

**Zhuohai Pantum Electronics Co.,Ltd.**

Application  
For  
Certification

**FCC ID: 2AEGOPANTUM-1**

**Monochrome Laser Multifunctional Printer**

**Model: M6550NW, M6552NW**

**2.4GHz WiFi Transceiver**

Report No.: 150319019SZN-001

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-13]

Prepared and Checked by:

Approved by:

Sign on file

Sunny Zhou  
Engineer



Digitally signed  
by Andy Yan  
Location: Intertek  
Testing Services

Andy Yan  
Senior Project Engineer  
Date: May 19, 2015

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
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- For Terms And Conditions of the services, it can be provided upon request.
- The evaluation data of the report will be kept for 3 years from the date of issuance.

TRF no.: FCC 15C\_Tx\_b

**Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch**

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## LIST OF EXHIBITS

### *INTRODUCTION*

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INTERTEK TESTING SERVICES

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**MEASUREMENT/TECHNICAL REPORT**

**Monochrome Laser Multifunctional Printer**

**Model: M6550NW, M6552NW**

**FCC ID: 2AEGOPANTUM-1**

This report concerns (check one)    Original Grant ☒ Class II Change ☐

Equipment Type: DTS - Part 15 Digital Transmission Systems (WiFi transmitter portion)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?    Yes ☐    No ☒

If yes, defer until :   
date

Company Name agrees to notify the Commission by:   
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37?    Yes ☐    No ☒

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-13] Edition] provision.

Report prepared by:

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# INTERTEK TESTING SERVICES

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## INTERTEK TESTING SERVICES

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### List of attached file

| Exhibit type          | File Description           | Filename             |
|-----------------------|----------------------------|----------------------|
| Test Report           | Test Report                | report.pdf           |
| Test Setup Photo      | Radiated Emission          | radiated photos.pdf  |
| Test Setup Photo      | Conducted Emission         | conducted photos.pdf |
| External Photo        | External Photo             | external photos.pdf  |
| Internal Photo        | Internal Photo             | internal photos.pdf  |
| Block Diagram         | Block Diagram              | block.pdf            |
| Schematics            | Circuit Diagram            | circuit.pdf          |
| Operation Description | Technical Description      | descri.pdf           |
| ID Label/Location     | Label Artwork and Location | label.pdf            |
| User Manual           | User Manual                | manual.pdf           |
| Cover Letter          | Confidentiality Letter     | request.pdf          |
| Cover Letter          | Letter of Agency           | agency.pdf           |

# **INTERTEK TESTING SERVICES**

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## **EXHIBIT 1**

### **SUMMARY OF TEST RESULTS**

## INTERTEK TESTING SERVICES

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### 1.0 Summary of Test results

#### **Monochrome Laser Multifunctional Printer**

**Model: M6550NW, M6552NW**

**FCC ID: 2AEGOPANTUM-1**

| TEST                                   | REFERENCE    | RESULTS          |
|----------------------------------------|--------------|------------------|
| Max. Output power                      | 15.247(b)(3) | Pass             |
| 6 dB Bandwidth                         | 15.247(a)(2) | Pass             |
| Max. Power Density                     | 15.247(e)    | Pass             |
| Out of Band Antenna Conducted Emission | 15.247(d)    | Pass             |
| Radiated Emission in Restricted Bands  | 15.247(d)    | Pass             |
| AC Conducted Emission                  | 15.207       | Pass             |
| Antenna Requirement                    | 15.203       | Pass (See Notes) |

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

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### **EXHIBIT 2**

#### **GENERAL DESCRIPTION**

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### 2.0 **General Description**

#### 2.1 Product Description

The Equipment Under Test (EUT) is a Monochrome Laser Multifunctional Printer with WiFi function operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing and 2422-2452MHz for 802.11n-HT40, 9 channels with 5MHz channel spacing. The EUT was powered by AC120V/60Hz. For more detailed features description, please refer to the user's manual.

The Model: M6550NW is identical with the Model: M6552NW in hardware and electronic aspect. The difference in model number serves as marketing strategy.

Type of Modulation: BPSK, QPSK, 16QAM, 64QAM for OFDM. CCK, DQPSK, DBPSK for DSSS.

Antenna Type: Integral Antenna.

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

## INTERTEK TESTING SERVICES

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### 2.2 Related Submittal(s) Grants

This is an application for certification of:

DTS- Part 15 Digital Transmission Systems (WiFi transmitter portion)

Remaining portions are subject to the following procedures:

1. Receiver portion of WiFi: exempt from technical requirement of this Part.
2. Other Digital Function: Subject to FCC Part 15B DoC .

### 2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009) and KDB 558074. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the “**Justification Section**” of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

### 2.4 Test Facility

The Semi-Anechoic chamber and shield room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, Block D, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 242492).

**EXHIBIT 3**  
**SYSTEM TEST CONFIGURATION**

## **INTERTEK TESTING SERVICES**

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### **3.0 System Test Configuration**

#### **3.1 Justification**

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by AC120V/ 60Hz during the testing. All the data rate of 802.11b/g/n was tested and only the worst case data was reported.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

The rear of unit shall be flushed with the rear of the table.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

#### **3.2 EUT Exercising Software**

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

The parameters of test software setting:

During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

#### **3.3 Special Accessories**

Shielded USB Cable and AC Power Cord attached with the EUT were used.

## INTERTEK TESTING SERVICES

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### 3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance – Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

### 3.5 Equipment Modification

Any modifications installed previous to testing by Zhuhai Pantum Electronics Co.,Ltd. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch.

### 3.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

| Description          | Manufacturer | Model No.                |
|----------------------|--------------|--------------------------|
| USB Interface Cable  | Seine        | shielded, Length 150cm   |
| Network cable (RJ45) | Smart.drive  | unshielded, Length 100cm |
| Power Cord           | Seine        | shielded, Length 180cm   |
| Laptop               | Lenovo       | T420                     |
| Hard Disk            | Smart.drive  | HD-003                   |
| USB Cable            | Smart.drive  | unshielded, Length 155cm |
| 1394 Cable           | Smart.drive  | unshielded, Length 180cm |

## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 4**

### **MEASUREMENT RESULTS**

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

### 4.0 Measurement Results

#### 4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter have a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

| IEEE 802.11b (Antenna Gain = 2dBi) (CCK, 1Mbps) |               |                 |
|-------------------------------------------------|---------------|-----------------|
| Frequency (MHz)                                 | Output in dBm | Output in mWatt |
| Low Channel: 2412                               | 14.30         | 26.92           |
| Middle Channel: 2437                            | 13.20         | 20.89           |
| High Channel: 2462                              | 12.80         | 19.05           |

| IEEE 802.11g (Antenna Gain = 2dBi) (16QAM, 6Mbps) |               |                 |
|---------------------------------------------------|---------------|-----------------|
| Frequency (MHz)                                   | Output in dBm | Output in mWatt |
| Low Channel: 2412                                 | 19.60         | 91.20           |
| Middle Channel: 2437                              | 18.70         | 74.13           |
| High Channel: 2462                                | 18.60         | 72.44           |

## INTERTEK TESTING SERVICES

| IEEE 802.11n-HT20 (Antenna Gain = 2dBi) (16QAM, 6.5Mbps) |               |                 |
|----------------------------------------------------------|---------------|-----------------|
| Frequency (MHz)                                          | Output in dBm | Output in mWatt |
| Low Channel: 2412                                        | 21.00         | 125.89          |
| Middle Channel: 2437                                     | 18.50         | 70.79           |
| High Channel: 2462                                       | 18.30         | 67.61           |

| IEEE 802.11n-HT40 (Antenna Gain = 2.0dBi) (64QAM, 13.5Mbps) |               |                 |
|-------------------------------------------------------------|---------------|-----------------|
| Frequency (MHz)                                             | Output in dBm | Output in mWatt |
| Low Channel: 2422                                           | 19.00         | 79.43           |
| Middle Channel: 2437                                        | 19.50         | 89.13           |
| High Channel: 2452                                          | 17.50         | 56.23           |

Cable loss: 1.5 dB    External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max output level = 21.00dBm

For RF Exposure, the information is saved with filename: RF exposure.pdf.

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

### 4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a)(2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Limit: The 6 dB Bandwidth is at least 500 kHz.

| IEEE 802.11b (CCK, 1Mbps) |                      |
|---------------------------|----------------------|
| Frequency (MHz)           | 6 dB Bandwidth (MHz) |
| 2412                      | 9.465                |
| 2437                      | 9.508                |
| 2462                      | 10.637               |

| IEEE 802.11g (16QAM, 6Mbps) |                      |
|-----------------------------|----------------------|
| Frequency (MHz)             | 6 dB Bandwidth (MHz) |
| 2412                        | 16.541               |
| 2437                        | 17.062               |
| 2462                        | 16.411               |

| IEEE 802.11n-HT20 (16QAM, 6.5Mbps) |                      |
|------------------------------------|----------------------|
| Frequency (MHz)                    | 6 dB Bandwidth (MHz) |
| 2412                               | 17.757               |
| 2437                               | 17.757               |
| 2462                               | 17.627               |

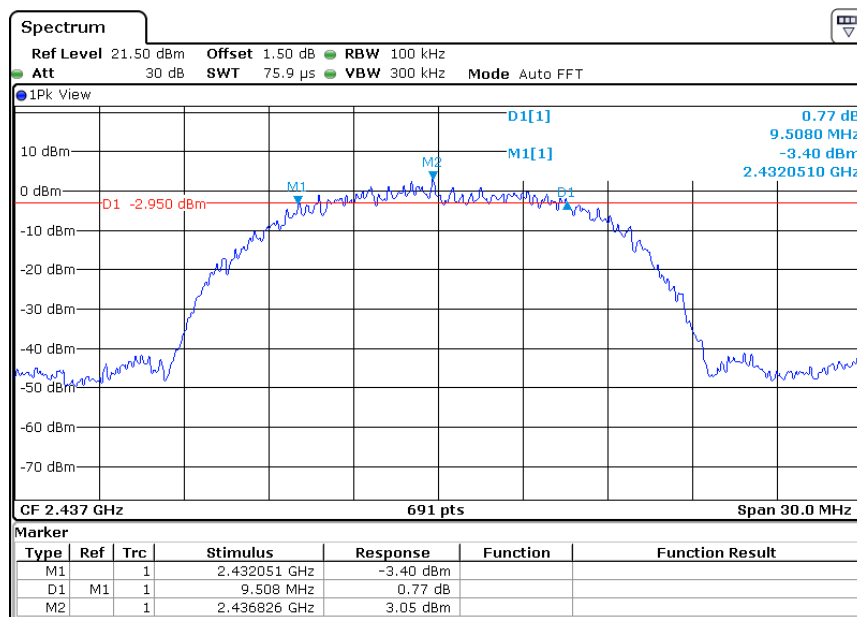
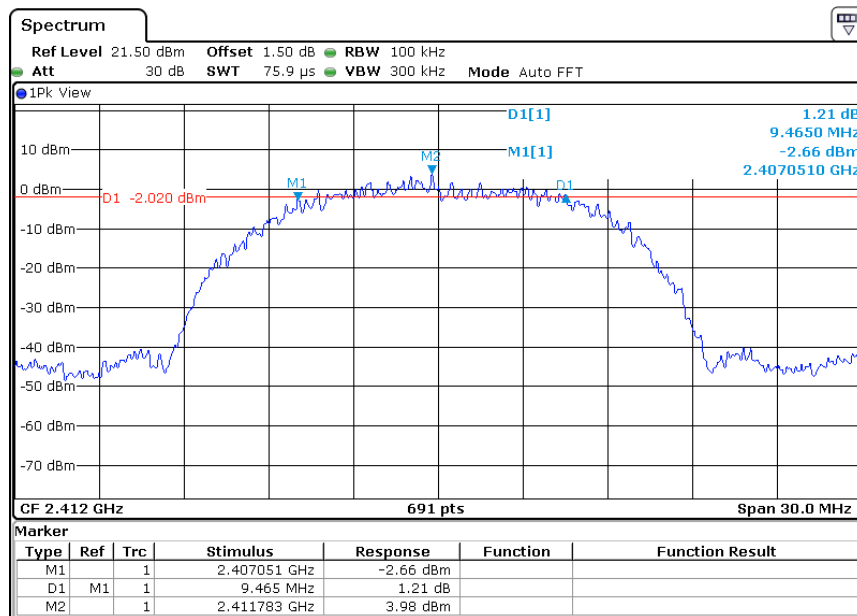
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| IEEE 802.11n-HT40 (64QAM, 13.5Mbps) |                      |
|-------------------------------------|----------------------|
| Frequency (MHz)                     | 6 dB Bandwidth (MHz) |
| 2422                                | 36.57                |
| 2437                                | 36.52                |
| 2452                                | 36.44                |

The test plots are attached as below.

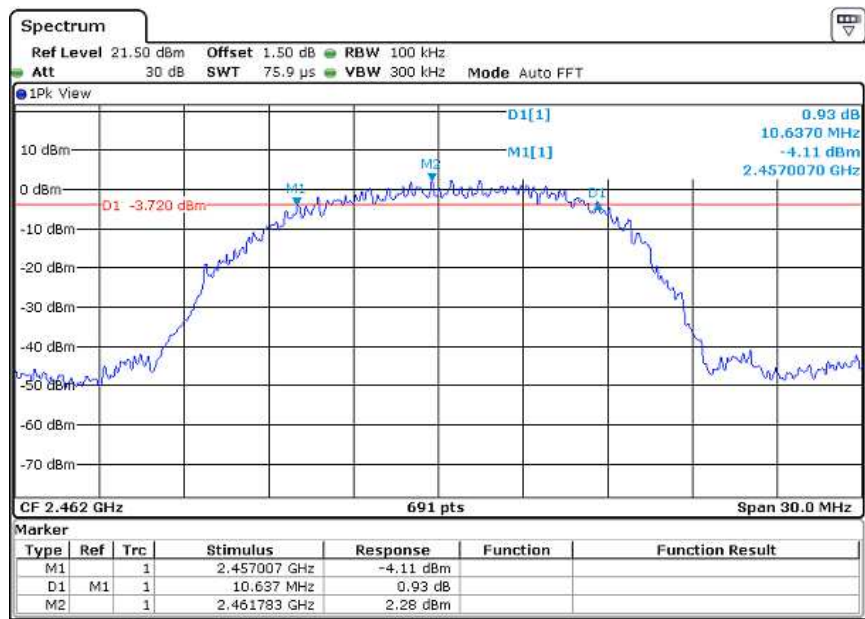
# INTERTEK TESTING SERVICES

802.11b



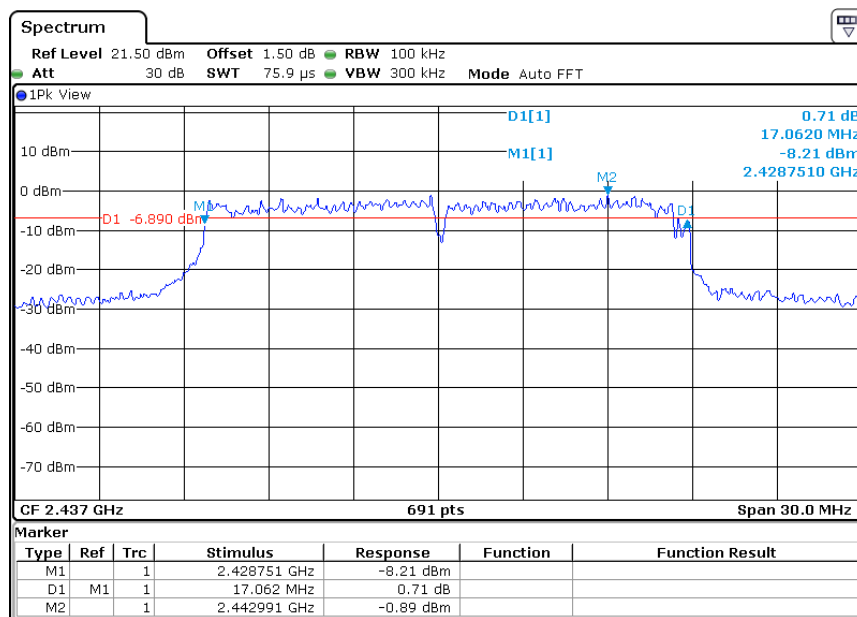
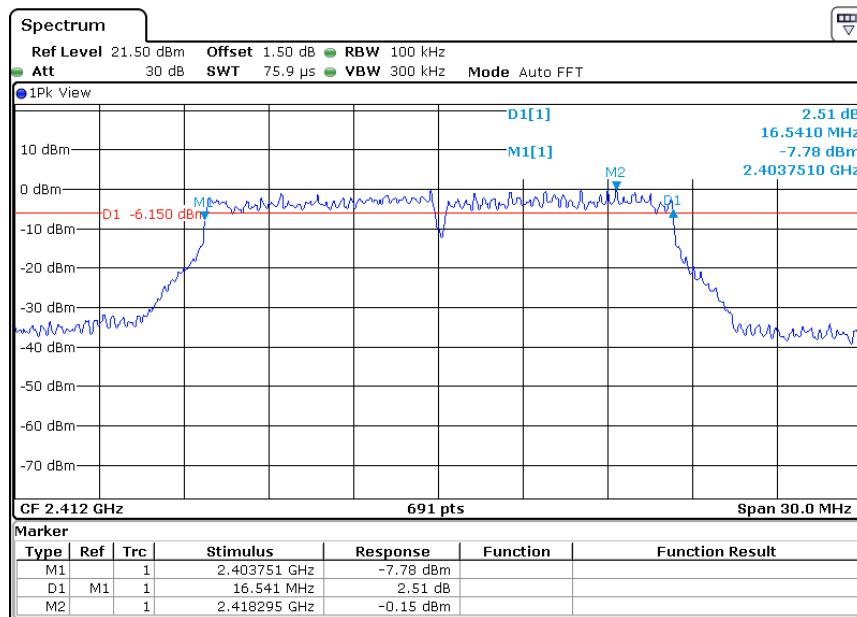
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 FCC ID: 2AEGOPANTUM-1  
 Report No.: 150319019SZN-001

