

# KTEST 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 : DRTFCC2008-0244
2. Customer
  - Name : BLUEBIRD INC.
  - Address : 3F, 115, Irwon-ro, Gangnam-gu, Seoul, South Korea
3. Use of Report : FCC Original Grant
4. Product Name / Model Name : Smart POS Payment Terminal / SP500  
FCC ID : SS4SP500
5. Test Method Used : ANSI C63.10-2013  
Test Specification : FCC Part 15.225
6. Date of Test : 2020.02.08 ~ 2020.02.26
7. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing
8. Testing Environment : See appended test report.
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.

|             |                                                                                                        |                                                                                                                     |
|-------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Affirmation | Tested by                                                                                              | Reviewed by                                                                                                         |
|             | Name : Jungwoo Kim  | Name : JaeJin Lee  (Signature) |

2020 . 08 . 21 .

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

Not abided by KS Q ISO / IEC 17025 and KOLAS accreditation.

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

## Test Report Version

| Test Report No. | Date          | Description   | Revised by  | Reviewed by |
|-----------------|---------------|---------------|-------------|-------------|
| DRTFCC2008-0244 | Aug. 21, 2020 | Initial issue | Jungwoo Kim | JaeJin Lee  |
|                 |               |               |             |             |
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## 1. General Information

### 1.1. Testing Laboratory

#### DT&C Co., Ltd.

The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042.

The test site complies with the requirements of § 2.948 according to ANSI C63.4-2014.

- FCC & ISSED MRA Designation No. : KR0034

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### 1.2. Testing Environment

#### Ambient Condition

▪ Temperature +20 °C ~ +23 °C

▪ Relative Humidity 35 % ~ 43 %

### 1.3. Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of  $k = 2$  to indicate a 95 % level of confidence.

| Parameter                             | Measurement uncertainty                               |
|---------------------------------------|-------------------------------------------------------|
| AC conducted emission                 | 2.4 dB (The confidence level is about 95 %, $k = 2$ ) |
| Radiated Disturbance<br>(Below 1 GHz) | 5.1 dB (The confidence level is about 95 %, $k = 2$ ) |

#### 1.4. Details of Applicant

Applicant : BLUEBIRD INC.  
Address : 3F, 115, Irwon-ro, Gangnam-gu, Seoul, South Korea  
Contact person : Yongsik Jang

#### 1.5. Description of EUT

|                  |                                                  |
|------------------|--------------------------------------------------|
| Equipment Class  | Low Power Communications Device Transmitter(DXX) |
| EUT              | Smart POS Payment Terminal                       |
| Model Name       | SP500                                            |
| Add Model Name   | NA                                               |
| Hardware Version | Rev0.4                                           |
| Software Version | R0.06                                            |
| Serial Number    | Identical prototype                              |
| Power Supply     | DC 7.26 V                                        |
| Frequency Band   | 13.56 MHz                                        |
| Modulation Type  | ASK                                              |
| Channel(s)       | 1                                                |
| Antenna type     | PCB Antenna                                      |

#### 1.6. EUT Capabilities

This EUT contains the following capabilities:

802.11b/g/n WLAN(2.4GHz), 802.11a/n WLAN(5GHz), Bluetooth(BDR, EDR, LE), NFC.

## 2. Information about test items

### 2.1 Test mode

|            |                              |
|------------|------------------------------|
| Test mode1 | Continuous transmitting mode |
|------------|------------------------------|

### 2.2 Tested frequency

| Channel | TX Frequency(MHz) |
|---------|-------------------|
| Lowest  | 13.56             |
| Middle  | -                 |
| Highest | -                 |

### 2.3 EMI Suppression Device(s)/Modifications

EMI suppression device(s) added and/or modifications made during testing  
→ None

## 3. Antenna requirements

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

The internal antenna is attached on the main PCB using the special spring tension.  
Therefore this E.U.T Complies with the requirement of §15.203

