

FCC Test Report

Equipment : AC800 Selectable Dual Band VPN Business Router
Brand Name : D-Link
Model No. : DSR-500AC
FCC ID : KA2SR500ACA1
Standard : 47 CFR FCC Part 15.407
Operating Band : 5725 MHz – 5850 MHz
FCC Classification : NII
Applicant : D-Link Corporation
17595 Mt. Herrmann, Fountain Valley, CA 92708 U.S.A.

The product sample received on Aug. 27, 2014 and completely tested on Jan. 05, 2015. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

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

Reviewed by:


James Fan / Assistant Manager





Table of Contents

| | | |
|----------|---|--------------|
| 1 | GENERAL DESCRIPTION | 5 |
| 1.1 | Information..... | 5 |
| 1.2 | Accessories and Support Equipment..... | 7 |
| 1.3 | Testing Applied Standards | 7 |
| 1.4 | Testing Location Information | 7 |
| 1.5 | Measurement Uncertainty | 8 |
| 2 | TEST CONFIGURATION OF EUT | 9 |
| 2.1 | The Worst Case Modulation Configuration | 9 |
| 2.2 | The Worst Case Power Setting Parameter | 9 |
| 2.3 | The Worst Case Measurement Configuration | 10 |
| 2.4 | Test Setup Diagram | 11 |
| 3 | TRANSMITTER TEST RESULT | 12 |
| 3.1 | AC Power-line Conducted Emissions | 12 |
| 3.2 | Emission Bandwidth..... | 15 |
| 3.3 | RF Output Power | 18 |
| 3.4 | Peak Power Spectral Density | 21 |
| 3.5 | Transmitter Radiated Unwanted Emissions and Band Edge | 24 |
| 3.6 | Frequency Stability..... | 47 |
| 4 | TEST EQUIPMENT AND CALIBRATION DATA..... | 49 |
| | APPENDIX A. TEST PHOTOS | A1-A5 |

Summary of Test Result

| Conformance Test Specifications | | | | | |
|---------------------------------|------------------|--|---|--|----------|
| Report Clause | Ref. Std. Clause | Description | Measured | Limit | Result |
| 1.1.2 | 15.203 | Antenna Requirement | Antenna connector mechanism complied | FCC 15.203 | Complied |
| 3.1 | 15.207 | AC Power-line Conducted Emissions | [dBuV]:0.3751190MHz 49.31 (Margin 9.08dB) – QP 45.23 (Margin 3.16dB) – AV | FCC 15.207 | Complied |
| 3.2 | 15.407(a) | Emission Bandwidth | 26dB Bandwidth [MHz] 20M: 52.09 / 40M: 84.26 80M: 89.04 6dB Bandwidth [MHz] 20M: 16.35 / 40M: 36.17 80M: 76.29 | Information only for 26dB bandwidth 500kHz for 6dB bandwidth | Complied |
| 3.3 | 15.407(a) | RF Output Power (Maximum Conducted (Average) Output Power) | Power [dBm] 5725-5850MHz: 23.92 | Power [dBm] 5725-5850MHz: 30 | Complied |
| 3.4 | 15.407(a) | Peak Power Spectral Density | PPSD [dBm/MHz] 5725-5850MHz: 7.27 | PPSD [dBm/500kHz] 5725-5850MHz: 30 | Complied |
| 3.5 | 15.407(b) | Transmitter Unwanted Emissions and Band Edge | Restricted Bands [dBuV/m at 3m]: 5715.00MHz 52.96 (Margin 1.04dB) – AV | Non-Restricted Bands: ≤ -27dBm (68.2dBuV/m@3m) Restricted Bands: FCC 15.209 | Complied |
| 3.6 | 15.407(g) | Frequency Stability | 3.7373 ppm | Signal shall remain in-band | Complied |



Revision History

| Report No. | Version | Description | Issued Date |
|------------|---------|----------------------------|---------------|
| FR4N2636AI | Rev. 01 | Initial issue of report | Feb. 04, 2015 |
| FR4N2636AI | Rev. 02 | Modify ANSI C63.10 version | May 21, 2015 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

1 General Description

1.1 Information

1.1.1 RF General Information

| RF General Information | | | | | | |
|------------------------|------------------|-----------------|----------------|------------------------------------|-----------------------|-------------|
| Frequency Range (MHz) | IEEE Std. 802.11 | Ch. Freq. (MHz) | Channel Number | Transmit Chains (N _{TX}) | RF Output Power (dBm) | Co-location |
| 5725-5850 | a | 5745-5825 | 149-165 [5] | 2 | 23.66 | No |
| 5725-5850 | n(HT20) | 5745-5825 | 149-165 [5] | 2 | 23.86 | No |
| 5725-5850 | n(HT40) | 5755-5795 | 151-159 [2] | 2 | 21.71 | No |
| 5725-5850 | ac(VHT20) | 5745-5825 | 149-165 [5] | 2 | 23.92 | No |
| 5725-5850 | ac(VHT40) | 5755-5795 | 151-159 [2] | 2 | 21.76 | No |
| 5725-5850 | ac(VHT80) | 5775 | 155 [1] | 2 | 14.04 | No |

Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.
 Note 2: 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
 Note 3: 802.11ac uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.
 Note 4: Co-location, Co-location is generally defined as simultaneously transmitting (co-transmitting) antennas within 20 cm of each other. (i.e., EUT has simultaneously co-transmitting that operating 2.4GHz and 5GHz.)

1.1.2 Antenna Information

| Antenna Category | |
|-------------------------------------|---|
| <input type="checkbox"/> | Integral antenna (antenna permanently attached) |
| <input type="checkbox"/> | Temporary RF connector provided |
| <input type="checkbox"/> | No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path. |
| <input checked="" type="checkbox"/> | External antenna (dedicated antennas) |
| <input checked="" type="checkbox"/> | Single power level with corresponding antenna(s). |
| <input type="checkbox"/> | Multiple power level and corresponding antenna(s). |
| <input checked="" type="checkbox"/> | RF connector provided |
| <input checked="" type="checkbox"/> | Unique antenna connector. (e.g., MMCX, U.FL, IPX, and RP-SMA, RP-N type...) |
| <input type="checkbox"/> | Standard antenna connector. (e.g., SMA, N, BNC, and TNC type...) |

| Antenna General Information | | | | | |
|-----------------------------|--------|-----------|--|-----------|-----------|
| No. | Type | Connector | Operating Frequencies (MHz) / Antenna Gain (dBi) | | |
| | | | 2400~2483.5 | 5150~5250 | 5725~5850 |
| 1 | Dipole | R-SMA | 2 | 2 | 2 |

1.1.3 Type of EUT

| Identify EUT | |
|-------------------------------------|---|
| EUT Serial Number | N/A |
| Presentation of Equipment | <input type="checkbox"/> Production ; <input checked="" type="checkbox"/> Pre-Production ; <input type="checkbox"/> Prototype |
| 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 Test Signal Duty Cycle

| Operated Mode for Worst Duty Cycle | |
|---|---------------------------------------|
| <input checked="" type="checkbox"/> Operated test mode for worst duty cycle | |
| Test Signal Duty Cycle (x) | Power Duty Factor [dB] – (10 log 1/x) |
| <input checked="" type="checkbox"/> 91.26% - IEEE 802.11a | 0.40 |
| <input checked="" type="checkbox"/> 96.46% - IEEE 802.11ac (VHT20) | 0.16 |
| <input checked="" type="checkbox"/> 94.17% - IEEE 802.11ac (VHT40) | 0.26 |
| <input checked="" type="checkbox"/> 89.05% - IEEE 802.11ac (VHT80) | 0.50 |

1.1.5 EUT Operational Condition

| | | | |
|----------------|--|--|--|
| Supply Voltage | <input checked="" type="checkbox"/> 12Vdc from adapter | | |
| Test Voltage | <input checked="" type="checkbox"/> Vnom (120 V) | <input checked="" type="checkbox"/> Vmax (102 V) | <input checked="" type="checkbox"/> Vmin (138 V) |
| Test Climatic | <input checked="" type="checkbox"/> Tnom (20°C) | <input checked="" type="checkbox"/> Tmax (50°C) | <input checked="" type="checkbox"/> Tmin (-30°C) |

1.2 Accessories and Support Equipment

| Accessories | | |
|-------------|------------|---|
| No. | Equipment | Description |
| 1 | AC Adapter | Brand: APD Model: DA-30P12 I/P: 100-240Vac, 50/60Hz, 0.8A Max O/P: 12Vdc, 2.5A DC line: 1.47m non-shielded w/o core |

| Support Equipment | | | | |
|-------------------|---------------|------------|----------------|--------|
| No. | Equipment | Brand Name | Model Name | FCC ID |
| 1 | Notebook | DELL | Latitude E6440 | DoC |
| 2 | Notebook | DELL | Latitude E6440 | DoC |
| 3 | USB 2.0 Flash | hp | V225w | --- |

Note: No.3 was provided by applicant.

1.3 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 C63.10-2009
- ◆ FCC KDB 789033 D02 v01
- ◆ FCC KDB 644545 D03 v01
- ◆ FCC KDB 662911 v02r01
- ◆ FCC KDB 412172 v01

Note: FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014

1.4 Testing Location Information

| Testing Location | | | | |
|---|---------------|--|----------------------|-------------------------|
| <input checked="" type="checkbox"/> | HWA YA | ADD : No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. | | |
| | | TEL : 886-3-327-3456 | FAX : 886-3-327-0973 | |
| Test Condition | Test Site No. | Test Engineer | Test Environment | Test Date |
| RF Conducted | TH01-HY | Mark Liao | 20°C / 63% | Jan. 05, 2015 |
| AC Conduction | CO04-HY | Skys Huang | 22°C / 54% | Dec. 15, 2014 |
| Radiated Emission | 03CH03-HY | Jack Li | 20-26°C / 64-65% | Aug. 29 ~ Dec. 12, 2014 |
| Test site registered number [643075] with FCC | | | | |
| Test site registered number [4086B-1] with IC | | | | |

1.5 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))

| Measurement Uncertainty | | | |
|-----------------------------------|---------------|-------------|-------|
| Test Item | | Uncertainty | Limit |
| AC power-line conducted emissions | | ±2.26 dB | N/A |
| Emission bandwidth | | ±1.42 % | N/A |
| RF output power, conducted | | ±0.63 dB | N/A |
| Power density, conducted | | ±0.81 dB | N/A |
| Unwanted emissions, conducted | 30 – 1000 MHz | ±0.51 dB | N/A |
| | 1 – 18 GHz | ±0.67 dB | N/A |
| | 18 – 40 GHz | ±0.83 dB | N/A |
| | 40 – 200 GHz | N/A | N/A |
| All emissions, radiated | 30 – 1000 MHz | ±2.56 dB | N/A |
| | 1 – 18 GHz | ±3.59 dB | N/A |
| | 18 – 40 GHz | ±3.82 dB | N/A |
| | 40 – 200 GHz | N/A | N/A |
| Temperature | | ±0.8 °C | N/A |
| Humidity | | ±3 % | N/A |
| DC and low frequency voltages | | ±3 % | N/A |
| Time | | ±1.42 % | N/A |
| Duty Cycle | | ±1.42 % | N/A |

2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

| Worst Modulation Used for Conformance Testing (5725-5850 MHz) | | | |
|---|------------------------------------|-----------------|-----------------------|
| Modulation Mode | Transmit Chains (N _{TX}) | Data Rate / MCS | Worst Data Rate / MCS |
| 11a | 2 | 6-54Mbps | 6 Mbps |
| HT20 | 2 | MCS 0-15 | MCS 0 |
| HT40 | 2 | MCS 0-15 | MCS 0 |
| VHT20 | 2 | MCS 0-9 | MCS 0 |
| VHT40 | 2 | MCS 0-9 | MCS 0 |
| VHT80 | 2 | MCS 0-9 | MCS 0 |

2.2 The Worst Case Power Setting Parameter




| The Worst Case Power Setting Parameter (5150-5250MHz band) | | | | | | | |
|--|----------------------|----------------------|------|------|------------|------|------------|
| Test Software | ART2 | | | | | | |
| Test Software Version | ver_4_9_802_1_CS_Bin | | | | | | |
| Modulation Mode | N _{TX} | Test Frequency (MHz) | | | | | |
| | | NCB: 20MHz | | | NCB: 40MHz | | NCB: 80MHz |
| | | 5745 | 5785 | 5825 | 5755 | 5795 | 5775 |
| 11a,6-54Mbps | 2 | 15 | 24 | 17.5 | -- | -- | -- |
| HT20,M0-15 | 2 | 14.5 | 24 | 17 | -- | -- | -- |
| HT40,M0-15 | 2 | -- | -- | -- | 15.5 | 20.5 | -- |
| VHT20,M0-9 | 2 | 14.5 | 24 | 17 | -- | -- | -- |
| VHT40,M0-9 | 2 | -- | -- | -- | 15.5 | 20.5 | -- |
| VHT80,M0-9 | 2 | -- | -- | -- | -- | -- | 11 |

2.3 The Worst Case Measurement Configuration

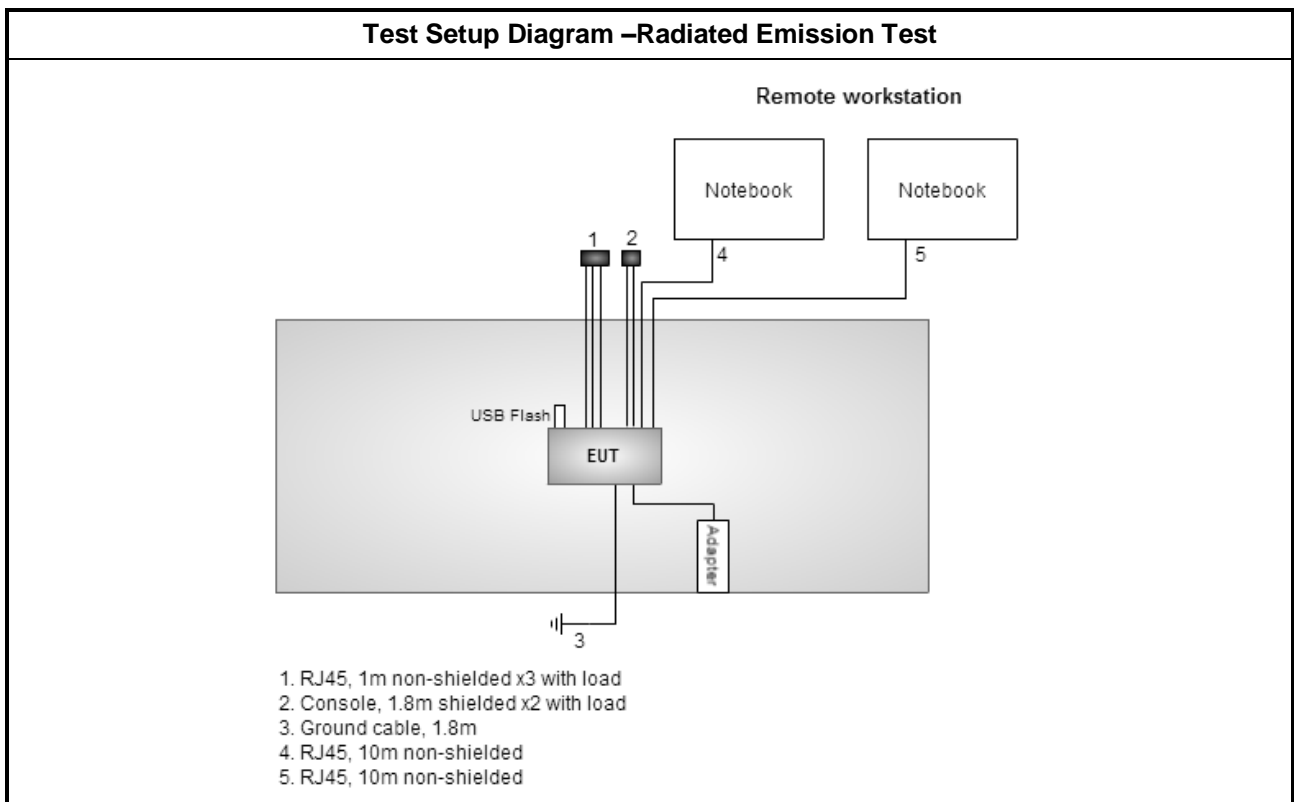
| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| Tests Item | AC power-line conducted emissions |
| Condition | AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz |
| Operating Mode | Operating Mode Description |
| 1 | AC Power & Radio link (WLAN) |

