



TEST REPORT

No. I21Z70658-EMC07

for

Samsung Electronics Co., Ltd.

Notebook PC

NP750XED

with

FCC ID: ZCANP750XED

Hardware Version: REV1.0

Software Version: Windows11

Issued Date: 2022-1-18

Note:

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The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

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REPORT HISTORY

| Report Number | Revision | Description | Issue Date |
|----------------------|-----------------|-------------------------|-------------------|
| I21Z70658-EMC07 | Rev.0 | 1 st edition | 2022-1-18 |

Note: the latest revision of the test report supersedes all previous versions.

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1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (ISED#: 24849). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

CTTL (Huayuan North Road)

Address: No. 52 Huayuan North Road, Haidian District, Beijing 100191, P.R. China

1.3. Testing Environment

Normal Temperature: 15-35°C
Relative Humidity: 20-75%

1.4. Project data

Testing Start Date: 2021-12-10
Testing End Date: 2022-01-15

1.5. Signature




Li Yan

(Prepared this test report)



Zhang Ying

(Reviewed this test report)



Zhang Xia

Deputy Director of the laboratory
(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name: Samsung Electronics Co., Ltd.
Address: 19 Chapin Rd., Building D Pine Brook, NJ 07058
City: /
Postal Code: /
Country: /
Contact: Jenni Chun
Email: j1.chun@samsung.com
Telephone: +1-201-937-4203

2.2. Manufacturer Information

Company Name: Samsung Electronics. Co., Ltd.
Address: Samsung R5, Maetan dong 129, Samsung ro
Youngtong gu, Suwon city 443 742, Korea
City: /
Postal Code: /
Country: /
Contact: Sunghoon Cho
Email: ggobi.cho@samsung.com
Telephone: +82-10-2722-4159

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

3.1. About EUT

| | |
|-------------|-------------|
| Description | Notebook PC |
| Model name | NP750XED |
| FCC ID | ZCANP750XED |

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL, Telecommunication Technology Labs, CAICT.

3.2. Internal Identification of EUT used during the test

| EUT ID* | IMEI/SN | HW Version | SW Version |
|---------|--------------|------------|------------|
| EUT1 | 2170658UT12a | REV1.0 | Windows 11 |
| EUT2 | 2170658UT15a | REV1.0 | Windows 11 |
| EUT3 | 2170658UT24a | REV1.0 | Windows 11 |

*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 | SN | Remarks |
|--------|-------------|----|---------|
| AE1 | Adapter | / | SOLUM |
| AE2 | Adapter | / | DY |
| AE3 | HDMI Cable | / | / |
| AE4 | Display | / | / |
| AE5 | Mobile HD | / | USB |
| AE6 | Mobile HD | / | USB |
| AE7 | Mobile HD | / | Type-C |
| AE8 | SD card | / | / |
| AE9 | Headset | / | / |
| AE10 | Battery | / | / |

AE1

| | |
|-----------------|----------------|
| Model | EP-TA845 |
| Manufacturer | SOLUM CO.,LTD. |
| Length of cable | / |

AE2

| | |
|-----------------|------------------|
| Model | EP-TA845 |
| Manufacturer | DONGYANG E&P Inc |
| Length of cable | / |

AE10

| | |
|--------------|-------------------------------|
| Model | AA-PBSN4AT |
| Manufacturer | SAMSUNG SDI CO., LTD. (SDI) |

Capacitance /
 Nominal voltage /

Note: The USB cables are shielded.

3.4. General Description

Equipment under Test (EUT) is a model of Notebook PC with integrated antenna.

It consists of normal options: lithium battery and charger.

Manual and specifications of the EUT were provided to fulfill the test.

Samples undergoing test were selected by the client.

For more EUT information please refers to the manufacturer's specifications or user's manual.

3.5. Key component list

| Item | Spec. | Vendor | Vendor Model |
|---------|----------------------------|--|--------------------------------------|
| CPU | Intel Alder Lake-U 28W(I7) | INTEL | INTEL(R) CORE(TM) PROCESSOR I7-1260P |
| | Intel Alder Lake-U 28W(I5) | INTEL | INTEL(R) CORE(TM) PROCESSOR I5-1240P |
| | Celeron 15W | INTEL | INTEL(R) CELERON(R) 7305 |
| WLAN | AX201.D2WG.SNVW | INTEL | AX201D2W |
| Memory | LPDDR4X 16GB | Samsung Electronics Co.,Ltd. (SAMSUNG) | K4UBE3D4AA-MGCR |
| SSD | 512G M.2 2280 PCIe(NVMe) | Samsung Electronics Co.,Ltd. (SAMSUNG) | MZVLQ512HBLU-00BKN |
| | | SOLID STATES STORAGE TECHNOLOGY CORPORATION | CL1-8D512 |
| | 1T M.2 2280 PCIe(NVMe) | Samsung Electronics Co.,Ltd. (SAMSUNG) | MZVLQ1T0HBLB-00BKN |
| | | Western Digital (WD) | SDBPNPZ-1T00 |
| VRAM | GDDR6 2GB | Samsung Electronics Co.,Ltd. (SAMSUNG) | K4Z80325BC-HC14 |
| LCD | 15.6" FHD IPS(Old IC) | BOE | LM156LF5L03 |
| | 15.6" FHD IPS(New IC) | BOE | NE156FHM-NS0 |
| Antenna | / | INNOWAVE | / |
| | / | SPEED | / |

Note: EUT1, EUT2 and EUT3 correspond to the configurations of different key components.



3.6. EUT set-ups

| EUT set-up No. | Combination of EUT and AE | Remarks |
|-----------------------|--|----------------|
| Set.1 | EUT1+AE1 +AE3+AE4+AE5+AE6+AE7+AE8+AE9+AE10 | EUT1+ Adapter1 |
| Set.2 | EUT2+AE1 +AE3+AE4+AE5+AE6+AE7+AE8+AE9+AE10 | EUT2+ Adapter1 |
| Set.3 | EUT3+AE1 +AE3+AE4+AE5+AE6+AE7+AE8+AE9+AE10 | EUT3+ Adapter1 |
| Set.4 | EUT1+AE2 +AE3+AE4+AE5+AE6+AE7+AE8+AE9+AE10 | EUT1+ Adapter2 |

4. Reference Documents

4.1. Documents supplied by applicant

EUT parameters are supplied by the client or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

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

| Reference | Title | Version |
|----------------------------------|--|----------------|
| FCC 47 CFR Part 15, Subpart B | Radio frequency devices - Unintentional Radiators | 2021 |
| ANSI C63.4 | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz | 2014 |

Note: The test methods have no deviation with standards.

