



HUAWEI TECHNOLOGIES CO., LTD.

Application
For
Certification

FCC ID: QIS-WS330

300Mbps Wireless Router

Model: WS330

WiFi Transceiver

Report No.: 130411010SZN-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 [10-1-12]

Prepared and Checked by:

Approved by:

Sign on file

Lin Lin
Project Engineer

Billy Li
Supervisor
Date: 18 April, 2013

- 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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TRF no.: FCC 15C_Tx_b

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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

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MEASUREMENT/TECHNICAL REPORT

Huawei Technologies Co.,Ltd - MODEL: WS330

FCC ID: QIS-WS330

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 [10-01-12 Edition] provision.

Report prepared by:

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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 Details of EUT and Description of Peripherals	8
3.4 Measurement Uncertainty	8
3.5 Equipment Modification	8
3.6 Support Equipment List and Description	9
4.0 <u>Measurement Results</u>	11
4.1 Maximum Conducted Output Power at Antenna Terminals	11
4.2 Minimum 6dB RF Bandwidth	24
4.3 Maximum Power Density	47
4.4 Out of Band Conducted Emissions	70
4.5 Out of Band Radiated Emissions	162
4.6 Transmitter Radiated Emissions in Restricted Bands	163
4.7 Field Strength Calculation	164
4.8 Radiated Spurious Emission	165
4.9 Conducted Emission	197
4.10 Radiated Emission from Digital Section of Transceiver	200
4.11 Transmitter Duty Cycle Calculation and Measurements	201
5.0 <u>Equipment Photographs</u>	203
6.0 <u>Product Labelling</u>	205
7.0 <u>Technical Specifications</u>	207
8.0 <u>Instruction Manual</u>	209
9.0 <u>Confidentiality Request</u>	211
10.0 <u>Miscellaneous Information</u>	213
11.0 <u>Test Equipment List</u>	215

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List of attached file

Exhibit Type	File Description	Filename
Cover Letter	Letter of Agency	agency.pdf
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
Cover Letter	Confidentiality Letter	request.pdf
RF Exposure report	RF exposure	RF exposure.pdf
User Manual	User Manual	manual.pdf

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EXHIBIT 1

SUMMARY OF TEST RESULTS

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1.0 Summary of Test

Huawei Technologies Co.,Ltd - MODEL: WS330

FCC ID: QIS-WS330

TEST	REFERENCE	RESULTS
Max. Output power	15.247(b)	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 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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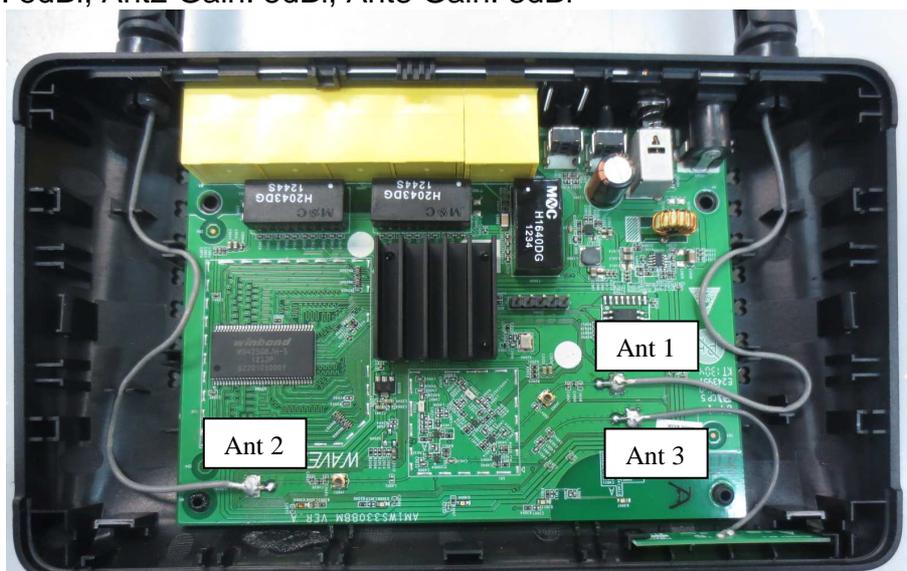
2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a 300Mbps Wireless Router, Model: WS330 operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing. EUT operated at 2422-2452MHz for 802.11n-HT40, 7 channels with 5MHz channel spacing. It is powered by AC/DC Adapter (Input: 100-240Vac, 50/60Hz; Output: 12V, 0.5A). The EUT including 3 antennas, the RF IC support 2Tx & 2Rx mode, in 802.11b/g/n-HT20/n-HT40 SISO mode Ant1 transceiver only and in MIMO mode can form 3 MIMO mode (Ant1+Ant2 or Ant1+Ant3 or Ant2+Ant3) under the 802.11n-HT20 & 802.11n-HT40, If the receiver sensitivity has meet internal limit valve, the antenna of EUT will auto transfer to the another antenna. For more detailed features description, please refer to the user's manual.

Antenna distribution diagram:

Ant1 Gain: 5dBi; Ant2 Gain: 5dBi, Ant3 Gain: 3dBi



Type of Modulation: DBPSK, DQPSK, BPSK, QPSK, 16QAM, 64QAM.

Antenna Type: Integral Antenna.

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

TRF no.: FCC 15C_TX_b

FCC ID: QIS-WS330

Report No.: 130411010SZN-001

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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. Data Transfer and other function: (Report No.: 130411010SZN-002).

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).

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EXHIBIT 3

SYSTEM TEST CONFIGURATION

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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. It was powered by AC/DC Adapter Input: 120Vac, 60Hz during the test. 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.

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.

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Power Parameters of IEEE 802.11b/g/n

Test software setting of IEEE 802.11b/g/n			
Channel No.	Output Power	Data rate	Modulation type
1,6,11	18.0	802.11b: 1-11Mbps	802.11b: DBPSK, DQPSK
	18.0	802.11g: 6-54Mbps	802.11g: BPSK, QPSK, 16QAM, 64QAM
1,6,11	18.0	802.11n-20M: 6.5-130Mbps	802.11n: BPSK, QPSK, 16QAM, 64QAM
3,6,9	18.0	802.11n-40M: 13.5-270Mbps	802.11n: BPSK, QPSK, 16QAM, 64QAM

3.3 Special Accessories

N/A

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 HUAWEI TECHNOLOGIES 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.

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3.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Model No.
Laptop	Lenovo	X1
Hard Disk	Smart.drive	HD-003
USB Cable	Smart.drive	Unshielded, Length 155cm
1394 Cable	Smart.drive	Unshielded, Length 180cm
LAN Cable*5	N/A	Unshielded, Length: 200cm
AC Adapter	Huawei	HW-120050U1W Input:100-240V 50/60Hz
Router*4	TP-LINK	TL-MR11U

Note: this production including three AC/DC Adapter suppliers, and had been arranged testing separately, the worst-case was recorded in this report.

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EXHIBIT 4

MEASUREMENT RESULTS

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Applicant: Huawei Technologies Co.,Ltd
Model: WS330

Date of Test: 12 April, 2013

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 spectrum analyzer. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.
- [x] The antenna port of the EUT was connected to the input of a spectrum analyzer. The analyzer was set according to the FCC KDB 558074 spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges and power was read directly in dBm. External attenuation and cable loss were compensated from the measured value.

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

IEEE 802.11b (Antenna Gain = 5dBi) (DBPSK, 1Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	19.21	83.37
Middle Channel: 2437	19.44	87.90
High Channel: 2462	19.11	81.47

IEEE 802.11g (Antenna Gain = 5dBi) (BPSK, 6Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	23.36	216.77
Middle Channel: 2437	22.79	190.11
High Channel: 2462	21.91	155.24

IEEE 802.11n-HT20 (SISO) (Antenna Gain = 5dBi) (BPSK, 6.5Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	23.33	215.28
Middle Channel: 2437	23.41	219.28
High Channel: 2462	21.16	130.62

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IEEE 802.11n-HT20 (MIMO) (Antenna Gain = 8.01dBi, Note3) (BPSK, 13Mbps)			
Frequency (MHz)	Output in dBm		Output in mWatt Total power
	Ant1	Ant2	
Low Channel: 2412	23.80	24.33	510.90
Middle Channel: 2437	20.15	24.62	393.25
High Channel: 2462	19.30	24.05	339.21

IEEE 802.11n-HT20 (MIMO) (Antenna Gain = 7.07dBi, Note3) (BPSK, 13Mbps)			
Frequency (MHz)	Output in dBm		Output in mWatt Total power
	Ant1	Ant3	
Low Channel: 2412	23.80	25.13	565.72
Middle Channel: 2437	20.15	23.93	350.69
High Channel: 2462	19.30	24.14	344.53

IEEE 802.11n-HT20 (MIMO) (Antenna Gain = 7.07dBi, Note3) (BPSK, 13Mbps)			
Frequency (MHz)	Output in dBm		Output in mWatt Total power
	Ant2	Ant3	
Low Channel: 2412	24.33	25.13	596.86
Middle Channel: 2437	24.62	23.93	536.91
High Channel: 2462	24.05	24.14	513.52

IEEE 802.11n-HT40 (SISO) (Antenna Gain = 5dBi) (BPSK, 13.5Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2422	20.36	108.64
Middle Channel: 2437	22.27	168.66
High Channel: 2452	20.05	101.16

IEEE 802.11n-HT40 (MIMO) (Antenna Gain = 8.01dBi, Note3) (BPSK, 27Mbps)			
Frequency (MHz)	Output in dBm		Output in mWatt Total power
	Ant1	Ant2	
Low Channel: 2422	18.89	24.26	344.13
Middle Channel: 2437	20.15	24.61	392.58
High Channel: 2452	17.53	24.27	323.92

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IEEE 802.11n-HT40 (MIMO) (Antenna Gain = 7.07dBi, Note3) (BPSK, 27Mbps)			
Frequency (MHz)	Output in dBm		Output in mWatt Total power
	Ant1	Ant3	
Low Channel: 2422	18.89	23.99	328.06
Middle Channel: 2437	20.15	23.92	350.12
High Channel: 2452	17.53	23.98	306.66

IEEE 802.11n-HT40 (MIMO) (Antenna Gain = 7.07dBi, Note3) (BPSK, 27Mbps)			
Frequency (MHz)	Output in dBm		Output in mWatt Total power
	Ant2	Ant3	
Low Channel: 2422	24.26	23.99	517.30
Middle Channel: 2437	24.61	23.92	535.67
High Channel: 2452	24.27	23.98	517.34

The test plots are attached as below.

Note 1: For MIMO system of 802.11n 20MHz and 40MHz, total power is calculated by combining the output power of each antenna according to KDB662911.

Note 2: Antenna1 Gain: 5dBi, Antenna 2 Gain: 5dBi, Antenna 3 Gain: 3dBi

Note 3: In MIMO, Ant1+Ant2 Directional gain = $G_{ANT} + 10 \log(N)$ dBi = $5 + 10 \log(2) = 8.01$ dBi, so the Power limit will reduce to 27.99dBm (629.506mW);
 Ant1+Ant3 Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}]$ dBi = 7.07dBi,
 so the power limit will reduce to 28.93dBm (781.628mW). Ant2+Ant3 Directional gain same as Ant1+Ant3 which according to KDB662911.

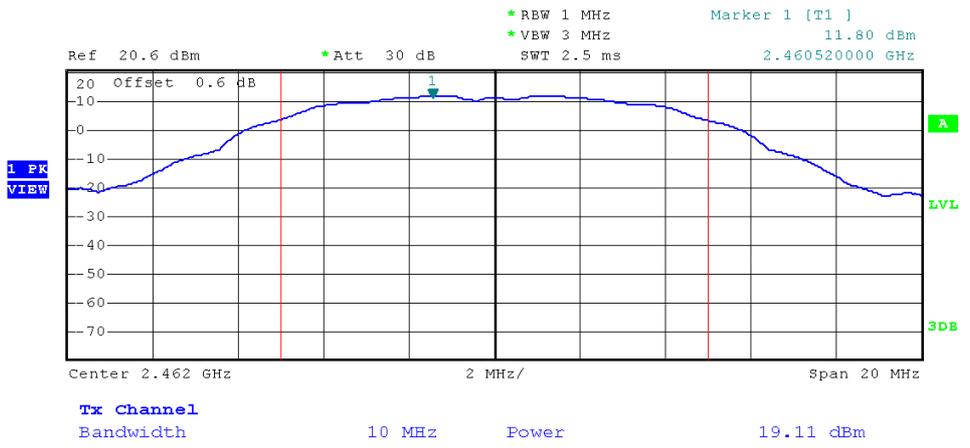
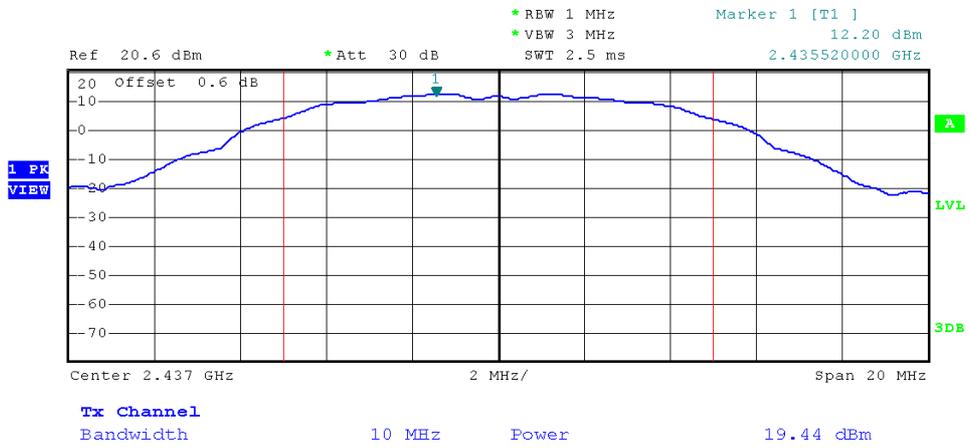
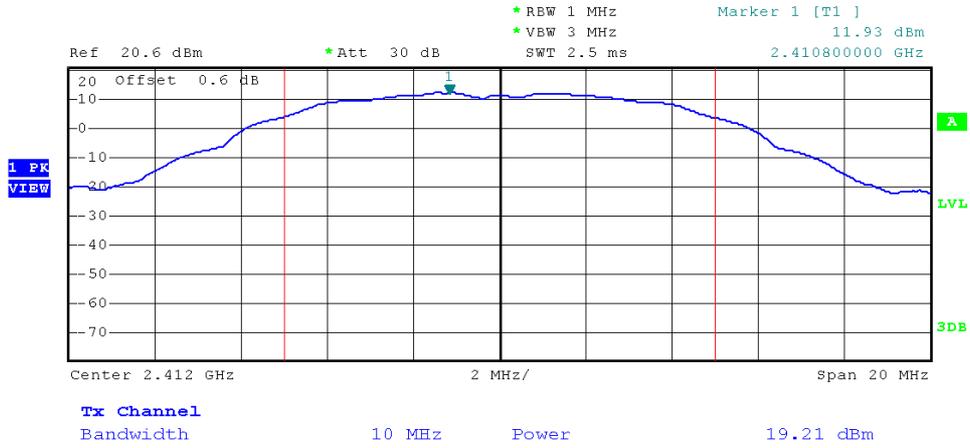
Cable loss, external attenuation has been included in OFFSET function

EUT dBm max. output level = 27.76dBm (802.11n-HT20 MIMO, Ant2+Ant3, 2412MHz)

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

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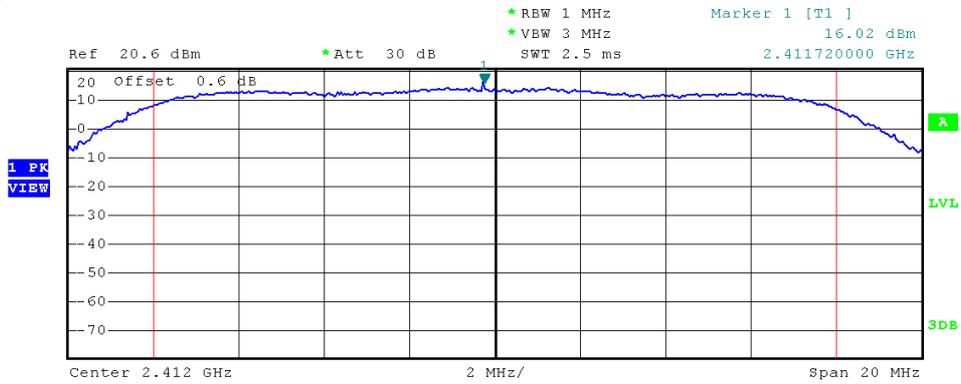
802.11b



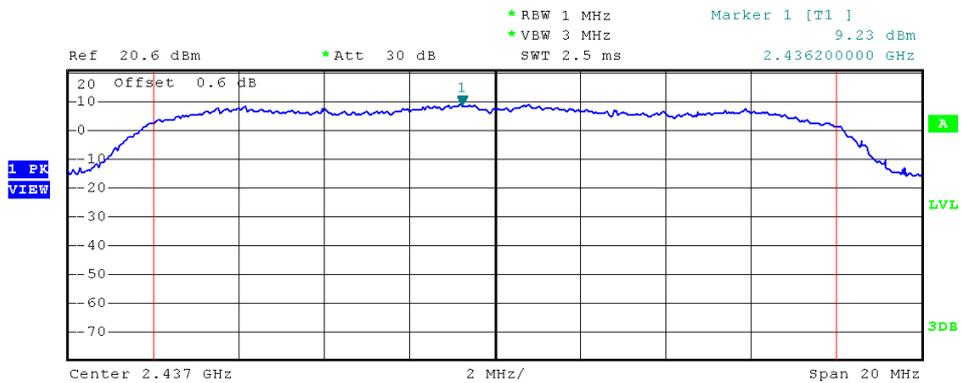
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FCC ID: QIS-WS330
Report No.: 130411010SZN-001

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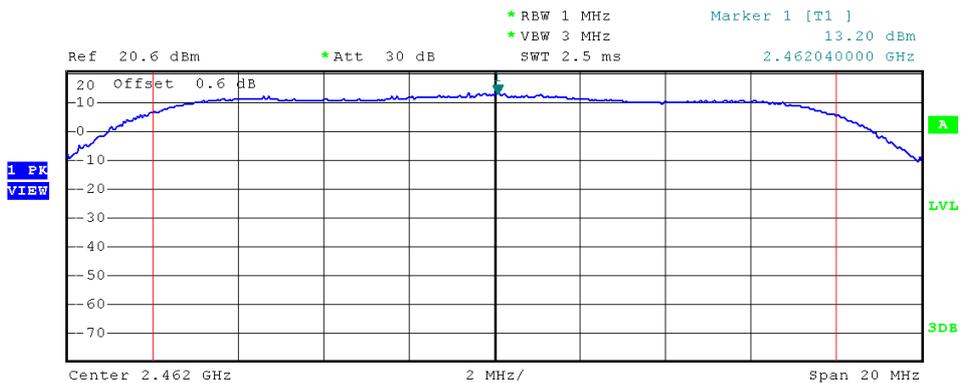
802.11g



Tx Channel
Bandwidth 16 MHz Power 23.36 dBm



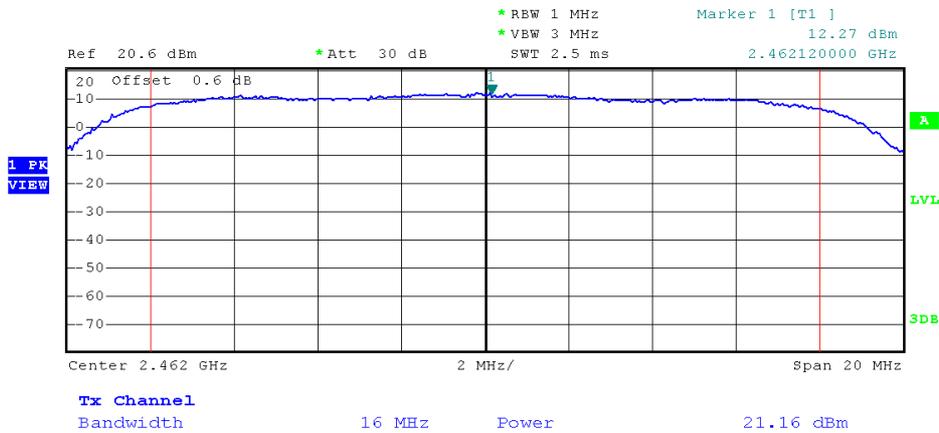
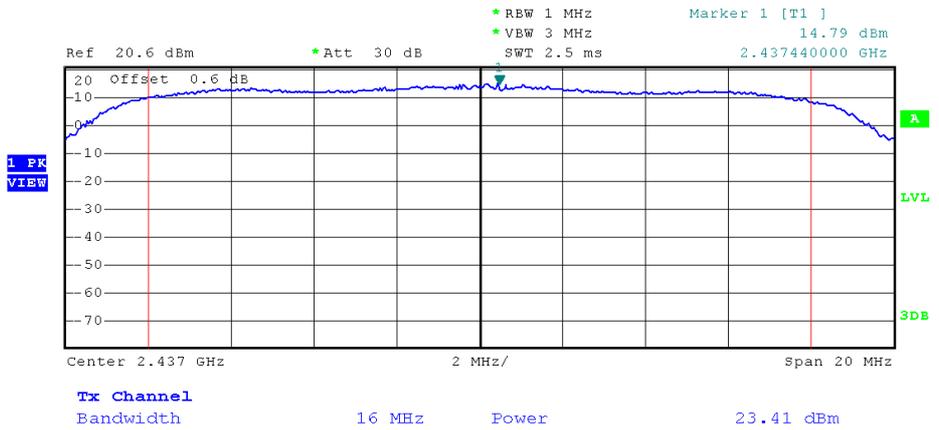
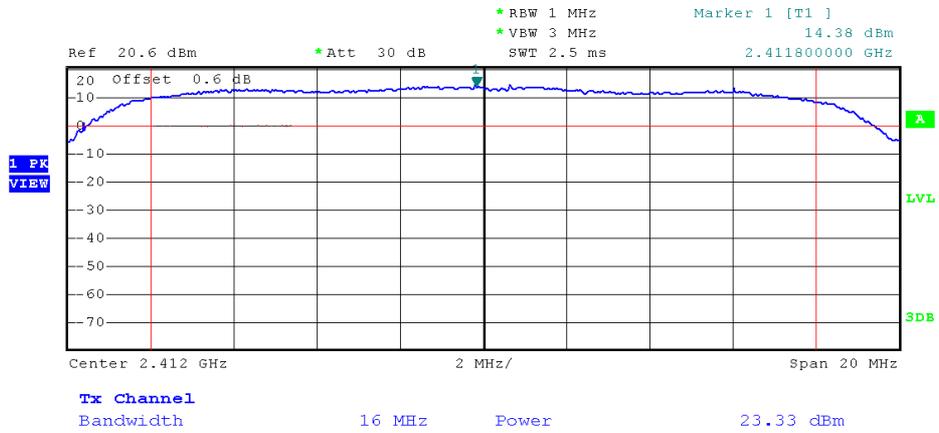
Tx Channel
Bandwidth 16 MHz Power 22.79 dBm



Tx Channel
Bandwidth 16 MHz Power 21.91 dBm

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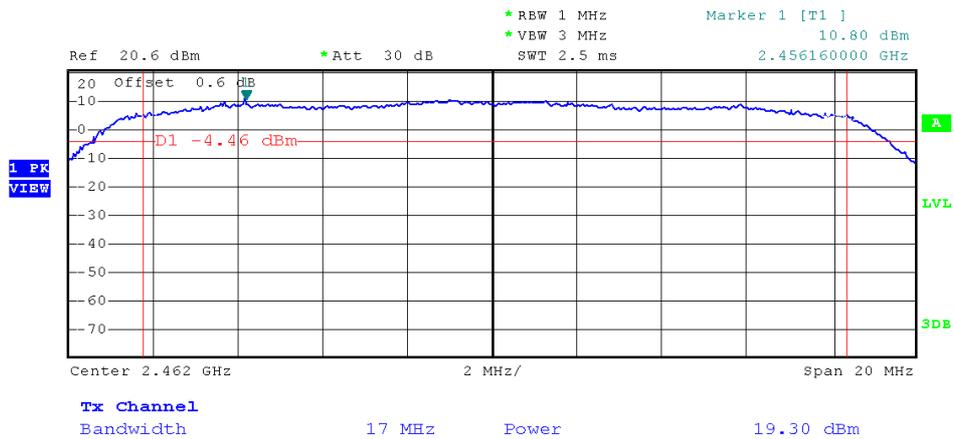
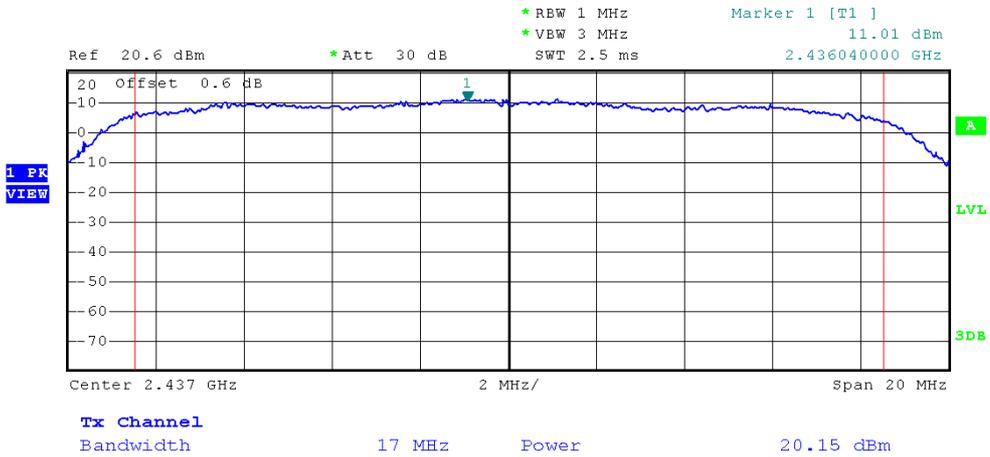
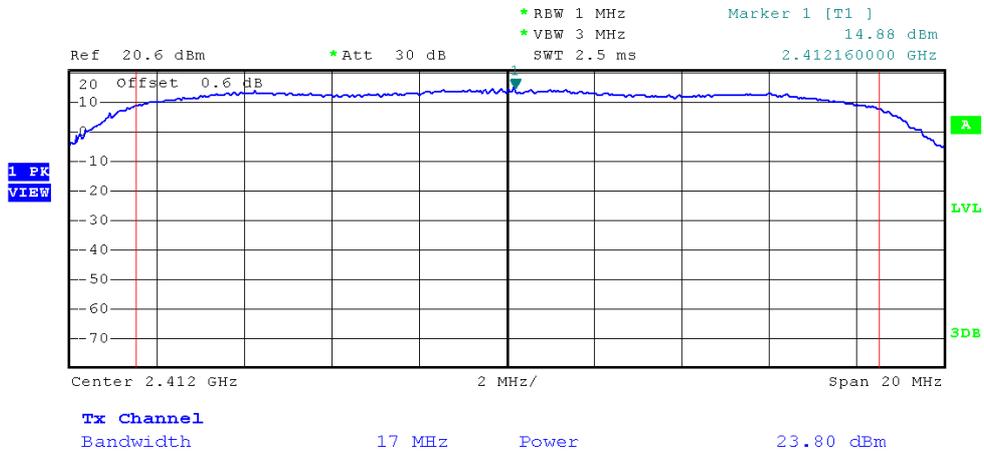
802.11n-HT20 SISO



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

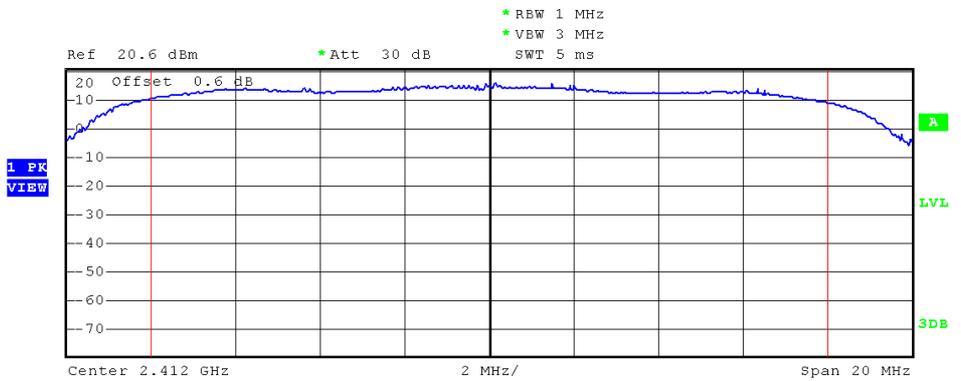
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802.11n-HT20 MIMO Ant1

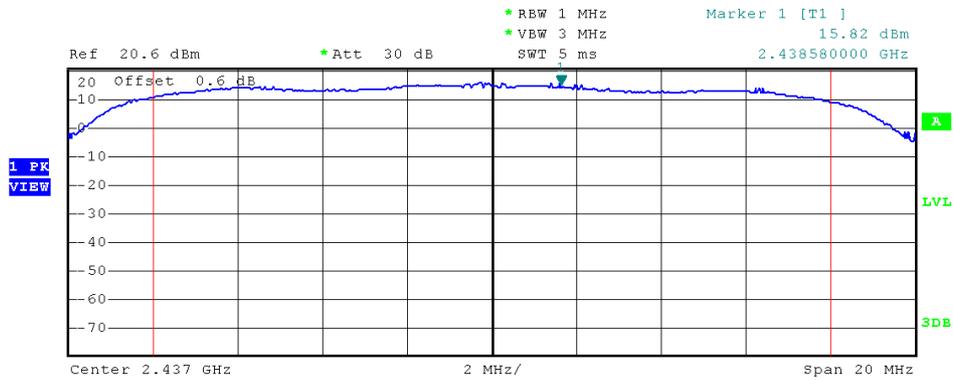


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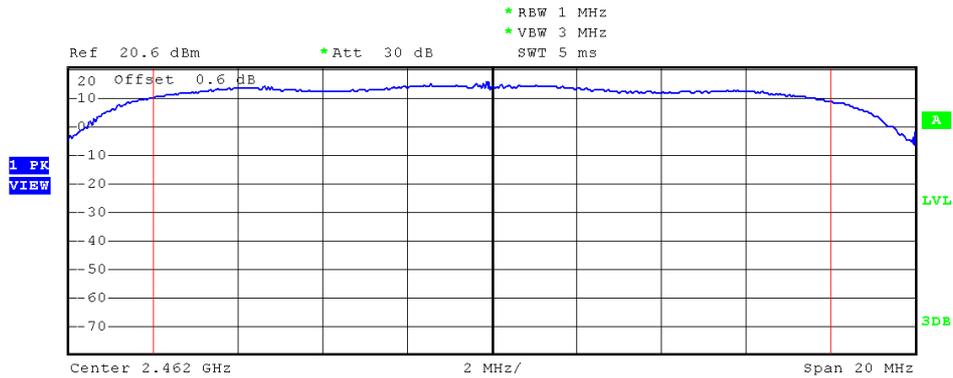
802.11n-HT20 MIMO Ant2



Tx Channel
Bandwidth 16 MHz Power 24.33 dBm



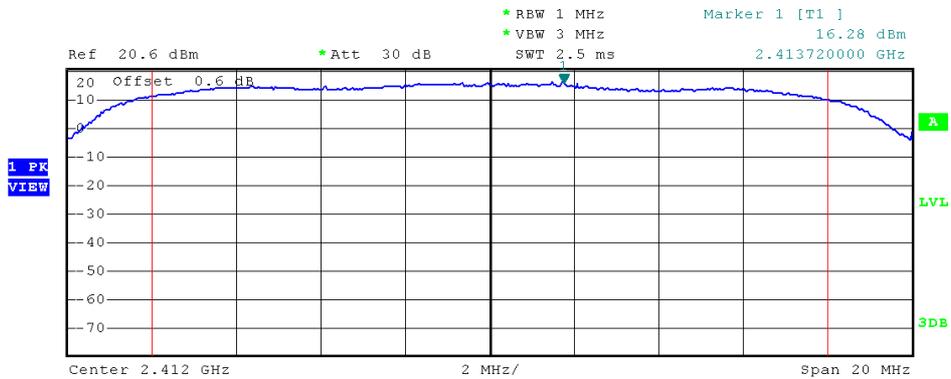
Tx Channel
Bandwidth 16 MHz Power 24.62 dBm



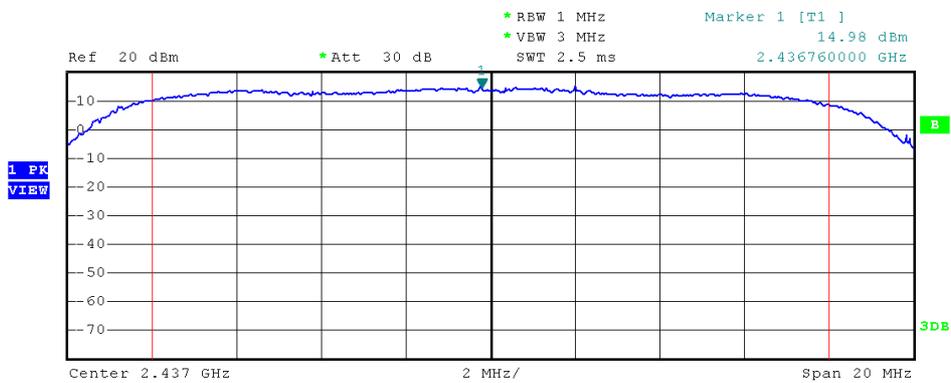
Tx Channel
Bandwidth 16 MHz Power 24.05 dBm

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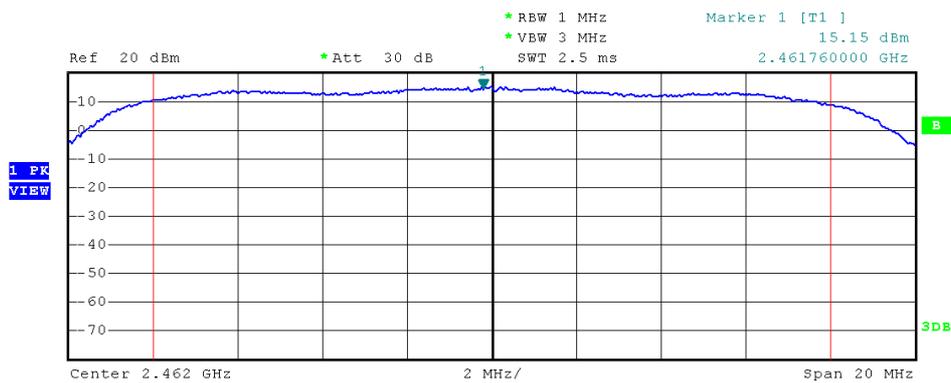
802.11n-HT20 MIMO Ant3



Tx Channel
Bandwidth 16 MHz Power 25.13 dBm



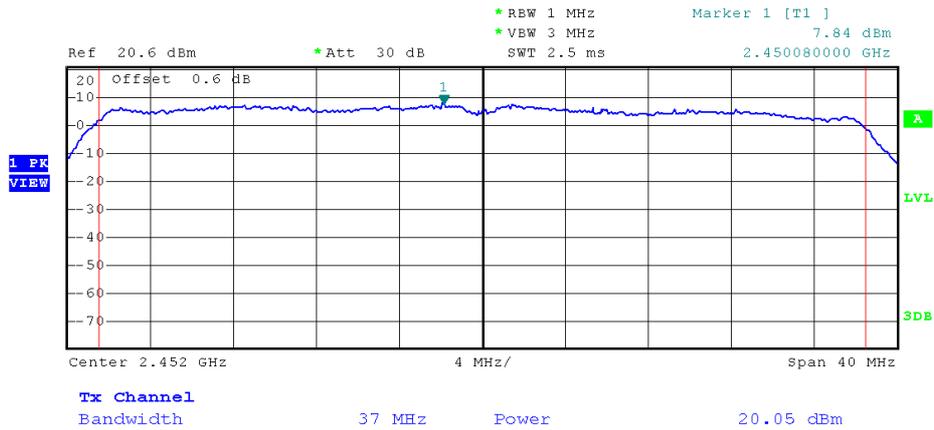
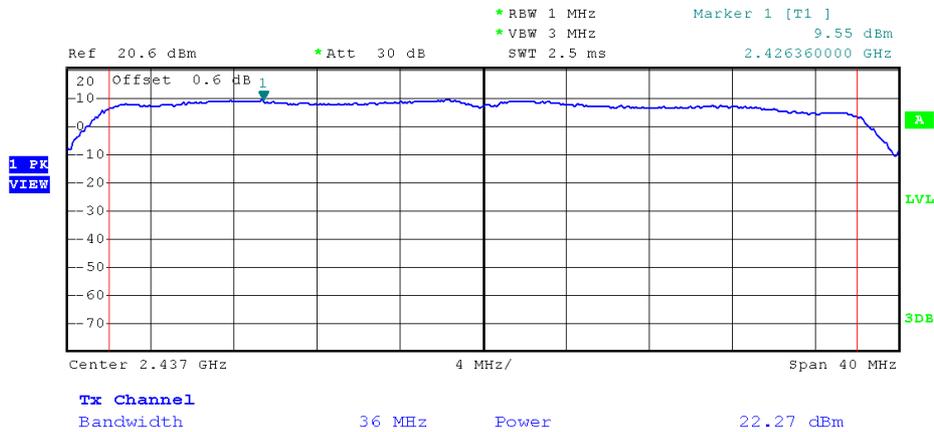
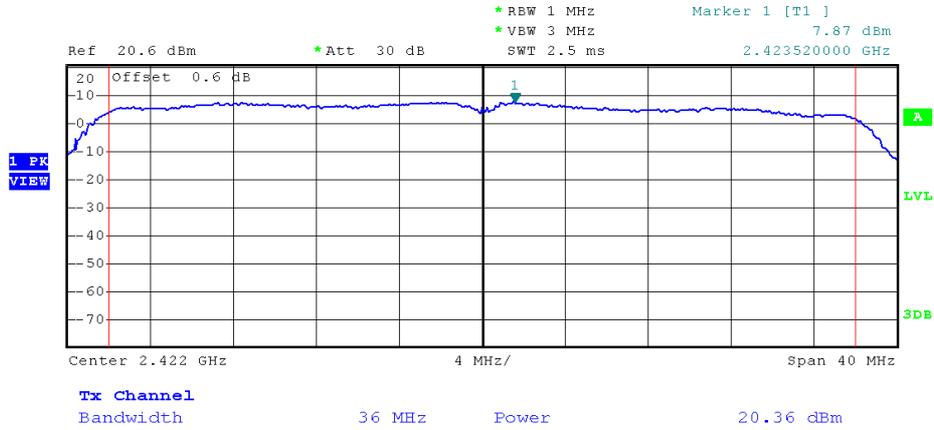
Tx Channel
Bandwidth 16 MHz Power 23.93 dBm



Tx Channel
Bandwidth 16 MHz Power 24.14 dBm

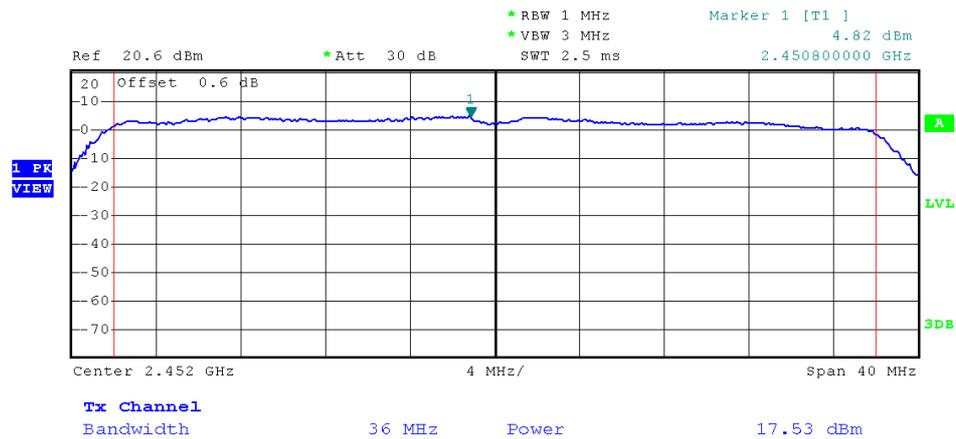
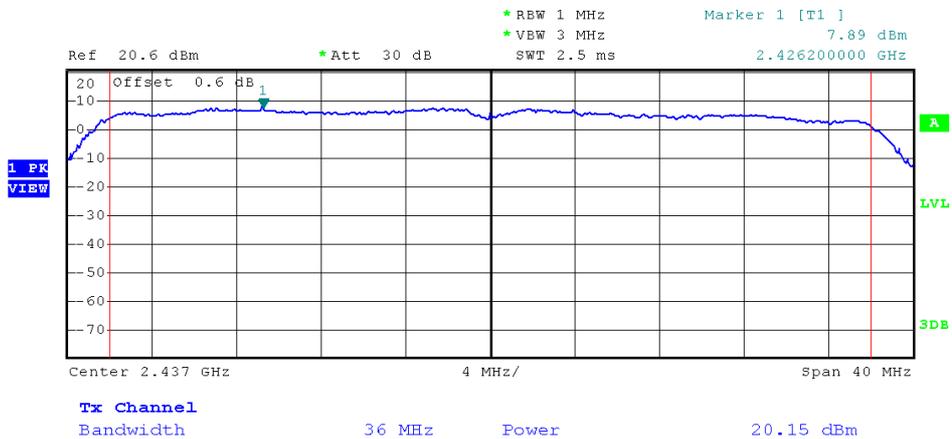
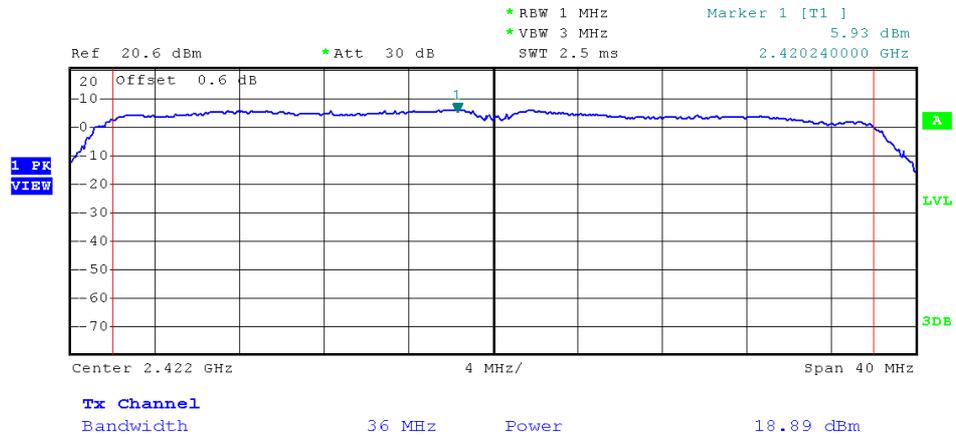
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802.11n-HT40 SISO



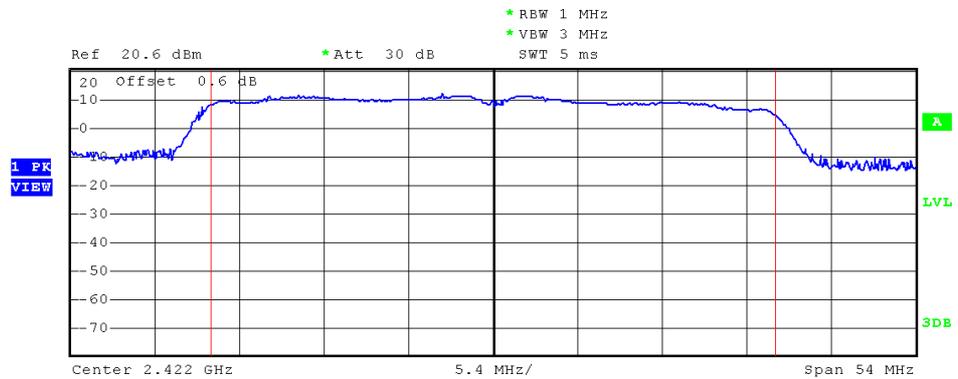
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802.11n-HT40 MIMO Ant1

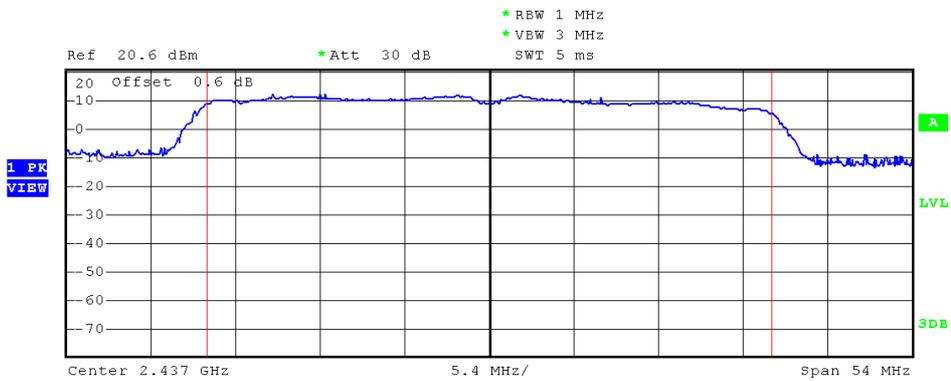


INTERTEK TESTING SERVICES

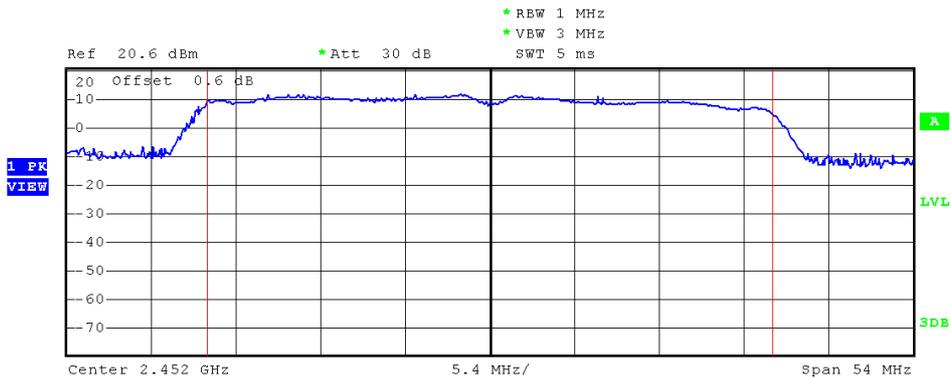
802.11n-HT40 MIMO Ant2



Tx Channel
Bandwidth 36 MHz Power 24.26 dBm



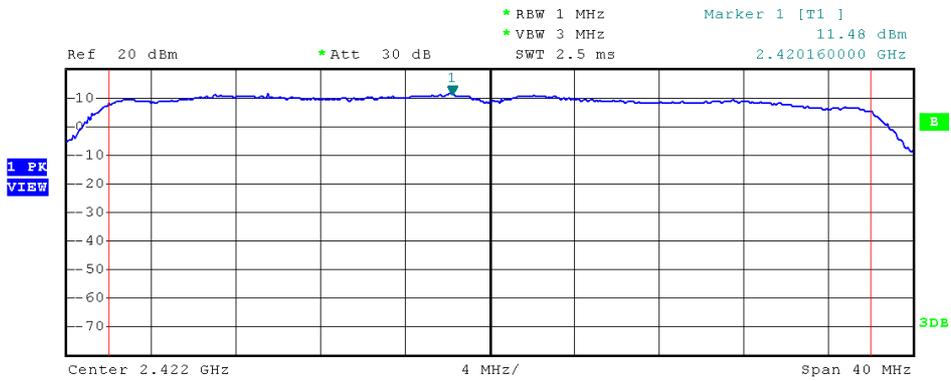
Tx Channel
Bandwidth 36 MHz Power 24.61 dBm



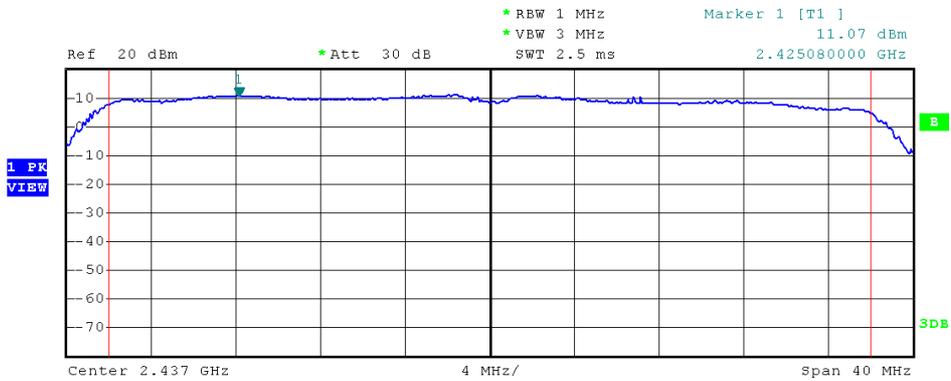
Tx Channel
Bandwidth 36 MHz Power 24.27 dBm

INTERTEK TESTING SERVICES

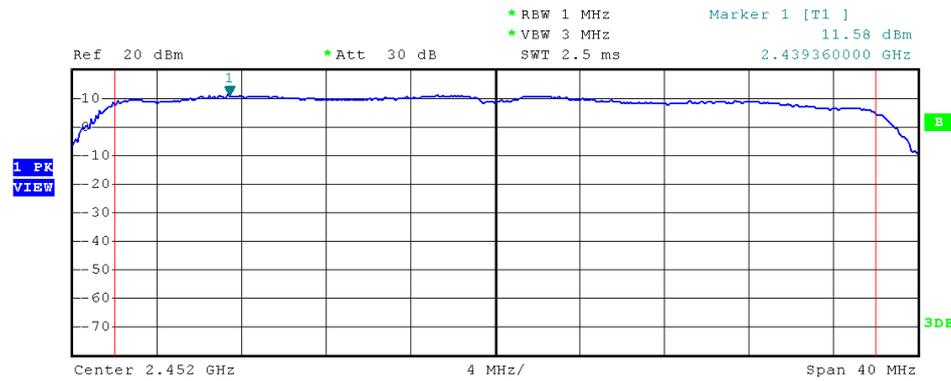
802.11n-HT40 MIMO Ant3



Tx Channel
Bandwidth 36 MHz Power 23.99 dBm



Tx Channel
Bandwidth 36 MHz Power 23.92 dBm



Tx Channel
Bandwidth 36 MHz Power 23.98 dBm

INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd
Model: WS330

Date of Test: 12 April, 2013

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 (DBPSK, 1Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	9.04
2437	9.04
2462	8.56

IEEE 802.11g (BPSK, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	15.12
2437	15.12
2462	15.12

IEEE 802.11n-HT20 SISO(BPSK, 6.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	15.12
2437	15.16
2462	15.16

INTERTEK TESTING SERVICES

IEEE 802.11n-HT20 MIMO Ant 1(BPSK, 13Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	16.08
2437	16.04
2462	15.40

IEEE 802.11n-HT20 MIMO Ant 2(BPSK, 13Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	15.12
2437	15.12
2462	15.08

IEEE 802.11n-HT20 MIMO Ant 3(BPSK, 13Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	15.12
2437	15.12
2462	15.16

IEEE 802.11n-HT40 SISO(BPSK, 13.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2422	35.84
2437	35.84
2452	36.56

IEEE 802.11n-HT40 MIMO Ant 1(BPSK, 27Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2422	35.84
2437	35.84
2452	35.84

INTERTEK TESTING SERVICES

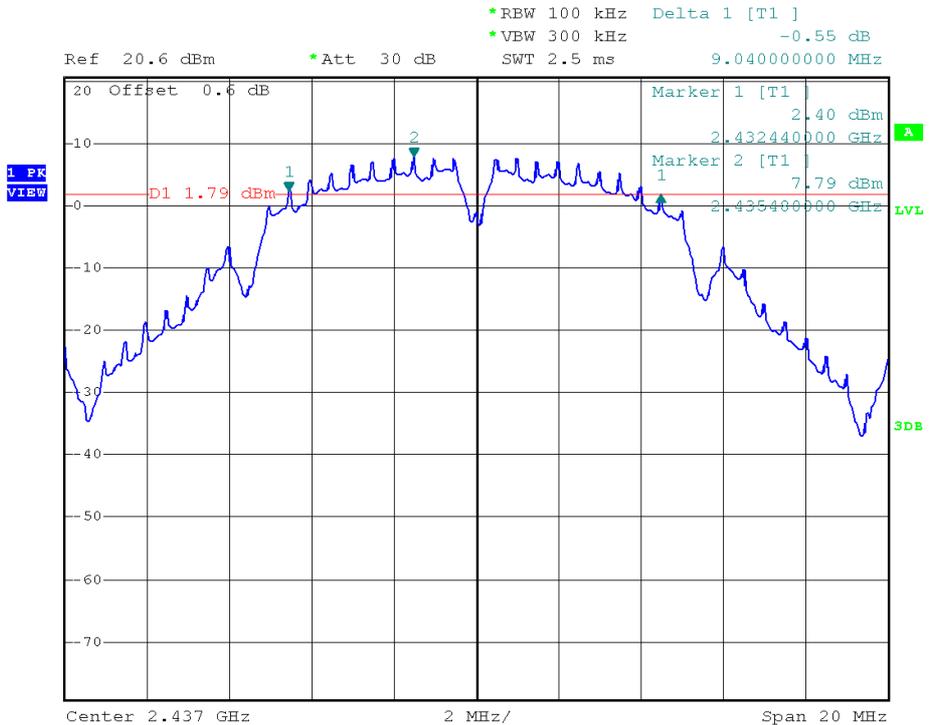
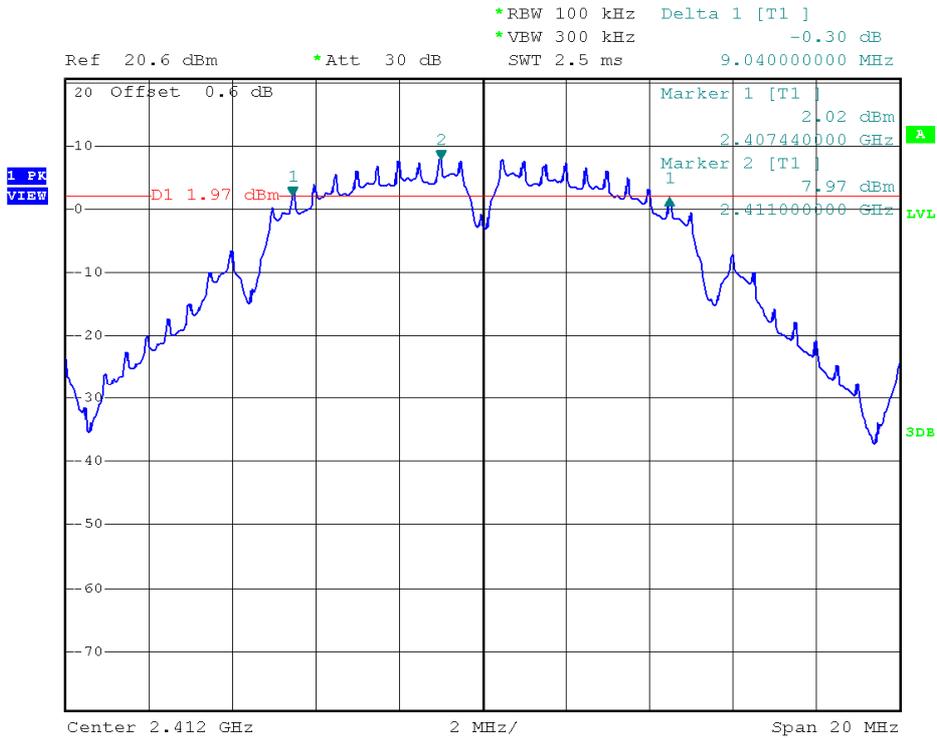
IEEE 802.11n-HT40 MIMO Ant 2(BPSK, 27Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2422	35.84
2437	35.84
2452	35.76

IEEE 802.11n-HT40 MIMO Ant 3(BPSK, 27Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2422	35.84
2437	35.92
2452	35.92

The test plots are attached as below.

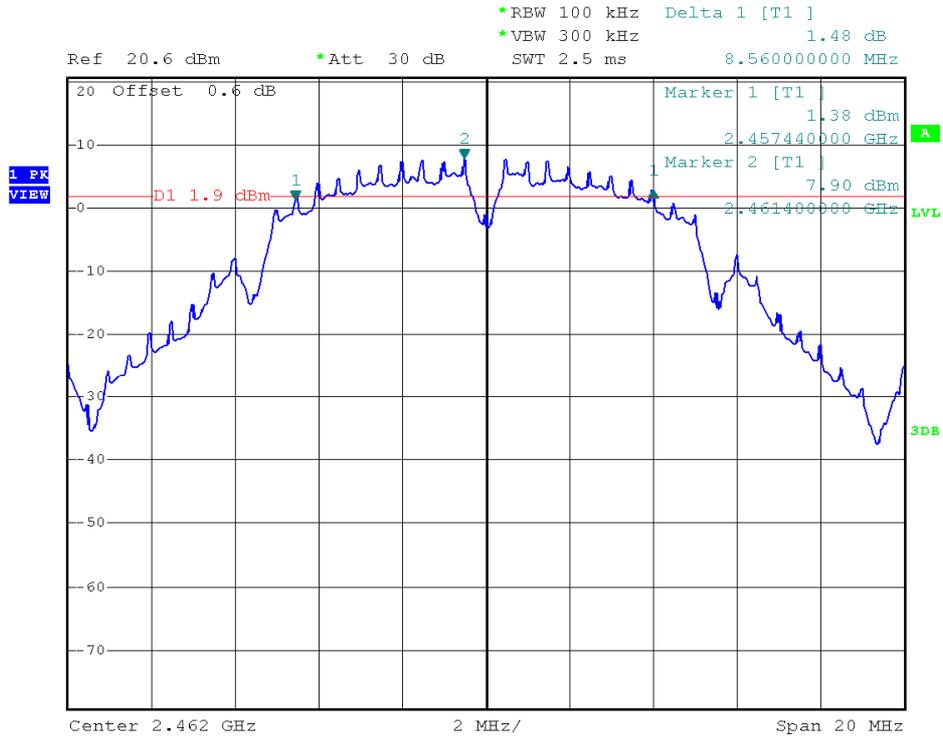
INTERTEK TESTING SERVICES

802.11b



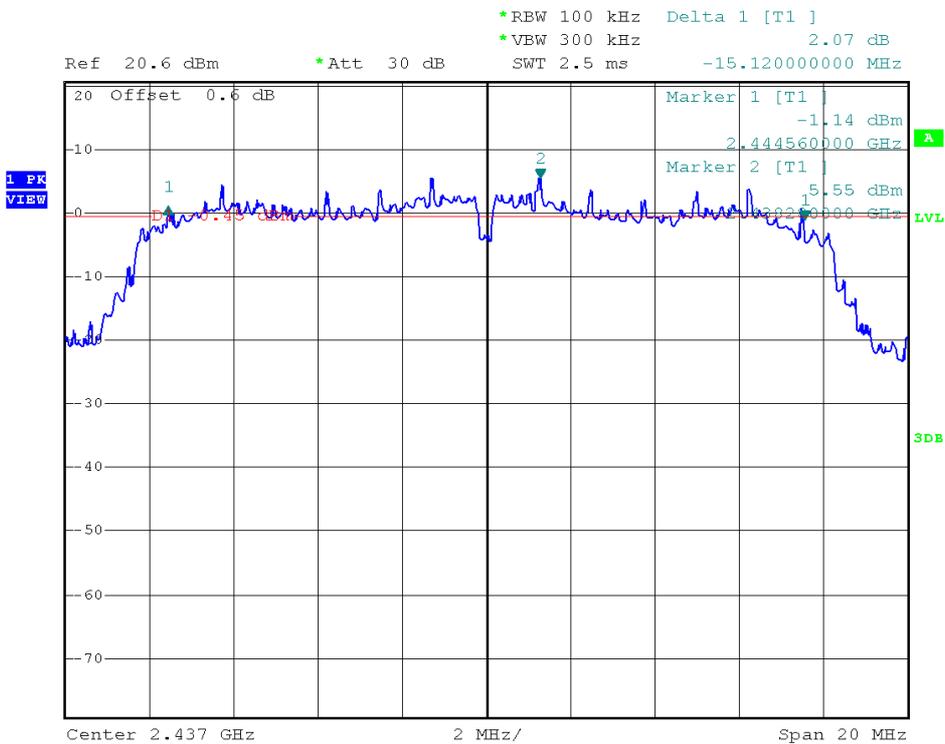
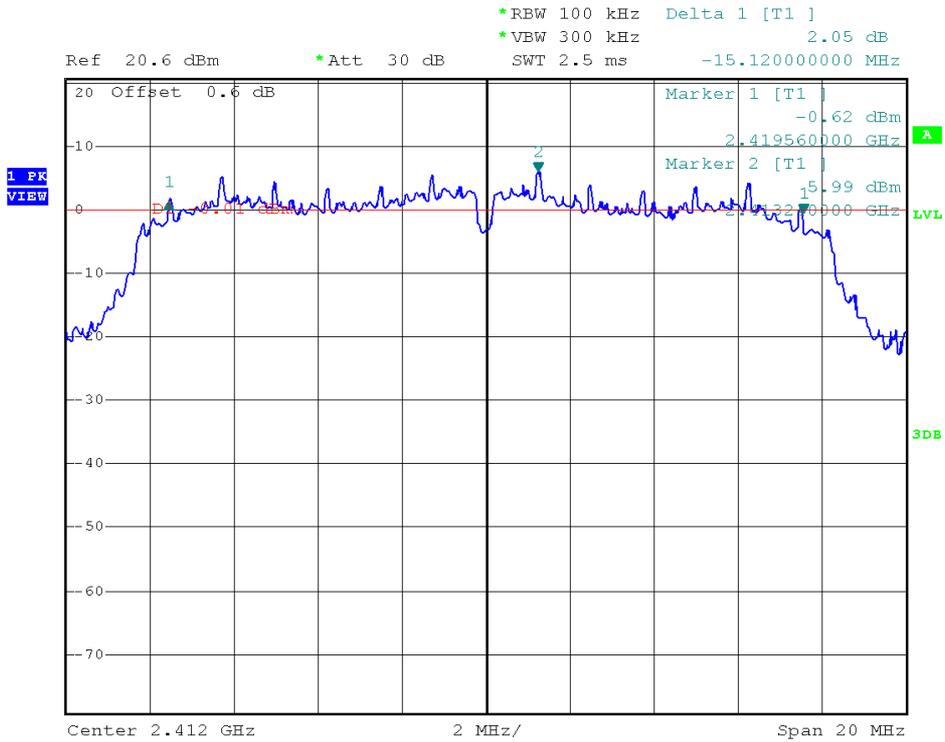
TRF no.: FCC 15C_TX_b
 FCC ID: QIS-WS330
 Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



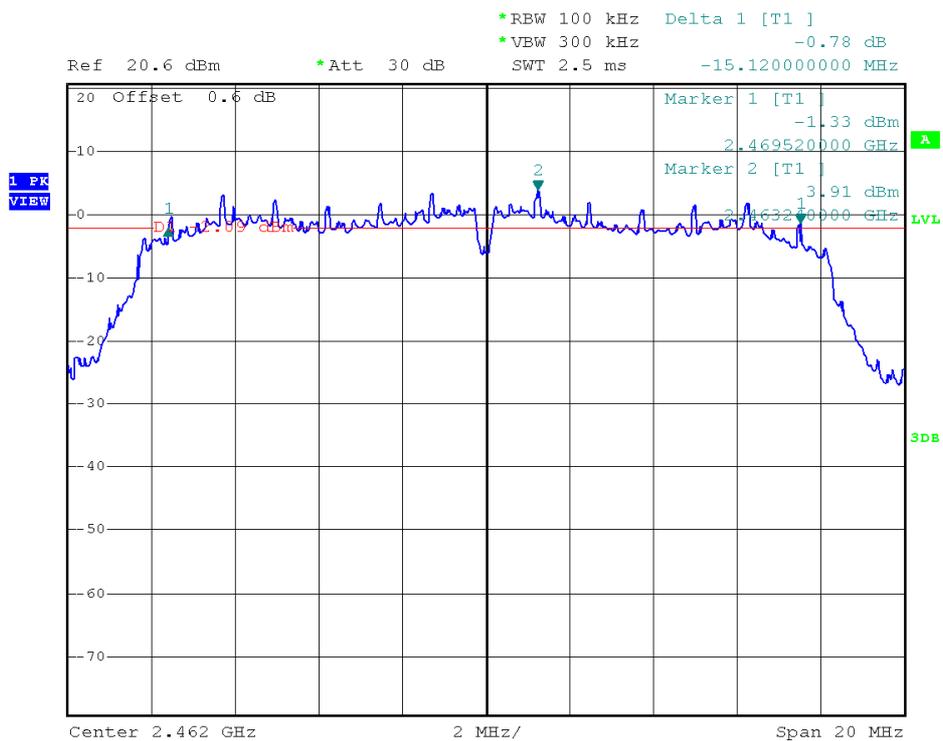
INTERTEK TESTING SERVICES

802.11g



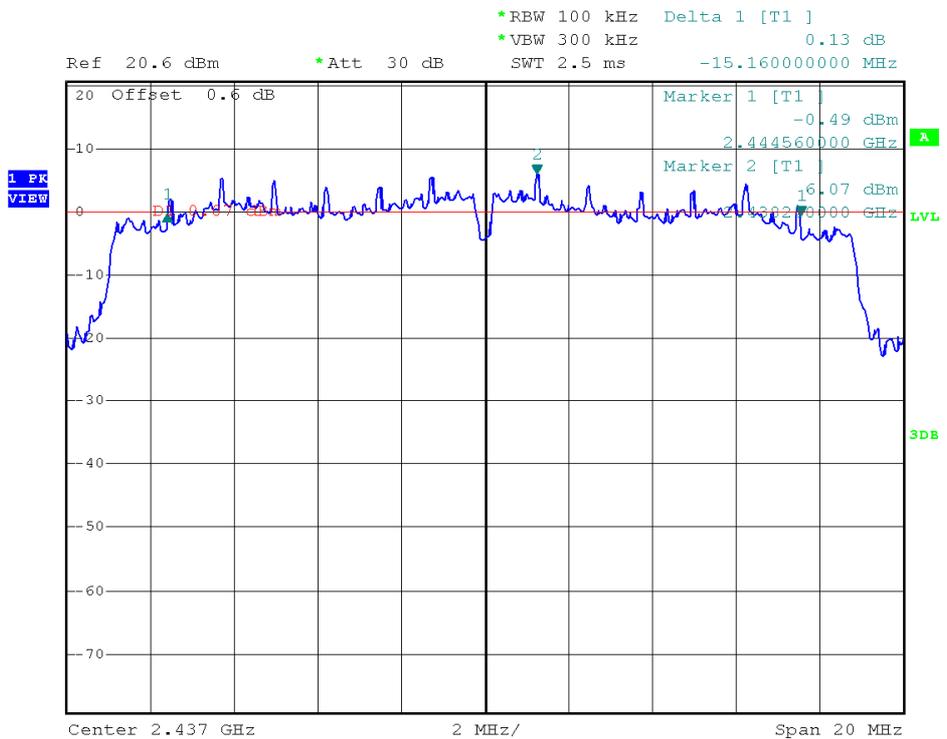
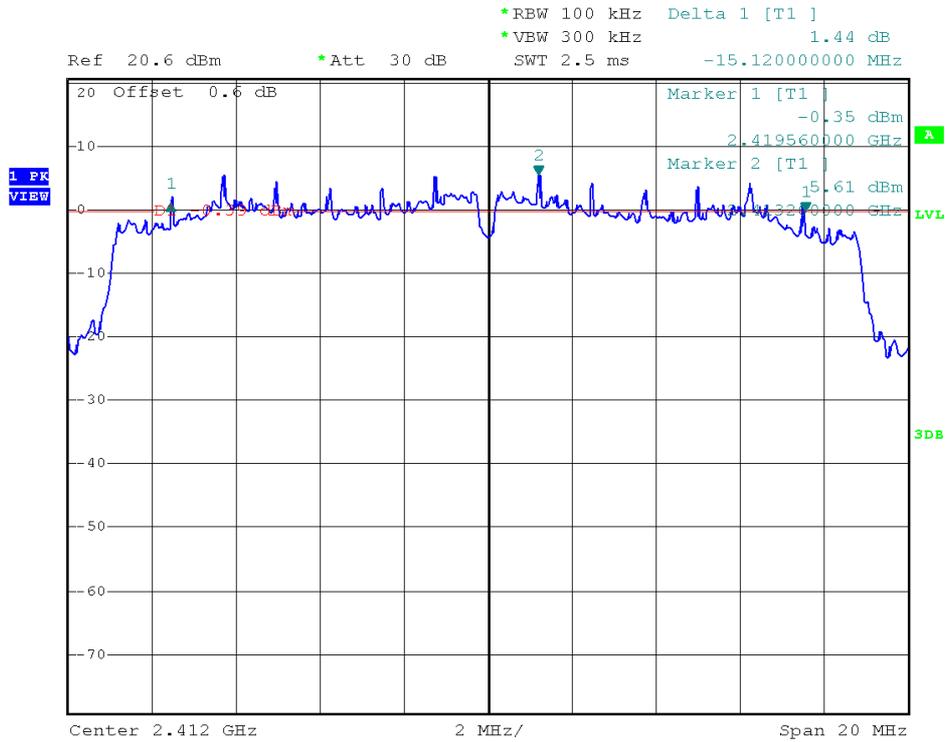
TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



