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TEST REPORT

ACCORDING TO: FCC 47CFR part 15 subpart C § 15.247 (DTS),
RSS-247 issue 1, RSS-Gen issue 4

FOR:
Visonic Ltd.
Control Panel (Wi-Fi module)
Model:PM-360
FCC ID:WP3PMASTER360
IC:1467C-PMASTER360

This report is in conformity with ISO/ IEC 17025. The "A2LA Accredited" symbol endorsement applies only to the tests and calibrations that are listed in the scope of Hermon Laboratories accreditation. The test results relate only to the items tested.
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1 Applicant information

Client name: Visonic Ltd.
Address: 24 Habarzel street, Tel Aviv 69710, Israel
Telephone: +972 3645 6832
Fax: +972 3645 6788
E-mail: zurir@tycoint.com
Contact name: Mr. Zuri Rubin

2 Equipment under test attributes

Product name: Wi-Fi module of Control Panel
Product type: Transceiver
Model(s): PM-360
Serial number: 1215140369
Hardware version: 90-207342
Software release: JS-702974
Receipt date: 12-Apr-15

3 Manufacturer information

Manufacturer name: Visonic Ltd.
Address: 24 Habarzel street, Tel Aviv 69710, Israel
Telephone: +972 3645 6832
Fax: +972 3645 6788
E-Mail: zurir@tycoint.com
Contact name: Mr. Zuri Rubin

4 Test details





Project ID: 26893
Location: Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel
Test started: 28-Jun-15
Test completed: 30-Jun-15
Test specification(s): FCC 47CFR part 15 subpart C § 15.247 (FHSS);
RSS-247 issue 1, RSS-Gen issue 4

5 Tests summary

| Test | Status |
|--------------------------------------------------------------------------|-------------------------------------------------------------------|
| Transmitter characteristics | |
| FCC Section 15.247(a)2 / RSS-247 section 5.2(1), 6 dB bandwidth | Pass |
| FCC Section 15.247(b)3/ RSS-247 section 5.4(4), Peak output power | Pass |
| FCC section 15.247(i) / RSS-102 section 2.5.2, RF exposure | Pass, the exhibit to the application of certification is provided |
| FCC Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | Pass |
| FCC Section 15.247(d)/ RSS-247 section 5.5, Emissions at band edges | Pass |
| FCC Section 15.247(e) / RSS-247 section 5.2(2), Peak power density | Pass |
| FCC section 15.203 / RSS-Gen section 8.3, Antenna requirement | Pass |
| FCC section 15.207(a) / RSS-Gen section 8.8, Conducted emission | Pass |

Testing was completed against all relevant requirements of the test standard. The results obtained indicate that the product under test complies in full with the requirements tested.

The test results relate only to the items tested. Pass/ fail decision was based on nominal values.

| | Name and Title | Date | Signature |
|---------------------|--------------------------------------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tested by: | Mr. S. Samokha, test engineer Mrs. E. Pitt, test engineer | June 30, 2015 |   |
| Reviewed by: | Mrs. M. Cherniavsky, certification engineer | October 20, 2015 |  |
| Approved by: | Mr. M. Nikishin, EMC and Radio group manager | February 11, 2016 |  |

6 EUT description

6.1 General information

The EUT, Control panel PM-360 is a wireless control panel powered via external AC/DC adaptor. The panel comprises four Visonic RF boards with below radio modules:

1. PG-2 module- communication within the alarm system in 902- 928 MHz band
2. WiFi module- approved under FCC ID:Z64-WL18SBMOD with Visonic antenna, connected to RF PCB
 - a. 802.11b
 - b. 802.11g
 - c. 802.11n HT20, 802.11n HT40.
3. Z-wave module with Visonic antenna connected to RF board
4. Cellular module UE910NAR modular approved with FCC ID:RI7UE910NA, IC: 5131A-UE910NA used for 3G/2G modes with Visonic antenna connected to RF board.

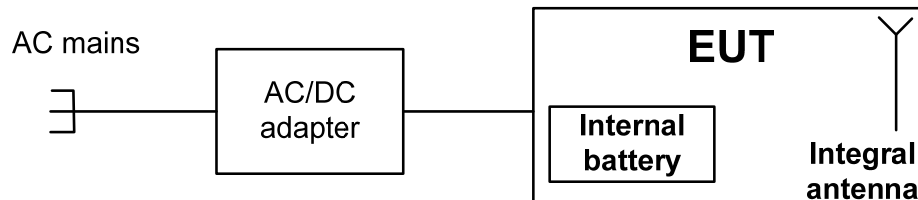
All radios could operate simultaneously.

The present test report involves the test results for certification of 2412-2462 MHz Wi-Fi transmitter as a part of a composite application for certification.

6.2 Ports and lines

| Port type | Port description | Connected from | Connected to | Qty. | Cable type | Cable length, m |
|-----------|------------------|----------------|---------------|------|------------|-----------------|
| Power | AC power | AC mains | AC/DC adaptor | 1 | Unshielded | 2.0 |

6.3 Test configuration

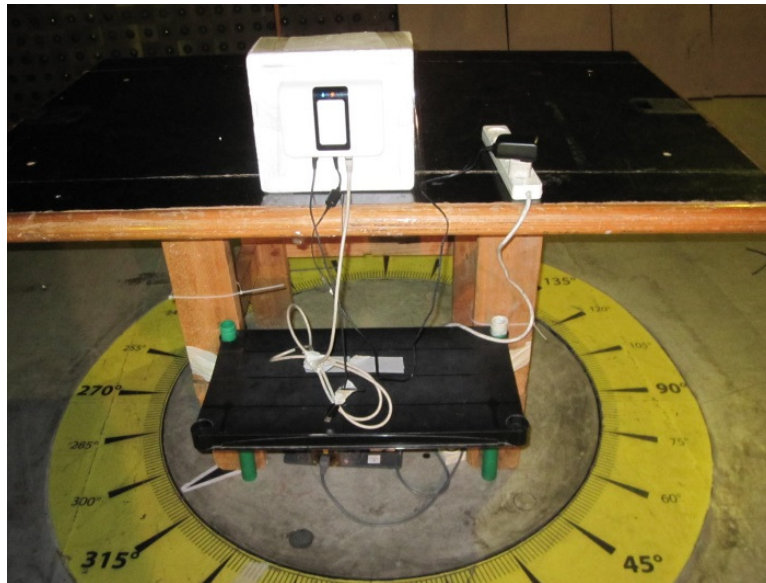


6.4 Changes made in the EUT

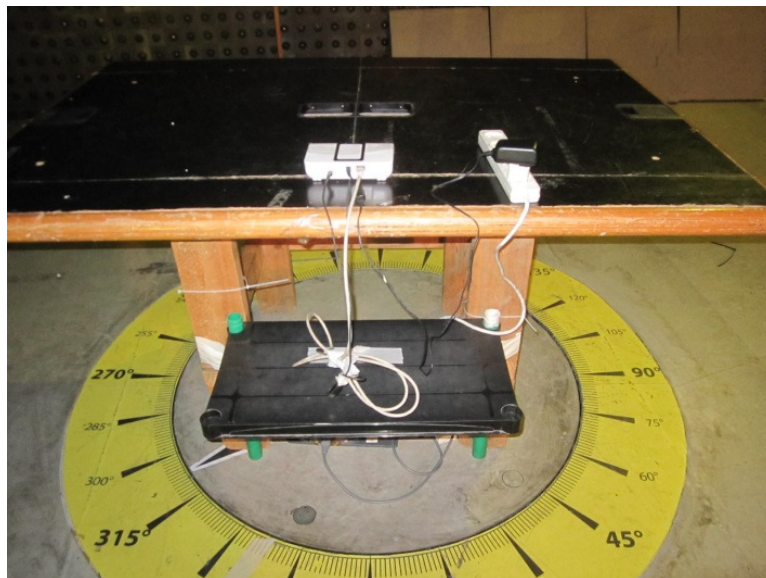
No changes were implemented in the EUT during the testing.

6.5 EUT test positions

Photograph 6.5.1 EUT in vertical position



Photograph 6.5.2 EUT in horizontal position





6.6 Transmitter characteristics

| Type of equipment | | | | | |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|---------|----------------------------------|--------------|
| X | Stand-alone (Equipment with or without its own control provisions) | | | | |
| | Combined equipment (Equipment where the radio part is fully integrated within another type of equipment) | | | | |
| | Plug-in card (Equipment intended for a variety of host systems) | | | | |
| Intended use | | Condition of use | | | |
| | fixed | Always at a distance more than 2 m from all people | | | |
| X | mobile | Always at a distance more than 20 cm from all people | | | |
| | portable | May operate at a distance closer than 20 cm to human body | | | |
| Assigned frequency ranges | | 2400 -2483.5 MHz | | | |
| Operating frequencies | | 2412-2462 MHz | | | |
| Maximum rated output power | | At transmitter 50 Ω RF output connector | | dBm | |
| | | Peak output power | | 23.8 dBm | |
| Is transmitter output power variable? | | X | No | | |
| | | | Yes | continuous variable | |
| | | | Yes | stepped variable with stepsize | dB |
| | | | Yes | minimum RF power | dBm |
| | Yes | maximum RF power | dBm | | |
| Antenna connection | | | | | |
| | unique coupling | standard connector | X | integral | |
| | | | | with temporary RF connector | |
| | | | | X without temporary RF connector | |
| Antenna/s technical characteristics | | | | | |
| Type | Manufacturer | Model number | | Gain | |
| Integral | Visonic | Printed | | 0 dBi | |
| Mode: | | 802.11b | 802.11g | 802.11n HT20 | 802.11n HT40 |
| Transmitter aggregate data rate/s, Mbps* | | 1 | 6 | 6.5 (MCS0) | 13.5(MCS0) |
| Type of modulation | | 802.11b:DSSS (DBPSK/DQPSK/CCK) | | | |
| | | 802.11g/n:OFDM (BPSK/QPSK/16QAM/64QAM) | | | |
| Transmitter power source | | | | | |
| | Battery | Nominal rated voltage | | Battery type | |
| | DC | Nominal rated voltage | | Lithium | |
| X | AC mains | Nominal rated voltage | 120 VAC | Frequency | |
| Common power source for transmitter and receiver | | | X | yes | no |

* Data rates associated with the highest power were chosen according to the test report Doc. No.FR3N2752-01C in the original application for Wi-Fi module under FCC ID: Z64-WL18SBMOD



| | | | |
|----------------------------|--------------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(a)(2) / RSS-247 section 5.2(1), 6 dB bandwidth | | |
| Test procedure: | ANSI C63.10 section 11.8.1 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

7 Transmitter tests according to 47CFR part 15 subpart C requirements

7.1 Minimum 6 dB bandwidth

7.1.1 General

This test was performed to measure 6 dB bandwidth of the EUT carrier frequency. Specification test limits are given in Table 7.1.1.

Table 7.1.1 The 6 dB bandwidth limits

| Assigned frequency, MHz | Modulation envelope reference points*, dBc | Minimum bandwidth, kHz |
|-------------------------|--------------------------------------------|------------------------|
| 902.0 – 928.0 | 6.0 | 500.0 |
| 2400.0 – 2483.5 | | |
| 5725.0 – 5850.0 | | |

* - Modulation envelope reference points provided in terms of attenuation below the peak of modulated carrier.

7.1.2 Test procedure

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and its proper operation was checked.

7.1.2.2 The EUT was set to transmit modulated carrier.

7.1.2.3 The transmitter minimum 6 dB bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.1.2 and associated plot.

Figure 7.1.1 The 6 dB bandwidth test setup





| | | | |
|----------------------------|-------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(a)(2) / RSS-247 section 5.2(1), 6 dB bandwidth | | |
| Test procedure: | ANSI C63.10 section 11.8.1 | | |
| Test mode: | Compliance | Verdict: PASS | |
| Date(s): | 28-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Table 7.1.2 The 6 dB bandwidth test results

ASSIGNED FREQUENCY BAND: 2400-2483.5 MHz
 DETECTOR USED: Peak
 SWEEP TIME: Auto
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 300 kHz
 MODULATION ENVELOPE REFERENCE POINTS: 6.0 dBc
 MODULATING SIGNAL: PRBS
 MODE: 802.11b

| Carrier frequency, MHz | 6 dB bandwidth, kHz | Limit, kHz | Margin, kHz | Verdict |
|------------------------|---------------------|------------|-------------|---------|
| Low frequency | | | | |
| 2412.99 | 9107 | 500 | -8607.0 | Pass |
| Mid frequency | | | | |
| 2437.0 | 9554 | 500 | -9054.0 | Pass |
| High frequency | | | | |
| 2462 | 9054 | 500 | -8554.0 | Pass |

MODE: 802.11g

| Carrier frequency, MHz | 6 dB bandwidth, kHz | Limit, kHz | Margin, kHz | Verdict |
|------------------------|---------------------|------------|-------------|---------|
| Low frequency | | | | |
| 2412 | 15064 | 500 | -14564 | Pass |
| Mid frequency | | | | |
| 2437 | 15111 | 500 | -14611 | Pass |
| High frequency | | | | |
| 2462 | 15335 | 500 | -14835 | Pass |

MODE: 802.11n HT20

| Carrier frequency, MHz | 6 dB bandwidth, kHz | Limit, kHz | Margin, kHz | Verdict |
|------------------------|---------------------|------------|-------------|---------|
| Low frequency | | | | |
| 2412 | 15450 | 500 | -14835 | Pass |
| Mid frequency | | | | |
| 2437 | 15491 | 500 | -14991 | Pass |
| High frequency | | | | |
| 2462 | 15872 | 500 | -15372 | Pass |

MODE: 802.11n HT40

| Carrier frequency, MHz | 6 dB bandwidth, kHz | Limit, kHz | Margin, kHz | Verdict |
|------------------------|---------------------|------------|-------------|---------|
| Low frequency | | | | |
| 2422 | 28831 | 500 | -28331 | Pass |
| Mid frequency | | | | |
| 2437 | 35708 | 500 | -35208 | Pass |
| High frequency | | | | |
| 2452 | 28759 | 500 | -28259 | Pass |

Reference numbers of test equipment used

| | | | | | | | |
|---------|--|--|--|--|--|--|--|
| HL 3818 | | | | | | | |
|---------|--|--|--|--|--|--|--|

Full description is given in Appendix A.

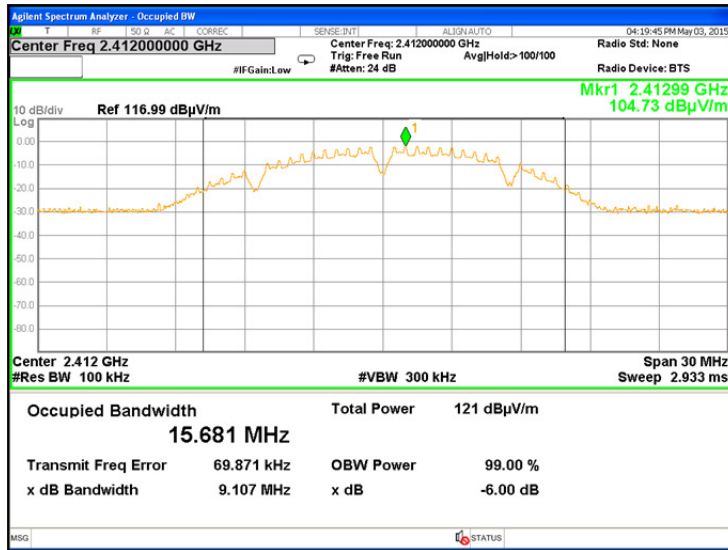


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| | |
|----------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(a)(2) / RSS-247 section 5.2(1), 6 dB bandwidth | |
| Test procedure: ANSI C63.10 section 11.8.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 28-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| Power Supply: 120 VAC | |
| Remarks: | |

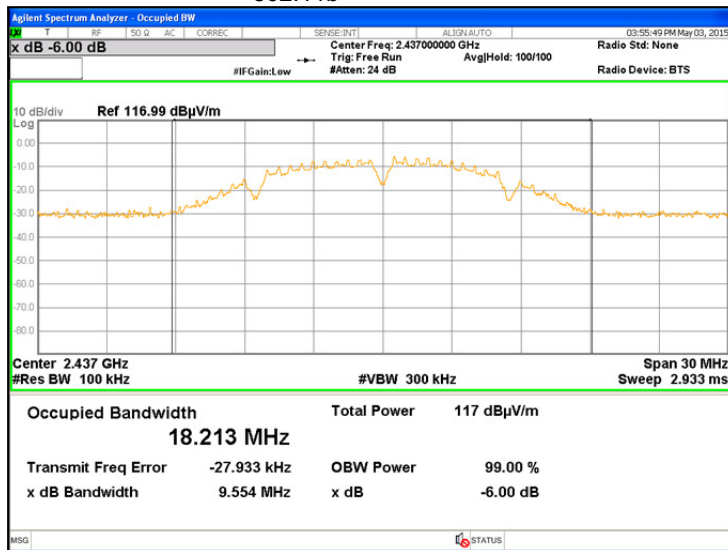
Plot 7.1.1 The 6 dB bandwidth test result at low frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODE: 802.11b



Plot 7.1.2 The 6 dB bandwidth test result at mid frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODE: 802.11b



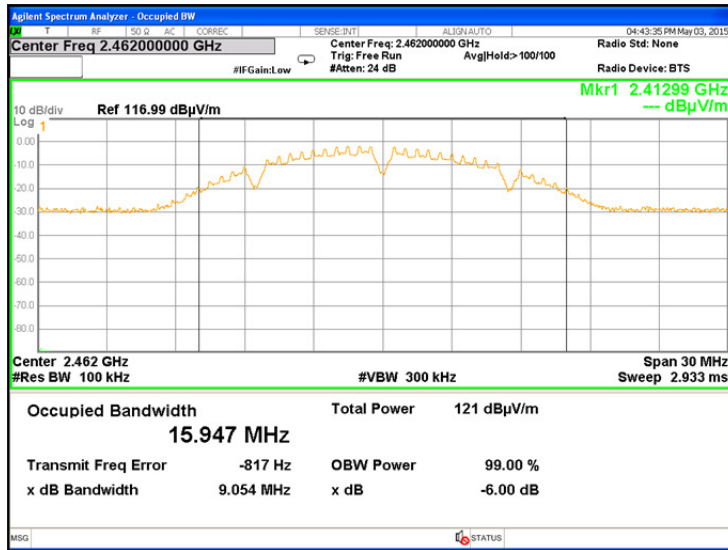


HERMON LABORATORIES

| | |
|----------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(a)(2) / RSS-247 section 5.2(1), 6 dB bandwidth | |
| Test procedure: ANSI C63.10 section 11.8.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 28-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| Power Supply: 120 VAC | |
| Remarks: | |

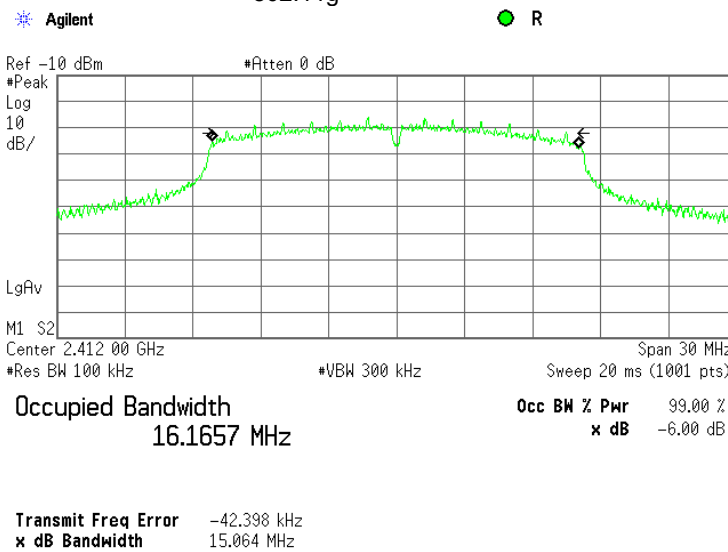
Plot 7.1.3 The 6 dB bandwidth test result at high frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODE: 802.11b



Plot 7.1.4 The 6 dB bandwidth test result at low frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODE: 802.11g





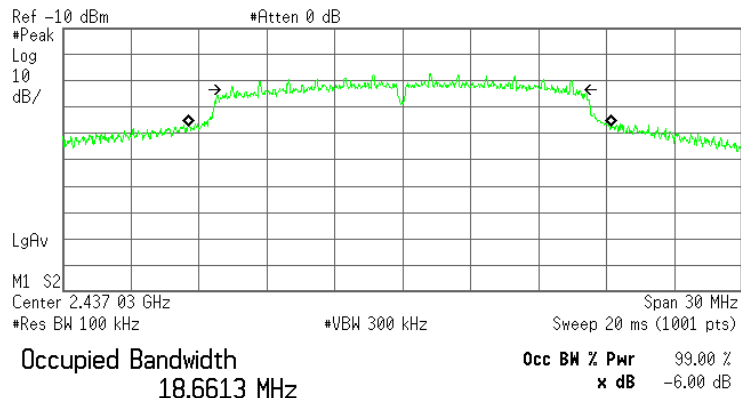
HERMON LABORATORIES

| | | | |
|----------------------------|--|--------------------------------------------------------------------------|--|
| Test specification: | | FCC section 15.247(a)(2) / RSS-247 section 5.2(1), 6 dB bandwidth | |
| Test procedure: | | ANSI C63.10 section 11.8.1 | |
| Test mode: | | Compliance | |
| Date(s): | | 28-Jun-15 | |
| Temperature: 25 °C | | Air Pressure: 1010 hPa | |
| | | Relative Humidity: 50 % | |
| | | Power Supply: 120 VAC | |
| Remarks: | | | |
| | | Verdict: PASS | |

Plot 7.1.5 The 6 dB bandwidth test result at mid frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODE: 802.11g

Agilent R

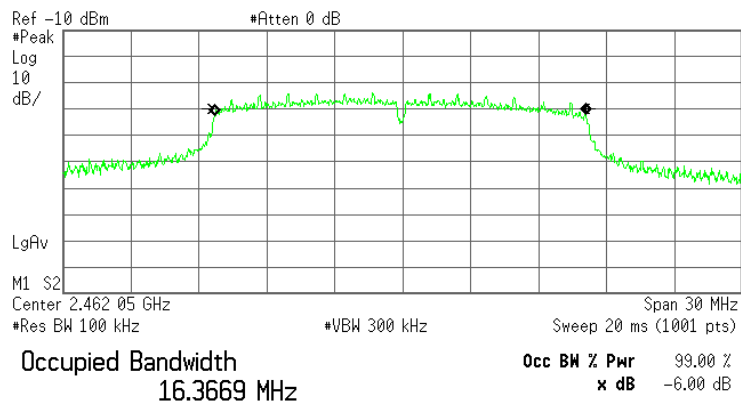


Transmit Freq Error -106.578 kHz
x dB Bandwidth 15.111 MHz

Plot 7.1.6 The 6 dB bandwidth test result at high frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODE: 802.11g

Agilent R



Transmit Freq Error -126.450 kHz
x dB Bandwidth 15.335 MHz

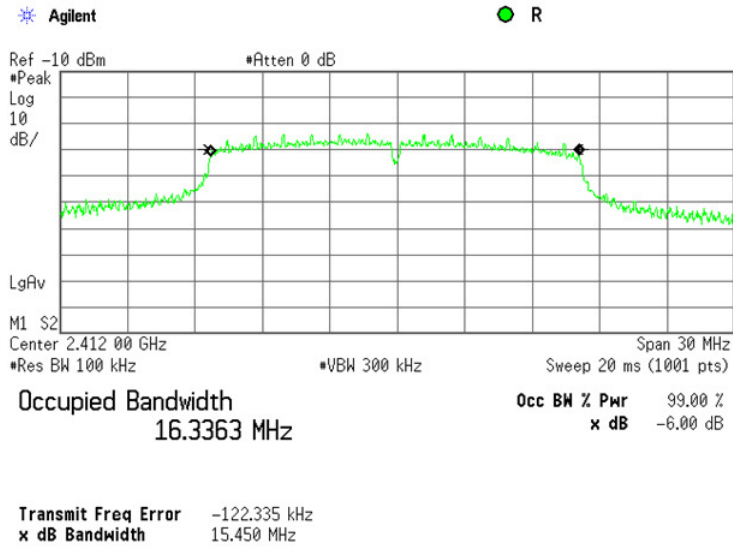


HERMON LABORATORIES

| | | | |
|--------------------------------|--|--------------------------------------------------------------------------|--|
| Test specification: | | FCC section 15.247(a)(2) / RSS-247 section 5.2(1), 6 dB bandwidth | |
| Test procedure: | | ANSI C63.10 section 11.8.1 | |
| Test mode: | | Compliance | |
| Date(s): | | 28-Jun-15 | |
| Temperature: 25 °C | | Air Pressure: 1010 hPa | |
| Relative Humidity: 50 % | | Power Supply: 120 VAC | |
| Remarks: | | | |
| | | Verdict: PASS | |

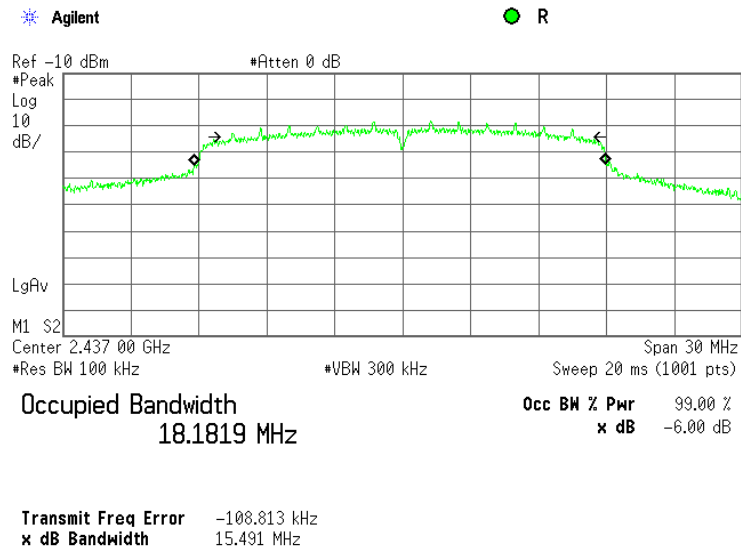
Plot 7.1.7 The 6 dB bandwidth test result at low frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODE: 802.11n HT20



Plot 7.1.8 The 6 dB bandwidth test result at mid frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODE: 802.11n HT20





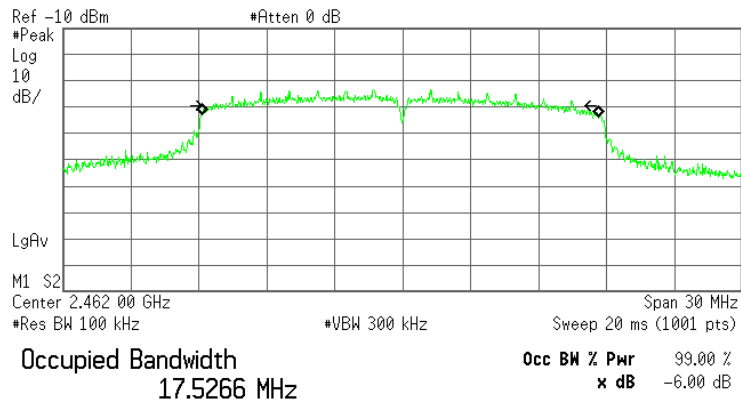
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| | | | |
|--------------------------------|--|--------------------------------------------------------------------------|--|
| Test specification: | | FCC section 15.247(a)(2) / RSS-247 section 5.2(1), 6 dB bandwidth | |
| Test procedure: | | ANSI C63.10 section 11.8.1 | |
| Test mode: | | Compliance | |
| Date(s): | | 28-Jun-15 | |
| Temperature: 25 °C | | Air Pressure: 1010 hPa | |
| Relative Humidity: 50 % | | Power Supply: 120 VAC | |
| Remarks: | | | |

Plot 7.1.9 The 6 dB bandwidth test result at high frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODE: 802.11n HT20

Agilent R

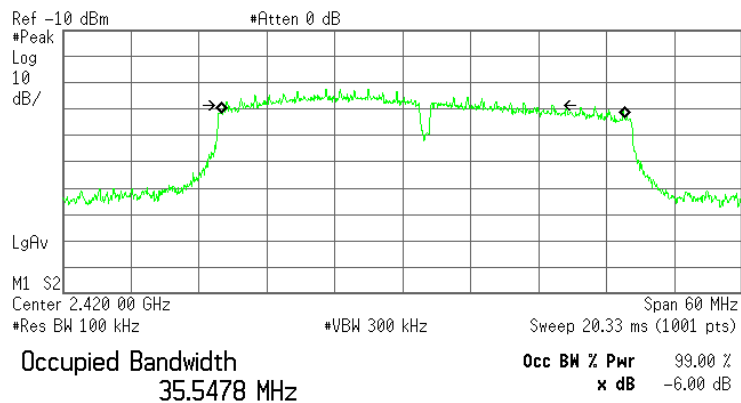


Transmit Freq Error -83.672 kHz
x dB Bandwidth 15.872 MHz

Plot 7.1.10 The 6 dB bandwidth test result at low frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODE: 802.11n HT40

Agilent R



Transmit Freq Error 1.827 MHz
x dB Bandwidth 28.830 MHz



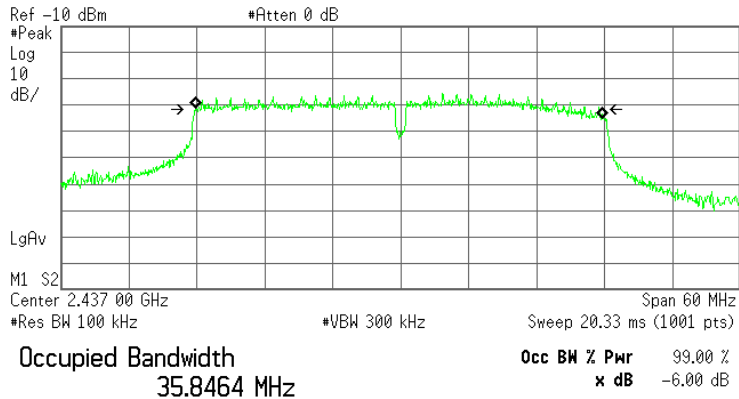
HERMON LABORATORIES

| | | | |
|----------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(a)(2) / RSS-247 section 5.2(1), 6 dB bandwidth | | | |
| Test procedure: ANSI C63.10 section 11.8.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 28-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.1.11 The 6 dB bandwidth test result at mid frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODE: 802.11n HT40

Agilent R

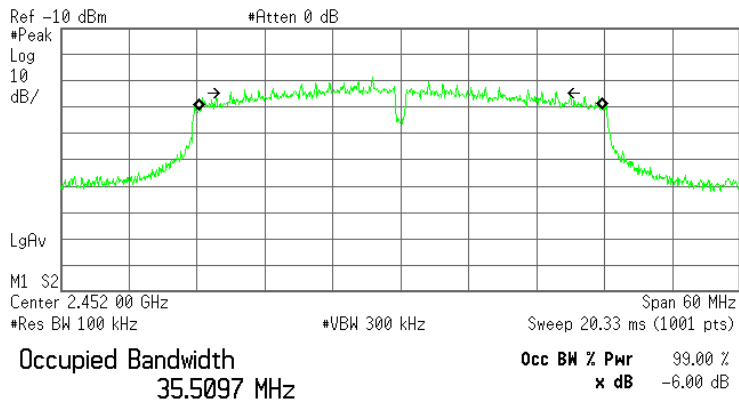


Transmit Freq Error -188.232 kHz
x dB Bandwidth 35.708 MHz

Plot 7.1.12 The 6 dB bandwidth test result at high frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODE: 802.11n HT40

Agilent R



Transmit Freq Error 24.174 kHz
x dB Bandwidth 28.759 MHz



| | | | |
|----------------------------|---------------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(b)3 / RSS-247 section 5.4(4), Peak output power | | |
| Test procedure: | ANSI C63.10 section 11.9.1.2 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 29-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1008 hPa | Relative Humidity: 45 % | Power Supply: 120 VAC |
| Remarks: | | | |

7.2 Peak output power

7.2.1 General

This test was performed to measure the maximum peak output power radiated by transmitter. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Peak output power limits

| Assigned frequency range, MHz | Maximum antenna gain, dBi | Peak output power* | | Equivalent field strength limit @ 3m, dB(μV/m)** |
|-------------------------------|---------------------------|--------------------|------|--------------------------------------------------|
| | | W | dBm | |
| 902.0 – 928.0 | 6.0 | 1.0 | 30.0 | 131.2 |
| 2400.0 – 2483.5 | | | | |
| 5725.0 – 5850.0 | | | | |

*- The limit is provided in terms of conducted RF power at the antenna connector. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power limit shall be reduced below the stated value as follows:

- by 1 dB for every 3 dB that the directional gain of antenna exceeds 6 dBi for fixed point-to-point transmitters operate in 2400-2483.5 MHz band;
- without any corresponding reduction for fixed point-to-point transmitters operate in 5725-5850 MHz band;
- by the amount in dB that the directional gain of antenna exceeds 6 dBi for the rest of transmitters.

**- Equivalent field strength limit was calculated from the peak output power as follows: $E = \sqrt{(30 \times P \times G)/r}$, where P is peak output power in Watts, r is antenna to EUT distance in meters and G is transmitter antenna gain in dBi.

7.2.2 Test procedure

7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.

7.2.2.2 The EUT was adjusted to produce maximum available to end user RF output power.

7.2.2.3 The resolution bandwidth of spectrum analyzer was set wider than 6 dB bandwidth of the EUT and the field strength of the EUT carrier frequency was measured with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360° and the measuring antenna height was swept in both vertical and horizontal polarizations.

7.2.2.4 The maximum field strength of the EUT carrier frequency was measured as provided in Table 7.2.2 and associated plots.

7.2.2.5 The maximum peak output power was calculated from the field strength of carrier as follows:

$$P = (E \times d)^2 / (30 \times G),$$

where P is the peak output power in W, E is the field strength in V/m, d is the test distance and G is the transmitter numeric antenna gain over an isotropic radiator.

