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Testing of
Electromagnetic Emissions
per

USA: CFR Title 47, Part 15.247
Canada: IC RSS-210/GNe

are herein reported for

Computer Performance, Inc.
EPCR5

Test Report No.: 20140624-01
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Report Date of Issue:

June 24, 2014

Results of testing completed on (or before) June 24, 2014 are as follows.

Emissions: The transmitter intentional emissions **COMPLY** with the regulatory limit(s) by no less than 40.1 dB. Transmit chain spurious harmonic emissions **COMPLY** by no less than 5.3 dB. Radiated spurious emissions associated with the receive chain of this device **COMPLY** the regulatory limit(s) by no less than 10.3 dB. Unintentional spurious emissions from digital circuitry **COMPLY** with radiated emission limit(s) by more than 5.0 dB. AC Power Line conducted emissions **COMPLY** by more than 14.3 dB.

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1 Test Specifications, General Procedures, and Location

1.1 Test Specification and General Procedures

The ultimate goal of Computer Performance, Inc. is to demonstrate that the Equipment Under Test (EUT) complies with the Rules and/or Directives below. Detailed in this report are the results of testing the Computer Performance, Inc. EPCR5 for compliance to:

| Country/Region | Rules or Directive | Referenced Section(s) |
|----------------|-----------------------------|---------------------------|
| United States | Code of Federal Regulations | CFR Title 47, Part 15.247 |
| Canada | Industry Canada | IC RSS-210/GNE |

In association with the rules and directives outlined above, the following specifications and procedures are followed herein.

| | |
|--------------------------|--|
| ANSI C63.4-2003 | "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" |
| FCC KDB 558074 (2013) | "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247" |
| FCC KDB 913591 (2007) | "Measurement of radiated emissions at the edge of the band for a Part 15 RF Device" |
| ICES-003; Issue 5 (2012) | "Information Technology Equipment (ITE) Limits and methods of measurement" |
| Industry Canada | "The Measurement of Occupied Bandwidth" |

1.2 Test Location and Equipment Used

Test Location The EUT was fully tested by **Willow Run Test Labs, LLC**, 8501 Beck Road, Building 2227, Belleville, Michigan 48111 USA. The Test Facility description and attenuation characteristics are on file with the FCC Laboratory, Columbia, Maryland (FCC Reg. No: 688478) and with Industry Canada, Ottawa, ON (File Ref. No: IC 8719A-1).

Test Equipment Pertinent test equipment used for measurements at this facility is listed in Table 1. The quality system employed at Willow Run Test Labs, LLC has been established to ensure all equipment has a clearly identifiable classification, calibration expiry date, and that all calibrations are traceable to the SI through NIST, other recognized national laboratories, accepted fundamental or natural physical constants, ratio type of calibration, or by comparison to consensus standards.

Table 1: Willow Run Test Labs, LLC Equipment List.

| Description | Manufacturer/Model | SN | Quality Number | Last Cal By / Date Due |
|--|--------------------|------------|--------------------|--------------------------|
| Antennas | | | | |
| Shielded Loop (9 kHz - 50 MHz) | EMCO/6502 | 2855 | UMLOOP1 | UMRL / July-2014 |
| Dipole Set (20 MHz - 1000 MHz) | EMCO/3121C | 9504-1121 | DIPEMCO01 | Liberty Labs / Sept-2016 |
| Bicone (20 MHz - 250 MHz) | JEF | 1 | BICJEF001 | UMRL / July-2014 |
| Bicone (200 MHz - 1000 MHz) | JEF | 1 | SBICJEF001 | UMRL / July-2014 |
| Log-Periodic Array (200 MHz - 1000 MHz) | JEF/Isbell | 1 | LOGJEF001 | UMRL / July-2014 |
| Ridge-Horn Antenna | Univ. of Michigan | 5 | UMHORN005 | UMRL / July-2014 |
| L-Band | JEF | | HRNL001 | JEF / July-2014* |
| LS-Band Horns | JEF/NRL | 001, 002 | HRN15001, HRN15002 | JEF / July-2014* |
| S-Band Horns | Scientific-Atlanta | 1854 | HRNSB001 | JEF / July-2014* |
| C-Band | JEF/NRL | 1 | HRNC001 | JEF / July-2014* |
| XN-Band Horns | JEF/NRL | 001, 002 | HRNXN001, HRNXN002 | JEF / July-2014* |
| X-Band Horns | JEF/NRL | 001, 002 | HRNXB001, HRNXB002 | JEF / July-2014* |
| Ku-Band Horns | JEF/NRL | 001, 002 | HRNKU001, HRNKU002 | JEF / July-2014* |
| Ka-Band Horns | JEF/NRL | 001, 002 | HRNKA001, HRNKA002 | JEF / July-2014* |
| Quad-Ridge Horns | Condor AS-48461 | C35200 | QRH218001 | WRTL / July-2014 |
| Analyzers & Generators | | | | |
| Spectrum Analyzer | HP/8593E | 3649A02722 | HP8593E001 | DTI / Nov-2014 |
| Spectrum Analyzer | R&S/FSV30 | 101660 | RSFSV30001 | R&S / Mar-2015 |
| Radio Test Set | R&S/CMU200 | 100104 | RSCMU20001 | Not Necessary |
| Line Impedance Stabilization Networks | | | | |
| LISN | EMCO | 9304-2081 | LISNEM001 | JEF / Jan-2015 |

* Verification Only - Standard Gain Horn Antennas

2 Configuration and Identification of the Equipment Under Test

2.1 Description and Declarations

The EUT is a Low Power 2.4 GHz Digital Spread Spectrum (DSS) commercial power controller. The EUT is approximately 3.5 x 4.5 x 19 inches in dimension, and is depicted in Figure 1. It is powered by a 115 VAC mains power. This device is envisioned to be a commercial AC power controller that may be actuated by Ethernet or WLAN communications. Table 2 outlines provider declared EUT specifications.



Figure 1: Photos of EUT.

Table 2: EUT Declarations.

| General Declarations | | | |
|----------------------|-----------------|---------------------|--|
| Equipment Type: | Low Power WLAN | Country of Origin: | USA |
| Nominal Supply: | 115 VAC | Oper. Temp Range: | -34° C to +77° C |
| Frequency Range: | 2412 – 2462 MHz | Antenna Dimension: | 17 cm |
| Antenna Type: | whip | Antenna Gain: | 2.0 dBi (spec.) |
| Number of Channels: | 11 | Channel Spacing: | 5 MHz |
| Alignment Range: | Not Declared | Type of Modulation: | OFDM |
| United States | | | |
| FCC ID Number: | 2ACIUEPCR5 | Classification: | DSS |
| Canada | | | |
| IC Number: | 12058A-EPCR5 | Classification: | Spread Spectrum Device, Digital Device |

2.1.1 EUT Configuration

The EUT is configured for testing as depicted in Figure 2.

2.1.2 Modes of Operation

The EUT is a Ethernet or WiLAN controlled AC power controller with two AC power cords for redundant operation. The 802.11n radio as deployed in this product is capable of only a single mode of operation, as a single-stream fixed data rate (OFDM-20) 1x1 radio.

2.1.3 Variants

There is only a single variant of the EUT, as tested.

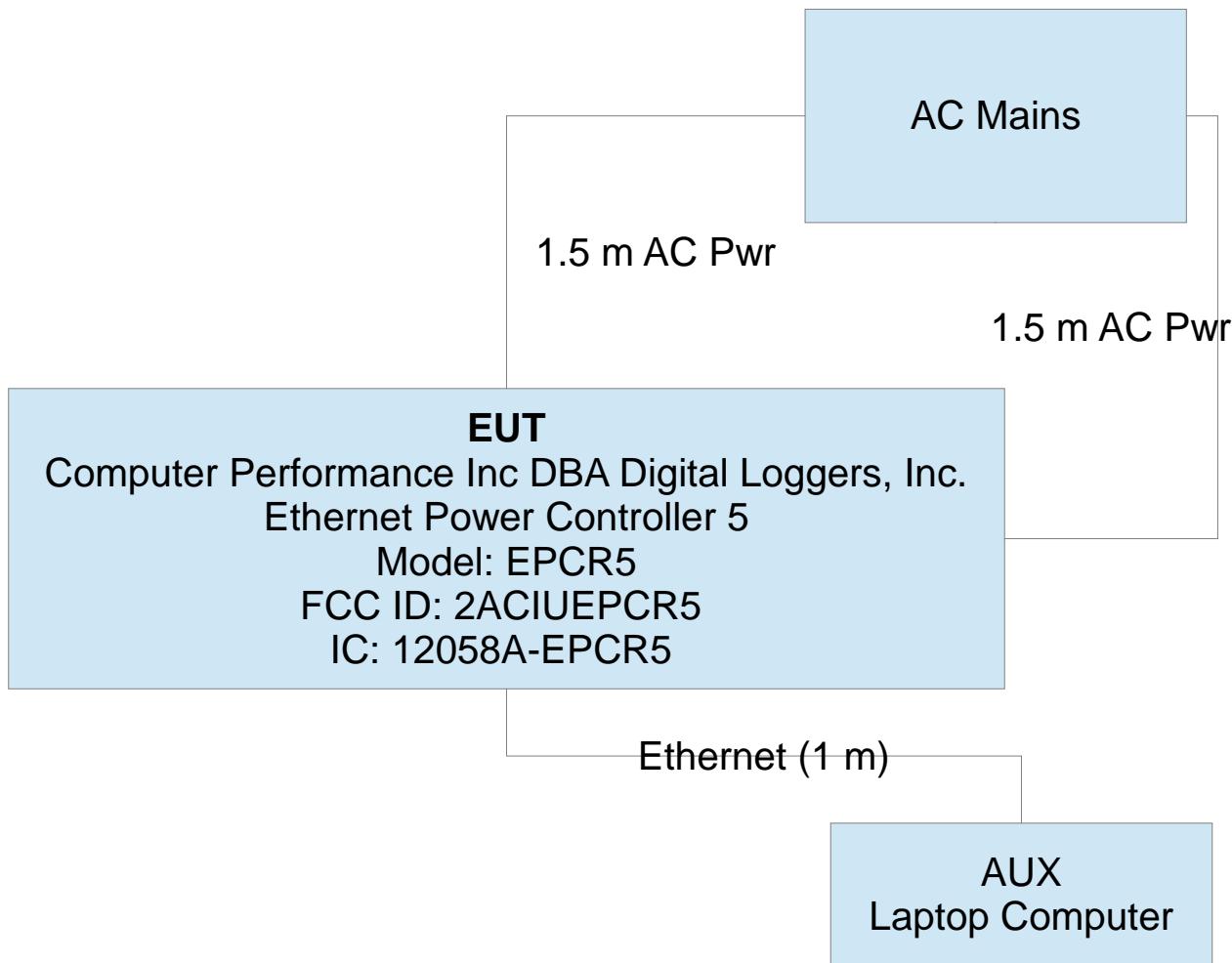


Figure 2: EUT Test Configuration Diagram.