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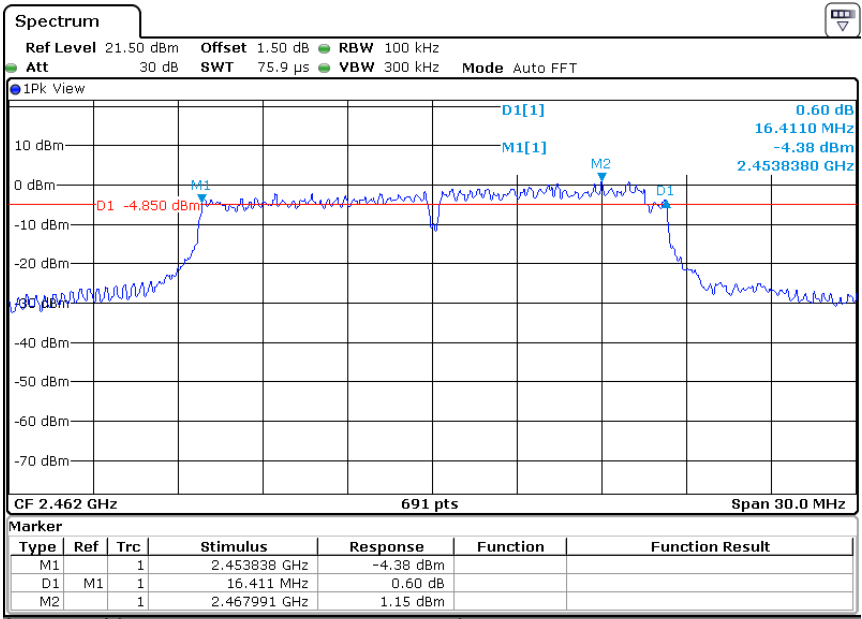
# INTERTEK TESTING SERVICES

802.11g



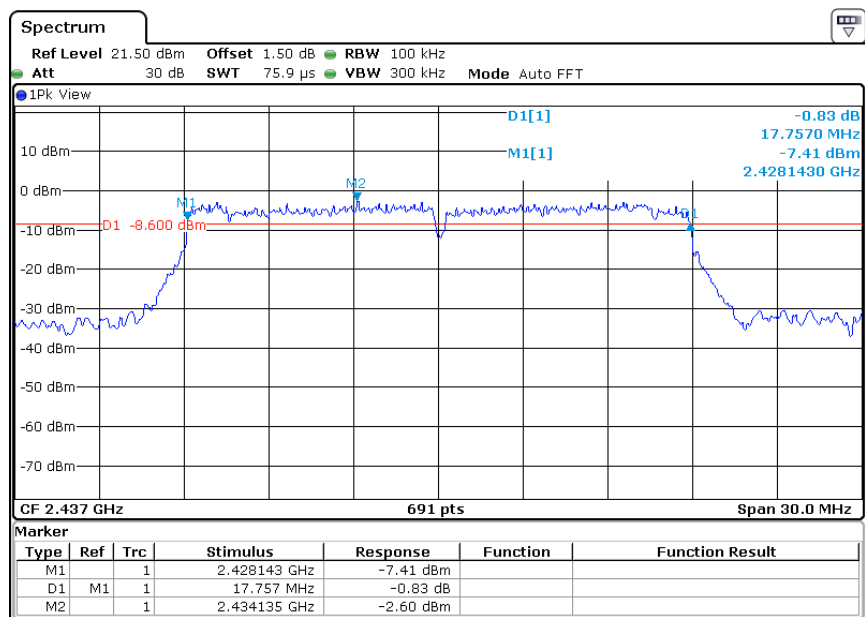
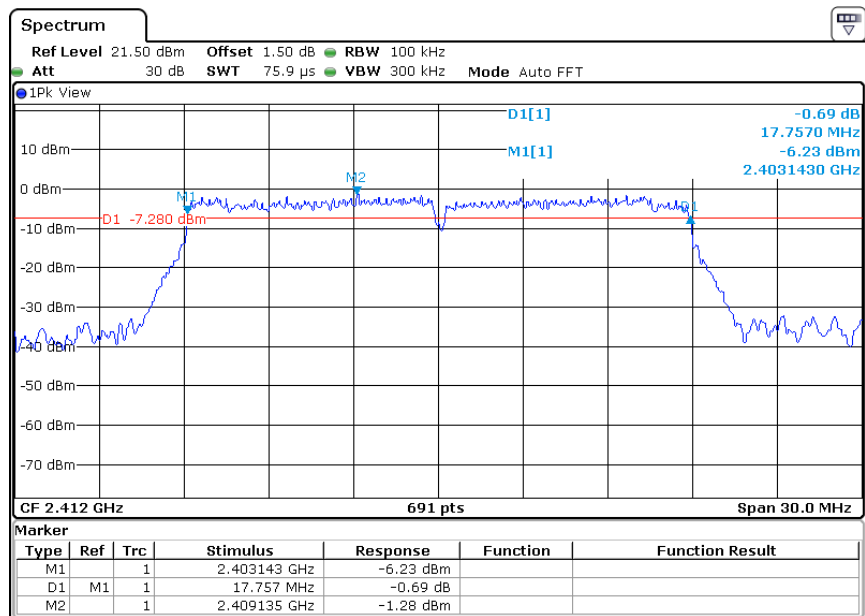
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FCC ID: 2AEGOPANTUM-1  
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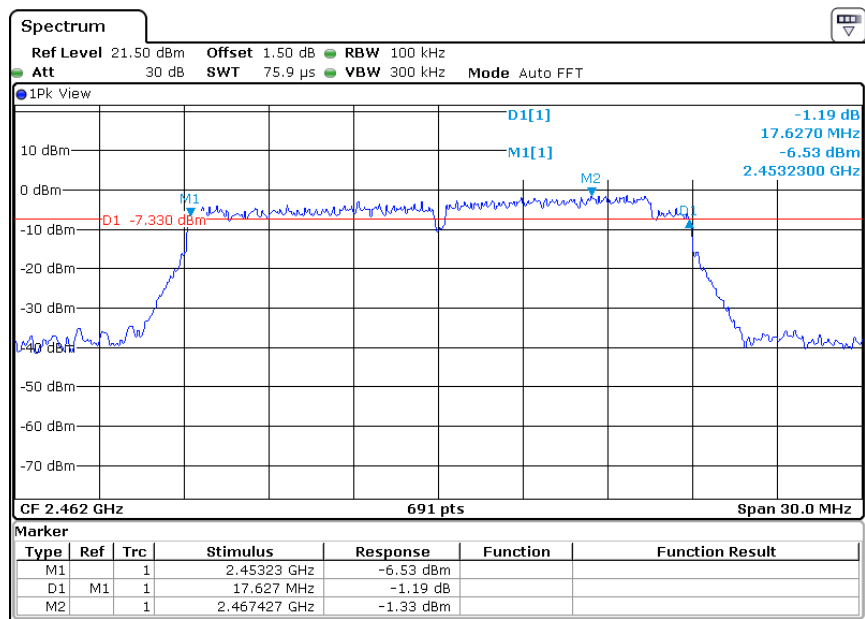
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802.11 n-HT20



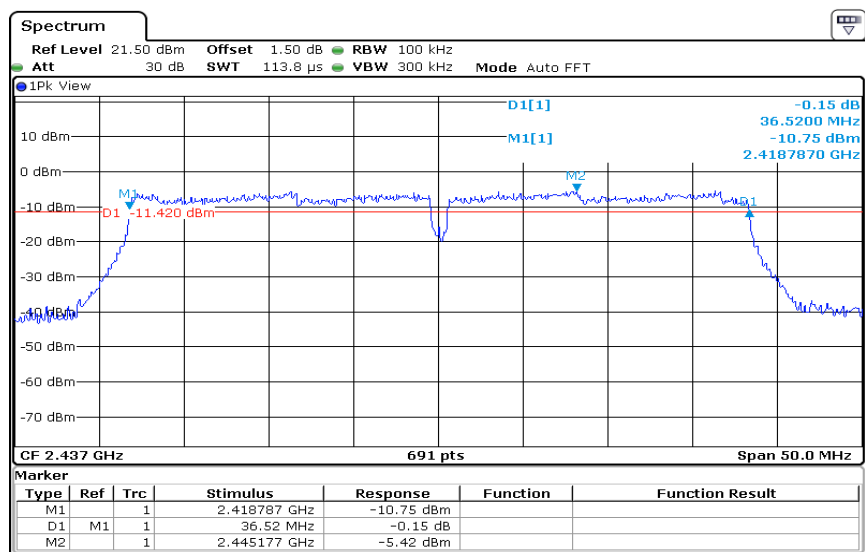
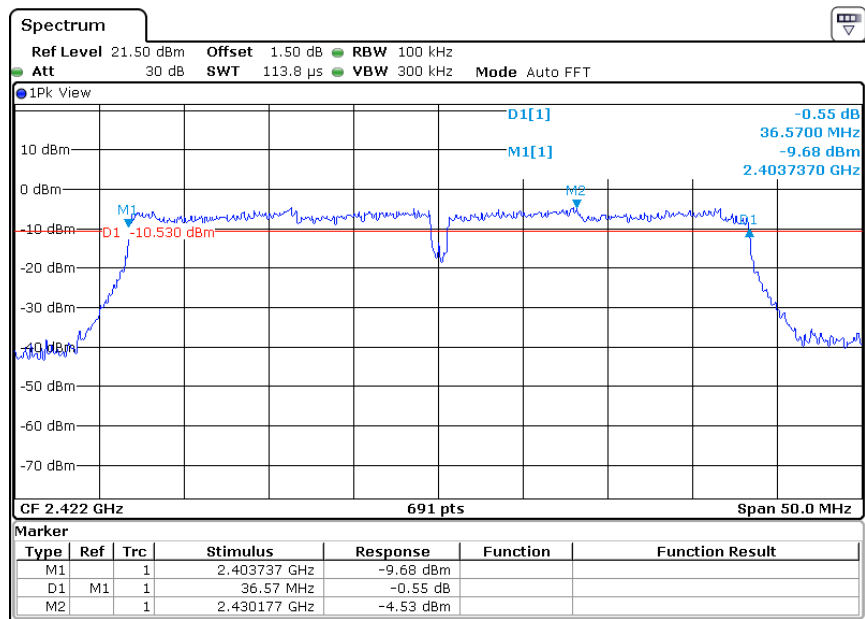
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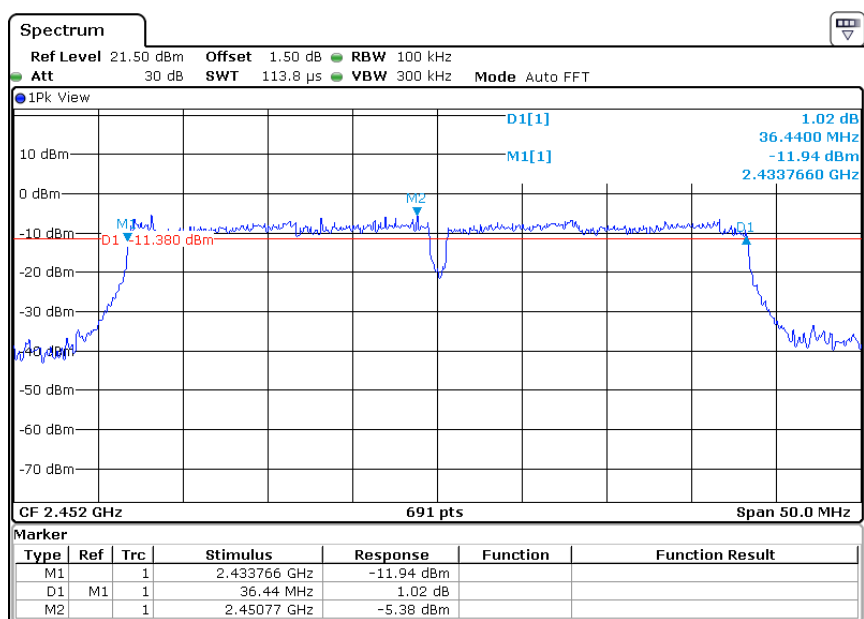
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802.11 n-HT40



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 FCC ID: 2AEGOPANTUM-1  
 Report No.: 150319019SZN-001

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## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

### 4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD was set according to the FCC KDB 558074.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Limit: The Power Density does not exceed 8dBm/3 kHz.

| IEEE 802.11b (CCK, 1Mbps) |                               |
|---------------------------|-------------------------------|
| Frequency (MHz)           | Power Density with RBW 100KHz |
| 2412                      | 4.00                          |
| 2437                      | 3.45                          |
| 2462                      | 3.51                          |

| IEEE 802.11g (16QAM, 6Mbps) |                               |
|-----------------------------|-------------------------------|
| Frequency (MHz)             | Power Density with RBW 100KHz |
| 2412                        | 0.53                          |
| 2437                        | -0.54                         |
| 2462                        | -1.11                         |

| IEEE 802.11n-HT20 (16QAM, 6.5Mbps) |                               |
|------------------------------------|-------------------------------|
| Frequency (MHz)                    | Power Density with RBW 100KHz |
| 2412                               | -1.08                         |
| 2437                               | -2.69                         |
| 2462                               | -3.45                         |

| IEEE 802.11n-HT40 (64QAM, 13.5Mbps) |                               |
|-------------------------------------|-------------------------------|
| Frequency (MHz)                     | Power Density with RBW 100KHz |
| 2422                                | -4.78                         |
| 2437                                | -5.65                         |
| 2452                                | -4.61                         |

The test plots are attached as below.

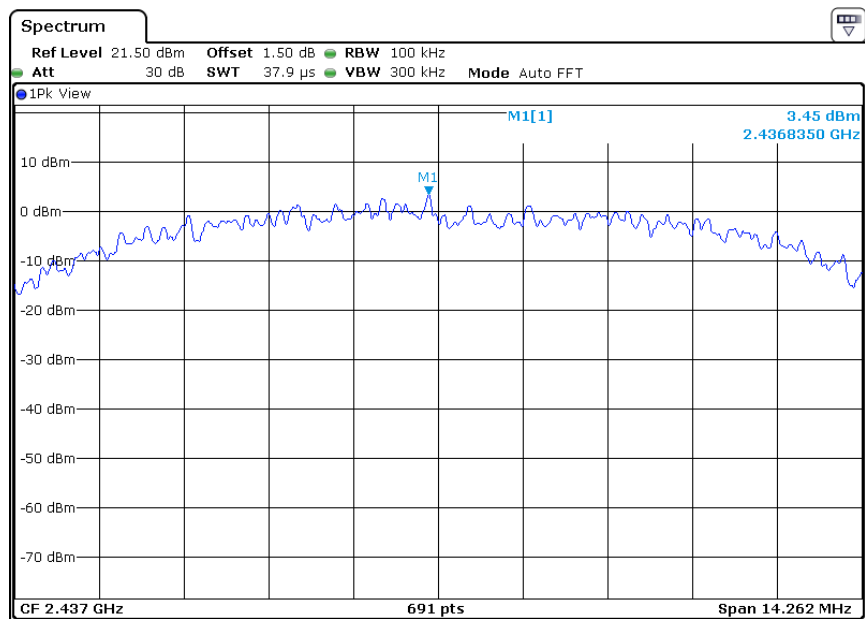
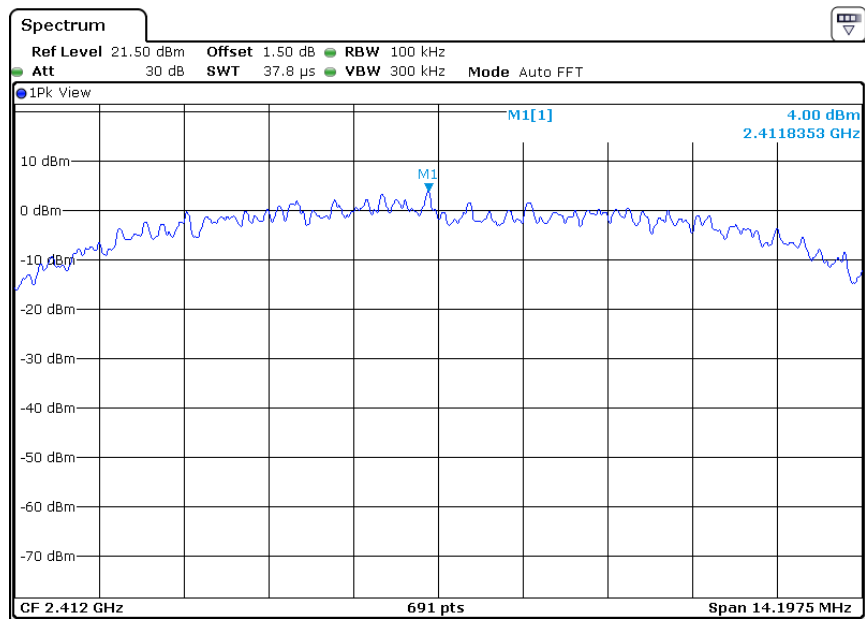
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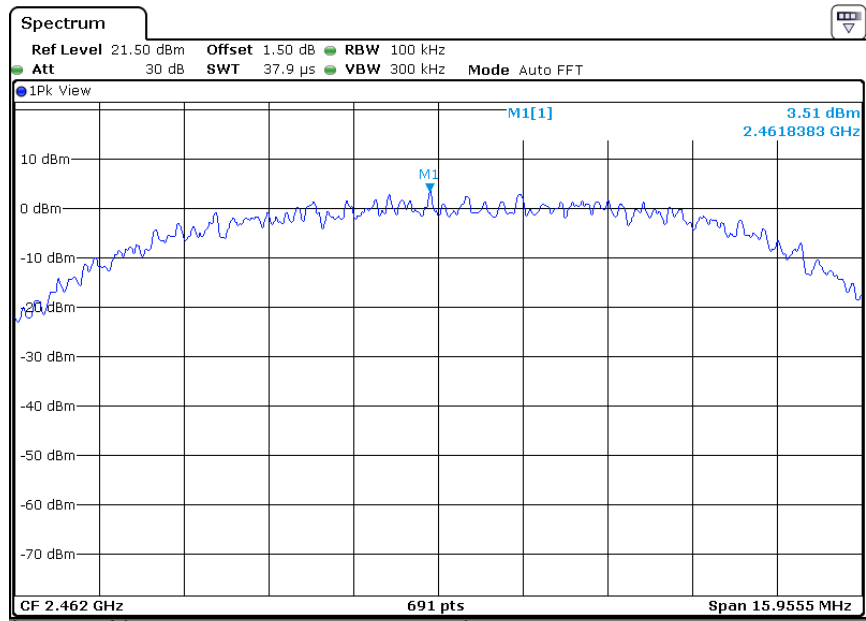
## INTERTEK TESTING SERVICES