The above equation was converted in logarithmic units for 3 m test distance:

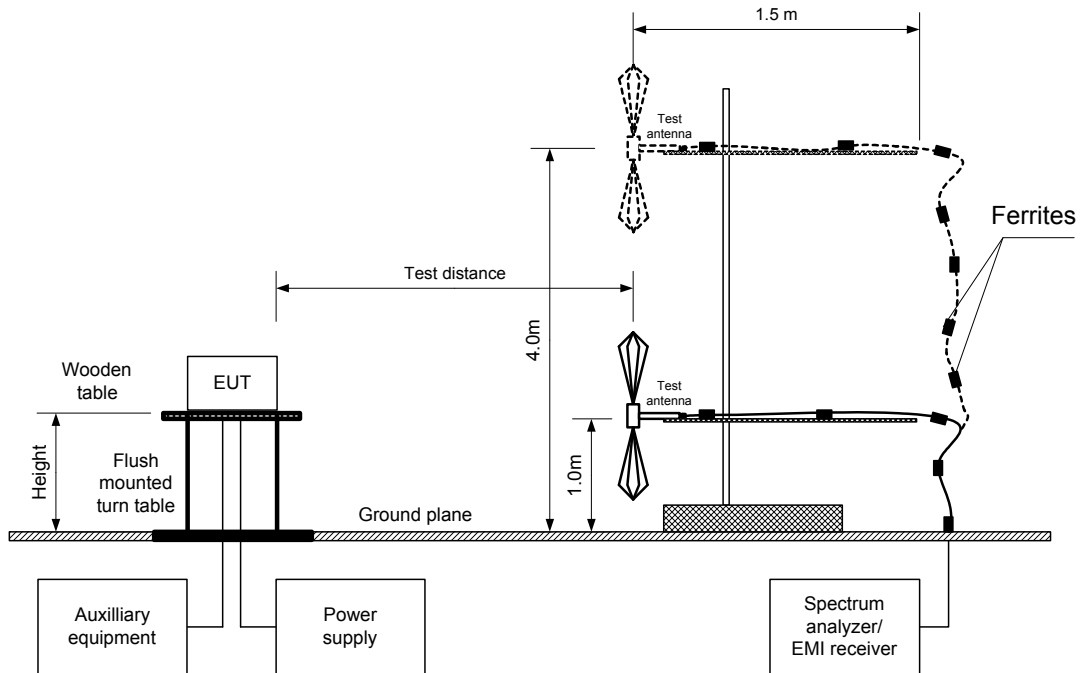
$$\text{Peak output power in dBm} = \text{Field strength in dB}(\mu\text{V/m}) - \text{Transmitter antenna gain in dBi} - 95.2 \text{ dB}$$

7.2.2.6 The worst test results (the lowest margins) were recorded in Table 7.2.2.



| | | | |
|----------------------------|---------------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(b)3 / RSS-247 section 5.4(4), Peak output power | | |
| Test procedure: | ANSI C63.10 section 11.9.1.2 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 29-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1008 hPa | Relative Humidity: 45 % | Power Supply: 120 VAC |
| Remarks: | | | |

Figure 7.2.1 Setup for carrier field strength measurements





| | | | |
|----------------------------|---------------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(b)3 / RSS-247 section 5.4(4), Peak output power | | |
| Test procedure: | ANSI C63.10 section 11.9.1.2 | | |
| Test mode: | Compliance | Verdict: PASS | |
| Date(s): | 29-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1008 hPa | Relative Humidity: 45 % | Power Supply: 120 VAC |
| Remarks: | | | |

Table 7.2.2 Peak output power test results

ASSIGNED FREQUENCY BAND: 2400 – 2483.5 MHz
 TEST DISTANCE: 3 m
 TEST SITE: Semi anechoic chamber
 EUT HEIGHT: 0.8 m
 DETECTOR USED: Peak
 RBW: 1 MHz
 TEST ANTENNA TYPE: Double ridged guide (above 1000 MHz)
 EUT ANTENNA GAIN: 0 dBi

MODE: 802.11b

| Frequency, MHz | Field strength, dB(µV/m) | Peak output power, dBm** | OBW, MHz | Antenna polariz | Antenna height, m | Azimuth, degrees* | Total output power over Tx OBW, dBm | Limit, dBm | Margin, dB*** | Verdict |
|----------------|--------------------------|--------------------------|----------|-----------------|-------------------|-------------------|-------------------------------------|------------|---------------|---------|
| 2411.00 | 104.14 | 8.90 | 9.107 | Hor | 2.1 | 185 | 18.50 | 30.0 | -11.50 | Pass |
| 2437.88 | 104.76 | 9.60 | 9.554 | Hor | 3.0 | 275 | 19.33 | 30.0 | -10.67 | |
| 2462.88 | 105.27 | 10.1 | 9.054 | Hor | 2.4 | 180 | 19.61 | 30.0 | -10.39 | |

MODE: 802.11g

| Frequency, MHz | Field strength, dB(µV/m) | Peak output power, dBm** | OBW, MHz | Antenna polariz | Antenna height, m | Azimuth, degrees* | Total output power over Tx OBW, dBm | Limit, dBm | Margin, dB*** | Verdict |
|----------------|--------------------------|--------------------------|----------|-----------------|-------------------|-------------------|-------------------------------------|------------|---------------|---------|
| 2413.38 | 104.88 | 9.7 | 15.064 | Hor | 2.8 | 182 | 21.43 | 30.0 | -8.57 | Pass |
| 2439.88 | 104.39 | 9.2 | 15.111 | Hor | 3.3 | 277 | 20.95 | 30.0 | -9.05 | |
| 2461.00 | 104.25 | 9.1 | 15.335 | Hor | 3.2 | 300 | 20.88 | 30.0 | -9.12 | |

MODE: 802.11n HT20

| Frequency, MHz | Field strength, dB(µV/m) | Peak output power, dBm** | OBW, MHz | Antenna polariz | Antenna height, m | Azimuth, degrees* | Total output power over Tx OBW, dBm | Limit, dBm | Margin, dB*** | Verdict |
|----------------|--------------------------|--------------------------|----------|-----------------|-------------------|-------------------|-------------------------------------|------------|---------------|---------|
| 2410.75 | 107.15 | 12.0 | 15.450 | Hor | 2.6 | 330 | 23.81 | 30.0 | -6.19 | Pass |
| 2434.88 | 106.73 | 11.5 | 15.491 | Hor | 3.5 | 350 | 23.40 | 30.0 | -6.60 | |
| 2460.88 | 107.03 | 11.8 | 15.872 | Hor | 3.0 | 340 | 23.81 | 30.0 | -6.19 | |

MODE: 802.11n HT40

| Frequency, MHz | Field strength, dB(µV/m) | Peak output power, dBm** | OBW, MHz | Antenna polariz | Antenna height, m | Azimuth, degrees* | Total output power over Tx OBW, dBm | Limit, dBm | Margin, dB*** | Verdict |
|----------------|--------------------------|--------------------------|----------|-----------------|-------------------|-------------------|-------------------------------------|------------|---------------|---------|
| 2414.10 | 100.06 | 4.9 | 28.831 | Hor | 3.5 | 304 | 19.43 | 30.0 | -10.57 | Pass |
| 2431.30 | 98.94 | 3.7 | 35.708 | Hor | 3.0 | 350 | 19.24 | 30.0 | -10.76 | |
| 2454.40 | 101.57 | 6.4 | 28.759 | Hor | 2.8 | 350 | 20.93 | 30.0 | -9.07 | |

*- EUT front panel refer to 0 degrees position of turntable.

** - Peak output power (RBW=1MHz) was calculated from the field strength of carrier as follows: $P = (E \times d)^2 / (30 \times G)$, where P is the peak output power in W, E is the field strength in V/m, d is the test distance in meters and G is the transmitter numeric antenna gain over an isotropic radiator. The above equation was converted in logarithmic units for 3 m test distance: *Peak output power in dBm (RBW=1MHz) = Field strength in dB(µV/m) - Transmitter antenna gain in dBi - 95.2 dB*

*** - Margin = Total output power – specification limit.

Reference numbers of test equipment used

| | | | | | | | |
|---------|---------|---------|---------|---------|--|--|--|
| HL 0521 | HL 4114 | HL 4353 | HL 4575 | HL 4922 | | | |
|---------|---------|---------|---------|---------|--|--|--|

Full description is given in Appendix A.

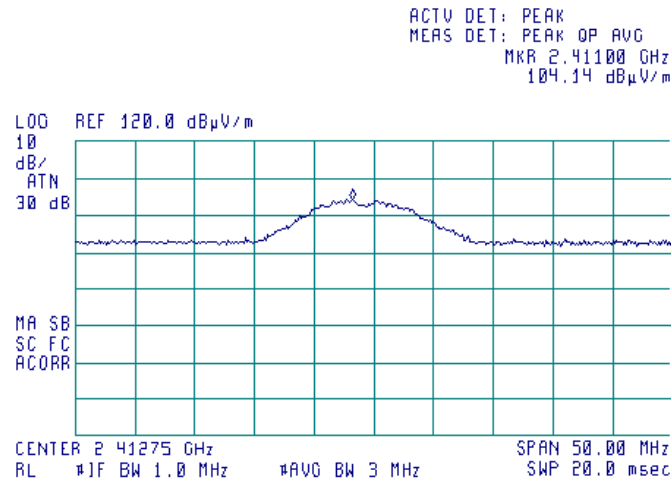


HERMON LABORATORIES

| | | | |
|--------------------------------|--|---------------------------------------------------------------------------|--|
| Test specification: | | FCC section 15.247(b)3 / RSS-247 section 5.4(4), Peak output power | |
| Test procedure: | | ANSI C63.10 section 11.9.1.2 | |
| Test mode: | | Compliance | |
| Date(s): | | 29-Jun-15 | |
| Temperature: 25 °C | | Air Pressure: 1008 hPa | |
| Relative Humidity: 45 % | | Power Supply: 120 VAC | |
| Remarks: | | | |

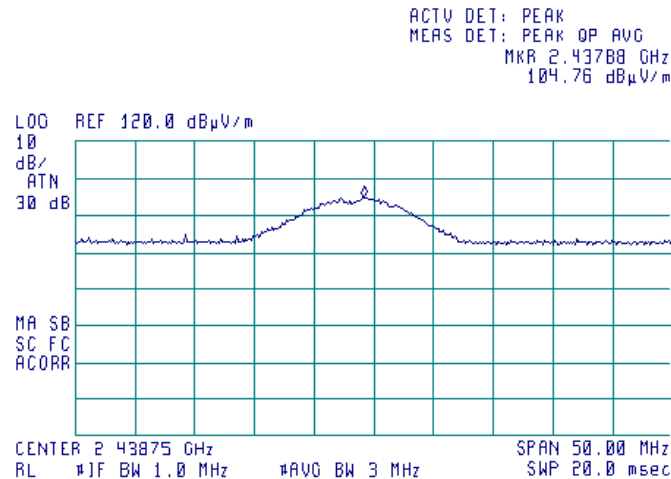
Plot 7.2.1 Field strength of carrier at low frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11b



Plot 7.2.2 Field strength of carrier at mid frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11b



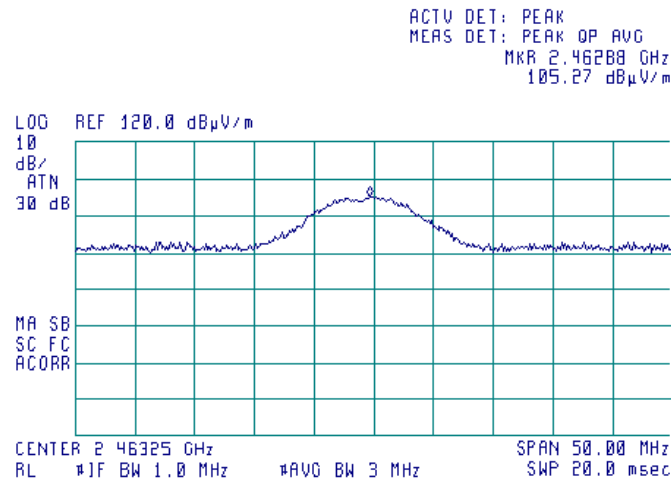


HERMON LABORATORIES

| | | | |
|--------------------------------|--|---------------------------------------------------------------------------|--|
| Test specification: | | FCC section 15.247(b)3 / RSS-247 section 5.4(4), Peak output power | |
| Test procedure: | | ANSI C63.10 section 11.9.1.2 | |
| Test mode: | | Compliance | |
| Date(s): | | 29-Jun-15 | |
| Temperature: 25 °C | | Air Pressure: 1008 hPa | |
| Relative Humidity: 45 % | | Power Supply: 120 VAC | |
| Remarks: | | | |

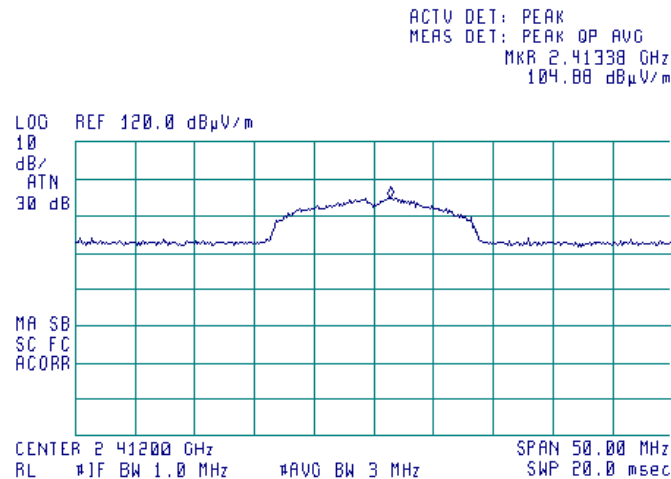
Plot 7.2.3 Field strength of carrier at high frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11b



Plot 7.2.4 Field strength of carrier at low frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11g



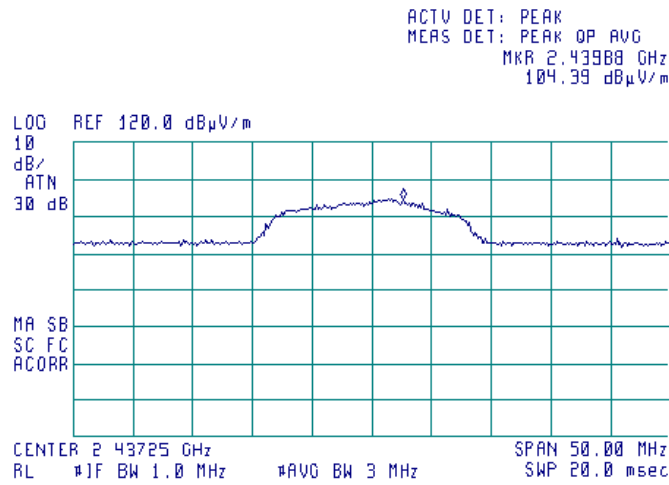


HERMON LABORATORIES

| | | | |
|--------------------------------|--|---------------------------------------------------------------------------|--|
| Test specification: | | FCC section 15.247(b)3 / RSS-247 section 5.4(4), Peak output power | |
| Test procedure: | | ANSI C63.10 section 11.9.1.2 | |
| Test mode: | | Compliance | |
| Date(s): | | 29-Jun-15 | |
| Temperature: 25 °C | | Air Pressure: 1008 hPa | |
| Relative Humidity: 45 % | | Power Supply: 120 VAC | |
| Remarks: | | | |

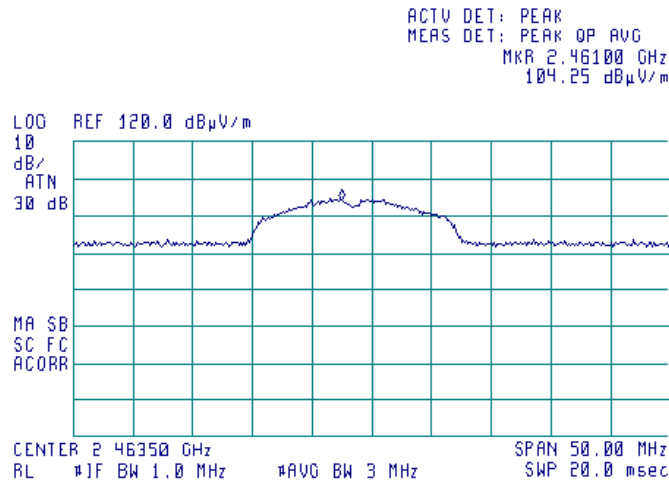
Plot 7.2.5 Field strength of carrier at mid frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11g



Plot 7.2.6 Field strength of carrier at high frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11g



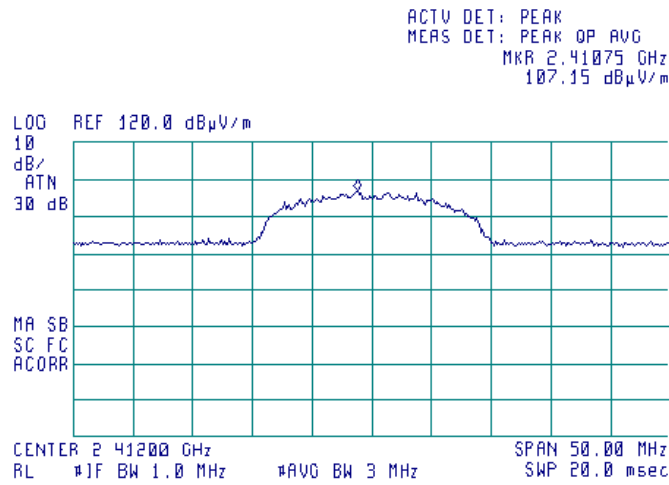


HERMON LABORATORIES

| | | | |
|--------------------------------|--|---------------------------------------------------------------------------|--|
| Test specification: | | FCC section 15.247(b)3 / RSS-247 section 5.4(4), Peak output power | |
| Test procedure: | | ANSI C63.10 section 11.9.1.2 | |
| Test mode: | | Compliance | |
| Date(s): | | 29-Jun-15 | |
| Temperature: 25 °C | | Air Pressure: 1008 hPa | |
| Relative Humidity: 45 % | | Power Supply: 120 VAC | |
| Remarks: | | | |

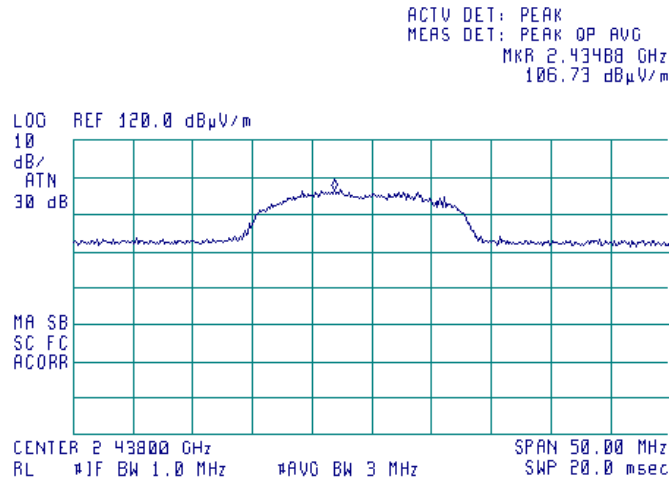
Plot 7.2.7 Field strength of carrier at low frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT20



Plot 7.2.8 Field strength of carrier at mid frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT20



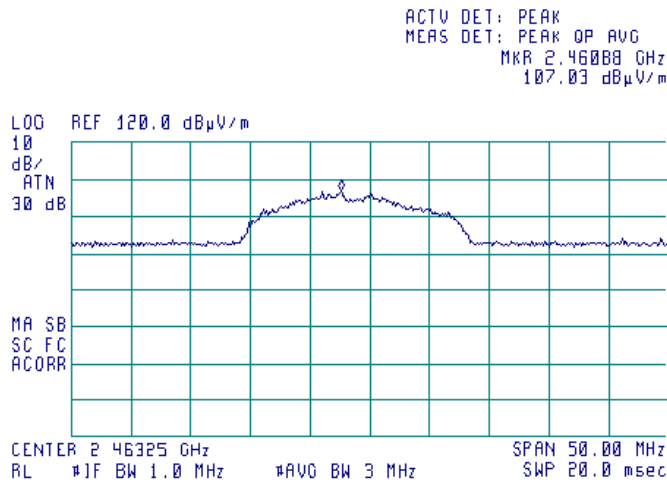


HERMON LABORATORIES

| | | | |
|-----------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(b)3 / RSS-247 section 5.4(4), Peak output power | | | |
| Test procedure: ANSI C63.10 section 11.9.1.2 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1008 hPa | Relative Humidity: 45 % | Power Supply: 120 VAC |
| Remarks: | | | |

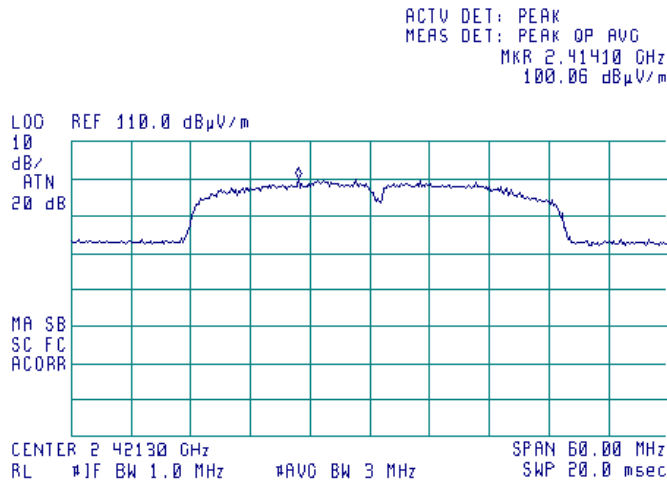
Plot 7.2.9 Field strength of carrier at high frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT20



Plot 7.2.10 Field strength of carrier at low frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT40



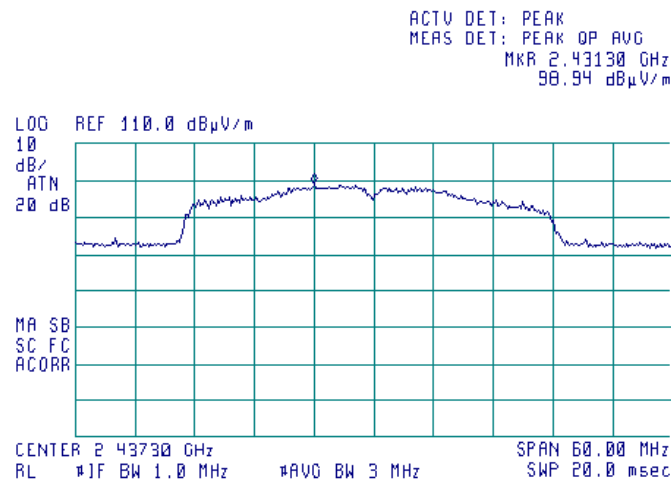


HERMON LABORATORIES

| | | | |
|-----------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(b)3 / RSS-247 section 5.4(4), Peak output power | | | |
| Test procedure: ANSI C63.10 section 11.9.1.2 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1008 hPa | Relative Humidity: 45 % | Power Supply: 120 VAC |
| Remarks: | | | |

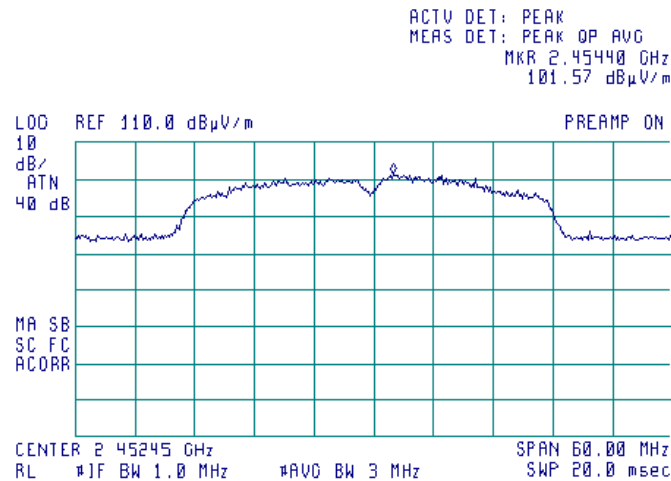
Plot 7.2.11 Field strength of carrier at mid frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT40



Plot 7.2.12 Field strength of carrier at high frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT40





| | | | |
|----------------------------|---------------------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | |
| Test procedure: | ANSI C63.10 section 11.12.1 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 29-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

7.3 Field strength of spurious emissions

7.3.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Radiated spurious emissions limits

| Frequency, MHz | Field strength at 3 m within restricted bands, dB(μV/m)* | | | Attenuation of field strength of spurious versus carrier outside restricted bands, dBc*** |
|----------------------------------|----------------------------------------------------------|-----------------|-----------------|-------------------------------------------------------------------------------------------|
| | Peak | Quasi Peak | Average | |
| 0.009 – 0.090 | 148.5 – 128.5 | NA | 128.5 – 108.5** | 20.0 |
| 0.090 – 0.110 | NA | 108.5 – 106.8** | NA | |
| 0.110 – 0.490 | 126.8 – 113.8 | NA | 106.8 – 93.8** | |
| 0.490 – 1.705 | NA | 73.8 – 63.0** | NA | |
| 1.705 – 30.0* | | 69.5 | | |
| 30 – 88 | | 40.0 | | |
| 88 – 216 | | 43.5 | | |
| 216 – 960 | | 46.0 | | |
| 960 - 1000 | | 54.0 | | |
| 1000 – 10 th harmonic | 74.0 | NA | 54.0 | |

*- The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows:

$$\text{Lim}_{S_2} = \text{Lim}_{S_1} + 40 \log (S_1/S_2),$$

where S₁ and S₂ – standard defined and test distance respectively in meters.

** - The limit decreases linearly with the logarithm of frequency.

*** - The field strength limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.

7.3.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band

7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and the performance check was conducted.

7.3.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360° and the measuring antenna was rotated around its vertical axis.

7.3.2.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.

7.3.3 Test procedure for spurious emission field strength measurements above 30 MHz

7.3.3.1 The EUT was set up as shown in Figure 7.3.2, energized and the performance check was conducted.

7.3.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

7.3.3.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.



| | | | |
|----------------------------|---------------------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | |
| Test procedure: | ANSI C63.10 section 11.12.1 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 29-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Figure 7.3.1 Setup for spurious emission field strength measurements below 30 MHz

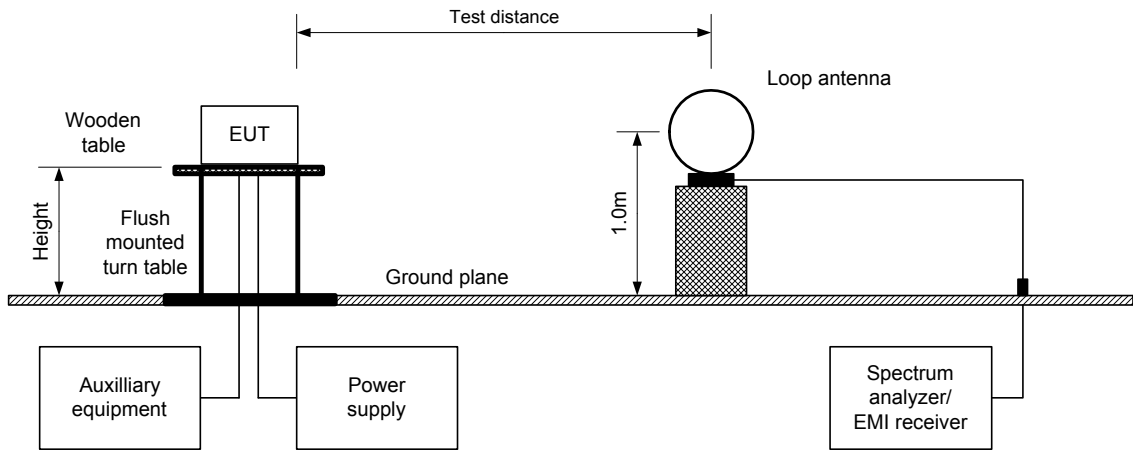
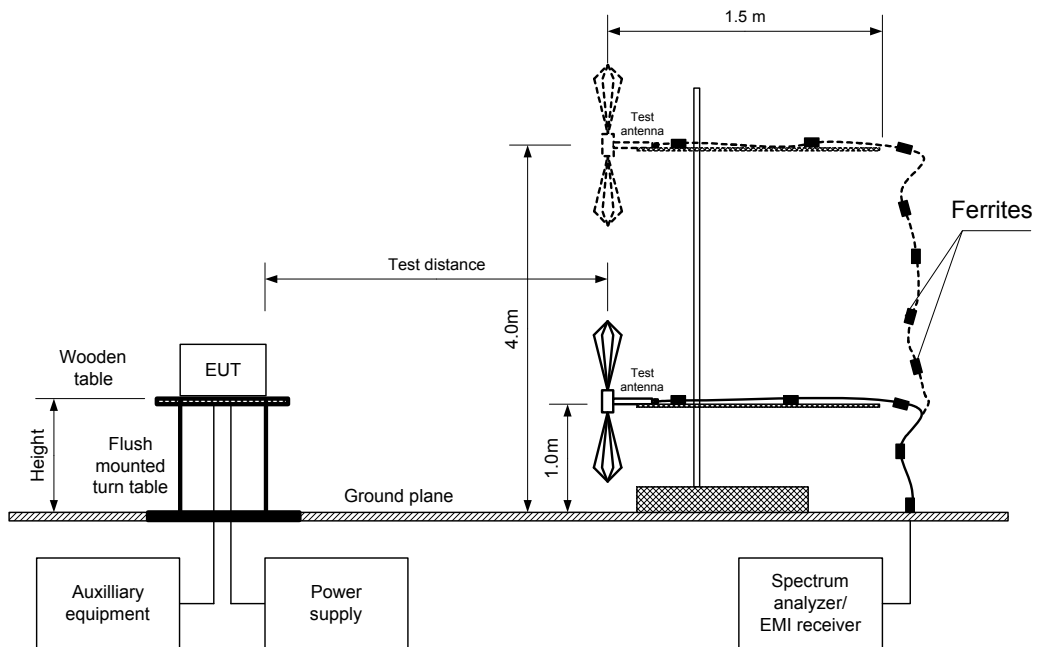


Figure 7.3.2 Setup for spurious emission field strength measurements above 30 MHz





| | | | |
|----------------------------|---------------------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | |
| Test procedure: | ANSI C63.10 section 11.12.1 | | |
| Test mode: | Compliance | Verdict: PASS | |
| Date(s): | 29-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Table 7.3.2 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY: 2400 – 2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 - 25000 MHz
 TEST DISTANCE: 3 m
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 300 kHz
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)
 Double ridged guide (above 1000 MHz)
 802.11b

| Frequency, MHz | Field strength of spurious, dB(μV/m) | Antenna polarization | Antenna height, m | Azimuth, degrees* | Field strength of carrier, dB(μV/m) | Attenuation below carrier, dBc | Limit, dBc | Margin, dB** | Verdict |
|-------------------------------|--------------------------------------|----------------------|-------------------|-------------------|-------------------------------------|--------------------------------|------------|--------------|---------|
| MODE: 802.11b | | | | | | | | | |
| Low carrier frequency | | | | | | | | | |
| | | | | | No emissions were found | | | | Pass |
| Mid carrier frequency | | | | | | | | | |
| | | | | | No emissions were found | | | | Pass |
| High carrier frequency | | | | | | | | | |
| | | | | | No emissions were found | | | | Pass |
| MODE: 802.11g | | | | | | | | | |
| Low carrier frequency | | | | | | | | | |
| | | | | | No emissions were found | | | | Pass |
| Mid carrier frequency | | | | | | | | | |
| | | | | | No emissions were found | | | | Pass |
| High carrier frequency | | | | | | | | | |
| | | | | | No emissions were found | | | | Pass |
| MODE: 802.11n HT20 | | | | | | | | | |
| Low carrier frequency | | | | | | | | | |
| | | | | | No emissions were found | | | | Pass |
| Mid carrier frequency | | | | | | | | | |
| | | | | | No emissions were found | | | | Pass |
| High carrier frequency | | | | | | | | | |
| | | | | | No emissions were found | | | | Pass |
| MODE: 802.11n HT40 | | | | | | | | | |
| Low carrier frequency | | | | | | | | | |
| | | | | | No emissions were found | | | | Pass |
| Mid carrier frequency | | | | | | | | | |
| | | | | | No emissions were found | | | | Pass |
| High carrier frequency | | | | | | | | | |
| | | | | | No emissions were found | | | | Pass |

*- EUT front panel refers to 0 degrees position of turntable.
 **- Margin = Attenuation below carrier – specification limit.



| | | | |
|----------------------------|---------------------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | |
| Test procedure: | ANSI C63.10 section 11.12.1 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 29-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Table 7.3.3 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY: 2400-2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 1000 – 25000 MHz
 TEST DISTANCE: 3 m
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 1000 kHz
 TEST ANTENNA TYPE: Double ridged guide

MODE: 802.11b

| Frequency, MHz | Antenna | | Azimuth, degrees* | Peak field strength(VBW=3 MHz) | | | Average field strength(VBW=10 Hz) | | | | Verdict |
|-------------------------------|--------------|-----------|-------------------|--------------------------------|-----------------|--------------|-----------------------------------|----------------------|-----------------|---------------|---------|
| | Polarization | Height, m | | Measured, dB(µV/m) | Limit, dB(µV/m) | Margin, dB** | Measured, dB(µV/m) | Calculated, dB(µV/m) | Limit, dB(µV/m) | Margin, dB*** | |
| MODE: 802.11b | | | | | | | | | | | |
| Low carrier frequency | | | | | | | | | | | |
| No emissions were found | | | | | | | | | | | Pass |
| Mid carrier frequency | | | | | | | | | | | |
| No emissions were found | | | | | | | | | | | Pass |
| High carrier frequency | | | | | | | | | | | |
| No emissions were found | | | | | | | | | | | Pass |
| MODE: 802.11g | | | | | | | | | | | |
| Low carrier frequency | | | | | | | | | | | |
| No emissions were found | | | | | | | | | | | Pass |
| Mid carrier frequency | | | | | | | | | | | |
| No emissions were found | | | | | | | | | | | Pass |
| High carrier frequency | | | | | | | | | | | |
| No emissions were found | | | | | | | | | | | Pass |
| MODE: 802.11n HT20 | | | | | | | | | | | |
| Low carrier frequency | | | | | | | | | | | |
| No emissions were found | | | | | | | | | | | Pass |
| Mid carrier frequency | | | | | | | | | | | |
| No emissions were found | | | | | | | | | | | Pass |
| High carrier frequency | | | | | | | | | | | |
| No emissions were found | | | | | | | | | | | Pass |
| MODE: 802.11n HT40 | | | | | | | | | | | |
| Low carrier frequency | | | | | | | | | | | |
| No emissions were found | | | | | | | | | | | Pass |
| Mid carrier frequency | | | | | | | | | | | |
| No emissions were found | | | | | | | | | | | Pass |
| High carrier frequency | | | | | | | | | | | |
| No emissions were found | | | | | | | | | | | Pass |

*- EUT front panel refers to 0 degrees position of turntable.
 **- Margin = Measured field strength - specification limit.
 ***- Margin = Calculated field strength - specification limit,
 where Calculated field strength = Measured field strength + average factor.



| | | | |
|----------------------------|---------------------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | |
| Test procedure: | ANSI C63.10 section 11.12.1 | | |
| Test mode: | Compliance | Verdict: PASS | |
| Date(s): | 29-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Table 7.3.4 Field strength of spurious emissions below 1 GHz within restricted bands

ASSIGNED FREQUENCY: 2400 – 2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 – 1000 MHz
 TEST DISTANCE: 3 m
 MODULATING SIGNAL: PRBS
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 RESOLUTION BANDWIDTH: 1.0 kHz (9 kHz – 150 kHz)
 9.0 kHz (150 kHz – 30 MHz)
 120 kHz (30 MHz – 1000 MHz)
 VIDEO BANDWIDTH: > Resolution bandwidth
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)
 MODE: 802.11b/g/n HT20/ n HT40

| Frequency, MHz | Peak emission, dB(µV/m) | Quasi-peak | | | Antenna polarization | Antenna height, m | Turn-table position**, degrees | Verdict |
|-------------------------|-------------------------|-----------------------------|-----------------|-------------|----------------------|-------------------|--------------------------------|---------|
| | | Measured emission, dB(µV/m) | Limit, dB(µV/m) | Margin, dB* | | | | |
| No emissions were found | | | | | | | | Pass |

*- Margin = Measured emission - specification limit.
 **- EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

| | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|
| HL 0446 | HL 0521 | HL 0604 | HL 0768 | HL 3818 | HL 3901 | HL 3903 | HL 4114 |
| HL 4224 | HL 4353 | HL 4722 | HL 4856 | HL 4932 | | | |

Full description is given in Appendix A.



