



TEST REPORT

No. I19D00159EMC01

For

Client : Toast, Inc.

Production : On-Counter Guest Facing Display

Model Name : TW200

Brand Name: Toast

FCC ID: 2AMNG-TW200

IC ID: /

Hardware Version: CT541SB40C_V1.0

Software Version: /

Issued date: 2019-09-29

NOTE

1. The test results in this test report relate only to the devices specified in this report.
2. This report shall not be reproduced except in full without the written approval of East China Institute of Telecommunications
3. The measurement uncertainty is not taken into account when deciding conformity, and the results of measurement (or the average of measurement results) are directly used as the criterion for the stating conformity.

Test Laboratory:

East China Institute of Telecommunications

Add: 7-8F, G Area, No.668, Beijing East Road, Huangpu District, Shanghai, P. R. China

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Revision Version

| Report Number | Revision | Date | Memo |
|-----------------|----------|------------|---------------------------------|
| I19D00159-EMC01 | 00 | 2019-09-29 | Initial creation of test report |

CONTENTS

| | |
|--|----|
| 1. TEST LABORATORY | 6 |
| 1.1. TESTING LOCATION | 6 |
| 1.2. TESTING ENVIRONMENT | 6 |
| 1.3. PROJECT DATA..... | 6 |
| 1.4. SIGNATURE..... | 6 |
| 2. CLIENT INFORMATION | 7 |
| 2.1. APPLICANT INFORMATION..... | 7 |
| 2.2. MANUFACTURER INFORMATION..... | 7 |
| 3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) | 8 |
| 3.1. ABOUT EUT..... | 8 |
| 3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST | 8 |
| 3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST | 8 |
| 4. REFERENCE DOCUMENTS..... | 9 |
| 4.1 REFERENCE DOCUMENTS FOR TESTING..... | 9 |
| 5. TEST RESULTS..... | 10 |
| 5.1 SUMMARY OF TEST RESULTS | 10 |
| 5.2 STATEMENTS..... | 10 |
| 6. TEST EQUIPMENT UTILIZED | 11 |
| 6.1 RADIATED EMISSION EQUIPMENT LIST | 11 |
| 6.2 AC CONDUCTED EMISSION EQUIPMENT LIST | 11 |
| 7. SYSTEM CONFIGURATION DURING TEST..... | 12 |
| 7.1 TEST MODE..... | 12 |
| 7.2 CONNECTION DIAGRAM OF TEST SYSTEM..... | 13 |
| 8. MEASUREMENT RESULTS..... | 14 |
| 8.1 RADIATED EMISSION 30MHZ-18GHZ..... | 14 |

8.2 AC CONDUCTED EMISSION..... 18

1. Test Laboratory

1.1. Testing Location

| | |
|----------------------|---|
| Company Name: | ECIT Shanghai, East China Institute of Telecommunications |
| Address: | 7-8F, G Area, No. 668, Beijing East Road, Huangpu District, Shanghai, P. R. China |
| Postal Code: | 200001 |
| Telephone: | (+86)-021-63843300 |
| Fax: | (+86)-021-63843301 |
| FCC registration No: | 958356 |

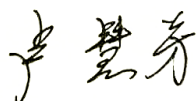
1.2. Testing Environment

| | |
|---------------------|-----------|
| Normal Temperature: | 15-35℃ |
| Relative Humidity: | 30-60% RH |
| Supply Voltage | 120V/60Hz |

1.3. Project data

| | |
|---------------------|------------|
| Project Leader: | Zhou Yan |
| Testing Start Date: | 2019-09-25 |
| Testing End Date: | 2019-09-26 |

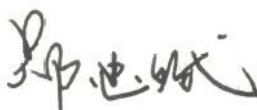
1.4. Signature



Lu Huifang
(Prepared this test report)



You Jinjun
(Reviewed this test report)



Zheng Zhongbin
(Approved this test report)

2. Client Information

2.1. Applicant Information

| | |
|--------------|--|
| Company Name | Toast, Inc. |
| Address | 401 Park Drive, Suite 801, Boston, MA 02215, USA |
| Telephone | (562) 546-2272 |
| Postcode | N/A |

