

# **Test Report**

FCC ID: 2ADOW-W1

Date of issue: Sep. 13, 2016

Sample Description: Wireless Upower

Model(s): MF-W1

Applicant: Hamedata Technology Co., Limited

Address: 1st Zone, 3F, Plant#1, Huahan Industrial Park, No.16, Jinniu

west Rd., Pingshan New District, Shenzhen 518118, China

Date of Test: Aug. 13,.2016 to Sep. 12,2016

Shenzhen Microtest Co., Ltd. http://www.mtitest.com

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| Test Result Certification |                                                                                                                      |  |  |  |
|---------------------------|----------------------------------------------------------------------------------------------------------------------|--|--|--|
|                           |                                                                                                                      |  |  |  |
| Applicant's name:         | Hamedata Technology Co., Limited                                                                                     |  |  |  |
| Address:                  | 1st Zone, 3F, Plant#1, Huahan Industrial Park, No.16, Jinniu west Rd., Pingshan New District, Shenzhen 518118, China |  |  |  |
| Manufacture's Name:       | Hamedata Technology Co., Limited                                                                                     |  |  |  |
| Address:                  | 1st Zone, 3F, Plant#1, Huahan Industrial Park, No.16, Jinniu west Rd., Pingshan New District, Shenzhen 518118, China |  |  |  |
|                           |                                                                                                                      |  |  |  |
| Product name:             | Wireless Upower                                                                                                      |  |  |  |
| Trademark:                | HAME                                                                                                                 |  |  |  |
| Model name:               | MF-W1                                                                                                                |  |  |  |
| Standards:                | FCC Part 15.247                                                                                                      |  |  |  |
| Test Procedure:           | ANSI C63.10-2013<br>558074 D01 DTS Meas Guidance v03r05                                                              |  |  |  |

This device described above has been tested by Shenzhen Toby Technology Co., Ltd. and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

| Tested by:   | David Chen |               |  |
|--------------|------------|---------------|--|
|              | David Chen | Sep. 13, 2016 |  |
| Reviewed by: | (en        | chan          |  |
|              | Leon Chen  | Sep. 13, 2016 |  |
| Approved by: |            | en liu.       |  |
|              | Ares Liu   | Sep. 13, 2016 |  |



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## **Summary of Test Result**

|      | T                            |                                  |        |
|------|------------------------------|----------------------------------|--------|
| Item | FCC Part No.                 | Description of Test              | Result |
| 1    | 15.203                       | Antenna requirement              | Pass   |
| 2    | 15.207                       | AC power line conducted emission | Pass   |
| 3    | 15.247(b)(3)                 | Maximum output power             | Pass   |
| 4    | 15.247(a)(2)                 | 6dB emission bandwidth           | Pass   |
| 5    | 15.247(e)                    | Power spectral density (PSD)     | Pass   |
| 8    | 15.247(d)                    | Band edge spurious emission      | Pass   |
| 9    | 15.247(d), 15.205,<br>15.209 | Radiated emission                | Pass   |



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## 1 General description

## 1.1 Feature of equipment under test (EUT)

| Product name:              | Wireless Upower                                                                |  |  |
|----------------------------|--------------------------------------------------------------------------------|--|--|
| Model name:                | MF-W1                                                                          |  |  |
| Operating frequency range: | Tx/Rx: 2412MHz~2462MHz for 802.11b/g/n20<br>Tx/Rx: 2422MHz~2452MHz for 802.n40 |  |  |
| WIFI feature:              | ⊠802.11b ⊠802.11g<br>⊠802.11n20 ⊠802.11n40                                     |  |  |
| Modulation type:           | DSSS, OFDM                                                                     |  |  |
| Antenna specification:     | PIFA antenna, the antenna gain is 2dBi                                         |  |  |

## 1.2 Operation channel list

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

#### 1.3 Test frequency channel

| Channel | 802.11b/g/n20 | 802.11n40 |  |
|---------|---------------|-----------|--|
| Low     | 2412MHz       | 2422MHz   |  |
| Middle  | 2437MHz       | 2437MHz   |  |
| High    | 2462MHz       | 2452MHz   |  |

#### 1.4 EUT operation mode

During testing, RF test program provided by the manufacture to control the Tx operation followed the test requirement. The EUT is configured to transmit continuously (duty cycle > 98 %) at the maximum power control level.

#### 1.5 Test conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 20°C~30°C

- Humidity: 30%~70%

- Atmospheric pressure: 98kPa~101kPa



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## 1.6 Testing site

| Test Site              | Shenzhen Toby Technology Co., Ltd.                                                                               |  |  |
|------------------------|------------------------------------------------------------------------------------------------------------------|--|--|
| Test Site Location     | 1 A/F., Bldg.6, Yusheng Industrial Zone The National Road No.107 Xixiang Section 467, Shenzhen, Guangdong, China |  |  |
| FCC Registration No.:  | 811562                                                                                                           |  |  |
| CNAS Registration No.: | CNAS L5813                                                                                                       |  |  |

## 1.7 Ancillary equipment list

| Equipment | Model                   | S/N | Manufacturer | Certificate type |
|-----------|-------------------------|-----|--------------|------------------|
| Adapter   | ADS-6MA-06<br>05050EPCU | /   | NEXGO        | FCC VOC          |

## 1.8 Measurement uncertainty

Measurement Uncertainty for a Level of Confidence of 95 %, U=2xUc(y)

| RF frequency                     | 1 x 10-7  |
|----------------------------------|-----------|
| RF power, conducted              | ± 1 dB    |
| Conducted emission(150kHz~30MHz) | ± 2.5 dB  |
| Radiated emission(30MHz~1GHz)    | ± 4.2 dB  |
| Radiated emission (above 1GHz)   | ± 4.3 dB  |
| Temperature                      | ±1 degree |
| Humidity                         | ±5%       |



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## 2 List of test equipment

For AC power line conducted emission:

| Equipment         | Manufacturer | Model      | Serial No. | Calibration Due |
|-------------------|--------------|------------|------------|-----------------|
| LISN              | R&S          | ENV216     | 101313     | 2016.12.06      |
| LISN              | SCHWARZBECK  | NNLK 8129  | 8129245    | 2016.12.25      |
| Pulse Limiter     | SCHWARZBECK  | VTSD 9561F | 9716       | 2016.12.25      |
| Test Cable        | N/A          | N/A        | C01        | 2016.12.06      |
| EMI Test Receiver | R&S          | ESCI       | 101160     | 2016.12.06      |

