

Huawei Technologies Co.,Ltd

Application
For
Certification

FCC ID: QISHG658V2

Home Gateway

Model: HG658 V2

WiFi Transceiver

Report No.: 140504020SZN-001

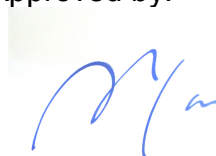
We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-13]

Prepared and Checked by:

Approved by:

Sign on file

Eason He
Engineer



Digitally signed
by Andy Yan
Location: Intertek
Testing Services

Andy Yan
Project Engineer
Date: 27 May, 2014

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
- This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results referenced from this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.
- For Terms And Conditions of the services, it can be provided upon request.
- The evaluation data of the report will be kept for 3 years from the date of issuance.

TRF no.: FCC 15C_Tx_b

Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch

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

LIST OF EXHIBITS

INTRODUCTION

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

INTERTEK TESTING SERVICES

MEASUREMENT/TECHNICAL REPORT

Huawei Technologies Co.,Ltd - MODEL: HG658 V2

FCC ID: QISHG658V2

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

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

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

If yes, defer until :
date

Company Name agrees to notify the Commission by:
date

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

Transition Rules Request per 15.37? Yes ☐ No ☒

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

Report prepared by:

Billy Li
Intertek Testing Services Shenzhen Ltd.
Kejiyuan Branch
6F, Block D, Huahan Building, Langshan Road,
Nanshan District, Shenzhen, P. R. China
Phone: (86 755) 8614 0645
Fax: (86 755) 8614 6751

INTERTEK TESTING SERVICES

Table of Contents

1.0 <u>Summary of test results</u>	2
2.0 <u>General Description</u>	4
2.1 Product Description	4
2.2 Related Submittal(s) Grants	5
2.3 Test Methodology	5
2.4 Test Facility	5
3.0 <u>System Test Configuration</u>	7
3.1 Justification	7
3.2 EUT Exercising Software	7
3.3 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	21
4.3 Maximum Power Density	39
4.4 Out of Band Conducted Emissions	57
4.5 Out of Band Radiated Emissions	110
4.6 Transmitter Radiated Emissions in Restricted Bands	111
4.7 Field Strength Calculation	112
4.8 Radiated Spurious Emission	113
4.9 Conducted Emission	133
4.10 Radiated Emission from Digital Section of Transceiver	136
4.11 Transmitter Duty Cycle Calculation and Measurements	137
5.0 <u>Equipment Photographs</u>	139
6.0 <u>Product Labelling</u>	141
7.0 <u>Technical Specifications</u>	143
8.0 <u>Instruction Manual</u>	145
9.0 <u>Confidentiality Request</u>	147
10.0 <u>Miscellaneous Information</u>	149
11.0 <u>Test Equipment List</u>	151

INTERTEK TESTING SERVICES

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

INTERTEK TESTING SERVICES

EXHIBIT 1

SUMMARY OF TEST RESULTS

INTERTEK TESTING SERVICES

1.0 Summary of Test

Huawei Technologies Co.,Ltd - MODEL: HG658 V2

FCC ID: QISHG658V2

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.

EXHIBIT 2

GENERAL DESCRIPTION

INTERTEK TESTING SERVICES

2.0 General Description

2.1 Product Description

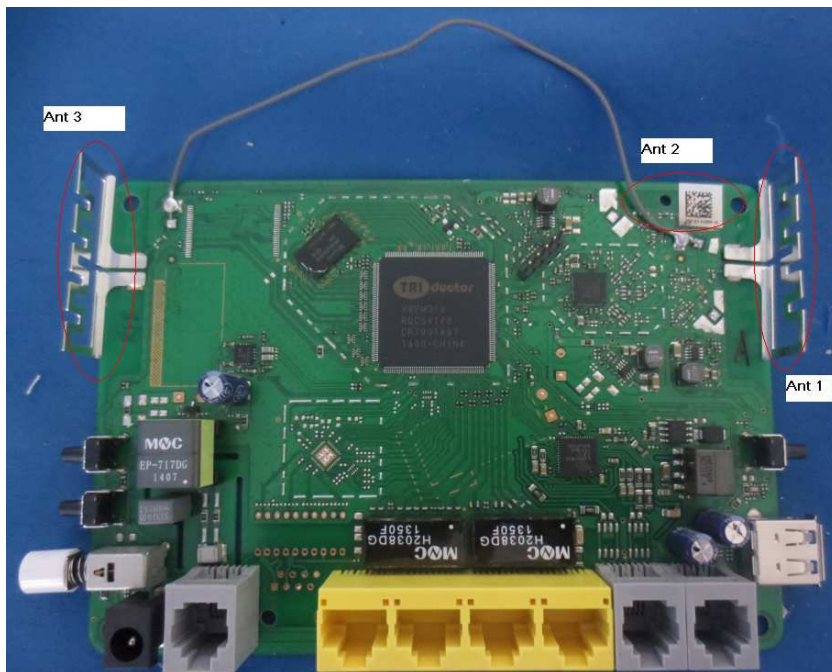
The Equipment Under Test (EUT) is a Home Gateway, Model: HG658 V2 operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing. EUT operated at 2422-2452MHz for 802.11n-HT40, 7 channels with 5MHz channel spacing. It is powered by AC/DC Adapter (Input: 100-240Vac, 50/60Hz; Output: 12V, 1A). The EUT including 3 antennas, the RF IC support 2*3 and optional diversity with 3 antennas, 802.11b SISO mode work at Ant1 only, 802.11g/n SISO mode and 801.11n-HT20/HT40 MIMO mode work at Ant1\Ant2\Ant3. Ant2 is only for reception, and Ant1\ Ant3 could be used for transmission and reception. For more detailed features description, please refer to the user's manual.

Antenna distribution diagram:

Ant1 Gain: 1dBi; Ant3 Gain: 1dBi; Ant2 (only receive)

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: QISHG658V2

Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

2.2 Related Submittal(s) Grants

This is an application for certification of:

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

Remaining portions are subject to the following procedures:

1. Receiver portion of WiFi: exempt from technical requirement of this Part.
2. Data Transfer and other function: (Report No.: 140504020SZN-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).

EXHIBIT 3
SYSTEM TEST CONFIGURATION

INTERTEK TESTING SERVICES

3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. 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.

INTERTEK TESTING SERVICES

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.

INTERTEK TESTING SERVICES

3.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Model No.	
Laptop	Lenovo	T420	
Hard Disk	Smart.drive	HD-003	
USB Cable	Smart.drive	Unshielded, Length 155cm	
1394 Cable	Smart.drive	Unshielded, Length 180cm	
RJ45 Cable*4	N/A	Unshielded, Length: 200cm	
RJ11 Cable*3	N/A	Unshielded, Length: 600cm	
DSL simulator	Huawei	02GN	
USB storage	Kingston	2GB	
AC Adapter	Huawei	Xinqiao	HW-120050U1W Input:100-240V 50/60Hz; Output: 12Vdc, 1A
		Huntkey	
		Note: This production has two AC/DC Adapter suppliers, and had been arranged testing separately, and the worst-case test data was recorded in this report.	
Router*4	TP-LINK	TL-MR11U	

EXHIBIT 4

MEASUREMENT RESULTS

INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd
Model: HG658 V2

Date of Test: 15 May, 2014

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 = 1dBi) (DBPSK, 1Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	18.98	79.07
Middle Channel: 2437	18.51	70.96
High Channel: 2462	18.64	73.11

IEEE 802.11g (Antenna Gain = 1dBi) (BPSK, 6Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	22.12	162.93
Middle Channel: 2437	24.21	263.63
High Channel: 2462	22.33	171.00

IEEE 802.11n-HT20 (SISO) (Antenna Gain = 1dBi) (BPSK, 6.5Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2412	21.91	155.24
Middle Channel: 2437	24.55	285.10
High Channel: 2462	21.68	147.23

INTERTEK TESTING SERVICES

IEEE 802.11n-HT20 (MIMO) (Antenna Gain = 4dBi, Note3) (BPSK, 13Mbps)			
Frequency (MHz)	Output in dBm		Output in mWatt Total power
	Ant1	Ant3	
Low Channel: 2412	19.59	20.09	193.09
Middle Channel: 2437	21.38	22.10	299.59
High Channel: 2462	19.21	18.88	160.64

IEEE 802.11n-HT40 (SISO) (Antenna Gain = 1dBi) (BPSK, 13.5Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2422	21.73	148.94
Middle Channel: 2437	24.18	261.82
High Channel: 2452	21.28	134.28

IEEE 802.11n-HT40 (MIMO) (Antenna Gain = 4dBi, Note3) (BPSK, 27Mbps)			
Frequency (MHz)	Output in dBm		Output in mWatt Total power
	Ant1	Ant3	
Low Channel: 2422	18.53	19.00	150.72
Middle Channel: 2437	21.48	21.25	273.96
High Channel: 2452	18.31	19.27	152.29

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: 1dBi, Antenna 3 Gain: 1dBi

Note 3: In MIMO, Ant1+Ant3 Directional gain = $G_{ANT} + 10 \log(N)$ dBi = $1 + 10 \log(2) = 4$ dBi, so the Power limit is 30dBm (1000mW);

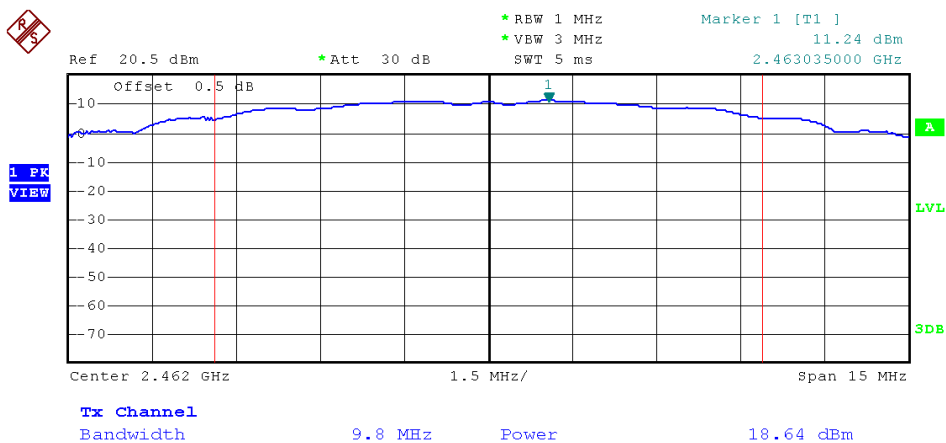
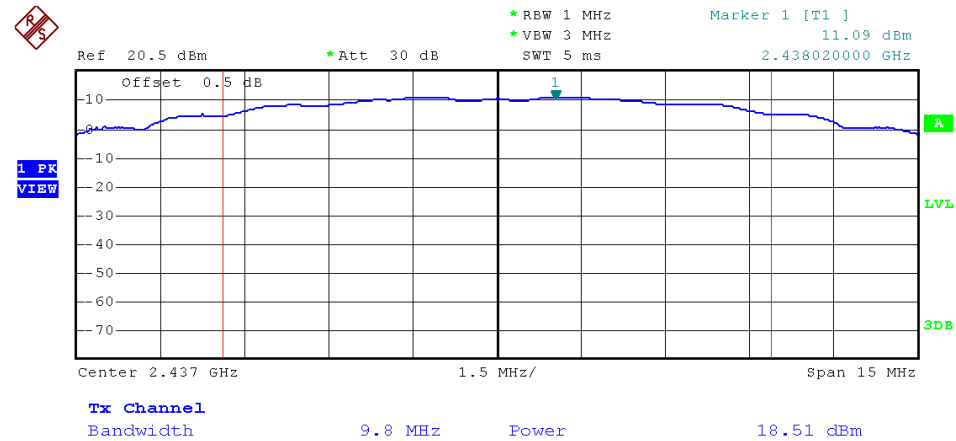
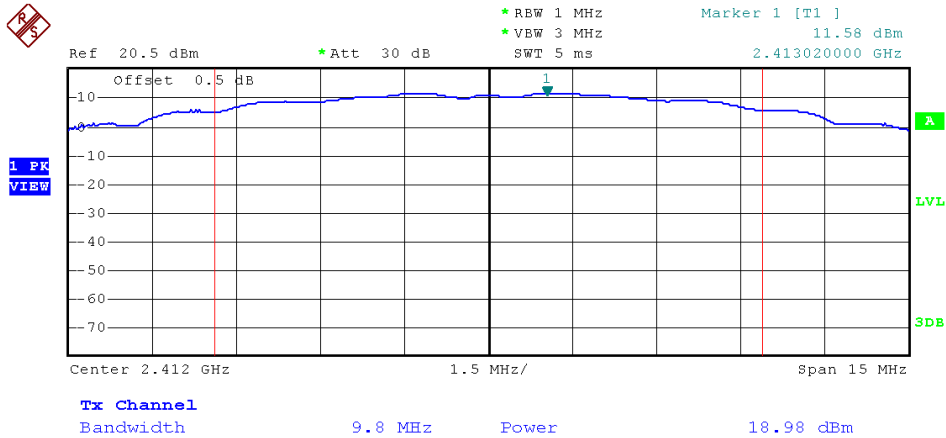
Cable loss, external attenuation has been included in OFFSET function