## 4. Test report

### 4.1 Summary of tests

| FCC part section(s)                                                                                                                                                                                  | RSS section(s)                       | Parameter              | Limit                                                                                                        | Test condition            | Status Note 1 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------|---------------|
| 2.1049                                                                                                                                                                                               | -                                    | 20 dB Bandwidth        | -                                                                                                            | Radiated                  | C             |
| 15.225 (a)                                                                                                                                                                                           | RSS-210 [ B6(a) ]                    | In-Band Emissions      | 15,848 $\mu\text{V/m}$ @ 30 m<br>13.553 – 13.567 MHz                                                         |                           | C             |
| 15.225 (b)                                                                                                                                                                                           | RSS-210 [ B6(b) ]                    | In-Band Emissions      | 334 $\mu\text{V/m}$ @ 30 m<br>13.410 – 13.553 MHz<br>13.567 – 13.710 MHz                                     |                           | C             |
| 15.225 (c)                                                                                                                                                                                           | RSS-210 [ B6(c) ]                    | In-Band Emissions      | 106 $\mu\text{V/m}$ @ 30 m<br>13.110 – 13.410 MHz<br>13.710 – 14.010 MHz                                     |                           | C             |
| 15.225 (d)<br>15.209                                                                                                                                                                                 | RSS-210 [ B6(d) ]<br>RSS-GEN [ 8.9 ] | Out-of Band Emissions  | Emissions outside of the specified band (13.110-14.010 MHz) must meet the radiated limits detailed in 15.209 |                           | C             |
| 15.225 (e)                                                                                                                                                                                           | RSS-210 [ B6 ]                       | Frequency Stability    | $\pm 0.01$ % of operating frequency                                                                          | Temp & Humid Test Chamber | C             |
| 15.207                                                                                                                                                                                               | RSS-Gen [ 8.8 ]                      | AC Conducted Emissions | FCC Part 15.207                                                                                              | AC Line Conducted         | C             |
| 15.203                                                                                                                                                                                               | -                                    | Antenna Requirements   | FCC Part 15.203                                                                                              | -                         | C             |
| <p>Note 1: C=Comply NC=Not Comply NT=Not Tested NA=Not Applicable</p> <p>Note 2: For radiated emission tests below 30 MHz were performed on semi-anechoic chamber which is correlated with OATS.</p> |                                      |                        |                                                                                                              |                           |               |

## 4.2 Transmitter requirements

### 4.2.1 20dB bandwidth

#### - Procedure:

The 20 dB Bandwidth is measured with a spectrum analyzer connected via a receive antenna placed near the EUT while the EUT is operating in transmission mode.

And spectrum analyzer setting use following test procedure of **ANCSI C63.10-2013 – Section 6.9.2.**

1. Center frequency = EUT channel center frequency
2. Span = 2 ~ 5 times the OBW
3. RBW = 1 % ~ 5 % OBW
4. VBW  $\geq 3 \times$  RBW
5. Detector = Peak
6. Trace = Max hold
7. The trace was allowed to stabilize
8. Determine the reference value = Set the spectrum analyzer marker to the highest level of the displayed trace
9. Using the marker-delta function of the instrument, determine the “-xx dB down amplitude” using [(reference value) - xx].
10. Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.

