

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     <p>CERTIFICATE 2518.08</p> <p>MS ISO/IEC 17025<br/>TESTING<br/>SAMM NO. 0825</p> |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <p><b>MOTOROLA PENANG ADV. COMM. LABORATORY</b><br/><b>Motorola Solutions Malaysia Sdn. Bhd.</b><br/><b>Plot 2A Medan Bayan Lepas,</b><br/><b>Mukim 12, S.W.D. 11900 Bayan Lepas,</b><br/><b>Penang, Malaysia.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p><b>FCC / ISSED TEST REPORT</b><br/><b>Report Revision : Rev.B</b></p>                                                                                                                                                                                                                                                                                                                                                        |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <table><tr><td><b>Date/s Tested</b></td><td>: 12-Nov-2021 - 19-Nov-2021</td></tr><tr><td><b>Report Issue Date</b></td><td>: 02-Dec-2021</td></tr><tr><td><b>Manufacturer/Location</b></td><td>: Motorola Solutions Malaysia Sdn Bhd<br/>Plot 2A, Medan Bayan Lepas, Mukim 12 SWD,<br/>11900, Bayan Lepas, Penang, Malaysia</td></tr><tr><td><b>Requestor</b></td><td>: SOH LEY KOON</td></tr><tr><td><b>Product Type</b></td><td>: Hand-held</td></tr><tr><td><b>Product Version (PMN)</b></td><td>: XPR 7550e</td></tr><tr><td><b>Model Number (HVIN)</b></td><td>: AAH56RDN9RA1AN (IC MODEL: PMUE3675DBCNA)</td></tr><tr><td><b>Frequency Band</b></td><td>: 2.412-2.462 GHz</td></tr><tr><td><b>Max RF Output Power</b></td><td>: 802.11b - 22.4 mWatts<br/>802.11g - 8.3 mWatts<br/>802.11n - 12.6 mWatts</td></tr><tr><td><b>Applicant Name</b></td><td>: Motorola Solutions Inc</td></tr><tr><td><b>Applicant Address</b></td><td>: 8000 West Sunrise Boulevard,<br/>Fort Lauderdale, Florida 33322</td></tr><tr><td><b>FCC Registrations</b></td><td>: 461337</td></tr><tr><td><b>ISSED Registrations</b></td><td>: MY0001</td></tr><tr><td><b>Firmware Version (FVIN)</b></td><td>: D02.21.06.0036</td></tr></table> <p><b>The equipment was tested accordance to the requirement listed below:</b></p> <table><tr><td><b>(2.4GHz Wifi)</b><br/><b>47CFR Part 15C</b><br/><b>ISSED RSS 247 Issue 2</b></td><td><b>PASS</b></td></tr></table>  |                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Date/s Tested</b> | : 12-Nov-2021 - 19-Nov-2021 | <b>Report Issue Date</b> | : 02-Dec-2021 | <b>Manufacturer/Location</b> | : Motorola Solutions Malaysia Sdn Bhd<br>Plot 2A, Medan Bayan Lepas, Mukim 12 SWD,<br>11900, Bayan Lepas, Penang, Malaysia | <b>Requestor</b> | : SOH LEY KOON | <b>Product Type</b> | : Hand-held | <b>Product Version (PMN)</b> | : XPR 7550e | <b>Model Number (HVIN)</b> | : AAH56RDN9RA1AN (IC MODEL: PMUE3675DBCNA) | <b>Frequency Band</b> | : 2.412-2.462 GHz | <b>Max RF Output Power</b> | : 802.11b - 22.4 mWatts<br>802.11g - 8.3 mWatts<br>802.11n - 12.6 mWatts | <b>Applicant Name</b> | : Motorola Solutions Inc | <b>Applicant Address</b> | : 8000 West Sunrise Boulevard,<br>Fort Lauderdale, Florida 33322 | <b>FCC Registrations</b> | : 461337 | <b>ISSED Registrations</b> | : MY0001 | <b>Firmware Version (FVIN)</b> | : D02.21.06.0036 | <b>(2.4GHz Wifi)</b><br><b>47CFR Part 15C</b><br><b>ISSED RSS 247 Issue 2</b> | <b>PASS</b> |
| <b>Date/s Tested</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | : 12-Nov-2021 - 19-Nov-2021                                                                                                                                                                                                                                                                                                                                                                                                     |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <b>Report Issue Date</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | : 02-Dec-2021                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <b>Manufacturer/Location</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | : Motorola Solutions Malaysia Sdn Bhd<br>Plot 2A, Medan Bayan Lepas, Mukim 12 SWD,<br>11900, Bayan Lepas, Penang, Malaysia                                                                                                                                                                                                                                                                                                      |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <b>Requestor</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | : SOH LEY KOON                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <b>Product Type</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | : Hand-held                                                                                                                                                                                                                                                                                                                                                                                                                     |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <b>Product Version (PMN)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | : XPR 7550e                                                                                                                                                                                                                                                                                                                                                                                                                     |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <b>Model Number (HVIN)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | : AAH56RDN9RA1AN (IC MODEL: PMUE3675DBCNA)                                                                                                                                                                                                                                                                                                                                                                                      |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <b>Frequency Band</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | : 2.412-2.462 GHz                                                                                                                                                                                                                                                                                                                                                                                                               |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <b>Max RF Output Power</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | : 802.11b - 22.4 mWatts<br>802.11g - 8.3 mWatts<br>802.11n - 12.6 mWatts                                                                                                                                                                                                                                                                                                                                                        |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <b>Applicant Name</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | : Motorola Solutions Inc                                                                                                                                                                                                                                                                                                                                                                                                        |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <b>Applicant Address</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | : 8000 West Sunrise Boulevard,<br>Fort Lauderdale, Florida 33322                                                                                                                                                                                                                                                                                                                                                                |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <b>FCC Registrations</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | : 461337                                                                                                                                                                                                                                                                                                                                                                                                                        |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <b>ISSED Registrations</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | : MY0001                                                                                                                                                                                                                                                                                                                                                                                                                        |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <b>Firmware Version (FVIN)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | : D02.21.06.0036                                                                                                                                                                                                                                                                                                                                                                                                                |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <b>(2.4GHz Wifi)</b><br><b>47CFR Part 15C</b><br><b>ISSED RSS 247 Issue 2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>PASS</b>                                                                                                                                                                                                                                                                                                                                                                                                                     |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <p>This report shall not be reproduced without written approval from an officially designated representative of the Motorola Penang Adv. Comm. Laboratory. The results and statements contained in this report pertain only to the device(s) evaluated.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |
| <p>Prepared By:</p> <br><hr/> <p><b>GAN BOON TEONG</b><br/><b>Test Personnel</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>Approved Signatory:</p> <br><hr/> <p><b>VINCENT FOONG CHUEN KIT</b><br/><b>Responsible Engineer</b></p>                                                                                                                                                                                                                                 |                      |                             |                          |               |                              |                                                                                                                            |                  |                |                     |             |                              |             |                            |                                            |                       |                   |                            |                                                                          |                       |                          |                          |                                                                  |                          |          |                            |          |                                |                  |                                                                               |             |

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### REVISION HISTORY

| Revision History | Description           | Date        | Originator     |
|------------------|-----------------------|-------------|----------------|
| Rev. A           | Initial Report        | 01-Dec-2021 | Gan Boon Teong |
| Rev. B           | Updated summary table | 20-Dec-2021 | Gan Boon Teong |

## 1.0. General Information

### EUT Description:

|                           |                                     |
|---------------------------|-------------------------------------|
| <b>Technologies</b>       | 2.4GHz Wi-Fi                        |
| <b>TX Frequency range</b> | 2412MHz – 2462MHz                   |
| <b>Modulation Type</b>    | DSSS, OFDM                          |
| <b>Connector type</b>     | PROGRAMMING, TEST & ALIGNMENT CABLE |
| <b>Antenna type</b>       | IFA BLUETOOTH/WIFI ANTENNA          |

### 1.1. Channel number and frequency information:

There are two bandwidth systems.

For 20MHz Bandwidth systems (802.11b, 802.11g, 802.11n), use channel 1 ~ channel 11

For 40MHz Bandwidth systems (802.11n), use channel 3 ~ channel 9

| Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|
| 1       | 2412      | 7       | 2442      |
| 2       | 2417      | 8       | 2447      |
| 3       | 2422      | 9       | 2452      |
| 4       | 2427      | 10      | 2457      |
| 5       | 2432      | 11      | 2462      |
| 6       | 2437      |         |           |

The EUT contains following accessory devices and data cable:

| Item                                                     | Brand    | Model or P/N |
|----------------------------------------------------------|----------|--------------|
| BELIZE TIA4950 IMPRES HIGH CAP LI ION BATTERY 2850M2900T | MOTOROLA | PMNN4489B    |
| PROGRAMMING, TEST AND ALIGNMENT CABLE                    | MOTOROLA | PMKN4013C    |
| UHF SLIM WHIP ANTENNA                                    | MOTOROLA | PMAE4079A    |

### General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, the EUT is to comply with the requirements of the following standards:

**FCC 47 CFR Part 15 Subpart C**  
**KDB 558074 D01 15.247 Meas Guidance v05**  
**ANSI C63.10-2013**

### Deviation from standard

Not applicable as no deviation from standard test method

### Modifications to EUT

For RF conducted measurements a pigtail was soldered out of the board while for radiated measurements there were no modifications to the device

### Test configuration of EUT

All relevant configurations involving radio models and accessories (including chargers, batteries, antennas) were assessed. Only worst case configurations will be included in this report.

## 2.0. Summary of Test Results

| FCC Clause                 | IC Clause      | Test Item                                 | Result | Remark                                                                                                                  | Serial number tested | Tested by      |
|----------------------------|----------------|-------------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------|----------------------|----------------|
| 15.247 (a)(2)              | RSS-247 5.2(a) | DTS & 99% Channel Bandwidth               | Pass   | Highest 99% OCB:<br>802.11b: 13.492 MHz(13M5G1D)<br>802.11g: 16.742 MHz(16M7D1D)<br>802.11n: 17.709 MHz(17M7D1D)        | 871TXVC358           | Gan            |
| 15.247 (b)(3)              | RSS-247 5.4(d) | Conducted RF Output Power (Average)       | Pass   | Highest output power:<br>802.11b: 13.184 dBm (20.82 mW)<br>802.11g: 8.725 dBm(7.46 mW)<br>802.11n: 10.769 dBm(11.94 mW) | 871TXVC358           | Gan            |
| 15.247(e)                  | RSS-247 5.2(b) | Maximum Power Spectral Density            | Pass   | Meet the limit requirement.                                                                                             | 871TXVC358           | Gan            |
| 15.247(d)                  | RSS-247 5.5    | Conducted Spurious Emissions              | Pass   | Worst case emission: -39.88 dBm                                                                                         | 871TXVC358           | Gan            |
| 15.247 (d)                 | RSS-247 5.5    | Band edge Conducted Spurious Emission     | Pass   | Worst case emission: -36.02 dBm                                                                                         | 871TXVC358           | Gan            |
| 15.205, 15.209, 15.247 (d) | RSS-247 5.5    | Radiated Emission within Restricted Bands | Pass   | Worst case emission:<br>RBE: 45.4106dBuV/m (margin: 8.5894dB)<br>RSE: 51.5183dBuV/m (margin 2.4817dB, noise floor)      | 871TXVC351           | Nazrin&Qawiman |
| 15.207                     | RSS-Gen 8.8    | AC Power Line Conducted Emission          | NA     | Testing is not required, radio shall turn off during charging mode                                                      | NA                   | NA             |
| 15.203                     |                | Antenna requirement                       | NA     | Internal antenna is not accessible to the enduser                                                                       | NA                   | NA             |

NA → Not Available

## 3.0. Measurement Uncertainty

| Measurement                                     | Frequency       | Expended Uncertainty (k=1.96) (±) |
|-------------------------------------------------|-----------------|-----------------------------------|
| AC Power Line Conducted Spurious Emission       | 150kHz ~ 30MHz  | 3.48 dB                           |
| Radiated Emissions up to 1 GHz (Field Strength) | 30MHz ~ 1000MHz | 5.88 dB                           |
| Radiated Emissions above 1 GHz (Field Strength) | 1GHz ~ 18GHz    | 5.84 dB                           |
|                                                 | 18GHz ~ 40GHz   | 6.02 dB                           |
| Conducted Spurious Emissions                    | 9kHz ~ 12.75GHz | 2.82 dB                           |

#### 4.0. Equipment List

##### Bluetooth ATE # 1 (SW Version: Ate Main\_3.1.11)

| Description         | Model         | Serial Number | Calibration Date | Calibration Due Date |
|---------------------|---------------|---------------|------------------|----------------------|
| POWER SUPPLY        | 6652A         | 3640A02941    | 22-Jan-21        | 22-Jan-22            |
| SPECTRUM ANALYZER   | E4440A        | US45303111    | 14-Jul-21        | 14-Jul-22            |
| CHAMBER             | SH-641        | 92003820      | 14-Jul-21        | 14-Jul-22            |
| N to N RF Cable # 1 | SF126/11N/11N | NA            | NA               | NA                   |

##### Radiated Emission Station (SW Version: EMC FCC RE v1.6.2)

| Description               | Model     | Serial Number | Calibration Date | Calibration Due Date |
|---------------------------|-----------|---------------|------------------|----------------------|
| DRG HORN FREQ.            | SAS-571   | 720           | 06-Apr-21        | 06-Apr-23            |
| DRG HORN FREQ.            | SAS-571   | 719           | 13-Sep-21        | 13-Sep-22            |
| POWER SUPPLY              | N7976A    | MY53410110    | 24-May-21        | 24-May-22            |
| SIGNAL GENERATOR          | SMB 100A  | 182511        | 4-Jun-21         | 4-Jun-24             |
| EMI TEST RECEIVER         | ESW44     | 101750        | 15-Jan-21        | 15-Jan-22            |
| EMI TEST RECEIVER         | ESIB26    | 827769/009    | 11-Mar-21        | 11-Mar-22            |
| 5m SEMI-ANECHOIC CHAMBER  | S800-HX   | J2308         | Not Required     | Not Required         |
| BILOG ANTENNA             | CBL6112D  | 55546         | 06-Jun-21        | 06-Jun-22            |
| BILOG ANTENNA             | CBL6112B  | 2964          | 4-May-21         | 4-May-22             |
| HYGRO-THERMOMETER         | SDL500    | A.016800      | 18-May-21        | 18-May-22            |
| SYSTEM CONTROLLER         | SC104V    | 050806-1      | Not Required     | Not Required         |
| TURNTABLE FLUSH MOUNT 2M  | FM2011    | NA            | Not Required     | Not Required         |
| ANTENNA POSITIONING TOWER | TLT2      | NA            | Not Required     | Not Required         |
| BROAD-BAND HORN ANTENNA   | BBHA9170  | BBHA9170255   | 4-Feb-21         | 4-Feb-22             |
| PREAMPLIFIER 18-40GHz     | BBV9721   | 9721-007      | Not Required     | Not Required         |
| PREAMPLIFIER              | PAM-0118P | 361           | 11-Sep-20        | 11-Sep-23            |
| LOOP ANTENNA              | 6502      | 00203479      | 5-Feb-21         | 5-Feb-22             |
| DRG HORN FREQ.            | SAS-571   | 720           | 06-Apr-21        | 06-Apr-23            |

#### 5.0. Test Mode Applicability and Test Channel Detail

The device employs MIMO technology. Below are the possible configurations.

| WLAN Configurations |                | Mode    |           |                                       |           |                               |           |
|---------------------|----------------|---------|-----------|---------------------------------------|-----------|-------------------------------|-----------|
|                     |                | SISO    |           | Spatial Diversity Multiplexing (MIMO) |           | Cyclic Delay Diversity (MIMO) |           |
| 2.4GHz              | Antenna        | Primary | Secondary | Primary                               | Secondary | Primary                       | Secondary |
|                     | 802.11b        | √       | √         | x                                     | x         | x                             | x         |
|                     | 802.11g        | √       | √         | x                                     | x         | x                             | x         |
|                     | 802.11n (HT20) | √       | √         | x                                     | x         | x                             | x         |
|                     | 802.11n (HT40) | x       | x         | x                                     | x         | x                             | x         |

√ = Support;  
 x = NOT Support

**Note:** This Device supports simultaneous transmission operation, which allows for two SISO or two MIMO channels to operate independent of one another in the 2.4GHz band on each antenna. 802.11n mode is capable of transmitting simultaneously on two antennas using Cyclic Delay Diversity and Spatial Diversity Multiplexing (2x2 MIMO).

The following tables show the worst case configurations determined during testing. The data for these configurations is contained in this test report.

### **Radiated Emission Test (Above 1GHz)**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Modulation     | Available Channel | Tested Channel | Modulation Technology | Data Modulation Type | Date Rate (Mbps) | Mode            | Environmental Conditions |
|--------------------|----------------|-------------------|----------------|-----------------------|----------------------|------------------|-----------------|--------------------------|
| Test Mode          | 802.11b        | 1 to 11           | 1,6,11         | DSSS                  | DBPSK                | 1                | SISO            | 23.3°C, 70.6%RH          |
| Test Mode          | 802.11g        | 1 to 11           | 1,6,11         | OFDM                  | BPSK                 | 6                | SISO            | 23.3°C, 70.6%RH          |
| Test Mode          | 802.11n (HT20) | 1 to 11           | 1,6,11         | OFDM                  | BPSK                 | 6.5              | SISO CDD (MIMO) | 23.3°C, 70.6%RH          |
| Test Mode          | 802.11n (HT40) | 3 to 9            | 3,6,9          | OFDM                  | BPSK                 | 6.5              | SISO CDD (MIMO) | NA                       |

### **Radiated Emission Test (Below 1GHz)**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Modulation     | Available Channel | Tested Channel | Modulation Technology | Data Modulation Type | Date Rate (Mbps) | Mode            | Environmental Conditions |
|--------------------|----------------|-------------------|----------------|-----------------------|----------------------|------------------|-----------------|--------------------------|
| Test Mode          | 802.11b        | 1 to 11           | 1,6,11         | DSSS                  | DBPSK                | 1                | SISO            | 23.3°C, 70.6%RH          |
| Test Mode          | 802.11g        | 1 to 11           | 1,6,11         | OFDM                  | BPSK                 | 6                | SISO            | 23.3°C, 70.6%RH          |
| Test Mode          | 802.11n (HT20) | 1 to 11           | 1,6,11         | OFDM                  | BPSK                 | 6.5              | SISO CDD (MIMO) | 23.3°C, 70.6%RH          |
| Test Mode          | 802.11n (HT40) | 3 to 9            | 3,6,9          | OFDM                  | BPSK                 | 6.5              | SISO CDD (MIMO) | NA                       |

### **Power Line Conducted Emission Test**

☐ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☐ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Modulation      | Available Channel | Tested Channel | Modulation Technology | Data Modulation Type | Data Rate (Mbps) | Environmental Conditions |
|--------------------|-----------------|-------------------|----------------|-----------------------|----------------------|------------------|--------------------------|
| Application Mode   | 802.11bgn mixed | 1 to 11           | AUTO           | DSSS, OFDM            | AUTO                 | AUTO             | NA                       |

### **Antenna Port Conducted Measurement:**

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Modulation     | Available Channel | Tested Channel | Modulation Technology | Data Modulation Type | Data Rate (Mbps) | Mode            | Environmental Conditions |
|--------------------|----------------|-------------------|----------------|-----------------------|----------------------|------------------|-----------------|--------------------------|
| Test Mode          | 802.11b        | 1 to 11           | 1,6,11         | DSSS                  | DBPSK                | 1                | SISO            | 25°C, 57.0%RH            |
| Test Mode          | 802.11g        | 1 to 11           | 1,6,11         | OFDM                  | BPSK                 | 6                | SISO            | 25°C, 57.0%RH            |
| Test Mode          | 802.11n (HT20) | 1 to 11           | 1,6,11         | OFDM                  | BPSK                 | 6.5              | SISO CDD (MIMO) | 25°C, 57.0%RH            |
| Test Mode          | 802.11n (HT40) | 1 to 11           | 3,6,9          | OFDM                  | BPSK                 | 6.5              | SISO CDD (MIMO) | NA                       |

### **Duty Cycle of Test Signal**

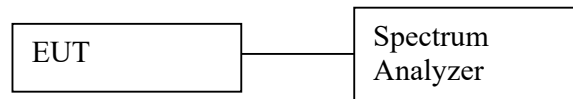
802.11b and 802.11n : Duty cycle of test signal is  $\geq 98\%$ .

802.11g : Duty cycle of test signal is  $\leq 98\%$ . (Refer to Clause 6.3 for duty cycle test signal)

## 6.0. Transmitter Test Parameters

### 6.1. 6dB Channel Bandwidth

#### 6.1.1. Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the DUT and set DUT to transmit maximum power.
- c) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
  - a. RBW = 100 kHz
  - b. VBW = 300 kHz
  - c. Detector mode = Peak
  - d. Trace = Max hold
  - e. Sweep = auto
- e) Measure the freq different of two frequencies that were attenuated 6dB from peak of the emission & record the frequency difference as the emission bandwidth.
- f) Measure every antenna port by repeat the step above for MIMO measurement.

