

Qbic technology Co., Ltd

Application
For
Certification

FCC ID: 2AF82-FHD100

BOX PC

Model: FHD-100

Additional Model: FHD-1XX(The letters "X" in the model no. can be 0 to 9, A to Z or blank, for marketing use only.)

2.4GHz WiFi Transceiver

Report No.: 151016016SZN-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 [10-1-14]

Prepared and Checked by:

Approved by:

Sign on file

Powell Bao
Engineer

Andy Yan
Senior Project Engineer
Date: November 18, 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.
- This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results referenced from this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.
- 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_c

Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch

6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China
Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751 Website: www.china.intertek-etlsemko.com

LIST OF EXHIBITS

INTRODUCTION

<i>EXHIBIT 1:</i>	Summary of Tests
<i>EXHIBIT 2:</i>	General Description
<i>EXHIBIT 3:</i>	System Test Configuration
<i>EXHIBIT 4:</i>	Measurement Results
<i>EXHIBIT 5:</i>	Equipment Photographs
<i>EXHIBIT 6:</i>	Product Labeling
<i>EXHIBIT 7:</i>	Technical Specifications
<i>EXHIBIT 8:</i>	Instruction Manual
<i>EXHIBIT 9:</i>	Confidentiality Request
<i>EXHIBIT 10:</i>	Miscellaneous Information
<i>EXHIBIT 11:</i>	Test Equipment List

INTERTEK TESTING SERVICES

MEASUREMENT/TECHNICAL REPORT

BOX PC

Model: FHD-100

FCC ID: 2AF82-FHD100

This report concerns (check one) Original Grant ☒ Class I 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 [10-01-14] Edition] provision.

Report prepared by:

Powell Bao
Intertek Testing Services Shenzhen Ltd.
Kejiyuan Branch
6F, Block D, Huahan Building, Langshan Road,
Nanshan District, Shenzhen, P. R. China
Phone: (86 755) 8614 0682
Fax: (86 755) 8614 6751

INTERTEK TESTING SERVICES

Table of Contents

1.0	<u>Summary of Test results</u>	2
2.0	<u>General Description</u>	4
2.1	Product Description	4
2.2	Related Submittal(s) Grants	5
2.3	Test Methodology	5
2.4	Test Facility	5
3.0	<u>System Test Configuration</u>	7
3.1	Justification.....	7
3.2	EUT Exercising Software.....	7
3.3	Special Accessories	7
3.4	Measurement Uncertainty	8
3.5	Equipment Modification.....	8
3.6	Support Equipment List and Description.....	8
4.0	<u>Measurement Results</u>	10
4.1	Maximum Conducted Output Power at Antenna Terminals	10
4.2	Minimum 6 dB RF Bandwidth.....	12
4.3	Maximum Power Density Reading	20
4.4	Out of Band Conducted Emissions.....	27
4.5	Out of Band Radiated Emissions	48
4.6	Transmitter Radiated Emissions in Restricted Bands.....	49
4.7	Field Strength Calculation.....	50
4.8	Radiated Spurious Emission	51
4.9	Conducted Emission	65
4.10	Radiated Emissions from Digital Section of Transceiver.....	68
4.11	Transmitter Duty Cycle Calculation and Measurements	69
5.0	<u>Equipment Photographs</u>	71
6.0	<u>Product Labelling</u>	73
7.0	<u>Technical Specifications</u>	75
8.0	<u>Instruction Manual</u>	77
9.0	<u>Confidentiality Request</u>	79
10.0	<u>Discussion of Pulse Desensitization</u>	81
11.0	<u>Test Equipment List</u>	83

INTERTEK TESTING SERVICES

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
Analysis Report	RF Exposure	RF Exposure.pdf
Cover Letter	Letter of Agency	agency.pdf

INTERTEK TESTING SERVICES

EXHIBIT 1

SUMMARY OF TEST RESULTS

INTERTEK TESTING SERVICES

1.0 Summary of Test results

Panel PC

Model: FHD-100
FCC ID: 2AF82-FHD100

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 a dedicated Antenna with nonstandard antenna jack which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

INTERTEK TESTING SERVICES

EXHIBIT 2

GENERAL DESCRIPTION

INTERTEK TESTING SERVICES

2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a BOX PC 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 AC/DC adaptor through AC120V/60Hz. For more detailed features description, please refer to the user's manual.

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

Antenna Type: Dedicated Antenna with nonstandard antenna jack.

The Models: FHD-1XX(The letters "X" in the model no. can be 0 to 9, A to Z or blank, for marketing use only.) are the same as the Model: FHD-100 in hardware aspect. The difference in model number and appearance, brand name serves as marketing strategy.

INTERTEK TESTING SERVICES

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 v03r03. 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).

INTERTEK TESTING SERVICES

EXHIBIT 3

SYSTEM TEST CONFIGURATION

INTERTEK TESTING SERVICES

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 AC/DC adaptor through 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

NA.

INTERTEK TESTING SERVICES

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 Qbic technology 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	Detail
Network cable (RJ45)	Smart.drive	unshielded, Length 500cm
RJ45 Terminal	N/A	N/A
HDMI cable	N/A	unshielded, Length 150cm
Earphone	N/A	unshielded, Length 150cm
Monitor	DELL	E2213
Optical Cable with Terminal	NA	unshielded, Length 500cm
USB Cable with USB Terminal	N/A	2GB
Mini SD Card	SanDisk	1GB
Keyboard	Lenovo	K4803A
USB Disk	SanDisk	4GB
Mouse	Lenovo	M4806A
Adapter	KUANTECH	Model: KSASB0241200150D5 Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 12V, 1.5A for main unit

INTERTEK TESTING SERVICES

EXHIBIT 4

MEASUREMENT RESULTS

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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 = -1.0dBi) (CCK, 1Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	19.49	88.92
Middle Channel: 2437	19.65	92.26
High Channel: 2462	19.71	93.54

IEEE 802.11g (Antenna Gain = -1.0dBi) (16QAM, 6Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	21.18	131.22
Middle Channel: 2437	21.63	145.55
High Channel: 2462	22.62	182.81

INTERTEK TESTING SERVICES

IEEE 802.11n-HT20 (Antenna Gain = -1.0dBi) (16QAM, 6.5Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	21.82	152.05
Middle Channel: 2437	21.45	139.64
High Channel: 2462	21.75	149.62

IEEE 802.11n-HT40 (Antenna Gain = -1.0dBi) (64QAM, 13.5Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2422	21.28	134.28
Middle Channel: 2437	21.49	140.93
High Channel: 2452	21.35	135.46

Cable loss: 1.0 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max output level = 22.62 dBm

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

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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	10.03
2437	10.07
2462	10.07

IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	16.45
2437	16.45
2462	16.41

IEEE 802.11n-HT20 (16QAM, 6.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	17.58
2437	17.50
2462	17.58

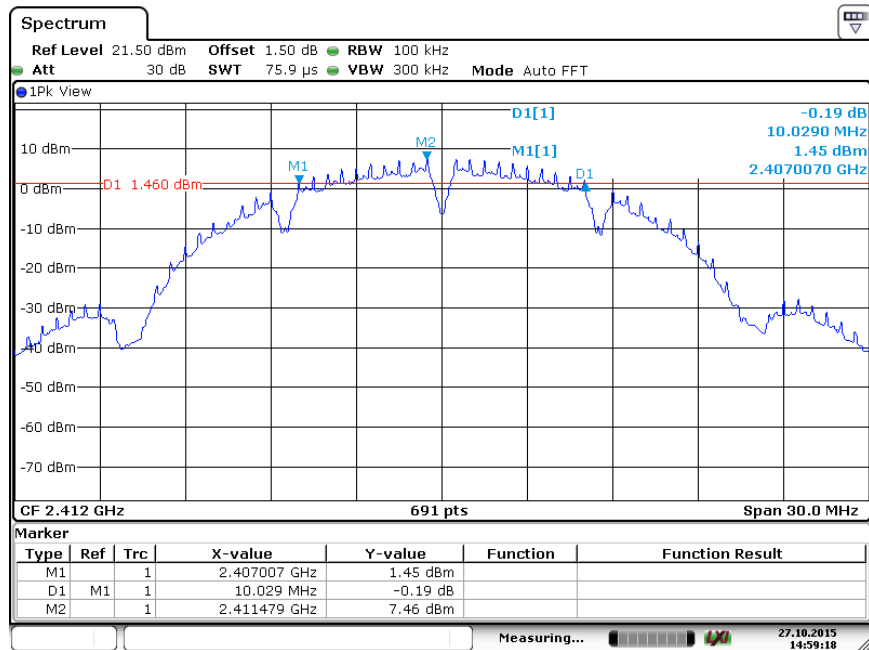
INTERTEK TESTING SERVICES

IEEE 802.11n-HT40 (64QAM, 13.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2422	35.75
2437	35.60
2452	35.53

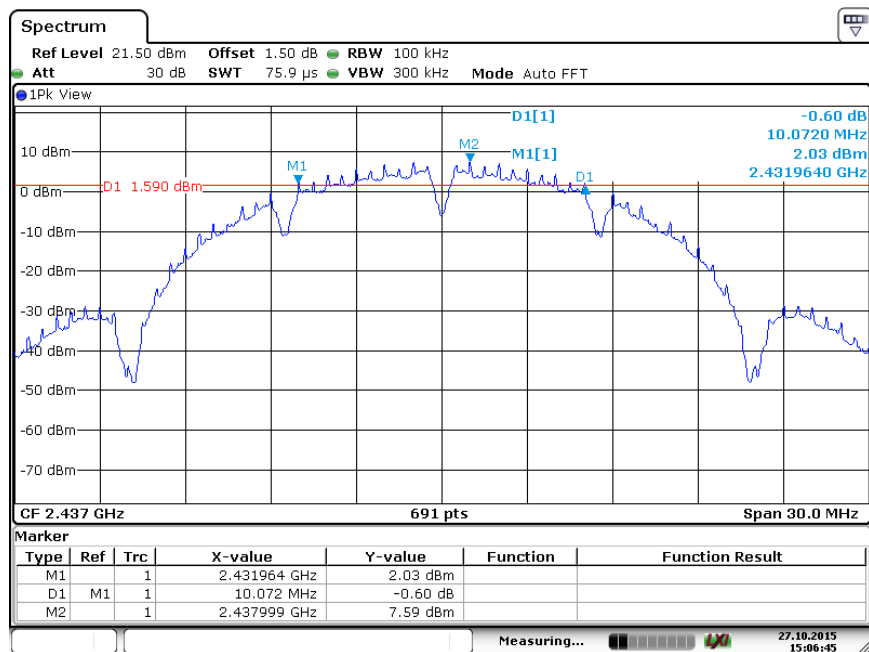
The test plots are attached as below.

INTERTEK TESTING SERVICES

802.11b



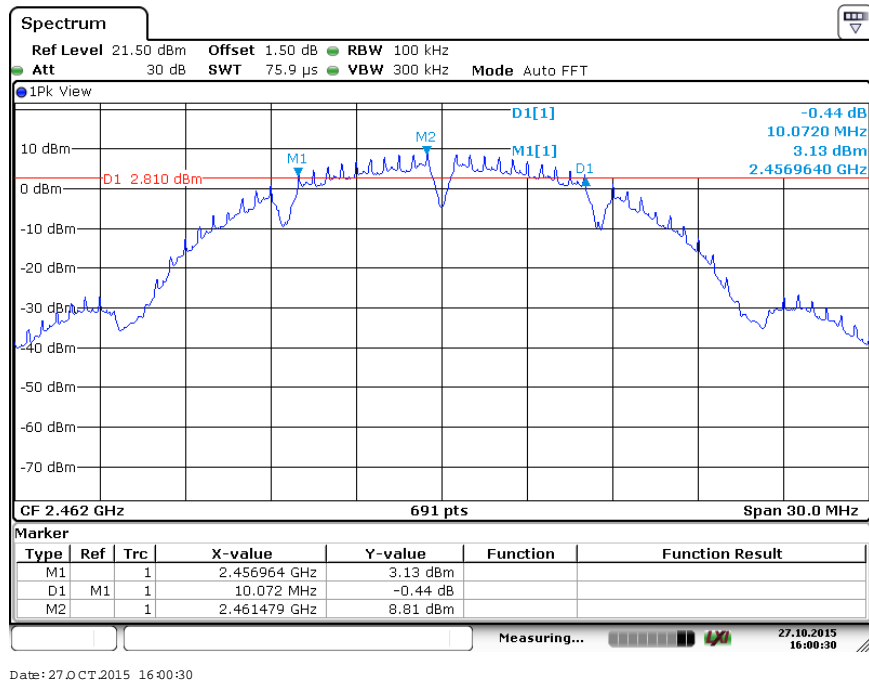
Date: 27.OCT.2015 14:59:18



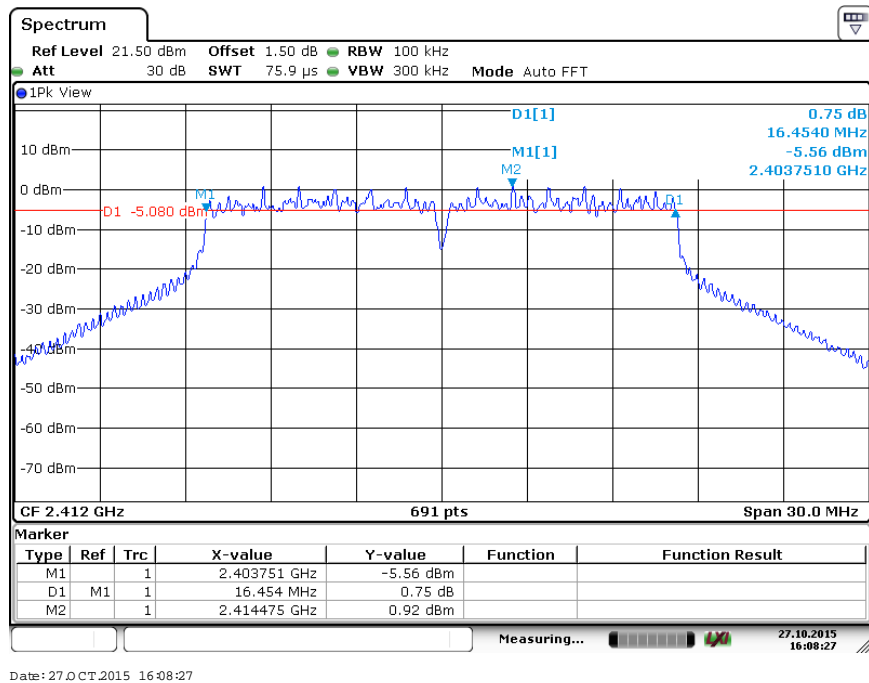
Date: 27.OCT.2015 15:06:44

TRF no.: FCC 15C_TX_c
 FCC ID: 2AF82-FHD100
 Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

