

# TEST REPORT



**DT&C Co., Ltd.**

42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042  
Tel : 031-321-2664, Fax : 031-321-1664

1. Report No. : DREFCC2106-0104
2. Client / Applicant
  - Name : The Whistler Group, Inc.
  - Address : 168 Ayer Road, Littleton, MA 01460, USA
3. Use of Report : Class II Permissive Change
4. Product Name / Model Name : 200CH Deskto Radio Scanner With FM Radio / WS1025  
(FCC ID / IC : HSXSC02 / 1698A-SC02)
5. Test Standard : ANSI C63.4 : 2014  
FCC Part 15 Subpart B  
(CSR - Scanning Receiver)  
RSS-215 Issue 2
6. Date of Test : Apr. 29. 2021
7. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing
8. Testing Environment : Temperature (21 ~ 24) °C , Humidity (38 ~ 40) % R.H.
9. Test Result : Refer to the attached Test Result

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
This test report is not related to KOLAS accreditation.

|             |                                                                                                        |                                                                                                             |
|-------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Affirmation | Tested by                                                                                              | Reviewed by                                                                                                 |
|             | Name : JunSeo Park  | Name : KyoungHwan Bae  |

**Jun. 11. 2021**

**DT&C Co., Ltd.**

If this report is required to confirmation of authenticity, please contact to [report@dtnc.net](mailto:report@dtnc.net)

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## 1. General Remarks

This report contains the result of tests performed by :

### DT&C Co., Ltd.

42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042

<http://www.dtnet.net>

Tel: +82-31-321-2664 Fax: +82-31-321-1664

## 2. Test Laboratory

DT&C Co., Ltd. has been accredited / filed / authorized by the agencies listed in the following table;

| Certificate   | Nation       | Agency | Code                                                                                                  | Remark        |
|---------------|--------------|--------|-------------------------------------------------------------------------------------------------------|---------------|
| Accreditation | Korea        | KOLAS  | 393                                                                                                   | ISO/IEC 17025 |
|               | South Africa | SABS   | 0006                                                                                                  | ISO/IEC 17025 |
|               | Ghana        | NCA    | NCA agreement<br>23rd,Oct,2018                                                                        | -             |
|               | USA          | FCC    | KR0034                                                                                                | Designation   |
|               | Canada       | IC     | KR0034                                                                                                | Designation   |
| Site Filing   | Japan        | VCCI   | C-1427,<br>R-3385, R-14076,<br>R-14180, R-14496,<br>T-11442,<br>G-10338, G-10754,<br>G-10815, G-20051 | Registered    |
| Certification | Korea        | KC     | KR0034                                                                                                | Designation   |
|               | Germany      | TUV    | CARAT 089112<br>0008 Rev.00                                                                           | ISO/IEC 17025 |
|               | Russia       | RMRS   | 17.10189.296                                                                                          | ISO/IEC 17025 |

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competent of calibration and testing laboratory".

### 3. General Information of EUT

|                               |                                                                                                                        |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Applicant                     | The Whistler Group, Inc.<br>168 Ayer Road, Littleton, MA 01460, USA                                                    |
| Manufacturer                  | RDX, Inc<br>1106 Daeryung Techno Twon 8, 96 Gamasanro, Guemcheon-gu,<br>Seoul, Korea                                   |
| Factory                       | Radix Telecom Phils., Industries Inc.<br>Sunpino BLDG, Block 6 Lot 10, Phase II CEZ Rosario Cabite 4106<br>Philippines |
| Product Name                  | 200CH Deskto Radio Scanner With FM Radio                                                                               |
| Model Name (FCC, IC)          | WS1025                                                                                                                 |
| Add Model Name (FCC)          | PRO-650                                                                                                                |
| Add Model Name (IC)           | None                                                                                                                   |
| PMN(IC)                       | WS1025                                                                                                                 |
| Add Model Difference          | Case color Difference                                                                                                  |
| H/W version                   | None                                                                                                                   |
| S/W version                   | None                                                                                                                   |
| Maximum<br>Internal Frequency | 501.3 MHz                                                                                                              |
| Rated Power                   | 100-240 V, 50/60 Hz                                                                                                    |
| FCC ID                        | HSXSC02                                                                                                                |
| IC                            | 1698A-SC02                                                                                                             |
| Remarks                       | None                                                                                                                   |

**Related Submittal(s) / Grant(s)**  
**Original submittal only**

## 4. EUT Operations and Test Configurations

### 4.1 Principle of Configuration Selection

**Emission :**

The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use. For each testing mode different configurations were used, Refer to the individual tests.

### 4.2 EUT Operation Mode

| No. | Mode  | Description                                                                                    |
|-----|-------|------------------------------------------------------------------------------------------------|
| 1   | SCAN  | The EUT was set to constantly scan all bands.                                                  |
| 2   | PC/IF | The EUT was set to connect PC/IF cable to the scanning receiver for receiving data and status. |

### 4.3 Test Configuration Mode

| No. | Mode  | Description                                                                             |
|-----|-------|-----------------------------------------------------------------------------------------|
| 1   | SCAN  | EUT is connected Ear mic<br>EUT is connected AC adaptor                                 |
| 2   | PC/IF | EUT is connected Ear mic<br>EUT is connected PC/IF Cable<br>EUT is connected AC adaptor |

#### 4.4 Supported Equipment

| Used*                                                                         | Product Type | Manufacturer | Model | Remarks |
|-------------------------------------------------------------------------------|--------------|--------------|-------|---------|
| AE                                                                            | Ear mic      | N/A          | N/A   | N/A     |
| *Abbreviations:<br>AE - Auxiliary/Associated Equipment, or<br>SIM - Simulator |              |              |       |         |

#### 4.5 EUT In/Output Port

| Name                                                                                                                                                         | Type* | Cable<br>Max. >3 m | Cable<br>Shielded | Cable<br>Back shell | Remarks |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------|-------------------|---------------------|---------|
| AUDIO                                                                                                                                                        | I/O   | 1.5                | Non shield        | Plastic             | N/A     |
| PC/IF                                                                                                                                                        | I/O   | 1.5                | Shield            | Plastic             | N/A     |
| ANT                                                                                                                                                          | I/O   | -                  | Shield            | Plastic             | N/A     |
| ANT                                                                                                                                                          | I/O   | -                  | Shield            | Plastic             | N/A     |
| *Abbreviations:<br>AC = AC Power Port      DC = DC Power Port      N/E = Non-Electrical<br>I/O = Signal Input or Output Port<br>TP = Telecommunication Ports |       |                    |                   |                     |         |

#### 4.6 Test Voltage and Frequency

| Case | Voltage<br>(V) | Frequency<br>(Hz) | Phases | Remarks |
|------|----------------|-------------------|--------|---------|
| 1    | AC 120         | 60                | Single | None    |

## 5. Test Summary

| Test Items                                                         | Applied Standards                    | Results | U (k = 2)                                      |
|--------------------------------------------------------------------|--------------------------------------|---------|------------------------------------------------|
| Conducted Disturbance                                              | ANSI C63.4 : 2014<br>RSS-215 Issue 2 | C       | Mains : 3.4 dB                                 |
| Radiated Disturbance                                               | ANSI C63.4 : 2014<br>RSS-215 Issue 2 | C       | Below 1 GHz : 4.64 dB<br>Above 1 GHz : 6.42 dB |
| Antenna Power Conduction                                           | ANSI C63.4 : 2014                    | C       | -                                              |
| C=Comply    N/C=Not Comply    N/T=Not Tested    N/A=Not Applicable |                                      |         |                                                |

The data in this test report are traceable to the national or international standards.

-Conducted Disturbance

| Frequency [MHz] | Phase | Result [dB $\mu$ V] | Detector        | Limit [dB $\mu$ V] | Margin [dB] |
|-----------------|-------|---------------------|-----------------|--------------------|-------------|
| 0.42718         | N     | 35.41               | Cispr - Average | 47.31              | 11.90       |

-Radiated Disturbance

| Frequency [MHz] | Pol. | Result [dB $\mu$ V/m] | Detector     | Limit [dB $\mu$ V/m] | Margin [dB] |
|-----------------|------|-----------------------|--------------|----------------------|-------------|
| 128.002         | V    | 27.75                 | Quasi - Peak | 43.50                | 15.75       |

- Antenna Power Conduction

| Frequency [MHz] | Result [dB $\mu$ V/m] | Detector     | Limit [dB $\mu$ V/m] | Margin [dB] |
|-----------------|-----------------------|--------------|----------------------|-------------|
| 952.470         | 28.50                 | Quasi - Peak | 51.70                | 19.51       |

## 6. Test Environment

| Test Items               | Test date (YYYY-MM-DD) | Temp. (°C) | Humidity (% R.H.) | Pressure (kPa) |
|--------------------------|------------------------|------------|-------------------|----------------|
| Conducted Disturbance    | 2021-04-29             | 24         | 38                | 100.2          |
| Radiated Disturbance     | 2021-04-29             | 23         | 40                | -              |
| Antenna Power Conduction | 2021-04-29             | 21         | 40                | 100.2          |

## 7. Test Results : Emission

### 7.1 Conducted Disturbance

| ANSI C63.4,<br>RSS-215 Issue 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Mains terminal disturbance voltage   |                   | Result |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------|--------|--|
| <u>Method:</u> The AMN placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0,8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN. The measuring port of the LISN for EUT was connected to spectrum analyzer. Using conducted emission test software, the emissions were scanned with peak detector mode. After scanning over the frequency range, suspected emissions were selected to perform final measurement. When performing final measurement, the receiver was used which has Quasi-Peak detector and CISPR Average detector. For (0.15 ~ 30) MHz frequency range, Quasi-Peak detector with 10 kHz RBW and 30 kHz VBW was used. By varying the configuration of the test sample and the cable routing it was attempted to maximize the emission. |                                      |                   | Comply |  |
| Fully configured sample scanned over the following frequency range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Frequency range on each side of line | Measurement Point |        |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 150 kHz to 30 MHz                    | Mains             |        |  |
| EUT mode<br>(Refer to clauses 4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Test configuration mode              | 1, 2              |        |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | EUT Operation mode                   | 1, 2              |        |  |
| Limits – Class A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                   |        |  |
| Frequency (MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Limit dBµV                           |                   |        |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Quasi-Peak                           | Average           |        |  |
| 0.15 to 0.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 79                                   | 66                |        |  |
| 0.50 to 30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 73                                   | 60                |        |  |
| Limits – Class B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                   |        |  |
| Frequency (MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Limit dBµV                           |                   |        |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Quasi-Peak                           | Average           |        |  |
| 0.15 to 0.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 66 to 56                             | 56 to 46          |        |  |
| 0.50 to 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 56                                   | 46                |        |  |
| 5 to 30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 60                                   | 50                |        |  |

| Measurement Instrument |                      |               |            |            |            |
|------------------------|----------------------|---------------|------------|------------|------------|
| Description            | Model                | Manufacturer  | Identifier | Cal. Date  | Cal. Due   |
| MEASUREMENT SOFTWARE   | EMI-C VER. 2.00.0171 | TSJ           | N/A        | N/A        | N/A        |
| EMI TEST RECEIVER      | ESR7                 | ROHDE&SCHWARZ | 101061     | 2021-01-28 | 2022-01-28 |
| TRANSIENT LIMITER      | TL-B0930A            | EMCIS         | 11002      | 2020-08-31 | 2021-08-31 |
| TWO-LINE V-NETWORK     | ENV216               | ROHDE&SCHWARZ | 101979     | 2020-12-04 | 2021-12-04 |
| LISN                   | LISN1600             | TTI           | 197204     | 2020-06-03 | 2021-06-03 |
| TERMINATION            | CT-01                | TME           | N/A        | 2020-12-14 | 2021-12-14 |

