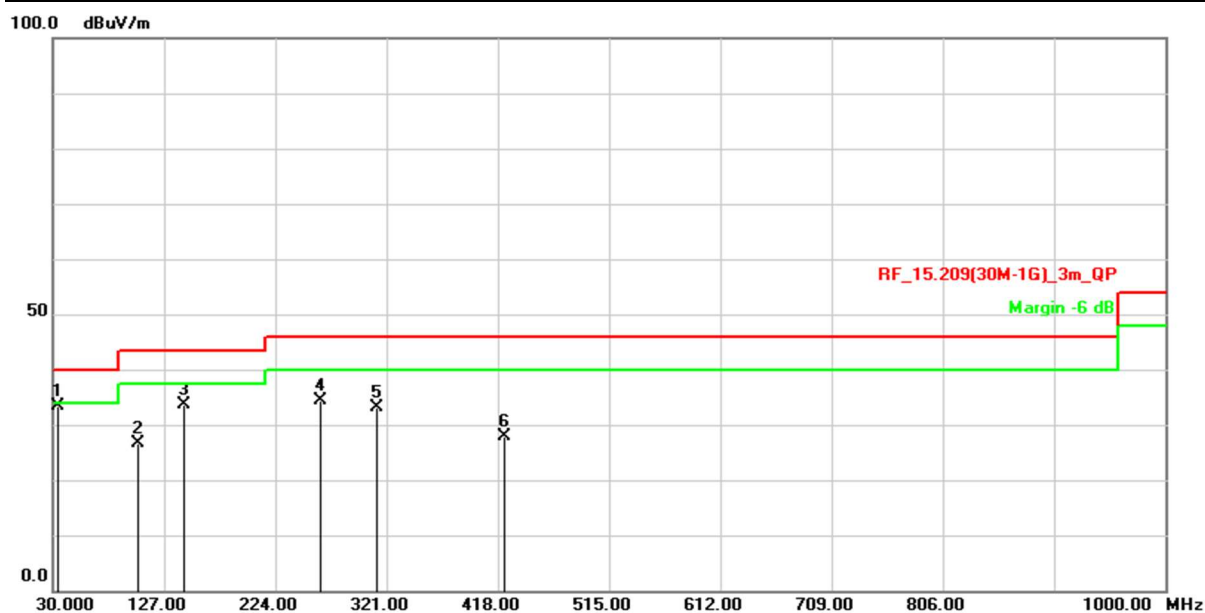


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	41.6400	46.31	-11.53	34.78	40.00	-5.22	QP
2	55.2200	43.47	-11.66	31.81	40.00	-8.19	QP
3	71.7100	42.67	-13.61	29.06	40.00	-10.94	QP
4	144.4600	40.39	-11.55	28.84	43.50	-14.66	QP
5	157.0700	40.90	-11.14	29.76	43.50	-13.74	QP
6	660.5000	36.65	-1.76	34.89	46.00	-11.11	QP

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 4 : Receiver BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH39 (2441 MHz)	Temperature :	25.2 °C
Polarization :	Horizontal	Relative Humidity :	40 %