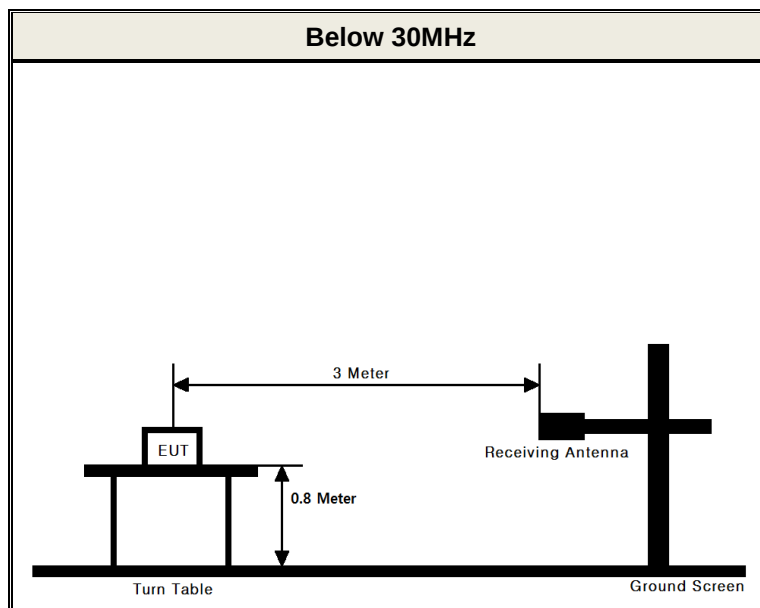
#### - Measurement Data: **Comply**



#### - Minimum Standard: NA

### 4.2.3 In-band emissions

#### - Test Configuration



- **Procedure:** The radiated emission was tested according to the **section 6.4 of the ANSI C63.10-2013**.

The EUT was placed on a 0.8 m high non-conductive table and it was placed at 3m distance from the antenna. Measurements were performed for each of the three antenna orientations. (ie. parallel, perpendicular, and ground-parallel)

Also, measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

RBW = As specified in below table, VBW  $\geq 3 \times$  RBW, Sweep = Auto, Detector = Peak  
Trace mode = Max Hold until the trace stabilizes.

| Frequency   | RBW         |
|-------------|-------------|
| 9-150 kHz   | 200-300 Hz  |
| 0.15-30 MHz | 9-10 kHz    |
| 30-1000 MHz | 100-120 kHz |
| > 1000 MHz  | 1 MHz       |

- **Minimum Standard: Part 15.225(a), (b), (c) & RSS-210 [ B6(a), (b), (c) ]**

| Frequency Band [MHz]           | Limit at 30 m measurement distance |          |
|--------------------------------|------------------------------------|----------|
|                                | [uV/m]                             | [dBuV/m] |
| 13.553-13.567                  | 15,848                             | 84.00    |
| 13.410-13.553<br>13.567-13.710 | 334                                | 50.47    |
| 13.110-13.410<br>13.710-14.010 | 106                                | 40.51    |

**- Measurement Data:**

Tested Frequency : 13.56 MHz  
Measurement Distance : 3 Meters

| Test Frequency Band [MHz] | Freq. [MHz] | EUT Axis. | ANT (Note 1) | Reading Level [dBuV] | T.F [dB/m] | Field Strength @3 m [dBuV/m] | Field Strength @30 m [dBuV/m] | Limit [dBuV/m] | Margin [dB] |
|---------------------------|-------------|-----------|--------------|----------------------|------------|------------------------------|-------------------------------|----------------|-------------|
| 13.110 ~ 13.410           | 13.404      | Z         | P            | 24.50                | 10.80      | 35.30                        | -4.70                         | 40.51          | 45.21       |
| 13.410 ~ 13.553           | 13.553      | Z         | P            | 58.80                | 10.70      | 69.50                        | 29.50                         | 50.47          | 20.97       |
| 13.553 ~ 13.567           | 13.559      | Z         | P            | 63.40                | 10.70      | 74.10                        | 34.10                         | 84.00          | 49.90       |
| 13.567 ~ 13.710           | 13.568      | Z         | P            | 57.50                | 10.70      | 68.20                        | 28.20                         | 50.47          | 22.27       |
| 13.710 ~ 14.010           | 13.719      | Z         | P            | 26.30                | 10.70      | 37.00                        | -3.00                         | 40.51          | 43.51       |

**Note 1.** Loop antenna orientation

“P”: Parallel, “V”: perpendicular, “G”: ground-parallel

**Note 2.** This test item was performed at 3 m and the data were extrapolated to the specified measurement distance of 30 m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)2.

▪ Extrapolation Factor =  $20 \log_{10}(30/3)^2 = 40$  dB

**Note 3.** All data were recorded using a spectrum analyzer employing a peak detector.

If PK results were meet Quasi-peak limit, Quasi-peak measurements were omitted.