EUT dBm max. output level = 24.77dBm (802.11n-HT20 MIMO, Ant1+Ant3, 2437MHz)

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

INTERTEK TESTING SERVICES

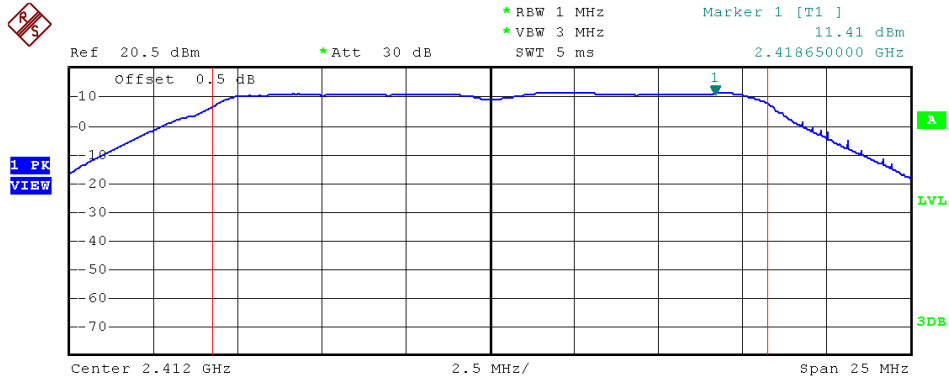
802.11b



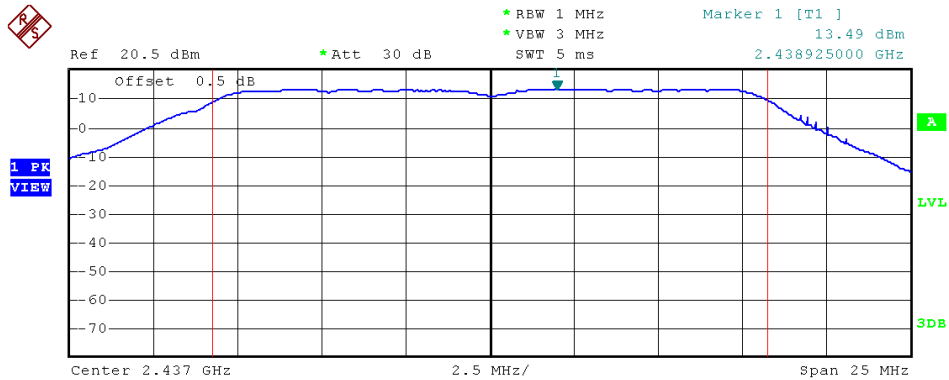
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

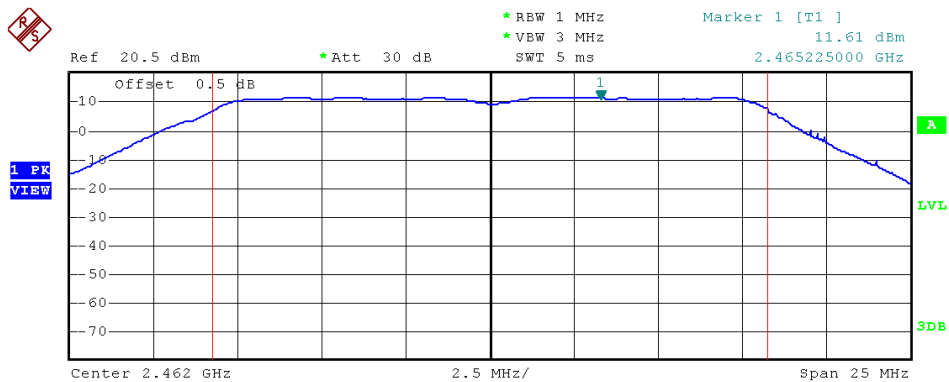
802.11g



Tx Channel
Bandwidth 16.5 MHz Power 22.12 dBm



Tx Channel
Bandwidth 16.5 MHz Power 24.21 dBm

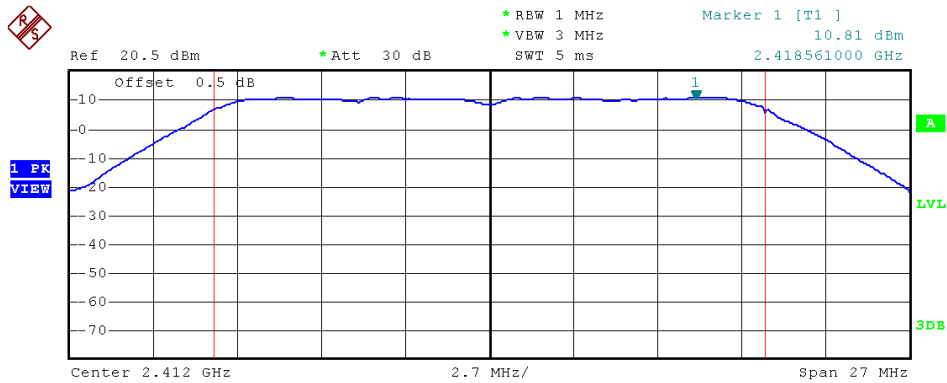


Tx Channel
Bandwidth 16.5 MHz Power 22.33 dBm

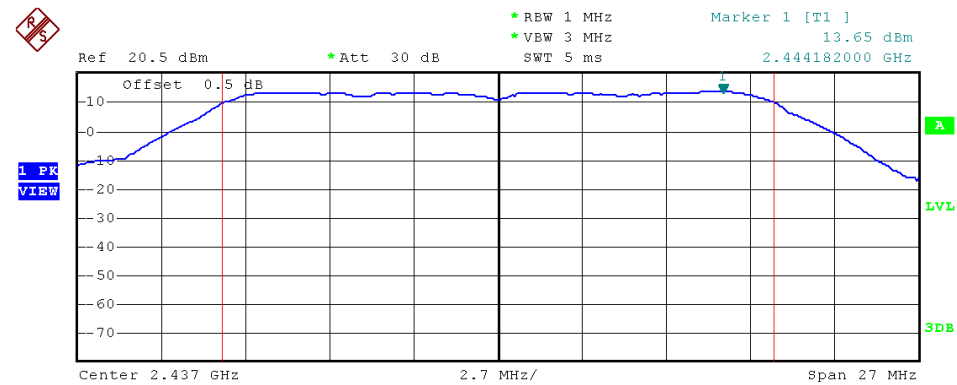
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

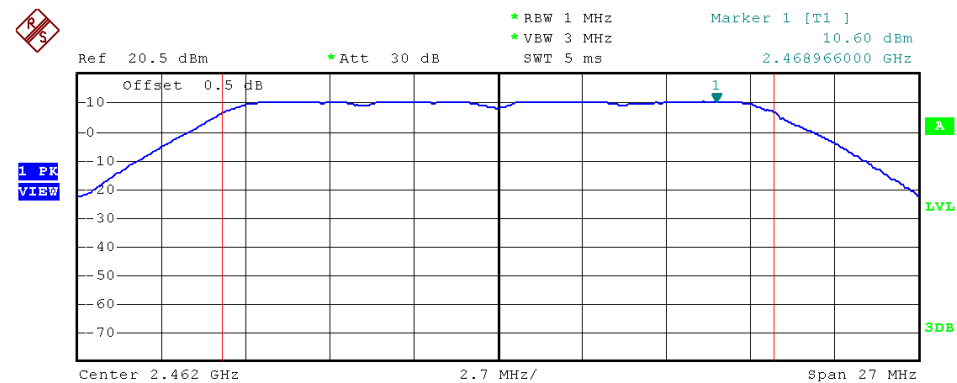
802.11n-HT20 SISO



Tx Channel
Bandwidth 17.7 MHz Power 21.91 dBm



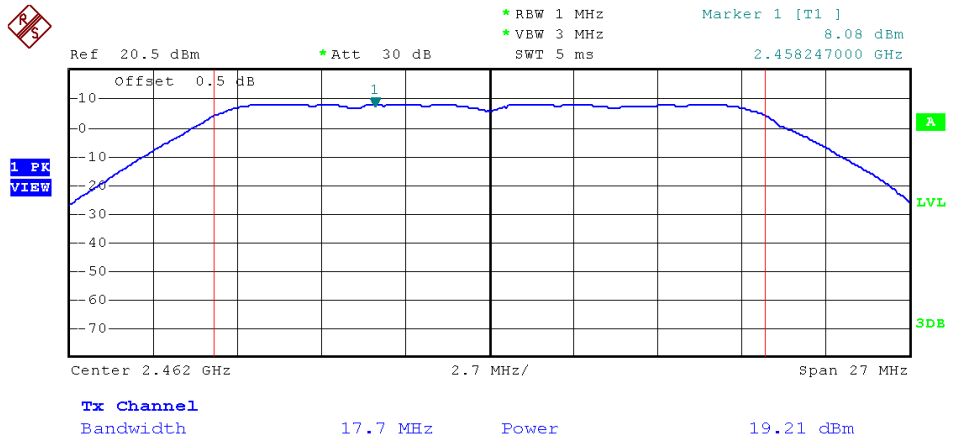
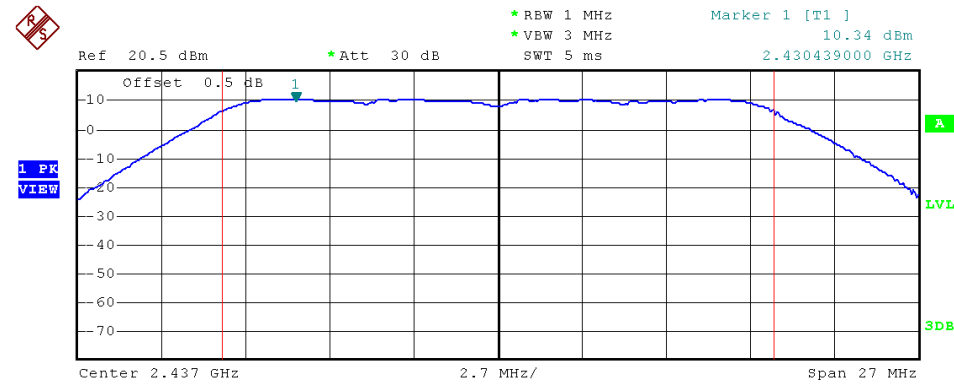
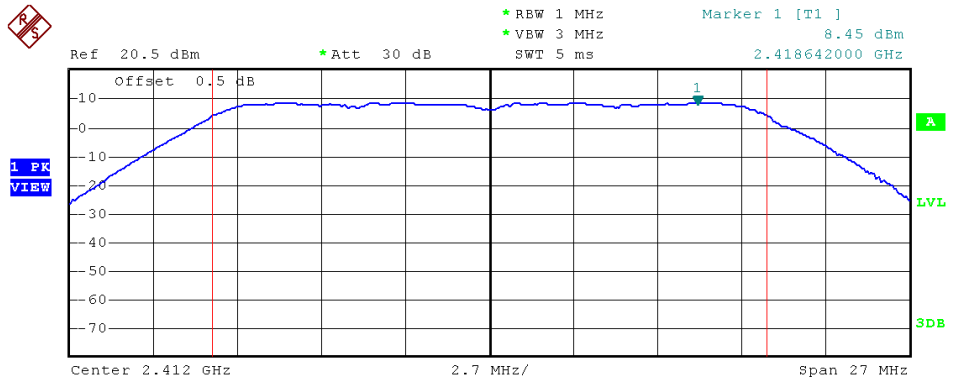
Tx Channel
Bandwidth 17.7 MHz Power 24.55 dBm