802.11b



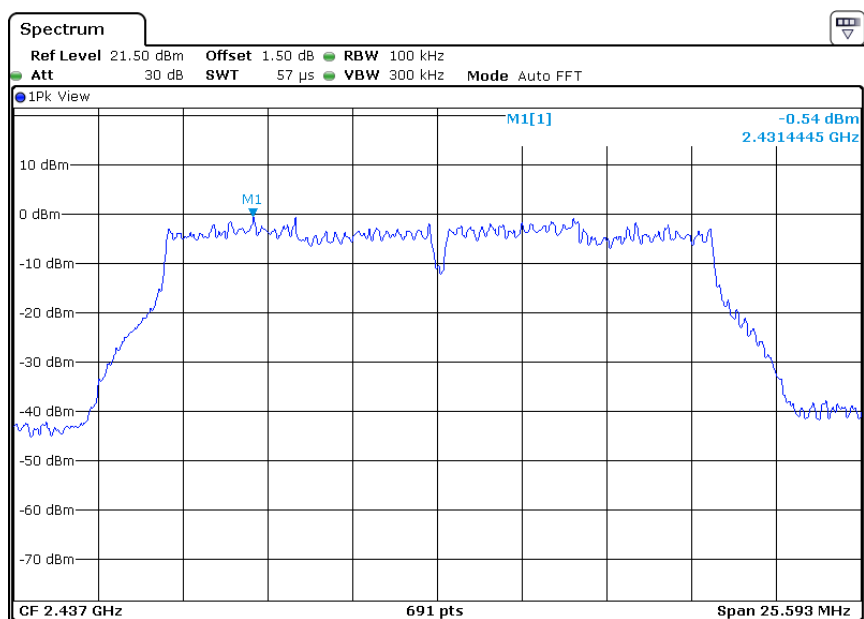
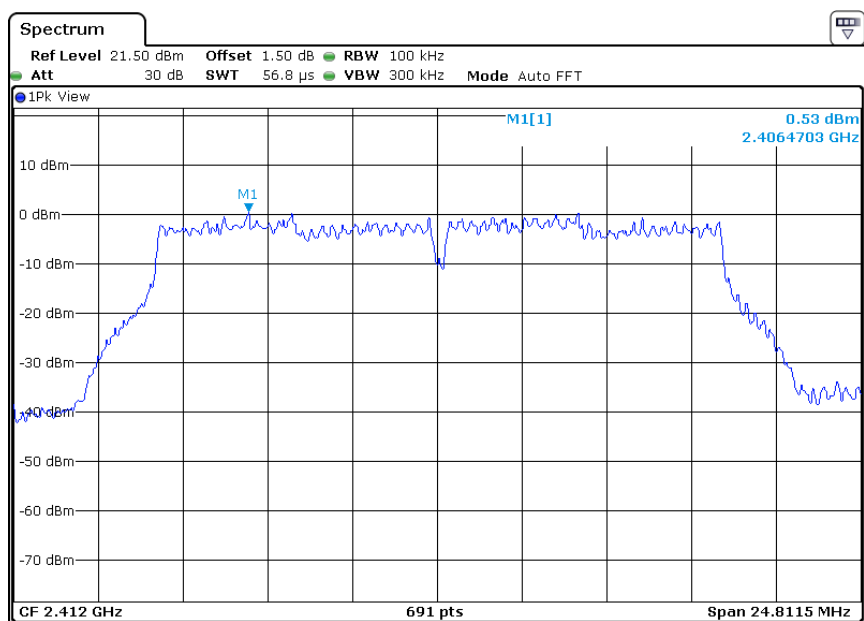
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## INTERTEK TESTING SERVICES



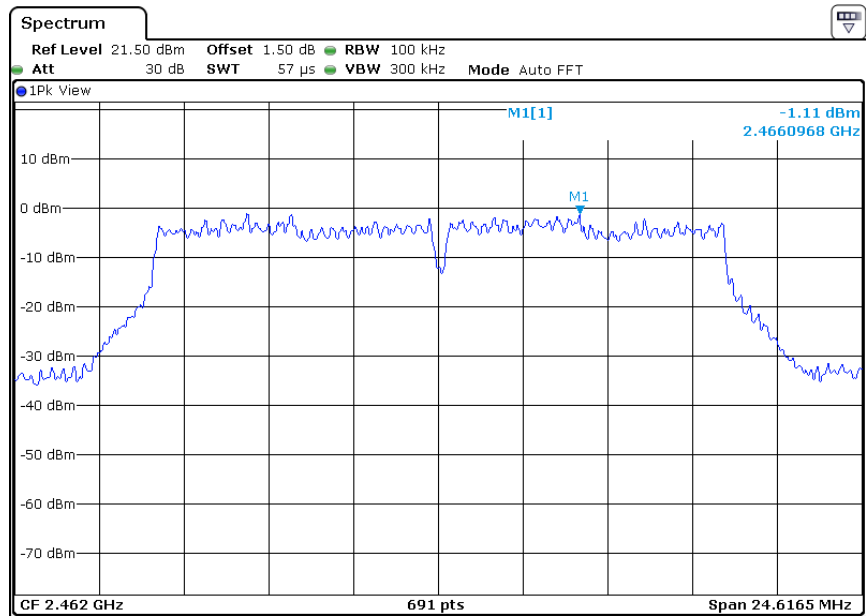
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802.11g



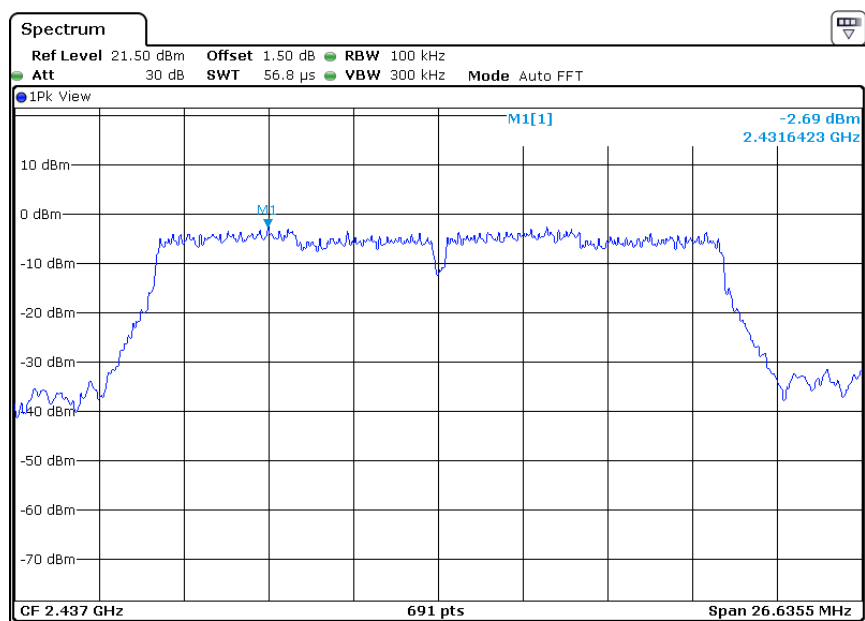
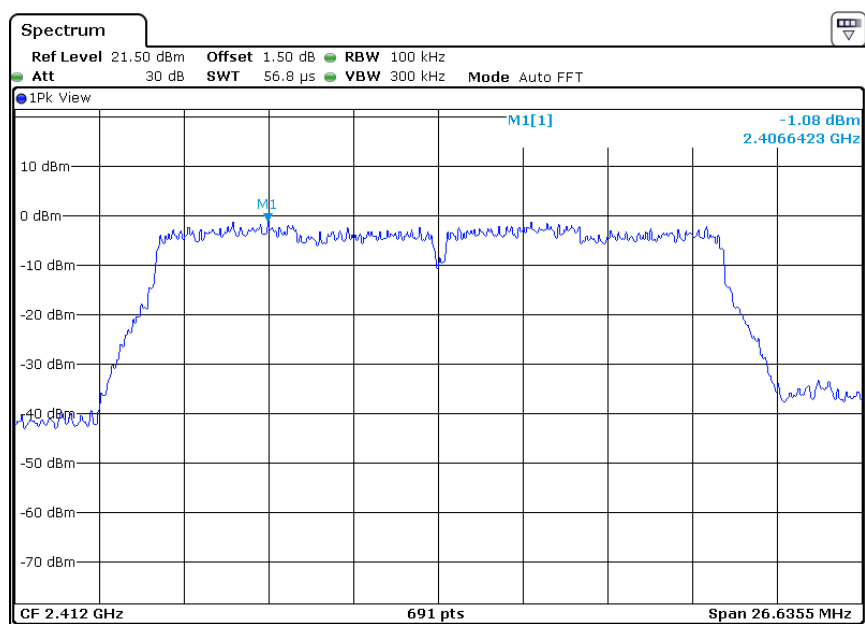
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## INTERTEK TESTING SERVICES



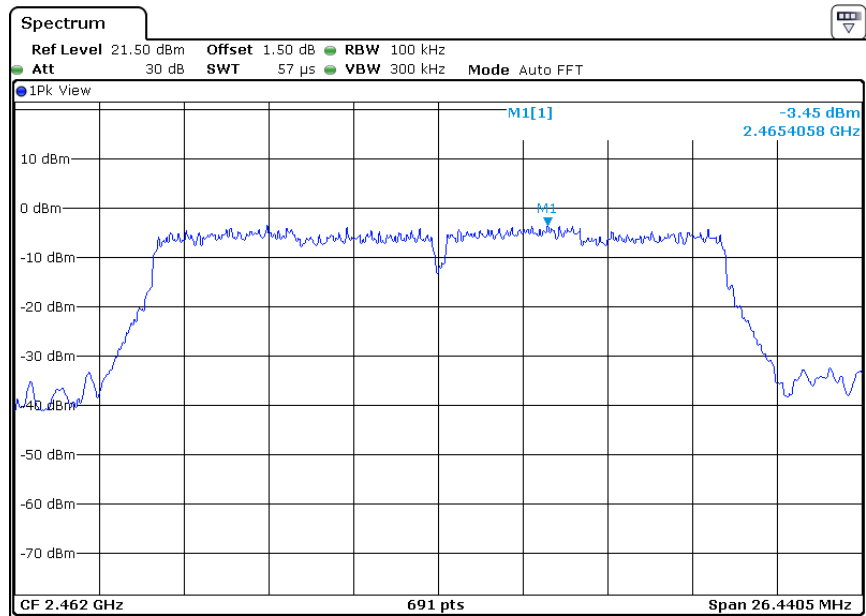
## INTERTEK TESTING SERVICES

802.11 n-HT20



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Report No.: 150319019SZN-001

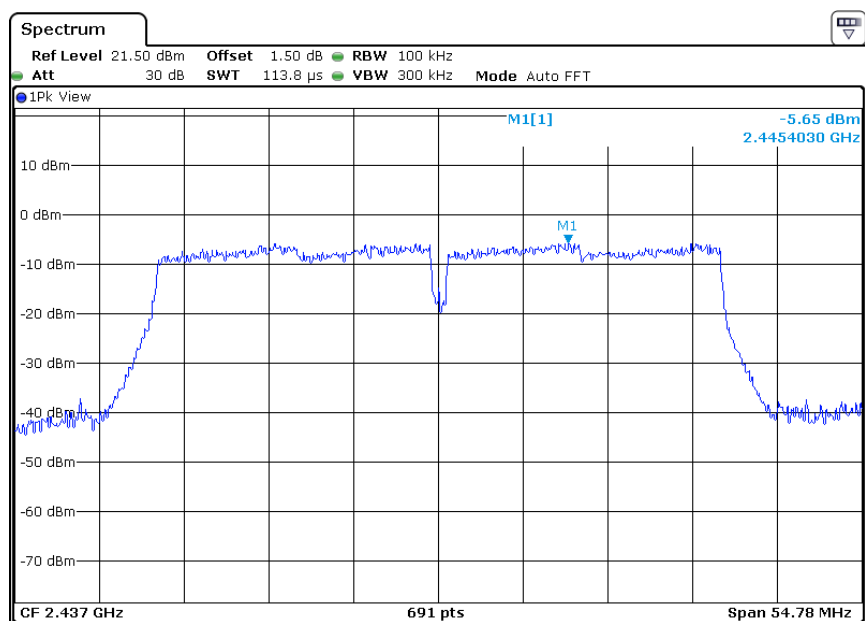
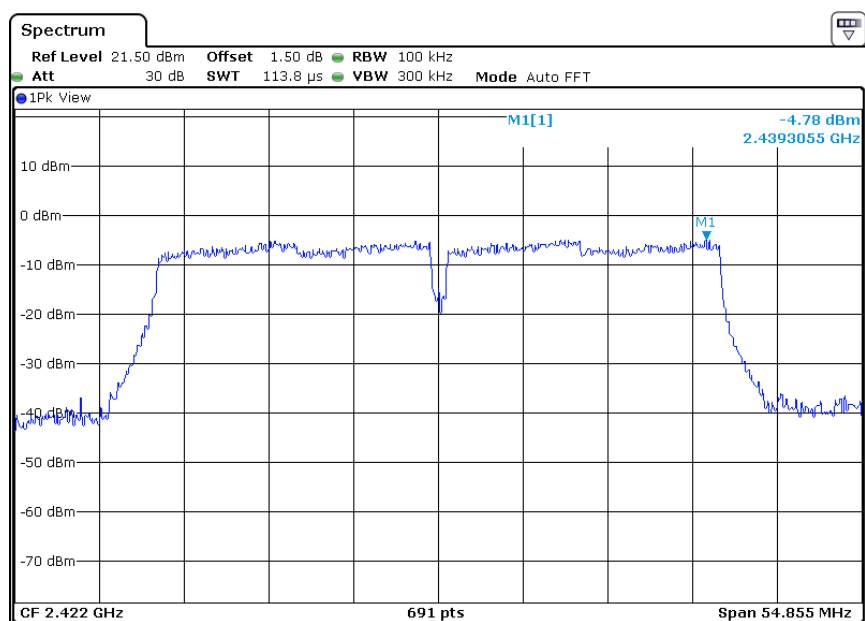
## INTERTEK TESTING SERVICES



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

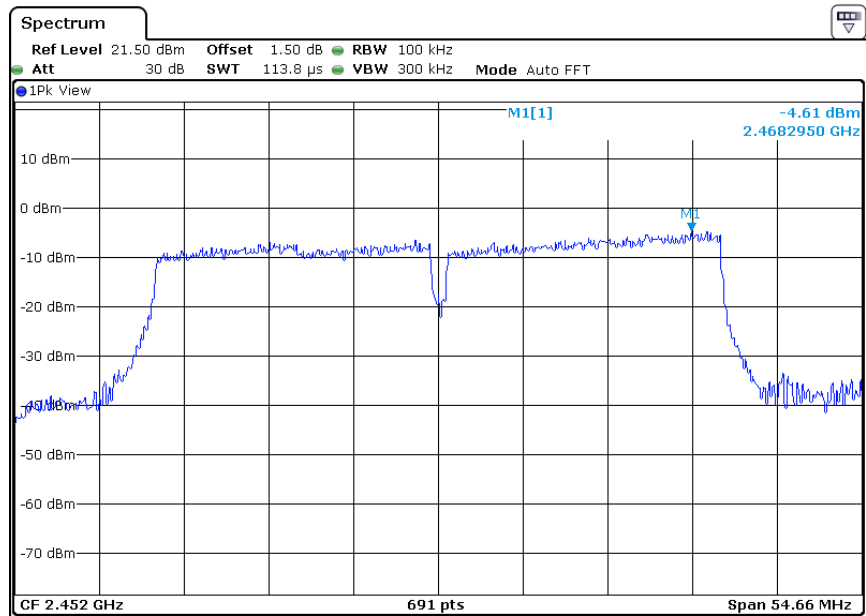
## INTERTEK TESTING SERVICES

802.11 n-HT40



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES



## INTERTEK TESTING SERVICES

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Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

### 4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

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. The Measurement Procedure was set according to the FCC KDB 558074.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n-HT20 and 13.5Mbps for 802.11n-HT40.