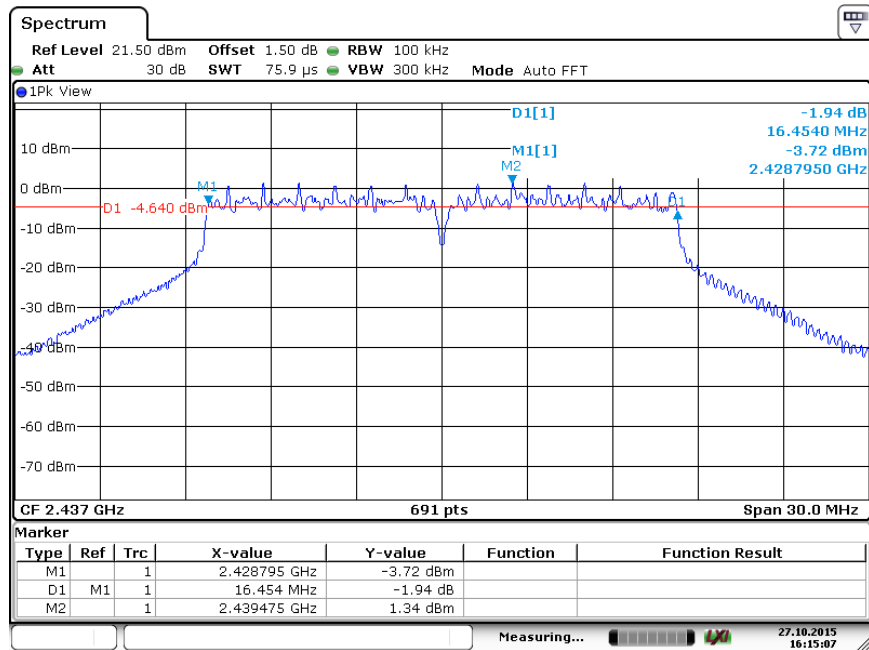


802.11g

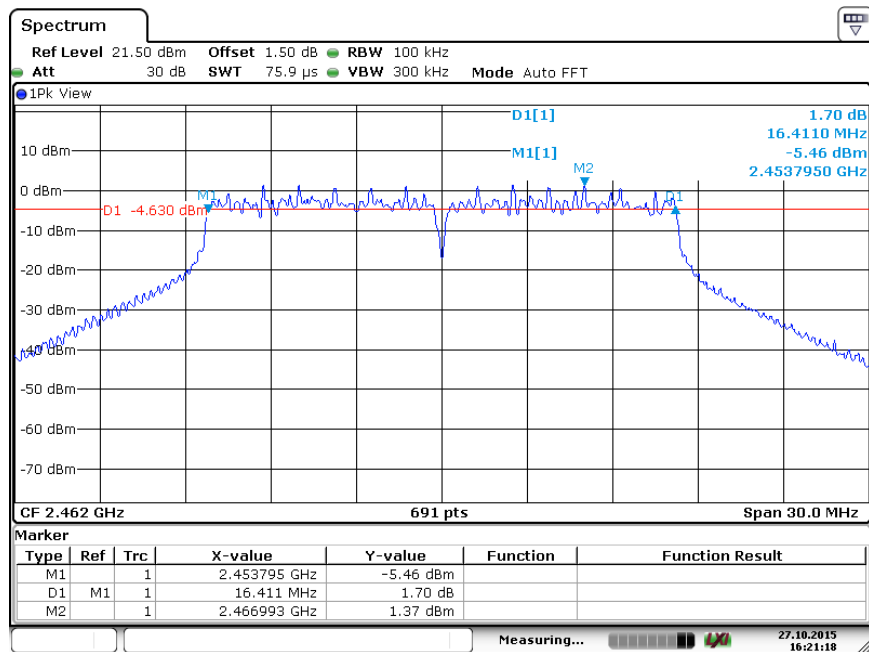


TRF no.: FCC 15C_TX_c
 FCC ID: 2AF82-FHD100
 Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES



Date: 27.OCT.2015 16:15:07

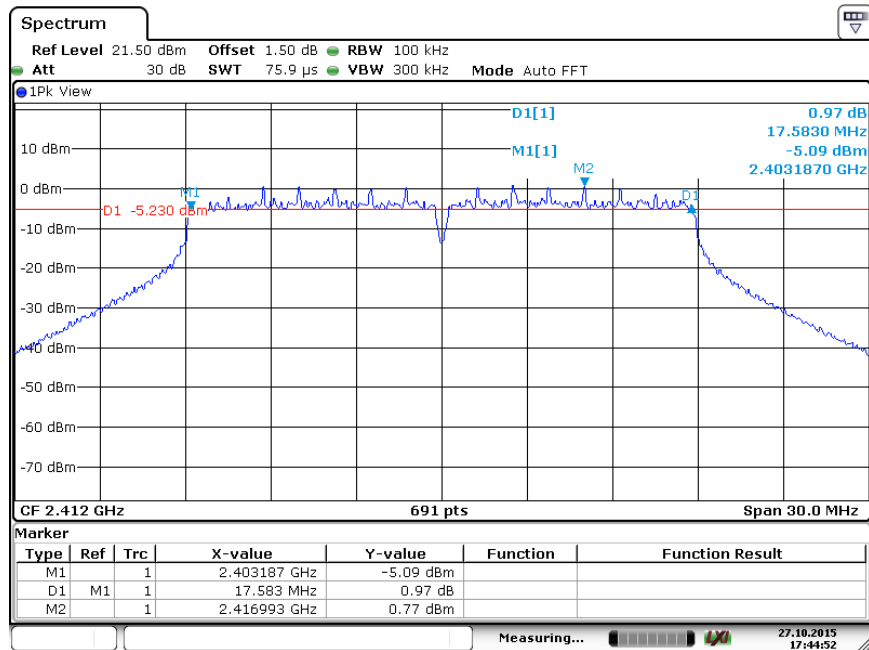


Date: 27.OCT.2015 16:21:19

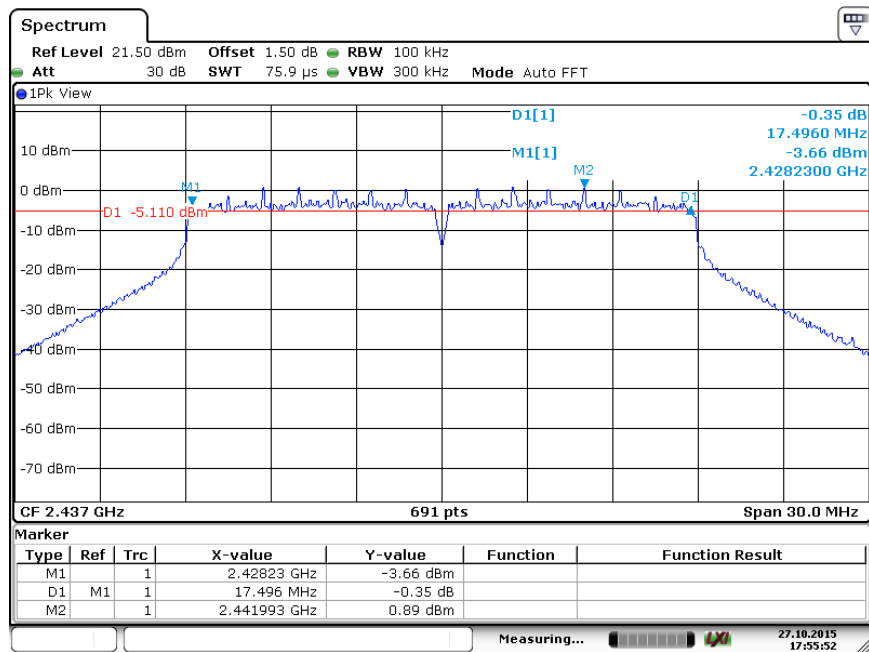
TRF no.: FCC 15C_TX_c
 FCC ID: 2AF82-FHD100
 Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

802.11 n-HT20



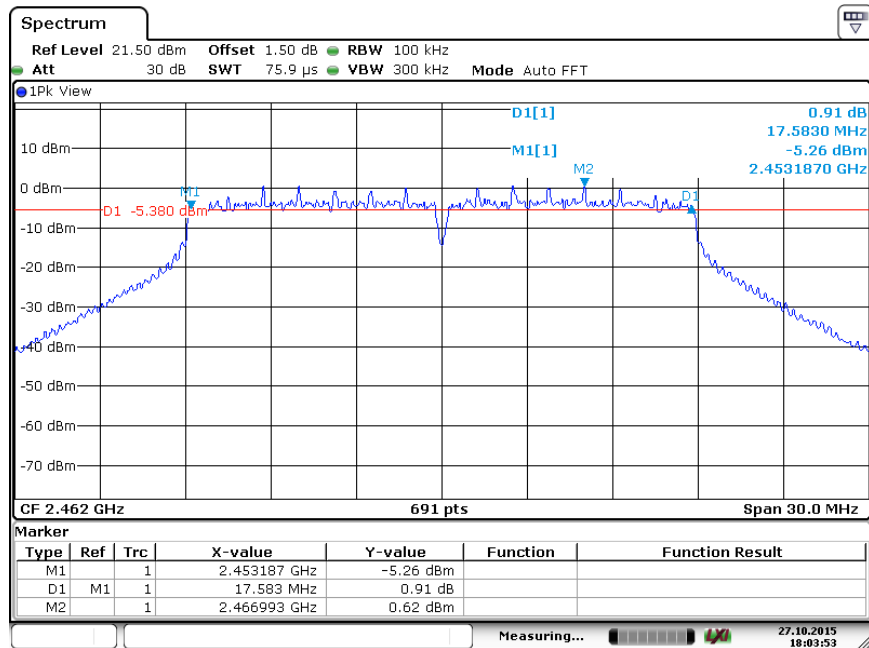
Date: 27.OCT.2015 17:44:52



Date: 27.OCT.2015 17:55:52

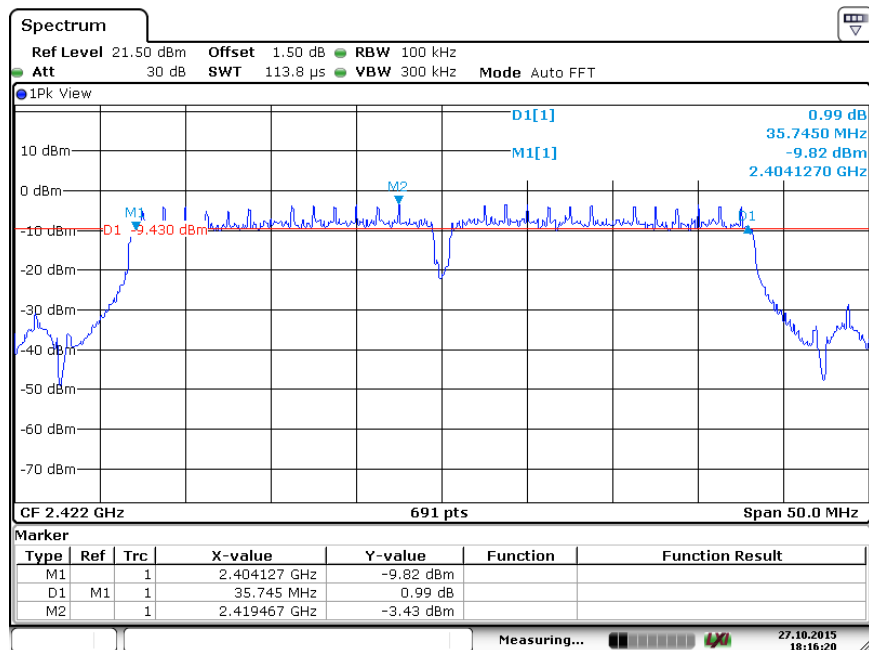
TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES



Date: 27.OCT.2015 18:03:54

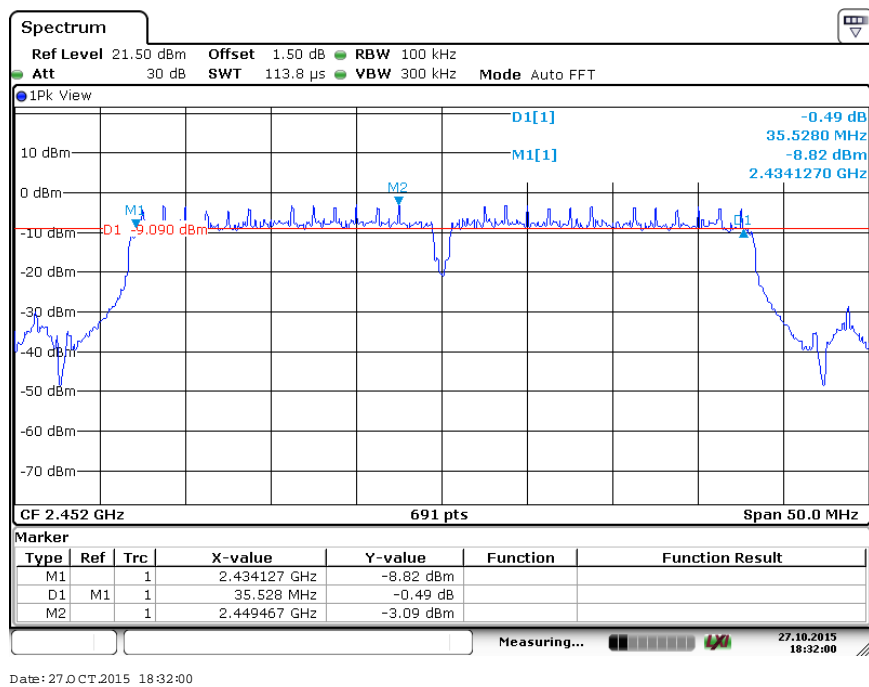
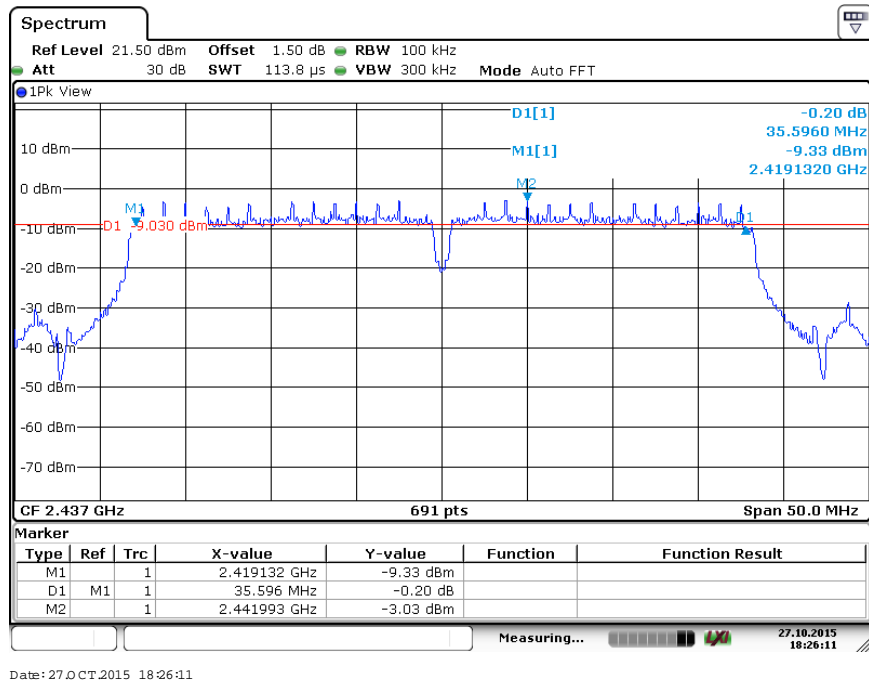
802.11 n-HT40



Date: 27.OCT.2015 18:16:20

TRF no.: FCC 15C_TX_c
 FCC ID: 2AF82-FHD100
 Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_c
 FCC ID: 2AF82-FHD100
 Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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	7.55
2437	6.69
2462	7.94

IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	1.06
2437	1.31
2462	1.24

IEEE 802.11n-HT20 (16QAM, 6.5Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	0.71
2437	1.04
2462	0.55

IEEE 802.11n-HT40 (64QAM, 13.5Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2422	-3.28
2437	-3.10
2452	-3.11

The test plots are attached as below.