#### For Radiated emission:

| Equipment               | Manufacturer        | Model       | Serial No. | Calibration Due |
|-------------------------|---------------------|-------------|------------|-----------------|
| Log-Bicon Antenna       | MESS-ELEKTRO<br>NIK | VULB 9160   | 3058       | 2016.12.11      |
| Horn Antenna            | Schwarzbeck         | BBHA 9120D  | 631        | 2016.12.05      |
| Horn Antenna            | Schwarzbeck         | BBHA 9170   | 373        | 2016.12.05      |
| Test Cable              | United Microwave    | 57793       | 1m         | 2016.12.05      |
| Test Cable              | United Microwave    | A30A30-5006 | 10m        | 2016.12.05      |
| Microwave Pre_amplifier | Agilent             | 8449B       | 3008A01714 | 2016.12.05      |
| Pre-Amplifier           | Anritsu             | MH648A      | M09961     | 2016.12.05      |
| EMI Test Receiver       | R&S                 | ESPI-7      | 101318     | 2016.12.05      |
| Spctrum analyzer        | Agient              | E4470B      | MY41441082 | 2017.06.01      |

## For RF conducted emission:

| Equipment        | Manufacturer | Model   | Serial No. | Calibration Due |
|------------------|--------------|---------|------------|-----------------|
| Spctrum analyzer | Agient       | E4470B  | MY41441082 | 2017.06.01      |
| Power meter      | Anritsu      | ML2495A | 1005002    | 2017.09.11      |
| Power Senor      | Anritsu      | MA2411B | 0917070    | 2017.09.11      |

Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



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#### 3 Test Result

#### 3.1 Conducted emission

#### 3.1.1 Limit

| Frequency | L          | imit     |
|-----------|------------|----------|
| (MHz)     | Quasi-peak | Average  |
| 0.15-0.5  | 66 to 56   | 56 to 46 |
| 0.5-5     | 56         | 46       |
| 5-30      | 60         | 50       |

Note: Decreases with the logarithm of the frequency from 0.15MHz to 0.5MHz.

#### 3.1.2 Test method

- 1. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/50uH of coupling impedance for the measuring instrument.
- 2. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- 3. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- 4. LISN is at least 80 cm from nearest part of EUT chassis.
- 5. The resolution bandwidth of EMI test receiver is set at 9 kHz.

#### 3.1.3 Test Result



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| Tempera     | ture:            | 25℃            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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| 2           | 0.1932           | -2.10          | 30.02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 3           | 0.6508           | 8.26           | 30.02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 7           | 3.8195           | 8.43           | 30.02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 9           | 7.4070           | 10.03          | 30.09                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 10          | 7.4070           | -2.79          | 30.09                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| Test vo      | ltage:                                                                                                                 | AC 1                                    | 20V/60H                   | ·lz                                                  | Test mode                                     | э:     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
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| 50           | X                                                                                                                      | <u>-</u> <u>-</u> - <u>-</u> - <u>-</u> |                           |                                                      |                                               |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |              |      | Conduction(AVG)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| 40           | $\sqrt[4]{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt$ | 74 MM MM.                               | h<br>Marien Jennyakirikhi | yarilyayyakitariliku                                 | portraining the resiliency                    | Mungli | and the state of t | whyty              | profession . | MA   | white and something of the same                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | southwest . |
| 30           | MA. J.                                                                                                                 | L. A. Ar                                | Mary                      | - CONTRACTOR AND | and the free free free free free free free fr |        | - Andrew Conference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | When the same      |              | ~~   | Aut. of the control o | peak        |
| 20           | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,                                                                                | A447 11-41 .                            | . A Market State          | Manual                                               |                                               | **     | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |              | ~    | and district the state of the s | AVG         |
| 10           |                                                                                                                        |                                         |                           |                                                      |                                               |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
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| -10          |                                                                                                                        |                                         |                           |                                                      |                                               |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| -20<br>0.150 |                                                                                                                        | 0.5                                     |                           |                                                      | (MHz)                                         |        | į                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5                  |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 30.000      |
|              |                                                                                                                        |                                         |                           |                                                      |                                               |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| No. N        | Лk. Freq.                                                                                                              | Reading                                 | Correct                   | Measure-                                             | Limit Ov                                      | /or    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| - NO. IV     | MHz                                                                                                                    | Level                                   | Factor                    | ment<br>dBuV                                         | dBuV d                                        |        | etector                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | (                  | Comm         | nent |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| 1            | 0.1932                                                                                                                 | 16.26                                   | 30.02                     | 46.28                                                | 63.89 -17.                                    | 61     | QP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| 2            | 0.1932                                                                                                                 | 1.73                                    | 30.02                     | 31.75                                                | 53.89 -22.                                    | 14     | AVG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| 3 *          | 0.5403                                                                                                                 | 14.35                                   | 30.02                     | 44.37                                                | 56.00 -11.                                    | 63     | QP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| 4            | 0.5403                                                                                                                 | -0.33                                   | 30.02                     | 29.69                                                | 46.00 -16.                                    | 31     | AVG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| 5            | 2.0548                                                                                                                 | 12.17                                   | 30.02                     | 42.19                                                | 56.00 -13.                                    |        | QP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| 6            | 2.0548                                                                                                                 | -1.60                                   | 30.02                     | 28.42                                                | 46.00 -17.                                    |        | AVG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| 7            | 4.7213                                                                                                                 | 12.47                                   | 30.04                     | 42.51                                                | 56.00 -13.                                    |        | QP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| 8<br>9       | 4.7213<br>7.5658                                                                                                       | -0.69<br>10.81                          | 30.04                     | 29.35<br>40.89                                       | 46.00 -16.<br>60.00 -19.                      |        | AVG<br>QP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| 10           | 7.5658                                                                                                                 | -0.61                                   | 30.08                     | 29.47                                                | 50.00 -20.                                    |        | AVG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| 11           | 10.6760                                                                                                                | 10.18                                   | 30.10                     | 40.28                                                | 60.00 -19.                                    |        | QP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| 12           | 10.6760                                                                                                                | -3.22                                   | 30.10                     | 26.88                                                | 50.00 -23.                                    |        | AVG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |



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#### 3.2 Antenna requirement

#### 3.2.1 Requirement defined in FCC 15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

## 3.2.2 EUT antenna description

The WIFI antenna of EUT is a PIFA antenna, the maximum gain of the antenna is 2dBi. So the antenna meets the requirement of this part.



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## 3.3 Maximum output power

#### 3.3.1 **Limits**

Conducted output power limit is 1W (30dBm).