**Note 4.** Sample Calculation.

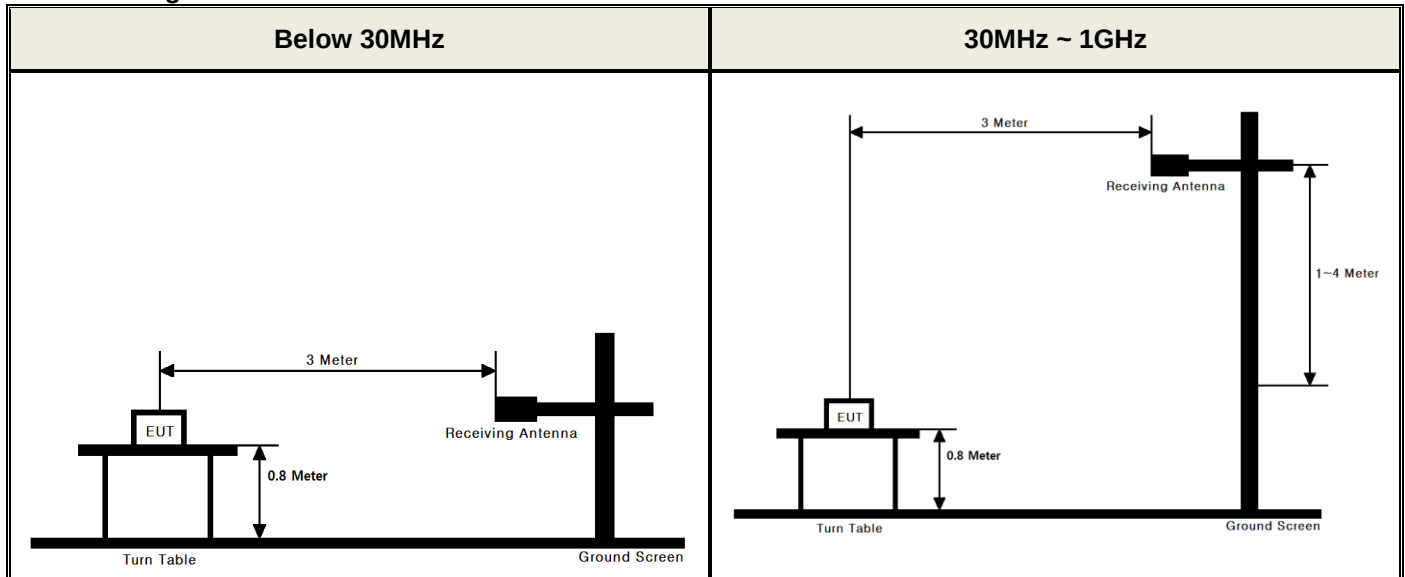
Margin = Limit – Field Strength @ 30 m / Field Strength @ 30 m = Field Strength @ 3 m – 40 dB

Field Strength @ 3 m = Reading + T.F / T.F = AF + CL

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss

#### 4.2.4 Out-of-band emissions

##### - Test configuration



- **Procedure:** The radiated emission was tested according to the **section 6.4, 6.5 of the ANSI C63.10-2013.**

The EUT was tested from 9 kHz up to the 1 GHz excluding the band 13.110-14.010 MHz.

A The EUT was placed on a 0.8 m high non-conductive table and it was placed at 3m distance from the antenna. For measurements below 30MHz were performed for each of the three antenna orientations. (ie. parallel, perpendicular, and ground-parallel) For measurements above 30MHz were performed for each of the both horizontal and vertical polarizations.