Tx Channel
Bandwidth 17.7 MHz Power 21.68 dBm

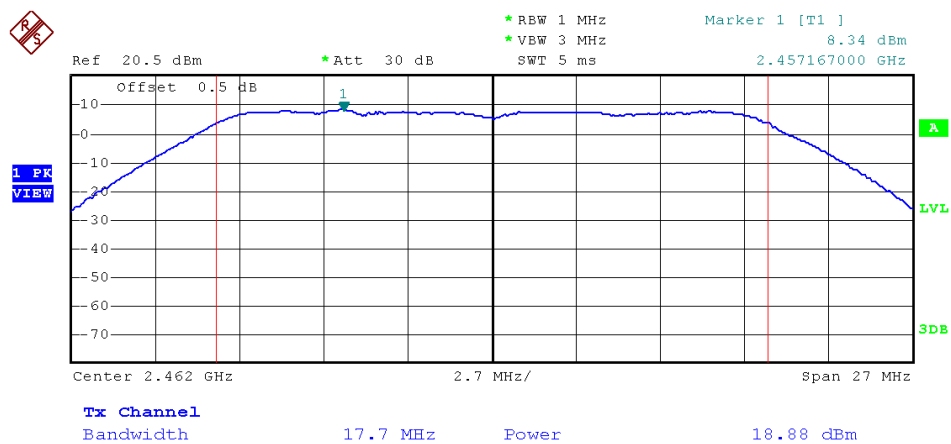
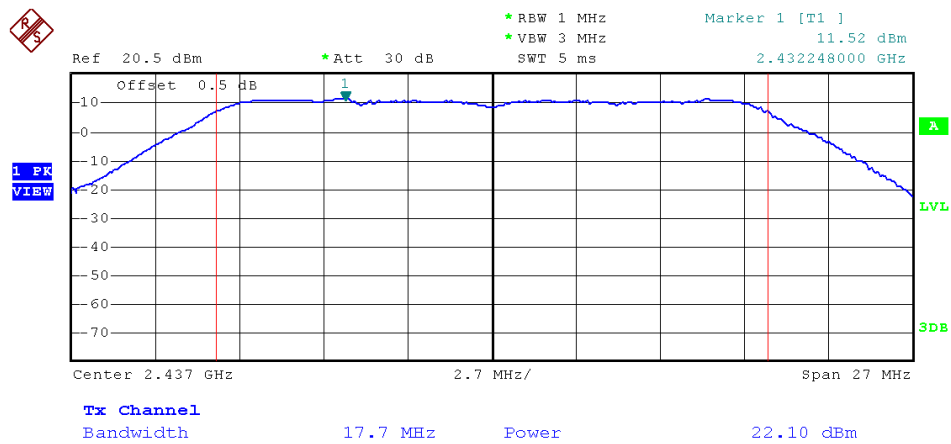
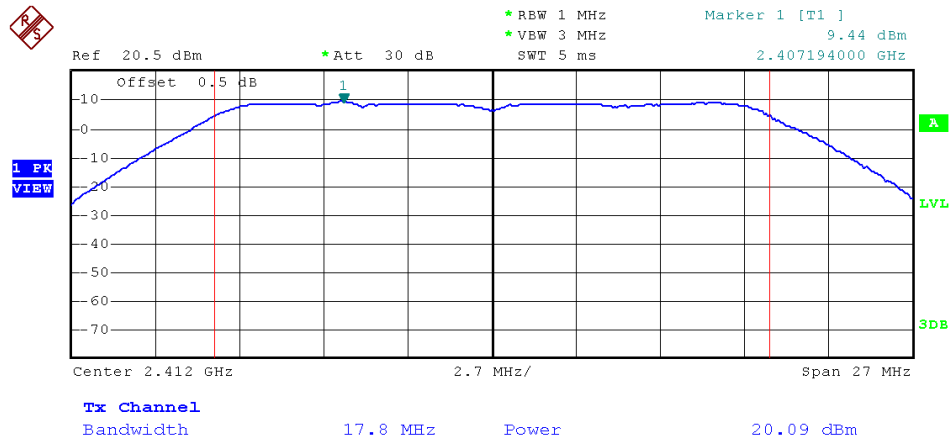
INTERTEK TESTING SERVICES

802.11n-HT20 MIMO Ant1



INTERTEK TESTING SERVICES

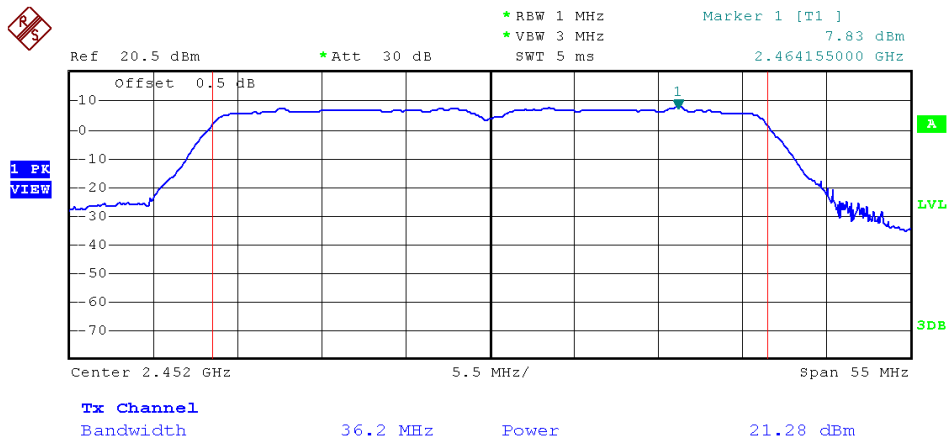
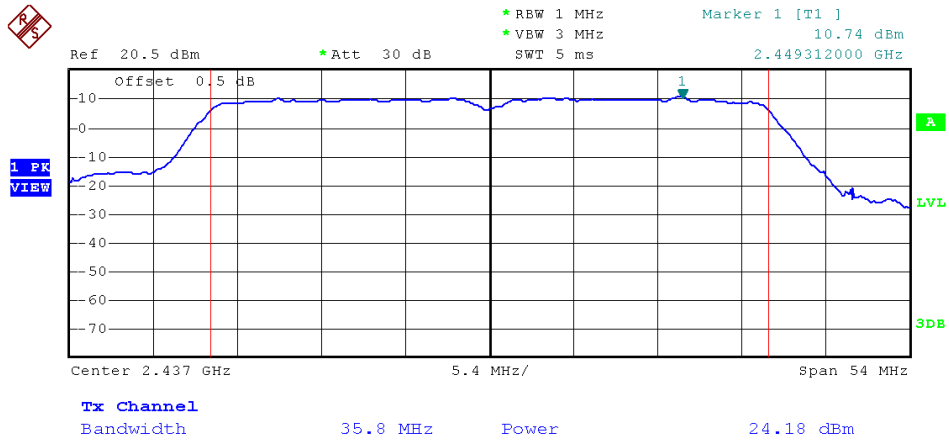
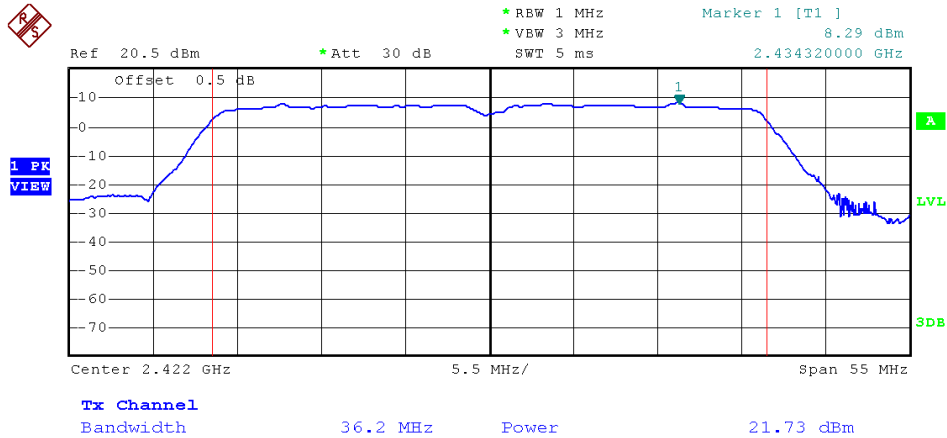
802.11n-HT20 MIMO Ant3



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

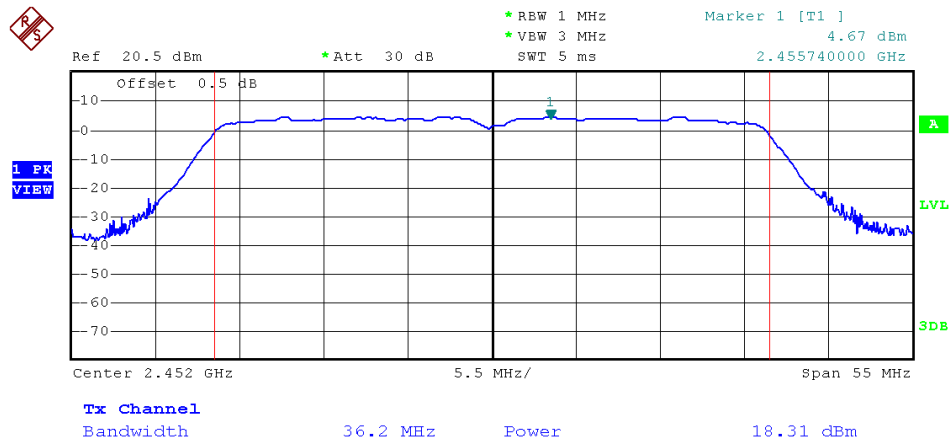
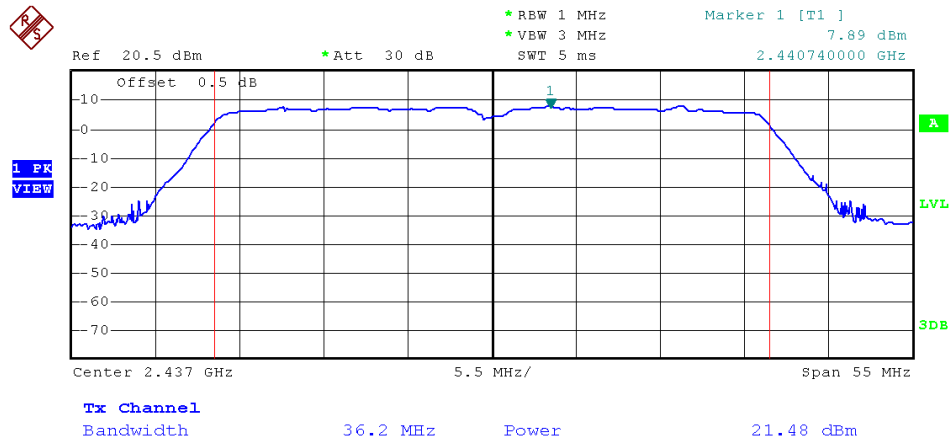
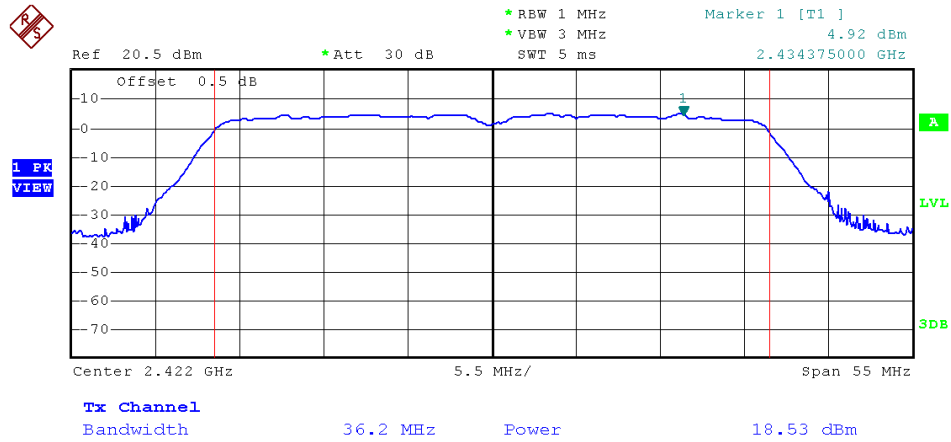
INTERTEK TESTING SERVICES