### Calculation

|                                                                                |
|--------------------------------------------------------------------------------|
| N : Neutral phase, L1 : Live phase                                             |
| C.FACTOR(dB) : Pulse Limiter(dB) + Cable loss(dB) + Insertion loss of LISN(dB) |
| Result(dBμV) : Reading Value(dBμV) + C.FACTOR(dB)                              |
| Margin(dB) : Limit(dBμV) - Result(dBμV)                                        |

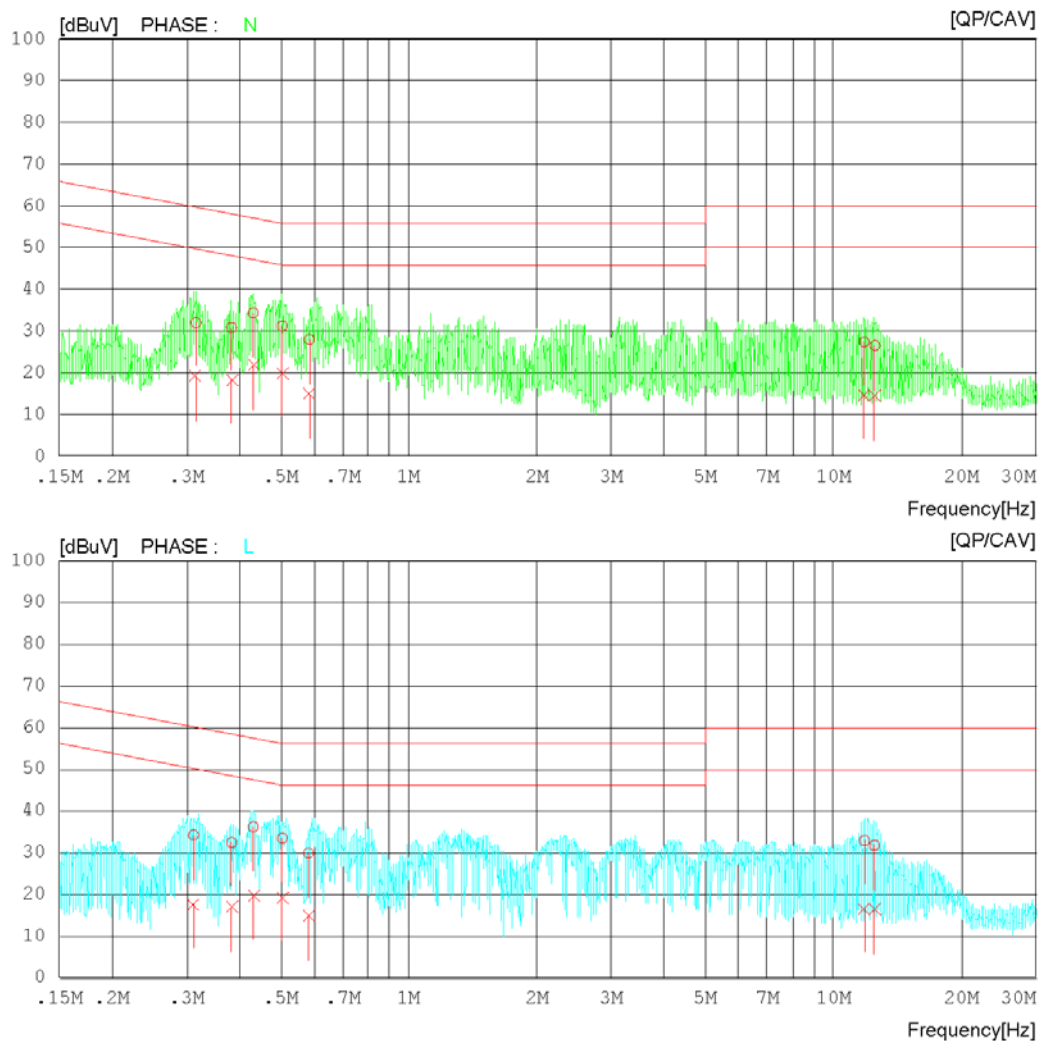
| Mains terminal disturbance voltage _ Measurement data |        |                     |    |
|-------------------------------------------------------|--------|---------------------|----|
| Test configuration mode                               | 1      | EUT Operation mode  | 1  |
| Test voltage (V)                                      | AC 120 | Test Frequency (Hz) | 60 |

## Results of Conducted Emission

DT&C  
Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi/Atm 24 °C 38 % R.H. 100.2 kPa  
Test Condition SCAN

Memo

LIMIT : CLASS B\_QP  
CLASS B\_AV


## Results of Conducted Emission

DT&C  
Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi/Atm 24 'C 38 % R.H. 100.2 kPa  
Test Condition SCAN

Memo

LIMIT : CLASS B\_QP  
CLASS B\_AV

| NO | FREQ<br>[MHz] | READING      |               | C.FACTOR<br>[dB] | RESULT       |               | LIMIT        |               | MARGIN       |               | PHASE |
|----|---------------|--------------|---------------|------------------|--------------|---------------|--------------|---------------|--------------|---------------|-------|
|    |               | QP<br>[dBuV] | CAV<br>[dBuV] |                  | QP<br>[dBuV] | CAV<br>[dBuV] | QP<br>[dBuV] | CAV<br>[dBuV] | QP<br>[dBuV] | CAV<br>[dBuV] |       |
| 1  | 0.31528       | 11.87        | -0.90         | 20.13            | 32.00        | 19.23         | 59.83        | 49.83         | 27.83        | 30.60         | N     |
| 2  | 0.38209       | 10.65        | -1.87         | 20.20            | 30.85        | 18.33         | 58.23        | 48.23         | 27.38        | 29.90         | N     |
| 3  | 0.43050       | 14.14        | 1.46          | 20.21            | 34.35        | 21.67         | 57.24        | 47.24         | 22.89        | 25.57         | N     |
| 4  | 0.50376       | 11.01        | -0.39         | 20.21            | 31.22        | 19.82         | 56.00        | 46.00         | 24.78        | 26.18         | N     |
| 5  | 0.58350       | 7.77         | -5.17         | 20.21            | 27.98        | 15.04         | 56.00        | 46.00         | 28.02        | 30.96         | N     |
| 6  | 11.82653      | 6.44         | -6.21         | 20.95            | 27.39        | 14.74         | 60.00        | 50.00         | 32.61        | 35.26         | N     |
| 7  | 12.54195      | 5.53         | -6.61         | 20.98            | 26.51        | 14.37         | 60.00        | 50.00         | 33.49        | 35.63         | N     |
| 8  | 0.31105       | 14.00        | -2.58         | 20.12            | 34.12        | 17.54         | 59.94        | 49.94         | 25.82        | 32.40         | L     |
| 9  | 0.38274       | 12.11        | -3.42         | 20.27            | 32.38        | 16.85         | 58.22        | 48.22         | 25.84        | 31.37         | L     |
| 10 | 0.43050       | 15.84        | -0.55         | 20.31            | 36.15        | 19.76         | 57.24        | 47.24         | 21.09        | 27.48         | L     |
| 11 | 0.50436       | 13.02        | -1.15         | 20.31            | 33.33        | 19.16         | 56.00        | 46.00         | 22.67        | 26.84         | L     |
| 12 | 0.58126       | 9.61         | -5.63         | 20.23            | 29.84        | 14.60         | 56.00        | 46.00         | 26.16        | 31.40         | L     |
| 13 | 11.86155      | 11.83        | -4.41         | 20.95            | 32.78        | 16.54         | 60.00        | 50.00         | 27.22        | 33.46         | L     |
| 14 | 12.49824      | 10.65        | -4.79         | 20.98            | 31.63        | 16.19         | 60.00        | 50.00         | 28.37        | 33.81         | L     |

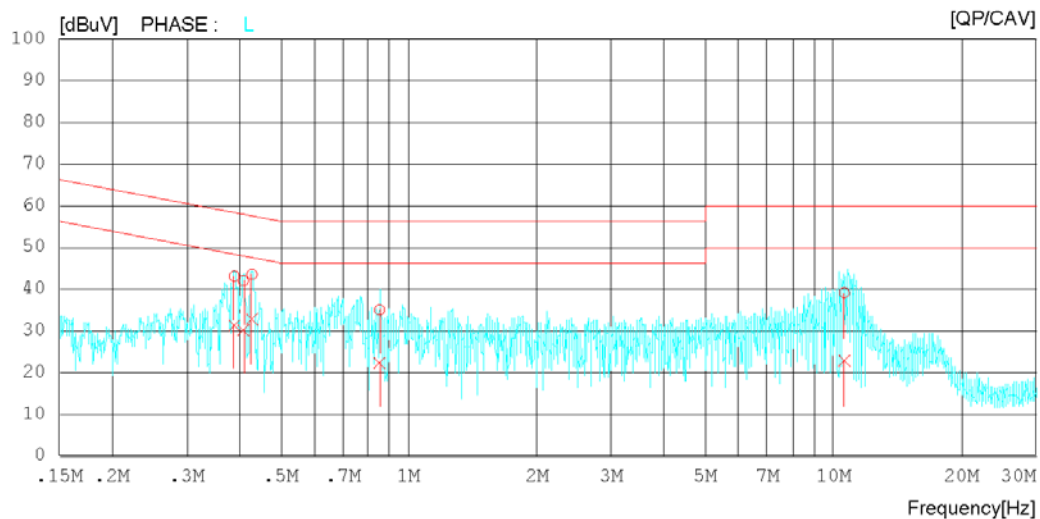
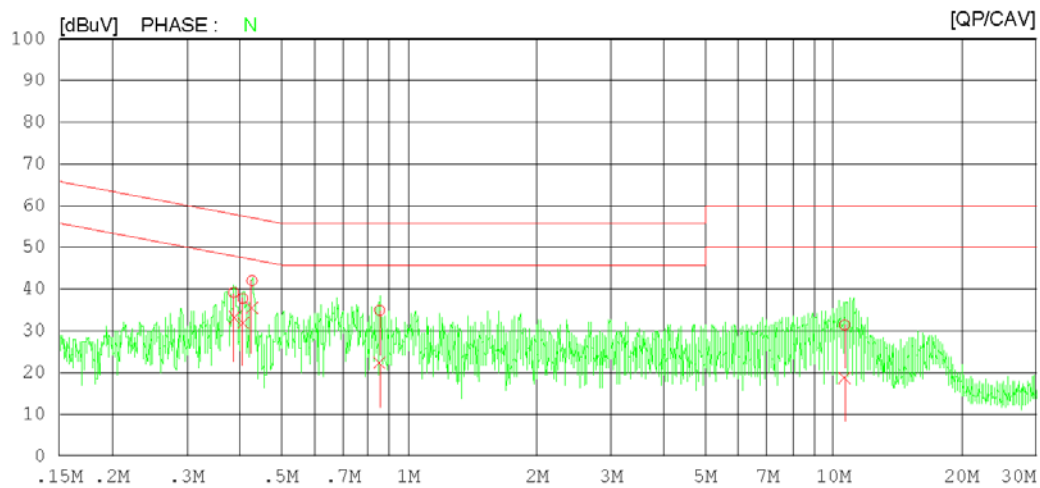
| Mains terminal disturbance voltage _ Measurement data |        |                     |    |
|-------------------------------------------------------|--------|---------------------|----|
| Test configuration mode                               | 2      | EUT Operation mode  | 2  |
| Test voltage (V)                                      | AC 120 | Test Frequency (Hz) | 60 |