Also, measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

RBW = As specified in below table, VBW  $\geq 3 \times$  RBW, Sweep = Auto, Detector = Peak  
Trace mode = Max Hold until the trace stabilizes.

| Frequency   | RBW         |
|-------------|-------------|
| 9-150 kHz   | 200-300 Hz  |
| 0.15-30 MHz | 9-10 kHz    |
| 30-1000 MHz | 100-120 kHz |
| > 1000 MHz  | 1 MHz       |

- **Minimum Standard: Part 15.209, 225(d) & RSS-210[B6(d)], RSS-GEN[8.9]**

▪ **FCC Part 15.209(a):**

| Frequency [MHz] | Field Strength [ $\mu$ V/m] | Measurement Distance [Meters] |
|-----------------|-----------------------------|-------------------------------|
| 0.009 ~ 0.490   | 2400/F(kHz)                 | 300                           |
| 0.490 ~ 1.705   | 24000/F(kHz)                | 30                            |
| 1.705 ~ 30      | 30                          | 30                            |
| 30 ~ 88         | 100 **                      | 3                             |
| 88 ~ 216        | 150 **                      | 3                             |
| 216 ~ 960       | 200 **                      | 3                             |
| Above 960       | 200                         | 3                             |

\*\* Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

▪ **FCC Part 15.209(b):**

In the emission table above, the tighter limit applies at the band edges.

**- Measurement Data:**

Tested Frequency : 13.56 MHz  
Measurement Distance : 3 Meters

| Frequency [MHz] | EUT Axis. | ANT (Note 1) | Reading [dBuV] | T.F [dB/m] | Distance factor [dB] | Field Strength [dBuV/m] | Limit [dBuV/m] | Margin [dB] |
|-----------------|-----------|--------------|----------------|------------|----------------------|-------------------------|----------------|-------------|
| 9.325           | Z         | P            | 23.2           | 11.1       | 40.0                 | -5.7                    | 29.5           | 35.2        |
| 11.020          | Z         | P            | 26.4           | 11.0       | 40.0                 | -2.6                    | 29.5           | 32.1        |
| 12.720          | Z         | P            | 39.5           | 10.8       | 40.0                 | 10.3                    | 29.5           | 19.2        |
| 14.400          | Z         | P            | 30.1           | 10.7       | 40.0                 | 0.8                     | 29.5           | 28.7        |
| 22.020          | Z         | P            | 27.4           | 10.0       | 40.0                 | -2.6                    | 29.5           | 32.1        |
| 27.120          | Z         | P            | 16.4           | 9.3        | 40.0                 | -14.3                   | 29.5           | 43.8        |
| 36.790          | Z         | H            | 35.6           | -9.7       | 0.0                  | 25.9                    | 40.0           | 14.1        |
| 65.890          | Z         | H            | 33.1           | -10.1      | 0.0                  | 23.0                    | 40.0           | 17.0        |
| 593.568         | Z         | H            | 29.0           | 0.9        | 0.0                  | 29.9                    | 46.0           | 16.1        |
| 587.890         | Z         | V            | 29.7           | 5.6        | 0.0                  | 35.3                    | 46.0           | 10.7        |
| -               | -         | -            | -              | -          | -                    | -                       | -              | -           |

**Note 1.** Loop antenna orientation (30 MHz Below)

“P”= Parallel, “V”= perpendicular, “G”= ground-parallel

Bilog antenna polarization (30 MHz above)

“H”= Horizontal, “V”= Vertical

**Note 2.** All data were recorded using a spectrum analyzer employing a peak detector.

If PK results were meet Quasi-peak limit, Quasi-peak measurements were omitted.

**Note 3.** No other spurious and harmonic emissions were reported greater than listed emissions above table.

**Note 4.** Sample calculation

Margin = Limit – Field Strength

Field Strength = Reading + T.F – Distance factor

T.F = AF + CL – AG

Distance factor =  $20\log(\text{Measurement distance} / \text{The measured distance})^2$

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

## 4.2.5 Frequency Stability

### - Procedure:

Part 15.225 requires that devices operating in the 13.553 – 13.567 MHz shall maintain the carrier frequency within 0.01 % of the operating frequency over the temperature variation of -20 degrees to + 50 degrees C at normal supply voltage.

