# EMC TEST REPORT

| | | | |
|---|---|---|---|
| **Project No.** | LBE20191415 | **Issue No.** | 1 |
| **Applicant** | **Name of organization** | Samsung Electronics Co., Ltd. | |
| | **Address** | (Maetan-dong) 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea | |
| | **Date of application** | December 3, 2019 | |
| **EUT** | **Type of device** | ☒ All other Receivers subject to part15<br>☒ Class B Personal Computers and peripherals<br>☒ Other Class B digital devices and peripherals<br>☐ FM Broadcast Receiver | |
| | **Equipment authorization** | ☒ Certification ☐ Supplier's Declaration of Conformity | |
| | **FCC ID** | A3LSMG981B | |
| | **Kind of product** | Mobile Phone | |
| | **Model No.** | SM-G981B/DS | |
| | **Variant Model No.** | Refer to clause 4.6 | |
| | **Manufacturer** | SAMSUNG ELECTRONICS VIETNAM CO.,LTD<br>Yenphong 1 - I.P Yentrung Commune, Yenphong Dist., Bac Ninh Province, Vietnam | |
| **Applied Standards** | | 47 CFR Part 15, Subpart B, Class B / ANSI C63.4-2014 | |
| **Test Period** | | December 4, 2019 ~ December 6, 2019 | |
| **Issue date** | | January 7, 2020 | |

**Test result** : **Complied**

The equipment under test has found to be compliant with the applied standards.
(Refer to the attached test result for more detail.)

| | |
|---|---|
| **Tested by** : Sun-Ho Kim | **Reviewed by** : Sung-Wook Choi |

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Global CS Center of Samsung Electronics Co., Ltd.
(Maetan-dong) 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea

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# 1. Report Information

## 1.1 Revision history

| No. | Date of Issue | Revised detailed information |
|---|---|---|
| Issue 0 | 6 December 2019 | There are no revisions and this version is basic test report. |
| Issue 1 | 13 December 2019 | Changed model name of data cable in clause 4.1 |
| Issue 2 | 27 December 2019 | Changed model name of data cable in clause 4.1<br>- EP-DN970 → EP-DG980 |
| Issue 3 | 7 January 2020 | FM Broadcast Receiver of Type of device on Page 1 changed to uncheck. |

※ Remark
Compliance with Part 15B requirements for the receiver part of the licensed transmitter (equipment code CXX) is covered by other test report.

# 2. Summary of test results

## 2.1 Emission

The EUT has been tested according to the following specifications:

| Applied | Test type | Applied standard | Result |
|---|---|---|---|
| ☒ | Conducted Disturbance (Mains port) | 47 CFR Part 15 Subpart B / ANSI C63.4-2014 (Class B) | Complied |
| ☒ | Radiated Disturbance | | Complied |

# 3. General Information

## 3.1 Test facility

The Global CS Center is located on Samsung Electronics Co., Ltd. at (Maetan-dong) 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea.
All testing are performed in Semi-anechoic chambers conforming to the site attenuation characteristics defined by ANSI C63.4, CISPR 32, CISPR 16-1-4 and Shielded rooms.
And all antennas are properly calibrated using ANSI C63.5:2017.

The Global CS Center is an ISO/IEC 17025:2005 accredited testing laboratory by the National Radio Research Agency with designation No. KR0004. for EMC testing.



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# 4. Test Setup configuration

## 4.1 Test Peripherals

The cables used for these peripherals are either permanently attached by the peripheral manufacturer or coupled with an assigned cable as defined below.
The following is a listing of the EUT and peripherals utilized during the performance of EMC test:

| Mark | Description | Model No. | Serial No. | Manufacturer / Trademark | FCC ID |
|---|---|---|---|---|---|
| A | Mobile Phone | SM-G981B/DS | - | SAMSUNG | A3LSMG981B |
| B | Battery | EB-BG980ABY | - | SAMSUNG | - |
| C | Headset | YBD-19HS | - | SAMSUNG | - |
| D | Data Cable | EP-DG980 | - | SAMSUNG | - |
| E | Micro SD Card | 64GB | - | SAMSUNG | - |
| F | Laptop Computer | Latitude5580 | 1CHRYM2 | Dell | DoC |
| | | Latitude5580 | D3HRYM2 | Dell | DoC |
| G | Laptop AC Adapter | LA65NM130 | 5D77 | Dell | DoC |
| | | LA65NM130 | 5B3C | Dell | DoC |
| H | Mouse | AA-SM7PCPB | CN57BA5903634ADV 8JJCD4371 | SAMSUNG | DoC |
| | | | CNBA5903634ADV8J 31O3050 | SAMSUNG | DoC |
| I | Router | DIR-806A | RF0F1D8011501 | D-Link | DoC |
| | | | RF0F1D8011504 | D-Link | DoC |
| J | Travel Adapter | EP-TA800 | R37M5WS3DY1SE3 | SAMSUNG | - |
| K | OTG Gender | EE-UG970 | - | SAMSUNG | - |
| L | USB Memory Stick | 64GB | - | SANDISK | |
| M | DP Monitor | 27UD88 | 711NTQD8H004 | LG | - |
| N | DP Monitor AC Adaptor | LCAP31 | EH8NN629490055062 | LG | - |
| O | DP Cable | JCA141 | BW2K1709000770 | J5CREATE | - |



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## 4.2 EUT operating mode

To achieve compliance applied standard specification including CXX, JAB and JBP requirement, the following mode(s) were made during compliance testing:

### 4.2.1 Conducted Emission

| No. | Operating mode |
|---|---|
| 1 | Camera (rear) + Charging (w/ TA) + Cellular receiver (LTE FDD26 Center Frequency) |
| 2 | Camera (front) + Charging (w/ TA) |
| 3 | Video + Audio playback from internal memory data + Charging (w/ TA) |
| 4 | USB Data Communication with PC (from external memory data) |

### 4.2.2 Radiated Emission

| No. | Operating mode |
|---|---|
| 1 | Camera (rear) + Charging (w/ TA) |
| 2 | Camera (front) + USB OTG (w/ USB gender: memory stick) |
| 3 | Video + Audio playback from internal memory data (w/ Headset) |
| 4 | Video + Audio playback from internal memory data + Display out (w/ USB to Direct DP cable) |
| 5 | USB Data Communication with PC (from external memory data) |

## 4.3 Details of Sampling

Customer selected, single unit.



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## 4.4 Used cable description

The EUT is configured, installed, arranged and operated in a manner consistent with typical applications. Interface cables/loads/devices are connected to at least one of each type of interface port of the EUT, and where practical, each cable shall be terminated in a device typical of actual usage. The type(s) of interconnecting cables to be used and the interface port (of the EUT) to which these were connected:

| No. | Connected cable | Length [m] | Shielded [Y/N] | Note |
|---|---|---|---|---|
| 1 | Data Cable | 1.0 | Y | From EUT to Laptop Computer |
| 2 | Headset | 1.2 | N | For EUT |
| 3 | Power | 1.8 | N | From Laptop Computer to AC Adapter |
| 4 | Power | 1.5 | N | For Laptop AC Adapter |
| 5 | LAN | 1.5 | N | From Laptop Computer to Router |
| 6 | USB | 0.8 | N | From Laptop Computer to Router for DC Power |
| 7 | USB | 1.8 | N | From Laptop Computer to Mouse |
| 8 | DP Cable | 1.2 | Y | From DP Monitor to EUT |
| 9 | Power | 1.2 | N | From DP Monitor to AC Adapter |
| 10 | Power | 1.5 | N | For DP Monitor AC Adapter |



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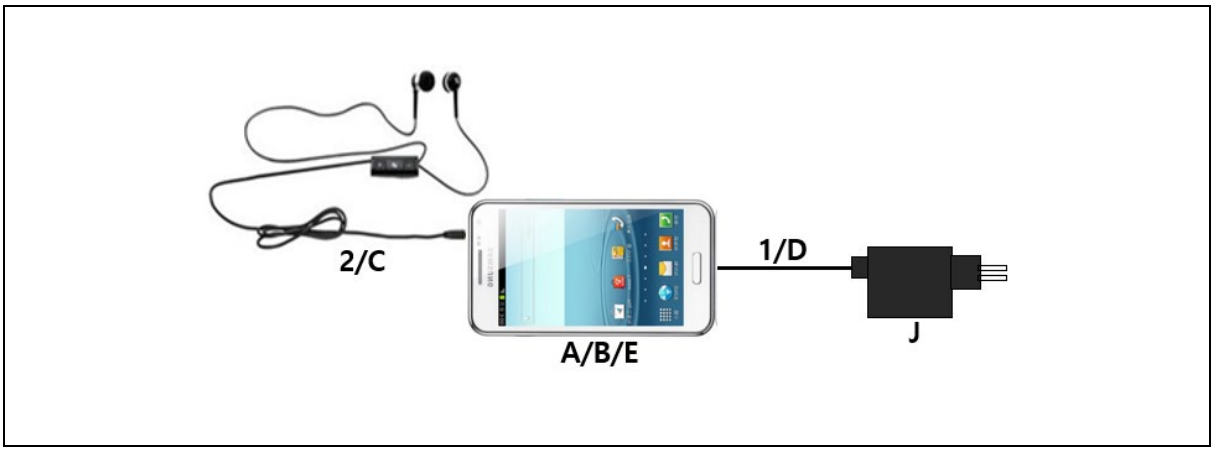
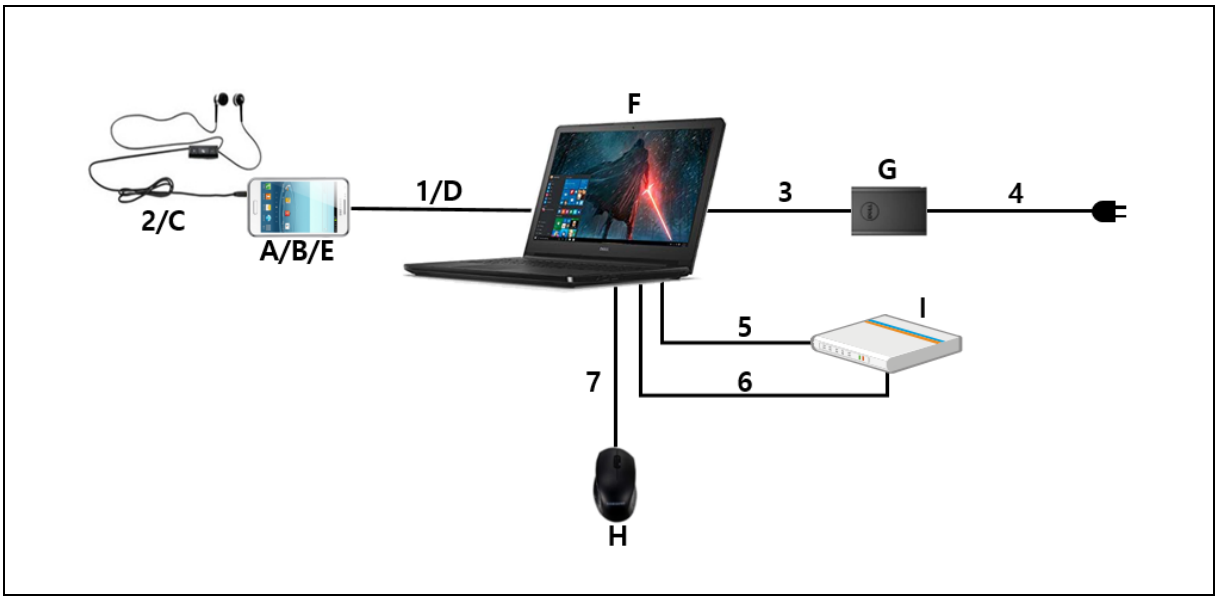
## 4.5 Test arrangement

