Test Report



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS

| Report No | ES0621-2 |
|----------------------------------|--|
| Client | Harman International Industries, Incorporated |
| Address | 30001 Cabot Drive Novi MI 48377 |
| Phone | 1-248-785-2513 |
| Items tested FCC ID IC | PV602 2AHPN-BE2841 6434C-BE2841 |
| Equipment Type Equipment Code | Digital Transmission System DTS |
| FCC/IC Rule Parts | CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 2 |
| Test Dates | 03/30/2018 to 04/25/2018 |
| Results | As detailed within this report |
| Prepared by | Christopher Hamel – EMC Engineer |
| Authorized by | Yurus Fazilogu - Sr. Engineer |
| Issue Date | 5/16/2018 |
| Conditions of Issue | This Test Report is issued subject to the conditions stated in the ' <i>Conditions of Testing</i> ' section on page 19 of this report. |

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Report REV Sep-08-2017 - YF





Summary

This test report supports an application for certification of a transmitter operating pursuant to: CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 2

The product is the "PV602" automotive infotainment unit with Bluetooth and WLAN. It is a direct sequence spread spectrum transmitter that operates in the 2412 – 2462 MHz frequency range. This report is for the 2.4GHz WLAN portion of the device only.

Antenna Type: PCB Trace Peak Gain: 2.3dBi

There are two variants to the product with the same model number:

| HVIN | FVIN | Remarks |
|---------|-----------------------------|---|
| (Model) | | |
| PV602 | SOC: BR_RC1_R12.0.0_R18102A | Tested variant |
| PV602 | SOC: NA_18.1.1 | No hardware differences from the tested variant above. |
| | | Only non-RF related software differences as follows: |
| | | Updated AM/FM tuner range and step size for |
| | | North American markets |
| | | Removal of backup camera from software |
| | | (external camera will not be connected), rear |
| | | view mirror will have RVC display instead (not |
| | | connected to the head unit) |
| | | HMI tweaks to follow NHTSA guidelines |

Test samples were received in good condition.

We found that the product met the above requirements without modifications.





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Test Methodology

All testing was performed according to the following rules/procedures/documents; CFR Title 47 FCC Part 15.247, RSS-247 Issue 2, RSS-Gen Issue 4, FCC KDB 558074 D01 DTS Measurement Guidance v04 and ANSI C63.10-2013.

Radiated emissions were tested in the installation orientation of the device in a vehicle. Emissions were maximized by rotating the device and varying the test antenna's height and polarity.

EUT operating voltage is 13.8V DC from a vehicle battery, therefore AC line conducted emissions requirements are not applicable.

Following bandwidths were used during radiated spurious emissions testing.

| Frequency | RBW | VBW |
|------------|--------|------|
| 30-1000MHz | 120kHz | 1MHz |
| 1-25GHz | 1MHz | 3MHz |





Product Tested - Configuration Documentation

| | | | | | EUT C | onfiguration | | | | | | | |
|-----------------------|----------|----------|--|-------------|------------|--------------|----------|------------|----------|-------|---------|--|--|
| Work | Order: | S0621 | 621 | | | | | | | | | | |
| Co | mpany: | Harman | arman International Industries, Incorporated | | | | | | | | | | |
| Company A | ddress: | 30001 C | 001 Cabot Drive | | | | | | | | | | |
| | | Novi, M | vi, MI, 48377 | | | | | | | | | | |
| | | | | | | | | | | | | | |
| (| Contact: | Sarah Re | owland | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | MN | PN | | | SN | | | | | |
| | EUT: | | | PV602 | | | | | | | | | |
| EUT Desc | | | eo Head Ui | nit | | | | | | | | | |
| EUT Max Fre | | 5825 M | | | | | | | | | | | |
| EUT Min Fre | quency: | 5825 MI | Hz | | | | | | | | | | |
| | | | | | | | | | | | | | |
| EUT Components | | | | M | | | | | SN | | | | |
| PV602 | | | | FC | - | | | | | | | | |
| PV602 | | | | FCC Cor | nducted | | | | | | | | |
| | | | | | | | | | | | | | |
| Support Equipmen | t | | | M | N | | | | SN | | | | |
| CS Supplied laptop | | | | | | | | | | | | | |
| USB to Ethernet con | verter | | | | | | | | | | | | |
| | | | | T | | 1 | T | <u> </u> | 1 | | | | |
| Port Label | Port | Туре | # ports | # populated | cable type | shielded | ferrites | length (m) | in/out | under | comment | | |
| Power | other | | 2 | 2 | other | No | No | 1 | in | test | | | |
| FM/AM | other | | 2 | 4 | Coaxial | Yes | No | 0.1 | in | yes | | | |
| | other | | 1 | 1 | other | No | No | | in | yes | | | |
| Back up camera USB | USB | | 1 | 1 | USB | No Yes | No No | 1 | in in | yes | | | |
| Vehicle port | | | 1 | 1 | | | | 1 | | yes | | | |
| venicle port | other | | 1 | 1 1 | other | No | No | 1 1 | in | ves | | | |

EUT will operate in constant TX mode for WiFi spurious emissions via client supplied test mode where channels and data rates are selectable. EUT will operate in constant TX mode for BT spurious emissions with a link to CMW communication tester where channels and packet types are selectable.





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| Statement of Comonnity | | | | | | | | | | | |
|------------------------|---------|---------|------------------|--|--|--|--|--|--|--|--|
| RSS-GEN | RSP-100 | RSS 247 | Part 15 | Comments | | | | | | | |
| 6.3 | | | 15.15(b) | There are no controls accessible to the user that varies the output power to operate in violation of the regulatory requirements. | | | | | | | |
| | 3.1 | | 15.19 | The label is shown in the label exhibit. | | | | | | | |
| | 4 | | 15.21 | Information to the user is shown in the instruction manual exhibit. | | | | | | | |
| | | | 15.27 | No special accessories are required for compliance. | | | | | | | |
| 3, 6.1 | | | 15.31 | The EUT was tested in accordance with the measurement standards in this section. | | | | | | | |
| 6.13 | | | 15.33 | Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates. | | | | | | | |
| 8.1 | | | 15.35 | The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates. | | | | | | | |
| 8.3 | | | 15.203 | EUT employs PCB trace antenna 2.3dBi peak gain. | | | | | | | |
| 8.10 | | | 15.205 15.209 | The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209 or RSS-Gen as applicable | | | | | | | |
| 8.8 | | | 15.207 | N/A. Vehicle battery powered only. | | | | | | | |

Statement of Conformity

Refer to Appendix A of this report for antenna port conducted measurements.





Test Results

Radiated Spurious Emissions

LIMITS

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a). [15.247(d)]

MEASUREMENTS / RESULTS

Worst case mode found to be 802.11b 1Mbps

| Curtis Straus - a Bureau Veritas Company | Work Order - S0621 |
|---|--------------------------------------|
| Radiated Emissions Electric Field 3m Distance | EUT Power Input - 13.8V DC |
| Top Peaks Horizontal 30-1000MHz | Test Site - CH2 |
| Operator: cch | Conditions - 22.5°C; 34%RH; 1010mBar |
| Notes: | Witnessed by - N/A |
| 2.4g wifi Spur. 802.11b 1Mbps 20MHz BW CH6 | 0 |
| | |

Data Taken at April 15, 2018

| | in all supring | , | | | | | | | | | | | |
|-------------|-----------------|----------------------|--|---------------------------|----------------|--------------------------------------|-------------------------|---------------------------|----------------|----------------------|-------------------------|--|--|
| Frequency | Peak Reading | Correction Factor | Adjusted Peak Amplitude | Lim1: FCC_pt15_2 09 | Lim1 Margin | Lim1 Test Results | Worst Margin Lim1 | Lim2: FCC_pt15_2 09 | Lim2 Margin | Lim2 Test Results | Worst Margin Lim2 | | |
| (MHz) | (dBµV) | (dB/m) | (dBµV/m) | (dBµV/m) | (dB) | (Pass/Fail) | (dB) | (dBµV/m) | (dB) | (Pass/Fail) | (dB) | | |
| 30.145 | 27 | -1.4 | 25.6 | 40 | -14.4 | PASS | -14.4 | 40 | -14.4 | PASS | -14.4 | | |
| 126.297 | 28.1 | -8.4 | -8.4 19.7 43.5 -23.8 PASS 43.5 -23.8 P | | | | | | | | | | |
| 184.084 | 32.6 | -11.2 | 21.4 | 43.5 | -22.1 | PASS | | 43.5 | -22.1 | PASS | | | |
| 292.337 | 31 | -8.6 | 22.4 | 46 | -23.6 | PASS | | 46 | -23.6 | PASS | | | |
| 466.33 | 32.7 | -4.2 | 28.5 | 46 | -17.5 | PASS | | 46 | -17.5 | PASS | | | |
| 916.459 | 28.5 | 3 | 31.5 | 46 | -14.5 | PASS | | 46 | -14.5 | PASS | | | |
| Curtis Stra | us - a Bure | au Veritas | Company | | | Work Order - S0621 | | | | | | | |
| Radiated E | Emissions I | Electric Fiel | ld 3m Dista | nce | | EUT Power Input - 13.8V DC | | | | | | | |
| Top Peaks | Vertical 3 | 0-1000MHz | | | | Test Site - CH2 | | | | | | | |
| Operator: | cch | | | | | Conditions - 22.5°C; 34%RH; 1010mBar | | | | | | | |
| Notes: | | | | | | Witnessed by - N/A | | | | | | | |
| 2.4g wifi S | pur. 802.1 | 1b 1Mbps 2 | 20MHz BW | CH6 | | 0 | | | | | | | |

2.4g wifi Spur. 802.11b 1Mbps 20MHz BW CH6

Data Taken at April 15, 2018

| Frequency (MHz) | Peak Reading (dBμV) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dBµV/m) | Lim1: FCC_pt15_2 09 (dBµV/m) | Lim1 Margin (dB) | Lim1 Test Results (Pass/Fail) | Worst Margin Lim1 (dB) | Lim2: FCC_pt15_2 09 (dBµV/m) | Lim2 Margin (dB) | Lim2 Test Results (Pass/Fail) | Worst Margin Lim2 (dB) |
|--------------------|---------------------------|--------------------------------|---|---------------------------------------|------------------------|-------------------------------------|---------------------------------|---------------------------------------|------------------------|-------------------------------------|---------------------------------|
| 30.873 | 28 | -2 | 25.9 | 40 | -14.1 | PASS | -14.1 | 40 | -14.1 | PASS | -14.1 |
| 65.72 | 40.2 | -14.7 | 25.4 | 40 | -14.6 | PASS | | 40 | -14.6 | PASS | |
| 73.286 | 35.4 | -14.2 | 21.2 | 40 | -18.8 | PASS | | 40 | -18.8 | PASS | |
| 466.354 | 31.1 | -4.2 | 27 | 46 | -19 | PASS | | 46 | -19 | PASS | |
| 742.514 | 29.8 | -0.1 | 29.7 | 46 | -16.3 | PASS | | 46 | -16.3 | PASS | |
| 930.912 | 27.8 | 3.1 | 30.9 | 46 | -15.1 | PASS | | 46 | -15.1 | PASS | |

30-1000MHz Channel Mid





May 16, 2018

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance 1-6GHz Horizontal Data Operator: cch Notes: 2.4g wifi Spur. 802.11b 1Mbps 20MHz BW CH1 Work Order - S0621 EUT Power Input - 13.8V DC Test Site - CH2 Conditions - 22.5°C; 34%RH; 1010mBar Witnessed by - N/A 0

Data Taken at April 12, 2018

| Frequency (MHz) | Raw Peak Reading (dBµV) | Raw Avg Reading (dBµV) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dBµV/m) | Pk Lim: FCC_pt15_2 09_Peak (dBµV/m) | Peak Margin (dB) | Peak Results (Pass/Fail) | Worst Peak Margin (dB) | • | Av Lim: FCC_pt15_2 09_Average (dBµV/m) | Avg Margin | Avg Results (Pass/Fail) | Worst Average Margin (dB) |
|--------------------|-------------------------------|------------------------------|--------------------------------|---|--|------------------------|--------------------------------|------------------------------|------|---|------------|----------------------------|------------------------------------|
| 1440 | 34.5 | 25.1 | 4.2 | 38.7 | 74 | -35.3 | PASS | | 29.3 | 54 | -24.7 | PASS | |
| 1706 | 34 | 24.1 | 5.5 | 39.5 | 74 | -34.5 | PASS | | 29.5 | 54 | -24.5 | PASS | |
| 1865.2 | 35.5 | 29.5 | 7.6 | 43 | 74 | -31 | PASS | | 37.1 | 54 | -16.9 | PASS | |
| 5259.3 | 33.2 | 24.7 | 13.2 | 46.4 | 74 | -27.6 | PASS | | 37.9 | 54 | -16.1 | PASS | |
| 5582.2 | 35.3 | 25.8 | 13.9 | 49.1 | 74 | -24.9 | PASS | | 39.7 | 54 | -14.3 | PASS | -14.3 |
| 5781.8 | 35.5 | 25 | 14.4 | 49.8 | 74 | -24.2 | PASS | -24.2 | 39.4 | 54 | -14.6 | PASS | |

| Curtis Straus - a Bureau Veritas Company | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|
| Radiated Emissions Electric Field 3m Distance | | | | | | | | | |
| 1-6GHz Vertical Data | | | | | | | | | |
| Operator: cch | | | | | | | | | |
| Notes: | | | | | | | | | |
| 2.4g wifi Spur. 802.11b 1Mbps 20MHz BW CH1 | | | | | | | | | |
| | | | | | | | | | |

Work Order - S0621 EUT Power Input - 13.8V DC Test Site - CH2 Conditions - 22.5°C; 34%RH; 1010mBar Witnessed by - N/A 0

Data Taken at April 12, 2018

| Frequency (MHz) | Raw Peak Reading (dBµV) | Raw Avg Reading (dBµV) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dBµV/m) | Pk Lim: FCC_pt15_2 09_Peak (dBµV/m) | Peak Margin (dB) | Peak Results (Pass/Fail) | Worst Peak Margin (dB) | • | Av Lim: FCC_pt15_2 09_Average (dBµV/m) | Avg Margin | Avg Results (Pass/Fail) | Worst Avg Margin (dB) |
|--------------------|-------------------------------|------------------------------|--------------------------------|---|--|------------------------|--------------------------------|------------------------------|------|---|------------|----------------------------|-----------------------------|
| 1440.3 | 37.3 | 26.6 | 4.2 | 41.5 | 74 | -32.5 | PASS | | 30.8 | 54 | -23.2 | PASS | |
| 1711.4 | 35.2 | 24.1 | 5.5 | 40.7 | 74 | -33.3 | PASS | | 29.7 | 54 | -24.3 | PASS | |
| 1865 | 36.1 | 26.5 | 7.6 | 43.6 | 74 | -30.4 | PASS | | 34 | 54 | -20 | PASS | |
| 5269.1 | 34.4 | 24.7 | 13.3 | 47.6 | 74 | -26.4 | PASS | | 38 | 54 | -16 | PASS | |
| 5582.3 | 34.8 | 25.8 | 13.9 | 48.7 | 74 | -25.3 | PASS | -25.3 | 39.6 | 54 | -14.4 | PASS | -14.4 |
| 5794.1 | 33.9 | 24.9 | 14.4 | 48.2 | 74 | -25.8 | PASS | | 39.3 | 54 | -14.7 | PASS | |

1-6GHz Channel Low





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Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance 1-6GHz Horizontal Data Operator: cch Notes: 2.4g wifi Spur. 802.11b 1Mbps 20MHz BW CH6 Work Order - S0621 EUT Power Input - 13.8V DC Test Site - CH2 Conditions - 22.5°C; 34%RH; 1010mBar Witnessed by - N/A 0

Data Taken at April 12, 2018

| Frequency (MHz) | Raw Peak Reading (dBµV) | Raw Avg Reading (dBµV) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dBµV/m) | Pk Lim: FCC_pt15_2 09_Peak (dBµV/m) | Peak Margin (dB) | Peak Results (Pass/Fail) | Worst Peak Margin (dB) | • | Av Lim: FCC_pt15_2 09_Average (dBμV/m) | | Avg Results (Pass/Fail) | Worst Average Margin (dB) |
|--------------------|-------------------------------|------------------------------|--------------------------------|---|--|------------------------|--------------------------------|------------------------------|------|---|-------|----------------------------|------------------------------------|
| 1439.1 | 36.8 | 26.9 | 4.2 | 41.1 | 74 | -32.9 | PASS | | 31.1 | 54 | -22.9 | PASS | |
| 1798.6 | 31.3 | 24.1 | 6.8 | 38.1 | 74 | -35.9 | PASS | | 30.9 | 54 | -23.1 | PASS | |
| 1865.8 | 35 | 28.8 | 7.6 | 42.6 | 74 | -31.4 | PASS | | 36.4 | 54 | -17.6 | PASS | |
| 2291.4 | 35.3 | 25 | 9.3 | 44.6 | 74 | -29.4 | PASS | | 34.3 | 54 | -19.7 | PASS | |
| 4288.4 | 33.2 | 24.4 | 12.2 | 45.4 | 74 | -28.6 | PASS | | 36.7 | 54 | -17.3 | PASS | |
| 5728.7 | 35.3 | 25.2 | 14.3 | 49.6 | 74 | -24.4 | PASS | -24.4 | 39.6 | 54 | -14.4 | PASS | -14.4 |

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance 1-6GHz Vertical Data Operator: cch Notes: 2.4g wifi Spur. 802.11b 1Mbps 20MHz BW CH6 Work Order - S0621 EUT Power Input - 13.8V DC Test Site - CH2 Conditions - 22.5°C; 34%RH; 1010mBar Witnessed by - N/A 0

Data Taken at April 12, 2018

| Frequency (MHz) | Raw Peak Reading (dBµV) | Raw Avg Reading (dBµV) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dBµV/m) | Pk Lim: FCC_pt15_2 09_Peak (dBµV/m) | Peak Margin (dB) | Peak Results (Pass/Fail) | Worst Peak Margin (dB) | • | Av Lim: FCC_pt15_2 09_Average (dBµV/m) | Avg Margin | Avg Results (Pass/Fail) | Worst Avg Margin (dB) |
|--------------------|-------------------------------|------------------------------|--------------------------------|---|--|------------------------|--------------------------------|------------------------------|------|---|------------|----------------------------|-----------------------------|
| 1865.8 | 35.6 | 28.9 | 7.6 | 43.2 | 74 | -30.8 | PASS | | 36.5 | 54 | -17.5 | PASS | |
| 2686 | 35.7 | 25.8 | 10.6 | 46.3 | 74 | -27.7 | PASS | | 36.4 | 54 | -17.6 | PASS | |
| 5253.8 | 33.7 | 24.7 | 13.2 | 46.9 | 74 | -27.1 | PASS | | 37.9 | 54 | -16.1 | PASS | |
| 5268.6 | 33 | 24.7 | 13.3 | 46.3 | 74 | -27.7 | PASS | | 38 | 54 | -16 | PASS | |
| 5286.8 | 32.7 | 24.7 | 13.4 | 46 | 74 | -28 | PASS | | 38.1 | 54 | -15.9 | PASS | |
| 5583.9 | 34.6 | 25.8 | 13.9 | 48.5 | 74 | -25.5 | PASS | -25.5 | 39.6 | 54 | -14.4 | PASS | -14.4 |

1-6GHz Channel Mid





Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance 1-6GHz Horizontal Data Operator: cch Notes: 2.4g wifi Spur. 802.11b 1Mbps 20MHz BW CH11 Work Order - S0621 EUT Power Input - 13.8V DC Test Site - CH2 Conditions - 22.5°C; 34%RH; 1010mBar Witnessed by - N/A 0

