

FCC Test Report

FCC ID : 2AT6813002019
Equipment : CBRSYS1300-WTE-3S
Brand Name : CBRSYS1300-WTE-3S
Model Name : CBRSYS1300-WTE-3S
**Applicant/
Manufacturer** : Celliber Technologies Private Limited
2nd Floor VYSHAK CENTRE,1027, 24th Main 11th
Cross, Sector 1 HSR Layout, Bangalore 560102 India
Standard : 47 CFR FCC Part 15.247

The product was received on Mar. 13, 2020, and testing was started from Apr. 07, 2020 and completed on Apr. 27, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



Table of Contents

HISTORY OF THIS TEST REPORT3

SUMMARY OF TEST RESULT4

1 GENERAL DESCRIPTION5

1.1 Information.....5

1.2 Testing Applied Standards7

1.3 Testing Location Information7

1.4 Measurement Uncertainty7

2 TEST CONFIGURATION OF EUT.....8

2.1 The Worst Case Measurement Configuration.....8

2.2 Accessories9

2.3 Test Setup Diagram10

3 TRANSMITTER TEST RESULT12

3.1 AC Power-line Conducted Emissions12

3.2 Emissions in Restricted Frequency Bands.....14

4 TEST EQUIPMENT AND CALIBRATION DATA18

APPENDIX A. TEST RESULTS OF AC POWER-LINE CONDUCTED EMISSIONS

APPENDIX B. TEST RESULTS OF EMISSIONS IN RESTRICTED FREQUENCY BANDS

APPENDIX C. TEST PHOTOS

PHOTOGRAPHS OF EUT V01



History of this test report

| Report No. | Version | Description | Issued Date |
|---------------|---------|-------------------------|--------------|
| FR971005-01AC | 01 | Initial issue of report | May 18, 2020 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |



Summary of Test Result

| Report Clause | Ref. Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|---------------|------------------|---|--------------------|--------|
| 1.1.2 | 15.203 | Antenna Requirement | PASS | - |
| 3.1 | 15.207 | AC Power-line Conducted Emissions | PASS | - |
| - | 15.247(a) | DTS Bandwidth | Not Performed | - |
| - | 15.247(b) | Maximum Conducted Output Power | Not Performed | - |
| - | 15.247(e) | Power Spectral Density | Not Performed | - |
| - | 15.247(d) | Emissions in Non-restricted Frequency Bands | Not Performed | - |
| 3.2 | 15.247(d) | Emissions in Restricted Frequency Bands | PASS | - |

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and explanations:

None

Reviewed by: Sam Tsai

Report Producer: Jenny Yang



1 General Description

1.1 Information

There are three WiFi Modules in the CQ30 Series Vehicle PC in the EUT. The antenna signals Tx transmit by only one connector and other connectors are restricted to Rx only mode with switches controlled by software.

1.1.1 RF General Information

| Frequency Range (MHz) | IEEE Std. 802.11 | Ch. Frequency (MHz) | Channel Number |
|-----------------------|------------------|---------------------|----------------|
| 2400-2483.5 | b, g, n (HT20) | 2412-2462 | 1-11 [11] |

| Band | Mode | BWch (MHz) | Nant |
|---------------|--------------|------------|------|
| 2.4-2.4835GHz | 802.11b | 20 | 1TX |
| 2.4-2.4835GHz | 802.11g | 20 | 1TX |
| 2.4-2.4835GHz | 802.11n HT20 | 20 | 1TX |

Note:

- ◆ 11b mode uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
- ◆ 11g and HT20 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- ◆ BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

| Ant. | Brand | Model Name | Antenna Type | Connector | Function |
|------|-------------|---------------------|--------------|---------------------|----------|
| 1 | Mobile Mark | RM-WHF-DN-BLK | Omni | N Type | TX/RX |
| 2 | Mobile Mark | MGRM-WHF-3C-BLK-120 | Omni | Cable with SMA Male | TX/RX |
| 3 | Mobile Mark | LP-2400-6000 | Directional | SMA Female | RX |
| 4 | Mobile Mark | LP-2400-6000 | Directional | SMA Female | RX |
| 5 | Mobile Mark | LP-2400-6000 | Directional | SMA Female | RX |
| 6 | Mobile Mark | LP-2400-6000 | Directional | SMA Female | RX |

| Ant. | Port | Gain (dBi) | |
|------|------|------------|----|
| | | 2.4G | 5G |
| 1 | 1 | 5 | 5 |
| 2 | - | 5 | 5 |
| 3 | - | 7.5 | 11 |
| 4 | - | 7.5 | 11 |
| 5 | - | 7.5 | 11 |
| 6 | - | 7.5 | 11 |

Note 1: The antenna 1 was used to test by transmit function.



For 2.4GHz function:

For IEEE 802.11 b/g/n mode
 Ant. 1 or Ant. 2 could transmit/receive.
 Ant. 3, Ant. 4, Ant. 5 and Ant. 6 could receive only.

For 5GHz function:

For IEEE 802.11 a/n mode
 Ant. 1 or Ant. 2 could transmit/receive.
 Ant. 3, Ant. 4, Ant. 5 and Ant. 6 could receive only.

1.1.3 EUT Information

| Operational Condition | | | | |
|-------------------------------------|---|---------------------|-------------------------------------|---------------------|
| EUT Power Type | From Switching Power Supply | | | |
| EUT Function | <input checked="" type="checkbox"/> | Point-to-multipoint | <input type="checkbox"/> | Point-to-point |
| Beamforming Function | <input type="checkbox"/> | With beamforming | <input checked="" type="checkbox"/> | Without beamforming |
| Type of EUT | | | | |
| <input checked="" type="checkbox"/> | Stand-alone | | | |
| <input type="checkbox"/> | Combined (EUT where the radio part is fully integrated within another device) | | | |
| | Combined Equipment - Brand Name / Model No.: | | ... | |
| <input type="checkbox"/> | Plug-in radio (EUT intended for a variety of host systems) | | | |
| | Host System - Brand Name / Model No.: | | ... | |
| <input type="checkbox"/> | Other: | | | |

1.1.4 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FR971005AC

Below is the table for the change of the product with respect to the original one.

| Modifications | Performance Checking |
|---|---|
| 5825MHz was added | N/A |
| Added a relay system power | AC Conducted Emissions and Emissions in Restricted Frequency Bands below 1GHz |
| Add one power cord for 1.8m | |
| GPS function can be working | N/A |
| Equipment, Brand Name and Model Name was updated | |
| Spilter/Combiner (MPN: ZACS622-100WS) was removed | |

