

## 低功率射頻器材測試報告

報告編號:

RTBHKO-WTW-P21090237-3

申請者

Neatframe Limited

產品名稱

Neat Bar Pro

型號

NF-D1

製造廠商

Neatframe Limited

商標或廠牌

neat.

該產品樣品試驗

國家通訊傳播委員會低功率射頻器材技術規範

依據之試驗標準

109 年 7 月 1 日訂定

試驗結果

符合

香港商立德國際商品試驗有限公司桃園分公司新竹實驗室

日期 110 年 11 月 30 日

報告簽署人簽章:

陳瓊美



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## 報告發行紀錄

| Issue No.              | Description       | Date Issued     |
|------------------------|-------------------|-----------------|
| RTBHKO-WTW-P21090237-3 | Original release. | 110 年 11 月 30 日 |

# 證 明 書

產 品 名 稱： Neat Bar Pro  
商 標： neat.  
型 號： NF-D1  
申 請 者： Neatframe Limited  
量 測 規 範： 低功率射頻器材技術規範 LP0002 (訂定日期：109 年 7 月 1 日)  
ANSI C63.10-2013

香港商立德國際商品試驗有限公司桃園分公司在此證明上述待測設備樣品(型號：NF-D1)，收件日期110年9月8日，於110年10月21日至11月1日，已在本公司的標準測試場地完成量測。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。

立德桃園分公司依“低功率射頻器材技術規範”及“電信管制射頻器材審驗管理辦法”製作測試結果報告。

特 此 證 明 ！

報告製作者： 黃健琳，日期： 110年11月30日  
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審 核 者： 陳瓊美，日期： 110年11月30日  
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香港商立德國際商品試驗有限公司桃園分公司

實驗室地址：300 新竹市科學工業園區力行一路1號E-2

此份報告不得摘錄複製，除全份複製外，需經實驗室書面同意。



## 1 低功率射頻器材量測記錄表

申請廠商： Neatframe Limited

製造廠商： Neatframe Limited

申請廠商地址： The Charter Building, Charter Place, Uxbridge, UB8 1JG, United Kingdom

廠牌： neat.

產品名稱： Neat Bar Pro

型號： NF-D1

量測單位名稱： 香港商立德國際商品試驗有限公司桃園分公司 新竹實驗室

量測單位地址： 300 新竹市科學工業園區力行一路 1 號 E-2

量測單位認可編號： TAF 2022

量測規範： 低功率射頻器材技術規範 LP0002 (訂定日期：109 年 7 月 1 日)

| 項次 | 量測項目      | 規 範                                                  | 量測結果判定 |
|----|-----------|------------------------------------------------------|--------|
| 1  | 場強輻射      | 低功率射頻器材技術規範 4.10.2.2 節, 4.10.2.4 節及 4.10.2.5 節       | 符合     |
| 2  | 開放頻帶邊緣之發射 | 低功率射頻器材技術規範 4.10.2.2 節, 4.10.2.4 節 4.10.2.5 節及 3.6 節 | 符合     |
| 3  | 電源線傳導干擾   | 低功率射頻器材技術規範 3.3 節                                    | 符合     |
| 4  | 天線        | 低功率射頻器材技術規範 3.2 節                                    | 符合     |

### 最大暴露允許值(Maximum Permissible Exposure, MPE)

| 項次 | 量測項目  | 規 範                  | 量測結果判定 |
|----|-------|----------------------|--------|
| 1  | 電波暴露量 | 低功率射頻器材技術規範 6.20.2 節 | 符合 (註) |

註： 電波暴露量值，請參照BV編號：RTBHKO-WTW-P21090237。

備註：量測結果之判定不考慮量測不確定度的貢獻。

## 2 一般敘述

### 2.1 待測設備

|        |                                                                                                                        |
|--------|------------------------------------------------------------------------------------------------------------------------|
| 產品名稱：  | Neat Bar Pro                                                                                                           |
| 型號：    | NF-D1                                                                                                                  |
| 測試軟體：  | Dalmore_24GHz Radar.bat (V1.1)                                                                                         |
| 額定電源：  | AC I/P: 100-240V, 50/60Hz, 1.2A                                                                                        |
| 調變方式：  | CW                                                                                                                     |
| 工作頻率：  | 24~24.25 GHz                                                                                                           |
| 電場強度：  | 106.7 dBuV/m (Average) at 3m                                                                                           |
| 天線種類：  | 見註                                                                                                                     |
| 電源線類別： | Non-shielded AC 2-Pin cable (3.0m) <蘇州力安捷連接技術有限公司/<br>LPC-ULC7-3000 or LPC-TWC7-3000>                                  |
| 信號線類別： | Shielded HDMI cable (2.0m) <蘇州力安捷連接技術有限公司 / LYNEA-HDM201><br>Shielded LAN cable (3.0m) <蘇州力安捷連接技術有限公司 / LRJ-8P8C-3000> |
| 配件：    | Neat pad <Brand: Neat / Model: A1 or A1C > (型號差異僅為銷售區分)                                                                |

註：

1. 此裝置為 Neat Bar Pro，其發射頻率落於 24 至 24.25GHz，本測報測試頻道的中心頻率與功率設定詳列如下：

| 對應頻率 (GHz) | Power Setting |
|------------|---------------|
| 24.06652   | Default       |

2. 此待測設備搭配測試的天線，其資料如下：

| Brand                                 | Model    | Antenna Net Gain (dBi) | Frequency Range (GHz) | Antenna Type                          | Connector Type |
|---------------------------------------|----------|------------------------|-----------------------|---------------------------------------|----------------|
| <b>RICHGREEN TEK</b><br>Incorporation | R1124GFZ | 10                     | 24~24.25              | Microstrip antenna<br>(antenna array) | None           |

3. 上述天線的規格資訊由申請者聲明，實驗室不承擔任何責任。

4. 此待測設備同時具有以下技術，且不會在同一時間發射，詳列如下：

| Radio 1              | Radio 2   | Radio 3     |
|----------------------|-----------|-------------|
| WLAN (2.4GHz + 5GHz) | Bluetooth | 24GHz Radar |

5. 此報告中，經過評估後以下列測試模式並同時搭配 HDMI 正常使用模式進行最終量測。

6. 其他詳細之規格請參考使用說明書，產品的照片請參照 BV 編號: BHKO-WTW-P21090237。

## 2.2 輔助測試之週邊設備描述

待測設備於受測時均接上其所屬的配件或一般用途之相關設備；下列輔助設備或配件測試中所使用的配備，以形成一個代表待測物實際運作的受測系統。

| ID | Product | Brand     | Model No.      | Serial No.   | FCC ID | Remarks         |
|----|---------|-----------|----------------|--------------|--------|-----------------|
| A  | Monitor | ASUS      | VA24EHE        | L3LMTF088915 | NA     | Provided by Lab |
| B  | Monitor | ViewSonic | VX2457-mhd     | UG01913A2522 | NA     | Provided by Lab |
| C  | Monitor | NEOKA     | 24NS50         | NA           | NA     | Provided by Lab |
| D  | Laptop  | Lenovo    | 20U5S01X00 L14 | PF-1ANPYA    | N/A    | Provided by Lab |
| E  | Router  | ASUS      | RT-N12+        | NA           | NA     | Provided by Lab |

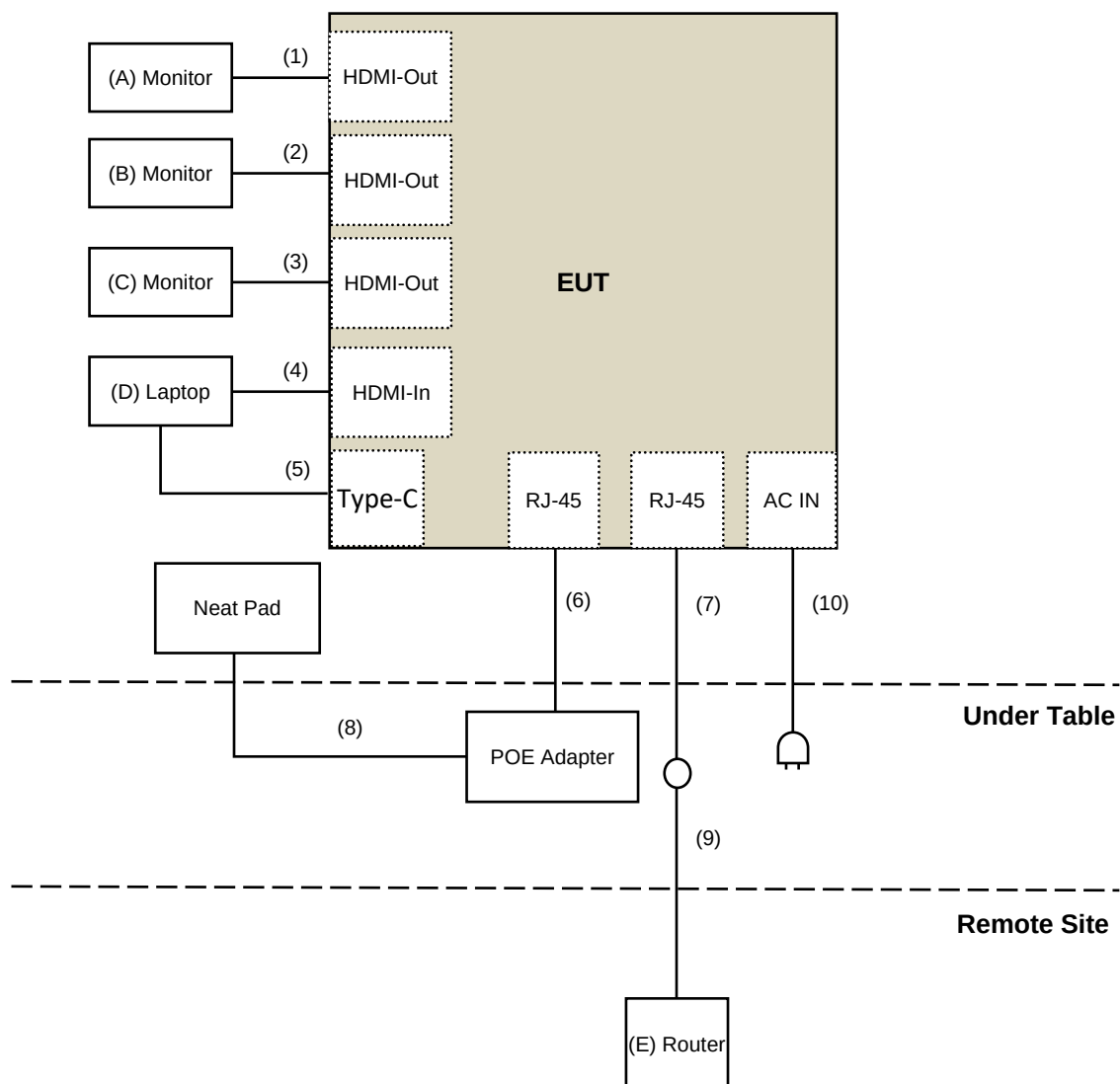
Note:

- All power cords of the above support units are non-shielded (1.8m).

| ID | Descriptions     | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks                                                                 |
|----|------------------|------|------------|--------------------|--------------|-------------------------------------------------------------------------|
| 1  | HDMI Cable       | 1    | 1.5        | Yes                | 0            | Supplied by applicant<br>(Brand: CHANGJIANG / Model: 20276)             |
| 2  | HDMI Cable       | 1    | 1.5        | Yes                | 0            | Supplied by applicant<br>(Brand: CHANGJIANG / Model: 20276)             |
| 3  | HDMI Cable       | 1    | 1.5        | Yes                | 0            | Supplied by applicant<br>(Brand: CHANGJIANG / Model: 20276)             |
| 4  | HDMI Cable       | 1    | 2          | Yes                | 0            | Supplied by applicant<br>(Brand: 蘇州力安捷連接技術有限公司 / Model: LYNEA-HDM201)   |
| 5  | USB Type C Cable | 1    | 1.7        | Yes                | 0            | Supplied by applicant<br>(Brand: TCW / Model: UC2100)                   |
| 6  | RJ-45 Cable      | 1    | 3          | Yes                | 0            | Supplied by applicant<br>(Brand: 蘇州力安捷連接技術有限公司 / Model: LRJ-8P8C-3000>) |
| 7  | RJ-45 Cable      | 1    | 3          | Yes                | 0            | Supplied by applicant<br>(Brand: 蘇州力安捷連接技術有限公司 / Model: LRJ-8P8C-3000>) |
| 8  | RJ-45 Cable      | 1    | 3          | Yes                | 0            | Supplied by applicant<br>(Brand: 蘇州力安捷連接技術有限公司 / Model: LRJ-8P8C-3000>) |
| 9  | RJ-45 Cable      | 1    | 10         | No                 | 0            | Provided by Lab<br>(Brand: Tatung / Model: E210587)                     |
| 10 | AC Cable         | 1    | 3          | No                 | 0            | Supplied by applicant<br>(Brand: 蘇州力安捷連接技術有限公司 / Model: LPC-ULC7-3000>) |

註：本案器材以申請者切結提供的隨貨配件，及實驗室提供的測試配件併同檢測。

## 2.3 測試架構圖



### 3 適用規範

#### 3.1 規範要求

##### (1) 傳導之規定

依據國家通訊傳播委員會低功率射頻器材技術規範之 3.3 節，電源傳導干擾之限制要求如下：

| 頻率(MHz)  | 傳導限制值 (dBuV)    |              |
|----------|-----------------|--------------|
|          | 準峰值(Quasi-peak) | 平均值(Average) |
| 0.15-0.5 | 66-56(註)        | 56-46(註)     |
| 0.5-5    | 56              | 46           |
| 5-30     | 60              | 50           |

(註)：隨頻率之對數遞減。

##### (2) 輻射之規定

依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.2.2 節

主波與諧波發射：除 4.10.2.3 外，發射之電場強度應小於或等於下表限制值。

| 主波頻率(兆赫)      | 主波電場強度(毫伏/公尺) | 諧波電場強度(微伏/公尺) |
|---------------|---------------|---------------|
| 2400 - 2483.5 | 50            | 500           |
| 5725 - 5875   | 50            | 500           |
| 24000 - 24250 | 250           | 2500          |

依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.2.3 節

固定式點對點操作(Fixed, point-to-point operation)之器材操作於 24.05 GHz～ 24.25 GHz，應符合下列限制：

1. 主波發射：距器材 3 公尺處之主波電場強度應小於或等於 2500 mV/m。
2. 頻率容許差度：應維持在主波頻率之 0.001% 以內。在正常供應電壓下，溫度在 -20 °C ~ 50 °C 間變化；及在 20 °C 下，供應電壓在額定值之 15% 內變化時。以電池作業者，應以新電池測試，並須符合 5.18 之要求。
3. 天線增益與主波瓣寬度(main lobe beamwidth)：天線增益應 33 dBi 以上，或主波瓣寬度應小於或等於 3.5 度(degree)。主波瓣寬度的方位角與俯仰角面(elevation plane) 皆須符合限制值。

註：固定式點對點操作(Fixed, point-to-point operation)係指一個固定傳送器傳輸資訊給遠端一個固定接收器。固定式點對點操作，不包括點對多點(point-to-multipoint)系統、全方向性應用(omnidirectional applications) 及多台共站(multiple co-located)發射機傳送相同資訊。

依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.2.4 節

除諧波外，指定頻帶外之發射應比主波低 50 dB 以上或依 3.6 之發射限制，兩者取其較鬆者。

依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.2.5 節

電場強度指距器材 3 公尺處所測量之值，且以平均值檢波器測量，同時須符合 6.15.2 之峰值規定。點對點操作之器材沿天線方位角之峰值電場強度應小於或等於 2500 mV/m。

第 3.6 節之發射限制：

| 頻率(MHz)                   | 電場強度(微伏特/公尺, uV/m)     | 測距(公尺) |
|---------------------------|------------------------|--------|
| $0.009 \leq f \leq 0.490$ | $2,400/f(\text{kHz})$  | 300    |
| $0.490 < f \leq 1.705$    | $24,000/f(\text{kHz})$ | 30     |
| $1.705 < f < 30$          | 30                     | 30     |
| $30 \leq f \leq 88$       | 100                    | 3      |
| $88 < f \leq 216$         | 150                    | 3      |
| $216 < f \leq 960$        | 200                    | 3      |
| $960 < f$                 | 500                    | 3      |

### (3) 天線之規定

低功率射頻器材之發射機或收發信機所使用之天線，除本規範章節中另有規定外，應為全固定、半固定式或以獨特之耦合（unique coupling）方式連接機體。製造者可設計供使用者因損壞而替換之天線，但不得設計或使用原認證以外之天線或可供引接各類電纜之標準天線插座或電氣連接頭，如：BNC、F type、N type、M type、UG type、RCA、SMA、SMB...等及其他各類工業或通訊標準接頭。

## 3.2 限制使用之頻帶

任何低功率射頻器材之主波皆不得使用下表所列各頻帶內之頻率。

| 頻率(兆赫)        | 頻率(兆赫)        | 頻率(兆赫)        |
|---------------|---------------|---------------|
| 0.090~0.110   | 240.00~285.00 | 3332.0~3339.0 |
| 0.490~0.510   | 322.00~335.40 | 3345.8~3358.0 |
| 2.172~2.198   | 399.90~410.00 | 3500.0~4400.0 |
| 3.013~3.033   | 485.00~510.00 | 4500.0~5250.0 |
| 4.115~4.198   | 608.00~614.00 | 5350.0~5460.0 |
| 5.670~5.690   | 703.00~748.00 | 7250.0~7750.0 |
| 6.200~6.300   | 758.00~803.00 | 8025.0~8500.0 |
| 8.230~8.400   | 825.00~915.00 | 9000.0~9200.0 |
| 12.265~12.600 | 930.00~1240.0 | 9300.0~9500.0 |
| 13.340~13.430 | 1300.0~1427.0 | 10600~12700   |
| 14.965~15.020 | 1435.0~1626.5 | 13250~13400   |
| 16.700~16.755 | 1660.0~1785.0 | 14470~14500   |
| 19.965~20.020 | 1805.0~1880.0 | 15350~16200   |
| 25.500~25.700 | 1885.0~1900.0 | 17700~21400   |
| 37.475~38.275 | 1905.0~1985.0 | 22010~23120   |
| 73.500~75.400 | 2010.0~2025.0 | 23600~24000   |
| 108.00~138.00 | 2110.0~2170.0 | 31200~31800   |
| 149.90~150.05 | 2200.0~2300.0 | 36430~36500   |
| 156.70~156.90 | 2310.0~2390.0 | 38600 以上      |
| 162.01~167.17 | 2483.5~2900.0 |               |
| 167.72~173.20 | 3260.0~3267.0 |               |

## 4 場強輻射及開放頻帶邊緣之量測

### 4.1 適用標準

請見本報告 3.1 節第(2)項的規定。

### 4.2 量測方法

#### < Frequency Range below 1GHz >

將待測物置於 0.8 米高的非金屬桌面，使其操作在工作狀態。接收天線置於 3 米距離。桌面要 360 度旋轉，另外接收天線從離地 1 米至 4 米升降變化，以找出最大的輻射電場強度，接收天線分別置於水平、垂直極化各執行測試一次。

#### < Frequency Range 1GHz ~ 40GHz >

將待測物置於 1.5 米高的非金屬桌面，使其操作在工作狀態。接收天線置於 3 米距離。桌面要 360 度旋轉，另外接收天線從離地 1 米至 4 米升降變化，以找出最大的輻射電場強度，接收天線分別置於水平、垂直極化各執行測試一次。