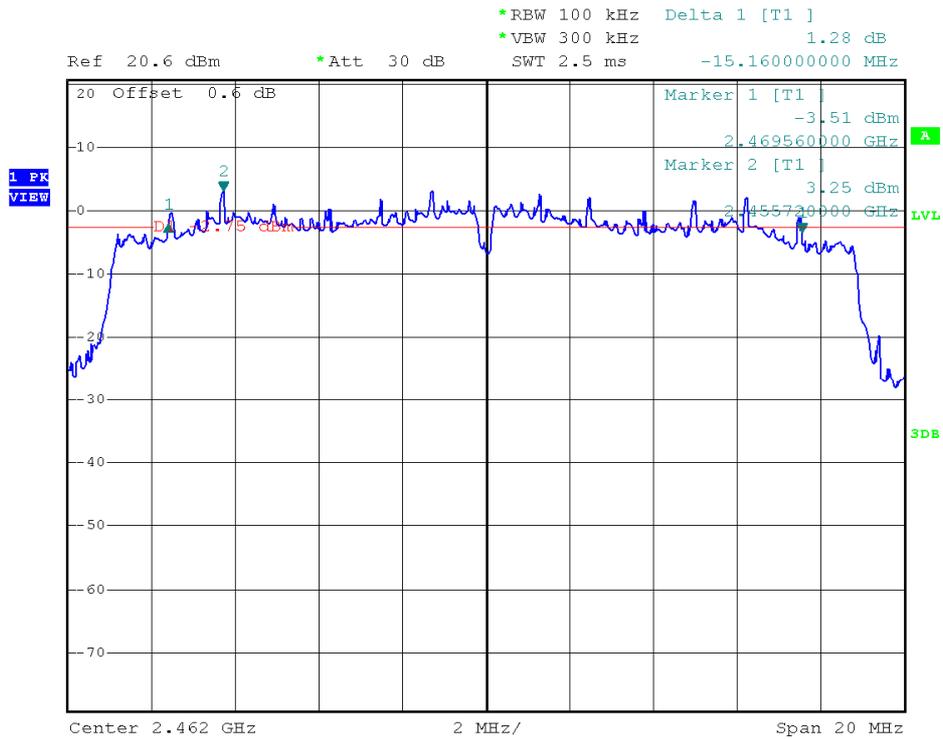
INTERTEK TESTING SERVICES

802.11n-HT20 SISO



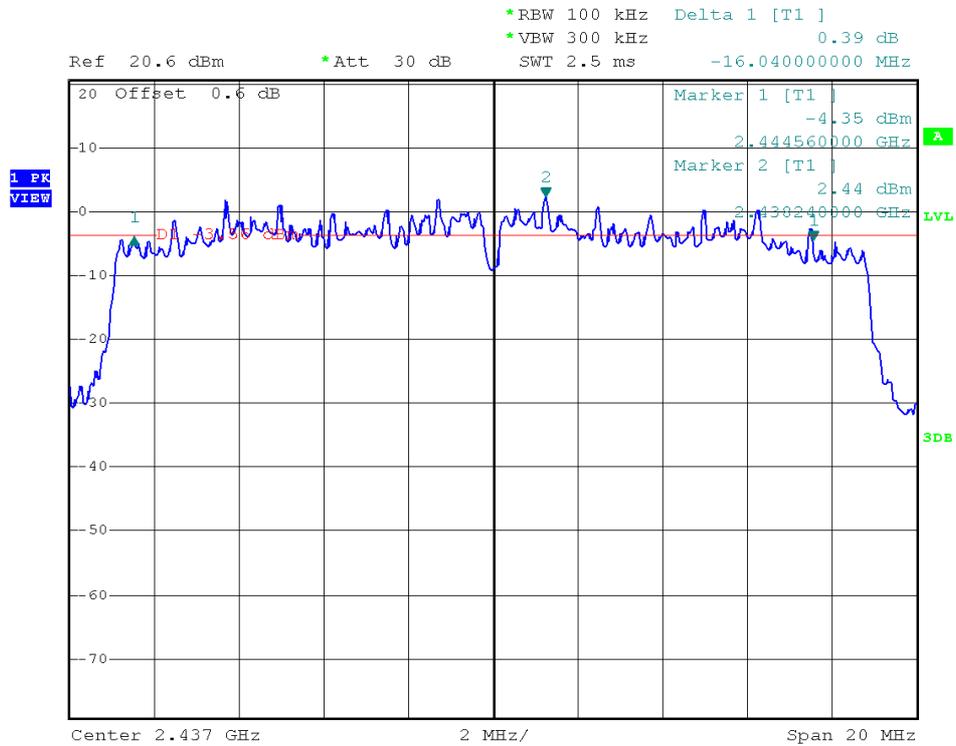
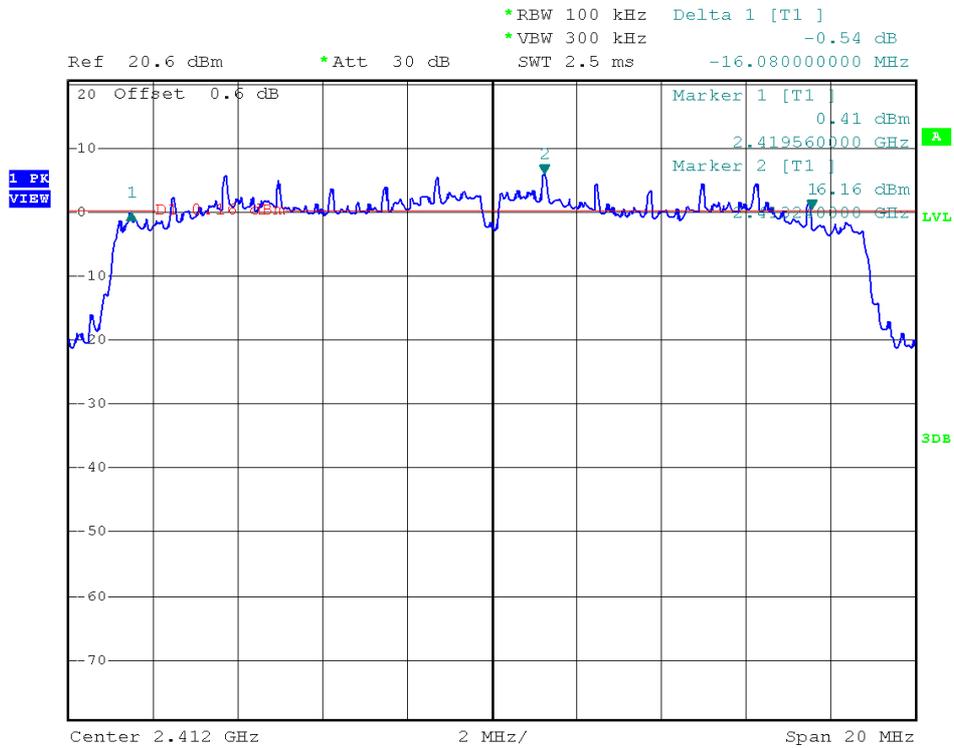
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 Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES

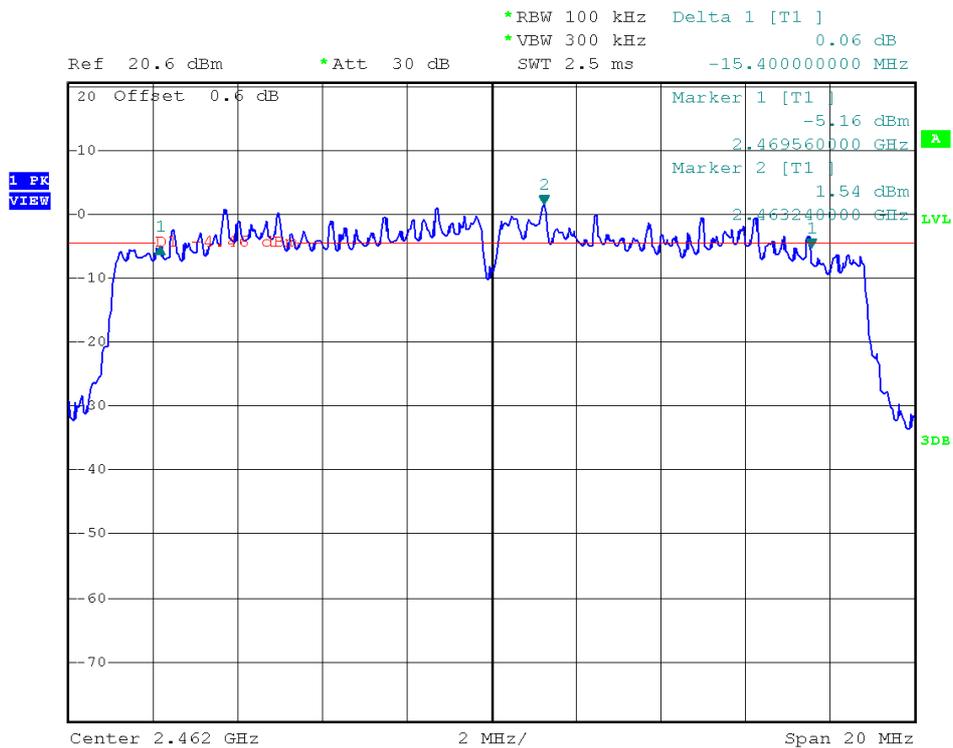


INTERTEK TESTING SERVICES

802.11n-HT20 MIMO Ant1

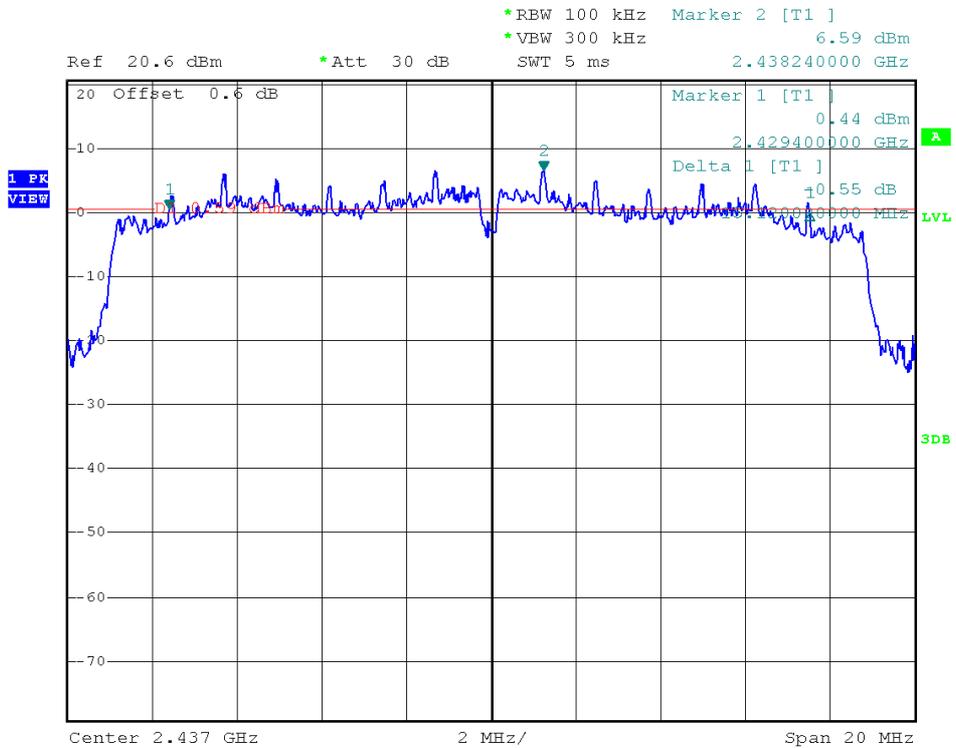
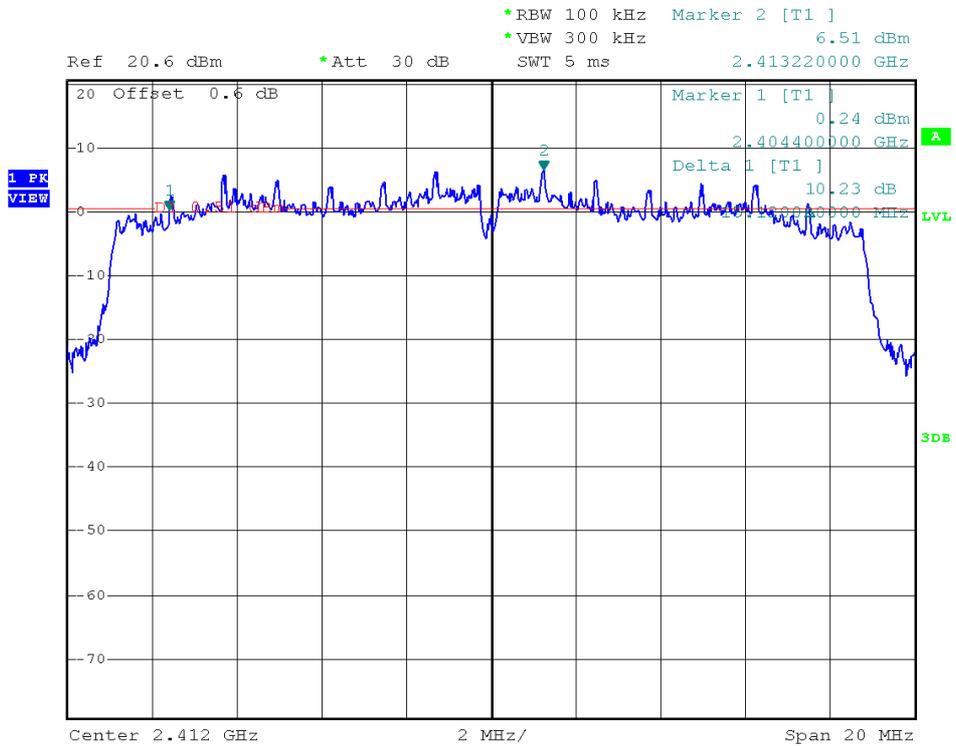


INTERTEK TESTING SERVICES

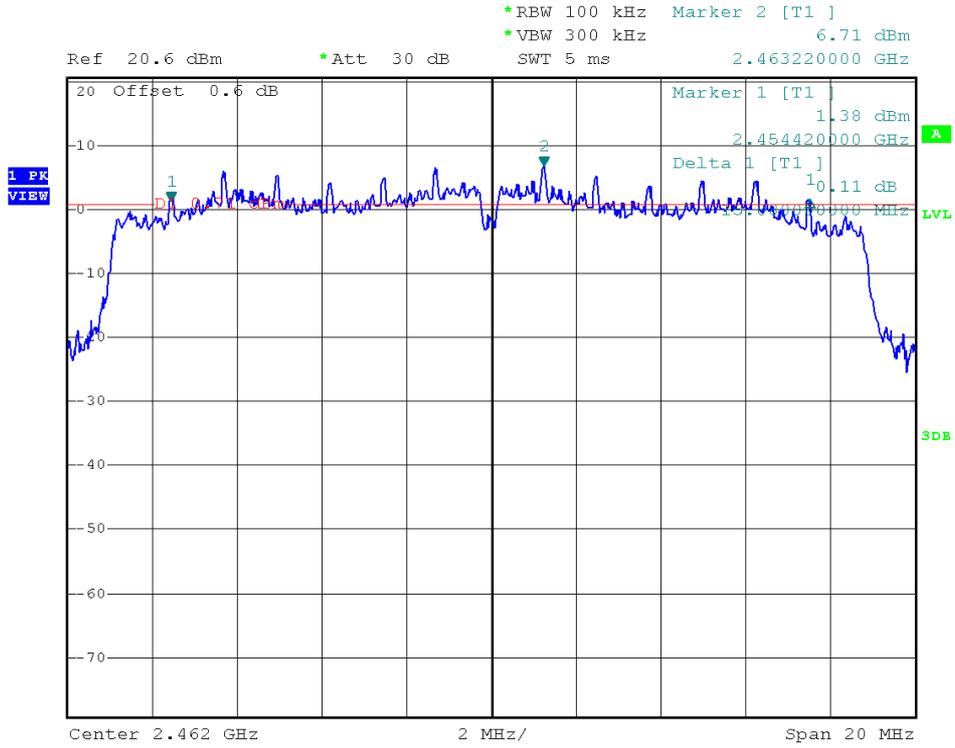


INTERTEK TESTING SERVICES

802.11n-HT20 MIMO Ant2

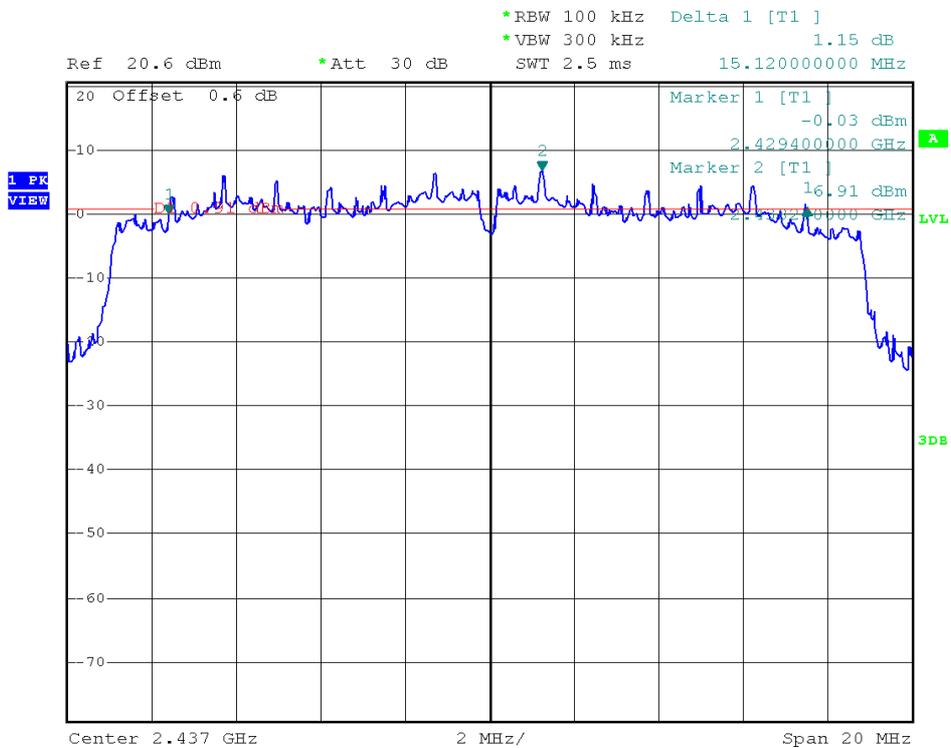
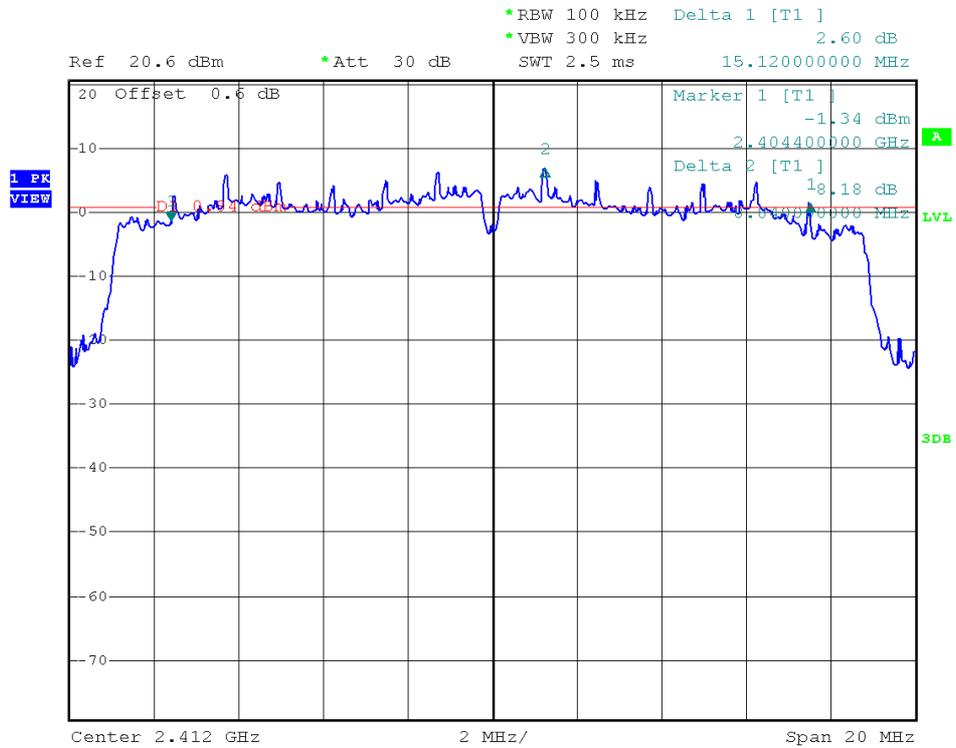


INTERTEK TESTING SERVICES



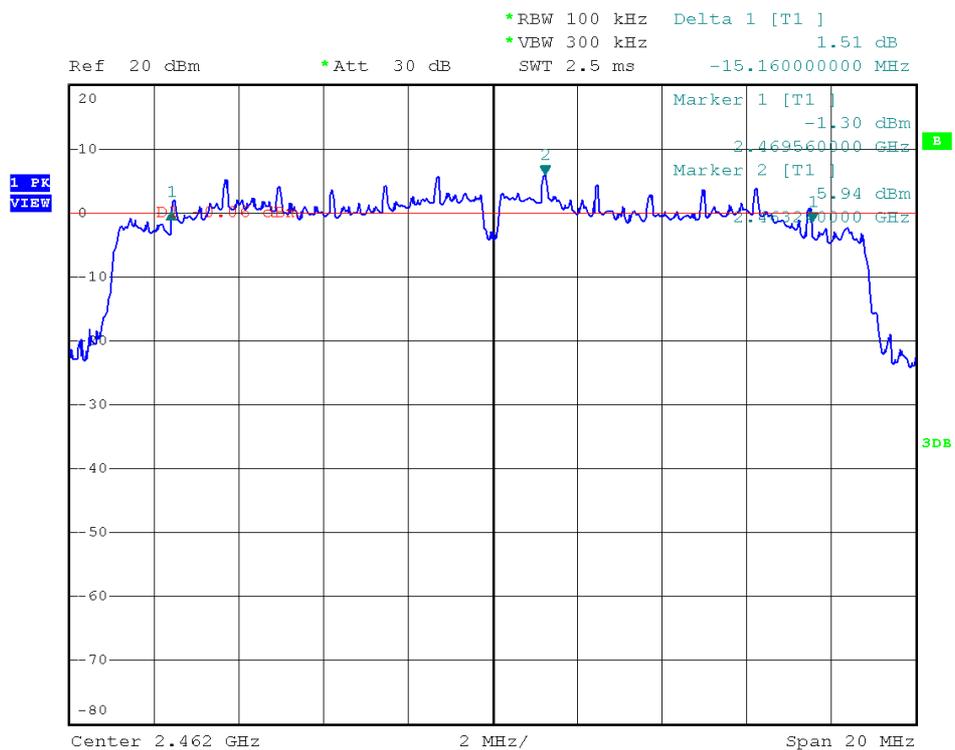
INTERTEK TESTING SERVICES

802.11n-HT20 MIMO Ant3



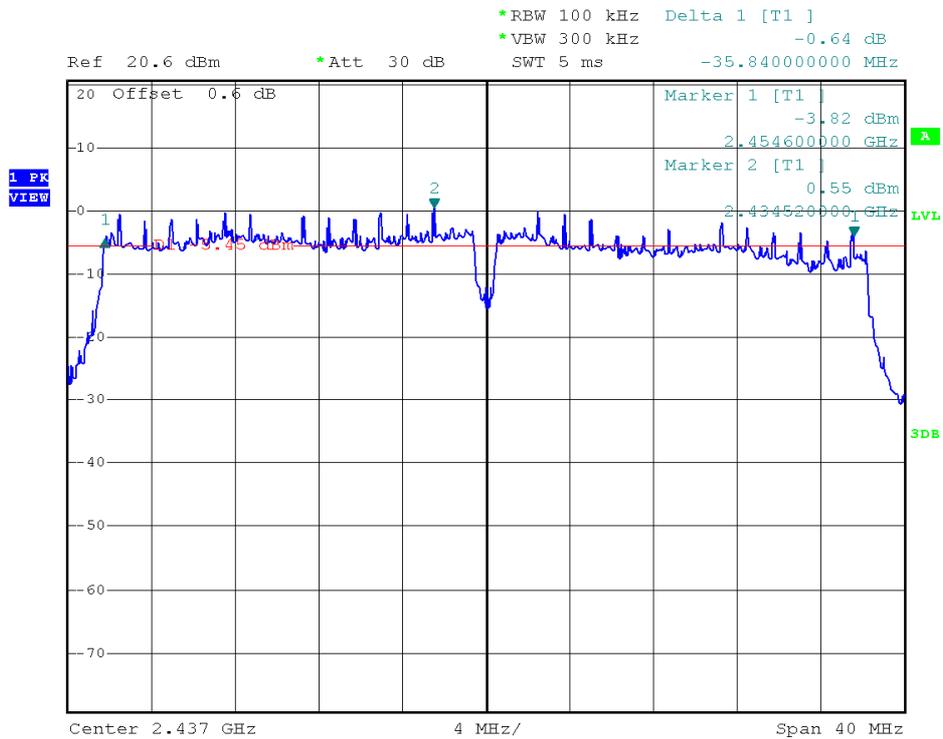
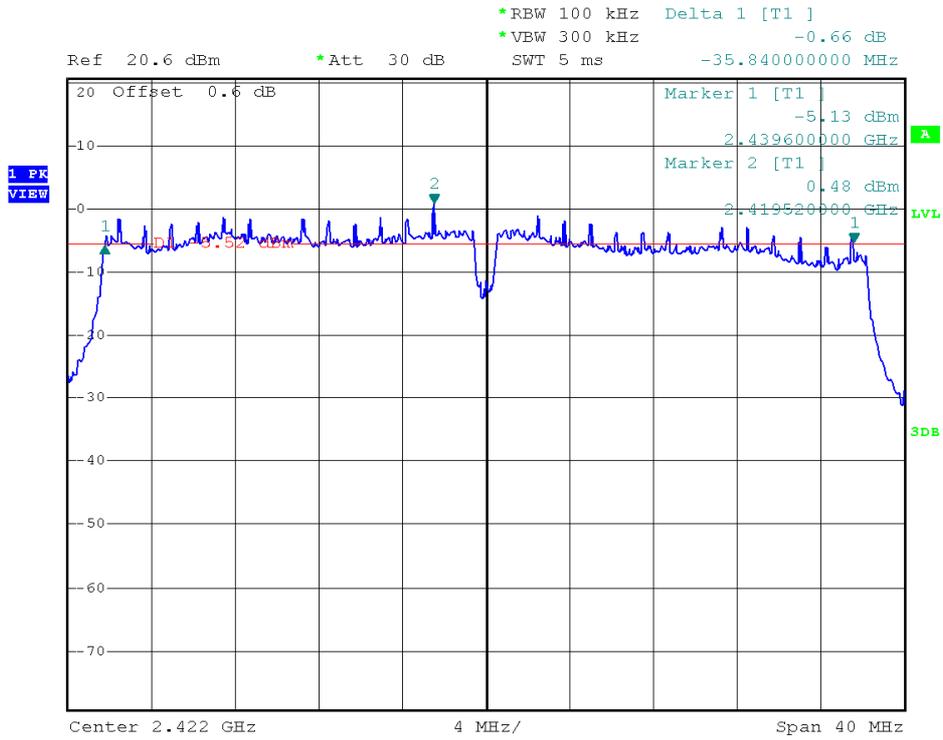
TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



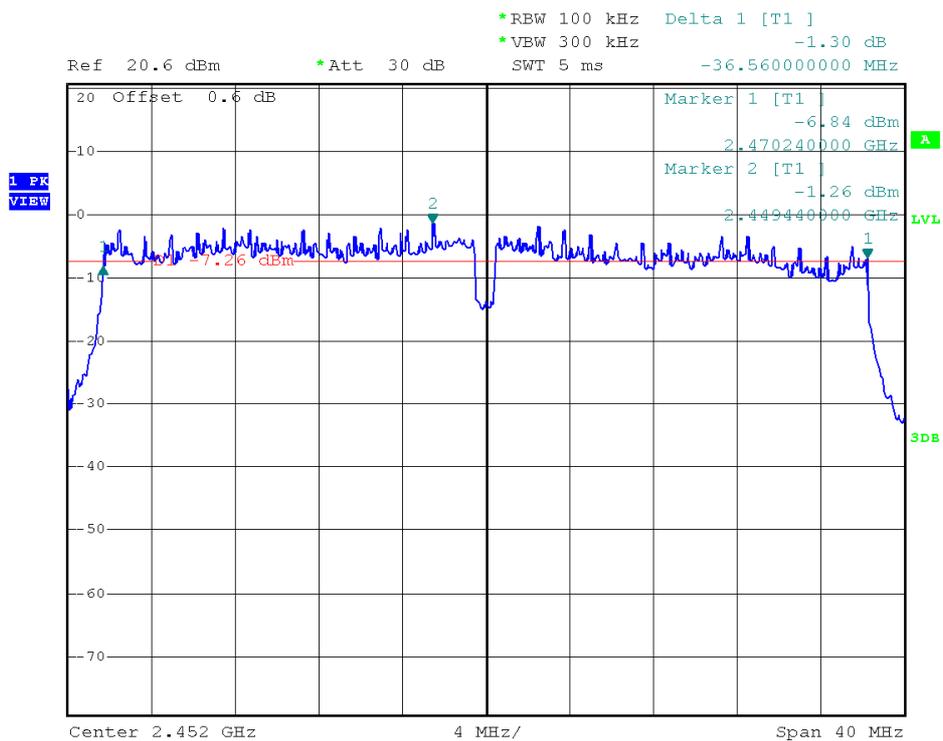
INTERTEK TESTING SERVICES

802.11n-HT40 SISO



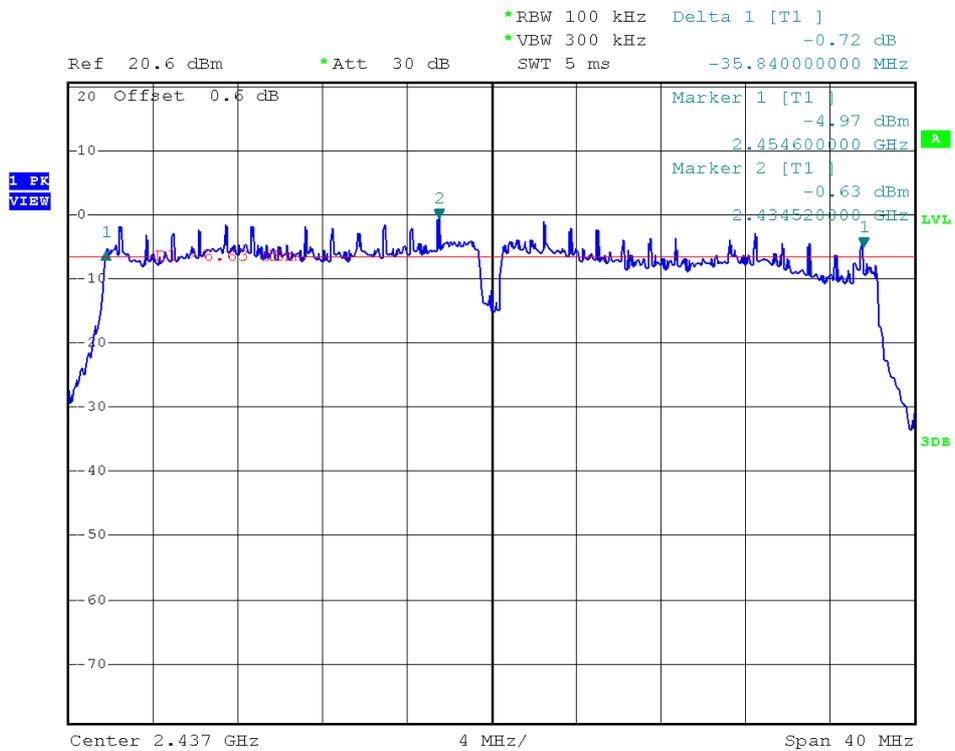
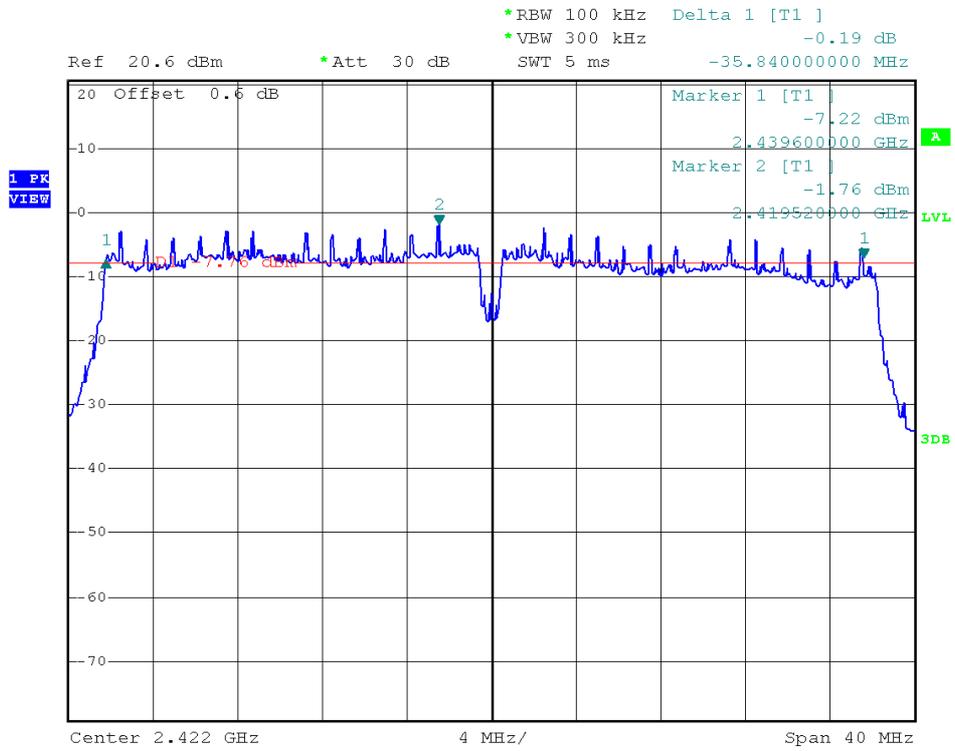
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FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



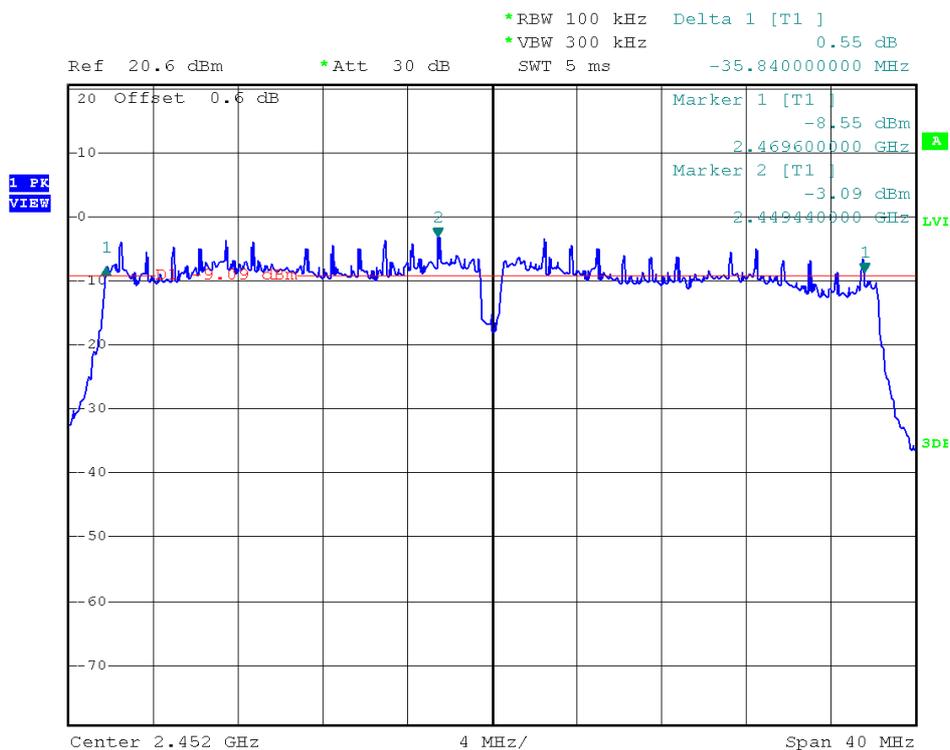
INTERTEK TESTING SERVICES

802.11n-HT40 MIMO Ant1



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 FCC ID: QIS-WS330
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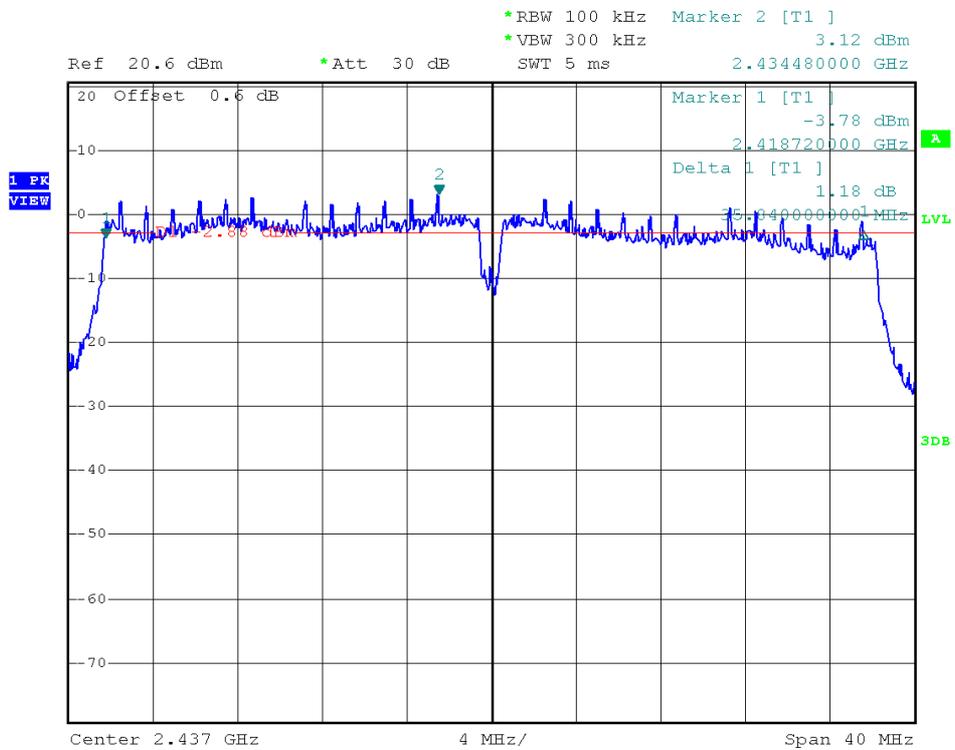
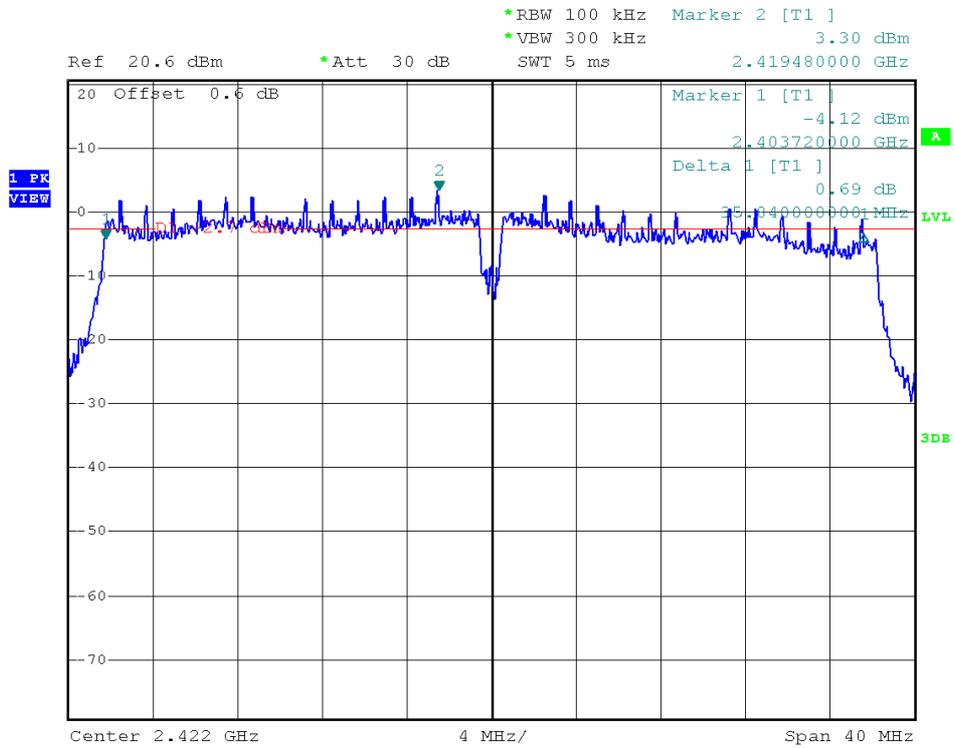
INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES

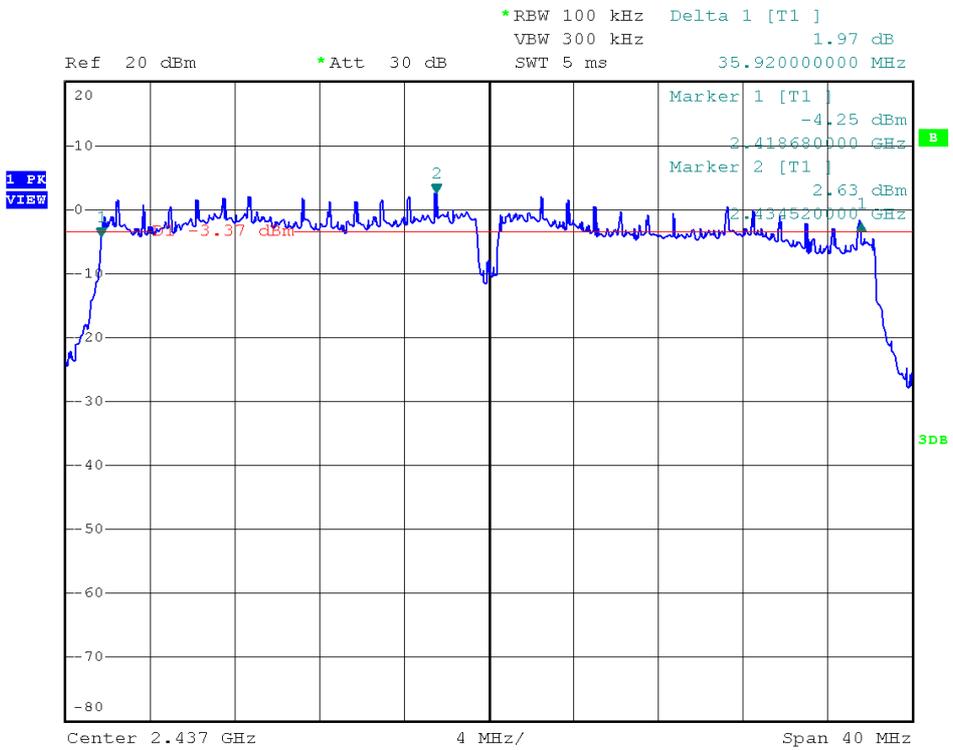
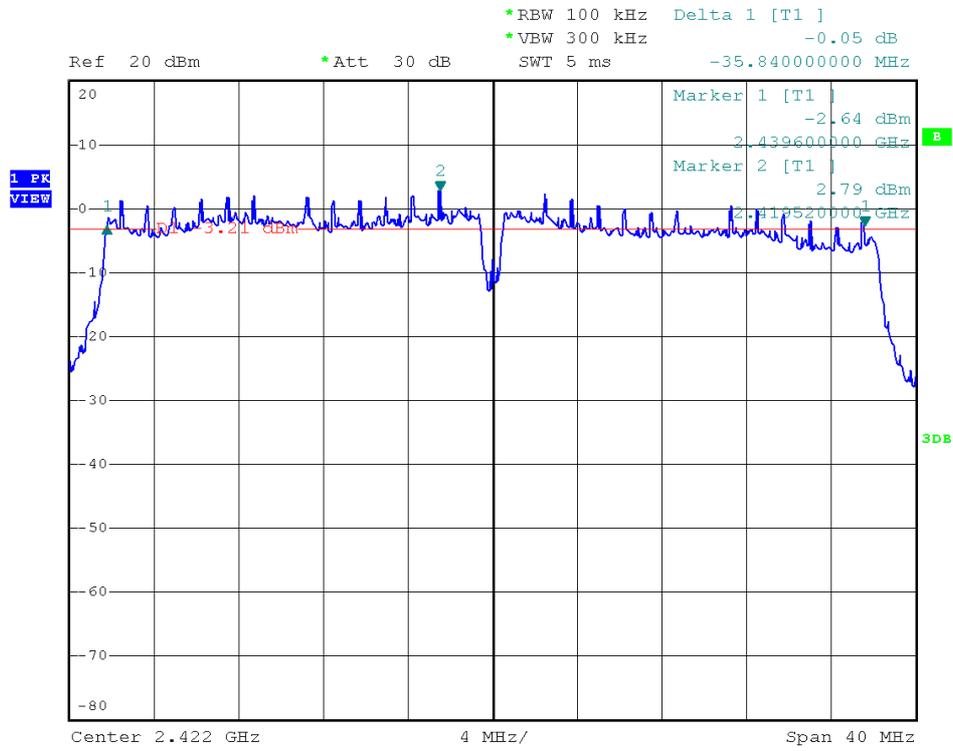
802.11n-HT40 MIMO Ant2



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

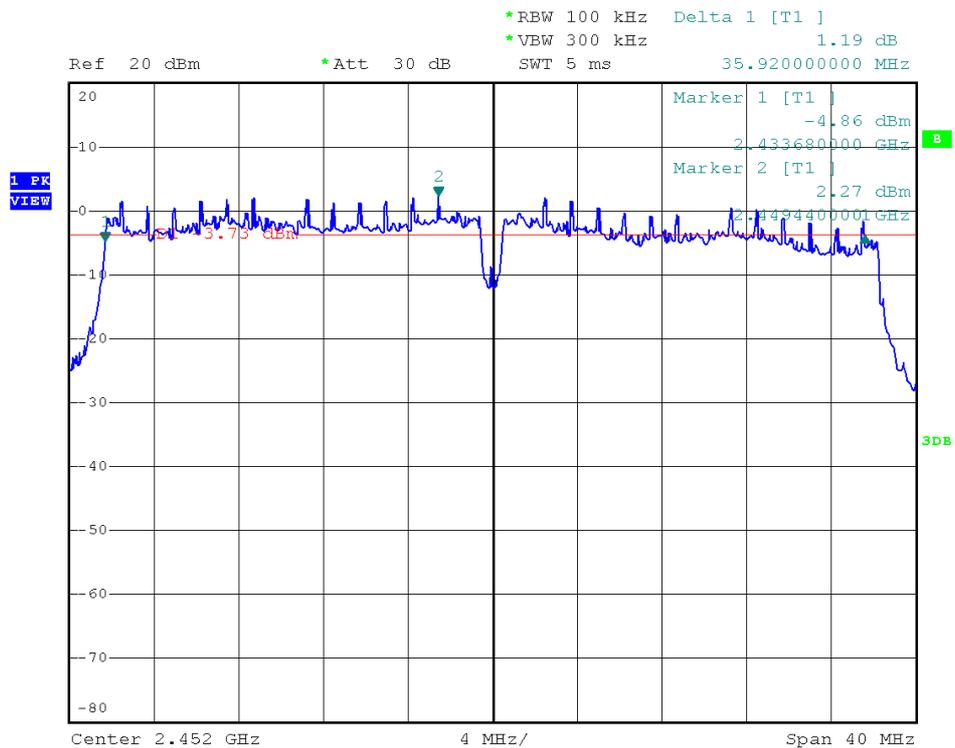
INTERTEK TESTING SERVICES

802.11n-HT40 MIMO Ant3



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd
Model: WS330

Date of Test: 12 April, 2013

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.

For MIMO system, both the antenna ports is checked, the worst case power density is calculated from the method of Measure by adding $10\log N$ according KDB662911.

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

Unit: dBm

IEEE 802.11b (DBPSK, 1Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	-5.02
2437	-5.18
2462	-5.92

IEEE 802.11g (BPSK, 6Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	-7.18
2437	-7.81
2462	-7.25

IEEE 802.11n-HT20 SISO (BPSK, 6.5Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	-6.73
2437	-6.96
2462	-8.16

INTERTEK TESTING SERVICES

Unit: dBm

IEEE 802.11n-HT20 MIMO(BPSK, 13Mbps)			
Frequency (MHz)	Power Density with RBW 3KHz		
	ANT 1	ANT 2	Total
2412	-8.27	-7.99	-4.98
2437	-7.35	-8.23	-4.34
2462	-7.61	-7.56	-4.55

IEEE 802.11n-HT20 MIMO(BPSK, 13Mbps)			
Frequency (MHz)	Power Density with RBW 3KHz		
	ANT 1	ANT 3	Total
2412	-8.27	-8.68	-5.26
2437	-7.35	-8.25	-4.34
2462	-7.61	-10.90	-4.60

IEEE 802.11n-HT20 MIMO(BPSK, 13Mbps)			
Frequency (MHz)	Power Density with RBW 3KHz		
	ANT 2	ANT 3	Total
2412	-7.99	-8.68	-4.98
2437	-8.23	-8.25	-5.22
2462	-7.56	-10.90	-4.55

IEEE 802.11n-HT40 SISO (BPSK, 13.5Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2422	-10.40
2437	-11.38
2452	-12.18

INTERTEK TESTING SERVICES

Unit: dBm

IEEE 802.11n-HT40 MIMO(BPSK, 27Mbps)			
Frequency (MHz)	Power Density with RBW 3KHz		
	ANT 1	ANT 2	Total
2422	-12.38	-11.65	-8.64
2437	-11.55	-12.05	-8.54
2452	-12.19	-11.69	-8.68

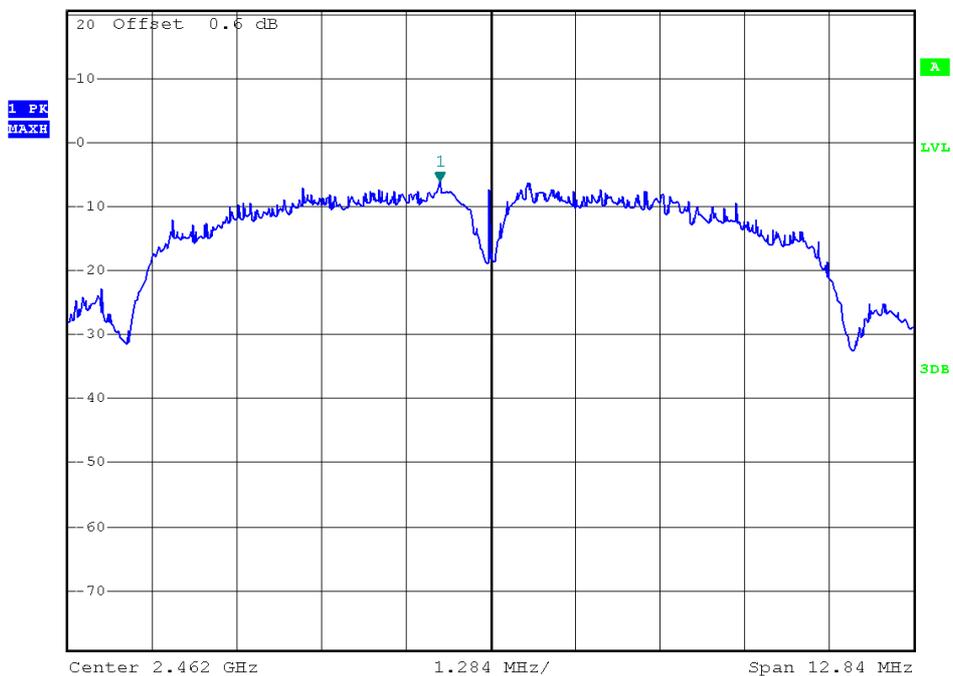
IEEE 802.11n-HT40 MIMO(BPSK, 27Mbps)			
Frequency (MHz)	Power Density with RBW 3KHz		
	ANT 1	ANT 3	Total
2422	-12.38	-12.28	-9.27
2437	-11.55	-11.75	-8.54
2452	-12.19	-11.10	-8.09

IEEE 802.11n-HT40 MIMO(BPSK, 27Mbps)			
Frequency (MHz)	Power Density with RBW 3KHz		
	ANT 2	ANT 3	Total
2422	-11.65	-12.28	-8.64
2437	-12.05	-11.75	-8.74
2452	-11.69	-11.10	-8.09

The test plots are attached as below.

INTERTEK TESTING SERVICES

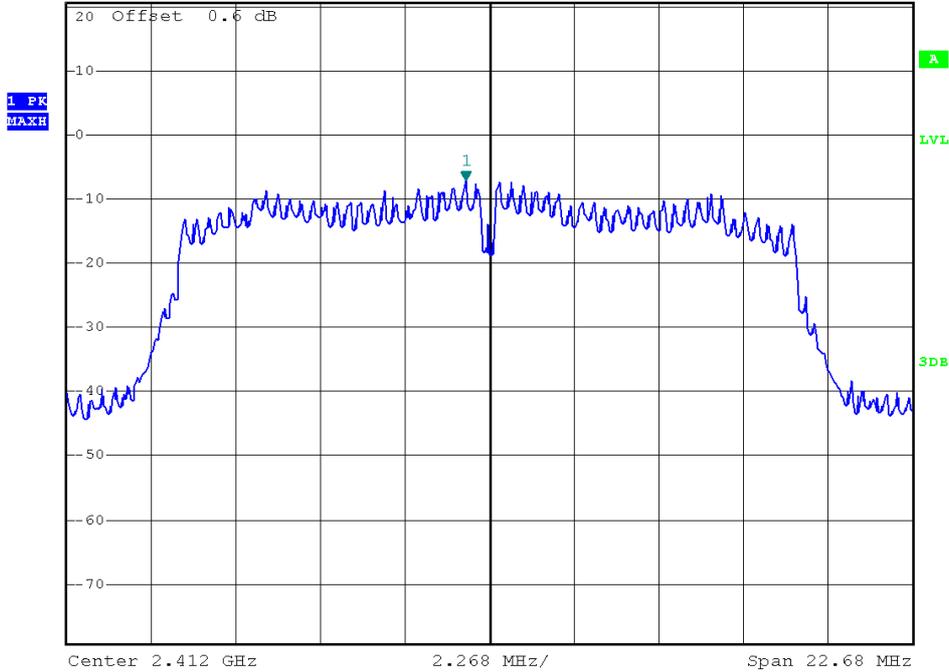
Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz -5.92 dBm
Ref 20.6 dBm *Att 30 dB SWT 1.45 s 2.461229600 GHz



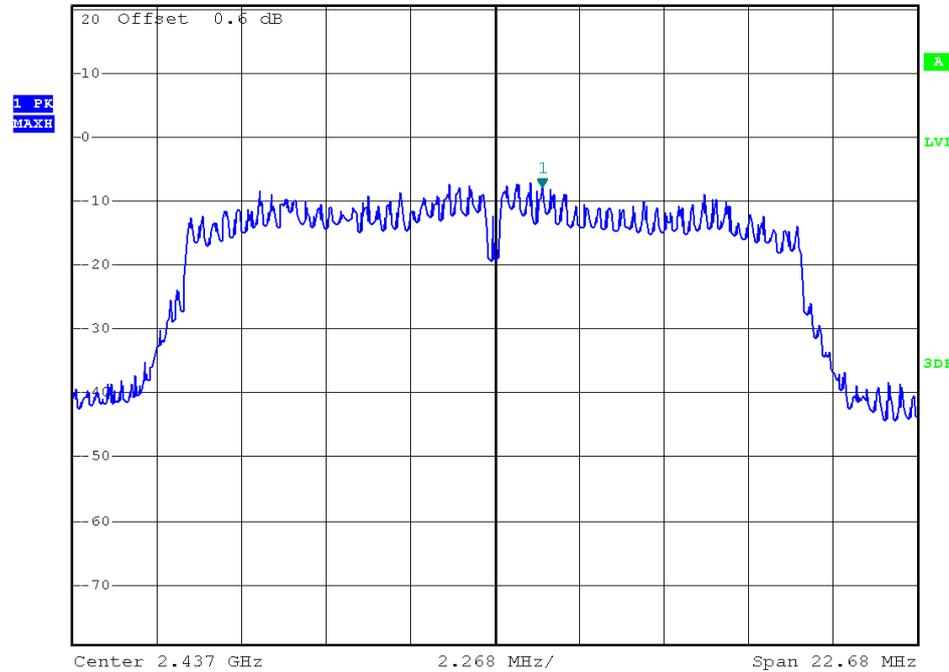
INTERTEK TESTING SERVICES

802.11g

Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz -7.18 dBm
Ref 20.6 dBm *Att 30 dB SWT 2.6 s 2.411364960 GHz

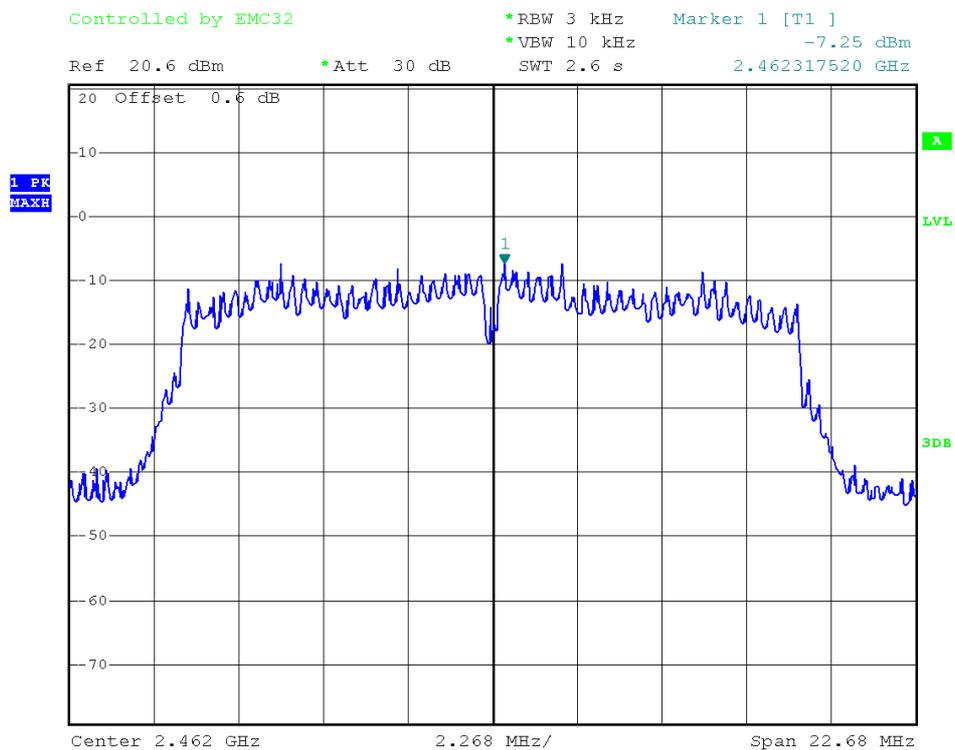


Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz -7.81 dBm
Ref 20.6 dBm *Att 30 dB SWT 2.6 s 2.438270080 GHz



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

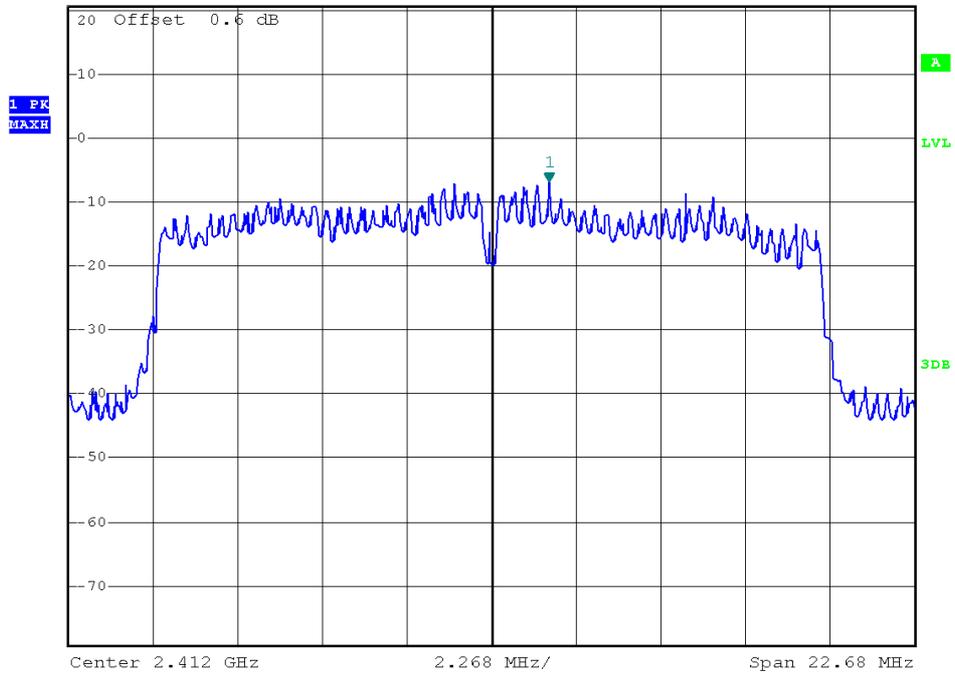
INTERTEK TESTING SERVICES



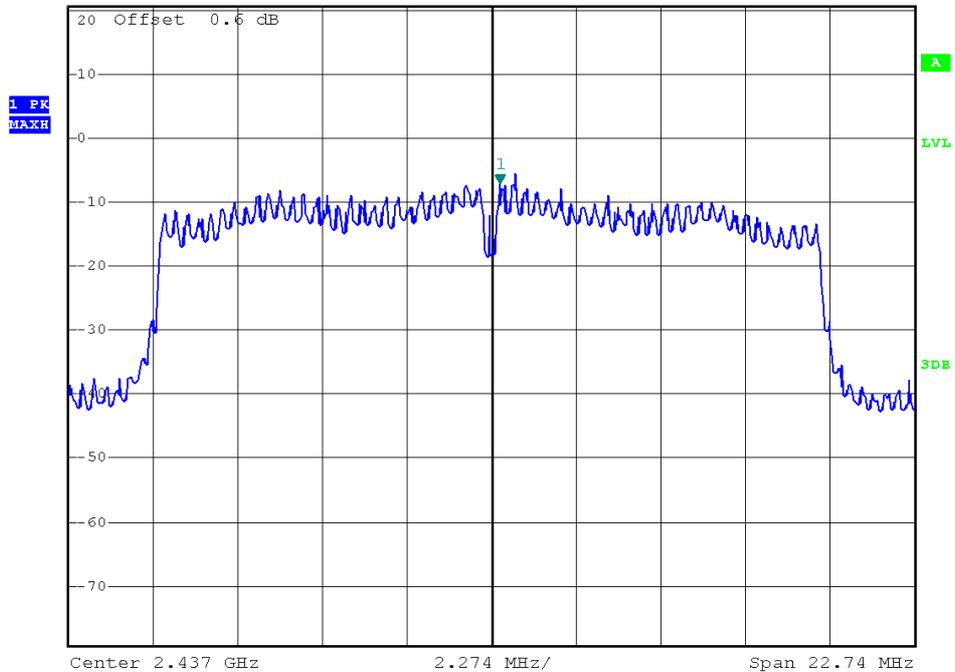
INTERTEK TESTING SERVICES

802.11n-HT20 SISO

Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
Ref 20.6 dBm *Att 30 dB *VBW 10 kHz -6.73 dBm
SWT 2.6 s 2.413542240 GHz



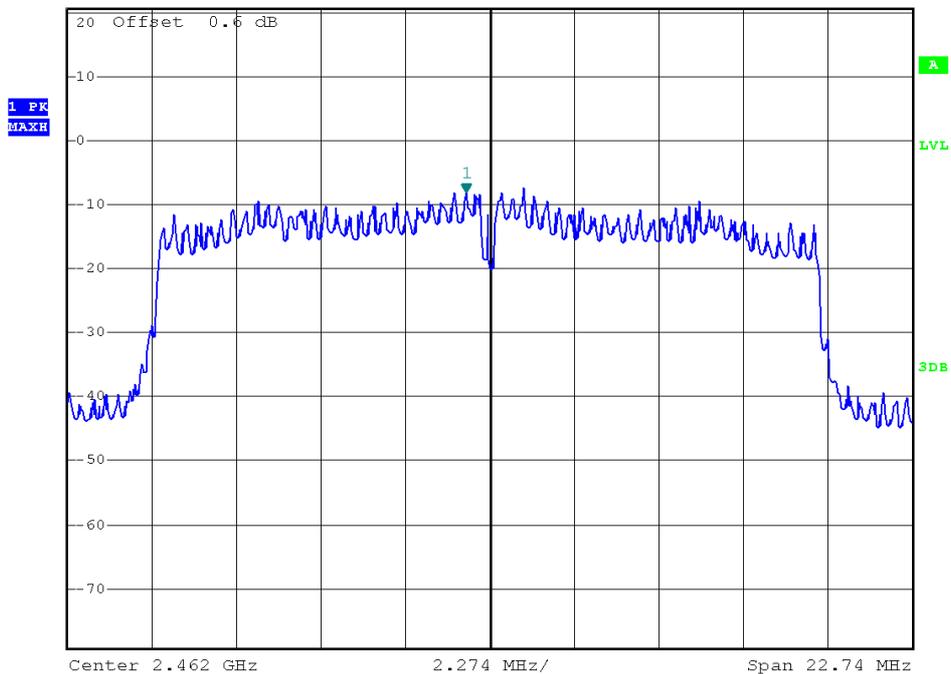
Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
Ref 20.6 dBm *Att 30 dB *VBW 10 kHz -6.96 dBm
SWT 2.6 s 2.437227400 GHz



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

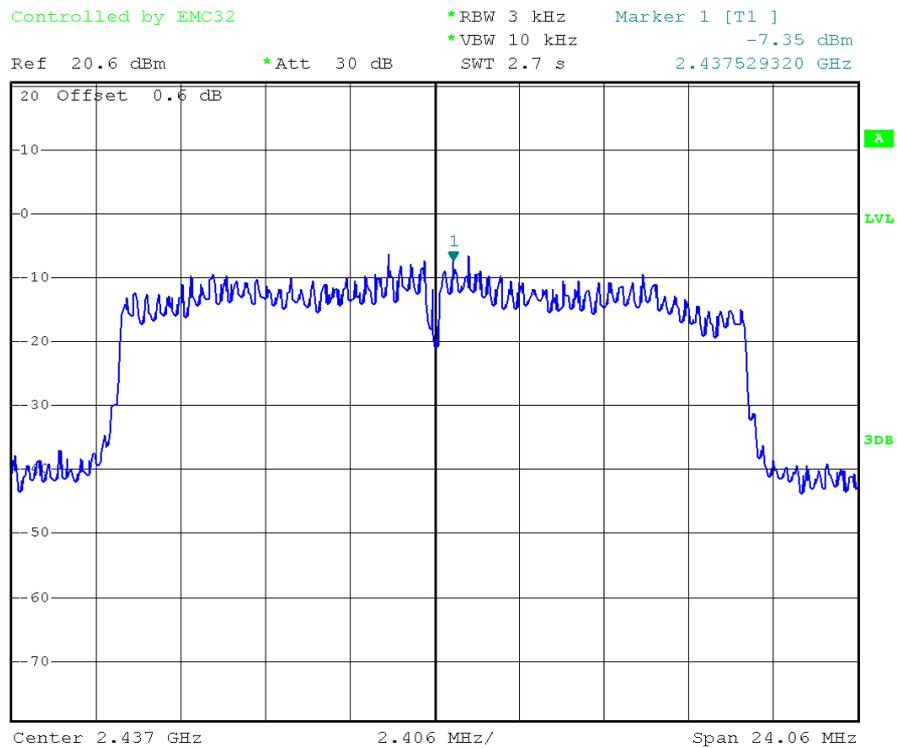
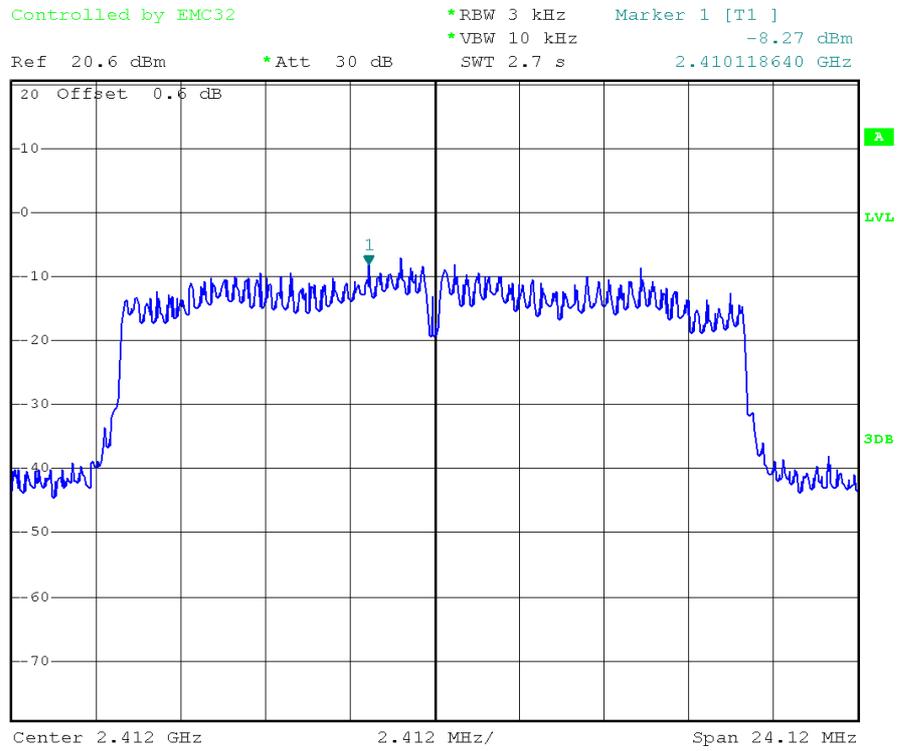
INTERTEK TESTING SERVICES

Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz -8.16 dBm
Ref 20.6 dBm *Att 30 dB SWT 2.6 s 2.461363280 GHz



INTERTEK TESTING SERVICES

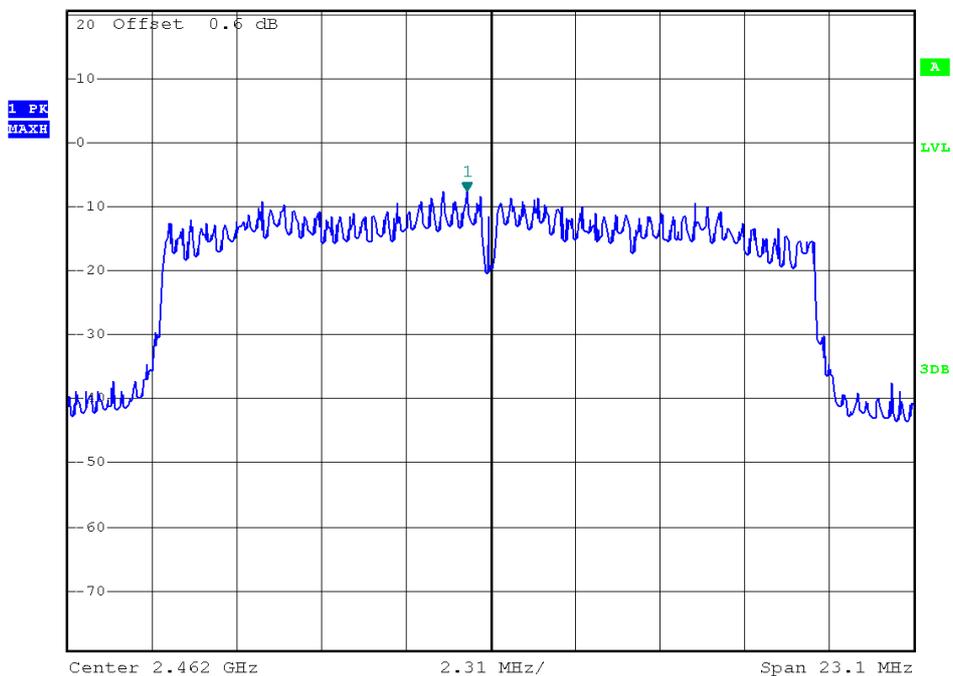
802.11n-HT20 MIMO Ant1



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES

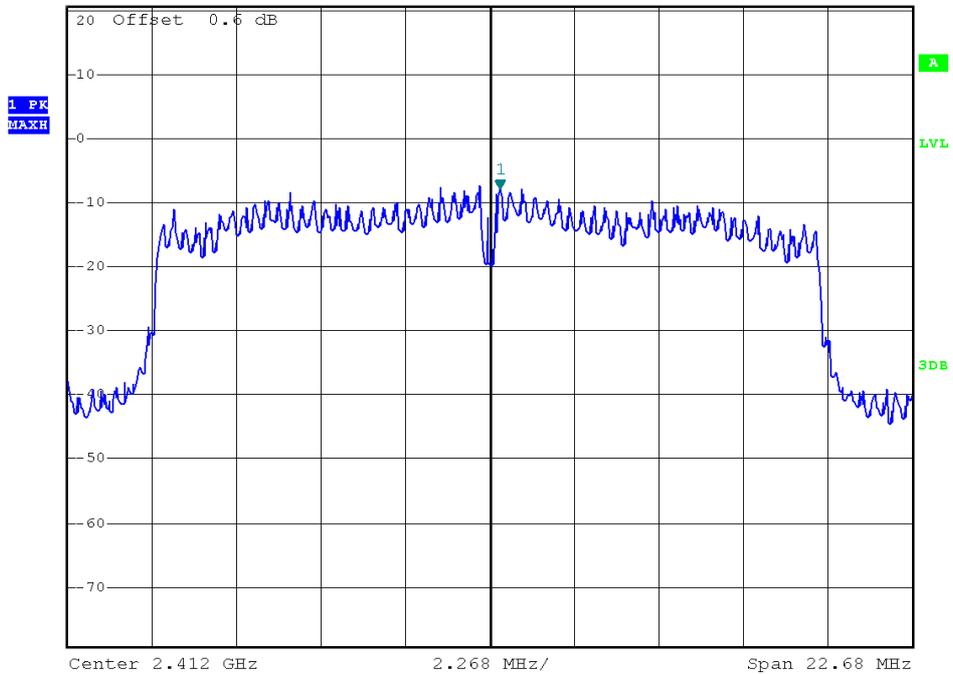
Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz -7.61 dBm
Ref 20.6 dBm *Att 30 dB SWT 2.6 s 2.461353200 GHz



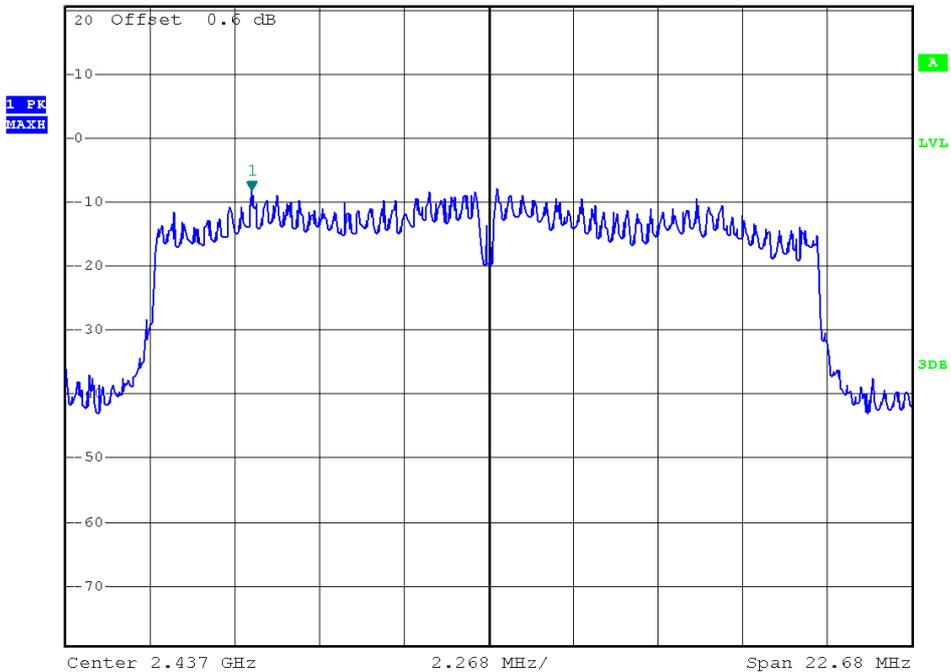
INTERTEK TESTING SERVICES

802.11n-HT20 MIMO Ant2

Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
Ref 20.6 dBm *Att 30 dB *VBW 10 kHz -7.99 dBm
SWT 2.6 s 2.412272160 GHz



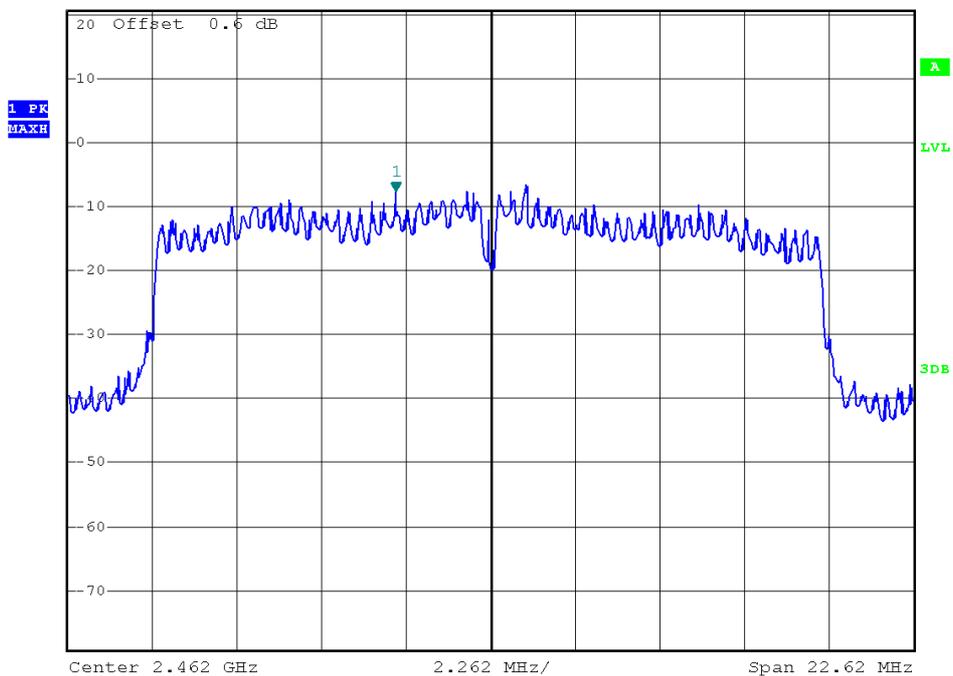
Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
Ref 20.6 dBm *Att 30 dB *VBW 10 kHz -8.23 dBm
SWT 2.6 s 2.430649600 GHz



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES

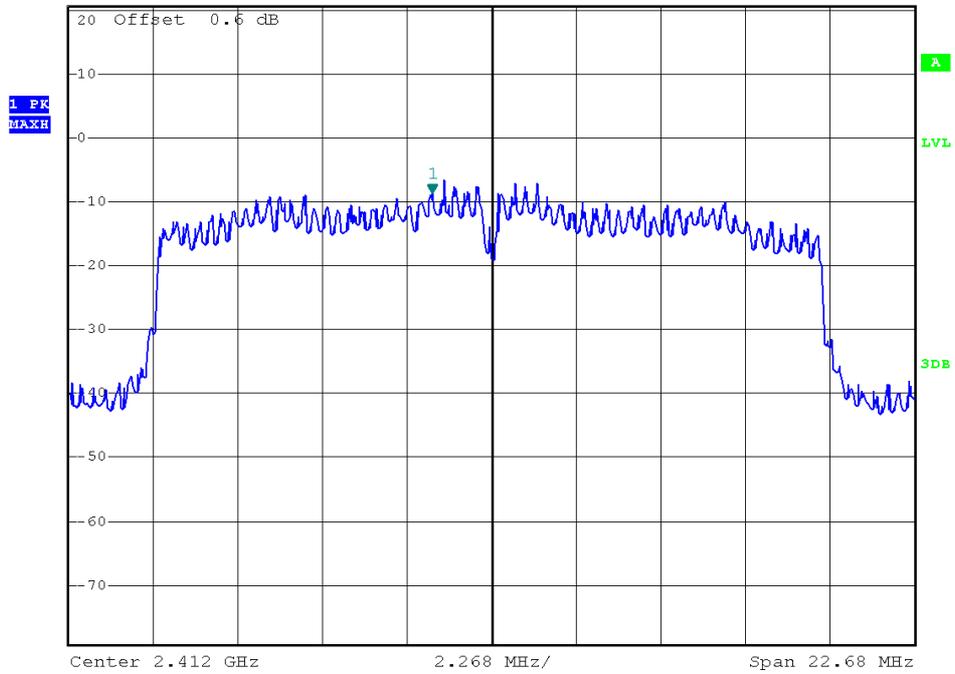
Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz -7.56 dBm
Ref 20.6 dBm *Att 30 dB SWT 2.6 s 2.459466560 GHz



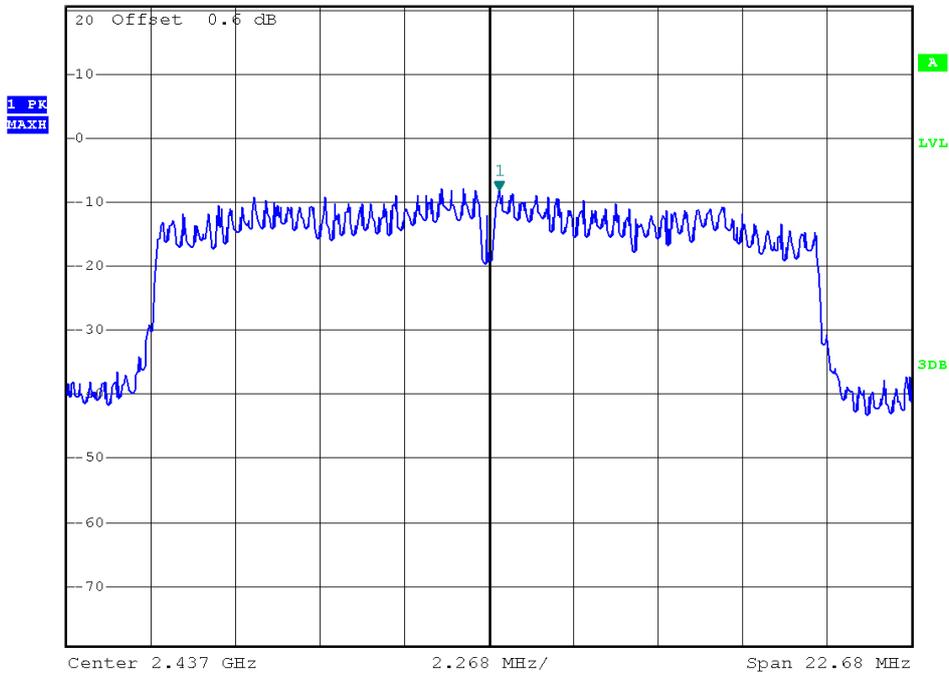
INTERTEK TESTING SERVICES

802.11n-HT20 MIMO Ant3

Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
Ref 20.6 dBm *Att 30 dB *VBW 10 kHz -8.68 dBm
SWT 2.6 s 2.410412400 GHz

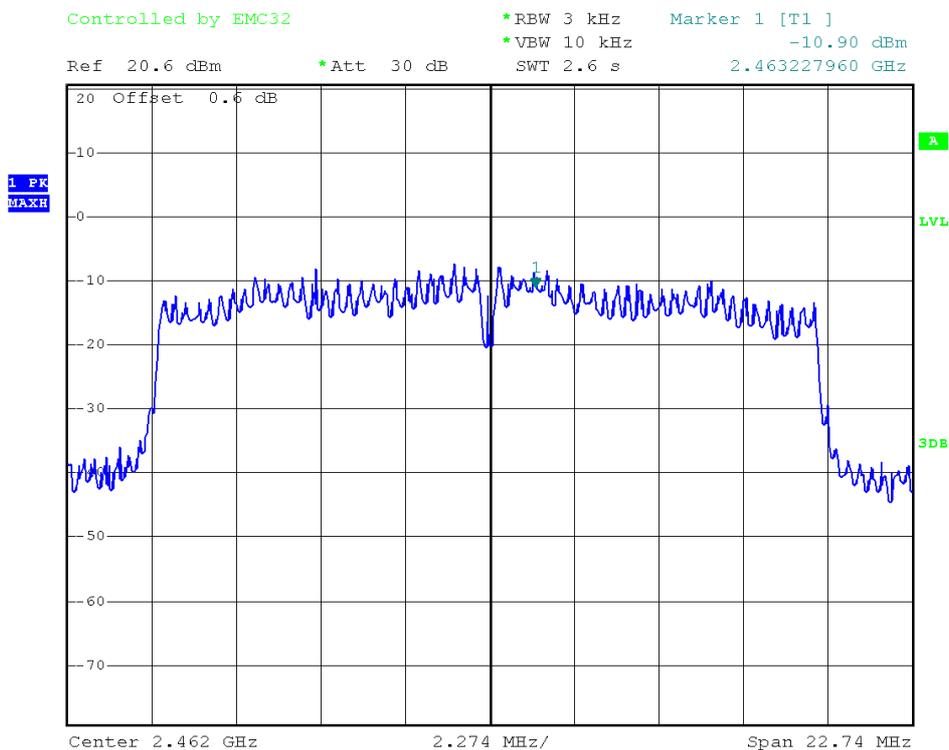


Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
Ref 20.6 dBm *Att 30 dB *VBW 10 kHz -8.25 dBm
SWT 2.6 s 2.437272160 GHz



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

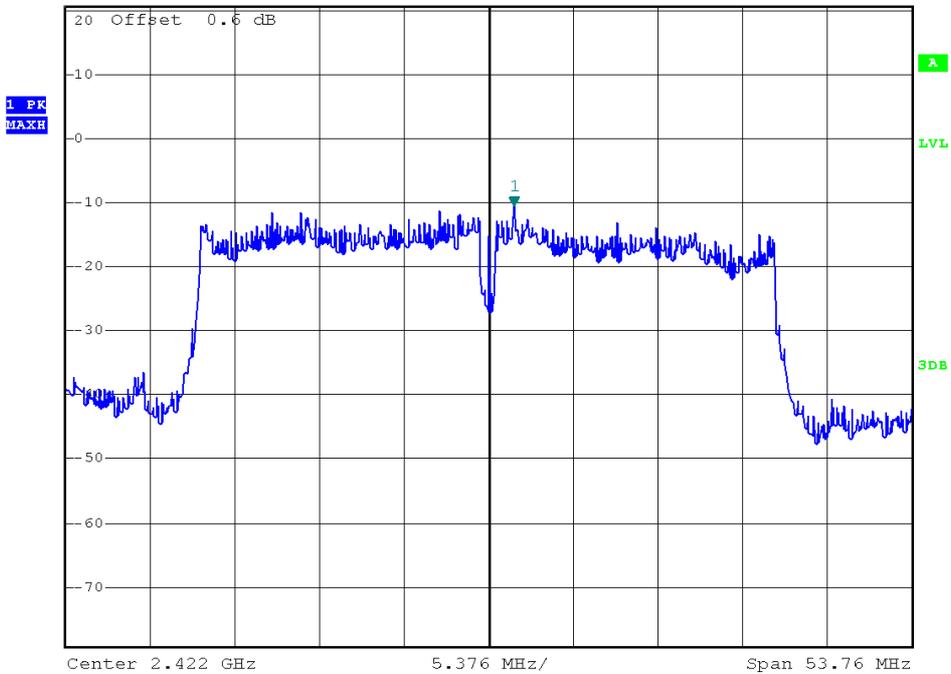
INTERTEK TESTING SERVICES



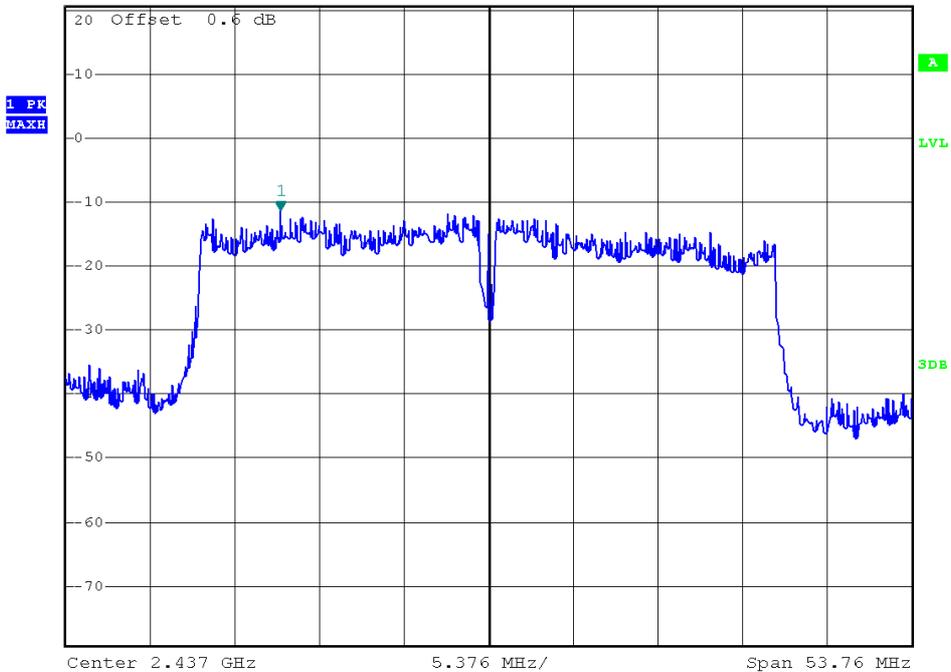
INTERTEK TESTING SERVICES

802.11n-HT40 SISO

Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz -10.40 dBm
Ref 20.6 dBm *Att 30 dB SWT 6 s 2.423612800 GHz



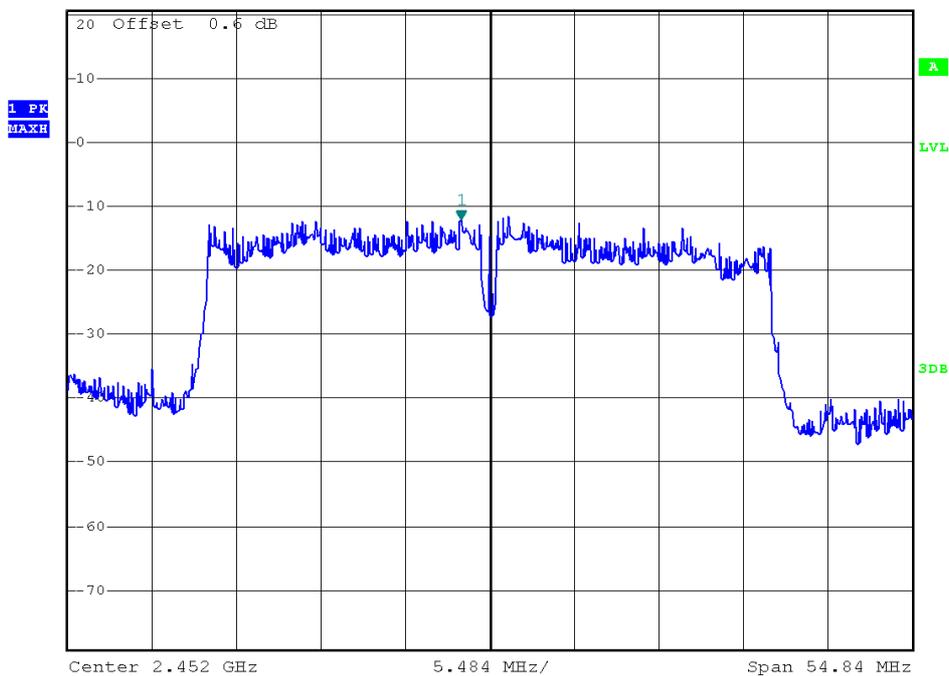
Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz -11.38 dBm
Ref 20.6 dBm *Att 30 dB SWT 6 s 2.423775040 GHz



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

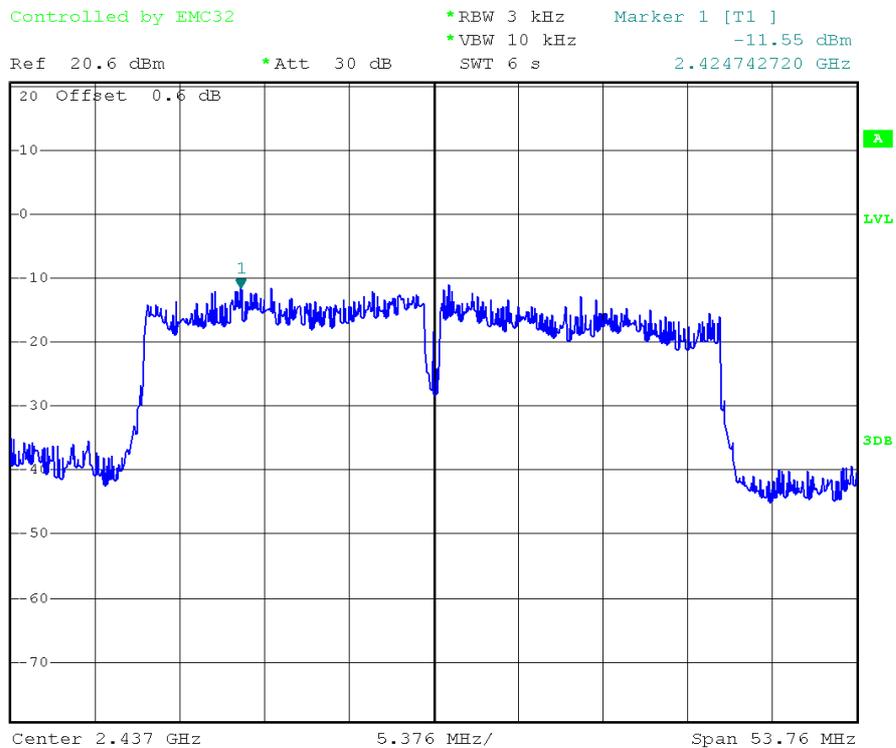
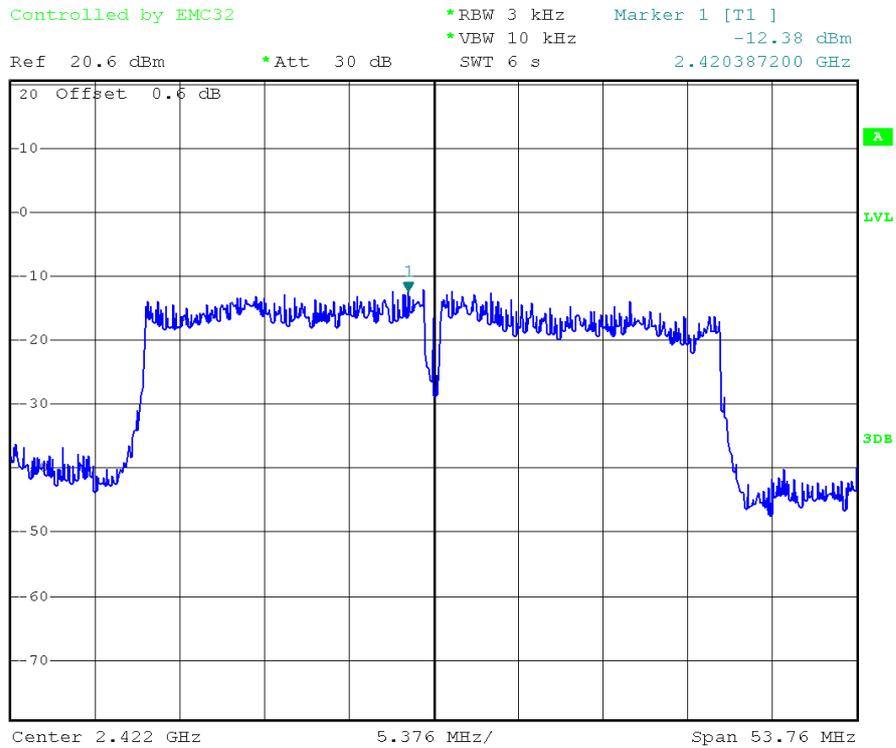
INTERTEK TESTING SERVICES

Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz -12.18 dBm
Ref 20.6 dBm *Att 30 dB SWT 6.2 s 2.450135440 GHz



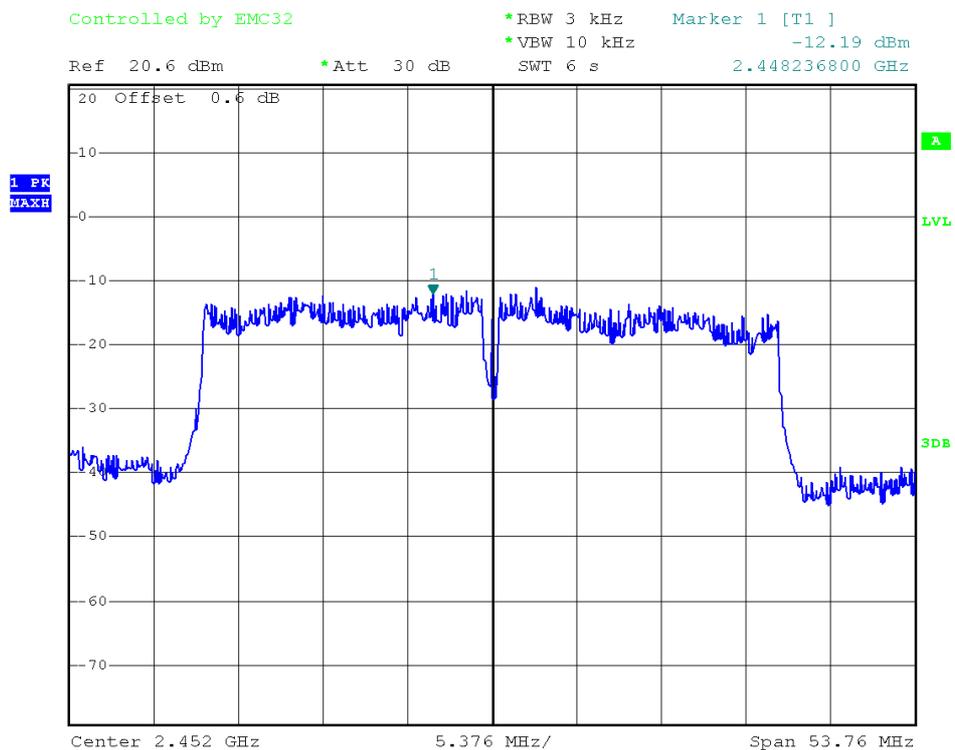
INTERTEK TESTING SERVICES

802.11n-HT40 MIMO Ant1



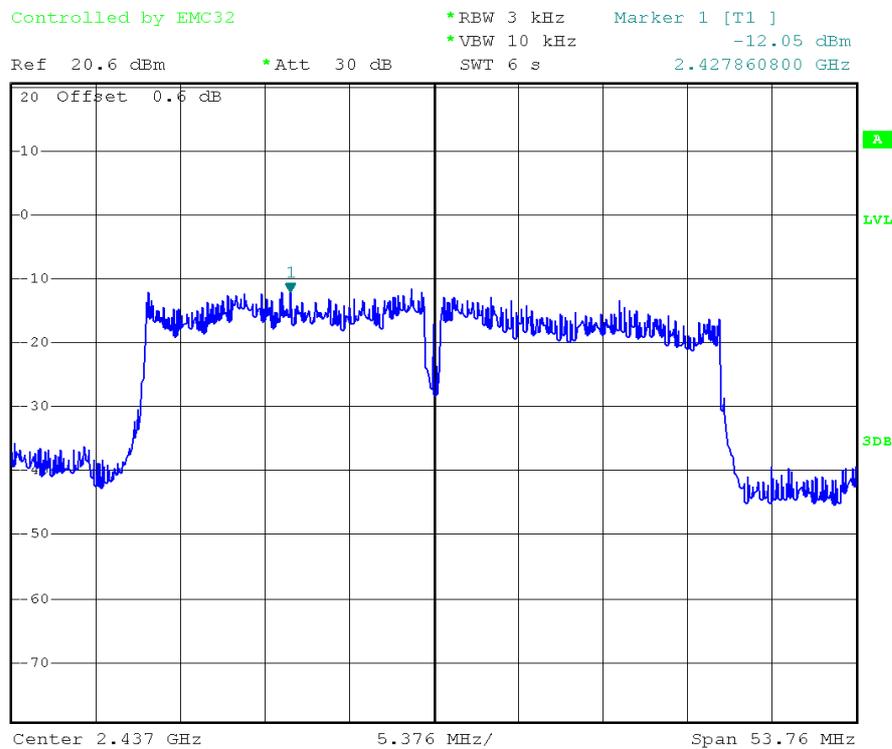
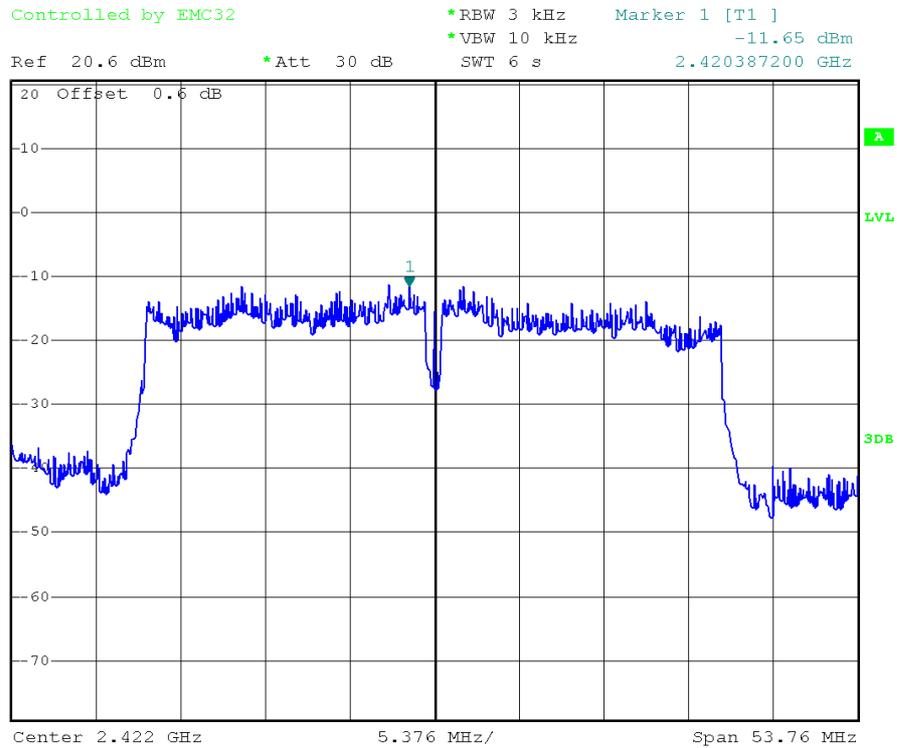
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FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

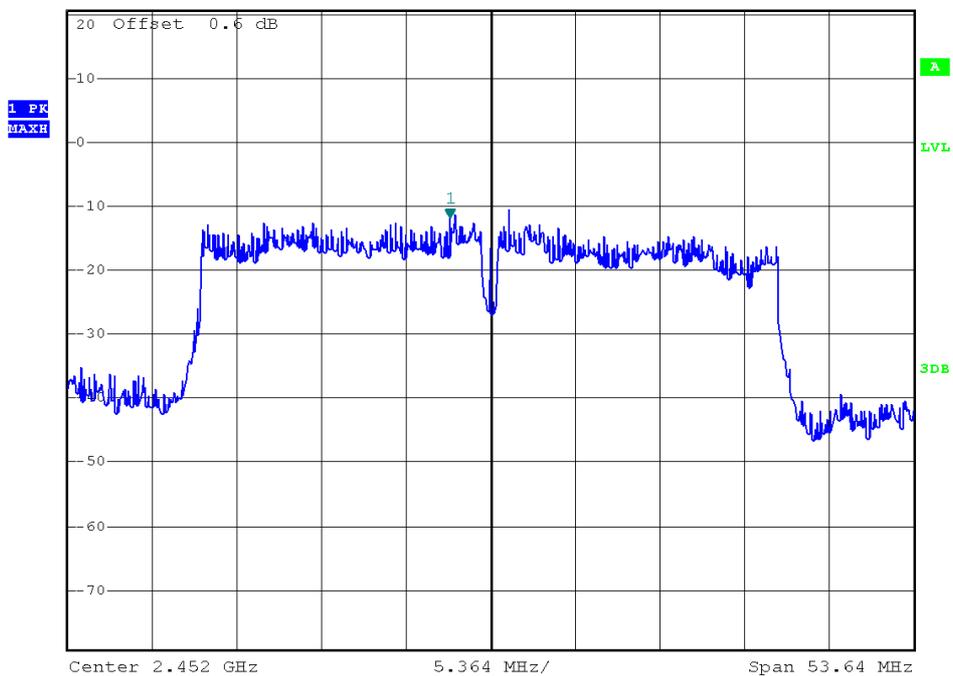
802.11n-HT40 MIMO Ant2



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

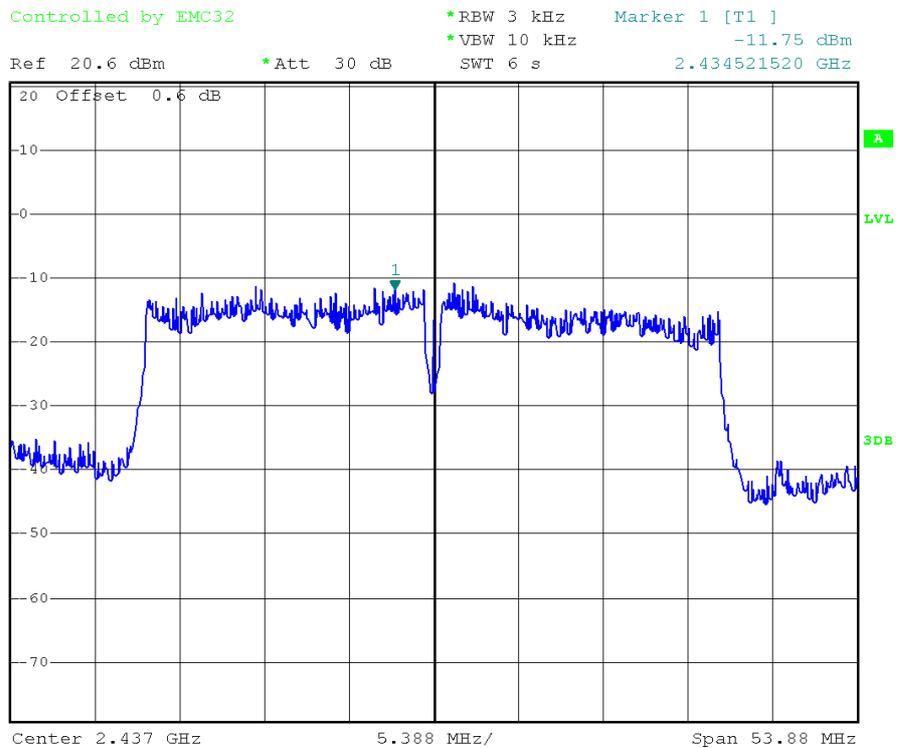
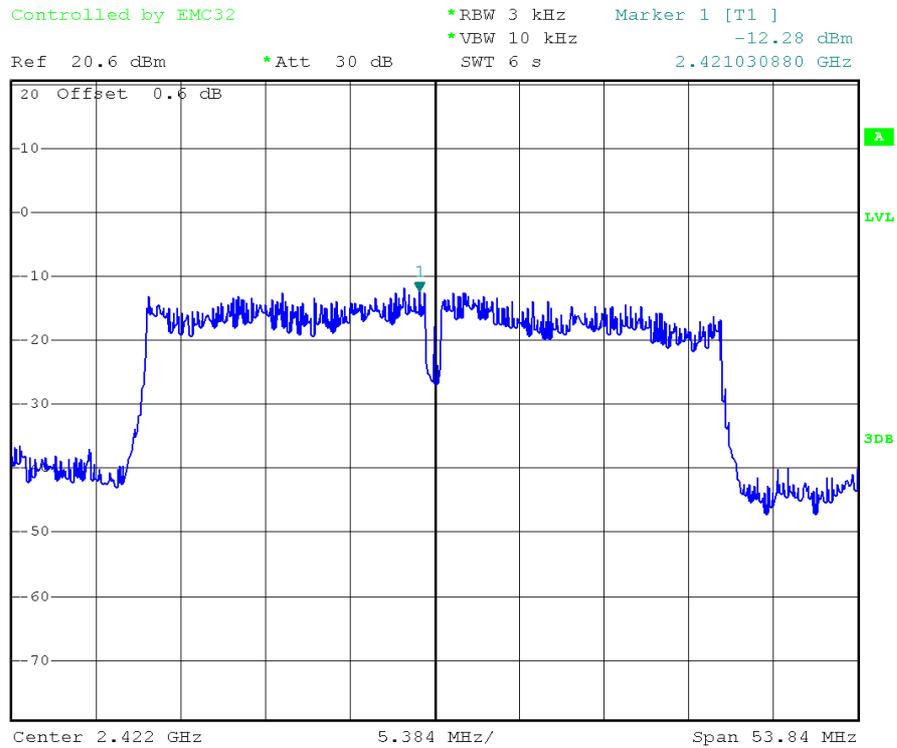
INTERTEK TESTING SERVICES

Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz -11.69 dBm
Ref 20.6 dBm *Att 30 dB SWT 6 s 2.449425280 GHz



INTERTEK TESTING SERVICES

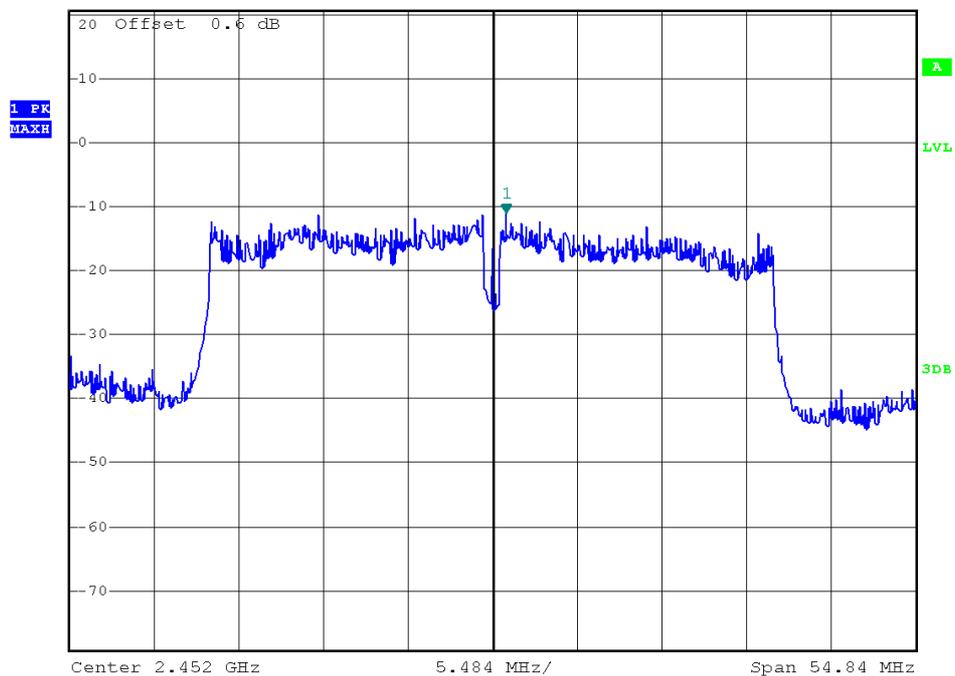
802.11n-HT40 MIMO Ant3



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES

Controlled by EMC32 *RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz -11.10 dBm
Ref 20.6 dBm *Att 30 dB SWT 6.2 s 2.452877440 GHz



INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd
Model: WS330

Date of Test: 12 April, 2013

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

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20dB below that of the maximum in-band 100 kHz emission, or else shall meet the general limits for radiated emissions at frequencies outside the passband, whichever results in lower attenuation. 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 plot for out of band conducted emissions data with rate of 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n-HT20 SISO, 13.5Mbps for 802.11n-HT40 SISO, 13Mbps for 802.11n-HT20 MIMO and 27Mbps for 802.11n-HT40 MIMO. For MIMO system, both the antenna ports was checked and the worst case are shown, The worst case Out of Band Conducted Emissions is derived from the method of Measure according KDB662911.

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

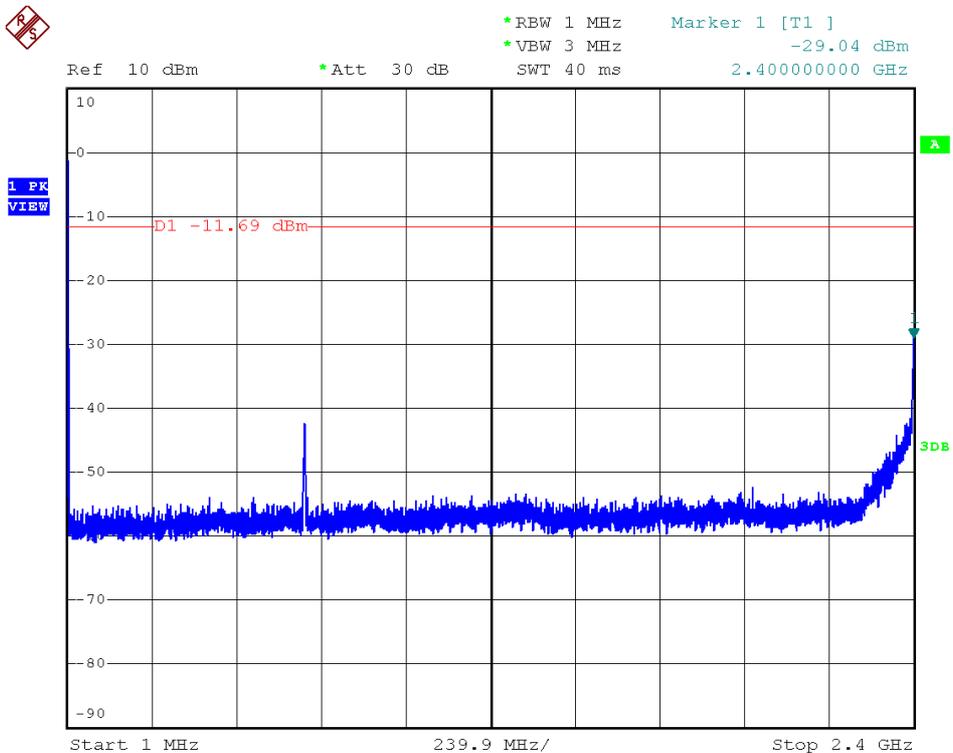
Spectrum Analyzer Setting
RBW=100KHz
VBW=>3 x RBW
Detector=Peak
Sweep point=8001
Sweep time=auto couple
Trace mode=Max hold

Note: the RBW was set to 1MHz rather than 100KHz in order to increase the measurement speed, if found out fail point at 1MHz RBW, we will use reduce the RBW to 100KHz determine the final result.

The test plots are attached as below.

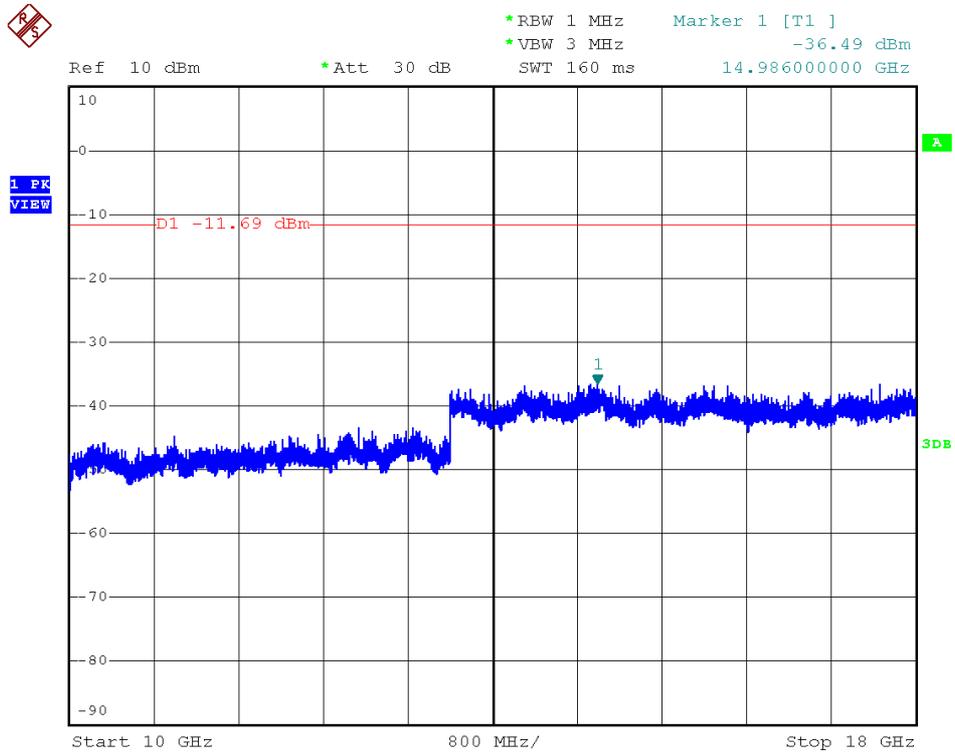
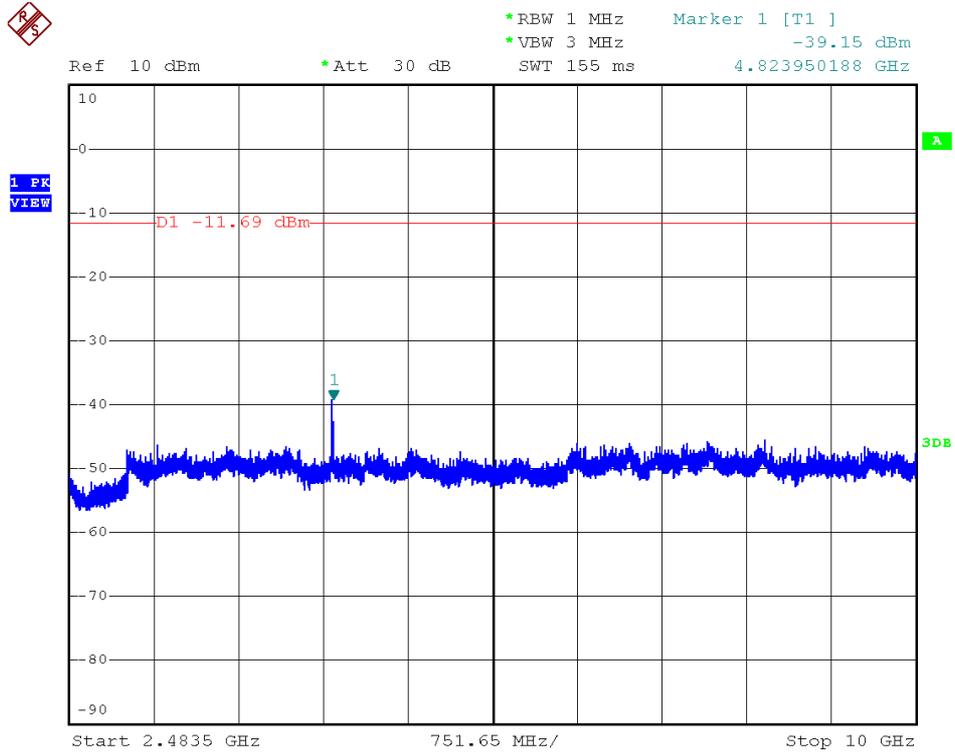
INTERTEK TESTING SERVICES

802.11b
Channel 1 (2412MHz) Reference Level: 8.31dBm

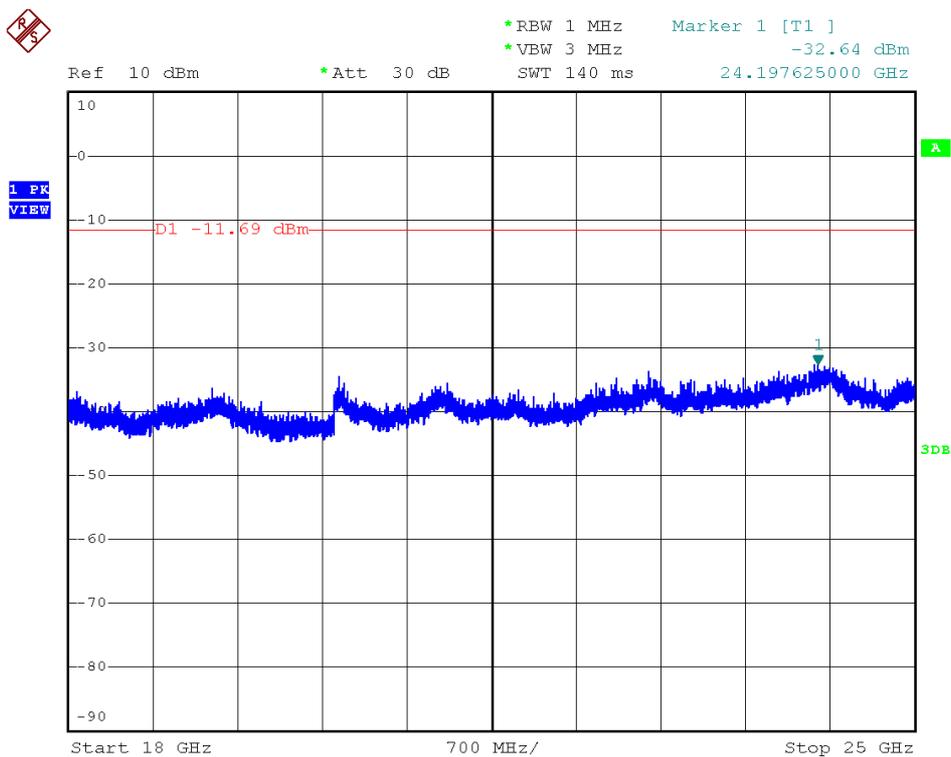


TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES

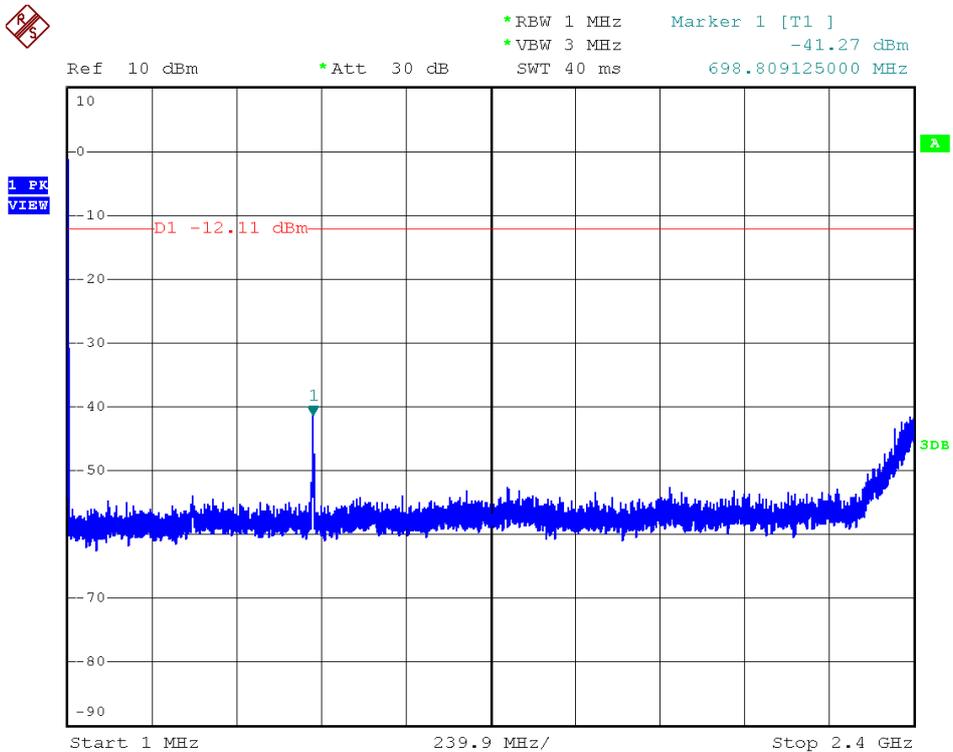


INTERTEK TESTING SERVICES



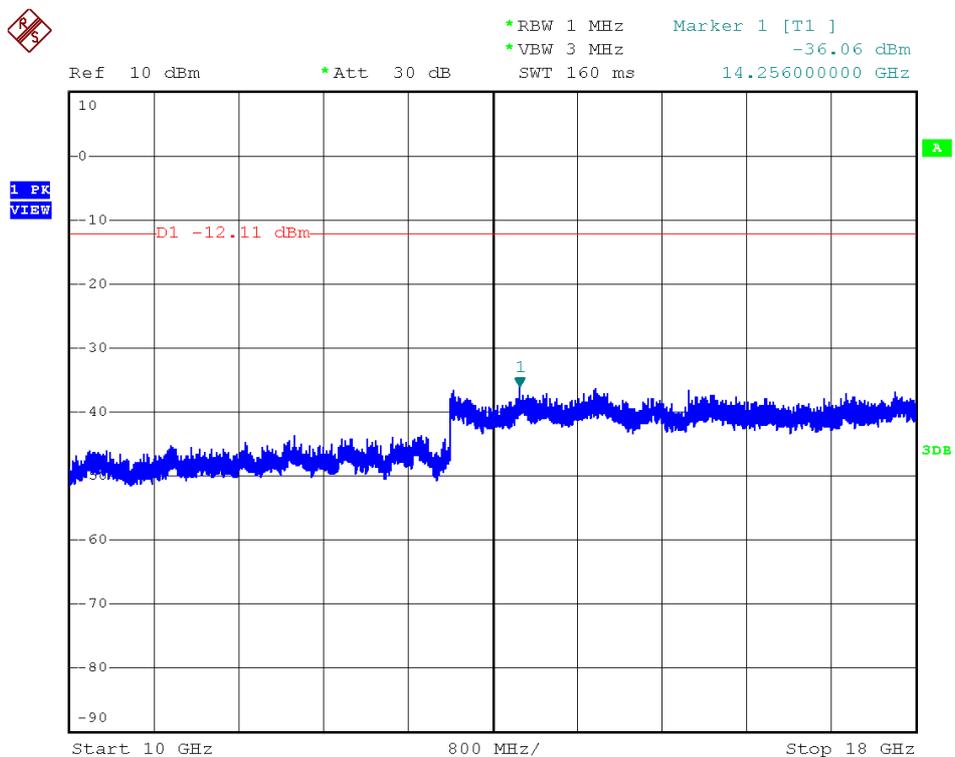
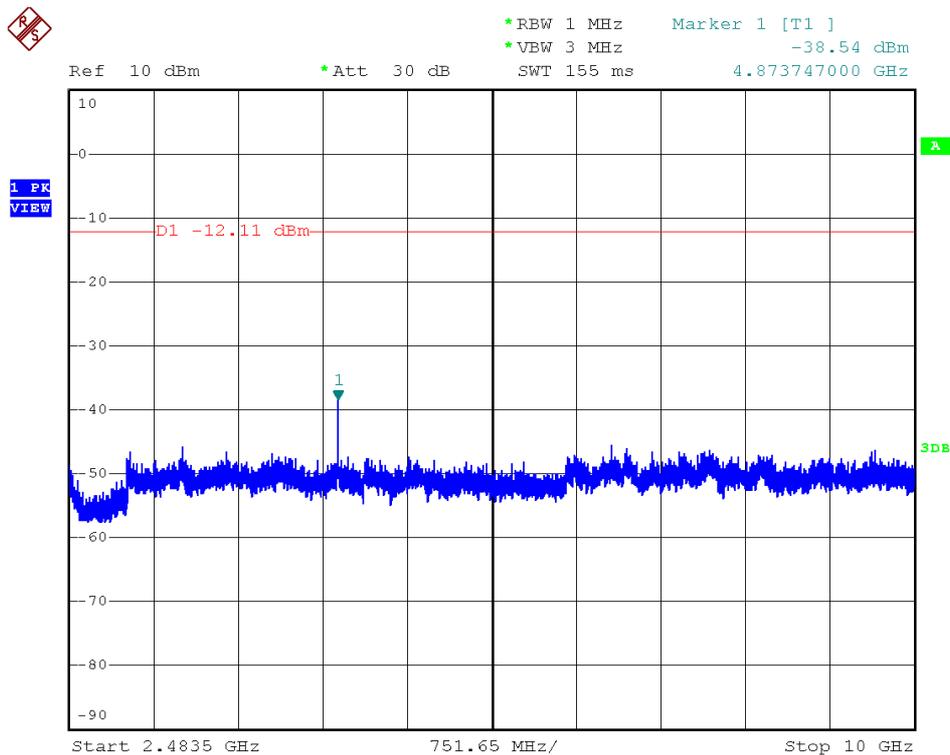
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 7.89dBm



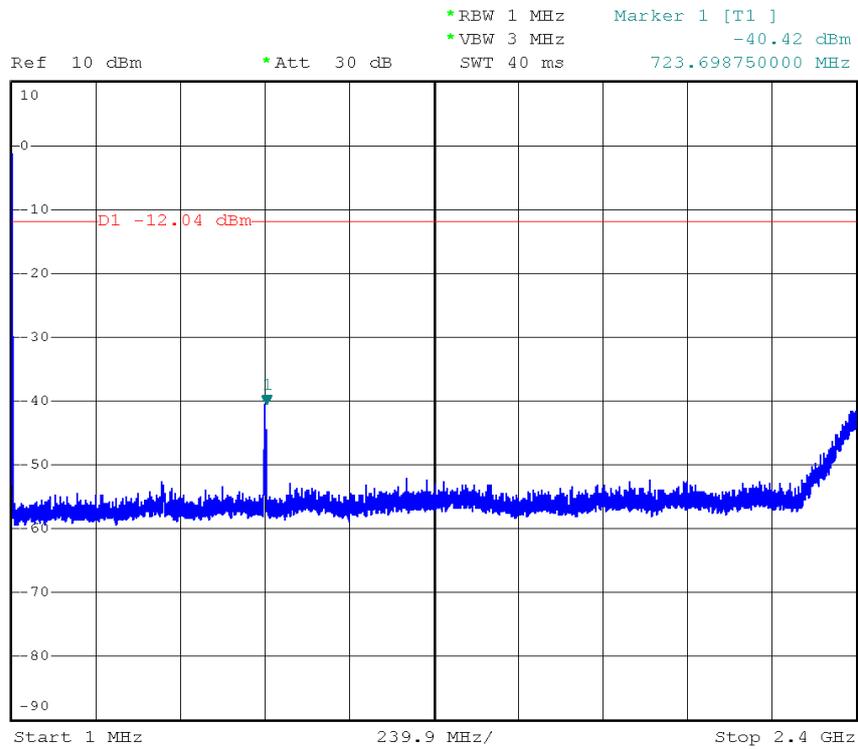
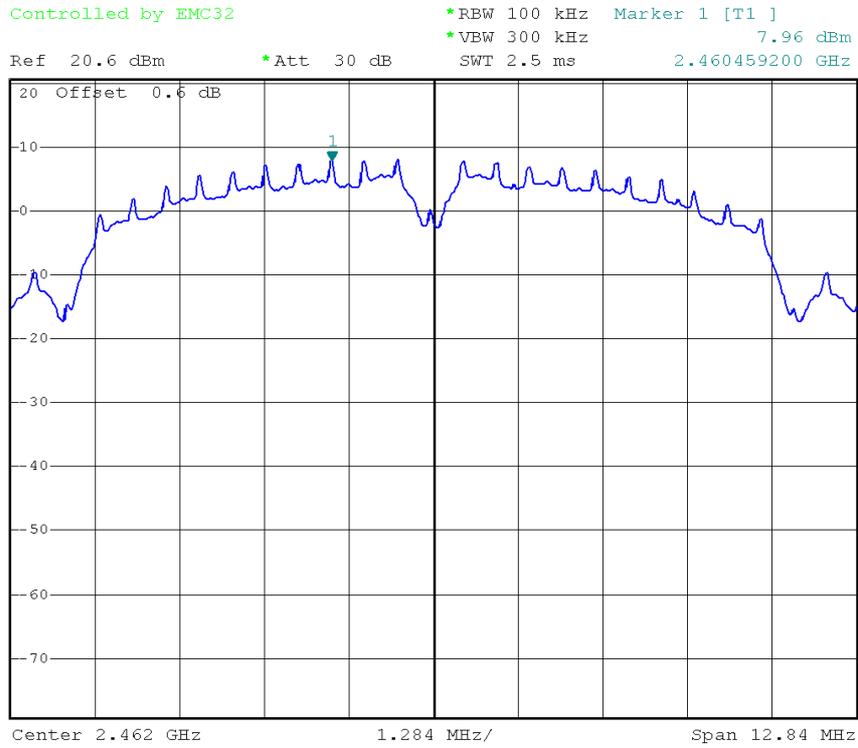
TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



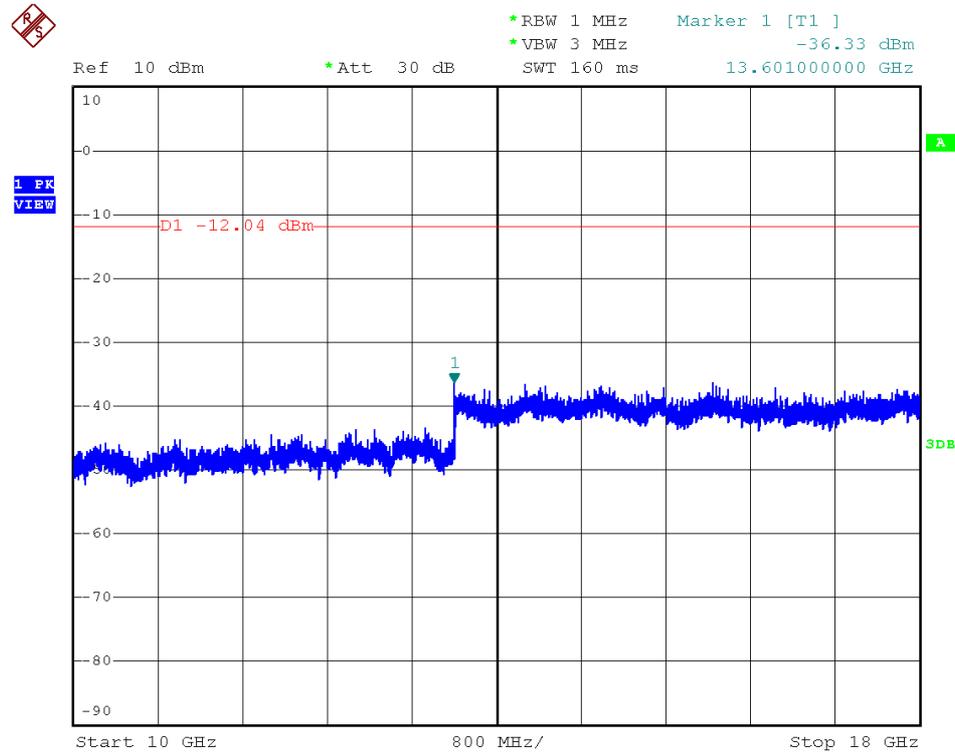
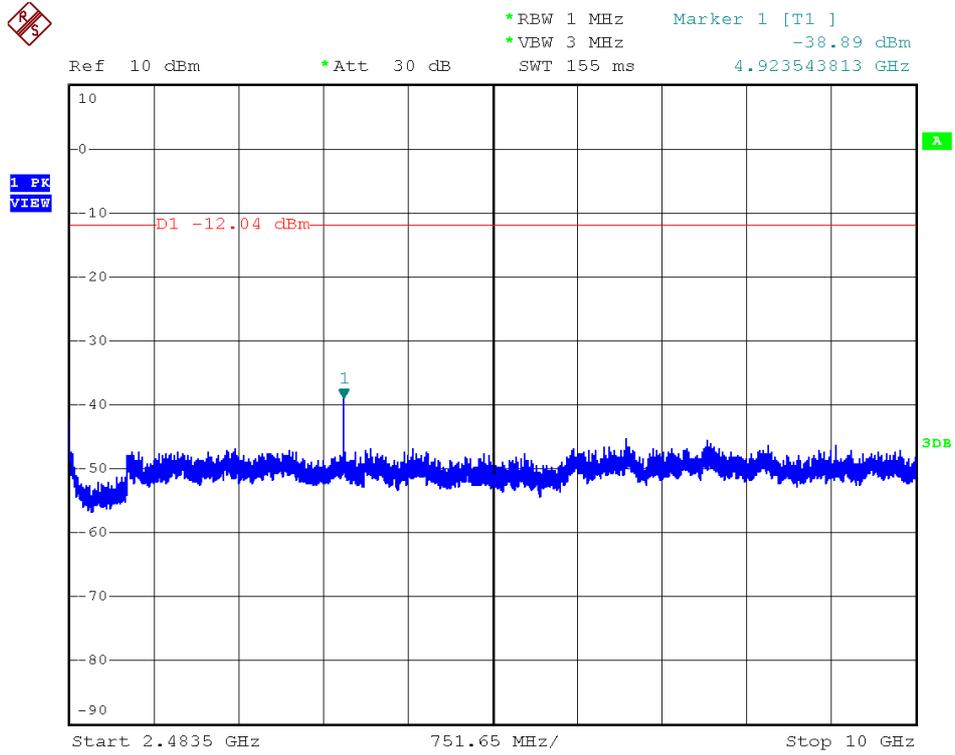
INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: 7.96dBm



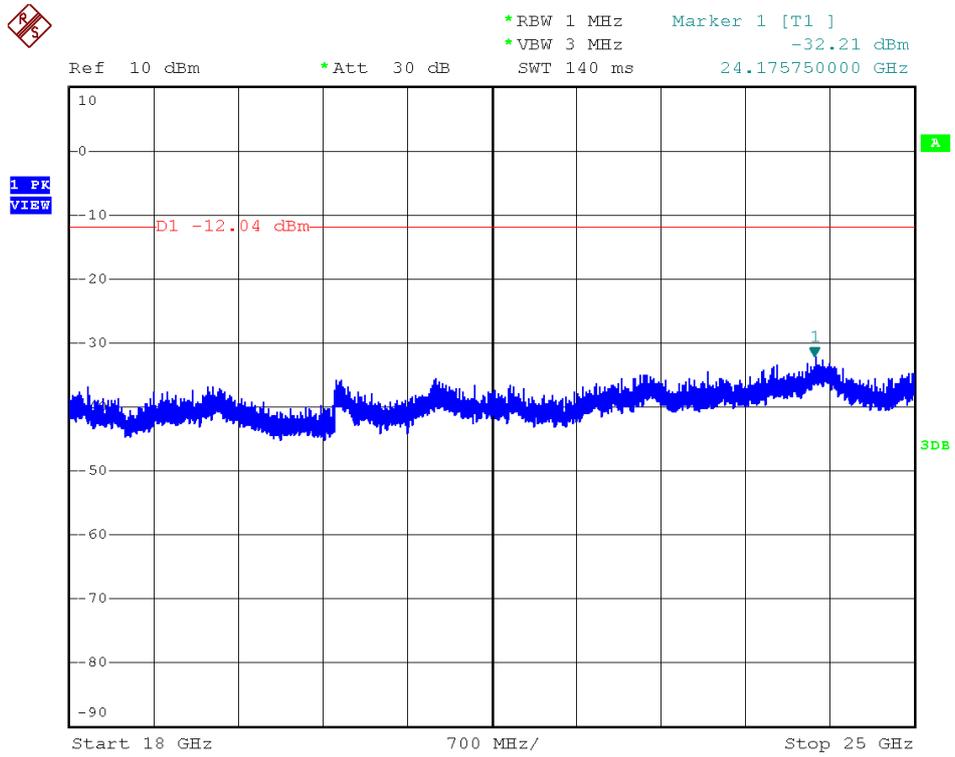
TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