802.11n-HT40 SISO



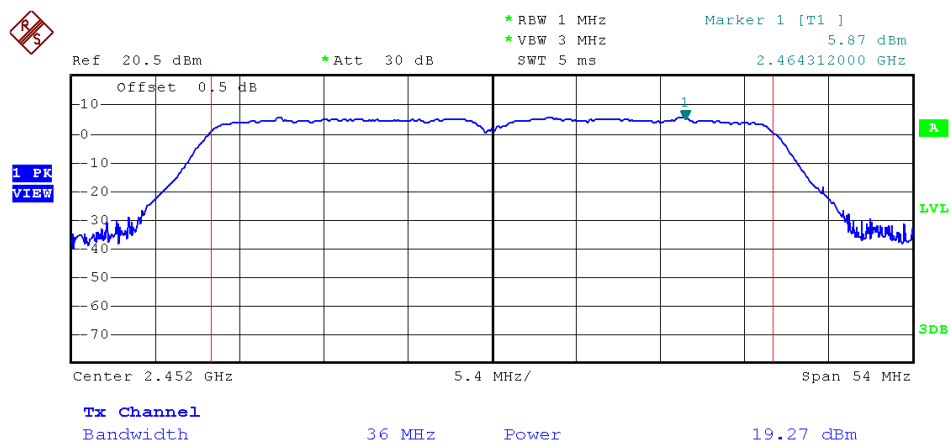
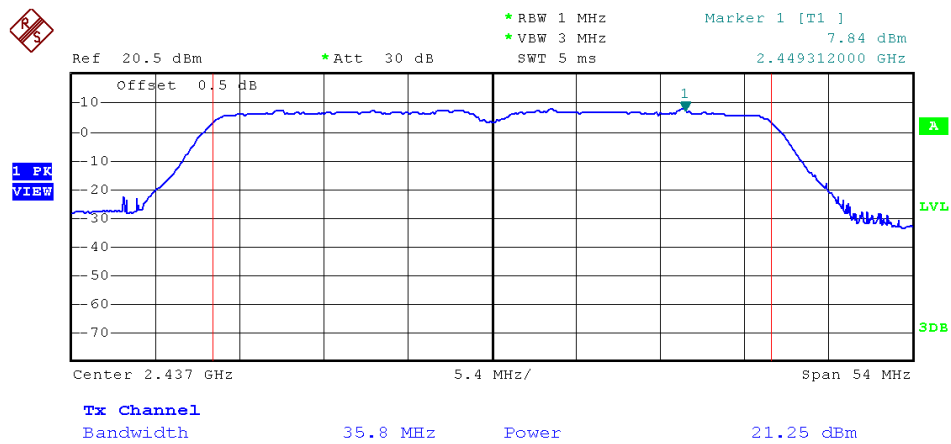
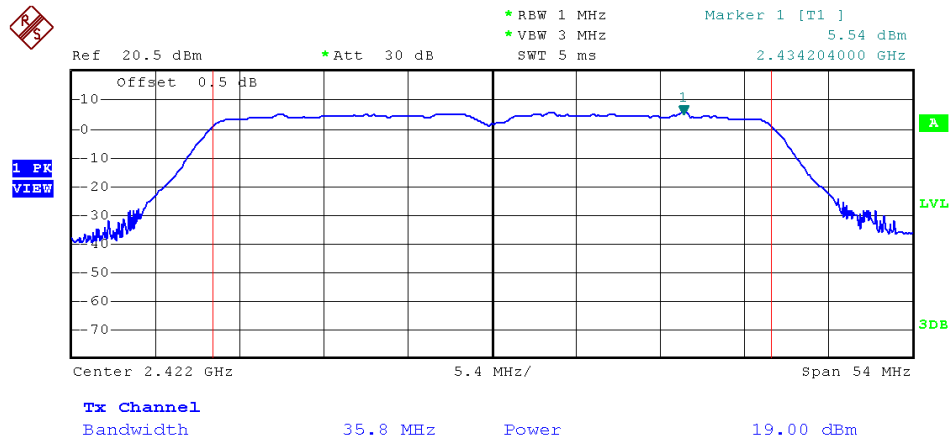
INTERTEK TESTING SERVICES

802.11n-HT40 MIMO Ant1



INTERTEK TESTING SERVICES

802.11n-HT40 MIMO Ant3



INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd
Model: HG658 V2

Date of Test: 15 May, 2014

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	9.8
2437	9.8
2462	9.8

IEEE 802.11g (BPSK, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	16.5
2437	16.5
2462	16.5

IEEE 802.11n-HT20 SISO(BPSK, 6.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	17.7
2437	17.7
2462	17.7

INTERTEK TESTING SERVICES

IEEE 802.11n-HT20 MIMO Ant 1(BPSK, 13Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	17.8
2437	17.7
2462	17.7

IEEE 802.11n-HT20 MIMO Ant 3(BPSK, 13Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	17.8
2437	17.7
2462	17.7

IEEE 802.11n-HT40 SISO(BPSK, 13.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2422	36.2
2437	35.8
2452	36.2

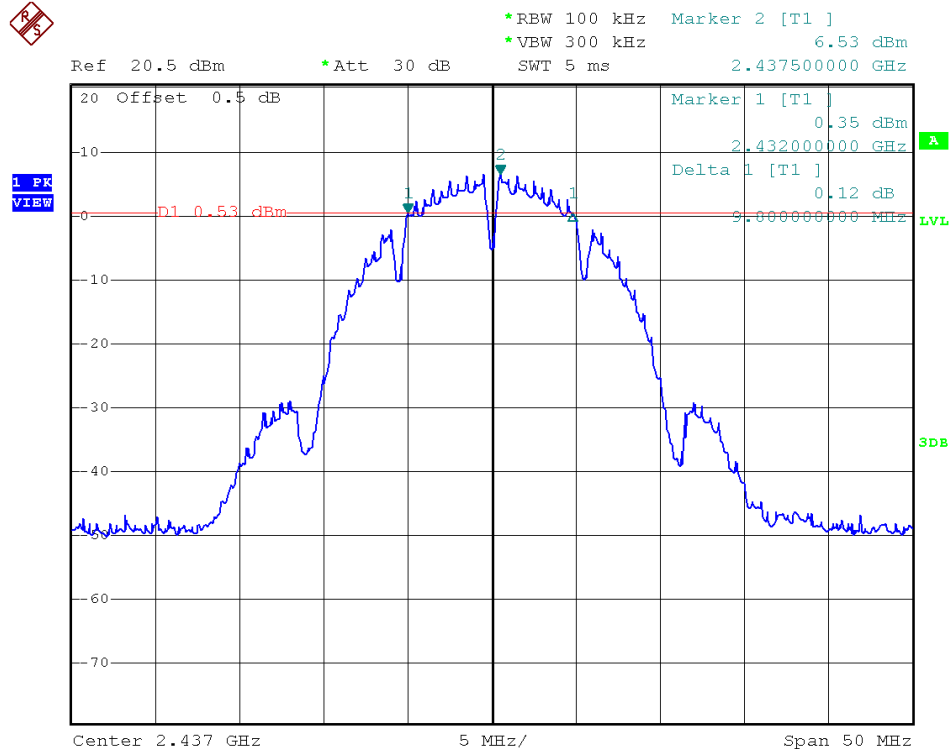
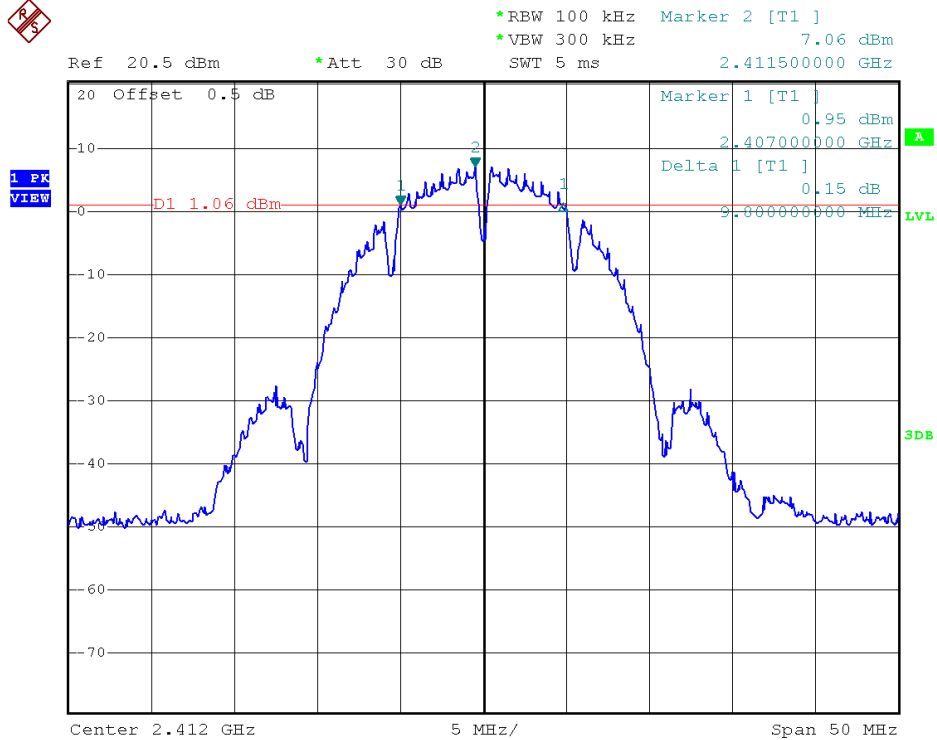
IEEE 802.11n-HT40 MIMO Ant 1(BPSK, 27Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2422	36.2
2437	36.2
2452	36.2

IEEE 802.11n-HT40 MIMO Ant 3(BPSK, 27Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2422	35.8
2437	35.8
2452	36.0

The test plots are attached as below.