### 4.5.1 Conducted Emission




**[ Mode 1 - 3 ]**




**[ Mode 4 ]**



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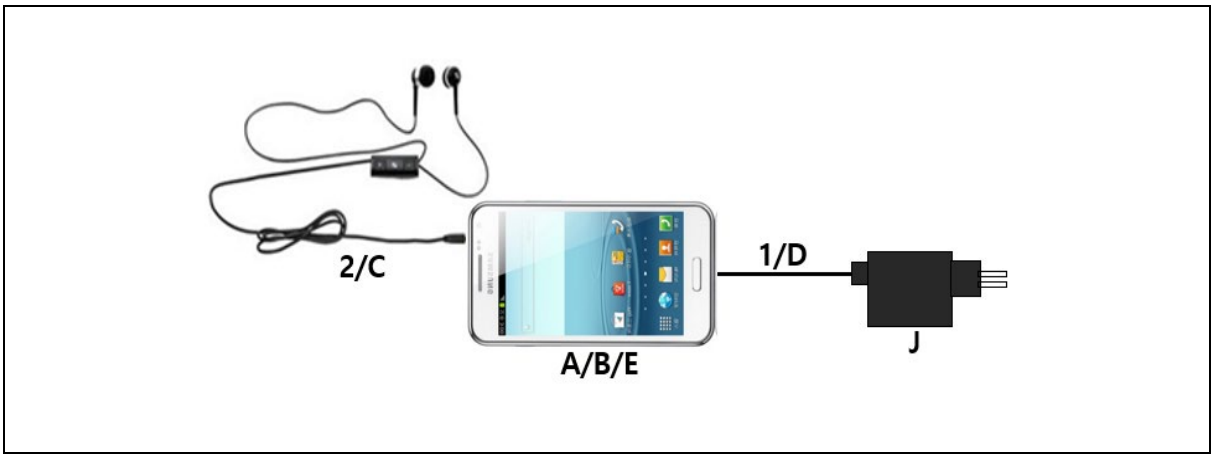
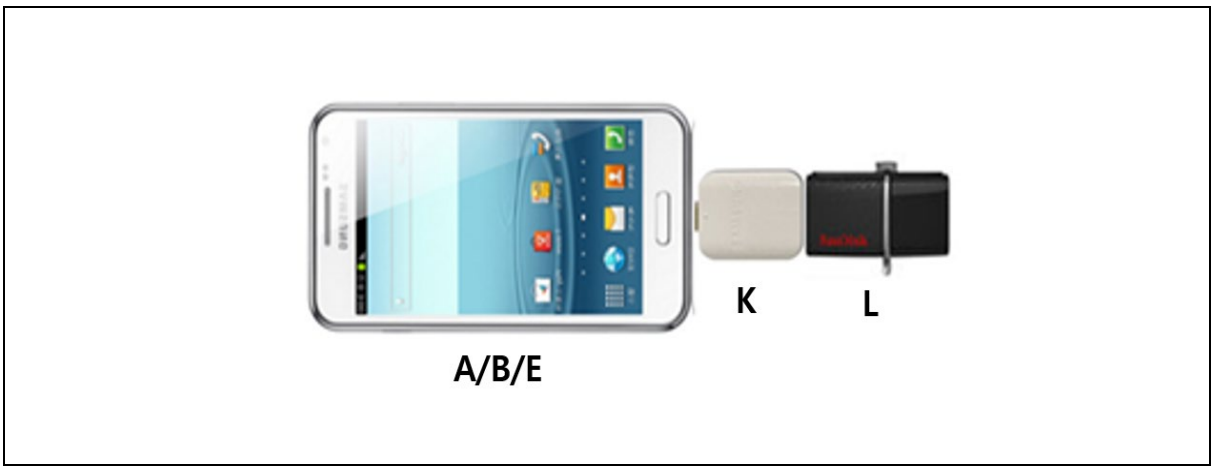
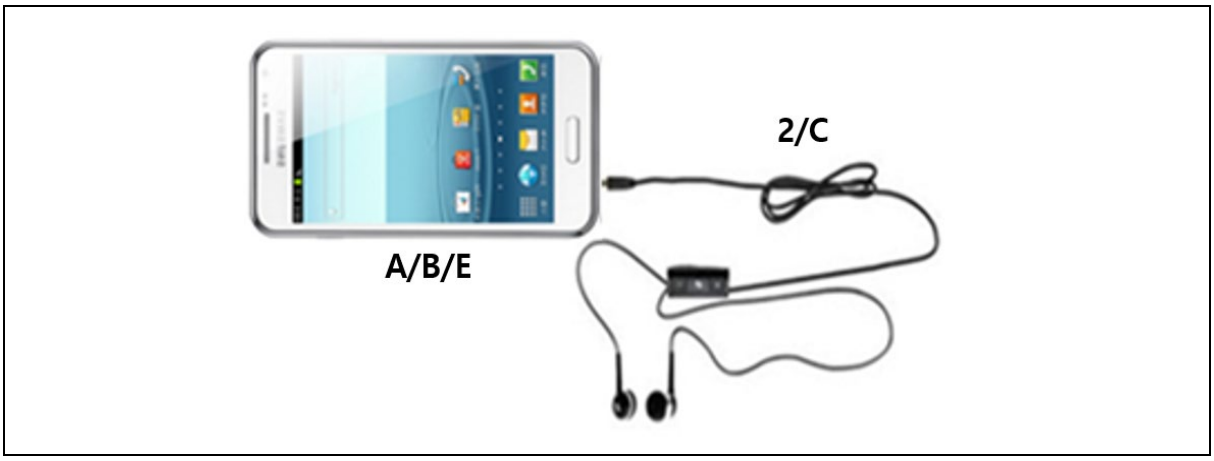
## 4.5.2 Radiated Emission




**[ Mode 1 ]**




**[ Mode 2 ]**




**[ Mode 3 ]**



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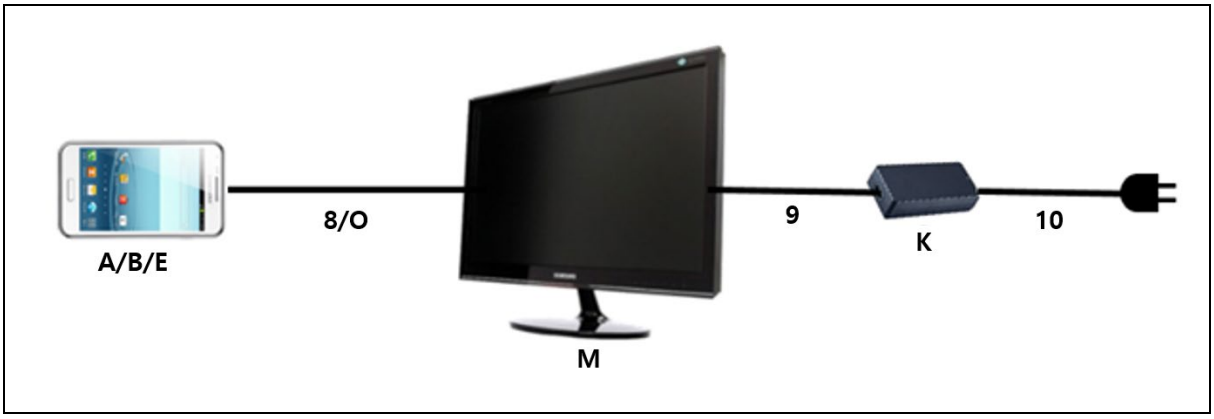
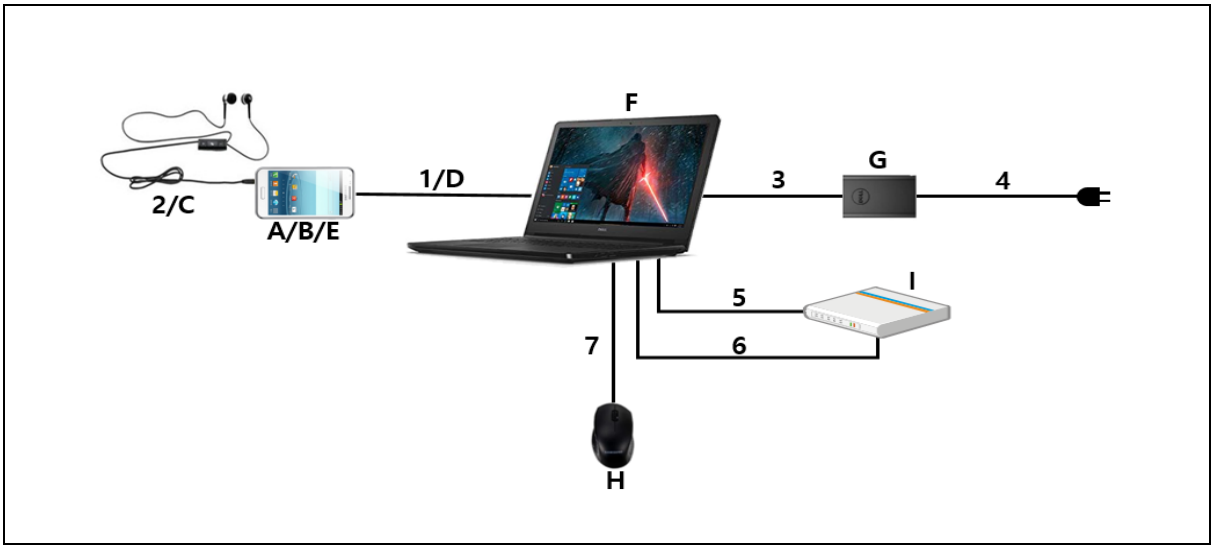



**[ Mode 4 ]**




**[ Mode 5 ]**

## 4.6 EUT Description

The EUT is a bar type Mobile Phone which can operate on GSM 850/900/1800/1900, WCDMA FDD 1/2/4/5/8, LTE FDD 1/2/3/4/5/7/8/12/13/17/18/19/20/25/26/28/32/66, LTE TDD 38/39/40/41 and incorporate Bluetooth, ANT+, Wi-Fi, NFC, GNSS, MST, OTG, Wireless Charging, DisplayPort, Camera, Audio and Video.