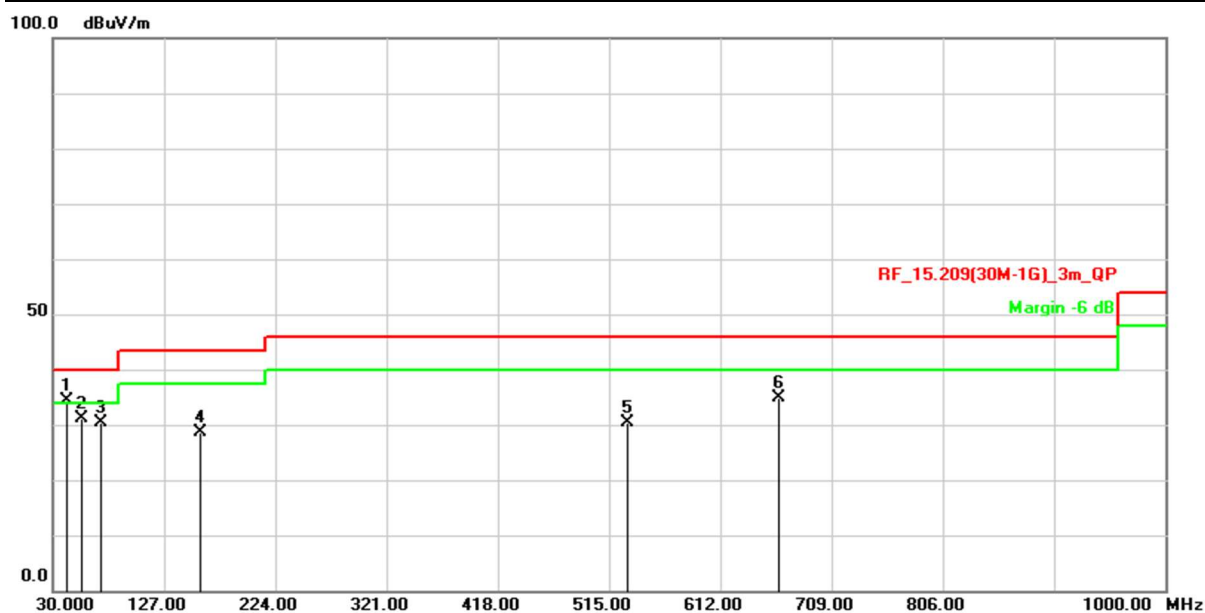


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	33.8800	45.94	-12.60	33.34	40.00	-6.66	QP
2	104.6900	42.05	-15.32	26.73	43.50	-16.77	QP
3	144.4600	45.29	-11.55	33.74	43.50	-9.76	QP
4	263.7700	46.26	-11.92	34.34	46.00	-11.66	QP
5	312.2700	43.29	-10.09	33.20	46.00	-12.80	QP
6	423.8200	34.75	-6.99	27.76	46.00	-18.24	QP

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Mode 4 : Receiver BT-BR(1Mbps) by TX-DM300BD113Y63M Antenna	Test Data :	110 年 12 月 13 日
Test Channel	CH39 (2441 MHz)	Temperature :	25.2 °C
Polarization :	Vertical	Relative Humidity :	40 %



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	41.6400	45.92	-11.53	34.39	40.00	-5.61	QP
2	55.2200	42.77	-11.66	31.11	40.00	-8.89	QP
3	71.7100	43.87	-13.61	30.26	40.00	-9.74	QP
4	158.0400	39.88	-11.23	28.65	43.50	-14.85	QP
5	531.4900	34.96	-4.47	30.49	46.00	-15.51	QP
6	662.4400	36.54	-1.75	34.79	46.00	-11.21	QP