### - Measurement Data: **Comply**

Operating Frequency : 13,560,000 Hz

| VOLTAGE (%) | POWER (V <sub>DC</sub> ) | TEMP (°C) | Frequency (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|-------------|--------------------------|-----------|----------------|-----------------|---------------|
| 100 %       | 7.26                     | +20(ref)  | 13,559,864     | -136            | 0.001 000     |
| 100 %       |                          | -20       | 13,559,855     | -145            | 0.001 066     |
| 100 %       |                          | -10       | 13,559,859     | -141            | 0.001 039     |
| 100 %       |                          | 0         | 13,559,862     | -138            | 0.001 020     |
| 100 %       |                          | +10       | 13,559,870     | -130            | 0.000 961     |
| 100 %       |                          | +20       | 13,559,864     | -136            | 0.001 000     |
| 100 %       |                          | +30       | 13,559,861     | -139            | 0.001 023     |
| 100 %       |                          | +40       | 13,559,858     | -142            | 0.001 048     |
| 100 %       |                          | +50       | 13,559,863     | -137            | 0.001 009     |
| 85 %        | 6.17                     | +20       | 13,559,852     | -148            | 0.001 095     |
| 115 %       | 8.35                     | +20       | 13,559,872     | -128            | 0.000 944     |

### - Minimum Standard: Part 15. 225(e) & RSS-210 [B6]

|                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------|
| The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01$ % of the operating frequency. |
|-------------------------------------------------------------------------------------------------------------------|

#### 4.2.6 AC Line Conducted Emissions

##### - Test Requirements and limit

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN).

| Frequency Range<br>(MHz) | Conducted Limit (dBuV) |            |
|--------------------------|------------------------|------------|
|                          | Quasi-Peak             | Average    |
| 0.15 ~ 0.5               | 66 to 56 *             | 56 to 46 * |
| 0.5 ~ 5                  | 56                     | 46         |
| 5 ~ 30                   | 60                     | 50         |

\* Decreases with the logarithm of the frequency

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

##### - Test Configuration

See test photographs for the actual connections between EUT and support equipment.

##### - Test Procedure

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.

- **Measurement Data:** **Comply** (refer to the next page)