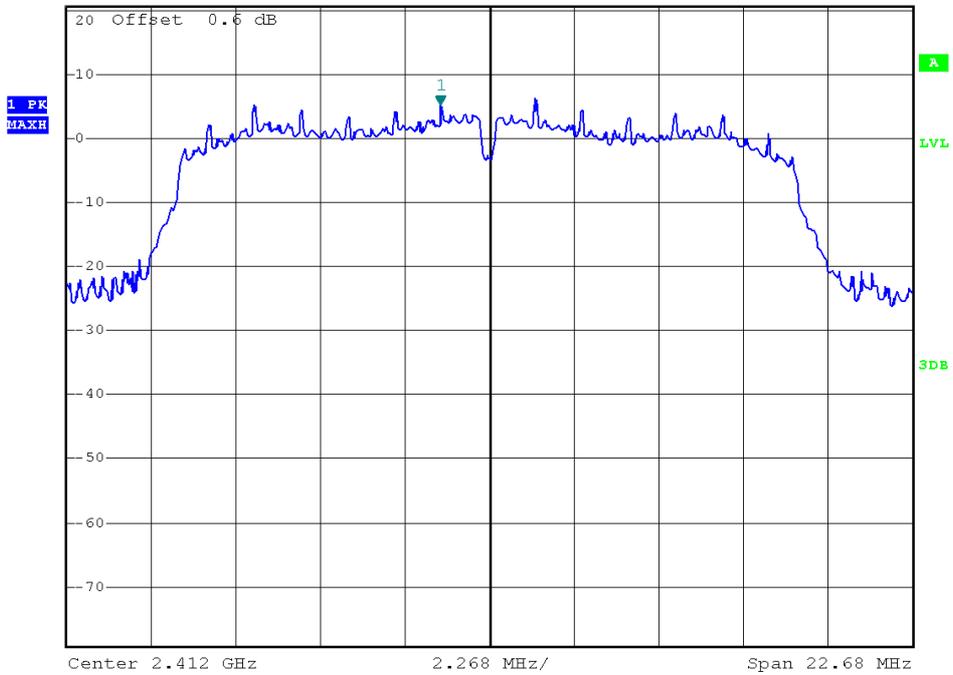
INTERTEK TESTING SERVICES



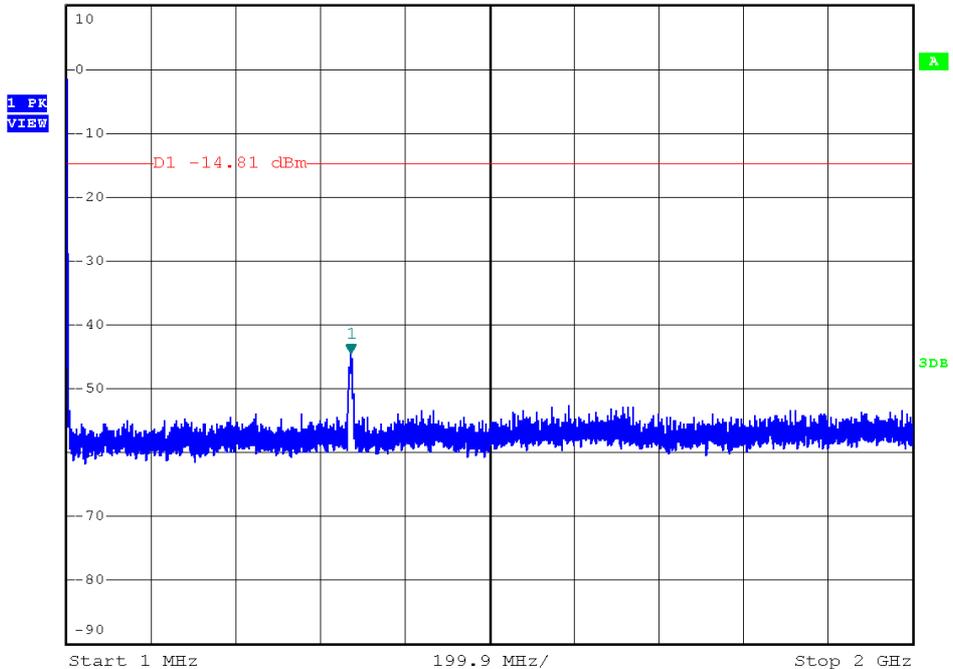
INTERTEK TESTING SERVICES

802.11g
Channel 1 (2412MHz) Reference Level: 5.19dBm

Controlled by EMC32 *RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 5.19 dBm
Ref 20.6 dBm *Att 30 dB SWT 2.5 ms 2.410684560 GHz



*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -44.45 dBm
Ref 10 dBm *Att 30 dB SWT 40 ms 671.664500000 MHz

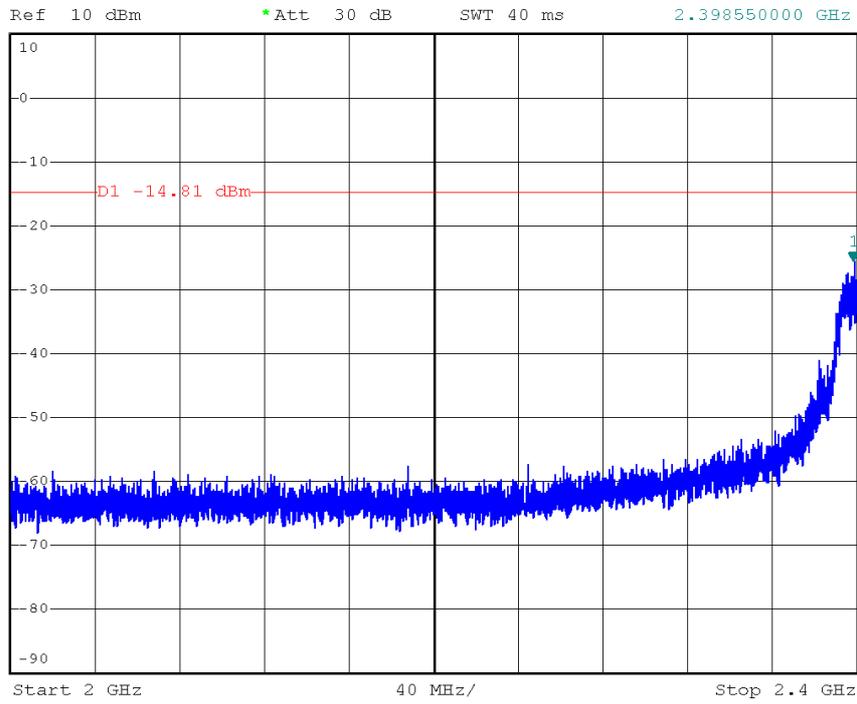


TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

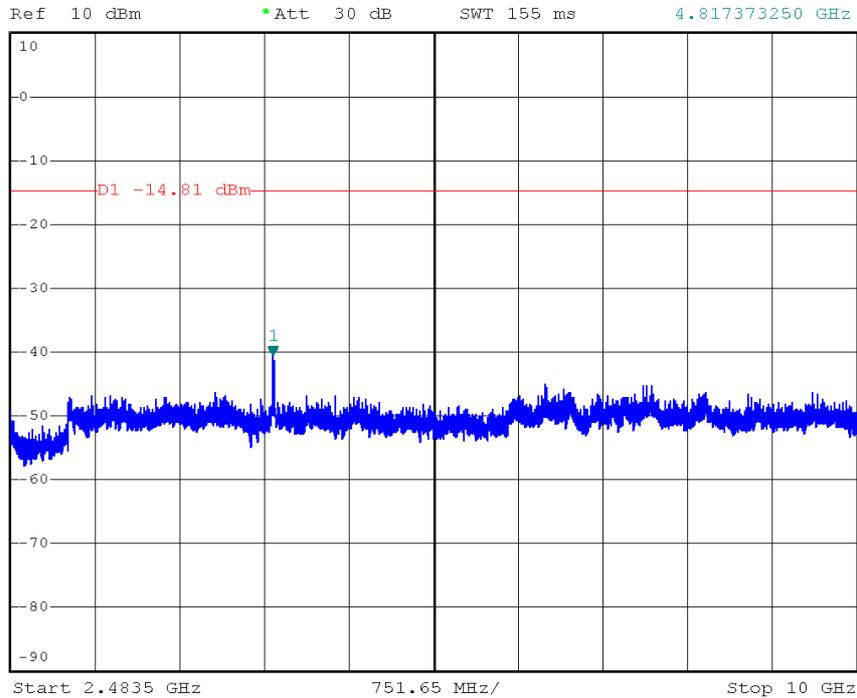
INTERTEK TESTING SERVICES



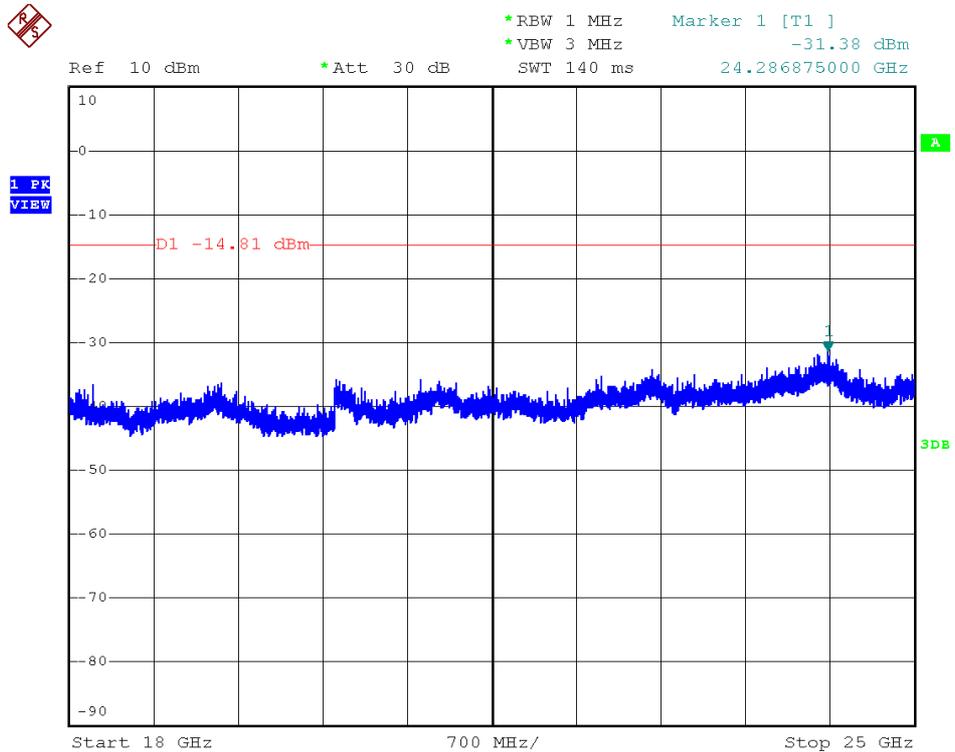
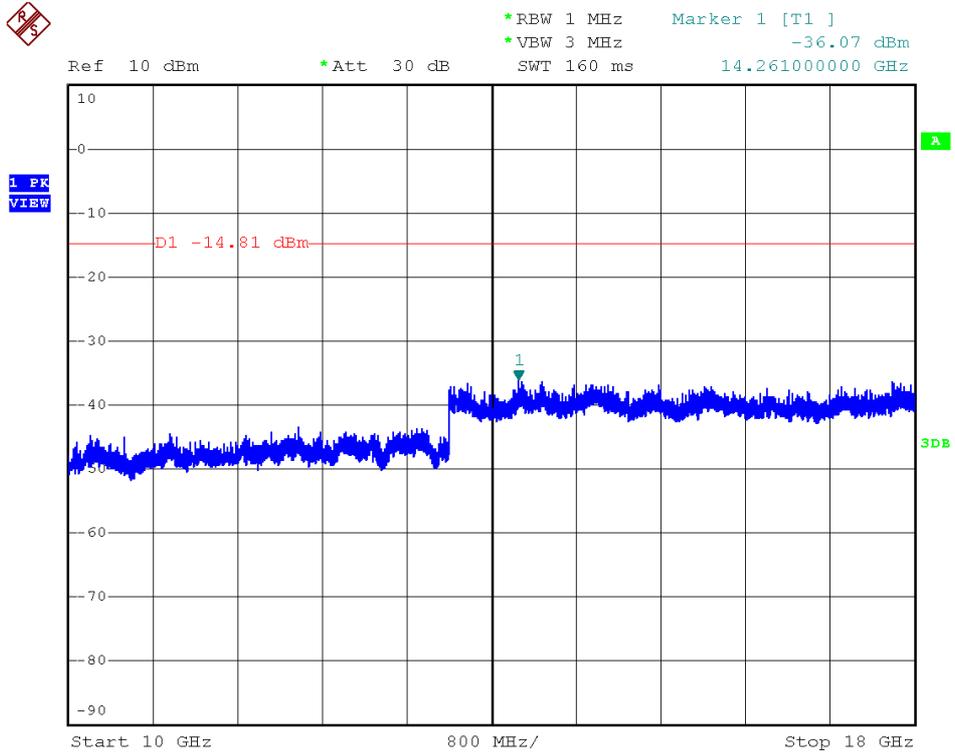
*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz -25.56 dBm
SWT 40 ms 2.398550000 GHz



*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -40.40 dBm
SWT 155 ms 4.817373250 GHz

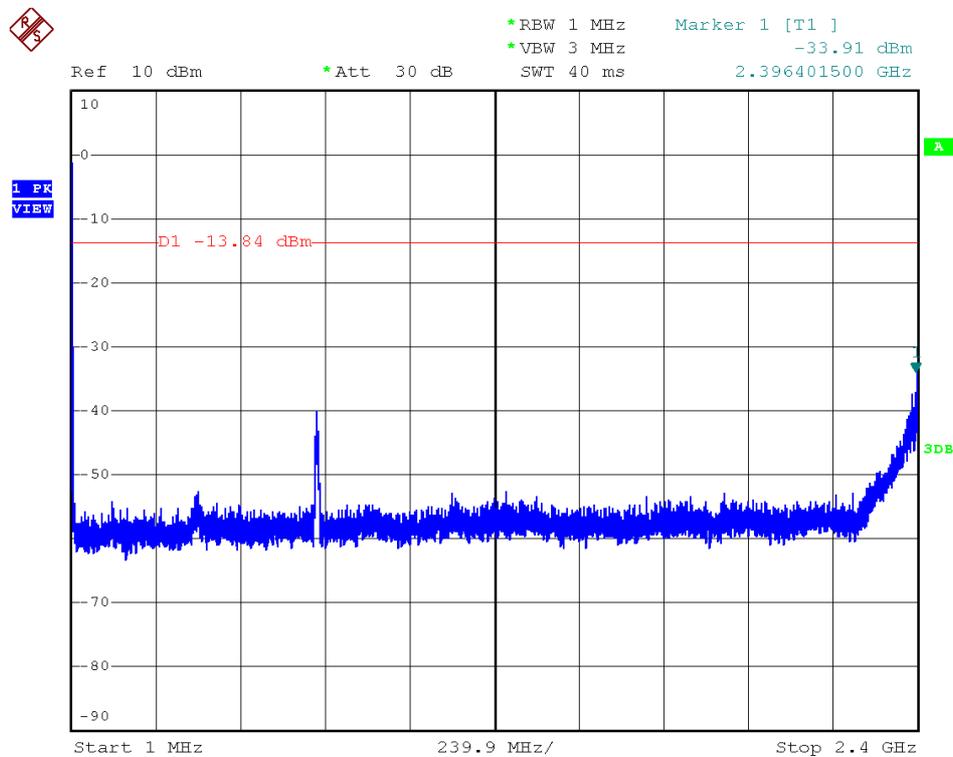
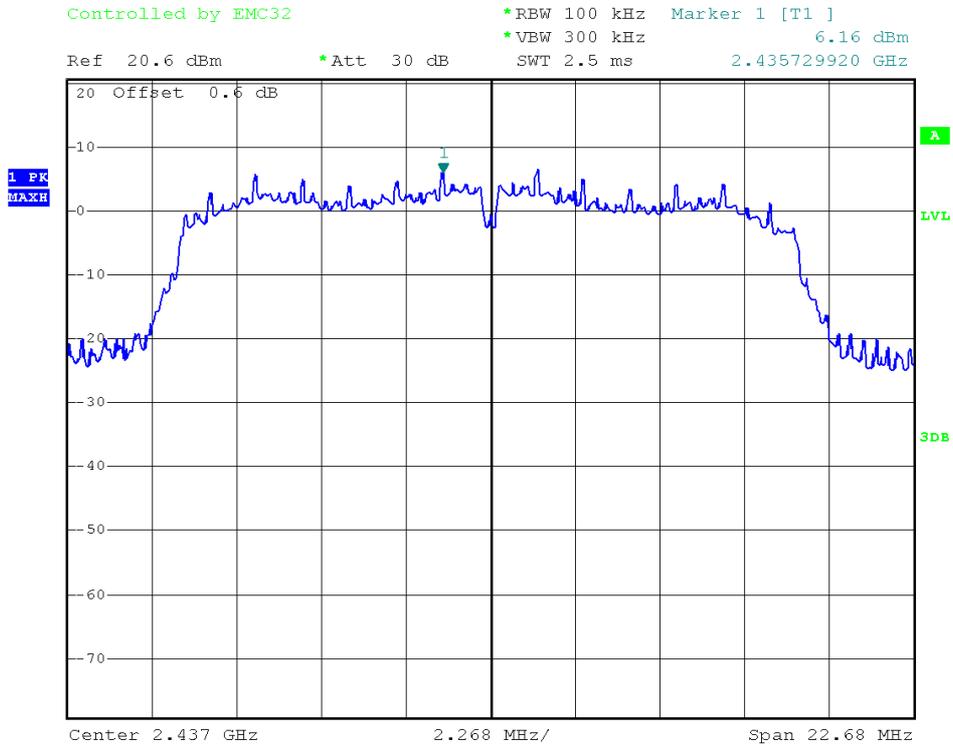


INTERTEK TESTING SERVICES



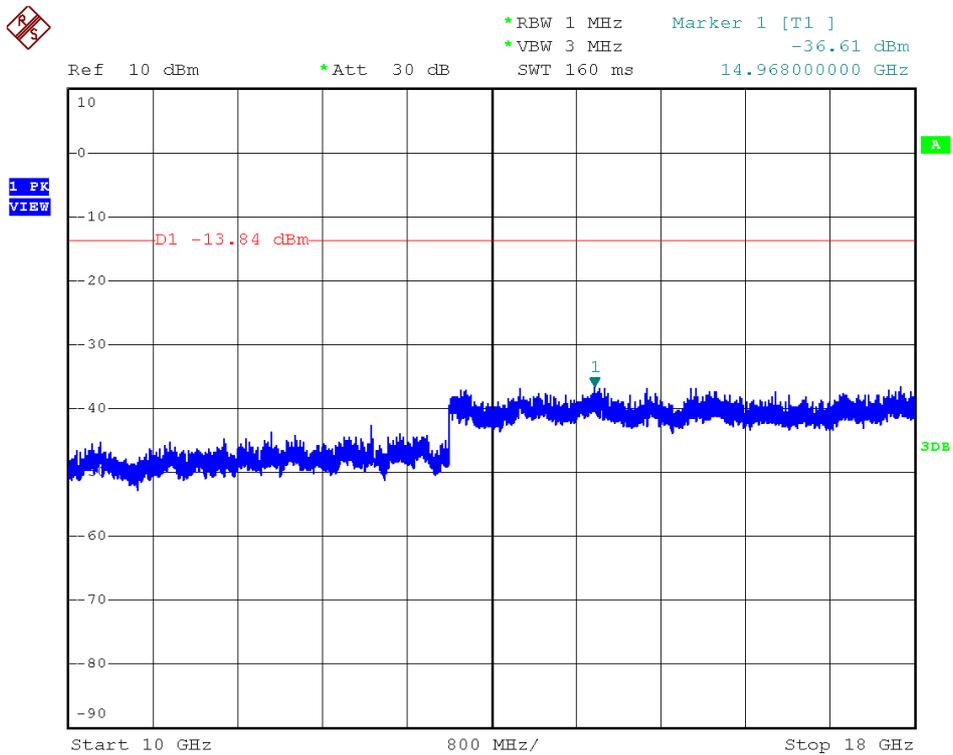
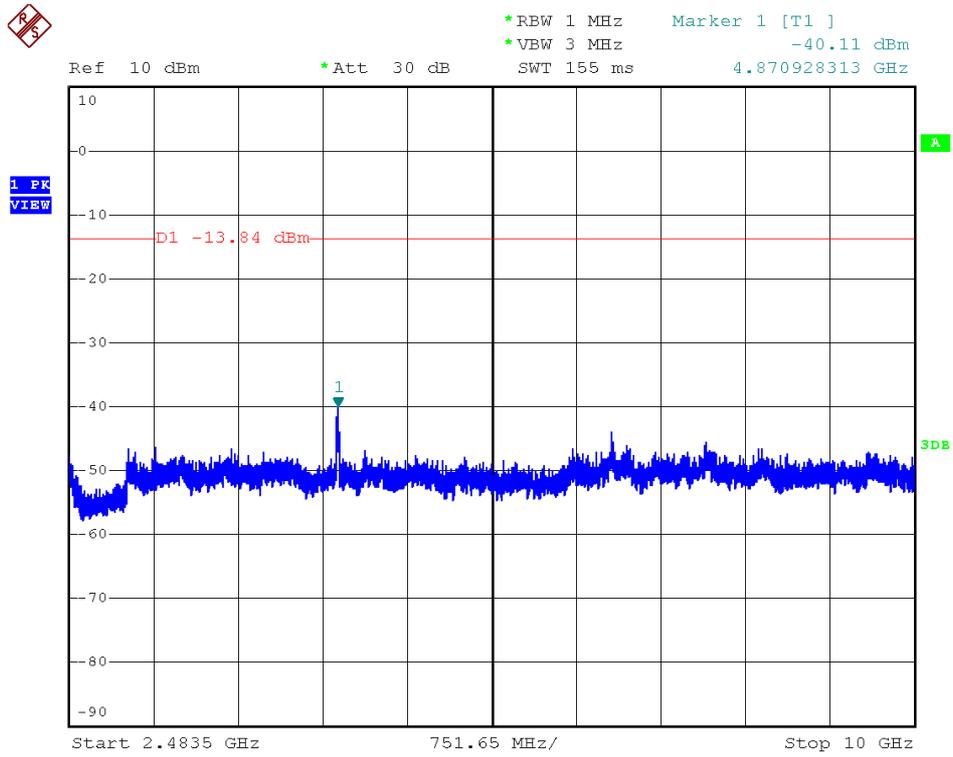
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 6.16dBm



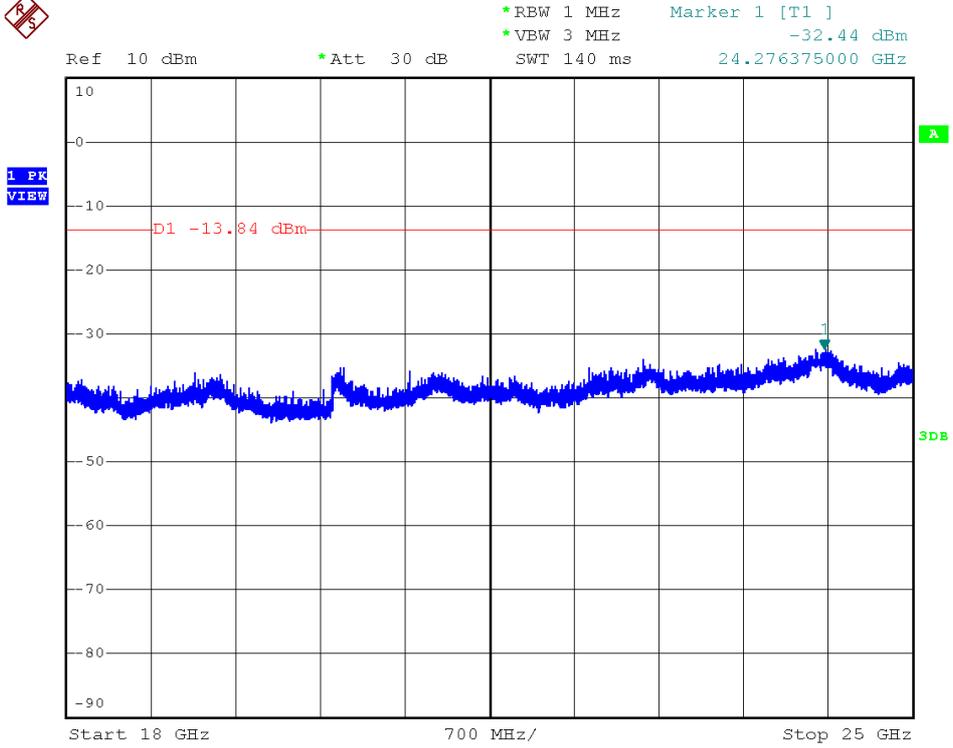
TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

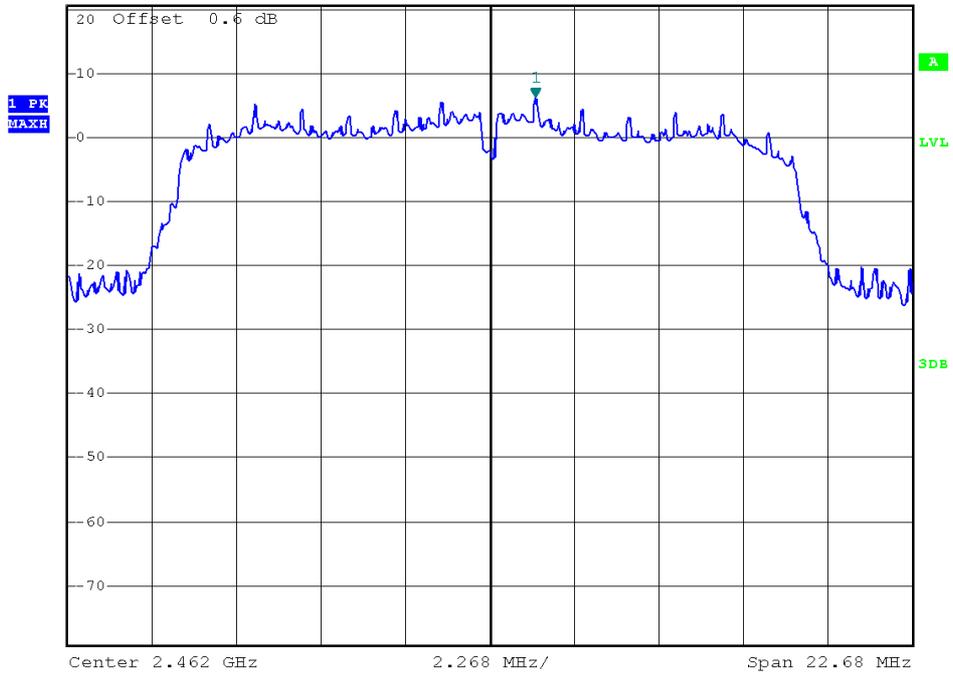
INTERTEK TESTING SERVICES



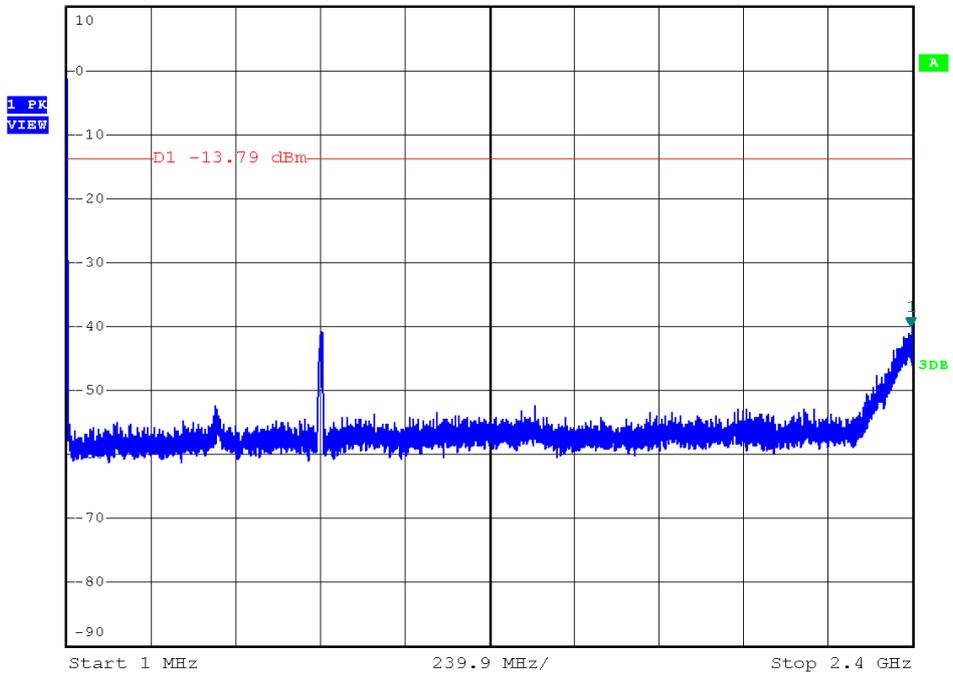
INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: 6.21dBm

Controlled by EMC32 *RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 6.21 dBm
Ref 20.6 dBm *Att 30 dB SWT 2.5 ms 2.463224720 GHz

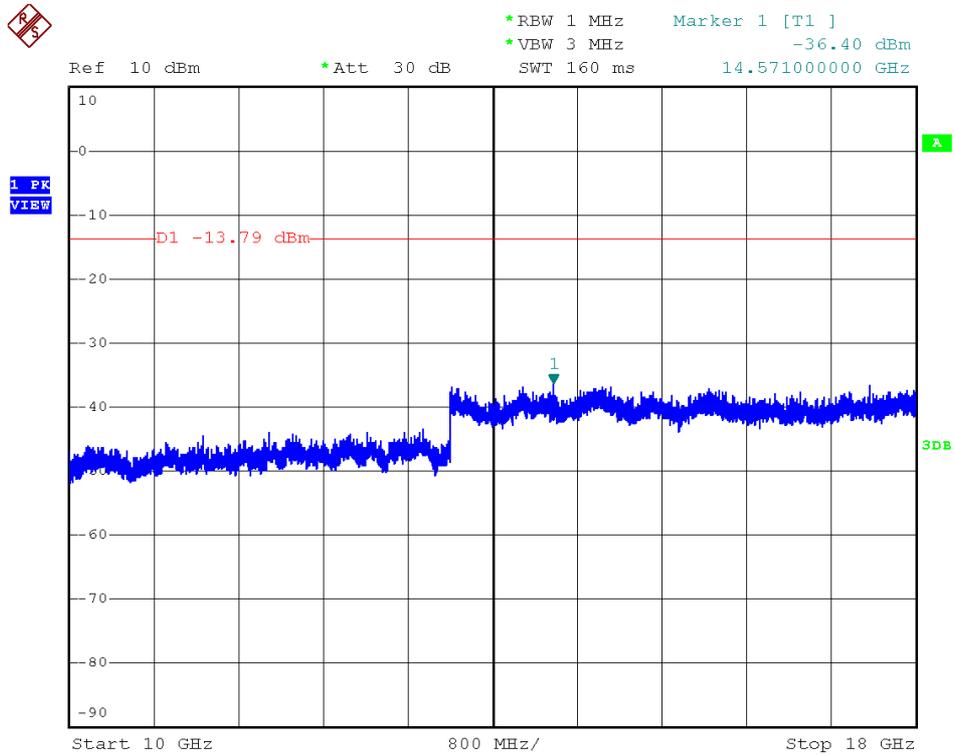
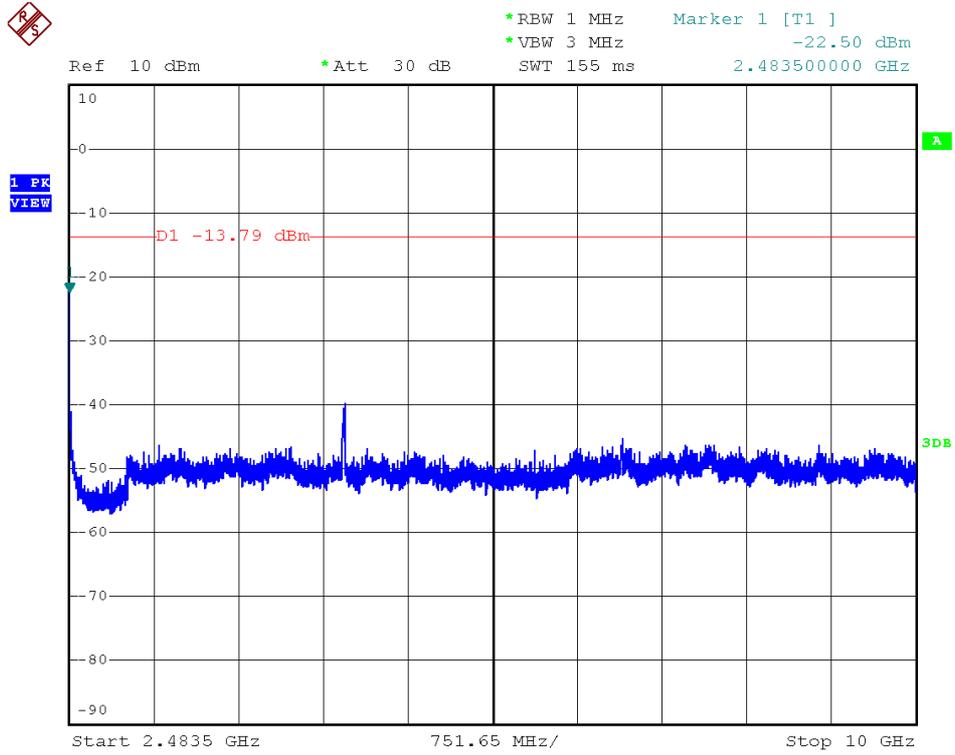


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -39.94 dBm
Ref 10 dBm *Att 30 dB SWT 40 ms 2.396101625 GHz

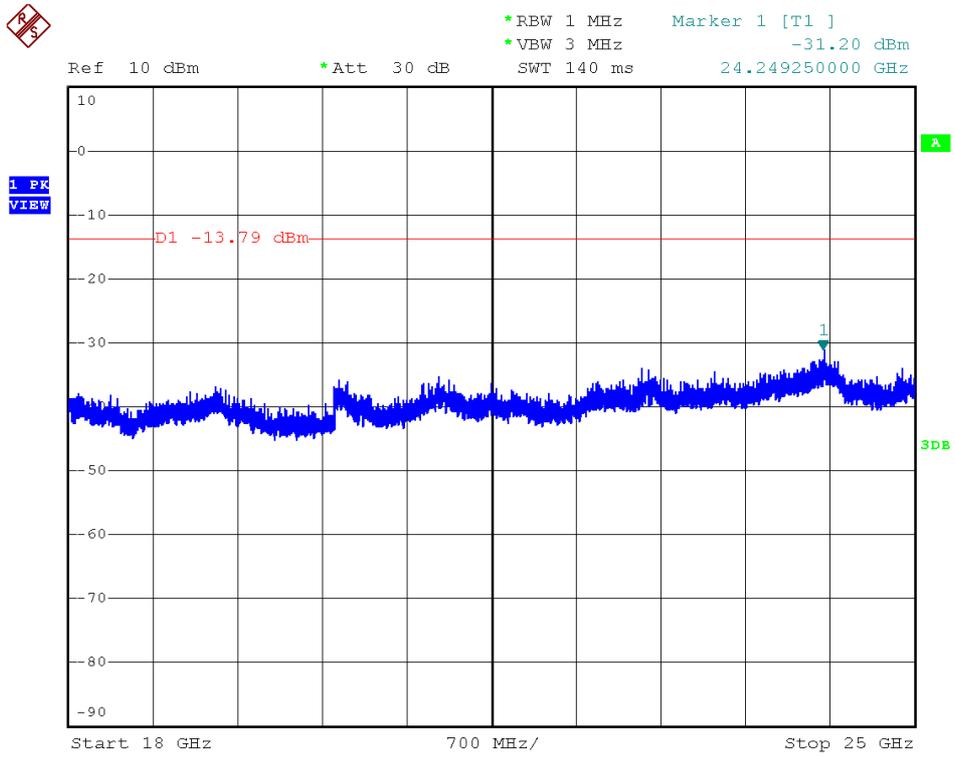


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FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES

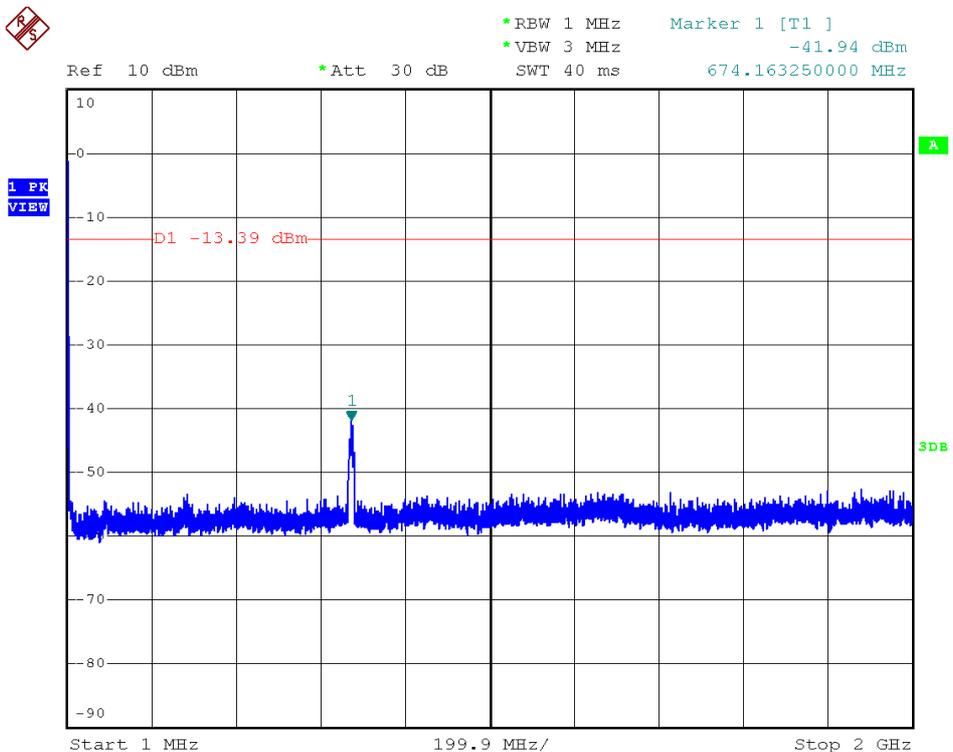


INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

802.11n-HT20 SISO
Channel 1 (2412MHz) Reference Level: 6.61dBm

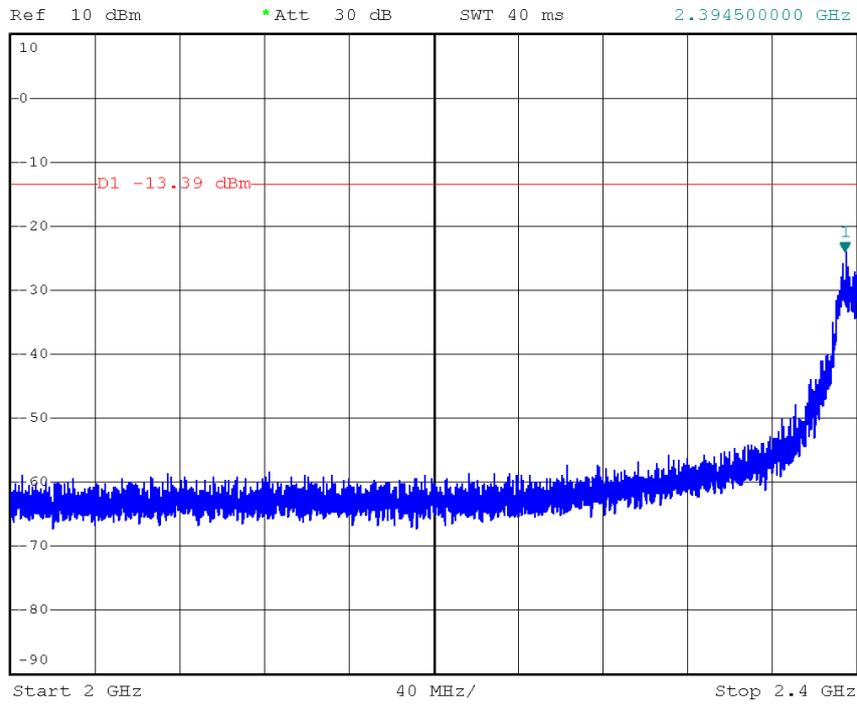


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Report No.: 130411010SZN-001

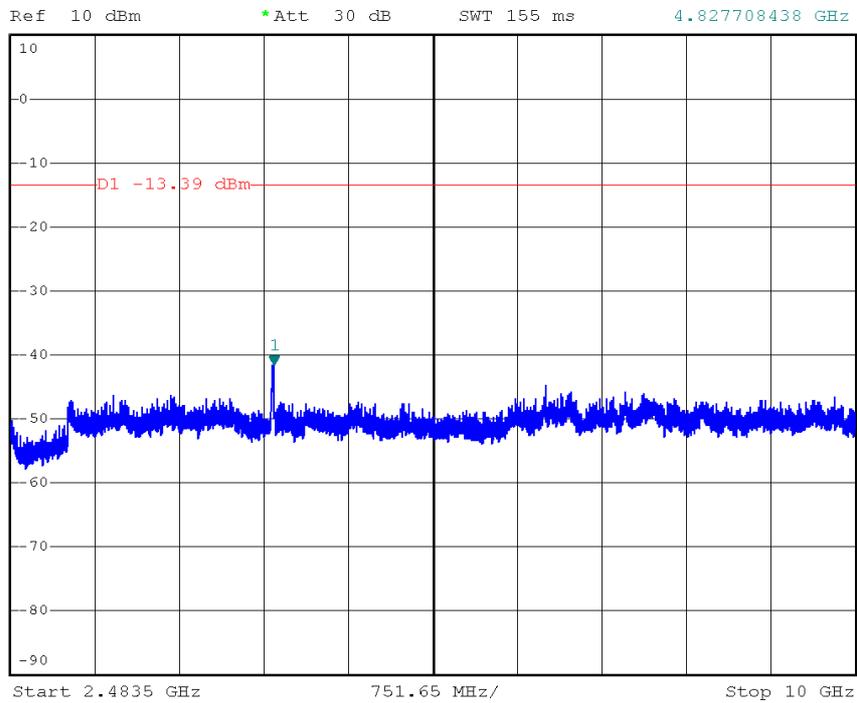
INTERTEK TESTING SERVICES



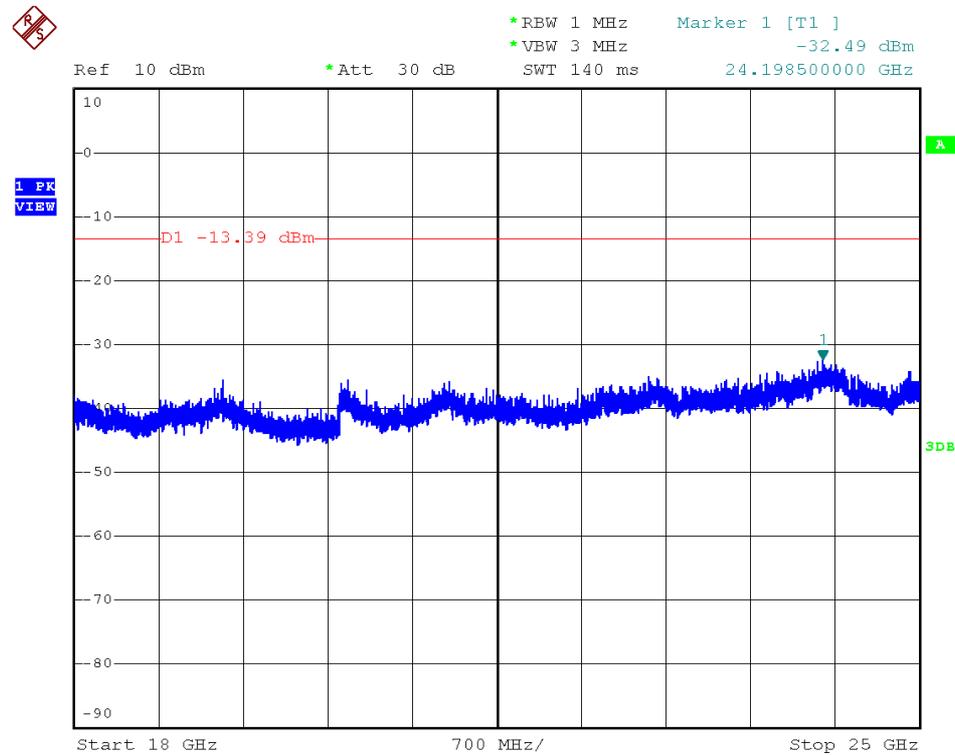
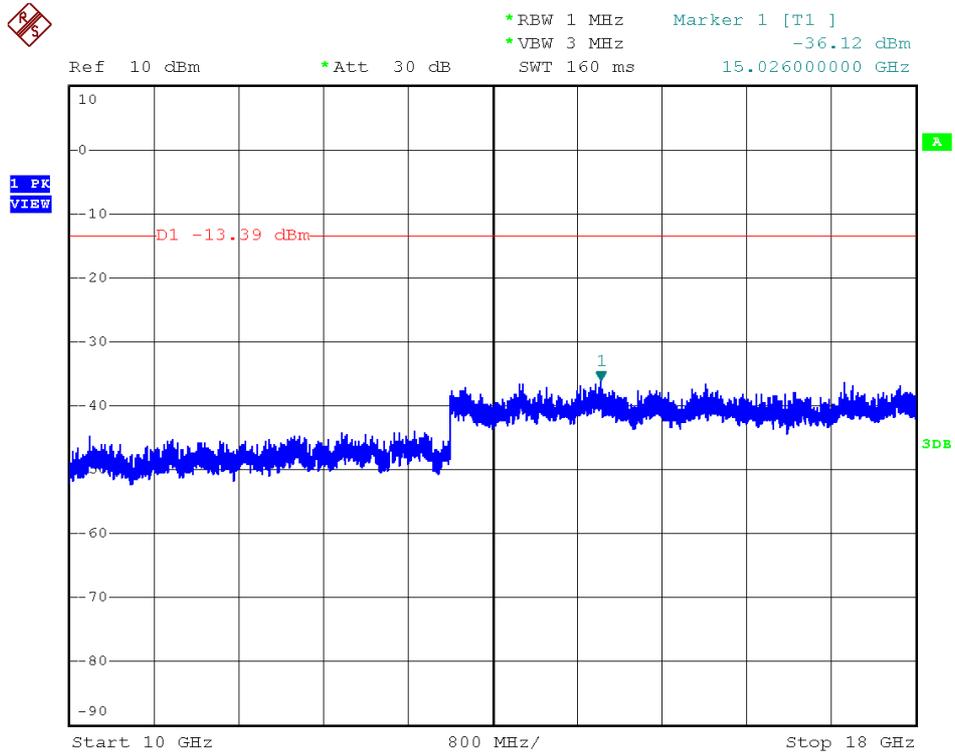
*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz -24.06 dBm
SWT 40 ms 2.394500000 GHz



*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -41.51 dBm
SWT 155 ms 4.827708438 GHz



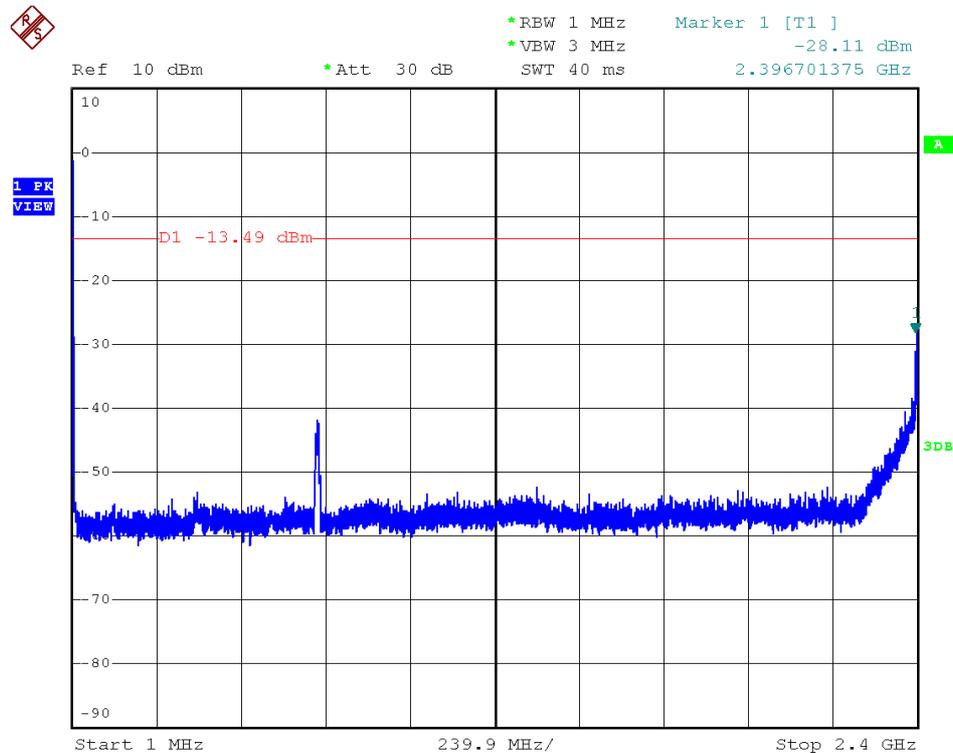
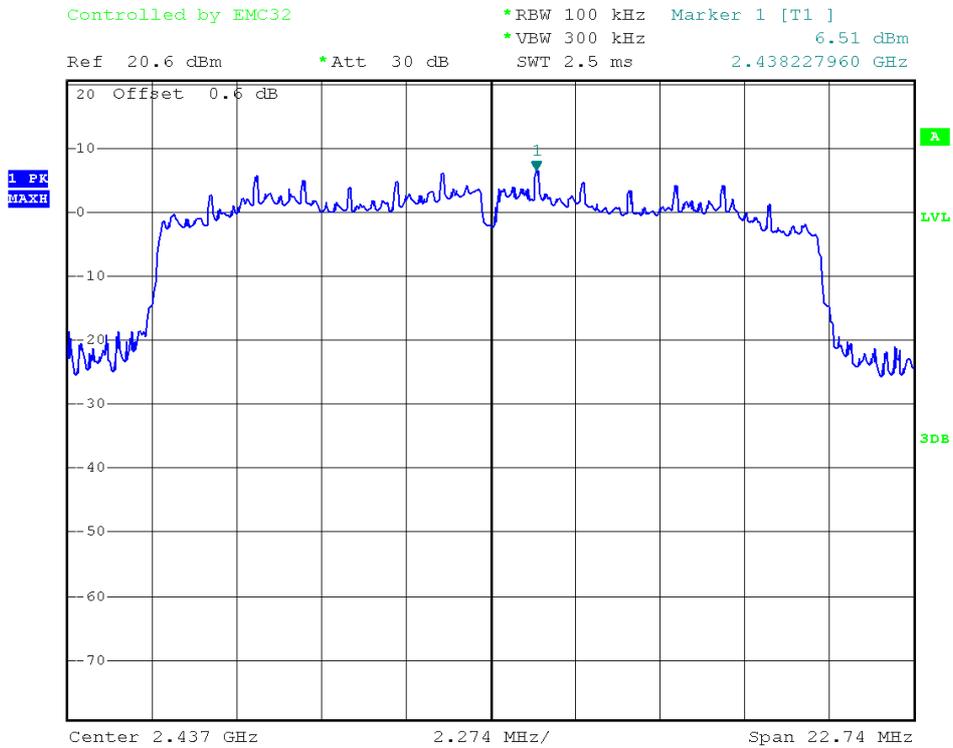
INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
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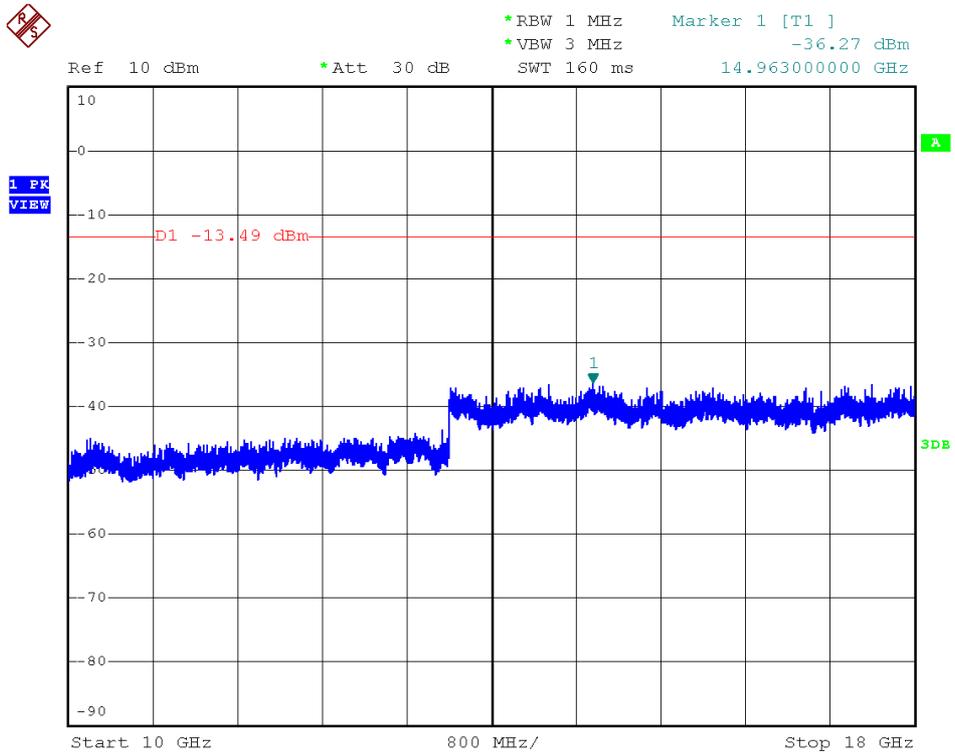
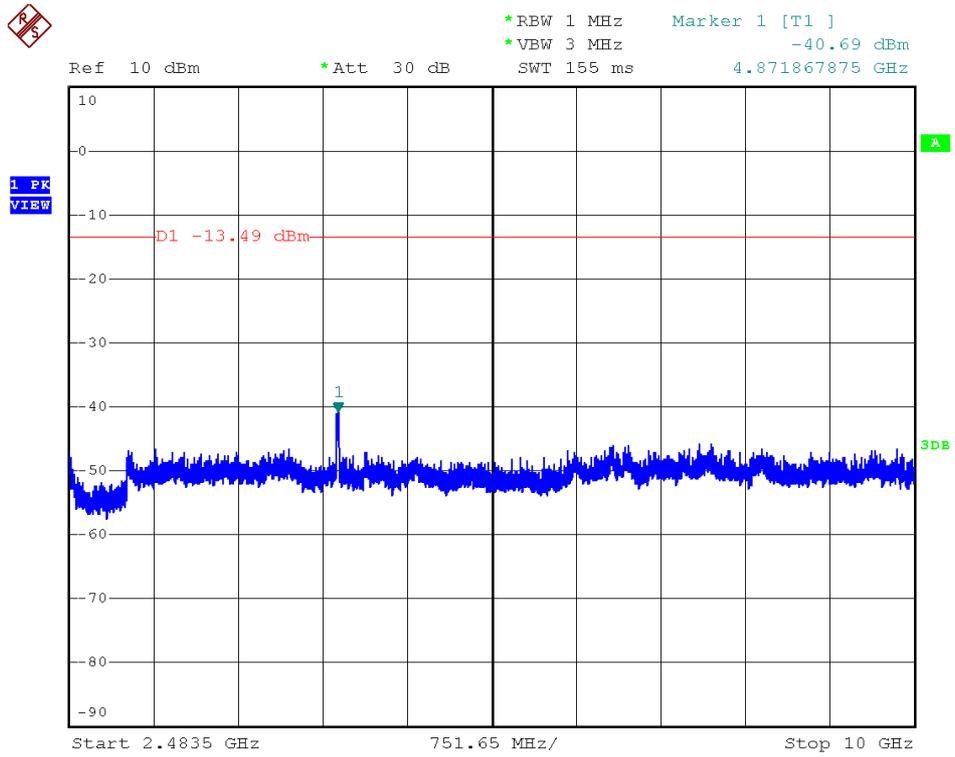
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 6.51dBm



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

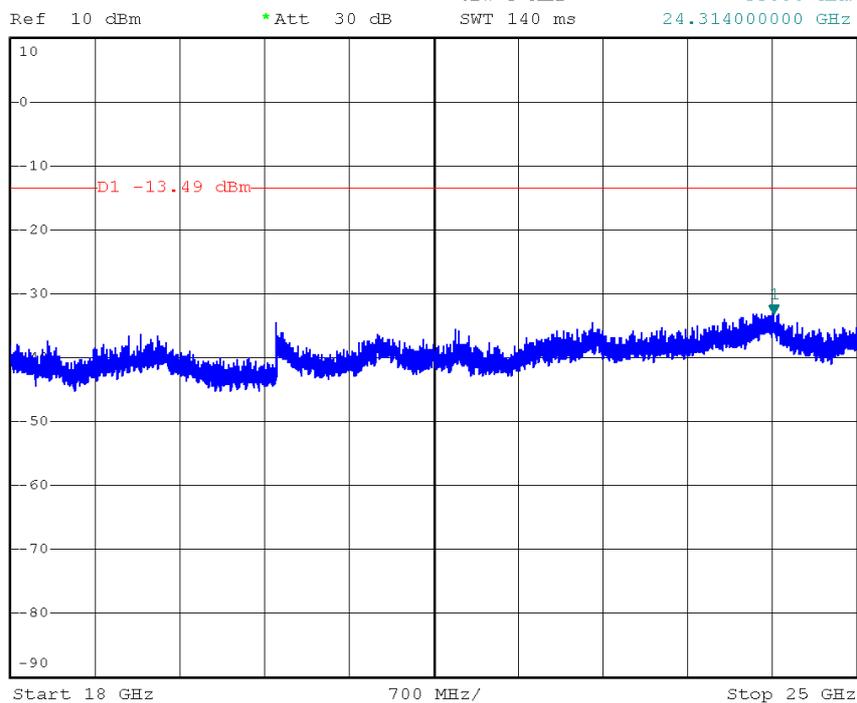
INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

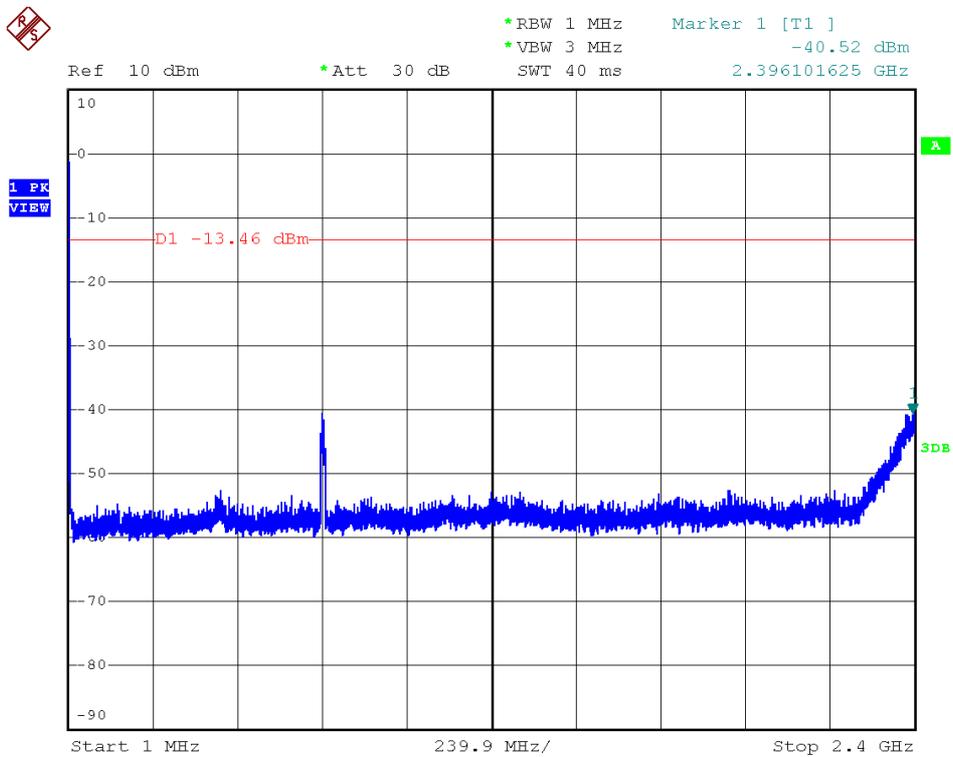
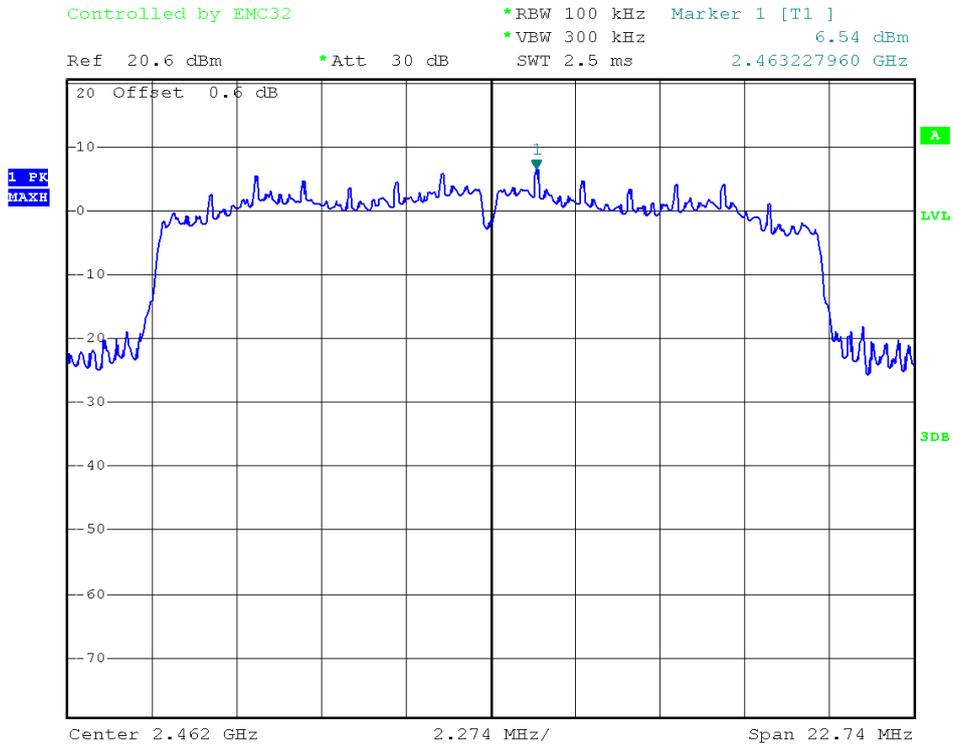


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -33.06 dBm
SWT 140 ms 24.31400000 GHz



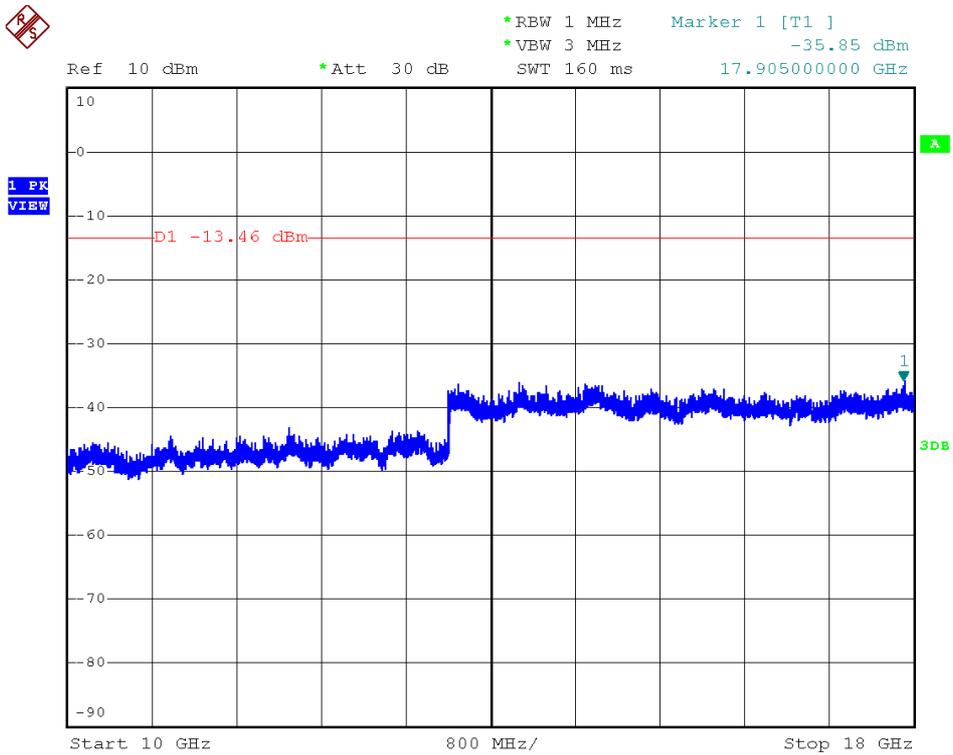
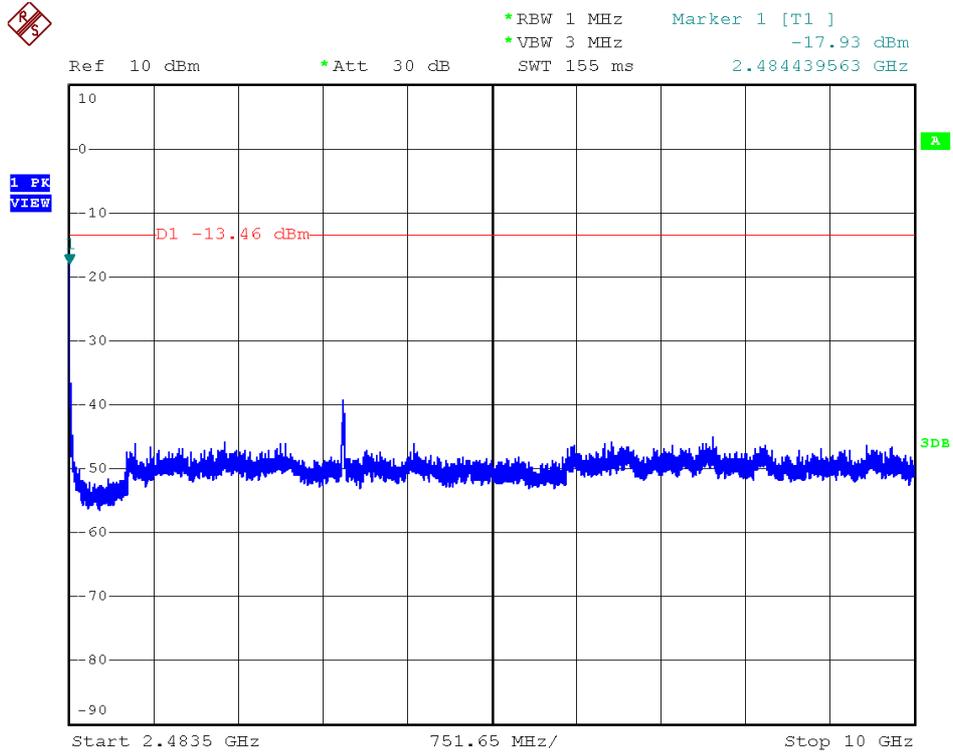
INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: 6.54dBm

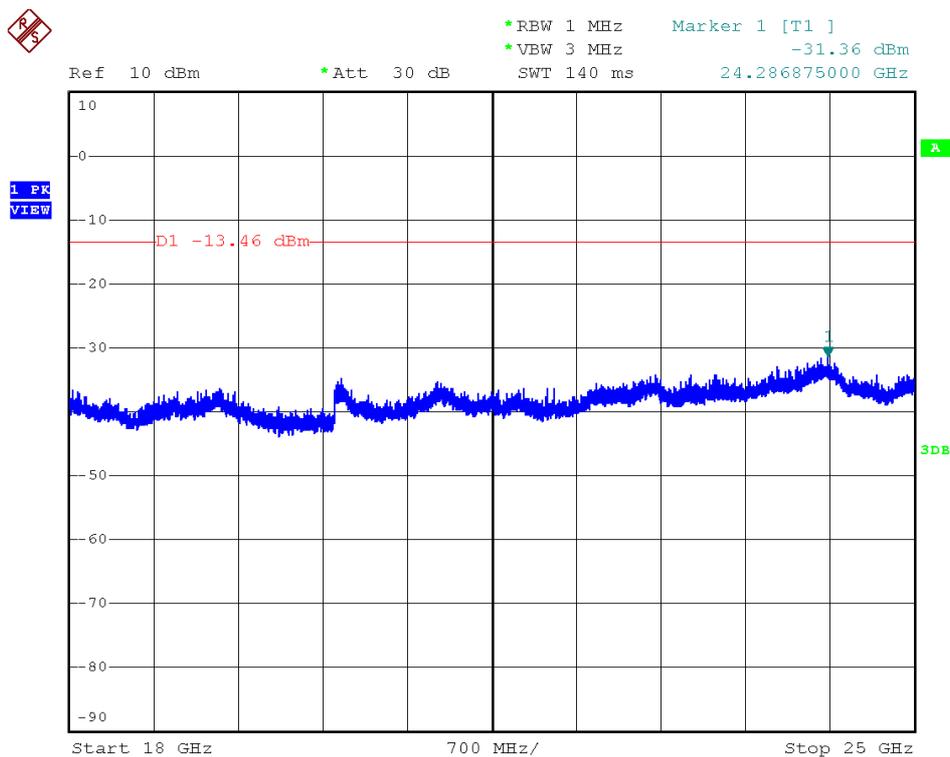


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FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