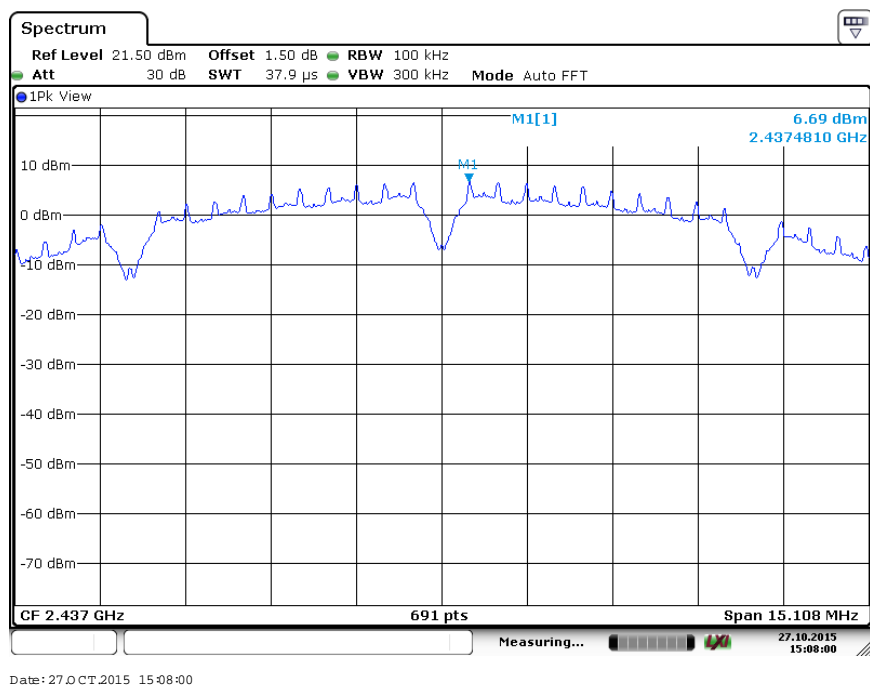
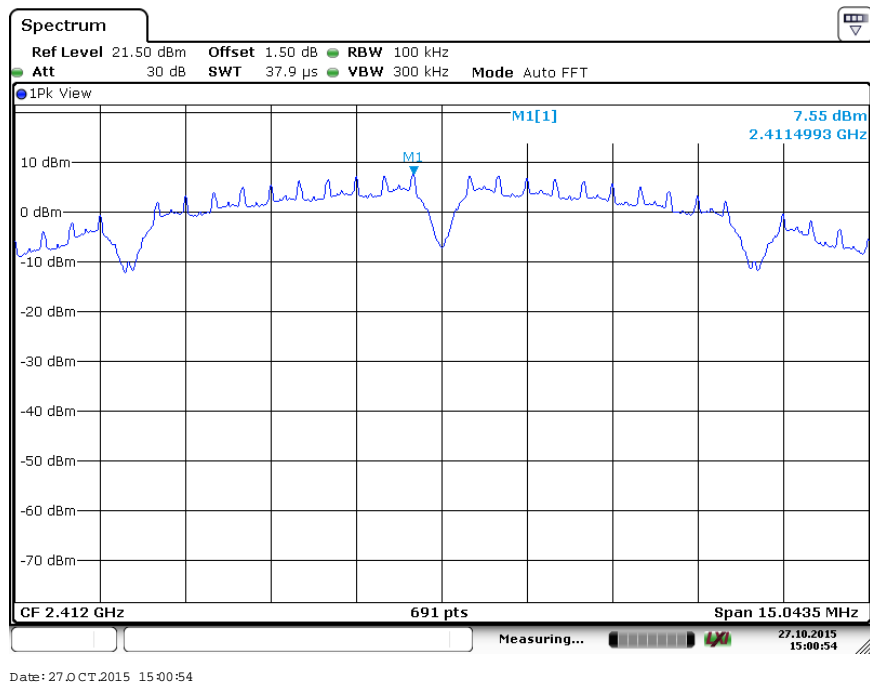
TRF no.: FCC 15C_TX_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

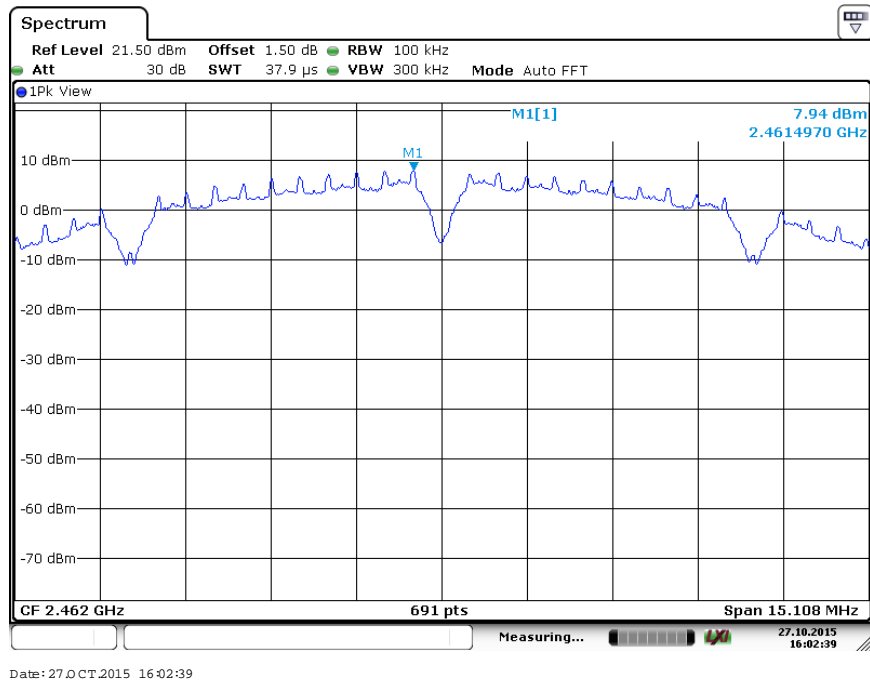
INTERTEK TESTING SERVICES

802.11b

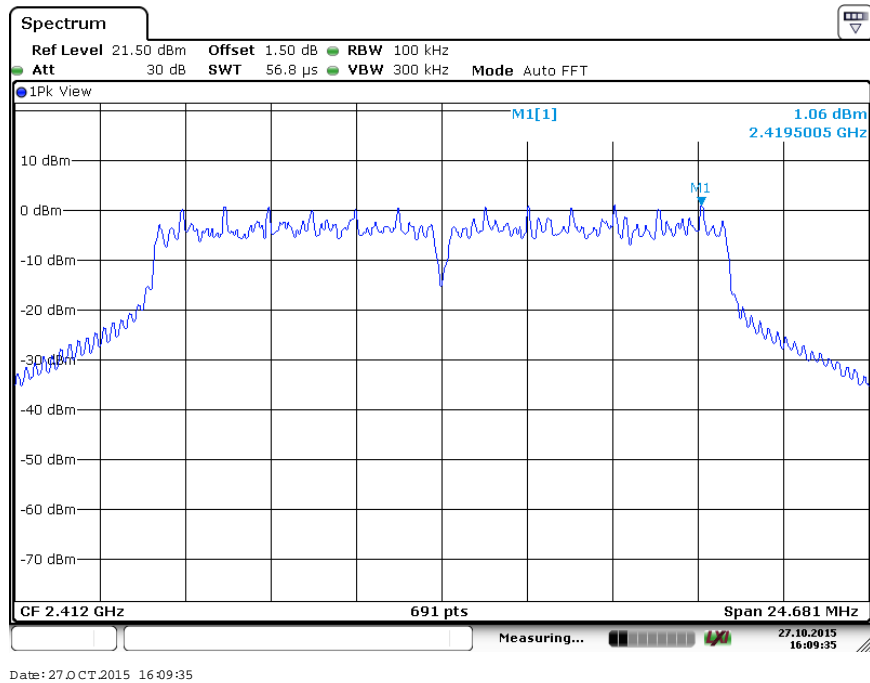


TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

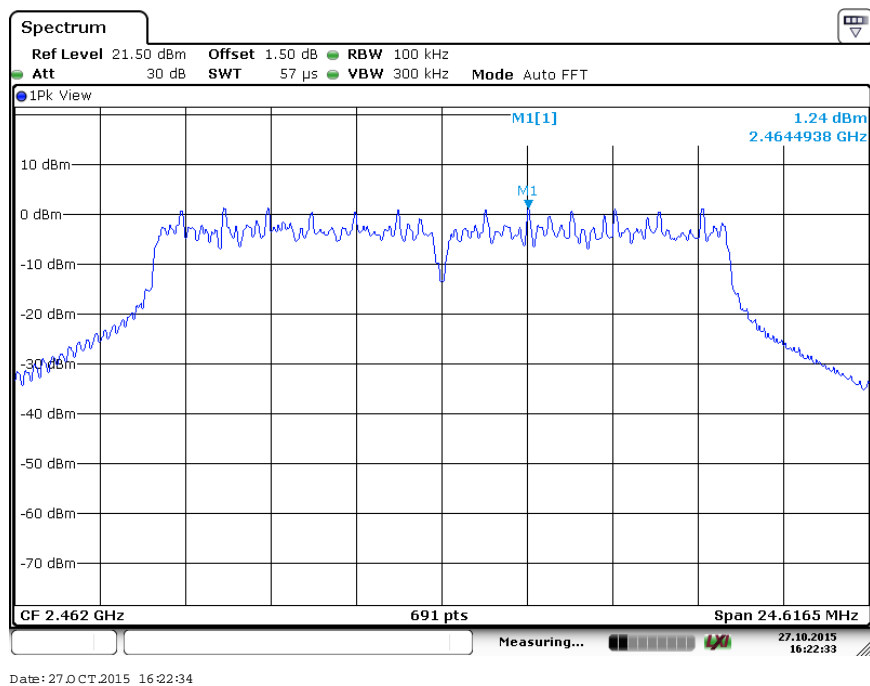
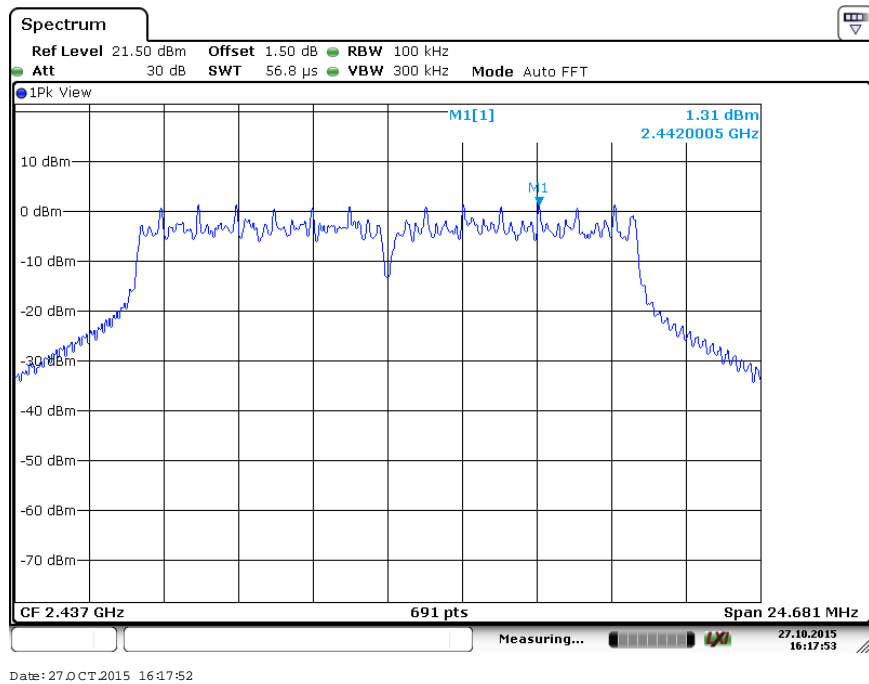


802.11g



TRF no.: FCC 15C_TX_c
 FCC ID: 2AF82-FHD100
 Report No.: 151016016SZN-001

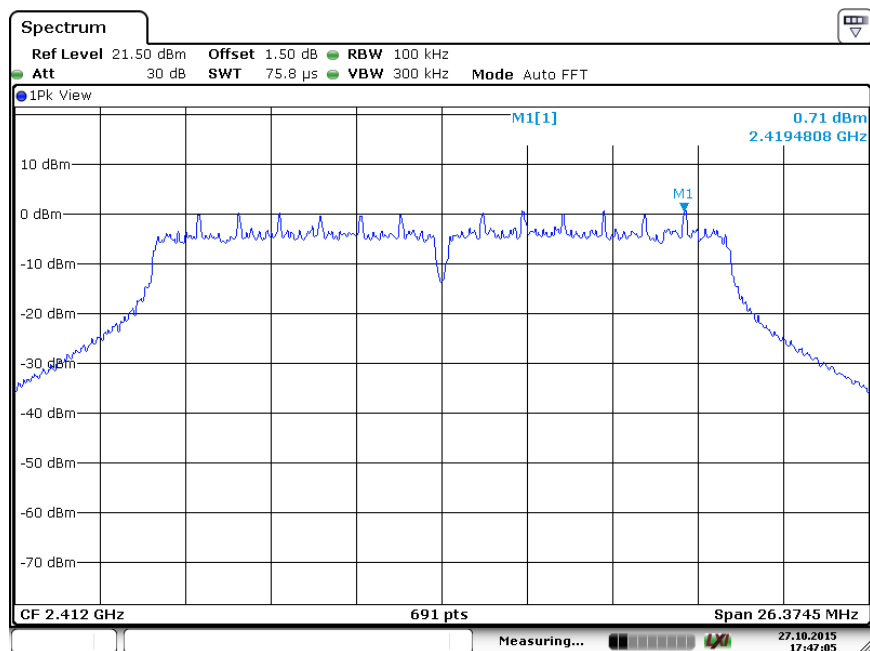
INTERTEK TESTING SERVICES



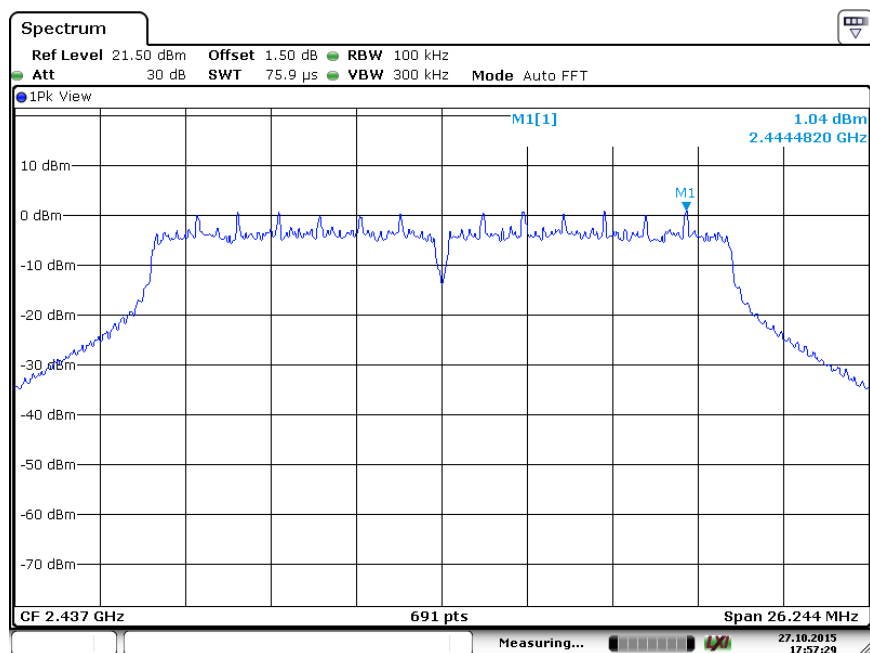
TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