4.6.1 The variant models

- SM-G981B

## 4.7 EUT Frequencies

| The highest frequencies (Generated and used) | Frequency [ MHz ] |
|---|---|
| Wi-Fi | 5 825 |



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## 4.8 Test configuration and condition

The system was configured for testing in a typical fashion that a customer would normally 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 are exercised, as well as internal and the external SD card, by writing and reading arbitrary data or charging with TA.

The EUT was investigated in three orientations and the worst case orientation is reported.

RX mode(850MHz) testing was performed with the LTE FDD26 RX Test mode at center frequency. All licensed communication (850MHz) RX mode, GSM/WCDMA/LTE, test results are not significantly different.

The video and audio were repetitively played with earphone connected.

The video and music were played on monitor through Display Out function using direct DP Cable.

The camera of the EUT was operated continuously.

The EUT was connected to USB memory stick using USB OTG gender.

Power source for the EUT operating was supplied by CVCF made by the Pacific Corp.

**- Test Voltage : AC 120 V, 60 Hz**

## 4.9 Measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus: (According to CISPR 16-4-2 and UKAS M3003)

4.9.1 Emission

| Test type | | Measurement uncertainty (C.L. 95 %, k = 2) |
|---|---|---|
| Conducted disturbance | AC Mains | 2.83 dB |
| Radiated Disturbance (30 MHz ~ 1 GHz) | Horizontal | 4.99 dB |
| | Vertical | 4.91 dB |
| Radiated Disturbance (1 GHz ~ 6 GHz) | Horizontal | 5.03 dB |
| | Vertical | 5.04 dB |
| Radiated Disturbance (6 GHz ~ 18 GHz) | Horizontal | 5.11 dB |
| | Vertical | 5.12 dB |



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# 5. Results of individual test

## 5.1 Conducted disturbance

The EUT is connected to a LISN via travel adapter. If the EUT is connected to the Laptop Computer USB port, the Laptop AC adapter is connected to a LISN.

Both conducted lines are measured in Quasi-Peak and CISPR-Average mode, including the worst-case data points for each tested configuration. The EUT measured in accordance with the methods described in standards.

**Limits for conducted disturbance at the mains ports of Class B ITE**

| Frequency range Limits [ MHz ] | Resolution Bandwidth [ kHz ] | Limits [ dB(μV) ] | |
|---|---|---|---|
| | | Quasi-peak | Average |
| 0,15 to 0,50 | 9 | 66 to 56 | 56 to 46 |
| 0,50 to 5 | 9 | 56 | 46 |
| 5 to 30 | 9 | 60 | 50 |
| NOTE 1 The lower limit shall apply at the transition frequency.<br>NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz. | | | |

### 5.1.1 Test instrumentation

| EMC No. | Test Instrument | Model name | Manufacturer | Serial No. | Calibration | |
|---|---|---|---|---|---|---|
| | | | | | Date | Interval (Month) |
| E5I-017 | EMI Test Receiver | ESU8 | R&S | 100483 | 2019-01-16 | 12 |
| E5I-127 | LISN | ENV216 | R&S | 102061 | 2019-08-01 | 12 |
| - | Test software | EMC32 | R&S | Ver 9.26.01 | - | - |

### 5.1.2 Temperature and humidity condition

| | | | |
|---|---|---|---|
| **Test date** | 2019-12-04 | **Test engineer** | Sun-Ho Kim |
| **Climate condition** | Ambient temperature | (21.3 ~ 21.5) ℃ | Limit (15.0 to 35.0) ℃ |
| | Relative humidity | (41.0 ~ 41.4) % R.H. | Limit (25.0 to 75.0) % R.H. |
| | Atmospheric pressure | (101.4 ~ 101.6) kPa | Limit (86.0 to 106.0) kPa |
| **Test place** | Shield Room (SR8) | | |



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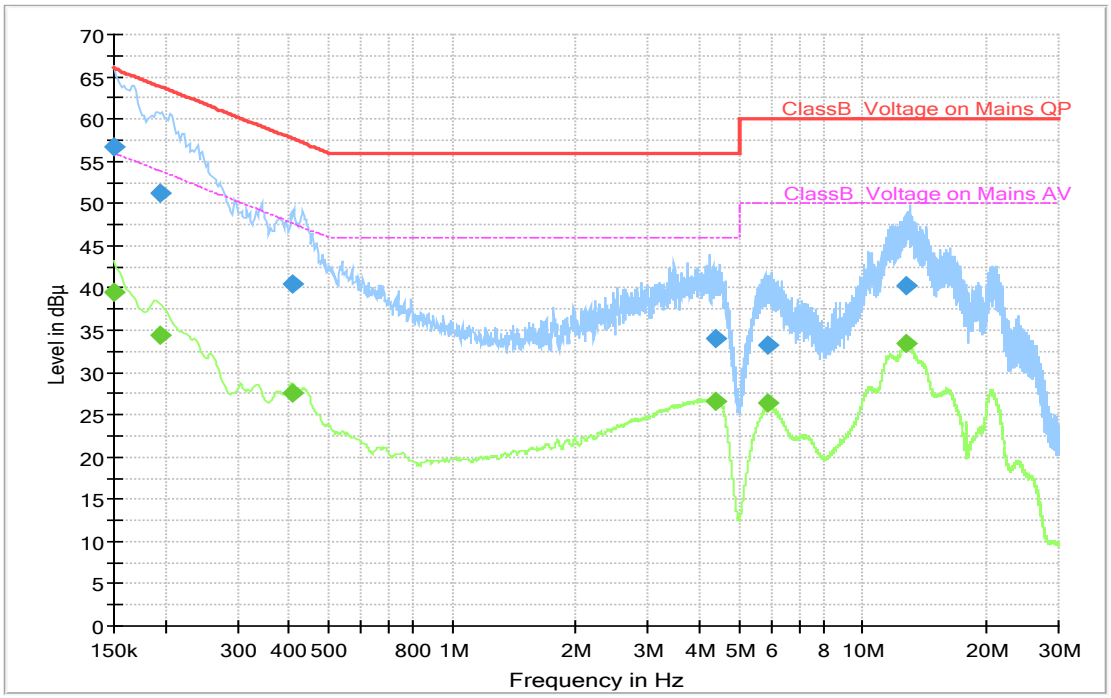
## 5.1.3 Test results

### ☐ Operating Mode 1: AC Mains




QP / CAV final measurement results table:

| Frequency (MHz) | QP (dBµV) | CAV (dBµV) | Limit (dBµV) | Margin (dB) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|
| 0.150 | 56.7 | --- | 66.0 | 9.3 | N | 9.9 |
| 0.150 | --- | 39.5 | 56.0 | 16.5 | N | 9.9 |
| 0.195 | 51.2 | --- | 63.8 | 12.6 | N | 10.1 |
| 0.195 | --- | 34.4 | 53.8 | 19.4 | N | 10.1 |
| 0.407 | 40.4 | --- | 57.7 | 17.3 | L1 | 10.1 |
| 0.407 | --- | 27.6 | 47.7 | 20.1 | L1 | 10.1 |
| 4.367 | --- | 26.6 | 46.0 | 19.4 | N | 10.0 |
| 4.367 | 34.1 | --- | 56.0 | 21.9 | N | 10.0 |
| 5.861 | --- | 26.3 | 50.0 | 23.7 | N | 10.1 |
| 5.861 | 33.2 | --- | 60.0 | 26.8 | N | 10.1 |
| 12.797 | --- | 33.4 | 50.0 | 16.6 | N | 10.4 |
| 12.797 | 40.3 | --- | 60.0 | 19.7 | N | 10.4 |

Note 1) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.
Note 2) Level (QP and/or CAV) = Meter Reading (QP and/or CAV) + Corr. (LISN Insertion Loss + Cable Loss)
Margin (QP and/or CAV) = Limit – Level (QP and/or CAV)
QP = Quasi-Peak, CAV = CISPR-Average, Corr. = Correction Factor



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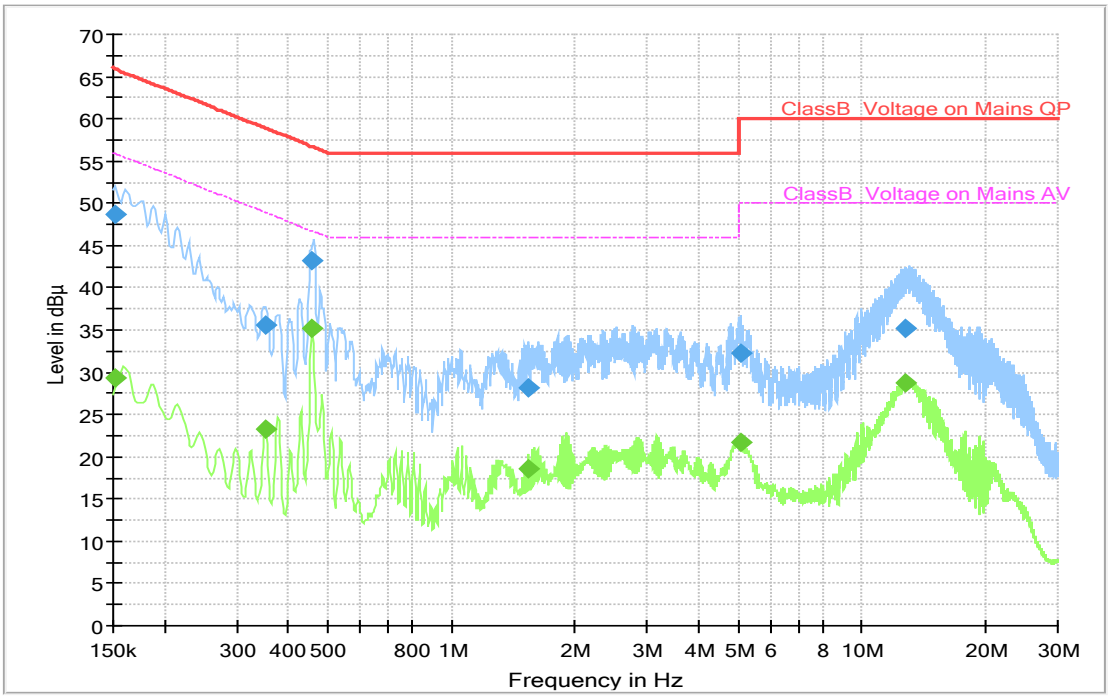
## ☐ Operating Mode 2: AC Mains