#### 3.3.2 Test Method

The maximum conducted output power may be measured using a broadband RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

#### 3.3.3 Test Result

| Frequency (MHz) | Maximum output power (dBm) | Limit (dBm) |  |  |  |  |  |  |  |
|-----------------|----------------------------|-------------|--|--|--|--|--|--|--|
| 802.11b         |                            |             |  |  |  |  |  |  |  |
| 2412            | 9.28                       | 30          |  |  |  |  |  |  |  |
| 2437            | 9.27                       | 30          |  |  |  |  |  |  |  |
| 2462            | 9.21                       | 30          |  |  |  |  |  |  |  |
|                 | 802.11g                    |             |  |  |  |  |  |  |  |
| 2412            | 9.25                       | 30          |  |  |  |  |  |  |  |
| 2437            | 9.02                       | 30          |  |  |  |  |  |  |  |
| 2462            | 9.04                       | 30          |  |  |  |  |  |  |  |
|                 | 802.11n20                  |             |  |  |  |  |  |  |  |
| 2412            | 9.13                       | 30          |  |  |  |  |  |  |  |
| 2437            | 9.11                       | 30          |  |  |  |  |  |  |  |
| 2462            | 9.18                       | 30          |  |  |  |  |  |  |  |
|                 | 802.11n40                  |             |  |  |  |  |  |  |  |
| 2422            | 9.24                       | 30          |  |  |  |  |  |  |  |
| 2437            | 9.08                       | 30          |  |  |  |  |  |  |  |
| 2452            | 9.25                       | 30          |  |  |  |  |  |  |  |



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#### 3.4 6dB emission bandwidth

#### 3.4.1 **Limits**

The minimum 6 dB bandwidth shall be at least 500 kHz.

#### 3.4.2 Test method

Use the following spectrum analyzer settings:

RBW = 100kHz VBW ≥ 3RBW Detector = peak

Trace mode = max hold

Sweep time = auto couple

Allow the trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

#### 3.4.3 Test result

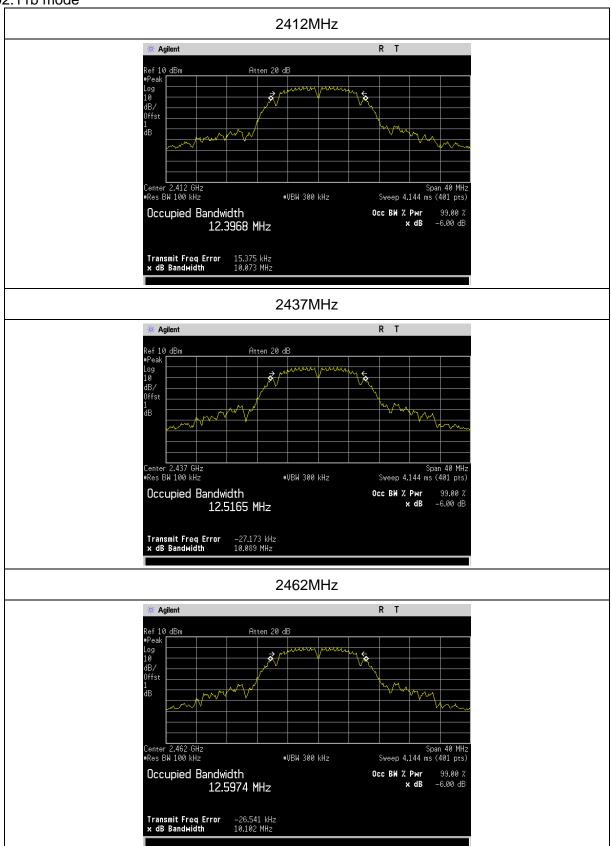
| Frequency (MHz) | 6dB emission bandwidth (MHz) | Limit  |  |  |  |  |  |  |
|-----------------|------------------------------|--------|--|--|--|--|--|--|
|                 | 802.11b                      |        |  |  |  |  |  |  |
| 2412            | 10.073                       |        |  |  |  |  |  |  |
| 2437            | 10.089                       | 500kHz |  |  |  |  |  |  |
| 2462            | 10.102                       |        |  |  |  |  |  |  |
|                 | 802.11g                      |        |  |  |  |  |  |  |
| 2412            | 15.232                       |        |  |  |  |  |  |  |
| 2437            | 15.708                       | 500kHz |  |  |  |  |  |  |
| 2462            | 15.406                       |        |  |  |  |  |  |  |
|                 | 802.11n20                    |        |  |  |  |  |  |  |
| 2412            | 15.181                       |        |  |  |  |  |  |  |
| 2437            | 15.217                       | 500kHz |  |  |  |  |  |  |
| 2462            | 15.166                       |        |  |  |  |  |  |  |
|                 | 802.11n40                    |        |  |  |  |  |  |  |
| 2422            | 35.408                       |        |  |  |  |  |  |  |
| 2437            | 35.379                       | 500kHz |  |  |  |  |  |  |
| 2452            | 35.413                       |        |  |  |  |  |  |  |

Test plots as below:



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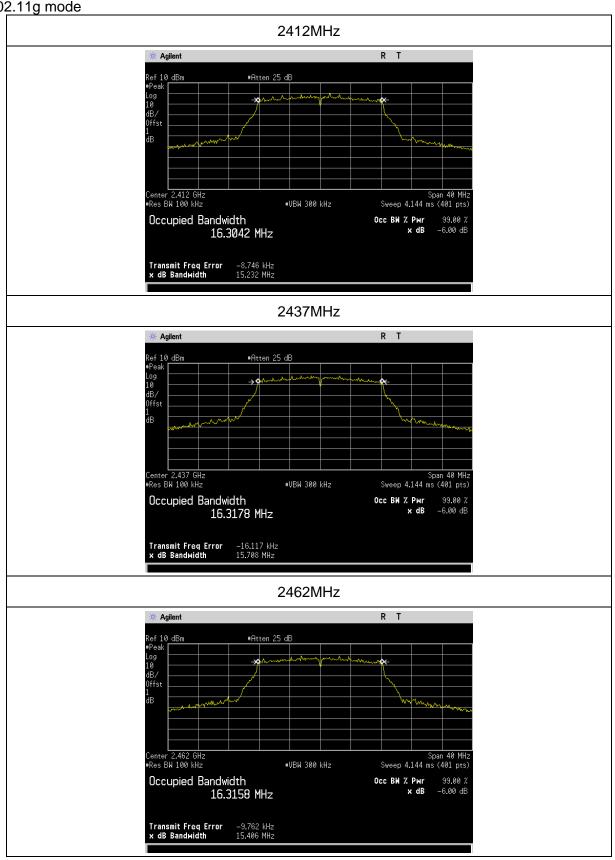
#### 802.11b mode





