



# 低功率射頻器材測試報告

申請廠商 : 雙全國際股份有限公司

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地址 : 深圳市寶安區新安街道靈芝園社區 22 區中糧紫云大廈 2103

產品名稱 : 諾基亞真無線降噪耳機

產品型號 : E3511

廠牌 : NOKIA

受理日期 : 110 年 08 月 16 日

完成日期 : 110 年 08 月 30 日

實驗室名稱：世騰電子科技股份有限公司測試實驗室

實驗室地址：桃園市蘆竹區聯福街 2 巷 10 號

實驗室認可證書有效期限：112 年 07 月 08 日

實驗室認可編號及範圍：1439 (9 kHz to 40 GHz)

實驗室認證資格





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## 修訂記錄

| 報告號碼.            | 發行日期          | 描述       |
|------------------|---------------|----------|
| 21080196-TRNCC02 | Aug. 30, 2021 | Original |
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## 證 明 書

|                    |   |                                                          |
|--------------------|---|----------------------------------------------------------|
| 申請廠商               | : | 雙全國際股份有限公司                                               |
| 地址                 | : | 新北市汐止區新台五路一段 77 號 10 樓之 4                                |
| 工廠                 | : | 瑞伸通智能科技(深圳)有限公司                                          |
| 地址                 | : | 深圳市寶安區新安街道靈芝園社區 22 區中糧紫<br>云大廈 2103                      |
| 產品名稱               | : | 諾基亞真無線降噪耳機                                               |
| 產品型號               | : | E3511                                                    |
| 廠牌                 | : | NOKIA                                                    |
| 該產品樣品試驗<br>依據之試驗標準 | : | 國家通訊傳播委員會低功率射頻器材技術規範(LP0002)。<br>規範修訂日期 109 年 07 月 01 日。 |
| 發射功率<br>(電場強度)     | : | 8.82dBm                                                  |

茲在此鄭重聲明：

本試驗報告所列之待測設備樣品已於民國 110 年 08 月 30 日在本公司的標準測試場地完成詳細及完整之量測。本試驗報告所列之量測皆依據低功率射頻器材技術規範之規定來執行。並判斷此待測設備樣品確實符合低功率射頻器材技術規範規定。

備註：本測試報告僅對受測之樣品負責。非經本公司同意，測試報告不得摘錄複印使用。(全部複製除外)。

| 項次 | 測試項目       | 低功率射頻器材技術<br>規範   | 量測設備    | 測試結果                 | 結果判定 |
|----|------------|-------------------|---------|----------------------|------|
| 1  | 天線增益之要求    | 4.10.1.3 節        | ---     | 請參閱 2.2 節            | ---  |
| 2  | 電源線傳導干擾之要求 | 3.3 節             | 請參閱 2 章 | 請參閱 4.4 節            | 合格   |
| 3  | 場強輻射之要求    | 4.10.1.5 節        | 請參閱 2 章 | 請參閱 5.4 節<br>及 5.5 節 | 合格   |
| 4  | 發射頻寬之要求    | 4.10.1.6 節(2).(A) | 請參閱 2 章 | 請參閱 6.4 節            | 合格   |
| 5  | 峰值輸出功率之要求  | 4.10.1.2 節(1)(C)  | 請參閱 2 章 | 請參閱 7.4 節            | 合格   |
| 6  | 混附波發射限制之要求 | 4.10.1.5 節        | 請參閱 2 章 | 請參閱 8.4 節            | 合格   |
| 7  | 功率密度之要求    | 4.10.1.6 節(2)(B)  | 請參閱 2 章 | 請參閱 9.4 節            | 合格   |

本實驗室已依據合約內的標準，降低儀器、環境、人員等不確定因素。因此測試結果將直接依照標準要求判定之。

報告簽署人：



## 1. 一般描述

### 1.1. 產品規格

|                              |                                                                                                                                                                                                                     |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wearing style                | : True wireless earphones                                                                                                                                                                                           |
| Ear coupling                 | : Ear canal                                                                                                                                                                                                         |
| Frequency response           | : 20Hz to 20kHz                                                                                                                                                                                                     |
| Transducer principle         | : Dynamic driver                                                                                                                                                                                                    |
| Transducer size              | : 10mm                                                                                                                                                                                                              |
| Sound pressure level(SPL)    | : 102dB±3dB                                                                                                                                                                                                         |
| Impedance                    | : 32Ω                                                                                                                                                                                                               |
| Microphone principle         | : MEMS x 2                                                                                                                                                                                                          |
| Power supply                 | : Built-in Lithium rechargeable batteries<br>Left earbud: 45mAh/3.7V<br>Right earbud: 45mAh/3.7V<br>Charging case: 350mAh/3.8V                                                                                      |
| Operating time               | : 6.5hrs with ANC off, 4.5hrs with ANC on<br>(music playback via A2DP) with rechargeable<br>batteries of the earphones*<br>25hrs with ANC off, 17hrs with ANC on with<br>rechargeable battery of the charging case* |
| Charging time                | : Earphones: approx. 2hrs<br>Charging case: approx. 2hrs                                                                                                                                                            |
| Ingress protection (earbuds) | : Anti-dust and splash proof (IP44)                                                                                                                                                                                 |
| Weight                       | : Left earbud; approx. 4g<br>Right earbud; approx. 4g<br>Charging case; approx. 40g                                                                                                                                 |
| Volume Control               | : Yes                                                                                                                                                                                                               |

### Bluetooth

|                           |                                       |
|---------------------------|---------------------------------------|
| Version                   | : Bluetooth specification version 5.2 |
| Profiles                  | : HSP, HFP, AVRCP, A2DP               |
| Effective Range           | : Line of sight approx. 30ft(10m)     |
| Transmission frequency    | : 2402MHz to 2480MHz                  |
| Output power              | : 3mW (max.)                          |
| Supported Audio Format(s) | : SBC                                 |



## RF Spec

|                 |                                                                                |
|-----------------|--------------------------------------------------------------------------------|
| Frequency Range | 2402-2480MHz                                                                   |
| Modulation Type | BT: GFSK, $\pi/4$ -DQPSK, 8DPSK<br>BLE: GFSK                                   |
| Data Rate       | BT:<br>GFSK: 1Mbps, $\pi/4$ -DQPSK: 2Mbps, 8DPSK: 3Mbps<br>BLE:<br>GFSK: 1Mbps |

|       |                                         |
|-------|-----------------------------------------|
| 電池規格： |                                         |
| 耳機    |                                         |
| 廠商：   | Dongguan Blue Power Technology Co.,Ltd. |
| 型號：   | 501012                                  |
| 規格：   | 3.7V,45mAh,0.167Wh                      |
| 充電盒   |                                         |
| 廠商：   | Dongguan Golden CEL Battery Co., Ltd.   |
| 型號：   | 751437                                  |
| 規格：   | 3.8V,350mAh,1.33Wh                      |

Note: 1) For more details, please refer to the User's manual of the EUT.

2) 此為右耳報告.

## 配件

| 產品名稱               | 廠牌               | 型號          |
|--------------------|------------------|-------------|
| 諾基亞真無線降噪耳機<br>(左耳) | NOKIA            | E3511       |
| 充電盒                | NOKIA            | E3511       |
| Type-C Cable       | 深圳市匯富源電子<br>有限公司 | HFY2105-020 |

## 1.2. 差異說明

無。



### 1.3. 無線界面規格及頻道對應頻率

| Channel    | Frequency (MHz) | Channel    | Frequency (MHz) | Channel    | Frequency (MHz) |
|------------|-----------------|------------|-----------------|------------|-----------------|
| <b>*00</b> | <b>2402</b>     | 14         | 2430            | 28         | 2458            |
| 01         | 2404            | 15         | 2432            | 29         | 2460            |
| 02         | 2406            | 16         | 2434            | 30         | 2462            |
| 03         | 2408            | 17         | 2436            | 31         | 2464            |
| 04         | 2410            | 18         | 2438            | 32         | 2466            |
| 05         | 2412            | <b>*19</b> | <b>2440</b>     | 33         | 2468            |
| 06         | 2414            | 20         | 2442            | 34         | 2470            |
| 07         | 2416            | 21         | 2444            | 35         | 2472            |
| 08         | 2418            | 22         | 2446            | 36         | 2474            |
| 09         | 2420            | 23         | 2448            | 37         | 2476            |
| 10         | 2422            | 24         | 2450            | 38         | 2478            |
| 11         | 2424            | 25         | 2452            | <b>*39</b> | <b>2480</b>     |
| 12         | 2426            | 26         | 2454            | --         | --              |
| 13         | 2428            | 27         | 2456            | --         | --              |

\*為量測之頻率

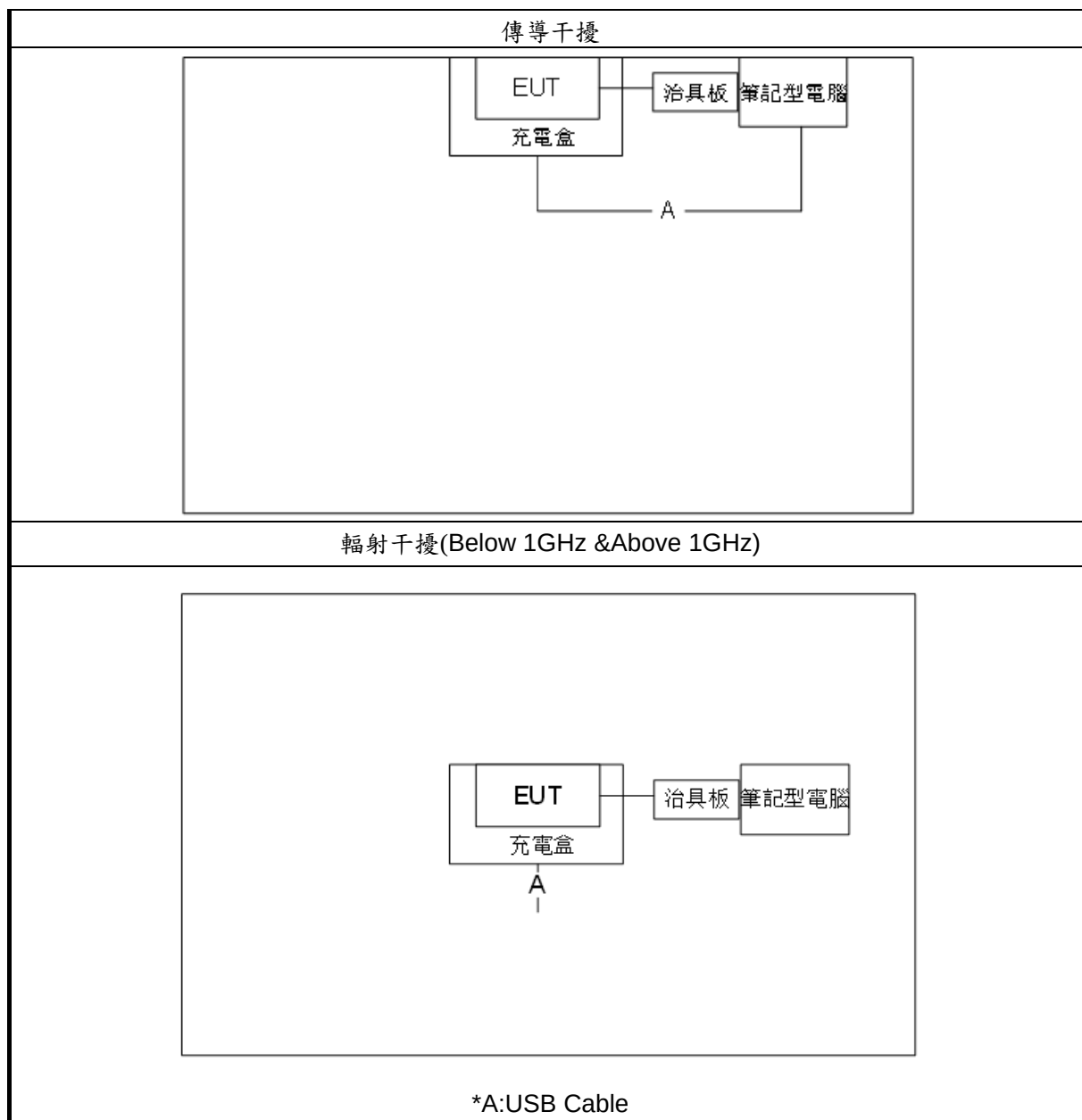
### 1.4. 測試模式之描述

- 電源傳導及輻射測試之測試軟體如下：
  - 將量測系統之全部電源打開。
  - EUT 連接治具，治具再連接電腦，電腦於 Win 7 作業系統下，EUT 進入 “BQB.exe” 來發射與接收訊號。(軟體版本號:無)
- 執行以下測試模式如下：

| Conducted Emissions from the AC mains power ports                                      |                                |
|----------------------------------------------------------------------------------------|--------------------------------|
| Test Mode                                                                              | Operating Description          |
| 1                                                                                      | GFSK (1Mbps) ,Transmitter Mode |
| 2                                                                                      | GFSK (1Mbps) ,Receiver Mode    |
| caused “Test Mode 1,2” generated the worst case, they were reported as the final data. |                                |
| Radiation Emissions (30MHz ~ 1GHz)                                                     |                                |
| Test Mode                                                                              | Operating Description          |
| 1                                                                                      | GFSK (1Mbps) ,Transmitter Mode |
| 2                                                                                      | GFSK (1Mbps) ,Receiver Mode    |
| caused “Test Mode 1,2” generated the worst case, they were reported as the final data. |                                |
| Radiation Emissions (1GHz ~ 25GHz)                                                     |                                |
| Test Mode                                                                              | Operating Description          |
| 1                                                                                      | GFSK (1Mbps) ,Transmitter Mode |
| 2                                                                                      | GFSK (1Mbps) ,Receiver Mode    |
| caused “Test Mode 1,2” generated the worst case, they were reported as the final data. |                                |



### 1.5. 受測裝置之系統說明



[本案經申請者切結器材不提供隨貨配件，配件由實驗室提供併同檢驗]，及其廠牌型號資訊如下：

| 輻射干擾(Below 1GHz) & 輻射干擾(above 1GHz) & 直量測試 |              |             |                    |                        |
|--------------------------------------------|--------------|-------------|--------------------|------------------------|
| Equipment                                  | Brand        | Model       | Length/Type        | Power cord/Length/Type |
| 筆記型電腦                                      | Sony         | PCG-71811P  | N/A                | 非隔離/1.8m               |
| 治具板                                        | QUALCOMM     | TRBI200     | 隔離/1m              | N/A                    |
| 充電盒 (隨貨)                                   | NOKIA        | E3511       | N/A                | N/A                    |
| USB Cable (隨貨)                             | 深圳市匯富源電子有限公司 | HFY2105-020 | 0.2m Non Shielding | N/A                    |