## Measurement Data

## Measurement Data

## Measurement Data (With antenna terminated)

Results of Conducted Emission

DTNC

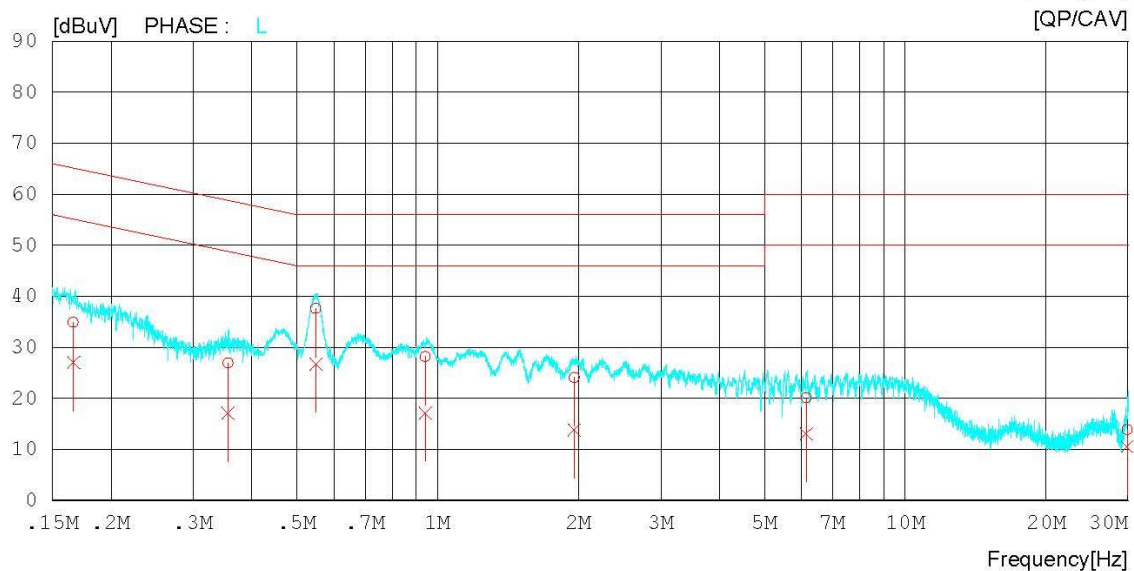
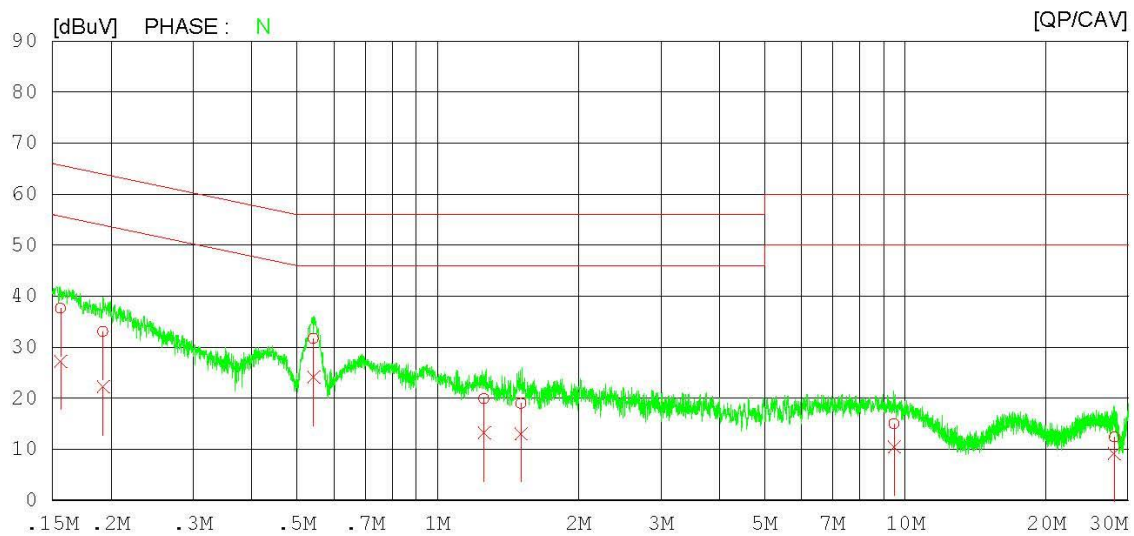
Date 2020-02-07

Order No.  
Model No. SP500  
Serial No.  
Test Condition NFC\_R

Reference No.  
Power Supply 120 V, 60 Hz  
Temp/Humi. 23 'C / 35 %  
Operator Jungwoo Kim

Memo

LIMIT : FCC P15.207 QP  
FCC P15.207 AV



## Measurement Data (With antenna terminated)

### Results of Conducted Emission

DTNC

Date 2020-02-07

Order No.  
Model No. SP500  
Serial No.  
Test Condition NFC\_R

Reference No.  
Power Supply 120 V, 60 Hz  
Temp/Humi. 23 'C / 35 %  
Operator Jungwoo Kim

