

# 低功率射頻器材 檢驗報告

|        |                                        |
|--------|----------------------------------------|
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| 製造廠商   | DENSO TEN Limited                      |
| 受檢設備名稱 | Car Navigation                         |
| 廠牌     | TOYOTA                                 |
| 型號     | TN0022C                                |
| 檢驗依據標準 | 國家通訊傳播委員會低功率射頻器材<br>技術規範<br>( LP0002 ) |
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實驗室認可編號及範圍：0371 (9 kHz to 325 GHz)

實驗室認可證書有效期限：110年10月31日



# 報告內容索引

|                     |           |
|---------------------|-----------|
| <b>1 一般資料</b>       | <b>5</b>  |
| 1.1 產品描述            | 5         |
| 1.2 產品特性            | 5         |
| 1.3 測試方法之依據         | 5         |
| <b>2 適用規範</b>       | <b>6</b>  |
| 2.1 規範要求            | 6         |
| 2.2 限制使用之頻帶         | 8         |
| <b>3 受測裝置之系統說明</b>  | <b>9</b>  |
| 3.1 受測裝置            | 9         |
| 3.2 測試模式說明          | 9         |
| <b>4 電源線傳導干擾之量測</b> | <b>17</b> |
| <b>5 天線增益之要求</b>    | <b>18</b> |
| 5.1 適用標準            | 18        |
| 5.2 天線增益            | 18        |
| 5.3 結果判定            | 18        |
| <b>6 發射頻寬之要求</b>    | <b>19</b> |
| 6.1 適用標準            | 19        |
| 6.2 測試配置            | 19        |
| 6.3 發射頻寬之量測儀器       | 19        |
| 6.4 量測結果            | 20        |
| 6.5 結果判定            | 28        |
| <b>7 峰值輸出功率之量測</b>  | <b>32</b> |
| 7.1 峰值適用標準          | 32        |
| 7.2 峰值輸出功率之測試配置     | 32        |
| 7.3 峰值輸出功率之量測儀器     | 32        |
| 7.4 峰值輸出功率之量測結果     | 33        |
| 7.5 結果判定            | 35        |
| <b>8 功率密度之量測</b>    | <b>36</b> |
| 8.1 適用標準            | 36        |
| 8.2 量測功率密度之配置       | 36        |
| 8.3 量測功率密度之儀器       | 36        |
| 8.4 量測結果            | 37        |
| 8.5 結果判定            | 45        |
| <b>9 混附波發射限制之量測</b> | <b>49</b> |

|                                              |            |
|----------------------------------------------|------------|
| 9.1 適用標準.....                                | 49         |
| 9.2 混附波發射限制之測試配置.....                        | 49         |
| 9.3 量測混附波發射限制之儀器.....                        | 49         |
| 9.4 混附波發射限制之量測結果 (傳導方式量測).....               | 49         |
| 9.5 結果判定.....                                | 61         |
| <b>10 場強輻射之量測.....</b>                       | <b>67</b>  |
| 10.1 適用標準.....                               | 67         |
| 10.2 量測方法.....                               | 67         |
| 10.3 量測場強輻射之儀器.....                          | 67         |
| 10.4 場強度之計算.....                             | 68         |
| 10.5 場強輻射之量測結果.....                          | 69         |
| 10.6 禁用頻段邊緣輻射場強之量測結果.....                    | 110        |
| 10.7 結果判定.....                               | 110        |
| 10.8 輻射之測試配置.....                            | 111        |
| 10.9 輻射量測之配置照片.....                          | 112        |
| <b>11 MAXIMUM PERMISSIBLE EXPOSURE .....</b> | <b>113</b> |
| <b>12 量測之儀器 .....</b>                        | <b>115</b> |

# 測試報告記錄

申請廠商：和泰汽車股份有限公司  
 製造廠商：DENSO TEN Limited  
 廠牌：TOYOTA  
 品名：Car Navigation  
 型號：TN0022C  
 檢驗依據標準：國家通訊傳播委員會低功率射頻器材技術規範(LP0002)  
 規範修訂日期109年07月01日  
 發射功率(電場強度)：17.37 dBm (發射功率)  
 工作頻率及調變方式：2412 ~ 2462 MHz / DSSS + OFDM  
 天線規格：內置固定式天線

- 備註：1. 本試驗報告中是描述本實驗室以最佳的知識和能力進行試驗，我們的責任僅限於合理與謹慎的試驗，並非確保賣方之法律和/或合同的義務。  
 2. 本符合性試驗係依據適當的標準及試驗樣品進行測試，其中量測不確定度可符合標準CISPR16-4-2及ETSI TR 100 028要求，則不列入測試結果考量。本試驗報告的結果僅與測試項目有關，且僅針對受試驗之樣品負責，無法確保產品生產過程中的品質與性能要求。  
 3. 非經本中心同意，檢驗報告不得摘錄複印使用。(全部複製除外)

| 項次 | 測試項目       | 適用規範                            | 量測設備     | 測試結果     | 結果判定         |
|----|------------|---------------------------------|----------|----------|--------------|
| 1  | 電源線傳導干擾之要求 | 低功率射頻器材技術規範<br>3.3節             | ----     | ----     | 因使用直流電源故無需測試 |
| 2  | 天線增益之要求    | 低功率射頻器材技術規範<br>4.10.1.3         | ----     | 請參閱5.2節  | ----         |
| 3  | 發射頻寬之要求    | 低功率射頻器材技術規範<br>4.10.1.6節之(2)(A) | 請參閱6.3節  | 請參閱6.4節  | 符合           |
| 4  | 峰值輸出功率之要求  | 低功率射頻器材技術規範<br>4.10.1.2節之(1)(C) | 請參閱7.3節  | 請參閱7.4節  | 符合           |
| 5  | 功率密度之要求    | 低功率射頻器材技術規範<br>4.10.1.6節之(2)(B) | 請參閱8.3節  | 請參閱8.4節  | 符合           |
| 6  | 混附波發射限制之要求 | 低功率射頻器材技術規範<br>4.10.1.5         | 請參閱9.3節  | 請參閱9.4節  | 符合           |
| 7  | 場強輻射之要求    | 低功率射頻器材技術規範<br>4.10.1.5         | 請參閱10.3節 | 請參閱10.5節 | 符合           |
| 8  | 電波暴露量之評估   | 低功率射頻器材技術規範<br>6.20             | 請參閱11節   | 請參閱11節   | 符合           |
|    | 以下空白       |                                 |          |          |              |

報告簽署人：

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## 1 一般資料

### 1.1 產品描述

- a) 產品型態 : Car Navigation  
 b) 商 標 : TOYOTA  
 c) 產品型號 : TN0022C  
 d) 供應電源 : DC 12V

備註：1.本產品內含WLAN、Bluetooth 及 Bluetooth LE無線技術，WLAN部份包含DTS頻帶。本報告僅記錄 DTS 部份，Bluetooth 部份請見ETC報告編號: 21-05-MAW-005-01，Bluetooth LE 部份請見ETC報告編號: 21-05-MAW-005-02。

2. 本案經申請者切結器材不提供隨貨配件，配件由實驗室(或申請者)提供併同檢驗。

### 1.2 產品特性

此裝置為 Car Navigation，內含之WLAN其發射頻率落於 2412 至 2462 MHz頻段分為 11 個頻道。採用 IEEE 802.11b/g/n HT20 直接序列展頻調變技術，最高資料傳送速度為 135 Mbps，調變方式為 DSSS (IEEE 802.11b)：DBPSK，DQPSK，CCK 以及 OFDM (IEEE 802.11g/n HT20)：BPSK，QPSK，16QAM，64QAM，其應用為區域網路無線傳輸。主波發射功率為 17.37 dBm，即為 54.58 mW，其頻道對應頻率如下：

| 頻道 | 對應頻率(MHz) | 頻道 | 對應頻率(MHz) |
|----|-----------|----|-----------|
| 01 | 2412      | 07 | 2442      |
| 02 | 2417      | 08 | 2447      |
| 03 | 2422      | 09 | 2452      |
| 04 | 2427      | 10 | 2457      |
| 05 | 2432      | 11 | 2462      |
| 06 | 2437      |    |           |

### 1.3 測試方法之依據

本測試報告之所有項目皆依據國家通訊傳播委員會低功率射頻器材技術規範以及參考 IEEE ANSI、歐盟ETSI EN與美國EIA、FCC 47 CFR PART 2、KDB及ARIB STD-T67 等有關檢驗之規定。

試驗室介紹：財團法人台灣商品檢測驗證中心電磁相容試驗室通過下列評鑑、認可、登錄與相互認可協議：

- ❶ ISO/IEC 17025 : TAF(0371), NVLAP(Lab code: 200133-0), CBTL(TÜ V SÜ D)
- ❷ Recognized : BSMI, NCC, FCC(TW0371, TW1112), ISED( Industry Canada Site # 2949A-2)
- ❸ Filing : VCCI (C-13518, R-13177, G-10098, T-11682)
- ❹ MRA : Australia, New Zealand, Singapore

## 2 適用規範

### 2.1 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，以市電為電源之低功率射頻器材，其傳導回電源線上頻率自150KHz~30MHz之射頻電壓(在電源端子每一電源線對接地點)應小於或等於下表所列之限制值。測量時應經過50微亨利及50歐姆之電源線阻抗穩定網路(Line Impedance Stabilization Network ; LISN)。頻率重疊處，以較低限制值為準。

| 頻率範圍<br>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

#### (2) 天線增益之要求

使用數位調變技術之低功率射頻器材，依據國家通訊傳播委員會低功率射頻器材技術規範4.10.1.3之規定，

(1)操作於2400 MHz~2483.5 MHz 頻段：

(A)進行固定式點對點操作時，其發射天線之方向性增益超過6 dBi，每超過3 dBi，最大傳導輸出功率限制值應降低1 dB。

(B)天線以多向波束發射方式(含同時發射或循序發射)將訊號導向多個接收機或接收機群組時，應符合下列規定：

(a)非同時發射多向波束者，所有載波或頻道傳輸至所有天線陣列或陣列群之總和傳導輸出功率應符合4.10.1.2 之功率限制值。如天線/天線陣列群之方向性增益超過6 dBi，每超過3 dBi，總和傳導輸出功率限制值應降低1 dB。方向性增益值應計算如下：

(i)方向性增益值=  $10\log(\text{天線陣列之單元數目})$  + 各單元中最高之方向性增益值。

(ii)天線陣列間之遮蔽效應或波束干涉損失能充分佐證時，方向性增益得低於(i)計算數值。

(b)同時發射多向波束於相同或不同頻道者，其每一波束功率應符合(a)之功率限制值。如發射波束有重疊現象，功率應降低，以確保總和傳導輸出功率符合(a)之限制值。同時發射的所有波束總和傳導輸出功率不大於(a) 總和傳導輸出功率限制值加8 dB。方向性增益值計算同(a)。

(c)發射機之天線具備單向波束功能者，應符合(1)(A)及(3)後段之規定。

(3)除(1)及(2)外，使用超過6 dBi 方向增益之發射天線時，應依超過6 dBi天線方向增益的dBi 總量，等量減少最大傳導輸出功率限制值。

**(3) 頻寬之要求**

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。

**(4) 峰值傳導輸出功率之要求**

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節之(1)(C)規定，數位調變技術系統：1 W(含) 以下。且其所使用天線之增益不可大於6 dBi，若使用大於6dBi增益之天線，則其峰值傳導輸出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。

**(5) 功率密度之要求**

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，在使用頻率範圍之任一3 kHz頻寬內，由發射機傳導至天線之功率頻譜密度在任意傳輸期間內，皆小於或等於8毫分貝(dBm)，且應依4.10.1.3之方式降低功率頻譜密度限制值。

**(6) 帶外發射限制之要求**

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

(1)輸出功率以附件二之峰值輸出功率方式測量者，至少須衰減20 dB，可使用射頻傳導或輻射方式測量。

(2)輸出功率以4.10.1.2(1)(C)之最大傳導輸出功率測量方式者，至少須衰減30 dB。

此外，落於3.5 禁用頻段之輻射發射，應符合3.6 之規定。

**(7) 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4.10.1.5之要求，落於3.5節禁用頻段之輻射發射，應符合3.6節之規定：

| 頻率(f)<br>MHz              | 電場強度<br>(微伏特/公尺, $\mu\text{V/m}$ ) | 測距<br>(公尺) |
|---------------------------|------------------------------------|------------|
| $0.009 \leq f \leq 0.490$ | $2400/f(\text{kHz})$               | 300        |
| $0.490 < f \leq 1.705$    | $24000/f(\text{kHz})$              | 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          |

## 2.2 限制使用之頻帶

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

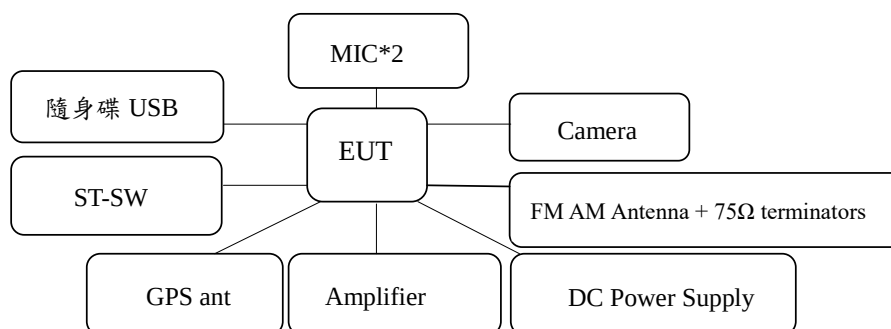
### 3 受測裝置之系統說明

#### 3.1 受測裝置

| 裝置名稱                            | 廠 牌                  | 型 號                                           | 纜線說明        |
|---------------------------------|----------------------|-----------------------------------------------|-------------|
| * Car Navigation                | TOYOTA               | TN0022C                                       | 非隔離電源線 1.5m |
| 隨身碟 USB                         | Kingston             | 100 G3 16GB                                   | ----        |
| FM AM Antenna + 75Ω terminators | DENSO TEN            | 146000-63300101(MAIN)<br>146000-63400101(SUB) | 非隔離 2.5m    |
| ST-SW                           | TOKAI RIKA CO., LTD. | 84250-33500                                   | ----        |
| GPS Antenna                     | DENSO TEN            | 195000-02900700                               | 非隔離 8m      |
| Amplifier                       | Harman               | 86280-42080                                   | ----        |
| MIC*2                           | Panasonic            | 86730-11010                                   | 非隔離 0.3m    |
| Camera                          | Panasonic            | 867B0-78080                                   | 非隔離 6.8m    |
| DC Power Supply                 | GW                   | GPS-1850                                      | 非隔離 1.8m    |
| Main-Cable                      | ITF Co., Ltd.        | -                                             | 非隔離 2.0m    |
| USB-Cable                       | KANADEN CORPORATION  | C7746-MX39J-MX59A-F2-F1-L3000                 | 非隔離 1.0m    |

註: 1.標記“\*”表欲申請之受測物及配件。

2.測試配置：



3. 軟體設定:

|       |                                                              |
|-------|--------------------------------------------------------------|
| 軟體名稱: | WLANTEST.exe                                                 |
| 軟體設定: | Power: 802.11b ➔ Data rate 1 Mbps (經驗證為最差模式) ; Power Set: 14 |
|       | 802.11g ➔ Data rate 6 Mbps (經驗證為最差模式) ; Power Set: 6         |
|       | 802.11n HT20 MCS0 (經驗證為最差模式) ; Power Set: 6                  |

#### 3.2 測試模式說明

##### 3.2.1 調變方式及模式

| Test Mode | Modulation        | Worse Case |
|-----------|-------------------|------------|
| A         | IEEE 802.11b      | B (註1)     |
| B         | IEEE 802.11g      |            |
| C         | IEEE 802.11n HT20 |            |

| Test Channel | Frequency (MHz) |
|--------------|-----------------|
| Channel Low  | 2412            |
| Channel Mid  | 2437            |
| Channel High | 2462            |

Normal Mode:

| Test Mode | Note      |
|-----------|-----------|
| D         | USB Link  |
| E         | BT Link   |
| F         | WiFi Link |

## 3.2.2 測試項目及模式

| Item | 測試項目            | 測試模式(註1)   | 測試頻道           |
|------|-----------------|------------|----------------|
| 1    | 電源線傳導干擾之量測      | -          | -              |
| 2    | 發射頻寬之量測         | A, B, C    | L, M, H        |
| 3    | 峰值輸出功率之量測       | A, B, C    | L, M, H        |
| 4    | 功率密度之量測         | A, B, C    | L, M, H        |
| 5    | 混附波發射限制之量測      | A, B, C    | L, M, H        |
| 6    | 場強輻射之量測(主諧波)    | A, B, C    | L, M, H        |
| 6.1  | 場強輻射之量測(1GHz以下) | B, D, E, F | M (Worse Case) |
| 6.2  | 場強輻射之量測(1GHz以上) | B, D, E, F | L, M, H        |
| 7    | 電波暴露量之評估        | B (註 3)    | M (註 3)        |

註: 1. 各調變預掃時無差異，擇一作最終測試並記錄之。

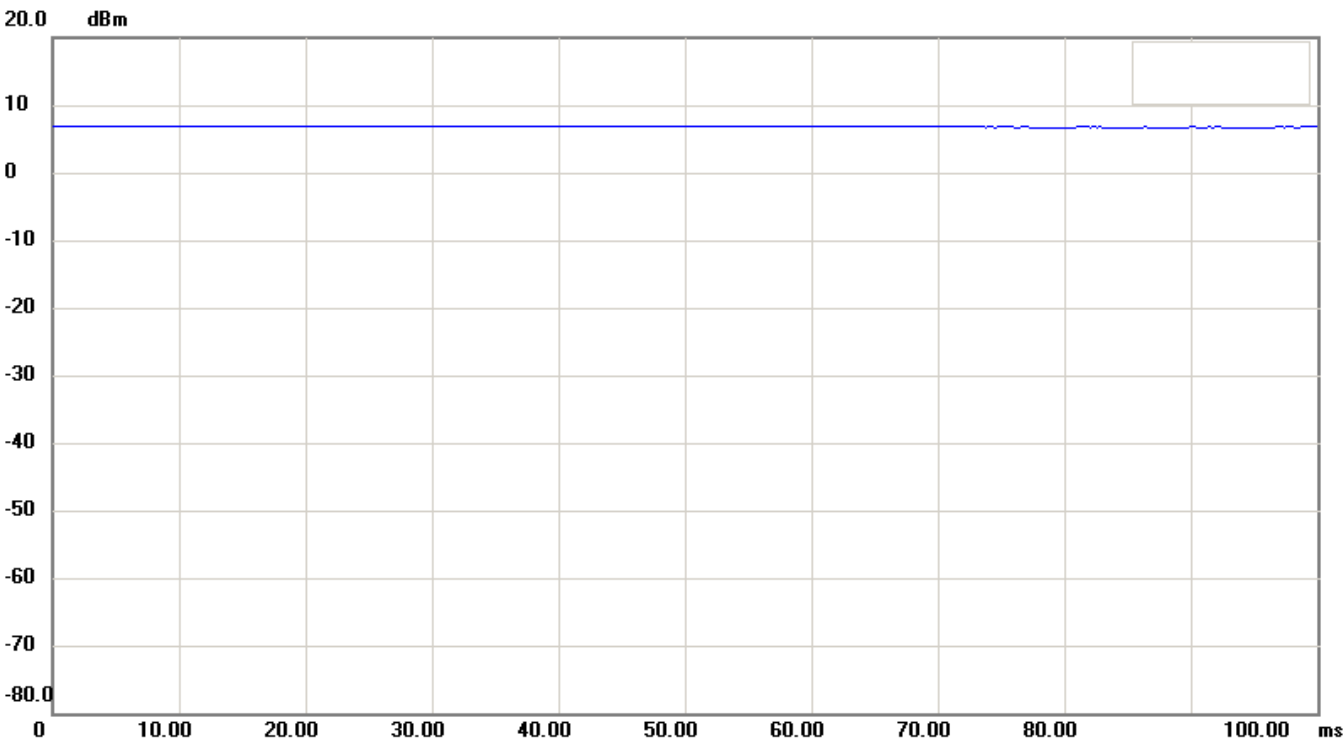
- 量測場強輻射時，應對其三個正交軸(X、Y、Z)的方位評估測試，並分別測試以找出最大輻射電場強度軸向，以最差軸模式測試，並記錄其值與軸向放置。
- 各調變及各頻道以峰值輸出功率最大者做為 Worse Case 並進行評估。
- 依 NCC 74 次一致性會議：審驗時不具一般正常使用模式者，得不包括一般正常使用模式。

## 3.2.3 測試場地

| 項次 | 測 試 場 地                                                                      |
|----|------------------------------------------------------------------------------|
| 1  | <input checked="" type="checkbox"/> RE02 — EMC B1 — N2 第一大樓地下二樓 3m 半電波暗室(N2) |
| 2  | <input type="checkbox"/> CE04 — 10M 2F 第三大樓二樓傳導測試室(10m 大樓)                   |
| 3  | <input checked="" type="checkbox"/> RF — Cond01 第一大樓地下一樓直量測試區                |
| 4  | <input type="checkbox"/> RF — Cond02 第一大樓地下二樓直量測試區                           |

3.2.4 Duty cycle  
IEEE 802.11b

|       |                 |     |       |           |              |      |
|-------|-----------------|-----|-------|-----------|--------------|------|
| File: | 21-05-MAW-005_B | #12 | Date: | 2021/5/19 | Temperature: | 25 ℃ |
| Site: | RF-Cond01       |     |       |           | Humidity:    | 52 % |



|            |                                 |                   |               |
|------------|---------------------------------|-------------------|---------------|
| Condition: |                                 | RF Conducted      |               |
| EUT:       | Car Navigation                  | Sweep Time: 100ms | Att.: 20dB    |
| Model:     | TN0022C                         | RBW: 1000 KHz     | VBW: 1000 KHz |
| Test Mode: | WIFI-B                          | Operator:         | Bruce         |
| Note:      | NCC_LP0002_802.11b Duty Cycle-1 |                   |               |

File: 21-05-MAW-005\_B

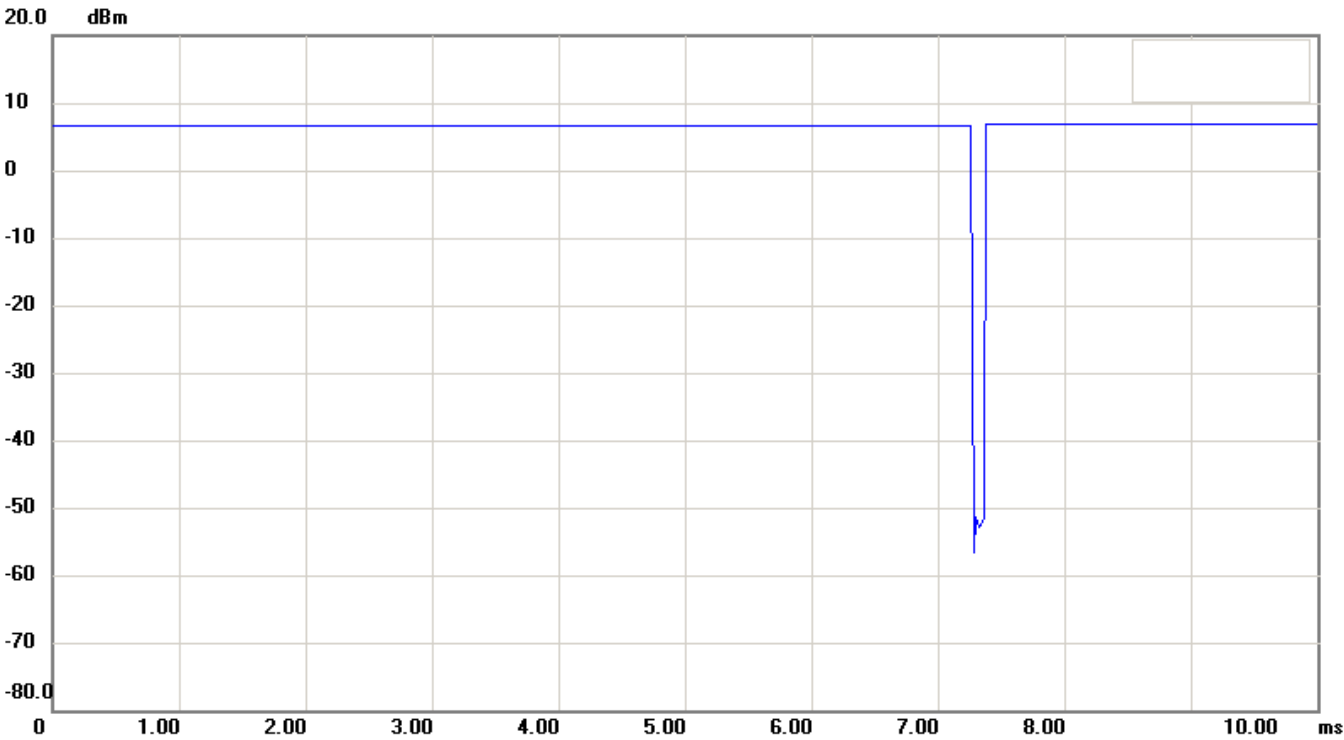
Site: RF-Cond01

#13

Date: 2021/5/19

Temperature: 25 ℃

Humidity: 52 %



Condition:

EUT: Car Navigation

Model: TN0022C

Test Mode: WIFI-B

Note: 大於 98%

RF Conducted

Sweep Time: 10ms

RBW: 1000 KHz

Operator:

Att.: 20dB

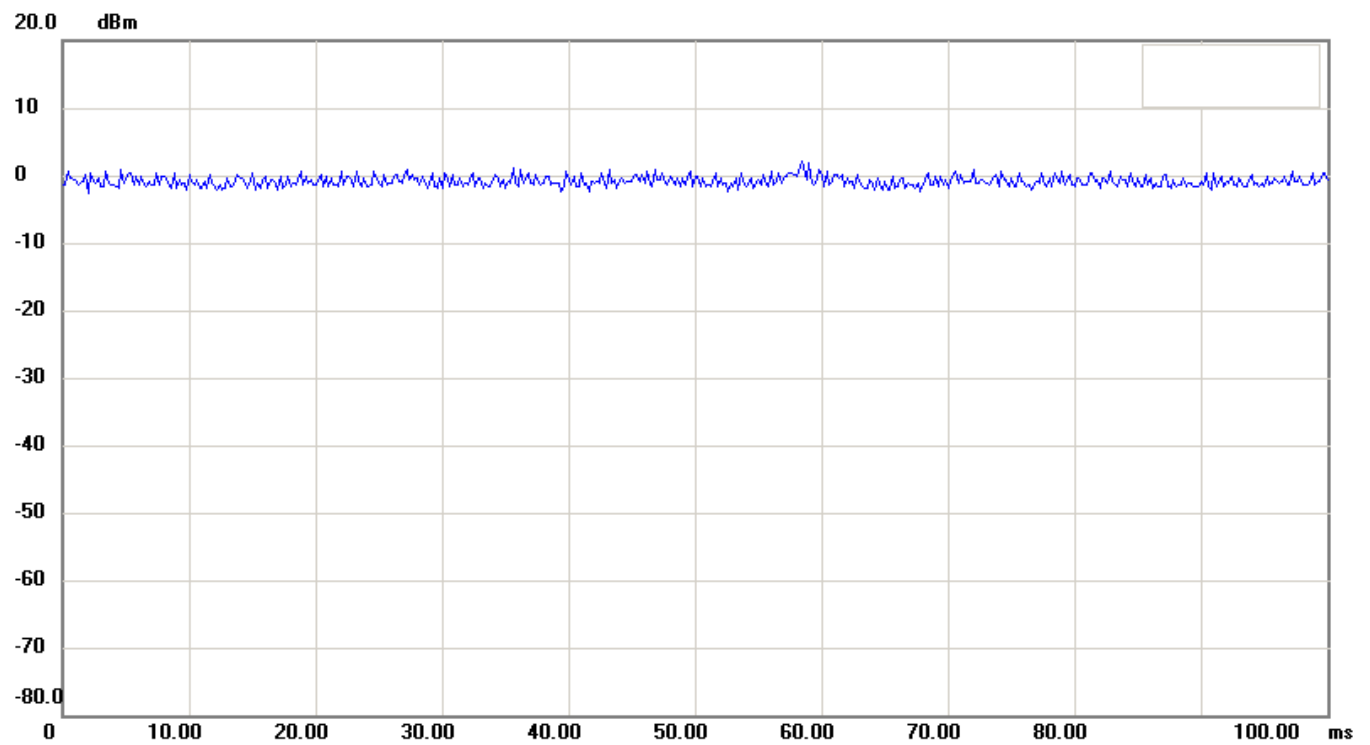
VBW: 1000 KHz

Bruce

## IEEE 802.11g

File: 21-05-MAW-005\_G  
Site: RF-Cond01

#12      Date: 2021/5/19      Temperature: 25 °C  
Humidity: 52 %



## Condition:

EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-G  
Note: NCC\_LP0002\_802.11g Duty Cycle-1

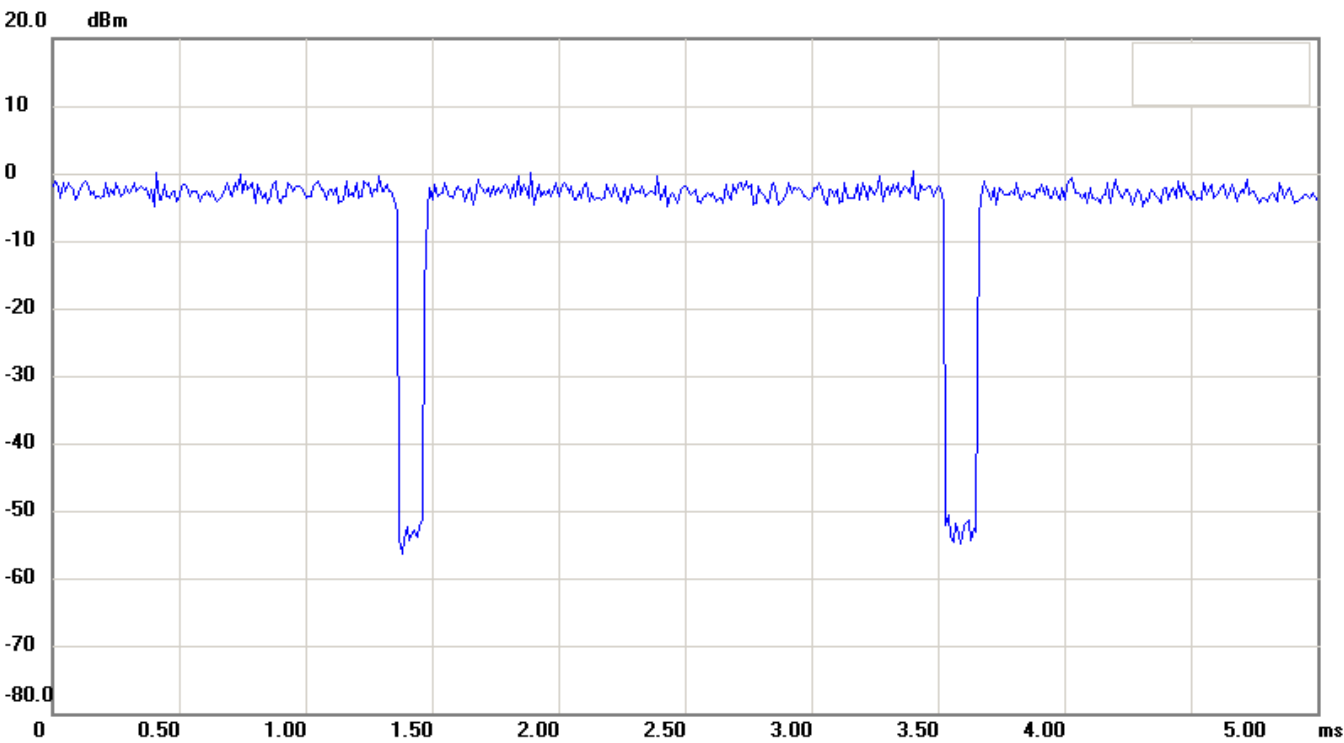
## RF Conducted

Sweep Time: 100ms      Att.: 20dB  
RBW: 1000 KHz      VBW: 1000 KHz  
Operator: Bruce

File: 21-05-MAW-005\_G  
Site: RF-Cond01

#13      Date: 2021/5/19

Temperature: 25 ℃  
Humidity: 52 %



Condition:  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-G  
Note: 94%

RF Conducted  
Sweep Time: 5ms    Att.: 20dB  
RBW: 1000 KHz    VBW: 1000 KHz  
Operator: Bruce

IEEE 802.11n HT20

File: 21-05-MAW-005\_N

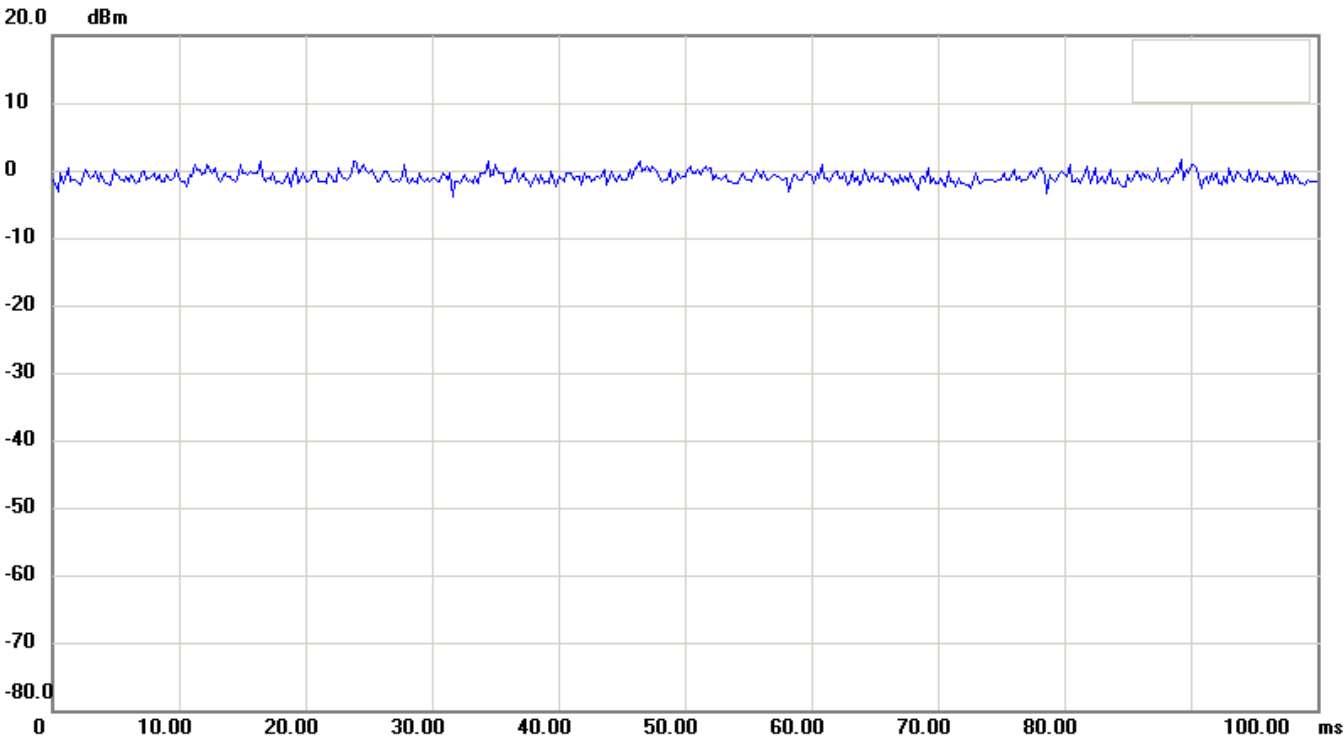
Site: RF-Cond01

#12

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition:

EUT: Car Navigation

Model: TN0022C

Test Mode: WIFI-N

Note: NCC\_LP0002\_802.11n20 Duty Cycle-1

RF Conducted

Sweep Time: 100ms

RBW: 1000 KHz

Operator:

Att.: 20dB

VBW: 1000 KHz

Bruce

File: 21-05-MAW-005\_N

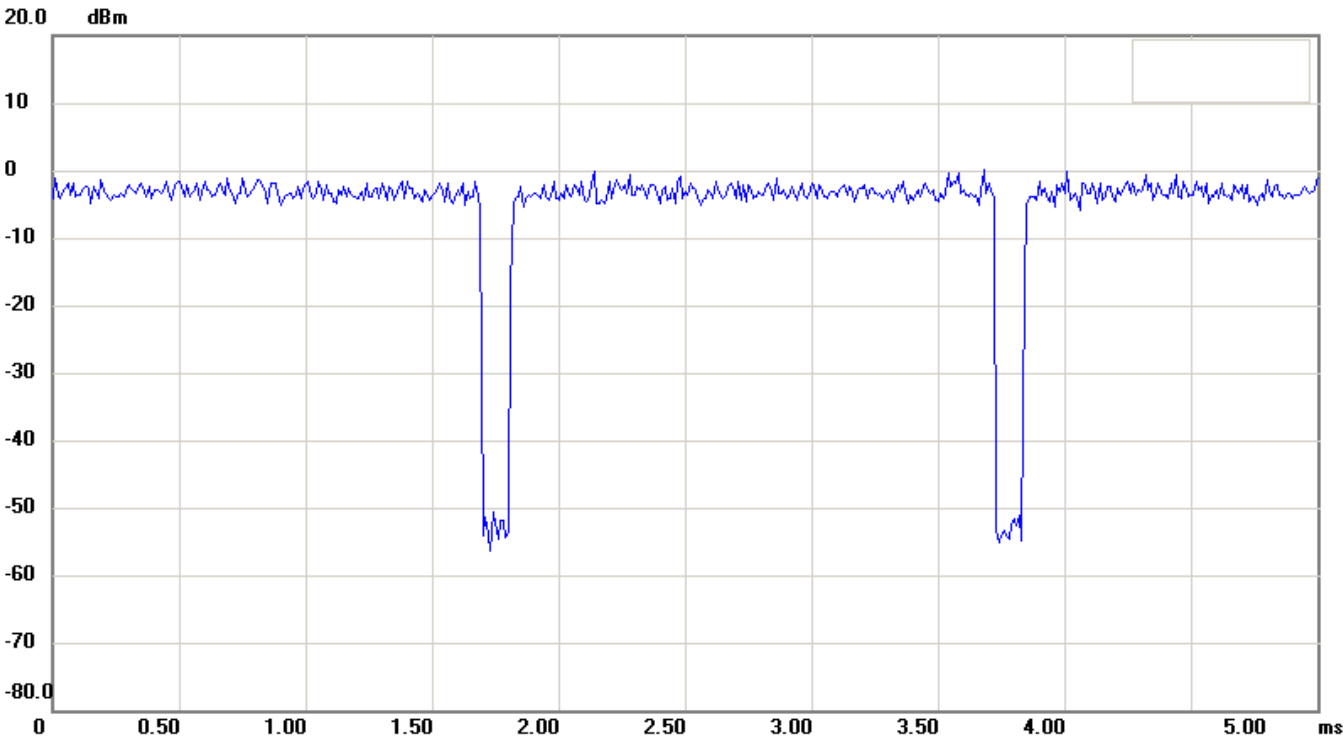
Site: RF-Cond01

#13

Date: 2021/5/19

Temperature: 25 ℃

Humidity: 52 %



Condition:

EUT: Car Navigation

Model: TN0022C

Test Mode: WIFI-N

Note: 93.1%

RF Conducted

Sweep Time: 5ms Att.: 20dB

RBW: 1000 KHz VBW: 1000 KHz

Operator: Bruce

#### 4 電源線傳導干擾之量測

本產品僅使用電池供電，使用電源為直流電源，故無須對其電源傳導干擾部份進行測試。

## 5 天線增益之要求

### 5.1 適用標準

使用數位調變技術之低功率射頻器材，依據國家通訊傳播委員會低功率射頻器材技術規範4.10.1.3之規定，

(1)操作於2400 MHz～2483.5 MHz 頻段：

(A)進行固定式點對點操作時，其發射天線之方向性增益超過6 dBi，每超過3 dBi，最大傳導輸出功率限制值應降低1 dB。

(B)天線以多向波束發射方式(含同時發射或循序發射)將訊號導向多個接收機或接收機群組時，應符合下列規定：

(a)非同時發射多向波束者，所有載波或頻道傳輸至所有天線陣列或陣列群之總和傳導輸出功率應符合4.10.1.2 之功率限制值。如天線/天線陣列群之方向性增益超過6 dBi，每超過3 dBi，總和傳導輸出功率限制值應降低1 dB。方向性增益值應計算如下：

(i)方向性增益值=  $10\log(\text{天線陣列之單元數目})$  + 各單元中最高之方向性增益值。

(ii)天線陣列間之遮蔽效應或波束干涉損失能充分佐證時，方向性增益得低於(i)計算數值。

(b)同時發射多向波束於相同或不同頻道者，其每一波束功率應符合(a)之功率限制值。如發射波束有重疊現象，功率應降低，以確保總和傳導輸出功率符合(a)之限制值。同時發射的所有波束總和傳導輸出功率不大於(a) 總和傳導輸出功率限制值加8 dB。方向性增益值計算同(a)。

(c)發射機之天線具備單向波束功能者，應符合(1)(A)及(3)後段之規定。

(3)除(1)及(2)外，使用超過6 dBi 方向增益之發射天線時，應依超過6 dBi 天線方向增益的dBi 總量，等量減少最大傳導輸出功率限制值。

### 5.2 天線增益

此裝置使用內接固定式天線連接於主體內 PCB 板上，天線增益 -1.59 dBi，未超過 6 dBi，不須降低峰值輸出功率。

### 5.3 結果判定

天線之方向性增益皆低於6dBi，因此無需減少峰值輸出功率及功率密度之限制值。

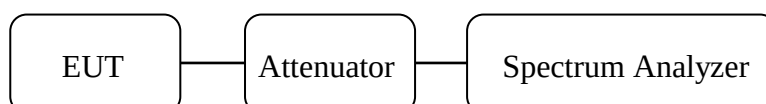
## 6 發射頻寬之要求

### 6.1 適用標準

對使用直接序列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)之規定，6dB頻寬至少應有500 kHz。

### 6.2 測試配置

圖 1：發射頻寬之測試配置



### 6.3 發射頻寬之量測儀器

| 儀器名稱              | 廠 牌       | 型 號    |
|-------------------|-----------|--------|
| Spectrum Analyzer | KEYSIGHT  | N9030B |
| Spectrum Analyzer | R&S       | FSV40  |
| Attenuator        | WEINSCHEL | 56-10  |

測試軟體: LZ-RF (Ver. ETC-3A2)

## 6.4 量測結果

測試工程師: 許志宏

### 6.4.1 調變技術: IEEE 802.11b

測試日期: May 19, 2021

環境溫度 : 25°C

環境濕度 : 52%

| Channel | 6dB Bandwidth<br>(MHz) | NCC Limit<br>(kHz) | Chart   |
|---------|------------------------|--------------------|---------|
| L       | 8.2                    | 500                | Page 21 |
| M       | 8.2                    | 500                | Page 22 |
| H       | 8.2                    | 500                | Page 23 |