## 1.6. 測試場地

|          |                                                                                                        |
|----------|--------------------------------------------------------------------------------------------------------|
| 測試場地：    | 世騰電子科技股份有限公司測試實驗室<br>338 桃園市蘆竹區聯福街 2 巷 10 號                                                            |
| 測試電壓：    | AC 110V / 60Hz                                                                                         |
| 適用規範：    | 本測試報告之所有項目皆依據國家通訊傳播委員會低功率射頻器材技術規範以及參考 ANSI、FCC/47CFR/2.1046、2.1047、2.1049、2.1051、2.1053 及 2.1055 之檢驗法。 |
| 測試頻率：    | 電源傳導：從 150 kHz 到 30 MHz。<br>場強輻射：從 30 MHz 到 25000 MHz。                                                 |
| 測試天線的距離： | 場強輻射之測試距離為 3 M。                                                                                        |

| Test Item                        | Test Site  | Finish Date           | Environmental Conditions | Tested By |
|----------------------------------|------------|-----------------------|--------------------------|-----------|
| RF Conducted                     | RFCON01-NK | 2021/08/23~2021/08/30 | 22~25°C / 50~60%         | Nick Guan |
| Radiated Emissions               | 3M01-NK    | 2021/08/23~2021/08/30 | 22~25°C / 50~60%         | Nick Guan |
| AC Power Line Conducted Emission | CON02-NK   | 2021/08/23~2021/08/30 | 22~25°C / 50~60%         | Nick Guan |

## 1.7. 量測不確定度

| 量測項目                                     | 不確定度     |
|------------------------------------------|----------|
| AC Power Line Conduction(150K~30MHz)     | ±1.90dB  |
| Radiated Spurious Emission(9KHz~30MHz)   | ±3.405dB |
| Radiated Spurious Emission(30MHz~1GHz)   | ±5.636dB |
| Radiated Spurious Emission(1GHz~25GHz)   | ±6.621dB |
| Conducted Spurious Emission              | ±1.8dB   |
| 6dB Bandwidth                            | ±4.4%    |
| 20dB Bandwidth                           | ±4.4%    |
| Occupied Bandwidth                       | ±4.4%    |
| Peak Output Power(Conducted Power Meter) | ±1.1dB   |
| Dwell Time                               | ±1.2%    |
| Power Spectral Density                   | ±1.8dB   |
| Duty Cycle                               | ±1.2%    |



## 2. 測試儀器

| Test Item           | Radiated Emissions          |               |            |                  |            |
|---------------------|-----------------------------|---------------|------------|------------------|------------|
| Test Site           | Semi Anechoic Room(3M01-NK) |               |            |                  |            |
| Instrument          | Manufacturer                | Model No      | Serial No  | Calibration Date | Valid Date |
| Active Loop Antenna | EMCO                        | 6507          | 40855      | 2021/06/10       | 2022/06/09 |
| Bilog Antenna       | Sunol                       | JB1           | A080713    | 2020/10/07       | 2021/10/06 |
| Horn Antenna        | Schwarzbeck                 | BBHA 9120 D   | 9120D-1785 | 2020/10/16       | 2021/10/15 |
| Horn Antenna        | EMCO                        | 3116          | 31974      | 2020/09/24       | 2021/09/23 |
| EMI Receiver        | ROHDE & SCHWARZ             | ESR 7         | 101906     | 2021/05/20       | 2022/05/19 |
| Spectrum Analyzer   | ROHDE & SCHWARZ             | FSV 40-N      | 102151     | 2021/07/14       | 2022/07/13 |
| Preamplifier        | EM Electronics corp.        | EM330         | 60644      | 2020/09/22       | 2021/09/21 |
| Preamplifier        | EM Electronics corp.        | EM01G18G      | 60700      | 2021/5/20        | 2022/5/19  |
| Preamplifier        | EMC INSTRUMENTS             | EMC184045     | 980065     | 2020/11/06       | 2021/11/05 |
| Cable-1m(1G-40G)    | HUBER SUHNER                | EM104-SMSM    | MY4569/2   | 2021/06/29       | 2022/06/28 |
| Cable-6m(9k~300M)   | NA                          | EMC5D-BM-BM-6 | 130605     | 2020/09/18       | 2021/09/17 |
| Cable-9m(1G-40G)    | HUBER SUHNER                | EM104-SMSM    | MY5740/2   | 2021/06/29       | 2022/06/28 |
| Cable-0.5m(30M-1G)  | HUBER SUHNER                | RG-214        | Cable-08   | 2021/03/15       | 2022/03/14 |
| Cable-1m(30M-1G)    | HUBER SUHNER                | RG-214        | Cable-09   | 2021/03/15       | 2022/03/14 |
| Cable-6m(30M-1G)    | HUBER SUHNER                | RG-214        | Cable-10   | 2021/03/15       | 2022/03/14 |
| Cable-1.5m(1G-40G)  | HUBER SUHNER                | EM104-SMSM    | MY5739/2   | 2021/06/29       | 2022/06/28 |
| Cable-3m(30M-40G)   | HUBER SUHNER                | SUCOFLEX 102  | MY2608/2   | 2021/04/09       | 2022/04/08 |
| Cable-0.5m(30M-40G) | HUBER SUHNER                | SUCOFLEX 102  | 28420/2    | 2021/04/03       | 2022/04/02 |
| E3                  | AUDIX                       | v8.2014-8-6   | RK-000533  | NA               | NA         |

| Test Item           | RF Conducted |          |            |                  |            |
|---------------------|--------------|----------|------------|------------------|------------|
| Test Site           | RFCON01-NK   |          |            |                  |            |
| Instrument          | Manufacturer | Model No | Serial No  | Calibration Date | Valid Date |
| Spectrum Analyzer   | KEYSIGHT     | N9010A   | MY54200207 | 2021/04/21       | 2022/04/20 |
| CAX Signal Analyzer | KEYSIGHT     | N9000B   | MY57100339 | 2020/11/10       | 2021/11/09 |
| Attenuator          | KEYSIGHT     | 8491B    | MY39250705 | 2020/09/28       | 2021/09/27 |
| Power Meter         | Anritsu      | ML2495A  | 2034001    | 2020/09/25       | 2021/09/24 |
| Power Sensor        | Anritsu      | MA2411B  | 1207295    | 2021/04/14       | 2022/04/13 |

| Test Item                            | AC Power Line Conducted Emission |               |           |                  |            |
|--------------------------------------|----------------------------------|---------------|-----------|------------------|------------|
| Test Site                            | CON02-NK                         |               |           |                  |            |
| Instrument                           | Manufacturer                     | Model No      | Serial No | Calibration Date | Valid Date |
| EMI Receiver                         | ROHDE & SCHWARZ                  | ESCI          | 100443    | 2021/05/20       | 2022/05/19 |
| Line Impedance Stabilization Network | Schwarzbeck                      | NSLK 8127     | 8127-516  | 2020/09/26       | 2021/09/25 |
| TWO-LINE V-NETWORK                   | ROHDE & SCHWARZ                  | ENV216        | 102185    | 2020/07/30       | 2021/07/29 |
| Cable-6m(9k~300M)                    | NA                               | EMC5D-BM-BM-6 | 130605    | 2020/09/18       | 2021/09/17 |
| E3                                   | AUDIX                            | v8.2014-8-6   | RK-000536 | NA               | NA         |



### 3. 天線增益之要求

天線規格不受國家通訊傳播委員會低功率射頻器材技術規範(3.2)節規定之限制，其發射天線之方向性增益超過 6dBi 時，應依其所超過之 dB 數等量降低峰值輸出功率。如用於固定式點對點操作時，應符合下列情形之一：

操作於 2400-2483.5 兆赫(MHz)者，其發射天線之方向性增益超過 6dBi，應於每超過 3dB 降低 1dB 之峰值輸出功率。

操作於 5725-5850 兆赫(MHz)者，其發射天線之方向性增益超過 6dBi，不需降低峰值輸出功率。

#### 3.1. 天線型式及其增益

|                      |              |
|----------------------|--------------|
| 1.1 Brand :          | 深圳市天啟微科技有限公司 |
| 1.2 Model :          | HT-2012-C02  |
| 1.3 Antenna type :   | Chip Antenna |
| 1.4 Frequency Rang : | 2400-2484MHz |
| 1.5 Gain(peak) :     | 1.06dBi      |
| (參照天線規格資料)           |              |

#### 3.2. 結果判定

其發射天線之方向性增益低於 6dBi，因此無需降低峰值輸出功率。

## 4. 電源線傳導干擾之量測規定

### 4.1. 適用標準

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：

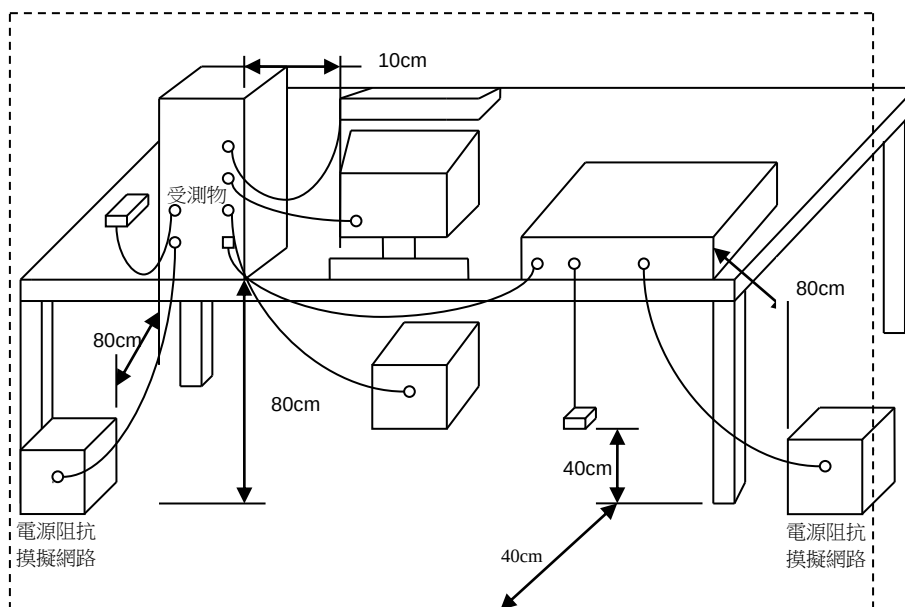
| 頻率範圍(MHz)  | 傳導限制值 (dB $\mu$ V) |              |
|------------|--------------------|--------------|
|            | 準峰值(Quasi-peak)    | 平均值(Average) |
| 0.15 ~ 0.5 | 66-56 (註)          | 56-46 (註)    |
| 0.5 ~ 5    | 56                 | 46           |
| 5 ~ 30     | 60                 | 50           |

註：隨頻率之對數遞減

### 4.2. 測試方法

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

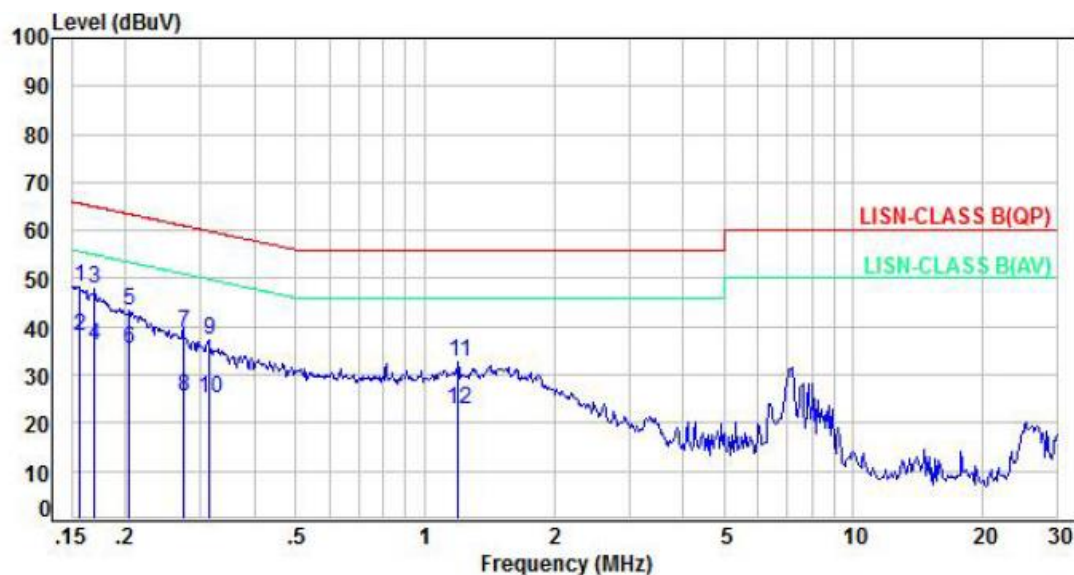
### 4.3. 傳導干擾之擺設





## 4.4. 傳導干擾之測試結果及數據

|           |                  |           |        |
|-----------|------------------|-----------|--------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : LINE |
| Test Mode | : Mode 1         |           | :      |



| No. | Frequency (MHz) | Factor (dB) | Reading (dBUV) | Level (dBUV) | Limit (dBUV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.16            | 9.65        | 38.55          | 48.20        | 65.65        | -17.45      | QP       | P   |
| 2   | 0.16            | 9.65        | 28.21          | 37.86        | 55.65        | -17.79      | Average  | P   |
| 3   | 0.17            | 9.65        | 38.21          | 47.86        | 64.99        | -17.13      | QP       | P   |
| 4   | 0.17            | 9.65        | 26.42          | 36.07        | 54.99        | -18.92      | Average  | P   |
| 5   | 0.20            | 9.64        | 33.71          | 43.35        | 63.45        | -20.10      | QP       | P   |
| 6   | 0.20            | 9.64        | 25.61          | 35.25        | 53.45        | -18.20      | Average  | P   |
| 7   | 0.27            | 9.64        | 29.18          | 38.82        | 61.03        | -22.21      | QP       | P   |
| 8   | 0.27            | 9.64        | 15.69          | 25.33        | 51.03        | -25.70      | Average  | P   |
| 9   | 0.31            | 9.63        | 27.51          | 37.14        | 59.88        | -22.74      | QP       | P   |
| 10  | 0.31            | 9.63        | 15.46          | 25.09        | 49.88        | -24.79      | Average  | P   |
| 11  | 1.20            | 9.67        | 23.07          | 32.74        | 56.00        | -23.26      | QP       | P   |
| 12  | 1.20            | 9.67        | 13.27          | 22.94        | 46.00        | -23.06      | Average  | P   |