802.11 n-HT20



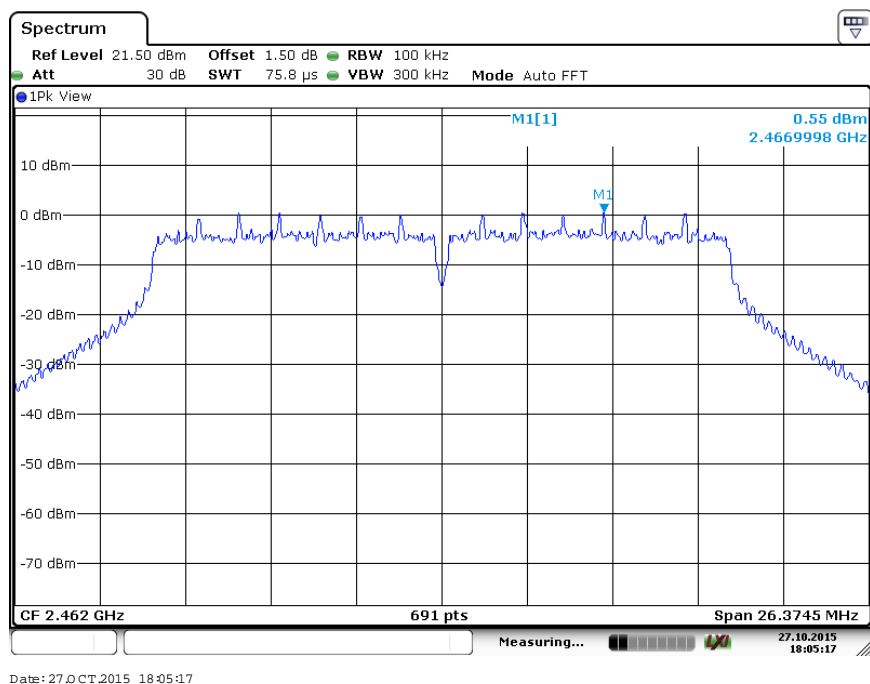
Date: 27.OCT.2015 17:47:04



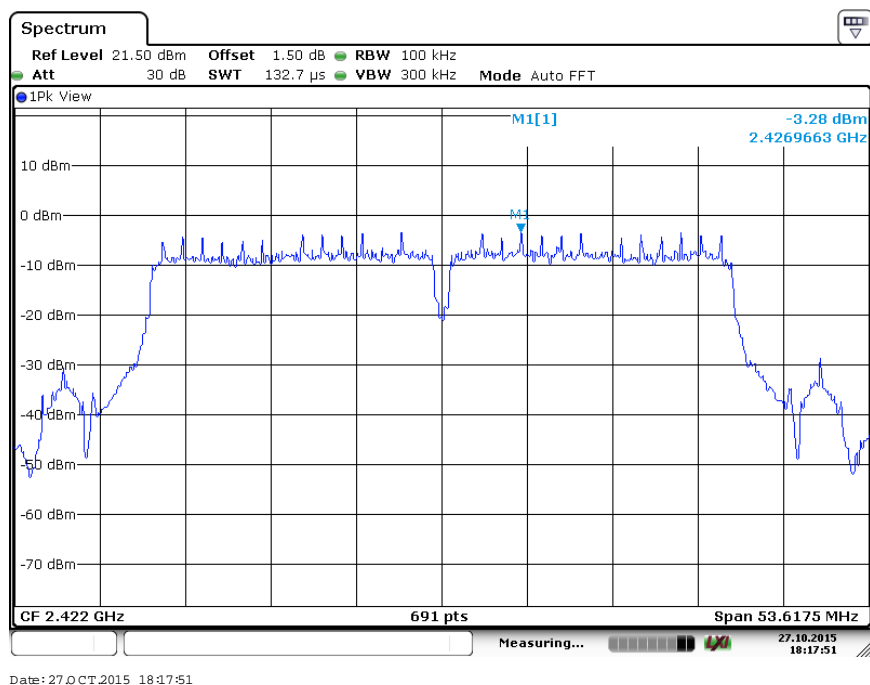
Date: 27.OCT.2015 17:57:30

TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

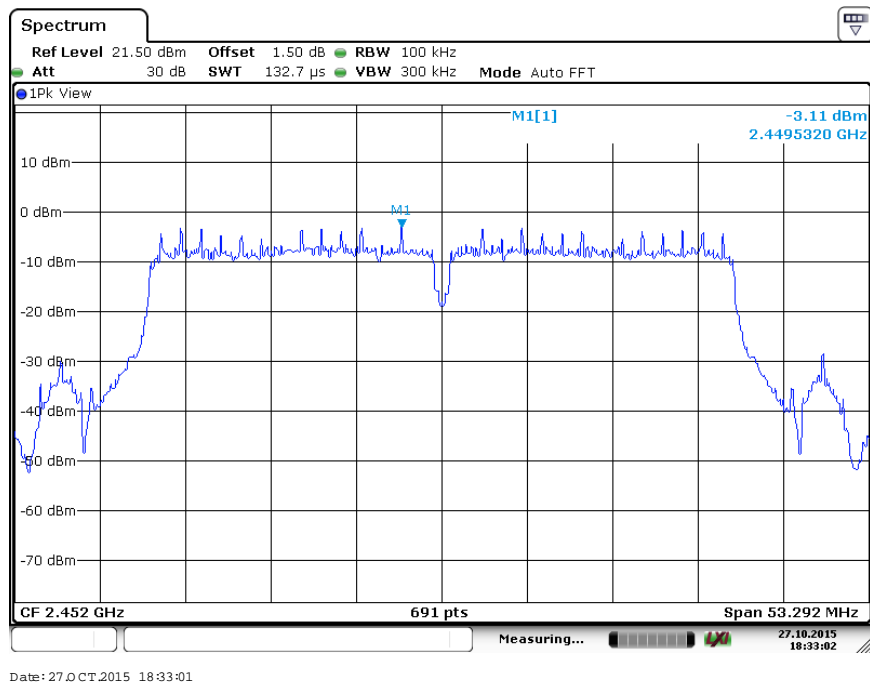
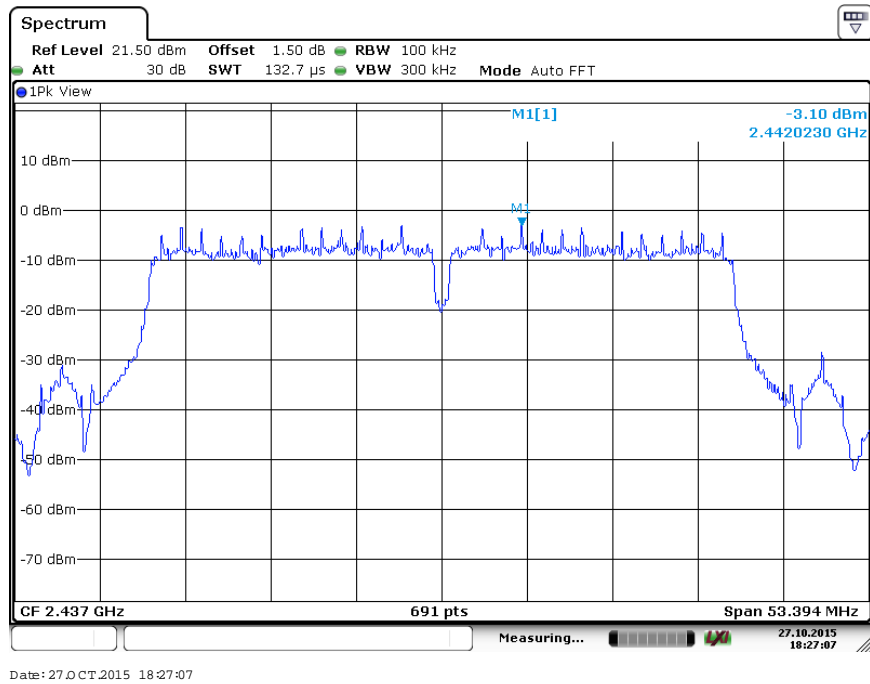


802.11 n-HT40



TRF no.: FCC 15C_TX_c
 FCC ID: 2AF82-FHD100
 Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_c
 FCC ID: 2AF82-FHD100
 Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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.

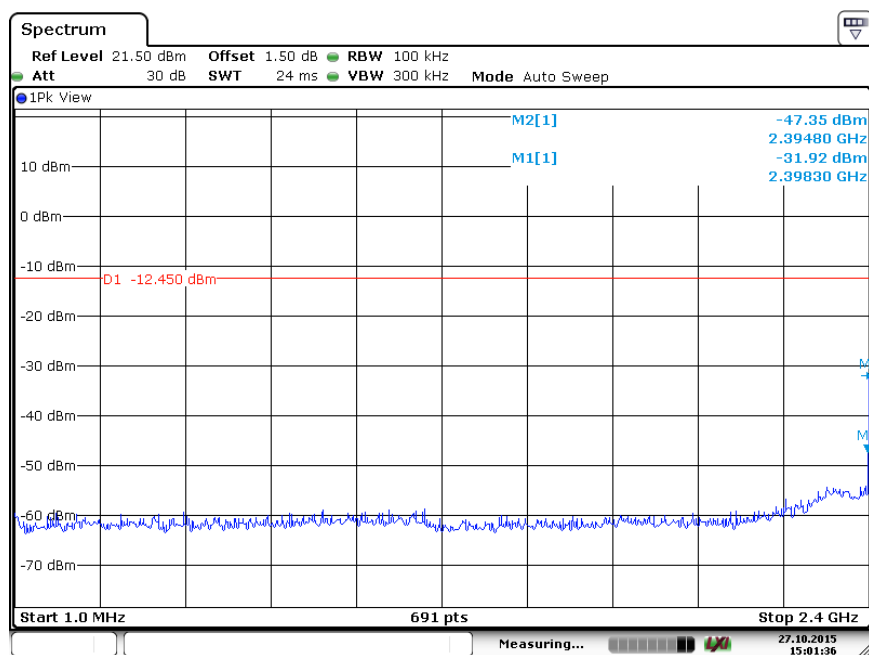
The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The test plots are attached as below.

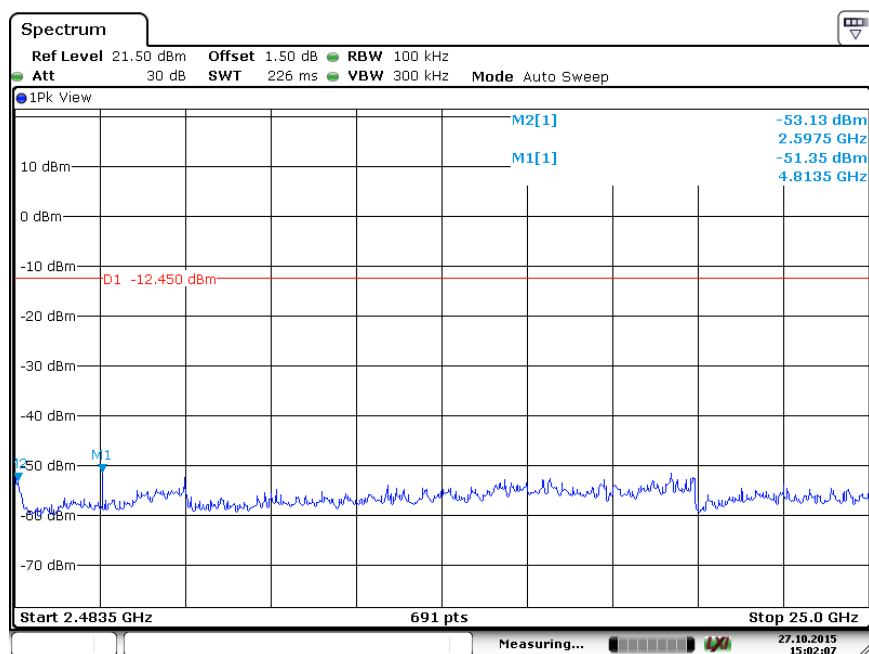
INTERTEK TESTING SERVICES

802.11b

Channel 01 (2412MHz) Reference Level: 7.55dBm



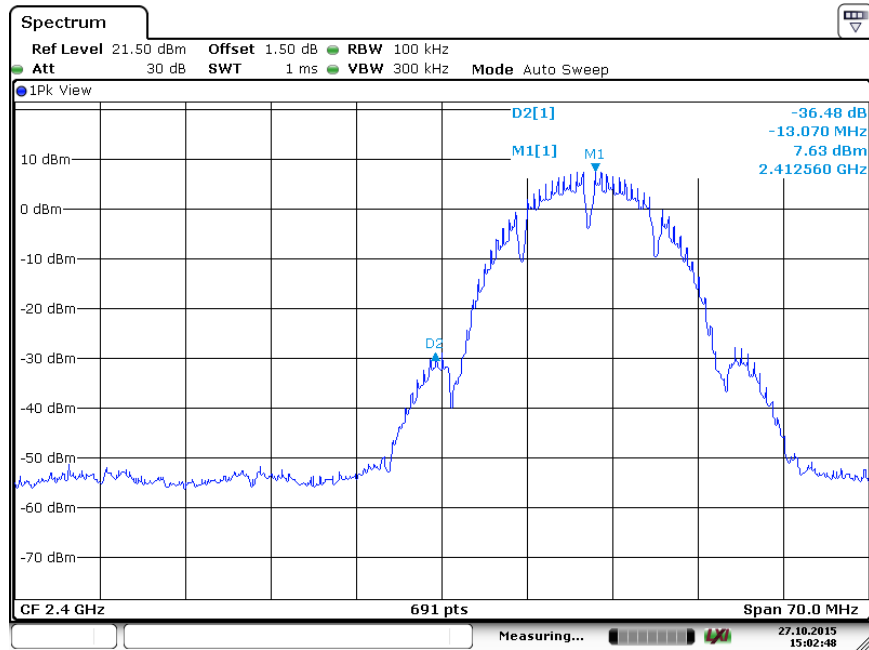
Date: 27.OCT.2015 15:01:37



Date: 27.OCT.2015 15:02:07

TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

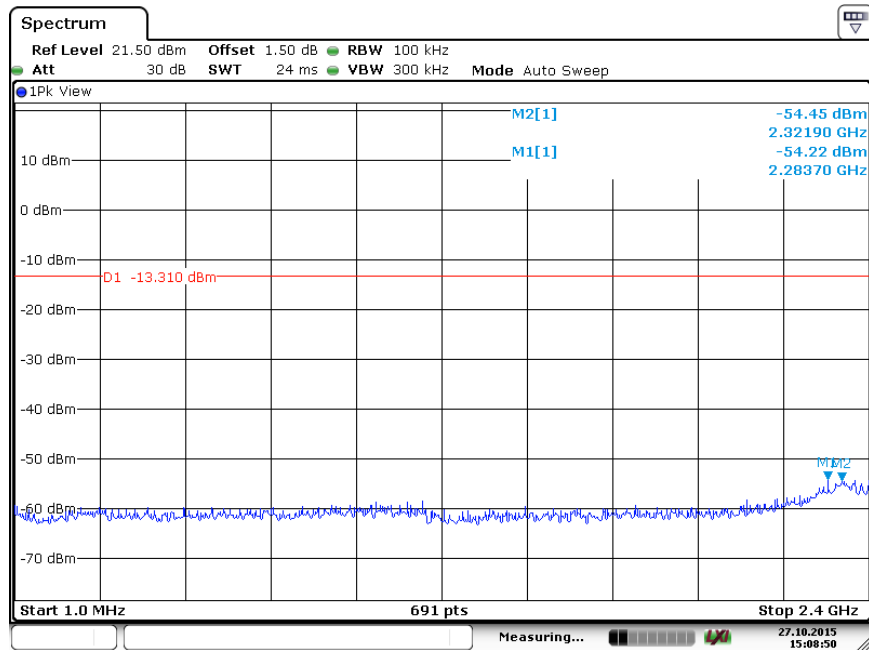


Date: 27.OCT.2015 15:02:48

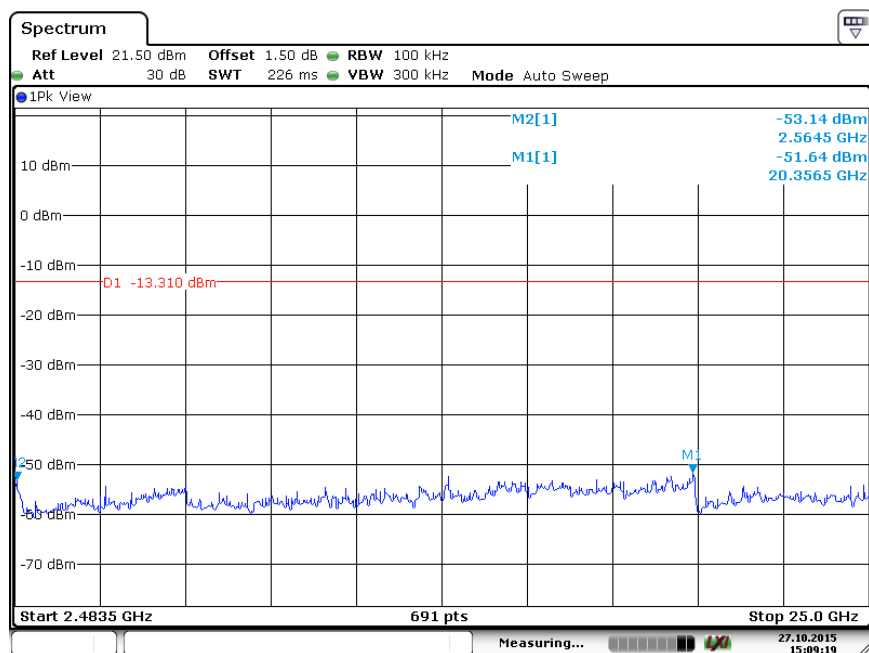
TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Channel 06 (2437MHz) Reference Level: 6.69dBm