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ◆ 47 CFR FCC Part 15
- ◆ ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of TAF:

- ◆ KDB 558074 D01 v05r02
- ◆ KDB 414788 D01 v01r01

1.3 Testing Location Information

| Testing Location | | |
|--|----------|---|
| <input checked="" type="checkbox"/> | HWA YA | ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL : 886-3-327-3456 FAX : 886-3-327-0973 |
| Test site Designation No. TW1190 with FCC. | | |
| <input type="checkbox"/> | JHUBEI | ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.) TEL : 886-3-656-9065 FAX : 886-3-656-9085 |
| Test site Designation No. TW0006 with FCC. | | |
| <input type="checkbox"/> | Wen Shan | ADD : No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL : 886-3-318-0787 FAX : 886-3-318-0287 |
| Test site Designation No. TW1097 with FCC. | | |

| Test Condition | Test Site No. | Test Engineer | Test Environment | Test Date |
|----------------|---------------|---------------|-----------------------|-------------|
| AC Conduction | CO04-HY | Edward Wang | 20.1~21.9°C / 56~ 59% | 07/Apr/2020 |
| Radiated | 03CH02-HY | Daniel Lin | 21.1~23.8°C / 51~ 62% | 27/Apr/2020 |

1.4 Measurement Uncertainty


ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

| Test Items | Uncertainty | Remark |
|--------------------------------------|-------------|--------------------------|
| Conducted Emission (150kHz ~ 30MHz) | 0.9 dB | Confidence levels of 95% |
| Radiated Emission (9kHz ~ 30MHz) | 2.4 dB | Confidence levels of 95% |
| Radiated Emission (30MHz ~ 1,000MHz) | 3.7 dB | Confidence levels of 95% |

2 Test Configuration of EUT

2.1 The Worst Case Measurement Configuration

| The Worst Case Mode for Following Conformance Tests | |
|---|--|
| Tests Item | AC power-line conducted emissions |
| Condition | AC power-line conducted measurement for line and neutral |
| Operating Mode | CTX |
| 1 | Switching Power Supply |

| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| Tests Item | Emissions in Restricted Frequency Bands |
| Test Condition | Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type. |
| Operating Mode < 1GHz | CTX |
| 1 | Switching Power Supply |
| Orthogonal Planes of EUT | Z Plane |
| |  |
| Worst Planes of EUT | V |