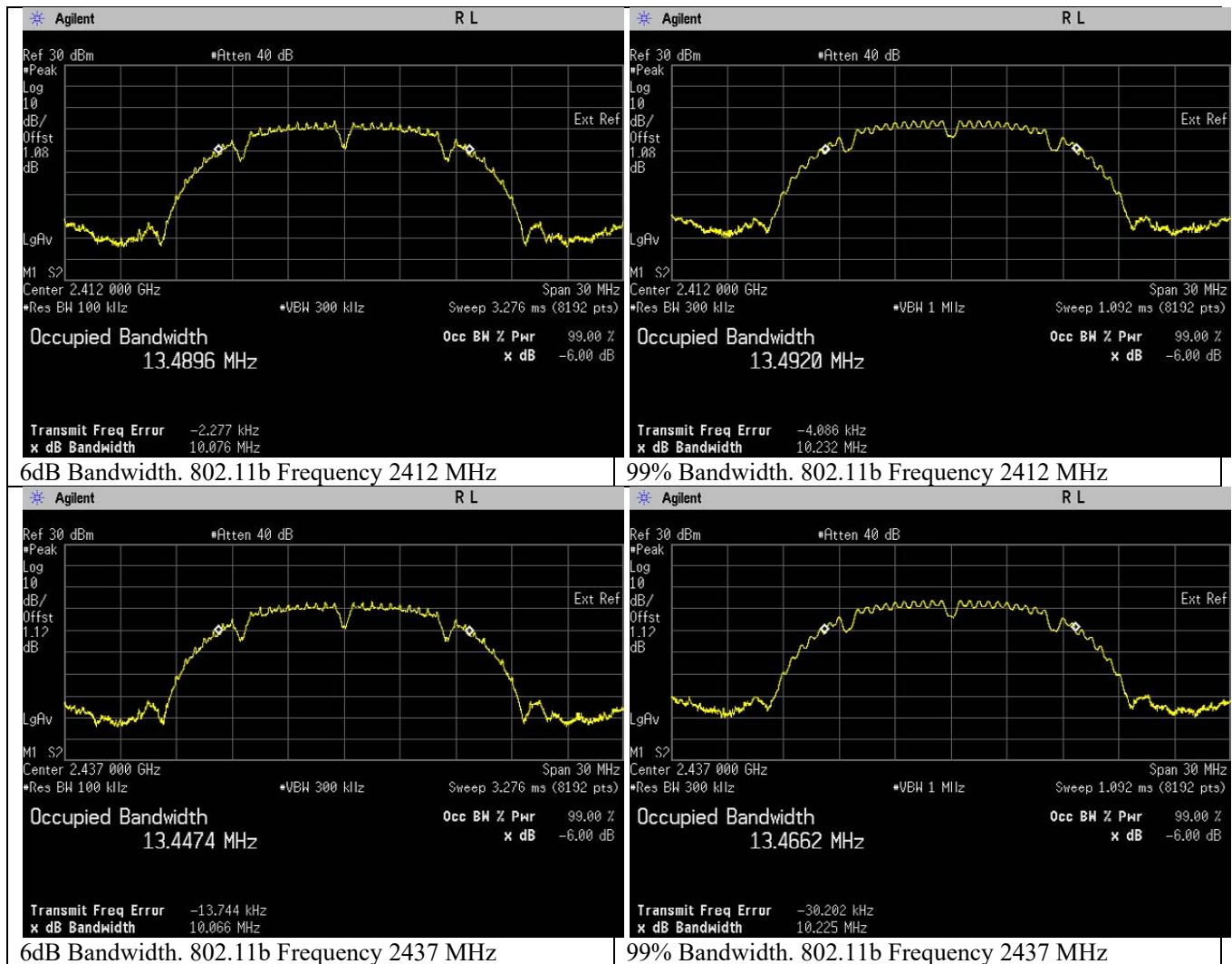
#### 6.1.2. Test Limits:

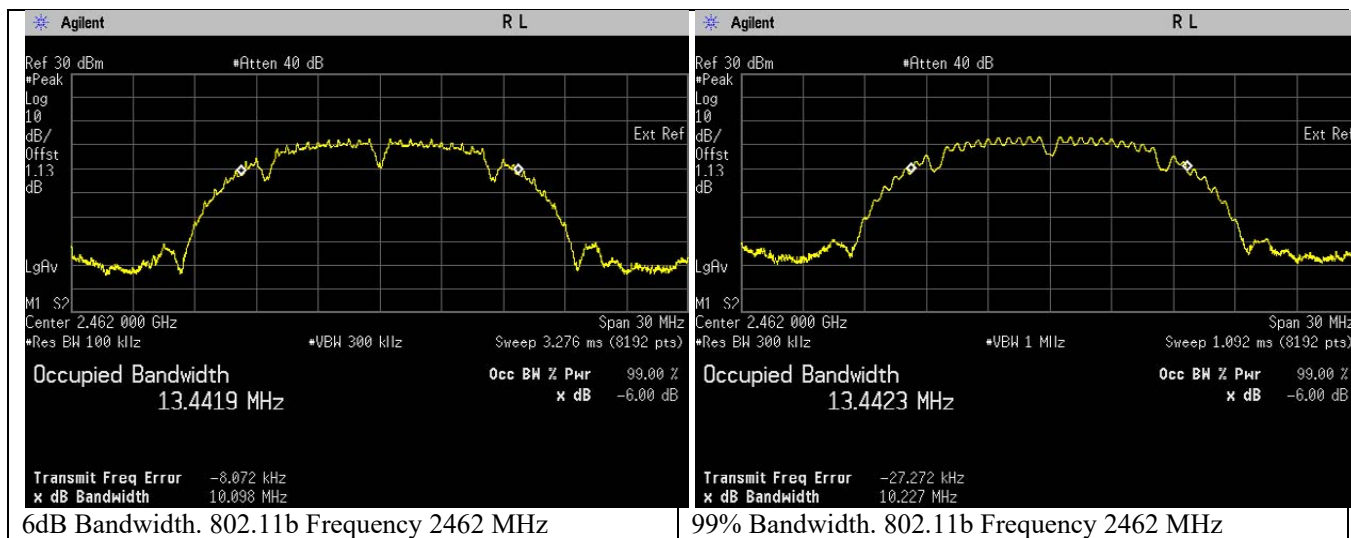
| Normal Condition (25 ° C) |
|---------------------------|
| $\geq 500$ kHz            |

### 6.1.3. Test Data:

#### 802.11 b

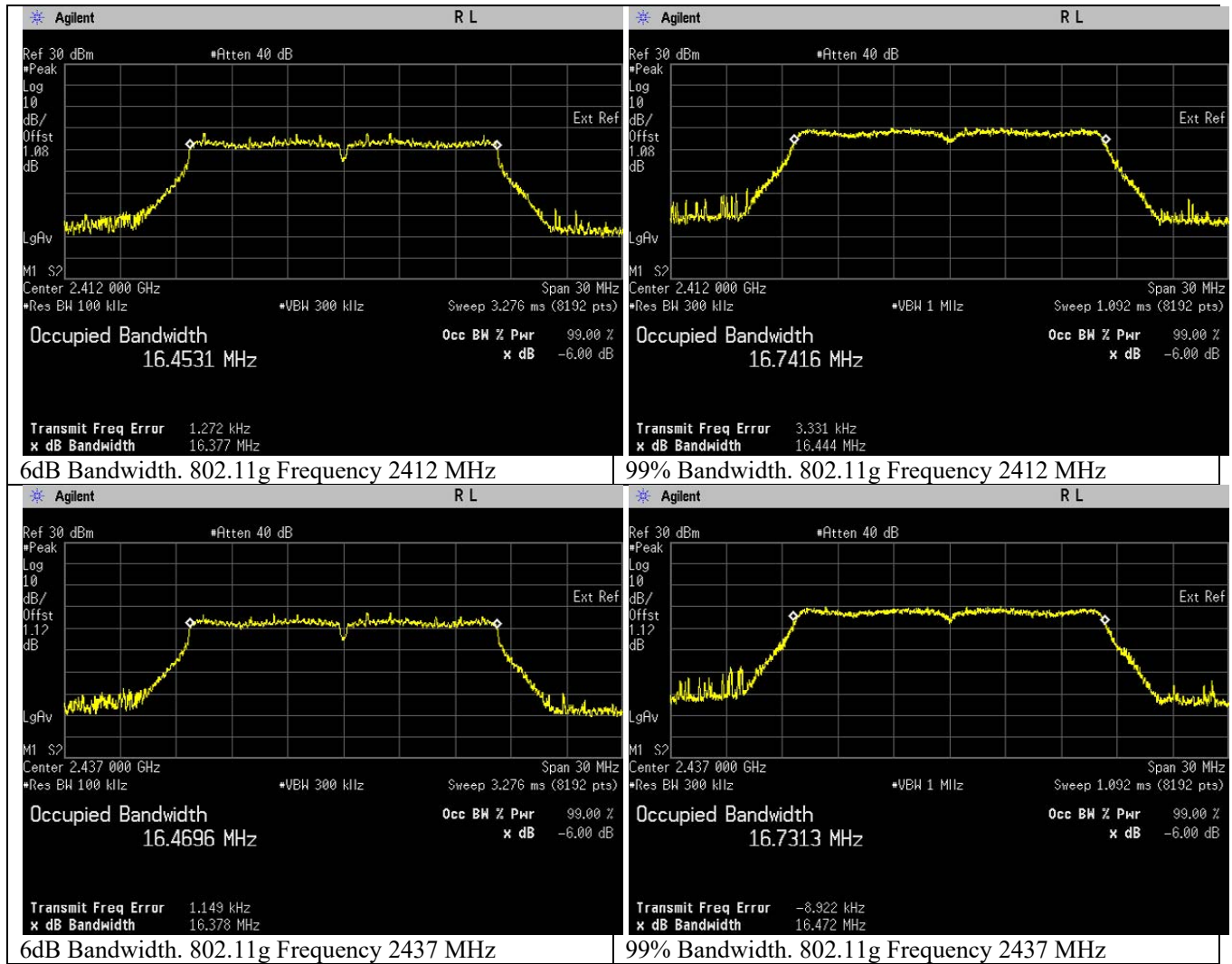
| Test Conditions |                 |                       |                  | Test Frequency | Results             |                     |        |
|-----------------|-----------------|-----------------------|------------------|----------------|---------------------|---------------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | 6dB Bandwidth (MHz) | 99% Bandwidth (MHz) | Status |
| 802.11b         | DSSS            | DBPSK                 | 1                | 2412           | 10.076              | 13.492              | Pass   |
| 802.11b         | DSSS            | DBPSK                 | 1                | 2437           | 10.066              | 13.466              | Pass   |
| 802.11b         | DSSS            | DBPSK                 | 1                | 2462           | 10.098              | 13.442              | Pass   |

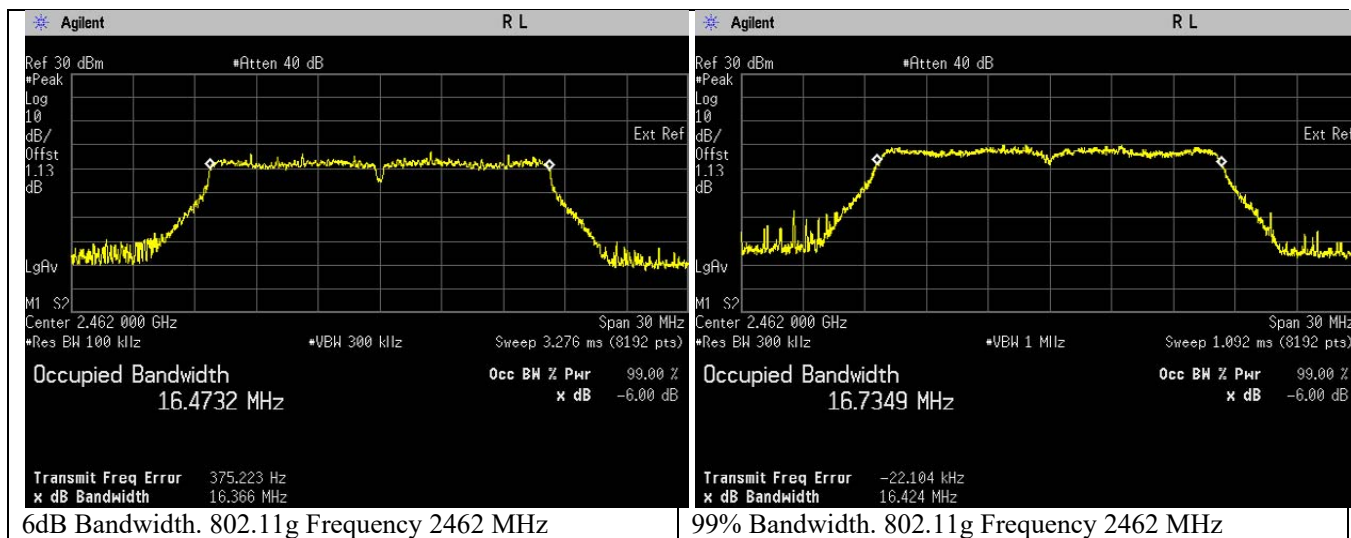




## 802.11g

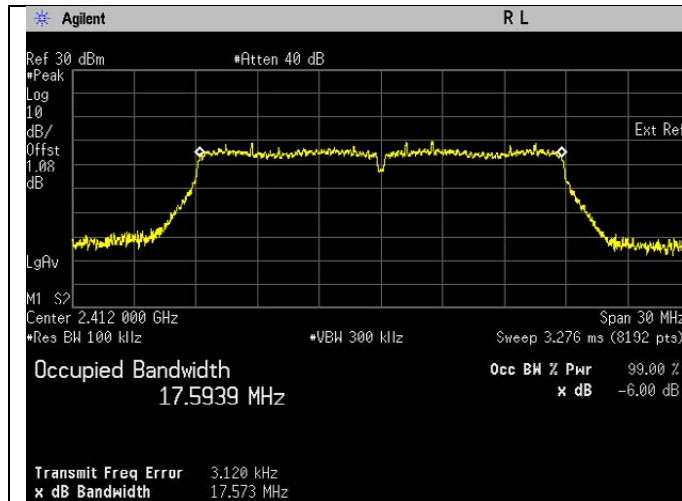
| Test Conditions |                 |                       |                  | Test Frequency | Results             |                     |        |
|-----------------|-----------------|-----------------------|------------------|----------------|---------------------|---------------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | 6dB Bandwidth (MHz) | 99% Bandwidth (MHz) | Status |
| 802.11g         | OFDM            | BPSK                  | 6                | 2412           | 16.377              | 16.742              | Pass   |
| 802.11g         | OFDM            | BPSK                  | 6                | 2437           | 16.378              | 16.731              | Pass   |
| 802.11g         | OFDM            | BPSK                  | 6                | 2462           | 16.366              | 16.735              | Pass   |



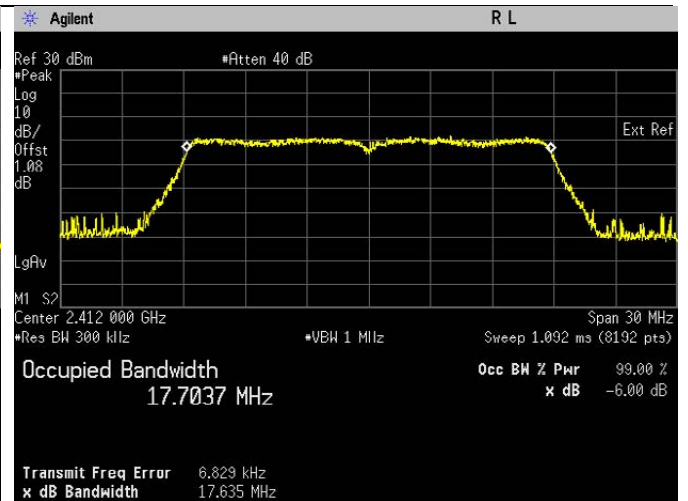


## 802.11n (HT20)

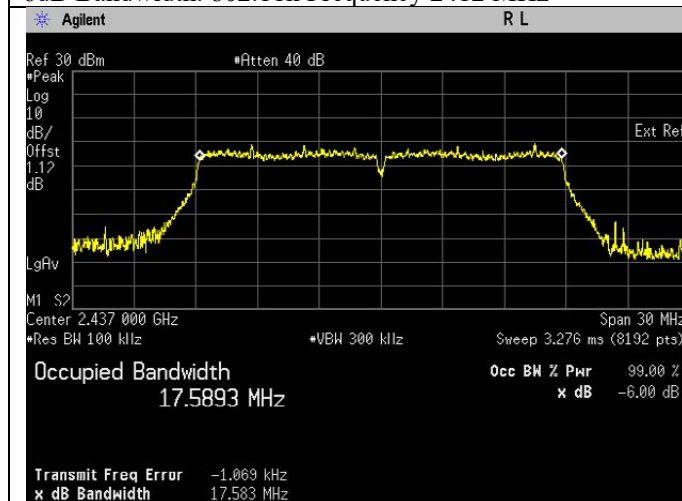
| Test Conditions |                 |                       |                  | Test Frequency | Results             |                     |        |
|-----------------|-----------------|-----------------------|------------------|----------------|---------------------|---------------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | 6dB Bandwidth (MHz) | 99% Bandwidth (MHz) | Status |
| 802.11n         | OFDM            | DBPSK                 | 6.5              | 2412           | 17.573              | 17.704              | Pass   |
| 802.11n         | OFDM            | DBPSK                 | 6.5              | 2437           | 17.583              | 17.709              | Pass   |
| 802.11n         | OFDM            | DBPSK                 | 6.5              | 2462           | 17.565              | 17.705              | Pass   |



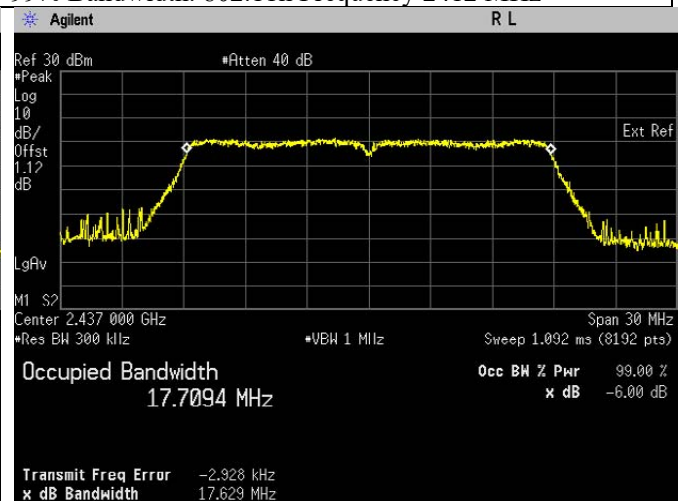
6dB Bandwidth. 802.11n Frequency 2412 MHz



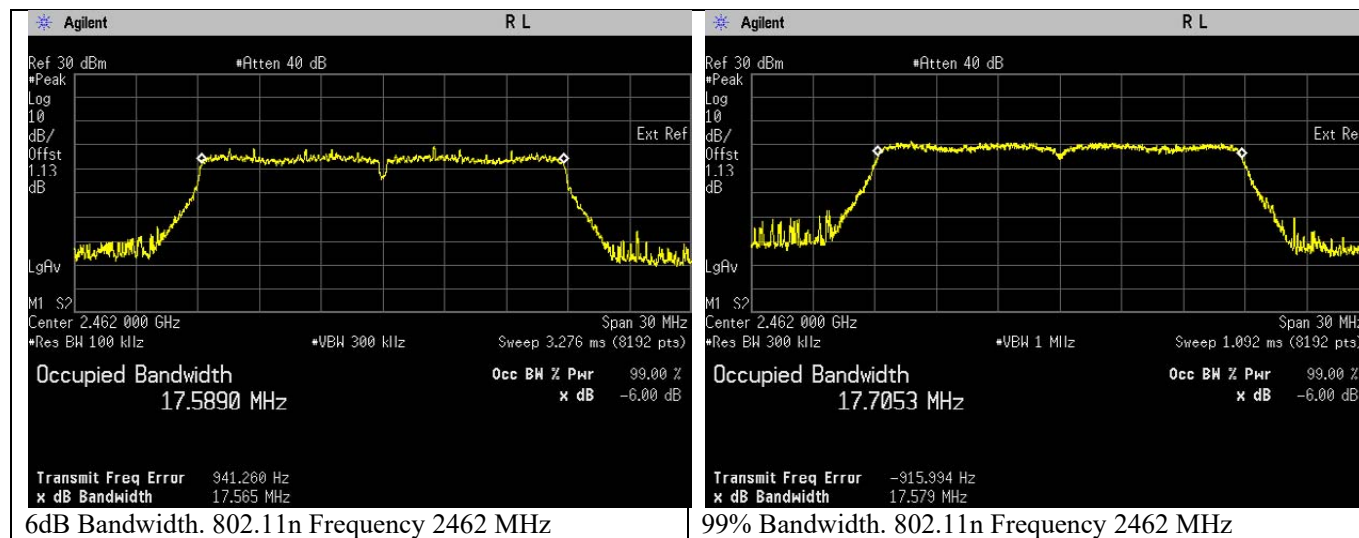
99% Bandwidth. 802.11n Frequency 2412 MHz



6dB Bandwidth. 802.11n Frequency 2437 MHz

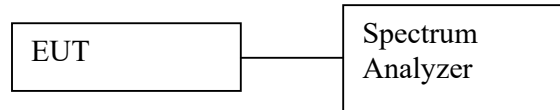


99% Bandwidth. 802.11n Frequency 2437 MHz



## 6.2. Conducted RF Output Power

### 6.2.1. Test Setup



#### Average

- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the DUT and set DUT to transmit maximum power.
- c) Measure the duty cycle of transmitter output signal.
- d) Setting of Spectrum analyzer :
  - a. Set the RBW = 300 kHz.
  - b. Set the VBW  $\geq [3 \times \text{RBW}]$ .
  - c. Set the span  $\geq [1.5 \times \text{OBW bandwidth}]$ .
  - d. Detector = average.
  - e. Sweep time = auto couple.
  - f. Trace mode = free run.
  - g. Allow trace to fully stabilize.
- e) Add in duty cycle correction into final test result.
- f) Duty cycle correction is calculated as below:  
 $10 \log (1/x)$
- g) Measure every antenna port by repeat the step above for MIMO measurement.