| The Worst Case Mode for Following Conformance Tests | |
|---|--|
| Tests Item | RF Output Power |
| Test Condition | Conducted measurement at transmit chains |
| Modulation Mode | 11a, HT20, HT40, VHT20, VHT40, VHT80 |
| Operating Mode | Operating Mode Description |
| 1 | AC Power & Radio link (WLAN) |

| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| Tests Item | Peak Power Spectral Density, Emission Bandwidth |
| Test Condition | Conducted measurement at transmit chains |
| Modulation Mode | 11a, VHT20, VHT40, VHT80 |
| Operating Mode | Operating Mode Description |
| 1 | AC Power & Radio link (WLAN) |

| The Worst Case Mode for Following Conformance Tests | | | |
|---|---|--|--|
| Tests Item | Transmitter Radiated Unwanted Emissions Transmitter Radiated Bandedge Emissions | | |
| 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. | | |
| User Position | <input checked="" type="checkbox"/> EUT will be placed in fixed position. | | |
| | <input type="checkbox"/> EUT will be placed in mobile position and operating multiple positions. EUT shall be performed three orthogonal planes. The worst planes is Z. | | |
| | <input type="checkbox"/> EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed two or three orthogonal planes. The worst planes is X. | | |
| Operating Mode | <input checked="" type="checkbox"/> 1. AC Power & Radio link (WLAN) | | |
| Modulation Mode | 11a, VHT20, VHT40, VHT80 | | |
| Orthogonal Planes of EUT | X Plane | Y Plane | Z Plane |
| |  |  |  |

2.4 Test Setup Diagram



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.

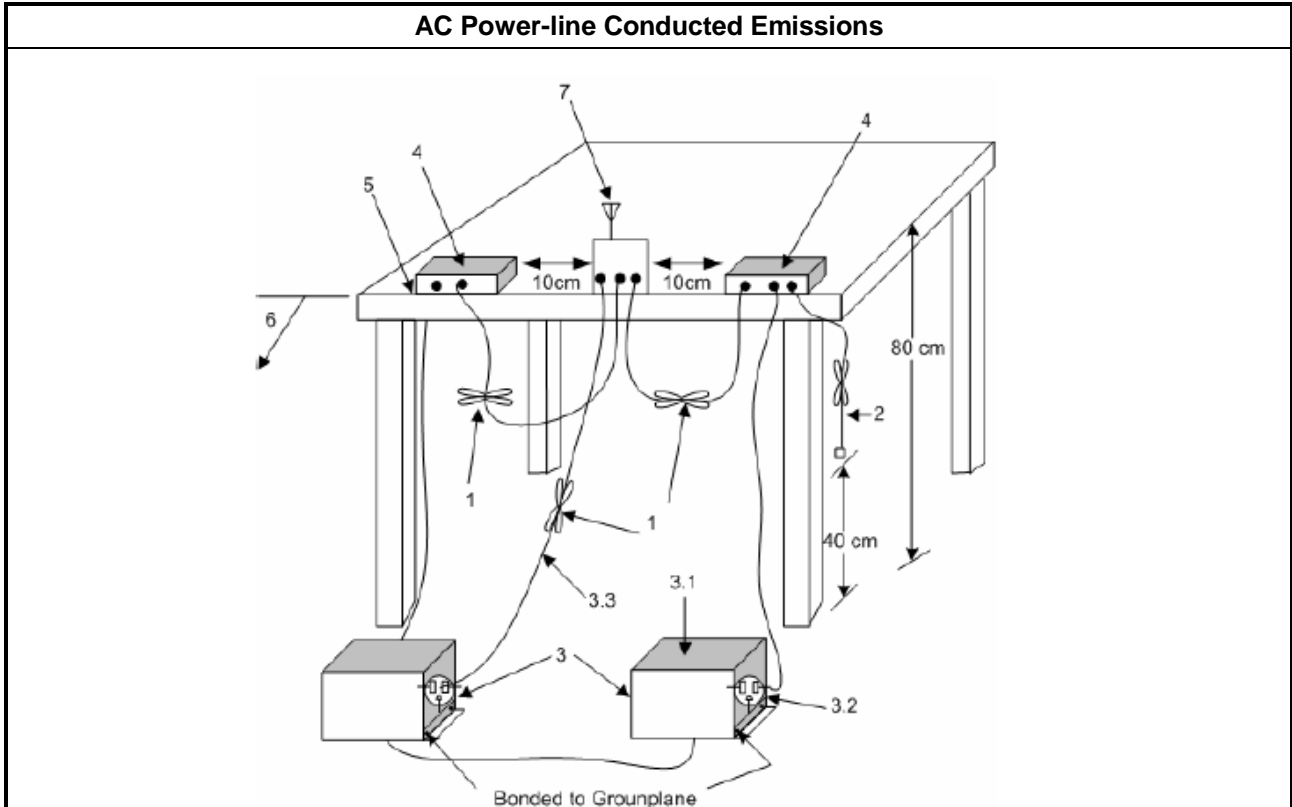
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

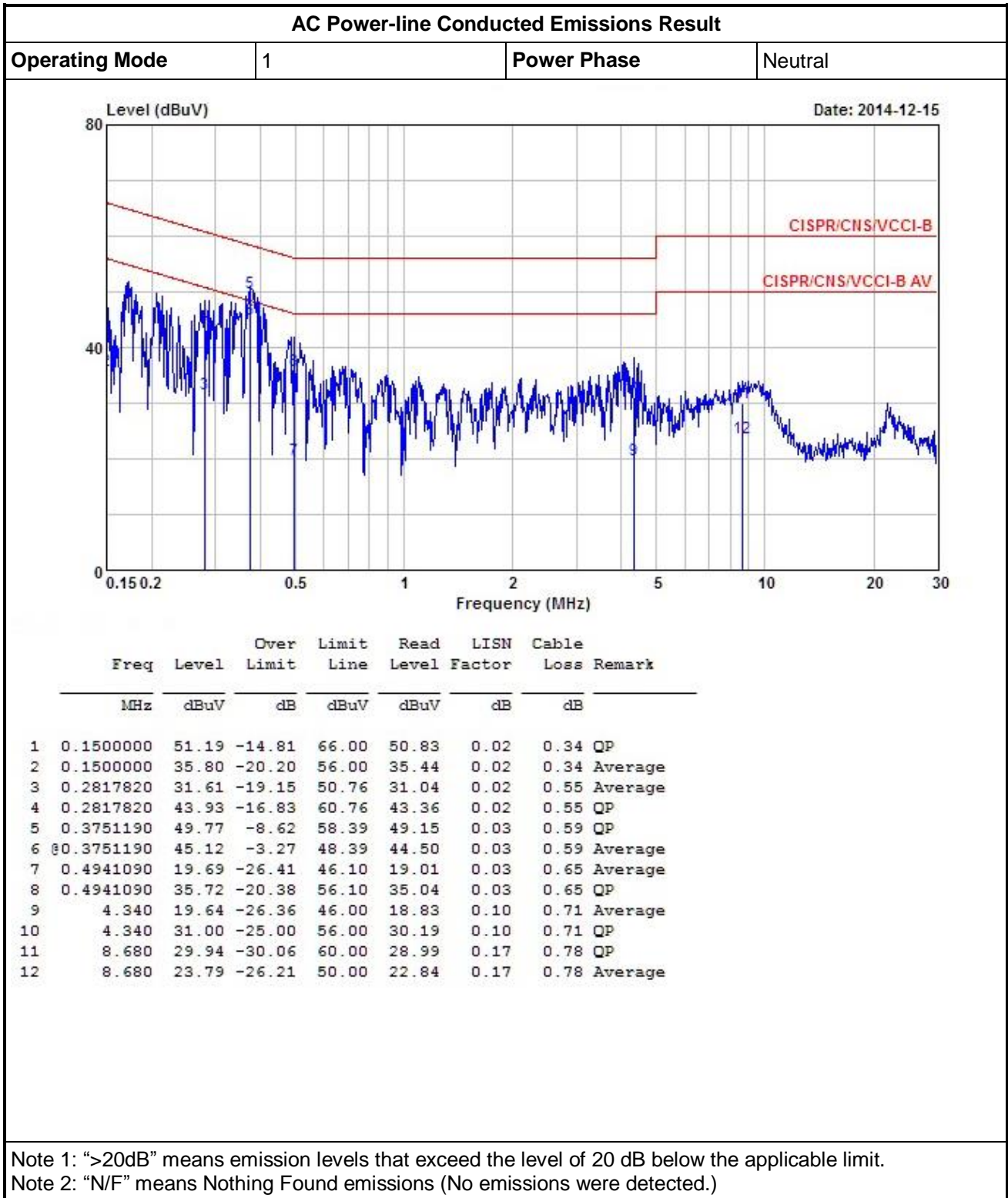
| Test Method |
|--|
| <input checked="" type="checkbox"/> Refer as ANSI C63.10-2009, clause 6.2 for AC power-line conducted emissions. |

3.1.4 Test Setup





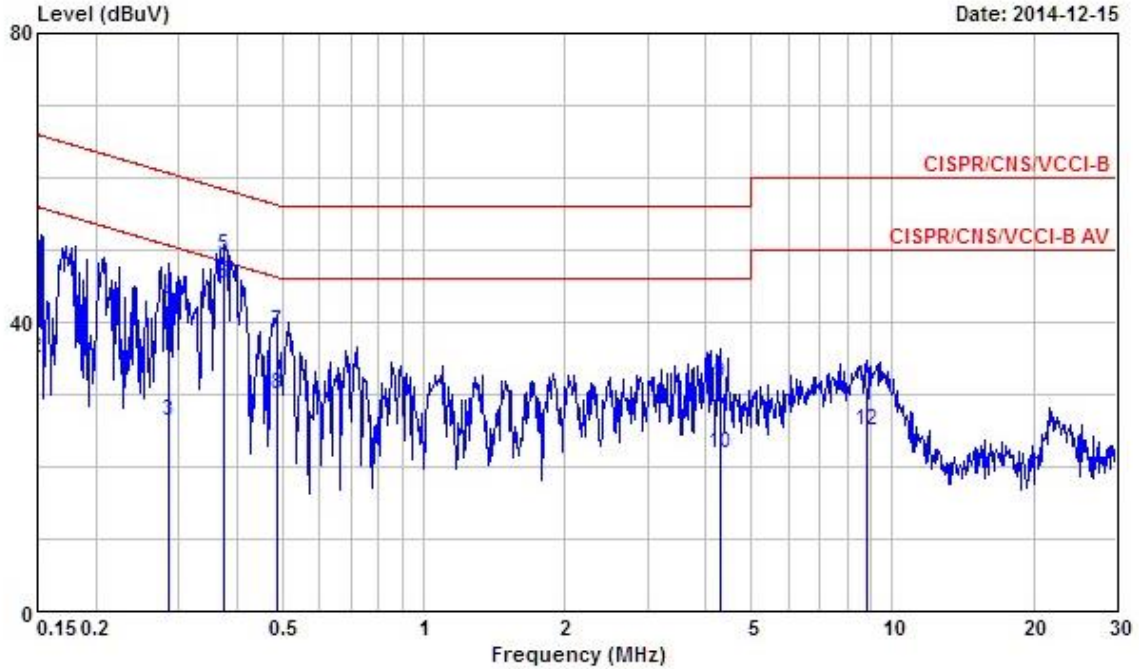
3.1.5 Test Result of AC Power-line Conducted Emissions





AC Power-line Conducted Emissions Result

| | | | |
|----------------|---|-------------|------|
| Operating Mode | 1 | Power Phase | Line |
|----------------|---|-------------|------|



| | Freq | Level | Over Limit | Limit Line | Read Level | LISN Factor | Cable Loss | Remark |
|----|-----------|-------|------------|------------|------------|-------------|------------|---------|
| | MHz | dBuV | dB | dBuV | dBuV | dB | dB | |
| 1 | 0.1500000 | 50.38 | -15.62 | 66.00 | 50.01 | 0.03 | 0.34 | QP |
| 2 | 0.1500000 | 35.02 | -20.98 | 56.00 | 34.65 | 0.03 | 0.34 | Average |
| 3 | 0.2847840 | 26.40 | -24.28 | 50.68 | 25.82 | 0.03 | 0.55 | Average |
| 4 | 0.2847840 | 42.69 | -17.99 | 60.68 | 42.11 | 0.03 | 0.55 | QP |
| 5 | 0.3751190 | 49.31 | -9.08 | 58.39 | 48.69 | 0.03 | 0.59 | QP |
| 6 | 0.3751190 | 45.23 | -3.16 | 48.39 | 44.61 | 0.03 | 0.59 | Average |
| 7 | 0.4863180 | 38.56 | -17.67 | 56.23 | 37.88 | 0.04 | 0.64 | QP |
| 8 | 0.4863180 | 30.09 | -16.14 | 46.23 | 29.41 | 0.04 | 0.64 | Average |
| 9 | 4.290 | 31.45 | -24.55 | 56.00 | 30.63 | 0.11 | 0.71 | QP |
| 10 | 4.290 | 21.85 | -24.15 | 46.00 | 21.03 | 0.11 | 0.71 | Average |
| 11 | 8.820 | 30.98 | -29.02 | 60.00 | 30.01 | 0.18 | 0.79 | QP |
| 12 | 8.820 | 25.04 | -24.96 | 50.00 | 24.07 | 0.18 | 0.79 | Average |

Note 1: ">20dB" means emission levels that exceeded the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

3.2 Emission Bandwidth

3.2.1 Emission Bandwidth (EBW) Limit

| Emission Bandwidth (EBW) Limit |
|---|
| Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz |

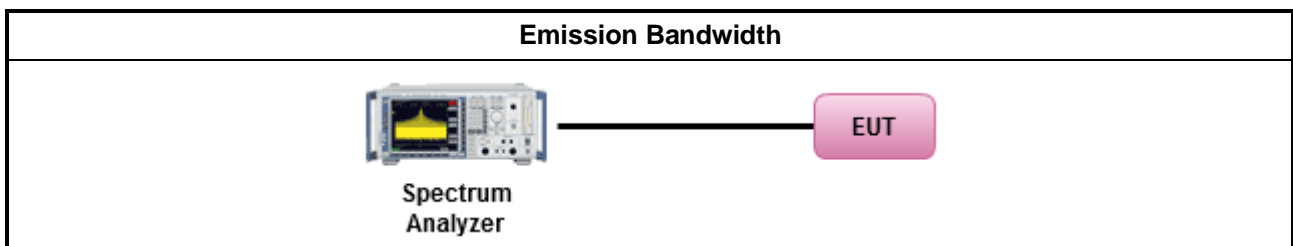
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

| Test Method | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | For the emission bandwidth shall be measured using one of the options below: |
| <input checked="" type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, clause C for EBW / 6dB bandwidth and clause D for OBW measurement. |
| <input type="checkbox"/> | Refer as ANSI C63.10, clause 6.9 for occupied bandwidth testing. |
| <input type="checkbox"/> | Refer as IC RSS-Gen, clause 6.6 for bandwidth testing. |
| <input checked="" type="checkbox"/> | For conducted measurement. |
| <input type="checkbox"/> | The EUT supports single transmit chain and measurements performed on this transmit chain. |
| <input type="checkbox"/> | The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case. |
| <input checked="" type="checkbox"/> | The EUT supports multiple transmit chains using options given below: |
| <input type="checkbox"/> | Option 1: Multiple transmit chains measurements need to be performed on one of the active transmit chains (antenna outputs). All measurement had be performed on transmit chains 1. |
| <input checked="" type="checkbox"/> | Option 2: Multiple transmit chains measurements need to be performed on each transmit chains individually (antenna outputs). All measurement had be performed on all transmit chains. |

3.2.4 Test Setup





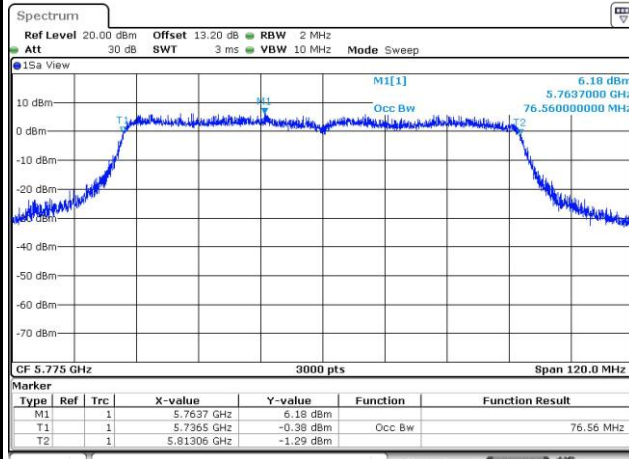
3.2.5 Test Result of Emission Bandwidth

| UNII Emission Bandwidth Result | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------|--------------------------|--------------|--------------|--------------|----------------|--------------|--------------|--------------|---------------|--------------|--------------|--------------|
| Condition | | | Emission Bandwidth (MHz) | | | | | | | | | | | |
| Modulation Mode | N _{TX} | Freq. (MHz) | 99% Bandwidth | | | | 26dB Bandwidth | | | | 6dB Bandwidth | | | |
| | | | Chain-Port 1 | Chain-Port 2 | Chain-Port 3 | Chain-Port 4 | Chain-Port 1 | Chain-Port 2 | Chain-Port 3 | Chain-Port 4 | Chain-Port 1 | Chain-Port 2 | Chain-Port 3 | Chain-Port 4 |
| 11a | 2 | 5745 | 16.82 | 16.83 | -- | -- | 24.52 | 21.91 | -- | -- | 16.35 | 16.35 | -- | -- |
| 11a | 2 | 5785 | 25.33 | 25.02 | -- | -- | 47.22 | 46.70 | -- | -- | 16.41 | 16.35 | -- | -- |
| 11a | 2 | 5825 | 16.98 | 16.83 | -- | -- | 29.16 | 27.13 | -- | -- | 16.35 | 16.35 | -- | -- |
| VHT20 | 2 | 5745 | 17.88 | 17.82 | -- | -- | 23.30 | 24.12 | -- | -- | 17.51 | 17.62 | -- | -- |
| VHT20 | 2 | 5785 | 25.42 | 24.91 | -- | -- | 52.09 | 50.26 | -- | -- | 17.62 | 16.87 | -- | -- |
| VHT20 | 2 | 5825 | 17.94 | 17.93 | -- | -- | 26.72 | 25.74 | -- | -- | 17.62 | 17.62 | -- | -- |
| VHT40 | 2 | 5755 | 36.78 | 36.84 | -- | -- | 48.23 | 46.61 | -- | -- | 36.41 | 36.17 | -- | -- |
| VHT40 | 2 | 5795 | 37.66 | 37.34 | -- | -- | 84.26 | 75.78 | -- | -- | 36.41 | 36.17 | -- | -- |
| VHT80 | 2 | 5775 | 76.56 | 76.56 | -- | -- | 89.04 | 87.88 | -- | -- | 76.29 | 76.52 | -- | -- |
| Result | | | Complied | | | | | | | | | | | |

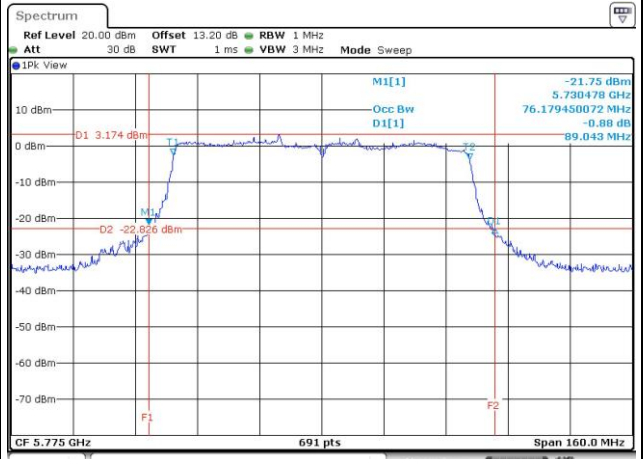


Worst Emission Bandwidth Plots

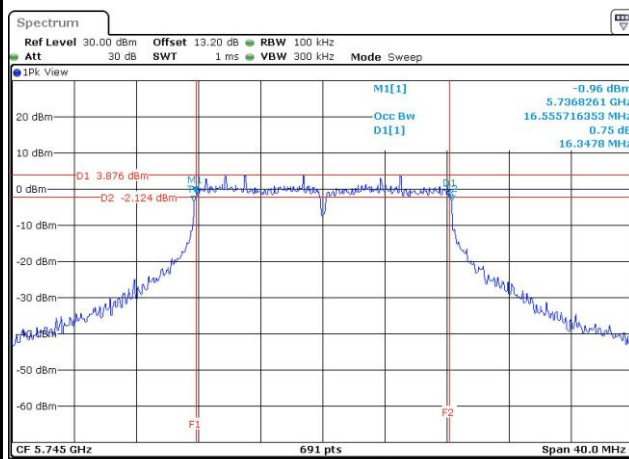
99% Bandwidth



26dB Bandwidth



6dB Bandwidth



--

--

3.3 RF Output Power

3.3.1 RF Output Power Limit

| Maximum Conducted Output Power Limit |
|--|
| <p>The maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi</p> |

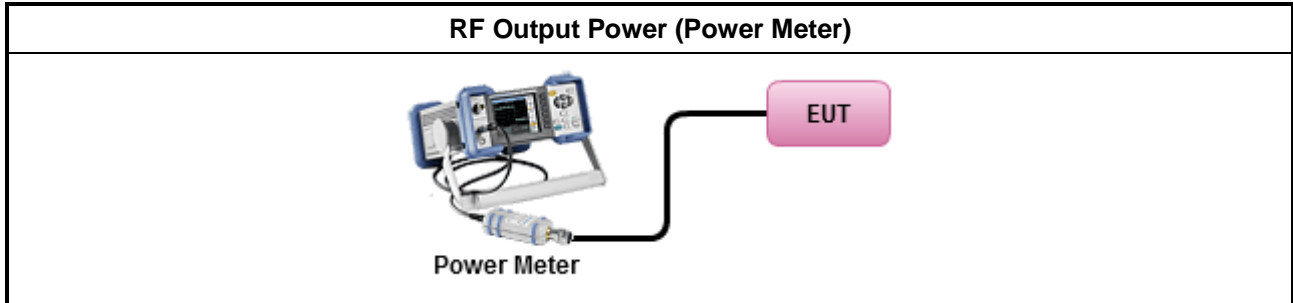
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

| Test Method | |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | Maximum Conducted Output Power |
| <input type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, clause E Method SA-1 (spectral trace averaging). |
| <input type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, clause E Method SA-1 Alt. (RMS detection with slow sweep speed) |
| <input type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, clause E Method SA-2 (spectral trace averaging). |
| <input type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, clause E Method SA-2 Alt. (RMS detection with slow sweep speed) |
| | Wideband RF power meter and average over on/off periods with duty factor |
| <input checked="" type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, clause E Method PM-G (using a gated RF average power meter). |
| <input checked="" type="checkbox"/> | For conducted measurement. |
| <input type="checkbox"/> | The EUT supports single transmit chain and measurements performed on this transmit chain. |
| <input type="checkbox"/> | The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case. |
| <input checked="" type="checkbox"/> | The EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them. |
| <input checked="" type="checkbox"/> | If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$ |

3.3.4 Test Setup



3.3.5 Directional Gain for Power Measurement

| Directional Gain (DG) Result | | | | | |
|--------------------------------|----------|-----------------|-----------------|------|-----------------|
| Transmit Chains No. | | 1 | 2 | - | - |
| Maximum G _{ANT} (dBi) | | 2 | 2 | - | - |
| Modulation Mode | DG (dBi) | N _{TX} | N _{SS} | STBC | Array Gain (dB) |
| 11a,6-54Mbps | 2 | 2 | 1 | - | - |
| HT20,M0-15 | 2 | 2 | 1 | - | - |
| HT20,M0-15 | 2 | 2 | 1 | - | - |
| VHT20,M0-9 | 2 | 2 | 1 | - | - |
| VHT40,M0-9 | 2 | 2 | 1 | - | - |
| VHT80,M0-9 | 2 | 2 | 1 | - | - |



3.3.6 Test Result of Maximum Conducted Output Power

| Maximum Conducted (Average) Output Power | | | | | | | | | | | |
|--|-----------------|-------------|-----------------------|--------------|--------------|--------------|--------------|-------------|----------|------------|------------|
| Condition | | | RF Output Power (dBm) | | | | | | | | |
| Modulation Mode | N _{TX} | Freq. (MHz) | Chain Port 1 | Chain Port 2 | Chain Port 3 | Chain Port 4 | Sum Chain | Power Limit | DG (dBi) | EIRP Power | EIRP Limit |
| 11a | 2 | 5745 | 15.52 | 13.49 | -- | -- | 17.63 | 30.00 | 2.00 | 19.63 | 36.00 |
| 11a | 2 | 5785 | 20.87 | 20.41 | -- | -- | 23.66 | 30.00 | 2.00 | 25.66 | 36.00 |
| 11a | 2 | 5825 | 17.86 | 16.91 | -- | -- | 20.42 | 30.00 | 2.00 | 22.42 | 36.00 |
| HT20 | 2 | 5745 | 15.02 | 13.25 | -- | -- | 17.23 | 30.00 | 2.00 | 19.23 | 36.00 |
| HT20 | 2 | 5785 | 21.01 | 20.69 | -- | -- | 23.86 | 30.00 | 2.00 | 25.86 | 36.00 |
| HT20 | 2 | 5825 | 17.11 | 16.57 | -- | -- | 19.86 | 30.00 | 2.00 | 21.86 | 36.00 |
| HT40 | 2 | 5755 | 14.28 | 13.43 | -- | -- | 16.89 | 30.00 | 2.00 | 18.89 | 36.00 |
| HT40 | 2 | 5795 | 18.81 | 18.59 | -- | -- | 21.71 | 30.00 | 2.00 | 23.71 | 36.00 |
| VHT20 | 2 | 5745 | 15.10 | 13.29 | -- | -- | 17.30 | 30.00 | 2.00 | 19.30 | 36.00 |
| VHT20 | 2 | 5785 | 21.06 | 20.75 | -- | -- | 23.92 | 30.00 | 2.00 | 25.92 | 36.00 |
| VHT20 | 2 | 5825 | 17.15 | 16.62 | -- | -- | 19.90 | 30.00 | 2.00 | 21.90 | 36.00 |
| VHT40 | 2 | 5755 | 14.32 | 13.48 | -- | -- | 16.93 | 30.00 | 2.00 | 18.93 | 36.00 |
| VHT40 | 2 | 5795 | 18.86 | 18.64 | -- | -- | 21.76 | 30.00 | 2.00 | 23.76 | 36.00 |
| VHT80 | 2 | 5775 | 10.69 | 11.35 | -- | -- | 14.04 | 30.00 | 2.00 | 16.04 | 36.00 |
| Result | | | Complied | | | | | | | | |

3.4 Peak Power Spectral Density

3.4.1 Peak Power Spectral Density Limit

| Peak Power Spectral Density Limit |
|---|
| The maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. |

3.4.2 Measuring Instruments

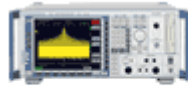
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

| Test Method | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Peak power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the peak power spectral density and use the peak search function on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density shall be measured using below options: |
| <input type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, F)5) power spectral density can be measured using resolution bandwidths < 1 MHz provided that the results are integrated over 1 MHz bandwidth |
| <input type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, clause E Method SA-1 (spectral trace averaging). |
| <input type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, clause E Method SA-1 Alt. (RMS detection with slow sweep speed) |
| <input type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, clause E Method SA-2 (spectral trace averaging). |
| <input checked="" type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, clause E Method SA-2 Alt. (RMS detection with slow sweep speed) |
| <input checked="" type="checkbox"/> | For conducted measurement. |
| <input type="checkbox"/> | The EUT supports single transmit chain and measurements performed on this transmit chain. |
| <input type="checkbox"/> | The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case. |
| <input checked="" type="checkbox"/> | The EUT supports multiple transmit chains using options given below: |
| <input type="checkbox"/> | Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them. |
| <input checked="" type="checkbox"/> | Option 2: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit. |
| <input checked="" type="checkbox"/> | If multiple transmit chains, EIRP PPSD calculation could be following as methods: $PPSD_{total} = PPSD_1 + PPSD_2 + \dots + PPSD_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = PPSD_{total} + DG$ |
| <input type="checkbox"/> | Each individually PPSD plots refer as test report clause 3.3.5 with each individually PPSD plots. |