2.2. Manufacturer Information

| | |
|--------------|--|
| Company Name | Toast, Inc. |
| Address | 401 Park Drive, Suite 801, Boston, MA 02215, USA |
| Telephone | (562) 546-2272 |
| Postcode | N/A |

3. Equipment under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

| | |
|--------------|---------------------------------|
| Product Name | On-Counter Guest Facing Display |
| Model name | TW200 |

3.2. Internal Identification of EUT used during the test

| EUT ID* | SN or IMEI | HW Version | SW Version | Date of receipt |
|---------|---------------|-----------------|------------|-----------------|
| N03 | LS09P99B40019 | CT541SB40C_V1.0 | / | 2019-09-24 |

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

| AE ID* | Description | Model | SN |
|--------|-------------------------|---------------------|----------------|
| EU01 | Data Processing Machine | TT202 | N/A |
| CA01 | Adapter | SOY-2400400 | N/A |
| UC01 | USB Cable | N/A | N/A |
| UD01 | LAN Cable | N/A | N/A |
| EB03 | Credit card machine | MAGTEK | B4A77E0 5JUN19 |
| EB02 | Credit card machine | N/A | N/A |
| EA01 | USB connector | N/A | N/A |
| EA02 | USB connector | N/A | N/A |
| AE1 | Notebook PC | DELL Latitude E6510 | N/A |

*AE ID: is used to identify the test sample in the lab internally.

4. Reference Documents

4.1 Reference Documents for testing

The following documents listed in this section are referred for testing.

| Reference | Title | Version |
|---------------------------|---|-----------|
| FCC Part 15, Subpart B | Radio frequency devices | 2019/9/24 |
| ANSI C63.4 | Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz | 2014 |
| ICES-003 | Information Technology Equipment(Including Digital Apparatus)-Limits and Methods of Measurement | 2016 |

5. Test Results

5.1 Summary of Test Results

| Items | Test List | Clause in FCC rules | Verdict |
|-------|-----------------------|---------------------|---------|
| 1 | Radiated Emission | 15.109(a) | Pass |
| 2 | AC Conducted Emission | 15.107(a) | Pass |

5.2 Statements

The TW200, manufactured by Toast, Inc. is a new product for testing. ECIT only performed test cases which identified with Pass/Fail/Inc result in section 5.1.

ECIT has verified that the compliance of the tested device specified in section 3 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 4 of this test report.

6. Test Equipment Utilized

6.1 Radiated Emission Equipment list

| Item | Instrument Name | Type | Serial Number | Manufacturer | Cal. Date | Cal. interval |
|------|-------------------------------|----------------|------------------|--------------|------------|---------------|
| 1 | Universal Radio Communication | CMU200 | 123126 | R&S | 2019-05-10 | 1 year |
| 2 | Test Receiver | ESU40 | 100307 | R&S | 2019-05-10 | 1 year |
| 3 | Trilog Antenna | VULB9163 | VULB9163-5 15 | Schwarzbeck | 2017-02-25 | 3 years |
| 4 | Double Ridged Guide | ETS-3117 | 00135885 | ETS | 2017-01-11 | 3 years |
| 5 | EMI Test Software | EMC32 V9.15 | NA | R&S | NA | NA |