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802.11g mode

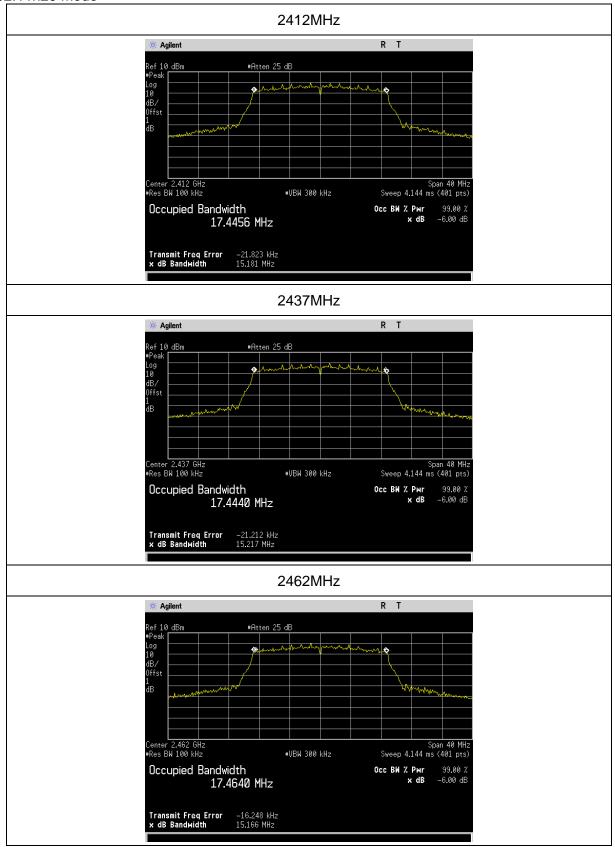


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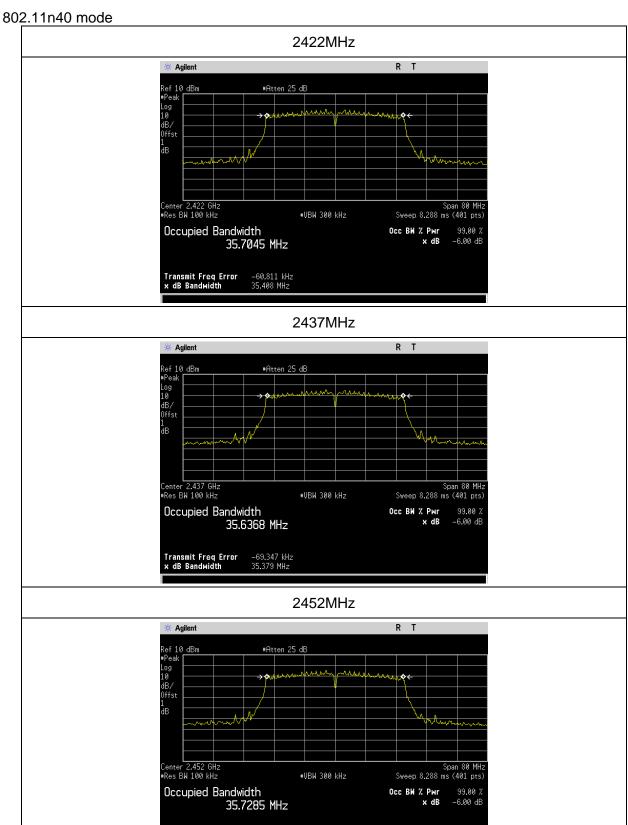
#### 802.11n20 mode





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-107.402 kHz 35.413 MHz

Transmit Freq Error x dB Bandwidth



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#### 3.5 Power spectral density

#### 3.5.1 **Limits**

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

#### 3.5.2 Test method

Span = 1.5 times DTS bandwidth (6dB emission bandwidth, see section 4.4)

RBW = 3kHz to 100kHz

VBW ≥ 3RBW

Detector = RMS

Sweep time = auto

Trace mode = max hold

Allow the trace to stabilize. Use the peak marker function to determine the maximum amplitude level within the RBW.

#### 3.5.3 Test result

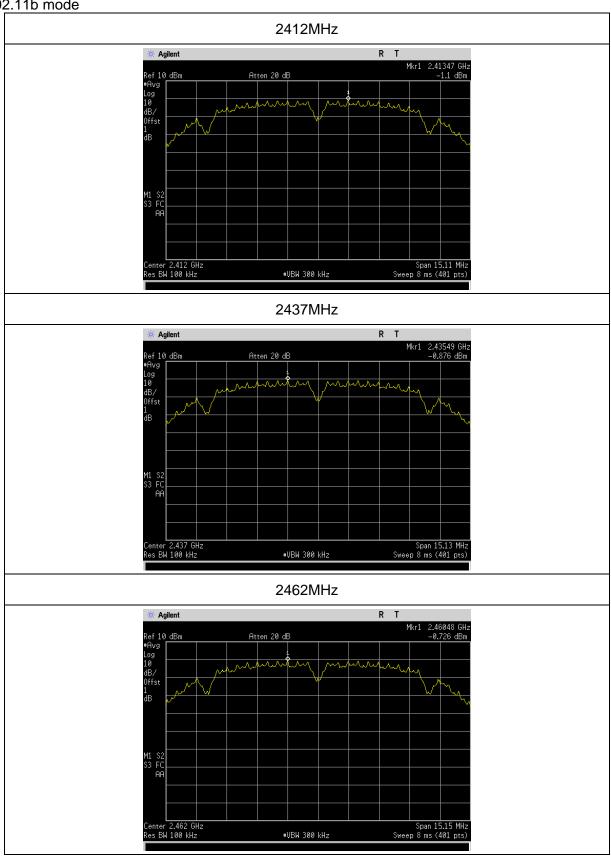
| Frequency (MHz) | PSD (dBm/100kHz) | Limit (dBm/3kHz) |  |  |  |  |
|-----------------|------------------|------------------|--|--|--|--|
|                 | 802.11b          |                  |  |  |  |  |
| 2412            | 2412 -1.1        |                  |  |  |  |  |
| 2437            | -0.876           | 8                |  |  |  |  |
| 2462            | -0.726           |                  |  |  |  |  |
|                 | 802.11g          |                  |  |  |  |  |
| 2412            | -0.643           |                  |  |  |  |  |
| 2437            | -1.737           | 8                |  |  |  |  |
| 2462            | -0.874           |                  |  |  |  |  |
|                 | 802.11n20        |                  |  |  |  |  |
| 2412            | -0.83            |                  |  |  |  |  |
| 2437            | -1.556           | 8                |  |  |  |  |
| 2462            | -0.357           |                  |  |  |  |  |
|                 | 802.11n40        |                  |  |  |  |  |
| 2422            | -4.462           |                  |  |  |  |  |
| 2437            | -3.995           | 8                |  |  |  |  |
| 2452            | -4.189           |                  |  |  |  |  |