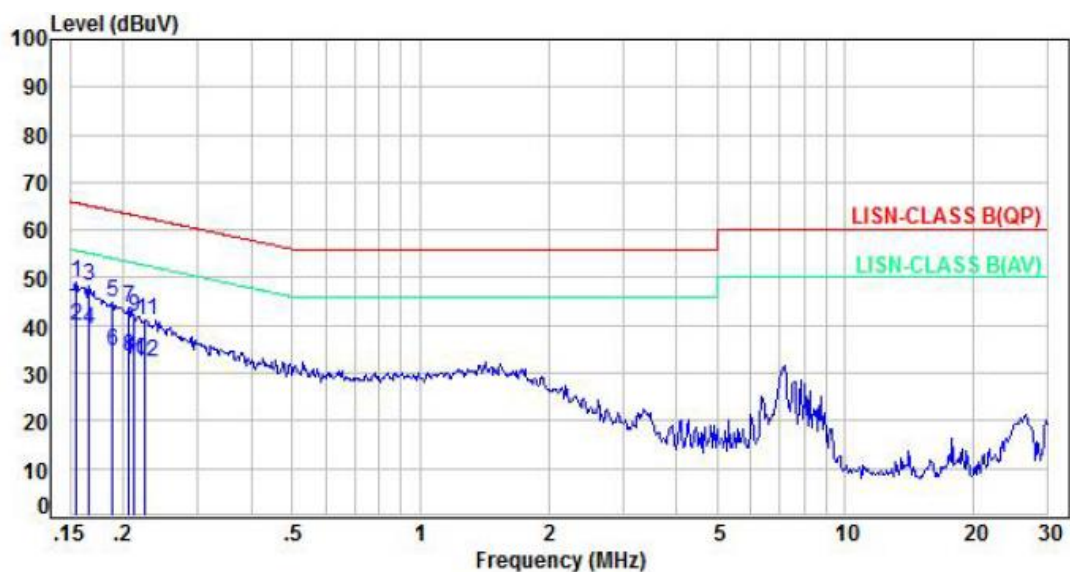
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



|           |                  |           |           |
|-----------|------------------|-----------|-----------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : NEUTRAL |
| Test Mode | : Mode 1         |           |           |



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.15            | 9.65        | 39.42          | 49.07        | 65.74        | -16.67      | QP       | P   |
| 2   | 0.15            | 9.65        | 30.30          | 39.95        | 55.74        | -15.79      | Average  | P   |
| 3   | 0.17            | 9.65        | 38.51          | 48.16        | 65.16        | -17.00      | QP       | P   |
| 4   | 0.17            | 9.65        | 29.40          | 39.05        | 55.16        | -16.11      | Average  | P   |
| 5   | 0.19            | 9.64        | 35.05          | 44.69        | 64.11        | -19.42      | QP       | P   |
| 6   | 0.19            | 9.64        | 25.04          | 34.68        | 54.11        | -19.43      | Average  | P   |
| 7   | 0.21            | 9.64        | 34.11          | 43.75        | 63.36        | -19.61      | QP       | P   |
| 8   | 0.21            | 9.64        | 23.92          | 33.56        | 53.36        | -19.80      | Average  | P   |
| 9   | 0.21            | 9.64        | 32.36          | 42.00        | 63.14        | -21.14      | QP       | P   |
| 10  | 0.21            | 9.64        | 22.98          | 32.62        | 53.14        | -20.52      | Average  | P   |
| 11  | 0.23            | 9.64        | 31.47          | 41.11        | 62.61        | -21.50      | QP       | P   |
| 12  | 0.23            | 9.64        | 22.59          | 32.23        | 52.61        | -20.38      | Average  | P   |

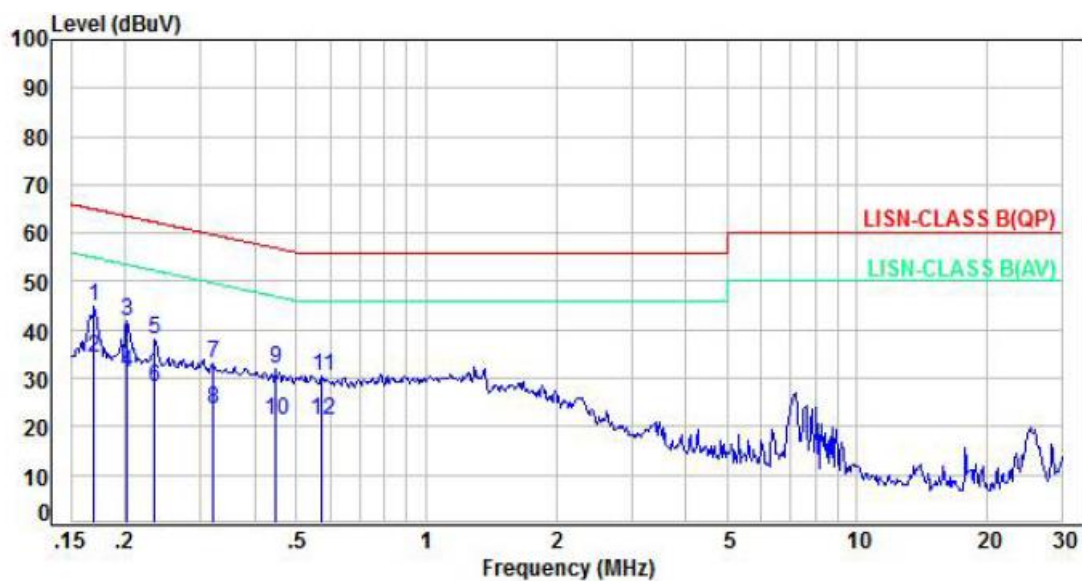
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



|           |                  |           |        |
|-----------|------------------|-----------|--------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : LINE |
| Test Mode | : Mode 2         |           | :      |



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.17            | 9.65        | 35.28          | 44.93        | 64.99        | -20.06      | QP       | P   |
| 2   | 0.17            | 9.65        | 24.47          | 34.12        | 54.99        | -20.87      | Average  | P   |
| 3   | 0.20            | 9.64        | 32.02          | 41.66        | 63.54        | -21.88      | QP       | P   |
| 4   | 0.20            | 9.64        | 21.61          | 31.25        | 53.54        | -22.29      | Average  | P   |
| 5   | 0.23            | 9.64        | 28.30          | 37.94        | 62.30        | -24.36      | QP       | P   |
| 6   | 0.23            | 9.64        | 18.39          | 28.03        | 52.30        | -24.27      | Average  | P   |
| 7   | 0.32            | 9.63        | 23.39          | 33.02        | 59.66        | -26.64      | QP       | P   |
| 8   | 0.32            | 9.63        | 13.93          | 23.56        | 49.66        | -26.10      | Average  | P   |
| 9   | 0.45            | 9.63        | 22.32          | 31.95        | 56.93        | -24.98      | QP       | P   |
| 10  | 0.45            | 9.63        | 11.80          | 21.43        | 46.93        | -25.50      | Average  | P   |
| 11  | 0.57            | 9.64        | 20.84          | 30.48        | 56.00        | -25.52      | QP       | P   |
| 12  | 0.57            | 9.64        | 11.50          | 21.14        | 46.00        | -24.86      | Average  | P   |

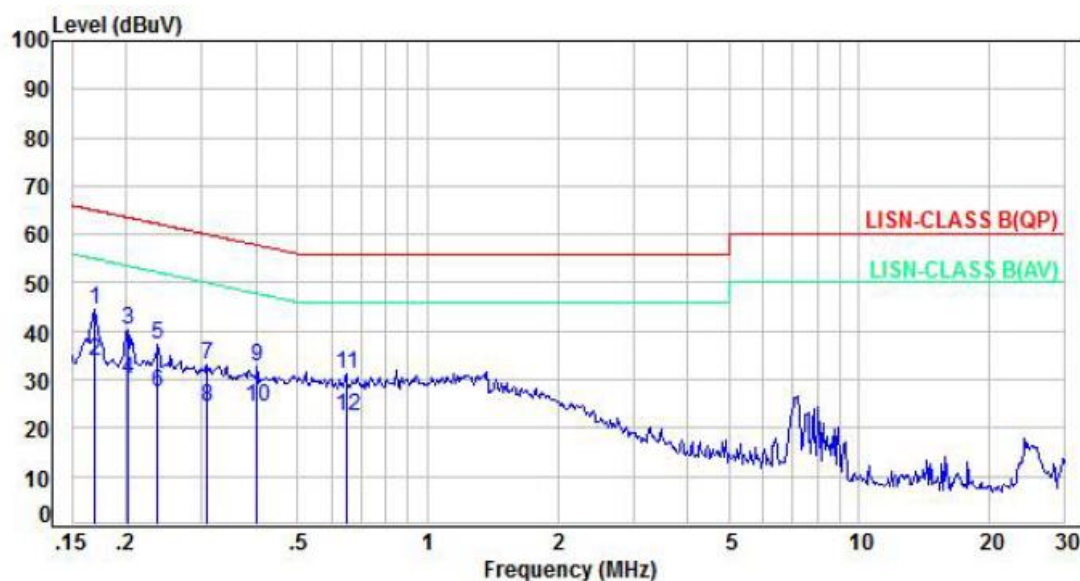
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



|           |                  |           |           |
|-----------|------------------|-----------|-----------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : NEUTRAL |
| Test Mode | : Mode 2         |           |           |



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.17            | 9.65        | 34.96          | 44.61        | 64.99        | -20.38      | QP       | P   |
| 2   | 0.17            | 9.65        | 24.16          | 33.81        | 54.99        | -21.18      | Average  | P   |
| 3   | 0.20            | 9.64        | 30.73          | 40.37        | 63.54        | -23.17      | QP       | P   |
| 4   | 0.20            | 9.64        | 20.55          | 30.19        | 53.54        | -23.35      | Average  | P   |
| 5   | 0.24            | 9.64        | 27.77          | 37.41        | 62.22        | -24.81      | QP       | P   |
| 6   | 0.24            | 9.64        | 17.68          | 27.32        | 52.22        | -24.90      | Average  | P   |
| 7   | 0.31            | 9.63        | 23.42          | 33.05        | 60.06        | -27.01      | QP       | P   |
| 8   | 0.31            | 9.63        | 14.53          | 24.16        | 50.06        | -25.90      | Average  | P   |
| 9   | 0.40            | 9.63        | 22.89          | 32.52        | 57.81        | -25.29      | QP       | P   |
| 10  | 0.40            | 9.63        | 14.79          | 24.42        | 47.81        | -23.39      | Average  | P   |
| 11  | 0.65            | 9.65        | 21.35          | 31.00        | 56.00        | -25.00      | QP       | P   |
| 12  | 0.65            | 9.65        | 12.91          | 22.56        | 46.00        | -23.44      | Average  | P   |

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss

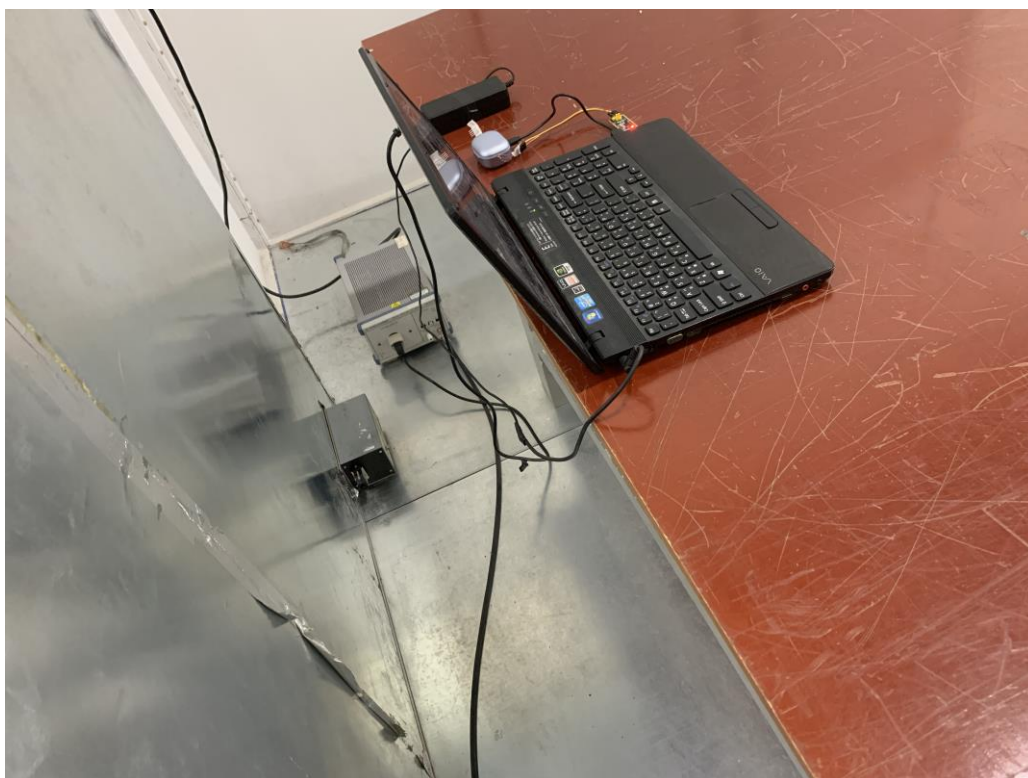


#### 4.5. 傳導量測之配置照片

正面照



側面照





## 5. 輻射之量測規定

### 5.1. 適用標準

依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.5 節之要求，落於 3.5 節禁用頻段之輻射干擾需符合 3.6 節之一般限制要求：

| 頻率(MHz)                | 測試距離(m) | 限制值(dB $\mu$ V) | 限制值( $\mu$ V/m) |
|------------------------|---------|-----------------|-----------------|
| 0.009 – 0.490 (含)      | 300     | 67.6 / f(kHz)   | 2400 / f(kHz)   |
| 0.490 (不含) – 1.705 (含) | 30      | 87.6 / f(kHz)   | 24000 / f(kHz)  |
| 1.705(不含) – 30(不含)     | 30      | 29.5            | 30              |
| 30 (含) – 88 (含)        | 3       | 40.0            | 100             |
| 88(不含) – 216 (含)       | 3       | 43.5            | 150             |
| 216(不含) – 960 (含)      | 3       | 46.0            | 200             |
| 960(不含)以上              | 3       | 54.0            | 500             |

### 5.2. 測試方法

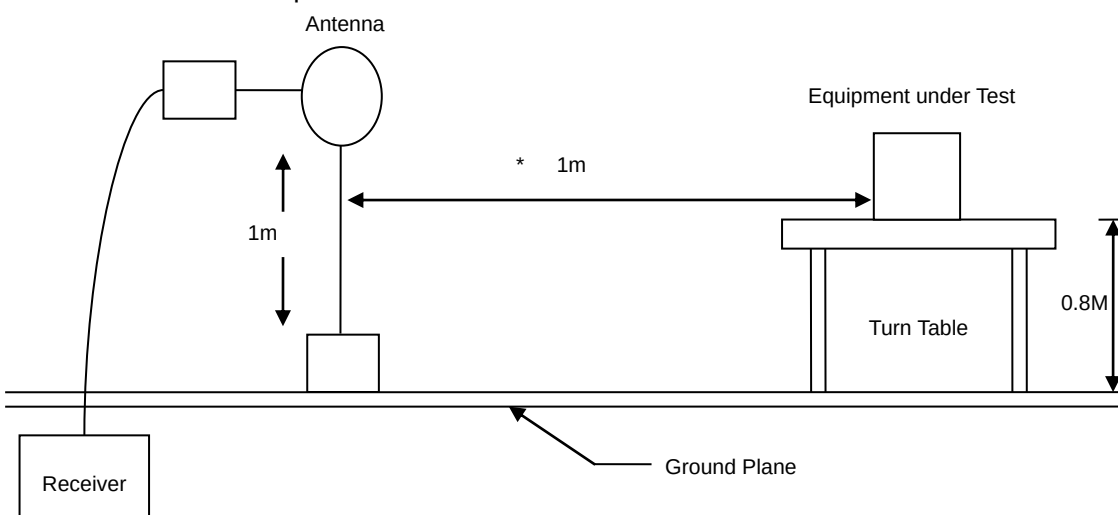
將待測物置於 0.8 米(Below 1G) & 1.5 米(Above 1G)高的非金屬桌面，使其在測試模式狀態，且設定為高、中、低各頻道產生最高峰值輸出功率的傳輸速率，接收天線置於 3 米外，且桌面要 360 度旋轉，另外接收天線也要從 1 米至 4 米升降變化，接收天線置於水平、垂直極向各執行測試一次。如待測物可以三軸相放置，並分別測試以找出最大輻射電場強度(最差的結果為 X 軸)。