2.1.4 Test Samples

One sample of the EUT was provided for testing with modified radio software capable of continuously modulated transmission on the low, middle, and high channels, as well as standby (Rx) mode.

2.1.5 Functional Exerciser

For RF testing, the radio was placed into the maximum possible (continuous) data rate and maximum power setting using custom software provided by the radio manufacturer.

2.1.6 Modifications Made

There were no modifications made to the EUT by this laboratory.

2.1.7 Production Intent

The EUT appears to be a production ready sample.

2.1.8 Declared Exemptions and Additional Product Notes

The EUT employs only single-stream fixed data rate (OFDM-20) communication on 11 selectable channels (2412 MHz through 2462 MHz). The radio parameters cannot be adjusted by the end user. This is an expensive product sold for use in commercial rack-mount installations. As such, it is subject to digital emissions regulation as a Class A commercial product. The EUT antenna is attached to the chassis via a RP-SMA unique connector.

3 Emissions

3.1 General Test Procedures

3.1.1 Radiated Test Setup and Procedures

Radiated electromagnetic emissions from the EUT are first evaluated in our shielded fully anechoic chamber. Spectrum and modulation characteristics of all emissions are recorded, and emissions above 1 GHz are fully characterized. The anechoic chamber contains a set-up similar to that of our outdoor 3-meter site, with a turntable and antenna mast. Instrumentation, including spectrum analyzers and other test equipment as detailed in Section 1.2 are employed. After indoor pre-scans, emission measurements are made on our outdoor 3-meter Open Area Test Site (OATS). If the EUT connects to auxiliary equipment and is table or floor standing, the configurations prescribed in ANSI C63.4 / CISPR-22 are followed. Alternatively, a layout closest to normal use (as declared by the provider) is employed if the resulting emissions appear to be worst-case in such a configuration. See Figure 3. All

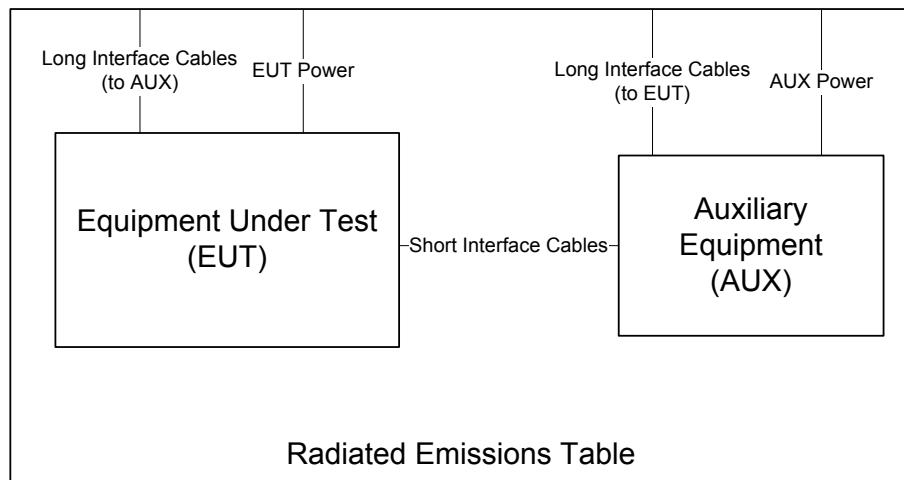


Figure 3: Radiated Emissions Diagram of the EUT.

intentionally radiating elements that are not fixed-mounted in use are placed on the test table lying flat, on their side, and on their end (3-axes) and the resulting worst case emissions are recorded. If the EUT is fixed-mounted in use, measurements are made with the device oriented in the manner consistent with installation and then emissions are recorded.

If the EUT exhibits spurious emissions due to internal receiver circuitry, such emissions are measured with an appropriate carrier signal applied. For devices with intentional emissions below 30 MHz, a shielded loop antenna is used as the test antenna. It is placed at a 1 meter receive height and appropriate low frequency magnetic field extrapolation to the regulatory limit distance is employed. Emissions between 30 MHz and 1 GHz are measured using tuned dipoles and/or calibrated broadband antennas. For both horizontal and vertical polarizations, the test antenna is raised and lowered from 1 to 4 m in height until a maximum emission level is detected. The EUT is then rotated through 360° in azimuth until the highest emission is detected. The test antenna is then raised and lowered one last time from 1 to 4 m and the worst case value is recorded. Emissions above 1 GHz are characterized using standard gain horn antennas or calibrated broadband ridge-horn antennas. Care is taken to ensure that test receiver resolution and video bandwidths meet the regulatory requirements, and that the emission bandwidth of the EUT is not reduced. Photographs of the test setup employed are depicted in Figure 4.

Where regulations allow for direct measurement of field strength, power values (dBm) measured on the test receiver / analyzer are converted to dB μ V/m at the regulatory distance, using

$$E_{dist} = 107 + P_R + K_A - K_G + K_E - C_F$$

where P_R is the power recorded on spectrum analyzer, in dBm, K_A is the test antenna factor in dB/m, K_G is the combined pre-amplifier gain and cable loss in dB, K_E is duty correction factor (when applicable) in dB, and C_F is

a distance conversion (employed only if limits are specified at alternate distance) in dB. This field strength value is then compared with the regulatory limit. If effective isotropic radiated power (EIRP) is compute, it is computed as

$$EIRP(dBm) = E_{3m}(dB\mu V/m) - 95.2.$$

When presenting data at each frequency, the highest measured emission under all possible EUT orientations (3-axes) is reported.

Where regulations call for substitution method measurements, the EUT is replaced by a substitution dipole or standard gain antenna if field strength measurements indicate the emission is close to the regulatory limit. This antenna is co-polarized with the test antenna and tuned (when necessary) to the emission frequency, after which the test antenna height is again optimized. The substitution antenna input signal level is then adjusted such that its emission is equal to the level measured from the EUT. The signal level applied to the substitution antenna is then recorded. Effective isotropic radiated power (EIRP) and effective radiated power (ERP) in dBm are formulated from

$$EIRP = P_T - G_A = ERP + 2.16, \quad (1)$$

where P_T is the power applied to substitution antenna in dBm, including correction for cable loss, and G_A is the substitution antenna gain, in dBi.

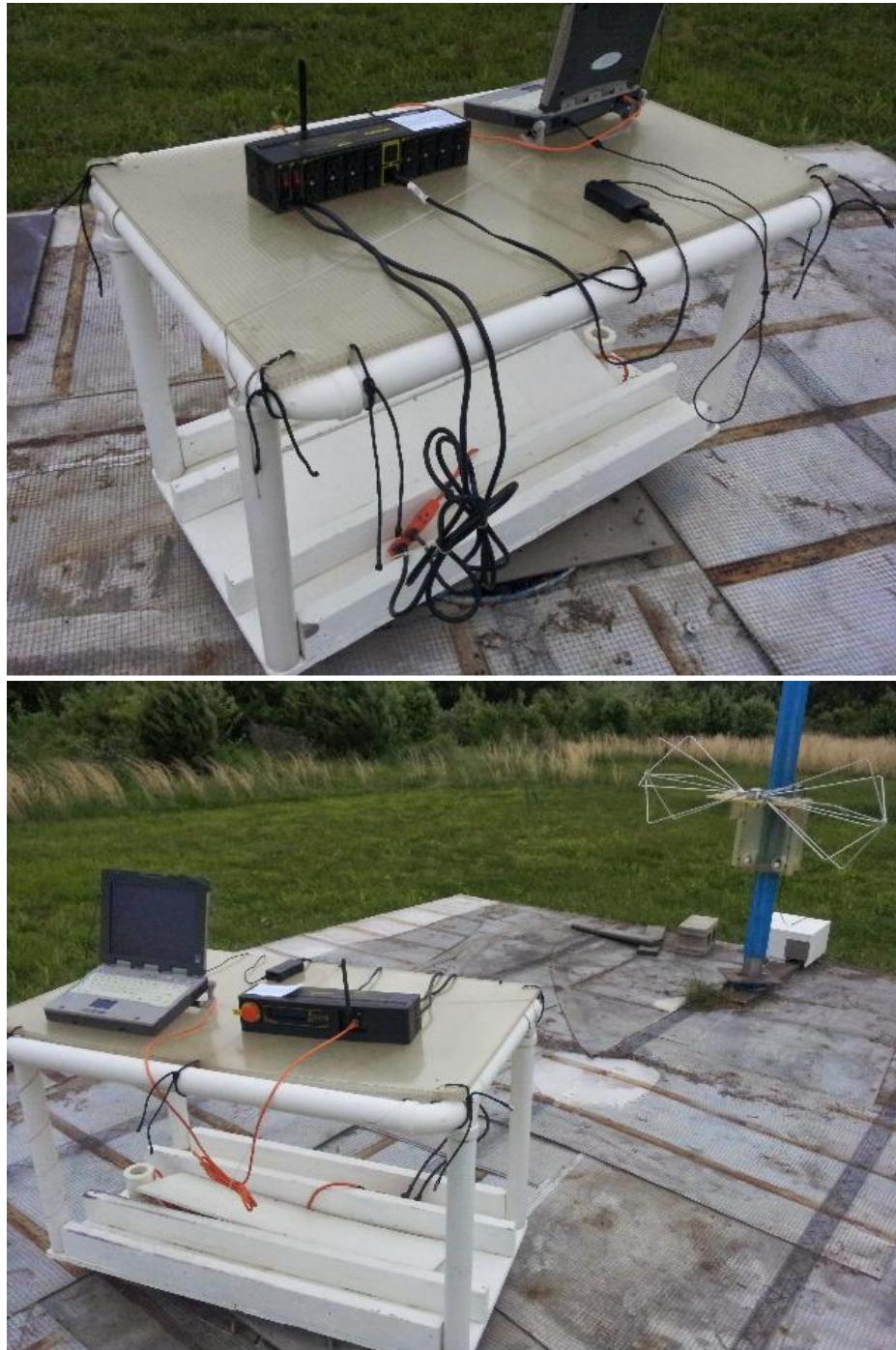


Figure 4: Radiated Emissions Test Setup Photograph(s).