Data Taken at April 13, 2018

| Frequency (MHz) | Raw Peak Reading (dBµV) | Raw Avg Reading (dBµV) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dBµV/m) | Pk Lim: FCC_pt15_2 09_Peak (dBµV/m) | Peak Margin (dB) | Peak Results (Pass/Fail) | Worst Peak Margin (dB) | 0 | Av Lim: FCC_pt15_2 09_Average (dBµV/m) | Avg Margin (dB) | Avg Results (Pass/Fail) | Worst Average Margin (dB) |
|--------------------|-------------------------------|------------------------------|--------------------------------|---|--|------------------------|--------------------------------|------------------------------|------|---|--------------------|----------------------------|------------------------------------|
| 1438.9 | 38.2 | 27 | 4.3 | 42.6 | 74 | -31.4 | PASS | | 31.4 | 54 | -22.6 | PASS | |
| 1795.8 | 31.2 | 24 | 7 | 38.1 | 74 | -35.9 | PASS | | 31 | 54 | -23 | PASS | |
| 1916.9 | 34.2 | 24.4 | 8.2 | 42.4 | 74 | -31.6 | PASS | | 32.6 | 54 | -21.4 | PASS | |
| 2675.4 | 35.4 | 25.9 | 10.5 | 45.9 | 74 | -28.1 | PASS | | 36.5 | 54 | -17.5 | PASS | |
| 5255.8 | 32.5 | 24.2 | 13.1 | 45.6 | 74 | -28.4 | PASS | | 37.4 | 54 | -16.6 | PASS | |
| 5498.2 | 34.3 | 24.5 | 13.6 | 47.9 | 74 | -26.1 | PASS | -26.1 | 38.1 | 54 | -15.9 | PASS | -15.9 |

Curtis Straus - a Bureau Veritas Company

Radiated Emissions Electric Field 3m Distance 1-6GHz Vertical Data Operator: cch Notes: 2.4g wifi Spur. 802.11b 1Mbps 20MHz BW CH11 Work Order - S0621 EUT Power Input - 13.8V DC Test Site - CH2 Conditions - 22.5°C; 34%RH; 1010mBar Witnessed by - N/A 0

Data Taken at April 13, 2018

| Frequency (MHz) | Raw Peak Reading (dBµV) | Raw Avg Reading (dBµV) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dBµV/m) | Pk Lim: FCC_pt15_2 09_Peak (dBµV/m) | Peak Margin (dB) | Peak Results (Pass/Fail) | Worst Peak Margin (dB) | • | Av Lim: FCC_pt15_2 09_Average (dBμV/m) | Avg Margin | Avg Results (Pass/Fail) | Worst Avg Margin (dB) |
|--------------------|-------------------------------|------------------------------|--------------------------------|---|--|------------------------|--------------------------------|------------------------------|------|---|------------|----------------------------|-----------------------------|
| 1187.7 | 36.9 | 30.7 | 3 | 39.9 | 74 | -34.1 | PASS | | 33.8 | 54 | -20.2 | PASS | |
| 1797.7 | 33.8 | 23.9 | 7 | 40.8 | 74 | -33.2 | PASS | | 30.9 | 54 | -23.1 | PASS | |
| 1926.9 | 33.8 | 24.3 | 8.2 | 42 | 74 | -32 | PASS | | 32.5 | 54 | -21.5 | PASS | |
| 5266.3 | 33.3 | 24.3 | 13.1 | 46.4 | 74 | -27.6 | PASS | | 37.4 | 54 | -16.6 | PASS | |
| 5500.4 | 34.2 | 24.5 | 13.6 | 47.8 | 74 | -26.2 | PASS | -26.2 | 38.1 | 54 | -15.9 | PASS | -15.9 |
| 5811.1 | 33.6 | 24.4 | 13.7 | 47.3 | 74 | -26.7 | PASS | | 38.1 | 54 | -15.9 | PASS | |

1-6GHz Channel High





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Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 1m Distance 6-18GHz Horizontal Data Operator: cch Notes: 2.4g wifi Spur. 802.11b 1Mbps 20MHz BW CH1 Work Order - S0621 EUT Power Input - 13.8V DC Test Site - CH2 Conditions - 22.5°C; 34%RH; 1010mBar Witnessed by - N/A 0

Data Taken at April 15, 2018

| Frequency | Raw Peak Reading | Raw Avg Reading | Correction Factor | Adjusted Peak Amplitude | Pk Lim: FCC_pt15_2 09_Peak | Peak Margin | Peak Test Results | Worst Peak Margin | • | Av Lim: FCC_pt15_2 09_Average | | Avg Test Results | Worst Avg Margin |
|-----------|---------------------|--------------------|----------------------|-------------------------------|----------------------------------|----------------|----------------------|----------------------|----------|-------------------------------------|-------|---------------------|---------------------|
| (MHz) | (dBµV) | (dBµV) | (dB/m) | (dBµV/m) | (dBµV/m) | (dB) | (Pass/Fail) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | (Pass/Fail) | (dB) |
| 17986 | 39.3 | 31.1 | 19.1 | 58.4 | 83.5 | -25.1 | PASS | -25.1 | 50.2 | 63.5 | -13.3 | PASS | -13.3 |

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 1m Distance 6-18GHz Vertical Data Operator: cch Notes: 2.4g wifi Spur. 802.11b 1Mbps 20MHz BW CH1 Work Order - S0621 EUT Power Input - 13.8V DC Test Site - CH2 Conditions - 22.5°C; 34%RH; 1010mBar Witnessed by - N/A 0

Data Taken at April 15, 2018

| | | -, | | | | | | | | | | | |
|-----------|---------------------|--------------------|----------------------|-------------------------------|----------------------------------|----------------|-----------------|----------------------|----------|-------------------------------------|-------|-------------|---------------------|
| Frequency | Raw Peak Reading | Raw Avg Reading | Correction Factor | Adjusted Peak Amplitude | Pk Lim: FCC_pt15_2 09_Peak | Peak Margin | Peak Results | Worst Peak Margin | • | Av Lim: FCC_pt15_2 09_Average | | Avg Results | Worst Avg Margin |
| (MHz) | (dBµV) | (dBµV) | (dB/m) | (dBµV/m) | (dBµV/m) | (dB) | (Pass/Fail) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | (Pass/Fail) | (dB) |
| 10532.9 | 40.6 | 30.2 | 11.2 | 51.7 | 83.5 | -31.8 | PASS | | 41.3 | 63.5 | -22.2 | PASS | |
| 17975.6 | 40.9 | 31.1 | 19.1 | 59.9 | 83.5 | -23.6 | PASS | -23.6 | 50.2 | 63.5 | -13.3 | PASS | -13.3 |
| | | | | | 6 10 | | honnol | | | | | | |

6-18GHz Channel Low

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 1m Distance 6-18GHz Horizontal Data Operator: cch Notes: 2.4g wifi Spur. 802.11b 1Mbps 20MHz BW CH6 Work Order - S0621 EUT Power Input - 13.8V DC Test Site - CH2 Conditions - 22.5°C; 34%RH; 1010mBar Witnessed by - N/A 0

Data Taken at April 15, 2018

| | Dave Davela | Da A | Compation. | Adjusted | Pk Lim: | Deels | Deale Test | Ward Daals | Adjusted | Av Lim: | | Ave Test | 14/ |
|-----------|-------------|---------|------------|-----------|------------|--------|-------------|------------|-----------|------------|------------|-------------|-----------|
| | Raw Peak | Raw Avg | Correction | Peak | FCC_pt15_2 | Peak | Peak Test | Worst Peak | Avg | FCC_pt15_2 | | Avg Test | Worst Avg |
| Frequency | Reading | Reading | Factor | Amplitude | 09_Peak | Margin | Results | Margin | Amplitude | 09_Average | Avg Margin | Results | Margin |
| (MHz) | (dBµV) | (dBµV) | (dB/m) | (dBµV/m) | (dBµV/m) | (dB) | (Pass/Fail) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | (Pass/Fail) | (dB) |
| 17945.3 | 39.9 | 31.1 | 18.9 | 58.8 | 83.5 | -24.7 | PASS | -24.7 | 50.1 | 63.5 | -13.4 | PASS | -13.4 |

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 1m Distance 6-18GHz Vertical Data Operator: cch Notes: 2.4g wifi Spur. 802.11b 1Mbps 20MHz BW CH6
 -24.7
 PASS
 -24.7
 50.1

 Work Order - S0621
 EUT Power Input - 13.8V DC
 Test Site - CH2

 Conditions - 22.5°C; 34%RH; 1010mBar
 Witnessed by - N/A

 0

Data Taken at April 15, 2018

| Frequency | Raw Peak Reading | Raw Avg Reading | Correction Factor | Adjusted Peak Amplitude | Pk Lim: FCC_pt15_2 09_Peak | Peak Margin | Peak Results | Worst Peak Margin | • | Av Lim: FCC_pt15_2 09_Average | Avg Margin | Avg Results | Worst Avg Margin |
|-----------|---------------------|--------------------|----------------------|-------------------------------|----------------------------------|----------------|-----------------|----------------------|----------|-------------------------------------|------------|-------------|---------------------|
| (MHz) | (dBµV) | (dBµV) | (dB/m) | (dBµV/m) | (dBµV/m) | (dB) | (Pass/Fail) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | (Pass/Fail) | (dB) |
| 17949.1 | 39.6 | 31.2 | 18.9 | 58.5 | 83.5 | -25 | PASS | -25 | 50.1 | 63.5 | -13.4 | PASS | -13.4 |
| | | | | | | <u></u> | | | | | | | |

6-18GHz Channel Mid





| Curtis Straus - a Bureau Veritas Company |
|---|
| Radiated Emissions Electric Field 1m Distance |
| 6-18GHz Horizontal Data |
| Operator: cch |
| Notes: |
| 2.4g wifi Spur. 802.11b 1Mbps 20MHz BW CH11 |
| |

Work Order - S0621 EUT Power Input - 13.8V DC Test Site - CH2 Conditions - 22.5°C; 34%RH; 1010mBar Witnessed by - N/A 0

Data Taken at , April 15, 2018

| Freework | Raw Peak | Raw Avg | Correction | Adjusted Peak | Pk Lim: FCC_pt15_2 | | | Worst Peak | | Av Lim: FCC_pt15_2 | Aug Margin | Avg Test | Worst Avg |
|--------------------|---------------------------|---------------------------|--------------------------|---------------------------------------|---|----------------------------------|--|-------------------------|--------------------------------------|--|--------------------|----------------------------|---------------------|
| Frequency (MHz) | Reading (dBµV) | Reading (dBµV) | Factor (dB/m) | Amplitude (dBµV/m) | 09_Peak (dBµV/m) | Margin (dB) | Results (Pass/Fail) | Margin (dB) | Amplitude (dBµV/m) | 09_Average (dBμV/m) | (dB) | Results (Pass/Fail) | Margin (dB) |
| 17947.2 | 39.5 | 31.1 | 18.9 | 58.4 | 83.5 | -25.1 | PASS | -25.1 | 50 | 63.5 | -13.5 | PASS | -13.5 |
| Curtis Stra | us - a Bure | au Veritas | Company | | | Work Ord | er - S0621 | | | | | | |
| | | | d 1m Dista | nce | | EUT Powe | r Input - 13 | .8V DC | | | | | |
| 6-18GHz V | ertical Data | a | | | | Test Site - | CH2 | | | | | | |
| Operator: | cch | | | | | Condition | s - 22.5°C; 3 | 34%RH; 101 | .0mBar | | | | |
| Notes: | | | | | | Witnesse | d by - N/A | , | | | | | |
| 2.4g wifi S | pur. 802.1 | 1b 1Mbps 2 | 20MHz BW | CH11 | | 0 | | | | | | | |
| - | - | - | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Data Taker | n at April 1 | 5. 2018 | | | | | | | | | | | |
| Data raite | | 0) 2010 | | | | | | | | | | | |
| | | | | ار محمد بالد ۵ | Dis Lines | | | | A allowed as all | A 1 | | | |
| | Raw Peak | Raw Avg | Correction | Adjusted Peak | Pk Lim: | Peak | Peak | Worst Peak | Adjusted | Av Lim: ECC nt15 2 | | | Worst Avg |
| Frequency | Raw Peak Reading | Raw Avg Reading | Correction Factor | - | Pk Lim: FCC_pt15_2 09_Peak | Peak Margin | Peak Results | Worst Peak Margin | Avg | Av Lim: FCC_pt15_2 09_Average | Avg Margin | Avg Results | Worst Avg Margin |
| Frequency (MHz) | | | | Peak | FCC_pt15_2 | | | | Avg | FCC_pt15_2 | Avg Margin (dB) | Avg Results (Pass/Fail) | • |
| | Reading | Reading | Factor | Peak Amplitude | FCC_pt15_2 09_Peak | Margin | Results | Margin | Avg Amplitude | FCC_pt15_2 09_Average | | - | Margin |
| (MHz) | Reading (dBµV) | Reading (dBµV) | Factor (dB/m) | Peak Amplitude (dBµV/m) | FCC_pt15_2 09_Peak (dBµV/m) | Margin (dB) | Results (Pass/Fail) | Margin | Avg Amplitude (dBμV/m) | FCC_pt15_2 09_Average (dBµV/m) | (dB) | (Pass/Fail) | Margin |
| (MHz) 10532.7 | Reading (dBμV) 39.4 | Reading (dBµV) 30.1 | Factor (dB/m) 11.2 | Peak Amplitude (dBµV/m) 50.6 | FCC_pt15_2 09_Peak (dBµV/m) 83.5 83.5 | Margin (dB) -32.9 -23.4 | Results (Pass/Fail) PASS PASS | Margin (dB) -23.4 | Avg Amplitude (dBµV/m) 41.3 | FCC_pt15_2 09_Average (dBµV/m) 63.5 | (dB) -22.2 | (Pass/Fail) PASS | Margin (dB) |
| (MHz) 10532.7 | Reading (dBμV) 39.4 | Reading (dBµV) 30.1 | Factor (dB/m) 11.2 | Peak Amplitude (dBµV/m) 50.6 | FCC_pt15_2 09_Peak (dBµV/m) 83.5 83.5 | Margin (dB) -32.9 -23.4 | Results (Pass/Fail) PASS | Margin (dB) -23.4 | Avg Amplitude (dBµV/m) 41.3 | FCC_pt15_2 09_Average (dBµV/m) 63.5 | (dB) -22.2 | (Pass/Fail) PASS | Margin (dB) |
| (MHz) 10532.7 | Reading (dBμV) 39.4 | Reading (dBµV) 30.1 | Factor (dB/m) 11.2 | Peak Amplitude (dBµV/m) 50.6 | FCC_pt15_2 09_Peak (dBµV/m) 83.5 83.5 | Margin (dB) -32.9 -23.4 | Results (Pass/Fail) PASS PASS | Margin (dB) -23.4 | Avg Amplitude (dBµV/m) 41.3 | FCC_pt15_2 09_Average (dBµV/m) 63.5 | (dB) -22.2 | (Pass/Fail) PASS | Margin (dB) |
| (MHz) 10532.7 | Reading (dBμV) 39.4 | Reading (dBµV) 30.1 | Factor (dB/m) 11.2 | Peak Amplitude (dBµV/m) 50.6 | FCC_pt15_2 09_Peak (dBµV/m) 83.5 83.5 | Margin (dB) -32.9 -23.4 | Results (Pass/Fail) PASS PASS | Margin (dB) -23.4 | Avg Amplitude (dBµV/m) 41.3 | FCC_pt15_2 09_Average (dBµV/m) 63.5 | (dB) -22.2 | (Pass/Fail) PASS | Margin (dB) |

| Itaalatoe | | | 510 | | | | | | | | | | | |
|----------------|---------------|-------------|---------------|--------------|-------------------------------|------------|--------------|-------------|----------|----------------------|-------------|--------------|--------------------------|--------------------|
| Date: | 15-Apr-18 | | | Company: | Harman In | ternationa | al | | | | | | Work Order: | S0621 |
| Engineer: | Chris Hamel | | | EUT Desc: | PV602 | | | | | | EUT Operat | ing Voltage | /Frequency: | 13.8V DC |
| Temp: | 22.7°C | | | Humidity: | 27% | | | Pressure: | 1023mBar | | | | | |
| | | Freque | ency Range | 18-25GHz | | | | | | | Measureme | nt Distance: | : 0.1 m | |
| Notes: | Tested channe | els 1 6 11. | No emission | s found. | | | | | | | EU | T Max Freq: | : 5825MHz | |
| Antenna | | Peak | Average | Preamp | Antenna | Cable | Adjusted | Adjusted | FCC Clas | s B High Fre Peak | equency - | FCC Cla | iss B High Fr Average | equency - |
| Polarization | Frequency | Reading | Reading | Factor | Factor | Factor | Peak Reading | Avg Reading | Limit | Margin | Result | Limit | Margin | Result |
| (H/V) | (MHz) | (dBµV) | (dBµV) | (dB) | (dB/m) | (dB) | (dBµV/m) | (dBµV/m) | (dBµV/m) | (dB) | (Pass/Fail) | (dBµV/m) | (dB) | (Pass/Fail) |
| | | | | | | | | | | | | | | |
| Table | e Result: | | Pass | by | N/A | dB | | | | | W | orst Freq: | N/A | MHz |
| Test Site: | EMI Chamber | 2 | | Cable 1: | Asset #23 | 23 | | | | Cable 2: | | | Cable 3: | |
| Analyzer: | 2093 | | | Preamp: | 18-26.5GH | z | | | | Antenna: | 18-26.5GHz | Horn | Preselector: | |
| CSsoft Radiate | d Emissions C | Calculator | v 1.017.203 | | | | | | | | | | Copyright Curti | is-Straus LLC 2000 |
| Adjusted Read | ing = Reading | - Preamp Fa | actor + Anter | nna Factor + | Cable Fac | tor | | | | | | | | |

18-25GHz All Channels





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| Spectrum Analyzers / Receivers / Preselectors | Range | MN | Mfr | SN | Asset | Cat | Calibration Du |
|---|--------------|-----------------------|-------------------|--------------|---------|-----|-----------------|
| Brown | 9kHz-26.5GHz | E4407B | Agilent | SG44210511 | 1510 | 1 | 7/26/2018 |
| 2093 MXE EMI Receiver | 20Hz-26.5GHz | N9038A | Agilent | MY51210181 | 2093 | 1 | 11/16/2018 |
| Rental MXE EMI Receiver(1170725) | 20Hz-26.5GHz | N9038A | Agilent | MY51210151 | 1170725 | I | 4/10/2019 |
| Radiated Emissions Sites | FCC Code | IC Code | VCCI Code | Range | Asset | Cat | Calibration Du |
| EMI Chamber 1 | 719150 | 2762A-6 | A-0015 | 30-1000M Hz | 1685 | 1 | 12/21/2018 |
| EMI Chamber 1 | 719150 | 2762A-6 | A-0015 | 1-18GHz | 1685 | 1 | 12/21/2018 |
| EMI Chamber 2 | 719150 | 2762A-7 | A-0015 | 30-1000M Hz | 1686 | 1 | 12/21/2018 |
| EMI Chamber 2 | 719150 | 2762A-7 | A-0015 | 1-18GHz | 1686 | I | 12/21/2018 |
| Preamps /Couplers Attenuators / Filters | Range | MN | Mfr | SN | Asset | Cat | Calibration D |
| 2443 PA | 9KHz-6GHz | BBV 9744 | SCWARZBECK | 63 | 2443 | 1 | 2/5/2019 |
| 2444 PA | 9KHz-6GHz | BBV 9744 | SCWARZBECK | 67 | 2444 | 1 | 2/5/2019 |
| 2111 HF Preamp | 0.5-18GHz | PAM-118A | COM-POWER | 551063 | 2111 | 11 | 11/19/2018 |
| HF (Y ellow) | 18-26.5GHz | AFS4-18002650-60-8P-4 | CS | 467559 | 1266 | П | 10/16/2018 |
| Antennas | Range | MN | Mfr | SN | Asset | Cat | Calibration D |
| Red-Black Bilog | 30-2000MHz | JB1 | Sunol | A091604-2 | 1106 | 1 | 2/28/2019 |
| Orange Horn | 1-18GHz | 3115 | EMCO | 0004-6123 | 390 | 1 | 10/13/2018 |
| HF (White) Horn | 18-26.5GHz | 801-WLM | Waveline | 758 | 758 | 11 | Verify before U |
| Blue Hom | 1-18Ghz | 3117 | ETS | 157647 | 1861 | I | 2/14/2019 |
| Meteorological Meters/Chambers | | MN | Mfr | SN | Asset | Cat | Calibration D |
| Weather Clock (Pressure Only) | | BA 928 | Oregon Scientific | C3166-1 | 831 | 1 | 4/28/2018 |
| TH A#2084 | | HTC-1 | HDE | | 2084 | 11 | 3/22/2019 |
| TH A#2085 | | HTC-1 | HDE | | 2085 | Ш | 3/22/2019 |
| Cables | Range | | Mfr | | | Cat | Calibration D |
| Asset #2456 | 9KHz-18GHz | | M egaP hase | | | 11 | 10/29/2018 |
| Asset #2458 | 9KHz-18GHz | | M egaP hase | | | 11 | 10/29/2018 |
| Asset #2459 | 9KHz-18GHz | | MegaPhase | | | 11 | 10/29/2018 |
| Asset #2480 | 9KHz-18GHz | | MegaPhase | | | | 10/29/2018 |
| Asset #2323 | 1-26.5GHz | TM26-S1S1-120 | MEGAPHASE | 17139101 002 | 2323 | | 8/19/2018 |
| Asset #2466 | 9KHz-18GHz | | MegaPhase | | | 1 | 10/29/2018 |