HERMON LABORATORIES

| | | | |
|----------------------------|---------------------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | |
| Test procedure: | ANSI C63.10 section 11.12.1 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 29-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Table 7.3.5 Restricted bands according to FCC section 15.205

| MHz | MHz | MHz | MHz | MHz | GHz |
|-------------------|---------------------|-----------------------|-----------------|---------------|---------------|
| 0.09 - 0.11 | 8.37625 - 8.38675 | 73 - 74.6 | 399.9 - 410 | 2690 - 2900 | 10.6 - 12.7 |
| 0.495 - 0.505 | 8.41425 - 8.41475 | 74.8 - 75.2 | 608 - 614 | 3260 - 3267 | 13.25 - 13.4 |
| 2.1735 - 2.1905 | 12.29 - 12.293 | 108 - 121.94 | 960 - 1240 | 3332 - 3339 | 14.47 - 14.5 |
| 4.125 - 4.128 | 12.51975 - 12.52025 | 123 - 138 | 1300 - 1427 | 3345.8 - 3358 | 15.35 - 16.2 |
| 4.17725 - 4.17775 | 12.57675 - 12.57725 | 149.9 - 150.05 | 1435 - 1626.5 | 3600 - 4400 | 17.7 - 21.4 |
| 4.20725 - 4.20775 | 13.36 - 13.41 | 156.52475 - 156.52525 | 1645.5 - 1646.5 | 4500 - 5150 | 22.01 - 23.12 |
| 6.215 - 6.218 | 16.42 - 16.423 | 156.7 - 156.9 | 1660 - 1710 | 5350 - 5460 | 23.6 - 24 |
| 6.26775 - 6.26825 | 16.69475 - 16.69525 | 162.0125 - 167.17 | 1718.8 - 1722.2 | 7250 - 7750 | 31.2 - 31.8 |
| 6.31175 - 6.31225 | 16.80425 - 16.80475 | 167.72 - 173.2 | 2200 - 2300 | 8025 - 8500 | 36.43 - 36.5 |
| 8.291 - 8.294 | 25.5 - 25.67 | 240 - 285 | 2310 - 2390 | 9000 - 9200 | Above 38.6 |
| 8.362 - 8.366 | 37.5 - 38.25 | 322 - 335.4 | 2483.5 - 2500 | 9300 - 9500 | |

Table 7.3.6 Restricted bands according to RSS-Gen

| MHz | MHz | MHz | MHz | MHz | GHz |
|-------------------|---------------------|-----------------------|-----------------|---------------|---------------|
| 0.09 - 0.11 | 8.291 - 8.294 | 16.80425 - 16.80475 | 399.9 - 410 | 3260 - 3267 | 10.6 - 12.7 |
| 2.1735 - 2.1905 | 8.362 - 8.366 | 25.5 - 25.67 | 608 - 614 | 3332 - 3339 | 13.25 - 13.4 |
| 3.020 - 3.026 | 8.37625 - 8.38675 | 37.5 - 38.25 | 960 - 1427 | 3345.8 - 3358 | 14.47 - 14.5 |
| 4.125 - 4.128 | 8.41425 - 8.41475 | 73 - 74.6 | 1435 - 1626.5 | 3500 - 4400 | 15.35 - 16.2 |
| 4.17725 - 4.17775 | 12.29 - 12.293 | 74.8 - 75.2 | 1645.5 - 1646.5 | 4500 - 5150 | 17.7 - 21.4 |
| 4.20725 - 4.20775 | 12.51975 - 12.52025 | 108 - 138 | 1660 - 1710 | 5350 - 5460 | 22.01 - 23.12 |
| 5.677 - 5.683 | 12.57675 - 12.57725 | 156.52475 - 156.52525 | 1718.8 - 1722.2 | 7250 - 7750 | 23.6 - 24 |
| 6.215 - 6.218 | 13.36 - 13.41 | 156.7 - 156.9 | 2200 - 2300 | 8025 - 8500 | 31.2 - 31.8 |
| 6.26775 - 6.26825 | 16.42 - 16.423 | 240 - 285 | 2310 - 2390 | 9000 - 9200 | 36.43 - 36.5 |
| 6.31175 - 6.31225 | 16.69475 - 16.69525 | 322 - 335.4 | 2655 - 2900 | 9300 - 9500 | Above 38.6 |

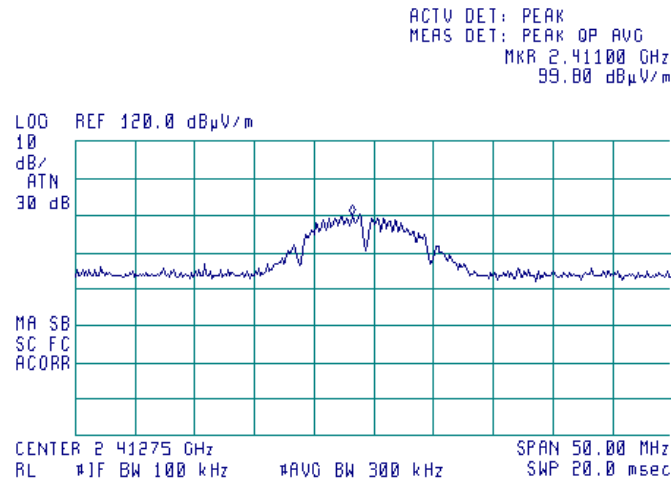


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| | | | |
|--------------------------------|--|---------------------------------------------------------------------------------|--|
| Test specification: | | FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: | | ANSI C63.10 section 11.12.1 | |
| Test mode: | | Compliance | |
| Date(s): | | 29-Jun-15 | |
| Temperature: 25 °C | | Air Pressure: 1010 hPa | |
| Relative Humidity: 50 % | | Power Supply: 120 VAC | |
| Remarks: | | | |

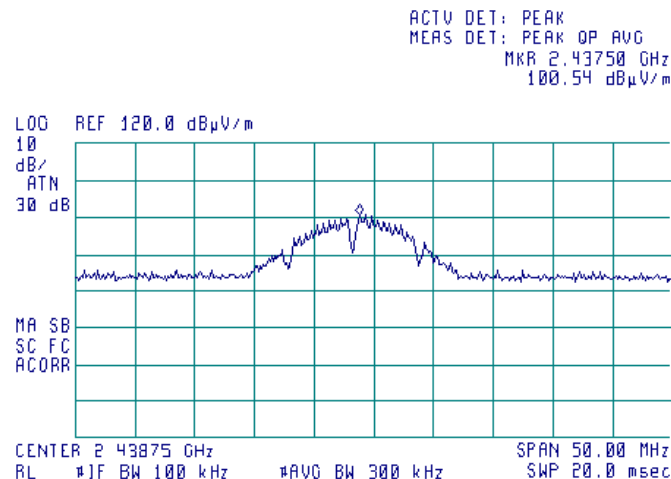
Plot 7.3.1 Radiated emission measurements at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11b



Plot 7.3.2 Radiated emission measurements at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11b



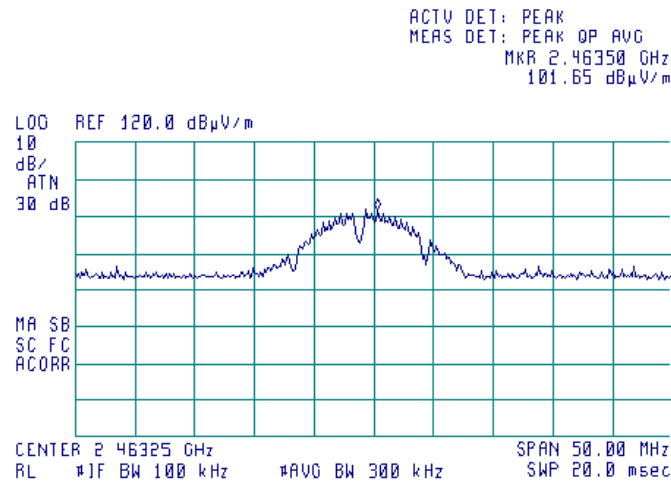


HERMON LABORATORIES

| | | | |
|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

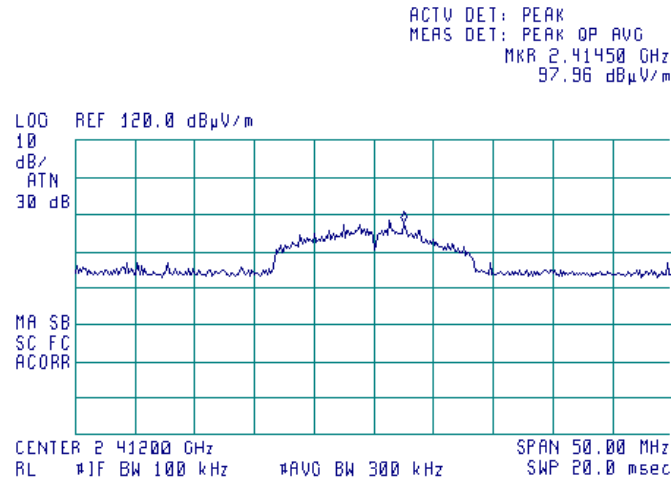
Plot 7.3.3 Radiated emission measurements at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11b



Plot 7.3.4 Radiated emission measurements at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11g



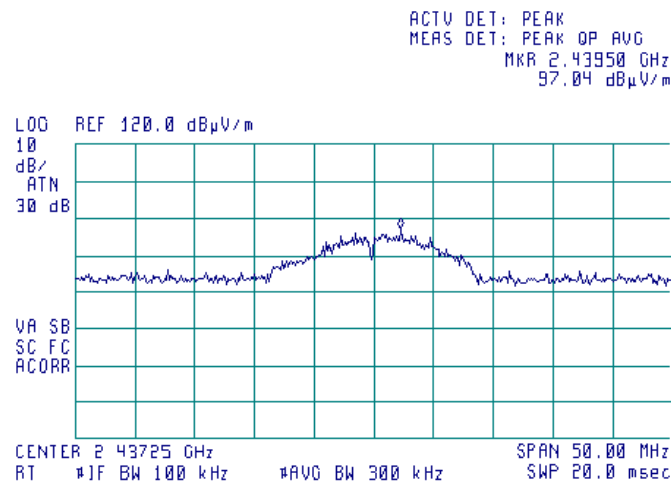


HERMON LABORATORIES

| | | | |
|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

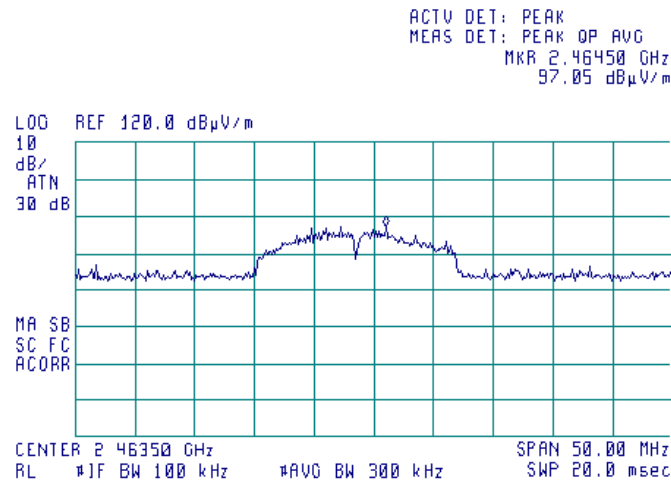
Plot 7.3.5 Radiated emission measurements at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11g



Plot 7.3.6 Radiated emission measurements at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11g



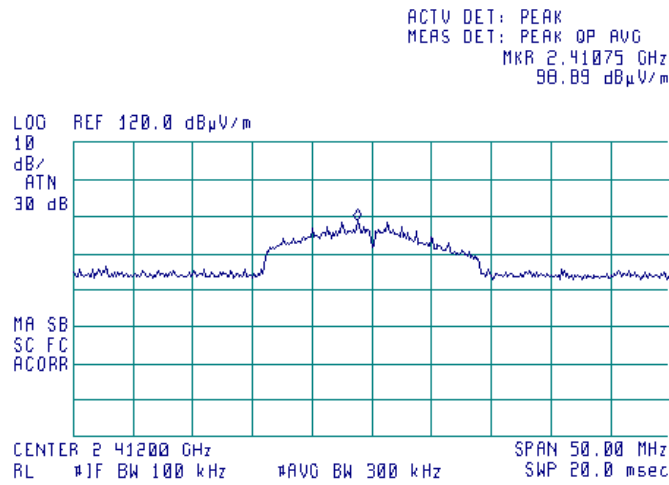


HERMON LABORATORIES

| | | | |
|--------------------------------|--|---------------------------------------------------------------------------------|--|
| Test specification: | | FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: | | ANSI C63.10 section 11.12.1 | |
| Test mode: | | Compliance | |
| Date(s): | | 29-Jun-15 | |
| Temperature: 25 °C | | Air Pressure: 1010 hPa | |
| Relative Humidity: 50 % | | Power Supply: 120 VAC | |
| Remarks: | | | |

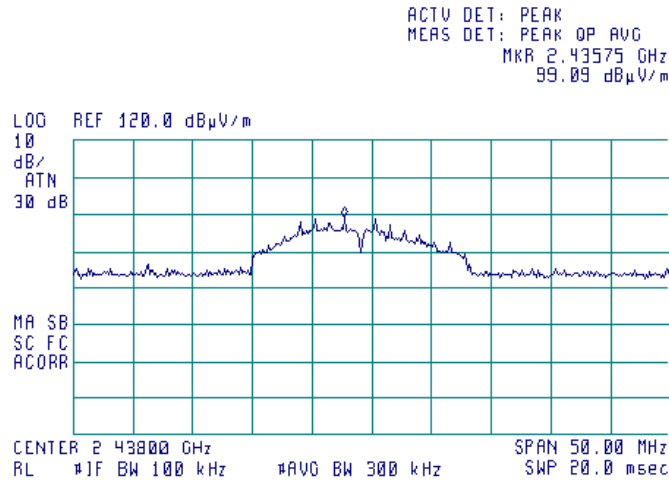
Plot 7.3.7 Radiated emission measurements at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT20



Plot 7.3.8 Radiated emission measurements at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT20



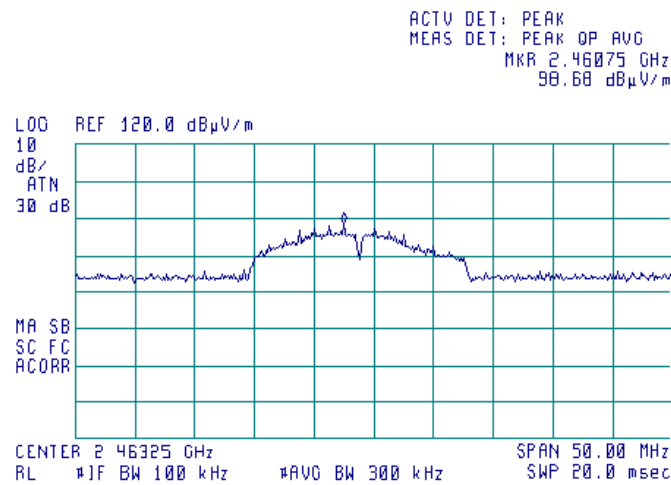


HERMON LABORATORIES

| | | | |
|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

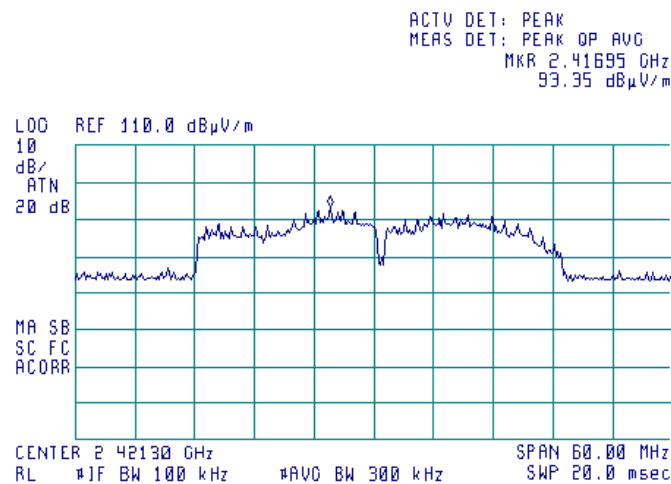
Plot 7.3.9 Radiated emission measurements at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT20



Plot 7.3.10 Radiated emission measurements at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT40



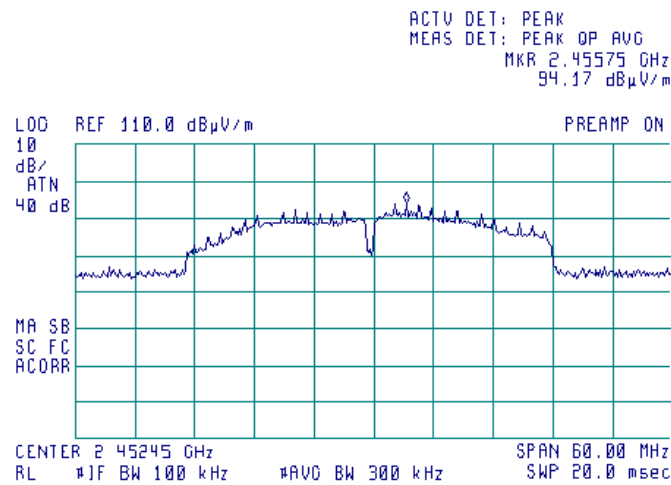


HERMON LABORATORIES

| | | | |
|--------------------------------|--|---------------------------------------------------------------------------------|--|
| Test specification: | | FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: | | ANSI C63.10 section 11.12.1 | |
| Test mode: | | Compliance | |
| Date(s): | | 29-Jun-15 | |
| Temperature: 25 °C | | Air Pressure: 1010 hPa | |
| Relative Humidity: 50 % | | Power Supply: 120 VAC | |
| Remarks: | | | |

Plot 7.3.11 Radiated emission measurements at the high carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT40



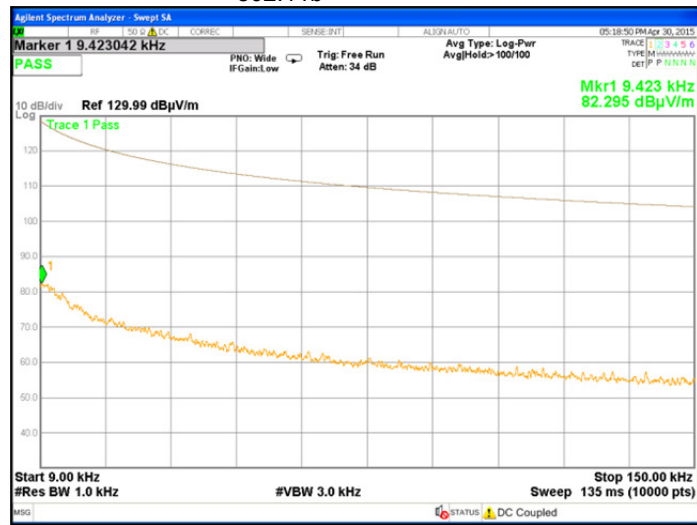


HERMON LABORATORIES

| | | | |
|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

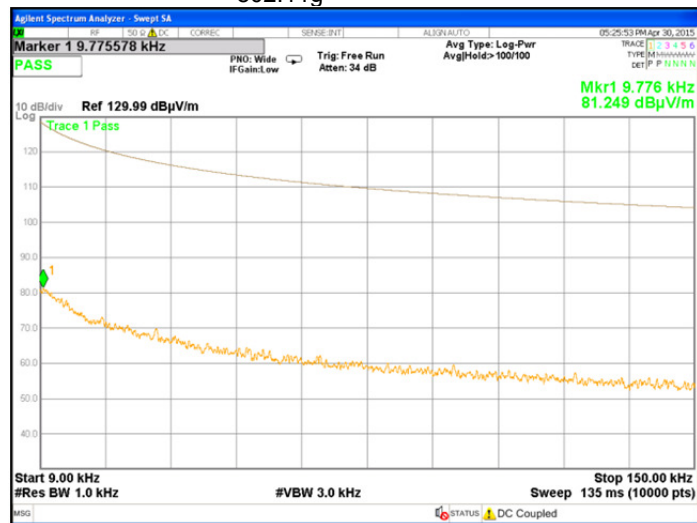
Plot 7.3.12 Radiated emission measurements from 9 to 150 kHz at the low, mid, high carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
MODE: 802.11b



Plot 7.3.13 Radiated emission measurements from 9 to 150 kHz at the low, mid, high carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
MODE: 802.11g



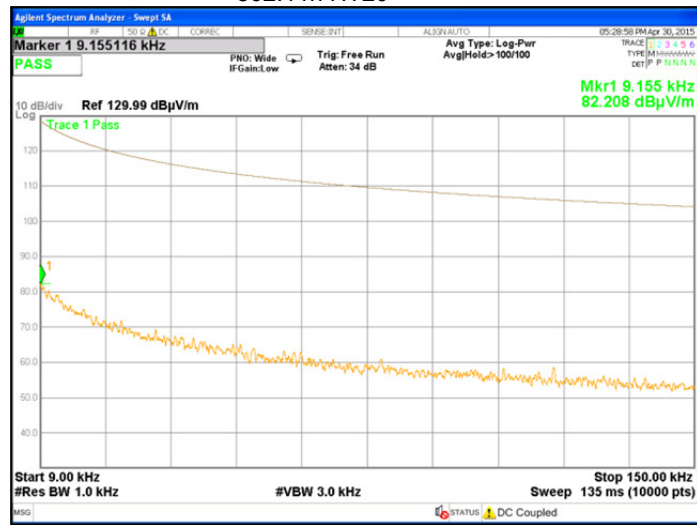


HERMON LABORATORIES

| | | | |
|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

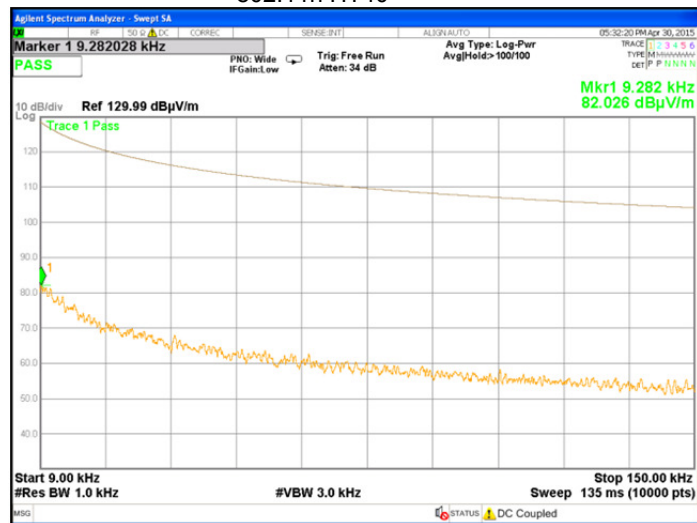
Plot 7.3.14 Radiated emission measurements from 9 to 150 kHz at the low, mid, high carrier frequency

TEST SITE: Anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical
 MODE: 802.11n HT20



Plot 7.3.15 Radiated emission measurements from 9 to 150 kHz at the low, mid, high carrier frequency

TEST SITE: Anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical
 MODE: 802.11n HT40



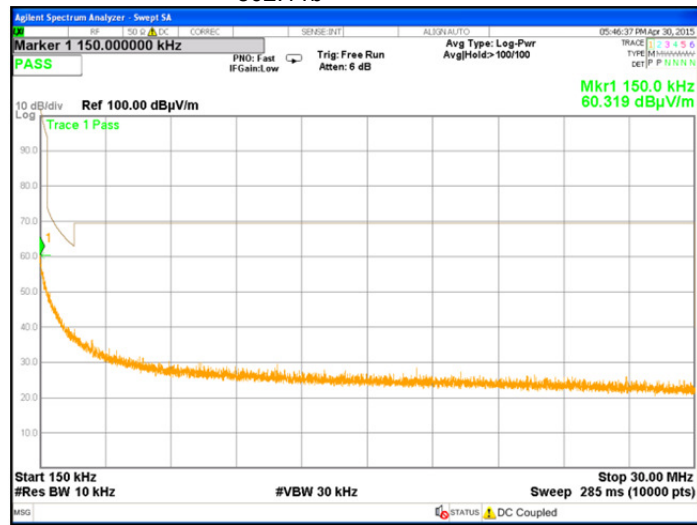


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

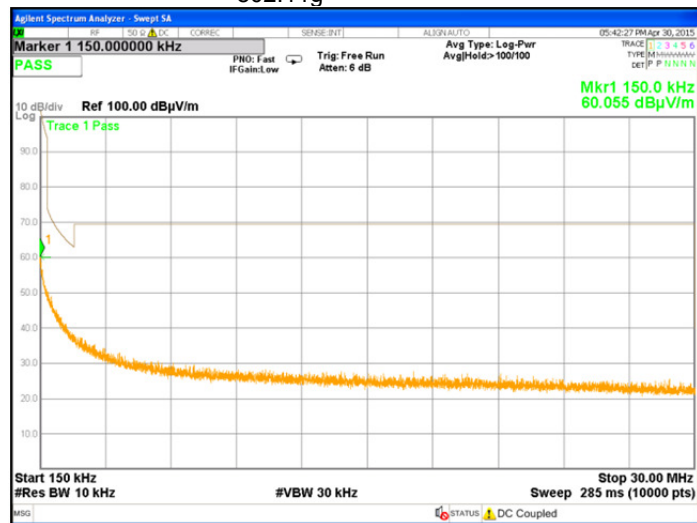
Plot 7.3.16 Radiated emission measurements from 0.15 to 30 MHz at the low, mid, high carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
MODE: 802.11b



Plot 7.3.17 Radiated emission measurements from 0.15 to 30 MHz at the low, mid, high carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
MODE: 802.11g



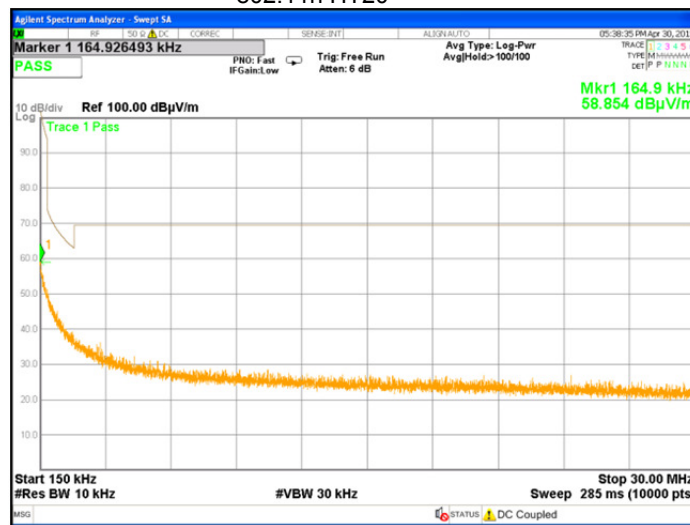


HERMON LABORATORIES

| | |
|-----------------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 29-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| Remarks: | Power Supply: 120 VAC |

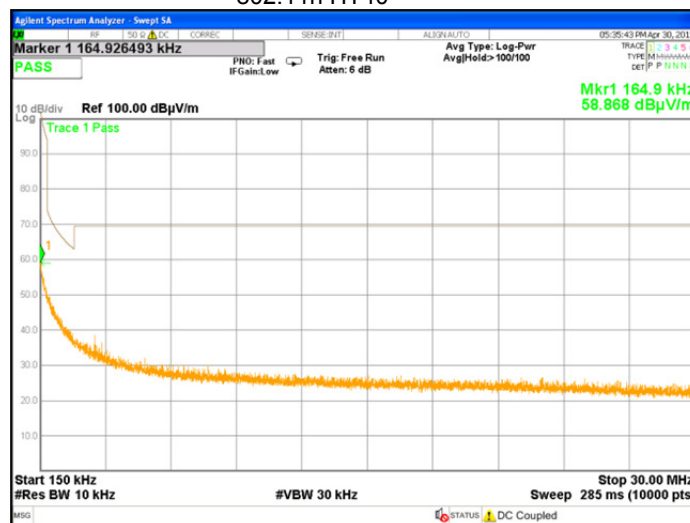
Plot 7.3.18 Radiated emission measurements from 0.15 to 30 MHz at the low, mid, high carrier frequency

TEST SITE: Anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical
 MODE: 802.11n HT20



Plot 7.3.19 Radiated emission measurements from 0.15 to 30 MHz at the low, mid, high carrier frequency

TEST SITE: Anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical
 MODE: 802.11n HT40



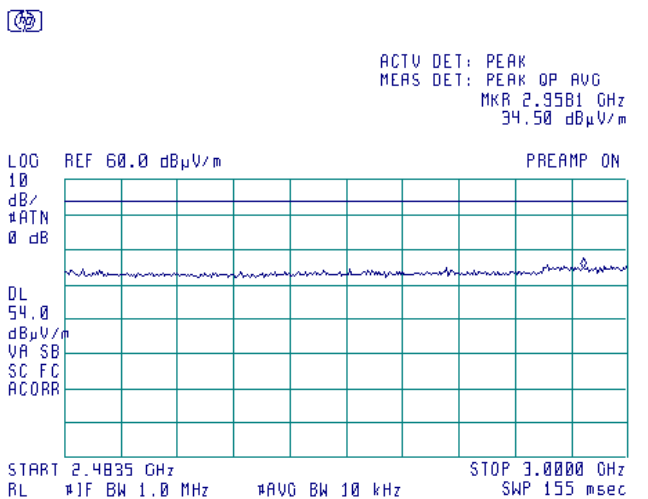
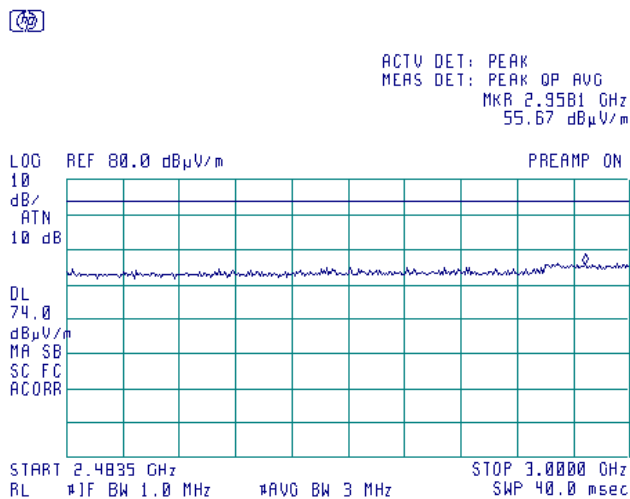
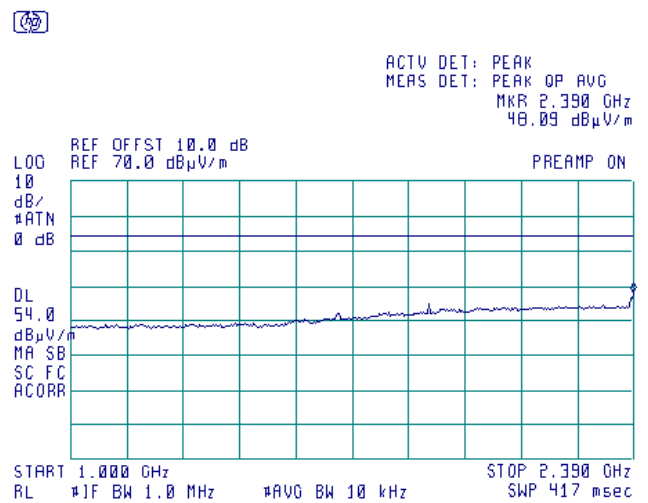
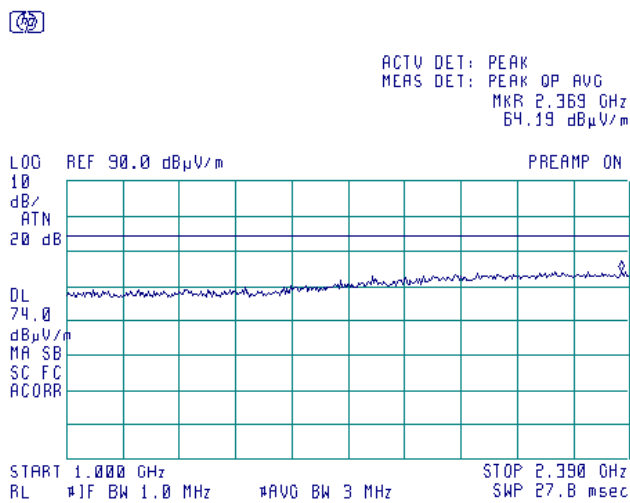


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.20 Radiated emission measurements from 1000 to 3000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11b



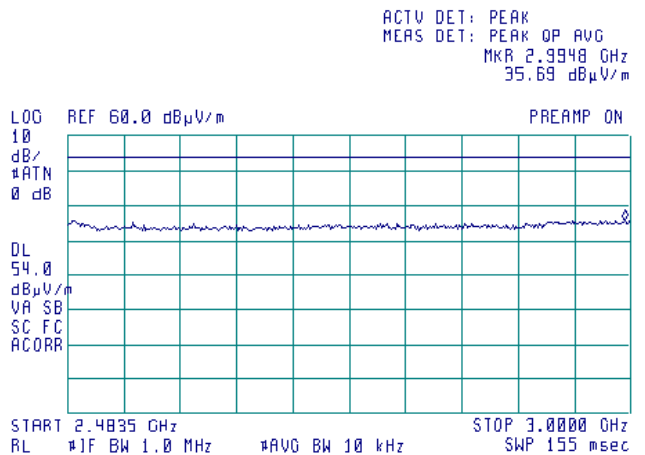
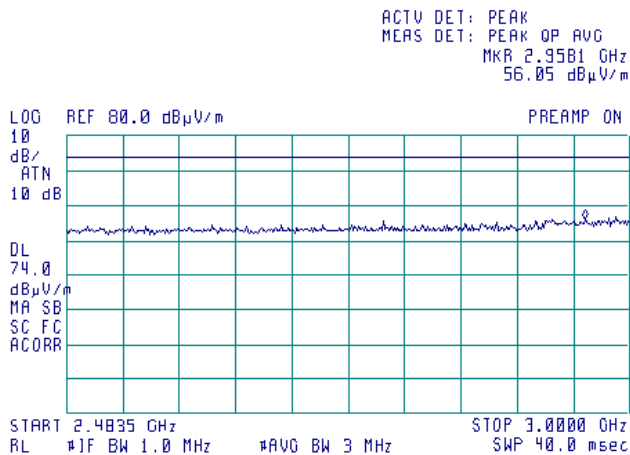
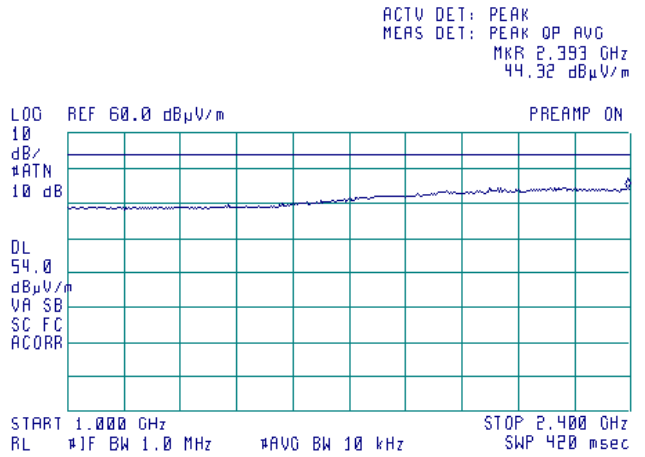
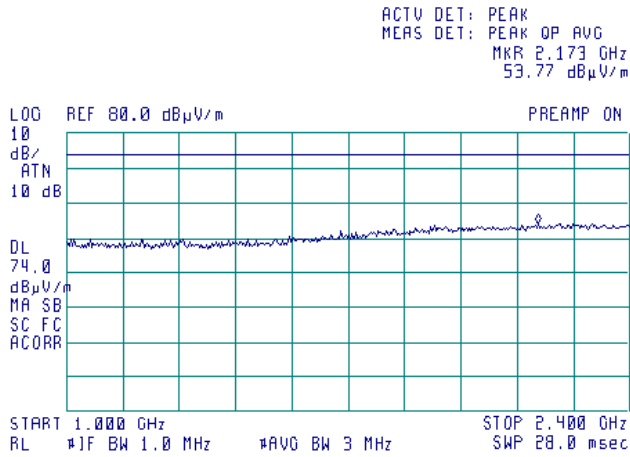


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.21 Radiated emission measurements from 1000 to 3000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11b



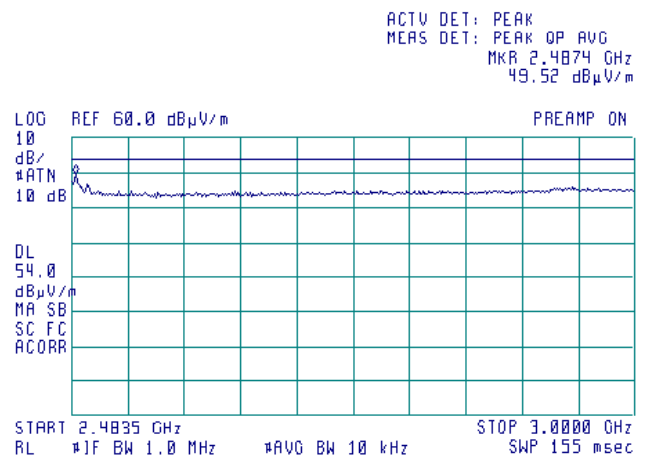
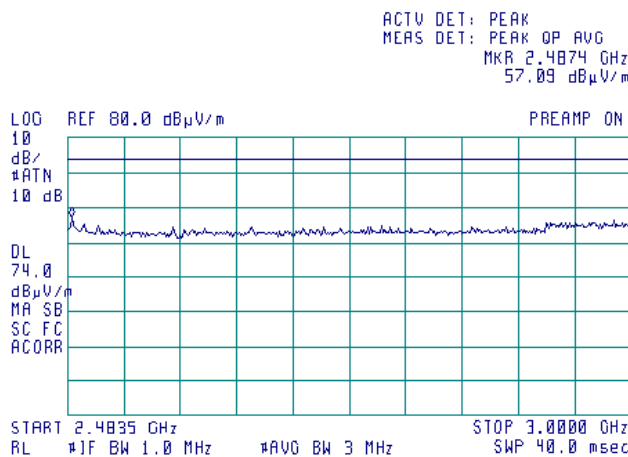
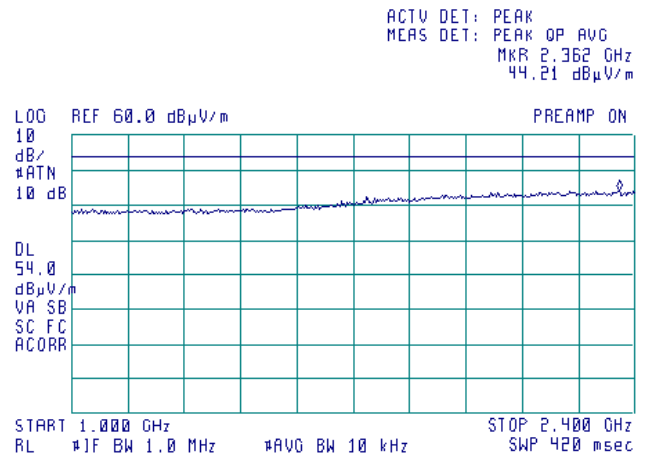
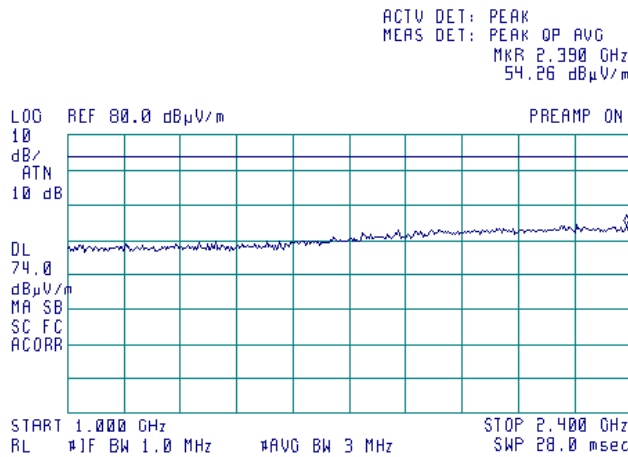


HERMON LABORATORIES

| | | | |
|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.22 Radiated emission measurements from 1000 to 3000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11b