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

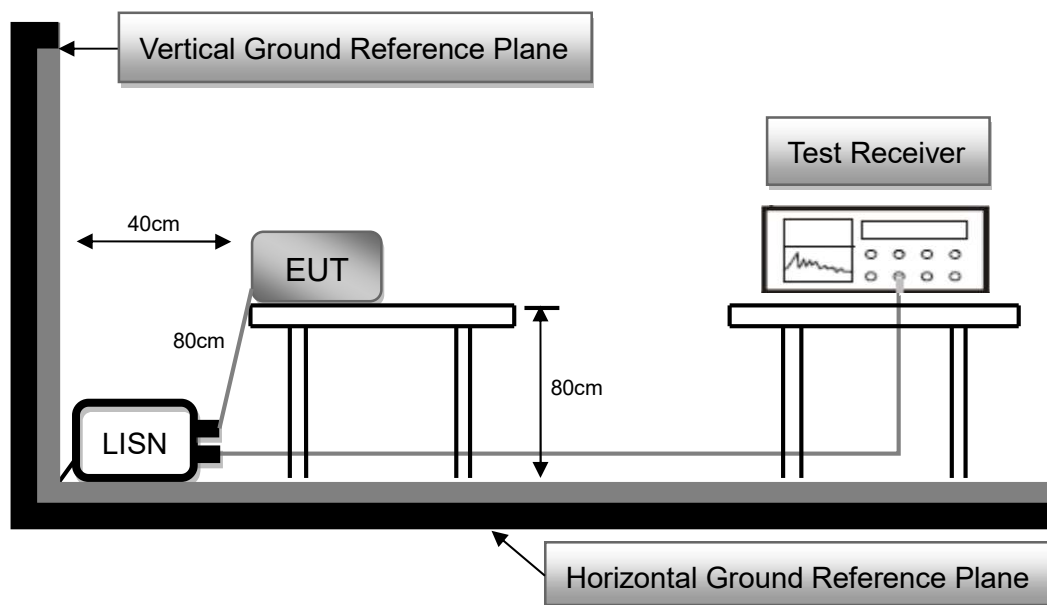
2.9 電源線傳導干擾

2.9.1 限制值

Frequency (MHz)	NCC LP0002 3.3 Limit	
	Quasi-peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.50 to 5.0	56	46
5.0 to 30.0	60	50

*隨頻率之對數遞減

2.9.2 測試架構

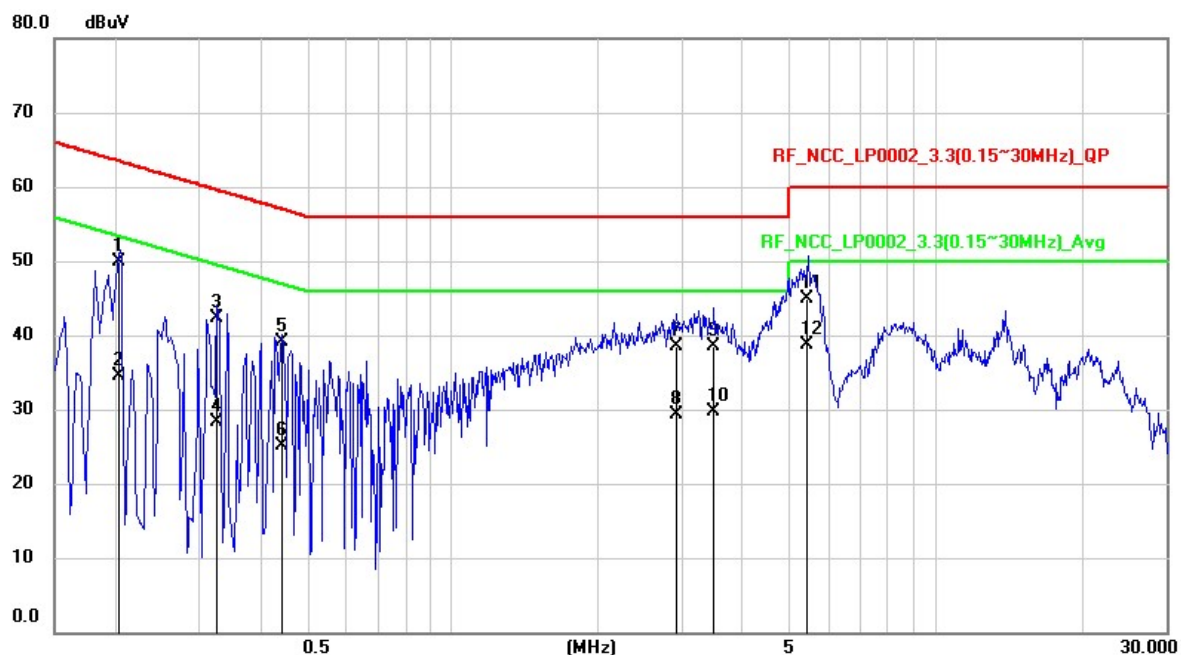


2.9.3 測試流程

1. 待測物從水平地平面放置 0.8 米高的木桌，待測物通過線路阻抗穩定網絡（LISN）連接到電源。 LISN 距離最近的待測物底盤至少 80 厘米。
2. 線路阻抗穩定網絡（LISN）為測量儀器提供 50 歐姆/ 50uH 的耦合阻抗。其他設備均由額外的 LISN 提供動力。
3. 懸掛在離地平面 40 厘米以內的相互關聯的電纜應在中心前後折疊形成一束。所有未連接到外圍設備的 I/O 電纜應在中心捆綁。如果需要，可以使用正確的終端阻抗終止電纜的末端。總長度不得超過 1 米。
4. EMI 測試接收器連接到 LISN 為待測物供電。實際測試配置請參考待測物測試照片。
5. 接收器在 150kHz 至 30MHz 範圍內掃描每種測試模式的發射。掃描兩條電源線，Line 和 Neutral，記錄至少六個最高排放。
6. 記錄上述最高排放水平的待測物和電纜配置。記錄了最差情況的測試數據。

