

## FCC Test Report

**Report No.:** RFBEBU-WTW-P20100580

**FCC ID:** E8HTPA-C001P

**Test Model:** TPA-C001P

**Received Date:** Oct. 26, 2020

**Test Date:** Nov. 9 to 16, 2020

**Issued Date:** Nov. 19, 2020

**Applicant:** Chicony Electronics Co., Ltd.

**Address:** No.69, Sec. 2, Guangfu Rd., Sanchong Dist., New Taipei City 241,  
Taiwan(R.O.C.)

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Lin Kou Laboratories

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

**FCC Registration /  
Designation Number:** 198487 / TW2021



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### Release Control Record

| Issue No.            | Description      | Date Issued   |
|----------------------|------------------|---------------|
| RFBEBU-WTW-P20100580 | Original release | Nov. 19, 2020 |

## 1 Certificate of Conformity

**Product:** HP USI Garaged Pen

**Brand:** hp

**Test Model:** TPA-C001P

**Sample Status:** Engineering sample

**Applicant:** Chicony Electronics Co., Ltd.

**Test Date:** Nov. 9 to 16, 2020

**Standards:** 47 CFR FCC Part 15, Subpart C (Section 15.209)  
ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

**Prepared by :**

*Annie Chang*

**Date:**

Nov. 19, 2020

Annie Chang / Senior Specialist

**Approved by :**

*Rex Lai*

**Date:**

Nov. 19, 2020

Rex Lai / Associate Technical Manager

## 2 Summary of Test Results

### 47 CFR FCC Part 15, Subpart C (Section 15.209)

| FCC Clause | Test Item                   | Result | Remarks                                                                               |
|------------|-----------------------------|--------|---------------------------------------------------------------------------------------|
| 15.207     | AC Power Conducted Emission | N/A    | Power supply is 2.7Vdc from Supercap.                                                 |
| 15.209     | Radiated Emission Test      | Pass   | Meet the requirement of limit.<br>Minimum passing margin is<br>-10.69 dB at 40.91 MHz |

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement                    | Frequency    | Expanded Uncertainty<br>(k=2) ( $\pm$ ) |
|--------------------------------|--------------|-----------------------------------------|
| Radiated Emissions up to 1 GHz | 9kHz ~ 30MHz | 2.61 dB                                 |
|                                | 30MHz ~ 1GHz | 5.43 dB                                 |

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

|                     |                                                  |
|---------------------|--------------------------------------------------|
| Product             | HP USI Garaged Pen                               |
| Brand               | hp                                               |
| Test Model          | TPA-C001P                                        |
| Sample Status       | Engineering sample                               |
| Power Supply Rating | 2.7Vdc from Supercap or 5Vdc from host equipment |
| Modulation Type     | PSK                                              |
| Operating Frequency | 111-494kHz                                       |
| Number of Channel   | 384                                              |
| Antenna Type        | Loop antenna                                     |
| Field Strength      | -46.58dBuV/m @300m                               |
| Accessory Device    | N/A                                              |
| Data Cable Supplied | N/A                                              |

Note:

1. The EUT uses following Supercap.

|              |          |
|--------------|----------|
| Manufacturer | KORCHIP  |
| Model        | SR2R7205 |
| Rating       | 2.7Vdc   |

2. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

### 3.2 Description of Test Modes

384 channels are provided for EUT:

| Channel | Freq. (kHz) | Channel | Freq. (kHz) | Channel | Freq. (kHz) | Channel | Freq. (kHz) | Channel | Freq. (kHz) |
|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|
| 1       | 111         | 51      | 161         | 101     | 211         | 151     | 261         | 201     | 311         |
| 2       | 112         | 52      | 162         | 102     | 212         | 152     | 262         | 202     | 312         |
| 3       | 113         | 53      | 163         | 103     | 213         | 153     | 263         | 203     | 313         |
| 4       | 114         | 54      | 164         | 104     | 214         | 154     | 264         | 204     | 314         |
| 5       | 115         | 55      | 165         | 105     | 215         | 155     | 265         | 205     | 315         |
| 6       | 116         | 56      | 166         | 106     | 216         | 156     | 266         | 206     | 316         |
| 7       | 117         | 57      | 167         | 107     | 217         | 157     | 267         | 207     | 317         |
| 8       | 118         | 58      | 168         | 108     | 218         | 158     | 268         | 208     | 318         |
| 9       | 119         | 59      | 169         | 109     | 219         | 159     | 269         | 209     | 319         |
| 10      | 120         | 60      | 170         | 110     | 220         | 160     | 270         | 210     | 320         |
| 11      | 121         | 61      | 171         | 111     | 221         | 161     | 271         | 211     | 321         |
| 12      | 122         | 62      | 172         | 112     | 222         | 162     | 272         | 212     | 322         |
| 13      | 123         | 63      | 173         | 113     | 223         | 163     | 273         | 213     | 323         |
| 14      | 124         | 64      | 174         | 114     | 224         | 164     | 274         | 214     | 324         |
| 15      | 125         | 65      | 175         | 115     | 225         | 165     | 275         | 215     | 325         |
| 16      | 126         | 66      | 176         | 116     | 226         | 166     | 276         | 216     | 326         |
| 17      | 127         | 67      | 177         | 117     | 227         | 167     | 277         | 217     | 327         |
| 18      | 128         | 68      | 178         | 118     | 228         | 168     | 278         | 218     | 328         |
| 19      | 129         | 69      | 179         | 119     | 229         | 169     | 279         | 219     | 329         |
| 20      | 130         | 70      | 180         | 120     | 230         | 170     | 280         | 220     | 330         |
| 21      | 131         | 71      | 181         | 121     | 231         | 171     | 281         | 221     | 331         |
| 22      | 132         | 72      | 182         | 122     | 232         | 172     | 282         | 222     | 332         |
| 23      | 133         | 73      | 183         | 123     | 233         | 173     | 283         | 223     | 333         |
| 24      | 134         | 74      | 184         | 124     | 234         | 174     | 284         | 224     | 334         |
| 25      | 135         | 75      | 185         | 125     | 235         | 175     | 285         | 225     | 335         |
| 26      | 136         | 76      | 186         | 126     | 236         | 176     | 286         | 226     | 336         |
| 27      | 137         | 77      | 187         | 127     | 237         | 177     | 287         | 227     | 337         |
| 28      | 138         | 78      | 188         | 128     | 238         | 178     | 288         | 228     | 338         |
| 29      | 139         | 79      | 189         | 129     | 239         | 179     | 289         | 229     | 339         |
| 30      | 140         | 80      | 190         | 130     | 240         | 180     | 290         | 230     | 340         |
| 31      | 141         | 81      | 191         | 131     | 241         | 181     | 291         | 231     | 341         |
| 32      | 142         | 82      | 192         | 132     | 242         | 182     | 292         | 232     | 342         |
| 33      | 143         | 83      | 193         | 133     | 243         | 183     | 293         | 233     | 343         |
| 34      | 144         | 84      | 194         | 134     | 244         | 184     | 294         | 234     | 344         |
| 35      | 145         | 85      | 195         | 135     | 245         | 185     | 295         | 235     | 345         |
| 36      | 146         | 86      | 196         | 136     | 246         | 186     | 296         | 236     | 346         |
| 37      | 147         | 87      | 197         | 137     | 247         | 187     | 297         | 237     | 347         |
| 38      | 148         | 88      | 198         | 138     | 248         | 188     | 298         | 238     | 348         |
| 39      | 149         | 89      | 199         | 139     | 249         | 189     | 299         | 239     | 349         |
| 40      | 150         | 90      | 200         | 140     | 250         | 190     | 300         | 240     | 350         |
| 41      | 151         | 91      | 201         | 141     | 251         | 191     | 301         | 241     | 351         |
| 42      | 152         | 92      | 202         | 142     | 252         | 192     | 302         | 242     | 352         |
| 43      | 153         | 93      | 203         | 143     | 253         | 193     | 303         | 243     | 353         |
| 44      | 154         | 94      | 204         | 144     | 254         | 194     | 304         | 244     | 354         |
| 45      | 155         | 95      | 205         | 145     | 255         | 195     | 305         | 245     | 355         |
| 46      | 156         | 96      | 206         | 146     | 256         | 196     | 306         | 246     | 356         |
| 47      | 157         | 97      | 207         | 147     | 257         | 197     | 307         | 247     | 357         |
| 48      | 158         | 98      | 208         | 148     | 258         | 198     | 308         | 248     | 358         |
| 49      | 159         | 99      | 209         | 149     | 259         | 199     | 309         | 249     | 359         |
| 50      | 160         | 100     | 210         | 150     | 260         | 200     | 310         | 250     | 360         |