### 6.2.2. Test Limits:

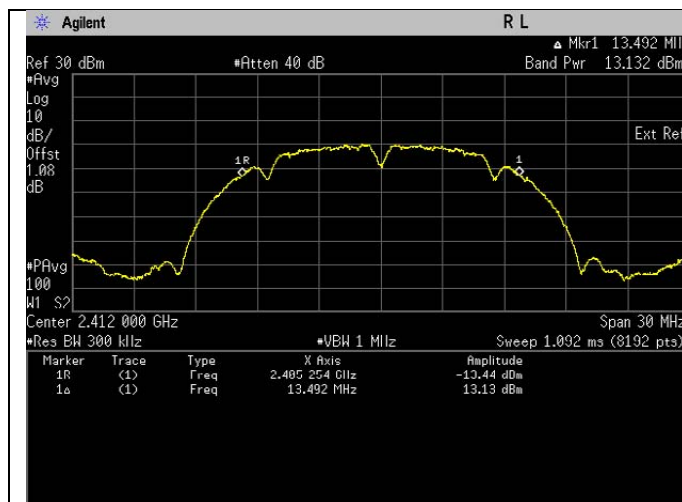
|                                                         |
|---------------------------------------------------------|
| <b>Normal Condition (25 ° C)</b>                        |
| <b><math>\leq 1 \text{ Watt}(30 \text{ dBm})</math></b> |

### 6.2.3. Test Data:

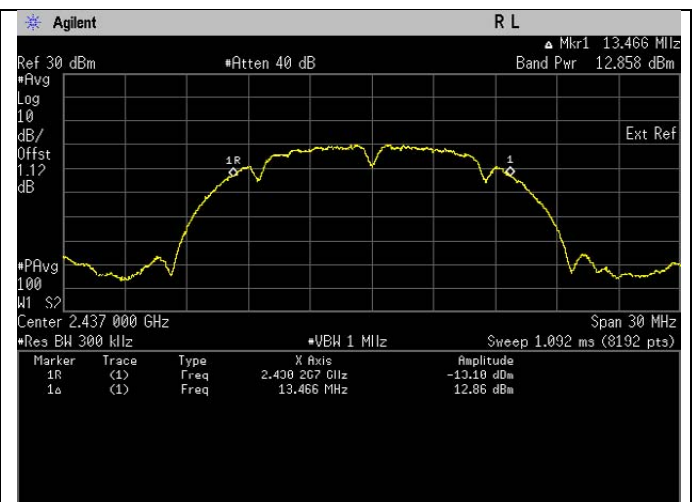
#### 802.11b

Output Power = Band Power + Duty Cycle Factor  
= Band Power + 0.051dBm

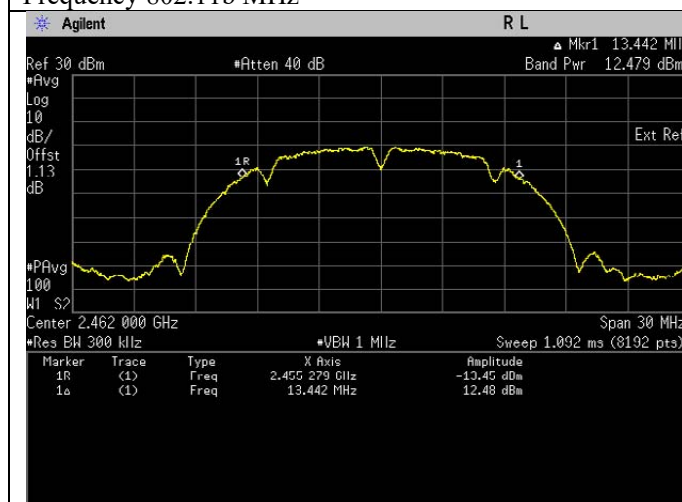
| Test Conditions |                 |                       |                  | Test Frequency | Results            |        |
|-----------------|-----------------|-----------------------|------------------|----------------|--------------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | Output Power (dBm) | Status |
| 802.11b         | DSSS            | DBPSK                 | 1                | 2412           | 13.183             | Pass   |
| 802.11b         | DSSS            | DBPSK                 | 1                | 2437           | 12.909             | Pass   |
| 802.11b         | DSSS            | DBPSK                 | 1                | 2462           | 12.530             | Pass   |



Frequency 802.11b MHz



Frequency 802.11b MHz

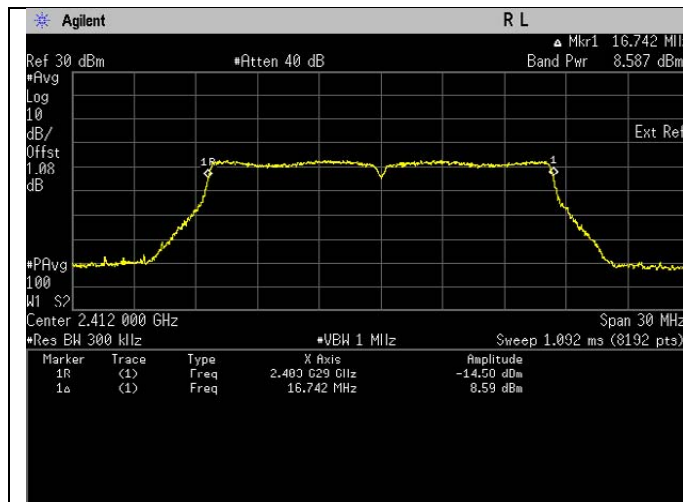


Frequency 802.11b MHz

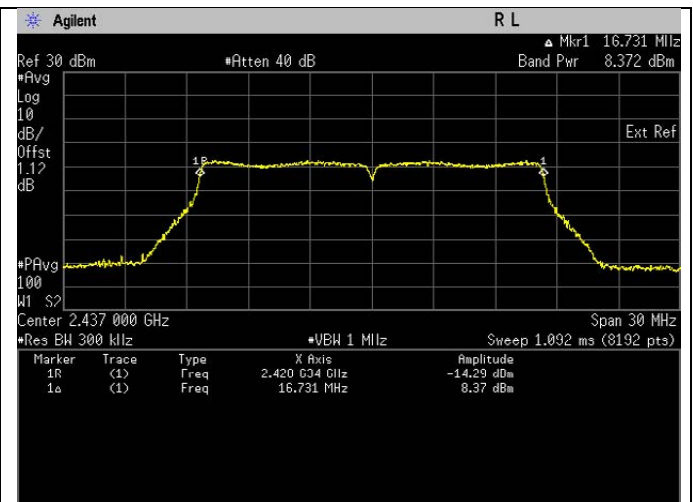
### 802.11g

Output Power = Band Power + Duty Cycle Factor  
 = Band Power + 0.137dBm

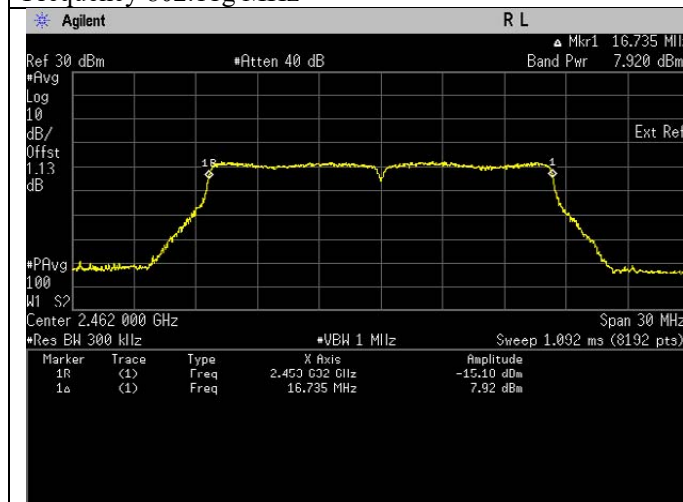
| Test Conditions |                 |                       |                  | Test Frequency | Results            |        |
|-----------------|-----------------|-----------------------|------------------|----------------|--------------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | Output Power (dBm) | Status |
| 802.11g         | OFDM            | BPSK                  | 6                | 2412           | 8.724              | Pass   |
| 802.11g         | OFDM            | BPSK                  | 6                | 2437           | 8.509              | Pass   |
| 802.11g         | OFDM            | BPSK                  | 6                | 2462           | 8.057              | Pass   |



Frequency 802.11g MHz



Frequency 802.11g MHz

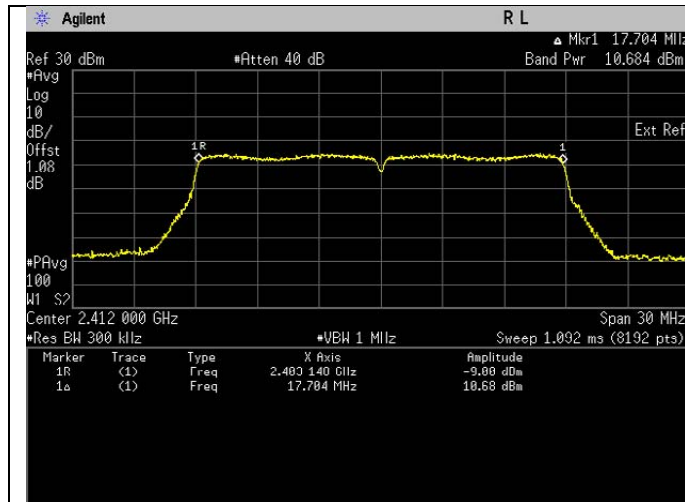


Frequency 802.11g MHz

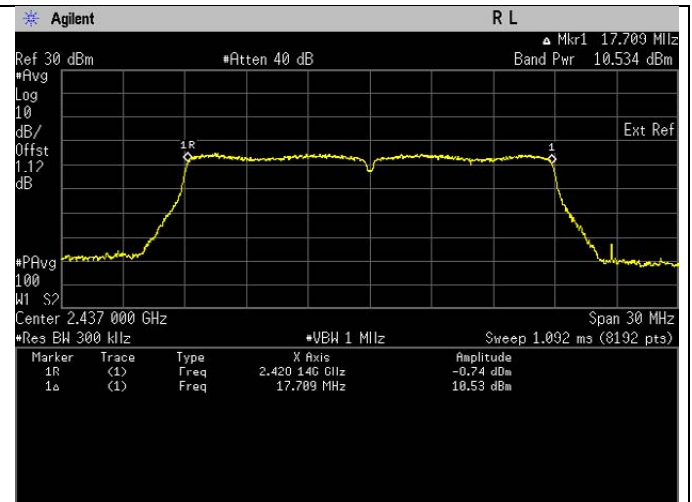
### 802.11n (HT20)

Output Power = Band Power + Duty Cycle Factor  
 = Band Power + 0.034dBm

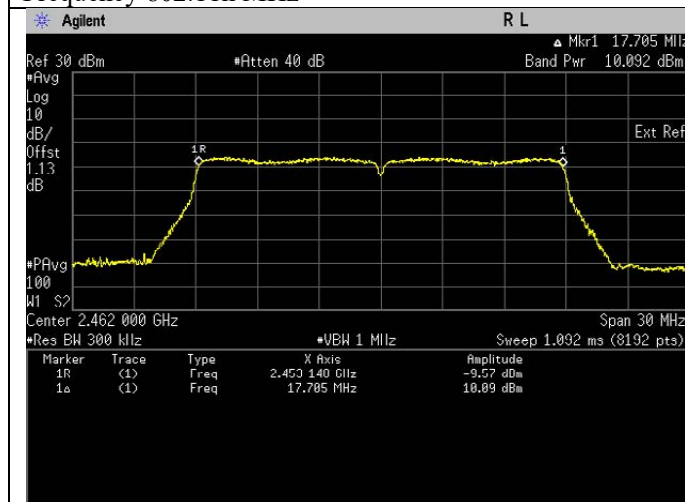
| Test Conditions |                 |                       |                  | Test Frequency | Results            |        |
|-----------------|-----------------|-----------------------|------------------|----------------|--------------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | Output Power (dBm) | Status |
| 802.11n         | OFDM            | DBPSK                 | 6.5              | 2412           | 10.768             | Pass   |
| 802.11n         | OFDM            | DBPSK                 | 6.5              | 2437           | 10.618             | Pass   |
| 802.11n         | OFDM            | DBPSK                 | 6.5              | 2462           | 10.176             | Pass   |



Frequency 802.11n MHz



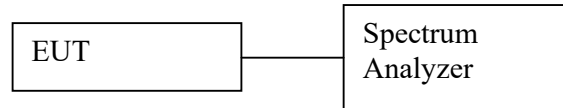
Frequency 802.11n MHz



Frequency 802.11n MHz

### 6.3.Duty Cycle of the test signal

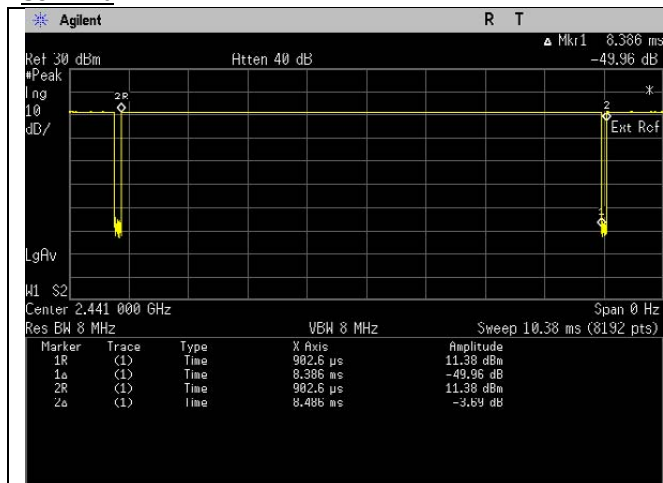
#### 6.3.1. Test Setup



- 1) Check and ensure the spectrum analyzer well calibrate.
- 2) Turn on the DUT and set DUT to transmit maximum power.
- 3) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- 4) Setting of Spectrum analyzer :
  - a. Set the RBW = 10 MHz or the highest RBW available on spectrum analyzer.
  - b. Set the VBW  $\geq$  RBW.
  - c. Set the span  $\geq [1.5 \times \text{DTS bandwidth}]$ .
  - d. Detector = Peak.
  - e. Sweep time = 10ms or others that allow to measure accurate duty cycle.
  - f. Trace mode = max hold.
  - g. Allow trace to fully stabilize.
- 5) Record the duty cycle as X and save the plot.
- 6) Measure every antenna port by repeat the step above for MIMO measurement.

### 6.3.2. Test Data

#### 802.11b



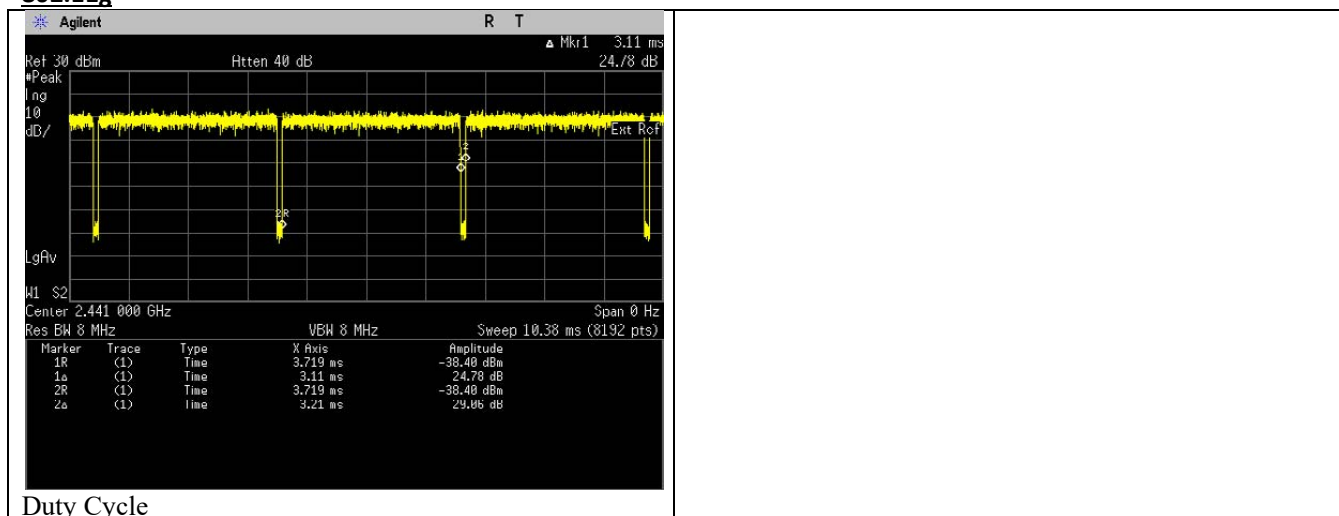
Duty Cycle

|                    |        |
|--------------------|--------|
| On time (ms)       | 8.386  |
| On + Off Time (ms) | 8.486  |
| Duty cycle         | 0.9882 |
| Duty Cycle factor  | 0.051  |

\*Duty cycle = On time/ On +off time

\*Duty Cycle factor =  $10 \cdot \log(1/\text{Duty Cycle})$

# 802.11g



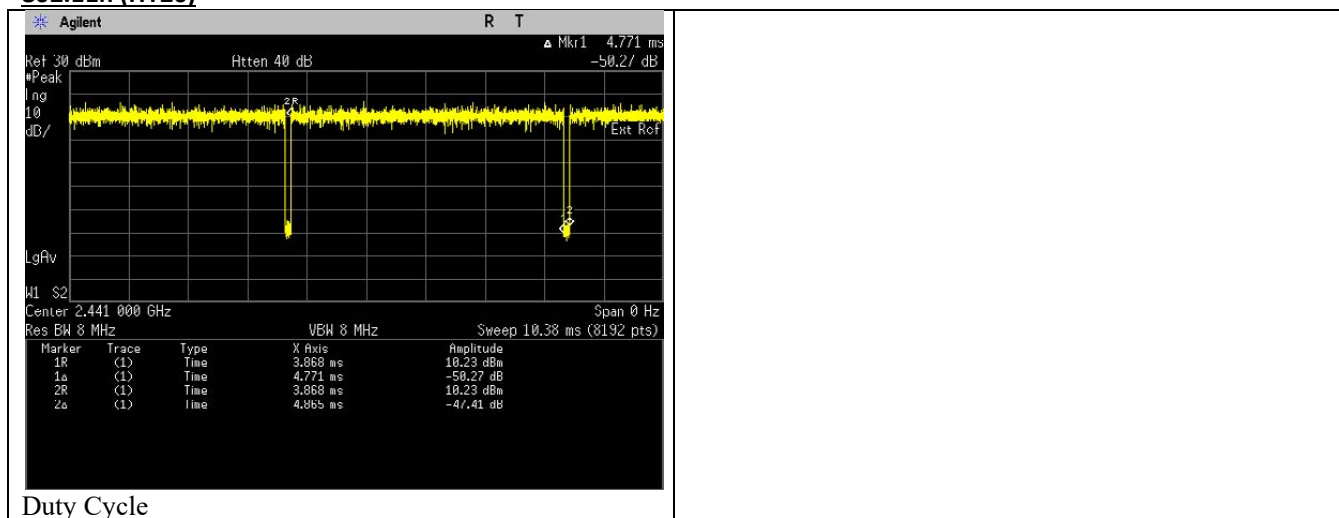
Duty Cycle

|                    |        |
|--------------------|--------|
| On time (ms)       | 3.11   |
| On + Off Time (ms) | 3.21   |
| Duty cycle         | 0.9688 |
| Duty Cycle factor  | 0.137  |

\*Duty cycle = On time/ On +off time

\*Duty Cycle factor = 10\*log(1/Duty Cycle)

### 802.11n (HT20)



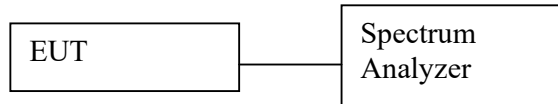
|                    |        |
|--------------------|--------|
| On time (ms)       | 4.771  |
| On + Off Time (ms) | 4.865  |
| Duty cycle         | 0.9807 |
| Duty Cycle factor  | 0.085  |

\*Duty cycle = On time/ On +off time

\*Duty Cycle factor =  $10 \cdot \log(1/\text{Duty Cycle})$

## 6.4. Maximum Peak Power Spectral Density

### 6.4.1. Test Setup



#### Maximum Peak

- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the DUT and set DUT to transmit maximum power.
- c) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
  - a. Set analyzer center frequency to DTS channel center frequency.
  - b. Set the span to 1.5 times the DTS bandwidth.
  - c. Set the RBW to  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
  - d. Set the VBW  $\geq [3 \times \text{RBW}]$ .
  - e. Detector = peak.
  - f. Sweep time = auto couple.
  - g. Trace mode = max hold.
  - h. Allow trace to fully stabilize.
  - i. Use the peak marker function to determine the maximum amplitude level within the RBW.
  - j. If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.
- e) Measure every antenna port by repeat the step above for MIMO measurement.