註：繪圖資料請參考第 21-23 頁。

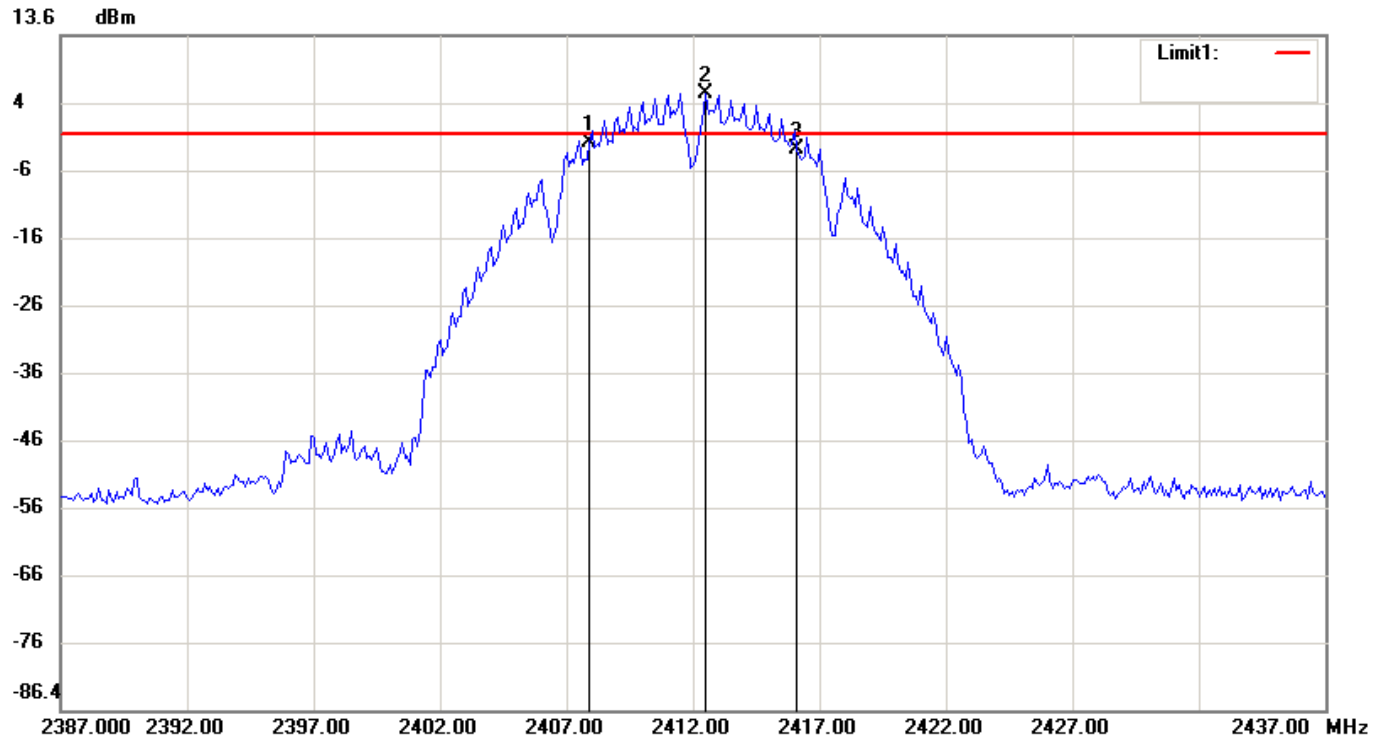
File: 21-05-MAW-005\_B  
Site: RF-Cond01

#1

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -0.99dBm

EUT: Car Navigation

Model: TN0022C

Test Mode: WIFI-B

Note: NCC\_LP0002\_802.11b Channel 01-6dB EBW

RF Conducted

Sweep Time: 500ms Att.: 20dB

RBW: 100 KHz VBW: 300 KHz

Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2407.90000     | -2.15      |
| 2   | 2412.50000     | 5.01       |
| 3   | 2416.10000     | -3.34      |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 8.2                     | -1.19              |

File: 21-05-MAW-005\_B  
Site: RF-Cond01

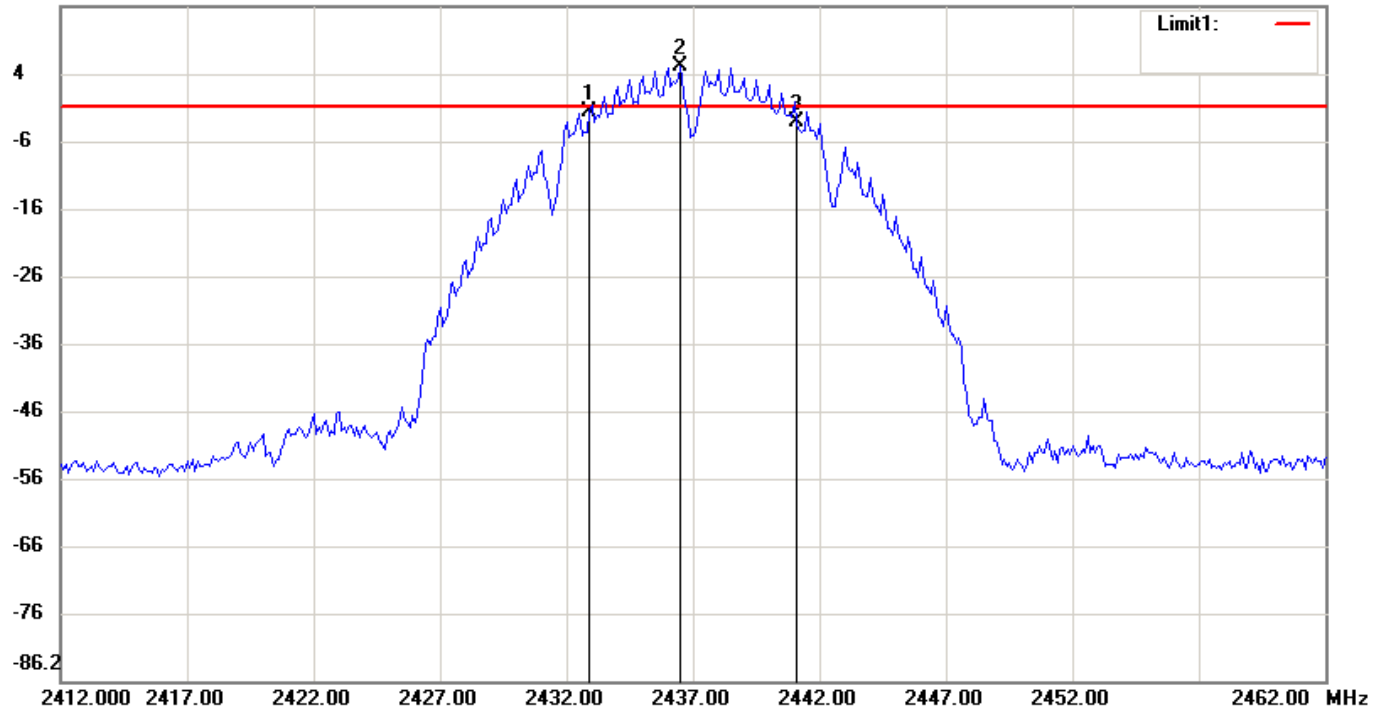
#5

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %

13.8 dBm



Condition: -0.95dBm

EUT: Car Navigation

Model: TN0022C

Test Mode: WIFI-B

Note: NCC\_LP0002\_802.11b Channel 06-6dB EBW

RF Conducted

Sweep Time: 500ms Att.: 20dB

RBW: 100 KHz VBW: 300 KHz

Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2432.90000     | -1.86      |
| 2   | 2436.50000     | 5.05       |
| 3   | 2441.10000     | -3.40      |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 8.2                     | -1.54              |

File: 21-05-MAW-005\_B  
Site: RF-Cond01

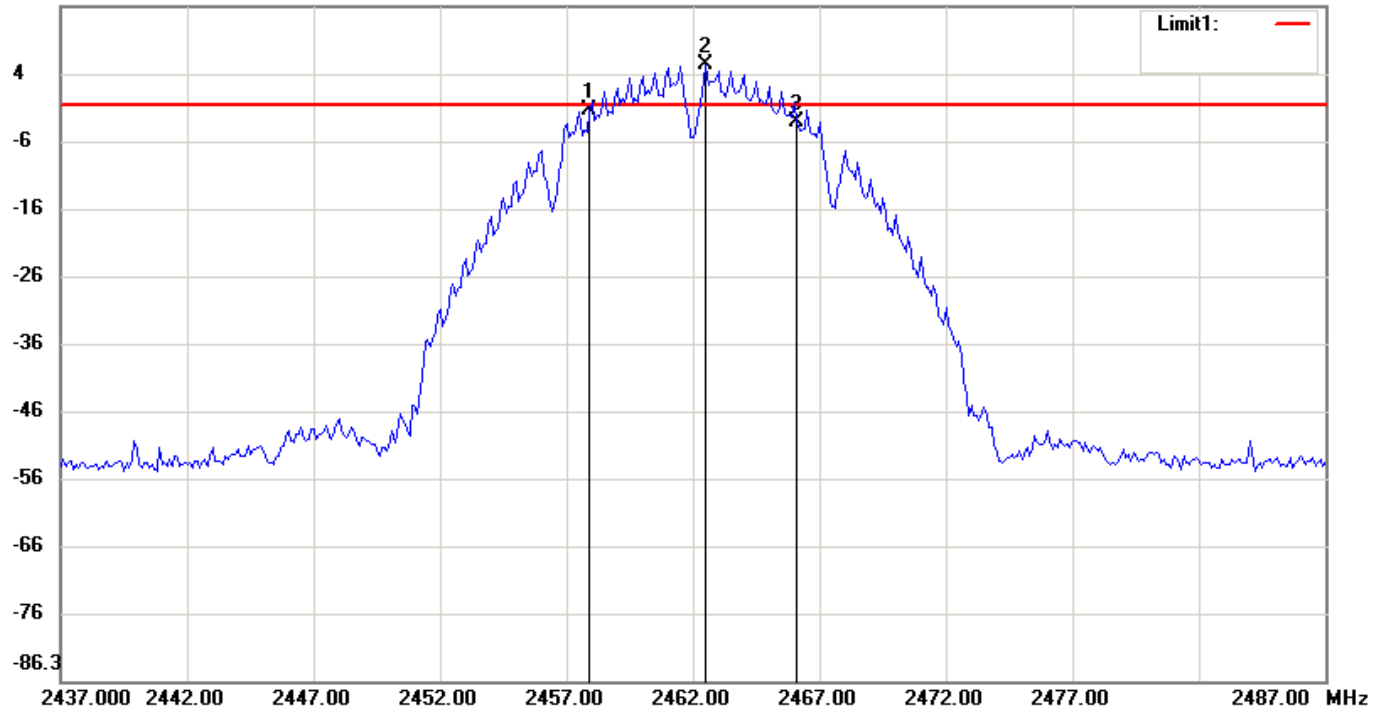
#8

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %

13.7 dBm



Condition: -0.94dBm

EUT: Car Navigation

Model: TN0022C

Test Mode: WIFI-B

Note: NCC\_LP0002\_802.11b Channel 11-6dB EBW

RF Conducted

Sweep Time: 500ms Att.: 20dB

RBW: 100 KHz VBW: 300 KHz

Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2457.90000     | -1.74      |
| 2   | 2462.50000     | 5.06       |
| 3   | 2466.10000     | -3.41      |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 8.2                     | -1.67              |

## 6.4.2 調變技術: IEEE 802.11g

測試日期: May 19, 2021

環境溫度 : 25°C

環境濕度 : 52%

| Channel | 6dB Bandwidth<br>(MHz) | NCC Limit<br>(kHz) | Chart   |
|---------|------------------------|--------------------|---------|
| L       | 15.7                   | 500                | Page 25 |
| M       | 15.6                   | 500                | Page 26 |
| H       | 16.0                   | 500                | Page 27 |

註：繪圖資料請參考第 25-27 頁。

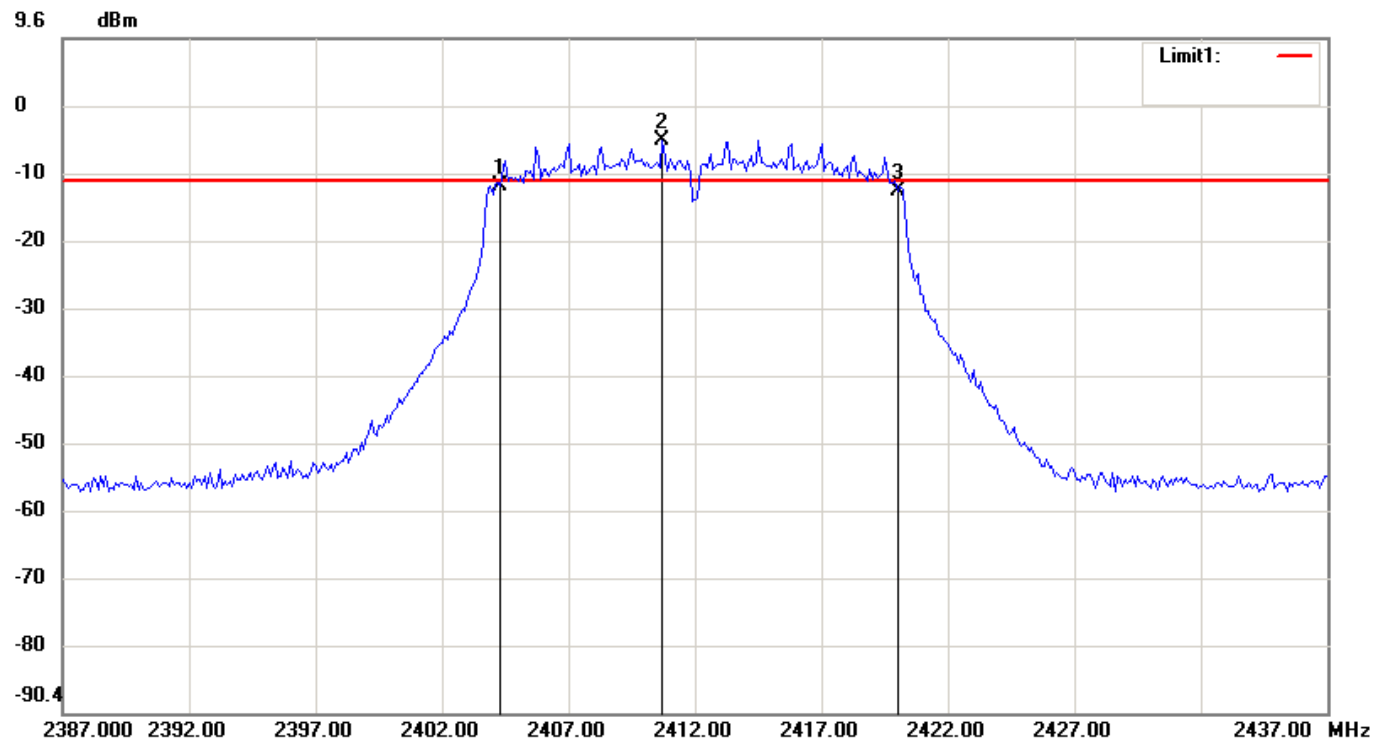
File: 21-05-MAW-005\_G  
Site: RF-Cond01

#1

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -11.56dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-G  
Note: NCC\_LP0002\_802.11g Channel 01-6dB EBW

RF Conducted  
Sweep Time: 500ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2404.30000     | -12.15     |
| 2   | 2410.70000     | -5.56      |
| 3   | 2420.00000     | -12.91     |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 15.7                    | -0.76              |

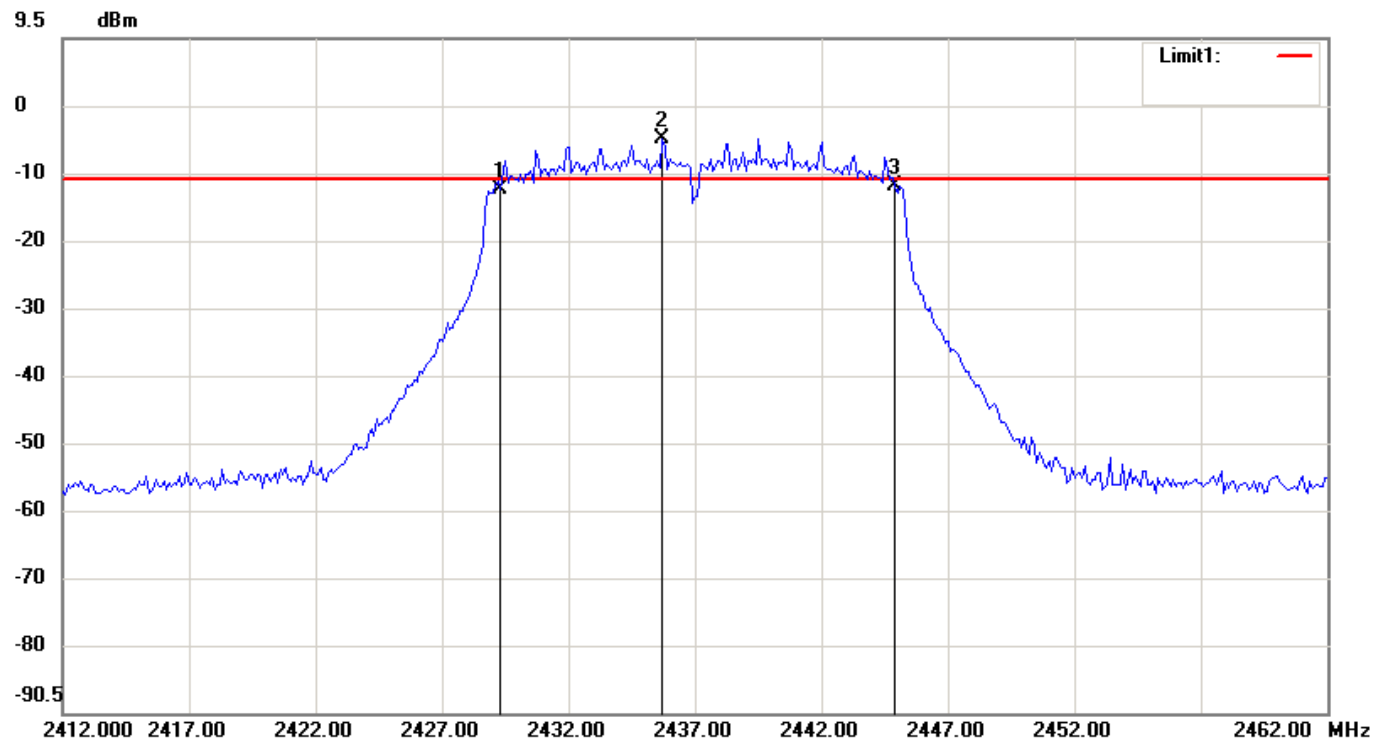
File: 21-05-MAW-005\_G  
Site: RF-Cond01

#5

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -11.36dBm

EUT: Car Navigation

Model: TN0022C

Test Mode: WIFI-G

Note: NCC\_LP0002\_802.11g Channel 06-6dB EBW

RF Conducted

Sweep Time: 500ms Att.: 20dB

RBW: 100 KHz VBW: 300 KHz

Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2429.30000     | -12.96     |
| 2   | 2435.70000     | -5.36      |
| 3   | 2444.90000     | -12.25     |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 15.6                    | 0.71               |

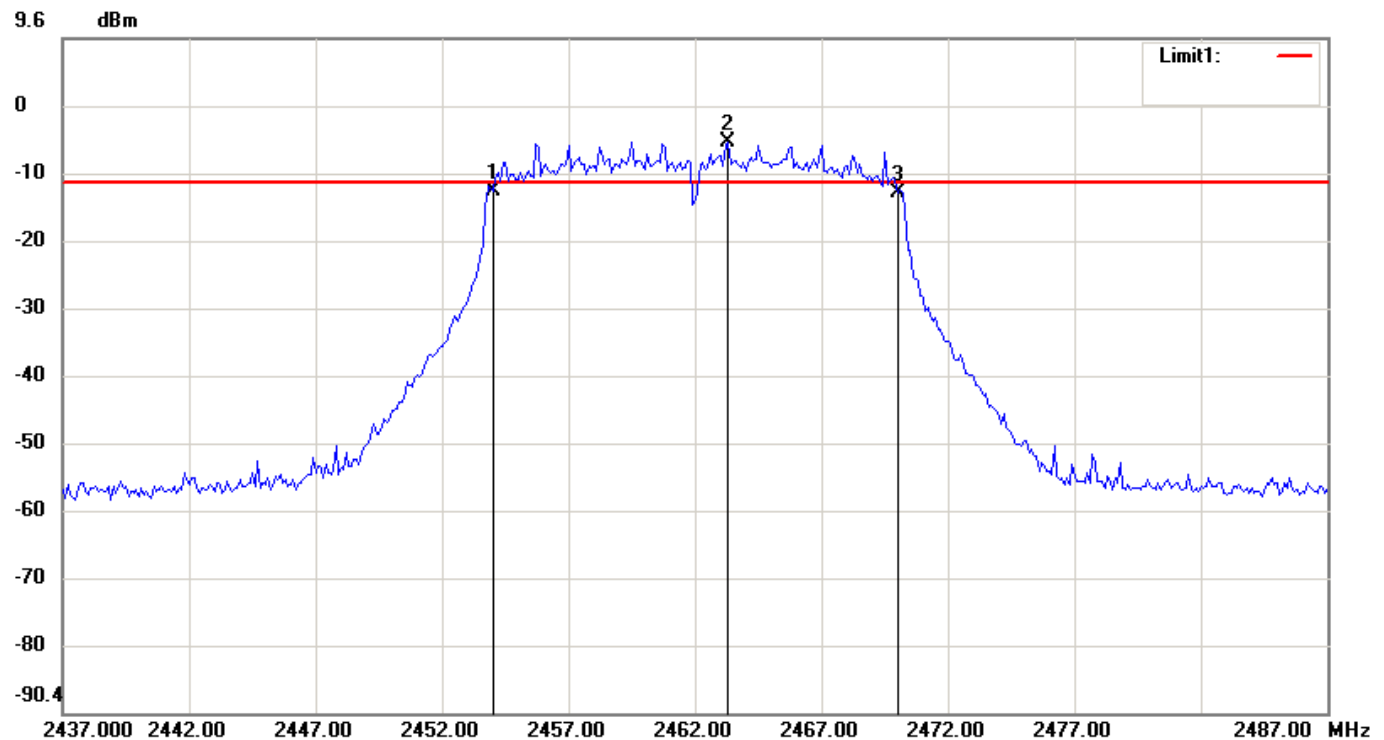
File: 21-05-MAW-005\_G  
Site: RF-Cond01

#8

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -11.63dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-G  
Note: NCC\_LP0002\_802.11g Channel 11-6dB EBW

RF Conducted  
Sweep Time: 500ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2454.00000     | -13.05     |
| 2   | 2463.30000     | -5.63      |
| 3   | 2470.00000     | -13.27     |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 16                      | -0.22              |

### 6.4.3 調變技術: IEEE 802.11n HT20

測試日期: May 19, 2021

環境溫度 : 25°C

環境濕度 : 52%

| Channel | 6dB Bandwidth<br>(MHz) | NCC Limit<br>(kHz) | Chart   |
|---------|------------------------|--------------------|---------|
| L       | 15.9                   | 500                | Page 29 |
| M       | 15.7                   | 500                | Page 30 |
| H       | 15.5                   | 500                | Page 31 |

註：繪圖資料請參考第 29-31 頁。

## 6.5 結果判定

高、中、低頻段的6dB頻寬皆大於500KHz。

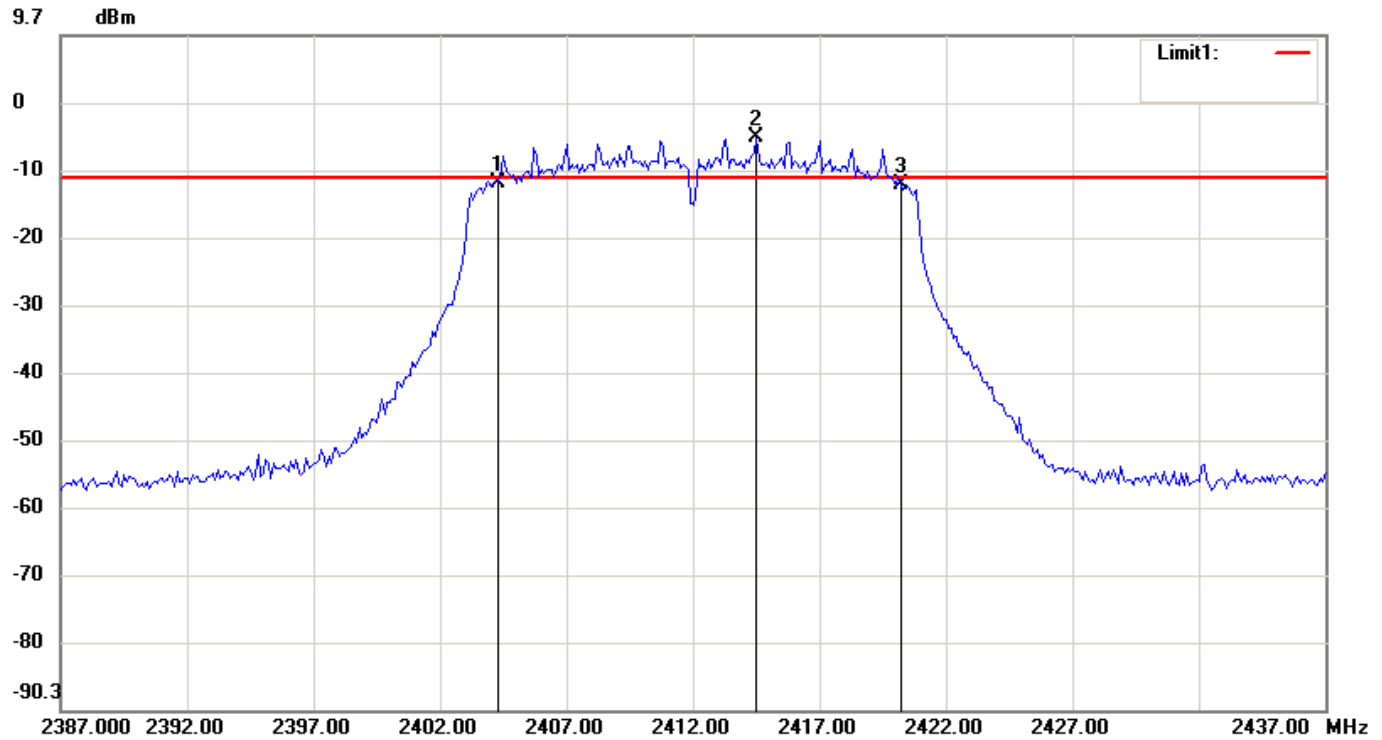
File: 21-05-MAW-005\_N  
Site: RF-Cond01

#1

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -11.49dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-N  
Note: NCC\_LP0002\_802.11n-HT20 Channel 01-6dB EBW

RF Conducted  
Sweep Time: 500ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2404.30000     | -12.19     |
| 2   | 2414.50000     | -5.49      |
| 3   | 2420.20000     | -12.52     |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 15.9                    | -0.33              |

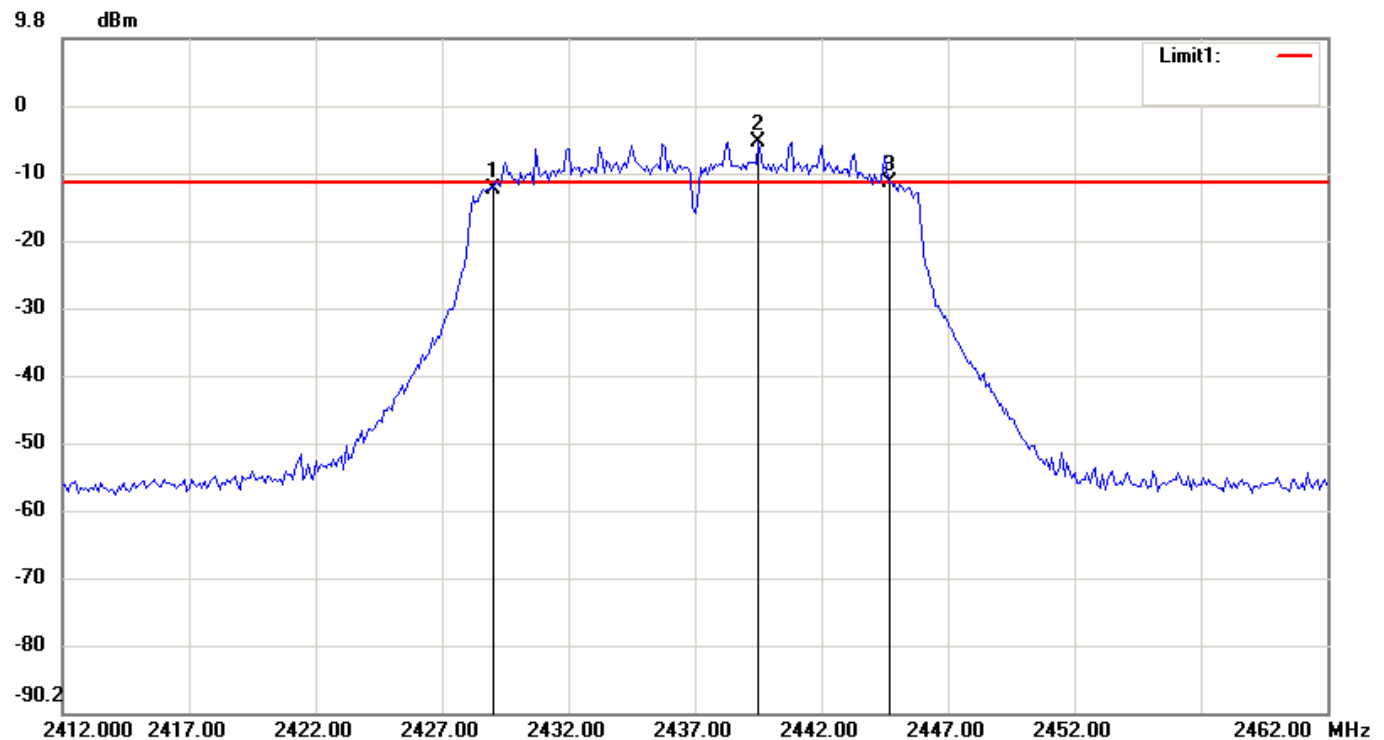
File: 21-05-MAW-005\_N  
Site: RF-Cond01

#5

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -11.49dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-N  
Note: NCC\_LP0002\_802.11n-HT20 Channel 06-6dB EBW

RF Conducted  
Sweep Time: 500ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2429.00000     | -12.61     |
| 2   | 2439.50000     | -5.49      |
| 3   | 2444.70000     | -11.61     |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 15.7                    | 1                  |

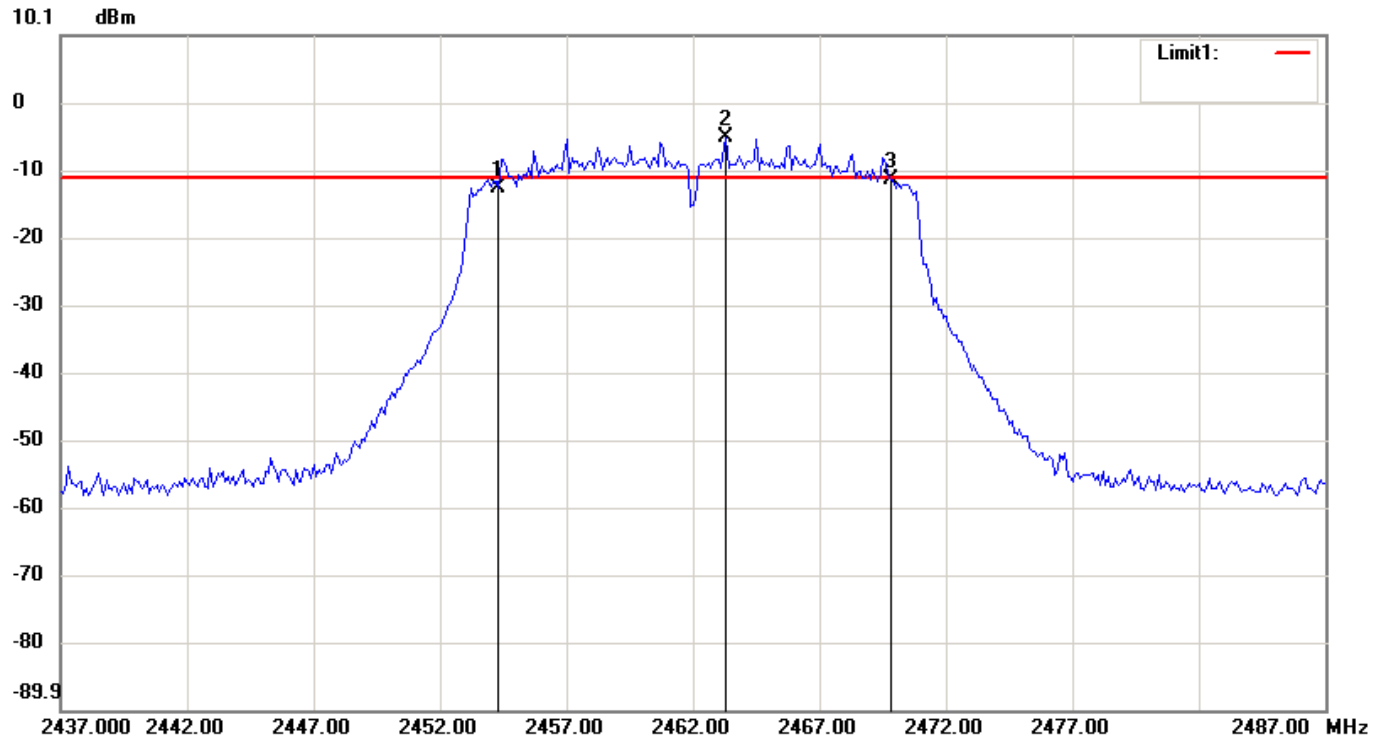
File: 21-05-MAW-005\_N  
Site: RF-Cond01

#8

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -11.03dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-N  
Note: NCC\_LP0002\_802.11n-HT20 Channel 11-6dB EBW

RF Conducted  
Sweep Time: 500ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2454.30000     | -12.50     |
| 2   | 2463.30000     | -5.03      |
| 3   | 2469.80000     | -11.29     |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 15.5                    | 1.21               |

## 7 峰值輸出功率之量測

### 7.1 峰值適用標準

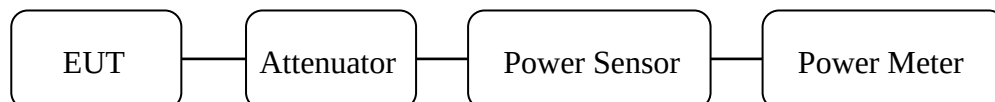
依據國家通訊傳播委員會低功率射頻器材技術規範4.10.1.2節之(1)(C)規定，操作於2400-2483.5兆赫(MHz)之所有數位調變技術系統:1瓦(W)(含)以下。

用於非於固定式點對點操作時，若其發射天線之方向性增益超過6dBi，應依所超過之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：

操作於2400-2483.5兆赫(MHz)者，其發射天線之方向性增益超過6dBi，每超過3 dBi，最大傳導輸出功率限制值應降低1dB。

### 7.2 峰值輸出功率之測試配置

圖 2：峰值輸出功率之測試配置



### 7.3 峰值輸出功率之量測儀器

| 儀器名稱         | 廠 牌       | 型 號    |
|--------------|-----------|--------|
| Power Meter  | Agilent   | N1912A |
| Power Sensor | Agilent   | N1922A |
| Attenuator   | WEINSCHEL | 56-10  |

測試軟體: LZ-RF (Ver. ETC-3A2)

## 7.4 峰值輸出功率之量測結果

測試工程師: 許志宏

7.4.1 調變技術: IEEE 802.11b

測試日期: May 19, 2021

環境溫度: 25°C

環境濕度: 52%

| Channel | Maximum Peak<br>Output Power<br>(dBm) | NCC Limit<br>(dBm) | Chart |
|---------|---------------------------------------|--------------------|-------|
| L       | 15.27                                 | 30                 | -     |
| M       | 15.45                                 | 30                 | -     |
| H       | 15.47                                 | 30                 | -     |

註：1. 最大峰值輸出功率 (Maximum Peak Output Power) 為經儀器校正補償過後的結果值。

2. If antenna gain  $\leq$  6dBi, NCC Limit = 30 dBm

3. If antenna gain > 6dBi, NCC Limit = 30dBm – (highest antenna gain – 6 dBi)

4. NCC Limit (dBm)=10 log NCC Limit (mW)

5. 量測不準確度:  $\pm 1.5\text{dB}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )

## 7.4.2 調變技術: IEEE 802.11g

測試日期: May 19, 2021

環境溫度: 25°C

環境濕度: 52%

| Channel | Maximum Peak<br>Output Power<br>(dBm) | NCC Limit<br>(dBm) | Chart |
|---------|---------------------------------------|--------------------|-------|
| L       | 16.59                                 | 30                 | -     |
| M       | 17.00                                 | 30                 | -     |
| H       | 17.37                                 | 30                 | -     |

註：1. 最大峰值輸出功率 (Maximum Peak Output Power) 為經儀器校正補償過後的結果值。

2. If antenna gain  $\leq$  6dBi, NCC Limit = 30 dBm

3. If antenna gain > 6dBi, NCC Limit = 30dBm – (highest antenna gain – 6 dBi)

4. NCC Limit (dBm)=10 log NCC Limit (mW)

5. 量測不準確度:  $\pm 1.5\text{dB}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )

## 7.4.3 調變技術: IEEE 802.11n HT20

測試日期: May 19, 2021

環境溫度: 25°C

環境濕度: 52%

| Channel | Maximum Peak<br>Output Power<br>(dBm) | NCC Limit<br>(dBm) | Chart |
|---------|---------------------------------------|--------------------|-------|
| L       | 16.41                                 | 30                 | -     |
| M       | 16.64                                 | 30                 | -     |
| H       | 17.20                                 | 30                 | -     |

註：1. 最大峰值輸出功率 (Maximum Peak Output Power) 為經儀器校正補償過後的結果值。

2. If antenna gain  $\leq$  6dBi, NCC Limit = 30 dBm

3. If antenna gain > 6dBi, NCC Limit = 30dBm – (highest antenna gain – 6 dBi)

4. NCC Limit (dBm)=10 log NCC Limit (mW)

5. 量測不準確度:  $\pm 1.5\text{dB}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )

## 7.5 結果判定

高、中、低頻段的峰值輸出功率皆低於限制值。

## 8 功率密度之量測

### 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4.10.1.6節之(2)(B)規定，對數位調變技術系統，在使用頻率範圍之任一3 kHz頻寬內，由發射機傳導至天線之功率頻譜密度在任意傳輸期間內，皆小於或等於8毫分貝(dBm)，且應依4.10.1.3之方式降低功率頻譜密度限制值。

### 8.2 量測功率密度之配置

如圖 1 所示。

### 8.3 量測功率密度之儀器

| 儀器名稱              | 廠 牌       | 型 號    |
|-------------------|-----------|--------|
| Spectrum Analyzer | KEYSIGHT  | N9030B |
| Spectrum Analyzer | R&S       | FSV40  |
| Attenuator        | WEINSCHEL | 56-10  |

|                            |
|----------------------------|
| 測試軟體: LZ-RF (Ver. ETC-3A2) |
|----------------------------|

## 8.4 量測結果

測試工程師: 許志宏

### 8.4.1 調變技術: IEEE 802.11b

測試日期: May 19, 2021

環境溫度: 25°C

環境濕度: 52%

| Channel | Peak Power Spectral<br>Density<br>(dBm) | NCC Limit<br>(dBm) | Chart   |
|---------|-----------------------------------------|--------------------|---------|
| L       | -7.77                                   | 8                  | Page 38 |
| M       | -7.67                                   | 8                  | Page 39 |
| H       | -7.83                                   | 8                  | Page 40 |

註：1. 繪圖資料請參考第 38-40 頁。

2. If antenna gain  $\leq$  6dBi, NCC Limit = 8 dBm

3. If antenna gain > 6dBi, NCC Limit = 8dBm – (highest antenna gain – 6 dBi)

4. 量測不準確度:  $\pm 1.5\text{dB}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )

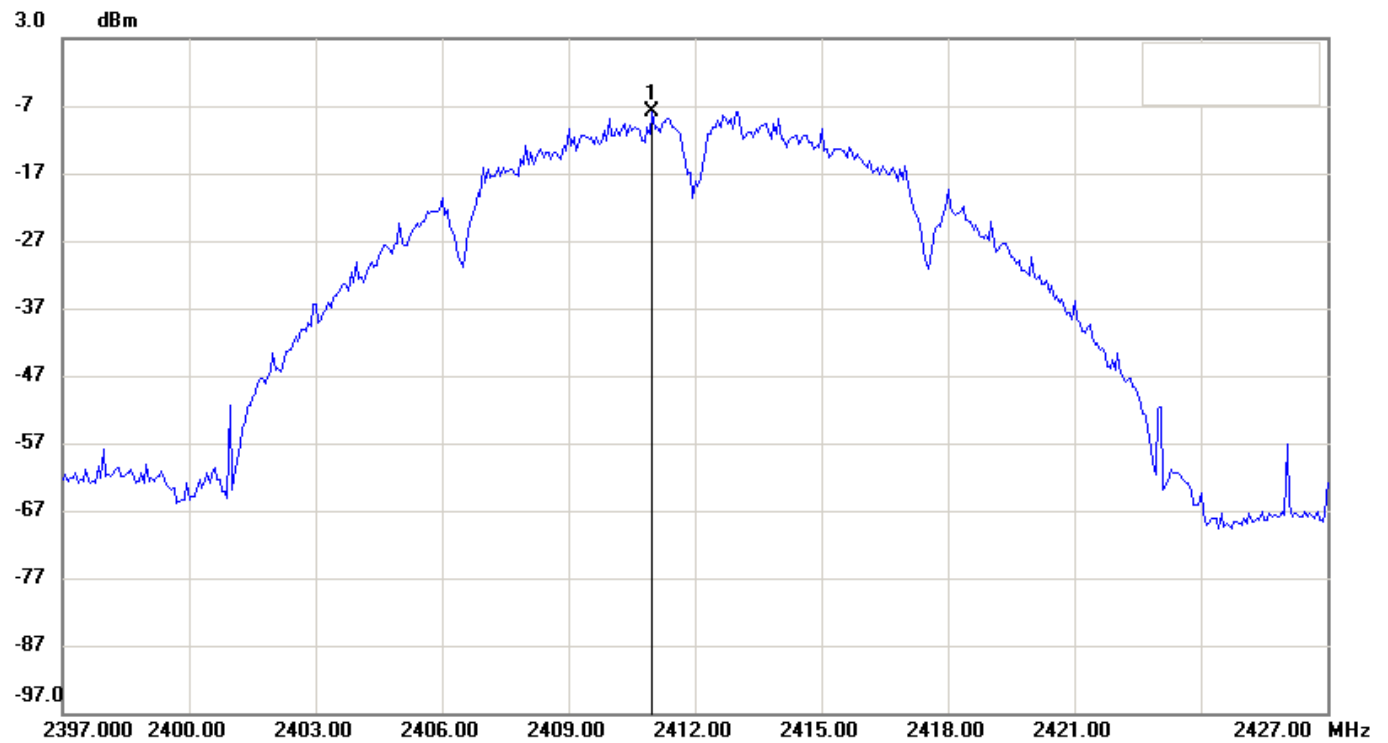
File: 21-05-MAW-005\_B  
Site: RF-Cond01

#3

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %

**Condition:**

EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-B  
Note: NCC\_LP0002\_802.11b Channel 01-Power Density (PK)

**RF Conducted**

Sweep Time: 334ms Att.: 20dB  
RBW: 3 KHz VBW: 10 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2410.98000     | -7.77      |