## Results of Conducted Emission

DT&C  
Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi/Atm 24 'C 38 % R.H. 100.2 kPa  
Test Condition PC/IF

Memo

LIMIT : CLASS B\_QP  
CLASS B\_AV


## Results of Conducted Emission

DT&C  
Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi/Atm 24 °C 38 % R.H. 100.2 kPa  
Test Condition PC/IF

Memo

LIMIT : CLASS B\_QP  
CLASS B\_AV

| NO | FREQ<br>[MHz] | READING      |               | C.FACTOR<br>[dB] | RESULT       |               | LIMIT        |               | MARGIN       |               | PHASE |
|----|---------------|--------------|---------------|------------------|--------------|---------------|--------------|---------------|--------------|---------------|-------|
|    |               | QP<br>[dBuV] | CAV<br>[dBuV] |                  | QP<br>[dBuV] | CAV<br>[dBuV] | QP<br>[dBuV] | CAV<br>[dBuV] | QP<br>[dBuV] | CAV<br>[dBuV] |       |
| 1  | 0.38674       | 19.02        | 13.00         | 20.20            | 39.22        | 33.20         | 58.13        | 48.13         | 18.91        | 14.93         | N     |
| 2  | 0.40653       | 17.60        | 11.83         | 20.20            | 37.80        | 32.03         | 57.72        | 47.72         | 19.92        | 15.69         | N     |
| 3  | 0.42718       | 21.86        | 15.20         | 20.21            | 42.07        | 35.41         | 57.31        | 47.31         | 15.24        | 11.90         | N     |
| 4  | 0.85350       | 14.88        | 2.31          | 20.12            | 35.00        | 22.43         | 56.00        | 46.00         | 21.00        | 23.57         | N     |
| 5  | 10.64212      | 10.51        | -2.03         | 20.90            | 31.41        | 18.87         | 60.00        | 50.00         | 28.59        | 31.13         | N     |
| 6  | 0.38841       | 22.65        | 10.90         | 20.28            | 42.93        | 31.18         | 58.10        | 48.10         | 15.17        | 16.92         | L     |
| 7  | 0.40780       | 21.56        | 9.95          | 20.30            | 41.86        | 30.25         | 57.69        | 47.69         | 15.83        | 17.44         | L     |
| 8  | 0.42693       | 23.09        | 12.24         | 20.31            | 43.40        | 32.55         | 57.31        | 47.31         | 13.91        | 14.76         | L     |
| 9  | 0.85366       | 14.73        | 2.06          | 20.17            | 34.90        | 22.23         | 56.00        | 46.00         | 21.10        | 23.77         | L     |
| 10 | 10.62735      | 18.03        | 1.79          | 20.90            | 38.93        | 22.69         | 60.00        | 50.00         | 21.07        | 27.31         | L     |

## 7.2 Radiated Disturbance

| ANSI C63.4,<br>RSS-215 Issue 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Radiated disturbance 30 MHz –30 GHz** |                      |                                                                                 | Result         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|----------------------|---------------------------------------------------------------------------------|----------------|
| <b>Method:</b> Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10 or 3 meter below 1GHz and 3 meter above 1GHz. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable. For final measurement below 1 GHz frequency range, Quasi-Peak detector with (RBW = 120 kHz Bandwidth) was used. For final measurement above 1 GHz frequency range, Peak detector with (RBW = 1 MHz Bandwidth) and CISPR Average detector with (RBW = 1 MHz Bandwidth) were used. |                                       |                      |                                                                                 | <b>Comply</b>  |
| <b>EUT mode</b><br><br><b>(Refer to clauses 4)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Test configuration mode</b>        |                      | <b>1, 2</b>                                                                     |                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>EUT Operation mode</b>             |                      | <b>1, 2</b>                                                                     |                |
| <b>Radiated Disturbance below 1 000 MHz</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                       |                      |                                                                                 |                |
| <b>Frequency range</b><br><br><b>(MHz)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Quasi-peak limit dBµV/m</b>        |                      |                                                                                 |                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Class A</b>                        |                      | <b>Class B</b>                                                                  |                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>3 m distance</b>                   | <b>10 m distance</b> | <b>3 m distance</b>                                                             |                |
| 30 to 88                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 49.1                                  | 39.1                 | 40                                                                              |                |
| 88 to 216                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 53.5                                  | 43.5                 | 43.5                                                                            |                |
| 216 to 960                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 56.4                                  | 46.4                 | 46                                                                              |                |
| 960 to 1 000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 59.5                                  | 49.5                 | 54                                                                              |                |
| According to 15.109(g), as an alternative to the radiated emission limit shown above, digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22 shown.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                       |                      |                                                                                 |                |
| <b>Frequency range</b><br><br><b>(MHz)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Quasi-peak limit dBµV/m</b>        |                      |                                                                                 |                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Class A (10 m distance)</b>        |                      | <b>Class B (10 m distance)</b>                                                  |                |
| 30 to 230                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 40                                    |                      | 30                                                                              |                |
| 230 to 1 000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 47                                    |                      | 37                                                                              |                |
| <b>Radiated Disturbance for above 1 000 MHz at a measurement distance of 3 m</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |                      |                                                                                 |                |
| <b>Frequency range</b><br><br><b>(GHz)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Peak limit dBµV/m</b>              |                      | <b>Average limit dBµV/m</b>                                                     |                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Class A</b>                        | <b>Class B</b>       | <b>Class A</b>                                                                  | <b>Class B</b> |
| 1 to 40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 80                                    | 74                   | 60                                                                              | 54             |
| <b>The test frequency range of Radiated Disturbance measurements are listed below.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                       |                      |                                                                                 |                |
| <b>Highest frequency generated or used in the device or on which the device operates or tunes (MHz)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       |                      | <b>Upper frequency of measurement range (MHz)</b>                               |                |
| Below 108                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                       |                      | 1 000                                                                           |                |
| 108 – 500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                       |                      | 2 000                                                                           |                |
| 500 – 1 000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                       |                      | 5 000                                                                           |                |
| Above 1 000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                       |                      | 5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower |                |

| Measurement Instrument                                                                             |                      |               |            |            |            |
|----------------------------------------------------------------------------------------------------|----------------------|---------------|------------|------------|------------|
| Description                                                                                        | Model                | Manufacturer  | Identifier | Cal. Date  | Cal. Due   |
| MEASUREMENT SOFTWARE                                                                               | EMI-R VER. 2.00.0177 | TSJ           | N/A        | N/A        | N/A        |
| EMI TEST RECEIVER                                                                                  | ESU40                | ROHDE&SCHWARZ | 100525     | 2020-12-14 | 2021-12-14 |
| TRILOG BROAD BAND ANTENNA                                                                          | VULB9160             | SCHWARZBECK   | 9160-3339  | 2020-10-05 | 2022-10-05 |
| 6 DB ATTENUATOR                                                                                    | 2708A                | HP            | 18403      | 2020-10-05 | 2022-10-05 |
| LOW NOISE PRE AMPLIFIER                                                                            | MLA-100K01-B01-26    | TSJ           | 1252741    | 2021-02-08 | 2022-02-08 |
| HORN ANTENNA                                                                                       | BBHA 9120D           | SCHWARZBECK   | 9120D-1828 | 2020-10-21 | 2021-10-21 |
| PRE AMPLIFIER                                                                                      | 8449B                | H.P           | 3008A00887 | 2020-08-31 | 2021-08-31 |
| (NOTE : THE MEASUREMENT ANTENNAS WERE CALIBRATED IN ACCORDANCE TO THE REQUIREMENTS OF C63.5-2017.) |                      |               |            |            |            |

### Calculation

|                                                                                                  |
|--------------------------------------------------------------------------------------------------|
| Result(dBuV/m) : Reading Value(dBuV) + Cable loss(dB) - Pre amplifier gain(dB) + Ant. Factor(dB) |
| Margin : Limit(dBuV/m) - Result(dBuV/m)                                                          |

| Radiated disturbance at (30 ~ 1000) MHz _Measurement data |        |                     |    |
|-----------------------------------------------------------|--------|---------------------|----|
| Test configuration mode                                   | 1      | EUT Operation mode  | 1  |
| Test voltage (V)                                          | AC 120 | Test Frequency (Hz) | 60 |
| FCC Part 15 Subpart B                                     |        |                     |    |

## RADIATED EMISSION

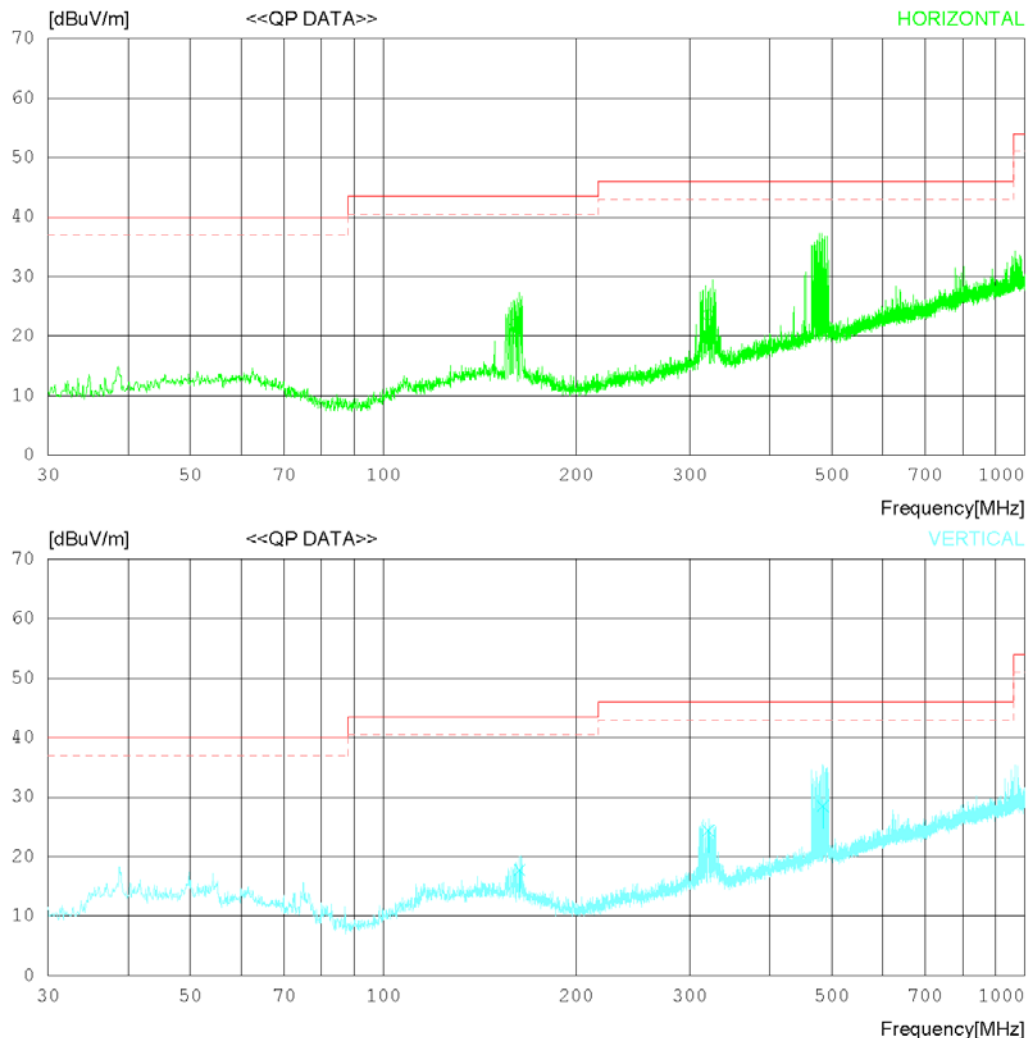
Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi 23 °C 40 % R.H.  
Test Condition SCAN