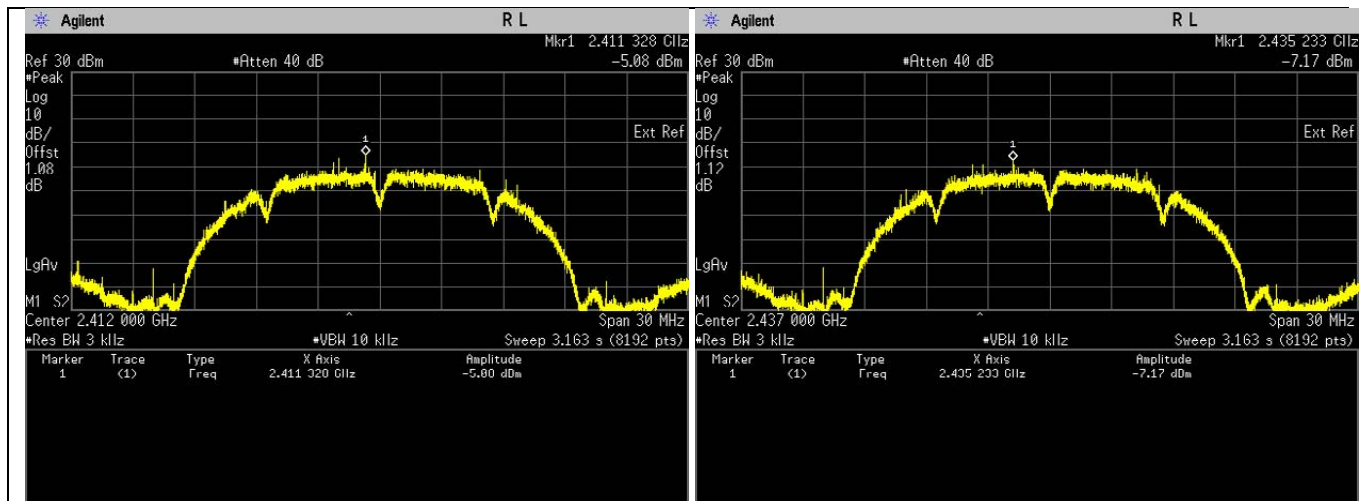
### 6.4.2. Test Limits

|                                             |
|---------------------------------------------|
| <b>Normal Condition (25 ° C)</b>            |
| <b><math>\leq 8 \text{ dBm/3kHz}</math></b> |

### 6.4.3. Test Result

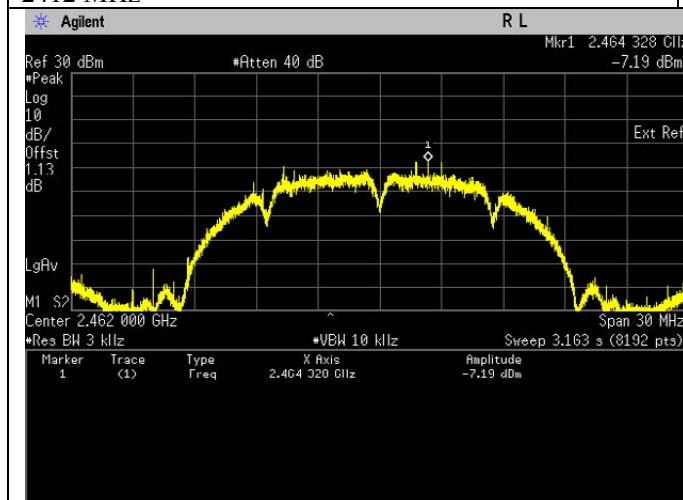
#### 802.11b

| Test Conditions |                 |                       |                  | Test Frequency | Results          |        |
|-----------------|-----------------|-----------------------|------------------|----------------|------------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | Power (dBm/3kHz) | Status |
| 802.11b         | DSSS            | DBPSK                 | 1                | 2412           | -5.08            | Pass   |
| 802.11b         | DSSS            | DBPSK                 | 1                | 2437           | -7.17            | Pass   |
| 802.11b         | DSSS            | DBPSK                 | 1                | 2462           | -7.19            | Pass   |



Maximum Power Spectral Density. 802.11b Frequency 2412 MHz

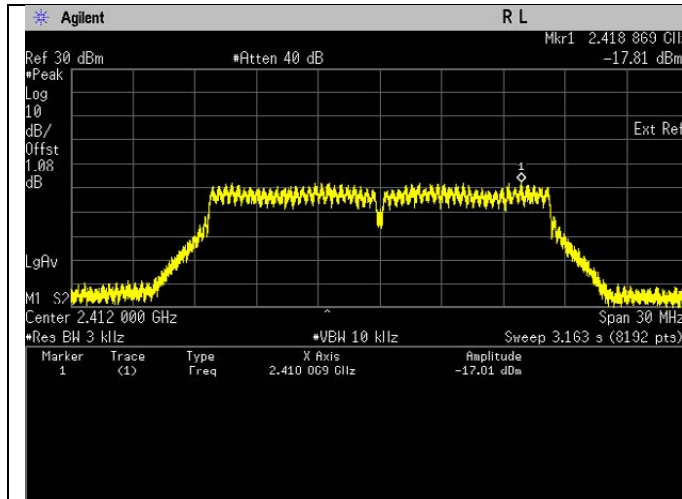
Maximum Power Spectral Density. 802.11b Frequency 2437 MHz



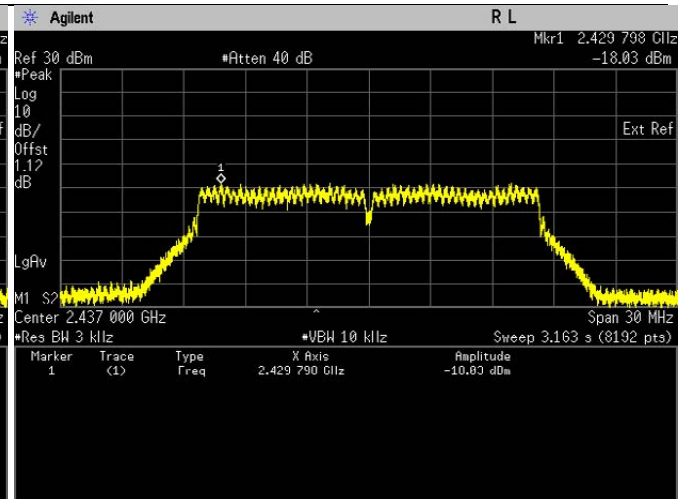
Maximum Power Spectral Density. 802.11b Frequency 2462 MHz

## 802.11g

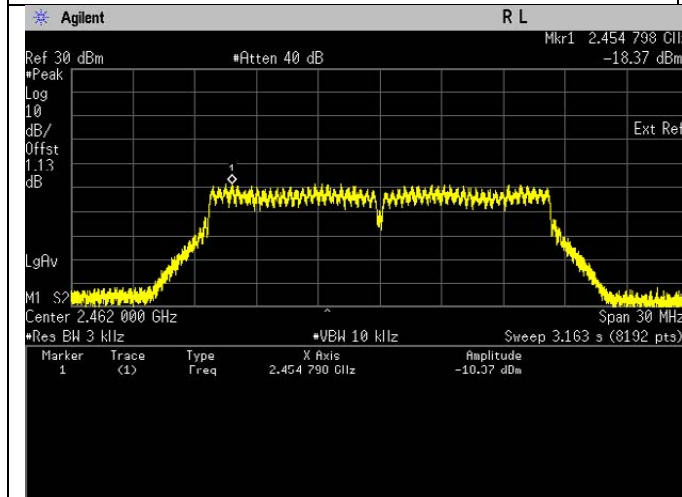
| Test Conditions |                 |                       |                  | Test Frequency | Results          |        |
|-----------------|-----------------|-----------------------|------------------|----------------|------------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | Power (dBm/3kHz) | Status |
| 802.11g         | OFDM            | BPSK                  | 6                | 2412           | -17.81           | Pass   |
| 802.11g         | OFDM            | BPSK                  | 6                | 2437           | -18.03           | Pass   |
| 802.11g         | OFDM            | BPSK                  | 6                | 2462           | -18.37           | Pass   |



Maximum Power Spectral Density. 802.11g Frequency 2412 MHz



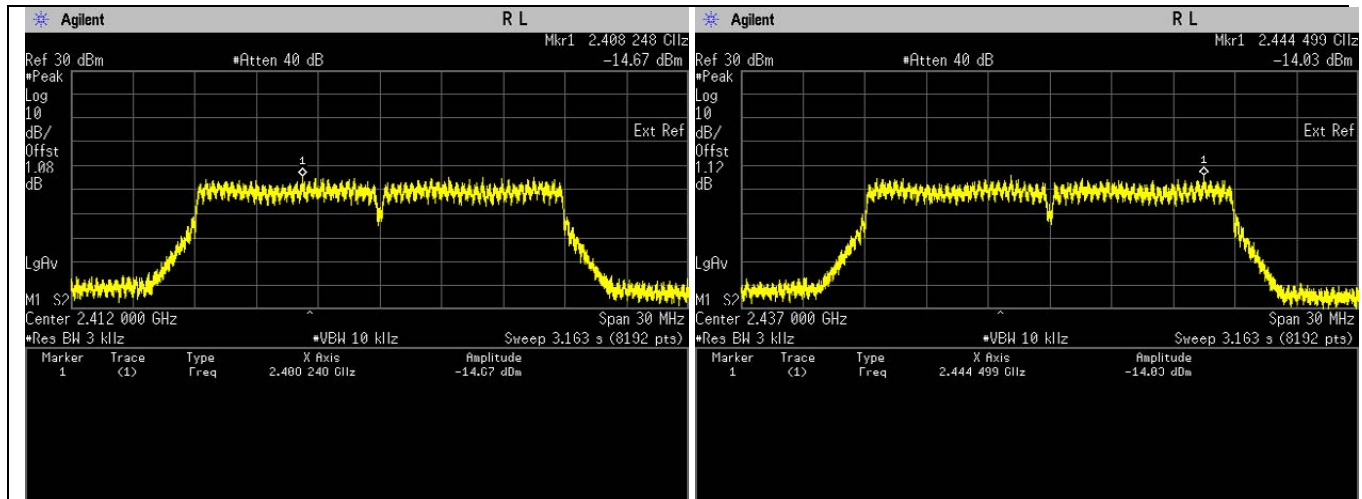
Maximum Power Spectral Density. 802.11g Frequency 2437 MHz



Maximum Power Spectral Density. 802.11g Frequency 2462 MHz

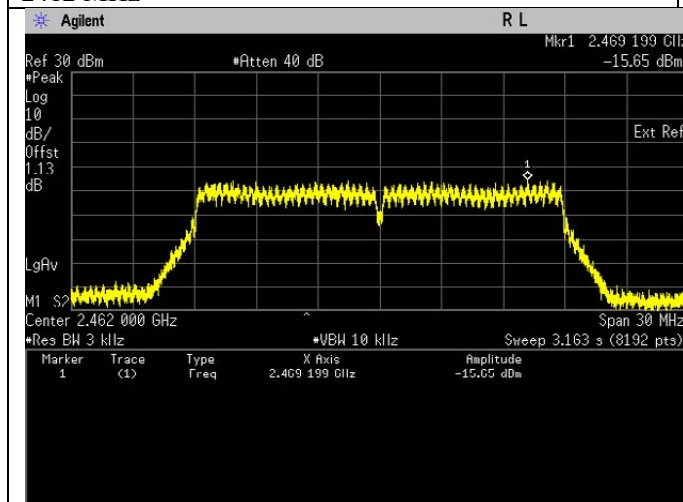
### 802.11n (HT20)

| Test Conditions |                 |                       |                  | Test Frequency | Results          |        |
|-----------------|-----------------|-----------------------|------------------|----------------|------------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | Power (dBm/3kHz) | Status |
| 802.11n         | OFDM            | DBPSK                 | 6.5              | 2412           | -14.67           | Pass   |
| 802.11n         | OFDM            | DBPSK                 | 6.5              | 2437           | -14.03           | Pass   |
| 802.11n         | OFDM            | DBPSK                 | 6.5              | 2462           | -15.65           | Pass   |



Maximum Power Spectral Density. 802.11n Frequency 2412 MHz

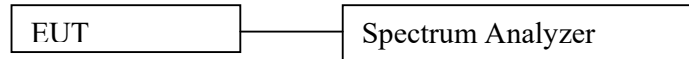
Maximum Power Spectral Density. 802.11n Frequency 2437 MHz



Maximum Power Spectral Density. 802.11n Frequency 2462 MHz

## 6.5. Conducted Spurious Emission

### 6.5.1. Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the DUT and set DUT to transmit maximum power.
- c) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
  - a. RBW = 100 kHz
  - b. VBW = 300 kHz
  - c. Detector mode = Peak
  - d. Trace = Max Hold
  - e. Sweep = auto
- e) Use the peak marker function to measure highest emission and scan up to 10<sup>th</sup> harmonic.
- f) Measure every antenna port by repeat the step above for MIMO measurement.

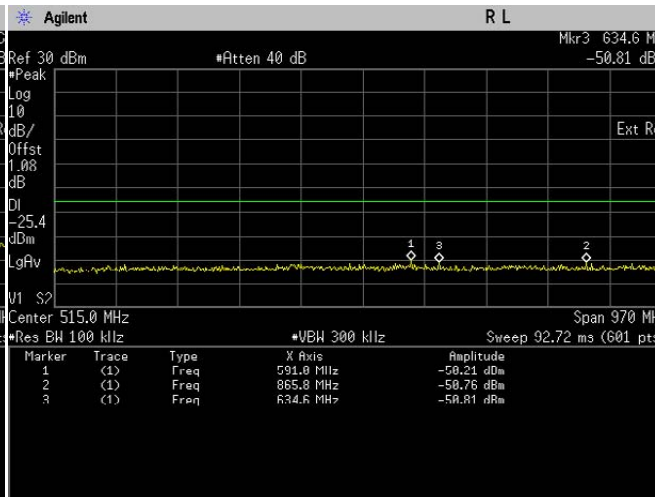
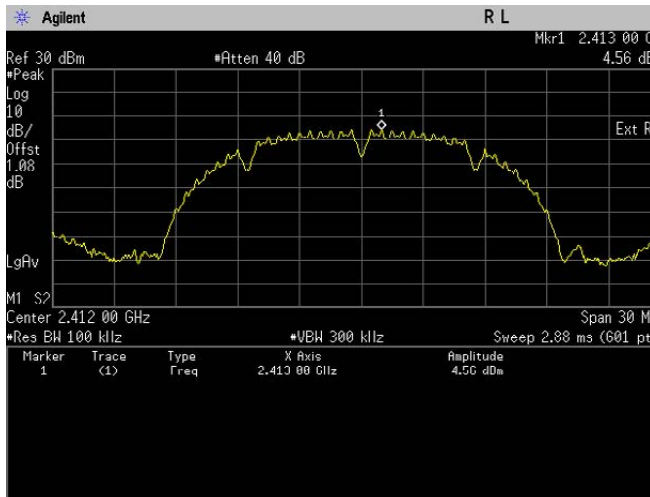
### 6.5.2. Test Limits:

|                                                        |
|--------------------------------------------------------|
| <b>Normal Condition (25 ° C)</b>                       |
| <b>Shall be at least 30 dB below peak (max) power.</b> |

### 6.5.3. Test Result

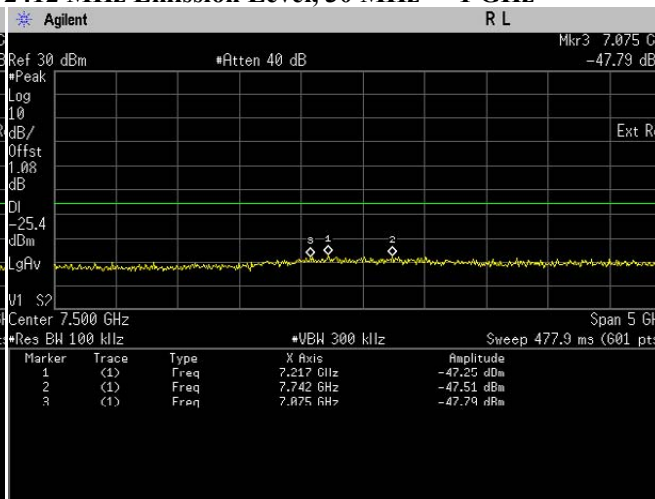
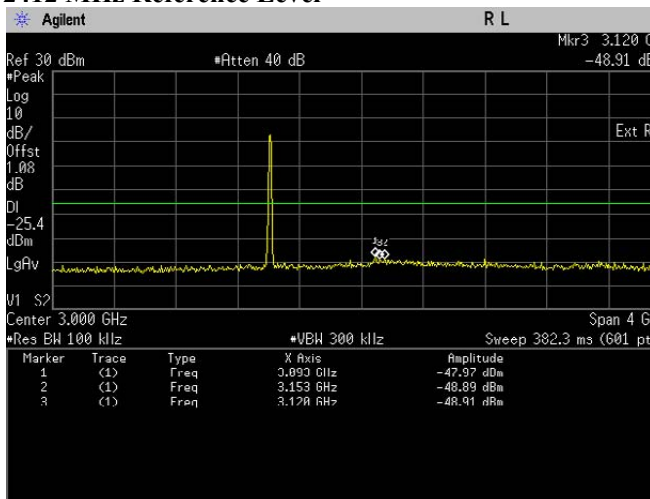
#### 802.11b

| Test Conditions |                 |                       |                  | Test Frequency | Results     |             |        |
|-----------------|-----------------|-----------------------|------------------|----------------|-------------|-------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | Spurs (MHz) | Level (dBm) | Status |
| 802.11b         | DSSS            | DBPSK                 | 1                | 2412           | 24942.00    | -40.76      | Pass   |
|                 |                 |                       |                  |                | 24883.00    | -40.99      | Pass   |
|                 |                 |                       |                  |                | 24158.00    | -41.11      | Pass   |
| 802.11b         | DSSS            | DBPSK                 | 1                | 2437           | 23925.00    | -40.69      | Pass   |
|                 |                 |                       |                  |                | 24875.00    | -41.27      | Pass   |
|                 |                 |                       |                  |                | 24850.00    | -41.38      | Pass   |
| 802.11b         | DSSS            | DBPSK                 | 1                | 2462           | 24950.00    | -41.17      | Pass   |
|                 |                 |                       |                  |                | 24142.00    | -41.47      | Pass   |
|                 |                 |                       |                  |                | 24575.00    | -41.47      | Pass   |



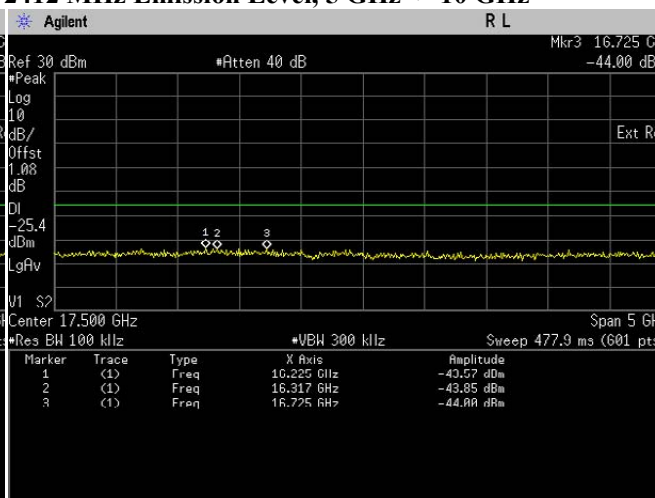
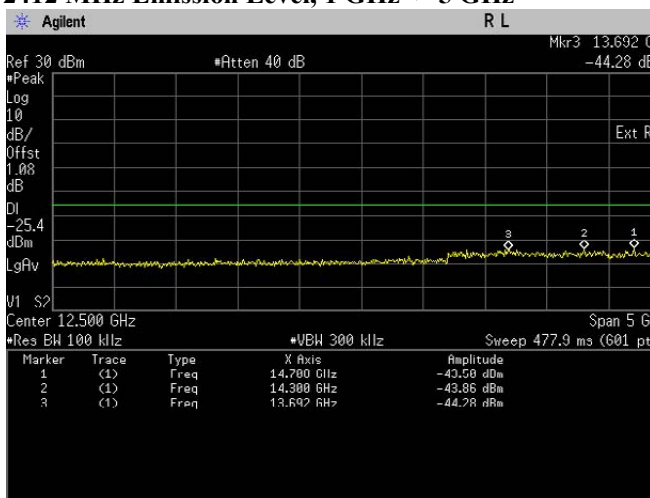
Conducted Emissions(Average). 802.11b, Frequency 2412 MHz Reference Level

Conducted Emissions(Average). 802.11b, Frequency 2412 MHz Emission Level, 30 MHz -> 1 GHz



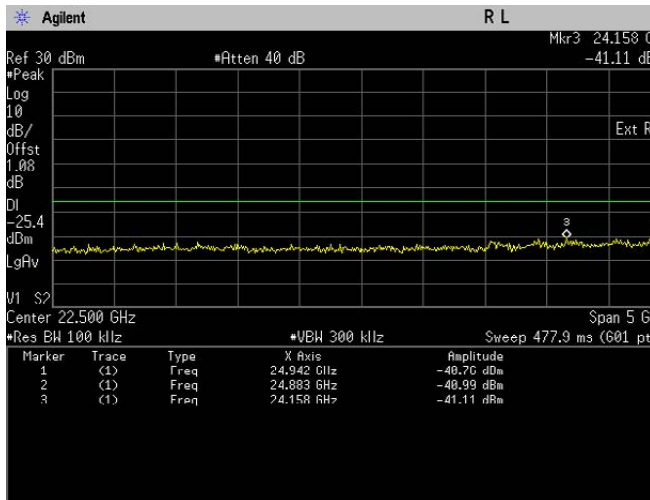
Conducted Emissions(Average). 802.11b, Frequency 2412 MHz Emission Level, 1 GHz -> 5 GHz