6.2 AC Conducted Emission Equipment list

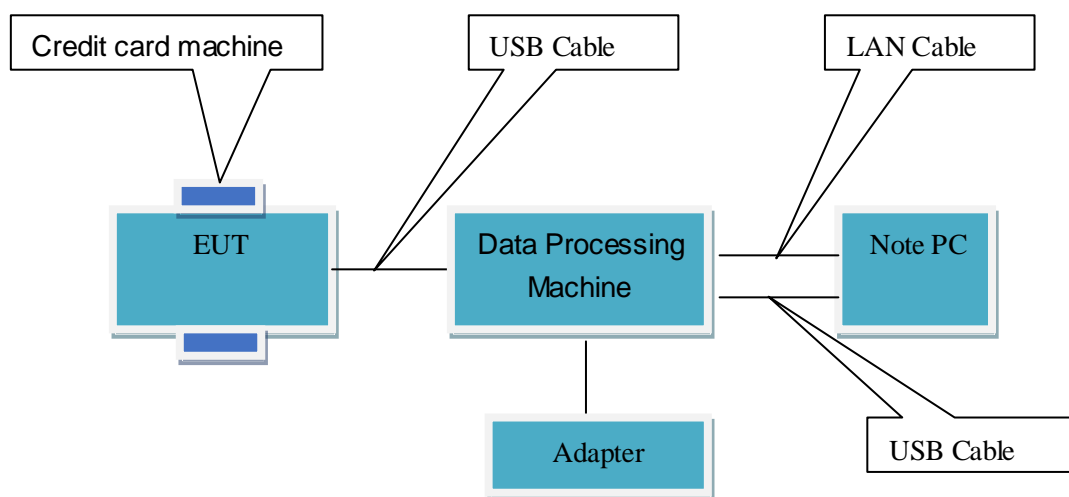
| Item | Instrument Name | Type | Serial Number | Manufacturer | Cal. Date | Cal. interval |
|------|-------------------------------|--------------------|---------------|--------------|------------|---------------|
| 1 | Universal Radio Communication | CMU200 | 123123 | R&S | 2019-05-10 | 1 year |
| 2 | Test Receiver | ESCI | 101235 | R&S | 2019-05-10 | 1 year |
| 3 | 2-Line V-Network | ENV216 | 101380 | R&S | 2019-05-10 | 1 year |
| 4 | EMI Test Software | EMC32 V10.35.02 | NA | R&S | NA | NA |

7. System Configuration during Test

7.1 Test Mode

| Test Item | Function Type |
|--|---|
| AC Conducted Emission | Mode 1: Working mode (Full system) <Figure 1> |
| Radiated Emission | Mode 1: Working mode (Full system) <Figure 1> |
| Remark: 1. All test modes are performed, only the worst cases test data are recorded in this report. 2. Working mode (Full system): EUT is powered by a Data Processing Machine, connected externally with a USB connector and a Credit card machine and turns on the camera to record video. Data Processing Machine connects USB cable to PC for data transmission, and through LAN cable to PC for data exchange of PING command, keep working at maximum load. | |

7.2 Connection Diagram of Test System



<Figure 1> Mode 1

8. Measurement Results

Only the worst test result was shown in this report.

8.1 Radiated Emission 30MHz-18GHz

Method of Measurement

For 30MHz -1000MHz, the EUT was placed on the top of a rotating 0.8m table above the ground at a semi-anechoic chamber. The distance between the EUT and the received antenna was 3 meters. The table was rotated 360 degree and the received antenna mounted on a variable-height antenna tower was varied from 1m to 4m to find the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement. Tested in accordance with the procedures of ANSI C63.4-2014, section 8.3.

For 1000MHz-18000MHz, The maximal emission value was acquired by adjusting the antenna height, The table was rotated 360 degree to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement.

Limits for Radiated Emission at a measuring distance of 3m

| Frequency Range (MHz) | Quasi-Peak (dBuV/m) |
|-----------------------|---------------------|
| 30-88 | 40 |
| 88-216 | 43.5 |
| 216-960 | 46 |
| Above 960 | 54 |

| Frequency Range (MHz) | Peak (dBuV/m) | Average (dBuV/m) |
|-----------------------|---------------|------------------|
| Above 1000 | 74 | 54 |

Test conditions

| Frequency Range (MHz) | RBW/VBW | Sweep Time (s) |
|-----------------------|---------------|----------------|
| 30-1000 | 120kHz/300kHz | Auto |
| 1000-18000 | 1MHz/3MHz | Auto |