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m)  
MARGIN: 3 dB

Antenna Factor  
1. EMC-228\_VULB9160\_9160-3339\_with ATT\_18403\_2020.10.05  
Cable Loss  
1. #24\_C1\_ANT to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19  
2. #25\_C2\_Amp to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19  
3. #26\_C3\_Amp to Receiver\_3m\_창의\_9K-1G\_2021-02-19  
Pre Amp Gain  
1. EMC-110\_AMP\_MLA-100K01-B01-26\_1252741\_2021.02.08



## RADIATED EMISSION

Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi 23 °C 40 % R.H.  
Test Condition SCAN

Memo

LIMIT : FCC Part15 Subpart B Class B (3m)  
MARGIN: 3 dB

Antenna Factor

1. EMC-228\_VULB9160\_9160-3339\_with ATT\_18403\_2020.10.05

Cable Loss

1. #24\_C1\_ANT to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19

2. #25\_C2\_Amp to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19

3. #26\_C3\_Amp to Receiver\_3m\_창의\_9K-1G\_2021-02-19

Pre Amp Gain

1. EMC-110\_AMP\_MLA-100K01-B01-26\_1252741\_2021.02.08

| No.                    | FREQ<br>[MHz] | READING<br>QP<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|-------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- HORIZONTAL ----- |               |                         |                       |              |              |                    |                   |                |                 |                |
| 1                      | 160.442       | 28.20                   | 18.76                 | 1.72         | 26.73        | 21.95              | 43.50             | 21.55          | 113             | 78             |
| 2                      | 320.532       | 27.70                   | 19.81                 | 2.59         | 26.54        | 23.56              | 46.00             | 22.44          | 202             | 102            |
| 3                      | 486.677       | 24.60                   | 23.73                 | 3.23         | 26.32        | 25.24              | 46.00             | 20.76          | 332             | 0              |
| ----- VERTICAL -----   |               |                         |                       |              |              |                    |                   |                |                 |                |
| 4                      | 163.104       | 24.10                   | 18.70                 | 1.73         | 26.73        | 17.80              | 43.50             | 25.70          | 122             | 56             |
| 5                      | 321.182       | 28.50                   | 19.82                 | 2.60         | 26.53        | 24.39              | 46.00             | 21.61          | 202             | 135            |
| 6                      | 484.295       | 27.90                   | 23.70                 | 3.22         | 26.32        | 28.50              | 46.00             | 17.50          | 134             | 343            |

| Radiated disturbance at (30 ~ 1000) MHz _Measurement data |        |                     |    |
|-----------------------------------------------------------|--------|---------------------|----|
| Test configuration mode                                   | 1      | EUT Operation mode  | 1  |
| Test voltage (V)                                          | AC 120 | Test Frequency (Hz) | 60 |
| RSS-215 Issue 2                                           |        |                     |    |

## RADIATED EMISSION

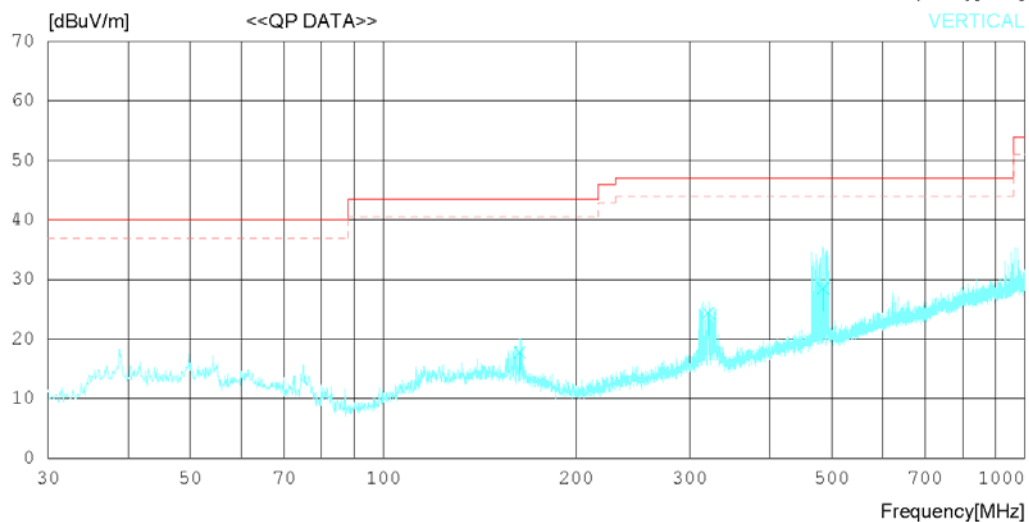
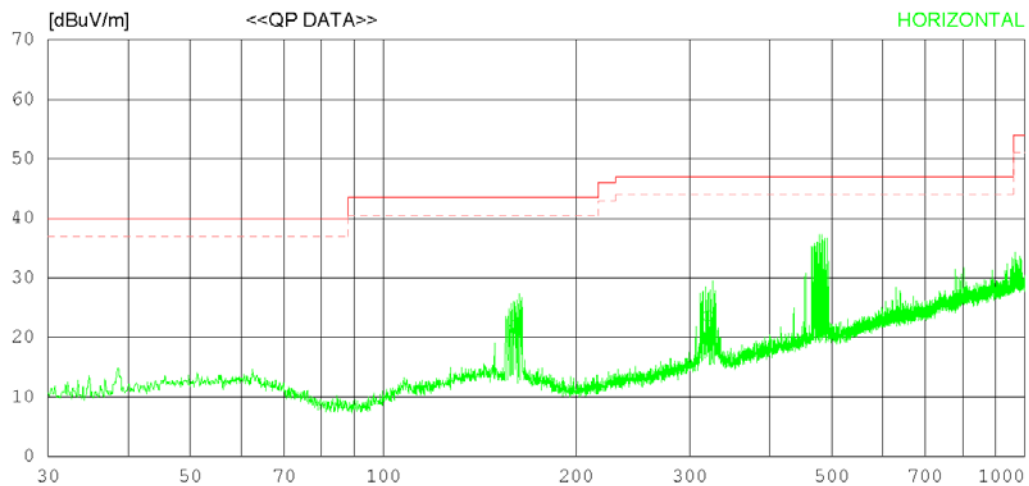
Date 2021-04-29

Order No. DTNC2104-02593  
Power Supply 120 V 60 Hz  
Temp/Humi 23 'C 40 % R.H.  
Test Condition SCAN

Memo

LIMIT : ICES-003 Issue 7 \_Class B  
MARGIN: 3 dB

Antenna Factor  
1. EMC-228\_VULB9160\_9160-3339\_with ATT\_18403\_2020.10.05  
Cable Loss  
1. #24\_C1\_ANT to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19  
2. #25\_C2\_Amp to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19  
3. #26\_C3\_Amp to Receiver\_3m\_창의\_9K-1G\_2021-02-19  
Pre Amp Gain  
1. EMC-110\_AMP\_MLA-100K01-B01-26\_1252741\_2021.02.08



## RADIATED EMISSION

Date 2021-04-29

Order No. DTNC2104-02593  
Power Supply 120 V 60 Hz  
Temp/Humi 23 °C 40 % R.H.  
Test Condition SCAN

Memo

LIMIT : ICES-003 Issue 7\_Class B  
MARGIN: 3 dB

Antenna Factor  
1. EMC-228\_VULB9160\_9160-3339\_with ATT\_18403\_2020.10.05  
Cable Loss  
1. #24\_C1\_ANT to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19  
2. #25\_C2\_Amp to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19  
3. #26\_C3\_Amp to Receiver\_3m\_창의\_9K-1G\_2021-02-19  
Pre Amp Gain  
1. EMC-110\_AMP\_MLA-100K01-B01-26\_1252741\_2021.02.08

| No.                    | FREQ<br>[MHz] | READING<br>QP<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|-------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- HORIZONTAL ----- |               |                         |                       |              |              |                    |                   |                |                 |                |
| 1                      | 160.442       | 28.20                   | 18.76                 | 1.72         | 26.73        | 21.95              | 43.50             | 21.55          | 113             | 78             |
| 2                      | 320.532       | 27.70                   | 19.81                 | 2.59         | 26.54        | 23.56              | 47.00             | 23.44          | 202             | 102            |
| 3                      | 486.677       | 24.60                   | 23.73                 | 3.23         | 26.32        | 25.24              | 47.00             | 21.76          | 332             | 0              |
| ----- VERTICAL -----   |               |                         |                       |              |              |                    |                   |                |                 |                |
| 4                      | 163.104       | 24.10                   | 18.70                 | 1.73         | 26.73        | 17.80              | 43.50             | 25.70          | 122             | 56             |
| 5                      | 321.182       | 28.50                   | 19.82                 | 2.60         | 26.53        | 24.39              | 47.00             | 22.61          | 202             | 135            |
| 6                      | 484.295       | 27.90                   | 23.70                 | 3.22         | 26.32        | 28.50              | 47.00             | 18.50          | 134             | 343            |

| Radiated disturbance at (1 ~ 6) GHz _Peak Measurement data |        |                     |    |
|------------------------------------------------------------|--------|---------------------|----|
| Test configuration mode                                    | 1      | EUT Operation mode  | 1  |
| Test voltage (V)                                           | AC 120 | Test Frequency (Hz) | 60 |