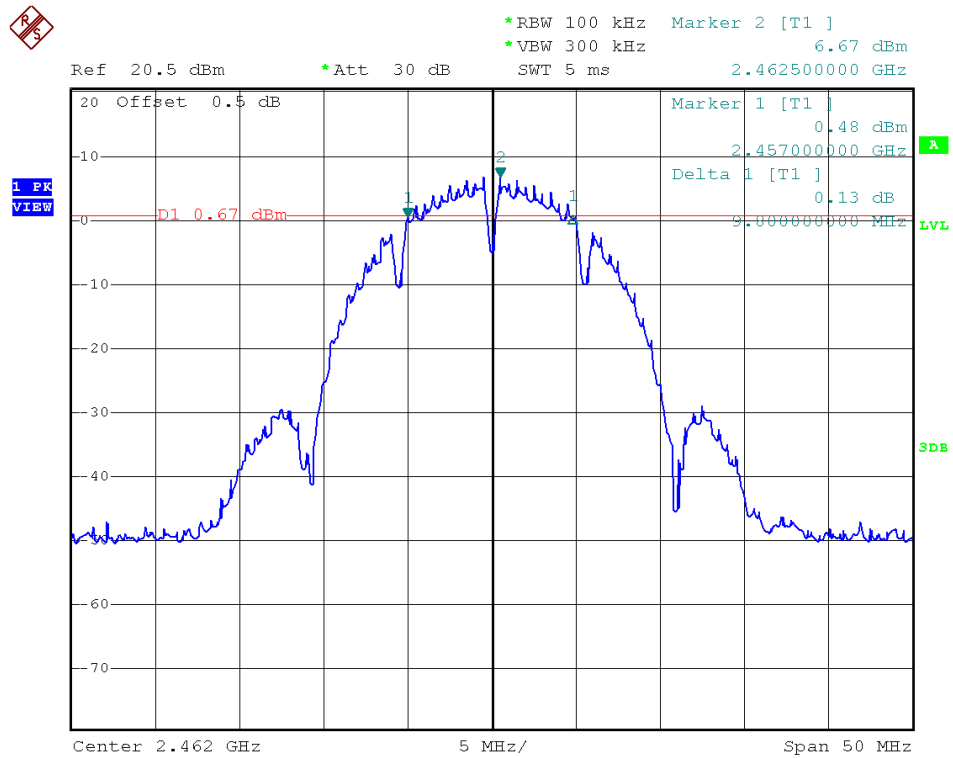
INTERTEK TESTING SERVICES

802.11b



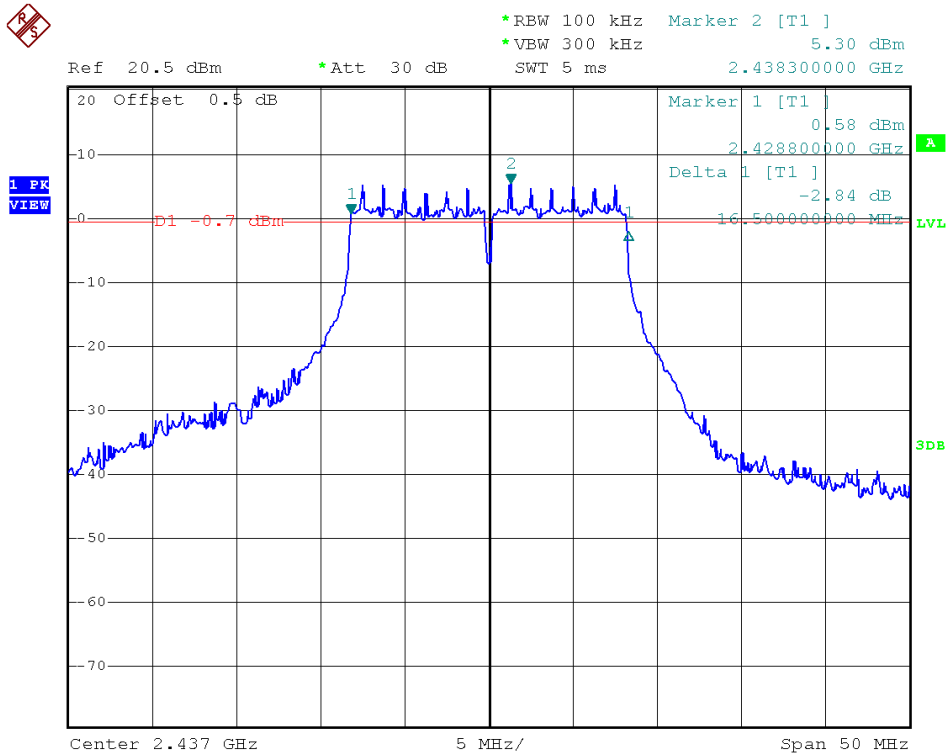
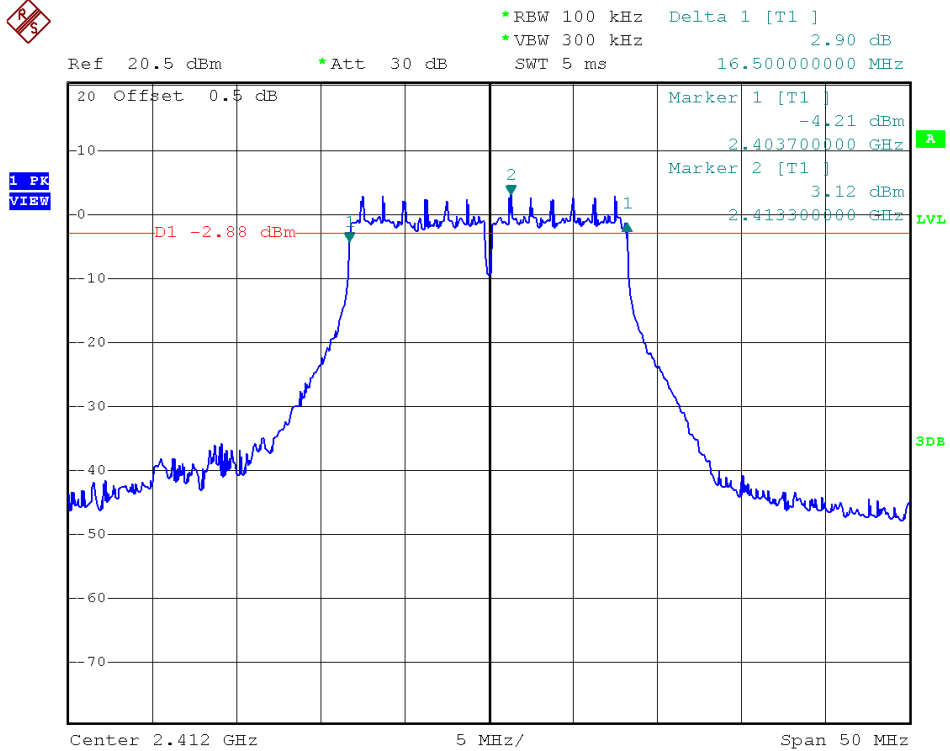
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



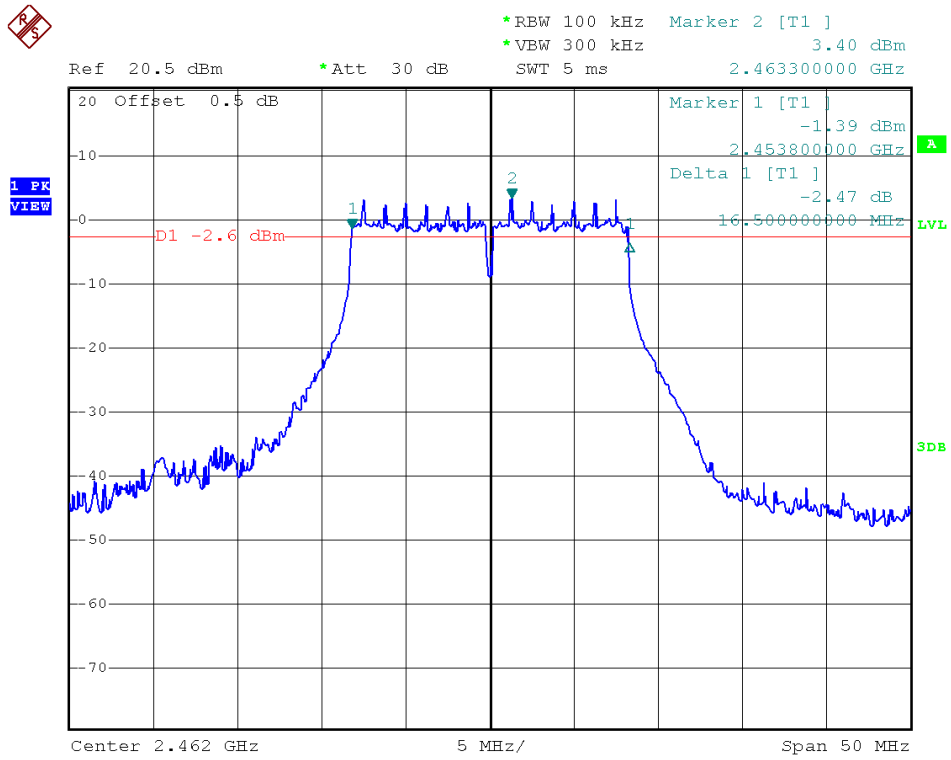
INTERTEK TESTING SERVICES

802.11g



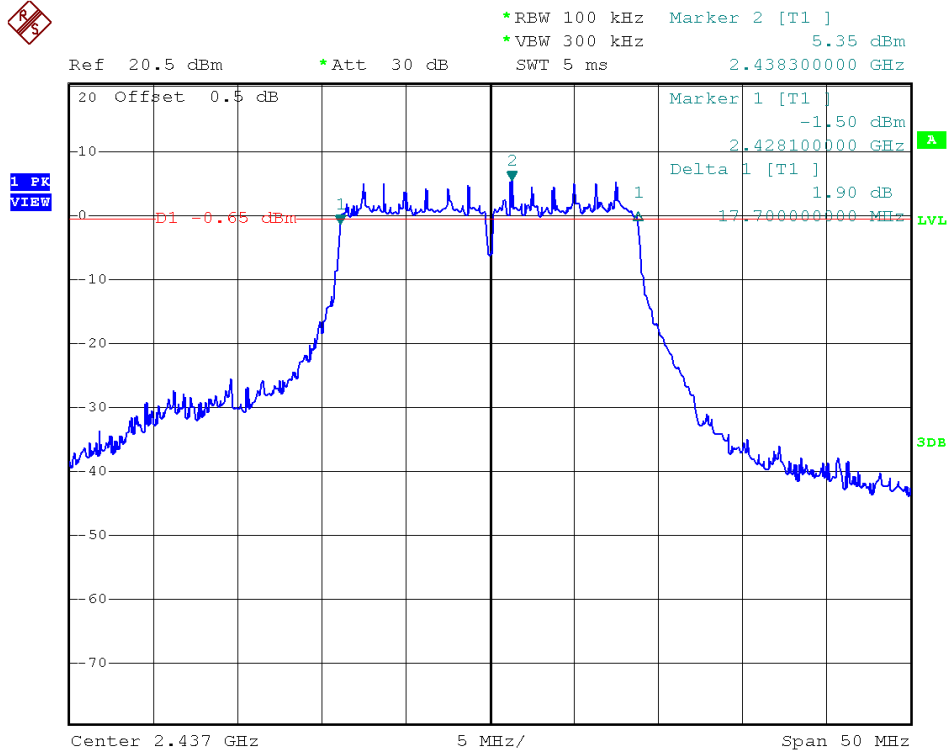
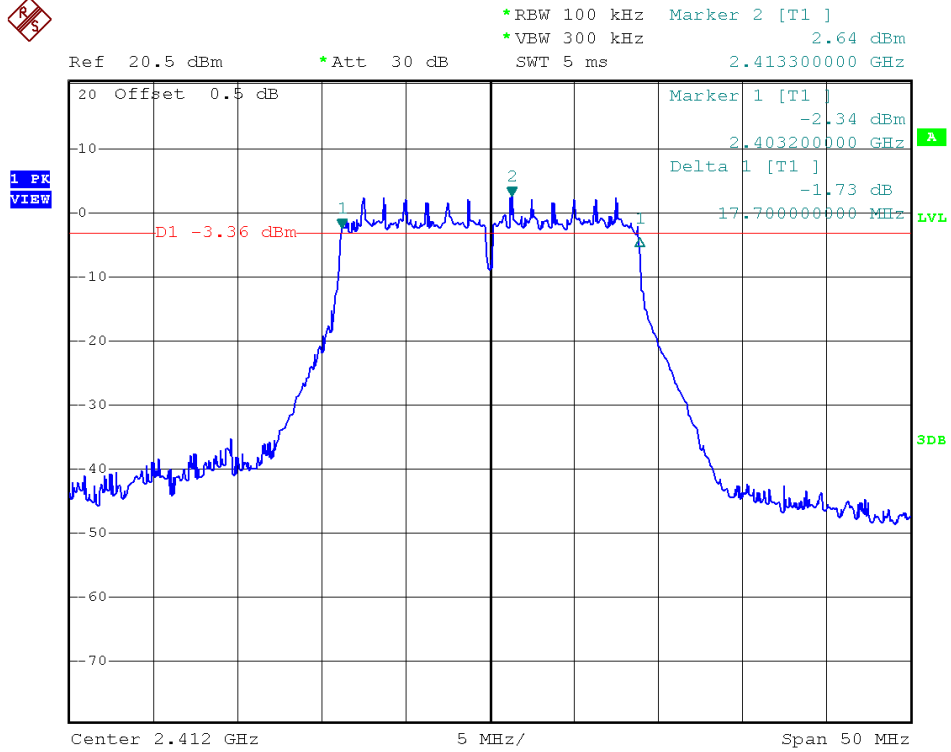
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