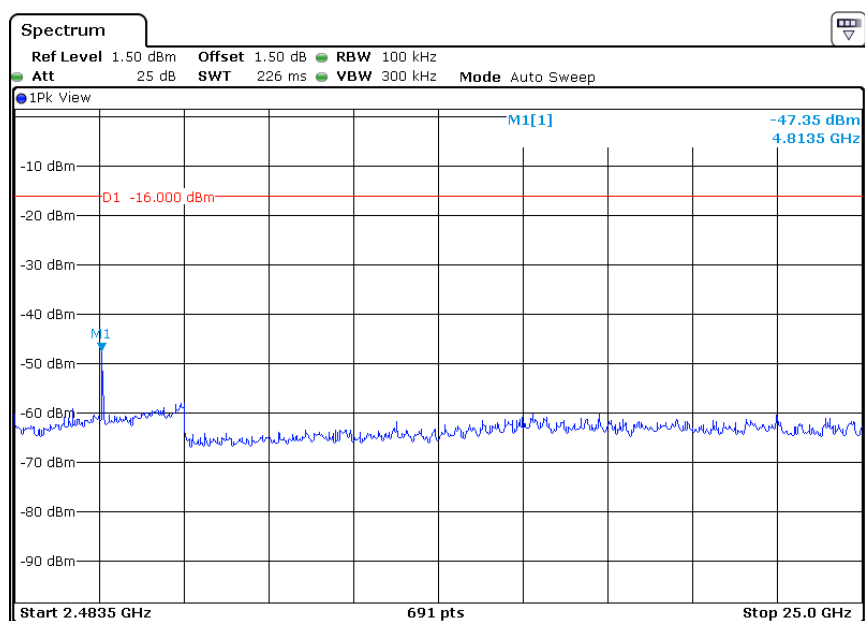
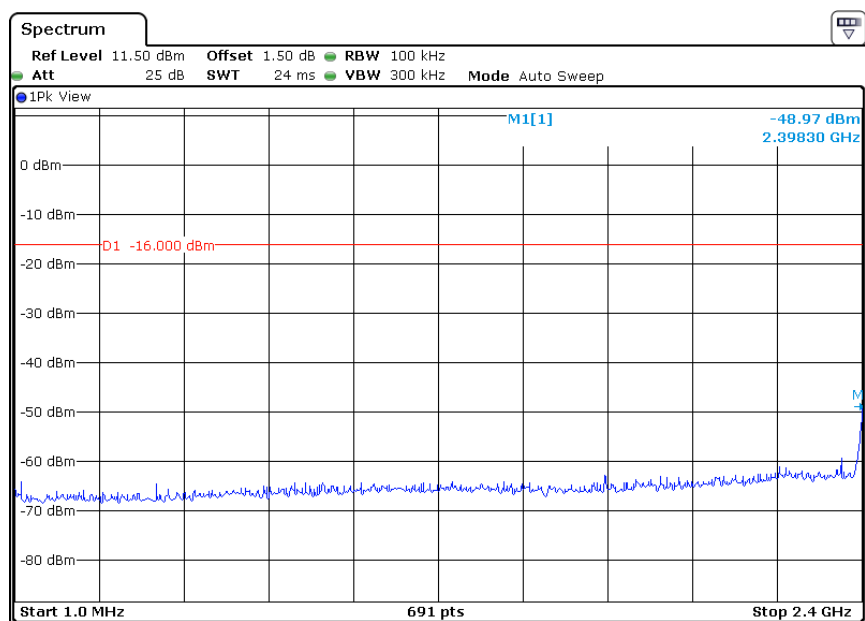
The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The test plots are attached as below.

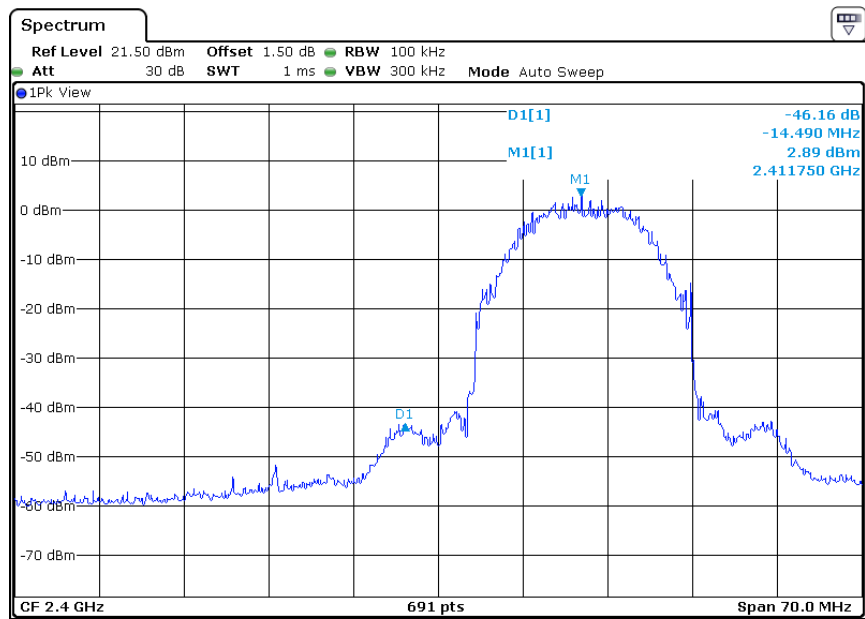
## INTERTEK TESTING SERVICES

802.11b

Channel 01 (2412MHz) Reference Level: 4.00dBm

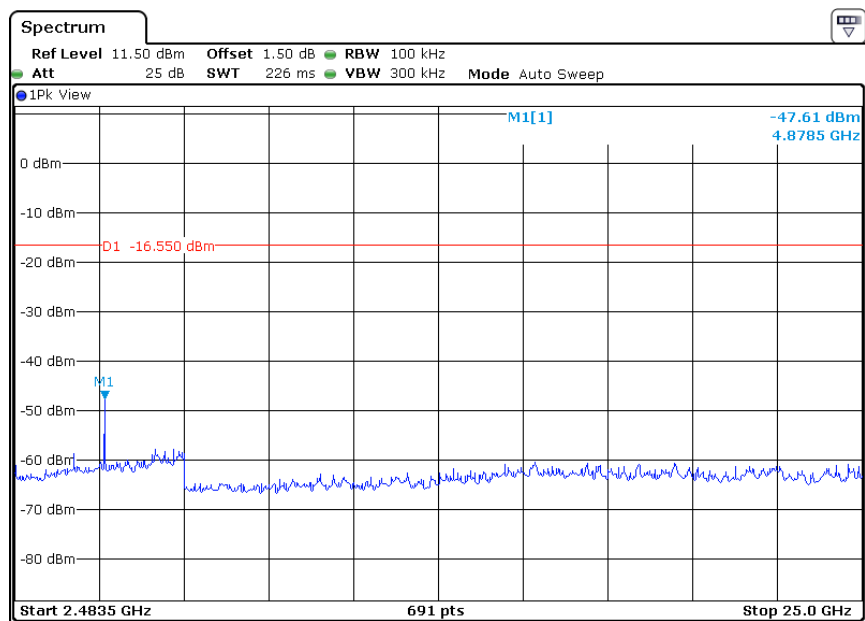
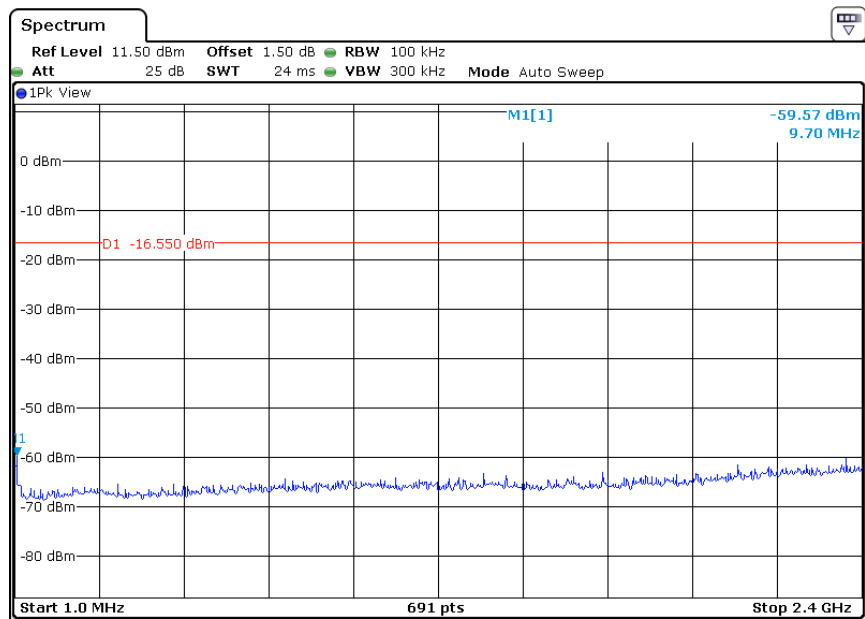


TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001



## INTERTEK TESTING SERVICES

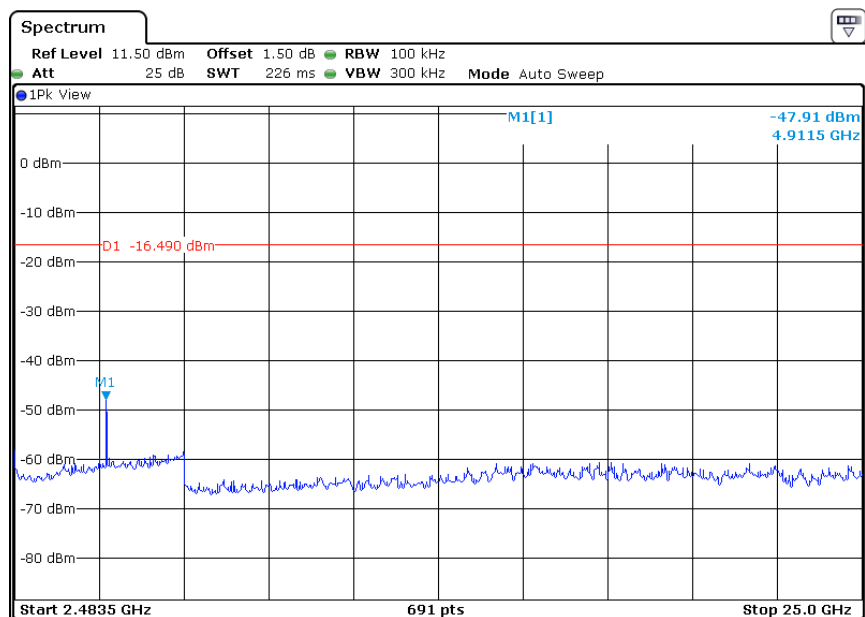
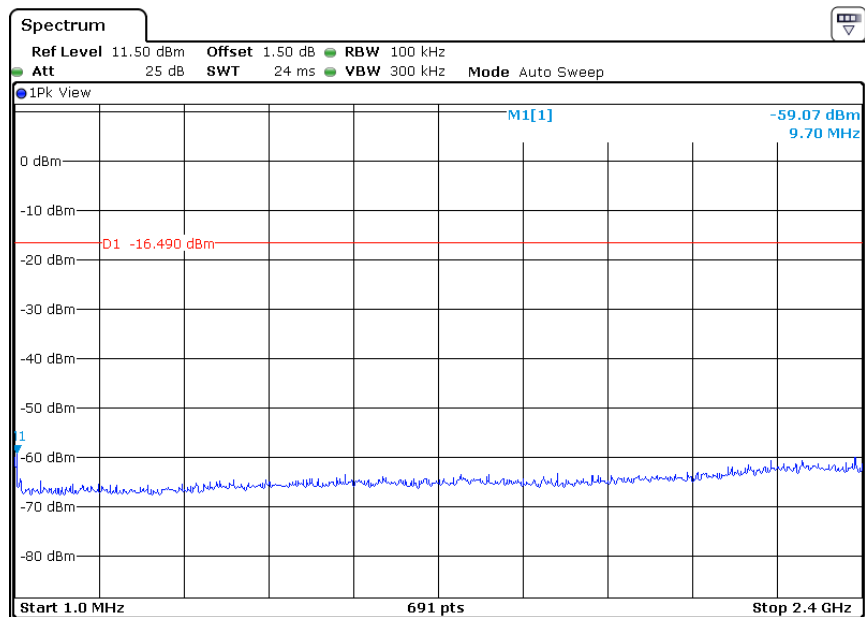
Channel 06 (2437MHz) Reference Level: 3.45dBm



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

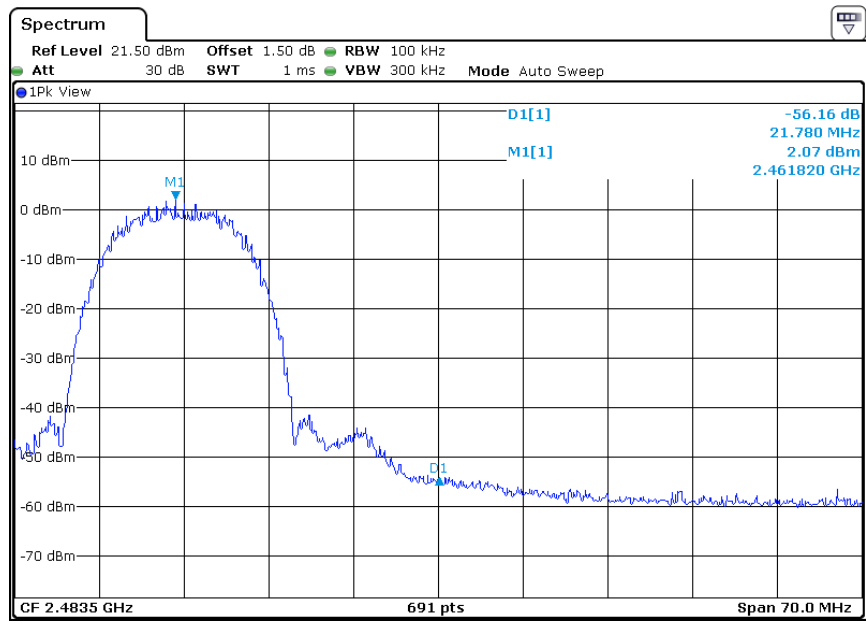
## INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: 3.51dBm



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

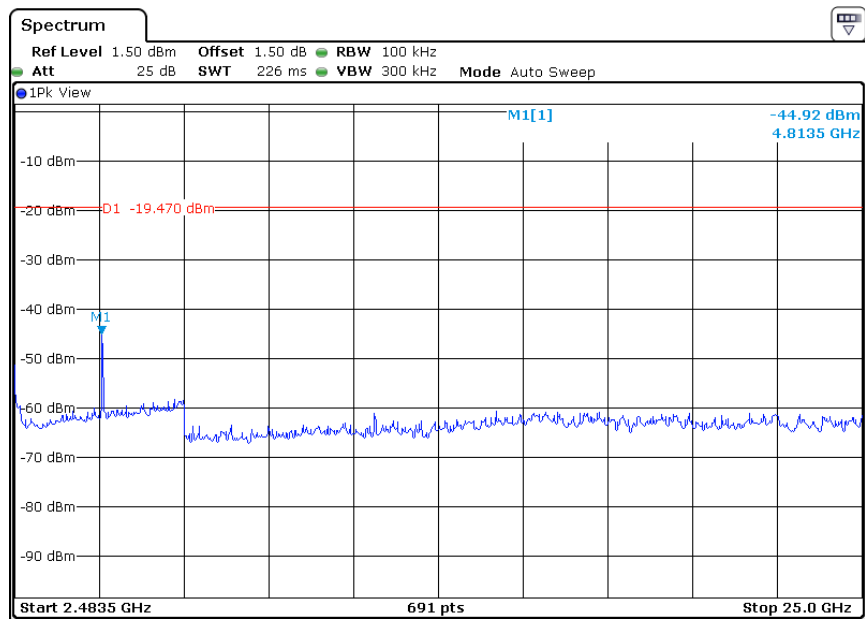
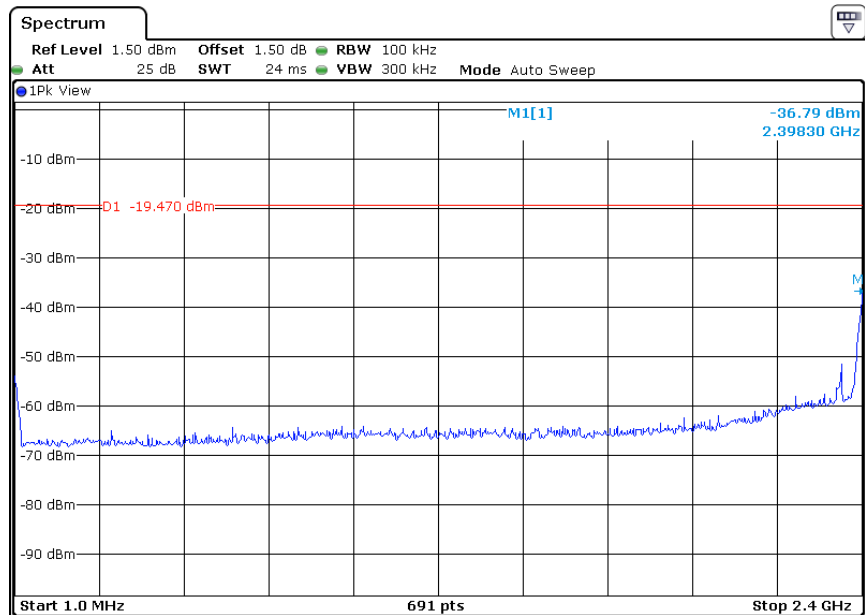
## INTERTEK TESTING SERVICES