Test Equipment Used





Radiated Band Edge

| hris Hamel 3.4°C | | | | | ternationa | 11 | | | | | | Vork Order: | 30021 |
|---|---|---|---|--|--|--|--|--|---|--|---|---|--|
| 3.4°C | | | EUT Desc: | PV602 | | | | | | EUT Operat | ing Voltage/ | Frequency: | 13.8V DC |
| | | | Humidity: | 24% | | | Pressure: | 1000mBar | | | | | |
| Frequency Range: 2300-2500MHz Measurement Distance: 3 m | | | | | | | | | | | | | |
| 02.11b 1Mbp | s | | | | | | | | | EUT | Г Max Freq: | | |
| | Peak | Average | Preamp | Antenna | Cable | Adjusted | Adjusted | FCC Clas | s B High Fre Peak | equency - | FCC Cla | ss B High Fr Average | equency - |
| Frequency (MHz) | Reading (dBµV) | Reading (dBµV) | Factor (dB) | Factor (dB/m) | Factor (dB) | Peak Reading (dBµV/m) | Avg Reading (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result (Pass/Fail) | Limit (dBµV/m) | Margin (dB) | Result (Pass/Fail |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | Pass Pass |
| 2369.5 | 36.03 | 36.0 | | | | | | | | | •• | | Pass |
| | | | | | | | | | | | | | |
| | 85.1 | | | | | | | | | | | | |
| | 84.9 | | | | | | | | | | | | |
| 2483.5 | 33.9 | 33.9 | 25.4 | 32.4 | 3.3 | 44.2 | 44.2 | 74.0 | -29.8 | Pass | 54.0 | -9.8 | Pass |
| 2495.6 | 38.8 | 38.8 | 25.4 | 32.4 | 3.3 | 49.1 | 49.1 | 74.0 | -24.9 | Pass | 54.0 | -4.9 | Pass |
| Result: | | Pass | by | -6.9 | dB | | | | | We | orst Freq: | 2495.6 | MHz |
| MI Chamber ental SA#1 | 1 | | | | | | | | | | | | |
| l N e | (MHz) 2390.0 2389.5 2483.5 2495.6 Result: M Chamber ntal SA#1 | requency (M+2) Reading (dBµV) 86.05 87.3 2389.5 38.03 2389.5 38.03 2483.5 33.9 2495.6 38.8 Result: 41 Chamber 1 | Reading (MHz) Reading (dBµV) Reading (dBµV) 86.05 87.3 (dBµV) 2390.0 34.6 34.6 2389.5 38.03 38.0 85.1 84.9 2483.5 2483.5 33.9 33.9 2485.6 38.8 88.8 Result: Pass Il Chamber 1 148 A#1 | Reading (M+z) Reading (dBµV) Factor (dBµV) 86.05 (dB) 87.3 (dB) 2390.0 34.6 34.6 2389.5 38.03 38.0 25.6 (dB) (dB) 2483.5 33.9 25.4 2485.6 38.8 25.4 2485.4 38.8 25.4 2485.4 38.8 25.4 2485.4 25.4 2485.4 25.4 2485.5 7 85.1 85.1 85.1 84.9 2495.6 38.8 25.4 Cable 1: Pass by 41 Chamber 1 Cable 1: 1 Kal SA#1 Preamp: | Reading (M+z) Reading (dB,uV) Reading (dB,uV) Factor (dB) Factor (dB) Factor (dB/m) 86.05 2390.0 34.6 34.6 25.6 32.2 2389.5 38.03 38.0 25.6 32.2 2483.5 33.9 25.4 32.4 2483.5 33.9 25.4 32.4 2495.6 32.2 86.11 85.1 2483.5 33.9 33.9 25.4 32.4 Result: Pass by -6.9 It Chamber 1 Cable 1: Asset #24 Preamp: Asset #24 | Reading (M+z) Reading (dBµV) Factor (dBµV) Factor (dB) Factor (dB) Factor (dB) Factor (dB) 86.05 87.3 2390.0 34.6 34.6 25.6 32.2 3.2 2389.5 38.03 38.0 25.6 32.2 3.2 2483.5 33.9 25.4 32.4 3.3 2485.6 32.2 32.4 3.3 2485.6 32.8 25.4 32.4 3.3 Result: Pass by -6.9 dB It Chamber 1 tal SA#1 Cable 1: Asset #2480 Preamp: Asset #2484 | requency (MHz) Reading (dBµV) Reading (dBµV) Factor (dB) Factor (dBm) Factor (dBm) Factor (dBm) Peak Reading (dBµV) 86.05 86.05 2390.0 34.6 34.6 25.6 32.2 3.2 44.4 2389.5 38.0 25.6 32.2 3.2 47.8 85.1 84.9 2483.5 33.9 33.8 25.4 32.4 3.3 44.2 2495.6 38.8 25.4 32.4 3.3 49.1 Result: Pass by -6.9 dB 1d Chamber 1 Cable 1: Asset #2480 Preamp: Asset #2480 | requency (M+z) Reading (BL/V) Reading (BL/V) Factor (BL/V) Factor (BL/V) Factor (BL/V) Factor (BL/V) Peak Reading (BL/V/m) Avg Reading (BL/V/m) 86.05 87.3 | Peak (M+2) Average (dBµV) Preamp (dBµV) Antenna Factor (dBµV) Cable Factor (dBµV) Adjusted Peak Reading (dBµV) Adjusted Avg Reading (dBµV) Adjusted Avg Reading (dBµV) Adjusted Mug Rading Mug Rad | Peak requency (M+z) Average (dBµV) Preamp (dBµV) Antenna Factor (dBµV) Cable Factor (dBµV) Adjusted Factor (dBµV) Adjusted (dBµV) Adjusted Factor (dBµV) Adjusted Facto | Reading (MHz) Reading (dBµV) Factor (dB/m) Factor (dB/m) Factor (dB/m) Factor (dB/m) Factor (dB/m) Pactor (dB/m) Pactor (dBµV/m) Limit (dBµV/m) Margin (dBµV/m) Result (dBµV/m) 86.05 87.3 2390.0 | Peak (M+z) Average (dBµV) Preamp (dBµV) Antenna Factor (dBµV) Cable Factor (dBµV) Adjusted Factor (dBµV) Adjustd Factor (dBµV) Adjusted Factor (| Peak (M+z) Average (dBµV) Preamp (dBµV) Antenna Factor (dBµV) Cable Factor (dBµV) Adjusted Factor (dBµV) Adjusted (dBµV/m) Imit (dBµV/m) Margin (dBµV/m) Margin (dBµV/m) Margin (dBµV/m) 2390.0 34.6 34.6 25.6 32.2 3.2 44.4 44.4 74.0 -26.2 Pass 54.0 -6.2 2389.5 38.03 38.0 25.6 32.2 3.2 447.8 47.8 74.0 -26.2 Pass 54.0 -6.2 85.1 |

802.11b: Worst Case 1Mbps

| Date: | 13-Apr-18 | | | Company: | Harman Int | ternationa | al | | | | | ١ | Vork Order: | S0621 |
|-----------------------|----------------------------|-------------------|-------------------|----------------|------------------------|----------------|--------------------------|-------------------------|-------------------|----------------------|--------------------------|-------------------|--------------------------|---------------------|
| Engineer: | Chris Hamel | | | EUT Desc: | PV602 | | | | | | EUT Operat | ing Voltage | Frequency: | 13.8V DC |
| Temp: | 23.4°C | | | Humidity: | 24% | | | Pressure: | 1000mBar | | | | | |
| | | Freque | ncy Range: | 2300-2500 | MHz | | | | | | Measureme | nt Distance: | 3 m | |
| Notes: | 802.11g 6Mbp | S | | | | | | | | | EU | T Max Freq: | | |
| Antenna | | Peak | Average | Preamp | Antenna | Cable | Adjusted | Adjusted | FCC Clas | s B High Fre Peak | equency - | FCC Cla | ss B High Fr Average | equency - |
| Polarization (H/V) | Frequency (MHz) | Reading (dBuV) | Reading (dBµV) | Factor (dB) | Factor (dB/m) | Factor (dB) | Peak Reading (dBuV/m) | Avg Reading (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Result (Pass/Fail) | Limit (dBuV/m) | Margin (dB) | Result (Pass/Fai |
| Low Edge | (111112) | (ubµv) | (ubµv) | (ub) | (dB/II) | (ub) | (dbµv/m) | (dbµ1/m) | (ubµ v/m) | (ub) | (1 a33/1 all) | (ubµv/iii) | (ub) | |
| MaxH | | 90.4 | | | | | | | | | | | | |
| MaxV | | 92.1 | | | | | | | | | | | | |
| V | 2390.0 | 50.6 | 35.3 | 25.6 | 32.2 | 3.2 | 60.4 | 45.1 | 74.0 | -13.6 | Pass | 54.0 | -8.9 | Pass |
| V | 2388.2 | 47.8 | 34.3 | 25.6 | 32.2 | 3.2 | 57.6 | 44.1 | 74.0 | -16.4 | Pass | 54.0 | -9.9 | Pass |
| V | 2384.4 | 47.2 | 32.6 | 25.6 | 32.2 | 3.2 | 57.0 | 42.4 | 74.0 | -17.0 | Pass | 54.0 | -11.6 | Pass |
| V | 2383.9 | 46.3 | 32.3 | 25.6 | 32.2 | 3.2 | 56.1 | 42.1 | 74.0 | -17.9 | Pass | 54.0 | -11.9 | Pass |
| High edge | | | | | | | | | | | | | | |
| MaxH | | 89.7 | | | | | | | | | | | | |
| MaxV | | 89.4 | | | | | | | | | | | | |
| н | 2483.5 | 49.6 | 35.4 | 25.4 | 32.4 | 3.3 | 59.9 | 45.7 | 74.0 | -14.1 | Pass | 54.0 | -8.3 | Pass |
| н | 2488.3 | 48.05 | 33.3 | 25.4 | 32.4 | 3.3 | 58.4 | 43.6 | 74.0 | -15.6 | Pass | 54.0 | -10.4 | Pass |
| н | 2487.2 | 47.3 | 33.7 | 25.4 | 32.4 | 3.3 | 57.6 | 44.0 | 74.0 | -16.4 | Pass | 54.0 | -10.0 | Pass |
| н | 2491.2 | 48.3 | 32.3 | 25.4 | 32.4 | 3.3 | 58.6 | 42.6 | 74.0 | -15.4 | Pass | 54.0 | -11.4 | Pass |
| Н | 2492.8 | 46.3 | 31.9 | 25.4 | 32.4 | 3.3 | 56.6 | 42.2 | 74.0 | -17.4 | Pass | 54.0 | -11.8 | Pass |
| Table | e Result: | | Pass | by | -10.3 | dB | | | | | We | orst Freq: | 2483.5 | MHz |
| | EMI Chamber Rental SA#1 | 1 | | | Asset #24 Asset #24 | | | | | | Asset #2456 Blue Horn | | Cable 3: Preselector: | |

802.11g: Worst Case 6Mbps





Test Report for Harman International Industries, Incorporated • Report No. ES0621-2

| Date: | 13-Apr-18 | | | Company: | Harman In | ternationa | al | | | | | v | Vork Order: | S0621 |
|-----------------------|--------------------|-------------------|------------|----------------|------------------|----------------|---|-------------------------|-------------------|----------------|-----------------------|-------------------|----------------|---------------------|
| Engineer: | Chris Hamel | | | EUT Desc: | PV602 | | | | | | EUT Operat | ing Voltage/ | Frequency: | 13.8V DC |
| Temp: | 23.4°C | | | Humidity: | 24% | | | Pressure: | 1000mBar | | | | | |
| | | Freque | ncy Range: | 2300-2500 | MHz | | | | | | Measureme | nt Distance: | 3 m | |
| Notes: | 802.11n MCS | 0 20MHz | | | | | | | | | EU | T Max Freq: | | |
| | | | | | | | | | FCC Clas | s B High Fr | equency - | FCC Clas | ss B High Fr | equency - |
| Antenna | _ | Peak | Average | Preamp | Antenna | Cable | Adjusted | Adjusted | | Peak | | | Average | |
| Polarization (H/V) | Frequency (MHz) | Reading (dBµV) | (dBµV) | Factor (dB) | Factor (dB/m) | Factor (dB) | Peak Reading (dBµV/m) | Avg Reading (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result (Pass/Fail) | Limit (dBµV/m) | Margin (dB) | Result (Pass/Fai |
| Low Edge | (11112) | (ubµv) | (uph t) | (ub) | (db/m) | (ub) | (00000000000000000000000000000000000000 | (ubµv/m) | (ubµ v/m) | (ub) | (1 233/1 211) | (dbµv/m) | (ub) | (1835/181 |
| MaxH | | 89.7 | | | | | | | | | | | | |
| Max V | | 90.62 | | | | | | | | | | | | |
| V | 2390.0 | 52.9 | 38.0 | 25.6 | 32.2 | 3.2 | 62.7 | 47.8 | 74.0 | -11.3 | Pass | 54.0 | -6.2 | Pass |
| V | 2385.9 | 48.1 | 33.5 | 25.6 | 32.2 | 3.2 | 57.9 | 43.3 | 74.0 | -16.1 | Pass | 54.0 | -10.7 | Pass |
| V | 2381.7 | 46.4 | 31.9 | 25.6 | 32.1 | 3.2 | 56.1 | 41.6 | 74.0 | -17.9 | Pass | 54.0 | -12.4 | Pass |
| V | 2380.6 | 46.1 | 31.5 | 25.6 | 32.1 | 3.2 | 55.8 | 41.2 | 74.0 | -18.2 | Pass | 54.0 | -12.8 | Pass |
| V | 2379.2 | 45.7 | 31.2 | 25.6 | 32.1 | 3.2 | 55.4 | 40.9 | 74.0 | -18.6 | Pass | 54.0 | -13.1 | Pass |
| | | | | | | | | | | | | | | |
| High edge | | | | | | | | | | | | | | |
| Max H | | 88.5 | | | | | | | | | | | | |
| MaxII | | 88.7 | | | | | | | | | | | | |
| V | 2483.5 | 42.2 | 34.2 | 25.4 | 32.4 | 3.3 | 52.5 | 44.5 | 74.0 | -21.5 | Pass | 54.0 | -9.5 | Pass |
| V | 2484.1 | 52.9 | 33.7 | 25.4 | 32.4 | 3.3 | 63.2 | 44.0 | 74.0 | -10.8 | Pass | 54.0 | -10.0 | Pass |
| V | 2485.5 | 52.8 | 32.8 | 25.4 | 32.4 | 3.3 | 63.1 | 43.1 | 74.0 | -10.9 | Pass | 54.0 | -10.9 | Pass |
| V | 2485.3 | 52.8 | 32.9 | 25.4 | 32.4 | 3.3 | 63.1 | 43.2 | 74.0 | -10.9 | Pass | 54.0 | -12.8 | Pass |
| Table | e Result: | | Pass | by | -8.2 | dB | | | | | W | orst Freq: | 2390.0 | MHz |
| Test Site: | EMI Chamber | 1 | | Cable 1: | Asset #24 | 80 | | | | Cable 2: | Asset #2456 | 6 | Cable 3: | |
| Analyzer: | Rental SA#1 | | | Preamp: | Asset #24 | 44 | | | | Antenna | Blue Horn | F | reselector: | |

802.11n (HT20): Worst Case MCS0

| Date: | 25-Apr-18 | | | Company: | Harman Int | ternationa | al | | | | | W | Vork Order: | S0621 |
|----------------------------|------------------|--------------|--------------|-----------|------------|------------|--------------|-------------|----------|---------------------|---------------|---------------|------------------------|-----------|
| Engineer: | Chris Hamel | | | EUT Desc: | PV602 | | | | | | EUT Operat | ing Voltage/I | Frequency: | 13.8V DC |
| Temp: | 24.4°C | | | Humidity: | 27% | | | Pressure: | 1012mBar | | | | | |
| | | | ncy Range: | 2300-2500 | MHz | | | | | | Measureme | nt Distance: | ince: 3 m | |
| Notes: | 802.11n MCS | 5 40MHz | | | | | | | | | EU | Г Max Freq: | | |
| Antenna | | Peak | Average | Preamp | Antenna | Cable | Adjusted | Adjusted | FCC Clas | s B High Fr Peak | equency - | FCC Clas | s B High Fr Average | |
| Polarization | Frequency | Reading | Reading | Factor | Factor | Factor | Peak Reading | Avg Reading | Limit | Margin | Result | Limit | Margin | Result |
| (H/V) | (MHz) | (dBµV) | (dBµV) | (dB) | (dB/m) | (dB) | (dBµV/m) | (dBµV/m) | (dBµV/m) | (dB) | (Pass/Fail) | (dBµV/m) | (dB) | (Pass/Fai |
| Low Edge Max H Max V | | 90.1 91.5 | | | | | | | | | | | | |
| V | 2390.0 | 53.4 | 38.2 | 25.4 | 32.2 | 3.2 | 63.4 | 48.2 | 74.0 | -10.6 | Pass | 54.0 | -5.8 | Margina |
| V | 2385.0 | 49.1 | 33.4 | 25.4 | 32.2 | 3.2 | 59.1 | 43.4 | 74.0 | -14.9 | Pass | 54.0 | -10.6 | Pass |
| V | 2383.0 | 46.0 | 32.1 | 25.4 | 32.2 | 3.2 | 56.0 | 42.1 | 74.0 | -18.0 | Pass | 54.0 | -11.9 | Pass |
| V | 2382.0 | 46.1 | 31.6 | 25.4 | 32.2 | 3.2 | 56.1 | 41.6 | 74.0 | -17.9 | Pass | 54.0 | -12.4 | Pass |
| V | 2378.3 | 45.4 | 29.9 | 25.4 | 32.1 | 3.2 | 55.3 | 39.8 | 74.0 | -18.7 | Pass | 54.0 | -14.2 | Pass |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| High edge Max H | | 90.2 | | | | | | | | | | | | |
| MaxV | 2483.5 | 91.1 | 35.6 | 25.3 | 32.4 | 3.3 | 52.6 | 46.0 | 74.0 | -21.4 | Pass | 54.0 | -8.0 | Pass |
| V V | 2483.5 2485.1 | 42.2 52.9 | 35.6 | 25.3 | 32.4 | 3.3 | 52.6 63.3 | 46.0 | 74.0 | -21.4 | Pass | 54.0 54.0 | -8.0 | Pass |
| v | 2485.1 | 52.9 52.8 | 34.2 34.0 | 25.3 | 32.4 | 3.3 | 63.2 | 44.6 | 74.0 | -10.7 | Pass | 54.0 54.0 | -9.4 | Pass |
| v | 2407.2 | 52.8 | 33.4 | 25.3 | 32.4 | 3.3 | 63.2 | 44.4 | 74.0 | -10.8 | Pass | 54.0 | -10.2 | Pass |
| Table | e Result: | 02.0 | Pass | by | -5.8 | | 00.2 | 1010 | 1 110 | 10.0 | | orst Frea: | 2390.0 | |
| Test Site: | EMI Chamber | 1 | | Cable 1: | Asset #24 | 56 | | | | Cable 2 | : Asset #2480 | | Cable 3: | |
| Analyzer: | Rental SA#3 | | | Preamp: | Asset #24 | 43 | | | | Antenna | : Blue Horn | P | reselector: | |