3.4.4 Test Setup

Power Spectral Density



Spectrum
Analyzer



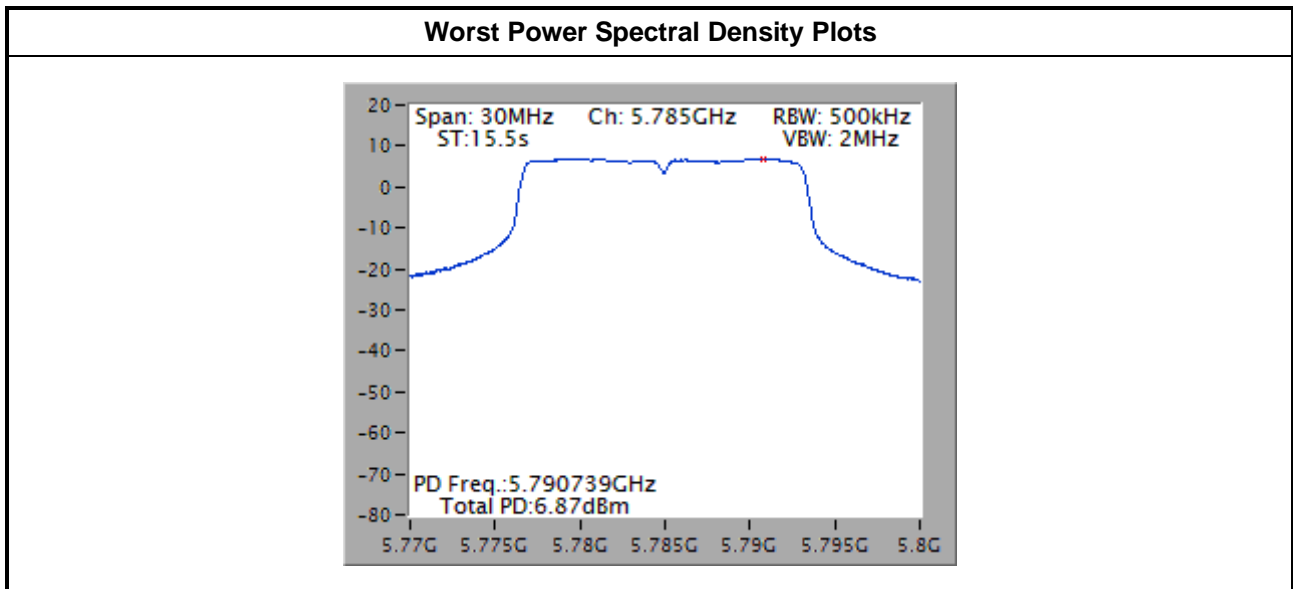
EUT

3.4.5 Test Result of Peak Power Spectral Density

| Peak Power Spectral Density Result | | | | | | | | | |
|------------------------------------|-----------------|-------------|--|----------|--------------------|-----------|----------|----------|------------|
| Condition | | | Peak Power Spectral Density (dBm/500kHz) | | | | | | |
| Modulation Mode | N _{TX} | Freq. (MHz) | PSD w/o D.F (dBm) | D.F (dB) | PSD with D.F (dBm) | PSD Limit | DG (dBi) | EIRP PSD | EIRP Limit |
| 11a | 2 | 5745 | 5.56 | 0.40 | 5.96 | 30.00 | 5.01 | 10.97 | 36.00 |
| 11a | 2 | 5785 | 6.87 | 0.40 | 7.27 | 30.00 | 5.01 | 12.28 | 36.00 |
| 11a | 2 | 5825 | 6.07 | 0.40 | 6.47 | 30.00 | 5.01 | 11.48 | 36.00 |
| VHT20 | 2 | 5745 | 3.34 | 0.16 | 3.50 | 30.00 | 5.01 | 8.51 | 36.00 |
| VHT20 | 2 | 5785 | 6.64 | 0.16 | 6.80 | 30.00 | 5.01 | 11.81 | 36.00 |
| VHT20 | 2 | 5825 | 5.42 | 0.16 | 5.58 | 30.00 | 5.01 | 10.59 | 36.00 |
| VHT40 | 2 | 5755 | -1.19 | 0.26 | -0.93 | 30.00 | 5.01 | 4.08 | 36.00 |
| VHT40 | 2 | 5795 | -4.12 | 0.26 | -3.86 | 30.00 | 5.01 | 1.15 | 36.00 |
| VHT80 | 2 | 5775 | -7.62 | 0.50 | -7.12 | 30.00 | 5.01 | -2.11 | 36.00 |
| Result | | | Complied | | | | | | |

Note:

1. D.F is duty factor.
2. Test result is bin-by-bin summing measured value of each TX port.



Note 1: Peak Power Spectral Density w/o Duty Factor.

3.5 Transmitter Radiated Unwanted Emissions and Band Edge

3.5.1 Transmitter Radiated Unwanted Emissions and Band Edge Limit

| Unwanted emissions below 1 GHz and restricted band emissions above 1GHz 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.

| Un-restricted band emissions above 1GHz Limit | |
|---|---|
| Operating Band | Limit |
| 5.15 - 5.25 GHz | e.i.r.p. -27 dBm [68.2 dBuV/m@3m] |
| 5.25 - 5.35 GHz | e.i.r.p. -27 dBm [68.2 dBuV/m@3m] |
| 5.47 - 5.725 GHz | e.i.r.p. -27 dBm [68.2 dBuV/m@3m] |
| 5.725 - 5.85 GHz | 5.715~ 5.725 GHz: e.i.r.p. -17 dBm [78.2 dBuV/m@3m] 5.85 ~5.86 GHz: e.i.r.p. -17 dBm [78.2 dBuV/m@3m] Other un-restricted band: e.i.r.p. -27 dBm [68.2 dBuV/m@3m] |

Note 1: 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).

3.5.2 Measuring Instruments

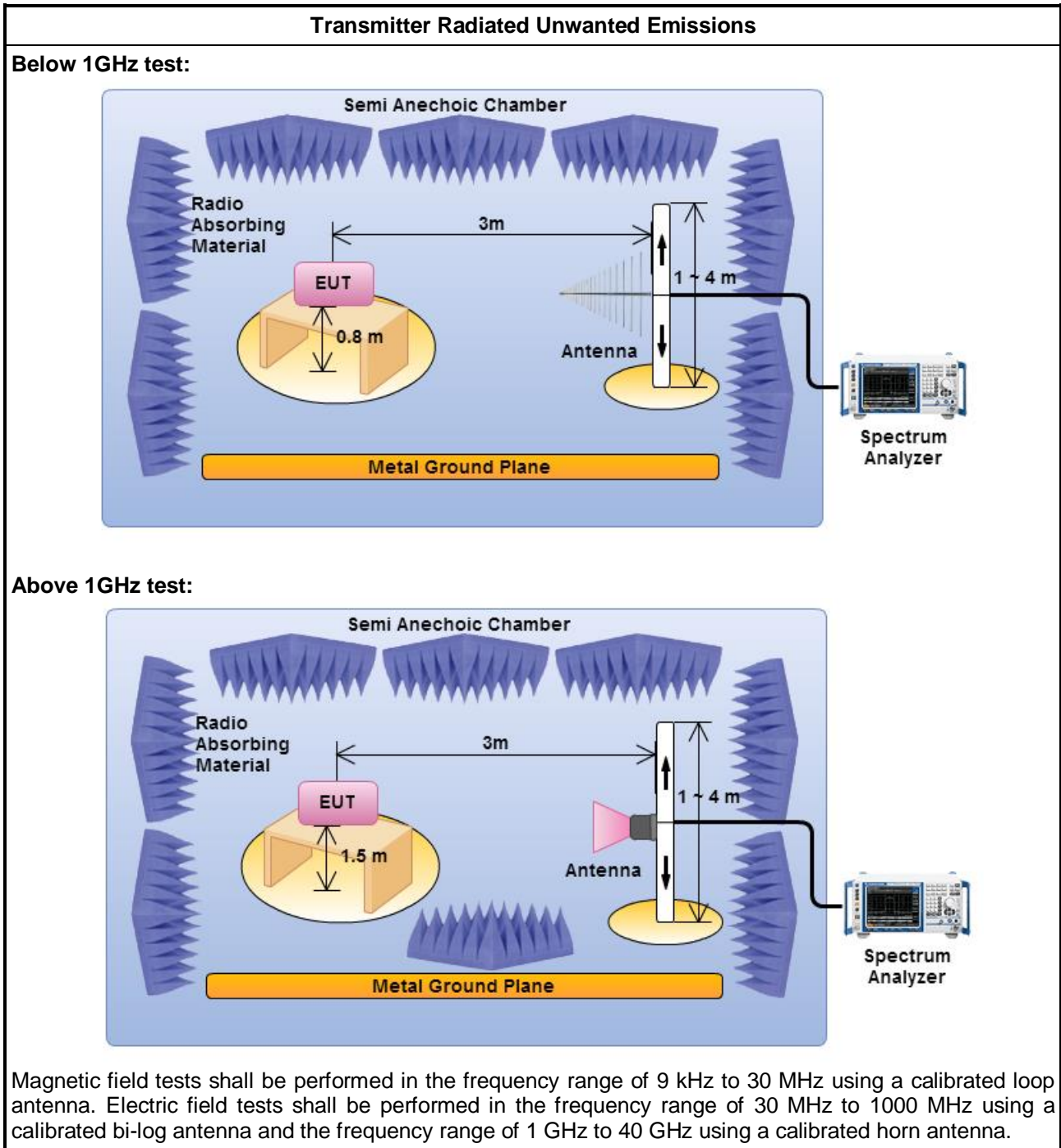
Refer a test equipment and calibration data table in this test report.



3.5.3 Test Procedures

| Test Method | |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | 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. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. 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). |
| <input checked="" type="checkbox"/> | For the transmitter unwanted emissions shall be measured using following options below: |
| <input checked="" type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, clause G)2) for unwanted emissions into non-restricted bands. |
| <input checked="" type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, clause G)1) for unwanted emissions into restricted bands. |
| <input type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, G)6) Method AD (Trace Averaging). |
| <input checked="" type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, G)6) Method VB (Reduced VBW). |
| <input type="checkbox"/> | Refer as ANSI C63.10, clause 12.7.7.3 (Reduced VBW). VBW $\geq 1/T$, where T is pulse time. |
| <input checked="" type="checkbox"/> | Refer as FCC KDB 789033 D02 v01, clause G)5) measurement procedure peak limit. |
| <input type="checkbox"/> | Refer as ANSI C63.10, clause 12.7.6 measurement procedure peak limit. |
| <input checked="" type="checkbox"/> | For radiated measurement. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 6.6 for radiated emissions from above 1 GHz. |
| <input type="checkbox"/> | For conducted and cabinet radiation measurement, refer as FCC KDB 789033 D02 v01, clause G)3). |
| <input type="checkbox"/> | For conducted unwanted emissions into non-restricted bands (relative emission limits). Devices with multiple transmit chains: Refer as FCC KDB 662911, when testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(N) if the measurements are made relative to the in-band emissions on the individual outputs. |
| <input type="checkbox"/> | For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB |
| <input type="checkbox"/> | For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred. |

3.5.4 Test Setup



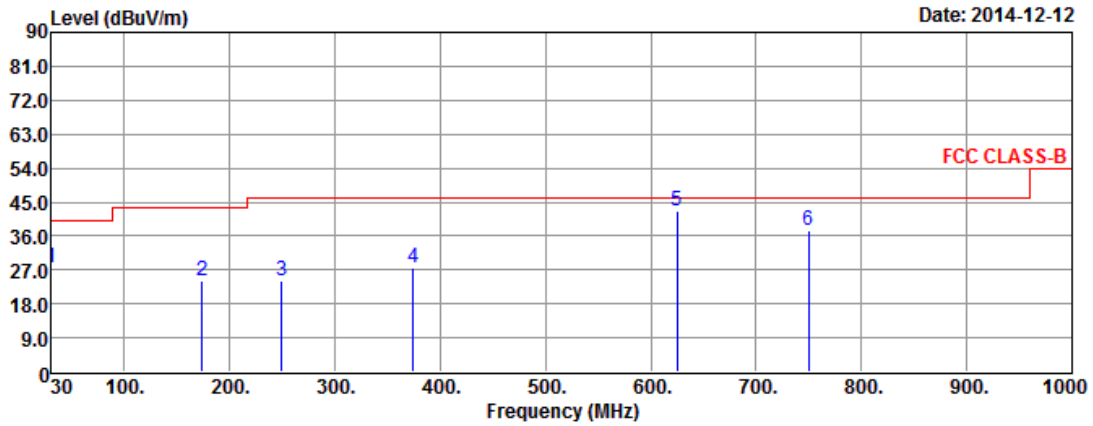
3.5.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

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



3.5.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

| Transmitter Radiated Unwanted Emissions (Below 1GHz) | | | |
|--|-------|------------------|------|
| Modulation Mode | VHT20 | Test Freq. (MHz) | 5785 |
| Polarization | H | | |



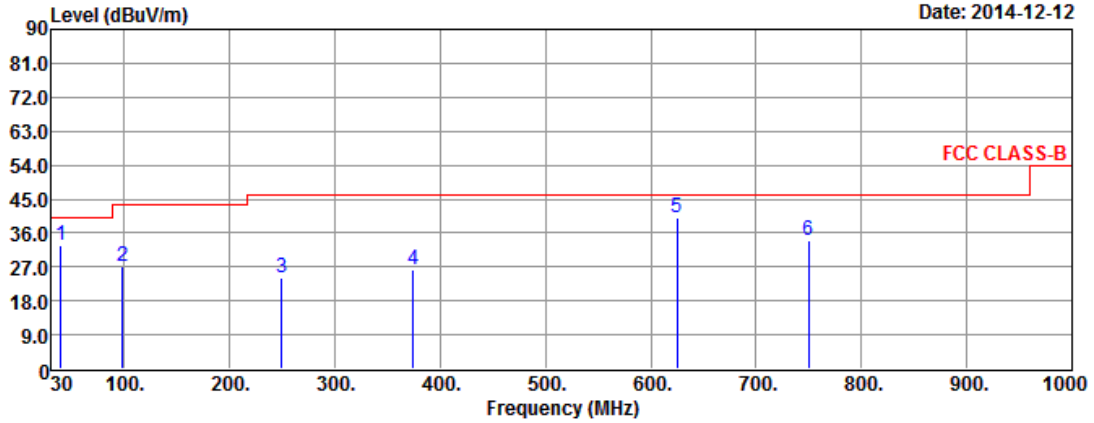
| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|---|--------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|--------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 30.00 | 27.54 | -12.46 | 40.00 | 45.38 | 13.60 | 0.42 | 31.86 | --- | --- | Peak |
| 2 | 173.56 | 24.02 | -19.48 | 43.50 | 41.96 | 12.81 | 0.84 | 31.59 | --- | --- | Peak |
| 3 | 249.22 | 24.33 | -21.67 | 46.00 | 42.20 | 12.58 | 1.03 | 31.48 | --- | --- | Peak |
| 4 | 374.35 | 27.39 | -18.61 | 46.00 | 41.71 | 15.83 | 1.29 | 31.44 | --- | --- | Peak |
| 5 | 624.61 | 42.43 | -3.57 | 46.00 | 51.60 | 20.50 | 1.71 | 31.38 | --- | --- | Peak |
| 6 | 749.74 | 37.38 | -8.62 | 46.00 | 44.56 | 22.30 | 1.88 | 31.36 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)



Transmitter Radiated Unwanted Emissions (Below 1GHz)

| | | | |
|-----------------|-------|------------------|------|
| Modulation Mode | VHT20 | Test Freq. (MHz) | 5785 |
| Polarization | V | | |