## INTERTEK TESTING SERVICES

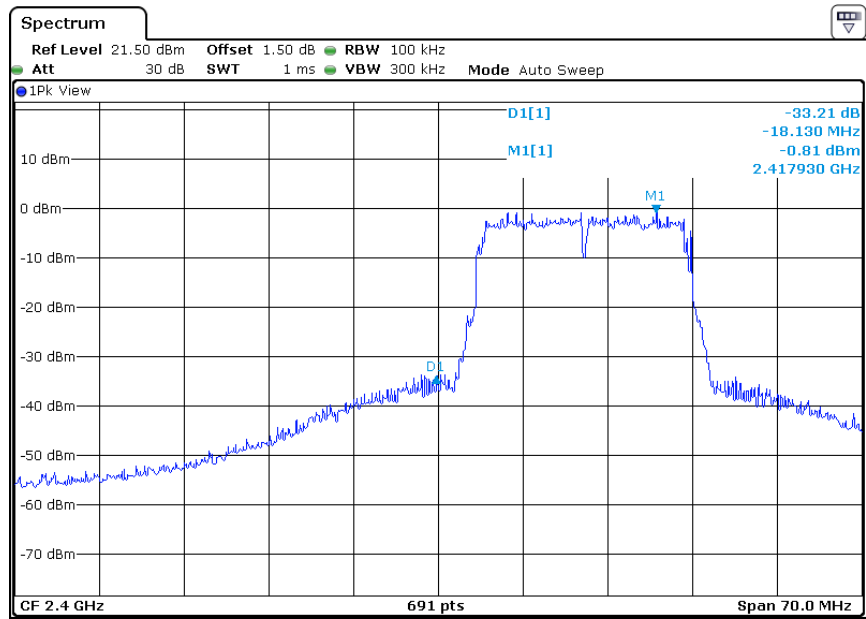
802.11g

Channel 01 (2412MHz) Reference Level: 0.53dBm



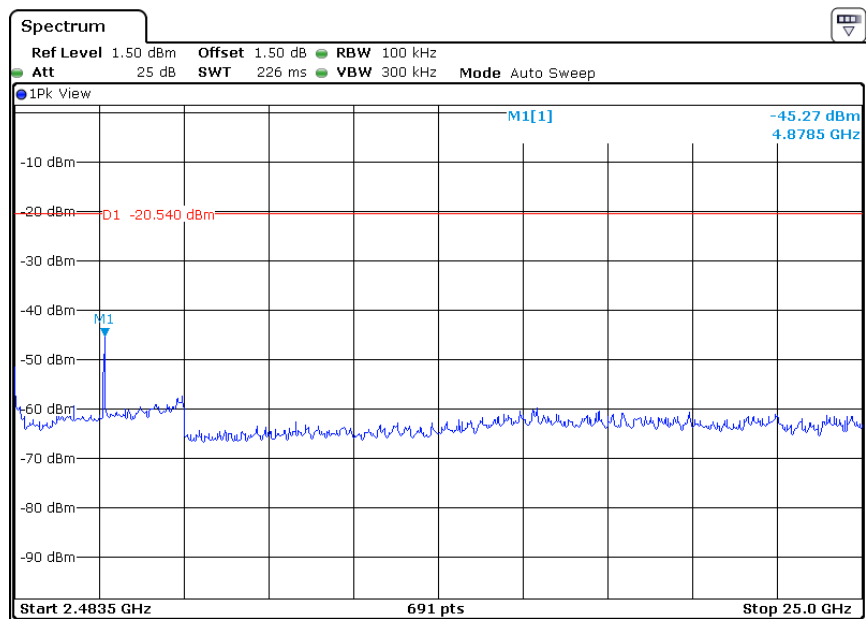
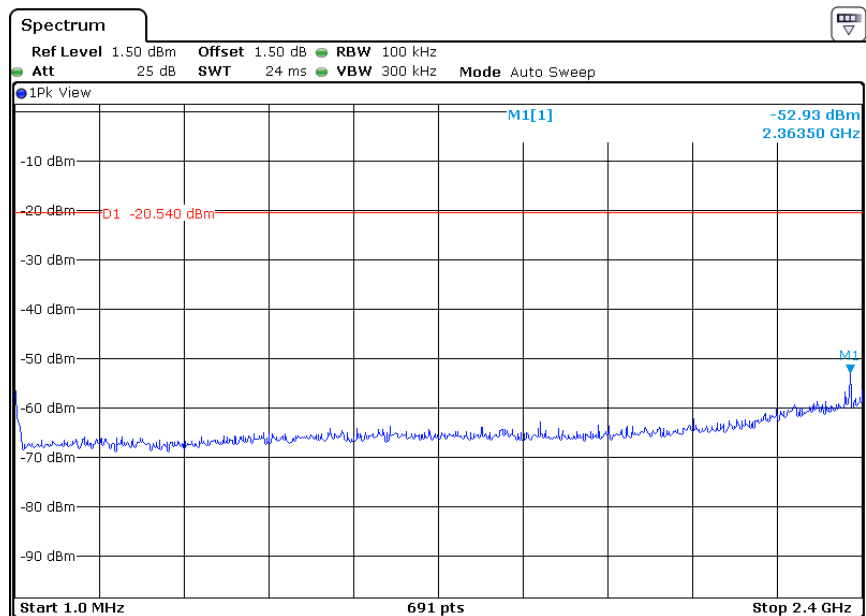
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FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES



## INTERTEK TESTING SERVICES

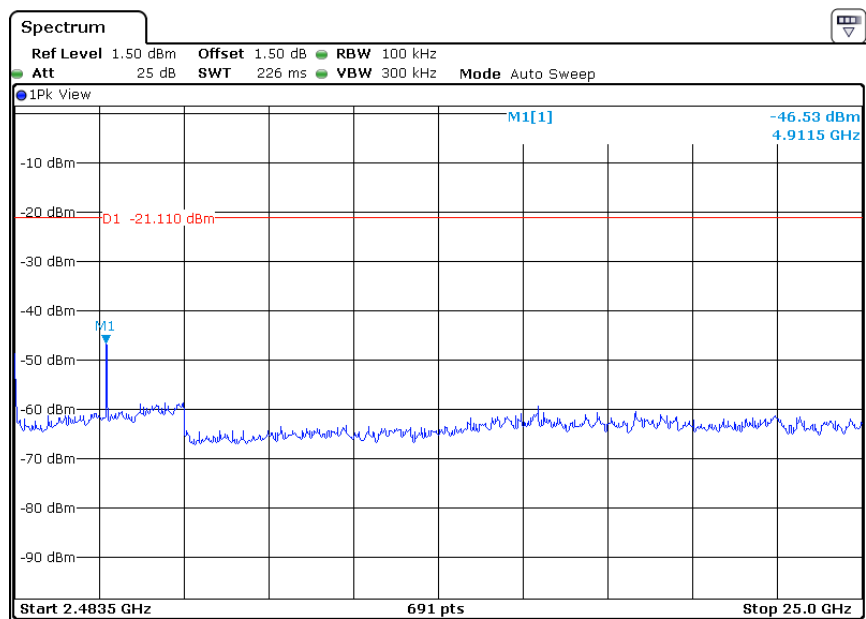
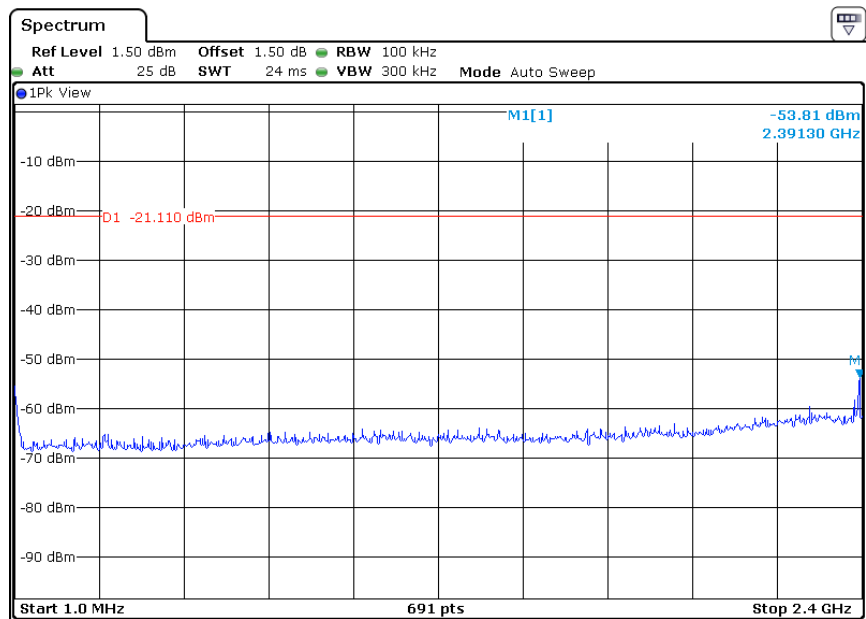
Channel 06 (2437MHz) Reference Level: -0.54dBm



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

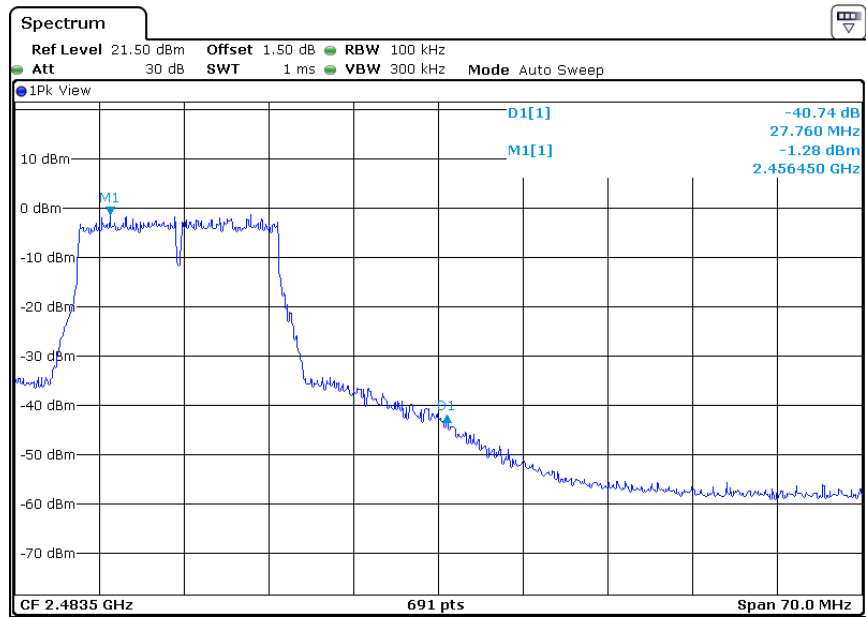
## INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: -1.11dBm



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

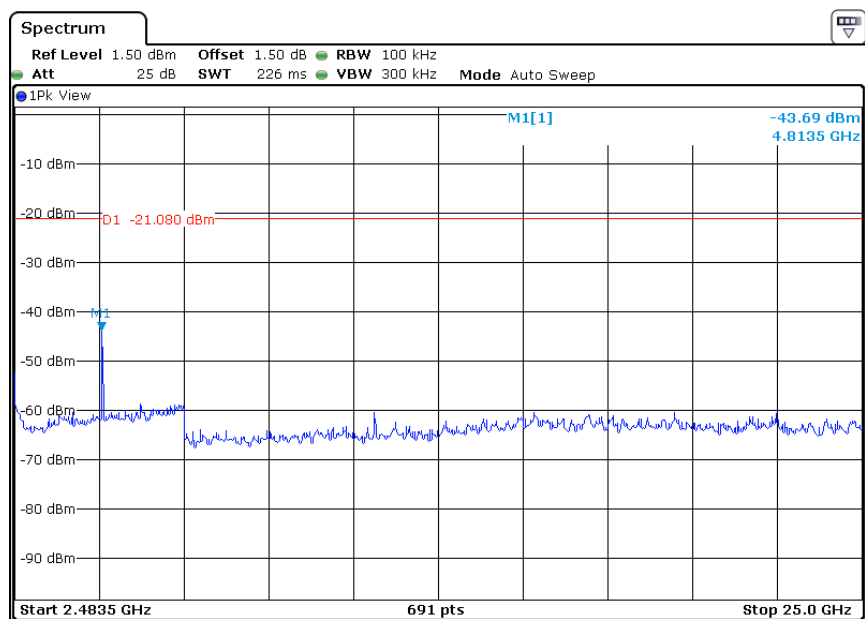
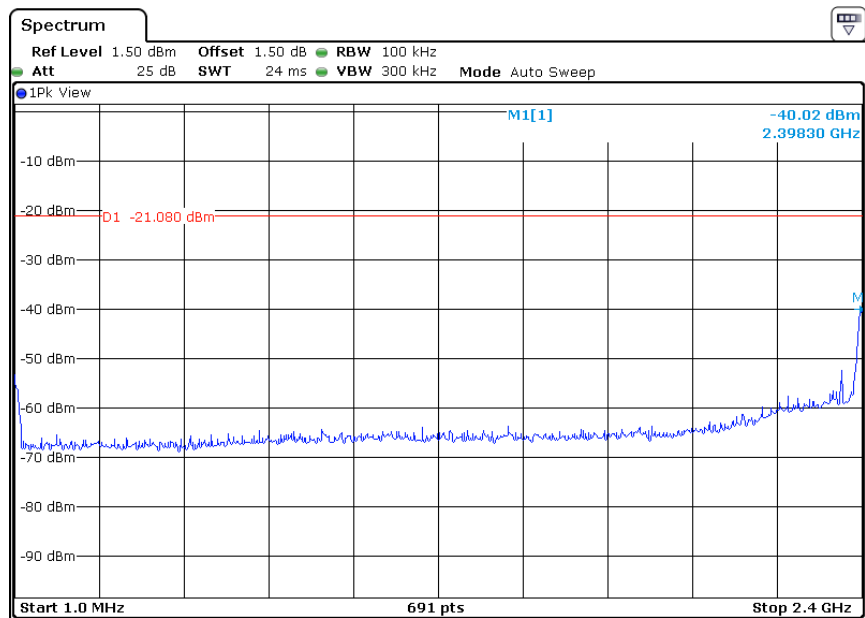
## INTERTEK TESTING SERVICES



## INTERTEK TESTING SERVICES

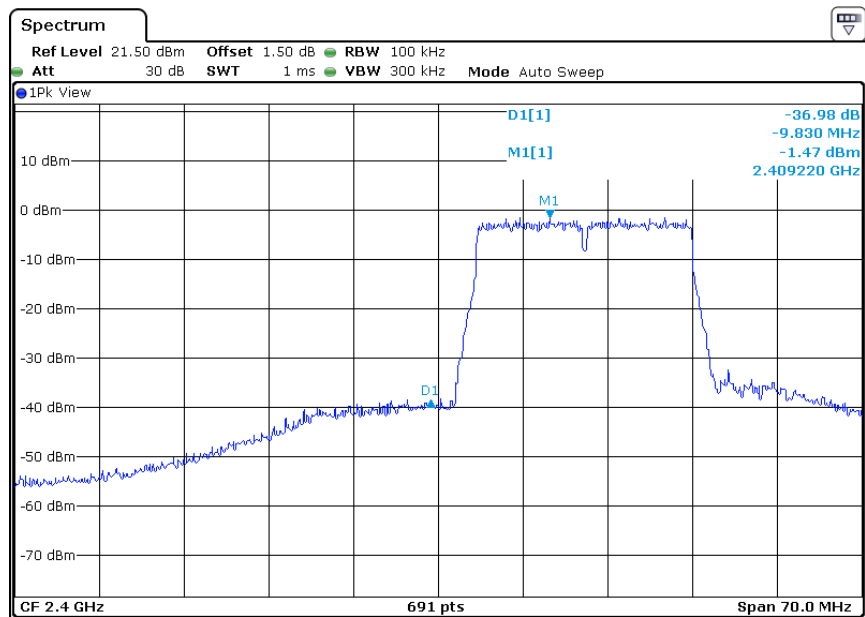
802.11 n-HT20

Channel 01 (2412MHz) Reference Level: -1.08dBm



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

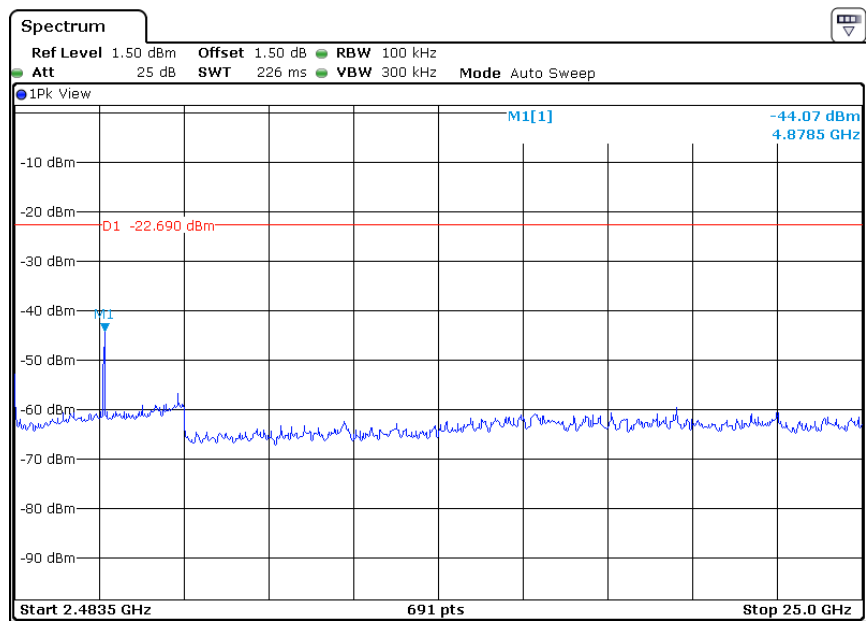
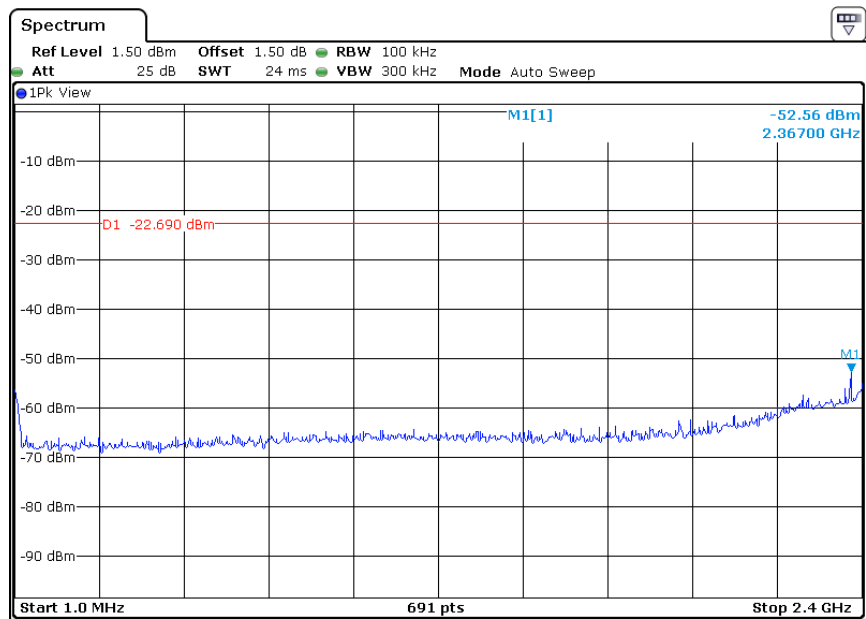
## INTERTEK TESTING SERVICES