3.1.2 Conducted Emissions Test Setup and Procedures

Transmit Antenna Port Conducted Emissions At least one sample EUT supplied for testing was provided with a 50Ω antenna port. Conducted transmit chain emissions measurements (where applicable) are made by connecting the EUT antenna port directly to the test receiver port. Photographs of the test setup employed are depicted in Figure 5.

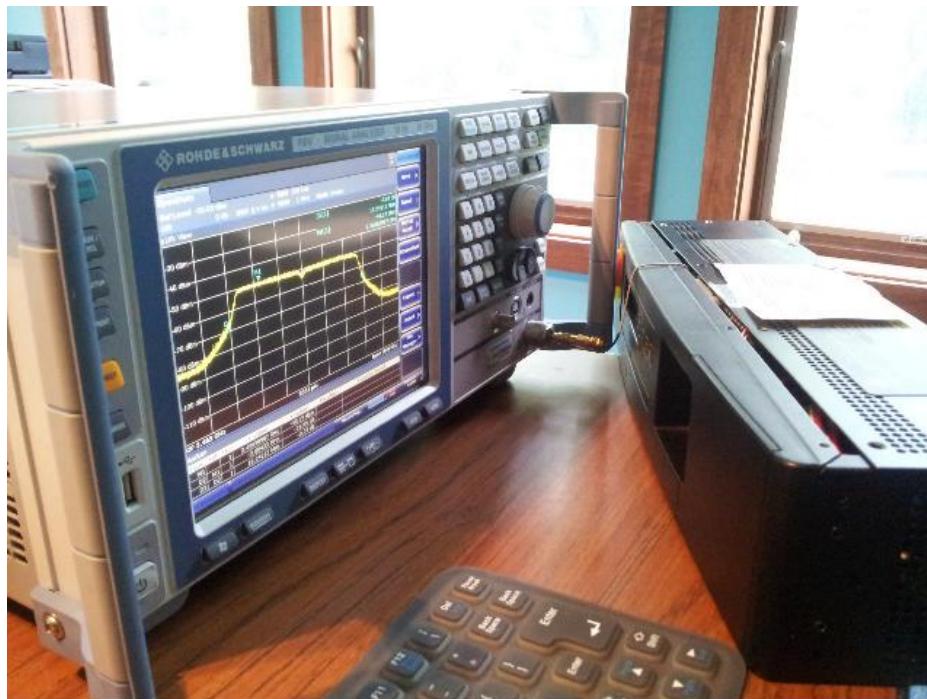


Figure 5: Conducted RF Test Setup Photograph(s).

AC Port Conducted Spurious For this device, AC power line conducted emissions are measured in our screen room. If the EUT connects to auxiliary equipment and is table or floor standing, the configurations prescribed in ANSI C63.4 / CISPR 22 are employed. Alternatively, an on-table layout more representative of actual use may be employed if the resulting emissions appear to be worst-case in such a configuration. See Figure 6. Conducted emissions are measured and recorded for each AC mains power source over the spectrum 0.15 MHz to 30 MHz for both the ungrounded (HI/PHASE) and grounded (LO/GRND) conductors with the EUT placed in its highest current draw operating mode(s). The test receiver is set to peak-hold mode in order to record the peak emissions throughout the course of functional operation. Only if an emission exceeds or is near the limit are quasi-peak and average detection applied.

3.1.3 Power Supply Variation

Tests at extreme supply voltages are made if required by the the procedures specified in the test standard, and results of this testing are detailed in this report.

In the case of this EUT, measurements of the worst-case radiated emissions are performed with the supply voltage varied by no less than 85% and 115% of the nominal rated value for devices connecting to AC power mains.

In the case the EUT is designed for operation from a battery power source, the extreme test voltages are evaluated over the range specified in the test standard; no less than $\pm 10\%$ of the nominal battery voltage declared by the manufacturer. For all battery operated equipment, worst case intentional and spurious emissions are re-checked employing a new (fully charged) battery.

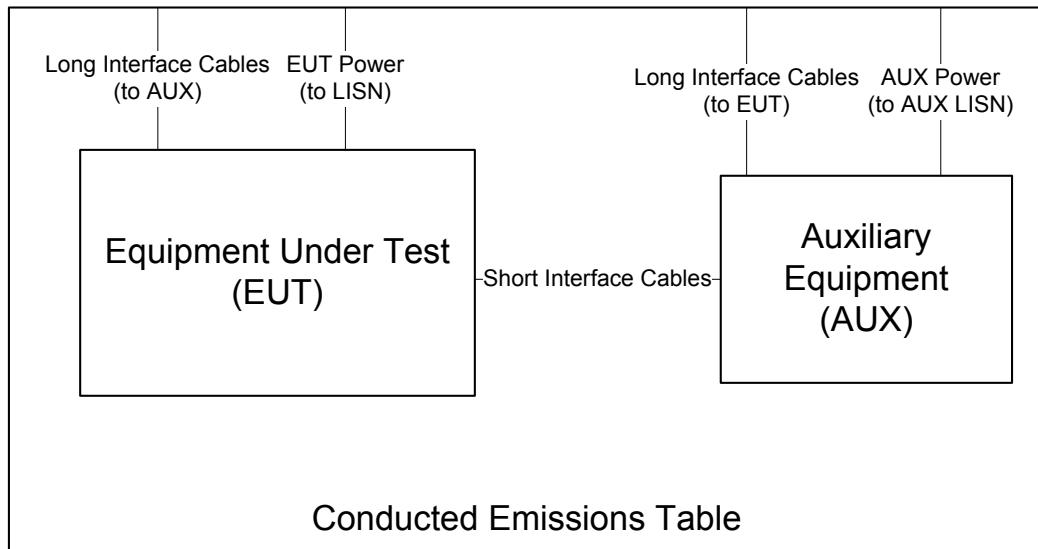


Figure 6: Conducted Emissions Setup Diagram of the EUT.

3.1.4 Thermal Variation

Tests at extreme temperatures are made if required by the procedures specified in the test standard, and results of this testing are detailed in this report. The provider has declared that the EUT is designed for operation over the temperature range -34° C to $+77^{\circ}\text{ C}$. Before any temperature measurements are made, the equipment is allowed to reach a thermal balance in the test chamber, temperature and humidity are recorded, and thermal balance is verified via a thermocouple based probe.

3.2 Intentional Emissions

3.2.1 Fundamental Emission Bandwidth

Emission bandwidth (EBW) of the EUT is measured with the device placed in the test mode(s) with the shortest available packet length and minimum packet spacing. Radiated emissions are recorded following the test procedures listed in Section 1.1. The 6 dB bandwidth is measured for the lowest, middle, and highest channels available. The 99% emission bandwidth per IC test procedures is also reported. The results of this testing are summarized in Table 3. Plots showing measurements obtain the emission bandwidths reported are provided in Figure 7.

Table 3: Intentional Emission Bandwidth.

| | | | | |
|---|-----------------------|-------------------------------|--------------------------------------|---|
| Frequency Range f > 1 000 MHz | Detector Pk | IF Bandwidth 30 kHz | Video Bandwidth > 3 x IFBW | Test Date: 20-Jun-14 |
| | | | | Test Engineer: Joseph Brunett |
| | | | | EUT Mode: DL EPCR5 |
| Equipment Used: HRN15001, RSFSV30001 | | | | Meas. Distance: 3m |

| FCC/IC | | | | | | | | |
|----------|------------|---------|-----------|-----------|-----------------|---------------|----------------|---------------------|
| Mode | Data Rate | Channel | Ant. Used | Ant. Pol. | Frequency (MHz) | 6 dB BW (MHz) | 20 dB BW (MHz) | IC 99% PWR BW (MHz) |
| Cont. Tx | Continuous | 1 | Horn LS | H/V | 2412.0 | 16.31 | 18.51 | 16.49 |
| | | 6 | Horn LS | H/V | 2437.0 | 16.36 | 18.56 | 16.48 |
| | | 11 | Horn LS | H/V | 2462.0 | 16.39 | 18.24 | 16.49 |