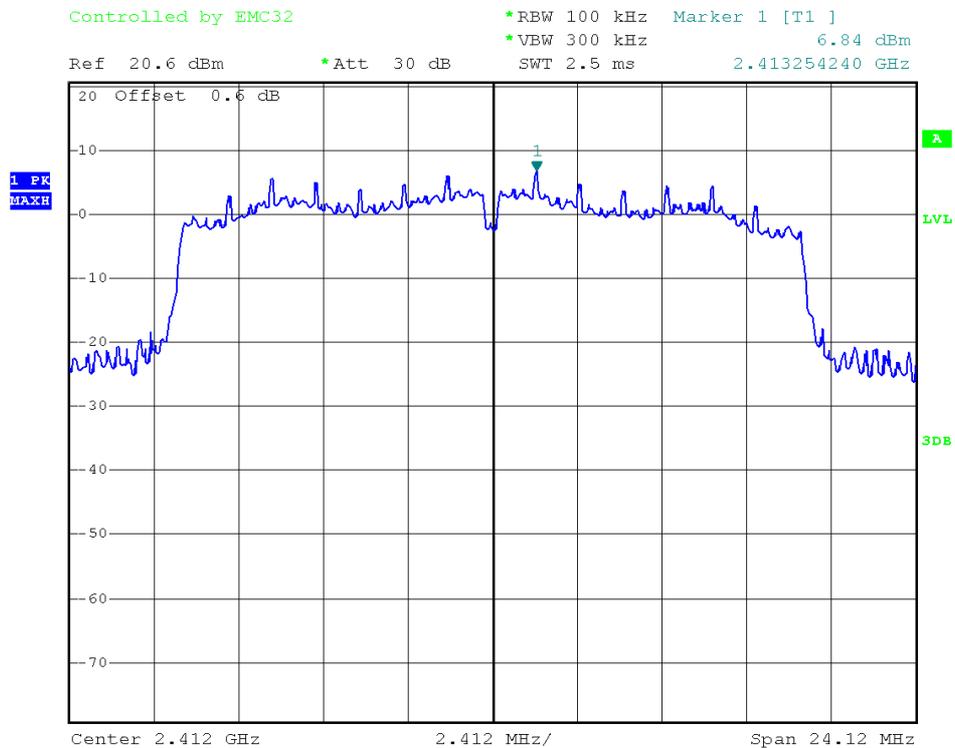
INTERTEK TESTING SERVICES



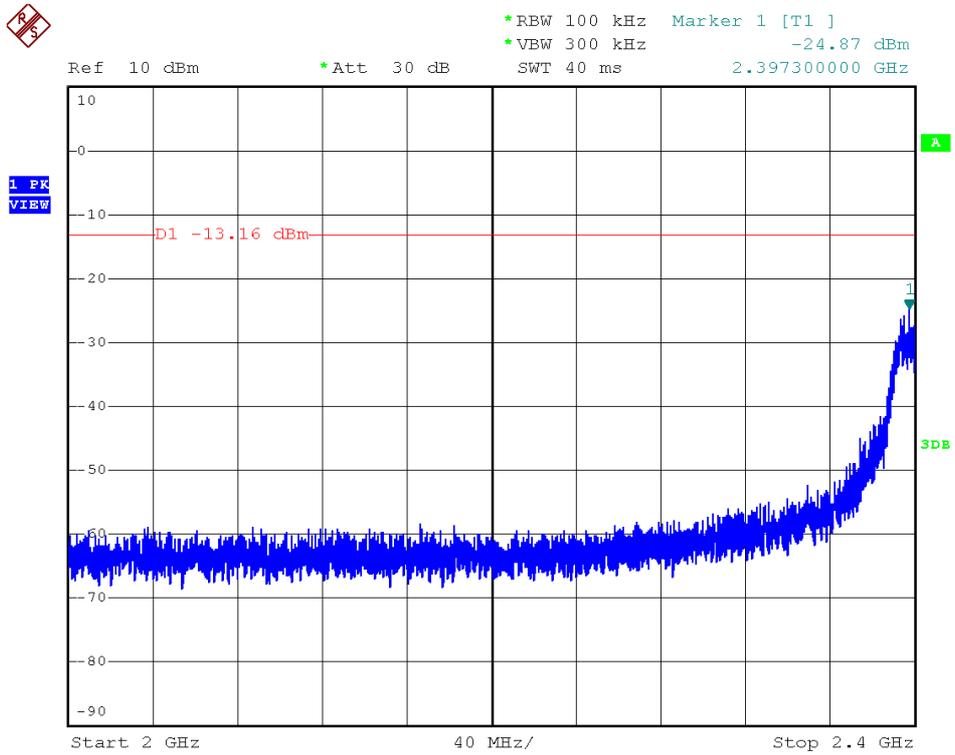
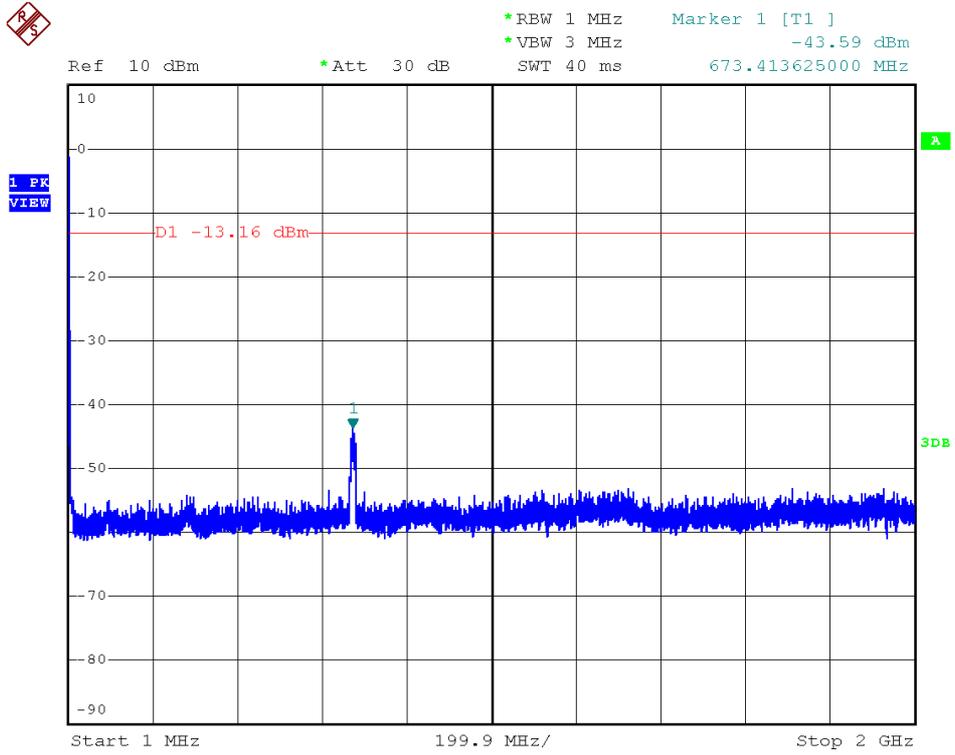
INTERTEK TESTING SERVICES

802.11n-HT20 MIMO

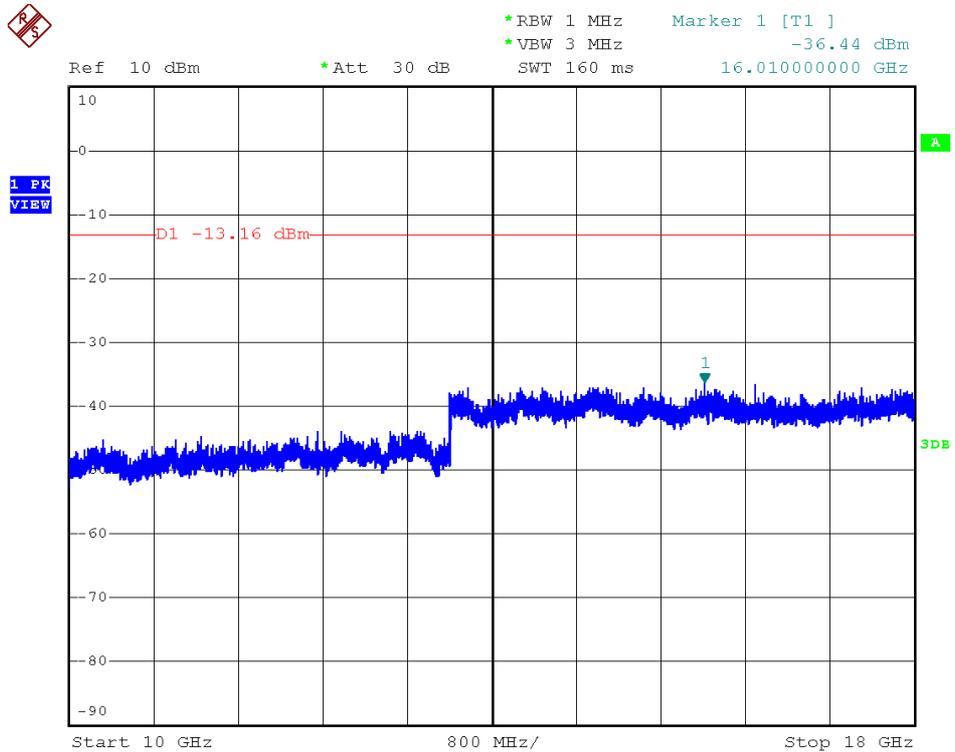
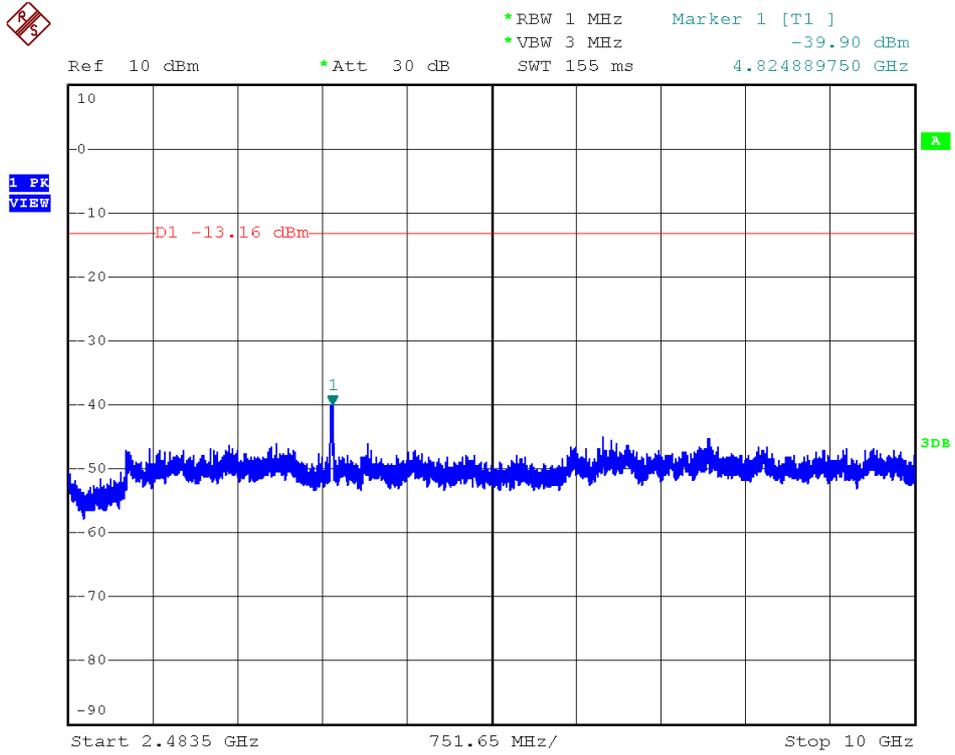
Channel 1 (2412MHz) Reference Level: 6.84dBm ANT 1



INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

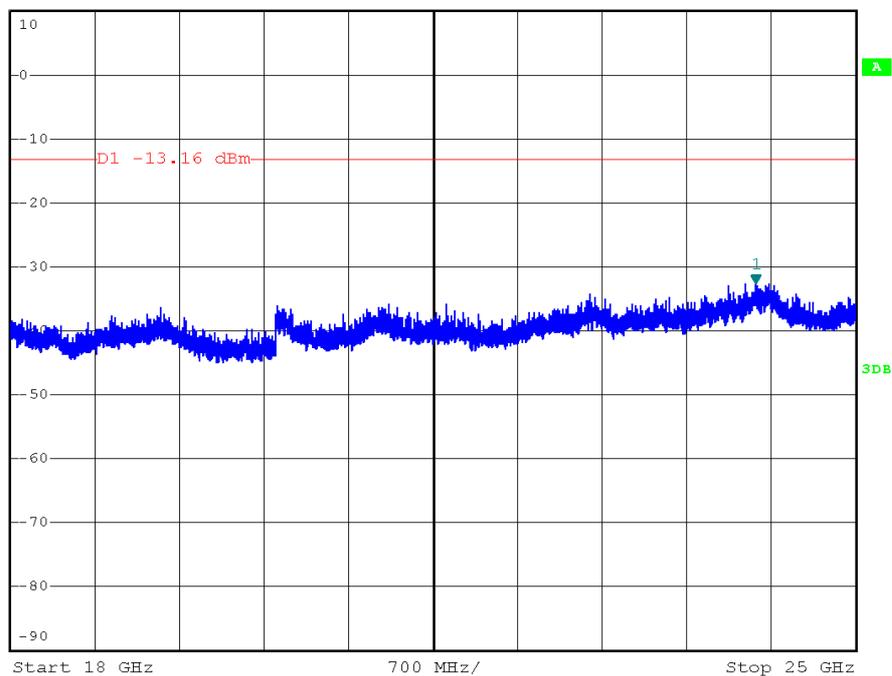


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -32.54 dBm
SWT 140 ms 24.173125000 GHz

Ref 10 dBm

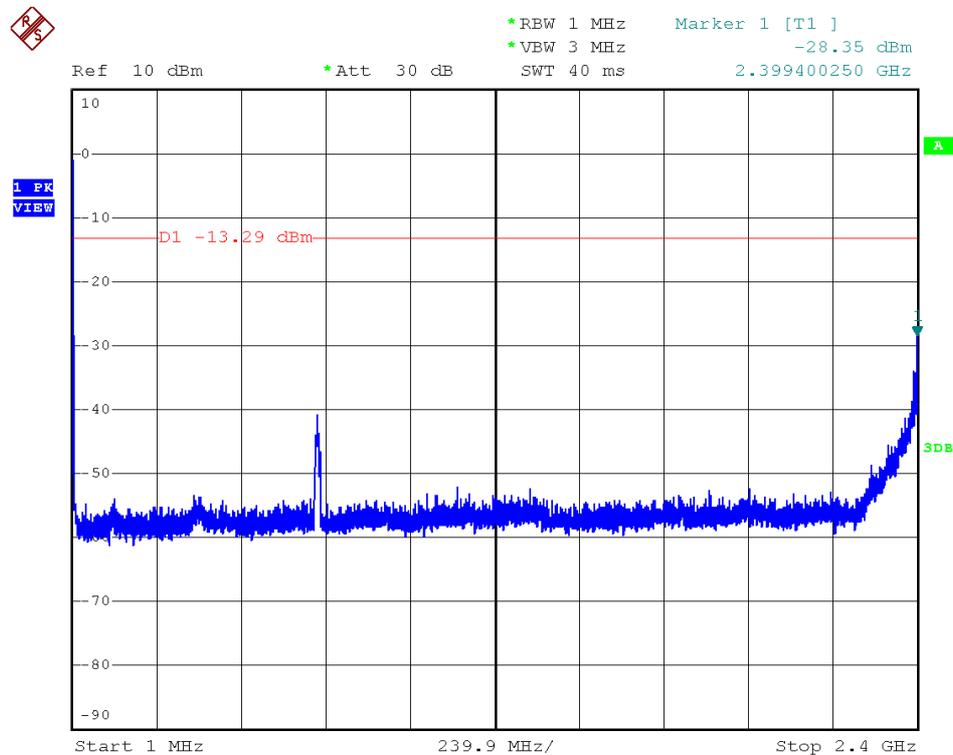
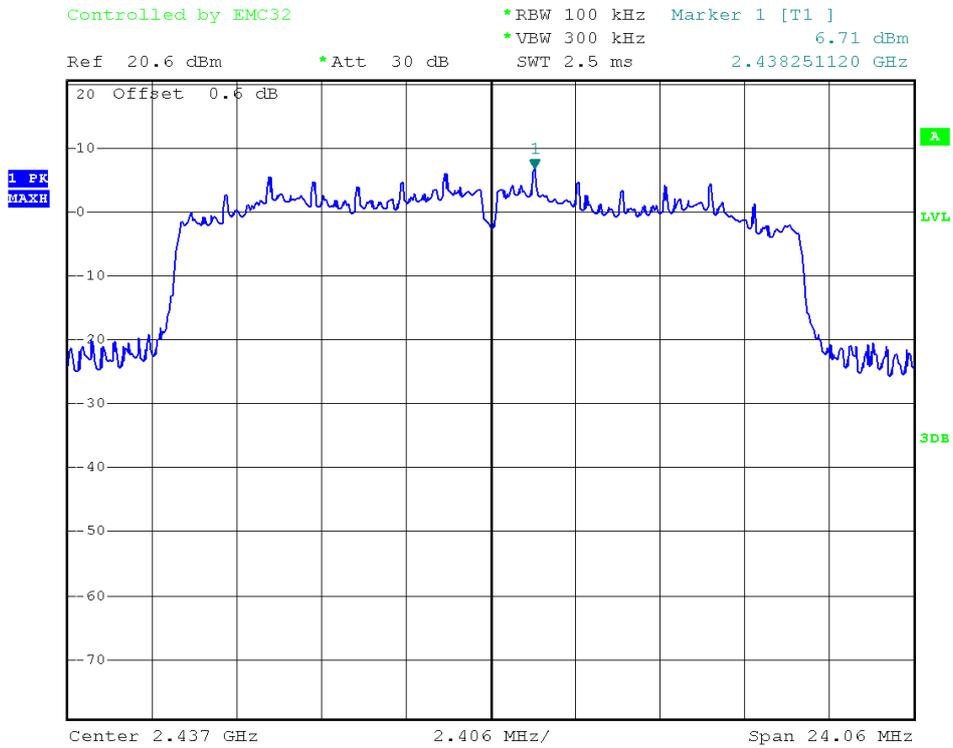
*Att 30 dB

1 PK
VIEW



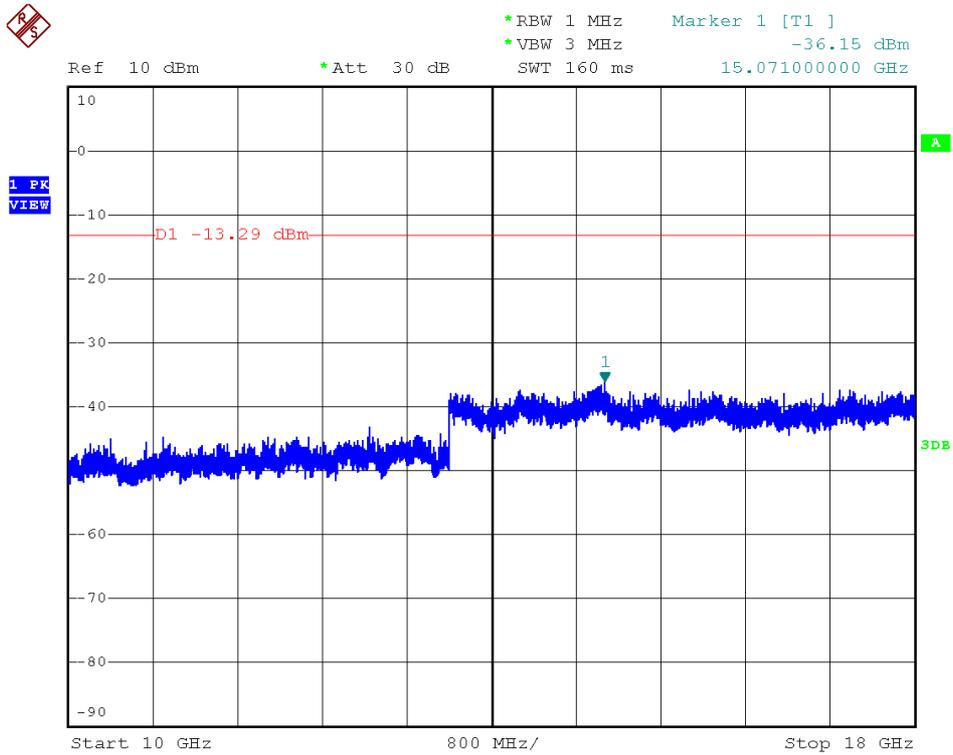
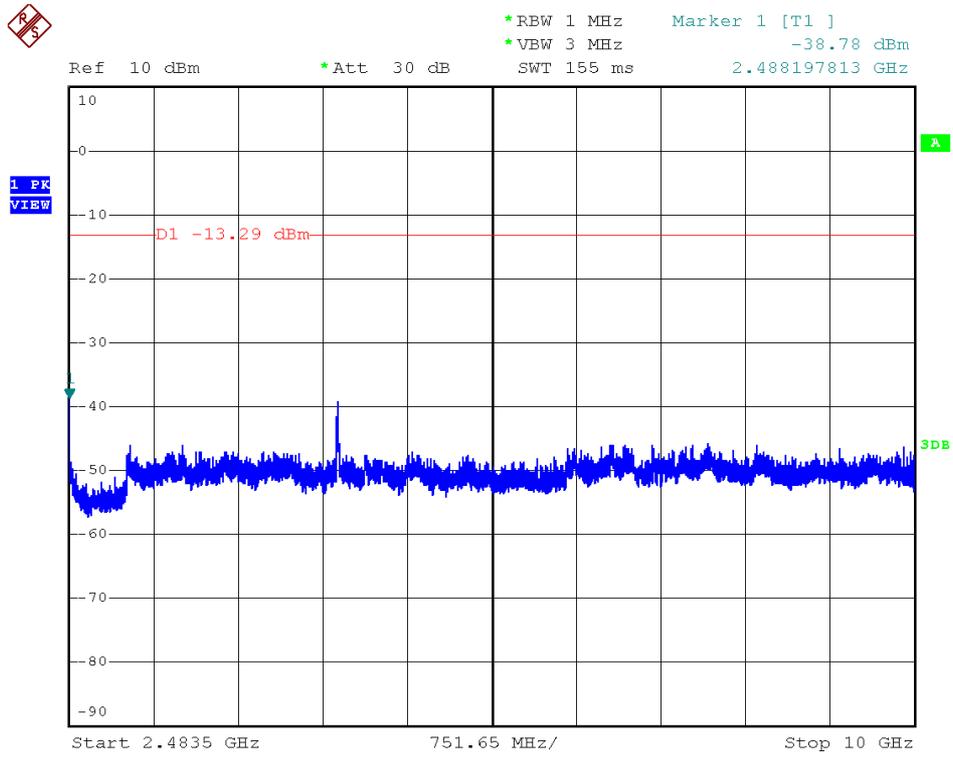
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 6.71dBm ANT 1



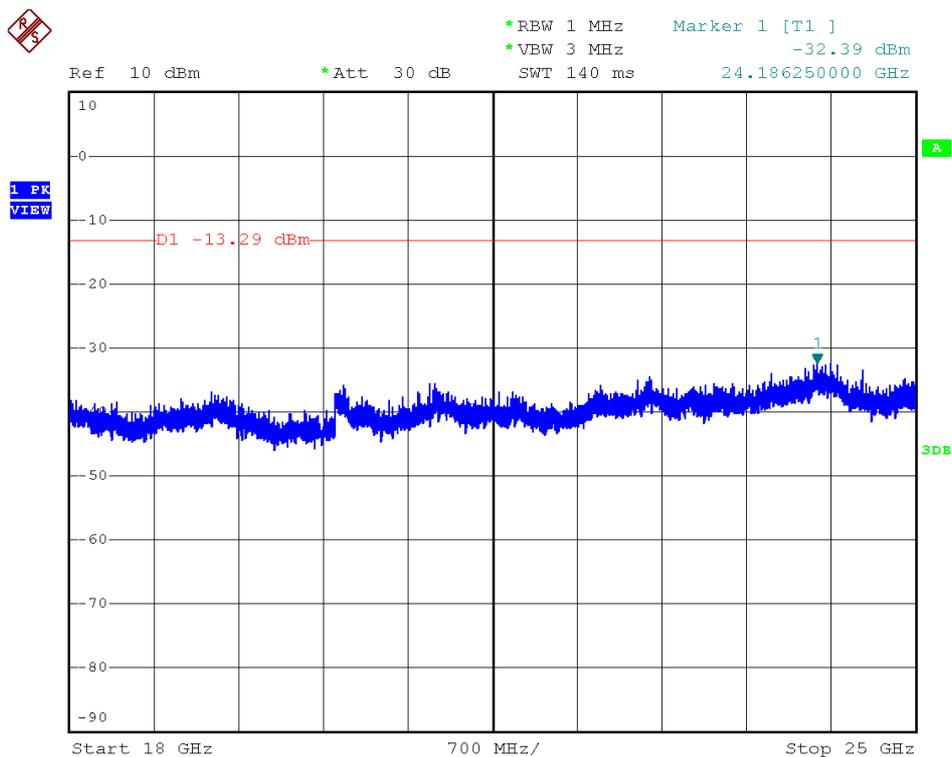
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FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



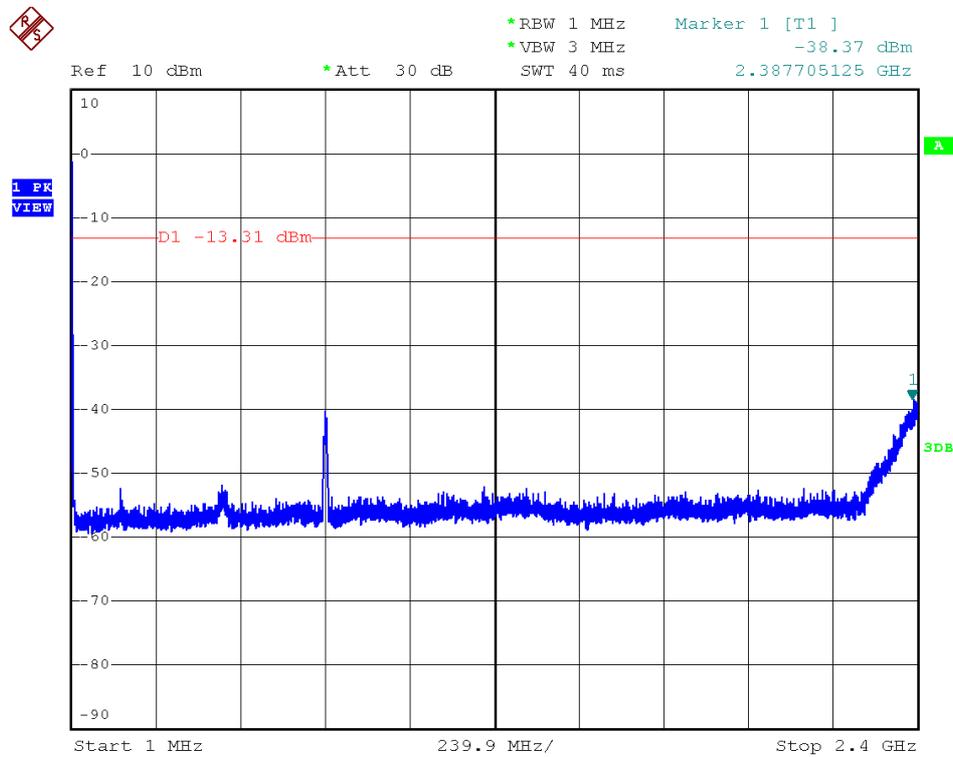
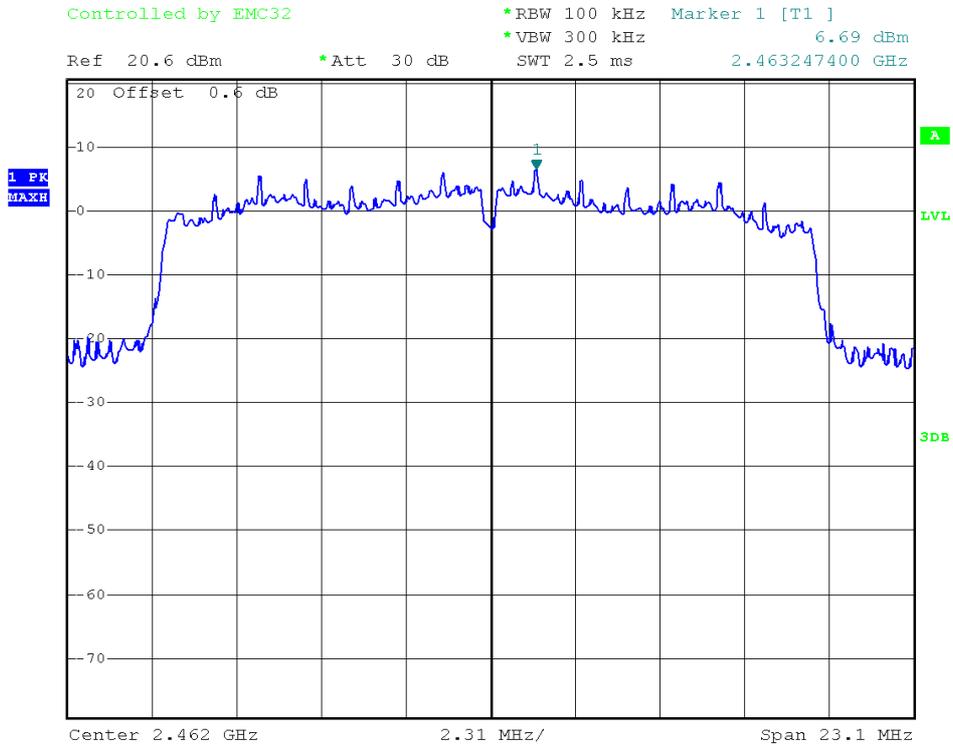
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Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



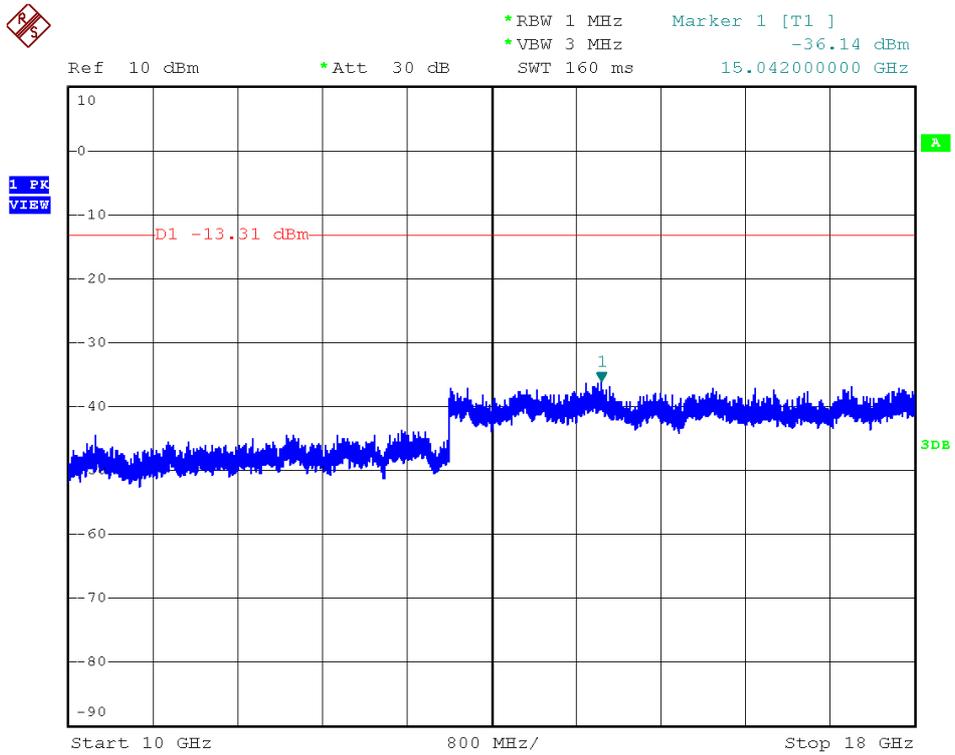
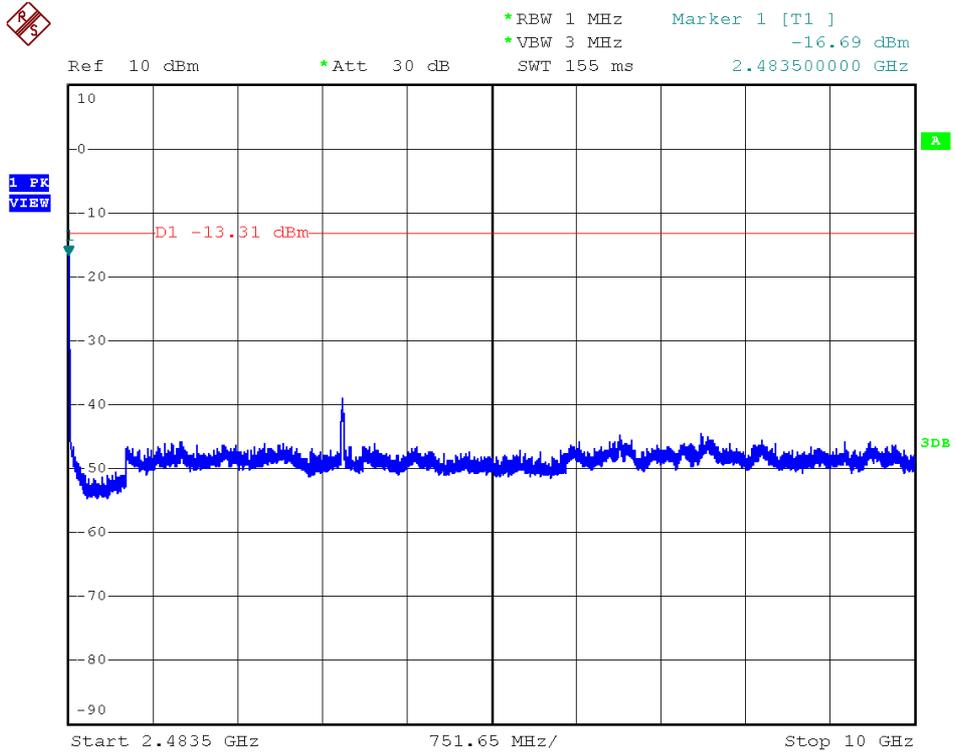
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Channel 11 (2462MHz) Reference Level: 6.69dBm ANT 1

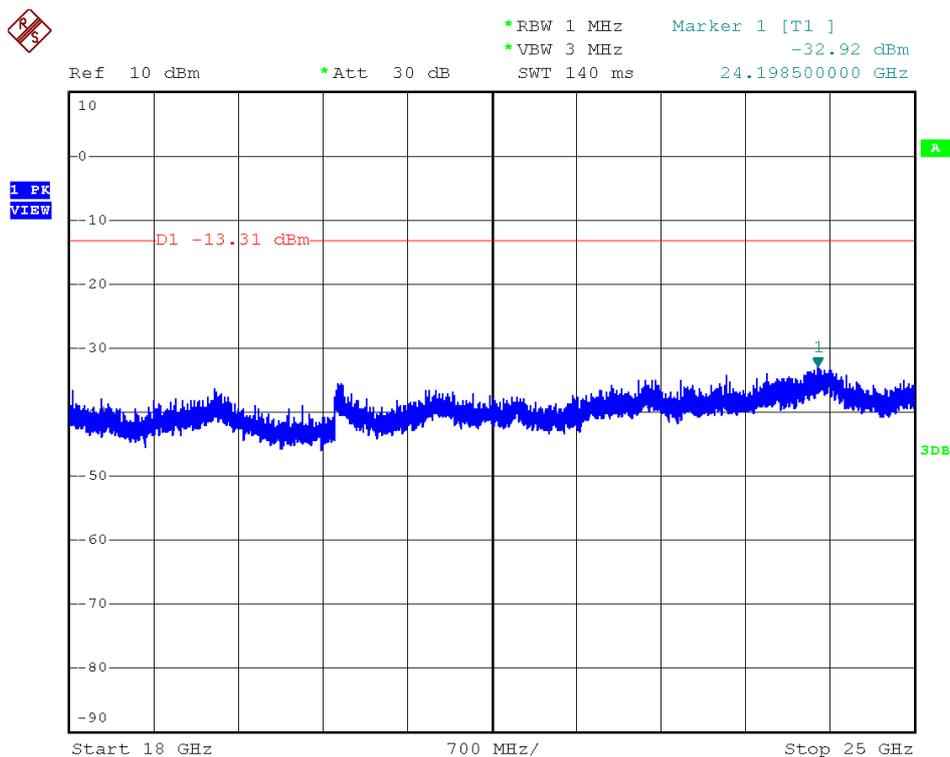


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INTERTEK TESTING SERVICES

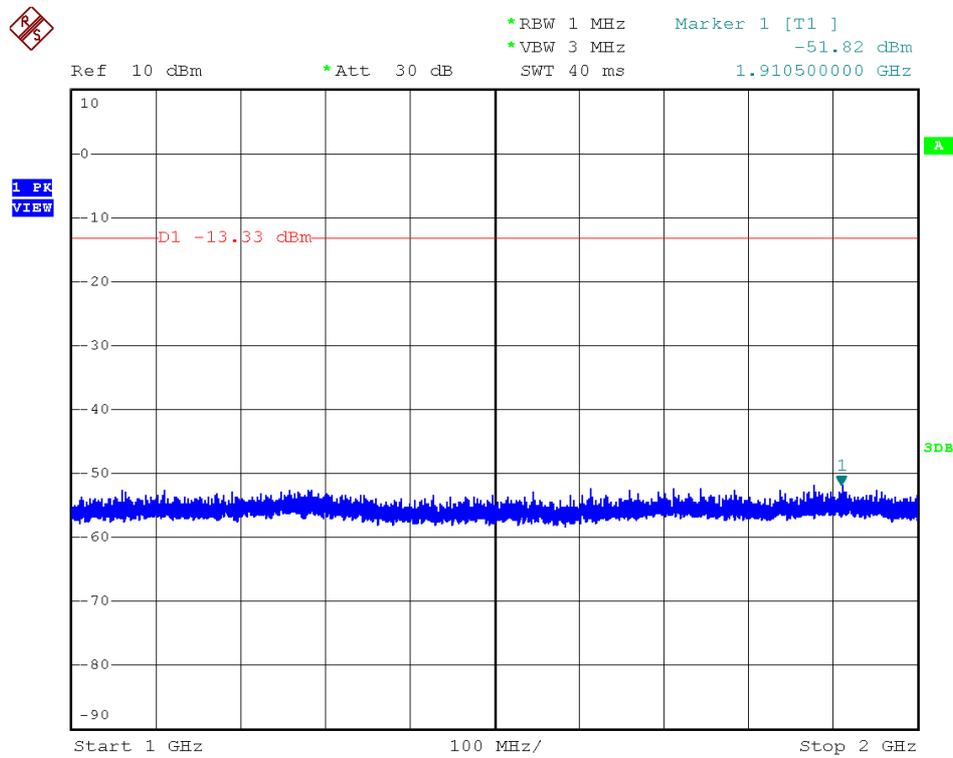
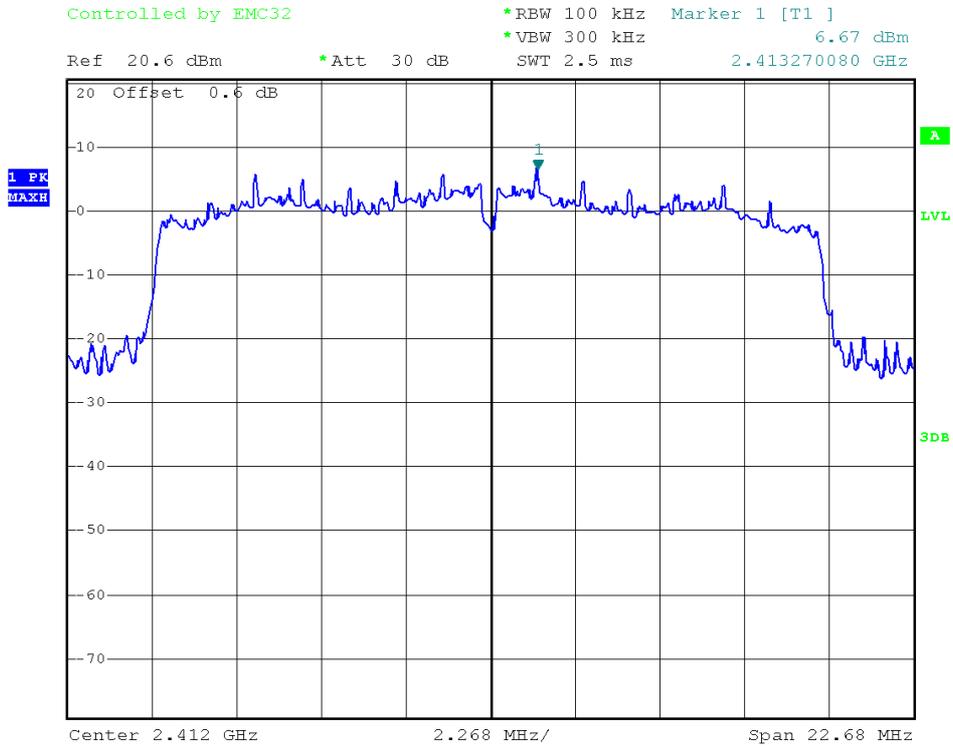


INTERTEK TESTING SERVICES



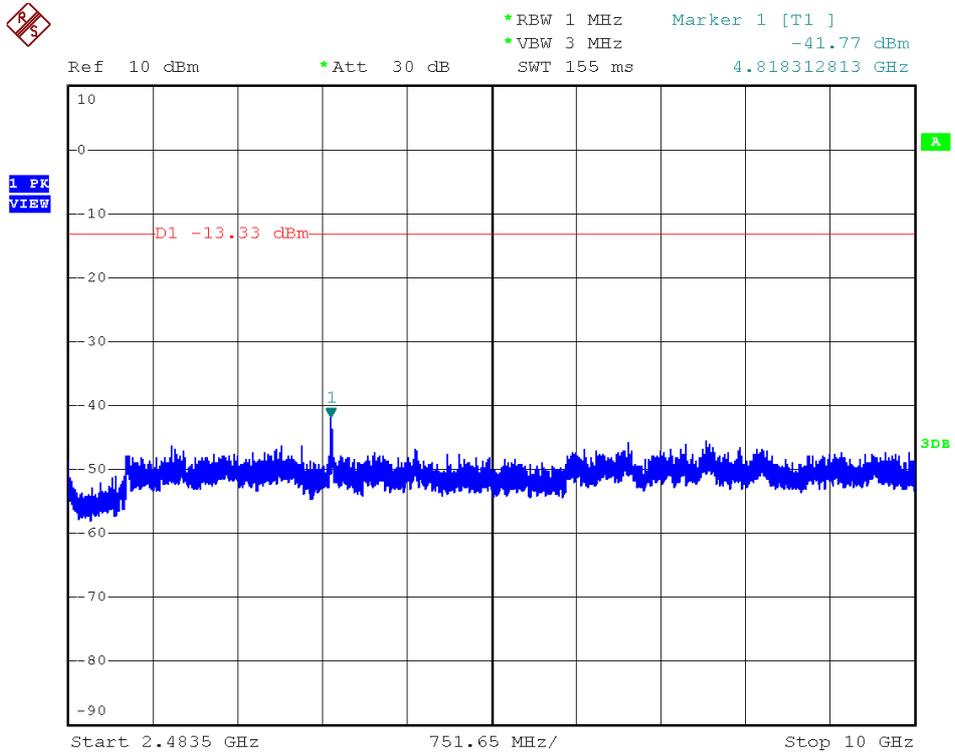
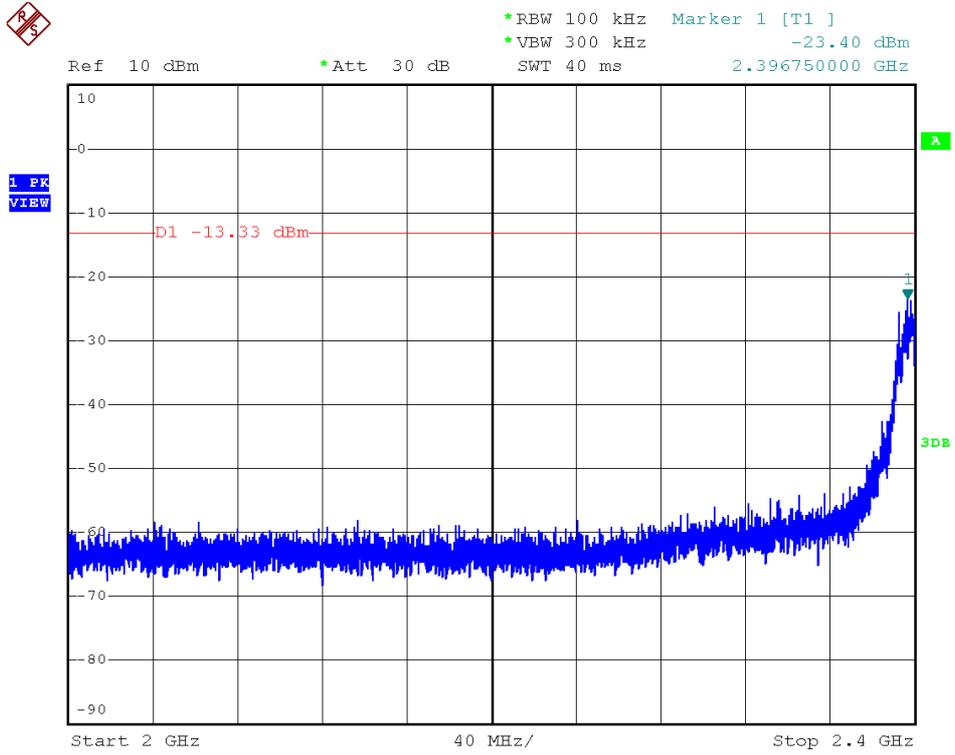
INTERTEK TESTING SERVICES

Channel 1 (2412MHz) Reference Level: 6.67dBm ANT 2

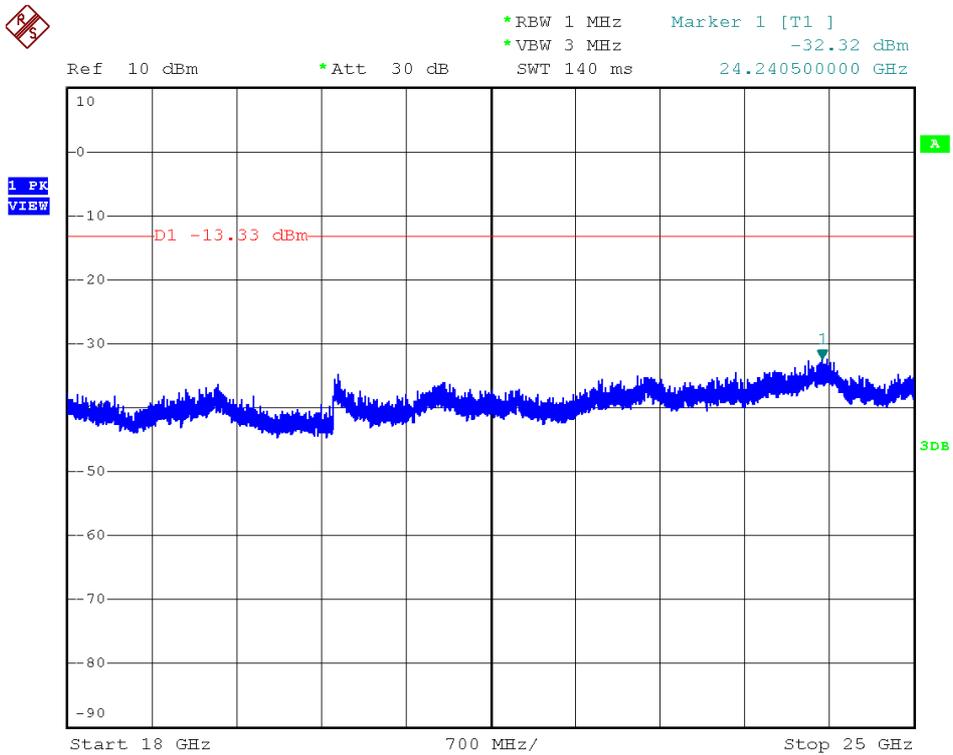
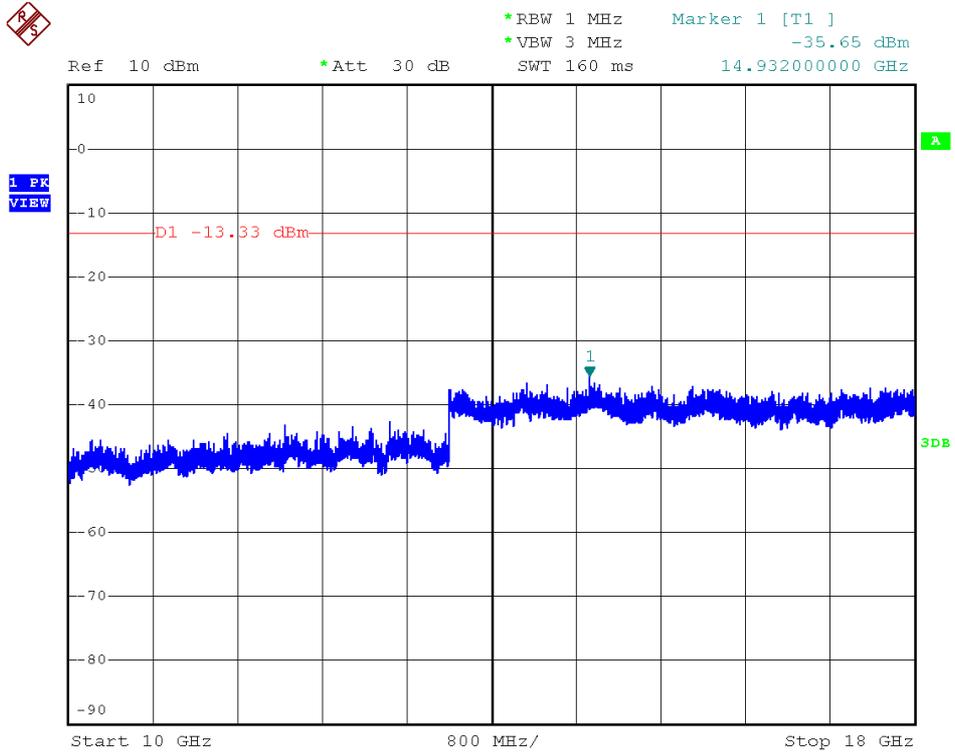


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Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES

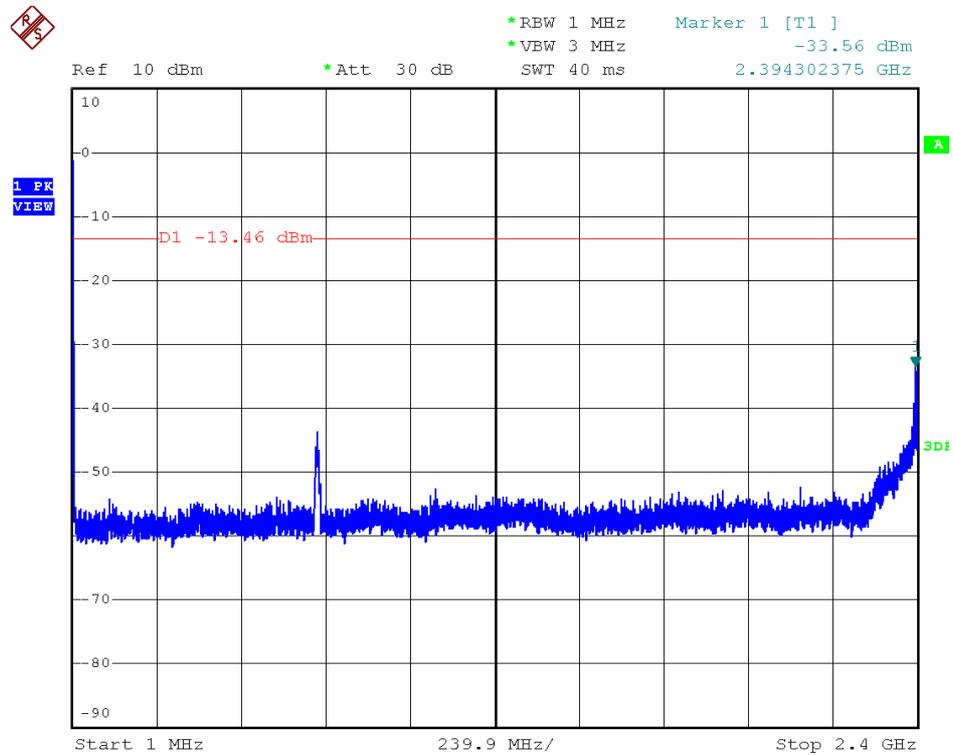


INTERTEK TESTING SERVICES



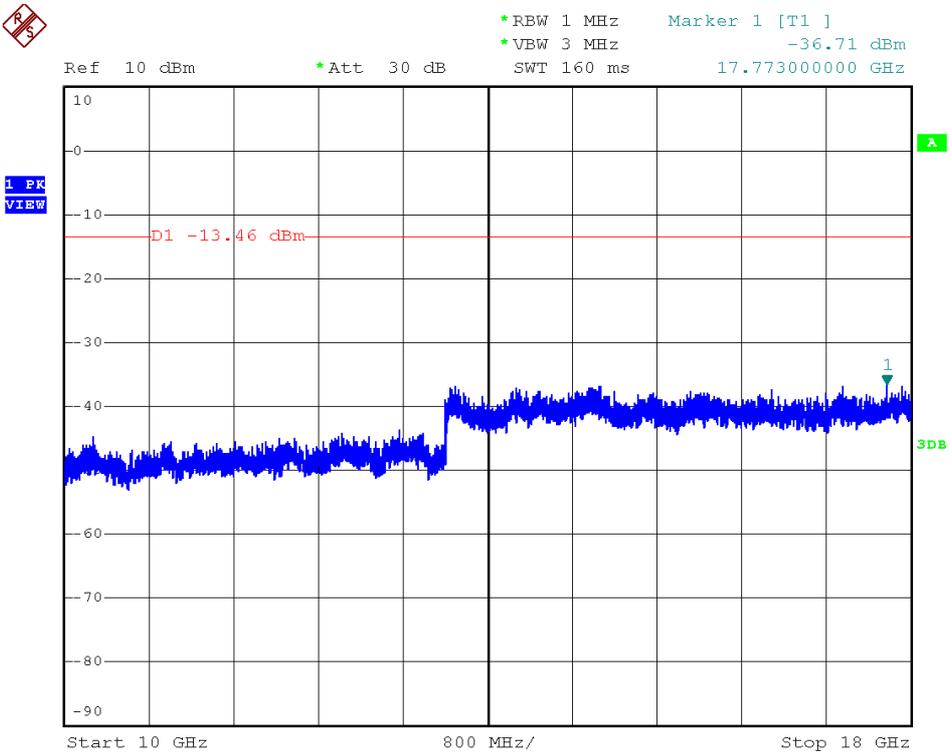
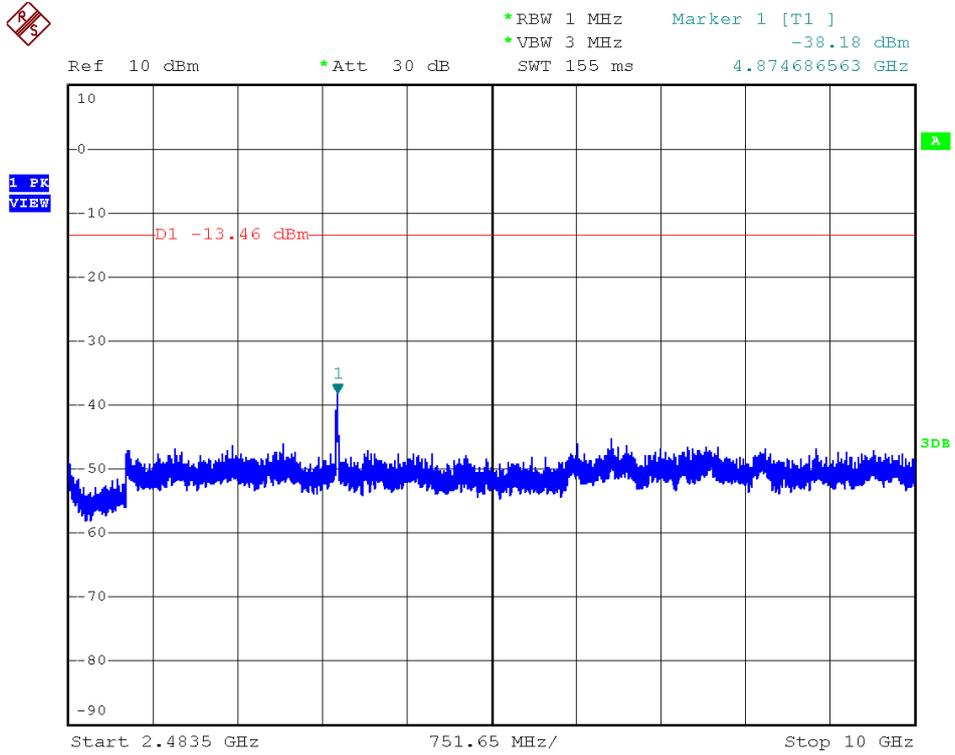
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 6.54dBm ANT 2

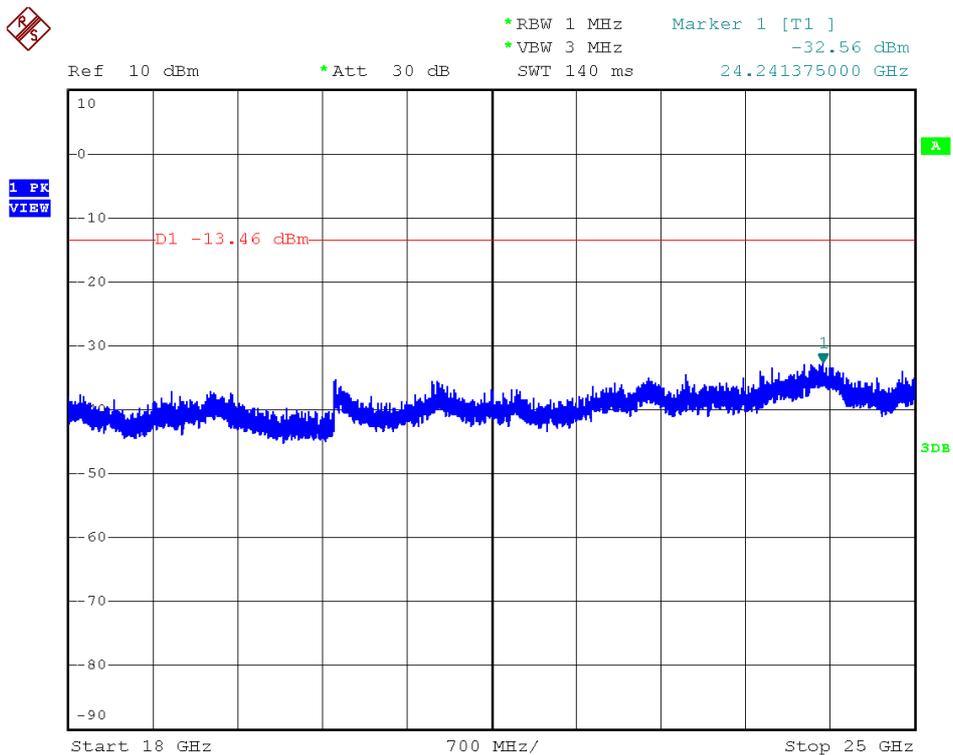


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INTERTEK TESTING SERVICES

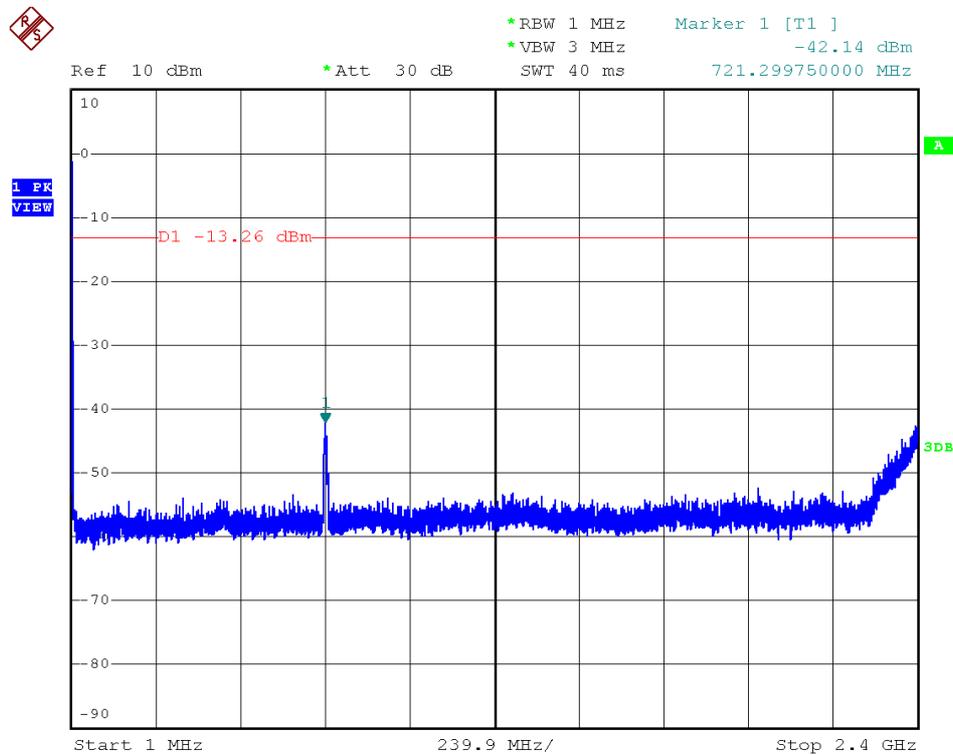


INTERTEK TESTING SERVICES



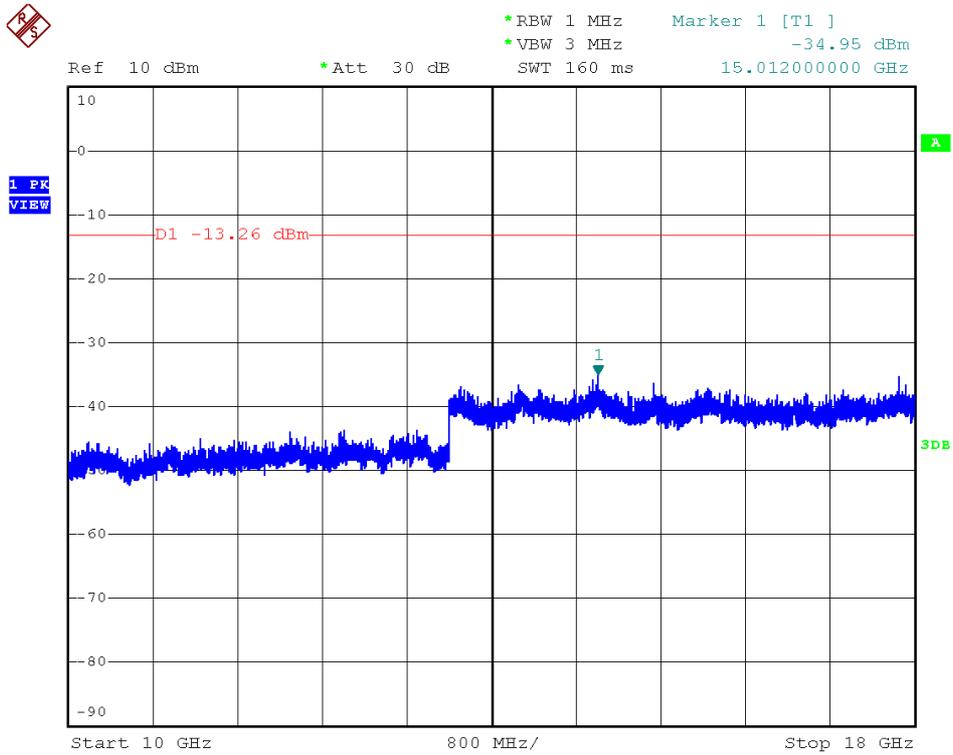
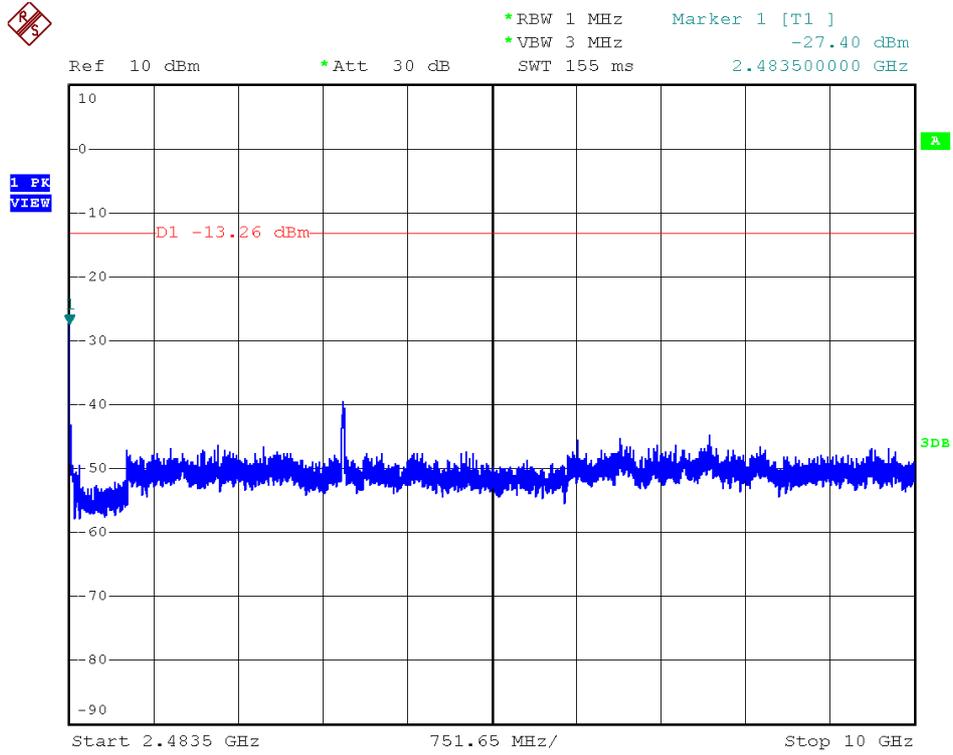
INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: 6.74dBm ANT 2



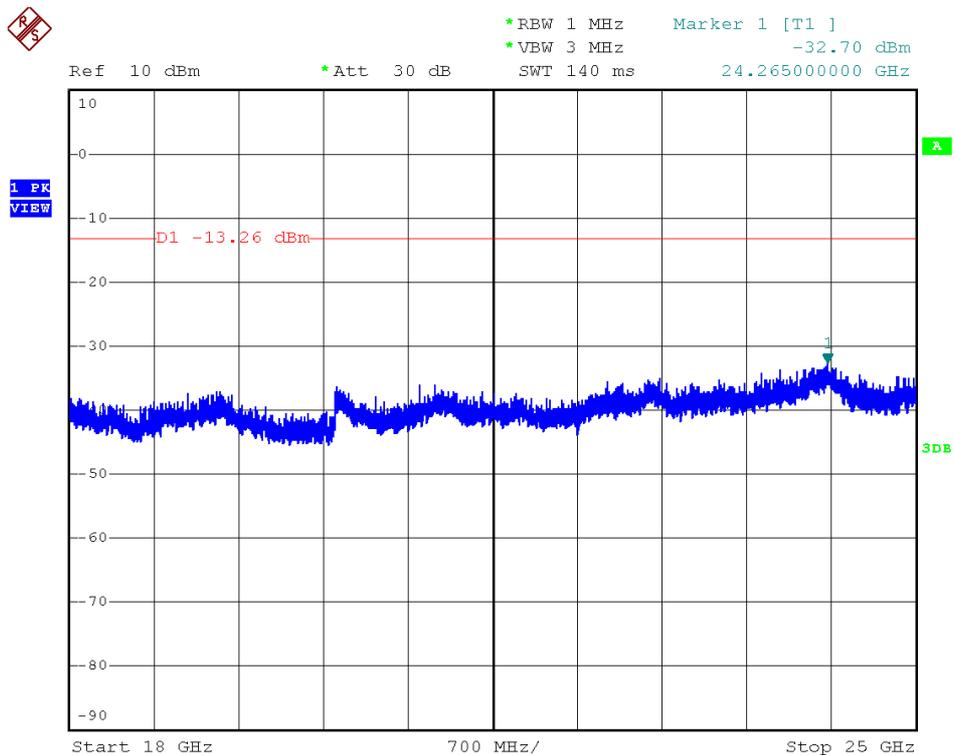
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INTERTEK TESTING SERVICES