5. LABORATORY ENVIRONMENT

Semi-anechoic chamber SAC-1 (23 meters×17meters×10meters) did not exceed following limits along the EMC testing:

| | |
|---|---|
| Temperature | Min. = 15 °C, Max. = 35 °C |
| Relative humidity | Min. = 15 %, Max. = 75 % |
| Shielding effectiveness | 0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB. |
| Electrical insulation | > 2 MΩ |
| Ground system resistance | < 4 Ω |
| Normalised site attenuation (NSA) | < ± 4 dB, 3m distance, from 30 to 1000 MHz |
| Site voltage standing-wave ratio (S_{VSWR}) | Between 0 and 6 dB, from 1GHz to 18GHz |
| Uniformity of field strength | Between 0 and 6 dB, from 80 to 6000 MHz |

Shielded room did not exceed following limits along the EMC testing:

| | |
|--------------------------|---|
| Temperature | Min. = 15 °C, Max. = 35 °C |
| Relative humidity | Min. = 20 %, Max. = 75 % |
| Shielding effectiveness | 0.014MHz-1MHz, >60dB; 1MHz—1000MHz, >90dB. |
| Electrical insulation | > 2 MΩ |
| Ground system resistance | < 4 Ω |

6. SUMMARY OF TEST RESULTS

| Abbreviations used in this clause: | | |
|------------------------------------|----|---|
| Verdict Column | P | Pass |
| | NA | Not applicable |
| | F | Fail |
| | BR | Re-use test data from basic model report. |

| Items | Test Name | Clause in FCC rules | Section in this report | Verdict | Test Location |
|-------|--------------------|---------------------|------------------------|---------|--------------------------|
| 1 | Radiated Emission | 15.109(a) | A.1 | P | CTTL(Huayuan North Road) |
| 2 | Conducted Emission | 15.107(a) | A.2 | P | CTTL(Huayuan North Road) |

7. Test Equipments Utilized

| NO. | Description | TYPE | SERIES NUMBER | MANUFACTURE | CAL DUE DATE | CALIBRATION INTERVAL |
|-----|-------------------------|-----------|---------------|--------------|--------------|----------------------|
| 1 | Test Receiver | ESCI | 100344 | R&S | 2022-02-23 | 1 year |
| 2 | LISN | ENV216 | 101200 | R&S | 2022-05-30 | 1 year |
| 3 | Test Receiver | ESW44 | 103023 | R&S | 2022-10-28 | 1 year |
| 4 | Analytical Spectrometer | FSW67 | 103290 | R&S | 2022-01-20 | 1 year |
| 5 | EMI Antenna | VULB 9163 | 9163-01223 | Schwarzbeck | 2022-03-22 | 1 year |
| 6 | EMI Antenna | 3115 | 00167250 | ETS-Lindgren | 2022-07-01 | 1 year |

ANNEX A: MEASUREMENT RESULTS

A.1 Radiated Emission

Reference

FCC: CFR Part 15.109(a).

A.1.1 Method of measurement

The field strength of radiated emissions from the unintentional radiator at distances of 10 meters (for 30MHz-1GHz) and 3 meters (for above 1GHz) is tested. Tested in accordance with the procedures of ANSI C63.4 – 2014, section 8.3.

The EUT was placed on a non-conductive table and arranged in a typical configuration in accordance with ANSI C63.4-2014 and manipulated to obtain worst case emissions. The measurement antenna was placed at a distance of 3 /10 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT.

For the test setup photographs please see the test setup photos document.

A.1.2 EUT Operating Mode

The EUT exercise program was tested using the Burn-in test program for windows.

The system was configured for testing in a typical mode that a customer would normal use.

Cables were attached to each of the available I/O ports. Where applicable, peripherals were attached to the I/O cables. All the external I/O ports were exercised.

LABTM software is used to let the EUT to continuously copy data to external (Hard Disk & SD card) storage media, read and erase the data after copy action was finished. During the test, the a pattern of “H” characters was written to display on the LCD panel; the camera was in video mode; the music was repetitively played through the headset; the WIFI and BT function was on and worked in receiver mode.

A.1.3 Measurement Limit

| Frequency range (MHz) | Field strength limit ($\mu\text{V}/\text{m}$) | | |
|--------------------------|---|---------|------|
| | Quasi-peak | Average | Peak |
| 30-88 | 100 | | |
| 88-216 | 150 | | |
| 216-960 | 200 | | |
| 960-1000 | 500 | | |
| >1000 | | 500 | 5000 |

Note: the above limit is for 3 meters test distance. 10 meters' limit is got by converting.

Limit (10m) = limit (3m) + 20(log (3/10))

A.1.4 Test Condition

| | |
|-------------|----------------|
| Voltage (V) | Frequency (Hz) |
| 120 | 60 |

| Frequency range (MHz) | RBW/VBW | Sweep Time (s) | Detector |
|-----------------------|-----------------------|----------------|-----------------|
| 30-1000 | 120kHz (IF Bandwidth) | 5 | Peak/Quasi-peak |
| Above 1000 | 1MHz/3MHz | 15 | Peak, Average |

A.1.5 Measurement Results

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss". It includes the antenna factor of receive antenna and the path loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{Mea}} + A_{\text{Rpl}} = P_{\text{Mea}} + G_A + G_{\text{PL}}$$

Where

G_A : Antenna factor of receive antenna

G_{PL} : Path Loss

P_{Mea} : Measurement result on receiver.

Measurement uncertainty (worst case): 30MHz-1GHz: 5.16dB, 1GHz-18GHz: 5.44dB, $k=2$.

Set.1

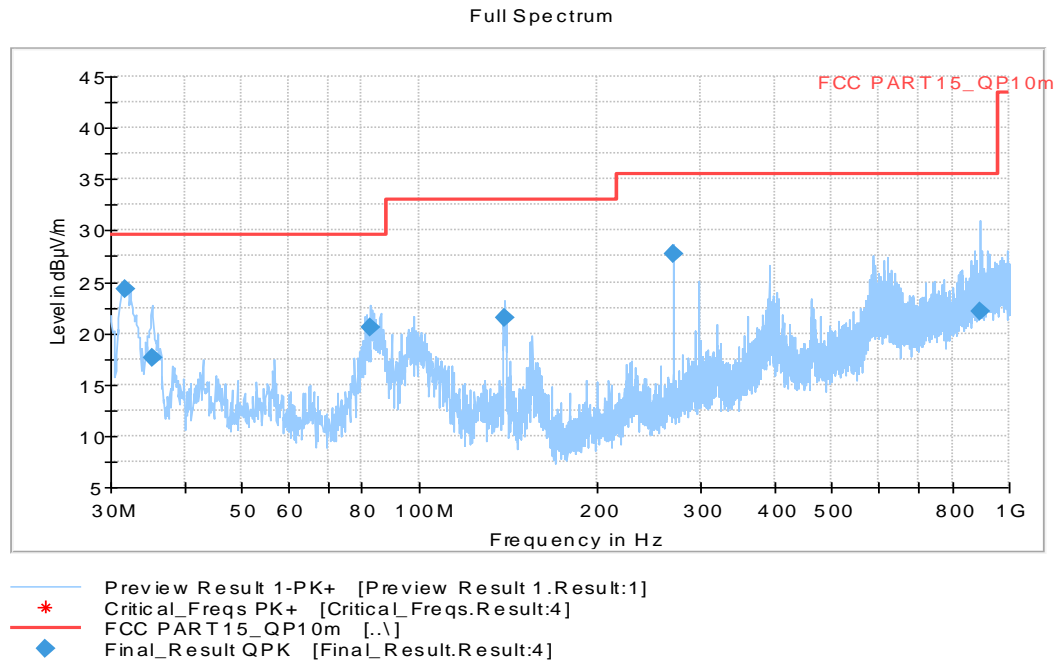


Figure A.1 Radiated Emission from 30MHz to 1GHz

Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|--------------|---------------|
| 31.64900 | 24.29 | 29.54 | 5.25 | 2000.0 | 120.000 | 101.0 | V | 61.0 |
| 35.33500 | 17.59 | 29.54 | 11.95 | 2000.0 | 120.000 | 300.0 | V | 90.0 |
| 82.76800 | 20.64 | 29.54 | 8.90 | 2000.0 | 120.000 | 215.0 | V | -10.0 |
| 139.9980 | 21.53 | 33.06 | 11.53 | 2000.0 | 120.000 | 325.0 | H | 170.0 |
| 269.2990 | 27.71 | 35.56 | 7.85 | 2000.0 | 120.000 | 230.0 | H | 260.0 |
| 891.0690 | 22.17 | 35.56 | 13.39 | 2000.0 | 120.000 | 296.0 | H | 81.0 |