| Channel | Freq.<br>(kHz) | Channel | Freq.<br>(kHz) | Channel | Freq.<br>(kHz) | Channel | Freq.<br>(kHz) | Channel | Freq.<br>(kHz) |
|---------|----------------|---------|----------------|---------|----------------|---------|----------------|---------|----------------|
| 251     | 361            | 281     | 391            | 311     | 421            | 341     | 451            | 371     | 481            |
| 252     | 362            | 282     | 392            | 312     | 422            | 342     | 452            | 372     | 482            |
| 253     | 363            | 283     | 393            | 313     | 423            | 343     | 453            | 373     | 483            |
| 254     | 364            | 284     | 394            | 314     | 424            | 344     | 454            | 374     | 484            |
| 255     | 365            | 285     | 395            | 315     | 425            | 345     | 455            | 375     | 485            |
| 256     | 366            | 286     | 396            | 316     | 426            | 346     | 456            | 376     | 486            |
| 257     | 367            | 287     | 397            | 317     | 427            | 347     | 457            | 377     | 487            |
| 258     | 368            | 288     | 398            | 318     | 428            | 348     | 458            | 378     | 488            |
| 259     | 369            | 289     | 399            | 319     | 429            | 349     | 459            | 379     | 489            |
| 260     | 370            | 290     | 400            | 320     | 430            | 350     | 460            | 380     | 490            |
| 261     | 371            | 291     | 401            | 321     | 431            | 351     | 461            | 381     | 491            |
| 262     | 372            | 292     | 402            | 322     | 432            | 352     | 462            | 382     | 492            |
| 263     | 373            | 293     | 403            | 323     | 433            | 353     | 463            | 383     | 493            |
| 264     | 374            | 294     | 404            | 324     | 434            | 354     | 464            | 384     | 494            |
| 265     | 375            | 295     | 405            | 325     | 435            | 355     | 465            |         |                |
| 266     | 376            | 296     | 406            | 326     | 436            | 356     | 466            |         |                |
| 267     | 377            | 297     | 407            | 327     | 437            | 357     | 467            |         |                |
| 268     | 378            | 298     | 408            | 328     | 438            | 358     | 468            |         |                |
| 269     | 379            | 299     | 409            | 329     | 439            | 359     | 469            |         |                |
| 270     | 380            | 300     | 410            | 330     | 440            | 360     | 470            |         |                |
| 271     | 381            | 301     | 411            | 331     | 441            | 361     | 471            |         |                |
| 272     | 382            | 302     | 412            | 332     | 442            | 362     | 472            |         |                |
| 273     | 383            | 303     | 413            | 333     | 443            | 363     | 473            |         |                |
| 274     | 384            | 304     | 414            | 334     | 444            | 364     | 474            |         |                |
| 275     | 385            | 305     | 415            | 335     | 445            | 365     | 475            |         |                |
| 276     | 386            | 306     | 416            | 336     | 446            | 366     | 476            |         |                |
| 277     | 387            | 307     | 417            | 337     | 447            | 367     | 477            |         |                |
| 278     | 388            | 308     | 418            | 338     | 448            | 368     | 478            |         |                |
| 279     | 389            | 309     | 419            | 339     | 449            | 369     | 479            |         |                |
| 280     | 390            | 310     | 420            | 340     | 450            | 370     | 480            |         |                |

### 3.2.1 Test Mode Applicability and Tested Channel Detail

| EUT Configure Mode | Applicable To |        | Description |
|--------------------|---------------|--------|-------------|
|                    | RE<1G         | PLC    |             |
| -                  | √             | Note 1 | -           |

Where **RE<1G**: Radiated Emission below 1GHz **PLC**: Power Line Conducted Emission

**NOTE:**

1. No need to concern of Conducted Emission due to the EUT is powered by Supercap.
2. The EUT had been pre-tested on the positioned of each 2 axis (X.Z). The worst case was found when positioned on **Z-plane**

#### **Radiated Emission Test (Below 1GHz):**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Operating Frequency (kHz) | Tested Frequency (kHz) | Modulation Type |
|--------------------|---------------------------|------------------------|-----------------|
| -                  | 111-494                   | 333                    | PSK             |

#### **Test Condition:**

| Applicable To   | Environmental Conditions | Input Power | Tested by |
|-----------------|--------------------------|-------------|-----------|
| <b>RE&lt;1G</b> | 25 deg. C, 76% RH        | 2.7Vdc      | Ian Chang |

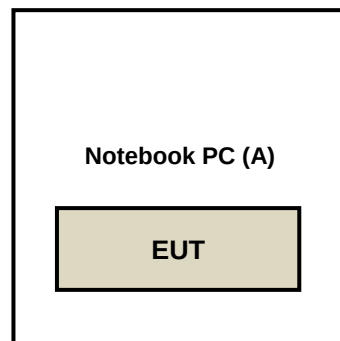
### 3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| ID | Product     | Brand | Model No.   | Serial No. | FCC ID | Remarks            |
|----|-------------|-------|-------------|------------|--------|--------------------|
| A. | Notebook PC | HP    | HP Notebook | N/A        | N/A    | Supplied by client |