#### < Frequency Range 40GHz ~ 100GHz >

將待測物置於 1.5 米高的非金屬桌面，使其操作在工作狀態。接收天線置於適當量測距離。桌面要 360 度旋轉，另外接收天線從離地 1 米至 4 米升降變化，以找出最大的輻射電場強度，接收天線分別置於水平、垂直極化各執行測試一次。

#### 4.3 量測儀器

##### For below 40GHz test:

| Description & Manufacturer                          | Model No.            | Serial No.  | Calibrated Date | Calibrated Until |
|-----------------------------------------------------|----------------------|-------------|-----------------|------------------|
| Test Receiver<br>R&S                                | ESR3                 | 102528      | 2021/3/2        | 2022/3/1         |
| Spectrum Analyzer<br>KEYSIGHT                       | N9030B               | MY57141948  | 2021/5/21       | 2022/5/20        |
| Software                                            | ADT_Radiated_V8.7.08 | NA          | NA              | NA               |
| Boresight Antenna Tower &<br>Turn Table<br>Max-Full | MF-7802BS            | MF780208530 | NA              | NA               |
| Pre_Amplifier<br>EMCI                               | EMC001340            | 980142      | 2021/5/24       | 2022/5/23        |
| LOOP ANTENNA<br>Electro-Metrics                     | EM-6879              | 264         | 2021/3/5        | 2022/3/4         |
| RF Coaxial Cable<br>JYEBO                           | 5D-FB                | LOOPCAB-001 | 2021/1/7        | 2022/1/6         |
| RF Coaxial Cable<br>JYEBO                           | 5D-FB                | LOOPCAB-002 | 2021/1/7        | 2022/1/6         |
| Pre_Amplifier<br>EMCI                               | EMC330N              | 980538      | 2021/4/26       | 2022/4/25        |
| Bilog Antenna<br>Schwarzbeck                        | VULB 9168            | 9168-0842   | 2020/11/3       | 2021/11/2        |
| RF Coaxial Cable<br>COMMATE/PEWC                    | 8D                   | 966-5-1     | 2021/4/26       | 2022/4/25        |
| RF Coaxial Cable<br>COMMATE/PEWC                    | 8D                   | 966-5-2     | 2021/4/26       | 2022/4/25        |
| RF Coaxial Cable<br>COMMATE/PEWC                    | 8D                   | 966-5-3     | 2021/4/26       | 2022/4/25        |
| Fixed attenuator<br>Mini-Circuits                   | UNAT-5+              | PAD-ATT5-02 | 2021/1/11       | 2022/1/10        |
| Broad-Band Horn Antenna<br>Schwarzbeck              | BBHA 9120D           | 9120D-1819  | 2020/11/22      | 2021/11/21       |
| Pre_Amplifier<br>EMCI                               | EMC12630SE           | 980509      | 2021/4/26       | 2022/4/25        |
| RF Coaxial Cable<br>EMCI                            | EMC104-SM-SM-1500    | 180503      | 2021/4/26       | 2022/4/25        |
| RF Coaxial Cable<br>EMCI                            | EMC104-SM-SM-2000    | 180501      | 2021/4/26       | 2022/4/25        |
| RF Coaxial Cable<br>EMCI                            | EMC104-SM-SM-6000    | 180506      | 2021/4/26       | 2022/4/25        |
| Pre_Amplifier<br>EMCI                               | EMC184045SE          | 980387      | 2021/1/11       | 2022/1/10        |
| Horn Antenna<br>Schwarzbeck                         | BBHA 9170            | BBHA9170519 | 2020/11/22      | 2021/11/21       |
| RF Cable-Frequency range:<br>1-40GHz<br>EMCI        | EMC102-KM-KM-1200    | 160924      | 2021/1/11       | 2022/1/10        |
| RF cable (40GHz)<br>EMCI                            | EMC-KM-KM-4000       | 200214      | 2021/3/10       | 2022/3/9         |

- Note: 1. The test was performed in 966 Chamber No. 3.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

| Measurement        | Frequency     | Uncertainty |
|--------------------|---------------|-------------|
| Radiated emissions | 9kHz ~ 30MHz  | 3.1 dB      |
|                    | 30MHz ~ 1GHz  | 5.1 dB      |
|                    | 1GHz ~ 18GHz  | 5.1 dB      |
|                    | 18GHz ~ 40GHz | 5.3 dB      |

**For above 40GHz test:**

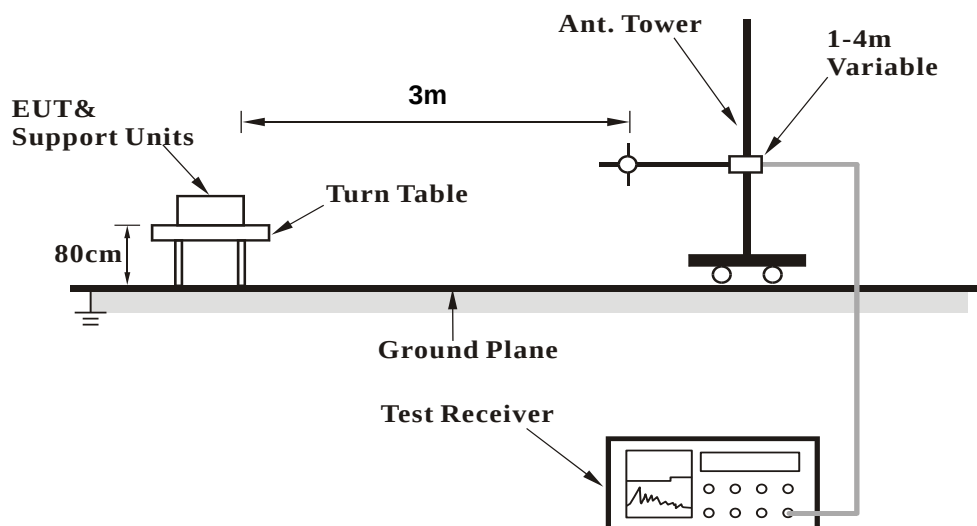
| Description & Manufacturer                                                                 | Model No.                      | Serial No.  | Calibrated Date | Calibrated Until |
|--------------------------------------------------------------------------------------------|--------------------------------|-------------|-----------------|------------------|
| Spectrum Analyzer<br>Keysight                                                              | N9030A                         | MY55330160  | 2021/2/5        | 2022/2/4         |
| Zero-Bias Detector<br>Vdi                                                                  | WR15ZBD                        | WR15R5 1-30 | CoC             | CoC              |
| 4CH Infiniivision Oscilloscope<br>Keysight                                                 | DSOX6004A                      | MY55190202  | 2021/6/28       | 2022/6/27        |
| OXE89 Horn Antenna<br>QuinStar                                                             | QWH-UCRR00                     | 924200002   | 2020/1/20       | 2022/1/19        |
| 50G~75G Conical Horn Antenna<br>Keysight                                                   | WR15CH-Conical Horn<br>Antenna | WR15CH_001  | 2020/1/20       | 2022/1/19        |
| 75G~110G Conical Horn<br>Antenna<br>Keysight                                               | WR10CH-Conical Horn<br>Antenna | WR10CH_001  | 2020/1/20       | 2022/1/19        |
| N9029AV15-DC9 - 50-75 GHz<br>VDI Standard Downconverter<br>with 9VDC supply<br>Keysight    | SA Extension WR15              | SAX 381     | CoC             | CoC              |
| N9029AV10-DC9 - 75-110 GHz<br>VDI Standard Downconverter<br>with 9VDC supply<br>Keysight   | SA Extension WR10              | SAX 378     | CoC             | CoC              |
| Millimeter-Wave Signal<br>Generator Frequency Extension<br>Module (50~75 GHz)<br>Keysight  | E8257DV15                      | SGX 050     | CoC             | CoC              |
| Millimeter-Wave Signal<br>Generator Frequency Extension<br>Module (75~110 GHz)<br>Keysight | E8257DV10                      | SGX 069     | CoC             | CoC              |
| PSG analog signal generator<br>(from 250 kHz to 50 GHz)<br>Keysight                        | E8257D                         | MY53401987  | 2021/6/18       | 2022/6/17        |
| Power Meter<br>VDI                                                                         | PM5                            | 431V        | 2019/12/9       | 2021/12/8        |
| Boresight Antenna Tower & Turn<br>Table<br>Max-Full                                        | MF-7802BS                      | MF780208530 | NA              | NA               |
| Antenna Tower & Turn Table<br>CT                                                           | NA                             | NA          | NA              | NA               |

- Note: 1. The test was performed in 966 Chamber No. 6.  
 2. The calibrations are traceable to NML/ROC and NIST/USA.  
 3. Certificate of Conformance (CoC) which is issued by manufacturer states that the product meets the specification.  
 4. The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

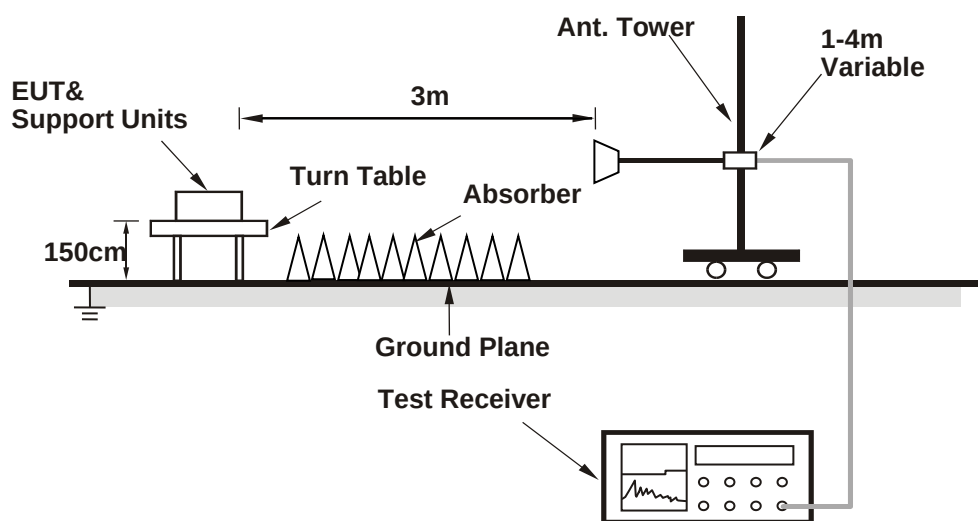
| Measurement        | Frequency      | Uncertainty |
|--------------------|----------------|-------------|
| Radiated emissions | 40GHz ~ 231GHz | 5.4 dB      |