802.11n (HT40): Worst Case MCS5





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| Spectrum Analyzers / Receivers / Preselectors | Range | MN | Mfr | SN | Asset | Cat | Calibration Due |
|---|--------------|---------|-----------|------------|---------|-----|-----------------|
| 2093 MXE EMI Receiver | 20Hz-26.5GHz | N9038A | Agilent | MY51210181 | 2093 | L | 11/16/2018 |
| Rental MXE EMI Receiver(1170725) | 20Hz-26.5GHz | N9038A | Agilent | MY51210151 | 1170725 | I | 4/10/2019 |
| Radiated Emissions Sites | FCC Code | IC Code | VCCI Code | Range | Asset | Cat | Calibration Due |
| EMI Chamber 1 | 719150 | 2762A-6 | A-0015 | 1-18GHz | 1685 | I | 12/21/2018 |
| EMI Chamber 2 | 719150 | 2762A-7 | A-0015 | 1-18GHz | 1686 | I | 12/21/2018 |
| Antennas | Range | MN | Mfr | SN | Asset | Cat | Calibration Due |
| Orange Horn | 1-18GHz | 3115 | EMCO | 0004-6123 | 390 | L | 10/13/2018 |
| Blue Horn | 1-18Ghz | 3117 | ETS | 157647 | 1861 | I | 2/14/2019 |
| Meteorological Meters/Chambers | | MN | Mfr | SN | Asset | Cat | Calibration Due |
| TH A#2084 | | HTC-1 | HDE | | 2084 | Ш | 3/22/2019 |
| TH A#2085 | | HTC-1 | HDE | | 2085 | II | 3/22/2019 |
| Cables | Range | | Mfr | | | Cat | Calibration Du |
| Asset #2456 | 9KHz-18GHz | | MegaPhase | | | Ш | 10/29/2018 |
| Asset #2458 | 9KHz-18GHz | | MegaPhase | | | Ш | 10/29/2018 |
| Asset #2459 | 9KHz-18GHz | | MegaPhase | | | Ш | 10/29/2018 |
| Asset #2480 | 9KHz-18GHz | | MegaPhase | | | Ш | 10/29/2018 |

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Test Equipment Used





AC Line Conducted Emissions

LIMITS

| Frequency of emission (MHz) | Quasi-peak limit (dBµV) | Average limit (dBµV) |
|--------------------------------|----------------------------|-------------------------|
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

*Decreases with the logarithm of the frequency.

[47 CFR 15.207(a)]

MEASUREMENTS / RESULTS

N/A. Vehicle battery powered only.





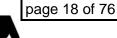
Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

| Measurement | Expanded Uncertainty k=2 | Maximum allowable uncertainty |
|--|--------------------------|-------------------------------|
| Radiated Emissions (30-1000MHz) NIST | 5.6dB | N/A |
| CISPR | 4.6dB | 5.2dB (Ucispr) N/A |
| Radiated Emissions (1-26.5GHz) | 4.6dB | |
| Radiated Emissions (above 26.5GHz) | 4.9dB | N/A |
| Magnetic Radiated Emissions Conducted Emissions | 5.6dB | N/A |
| NIST CISPR | 3.9dB 3.6dB | N/A 3.6dB (Ucispr) |
| Telco Conducted Emissions (Current) | 2.9dB | N/A |
| Telco Conducted Emissions (Voltage) | 4.4dB | N/A |
| Electrostatic Discharge | 11.5% | N/A |
| Radiated RF Immunity (Uniform Field) | 1.6dB | N/A |
| Electrical Fast Transients | 23.1% | N/A |
| Surge | 23.1% | N/A |
| Conducted RF Immunity | 3dB | N/A |
| Magnetic Immunity | 12.8% | N/A |
| Dips and Interrupts | 2.3V | N/A |
| Harmonics | 3.5% | N/A |
| Flicker | 3.5% | N/A |
| Radio frequency (@ 2.4GHz) | 3.23 x 10 ⁻⁸ | 1 x 10 ⁻⁷ |
| RF power, conducted | 0.40dB | 0.75dB |
| Maximum frequency deviation: • Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency | 3.4% 0.3dB | 5% 3dB |
| Adjacent channel power | 1.9dB | 3dB |
| Conducted spurious emission of transmitter, valid up to 12.75GHz | 2.39dB | 3dB |
| Conducted emission of receivers | 1.3dB | 3dB |
| Radiated emission of transmitter, valid up to 26.5GHz | 3.9dB | 6dB |
| Radiated emission of transmitter, valid up to 80GHz | 3.3dB | 6dB |
| Radiated emission of receiver, valid up to 26.5GHz | 3.9dB | 6dB |
| Radiated emission of receiver, valid up to 80GHz | 3.3dB | 6dB |
| Humidity | 2.37% | 5% |
| Temperature | 0.7°C | 1.0°C |
| Time | 4.1% | 10% |
| RF Power Density, Conducted | 0.4dB | 3dB |
| DC and low frequency voltages | 1.3% | 3% |
| Voltage (AC, <10kHz) | 1.3% | 2% |
| Voltage (DC) | 0.62% | 1% |
| The above reflects a 95% confidence level | | |



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ACCREDITED

Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "Conditions"): 1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("Test Report") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.

2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.

 The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
 These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof

4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.

5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "BUREAU VERITAS," "BUREAU VERITAS CONSUMER PRODUCTS SERVICES," "BVCPS", "MTL", "ACTS", "MTL-ACTS" and CURTIS-STRAUS (collectively, the "Marks") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.

6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.

The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
 Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.

9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.

10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.

11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only were such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.

12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.

13. CLIÉNT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.





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15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B)NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.\$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any litigation arising hereunder.

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request. Rev.160009121(2)_#684340 v14CS





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ES0621-2 Appendix A CFR Title 47 FCC Part §15.247 and ISED Canada RSS-247 Issue 2

Model: Manufacturer: Serial Number: Software Version: PV602 Harman International Industries, Inc. 34670010475 SOC: BR_RC1_R12.0.0_R18102A

Mode Channel Frequency 802.11b/g/n(HT20) 2412 MHz 1 802.11b/g/n(HT20) 2 2417 MHz 802.11b/g/n(HT20) 3 2422 MHz 802.11b/g/n(HT20) 4 2427 MHz 802.11b/g/n(HT20) 5 2432 MHz 802.11b/g/n(HT20) 6 2437 MHz 802.11b/g/n(HT20) 7 2442 MHz 802.11b/g/n(HT20) 8 2447 MHz 802.11b/g/n(HT20) 9 2452 MHz 802.11b/g/n(HT20) 10 2457 MHz 802.11b/g/n(HT20) 2462 MHz 11

| Mode | Channel | Frequency |
|---------------|---------|-----------|
| 802.11n(HT40) | 3 | 2422 MHz |
| 802.11n(HT40) | 4 | 2427 MHz |
| 802.11n(HT40) | 5 | 2432 MHz |
| 802.11n(HT40) | 6 | 2437 MHz |
| 802.11n(HT40) | 7 | 2442 MHz |
| 802.11n(HT40) | 8 | 2447 MHz |
| 802.11n(HT40) | 9 | 2452 MHz |

Antenna:

2400-2500MHz Gain: 2.3dBi Peak

| WIFI Antenna | | | |
|--------------|------------|-----------------|-----------|
| Frequency | Efficiency | Efficiency . dB | Peak Gain |
| 2400 | 33% | -4.8 | 2.2 |
| 2410 | 34% | -4.7 | 2.3 |
| 2420 | 34% | -4.7 | 2.1 |
| 2430 | 35% | -4.6 | 2.0 |
| 2440 | 35% | -4.6 | 1.6 |
| 2450 | 36% | -4.5 | 1.3 |
| 2460 | 35% | -4.5 | 1.5 |
| 2470 | 34% | -4.6 | 1.5 |
| 2480 | 33% | -4.9 | 1.3 |
| 2490 | 31% | -5.1 | 0.9 |
| 2500 | 29% | -5.4 | 0.9 |
| AVG | 33% | -4.8 | 1.6 |

1

Number of transmission chains Equipment Type

Digital Transmission System (DTS)



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Test Equipment Used:

| Spectrum Analyzers / Receivers / Preselectors | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated or |
|---|--------------|----------|-----------------|--------|-------|-----|-----------------|---------------|
| FSV40 Signal/Spectrum Analyzer | 10Hz-40GHz | FSV40 | ROHDE & SCHWARZ | 101551 | 2200 | I | 6/30/2018 | 6/30/2017 |
| Signal Generators/Comparaison Noise Emitter | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated or |
| SMBV100A Vector Signal Generator | 9KHz-6GHz | SMBV100A | ROHDE & SCHWARZ | 261919 | 2201 | 1 | 6/26/2018 | 6/26/2017 |
| SMB100A Signal Generator | 100kHz-40GHz | SMB100A | ROHDE & SCHWARZ | 179846 | 2434 | Т | 5/30/2018 | 5/30/2017 |
| Power/Noise Meters | | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated or |
| OSP - open switch and control platform | 30MHz-18GHz | OSP120 | ROHDE & SCHWARZ | 101674 | | Т | 6/1/2018 | 6/1/2017 |
| Cables | Range | | Mfr | | | Cat | Calibration Due | Calibrated or |
| DUT1 | 30MHz-26GHz | | Micro-Coax | | | Ш | 6/21/2018 | 6/21/2017 |
| DUT2 | 30MHz-26GHz | | Micro-Coax | | | Ш | 6/22/2018 | 6/22/2017 |
| DUT3 | 30MHz-26GHz | | Micro-Coax | | | Ш | 6/23/2018 | 6/23/2017 |
| DUT4 | 30MHz-26GHz | | Micro-Coax | | | Ш | 6/24/2018 | 6/24/2017 |
| Attenuators / Couplers | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated or |
| 10dB Attenuator-01 Brown | 30MHz-26GHz | | Mini Curcuits | | | II | 7/13/2018 | 7/14/2017 |
| 10dB Attenuator-02 Yellow | 30MHz-26GHz | | Mini Curcuits | | | II | 7/13/2018 | 7/14/2017 |
| 10dB Attenuator-03 Red | 30MHz-26GHz | | Mini Curcuits | | | Ш | 7/13/2018 | 7/14/2017 |
| 10dB Attenuator-04 orange | 30MHz-26GHz | | Mini Curcuits | | | II | 7/13/2018 | 7/14/2017 |
| API - 30dB 20W Attenuator | 9KHz-40GHz | 89-30-11 | API Weinschel | 703 | 2121 | 1 | 3/23/2019 | 3/23/2018 |
| Directional Coupler | 0.5GHz-18GHz | UDC | AA MCS | 001040 | | I | 8/11/2018 | 8/11/2017 |
| Communication Tester | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated o |
| MW500 Wideband Radio Communication Tester | DC to 6GHz | CMW500 | ROHDE & SCHWARZ | 155905 | | I | 6/2/2018 | 6/2/2017 |
| Meteorological Meters/Chambers | | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated or |
| Temp/Humidity Chamber #18 | | EPX-2H | Espec | 137664 | 1645 | I | 1/5/2019 | 1/5/2018 |





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Test Results Summary

| Test | Frequency | | | 802.11n |
|------------------------------|-----------|---------|---------|---------|
| | (MHz) | 802.11b | 802.11g | (HT20) |
| Average Output Power | 2412.000 | PASS | PASS | PASS |
| Peak Power Spectral Density | 2412.000 | PASS | PASS | PASS |
| DTS Bandwidth (6dB) | 2412.000 | PASS | PASS | PASS |
| Conducted Band Edges | 2412.000 | PASS | PASS | PASS |
| Conducted Spurious Emissions | 2412.000 | PASS | PASS | PASS |
| Average Output Power | 2437.000 | PASS | PASS | PASS |
| Peak Power Spectral Density | 2437.000 | PASS | PASS | PASS |
| DTS Bandwidth (6dB) | 2437.000 | PASS | PASS | PASS |
| Conducted Band Edges | 2437.000 | PASS | PASS | PASS |
| Conducted Spurious Emissions | 2437.000 | PASS | PASS | PASS |
| Average Output Power | 2462.000 | PASS | PASS | PASS |
| Peak Power Spectral Density | 2462.000 | PASS | PASS | PASS |
| DTS Bandwidth (6dB) | 2462.000 | PASS | PASS | PASS |
| Conducted Band Edges | 2462.000 | PASS | PASS | PASS |
| Conducted Spurious Emissions | 2462.000 | PASS | PASS | PASS |

| Test | Frequency (MHz) | 802.11n (HT40) |
|------------------------------|--------------------|-------------------|
| Average Output Power | 2422.000 | PASS |
| Peak Power Spectral Density | 2422.000 | PASS |
| DTS Bandwidth (6dB) | 2422.000 | PASS |
| Conducted Band Edges | 2422.000 | PASS |
| Conducted Spurious Emissions | 2422.000 | PASS |
| Average Output Power | 2437.000 | PASS |
| Peak Power Spectral Density | 2437.000 | PASS |
| DTS Bandwidth (6dB) | 2437.000 | PASS |
| Conducted Band Edges | 2437.000 | PASS |
| Conducted Spurious Emissions | 2437.000 | PASS |
| Average Output Power | 2452.000 | PASS |
| Peak Power Spectral Density | 2452.000 | PASS |
| DTS Bandwidth (6dB) | 2452.000 | PASS |
| Conducted Band Edges | 2452.000 | PASS |
| Conducted Spurious Emissions | 2452.000 | PASS |





Average Output Power (Gated)

Test according to FCC KDB 558074 DTS Measurement Guidance v04 Section 9.2.3.2.

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Combined Uncertainty of absolute Level Measurement (K=2) < 1 dB

802.11b

| Data Rate | Gated RMS (dBm) 2412 MHz | Gated RMS (dBm) 2437 MHz | Gated RMS (dBm) 2462 MHz | Limit (dBm) | Duty Cycle (%) |
|-----------|-----------------------------|-----------------------------|-----------------------------|----------------|----------------|
| 1 Mbps | 11.637 | 14.685 | 12.876 | 30 | 99.755 |
| 2 Mbps | 11.641 | 13.116 | 13.343 | 30 | 99.511 |
| 5.5 Mbps | 12.515 | 12.359 | 11.888 | 30 | 98.717 |
| 11 Mbps | 12.33 | 12.338 | 12.305 | 30 | 97.609 |

802.11g

| Data Rate | Gated RMS (dBm) 2412 MHz | Gated RMS (dBm) 2437 MHz | Gated RMS (dBm) 2462 MHz | Limit (dBm) | Duty Cycle (%) |
|-----------|-----------------------------|-----------------------------|-----------------------------|----------------|----------------|
| 6 Mbps | 13.847 | 13.96 | 14.578 | 30 | 98.502 |
| 9 Mbps | 13.815 | 13.653 | 13.509 | 30 | 97.776 |
| 12 Mbps | 13.878 | 13.658 | 13.502 | 30 | 97.093 |
| 18 Mbps | 13.555 | 13.548 | 13.495 | 30 | 95.762 |
| 24 Mbps | 13.856 | 13.657 | 13.507 | 30 | 94.512 |
| 36 Mbps | 13.608 | 13.48 | 13.51 | 30 | 92.151 |
| 48 Mbps | 13.595 | 13.463 | 13.371 | 30 | 90.151 |
| 54 Mbps | 13.558 | 13.499 | 13.378 | 30 | 89.196 |

802.11n(HT20)

| Data Rate | Gated RMS (dBm) 2412 MHz | Gated RMS (dBm) 2437 MHz | Gated RMS (dBm) 2462 MHz | Limit (dBm) | Duty Cycle (%) |
|-----------|-----------------------------|-----------------------------|-----------------------------|----------------|----------------|
| MCS0 | 13.627 | 13.575 | 13.601 | 30 | 98.399 |
| MCS1 | 13.548 | 13.563 | 13.082 | 30 | 96.923 |
| MCS2 | 13.638 | 13.622 | 13.6 | 30 | 95.584 |
| MCS3 | 13.605 | 13.588 | 13.505 | 30 | 94.348 |
| MCS4 | 13.802 | 13.677 | 13.496 | 30 | 92.153 |
| MCS5 | 13.546 | 13.673 | 13.558 | 30 | 90.163 |
| MCS6 | 13.782 | 13.621 | 13.565 | 30 | 89.402 |
| MCS7 | 13.62 | 13.612 | 13.571 | 30 | 88.499 |

802.11n(HT40)

| Data Rate | Gated RMS (dBm) 2422 MHz | Gated RMS (dBm) 2437 MHz | Gated RMS (dBm) 2452 MHz | Limit (dBm) | Duty Cycle (%) |
|-----------|-----------------------------|-----------------------------|-----------------------------|----------------|----------------|
| MCS0 | 13.938 | 13.966 | 13.804 | 30 | 96.837 |
| MCS1 | 13.94 | 13.903 | 13.813 | 30 | 94.216 |
| MCS2 | 13.883 | 13.564 | 13.522 | 30 | 91.978 |
| MCS3 | 13.683 | 13.788 | 13.713 | 30 | 90.073 |
| MCS4 | 13.804 | 13.922 | 13.777 | 30 | 86.933 |
| MCS5 | 13.988 | 13.987 | 13.835 | 30 | 84.313 |
| MCS6 | 14.077 | 13.975 | 13.834 | 30 | 83.331 |
| MCS7 | 13.768 | 13.951 | 13.905 | 30 | 82.232 |





Peak Power Spectral Density

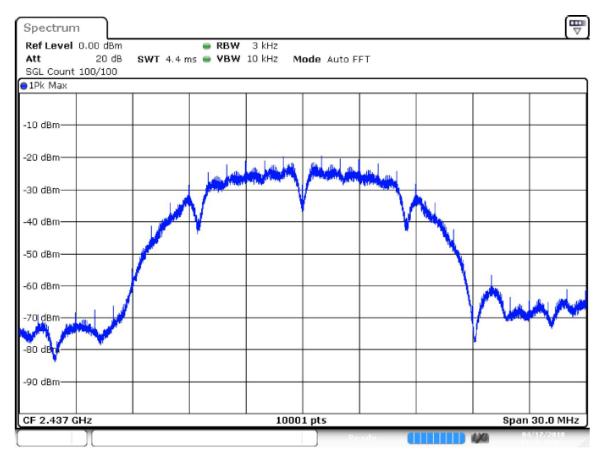
Test according to FCC KDB 558074 DTS Measurement Guidance v04 Section 10.2

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 1.3 dB

802.11b

| Data Rate | Peak PSD (dBm) 2412 MHz | Peak PSD (dBm) 2437 MHz | Peak PSD (dBm) 2462 MHz | Limit (dBm) |
|-----------|-------------------------------|-------------------------------|-------------------------------|----------------|
| 1 Mbps | -10.959 | -7.835 | -9.802 | 8 |
| 2 Mbps | -10.914 | -10.447 | -10.071 | 8 |
| 5.5 Mbps | -11.513 | -11.605 | -11.633 | 8 |
| 11 Mbps | -12.257 | -12.310 | -12.778 | 8 |