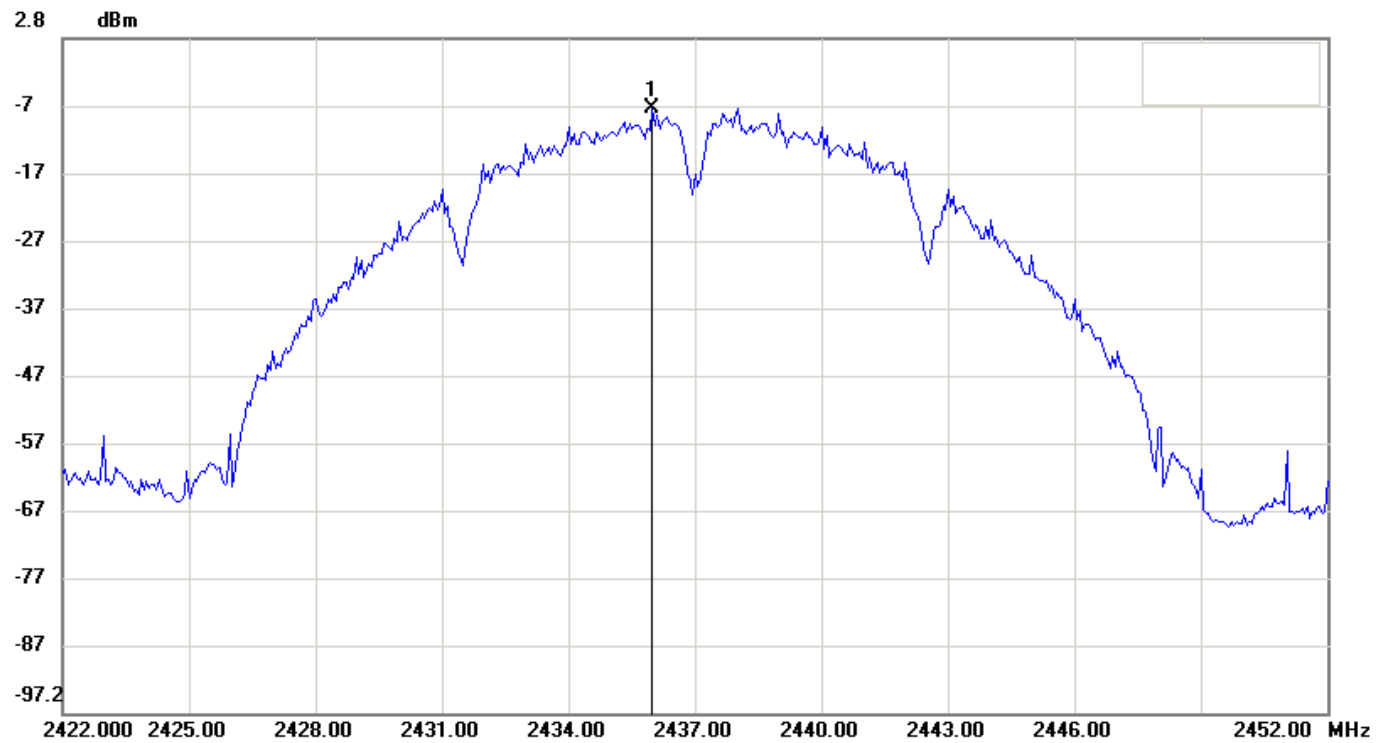
File: 21-05-MAW-005\_B  
Site: RF-Cond01

#7

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



## Condition:

EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-B  
Note: NCC\_LP0002\_802.11b Channel 06-Power Density (PK)

## RF Conducted

Sweep Time: 334ms Att.: 20dB  
RBW: 3 KHz VBW: 10 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2435.98000     | -7.67      |

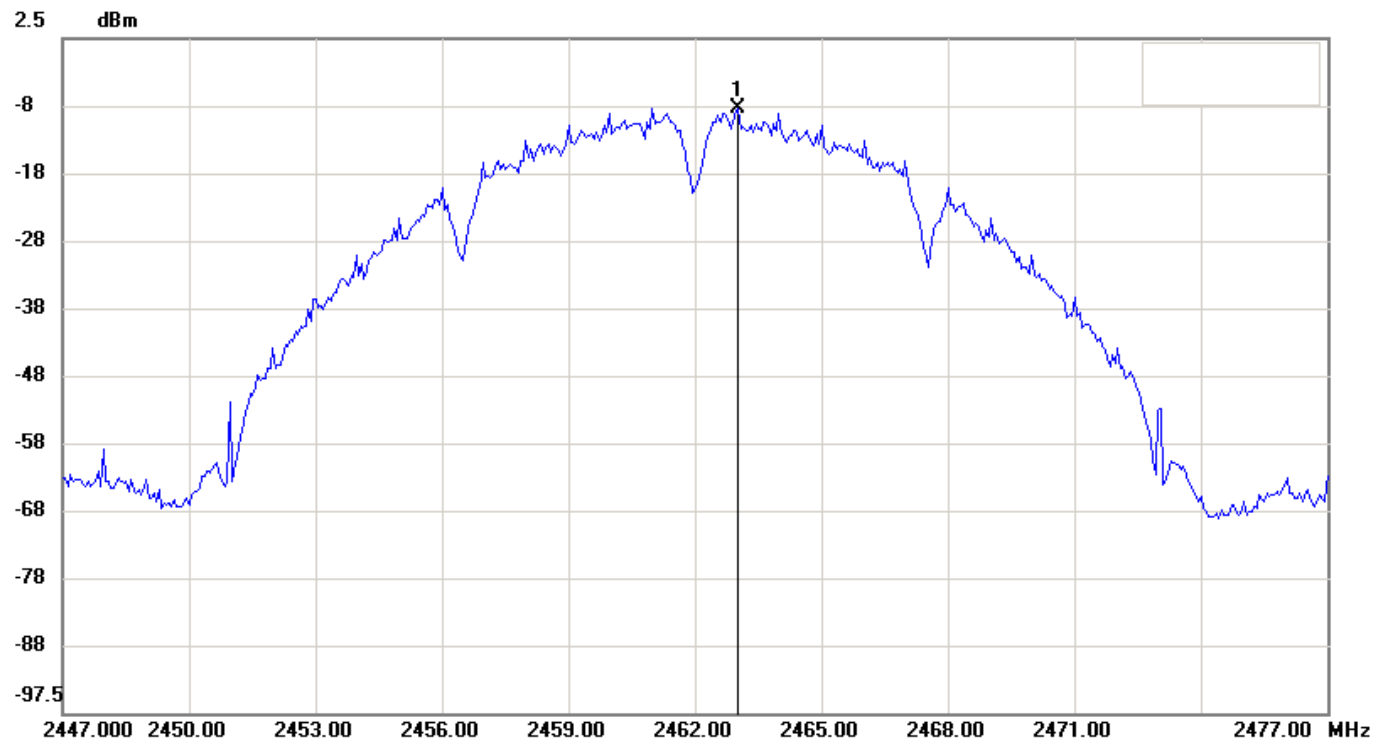
File: 21-05-MAW-005\_B  
Site: RF-Cond01

#10

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition:

EUT: Car Navigation

Model: TN0022C

Test Mode: WIFI-B

Note: NCC\_LP0002\_802.11b Channel 11-Power Density (PK)

RF Conducted

Sweep Time: 334ms Att.: 20dB

RBW: 3 KHz

VBW: 10 KHz

Operator:

Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2463.02000     | -7.83      |

## 8.4.2 調變技術: IEEE 802.11g

測試日期: May 19, 2021

環境溫度: 25°C

環境濕度: 52%

| Channel | Peak Power Spectral<br>Density<br>(dBm) | NCC Limit<br>(dBm) | Chart   |
|---------|-----------------------------------------|--------------------|---------|
| L       | -19.23                                  | 8                  | Page 42 |
| M       | -18.69                                  | 8                  | Page 43 |
| H       | -19.38                                  | 8                  | Page 44 |

註：1. 繪圖資料請參考第 42-44 頁。

2. If antenna gain  $\leq$  6dBi, NCC Limit = 8 dBm

3. If antenna gain > 6dBi, NCC Limit = 8dBm – (highest antenna gain – 6 dBi)

4. 量測不準確度:  $\pm 1.5\text{dB}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )

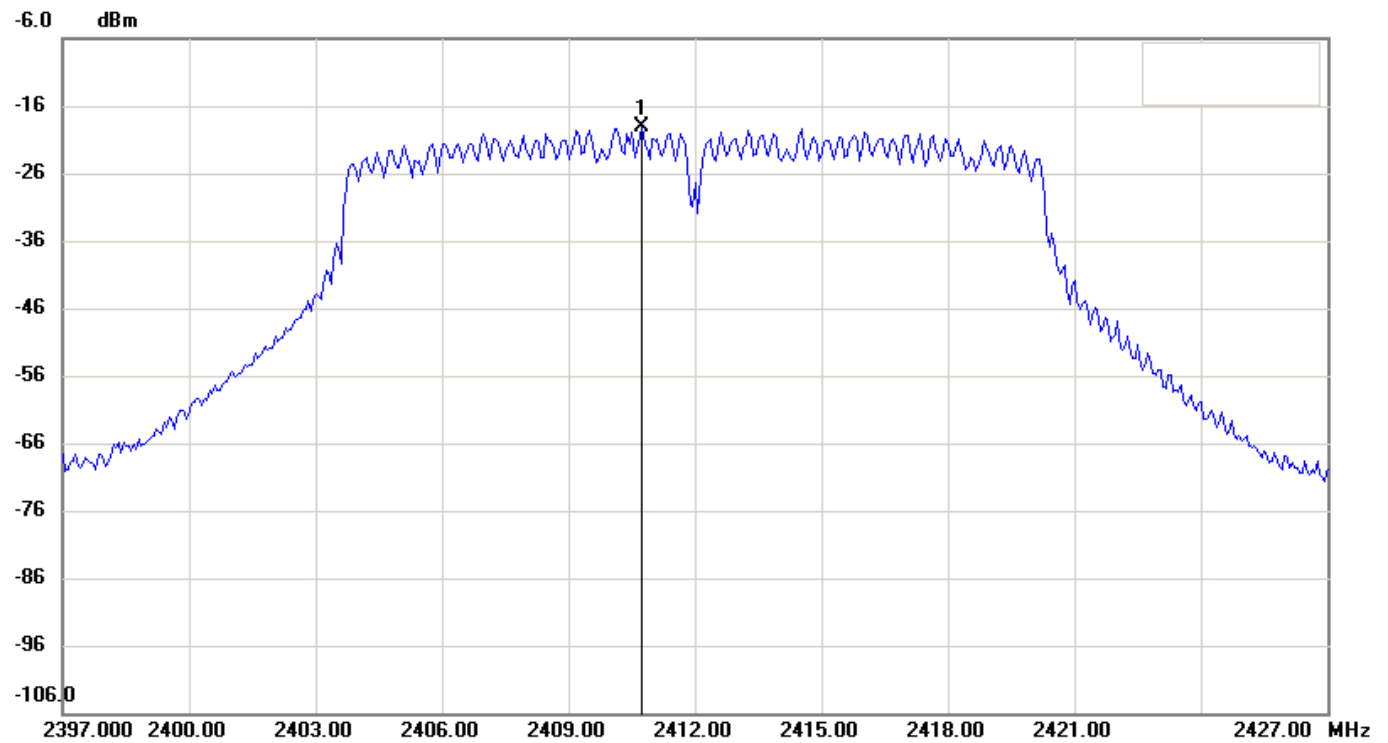
File: 21-05-MAW-005\_G  
Site: RF-Cond01

#3

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



## Condition:

EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-G  
Note: NCC\_LP0002\_802.11g Channel 01-Power Density (PK)

## RF Conducted

Sweep Time: 334ms Att.: 20dB  
RBW: 3 KHz VBW: 10 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2410.74000     | -19.23     |

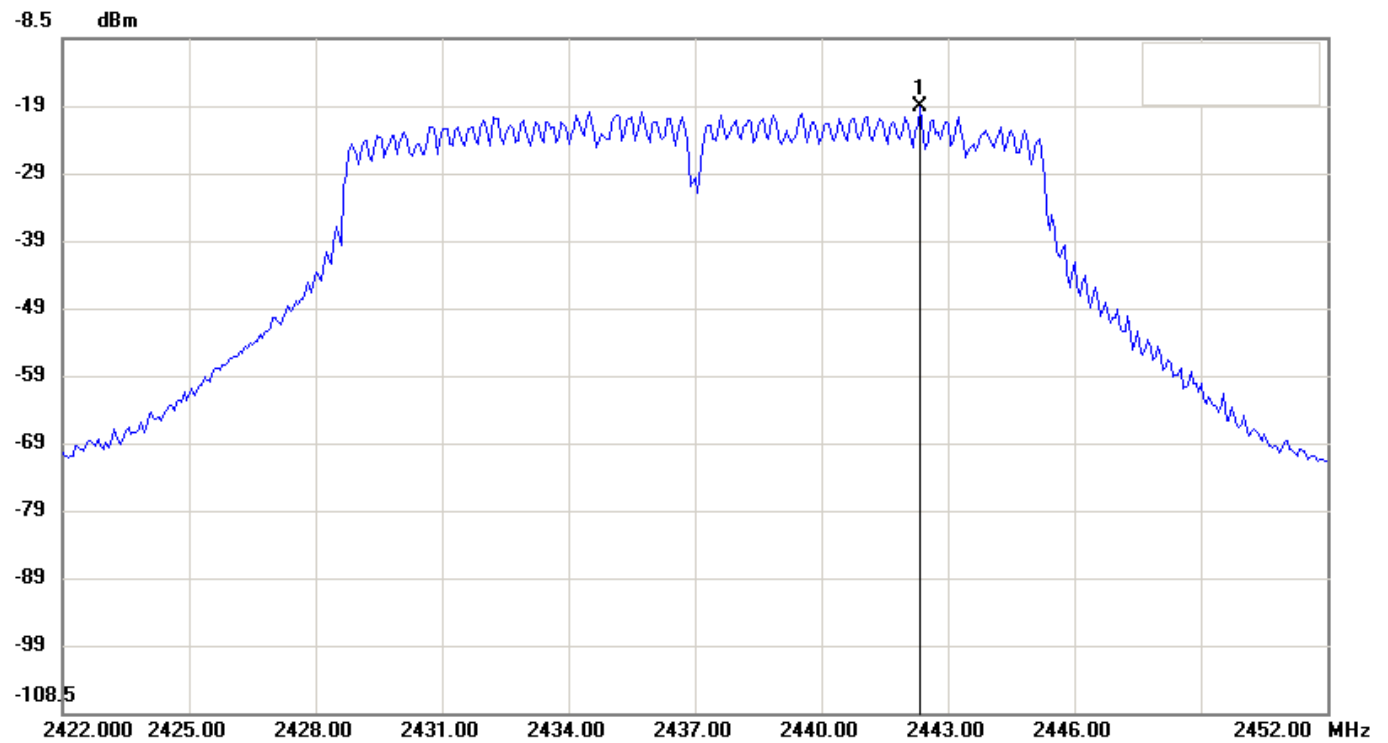
File: 21-05-MAW-005\_G  
Site: RF-Cond01

#7

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition:

EUT: Car Navigation

Model: TN0022C

Test Mode: WIFI-G

Note: NCC\_LP0002\_802.11g Channel 06-Power Density (PK)

RF Conducted

Sweep Time: 334ms Att.: 20dB

RBW: 3 KHz

VBW: 10 KHz

Operator:

Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2442.34000     | -18.69     |

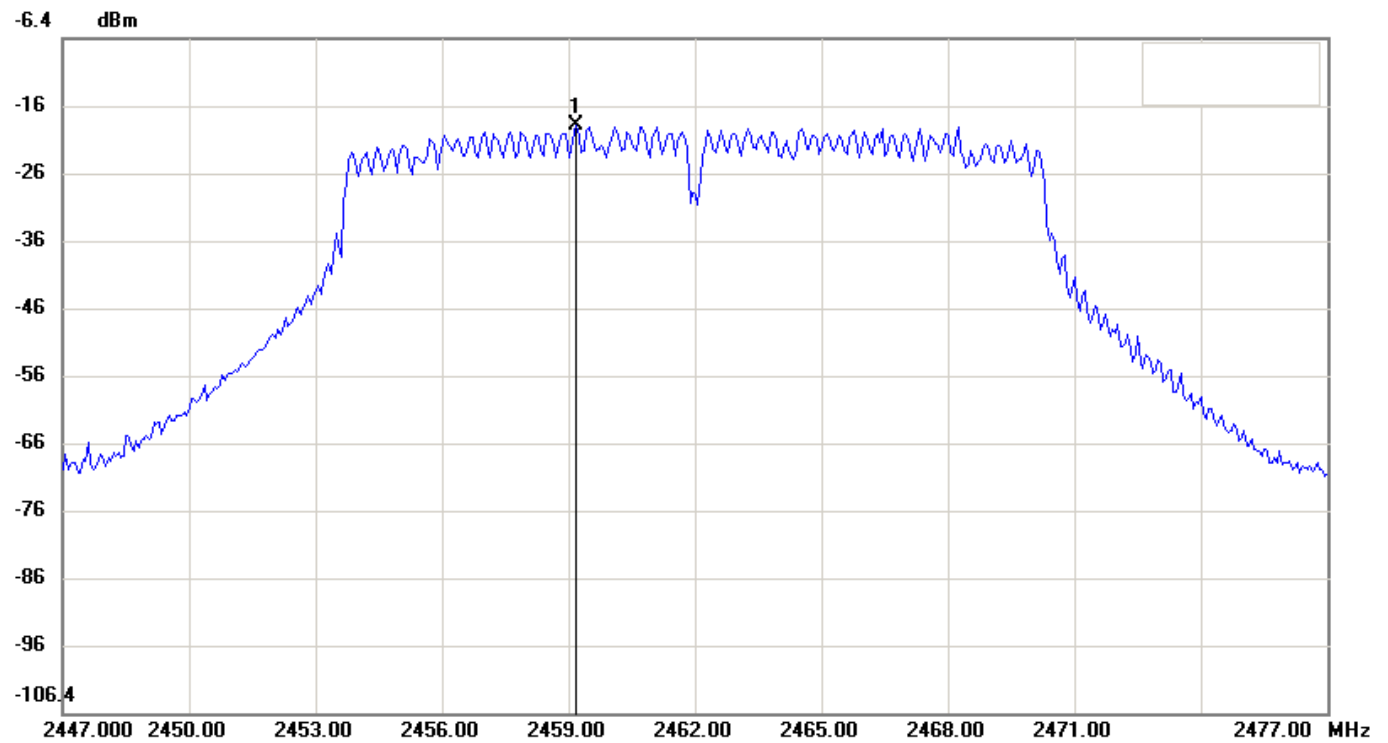
File: 21-05-MAW-005\_G  
Site: RF-Cond01

#10

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition:

EUT: Car Navigation

Model: TN0022C

Test Mode: WIFI-G

Note: NCC\_LP0002\_802.11g Channel 11-Power Density (PK)

RF Conducted

Sweep Time: 334ms Att.: 20dB

RBW: 3 KHz VBW: 10 KHz

Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2459.18000     | -19.38     |

## 8.4.3 調變技術: IEEE 802.11n HT20

測試日期: May 19, 2021

環境溫度: 25°C

環境濕度: 52%

| Channel | Peak Power Spectral<br>Density<br>(dBm) | NCC Limit<br>(dBm) | Chart   |
|---------|-----------------------------------------|--------------------|---------|
| L       | -18.65                                  | 8                  | Page 46 |
| M       | -18.76                                  | 8                  | Page 47 |
| H       | -18.23                                  | 8                  | Page 48 |

註：1. 繪圖資料請參考第 46-48 頁。

2. If antenna gain  $\leq$  6dBi, NCC Limit = 8 dBm

3. If antenna gain > 6dBi, NCC Limit = 8dBm – (highest antenna gain – 6 dBi)

4. 量測不準確度:  $\pm 1.5\text{dB}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )

## 8.5 結果判定

高、中、低頻段的3kHz功率密度皆低於限制值，合乎標準規定。

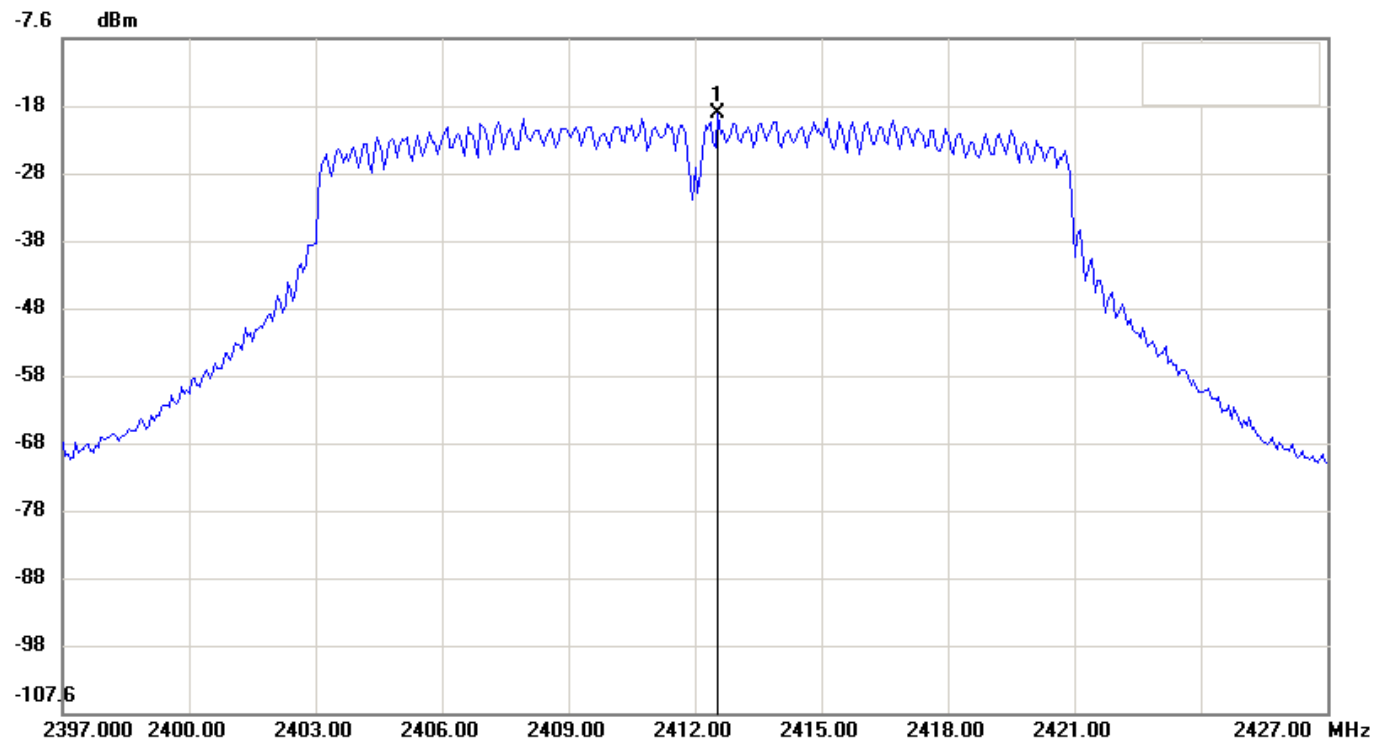
File: 21-05-MAW-005\_N  
Site: RF-Cond01

#3

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



## Condition:

EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-N  
Note: NCC\_LP0002\_802.11n-HT20 Channel 01-Power Density (PK)

## RF Conducted

Sweep Time: 334ms Att.: 20dB  
RBW: 3 KHz VBW: 10 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2412.54000     | -18.65     |

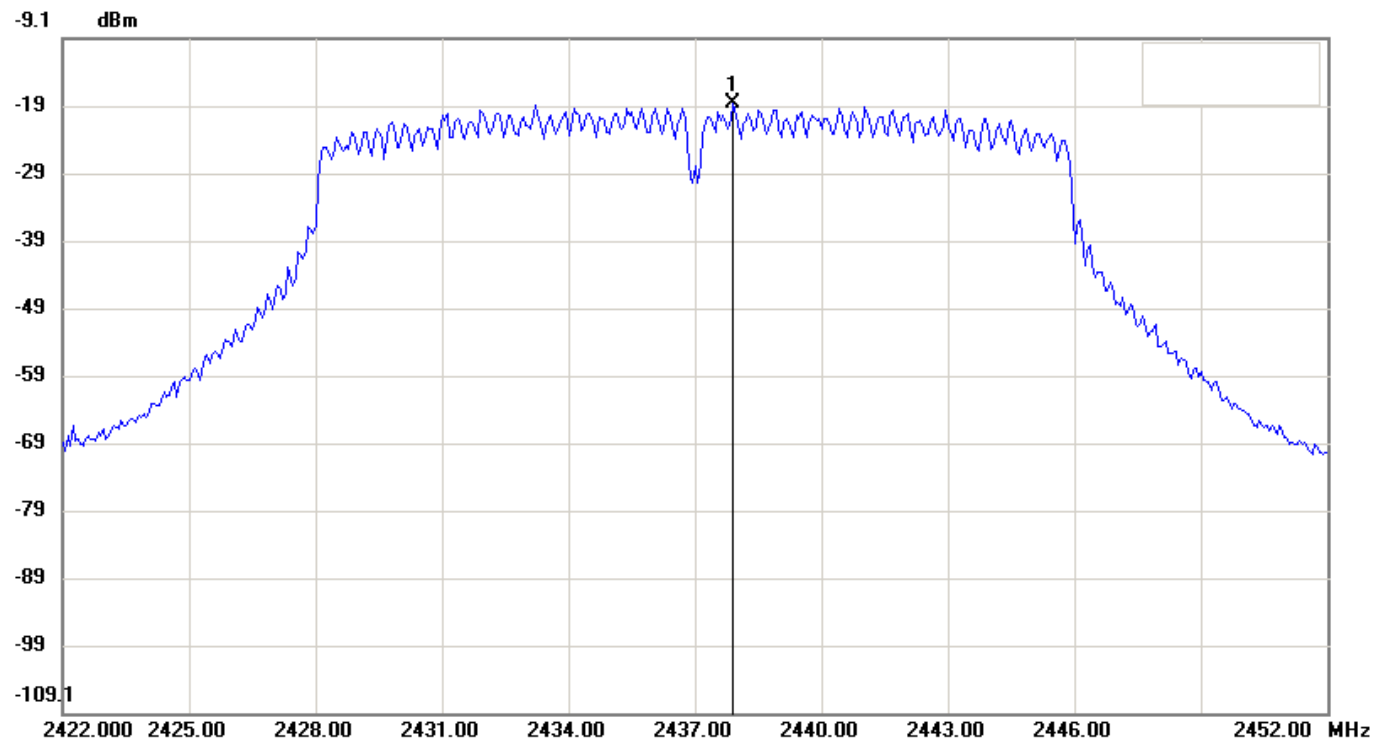
File: 21-05-MAW-005\_N  
Site: RF-Cond01

#7

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



## Condition:

EUT: Car Navigation

Model: TN0022C

Test Mode: WIFI-N

Note: NCC\_LP0002\_802.11n-HT20 Channel 06-Power Density (PK)

## RF Conducted

Sweep Time: 334ms Att.: 20dB

RBW: 3 KHz VBW: 10 KHz

Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2437.90000     | -18.76     |

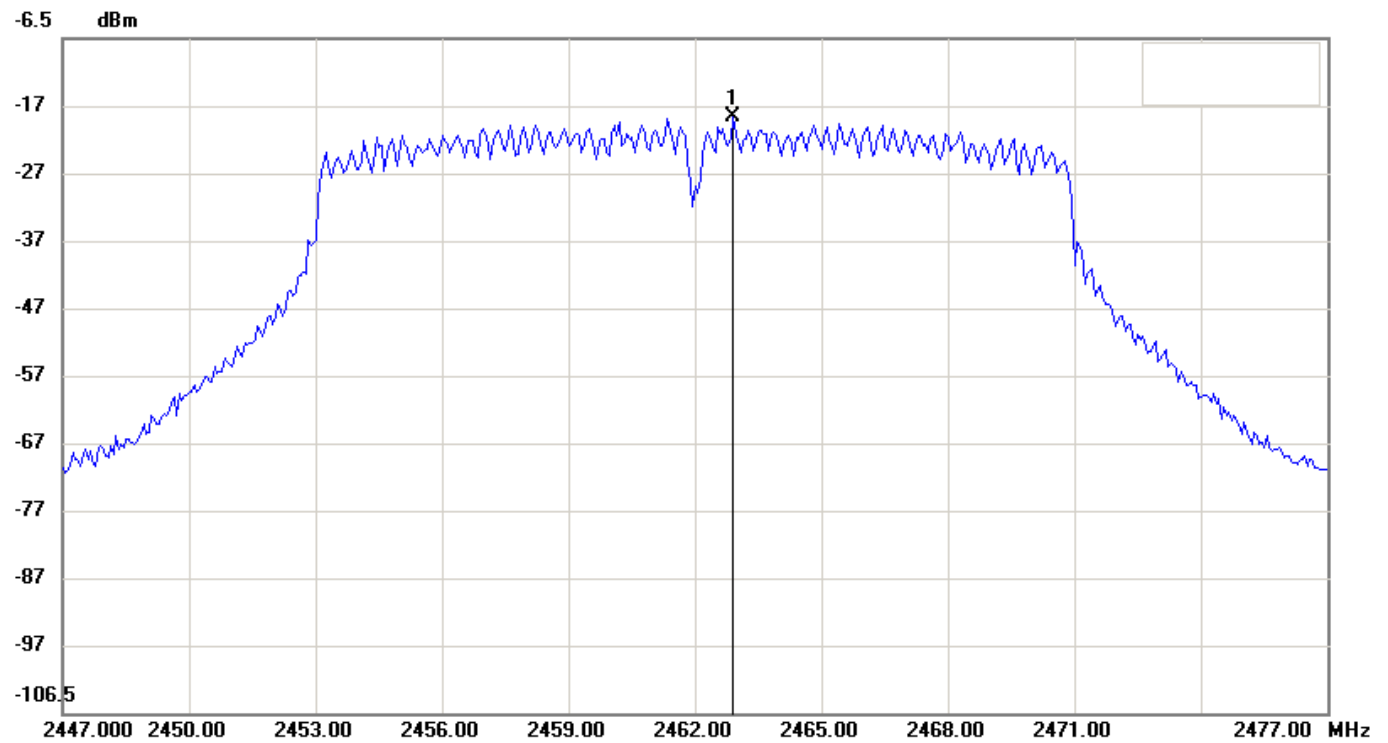
File: 21-05-MAW-005\_N  
Site: RF-Cond01

#10

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



## Condition:

EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-N  
Note: NCC\_LP0002\_802.11n-HT20 Channel 11-Power Density (PK)

## RF Conducted

Sweep Time: 334ms Att.: 20dB  
RBW: 3 KHz VBW: 10 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2462.90000     | -18.23     |

## 9 混附波發射限制之量測

### 9.1 適用標準

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

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

此外，落於國家通訊傳播委員會低功率射頻器材技術規範第3.5節禁用頻段之輻射發射，應符合國家通訊傳播委員會低功率射頻器材技術規範第3.6節之規定。

### 9.2 混附波發射限制之測試配置

如圖1 所示。

### 9.3 量測混附波發射限制之儀器

| 儀器名稱              | 廠 牌       | 型 號    |
|-------------------|-----------|--------|
| Spectrum Analyzer | KEYSIGHT  | N9030B |
| Spectrum Analyzer | R&S       | FSV40  |
| Attenuator        | WEINSCHEL | 56-10  |

測試軟體: LZ-RF (Ver. ETC-3A2)

### 9.4 混附波發射限制之量測結果 (傳導方式量測)

測試工程師: 許志宏

#### 9.4.1 調變技術: IEEE 802.11b

測試日期: May 19, 2021

環境溫度: 25°C

環境濕度: 52%

- a. 下邊緣頻帶：距下頻帶邊緣40MHz內最大混附波產生於 2398.450 MHz，比主波低20dB以上，合乎標準規定。
- b. 上邊緣頻帶：距上頻帶邊緣40MHz內最大混附波產生於 2483.892 MHz，比主波低20dB以上，合乎標準規定。

註：1. 繪圖資料請參考第 50-54 頁。

2. 量測不準確度:  $\pm 1.5\text{dB}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )

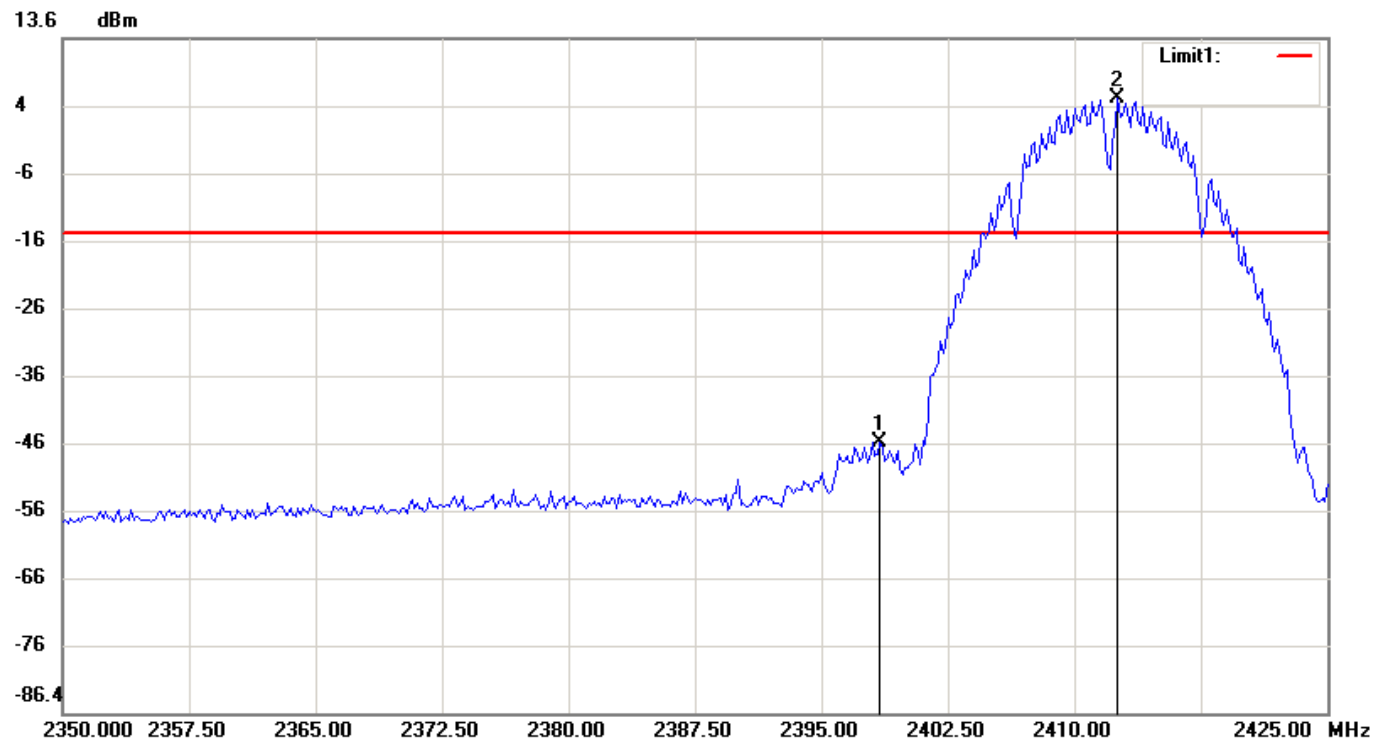
File: 21-05-MAW-005\_B  
Site: RF-Cond01

#4

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -15.34dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-B  
Note: NCC\_LP0002\_802.11b Channel 01-Bandedge

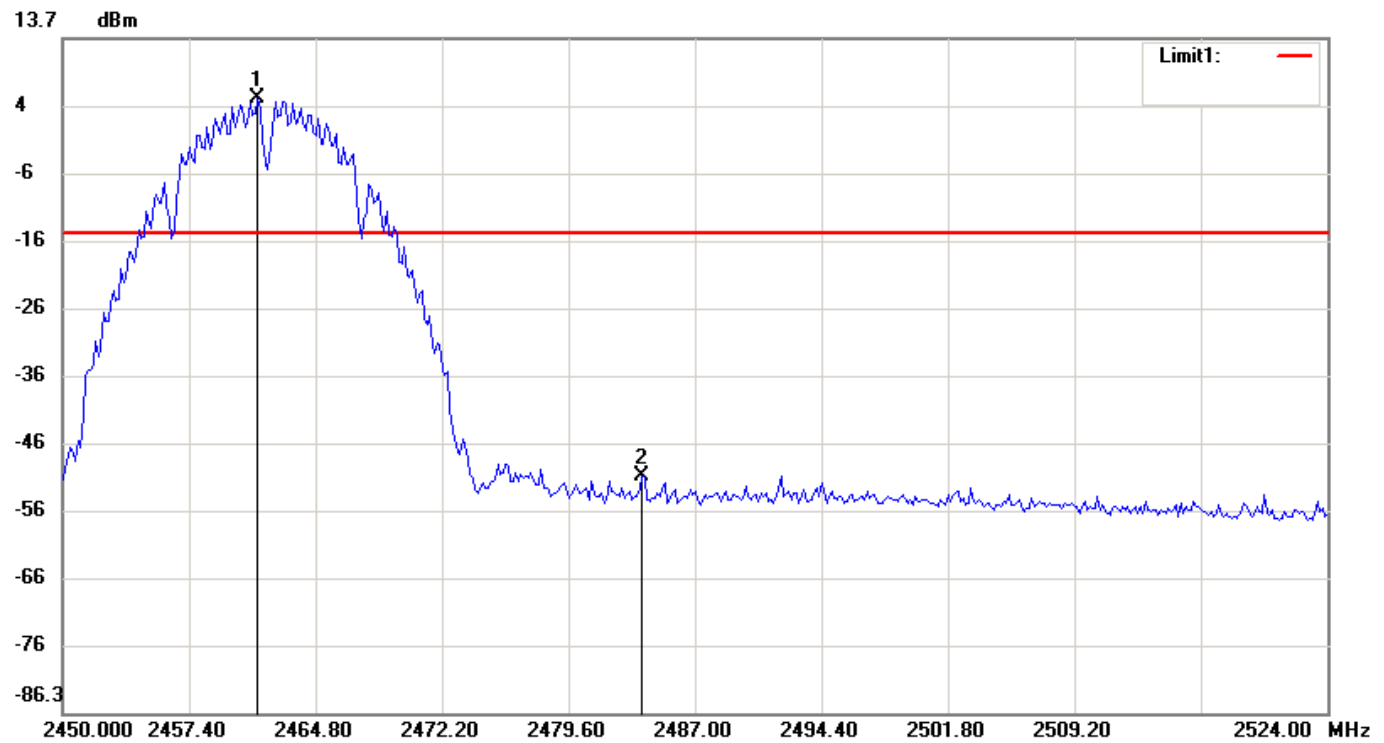
RF Conducted  
Sweep Time: 500ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2398.45000     | -46.16     |
| 2   | 2412.55000     | 4.66       |

File: 21-05-MAW-005\_B  
Site: RF-Cond01

#11 Date: 2021/5/19

Temperature: 25 °C  
Humidity: 52 %



Condition: -15.22dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-B  
Note: NCC\_LP0002\_802.11b Channel 11-Bandedge

RF Conducted  
Sweep Time: 500ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2461.39600     | 4.78       |
| 2   | 2483.89200     | -51.10     |

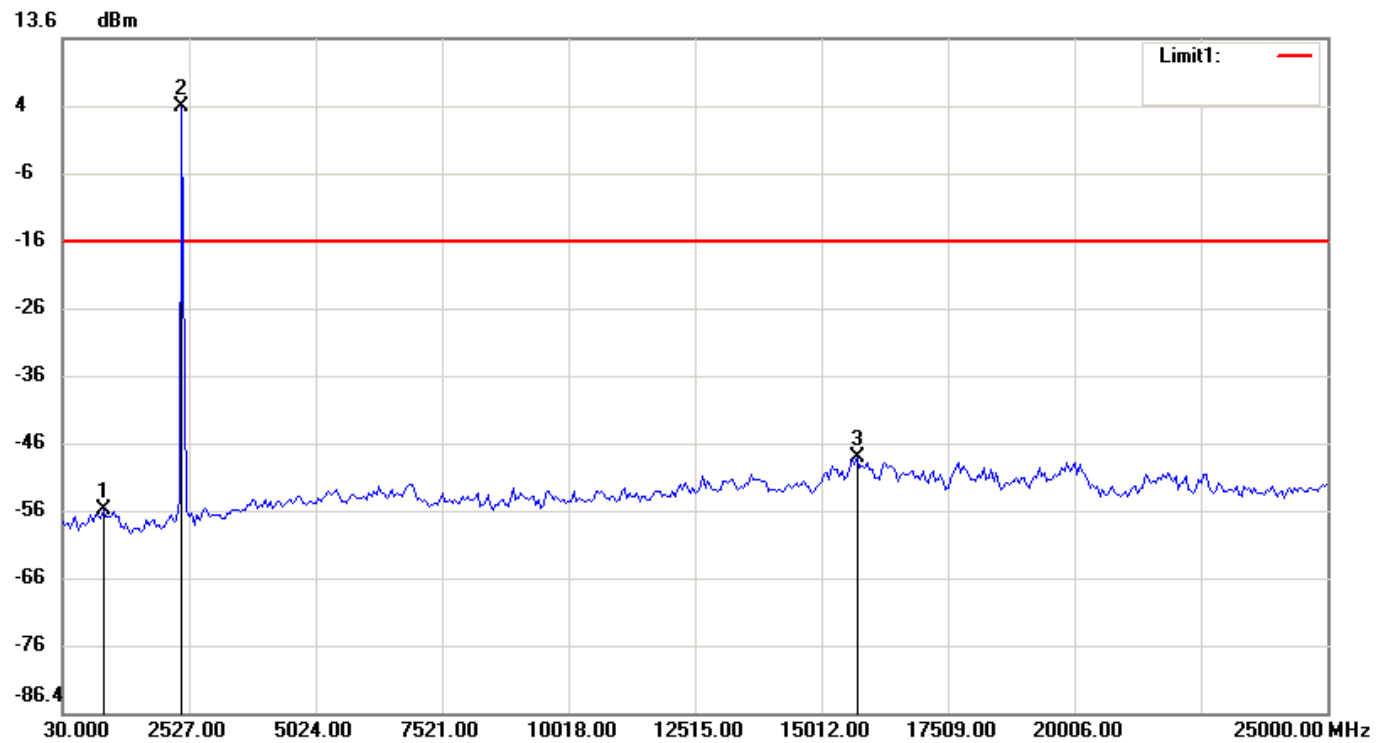
File: 21-05-MAW-005\_B  
Site: RF-Cond01

#2

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -16.59dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-B  
Note: NCC\_LP0002\_802.11b Channel 01-Conducted Spurious

RF Conducted  
Sweep Time: 250ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 829.0400       | -56.32     |
| 2   | 2377.18000     | 3.41       |
| 3   | 15711.16000    | -48.47     |