#### 4.4 測試配置

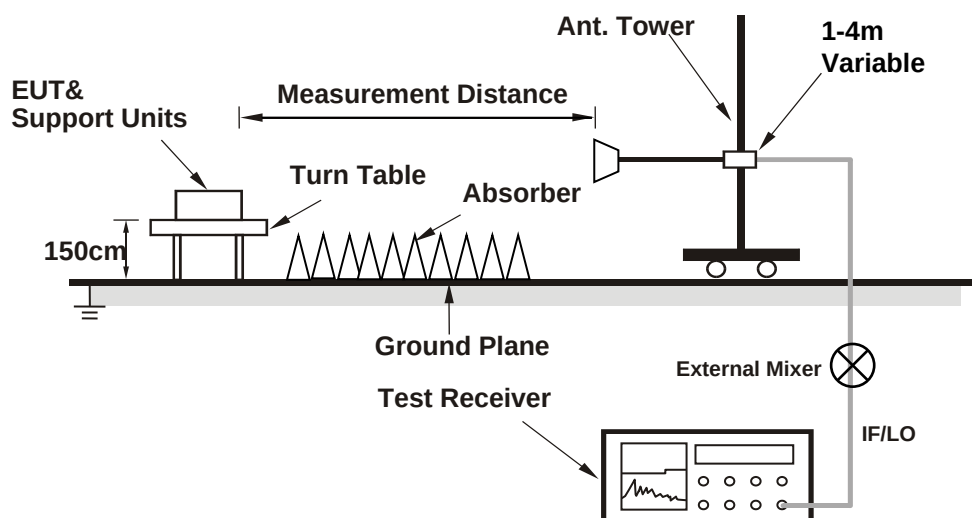
##### < Frequency Range below 1GHz >



##### < Frequency Range above 1GHz ~ 50GHz >



# < Frequency Range above 50GHz >



## 4.5 場強度之計算

場強之計算公式如下：

結果值 Emission level (dBuV/m)=機器讀值 Raw Value (dBuV) +校正因子 Correction Factor (dB/m)

餘裕度 Margin(dB)= 結果值 Emission level (dBuV/m)-限制值 Limit value (dBuV/m)

量測結果請見下頁。

#### 4.6 量測結果

##### 4.6.1 主波發射及發射諧波

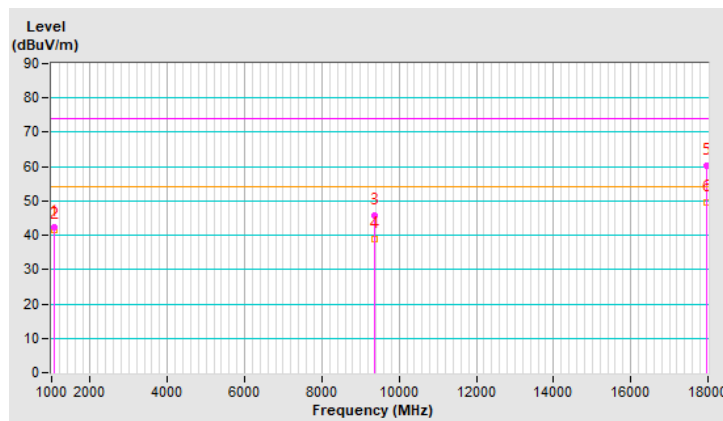
##### For 1~18GHz

|         |                 |         |                                                |
|---------|-----------------|---------|------------------------------------------------|
| 操作模式：   | 發射              | 調變技術：   | CW                                             |
| 基本波頻率：  | 24.06652 GHz    | 檢測器與頻寬： | (PK) RB=1MHz, VB=3MHz<br>(AV) RB=1MHz, VB=3MHz |
| 量測場地溫度： | 25 °C           | 量測場地濕度： | 65% RH                                         |
| 測試日期：   | 110 年 10 月 21 日 | 測試者：    | 鄧傑仁                                            |

| Antenna Polarity & Test Distance : Horizontal at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|------------------------------------------------------|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No                                                   | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                    | 1060.75         | 42.3 PK                 | 74.0           | -31.7       | 1.50 H             | 349                  | 48.6             | -6.3                     |
| 2                                                    | 1060.75         | 41.6 AV                 | 54.0           | -12.4       | 1.50 H             | 349                  | 47.9             | -6.3                     |
| 3                                                    | 9360.55         | 45.6 PK                 | 74.0           | -28.4       | 1.00 H             | 237                  | 35.1             | 10.5                     |
| 4                                                    | 9360.55         | 38.9 AV                 | 54.0           | -15.1       | 1.00 H             | 237                  | 28.4             | 10.5                     |
| 5                                                    | 17978.89        | 60.2 PK                 | 74.0           | -13.8       | 4.00 H             | 323                  | 34.3             | 25.9                     |
| 6                                                    | 17978.89        | 49.6 AV                 | 54.0           | -4.4        | 4.00 H             | 323                  | 23.7             | 25.9                     |

##### Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

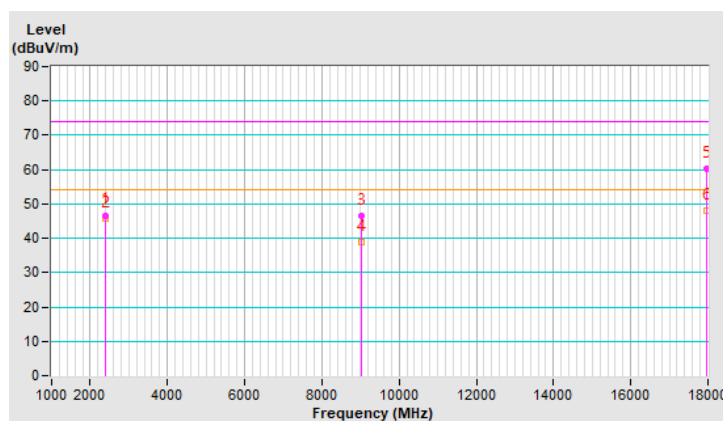


|         |                 |         |                                                |
|---------|-----------------|---------|------------------------------------------------|
| 操作模式：   | 發射              | 調變技術：   | CW                                             |
| 基本波頻率：  | 24.06652 GHz    | 檢測器與頻寬： | (PK) RB=1MHz, VB=3MHz<br>(AV) RB=1MHz, VB=3MHz |
| 量測場地溫度： | 25 °C           | 量測場地濕度： | 65% RH                                         |
| 測試日期：   | 110 年 10 月 21 日 | 測試者：    | 鄧傑仁                                            |

| Antenna Polarity & Test Distance : Vertical at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|----------------------------------------------------|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No                                                 | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                  | 2390.05         | 46.7 PK                 | 74.0           | -27.3       | 1.00 V             | 86                   | 49.4             | -2.7                     |
| 2                                                  | 2390.05         | 45.6 AV                 | 54.0           | -8.4        | 1.00 V             | 86                   | 48.3             | -2.7                     |
| 3                                                  | 9024.40         | 46.6 PK                 | 74.0           | -27.4       | 2.50 V             | 148                  | 37.2             | 9.4                      |
| 4                                                  | 9024.40         | 39.0 AV                 | 54.0           | -15.0       | 2.50 V             | 148                  | 29.6             | 9.4                      |
| 5                                                  | 17977.75        | 60.1 PK                 | 74.0           | -13.9       | 3.50 V             | 324                  | 34.3             | 25.8                     |
| 6                                                  | 17977.75        | 48.0 AV                 | 54.0           | -6.0        | 3.50 V             | 324                  | 22.2             | 25.8                     |

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



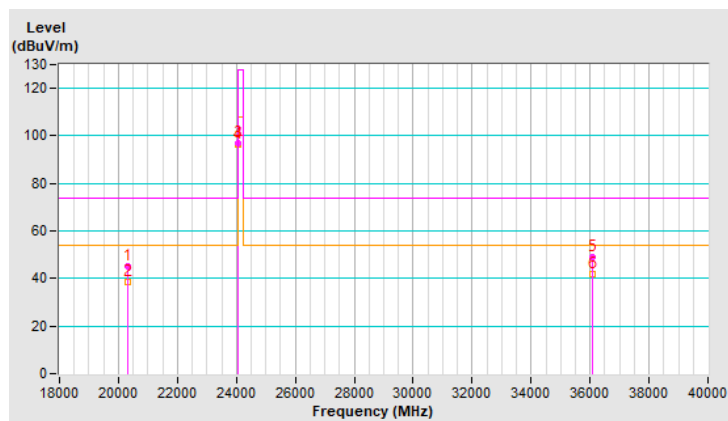
For 18~40GHz

|         |                 |         |                                                |
|---------|-----------------|---------|------------------------------------------------|
| 操作模式：   | 發射              | 調變技術：   | CW                                             |
| 基本波頻率：  | 24.06652 GHz    | 檢測器與頻寬： | (PK) RB=1MHz, VB=3MHz<br>(AV) RB=1MHz, VB=3MHz |
| 量測場地溫度： | 25 °C           | 量測場地濕度： | 65% RH                                         |
| 測試日期：   | 110 年 10 月 21 日 | 測試者：    | 鄧傑仁                                            |

| Antenna Polarity & Test Distance : Horizontal at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|------------------------------------------------------|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No                                                   | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                    | 20332.00        | 45.4 PK                 | 74.0           | -28.6       | 1.50 H             | 200                  | 50.6             | -5.2                     |
| 2                                                    | 20332.00        | 38.4 AV                 | 54.0           | -15.6       | 1.50 H             | 200                  | 43.6             | -5.2                     |
| 3                                                    | *24066.52       | 96.7 PK                 | 127.9          | -31.2       | 1.72 H             | 46                   | 99.4             | -2.7                     |
| 4                                                    | *24066.52       | 96.3 AV                 | 107.9          | -11.6       | 1.72 H             | 46                   | 99.0             | -2.7                     |
| 5                                                    | 36084.00        | 48.9 PK                 | 74.0           | -25.1       | 2.00 H             | 157                  | 48.8             | 0.1                      |
| 6                                                    | 36084.00        | 41.9 AV                 | 54.0           | -12.1       | 2.00 H             | 157                  | 41.8             | 0.1                      |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency (主頻).