備註：

For Below 1G 若待測物之輻射峰值低於限制值 3dB 以上，則將終止測試，並以峰值之讀值作為報告之記錄;反之，若無 3dB 餘裕範圍之輻射，則每一訊號皆以準峰值之測試方法量測，並記錄於報告之中

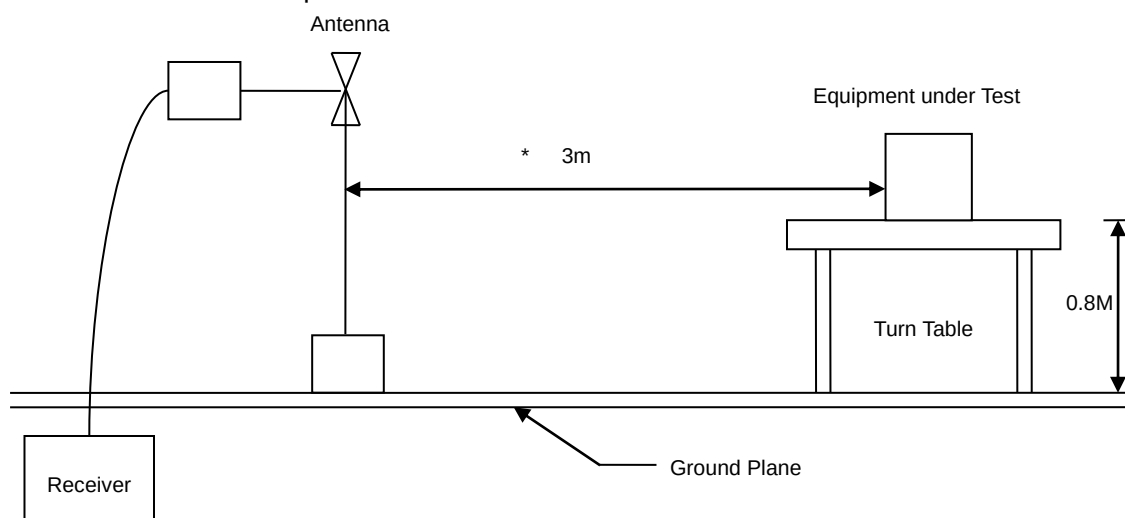
### 5.3. 輻射場地之擺設

Below 30MHz test setup

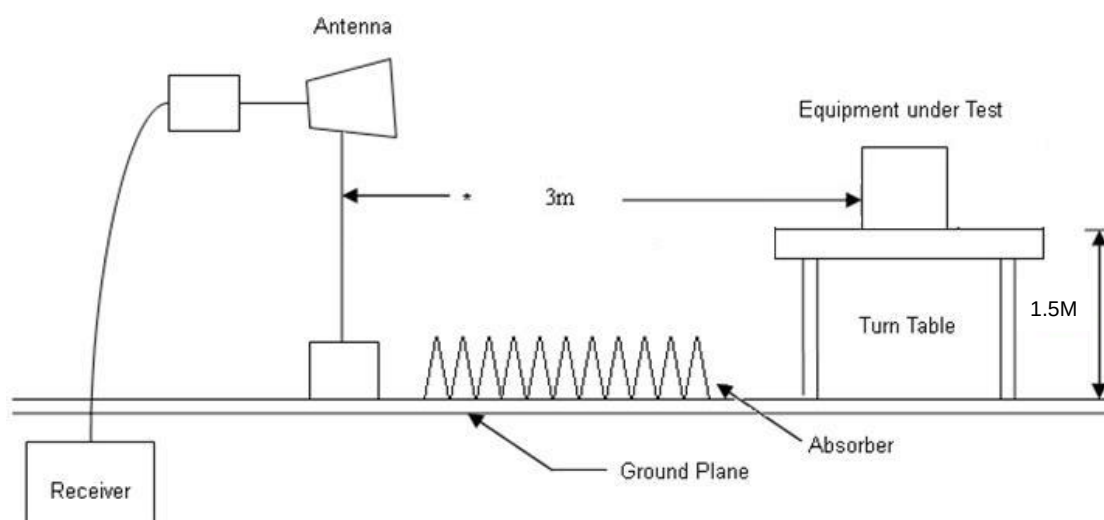




### 30MHz- 1GHz Test Setup



### Above 1GHz Test Setup



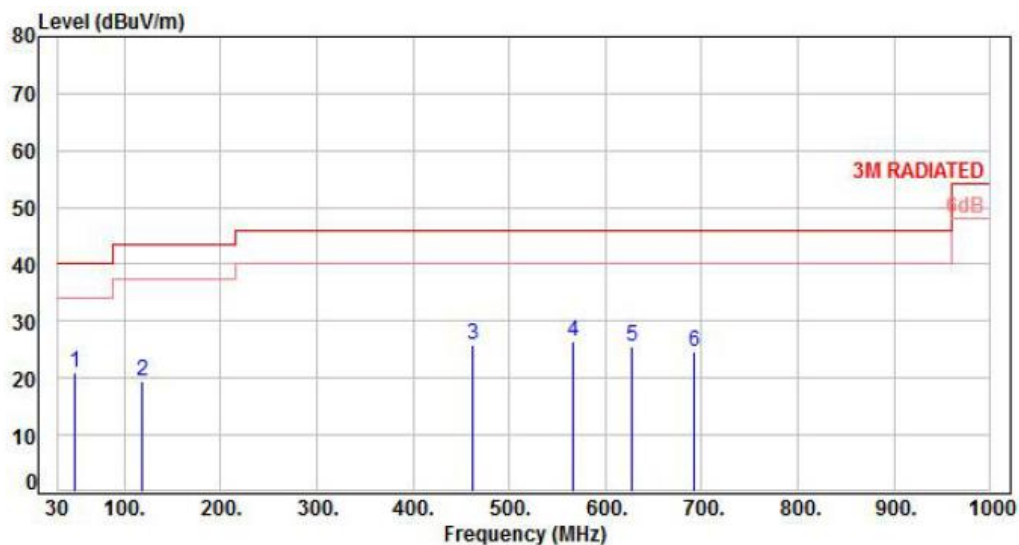


#### 5.4. 輻射之測試結果及數據 (9kHz ~ 30MHz)

The 9kHz - 30MHz spurious emission is under limit 20dB more.

#### 5.5. 輻射之測試結果及數據 (30MHz ~ 1GHz)

|           |                  |           |            |
|-----------|------------------|-----------|------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : VERTICAL |
| Test Mode | : Mode 1         |           | :          |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 48.43           | -15.19        | 36.12          | 20.93          | 40.00          | -19.07      | Peak     | 100         | 169           | P   |
| 2   | 118.27          | -10.24        | 29.63          | 19.39          | 43.50          | -24.11      | Peak     | 100         | 263           | P   |
| 3   | 461.65          | -5.71         | 31.54          | 25.83          | 46.00          | -20.17      | Peak     | 200         | 344           | P   |
| 4   | 566.41          | -3.68         | 30.04          | 26.36          | 46.00          | -19.64      | Peak     | 100         | 172           | P   |
| 5   | 627.52          | -2.74         | 28.25          | 25.51          | 46.00          | -20.49      | Peak     | 200         | 317           | P   |
| 6   | 691.54          | -1.95         | 26.70          | 24.75          | 46.00          | -21.25      | Peak     | 100         | 215           | P   |

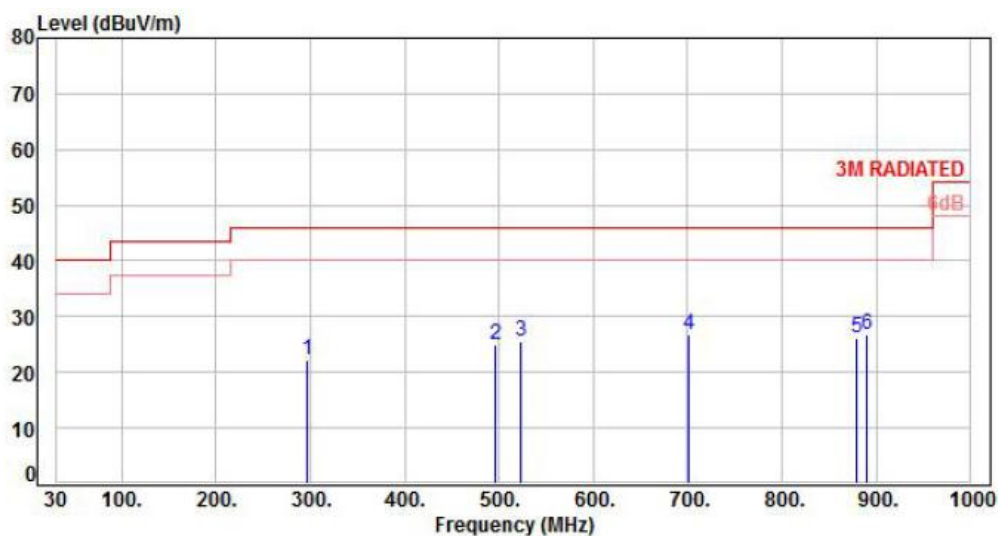
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



|           |                  |           |              |
|-----------|------------------|-----------|--------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : HORIZONTAL |
| Test Mode | : Mode 1         |           |              |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 296.75          | -9.65         | 31.96          | 22.31          | 46.00          | -23.69      | Peak     | 100         | 328           | P   |
| 2   | 495.60          | -4.81         | 29.62          | 24.81          | 46.00          | -21.19      | Peak     | 200         | 262           | P   |
| 3   | 523.73          | -4.54         | 30.04          | 25.50          | 46.00          | -20.50      | Peak     | 200         | 193           | P   |
| 4   | 701.24          | -1.80         | 28.43          | 26.63          | 46.00          | -19.37      | Peak     | 200         | 307           | P   |
| 5   | 878.75          | 0.95          | 25.13          | 26.08          | 46.00          | -19.92      | Peak     | 100         | 215           | P   |
| 6   | 889.42          | 1.17          | 25.49          | 26.66          | 46.00          | -19.34      | Peak     | 200         | 173           | P   |

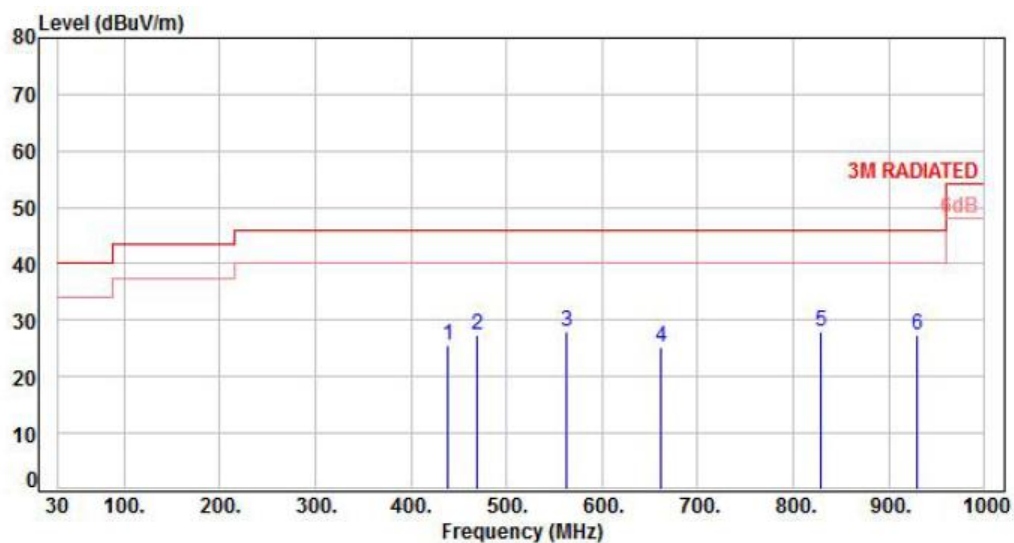
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



|           |                  |           |            |
|-----------|------------------|-----------|------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : VERTICAL |
| Test Mode | : Mode 2         |           |            |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 439.34          | -6.26         | 31.80          | 25.54          | 46.00          | -20.46      | Peak     | 100         | 251           | P   |
| 2   | 468.44          | -5.51         | 32.99          | 27.48          | 46.00          | -18.52      | Peak     | 200         | 93            | P   |
| 3   | 563.50          | -3.76         | 31.70          | 27.94          | 46.00          | -18.06      | Peak     | 200         | 267           | P   |
| 4   | 661.47          | -2.15         | 27.55          | 25.40          | 46.00          | -20.60      | Peak     | 100         | 192           | P   |
| 5   | 829.28          | 0.48          | 27.37          | 27.85          | 46.00          | -18.15      | Peak     | 200         | 226           | P   |
| 6   | 929.19          | 1.67          | 25.73          | 27.40          | 46.00          | -18.60      | Peak     | 100         | 313           | P   |

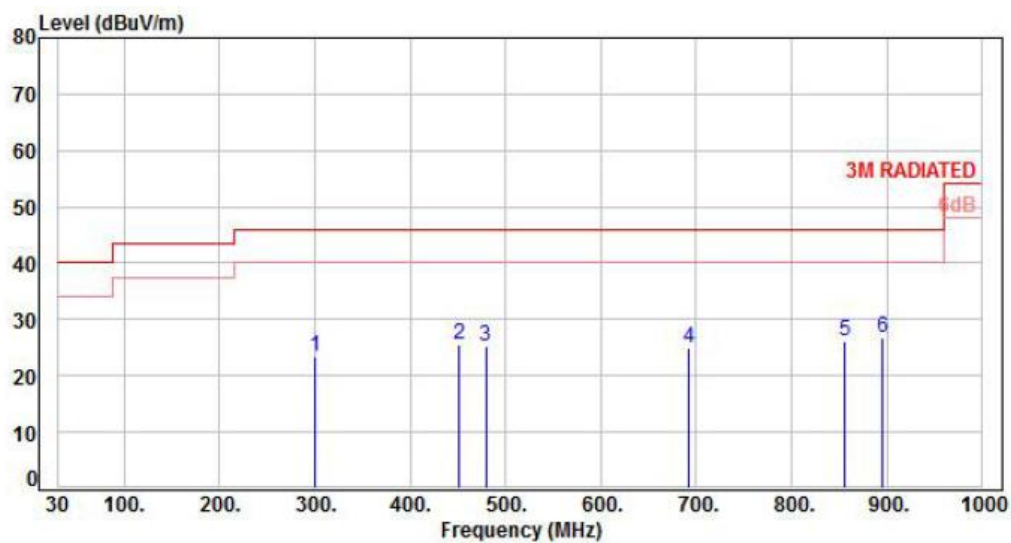
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



|           |                  |           |              |
|-----------|------------------|-----------|--------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : HORIZONTAL |
| Test Mode | : Mode 2         |           |              |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 299.66          | -9.57         | 32.99          | 23.42          | 46.00          | -22.58      | Peak     | 100         | 307           | P   |
| 2   | 451.95          | -5.97         | 31.50          | 25.53          | 46.00          | -20.47      | Peak     | 200         | 233           | P   |
| 3   | 479.11          | -5.06         | 30.19          | 25.13          | 46.00          | -20.87      | Peak     | 200         | 174           | P   |
| 4   | 692.51          | -1.94         | 26.99          | 25.05          | 46.00          | -20.95      | Peak     | 100         | 338           | P   |
| 5   | 855.47          | 0.77          | 25.41          | 26.18          | 46.00          | -19.82      | Peak     | 200         | 299           | P   |
| 6   | 895.24          | 1.40          | 25.40          | 26.80          | 46.00          | -19.20      | Peak     | 200         | 178           | P   |