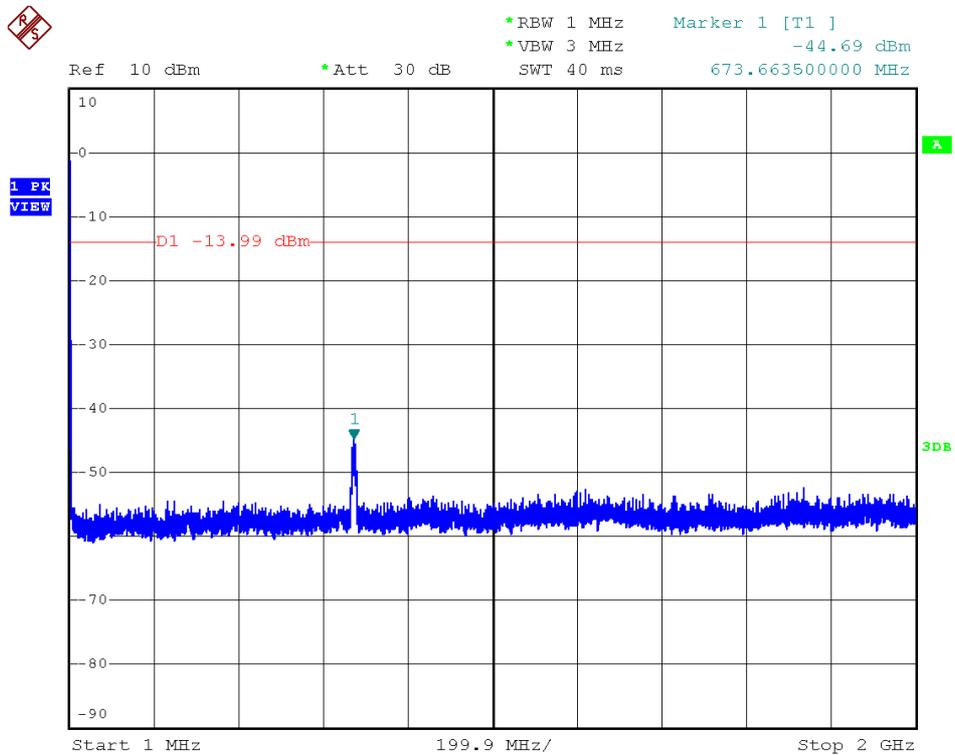
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 FCC ID: QIS-WS330
 Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

Channel 1 (2412MHz) Reference Level: 6.01dBm ANT 3

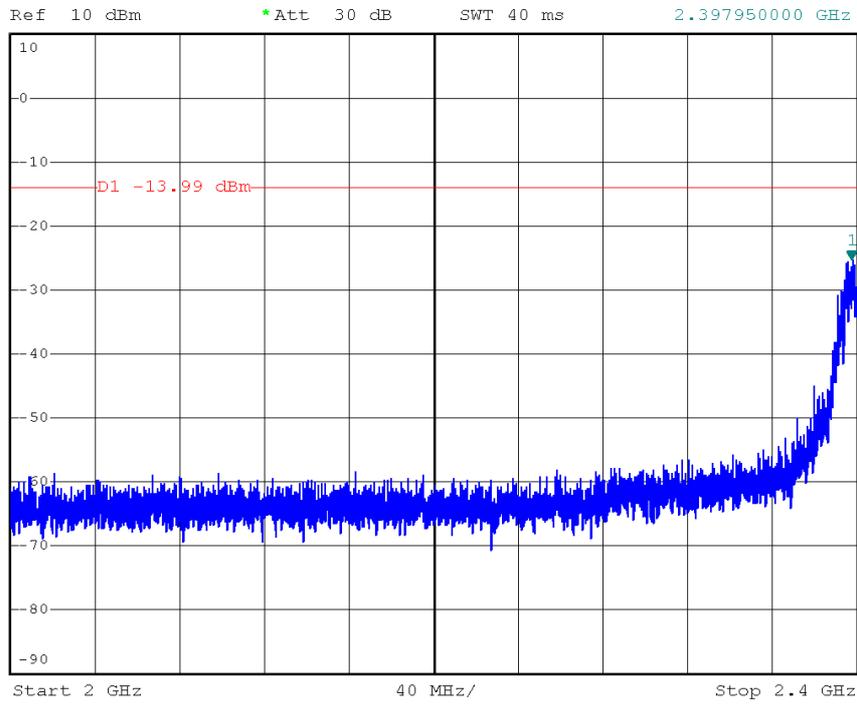


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Report No.: 130411010SZN-001

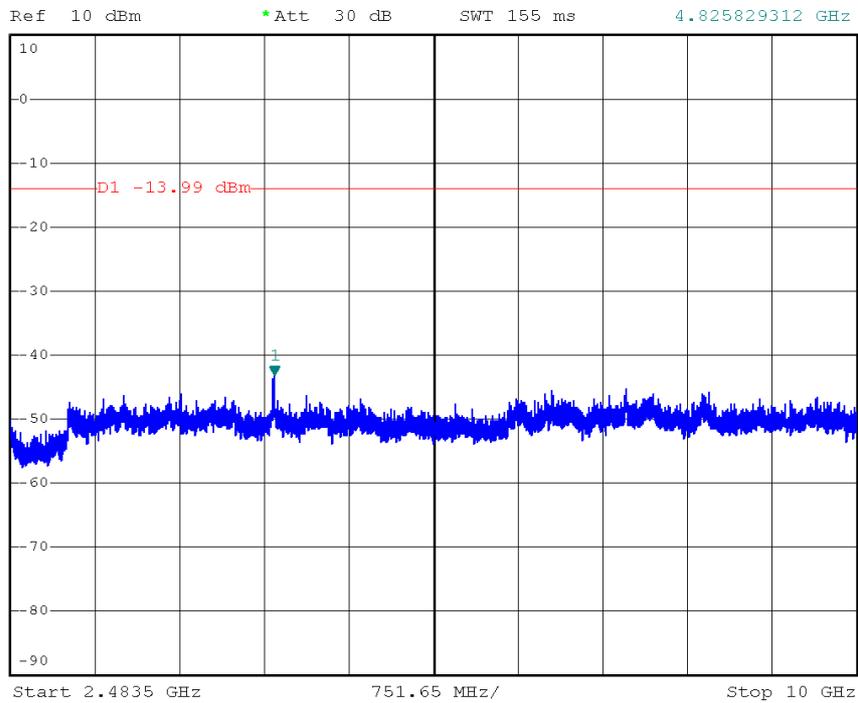
INTERTEK TESTING SERVICES



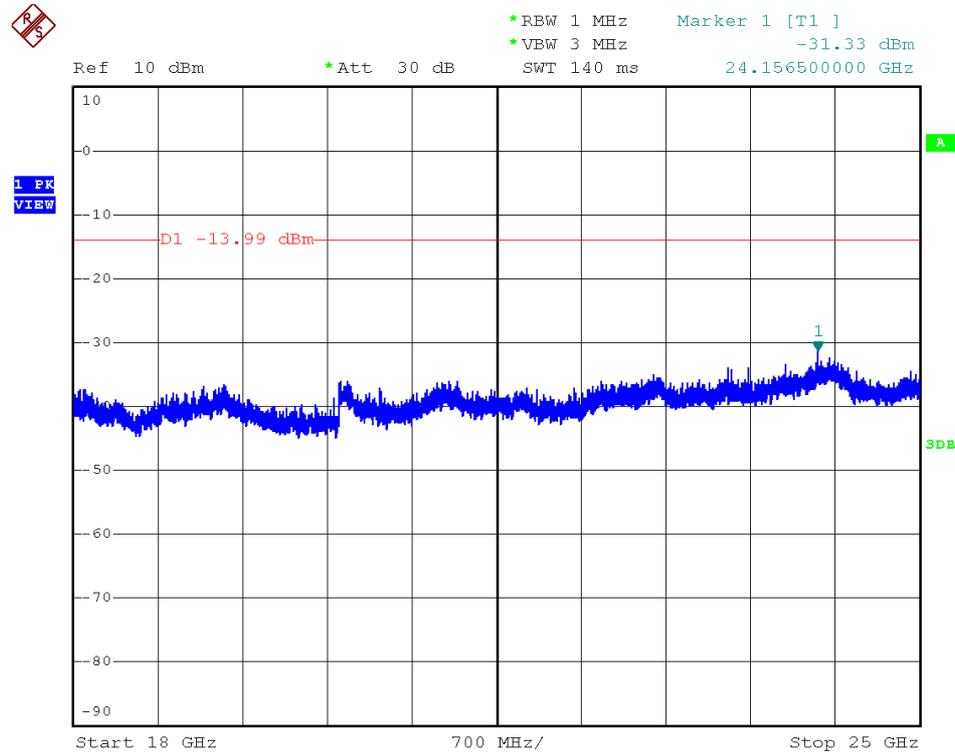
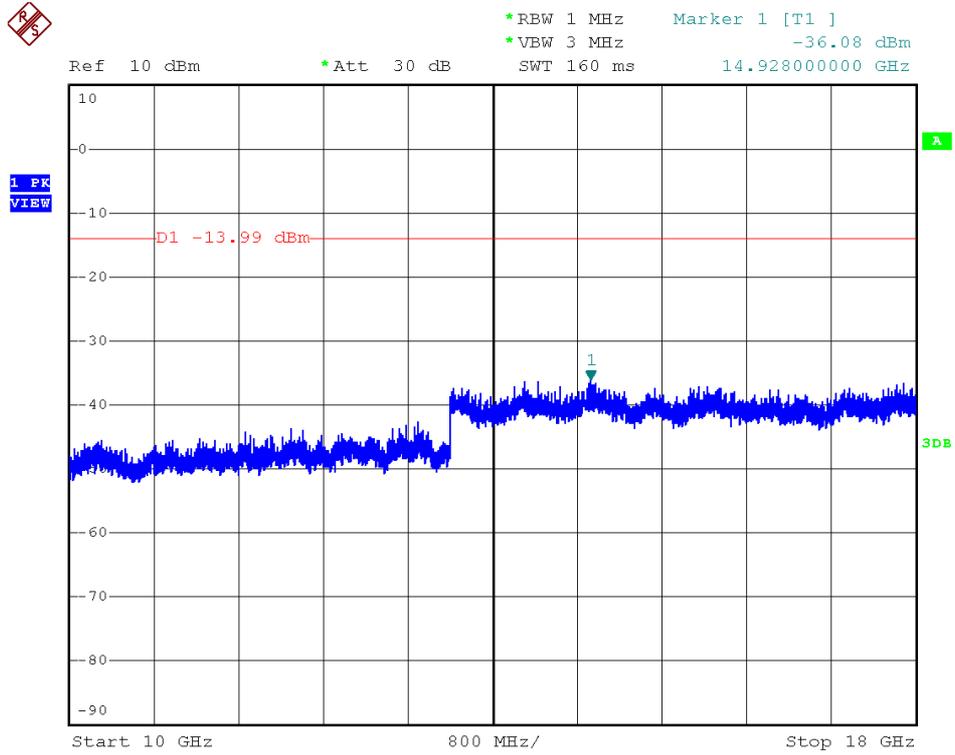
*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz -25.39 dBm
SWT 40 ms 2.397950000 GHz



*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -43.26 dBm
SWT 155 ms 4.825829312 GHz



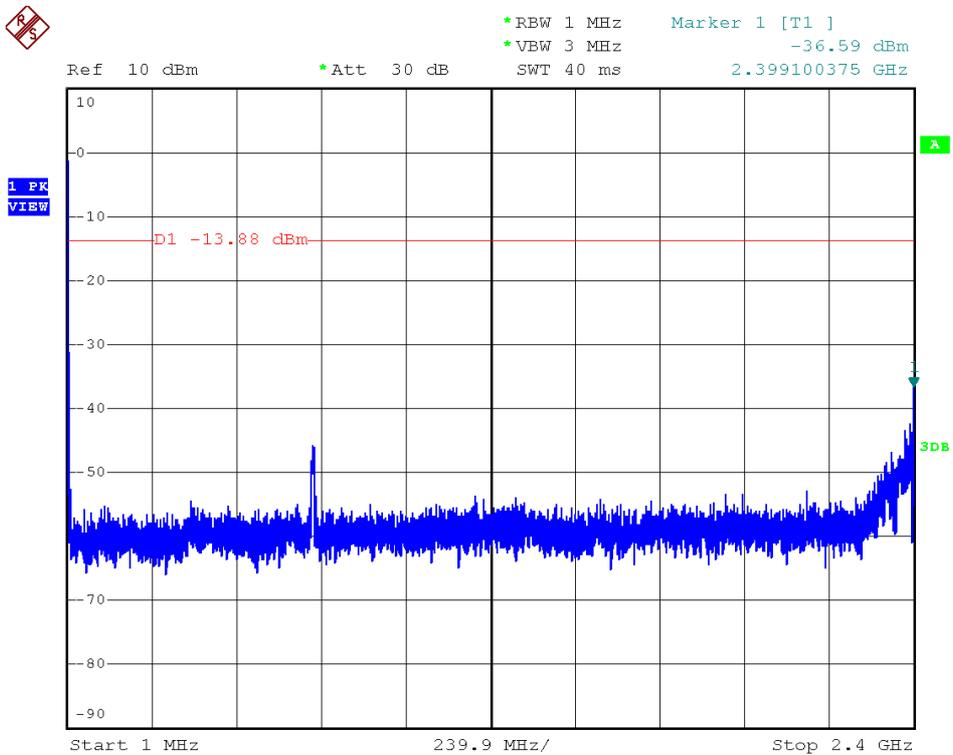
INTERTEK TESTING SERVICES



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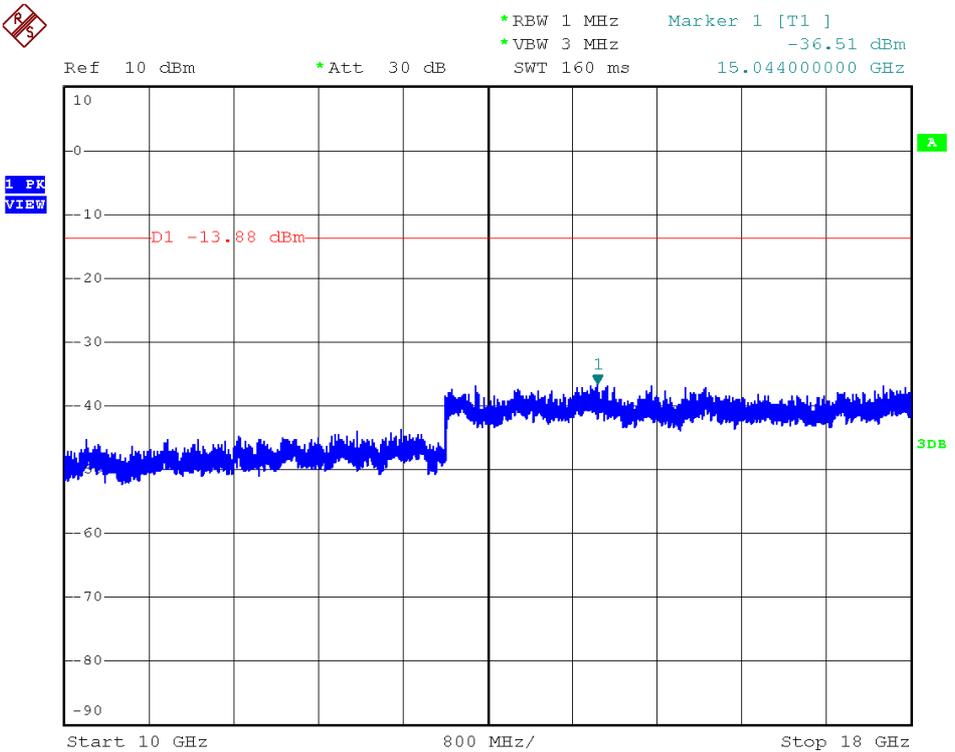
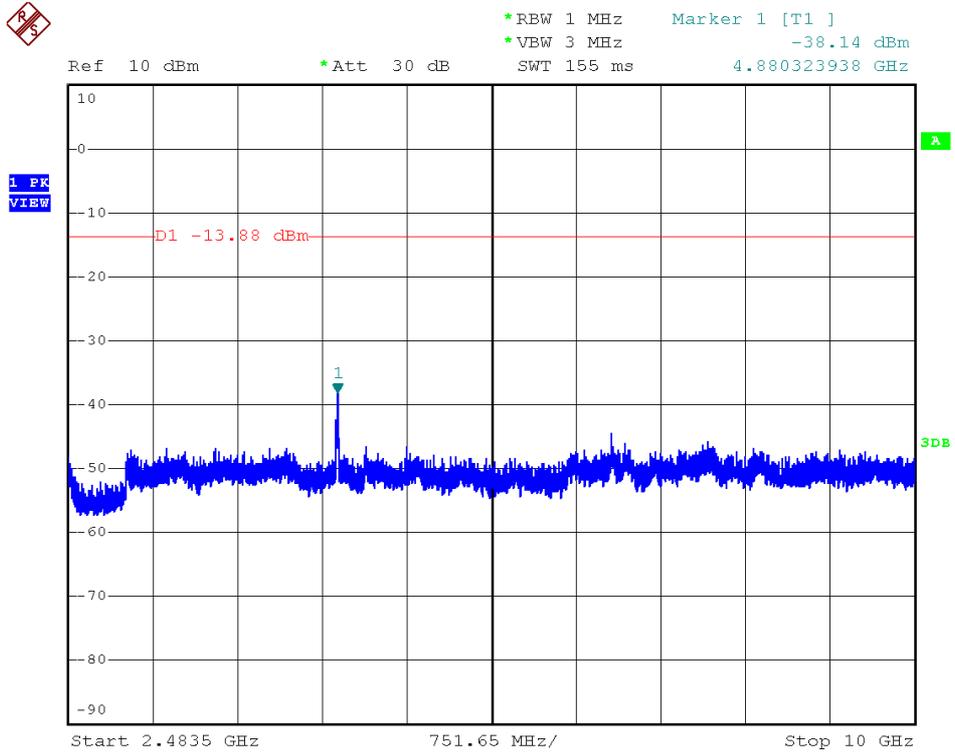
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 6.12dBm ANT 3

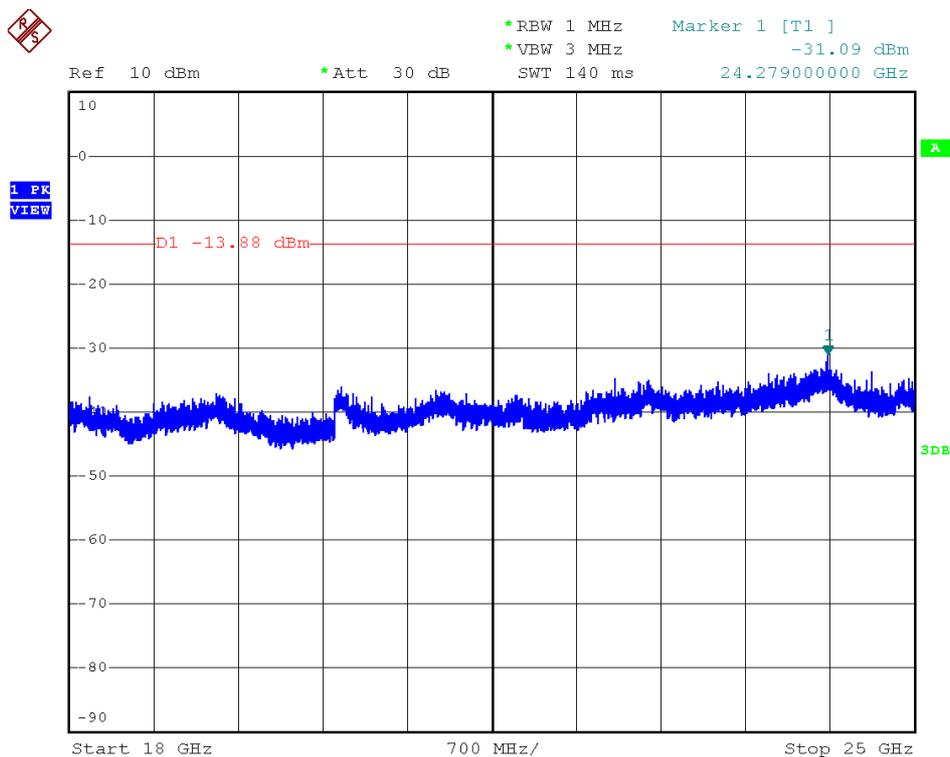


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INTERTEK TESTING SERVICES

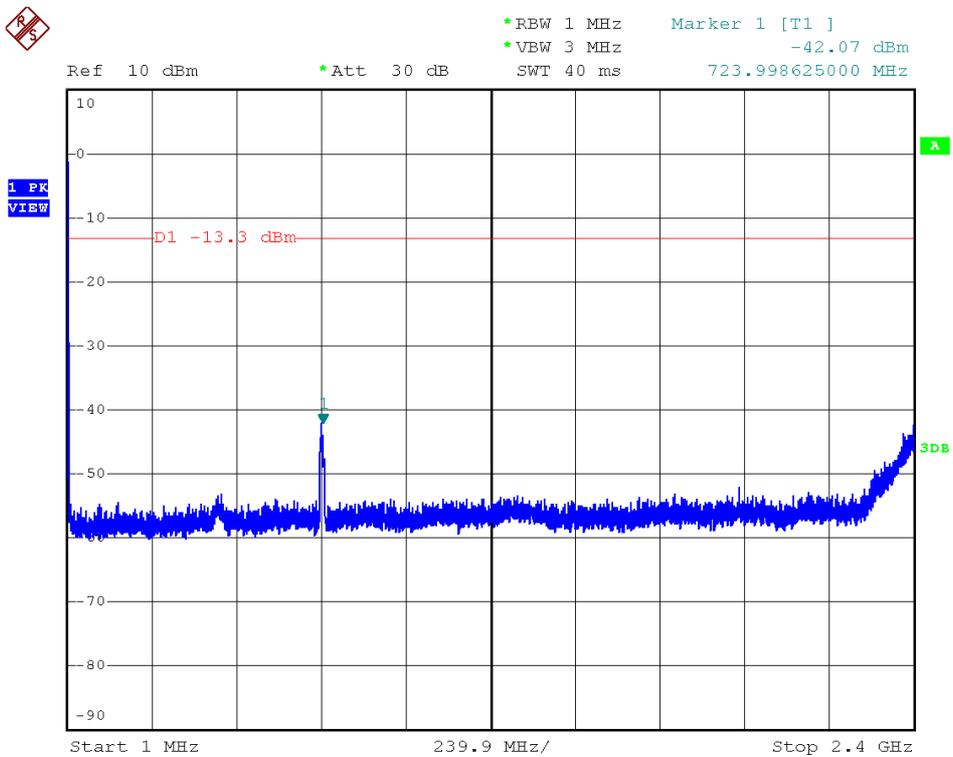


INTERTEK TESTING SERVICES



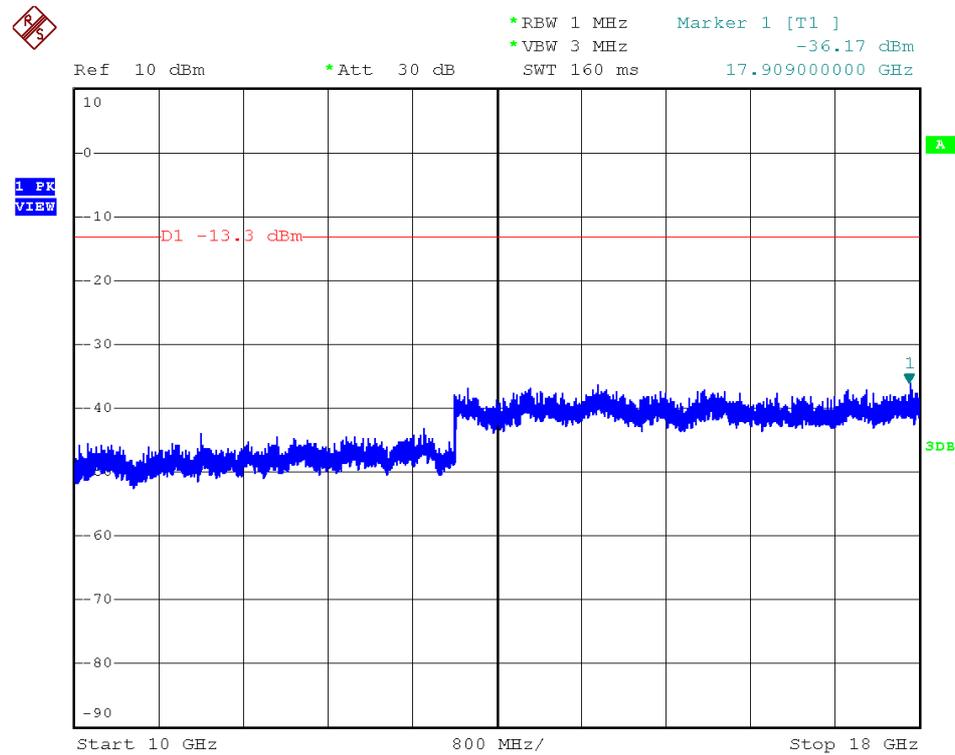
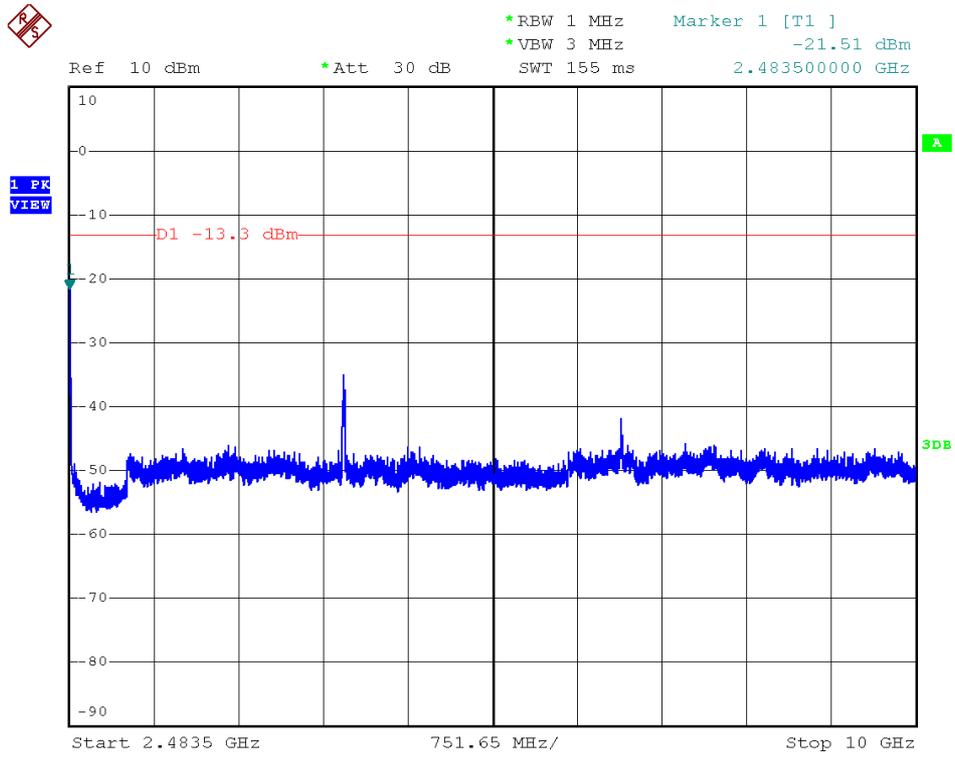
INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: 6.70dBm ANT 3



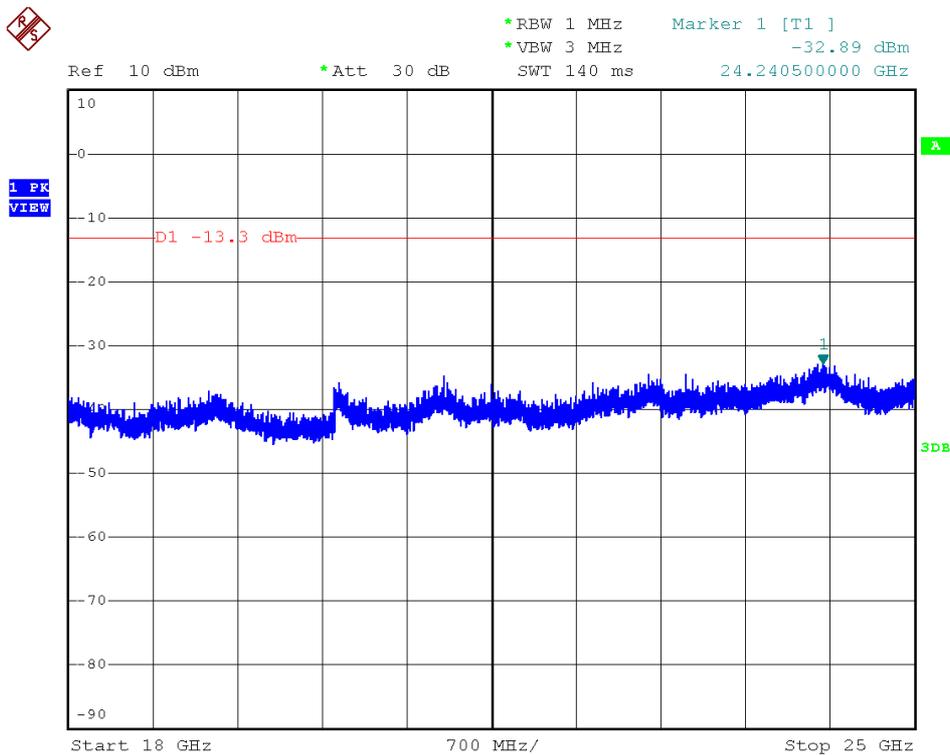
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INTERTEK TESTING SERVICES



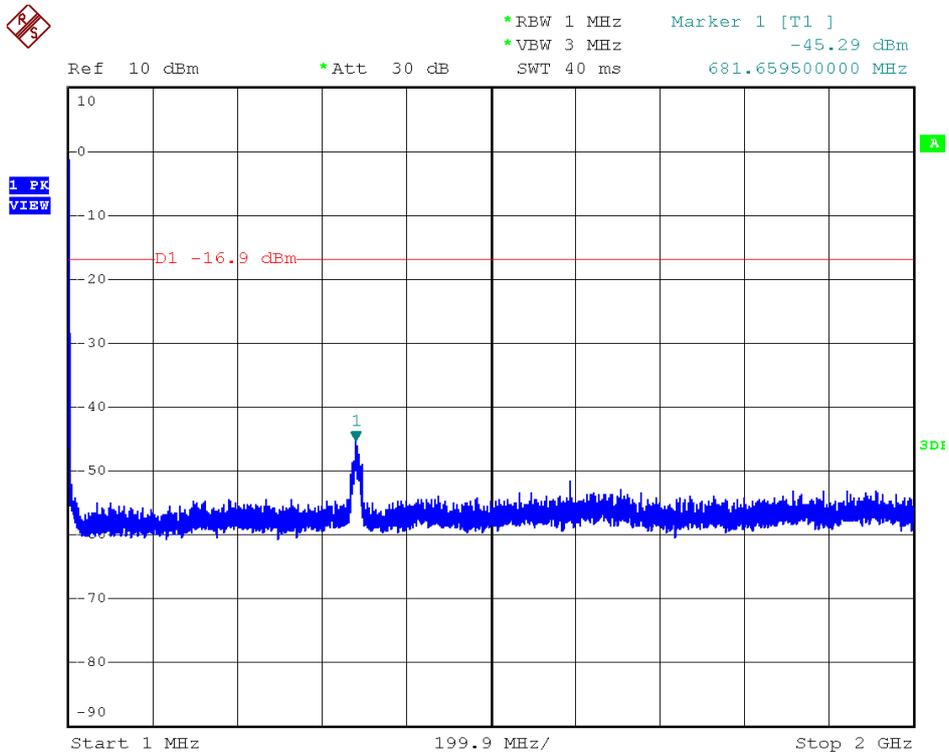
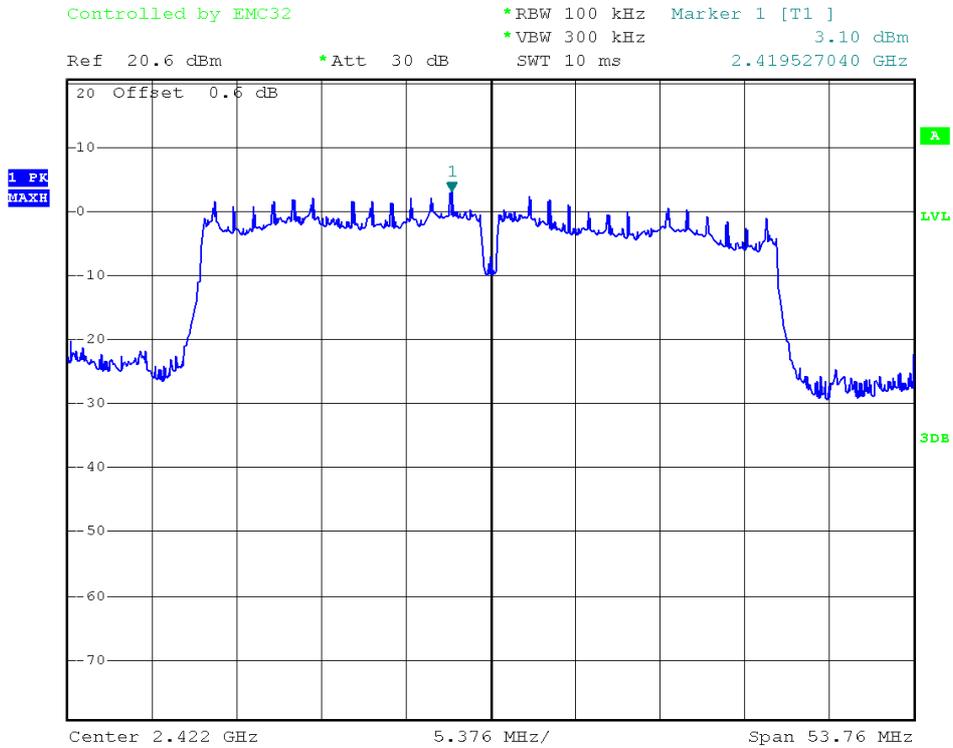
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INTERTEK TESTING SERVICES



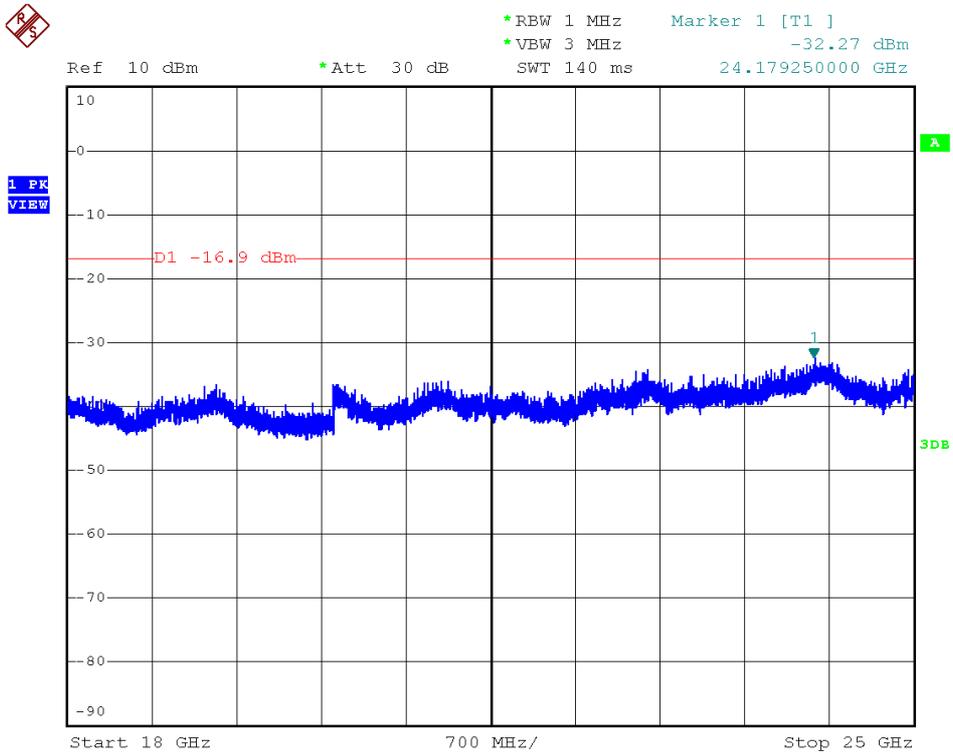
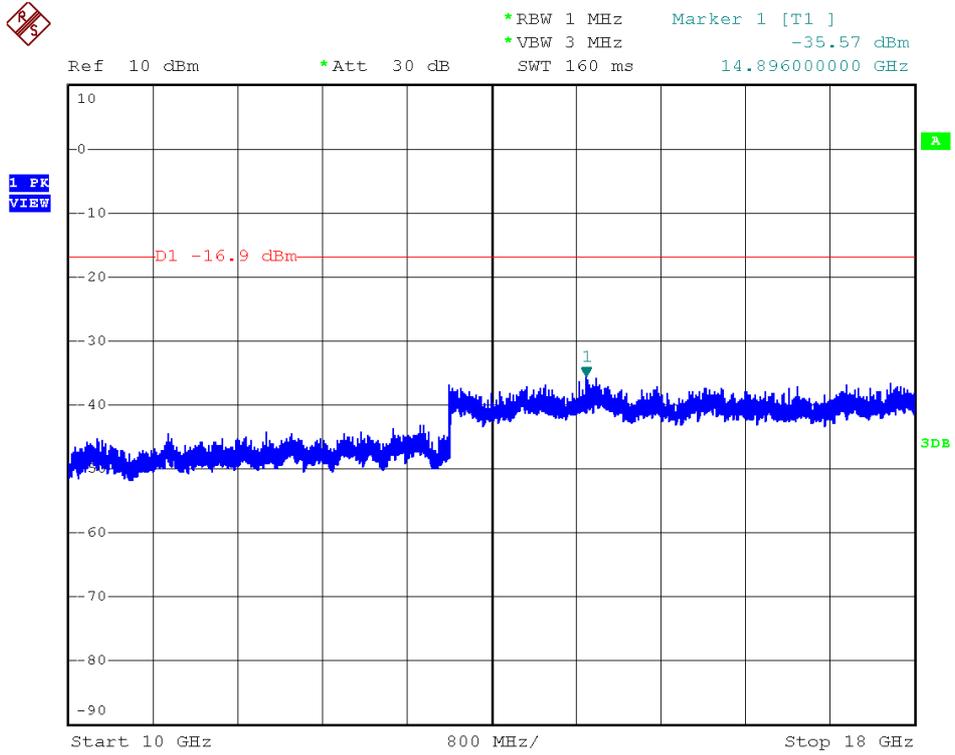
INTERTEK TESTING SERVICES

802.11n-HT40 SISO
Channel 3 (2422MHz) Reference Level: 3.10dBm



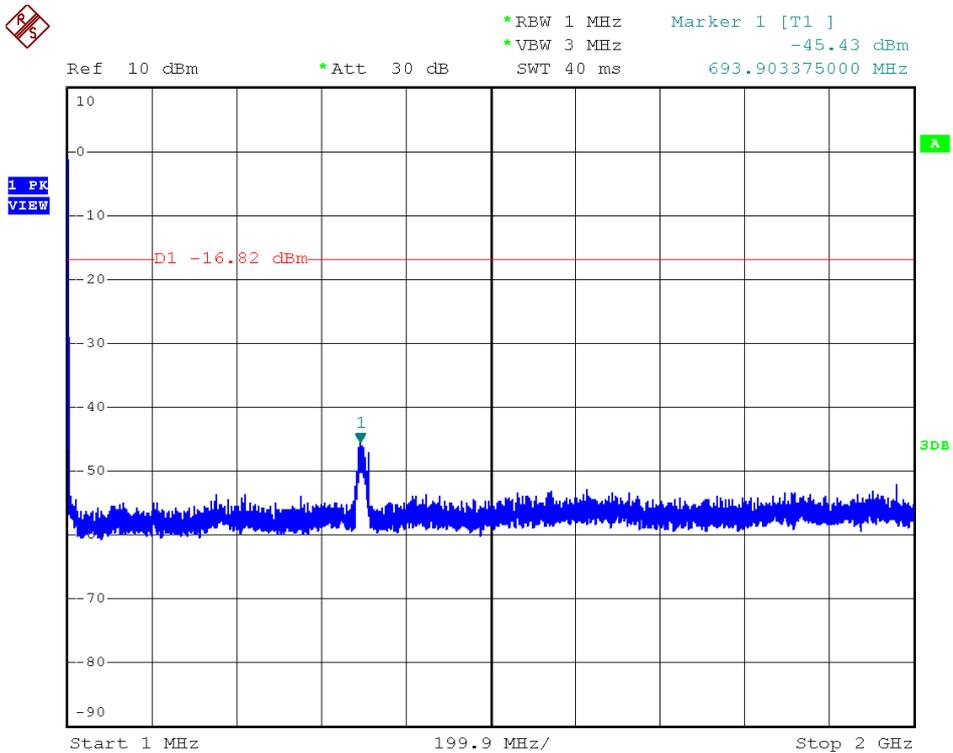
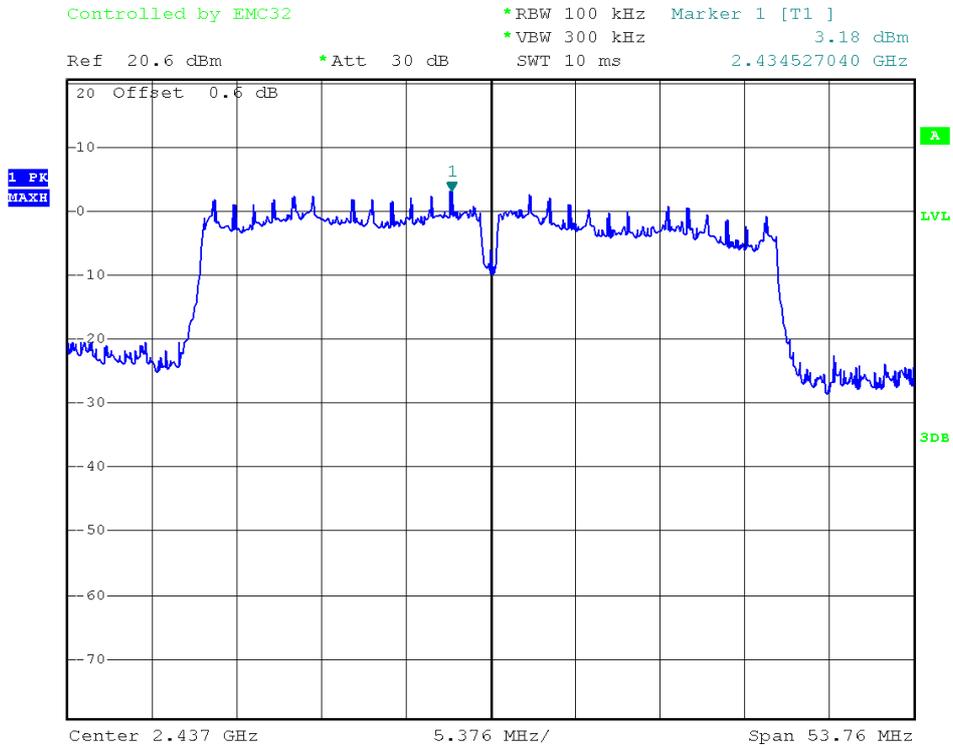
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INTERTEK TESTING SERVICES



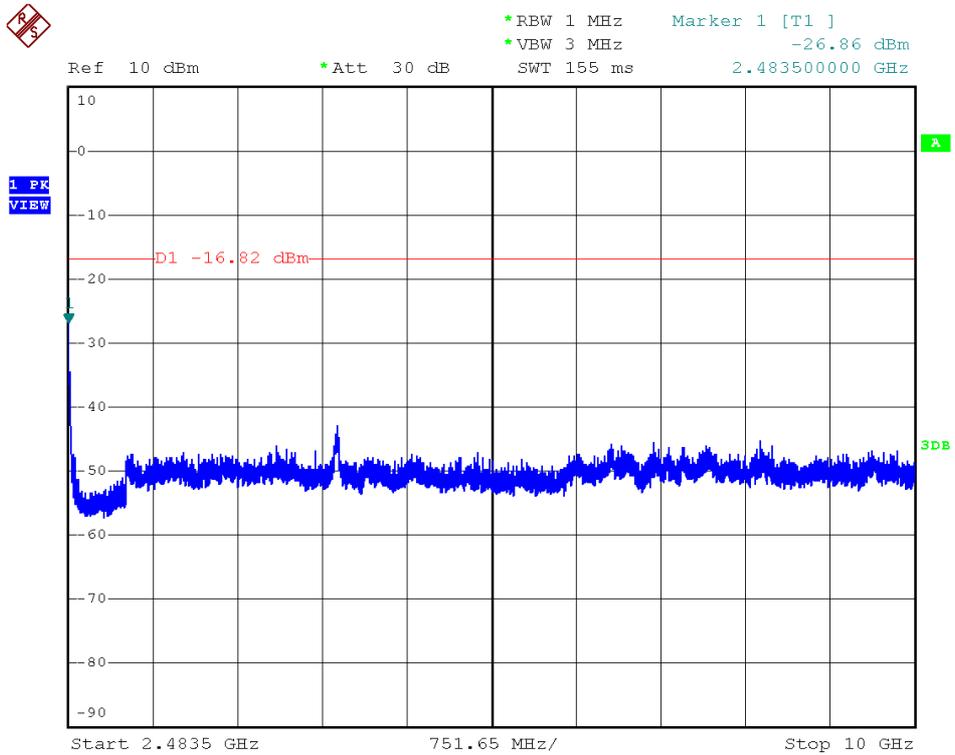
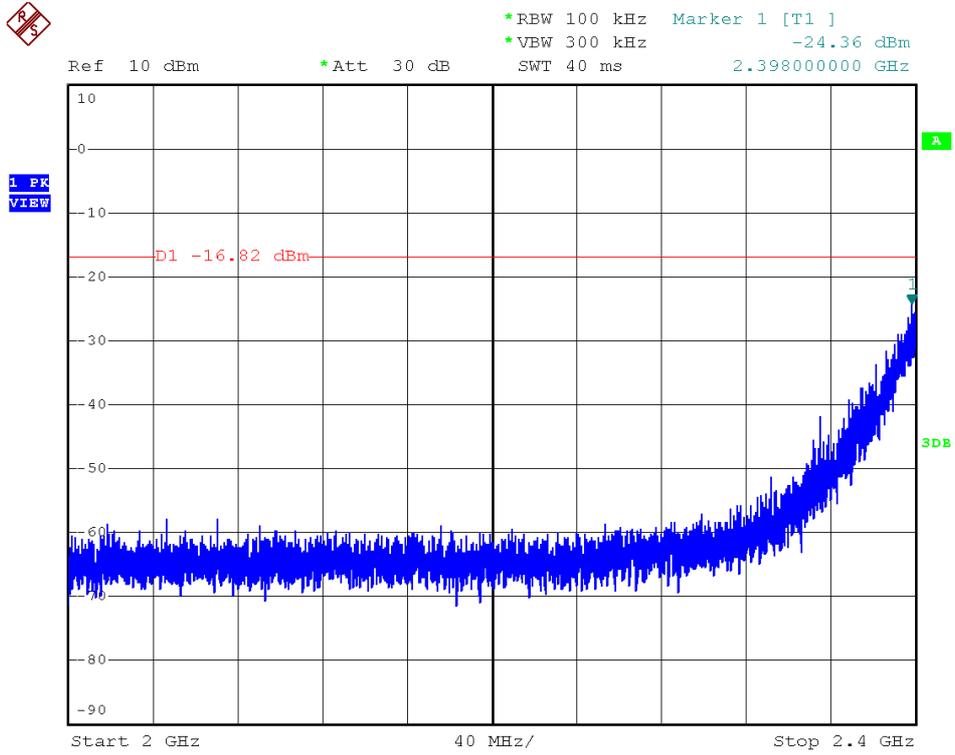
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 3.18dBm

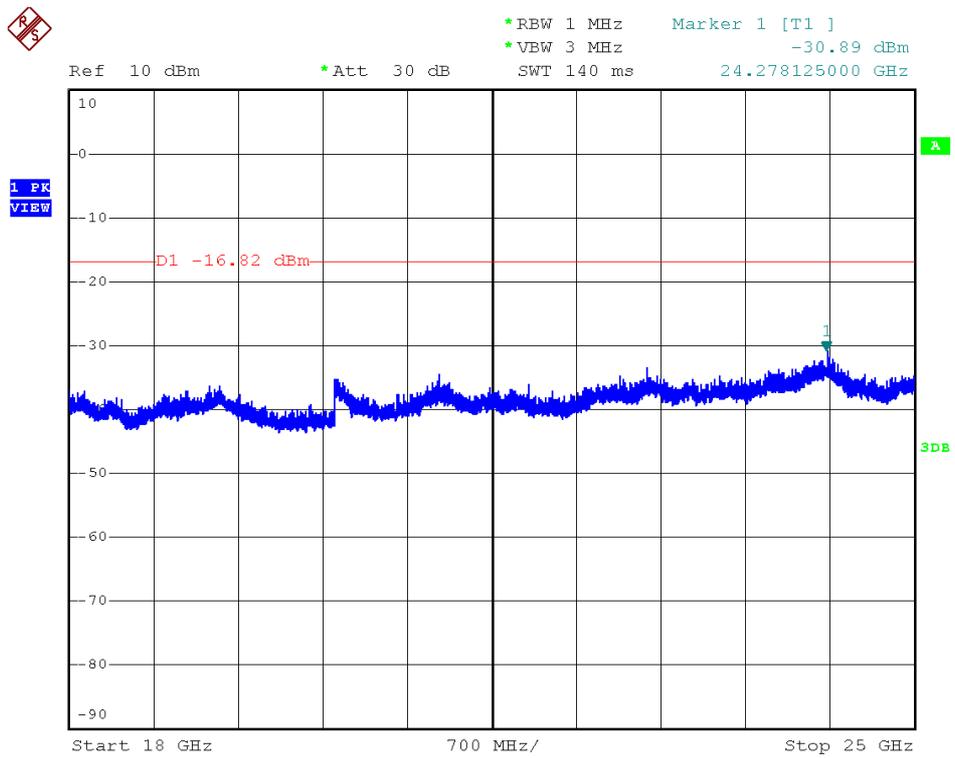
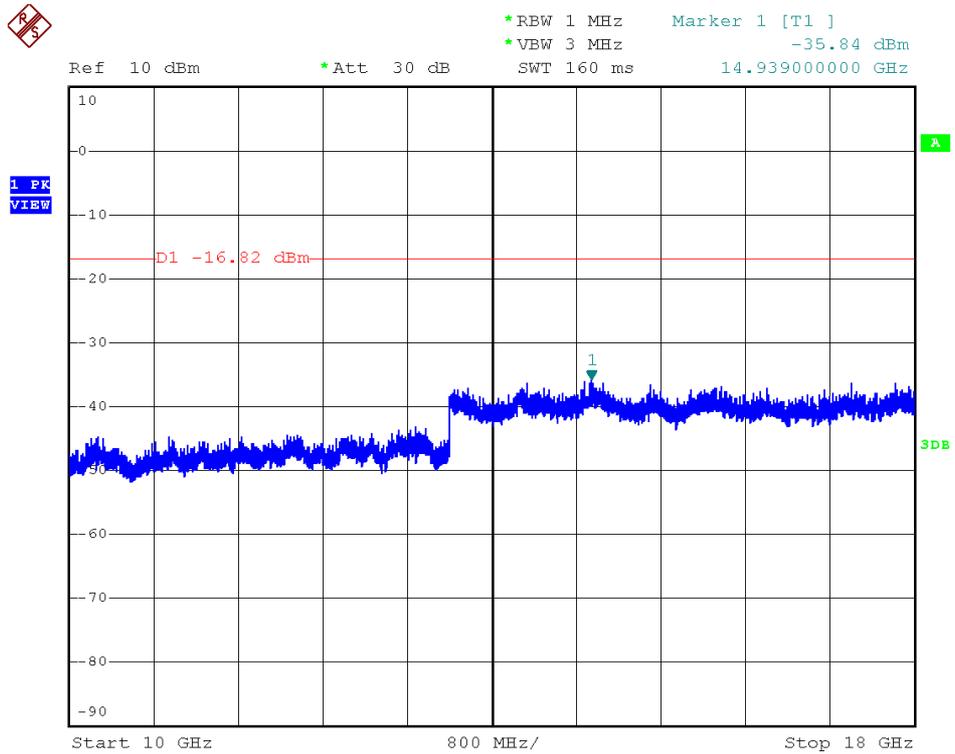


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INTERTEK TESTING SERVICES



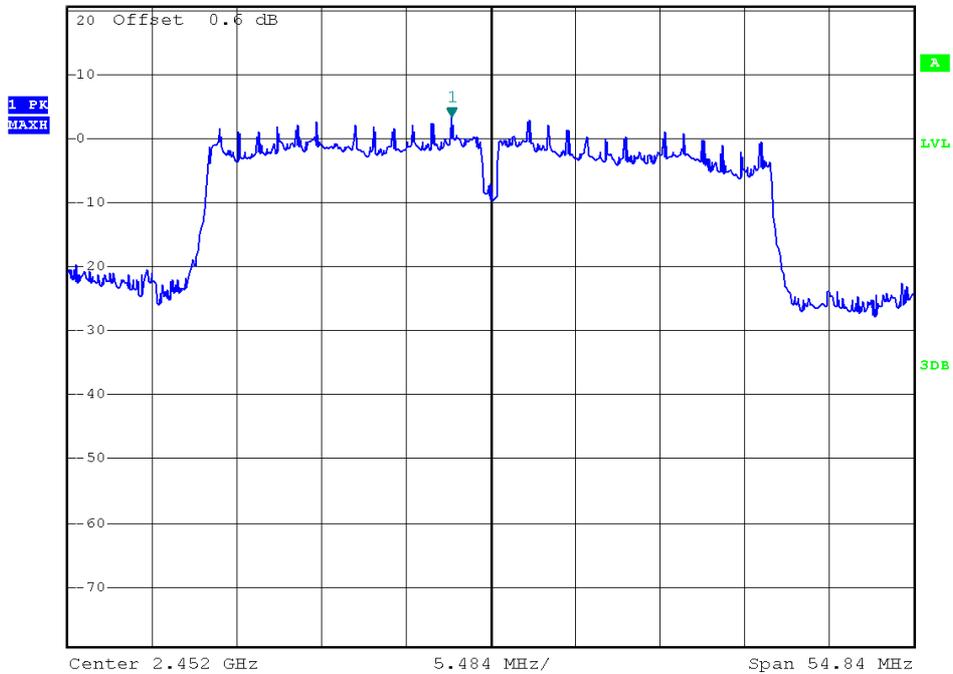
INTERTEK TESTING SERVICES



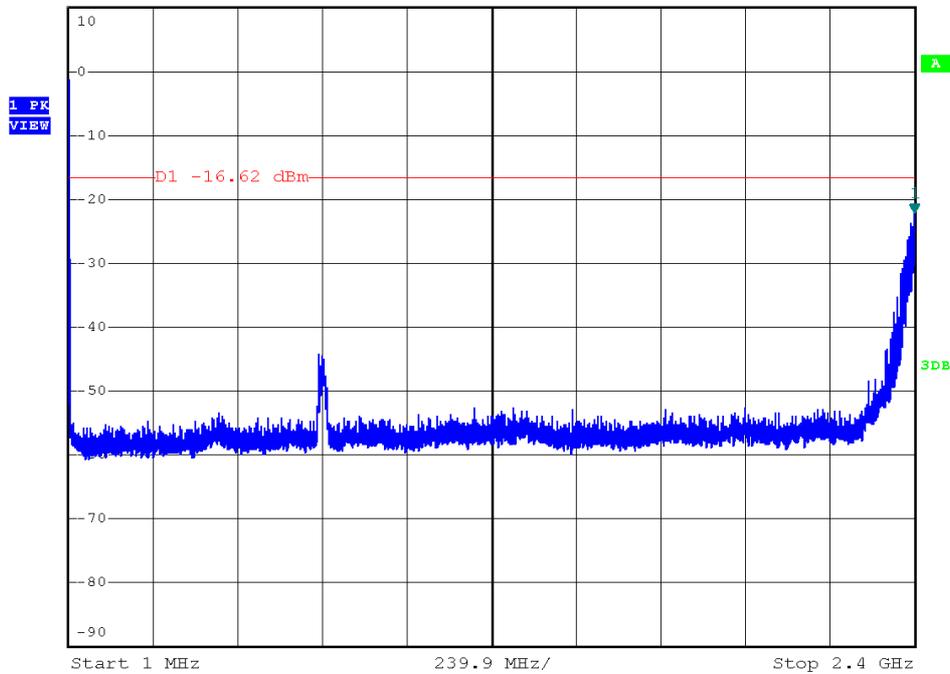
INTERTEK TESTING SERVICES

Channel 9 (2452MHz) Reference Level: 3.38dBm

Controlled by EMC32 *RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 3.38 dBm
Ref 20.6 dBm *Att 30 dB SWT 10 ms 2.449477360 GHz

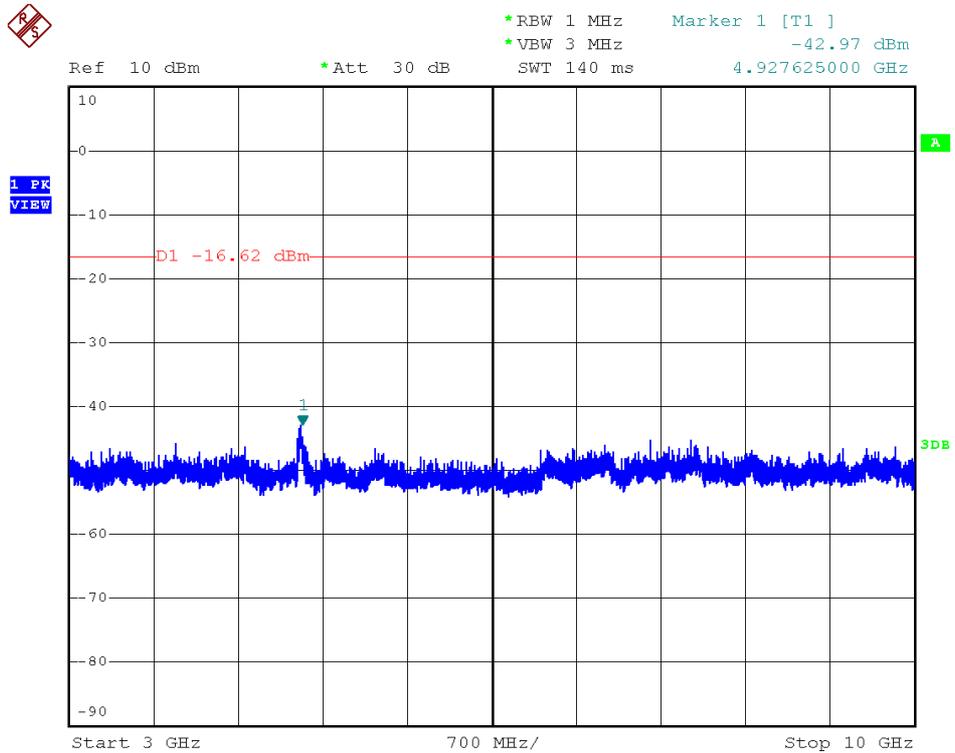
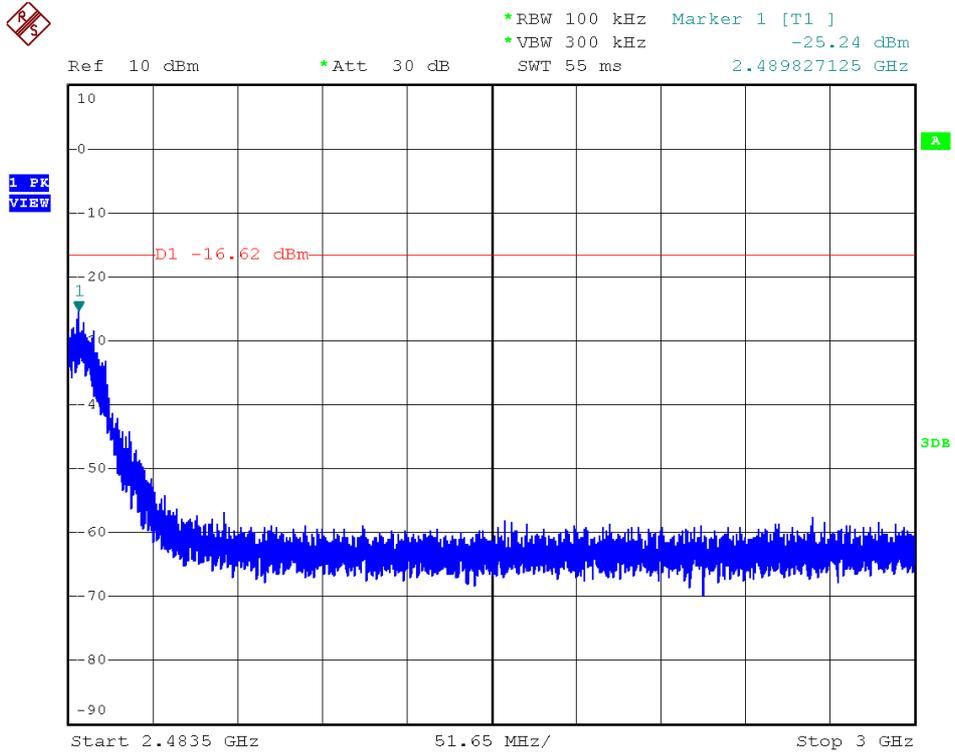


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -22.13 dBm
Ref 10 dBm *Att 30 dB SWT 40 ms 2.399400250 GHz

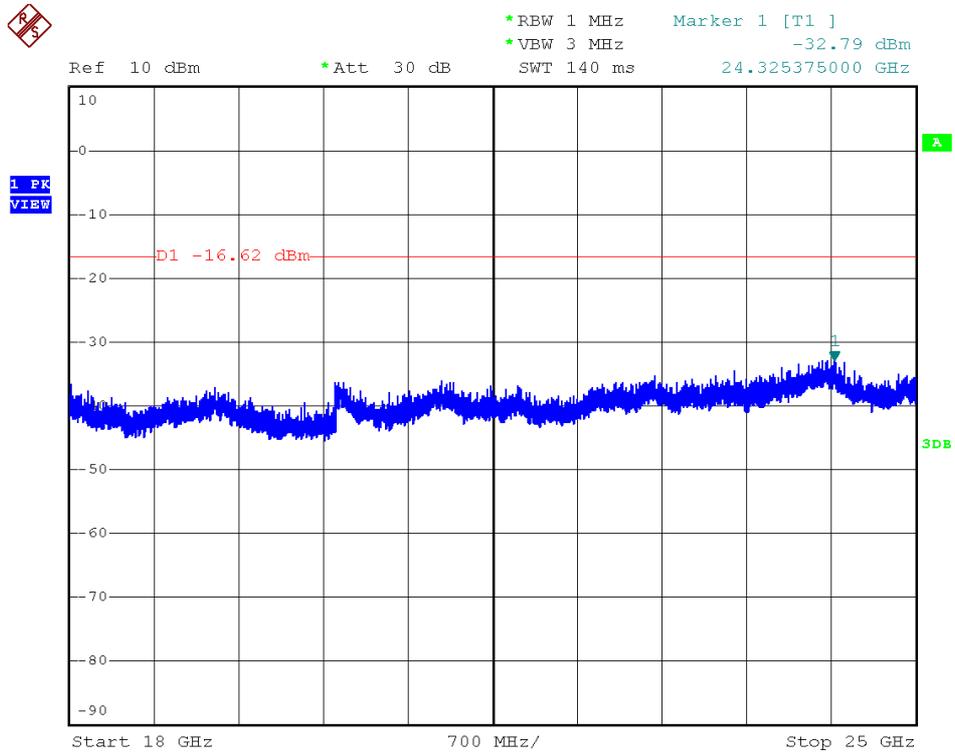
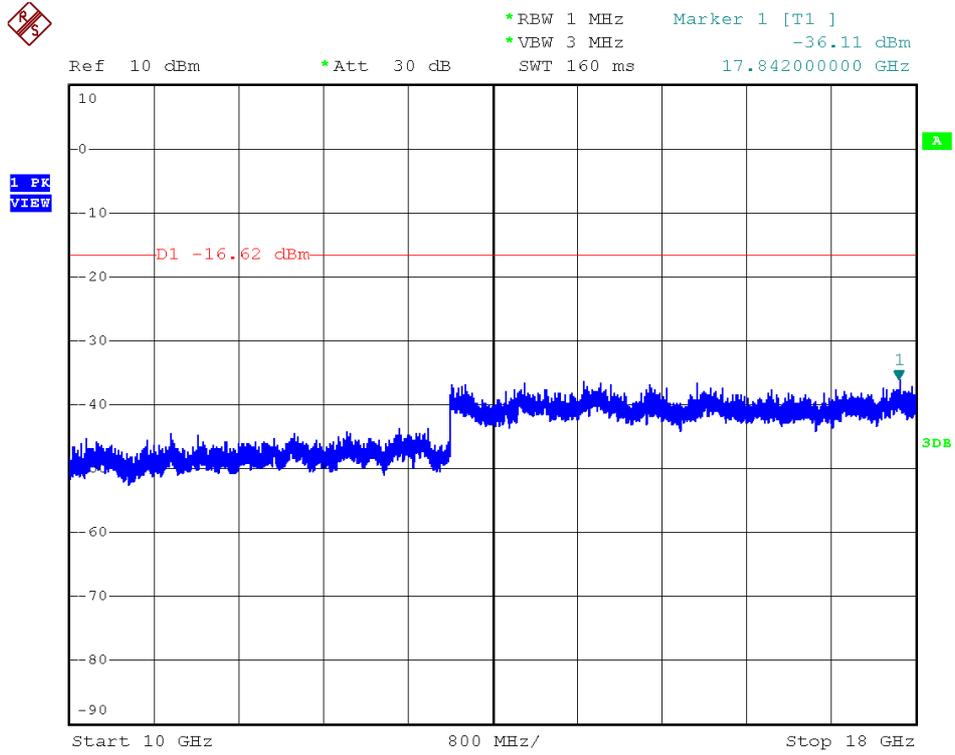


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Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

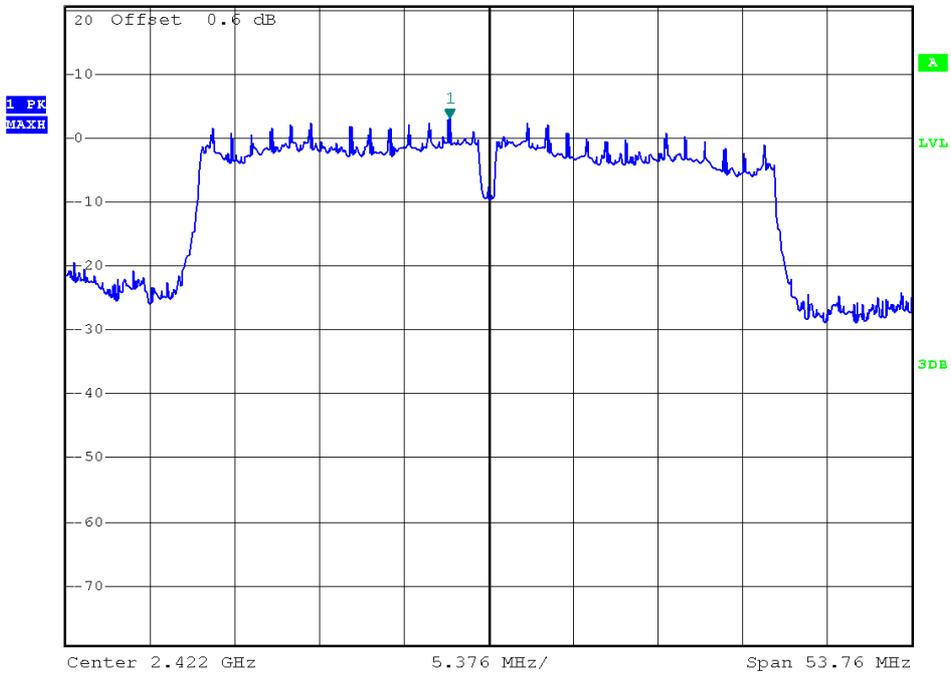


INTERTEK TESTING SERVICES

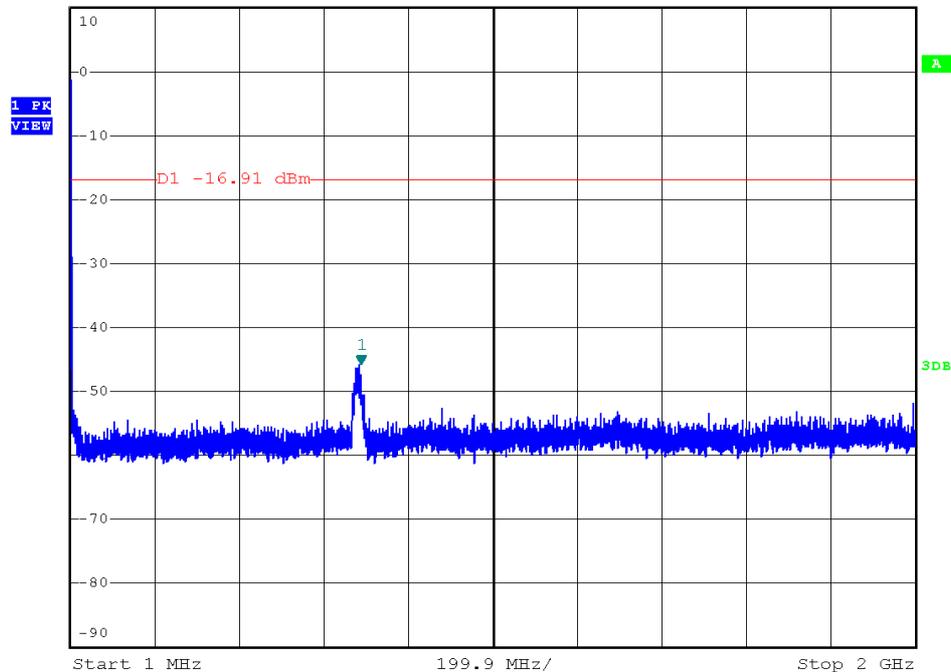
802.11n-HT40 MIMO

Channel 3 (2422MHz) Reference Level: 3.09dBm ANT 1

Controlled by EMC32 *RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 3.09 dBm
Ref 20.6 dBm *Att 30 dB SWT 10 ms 2.419527040 GHz