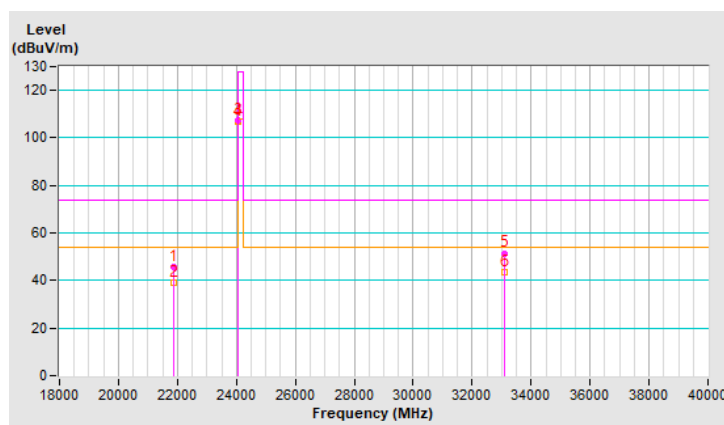


|         |                 |         |                                                |
|---------|-----------------|---------|------------------------------------------------|
| 操作模式：   | 發射              | 調變技術：   | CW                                             |
| 基本波頻率：  | 24.06652 GHz    | 檢測器與頻寬： | (PK) RB=1MHz, VB=3MHz<br>(AV) RB=1MHz, VB=3MHz |
| 量測場地溫度： | 25 °C           | 量測場地濕度： | 65% RH                                         |
| 測試日期：   | 110 年 10 月 21 日 | 測試者：    | 鄧傑仁                                            |

| Antenna Polarity & Test Distance : Vertical at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|----------------------------------------------------|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No                                                 | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                  | 21894.00        | 45.6 PK                 | 74.0           | -28.4       | 1.50 V             | 242                  | 49.3             | -3.7                     |
| 2                                                  | 21894.00        | 38.9 AV                 | 54.0           | -15.1       | 1.50 V             | 242                  | 42.6             | -3.7                     |
| 3                                                  | *24066.52       | 107.6 PK                | 127.9          | -20.3       | 1.62 V             | 276                  | 110.3            | -2.7                     |
| 4                                                  | *24066.52       | 106.7 AV                | 107.9          | -1.2        | 1.61 V             | 276                  | 109.4            | -2.7                     |
| 5                                                  | 33084.00        | 51.5 PK                 | 74.0           | -22.5       | 2.24 V             | 155                  | 53.9             | -2.4                     |
| 6                                                  | 33084.00        | 43.7 AV                 | 54.0           | -10.3       | 2.24 V             | 155                  | 46.1             | -2.4                     |

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency (主頻).



For 40~100GHz

|         |                 |         |                                                |
|---------|-----------------|---------|------------------------------------------------|
| 操作模式：   | 發射              | 調變技術：   | CW                                             |
| 基本波頻率：  | 24.06652 GHz    | 檢測器與頻寬： | (PK) RB=1MHz, VB=3MHz<br>(AV) RB=1MHz, VB=3MHz |
| 量測場地溫度： | 23 °C           | 量測場地濕度： | 62% RH                                         |
| 測試日期：   | 110 年 10 月 28 日 | 測試者：    | 廖偉鈞                                            |

| Antenna Polarity : Horizontal |                 |               |                |                   |                |             |          |           |
|-------------------------------|-----------------|---------------|----------------|-------------------|----------------|-------------|----------|-----------|
| No.                           | Frequency (GHz) | Factor (dB/m) | Reading (dBuV) | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Pass/Fail |
| 1                             | 48.13           | 20.09         | 36.49          | 56.58             | 87.9           | -31.318     | Peak     | Pass      |
| 2                             | 48.13           | 20.09         | 26.45          | 46.54             | 67.9           | -21.359     | Average  | Pass      |
| 3                             | 72.20           | 1.50          | 53.31          | 54.81             | 87.9           | -33.092     | Peak     | Pass      |
| 4                             | 72.20           | 1.50          | 35.58          | 37.08             | 67.9           | -30.822     | Average  | Pass      |
| 5                             | 98.32           | 19.59         | 21.23          | 40.82             | 74             | -33.182     | Peak     | Pass      |
| 6                             | 98.32           | 19.59         | 3.69           | 23.28             | 54             | -30.722     | Average  | Pass      |
| Antenna Polarity : Vertical   |                 |               |                |                   |                |             |          |           |
| No.                           | Frequency (GHz) | Factor (dB/m) | Reading (dBuV) | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Pass/Fail |
| 1                             | 48.13           | 20.09         | 43.78          | 63.87             | 87.9           | -24.030     | Peak     | Pass      |
| 2                             | 48.13           | 20.09         | 33.77          | 53.85             | 67.9           | -14.047     | Average  | Pass      |
| 3                             | 72.20           | 1.50          | 52.81          | 54.31             | 87.9           | -33.592     | Peak     | Pass      |
| 4                             | 72.20           | 1.50          | 34.91          | 36.41             | 67.9           | -31.492     | Average  | Pass      |
| 5                             | 98.47           | 19.59         | 20.57          | 40.16             | 74             | -33.842     | Peak     | Pass      |
| 6                             | 98.47           | 19.59         | 3.55           | 23.14             | 54             | -30.862     | Average  | Pass      |

REMARKS:

1. The measured power level is converted to  $E_{Meas}$  using the equation:

Emission =Factor+Reading

where:

Measurements made at 1 m

2. Shorter measurement distances may be used to improve the measurement system's noise floor.

As ANSI C63.10 section 9.4 description is based on the measurement in distance of 3 meters,

the data obtained at 1-meter distance was extrapolate results to the 3-m distance:

Test value at 3-meter distance (dBuV) = Test value at 1 meter distance (dBuV) +20log(1/3)(dB)

= Test value at 1 meter distance (dBuV) -9.5(dB).

\*Measurements made at 1 meter distance. Test value converted to account for 3-meter measurement distance.

3. The far-field boundary is given in ANSI 63.10 section 9.1 as:

$R \text{ far field} = (2 * D^2) / \lambda$

D is the Largest Antenna Dimension of measurement antenna, including the reflector

$\lambda$  is the wavelength

| Frequency (GHz) | L (m) | Lambda (m) | R (Far Field) (m) |
|-----------------|-------|------------|-------------------|
| 40              | 0.03  | 0.0075     | 0.240             |
| 50              | 0.03  | 0.0060     | 0.300             |

| Frequency (GHz) | L (m) | Lambda (m) | R (Far Field) (m) |
|-----------------|-------|------------|-------------------|
| 50              | 0.025 | 0.0060     | 0.208             |
| 75              | 0.025 | 0.0040     | 0.313             |

| Frequency (GHz) | L (m) | Lambda (m) | R (Far Field) (m) |
|-----------------|-------|------------|-------------------|
| 75              | 0.018 | 0.0040     | 0.162             |
| 100             | 0.018 | 0.0030     | 0.216             |

#### 4.6.2 接收諧波

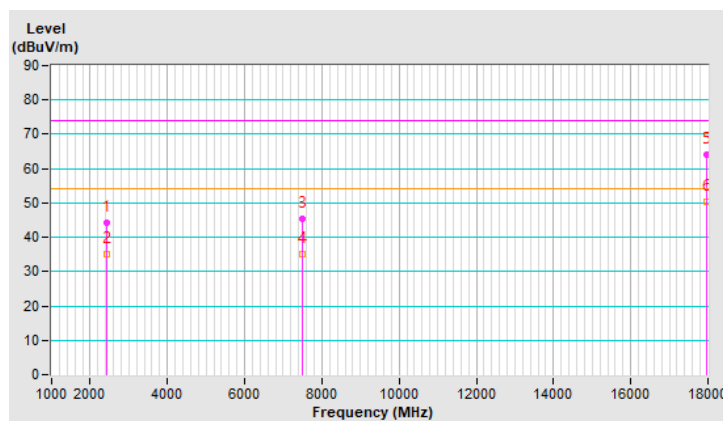
For 1~18GHz

|         |                 |         |                                                |
|---------|-----------------|---------|------------------------------------------------|
| 操作模式：   | 接收              |         |                                                |
| 基本波頻率：  | 24.06652 GHz    | 檢測器與頻寬： | (PK) RB=1MHz, VB=3MHz<br>(AV) RB=1MHz, VB=3MHz |
| 量測場地溫度： | 25 °C           | 量測場地濕度： | 65% RH                                         |
| 測試日期：   | 110 年 10 月 22 日 | 測試者：    | 鄧傑仁                                            |

| Antenna Polarity & Test Distance : Horizontal at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|------------------------------------------------------|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No                                                   | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                    | 2431.91         | 44.3 PK                 | 74.0           | -29.7       | 1.00 H             | 277                  | 47.0             | -2.7                     |
| 2                                                    | 2431.91         | 35.2 AV                 | 54.0           | -18.8       | 1.00 H             | 277                  | 37.9             | -2.7                     |
| 3                                                    | 7488.78         | 45.2 PK                 | 74.0           | -28.8       | 3.00 H             | 273                  | 37.5             | 7.7                      |
| 4                                                    | 7488.78         | 35.1 AV                 | 54.0           | -18.9       | 3.00 H             | 273                  | 27.4             | 7.7                      |
| 5                                                    | 17973.62        | 64.0 PK                 | 74.0           | -10.0       | 3.50 H             | 319                  | 38.3             | 25.7                     |
| 6                                                    | 17973.62        | 50.3 AV                 | 54.0           | -3.7        | 3.50 H             | 319                  | 24.6             | 25.7                     |

#### Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

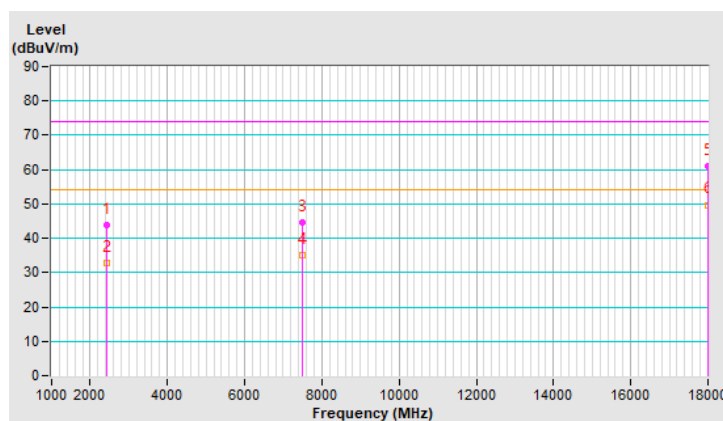


|         |                 |         |                                                |
|---------|-----------------|---------|------------------------------------------------|
| 操作模式：   | 接收              |         |                                                |
| 基本波頻率：  | 24.06652 GHz    | 檢測器與頻寬： | (PK) RB=1MHz, VB=3MHz<br>(AV) RB=1MHz, VB=3MHz |
| 量測場地溫度： | 25 °C           | 量測場地濕度： | 65% RH                                         |
| 測試日期：   | 110 年 10 月 22 日 | 測試者：    | 鄧傑仁                                            |

| Antenna Polarity & Test Distance : Vertical at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|----------------------------------------------------|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No                                                 | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                  | 2438.15         | 43.9 PK                 | 74.0           | -30.1       | 1.50 V             | 278                  | 46.6             | -2.7                     |
| 2                                                  | 2438.15         | 32.9 AV                 | 54.0           | -21.1       | 1.50 V             | 278                  | 35.6             | -2.7                     |
| 3                                                  | 7494.65         | 44.5 PK                 | 74.0           | -29.5       | 2.50 V             | 270                  | 36.7             | 7.8                      |
| 4                                                  | 7494.65         | 35.1 AV                 | 54.0           | -18.9       | 2.50 V             | 270                  | 27.3             | 7.8                      |
| 5                                                  | 17985.88        | 60.9 PK                 | 74.0           | -13.1       | 3.50 V             | 355                  | 34.8             | 26.1                     |
| 6                                                  | 17985.88        | 49.8 AV                 | 54.0           | -4.2        | 3.50 V             | 355                  | 23.7             | 26.1                     |

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



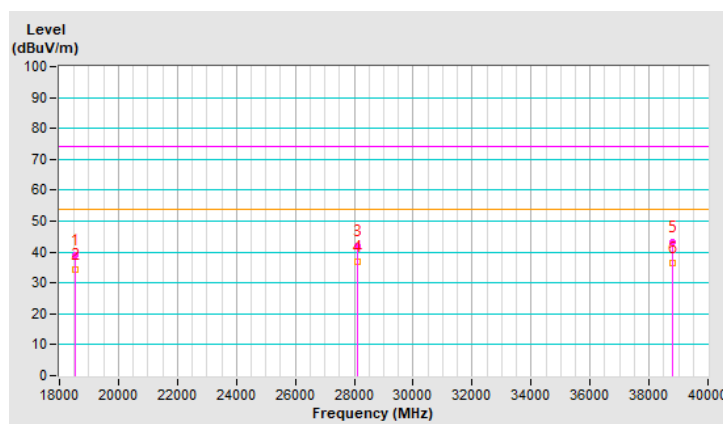
For 18~40GHz

|         |                 |         |                                                |
|---------|-----------------|---------|------------------------------------------------|
| 操作模式：   | 接收              |         |                                                |
| 基本波頻率：  | 24.06652 GHz    | 檢測器與頻寬： | (PK) RB=1MHz, VB=3MHz<br>(AV) RB=1MHz, VB=3MHz |
| 量測場地溫度： | 25 °C           | 量測場地濕度： | 65% RH                                         |
| 測試日期：   | 110 年 10 月 22 日 | 測試者：    | 鄧傑仁                                            |

| Antenna Polarity & Test Distance : Horizontal at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|------------------------------------------------------|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No                                                   | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                    | 18542.34        | 39.1 PK                 | 74.0           | -34.9       | 1.17 H             | 50                   | 45.4             | -6.3                     |
| 2                                                    | 18542.34        | 34.4 AV                 | 54.0           | -19.6       | 1.17 H             | 50                   | 40.7             | -6.3                     |
| 3                                                    | 28112.76        | 42.1 PK                 | 74.0           | -31.9       | 1.61 H             | 218                  | 43.5             | -1.4                     |
| 4                                                    | 28112.76        | 37.0 AV                 | 54.0           | -17.0       | 1.61 H             | 218                  | 38.4             | -1.4                     |
| 5                                                    | 38817.64        | 43.3 PK                 | 74.0           | -30.7       | 1.37 H             | 200                  | 38.3             | 5.0                      |
| 6                                                    | 38817.64        | 36.5 AV                 | 54.0           | -17.5       | 1.37 H             | 200                  | 31.5             | 5.0                      |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

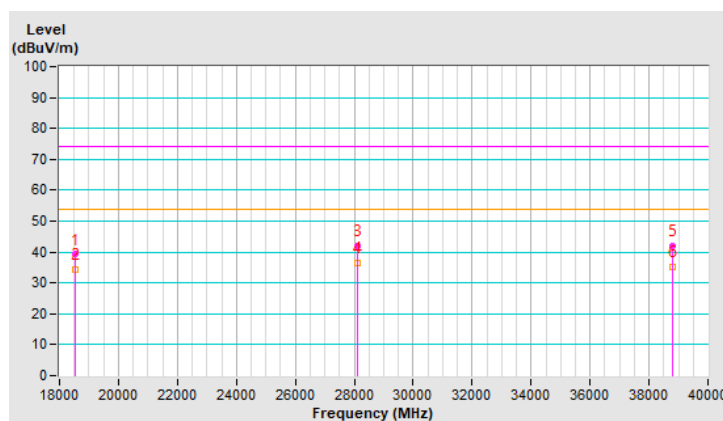


|         |                 |         |                                                |
|---------|-----------------|---------|------------------------------------------------|
| 操作模式：   | 接收              |         |                                                |
| 基本波頻率：  | 24.06652 GHz    | 檢測器與頻寬： | (PK) RB=1MHz, VB=3MHz<br>(AV) RB=1MHz, VB=3MHz |
| 量測場地溫度： | 25 °C           | 量測場地濕度： | 65% RH                                         |
| 測試日期：   | 110 年 10 月 22 日 | 測試者：    | 鄧傑仁                                            |

| Antenna Polarity & Test Distance : Vertical at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|----------------------------------------------------|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No                                                 | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                  | 18542.61        | 39.2 PK                 | 74.0           | -34.8       | 1.22 V             | 35                   | 45.5             | -6.3                     |
| 2                                                  | 18542.61        | 34.4 AV                 | 54.0           | -19.6       | 1.22 V             | 35                   | 40.7             | -6.3                     |
| 3                                                  | 28112.47        | 41.9 PK                 | 74.0           | -32.1       | 1.41 V             | 201                  | 43.2             | -1.3                     |
| 4                                                  | 28112.47        | 36.6 AV                 | 54.0           | -17.4       | 1.41 V             | 201                  | 37.9             | -1.3                     |
| 5                                                  | 38817.54        | 41.9 PK                 | 74.0           | -32.1       | 1.46 V             | 212                  | 36.9             | 5.0                      |
| 6                                                  | 38817.54        | 35.2 AV                 | 54.0           | -18.8       | 1.46 V             | 212                  | 30.2             | 5.0                      |