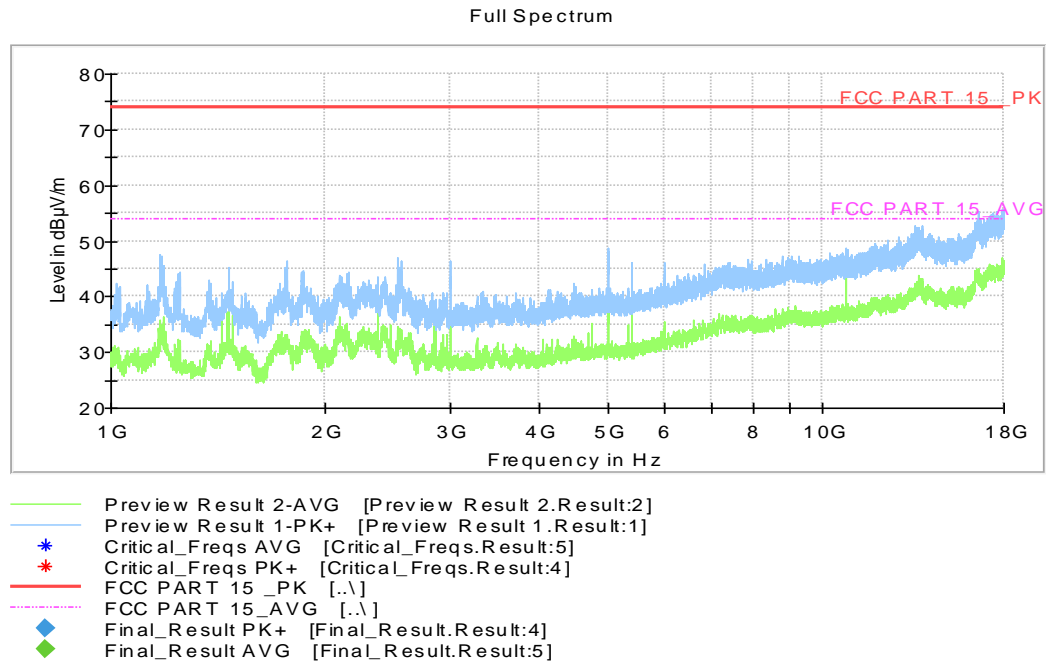


Figure A.2 Radiated Emission from 1GHz to 18GHz

Average detector result

| Frequency (MHz) | Measurement Result (dBµV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBµV) | Limit (dBµV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 1182.47 | 35.40 | -40.00 | 23.99 | 51.41 | 54.00 | 18.60 | V |
| 1462.40 | 40.20 | -39.89 | 24.80 | 55.29 | 54.00 | 13.80 | H |
| 2995.80 | 37.00 | -39.51 | 29.96 | 46.55 | 54.00 | 17.00 | H |
| 4997.83 | 37.60 | -38.79 | 33.33 | 43.07 | 54.00 | 16.40 | V |
| 5400.73 | 42.00 | -38.41 | 34.01 | 46.41 | 54.00 | 12.00 | V |
| 10801.63 | 43.90 | -35.87 | 38.49 | 41.28 | 54.00 | 10.10 | H |

Peak detector result

| Frequency (MHz) | Measurement Result (dBµV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBµV) | Limit (dBµV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 1173.40 | 47.60 | -39.91 | 23.99 | 63.52 | 74.00 | 26.40 | H |
| 1461.83 | 45.10 | -39.89 | 24.80 | 60.19 | 74.00 | 28.90 | V |
| 2530.57 | 46.90 | -39.68 | 28.38 | 58.20 | 74.00 | 27.10 | H |
| 2998.63 | 46.40 | -39.51 | 29.96 | 55.95 | 74.00 | 27.60 | V |
| 4992.17 | 48.80 | -38.79 | 33.33 | 54.27 | 74.00 | 25.20 | H |
| 16599.77 | 55.40 | -29.84 | 39.82 | 45.42 | 74.00 | 18.60 | H |

Set.2

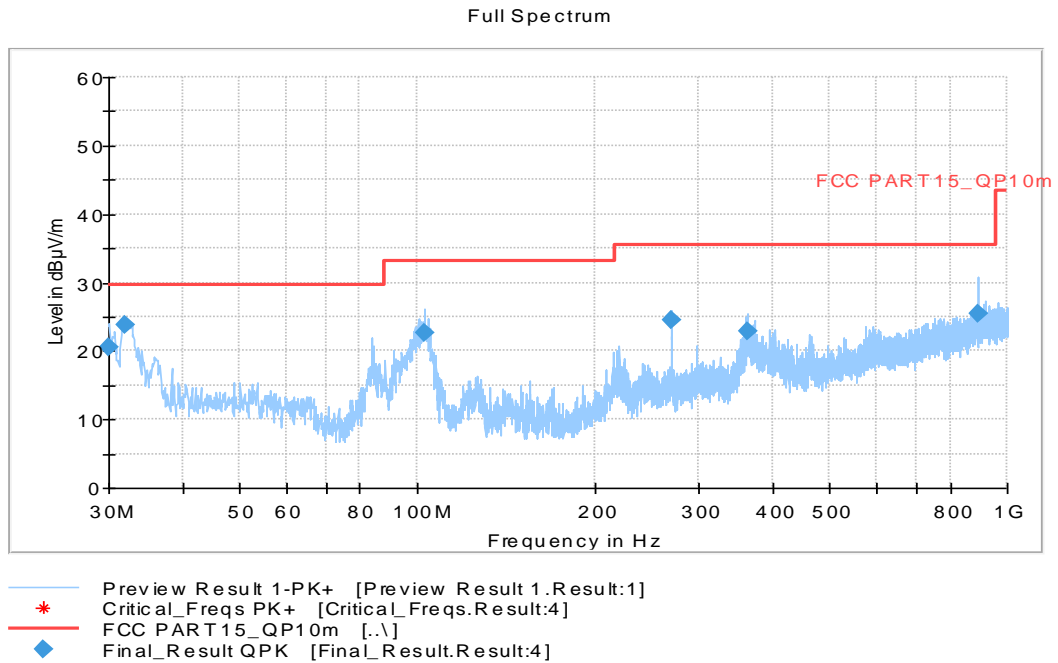


Figure A.3 Radiated Emission from 30MHz to 1GHz

Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|--------------|---------------|
| 30.09700 | 20.51 | 29.54 | 9.03 | 2000.0 | 120.000 | 100.0 | V | 30.0 |
| 32.03700 | 23.83 | 29.54 | 5.71 | 2000.0 | 120.000 | 116.0 | V | 210.0 |
| 102.9440 | 22.57 | 33.06 | 10.49 | 2000.0 | 120.000 | 276.0 | V | 279.0 |
| 269.3960 | 24.54 | 35.56 | 11.02 | 2000.0 | 120.000 | 205.0 | H | 0.0 |
| 362.4190 | 22.92 | 35.56 | 12.64 | 2000.0 | 120.000 | 276.0 | H | 279.0 |
| 890.9720 | 25.34 | 35.56 | 10.22 | 2000.0 | 120.000 | 100.0 | H | 49.0 |