Test plots as below:



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802.11b mode

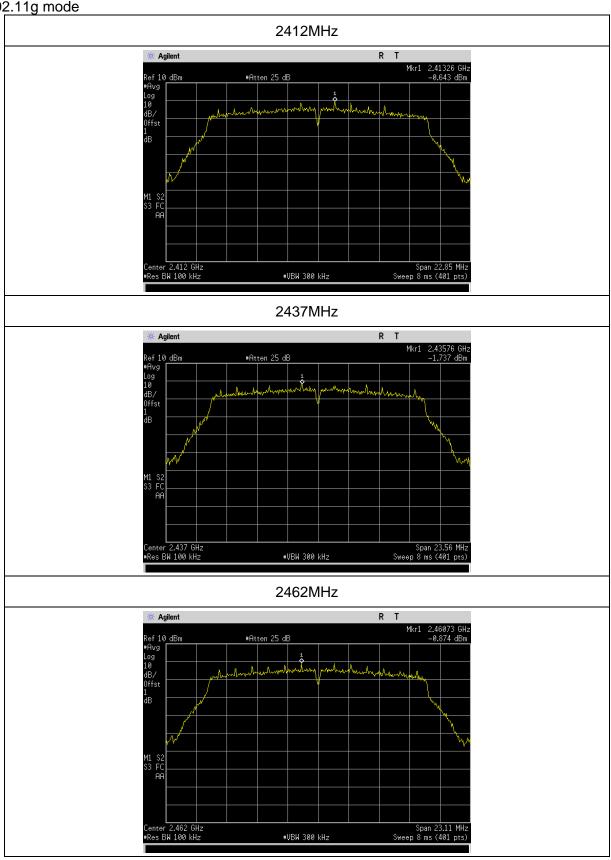


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802.11g mode

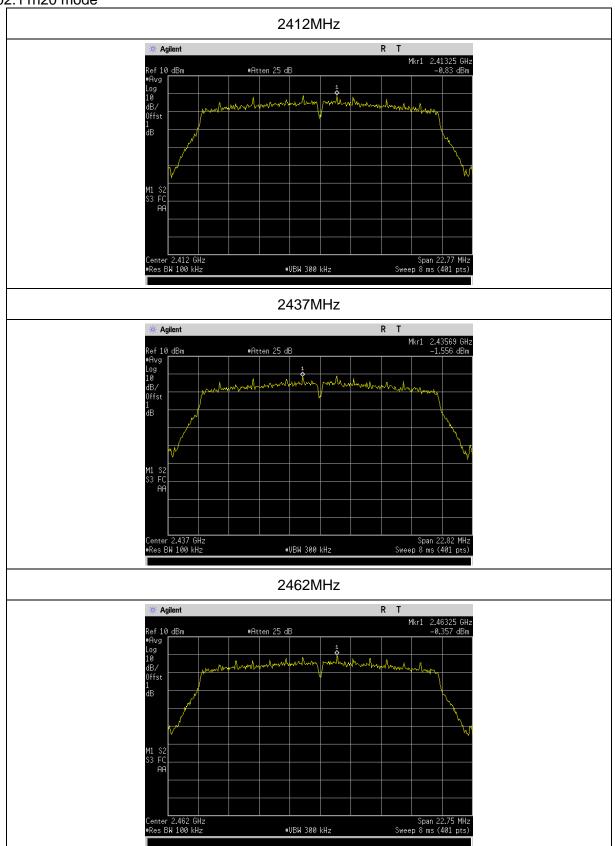


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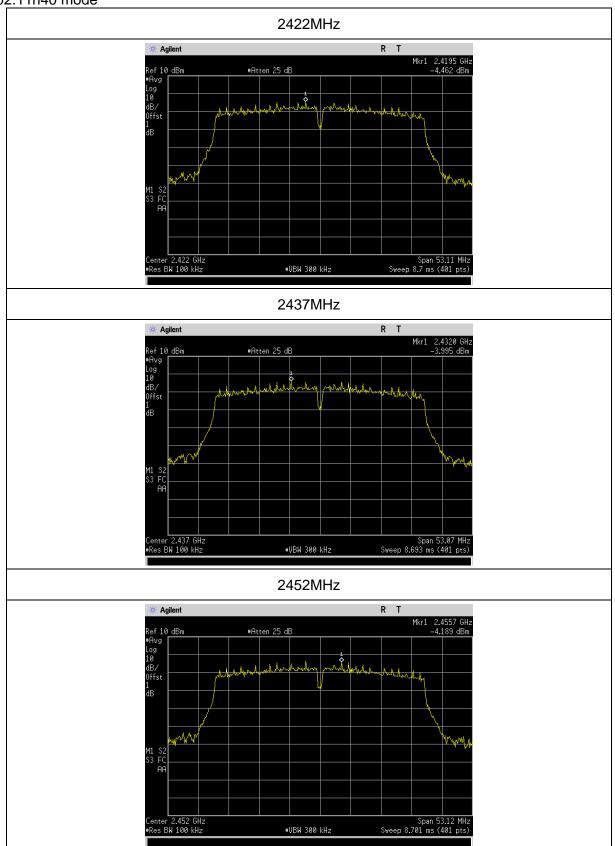
## 802.11n20 mode





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## 802.11n40 mode





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## 3.6 Band edge emission

#### 3.6.1 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30dB instead of 20dB.

#### 3.6.2 Test method

Use the following spectrum analyzer settings:

Set RBW = 100 kHz. VBW ≥ 3RBW. Detector = peak, Sweep time = auto couple, Trace mode = max hold.