Conducted Emissions(Average). 802.11b, Frequency 2412 MHz Emission Level, 5 GHz -> 10 GHz

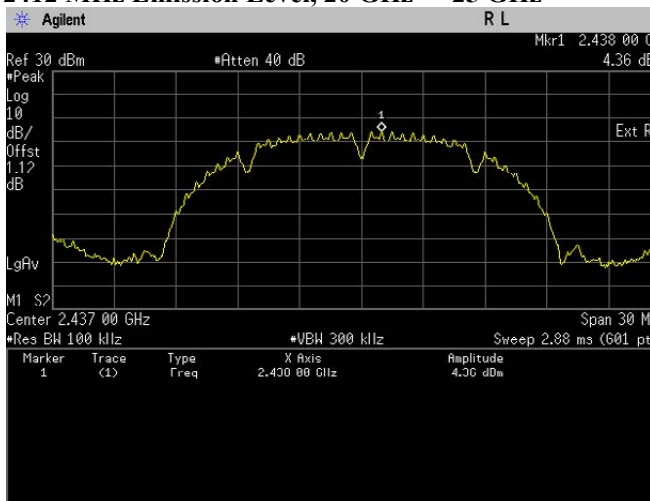


Conducted Emissions(Average). 802.11b, Frequency 2412 MHz Emission Level, 10 GHz -> 15 GHz

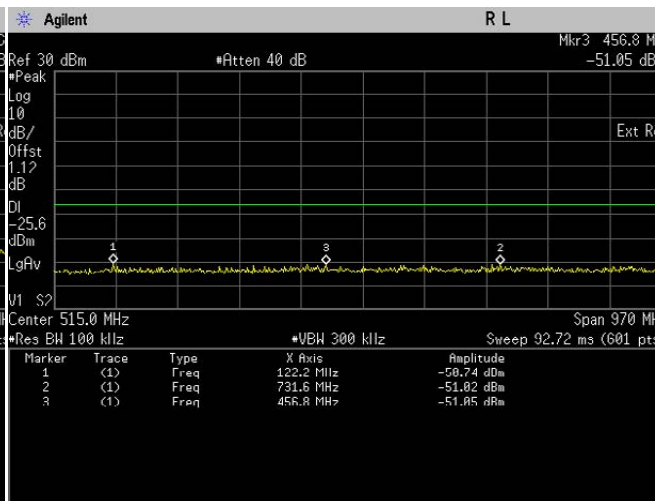
Conducted Emissions(Average). 802.11b, Frequency 2412 MHz Emission Level, 15 GHz -> 20 GHz



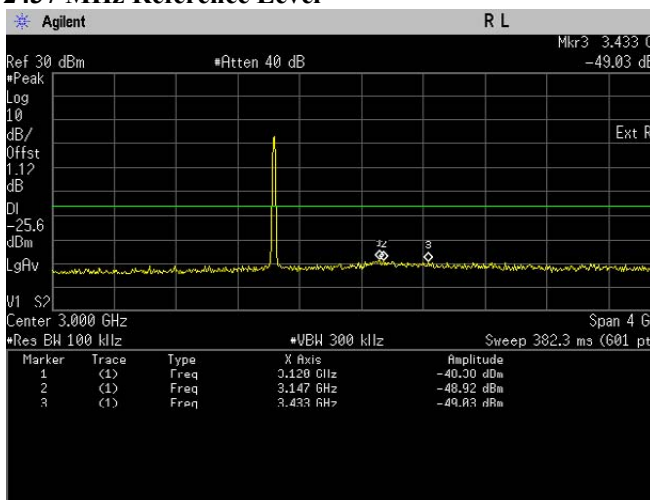
Conducted Emissions(Average). 802.11b, Frequency 2412 MHz Emission Level, 20 GHz -> 25 GHz



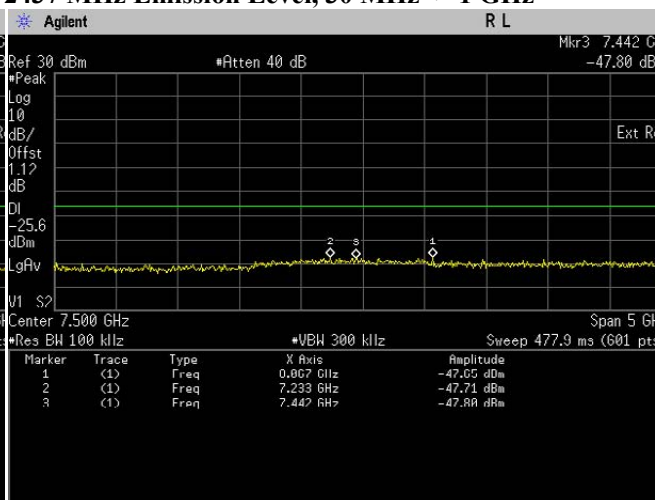
Conducted Emissions(Average). 802.11b, Frequency 2437 MHz Reference Level



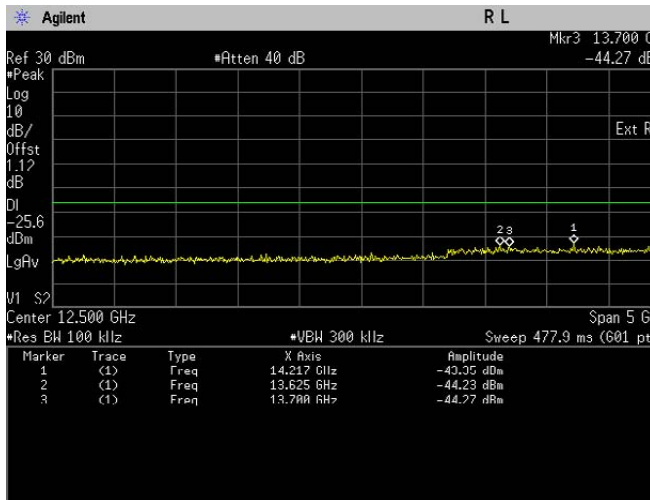
Conducted Emissions(Average). 802.11b, Frequency 2437 MHz Emission Level, 30 MHz -> 1 GHz



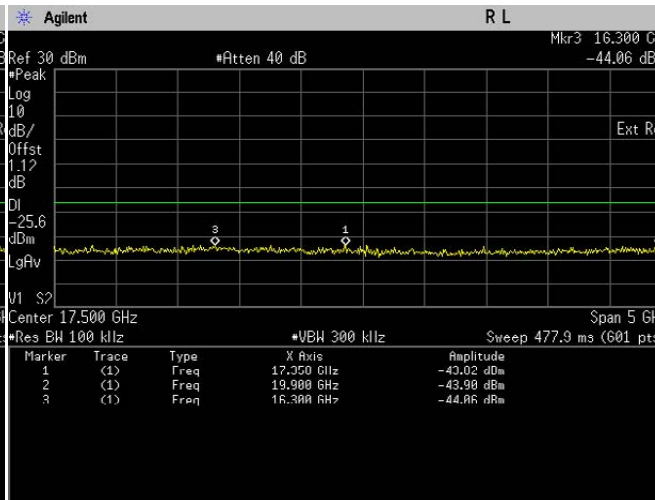
Conducted Emissions(Average). 802.11b, Frequency 2437 MHz Emission Level, 1 GHz -> 5 GHz



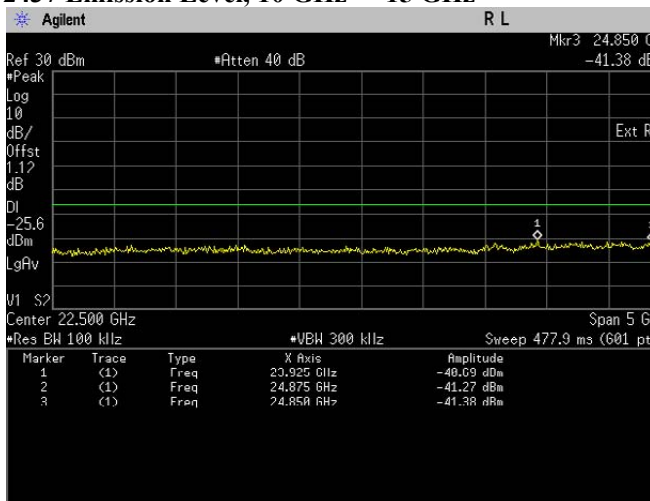
Conducted Emissions(Average). 802.11b, Frequency 2437 MHz Emission Level, 5 GHz -> 10 GHz



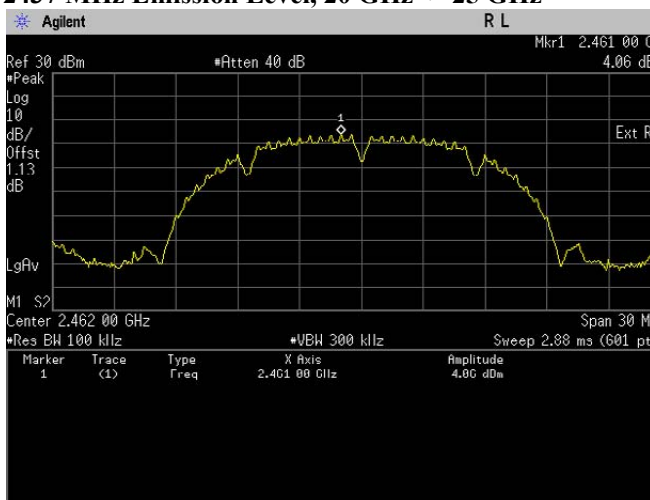
Conducted Emissions(Average). 802.11b, Frequency 2437 Emission Level, 10 GHz -> 15 GHz



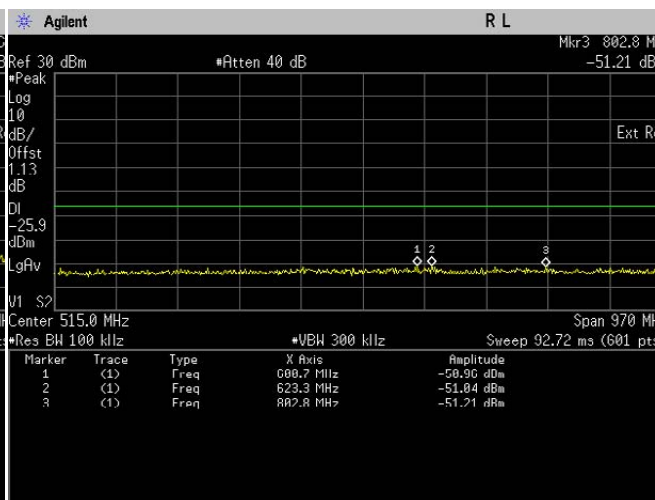
Conducted Emissions(Average). 802.11b, Frequency 2437 MHz Emission Level, 15 GHz -> 20 GHz



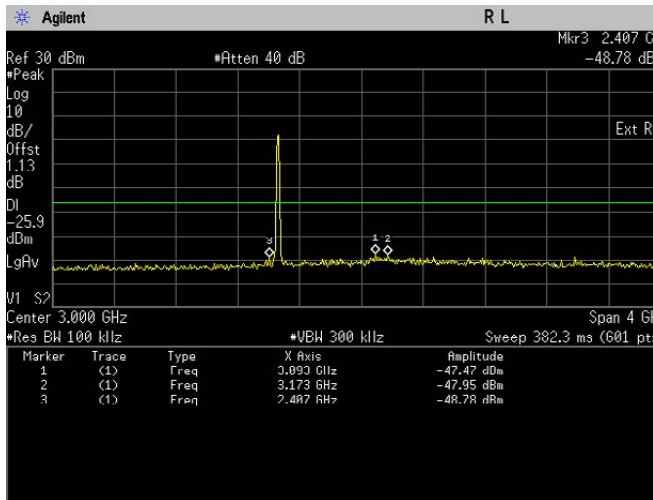
Conducted Emissions(Average). 802.11b, Frequency 2437 MHz Emission Level, 20 GHz -> 25 GHz



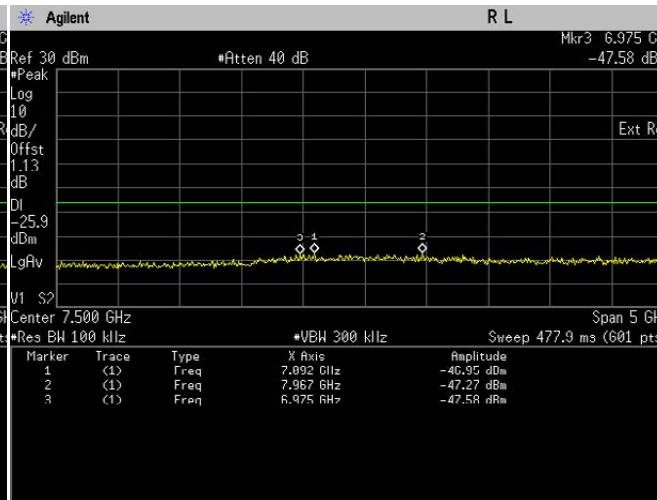
Conducted Emissions(Average). 802.11b, Frequency 2462 MHz Reference Level



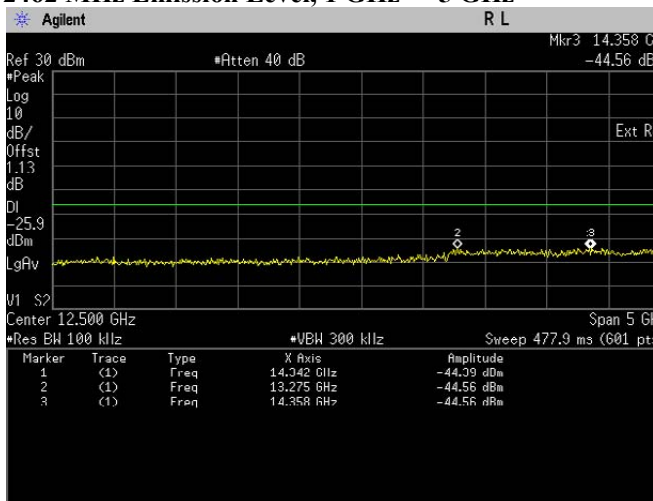
Conducted Emissions(Average). 802.11b, Frequency 2462 MHz Emission Level, 30 MHz -> 1 GHz



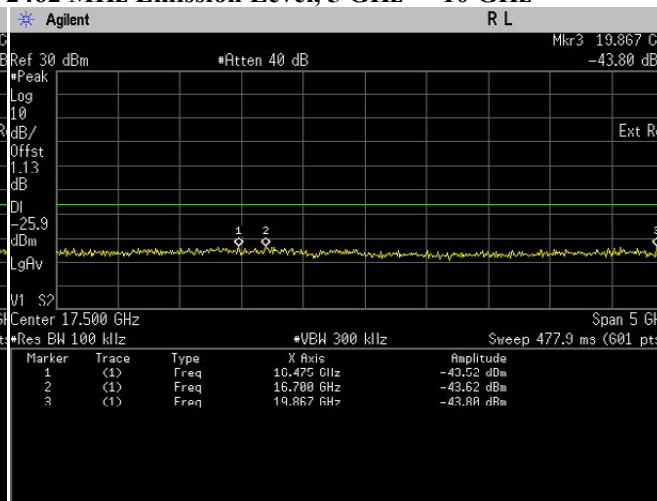
Conducted Emissions(Average). 802.11b, Frequency 2462 MHz Emission Level, 1 GHz -> 5 GHz



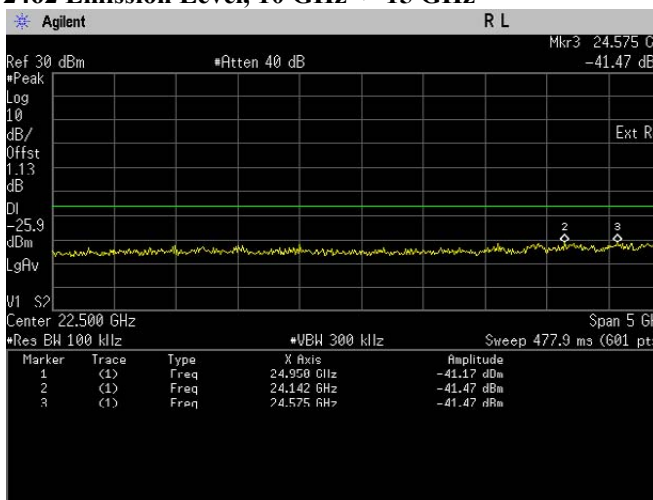
Conducted Emissions(Average). 802.11b, Frequency 2462 MHz Emission Level, 5 GHz -> 10 GHz



Conducted Emissions(Average). 802.11b, Frequency 2462 MHz Emission Level, 10 GHz -> 15 GHz



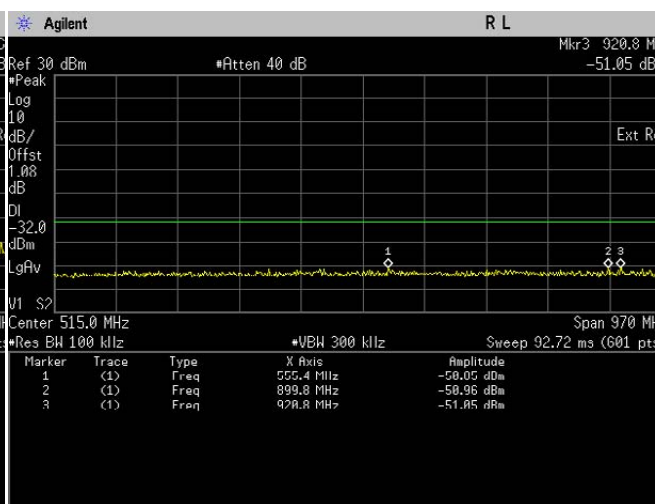
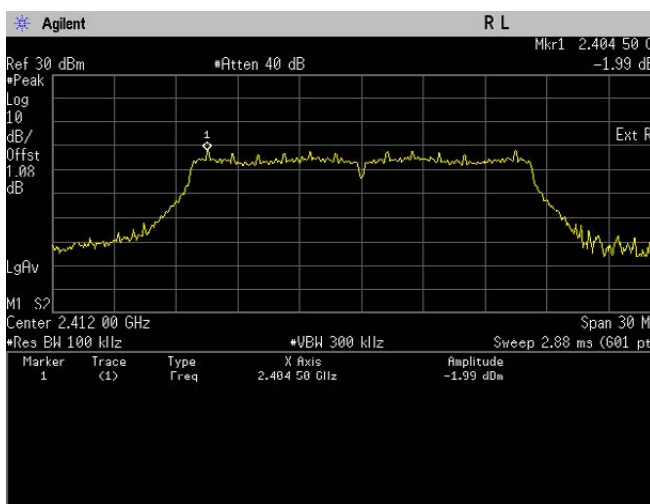
Conducted Emissions(Average). 802.11b, Frequency 2462 MHz Emission Level, 15 GHz -> 20 GHz



Conducted Emissions(Average). 802.11b, Frequency 2462 MHz Emission Level, 20 GHz -> 25 GHz

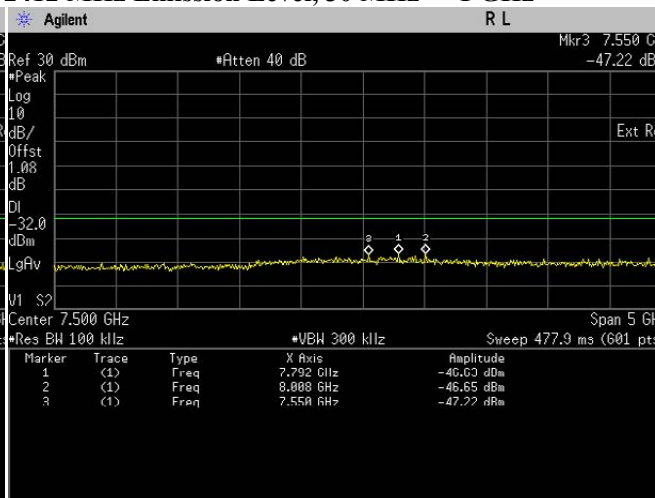
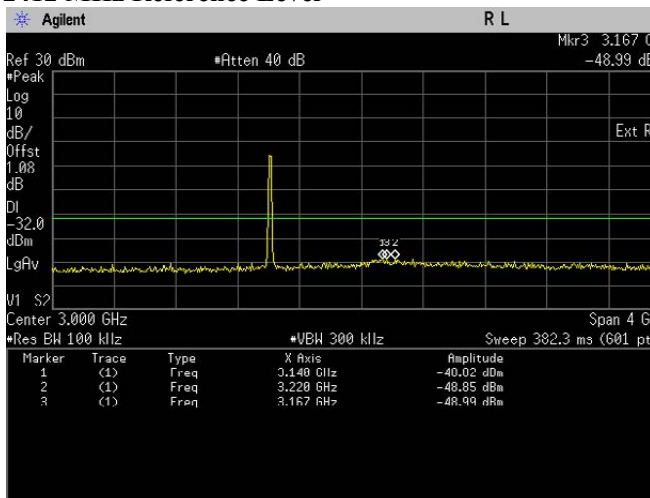
## 802.11g

| Test Conditions |                 |                       |                  | Test Frequency | Results     |             |        |
|-----------------|-----------------|-----------------------|------------------|----------------|-------------|-------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | Spurs (MHz) | Level (dBm) | Status |
| 802.11g         | OFDM            | BPSK                  | 6                | 2412           | 24892.00    | -41.19      | Pass   |
|                 |                 |                       |                  |                | 24833.00    | -41.43      | Pass   |
|                 |                 |                       |                  |                | 24958.00    | -41.51      | Pass   |
| 802.11g         | OFDM            | BPSK                  | 6                | 2437           | 24600.00    | -41.25      | Pass   |
|                 |                 |                       |                  |                | 24942.00    | -41.37      | Pass   |
|                 |                 |                       |                  |                | 24558.00    | -41.68      | Pass   |
| 802.11g         | OFDM            | BPSK                  | 6                | 2462           | 24242.00    | -40.19      | Pass   |
|                 |                 |                       |                  |                | 24650.00    | -40.74      | Pass   |
|                 |                 |                       |                  |                | 24308.00    | -41.04      | Pass   |