802.11b 1 Mbps 2437MHz



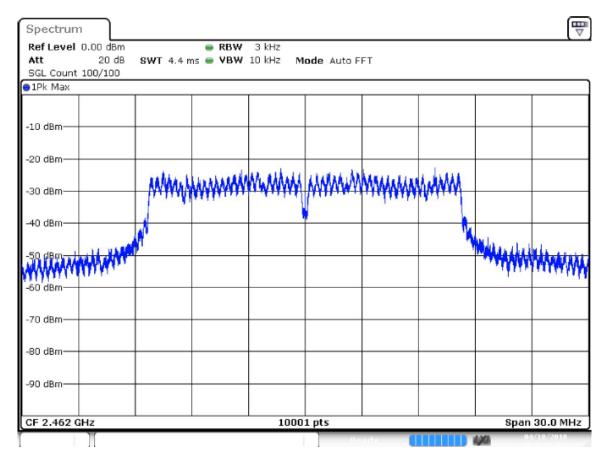




| <u></u> | | | | |
|-----------|-------------------|-------------------|-------------------|----------------|
| Data Rate | Peak PSD (dBm) | Peak PSD (dBm) | Peak PSD (dBm) | Limit (dBm) |
| | 2412 MHz | 2437 MHz | 2462 MHz | (abiii) |
| 6 Mbps | -11.484 | -11.251 | -10.888 | 8 |
| 9 Mbps | -11.845 | -11.807 | -12.393 | 8 |
| 12 Mbps | -12.252 | -11.705 | -12.363 | 8 |
| 18 Mbps | -12.234 | -11.723 | -12.144 | 8 |
| 24 Mbps | -11.548 | -12.011 | -12.114 | 8 |
| 36 Mbps | -11.897 | -12.355 | -12.168 | 8 |
| 48 Mbps | -12.173 | -12.418 | -12.282 | 8 |
| 54 Mbps | -11.425 | -11.479 | -11.503 | 8 |

802.11g

802.11g 6Mbps 2462MHz



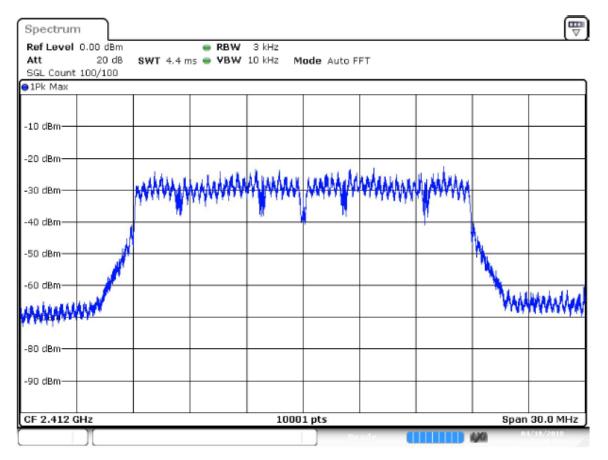




802.11n(HT20)

| Data Rate | Peak PSD (dBm) 2412 MHz | Peak PSD (dBm) 2437 MHz | Peak PSD (dBm) 2462 MHz | Limit (dBm) |
|-----------|-------------------------------|-------------------------------|-------------------------------|----------------|
| MCS0 | -11.338 | -11.180 | -11.180 | 8 |
| MCS1 | -11.709 | -12.132 | -12.224 | 8 |
| MCS2 | -11.700 | -11.391 | -11.589 | 8 |
| MCS3 | -11.893 | -12.199 | -12.345 | 8 |
| MCS4 | -11.271 | -11.159 | -11.496 | 8 |
| MCS5 | -11.357 | -11.599 | -12.127 | 8 |
| MCS6 | -10.799 | -11.134 | -11.272 | 8 |
| MCS7 | -11.598 | -11.617 | -11.827 | 8 |

802.11n(HT20) MCS6 2412MHz



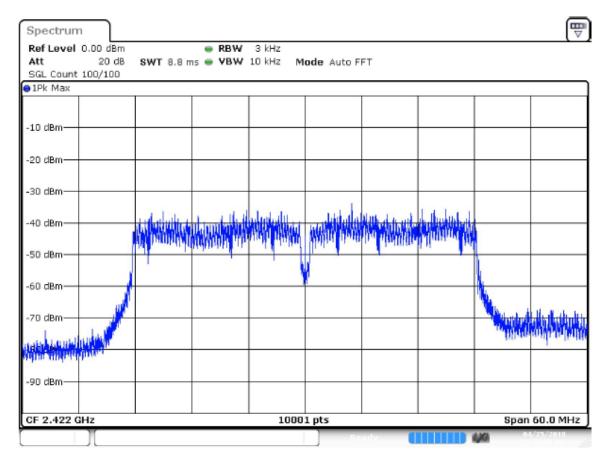




802.11n(HT40)

| Data Rate | Peak PSD (dBm) 2422 MHz | Peak PSD (dBm) 2437 MHz | Peak PSD (dBm) 2452 MHz | Limit (dBm) |
|-----------|-------------------------------|-------------------------------|-------------------------------|----------------|
| MCS0 | -14.570 | -14.730 | -14.834 | 8 |
| MCS1 | -13.467 | -13.876 | -14.299 | 8 |
| MCS2 | -13.194 | -13.341 | -13.414 | 8 |
| MCS3 | -13.755 | -13.935 | -14.378 | 8 |
| MCS4 | -13.473 | -13.539 | -13.785 | 8 |
| MCS5 | -11.917 | -12.093 | -12.274 | 8 |
| MCS6 | -12.420 | -12.618 | -12.851 | 8 |
| MCS7 | -13.001 | -13.217 | -13.236 | 8 |

802.11n(HT40) MCS5 2422MHz







DTS Bandwidth (6dB) Test according to FCC KDB 558074 DTS Measurement Guidance v04 Section 8.1

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

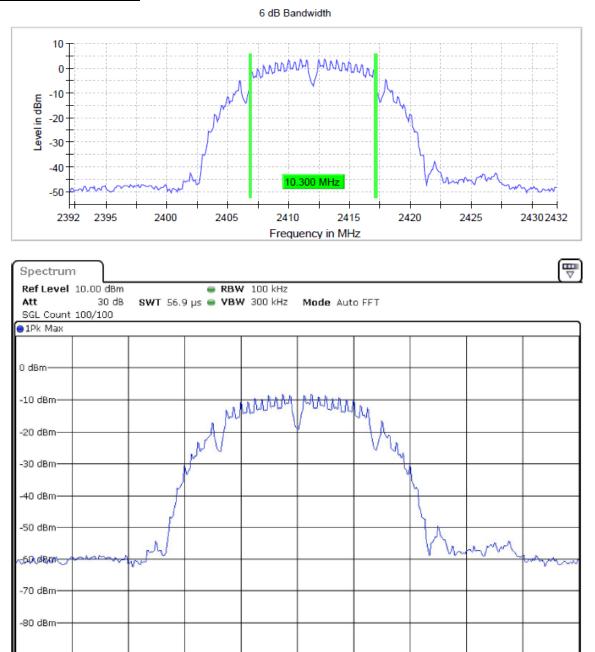
| Data Rate | DUT Frequency (MHz) | Bandwidth (MHz) | Minimum Limit (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|--------------------|---------------------------|--------------------|---------------------------|----------------------------|-----------------------------|
| 802.11b 1 Mbps | 2412.000 | 10.300000 | 0.5 | 2406.850000 | 2417.150000 |
| 802.11g 6 Mbps | 2412.000 | 16.500000 | 0.5 | 2403.750000 | 2420.250000 |
| 802.11n(HT20) MCS4 | 2412.000 | 17.900000 | 0.5 | 2403.050000 | 2420.950000 |
| 802.11n(HT40) MCS6 | 2422.000 | 37.000000 | 0.5 | 2403.750000 | 2440.750000 |
| 802.11b 1 Mbps | 2437.000 | 10.300000 | 0.5 | 2431.850000 | 2442.150000 |
| 802.11g 6 Mbps | 2437.000 | 16.500000 | 0.5 | 2428.750000 | 2445.250000 |
| 802.11n(HT20) MCS4 | 2437.000 | 17.900000 | 0.5 | 2428.050000 | 2445.950000 |
| 802.11n(HT40) MCS6 | 2437.000 | 37.500000 | 0.5 | 2418.250000 | 2455.750000 |
| 802.11b 1 Mbps | 2462.000 | 10.300000 | 0.5 | 2456.850000 | 2467.150000 |
| 802.11g 6 Mbps | 2462.000 | 16.500000 | 0.5 | 2453.750000 | 2470.250000 |
| 802.11n(HT20) MCS4 | 2462.000 | 17.900000 | 0.5 | 2453.050000 | 2470.950000 |
| 802.11n(HT40) MCS6 | 2452.000 | 37.500000 | 0.5 | 2433.250000 | 2470.750000 |





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802.11b 1Mbps 2412MHz





CF 2.412 GHz

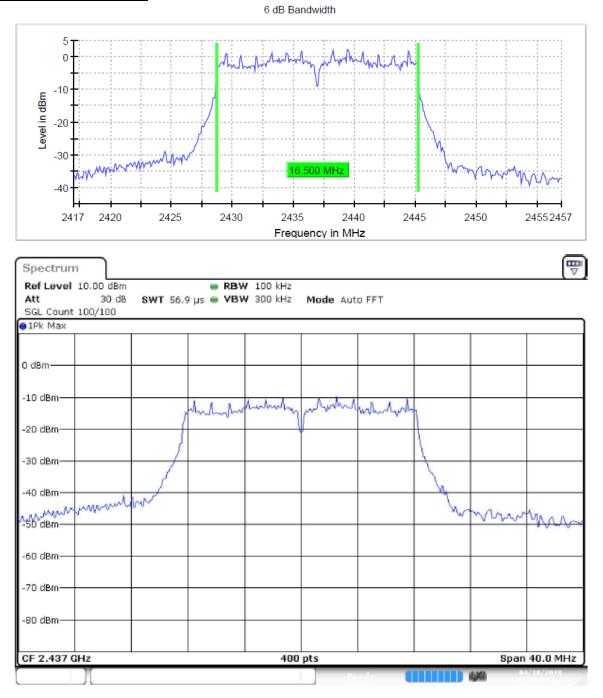
400 pts



Span 40.0 MHz

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802.11g 6 Mbps 2437MHz



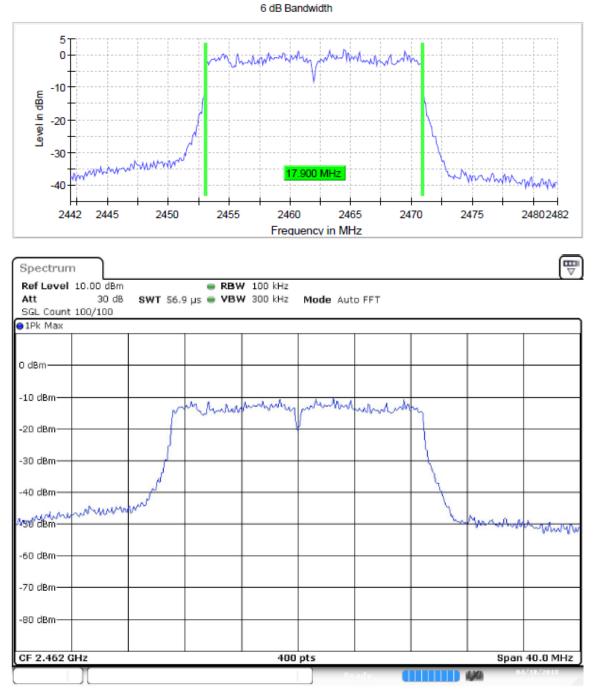




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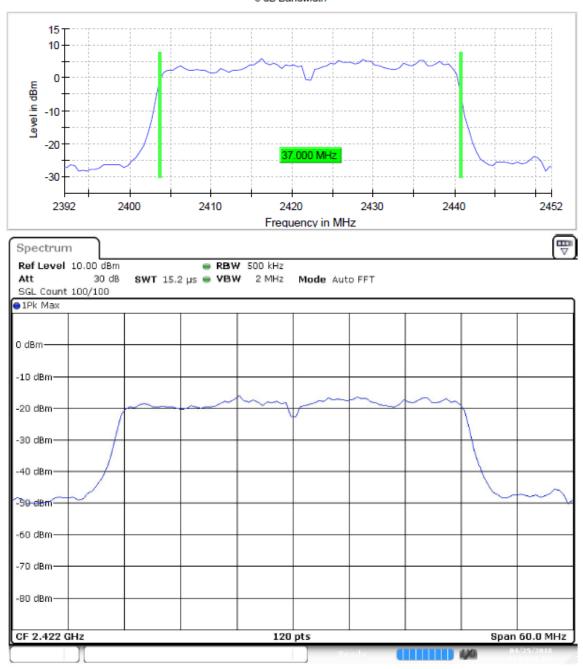






802.11n(HT40) MCS6 2422MHz

6 dB Bandwidth







Conducted Band Edge

Test according to FCC KDB 558074 DTS Measurement Guidance v04 Section 11.

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 0.8 dB

802.11b 1Mbps 2412MHz

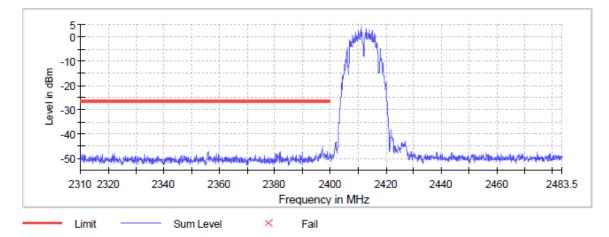
Band Edge Low

Inband Peak

| Frequency | Level |
|-------------|-------|
| (MHz) | (dBm) |
| 2412.975000 | 3.7 |

Measurements

| Frequency | Level | Margin | Limit | Result |
|-------------|-------|--------|-------|---------|
| (MHz) | (dBm) | (dB) | (dBm) | |
| 2396.975000 | 45.9 | 19.6 | -26.3 | PASS |
| 2397.025000 | -46.0 | 19.7 | -26.3 | PASS |
| 2397.075000 | -47.1 | 20.7 | -26.3 | PASS |
| 2397.125000 | -47.2 | 20.9 | -26.3 | PASS |
| 2389.925000 | -47.4 | 21.1 | -26.3 | PASS |
| 2381.825000 | -47.5 | 21.1 | -26.3 | PASS |
| 2397.225000 | -47.5 | 21.2 | -26.3 | PASS |
| 2389.875000 | -47.5 | 21.2 | -26.3 | PASS |
| 2355.925000 | -47.7 | 21.3 | -26.3 | PASS |
| 2381.775000 | -47.7 | 21.4 | -26.3 | PASS |
| 2398.825000 | -47.7 | 21.4 | -26.3 | PASS |
| 2396.925000 | -47.8 | 21.5 | -26.3 | PASS |
| 2398.775000 | -47.9 | 21.5 | -26.3 | PASS |
| 2397.925000 | -47.9 | 21.5 | -26.3 | PASS |
| 2359.075000 | -47.9 | 21.6 | -26.3 | PASS |
| | | | Bar | nd Edge |



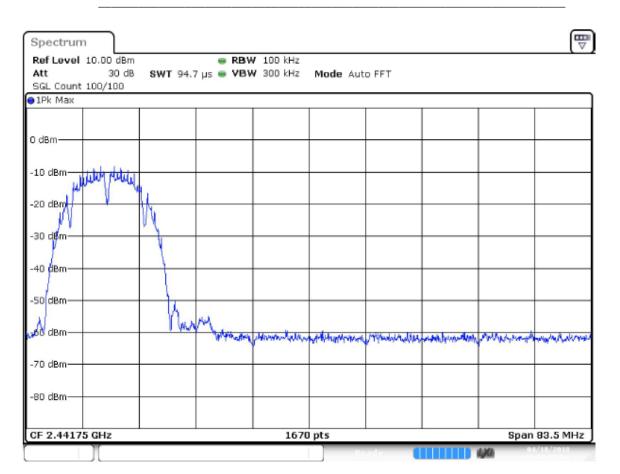




| Spectrun | | | | | | | | | ₿ |
|-----------------------------------|----------------|------------------------|------------|------------------|---------------------|--------------|---|-------------------|-------------|
| Ref Level 10.00 dBm e RBW 100 kHz | | | | | | | | | |
| Att | 30 dB | SWT 113 | .7 µs 🖷 VB | W 300 kHz | Mode Au | ito FFT | | | |
| SGL Count | 100/100 | | | | | | | | |
| ⊖1Pk Max | | | | | | | | | |
| | | | | | | | | | |
| 0 dBm | | | | | | | | | |
| | | | | | | | | | |
| -10 dBm | | | | | | | | | |
| | | | | | | | | | |
| -20 dBm | | | | | | | | | |
| | | | | | | | | | |
| -30 dBm | | | | | | | | | |
| | | | | | | | | | |
| -40 dBm | | | | | | | | | |
| | | | | | | | | | |
| -50 dBm | | | | | | | | | |
| 00 000 | | | | | | | | | |
| ~60 dBm | | | | | | | | | - |
| and the second | multiply where | with the second second | Mar Maleri | 1. HAR BURNER | /www.witchind.on.ma | yutudhe have | mahalana mahalana mahana ma | anon a worked the | en internet |
| -70 dBm | | | | | | | | | |
| | | | | | | | | | |
| -80 dBm | | | | | | | | | |
| oo dom | | | | | | | | | |
| | | | | | | | | | |
| CF 2.355 C | Hz | | | 1800 | pts | | | Span | 90.0 MHz |
| |)I | | | | Re | ady 🚺 | | 4/4 | /18/2018 |







802.11b 1Mbps 2462MHz

Band Edge High

Inband Peak

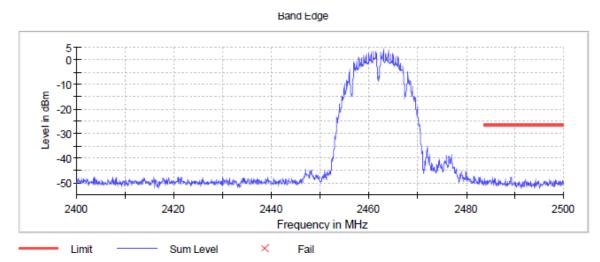
| Frequency | Level |
|-------------|-------|
| (MHz) | (dBm) |
| 2462.975000 | 3.5 |





Measurements

| Frequency | Level | Margin | Limit | Result |
|-------------|-------|--------|-------|--------|
| (MHz) | (dBm) | (dB) | (dBm) | |
| 2489.175000 | -47.9 | 21.4 | -26.5 | PASS |
| 2489.225000 | -47.9 | 21.5 | -26.5 | PASS |
| 2485.925000 | -48.4 | 21.9 | -26.5 | PASS |
| 2497.175000 | -48.5 | 22.1 | -26.5 | PASS |
| 2485.975000 | -48.6 | 22.2 | -26.5 | PASS |
| 2497.125000 | -48.6 | 22.2 | -26.5 | PASS |
| 2492.225000 | -48.6 | 22.2 | -26.5 | PASS |
| 2485.425000 | -48.7 | 22.2 | -26.5 | PASS |
| 2485.475000 | -48.7 | 22.3 | -26.5 | PASS |
| 2486.675000 | -48.8 | 22.4 | -26.5 | PASS |
| 2492.175000 | -48.8 | 22.4 | -26.5 | PASS |
| 2499.825000 | -48.8 | 22.4 | -26.5 | PASS |
| 2484.875000 | -48.9 | 22.4 | -26.5 | PASS |
| 2485.775000 | -48.9 | 22.4 | -26.5 | PASS |
| 2483.825000 | -48.9 | 22.5 | -26.5 | PASS |