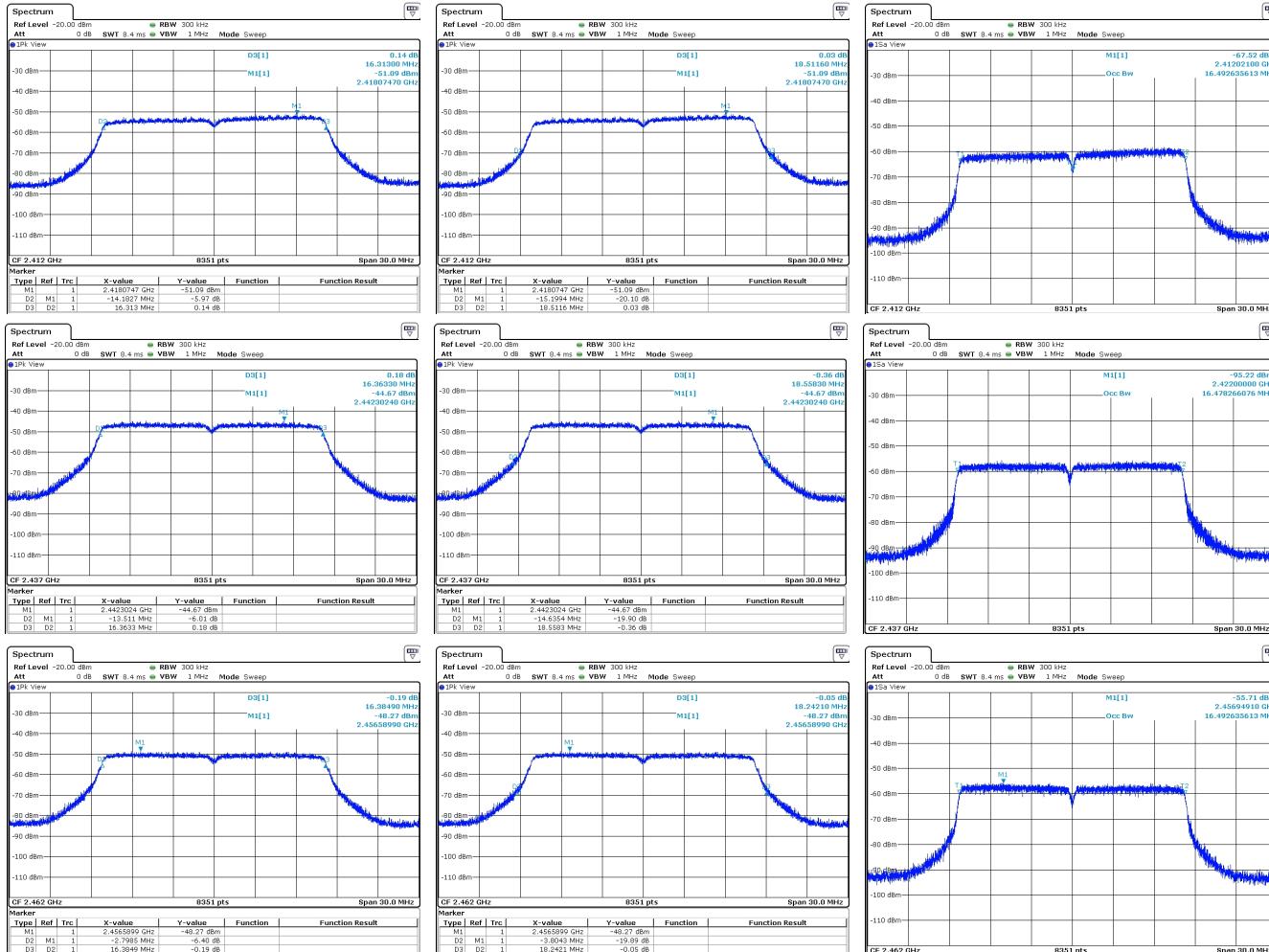


Figure 7: Intentional Emission Bandwidth.

3.2.2 Effective Isotropic Radiated Power

The EUT's radiated power is computed from antenna port conducted power measurements and the gain of the EUT antenna(s). Where the EUT is not sold with an antenna connector, a modified product has been provided including such. Method AVGSA-1 (trace averaging with the EUT transmitting at full power throughout each sweep) in the FCCs DTS measurement procedures is employed in determining average output power. The results of this testing are summarized in Table 4. Plots showing the measurements made to obtain these values are provided in Figure 8.

Table 4: Radiated Power Results.

| Frequency Range | Det | IF Bandwidth | Video Bandwidth | | | | Test Date: | 20-Jun-14 |
|---|-----------|--------------|-----------------|---------|--|--|-----------------|----------------|
| 25 MHz $f \leq 1000$ MHz | Pk/QPk | 120 kHz | | 300 kHz | | | Test Engineer: | Joseph Brunett |
| $f > 1000$ MHz | RMS(Int.) | 300 kHz | | 1 MHz | | | EUT: | DL EPCR5 |
| Equipment Used: HRN15001, RSFSV30001 | | | | | | | | |
| | | | | | | | Meas. Distance: | 3m |

| FCC/IC | | | | | | | | | | | | |
|-----------|---------|--------------|-------------------|--------------|---------------------|--------------|------------|---------------------|----------------------|-------------------------|---------------------------|--------------|
| Mode | Channel | Freq. MHz | Ant. Used | Ant. Pol. | Pr (Avg)** (dBm) | Ka (dB/m) | Kg (dB) | EIRP (Avg) (dBm) | Pout* (Avg) (dBm) | Calc. Ant Gain (dBi) | EIRP (Avg) Limit (dBm) | Pass (dB) |
| Cont. Tx. | 1 | 2412.0 | Horn LS | H/V | -45.8 | 21.4 | -0.4 | -12.2 | -11.1 | -1.1 | 30.0 | 42.2 |
| | 2 | 2437.0 | Horn LS | H/V | -43.9 | 21.5 | -0.4 | -10.2 | -11.5 | 1.3 | 30.0 | 40.2 |
| | 4 | 2462.0 | Horn LS | H/V | -44.0 | 21.6 | -0.4 | -10.1 | -11.8 | 1.7 | 30.0 | 40.1 |
| Mode | Channel | Freq. MHz | Supply Voltage | Ant. Pol. | Pr ** dBm | Ka dB/m | Kg dB | EIRP (Pk) dBm | | | | |
| Cont. Tx. | 2 | 2462.0 | 140.0 | H/V | -44.0 | 21.6 | -0.4 | -10.2 | | | | |
| | | 2462.0 | 125.0 | H/V | -44.0 | 21.6 | -0.4 | -10.2 | | | | |
| | | 2462.0 | 115.0 | H/V | -43.9 | 21.6 | -0.4 | -10.1 | | | | |
| | | 2462.0 | 100.0 | H/V | -43.9 | 21.6 | -0.4 | -10.1 | | | | |
| | | 2462.0 | 85.0 | H/V | -44.0 | 21.6 | -0.4 | -10.2 | | | | |

* Measured conducted from radio port via modified device following FCC's DTS measurement procedures method AVGSA-1.

** Measured radiated at 3 meter distance following FCC's DTS measurement procedures method AVGSA-1.

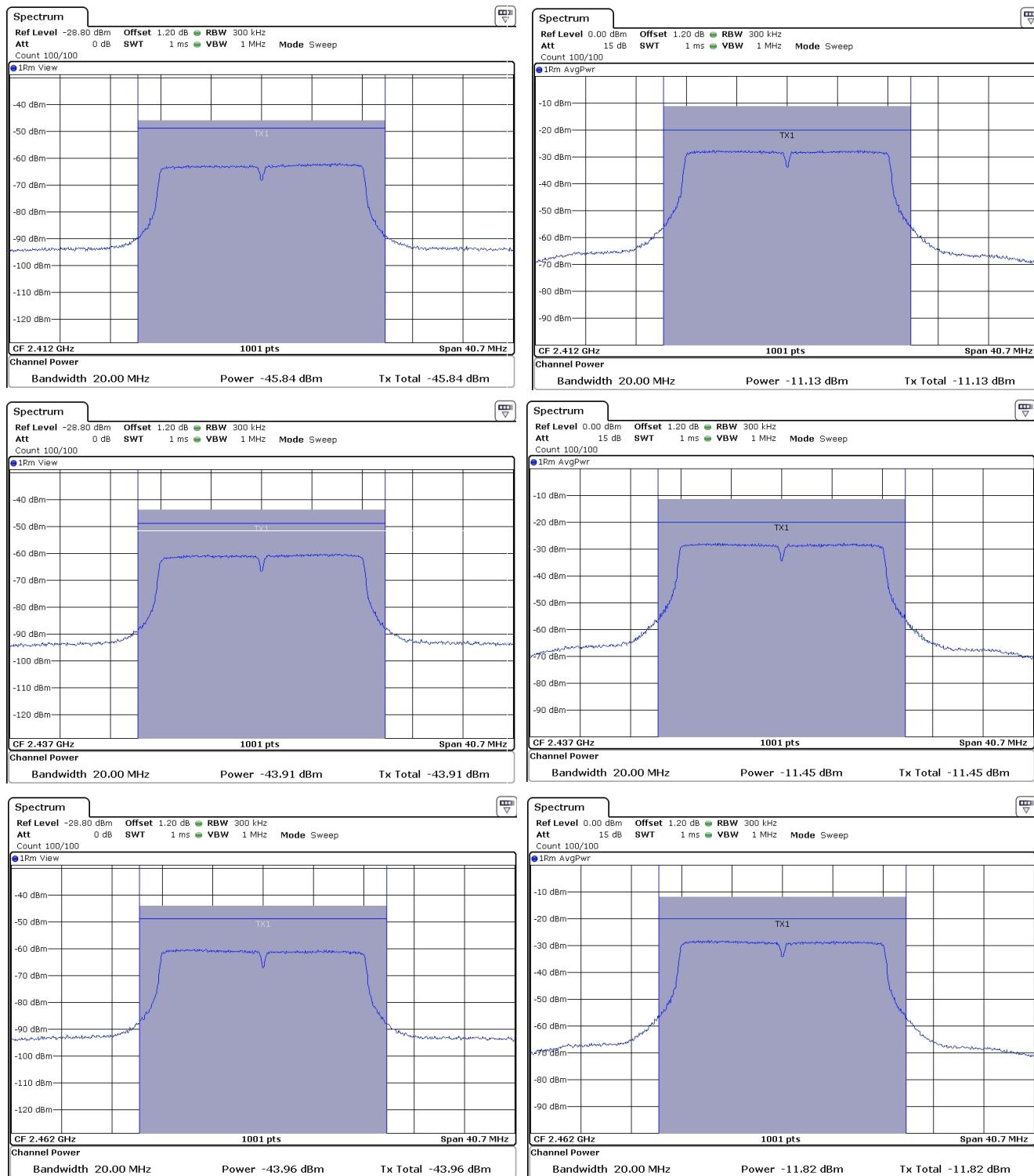


Figure 8: Power Measurement Plots.

3.2.3 Power Spectral Density

For this test, the EUT was attached directly to the test receiver. Following FCC DTS measurement procedures, the emission spectrum is first scanned for maximum spectral peaks, the span and receiver bandwidth are then reduced until the power spectral density is measured in the prescribed receiver bandwidth. The results of this testing are summarized in Table 5. Plots showing how these measurements were made are depicted in Figure 9.