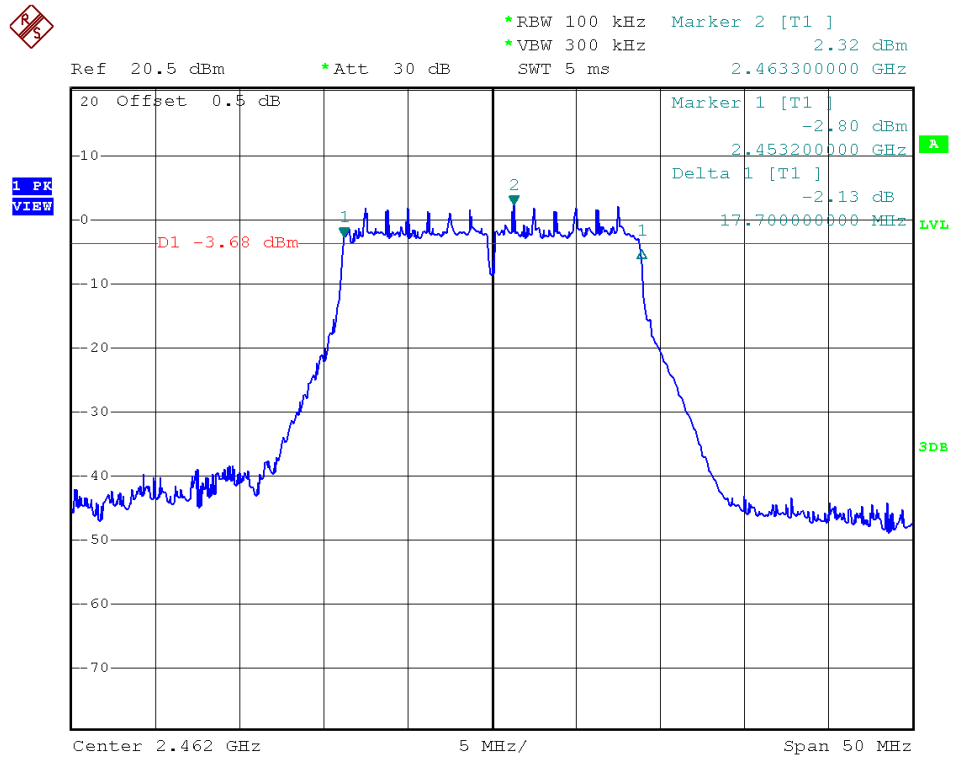
INTERTEK TESTING SERVICES

802.11n-HT20 SISO



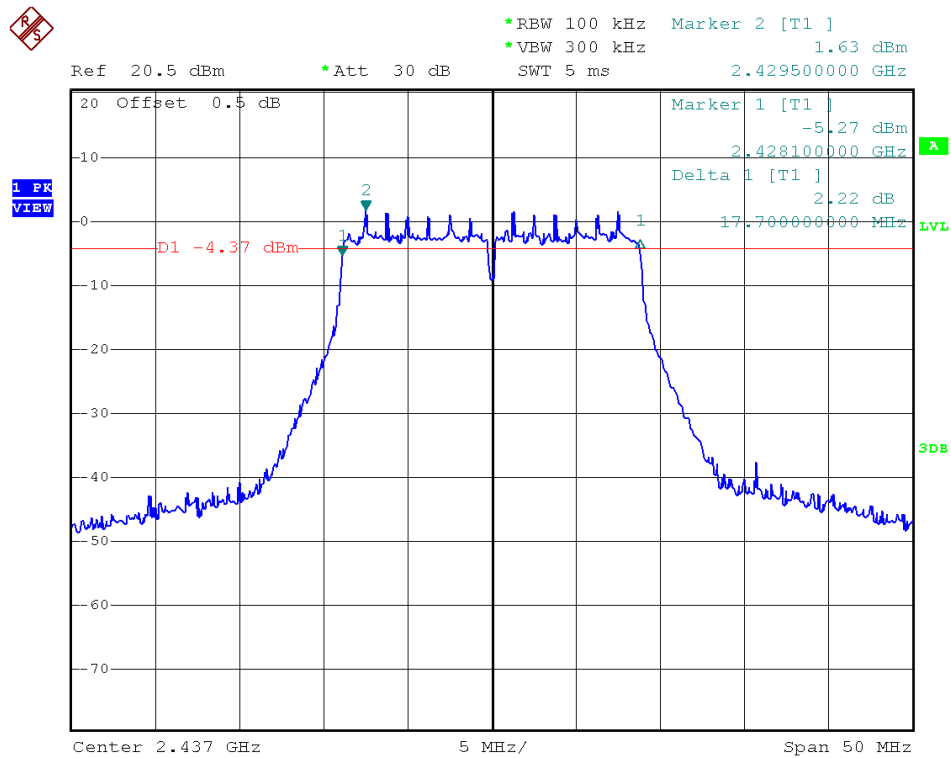
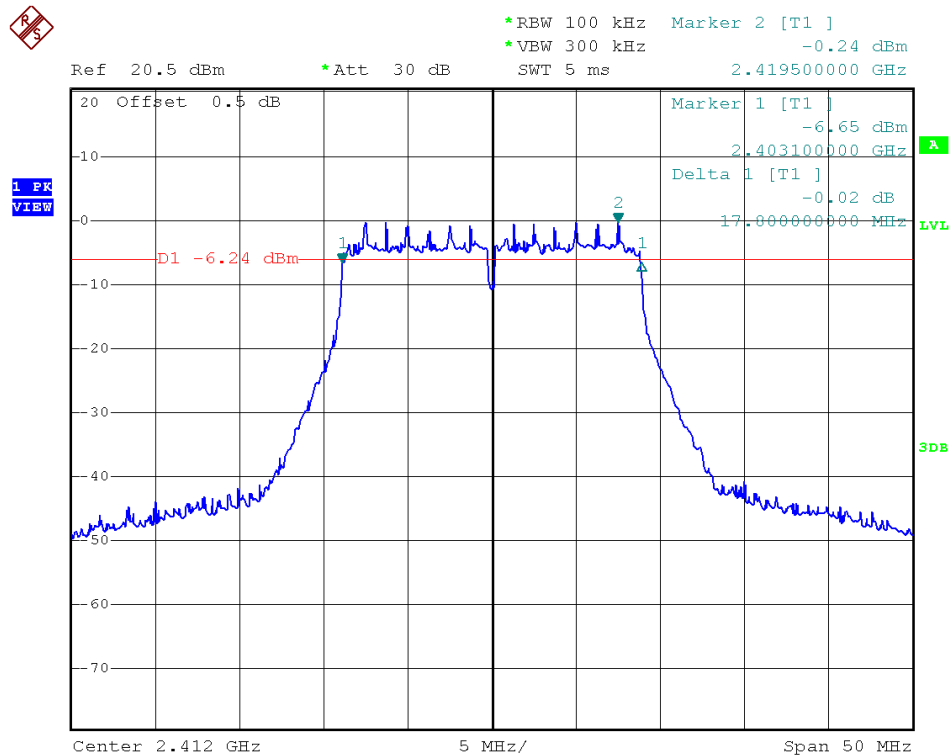
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



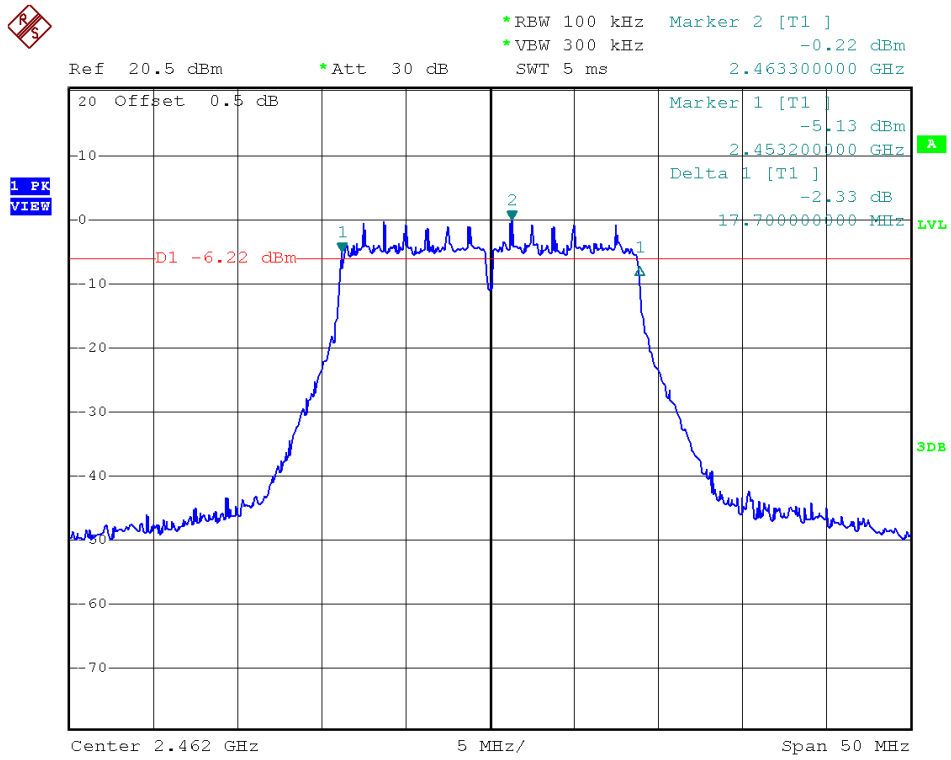
INTERTEK TESTING SERVICES

802.11n-HT20 MIMO Ant1



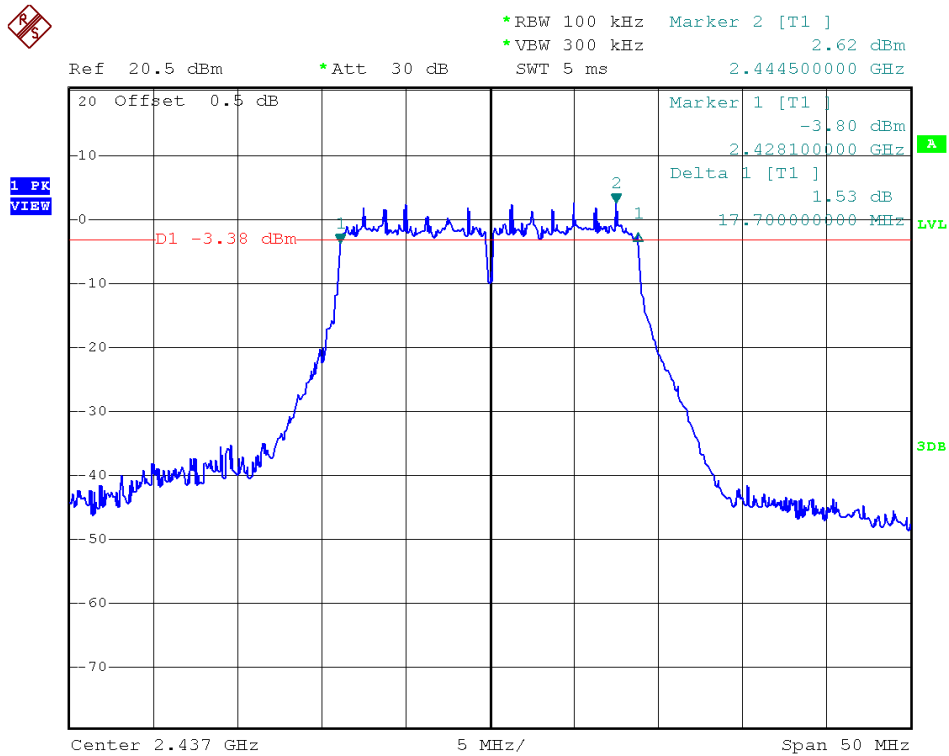
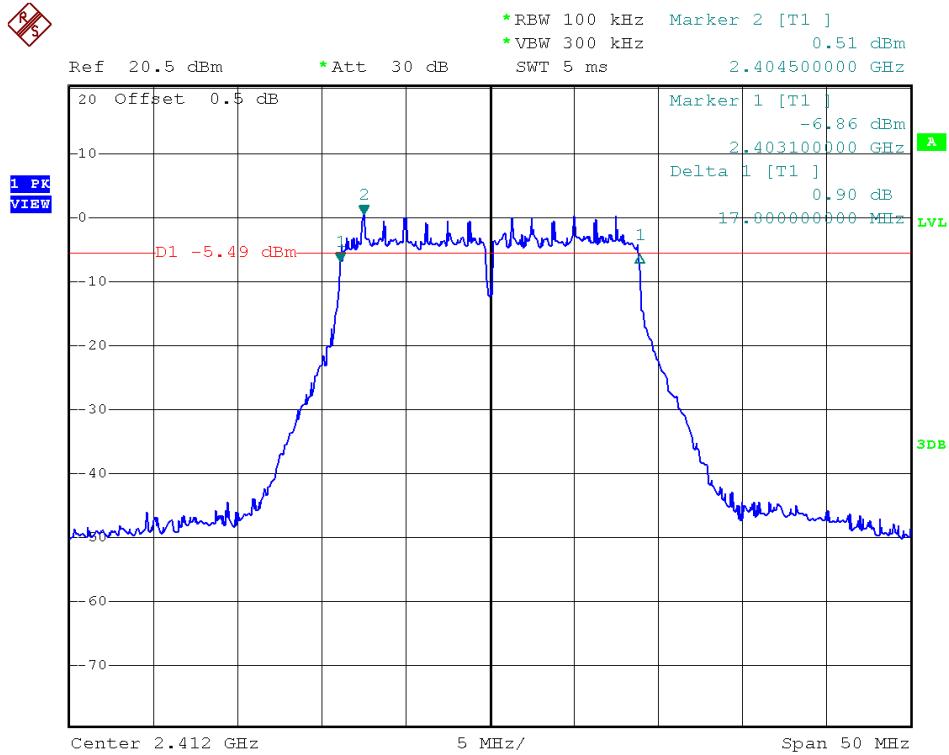
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