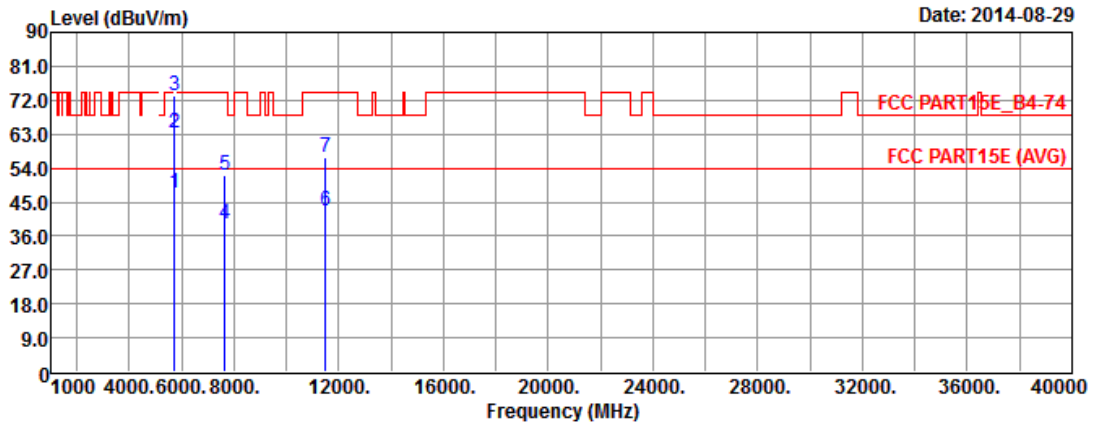
| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|---|--------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|--------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 39.70 | 32.53 | -7.47 | 40.00 | 49.81 | 14.08 | 0.47 | 31.83 | --- | --- | Peak |
| 2 | 97.90 | 26.96 | -16.54 | 43.50 | 49.20 | 8.83 | 0.65 | 31.72 | --- | --- | Peak |
| 3 | 249.22 | 24.09 | -21.91 | 46.00 | 41.96 | 12.58 | 1.03 | 31.48 | --- | --- | Peak |
| 4 | 374.35 | 26.33 | -19.67 | 46.00 | 40.65 | 15.83 | 1.29 | 31.44 | --- | --- | Peak |
| 5 | 624.61 | 39.96 | -6.04 | 46.00 | 49.13 | 20.50 | 1.71 | 31.38 | --- | --- | Peak |
| 6 | 749.74 | 33.95 | -12.05 | 46.00 | 41.13 | 22.30 | 1.88 | 31.36 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)



3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11a

| Transmitter Radiated Unwanted Emissions (Above 1GHz) | | | |
|--|-----|------------------|------|
| Modulation Mode | 11a | Test Freq. (MHz) | 5745 |
| N _{TX} | 2 | Polarization | H |



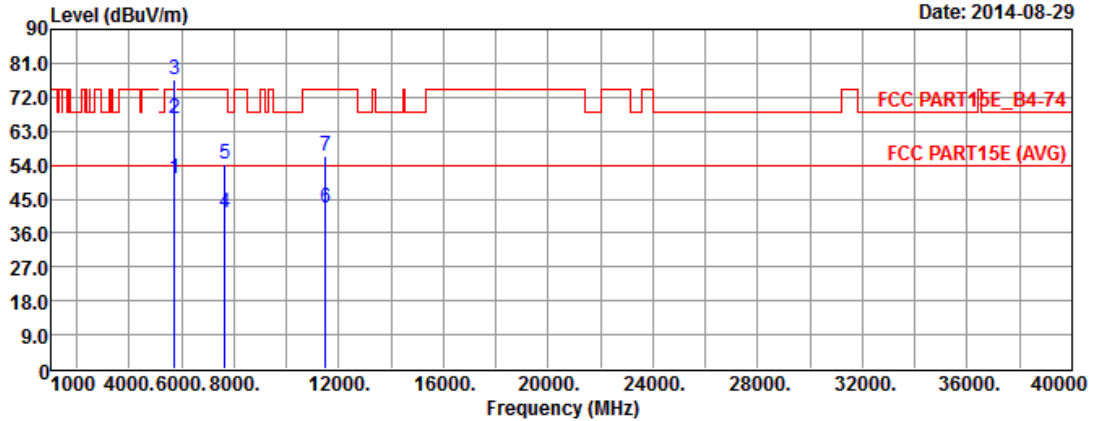
| | Over | Limit | Read | Antenna | Cable | Preamp | A/Pos | T/Pos | Remark | |
|------|----------|-------|--------|---------|--------|--------|--------|-------|--------|---------|
| Freq | Level | Limit | Line | Level | Factor | Loss | Factor | | | |
| MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5715.00 | 47.23 | -6.77 | 54.00 | 40.65 | 32.30 | 7.41 | 33.13 | --- | Average |
| 2 | 5715.00 | 63.27 | -10.73 | 74.00 | 56.69 | 32.30 | 7.41 | 33.13 | --- | Peak |
| 3 | 5725.00 | 73.34 | -4.86 | 78.20 | 66.75 | 32.31 | 7.42 | 33.14 | --- | Peak |
| 4 | 7660.00 | 39.22 | -14.78 | 54.00 | 28.11 | 36.83 | 9.19 | 34.91 | --- | Average |
| 5 | 7660.00 | 52.29 | -21.71 | 74.00 | 41.18 | 36.83 | 9.19 | 34.91 | --- | Peak |
| 6 | 11490.00 | 42.78 | -11.22 | 54.00 | 27.58 | 40.31 | 10.35 | 35.46 | --- | Average |
| 7 | 11490.00 | 56.91 | -17.09 | 74.00 | 41.71 | 40.31 | 10.35 | 35.46 | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition..



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|-----------------|-----|------------------|------|
| Modulation Mode | 11a | Test Freq. (MHz) | 5745 |
| N _{TX} | 2 | Polarization | V |



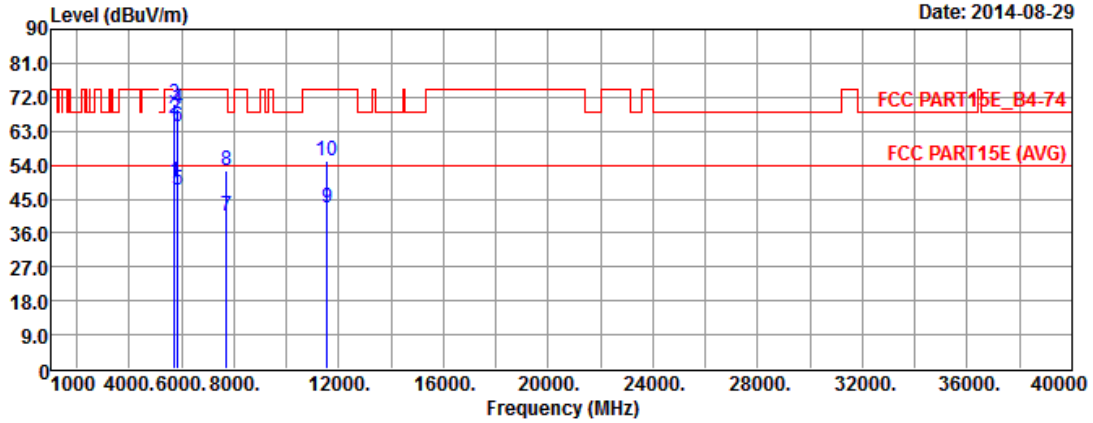
| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|---|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5715.00 | 50.38 | -3.62 | 54.00 | 43.80 | 32.30 | 7.41 | 33.13 | --- | --- | Average |
| 2 | 5715.00 | 66.47 | -7.53 | 74.00 | 59.89 | 32.30 | 7.41 | 33.13 | --- | --- | Peak |
| 3 | 5725.00 | 76.75 | -1.45 | 78.20 | 70.16 | 32.31 | 7.42 | 33.14 | --- | --- | Peak |
| 4 | 7660.00 | 41.48 | -12.52 | 54.00 | 30.37 | 36.83 | 9.19 | 34.91 | --- | --- | Average |
| 5 | 7660.00 | 54.35 | -19.65 | 74.00 | 43.24 | 36.83 | 9.19 | 34.91 | --- | --- | Peak |
| 6 | 11490.00 | 42.50 | -11.50 | 54.00 | 27.30 | 40.31 | 10.35 | 35.46 | --- | --- | Average |
| 7 | 11490.00 | 56.50 | -17.50 | 74.00 | 41.30 | 40.31 | 10.35 | 35.46 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition..



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|-----------------|-----|------------------|------|
| Modulation Mode | 11a | Test Freq. (MHz) | 5785 |
| N _{TX} | 2 | Polarization | H |



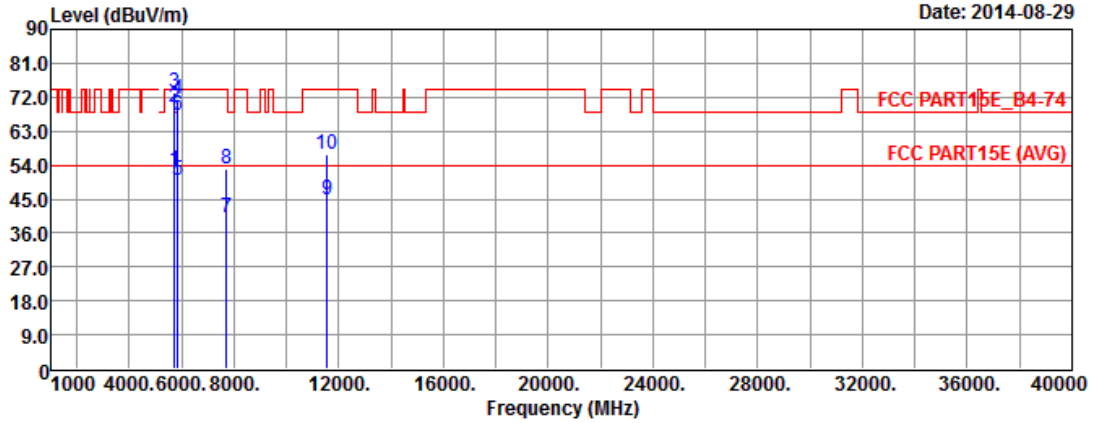
| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|----|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5715.00 | 49.33 | -4.67 | 54.00 | 42.75 | 32.30 | 7.41 | 33.13 | --- | --- | Average |
| 2 | 5715.00 | 66.12 | -7.88 | 74.00 | 59.54 | 32.30 | 7.41 | 33.13 | --- | --- | Peak |
| 3 | 5725.00 | 70.15 | -8.05 | 78.20 | 63.56 | 32.31 | 7.42 | 33.14 | --- | --- | Peak |
| 4 | 5850.00 | 68.88 | -9.32 | 78.20 | 62.09 | 32.49 | 7.48 | 33.18 | --- | --- | Peak |
| 5 | 5860.00 | 47.51 | -6.49 | 54.00 | 40.73 | 32.50 | 7.47 | 33.19 | --- | --- | Average |
| 6 | 5860.00 | 64.29 | -9.71 | 74.00 | 57.51 | 32.50 | 7.47 | 33.19 | --- | --- | Peak |
| 7 | 7713.00 | 40.47 | -13.53 | 54.00 | 29.40 | 36.87 | 9.16 | 34.96 | --- | --- | Average |
| 8 | 7713.00 | 52.39 | -21.61 | 74.00 | 41.32 | 36.87 | 9.16 | 34.96 | --- | --- | Peak |
| 9 | 11570.00 | 42.82 | -11.18 | 54.00 | 27.67 | 40.15 | 10.45 | 35.45 | --- | --- | Average |
| 10 | 11570.00 | 55.06 | -18.94 | 74.00 | 39.91 | 40.15 | 10.45 | 35.45 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|-----------------|-----|------------------|------|
| Modulation Mode | 11a | Test Freq. (MHz) | 5785 |
| N _{TX} | 2 | Polarization | V |



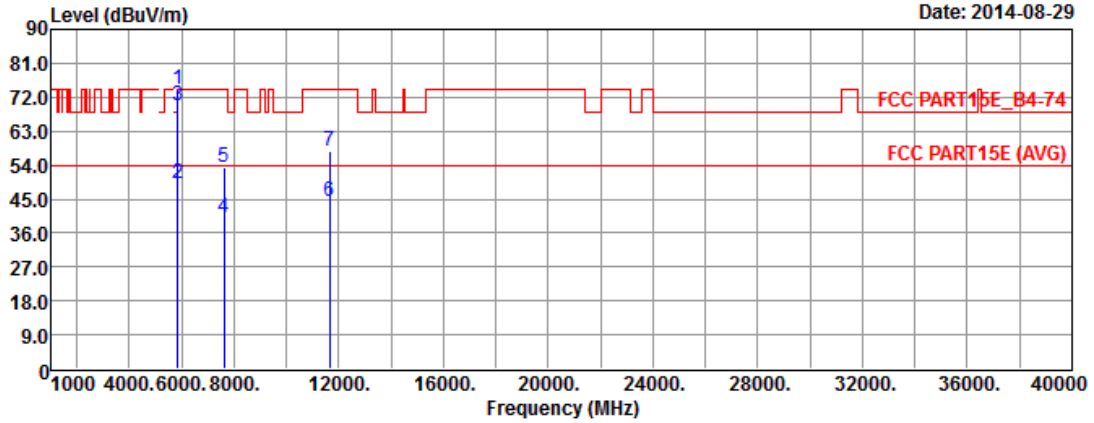
| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|----|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5715.00 | 52.68 | -1.32 | 54.00 | 46.10 | 32.30 | 7.41 | 33.13 | --- | --- | Average |
| 2 | 5715.00 | 69.25 | -4.75 | 74.00 | 62.67 | 32.30 | 7.41 | 33.13 | --- | --- | Peak |
| 3 | 5725.00 | 73.21 | -4.99 | 78.20 | 66.62 | 32.31 | 7.42 | 33.14 | --- | --- | Peak |
| 4 | 5850.00 | 71.44 | -6.76 | 78.20 | 64.65 | 32.49 | 7.48 | 33.18 | --- | --- | Peak |
| 5 | 5860.00 | 50.03 | -3.97 | 54.00 | 43.25 | 32.50 | 7.47 | 33.19 | --- | --- | Average |
| 6 | 5860.00 | 67.01 | -6.99 | 74.00 | 60.23 | 32.50 | 7.47 | 33.19 | --- | --- | Peak |
| 7 | 7713.00 | 39.86 | -14.14 | 54.00 | 28.79 | 36.87 | 9.16 | 34.96 | --- | --- | Average |
| 8 | 7713.00 | 53.03 | -20.97 | 74.00 | 41.96 | 36.87 | 9.16 | 34.96 | --- | --- | Peak |
| 9 | 11570.00 | 44.65 | -9.35 | 54.00 | 29.50 | 40.15 | 10.45 | 35.45 | --- | --- | Average |
| 10 | 11570.00 | 57.01 | -16.99 | 74.00 | 41.86 | 40.15 | 10.45 | 35.45 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|-----------------|-----|------------------|------|
| Modulation Mode | 11a | Test Freq. (MHz) | 5825 |
| N _{TX} | 2 | Polarization | H |