QP / CAV final measurement results table:

| Frequency (MHz) | QP (dBµV) | CAV (dBµV) | Limit (dBµV) | Margin (dB) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|
| 0.152 | --- | 29.3 | 55.9 | 26.6 | L1 | 9.9 |
| 0.152 | 48.7 | --- | 65.9 | 17.2 | L1 | 9.9 |
| 0.353 | --- | 23.3 | 48.9 | 25.6 | L1 | 10.0 |
| 0.353 | 35.6 | --- | 58.9 | 23.3 | L1 | 10.0 |
| 0.458 | --- | 35.3 | 46.7 | 11.4 | L1 | 10.1 |
| 0.458 | 43.2 | --- | 56.7 | 13.5 | L1 | 10.1 |
| 1.538 | --- | 18.6 | 46.0 | 27.4 | N | 9.9 |
| 1.538 | 28.2 | --- | 56.0 | 27.8 | N | 9.9 |
| 5.057 | --- | 21.7 | 50.0 | 28.3 | N | 10.0 |
| 5.057 | 32.3 | --- | 60.0 | 27.7 | N | 10.0 |
| 12.755 | --- | 28.8 | 50.0 | 21.2 | N | 10.4 |
| 12.755 | 35.1 | --- | 60.0 | 24.9 | N | 10.4 |

Note 1) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.
Note 2) Level (QP and/or CAV) = Meter Reading (QP and/or CAV) + Corr. (LISN Insertion Loss + Cable Loss)
Margin (QP and/or CAV) = Limit – Level (QP and/or CAV)
QP = Quasi-Peak, CAV = CISPR-Average, Corr. = Correction Factor



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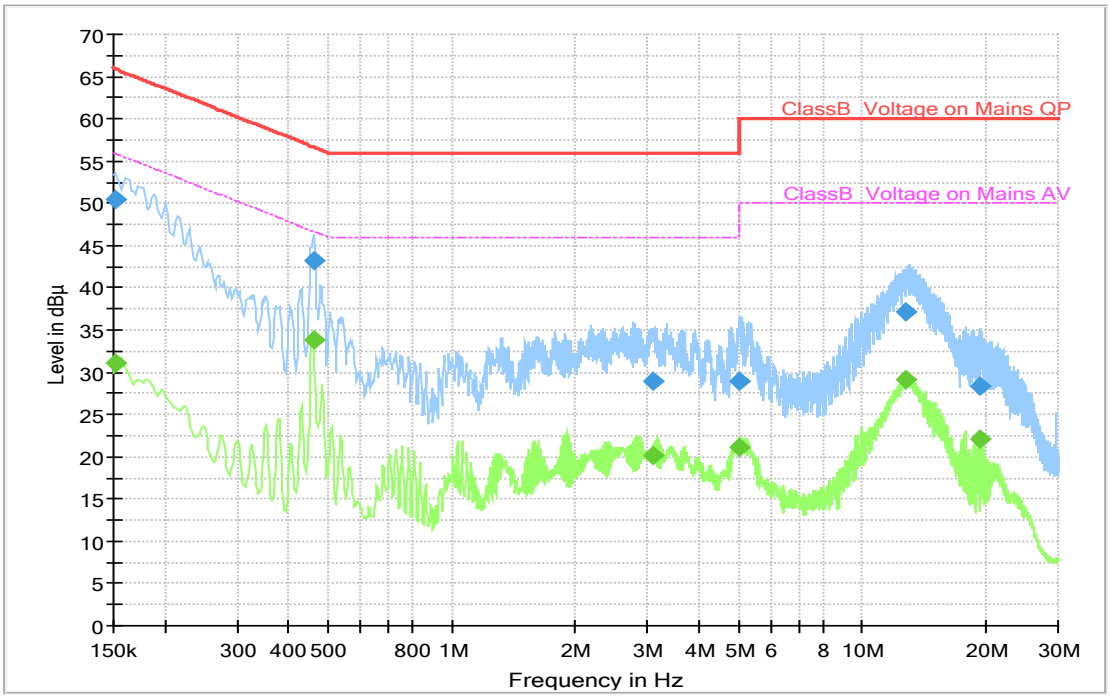
## ☐ Operating Mode 3: AC Mains




QP / CAV final measurement results table:

| Frequency (MHz) | QP (dBµV) | CAV (dBµV) | Limit (dBµV) | Margin (dB) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|
| 0.152 | --- | 31.2 | 55.9 | 24.7 | L1 | 9.9 |
| 0.152 | 50.4 | --- | 65.9 | 15.5 | L1 | 9.9 |
| 0.461 | --- | 33.8 | 46.7 | 12.9 | L1 | 10.1 |
| 0.461 | 43.2 | --- | 56.7 | 13.5 | L1 | 10.1 |
| 3.082 | --- | 20.1 | 46.0 | 25.9 | N | 9.9 |
| 3.082 | 28.9 | --- | 56.0 | 27.1 | N | 9.9 |
| 5.019 | --- | 21.2 | 50.0 | 28.8 | N | 10.0 |
| 5.019 | 29.0 | --- | 60.0 | 31.0 | N | 10.0 |
| 12.824 | --- | 29.2 | 50.0 | 20.8 | N | 10.4 |
| 12.824 | 37.1 | --- | 60.0 | 22.9 | N | 10.4 |
| 19.372 | --- | 22.0 | 50.0 | 28.0 | N | 10.7 |
| 19.372 | 28.4 | --- | 60.0 | 31.6 | N | 10.7 |

Note 1) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.
Note 2) Level (QP and/or CAV) = Meter Reading (QP and/or CAV) + Corr. (LISN Insertion Loss + Cable Loss)
Margin (QP and/or CAV) = Limit – Level (QP and/or CAV)
QP = Quasi-Peak, CAV = CISPR-Average, Corr. = Correction Factor



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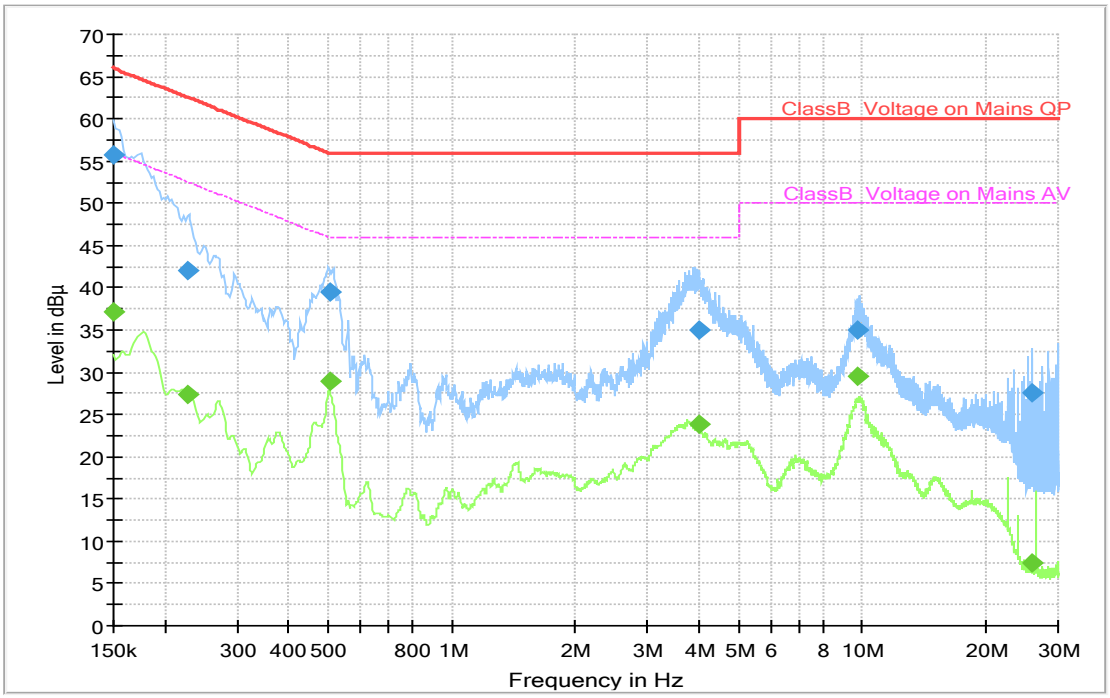
## ☐ Operating Mode 4: AC Mains




QP / CAV final measurement results table:

| Frequency (MHz) | QP (dBµV) | CAV (dBµV) | Limit (dBµV) | Margin (dB) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|
| 0.150 | --- | 37.2 | 56.0 | 18.8 | L1 | 9.8 |
| 0.150 | 55.7 | --- | 66.0 | 10.3 | L1 | 9.8 |
| 0.227 | 42.1 | --- | 62.6 | 20.5 | N | 9.8 |
| 0.227 | --- | 27.3 | 52.6 | 25.3 | N | 9.8 |
| 0.503 | --- | 28.9 | 46.0 | 17.1 | L1 | 10.1 |
| 0.503 | 39.5 | --- | 56.0 | 16.5 | L1 | 10.1 |
| 3.998 | --- | 23.9 | 46.0 | 22.1 | N | 9.8 |
| 3.998 | 35.0 | --- | 56.0 | 21.0 | N | 9.8 |
| 9.780 | 35.0 | --- | 60.0 | 25.0 | L1 | 9.8 |
| 9.780 | --- | 29.6 | 50.0 | 20.4 | L1 | 9.8 |
| 26.014 | --- | 7.5 | 50.0 | 42.5 | N | 10.0 |
| 26.014 | 27.6 | --- | 60.0 | 32.4 | N | 10.0 |

Note 1) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.
Note 2) Level (QP and/or CAV) = Meter Reading (QP and/or CAV) + Corr. (LISN Insertion Loss + Cable Loss)
Margin (QP and/or CAV) = Limit – Level (QP and/or CAV)
QP = Quasi-Peak, CAV = CISPR-Average, Corr. = Correction Factor



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## 5.2 Radiated disturbance

The following data lists the significant emission frequencies, measured levels, correction factors (for antenna and cables), orientation of table, polarization and height of antenna, the corrected reading, the limit, and the amount of margin.

Peak measurements were made over the changeable frequency range 30 MHz to 1 GHz at a measurement distance of 10 m for the following antenna and turntable arrangements:

| Antenna Height [ cm ] | Antenna Polarisation | Resolution Bandwidth [ kHz ] | Video Bandwidth [ kHz ] | Turntable position [ degrees ] |
|---|---|---|---|---|
| 100 ~ 400 | Horizontal, Vertical | 120 | 300 | Continuous |

Measurements within 6 dB of the limit were then maximized by adjusting turntable position.
Final measurements were made using quasi-peak detector.