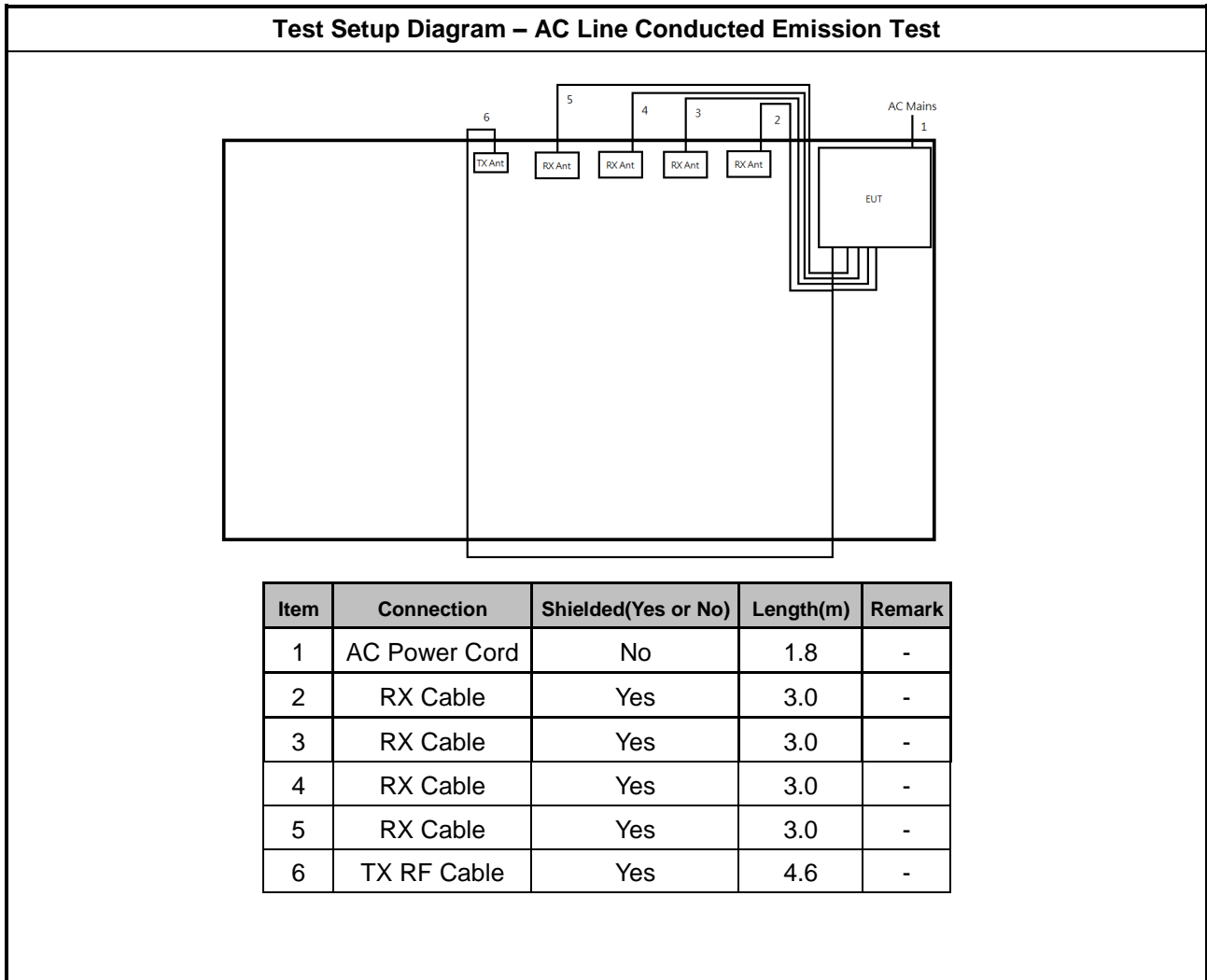


2.2 Accessories

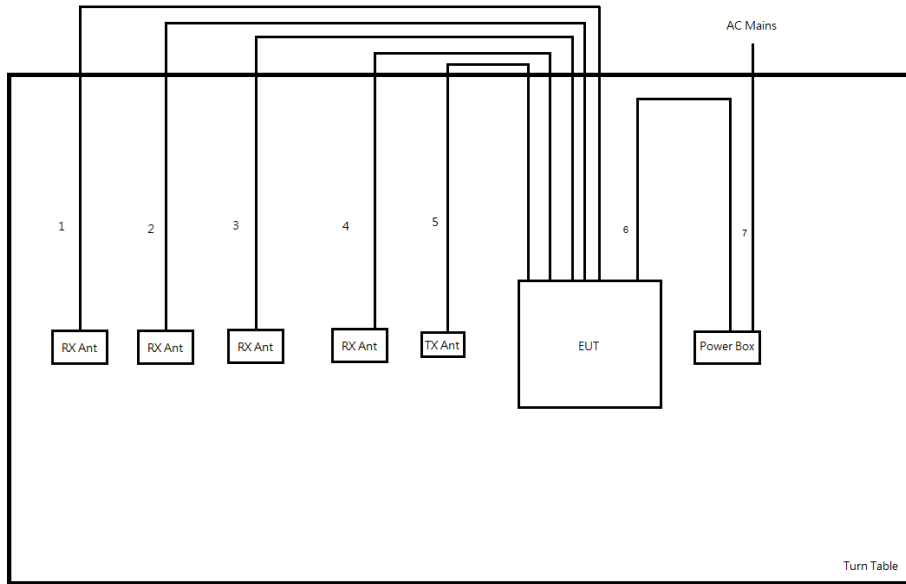
| | | | | |
|--|--------------|--|------------|-----------------------------|
| AC power Cord | Brand Name | AC Power cord | Model Name | 11-00022 |
| | Manufacturer | Tensility | | |
| | Power Rating | I/P: 110 -250 Vac, 2.5 A | | |
| | Power Cord | 1 meter, non-shielded cable, w/o ferrite core | | |
| Universal Adaptor | Brand Name | Universal Adapter | Model Name | APK01AP-52 |
| | Manufacturer | Targus | | |
| Additional power cable with Fischer connector for DC | Brand Name | Open ended cable with 2 pin Fischer | Model Name | 600090256 |
| | Manufacturer | Celliber | | |
| | Power Cord | 2 meter, non-shielded cable, w/o ferrite core | | |
| M12 Ethernet cable | Brand Name | M12 08 pos Male to RJ45 cable | Model Name | 1407415 |
| | Manufacturer | Phoenix Contact | | |
| | Power Cord | 2 meter, shielded cable, w/o ferrite core | | |
| M12 Ethernet cable | Brand Name | Circular M12 08 pos Male to M12 08 pos Male | Model Name | 1408748 |
| | Manufacturer | Phoenix Contact | | |
| | Power Cord | 0.5 meter, shielded cable, w/o ferrite core | | |
| VGA Cable | Brand Name | VGA Cable | Model Name | P502-006 |
| | Manufacturer | P502-006 | | |
| | Power Cord | 1.83 meter, shielded cable, w/o ferrite core | | |
| RX Antenna Assembly | Brand Name | RX Antenna Assembly | Model Name | 800090085-01 |
| | Manufacturer | Celliber | PN | LP-2400-6000 |
| TX Antenna | Brand Name | TX Antenna | Model Name | MGRM-WHF-3C-BLK-120 |
| | Manufacturer | Mobile Mark Antennas Solutions | | |
| | Power Cord | 3 meter, shielded cable, w/o ferrite core | | |
| TX Antenna | Brand Name | TX Antenna | Model Name | RM-WHF-DN-BLK |
| | Manufacturer | Mobile Mark Antennas Solutions | | |
| GPS antenna | Brand Name | GPS Antenna | Model Name | 33-4721-00-3000 |
| | Manufacturer | Tallysman Wireless Inc. | | |
| | Power Cord | 3 meter, shielded cable, w/o ferrite core | | |
| N Type to SMA adapter | Brand Name | Adapter | Model Name | 53S132-K00L5 |
| | Manufacturer | Rosenberger | | |
| RX Cable | Brand Name | Rx Cable | Model Name | ULC-10FT-SMSM+ |
| | Manufacturer | Mini-Circuits | | |
| | Power Cord | 3 meter, shielded cable, w/o ferrite core | | |
| TX Cable | Brand Name | TX Cable | Model Name | SPU400FR/11SMA/11SMA/004600 |
| | Manufacturer | HUBER+SUHNER | | |
| | Power Cord | 4.6 meter, shielded cable, w/o ferrite core | | |
| AC power cord (Add) | Power Cord | 1.8meter, non-shielded cable, w/o ferrite core | | |

Reminder: Regarding to more detail and other information, please refer to user manual.

2.3 Test Setup Diagram



Test Setup Diagram - Radiated Test



| Item | Connection | Shielded | Length(m) | Remark |
|------|---------------|----------|-----------|--------|
| 1 | RX Cable | No | 3.0 | - |
| 2 | RX Cable | No | 3.0 | - |
| 3 | RX Cable | No | 3.0 | - |
| 4 | RX Cable | No | 3.0 | - |
| 5 | TX Cable | No | 4.6 | - |
| 6 | AC Power Cord | No | 1.8 | - |
| 7 | Power Cable | No | 1.8 | - |



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

| AC Power-line Conducted Emissions Limit | | |
|---|------------|-----------|
| Frequency Emission (MHz) | Quasi-Peak | Average |
| 0.15-0.5 | 66 - 56 * | 56 - 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

Note 1: * Decreases with the logarithm of the frequency.