Note: Level=Reading+Factor

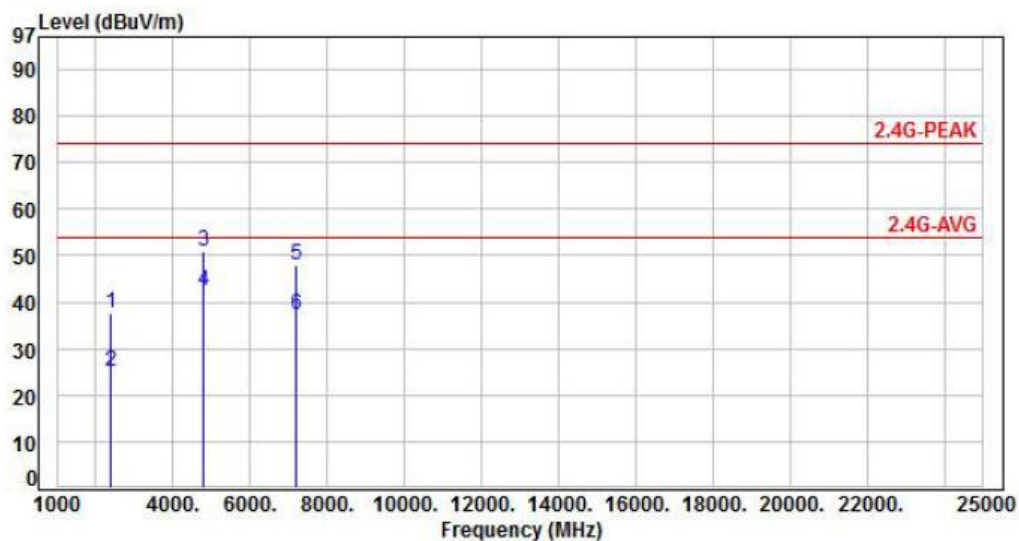
Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



## 5.6. 輻射之測試結果及數據 (1GHz ~ 25GHz)

|           |                  |           |            |
|-----------|------------------|-----------|------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : VERTICAL |
| Test Mode | : Mode 1, CH00   |           | :          |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 2390.00         | -30.60        | 68.28          | 37.68          | 74.00          | -36.32      | Peak     | 100         | 286           | P   |
| 2   | 2390.00         | -30.60        | 55.68          | 25.08          | 54.00          | -28.92      | Average  | 100         | 286           | P   |
| 3   | 4804.00         | -25.35        | 76.42          | 51.07          | 74.00          | -22.93      | Peak     | 100         | 324           | P   |
| 4   | 4804.00         | -25.35        | 67.62          | 42.27          | 54.00          | -11.73      | Average  | 100         | 324           | P   |
| 5   | 7206.00         | -19.76        | 67.61          | 47.85          | 74.00          | -26.15      | Peak     | 100         | 192           | P   |
| 6   | 7206.00         | -19.76        | 56.90          | 37.14          | 54.00          | -16.86      | Average  | 100         | 192           | P   |

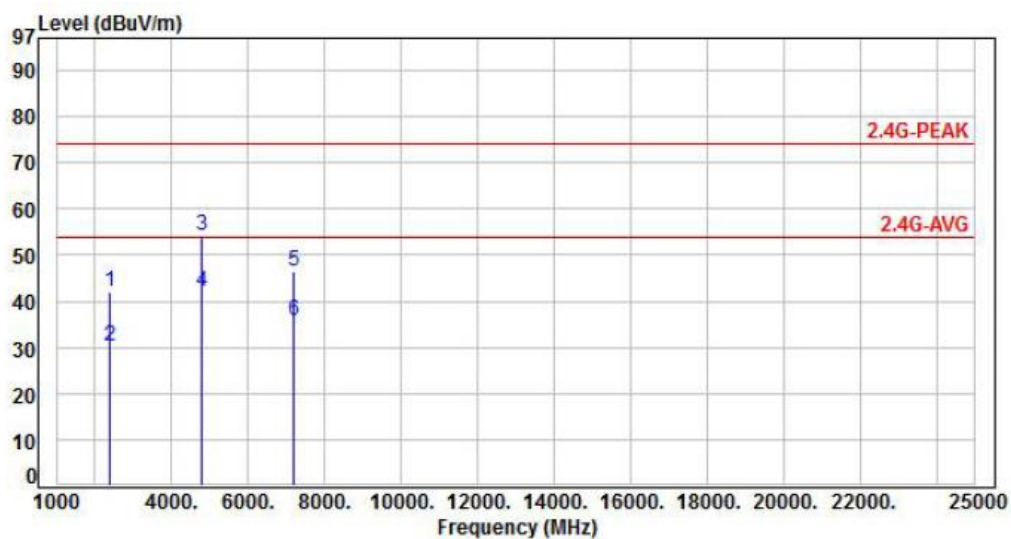
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



|           |                  |           |              |
|-----------|------------------|-----------|--------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : HORIZONTAL |
| Test Mode | : Mode 1, CH00   |           |              |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 2390.00         | -30.60        | 72.83          | 42.23          | 74.00          | -31.77      | Peak     | 100         | 43            | P   |
| 2   | 2390.00         | -30.60        | 60.66          | 30.06          | 54.00          | -23.94      | Average  | 100         | 43            | P   |
| 3   | 4804.00         | -25.35        | 79.59          | 54.24          | 74.00          | -19.76      | Peak     | 100         | 218           | P   |
| 4   | 4804.00         | -25.35        | 67.27          | 41.92          | 54.00          | -12.08      | Average  | 100         | 218           | P   |
| 5   | 7206.00         | -19.76        | 66.38          | 46.62          | 74.00          | -27.38      | Peak     | 100         | 337           | P   |
| 6   | 7206.00         | -19.76        | 55.48          | 35.72          | 54.00          | -18.28      | Average  | 100         | 337           | P   |

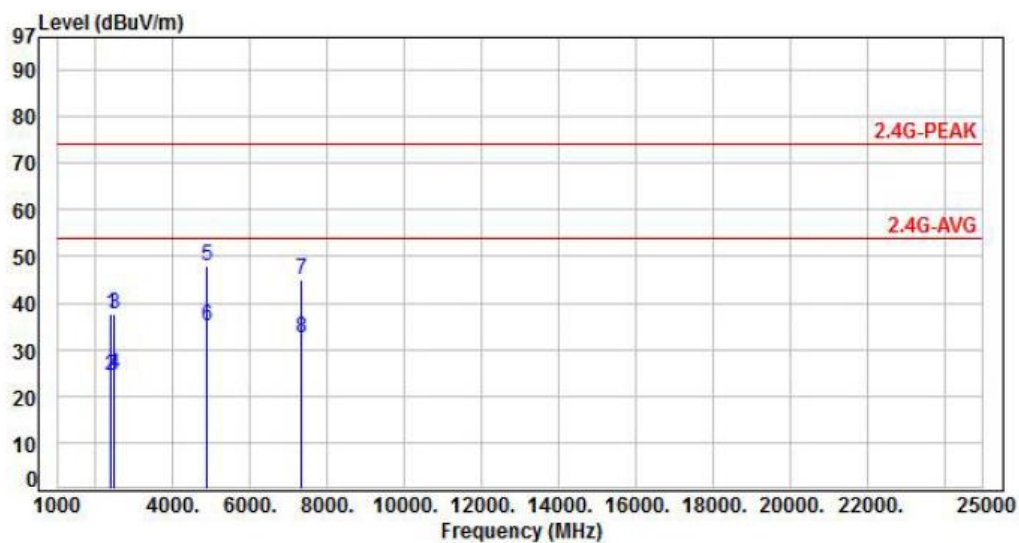
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



|           |                  |           |            |
|-----------|------------------|-----------|------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : VERTICAL |
| Test Mode | : Mode 1, CH19   |           | :          |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 2390.00         | -30.60        | 68.06          | 37.46          | 74.00          | -36.54      | Peak     | 100         | 262           | P   |
| 2   | 2390.00         | -30.60        | 54.99          | 24.39          | 54.00          | -29.61      | Average  | 100         | 262           | P   |
| 3   | 2483.50         | -30.72        | 68.33          | 37.61          | 74.00          | -36.39      | Peak     | 100         | 307           | P   |
| 4   | 2483.50         | -30.72        | 55.58          | 24.86          | 54.00          | -29.14      | Average  | 100         | 307           | P   |
| 5   | 4880.00         | -25.29        | 73.12          | 47.83          | 74.00          | -26.17      | Peak     | 100         | 326           | P   |
| 6   | 4880.00         | -25.29        | 60.23          | 34.94          | 54.00          | -19.06      | Average  | 100         | 326           | P   |
| 7   | 7320.00         | -19.59        | 64.56          | 44.97          | 74.00          | -29.03      | Peak     | 100         | 173           | P   |
| 8   | 7320.00         | -19.59        | 52.17          | 32.58          | 54.00          | -21.42      | Average  | 100         | 173           | P   |

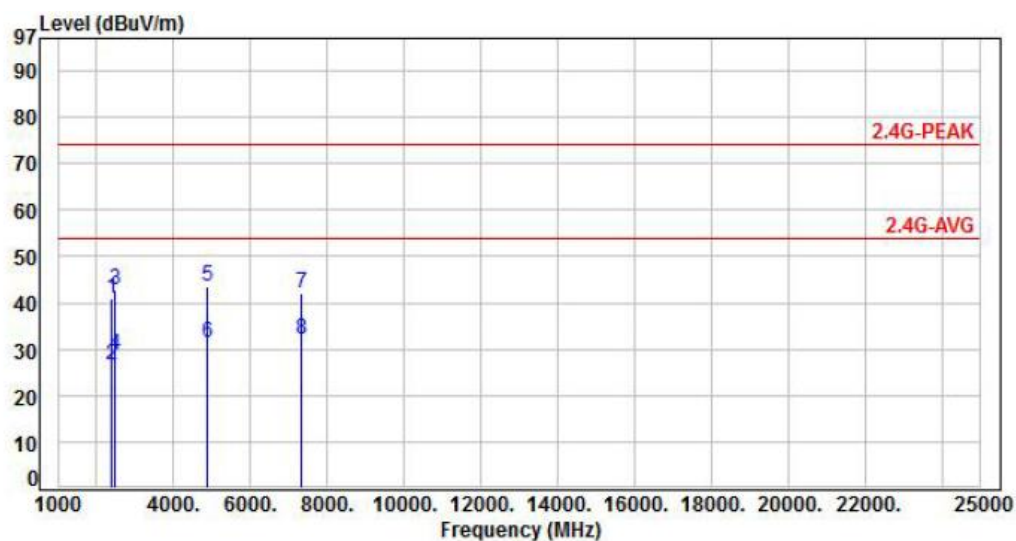
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



|           |                  |           |              |
|-----------|------------------|-----------|--------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : HORIZONTAL |
| Test Mode | : Mode 1, CH19   |           |              |

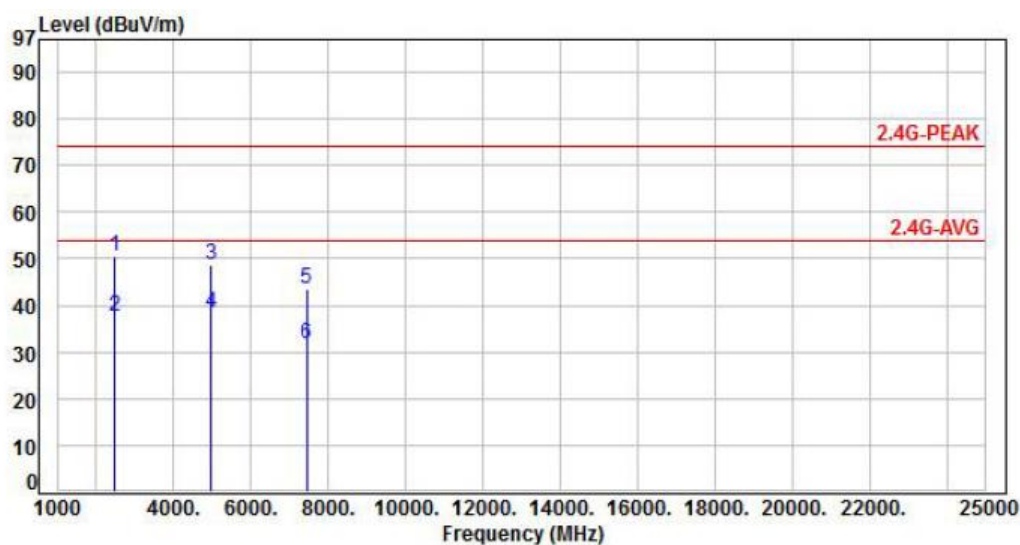


| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 2390.00         | -30.60        | 71.48          | 40.88          | 74.00          | -33.12      | Peak     | 100         | 337           | P   |
| 2   | 2390.00         | -30.60        | 57.27          | 26.67          | 54.00          | -27.33      | Average  | 100         | 337           | P   |
| 3   | 2483.50         | -30.72        | 73.47          | 42.75          | 74.00          | -31.25      | Peak     | 100         | 173           | P   |
| 4   | 2483.50         | -30.72        | 59.57          | 28.85          | 54.00          | -25.15      | Average  | 100         | 173           | P   |
| 5   | 4880.00         | -25.29        | 68.63          | 43.34          | 74.00          | -30.66      | Peak     | 100         | 185           | P   |
| 6   | 4880.00         | -25.29        | 56.52          | 31.23          | 54.00          | -22.77      | Average  | 100         | 185           | P   |
| 7   | 7320.00         | -19.59        | 61.80          | 42.21          | 74.00          | -31.79      | Peak     | 100         | 293           | P   |
| 8   | 7320.00         | -19.59        | 51.67          | 32.08          | 54.00          | -21.92      | Average  | 100         | 293           | P   |