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

#### 3.3.1 Configuration of System under Test



### 3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart C (15.209)**

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

## 4 Test Types and Results

### 4.1 Radiated Emission and Bandedge Measurement

#### 4.1.1 Limits of Radiated Emission and Bandedge Measurement

##### For Frequency Below 30MHz

| Frequency (MHz) | Field Strength (dBuV/m) |             | Measurement Distance (meters) |
|-----------------|-------------------------|-------------|-------------------------------|
|                 | uV/m                    | dBuV/m      |                               |
| 0.009 – 0.490   | 2400 / F (kHz)          | 48.52-13.80 | 300                           |
| 0.490 – 1.705   | 24000 / F (kHz)         | 33.80-22.97 | 30                            |
| 1.705 – 30.0    | 30                      | 29.54       | 30                            |

##### For Frequency Between 30-1000MHz

| Frequency (MHz) | Class A (at 10m) |        | Class B (at 3m) |        |
|-----------------|------------------|--------|-----------------|--------|
|                 | uV/m             | dBuV/m | uV/m            | dBuV/m |
| 30-88           | 90               | 39.1   | 100             | 40.0   |
| 88-216          | 150              | 43.5   | 150             | 43.5   |
| 216-960         | 210              | 46.4   | 200             | 46.0   |
| Above 960       | 300              | 49.5   | 500             | 54.0   |

#### 4.1.2 Test Instruments

| DESCRIPTION & MANUFACTURER              | MODEL NO.            | SERIAL NO.   | CALIBRATED DATE | CALIBRATED UNTIL |
|-----------------------------------------|----------------------|--------------|-----------------|------------------|
| HP Preamplifier                         | 8447D                | 2432A03504   | Feb. 19, 2020   | Feb. 18, 2021    |
| HP Preamplifier                         | 8449B                | 3008A01201   | Feb. 20, 2020   | Feb. 19, 2021    |
| MITEQ Preamplifier                      | AMF-6F-260400-33-8P  | 892164       | Feb. 19, 2020   | Feb. 18, 2021    |
| Agilent TEST RECEIVER                   | N9038A               | MY51210129   | Mar. 18, 2020   | Mar. 17, 2021    |
| Schwarzbeck Antenna                     | VULB 9168            | 139          | Nov. 6, 2020    | Nov. 5, 2021     |
| Schwarzbeck Antenna                     | VHBA 9123            | 480          | Jun. 3, 2019    | Jun. 2, 2021     |
| Schwarzbeck Horn Antenna                | BBHA-9170            | 212          | Nov. 24, 2019   | Nov. 23, 2020    |
| Schwarzbeck Horn Antenna                | BBHA 9120-D1         | D130         | Nov. 24, 2019   | Nov. 23, 2020    |
| ADT. Turn Table                         | TT100                | 0306         | NA              | NA               |
| ADT. Tower                              | AT100                | 0306         | NA              | NA               |
| Software                                | Radiated_V7.6.15.9.5 | NA           | NA              | NA               |
| SUHNER RF cable With 4dB PAD            | SF102                | Cable-CH6-01 | Jul. 9, 2020    | Jul. 8, 2021     |
| EMEC RF cable With 3/4dB PAD            | EM102-KMKM           | 01           | Aug. 21, 2020   | Aug. 20, 2021    |
| KEYSIGHT MIMO Powermeasurement Test set | U2021XA              | U2021XA-001  | Jun. 16, 2020   | Jun. 15, 2021    |
| KEYSIGHT Spectrum Analyzer              | N9030A               | MY54490260   | Jul. 22, 2020   | Jul. 21, 2021    |
| Loop Antenna EMCI                       | LPA600               | 270          | Aug. 23, 2019   | Aug. 22, 2021    |
| EMCO Horn Antenna                       | 3115                 | 00028257     | Nov. 24, 2019   | Nov. 23, 2020    |
| Highpass filter Wainwright Instruments  | WHK 3.1/18G-10SS     | SN 8         | NA              | NA               |
| ROHDE & SCHWARZ Spectrum Analyzer       | FSV40                | 101042       | Sep. 8, 2020    | Sep. 7, 2021     |

- NOTE:**
1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
  2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  3. The test was performed in Chamber No. 6.