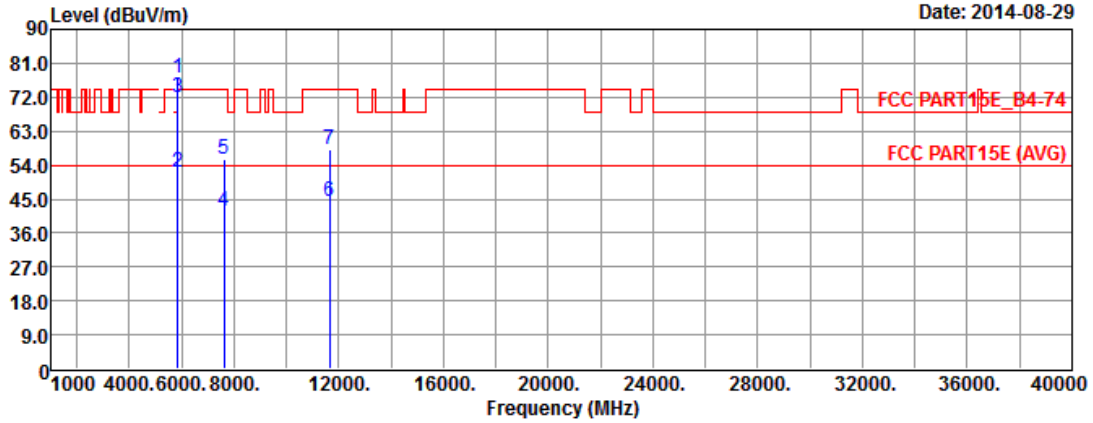
| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|---|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5850.00 | 74.09 | -4.11 | 78.20 | 67.30 | 32.49 | 7.48 | 33.18 | --- | --- | Peak |
| 2 | 5860.00 | 49.11 | -4.89 | 54.00 | 42.33 | 32.50 | 7.47 | 33.19 | --- | --- | Average |
| 3 | 5860.00 | 69.82 | -4.18 | 74.00 | 63.04 | 32.50 | 7.47 | 33.19 | --- | --- | Peak |
| 4 | 7633.30 | 39.94 | -14.06 | 54.00 | 28.81 | 36.81 | 9.21 | 34.89 | --- | --- | Average |
| 5 | 7633.30 | 53.27 | -20.73 | 74.00 | 42.14 | 36.81 | 9.21 | 34.89 | --- | --- | Peak |
| 6 | 11650.00 | 44.27 | -9.73 | 54.00 | 29.16 | 39.97 | 10.57 | 35.43 | --- | --- | Average |
| 7 | 11650.00 | 57.63 | -16.37 | 74.00 | 42.52 | 39.97 | 10.57 | 35.43 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|-----------------|-----|------------------|------|
| Modulation Mode | 11a | Test Freq. (MHz) | 5825 |
| N _{TX} | 2 | Polarization | V |

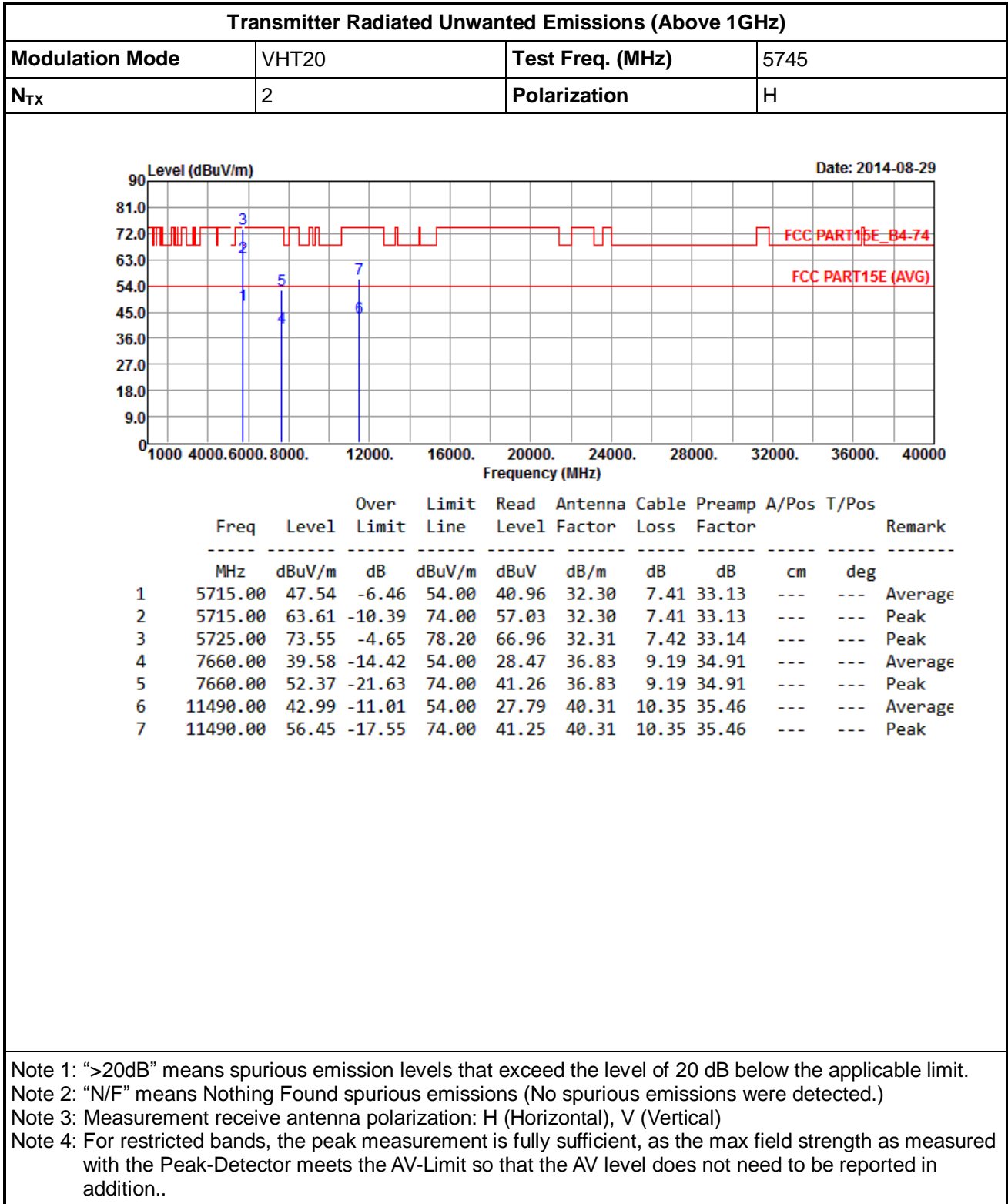


| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|---|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5850.00 | 77.13 | -1.07 | 78.20 | 70.34 | 32.49 | 7.48 | 33.18 | --- | --- | Peak |
| 2 | 5860.00 | 52.03 | -1.97 | 54.00 | 45.25 | 32.50 | 7.47 | 33.19 | --- | --- | Average |
| 3 | 5860.00 | 72.00 | -2.00 | 74.00 | 65.22 | 32.50 | 7.47 | 33.19 | --- | --- | Peak |
| 4 | 7633.30 | 41.94 | -12.06 | 54.00 | 30.81 | 36.81 | 9.21 | 34.89 | --- | --- | Average |
| 5 | 7633.30 | 55.36 | -18.64 | 74.00 | 44.23 | 36.81 | 9.21 | 34.89 | --- | --- | Peak |
| 6 | 11650.00 | 44.35 | -9.65 | 54.00 | 29.24 | 39.97 | 10.57 | 35.43 | --- | --- | Average |
| 7 | 11650.00 | 57.98 | -16.02 | 74.00 | 42.87 | 39.97 | 10.57 | 35.43 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



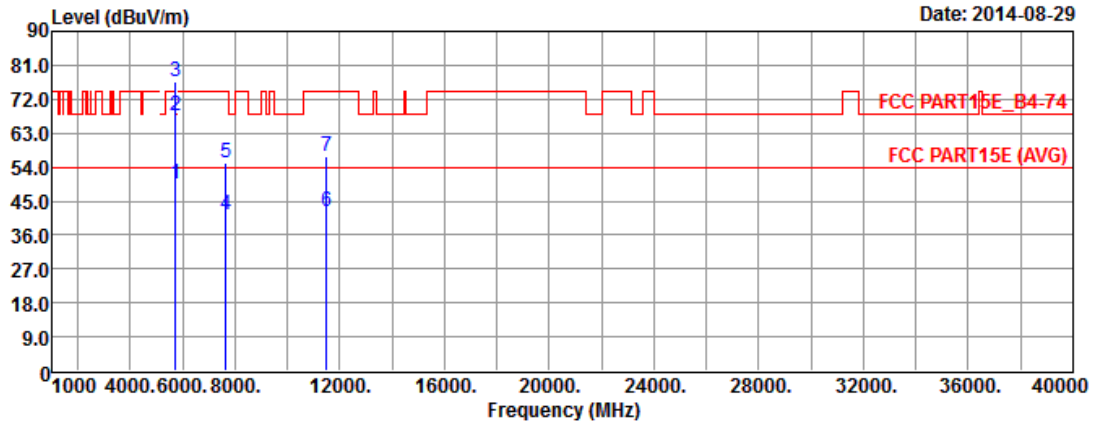
3.5.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT20





Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|-----------------|-------|------------------|------|
| Modulation Mode | VHT20 | Test Freq. (MHz) | 5745 |
| N _{TX} | 2 | Polarization | V |



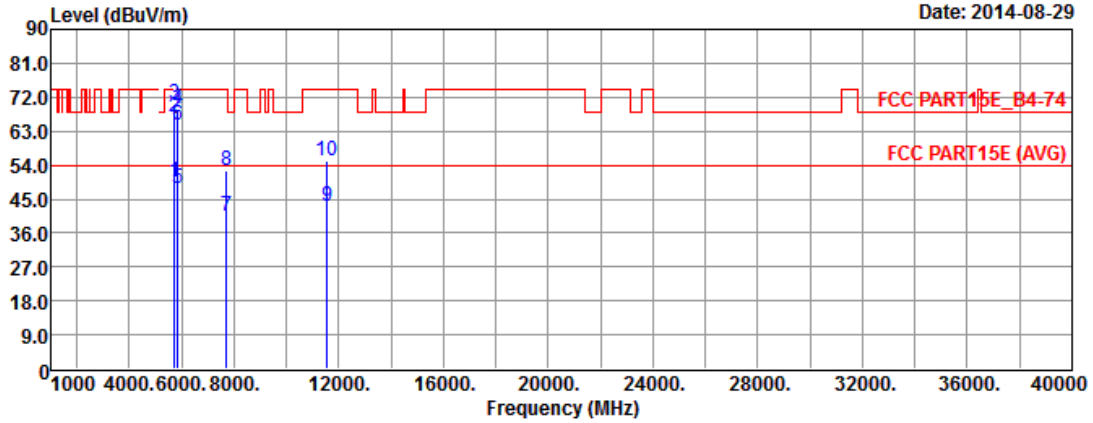
| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|---|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5715.00 | 49.61 | -4.39 | 54.00 | 43.03 | 32.30 | 7.41 | 33.13 | --- | --- | Average |
| 2 | 5715.00 | 67.43 | -6.57 | 74.00 | 60.85 | 32.30 | 7.41 | 33.13 | --- | --- | Peak |
| 3 | 5725.00 | 76.86 | -1.34 | 78.20 | 70.27 | 32.31 | 7.42 | 33.14 | --- | --- | Peak |
| 4 | 7660.00 | 41.35 | -12.65 | 54.00 | 30.24 | 36.83 | 9.19 | 34.91 | --- | --- | Average |
| 5 | 7660.00 | 54.98 | -19.02 | 74.00 | 43.87 | 36.83 | 9.19 | 34.91 | --- | --- | Peak |
| 6 | 11490.00 | 42.32 | -11.68 | 54.00 | 27.12 | 40.31 | 10.35 | 35.46 | --- | --- | Average |
| 7 | 11490.00 | 56.76 | -17.24 | 74.00 | 41.56 | 40.31 | 10.35 | 35.46 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|-----------------|-------|------------------|------|
| Modulation Mode | VHT20 | Test Freq. (MHz) | 5785 |
| N _{TX} | 2 | Polarization | H |



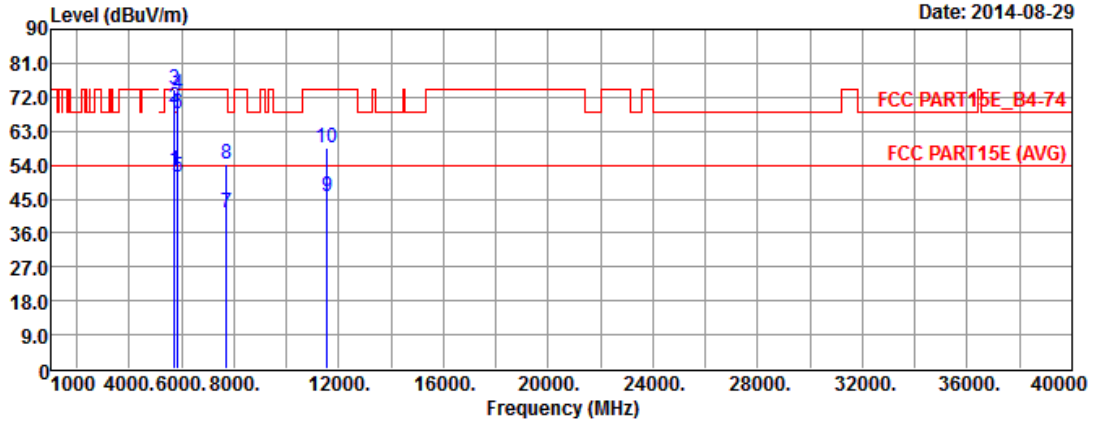
| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|----|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5715.00 | 49.64 | -4.36 | 54.00 | 43.06 | 32.30 | 7.41 | 33.13 | --- | --- | Average |
| 2 | 5715.00 | 66.78 | -7.22 | 74.00 | 60.20 | 32.30 | 7.41 | 33.13 | --- | --- | Peak |
| 3 | 5725.00 | 70.39 | -7.81 | 78.20 | 63.80 | 32.31 | 7.42 | 33.14 | --- | --- | Peak |
| 4 | 5850.00 | 69.10 | -9.10 | 78.20 | 62.31 | 32.49 | 7.48 | 33.18 | --- | --- | Peak |
| 5 | 5860.00 | 47.82 | -6.18 | 54.00 | 41.04 | 32.50 | 7.47 | 33.19 | --- | --- | Average |
| 6 | 5860.00 | 64.49 | -9.51 | 74.00 | 57.71 | 32.50 | 7.47 | 33.19 | --- | --- | Peak |
| 7 | 7713.00 | 40.52 | -13.48 | 54.00 | 29.45 | 36.87 | 9.16 | 34.96 | --- | --- | Average |
| 8 | 7713.00 | 52.34 | -21.66 | 74.00 | 41.27 | 36.87 | 9.16 | 34.96 | --- | --- | Peak |
| 9 | 11570.00 | 42.88 | -11.12 | 54.00 | 27.73 | 40.15 | 10.45 | 35.45 | --- | --- | Average |
| 10 | 11570.00 | 54.91 | -19.09 | 74.00 | 39.76 | 40.15 | 10.45 | 35.45 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|-----------------|-------|------------------|------|
| Modulation Mode | VHT20 | Test Freq. (MHz) | 5785 |
| N _{TX} | 2 | Polarization | V |