Date: 27.OCT.2015 15:08:51

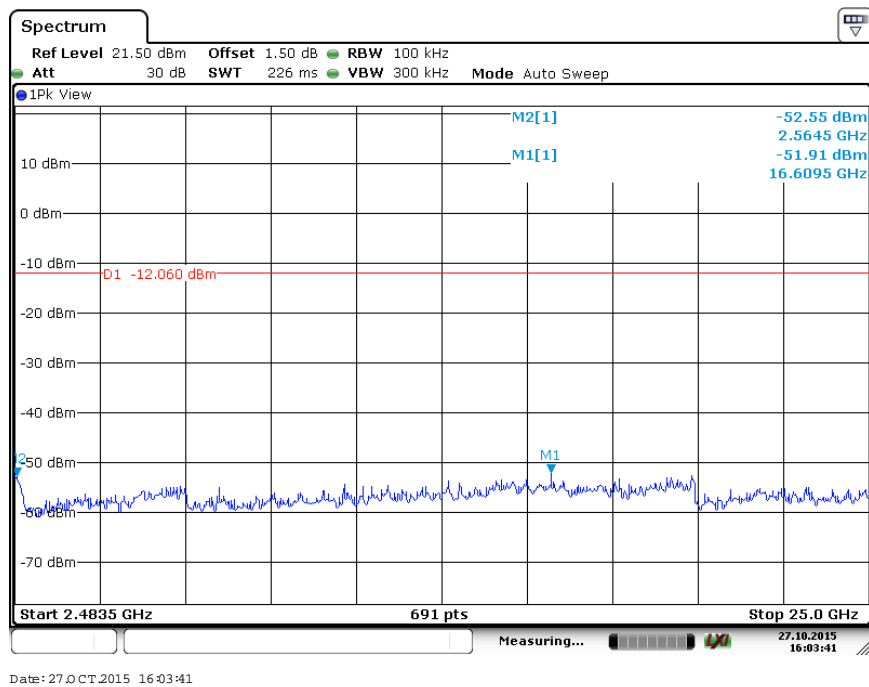
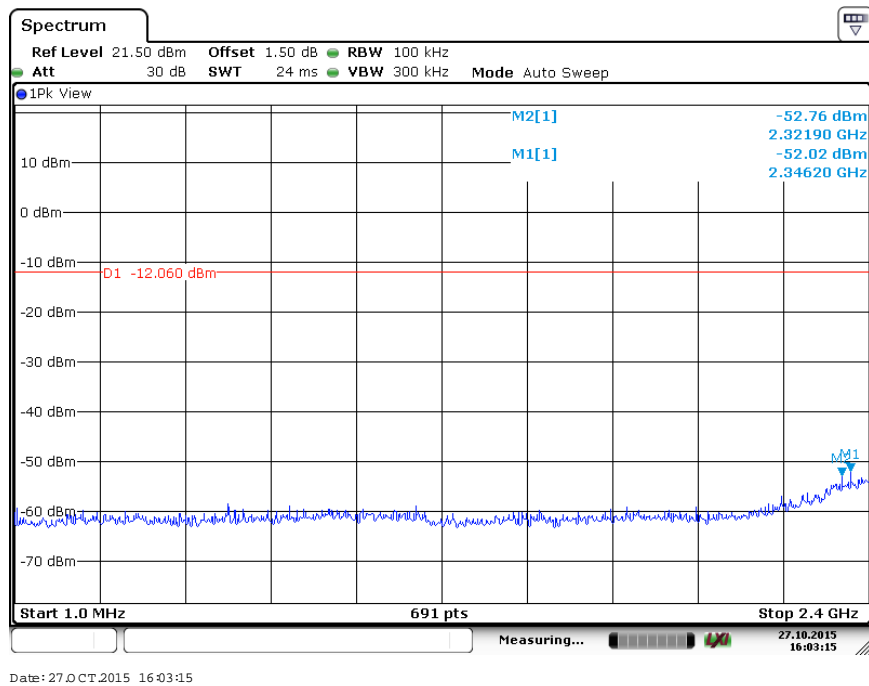


Date: 27.OCT.2015 15:09:19

TRF no.: FCC 15C_TX_c
 FCC ID: 2AF82-FHD100
 Report No.: 151016016SZN-001

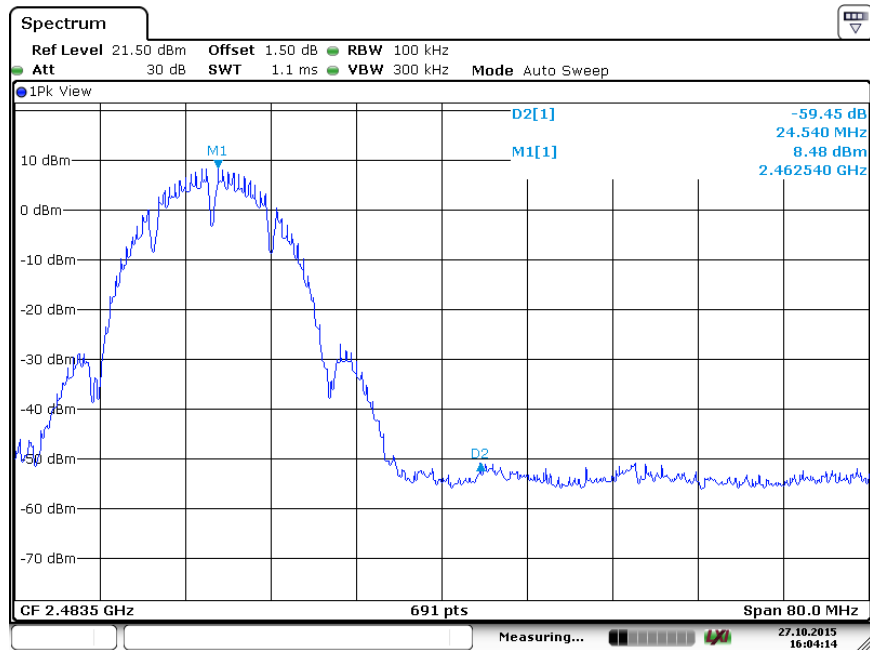
INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: 7.94dBm



TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

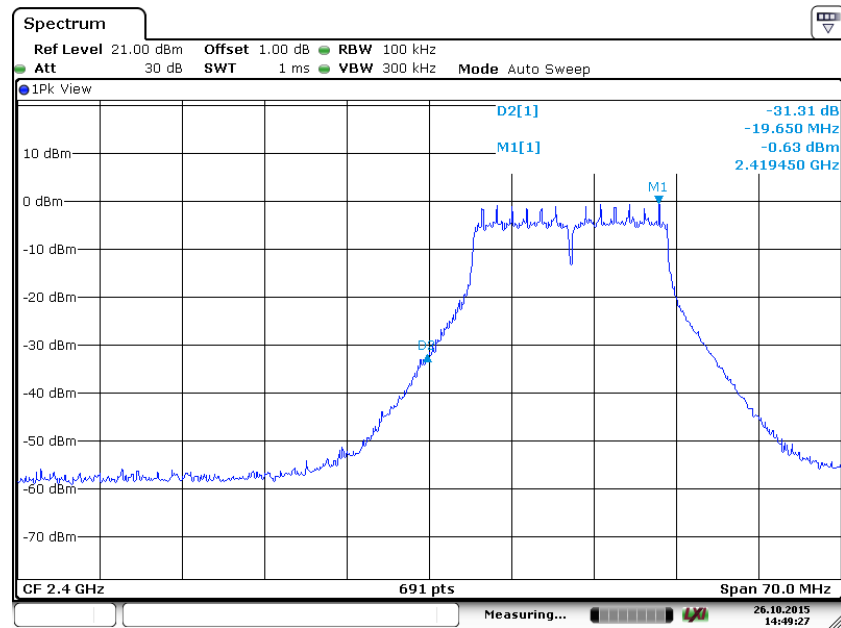
INTERTEK TESTING SERVICES



Date: 27.OCT.2015 16:04:15

TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

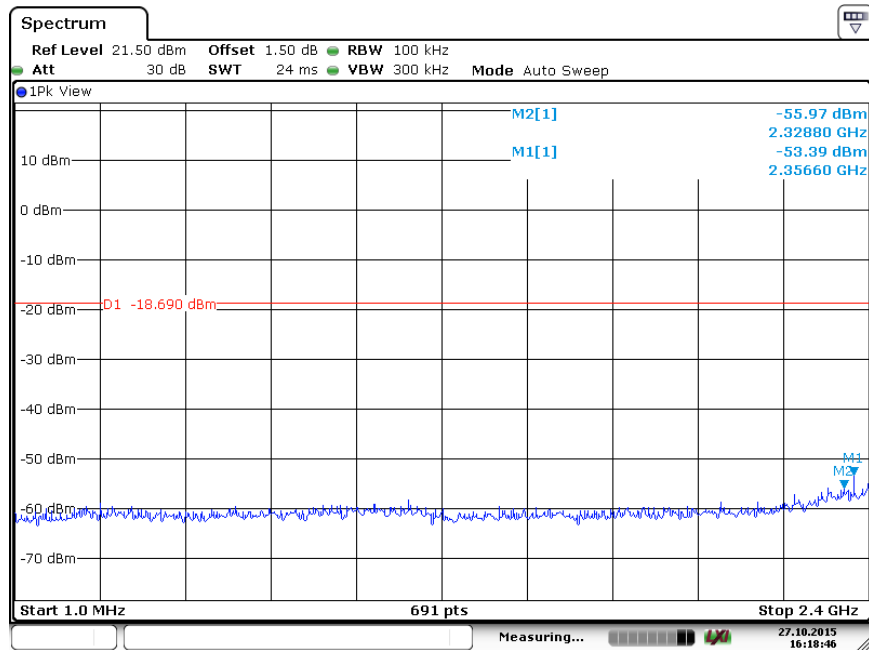


Date: 26.OCT.2015 14:49:28

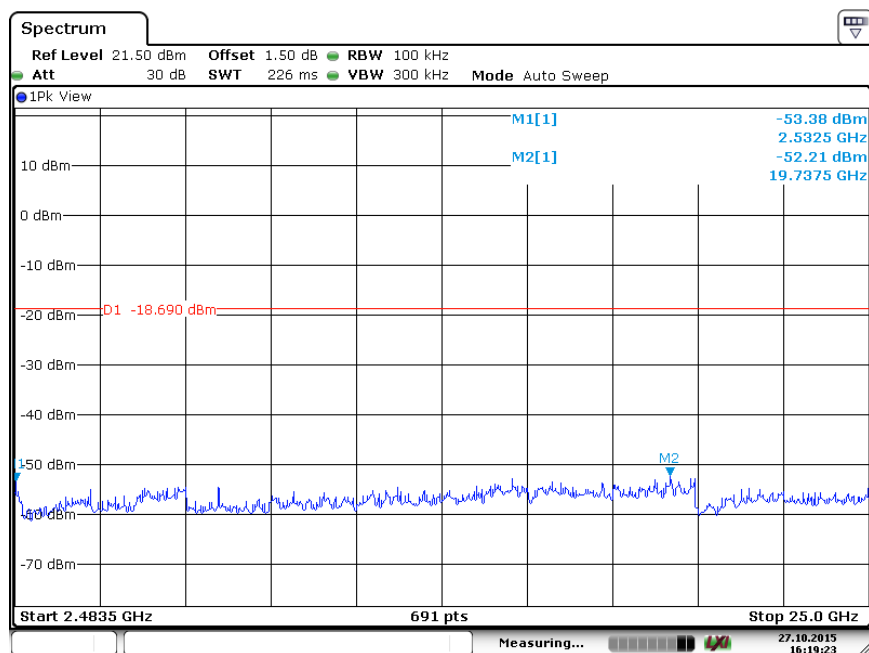
TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Channel 06 (2437MHz) Reference Level: 1.31dBm



Date: 27.OCT.2015 16:18:47

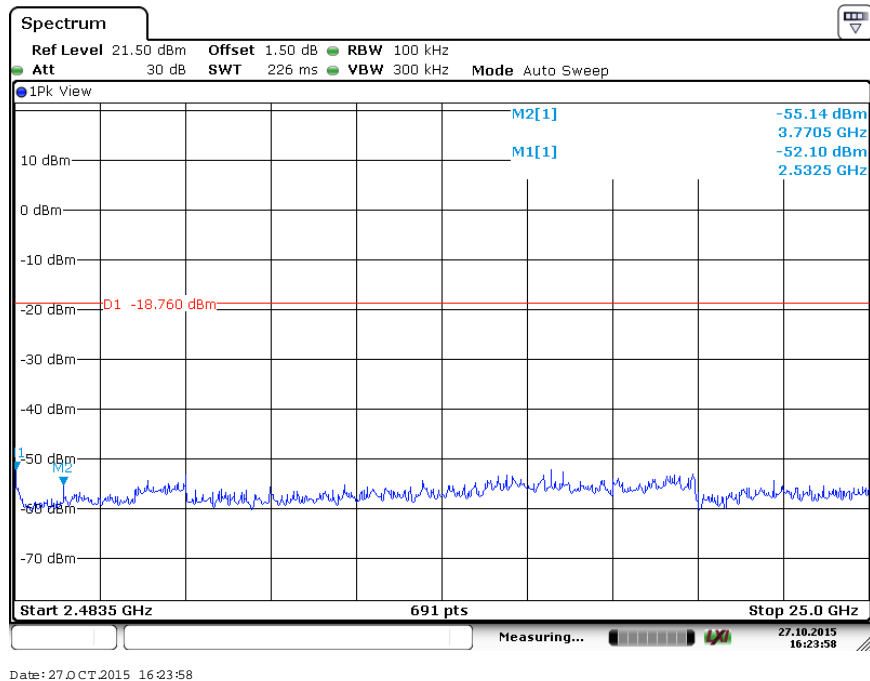
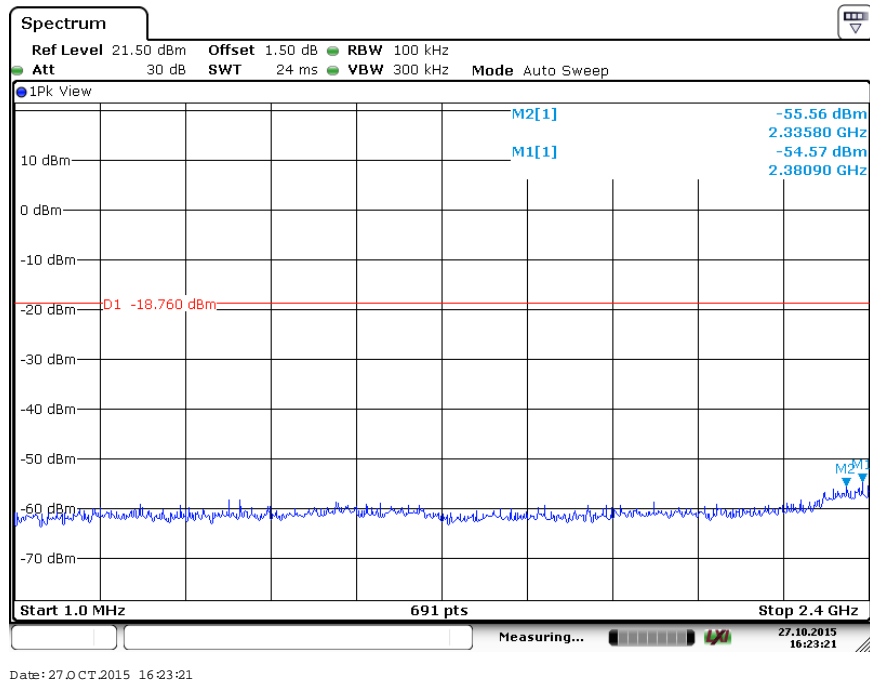


Date: 27.OCT.2015 16:19:23

TRF no.: FCC 15C_TX_c
 FCC ID: 2AF82-FHD100
 Report No.: 151016016SZN-001

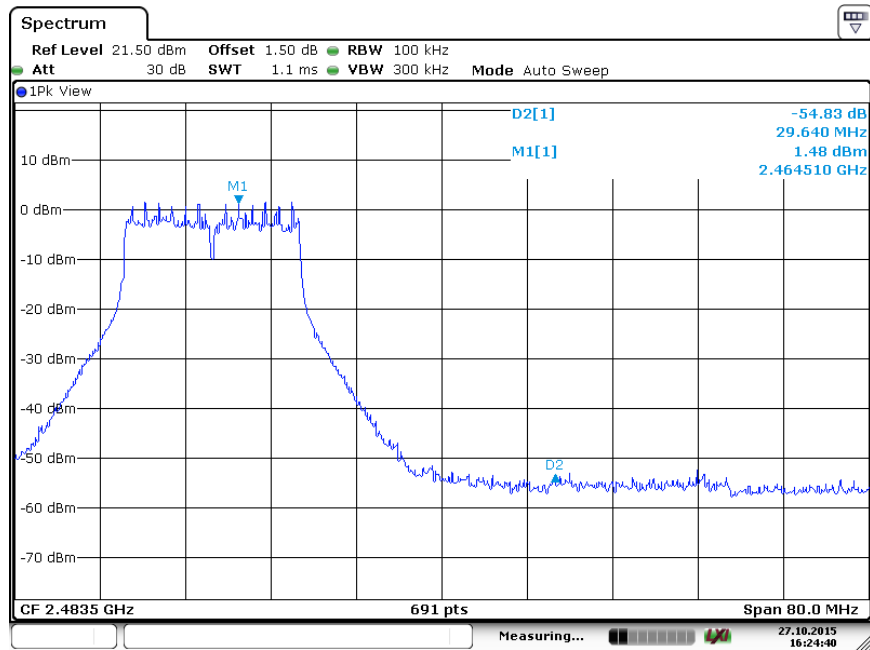
INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: 1.24dBm



TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES



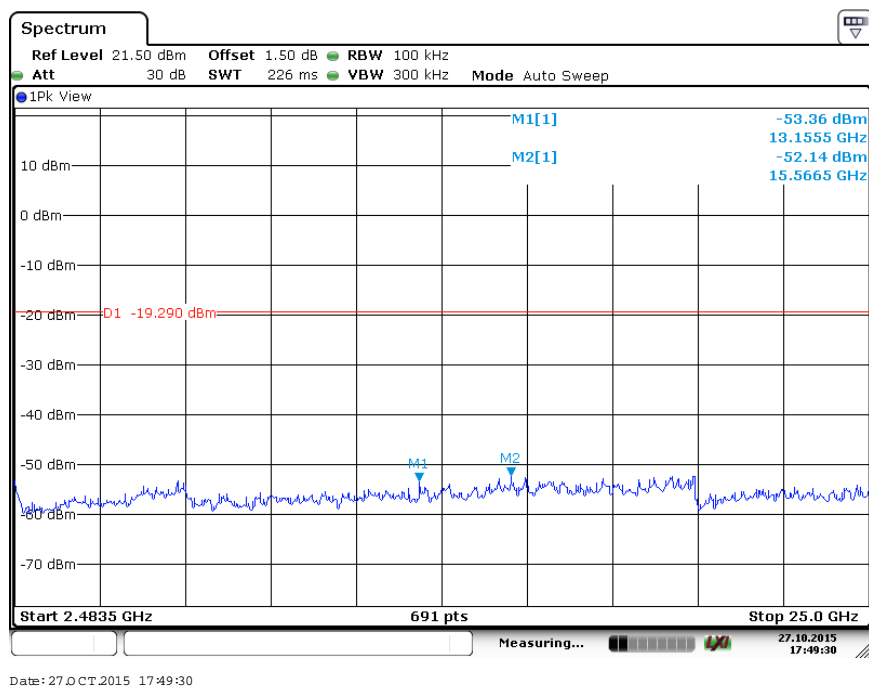
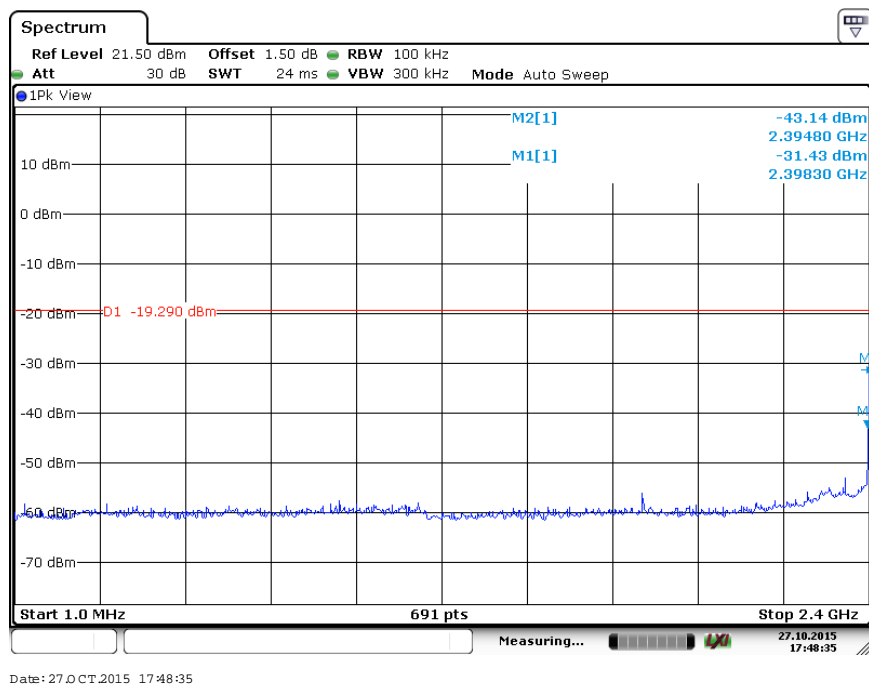
Date: 27.OCT.2015 16:24:40

TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

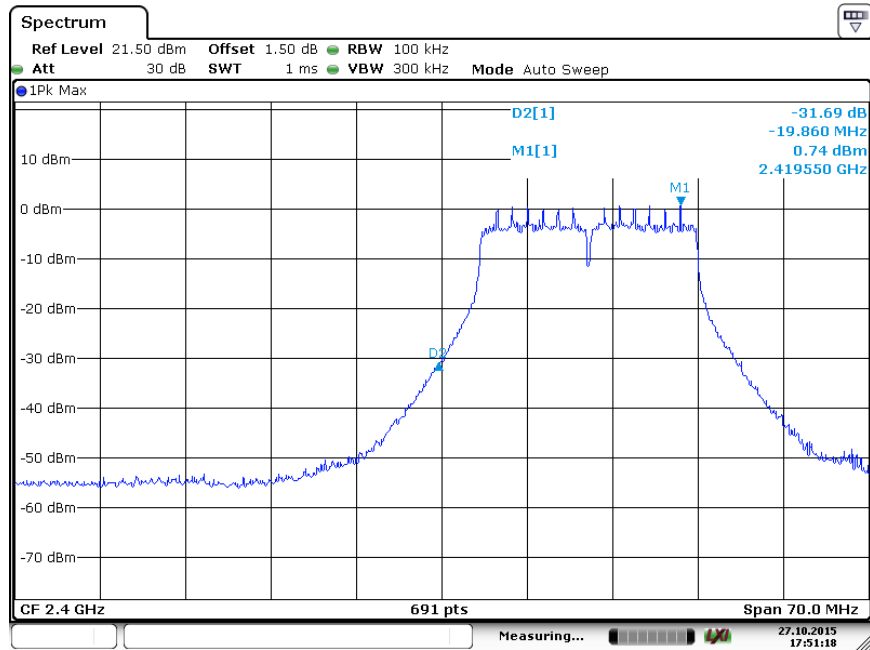
802.11 n-HT20

Channel 01 (2412MHz) Reference Level: 0.71dBm



TRF no.: FCC 15C_TX_c
 FCC ID: 2AF82-FHD100
 Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

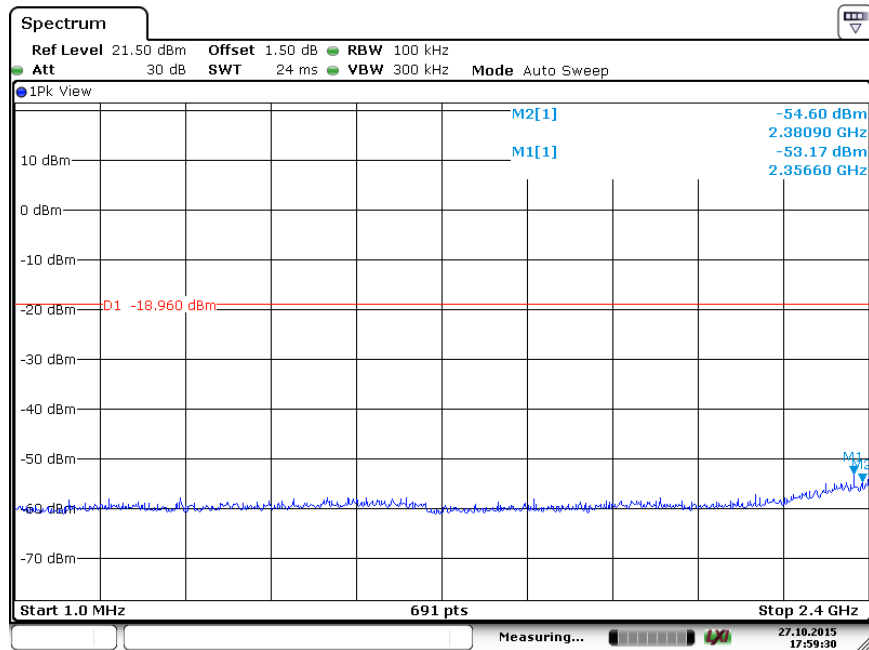


Date: 27.OCT.2015 17:51:18

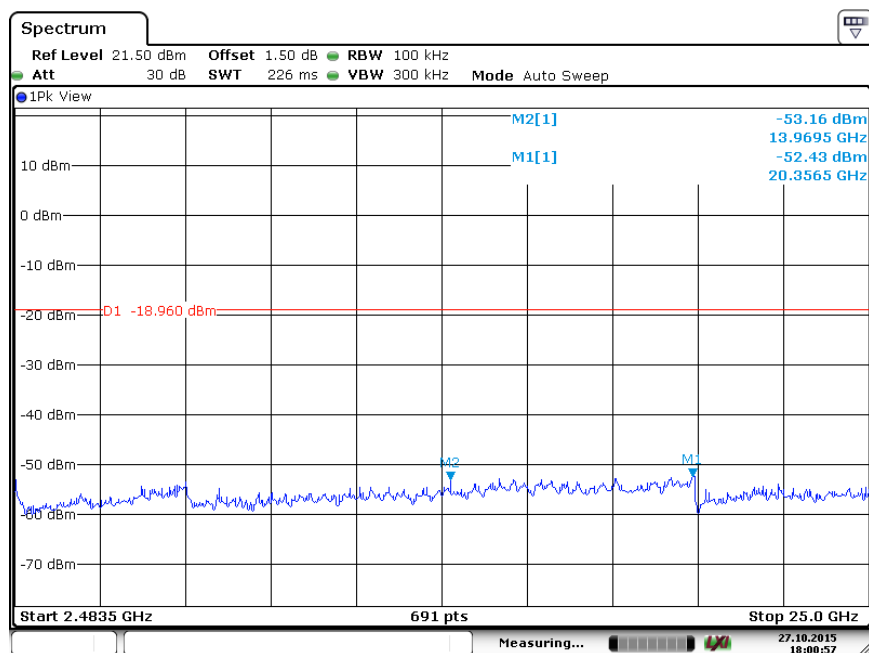
TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Channel 06 (2437MHz) Reference Level: 1.04dBm



Date: 27.OCT.2015 17:59:30

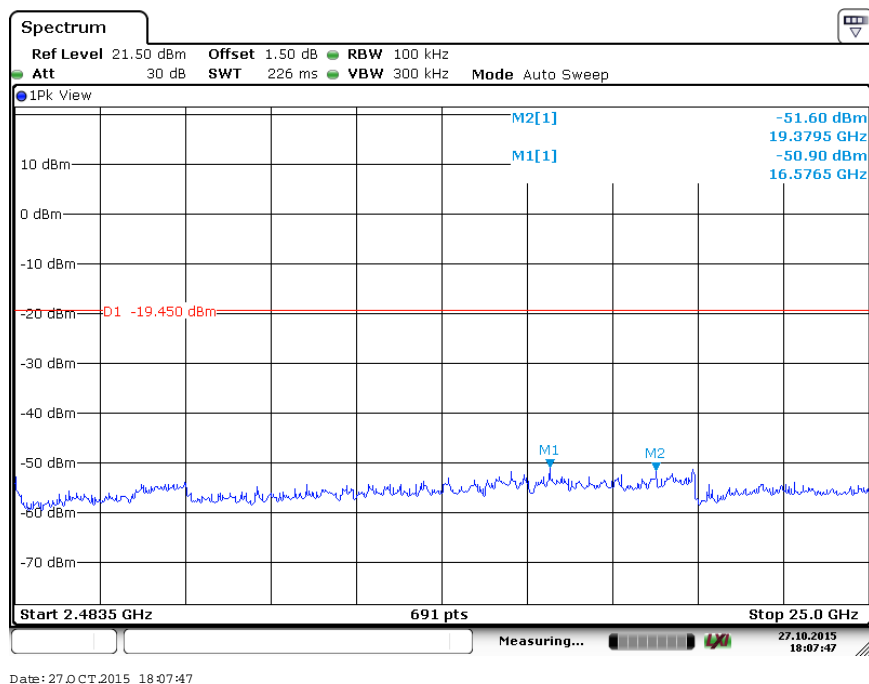
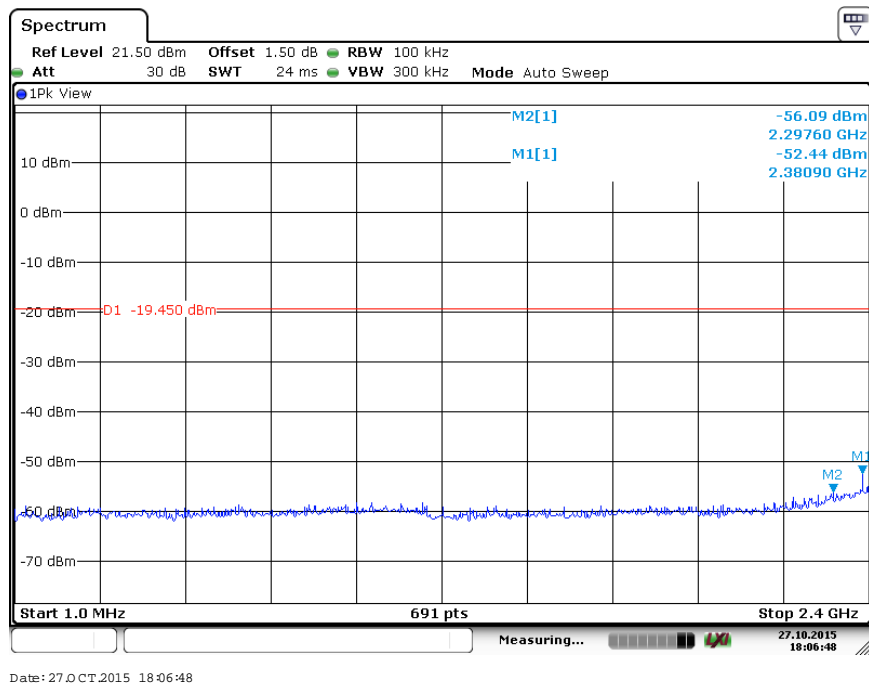


Date: 27.OCT.2015 18:00:57

TRF no.: FCC 15C_TX_c
 FCC ID: 2AF82-FHD100
 Report No.: 151016016SZN-001

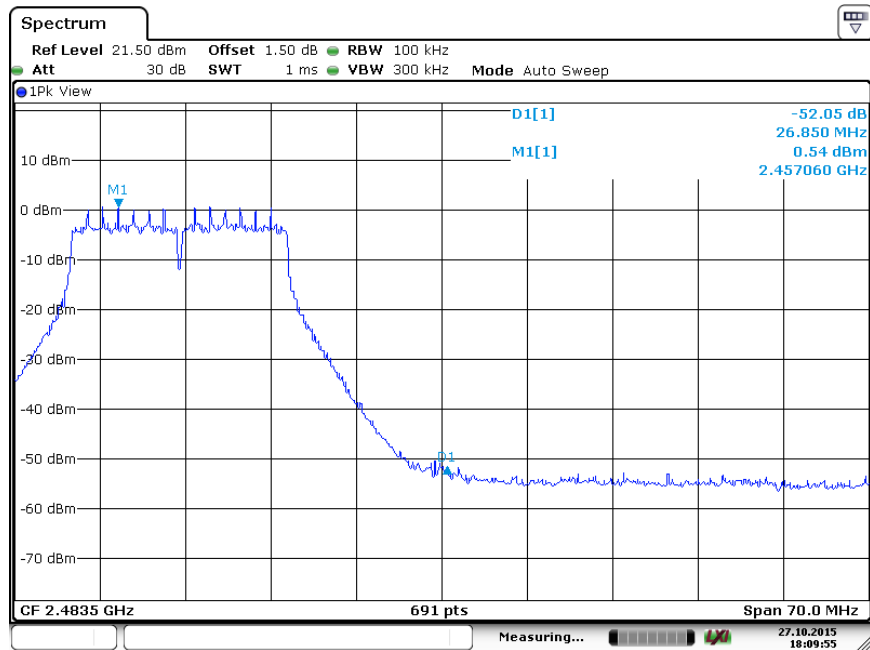
INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: 0.55dBm



TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES



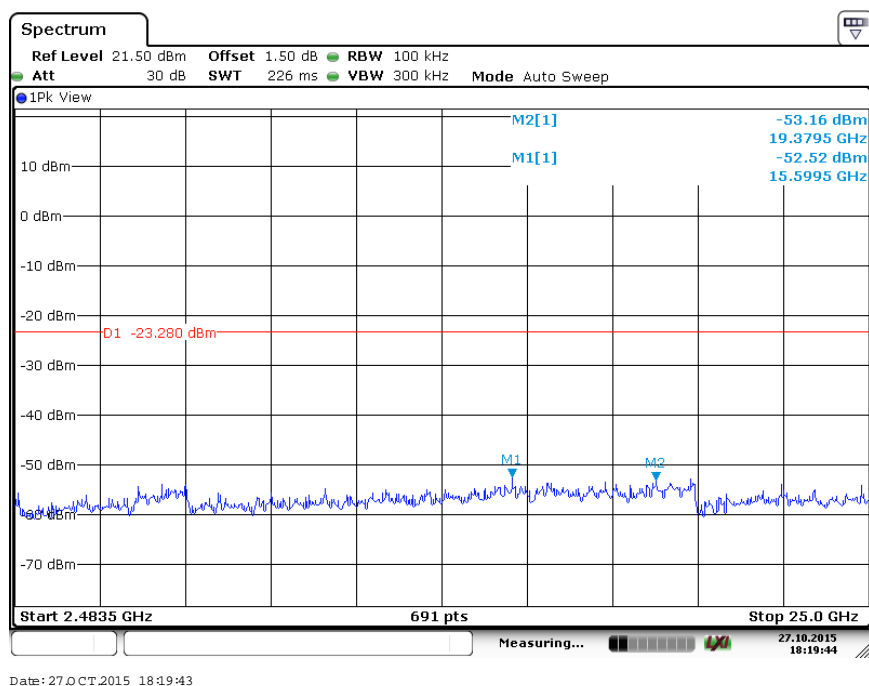
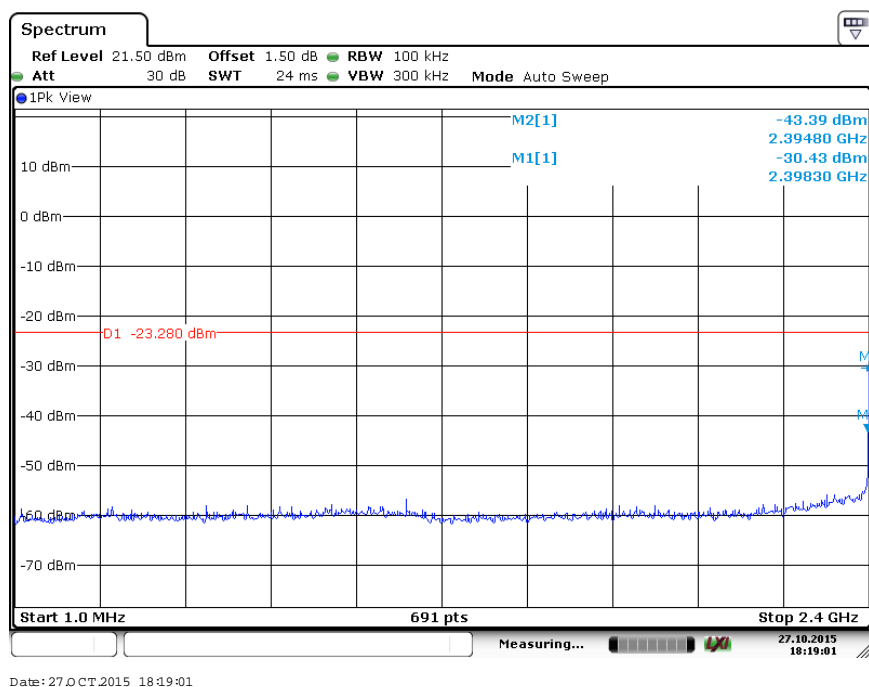
Date: 27.OCT.2015 18:09:55

TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

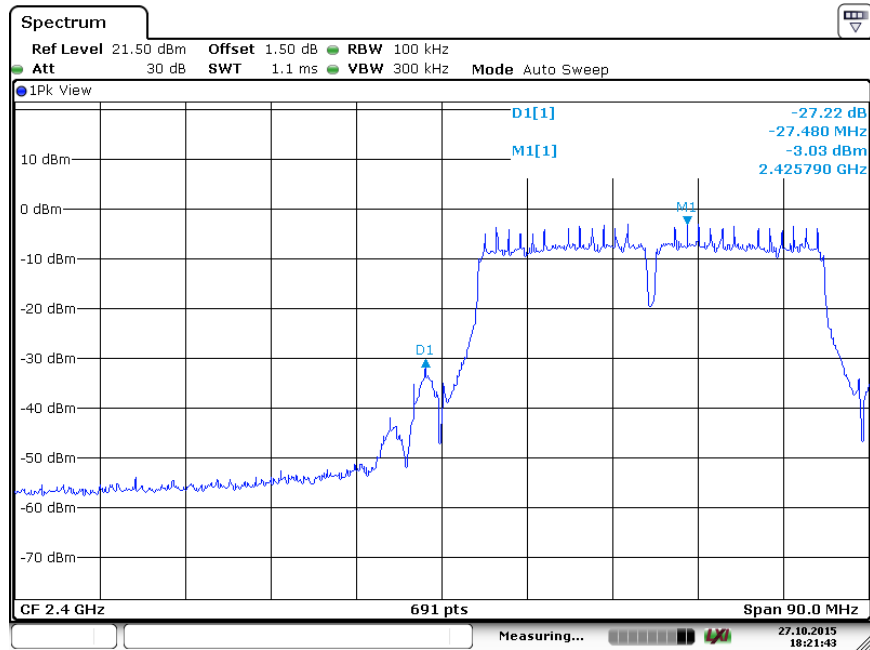
802.11 n-HT40

Channel 03 (2422MHz) Reference Level: -3.28dBm



TRF no.: FCC 15C_TX_c
 FCC ID: 2AF82-FHD100
 Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

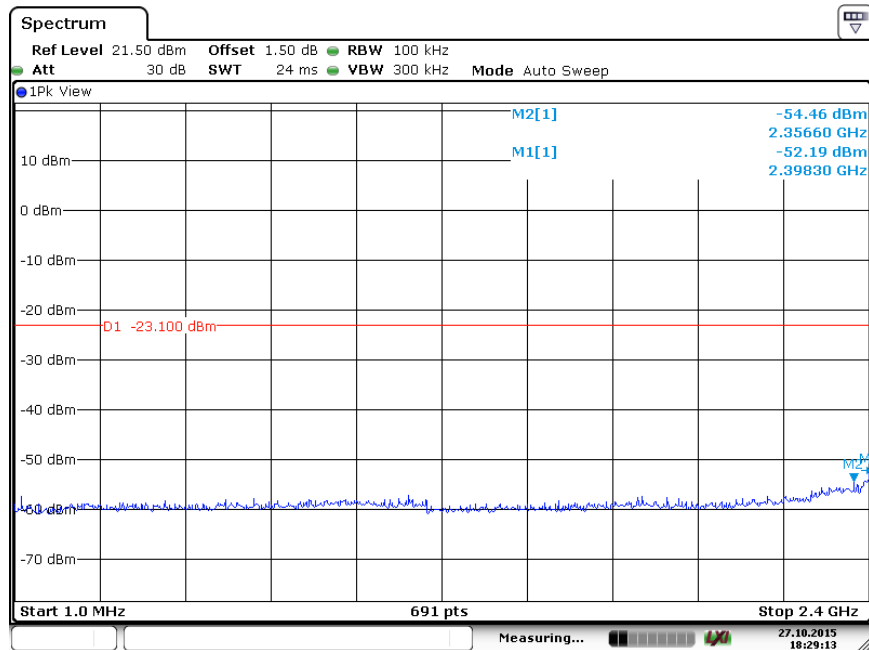


Date: 27.OCT.2015 18:21:44

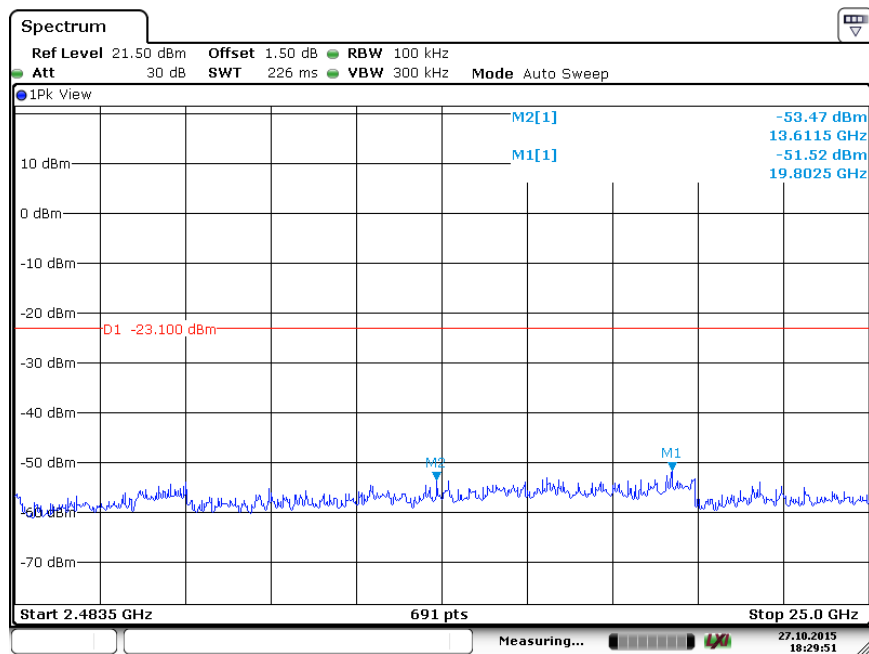
TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Channel 06 (2437MHz) Reference Level: -3.10dBm



Date: 27.OCT.2015 18:29:14

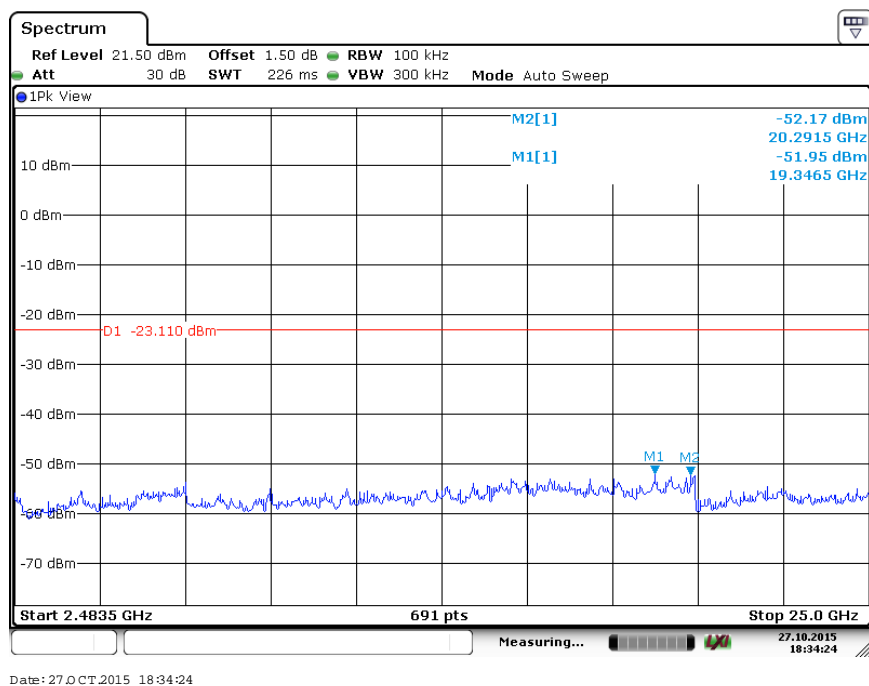
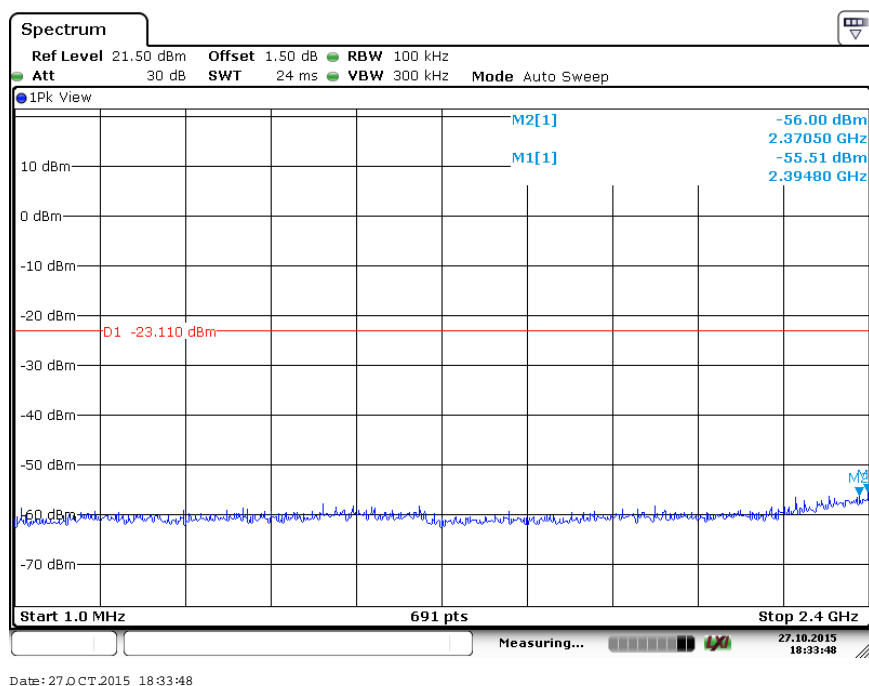


Date: 27.OCT.2015 18:29:51

TRF no.: FCC 15C_TX_c
 FCC ID: 2AF82-FHD100
 Report No.: 151016016SZN-001

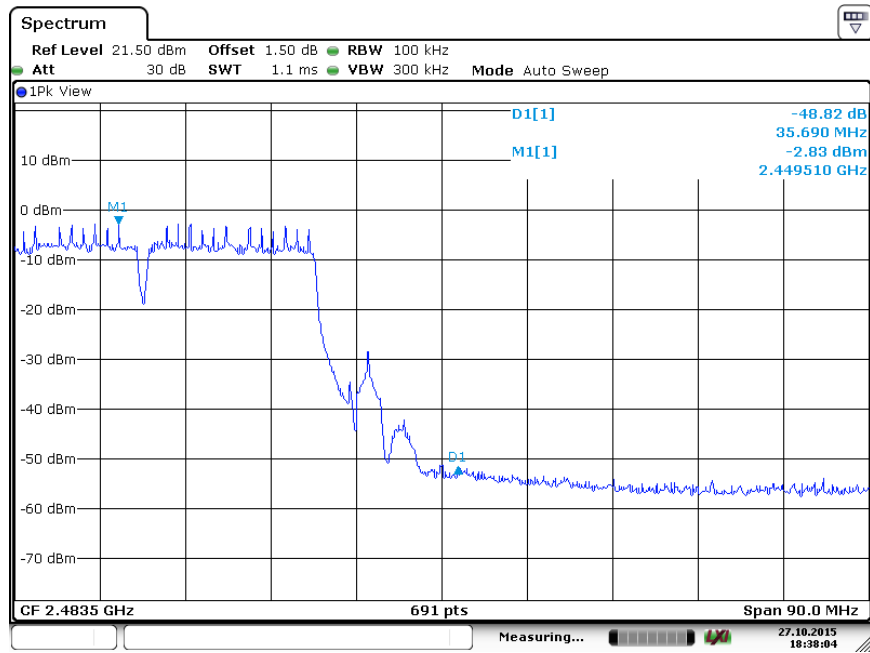
INTERTEK TESTING SERVICES

Channel 09 (2452MHz) Reference Level: -3.11dBm



TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES



Date: 27.OCT.2015 18:38:04

TRF no.: FCC 15C_TX_c
FCC ID: 2AF82-FHD100
Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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 μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ 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 μ 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 μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

RA = 62.0 dB μ V

AF = 7.4 dB

CF = 1.6 dB

AG = 29.0 dB

PD = 0 dB

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

Level in mV/m = Common Antilogarithm [(42 dB μ V/m)/20] = 125.9 μ V/m

TRF no.: FCC 15C_TX_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd
Date of Test: October 27, 2015
Model: FHD-100

4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission at (802. 11N-HT20) 2484.870 MHz is passed by 4.2 dB margin.