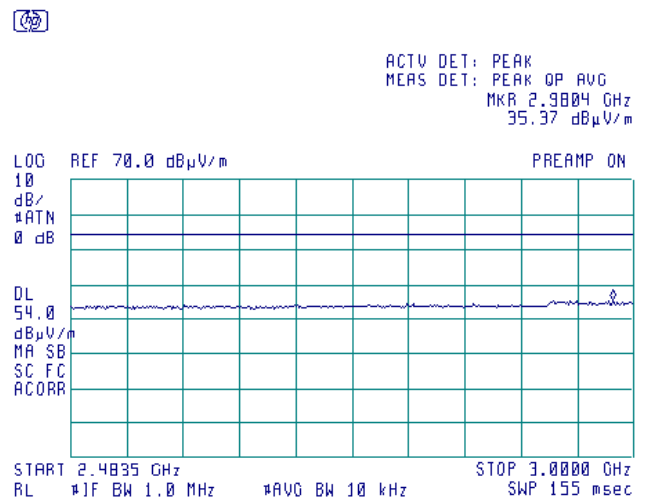
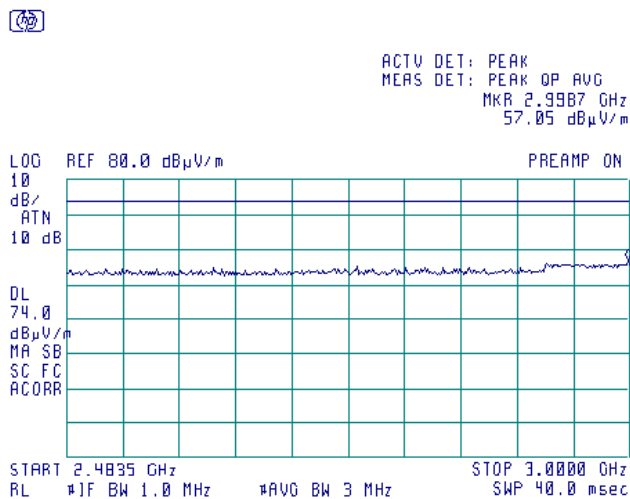
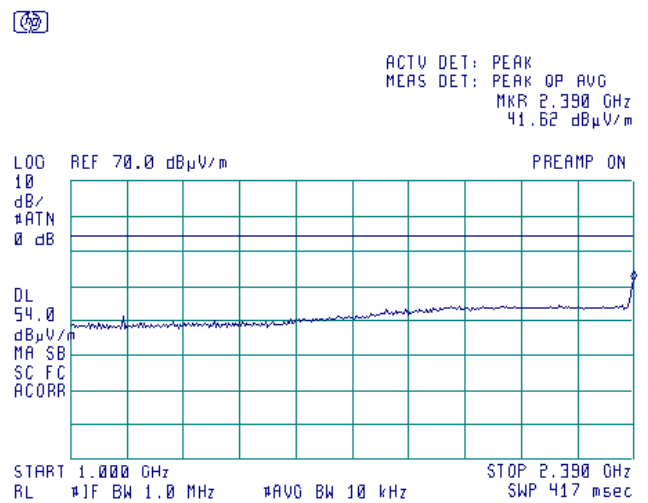
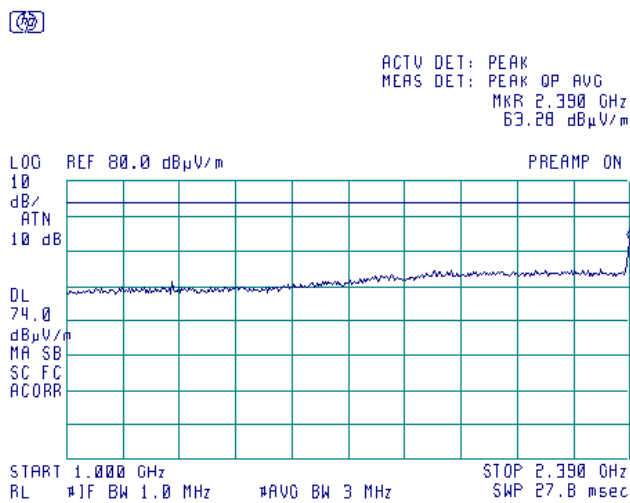


HERMON LABORATORIES

| | | | |
|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.23 Radiated emission measurements from 1000 to 3000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11g



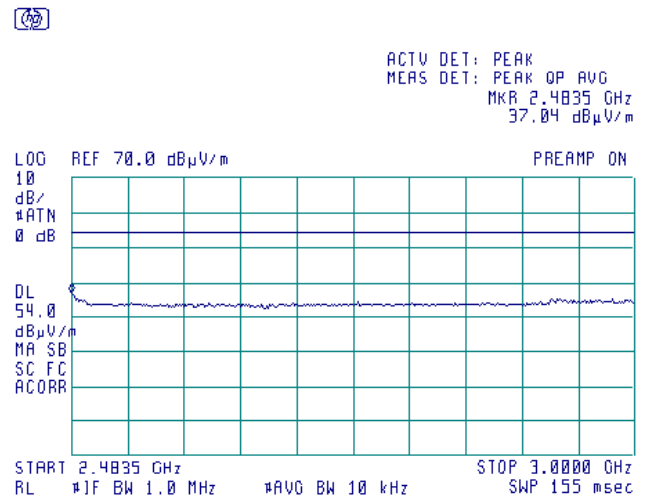
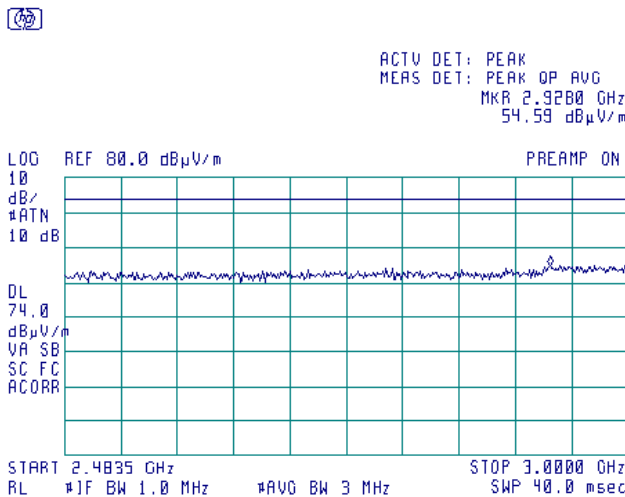
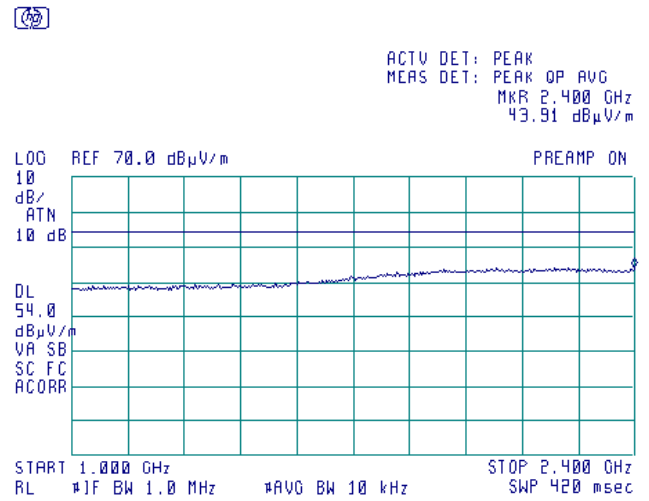
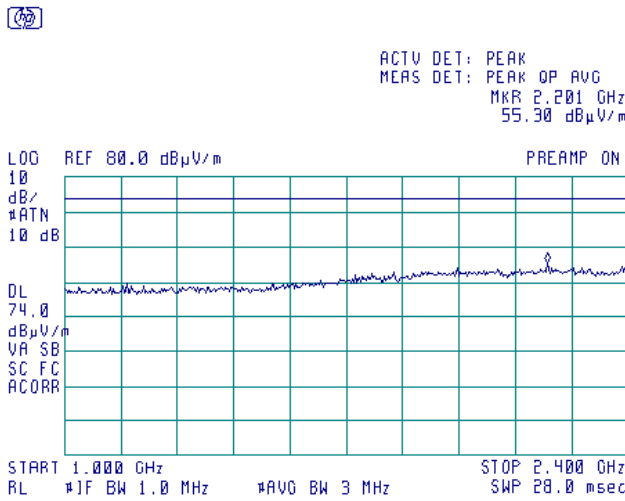


HERMON LABORATORIES

| | | | |
|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.24 Radiated emission measurements from 1000 to 3000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11g



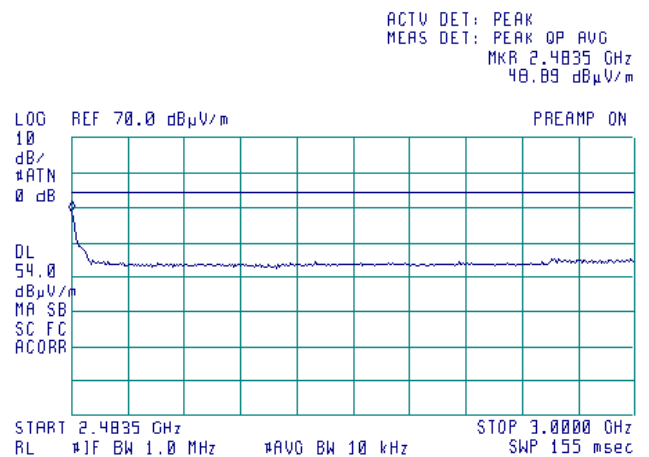
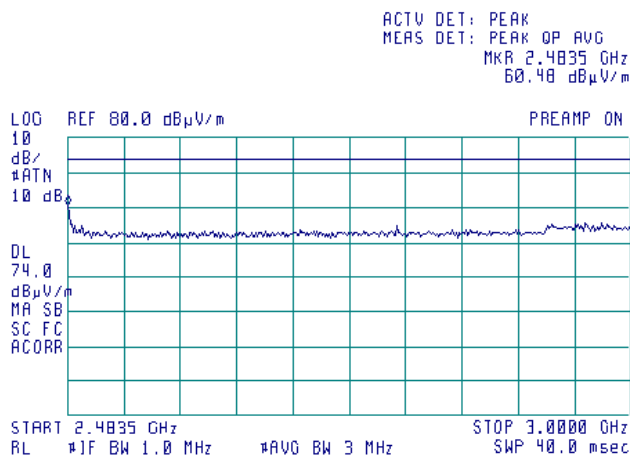
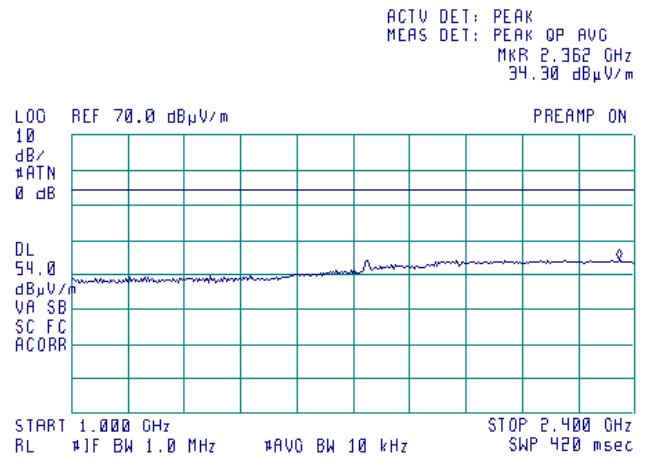
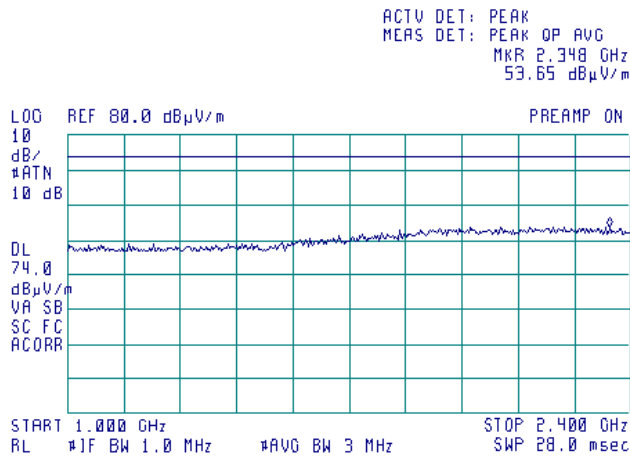


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.25 Radiated emission measurements from 1000 to 3000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11g



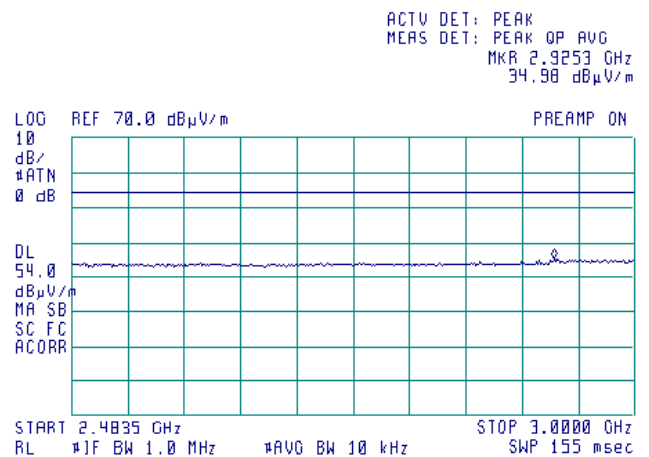
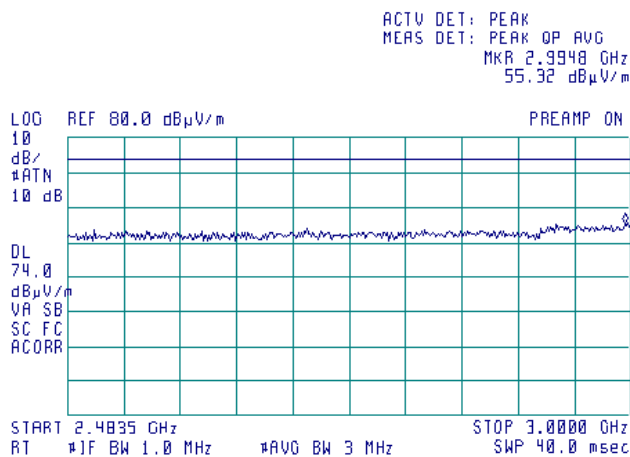
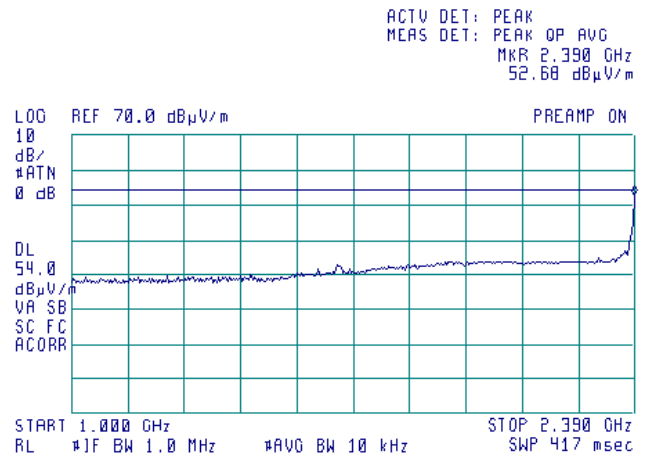
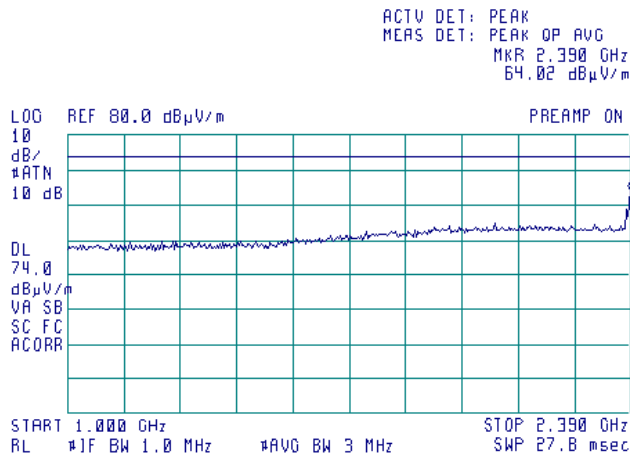


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.26 Radiated emission measurements from 1000 to 3000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT20



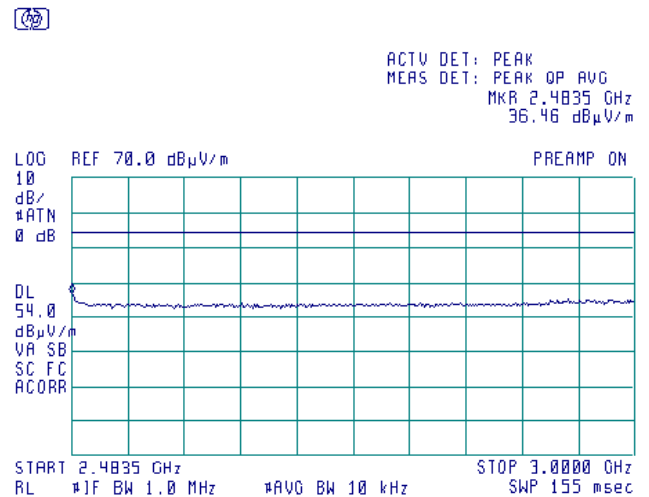
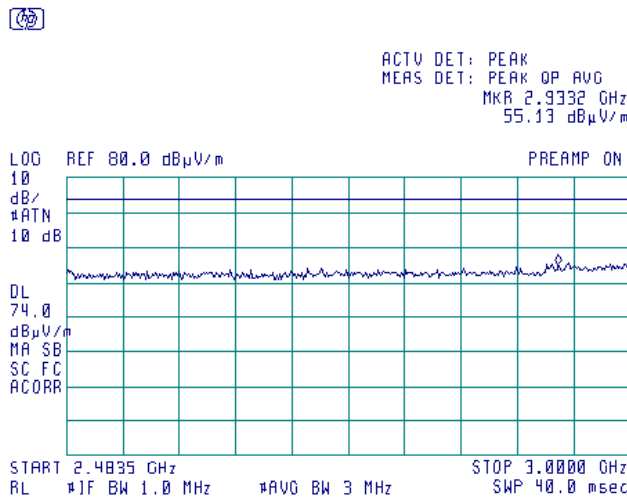
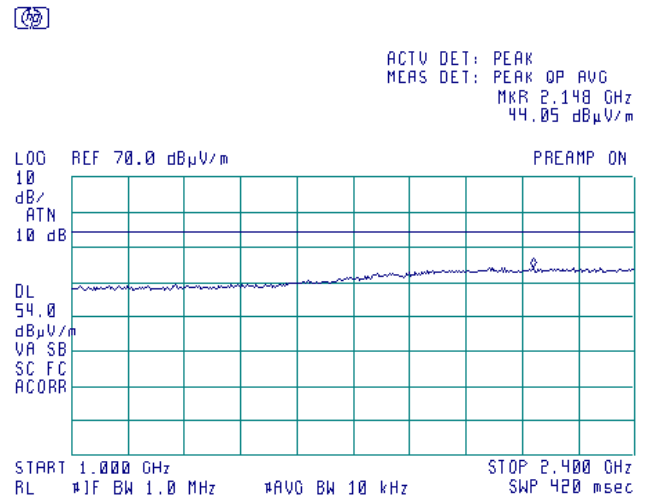
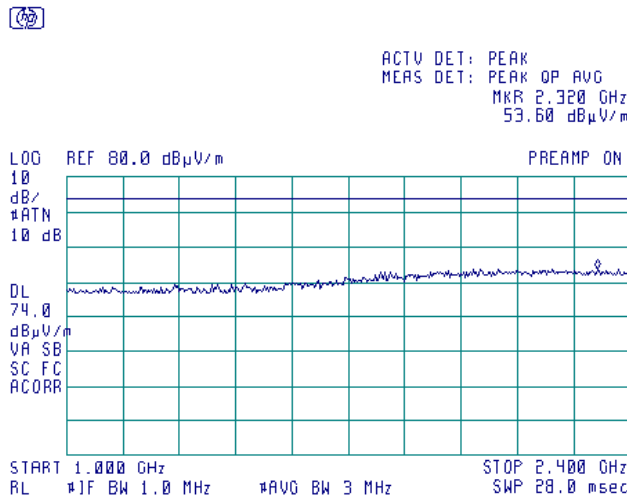


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.27 Radiated emission measurements from 1000 to 3000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT20



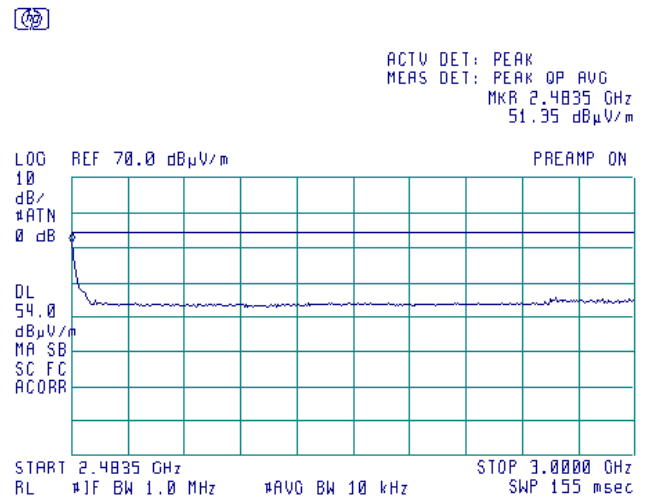
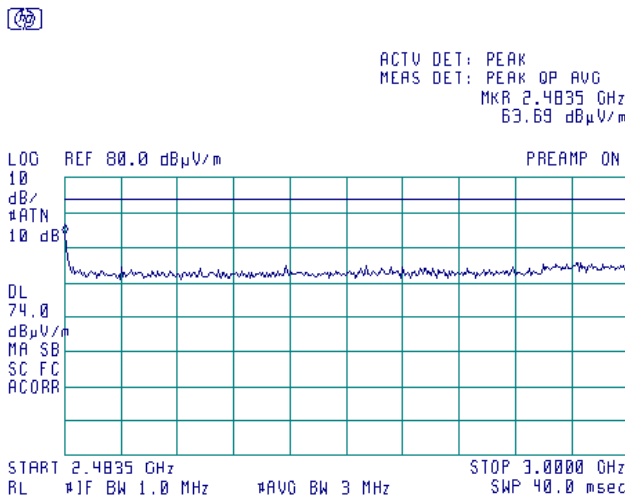
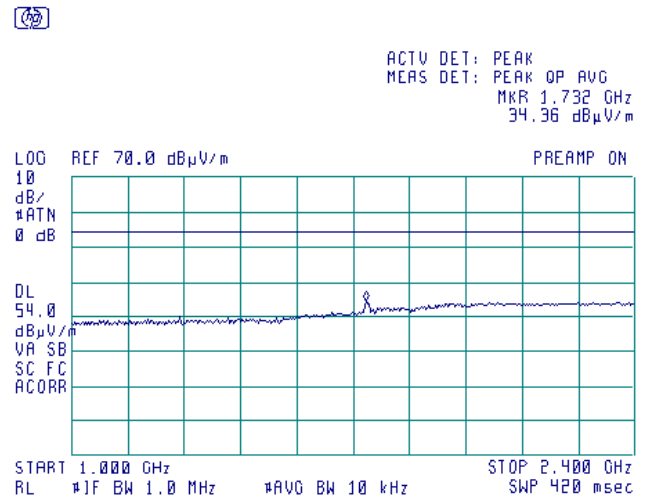
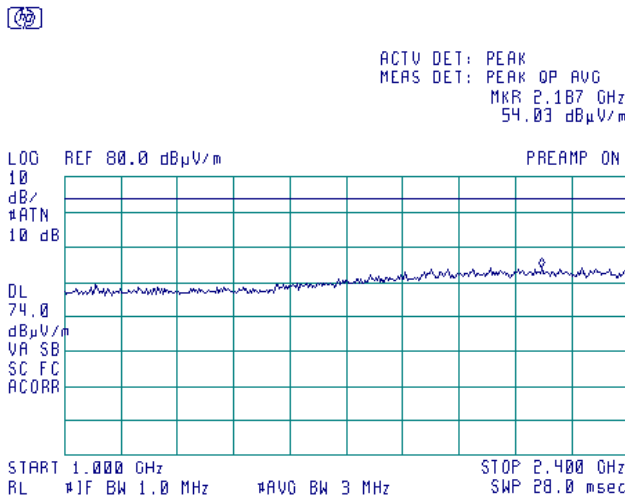


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.28 Radiated emission measurements from 1000 to 3000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT20



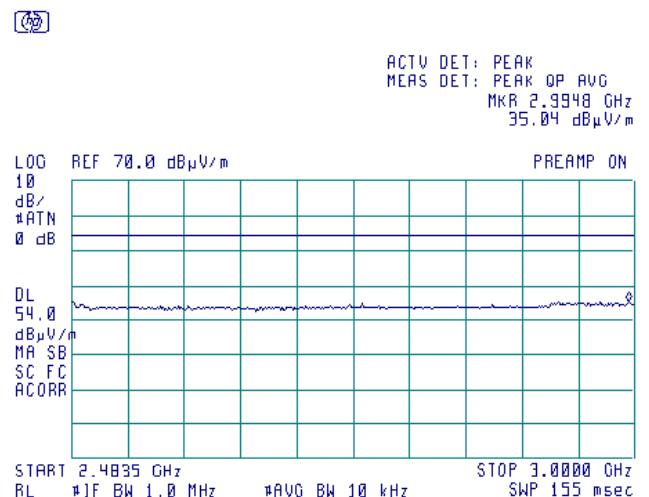
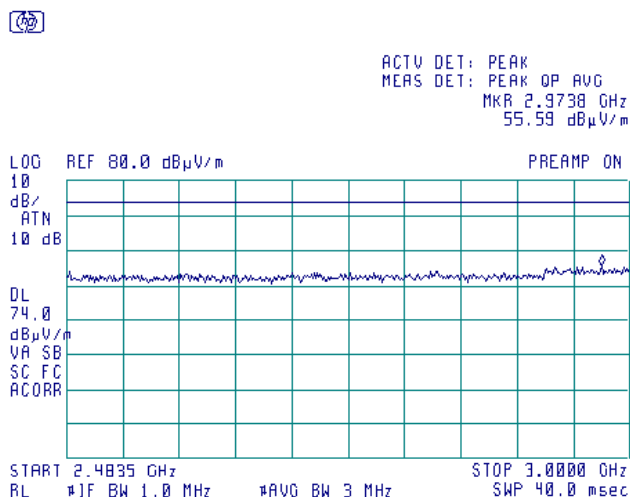
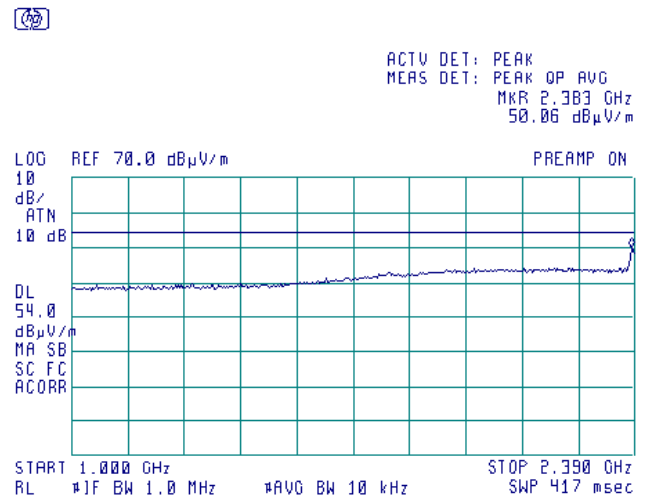
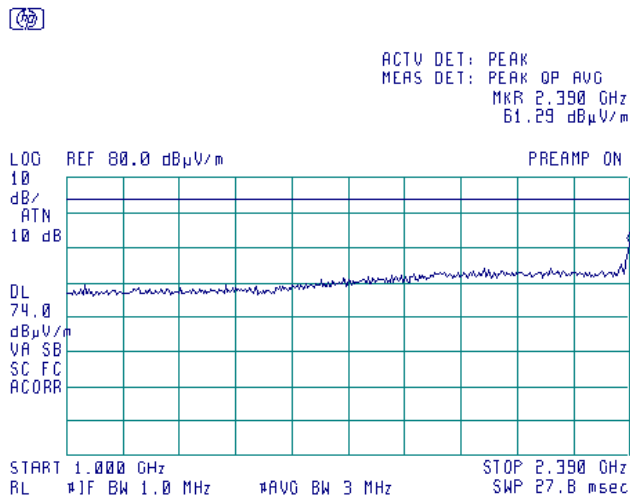


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.29 Radiated emission measurements from 1000 to 3000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT40



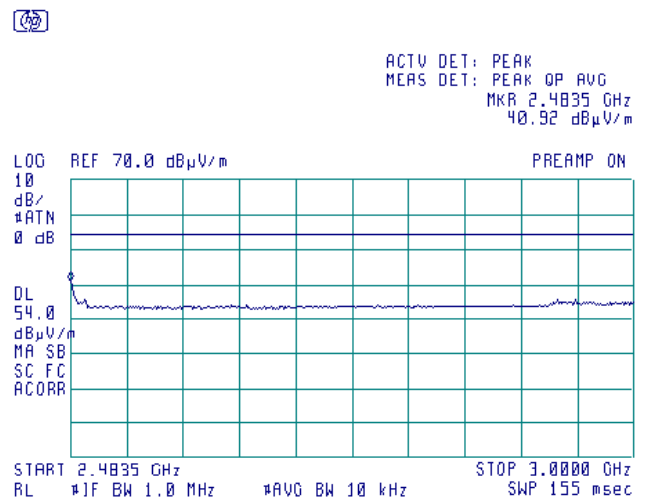
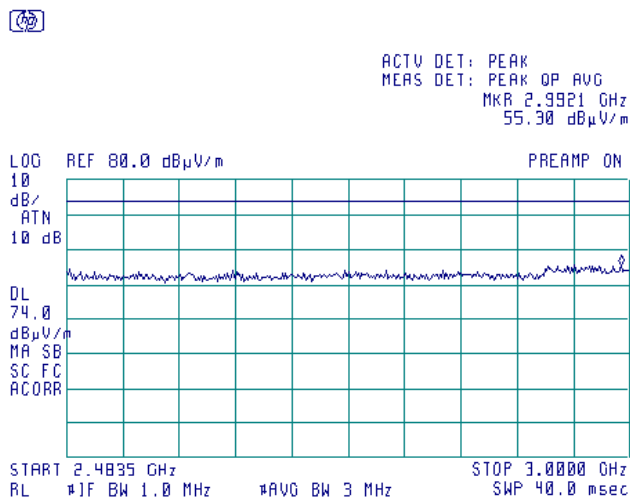
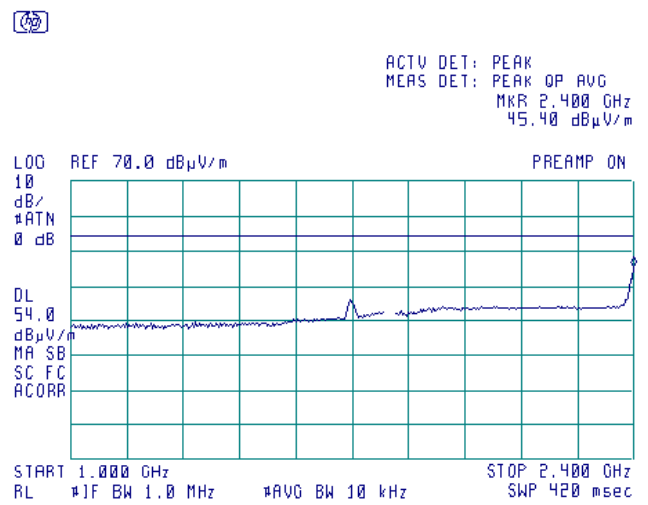
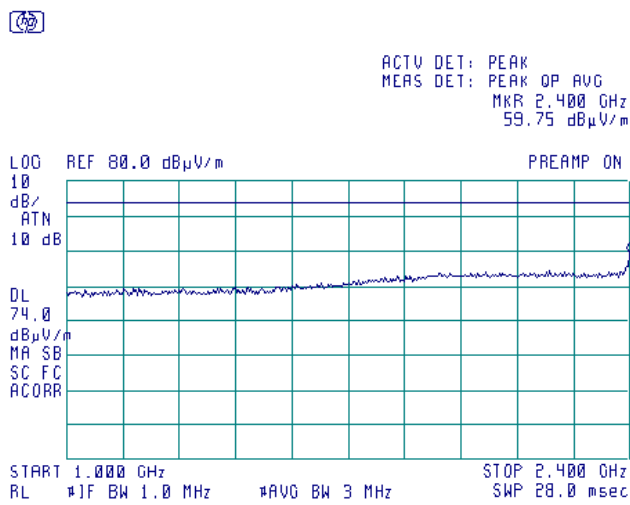


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.30 Radiated emission measurements from 1000 to 3000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT40



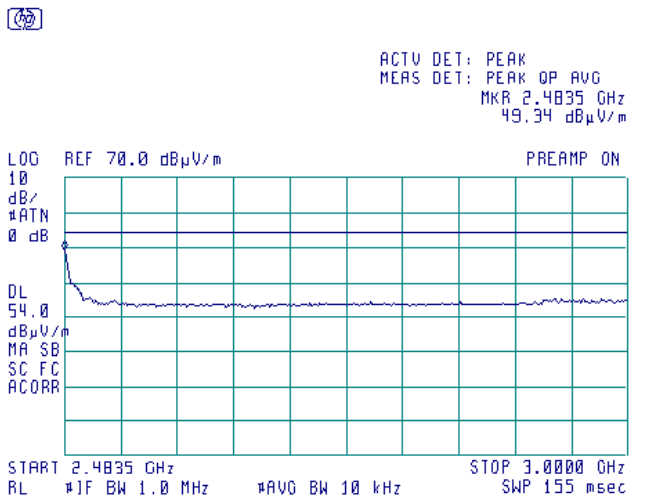
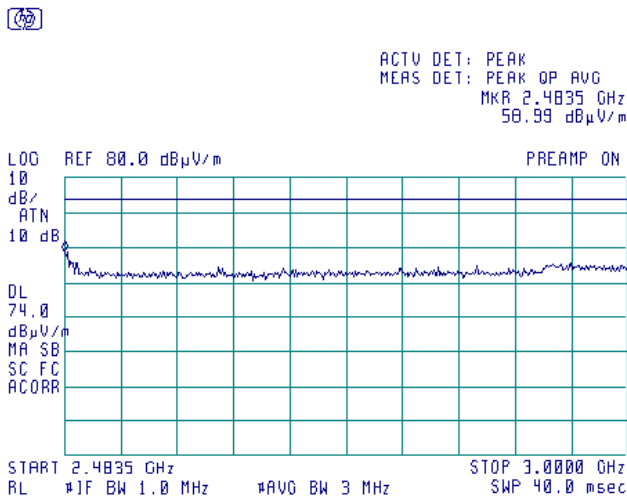
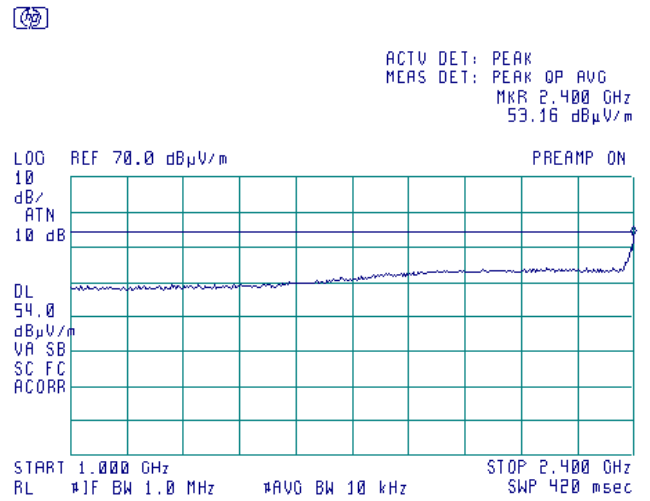
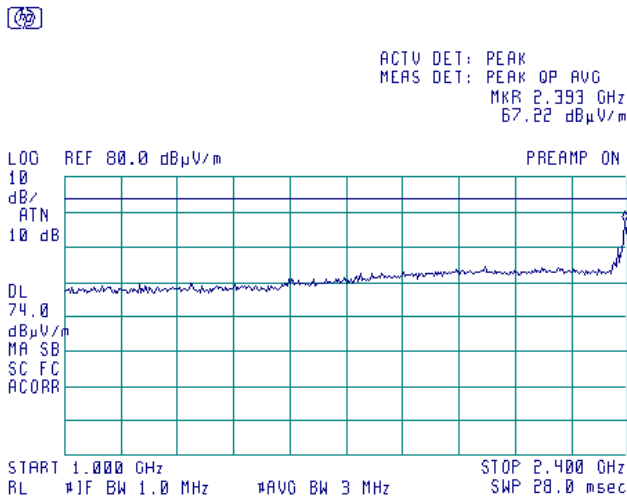


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.31 Radiated emission measurements from 1000 to 3000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT40