Peak/CISPR-Average measurements were made over the changeable frequency range 1 GHz to 40 GHz or 5th harmonics of the highest frequency generated or used in the device or on which the device operates or tunes at a measurement distance of 3 m for the following antenna and turntable arrangements. The measurements above 1 GHz were performed with the bore-sighting antenna aimed at the EUT.

| Antenna Height [ cm ] | Antenna Polarisation | Resolution Bandwidth [ MHz ] | Video Bandwidth [ MHz ] | Turntable position |
|---|---|---|---|---|
| 100 ~ 400 | Horizontal, Vertical | 1 | 3 | Continuous |

Measurements within 6 dB of the limit were then maximized by adjusting turntable position.
Final measurements were made using peak and CISPR-average detectors.

**Limits for radiated disturbance of Class B ITE at a measuring distance of 3 m and 10 m**

| Frequency range Limits [ MHz ] | Field Strength | | |
|---|---|---|---|
| | 3 m [ μV/m ] | 3 m [ dB(μV/m) ] | 10 m [ dB(μV/m) ] |
| 30 to 88 | 100 | 40.0 | 29.5 |
| 88 to 216 | 150 | 43.5 | 33.0 |
| 216 to 960 | 200 | 46.0 | 35.5 |
| Above 960 | 500 | 54.0 | 43.5 |

Note) Distance correction fomula from $D_1$(3m) to $D_2$(10m)
: Limit at $D_2$ = Limit at $D_1$ + 20Log($D_1$ /$D_2$)

Results checked manually; and points close to the limit line were re-measured.



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## 5.2.1 Test instrumentation

| EMC No. | Test Instrument | Model name | Manufacturer | Serial No. | Calibration | |
|---|---|---|---|---|---|---|
| | | | | | Date | Interval (Month) |
| E5I-020 | EMI Test Receiver | ESU40 | R&S | 100375 | 2019-09-02 | 12 |
| E5I-015 | EMI Test Receiver | ESU8 | R&S | 100481 | 2019-06-28 | 12 |
| E5I-036 | Horn Antenna | HF907 | R&S | 100507 | 2018-06-15 | 24 |
| E5I-040 | Signal Conditioning Unit | SCU-18 | R&S | 10210 | 2019-04-05 | 12 |
| E5I-037 | WideBand Horn Antenna | WBH 18-40K | R&S | 11201 | 2019-01-31 | 24 |
| E5I-042 | Signal Conditioning Unit | SCU-40A | R&S | 10004 | 2019-09-11 | 12 |
| E5I-070 | BiLog Antenna | CBL6112D | TESEQ | 35383 | 2018-10-12 | 24 |
| E5I-121 | BiLog Antenna | CBL6112D | TESEQ | 36999 | 2018-10-12 | 24 |
| E5I-093 | Preamplifier | 310N | SONOMA | 273122 | 2019-01-23 | 12 |
| E5I-094 | Preamplifier | 310N | SONOMA | 282363 | 2019-01-23 | 12 |
| - | Test software | EP7RE | TOYO | Ver 5.8.2 | - | - |
| - | Test software | EMC32 | R&S | Ver 9.25.00 | - | - |

## 5.2.2 Temperature and humidity condition

| Test date | 2019-12-05 ~ 2019-12-06 | Test engineer | Sun-Ho Kim |
|---|---|---|---|
| Climate condition | Ambient temperature | (20.9 ~ 21.5) ℃ | Limit (15.0 to 35.0) ℃ |
| | Relative humidity | (42.5 ~ 42.9) % R.H. | Limit (25.0 to 75.0) % R.H. |
| | Atmospheric pressure | (101.0 ~ 101.4) kPa | Limit (86.0 to 106.0) kPa |
| Test place | Semi-Anechoic Chamber (SAC5) | | |



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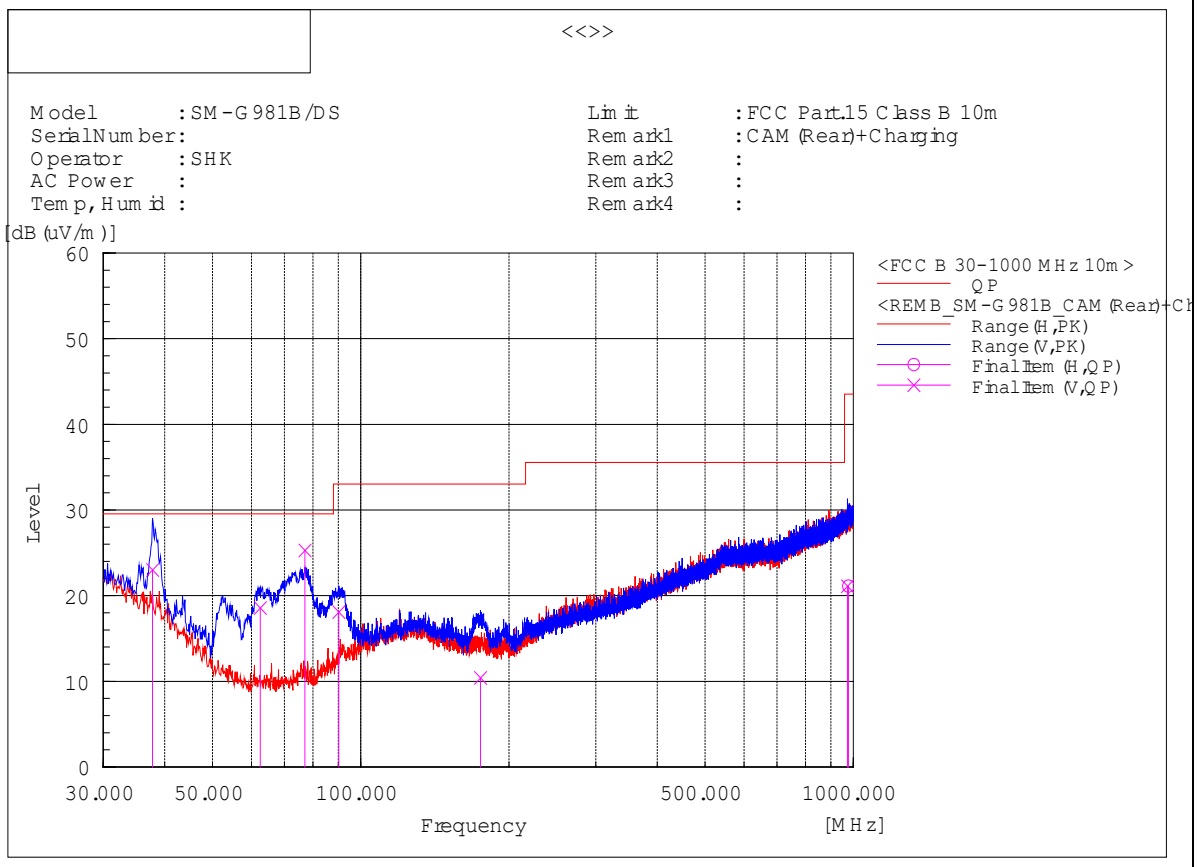
Form No.: SRA-TRF-46/9

## 5.2.3 Test results

### ☐ Operating Mode 1

### - Frequencies below 1 GHz




Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | System |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 37.760 | V | 31.7 | -8.7 | 23.0 | 29.5 | 6.5 | 200 | 88 | 2 |
| 2 | 62.495 | V | 36.7 | -18.1 | 18.6 | 29.5 | 10.9 | 200 | 221 | 2 |
| 3 | 77.045 | V | 42.4 | -17.1 | 25.3 | 29.5 | 4.2 | 200 | 194 | 2 |
| 4 | 90.261 | V | 33.1 | -15.0 | 18.1 | 33.0 | 14.9 | 100 | 214 | 2 |
| 5 | 174.894 | V | 24.3 | -13.9 | 10.4 | 33.0 | 22.6 | 100 | 38 | 2 |
| 6 | 973.325 | V | 19.1 | 2.0 | 21.1 | 43.5 | 22.4 | 300 | 145 | 2 |
| 7 | 977.569 | H | 20.5 | 0.6 | 21.1 | 43.5 | 22.4 | 200 | 149 | 1 |

Note1) Receiving antenna polarization : Horizontal, Vertical
Test Distance : 10 m, Antenna Height : 1 to 4 meters
Result (QP) = Reading (QP) + c.f (Antenna Factor + Cable Loss - Amp. Gain)
Margin (QP) = Limit – Level (QP)
QP = Quasi-Peak, c.f = Correction Factor



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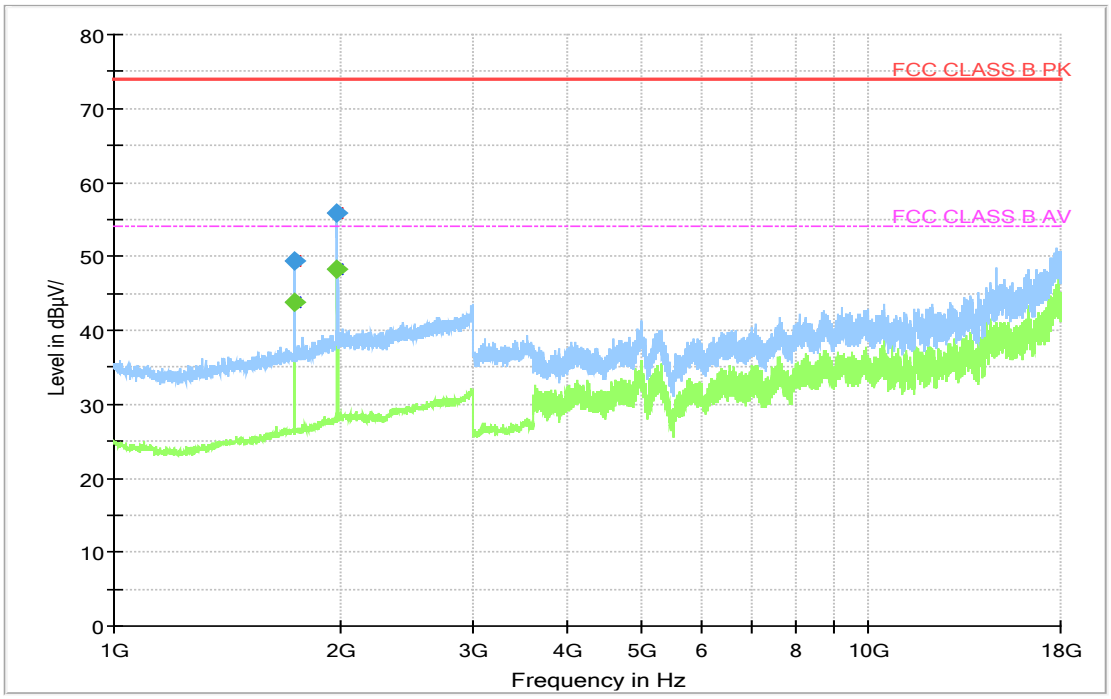
## - Frequencies above 1 GHz




| Frequency (MHz) | PK (dBµV/ | CAV (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 1 739.000 | 49.5 | --- | 74.0 | 24.5 | 100.0 | V | 0.0 | 10.0 |
| 1 739.000 | --- | 43.9 | 54.0 | 10.1 | 100.0 | V | 0.0 | 10.0 |
| 1 977.500 | --- | 48.3 | 54.0 | 5.7 | 100.0 | V | 302.0 | 11.7 |
| 1 978.000 | 55.8 | --- | 74.0 | 18.2 | 100.0 | V | 302.0 | 11.7 |