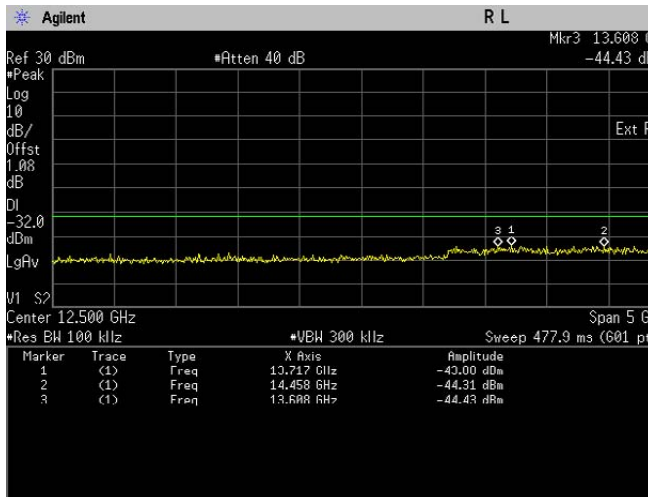
Conducted Emissions(Average). 802.11g, Frequency 2412 MHz Reference Level

Conducted Emissions(Average). 802.11g, Frequency 2412 MHz Emission Level, 30 MHz -> 1 GHz

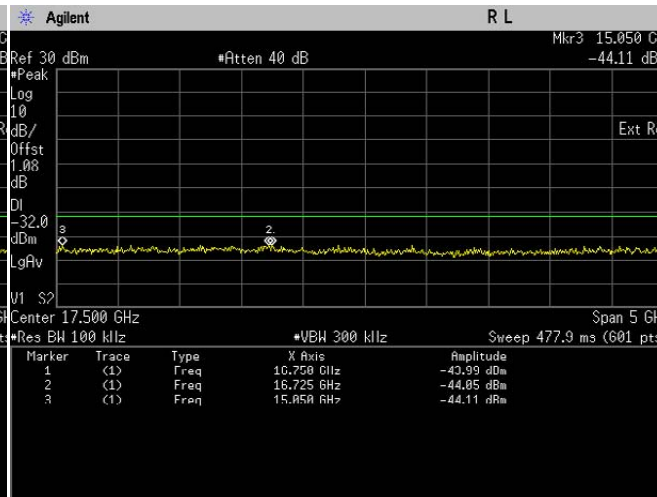


Conducted Emissions(Average). 802.11g, Frequency 2412 MHz Emission Level, 1 GHz -> 5 GHz

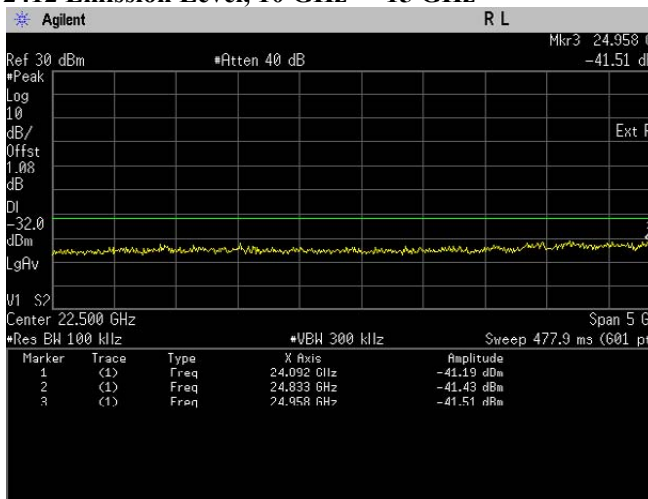
Conducted Emissions(Average). 802.11g, Frequency 2412 MHz Emission Level, 5 GHz -> 10 GHz



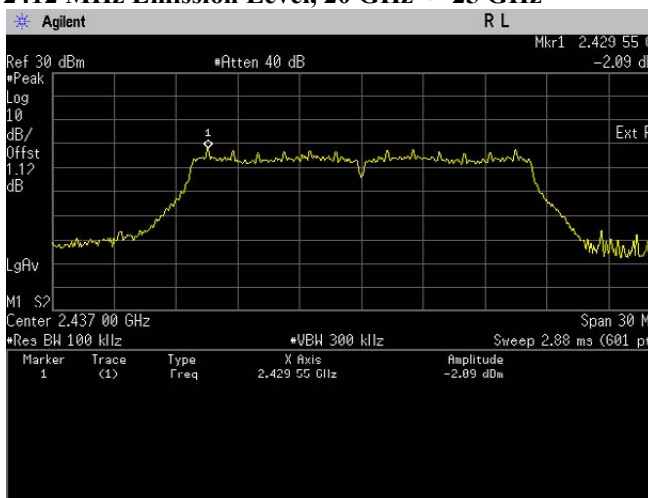
Conducted Emissions(Average). 802.11g, Frequency 2412 Emission Level, 10 GHz -> 15 GHz



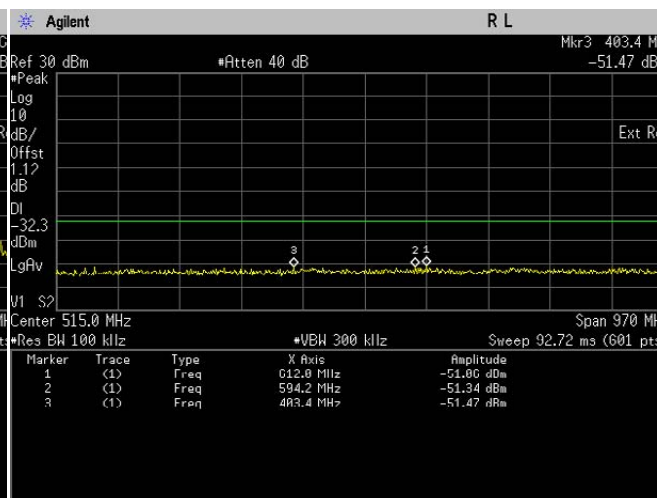
Conducted Emissions(Average). 802.11g, Frequency 2412 MHz Emission Level, 15 GHz -> 20 GHz



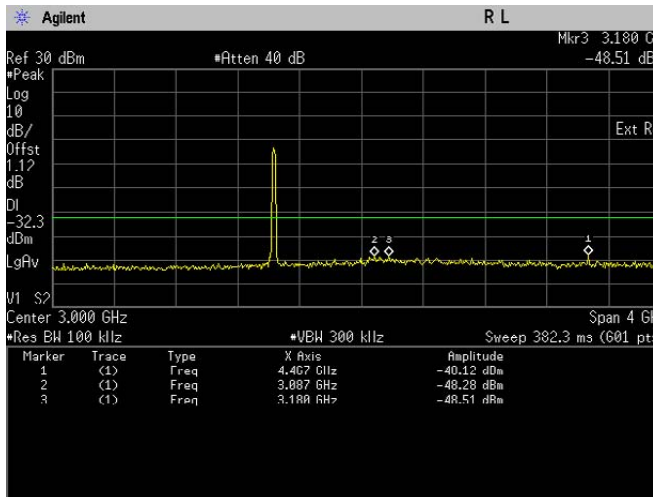
Conducted Emissions(Average). 802.11g, Frequency 2412 MHz Emission Level, 20 GHz -> 25 GHz



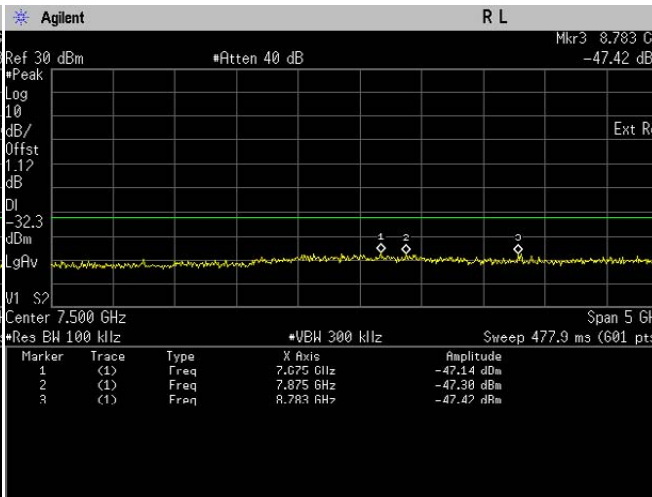
Conducted Emissions(Average). 802.11g, Frequency 2437 MHz Reference Level



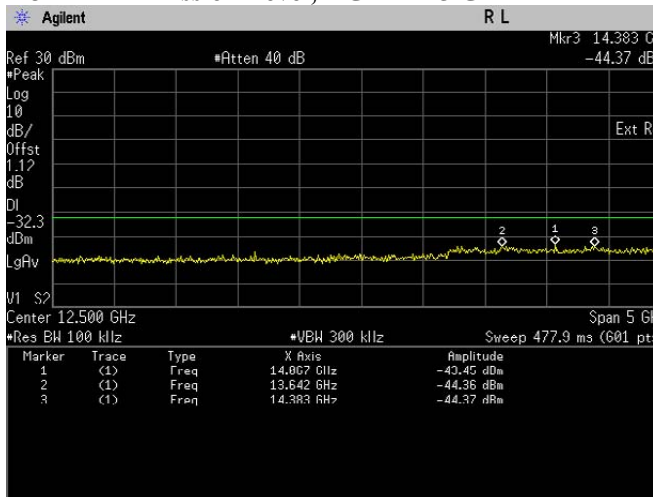
Conducted Emissions(Average). 802.11g, Frequency 2437 MHz Emission Level, 30 MHz -> 1 GHz



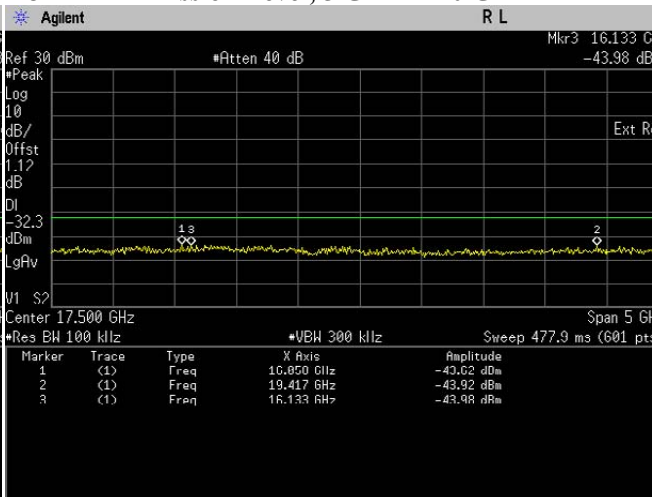
Conducted Emissions(Average). 802.11g, Frequency 2437 MHz Emission Level, 1 GHz -> 5 GHz



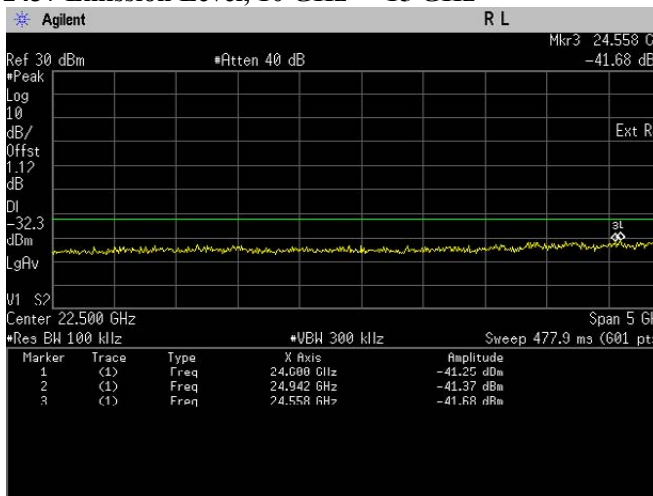
Conducted Emissions(Average). 802.11g, Frequency 2437 MHz Emission Level, 5 GHz -> 10 GHz



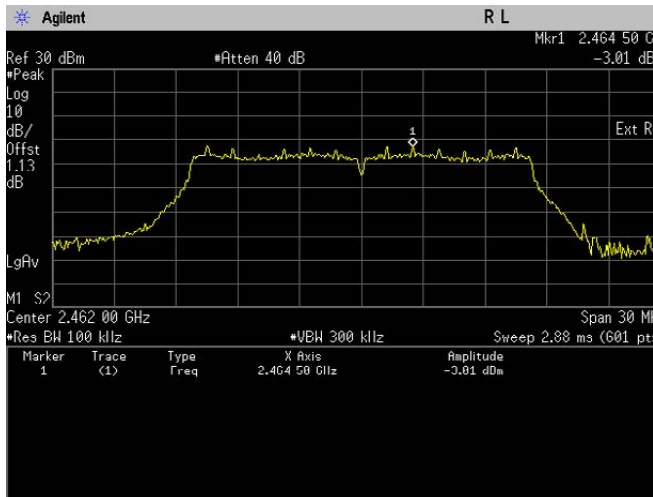
Conducted Emissions(Average). 802.11g, Frequency 2437 MHz Emission Level, 10 GHz -> 15 GHz



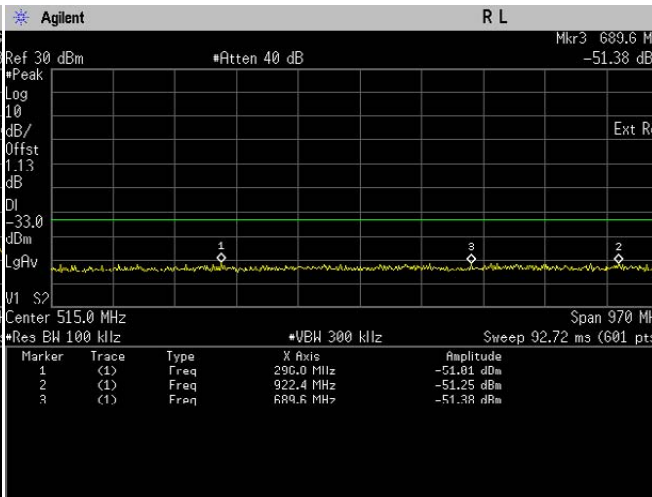
Conducted Emissions(Average). 802.11g, Frequency 2437 MHz Emission Level, 15 GHz -> 20 GHz



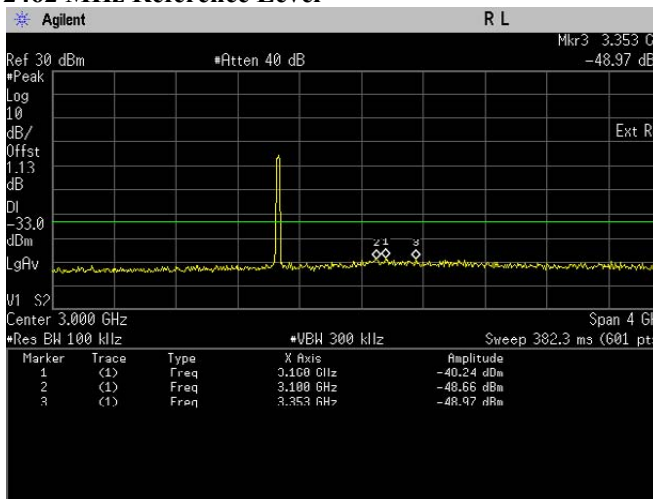
Conducted Emissions(Average). 802.11g, Frequency 2437 MHz Emission Level, 20 GHz -> 25 GHz



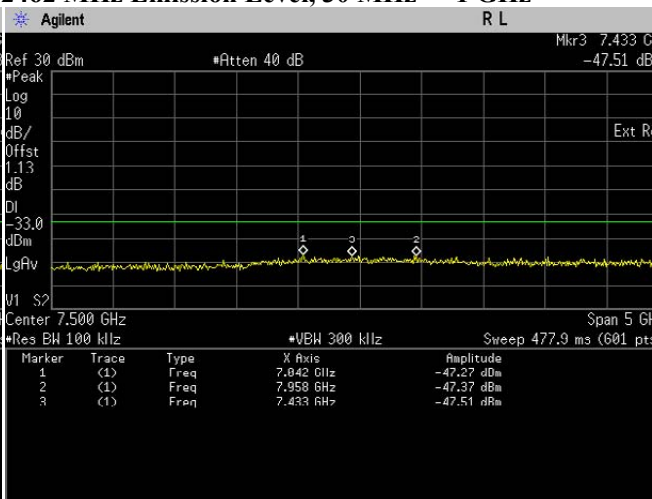
Conducted Emissions(Average). 802.11g, Frequency 2462 MHz Reference Level



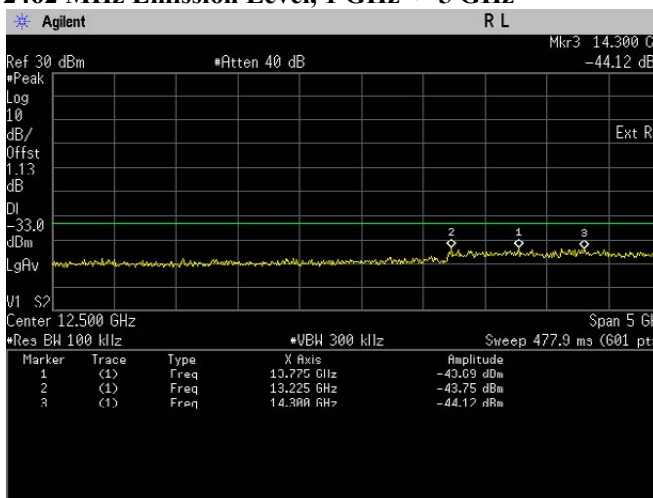
Conducted Emissions(Average). 802.11g, Frequency 2462 MHz Emission Level, 30 MHz -> 1 GHz



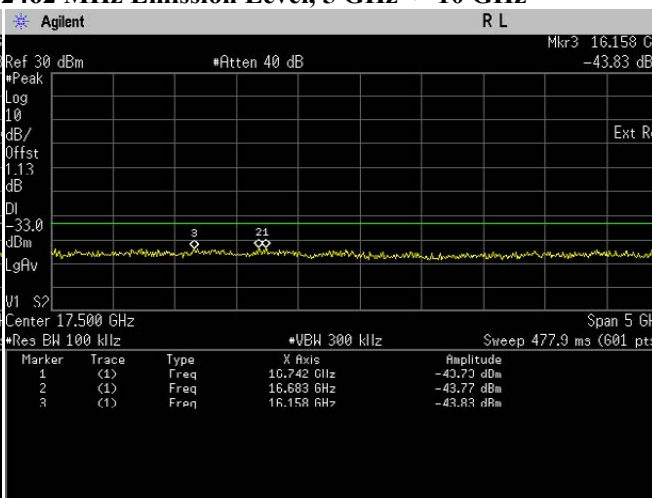
Conducted Emissions(Average). 802.11g, Frequency 2462 MHz Emission Level, 1 GHz -> 5 GHz



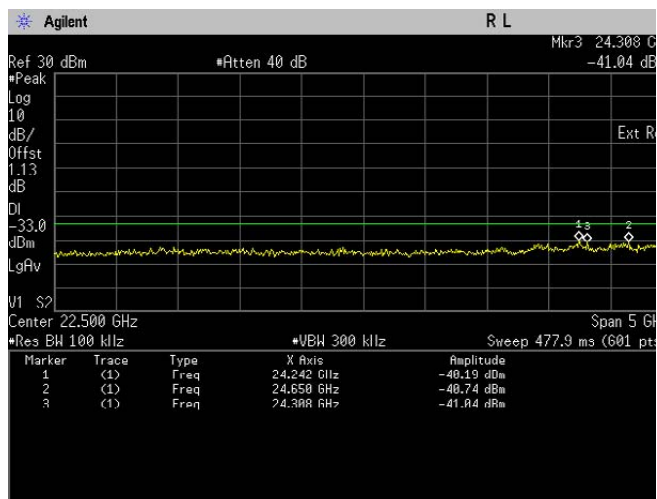
Conducted Emissions(Average). 802.11g, Frequency 2462 MHz Emission Level, 5 GHz -> 10 GHz



Conducted Emissions(Average). 802.11g, Frequency 2462 MHz Emission Level, 10 GHz -> 15 GHz