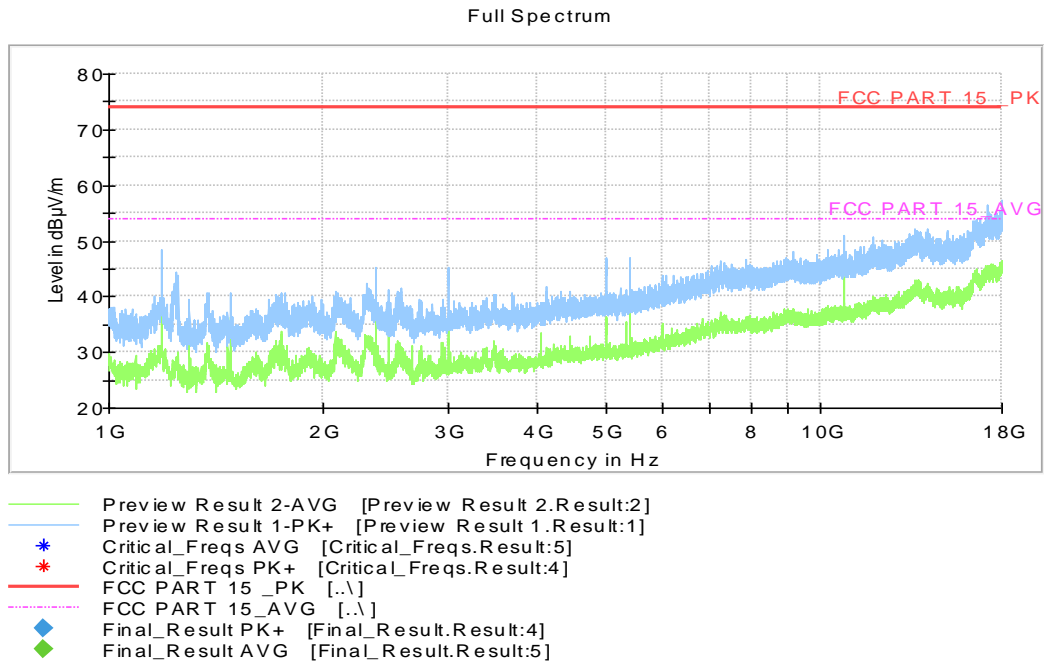


Figure A.4 Radiated Emission from 1GHz to 18GHz

Average detector result

| Frequency (MHz) | Measurement Result (dBµV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBµV) | Limit (dBµV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 1187.57 | 37.80 | -40.00 | 24.03 | 53.77 | 54.00 | 16.20 | H |
| 2375.87 | 42.20 | -39.70 | 27.97 | 53.93 | 54.00 | 11.80 | V |
| 2999.20 | 36.70 | -39.51 | 29.96 | 46.25 | 54.00 | 17.30 | H |
| 5400.73 | 42.50 | -38.41 | 34.01 | 46.91 | 54.00 | 11.50 | H |
| 10801.63 | 43.60 | -35.87 | 38.49 | 40.98 | 54.00 | 10.40 | H |
| 17905.93 | 46.60 | -29.33 | 45.95 | 29.97 | 54.00 | 7.40 | H |

Peak detector result

| Frequency (MHz) | Measurement Result (dBµV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBµV) | Limit (dBµV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 1187.57 | 48.50 | -40.00 | 24.03 | 64.47 | 74.00 | 25.50 | H |
| 2375.87 | 45.30 | -39.70 | 27.97 | 57.03 | 74.00 | 28.70 | V |
| 2999.20 | 45.20 | -39.51 | 29.96 | 54.75 | 74.00 | 28.80 | H |
| 4987.07 | 37.20 | -38.79 | 33.33 | 42.67 | 74.00 | 36.80 | V |
| 4991.03 | 47.00 | -38.79 | 33.33 | 52.47 | 74.00 | 27.00 | V |
| 10802.20 | 51.00 | -35.87 | 38.49 | 48.38 | 74.00 | 23.00 | V |

Set.3

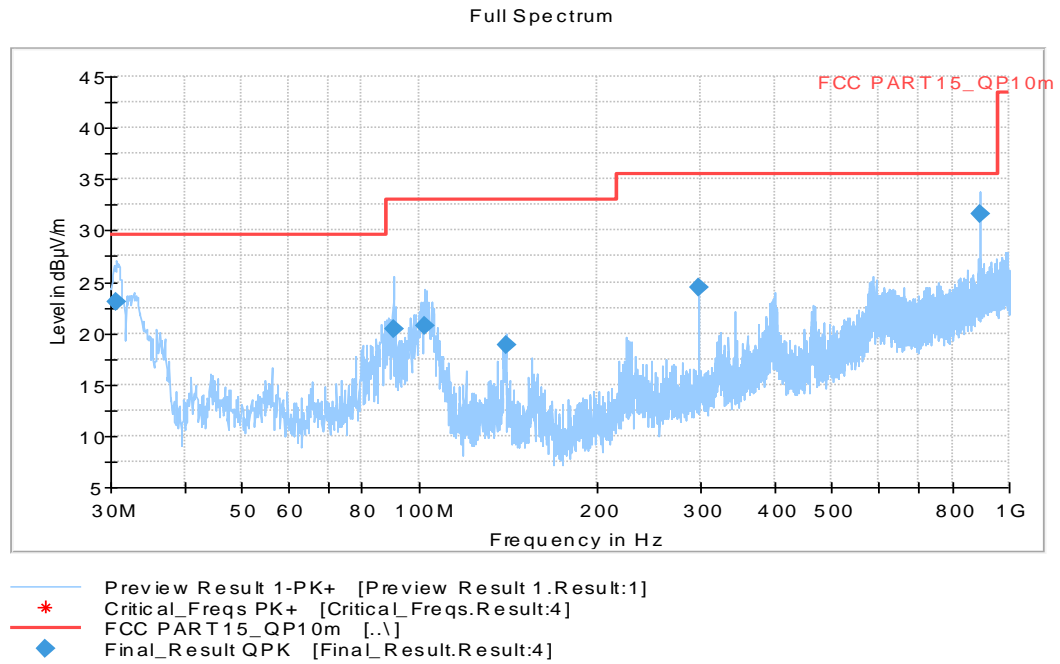


Figure A.5 Radiated Emission from 30MHz to 1GHz

Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|--------------|---------------|
| 30.67900 | 23.10 | 29.54 | 6.44 | 2000.0 | 120.000 | 100.0 | V | 30.0 |
| 90.43100 | 20.39 | 33.06 | 12.67 | 2000.0 | 120.000 | 188.0 | V | -30.0 |
| 102.1680 | 20.73 | 33.06 | 12.33 | 2000.0 | 120.000 | 205.0 | V | 0.0 |
| 140.1920 | 18.81 | 33.06 | 14.25 | 2000.0 | 120.000 | 118.0 | V | 30.0 |
| 296.9440 | 24.48 | 35.56 | 11.08 | 2000.0 | 120.000 | 100.0 | V | 300.0 |
| 890.9720 | 31.66 | 35.56 | 3.90 | 2000.0 | 120.000 | 100.0 | H | 81.0 |