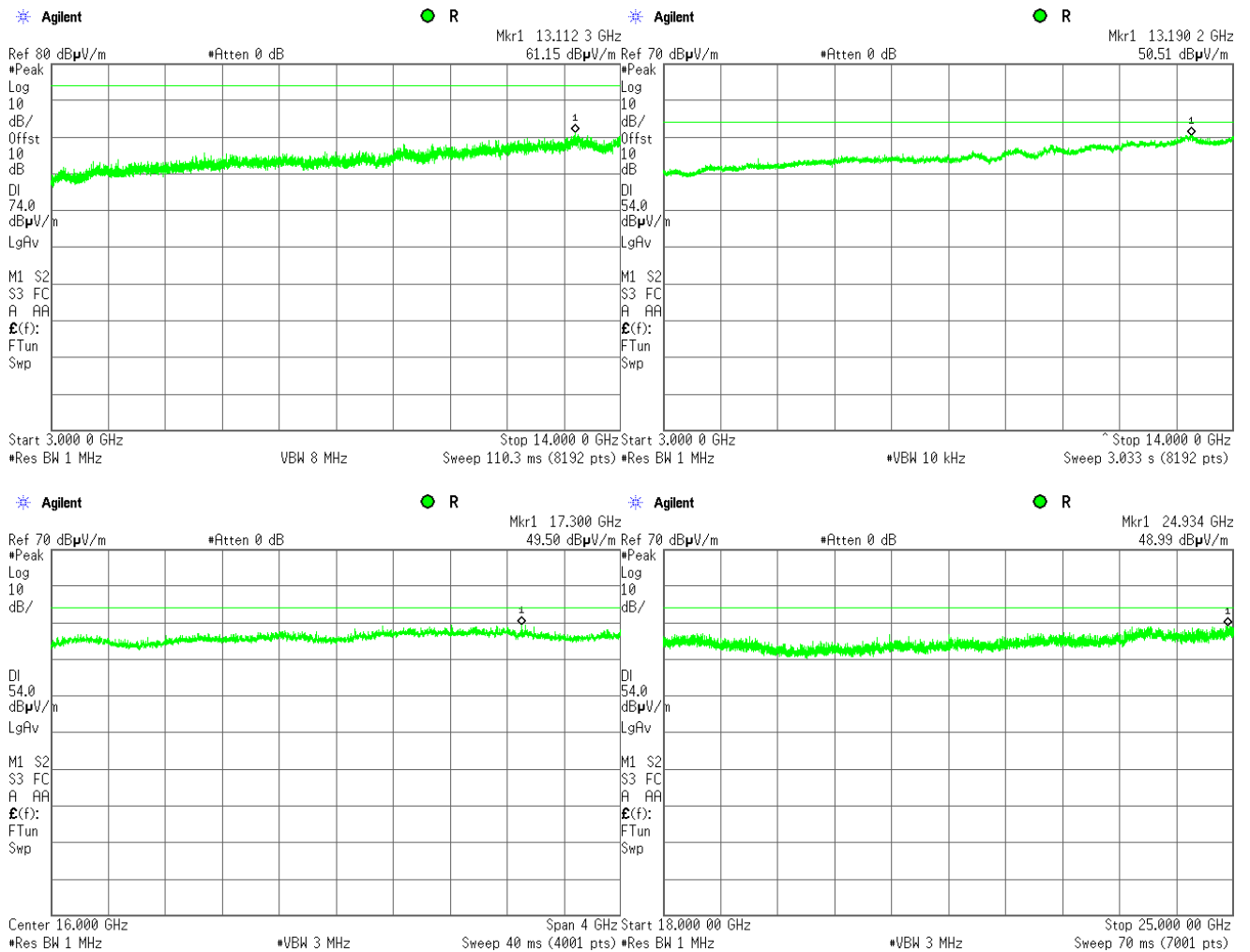


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 29-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| | Power Supply: 120 VAC |
| Remarks: | |

Plot 7.3.32 Radiated emission measurements from 3000 to 25000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11b



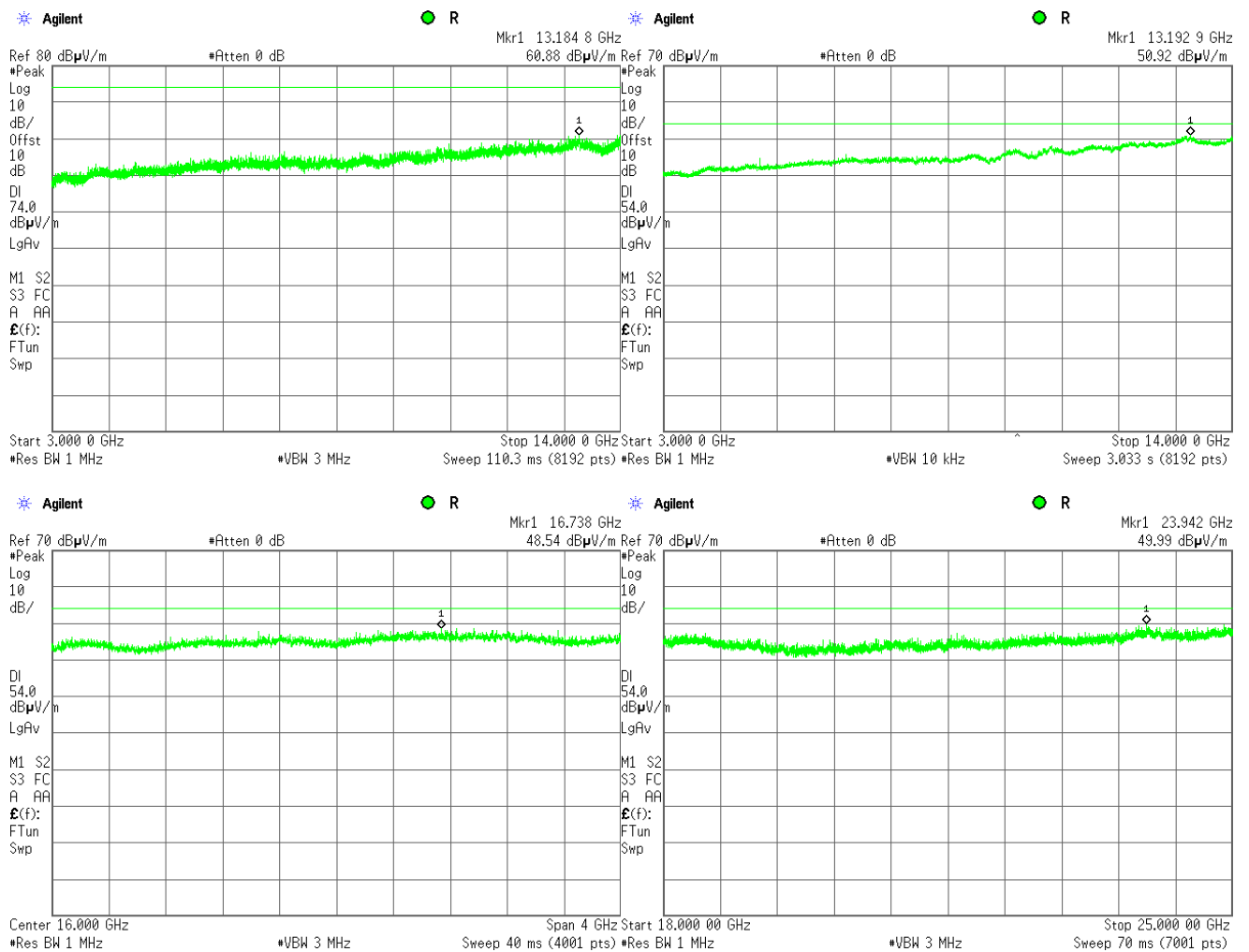


HERMON LABORATORIES

| | |
|-----------------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 29-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| | Power Supply: 120 VAC |
| Remarks: | |

Plot 7.3.33 Radiated emission measurements from 3000 to 25000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11b



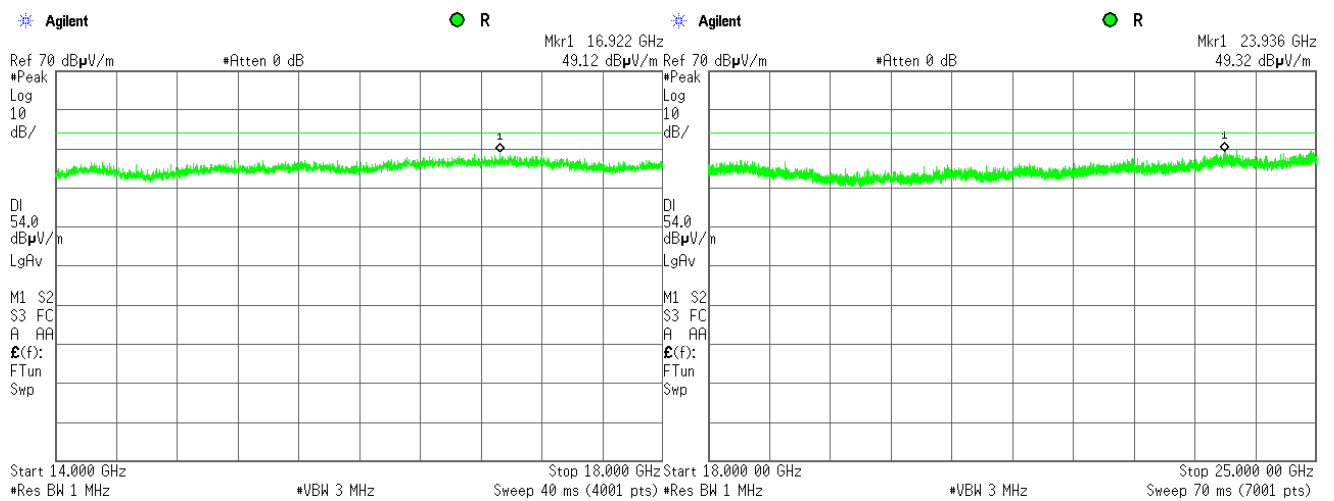
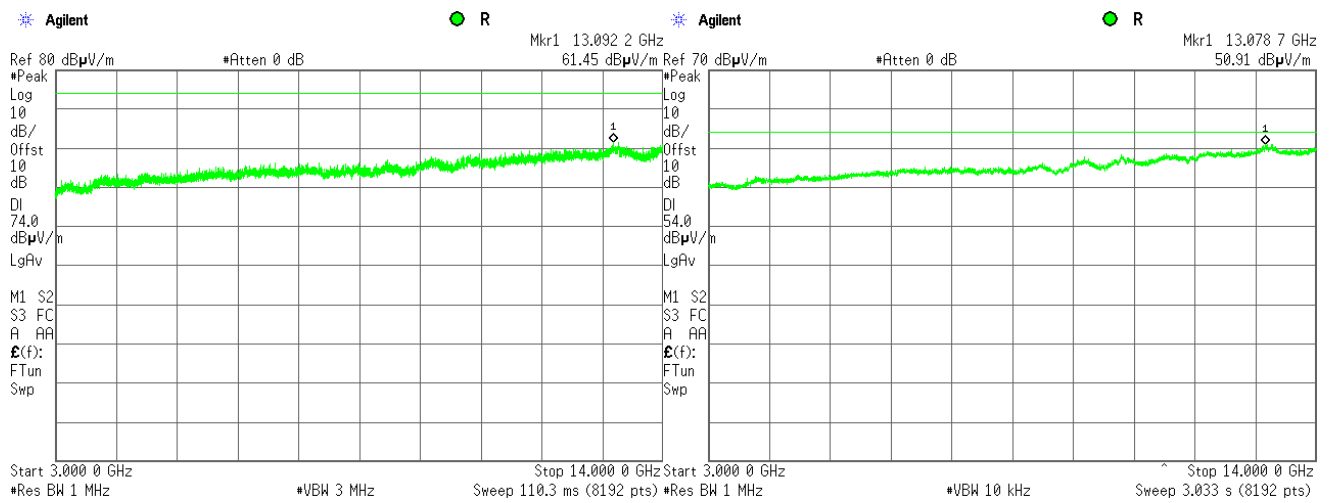


HERMON LABORATORIES

| | |
|-----------------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 29-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| | Power Supply: 120 VAC |
| Remarks: | |

Plot 7.3.34 Radiated emission measurements from 3000 to 25000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11b



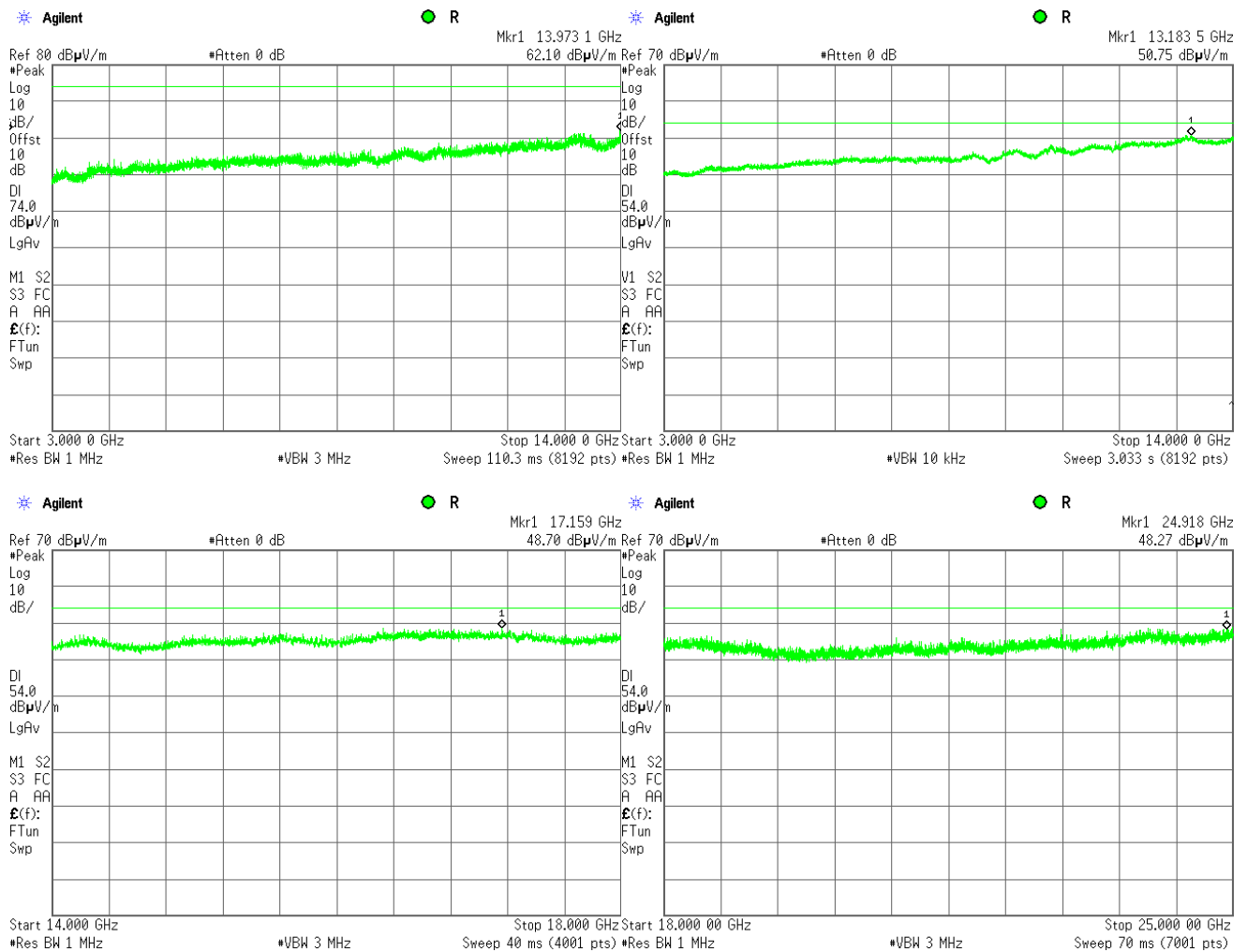


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 29-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| | Power Supply: 120 VAC |
| Remarks: | |

Plot 7.3.35 Radiated emission measurements from 3000 to 25000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11g



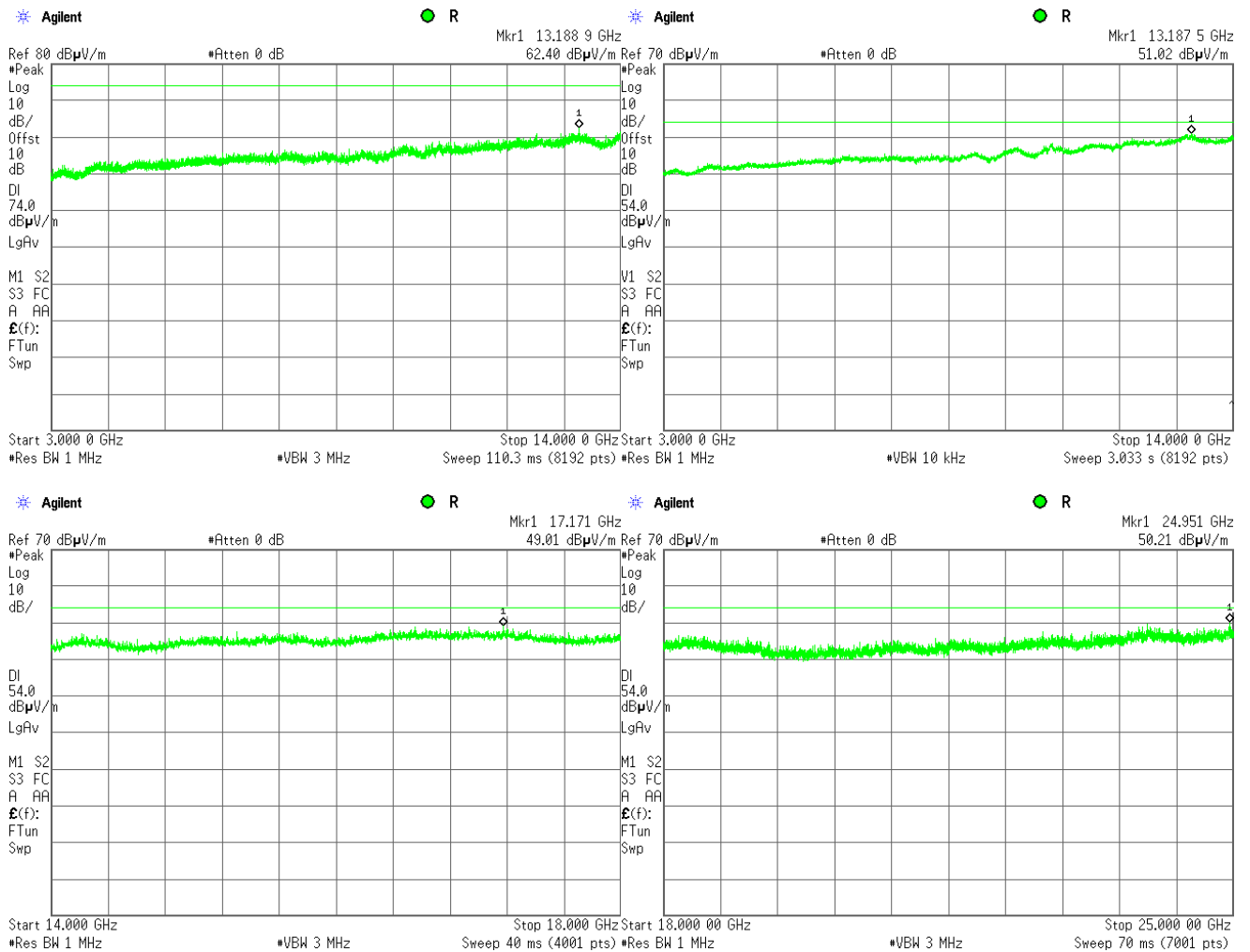


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 29-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| | Power Supply: 120 VAC |
| Remarks: | |

Plot 7.3.36 Radiated emission measurements from 3000 to 25000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11g



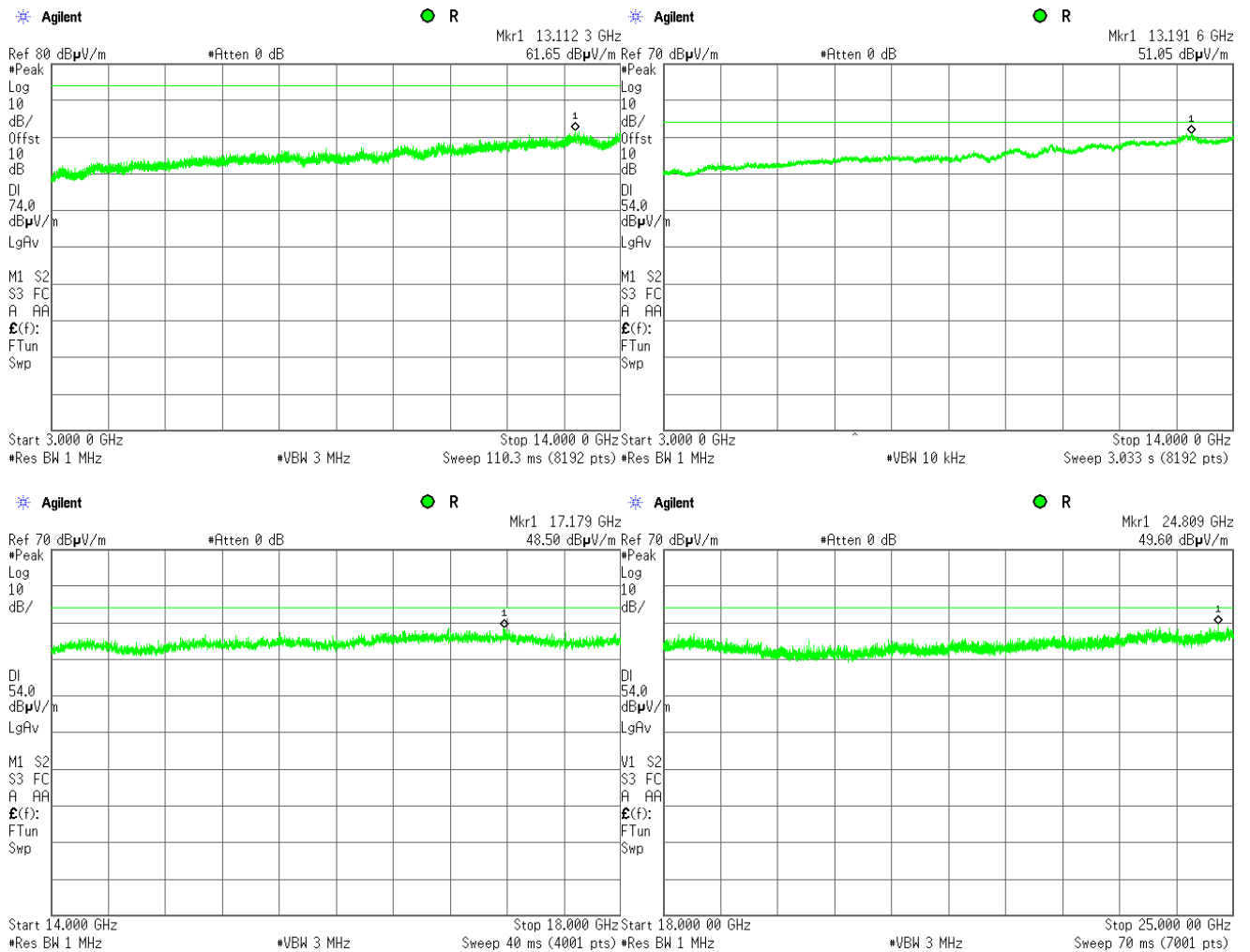


HERMON LABORATORIES

| | |
|-----------------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 29-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| | Power Supply: 120 VAC |
| Remarks: | |

Plot 7.3.37 Radiated emission measurements from 3000 to 25000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11g



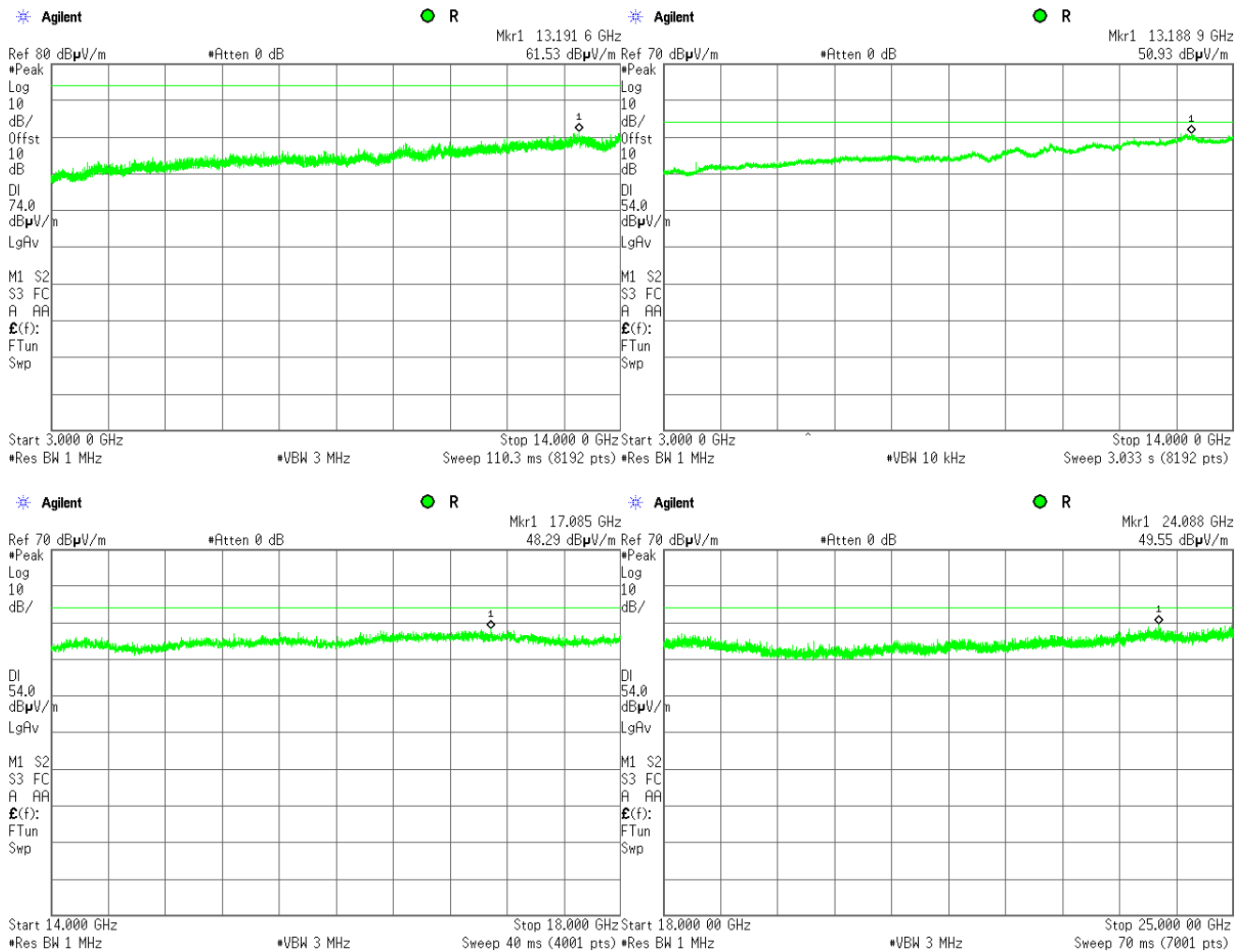


HERMON LABORATORIES

| | |
|-----------------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 29-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| | Power Supply: 120 VAC |
| Remarks: | |

Plot 7.3.38 Radiated emission measurements from 3000 to 25000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT20



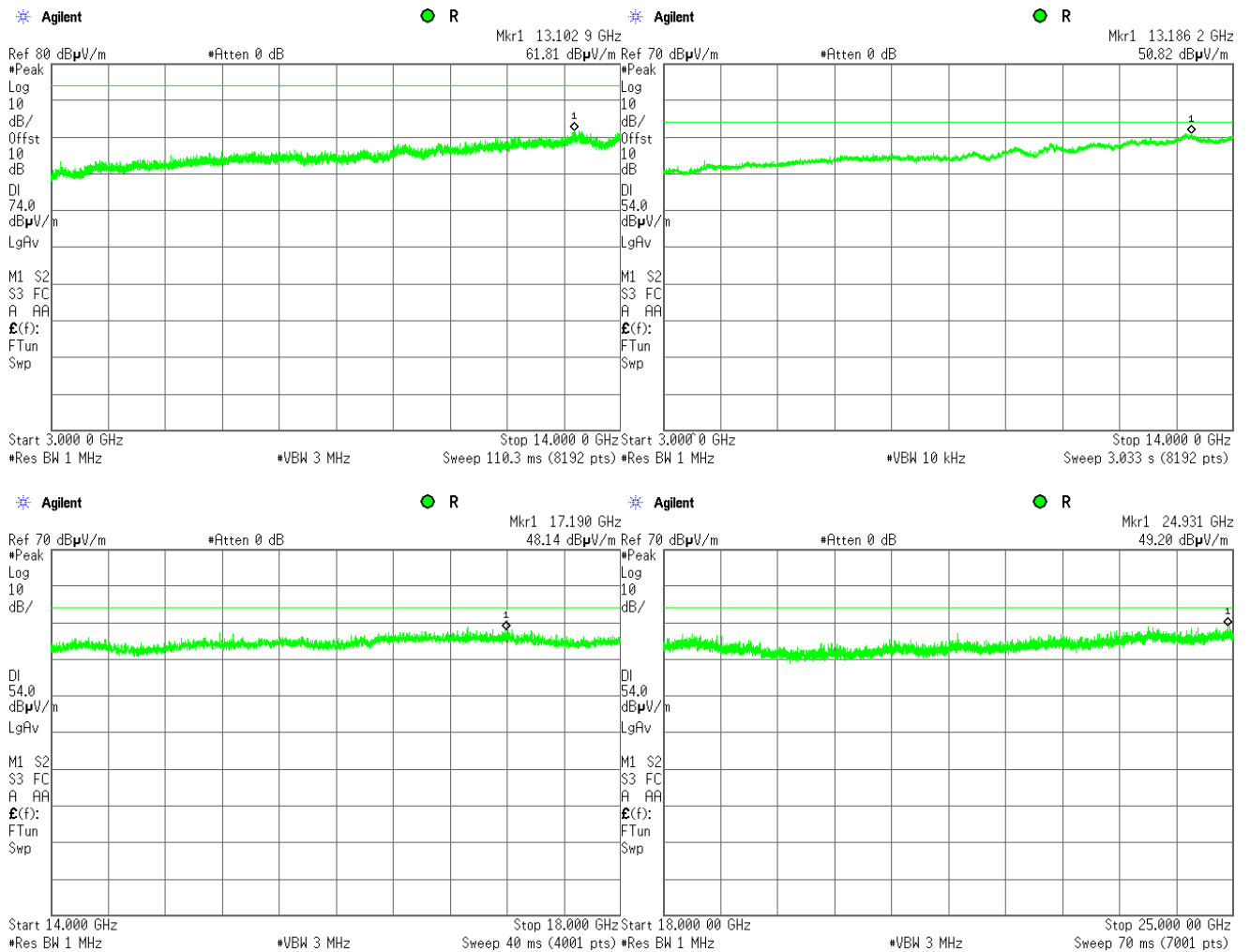


HERMON LABORATORIES

| | |
|-----------------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 29-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| | Power Supply: 120 VAC |
| Remarks: | |

Plot 7.3.39 Radiated emission measurements from 3000 to 25000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT20



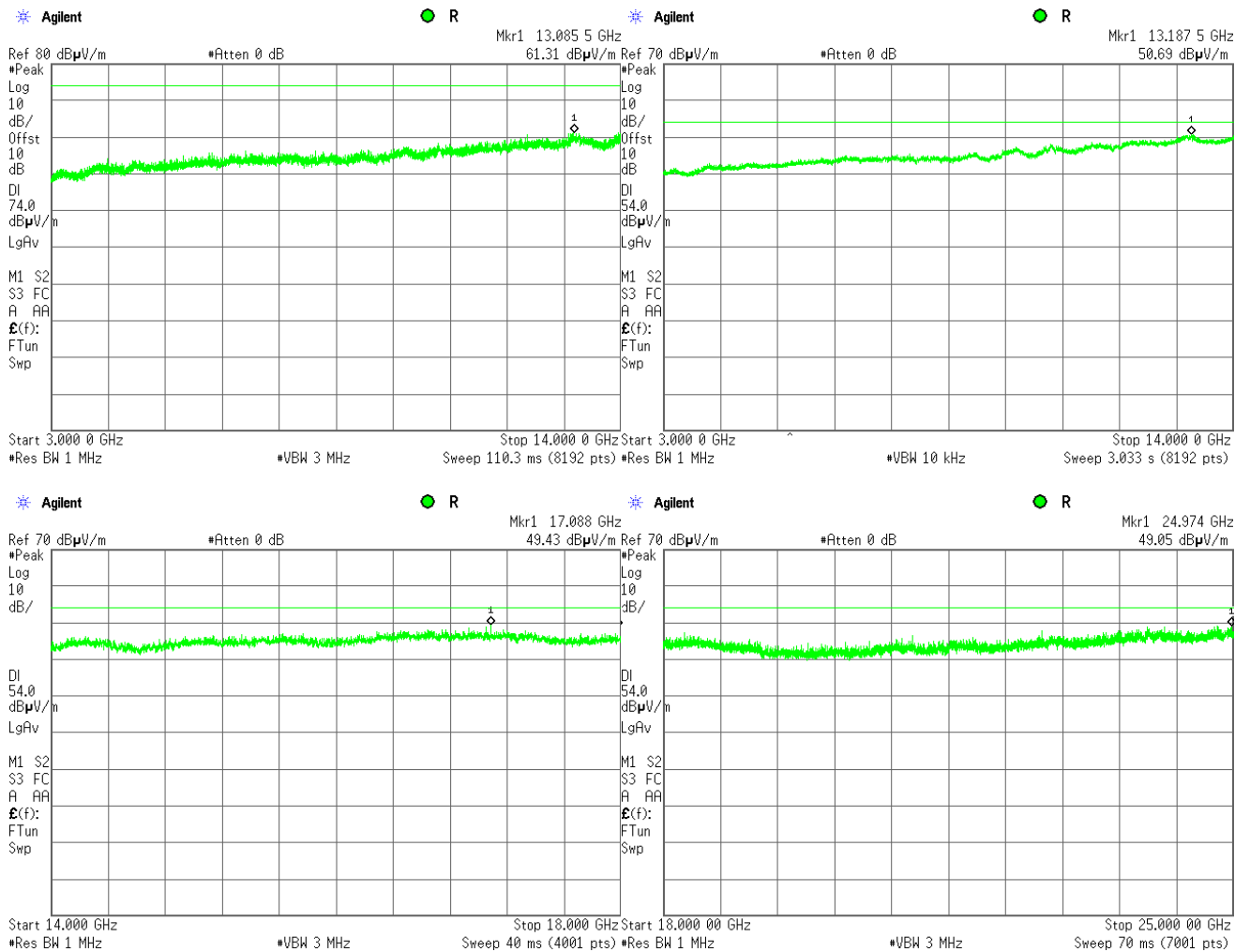


HERMON LABORATORIES

| | |
|-----------------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 29-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| | Power Supply: 120 VAC |
| Remarks: | |

Plot 7.3.40 Radiated emission measurements from 3000 to 25000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT20



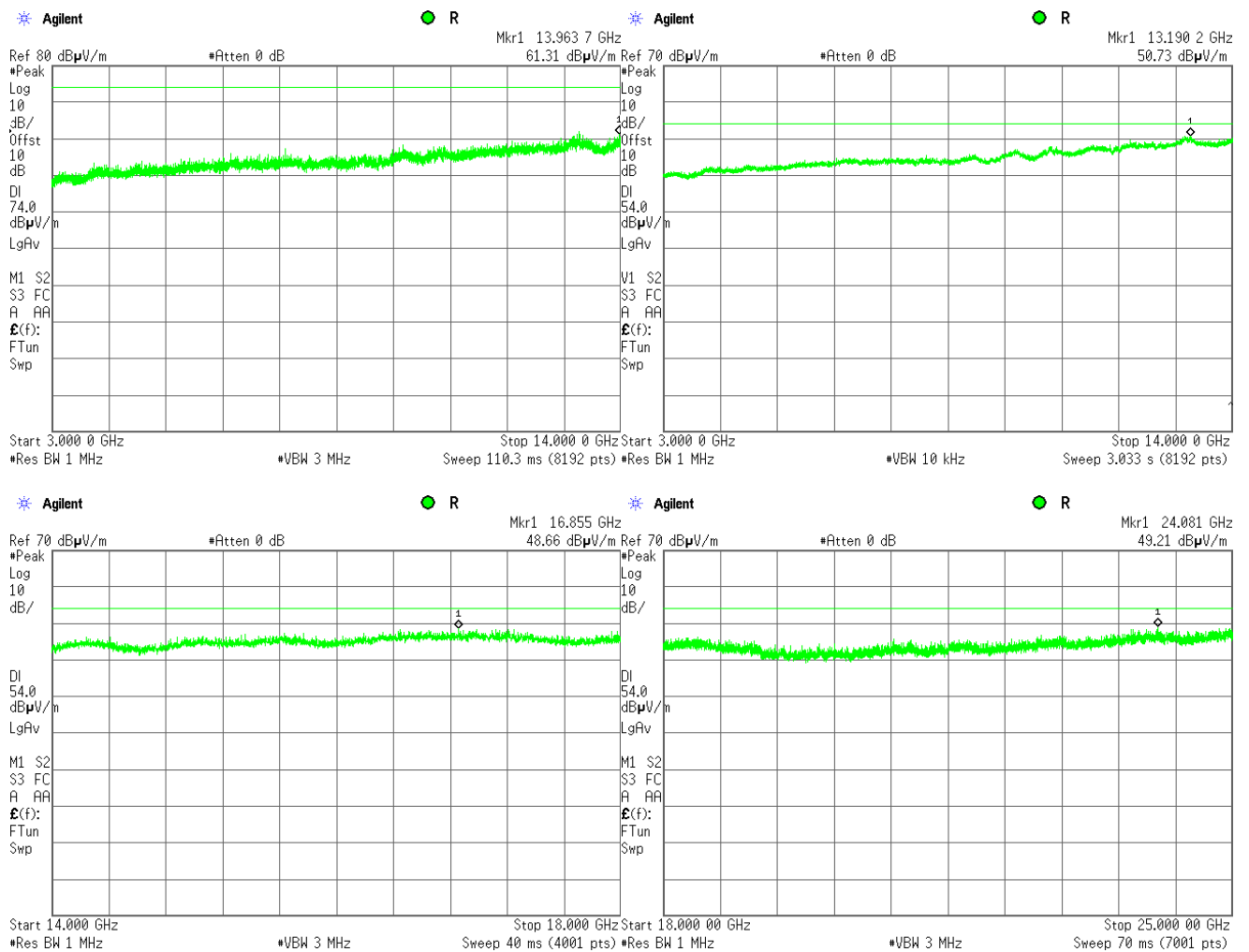


HERMON LABORATORIES

| | |
|-----------------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 29-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| | Power Supply: 120 VAC |
| Remarks: | |