Table 5: Power Spectral Density Results.

| Frequency Range | Detector | IF Bandwidth | Video Bandwidth | Test Date: | 20-Apr-14 |
|-----------------------------------|----------|--------------|-----------------|-----------------|----------------|
| 2400-2483.5 | Pk | 3 kHz | 300 kHz | Test Engineer: | Joseph Brunett |
| | | | | EUT: | DL EPCR5 |
| | | | | Meas. Distance: | Conducted |
| Equipment Used: RSFSV30001 | | | | | |

* PSD measured conducted out the the EUT antenna port following FCC DTS AVGPSD-1

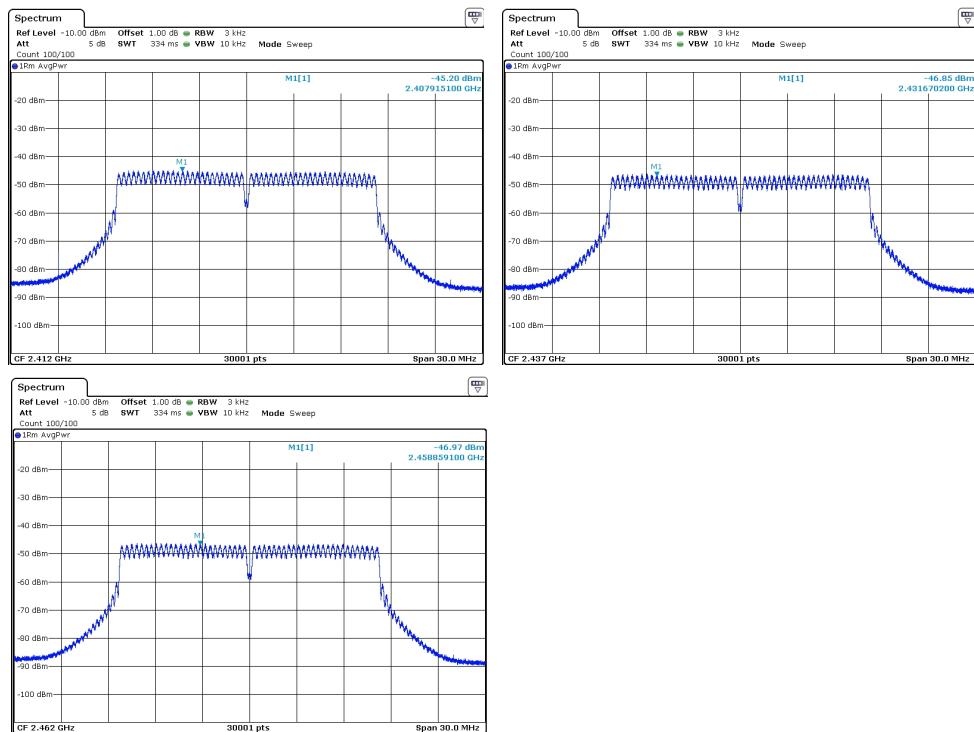


Figure 9: Power Spectral Density Plots.

3.3 Unintentional Emissions

3.3.1 Transmit Chain Spurious Emissions

The results for the measurement of transmit chain spurious emissions at the nominal voltage and temperature are provided in Table 6. Measurements are performed to 10 times the highest fundamental operating frequency.

Table 6: Transmit Chain Spurious Emissions.

| Frequency Range | | Det | IF Bandwidth | | Video Bandwidth | | Test Date: | | 18-Jun-14 | | | | | | | | | |
|---|--|----------------|--------------|-----------|-----------------|---------------|----------------|-------|---------------------|----------------------|-------------------------|-------------|------------------------------|--|--|--|--|--|
| 25 MHz $f \leq 1000$ MHz | | Pk/QPk | 120 kHz | | 300 kHz | | Test Engineer: | | Joseph Brunett | | | | | | | | | |
| $f > 1000$ MHz | | Pk/Avg | 1 MHz | | 3 MHz | | EUT: | | DL EPCR5 | | | | | | | | | |
| Equipment Used: HRN15001, HRNC001, HNRNXN001, HRXB001, HRNKU001, HRNK001, RSFSV30001 | | | | | | | | | | | | | | | | | | |
| Meas. Distance: 3m | | | | | | | | | | | | | | | | | | |
| FCC/IC | | | | | | | | | | | | | | | | | | |
| # | Freq. Start MHz | Freq. Stop MHz | Ant. Used | Ant. Pol. | Pr (Pk) dBm | Pr (Avg)* dBm | Ka dB/m | Kg dB | E3(Pk) dB μ V/m | E3(Avg) dB μ V/m | E3 Avg Lim dB μ V/m | Pass dB | Comments | | | | | |
| 1 | Fundamental Restricted Band Edge (Low Side) | | | | | | | | | | | | | | | | | |
| 2 | 2390.0 | 2390.0 | Horn LS | H/V | -81.0 | -90.7 | 21.3 | -0.4 | 47.7 | 38.0 | 54.0 | 16.0 | CH 1, 2412 MHz; max all | | | | | |
| 3 | 2390.0 | 2390.0 | Horn LS | H/V | -81.1 | -90.7 | 21.3 | -0.4 | 47.6 | 38.0 | 54.0 | 16.0 | CH6, 2437 MHz; max all | | | | | |
| 4 | 2390.0 | 2390.0 | Horn LS | H/V | -81.0 | -90.8 | 21.3 | -0.4 | 47.7 | 37.9 | 54.0 | 16.1 | CH11, 2462 MHz; max all | | | | | |
| 5 | Fundamental Restricted Band Edge (High Side) | | | | | | | | | | | | | | | | | |
| 6 | 2483.5 | 2483.5 | Horn LS | H/V | -81.2 | -90.6 | 21.8 | -0.4 | 48.0 | 38.6 | 54.0 | 15.4 | CH 1, 2412 MHz; max all | | | | | |
| 7 | 2483.5 | 2483.5 | Horn LS | H/V | -81.1 | -90.7 | 21.8 | -0.4 | 48.1 | 38.5 | 54.0 | 15.5 | CH6, 2437 MHz; max all | | | | | |
| 8 | 2483.5 | 2483.5 | Horn LS | H/V | -81.1 | -90.6 | 21.8 | -0.4 | 48.1 | 38.6 | 54.0 | 15.4 | CH11, 2462 MHz; max all | | | | | |
| 9 | | | | | | | | | | | | | | | | | | |
| 10 | Harmonic / Spurious Emissions | | | | | | | | | | | | | | | | | |
| 11 | 4000.0 | 6000.0 | Horn C | H/V | -87.8 | -88.6 | 24.9 | -0.8 | 44.9 | 44.1 | 54.0 | 9.9 | all channels; max all; noise | | | | | |
| 12 | 6000.0 | 8400.0 | Horn XN | H/V | -86.2 | -87.3 | 27.1 | -1.2 | 49.1 | 48.0 | 54.0 | 6.0 | all channels; max all; noise | | | | | |
| 13 | 8400.0 | 12500.0 | Horn X | H/V | -96.3 | -103.8 | 32.0 | -2.0 | 44.7 | 37.2 | 54.0 | 16.8 | all channels; max all; noise | | | | | |
| 14 | 12500.0 | 18000.0 | Horn Ku | H/V | -93.8 | -96.2 | 35.4 | -2.5 | 51.1 | 48.7 | 54.0 | 5.3 | all channels; max all; noise | | | | | |
| 15 | 18000.0 | 25000.0 | Horn K | H/V | -90.8 | -101.3 | 33.4 | -1.7 | 51.3 | 40.8 | 54.0 | 13.2 | all channels; max all; noise | | | | | |
| 16 | | | | | | | | | | | | | | | | | | |

*QPk detection below 1 GHz, Avg detection at or above 1 GHz with receiver bandwidth as specified at top of table.

** Band Edge Avg. meas. via FCC DTS procedures method 13.3 Integration Method

3.3.2 Radiated Receiver Spurious

The results for the measurement of radiated receiver spurious emissions (emissions from the receiver chain, e.g. LO or VCO) at the nominal voltage and temperature are reported in Table 7. Receive chain emissions are measured to 5 times the highest receive chain frequency observed, or 4 GHz, whichever is higher. If no emissions are detected, only those noise floor emissions at the LO/VCO frequency are reported.

Table 7: Receiver Chain Spurious Emissions \geq 30 MHz.

| Frequency Range | | Det | | IF Bandwidth | | Video Bandwidth | | | Test Date: | | 18-Jun-14 | | |
|---|--|-----------|-----------|--------------|-------------------|-----------------|-------|---------------------|----------------------|---------------------------|------------------------|-------------|----------------|
| 25 MHz \leq f \leq 1000 MHz | | Pk/QPk | | 120 kHz | | 300 kHz | | | Test Engineer: | | Joseph Brunett | | |
| f > 1000 MHz | | Pk/Avg | | 1 MHz | | 3 MHz | | | EUT Mode: | | Receive Only - Standby | | |
| Equipment Used: HRN15001, RSFSV30001 | | | | | | | | | | | | | |
| # | Freq. MHz | Ant. Used | Ant. Pol. | Pr (Pk) dBm | Pr (QPk/Avg) dBm* | Ka dB/m | Kg dB | E3(Pk) dB μ V/m | E3(Avg) dB μ V/m | FCC/IC E3lim dB μ V/m | CE E3lim dB μ V/m | Pass dB | FCC/IC |
| 1 | 2372.0 | Horn LS | H/V | -81.1 | -90.6 | 21.2 | -0.4 | 47.5 | 38.0 | 54.0 | | 16.0 | max all, noise |
| 2 | 2397.0 | Horn LS | H/V | -81.7 | -89.6 | 21.3 | -0.4 | 47.0 | 39.1 | 54.0 | | 14.9 | max all, noise |
| 3 | 2422.0 | Horn LS | H/V | -80.9 | -88.6 | 21.4 | -0.4 | 47.9 | 40.2 | 54.0 | | 13.8 | max all, noise |
| 4 | 2452.0 | Horn LS | H/V | -80.9 | -87.6 | 21.6 | -0.4 | 48.1 | 41.4 | 54.0 | | 12.6 | max all, noise |
| 5 | 2477.0 | Horn LS | H/V | -80.3 | -86.6 | 21.7 | -0.4 | 48.8 | 42.5 | 54.0 | | 11.5 | max all, noise |
| 6 | 2502.0 | Horn LS | H/V | -82.0 | -85.6 | 21.9 | -0.4 | 47.3 | 43.7 | 54.0 | | 10.3 | max all, noise |
| 7 | NOTE: VCO/LO is 40 MHz offset from Rx Channel. Low, Middle and High Channels tested. | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |

*QPk detection below 1 GHz, Avg detection at or above 1 GHz with receiver bandwidth as specified at top of table.

3.3.3 Radiated Digital Spurious

The results for the measurement of digital spurious emissions (emissions arising from digital circuitry) at the nominal voltage and temperature are provided in Table 8. Radiation from digital components has been measured to 4 GHz, or to five times the maximum digital component operating frequency, whichever is greater.