Note: Level=Reading+Factor  
Margin=Level-Limit  
Factor=Antenna Factor + cable loss - Amplifier Factor



|           |                  |           |            |
|-----------|------------------|-----------|------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : VERTICAL |
| Test Mode | : Mode 1, CH39   |           | :          |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 2483.50         | -30.72        | 81.39          | 50.67          | 74.00          | -23.33      | Peak     | 100         | 293           | P   |
| 2   | 2483.50         | -30.72        | 68.34          | 37.62          | 54.00          | -16.38      | Average  | 100         | 293           | P   |
| 3   | 4960.00         | -25.09        | 73.94          | 48.85          | 74.00          | -25.15      | Peak     | 100         | 210           | P   |
| 4   | 4960.00         | -25.09        | 63.33          | 38.24          | 54.00          | -15.76      | Average  | 100         | 210           | P   |
| 5   | 7440.00         | -19.68        | 63.02          | 43.34          | 74.00          | -30.66      | Peak     | 100         | 318           | P   |
| 6   | 7440.00         | -19.68        | 51.41          | 31.73          | 54.00          | -22.27      | Average  | 100         | 318           | P   |

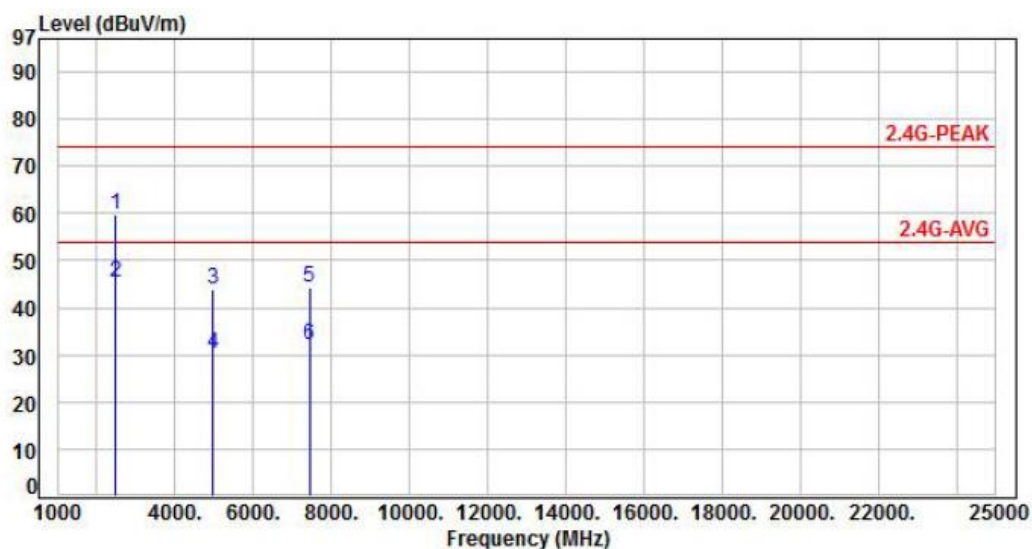
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



|           |                  |           |              |
|-----------|------------------|-----------|--------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : HORIZONTAL |
| Test Mode | : Mode 1, CH39   |           |              |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 2483.50         | -30.72        | 90.53          | 59.81          | 74.00          | -14.19      | Peak     | 100         | 314           | P   |
| 2   | 2483.50         | -30.72        | 76.14          | 45.42          | 54.00          | -8.58       | Average  | 100         | 314           | P   |
| 3   | 4960.00         | -25.09        | 69.15          | 44.06          | 74.00          | -29.94      | Peak     | 100         | 138           | P   |
| 4   | 4960.00         | -25.09        | 55.23          | 30.14          | 54.00          | -23.86      | Average  | 100         | 138           | P   |
| 5   | 7440.00         | -19.68        | 64.04          | 44.36          | 74.00          | -29.64      | Peak     | 100         | 286           | P   |
| 6   | 7440.00         | -19.68        | 51.87          | 32.19          | 54.00          | -21.81      | Average  | 100         | 286           | P   |

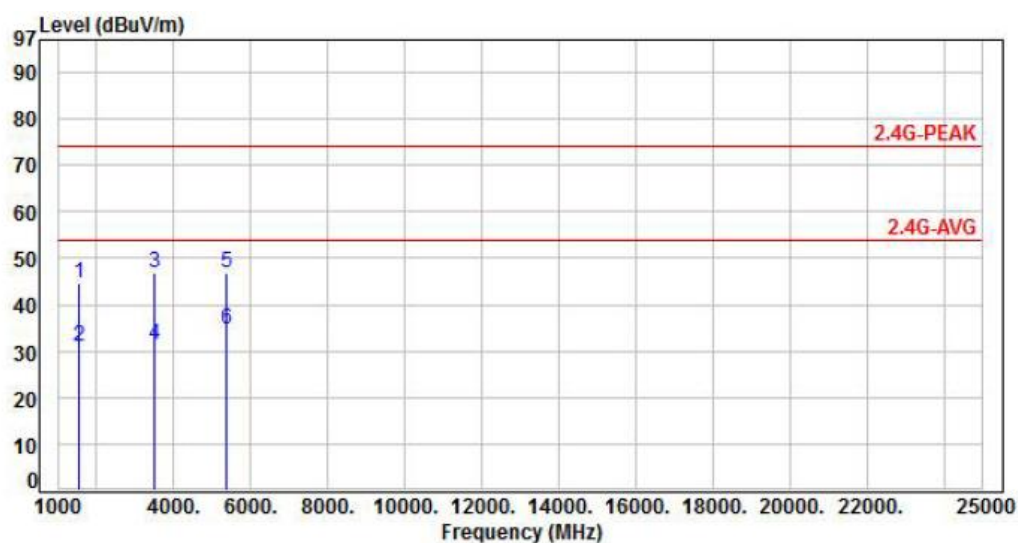
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



|           |                  |           |            |
|-----------|------------------|-----------|------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : VERTICAL |
| Test Mode | : Mode 2, CH00   |           |            |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 1532.00         | -33.69        | 78.40          | 44.71          | 74.00          | -29.29      | Peak     | 100         | 287           | P   |
| 2   | 1532.00         | -33.69        | 64.75          | 31.06          | 54.00          | -22.94      | Average  | 100         | 287           | P   |
| 3   | 3491.00         | -28.71        | 75.39          | 46.68          | 74.00          | -27.32      | Peak     | 100         | 176           | P   |
| 4   | 3491.00         | -28.71        | 59.97          | 31.26          | 54.00          | -22.74      | Average  | 100         | 176           | P   |
| 5   | 5361.00         | -24.87        | 71.70          | 46.83          | 74.00          | -27.17      | Peak     | 100         | 342           | P   |
| 6   | 5361.00         | -24.87        | 59.45          | 34.58          | 54.00          | -19.42      | Average  | 100         | 342           | P   |

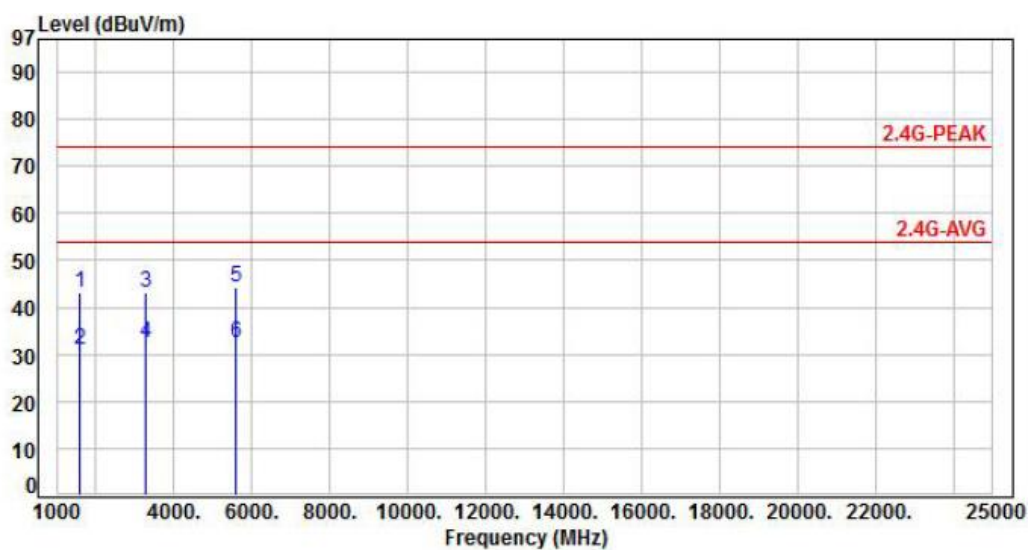
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



|           |                  |           |              |
|-----------|------------------|-----------|--------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : HORIZONTAL |
| Test Mode | : Mode 2, CH00   |           |              |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 1573.00         | -33.90        | 77.02          | 43.12          | 74.00          | -30.88      | Peak     | 100         | 253           | P   |
| 2   | 1573.00         | -33.90        | 64.92          | 31.02          | 54.00          | -22.98      | Average  | 100         | 253           | P   |
| 3   | 3291.00         | -29.12        | 72.16          | 43.04          | 74.00          | -30.96      | Peak     | 100         | 176           | P   |
| 4   | 3291.00         | -29.12        | 61.50          | 32.38          | 54.00          | -21.62      | Average  | 100         | 176           | P   |
| 5   | 5573.00         | -24.31        | 68.58          | 44.27          | 74.00          | -29.73      | Peak     | 100         | 353           | P   |
| 6   | 5573.00         | -24.31        | 56.59          | 32.28          | 54.00          | -21.72      | Average  | 100         | 353           | P   |

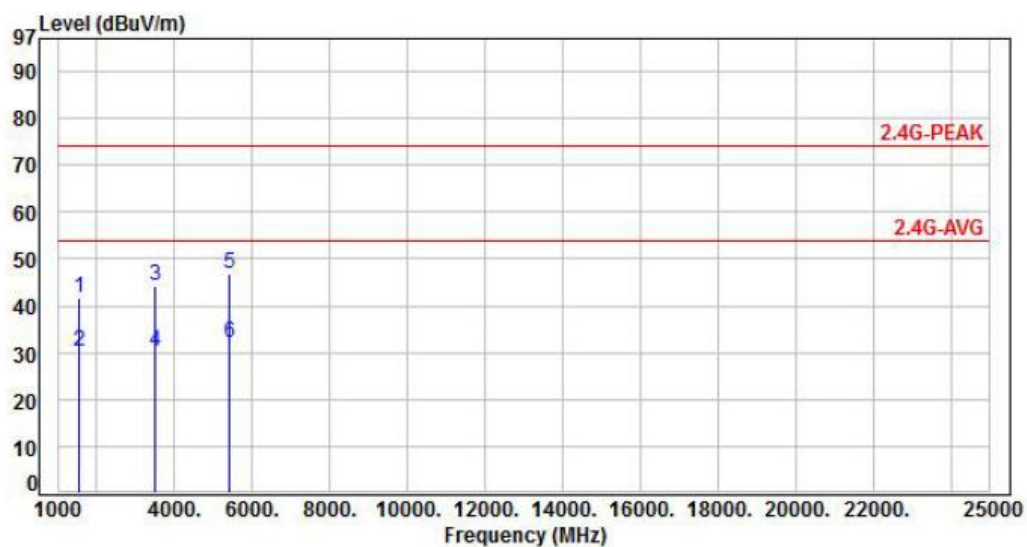
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



|           |                  |           |            |
|-----------|------------------|-----------|------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : VERTICAL |
| Test Mode | : Mode 2, CH19   |           | :          |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBUV) | Level (dBUV/m) | Limit (dBUV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 1539.00         | -33.72        | 75.34          | 41.62          | 74.00          | -32.38      | Peak     | 100         | 158           | P   |
| 2   | 1539.00         | -33.72        | 63.79          | 30.07          | 54.00          | -23.93      | Average  | 100         | 158           | P   |
| 3   | 3492.00         | -28.70        | 72.88          | 44.18          | 74.00          | -29.82      | Peak     | 100         | 282           | P   |
| 4   | 3492.00         | -28.70        | 59.07          | 30.37          | 54.00          | -23.63      | Average  | 100         | 282           | P   |
| 5   | 5417.00         | -24.59        | 71.42          | 46.83          | 74.00          | -27.17      | Peak     | 100         | 326           | P   |
| 6   | 5417.00         | -24.59        | 56.61          | 32.02          | 54.00          | -21.98      | Average  | 100         | 326           | P   |

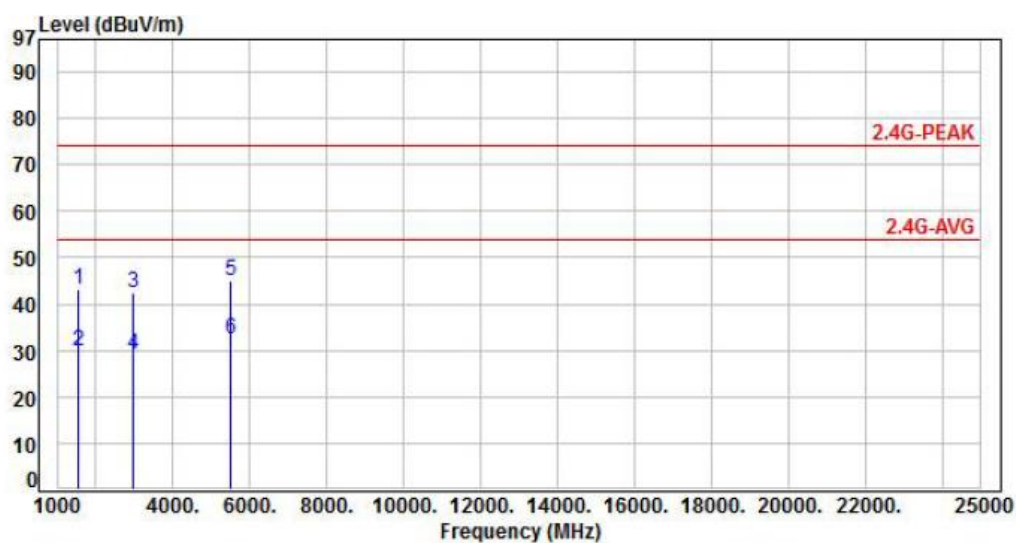
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



|           |                  |           |              |
|-----------|------------------|-----------|--------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : HORIZONTAL |
| Test Mode | : Mode 2, CH19   |           |              |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 1538.00         | -33.72        | 76.74          | 43.02          | 74.00          | -30.98      | Peak     | 100         | 295           | P   |
| 2   | 1538.00         | -33.72        | 63.74          | 30.02          | 54.00          | -23.98      | Average  | 100         | 295           | P   |
| 3   | 2983.00         | -29.31        | 71.58          | 42.27          | 74.00          | -31.73      | Peak     | 100         | 174           | P   |
| 4   | 2983.00         | -29.31        | 58.46          | 29.15          | 54.00          | -24.85      | Average  | 100         | 174           | P   |
| 5   | 5503.00         | -24.37        | 69.44          | 45.07          | 74.00          | -28.93      | Peak     | 100         | 327           | P   |
| 6   | 5503.00         | -24.37        | 56.75          | 32.38          | 54.00          | -21.62      | Average  | 100         | 327           | P   |