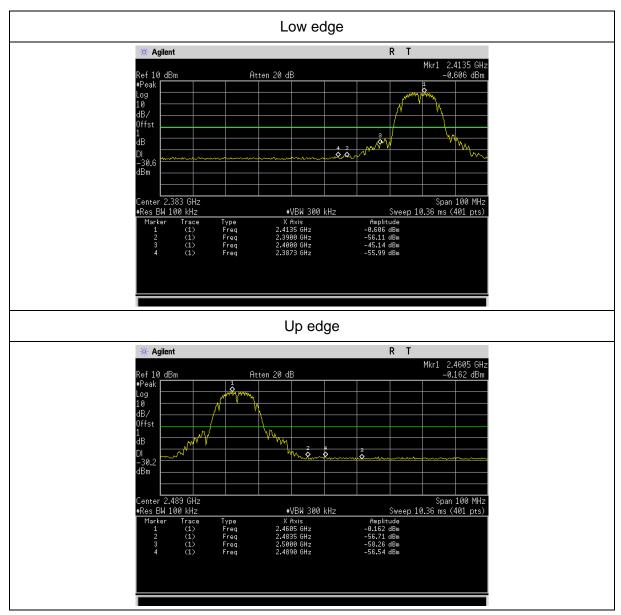
#### 3.6.3 Test Result

Test plots as below: Comply with 30dBc requirement



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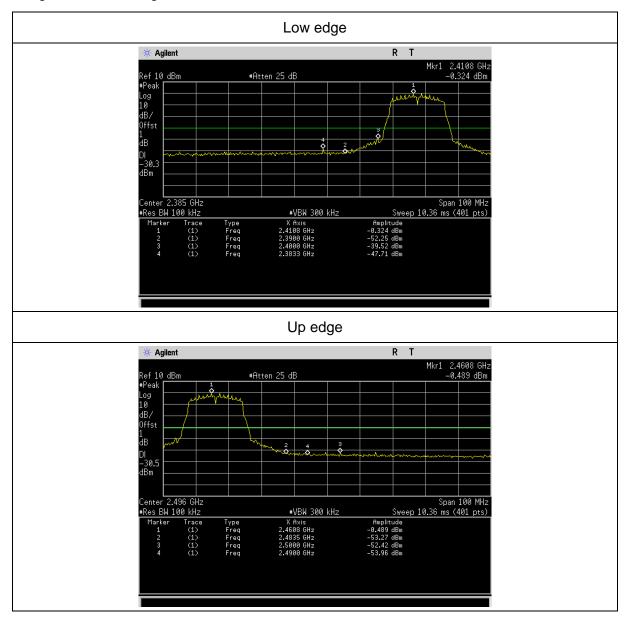
## 802.11b mode, Band edge





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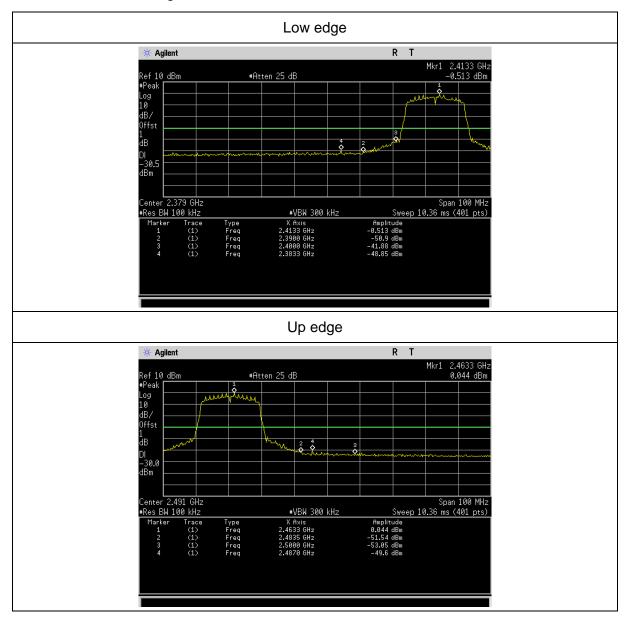
## 802.11g mode, Band edge





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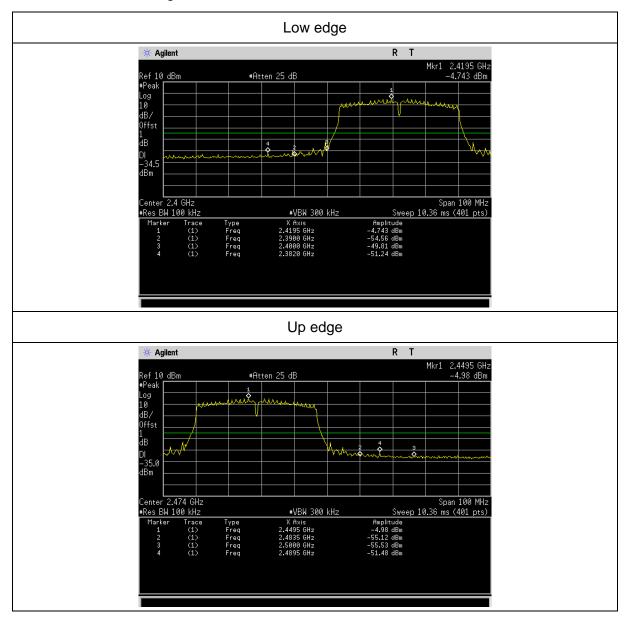
## 802.11n20 mode, Band edge





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## 802.11n40 mode, Band edge





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#### 3.7 Radiated emission

#### 3.7.1 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20dB. Attenuation below the general limits defined in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits defined in §15.209(a).

#### Radiated emission limits defined in FCC 15.209:

| Frequency<br>(MHz) | Field strength<br>µV/m | Field strength dBµV/m | Detector | Measurement distance |
|--------------------|------------------------|-----------------------|----------|----------------------|
| 30-88              | 100                    | 40                    | QP       |                      |
| 88-216             | 150                    | 43.5                  | QP       |                      |
| 216-960            | 200                    | 46                    | QP       | 2                    |
| 960-1000           | 500                    | 46                    | QP       | 3m                   |
| Above 1000         | 500                    | 54                    | AV       |                      |
| Above 1000         | 5000                   | 74                    | PK       |                      |

#### Restricted bands defined in FCC 15.205:

| MHz               | MHz                 | MHz           | GHz         |
|-------------------|---------------------|---------------|-------------|
| 0.090-0.110       | 16.42-16.423        | 399.9-410     | 4.5-5.15    |
| 0.495-0.505       | 16.69475-16.69525   | 608-614       | 5.35-5.46   |
| 2.1735-2.1905     | 16.80425-16.80475   | 960-1240      | 7.25-7.75   |
| 4.125-4.128       | 25.5-25.67          | 1300-1427     | 8.025-8.5   |
| 4.17725-4.17775   | 37.5-38.25          | 1435-1626.5   | 9.0-9.2     |
| 4.20725-4.20775   | 73-74.6             | 1645.5-1646.5 | 9.3-9.5     |
| 6.215-6.218       | 74.8-75.2           | 1660-1710     | 10.6-12.7   |
| 6.26775-6.26825   | 108-121.94          | 1718.8-1722.2 | 13.25-13.4  |
| 6.31175-6.31225   | 123-138             | 2200-2300     | 14.47-14.5  |
| 8.291-8.294       | 149.9-150.05        | 2310-2390     | 15.35-16.2  |
| 8.362-8.366       | 156.52475-156.52525 | 2483.5-2500   | 17.7-21.4   |
| 8.37625-8.38675   | 156.7-156.9         | 2690-2900     | 22.01-23.12 |
| 8.41425-8.41475   | 162.0125-167.17     | 3260-3267     | 23.6-24.0   |
| 12.29-12.293      | 167.72-173.2        | 3332-3339     | 31.2-31.8   |
| 12.51975-12.52025 | 240-285             | 3345.8-3358   | 36.43-36.5  |
| 12.57675-12.57725 | 322-335.4           | 3600-4400     | Above 38.6  |
| 13.36-13.41       |                     |               |             |