Uncertainty Measurement

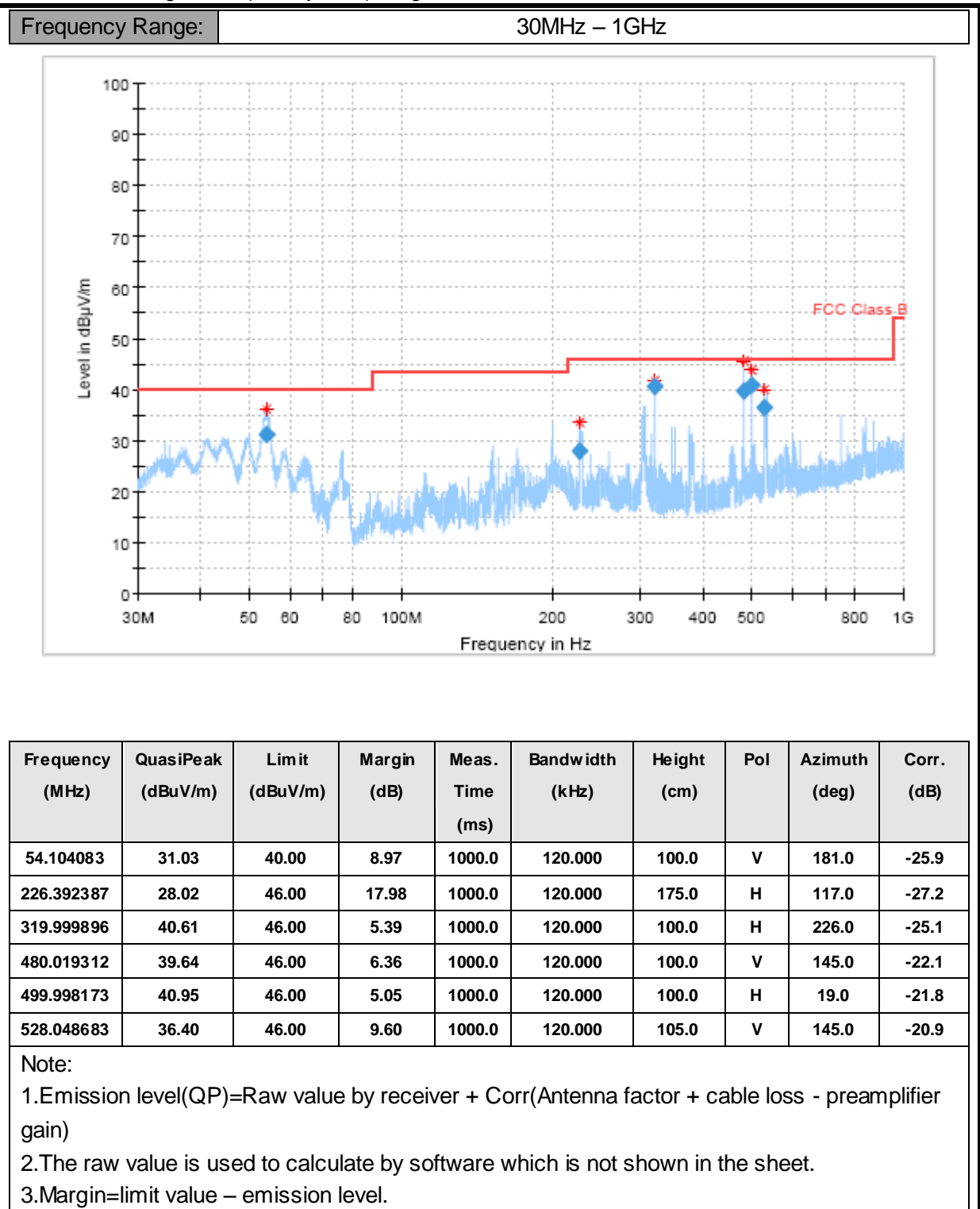
The measurement uncertainty (30MHz-1000MHz) is 4.98 dB (k=2).

The measurement uncertainty (1000MHz-18000MHz) is 5.06 dB (k=2).