Note 1) We have also tested from 18 GHz to 30 GHz and found no emissions
Note 2) Receiving antenna polarization : Horizontal, Vertical
Test Distance : 3 m, Antenna Height : 1 to 4 meters
Level (PK and/or CAV) = Reading (PK and/or CAV) + Corr. (Antenna Factor + Cable Loss - Amp. Gain)
Margin (PK and/or CAV) = Limit – Level (PK and/or CAV)
PK = Peak, CAV = CISPR-Average, Corr. = Correction Factor



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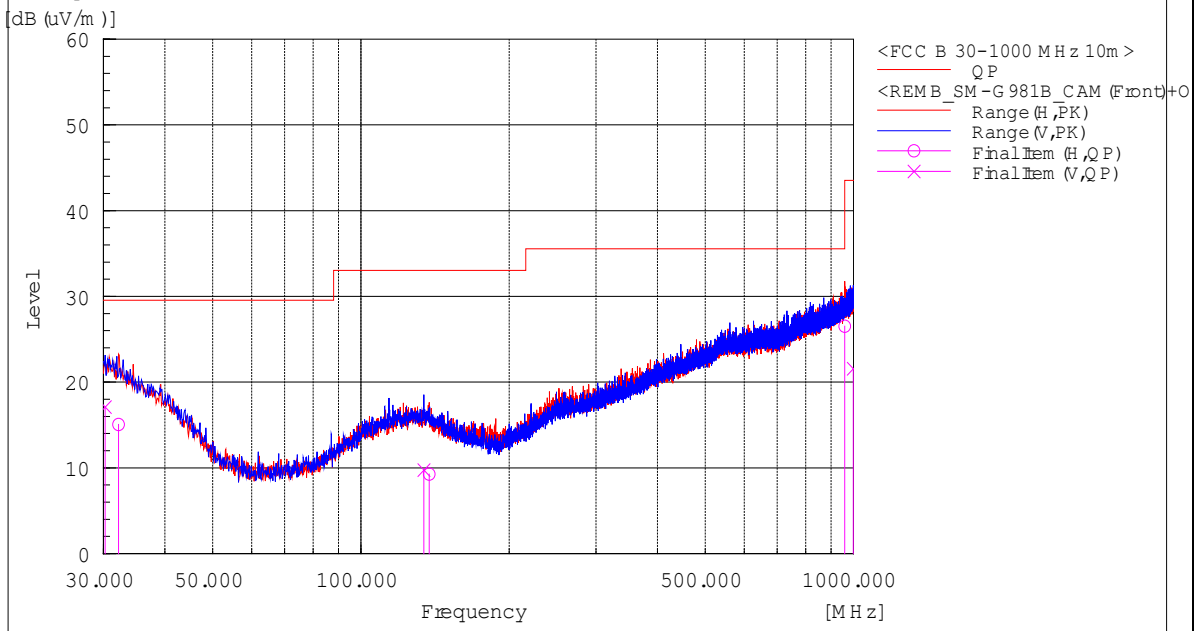
## ☐ Operating Mode 2

### - Frequencies below 1 GHz

<<>>

Model : SM-G981B/DS
SerialNumber:
Operator : SHK
AC Power :
Temp,Humid :

Limit : FCC Part.15 Class B 10m
Remark1 : CAM (Front)+OTG
Remark2 : w
Remark3 :
Remark4 :




Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | System |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 30.243 | V | 23.0 | -5.9 | 17.1 | 29.5 | 12.4 | 347 | 162 | 2 |
| 2 | 32.183 | H | 23.2 | -8.1 | 15.1 | 29.5 | 14.4 | 108 | 296 | 1 |
| 3 | 134.154 | V | 20.9 | -11.2 | 9.7 | 33.0 | 23.3 | 293 | 339 | 2 |
| 4 | 137.549 | H | 22.3 | -13.0 | 9.3 | 33.0 | 23.7 | 243 | 102 | 1 |
| 5 | 960.230 | H | 26.3 | 0.2 | 26.5 | 43.5 | 17.0 | 111 | 340 | 1 |
| 6 | 999.394 | V | 18.8 | 2.8 | 21.6 | 43.5 | 21.9 | 284 | 0 | 2 |

Note1) Receiving antenna polarization : Horizontal, Vertical
Test Distance : 10 m, Antenna Height : 1 to 4 meters
Result (QP) = Reading (QP) + c.f (Antenna Factor + Cable Loss - Amp. Gain)
Margin (QP) = Limit – Level (QP)
QP = Quasi-Peak, c.f = Correction Factor

.



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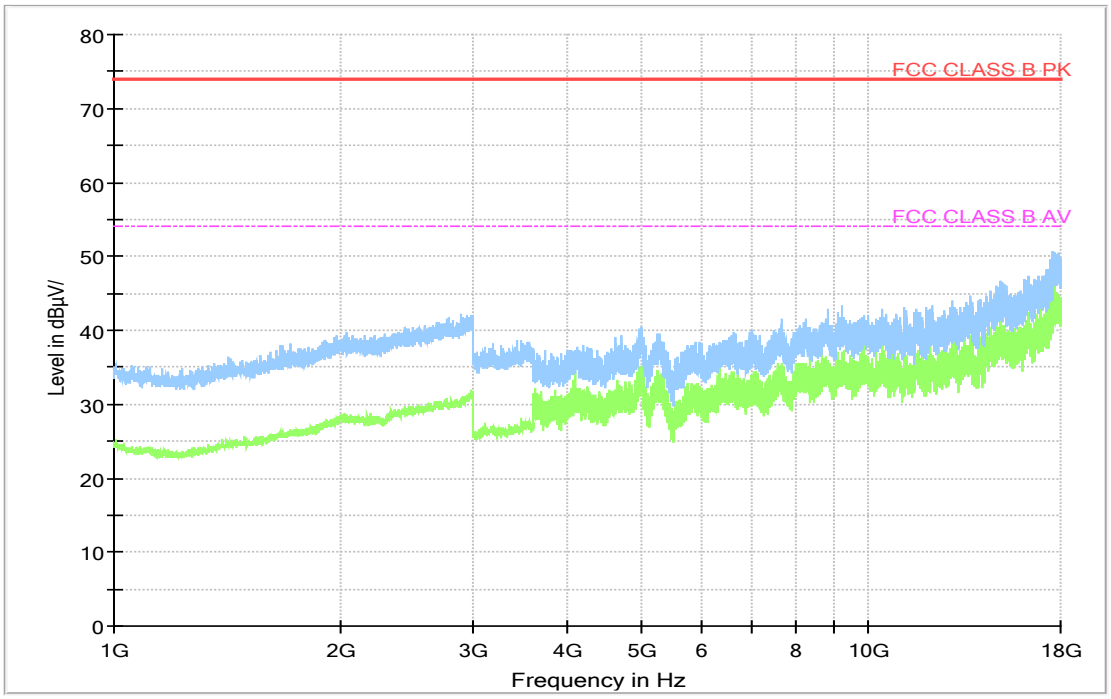
## - Frequencies above 1 GHz




Note 1) We have also tested from 18 GHz to 30 GHz and found no emissions

Note 2) Receiving antenna polarization : Horizontal, Vertical

Test Distance : 3 m, Antenna Height : 1 to 4 meters

Level (PK and/or CAV) = Reading (PK and/or CAV) + Corr. (Antenna Factor + Cable Loss - Amp. Gain)

Margin (PK and/or CAV) = Limit – Level (PK and/or CAV)

PK = Peak, CAV = CISPR-Average, Corr. = Correction Factor



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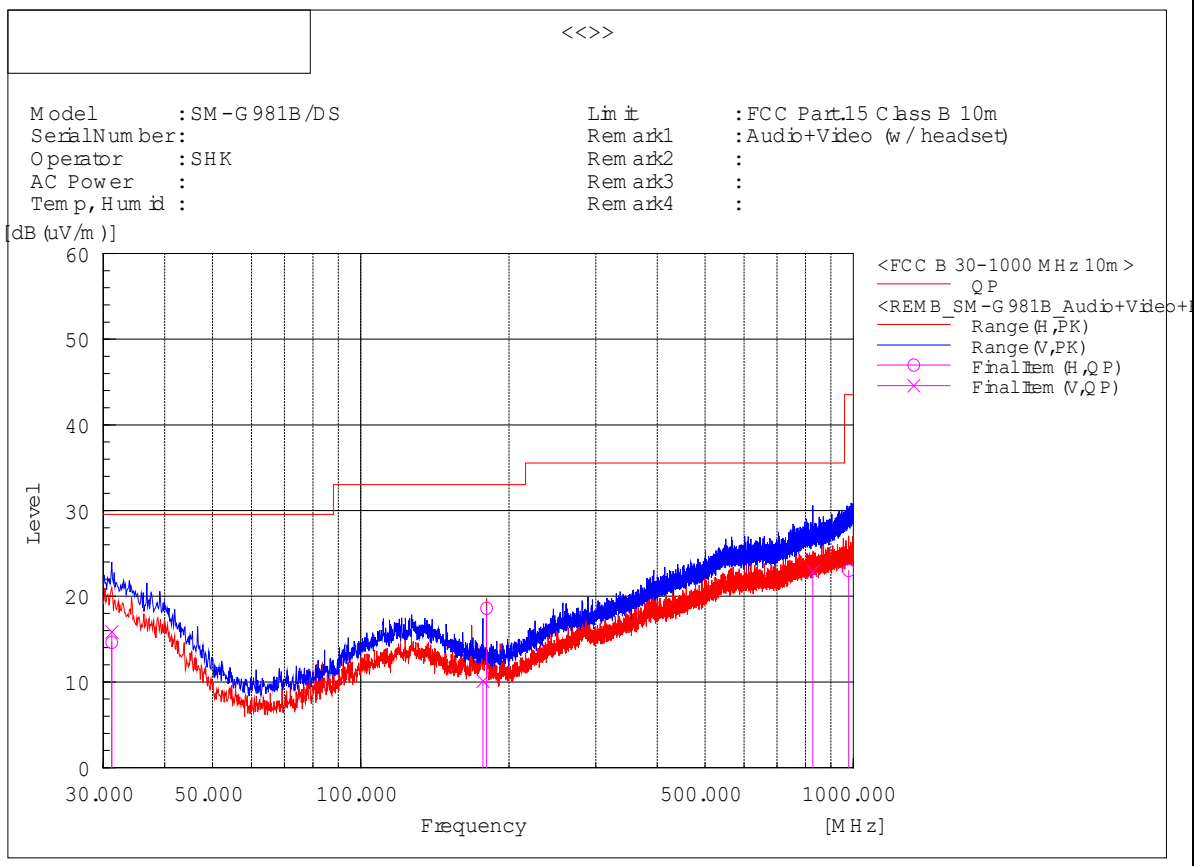
## ☐ Operating Mode 3