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#### 3.7.2 Test method

- 1. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 2. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 3. Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured, RBW = 1 MHz for  $f \ge 1$ GHz, 100 kHz for f < 1 GHz, VBW  $\ge$  RBW, Sweep = auto, Detector function = peak, Trace = max hold

- 4. Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 5. Set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209.
- 6. The three orthogonal axis (x, y, z) are pre-tested, only the worst emission were reported

#### 3.7.3 Test Result

#### Remark:

If the PK measured values lower than average mode limit, the EUT shall be deemed to meet average limits and then no additional average mode measurement performed.



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| 802.11b: 241 | 2MHz                 |                |        |          |        |                   |
|--------------|----------------------|----------------|--------|----------|--------|-------------------|
| Frequency    | Ant.<br>Polarization | Emission level | Limits | Detector | Result | Comment           |
| (MHz)        | H/V                  | dBµV/m         | dBµV/m |          |        |                   |
| 214          | V                    | 31.7           | 43.5   | QP       |        | Spurious emission |
| 214          | Н                    | 34.6           | 43.5   | QP       |        | Spurious emission |
| 2390         | V                    | 46.51          | 74     | PK       |        | Restricted bands  |
| 2390         | Н                    | 46.33          | 74     | PK       | Door   | Restricted bands  |
| 4824         | V                    | 47.28          | 74     | PK       | Pass   | Restricted bands  |
| 4824         | Н                    | 46.52          | 74     | PK       |        | Restricted bands  |
| 7236         | V                    | 50.63          | 74     | PK       |        | Spurious emission |
| 7236         | Н                    | 50.28          | 74     | PK       |        | Spurious emission |
| 802.11b: 243 | 37MHz                |                |        | 1        |        |                   |
| Frequency    | Ant.<br>Polarization | Emission level | Limits | Detector | Result | Comment           |
| (MHz)        | H/V                  | dBµV/m         | dBµV/m |          |        |                   |
| 214          | V                    | 32.4           | 43.5   | QP       |        | Spurious emission |
| 214          | Н                    | 34.1           | 43.5   | QP       |        | Spurious emission |
| 4874         | V                    | 48.19          | 74     | PK       | Pass   | Restricted bands  |
| 4874         | Н                    | 47.51          | 74     | PK       | Pass   | Restricted bands  |
| 7311         | V                    | 50.18          | 74     | PK       |        | Restricted bands  |
| 7311         | Н                    | 50.34          | 74     | PK       |        | Restricted bands  |
| 802.11b: 246 | 2MHz                 |                |        | •        |        |                   |
| Frequency    | Ant.<br>Polarization | Emission level | Limits | Detector |        | Comment           |
| (MHz)        | H/V                  | dBµV/m         | dBµV/m |          |        |                   |
| 214          | V                    | 31.5           | 43.5   | QP       |        | Spurious emission |
| 214          | Н                    | 34.4           | 43.5   | QP       |        | Spurious emission |
| 2483.5       | V                    | 46.37          | 74     | PK       | Pass   | Restricted bands  |
| 2483.5       | Н                    | 47.05          | 74     | PK       |        | Restricted bands  |
| 4924         | V                    | 51.74          | 74     | PK       |        | Restricted bands  |
| 4924         | Н                    | 51.29          | 74     | PK       |        | Restricted bands  |
| 7386         | V                    | 50.87          | 74     | PK       |        | Restricted bands  |
| 7386         | Н                    | 50.24          | 74     | PK       |        | Restricted bands  |



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| 802.11g: 241 | 2MHz                 |                |        |          |         |                   |  |
|--------------|----------------------|----------------|--------|----------|---------|-------------------|--|
| Frequency    | Ant.<br>Polarization | Emission level | Limits | Detector | Result  | Comment           |  |
| (MHz)        | H/V                  | dBµV/m         | dBµV/m |          |         |                   |  |
| 214          | V                    | 32.6           | 43.5   | QP       |         | Spurious emission |  |
| 214          | Н                    | 35.7           | 43.5   | QP       |         | Spurious emission |  |
| 2390         | V                    | 48.56          | 74     | PK       |         | Restricted bands  |  |
| 2390         | Н                    | 48.01          | 74     | PK       | Pass    | Restricted bands  |  |
| 4824         | V                    | 49.22          | 74     | PK       | F a 5 5 | Restricted bands  |  |
| 4824         | Н                    | 50.07          | 74     | PK       |         | Restricted bands  |  |
| 7236         | V                    | 50.73          | 74     | PK       |         | Spurious emission |  |
| 7236         | Н                    | 51.26          | 74     | PK       |         | Spurious emission |  |
| 802.11g: 243 | 7MHz                 |                |        | •        |         |                   |  |
| Frequency    | Ant.<br>Polarization | Emission level | Limits | Detector | Result  | Comment           |  |
| (MHz)        | H/V                  | dBµV/m         | dBµV/m |          |         |                   |  |
| 214          | V                    | 32             | 43.5   | QP       |         | Spurious emission |  |
| 214          | Н                    | 34.8           | 43.5   | QP       |         | Spurious emission |  |
| 4874         | V                    | 48.36          | 74     | PK       | Pass    | Restricted bands  |  |
| 4874         | Н                    | 48.59          | 74     | PK       | F a 5 5 | Restricted bands  |  |
| 7311         | V                    | 50.17          | 74     | PK       |         | Restricted bands  |  |
| 7311         | Н                    | 50.82          | 74     | PK       |         | Restricted bands  |  |
| 802.11g: 246 | 2MHz                 |                |        |          |         |                   |  |
| Frequency    | Ant.<br>Polarization | Emission level | Limits | Detector |         | Comment           |  |
| (MHz)        | H/V                  | dBµV/m         | dBµV/m |          |         |                   |  |
| 214          | V                    | 32.3           | 43.5   | QP       |         | Spurious emission |  |
| 214          | Н                    | 34.2           | 43.5   | QP       |         | Spurious emission |  |
| 2483.5       | V                    | 47.15          | 74     | PK       | Pass    | Restricted bands  |  |
| 2483.5       | Н                    | 46.22          | 74     | PK       |         | Restricted bands  |  |
| 4924         | V                    | 48.54          | 74     | PK       |         | Restricted bands  |  |
| 4924         | Н                    | 49.55          | 74     | PK       |         | Restricted bands  |  |
| 7386         | V                    | 50.73          | 74     | PK       |         | Restricted bands  |  |
| 7386         | Н                    | 50.21          | 74     | PK       |         | Restricted bands  |  |