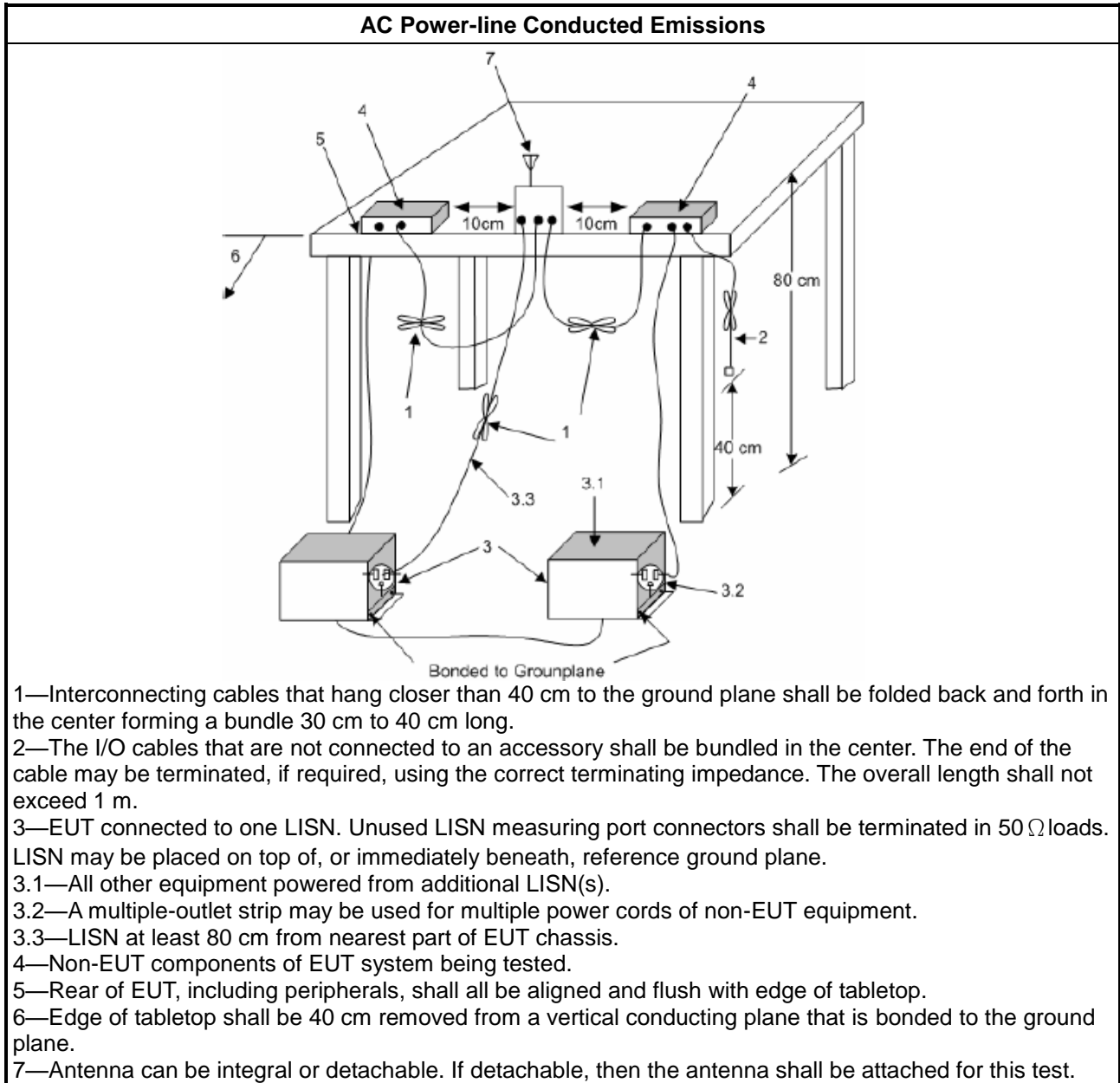
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

| Test Method |
|--|
| <input checked="" type="checkbox"/> Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions. |

3.1.4 Test Setup



3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A



3.2 Emissions in Restricted Frequency Bands

3.2.1 Emissions in Restricted Frequency Bands Limit

| Restricted Band Emissions Limit | | | |
|---------------------------------|-----------------------|-------------------------|----------------------|
| Frequency Range (MHz) | Field Strength (uV/m) | Field Strength (dBuV/m) | Measure Distance (m) |
| 0.009~0.490 | 2400/F(kHz) | 48.5 - 13.8 | 300 |
| 0.490~1.705 | 24000/F(kHz) | 33.8 - 23 | 30 |
| 1.705~30.0 | 30 | 29 | 30 |
| 30~88 | 100 | 40 | 3 |
| 88~216 | 150 | 43.5 | 3 |
| 216~960 | 200 | 46 | 3 |
| Above 960 | 500 | 54 | 3 |

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

3.2.2 Measuring Instruments

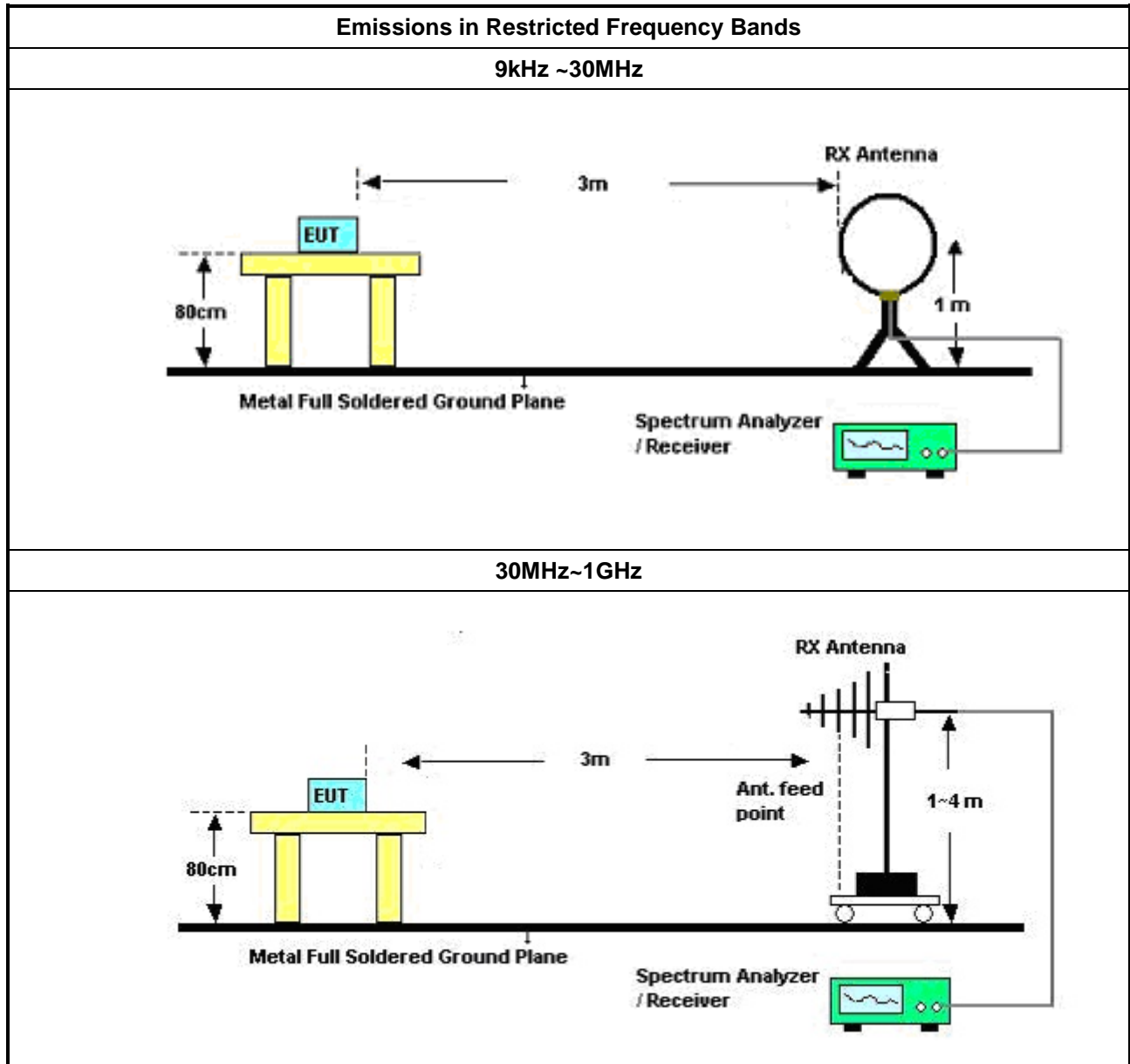
Refer a test equipment and calibration data table in this test report.