Table 8: Radiated Digital Spurious Emissions.

| Frequency Range | Det | IF Bandwidth | Video Bandwidth | Test Date: | 2-Jun-14 |
|---------------------|--------|--------------|-----------------|-----------------|---------------------------------|
| 25 MHz f < 1000 MHz | Pk/QPk | 120 kHz | 300 kHz | Test Engineer: | Joseph Brunett |
| f > 1000 MHz | Pk | 1 MHz | 3 MHz | EUT: | Digital Logger Power Controller |
| f > 1000 MHz | Avg | 1 MHz | 10kHz | EUT Mode: | Active |
| | | | | Meas. Distance: | 3 meters |

| # | Digital Spurious Emissions | | | | | | | | | | | | FCC/IC + CE(CISPR) | | | | |
|----|----------------------------|--------------|-----------|---------------------|--------------|------|-------|------------------------------|-------------------------------------|---------|-------------------------------|---------|-----------------------------------|---------|-------------------------------|---------|------------|
| | Test Freq. MHz | Antenna Type | Test Pol. | Pr (Pwr Rx.) Pk dBm | QPk/Avg dBm* | Ka | Kg dB | E-Field @ 3m Pk dB μ V/m | FCC/IC Class B QPk/Avg dB μ V/m | Pass dB | CE Class B E3lim dB μ V/m | Pass dB | FCC/IC Class A E3lim dB μ V/m | Pass dB | CE Class A E3lim dB μ V/m | Pass dB | Comments |
| 1 | 59.0 | Bic | H | -58.3 | | 8.2 | 38.2 | 18.7 | 77.0 | 40.0 | 21.3 | 40.5 | 21.8 | 49.5 | 30.8 | 50.5 | 31.8 |
| 2 | 65.2 | Bic | H | -56.2 | -58.5 | 7.8 | 38.0 | 20.5 | 18.2 | 40.0 | 21.8 | 40.5 | 22.3 | 49.5 | 31.3 | 50.5 | 32.3 |
| 3 | 80.3 | Bic | H | -57.1 | | 7.6 | 37.7 | 19.8 | | 40.0 | 20.2 | 40.5 | 20.7 | 49.5 | 29.7 | 50.5 | 30.7 |
| 4 | 114.4 | Bic | H | -53.4 | | 9.5 | 37.0 | 26.1 | | 43.5 | 17.4 | 40.5 | 14.4 | 54.0 | 27.9 | 50.5 | 24.4 |
| 5 | 117.9 | Bic | H | -44.5 | -47.4 | 9.8 | 36.9 | 35.4 | 32.5 | 43.5 | 11.0 | 40.5 | 8.0 | 54.0 | 21.5 | 50.5 | 18.0 |
| 6 | 117.9 | Bic | H | -43.8 | -46.3 | 9.8 | 36.9 | 36.1 | 33.6 | 43.5 | 9.9 | 40.5 | 6.9 | 54.0 | 20.4 | 50.5 | 16.9 |
| 7 | 155.8 | Bic | H | -43.8 | -55.5 | 12.9 | 36.2 | 39.9 | 28.2 | 43.5 | 15.3 | 40.5 | 12.3 | 54.0 | 25.8 | 50.5 | 22.3 |
| 8 | 162.2 | Bic | H | -47.5 | | 13.3 | 36.1 | 36.7 | | 43.5 | 6.8 | 40.5 | 3.8 | 54.0 | 17.3 | 50.5 | 13.8 |
| 9 | 200.0 | Bic | H | -34.8 | -41.4 | 14.7 | 35.5 | 51.4 | 44.8 | 43.5 | -1.3 | 40.5 | -4.3 | 54.0 | 9.2 | 50.5 | 5.7 |
| 10 | 200.0 | Bic | H | -31.8 | -37.2 | 14.7 | 35.5 | 54.4 | 49.0 | 43.5 | -5.5 | 40.5 | -8.5 | 54.0 | 5.0 | 50.5 | 1.5 |
| 11 | 243.0 | Bic | H | -44.4 | -57.7 | 14.6 | 34.8 | 42.4 | 29.1 | 46.0 | 16.9 | 47.5 | 18.4 | 56.9 | 27.8 | 57.5 | 28.4 |
| 12 | 254.8 | Log | H | -43.4 | -50.3 | 13.7 | 34.6 | 42.7 | 35.8 | 46.0 | 10.2 | 47.5 | 11.7 | 56.9 | 21.1 | 57.5 | 21.7 |
| 13 | 267.1 | Log | H | -50.6 | | 14.0 | 34.5 | 36.0 | | 46.0 | 10.0 | 47.5 | 11.5 | 56.9 | 20.9 | 57.5 | 21.5 |
| 14 | 288.5 | Log | H | -42.2 | -55.4 | 14.5 | 34.2 | 45.1 | 31.9 | 46.0 | 14.1 | 47.5 | 15.6 | 56.9 | 25.0 | 57.5 | 25.6 |
| 15 | 336.6 | Log | H | -50.9 | -56.9 | 15.5 | 33.5 | 38.1 | 32.1 | 46.0 | 13.9 | 47.5 | 15.4 | 56.9 | 24.8 | 57.5 | 25.4 |
| 16 | 336.6 | Log | H | -56.3 | | 15.5 | 33.5 | 32.7 | | 46.0 | 13.3 | 47.5 | 14.8 | 56.9 | 24.2 | 57.5 | 24.8 |
| 17 | 400.0 | Log | H | -51.2 | -55.7 | 16.6 | 32.8 | 39.6 | 35.1 | 46.0 | 10.9 | 47.5 | 12.4 | 56.9 | 21.8 | 57.5 | 22.4 |
| 18 | 509.0 | Log | H | -58.9 | -68.7 | 18.2 | 31.6 | 34.7 | 24.9 | 46.0 | 21.1 | 47.5 | 22.6 | 56.9 | 32.0 | 57.5 | 32.6 |
| 19 | 555.0 | Log | H | -63.8 | | 18.7 | 31.2 | 30.8 | | 46.0 | 15.2 | 47.5 | 16.7 | 56.9 | 26.1 | 57.5 | 26.7 |
| 20 | 600.0 | Log | H | -48.2 | -52.6 | 19.3 | 30.7 | 47.3 | 42.9 | 46.0 | 3.1 | 47.5 | 4.6 | 56.9 | 14.0 | 57.5 | 14.6 |
| 21 | | | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | |
| 26 | | | | | | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | | | |
| 31 | | | | | | | | | | | | | | | | | |
| 32 | | | | | | | | | | | | | | | | | |
| 33 | | | | | | | | | | | | | | | | | |
| 34 | | | | | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | | | | | |
| 36 | | | | | | | | | | | | | | | | | |

*QPk detection below 1 GHz, Avg detection at or above 1 GHz with receiver bandwidth as specified at top of table.

3.3.4 Conducted Transmitter Spurious

One of the EUT samples provided for testing employs one (or more) external antenna terminals. Measurement of conducted spurious emissions out of such ports at the nominal voltage and temperature were measured in accordance with the regulations. Results of these measurements are provided in Figure 10 below.

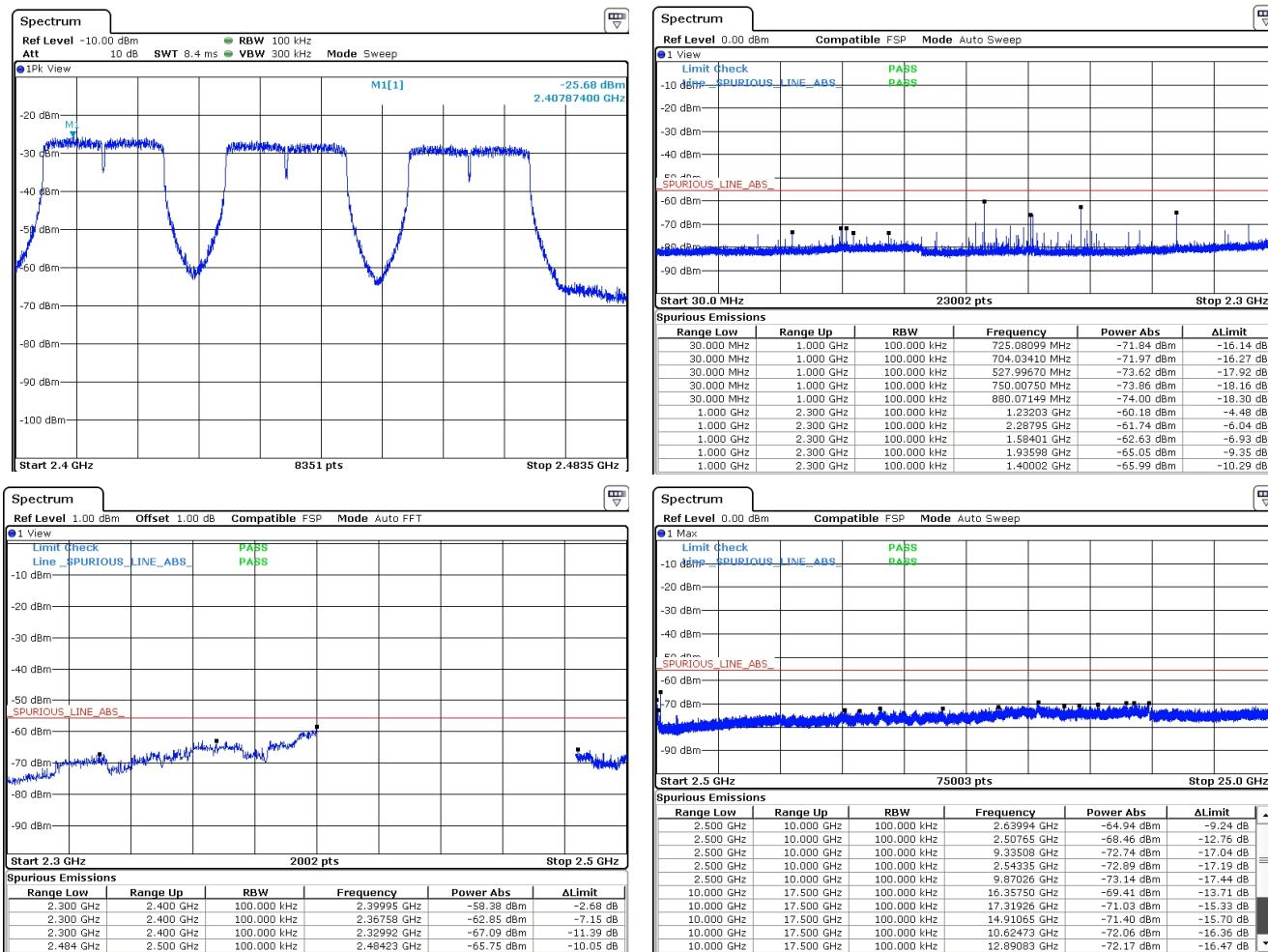


Figure 10: Conducted Transmitter Emissions Measured.