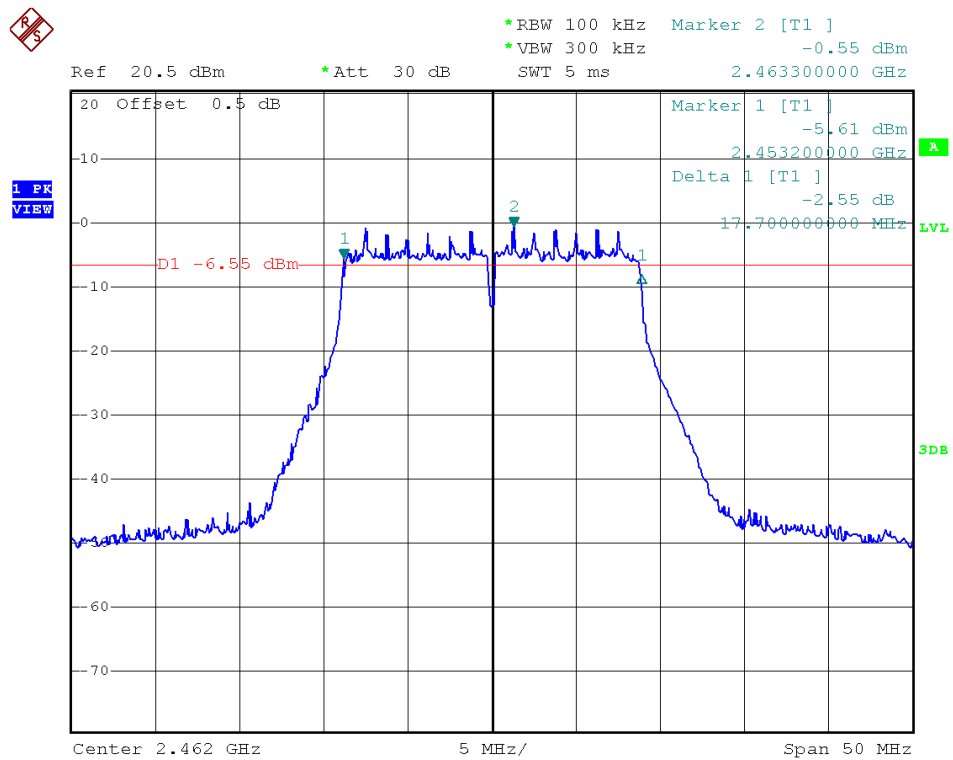
INTERTEK TESTING SERVICES

802.11n-HT20 MIMO Ant3



TRF no.: FCC 15C_TX_b
 FCC ID: QISHG658V2
 Report No.: 140504020SZN-001

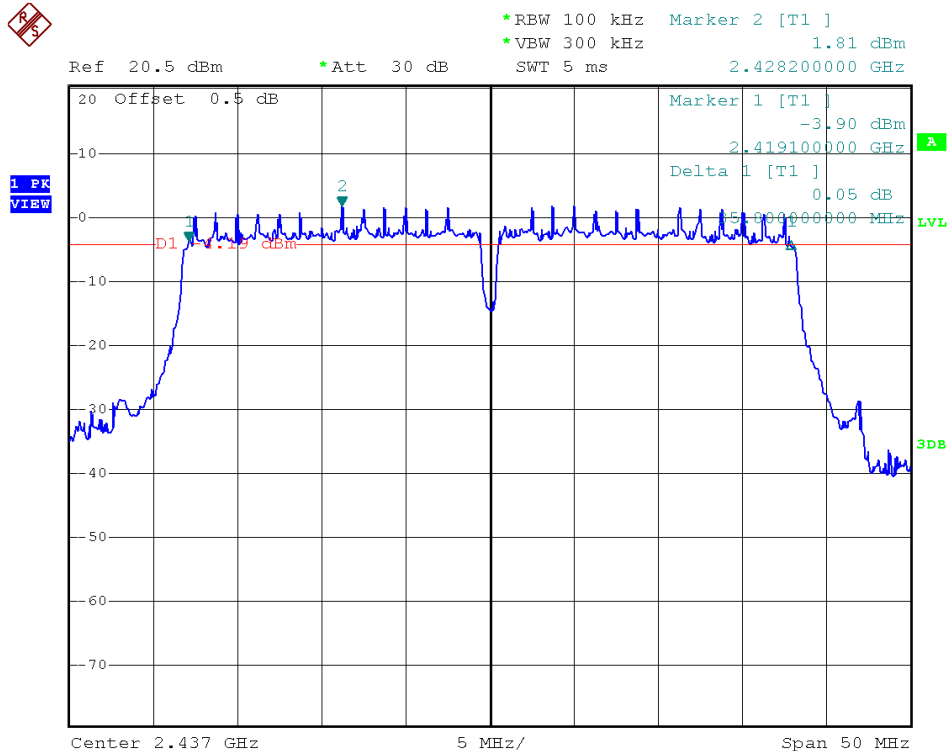
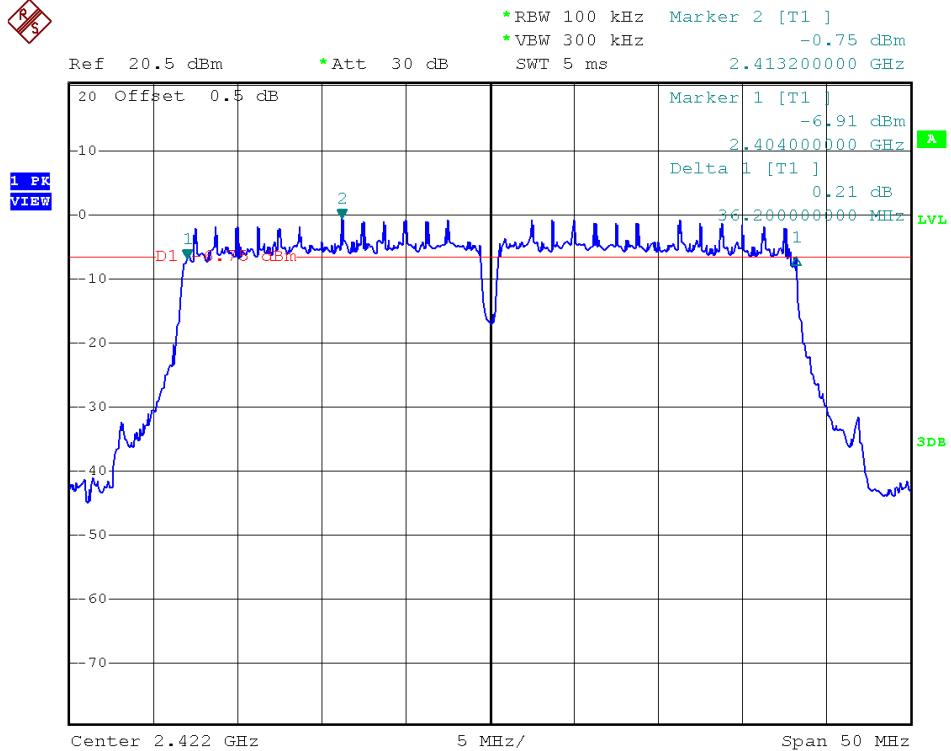
INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
 FCC ID: QISHG658V2
 Report No.: 140504020SZN-001

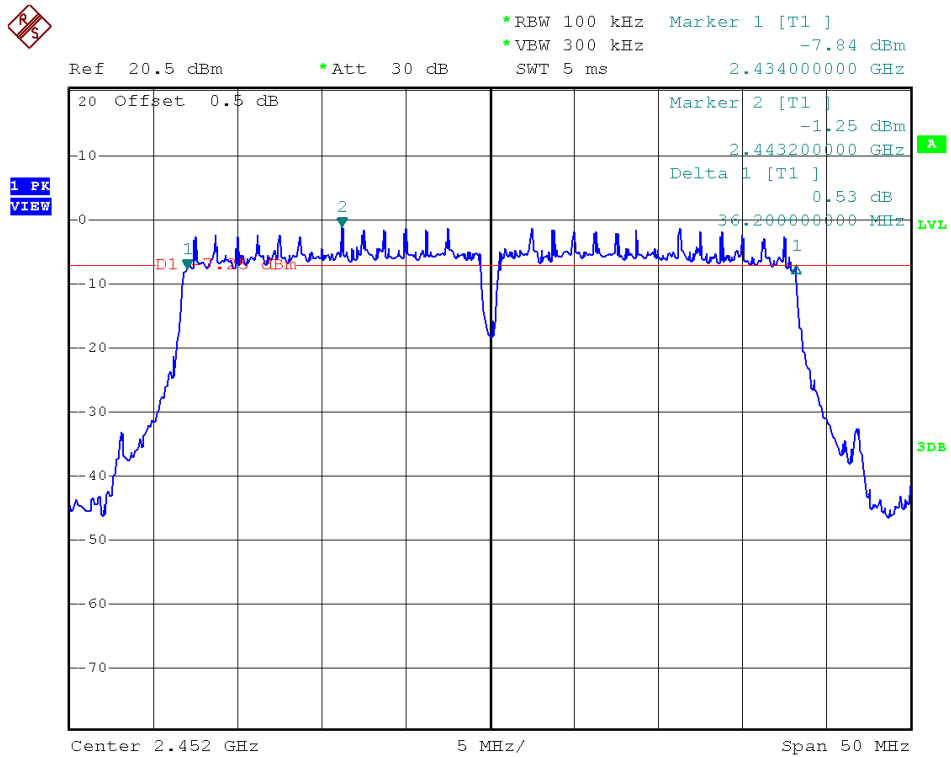
INTERTEK TESTING SERVICES

802.11n-HT40 SISO



TRF no.: FCC 15C_TX_b
 FCC ID: QISHG658V2
 Report No.: 140504020SZN-001

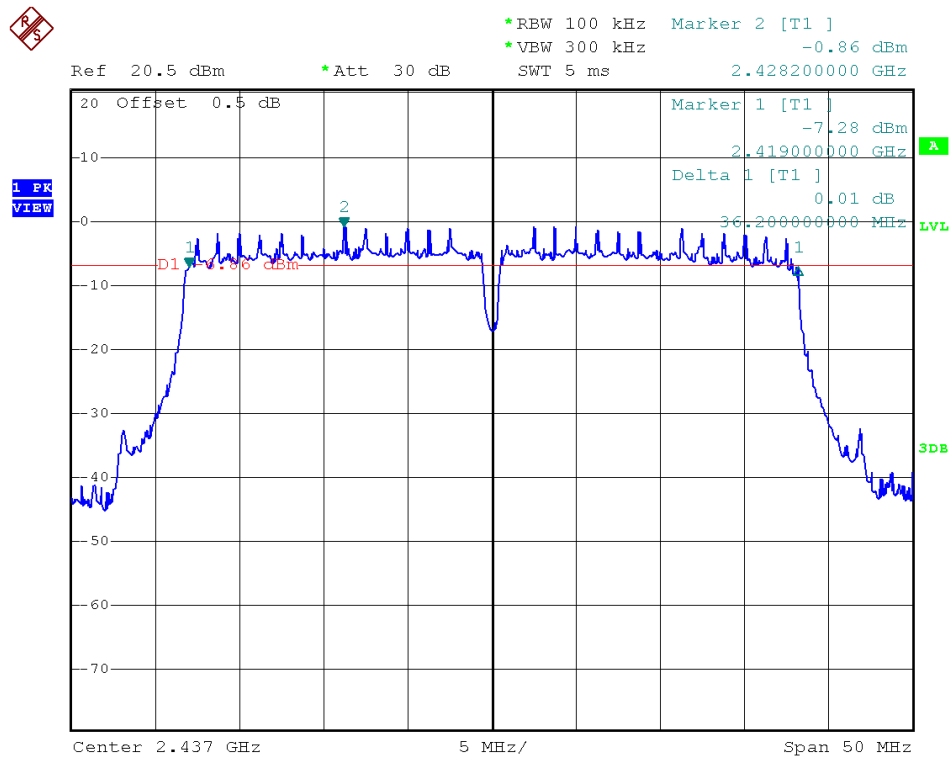
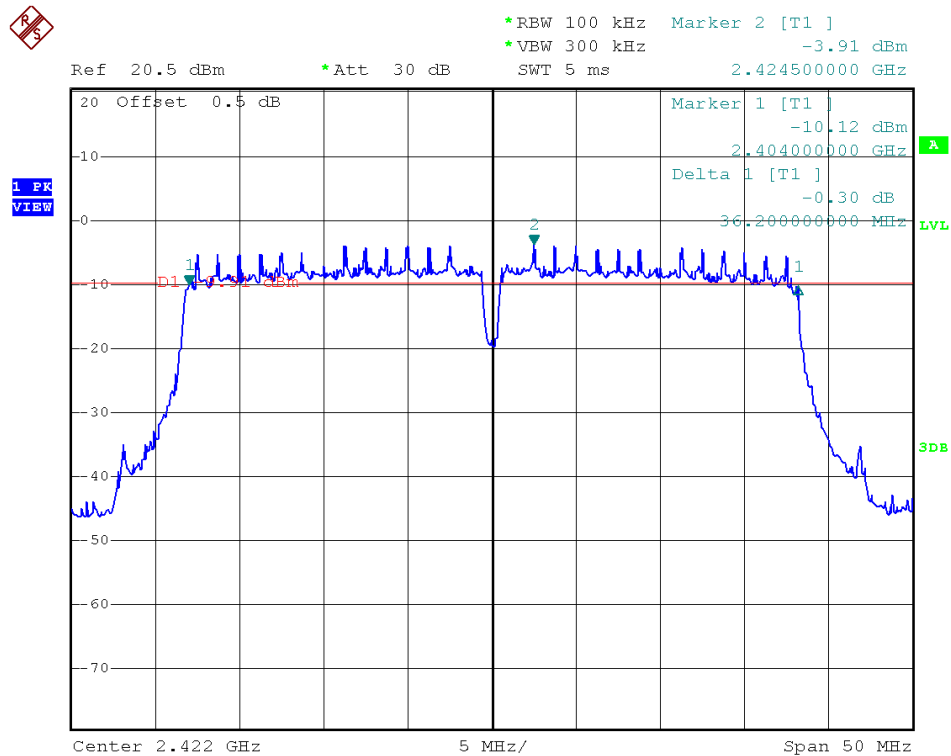
INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
 FCC ID: QISHG658V2
 Report No.: 140504020SZN-001