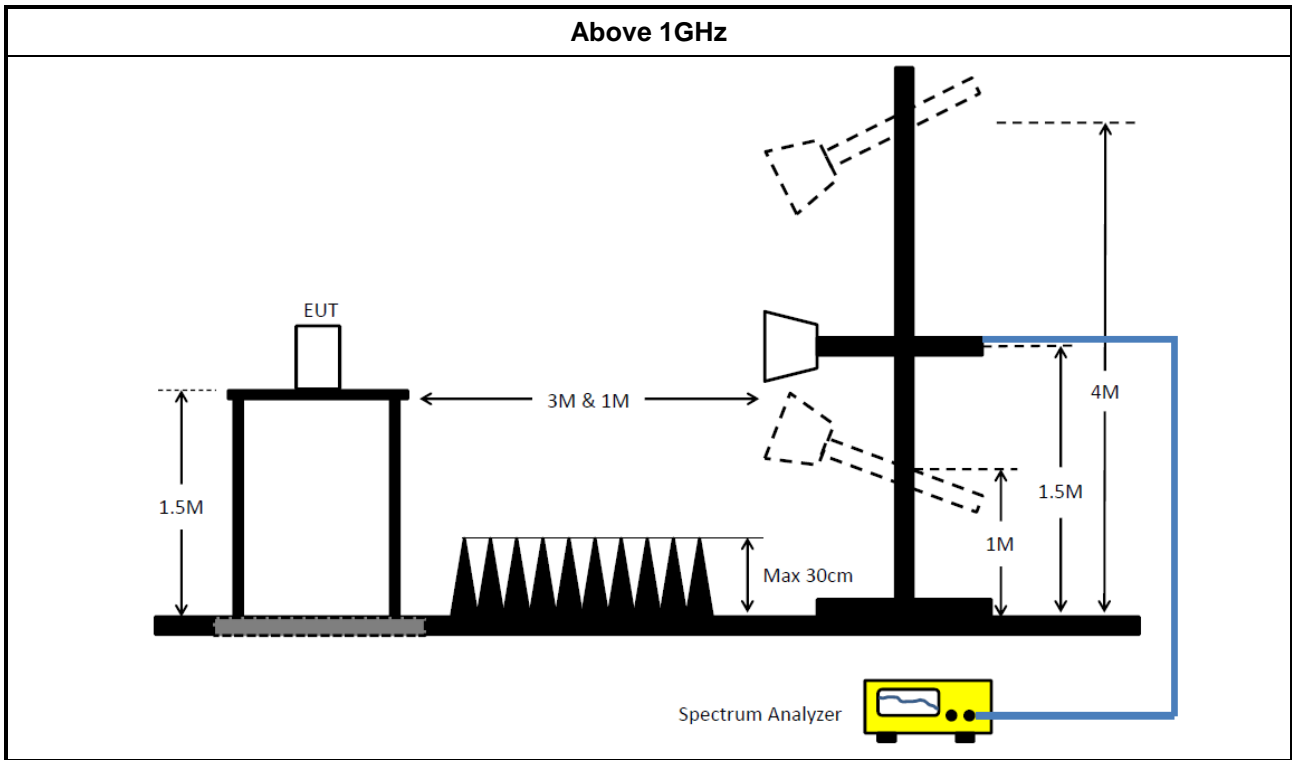


3.2.3 Test Procedures

| Test Method | |
|-------------|--|
| | <ul style="list-style-type: none"> The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor]. |
| | <ul style="list-style-type: none"> Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band. |
| | <ul style="list-style-type: none"> For the transmitter unwanted emissions shall be measured using following options below: |
| | <ul style="list-style-type: none"> Refer as KDB 558074, clause 8.6 (11.12 of ANSI C63.10) for restricted frequency bands. |
| | <ul style="list-style-type: none"> For the transmitter band-edge emissions shall be measured using following options below: |
| | <ul style="list-style-type: none"> Refer as KDB 558074 clause 8.7.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below. |
| | <ul style="list-style-type: none"> Refer as KDB 558074, clause 8.7.2 (6.10.6 of ANSI C63.10) for marker-delta method for band-edge measurements. |
| | <ul style="list-style-type: none"> Refer as KDB 558074, clause 8.7.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels. |
| | <ul style="list-style-type: none"> Use the following spectrum analyzer settings: |
| | <ul style="list-style-type: none"> Set RBW=100 kHz for f < 1 GHz; VBW=3 * RBW; Sweep = auto; Detector function = peak; Trace = max hold. |
| | <ul style="list-style-type: none"> Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement. For average measurement, refer as 1.1.4. |
| | <ul style="list-style-type: none"> KDB 414788 Open-Field Test Sites and Chamber Correlation Justification. |
| | <ul style="list-style-type: none"> Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in regulations; however, an attempt should be made to avoid making measurements in the near field. |
| | <ul style="list-style-type: none"> Open-field site and chamber correlation testing had been performed and chamber measured test result is the worst case test result. |