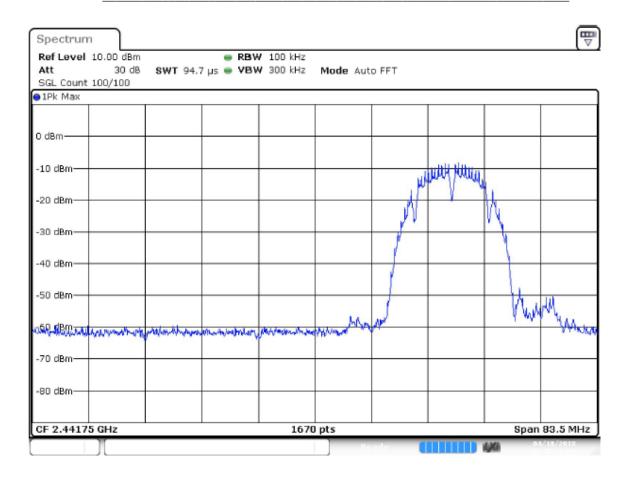




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| Spectrun | | | | | | | | | ₩ |
|------------|-----------|---|-------------|------------------|----------|--------|----|----------|----------|
| | 10.00 dBm | | | W 100 kHz | | | | | |
| Att | 30 dB | SWT 18 |).9 µs 🖷 VB | W 300 kHz | Mode Aut | to FFT | | | |
| SGL Count | 100/100 | | | | | | | | |
| 1Pk Max | | | | | | | | | |
| | | | | 1 | | | | | |
| 0 dBm | | | | | | | | | |
| | | | | | | | | | |
| -10 dBm | | | | | | | | | |
| | | | | | | | | | |
| -20 dBm | | | | | | | | | |
| | | | | | | | | | |
| -30 dBm | | | | | | | | <u> </u> | |
| | | | | | | | | | |
| -40 dBm | | | | | | | | | |
| | | | | | | | | | |
| -50 dBm | | | | | | | | | |
| | | | | | | | | | |
| Je galling | min | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | man | m | mon | mound | mm | m | mm |
| -70 dBm | | | | | | | | | |
| | | | | | | | | | |
| -80 dBm | | | | | | | | | |
| | | | | | | | | | |
| CF 2.4917 | 5 GHz | | | 330 | pts | | | Snan | 16.5 MHz |

802.11g 6 Mbps 2412MHz

Band Edge Low

Inband Peak

| Frequency | Level |
|-------------|-------|
| (MHz) | (dBm) |
| 2414.475000 | 2.1 |

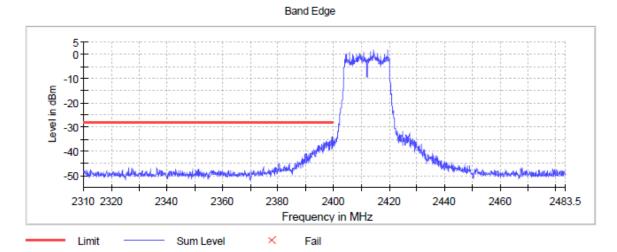




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Measurements

| Frequency | Level | Margin | Limit | Result |
|-------------|-------|--------|-------|--------|
| (MHz) | (dBm) | (dB) | (dBm) | |
| 2399.475000 | -33.9 | 6.0 | -27.9 | PASS |
| 2399.425000 | -34.4 | 6.5 | -27.9 | PASS |
| 2399.525000 | -34.5 | 6.6 | -27.9 | PASS |
| 2398.875000 | -35.5 | 7.6 | -27.9 | PASS |
| 2398.475000 | -35.8 | 7.9 | -27.9 | PASS |
| 2398.525000 | -35.9 | 8.0 | -27.9 | PASS |
| 2399.825000 | -36.0 | 8.1 | -27.9 | PASS |
| 2399.875000 | -36.0 | 8.1 | -27.9 | PASS |
| 2397.875000 | -36.1 | 8.2 | -27.9 | PASS |
| 2397.575000 | -36.1 | 8.2 | -27.9 | PASS |
| 2398.825000 | -36.1 | 8.2 | -27.9 | PASS |
| 2397.625000 | -36.1 | 8.2 | -27.9 | PASS |
| 2396.375000 | -36.1 | 8.3 | -27.9 | PASS |
| 2399.075000 | -36.2 | 8.3 | -27.9 | PASS |
| 2397.825000 | -36.3 | 8.4 | -27.9 | PASS |

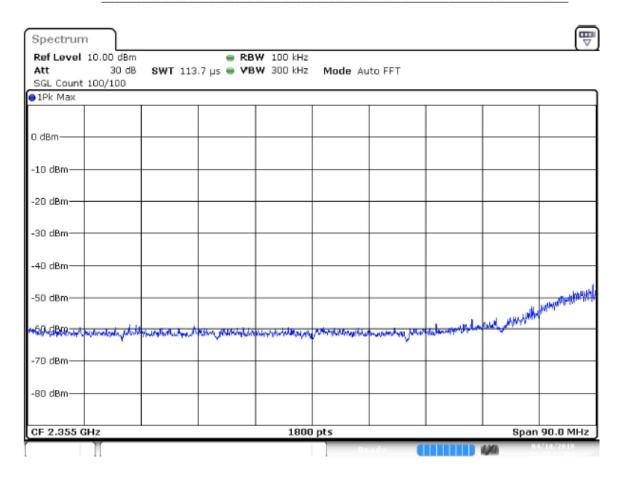






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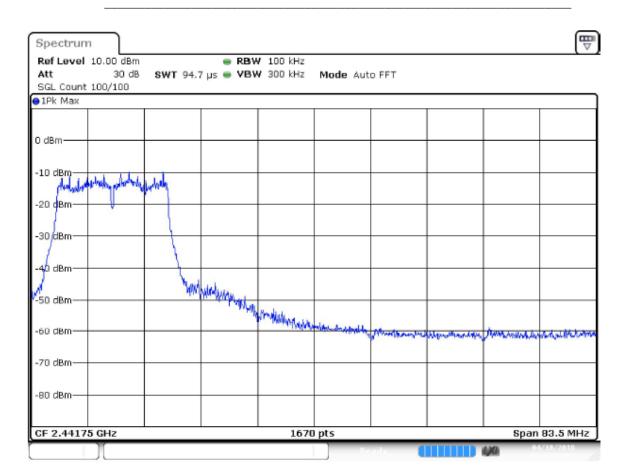








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802.11g 6 Mbps 2462MHz

Band Edge High

Inband Peak

| Frequency | Level |
|-------------|-------|
| (MHz) | (dBm) |
| 2464.475000 | 1.9 |

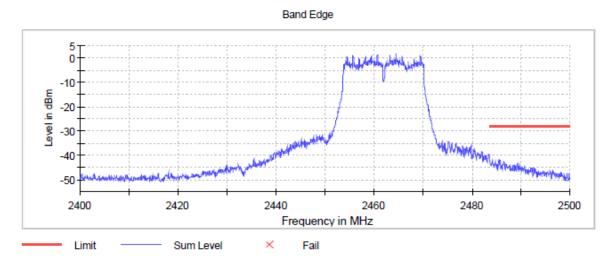




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Measurements

| Frequency | Level | Margin | Limit | Result |
|-------------|-------|--------|-------|--------|
| (MHz) | (dBm) | (dB) | (dBm) | |
| 2483.575000 | -39.5 | 11.4 | -28.1 | PASS |
| 2483.525000 | -39.6 | 11.5 | -28.1 | PASS |
| 2483.625000 | -40.0 | 11.8 | -28.1 | PASS |
| 2485.725000 | -42.0 | 13.9 | -28.1 | PASS |
| 2483.675000 | -42.1 | 13.9 | -28.1 | PASS |
| 2485.775000 | -42.2 | 14.1 | -28.1 | PASS |
| 2484.175000 | -42.3 | 14.2 | -28.1 | PASS |
| 2485.475000 | -42.4 | 14.3 | -28.1 | PASS |
| 2484.125000 | -42.4 | 14.3 | -28.1 | PASS |
| 2485.675000 | -42.4 | 14.3 | -28.1 | PASS |
| 2484.225000 | -42.5 | 14.4 | -28.1 | PASS |
| 2486.525000 | -42.5 | 14.4 | -28.1 | PASS |
| 2485.425000 | -42.6 | 14.5 | -28.1 | PASS |
| 2486.475000 | -42.6 | 14.5 | -28.1 | PASS |
| 2484.725000 | -42.7 | 14.6 | -28.1 | PASS |

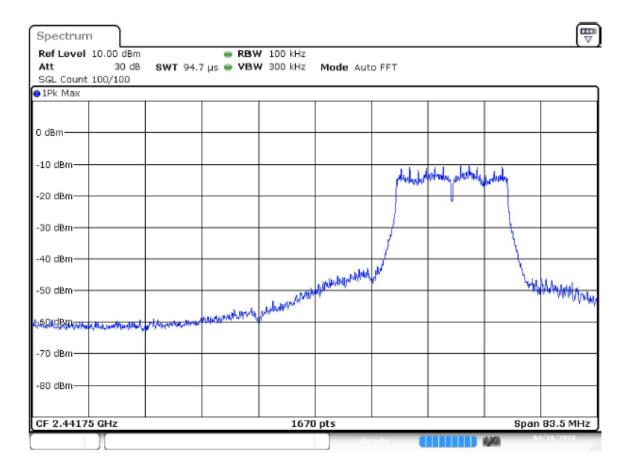






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| Spectrun | n) | | | | | | | | T |
|-----------|-----------|---------|------------|-----------|----------|----------|-----|-------|----------|
| | 10.00 dBm | | _ | / 100 kHz | | | | | |
| Att | 30 dB | SWT 18. | 9 µs 🖷 VBV | V 300 kHz | Mode Aut | o FFT | | | |
| SGL Count | 100/100 | | | | | | | | |
| ●1Pk Max | | | 1 | | | | | | |
| | | | | | | | | | |
| 0 dBm | | | | | | | | | |
| | | | | | | | | | |
| -10 dBm | | | | | | | | | |
| | | | | | | | | | |
| -20 dBm | | | | | | | | | |
| | | | | | | | | | |
| -30 dBm | | | | | | | | | |
| | | | | | | | | | |
| -40 dBm | | | | | | | | | |
| | | | | | | | | | |
| -50 dBm | | | | | | | | | |
| | ~ ~ | | | | | | | | |
| -60 dBm- | N. W. I | m | m | mon | mm | 1 mg 000 | man | AAAAA | |
| 00 0.011 | | | | | | | | | which |
| -70 dBm | | | | | | | | | |
| | | | | | | | | | |
| -80 dBm | | | | | | | | | |
| -co dom | | | | | | | | | |
| | | | | | | | | | |
| CF 2.4917 | 5 GHz | | | 330 | pts | | | Span | 16.5 MHz |
| | Tr. | | | | Re | ady | | 4,49 | /18/2018 |





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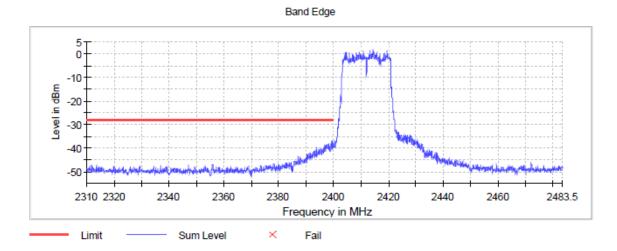
802.11n(HT20) MCS4 2412MHz **Band Edge Low**

Inband Peak

| Frequency | Level |
|-------------|-------|
| (MHz) | (dBm) |
| 2414.475000 | 2.1 |

Measurements

| Frequency | Level | Margin | Limit | Result |
|-------------|-------|--------|-------|--------|
| (MHz) | (dBm) | (dB) | (dBm) | |
| 2399.475000 | -36.9 | 9.0 | -27.9 | PASS |
| 2399.425000 | -37.0 | 9.1 | -27.9 | PASS |
| 2399.525000 | -37.6 | 9.7 | -27.9 | PASS |
| 2399.175000 | -38.0 | 10.1 | -27.9 | PASS |
| 2399.125000 | -38.2 | 10.3 | -27.9 | PASS |
| 2398.225000 | -38.2 | 10.3 | -27.9 | PASS |
| 2398.875000 | -38.2 | 10.3 | -27.9 | PASS |
| 2397.675000 | -38.4 | 10.4 | -27.9 | PASS |
| 2396.675000 | -38.6 | 10.7 | -27.9 | PASS |
| 2398.825000 | -38.6 | 10.7 | -27.9 | PASS |
| 2399.575000 | -38.6 | 10.7 | -27.9 | PASS |
| 2399.825000 | -38.7 | 10.8 | -27.9 | PASS |
| 2397.625000 | -38.7 | 10.8 | -27.9 | PASS |
| 2398.925000 | -38.7 | 10.8 | -27.9 | PASS |
| 2396.625000 | -38.8 | 10.8 | -27.9 | PASS |







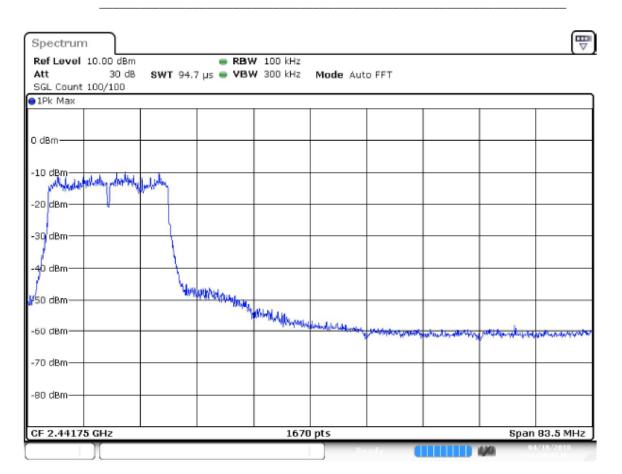
May 16, 2018

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| Spectrun | | | | | | | | | (₩) |
|----------------------|--------------|--|----------------------------|------------------|-------------|--------------|-----------------------|------------|---|
| | 10.00 dBm | | _ | ₩ 100 kHz | | | | | |
| Att | 30 dB | SWT 113 | .7 µs 🖷 VB | W 300 kHz | Mode Au | ito FFT | | | |
| SGL Count 1Pk Max | 100/100 | | | | | | | | |
| отык мах | | | | | | | | | |
| 0 dBm | | | | | | | | | |
| -10 dBm | | | | | | | | | |
| -20 dBm | | | | | | | | | |
| -30 dBm | | | | | | | | | |
| -40 dBm | | | | | | | | | |
| -50 dBm | | | | | | | | | |
| 169.180 | alandah Mada | hat was a start of the start of | entertyle oliversations, a | atrothrowskie | Antologiant | when the man | and the second second | wayallowat | No. WHERE AND |
| -70 dBm | | | | | | | | | |
| -80 dBm | | | | | | | | | |
| CF 2.355 0 | Hz | | | 1800 | pts | | | Span | 90.0 MHz |
| |)(| | | | Re | ady | | 4,40 | /18/2018 |







802.11n(HT20) MCS4 2462MHz

Band Edge High

Inband Peak

| Frequency | Level |
|-------------|-------|
| (MHz) | (dBm) |
| 2464.475000 | 1.7 |

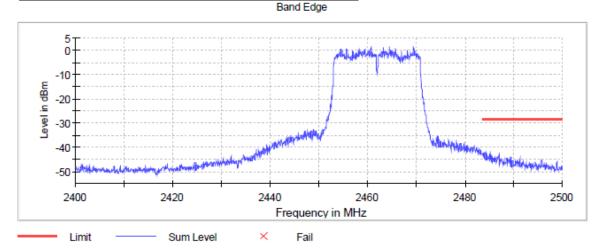




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Measurements

| Frequency | Level | Margin | Limit | Result |
|-------------|-------|--------|-------|--------|
| (MHz) | (dBm) | (dB) | (dBm) | |
| 2483.825000 | -42.1 | 13.7 | -28.3 | PASS |
| 2484.125000 | -42.3 | 13.9 | -28.3 | PASS |
| 2484.425000 | -42.3 | 14.0 | -28.3 | PASS |
| 2484.475000 | -42.3 | 14.0 | -28.3 | PASS |
| 2484.075000 | -42.4 | 14.0 | -28.3 | PASS |
| 2485.125000 | -42.4 | 14.1 | -28.3 | PASS |
| 2483.625000 | -42.4 | 14.1 | -28.3 | PASS |
| 2483.875000 | -42.5 | 14.1 | -28.3 | PASS |
| 2483.525000 | -42.7 | 14.3 | -28.3 | PASS |
| 2483.575000 | -42.7 | 14.4 | -28.3 | PASS |
| 2485.175000 | -42.8 | 14.5 | -28.3 | PASS |
| 2485.425000 | -42.9 | 14.5 | -28.3 | PASS |
| 2484.175000 | -42.9 | 14.5 | -28.3 | PASS |
| 2486.975000 | -43.0 | 14.7 | -28.3 | PASS |
| 2483.675000 | -43.0 | 14.7 | -28.3 | PASS |

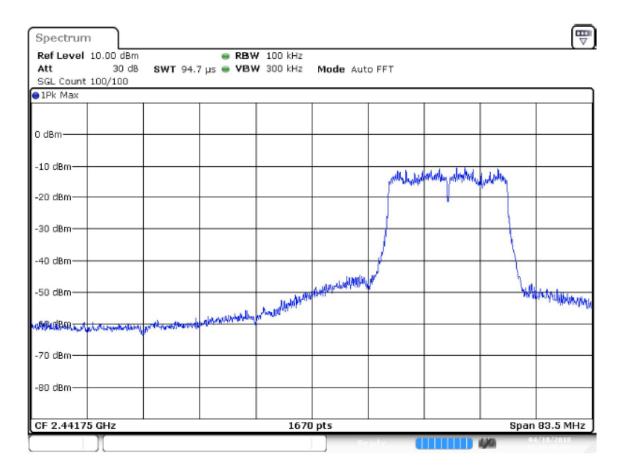






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| Spectrun | | | | | | | | | Ē |
|-----------|-----------|----------|----------|-----------|----------|-------|-----|------|----------|
| Ref Level | 10.00 dBm | | ■ RBW | / 100 kHz | | | | | |
| Att | 30 dB | SWT 18.9 | us 🖷 VBW | / 300 kHz | Mode Aut | o FFT | | | |
| SGL Count | 100/100 | | | | | | | | |
| ●1Pk Max | | | | | | | | | |
| | | | | | | | | | |
| 0 dBm | | | | | | | | | |
| -10 dBm | | | | | | | | | |
| | | | | | | | | | |
| -20 dBm | | | | | | | | | |
| -30 dBm | | | | | | | | | |
| -40 dBm | | | | | | | | | |
| -50 dBm | | | | | | | | | |
| | 0 | | | | | | | | |
| -60 dBm | num | min | man | m | maran | mon | man | | mon |
| -70 dBm | | | | | | | | | |
| | | | | | | | | | |
| -80 dBm | | | | | | | | | |
| CF 2.4917 | 5 GHz | | | 330 | pts | | | Span | 16.5 MHz |





1,00

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802.11n(HT40) MCS6 2422MHz

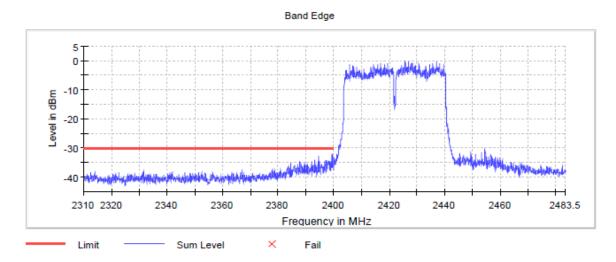
Band Edge Low

Inband Peak

| Frequency | Level |
|-------------|-------|
| (MHz) | (dBm) |
| 2425.725000 | -0.2 |