#### 4.1.3 Test Procedures

##### For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

##### For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

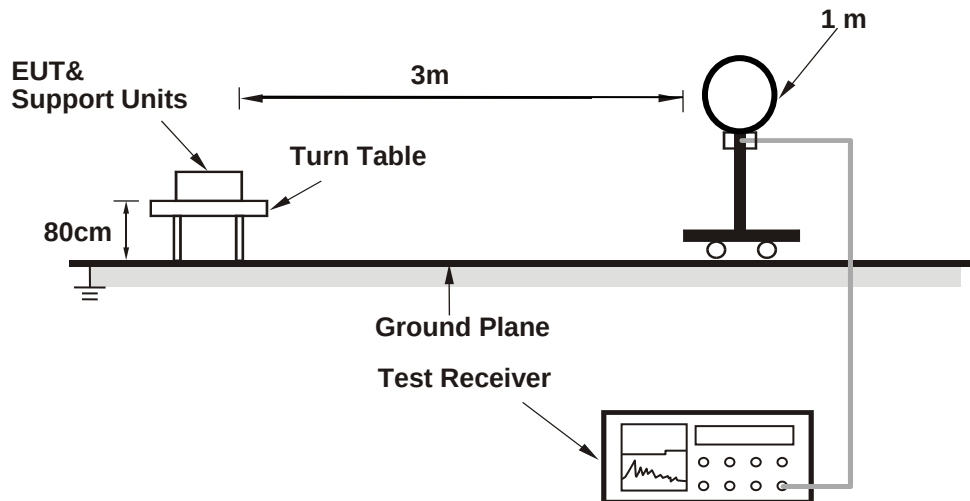
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle  $< 98\%$ ) or 10Hz (Duty cycle  $\geq 98\%$ ) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 Deviation from Test Standard

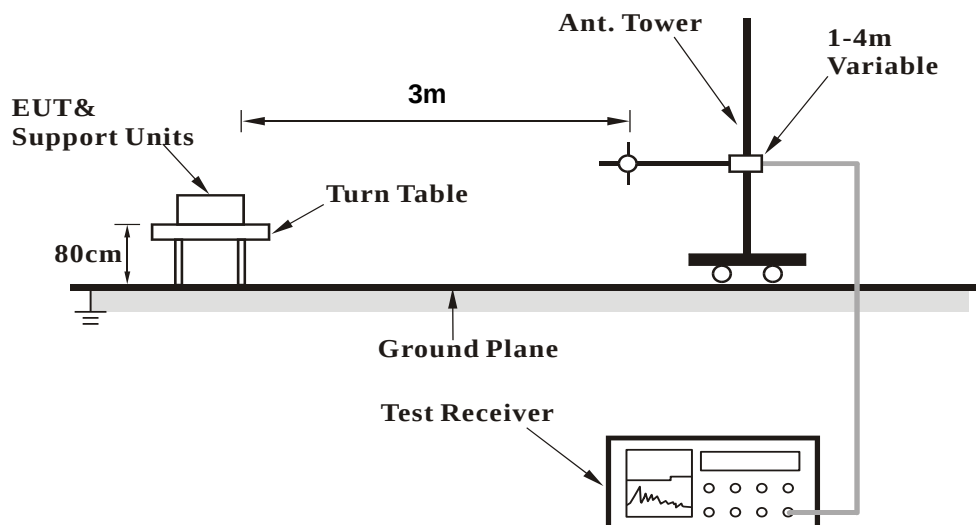
No deviation.

#### 4.1.5 Test Set Up

For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.1.6 EUT Operating Conditions

- Put the EUT on the Notebook.
- Set the EUT under transmission condition continuously at specific channel frequency.

#### 4.1.7 Test Results

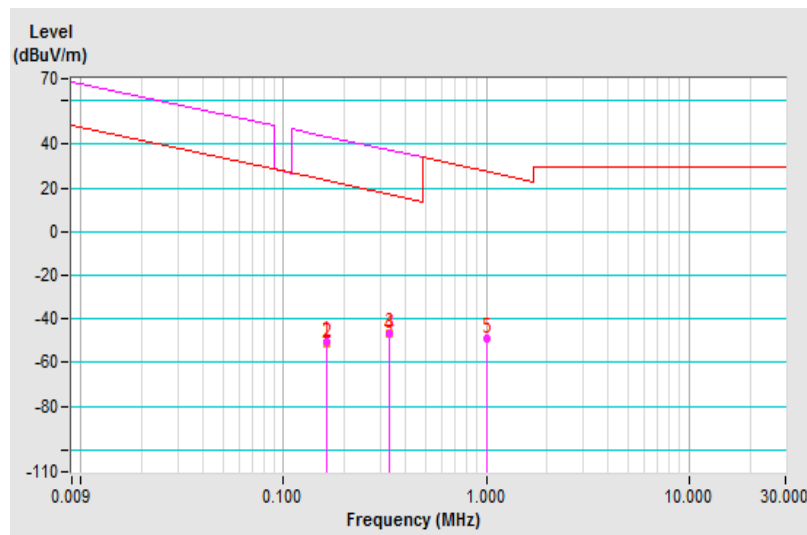
Below 30MHz Data:

|                 |                |                   |                                 |
|-----------------|----------------|-------------------|---------------------------------|
| Test Frequency  | 333kHz         | Detector Function | Peak (PK)                       |
| Frequency Range | 9 kHz ~ 30 MHz |                   | Average (AV)<br>Quasi-Peak (QP) |

| Antenna Polarity & Test Distance: Loop Antenna Parallel At 3m |             |                         |                |             |                    |                      |                  |                          |
|---------------------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No.                                                           | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                             | 0.1642      | -50.51 PK               | 43.29          | -93.80      | 1.00               | 237                  | 65.84            | -116.35                  |
| 2                                                             | 0.1642      | -51.02 AV               | 23.29          | -74.31      | 1.00               | 237                  | 65.33            | -116.35                  |
| 3                                                             | *0.3330     | -46.58 PK               | 37.15          | -83.73      | 1.00               | 185                  | 69.51            | -116.09                  |
| 4                                                             | *0.3330     | -47.04 AV               | 17.15          | -64.19      | 1.00               | 185                  | 69.05            | -116.09                  |
| 5                                                             | 0.9994      | -48.74 QP               | 27.60          | -76.34      | 1.00               | 304                  | -13.03           | -35.71                   |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. “ \* ”: Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. Test Result @300m= Emission Level @3m-40log(300 / 3)= Emission Level @3m-80
8. Test Result @30m= Emission Level @3m-40log(30 / 3)= Emission Level @3m-40

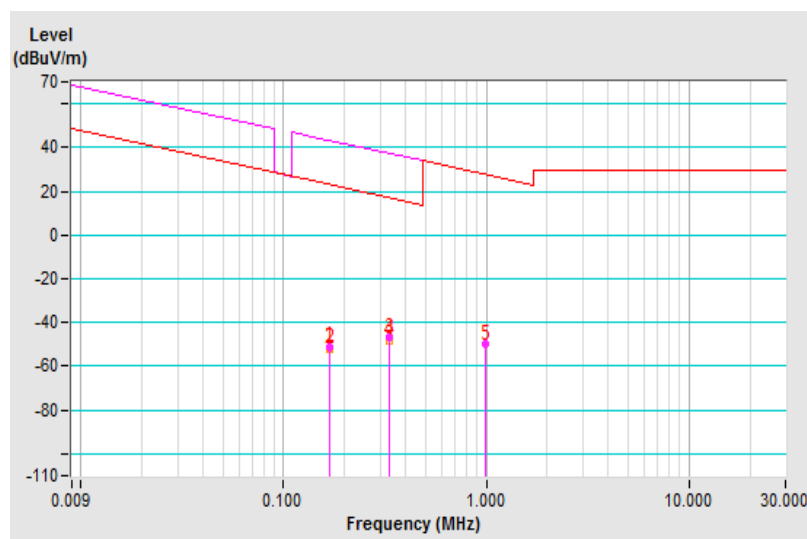


|                 |                |                   |                                 |
|-----------------|----------------|-------------------|---------------------------------|
| Test Frequency  | 333kHz         | Detector Function | Peak (PK)                       |
| Frequency Range | 9 kHz ~ 30 MHz |                   | Average (AV)<br>Quasi-Peak (QP) |

| Antenna Polarity & Test Distance: Loop Antenna Perpendicular At 3m |             |                         |                |             |                    |                      |                  |                          |
|--------------------------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No.                                                                | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                                  | 0.1672      | -51.26 PK               | 43.14          | -94.40      | 1.00               | 149                  | 65.08            | -116.34                  |
| 2                                                                  | 0.1672      | -51.97 AV               | 23.14          | -75.11      | 1.00               | 149                  | 64.37            | -116.34                  |
| 3                                                                  | *0.3330     | -47.07 PK               | 37.15          | -84.22      | 1.00               | 261                  | 69.02            | -116.09                  |
| 4                                                                  | *0.3330     | -47.98 AV               | 17.15          | -65.13      | 1.00               | 261                  | 68.11            | -116.09                  |
| 5                                                                  | 0.9989      | -49.87 QP               | 27.61          | -77.48      | 1.00               | 57                   | -14.16           | -35.71                   |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. “ \* “: Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. Test Result @300m= Emission Level @3m-40log(300 / 3)= Emission Level @3m-80
8. Test Result @30m= Emission Level @3m-40log(30 / 3)= Emission Level @3m-40