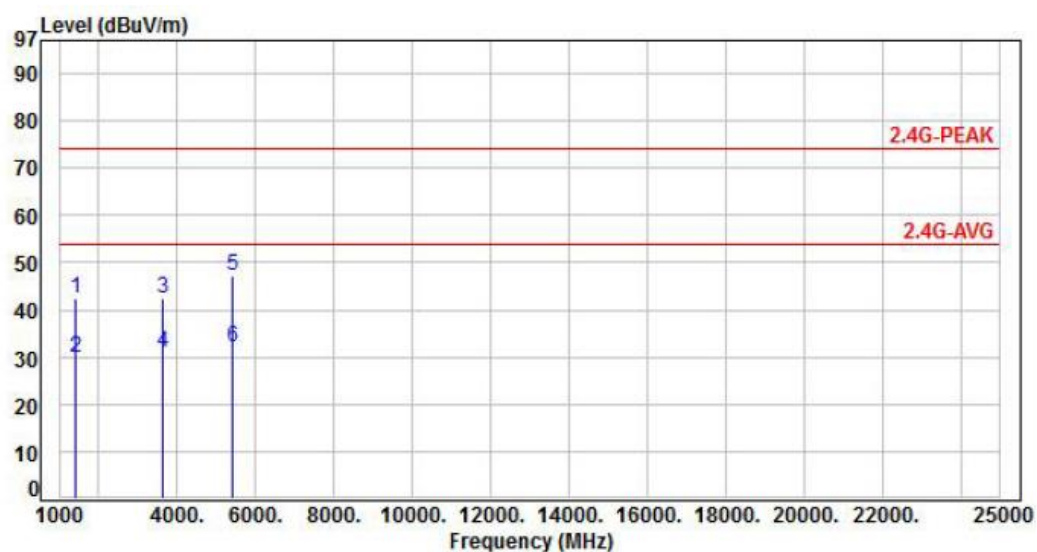
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



|           |                  |           |            |
|-----------|------------------|-----------|------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : VERTICAL |
| Test Mode | : Mode 2, CH39   |           | :          |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 1403.00         | -33.29        | 75.67          | 42.38          | 74.00          | -31.62      | Peak     | 100         | 149           | P   |
| 2   | 1403.00         | -33.29        | 63.34          | 30.05          | 54.00          | -23.95      | Average  | 100         | 149           | P   |
| 3   | 3617.00         | -28.15        | 70.54          | 42.39          | 74.00          | -31.61      | Peak     | 100         | 291           | P   |
| 4   | 3617.00         | -28.15        | 58.97          | 30.82          | 54.00          | -23.18      | Average  | 100         | 291           | P   |
| 5   | 5413.00         | -24.61        | 71.77          | 47.16          | 74.00          | -26.84      | Peak     | 100         | 348           | P   |
| 6   | 5413.00         | -24.61        | 56.76          | 32.15          | 54.00          | -21.85      | Average  | 100         | 348           | P   |

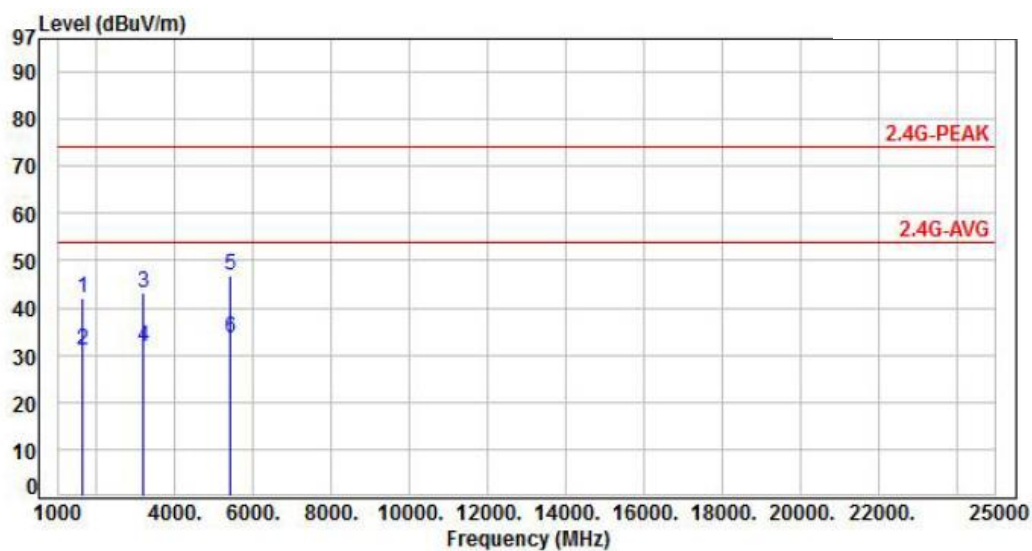
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



|           |                  |           |              |
|-----------|------------------|-----------|--------------|
| Power     | : AC 110V / 60Hz | Pol/Phase | : HORIZONTAL |
| Test Mode | : Mode 2, CH39   |           |              |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 1638.00         | -33.97        | 76.17          | 42.20          | 74.00          | -31.80      | Peak     | 100         | 163           | P   |
| 2   | 1638.00         | -33.97        | 65.01          | 31.04          | 54.00          | -22.96      | Average  | 100         | 163           | P   |
| 3   | 3208.00         | -28.81        | 71.88          | 43.07          | 74.00          | -30.93      | Peak     | 100         | 226           | P   |
| 4   | 3208.00         | -28.81        | 60.44          | 31.63          | 54.00          | -22.37      | Average  | 100         | 226           | P   |
| 5   | 5427.00         | -24.58        | 71.46          | 46.88          | 74.00          | -27.12      | Peak     | 100         | 320           | P   |
| 6   | 5427.00         | -24.58        | 58.26          | 33.68          | 54.00          | -20.32      | Average  | 100         | 320           | P   |

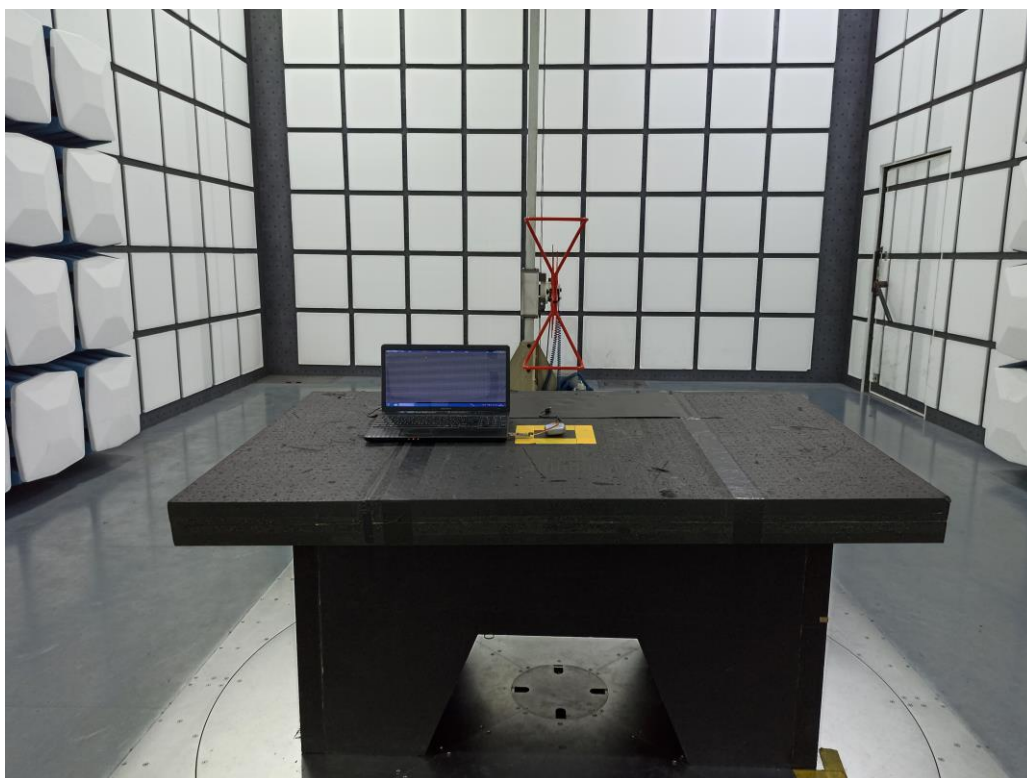
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor

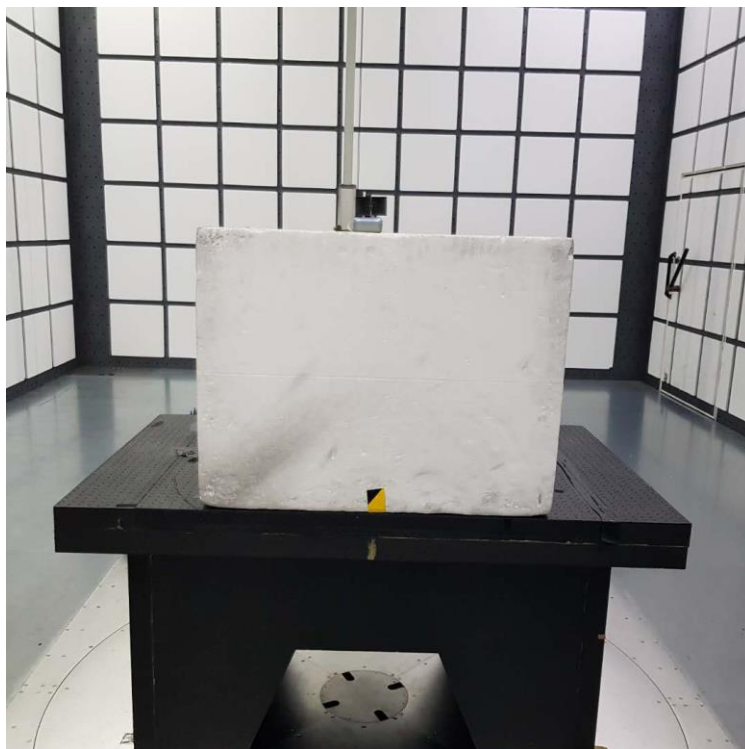


### 5.7. 輻射量測之配置照片(30MHz ~ 1GHz)





### 5.8. 輻射量測之配置照片 (1GHz ~ 25GHz)





## 6. On Time, Duty Cycle and Measurement methods

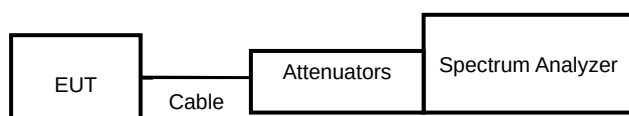
### 6.1. 適用標準

None; for reporting purposes only.

### 6.2. 測試方法

ANSI 63.10 第11.6節 Duty cycle zero-span mode Method.

### 6.3. 測試配置



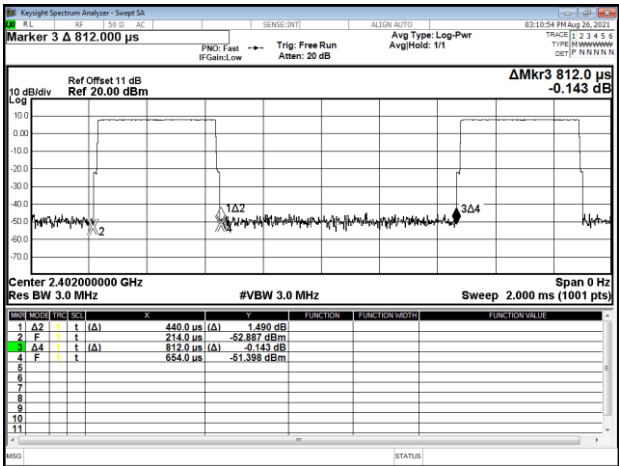
### 6.4. 測試結果及數據

| Modulation Mode | On Time (ms) | Period Time (ms) | Duty Cycle (%) |
|-----------------|--------------|------------------|----------------|
| GFSK(1Mbps)     | 0.44         | 1.25             | 35.14%         |

備註：繪圖資料請參考下頁。



Modulation Type: GFSK(1Mbps)





## 7. 6dB 頻寬之規定

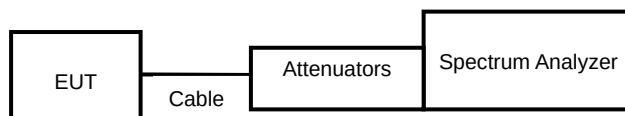
### 7.1. 適用標準

對使用數位調變技術之低功率發射機，依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.6 節之(2)(A)規定，6dB 頻寬至少應有 500 kHz。

### 7.2. 測試方法

- 將待測物和儀器相連接。
- 設定儀器解析頻寬 100KHz 和視訊頻寬為 300KHz。
- 量測峰值減去 6 dB 之頻寬並記錄於報告中。

### 7.3. 測試配置



### 7.4. 6dB 頻寬之測試結果及數據

| Modulation Type | Channel | Frequency (MHz) | 6dB Bandwidth (KHz) | Limit (KHz) |
|-----------------|---------|-----------------|---------------------|-------------|
| GFSK(1Mbps)     | 0       | 2402            | <b>662.40</b>       | 500         |
|                 | 19      | 2440            | 670.00              | 500         |
|                 | 39      | 2480            | 675.40              | 500         |