Measurements

| Frequency | Level | Margin | Limit | Result |
|-------------|-------|--------|-------|--------|
| (MHz) | (dBm) | (dB) | (dBm) | |
| 2399.475000 | -32.0 | 1.8 | -30.2 | PASS |
| 2399.425000 | -32.4 | 2.2 | -30.2 | PASS |
| 2399.525000 | -32.7 | 2.5 | -30.2 | PASS |
| 2394.475000 | -32.9 | 2.7 | -30.2 | PASS |
| 2394.525000 | -33.2 | 3.0 | -30.2 | PASS |
| 2394.425000 | -33.4 | 3.2 | -30.2 | PASS |
| 2393.275000 | -34.1 | 3.9 | -30.2 | PASS |
| 2393.225000 | -34.2 | 4.0 | -30.2 | PASS |
| 2397.275000 | -34.4 | 4.2 | -30.2 | PASS |
| 2397.325000 | -34.4 | 4.2 | -30.2 | PASS |
| 2398.475000 | -34.6 | 4.4 | -30.2 | PASS |
| 2398.025000 | -34.6 | 4.4 | -30.2 | PASS |
| 2398.525000 | -34.7 | 4.5 | -30.2 | PASS |
| 2399.125000 | -34.7 | 4.5 | -30.2 | PASS |
| 2399.175000 | -34.7 | 4.5 | -30.2 | PASS |



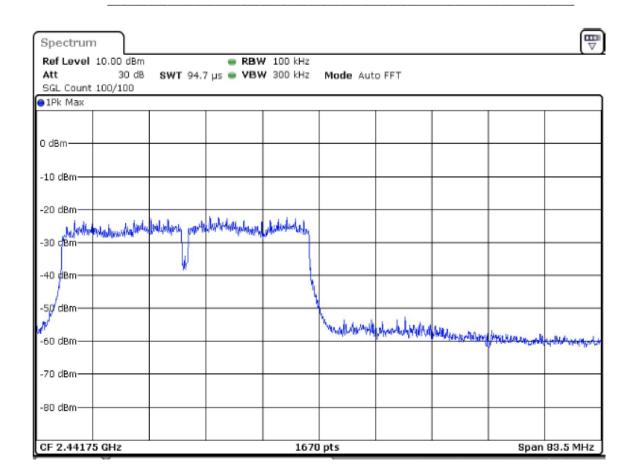




| Spectrun | | | | | | | | | ₩ | |
|---|-----------------------|---------------------------|---------------------|---------------|-----------|--------------|---------------------|---------------|-----------------|--|
| Ref Level 10.00 dBm | | | | | | | | | | |
| Att 30 dB SWT 113.7 µs WBW 300 kHz Mode Auto FFT | | | | | | | | | | |
| SGL Count 1Pk Max | SGL Count 100/100 | | | | | | | | | |
| | | | | | | | | | | |
| 0 dBm | | | | | | | | | | |
| -10 dBm | | | | | | | | | | |
| -20 dBm | | | | | | | | | | |
| -30 dBm | | | | | | | | | | |
| -40 dBm | | | | | | | | | | |
| -50 dBm | | | | | | | | | | |
| -60 dBm | with the way the with | demostiles the control of | Here and the second | thelinitation | Manualati | wm.lilewew.e | berry and the state | and any house | ulabalkpullimat | |
| -70 dBm | | | | | | | | | | |
| -80 dBm | | | | | | | | | | |
| CF 2.355 0 | Hz | | | 1800 | pts | | | Span | 90.0 MHz | |
| | Y | | | | Re | adv | | 100 | /25/2018 | |







802.11n(HT40) MCS6 2452MHz

Band Edge High

Inband Peak

| Frequency | Level |
|-------------|-------|
| (MHz) | (dBm) |
| 2456.975000 | -0.5 |



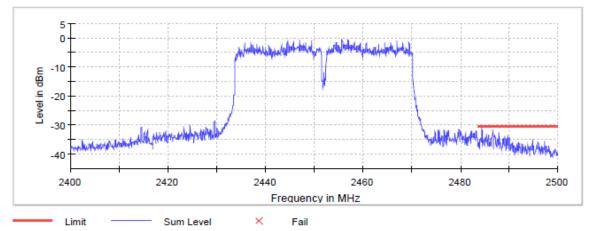


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Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|--------------------|----------------|----------------|----------------|--------|
| 2484.475000 | -31.2 | 0.7 | -30.5 | PASS |
| 2486.675000 | -31.5 | 1.0 | -30.5 | PASS |
| 2484.425000 | -31.6 | 1.1 | -30.5 | PASS |
| 2486.625000 | -31.8 | 1.3 | -30.5 | PASS |
| 2484.525000 | -32.3 | 1.8 | -30.5 | PASS |
| 2486.725000 | -32.3 | 1.8 | -30.5 | PASS |
| 2487.925000 | -32.6 | 2.1 | -30.5 | PASS |
| 2487.975000 | -32.9 | 2.4 | -30.5 | PASS |
| 2486.575000 | -32.9 | 2.4 | -30.5 | PASS |
| 2485.375000 | -33.1 | 2.6 | -30.5 | PASS |
| 2485.425000 | -33.2 | 2.6 | -30.5 | PASS |
| 2487.075000 | -33.3 | 2.8 | -30.5 | PASS |
| 2485.825000 | -33.4 | 2.9 | -30.5 | PASS |
| 2485.775000 | -33.4 | 2.9 | -30.5 | PASS |
| 2487.025000 | -33.6 | 3.1 | -30.5 | PASS |



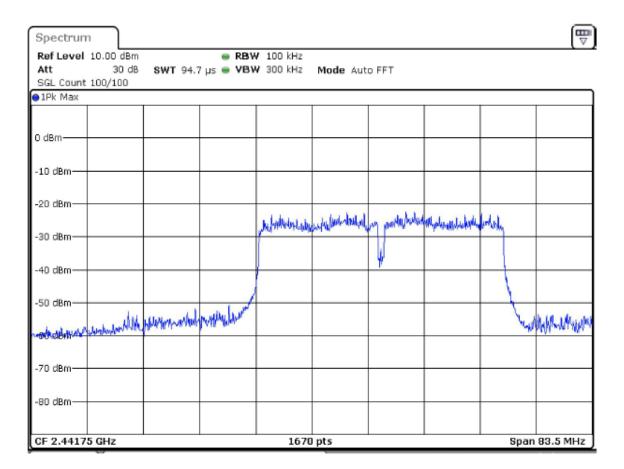






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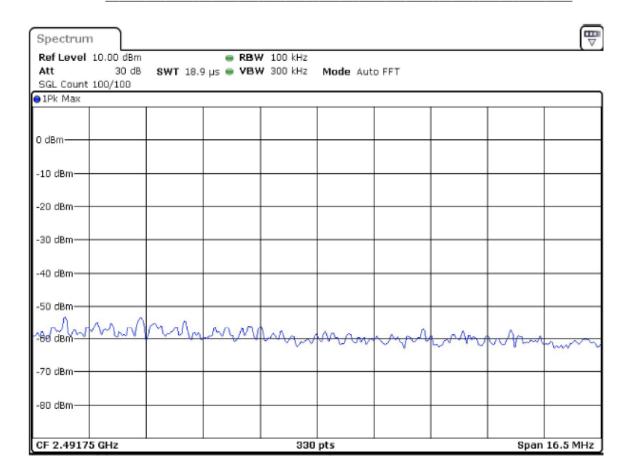






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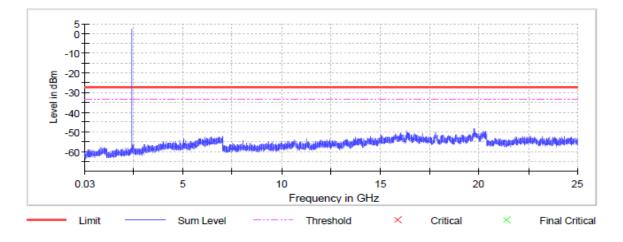


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Conducted Spurious Emissions

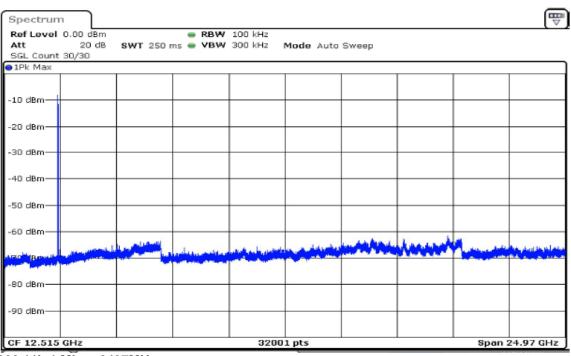
Test according to FCC KDB 558074 DTS Measurement Guidance v04 Section 11. Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 1.8 dB

| <u>802.11b 1 Mbps 2412MHz</u> Pre Measurements | | | | | | | | | |
|---|-------|--------|-------|--|--|--|--|--|--|
| Frequency | Level | Margin | Limit | | | | | | |
| (MHz) | (dBm) | (dB) | (dBm) | | | | | | |
| 19754.513140 | 48.2 | 20.8 | -27.4 | | | | | | |
| 19763.096309 | -48.3 | 20.9 | -27.4 | | | | | | |
| 19805.231868 | -49.4 | 22.0 | -27.4 | | | | | | |
| 19750.611700 | -49.5 | 22.1 | -27.4 | | | | | | |
| 19793.527546 | -49.6 | 22.1 | -27.4 | | | | | | |
| 20257.798975 | -49.6 | 22.2 | -27.4 | | | | | | |
| 20362.357583 | -49.7 | 22.3 | -27.4 | | | | | | |
| 19817.716478 | -49.8 | 22.4 | -27.4 | | | | | | |
| 20310.078279 | -49.8 | 22.4 | -27.4 | | | | | | |
| 17806.133715 | -49.8 | 22.4 | -27.4 | | | | | | |
| 20263.260992 | -49.9 | 22.4 | -27.4 | | | | | | |
| 19771.679479 | -49.9 | 22.5 | -27.4 | | | | | | |
| 16392.251648 | -50.0 | 22.5 | -27.4 | | | | | | |
| 19798.989563 | -50.0 | 22.5 | -27.4 | | | | | | |
| 19784.164089 | -50.0 | 22.6 | -27.4 | | | | | | |









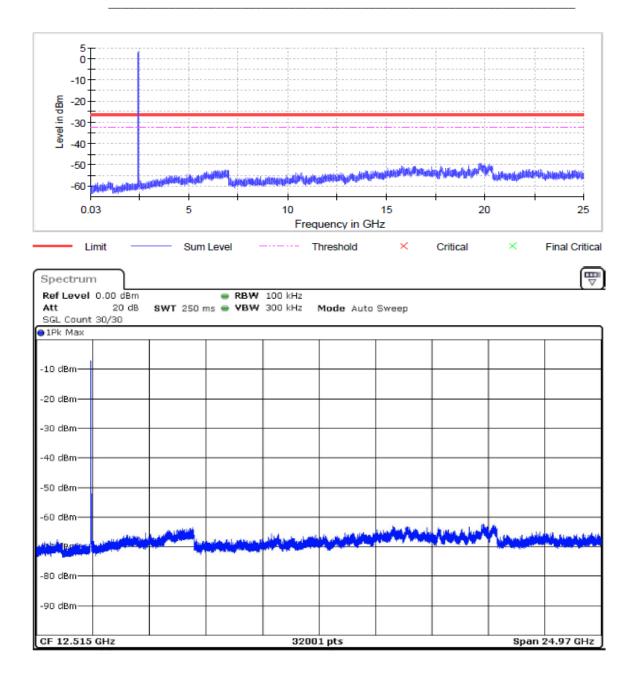
802.11b 1 Mbps 2437MHz

Pre Measurements

| Frequency | Level | Margin | Limit | | | | | | |
|--------------|-------|--------|-------|--|--|--|--|--|--|
| (MHz) | (dBm) | (dB) | (dBm) | | | | | | |
| 19795.088122 | -49.0 | 22.6 | -26.4 | | | | | | |
| 19745.929971 | -49.3 | 22.8 | -26.4 | | | | | | |
| 19815.375613 | -49.4 | 23.0 | -26.4 | | | | | | |
| 19791.186682 | -49.4 | 23.0 | -26.4 | | | | | | |
| 19775.580919 | -49.5 | 23.1 | -26.4 | | | | | | |
| 19776.361207 | -49.6 | 23.1 | -26.4 | | | | | | |
| 19701.453548 | -49.6 | 23.1 | -26.4 | | | | | | |
| 20245.314365 | -49.6 | 23.2 | -26.4 | | | | | | |
| 19800.550139 | -49.8 | 23.3 | -26.4 | | | | | | |
| 19762.316021 | -49.8 | 23.3 | -26.4 | | | | | | |
| 19777.921784 | -49.8 | 23.4 | -26.4 | | | | | | |
| 20226.587450 | -49.9 | 23.5 | -26.4 | | | | | | |
| 20247.655230 | -49.9 | 23.5 | -26.4 | | | | | | |
| 19820.057342 | -50.0 | 23.5 | -26.4 | | | | | | |
| 19790.406394 | -50.0 | 23.5 | -26.4 | | | | | | |





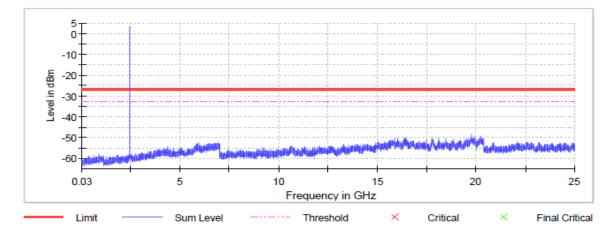






802.11b 1Mbps 2462MHz

Pre Measurements Frequency Level Margin Limit (MHz) (dBm) (dB)(dBm) 19759.975157 48.2 21.5 -26.8 19780.262648 48.6 21.8 26.8 19774.800631 48.9 22.1 26.8 20239.852348 49.2 22.4 26.8 19958.948627 49.5 22.7 -26.8 20253.117246 49.5 22.7 -26.8 19781.042936 49.8 23.0 -26.8 20232.829755 49.8 23.0 -26.8 49.9 23.1 20296.813381 -26.8 49.9 23.1 19803.671292 -26.8 <u>19767.778038</u> 49.9 23.2 -26.8 49.9 23.2 <u>19792.747258</u> -26.8 -50.0 17788.187088 23.2 -26.8 -50.0 23.2 26.8 17794.429393 -50.0 19754.513140 23.3 26.8





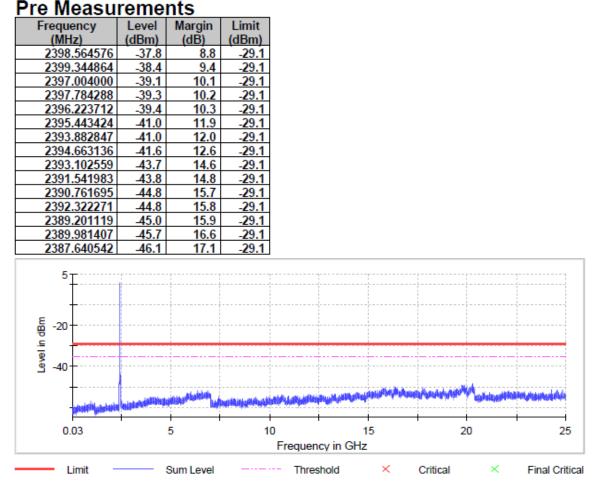


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| Spectrun | ٦ | | | | | | | | ₽ |
|------------------------------------|-------------|---------------------------|----------|-----------------|-----------------------|----------------|-----------------|--------|---------------|
| Ref Level | | | RBW | | | | | | |
| Att | 20 dB | SWT 250 r | ns 👄 VBW | 300 kHz | Mode Auto | Sweep | | | |
| SGL Count | 30/30 | | | | | | | | |
| ⊖1Pk Max | | | | | | | | | |
| | | | | | | | | | |
| -10 dBm- | | | | | | | | | |
| -10 0.011 | | | | | | | | | |
| -20 dBm | | | | | | | | | |
| -20 abm- | | | | | | | | | |
| -30 dBm | | | | | | | | | |
| -30 aBm | | | | | | | | | |
| | | | | | | | | | |
| -40 dBm | | | | | | | | | |
| | | | | | | | | | |
| -50 dBm | | | | | | | | | |
| | | | | | | | | | |
| -60 dBm | | | | | | | | | |
| | a sumal a s | and and the second second | 190 | . At the second | and the second second | and the states | A had a loss of | A | A A second at |
| Beller | 1.4.4 | - | | | a second second | and the second | A SAME | | |
| and a state of the second state of | | | | | | | | | |
| -80 dBm | | | | | | | | | |
| | | | | | | | | | |
| -90 dBm | | | | | | | | | |
| 50 0.011 | | | | | | | | | |
| | | | | | | | | | |
| CF 12.515 | GHz | | | 3200 | 1 pts | | | Span 2 | 24.97 GHz |







802.11g 6 Mbps 2412MHz





| Spectrun | n | | | | | | | | |
|------------------|-----------------------|-----------|--------------------------|-------------------|-------------|-------|-----------|------------|----------------------|
| Ref Level Att | 20 dB | SWT 250 r | e RBW | | Mode Auto | Sweep | | | |
| SGL Count | : 30/30 | | | | | | | | |
| ●1Pk Max | | | | | | | | | |
| | | | | | | | | | |
| -10 dBm | | | | | | | | | |
| | | | | | | | | | |
| -20 dBm- | | | | | | | | | |
| -30 dBm | | | | | | | | | |
| -30 abm- | | | | | | | | | |
| -40 dBm | | | | | | | | | |
| | | | | | | | | | |
| -50 dBm— | | | | | | | | | |
| | | | | | | | | | |
| -60 dBm— | | and their | | | | | the stand | 4 | |
| Bohula | a la sub la faith and | | ALL MARKEN | a fin planter and | in Jacobsky | | WWW. | Anderstein | and the second state |
| Castle Inchest | | | A strategy in the second | | | | | | |
| -80 dBm | | | | | | | | | |
| | | | | | | | | | |
| -90 dBm | | | | | | | | | |
| | | | | | | | | | |
| CF 12.515 | GHz | | | 3200 | 1 pts | | | Span 2 | 24.97 GHz |

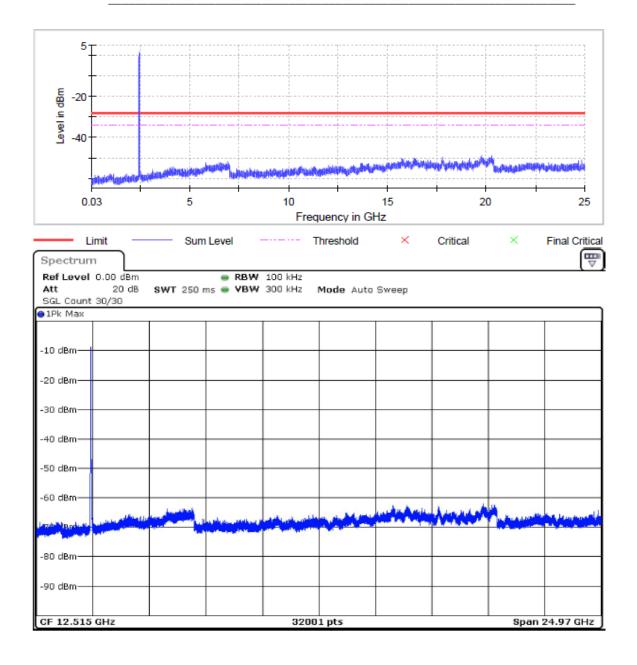
802.11g 6 Mbps 2437MHz Pre Measurements

| Frequency | Level | Margin | Limit | | | | | | |
|--------------|-------|--------|-------|--|--|--|--|--|--|
| (MHz) | (dBm) | (dB) | (dBm) | | | | | | |
| 19777.921784 | -48.7 | 20.7 | -28.0 | | | | | | |
| 20293.692228 | -49.5 | 21.4 | -28.0 | | | | | | |
| 19738.907378 | -49.6 | 21.5 | -28.0 | | | | | | |
| 20264.821568 | -49.6 | 21.6 | -28.0 | | | | | | |
| 20167.285554 | -49.7 | 21.6 | -28.0 | | | | | | |
| 19750.611700 | -49.7 | 21.6 | -28.0 | | | | | | |
| 19773.240055 | -49.7 | 21.7 | -28.0 | | | | | | |
| 19762.316021 | -49.8 | 21.8 | -28.0 | | | | | | |
| 19798.989563 | -49.8 | 21.8 | -28.0 | | | | | | |
| 17787.406800 | -49.9 | 21.9 | -28.0 | | | | | | |
| 19781.042936 | -49.9 | 21.9 | -28.0 | | | | | | |
| 19734.225649 | -49.9 | 21.9 | -28.0 | | | | | | |
| 19738.127090 | -50.0 | 21.9 | -28.0 | | | | | | |
| 19741.248242 | -50.0 | 21.9 | -28.0 | | | | | | |
| 19852.049155 | -50.0 | 21.9 | -28.0 | | | | | | |