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

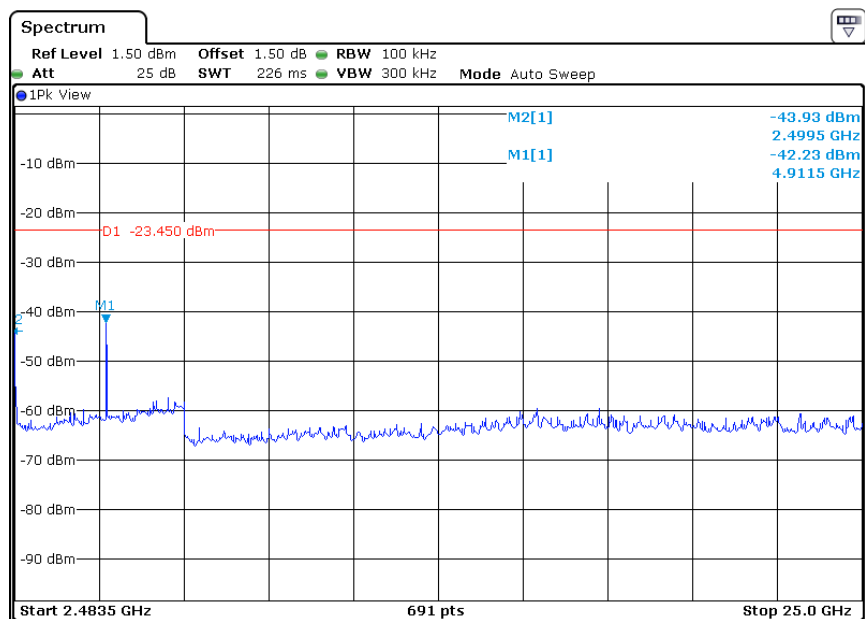
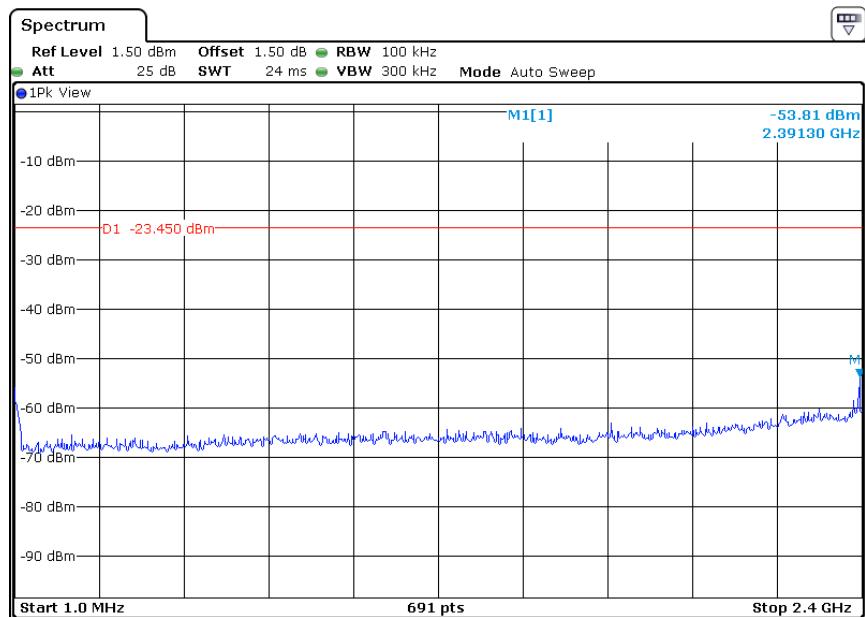
Channel 06 (2437MHz) Reference Level: -2.69dBm



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

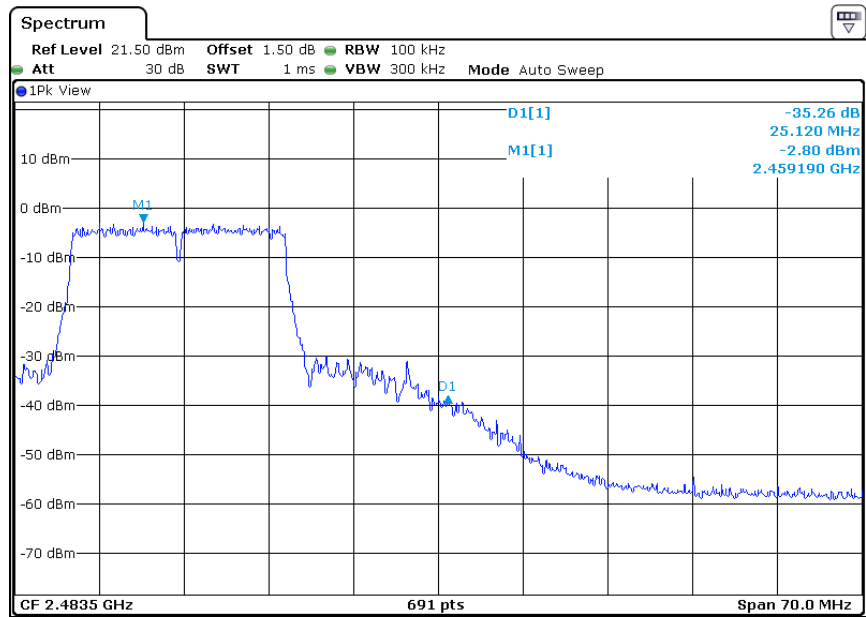
# INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: -3.45dBm



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

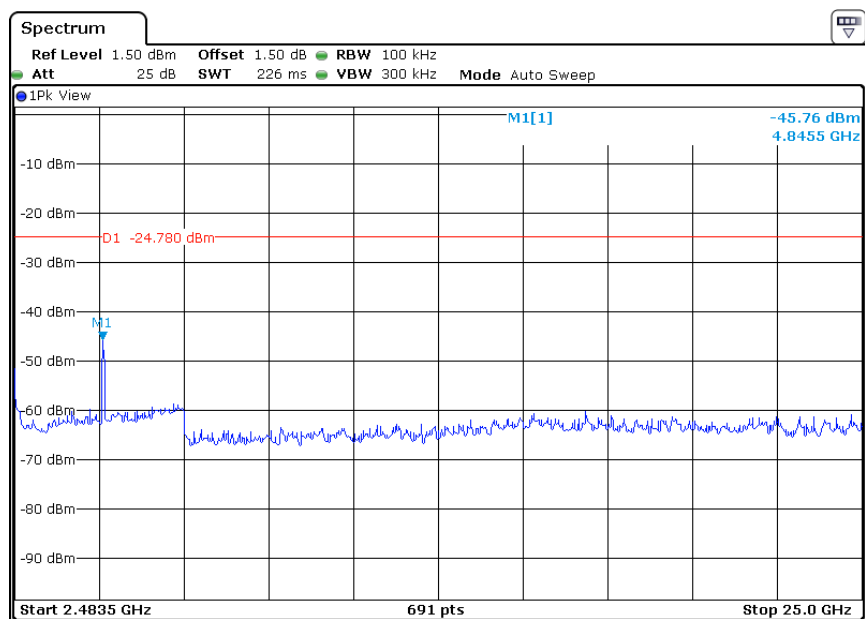
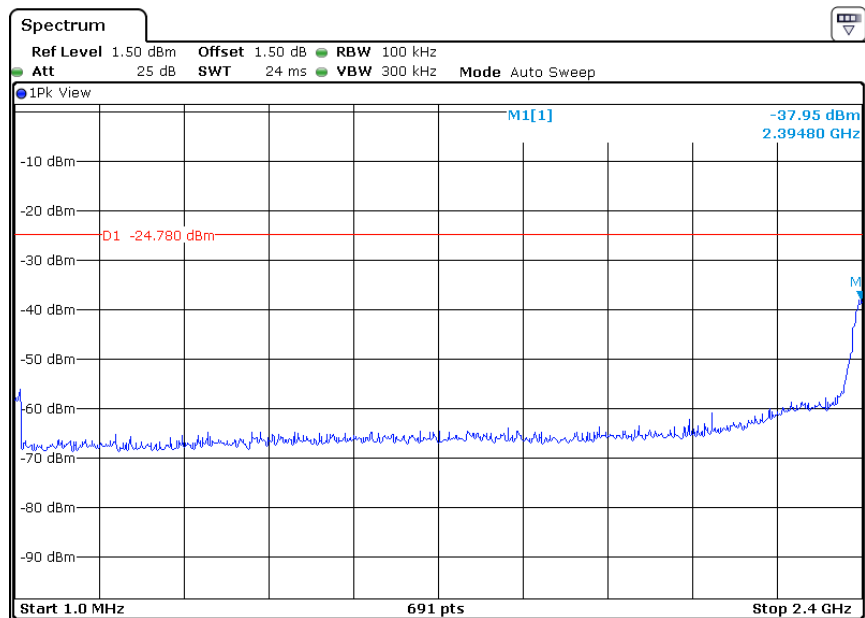


TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

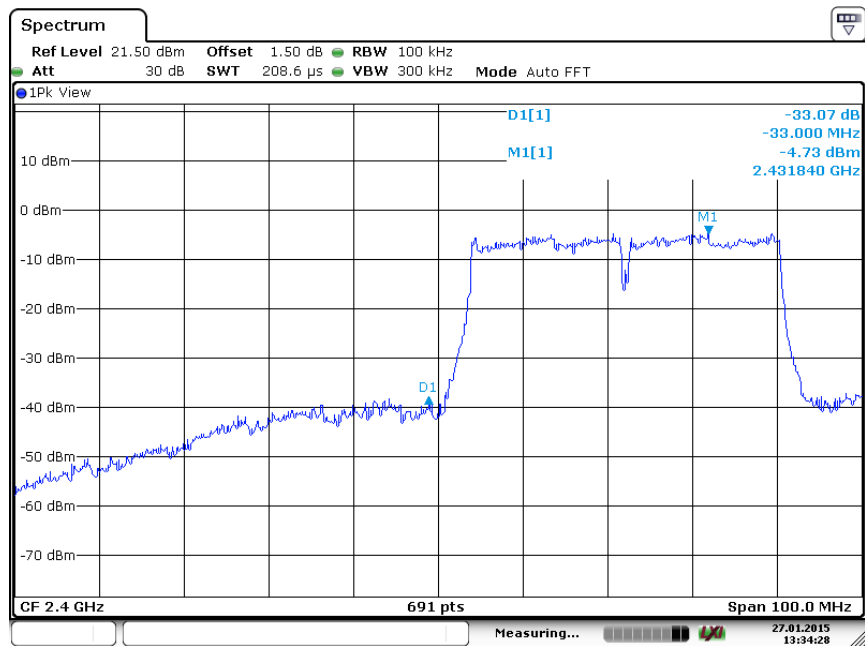
802.11 n-HT40

Channel 03 (2422MHz) Reference Level: -4.78dBm



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

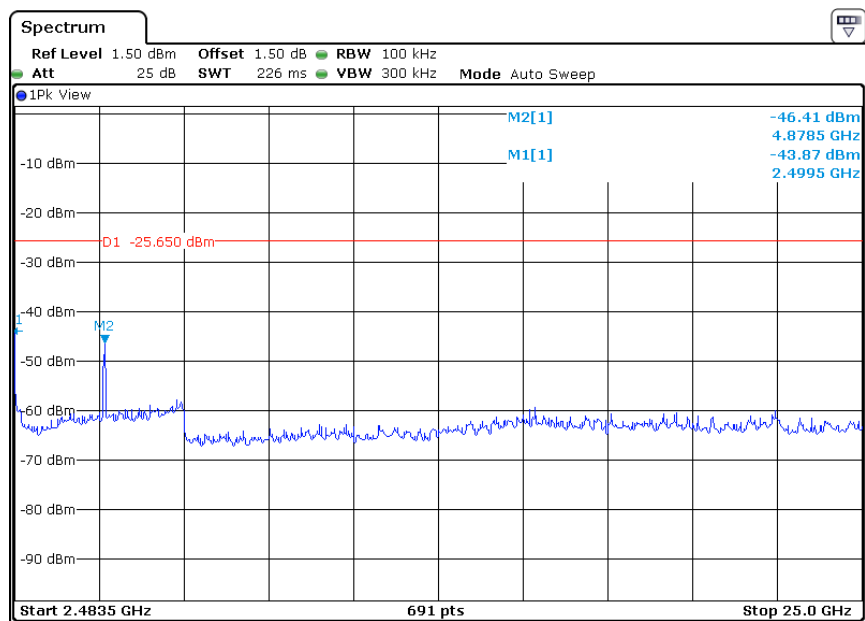
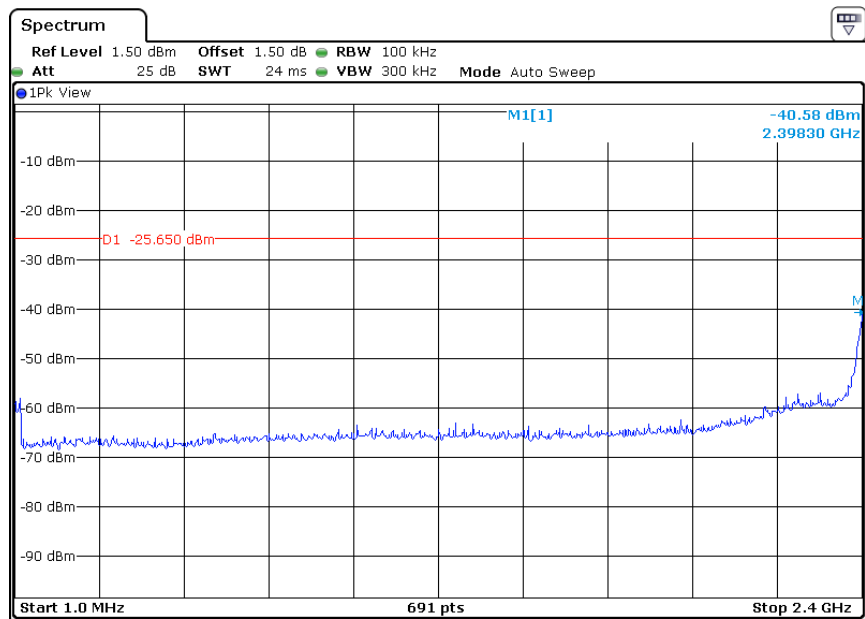


Date: 27.JAN.2015 13:34:27

TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

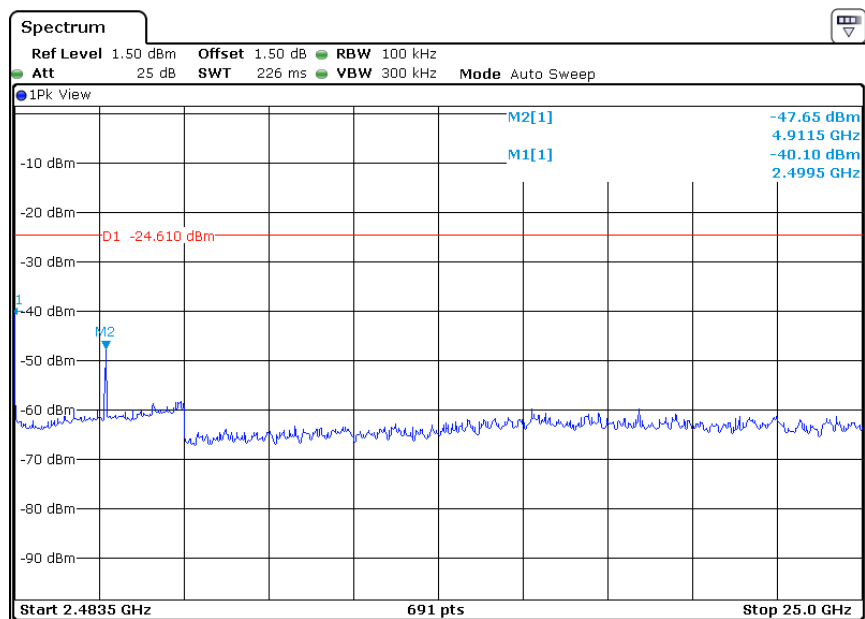
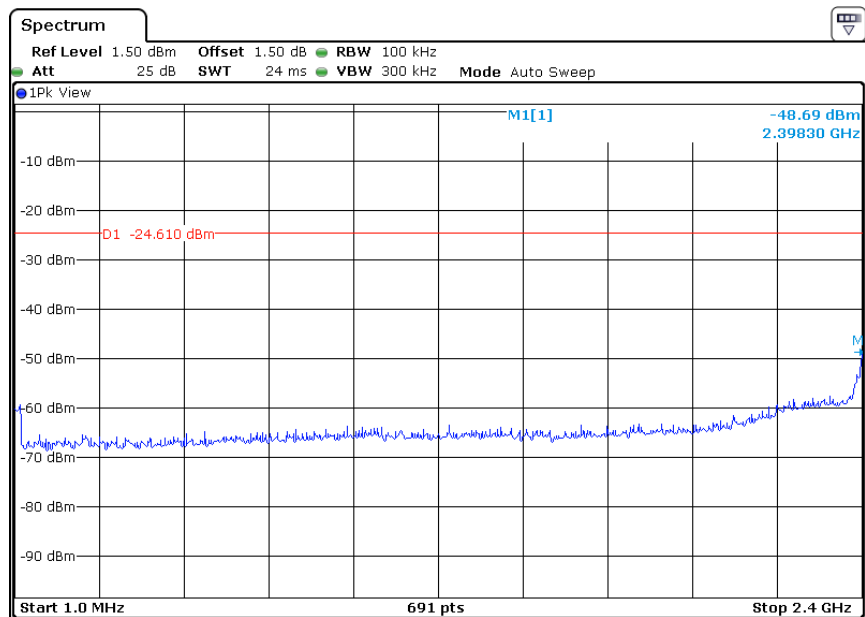
Channel 06 (2437MHz) Reference Level: -5.65dBm