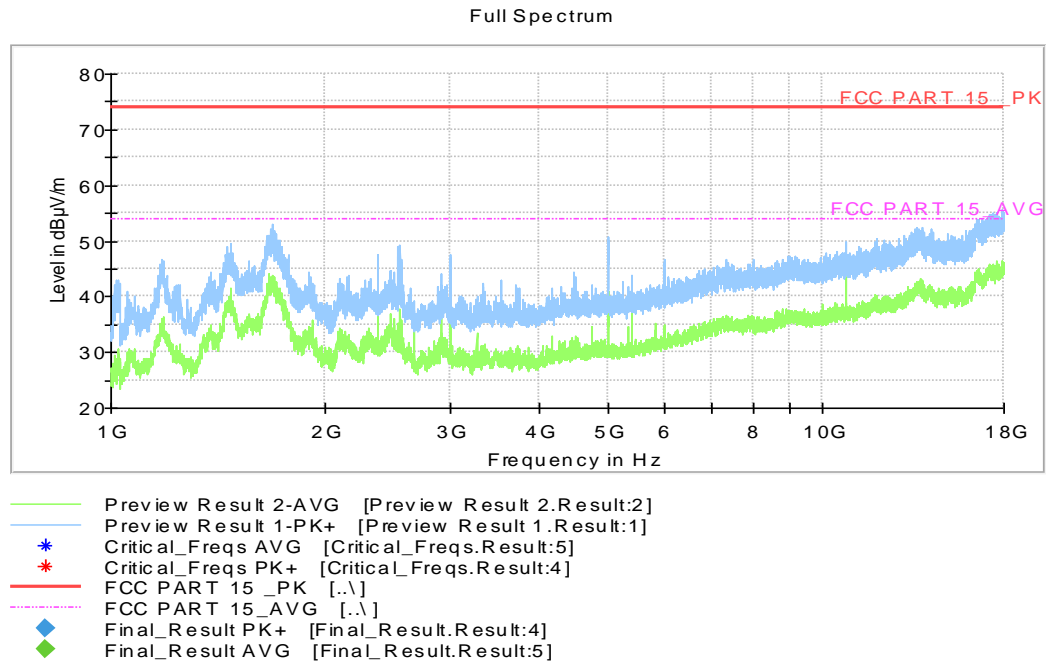


Figure A.6 Radiated Emission from 1GHz to 18GHz

Average detector result

| Frequency (MHz) | Measurement Result (dBµV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBµV) | Limit (dBµV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 1179.63 | 36.10 | -39.91 | 23.99 | 52.02 | 54.00 | 17.90 | V |
| 1685.10 | 43.70 | -39.91 | 25.76 | 57.85 | 54.00 | 10.30 | V |
| 2910.80 | 41.00 | -39.49 | 29.68 | 50.80 | 54.00 | 13.00 | H |
| 4990.47 | 41.10 | -38.79 | 33.33 | 46.57 | 54.00 | 12.90 | V |
| 5400.73 | 40.10 | -38.41 | 34.01 | 44.51 | 54.00 | 13.90 | V |
| 17989.23 | 46.40 | -29.06 | 46.66 | 28.80 | 54.00 | 7.60 | H |

Peak detector result

| Frequency (MHz) | Measurement Result (dBµV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBµV) | Limit (dBµV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 1180.20 | 46.70 | -40.00 | 23.99 | 62.71 | 74.00 | 27.30 | V |
| 1475.43 | 49.50 | -39.89 | 24.84 | 64.56 | 74.00 | 24.50 | H |
| 1688.50 | 53.00 | -39.91 | 25.76 | 67.15 | 74.00 | 21.00 | V |
| 2532.27 | 49.10 | -39.68 | 28.38 | 60.40 | 74.00 | 24.90 | H |
| 2992.97 | 38.70 | -39.51 | 29.96 | 48.25 | 74.00 | 35.30 | H |
| 2995.23 | 47.60 | -39.51 | 29.96 | 57.15 | 74.00 | 26.40 | V |

Set.4

Full Spectrum

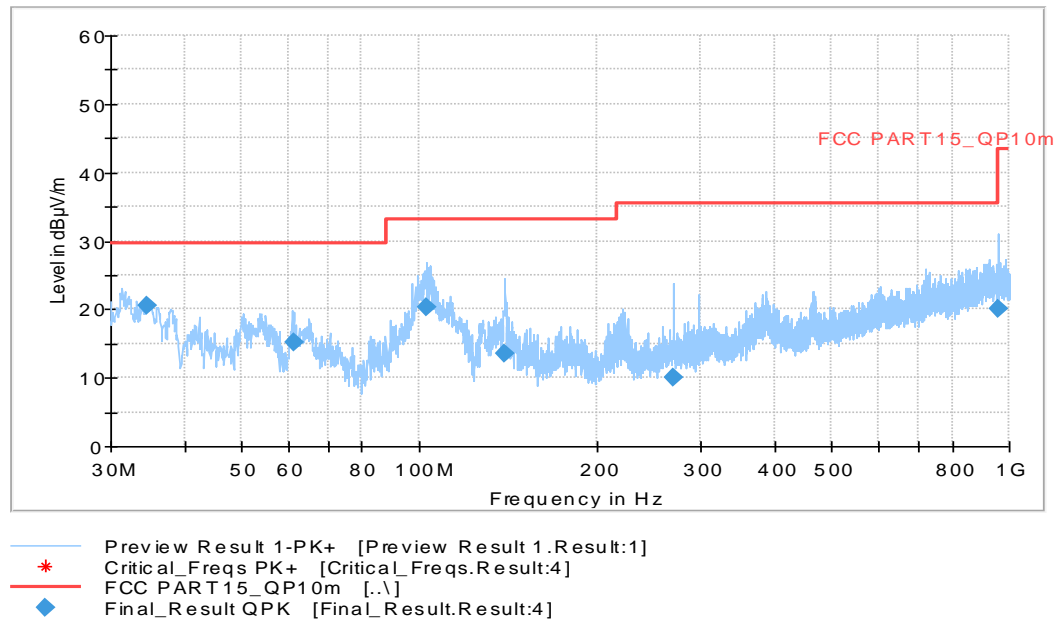


Figure A.7 Radiated Emission from 30MHz to 1GHz

Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|--------------|---------------|
| 34.46200 | 20.61 | 29.54 | 8.93 | 2000.0 | 120.000 | 275.0 | V | 241.0 |
| 61.33100 | 15.23 | 29.54 | 14.31 | 2000.0 | 120.000 | 275.0 | V | 30.0 |
| 102.8470 | 20.26 | 33.06 | 12.80 | 2000.0 | 120.000 | 201.0 | V | 60.0 |
| 139.9010 | 13.65 | 33.06 | 19.41 | 2000.0 | 120.000 | 125.0 | V | 241.0 |
| 268.9110 | 10.01 | 35.56 | 25.55 | 2000.0 | 120.000 | 124.0 | V | 270.0 |
| 960.0360 | 20.12 | 43.52 | 23.40 | 2000.0 | 120.000 | 226.0 | V | 120.0 |