2.9.4 測試結果

Test Voltage :	110Vac, 60Hz	Frequency Range:	0.15-30 MHz
Test Mode :	Mode 1 : Transmit	6dB Bandwidth :	9 kHz
Test Data :	110年12月23日	Phase :	L
Temperature :	26°C	Humidity :	38 %

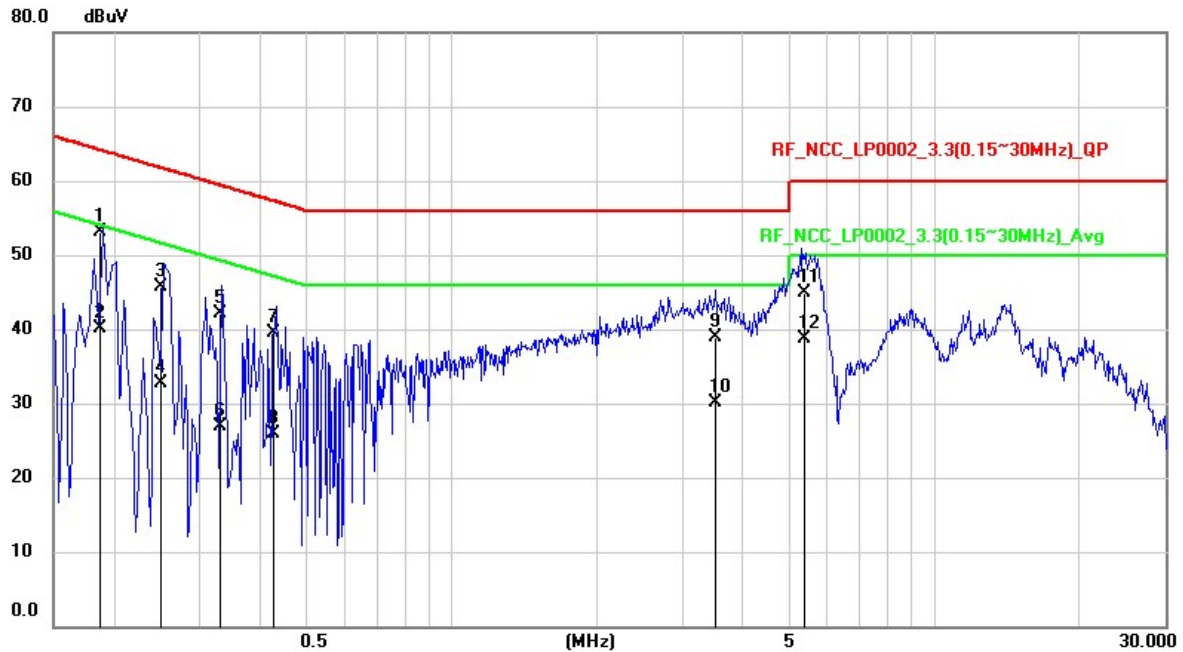


No.	Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2033	40.1	9.81	49.91	63.47	-13.56	QP
2	0.2033	24.61	9.81	34.42	53.47	-19.05	AVG
3	0.3243	32.58	9.81	42.39	59.6	-17.21	QP
4	0.3243	18.48	9.81	28.29	49.6	-21.31	AVG
5	0.4427	29.34	9.81	39.15	57.01	-17.86	QP
6	0.4427	15.3	9.81	25.11	47.01	-21.9	AVG
7	2.9169	28.56	9.92	38.48	56	-17.52	QP
8	2.9169	19.47	9.92	29.39	46	-16.61	AVG
9	3.499	28.49	9.93	38.42	56	-17.58	QP
10	3.499	19.73	9.93	29.66	46	-16.34	AVG
11	5.4249	34.97	9.99	44.96	60	-15.04	QP
12	5.4249	28.65	9.99	38.64	50	-11.36	AVG