### - Frequencies below 1 GHz




Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | System |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 31.213 | H | 22.3 | -7.7 | 14.6 | 29.5 | 14.9 | 400 | 11 | 1 |
| 2 | 31.213 | V | 22.0 | -6.2 | 15.8 | 29.5 | 13.7 | 400 | 109 | 2 |
| 3 | 179.986 | H | 33.5 | -14.9 | 18.6 | 33.0 | 14.4 | 400 | 22 | 1 |
| 4 | 176.955 | V | 24.1 | -14.0 | 10.1 | 33.0 | 22.9 | 101 | 133 | 2 |
| 5 | 978.539 | H | 22.4 | 0.6 | 23.0 | 43.5 | 20.5 | 200 | 55 | 1 |
| 6 | 827.461 | V | 22.9 | 0.0 | 22.9 | 35.5 | 12.6 | 400 | 66 | 2 |

Note1) Receiving antenna polarization : Horizontal, Vertical
Test Distance : 10 m, Antenna Height : 1 to 4 meters
Result (QP) = Reading (QP) + c.f (Antenna Factor + Cable Loss - Amp. Gain)
Margin (QP) = Limit – Level (QP)
QP = Quasi-Peak, c.f = Correction Factor



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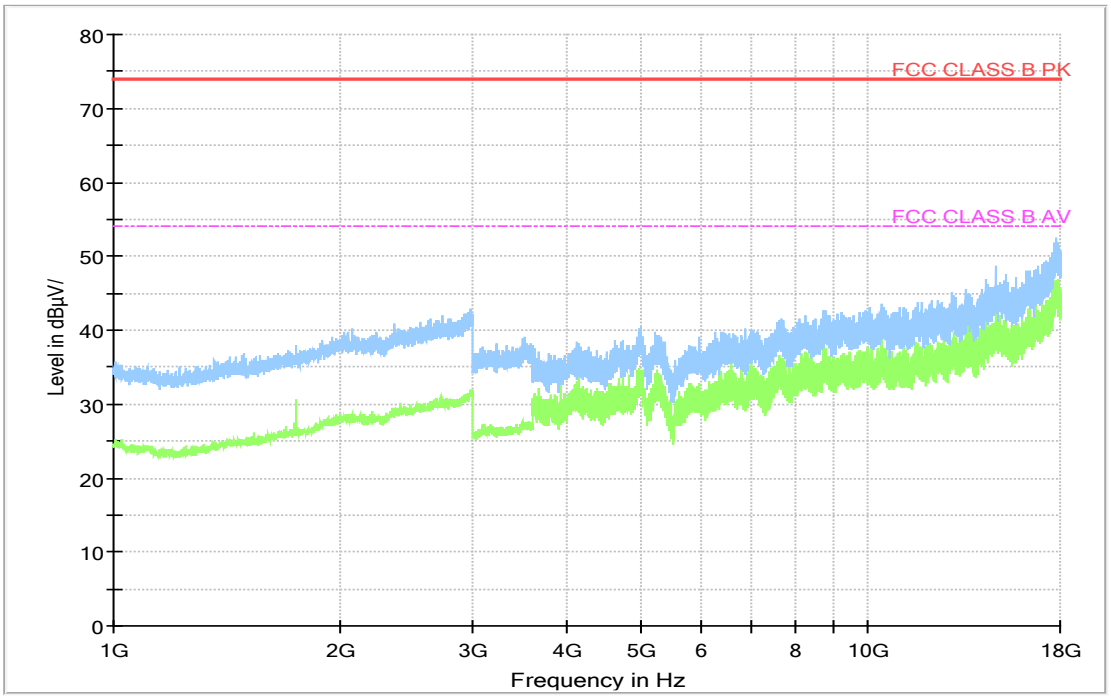
## - Frequencies above 1 GHz




Note 1) We have also tested from 18 GHz to 30 GHz and found no emissions

Note 2) Receiving antenna polarization : Horizontal, Vertical

Test Distance : 3 m, Antenna Height : 1 to 4 meters

Level (PK and/or CAV) = Reading (PK and/or CAV) + Corr. (Antenna Factor + Cable Loss - Amp. Gain)

Margin (PK and/or CAV) = Limit – Level (PK and/or CAV)

PK = Peak, CAV = CISPR-Average, Corr. = Correction Factor



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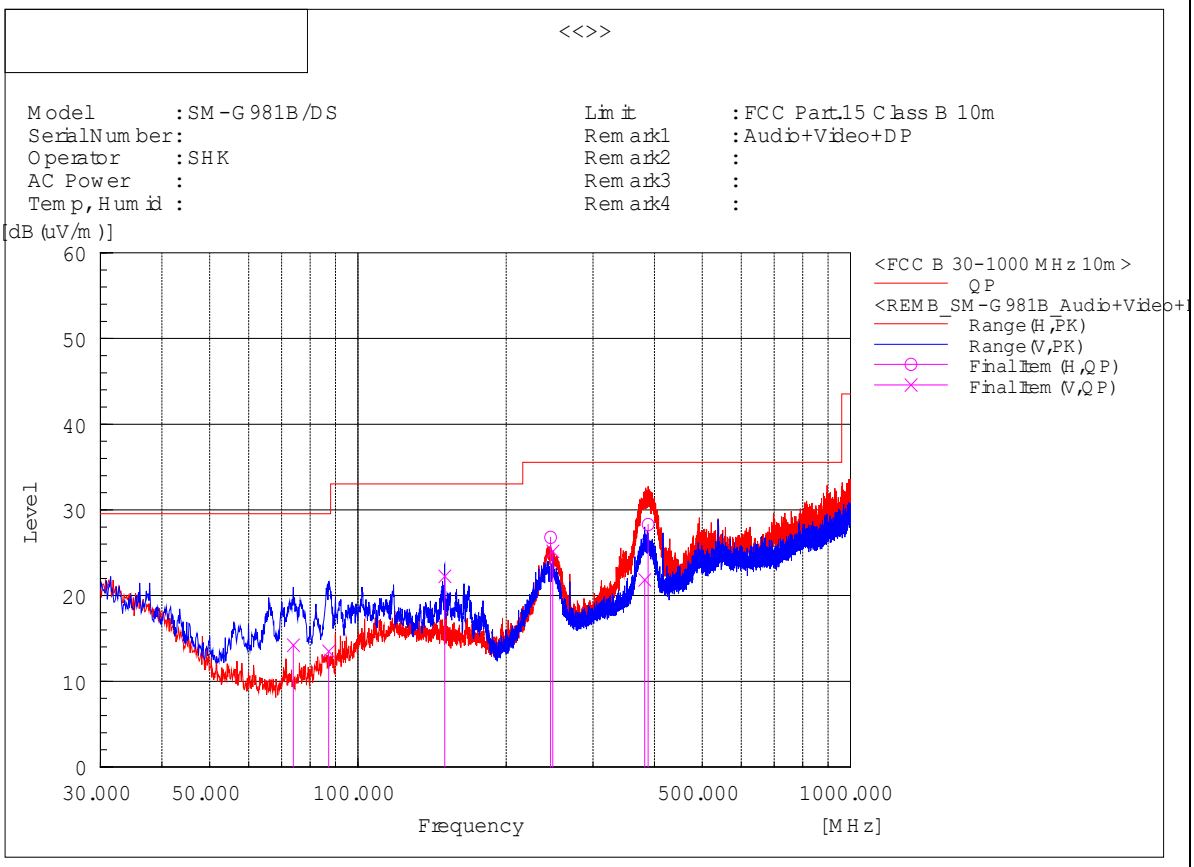
## ☐ Operating Mode 4

### - Frequencies below 1 GHz




Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | System |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 73.892 | V | 32.8 | -18.6 | 14.2 | 29.5 | 15.3 | 400 | 258 | 2 |
| 2 | 87.230 | V | 30.0 | -16.5 | 13.5 | 29.5 | 16.0 | 400 | 276 | 2 |
| 3 | 150.038 | V | 35.6 | -13.3 | 22.3 | 33.0 | 10.7 | 100 | 343 | 2 |
| 4 | 246.189 | H | 38.6 | -11.8 | 26.8 | 35.5 | 8.7 | 400 | 229 | 1 |
| 5 | 248.614 | V | 36.3 | -11.1 | 25.2 | 35.5 | 10.3 | 100 | 4 | 2 |
| 6 | 381.989 | V | 29.3 | -7.5 | 21.8 | 35.5 | 13.7 | 100 | 30 | 2 |
| 7 | 388.294 | H | 36.2 | -7.9 | 28.3 | 35.5 | 7.2 | 200 | 138 | 1 |

Note1) Receiving antenna polarization : Horizontal, Vertical
Test Distance : 10 m, Antenna Height : 1 to 4 meters
Result (QP) = Reading (QP) + c.f (Antenna Factor + Cable Loss - Amp. Gain)
Margin (QP) = Limit – Level (QP)
QP = Quasi-Peak, c.f = Correction Factor