Plot 7.3.41 Radiated emission measurements from 3000 to 25000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT40



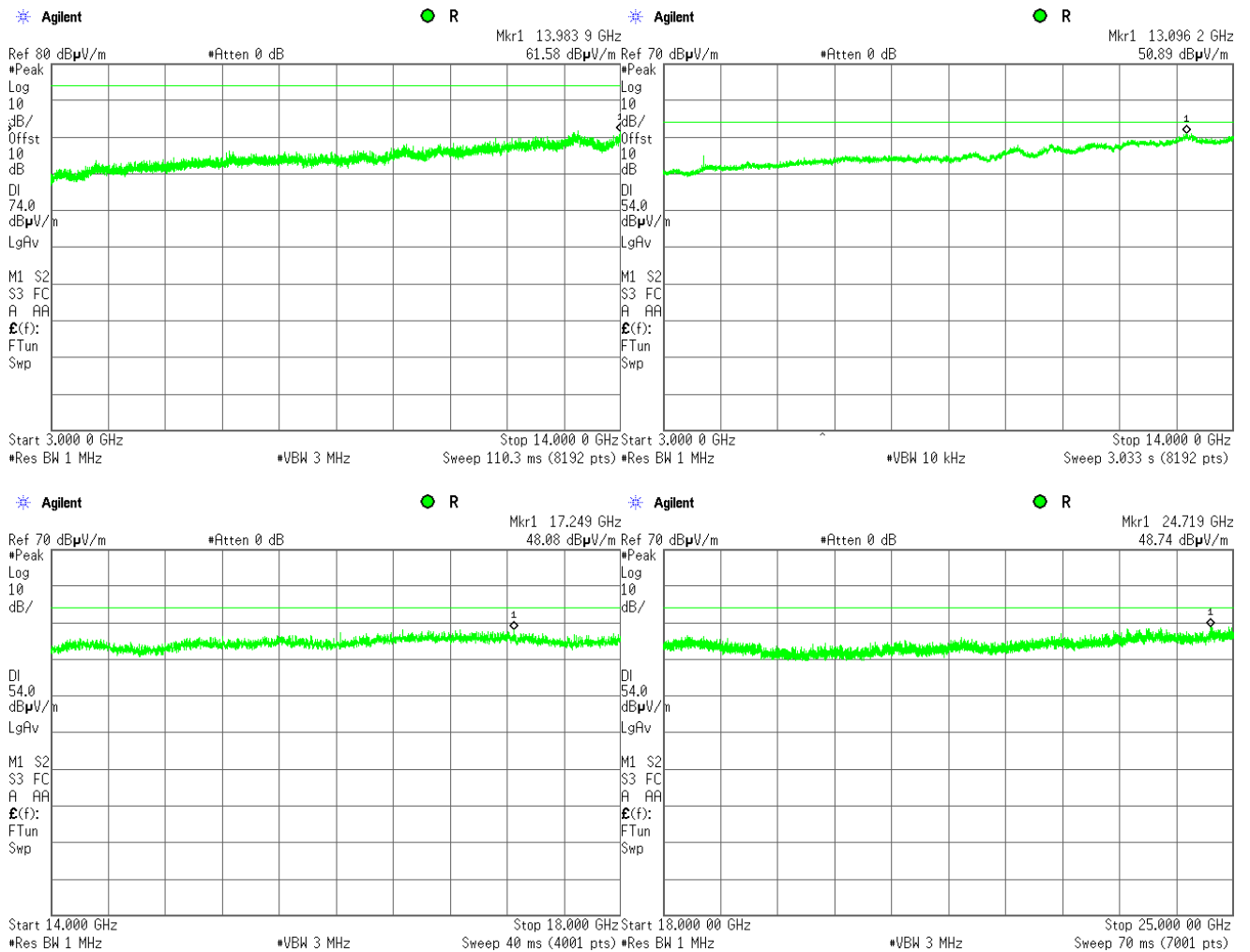


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 29-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| | Power Supply: 120 VAC |
| Remarks: | |

Plot 7.3.42 Radiated emission measurements from 3000 to 25000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT40



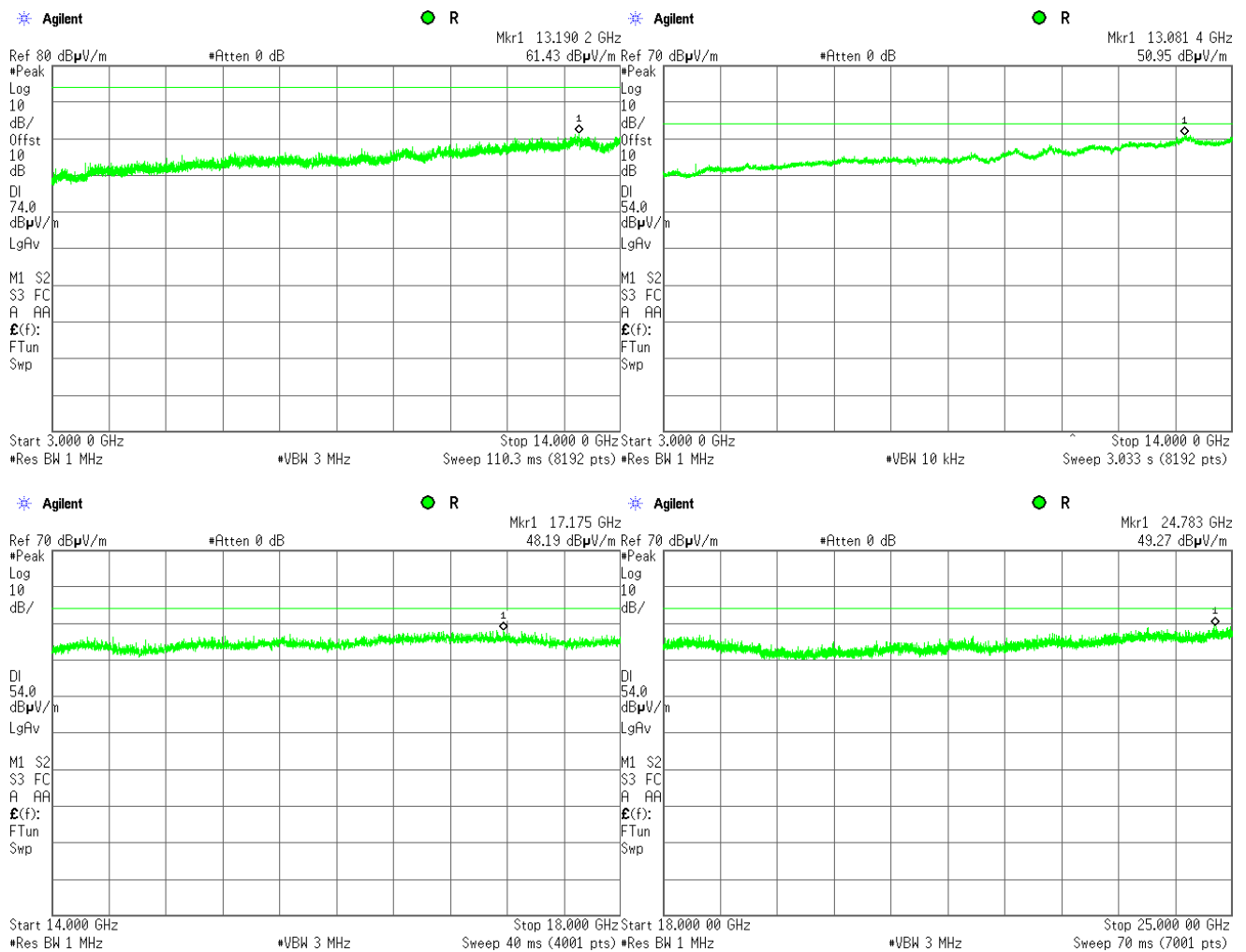


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 29-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| | Power Supply: 120 VAC |
| Remarks: | |

Plot 7.3.43 Radiated emission measurements from 3000 to 25000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT40



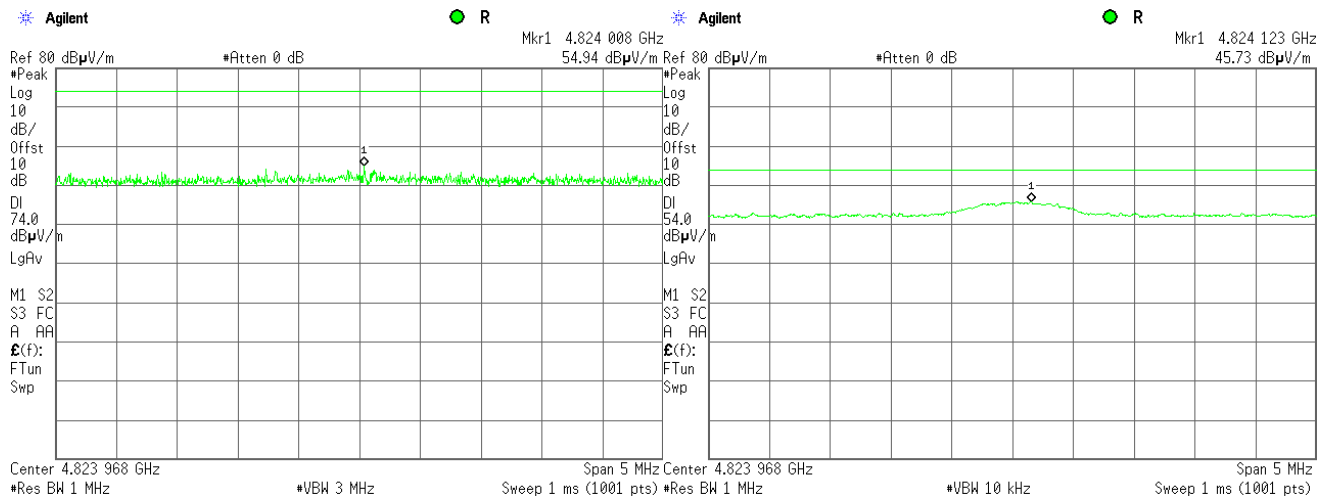


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 29-Jun-15 | |
| Temperature: 25 °C | Air Pressure: 1010 hPa |
| | Relative Humidity: 50 % |
| | Power Supply: 120 VAC |
| Remarks: | |

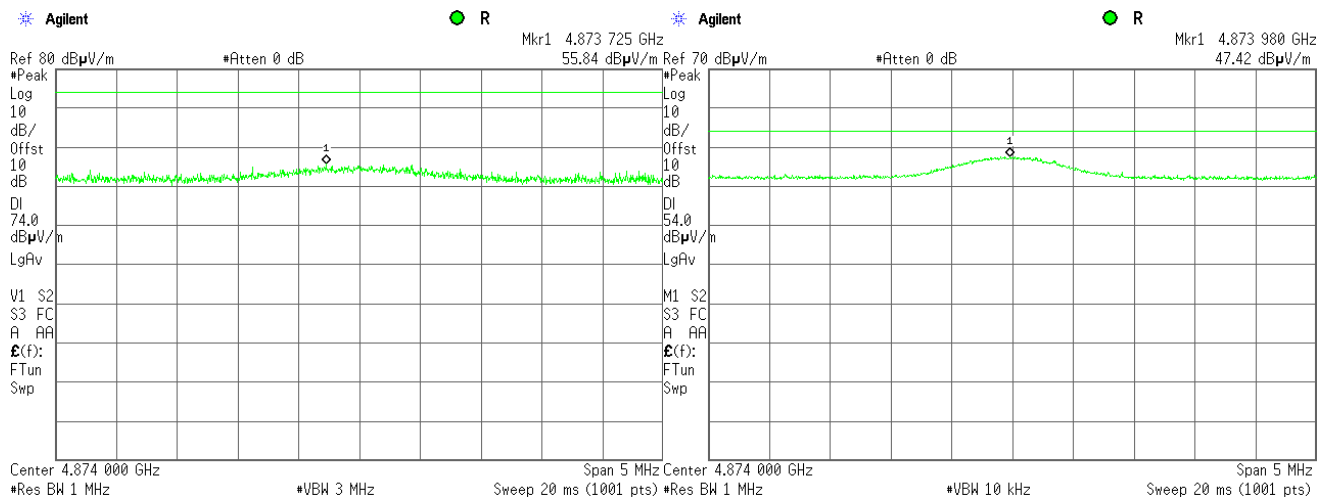
Plot 7.3.44 Radiated emission measurements at the second harmonic of low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11b



Plot 7.3.45 Radiated emission measurements at the second harmonic of mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11b



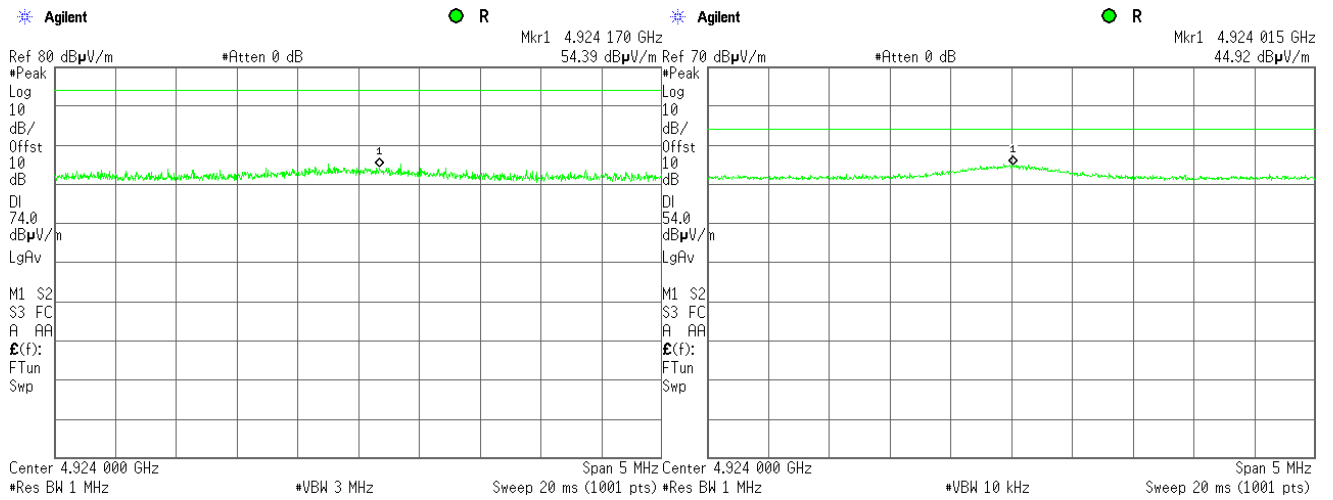


HERMON LABORATORIES

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|-----------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.46 Radiated emission measurements at the second harmonic of high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11b



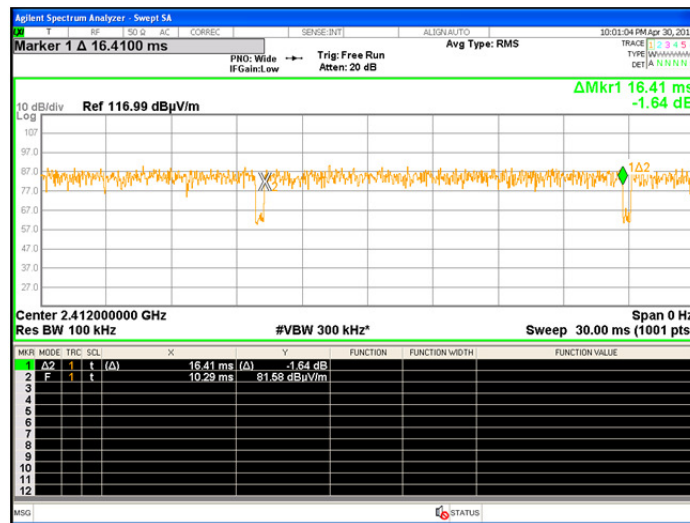


HERMON LABORATORIES

| | | | |
|----------------------------|---------------------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | |
| Test procedure: | ANSI C63.10 section 11.12.1 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 29-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

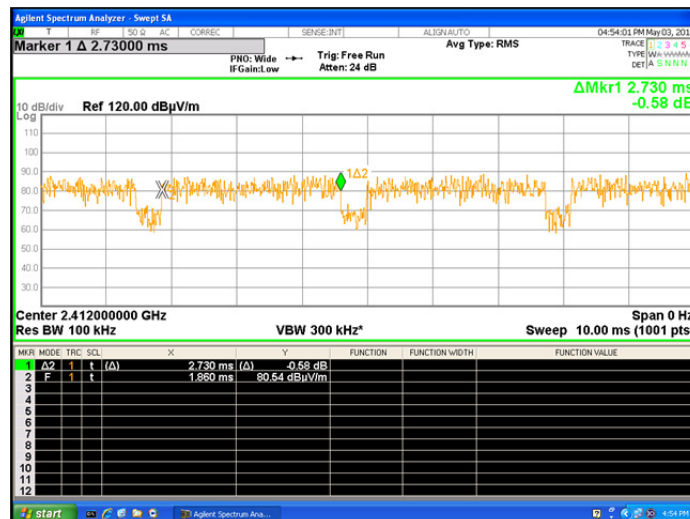
Plot 7.3.47 Transmission pulse duration

MODE: 802.11b



Plot 7.3.48 Transmission pulse duration

MODE: 802.11g



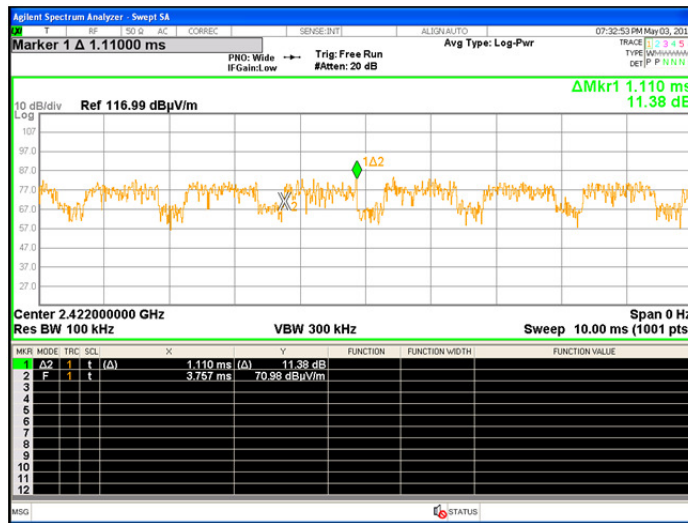


HERMON LABORATORIES

| | | | |
|----------------------------|---------------------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | |
| Test procedure: | ANSI C63.10 section 11.12.1 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 29-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.49 Transmission pulse duration

MODE: 802.11n HT40



Plot 7.3.50 Transmission pulse period

MODE: 802.11b



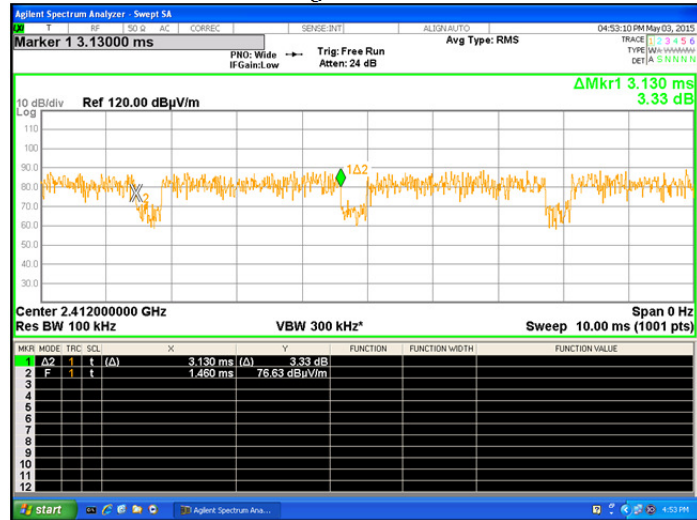


HERMON LABORATORIES

| | | | |
|----------------------------|--------------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | |
| Test procedure: | ANSI C63.10 section 11.12.1 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 29-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1010 hPa | Relative Humidity: 50 % | Power Supply: 120 VAC |
| Remarks: | | | |

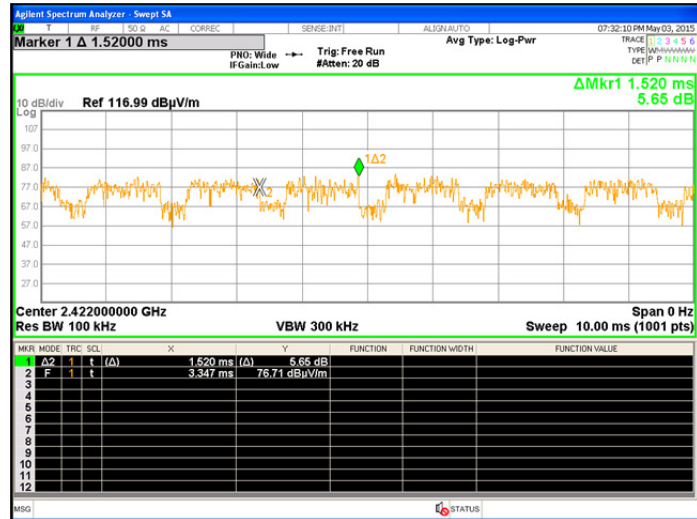
Plot 7.3.51 Transmission pulse period

MODE: 802.11g



Plot 7.3.52 Transmission pulse period

MODE: 802.11n HT40





| | | | |
|----------------------------|--|-------------------------------------------------------------------------|--|
| Test specification: | | FCC section 15.247(d) / RSS-247 section 5.5, Band edge emissions | |
| Test procedure: | | ANSI C63.10 section 11.12.1 | |
| Test mode: | | Compliance | |
| Date(s): | | 30-Jun-15 | |
| Temperature: 23 °C | | Air Pressure: 1008 hPa | |
| | | Relative Humidity: 48 % | |
| | | Power Supply: 120 VAC | |
| Remarks: | | | |

7.4 Band edge radiated emissions

7.4.1 General

This test was performed to measure emissions, radiated from the EUT at the assigned frequency band edges. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Band edge emission limits

| Output power | Assigned frequency, MHz | Attenuation below carrier*, dBc | Field strength at 3 m within restricted bands, dB(μV/m) | |
|--------------|-------------------------|---------------------------------|---------------------------------------------------------|---------|
| | | | Peak | Average |
| Peak | 902.0 – 928.0 | 20.0 | 74.0 | 54.0 |
| | 2400.0 – 2483.5 | | | |
| | 5725.0 – 5850.0 | | | |

* - Band edge emission limit is provided in terms of attenuation below the peak of modulated carrier measured with the same resolution bandwidth.

7.4.2 Test procedure

- 7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized normally modulated at the maximum data rate and its proper operation was checked.
- 7.4.2.2 The EUT was adjusted to produce maximum available to end user RF output power at the lowest carrier frequency.
- 7.4.2.3 The spectrum analyzer span was set to capture the carrier frequency and associated modulation products. The resolution bandwidth was set wider than 1 % of the frequency span.
- 7.4.2.4 The spectrum analyzer was set in max hold mode and allowed trace to stabilize. The highest emission level within the authorized band was measured.
- 7.4.2.5 The maximum band edge emission and modulation product outside of the band were measured as provided in Table 7.4.2 and associated plots and referenced to the highest emission level measured within the authorized band.
- 7.4.2.6 The above procedure was repeated with the EUT adjusted to produce maximum RF output power at the highest carrier frequency.
- 7.4.2.7 The above procedure was repeated with the frequency hopping function enabled.

Figure 7.4.1 Band edge emission test setup





| | | | |
|----------------------------|------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(d) / RSS-247 section 5.5, Band edge emissions | | |
| Test procedure: | ANSI C63.10 section 11.12.1 | | |
| Test mode: | Compliance | Verdict: PASS | |
| Date(s): | 30-Jun-15 | | |
| Temperature: 23 °C | Air Pressure: 1008 hPa | Relative Humidity: 48 % | Power Supply: 120 VAC |
| Remarks: | | | |

Table 7.4.2 Band edge emission test results

ASSIGNED FREQUENCY RANGE: 2400-2483.5 MHz
 DETECTOR USED: Peak
 MODULATING SIGNAL: PRBS
 RESOLUTION BANDWIDTH: ≥ 1% of the span
 VIDEO BANDWIDTH: ≥ RBW

MODE: 802.11b

| Frequency, MHz | Band edge emission, dB(μV/m) | Emission at carrier, dB(μV/m) | Attenuation below carrier, dBc | Limit, dBc | Margin, dB* | Verdict |
|----------------|------------------------------|-------------------------------|--------------------------------|------------|-------------|---------|
| 2.400 | 58.29 | 99.80 | 41.51 | 20.00 | -21.51 | Pass |

| Frequency, MHz | Band edge emission, dBμV/m, peak | Limit, dBμV/m | Margin, dB** | Band edge emission, dBμV/m, average | Limit, dBμV/m | Margin, dB** | Verdict |
|----------------|----------------------------------|---------------|--------------|-------------------------------------|---------------|--------------|---------|
| 2.3890 | 55.42 | 74 | -18.58 | 48.10 | 54 | -5.90 | Pass |
| 2483.5 | 57.09 | | -16.91 | 49.52 | | -4.48 | |

MODE: 802.11g

| Frequency, MHz | Band edge emission, dB(μV/m) | Emission at carrier, dB(μV/m) | Attenuation below carrier, dBc | Limit, dBc | Margin, dB* | Verdict |
|----------------|------------------------------|-------------------------------|--------------------------------|------------|-------------|---------|
| 2.400 | 64.38 | 97.96 | 33.58 | 20.00 | -13.58 | Pass |

| Frequency, MHz | Band edge emission, dBμV/m, peak | Limit, dBμV/m | Margin, dB** | Band edge emission, dBμV/m, average | Limit, dBμV/m | Margin, dB** | Verdict |
|----------------|----------------------------------|---------------|--------------|-------------------------------------|---------------|--------------|---------|
| 2.3890 | 63.52 | 74 | -10.48 | 46.57 | 54 | -7.43 | Pass |
| 2483.5 | 68.32 | | -5.68 | 51.22 | | -2.78 | |

MODE: 802.11n HT20

| Frequency, MHz | Band edge emission, dB(μV/m) | Emission at carrier, dB(μV/m) | Attenuation below carrier, dBc | Limit, dBc | Margin, dB* | Verdict |
|----------------|------------------------------|-------------------------------|--------------------------------|------------|-------------|---------|
| 2400 | 67.51 | 98.89 | 31.38 | 20.00 | -11.38 | Pass |

| Frequency, MHz | Band edge emission, dBμV/m, peak | Limit, dBμV/m | Margin, dB** | Band edge emission, dBμV/m, average | Limit, dBμV/m | Margin, dB** | Verdict |
|----------------|----------------------------------|---------------|--------------|-------------------------------------|---------------|--------------|---------|
| 2.3890 | 69.99 | 74 | -4.01 | 51.68 | 54 | -2.32 | Pass |
| 2483.5 | 68.92 | | -5.08 | 49.59 | | -4.41 | |

MODE: 802.11n HT40

| Frequency, MHz | Band edge emission, dB(μV/m) | Emission at carrier, dB(μV/m) | Attenuation below carrier, dBc | Limit, dBc | Margin, dB* | Verdict |
|----------------|------------------------------|-------------------------------|--------------------------------|------------|-------------|---------|
| 2.400 | 66.18 | 93.35 | 27.17 | 20.00 | -7.17 | Pass |

| Frequency, MHz | Band edge emission, dBμV/m, peak | Limit, dBμV/m | Margin, dB** | Band edge emission, dBμV/m, average | Limit, dBμV/m | Margin, dB** | Verdict |
|----------------|----------------------------------|---------------|--------------|-------------------------------------|---------------|--------------|---------|
| 2.3890 | 67.18 | 74 | -6.82 | 53.90 | 54 | -0.10 | Pass |
| 2483.5 | 66.04 | | -7.96 | 48.78 | | -5.22 | |

Reference numbers of test equipment used

| | | | | | | |
|---------|---------|---------|---------|---------|--|--|
| HL 0521 | HL 1984 | HL 4114 | HL 4353 | HL 4722 | | |
|---------|---------|---------|---------|---------|--|--|

Full description is given in Appendix A.

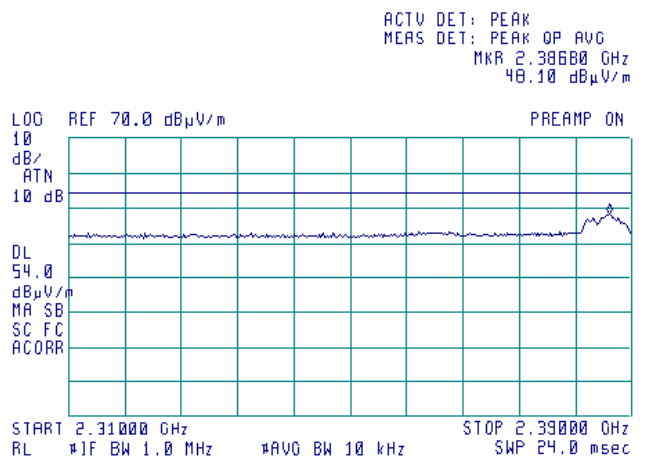
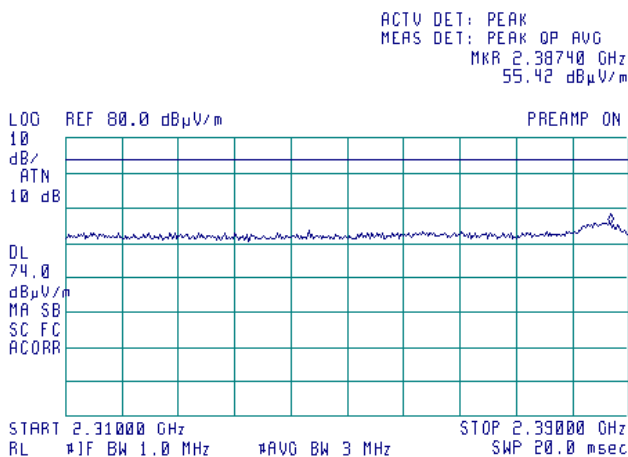
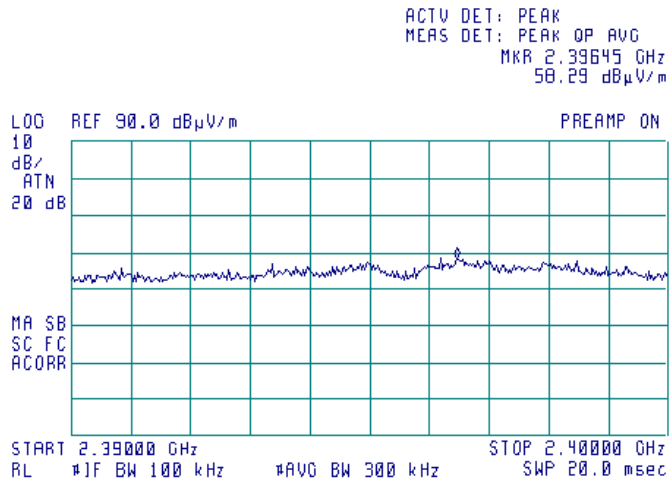


HERMON LABORATORIES

| | | | |
|---------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Band edge emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 30-Jun-15 | | | |
| Temperature: 23 °C | Air Pressure: 1008 hPa | Relative Humidity: 48 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.4.1 The highest emission level within the assigned band at low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11b



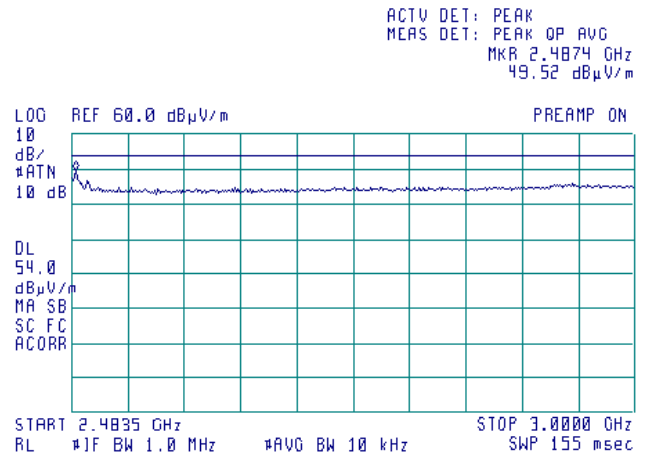
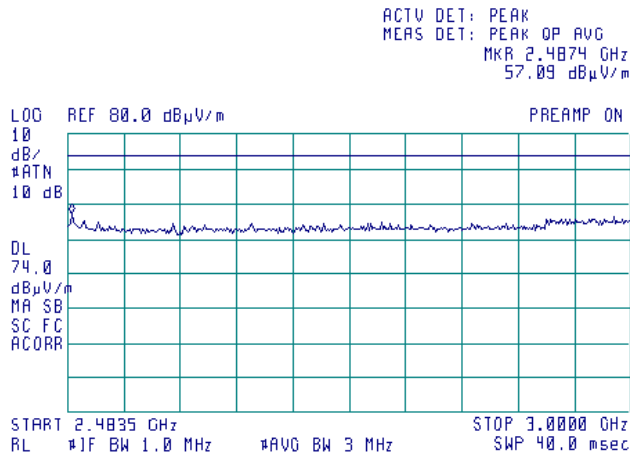


HERMON LABORATORIES

| | | | |
|---------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Band edge emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 30-Jun-15 | | | |
| Temperature: 23 °C | Air Pressure: 1008 hPa | Relative Humidity: 48 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.4.2 The highest emission level within the assigned band at high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
WiFi Standard 802.11b



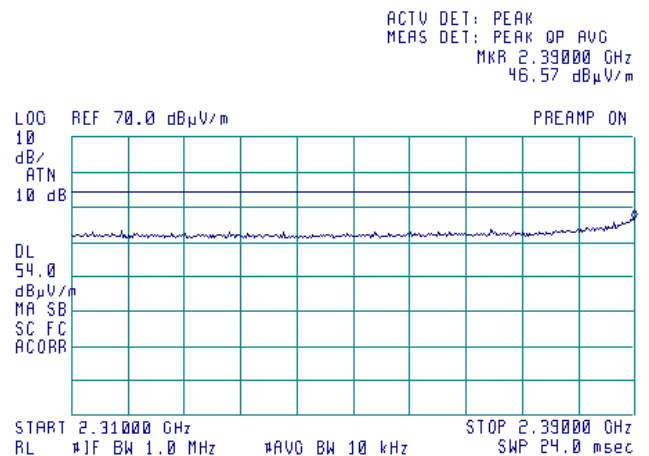
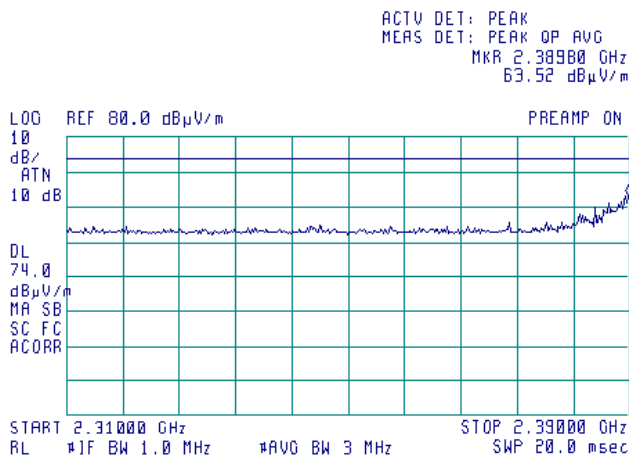
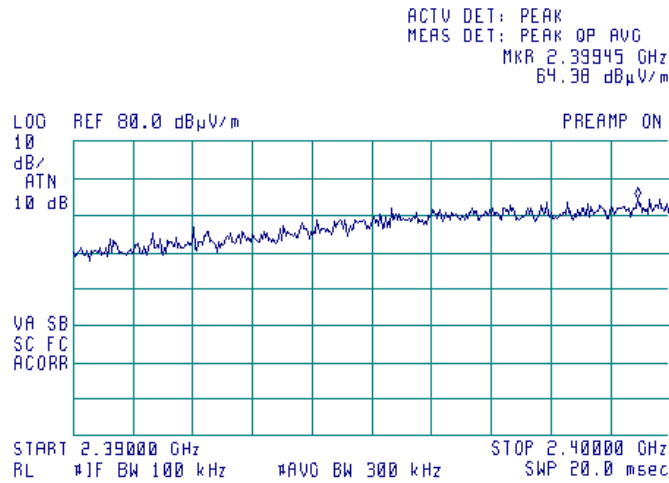


HERMON LABORATORIES

| | | | |
|---------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Band edge emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 30-Jun-15 | | | |
| Temperature: 23 °C | Air Pressure: 1008 hPa | Relative Humidity: 48 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.4.3 The highest emission level within the assigned band at low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11g