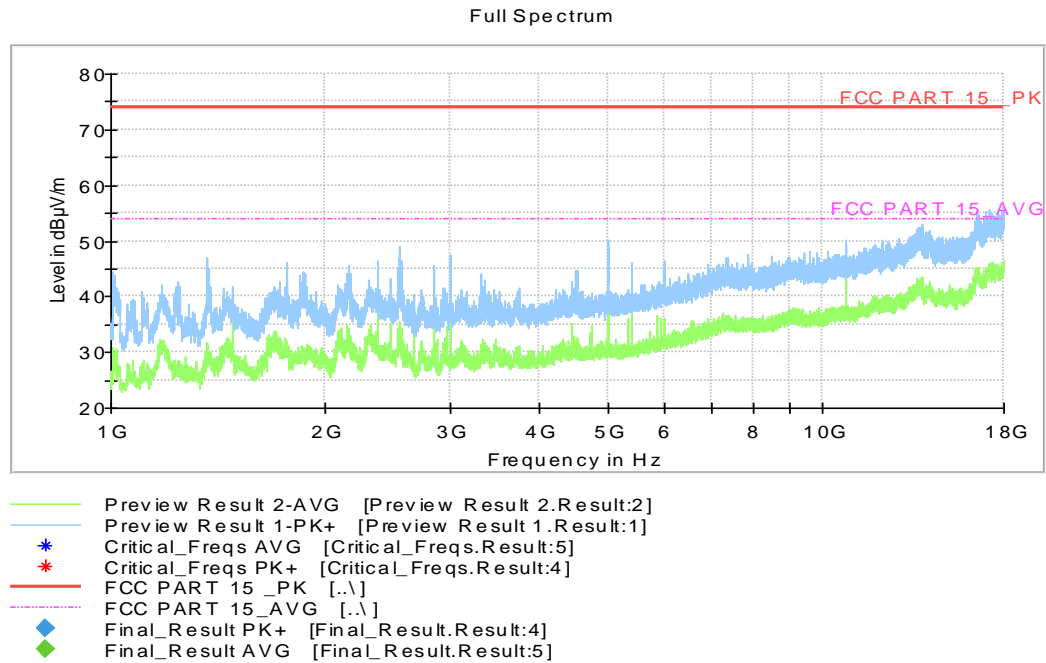


Figure A.8 Radiated Emission from 1GHz to 18GHz

Average detector result

| Frequency (MHz) | Measurement Result (dBµV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBµV) | Limit (dBµV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2375.87 | 43.40 | -39.70 | 27.97 | 55.13 | 54.00 | 10.60 | H |
| 2849.03 | 42.40 | -39.57 | 29.50 | 52.48 | 54.00 | 11.60 | H |
| 2998.63 | 38.80 | -39.51 | 29.96 | 48.35 | 54.00 | 15.20 | H |
| 4996.13 | 39.40 | -38.79 | 33.33 | 44.87 | 54.00 | 14.60 | V |
| 5400.73 | 39.70 | -38.41 | 34.01 | 44.11 | 54.00 | 14.30 | V |
| 10801.63 | 44.00 | -35.87 | 38.49 | 41.38 | 54.00 | 10.00 | H |

Peak detector result

| Frequency (MHz) | Measurement Result (dBµV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBµV) | Limit (dBµV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 1007.93 | 44.30 | -39.83 | 23.40 | 60.73 | 74.00 | 29.70 | V |
| 1363.80 | 47.00 | -39.91 | 24.54 | 62.37 | 74.00 | 27.00 | H |
| 1772.37 | 46.00 | -39.84 | 26.14 | 59.71 | 74.00 | 28.00 | V |
| 2548.13 | 49.10 | -39.69 | 28.48 | 60.31 | 74.00 | 24.90 | H |
| 2994.67 | 47.50 | -39.51 | 29.96 | 57.05 | 74.00 | 26.50 | H |
| 4998.40 | 50.10 | -38.79 | 33.33 | 55.57 | 74.00 | 23.90 | V |

A.2 Conducted Emission

Reference

FCC: CFR Part 15.107(a).

A.2.1 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 within the band 150 kHz to 30 MHz shall not exceed the limits. Tested in accordance with the procedures of ANSI C63.4 – 2014, section 7.3.

For the test setup photographs please see the test setup photos document.

A.2.2 EUT Operating Mode

The EUT exercise program was tested using the Burn-in test program for windows.

The system was configured for testing in a typical mode that a customer would normal use.

Cables were attached to each of the available I/O ports. Where applicable, peripherals were attached to the I/O cables. All the external I/O ports were exercised.

LABTM software is used to let the EUT to continuously copy data to external (Hard Disk & SD card) storage media, read and erase the data after copy action was finished. During the test, the a pattern of “H” characters was written to display on the LCD panel; the camera was in video mode; the music was repetitively played through the headset; the WIFI and BT function was on and worked in receiver mode.

A.2.3 Measurement Limit

| Frequency of emission (MHz) | Conducted limit (dB μ V) | |
|-----------------------------|------------------------------|-----------|
| | 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

A.2.4 Test Condition in charging mode

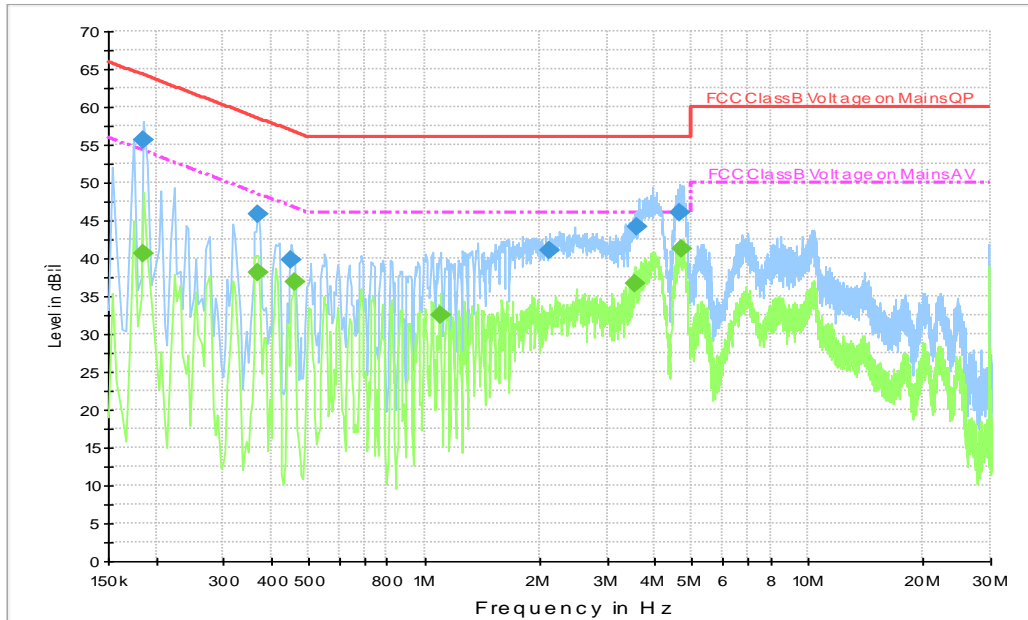
| Voltage (V) | Frequency (Hz) |
|-------------|----------------|
| 120 | 60 |

| RBW/IF bandwidth | Sweep Time(s) |
|------------------|---------------|
| 9kHz | 1 |