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

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

Worst Case Operating Mode: 802.11n-HT40 (TX-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	68.315	39.6	20.0	6.1	25.7	40.0	-14.3
Horizontal	371.440	40.8	20.0	10.3	31.1	46.0	-14.9
Horizontal	960.230	43.4	20.0	13.9	37.3	54.0	-16.7
Vertical	30.485	38.1	20.0	9.8	27.9	40.0	-12.1
Vertical	116.330	41.6	20.0	6.8	28.4	43.5	-15.1
Vertical	958.470	39.8	20.0	16.3	36.1	46.0	-9.9

- 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.

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

Worst Case Operating Mode: 802.11b (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	55.4	36.1	34.2	53.5	74.0	-20.5
Horizontal	*2389.400	51.4	20.0	28.2	59.6	74.0	-14.4

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	*4824.000	47.9	36.1	34.2	46.0	54.0	-8.0
Horizontal	*2389.400	37.8	20.0	28.2	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_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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	55.4	36.1	34.6	53.9	74.0	-20.1
Horizontal	*7311.000	55.8	35.6	37.1	57.3	74.0	-16.7
Horizontal	*9748.000	57.7	36.3	38.5	59.9	74.0	-14.1

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	*4874.000	47.7	36.1	34.6	46.2	54.0	-7.8
Horizontal	*7311.000	40.1	35.6	37.1	41.6	54.0	-12.4
Horizontal	*9748.000	42.6	36.3	38.5	44.8	54.0	-9.2

- 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_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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	54.4	36.1	34.6	52.9	74.0	-21.1
Horizontal	*7386.000	55.9	35.6	37.2	57.5	74.0	-16.5
Horizontal	*9848.000	58.0	36.3	38.6	60.3	74.0	-13.7
Horizontal	*2483.518	52.4	20.0	28.0	60.4	74.0	-13.6

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	*4924.000	46.6	36.1	34.6	45.1	54.0	-8.9
Horizontal	*7386.000	44.2	35.6	37.2	45.8	54.0	-8.2
Horizontal	*9848.000	43.0	36.3	38.6	45.3	54.0	-8.7
Horizontal	*2483.518	38.8	20.0	28.0	46.8	54.0	-7.2

- 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_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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	53.5	36.1	34.2	51.6	74.0	-22.4
Horizontal	*2388.960	51.2	20.0	28.2	59.4	74.0	-14.6

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	*4824.000	38.7	36.1	34.2	36.8	54.0	-17.2
Horizontal	*2388.960	37.5	20.0	28.2	45.7	54.0	-8.3

- 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_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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	52.3	36.1	34.6	50.8	74.0	-23.2
Horizontal	*7311.000	55.6	35.6	37.1	57.1	74.0	-16.9
Horizontal	*9748.000	57.3	36.8	38.5	59.0	74.0	-15.0

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	37.7	36.1	34.6	36.2	54.0	-17.8
Horizontal	*7311.000	39.6	35.6	37.1	41.1	54.0	-12.9
Horizontal	*9748.000	42.1	36.8	38.5	43.8	54.0	-10.2

- 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_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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	52.8	36.1	34.6	51.3	74.0	-22.7
Horizontal	*7386.000	56.2	35.6	37.2	57.8	74.0	-16.2
Horizontal	*9848.000	57.1	35.6	38.6	60.1	74.0	-13.9
Horizontal	*2483.529	50.9	20.0	28.0	58.9	74.0	-15.1

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	*4924.000	38.1	36.1	34.6	36.6	54.0	-17.4
Horizontal	*7386.000	40.5	35.6	37.2	42.1	54.0	-11.9
Horizontal	*9848.000	41.4	35.6	38.6	44.4	54.0	-9.6
Horizontal	*2483.529	37.1	20.0	28.0	45.1	54.0	-8.9

- 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_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

Worst Case Operating Mode: 802.11n-HT20 (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	52.5	36.1	34.2	50.6	74.0	-23.4
Horizontal	*2389.440	50.7	20.0	28.2	58.9	74.0	-15.1

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	38.3	36.1	34.2	36.4	54.0	-17.6
Horizontal	*2389.440	37.7	20.0	28.2	45.9	54.0	-8.1

- 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_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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	52.9	36.1	34.2	51.0	74.0	-23.0
Horizontal	*7311.000	55.6	35.6	37.1	57.1	74.0	-16.9
Horizontal	*9748.000	57.6	36.8	38.5	59.3	74.0	-14.7

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	38.1	36.1	34.2	36.2	54.0	-17.8
Horizontal	*7311.000	39.6	35.6	37.1	41.1	54.0	-12.9
Horizontal	*9748.000	42.5	36.8	38.5	44.2	54.0	-9.8

- 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_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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	50.9	36.1	34.6	49.4	74.0	-24.6
Horizontal	*7386.000	55.4	35.6	37.2	57.0	74.0	-17.0
Horizontal	*9848.000	56.9	35.6	38.6	59.9	74.0	-14.1
Horizontal	*2484.870	51.7	20.0	28.0	59.7	74.0	-14.3

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	37.4	36.1	34.6	35.9	54.0	-18.1
Horizontal	*7386.000	38.9	35.6	37.2	40.5	54.0	-13.5
Horizontal	*9848.000	42.1	35.6	38.6	45.1	54.0	-8.9
Horizontal	*2484.870	41.8	20.0	28.0	49.8	54.0	-4.2

- 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_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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	*4844.000	52.3	36.1	34.2	50.4	74.0	-23.6
Horizontal	*2389.800	50.7	20.0	28.2	58.9	74.0	-15.1

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	*4844.000	37.7	36.1	34.2	35.8	54.0	-18.2
Horizontal	*2389.800	37.4	20.0	28.2	45.6	54.0	-8.4

- 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_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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	51.7	36.1	34.2	49.8	74.0	-24.2
Horizontal	*7311.000	55.3	35.6	37.1	56.8	74.0	-17.2
Horizontal	*9748.000	57.1	36.8	38.5	58.8	74.0	-15.2

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	37.3	36.1	34.2	35.4	54.0	-18.6
Horizontal	*7311.000	38.9	35.6	37.1	40.4	54.0	-13.6
Horizontal	*9748.000	42.2	36.8	38.5	43.9	54.0	-10.1

- 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_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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

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	*4904.000	52.3	36.1	34.6	50.8	74.0	-23.2
Horizontal	*2483.552	51.1	20.0	28.0	59.1	74.0	-14.9

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	*4904.000	37.3	36.1	34.6	35.8	54.0	-18.2
Horizontal	2483.552	37.1	20.0	28.0	45.1	54.0	-8.9

- 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_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

4.9 Conducted Emission

Worst Case Conducted emission at 0.438MHz is Passed by 10.4 dB margin

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

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

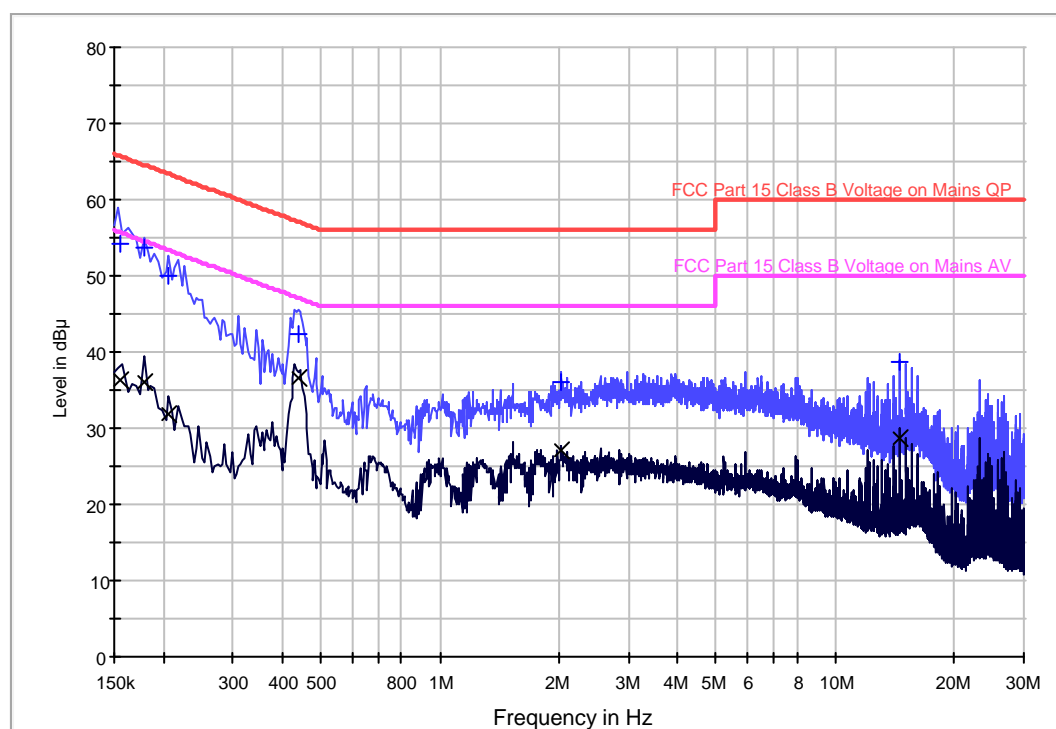
Date of Test: October 27, 2015

Model: FHD-100

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

Line: Live

Conducted Emission Test - FCC



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBμV)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.156000	54.2	L1	9.8	11.5	65.7
0.178000	53.6	L1	9.8	11.0	64.6
0.206000	50.1	L1	9.8	13.3	63.4
0.438000	42.5	L1	9.9	14.6	57.1
2.030000	36.1	L1	9.9	19.9	56.0
14.626000	38.7	L1	9.9	21.3	60.0

Limit and Margin AV

Frequency (MHz)	Average (dBμV)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.156000	36.4	L1	9.8	19.3	55.7
0.178000	36.1	L1	9.8	18.5	54.6
0.206000	31.8	L1	9.8	21.6	53.4
0.438000	36.7	L1	9.9	10.4	47.1
2.030000	27.1	L1	9.9	18.9	46.0
14.626000	28.6	L1	9.9	21.4	50.0

TRF no.: FCC 15C_TX_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd

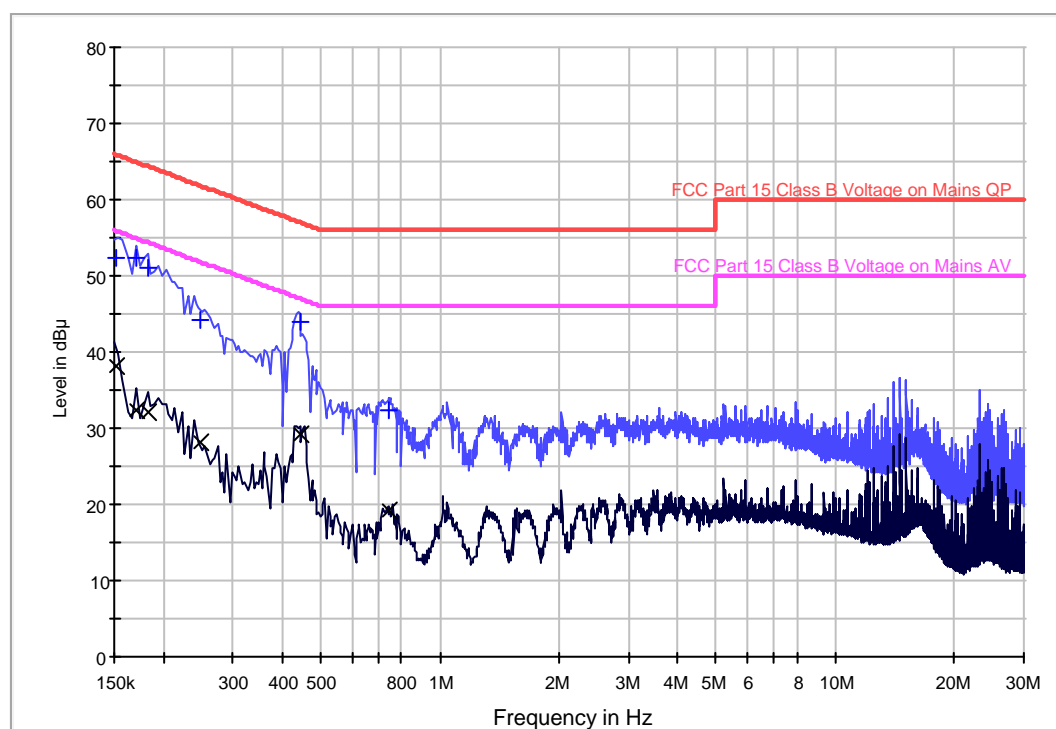
Date of Test: October 27, 2015

Model: FHD-100

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

Line: Neutral

Conducted Emission Test - FCC



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBμV)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.151000	52.4	N	10.2	13.5	65.9
0.171000	52.4	N	10.2	12.5	64.9
0.182000	51.1	N	10.1	13.3	64.4
0.248000	44.2	N	10.2	17.6	61.8
0.444000	44.0	N	10.2	13.0	57.0
0.738000	32.3	N	10.3	23.7	56.0

Limit and Margin AV

Frequency (MHz)	Average (dBμV)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.151000	26.8	N	10.2	17.8	55.9
0.171000	32.8	N	10.2	22.6	54.9
0.182000	28.6	N	10.1	22.3	54.4
0.248000	26.2	N	10.2	23.7	51.8
0.444000	26.0	N	10.2	17.9	47.0
0.738000	24.1	N	10.3	26.9	46.0

TRF no.: FCC 15C_TX_c

FCC ID: 2AF82-FHD100

Report No.: 151016016SZN-001

INTERTEK TESTING SERVICES

Applicant: Qbic technology Co., Ltd
Date of Test: October 27, 2015
Model: FHD-100

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

Applicant: Qbic technology Co., Ltd

Date of Test: October 27, 2015

Model: FHD-100

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

EXHIBIT 5

EQUIPMENT PHOTOGRAPHS

INTERTEK TESTING SERVICES

5.0 **Equipment Photographs**

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

INTERTEK TESTING SERVICES

EXHIBIT 6

PRODUCT LABELLING

INTERTEK TESTING SERVICES

6.0 **Product Labeling**

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

INTERTEK TESTING SERVICES

EXHIBIT 7

TECHNICAL SPECIFICATIONS

INTERTEK TESTING SERVICES

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

EXHIBIT 8

INSTRUCTION MANUAL

INTERTEK TESTING SERVICES

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

EXHIBIT 9

CONFIDENTIALITY REQUEST

INTERTEK TESTING SERVICES

9.0 **Confidentiality Request**

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

INTERTEK TESTING SERVICES

EXHIBIT 10

MISCELLANEOUS INFORMATION

INTERTEK TESTING SERVICES

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

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	20-May-2015	20-May-2016
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	20-May-2015	20-May-2016
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	14-Jun-2015	14-Jun-2016
SZ185-01	EMI Receiver	R&S	ESCI	100547	7-Feb-2015	7-Feb-2016
SZ061-09	Horn Antenna	ETS	3115	00092346	1-Nov-2014	1-Nov-2015
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	3-Sep-2015	3-Sep-2016
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	29-Apr-2015	29-Apr-2016
SZ056-06	Signal Analyzer	R&S	FSV40	OTC-76	8-Jul-2015	8-Jul-2016
SZ181-04	Preamplifier	Agilent	8449B	3008A0247 4	7-Feb-2015	7-Feb-2016
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-1 00	4102	19-Apr-2015	19-Apr-2016
SZ062-02	RF Cable	RADIAL	RG 213U	--	27-Jun-2015	27-Dec-2015
SZ062-05	RF Cable	RADIAL	0.04-26.5 GHz	--	27-Jun-2015	27-Dec-2015
SZ062-12	RF Cable	RADIAL	0.04-26.5 GHz	--	27-Jun-2015	27-Dec-2015
SZ067-04	Notch Filter	Micro-Tronics	BRM5070 2-02	--	20-May-2015	20-May-2016
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	1-Nov-2014	1-Nov-2015
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	1-Nov-2014	1-Nov-2015
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	24-Jun-2015	24-Jun-2016
SZ188-03	Shielding Room	ETS	RFD-100	4100	23-Aug-2014	23-Aug-2016