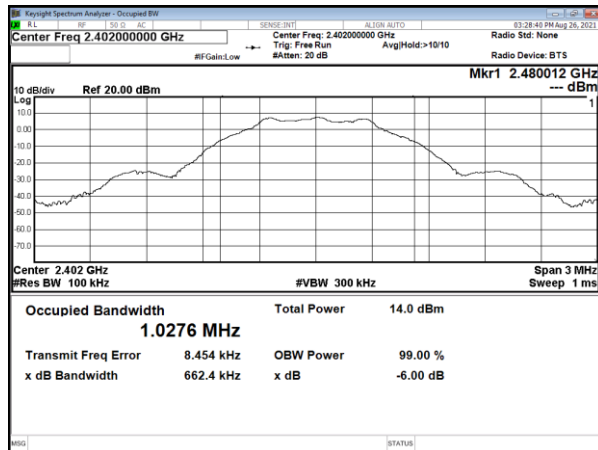
備註：繪圖資料請參考下頁。

### 7.5. 結果判定

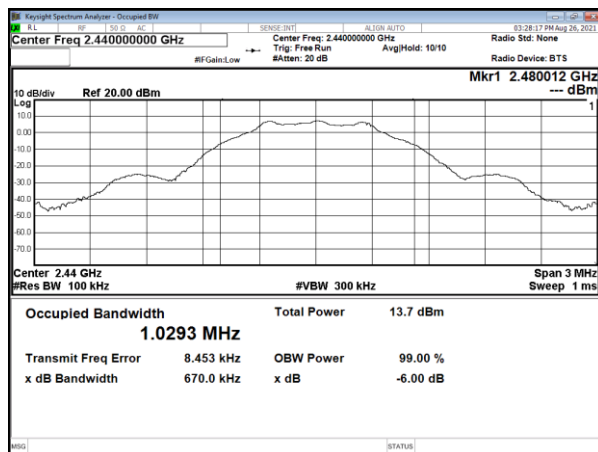
高、中、低頻段的 6dB 頻寬皆大於 500 KHz，合乎標準規定。



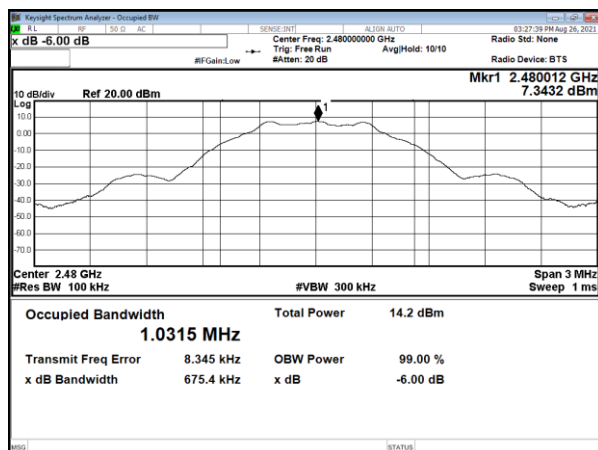
### Modulation Type: GFSK(1Mbps) CH00



### Modulation Type: GFSK(1Mbps) CH19



### Modulation Type: GFSK(1Mbps) CH39





## 8. 峰值輸出功率之規定

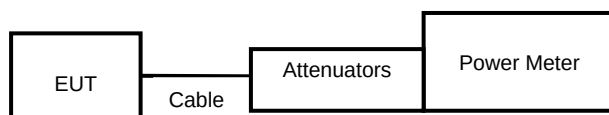
### 8.1. 適用標準

依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.2 節(1)(C)之規定，對使用數位調變技術之低功率發射機，其輸出峰值功率不得大於 1 Watt，且其所使用天線之增益不可大於 6dBi，若使用大於 6dBi 增益之天線，則其輸出峰值功率相對需衰減天線增益所增加之量(單位為 dB)。放寬之條件請參考天線增益之要求。

### 8.2. 測試方法

- 將待測物和儀器相連接。
- 量測輸出功率並記錄於報告中。

### 8.3. 測試配置



### 8.4. 峰值輸出功率之測試結果及數據

(BT 1Mbps)

| Modulation Standard | Channel | Frequency (MHz) | Power Output (dBm) | Peak Power Output (mW) |
|---------------------|---------|-----------------|--------------------|------------------------|
| GFSK                | 00      | 2402            | 8.76               | 7.516                  |
|                     | 19      | 2440            | 8.60               | 7.244                  |
|                     | 39      | 2480            | 8.82               | 7.621                  |

### 8.5. 結果判定

高、中、低頻段的峰值輸出功率皆低於 30 dBm，合乎標準規定。



## 9. 混附波發射限制之規定

### 9.1. 適用方法

依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.5 節之規定，使用頻帶範圍外之任意 100 千赫(kHz)內，發射器所產生的射頻功率相較於使用頻帶範圍中包含最高所需功率之 100 千赫(kHz)內的射頻功率，其衰減值限制如下：

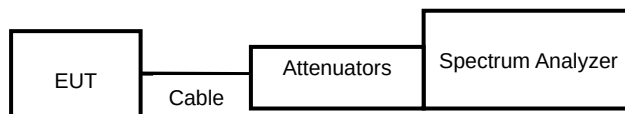
- (1) 輸出功率以峰值輸出功率方式量測者，至少需衰減 20dB，可使用射頻傳導或輻射方式測量。
- (2) 輸出功率以 4.10.1.2(1)(C)之最大傳導輸出功率測量方式者，至少需衰減 30dB，可使用射頻傳導或輻射方式測量。

此外，落於第 3.5 節禁用頻段之輻射發射，應符合第 3.6 節之規定。

### 9.2. 測試方法

1. 將待測物和儀器相連接。
2. 設定儀器解析頻寬為 100 kHz 和視訊頻寬為 300 kHz。
3. 將頻寬展開至 100 MHz。
4. 量測並記錄於報告中。

### 9.3. 測試配置



### 9.4. 結果判定

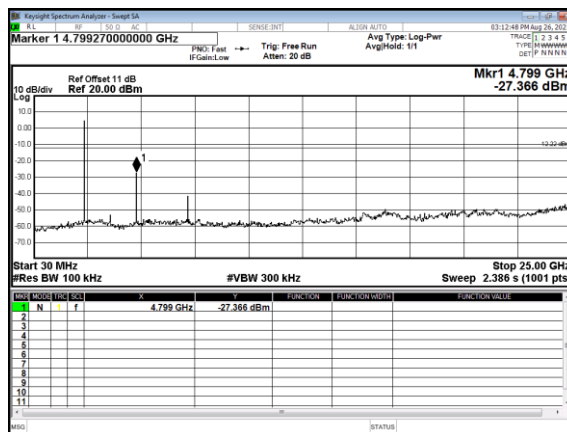
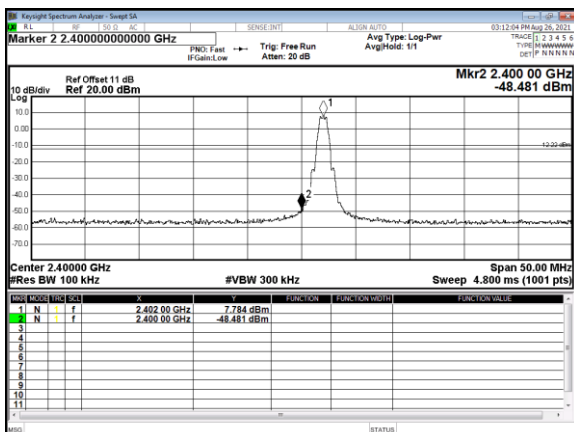
7.6.1 下邊緣頻帶：距下頻帶邊緣 40MHz 內最大混附波比主波低 20dB 以上，合乎標準規定。

7.6.2 上邊緣頻帶：距上頻帶邊緣 40MHz 內最大混附波比主波低 20dB 以上，合乎標準規定。

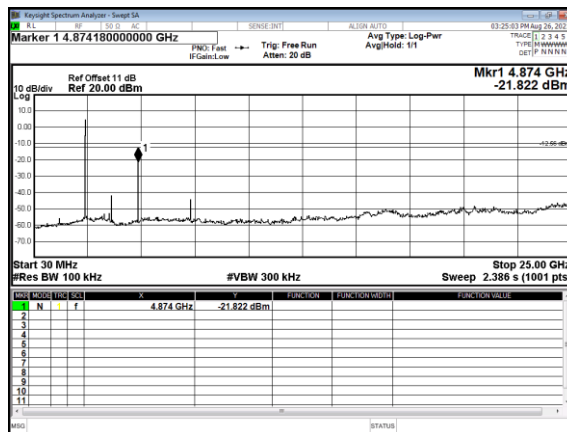
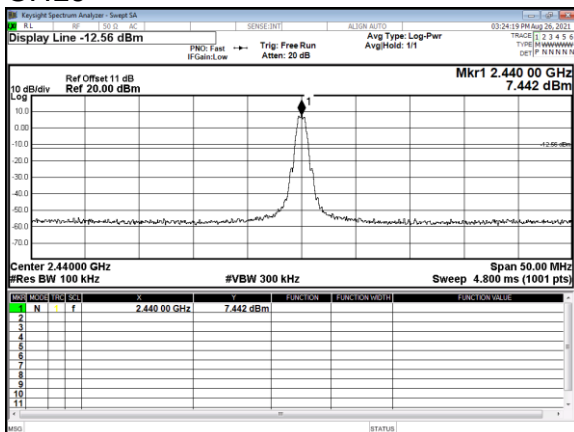
備註：繪圖資料請參考下頁。



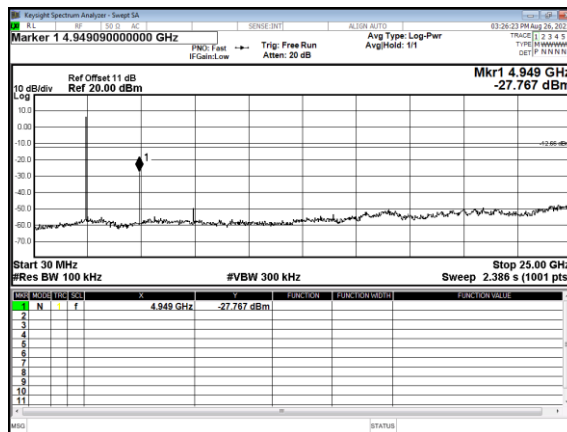
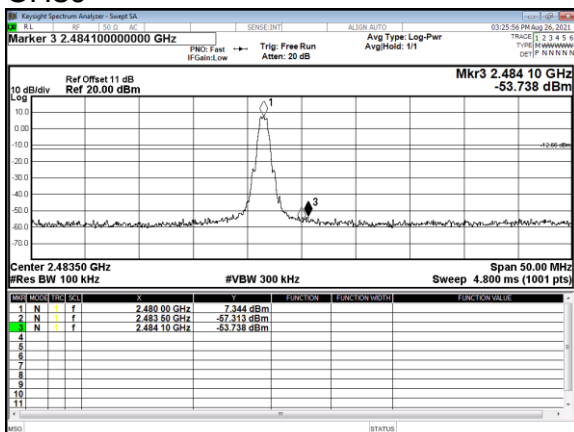
## Modulation Type: GFSK(1Mbps) Channel 00



## Modulation Type: GFSK(1Mbps) CH19



## Modulation Type: GFSK(1Mbps) CH39





## 10. 功率密度之規定

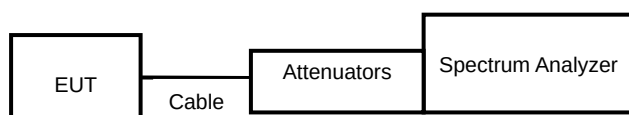
### 10.1. 適用標準

依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.6 節之(2)(B)規定，對數位調變技術系統，在使用任意 3 kHz 之頻寬內，由發射機傳導至天線之峰值發射電功率密度在任意期間內，皆不得大於 8dBm，且應依 4.10.1.3 之方式降低功率頻譜密度限制值。

### 10.2. 測試方法

1. 將待測物和儀器相連接。
2. 設定儀器解析頻寬為 3kHz、視訊頻寬為 10 kHz。
3. 量測並記錄於報告中。

### 10.3. 測試配置



### 10.4. 功率密度之量測結果及數據

| Modulation Type | Channel | Frequency (MHz) | Maximum Power Density of 3KHz Bandwidth(dBm) | Limit |
|-----------------|---------|-----------------|----------------------------------------------|-------|
| GFSK(1Mbps)     | 0       | 2402            | -8.704                                       | 8.00  |
|                 | 19      | 2440            | -8.841                                       | 8.00  |
|                 | 39      | 2480            | -8.429                                       | 8.00  |

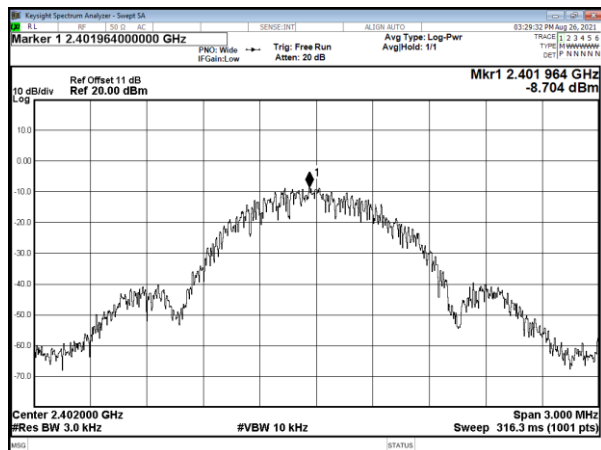
備註：繪圖資料請參考下頁。

### 10.5. 結果判定

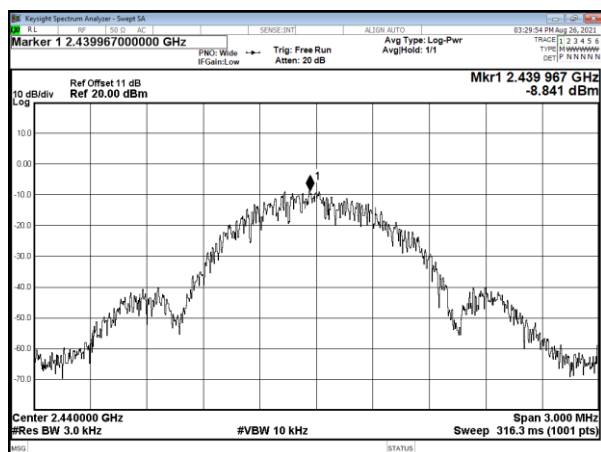
高、中、低頻段的3 kHz功率密度皆低於 8 dBm，合乎標準規定。



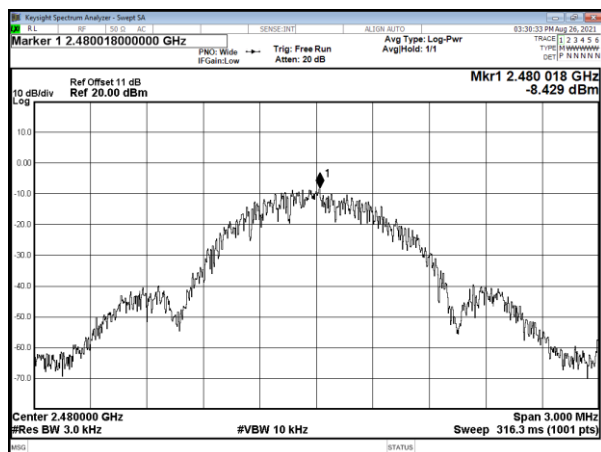
### Modulation Type: GFSK(1Mbps) CH00



### Modulation Type: GFSK(1Mbps) CH19



### Modulation Type: GFSK(1Mbps) CH39





## 11. 電波暴露量之評估

### 11.1. 適用標準

若受測物於正常操作模式下，其發射機距離人體 20 公分以內者，須測試電磁波能量比吸收率 (Specific Absorption Rate, SAR) 以證明其符電波暴露量之要求。限制值如下：

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$
$$f(\text{GHz}) \text{ is the RF channel transmit frequency in GHz}$$

Power and distance are rounded to the nearest mW and mm before calculation

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion.

### 11.2. 電波暴露量之評估結果及數據

| Modulation Mode | Channel Frequency (MHz) | Max. Conducted output power (dBm) | Max. Tune up power (dBm) | Max. Tune up power (mW) | Distance (mm) | SAR test exclusion thresholds (mW) |
|-----------------|-------------------------|-----------------------------------|--------------------------|-------------------------|---------------|------------------------------------|
| GFSK(1Mbps)     | 2402-2480               | 8.82                              | 9.82                     | 9.59                    | 5             | 10.00                              |

### 11.3. 結果判定

高、中、低頻段的電波暴露量皆低於限制值，合乎標準規定。



## 12. 限制使用之頻帶

Only spurious emissions are permitted in any of the frequency bands listed below:

| 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 |                 |

-----THE END OF REPORT-----