3.2.4 Test Setup





3.2.5 Test Result of Emissions in Restricted Frequency Bands (Below 30MHz)

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

3.2.6 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix B



4 Test Equipment and Calibration Data

Instrument for AC Conduction

| Instrument | Manufacturer | Model No. | Serial No. | Spec. | Calibration Date | Calibration Due Date |
|--------------------------------------|--------------|-------------|------------|---------------------|------------------|----------------------|
| EMC Receiver | R&S | ESR3 | 102052 | 9kHz ~ 3.6GHz | 09/Apr/2019 | 08/Apr/2020 |
| LISN | R&S | ENV216 | 101295 | 9kHz ~ 30MHz | 04/Nov/2019 | 05/Nov/2020 |
| RF Cable-CON | MTJ | RG142 | CB002-CO | 9kHz ~ 200MHz | 12/Sep/2019 | 11/Sep/2020 |
| AC POWER | APC | AFC-11005G | F310050055 | 47Hz~63Hz 5~300V | NCR | NCR |
| Impuls Begrenzer Pulse Limiter | SCHWARZBECK | VTSD 9561-F | 9561-F041 | 9 kHz ~ 30 MHz | 24/Sep/2019 | 23/Sep/2020 |

NCR: Non-Calibration Require

Instrument for Radiated Test

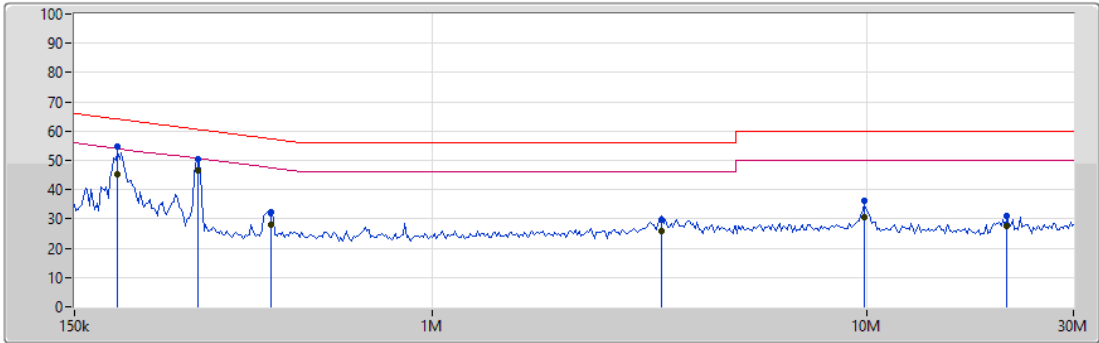
| Instrument | Manufacturer | Model No. | Serial No. | Spec. | Calibration Date | Calibration Due Date |
|-----------------------------------|--------------------|---------------------------|------------|--------------------|------------------|----------------------|
| 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH02-HY | 30MHz ~ 1GHz 3m | 29/Aug/2019 | 28/Aug/2020 |
| 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH02-HY | 1GHz ~ 18GHz 3m | 29/Aug/2019 | 28/Aug/2020 |
| Amplifier | Agilent | 8447D | 2944A11149 | 100kHz ~ 1.3GHz | 02/Jul/2019 | 01/Jul/2020 |
| Spectrum Analyzer | Rohde & Schwarz | FSP40 | 100593 | 9kHz - 40GHz | 27/Feb/2020 | 26/Feb/2021 |
| EMI Test Receiver | R&S | ESR3 | 102051 | 9kHz ~ 3.6GHz | 28/May/2019 | 27/May/2020 |
| RF Cable-R03m | Jye Bao | RG142 | CB017 | 9kHz ~ 1GHz | 21/Mar/2020 | 20/Mar/2021 |
| Bilog Antenna & 5dB Attenuator | SCHAFFNER / MTJ | CBL 6112B / MTJ6102-05 | 2723 / 2 | 30MHz ~ 1GHz | 28/Feb/2020 | 27/Feb/2021 |
| Loop Antenna | TESEQ | HLA 6120 | 31244 | 9k-30MHz | 16/Mar/2020 | 15/Mar/2021 |



AC Power-line Conducted Emissions Result

| | | | |
|--------------------|-----------------------------|-------------|---------|
| Operating Mode | 1 | Power Phase | Neutral |
| Operating Function | Switching Power Supply mode | | |

07/04/2020



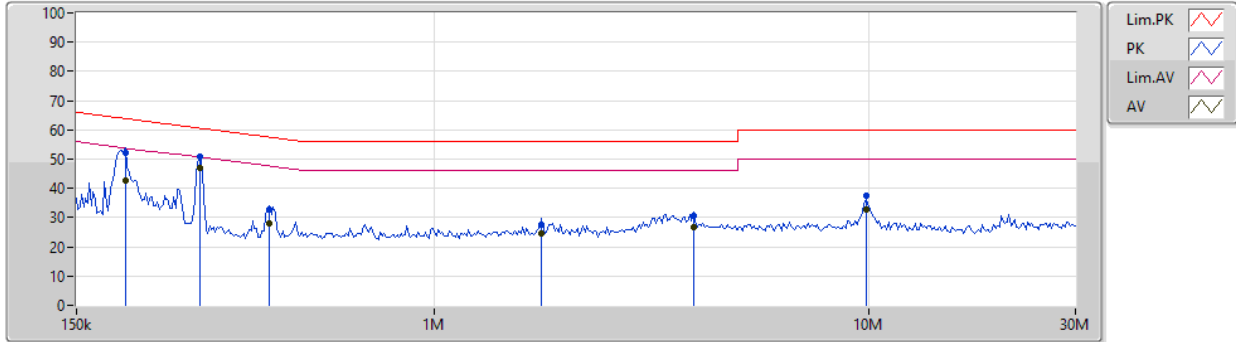
| Type | Freq (Hz) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Factor (dB) | Condition | Comment | Raw (dBuV) | LISN (dB) | CL (dB) | AT (dB) |
|------|-----------|--------------|--------------|-------------|-------------|-----------|---------|------------|-----------|---------|---------|
| QP | 188.574k | 54.77 | 64.11 | -9.34 | 19.62 | Neutral | - | 35.15 | 9.64 | 0.11 | 9.87 |
| AV | 188.574k | 45.17 | 54.11 | -8.94 | 19.62 | Neutral | - | 25.55 | 9.64 | 0.11 | 9.87 |
| QP | 289.269k | 50.50 | 60.55 | -10.05 | 19.62 | Neutral | - | 30.88 | 9.63 | 0.12 | 9.87 |
| AV | 289.269k | 46.36 | 50.55 | -4.19 | 19.62 | Neutral | "Worst" | 26.74 | 9.63 | 0.12 | 9.87 |
| QP | 426.418k | 32.38 | 57.32 | -24.94 | 19.63 | Neutral | - | 12.75 | 9.63 | 0.13 | 9.87 |
| AV | 426.418k | 28.04 | 47.32 | -19.28 | 19.63 | Neutral | - | 8.41 | 9.63 | 0.13 | 9.87 |
| QP | 3.378M | 29.68 | 56.00 | -26.32 | 19.72 | Neutral | - | 9.96 | 9.66 | 0.18 | 9.88 |
| AV | 3.378M | 26.05 | 46.00 | -19.95 | 19.72 | Neutral | - | 6.33 | 9.66 | 0.18 | 9.88 |
| QP | 9.894M | 36.28 | 60.00 | -23.72 | 19.85 | Neutral | - | 16.43 | 9.70 | 0.27 | 9.88 |
| AV | 9.894M | 30.45 | 50.00 | -19.55 | 19.85 | Neutral | - | 10.60 | 9.70 | 0.27 | 9.88 |
| QP | 21.077M | 30.95 | 60.00 | -29.05 | 19.97 | Neutral | - | 10.98 | 9.71 | 0.37 | 9.89 |
| AV | 21.077M | 27.60 | 50.00 | -22.40 | 19.97 | Neutral | - | 7.63 | 9.71 | 0.37 | 9.89 |