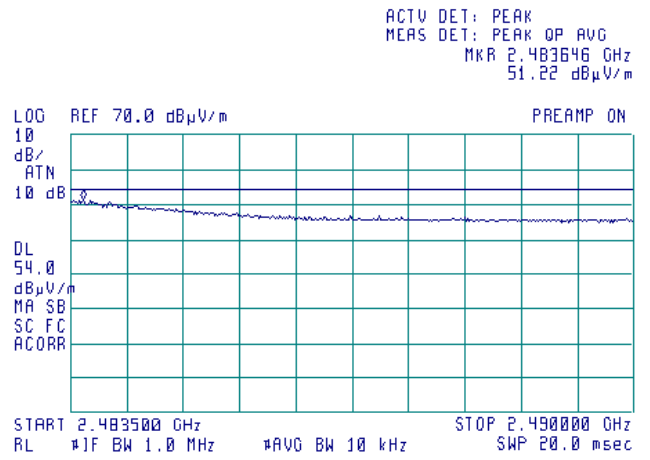
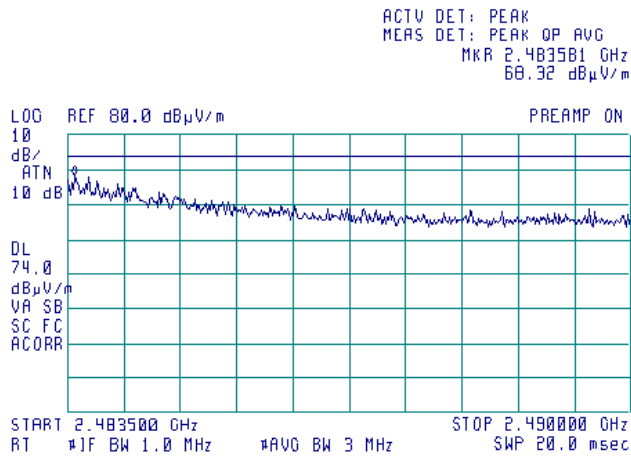


HERMON LABORATORIES

| | | | |
|---------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Band edge emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 30-Jun-15 | | | |
| Temperature: 23 °C | Air Pressure: 1008 hPa | Relative Humidity: 48 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.4.4 The highest emission level within the assigned band at high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11g



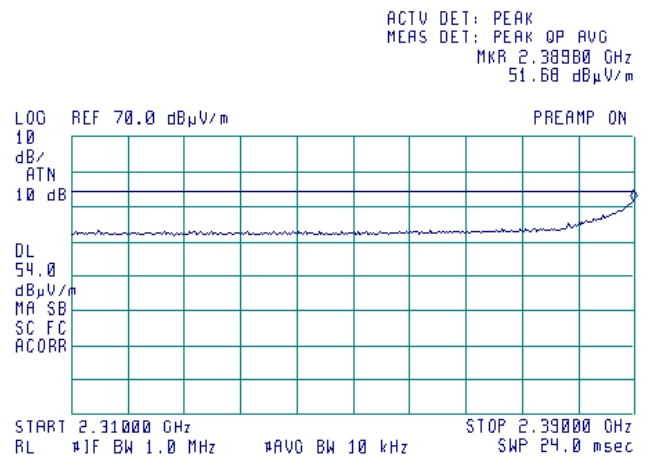
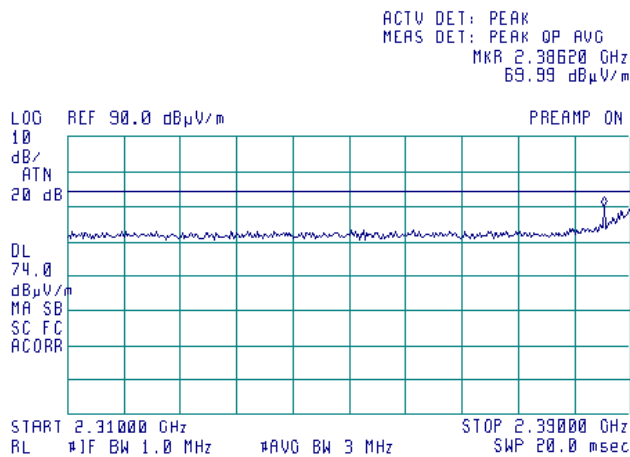
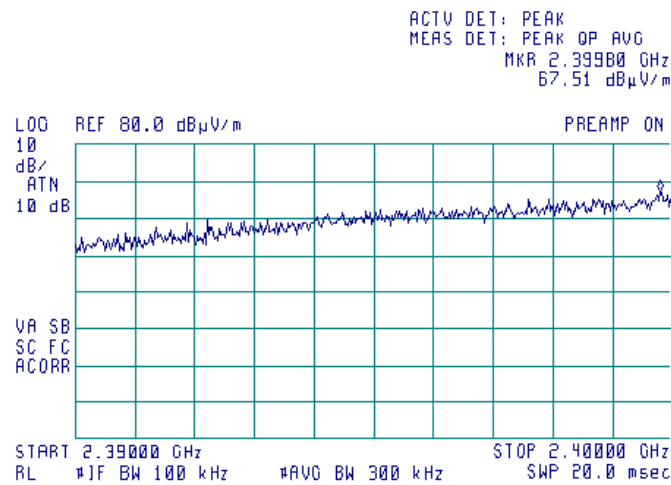


HERMON LABORATORIES

| | | | |
|---------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Band edge emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 30-Jun-15 | | | |
| Temperature: 23 °C | Air Pressure: 1008 hPa | Relative Humidity: 48 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.4.5 The highest emission level within the assigned band at low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT20



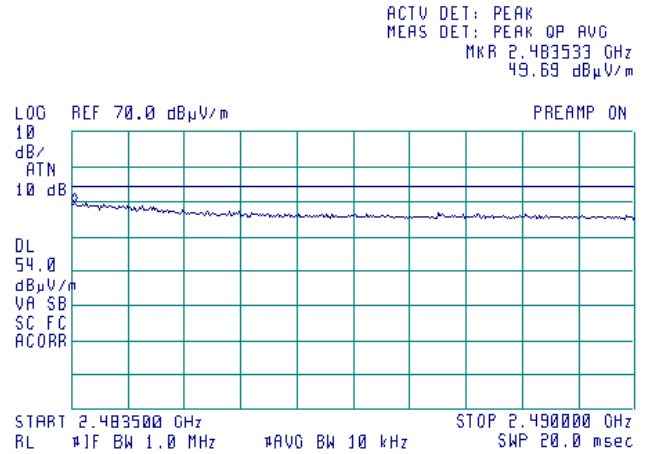
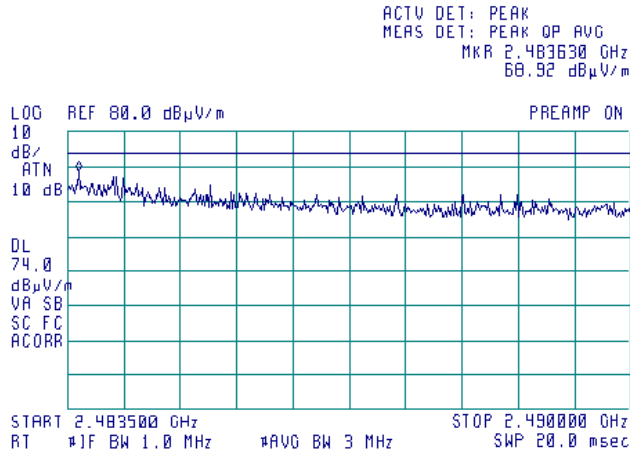


HERMON LABORATORIES

| | | | |
|---------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Band edge emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 30-Jun-15 | | | |
| Temperature: 23 °C | Air Pressure: 1008 hPa | Relative Humidity: 48 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.4.6 The highest emission level within the assigned band at high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT20



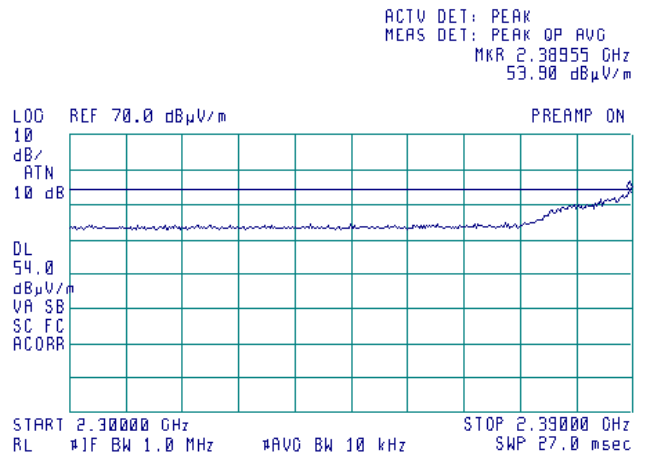
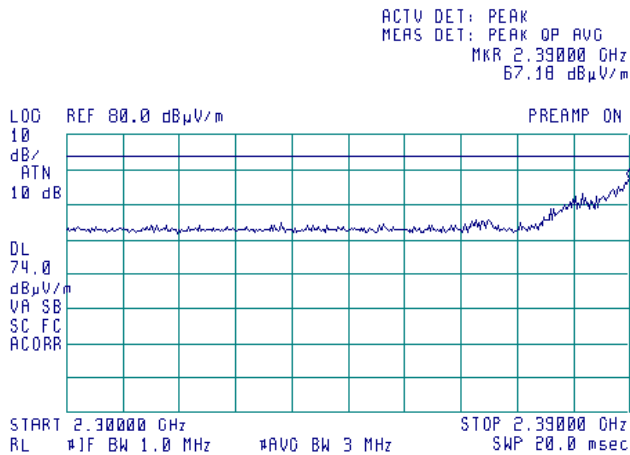
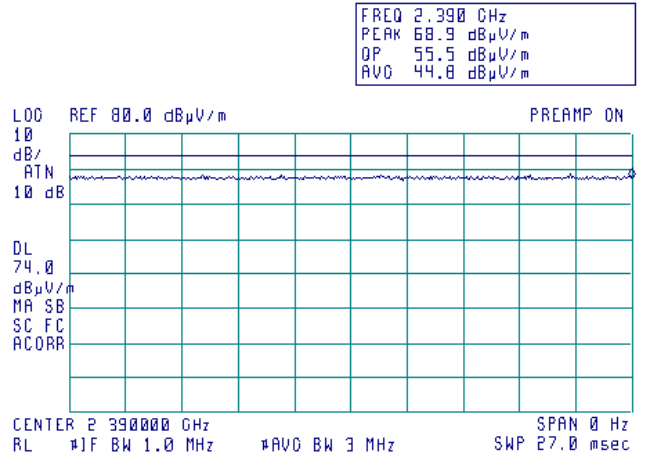
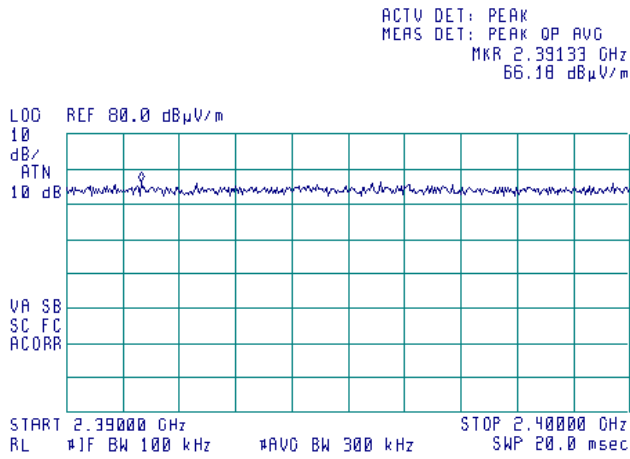


HERMON LABORATORIES

| | |
|---------------------------------------------------------------------------------------------|--------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Band edge emissions | |
| Test procedure: ANSI C63.10 section 11.12.1 | |
| Test mode: Compliance | Verdict: PASS |
| Date(s): 30-Jun-15 | |
| Temperature: 23 °C | Air Pressure: 1008 hPa |
| | Relative Humidity: 48 % |
| | Power Supply: 120 VAC |
| Remarks: | |

Plot 7.4.7 The highest emission level within the assigned band at low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT40



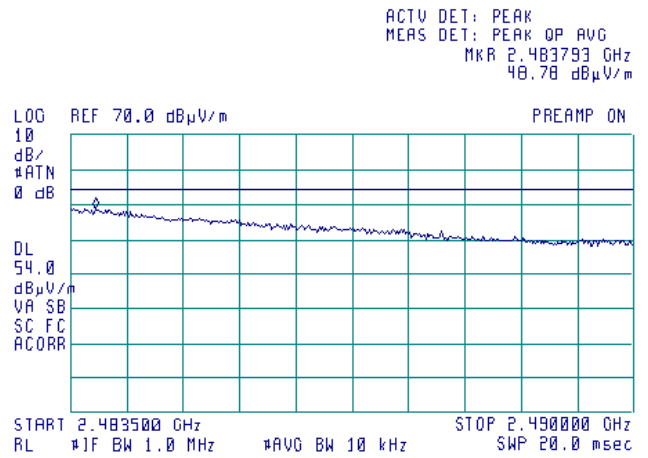
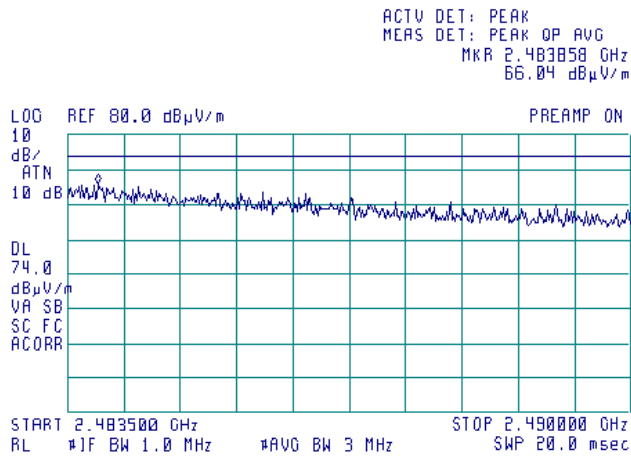


HERMON LABORATORIES

| | | | |
|---------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(d) / RSS-247 section 5.5, Band edge emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 30-Jun-15 | | | |
| Temperature: 23 °C | Air Pressure: 1008 hPa | Relative Humidity: 48 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.4.8 The highest emission level within the assigned band at high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT40





| | | | |
|----------------------------|--|---------------------------------------------------------------------------|--|
| Test specification: | | FCC section 15.247(e) / RSS-247 section 5.2(2), Peak power density | |
| Test procedure: | | ANSI C63.10 section 11.10.2 | |
| Test mode: | | Compliance | |
| Date(s): | | 30-Jun-15 | |
| Temperature: 25 °C | | Air Pressure: 1008 hPa | |
| Remarks: | | Verdict: PASS | |
| | | Relative Humidity: 45 % | |
| | | Power Supply: 120 VAC | |

7.5 Peak spectral power density

7.5.1 General

This test was performed to measure the peak spectral power density radiated by the transmitter RF antenna. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Peak spectral power density limits

| Assigned frequency range, MHz | Measurement bandwidth, kHz | Peak spectral power density, dBm | Equivalent field strength limit @ 3m, dB(μV/m)* |
|-------------------------------|----------------------------|----------------------------------|-------------------------------------------------|
| 902.0 – 928.0 | 3.0 | 8.0 | 103.2 |
| 2400.0 – 2483.5 | | | |
| 5725.0 – 5850.0 | | | |

* - Equivalent field strength limit was calculated from the peak spectral power density as follows: $E = \sqrt{30 \times P} / r$, where P is peak spectral power density and r is antenna to EUT distance in meters.

7.5.2 Test procedure for field strength measurements

7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized and its proper operation was checked.

7.5.2.2 The EUT was adjusted to produce maximum available to end user RF output power.

7.5.2.3 The field strength of the EUT carrier frequency was measured with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360° and the measuring antenna height was swept in both vertical and horizontal polarizations.

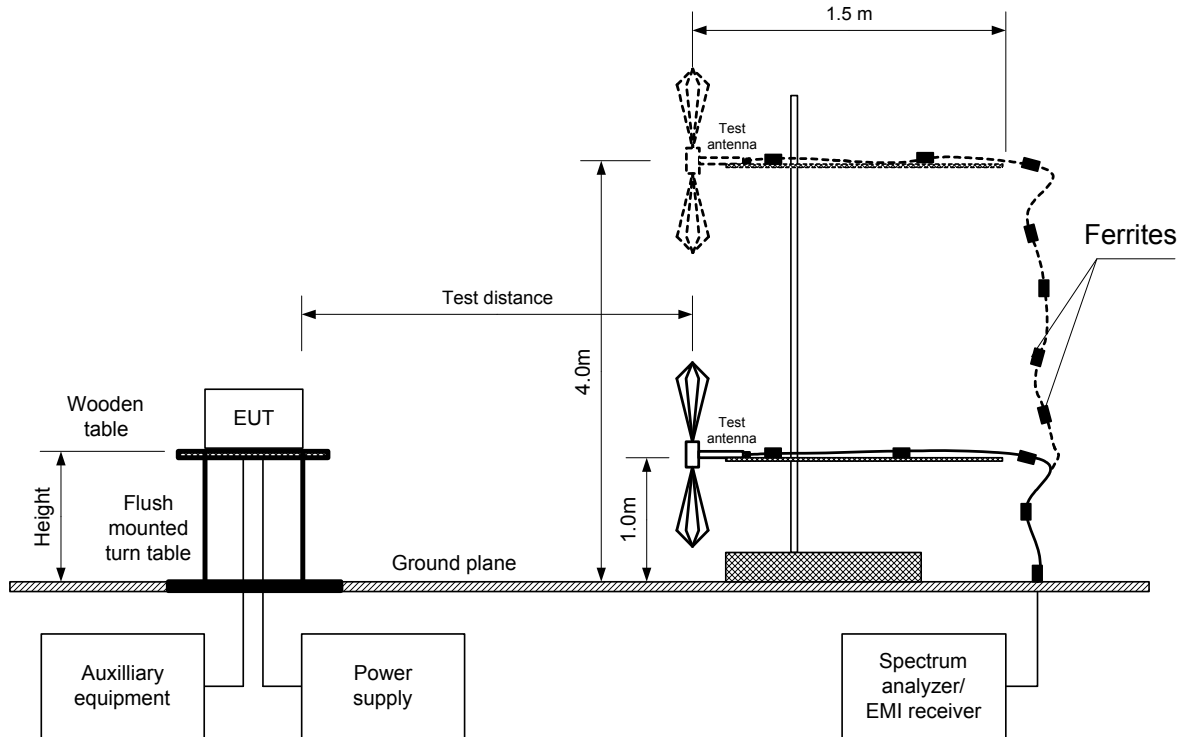
7.5.2.4 The frequency span of spectrum analyzer was set to capture the entire 6 dB band of the transmitter, in peak hold mode with resolution bandwidth set to 3.0 kHz, video bandwidth wider than resolution bandwidth, auto sweep time and sufficient number of sweeps was allowed for trace stabilization. The spectrum lines spacing was verified to be wider than 3 kHz. Otherwise the resolution bandwidth was reduced until individual spectrum lines were resolved and the power of individual spectrum lines was integrated over 3 kHz band.

7.5.2.5 The peak of emission was zoomed with span set just wide enough to capture the emission peak area and sweep time was set equal to span width divided by resolution bandwidth. Spectrum analyzer was set in peak hold mode, sufficient number of sweeps was allowed for trace stabilization and peak spectral power density was measured as provided in Table 7.5.2 and associated plots.



| | | | |
|----------------------------|---------------------------------------------------------------------------|--------------------------------|------------------------------|
| Test specification: | FCC section 15.247(e) / RSS-247 section 5.2(2), Peak power density | | |
| Test procedure: | ANSI C63.10 section 11.10.2 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 30-Jun-15 | | |
| Temperature: 25 °C | Air Pressure: 1008 hPa | Relative Humidity: 45 % | Power Supply: 120 VAC |
| Remarks: | | | |

Figure 7.5.1 Setup for carrier field strength measurements





| | | | |
|-----------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(e) / RSS-247 section 5.2(2), Peak power density | | | |
| Test procedure: ANSI C63.10 section 11.10.2 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 30-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1008 hPa | Relative Humidity: 45 % | Power Supply: 120 VAC |
| Remarks: | | | |

Table 7.5.2 Field strength measurement of peak spectral power density

ASSIGNED FREQUENCY: 2400-2483.5 MHz
 TEST DISTANCE: 3 m
 TEST SITE: Semi anechoic chamber
 EUT HEIGHT: 0.8 m
 DETECTOR USED: RMS
 RESOLUTION BANDWIDTH: 10 kHz
 VIDEO BANDWIDTH: 30 kHz
 TEST ANTENNA TYPE: Double ridged guide (above 1000 MHz)

MODE: 802.11b

| Frequency, MHz | Field strength, dB(μV/m) | EUT antenna gain, dBi | Limit, dB(μV/m) | Margin, dB* | Antenna polarization | Antenna height, m | Turn-table position**, degrees |
|----------------|--------------------------|-----------------------|-----------------|-------------|----------------------|-------------------|--------------------------------|
| 2409.00 | 90.25 | 0 | 103.2 | -12.95 | Horizontal | 2.1 | 185 |
| 2438.13 | 91.98 | 0 | 103.2 | -11.22 | Horizontal | 3.0 | 275 |
| 2462.75 | 93.21 | 0 | 103.2 | -9.99 | Horizontal | 2.4 | 180 |

MODE: 802.11g

| Frequency, MHz | Field strength, dB(μV/m) | EUT antenna gain, dBi | Limit, dB(μV/m) | Margin, dB* | Antenna polarization | Antenna height, m | Turn-table position**, degrees |
|----------------|--------------------------|-----------------------|-----------------|-------------|----------------------|-------------------|--------------------------------|
| 2413.00 | 89.81 | 0 | 103.2 | -13.39 | Horizontal | 2.8 | 182 |
| 2438.38 | 89.49 | 0 | 103.2 | -13.71 | Horizontal | 3.3 | 277 |
| 2463.25 | 88.29 | 0 | 103.2 | -14.91 | Horizontal | 3.2 | 300 |

MODE: 802.11n HT20

| Frequency, MHz | Field strength, dB(μV/m) | EUT antenna gain, dBi | Limit, dB(μV/m) | Margin, dB* | Antenna polarization | Antenna height, m | Turn-table position**, degrees |
|----------------|--------------------------|-----------------------|-----------------|-------------|----------------------|-------------------|--------------------------------|
| 2407.63 | 89.10 | 0 | 103.2 | -14.10 | Horizontal | 2.6 | 330 |
| 2435.75 | 99.70 | 0 | 103.2 | -3.50 | Horizontal | 3.5 | 350 |
| 2459.88 | 88.79 | 0 | 103.2 | -14.41 | Horizontal | 3.0 | 340 |

MODE: 802.11n HT40

| Frequency, MHz | Field strength, dB(μV/m) | EUT antenna gain, dBi | Limit, dB(μV/m) | Margin, dB* | Antenna polarization | Antenna height, m | Turn-table position**, degrees |
|----------------|--------------------------|-----------------------|-----------------|-------------|----------------------|-------------------|--------------------------------|
| 2417.10 | 82.96 | 0 | 103.2 | -20.24 | Horizontal | 3.5 | 304 |
| 2434.60 | 82.28 | 0 | 103.2 | -20.92 | Horizontal | 3.0 | 350 |
| 2459.20 | 83.94 | 0 | 103.2 | -19.26 | Horizontal | 2.8 | 350 |

*- Margin = Field strength - EUT antenna gain - calculated field strength limit.

** - EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

| | | | | | | | |
|---------|---------|---------|---------|--|--|--|--|
| HL 4114 | HL 4353 | HL 4575 | HL 4922 | | | | |
|---------|---------|---------|---------|--|--|--|--|

Full description is given in Appendix A.

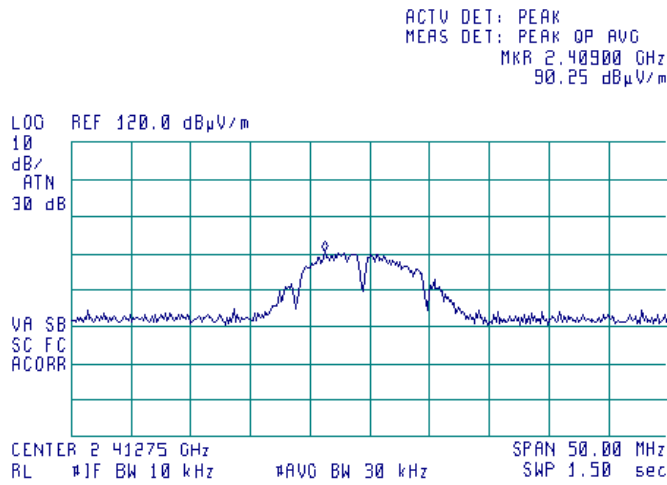


HERMON LABORATORIES

| | | | |
|--------------------------------|--|---------------------------------------------------------------------------|--|
| Test specification: | | FCC section 15.247(e) / RSS-247 section 5.2(2), Peak power density | |
| Test procedure: | | ANSI C63.10 section 11.10.2 | |
| Test mode: | | Compliance | |
| Date(s): | | 30-Jun-15 | |
| Temperature: 25 °C | | Air Pressure: 1008 hPa | |
| Relative Humidity: 45 % | | Power Supply: 120 VAC | |
| Remarks: | | | |

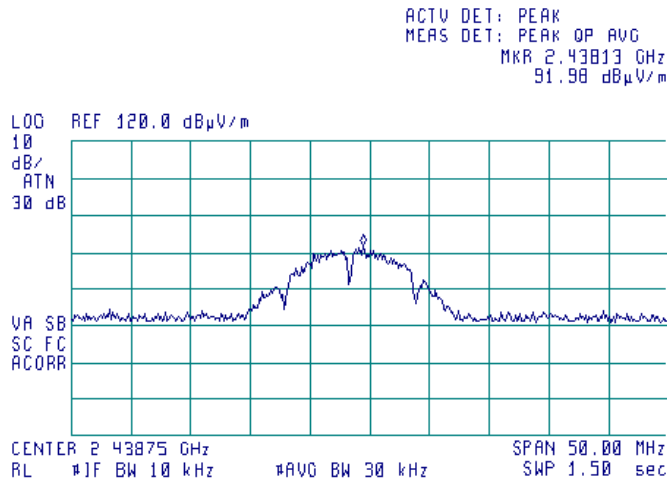
Plot 7.5.1 Peak spectral power density at low frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11b



Plot 7.5.2 Peak spectral power density at mid frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11b





HERMON LABORATORIES

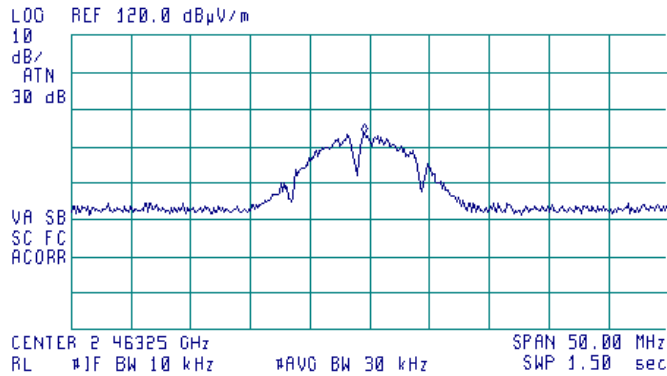
| | | | |
|-----------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(e) / RSS-247 section 5.2(2), Peak power density | | | |
| Test procedure: ANSI C63.10 section 11.10.2 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 30-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1008 hPa | Relative Humidity: 45 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.5.3 Peak spectral power density at high frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11b



ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.46275 GHz
93.21 dBµV/m

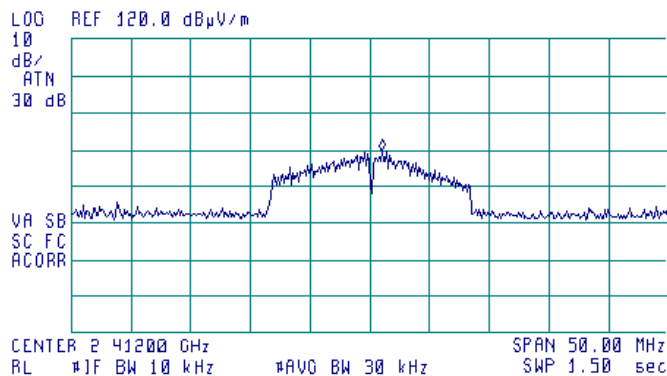


Plot 7.5.4 Peak spectral power density at low frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11g



ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.41300 GHz
89.81 dBµV/m





HERMON LABORATORIES

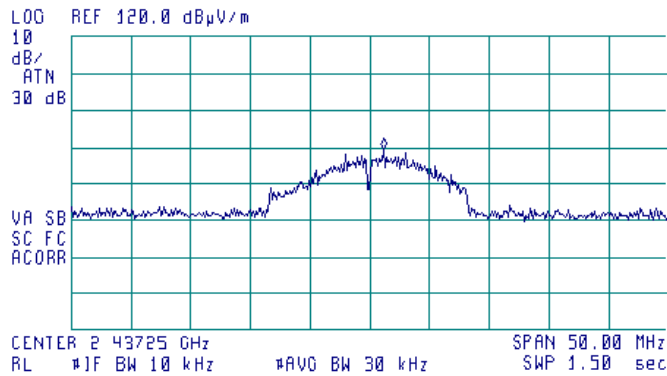
| | | | |
|--------------------------------|--|---------------------------------------------------------------------------|--|
| Test specification: | | FCC section 15.247(e) / RSS-247 section 5.2(2), Peak power density | |
| Test procedure: | | ANSI C63.10 section 11.10.2 | |
| Test mode: | | Compliance | |
| Date(s): | | 30-Jun-15 | |
| Temperature: 25 °C | | Air Pressure: 1008 hPa | |
| Relative Humidity: 45 % | | Power Supply: 120 VAC | |
| Remarks: | | | |

Plot 7.5.5 Peak spectral power density at mid frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11g



ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.43838 GHz
89.49 dBµV/m

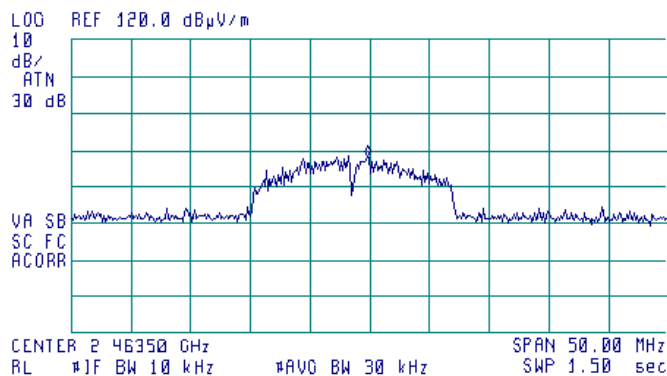


Plot 7.5.6 Peak spectral power density at high frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11g



ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.46325 GHz
88.29 dBµV/m





HERMON LABORATORIES

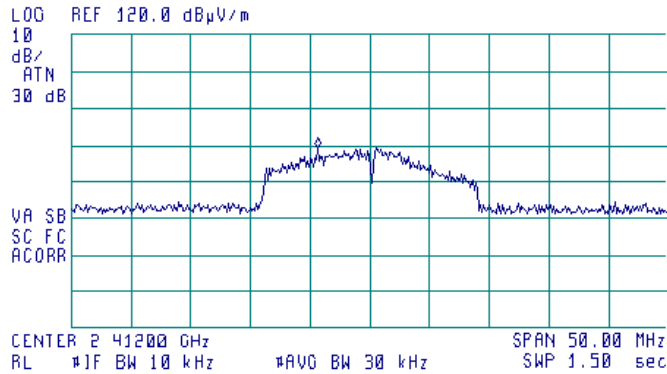
| | | | |
|-----------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(e) / RSS-247 section 5.2(2), Peak power density | | | |
| Test procedure: ANSI C63.10 section 11.10.2 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 30-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1008 hPa | Relative Humidity: 45 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.5.7 Peak spectral power density at low frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT20



ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.40763 GHz
89.10 dBµV/m

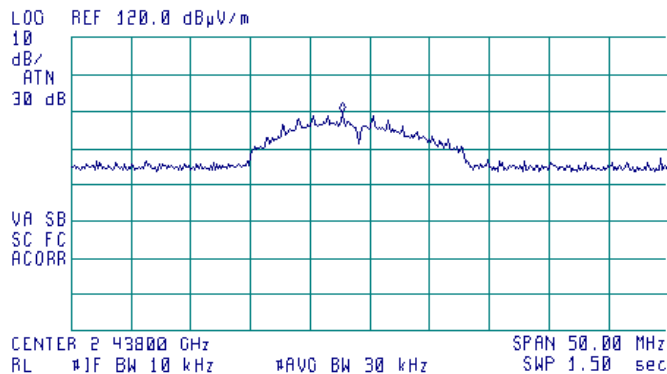


Plot 7.5.8 Peak spectral power density at mid frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT20



ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.43575 GHz
99.70 dBµV/m



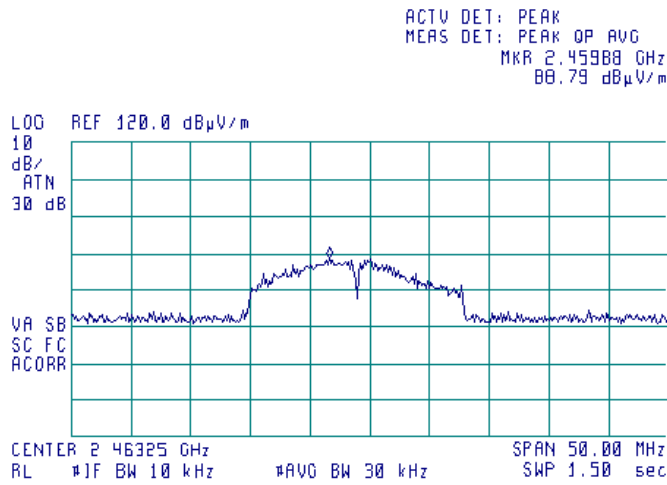


HERMON LABORATORIES

| | | | |
|-----------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(e) / RSS-247 section 5.2(2), Peak power density | | | |
| Test procedure: ANSI C63.10 section 11.10.2 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 30-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1008 hPa | Relative Humidity: 45 % | Power Supply: 120 VAC |
| Remarks: | | | |

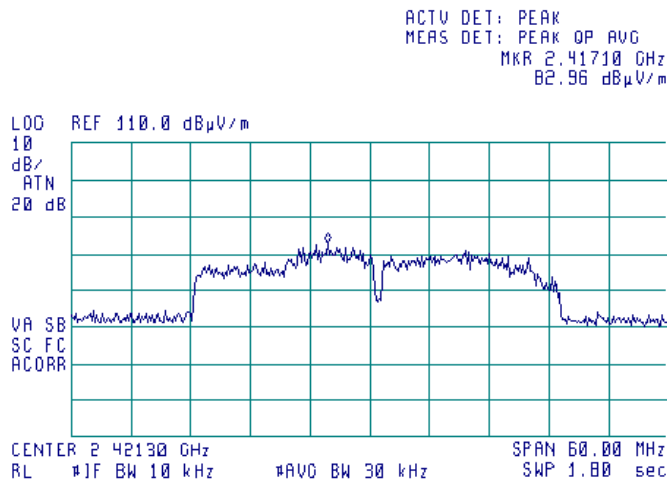
Plot 7.5.9 Peak spectral power density at high frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT20



Plot 7.5.10 Peak spectral power density at low frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 802.11n HT40



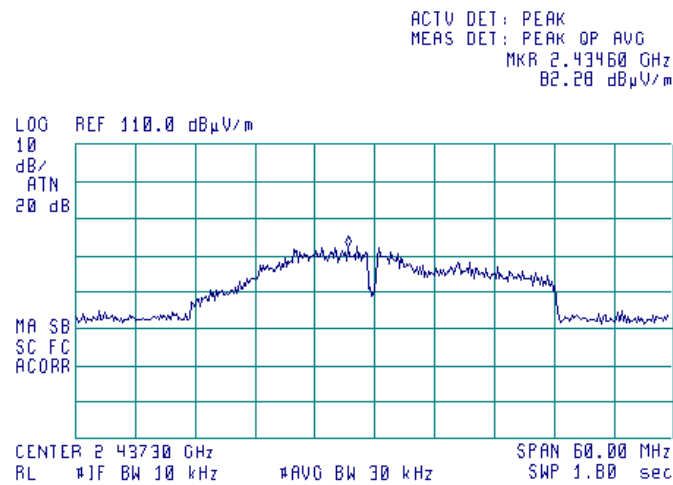


HERMON LABORATORIES

| | | | |
|-----------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: FCC section 15.247(e) / RSS-247 section 5.2(2), Peak power density | | | |
| Test procedure: ANSI C63.10 section 11.10.2 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 30-Jun-15 | | | |
| Temperature: 25 °C | Air Pressure: 1008 hPa | Relative Humidity: 45 % | Power Supply: 120 VAC |
| Remarks: | | | |

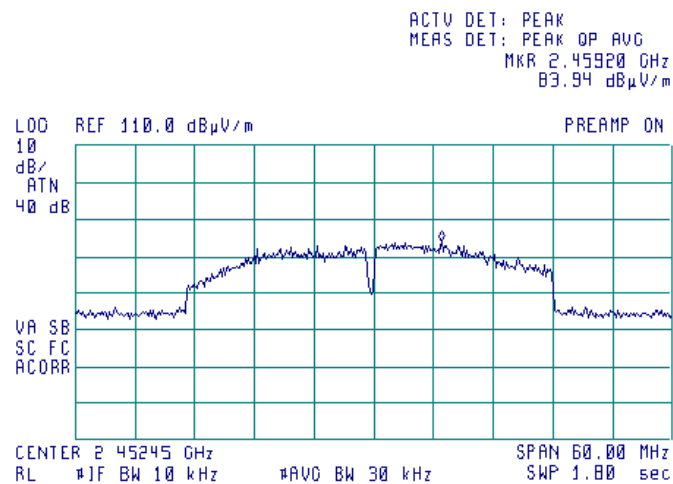
Plot 7.5.11 Peak spectral power density at mid frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT40



Plot 7.5.12 Peak spectral power density at high frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODE: 802.11n HT40





| | | | |
|--------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: Section 15.203, RSS-Gen section 8.3, Antenna requirements | | | |
| Test procedure: | | | |
| Test mode: | Compliance | Verdict: PASS | |
| Date(s): | 22-Apr-15 | | |
| Temperature: 23 °C | Air Pressure: 1010 hPa | Relative Humidity: 60 % | Power Supply: 120 VAC |
| Remarks: | | | |

7.6 Antenna requirements

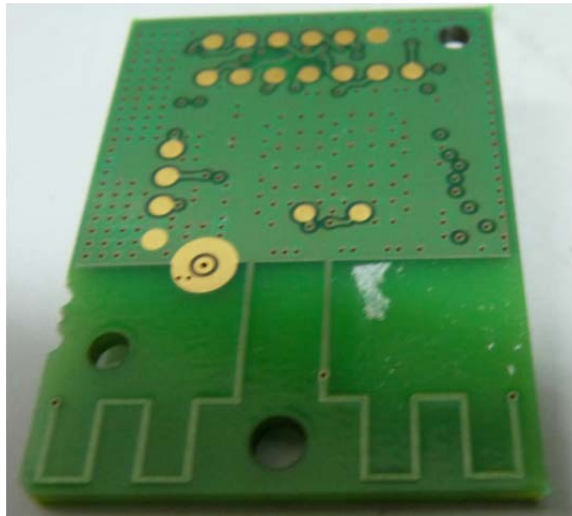
The EUT was verified for compliance with antenna requirements. A transmitter shall be designed to ensure that no antenna other than that furnished by the responsible party will be used with the device. It may be either permanently attached or employs a unique antenna connector for every antenna proposed for use with the EUT. This requirement does not apply to professionally installed transmitters.