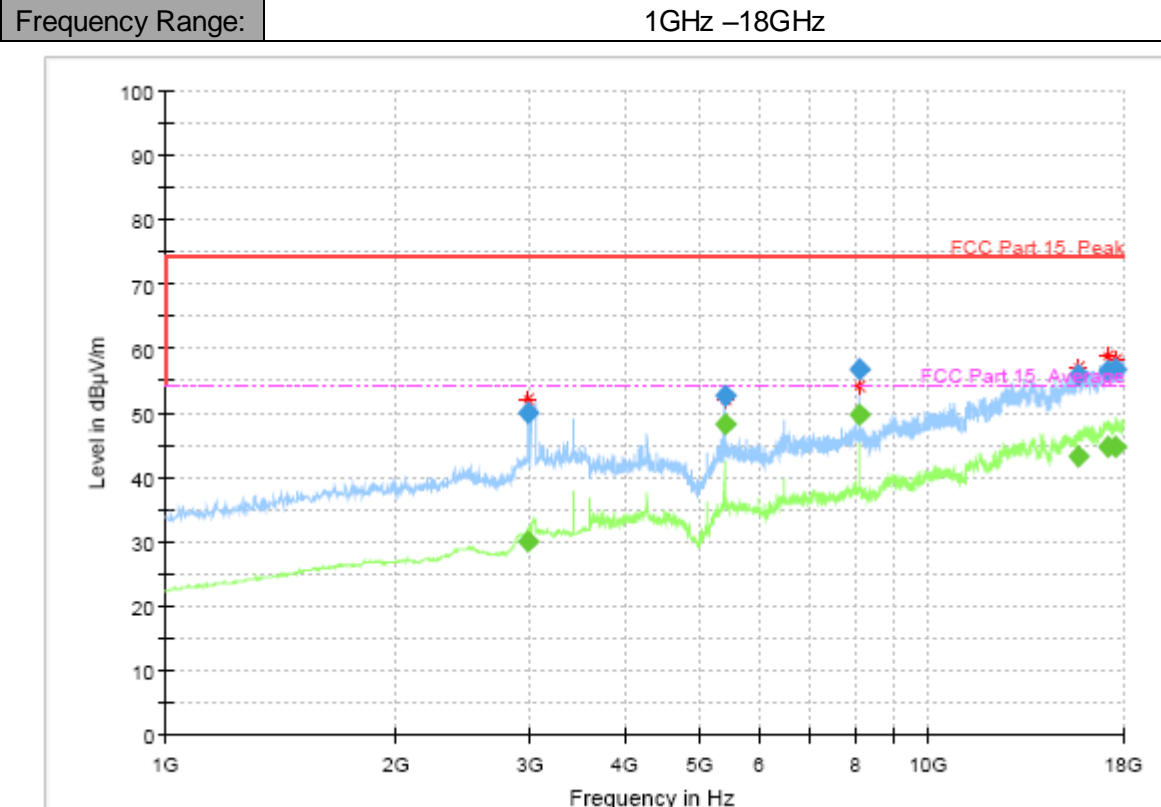
Test Results

Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier, the Emissions in the frequency band 18GHz-40GHz is more than 20dB below the limit are not report.