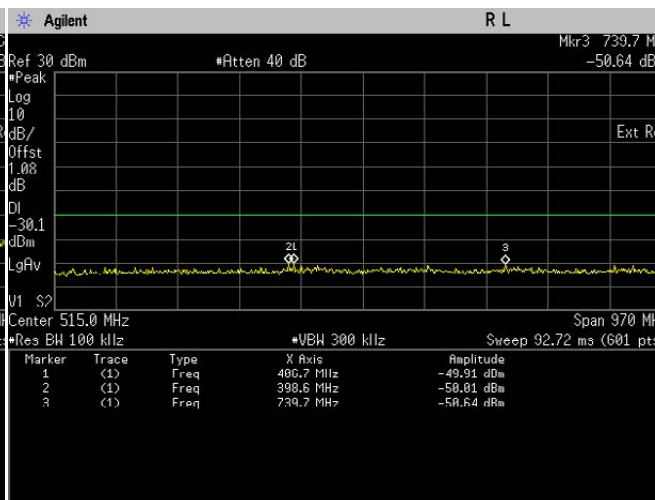
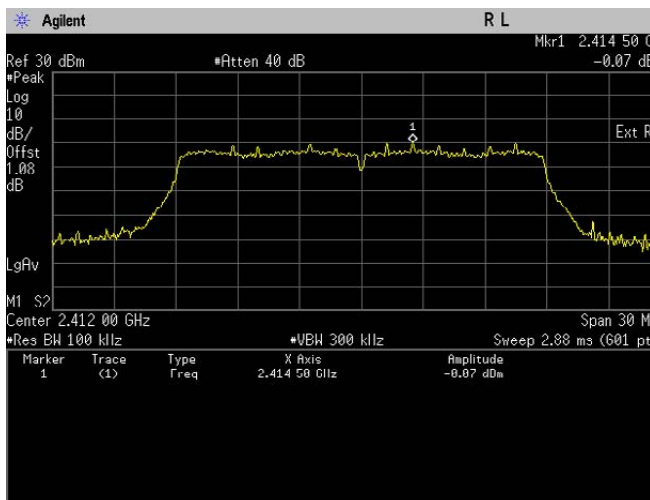
Conducted Emissions(Average). 802.11g, Frequency 2462 MHz Emission Level, 15 GHz -> 20 GHz



Conducted Emissions(Average). 802.11g, Frequency  
2462 MHz Emission Level, 20 GHz -> 25 GHz

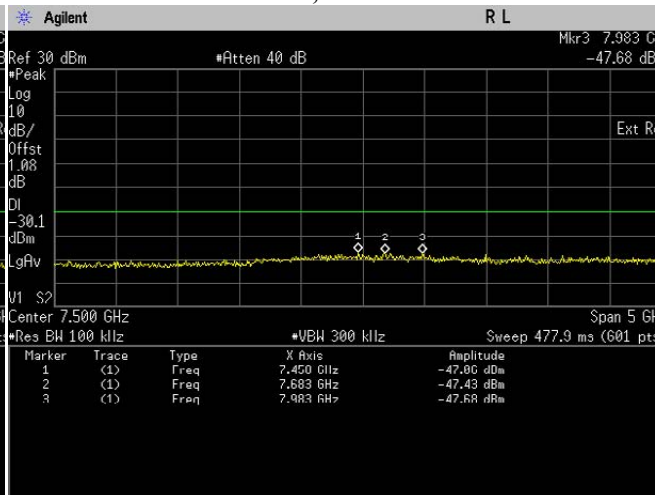
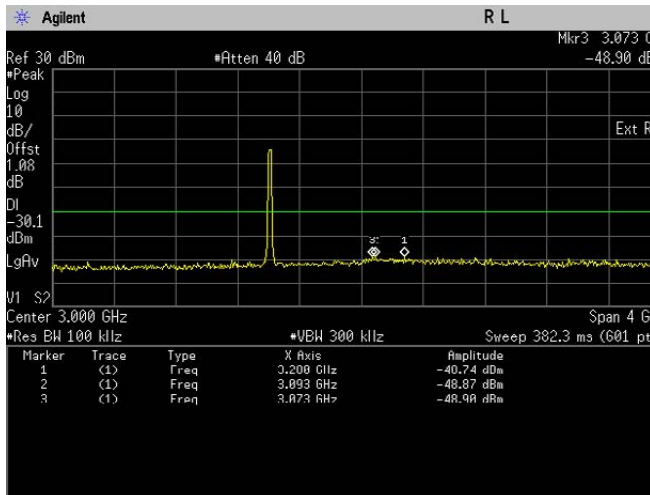
### 802.11n (HT20)

| Test Conditions |                 |                       |                  | Test Frequency | Results     |             |        |
|-----------------|-----------------|-----------------------|------------------|----------------|-------------|-------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | Spurs (MHz) | Level (dBm) | Status |
| 802.11n         | OFDM            | DBPSK                 | 6.5              | 2412           | 24908.00    | -40.78      | Pass   |
|                 |                 |                       |                  |                | 24792.00    | -41.08      | Pass   |
|                 |                 |                       |                  |                | 24925.00    | -41.23      | Pass   |
| 802.11n         | OFDM            | DBPSK                 | 6.5              | 2437           | 24217.00    | -40.75      | Pass   |
|                 |                 |                       |                  |                | 24850.00    | -41.15      | Pass   |
|                 |                 |                       |                  |                | 24583.00    | -41.17      | Pass   |
| 802.11n         | OFDM            | DBPSK                 | 6.5              | 2462           | 24892.00    | -39.88      | Pass   |
|                 |                 |                       |                  |                | 24208.00    | -40.80      | Pass   |
|                 |                 |                       |                  |                | 24183.00    | -40.95      | Pass   |



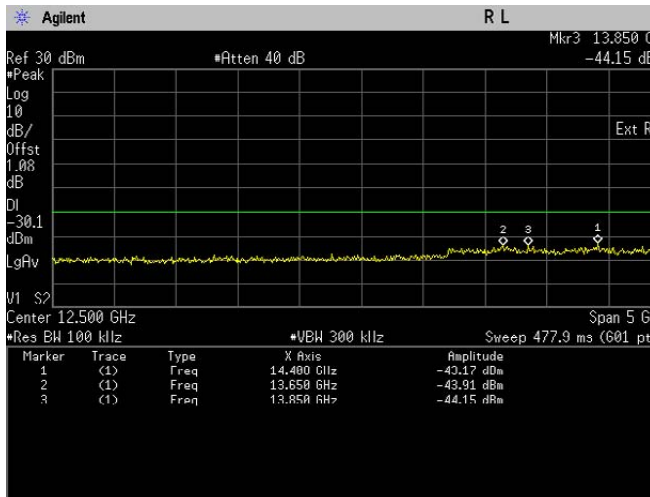
Conducted Emissions(Average). 802.11n, Frequency 2412 MHz Reference Level

Conducted Emissions(Average). 802.11n, Frequency 2412 MHz Emission Level, 30 MHz -> 1 GHz

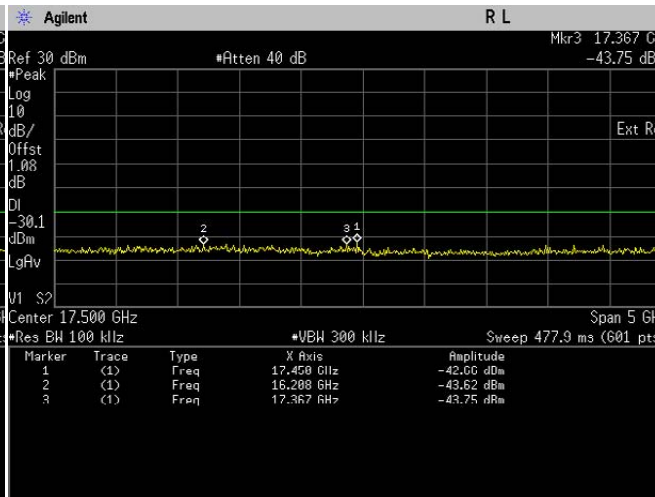


Conducted Emissions(Average). 802.11n, Frequency 2412 MHz Emission Level, 1 GHz -> 5 GHz

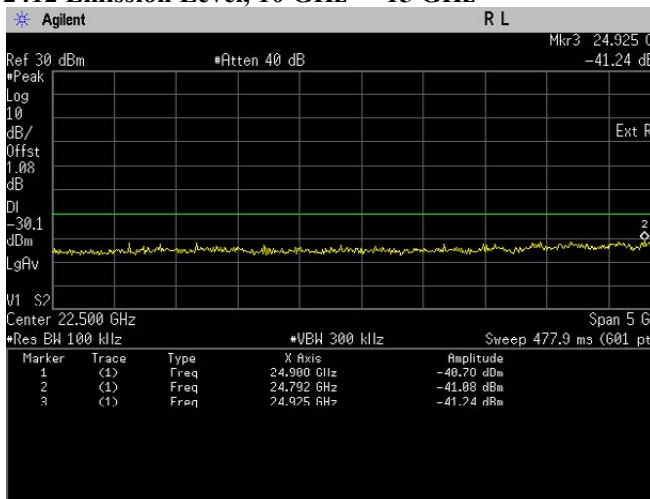
Conducted Emissions(Average). 802.11n, Frequency 2412 MHz Emission Level, 5 GHz -> 10 GHz



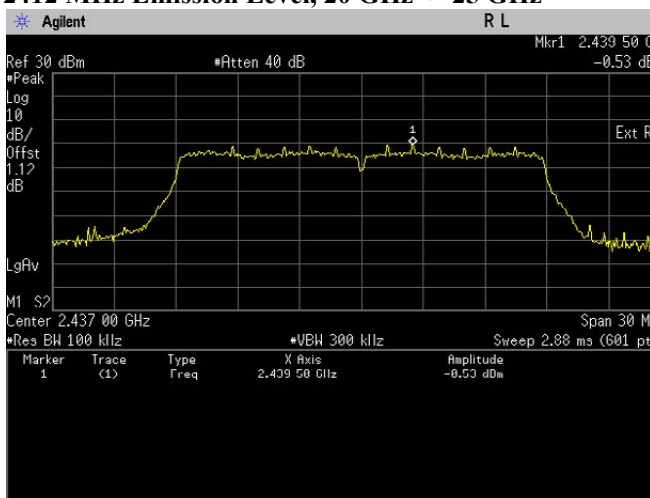
Conducted Emissions(Average). 802.11n, Frequency 2412 Emission Level, 10 GHz -> 15 GHz



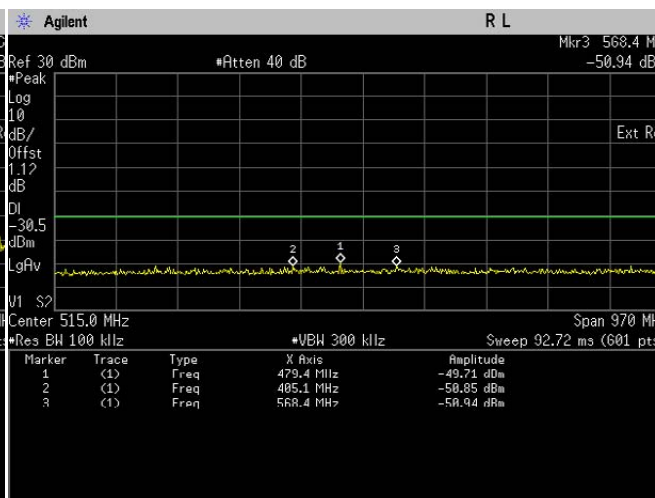
Conducted Emissions(Average). 802.11n, Frequency 2412 MHz Emission Level, 15 GHz -> 20 GHz



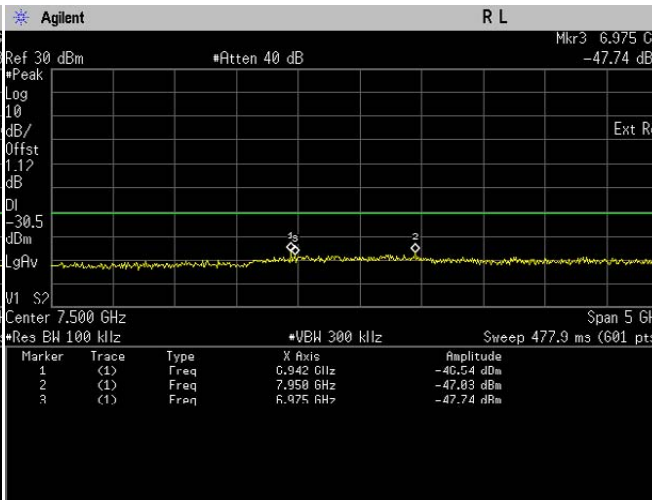
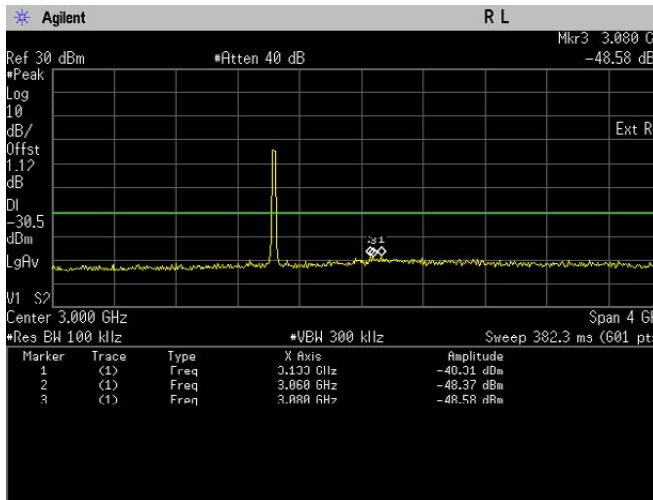
Conducted Emissions(Average). 802.11n, Frequency 2412 MHz Emission Level, 20 GHz -> 25 GHz



Conducted Emissions(Average). 802.11n, Frequency 2437 MHz Reference Level

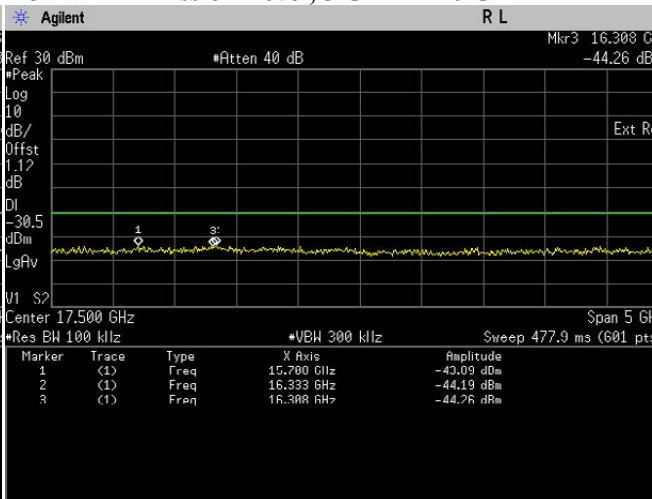
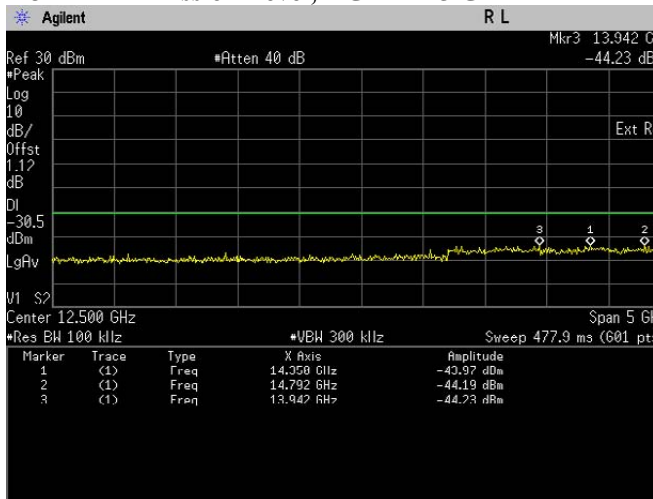


Conducted Emissions(Average). 802.11n, Frequency 2437 MHz Emission Level, 30 MHz -> 1 GHz



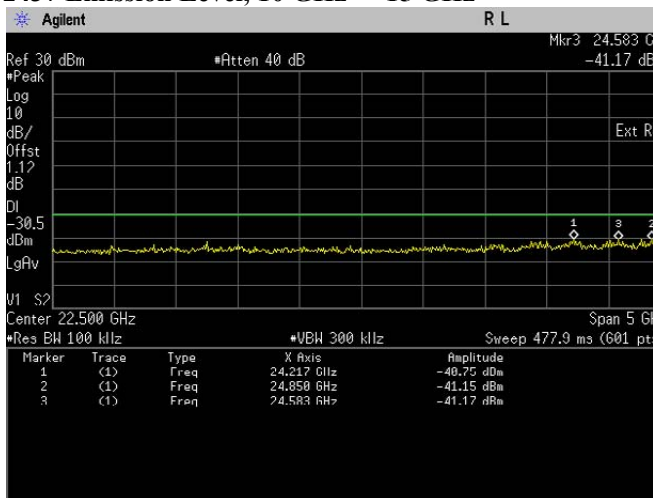
Conducted Emissions(Average). 802.11n, Frequency 2437 MHz Emission Level, 1 GHz -> 5 GHz

Conducted Emissions(Average). 802.11n, Frequency 2437 MHz Emission Level, 5 GHz -> 10 GHz

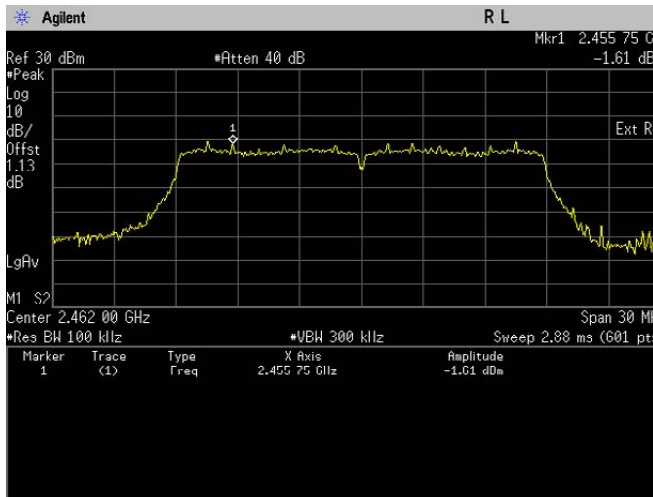


Conducted Emissions(Average). 802.11n, Frequency 2437 MHz Emission Level, 10 GHz -> 15 GHz

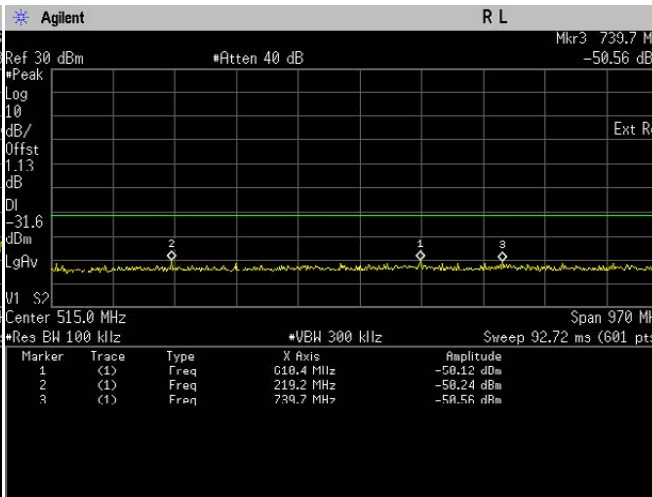
Conducted Emissions(Average). 802.11n, Frequency 2437 MHz Emission Level, 15 GHz -> 20 GHz



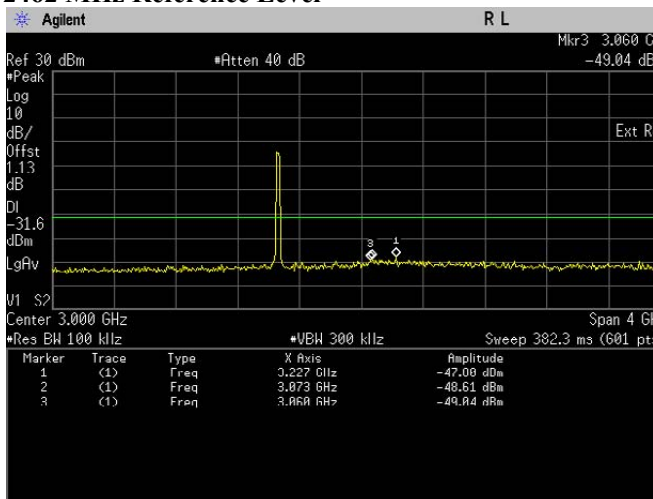
Conducted Emissions(Average). 802.11n, Frequency 2437 MHz Emission Level, 20 GHz -> 25 GHz



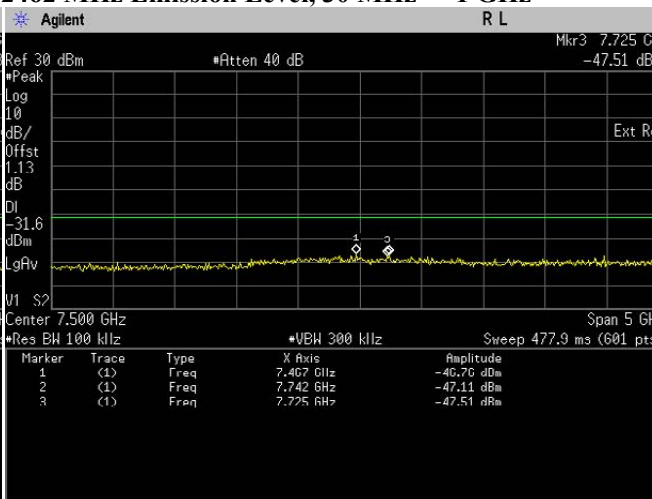
Conducted Emissions(Average). 802.11n, Frequency 2462 MHz Reference Level