A.2.5 Measurement Results

Measurement uncertainty: $U= 3.08 \text{ dB}$, $k=2$.

Set.1



Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Figure A.9 Conducted Emission

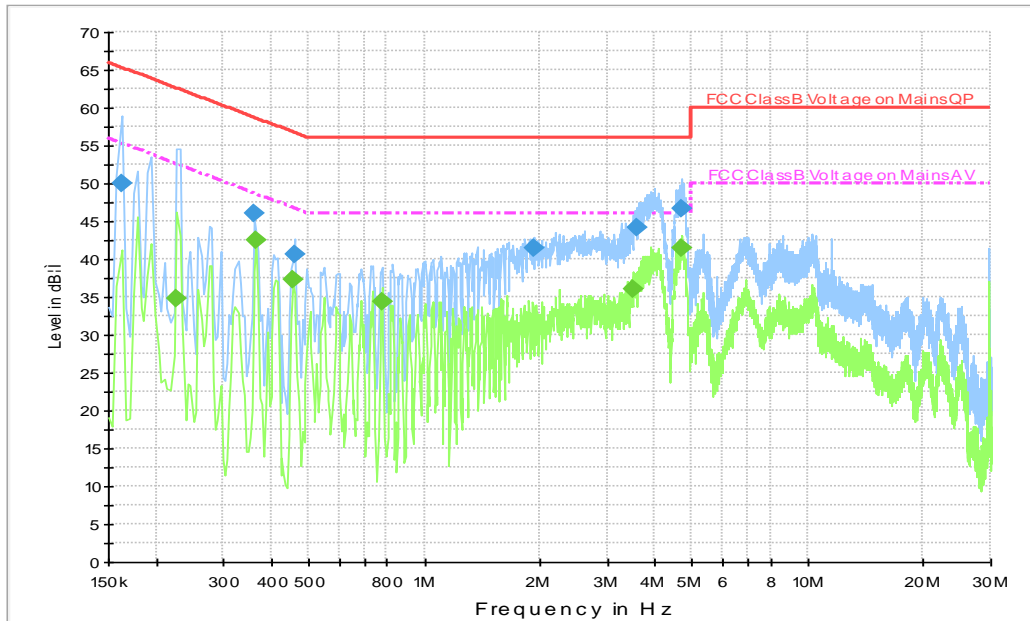
Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.186000 | 55.5 | 2000.0 | 9.000 | On | L1 | 20.0 | 8.7 | 64.2 |
| 0.370000 | 45.7 | 2000.0 | 9.000 | On | L1 | 19.9 | 12.8 | 58.5 |
| 0.450000 | 39.8 | 2000.0 | 9.000 | On | L1 | 19.9 | 17.0 | 56.9 |
| 2.114000 | 41.0 | 2000.0 | 9.000 | On | L1 | 19.5 | 15.0 | 56.0 |
| 3.594000 | 44.2 | 2000.0 | 9.000 | On | L1 | 19.5 | 11.8 | 56.0 |
| 4.618000 | 46.1 | 2000.0 | 9.000 | On | L1 | 19.6 | 9.9 | 56.0 |

Final Result 2

| Frequency (MHz) | Average (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|----------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.186000 | 40.7 | 2000.0 | 9.000 | On | L1 | 20.0 | 13.5 | 54.2 |
| 0.370000 | 38.1 | 2000.0 | 9.000 | On | L1 | 19.9 | 10.4 | 48.5 |
| 0.458000 | 36.9 | 2000.0 | 9.000 | On | L1 | 19.9 | 9.8 | 46.7 |
| 1.102000 | 32.5 | 2000.0 | 9.000 | On | L1 | 19.5 | 13.5 | 46.0 |
| 3.538000 | 36.7 | 2000.0 | 9.000 | On | L1 | 19.5 | 9.3 | 46.0 |
| 4.694000 | 41.2 | 2000.0 | 9.000 | On | L1 | 19.6 | 4.8 | 46.0 |

Set.2



Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Figure A.10 Conducted Emission

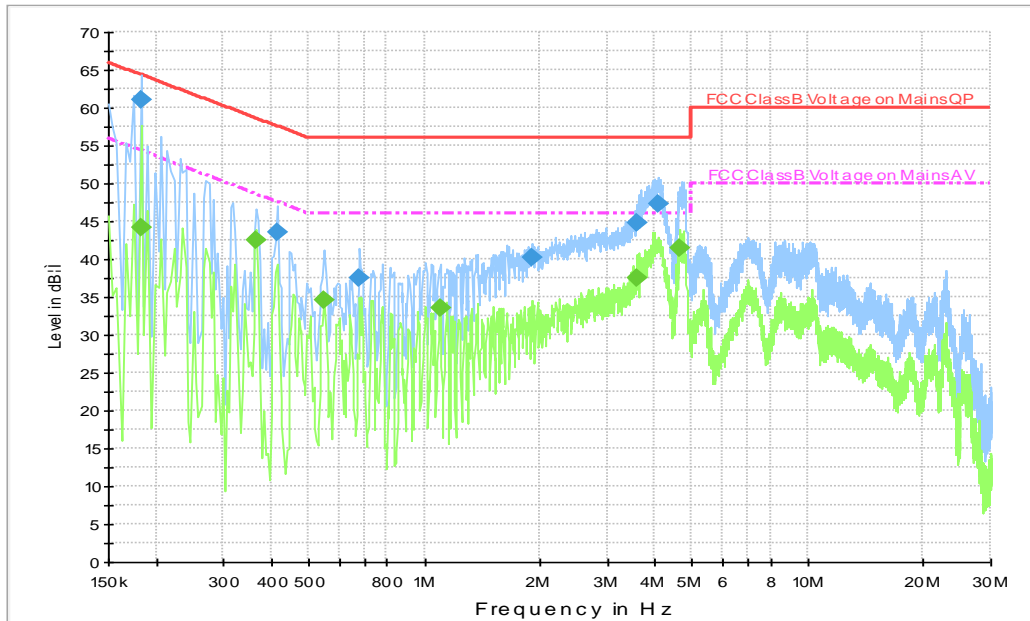
Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.162000 | 50.0 | 2000.0 | 9.000 | On | L1 | 20.0 | 15.4 | 65.4 |
| 0.362000 | 46.0 | 2000.0 | 9.000 | On | L1 | 19.9 | 12.6 | 58.7 |
| 0.458000 | 40.5 | 2000.0 | 9.000 | On | L1 | 19.9 | 16.2 | 56.7 |
| 1.930000 | 41.5 | 2000.0 | 9.000 | On | L1 | 19.4 | 14.5 | 56.0 |
| 3.590000 | 44.3 | 2000.0 | 9.000 | On | L1 | 19.5 | 11.7 | 56.0 |
| 4.670000 | 46.6 | 2000.0 | 9.000 | On | L1 | 19.6 | 9.4 | 56.0 |