Mode 1: Working mode (Full system) <Figure 1>



Mode 1: Working mode (Full system) <Figure 1>

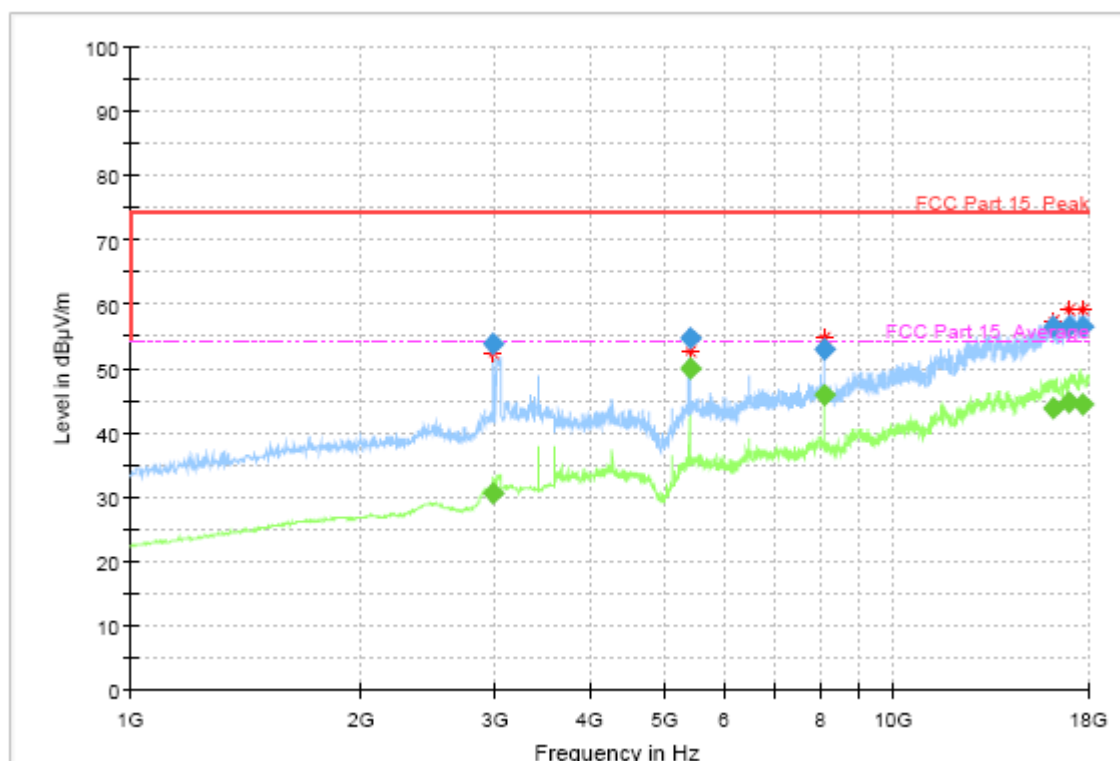


Final Result

| Frequency (MHz) | MaxPeak (dBuV/m) | Average (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Meas. Time | Band width | Heigh t | Po l | Azimu th | Corr. (dB) |
|--------------------|---------------------|---------------------|-------------------|----------------|---------------|---------------|------------|---------|-------------|---------------|
| 2986.200000 | 49.95 | --- | 74.00 | 24.05 | 100.0 | 1000. | 100.0 | V | 13.0 | -1.2 |
| 2986.200000 | --- | 30.09 | 54.00 | 23.91 | 100.0 | 1000. | 100.0 | V | 13.0 | -1.2 |
| 5399.800000 | --- | 48.14 | 54.00 | 5.86 | 100.0 | 1000. | 100.0 | V | 218.0 | 4.3 |
| 5399.800000 | 52.76 | --- | 74.00 | 21.24 | 100.0 | 1000. | 100.0 | V | 218.0 | 4.3 |
| 8099.400000 | 56.77 | --- | 74.00 | 17.23 | 100.0 | 1000. | 200.0 | V | 223.0 | 9.3 |
| 8099.400000 | --- | 49.67 | 54.00 | 4.33 | 100.0 | 1000. | 200.0 | V | 223.0 | 9.3 |
| 15701.800000 | --- | 43.28 | 54.00 | 10.72 | 100.0 | 1000. | 200.0 | V | 346.0 | 21.8 |
| 15701.800000 | 55.75 | --- | 74.00 | 18.25 | 100.0 | 1000. | 200.0 | V | 346.0 | 21.8 |
| 17153.600000 | 56.57 | --- | 74.00 | 17.43 | 100.0 | 1000. | 200.0 | V | 0.0 | 24.1 |
| 17153.600000 | --- | 44.74 | 54.00 | 9.26 | 100.0 | 1000. | 200.0 | V | 0.0 | 24.1 |
| 17543.600000 | 56.70 | --- | 74.00 | 17.30 | 100.0 | 1000. | 100.0 | V | 74.0 | 24.6 |
| 17543.600000 | --- | 44.63 | 54.00 | 9.37 | 100.0 | 1000. | 100.0 | V | 74.0 | 24.6 |

Note:

- 1.Emission level(peak or average)=Raw value by receiver + Corr(Antenna factor+ cable loss - preamplifier gain)
- 2.The raw value is used to calculate by software which is not shown in the sheet.
- 3.Margin=limit value – emission level.