## RADIATED EMISSION

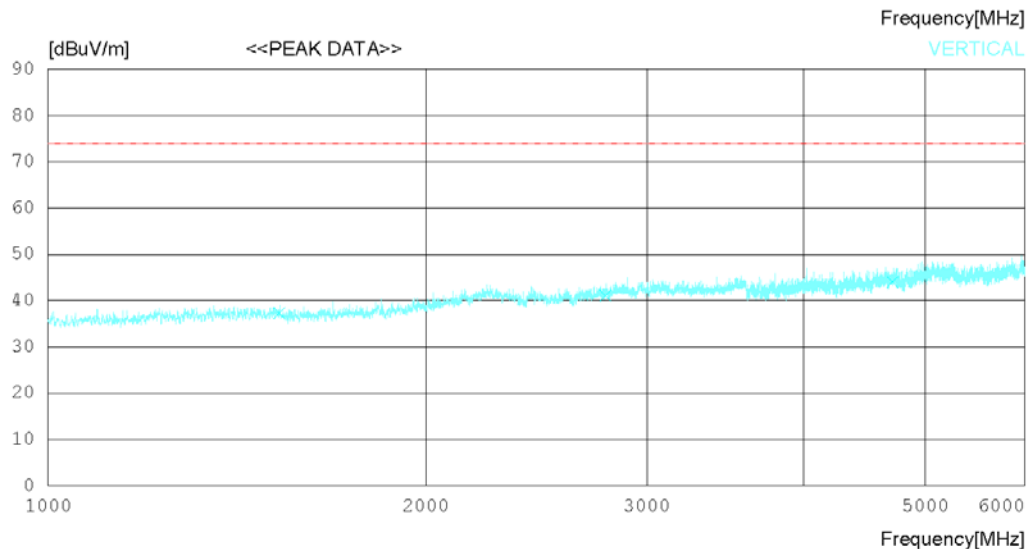
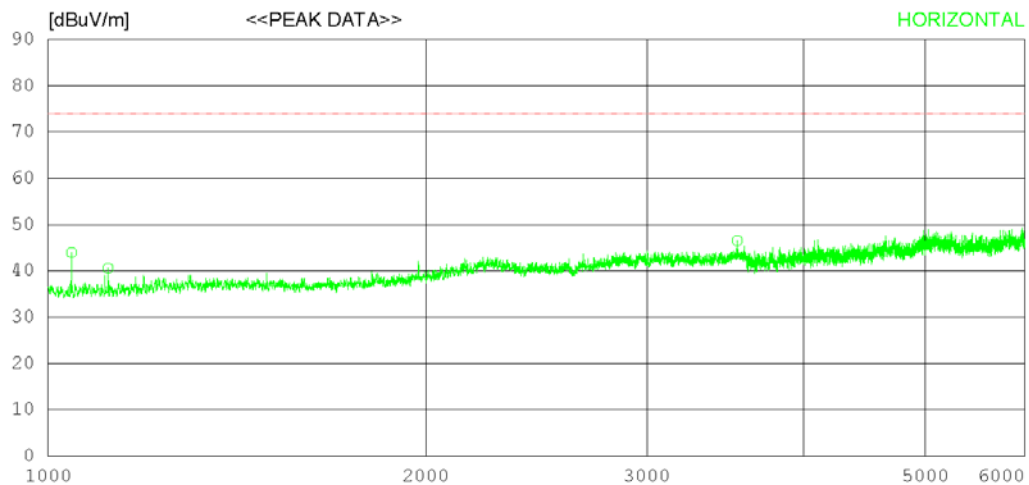
Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi 23 'C 40 % R.H.  
Test Condition Scan

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)  
FCC Part15 Subpart.B Class B (3m) - GHz(Peak)

Antenna Factor  
1. ANT\_9120D\_1828\_20.10.21  
Cable Loss  
1. #27\_C1\_Ant to Bottom\_3m\_창의\_1-18G\_2021.02.25  
2. #28\_C2\_Bottom to Amp(Filter,Receiver)\_3m\_창의\_1-18G\_2021.02.25  
3. #29\_C3\_Amp to Receiver\_3m\_창의\_1-18G\_2021.02.25  
Pre Amp Gain  
1. AMP\_8449B\_3008A00887\_2020.08.31



## RADIATED EMISSION

Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi 23 °C 40 % R.H.  
Test Condition Scan

### Memo

LIMIT : FCC Part15 Subpart B Class B (3m) - GHz(Peak)  
FCC Part15 Subpart B Class B (3m) - GHz(Peak)

### Antenna Factor

1. ANT\_9120D\_1828\_20.10.21

### Cable Loss

1. #27\_C1\_Ant to Bottom\_3m\_참의\_1-18G\_2021.02.25

2. #28\_C2\_Bottom to Amp(Filter,Receiver)\_3m\_참의\_1-18G\_2021.02.25

3. #29\_C3\_Amp to Receiver\_3m\_참의\_1-18G\_2021.02.25

### Pre Amp Gain

1. AMP\_8449B\_3008A00887\_2020.08.31

| No.                    | FREQ<br>[MHz] | READING<br>PEAK<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|---------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- HORIZONTAL ----- |               |                           |                       |              |              |                    |                   |                |                 |                |
| 1                      | 1043.750      | 51.30                     | 24.79                 | 4.01         | 36.15        | 43.95              | 74.0              | 30.05          | 123             | 126            |
| 2                      | 1116.250      | 47.70                     | 24.80                 | 4.18         | 36.07        | 40.61              | 74.0              | 33.39          | 305             | 358            |
| 3                      | 3540.625      | 44.60                     | 28.88                 | 7.99         | 34.93        | 46.54              | 74.0              | 27.46          | 121             | 28             |
| ----- VERTICAL -----   |               |                           |                       |              |              |                    |                   |                |                 |                |
| 4                      | 1528.750      | 42.50                     | 25.37                 | 5.05         | 35.62        | 37.30              | 74.0              | 36.7           | 113             | 165            |
| 5                      | 2780.625      | 40.80                     | 28.06                 | 7.33         | 35.18        | 41.01              | 74.0              | 32.99          | 230             | 0              |
| 6                      | 4710.000      | 38.10                     | 31.10                 | 9.80         | 34.98        | 44.02              | 74.0              | 29.98          | 305             | 169            |

| Radiated disturbance at (1 ~ 6) GHz _ Average Measurement data |        |                     |    |
|----------------------------------------------------------------|--------|---------------------|----|
| Test configuration mode                                        | 1      | EUT Operation mode  | 1  |
| Test voltage (V)                                               | AC 120 | Test Frequency (Hz) | 60 |

## RADIATED EMISSION

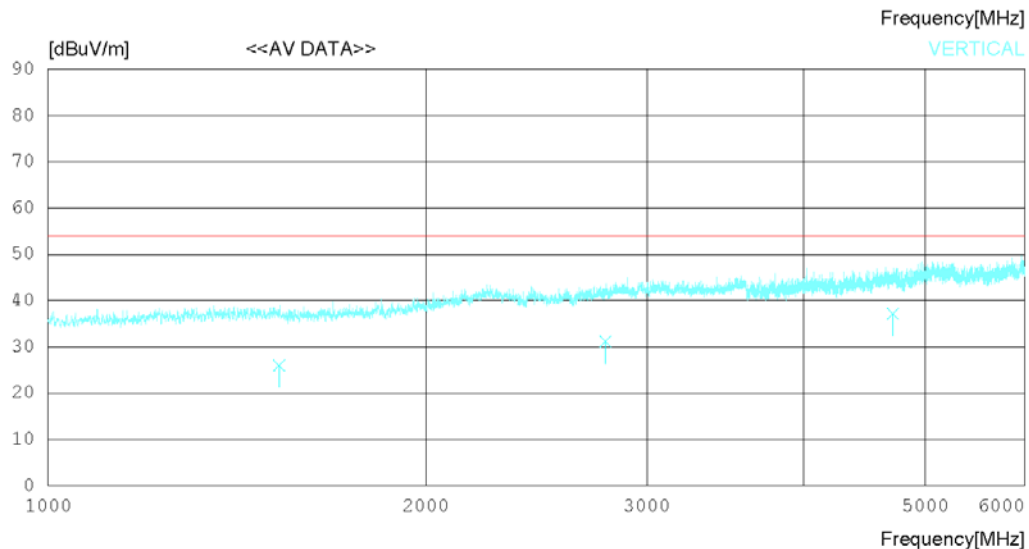
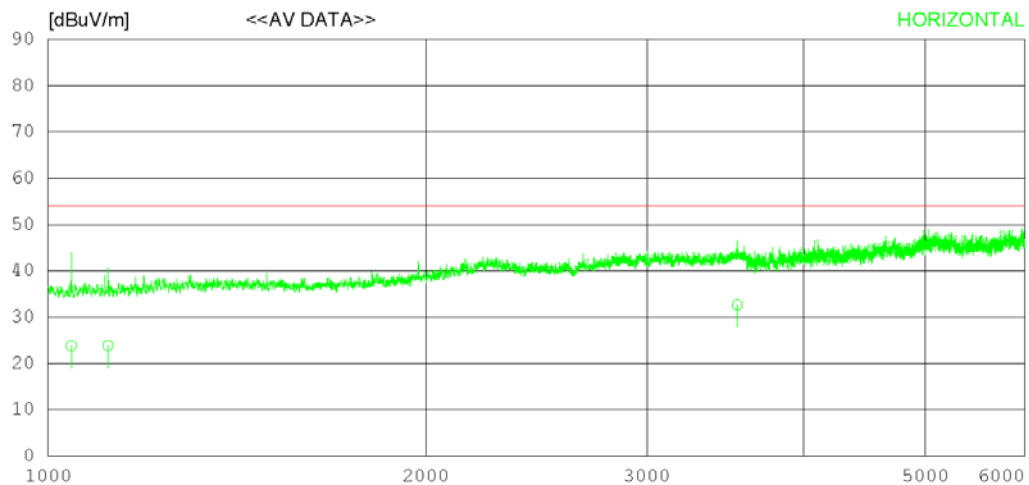
Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi 23 'C 40 % R.H.  
Test Condition Scan

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)  
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

Antenna Factor  
1. ANT\_9120D\_1828\_20.10.21  
Cable Loss  
1. #27\_C1\_Ant to Bottom\_3m\_창의\_1-18G\_2021.02.25  
2. #28\_C2\_Bottom to Amp(Filter,Receiver)\_3m\_창의\_1-18G\_2021.02.25  
3. #29\_C3\_Amp to Receiver\_3m\_창의\_1-18G\_2021.02.25  
Pre Amp Gain  
1. AMP\_8449B\_3008A00887\_2020.08.31



## RADIATED EMISSION

Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi 23 °C 40 % R.H.  
Test Condition Scan

Memo

LIMIT : FCC Part15 Subpart B Class B (3m) - GHz(Average)  
FCC Part15 Subpart B Class B (3m) - GHz(Average)