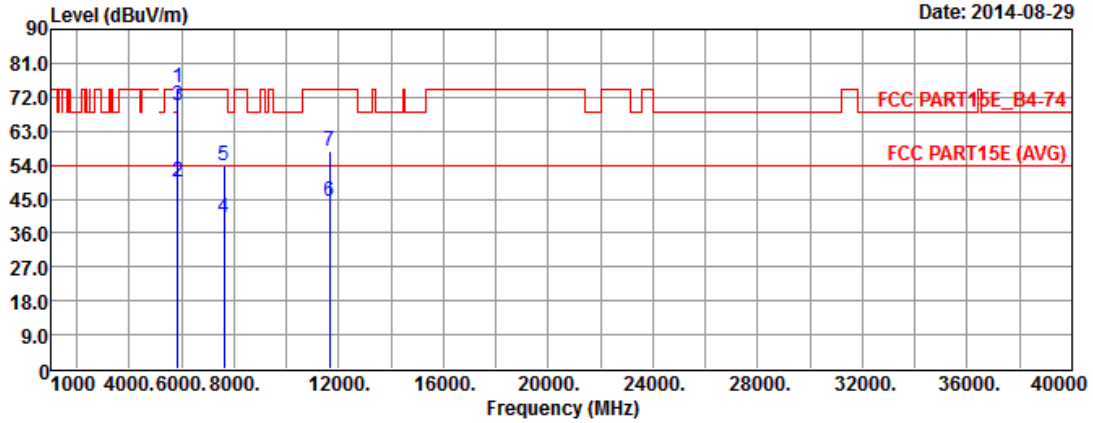
| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|----|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5715.00 | 52.64 | -1.36 | 54.00 | 46.06 | 32.30 | 7.41 | 33.13 | --- | --- | Average |
| 2 | 5715.00 | 69.12 | -4.88 | 74.00 | 62.54 | 32.30 | 7.41 | 33.13 | --- | --- | Peak |
| 3 | 5725.00 | 73.98 | -4.22 | 78.20 | 67.39 | 32.31 | 7.42 | 33.14 | --- | --- | Peak |
| 4 | 5850.00 | 72.98 | -5.22 | 78.20 | 66.19 | 32.49 | 7.48 | 33.18 | --- | --- | Peak |
| 5 | 5860.00 | 50.72 | -3.28 | 54.00 | 43.94 | 32.50 | 7.47 | 33.19 | --- | --- | Average |
| 6 | 5860.00 | 67.60 | -6.40 | 74.00 | 60.82 | 32.50 | 7.47 | 33.19 | --- | --- | Peak |
| 7 | 7713.00 | 41.20 | -12.80 | 54.00 | 30.13 | 36.87 | 9.16 | 34.96 | --- | --- | Average |
| 8 | 7713.00 | 54.29 | -19.71 | 74.00 | 43.22 | 36.87 | 9.16 | 34.96 | --- | --- | Peak |
| 9 | 11570.00 | 45.73 | -8.27 | 54.00 | 30.58 | 40.15 | 10.45 | 35.45 | --- | --- | Average |
| 10 | 11570.00 | 58.60 | -15.40 | 74.00 | 43.45 | 40.15 | 10.45 | 35.45 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|-----------------|-------|------------------|------|
| Modulation Mode | VHT20 | Test Freq. (MHz) | 5825 |
| N _{TX} | 2 | Polarization | H |



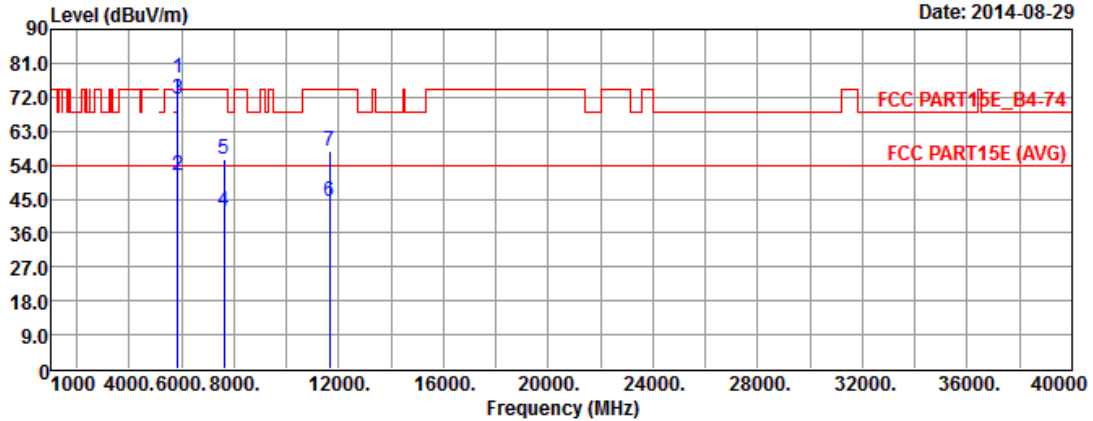
| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|---|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5850.00 | 74.36 | -3.84 | 78.20 | 67.57 | 32.49 | 7.48 | 33.18 | --- | --- | Peak |
| 2 | 5860.00 | 49.52 | -4.48 | 54.00 | 42.74 | 32.50 | 7.47 | 33.19 | --- | --- | Average |
| 3 | 5860.00 | 69.97 | -4.03 | 74.00 | 63.19 | 32.50 | 7.47 | 33.19 | --- | --- | Peak |
| 4 | 7633.30 | 40.00 | -14.00 | 54.00 | 28.87 | 36.81 | 9.21 | 34.89 | --- | --- | Average |
| 5 | 7633.30 | 53.66 | -20.34 | 74.00 | 42.53 | 36.81 | 9.21 | 34.89 | --- | --- | Peak |
| 6 | 11650.00 | 44.52 | -9.48 | 54.00 | 29.41 | 39.97 | 10.57 | 35.43 | --- | --- | Average |
| 7 | 11650.00 | 57.83 | -16.17 | 74.00 | 42.72 | 39.97 | 10.57 | 35.43 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|-----------------|-------|------------------|------|
| Modulation Mode | VHT20 | Test Freq. (MHz) | 5825 |
| N _{TX} | 2 | Polarization | V |



| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|---|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5850.00 | 76.96 | -1.24 | 78.20 | 70.17 | 32.49 | 7.48 | 33.18 | --- | --- | Peak |
| 2 | 5860.00 | 51.34 | -2.66 | 54.00 | 44.56 | 32.50 | 7.47 | 33.19 | --- | --- | Average |
| 3 | 5860.00 | 71.55 | -2.45 | 74.00 | 64.77 | 32.50 | 7.47 | 33.19 | --- | --- | Peak |
| 4 | 7633.30 | 41.57 | -12.43 | 54.00 | 30.44 | 36.81 | 9.21 | 34.89 | --- | --- | Average |
| 5 | 7633.30 | 55.39 | -18.61 | 74.00 | 44.26 | 36.81 | 9.21 | 34.89 | --- | --- | Peak |
| 6 | 11650.00 | 44.16 | -9.84 | 54.00 | 29.05 | 39.97 | 10.57 | 35.43 | --- | --- | Average |
| 7 | 11650.00 | 57.52 | -16.48 | 74.00 | 42.41 | 39.97 | 10.57 | 35.43 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



3.5.9 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT40

| Transmitter Radiated Unwanted Emissions (Above 1GHz) | | | |
|--|-------|------------------|------|
| Modulation Mode | VHT40 | Test Freq. (MHz) | 5755 |
| N _{TX} | 2 | Polarization | H |

The graph plots Level (dBuV/m) on the y-axis (0 to 90) against Frequency (MHz) on the x-axis (1000 to 40000). A red line represents the FCC PART 15E (AVG) limit at 54.0 dBuV/m. A red line represents the FCC PART 15E B4-74 limit at 72.0 dBuV/m. The test results are shown as a blue line with peaks at 5715.00 MHz (Peak 3 at 78.20 dBuV/m, Average 4 at 43.15 dBuV/m) and 11510.00 MHz (Peak 5 at 74.00 dBuV/m, Average 40.25 dBuV/m). Vertical blue lines indicate the peak levels (3, 4, 5) and horizontal red lines indicate the average levels (2, 4).

Date: 2014-08-29

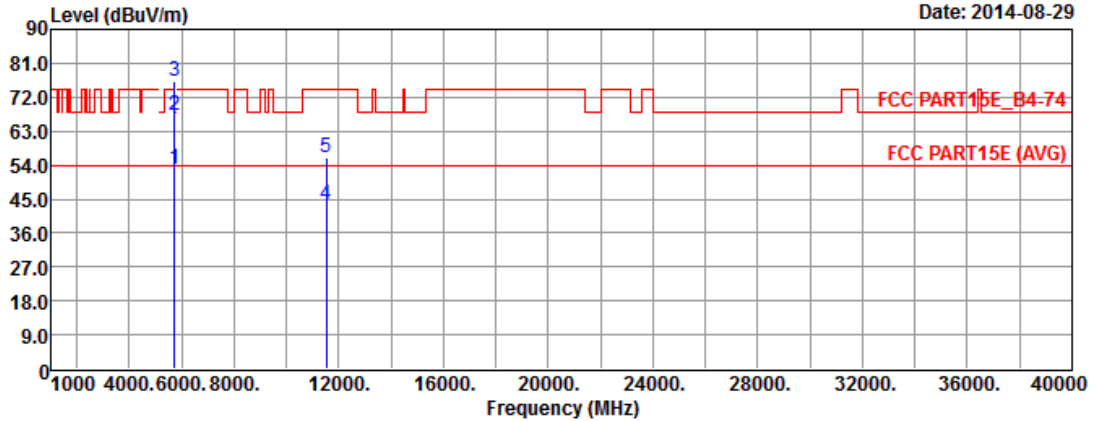
| | Over | Limit | Read | Antenna | Cable | Preamp | A/Pos | T/Pos | |
|---|--------|--------|-------|---------|-------|--------|-------|-------|---------|
| | Limit | Line | Level | Factor | Loss | Factor | | | Remark |
| | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | -3.89 | 54.00 | 43.53 | 32.30 | 7.41 | 33.13 | --- | --- | Average |
| 2 | -9.74 | 74.00 | 57.68 | 32.30 | 7.41 | 33.13 | --- | --- | Peak |
| 3 | -5.14 | 78.20 | 66.47 | 32.31 | 7.42 | 33.14 | --- | --- | Peak |
| 4 | -10.85 | 54.00 | 27.97 | 40.28 | 10.36 | 35.46 | --- | --- | Average |
| 5 | -18.57 | 74.00 | 40.25 | 40.28 | 10.36 | 35.46 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|-----------------|-------|------------------|------|
| Modulation Mode | VHT40 | Test Freq. (MHz) | 5755 |
| N _{TX} | 2 | Polarization | V |



Date: 2014-08-29

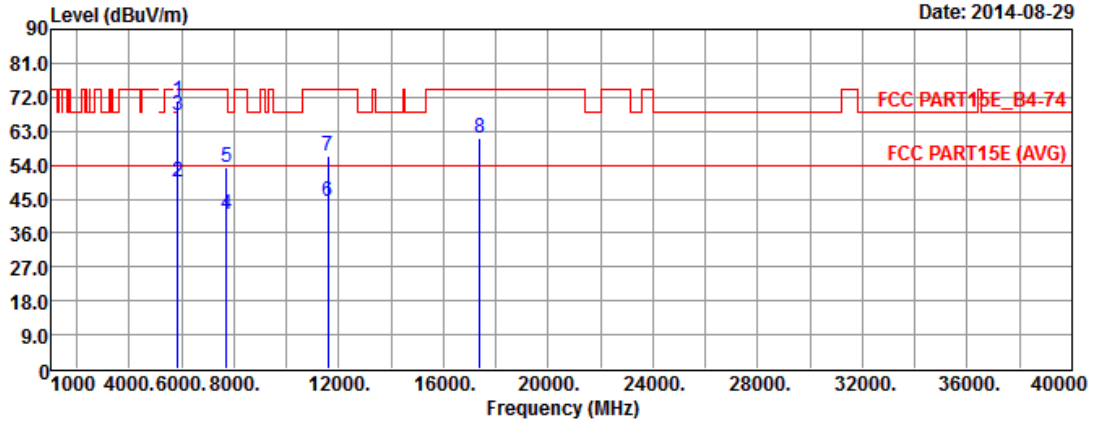
| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|---|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5715.00 | 52.96 | -1.04 | 54.00 | 46.38 | 32.30 | 7.41 | 33.13 | --- | --- | Average |
| 2 | 5715.00 | 67.33 | -6.67 | 74.00 | 60.75 | 32.30 | 7.41 | 33.13 | --- | --- | Peak |
| 3 | 5725.00 | 76.25 | -1.95 | 78.20 | 69.66 | 32.31 | 7.42 | 33.14 | --- | --- | Peak |
| 4 | 11510.00 | 43.30 | -10.70 | 54.00 | 28.12 | 40.28 | 10.36 | 35.46 | --- | --- | Average |
| 5 | 11510.00 | 55.87 | -18.13 | 74.00 | 40.69 | 40.28 | 10.36 | 35.46 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|-----------------|-------|------------------|------|
| Modulation Mode | VHT40 | Test Freq. (MHz) | 5795 |
| N _{TX} | 2 | Polarization | H |



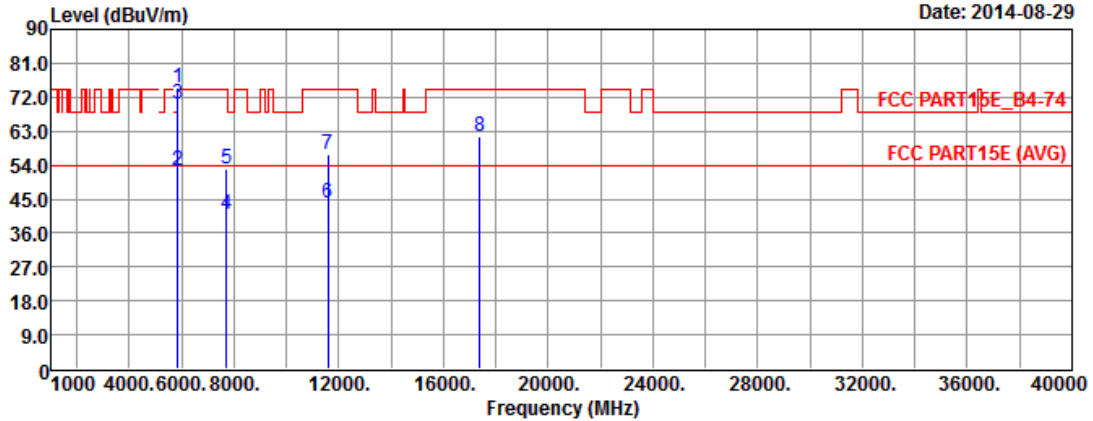
| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|---|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5850.00 | 71.24 | -6.96 | 78.20 | 64.45 | 32.49 | 7.48 | 33.18 | --- | --- | Peak |
| 2 | 5860.00 | 49.49 | -4.51 | 54.00 | 42.71 | 32.50 | 7.47 | 33.19 | --- | --- | Average |
| 3 | 5860.00 | 67.30 | -6.70 | 74.00 | 60.52 | 32.50 | 7.47 | 33.19 | --- | --- | Peak |
| 4 | 7726.00 | 40.88 | -13.12 | 54.00 | 29.82 | 36.88 | 9.15 | 34.97 | --- | --- | Average |
| 5 | 7726.00 | 53.43 | -20.57 | 74.00 | 42.37 | 36.88 | 9.15 | 34.97 | --- | --- | Peak |
| 6 | 11590.00 | 44.22 | -9.78 | 54.00 | 29.08 | 40.10 | 10.48 | 35.44 | --- | --- | Average |
| 7 | 11590.00 | 56.36 | -17.64 | 74.00 | 41.22 | 40.10 | 10.48 | 35.44 | --- | --- | Peak |
| 8 | 17385.00 | 61.24 | -6.96 | 68.20 | 40.97 | 42.86 | 12.22 | 34.81 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|-----------------|-------|------------------|------|
| Modulation Mode | VHT40 | Test Freq. (MHz) | 5795 |
| N _{TX} | 2 | Polarization | V |



| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|---|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5850.00 | 74.59 | -3.61 | 78.20 | 67.80 | 32.49 | 7.48 | 33.18 | --- | --- | Peak |
| 2 | 5860.00 | 52.55 | -1.45 | 54.00 | 45.77 | 32.50 | 7.47 | 33.19 | --- | --- | Average |
| 3 | 5860.00 | 70.01 | -3.99 | 74.00 | 63.23 | 32.50 | 7.47 | 33.19 | --- | --- | Peak |
| 4 | 7726.00 | 40.74 | -13.26 | 54.00 | 29.68 | 36.88 | 9.15 | 34.97 | --- | --- | Average |
| 5 | 7726.00 | 53.15 | -20.85 | 74.00 | 42.09 | 36.88 | 9.15 | 34.97 | --- | --- | Peak |
| 6 | 11590.00 | 44.09 | -9.91 | 54.00 | 28.95 | 40.10 | 10.48 | 35.44 | --- | --- | Average |
| 7 | 11590.00 | 56.89 | -17.11 | 74.00 | 41.75 | 40.10 | 10.48 | 35.44 | --- | --- | Peak |
| 8 | 17385.00 | 61.59 | -6.61 | 68.20 | 41.32 | 42.86 | 12.22 | 34.81 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



3.5.10 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT80

| Transmitter Radiated Unwanted Emissions (Above 1GHz) | | | |
|--|-------|------------------|------|
| Modulation Mode | VHT80 | Test Freq. (MHz) | 5775 |
| N _{TX} | 2 | Polarization | H |

The graph plots Level (dBuV/m) on the y-axis (0 to 90) against Frequency (MHz) on the x-axis (1000 to 40000). A red line represents the FCC PART 15E (AVG) limit at 54.0 dBuV/m. A red stepped line represents the FCC PART 15E B4-74 limit. Blue vertical lines indicate test results at 5715.00, 5725.00, 5850.00, 5860.00, 7700.00, and 11550.00 MHz. The levels at these frequencies are 49.37, 66.27, 57.22, 44.69, 40.30, and 55.70 dBuV/m respectively. The levels at 5715.00, 5725.00, 5850.00, and 11550.00 MHz exceed the 54.0 dBuV/m limit.