The rationale for compliance with the above requirements was either visual inspection results or supplier declaration. The summary of results is provided in Table 7.6.1.

Table 7.6.1 Antenna requirements

| Requirement | Rationale | Verdict |
|----------------------------------------------------|-------------------|---------|
| The transmitter antenna is permanently attached | Visual inspection | Comply |
| The transmitter employs a unique antenna connector | NA | |
| The transmitter requires professional installation | NA | |

Photograph 7.6.1 Antenna assembly





| | | | |
|----------------------------|--|---------------------------------------------------------------------|--|
| Test specification: | | Section 15.207(a) / RSS-Gen, Section 8.8, Conducted emission | |
| Test procedure: | | ANSI C63.4, Section 13.1.3 | |
| Test mode: | | Compliance | |
| Date(s): | | 29-Jun-15 | |
| Temperature: 22 °C | | Air Pressure: 1011 hPa | |
| | | Relative Humidity: 39 % | |
| | | Power Supply: 120 VAC | |
| Remarks: | | | |

7.7 Conducted emissions

7.7.1 General

This test was performed to measure common mode conducted emissions at the power port. Specification test limits are given in Table 7.7.1.

Table 7.7.1 Limits for conducted emissions

| Frequency, MHz | Class B limit, dB(μV) | |
|----------------|-----------------------|----------|
| | QP | AVRG |
| 0.15 - 0.5 | 66 - 56* | 56 - 46* |
| 0.5 - 5.0 | 56 | 46 |
| 5.0 - 30 | 60 | 50 |

* The limit decreases linearly with the logarithm of frequency.

7.7.2 Test procedure

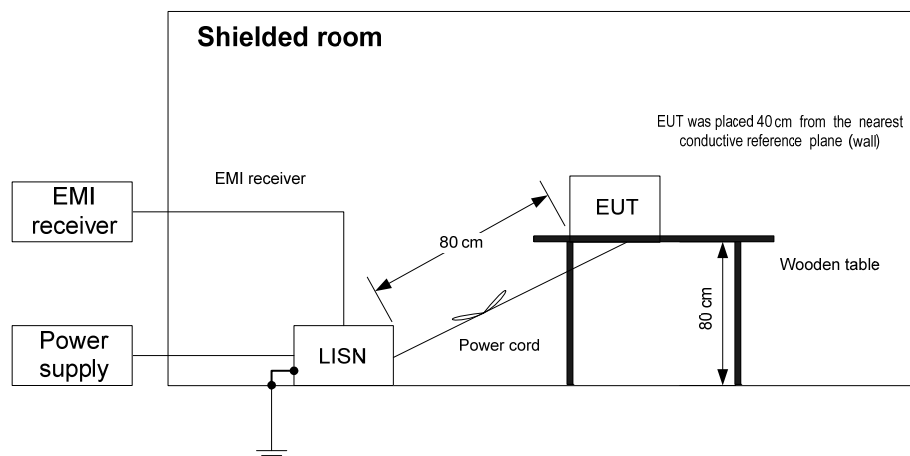
7.7.2.1 The EUT was set up as shown in Figure 7.7.1, energized and the performance check was conducted.

7.7.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 7.7.2. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.

7.7.2.3 The position of the device cables was varied to determine maximum emission level.

7.7.2.4 The worst test results (the lowest margins) were recorded in Table 7.7.2 and shown in the associated plots.

Figure 7.7.1 Setup for conducted emission measurements, table-top equipment





| | | | |
|-----------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: Section 15.207(a) / RSS-Gen, Section 8.8, Conducted emission | | | |
| Test procedure: ANSI C63.4, Section 13.1.3 | | | |
| Test mode: Compliance | | | Verdict: PASS |
| Date(s): 29-Jun-15 | | | |
| Temperature: 22 °C | Air Pressure: 1011 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Table 7.7.2 Conducted emission test results

LINE: AC mains
 EUT OPERATING MODE: Transmit
 EUT SET UP: TABLE-TOP
 TEST SITE: SHIELDED ROOM
 DETECTORS USED: PEAK / QUASI-PEAK / AVERAGE
 FREQUENCY RANGE: 150 kHz - 30 MHz
 RESOLUTION BANDWIDTH: 9 kHz

| Frequency, MHz | Peak emission, dB(µV) | Quasi-peak | | | Average | | | Line ID | Verdict |
|----------------|-----------------------|---------------------------|---------------|-------------|---------------------------|---------------|-------------|---------|---------|
| | | Measured emission, dB(µV) | Limit, dB(µV) | Margin, dB* | Measured emission, dB(µV) | Limit, dB(µV) | Margin, dB* | | |
| 0.150 | 53.02 | 51.09 | 66.00 | -14.91 | 38.45 | 56.00 | -17.55 | L1 | Pass |
| 0.160 | 50.67 | 43.35 | 65.48 | -22.13 | 28.74 | 55.48 | -26.74 | | |
| 0.189 | 47.92 | 42.50 | 64.05 | -21.55 | 26.00 | 54.05 | -28.05 | | |
| 0.409 | 37.40 | 32.88 | 57.68 | -24.80 | 23.67 | 47.68 | -24.01 | | |
| 7.805 | 29.73 | 25.47 | 60.00 | -34.53 | 17.33 | 50.00 | -32.67 | | |
| 0.150 | 52.73 | 50.78 | 65.96 | -15.18 | 35.23 | 55.96 | -20.73 | L2 | Pass |
| 0.163 | 52.86 | 43.57 | 65.35 | -21.78 | 22.17 | 55.35 | -33.18 | | |
| 0.194 | 48.54 | 45.03 | 63.88 | -18.85 | 26.95 | 53.88 | -26.93 | | |
| 0.280 | 39.65 | 37.42 | 60.85 | -23.43 | 18.12 | 50.85 | -32.73 | | |
| 0.510 | 28.69 | 25.27 | 56.00 | -30.73 | 13.29 | 46.00 | -32.71 | | |
| 0.597 | 27.47 | 21.83 | 56.00 | -34.17 | 10.33 | 46.00 | -35.67 | | |

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

| | | | | | | | |
|---------|---------|---------|---------|---------|---------|--|--|
| HL 0447 | HL 1425 | HL 1513 | HL 3612 | HL 3774 | HL 4527 | | |
|---------|---------|---------|---------|---------|---------|--|--|

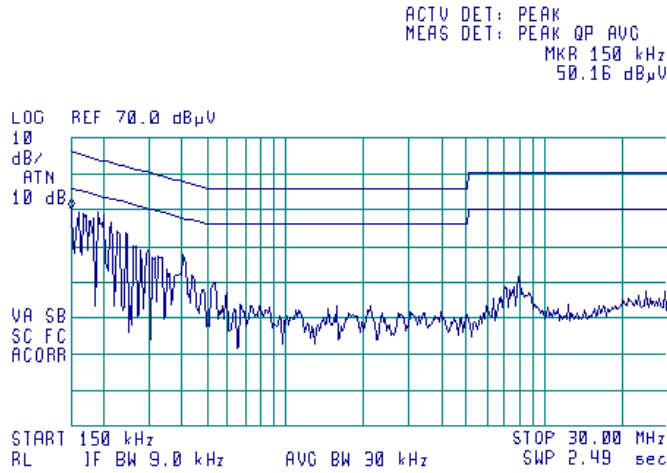
Full description is given in Appendix A.



| | | | |
|-----------------------------------------------------------------------------------------|-------------------------------|--------------------------------|------------------------------|
| Test specification: Section 15.207(a) / RSS-Gen, Section 8.8, Conducted emission | | | |
| Test procedure: ANSI C63.4, Section 13.1.3 | | | |
| Test mode: Compliance | Verdict: PASS | | |
| Date(s): 29-Jun-15 | | | |
| Temperature: 22 °C | Air Pressure: 1011 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

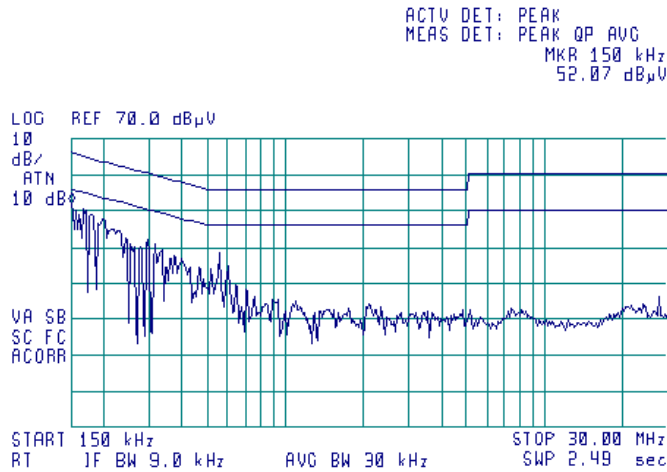
Plot 7.7.1 Conducted emission measurements

LINE: L1
EUT OPERATING MODE: Transmit
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



Plot 7.7.2 Conducted emission measurements

LINE: L2
EUT OPERATING MODE: Transmit
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



**8 APPENDIX A Test equipment and ancillaries used for tests**

| HL No | Description | Manufacturer | Model | Ser. No. | Last Cal./ Check | Due Cal./ Check |
|-------|-----------------------------------------------------------------------|-----------------------|---------------------|-----------------------------------|------------------|-----------------|
| 0446 | Antenna, Loop, Active, 10 kHz - 30 MHz | EMCO | 6502 | 2857 | 13-Jan-15 | 13-Jan-16 |
| 0447 | LISN, 16/2, 300V RMS, 50 Ohm/50 uH + 5 Ohm, STD CISPR 16-1 | Hermon Laboratories | LISN 16 - 1 | 066 | 13-Oct-15 | 13-Oct-16 |
| 0521 | EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz | Hewlett Packard | 8546A | 3617A 00319, 3448A002 53 | 22-Oct-14 | 22-Oct-15 |
| 0604 | Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz | EMCO | 3141 | 9611-1011 | 15-May-15 | 15-May-16 |
| 0768 | Antenna Standard Gain Horn, 18-26.5 GHz, WR-42, 25 dB gain | Quinstar Technology | QWH-4200-BA | 110 | 25-Dec-14 | 25-Dec-15 |
| 1425 | EMI Receiver, 9 kHz - 2.9 GHz, System: HL1426, HL1427 | Agilent Technologies | 8542E | 3710A002 22, 3705A002 04 | 24-Dec-14 | 24-Dec-15 |
| 1513 | Cable RF, 8 m, BNC/BNC | Belden | M17/167 MIL-C-17 | 1513 | 08-Sep-15 | 08-Sep-16 |
| 1984 | Antenna, Double-Ridged Waveguide Horn, 1 to 18 GHz, 300 W | EMC Test Systems | 3115 | 9911-5964 | 17-Apr-15 | 17-Apr-16 |
| 3612 | Cable RF, 17.5 m, N type-N type | Teldor | RG-214/U | NA | 07-Dec-14 | 07-Dec-15 |
| 3774 | Attenuator, N-type, 10 dB, DC to 18 GHz, 5 W | Mini-Circuits | BW-N10W5+ | NA | 30-Dec-14 | 30-Dec-15 |
| 3818 | PSA Series Spectrum Analyzer, 3 Hz- 44 GHz | Agilent Technologies | E4446A | MY482502 88 | 29-Apr-15 | 29-Apr-16 |
| 3901 | Microwave Cable Assembly, 40.0 GHz, 3.5 m, SMA/SMA | Huber-Suhner | SUCOFLE X 102A | 1225/2A | 10-Feb-15 | 10-Feb-16 |
| 3903 | Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA | Huber-Suhner | SUCOFLE X 102A | 1226/2A | 10-Feb-15 | 10-Feb-16 |
| 4114 | Antenna, Double-Ridged Waveguide Horn, 1 to 18 GHz | ETS Lindgren | 3117 | 00123515 | 19-Dec-14 | 19-Dec-15 |
| 4224 | Precision Fixed Attenuator, 50 Ohm, 5W, 10dB, DC to 18000 MHz | Mini-Circuits | BW-N10W5+ | NA | 09-Mar-15 | 09-Mar-16 |
| 4353 | Low Loss Armored Test Cable, DC - 18 GHz, 6.2 m, N type-M/N type-M | MegaPhase | NC29-N1N1-244 | 12025101 003 | 15-Mar-15 | 15-Mar-16 |
| 4527 | DC block , 50 Ohm, 10 MHz to 6 GHz | Mini-Circuits | BLK-6-N+ | NA | 13-Jan-15 | 13-Jan-17 |
| 4575 | EXA Signal Analyzer, 9 kHz - 26.5 GHz | Agilent Technologies | N9010A | MY480301 10 | 05-Feb-15 | 05-Feb-16 |
| 4722 | Low Loss Armored Test Cable, DC - 18 GHz, 6.2 m, N type-M/N type-M | MegaPhase | NC29-N1N1-244 | 51228701 001 | 31-Aug-15 | 31-Aug-16 |
| 4856 | Amplifier, solid state, 18 GHz to 40 GHz, 20 dBm output power | Quinstar Technology | QGW-18402023-JO | 167790010 01 | 03-Apr-15 | 03-Apr-16 |
| 4922 | Low Pass Filter, 50 Ohm, DC to 630 MHz, SMA/M-SMA/F | Mini-Circuits | VLF-630+ | NA | 01-Oct-15 | 01-Oct-17 |
| 4932 | Microwave preamplifier, 500 MHz to 18 GHz, 40 dB Gain | Com-Power Corporation | PAM-118A | 551029 | 18-Nov-14 | 18-Nov-15 |



9 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

| Test description | Expanded uncertainty |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Conducted carrier power at RF antenna connector | Below 12.4 GHz: ± 1.7 dB 12.4 GHz to 40 GHz: ± 2.3 dB |
| Conducted emissions at RF antenna connector | 9 kHz to 2.9 GHz: ± 2.6 dB 2.9 GHz to 6.46 GHz: ± 3.5 dB 6.46 GHz to 13.2 GHz: ± 4.3 dB 13.2 GHz to 22.0 GHz: ± 5.0 dB 22.0 GHz to 26.8 GHz: ± 5.5 dB 26.8 GHz to 40.0 GHz: ± 4.8 dB |
| Occupied bandwidth | ± 8.0 % |
| Duty cycle, timing (Tx ON / OFF) and average factor measurements | ± 1.0 % |
| Conducted emissions with LISN | 9 kHz to 150 kHz: ± 3.9 dB 150 kHz to 30 MHz: ± 3.8 dB |
| Radiated emissions at 3 m measuring distance Horizontal polarization | Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB |
| Vertical polarization | Biconilog antenna: ± 6.0 dB Biconical antenna: ± 5.7 dB Log periodic antenna: ± 6.0 dB Double ridged horn antenna: ± 6.0 dB |

Hermon Laboratories is accredited by A2LA for calibration according to present requirements of ISO/IEC 17025 and NCSL Z540-1. The accreditation is granted to perform calibration of parameters that are listed in the Scope of Hermon Laboratories Accreditation.

Hermon Laboratories calibrates its reference and transfer standards by calibration laboratories accredited to ISO/IEC 17025 by a mutually recognized Accreditation Body or by a recognized national metrology institute. All reference and transfer standards used in the calibration system are traceable to national or international standards.

In-house calibration of all test and measurement equipment is performed on a regular basis according to Hermon Laboratories calibration procedures, manufacturer calibration/verification procedures or procedures defined in the relevant standards. The Hermon Laboratories test and measurement equipment is calibrated within the tolerances specified by the manufacturers and/or by the relevant standards.

10 APPENDIX C Test laboratory description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, safety, environmental and telecommunication testing facility.

Hermon Laboratories is listed by the Federal Communications Commission (USA) for all parts of Code of Federal Regulations 47 (CFR 47), Registration Numbers 90624 for OATS and 90623 for the anechoic chamber; by Industry Canada for electromagnetic emissions (file number IC 2186A-1 for OATS), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, C-845 for conducted emissions site, T-1606 for conducted emissions at telecommunication ports), has a status of a Telefication - Listed Testing Laboratory, Certificate No. L138/00. The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing and environmental simulation (for exact scope please refer to Certificate No. 839.01). The FCC Designation Number is IL1001.

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Fax: +972 4628 8277
e-mail: mail@hermonlabs.com
website: www.hermonlabs.com

Person for contact: Mr. Alex Usoskin, CEO.

11 APPENDIX D Specification references

| | |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RSS-247 Issue 1: 2015 | Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence- Exempt Local Area Network (LE-LAN) Devices |
| RSS-Gen Issue 4: 2014 | General Requirements for Compliance of Radio Apparatus |
| FCC 47CFR part 15: 2014 | Radio Frequency Devices |
| ANSI C63.2: 1996 | American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications |
| ANSI C63.4: 2009 | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz |

12 APPENDIX E Test equipment correction factors

**Correction factor
Line impedance stabilization network
Model LISN 16 - 1
Hermon Laboratories, HL 0447**

| Frequency, kHz | Correction factor, dB |
|-----------------------|------------------------------|
| 10 | 4.9 |
| 15 | 2.86 |
| 20 | 1.83 |
| 25 | 1.25 |
| 30 | 0.91 |
| 35 | 0.69 |
| 40 | 0.53 |
| 50 | 0.35 |
| 60 | 0.25 |
| 70 | 0.18 |
| 80 | 0.14 |
| 90 | 0.11 |
| 100 | 0.09 |
| 125 | 0.06 |
| 150 | 0.04 |

The correction factor in dB is to be added to meter readings of an interference analyzer or a spectrum analyzer.



**Antenna factor
Active loop antenna
Model 6502, S/N 2857, HL 0446**

| Frequency, MHz | Magnetic antenna factor, dB | Electric antenna factor, dB |
|----------------|-----------------------------|-----------------------------|
| 0.009 | -32.8 | 18.7 |
| 0.010 | -33.8 | 17.7 |
| 0.020 | -38.3 | 13.2 |
| 0.050 | -41.1 | 10.4 |
| 0.075 | -41.3 | 10.2 |
| 0.100 | -41.6 | 9.9 |
| 0.150 | -41.7 | 9.8 |
| 0.250 | -41.6 | 9.9 |
| 0.500 | -41.8 | 9.8 |
| 0.750 | -41.9 | 9.7 |
| 1.000 | -41.4 | 10.1 |
| 2.000 | -41.5 | 10.0 |
| 3.000 | -41.4 | 10.2 |
| 4.000 | -41.4 | 10.1 |
| 5.000 | -41.5 | 10.1 |
| 10.000 | -41.9 | 9.6 |
| 15.000 | -41.9 | 9.6 |
| 20.000 | -42.2 | 9.3 |
| 25.000 | -42.8 | 8.7 |
| 30.000 | -44.0 | 7.5 |

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field strength in dB(μV/m).

**Antenna factor
Standard gain horn antenna
Quinstar Technology
Model QWH
Ser.No.112, HL 0768, 0769, 0770, 0771, 0772**

| Frequency min, GHz | Frequency max, GHz | Antenna factor, dB(1/m) |
|--------------------|--------------------|-------------------------|
| 18.000 | 26.500 | 32.01 |
| 26.500 | 40.000 | 35.48 |
| 40.000 | 60.000 | 39.03 |
| 60.000 | 90.000 | 42.55 |
| 90.000 | 140.000 | 46.23 |
| 140.000 | 220.000 | 50.11 |

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field strength in dB(μV/m).



Antenna factor
Biconilog antenna EMCO Model 3141
Ser.No.1011, HL 0604

| Frequency, MHz | Antenna factor, dB(1/m) | Frequency, MHz | Antenna factor, dB(1/m) | Frequency, MHz | Antenna factor, dB(1/m) |
|----------------|-------------------------|----------------|-------------------------|----------------|-------------------------|
| 26 | 7.8 | 580 | 20.6 | 1320 | 27.8 |
| 28 | 7.8 | 600 | 21.3 | 1340 | 28.3 |
| 30 | 7.8 | 620 | 21.5 | 1360 | 28.2 |
| 40 | 7.2 | 640 | 21.2 | 1380 | 27.9 |
| 60 | 7.1 | 660 | 21.4 | 1400 | 27.9 |
| 70 | 8.5 | 680 | 21.9 | 1420 | 27.9 |
| 80 | 9.4 | 700 | 22.2 | 1440 | 27.8 |
| 90 | 9.8 | 720 | 22.2 | 1460 | 27.8 |
| 100 | 9.7 | 740 | 22.1 | 1480 | 28.0 |
| 110 | 9.3 | 760 | 22.3 | 1500 | 28.5 |
| 120 | 8.8 | 780 | 22.6 | 1520 | 28.9 |
| 130 | 8.7 | 800 | 22.7 | 1540 | 29.6 |
| 140 | 9.2 | 820 | 22.9 | 1560 | 29.8 |
| 150 | 9.8 | 840 | 23.1 | 1580 | 29.6 |
| 160 | 10.2 | 860 | 23.4 | 1600 | 29.5 |
| 170 | 10.4 | 880 | 23.8 | 1620 | 29.3 |
| 180 | 10.4 | 900 | 24.1 | 1640 | 29.2 |
| 190 | 10.3 | 920 | 24.1 | 1660 | 29.4 |
| 200 | 10.6 | 940 | 24.0 | 1680 | 29.6 |
| 220 | 11.6 | 960 | 24.1 | 1700 | 29.8 |
| 240 | 12.4 | 980 | 24.5 | 1720 | 30.3 |
| 260 | 12.8 | 1000 | 24.9 | 1740 | 30.8 |
| 280 | 13.7 | 1020 | 25.0 | 1760 | 31.1 |
| 300 | 14.7 | 1040 | 25.2 | 1780 | 31.0 |
| 320 | 15.2 | 1060 | 25.4 | 1800 | 30.9 |
| 340 | 15.4 | 1080 | 25.6 | 1820 | 30.7 |
| 360 | 16.1 | 1100 | 25.7 | 1840 | 30.6 |
| 380 | 16.4 | 1120 | 26.0 | 1860 | 30.6 |
| 400 | 16.6 | 1140 | 26.4 | 1880 | 30.6 |
| 420 | 16.7 | 1160 | 27.0 | 1900 | 30.6 |
| 440 | 17.0 | 1180 | 27.0 | 1920 | 30.7 |
| 460 | 17.7 | 1200 | 26.7 | 1940 | 30.9 |
| 480 | 18.1 | 1220 | 26.5 | 1960 | 31.2 |
| 500 | 18.5 | 1240 | 26.5 | 1980 | 31.6 |
| 520 | 19.1 | 1260 | 26.5 | 2000 | 32.0 |
| 540 | 19.5 | 1280 | 26.6 | | |
| 560 | 19.8 | 1300 | 27.0 | | |

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field strength in dB(μ V/m).



Antenna factor
Double-ridged wave guide horn antenna
Model 3115, S/N 9911-5964, HL1984

| Frequency, MHz | Antenna factor, dB(1/m) |
|---------------------------|------------------------------------|
| 1000.0 | 24.7 |
| 1500.0 | 25.7 |
| 2000.0 | 27.6 |
| 2500.0 | 28.9 |
| 3000.0 | 31.2 |
| 3500.0 | 32.0 |
| 4000.0 | 32.5 |
| 4500.0 | 32.7 |
| 5000.0 | 33.6 |
| 5500.0 | 35.1 |
| 6000.0 | 35.4 |
| 6500.0 | 34.9 |
| 7000.0 | 36.1 |
| 7500.0 | 37.8 |
| 8000.0 | 38.0 |
| 8500.0 | 38.1 |
| 9000.0 | 39.1 |
| 9500.0 | 38.3 |
| 10000.0 | 38.6 |
| 10500.0 | 38.2 |
| 11000.0 | 38.7 |
| 11500.0 | 39.5 |
| 12000.0 | 40.0 |
| 12500.0 | 40.4 |
| 13000.0 | 40.5 |
| 13500.0 | 41.1 |
| 14000.0 | 41.6 |
| 14500.0 | 41.7 |
| 15000.0 | 38.7 |
| 15500.0 | 38.2 |
| 16000.0 | 38.8 |
| 16500.0 | 40.5 |
| 17000.0 | 42.5 |
| 17500.0 | 45.9 |
| 18000.0 | 49.4 |

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field strength in dB(μ V/m).



Antenna factor
Double-ridged waveguide horn antenna
ETS Lindgren, Model 3117, serial number: 00123515, HL 4114

| Frequency, MHz | Antenna factor, dB/m | | |
|----------------|----------------------|--------------|-----------|
| | Measured | Manufacturer | Deviation |
| 1000 | 28.0 | 28.4 | -0.4 |
| 1500 | 28.0 | 27.4 | 0.6 |
| 2000 | 31.2 | 30.9 | 0.3 |
| 2500 | 32.5 | 33.4 | -0.9 |
| 3000 | 32.9 | 32.6 | 0.3 |
| 3500 | 32.7 | 32.8 | -0.1 |
| 4000 | 33.1 | 33.4 | -0.3 |
| 4500 | 33.8 | 33.9 | -0.1 |
| 5000 | 33.8 | 34.1 | -0.3 |
| 5500 | 34.4 | 34.5 | -0.1 |
| 6000 | 35.0 | 35.2 | -0.2 |
| 6500 | 35.4 | 35.5 | -0.1 |
| 7000 | 35.7 | 35.7 | 0.0 |
| 7500 | 35.9 | 35.7 | 0.2 |
| 8000 | 35.8 | 35.8 | 0.0 |
| 8500 | 35.9 | 35.8 | 0.1 |
| 9000 | 36.3 | 36.2 | 0.1 |
| 9500 | 36.6 | 36.6 | 0.0 |
| 10000 | 37.1 | 37.1 | 0.0 |
| 10500 | 37.6 | 37.5 | 0.1 |
| 11000 | 37.9 | 37.7 | 0.2 |
| 11500 | 38.5 | 38.1 | 0.4 |
| 12000 | 39.2 | 38.7 | 0.5 |
| 12500 | 39.0 | 38.9 | 0.1 |
| 13000 | 39.1 | 39.1 | 0.0 |
| 13500 | 38.9 | 38.8 | 0.1 |
| 14000 | 39.0 | 38.8 | 0.2 |
| 14500 | 39.6 | 39.9 | -0.3 |
| 15000 | 39.9 | 39.7 | 0.2 |
| 15500 | 39.9 | 40.1 | -0.2 |
| 16000 | 40.7 | 40.8 | -0.1 |
| 16500 | 41.3 | 41.8 | -0.5 |
| 17000 | 42.5 | 42.1 | 0.4 |
| 17500 | 41.3 | 41.2 | 0.1 |
| 18000 | 41.4 | 40.9 | 0.5 |

Antenna factor is to be added to receiver meter reading in dB(μ V) to convert to field strength in dB(μ V/meter)



Cable loss
Cable coaxial, RG-214/U, N type-N type, 17 m
Teldor, HL 3612

| Frequency, MHz | Cable loss, dB |
|----------------|----------------|
| 0.1 | 0.05 |
| 0.5 | 0.07 |
| 1 | 0.10 |
| 3 | 0.22 |
| 5 | 0.29 |
| 10 | 0.39 |
| 30 | 0.68 |
| 50 | 0.90 |
| 100 | 1.27 |
| 150 | 1.58 |
| 200 | 1.80 |
| 250 | 2.12 |
| 300 | 2.36 |
| 350 | 2.60 |
| 400 | 2.82 |
| 450 | 2.99 |
| 500 | 3.23 |
| 550 | 3.40 |
| 600 | 3.56 |
| 650 | 3.71 |
| 700 | 3.90 |
| 750 | 4.04 |
| 800 | 4.23 |
| 850 | 4.39 |
| 900 | 4.55 |
| 950 | 4.65 |
| 1000 | 4.79 |



Cable loss
Microwave Cable Assembly, Huber-Suhner, 40 GHz, 3.5 m, SMA-SMA, S/N 1225/2A
HL 3901

| Frequency, MHz | Cable loss, dB | Frequency, MHz | Cable loss, dB | Frequency, MHz | Cable loss, dB |
|----------------|----------------|----------------|----------------|----------------|----------------|
| 10 | 0.09 | 9500 | 4.29 | 21000 | 6.67 |
| 100 | 0.41 | 10000 | 4.40 | 22000 | 6.92 |
| 500 | 0.93 | 10500 | 4.52 | 23000 | 7.00 |
| 1000 | 1.33 | 11000 | 4.64 | 24000 | 7.18 |
| 1500 | 1.63 | 11500 | 4.76 | 25000 | 7.29 |
| 2000 | 1.90 | 12000 | 4.87 | 26000 | 7.55 |
| 2500 | 2.12 | 12500 | 4.99 | 27000 | 7.70 |
| 3000 | 2.33 | 13000 | 5.11 | 28000 | 7.88 |
| 3500 | 2.50 | 13500 | 5.20 | 29000 | 8.02 |
| 4000 | 2.67 | 14000 | 5.31 | 30000 | 8.15 |
| 4500 | 2.82 | 14500 | 5.42 | 31000 | 8.35 |
| 5000 | 2.99 | 15000 | 5.51 | 32000 | 8.40 |
| 5500 | 3.16 | 15500 | 5.58 | 33000 | 8.62 |
| 6000 | 3.32 | 16000 | 5.68 | 34000 | 8.73 |
| 6500 | 3.51 | 16500 | 5.78 | 35000 | 8.78 |
| 7000 | 3.65 | 17000 | 5.91 | 36000 | 8.94 |
| 7500 | 3.79 | 17500 | 5.99 | 37000 | 9.21 |
| 8000 | 3.92 | 18000 | 6.07 | 38000 | 9.37 |
| 8500 | 4.04 | 19000 | 6.36 | 39000 | 9.45 |
| 9000 | 4.18 | 20000 | 6.49 | 40000 | 9.52 |



Cable loss
Microwave Cable Assembly, Huber-Suhner, 40 GHz, 1.5 m, SMA-SMA, S/N 1226/2A
HL 3903

| Frequency, MHz | Cable loss, dB | Frequency, MHz | Cable loss, dB | Frequency, MHz | Cable loss, dB |
|----------------|----------------|----------------|----------------|----------------|----------------|
| 10 | -0.02 | 9500 | 1.84 | 21000 | 2.98 |
| 100 | 0.15 | 10000 | 1.86 | 22000 | 3.07 |
| 500 | 0.38 | 10500 | 1.93 | 23000 | 3.13 |
| 1000 | 0.56 | 11000 | 1.99 | 24000 | 3.21 |
| 1500 | 0.69 | 11500 | 2.04 | 25000 | 3.26 |
| 2000 | 0.82 | 12000 | 2.10 | 26000 | 3.48 |
| 2500 | 0.90 | 12500 | 2.15 | 27000 | 3.44 |
| 3000 | 0.98 | 13000 | 2.21 | 28000 | 3.53 |
| 3500 | 1.06 | 13500 | 2.25 | 29000 | 3.59 |
| 4000 | 1.11 | 14000 | 2.29 | 30000 | 3.66 |
| 4500 | 1.17 | 14500 | 2.34 | 31000 | 3.70 |
| 5000 | 1.24 | 15000 | 2.36 | 32000 | 3.79 |
| 5500 | 1.32 | 15500 | 2.40 | 33000 | 3.88 |
| 6000 | 1.40 | 16000 | 2.45 | 34000 | 3.94 |
| 6500 | 1.50 | 16500 | 2.48 | 35000 | 3.91 |
| 7000 | 1.56 | 17000 | 2.56 | 36000 | 4.05 |
| 7500 | 1.62 | 17500 | 2.58 | 37000 | 4.22 |
| 8000 | 1.68 | 18000 | 2.60 | 38000 | 4.25 |
| 8500 | 1.74 | 19000 | 2.84 | 39000 | 4.27 |
| 9000 | 1.78 | 20000 | 2.88 | 40000 | 4.33 |



Cable loss
Low Loss Armored Test Cable, MegaPhase, 18 GHz, 6.2 m, N type-M/N type-M,
NC29-N1N1-244S/N 12025101 003,
HL 4353

| Frequency, MHz | Cable loss, dB | Frequency, MHz | Cable loss, dB |
|---------------------------|---------------------------|---------------------------|---------------------------|
| 50 | 0.20 | 9000 | 2.71 |
| 100 | 0.27 | 9500 | 2.81 |
| 300 | 0.47 | 10000 | 2.90 |
| 500 | 0.61 | 10500 | 2.97 |
| 1000 | 0.87 | 11000 | 3.06 |
| 1500 | 1.07 | 11500 | 3.13 |
| 2000 | 1.24 | 12000 | 3.20 |
| 2500 | 1.39 | 12500 | 3.26 |
| 3000 | 1.53 | 13000 | 3.34 |
| 3500 | 1.65 | 13500 | 3.39 |
| 4000 | 1.77 | 14000 | 3.47 |
| 4500 | 1.89 | 14500 | 3.54 |
| 5000 | 1.99 | 15000 | 3.62 |
| 5500 | 2.07 | 15500 | 3.69 |
| 6000 | 2.20 | 16000 | 3.76 |
| 6500 | 2.30 | 16500 | 3.83 |
| 7000 | 2.39 | 17000 | 3.86 |
| 7500 | 2.51 | 17500 | 3.94 |
| 8000 | 2.58 | 18000 | 4.02 |
| 8500 | 2.65 | | |



Cable loss
Low Loss Armored Test Cable, MegaPhase, 18 GHz, 6.2 m, N type-M/N type-M,
NC29-N1N1-244, S/N 51228701001
HL 4722

| Frequency, MHz | Cable loss, dB | Frequency, MHz | Cable loss, dB |
|----------------|----------------|----------------|----------------|
| 50 | 0.22 | 9000 | 2.93 |
| 100 | 0.30 | 9500 | 3.06 |
| 300 | 0.52 | 10000 | 3.16 |
| 500 | 0.66 | 10500 | 3.20 |
| 1000 | 0.93 | 11000 | 3.34 |
| 1500 | 1.15 | 11500 | 3.39 |
| 2000 | 1.33 | 12000 | 3.48 |
| 2500 | 1.49 | 12500 | 3.55 |
| 3000 | 1.64 | 13000 | 3.66 |
| 3500 | 1.77 | 13500 | 3.75 |
| 4000 | 1.90 | 14000 | 3.76 |
| 4500 | 2.03 | 14500 | 3.87 |
| 5000 | 2.17 | 15000 | 3.98 |
| 5500 | 2.30 | 15500 | 4.01 |
| 6000 | 2.39 | 16000 | 4.14 |
| 6500 | 2.51 | 16500 | 4.15 |
| 7000 | 2.59 | 17000 | 4.32 |
| 7500 | 2.67 | 17500 | 4.36 |
| 8000 | 2.76 | 18000 | 4.38 |
| 8500 | 2.84 | | |



13 APPENDIX F Abbreviations and acronyms

| | |
|----------------|---------------------------------------------|
| A | ampere |
| AC | alternating current |
| AM | amplitude modulation |
| AVRG | average (detector) |
| cm | centimeter |
| dB | decibel |
| dBm | decibel referred to one milliwatt |
| dB(μ V) | decibel referred to one microvolt |
| dB(μ V/m) | decibel referred to one microvolt per meter |
| dB(μ A) | decibel referred to one microampere |
| DC | direct current |
| EIRP | equivalent isotropically radiated power |
| ERP | effective radiated power |
| EUT | equipment under test |
| F | frequency |
| GHz | gigahertz |
| GND | ground |
| H | height |
| HL | Hermon laboratories |
| Hz | hertz |
| k | kilo |
| kHz | kilohertz |
| LO | local oscillator |
| m | meter |
| MHz | megahertz |
| min | minute |
| mm | millimeter |
| ms | millisecond |
| μ s | microsecond |
| NA | not applicable |
| NB | narrow band |
| OATS | open area test site |
| Ω | Ohm |
| PM | pulse modulation |
| PS | power supply |
| ppm | part per million (10^{-6}) |
| QP | quasi-peak |
| RE | radiated emission |
| RF | radio frequency |
| rms | root mean square |
| Rx | receive |
| s | second |
| T | temperature |
| Tx | transmit |
| V | volt |
| WB | wideband |

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