Antenna Factor

1. ANT\_9120D\_1828\_20.10.21

Cable Loss

1. #27\_C1\_Ant to Bottom\_3m\_창의\_1-18G\_2021.02.25

2. #28\_C2\_Bottom to Amp(Filter,Receiver)\_3m\_창의\_1-18G\_2021.02.25

3. #29\_C3\_Amp to Receiver\_3m\_창의\_1-18G\_2021.02.25

Pre Amp Gain

1. AMP\_8449B\_3008A00887\_2020.08.31

| No.                    | FREQ<br>[MHz] | READING<br>CAV<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|--------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- HORIZONTAL ----- |               |                          |                       |              |              |                    |                   |                |                 |                |
| 1                      | 1043.413      | 31.20                    | 24.79                 | 4.01         | 36.15        | 23.85              | 54.00             | 30.15          | 301             | 78             |
| 2                      | 1116.211      | 30.98                    | 24.80                 | 4.18         | 36.07        | 23.89              | 54.00             | 30.11          | 112             | 220            |
| 3                      | 3540.473      | 30.71                    | 28.88                 | 7.99         | 34.93        | 32.65              | 54.00             | 21.35          | 305             | 331            |
| ----- VERTICAL -----   |               |                          |                       |              |              |                    |                   |                |                 |                |
| 4                      | 1528.133      | 31.20                    | 25.37                 | 5.05         | 35.62        | 26.00              | 54.00             | 28.00          | 230             | 78             |
| 5                      | 2780.624      | 30.92                    | 28.06                 | 7.33         | 35.18        | 31.13              | 54.00             | 22.87          | 223             | 110            |
| 6                      | 4710.131      | 31.22                    | 31.10                 | 9.80         | 34.98        | 37.14              | 54.00             | 16.86          | 131             | 223            |

| Radiated disturbance at (30 ~ 1000) MHz _ Measurement data |        |                     |    |
|------------------------------------------------------------|--------|---------------------|----|
| Test configuration mode                                    | 2      | EUT Operation mode  | 2  |
| Test voltage (V)                                           | AC 120 | Test Frequency (Hz) | 60 |
| FCC Part 15 Subpart B                                      |        |                     |    |

## RADIATED EMISSION

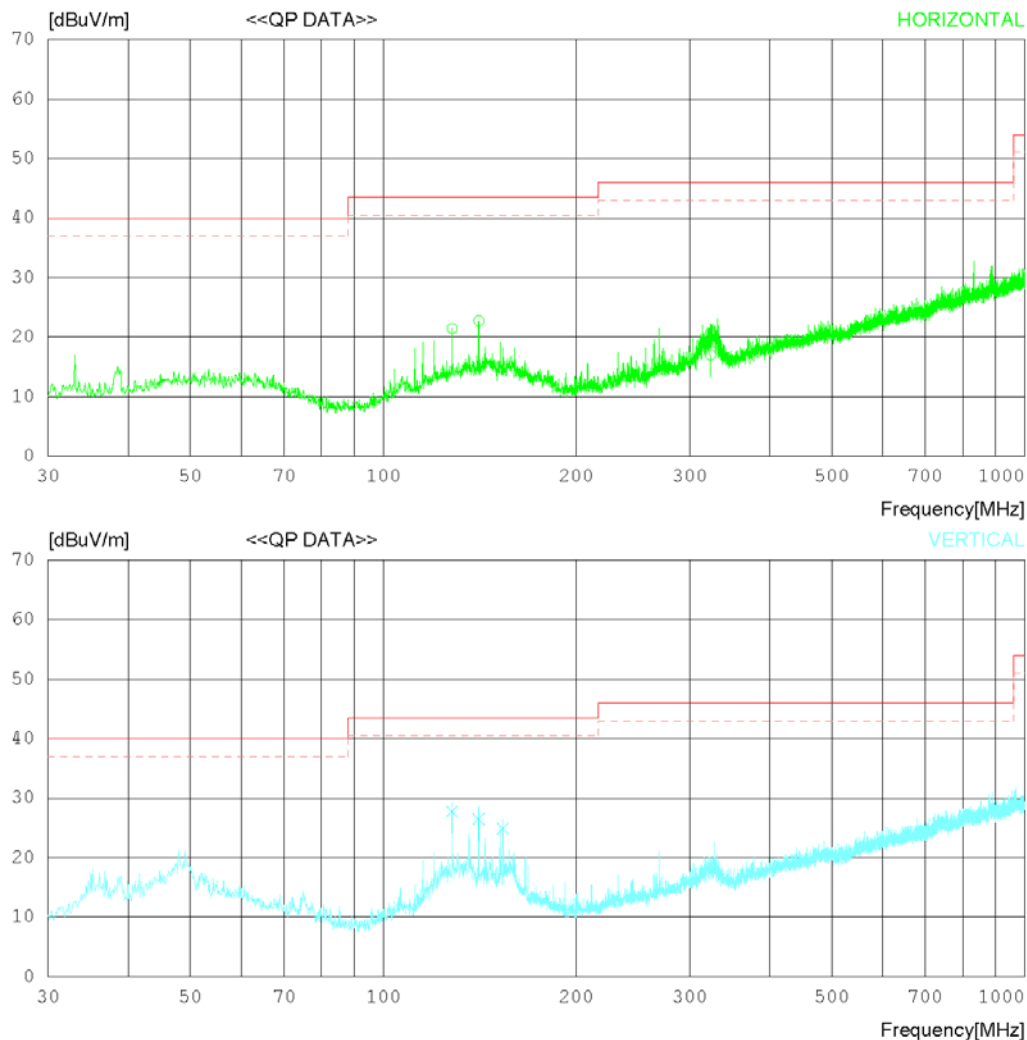
Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi 23 °C 40 % R.H.  
Test Condition PC/IF

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m)  
MARGIN: 3 dB

Antenna Factor  
1. EMC-228\_VULB9160\_9160-3339\_with ATT\_18403\_2020.10.05  
Cable Loss  
1. #24\_C1\_ANT to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19  
2. #25\_C2\_Amp to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19  
3. #26\_C3\_Amp to Receiver\_3m\_창의\_9K-1G\_2021-02-19  
Pre Amp Gain  
1. EMC-110\_AMP\_MLA-100K01-B01-26\_1252741\_2021.02.08



## RADIATED EMISSION

Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi 23 °C 40 % R.H.  
Test Condition PC/IF

Memo

LIMIT : FCC Part15 Subpart B Class B (3m)  
MARGIN: 3 dB

Antenna Factor

1. EMC-228\_VULB9160\_9160-3339\_with ATT\_18403\_2020.10.05  
Cable Loss

1. #24\_C1\_ANT to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19

2. #25\_C2\_Amp to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19

3. #26\_C3\_Amp to Receiver\_3m\_창의\_9K-1G\_2021-02-19

Pre Amp Gain

1. EMC-110\_AMP\_MLA-100K01-B01-26\_1252741\_2021.02.08

| No.                    | FREQ<br>[MHz] | READING<br>QP<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|-------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- HORIZONTAL ----- |               |                         |                       |              |              |                    |                   |                |                 |                |
| 1                      | 128.002       | 28.85                   | 17.90                 | 1.49         | 26.80        | 21.44              | 43.50             | 22.06          | 130             | 131            |
| 2                      | 140.797       | 29.00                   | 18.90                 | 1.59         | 26.77        | 22.72              | 43.50             | 20.78          | 118             | 79             |
| 3                      | 323.701       | 21.04                   | 19.87                 | 2.61         | 26.53        | 16.99              | 46.00             | 29.01          | 130             | 93             |
| ----- VERTICAL -----   |               |                         |                       |              |              |                    |                   |                |                 |                |
| 4                      | 128.002       | 35.16                   | 17.90                 | 1.49         | 26.80        | 27.75              | 43.50             | 15.75          | 105             | 81             |
| 5                      | 140.802       | 32.78                   | 18.90                 | 1.59         | 26.77        | 26.50              | 43.50             | 17.00          | 115             | 101            |
| 6                      | 153.598       | 31.09                   | 18.90                 | 1.67         | 26.75        | 24.91              | 43.50             | 18.59          | 123             | 154            |

| Radiated disturbance at (30 ~ 1000) MHz _Measurement data |        |                     |    |
|-----------------------------------------------------------|--------|---------------------|----|
| Test configuration mode                                   | 2      | EUT Operation mode  | 2  |
| Test voltage (V)                                          | AC 120 | Test Frequency (Hz) | 60 |
| RSS-215 Issue 2                                           |        |                     |    |

## RADIATED EMISSION

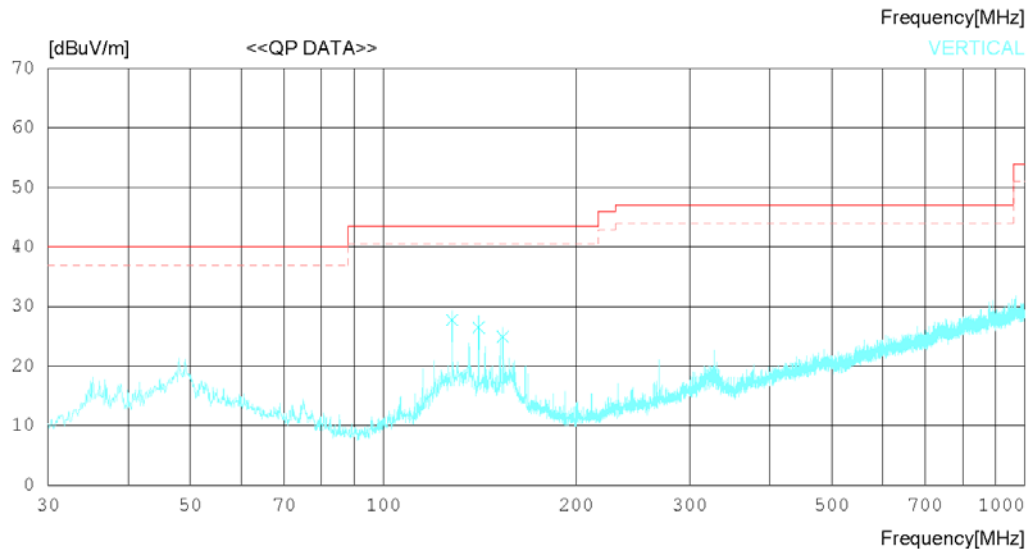
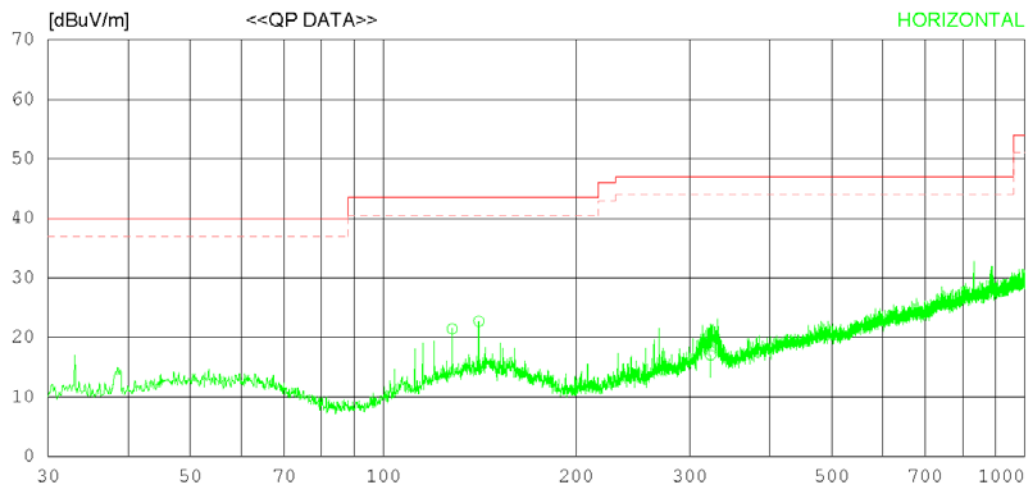
Date 2021-04-29