Final Result

| Frequency (MHz) | MaxPeak (dBuV/m) | Average (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Meas. Time | Bandwidth (Hz) | Height (m) | Polarization | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|------------------|----------------|-------------|------------|----------------|------------|--------------|---------------|------------|
| 2986.400000 | 53.74 | --- | 74.00 | 20.26 | 100.0 | 1000.00 | 100.0 | H | 55.0 | -1.2 |
| 2986.400000 | --- | 30.71 | 54.00 | 23.29 | 100.0 | 1000.00 | 100.0 | H | 55.0 | -1.2 |
| 5400.000000 | 54.64 | --- | 74.00 | 19.36 | 100.0 | 1000.00 | 198.0 | H | 203.0 | 4.3 |
| 5400.000000 | --- | 49.97 | 54.00 | 4.03 | 100.0 | 1000.00 | 198.0 | H | 203.0 | 4.3 |
| 8100.000000 | 53.00 | --- | 74.00 | 21.00 | 100.0 | 1000.00 | 100.0 | H | 232.0 | 9.3 |
| 8100.000000 | --- | 45.79 | 54.00 | 8.21 | 100.0 | 1000.00 | 100.0 | H | 232.0 | 9.3 |
| 16139.800000 | --- | 43.78 | 54.00 | 10.22 | 100.0 | 1000.00 | 100.0 | H | 0.0 | 22.4 |
| 16139.800000 | 56.45 | --- | 74.00 | 17.55 | 100.0 | 1000.00 | 100.0 | H | 0.0 | 22.4 |
| 16973.000000 | --- | 44.56 | 54.00 | 9.44 | 100.0 | 1000.00 | 200.0 | H | 236.0 | 23.6 |
| 16973.000000 | 56.58 | --- | 74.00 | 17.42 | 100.0 | 1000.00 | 200.0 | H | 236.0 | 23.6 |
| 17703.600000 | 56.39 | --- | 74.00 | 17.61 | 100.0 | 1000.00 | 100.0 | H | 118.0 | 24.3 |
| 17703.600000 | --- | 44.51 | 54.00 | 9.49 | 100.0 | 1000.00 | 100.0 | H | 118.0 | 24.3 |

Note:

- 1.Emission level(peak or average)=Raw value by receiver + Corr(Antenna factor+ cable loss - preamplifier gain)
- 2.The raw value is used to calculate by software which is not shown in the sheet.
- 3.Margin=limit value – emission level.

8.2 AC Conducted Emission

Method of Measurement

For equipment 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 with the band 150 kHz to 30MHz shall not exceed the limits. Both lines of the power mains connected to the EUT were checked for maximum conducted interference. Tested in accordance with the procedures of ANSI C63.4-2014, section 7.3

Limit of Conducted Emission

| Frequency Range (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 | | |

Test Condition in Charging Mode

| Voltage (V) | Frequency (Hz) | RBW | Sweep Time (s) |
|-------------|----------------|-------|----------------|
| 120 | 60 | 9 kHz | Auto |