Date: 2014-08-29

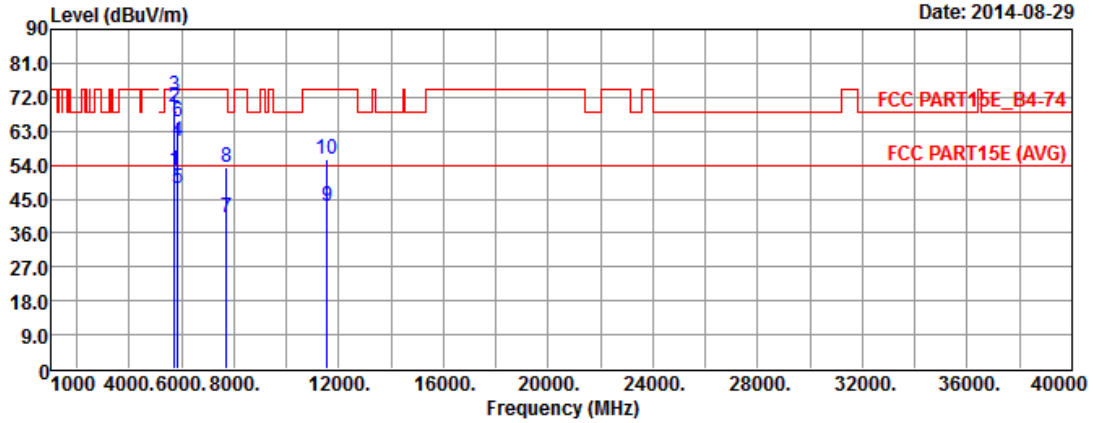
| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|----|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5715.00 | 49.37 | -4.63 | 54.00 | 42.79 | 32.30 | 7.41 | 33.13 | --- | --- | Average |
| 2 | 5715.00 | 66.27 | -7.73 | 74.00 | 59.69 | 32.30 | 7.41 | 33.13 | --- | --- | Peak |
| 3 | 5725.00 | 69.29 | -8.91 | 78.20 | 62.70 | 32.31 | 7.42 | 33.14 | --- | --- | Peak |
| 4 | 5850.00 | 57.22 | -20.98 | 78.20 | 50.43 | 32.49 | 7.48 | 33.18 | --- | --- | Peak |
| 5 | 5860.00 | 44.69 | -9.31 | 54.00 | 37.91 | 32.50 | 7.47 | 33.19 | --- | --- | Average |
| 6 | 5860.00 | 62.27 | -11.73 | 74.00 | 55.49 | 32.50 | 7.47 | 33.19 | --- | --- | Peak |
| 7 | 7700.00 | 40.30 | -13.70 | 54.00 | 29.22 | 36.86 | 9.17 | 34.95 | --- | --- | Average |
| 8 | 7700.00 | 53.70 | -20.30 | 74.00 | 42.62 | 36.86 | 9.17 | 34.95 | --- | --- | Peak |
| 9 | 11550.00 | 43.50 | -10.50 | 54.00 | 28.34 | 40.19 | 10.42 | 35.45 | --- | --- | Average |
| 10 | 11550.00 | 55.70 | -18.30 | 74.00 | 40.54 | 40.19 | 10.42 | 35.45 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|-----------------|-------|------------------|------|
| Modulation Mode | VHT80 | Test Freq. (MHz) | 5775 |
| N _{TX} | 2 | Polarization | V |



| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | A/Pos | T/Pos | Remark |
|----|----------|--------|------------|------------|------------|----------------|------------|---------------|-------|-------|---------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 5715.00 | 52.51 | -1.49 | 54.00 | 45.93 | 32.30 | 7.41 | 33.13 | --- | --- | Average |
| 2 | 5715.00 | 69.28 | -4.72 | 74.00 | 62.70 | 32.30 | 7.41 | 33.13 | --- | --- | Peak |
| 3 | 5725.00 | 72.43 | -5.77 | 78.20 | 65.84 | 32.31 | 7.42 | 33.14 | --- | --- | Peak |
| 4 | 5850.00 | 60.40 | -17.80 | 78.20 | 53.61 | 32.49 | 7.48 | 33.18 | --- | --- | Peak |
| 5 | 5860.00 | 47.83 | -6.17 | 54.00 | 41.05 | 32.50 | 7.47 | 33.19 | --- | --- | Average |
| 6 | 5860.00 | 65.46 | -8.54 | 74.00 | 58.68 | 32.50 | 7.47 | 33.19 | --- | --- | Peak |
| 7 | 7700.00 | 40.16 | -13.84 | 54.00 | 29.08 | 36.86 | 9.17 | 34.95 | --- | --- | Average |
| 8 | 7700.00 | 53.43 | -20.57 | 74.00 | 42.35 | 36.86 | 9.17 | 34.95 | --- | --- | Peak |
| 9 | 11550.00 | 43.26 | -10.74 | 54.00 | 28.10 | 40.19 | 10.42 | 35.45 | --- | --- | Average |
| 10 | 11550.00 | 55.52 | -18.48 | 74.00 | 40.36 | 40.19 | 10.42 | 35.45 | --- | --- | Peak |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

3.6 Frequency Stability

3.6.1 Frequency Stability Limit

| Frequency Stability Limit | |
|-------------------------------------|--|
| UNII Devices | |
| <input checked="" type="checkbox"/> | In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual. |
| LE-LAN Devices | |
| <input checked="" type="checkbox"/> | N/A |
| IEEE Std. 802.11n-2009 | |
| <input checked="" type="checkbox"/> | The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band and ± 25 ppm maximum for the 2.4 GHz band. |

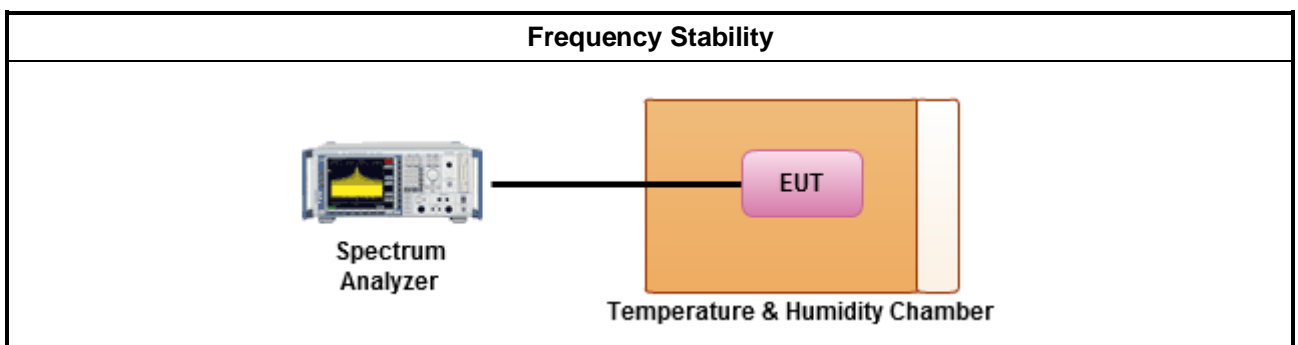
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

| Test Method | |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 6.8 for frequency stability tests |
| <input checked="" type="checkbox"/> | Frequency stability with respect to ambient temperature |
| <input checked="" type="checkbox"/> | Frequency stability when varying supply voltage |
| <input checked="" type="checkbox"/> | For conducted measurement. |
| <input checked="" type="checkbox"/> | For conducted measurements on devices with multiple transmit chains: Measurements need only to be performed on one of the active transmit chains (antenna outputs) |
| <input type="checkbox"/> | For radiated measurement. The equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted power level. |

3.6.4 Test Setup



3.6.5 Test Result of Frequency Stability

| Frequency Stability Result | | | |
|--|-------------|---------------------------|---------------------------|
| Mode | | Frequency Stability (ppm) | |
| Condition | Freq. (MHz) | Test Frequency (MHz) | Frequency Stability (ppm) |
| T _{20°C} V _{max} | 5785 | 5785.00343 | 0.5929 |
| T _{20°C} V _{min} | 5785 | 5785.01801 | 3.1132 |
| T _{50°C} V _{nom} | 5785 | 5785.01459 | 2.5220 |
| T _{40°C} V _{nom} | 5785 | 5785.02162 | 3.7373 |
| T _{30°C} V _{nom} | 5785 | 5785.01576 | 2.7243 |
| T _{20°C} V _{nom} | 5785 | 5785.00710 | 1.2273 |
| T _{10°C} V _{nom} | 5785 | 5785.01457 | 2.5186 |
| T _{0°C} V _{nom} | 5785 | 5785.01256 | 2.1711 |
| T _{-10°C} V _{nom} | 5785 | 5785.00596 | 1.0303 |
| T _{-20°C} V _{nom} | 5785 | 5785.00799 | 1.3812 |
| T _{-30°C} V _{nom} | 5785 | 5785.00338 | 0.5843 |
| Limit (ppm) | | 20 | |
| Result | | Complied | |
| Note 1: Measure at 85 % [V _{min}] and 115 % [V _{max}] of the nominal voltage [V _{nom}]. Note 2: The nominal voltage refer test report clause 1.1.5 for EUT operational condition. | | | |



4 Test Equipment and Calibration Data

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|---------------|----------------|--------------|-------------|-----------------|------------------|--------------------------|
| Amplifier | HP | 8447D | 2944A08033 | 10kHz ~ 1.3GHz | May 05, 2014 | Radiation (03CH03-HY) |
| Amplifier | Agilent | 8449B | 3008A02120 | 1GHz ~ 26.5GHz | Aug. 20, 2014 | Radiation (03CH03-HY) |
| Spectrum | R&S | FSP40 | 100004 | 9kHz ~ 40GHz | Mar. 27, 2014 | Radiation (03CH03-HY) |
| Bilog Antenna | SCHAFFNER | CBL 6112D | 22237 | 30MHz ~ 1GHz | Aug. 04, 2014 | Radiation (03CH03-HY) |
| Horn Antenna | ETS • LINDGREN | 3115 | 6741 | 1GHz ~ 18GHz | Jul. 11, 2014 | Radiation (03CH03-HY) |
| Horn Antenna | SCHWARZBECK | BBHA9170 | BBHA9170154 | 18GHz ~ 40GHz | Jan. 10, 2014 | Radiation (03CH03-HY) |
| RF Cable-R03m | Jye Bao | RG142 | CB021 | 9kHz ~ 1GHz | Aug. 03, 2014 | Radiation (03CH03-HY) |
| RF Cable-high | SUHNER | SUCOFLEX 106 | 03CH03-HY | 1GHz ~ 40GHz | Mar. 05, 2014 | Radiation (03CH03-HY) |

Note: Calibration Interval of instruments listed above is one year.

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|--------------|-----------------|-----------|------------|-----------------|------------------|--------------------------|
| Amplifier | EM | EM18G40G | 060604 | 18GHz ~ 40GHz | Oct. 17.2013 | Radiation (03CH03-HY) |
| Loop Antenna | Rohde & Schwarz | HFH2-Z2 | 100315 | 9kHz ~ 30MHz | Jul. 28, 2014 | Radiation (03CH03-HY) |

Note: Calibration Interval of instruments listed above is two year.



| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|------------------------|--------------------------------|-----------|----------------|-----------------|------------------|----------------------|
| EMC Receiver | R&S | ESCS 30 | 100174 | 9kHz ~ 2.75GHz | Apr. 14, 2014 | Conduction (CO04-HY) |
| LISN | SCHWARZBECK MESS-ELEKTRONIK | NSLK 8127 | 8127-477 | 9kHz ~ 30MHz | Jan. 22, 2014 | Conduction (CO04-HY) |
| LISN (Support Unit) | EMCO | 3810/2NM | 9703-1839 | 9kHz ~ 30MHz | Apr. 21, 2014 | Conduction (CO04-HY) |
| RF Cable-CON | HUBER+SUHNER | RG213/U | 07611832020001 | 9kHz ~ 30MHz | Oct. 31, 2014 | Conduction (CO04-HY) |
| 50 ohm terminal | N/A | N/A | CON-01-04 | N/A | Feb. 25, 2014 | Conduction (CO04-HY) |
| Software | Audix | E3 | 3 | Conducted | NCR | Conduction (CO04-HY) |

Note: Calibration Interval of instruments listed above is one year.

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|----------------------------|--------------|----------------------|-------------|-----------------|------------------|---------------------|
| Spectrum Analyzer | R&S | FSV 40 | 101013 | 9KHz~40GHz | Jan. 25, 2014 | Conducted (TH01-HY) |
| Temp. and Humidity Chamber | Giant Force | GTH-225-20- SP-SD | MAA1112-007 | -20 ~ 100°C | Nov. 25, 2014 | Conducted (TH01-HY) |
| Power Sensor | Anritsu | MA2411B | 0917017 | 300MHz ~ 40GHz | Jan. 28, 2014 | Conducted (TH01-HY) |
| Power Meter | Anritsu | ML2495A | 0949003 | 300MHz ~ 40GHz | Jan. 28, 2014 | Conducted (TH01-HY) |
| RF Cable-2m | HUBER+SUHNER | SUCOFLEX_ 104 | SN 345675/4 | 30MHz ~ 26.5GHz | Dec. 01, 2014 | Conducted (TH01-HY) |
| RF Cable-3m | HUBER+SUHNER | SUCOFLEX_ 104 | SN 345669/4 | 30MHz ~ 26.5GHz | Dec. 01, 2014 | Conducted (TH01-HY) |

Note: Calibration Interval of instruments listed above is one year.