Order No. DTNC2104-02593  
Power Supply 120 V 60 Hz  
Temp/Humi 23 'C 40 % R.H.  
Test Condition PC/IF

Memo

LIMIT : ICES-003 Issue 7 \_Class B  
MARGIN: 3 dB

Antenna Factor  
1. EMC-228\_VULB9160\_9160-3339\_with ATT\_18403\_2020.10.05  
Cable Loss  
1. #24\_C1\_ANT to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19  
2. #25\_C2\_Amp to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19  
3. #26\_C3\_Amp to Receiver\_3m\_창의\_9K-1G\_2021-02-19  
Pre Amp Gain  
1. EMC-110\_AMP\_MLA-100K01-B01-26\_1252741\_2021.02.08



## RADIATED EMISSION

Date 2021-04-29

Order No. DTNC2104-02593  
Power Supply 120 V 60 Hz  
Temp/Humi 23 °C 40 % R.H.  
Test Condition PC/IF

Memo

LIMIT : ICES-003 Issue 7\_Class B  
MARGIN: 3 dB

Antenna Factor  
1. EMC-228\_VULB9160\_9160-3339\_with ATT\_18403\_2020.10.05  
Cable Loss  
1. #24\_C1\_ANT to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19  
2. #25\_C2\_Amp to BOTTOM\_3m\_창의\_9K-1G\_2021-02-19  
3. #26\_C3\_Amp to Receiver\_3m\_창의\_9K-1G\_2021-02-19  
Pre Amp Gain  
1. EMC-110\_AMP\_MLA-100K01-B01-26\_1252741\_2021.02.08

| No.                    | FREQ<br>[MHz] | READING<br>QP<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|-------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- HORIZONTAL ----- |               |                         |                       |              |              |                    |                   |                |                 |                |
| 1                      | 128.002       | 28.85                   | 17.90                 | 1.49         | 26.80        | 21.44              | 43.50             | 22.06          | 130             | 131            |
| 2                      | 140.797       | 29.00                   | 18.90                 | 1.59         | 26.77        | 22.72              | 43.50             | 20.78          | 118             | 79             |
| 3                      | 323.701       | 21.04                   | 19.87                 | 2.61         | 26.53        | 16.99              | 47.00             | 30.01          | 130             | 93             |
| ----- VERTICAL -----   |               |                         |                       |              |              |                    |                   |                |                 |                |
| 4                      | 128.002       | 35.16                   | 17.90                 | 1.49         | 26.80        | 27.75              | 43.50             | 15.75          | 105             | 81             |
| 5                      | 140.802       | 32.78                   | 18.90                 | 1.59         | 26.77        | 26.50              | 43.50             | 17.00          | 115             | 101            |
| 6                      | 153.598       | 31.09                   | 18.90                 | 1.67         | 26.75        | 24.91              | 43.50             | 18.59          | 123             | 154            |

| Radiated disturbance at (1 ~ 6) GHz _Peak Measurement data |        |                     |    |
|------------------------------------------------------------|--------|---------------------|----|
| Test configuration mode                                    | 2      | EUT Operation mode  | 2  |
| Test voltage (V)                                           | AC 120 | Test Frequency (Hz) | 60 |

## RADIATED EMISSION

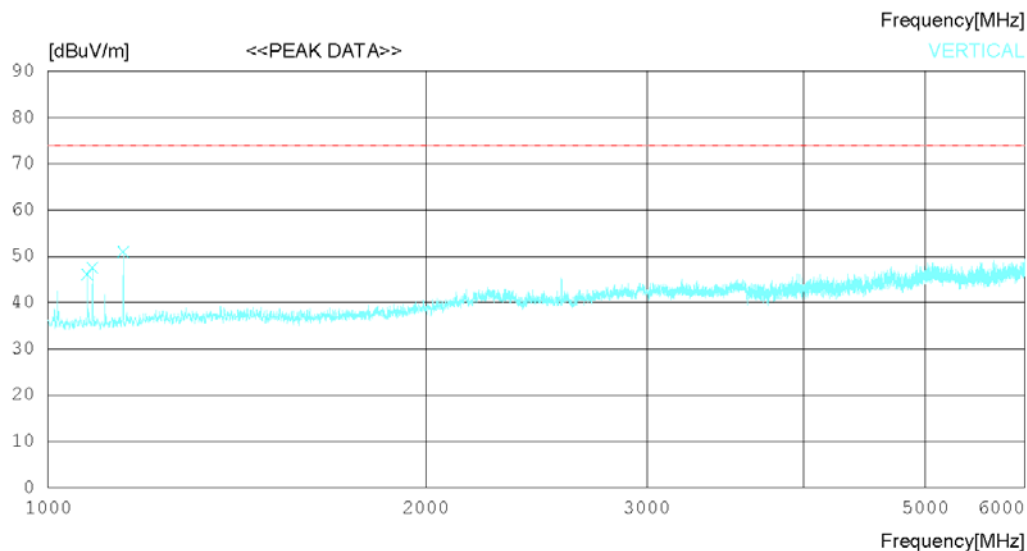
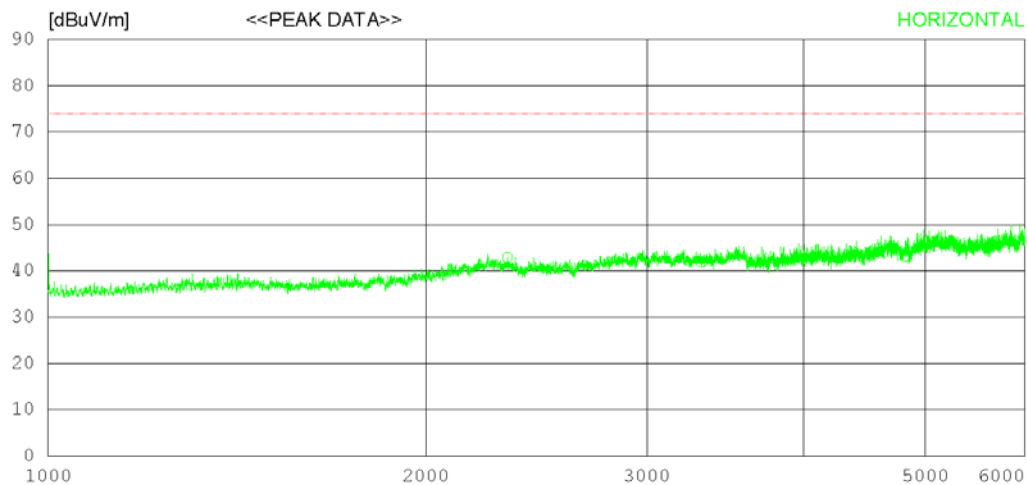
Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi 23 'C 40 % R.H.  
Test Condition PC/IF

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)  
FCC Part15 Subpart.B Class B (3m) - GHz(Peak)

Antenna Factor  
1. ANT\_9120D\_1828\_20.10.21  
Cable Loss  
1. #27\_C1\_Ant to Bottom\_3m\_창의\_1-18G\_2021.02.25  
2. #28\_C2\_Bottom to Amp(Filter,Receiver)\_3m\_창의\_1-18G\_2021.02.25  
3. #29\_C3\_Amp to Receiver\_3m\_창의\_1-18G\_2021.02.25  
Pre Amp Gain  
1. AMP\_8449B\_3008A00887\_2020.08.31



## RADIATED EMISSION

Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi 23 °C 40 % R.H.  
Test Condition PC/IF

### Memo

LIMIT : FCC Part15 Subpart B Class B (3m) - GHz(Peak)  
FCC Part15 Subpart B Class B (3m) - GHz(Peak)

### Antenna Factor

1. ANT\_9120D\_1828\_20.10.21

### Cable Loss

1. #27\_C1\_Ant to Bottom\_3m\_창의\_1-18G\_2021.02.25

2. #28\_C2\_Bottom to Amp(Filter,Receiver)\_3m\_창의\_1-18G\_2021.02.25

3. #29\_C3\_Amp to Receiver\_3m\_창의\_1-18G\_2021.02.25

### Pre Amp Gain

1. AMP\_8449B\_3008A00887\_2020.08.31

| No.                    | FREQ<br>[MHz] | READING<br>PEAK<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|---------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- HORIZONTAL ----- |               |                           |                       |              |              |                    |                   |                |                 |                |
| 1                      | 2322.500      | 43.80                     | 27.73                 | 6.54         | 35.13        | 42.94              | 74.0              | 31.06          | 321             | 230            |
| 2                      | 3315.625      | 40.90                     | 28.27                 | 7.73         | 35.04        | 41.86              | 74.0              | 32.14          | 128             | 130            |
| 3                      | 4820.625      | 37.40                     | 31.14                 | 9.73         | 35.03        | 43.24              | 74.0              | 30.76          | 223             | 33             |
| ----- VERTICAL -----   |               |                           |                       |              |              |                    |                   |                |                 |                |
| 4                      | 1075.000      | 53.30                     | 24.80                 | 4.08         | 36.12        | 46.06              | 74.0              | 27.94          | 375             | 158            |
| 5                      | 1085.000      | 54.80                     | 24.80                 | 4.10         | 36.11        | 47.59              | 74.0              | 26.41          | 350             | 158            |
| 6                      | 1148.125      | 58.00                     | 24.80                 | 4.25         | 36.04        | 51.01              | 74.0              | 22.99          | 100             | 158            |

| Radiated disturbance at (1 ~ 6) GHz _ Average Measurement data |        |                     |    |
|----------------------------------------------------------------|--------|---------------------|----|
| Test configuration mode                                        | 2      | EUT Operation mode  | 2  |
| Test voltage (V)                                               | AC 120 | Test Frequency (Hz) | 60 |