Memo

LIMIT : FCC P15.207 QP  
FCC P15.207 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  | 0.15624       | 27.63        | 17.27         | 10.00            | 37.63        | 27.27         | 65.66        | 55.66         | 28.03        | 28.39         | N     |
| 2  | 0.19230       | 23.10        | 12.17         | 10.02            | 33.12        | 22.19         | 63.94        | 53.94         | 30.82        | 31.75         | N     |
| 3  | 0.54253       | 21.62        | 14.07         | 10.06            | 31.68        | 24.13         | 56.00        | 46.00         | 24.32        | 21.87         | N     |
| 4  | 1.25653       | 9.78         | 3.15          | 10.07            | 19.85        | 13.22         | 56.00        | 46.00         | 36.15        | 32.78         | N     |
| 5  | 1.50837       | 8.85         | 2.95          | 10.09            | 18.94        | 13.04         | 56.00        | 46.00         | 37.06        | 32.96         | N     |
| 6  | 9.47265       | 4.60         | 0.20          | 10.33            | 14.93        | 10.53         | 60.00        | 50.00         | 45.07        | 39.47         | N     |
| 7  | 27.97442      | 1.70         | -1.46         | 10.64            | 12.34        | 9.18          | 60.00        | 50.00         | 47.66        | 40.82         | N     |
| 8  | 0.16650       | 24.88        | 16.94         | 10.01            | 34.89        | 26.95         | 65.13        | 55.13         | 30.24        | 28.18         | L     |
| 9  | 0.35596       | 16.85        | 7.02          | 10.04            | 26.89        | 17.06         | 58.82        | 48.82         | 31.93        | 31.76         | L     |
| 10 | 0.54922       | 27.49        | 16.65         | 10.06            | 37.55        | 26.71         | 56.00        | 46.00         | 18.45        | 19.29         | L     |
| 11 | 0.94150       | 18.08        | 7.04          | 10.05            | 28.13        | 17.09         | 56.00        | 46.00         | 27.87        | 28.91         | L     |
| 12 | 1.96034       | 13.95        | 3.62          | 10.12            | 24.07        | 13.74         | 56.00        | 46.00         | 31.93        | 32.26         | L     |
| 13 | 6.14071       | 9.87         | 2.79          | 10.24            | 20.11        | 13.03         | 60.00        | 50.00         | 39.89        | 36.97         | L     |
| 14 | 29.81413      | 3.21         | -0.10         | 10.61            | 13.82        | 10.51         | 60.00        | 50.00         | 46.18        | 39.49         | L     |

# APPENDIX

## TEST EQUIPMENT FOR TESTS

| Type              | Manufacturer         | Model     | Cal.Date<br>(yy/mm/dd) | Next.Cal.Date<br>(yy/mm/dd) | S/N        |
|-------------------|----------------------|-----------|------------------------|-----------------------------|------------|
| Spectrum Analyzer | Agilent Technologies | N9020A    | 19/03/11               | 20/03/11                    | MY48010133 |
| Spectrum Analyzer | Agilent Technologies | N9020A    | 19/06/26               | 20/06/26                    | MY46471251 |
| Multimeter        | FLUKE                | 17B       | 19/12/16               | 20/12/16                    | 26030065WS |
| Signal Generator  | Rohde Schwarz        | SMBV100A  | 19/12/16               | 20/12/16                    | 255571     |
| Thermohygrometer  | BODYCOM              | BJ5478    | 19/12/18               | 20/12/18                    | 120612-1   |
| Thermohygrometer  | BODYCOM              | BJ5478    | 19/12/18               | 20/12/18                    | 120612-2   |
| HYGROMETER        | TESTO                | 608-H1    | 20/01/21               | 21/01/21                    | 34862883   |
| Temp & Humi       | SJ Science           | SJ-TH-S50 | 19/06/25               | 20/06/25                    | U5542113   |
| Loop Antenna      | ETS                  | 6502      | 19/03/21               | 21/03/21                    | 3471       |
| BILOG ANTENNA     | Schwarzbeck          | VULB 9160 | 19/04/23               | 21/04/23                    | 9160-3362  |
| PreAmplifier      | H.P                  | 8447D     | 19/12/16               | 20/12/16                    | 2944A07774 |
| EMI Test Receiver | Rohde Schwarz        | ESCI7     | 20/01/28               | 21/01/28                    | 100910     |
| PULSE LIMITER     | Rohde Schwarz        | ESH3-Z2   | 19/09/17               | 20/09/17                    | 101333     |
| LISN              | SCHWARZBECK          | NNLK 8121 | 19/05/23               | 20/05/23                    | 06183      |
| Cable             | Radiall              | TESTPRO3  | 20/01/16               | 21/01/16                    | M-01       |
| Cable             | DTNC                 | Cable     | 20/01/16               | 21/01/16                    | M-04       |
| Cable             | Junkosha             | MWX315    | 20/01/16               | 21/01/16                    | M-05       |
| Cable             | Junkosha             | MWX221    | 20/01/16               | 21/01/16                    | M-06       |

Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017.

Note2: The cable is not a regular calibration item, so it has been calibrated by DT&C itself.