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

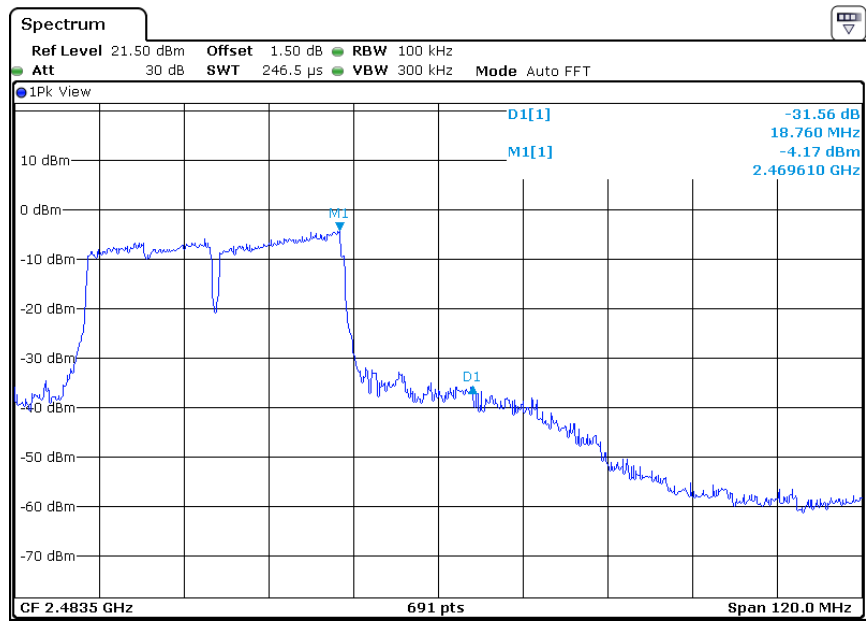
## INTERTEK TESTING SERVICES

Channel 09 (2452MHz) Reference Level: -4.61dBm



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2AEGOPANTUM-1  
Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES



## INTERTEK TESTING SERVICES

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Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

### 4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

☒ Not required, since all emissions are more than 20dB below fundamental

☐ See attached data sheet

## INTERTEK TESTING SERVICES

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Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

### 4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b), (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

## INTERTEK TESTING SERVICES

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Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

### 4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD$$

Where FS = Field Strength in dB $\mu$ V/m

RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD$$

#### Example

Assume a receiver reading of 62.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$RA = 62.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 \text{ dB}\mu\text{V/m}$$

$$\text{Level in mV/m} = \text{Common Antilogarithm} [(42 \text{ dB}\mu\text{V/m})/20] = 125.9 \mu\text{V/m}$$

TRF no.: FCC 15C\_TX\_b

FCC ID: 2AEGOPANTUM-1

Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

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Applicant: Zhuhai Pantum Electronics Co.,Ltd.  
Date of Test: January 27, 2015  
Model: M6550NW, M6552NW

### 4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission (802.11 n-HT20) at 2483.750MHz is passed by 2.0dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

Worst Case Operating Mode: 802.11n-HT20 (TX-Channel 01)

### Radiated Emissions

| Polarization | Frequency<br>(MHz) | Reading<br>(dBμV) | Pre-<br>Amp<br>Gain<br>(dB) | Antenna<br>Factor<br>(dB) | Net<br>at 3m<br>(dBμV/m) | Limit<br>at 3m<br>(dBμV/m) | Margin<br>(dB) |
|--------------|--------------------|-------------------|-----------------------------|---------------------------|--------------------------|----------------------------|----------------|
| Horizontal   | 214.330            | 43.9              | 20.0                        | 6.1                       | 30.0                     | 43.5                       | -13.5          |
| Horizontal   | 242.915            | 51.2              | 20.0                        | 10.3                      | 41.5                     | 46.0                       | -4.5           |
| Horizontal   | 351.070            | 41.3              | 20.0                        | 13.9                      | 35.2                     | 46.0                       | -10.8          |
| Vertical     | 57.645             | 37.5              | 20.0                        | 9.8                       | 27.3                     | 40.0                       | -12.7          |
| Vertical     | 143.005            | 43.4              | 20.0                        | 6.8                       | 30.2                     | 43.5                       | -13.3          |
| Vertical     | 258.300            | 44.4              | 20.0                        | 16.3                      | 40.7                     | 46.0                       | -5.3           |

NOTES: 1. Quasi-Peak detector is used except for others stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. All emissions are below the QP limit.

TRF no.: FCC 15C\_TX\_b

FCC ID: 2AEGOPANTUM-1

Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.  
 Date of Test: January 27, 2015  
 Model: M6550NW, M6552NW  
 Worst Case Operating Mode: 802.11b (TX-Channel 01)

### Radiated Emissions

| Polarization | Frequency<br>(MHz) | Reading<br>(dBμV) | Pre-<br>Amp<br>Gain<br>(dB) | Antenna<br>Factor<br>(dB) | Net<br>at 3m<br>(dBμV/m) | Peak Limit<br>at 3m<br>(dBμV/m) | Margin<br>(dB) |
|--------------|--------------------|-------------------|-----------------------------|---------------------------|--------------------------|---------------------------------|----------------|
| Horizontal   | *4824.000          | 52.9              | 36.1                        | 34.2                      | 51.0                     | 74.0                            | -23.0          |
| Horizontal   | *7236.000          | 55.5              | 36.8                        | 36.9                      | 55.6                     | 74.0                            | -18.4          |
| Horizontal   | *9648.000          | 61.0              | 36.2                        | 36.2                      | 61.0                     | 74.0                            | -13.0          |
| Horizontal   | *2389.071          | 47.1              | 20.0                        | 28.2                      | 55.3                     | 74.0                            | -18.7          |

| Polarization | Frequency<br>(MHz) | Reading<br>(dBμV) | Pre-<br>Amp<br>Gain<br>(dB) | Antenna<br>Factor<br>(dB) | Net<br>at 3m<br>(dBμV/m) | Average Limit<br>at 3m<br>(dBμV/m) | Margin<br>(dB) |
|--------------|--------------------|-------------------|-----------------------------|---------------------------|--------------------------|------------------------------------|----------------|
| Horizontal   | *4824.000          | 40.3              | 36.1                        | 34.2                      | 38.4                     | 54.0                               | -15.6          |
| Horizontal   | *7236.000          | 43.1              | 36.8                        | 36.9                      | 43.2                     | 54.0                               | -10.8          |
| Horizontal   | *9648.000          | 47.2              | 36.2                        | 36.2                      | 47.2                     | 54.0                               | -6.8           |
| Horizontal   | *2389.071          | 40.1              | 20.0                        | 28.2                      | 48.3                     | 54.0                               | -5.7           |

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.
- \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

Worst Case Operating Mode: 802.11b (TX-Channel 06)

### Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | *4874.000       | 52.9           | 36.1              | 34.6                | 51.4               | 74.0                      | -22.6       |
| Horizontal   | *7311.000       | 55.3           | 35.6              | 37.1                | 56.8               | 74.0                      | -17.2       |
| Horizontal   | *9748.000       | 59.3           | 36.3              | 38.5                | 61.5               | 74.0                      | -12.5       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | *4874.000       | 39.8           | 36.1              | 34.6                | 38.3               | 54.0                         | -15.7       |
| Horizontal   | *7311.000       | 42.3           | 35.6              | 37.1                | 43.8               | 54.0                         | -10.2       |
| Horizontal   | *9748.000       | 45.0           | 36.3              | 38.5                | 47.2               | 54.0                         | -6.8        |

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.
- \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

Worst Case Operating Mode: 802.11b (TX-Channel 11)

### Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | *4924.000       | 53.0           | 36.1              | 34.6                | 51.5               | 74.0                      | -22.5       |
| Horizontal   | *7386.000       | 54.7           | 35.6              | 37.2                | 56.3               | 74.0                      | -17.7       |
| Horizontal   | *9848.000       | 58.7           | 36.3              | 38.6                | 61.0               | 74.0                      | -13.0       |
| Horizontal   | *2485.300       | 44.0           | 20.0              | 28.0                | 52.0               | 74.0                      | -22.0       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | *4924.000       | 39.9           | 36.1              | 34.6                | 38.4               | 54.0                         | -15.6       |
| Horizontal   | *7386.000       | 41.6           | 35.6              | 37.2                | 43.2               | 54.0                         | -10.8       |
| Horizontal   | *9848.000       | 45.7           | 36.3              | 38.6                | 48.0               | 54.0                         | -6.0        |
| Horizontal   | *2485.300       | 38.5           | 20.0              | 28.0                | 46.5               | 54.0                         | -7.5        |

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.
- \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TRF no.: FCC 15C\_TX\_b

FCC ID: 2AEGOPANTUM-1

Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

Worst Case Operating Mode: 802.11g (TX-Channel 01)

### Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | *4824.000       | 52.2           | 36.1              | 34.2                | 50.3               | 74.0                      | -23.7       |
| Horizontal   | *7236.000       | 55.8           | 36.8              | 36.9                | 55.9               | 74.0                      | -18.1       |
| Horizontal   | *9648.000       | 60.7           | 35.6              | 36.2                | 61.3               | 74.0                      | -12.7       |
| Horizontal   | *2388.690       | 52.0           | 20.0              | 28.2                | 60.2               | 74.0                      | -13.8       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | *4824.000       | 39.4           | 36.1              | 34.2                | 37.5               | 54.0                         | -16.5       |
| Horizontal   | *7236.000       | 42.9           | 36.8              | 36.9                | 43.0               | 54.0                         | -11.0       |
| Horizontal   | *9648.000       | 44.7           | 35.6              | 36.2                | 45.3               | 54.0                         | -8.7        |
| Horizontal   | *2388.690       | 39.8           | 20.0              | 28.2                | 48.0               | 54.0                         | -6.0        |

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.
- \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TRF no.: FCC 15C\_TX\_b

FCC ID: 2AEGOPANTUM-1

Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

Worst Case Operating Mode: 802.11g (TX-Channel 06)

### Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | *4874.000       | 52.0           | 36.1              | 34.6                | 50.5               | 74.0                      | -23.5       |
| Horizontal   | *7311.000       | 55.0           | 35.6              | 37.1                | 56.5               | 74.0                      | -17.5       |
| Horizontal   | *9748.000       | 59.3           | 36.8              | 38.5                | 61.0               | 74.0                      | -13.0       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | *4874.000       | 38.4           | 36.1              | 34.6                | 36.9               | 54.0                         | -17.1       |
| Horizontal   | *7311.000       | 41.3           | 35.6              | 37.1                | 42.8               | 54.0                         | -11.2       |
| Horizontal   | *9748.000       | 44.6           | 36.8              | 38.5                | 46.3               | 54.0                         | -7.7        |

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.
- \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TRF no.: FCC 15C\_TX\_b

FCC ID: 2AEGOPANTUM-1

Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

Worst Case Operating Mode: 802.11g (TX-Channel 11)

### Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | *4924.000       | 51.8           | 36.1              | 34.6                | 50.3               | 74.0                      | -23.7       |
| Horizontal   | *7386.000       | 54.6           | 35.6              | 37.2                | 56.2               | 74.0                      | -17.8       |
| Horizontal   | *9848.000       | 58.5           | 35.6              | 38.6                | 61.5               | 74.0                      | -12.5       |
| Horizontal   | *2484.660       | 54.0           | 20.0              | 28.0                | 62.0               | 74.0                      | -12.0       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | *4924.000       | 39.0           | 36.1              | 34.6                | 37.5               | 54.0                         | -16.5       |
| Horizontal   | *7386.000       | 41.4           | 35.6              | 37.2                | 43.0               | 54.0                         | -11.0       |
| Horizontal   | *9848.000       | 44.3           | 35.6              | 38.6                | 47.3               | 54.0                         | -6.7        |
| Horizontal   | *2484.660       | 41.2           | 20.0              | 28.0                | 49.2               | 54.0                         | -4.8        |

- NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
  2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
  3. Negative value in the margin column shows emission below limit.
  4. Horn antenna used for the emission over 1000MHz.
- \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TRF no.: FCC 15C\_TX\_b

FCC ID: 2AEGOPANTUM-1

Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

Worst Case Operating Mode: 802.11n-HT20 (TX-Channel 01)

### Radiated Emissions

| Polarization | Frequency<br>(MHz) | Reading<br>(dBμV) | Pre-<br>Amp<br>Gain<br>(dB) | Antenna<br>Factor<br>(dB) | Net<br>at 3m<br>(dBμV/m) | Peak Limit<br>at 3m<br>(dBμV/m) | Margin<br>(dB) |
|--------------|--------------------|-------------------|-----------------------------|---------------------------|--------------------------|---------------------------------|----------------|
| Horizontal   | *4824.000          | 52.7              | 36.1                        | 34.2                      | 50.8                     | 74.0                            | -23.2          |
| Horizontal   | *7236.000          | 56.8              | 36.8                        | 36.9                      | 56.9                     | 74.0                            | -17.1          |
| Horizontal   | *9648.000          | 60.7              | 35.6                        | 36.2                      | 61.3                     | 74.0                            | -12.7          |
| Horizontal   | *2389.860          | 53.8              | 20.0                        | 28.2                      | 62.0                     | 74.0                            | -12.0          |

| Polarization | Frequency<br>(MHz) | Reading<br>(dBμV) | Pre-<br>Amp<br>Gain<br>(dB) | Antenna<br>Factor<br>(dB) | Net<br>at 3m<br>(dBμV/m) | Average Limit<br>at 3m<br>(dBμV/m) | Margin<br>(dB) |
|--------------|--------------------|-------------------|-----------------------------|---------------------------|--------------------------|------------------------------------|----------------|
| Horizontal   | *4824.000          | 39.7              | 36.1                        | 34.2                      | 37.8                     | 54.0                               | -16.2          |
| Horizontal   | *7236.000          | 43.6              | 36.8                        | 36.9                      | 43.7                     | 54.0                               | -10.3          |
| Horizontal   | *9648.000          | 47.0              | 35.6                        | 36.2                      | 47.6                     | 54.0                               | -6.4           |
| Horizontal   | *2389.860          | 43.5              | 20.0                        | 28.2                      | 51.7                     | 54.0                               | -2.3           |

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.
- \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TRF no.: FCC 15C\_TX\_b

FCC ID: 2AEGOPANTUM-1

Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

Worst Case Operating Mode: 802.11n-HT20 (TX-Channel 06)

### Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | *4874.000       | 53.0           | 36.1              | 34.2                | 51.1               | 74.0                      | -22.9       |
| Horizontal   | *7311.000       | 54.8           | 35.6              | 37.1                | 56.3               | 74.0                      | -17.7       |
| Horizontal   | *9748.000       | 59.9           | 36.8              | 38.5                | 61.6               | 74.0                      | -12.4       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | *4874.000       | 39.7           | 36.1              | 34.2                | 37.8               | 54.0                         | -16.2       |
| Horizontal   | *7311.000       | 41.7           | 35.6              | 37.1                | 43.2               | 54.0                         | -10.8       |
| Horizontal   | *9748.000       | 45.8           | 36.8              | 38.5                | 47.5               | 54.0                         | -6.5        |

- NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
  2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
  3. Negative value in the margin column shows emission below limit.
  4. Horn antenna used for the emission over 1000MHz.
- \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TRF no.: FCC 15C\_TX\_b

FCC ID: 2AEGOPANTUM-1

Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

Worst Case Operating Mode: 802.11n-HT20 (TX-Channel 11)

### Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | *4924.000       | 52.5           | 36.1              | 34.6                | 51.0               | 74.0                      | -23.0       |
| Horizontal   | *7386.000       | 54.9           | 35.6              | 37.2                | 56.5               | 74.0                      | -17.5       |
| Horizontal   | *9848.000       | 58.0           | 35.6              | 38.6                | 61.0               | 74.0                      | -13.0       |
| Horizontal   | *2483.750       | 55.2           | 20.0              | 28.0                | 63.2               | 74.0                      | -10.8       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | *4924.000       | 39.5           | 36.1              | 34.6                | 38.0               | 54.0                         | -16.0       |
| Horizontal   | *7386.000       | 43.7           | 35.6              | 37.2                | 45.3               | 54.0                         | -8.7        |
| Horizontal   | *9848.000       | 45.0           | 35.6              | 38.6                | 48.0               | 54.0                         | -6.0        |
| Horizontal   | *2483.750       | 44.0           | 20.0              | 28.0                | 52.0               | 54.0                         | -2.0        |