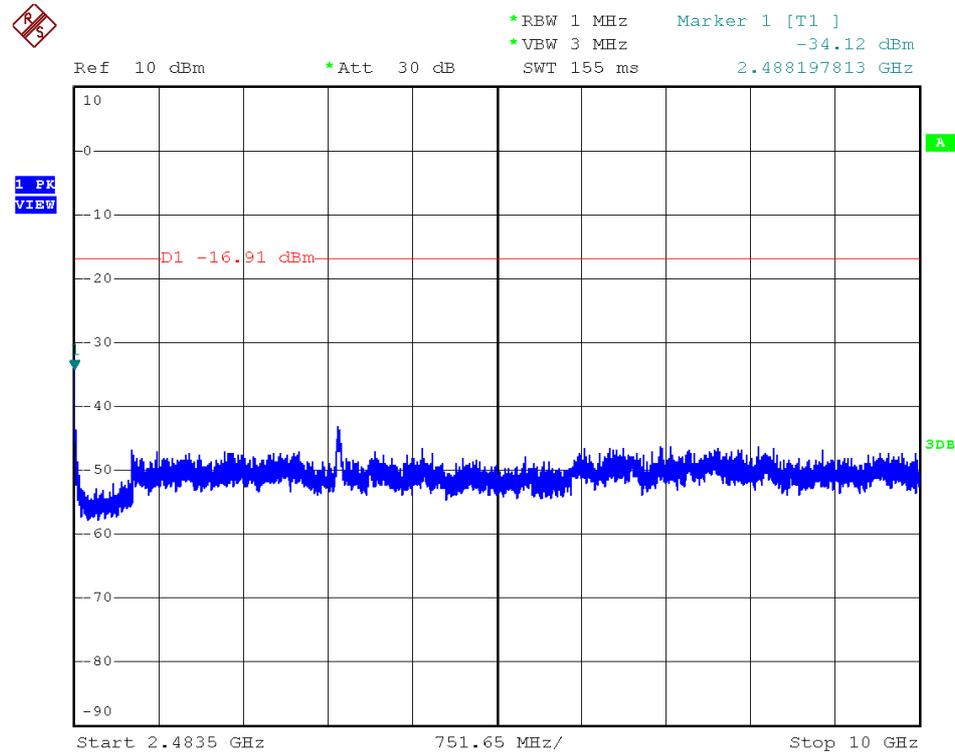
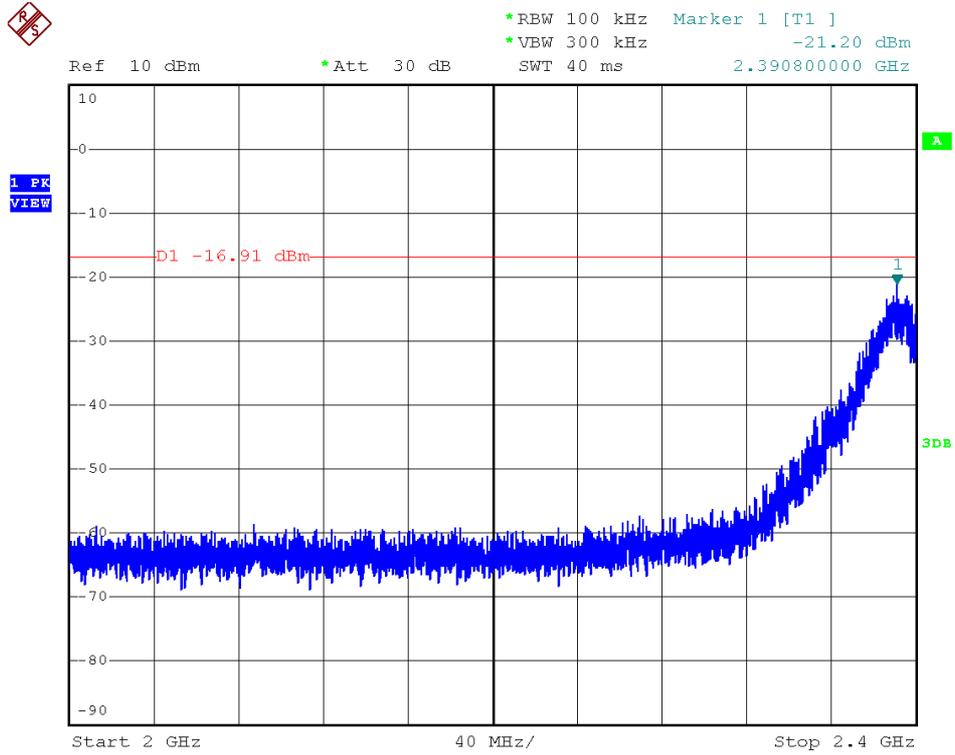


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -45.82 dBm
Ref 10 dBm *Att 30 dB SWT 40 ms 687.156750000 MHz

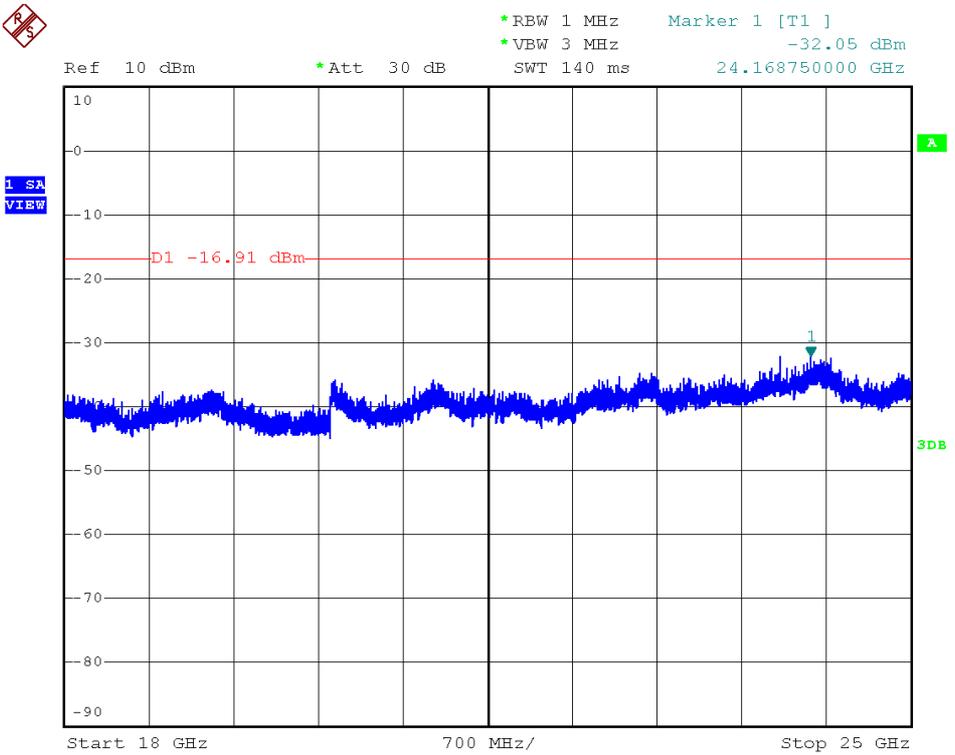
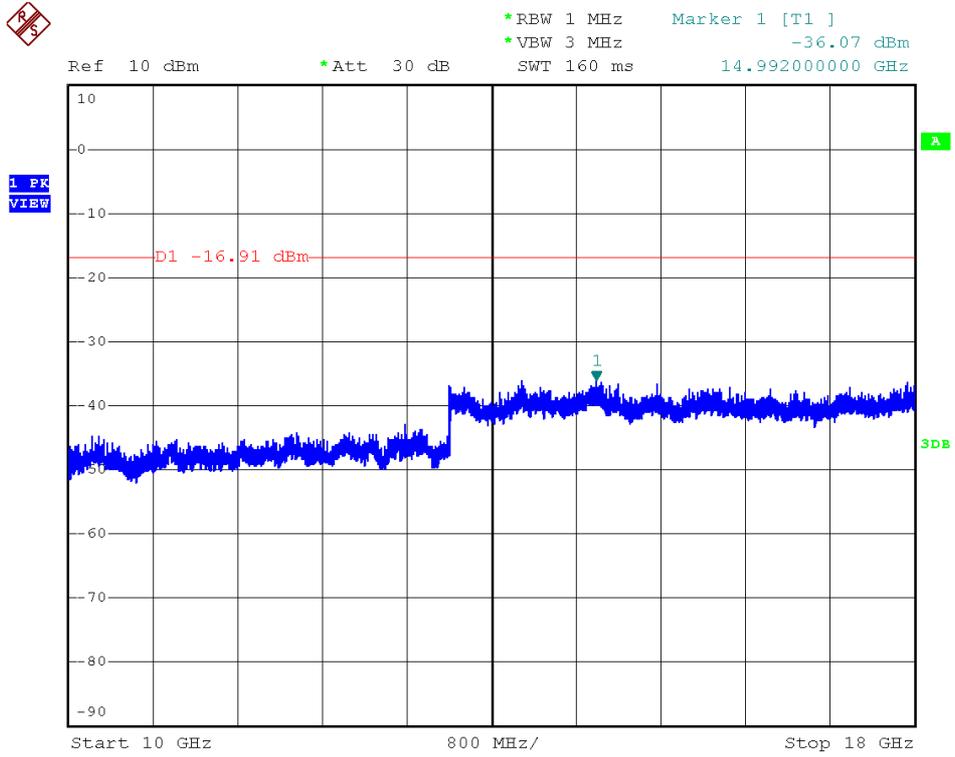


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INTERTEK TESTING SERVICES

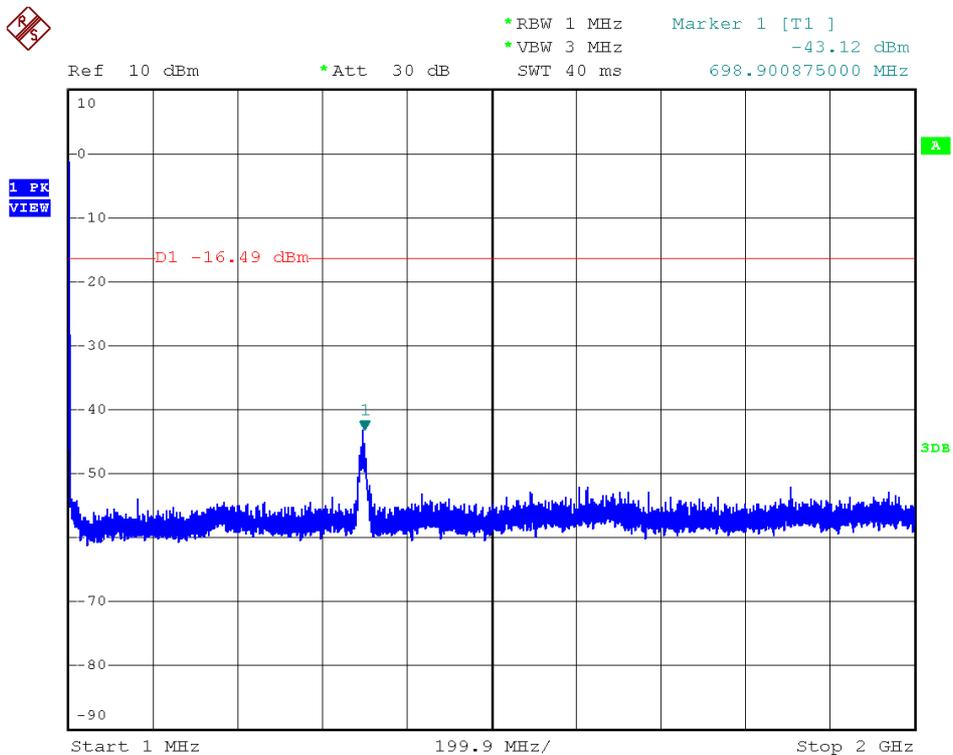
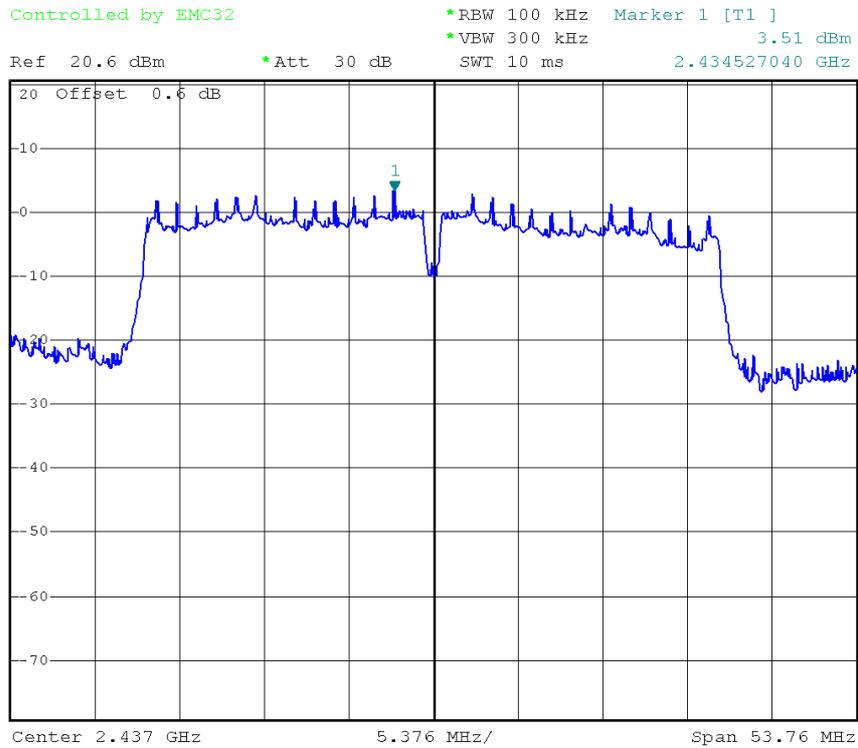


INTERTEK TESTING SERVICES



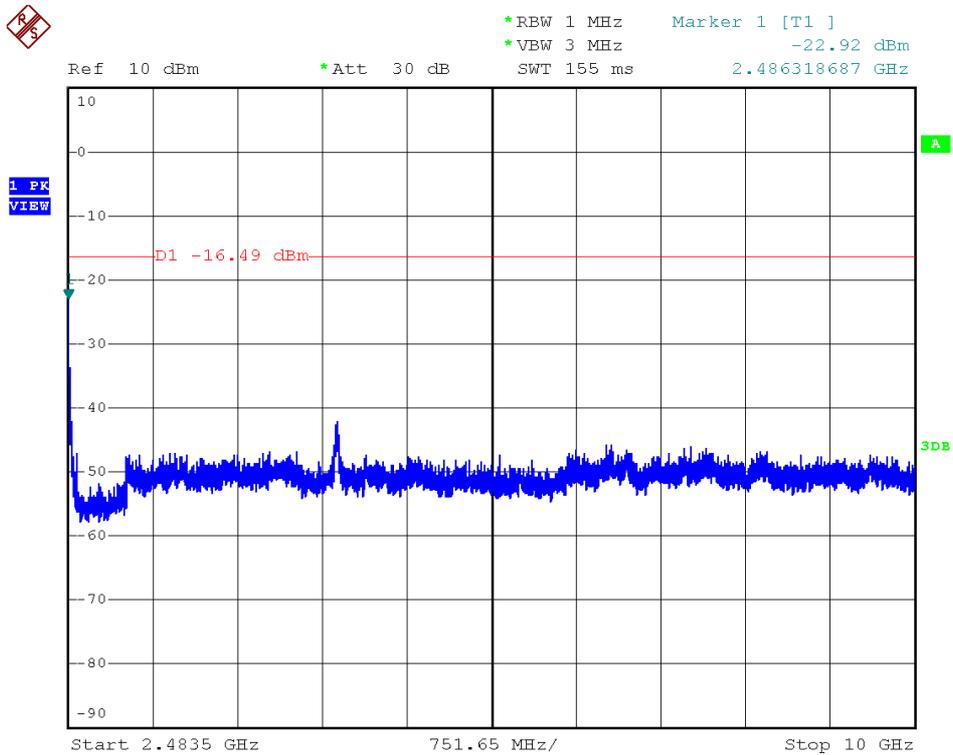
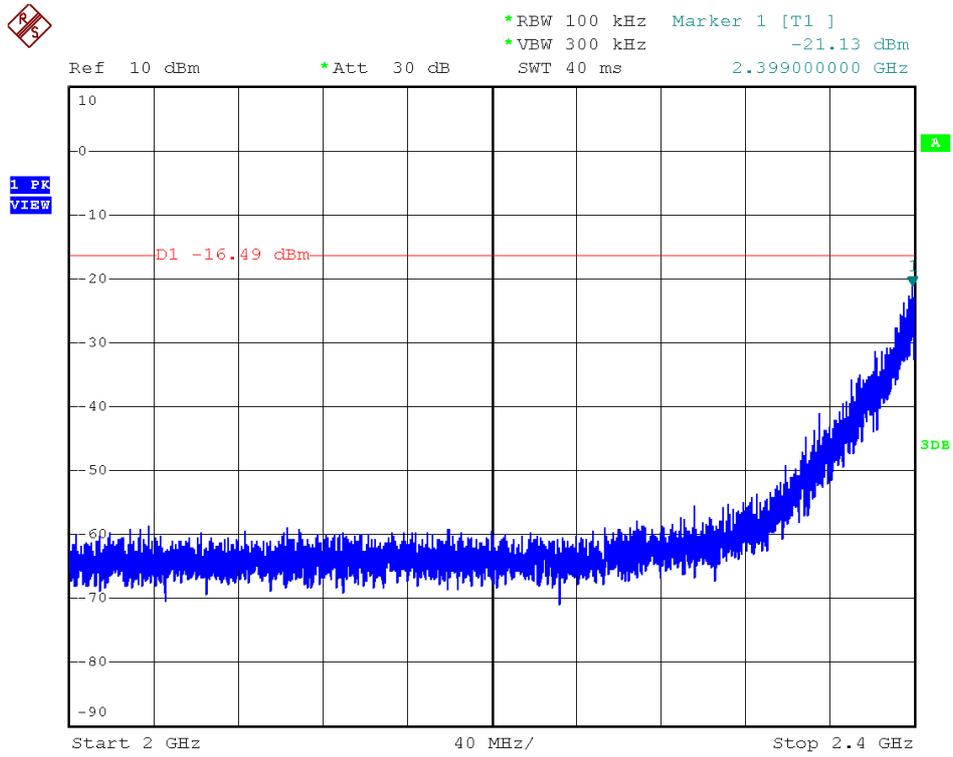
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 3.51dBm ANT 1

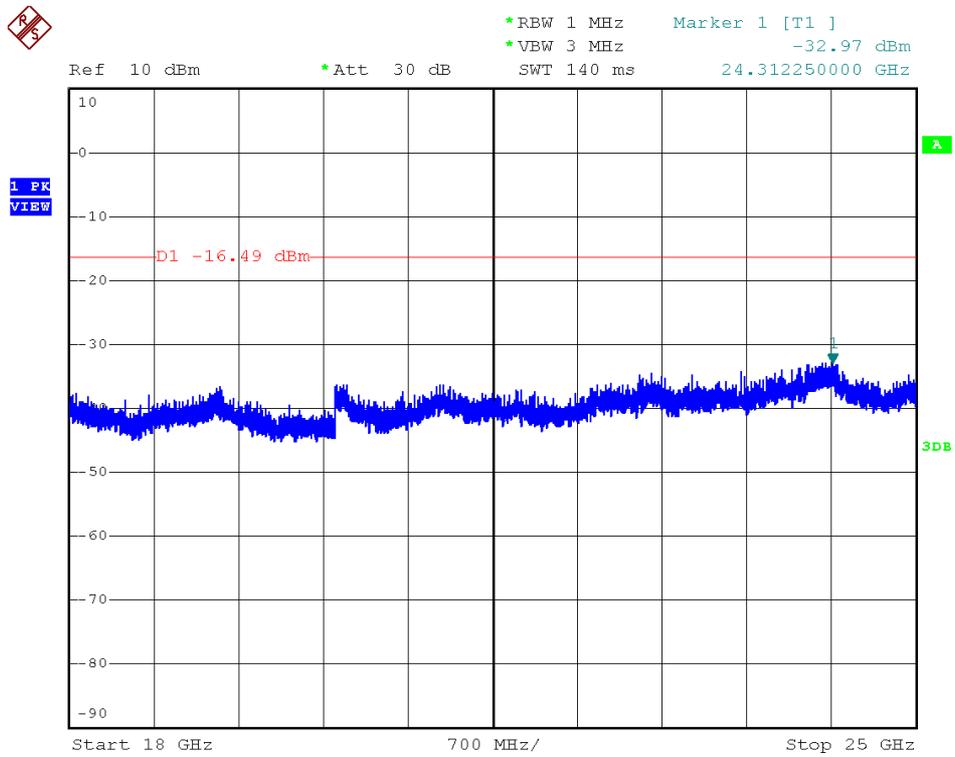
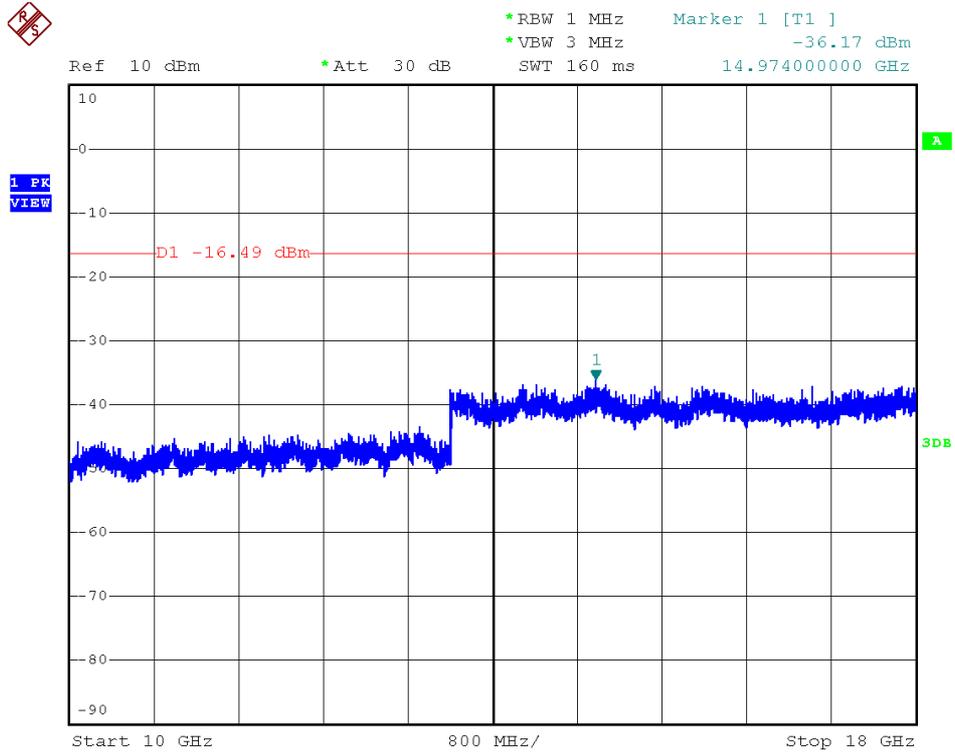


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INTERTEK TESTING SERVICES

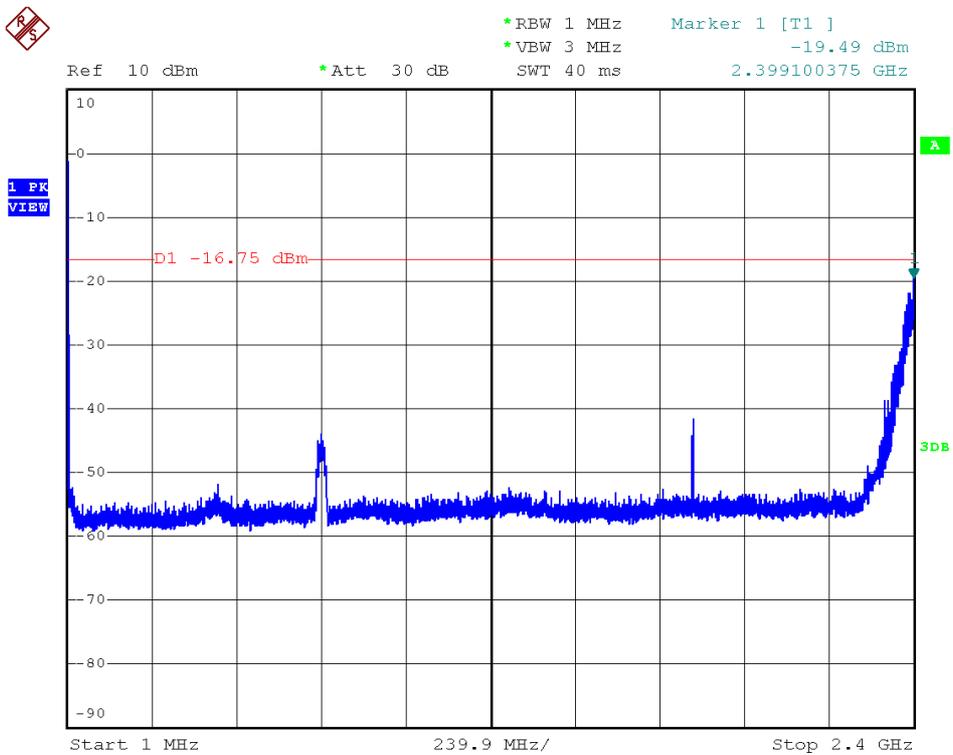
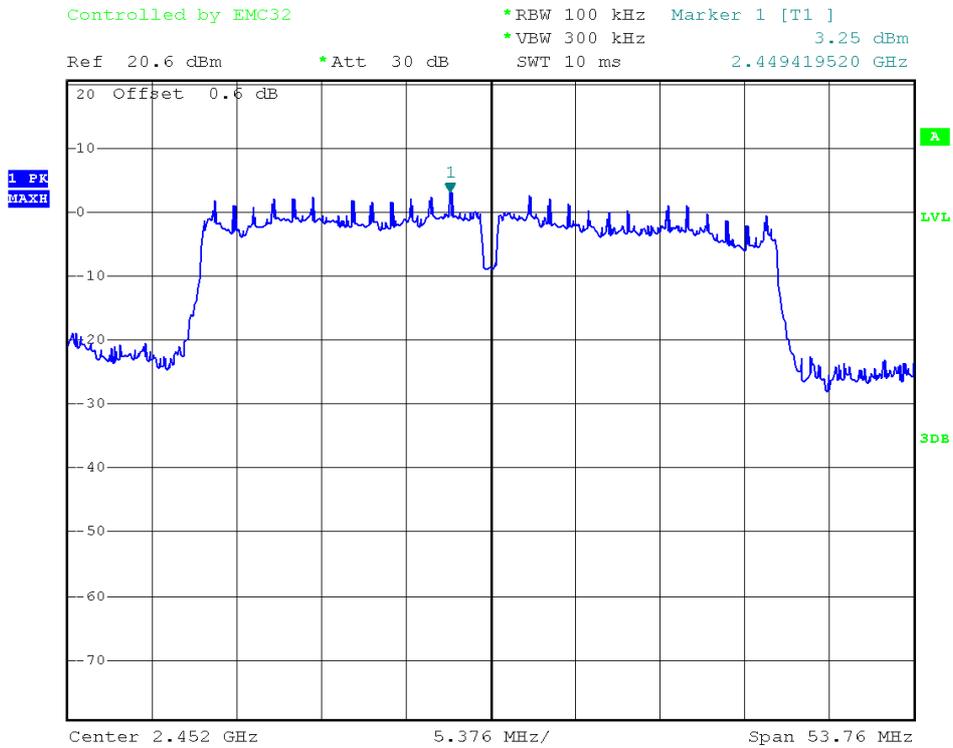


INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

Channel 9 (2452MHz) Reference Level: 3.25dBm ANT 1

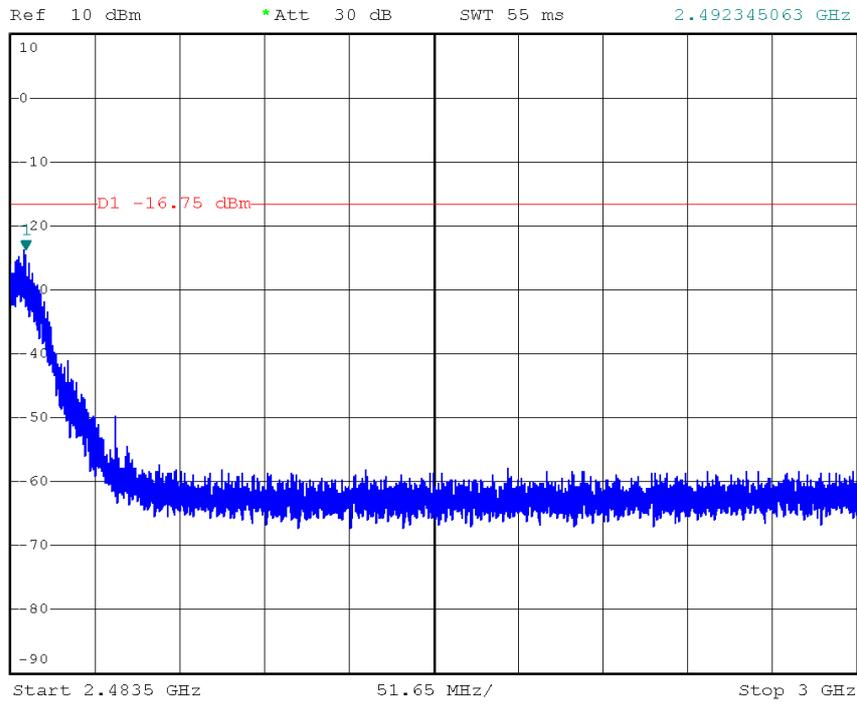


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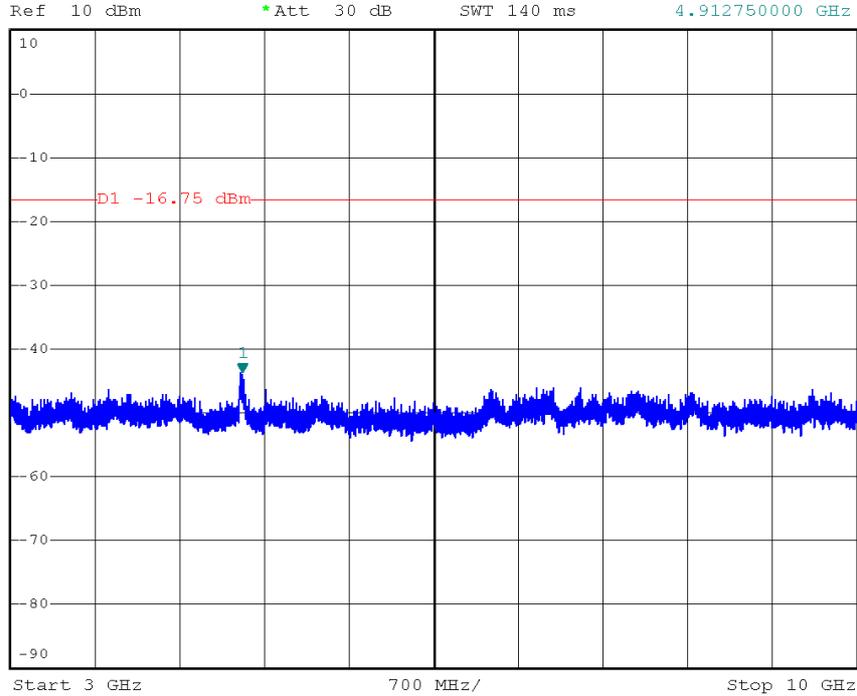
INTERTEK TESTING SERVICES



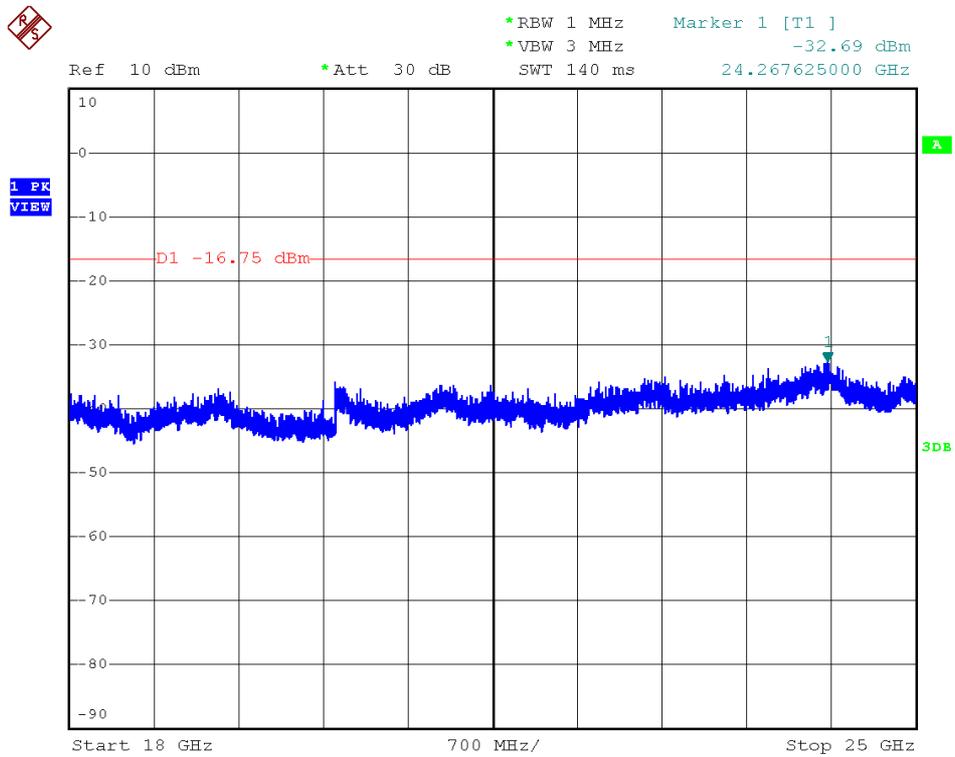
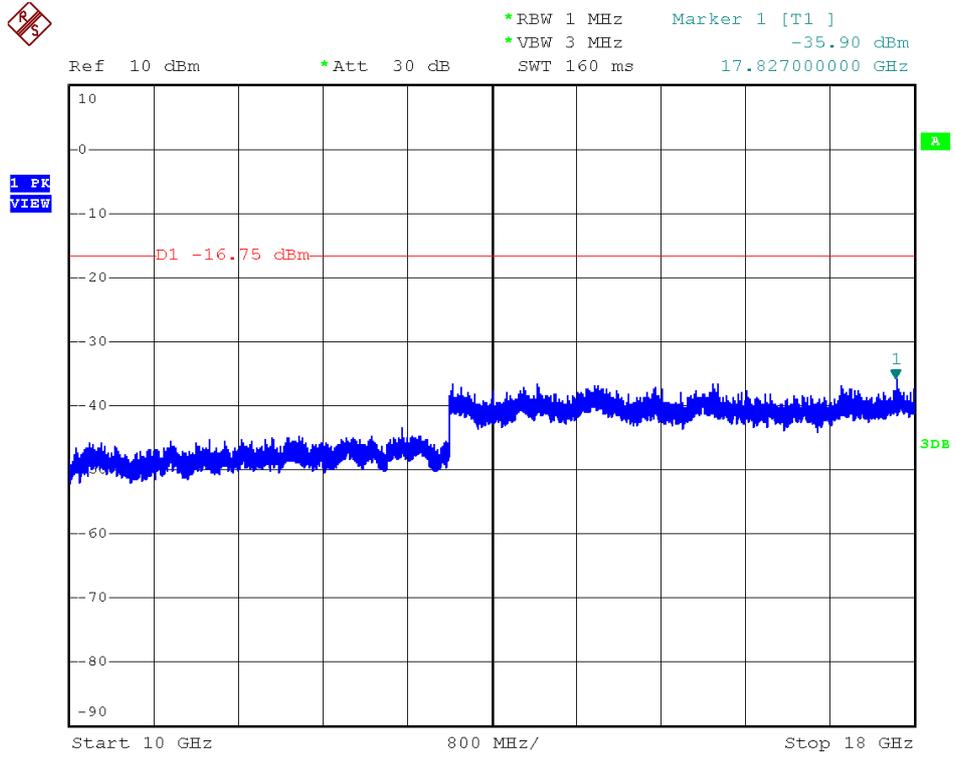
*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz -23.74 dBm
SWT 55 ms 2.492345063 GHz



*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -43.77 dBm
SWT 140 ms 4.912750000 GHz



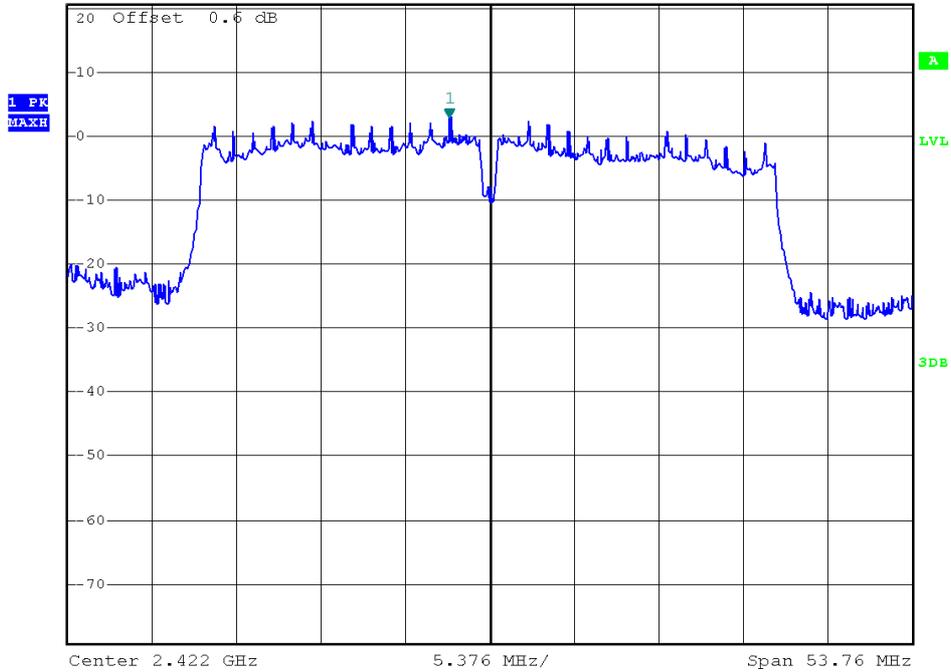
INTERTEK TESTING SERVICES



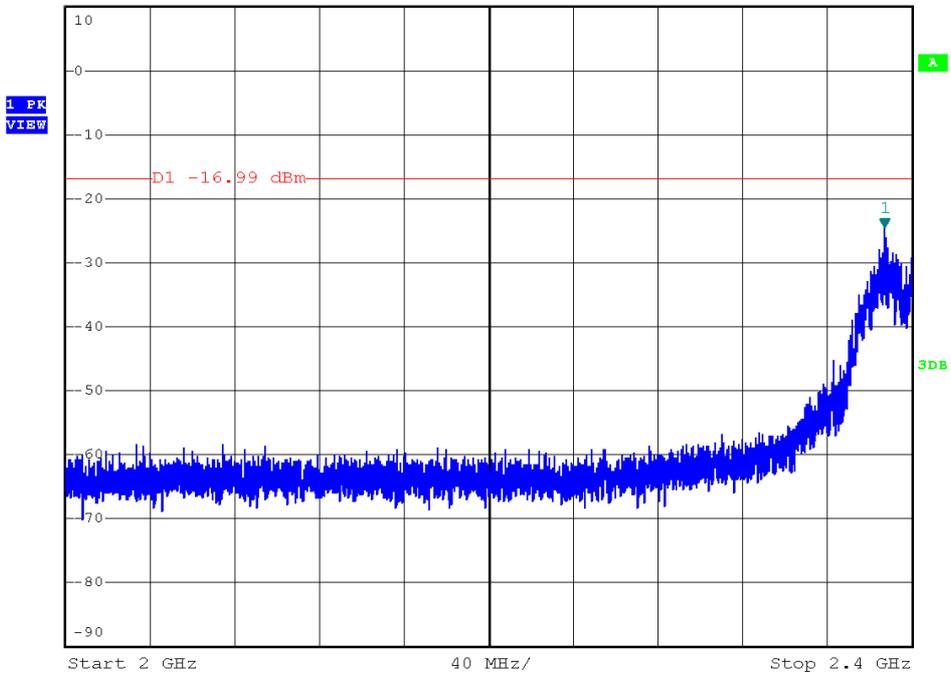
INTERTEK TESTING SERVICES

Channel 3 (2422MHz) Reference Level: 3.01dBm ANT 2

Controlled by EMC32 *RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 3.01 dBm
Ref 20.6 dBm *Att 30 dB SWT 10 ms 2.419419520 GHz

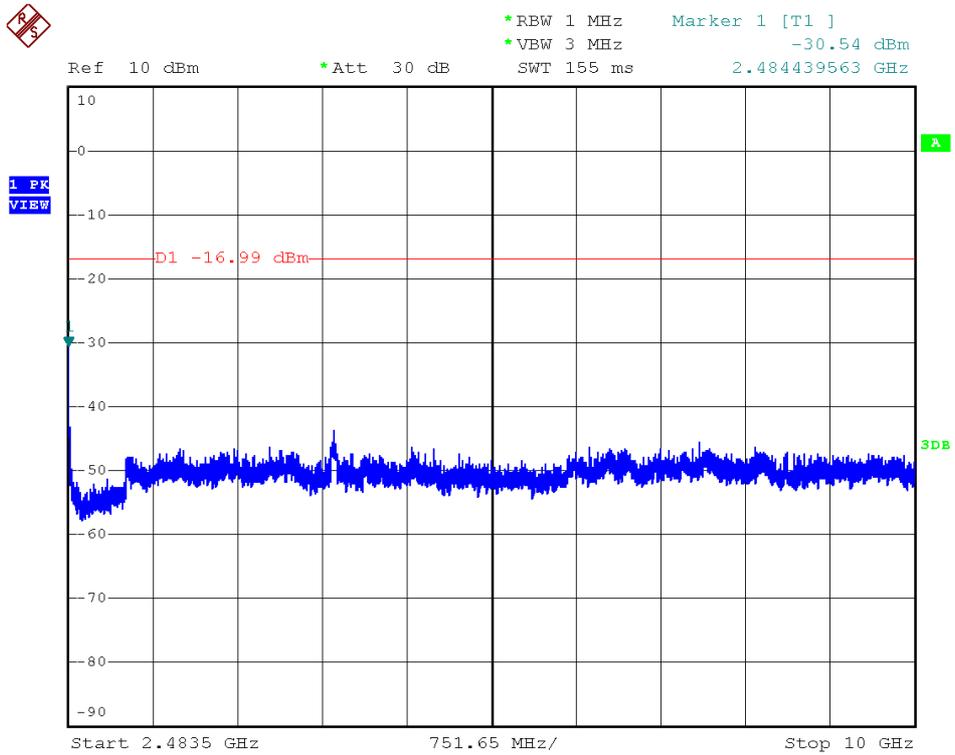
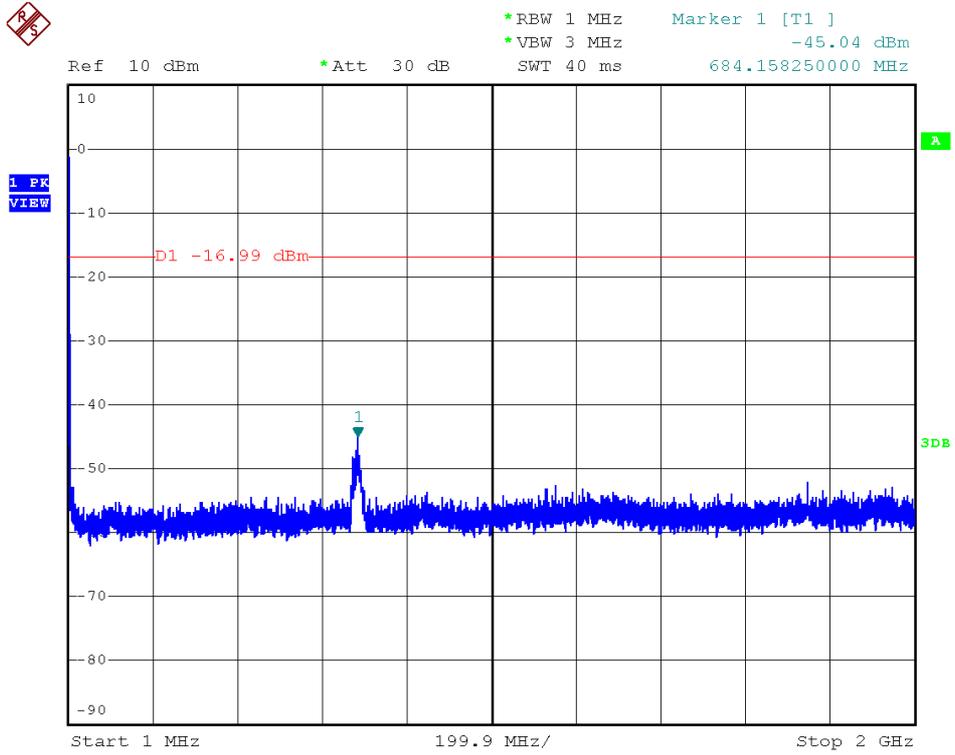


*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz -24.43 dBm
Ref 10 dBm *Att 30 dB SWT 40 ms 2.386950000 GHz

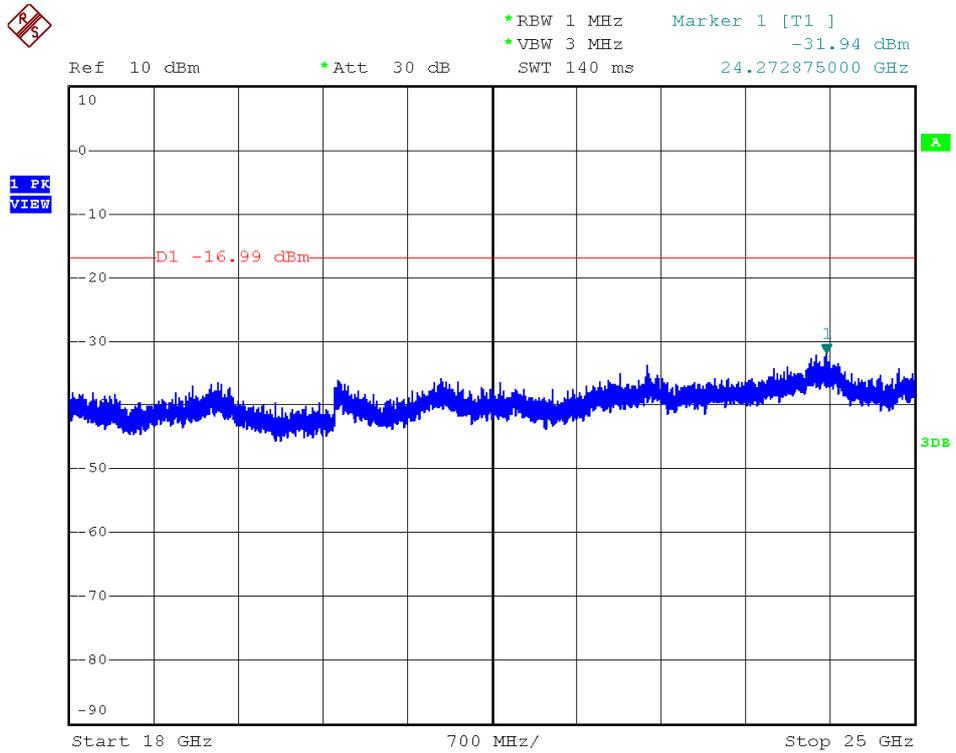
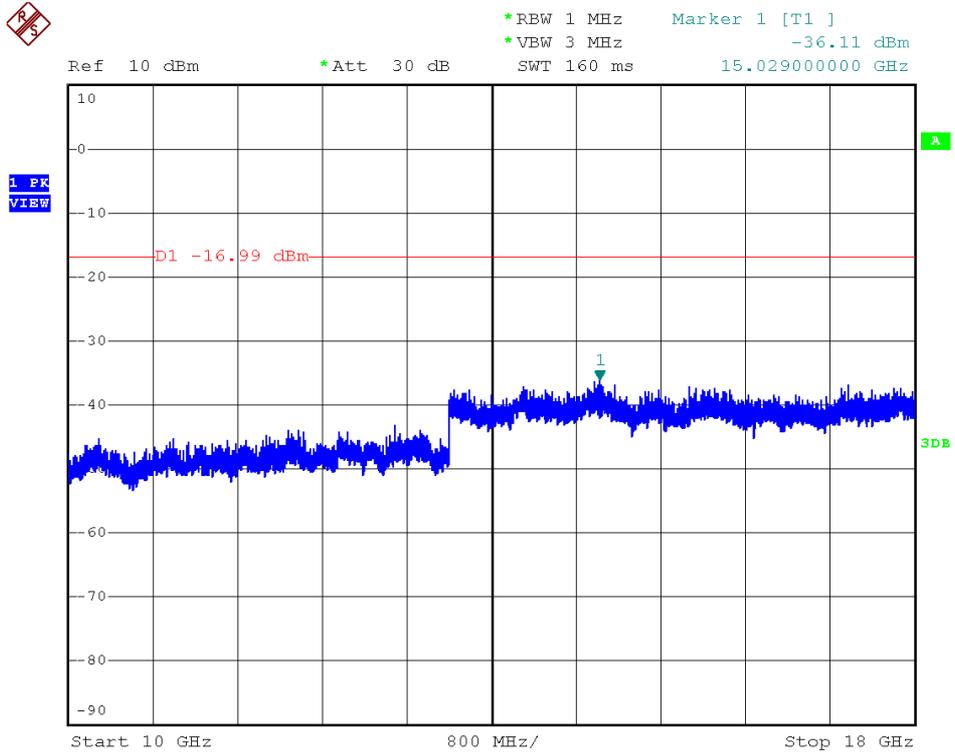


TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

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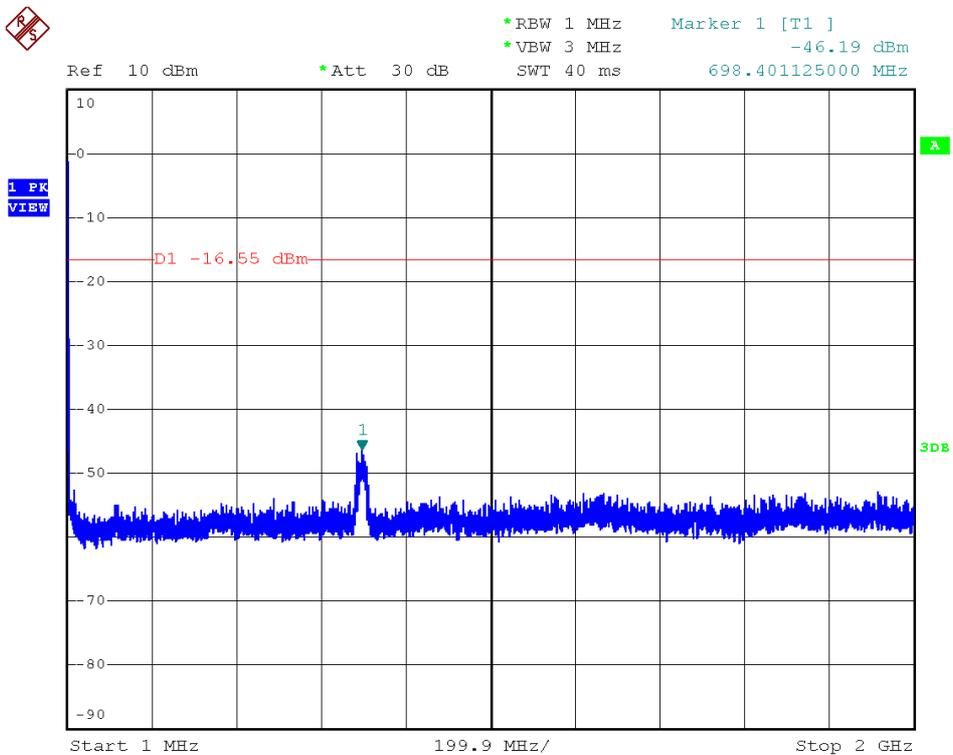
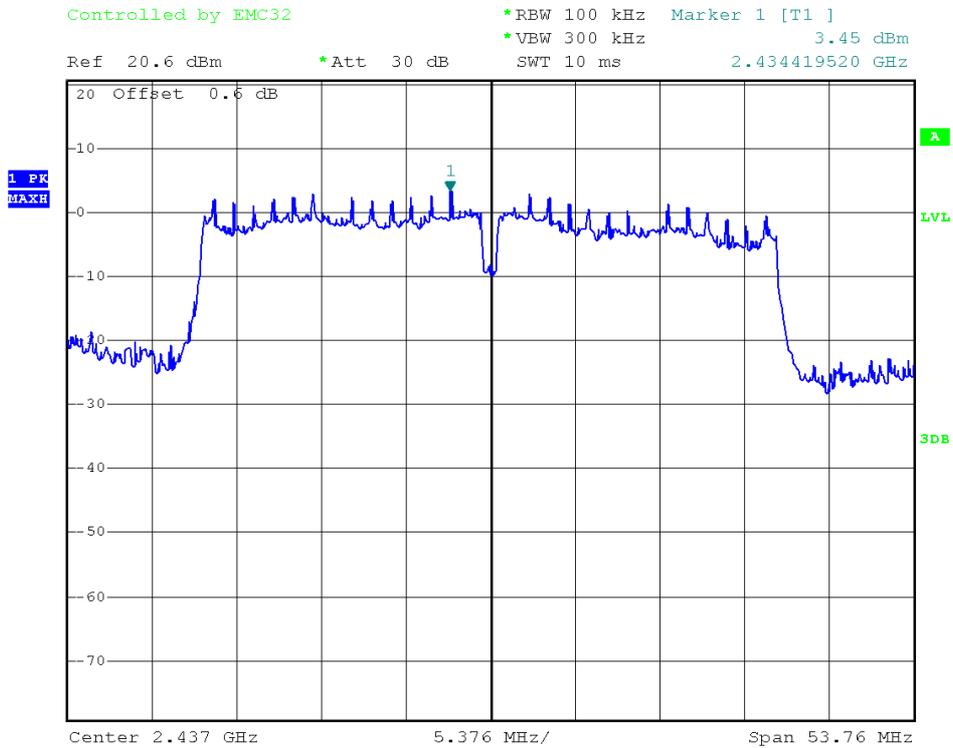


INTERTEK TESTING SERVICES



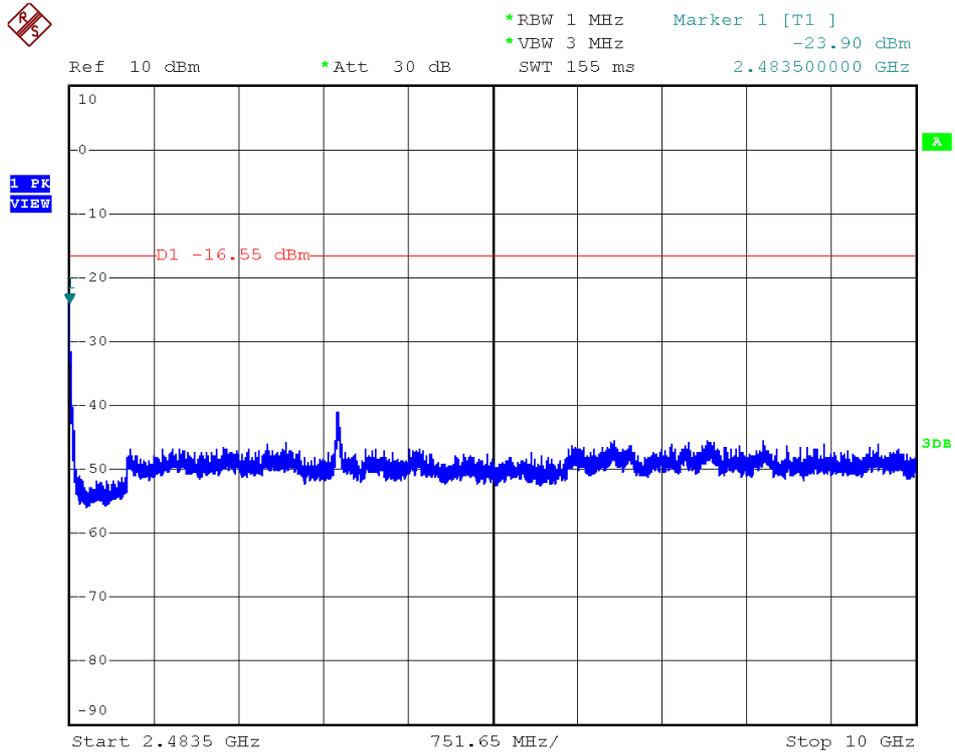
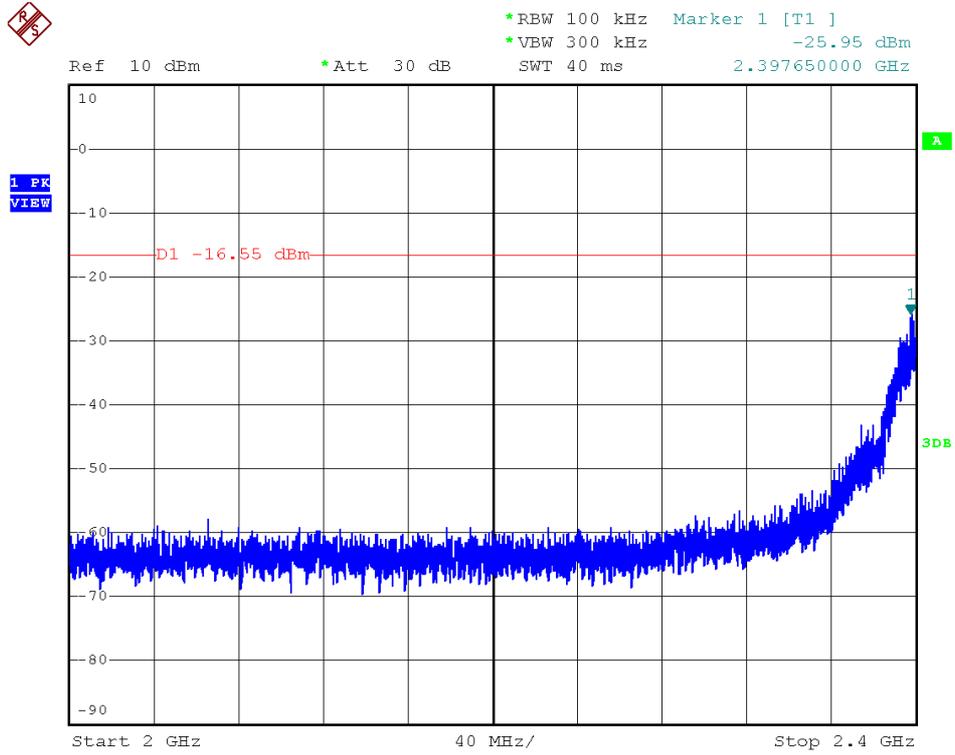
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 3.45dBm ANT 2

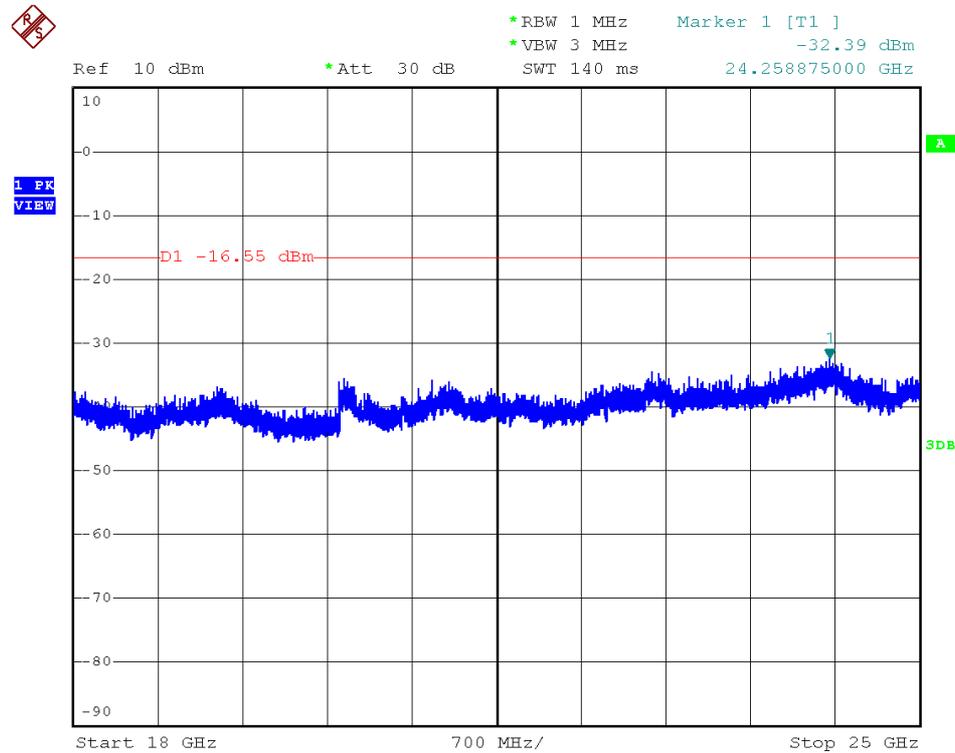
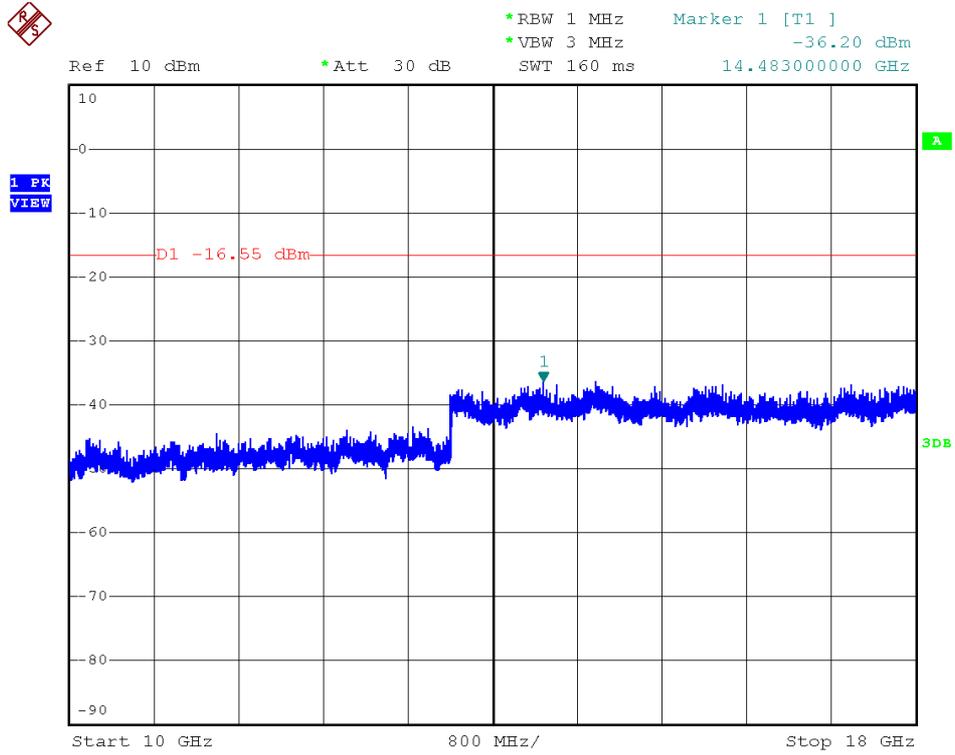


TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES

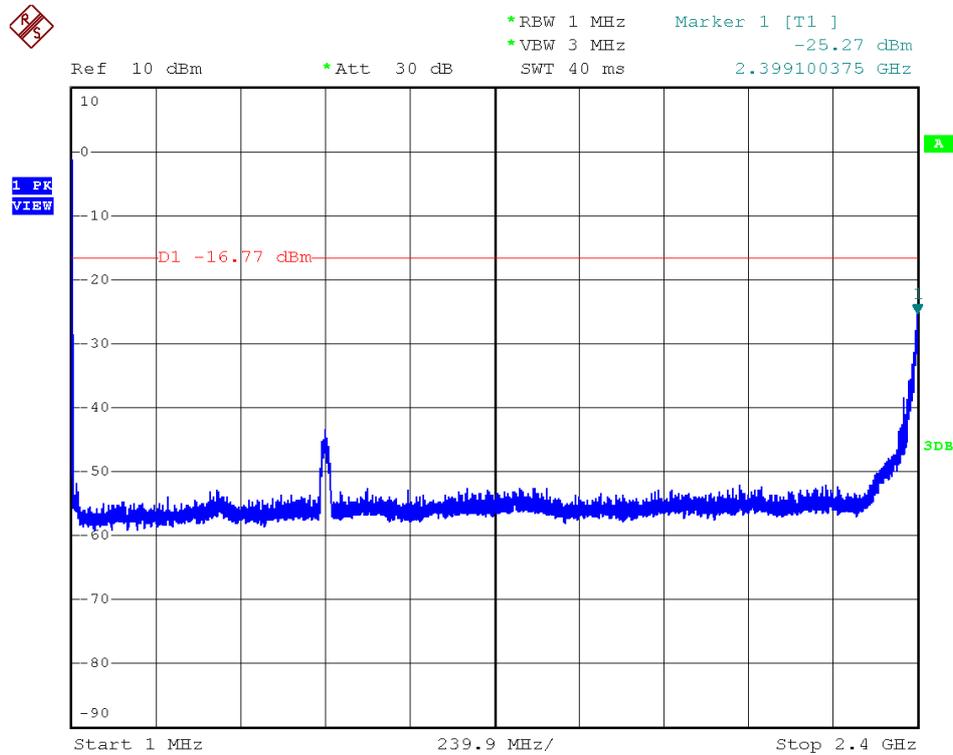
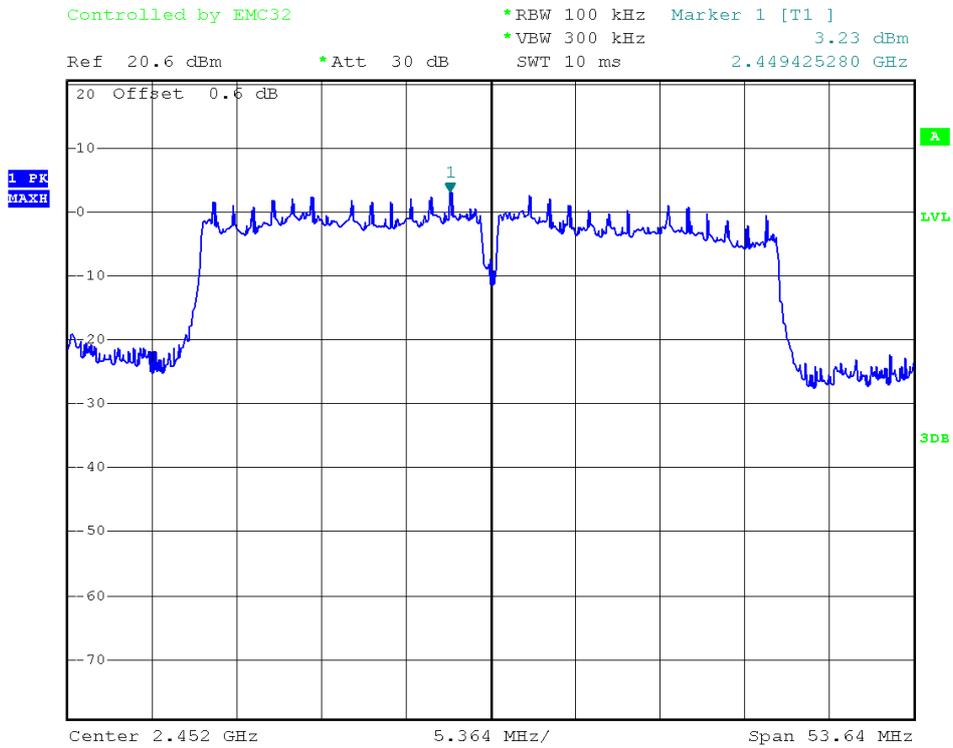