AC Power-line Conducted Emissions Result

| | | | |
|--------------------|-----------------------------|-------------|------|
| Operating Mode | 1 | Power Phase | Line |
| Operating Function | Switching Power Supply mode | | |

07/04/2020



| Type | Freq (Hz) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Factor (dB) | Condition | Comment | Raw (dBuV) | LISN (dB) | CL (dB) | AT (dB) |
|------|-----------|--------------|--------------|-------------|-------------|-----------|---------|------------|-----------|---------|---------|
| QP | 194.288k | 52.04 | 63.86 | -11.82 | 19.63 | Line | - | 32.41 | 9.65 | 0.11 | 9.87 |
| AV | 194.288k | 42.52 | 53.86 | -11.34 | 19.63 | Line | - | 22.89 | 9.65 | 0.11 | 9.87 |
| QP | 289.269k | 50.72 | 60.55 | -9.83 | 19.63 | Line | - | 31.09 | 9.64 | 0.12 | 9.87 |
| AV | 289.269k | 46.86 | 50.55 | -3.69 | 19.63 | Line | "Worst" | 27.23 | 9.64 | 0.12 | 9.87 |
| QP | 418.016k | 32.56 | 57.49 | -24.93 | 19.64 | Line | - | 12.92 | 9.64 | 0.13 | 9.87 |
| AV | 418.016k | 27.91 | 47.49 | -19.58 | 19.64 | Line | - | 8.27 | 9.64 | 0.13 | 9.87 |
| QP | 1.769M | 27.64 | 56.00 | -28.36 | 19.66 | Line | - | 7.98 | 9.65 | 0.14 | 9.87 |
| AV | 1.769M | 24.39 | 46.00 | -21.61 | 19.66 | Line | - | 4.73 | 9.65 | 0.14 | 9.87 |
| QP | 3.961M | 30.60 | 56.00 | -25.40 | 19.73 | Line | - | 10.87 | 9.66 | 0.19 | 9.88 |
| AV | 3.961M | 26.81 | 46.00 | -19.19 | 19.73 | Line | - | 7.08 | 9.66 | 0.19 | 9.88 |
| QP | 9.894M | 37.58 | 60.00 | -22.42 | 19.84 | Line | - | 17.74 | 9.69 | 0.27 | 9.88 |
| AV | 9.894M | 32.58 | 50.00 | -17.42 | 19.84 | Line | - | 12.74 | 9.69 | 0.27 | 9.88 |



Summary

| Mode | Result | Type | Freq (Hz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Dist (m) | Condition | Azimuth (°) | Height (m) | Comments |
|------------------------------|--------|------|--------------|-------------------|-------------------|----------------|-------------|-----------|----------------|---------------|----------|
| 2.4-2.4835GHz | - | - | - | - | - | - | - | - | - | - | - |
| 802.11n HT20_Nss1,(MCS0)_1TX | Pass | PK | 47.46M | 29.50 | 40.00 | -10.50 | 3 | Vertical | 0 | 1.00 | - |