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.
- \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TRF no.: FCC 15C\_TX\_b

FCC ID: 2AEGOPANTUM-1

Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

Worst Case Operating Mode: 802.11n-HT40 (TX-Channel 03)

### Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | *4824.000       | 52.4           | 36.1              | 34.2                | 50.5               | 74.0                      | -23.5       |
| Horizontal   | *7236.000       | 60.2           | 36.8              | 36.9                | 60.3               | 74.0                      | -13.7       |
| Horizontal   | *9648.000       | 59.6           | 35.6              | 36.2                | 60.2               | 74.0                      | -13.8       |
| Horizontal   | *2389.460       | 54.7           | 20.0              | 28.2                | 62.9               | 74.0                      | -11.1       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | *4824.000       | 39.9           | 36.1              | 34.2                | 38.0               | 54.0                         | -16.0       |
| Horizontal   | *7236.000       | 42.0           | 36.8              | 36.9                | 42.1               | 54.0                         | -11.9       |
| Horizontal   | *9648.000       | 45.7           | 35.6              | 36.2                | 46.3               | 54.0                         | -7.7        |
| Horizontal   | *2389.460       | 42.4           | 20.0              | 28.2                | 50.6               | 54.0                         | -3.4        |

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.
- \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TRF no.: FCC 15C\_TX\_b

FCC ID: 2AEGOPANTUM-1

Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

Worst Case Operating Mode: 802.11n-HT40 (TX-Channel 06)

### Radiated Emissions

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | *4874.000       | 52.0           | 36.1              | 34.2                | 50.1               | 74.0                      | -23.9       |
| Horizontal   | *7311.000       | 54.3           | 35.6              | 37.1                | 55.8               | 74.0                      | -18.2       |
| Horizontal   | *9748.000       | 59.7           | 36.8              | 38.5                | 61.4               | 74.0                      | -12.6       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | *4874.000       | 39.7           | 36.1              | 34.2                | 37.8               | 54.0                         | -16.2       |
| Horizontal   | *7311.000       | 41.7           | 35.6              | 37.1                | 43.2               | 54.0                         | -10.8       |
| Horizontal   | *9748.000       | 44.3           | 36.8              | 38.5                | 46.0               | 54.0                         | -8.0        |

- NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
  2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
  3. Negative value in the margin column shows emission below limit.
  4. Horn antenna used for the emission over 1000MHz.
- \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TRF no.: FCC 15C\_TX\_b

FCC ID: 2AEGOPANTUM-1

Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

Worst Case Operating Mode: 802.11n-HT40 (TX-Channel 09)

### Radiated Emissions

| Polarization | Frequency<br>(MHz) | Reading<br>(dBμV) | Pre-<br>Amp<br>Gain<br>(dB) | Antenna<br>Factor<br>(dB) | Net<br>at 3m<br>(dBμV/m) | Peak Limit<br>at 3m<br>(dBμV/m) | Margin<br>(dB) |
|--------------|--------------------|-------------------|-----------------------------|---------------------------|--------------------------|---------------------------------|----------------|
| Horizontal   | *4924.000          | 51.7              | 36.1                        | 34.6                      | 50.2                     | 74.0                            | -23.8          |
| Horizontal   | *7386.000          | 54.7              | 35.6                        | 37.2                      | 56.3                     | 74.0                            | -17.7          |
| Horizontal   | *9848.000          | 58.0              | 35.6                        | 38.6                      | 61.0                     | 74.0                            | -13.0          |
| Horizontal   | *2483.850          | 56.0              | 20.0                        | 28.0                      | 64.0                     | 74.0                            | -10.0          |

| Polarization | Frequency<br>(MHz) | Reading<br>(dBμV) | Pre-<br>Amp<br>Gain<br>(dB) | Antenna<br>Factor<br>(dB) | Net<br>at 3m<br>(dBμV/m) | Average Limit<br>at 3m<br>(dBμV/m) | Margin<br>(dB) |
|--------------|--------------------|-------------------|-----------------------------|---------------------------|--------------------------|------------------------------------|----------------|
| Horizontal   | *4924.000          | 39.0              | 36.1                        | 34.6                      | 37.5                     | 54.0                               | -16.5          |
| Horizontal   | *7386.000          | 41.6              | 35.6                        | 37.2                      | 43.2                     | 54.0                               | -10.8          |
| Horizontal   | *9848.000          | 43.2              | 35.6                        | 38.6                      | 46.2                     | 54.0                               | -7.8           |
| Horizontal   | *2483.850          | 42.3              | 20.0                        | 28.0                      | 50.3                     | 54.0                               | -3.7           |

- NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
  2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
  3. Negative value in the margin column shows emission below limit.
  4. Horn antenna used for the emission over 1000MHz.
- \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TRF no.: FCC 15C\_TX\_b

FCC ID: 2AEGOPANTUM-1

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## INTERTEK TESTING SERVICES

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### 4.9 Conducted Emission

Worst Case Conducted emission at 0.230MHz is Passed by 8.5dB margin

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

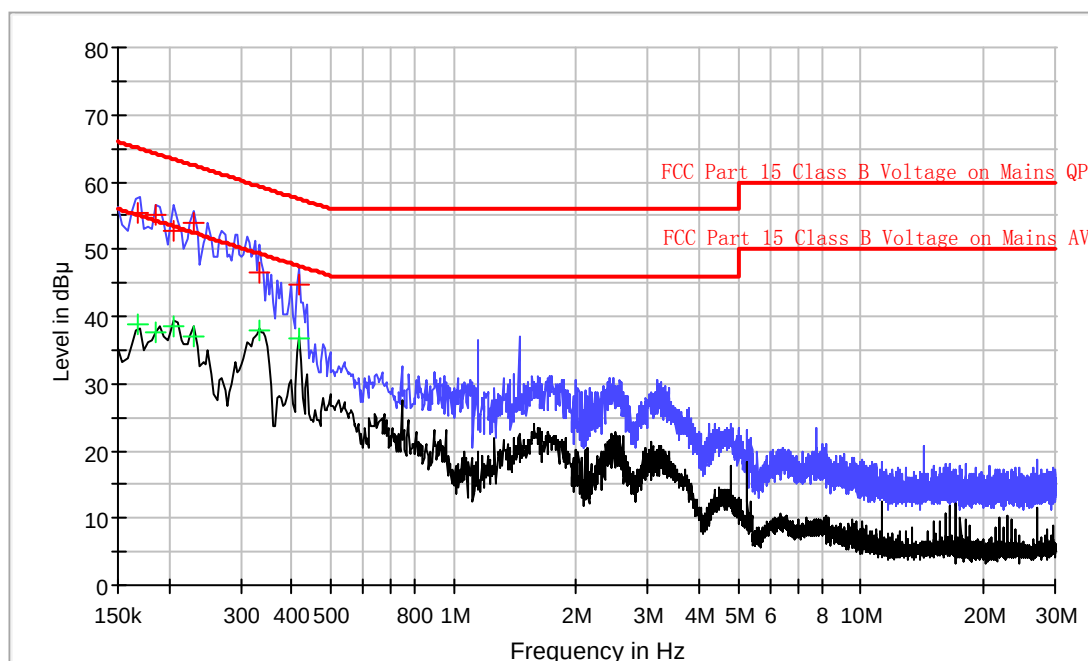
Date of Test: January 27, 2015

Model: M6550NW, M6552NW

Worst Case Operating Mode: 802.11n-HT20 (TX-Channel 01)

Line: Live

### Conducted Emission Test - FCC



### Result Table QP

| Frequency (MHz) | QuasiPeak (dB μV) | Line | Corr. (dB) | Margin (dB) | Limit (dB μV) |
|-----------------|-------------------|------|------------|-------------|---------------|
| 0.168           | 55.4              | L1   | 9.8        | 9.7         | 65.1          |
| 0.186           | 55.1              | L1   | 9.8        | 9.1         | 64.2          |
| 0.206           | 52.7              | L1   | 9.8        | 10.7        | 63.4          |
| 0.230           | 53.9              | L1   | 9.8        | 8.5         | 62.4          |
| 0.334           | 46.6              | L1   | 9.8        | 12.8        | 59.4          |
| 0.418           | 44.7              | L1   | 9.8        | 12.8        | 57.5          |

### Result Table AV

| Frequency (MHz) | Average (dB μV) | Line | Corr. (dB) | Margin (dB) | Limit (dB μV) |
|-----------------|-----------------|------|------------|-------------|---------------|
| 0.168           | 38.7            | L1   | 9.8        | 16.4        | 55.1          |
| 0.186           | 37.6            | L1   | 9.8        | 16.6        | 54.2          |
| 0.206           | 38.5            | L1   | 9.8        | 14.9        | 53.4          |
| 0.230           | 37.0            | L1   | 9.8        | 15.4        | 52.4          |
| 0.334           | 38.0            | L1   | 9.8        | 11.4        | 49.4          |
| 0.418           | 36.8            | L1   | 9.8        | 10.7        | 47.5          |

TRF no.: FCC 15C\_TX\_b

FCC ID: 2AEGOPANTUM-1

Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

Applicant: Zhuhai Pantum Electronics Co.,Ltd.

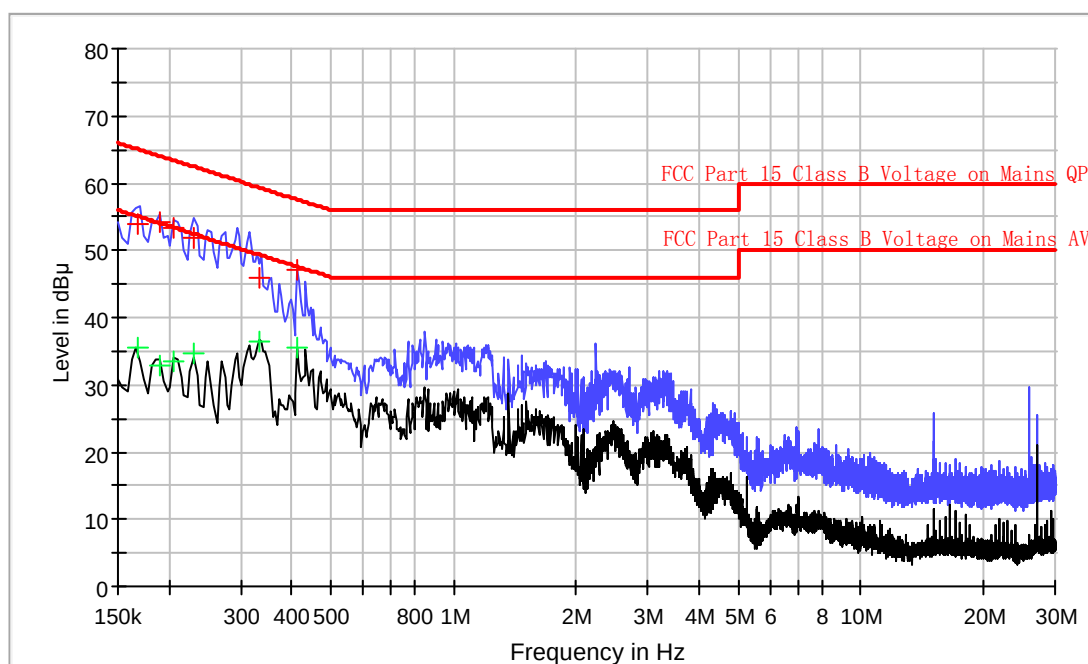
Date of Test: January 27, 2015

Model: M6550NW, M6552NW

Worst Case Operating Mode: 802.11n-HT20 (TX-Channel 01)

Line: Neutral

### Conducted Emission Test - FCC



### Result Table QP

| Frequency (MHz) | QuasiPeak (dB μV) | Line | Corr. (dB) | Margin (dB) | Limit (dB μV) |
|-----------------|-------------------|------|------------|-------------|---------------|
| 0.168           | 54.0              | N    | 10.0       | 11.1        | 65.1          |
| 0.190           | 54.2              | N    | 10.0       | 9.8         | 64.0          |
| 0.206           | 53.2              | N    | 10.1       | 10.2        | 63.4          |
| 0.230           | 51.9              | N    | 10.1       | 10.5        | 62.4          |
| 0.334           | 45.9              | N    | 10.1       | 13.5        | 59.4          |
| 0.414           | 47.2              | N    | 10.1       | 10.4        | 57.6          |

### Result Table AV

| Frequency (MHz) | Average (dB μV) | Line | Corr. (dB) | Margin (dB) | Limit (dB μV) |
|-----------------|-----------------|------|------------|-------------|---------------|
| 0.168           | 35.5            | N    | 10.0       | 19.6        | 55.1          |
| 0.190           | 32.8            | N    | 10.0       | 21.2        | 54.0          |
| 0.206           | 33.6            | N    | 10.1       | 19.8        | 53.4          |
| 0.230           | 34.6            | N    | 10.1       | 17.8        | 52.4          |
| 0.334           | 36.4            | N    | 10.1       | 13.0        | 49.4          |
| 0.414           | 35.6            | N    | 10.1       | 12.0        | 47.6          |

TRF no.: FCC 15C\_TX\_b

FCC ID: 2AEGOPANTUM-1

Report No.: 150319019SZN-001

## INTERTEK TESTING SERVICES

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Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

4.10 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109

☐ Not required - No digital part

☐ Test results are attached

☒ Included in the separated report.

## INTERTEK TESTING SERVICES

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Applicant: Zhuhai Pantum Electronics Co.,Ltd.

Date of Test: January 27, 2015

Model: M6550NW, M6552NW

### 4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

|   |                                                                 |
|---|-----------------------------------------------------------------|
|   | See attached spectrum analyzer chart (s) for Transmitter timing |
|   | See Transmitter timing diagram provided by manufacturer         |
| x | Not applicable, duty cycle was not used.                        |

## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 5**

### **EQUIPMENT PHOTOGRAPHS**

## INTERTEK TESTING SERVICES

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### 5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

**EXHIBIT 6**

**PRODUCT LABELLING**

## INTERTEK TESTING SERVICES

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### 6.0 **Product Labeling**

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 7**

### **TECHNICAL SPECIFICATIONS**

## INTERTEK TESTING SERVICES

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### 7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 8**

### **INSTRUCTION MANUAL**

## INTERTEK TESTING SERVICES

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### 8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 9**

### **CONFIDENTIALITY REQUEST**

## INTERTEK TESTING SERVICES

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### 9.0 Confidentiality Request

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 10**

### **MISCELLANEOUS INFORMATION**

## INTERTEK TESTING SERVICES

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### 10.0 **Discussion of Pulse Desensitization**

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF*.

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 11**

### **TEST EQUIPMENT LIST**

## INTERTEK TESTING SERVICES

### 11.0 Test Equipment List

| Equipment No. | Equipment              | Manufacturer    | Model No.     | Serial No. | Cal. Date   | Due Date    |
|---------------|------------------------|-----------------|---------------|------------|-------------|-------------|
| SZ182-02      | RF Power Meter         | Anritsu         | ML2496A       | 1302005    | 21-May-2014 | 21-May-2015 |
| SZ182-02-01   | Power Sensor           | Anritsu         | MA2411B       | 1207429    | 21-May-2014 | 21-May-2015 |
| SZ061-03      | BiConiLog Antenna      | ETS             | 3142C         | 00066460   | 28-Jun-2014 | 28-Jun-2015 |
| SZ185-01      | EMI Receiver           | R&S             | ESCI          | 100547     | 10-Mar-2014 | 10-Mar-2015 |
| SZ061-09      | Horn Antenna           | ETS             | 3115          | 00092346   | 01-Nov-2014 | 01-Nov-2015 |
| SZ061-07      | Pyramidal Horn Antenna | ETS             | 3160-09       | 00083067   | 03-Sep-2014 | 03-Sep-2015 |
| SZ061-06      | Active Loop Antenna    | Electro-Metrics | EM-6876       | 217        | 29-Apr-2014 | 29-Apr-2015 |
| EM031-03      | EXA Spectrum Analyzer  | R&S             | FSV40         | 101506     | 09-Jun-2014 | 09-Jun-2015 |
| SZ181-04      | Preamplifier           | Agilent         | 8449B         | 3008A02474 | 10-Mar-2014 | 10-Mar-2015 |
| SZ188-01      | Anechoic Chamber       | ETS             | RFD-F/A-100   | 4102       | 19-Apr-2014 | 19-Apr-2015 |
| SZ062-02      | RF Cable               | RADIAL          | RG 213U       | --         | 09-Oct-2014 | 09-Apr-2015 |
| SZ062-05      | RF Cable               | RADIAL          | 0.04-26.5 GHz | --         | 09-Oct-2014 | 09-Apr-2015 |
| SZ062-12      | RF Cable               | RADIAL          | 0.04-26.5 GHz | --         | 09-Oct-2014 | 09-Apr-2015 |
| SZ067-04      | Notch Filter           | Micro-Tronics   | BRM5070 2-02  | --         | 21-May-2014 | 21-May-2015 |
| SZ185-02      | EMI Test Receiver      | R&S             | ESCI          | 100692     | 01-Nov-2014 | 01-Nov-2015 |
| SZ187-01      | Two-Line V-Network     | R&S             | ENV216        | 100072     | 01-Nov-2014 | 01-Nov-2015 |
| SZ187-02      | Two-Line V-Network     | R&S             | ENV216        | 100073     | 16-Jun-2014 | 16-Jun-2015 |
| SZ188-03      | Shielding Room         | ETS             | RFD-100       | 4100       | 23-Aug-2014 | 23-Aug-2015 |