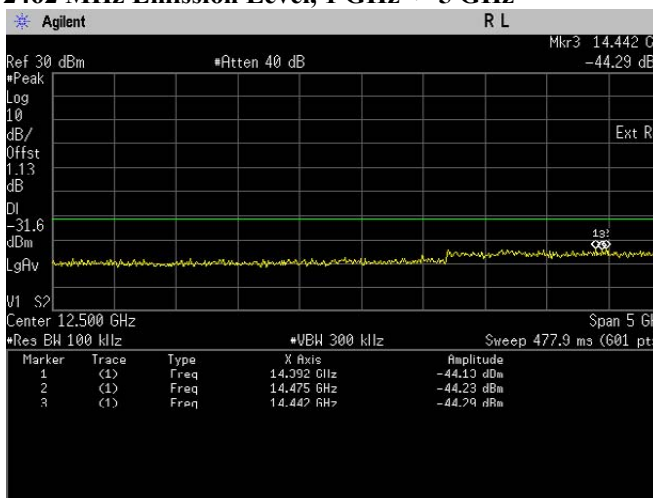
Conducted Emissions(Average). 802.11n, Frequency 2462 MHz Emission Level, 30 MHz -> 1 GHz



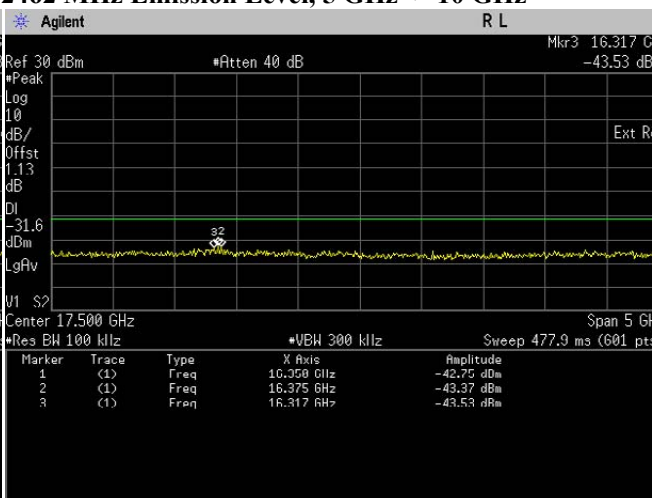
Conducted Emissions(Average). 802.11n, Frequency 2462 MHz Emission Level, 1 GHz -> 5 GHz



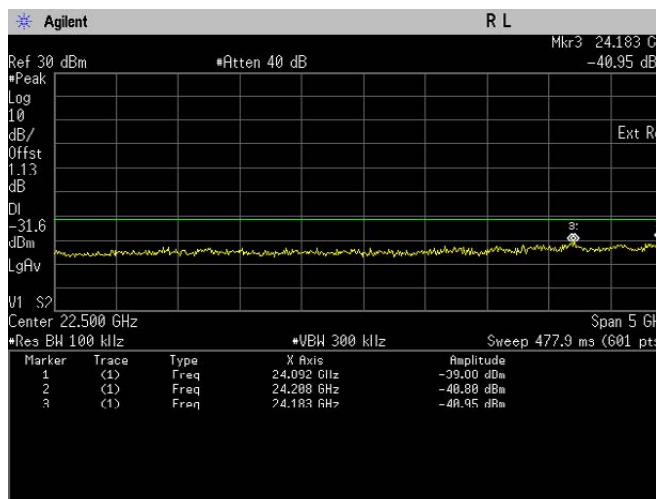
Conducted Emissions(Average). 802.11n, Frequency 2462 MHz Emission Level, 5 GHz -> 10 GHz



Conducted Emissions(Average). 802.11n, Frequency 2462 MHz Emission Level, 10 GHz -> 15 GHz



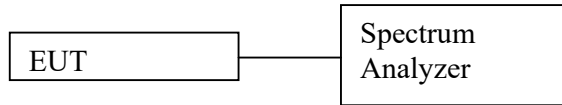
Conducted Emissions(Average). 802.11n, Frequency 2462 MHz Emission Level, 15 GHz -> 20 GHz



Conducted Emissions(Average). 802.11n, Frequency  
2462 MHz Emission Level, 20 GHz -> 25 GHz

## 6.6. Band edge Conducted Spurious Emission

### 6.6.1. Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the DUT and set DUT to transmit maximum power.
- c) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
  - a. RBW = 100 kHz
  - b. VBW = 300 kHz
  - c. Detector mode = Peak
  - d. Trace = Max Hold
  - e. Sweep = auto
- e) Use the peak marker function to measure highest emission.
- f) Measure every antenna port by repeat the step above for MIMO measurement.

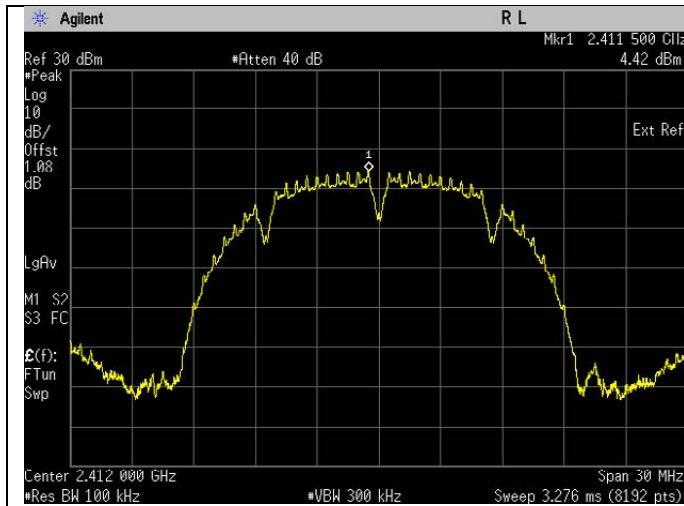
### 6.6.2. Test Limits:

|                                                        |
|--------------------------------------------------------|
| <b>Normal Condition (25 ° C)</b>                       |
| <b>Shall be at least 30 dB below peak (max) power.</b> |

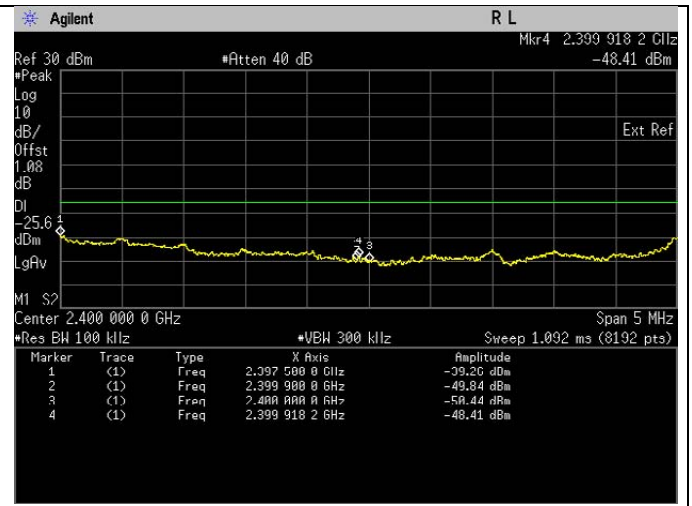
### 6.6.3. Test Result

#### **802.11b**

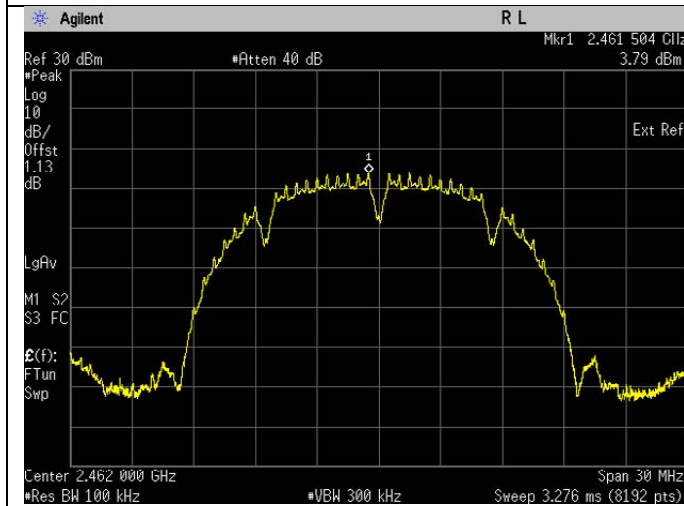
| Test Conditions |                 |                       |                  | Test Frequency | Results           |             |        |
|-----------------|-----------------|-----------------------|------------------|----------------|-------------------|-------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | Frequencies (MHz) | Power (dBm) | Status |
| 802.11b         | DSSS            | DBPSK                 | 1                | 2412           | 2399.92           | -48.41      | Pass   |
| 802.11b         | DSSS            | DBPSK                 | 1                | 2462           | 2483.50           | -48.82      | Pass   |



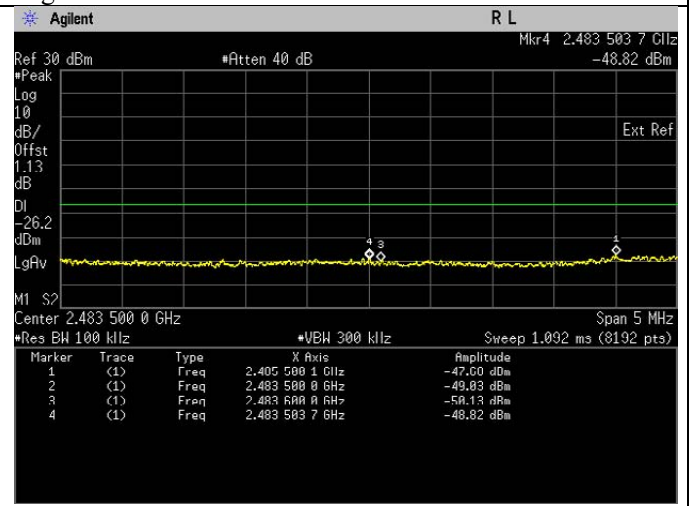
Band Edge(Average). 802.11b Frequency 2412 MHz  
 Reference Level



Band Edge(Average). 802.11b Frequency 2412 MHz Band  
 Edge



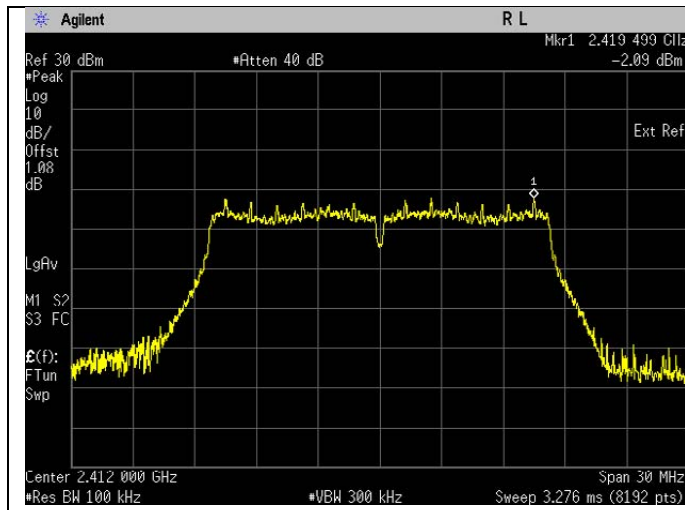
Band Edge(Average). 802.11b Frequency 2462 MHz  
 Reference Level



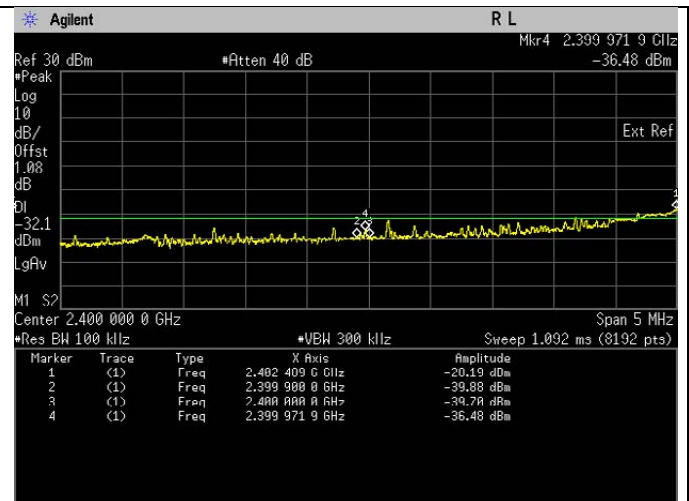
Band Edge(Average). 802.11b Frequency 2462 MHz Band  
 Edge

## 802.11g

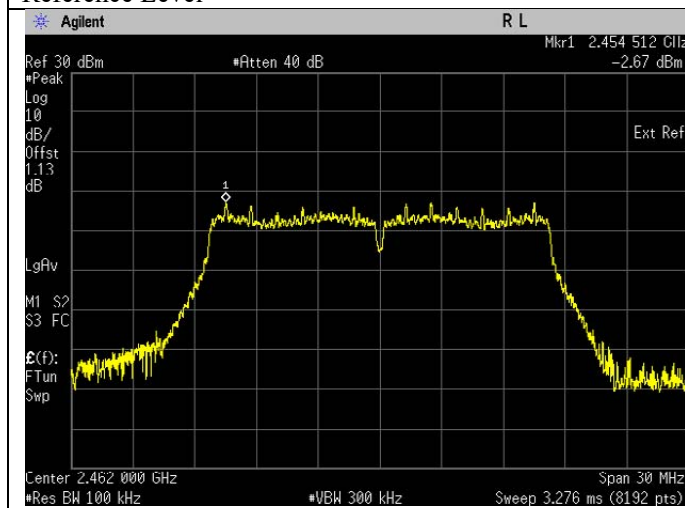
| Test Conditions |                 |                       |                  | Test Frequency | Results           |             |        |
|-----------------|-----------------|-----------------------|------------------|----------------|-------------------|-------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | Frequencies (MHz) | Power (dBm) | Status |
| 802.11g         | OFDM            | BPSK                  | 6                | 2412           | 2399.97           | -36.48      | Pass   |
| 802.11g         | OFDM            | BPSK                  | 6                | 2462           | 2483.52           | -47.56      | Pass   |



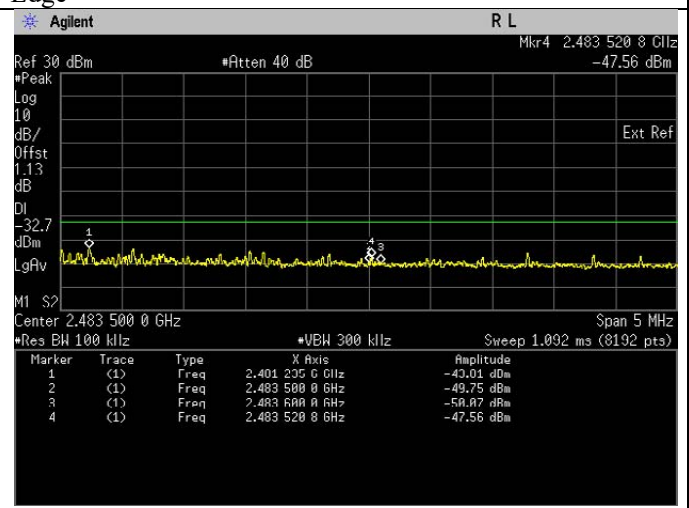
Band Edge(Average). 802.11g Frequency 2412 MHz  
 Reference Level



Band Edge(Average). 802.11g Frequency 2412 MHz Band  
 Edge



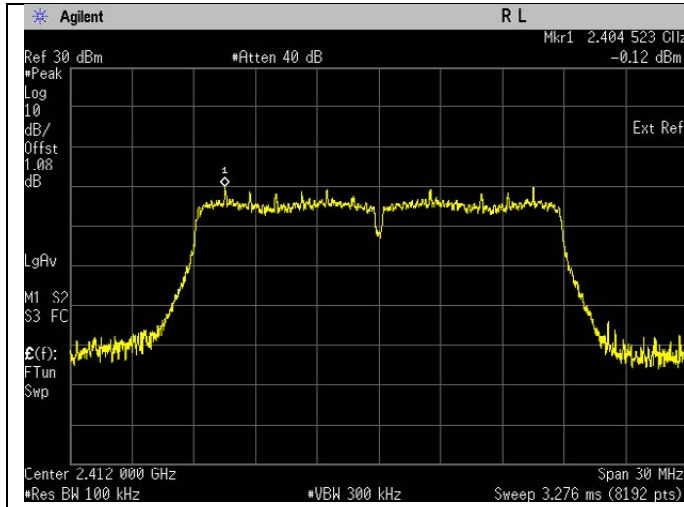
Band Edge(Average). 802.11g Frequency 2462 MHz  
 Reference Level



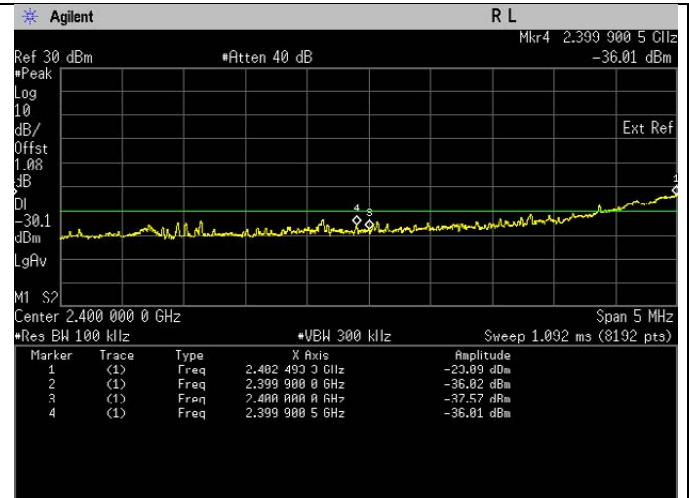
Band Edge(Average). 802.11g Frequency 2462 MHz Band  
 Edge

## 802.11n (HT20)

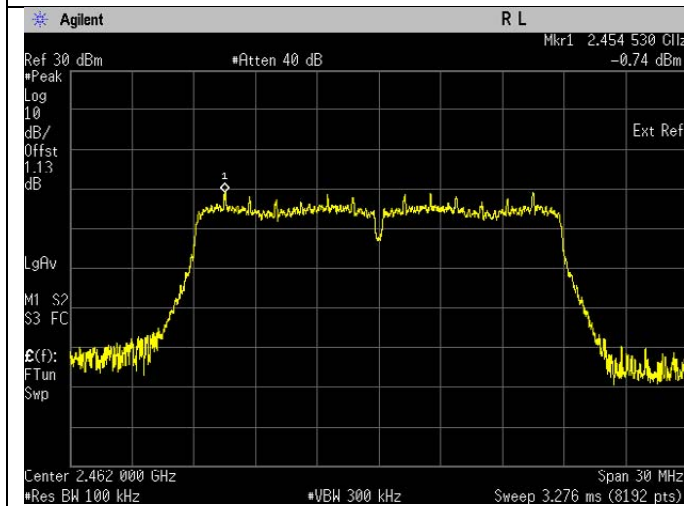
| Test Conditions |                 |                       |                  | Test Frequency | Results           |             |        |
|-----------------|-----------------|-----------------------|------------------|----------------|-------------------|-------------|--------|
| Standard        | Modulation Type | Modulation Technology | Data Rate (mbps) | Tx (MHz)       | Frequencies (MHz) | Power (dBm) | Status |
| 802.11n         | OFDM            | DBPSK                 | 6.5              | 2412           | 2399.90           | -36.02      | Pass   |
| 802.11n         | OFDM            | DBPSK                 | 6.5              | 2462           | 2483.50           | -47.66      | Pass   |



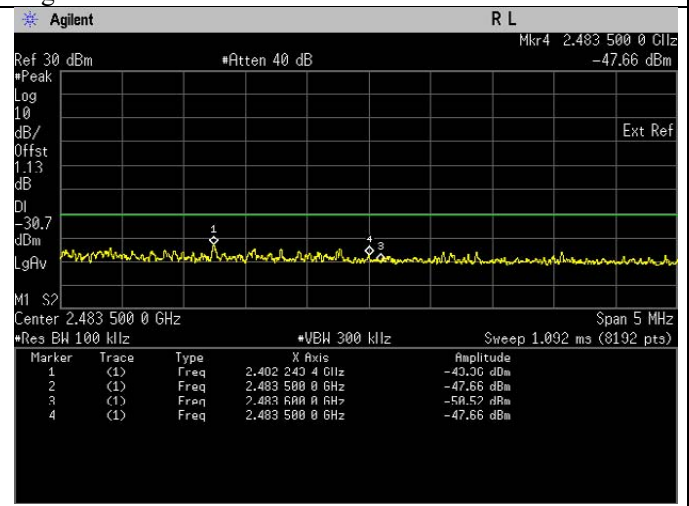
Band Edge(Average). 802.11n Frequency 2412 MHz  
Reference Level



Band Edge(Average). 802.11n Frequency 2412 MHz Band  
Edge



Band Edge(Average). 802.11n Frequency 2462 MHz  
Reference Level



Band Edge(Average). 802.11n Frequency 2462 MHz Band  
Edge