3.3.5 Conducted Emissions Test Results - AC Power Port(s)

The results of emissions from the EUT's AC mains power port(s) are reported in Table 9.

Table 9(a): AC Mains Power Conducted Emissions Results.

| | | | | |
|---|--------------------------|------------------------------|----------------------------------|---|
| Frequency Range 150kHz f 30 MHz | Det Pk/QPk/Avg | IF Bandwidth 9 kHz | Video Bandwidth 30 kHz | Test Date: 4-Jun-14 |
| | | | | Test Engineer: Joseph Brunett |
| | | | | EUT Mode: DL ECPR5 (AC LINE A) |
| | | | | Meas. Distance: AC Mains Conducted |

Equipment Used: LISNEM001, HP8593E001

| AC Mains Power Conducted Emissions | | | | | | | | | | | | | | |
|------------------------------------|--------------|--------------|------------|-------------|-------------|---------------|--------------|---------------|--------------|---------------|--------------|---------------|--------------|----------|
| # | Freq. MHz | Line Side | Vmeas | | | Class A Qpk | | Class A Avg | | Class B Qpk | | Class B Avg | | Comments |
| | | | Pk dBuV | Qpk dBuV | Avg dBuV | Vlim* dBuV | Margin dB | Vlim* dBuV | Margin dB | Vlim* dBuV | Margin dB | Vlim* dBuV | Margin dB | |
| 1 | 0.160 | Lo | 63.8 | 61.6 | 53.4 | 79.0 | 17.4 | 66.0 | 12.6 | 65.5 | 3.9 | 55.4 | 2.0 | |
| 2 | 0.190 | Lo | 61.0 | 57.2 | 45.4 | 79.0 | 21.8 | 66.0 | 20.6 | 64.1 | 6.9 | 54.0 | 8.6 | |
| 3 | 0.220 | Lo | 58.3 | 53.0 | 40.4 | 79.0 | 26.0 | 66.0 | 25.6 | 62.8 | 9.8 | 52.8 | 12.4 | |
| 4 | 0.290 | Lo | 53.7 | 49.9 | 40.9 | 79.0 | 29.1 | 66.0 | 25.1 | 60.5 | 10.6 | 50.5 | 9.6 | |
| 5 | 0.320 | Lo | 52.3 | 48.9 | 39.8 | 79.0 | 30.1 | 66.0 | 26.2 | 59.7 | 10.8 | 49.7 | 9.9 | |
| 6 | 0.430 | Lo | 47.6 | 42.1 | 29.7 | 79.0 | 36.9 | 66.0 | 36.3 | 57.3 | 15.2 | 47.2 | 17.5 | |
| 7 | 0.630 | Lo | 46.1 | 43.0 | 33.6 | 73.0 | 30.0 | 60.0 | 26.4 | 56.0 | 13.0 | 46.0 | 12.4 | |
| 8 | 0.730 | Lo | 44.5 | 39.6 | 30.0 | 73.0 | 33.4 | 60.0 | 30.0 | 56.0 | 16.4 | 46.0 | 16.0 | |
| 9 | 0.780 | Lo | 42.8 | 36.5 | 29.9 | 73.0 | 36.5 | 60.0 | 30.1 | 56.0 | 19.5 | 46.0 | 16.1 | |
| 10 | 1.110 | Lo | 43.5 | 37.5 | 28.0 | 73.0 | 35.5 | 60.0 | 32.0 | 56.0 | 18.5 | 46.0 | 18.0 | |
| 11 | 1.360 | Lo | 40.5 | 37.0 | 27.6 | 73.0 | 36.0 | 60.0 | 32.4 | 56.0 | 19.0 | 46.0 | 18.4 | |
| 12 | 1.480 | Lo | 41.4 | 39.5 | 29.2 | 73.0 | 33.5 | 60.0 | 30.8 | 56.0 | 16.5 | 46.0 | 16.8 | |
| 13 | 1.840 | Lo | 41.7 | 38.2 | 28.4 | 73.0 | 34.8 | 60.0 | 31.6 | 56.0 | 17.8 | 46.0 | 17.6 | |
| 14 | 3.180 | Lo | 40.5 | 35.8 | 28.1 | 73.0 | 37.2 | 60.0 | 31.9 | 56.0 | 20.2 | 46.0 | 17.9 | |
| 15 | 4.840 | Lo | 38.8 | 34.7 | 28.0 | 73.0 | 38.3 | 60.0 | 32.0 | 56.0 | 21.3 | 46.0 | 18.0 | |
| 16 | 12.50 | Lo | 34.4 | 30.7 | 29.0 | 73.0 | 42.3 | 60.0 | 31.0 | 60.0 | 29.3 | 50.0 | 21.0 | |
| 17 | 15.62 | Lo | 39.5 | 37.0 | 35.4 | 73.0 | 36.0 | 60.0 | 24.6 | 60.0 | 23.0 | 50.0 | 14.6 | |
| 18 | 18.750 | Lo | 33.6 | 31.2 | 30.1 | 73.0 | 41.8 | 60.0 | 29.9 | 60.0 | 28.8 | 50.0 | 19.9 | |
| 19 | 21.870 | Lo | 32.1 | 29.5 | 28.0 | 73.0 | 43.5 | 60.0 | 32.0 | 60.0 | 30.5 | 50.0 | 22.0 | |
| 20 | 25.000 | Lo | 35.1 | 32.8 | 31.8 | 73.0 | 40.2 | 60.0 | 28.2 | 60.0 | 27.2 | 50.0 | 18.2 | |
| 21 | | | | | | | | | | | | | | |
| 22 | 0.150 | Hi | 62.8 | 60.0 | 50.8 | 79.0 | 19.0 | 66.0 | 15.2 | 66.0 | 6.0 | 56.0 | 5.2 | |
| 23 | 0.170 | Hi | 60.3 | 57.6 | 49.1 | 79.0 | 21.4 | 66.0 | 16.9 | 65.0 | 7.4 | 54.9 | 5.8 | |
| 24 | 0.200 | Hi | 57.4 | 54.6 | 44.5 | 79.0 | 24.4 | 66.0 | 21.5 | 63.6 | 9.0 | 53.6 | 9.1 | |
| 25 | 0.270 | Hi | 61.6 | 48.9 | 34.7 | 79.0 | 30.1 | 66.0 | 31.3 | 61.1 | 12.2 | 51.1 | 16.4 | |
| 26 | 0.350 | Hi | 51.4 | 46.0 | 35.9 | 79.0 | 33.0 | 66.0 | 30.1 | 59.0 | 13.0 | 48.9 | 13.0 | |
| 27 | 0.350 | Hi | 52.2 | 45.4 | 35.7 | 79.0 | 33.6 | 66.0 | 30.3 | 59.0 | 13.6 | 48.9 | 13.2 | |
| 28 | 0.579 | Hi | 47.5 | 43.0 | 33.7 | 73.0 | 30.0 | 60.0 | 26.3 | 56.0 | 13.0 | 46.0 | 12.3 | |
| 29 | 0.690 | Hi | 50.8 | 41.2 | 30.3 | 73.0 | 31.8 | 60.0 | 29.7 | 56.0 | 14.8 | 46.0 | 15.7 | |
| 30 | 0.740 | Hi | 49.6 | 32.0 | 21.4 | 73.0 | 41.0 | 60.0 | 38.6 | 56.0 | 24.0 | 46.0 | 24.6 | |
| 31 | 0.830 | Hi | 40.2 | 34.4 | 25.0 | 73.0 | 38.6 | 60.0 | 35.0 | 56.0 | 21.6 | 46.0 | 21.0 | |
| 32 | 1.150 | Hi | 45.4 | 34.4 | 25.0 | 73.0 | 38.6 | 60.0 | 35.0 | 56.0 | 21.6 | 46.0 | 21.0 | |
| 33 | 1.17 | Hi | 40.4 | 34.5 | 24.9 | 73.0 | 38.5 | 60.0 | 35.1 | 56.0 | 21.5 | 46.0 | 21.1 | |
| 34 | 1.64 | Hi | 38.0 | 36.1 | 25.1 | 73.0 | 36.9 | 60.0 | 34.9 | 56.0 | 19.9 | 46.0 | 20.9 | |
| 35 | 1.65 | Hi | 38.3 | 34.3 | 25.1 | 73.0 | 38.7 | 60.0 | 34.9 | 56.0 | 21.7 | 46.0 | 20.9 | |
| 36 | 1.80 | Hi | 49.7 | 36.2 | 22.9 | 73.0 | 36.8 | 60.0 | 37.1 | 56.0 | 19.8 | 46.0 | 23.1 | |
| 37 | 1.97 | Hi | 42.5 | 32.2 | 21.0 | 73.0 | 40.8 | 60.0 | 39.0 | 56.0 | 23.8 | 46.0 | 25.0 | |
| 38 | 3.12 | Hi | 48.8 | 36.2 | 24.0 | 73.0 | 36.8 | 60.0 | 36.0 | 56.0 | 19.8 | 46.0 | 22.0 | |
| 39 | 4.64 | Hi | 35.1 | 29.0 | 21.0 | 73.0 | 44.0 | 60.0 | 39.0 | 56.0 | 27.0 | 46.0 | 25.0 | |
| 40 | 6.77 | Hi | 36.4 | 34.0 | 32.6 | 73.0 | 39.0 | 60.0 | 27.4 | 60.0 | 26.0 | 50.0 | 17.4 | |
| 41 | 10.15 | Hi | 33.0 | 27.3 | 23.9 | 73.0 | 45.7 | 60.0 | 36.1 | 60.0 | 32.7 | 50.0 | 26.1 | |
| 42 | 16.93 | Hi | 33.1 | 29.9 | 28.1 | 73.0 | 43.1 | 60.0 | 31.9 | 60.0 | 30.1 | 50.0 | 21.9 | |
| 40 | 29.49 | Hi | 29.5 | 26.5 | 24.5 | 73.0 | 46.5 | 60.0 | 35.5 | 60.0 | 33.5 | 50.0 | 25.5 | |

*In all cases, Vpk VQpk VAve. If Vpk < Vavg limit, then VQpk limit and Vavg limit are met.