INTERTEK TESTING SERVICES



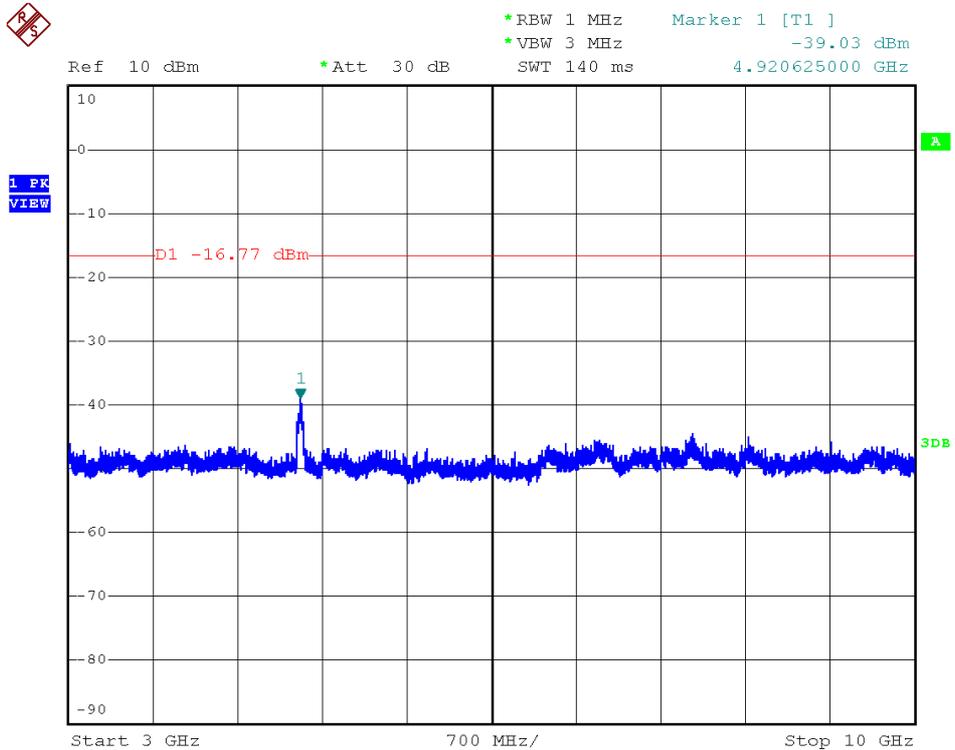
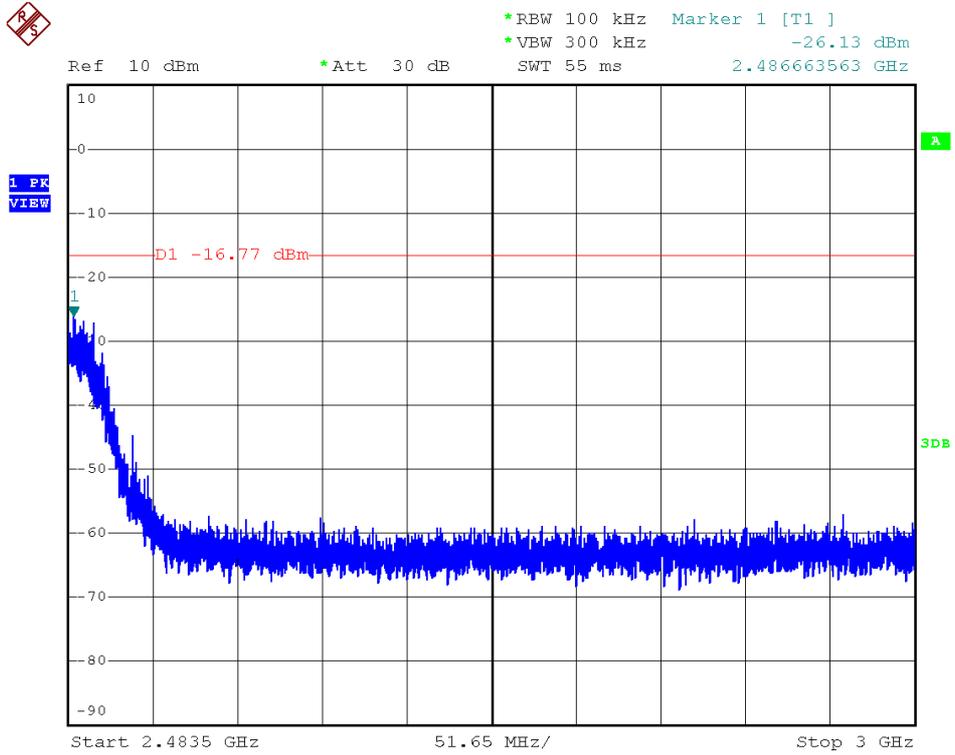
INTERTEK TESTING SERVICES

Channel 9 (2452MHz) Reference Level: 3.23dBm ANT 2

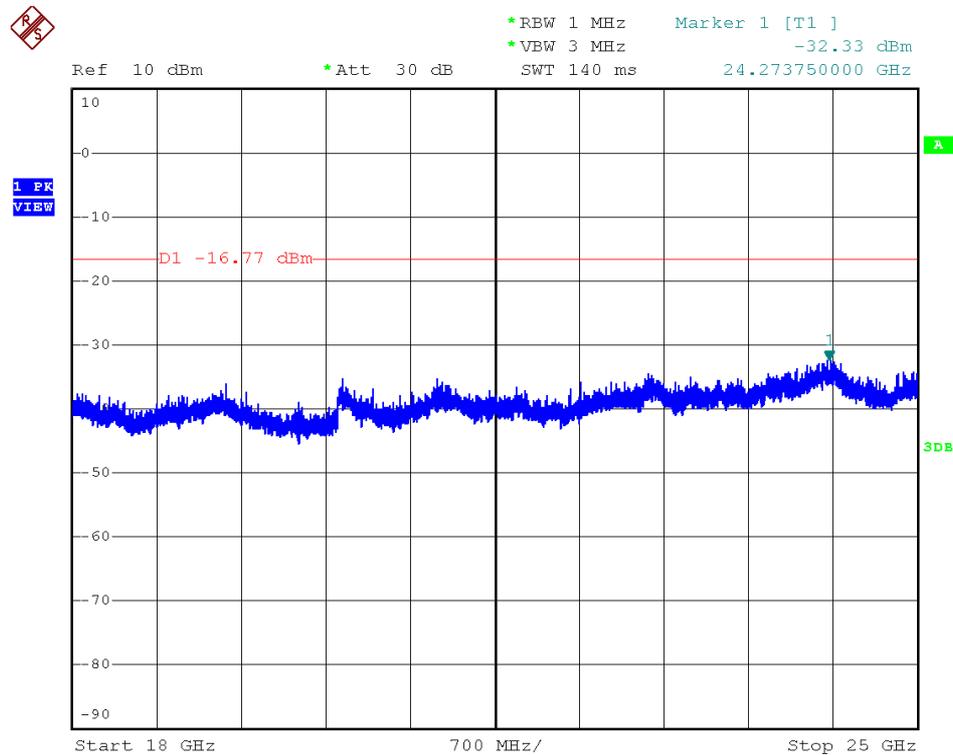
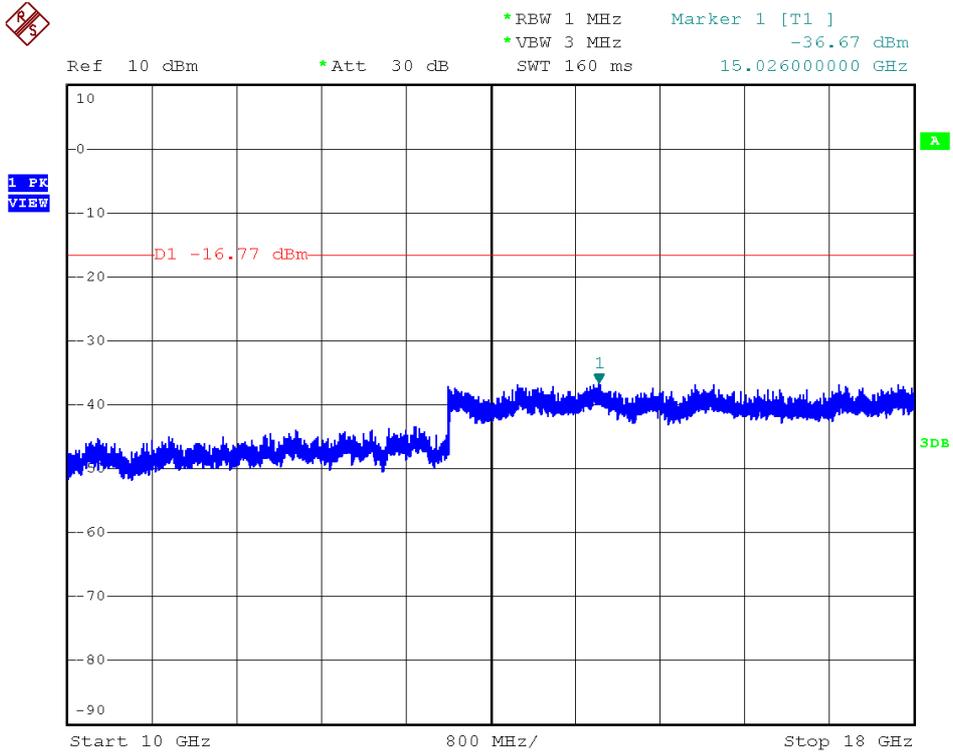


TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



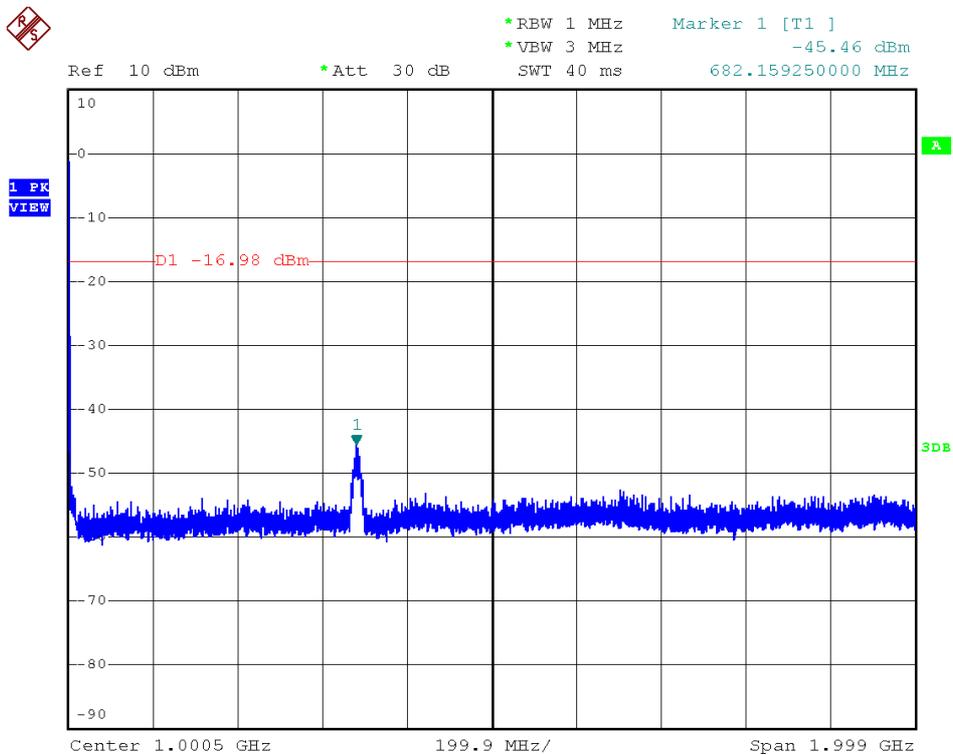
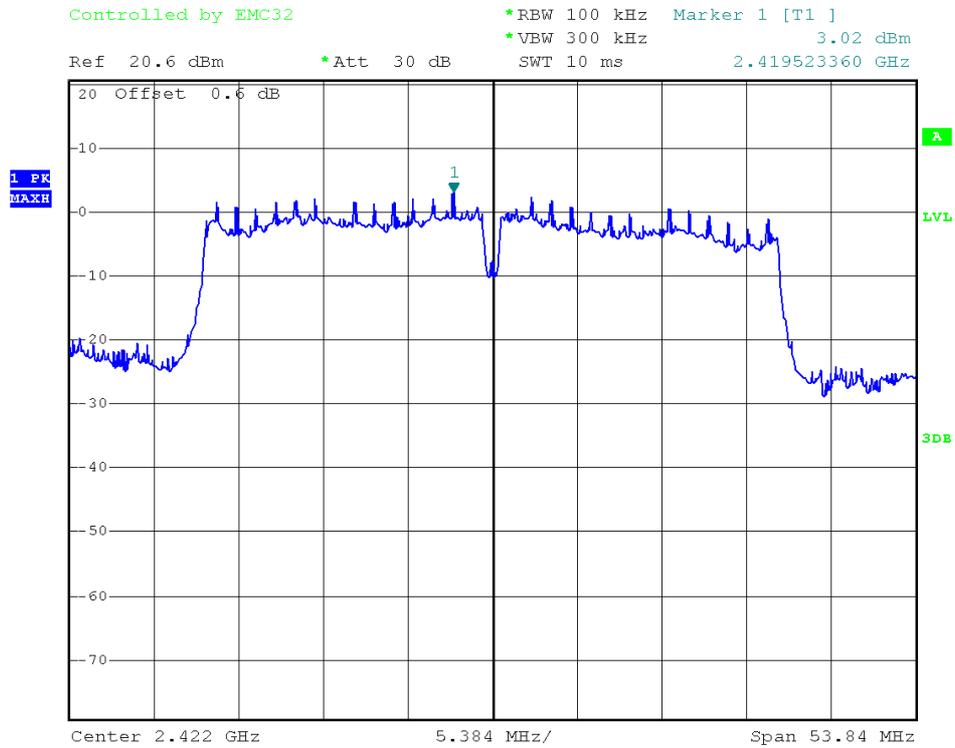
INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

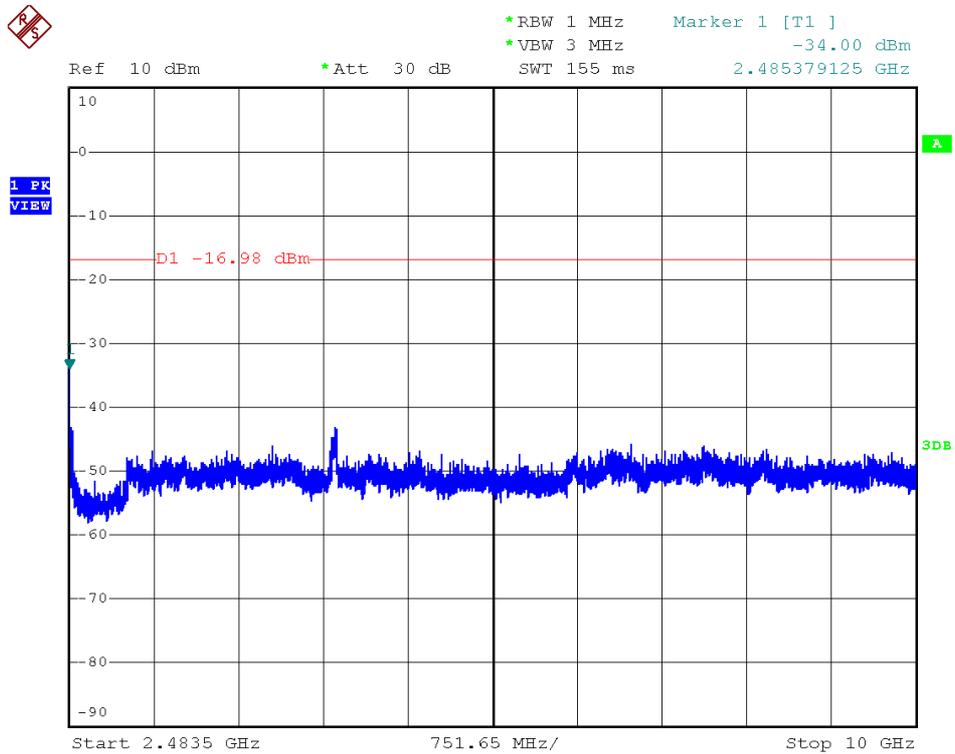
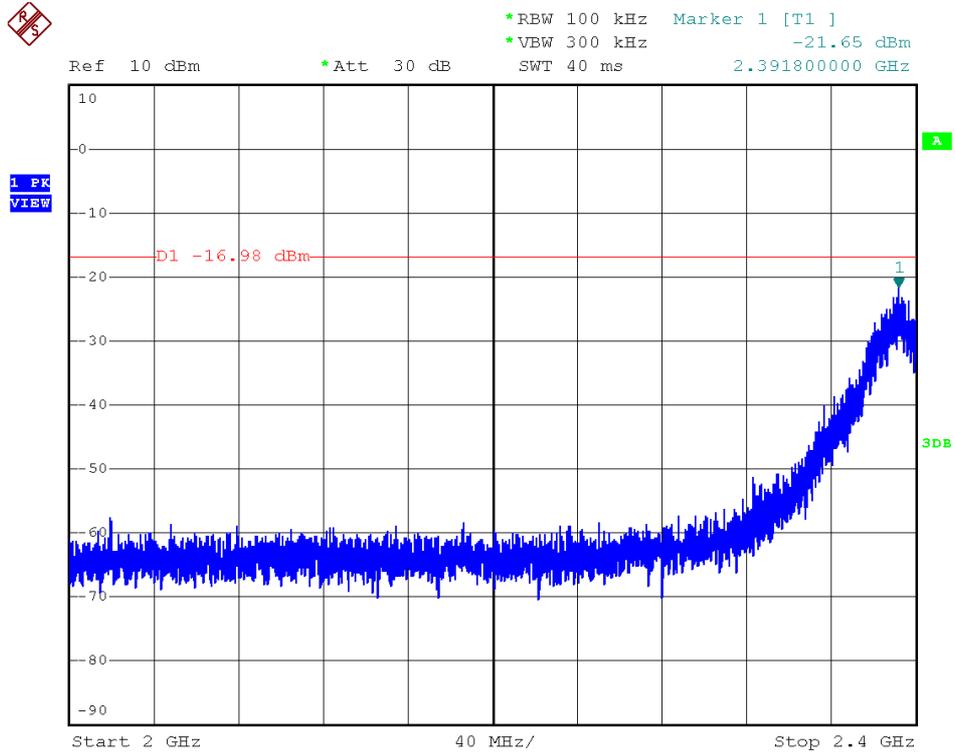
INTERTEK TESTING SERVICES

Channel 3 (2422MHz) Reference Level: 3.02dBm ANT 3



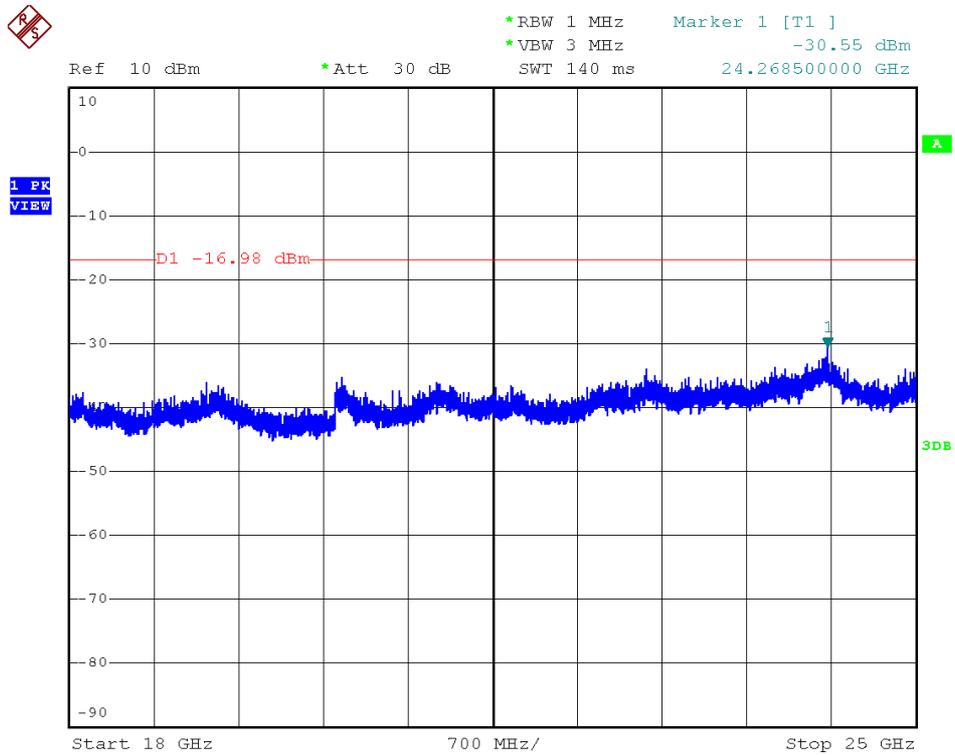
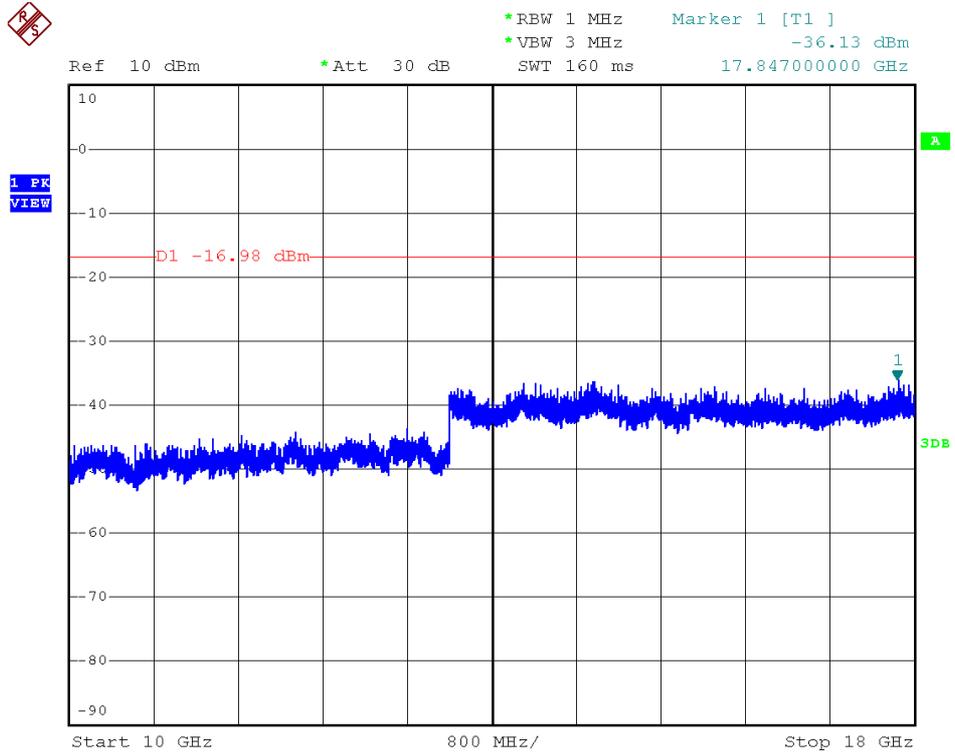
TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



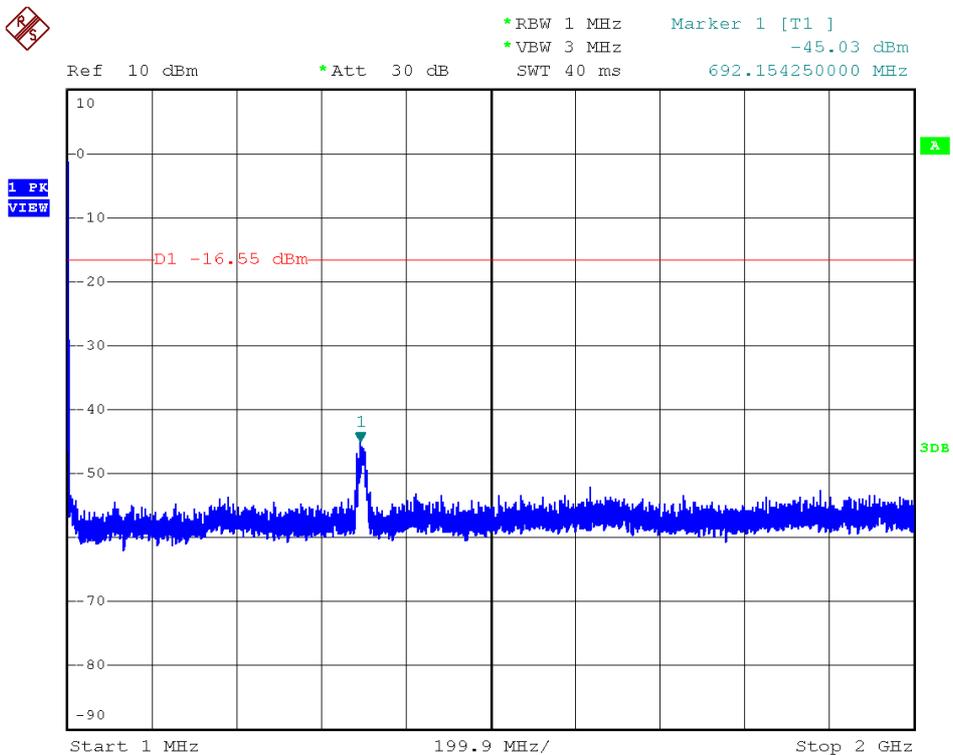
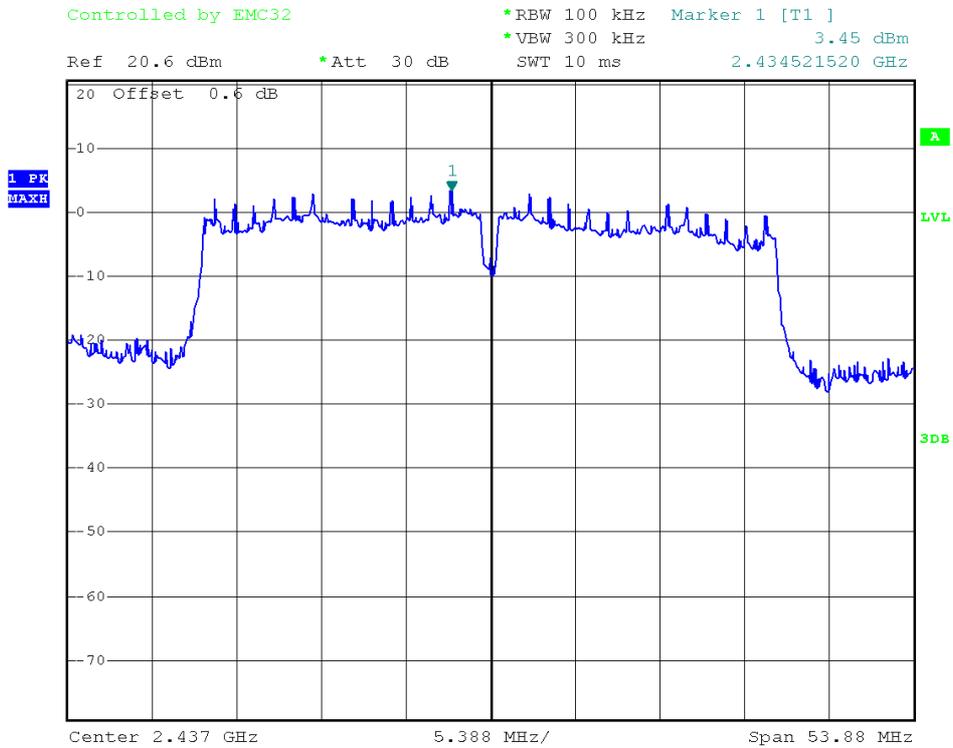
TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES



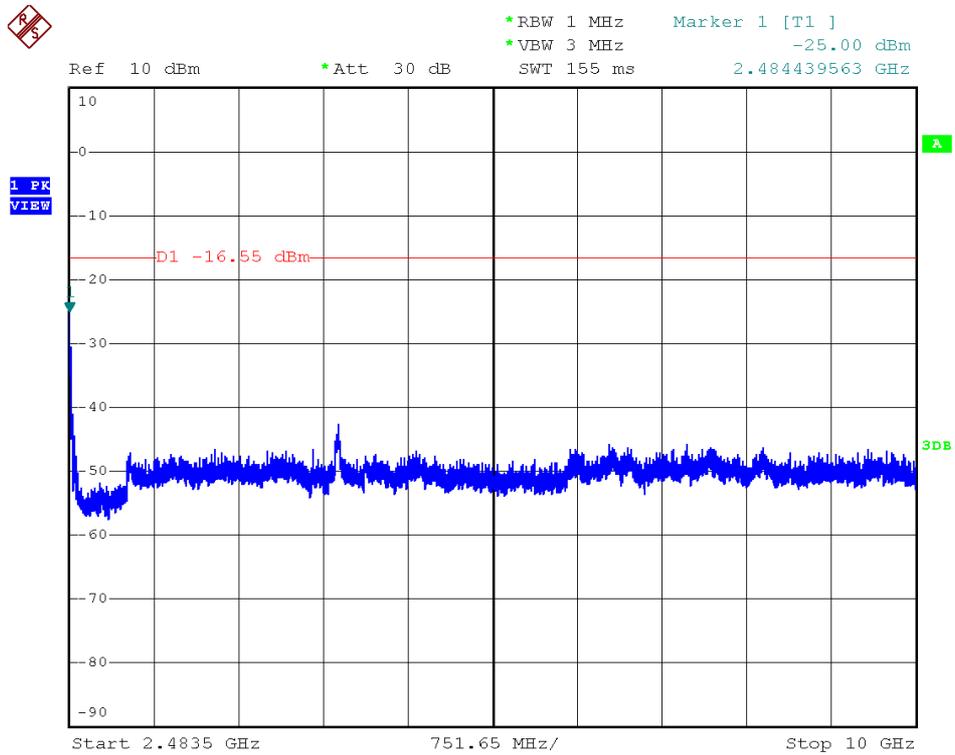
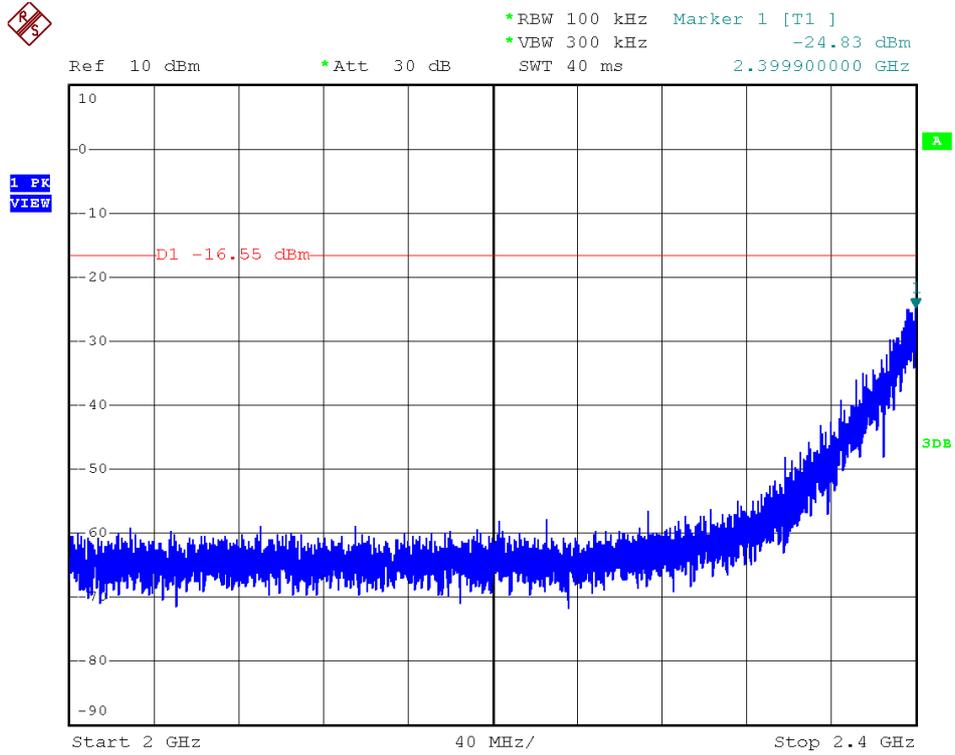
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 3.45dBm ANT 3

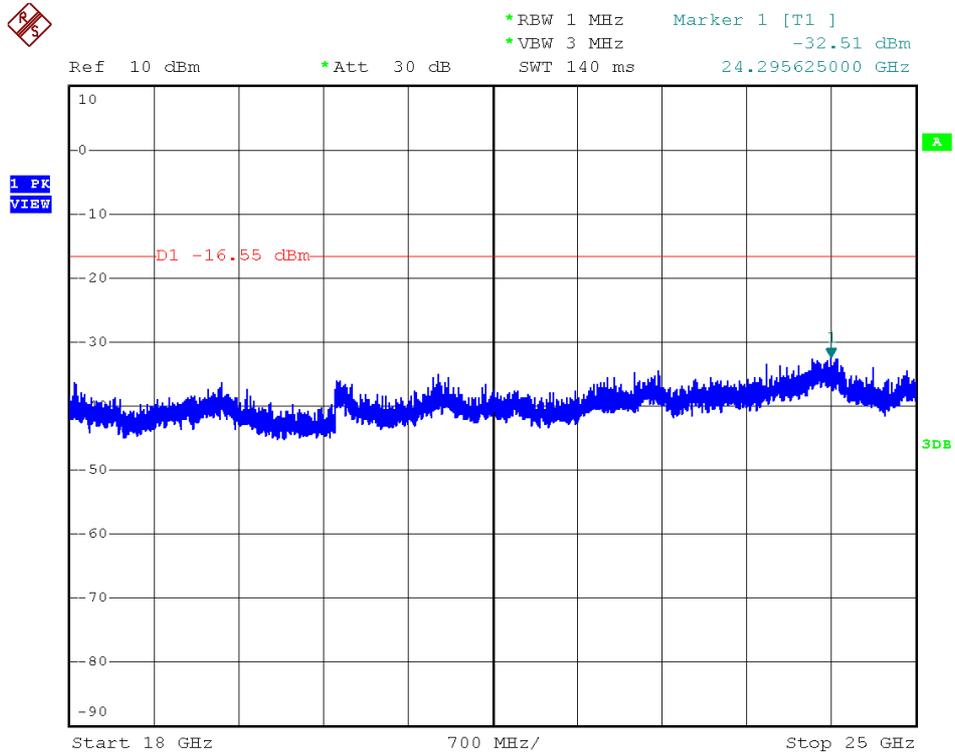
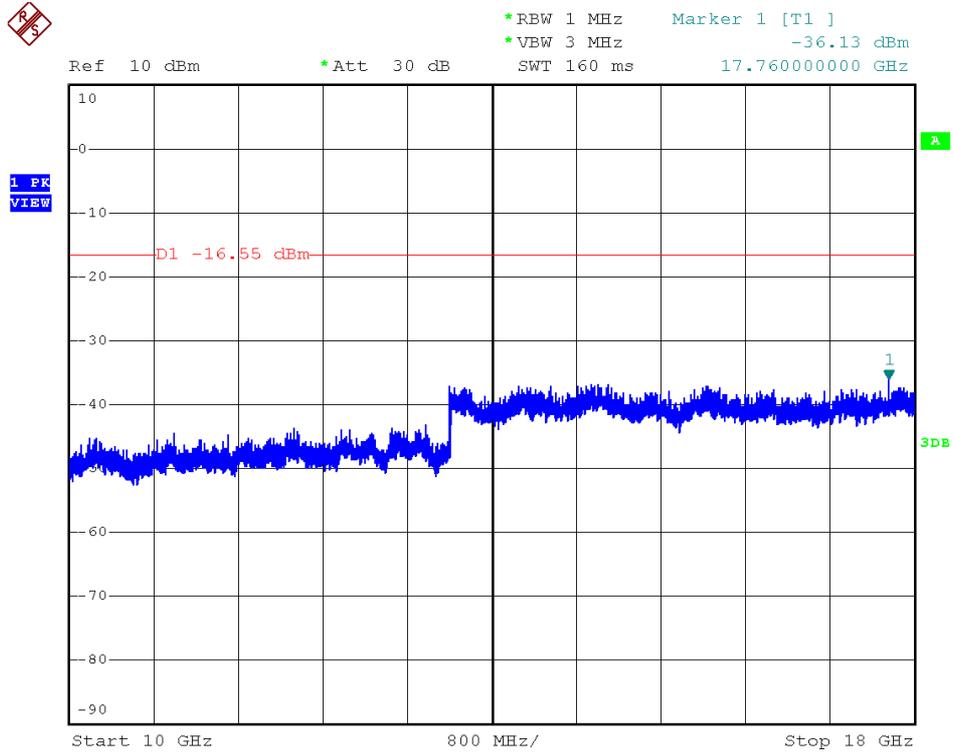


TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES

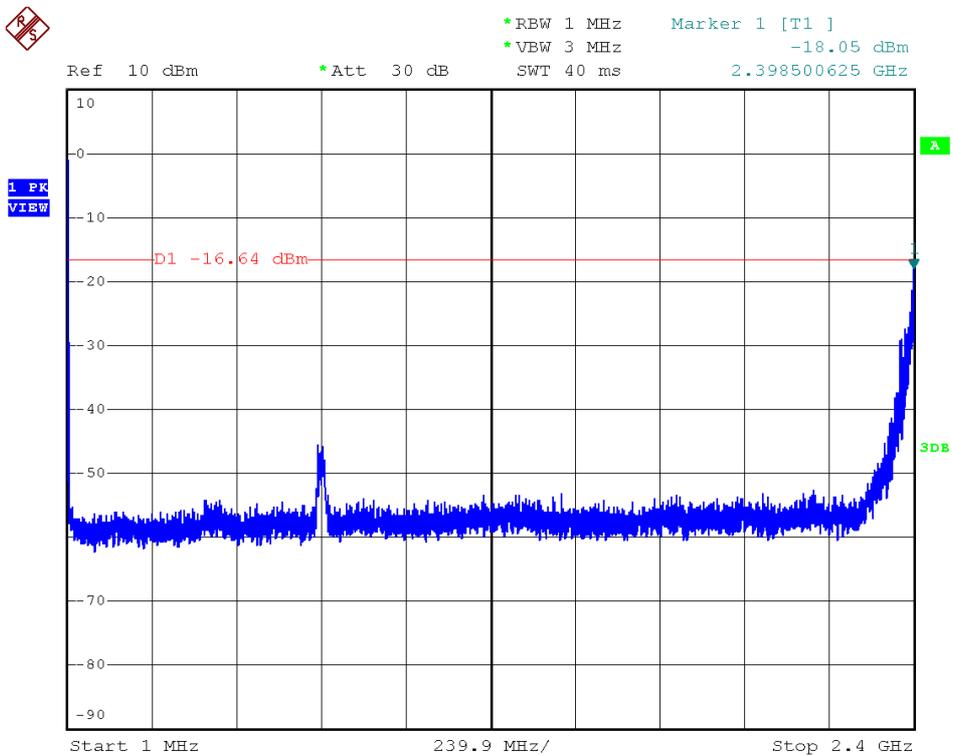
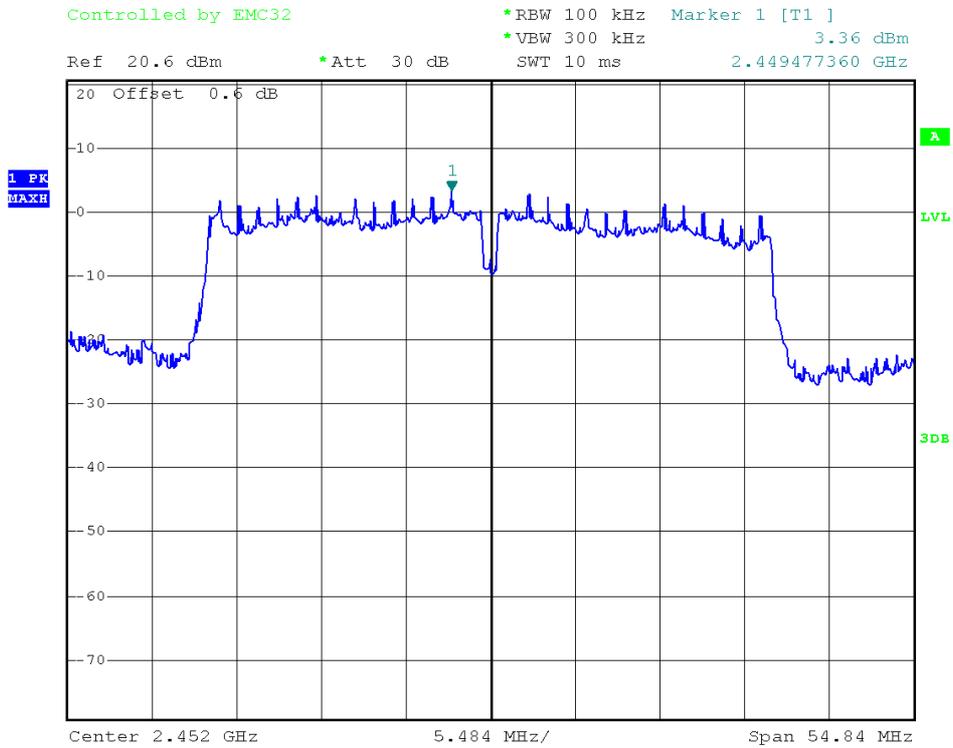


INTERTEK TESTING SERVICES



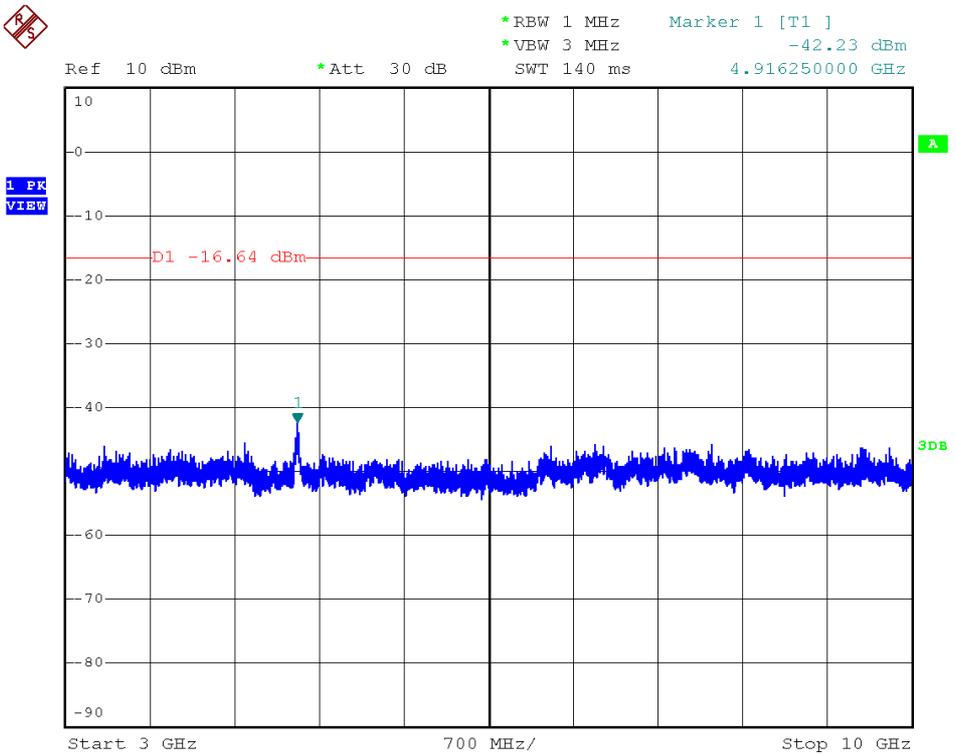
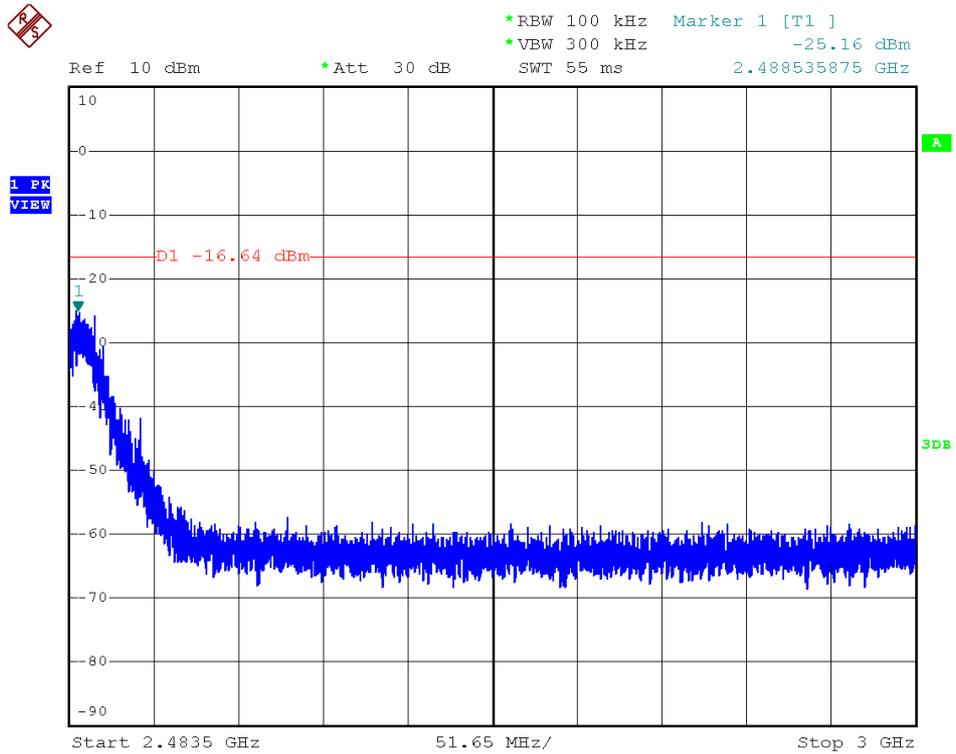
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Channel 9 (2452MHz) Reference Level: 3.36dBm ANT 3



TRF no.: FCC 15C_TX_b
FCC ID: QIS-WS330
Report No.: 130411010SZN-001

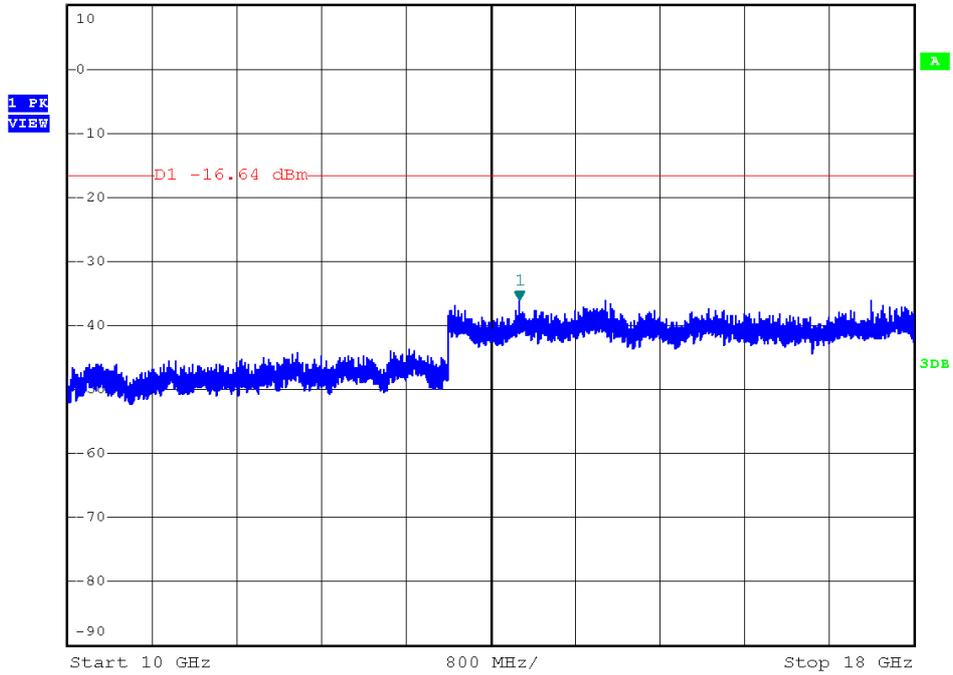
INTERTEK TESTING SERVICES



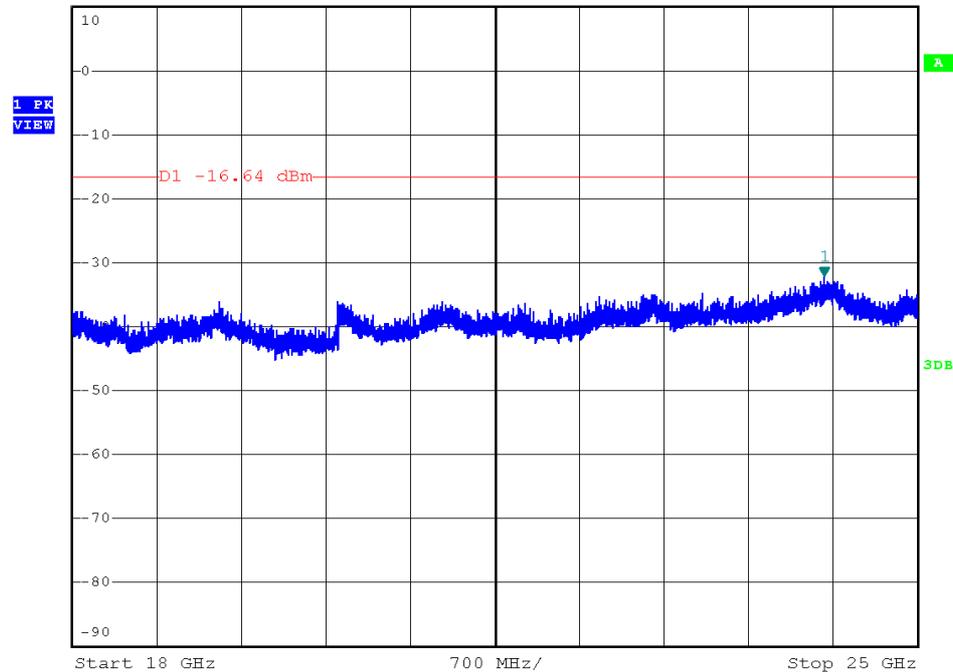
INTERTEK TESTING SERVICES



Ref 10 dBm *Att 30 dB *RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -35.95 dBm
SWT 160 ms 14.278000000 GHz



Ref 10 dBm *Att 30 dB *RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -32.17 dBm
SWT 140 ms 24.223875000 GHz



INTERTEK TESTING SERVICES

Applicant: HUAWEI TECHNOLOGIES CO., LTD.
Model: WS330

Date of Test: 15 April, 2013

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: HUAWEI TECHNOLOGIES CO., LTD.
Model: WS330

Date of Test: 15 April, 2013

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: HUAWEI TECHNOLOGIES CO., LTD.
Model: WS330

Date of Test: 15 April, 2013

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 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$\begin{aligned} RA &= 62.0 \text{ dB}\mu\text{V} \\ AF &= 7.4 \text{ dB} \\ CF &= 1.6 \text{ dB} \\ AG &= 29.0 \text{ dB} \\ PD &= 0 \text{ dB} \\ FS &= 62 + 7.4 + 1.6 - 29 + 0 = 42 \text{ dB}\mu\text{V/m} \end{aligned}$$

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

INTERTEK TESTING SERVICES

Applicant: HUAWEI TECHNOLOGIES CO., LTD.
Model: WS330

Date of Test: 15 April, 2013

4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission (802.11n-HT20 MIMO, Ant2+Ant3) at 7311 MHz is passed by 5.0 dB margin.

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

INTERTEK TESTING SERVICES

Applicant: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Worst Case Operating Mode: 802.11n-HT20 SISO Channel 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	98.367	45.0	20.0	8.4	33.4	43.5	-10.1
Horizontal	299.660	42.0	20.0	14.9	36.9	46.0	-9.1
Horizontal	499.965	39.4	20.0	18.4	37.8	46.0	-8.2
Vertical	85.290	41.8	20.0	7.0	28.8	40.0	-11.2
Vertical	98.385	45.9	20.0	8.4	34.3	43.5	-9.2
Vertical	499.968	39.5	20.0	18.4	31.6	46.0	-14.4

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: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11b Channel 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	52.3	36.1	34.1	50.3	74.0	-23.7
Horizontal	*2388.920	66.5	36.7	27.2	57.0	74.0	-17.0

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	45.7	36.1	34.1	43.7	54.0	-10.3
Horizontal	*2388.920	54.2	36.7	27.2	44.7	54.0	-9.3

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: QIS-WS330

Report No.: 130411010SZN-001

167

INTERTEK TESTING SERVICES

Applicant: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11b Channel 6

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	51.7	36.1	34.5	50.1	74.0	-23.9
Horizontal	*7311.000	49.9	35.6	37.1	51.4	74.0	-22.6

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	45.0	36.1	34.5	43.4	54.0	-10.6
Horizontal	*7311.000	40.0	35.6	37.1	41.5	54.0	-12.5

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: QIS-WS330

Report No.: 130411010SZN-001

168

INTERTEK TESTING SERVICES

Applicant: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11b Channel 11

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	49.5	36.1	34.7	48.1	74.0	-25.9
Horizontal	*2484.100	64.1	36.7	27.7	55.1	74.0	-18.9

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	41.8	36.1	34.7	40.4	54.0	-13.6
Horizontal	*2484.100	53.0	36.7	27.7	44.0	54.0	-10.0

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11g Channel 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	55.2	36.1	34.1	53.2	74.0	-20.9
Horizontal	*2389.580	67.2	36.7	27.2	57.7	74.0	-16.3

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	43.4	36.1	34.1	41.4	54.0	-12.6
Horizontal	*2389.580	54.7	36.7	27.2	45.2	54.0	-8.8

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11g Channel 6

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	54.3	36.1	34.5	52.7	74.0	-21.3
Horizontal	*7311.000	52.3	35.6	37.1	53.8	74.0	-20.2

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	43.3	36.1	34.5	41.7	54.0	-12.3
Horizontal	*7311.000	40.4	35.6	37.1	41.9	54.0	-12.1

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: QIS-WS330

Report No.: 130411010SZN-001

171

INTERTEK TESTING SERVICES

Applicant: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11g Channel 11

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	50.1	36.1	34.7	48.7	74.0	-25.3
Horizontal	*2484.340	69.2	36.7	27.7	60.2	74.0	-13.8

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	38.2	36.1	34.7	36.8	54.0	-17.2
Horizontal	*2484.340	56.5	36.7	27.7	47.5	54.0	-6.5

- NOTES: 1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
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: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11n-HT20 SISO Channel 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	53.7	36.1	34.1	51.7	74.0	-22.3
Horizontal	*2389.860	67.9	36.7	27.2	58.4	74.0	-15.6

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	42.0	36.1	34.1	40.0	54.0	-14.0
Horizontal	*2389.860	56.1	36.7	27.2	46.6	54.0	-7.4

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11n-HT20 SISO Channel 6

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	52.8	36.1	34.5	51.2	74.0	-22.8
Horizontal	*7311.000	55.1	35.6	37.1	56.6	74.0	-17.4

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	40.9	36.1	34.5	39.3	54.0	-14.7
Horizontal	*7311.000	40.1	35.6	37.1	41.6	54.0	-12.4

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11n-HT20 SISO Channel 11

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	49.9	36.1	34.7	48.5	74.0	-25.5
Horizontal	*2483.780	74.2	36.7	27.7	65.2	74.0	-8.8

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	39.2	36.1	34.7	37.8	54.0	-16.2
Horizontal	*2483.780	57.6	36.7	27.7	48.6	54.0	-5.4

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT20 MIMO Channel 1 (Ant1+Ant2)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	52.6	36.1	34.1	50.6	74.0	-23.4
Horizontal	*2389.593	66.4	36.7	27.2	56.9	74.0	-17.1

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	45.5	36.1	34.1	43.5	54.0	-10.5
Horizontal	*2385.593	56.2	36.7	27.2	46.7	54.0	-7.3

- NOTES: 1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT20 MIMO Channel 6 (Ant1+Ant2)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	54.6	36.1	34.5	53.0	74.0	-21.0
Horizontal	*7311.000	58.3	35.6	37.1	59.8	74.0	-14.2

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	44.8	36.1	34.5	43.2	54.0	-10.8
Horizontal	*7311.000	45.4	35.6	37.1	46.9	54.0	-7.1

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11n-HT20 MIMO Channel 11 (Ant1+Ant2)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	49.0	36.1	34.7	47.6	74.0	-26.4
Horizontal	*2484.658	69.3	36.7	27.7	60.3	74.0	-13.7

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	44.9	36.1	34.7	43.5	54.0	-10.5
Horizontal	*2484.658	54.6	36.7	27.7	45.6	54.0	-8.4

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT20 MIMO Channel 1 (Ant1+Ant3)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	54.8	36.1	34.1	52.8	74.0	-21.2
Horizontal	*2388.542	72.9	36.7	27.2	63.4	74.0	-10.6

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	47.0	36.1	34.1	45.0	54.0	-9.0
Horizontal	*2388.542	57.4	36.7	27.2	47.9	54.0	-6.1

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT20 MIMO Channel 6 (Ant1+Ant3)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	54.8	36.1	34.5	53.2	74.0	-20.8
Horizontal	*7311.000	58.3	35.6	37.1	59.8	74.0	-14.2

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	46.1	36.1	34.5	44.5	54.0	-9.5
Horizontal	*7311.000	46.5	35.6	37.1	48.0	54.0	-6.0

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11n-HT20 MIMO Channel 11 (Ant1+Ant3)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	52.2	36.1	34.7	50.8	74.0	-23.2
Horizontal	*2484.970	66.2	36.7	27.7	57.2	74.0	-16.8

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	44.9	36.1	34.7	43.5	54.0	-10.5
Horizontal	*2484.970	56.9	36.7	27.7	47.9	54.0	-6.1

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT20 MIMO Channel 1 (Ant2+Ant3)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	54.0	36.1	34.1	52.0	74.0	-22.0
Horizontal	*2387.578	69.8	36.7	27.2	60.3	74.0	-13.7

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	44.0	36.1	34.1	42.0	54.0	-12.0
Horizontal	*2387.578	56.0	36.7	27.2	46.5	54.0	-7.5

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT20 MIMO Channel 6 (Ant2+Ant3)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	56.5	36.1	34.5	54.9	74.0	-19.1
Horizontal	*7311.000	61.5	35.6	37.1	63.0	74.0	-11.0

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	46.4	36.1	34.5	44.8	54.0	-9.2
Horizontal	*7311.000	47.5	35.6	37.1	49.0	54.0	-5.0

- NOTES: 1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
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: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11n-HT20 MIMO Channel 11 (Ant2+Ant3)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	57.3	36.1	34.7	55.9	74.0	-18.1
Horizontal	*2484.096	74.0	36.7	27.7	65.0	74.0	-9.0

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	45.4	36.1	34.7	44.0	54.0	-10.0
Horizontal	*2484.096	56.9	36.7	27.7	47.9	54.0	-6.1

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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

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Report No.: 130411010SZN-001

184

INTERTEK TESTING SERVICES

Applicant: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11n-HT40 SISO Channel 3

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4844.000	53.6	36.1	34.6	52.1	74.0	-21.9
Horizontal	*2388.051	73.0	36.7	27.2	63.5	74.0	-10.5

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4844.000	44.4	36.1	34.6	42.9	54.0	-11.1
Horizontal	*2388.051	54.5	36.7	27.2	45.0	54.0	-9.0

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11n-HT40 SISO Channel 6

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	51.6	36.1	34.5	50.0	74.0	-24.0
Horizontal	*7311.000	55.8	35.6	37.1	57.3	74.0	-16.7

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	43.7	36.1	34.5	42.1	54.0	-11.9
Horizontal	*7311.000	43.7	35.6	37.1	45.2	54.0	-8.8

- NOTES: 1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
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: HUAWEI TECHNOLOGIES CO., LTD.

Date of Test: 15 April, 2013

Model: WS330

Mode: 802.11n-HT40 SISO Channel 9

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4904.000	52.0	36.1	34.8	50.7	74.0	-23.3
Horizontal	*2484.953	66.1	36.7	27.7	57.1	74.0	-16.9

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4904.000	43.3	36.1	34.8	42.0	54.0	-12.0
Horizontal	*2484.953	54.0	36.7	27.7	45.0	54.0	-9.0

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT40 MIMO Channel 3 (Ant1+Ant2)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4844.000	54.4	36.1	34.6	52.9	74.0	-21.1
Horizontal	*2387.242	69.7	36.7	27.2	60.2	74.0	-13.8

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4844.000	44.0	36.1	34.6	42.5	54.0	-11.5
Horizontal	*2387.242	55.5	36.7	27.2	46.0	54.0	-8.0

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT40 MIMO Channel 6 (Ant1+Ant2)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	55.5	36.1	34.5	53.9	74.0	-20.1
Horizontal	*7311.000	59.8	35.6	37.1	61.3	74.0	-12.7

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	43.6	36.1	34.5	42.0	54.0	-12.0
Horizontal	*7311.000	43.5	35.6	37.1	45.0	54.0	-9.0

- NOTES: 1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT40 MIMO Channel 9 (Ant1+Ant2)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4904.000	54.2	36.1	34.8	52.9	74.0	-21.1
Horizontal	*2484.023	72.0	36.7	27.7	63.0	74.0	-11.0

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4904.000	43.2	36.1	34.8	41.9	54.0	-12.1
Horizontal	*2484.023	54.8	36.7	27.7	45.8	54.0	-8.2

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT40 MIMO Channel 3 (Ant1+Ant3)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4844.000	55.0	36.1	34.6	53.5	74.0	-20.5
Horizontal	*2389.956	70.5	36.7	27.2	61.0	74.0	-13.0

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4844.000	43.6	36.1	34.6	42.1	54.0	-11.9
Horizontal	*2389.956	55.4	36.7	27.2	45.9	54.0	-8.1

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT40 MIMO Channel 6 (Ant1+Ant3)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	55.2	36.1	34.5	53.6	74.0	-20.4
Horizontal	*7311.000	61.5	35.6	37.1	63.0	74.0	-11.0

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	43.7	36.1	34.5	42.1	54.0	-11.9
Horizontal	*7311.000	44.7	35.6	37.1	46.2	54.0	-7.8

- NOTES: 1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT40 MIMO Channel 9 (Ant1+Ant3)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4904.000	53.4	36.1	34.8	52.1	74.0	-21.9
Horizontal	*2484.235	68.7	36.7	27.7	59.7	74.0	-14.3

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4904.000	43.5	36.1	34.8	42.2	54.0	-11.8
Horizontal	*2484.235	55.5	36.7	27.7	46.5	54.0	-7.5

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT40 MIMO Channel 3 (Ant2+Ant3)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4844.000	55.4	36.1	34.6	53.9	74.0	-20.1
Horizontal	*2388.355	70.9	36.7	27.2	61.4	74.0	-12.6

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4844.000	42.7	36.1	34.6	41.2	54.0	-12.8
Horizontal	*2388.355	55.8	36.7	27.2	46.3	54.0	-7.7

- NOTES: 1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT40 MIMO Channel 6 (Ant2+Ant3)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	53.9	36.1	34.5	52.3	74.0	-21.7
Horizontal	*7311.000	55.4	35.6	37.1	56.9	74.0	-17.1

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	45.1	36.1	34.5	43.5	54.0	-10.5
Horizontal	*7311.000	45.3	35.6	37.1	46.8	54.0	-7.2

- NOTES: 1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
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: HUAWEI TECHNOLOGIES CO., LTD.
 Model: WS330
 Mode: 802.11n-HT40 MIMO Channel 9 (Ant2+Ant3)

Date of Test: 15 April, 2013

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4904.000	54.4	36.1	34.8	53.1	74.0	-20.9
Horizontal	*2484.051	69.0	36.7	27.7	60.0	74.0	-14.0

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4904.000	42.5	36.1	34.8	41.2	54.0	-12.8
Horizontal	*2484.051	54.5	36.7	27.7	45.5	54.0	-8.5

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
 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

4.9 Conducted Emission

Worst Case Live-Conducted emission at 0.514MHz is Passed by 9.7 dB margin

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

INTERTEK TESTING SERVICES

Applicant: HUAWEI TECHNOLOGIES CO., LTD.

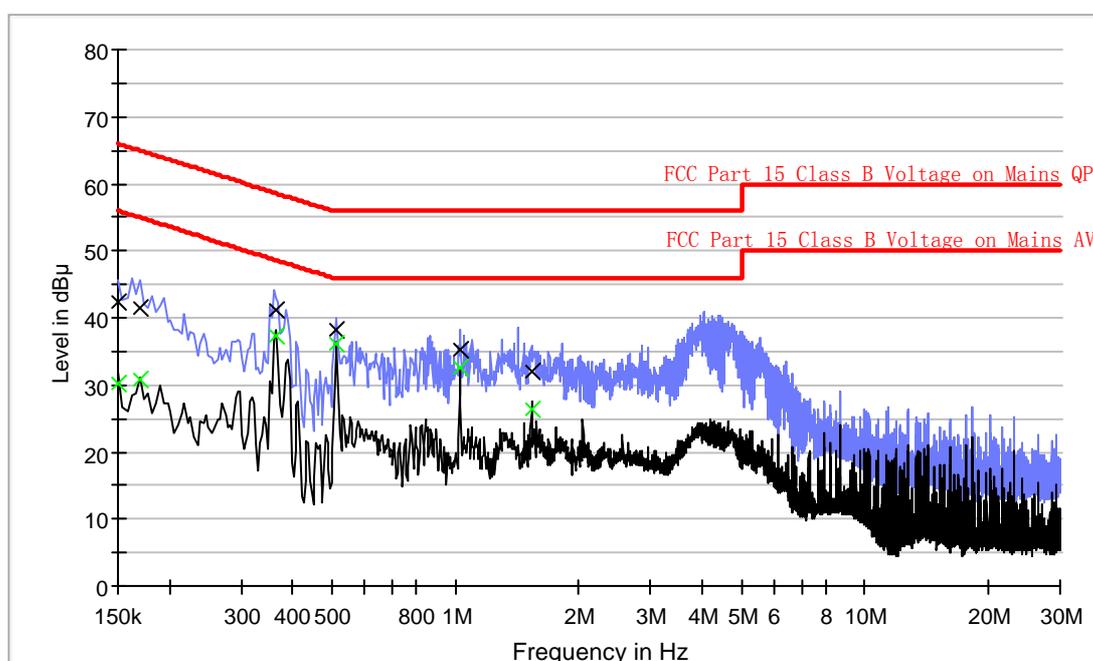
Date of Test: 15 April, 2013

Model: WS330

Worst Case Operating Mode: 802.11n-HT20 MIMO 2412MHz

AC/DC Adapter: XinQiao

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.150	42.3	L1	9.6	23.7	66.0
0.170	41.6	L1	9.6	23.4	65.0
0.366	41.1	L1	9.6	17.5	58.6
0.514	38.2	L1	9.6	17.8	56.0
1.026	35.1	L1	9.7	20.9	56.0
1.538	32.0	L1	9.7	24.0	56.0

Result Table AV

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.150	30.2	L1	9.6	25.8	56.0
0.170	30.8	L1	9.6	24.2	55.0
0.366	37.2	L1	9.6	11.4	48.6
0.514	36.3	L1	9.6	9.7	46.0
1.026	32.5	L1	9.7	13.5	46.0
1.538	26.4	L1	9.7	19.6	46.0

TRF no.: FCC 15C_TX_b

FCC ID: QIS-WS330

Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES

Applicant: HUAWEI TECHNOLOGIES CO., LTD.

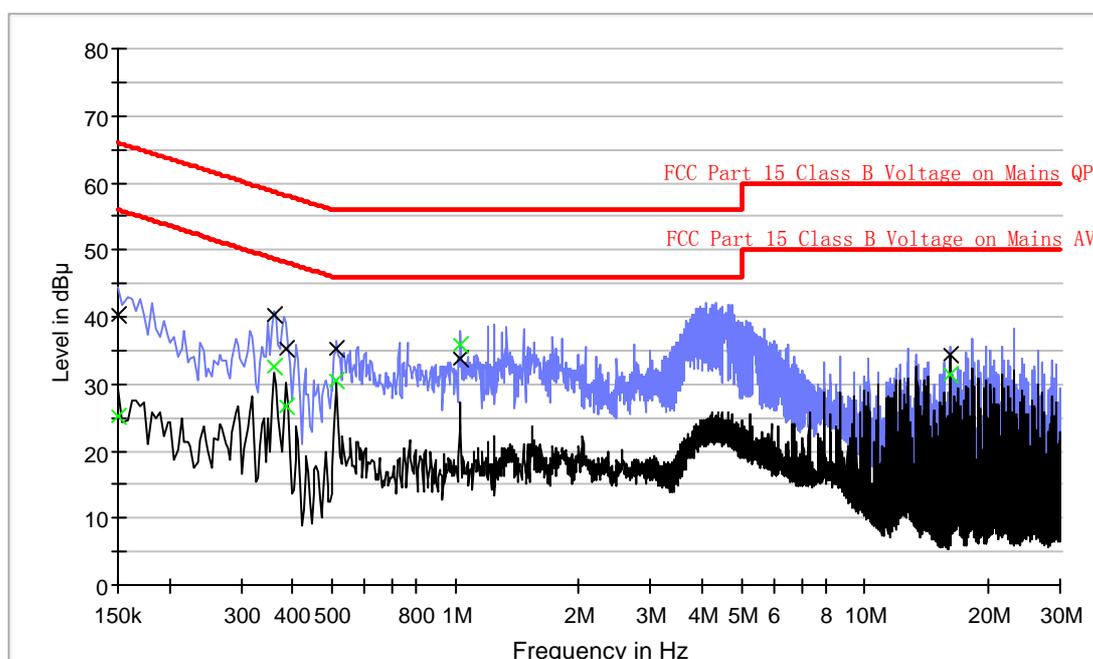
Date of Test: 15 April, 2013

Model: WS330

Worst Case Operating Mode: 802.11n-HT20 MIMO 2412MHz

AC/DC Adapter: XinQiao

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.150	40.2	N	9.6	25.8	66.0
0.362	40.2	N	9.6	18.5	58.7
0.386	35.2	N	9.6	22.9	58.1
0.514	35.2	N	9.6	20.8	56.0
1.026	33.9	N	9.7	22.1	56.0
16.230	34.3	N	10.4	25.7	60.0

Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.150	25.1	N	9.6	30.9	56.0
0.362	32.6	N	9.6	16.1	48.7
0.386	26.7	N	9.6	21.4	48.1
0.514	30.6	N	9.6	15.4	46.0
1.026	36.0	N	9.7	10.0	46.0
16.230	31.5	N	10.4	18.5	50.0

TRF no.: FCC 15C_TX_b

FCC ID: QIS-WS330

Report No.: 130411010SZN-001

INTERTEK TESTING SERVICES

Applicant: HUAWEI TECHNOLOGIES CO., LTD.
Model: WS330

Date of Test: 15 April, 2013

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: HUAWEI TECHNOLOGIES CO., LTD.
Model: WS330

Date of Test: 15 April, 2013

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.doc & internal photos.pdf.

INTERTEK TESTING SERVICES

EXHIBIT 6

PRODUCT LABELLING

INTERTEK TESTING SERVICES

6.0 Product Labelling

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

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
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	30-Jun-12	30-Jun-13
SZ185-01	EMI Receiver	R&S	ESCI	100547	22-Sep-12	22-Jun-13
SZ061-09	Horn Antenna	ETS	3115	00092346	28-Nov-12	28-Nov-13
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	8-Sep-12	22-Jun-13
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	8-Dec-12	8-Jun-13
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	22-Sep-12	22-Jun-13
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	17-Nov-12	17-May-13
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	3-Dec-12	08-Jun-13
SZ062-02	RF Cable	RADIALL	RG 213U	--	17-Mar-12	17-Sep-13
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	29-Dec-12	29-Jun-13
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	29-Dec-12	29-Jun-13
SZ067-04	Notch Filter	Micro-Tronics	BRM5070 2-02	--	11-Jun-12	11-Jun-13
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	5-Nov-12	5-Nov-13
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	5-Nov-12	5-Nov-13
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	5-Nov-12	5-Nov-13
SZ188-03	Shielding Room	ETS	RFD-100	4100	10-Sep-12	10-Sep-13