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| 802.11n20: 2 | 412MHz               |                |        |          |        |                   |  |
|--------------|----------------------|----------------|--------|----------|--------|-------------------|--|
| Frequency    | Ant.<br>Polarization | Emission level | Limits | Detector | Result | Comment           |  |
| (MHz)        | H/V                  | dBµV/m         | dBµV/m |          |        |                   |  |
| 214          | V                    | 31.9           | 43.5   | QP       |        | Spurious emission |  |
| 214          | Н                    | 33.7           | 43.5   | QP       |        | Spurious emission |  |
| 2390         | V                    | 47.32          | 74     | PK       |        | Restricted bands  |  |
| 2390         | Н                    | 46.85          | 74     | PK       | Door   | Restricted bands  |  |
| 4844         | V                    | 49.56          | 74     | PK       | Pass   | Restricted bands  |  |
| 4844         | Н                    | 50.32          | 74     | PK       |        | Restricted bands  |  |
| 7266         | V                    | 50.62          | 74     | PK       |        | Restricted bands  |  |
| 7266         | Н                    | 50.33          | 74     | PK       |        | Restricted bands  |  |
| 802.11n20: 2 | 437MHz               |                |        |          | •      |                   |  |
| Frequency    | Ant.<br>Polarization | Emission level | Limits | Detector | Result | Comment           |  |
| (MHz)        | H/V                  | dBµV/m         | dBµV/m |          |        |                   |  |
| 214          | V                    | 32             | 43.5   | QP       |        | Spurious emission |  |
| 214          | Н                    | 32.5           | 43.5   | QP       |        | Spurious emission |  |
| 4874         | V                    | 48.65          | 74     | PK       | Door   | Restricted bands  |  |
| 4874         | Н                    | 48.34          | 74     | PK       | Pass   | Restricted bands  |  |
| 7311         | V                    | 50.12          | 74     | PK       |        | Restricted bands  |  |
| 7311         | Н                    | 49.64          | 74     | PK       |        | Restricted bands  |  |
| 802.11n20: 2 | 462MHz               |                |        |          |        |                   |  |
| Frequency    | Ant.<br>Polarization | Emission level | Limits | Detector |        | Comment           |  |
| (MHz)        | H/V                  | dBµV/m         | dBµV/m |          |        |                   |  |
| 214          | V                    | 31.5           | 43.5   | QP       |        | Spurious emission |  |
| 214          | Н                    | 32.8           | 43.5   | QP       |        | Spurious emission |  |
| 2483.5       | V                    | 47.24          | 74     | PK       | Pass   | Restricted bands  |  |
| 2483.5       | Н                    | 48.11          | 74     | PK       |        | Restricted bands  |  |
| 4924         | V                    | 46.73          | 74     | PK       |        | Restricted bands  |  |
| 4924         | Н                    | 48.21          | 74     | PK       |        | Restricted bands  |  |
| 7386         | V                    | 50.78          | 74     | PK       |        | Restricted bands  |  |
| 7386         | Н                    | 50.34          | 74     | PK       |        | Restricted bands  |  |



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| 802.11n40: 2       | 422MHz               |                |        |          |        |                   |
|--------------------|----------------------|----------------|--------|----------|--------|-------------------|
| Frequency          | Ant.<br>Polarization | Emission level | Limits | Detector | Result | Comment           |
| (MHz)              | H/V                  | dBµV/m         | dBµV/m |          |        |                   |
| 214                | V                    | 35.7           | 43.5   | QP       | Pass   | Spurious emission |
| 214                | Н                    | 39.5           | 43.5   | QP       |        | Spurious emission |
| 2390               | V                    | 48.21          | 74     | PK       |        | Restricted bands  |
| 2390               | Н                    | 47.33          | 74     | PK       |        | Restricted bands  |
| 4844               | V                    | 51.57          | 74     | PK       |        | Restricted bands  |
| 4844               | Н                    | 49.83          | 74     | PK       |        | Restricted bands  |
| 7266               | V                    | 50.66          | 74     | PK       |        | Spurious emission |
| 7266               | Н                    | 49.97          | 74     | PK       |        | Spurious emission |
| 802.11n40: 2437MHz |                      |                |        |          |        |                   |
| Frequency          | Ant.<br>Polarization | Emission level | Limits | Detector | Result | Comment           |
| (MHz)              | H/V                  | dBµV/m         | dBµV/m |          |        |                   |
| 214                | V                    | 34.8           | 43.5   | QP       | Pass   | Spurious emission |
| 214                | Н                    | 38.7           | 43.5   | QP       |        | Spurious emission |
| 4874               | V                    | 49.7           | 74     | PK       |        | Restricted bands  |
| 4874               | Н                    | 51.47          | 74     | PK       |        | Restricted bands  |
| 7311               | V                    | 50.62          | 74     | PK       |        | Restricted bands  |
| 7311               | Н                    | 51.89          | 74     | PK       |        | Restricted bands  |
| 802.11n40: 2452MHz |                      |                |        |          |        |                   |
| Frequency          | Ant.<br>Polarization | Emission level | Limits | Detector | Pass   | Comment           |
| (MHz)              | H/V                  | dBµV/m         | dBµV/m |          |        |                   |
| 214                | V                    | 36.1           | 43.5   | QP       |        | Spurious emission |
| 214                | Н                    | 40.2           | 43.5   | QP       |        | Spurious emission |
| 2483.5             | V                    | 46.69          | 74     | PK       |        | Restricted bands  |
| 2483.5             | Н                    | 47.36          | 74     | PK       |        | Restricted bands  |
| 4904               | V                    | 51.98          | 74     | PK       |        | Restricted bands  |
| 4904               | Н                    | 51.23          | 74     | PK       |        | Restricted bands  |
| 7356               | V                    | 52.55          | 74     | PK       |        | Restricted bands  |
| 7356               | Н                    | 51.46          | 74     | PK       |        | Restricted bands  |

#### ----END OF REPORT----