Table 9(b): AC Mains Power Conducted Emissions Results.

| | | | | |
|---|--------------------------|------------------------------|----------------------------------|--|
| Frequency Range 150kHz f 30 MHz | Det Pk/QPk/Avg | IF Bandwidth 9 kHz | Video Bandwidth 30 kHz | Test Date: 4-Jun-14 |
| | | | | Test Engineer: Joseph Brunett |
| | | | | EUT Mode: DL ECPR5 (AC LINE B) |
| | | | | Meas. Distance: AC Mains Conducted |

| AC Mains Power Conducted Emissions | | | | | | | | | | | | | | |
|------------------------------------|--------------|--------------|------------|-------------|-------------|---------------|--------------|---------------|--------------|---------------|--------------|---------------|--------------|----------|
| # | Freq. MHz | Line Side | Vmeas | | | Class A Qpk | | Class A Avg | | Class B Qpk | | Class B Avg | | Comments |
| | | | Pk dBuV | Qpk dBuV | Avg dBuV | Vlim* dBuV | Margin dB | Vlim* dBuV | Margin dB | Vlim* dBuV | Margin dB | Vlim* dBuV | Margin dB | |
| 1 | 0.160 | Lo | 66.2 | 63.2 | 54.5 | 79.0 | 15.8 | 66.0 | 11.5 | 65.5 | 2.3 | 55.4 | 0.9 | |
| 2 | 0.230 | Lo | 59.7 | 55.4 | 46.0 | 79.0 | 23.6 | 66.0 | 20.0 | 62.5 | 7.1 | 52.4 | 6.4 | |
| 3 | 0.290 | Lo | 56.9 | 51.9 | 41.0 | 79.0 | 27.1 | 66.0 | 25.0 | 60.5 | 8.6 | 50.5 | 9.5 | |
| 4 | 0.300 | Lo | 56.3 | 50.8 | 37.8 | 79.0 | 28.2 | 66.0 | 28.2 | 60.3 | 9.5 | 50.2 | 12.4 | |
| 5 | 0.330 | Lo | 54.5 | 49.4 | 38.4 | 79.0 | 29.6 | 66.0 | 27.6 | 59.5 | 10.1 | 49.4 | 11.0 | |
| 6 | 0.410 | Lo | 50.5 | 44.9 | 31.0 | 79.0 | 34.1 | 66.0 | 35.0 | 57.7 | 12.8 | 47.6 | 16.6 | |
| 7 | 0.590 | Lo | 44.9 | 42.3 | 32.8 | 73.0 | 30.7 | 60.0 | 27.2 | 56.0 | 13.7 | 46.0 | 13.2 | |
| 8 | 0.700 | Lo | 44.1 | 38.3 | 28.6 | 73.0 | 34.7 | 60.0 | 31.4 | 56.0 | 17.7 | 46.0 | 17.4 | |
| 9 | 1.040 | Lo | 42.6 | 38.8 | 29.3 | 73.0 | 34.2 | 60.0 | 30.7 | 56.0 | 17.2 | 46.0 | 16.7 | |
| 10 | 1.440 | Lo | 42.6 | 39.4 | 30.2 | 73.0 | 33.6 | 60.0 | 29.8 | 56.0 | 16.6 | 46.0 | 15.8 | |
| 11 | 1.830 | Lo | 43.4 | 39.9 | 30.9 | 73.0 | 33.1 | 60.0 | 29.1 | 56.0 | 16.1 | 46.0 | 15.1 | |
| 12 | 3.120 | Lo | 48.1 | 45.1 | 43.1 | 73.0 | 27.9 | 60.0 | 16.9 | 56.0 | 10.9 | 46.0 | 2.9 | |
| 13 | 6.250 | Lo | 41.8 | 40.3 | 39.9 | 73.0 | 32.7 | 60.0 | 20.1 | 60.0 | 19.7 | 50.0 | 10.1 | |
| 14 | 6.250 | Lo | 41.9 | 40.4 | 39.9 | 73.0 | 32.6 | 60.0 | 20.1 | 60.0 | 19.6 | 50.0 | 10.1 | |
| 15 | 18.750 | Lo | 37.3 | 33.6 | 32.6 | 73.0 | 39.4 | 60.0 | 27.4 | 60.0 | 26.4 | 50.0 | 17.4 | |
| 16 | 18.75 | Lo | 36.3 | 33.6 | 32.6 | 73.0 | 39.4 | 60.0 | 27.4 | 60.0 | 26.4 | 50.0 | 17.4 | |
| 17 | 20.34 | Lo | 49.4 | 48.2 | 38.5 | 73.0 | 24.8 | 60.0 | 21.5 | 60.0 | 11.8 | 50.0 | 11.5 | |
| 18 | 25.000 | Lo | 39.4 | 37.1 | 36.4 | 73.0 | 35.9 | 60.0 | 23.6 | 60.0 | 22.9 | 50.0 | 13.6 | |
| 19 | 28.120 | Lo | 32.8 | 30.3 | 29.1 | 73.0 | 42.7 | 60.0 | 30.9 | 60.0 | 29.7 | 50.0 | 20.9 | |
| 20 | 29.490 | Lo | 33.9 | 32.1 | 31.6 | 73.0 | 40.9 | 60.0 | 28.4 | 60.0 | 27.9 | 50.0 | 18.4 | |
| 21 | | | | | | | | | | | | | | |
| 22 | 0.160 | Hi | 68.3 | 64.7 | 54.7 | 79.0 | 14.3 | 66.0 | 11.3 | 65.5 | 0.8 | 55.4 | 0.7 | |
| 23 | 0.250 | Hi | 60.8 | 55.1 | 42.7 | 79.0 | 23.9 | 66.0 | 23.3 | 61.8 | 6.7 | 51.7 | 9.0 | |
| 24 | 0.330 | Hi | 56.3 | 52.5 | 42.5 | 79.0 | 26.5 | 66.0 | 23.5 | 59.5 | 7.0 | 49.4 | 6.9 | |
| 25 | 0.350 | Hi | 54.9 | 49.9 | 38.4 | 79.0 | 29.1 | 66.0 | 27.6 | 59.0 | 9.1 | 48.9 | 10.5 | |
| 26 | 0.380 | Hi | 53.6 | 48.1 | 35.1 | 79.0 | 30.9 | 66.0 | 30.9 | 58.3 | 10.2 | 48.2 | 13.1 | |
| 27 | 0.430 | Hi | 50.3 | 45.0 | 32.8 | 79.0 | 34.0 | 66.0 | 33.2 | 57.3 | 12.3 | 47.2 | 14.4 | |
| 28 | 0.590 | Hi | 48.7 | 44.4 | 34.8 | 73.0 | 28.6 | 60.0 | 25.2 | 56.0 | 11.6 | 46.0 | 11.2 | |
| 29 | 0.630 | Hi | 47.3 | 42.5 | 32.5 | 73.0 | 30.5 | 60.0 | 27.5 | 56.0 | 13.5 | 46.0 | 13.5 | |
| 30 | 1.460 | Hi | 46.1 | 41.7 | 32.1 | 73.0 | 31.3 | 60.0 | 27.9 | 56.0 | 14.3 | 46.0 | 13.9 | |
| 31 | 1.830 | Hi | 45.6 | 41.8 | 32.4 | 73.0 | 31.2 | 60.0 | 27.6 | 56.0 | 14.2 | 46.0 | 13.6 | |
| 32 | 3.120 | Hi | 49.8 | 47.4 | 45.8 | 73.0 | 25.6 | 60.0 | 14.2 | 56.0 | 8.6 | 46.0 | 0.2 | |
| 33 | 6.25 | Hi | 43.9 | 39.2 | 36.7 | 73.0 | 33.8 | 60.0 | 23.3 | 60.0 | 20.8 | 50.0 | 13.3 | |
| 34 | 9.37 | Hi | 44.4 | 40.3 | 38.1 | 73.0 | 32.7 | 60.0 | 21.9 | 60.0 | 19.7 | 50.0 | 11.9 | |
| 35 | 15.62 | Hi | 39.5 | 36.9 | 35.8 | 73.0 | 36.1 | 60.0 | 24.2 | 60.0 | 23.1 | 50.0 | 14.2 | |
| 36 | 18.75 | Hi | 44.6 | 41.7 | 40.1 | 73.0 | 31.3 | 60.0 | 19.9 | 60.0 | 18.3 | 50.0 | 9.9 | |
| 37 | 20.30 | Hi | 54.9 | 53.9 | 46.1 | 73.0 | 19.1 | 60.0 | 13.9 | 60.0 | 6.1 | 50.0 | 3.9 | |
| 38 | 20.33 | Hi | 56.4 | 55.4 | 45.8 | 73.0 | 17.6 | 60.0 | 14.2 | 60.0 | 4.6 | 50.0 | 4.2 | |
| 39 | 21.87 | Hi | 39.2 | 36.6 | 35.8 | 73.0 | 36.4 | 60.0 | 24.2 | 60.0 | 23.4 | 50.0 | 14.2 | |
| 40 | 25.00 | Hi | 43.9 | 41.6 | 40.7 | 73.0 | 31.4 | 60.0 | 19.3 | 60.0 | 18.4 | 50.0 | 9.3 | |
| 41 | 28.13 | Hi | 39.6 | 35.1 | 33.0 | 73.0 | 37.9 | 60.0 | 27.0 | 60.0 | 24.9 | 50.0 | 17.0 | |
| 42 | 29.49 | Hi | 43.7 | 42.7 | 42.6 | 73.0 | 30.3 | 60.0 | 17.4 | 60.0 | 17.3 | 50.0 | 7.4 | |
| 43 | 29.49 | Hi | 29.5 | 26.5 | 24.5 | 73.0 | 46.5 | 60.0 | 35.5 | 60.0 | 33.5 | 50.0 | 25.5 | |

*In all cases, Vpk VQpk VAve. If Vpk < Vavg limit, then VQpk limit and Vavg limit are met.