Remark:

1. QP = Quasi Peak, AVG = Average
2. Correction Factor = Insertion loss of LISN + Cable loss
3. Measurement Value = Reading Level + Correct Factor
4. Margin Level = Measurement Value – Limit Value

Test Voltage :	110Vac, 60Hz	Frequency Range:	0.15-30 MHz
Test Mode :	Mode 1 : Transmit	6dB Bandwidth :	9 kHz
Test Data :	110年12月23日	Phase :	N
Temperature :	26°C	Humidity :	38 %



No.	Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1865	43.21	9.83	53.04	64.19	-11.15	QP
2	0.1865	30.37	9.83	40.2	54.19	-13.99	AVG
3	0.2506	35.85	9.83	45.68	61.74	-16.06	QP
4	0.2506	22.86	9.83	32.69	51.74	-19.05	AVG
5	0.3313	32.24	9.82	42.06	59.42	-17.36	QP
6	0.3313	17.03	9.82	26.85	49.42	-22.57	AVG
7	0.4293	29.72	9.81	39.53	57.27	-17.74	QP
8	0.4293	16.05	9.81	25.86	47.27	-21.41	AVG
9	3.5141	28.88	9.94	38.82	56	-17.18	QP
10	3.5141	20.23	9.94	30.17	46	-15.83	AVG
11	5.3586	34.9	9.99	44.89	60	-15.11	QP
12	5.3586	28.64	9.99	38.63	50	-11.37	AVG

Remark:

1. QP = Quasi Peak, AVG = Average
2. Correction Factor = Insertion loss of LISN + Cable loss
3. Measurement Value = Reading Level + Correct Factor
4. Margin Level = Measurement Value – Limit Value

2.10 電波暴露量之評估

2.10.1 限制值

依據低功率射頻器材技術規範第 6.20.2 章節要求:

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

(1) 職業性/可控制之暴露

頻率範圍 (MHz)	電場強度 (V/m)	磁場強度 (A/m)	功率密度 (mW/cm ²)	平均時間 (minutes)
0.3-3.0	614	1.63	*100	6
3-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5.0	6

註 1：標記*表平面波等效功率密度。

註 2：f 表測試頻率，單位：百萬赫(MHz)。

(2) 一般人/不可控制之暴露

頻率範圍 (MHz)	電場強度 (V/m)	磁場強度 (A/m)	功率密度 (mW/cm ²)	平均時間 (minutes)
0.3-3.0	614	1.63	*100	30
3-30	1842/f	4.89/f	*180/f ²	30
30-300	27.5	0.073	1.0	30
300-1,500	--	--	f/1500	30
1,500-100,000	--	--	1.0	30

註 1：標記*表平面波等效功率密度。

註 2：f 表測試頻率，單位：百萬赫(MHz)。

Estimation of the expected exposure in power density can be made with the following equation:

$$S = \frac{P \times G}{4\pi \times R^2} = \frac{\text{EIRP}}{4\pi \times R^2}$$

S: power density

P: power input to the antenna

G: power gain of the antenna in the direction of interest relative to an isotropic radiator.

R: distance to the center of radiation of the antenna.

EIRP: Effective Isotropic Radiated Power

2.10.2 測試結果

Mode	Max. Power (E.I.R.P)		Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
	dBm	mW				
BT	19.84	96.38	20	0.01917	1	Pass
LE	19.46	88.31	20	0.01757	1	Pass
WLAN 2.4G	22.57	180.72	20	0.03595	1	Pass
WLAN 5G	21.86	153.46	20	0.03053	1	Pass

Note:

- * Each Function of the max power which perform MPE of any configurations.
- * The WLAN 2.4G、WLAN 5G、BT and LE cannot be transmitted at the same time.
- * The frequency (range) used by the radio frequency function is 1.5GHz~100GHz, the RF field strength limits is e.i.r.p. less than or equal to 1mW/cm².
- * The limit is equal to the minimum value.
- * The Max total MPE = WLAN 2.4G = 0.03595 (mW/cm²)

--- END ---