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



# For 40~100GHz

|         |                 |         |                                                |
|---------|-----------------|---------|------------------------------------------------|
| 操作模式：   | 接收              |         |                                                |
| 基本波頻率：  | 24.06652 GHz    | 檢測器與頻寬： | (PK) RB=1MHz, VB=3MHz<br>(AV) RB=1MHz, VB=3MHz |
| 量測場地溫度： | 25 °C           | 量測場地濕度： | 65% RH                                         |
| 測試日期：   | 110 年 10 月 28 日 | 測試者：    | 廖偉鈺                                            |

| Antenna Polarity : Horizontal |                 |               |                |                   |                |             |          |           |
|-------------------------------|-----------------|---------------|----------------|-------------------|----------------|-------------|----------|-----------|
| No.                           | Frequency (GHz) | Factor (dB/m) | Reading (dBuV) | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Pass/Fail |
| 1                             | 48.35           | 20.09         | 34.84          | 54.93             | 74             | -19.072     | Peak     | Pass      |
| 2                             | 48.35           | 20.09         | 17.03          | 37.12             | 54             | -16.882     | Average  | Pass      |
| 3                             | 74.23           | 1.50          | 52.93          | 54.43             | 74             | -19.572     | Peak     | Pass      |
| 4                             | 74.23           | 1.50          | 35.54          | 37.04             | 54             | -16.962     | Average  | Pass      |
| 5                             | 98.55           | 19.59         | 21.18          | 40.77             | 74             | -33.232     | Peak     | Pass      |
| 6                             | 98.55           | 19.59         | 3.52           | 23.11             | 54             | -30.892     | Average  | Pass      |
| Antenna Polarity : Vertical   |                 |               |                |                   |                |             |          |           |
| No.                           | Frequency (GHz) | Factor (dB/m) | Reading (dBuV) | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Pass/Fail |
| 1                             | 48.22           | 20.09         | 34.94          | 55.03             | 74             | -18.972     | Peak     | Pass      |
| 2                             | 48.22           | 20.09         | 17.06          | 37.15             | 54             | -16.852     | Average  | Pass      |
| 3                             | 74.22           | 1.50          | 52.41          | 53.91             | 74             | -20.092     | Peak     | Pass      |
| 4                             | 74.22           | 1.50          | 34.42          | 35.92             | 54             | -18.082     | Average  | Pass      |
| 5                             | 98.52           | 19.59         | 21.05          | 40.64             | 74             | -33.362     | Peak     | Pass      |
| 6                             | 98.52           | 19.59         | 4.06           | 23.65             | 54             | -30.352     | Average  | Pass      |

## REMARKS:

1. The measured power level is converted to  $E_{Meas}$  using the equation:

Emission =Factor+Reading

where:

Measurements made at 1 m

2. Shorter measurement distances may be used to improve the measurement system's noise floor.

As ANSI C63.10 section 9.4 description is based on the measurement in distance of 3 meters,

the data obtained at 1-meter distance was extrapolate results to the 3-m distance:

Test value at 3-meter distance (dBuV) = Test value at 1 meter distance (dBuV) +20log(1/3)(dB)

= Test value at 1 meter distance (dBuV) -9.5(dB).

\*Measurements made at 1 meter distance. Test value converted to account for 3-meter measurement distance.

3. The far-field boundary is given in ANSI 63.10 section 9.1 as:

$R \text{ far field} = (2 * D^2) / \lambda$

D is the Largest Antenna Dimension of measurement antenna, including the reflector

$\lambda$  is the wavelength

| Frequency (GHz) | L (m) | Lambda (m) | R (Far Field) (m) |
|-----------------|-------|------------|-------------------|
| 40              | 0.03  | 0.0075     | 0.240             |
| 50              | 0.03  | 0.0060     | 0.300             |

| Frequency (GHz) | L (m) | Lambda (m) | R (Far Field) (m) |
|-----------------|-------|------------|-------------------|
| 50              | 0.025 | 0.0060     | 0.208             |
| 75              | 0.025 | 0.0040     | 0.313             |

| Frequency (GHz) | L (m) | Lambda (m) | R (Far Field) (m) |
|-----------------|-------|------------|-------------------|
| 75              | 0.018 | 0.0040     | 0.162             |
| 100             | 0.018 | 0.0030     | 0.216             |

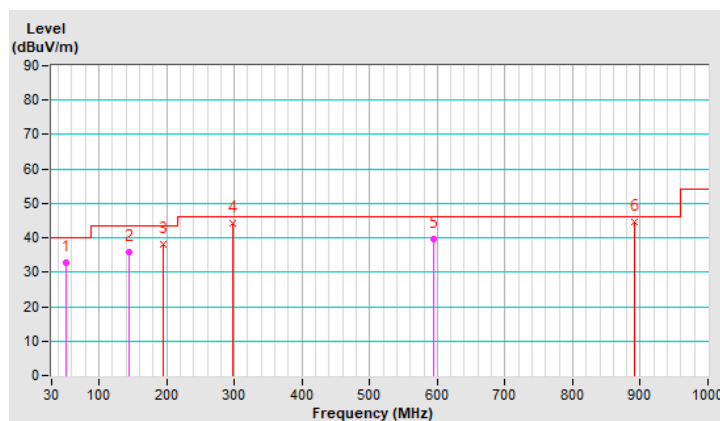
#### 4.6.3 其它不必要之訊號

|         |                |         |                |
|---------|----------------|---------|----------------|
| 操作模式：   | 發射接收           | 調變技術：   | CW             |
| 基本波頻率：  | 24.06652 GHz   | 檢測器與頻寬： | (QP) RB=120kHz |
| 量測場地溫度： | 25 °C          | 量測場地濕度： | 72% RH         |
| 測試日期：   | 110 年 11 月 1 日 | 測試者：    | 張君煌            |

| Antenna Polarity & Test Distance : Horizontal at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|------------------------------------------------------|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No                                                   | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                    | 52.21           | 32.7 QP                 | 40.0           | -7.3        | 1.96 H             | 146                  | 45.5             | -12.8                    |
| 2                                                    | 144.46          | 35.9 QP                 | 43.5           | -7.6        | 2.43 H             | 358                  | 48.7             | -12.8                    |
| 3                                                    | 195.42          | 38.0 QP                 | 43.5           | -5.5        | 1.88 H             | 210                  | 53.9             | -15.9                    |
| 4                                                    | 296.99          | 44.3 QP                 | 46.0           | -1.7        | 1.08 H             | 184                  | 56.7             | -12.4                    |
| 5                                                    | 594.01          | 39.8 QP                 | 46.0           | -6.2        | 2.24 H             | 355                  | 45.2             | -5.4                     |
| 6                                                    | 890.99          | 44.6 QP                 | 46.0           | -1.4        | 2.18 H             | 132                  | 46.0             | -1.4                     |

#### Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

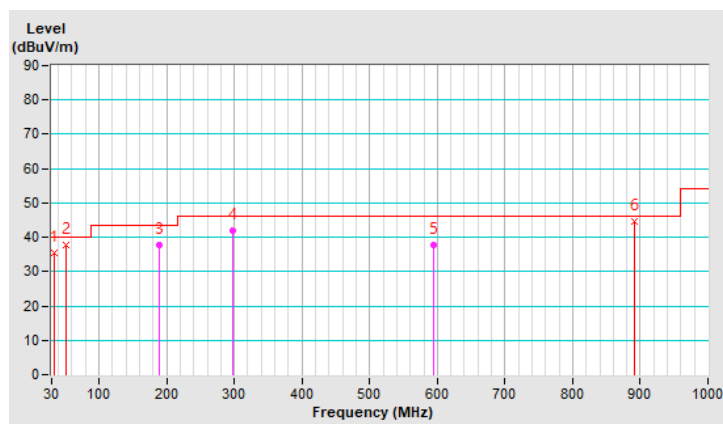


|         |                |         |                |
|---------|----------------|---------|----------------|
| 操作模式：   | 發射接收           | 調變技術：   | CW             |
| 基本波頻率：  | 24.06652 GHz   | 檢測器與頻寬： | (QP) RB=120kHz |
| 量測場地溫度： | 25 °C          | 量測場地濕度： | 72% RH         |
| 測試日期：   | 110 年 11 月 1 日 | 測試者：    | 張君煌            |

| Antenna Polarity & Test Distance : Vertical at 3 m |                 |                         |                |             |                    |                      |                  |                          |
|----------------------------------------------------|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No                                                 | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                  | 33.48           | 35.5 QP                 | 40.0           | -4.5        | 1.03 V             | 182                  | 44.0             | -8.5                     |
| 2                                                  | 52.22           | 37.9 QP                 | 40.0           | -2.1        | 1.27 V             | 44                   | 44.8             | -6.9                     |
| 3                                                  | 188.50          | 37.8 QP                 | 43.5           | -5.7        | 1.63 V             | 191                  | 46.1             | -8.3                     |
| 4                                                  | 296.99          | 41.8 QP                 | 46.0           | -4.2        | 2.25 V             | 202                  | 46.1             | -4.3                     |
| 5                                                  | 593.96          | 37.7 QP                 | 46.0           | -8.3        | 2.15 V             | 156                  | 35.5             | 2.2                      |
| 6                                                  | 890.98          | 44.5 QP                 | 46.0           | -1.5        | 1.97 V             | 120                  | 36.9             | 7.6                      |

#### Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



#### 4.7 量測結果判定

依據測試數據結果，符合低功率射頻器材技術規範之要求。

#### 4.8 配置照片

請參照 Test Setup Photos (BV 編號: BHKO-WTW-P21090237\_TSup (24GHz))

## 5 電源線傳導干擾之量測

### 5.1 適用標準

請見本報告 3.1 節第(1)項的規定。

### 5.2 量測方法

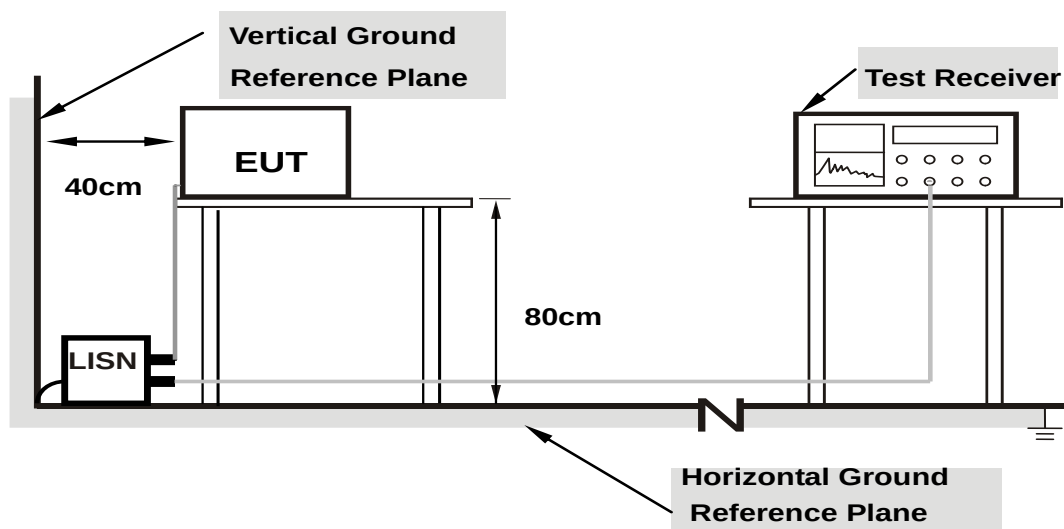
將待測物置於 0.8 米高的非金屬桌面，使其操作在工作狀態，待測物電源線接至電源線阻抗穩定網路上，從測試接收機記錄頻率由 0.15MHz 至 30MHz 之間之電源線傳導放射強度。