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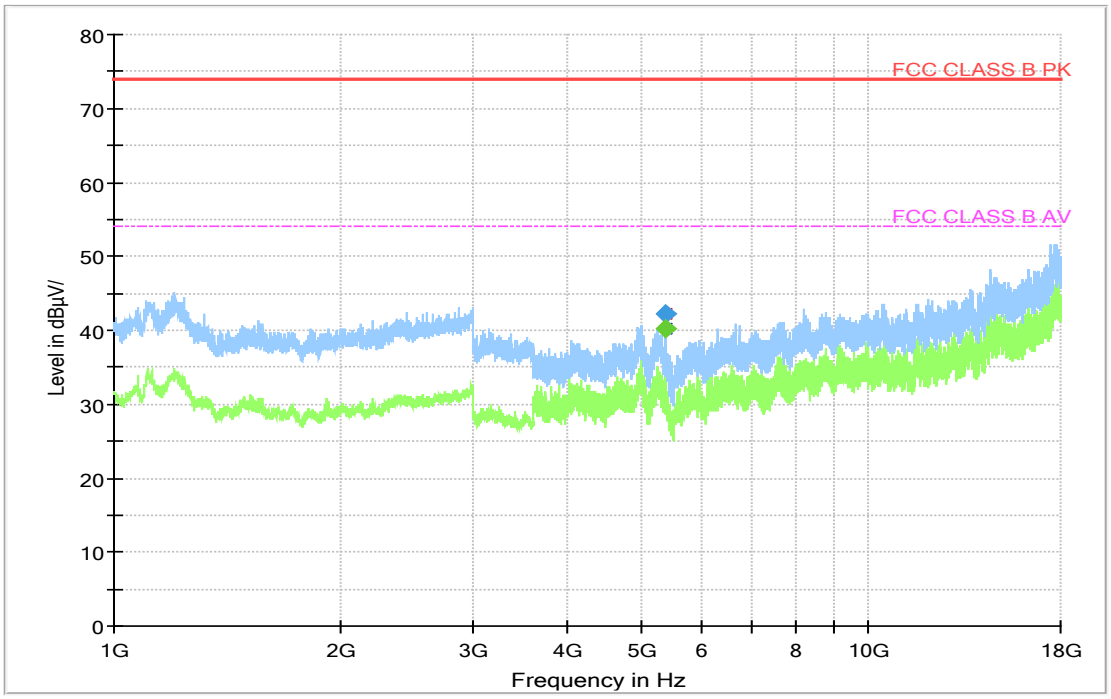
## - Frequencies above 1 GHz




| Frequency (MHz) | PK (dBµV/ | CAV (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 5 399.500 | 42.2 | --- | 74.0 | 31.8 | 100.0 | V | 184.0 | 6.3 |
| 5 400.000 | --- | 40.2 | 54.0 | 13.8 | 100.0 | V | 155.0 | 6.3 |

Note 1) We have also tested from 18 GHz to 30 GHz and found no emissions
Note 2) Receiving antenna polarization : Horizontal, Vertical
Test Distance : 3 m, Antenna Height : 1 to 4 meters
Level (PK and/or CAV) = Reading (PK and/or CAV) + Corr. (Antenna Factor + Cable Loss - Amp. Gain)
Margin (PK and/or CAV) = Limit – Level (PK and/or CAV)
PK = Peak, CAV = CISPR-Average, Corr. = Correction Factor



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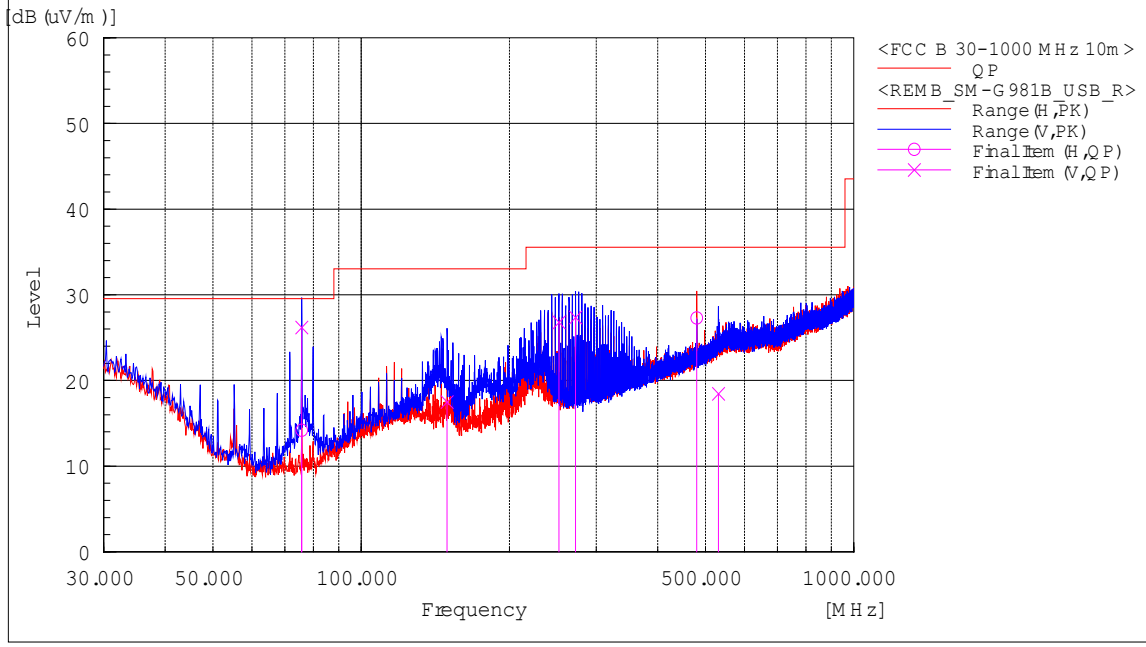
## ☐ Operating Mode 5

### - Frequencies below 1 GHz

<<>>

Model : SM-G981B/DS
SerialNumber:
Operator : SHK
AC Power :
Temp,Humid :

Limit : FCC Part15 Class B 10m
Remark1 : USB Communication
Remark2 : r
Remark3 :
Remark4 :




Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | System |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 75.711 | H | 33.0 | -18.8 | 14.2 | 29.5 | 15.3 | 400 | 287 | 1 |
| 2 | 75.711 | V | 43.4 | -17.2 | 26.2 | 29.5 | 3.3 | 170 | 66 | 2 |
| 3 | 149.431 | V | 30.2 | -12.7 | 17.5 | 33.0 | 15.5 | 100 | 298 | 2 |
| 4 | 251.888 | V | 37.0 | -10.2 | 26.8 | 35.5 | 8.7 | 100 | 327 | 2 |
| 5 | 272.379 | V | 37.1 | -9.7 | 27.4 | 35.5 | 8.1 | 100 | 158 | 2 |
| 6 | 479.959 | H | 33.5 | -6.2 | 27.3 | 35.5 | 8.2 | 200 | 59 | 1 |
| 7 | 530.884 | V | 21.5 | -3.0 | 18.5 | 35.5 | 17.0 | 300 | 305 | 2 |

Note1) Receiving antenna polarization : Horizontal, Vertical
Test Distance : 10 m, Antenna Height : 1 to 4 meters
Result (QP) = Reading (QP) + c.f (Antenna Factor + Cable Loss - Amp. Gain)
Margin (QP) = Limit – Level (QP)
QP = Quasi-Peak, c.f = Correction Factor



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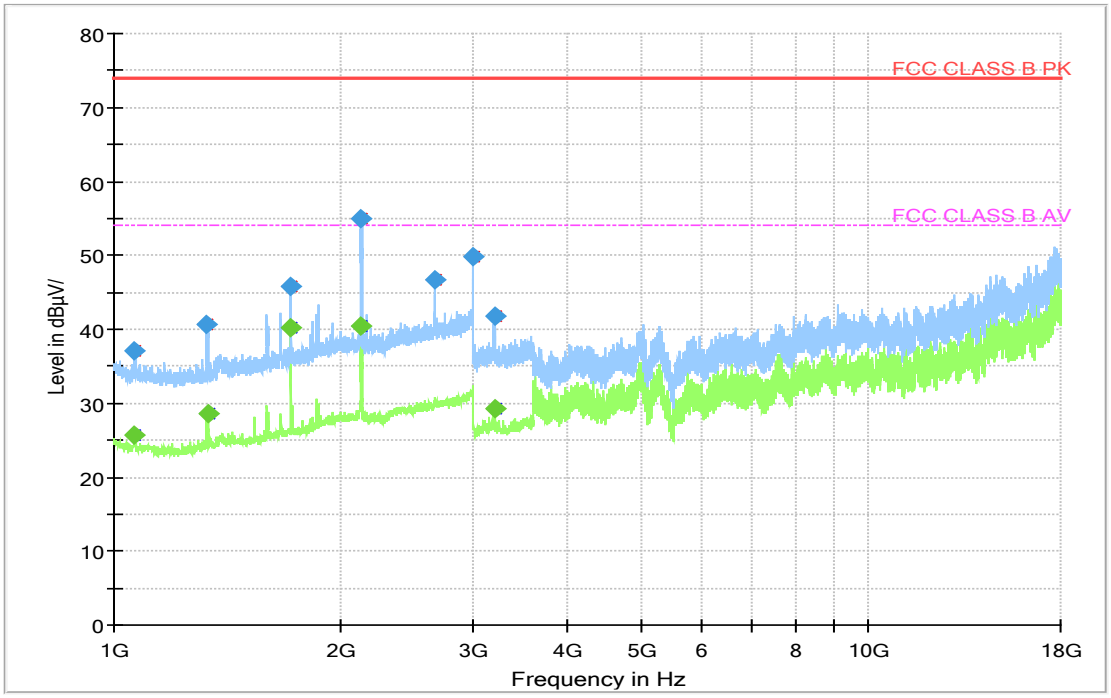
## - Frequencies above 1 GHz




| Frequency (MHz) | PK (dBµV/ | CAV (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 1 062.500 | --- | 25.6 | 54.0 | 28.4 | 130.0 | V | 162.0 | 6.0 |
| 1 063.500 | 37.1 | --- | 74.0 | 36.9 | 115.0 | V | 118.0 | 6.0 |
| 1 329.000 | 40.7 | --- | 74.0 | 33.3 | 100.0 | V | 139.0 | 7.0 |
| 1 332.000 | --- | 28.7 | 54.0 | 25.3 | 100.0 | V | 65.0 | 7.0 |
| 1 717.000 | 45.9 | --- | 74.0 | 28.1 | 183.0 | V | 160.0 | 9.8 |
| 1 717.000 | --- | 40.1 | 54.0 | 13.9 | 148.0 | V | 160.0 | 9.8 |
| 2 128.500 | --- | 40.4 | 54.0 | 13.6 | 100.0 | V | 21.0 | 11.9 |
| 2 130.000 | 55.0 | --- | 74.0 | 19.0 | 100.0 | V | 21.0 | 11.9 |
| 2 666.500 | 46.8 | --- | 74.0 | 27.2 | 110.0 | V | 284.0 | 14.0 |
| 3 000.000 | 49.9 | --- | 74.0 | 24.1 | 115.0 | V | 325.0 | 15.7 |
| 3 191.500 | 41.8 | --- | 74.0 | 32.2 | 100.0 | V | 0.0 | 0.8 |
| 3 199.500 | --- | 29.2 | 54.0 | 24.8 | 112.0 | V | 353.0 | 0.8 |

Note 1) We have also tested from 18 GHz to 30 GHz and found no emissions
Note 2) Receiving antenna polarization : Horizontal, Vertical
Test Distance : 3 m, Antenna Height : 1 to 4 meters
Level (PK and/or CAV) = Reading (PK and/or CAV) + Corr. (Antenna Factor + Cable Loss - Amp. Gain)
Margin (PK and/or CAV) = Limit – Level (PK and/or CAV)
PK = Peak, CAV = CISPR-Average, Corr. = Correction Factor



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