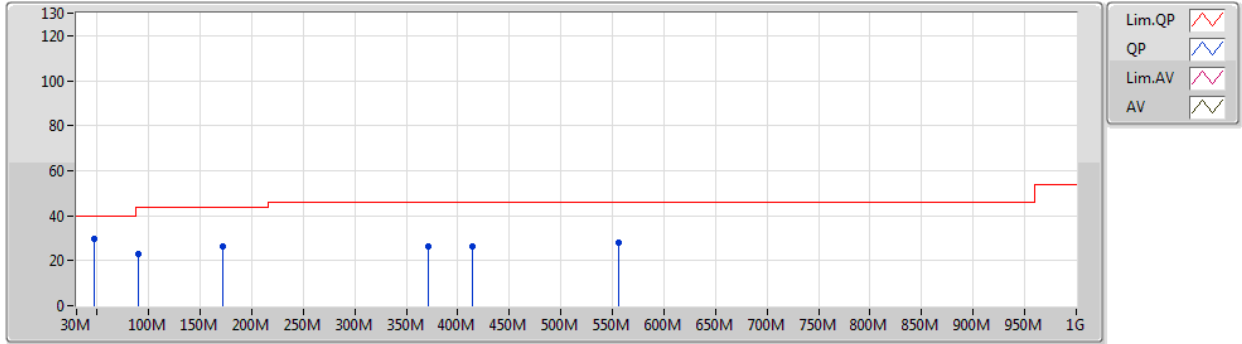


Result

| Mode | Result | Type | Freq (Hz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Dist (m) | Condition | Azimuth (°) | Height (m) | Comments |
|------------------------------|--------|------|--------------|-------------------|-------------------|----------------|-------------|------------|----------------|---------------|----------|
| 802.11n HT20_Nss1.(MCS0)_1TX | - | - | - | - | - | - | - | - | - | - | - |
| 2437MHz | Pass | PK | 47.46M | 29.50 | 40.00 | -10.50 | 3 | Vertical | 0 | 1.00 | - |
| 2437MHz | Pass | PK | 90.14M | 22.75 | 43.50 | -20.75 | 3 | Vertical | 0 | 1.00 | - |
| 2437MHz | Pass | PK | 171.62M | 26.35 | 43.50 | -17.15 | 3 | Vertical | 0 | 1.00 | - |
| 2437MHz | Pass | PK | 371.44M | 26.41 | 46.00 | -19.59 | 3 | Vertical | 0 | 1.00 | - |
| 2437MHz | Pass | PK | 414.12M | 26.41 | 46.00 | -19.59 | 3 | Vertical | 0 | 1.00 | - |
| 2437MHz | Pass | PK | 555.74M | 27.74 | 46.00 | -18.26 | 3 | Vertical | 0 | 1.00 | - |
| 2437MHz | Pass | PK | 41.64M | 25.75 | 40.00 | -14.25 | 3 | Horizontal | 360 | 1.00 | - |
| 2437MHz | Pass | PK | 90.14M | 20.21 | 43.50 | -23.29 | 3 | Horizontal | 360 | 1.00 | - |
| 2437MHz | Pass | PK | 171.62M | 19.39 | 43.50 | -24.11 | 3 | Horizontal | 360 | 1.00 | - |
| 2437MHz | Pass | PK | 402.48M | 24.86 | 46.00 | -21.14 | 3 | Horizontal | 360 | 1.00 | - |
| 2437MHz | Pass | PK | 493.66M | 26.14 | 46.00 | -19.86 | 3 | Horizontal | 360 | 1.00 | - |
| 2437MHz | Pass | PK | 610.06M | 28.36 | 46.00 | -17.64 | 3 | Horizontal | 360 | 1.00 | - |

802.11n HT20_Nss1,(MCS0)_1TX
2437MHz_Switching Power Supply

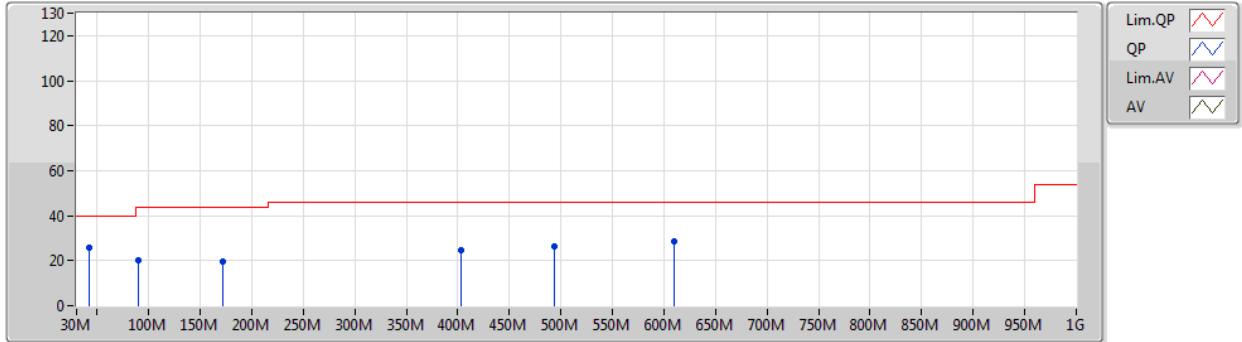
27/04/2020



| Type | Freq (Hz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Factor (dB) | Dist (m) | Condition | Azimuth (°) | Height (m) | Comment | Raw (dBuV) | AF (dB) | CL (dB) | PA (dB) |
|------|-----------|----------------|----------------|-------------|-------------|----------|-----------|-------------|------------|---------|------------|---------|---------|---------|
| PK | 47.46M | 29.50 | 40.00 | -10.50 | -12.24 | 3 | Vertical | 0 | 1.00 | - | 41.74 | 14.23 | 1.05 | 27.52 |
| PK | 90.14M | 22.75 | 43.50 | -20.75 | -11.90 | 3 | Vertical | 0 | 1.00 | - | 34.65 | 14.02 | 1.50 | 27.42 |
| PK | 171.62M | 26.35 | 43.50 | -17.15 | -10.26 | 3 | Vertical | 0 | 1.00 | - | 36.61 | 14.69 | 2.12 | 27.07 |
| PK | 371.44M | 26.41 | 46.00 | -19.59 | -3.82 | 3 | Vertical | 0 | 1.00 | - | 30.23 | 20.06 | 3.19 | 27.07 |
| PK | 414.12M | 26.41 | 46.00 | -19.59 | -2.35 | 3 | Vertical | 0 | 1.00 | - | 28.76 | 21.69 | 3.33 | 27.37 |
| PK | 555.74M | 27.74 | 46.00 | -18.26 | -0.06 | 3 | Vertical | 0 | 1.00 | - | 27.80 | 24.04 | 3.92 | 28.02 |

802.11n HT20_Nss1,(MCS0)_1TX
2437MHz_Switching Power Supply

27/04/2020



| Type | Freq (Hz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Factor (dB) | Dist (m) | Condition | Azimuth (°) | Height (m) | Comment | Raw (dBuV) | AF (dB) | CL (dB) | PA (dB) |
|------|-----------|----------------|----------------|-------------|-------------|----------|------------|-------------|------------|---------|------------|---------|---------|---------|
| PK | 41.64M | 25.75 | 40.00 | -14.25 | -9.55 | 3 | Horizontal | 360 | 1.00 | - | 35.30 | 16.99 | 1.00 | 27.54 |
| PK | 90.14M | 20.21 | 43.50 | -23.29 | -11.90 | 3 | Horizontal | 360 | 1.00 | - | 32.11 | 14.02 | 1.50 | 27.42 |
| PK | 171.62M | 19.39 | 43.50 | -24.11 | -10.26 | 3 | Horizontal | 360 | 1.00 | - | 29.65 | 14.69 | 2.12 | 27.07 |
| PK | 402.48M | 24.86 | 46.00 | -21.14 | -2.84 | 3 | Horizontal | 360 | 1.00 | - | 27.70 | 21.13 | 3.30 | 27.27 |
| PK | 493.66M | 26.14 | 46.00 | -19.86 | -1.29 | 3 | Horizontal | 360 | 1.00 | - | 27.43 | 22.83 | 3.66 | 27.78 |
| PK | 610.06M | 28.36 | 46.00 | -17.64 | 0.07 | 3 | Horizontal | 360 | 1.00 | - | 28.29 | 23.96 | 4.14 | 28.03 |