## RADIATED EMISSION

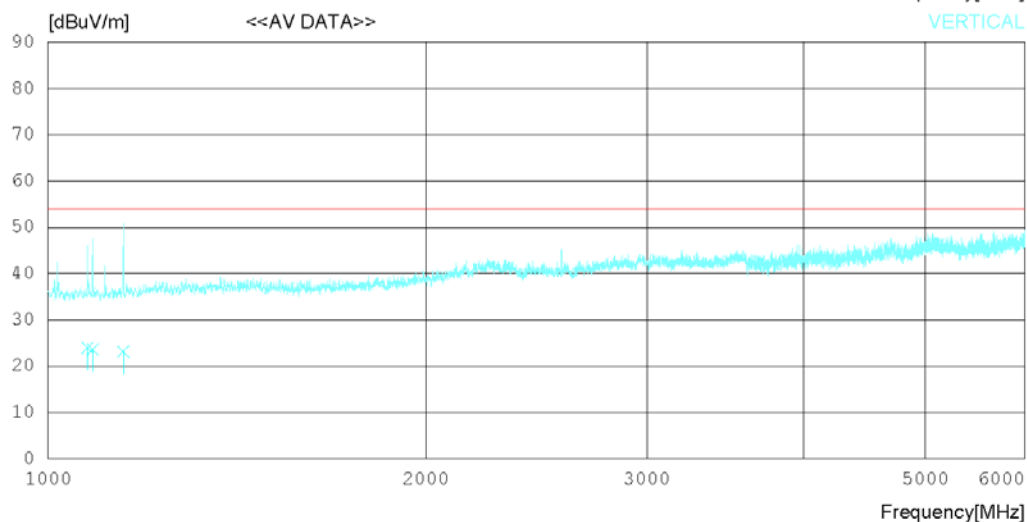
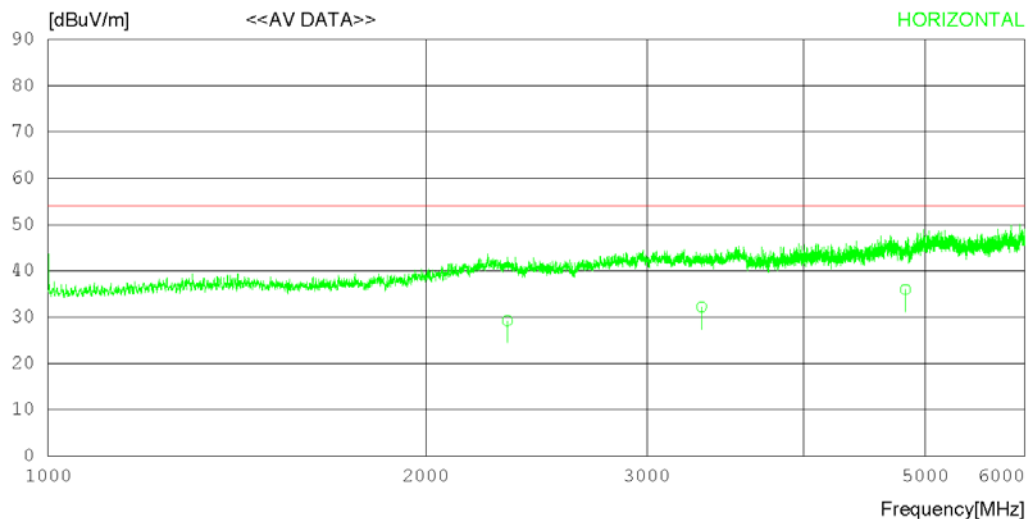
Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi 23 °C 40 % R.H.  
Test Condition PC/IF

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)  
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

Antenna Factor  
1. ANT\_9120D\_1828\_20.10.21  
Cable Loss  
1. #27\_C1\_Ant to Bottom\_3m\_창의\_1-18G\_2021.02.25  
2. #28\_C2\_Bottom to Amp(Filter,Receiver)\_3m\_창의\_1-18G\_2021.02.25  
3. #29\_C3\_Amp to Receiver\_3m\_창의\_1-18G\_2021.02.25  
Pre Amp Gain  
1. AMP\_8449B\_3008A00887\_2020.08.31



## RADIATED EMISSION

Date 2021-04-29

Order No. DTNC2104-02591  
Power Supply 120 V 60 Hz  
Temp/Humi 23 °C 40 % R.H.  
Test Condition PC/IF

### Memo

LIMIT : FCC Part15 Subpart B Class B (3m) - GHz(Average)  
FCC Part15 Subpart B Class B (3m) - GHz(Average)

### Antenna Factor

1. ANT\_9120D\_1828\_20.10.21

### Cable Loss

1. #27\_C1\_Ant to Bottom\_3m\_창의\_1-18G\_2021.02.25

2. #28\_C2\_Bottom to Amp(Filter,Receiver)\_3m\_창의\_1-18G\_2021.02.25

3. #29\_C3\_Amp to Receiver\_3m\_창의\_1-18G\_2021.02.25

### Pre Amp Gain

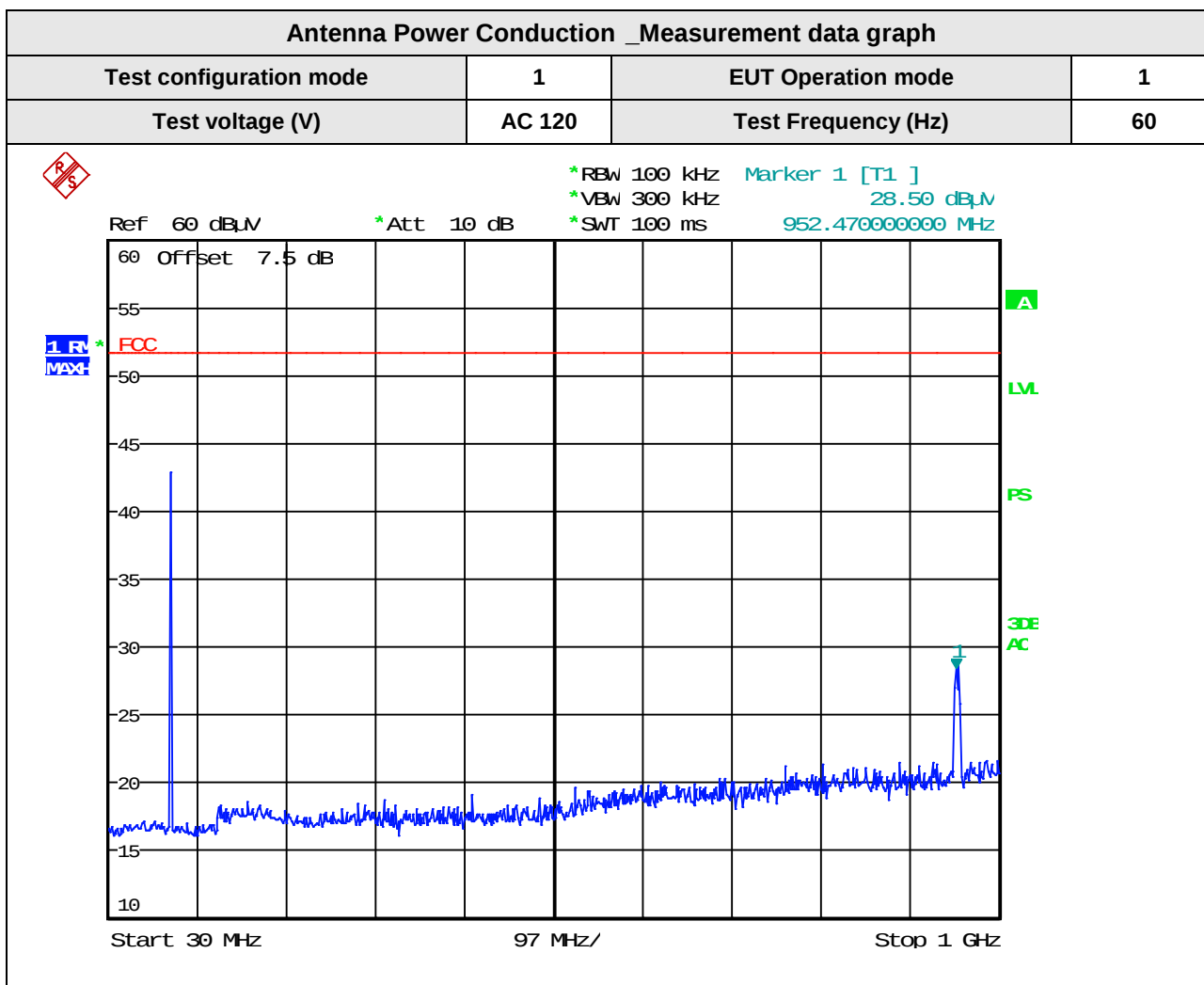
1. AMP\_8449B\_3008A00887\_2020.08.31

| No.                    | FREQ<br>[MHz] | READING<br>CAV<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|--------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- HORIZONTAL ----- |               |                          |                       |              |              |                    |                   |                |                 |                |
| 1                      | 2322.241      | 30.12                    | 27.73                 | 6.54         | 35.13        | 29.26              | 54.00             | 24.74          | 230             | 248            |
| 2                      | 3315.611      | 31.25                    | 28.27                 | 7.73         | 35.04        | 32.21              | 54.00             | 21.79          | 223             | 335            |
| 3                      | 4820.247      | 30.17                    | 31.14                 | 9.73         | 35.03        | 36.01              | 54.00             | 17.99          | 113             | 33             |
| ----- VERTICAL -----   |               |                          |                       |              |              |                    |                   |                |                 |                |
| 4                      | 1075.210      | 31.22                    | 24.80                 | 4.08         | 36.12        | 23.98              | 54.00             | 30.02          | 202             | 78             |
| 5                      | 1085.067      | 30.82                    | 24.80                 | 4.10         | 36.11        | 23.61              | 54.00             | 30.39          | 223             | 102            |
| 6                      | 1148.344      | 30.11                    | 24.80                 | 4.25         | 36.04        | 23.12              | 54.00             | 30.88          | 122             | 305            |

### 7.3 Antenna Power Conduction

| ANSI C63.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Antenna power conduction                                      |                                                                | Result |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------|--------|
| <u>Method:</u> Power on the receive antenna terminals was to be determined by measurement of the voltage present at these terminals. Antenna conducted power measurements was performed with the EUT antenna terminals connected directly to measuring instrument using a impedance-Matching network to connect the measurement Instrument to the antenna terminals of the EUT. The losses in decibels in impedance-matching network and cables was added to the measured values in dBµV. The measurements were repeated with the receiver tuned to a frequency until all of frequencies had been successively measured. Power in the receive antenna terminals in the ratio of V <sup>2</sup> /R, where V is the loss-corrected voltage measured at the antenna terminals, and R is the impedance of the measuring instrument |                                                               |                                                                | Comply |
| Fully configured sample scanned over the following frequency range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Frequency range on each side of line                          | Limit                                                          |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 30 MHz to 300 MHz<br>300 MHz to 1 000 MHz                     | 2 nW (51.7 dBµV)                                               |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 54 MHz to 300 MHz<br>300 MHz to 450 MHz<br>450 MHz to 804 MHz | -26 dBmV (34 dBµV)<br>-20 dBmV (40 dBµV)<br>-15 dBmV (45 dBµV) |        |
| Measurement Point                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Tuner port                                                    |                                                                |        |
| EUT mode<br>(Refer to clauses 4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Test configuration mode                                       | 1                                                              |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | EUT Operation mode                                            | 1                                                              |        |

| Measurement Instrument |              |               |             |            |            |
|------------------------|--------------|---------------|-------------|------------|------------|
| Description            | Model        | Manufacturer  | Identifier  | Cal. Date  | Cal. Due   |
| EMI TEST RECEIVER      | ESC17        | ROHDE&SCHWARZ | 100910      | 2021-01-28 | 2022-01-28 |
| SIGNAL GENERATOR       | SMT03        | ROHDE&SCHWARZ | 100416      | 2020-06-03 | 2021-06-03 |
| POWER SPLITTER         | ZFRSC-123-S+ | MINI CIRCUITS | SF139801142 | 2020-07-21 | 2021-07-21 |
| MATCHING PAD           | RAM          | ROHDE&SCHWARZ | 102138      | 2020-10-23 | 2021-10-23 |



## 8. Revision History

| Date          | Description    | Revised By  | Reviewed By    |
|---------------|----------------|-------------|----------------|
| Jun. 11. 2021 | Initial report | JunSeo Park | KyoungHwan Bae |
|               |                |             |                |
|               |                |             |                |
|               |                |             |                |
|               |                |             |                |
|               |                |             |                |
|               |                |             |                |
|               |                |             |                |

-End of test report-