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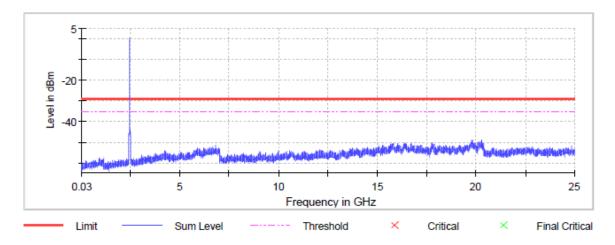






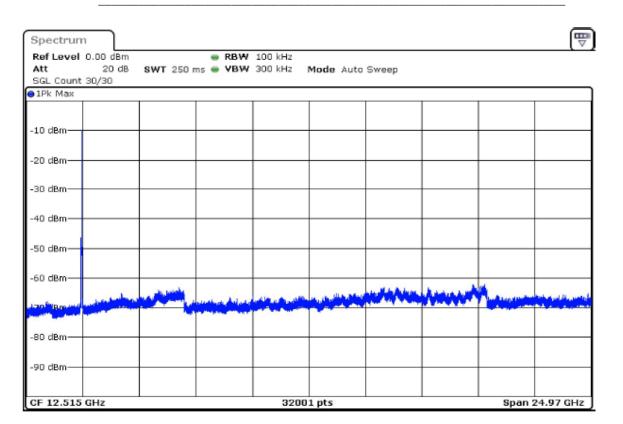
802.11g 6 Mbps 2462MHz Pre Measurements

| Frequency | Level | Margin | Limit | | | | | | |
|--------------|-------|--------|-------|--|--|--|--|--|--|
| (MHz) | (dBm) | (dB) | (dBm) | | | | | | |
| 2484.396269 | 42.5 | 13.3 | -29.2 | | | | | | |
| 2485.956845 | -42.6 | 13.3 | -29.2 | | | | | | |
| 2483.615981 | -43.8 | 14.6 | -29.2 | | | | | | |
| 2485.176557 | -44.9 | 15.7 | -29.2 | | | | | | |
| 2487.517421 | -45.5 | 16.3 | -29.2 | | | | | | |
| 2489.858286 | -45.9 | 16.7 | -29.2 | | | | | | |
| 2486.737133 | -46.0 | 16.8 | -29.2 | | | | | | |
| 2490.638574 | -46.2 | 17.0 | -29.2 | | | | | | |
| 2489.077998 | -46.3 | 17.1 | -29.2 | | | | | | |
| 2488.297709 | -46.7 | 17.4 | -29.2 | | | | | | |
| 2492.979438 | -47.7 | 18.5 | -29.2 | | | | | | |
| 2491.418862 | -47.9 | 18.7 | -29.2 | | | | | | |
| 2495.320302 | -48.4 | 19.1 | -29.2 | | | | | | |
| 2494.540014 | -48.8 | 19.6 | -29.2 | | | | | | |
| 19759.975157 | -48.9 | 19.7 | -29.2 | | | | | | |









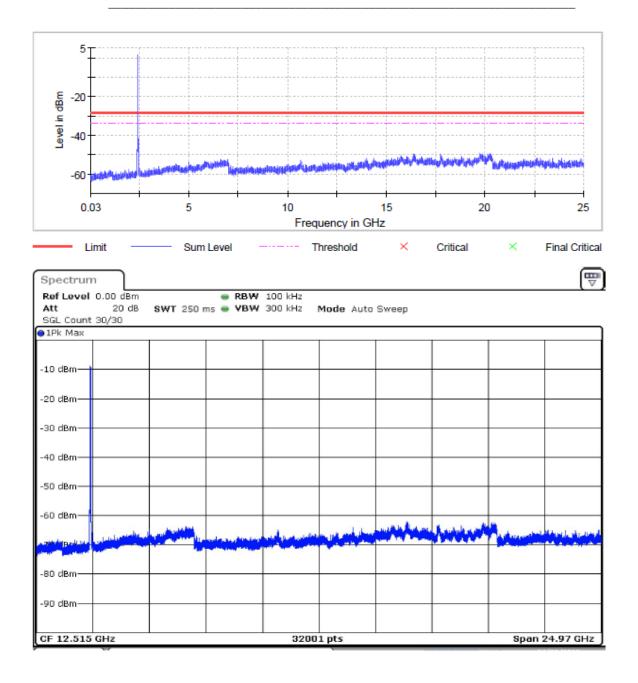
802.11n(HT20) MCS4 2412MHz

Pre Measurements

| Frequency | Level | Margin | Limit | | | | | |
|-------------|-------|--------|-------|--|--|--|--|--|
| (MHz) | (dBm) | (dB) | (dBm) | | | | | |
| 2398.564576 | -38.1 | 10.0 | -28.1 | | | | | |
| 2399.344864 | -39.4 | 11.3 | -28.1 | | | | | |
| 2397.784288 | -40.4 | 12.3 | -28.1 | | | | | |
| 2395.443424 | -40.5 | 12.4 | -28.1 | | | | | |
| 2396.223712 | -40.8 | 12.7 | -28.1 | | | | | |
| 2397.004000 | -40.8 | 12.7 | -28.1 | | | | | |
| 2394.663136 | -42.2 | 14.0 | -28.1 | | | | | |
| 2393.102559 | -42.5 | 14.4 | -28.1 | | | | | |
| 2393.882847 | -42.6 | 14.5 | -28.1 | | | | | |
| 2392.322271 | -43.7 | 15.5 | -28.1 | | | | | |
| 2391.541983 | -43.8 | 15.7 | -28.1 | | | | | |
| 2390.761695 | -44.0 | 15.9 | -28.1 | | | | | |
| 2389.981407 | -44.3 | 16.2 | -28.1 | | | | | |
| 2389.201119 | -45.5 | 17.4 | -28.1 | | | | | |
| 2385.299678 | -47.0 | 18.9 | -28.1 | | | | | |







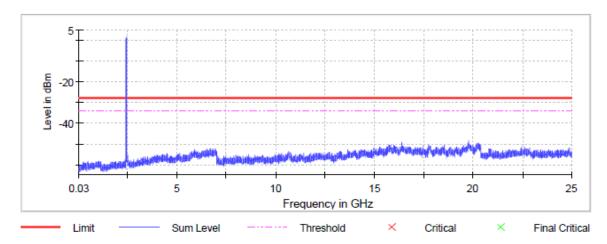




802.11n(HT20) MCS4 2437MHz

Pre Measurements

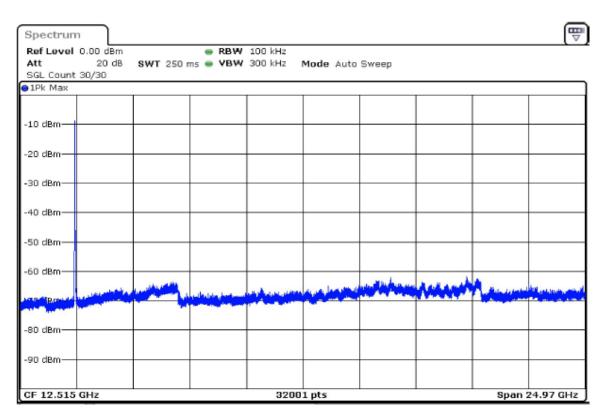
| Frequency | Level | Margin | Limit | |
|--------------|-------|--------|-------|--|
| (MHz) | (dBm) | (dB) | (dBm) | |
| 19761.535733 | -48.5 | 20.4 | -28.0 | |
| 16400.054530 | -49.3 | 21.3 | -28.0 | |
| 19779.482360 | -49.3 | 21.3 | -28.0 | |
| 20232.049467 | -49.5 | 21.4 | -28.0 | |
| 20271.063873 | -49.8 | 21.8 | -28.0 | |
| 20209.421112 | -49.8 | 21.8 | -28.0 | |
| 19731.884785 | -49.8 | 21.8 | -28.0 | |
| 16396.153089 | -49.9 | 21.8 | -28.0 | |
| 19767.778038 | -49.9 | 21.8 | -28.0 | |
| 19769.338614 | -49.9 | 21.8 | -28.0 | |
| 19765.437174 | -49.9 | 21.9 | -28.0 | |
| 19805.231868 | -50.0 | 22.0 | -28.0 | |
| 20207.860536 | -50.0 | 22.0 | -28.0 | |
| 20278.866754 | -50.0 | 22.0 | -28.0 | |
| 19778.702072 | -50.0 | 22.0 | -28.0 | |







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802.11n(HT20) MCS4 2462MHz

Pre Measurements

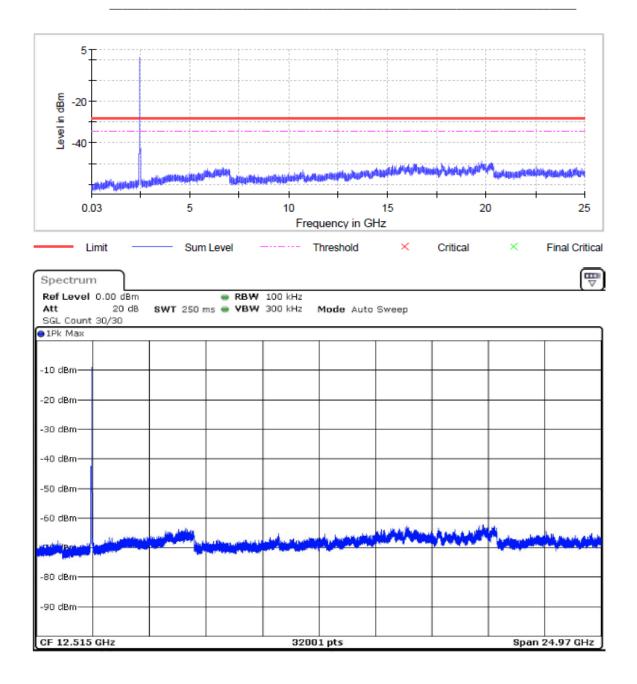
| Frequency Level Margin Limit | | | | | | | |
|------------------------------|-------|------|-------|--|--|--|--|
| | | | | | | | |
| (MHz) | (dBm) | (dB) | (dBm) | | | | |
| 2483.615981 | -40.9 | 12.6 | -28.3 | | | | |
| 2485.176557 | -41.3 | 13.0 | -28.3 | | | | |
| 2484.396269 | -41.8 | 13.5 | -28.3 | | | | |
| 2486.737133 | -43.0 | 14.7 | -28.3 | | | | |
| 2485.956845 | -44.5 | 16.2 | -28.3 | | | | |
| 2488.297709 | -44.7 | 16.4 | -28.3 | | | | |
| 2487.517421 | -45.2 | 17.0 | -28.3 | | | | |
| 2489.077998 | -46.3 | 18.0 | -28.3 | | | | |
| 2491.418862 | -46.4 | 18.1 | -28.3 | | | | |
| 2496.100591 | -46.4 | 18.1 | -28.3 | | | | |
| 2493.759726 | -46.5 | 18.2 | -28.3 | | | | |
| 2492.199150 | -46.8 | 18.5 | -28.3 | | | | |
| 2490.638574 | -47.1 | 18.8 | -28.3 | | | | |
| 2489.858286 | -47.3 | 19.0 | -28.3 | | | | |
| 2492.979438 | -47.7 | 19.4 | -28.3 | | | | |





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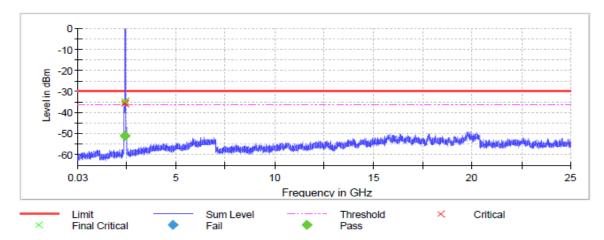




802.11n(HT40) MCS6 2422MHz

Pre Measurements

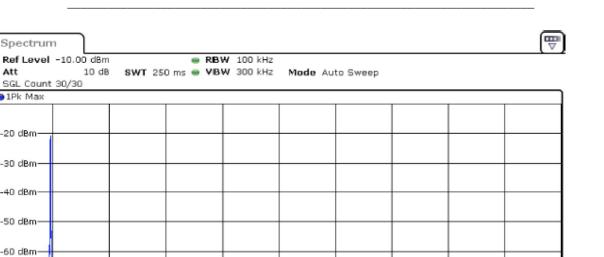
| Frequency | Level | Margin | Limit | |
|-------------|-------|--------|-------|--|
| (MHz) | (dBm) | (dB) | (dBm) | |
| 2394.663136 | -34.7 | 4.6 | -30.1 | |
| 2399.344864 | -34.7 | 4.6 | -30.1 | |
| 2398.564576 | -35.4 | 5.3 | -30.1 | |
| 2397.004000 | -35.8 | 5.7 | -30.1 | |
| 2397.784288 | -36.3 | 6.2 | -30.1 | |
| 2384.519390 | -37.1 | 7.0 | -30.1 | |
| 2386.860254 | -37.6 | 7.5 | -30.1 | |
| 2388.420831 | -37.8 | 7.7 | -30.1 | |
| 2393.102559 | -37.9 | 7.8 | -30.1 | |
| 2395.443424 | -38.0 | 7.9 | -30.1 | |
| 2389.201119 | -38.3 | 8.2 | -30.1 | |
| 2396.223712 | -38.3 | 8.2 | -30.1 | |
| 2393.882847 | -38.4 | 8.3 | -30.1 | |
| 2390.761695 | -38.4 | 8.3 | -30.1 | |
| 2386.079966 | -38.4 | 8.3 | -30.1 | |







32001 pts



802.11n(HT40) MCS6 2437MHz

Spectrum

Att

1Pk Max

-20 dBm-

-30 dBm-

-40 dBm-

-50 dBm

-60 dBm-

-70 dBm

-90 dBm-

-100 dBm-

CF 12.515 GHz

Pre Measurements

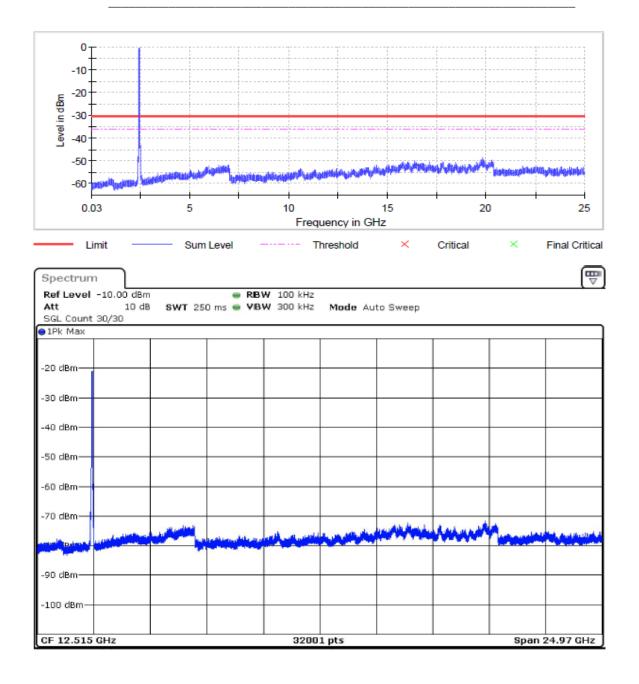
| Frequency | Level | Margin | Limit | | | | |
|-------------|-------|--------|-------|--|--|--|--|
| (MHz) | (dBm) | (dB) | (dBm) | | | | |
| 2399.344864 | -38.3 | 8.1 | -30.2 | | | | |
| 2394.663136 | -42.5 | 12.2 | -30.2 | | | | |
| 2489.858286 | -42.8 | 12.6 | -30.2 | | | | |
| 2483.615981 | -43.0 | 12.8 | -30.2 | | | | |
| 2484.396269 | -43.1 | 12.8 | -30.2 | | | | |
| 2485.176557 | -43.3 | 13.0 | -30.2 | | | | |
| 2398.564576 | -43.3 | 13.1 | -30.2 | | | | |
| 2397.784288 | -43.7 | 13.5 | -30.2 | | | | |
| 2487.517421 | -43.8 | 13.6 | -30.2 | | | | |
| 2397.004000 | -43.8 | 13.6 | -30.2 | | | | |
| 2486.737133 | -43.8 | 13.6 | -30.2 | | | | |
| 2395.443424 | -44.1 | 13.9 | -30.2 | | | | |
| 2392.322271 | -44.1 | 13.9 | -30.2 | | | | |
| 2393.102559 | -44.2 | 14.0 | -30.2 | | | | |
| 2492.199150 | -44.3 | 14.1 | -30.2 | | | | |





Span 24.97 GHz

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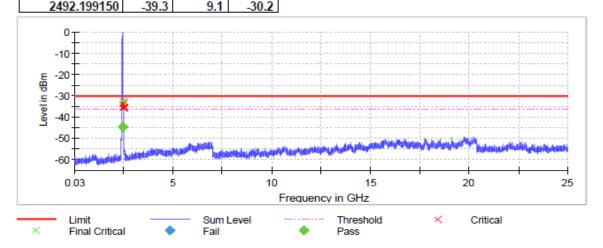


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802.11n(HT40) MCS6 2452MHz

Pre Measurements

| Frequency | Level | Margin | Limit |
|-------------|-------|--------|-------|
| (MHz) | (dBm) | (dB) | (dBm) |
| 2484.396269 | -32.2 | 2.0 | -30.2 |
| 2486.737133 | -33.1 | 2.9 | -30.2 |
| 2483.615981 | -34.0 | 3.8 | -30.2 |
| 2485.956845 | -34.3 | 4.1 | -30.2 |
| 2487.517421 | -35.3 | 5.2 | -30.2 |
| 2488.297709 | -35.5 | 5.3 | -30.2 |
| 2489.858286 | -35.5 | 5.3 | -30.2 |
| 2485.176557 | -35.5 | 5.4 | -30.2 |
| 2489.077998 | -36.1 | 5.9 | -30.2 |
| 2494.540014 | -37.2 | 7.0 | -30.2 |
| 2491.418862 | -38.7 | 8.6 | -30.2 |
| 2492.979438 | -38.8 | 8.6 | -30.2 |
| 2496.880879 | -39.1 | 8.9 | -30.2 |
| 2490.638574 | -39.2 | 9.0 | -30.2 |
| 2402 100150 | 20.2 | 0.1 | 20.2 |







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| Spectrun | | | | | | | | | E |
|-----------|---------------|---------|-------------------|-----------------------|-------------------|----------|-----------|-----------------|--------------|
| Ref Level | -10.00 dBm | | RB\ | ₩ 100 kHz | | | | | |
| | | SWT 25 | D ms 🖷 VBN | W 300 kHz | Mode Au | to Sweep | | | |
| SGL Count | 30/30 | | | | | | | | |
| ●1Pk Max | | | | | | | | | |
| -20 dBm | | | | | | | | | |
| -30 dBm | | | | | | | | | |
| -40 dBm | | | | | | | | | |
| -50 dBm— | | | | | | | | | |
| -60 dBm— | | | | | | | | | |
| -70 dBm | | | | | | | 100 C 100 | i. | |
| ملائمة ا | A STREET BOOM | | والمراجع والمعامر | التحرير بالبروبا البل | No. of Lot of Lot | | A ANA | And when be the | A. A. M. LOW |
| Poly | | ALC: NO | and the second | | | | | | |
| -90 dBm | | | | | | | | | |
| -100 dBm— | | | | | | | | | |

32001 pts



CF 12.515 GHz



Span 24.97 GHz