Final Result 2

| Frequency (MHz) | Average (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|----------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.226000 | 34.7 | 2000.0 | 9.000 | On | N | 19.8 | 17.9 | 52.6 |
| 0.366000 | 42.5 | 2000.0 | 9.000 | On | L1 | 19.9 | 6.0 | 48.6 |
| 0.454000 | 37.3 | 2000.0 | 9.000 | On | L1 | 19.9 | 9.5 | 46.8 |
| 0.778000 | 34.3 | 2000.0 | 9.000 | On | L1 | 19.7 | 11.7 | 46.0 |
| 3.490000 | 36.1 | 2000.0 | 9.000 | On | L1 | 19.5 | 9.9 | 46.0 |
| 4.670000 | 41.4 | 2000.0 | 9.000 | On | L1 | 19.6 | 4.6 | 46.0 |

Set.3



Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Figure A.11 Conducted Emission

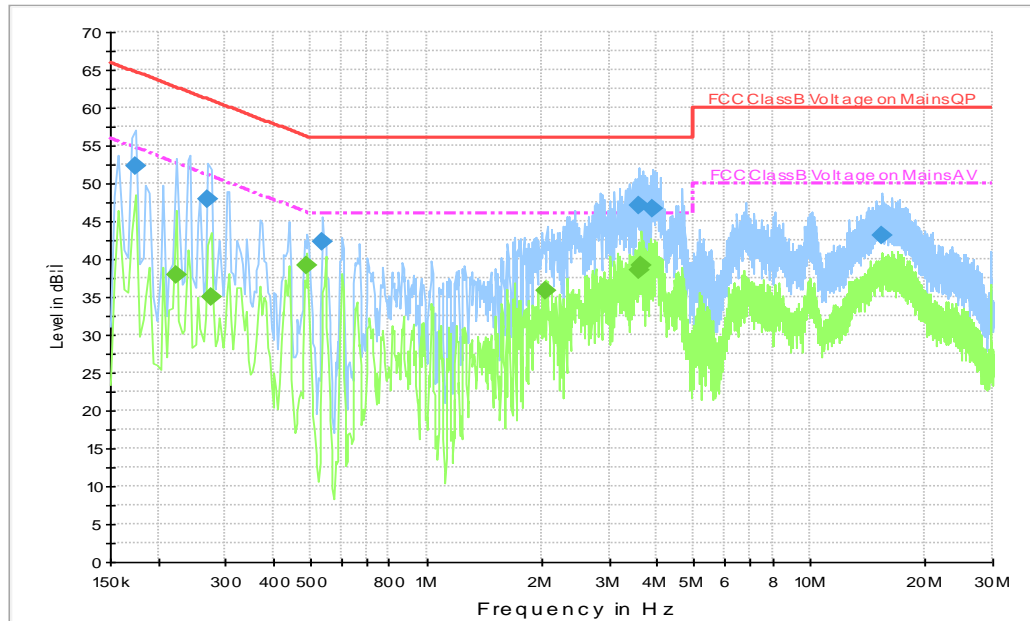
Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.182000 | 61.1 | 2000.0 | 9.000 | On | L1 | 20.0 | 3.3 | 64.4 |
| 0.414000 | 43.5 | 2000.0 | 9.000 | On | L1 | 19.9 | 14.1 | 57.6 |
| 0.678000 | 37.6 | 2000.0 | 9.000 | On | L1 | 19.7 | 18.4 | 56.0 |
| 1.914000 | 40.3 | 2000.0 | 9.000 | On | L1 | 19.4 | 15.7 | 56.0 |
| 3.590000 | 44.8 | 2000.0 | 9.000 | On | L1 | 19.5 | 11.2 | 56.0 |
| 4.086000 | 47.4 | 2000.0 | 9.000 | On | L1 | 19.6 | 8.6 | 56.0 |

Final Result 2

| Frequency (MHz) | Average (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|----------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.182000 | 44.1 | 2000.0 | 9.000 | On | L1 | 20.0 | 10.3 | 54.4 |
| 0.366000 | 42.4 | 2000.0 | 9.000 | On | L1 | 19.9 | 6.2 | 48.6 |
| 0.546000 | 34.6 | 2000.0 | 9.000 | On | L1 | 19.9 | 11.4 | 46.0 |
| 1.098000 | 33.5 | 2000.0 | 9.000 | On | L1 | 19.5 | 12.5 | 46.0 |
| 3.590000 | 37.5 | 2000.0 | 9.000 | On | L1 | 19.5 | 8.5 | 46.0 |
| 4.638000 | 41.5 | 2000.0 | 9.000 | On | L1 | 19.6 | 4.5 | 46.0 |

Set.4



Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Figure A.12 Conducted Emission

Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.174000 | 52.2 | 2000.0 | 9.000 | On | L1 | 20.0 | 12.5 | 64.8 |
| 0.270000 | 47.8 | 2000.0 | 9.000 | On | N | 19.8 | 13.3 | 61.1 |
| 0.538000 | 42.2 | 2000.0 | 9.000 | On | L1 | 19.9 | 13.8 | 56.0 |
| 3.582000 | 47.1 | 2000.0 | 9.000 | On | N | 19.7 | 8.9 | 56.0 |
| 3.894000 | 46.7 | 2000.0 | 9.000 | On | N | 19.7 | 9.3 | 56.0 |
| 15.454000 | 43.2 | 2000.0 | 9.000 | On | N | 20.0 | 16.8 | 60.0 |

Final Result 2

| Frequency (MHz) | Average (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|----------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.222000 | 37.9 | 2000.0 | 9.000 | On | N | 19.8 | 14.9 | 52.7 |
| 0.274000 | 35.0 | 2000.0 | 9.000 | On | L1 | 20.0 | 16.0 | 51.0 |
| 0.490000 | 39.3 | 2000.0 | 9.000 | On | N | 20.0 | 6.9 | 46.2 |
| 2.058000 | 35.7 | 2000.0 | 9.000 | On | N | 19.7 | 10.3 | 46.0 |
| 3.602000 | 38.6 | 2000.0 | 9.000 | On | N | 19.7 | 7.4 | 46.0 |
| 3.646000 | 39.1 | 2000.0 | 9.000 | On | N | 19.7 | 6.9 | 46.0 |



ANNEX B: Persons involved in this testing

| Test Item | Tester |
|--------------------|------------------------------------|
| Radiated Emission | DING Zai, ZHANG Tianli, LI Pengfei |
| Conducted Emission | ZHANG Tianli |

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