### 5.3 量測儀器

| Description & Manufacturer | Model No.           | Serial No. | Calibrated Date | Calibrated Until |
|----------------------------|---------------------|------------|-----------------|------------------|
| Test Receiver<br>R&S       | ESCS 30             | 847124/029 | 2021/10/13      | 2022/10/12       |
| LISN<br>R&S                | ESH3-Z5             | 848773/004 | 2021/10/29      | 2022/10/28       |
| LISN<br>R & S              | ESH3-Z5             | 835239/001 | 2021/3/26       | 2022/3/25        |
| 50 ohms Terminator         | 50                  | 3          | 2021/10/27      | 2022/10/26       |
| RF Coaxial Cable<br>JYEBO  | 5D-FB               | COCCAB-001 | 2021/9/25       | 2022/9/24        |
| Fixed attenuator<br>STI    | STI02-2200-10       | 005        | 2021/8/27       | 2022/8/26        |
| Software<br>BVADT          | BVADT_Cond_V7.3.7.4 | NA         | NA              | NA               |

- Note: 1. The test was performed in Conduction 1.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The measurement uncertainty is 1.9 dB, which is calculated as per the document CISPR 16-4-2 This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

#### 5.4 測試配置



**Note: 1.**Support units were connected to second LISN.

**2.**Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

#### 5.5 干擾值之計算

餘裕度 Margin(dB)= 結果值 Emission level (dBuV)-限制值 Limit value (dBuV)

電源傳導干擾電壓之計算公式如下

結果值 Emission level (dBuV)=校正因子 Correction Factor (dB)+儀器讀值 Reading value (dBuV)

其中校正因子 Correction Factor (dB)為：

饋線損失+電源阻抗模擬網路損失

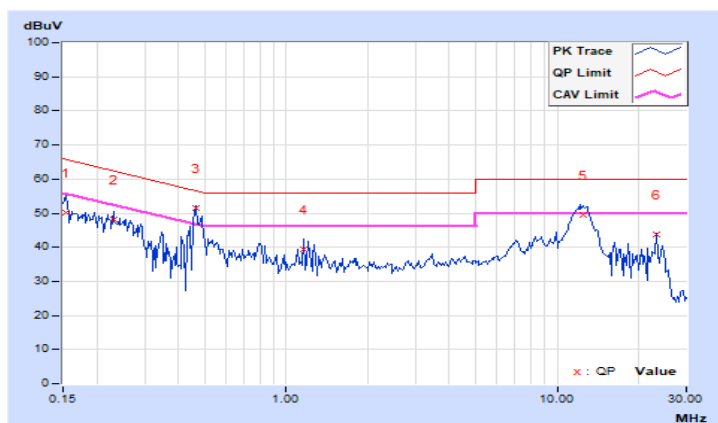
## 5.6 量測結果

|         |                |         |                           |
|---------|----------------|---------|---------------------------|
| 操作模式：   | 發射接收           | 基本波頻率：  | 24.06652 GHz              |
| 量測頻率範圍： | 150kHz ~ 30MHz | 檢測器與頻寬： | 準峰值 (QP) / 平均值 (AV), 9kHz |
| 量測場地溫度： | 25 °C          | 量測場地濕度： | 67% RH                    |
| 測試日期：   | 110 年 11 月 1 日 | 測試者：    | 張君煌                       |

| Phase Of Power : Line (L) |                 |                        |                      |       |                       |       |              |       |             |        |
|---------------------------|-----------------|------------------------|----------------------|-------|-----------------------|-------|--------------|-------|-------------|--------|
| No                        | Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) |       | Emission Level (dBuV) |       | Limit (dBuV) |       | Margin (dB) |        |
|                           |                 |                        | Q.P.                 | AV.   | Q.P.                  | AV.   | Q.P.         | AV.   | Q.P.        | AV.    |
| 1                         | 0.15391         | 10.03                  | 40.29                | 31.65 | 50.32                 | 41.68 | 65.79        | 55.79 | -15.47      | -14.11 |
| 2                         | 0.23203         | 10.04                  | 38.16                | 30.75 | 48.20                 | 40.79 | 62.38        | 52.38 | -14.18      | -11.59 |
| 3                         | 0.46250         | 10.05                  | 41.46                | 32.55 | 51.51                 | 42.60 | 56.65        | 46.65 | -5.14       | -4.05  |
| 4                         | 1.16016         | 10.10                  | 29.33                | 21.51 | 39.43                 | 31.61 | 56.00        | 46.00 | -16.57      | -14.39 |
| 5                         | 12.44531        | 10.81                  | 38.72                | 30.91 | 49.53                 | 41.72 | 60.00        | 50.00 | -10.47      | -8.28  |
| 6                         | 23.12891        | 11.50                  | 32.17                | 31.28 | 43.67                 | 42.78 | 60.00        | 50.00 | -16.33      | -7.22  |

### Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

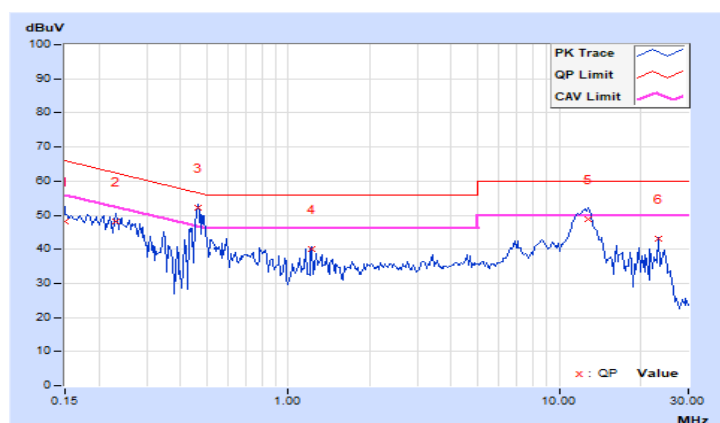


|         |                |         |                           |
|---------|----------------|---------|---------------------------|
| 操作模式：   | 發射接收           | 基本波頻率：  | 24.06652 GHz              |
| 量測頻率範圍： | 150kHz ~ 30MHz | 檢測器與頻寬： | 準峰值 (QP) / 平均值 (AV), 9kHz |
| 量測場地溫度： | 25 °C          | 量測場地濕度： | 67% RH                    |
| 測試日期：   | 110 年 11 月 1 日 | 測試者：    | 張君煌                       |

| Phase Of Power : Neutral (N) |                 |                        |                      |       |                       |       |              |       |             |        |
|------------------------------|-----------------|------------------------|----------------------|-------|-----------------------|-------|--------------|-------|-------------|--------|
| No                           | Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) |       | Emission Level (dBuV) |       | Limit (dBuV) |       | Margin (dB) |        |
|                              |                 |                        | Q.P.                 | AV.   | Q.P.                  | AV.   | Q.P.         | AV.   | Q.P.        | AV.    |
| 1                            | 0.15000         | 10.04                  | 38.23                | 32.26 | 48.27                 | 42.30 | 66.00        | 56.00 | -17.73      | -13.70 |
| 2                            | 0.23203         | 10.04                  | 38.10                | 30.47 | 48.14                 | 40.51 | 62.38        | 52.38 | -14.24      | -11.87 |
| 3                            | 0.46641         | 10.06                  | 42.05                | 32.34 | 52.11                 | 42.40 | 56.58        | 46.58 | -4.47       | -4.18  |
| 4                            | 1.21875         | 10.11                  | 29.92                | 21.90 | 40.03                 | 32.01 | 56.00        | 46.00 | -15.97      | -13.99 |
| 5                            | 12.77734        | 10.67                  | 38.12                | 30.92 | 48.79                 | 41.59 | 60.00        | 50.00 | -11.21      | -8.41  |
| 6                            | 23.12891        | 11.17                  | 31.86                | 30.72 | 43.03                 | 41.89 | 60.00        | 50.00 | -16.97      | -8.11  |

#### Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



#### 5.7 量測結果判定

依據測試數據結果，符合低功率射頻器材技術規範之要求。

#### 5.8 配置照片

請參照 Test Setup Photos (BV 編號: BHKO-WTW-P21090237\_TSup (24GHz))

## 6 天線之要求

### 6.1 適用標準

請見本報告 3.1 節第(3)項的規定。

### 6.2 天線之規定

此待測物搭配 Microstrip antenna (antenna array)，無使用天線接頭。

### 6.3 結果判定

符合低功率射頻器材技術規範之要求。

## 7 檢測實驗室基本資料

立德國際商品試驗有限公司桃園分公司提供產業界最佳的檢測以及諮詢服務。  
本公司為 ISO/IEC 17025 認可實驗室。

如您有任何問題或建議，請與下列實驗室聯絡：

林口 EMC / RF 實驗室：

Tel: 886-2-26052180

Fax: 886-2-26051924

新竹 EMC / RF 及通訊實驗室：

Tel: 886-3-6668565

Fax: 886-3-6668323

華亞 EMC / RF / Safety 實驗室：

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

Web Site: [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

您也可以在我们的網站內找到各實驗室的地圖。

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