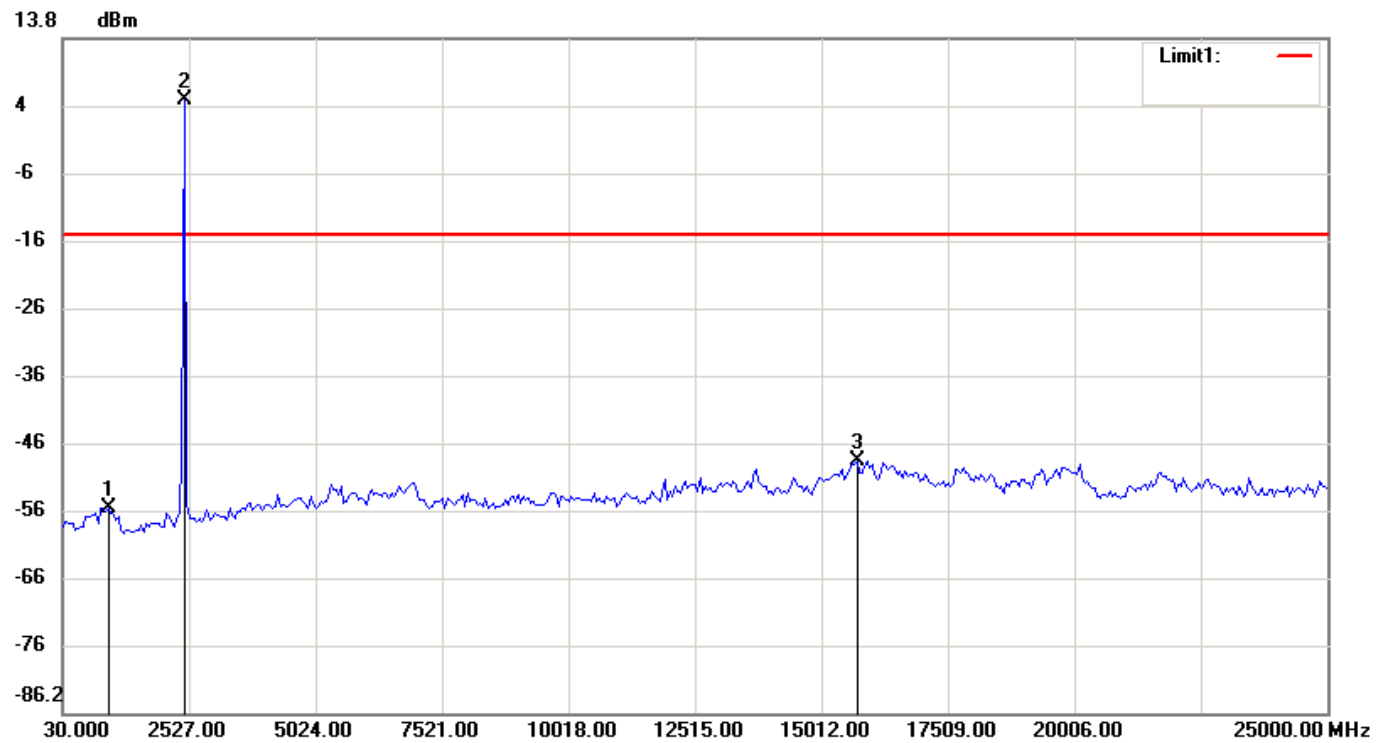
File: 21-05-MAW-005\_B  
Site: RF-Cond01

#6

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -15.42dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-B  
Note: NCC\_LP0002\_802.11b Channel 06-Conducted Spurious

RF Conducted  
Sweep Time: 250ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 928.9200       | -55.76     |
| 2   | 2427.12000     | 4.58       |
| 3   | 15711.16000    | -48.77     |

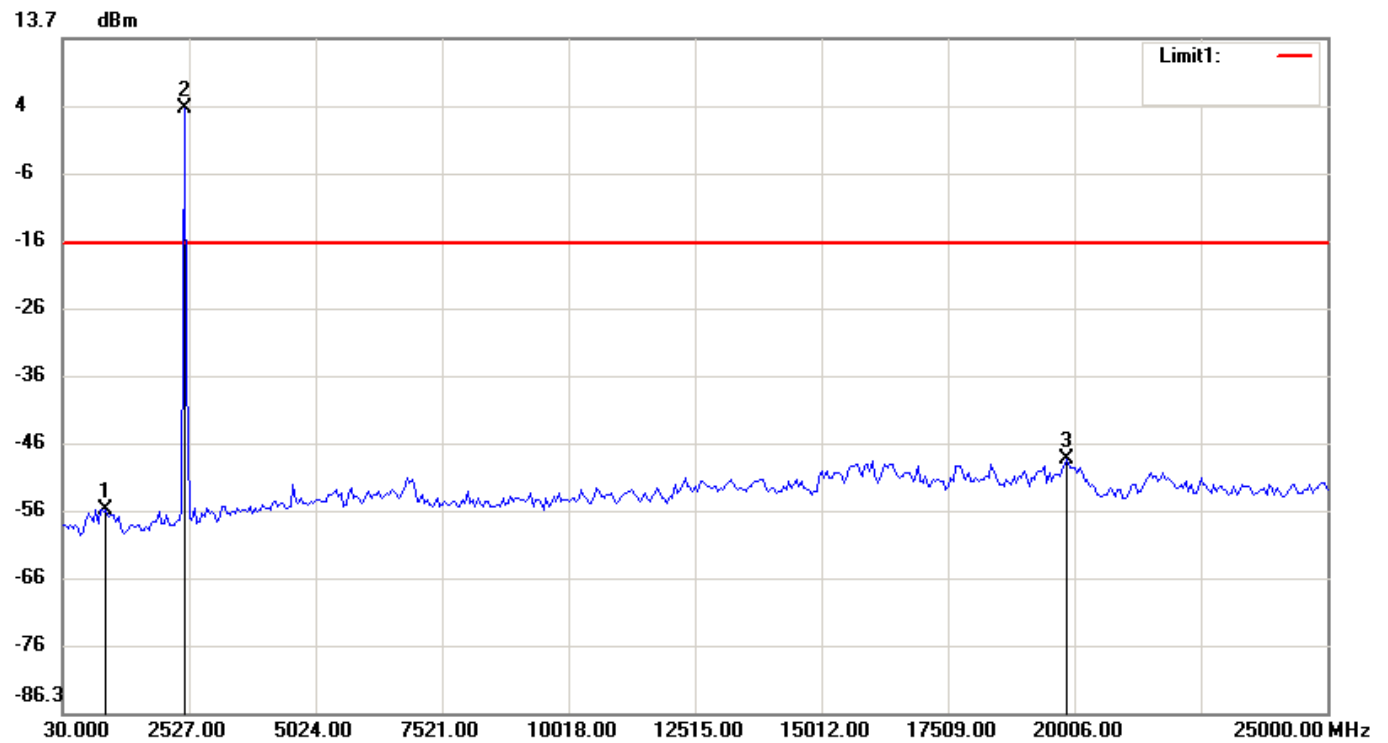
File: 21-05-MAW-005\_B  
Site: RF-Cond01

#9

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -16.56dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-B  
Note: NCC\_LP0002\_802.11b Channel 11-Conducted Spurious

RF Conducted  
Sweep Time: 250ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 878.9800       | -56.09     |
| 2   | 2427.12000     | 3.44       |
| 3   | 19856.18000    | -48.56     |

## 9.4.2 調變技術: IEEE 802.11g

測試日期: May 19, 2021

環境溫度: 25°C

環境濕度: 52%

- a. 下邊緣頻帶：距下頻帶邊緣40MHz內最大混附波產生於 2399.950 MHz，比主波低 20dB以上，合乎標準規定。
- b. 上邊緣頻帶：距上頻帶邊緣40MHz內最大混附波產生於 2494.400 MHz，比主波低 20dB以上，合乎標準規定。

註：1. 繪圖資料請參考第 56-60 頁。

2. 量測不準確度: $\pm 1.5\text{dB}(1\text{GHz} \leq f \leq 18\text{GHz})$

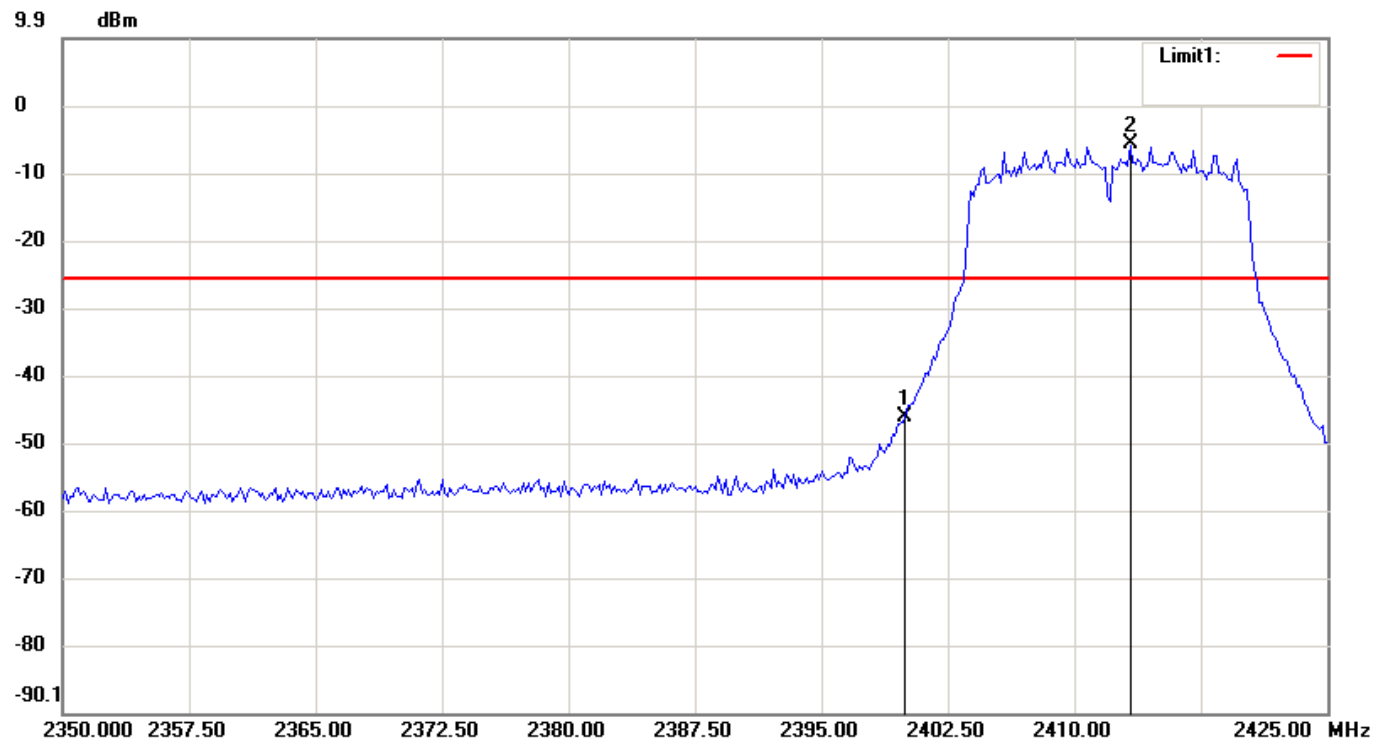
File: 21-05-MAW-005\_G  
Site: RF-Cond01

#4

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -25.84dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-G  
Note: NCC\_LP0002\_802.11g Channel 01-Bandedge

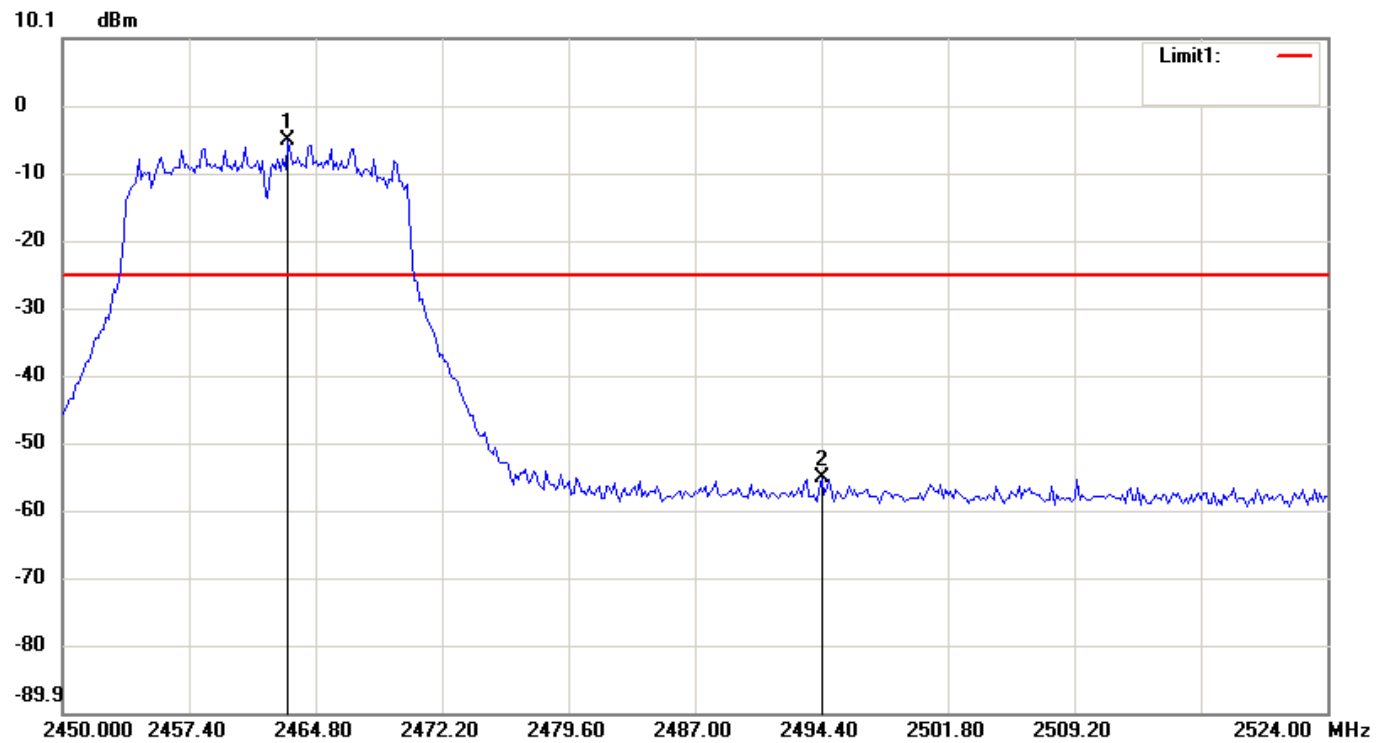
RF Conducted  
Sweep Time: 500ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2399.95000     | -46.27     |
| 2   | 2413.30000     | -5.84      |

File: 21-05-MAW-005\_G  
Site: RF-Cond01

#11 Date: 2021/5/19

Temperature: 25 °C  
Humidity: 52 %



Condition: -24.9dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-G  
Note: NCC\_LP0002\_802.11g Channel 11-Bandedge

RF Conducted  
Sweep Time: 500ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2463.17200     | -4.90      |
| 2   | 2494.40000     | -55.10     |

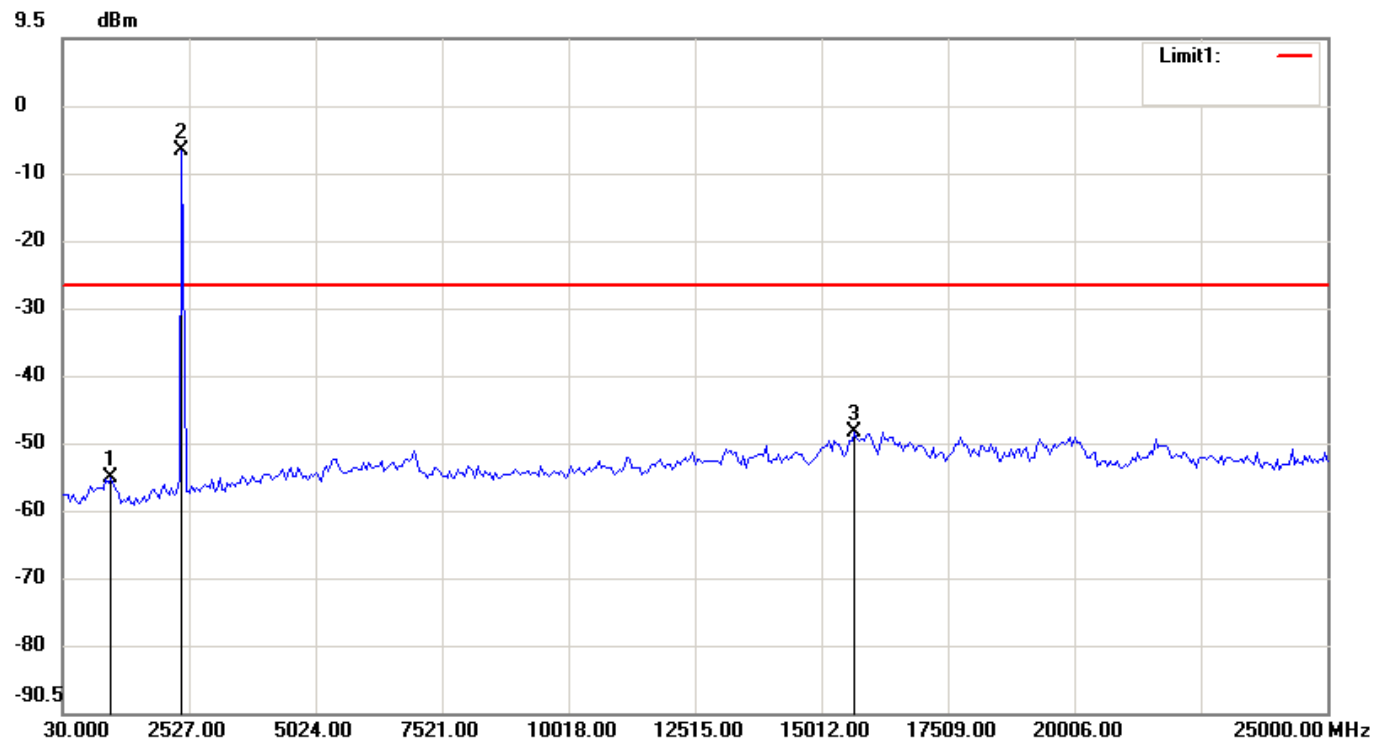
File: 21-05-MAW-005\_G  
Site: RF-Cond01

#2

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -26.99dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-G  
Note: NCC\_LP0002\_802.11g Channel 01-Conducted Spurious

RF Conducted  
Sweep Time: 250ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 978.8600       | -55.62     |
| 2   | 2377.18000     | -6.99      |
| 3   | 15661.22000    | -48.93     |

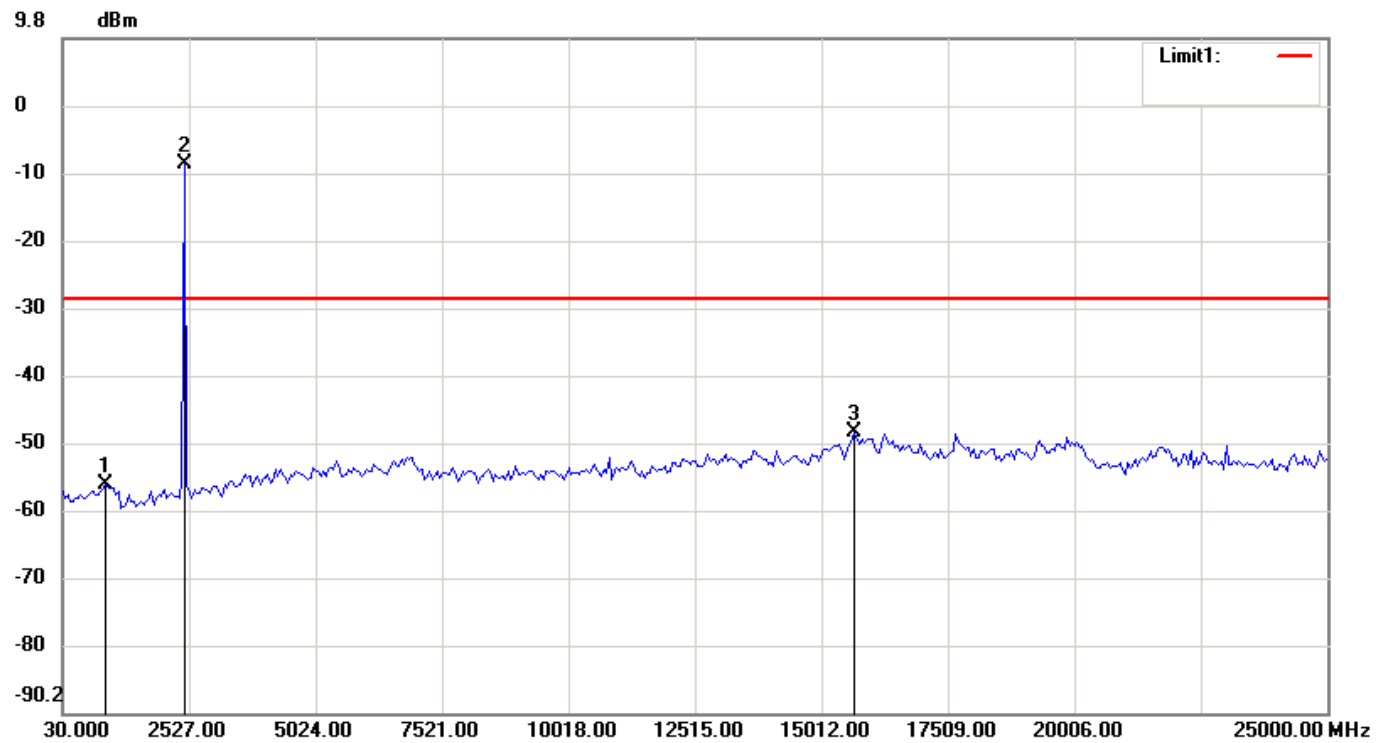
File: 21-05-MAW-005\_G  
Site: RF-Cond01

#6

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -28.77dBm

EUT: Car Navigation

Model: TN0022C

Test Mode: WIFI-G

Note: NCC\_LP0002\_802.11g Channel 06-Conducted Spurious

RF Conducted

Sweep Time: 250ms Att.: 20dB

RBW: 100 KHz VBW: 300 KHz

Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 878.9800       | -56.24     |
| 2   | 2427.12000     | -8.77      |
| 3   | 15661.22000    | -48.46     |

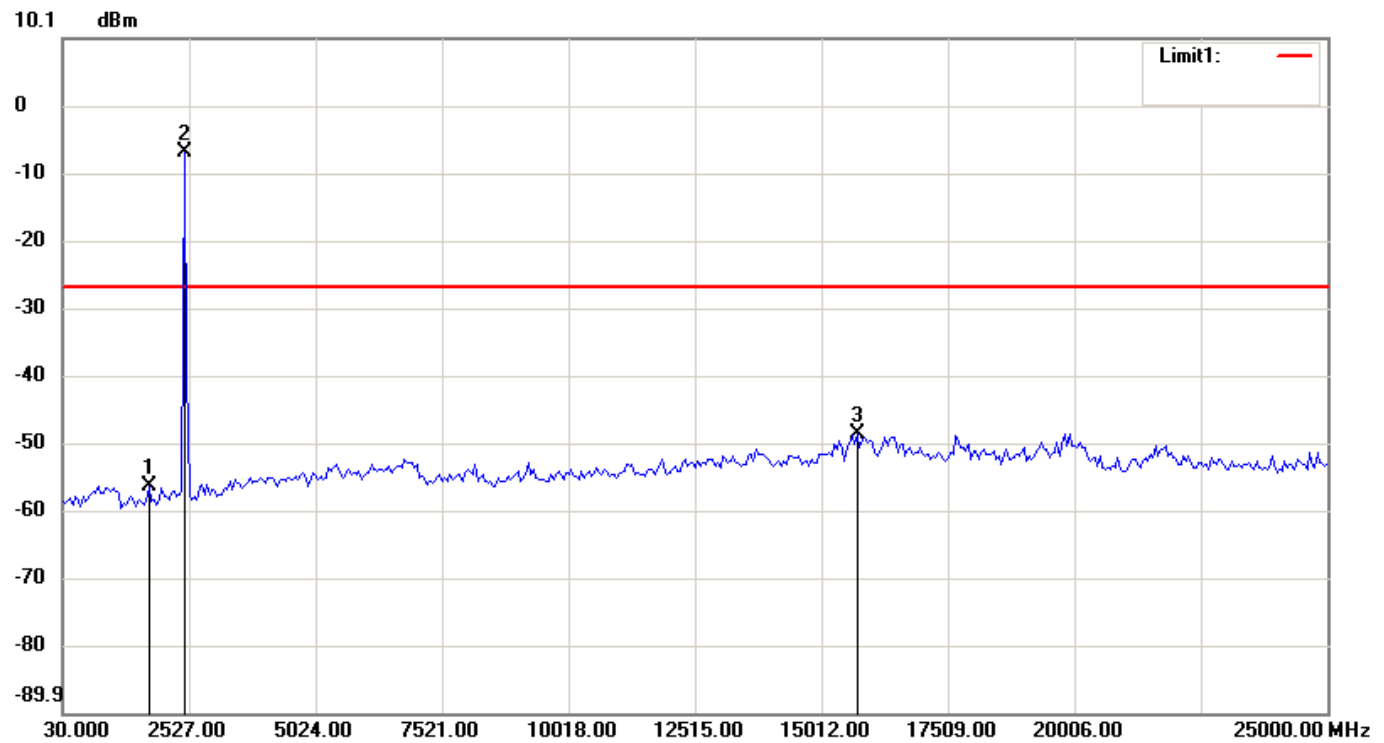
File: 21-05-MAW-005\_G  
Site: RF-Cond01

#9

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -26.86dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-G  
Note: NCC\_LP0002\_802.11g Channel 11-Conducted Spurious

RF Conducted  
Sweep Time: 250ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 1727.96000     | -56.31     |
| 2   | 2427.12000     | -6.86      |
| 3   | 15711.16000    | -48.44     |

### 9.4.3 調變技術: IEEE 802.11n HT20

測試日期: May 19, 2021

環境溫度: 25°C

環境濕度: 52%

- a. 下邊緣頻帶：距下頻帶邊緣40MHz內最大混附波產生於 2399.950 MHz，比主波低 20dB以上，合乎標準規定。
- b. 上邊緣頻帶：距上頻帶邊緣40MHz內最大混附波產生於 2486.704 MHz，比主波低 20dB以上，合乎標準規定。

註：1. 繪圖資料請參考第 62-66 頁。

2. 量測不準確度: $\pm 1.5\text{dB}$ ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )

## 9.5 結果判定

混附波之發射皆低於使用頻帶內最高的射頻功率20dB以上，符合標準規定。

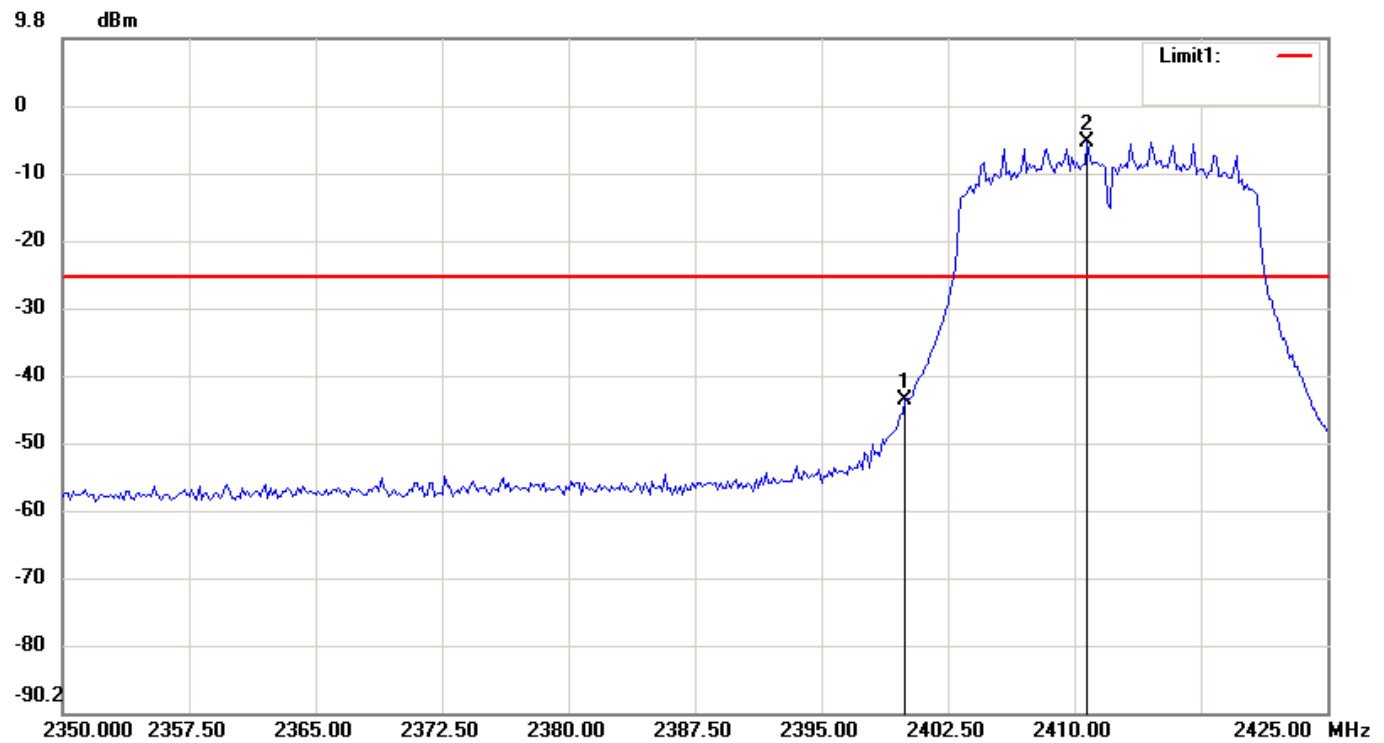
File: 21-05-MAW-005\_N  
Site: RF-Cond01

#4

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -25.54dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-N  
Note: NCC\_LP0002\_802.11n-HT20 Channel 01-Bandedge

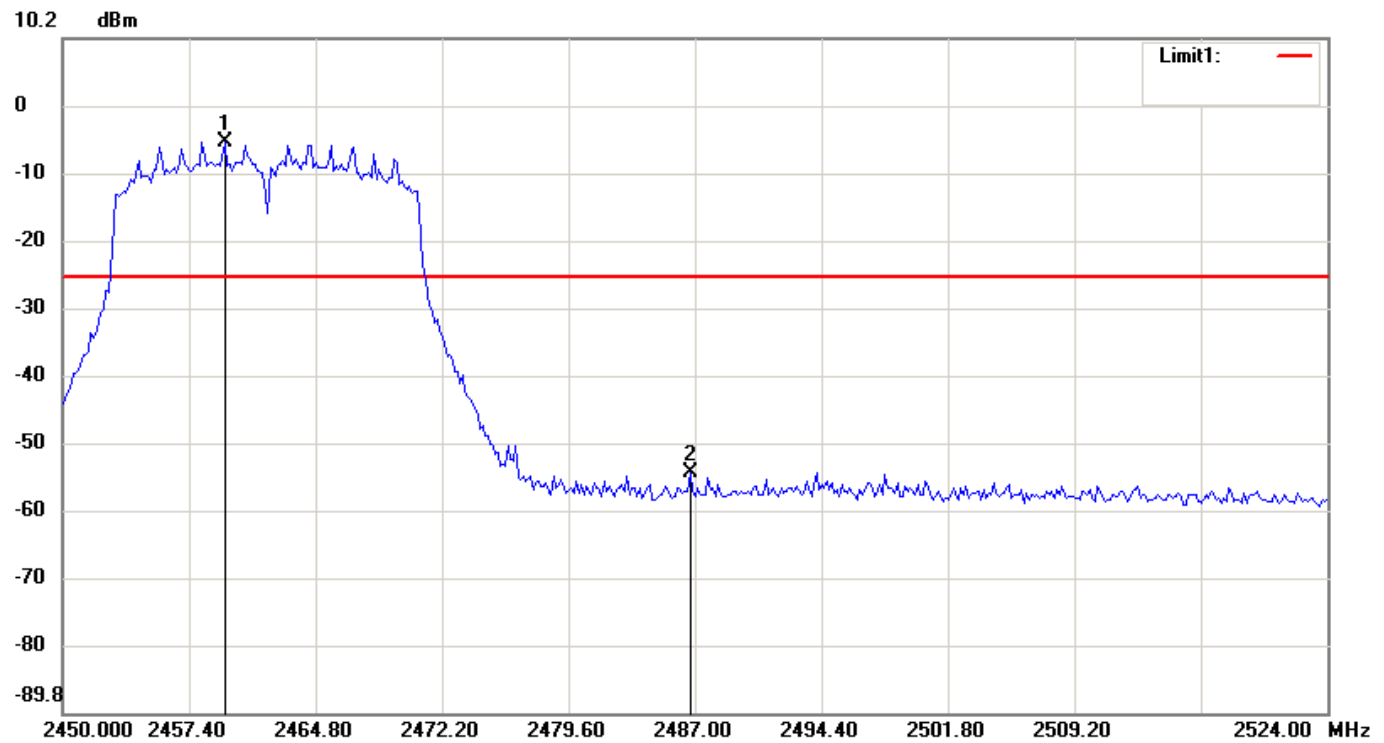
RF Conducted  
Sweep Time: 500ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2399.95000     | -43.84     |
| 2   | 2410.75000     | -5.54      |

File: 21-05-MAW-005\_N  
Site: RF-Cond01

#11 Date: 2021/5/19

Temperature: 25 °C  
Humidity: 52 %



Condition: -25.15dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-N  
Note: NCC\_LP0002\_802.11n-HT20 Channel 11-Bandedge

RF Conducted  
Sweep Time: 500ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2459.47200     | -5.15      |
| 2   | 2486.70400     | -54.21     |

File: 21-05-MAW-005\_N  
Site: RF-Cond01

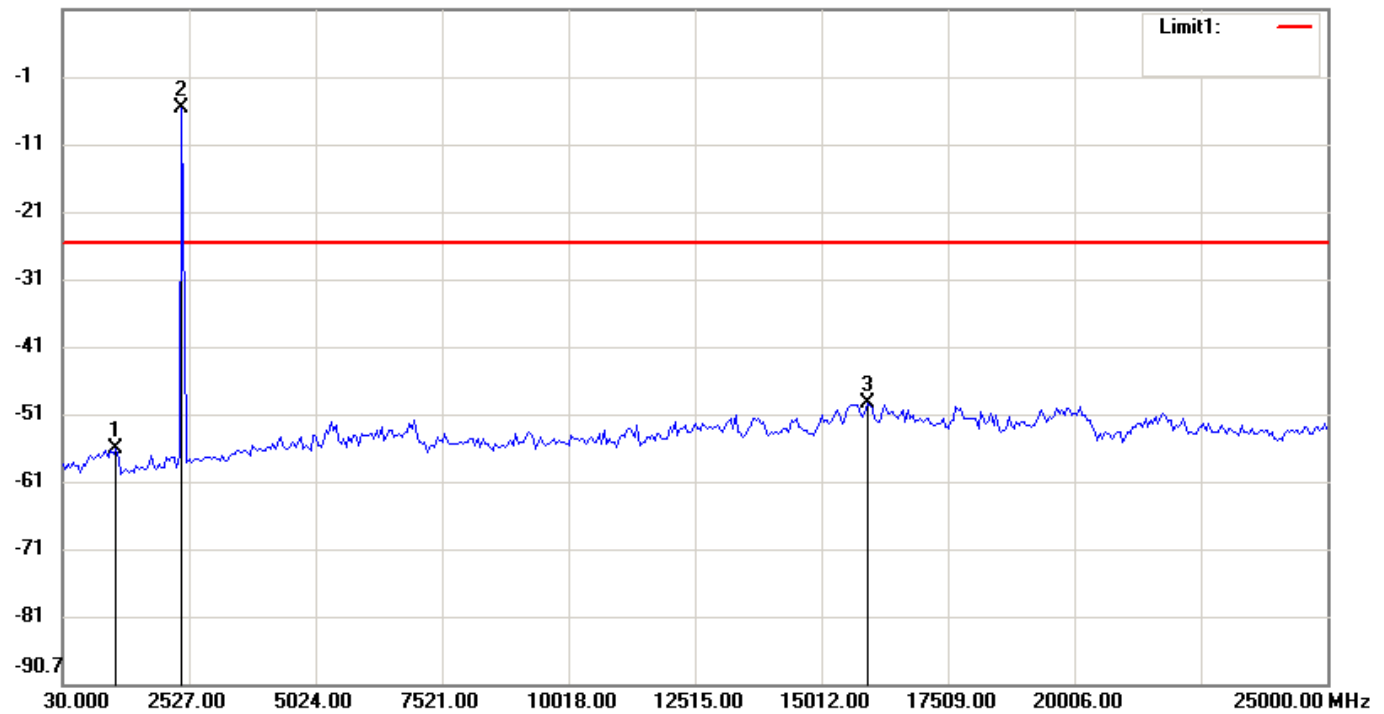
#2

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %

9.3 dBm



Condition: -25.35dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-N  
Note: NCC\_LP0002\_802.11n-HT20 Channel 01-Conducted Spurious

RF Conducted  
Sweep Time: 250ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 1078.74000     | -55.75     |
| 2   | 2377.18000     | -5.35      |
| 3   | 15910.92000    | -49.01     |

File: 21-05-MAW-005\_N  
Site: RF-Cond01

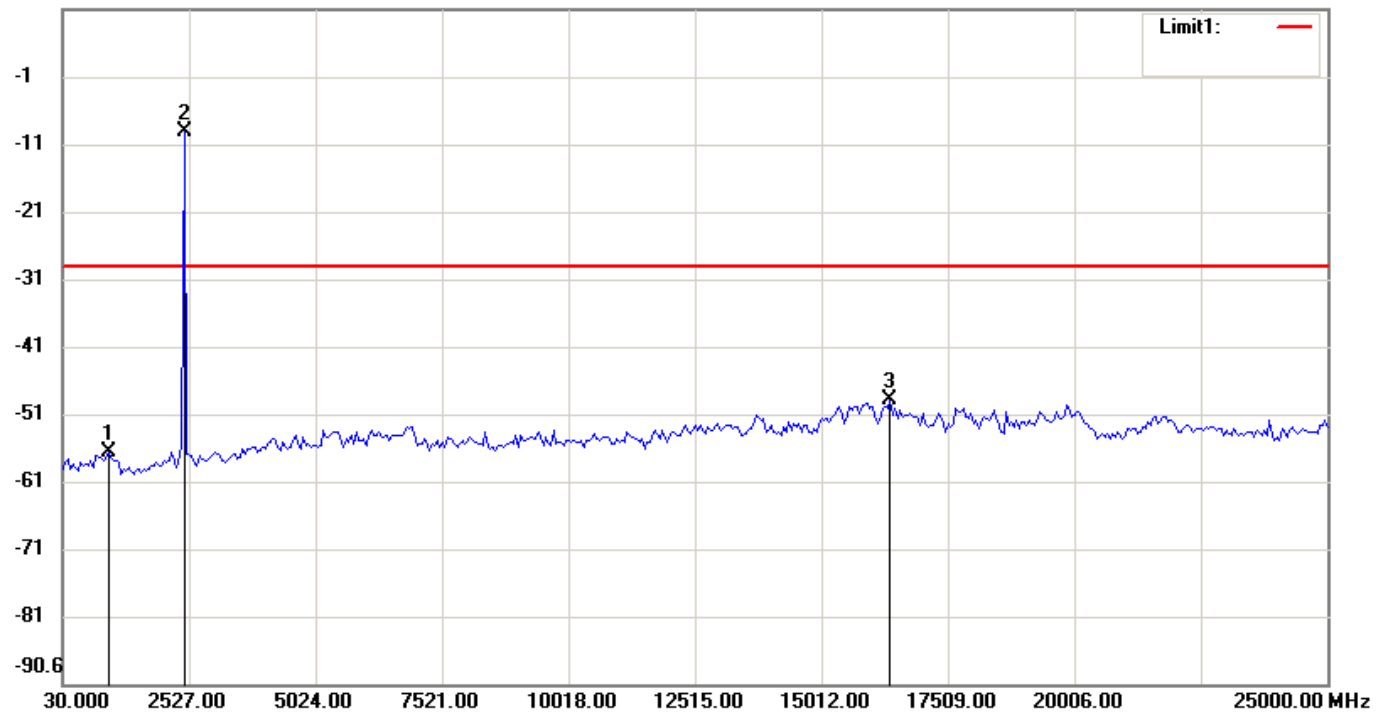
#6

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %

9.4 dBm



Condition: -28.73dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-N  
Note: NCC\_LP0002\_802.11n-HT20 Channel 06-Conducted Spurious

RF Conducted  
Sweep Time: 250ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 928.9200       | -56.17     |
| 2   | 2427.12000     | -8.73      |
| 3   | 16360.38000    | -48.46     |

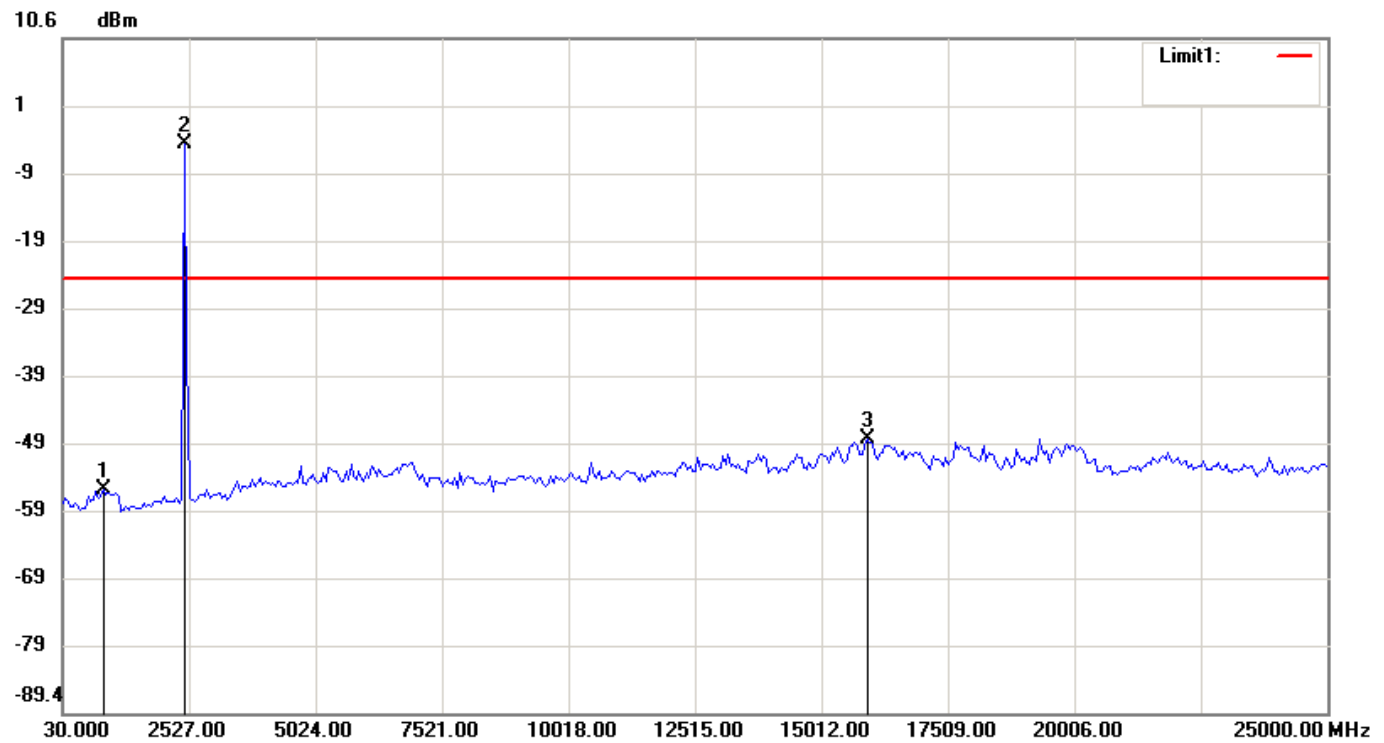
File: 21-05-MAW-005\_N  
Site: RF-Cond01

#9

Date: 2021/5/19

Temperature: 25 °C

Humidity: 52 %



Condition: -25.11dBm  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-N  
Note: NCC\_LP0002\_802.11n-HT20 Channel 11-Conducted Spurious

RF Conducted  
Sweep Time: 250ms Att.: 20dB  
RBW: 100 KHz VBW: 300 KHz  
Operator: Bruce