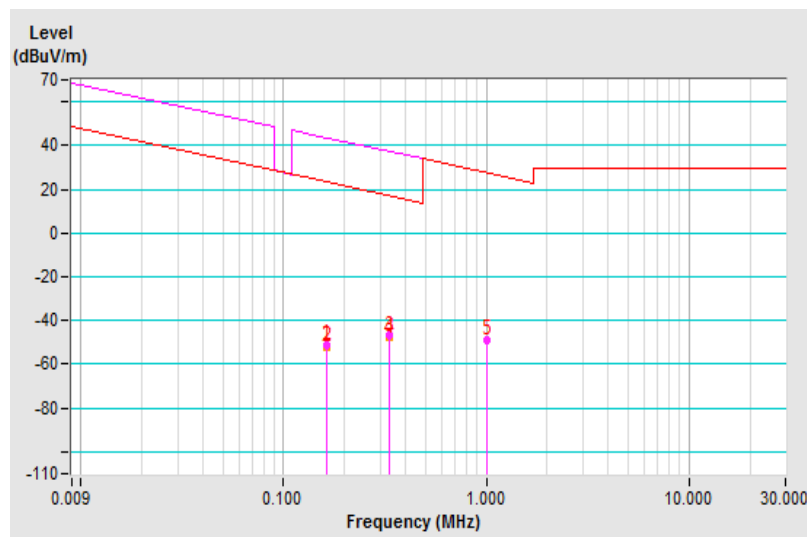


|                 |                |                   |                                 |
|-----------------|----------------|-------------------|---------------------------------|
| Test Frequency  | 333kHz         | Detector Function | Peak (PK)                       |
| Frequency Range | 9 kHz ~ 30 MHz |                   | Average (AV)<br>Quasi-Peak (QP) |

| Antenna Polarity & Test Distance: Loop Antenna Ground-parallel At 3m |             |                         |                |             |                    |                      |                  |                          |
|----------------------------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No.                                                                  | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                                    | 0.1629      | -51.04 PK               | 43.36          | -94.40      | 1.00               | 34                   | 65.31            | -116.35                  |
| 2                                                                    | 0.1629      | -51.97 AV               | 23.36          | -75.33      | 1.00               | 34                   | 64.38            | -116.35                  |
| 3                                                                    | *0.3330     | -46.84 PK               | 37.15          | -83.99      | 1.00               | 208                  | 69.25            | -116.09                  |
| 4                                                                    | *0.3330     | -47.72 AV               | 17.15          | -64.87      | 1.00               | 208                  | 68.37            | -116.09                  |
| 5                                                                    | 0.9993      | -48.95 QP               | 27.60          | -76.55      | 1.00               | 155                  | -13.24           | -35.71                   |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. “ \* “: Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. Test Result @300m= Emission Level @3m-40log(300 / 3)= Emission Level @3m-80
8. Test Result @30m= Emission Level @3m-40log(30 / 3)= Emission Level @3m-40



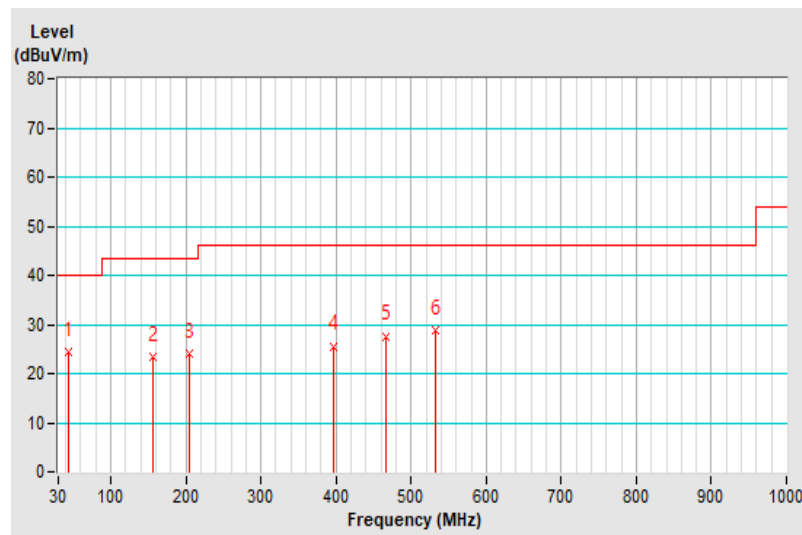
#### Below 1GHz Data:

|                 |               |                   |            |
|-----------------|---------------|-------------------|------------|
| Test Frequency  | 333kHz        | Detector Function | Quasi-Peak |
| Frequency Range | 30 MHz ~ 1GHz |                   |            |

| Antenna Polarity & Test Distance: Horizontal At 3m |             |                         |                |             |                    |                      |                  |                          |
|----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No.                                                | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                  | 43.24       | 24.29 QP                | 40.00          | -15.71      | 1.36 H             | 315                  | 31.80            | -7.51                    |
| 2                                                  | 155.81      | 23.25 QP                | 43.50          | -20.25      | 1.81 H             | 130                  | 29.84            | -6.59                    |
| 3                                                  | 205.47      | 23.97 QP                | 43.50          | -19.53      | 1.35 H             | 180                  | 33.08            | -9.11                    |
| 4                                                  | 396.71      | 25.36 QP                | 46.00          | -20.64      | 1.70 H             | 275                  | 27.73            | -2.37                    |
| 5                                                  | 466.84      | 27.39 QP                | 46.00          | -18.61      | 2.17 H             | 244                  | 27.86            | -0.47                    |
| 6                                                  | 533.14      | 28.67 QP                | 46.00          | -17.33      | 1.92 H             | 12                   | 28.19            | 0.48                     |

#### Remarks:

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

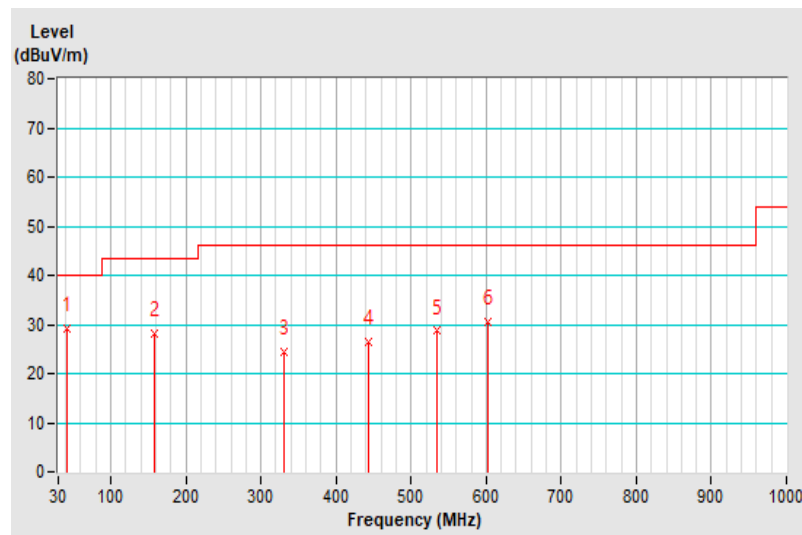


|                 |               |                   |            |
|-----------------|---------------|-------------------|------------|
| Test Frequency  | 333kHz        | Detector Function | Quasi-Peak |
| Frequency Range | 30 MHz ~ 1GHz |                   |            |

| Antenna Polarity & Test Distance: Vertical At 3m |             |                         |                |             |                    |                      |                  |                          |
|--------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No.                                              | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1                                                | 40.91       | 29.31 QP                | 40.00          | -10.69      | 1.53 V             | 47                   | 37.02            | -7.71                    |
| 2                                                | 157.26      | 28.06 QP                | 43.50          | -15.44      | 1.42 V             | 195                  | 34.53            | -6.47                    |
| 3                                                | 330.94      | 24.38 QP                | 46.00          | -21.62      | 1.89 V             | 313                  | 27.71            | -3.33                    |
| 4                                                | 444.04      | 26.50 QP                | 46.00          | -19.50      | 1.64 V             | 318                  | 27.47            | -0.97                    |
| 5                                                | 533.77      | 28.71 QP                | 46.00          | -17.29      | 1.08 V             | 313                  | 28.23            | 0.48                     |
| 6                                                | 602.45      | 30.65 QP                | 46.00          | -15.35      | 1.97 V             | 40                   | 28.35            | 2.30                     |

Remarks:

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



## 5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

## Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

### **Lin Kou EMC/RF Lab**

Tel: 886-2-26052180

Fax: 886-2-26051924

### **Hsin Chu EMC/RF/Telecom Lab**

Tel: 886-3-6668565

Fax: 886-3-6668323

### **Hwa Ya EMC/RF/Safety Lab**

Tel: 886-3-3183232

Fax: 886-3-3270892

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

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

The address and road map of all our labs can be found in our web site also.

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