Uncertainty Measurement

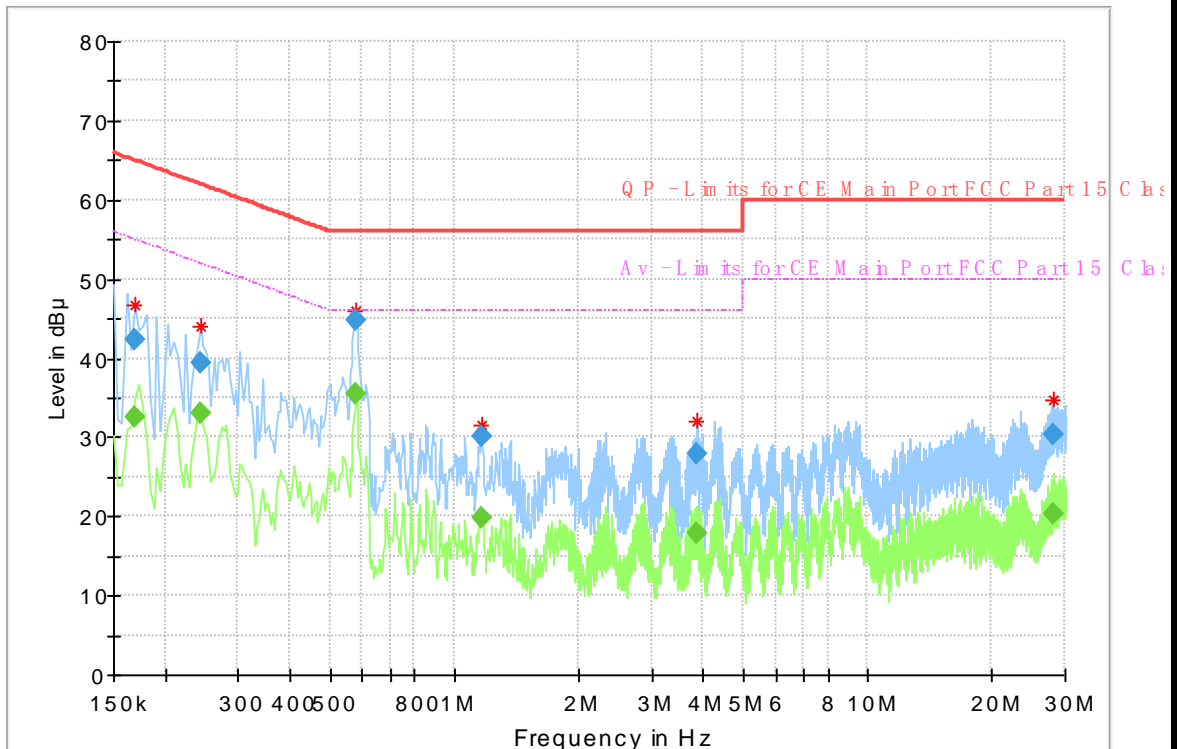
The measurement uncertainty is 3.66dB (k=2).

Test Results

Mode 1: Working mode (Full system) <Figure 1>

Frequency Range:

150kHz – 30MHz



| Frequency (MHz) | QuasiPeak (dBμ V) | Average (dBμ V) | Limit (dBμ V) | Margin (dB) | Meas. Time | Bandwidth (kHz) | Line | Filter | Corr. (dB) |
|-----------------|-------------------|-----------------|---------------|-------------|------------|-----------------|------|--------|------------|
| 0.168656 | 42.25 | --- | 65.03 | 22.77 | 15000. | 9.000 | N | ON | 9.7 |
| 0.168656 | --- | 32.42 | 55.03 | 22.61 | 15000. | 9.000 | N | ON | 9.7 |
| 0.243281 | 39.30 | --- | 61.98 | 22.68 | 15000. | 9.000 | N | ON | 9.7 |
| 0.243281 | --- | 33.08 | 51.98 | 18.91 | 15000. | 9.000 | N | ON | 9.7 |
| 0.579094 | --- | 35.35 | 46.00 | 10.65 | 15000. | 9.000 | N | ON | 9.8 |
| 0.579094 | 44.80 | --- | 56.00 | 11.20 | 15000. | 9.000 | N | ON | 9.8 |
| 1.164900 | --- | 19.81 | 46.00 | 26.19 | 15000. | 9.000 | L1 | ON | 9.7 |
| 1.164900 | 30.16 | --- | 56.00 | 25.84 | 15000. | 9.000 | L1 | ON | 9.7 |
| 3.870056 | --- | 17.80 | 46.00 | 28.20 | 15000. | 9.000 | N | ON | 10.0 |
| 3.870056 | 27.89 | --- | 56.00 | 28.11 | 15000. | 9.000 | N | ON | 10.0 |
| 28.003781 | --- | 20.33 | 50.00 | 29.67 | 15000. | 9.000 | L1 | ON | 10.2 |
| 28.003781 | 30.24 | --- | 60.00 | 29.76 | 15000. | 9.000 | L1 | ON | 10.2 |

Note:

- 1.Emission level(quasi-peak or Average peak)=Raw value by receiver + Corr(Insertion loss+ cable loss)
- 2.The raw value is used to calculate by software which is not shown in the sheet.
- 3.Margin=limit value – emission level.
- 4.L1 and N line is all have been tested, the result of them is synthesized in the above data diagram.

*****END OF REPORT*****