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 829.0400       | -56.21     |
| 2   | 2427.12000     | -5.11      |
| 3   | 15910.92000    | -48.90     |

## 10 場強輻射之量測

### 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4.10.1.5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。

### 10.2 量測方法

將待測物置於非金屬桌面，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。待測物若為手持式則分別要以三軸相放置，並分別測試以找出最大輻射電場強度。

### 10.3 量測場強輻射之儀器

#### (1)量測儀器

| 儀器名稱                                  | 廠 牌              | 型 號                     |
|---------------------------------------|------------------|-------------------------|
| EMI Receiver                          | R&S              | ESCI                    |
| Spectrum Analyzer                     | R&S              | FSU46                   |
| Spectrum Analyzer                     | R&S              | FSV40                   |
| Horn Antenna                          | EMCO             | 3117                    |
| Horn Antenna                          | EMCO             | 3116                    |
| PRE-Amplifier                         | Agilent          | 8449B                   |
| PRE-Amplifier                         | Agilent          | 8447D                   |
| BiLog Antenna                         | ETC              | MCTD 2786               |
| Trilog Broadband Antenna with 5dB Pad | SCHWARZBECK&EMCI | VULB 9168 & EMCI-N-6-05 |
| Spectrum Analyzer                     | KEYSIGHT         | N9030B                  |

測試軟體: LZ-RF (Ver. ETC-3A2)

#### (2)儀器設定

| Frequency Band (MHz) | Instrument        | Function   | Resolution Bandwidth | Video Bandwidth |
|----------------------|-------------------|------------|----------------------|-----------------|
| 30 to 1000           | RF Test Receiver  | Quasi-Peak | 120 kHz              | 300 kHz         |
|                      | RF Test Receiver  | Peak       | 120 kHz              | 300 kHz         |
| Above 1000           | Spectrum Analyzer | Peak       | 1 MHz                | 1 MHz           |
|                      | Spectrum Analyzer | Average    | 1 MHz                | 10 Hz           |

## 10.4 場強度之計算

場強之計算公式如下

$$\text{結果值} = \text{讀值} + \text{校正因子}$$

其中校正因子為：

天線因子+饋線損失+濾波器損失（若有使用）-放大器增益（若有使用）  
量測結果請見下頁。

## 10.5 場強輻射之量測結果

測試工程師: 許志宏

### 10.5.1 諧波發射量測值

10.5.1.1 調變技術: IEEE 802.11b

#### a. Channel Low

操作模式 : 發射接收

基本波頻率 : 2412 MHz

測試日期: May 25, 2021

環境溫度: 21°C

環境濕度: 59%

| 輻射<br>頻率<br>(MHz) | 天線<br>極性<br>H/V | 機器讀值<br>(dBuV/m)@3m |     | 校正<br>因子<br>(dB) | 結果值<br>(dBuV/m)@3m |     | 限制值<br>(dBuV/m)@3m |      | 餘裕值<br>(dB)<br>(worse) |
|-------------------|-----------------|---------------------|-----|------------------|--------------------|-----|--------------------|------|------------------------|
|                   |                 | Peak                | AVG |                  | Peak               | AVG | Peak               | AVG  |                        |
| 4824.0000         | H               | ---                 | --- | 1.06             | ---                | --- | 74.0               | 54.0 | ---                    |
| 4824.0000         | V               | ---                 | --- | 1.06             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7236.0000         | H               | ---                 | --- | 3.64             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7236.0000         | V               | ---                 | --- | 3.64             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9648.0000         | H               | ---                 | --- | 4.70             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9648.0000         | V               | ---                 | --- | 4.70             | ---                | --- | 74.0               | 54.0 | ---                    |
| 12060.0000        | H               | ---                 | --- | 8.06             | ---                | --- | 74.0               | 54.0 | ---                    |
| 12060.0000        | V               | ---                 | --- | 8.06             | ---                | --- | 74.0               | 54.0 | ---                    |

註：1. 標記“---”表發射之訊號太弱而儀器無法量測。

2. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

3. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ) ; HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ) ; HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ) ; HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

**b. Channel Mid**

操作模式：發射接收

基本波頻率：2437 MHz

測試日期：May 25, 2021

環境溫度：21°C

環境濕度：59%

| 輻射<br>頻率<br>(MHz) | 天線<br>極性<br>H/V | 機器讀值<br>(dBuV/m)@3m |     | 校正<br>因子<br>(dB) | 結果值<br>(dBuV/m)@3m |     | 限制值<br>(dBuV/m)@3m |      | 餘裕值<br>(worse)<br>(dB) |
|-------------------|-----------------|---------------------|-----|------------------|--------------------|-----|--------------------|------|------------------------|
|                   |                 | Peak                | AVG |                  | Peak               | AVG | Peak               | AVG  |                        |
| 4874.0000         | H               | ---                 | --- | 1.17             | ---                | --- | 74.0               | 54.0 | ---                    |
| 4874.0000         | V               | ---                 | --- | 1.17             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7311.0000         | H               | ---                 | --- | 3.66             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7311.0000         | V               | ---                 | --- | 3.66             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9748.0000         | H               | ---                 | --- | 4.82             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9748.0000         | V               | ---                 | --- | 4.82             | ---                | --- | 74.0               | 54.0 | ---                    |
| 12185.0000        | H               | ---                 | --- | 8.29             | ---                | --- | 74.0               | 54.0 | ---                    |
| 12185.0000        | V               | ---                 | --- | 8.29             | ---                | --- | 74.0               | 54.0 | ---                    |

註：1. 標記“---”表發射之訊號太弱而儀器無法量測。

2. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

3. 量測不準確度：

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ) ; HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ) ; HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ) ; HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

**c. Channel High**

操作模式：發射接收

基本波頻率：2462 MHz

測試日期：May 25, 2021

環境溫度：21°C

環境濕度：59%

| 輻射<br>頻率<br>(MHz) | 天線<br>極性<br>H/V | 機器讀值<br>(dBuV/m)@3m |     | 校正<br>因子<br>(dB) | 結果值<br>(dBuV/m)@3m |     | 限制值<br>(dBuV/m)@3m |      | 餘裕值<br>(worse)<br>(dB) |
|-------------------|-----------------|---------------------|-----|------------------|--------------------|-----|--------------------|------|------------------------|
|                   |                 | Peak                | AVG |                  | Peak               | AVG | Peak               | AVG  |                        |
| 4924.0000         | H               | ---                 | --- | 1.28             | ---                | --- | 74.0               | 54.0 | ---                    |
| 4924.0000         | V               | ---                 | --- | 1.28             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7386.0000         | H               | ---                 | --- | 3.68             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7386.0000         | V               | ---                 | --- | 3.68             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9848.0000         | H               | ---                 | --- | 4.94             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9848.0000         | V               | ---                 | --- | 4.94             | ---                | --- | 74.0               | 54.0 | ---                    |
| 14772.0000        | H               | ---                 | --- | 10.74            | ---                | --- | 74.0               | 54.0 | ---                    |
| 14772.0000        | V               | ---                 | --- | 10.74            | ---                | --- | 74.0               | 54.0 | ---                    |

註：1. 標記“---”表發射之訊號太弱而儀器無法量測。

2. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

3. 量測不準確度：

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ) ; HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ) ; HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ) ; HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

## 10.5.1.2 調變技術: IEEE 802.11g

**a. Channel Low**

操作模式：發射接收

基本波頻率：2412 MHz

測試日期: May 25, 2021

環境溫度: 21°C

環境濕度: 59%

| 輻射<br>頻率<br>(MHz) | 天線<br>極性<br>H/V | 機器讀值<br>(dBuV/m)@3m |     | 校正<br>因子<br>(dB) | 結果值<br>(dBuV/m)@3m |     | 限制值<br>(dBuV/m)@3m |      | 餘裕值<br>(worse)<br>(dB) |
|-------------------|-----------------|---------------------|-----|------------------|--------------------|-----|--------------------|------|------------------------|
|                   |                 | Peak                | AVG |                  | Peak               | AVG | Peak               | AVG  |                        |
| 4824.0000         | H               | ---                 | --- | 1.06             | ---                | --- | 74.0               | 54.0 | ---                    |
| 4824.0000         | V               | ---                 | --- | 1.06             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7236.0000         | H               | ---                 | --- | 3.64             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7236.0000         | V               | ---                 | --- | 3.64             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9648.0000         | H               | ---                 | --- | 4.70             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9648.0000         | V               | ---                 | --- | 4.70             | ---                | --- | 74.0               | 54.0 | ---                    |
| 12060.0000        | H               | ---                 | --- | 8.06             | ---                | --- | 74.0               | 54.0 | ---                    |
| 12060.0000        | V               | ---                 | --- | 8.06             | ---                | --- | 74.0               | 54.0 | ---                    |

註：1. 標記“---”表發射之訊號太弱而儀器無法量測。

2. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

3. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ) ; HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ) ; HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ) ; HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

**b. Channel Mid**

操作模式：發射接收

基本波頻率：2437 MHz

測試日期：May 25, 2021

環境溫度：21°C

環境濕度：59%

| 輻射<br>頻率<br>(MHz) | 天線<br>極性<br>H/V | 機器讀值<br>(dBuV/m)@3m |     | 校正<br>因子<br>(dB) | 結果值<br>(dBuV/m)@3m |     | 限制值<br>(dBuV/m)@3m |      | 餘裕值<br>(worse)<br>(dB) |
|-------------------|-----------------|---------------------|-----|------------------|--------------------|-----|--------------------|------|------------------------|
|                   |                 | Peak                | AVG |                  | Peak               | AVG | Peak               | AVG  |                        |
| 4874.0000         | H               | ---                 | --- | 1.17             | ---                | --- | 74.0               | 54.0 | ---                    |
| 4874.0000         | V               | ---                 | --- | 1.17             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7311.0000         | H               | ---                 | --- | 3.66             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7311.0000         | V               | ---                 | --- | 3.66             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9748.0000         | H               | ---                 | --- | 4.82             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9748.0000         | V               | ---                 | --- | 4.82             | ---                | --- | 74.0               | 54.0 | ---                    |
| 12185.0000        | H               | ---                 | --- | 8.29             | ---                | --- | 74.0               | 54.0 | ---                    |
| 12185.0000        | V               | ---                 | --- | 8.29             | ---                | --- | 74.0               | 54.0 | ---                    |

註：1. 標記“---”表發射之訊號太弱而儀器無法量測。

2. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

3. 量測不準確度：

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ) ; HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ) ; HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ) ; HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

**c. Channel High**

操作模式：發射接收

基本波頻率：2462 MHz

測試日期：May 25, 2021

環境溫度：21°C

環境濕度：59%

| 輻射<br>頻率<br>(MHz) | 天線<br>極性<br>H/V | 機器讀值<br>(dBuV/m)@3m |     | 校正<br>因子<br>(dB) | 結果值<br>(dBuV/m)@3m |     | 限制值<br>(dBuV/m)@3m |      | 餘裕值<br>(worse)<br>(dB) |
|-------------------|-----------------|---------------------|-----|------------------|--------------------|-----|--------------------|------|------------------------|
|                   |                 | Peak                | AVG |                  | Peak               | AVG | Peak               | AVG  |                        |
| 4924.0000         | H               | ---                 | --- | 1.28             | ---                | --- | 74.0               | 54.0 | ---                    |
| 4924.0000         | V               | ---                 | --- | 1.28             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7386.0000         | H               | ---                 | --- | 3.68             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7386.0000         | V               | ---                 | --- | 3.68             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9848.0000         | H               | ---                 | --- | 4.94             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9848.0000         | V               | ---                 | --- | 4.94             | ---                | --- | 74.0               | 54.0 | ---                    |
| 14772.0000        | H               | ---                 | --- | 10.74            | ---                | --- | 74.0               | 54.0 | ---                    |
| 14772.0000        | V               | ---                 | --- | 10.74            | ---                | --- | 74.0               | 54.0 | ---                    |

註：1. 標記“---”表發射之訊號太弱而儀器無法量測。

2. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

3. 量測不準確度：

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ) ; HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ) ; HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ) ; HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

## 10.5.1.3 調變技術: IEEE 802.11n HT20

**a. Channel Low**

操作模式：發射接收

基本波頻率：2412 MHz

測試日期: May 25, 2021

環境溫度: 21°C

環境濕度: 59%

| 輻射<br>頻率<br>(MHz) | 天線<br>極性<br>H/V | 機器讀值<br>(dBuV/m)@3m |     | 校正<br>因子<br>(dB) | 結果值<br>(dBuV/m)@3m |     | 限制值<br>(dBuV/m)@3m |      | 餘裕值<br>(worse)<br>(dB) |
|-------------------|-----------------|---------------------|-----|------------------|--------------------|-----|--------------------|------|------------------------|
|                   |                 | Peak                | AVG |                  | Peak               | AVG | Peak               | AVG  |                        |
| 4824.0000         | H               | ---                 | --- | 1.06             | ---                | --- | 74.0               | 54.0 | ---                    |
| 4824.0000         | V               | ---                 | --- | 1.06             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7236.0000         | H               | ---                 | --- | 3.64             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7236.0000         | V               | ---                 | --- | 3.64             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9648.0000         | H               | ---                 | --- | 4.70             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9648.0000         | V               | ---                 | --- | 4.70             | ---                | --- | 74.0               | 54.0 | ---                    |
| 12060.0000        | H               | ---                 | --- | 8.06             | ---                | --- | 74.0               | 54.0 | ---                    |
| 12060.0000        | V               | ---                 | --- | 8.06             | ---                | --- | 74.0               | 54.0 | ---                    |

註：1. 標記“---”表發射之訊號太弱而儀器無法量測。

2. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

3. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

**b. Channel Mid**

操作模式：發射接收

基本波頻率：2437 MHz

測試日期：May 25, 2021

環境溫度：21°C

環境濕度：59%

| 輻射<br>頻率   | 天線<br>極性 | 機器讀值<br>(dBuV/m)@3m |     | 校正<br>因子 | 結果值<br>(dBuV/m)@3m |     | 限制值<br>(dBuV/m)@3m |      | 餘裕值<br>(worse) |
|------------|----------|---------------------|-----|----------|--------------------|-----|--------------------|------|----------------|
|            |          | Peak                | AVG |          | Peak               | AVG | Peak               | AVG  |                |
| (MHz)      | H/V      |                     |     | (dB)     |                    |     |                    |      | (dB)           |
| 4874.0000  | H        | ---                 | --- | 1.17     | ---                | --- | 74.0               | 54.0 | ---            |
| 4874.0000  | V        | ---                 | --- | 1.17     | ---                | --- | 74.0               | 54.0 | ---            |
| 7311.0000  | H        | ---                 | --- | 3.66     | ---                | --- | 74.0               | 54.0 | ---            |
| 7311.0000  | V        | ---                 | --- | 3.66     | ---                | --- | 74.0               | 54.0 | ---            |
| 9748.0000  | H        | ---                 | --- | 4.82     | ---                | --- | 74.0               | 54.0 | ---            |
| 9748.0000  | V        | ---                 | --- | 4.82     | ---                | --- | 74.0               | 54.0 | ---            |
| 12185.0000 | H        | ---                 | --- | 8.29     | ---                | --- | 74.0               | 54.0 | ---            |
| 12185.0000 | V        | ---                 | --- | 8.29     | ---                | --- | 74.0               | 54.0 | ---            |

註：1. 標記“---”表發射之訊號太弱而儀器無法量測。

2. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

3. 量測不準確度：

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ) ; HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ) ; HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ) ; HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

**c. Channel High**

操作模式：發射接收

基本波頻率：2462 MHz

測試日期：May 25, 2021

環境溫度：21°C

環境濕度：59%

| 輻射<br>頻率<br>(MHz) | 天線<br>極性<br>H/V | 機器讀值<br>(dBuV/m)@3m |     | 校正<br>因子<br>(dB) | 結果值<br>(dBuV/m)@3m |     | 限制值<br>(dBuV/m)@3m |      | 餘裕值<br>(worse)<br>(dB) |
|-------------------|-----------------|---------------------|-----|------------------|--------------------|-----|--------------------|------|------------------------|
|                   |                 | Peak                | AVG |                  | Peak               | AVG | Peak               | AVG  |                        |
| 4924.0000         | H               | ---                 | --- | 1.28             | ---                | --- | 74.0               | 54.0 | ---                    |
| 4924.0000         | V               | ---                 | --- | 1.28             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7386.0000         | H               | ---                 | --- | 3.68             | ---                | --- | 74.0               | 54.0 | ---                    |
| 7386.0000         | V               | ---                 | --- | 3.68             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9848.0000         | H               | ---                 | --- | 4.94             | ---                | --- | 74.0               | 54.0 | ---                    |
| 9848.0000         | V               | ---                 | --- | 4.94             | ---                | --- | 74.0               | 54.0 | ---                    |
| 14772.0000        | H               | ---                 | --- | 10.74            | ---                | --- | 74.0               | 54.0 | ---                    |
| 14772.0000        | V               | ---                 | --- | 10.74            | ---                | --- | 74.0               | 54.0 | ---                    |

註：1. 標記“---”表發射之訊號太弱而儀器無法量測。

2. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

3. 量測不準確度：

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ) ; HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ) ; HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ) ; HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

## 10.5.2 諧波及其它不必要之訊號測試圖

## 10.5.2.1 調變技術: IEEE 802.11b

## a. Channel Low

操作模式：發射接收

基本波頻率：2412 MHz

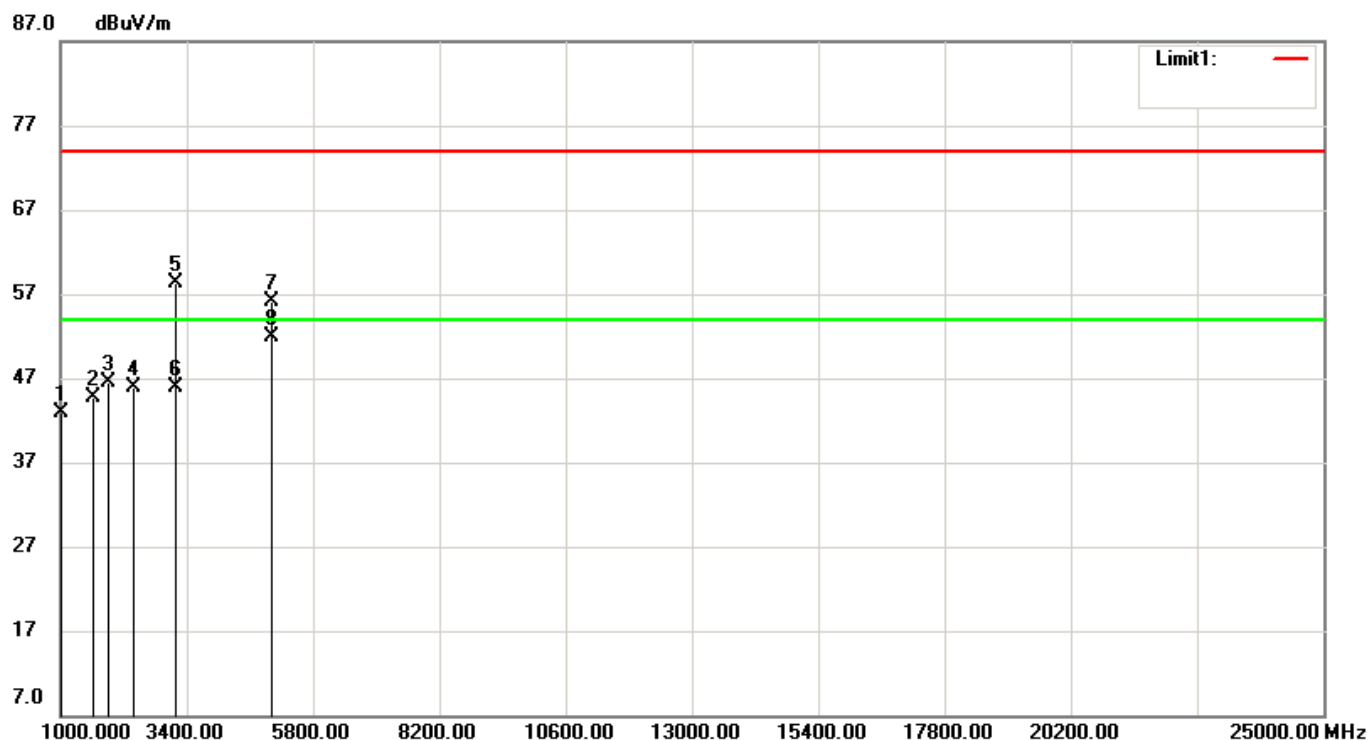
File: 21-05-MAW- #35

Date: 2021/5/25

Temperature: 21 °C

Site: RE02-EMC  
B1-N2

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-B-LOW

Polarization: Horizontal  
Distance: 3m  
Operator: Bruce

Note:

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1038.14100      | 52.22            | peak     | -9.37          | 42.85           | 74.00          | -31.15      |
| 2   | 1581.08970      | 51.94            | peak     | -7.26          | 44.68           | 74.00          | -29.32      |
| 3   | 1922.11530      | 51.15            | peak     | -4.58          | 46.57           | 74.00          | -27.43      |
| 4   | 2377.56410      | 48.80            | peak     | -2.97          | 45.83           | 74.00          | -28.17      |
| 5   | 3159.84780      | 60.14            | peak     | -1.86          | 58.28           | 74.00          | -15.72      |
| 6   | 3159.84780      | 47.73            | AVG      | -1.86          | 45.87           | 54.00          | -8.13       |
| 7   | 4999.97120      | 54.34            | peak     | 1.74           | 56.08           | 74.00          | -17.92      |
| 8   | 4999.97120      | 50.12            | AVG      | 1.74           | 51.86           | 54.00          | -2.14       |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

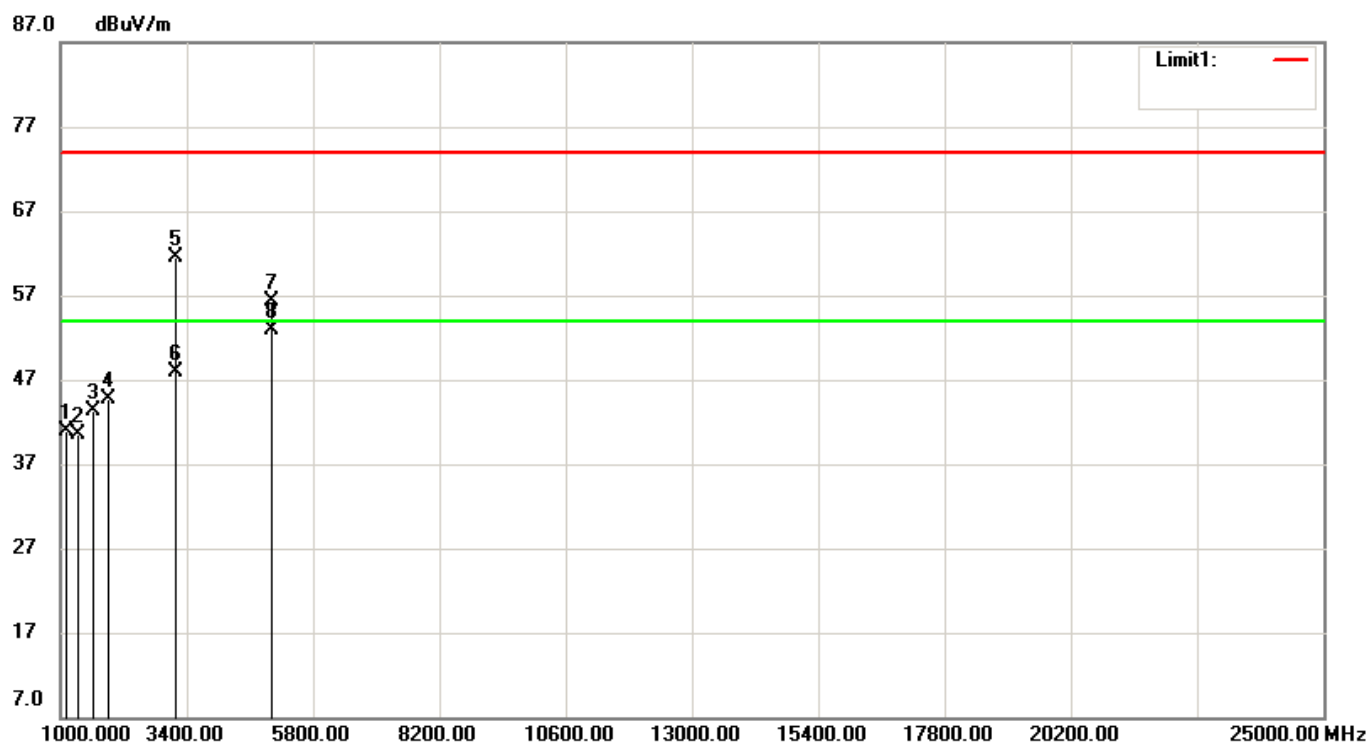
操作模式：發射接收  
基本波頻率：2412 MHz

File: 21-05-MAW- #36  
005\_B  
Site: RE02-EMC  
B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-B-LOW  
Note:

Polarization: Vertical  
Distance: 3m  
Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1089.74350      | 50.03            | peak     | -9.20          | 40.83           | 74.00          | -33.17      |
| 2   | 1320.83330      | 49.05            | peak     | -8.47          | 40.58           | 74.00          | -33.42      |
| 3   | 1581.08970      | 50.64            | peak     | -7.26          | 43.38           | 74.00          | -30.62      |
| 4   | 1922.11530      | 49.21            | peak     | -4.58          | 44.63           | 74.00          | -29.37      |
| 5   | 3159.92950      | 63.44            | peak     | -1.86          | 61.58           | 74.00          | -12.42      |
| 6   | 3159.92950      | 49.69            | AVG      | -1.86          | 47.83           | 54.00          | -6.17       |
| 7   | 4999.97120      | 54.59            | peak     | 1.74           | 56.33           | 74.00          | -17.67      |
| 8   | 4999.97120      | 51.24            | AVG      | 1.74           | 52.98           | 54.00          | -1.02       |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

## b. Channel Mid

操作模式：發射接收

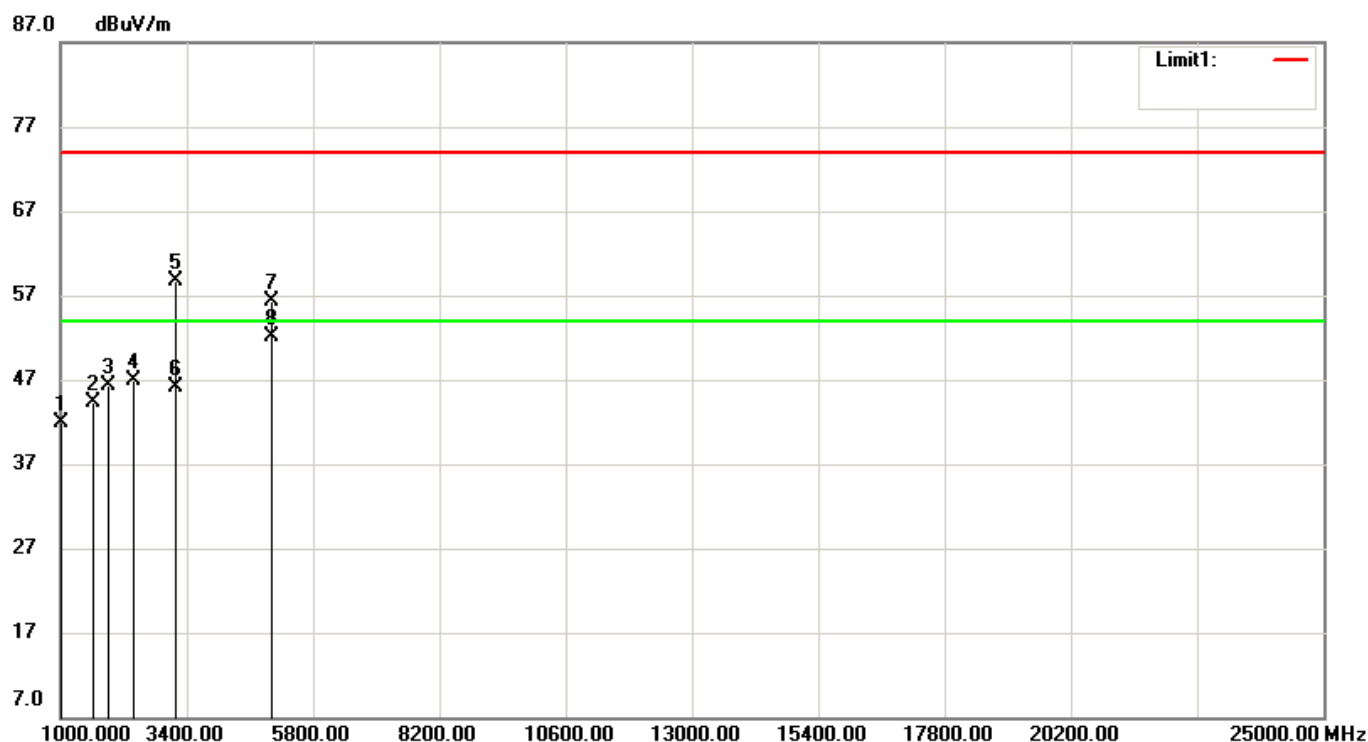
基本波頻率：2437 MHz

File: 21-05-MAW- #37  
 005\_B  
 Site: RE02-EMC  
 B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
 EUT: Car Navigation  
 Model: TN0022C  
 Test Mode: WIFI-B-MID  
 Note:

Polarization: Horizontal  
 Distance: 3m  
 Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1035.89740      | 51.19            | peak     | -9.38          | 41.81           | 74.00          | -32.19      |
| 2   | 1581.08970      | 51.48            | peak     | -7.26          | 44.22           | 74.00          | -29.78      |
| 3   | 1922.11530      | 50.80            | peak     | -4.58          | 46.22           | 74.00          | -27.78      |
| 4   | 2382.05120      | 49.89            | peak     | -2.96          | 46.93           | 74.00          | -27.07      |
| 5   | 3159.85230      | 60.56            | peak     | -1.86          | 58.70           | 74.00          | -15.30      |
| 6   | 3159.85230      | 47.92            | AVG      | -1.86          | 46.06           | 54.00          | -7.94       |
| 7   | 4999.95900      | 54.54            | peak     | 1.74           | 56.28           | 74.00          | -17.72      |
| 8   | 4999.95900      | 50.27            | AVG      | 1.74           | 52.01           | 54.00          | -1.99       |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

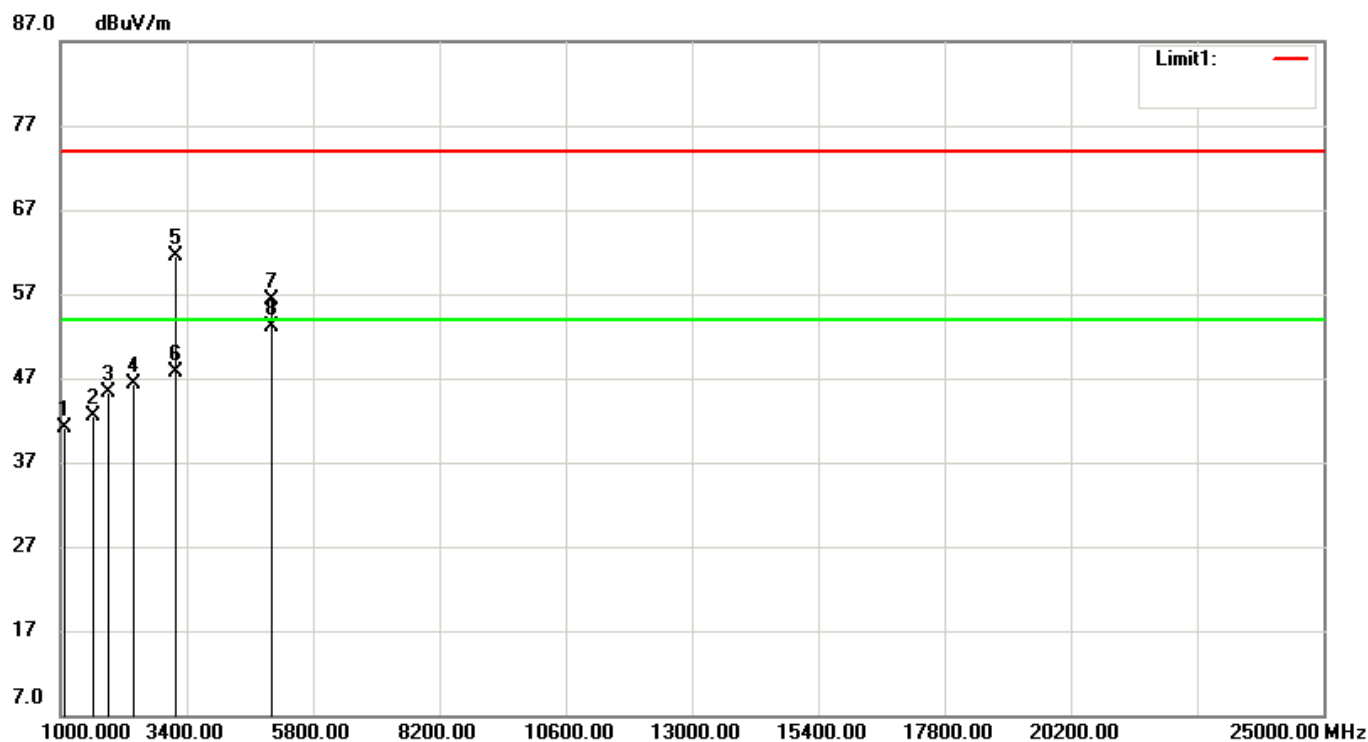
操作模式：發射接收  
基本波頻率：2437 MHz

File: 21-05-MAW- #38  
005\_B  
Site: RE02-EMC  
B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-B-MID  
Note:

Polarization: Vertical  
Distance: 3m  
Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1067.30760      | 50.28            | peak     | -9.27          | 41.01           | 74.00          | -32.99      |
| 2   | 1581.08970      | 49.84            | peak     | -7.26          | 42.58           | 74.00          | -31.42      |
| 3   | 1922.11530      | 49.85            | peak     | -4.58          | 45.27           | 74.00          | -28.73      |
| 4   | 2373.07700      | 49.21            | peak     | -2.98          | 46.23           | 74.00          | -27.77      |
| 5   | 3159.93410      | 63.46            | peak     | -1.86          | 61.60           | 74.00          | -12.40      |
| 6   | 3159.93410      | 49.63            | AVG      | -1.86          | 47.77           | 54.00          | -6.23       |
| 7   | 4999.96340      | 54.65            | peak     | 1.74           | 56.39           | 74.00          | -17.61      |
| 8   | 4999.96340      | 51.31            | AVG      | 1.74           | 53.05           | 54.00          | -0.95       |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

## c. Channel High

操作模式：發射接收

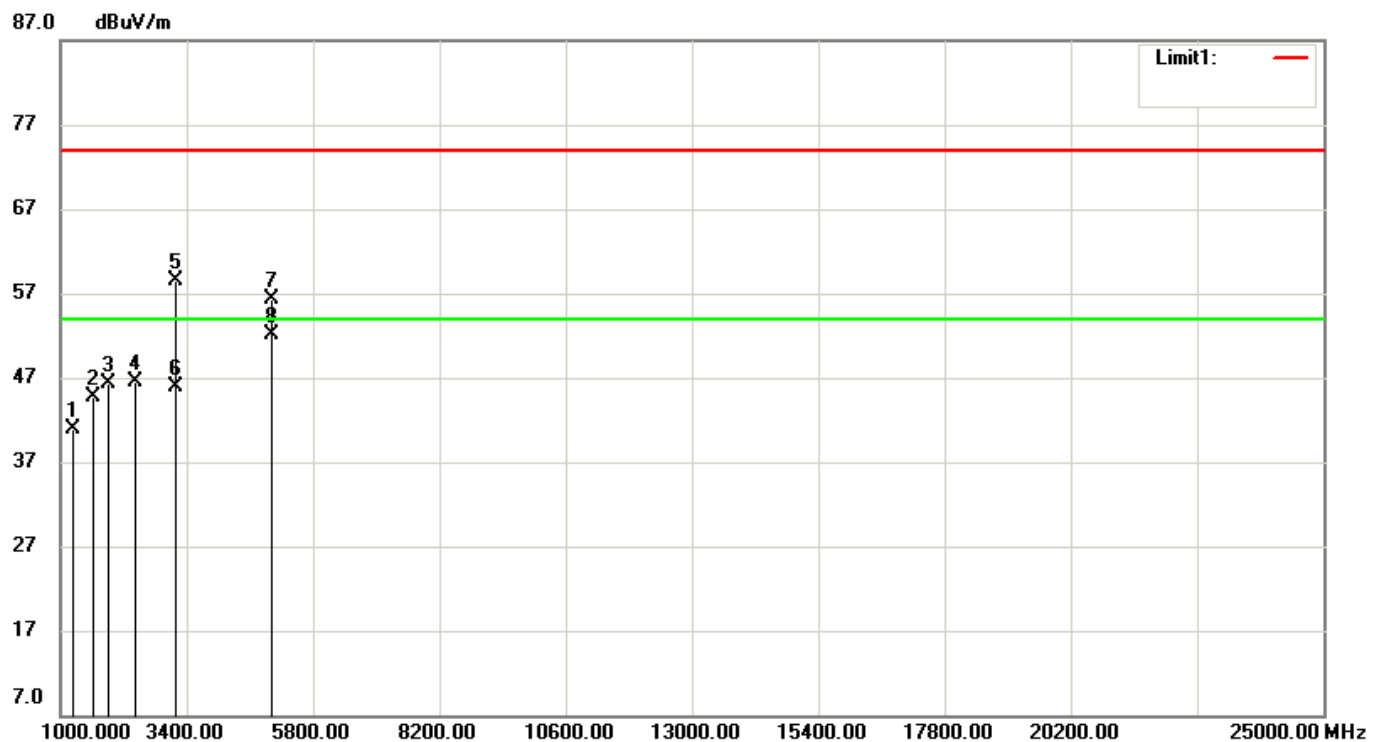
基本波頻率：2462 MHz

File: 21-05-MAW- #39  
 Site: RE02-EMC B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
 EUT: Car Navigation  
 Model: TN0022C  
 Test Mode: WIFI-B-HIGH  
 Note:

Polarization: Horizontal  
 Distance: 3m  
 Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1224.35900      | 49.75            | peak     | -8.78          | 40.97           | 74.00          | -33.03      |
| 2   | 1581.08970      | 51.94            | peak     | -7.26          | 44.68           | 74.00          | -29.32      |
| 3   | 1922.11530      | 50.87            | peak     | -4.58          | 46.29           | 74.00          | -27.71      |
| 4   | 2397.75640      | 49.47            | peak     | -2.92          | 46.55           | 74.00          | -27.45      |
| 5   | 3159.84320      | 60.42            | peak     | -1.86          | 58.56           | 74.00          | -15.44      |
| 6   | 3159.84320      | 47.71            | AVG      | -1.86          | 45.85           | 54.00          | -8.15       |
| 7   | 4999.96740      | 54.58            | peak     | 1.74           | 56.32           | 74.00          | -17.68      |
| 8   | 4999.96740      | 50.29            | AVG      | 1.74           | 52.03           | 54.00          | -1.97       |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

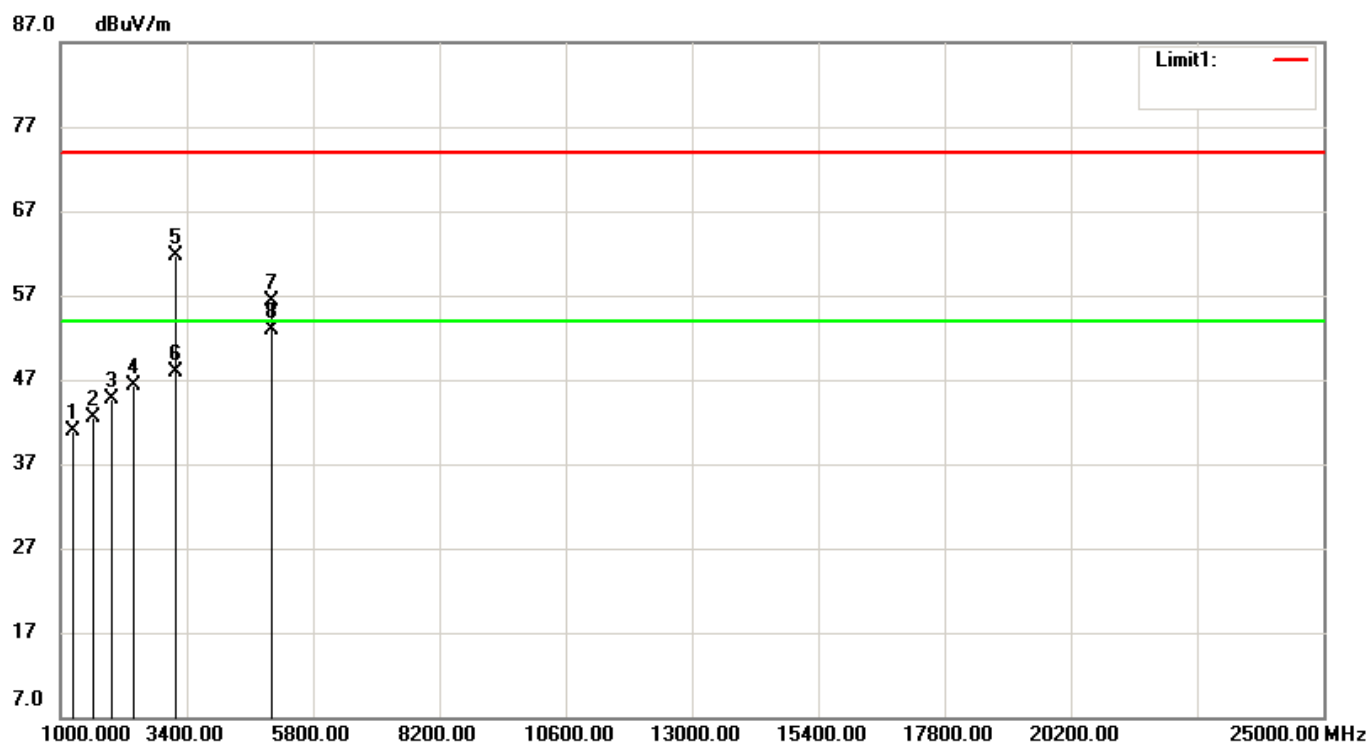
操作模式：發射接收  
基本波頻率：2462 MHz

File: 21-05-MAW- #40  
005\_B  
Site: RE02-EMC  
B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-B-HIGH  
Note:

Polarization: Vertical  
Distance: 3m  
Operator: Bruce

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 1217.62820         | 49.76               | peak     | -8.80             | 40.96              | 74.00             | -33.04         |
| 2   | 1581.08970         | 49.68               | peak     | -7.26             | 42.42              | 74.00             | -31.58         |
| 3   | 1953.52560         | 49.05               | peak     | -4.33             | 44.72              | 74.00             | -29.28         |
| 4   | 2364.10250         | 49.37               | peak     | -3.00             | 46.37              | 74.00             | -27.63         |
| 5   | 3159.92610         | 63.56               | peak     | -1.86             | 61.70              | 74.00             | -12.30         |
| 6   | 3159.92610         | 49.72               | AVG      | -1.86             | 47.86              | 54.00             | -6.14          |
| 7   | 4999.95570         | 54.57               | peak     | 1.74              | 56.31              | 74.00             | -17.69         |
| 8   | 4999.95570         | 51.25               | AVG      | 1.74              | 52.99              | 54.00             | -1.01          |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

## 10.5.2.2 調變技術: IEEE 802.11g

## a. Channel Low

操作模式：發射接收

基本波頻率：2412 MHz

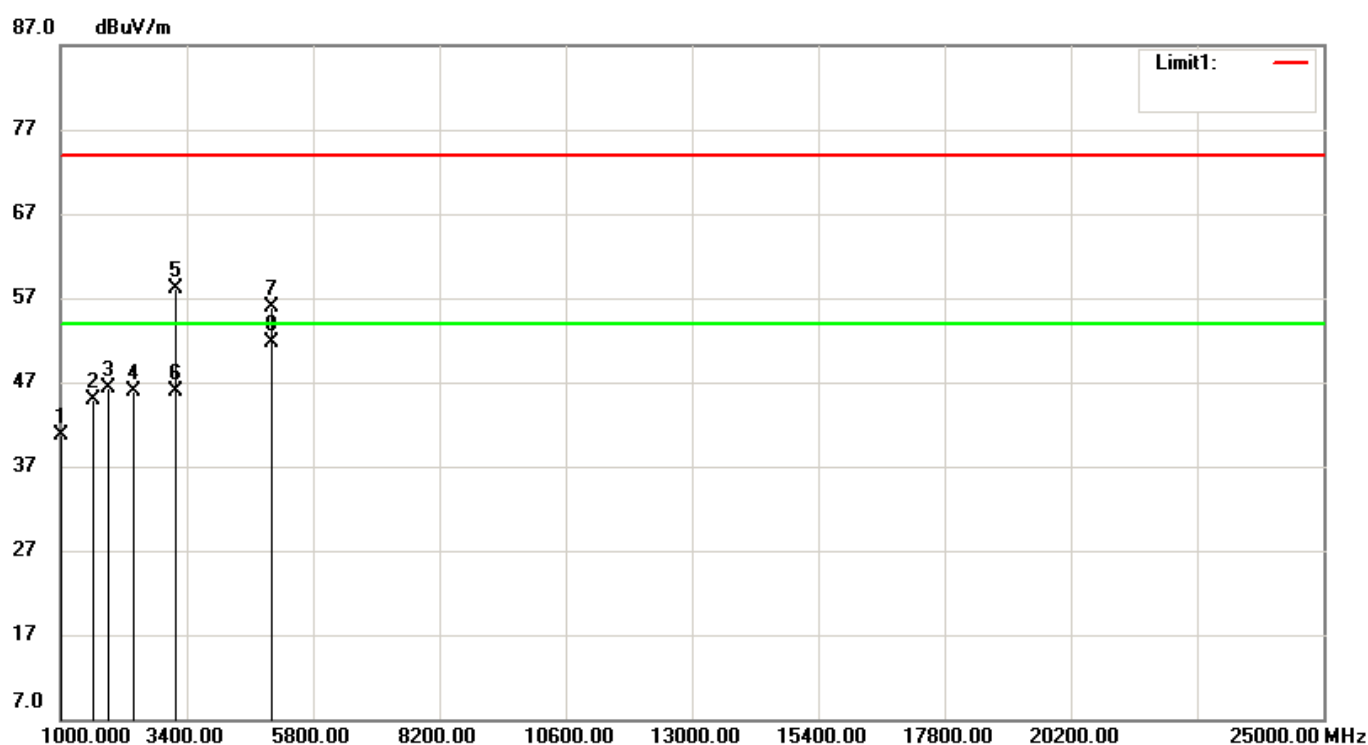
File: 21-05-MAW- #35

Date: 2021/5/25

Temperature: 21 °C

Site: RE02-EMC  
B1-N2

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
 EUT: Car Navigation  
 Model: TN0022C  
 Test Mode: WIFI-G-LOW  
 Note:

Polarization: Horizontal  
 Distance: 3m  
 Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1038.14100      | 50.13            | peak     | -9.37          | 40.76           | 74.00          | -33.24      |
| 2   | 1581.08970      | 52.16            | peak     | -7.26          | 44.90           | 74.00          | -29.10      |
| 3   | 1922.11530      | 50.97            | peak     | -4.58          | 46.39           | 74.00          | -27.61      |
| 4   | 2377.56410      | 48.88            | peak     | -2.97          | 45.91           | 74.00          | -28.09      |
| 5   | 3159.86540      | 60.02            | peak     | -1.86          | 58.16           | 74.00          | -15.84      |
| 6   | 3159.86540      | 47.76            | AVG      | -1.86          | 45.90           | 54.00          | -8.10       |
| 7   | 4999.95900      | 54.25            | peak     | 1.74           | 55.99           | 74.00          | -18.01      |
| 8   | 4999.95900      | 50.06            | AVG      | 1.74           | 51.80           | 54.00          | -2.20       |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

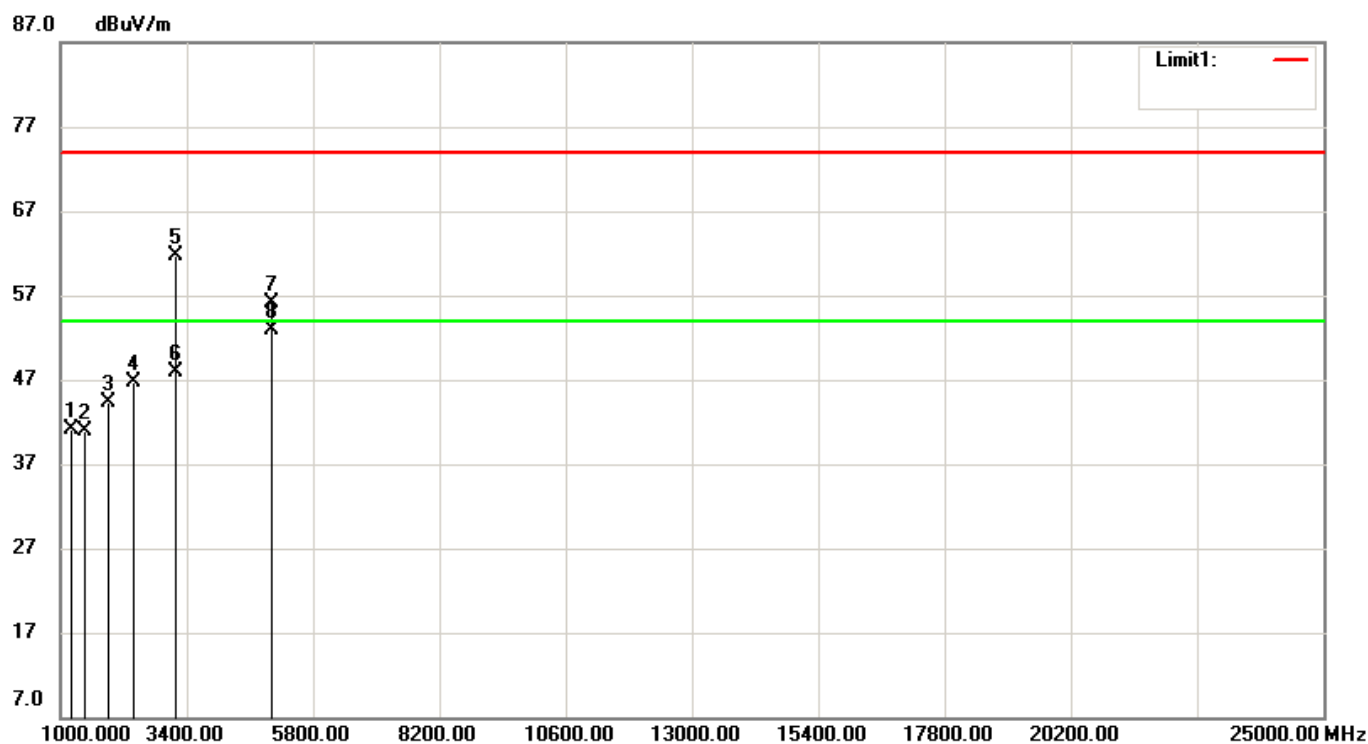
操作模式：發射接收  
基本波頻率：2412 MHz

File: 21-05-MAW- #36  
005\_G  
Site: RE02-EMC  
B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-G-LOW  
Note:

Polarization: Vertical  
Distance: 3m  
Operator: Bruce

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 1161.53840         | 50.07               | peak     | -8.97             | 41.10              | 74.00             | -32.90         |
| 2   | 1424.03840         | 49.04               | peak     | -8.14             | 40.90              | 74.00             | -33.10         |
| 3   | 1922.11530         | 48.90               | peak     | -4.58             | 44.32              | 74.00             | -29.68         |
| 4   | 2377.56410         | 49.72               | peak     | -2.97             | 46.75              | 74.00             | -27.25         |
| 5   | 3159.94220         | 63.56               | peak     | -1.86             | 61.70              | 74.00             | -12.30         |
| 6   | 3159.94220         | 49.73               | AVG      | -1.86             | 47.87              | 54.00             | -6.13          |
| 7   | 4999.98900         | 54.45               | peak     | 1.74              | 56.19              | 74.00             | -17.81         |
| 8   | 4999.98900         | 51.20               | AVG      | 1.74              | 52.94              | 54.00             | -1.06          |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

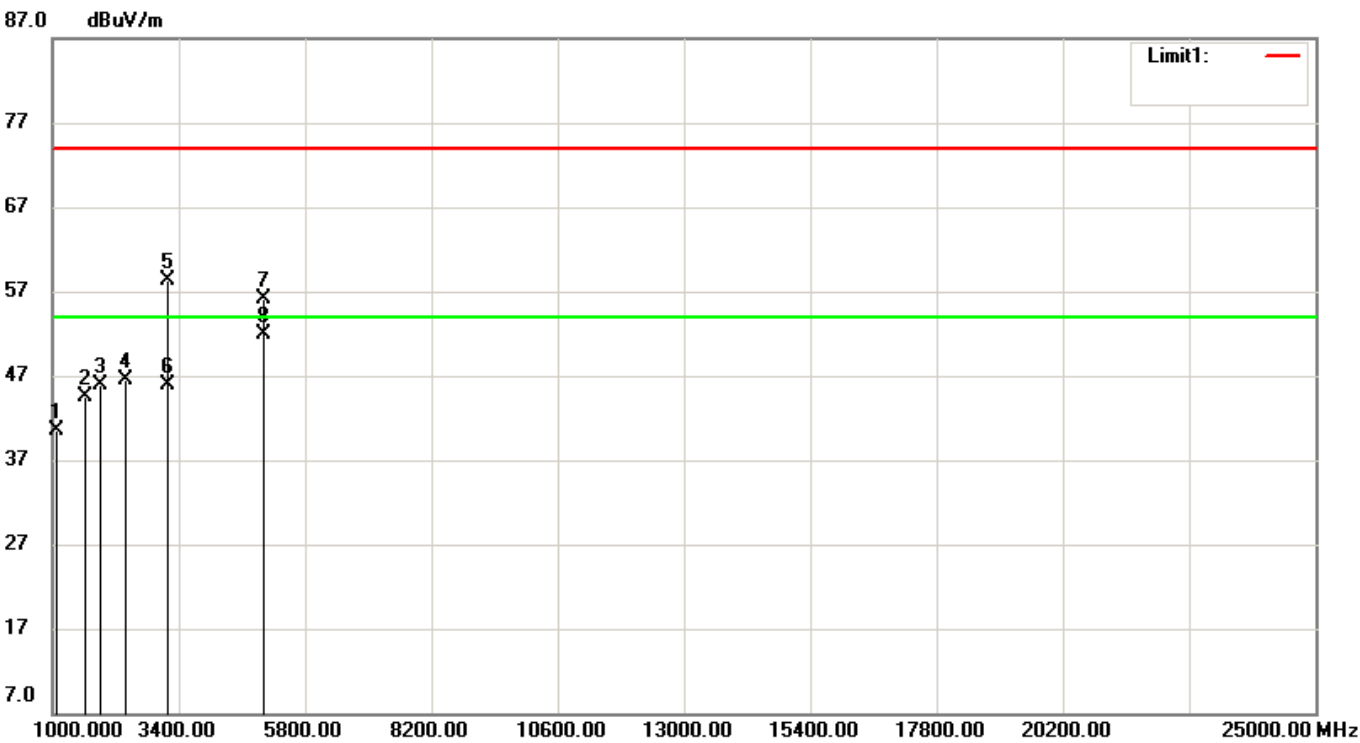
VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

b. Channel Mid

操作模式：發射接收  
基本波頻率：2437 MHz

File: 21-05-MAW- #37 Date: 2021/5/25 Temperature: 21 °C  
Site: RE02-EMC B1-N2 Humidity: 59 %



Condition: NCC\_Above1G\_Pk Polarization: Horizontal  
EUT: Car Navigation Distance: 3m  
Model: TN0022C  
Test Mode: WIFI-G-MID Operator: Bruce  
Note:

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 1067.30760         | 49.77               | peak     | -9.27             | 40.50              | 74.00             | -33.50         |
| 2   | 1581.08970         | 51.81               | peak     | -7.26             | 44.55              | 74.00             | -29.45         |
| 3   | 1922.11530         | 50.54               | peak     | -4.58             | 45.96              | 74.00             | -28.04         |
| 4   | 2379.80760         | 49.54               | peak     | -2.97             | 46.57              | 74.00             | -27.43         |
| 5   | 3159.84320         | 60.22               | peak     | -1.86             | 58.36              | 74.00             | -15.64         |
| 6   | 3159.84320         | 47.78               | AVG      | -1.86             | 45.92              | 54.00             | -8.08          |
| 7   | 4999.96670         | 54.45               | peak     | 1.74              | 56.19              | 74.00             | -17.81         |
| 8   | 4999.96670         | 50.20               | AVG      | 1.74              | 51.94              | 54.00             | -2.06          |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ) ; HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )  
VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ) ; HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )  
VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ) ; HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

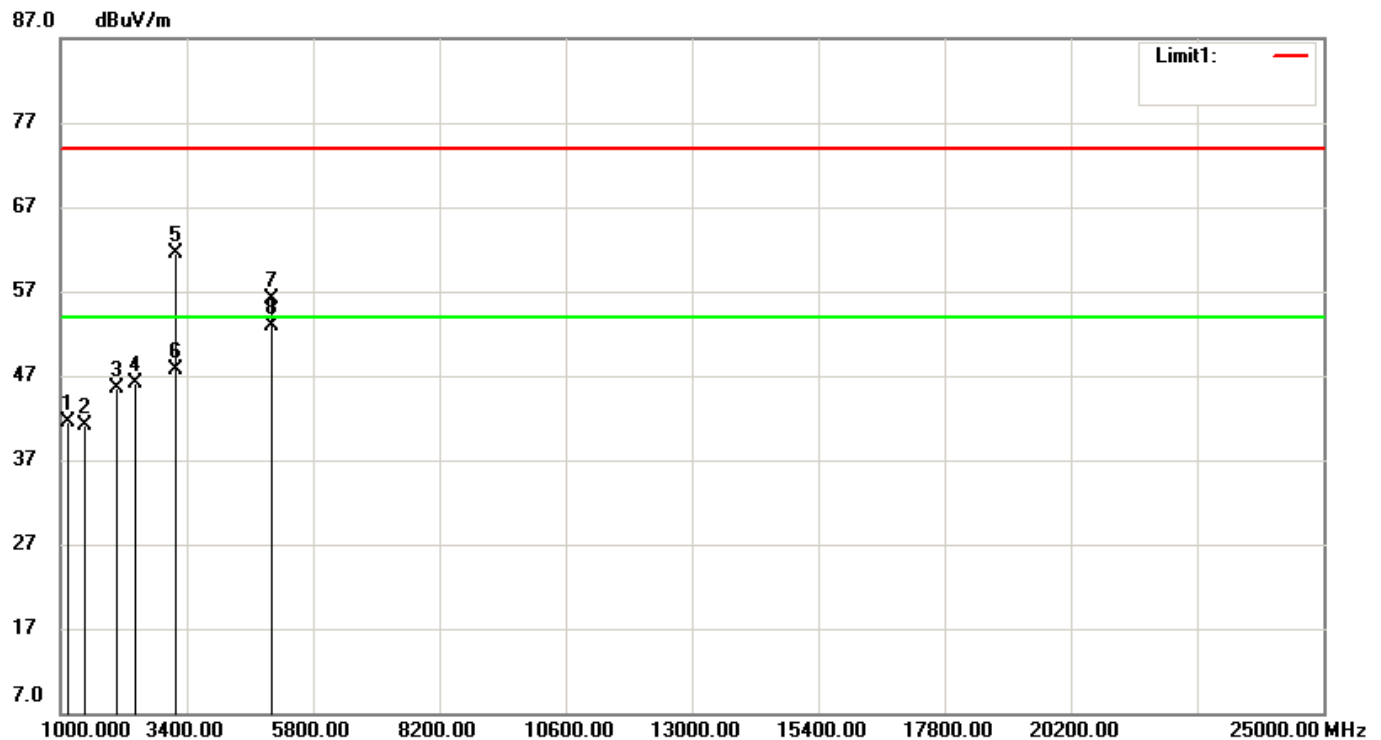
操作模式：發射接收  
基本波頻率：2437 MHz

File: 21-05-MAW- #38  
005\_G  
Site: RE02-EMC  
B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-G-MID  
Note:

Polarization: Vertical  
Distance: 3m  
Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1118.91020      | 50.58            | peak     | -9.11          | 41.47           | 74.00          | -32.53      |
| 2   | 1448.71800      | 49.09            | peak     | -8.06          | 41.03           | 74.00          | -32.97      |
| 3   | 2045.51280      | 49.35            | peak     | -3.84          | 45.51           | 74.00          | -28.49      |
| 4   | 2400.00000      | 49.11            | peak     | -2.91          | 46.20           | 74.00          | -27.80      |
| 5   | 3159.93450      | 63.36            | peak     | -1.86          | 61.50           | 74.00          | -12.50      |
| 6   | 3159.93450      | 49.59            | AVG      | -1.86          | 47.73           | 54.00          | -6.27       |
| 7   | 4999.96430      | 54.40            | peak     | 1.74           | 56.14           | 74.00          | -17.86      |
| 8   | 4999.96430      | 51.15            | AVG      | 1.74           | 52.89           | 54.00          | -1.11       |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

## c. Channel High

操作模式：發射接收

基本波頻率：2462 MHz

File: 21-05-MAW-005\_G

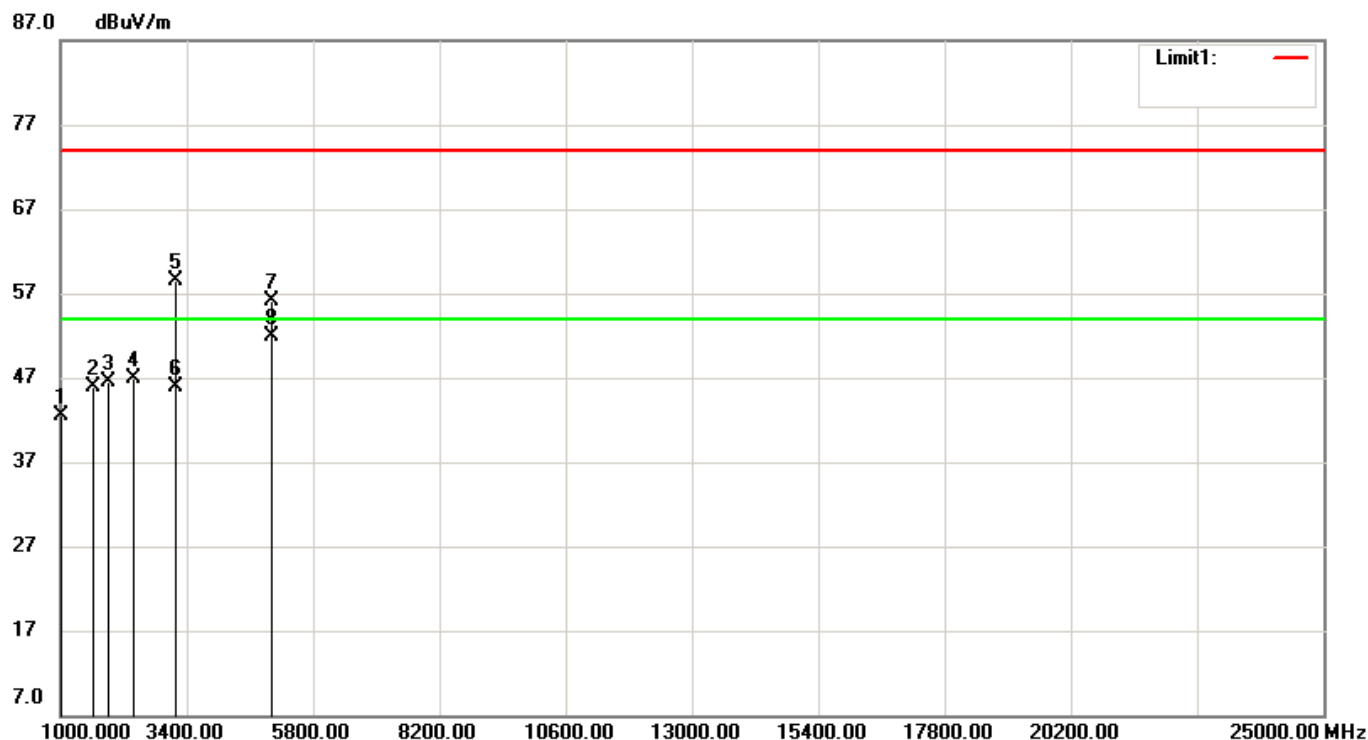
#39

Date: 2021/5/25

Temperature: 21 °C

Site: RE02-EMC  
B1-N2

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-G-HIGH  
Note:

Polarization: Horizontal  
Distance: 3m  
Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1038.14100      | 51.82            | peak     | -9.37          | 42.45           | 74.00          | -31.55      |
| 2   | 1581.08970      | 53.07            | peak     | -7.26          | 45.81           | 74.00          | -28.19      |
| 3   | 1919.87170      | 51.04            | peak     | -4.59          | 46.45           | 74.00          | -27.55      |
| 4   | 2375.32050      | 49.80            | peak     | -2.97          | 46.83           | 74.00          | -27.17      |
| 5   | 3159.83330      | 60.34            | peak     | -1.86          | 58.48           | 74.00          | -15.52      |
| 6   | 3159.83330      | 47.86            | AVG      | -1.86          | 46.00           | 54.00          | -8.00       |
| 7   | 4999.96980      | 54.40            | peak     | 1.74           | 56.14           | 74.00          | -17.86      |
| 8   | 4999.96980      | 50.14            | AVG      | 1.74           | 51.88           | 54.00          | -2.12       |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ) ; HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ) ; HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ) ; HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

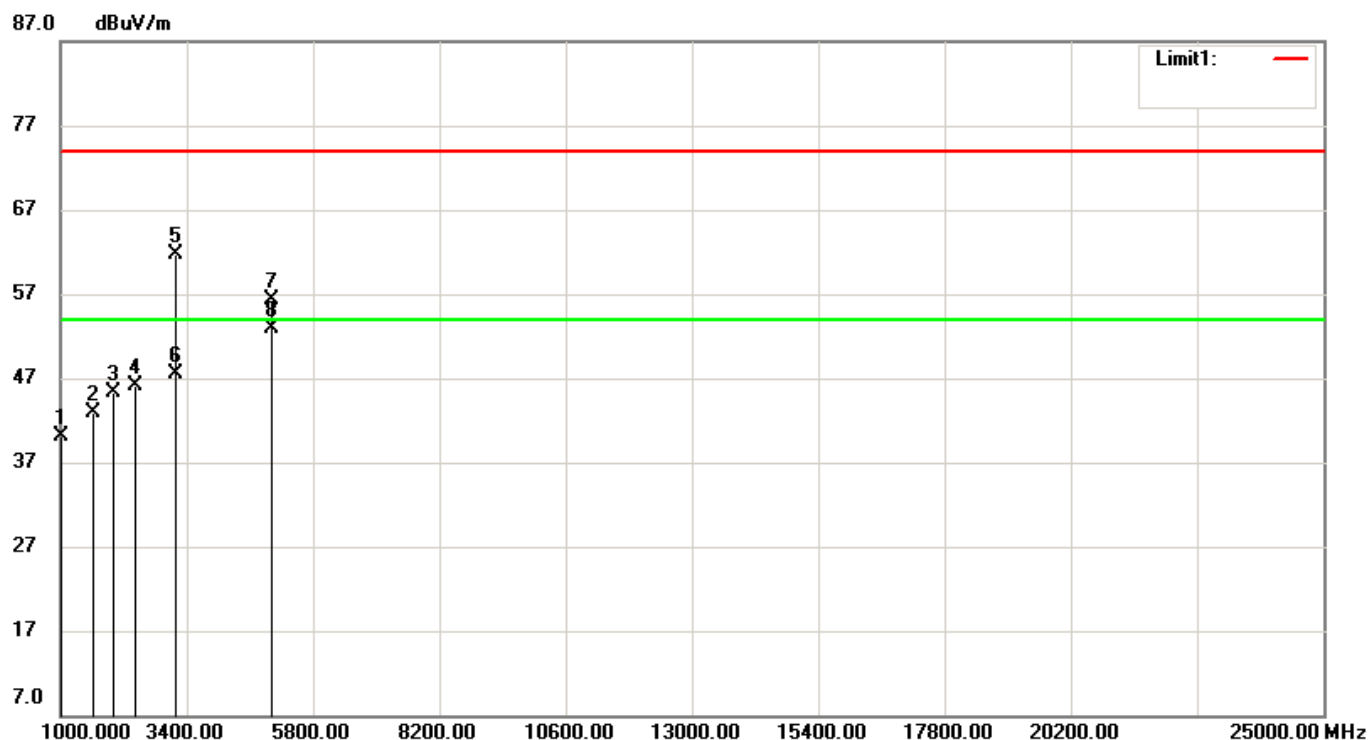
操作模式：發射接收  
基本波頻率：2462 MHz

File: 21-05-MAW- #40  
005\_G  
Site: RE02-EMC  
B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-G-HIGH  
Note:

Polarization: Vertical  
Distance: 3m  
Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1038.14100      | 49.57            | peak     | -9.37          | 40.20           | 74.00          | -33.80      |
| 2   | 1581.08970      | 50.09            | peak     | -7.26          | 42.83           | 74.00          | -31.17      |
| 3   | 1975.96150      | 49.50            | peak     | -4.14          | 45.36           | 74.00          | -28.64      |
| 4   | 2397.75640      | 49.07            | peak     | -2.92          | 46.15           | 74.00          | -27.85      |
| 5   | 3159.94620      | 63.55            | peak     | -1.86          | 61.69           | 74.00          | -12.31      |
| 6   | 3159.94620      | 49.46            | AVG      | -1.86          | 47.60           | 54.00          | -6.40       |
| 7   | 4999.95800      | 54.47            | peak     | 1.74           | 56.21           | 74.00          | -17.79      |
| 8   | 4999.95800      | 51.22            | AVG      | 1.74           | 52.96           | 54.00          | -1.04       |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

## 10.5.2.3 調變技術: IEEE 802.11n HT20

## a. Channel Low

操作模式 : 發射接收

基本波頻率 : 2412 MHz

File: 21-05-MAW-005\_N

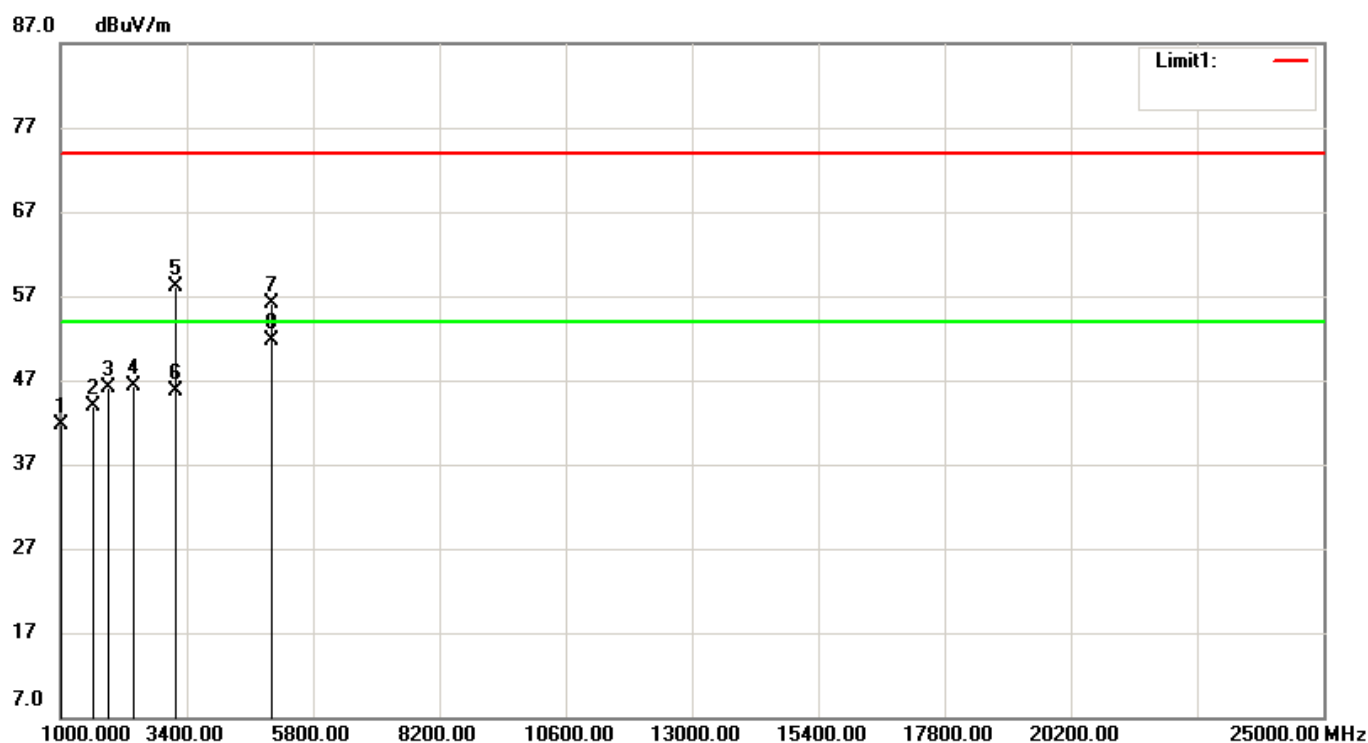
#43

Date: 2021/5/25

Temperature: 21 °C

Site: RE02-EMC  
B1-N2

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-N-LOW  
Note:

Polarization: Horizontal  
Distance: 3m  
Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1038.14100      | 51.04            | peak     | -9.37          | 41.67           | 74.00          | -32.33      |
| 2   | 1581.08970      | 51.12            | peak     | -7.26          | 43.86           | 74.00          | -30.14      |
| 3   | 1919.87170      | 50.61            | peak     | -4.59          | 46.02           | 74.00          | -27.98      |
| 4   | 2379.80760      | 49.23            | peak     | -2.97          | 46.26           | 74.00          | -27.74      |
| 5   | 3159.85560      | 60.04            | peak     | -1.86          | 58.18           | 74.00          | -15.82      |
| 6   | 3159.85560      | 47.66            | AVG      | -1.86          | 45.80           | 54.00          | -8.20       |
| 7   | 4999.98750      | 54.30            | peak     | 1.74           | 56.04           | 74.00          | -17.96      |
| 8   | 4999.98750      | 50.05            | AVG      | 1.74           | 51.79           | 54.00          | -2.21       |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值, 則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ) ; HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ) ; HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ) ; HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

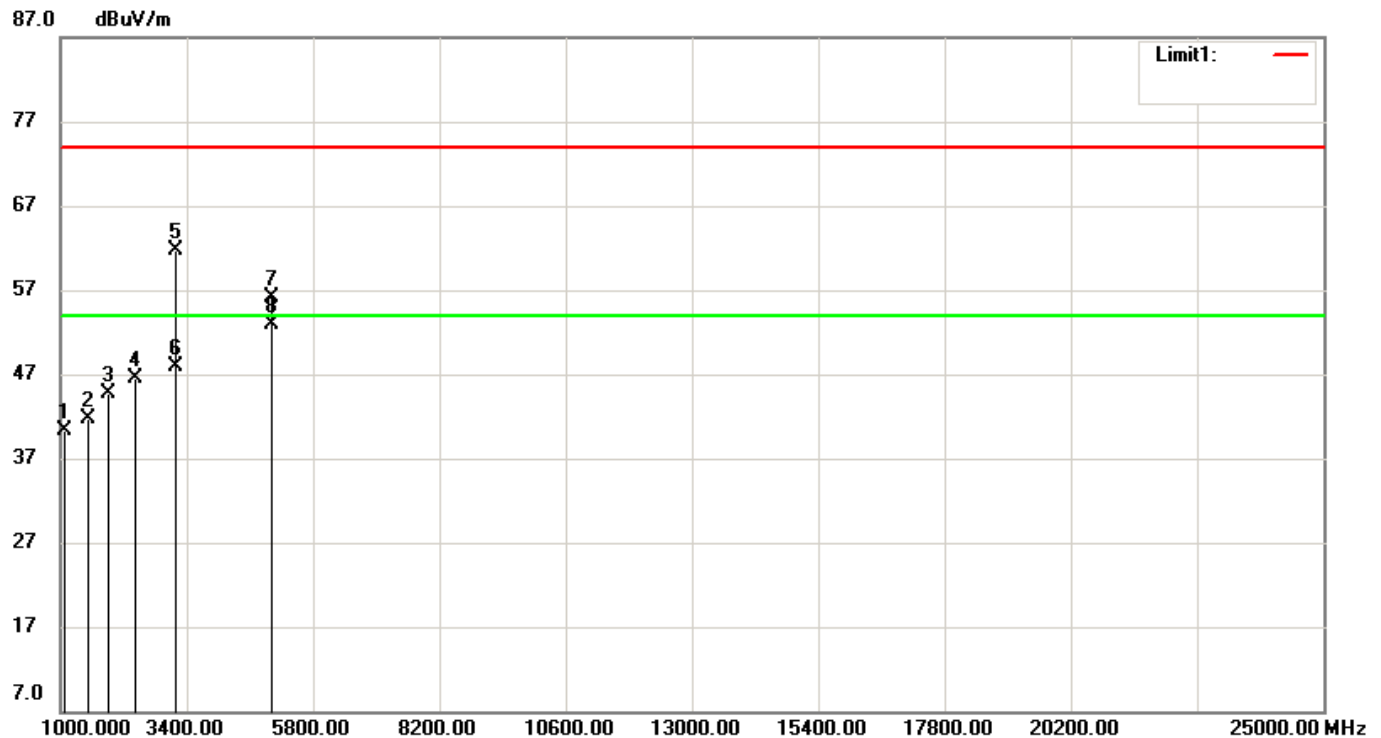
操作模式：發射接收  
基本波頻率：2412 MHz

File: 21-05-MAW- #44  
005\_N  
Site: RE02-EMC  
B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-N-LOW  
Note:

Polarization: Vertical  
Distance: 3m  
Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1065.06410      | 49.59            | peak     | -9.29          | 40.30           | 74.00          | -33.70      |
| 2   | 1522.75640      | 49.46            | peak     | -7.72          | 41.74           | 74.00          | -32.26      |
| 3   | 1917.62820      | 49.30            | peak     | -4.61          | 44.69           | 74.00          | -29.31      |
| 4   | 2397.75640      | 49.36            | peak     | -2.92          | 46.44           | 74.00          | -27.56      |
| 5   | 3159.93420      | 63.56            | peak     | -1.86          | 61.70           | 74.00          | -12.30      |
| 6   | 3159.93420      | 49.74            | AVG      | -1.86          | 47.88           | 54.00          | -6.12       |
| 7   | 4999.96740      | 54.44            | peak     | 1.74           | 56.18           | 74.00          | -17.82      |
| 8   | 4999.96740      | 51.19            | AVG      | 1.74           | 52.93           | 54.00          | -1.07       |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

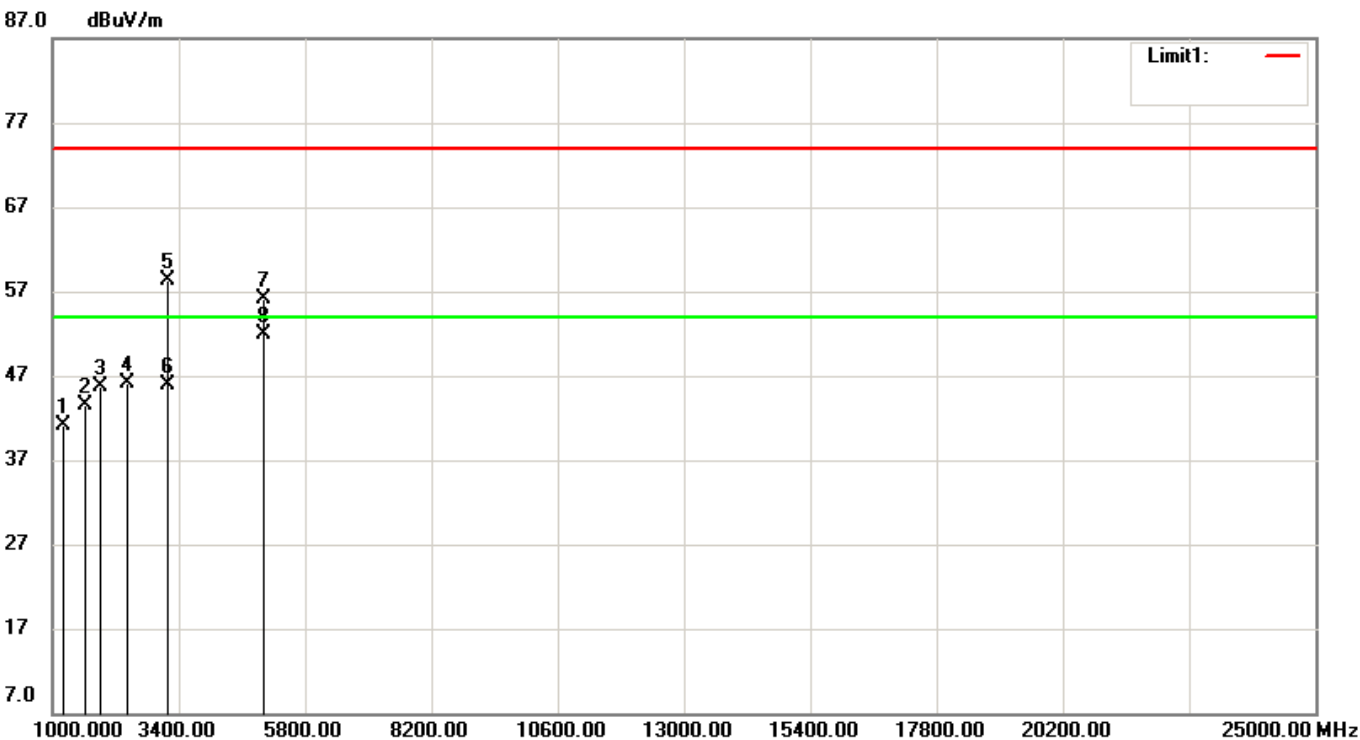
VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

b. Channel Mid

操作模式：發射接收  
基本波頻率：2437 MHz

File: 21-05-MAW-#45      Date: 2021/5/25      Temperature: 21 °C  
Site: RE02-EMC      Humidity: 59 %  
B1-N2



Condition: NCC\_Above1G\_Pk      Polarization: Horizontal  
EUT: Car Navigation      Distance: 3m  
Model: TN0022C  
Test Mode: WIFI--MID      Operator: Bruce  
Note:

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 1166.02560         | 50.13               | peak     | -8.96             | 41.17              | 74.00             | -32.83         |
| 2   | 1581.08970         | 50.80               | peak     | -7.26             | 43.54              | 74.00             | -30.46         |
| 3   | 1922.11530         | 50.23               | peak     | -4.58             | 45.65              | 74.00             | -28.35         |
| 4   | 2393.26920         | 49.12               | peak     | -2.93             | 46.19              | 74.00             | -27.81         |
| 5   | 3159.86640         | 60.21               | peak     | -1.86             | 58.35              | 74.00             | -15.65         |
| 6   | 3159.86640         | 47.77               | AVG      | -1.86             | 45.91              | 54.00             | -8.09          |
| 7   | 4999.97810         | 54.35               | peak     | 1.74              | 56.09              | 74.00             | -17.91         |
| 8   | 4999.97810         | 50.15               | AVG      | 1.74              | 51.89              | 54.00             | -2.11          |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:
- VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ) ; HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )
  - VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ) ; HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )
  - VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ) ; HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

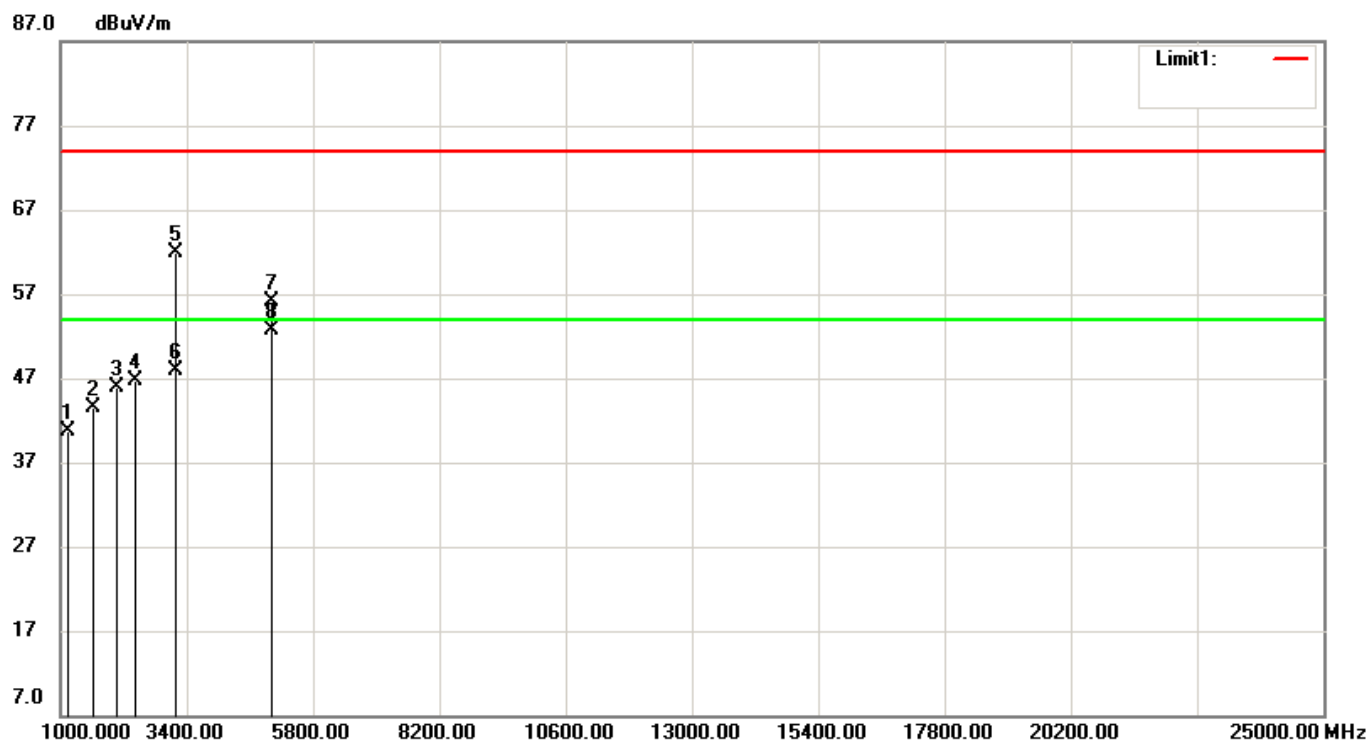
操作模式：發射接收  
基本波頻率：2437 MHz

File: 21-05-MAW- #46  
005\_N  
Site: RE02-EMC  
B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI--MID  
Note:

Polarization: Vertical  
Distance: 3m  
Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1118.91020      | 49.76            | peak     | -9.11          | 40.65           | 74.00          | -33.35      |
| 2   | 1581.08970      | 50.79            | peak     | -7.26          | 43.53           | 74.00          | -30.47      |
| 3   | 2047.75640      | 49.67            | peak     | -3.83          | 45.84           | 74.00          | -28.16      |
| 4   | 2388.78200      | 49.60            | peak     | -2.94          | 46.66           | 74.00          | -27.34      |
| 5   | 3159.95310      | 63.78            | peak     | -1.86          | 61.92           | 74.00          | -12.08      |
| 6   | 3159.95310      | 49.82            | AVG      | -1.86          | 47.96           | 54.00          | -6.04       |
| 7   | 4999.97400      | 54.33            | peak     | 1.74           | 56.07           | 74.00          | -17.93      |
| 8   | 4999.97400      | 51.05            | AVG      | 1.74           | 52.79           | 54.00          | -1.21       |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

## c. Channel High

操作模式：發射接收

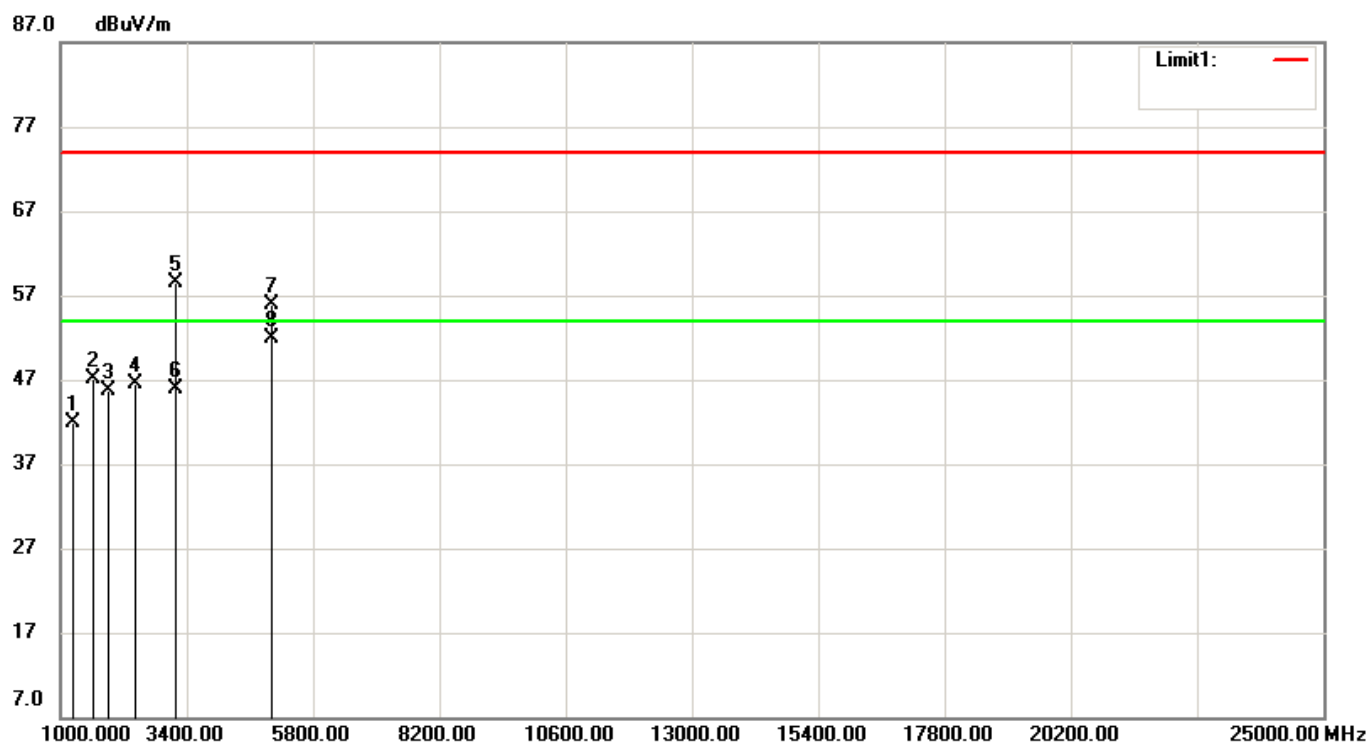
基本波頻率：2462 MHz

File: 21-05-MAW- #47  
 Site: RE02-EMC B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
 EUT: Car Navigation  
 Model: TN0022C  
 Test Mode: WIFI-N-HIGH  
 Note:

Polarization: Horizontal  
 Distance: 3m  
 Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1222.11530      | 50.64            | peak     | -8.78          | 41.86           | 74.00          | -32.14      |
| 2   | 1581.08970      | 54.35            | peak     | -7.26          | 47.09           | 74.00          | -26.91      |
| 3   | 1922.11530      | 50.26            | peak     | -4.58          | 45.68           | 74.00          | -28.32      |
| 4   | 2386.53840      | 49.50            | peak     | -2.94          | 46.56           | 74.00          | -27.44      |
| 5   | 3159.84350      | 60.43            | peak     | -1.86          | 58.57           | 74.00          | -15.43      |
| 6   | 3159.84350      | 47.85            | AVG      | -1.86          | 45.99           | 54.00          | -8.01       |
| 7   | 4999.96710      | 54.21            | peak     | 1.74           | 55.95           | 74.00          | -18.05      |
| 8   | 4999.96710      | 50.07            | AVG      | 1.74           | 51.81           | 54.00          | -2.19       |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

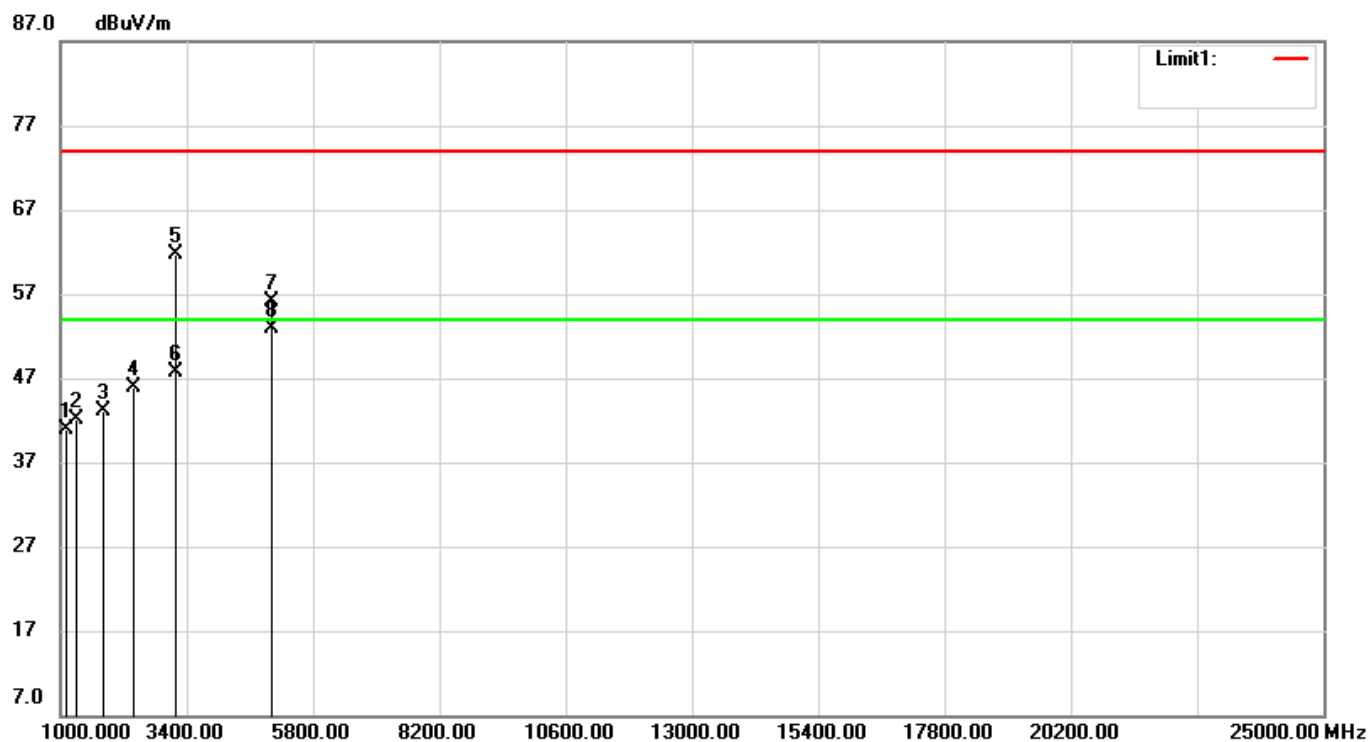
操作模式：發射接收  
基本波頻率：2462 MHz

File: 21-05-MAW- #48  
005\_N  
Site: RE02-EMC  
B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI-N-HIGH  
Note:

Polarization: Vertical  
Distance: 3m  
Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1085.25640      | 50.04            | peak     | -9.22          | 40.82           | 74.00          | -33.18      |
| 2   | 1271.47430      | 50.80            | peak     | -8.63          | 42.17           | 74.00          | -31.83      |
| 3   | 1785.25640      | 48.85            | peak     | -5.65          | 43.20           | 74.00          | -30.80      |
| 4   | 2364.10250      | 48.83            | peak     | -3.00          | 45.83           | 74.00          | -28.17      |
| 5   | 3159.94160      | 63.56            | peak     | -1.86          | 61.70           | 74.00          | -12.30      |
| 6   | 3159.94160      | 49.66            | AVG      | -1.86          | 47.80           | 54.00          | -6.20       |
| 7   | 4999.97770      | 54.43            | peak     | 1.74           | 56.17           | 74.00          | -17.83      |
| 8   | 4999.97770      | 51.13            | AVG      | 1.74           | 52.87           | 54.00          | -1.13       |

註: 1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

## 10.5.2.4 測試狀態: USB Link

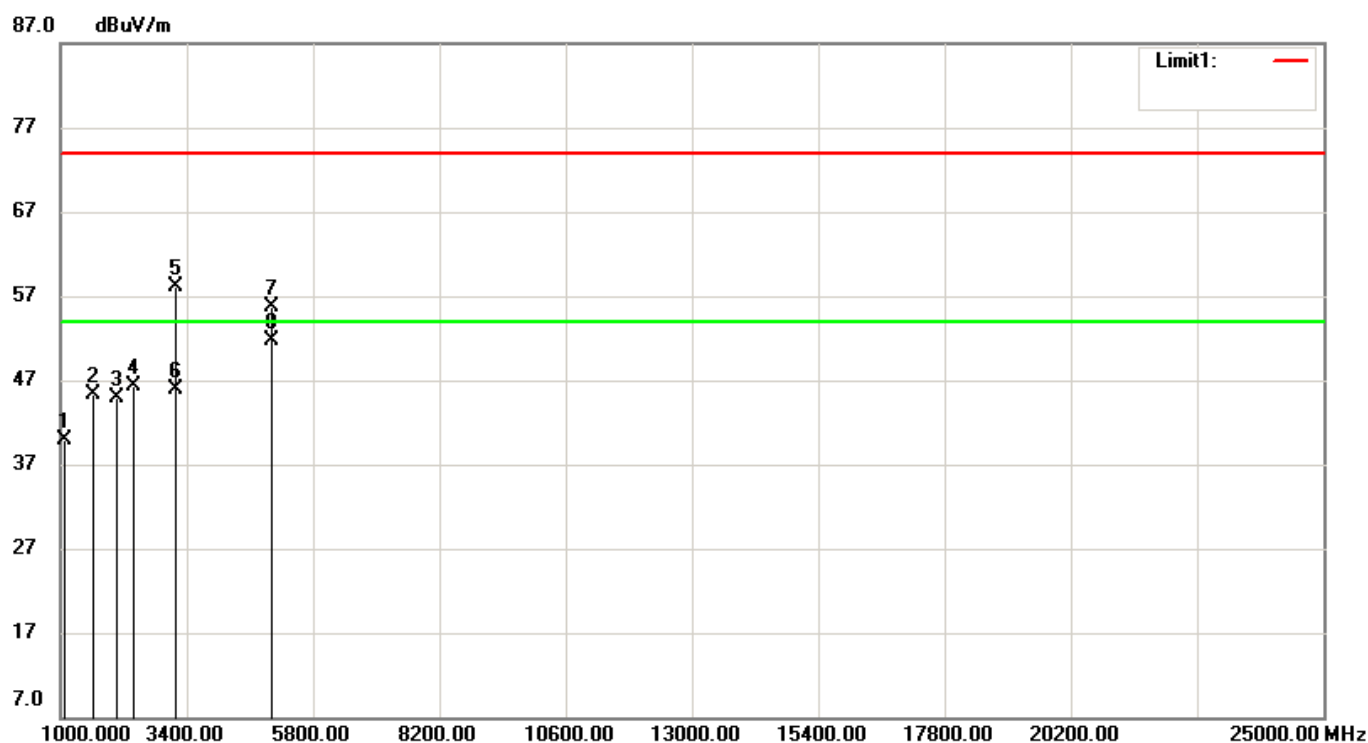
操作模式: Mode D

File: 21-05-MAW- #27  
005  
Site: RE02-EMC  
B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: USB  
Note:

Polarization: Horizontal  
Distance: 3m  
Operator: Bruce

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 1051.60250         | 49.29               | peak     | -9.33             | 39.96              | 74.00             | -34.04         |
| 2   | 1581.08970         | 52.50               | peak     | -7.26             | 45.24              | 74.00             | -28.76         |
| 3   | 2061.21800         | 48.74               | peak     | -3.80             | 44.94              | 74.00             | -29.06         |
| 4   | 2377.56410         | 49.35               | peak     | -2.97             | 46.38              | 74.00             | -27.62         |
| 5   | 3159.87640         | 59.99               | peak     | -1.86             | 58.13              | 74.00             | -15.87         |
| 6   | 3159.87640         | 47.78               | AVG      | -1.86             | 45.92              | 54.00             | -8.08          |
| 7   | 4999.97830         | 54.04               | peak     | 1.74              | 55.78              | 74.00             | -18.22         |
| 8   | 4999.97830         | 49.88               | AVG      | 1.74              | 51.62              | 54.00             | -2.38          |

註:1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

操作模式: Mode D

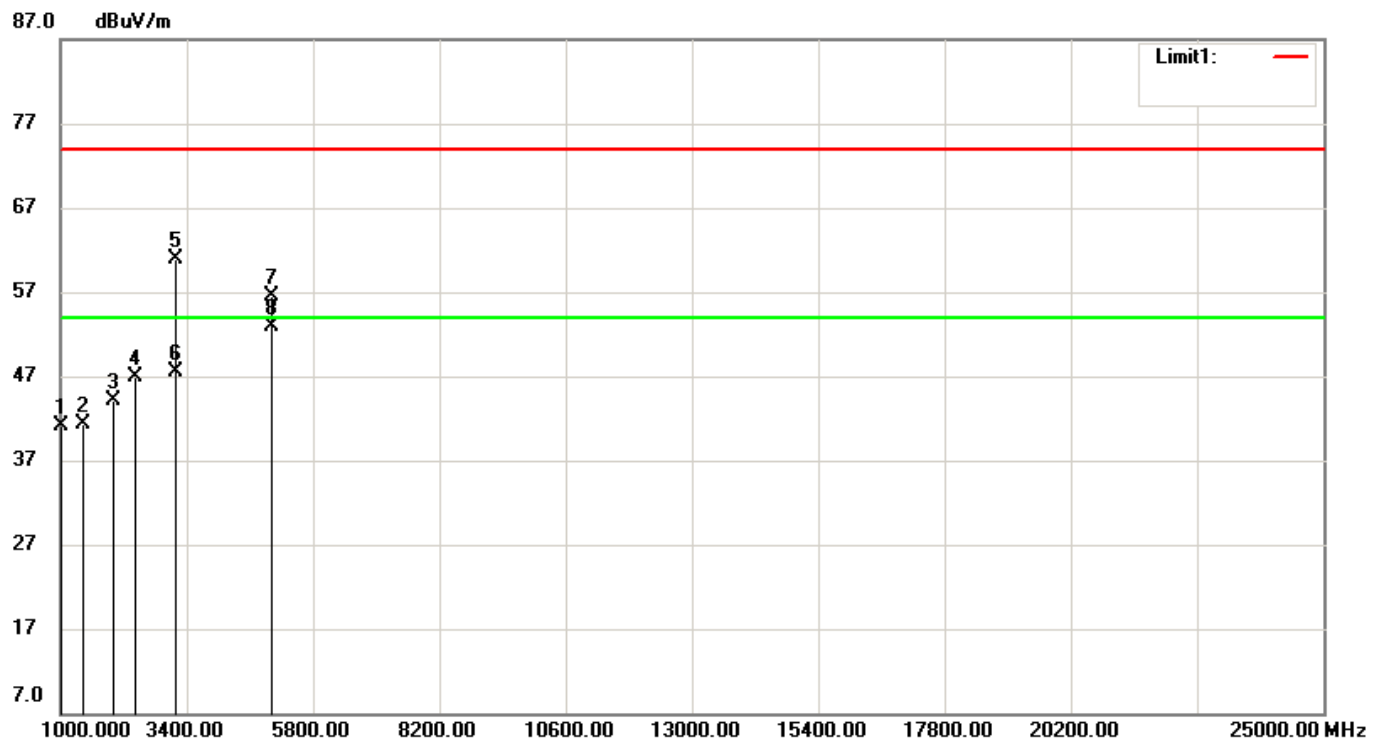
File: 21-05-MAW-005 #28

Date: 2021/5/25

Temperature: 21 °C

Site: RE02-EMC  
B1-N2

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
 EUT: Car Navigation  
 Model: TN0022C  
 Test Mode: USB  
 Note:

Polarization: Vertical  
 Distance: 3m  
 Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1038.14100      | 50.49            | peak     | -9.37          | 41.12           | 74.00          | -32.88      |
| 2   | 1399.35900      | 49.52            | peak     | -8.22          | 41.30           | 74.00          | -32.70      |
| 3   | 1962.50000      | 48.36            | peak     | -4.25          | 44.11           | 74.00          | -29.89      |
| 4   | 2391.02560      | 49.83            | peak     | -2.94          | 46.89           | 74.00          | -27.11      |
| 5   | 3159.96770      | 62.67            | peak     | -1.86          | 60.81           | 74.00          | -13.19      |
| 6   | 3159.96770      | 49.43            | AVG      | -1.86          | 47.57           | 54.00          | -6.43       |
| 7   | 4999.95120      | 54.67            | peak     | 1.74           | 56.41           | 74.00          | -17.59      |
| 8   | 4999.95120      | 51.21            | AVG      | 1.74           | 52.95           | 54.00          | -1.05       |

註:1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ); HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ); HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

## 10.5.2.5 測試狀態: BT Link

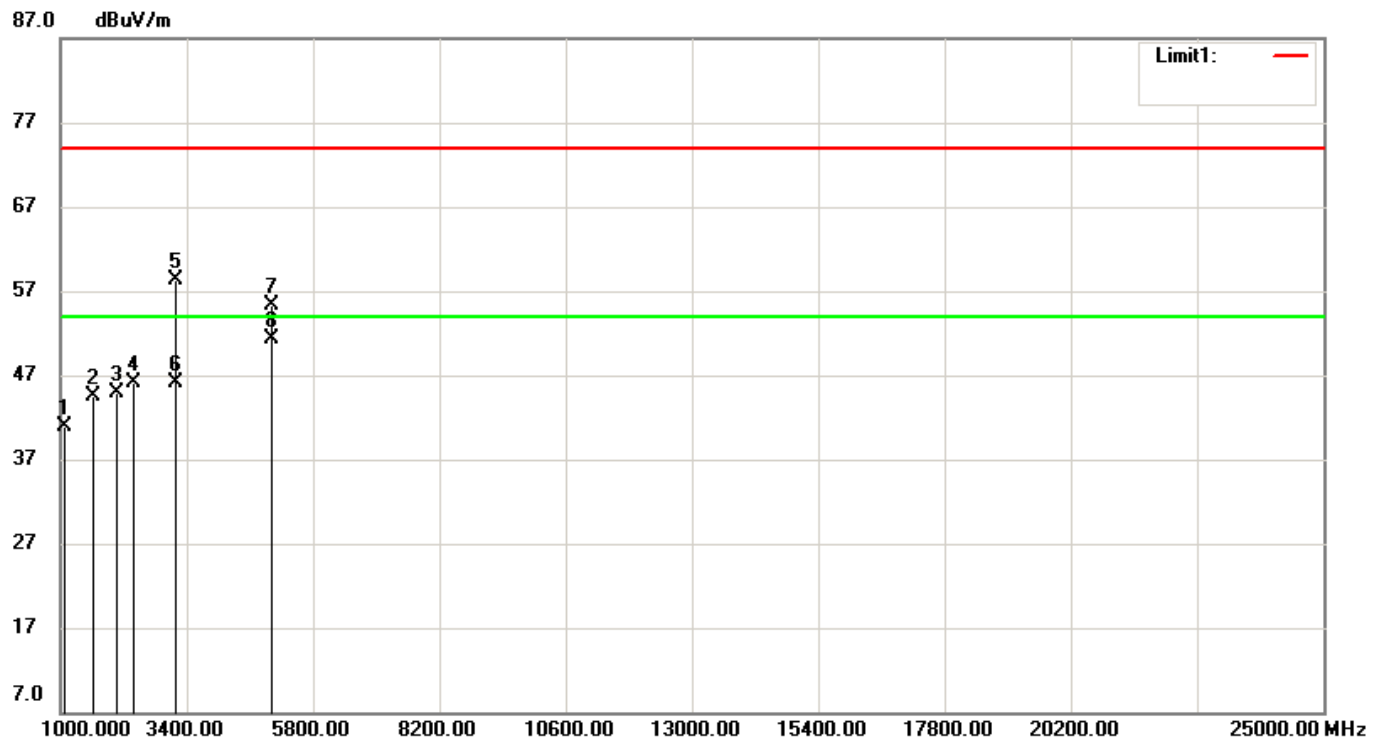
操作模式: Mode E

File: 21-05-MAW- #25  
005  
Site: RE02-EMC  
B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: LINK BT  
Note:

Polarization: Horizontal  
Distance: 3m  
Operator: Bruce

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 1069.55120         | 50.23               | peak     | -9.27             | 40.96              | 74.00             | -33.04         |
| 2   | 1581.08970         | 51.68               | peak     | -7.26             | 44.42              | 74.00             | -29.58         |
| 3   | 2070.19230         | 48.74               | peak     | -3.78             | 44.96              | 74.00             | -29.04         |
| 4   | 2366.34610         | 49.20               | peak     | -3.00             | 46.20              | 74.00             | -27.80         |
| 5   | 3159.84310         | 60.21               | peak     | -1.86             | 58.35              | 74.00             | -15.65         |
| 6   | 3159.84310         | 47.99               | AVG      | -1.86             | 46.13              | 54.00             | -7.87          |
| 7   | 4999.96700         | 53.65               | peak     | 1.74              | 55.39              | 74.00             | -18.61         |
| 8   | 4999.96700         | 49.54               | AVG      | 1.74              | 51.28              | 54.00             | -2.72          |

註:1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ) ; HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ) ; HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ) ; HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

操作模式: Mode E

File: 21-05-MAW-005

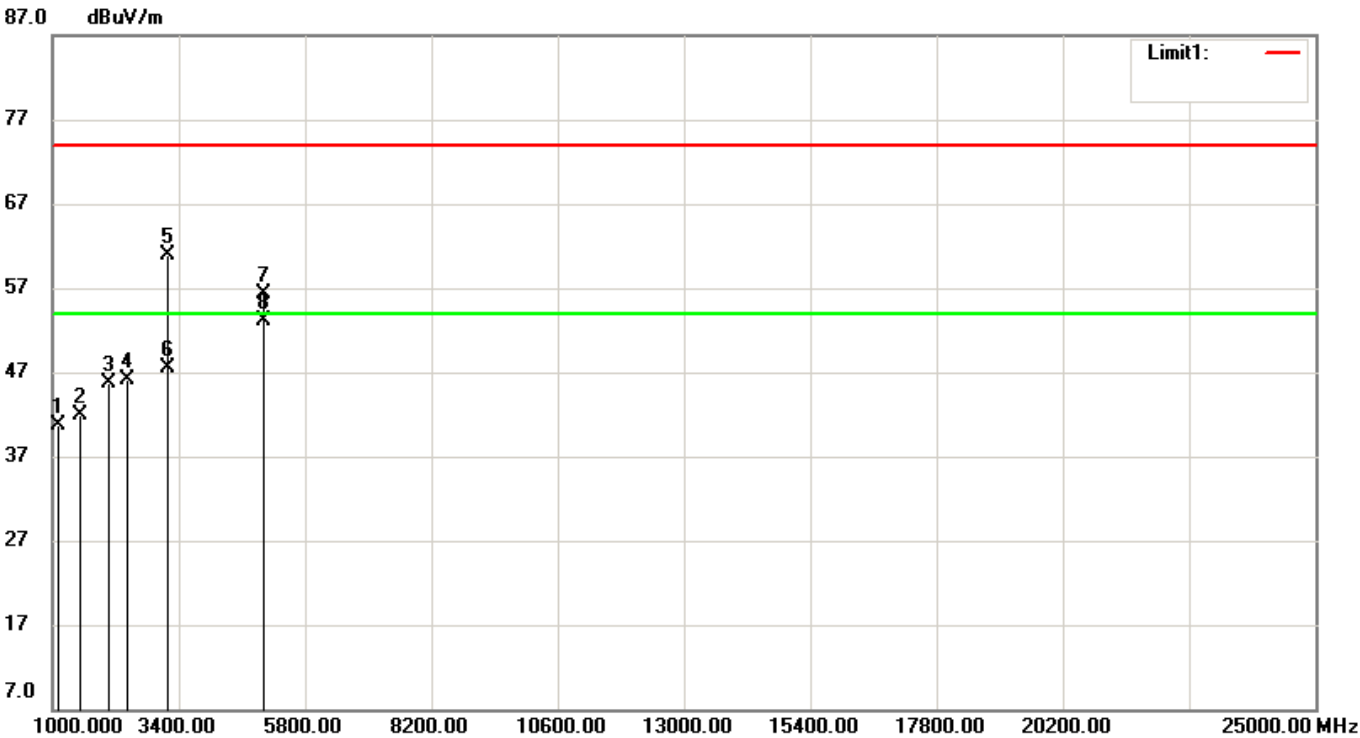
#26

Date: 2021/5/25

Temperature: 21 °C

Site: RE02-EMC B1-N2

Humidity: 59 %



Condition: NCC\_Above1G\_Pk

EUT: Car Navigation

Model: TN0022C

Test Mode: LINK BT

Note:

Polarization: Vertical

Distance: 3m

Operator: Bruce

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 1094.23070         | 49.92               | peak     | -9.19             | 40.73              | 74.00             | -33.27         |
| 2   | 1504.80760         | 49.82               | peak     | -7.87             | 41.95              | 74.00             | -32.05         |
| 3   | 2043.26920         | 49.49               | peak     | -3.84             | 45.65              | 74.00             | -28.35         |
| 4   | 2393.26920         | 49.11               | peak     | -2.93             | 46.18              | 74.00             | -27.82         |
| 5   | 3159.94310         | 62.80               | peak     | -1.86             | 60.94              | 74.00             | -13.06         |
| 6   | 3159.94310         | 49.27               | AVG      | -1.86             | 47.41              | 54.00             | -6.59          |
| 7   | 4999.95900         | 54.55               | peak     | 1.74              | 56.29              | 74.00             | -17.71         |
| 8   | 4999.95900         | 51.35               | AVG      | 1.74              | 53.09              | 54.00             | -0.91          |

註:1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:
- VER: ±5.32dB(1GHz ≤ f < 6GHz) ;HOR: ±5.05dB(1GHz ≤ f < 6GHz)

VER: ±4.71dB(6GHz ≤ f < 18GHz) ;HOR: ±4.96dB(6GHz ≤ f < 18GHz)

VER: ±5.37dB(18GHz ≤ f ≤ 40GHz) ;HOR: ±5.61dB(18GHz ≤ f ≤ 40GHz)

## 10.5.2.6 測試狀態: WiFi Link

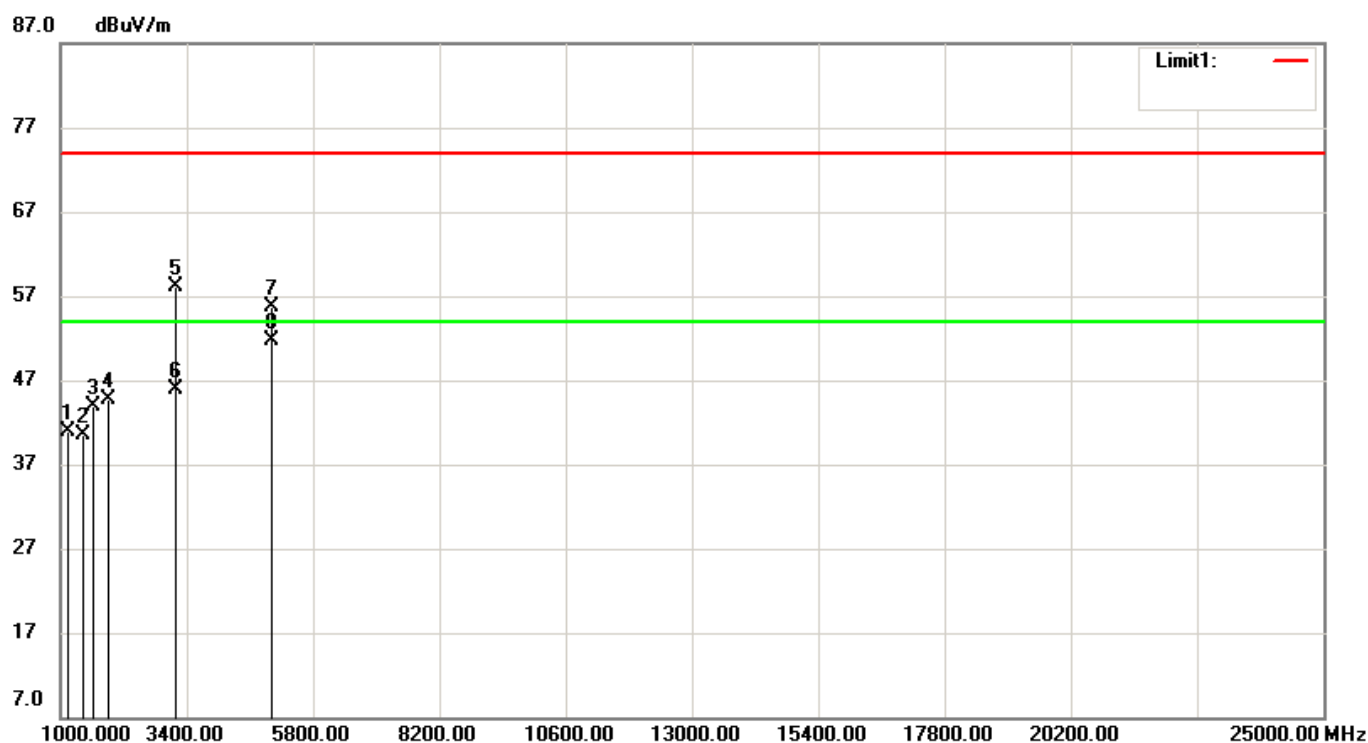
操作模式: Mode F

File: 21-05-MAW- #29  
005  
Site: RE02-EMC  
B1-N2

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: LINK WIFI  
Note:

Polarization: Horizontal  
Distance: 3m  
Operator: Bruce

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 1123.39740         | 49.92               | peak     | -9.11             | 40.81              | 74.00             | -33.19         |
| 2   | 1399.35900         | 48.65               | peak     | -8.22             | 40.43              | 74.00             | -33.57         |
| 3   | 1581.08970         | 51.11               | peak     | -7.26             | 43.85              | 74.00             | -30.15         |
| 4   | 1922.11530         | 49.37               | peak     | -4.58             | 44.79              | 74.00             | -29.21         |
| 5   | 3159.86230         | 59.88               | peak     | -1.86             | 58.02              | 74.00             | -15.98         |
| 6   | 3159.86230         | 47.76               | AVG      | -1.86             | 45.90              | 54.00             | -8.10          |
| 7   | 4999.96420         | 53.98               | peak     | 1.74              | 55.72              | 74.00             | -18.28         |
| 8   | 4999.96420         | 49.89               | AVG      | 1.74              | 51.63              | 54.00             | -2.37          |

註:1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:

VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ) ; HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

VER:  $\pm 4.71\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ ) ; HOR:  $\pm 4.96\text{dB}$  ( $6\text{GHz} \leq f < 18\text{GHz}$ )

VER:  $\pm 5.37\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ) ; HOR:  $\pm 5.61\text{dB}$  ( $18\text{GHz} \leq f \leq 40\text{GHz}$ )

操作模式: Mode F

File: 21-05-MAW-005

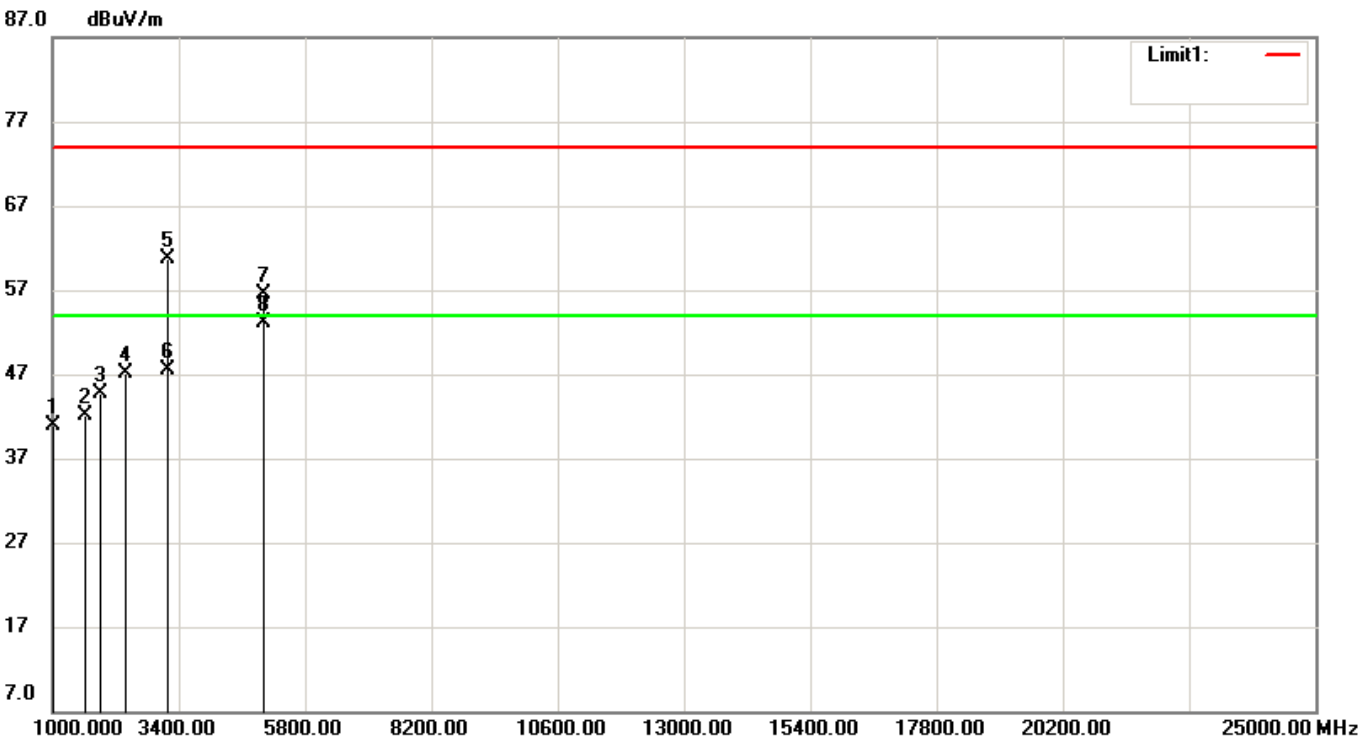
Site: RE02-EMC B1-N2

#30

Date: 2021/5/25

Temperature: 21 °C

Humidity: 59 %



Condition: NCC\_Above1G\_Pk

EUT: Car Navigation

Model: TN0022C

Test Mode: LINK WIFI

Note:

Polarization: Vertical

Distance: 3m

Operator: Bruce

| No. | Frequency (MHz) | Reading (dBuV/m) | Detector | Corrected dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----|-----------------|------------------|----------|----------------|-----------------|----------------|-------------|
| 1   | 1015.70510      | 50.26            | peak     | -9.44          | 40.82           | 74.00          | -33.18      |
| 2   | 1581.08970      | 49.42            | peak     | -7.26          | 42.16           | 74.00          | -31.84      |
| 3   | 1922.11530      | 49.22            | peak     | -4.58          | 44.64           | 74.00          | -29.36      |
| 4   | 2379.80760      | 50.05            | peak     | -2.97          | 47.08           | 74.00          | -26.92      |
| 5   | 3159.95770      | 62.56            | peak     | -1.86          | 60.70           | 74.00          | -13.30      |
| 6   | 3159.95770      | 49.29            | AVG      | -1.86          | 47.43           | 54.00          | -6.57       |
| 7   | 4999.96900      | 54.67            | peak     | 1.74           | 56.41           | 74.00          | -17.59      |
| 8   | 4999.96900      | 51.30            | AVG      | 1.74           | 53.04           | 54.00          | -0.96       |

註:1. 若以峰值檢測功能測量之值符合平均值限制值，則可視同以平均值功能測量之值亦符合平均值限制值。

2. 量測不準確度:
- VER: ±5.32dB(1GHz ≤ f < 6GHz) ;HOR: ±5.05dB(1GHz ≤ f < 6GHz)

VER: ±4.71dB(6GHz ≤ f < 18GHz) ;HOR: ±4.96dB(6GHz ≤ f < 18GHz)

VER: ±5.37dB(18GHz ≤ f ≤ 40GHz) ;HOR: ±5.61dB(18GHz ≤ f ≤ 40GHz)

## 10.5.2.4 其它不必要之訊號1GHz以下

## 10.5.2.4.1 測試狀態: IEEE 802.11g

File: 21-05-MAW-005

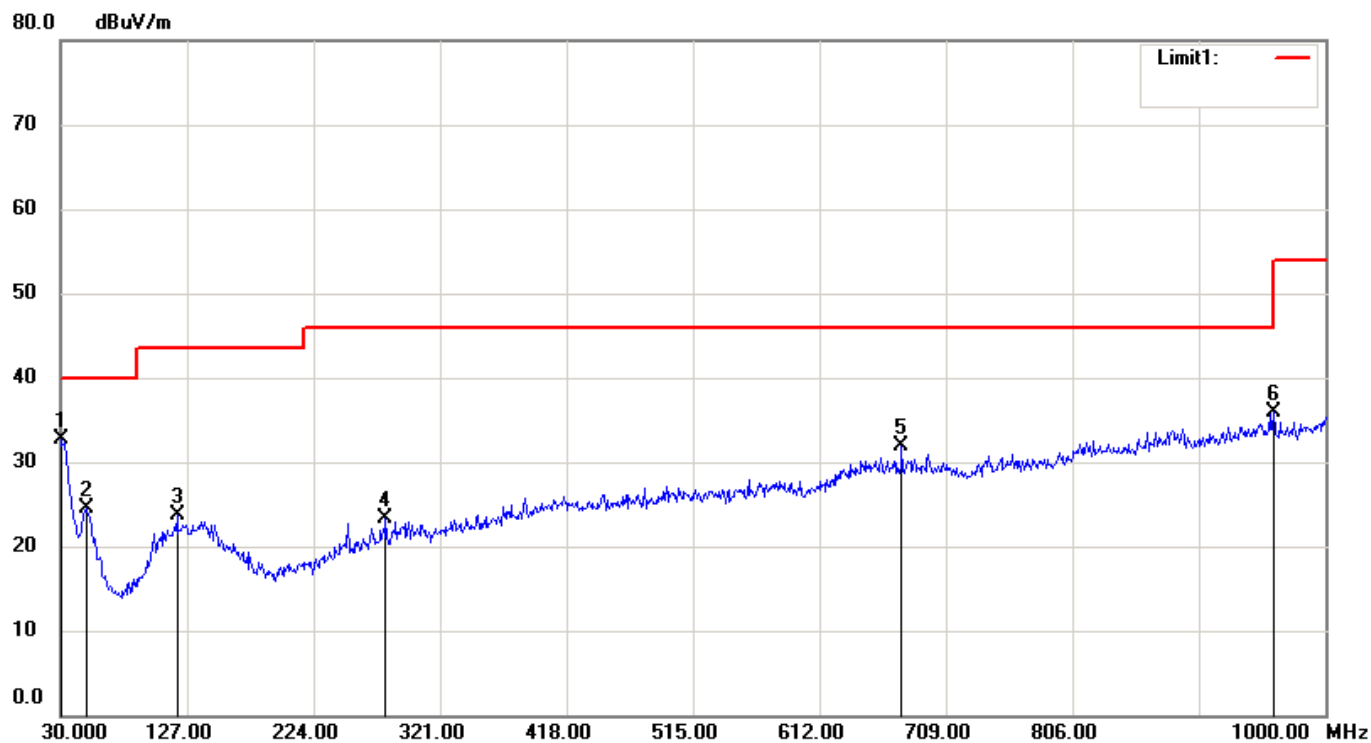
#19

Date: 2021/5/26

Temperature: 20 °C

Site: RE02-EMC B1- N2

Humidity: 61 %



Condition: NCC\_LP0002\_30-1000MHz

Polarization: Horizontal

EUT: Car Navigation

Distance: 3m

Model: TN0022C

Test Mode: WIFI

Operator: Bruce

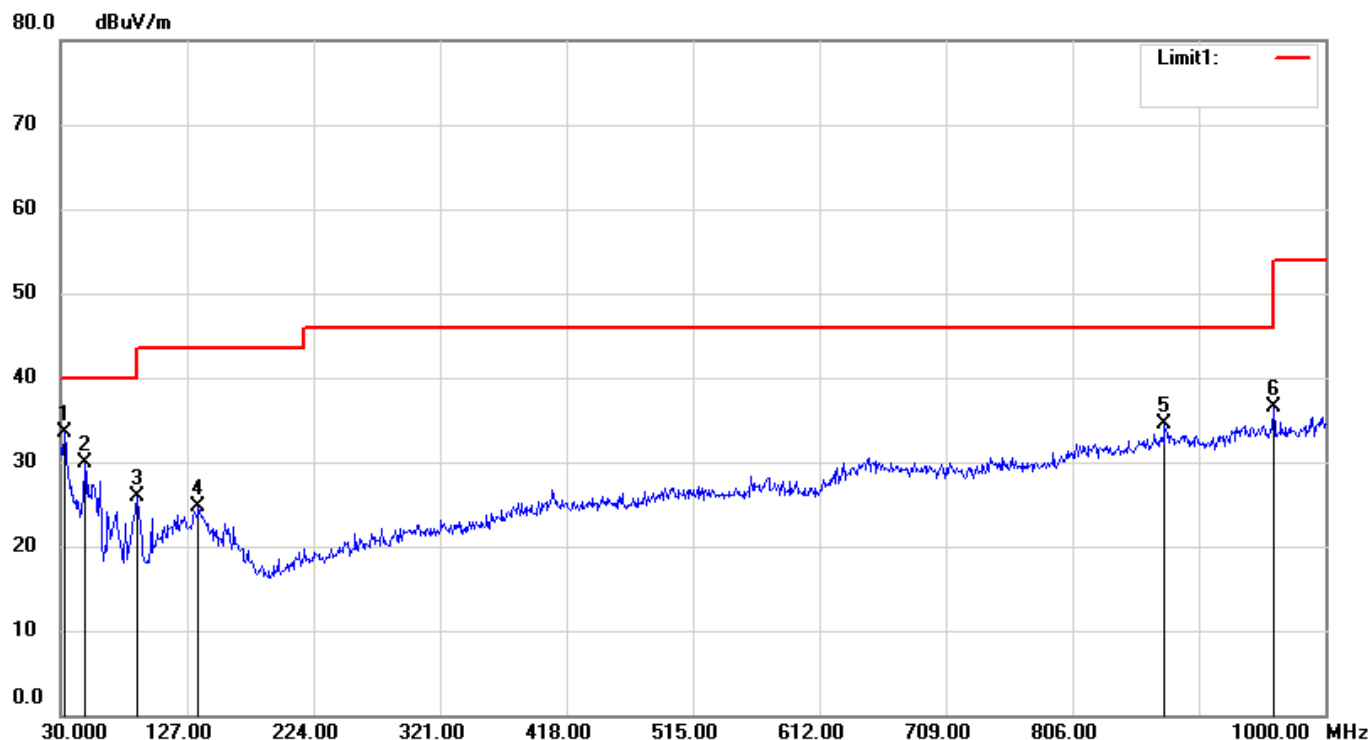
Note:

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 30.0000            | 39.63               | QP       | -6.97             | 32.66              | 40.00             | -7.34          |
| 2   | 49.4000            | 33.35               | QP       | -8.81             | 24.54              | 40.00             | -15.46         |
| 3   | 119.2400           | 29.07               | QP       | -5.35             | 23.72              | 43.50             | -19.78         |
| 4   | 279.2900           | 28.99               | QP       | -5.63             | 23.36              | 46.00             | -22.64         |
| 5   | 675.0500           | 30.03               | QP       | 1.94              | 31.97              | 46.00             | -14.03         |
| 6   | 960.2300           | 28.71               | QP       | 7.20              | 35.91              | 54.00             | -18.09         |

File: 21-05-MAW-005  
Site: RE02-EMC B1- N2

#20 Date: 2021/5/26

Temperature: 20 °C  
Humidity: 61 %



Condition: NCC\_LP0002\_30-1000MHz  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: WIFI  
Note:

Polarization: Vertical  
Distance: 3m  
Operator: Bruce

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 32.9100            | 40.91               | QP       | -7.50             | 33.41              | 40.00             | -6.59          |
| 2   | 48.4300            | 38.67               | QP       | -8.70             | 29.97              | 40.00             | -10.03         |
| 3   | 88.2000            | 38.17               | QP       | -12.18            | 25.99              | 43.50             | -17.51         |
| 4   | 135.7300           | 29.90               | QP       | -5.14             | 24.76              | 43.50             | -18.74         |
| 5   | 876.8100           | 28.89               | QP       | 5.59              | 34.48              | 46.00             | -11.52         |
| 6   | 960.2300           | 29.31               | QP       | 7.20              | 36.51              | 54.00             | -17.49         |

註：1. 若以峰值檢測功能測量之值符合準峰值限制值，則可視同以準峰值功能測量之值亦符合準峰值限制值。

2. 量測不準確度:

VER:  $\pm 6.23\text{dB}$  ( $30\text{MHz} \leq f < 200\text{MHz}$ ) ; HOR:  $\pm 4.55\text{dB}$  ( $30\text{MHz} \leq f < 200\text{MHz}$ )

VER:  $\pm 5.94\text{dB}$  ( $2000\text{MHz} \leq f < 1\text{GHz}$ ) ; HOR:  $\pm 4.34\text{dB}$  ( $200\text{MHz} \leq f < 1\text{GHz}$ )

## 10.5.2.4.2 測試狀態: USB Link

File: 21-05-MAW-005

#17

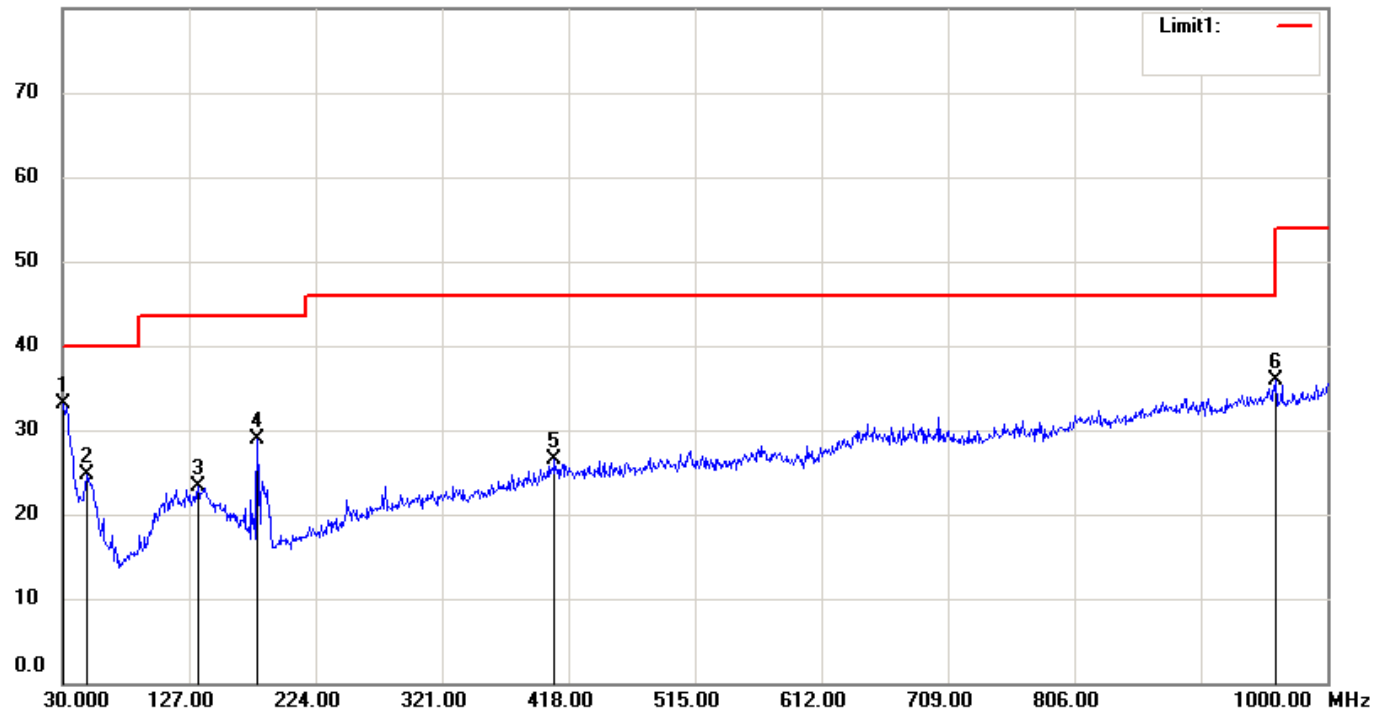
Date: 2021/5/26

Temperature: 20 °C

Site: RE02-EMC B1- N2

Humidity: 61 %

80.0 dBuV/m



Condition: NCC\_LP0002\_30-1000MHz

Polarization: Horizontal

EUT: Car Navigation

Distance: 3m

Model: TN0022C

Test Mode: USB

Operator: Bruce

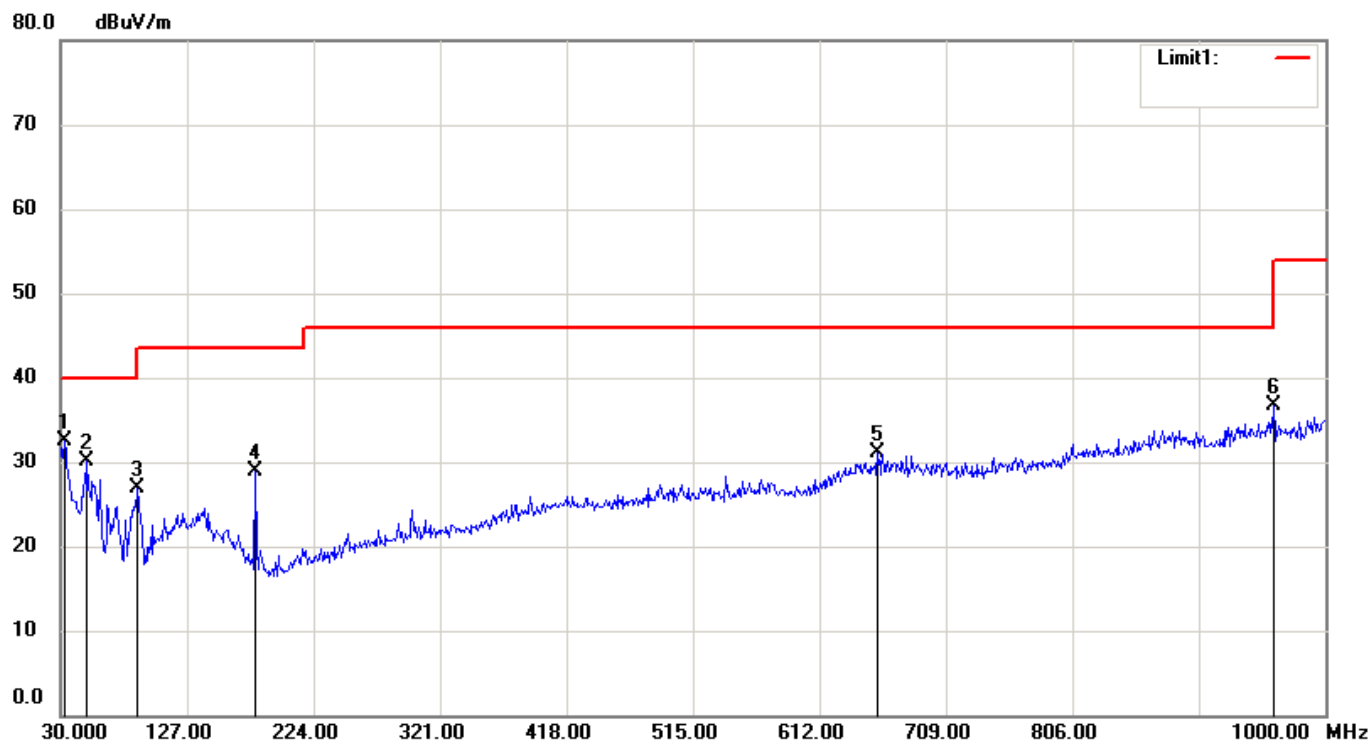
Note:

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 30.0000            | 40.11               | QP       | -6.97             | 33.14              | 40.00             | -6.86          |
| 2   | 48.4300            | 33.31               | QP       | -8.70             | 24.61              | 40.00             | -15.39         |
| 3   | 133.7900           | 28.36               | QP       | -5.08             | 23.28              | 43.50             | -20.22         |
| 4   | 179.3800           | 38.91               | QP       | -9.94             | 28.97              | 43.50             | -14.53         |
| 5   | 407.3300           | 28.62               | QP       | -2.17             | 26.45              | 46.00             | -19.55         |
| 6   | 960.2300           | 28.80               | QP       | 7.20              | 36.00              | 54.00             | -18.00         |

File: 21-05-MAW-005  
Site: RE02-EMC B1- N2

#18 Date: 2021/5/26

Temperature: 20 °C  
Humidity: 61 %



Condition: NCC\_LP0002\_30-1000MHz  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: USB  
Note:

Polarization: Vertical  
Distance: 3m  
Operator: Bruce

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 32.9100            | 39.95               | QP       | -7.50             | 32.45              | 40.00             | -7.55          |
| 2   | 50.3700            | 39.05               | QP       | -8.93             | 30.12              | 40.00             | -9.88          |
| 3   | 89.1700            | 38.82               | QP       | -11.96            | 26.86              | 43.50             | -16.64         |
| 4   | 179.3800           | 38.85               | QP       | -9.94             | 28.91              | 43.50             | -14.59         |
| 5   | 656.6200           | 29.01               | QP       | 2.05              | 31.06              | 46.00             | -14.94         |
| 6   | 960.2300           | 29.52               | QP       | 7.20              | 36.72              | 54.00             | -17.28         |

註：1. 若以峰值檢測功能測量之值符合準峰值限制值，則可視同以準峰值功能測量之值亦符合準峰值限制值。

2. 量測不準確度:

VER:  $\pm 6.23\text{dB}$  ( $30\text{MHz} \leq f < 200\text{MHz}$ ) ; HOR:  $\pm 4.55\text{dB}$  ( $30\text{MHz} \leq f < 200\text{MHz}$ )

VER:  $\pm 5.94\text{dB}$  ( $2000\text{MHz} \leq f < 1\text{GHz}$ ) ; HOR:  $\pm 4.34\text{dB}$  ( $200\text{MHz} \leq f < 1\text{GHz}$ )

## 10.5.2.4.3 測試狀態: BT Link

File: 21-05-MAW-005

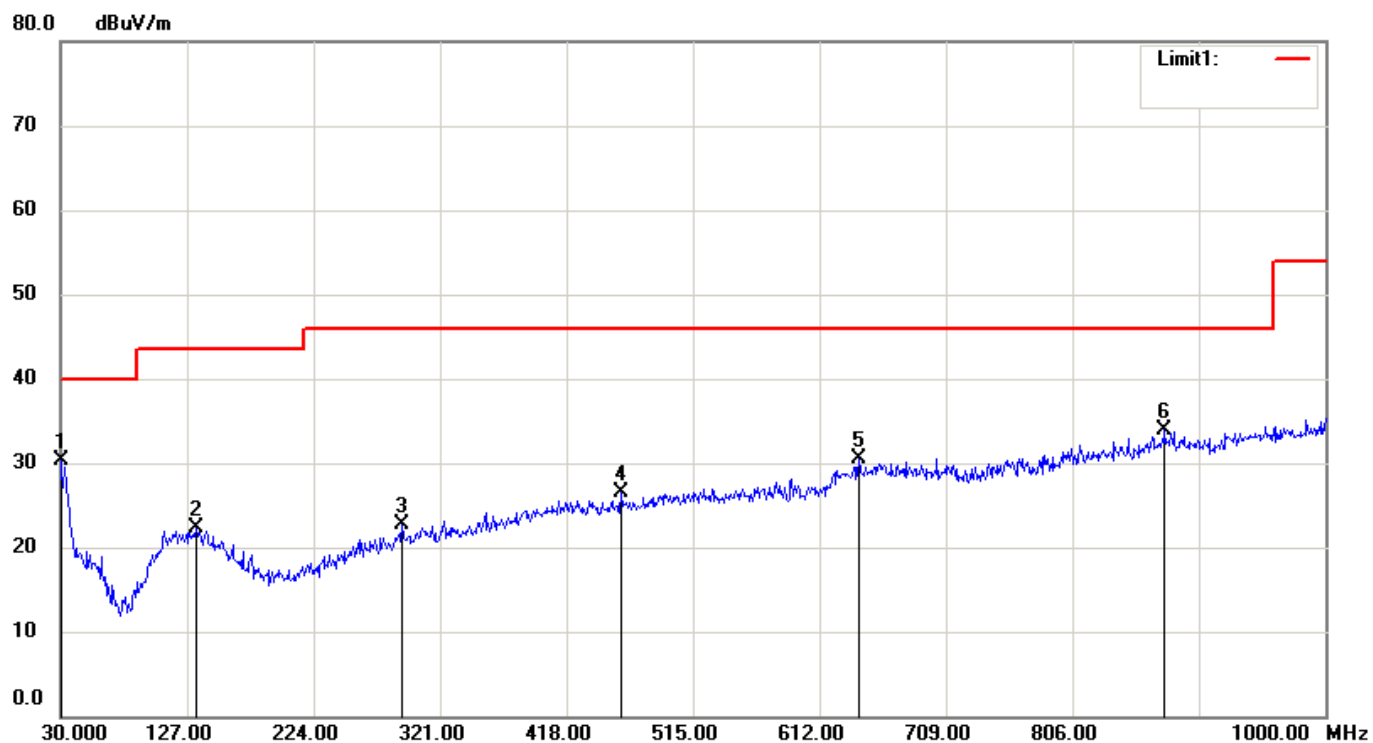
#13

Date: 2021/5/26

Temperature: 20 °C

Site: RE02-EMC B1- N2

Humidity: 61 %



Condition: NCC\_LP0002\_30-1000MHz

Polarization: Horizontal

EUT: Car Navigation

Distance: 3m

Model: TN0022C

Test Mode: LINK BT

Operator: Bruce

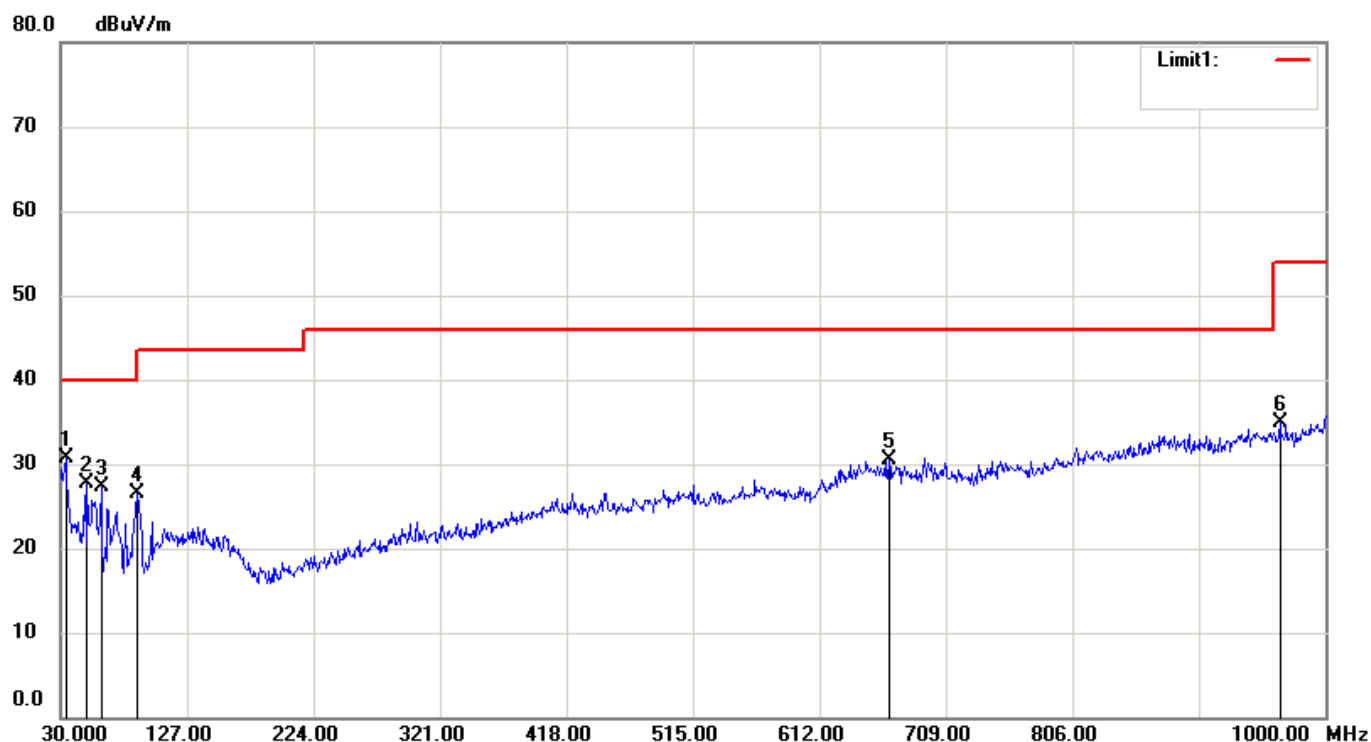
Note:

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 30.0000            | 37.36               | peak     | -6.97             | 30.39              | 40.00             | -9.61          |
| 2   | 133.7900           | 27.46               | peak     | -5.08             | 22.38              | 43.50             | -21.12         |
| 3   | 291.9000           | 27.74               | peak     | -4.99             | 22.75              | 46.00             | -23.25         |
| 4   | 459.7100           | 28.48               | peak     | -1.93             | 26.55              | 46.00             | -19.45         |
| 5   | 642.0700           | 28.77               | peak     | 1.64              | 30.41              | 46.00             | -15.59         |
| 6   | 876.8100           | 28.23               | peak     | 5.59              | 33.82              | 46.00             | -12.18         |

File: 21-05-MAW-005  
Site: RE02-EMC B1- N2

#14 Date: 2021/5/26

Temperature: 20 °C  
Humidity: 61 %



Condition: NCC\_LP0002\_30-1000MHz  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: LINK BT  
Note:

Polarization: Vertical  
Distance: 3m  
Operator: Bruce

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 33.8800            | 38.30               | QP       | -7.69             | 30.61              | 40.00             | -9.39          |
| 2   | 50.3700            | 36.70               | QP       | -8.93             | 27.77              | 40.00             | -12.23         |
| 3   | 61.0400            | 38.00               | QP       | -10.76            | 27.24              | 40.00             | -12.76         |
| 4   | 88.2000            | 38.63               | QP       | -12.18            | 26.45              | 43.50             | -17.05         |
| 5   | 665.3500           | 28.44               | QP       | 1.99              | 30.43              | 46.00             | -15.57         |
| 6   | 965.0800           | 27.66               | QP       | 7.32              | 34.98              | 54.00             | -19.02         |

註：1. 若以峰值檢測功能測量之值符合準峰值限制值，則可視同以準峰值功能測量之值亦符合準峰值限制值。

2. 量測不準確度:

VER:  $\pm 6.23\text{dB}$  ( $30\text{MHz} \leq f < 200\text{MHz}$ ) ; HOR:  $\pm 4.55\text{dB}$  ( $30\text{MHz} \leq f < 200\text{MHz}$ )

VER:  $\pm 5.94\text{dB}$  ( $2000\text{MHz} \leq f < 1\text{GHz}$ ) ; HOR:  $\pm 4.34\text{dB}$  ( $200\text{MHz} \leq f < 1\text{GHz}$ )

## 10.5.2.4.4 測試狀態: WiFi Link

File: 21-05-MAW-005

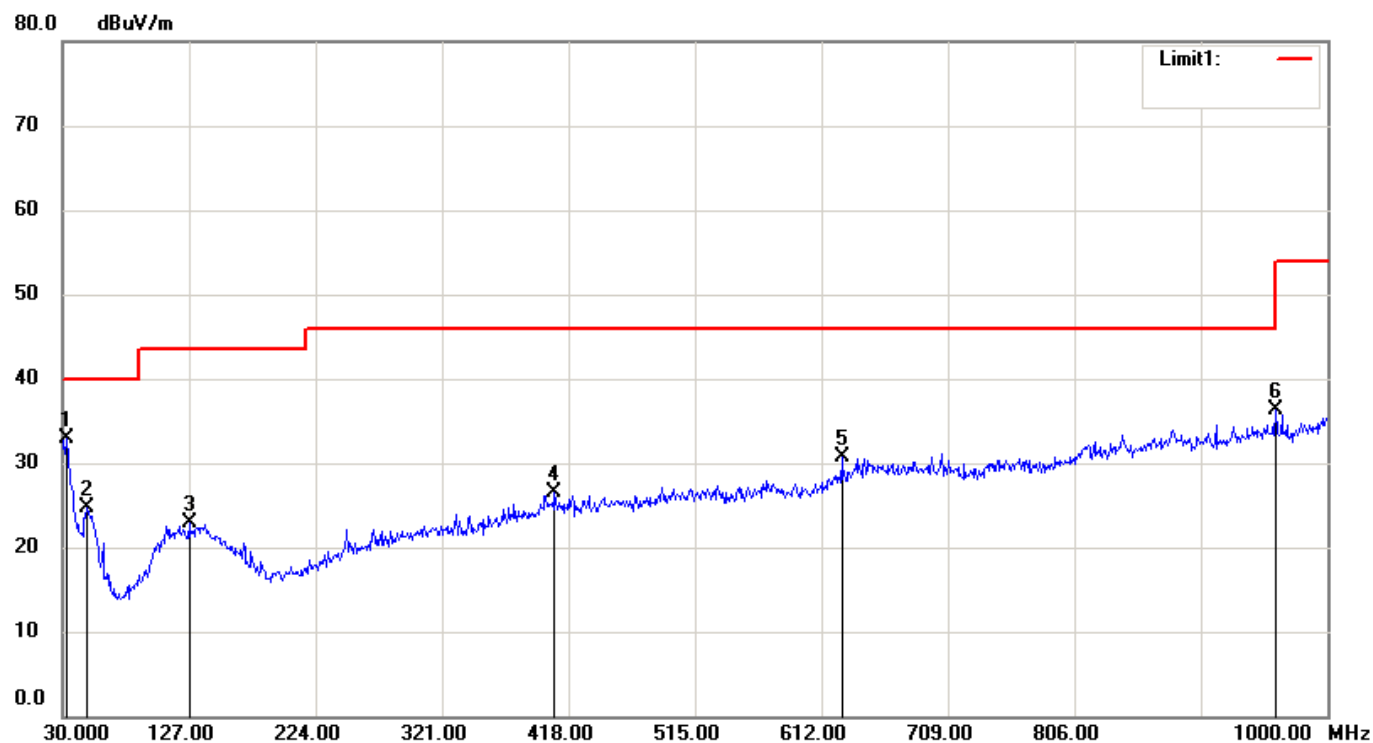
#15

Date: 2021/5/26

Temperature: 20 °C

Site: RE02-EMC B1- N2

Humidity: 61 %



Condition: NCC\_LP0002\_30-1000MHz

Polarization: Horizontal

EUT: Car Navigation

Distance: 3m

Model: TN0022C

Test Mode: LINK WIFI

Operator: Bruce

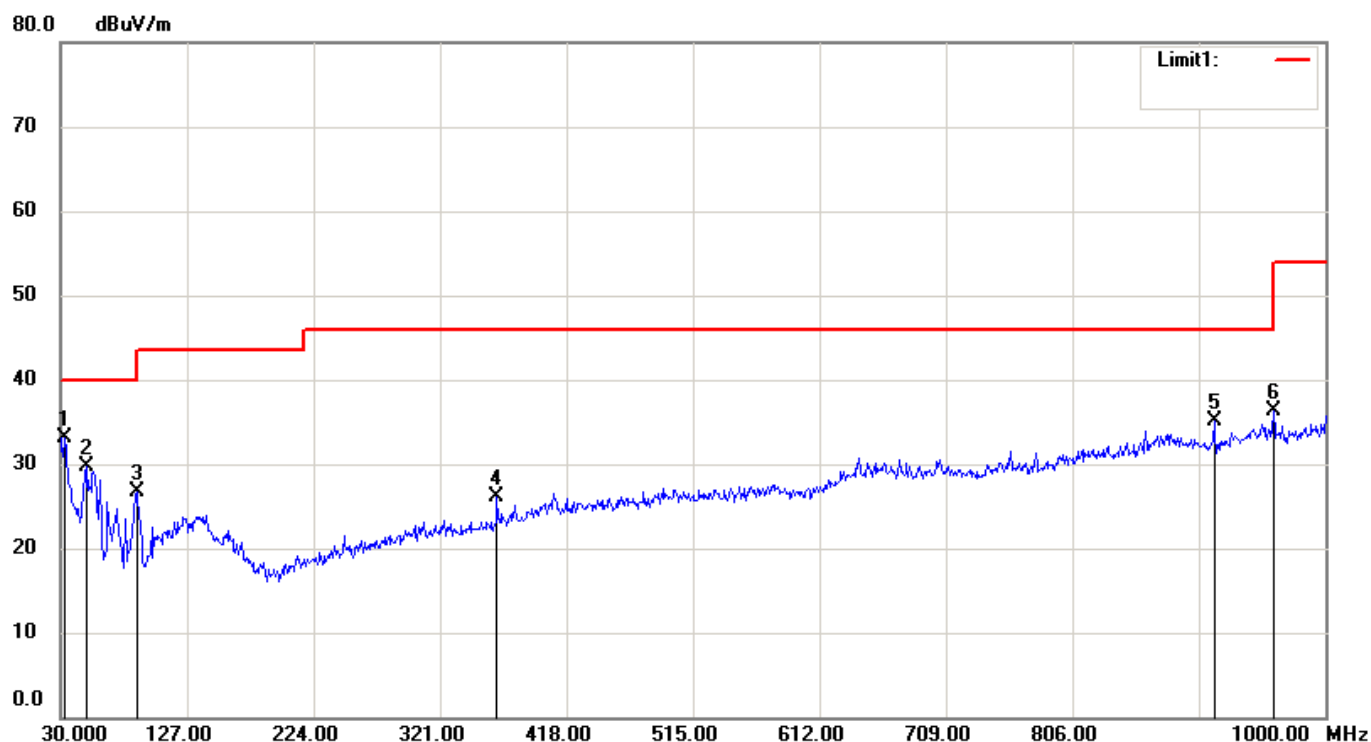
Note:

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 32.9100            | 40.34               | QP       | -7.50             | 32.84              | 40.00             | -7.16          |
| 2   | 48.4300            | 33.42               | QP       | -8.70             | 24.72              | 40.00             | -15.28         |
| 3   | 127.0000           | 27.89               | QP       | -5.07             | 22.82              | 43.50             | -20.68         |
| 4   | 407.3300           | 28.65               | QP       | -2.17             | 26.48              | 46.00             | -19.52         |
| 5   | 627.5200           | 29.85               | QP       | 0.84              | 30.69              | 46.00             | -15.31         |
| 6   | 960.2300           | 29.01               | QP       | 7.20              | 36.21              | 54.00             | -17.79         |

File: 21-05-MAW-005  
Site: RE02-EMC B1- N2

#16 Date: 2021/5/26

Temperature: 20 °C  
Humidity: 61 %



Condition: NCC\_LP0002\_30-1000MHz  
EUT: Car Navigation  
Model: TN0022C  
Test Mode: LINK WIFI  
Note:

Polarization: Vertical  
Distance: 3m  
Operator: Bruce

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 32.9100            | 40.53               | QP       | -7.50             | 33.03              | 40.00             | -6.97          |
| 2   | 50.3700            | 38.66               | QP       | -8.93             | 29.73              | 40.00             | -10.27         |
| 3   | 88.2000            | 38.80               | QP       | -12.18            | 26.62              | 43.50             | -16.88         |
| 4   | 364.6500           | 29.50               | QP       | -3.48             | 26.02              | 46.00             | -19.98         |
| 5   | 914.6400           | 28.98               | QP       | 6.17              | 35.15              | 46.00             | -10.85         |
| 6   | 960.2300           | 29.08               | QP       | 7.20              | 36.28              | 54.00             | -17.72         |

註：1. 若以峰值檢測功能測量之值符合準峰值限制值，則可視同以準峰值功能測量之值亦符合準峰值限制值。

2. 量測不準確度:

VER:  $\pm 6.23\text{dB}$  ( $30\text{MHz} \leq f < 200\text{MHz}$ ) ; HOR:  $\pm 4.55\text{dB}$  ( $30\text{MHz} \leq f < 200\text{MHz}$ )

VER:  $\pm 5.94\text{dB}$  ( $2000\text{MHz} \leq f < 1\text{GHz}$ ) ; HOR:  $\pm 4.34\text{dB}$  ( $200\text{MHz} \leq f < 1\text{GHz}$ )

## 10.6 禁用頻段邊緣輻射場強之量測結果

操作模式: 發射接收

測試日期: May 25, 2021

環境溫度: 21°C

環境濕度: 59%

### 10.6.1 調變技術: IEEE 802.11b

| 主波<br>頻道 | 輻射<br>頻率 | 儀器讀值@3m (dBuV/m) |       |       |       | 校正<br>因子 | 結果值      |       | 限制值@3m   |       | 餘裕值<br>(worse) |       |
|----------|----------|------------------|-------|-------|-------|----------|----------|-------|----------|-------|----------------|-------|
|          |          | 水平               |       | 垂直    |       |          | (dBuV/m) |       | (dBuV/m) |       | (dB)           |       |
|          | (MHz)    | 峰值               | 平均值   | 峰值    | 平均值   | (dB)     | 峰值       | 平均值   | 峰值       | 平均值   | 峰值             | 平均值   |
| CH Low   | 2389.231 | 27.21            | 13.96 | 27.43 | 14.12 | 34.42    | 61.85    | 48.54 | 74.00    | 54.00 | -12.15         | -5.46 |
| CH High  | 2485.986 | 28.65            | 14.15 | 28.26 | 14.23 | 34.64    | 63.29    | 48.87 | 74.00    | 54.00 | -10.71         | -5.13 |

### 10.6.2 調變技術: IEEE 802.11g

| 主波<br>頻道 | 輻射<br>頻率 | 儀器讀值@3m (dBuV/m) |       |       |       | 校正<br>因子 | 結果值      |       | 限制值@3m   |       | 餘裕值<br>(worse) |       |
|----------|----------|------------------|-------|-------|-------|----------|----------|-------|----------|-------|----------------|-------|
|          |          | 水平               |       | 垂直    |       |          | (dBuV/m) |       | (dBuV/m) |       | (dB)           |       |
|          | (MHz)    | 峰值               | 平均值   | 峰值    | 平均值   | (dB)     | 峰值       | 平均值   | 峰值       | 平均值   | 峰值             | 平均值   |
| CH Low   | 2389.744 | 27.36            | 13.95 | 27.28 | 13.98 | 34.42    | 61.78    | 48.40 | 74.00    | 54.00 | -12.22         | -5.60 |
| CH High  | 2497.990 | 28.11            | 14.05 | 29.85 | 14.08 | 34.68    | 64.53    | 48.76 | 74.00    | 54.00 | -9.47          | -5.24 |

### 10.6.3 調變技術: IEEE 802.11n HT20

| 主波<br>頻道 | 輻射<br>頻率 | 儀器讀值@3m (dBuV/m) |       |       |       | 校正<br>因子 | 結果值      |       | 限制值@3m   |       | 餘裕值<br>(worse) |       |
|----------|----------|------------------|-------|-------|-------|----------|----------|-------|----------|-------|----------------|-------|
|          |          | 水平               |       | 垂直    |       |          | (dBuV/m) |       | (dBuV/m) |       | (dB)           |       |
|          | (MHz)    | 峰值               | 平均值   | 峰值    | 平均值   | (dB)     | 峰值       | 平均值   | 峰值       | 平均值   | 峰值             | 平均值   |
| CH Low   | 2387.564 | 27.59            | 13.95 | 28.44 | 13.97 | 34.42    | 62.86    | 48.39 | 74.00    | 54.00 | -11.14         | -5.61 |
| CH High  | 2499.101 | 27.86            | 14.04 | 29.52 | 14.05 | 34.68    | 64.20    | 48.73 | 74.00    | 54.00 | -9.80          | -5.27 |

註:1. 量測不準確度: VER:  $\pm 5.32\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ ); HOR:  $\pm 5.05\text{dB}$  ( $1\text{GHz} \leq f < 6\text{GHz}$ )

2. 量測頻率範圍為 2310 ~ 2390 MHz 及 2483.5 ~ 2900 MHz, 並記錄兩頻率範圍中之最大讀值。

## 10.7 結果判定

以上之場強輻射測試結果皆低於限制值, 合乎標準規定。

## 10.8 輻射之測試配置

圖 3: 量測頻率低於1GHz之測試配置

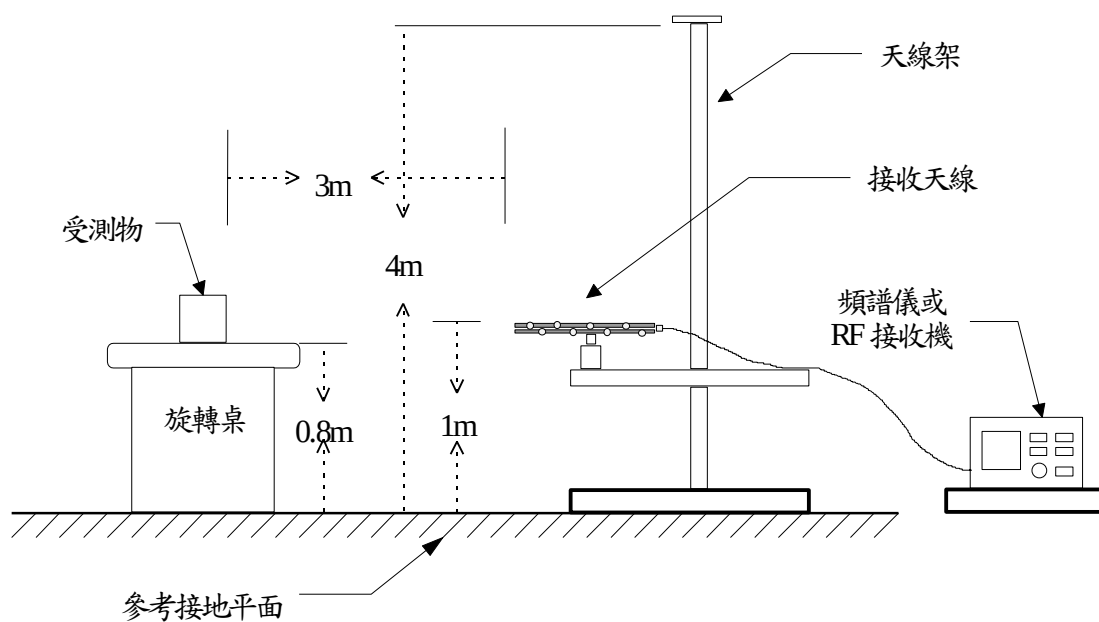
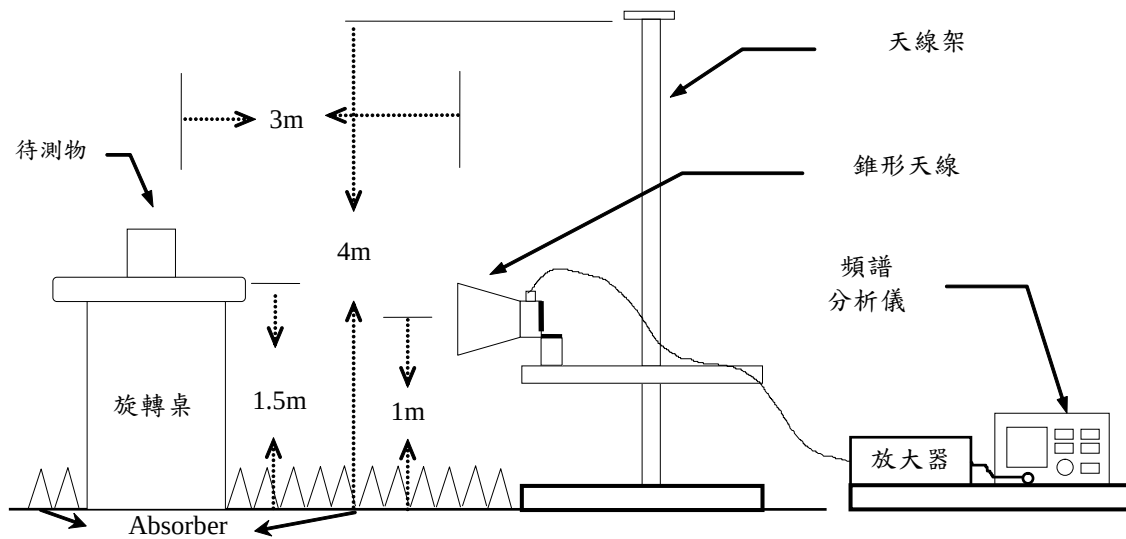


圖 4: 量測頻率高於1GHz之測試配置



## 10.9 輻射量測之配置照片

請參考產品照片

## 11 MAXIMUM PERMISSIBLE EXPOSURE

### Standard Applicable

According to FCC Part1.1310: Radiofrequency radiation exposure limits. The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency radiation as specified in 1.1307(b) LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency range                                                | Electric field strength | Magnetic field strength | Power density         | Averaging time |
|----------------------------------------------------------------|-------------------------|-------------------------|-----------------------|----------------|
| (MHz)                                                          | (V/m)                   | (A/m)                   | (mW/cm <sup>2</sup> ) | (minutes)      |
| <b>(A) Limits for Occupational/Controlled Exposure</b>         |                         |                         |                       |                |
| 0.3-3.0                                                        | 614                     | 1.63                    | *100                  | 6              |
| 3.0-30                                                         | 1842/f                  | 4.89/f                  | *900/f <sup>2</sup>   | 6              |
| 30-300                                                         | 61.4                    | 0.163                   | 1                     | 6              |
| 300-1,500                                                      |                         |                         | f/300                 | 6              |
| 1,500-100,000                                                  |                         |                         | 5                     | 6              |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                         |                         |                       |                |
| 0.3-1.34                                                       | 614                     | 1.63                    | *100                  | 30             |
| 1.34-30                                                        | 824/f                   | 2.19/f                  | *180/f <sup>2</sup>   | 30             |
| 30-300                                                         | 27.5                    | 0.073                   | 0.2                   | 30             |
| 300-1,500                                                      |                         |                         | f/1500                | 30             |
| 1,500-100,000                                                  |                         |                         | 1                     | 30             |

F = Frequency in MHz

### Calculations

Friis transmission formula:  $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 3.1416

$r$  = distance between observation point and center of the radiator in cm

The limit of  $P_d$  is 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the  $P_d$  at 20 cm is meet the limit of MPE.

**Result (Worse case mode)**

測試日期: May 19, 2021

環境溫度: 25°C

環境濕度: 52%

| Radio Technology | Operation Frequency (MHz) | Distance (cm) | Maximu Output Power with Antenna Gain (mW) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|------------------|---------------------------|---------------|--------------------------------------------|-------------------------------------|-----------------------------|
| 2.4 GHz          | 2462                      | 20            | 37.84                                      | 0.0075                              | 1                           |

The **P<sub>d</sub>** at 20 cm distance calculated from the Friis transmission formula is mush smaller than the limit requirement 1 mW/cm<sup>2</sup> or 10W/m<sup>2</sup>.

The **Installation Manual** instructs the user to install the device such that it has a separation of at least 20 cm from persons to comply with the FCC's requirements. This separation of 20 cm more than meets the FCC's and Industry Canada RF exposure requirements.

**Simultaneous Evaluation:**

All MPE evaluations are less than 1, which confirm the device comply the MPE limit.

## 12 量測之儀器

| 儀器名稱                                  | 廠 牌              | 型 號                     | 財產編號/序號       | 校驗日期       | 下次校驗日期     |
|---------------------------------------|------------------|-------------------------|---------------|------------|------------|
| Spectrum Analyzer                     | KEYSIGHT         | N9030B                  | MY60070506    | 09/23/2020 | 09/24/2021 |
| Spectrum Analyzer                     | R&S              | FSV40                   | 13052017-001  | 05/27/2021 | 05/26/2022 |
| Attenuator                            | WEINSCHEL        | 56-10                   | 58772         | 05/03/2021 | 05/02/2022 |
| Power Meter                           | Agilent          | N1912A                  | 13050625-001  | 10/14/2020 | 10/13/2021 |
| Power Sensor                          | Agilent          | N1922A                  | 13053523-001  | 10/14/2020 | 10/13/2021 |
| EMI Receiver                          | R&S              | ESCI                    | 13054423-001  | 12/15/2020 | 12/14/2021 |
| Spectrum Analyzer                     | R&S              | FSU46                   | 13040904-001  | 05/13/2021 | 05/12/2022 |
| Horn Antenna                          | EMCO             | 3117                    | 13059211-004  | 04/09/2021 | 04/08/2022 |
| Horn Antenna                          | EMCO             | 3116                    | 13059202-001  | 11/06/2020 | 11/05/2021 |
| PRE-Amplifier                         | Agilent          | 8449B                   | 13040709-001  | 12/21/2020 | 12/20/2021 |
| PRE-Amplifier                         | Agilent          | 8447D                   | 13040715-002  | 05/03/2021 | 05/02/2022 |
| BiLog Antenna                         | ETC              | MCTD 2786               | BL19J04024    | 03/11/2021 | 03/10/2022 |
| Trilog Broadband Antenna with 5dB Pad | SCHWARZBECK&EMCI | VULB 9168 & EMCI-N-6-05 | 1211&AT-N0569 | 05/10/2021 | 05/09/2022 |