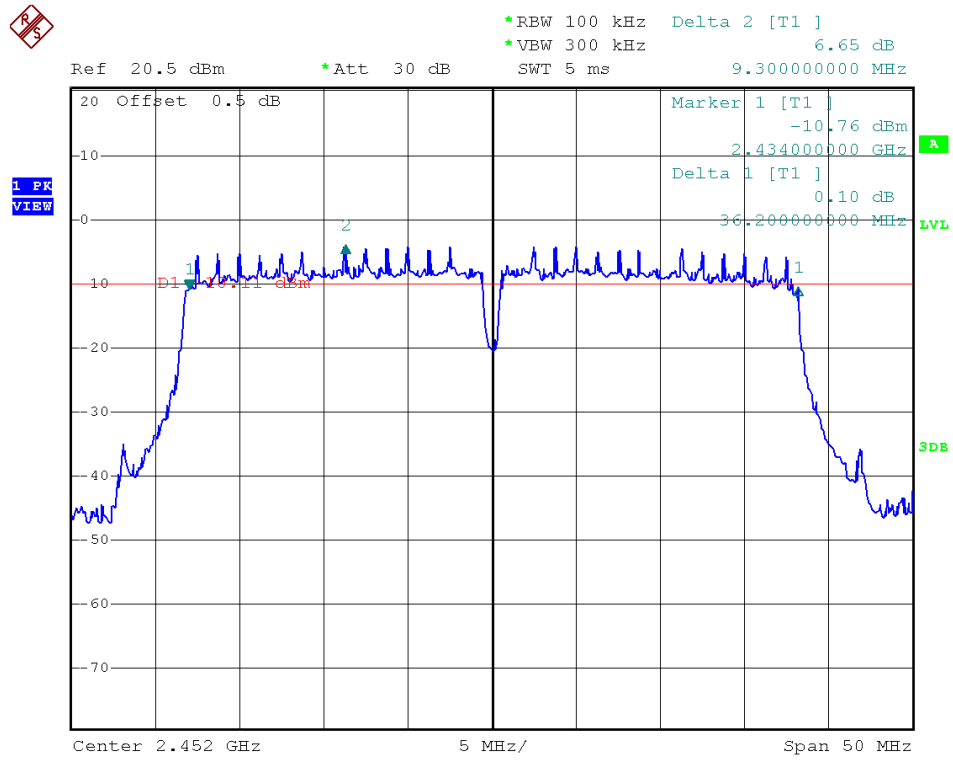
INTERTEK TESTING SERVICES

802.11n-HT40 MIMO Ant1



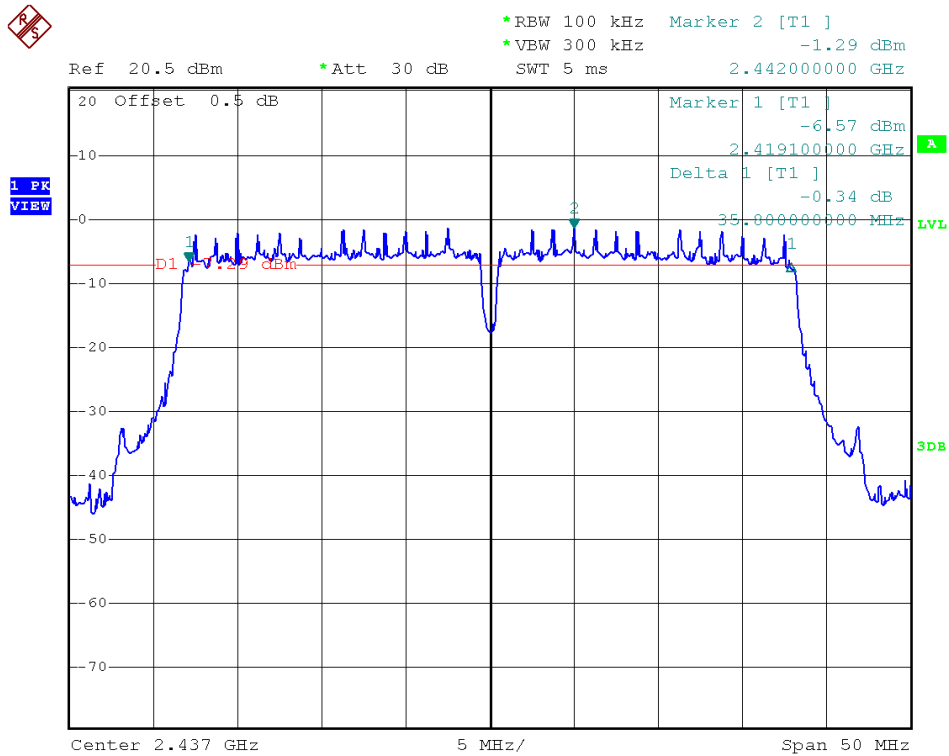
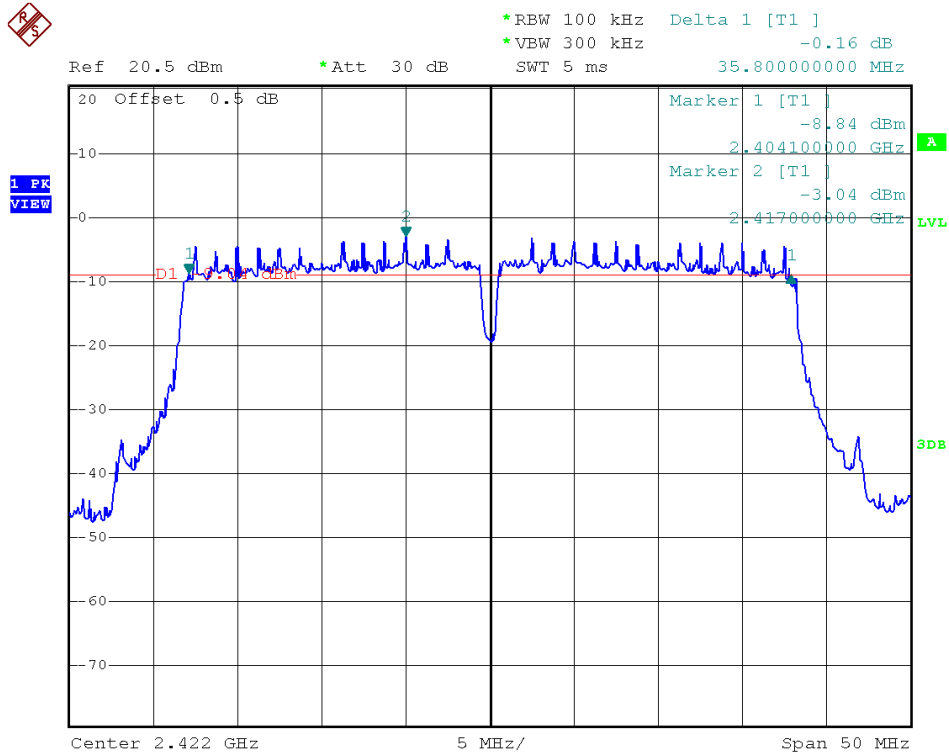
TRF no.: FCC 15C_TX_b
 FCC ID: QISHG658V2
 Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



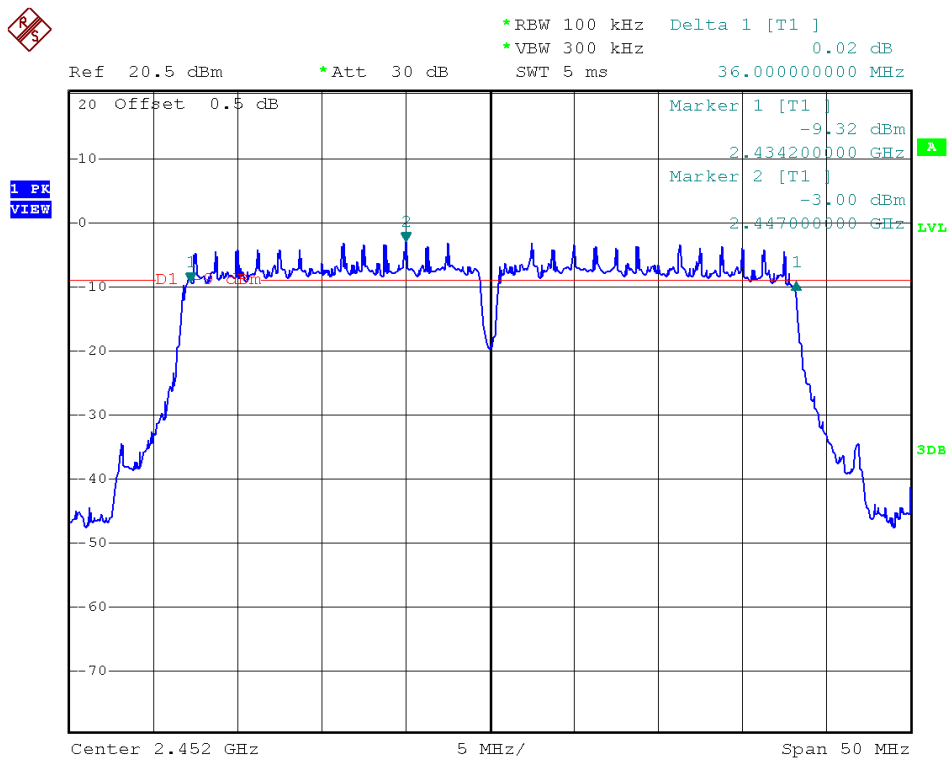
INTERTEK TESTING SERVICES

802.11n-HT40 MIMO Ant3



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
 FCC ID: QISHG658V2
 Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd
Model: HG658 V2

Date of Test: 15 May, 2014

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 100KHz
2412	6.84
2437	6.47
2462	6.56

IEEE 802.11g (BPSK, 6Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	2.66
2437	5.15
2462	3.19

IEEE 802.11n-HT20 SISO (BPSK, 6.5Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	2.33
2437	5.12
2462	1.98

INTERTEK TESTING SERVICES

Unit: dBm

IEEE 802.11n-HT20 MIMO(BPSK, 13Mbps)			
Frequency (MHz)	Power Density with RBW 100KHz		
	ANT 1	ANT 3	Total
2412	-0.22	0.42	3.12
2437	1.65	2.68	5.21
2462	-0.59	-0.73	2.36

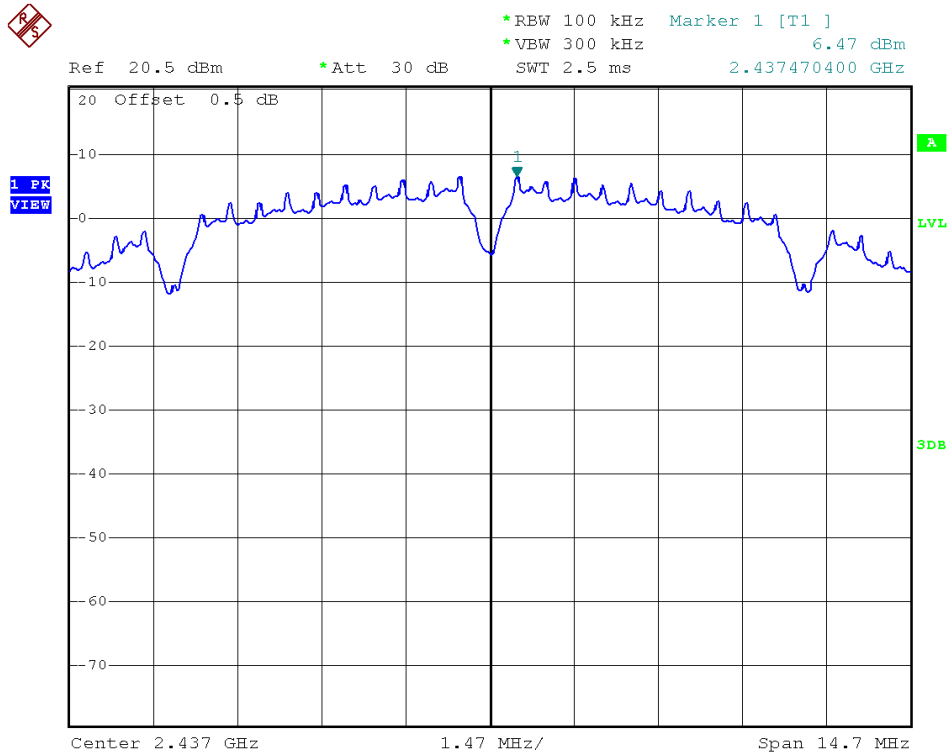
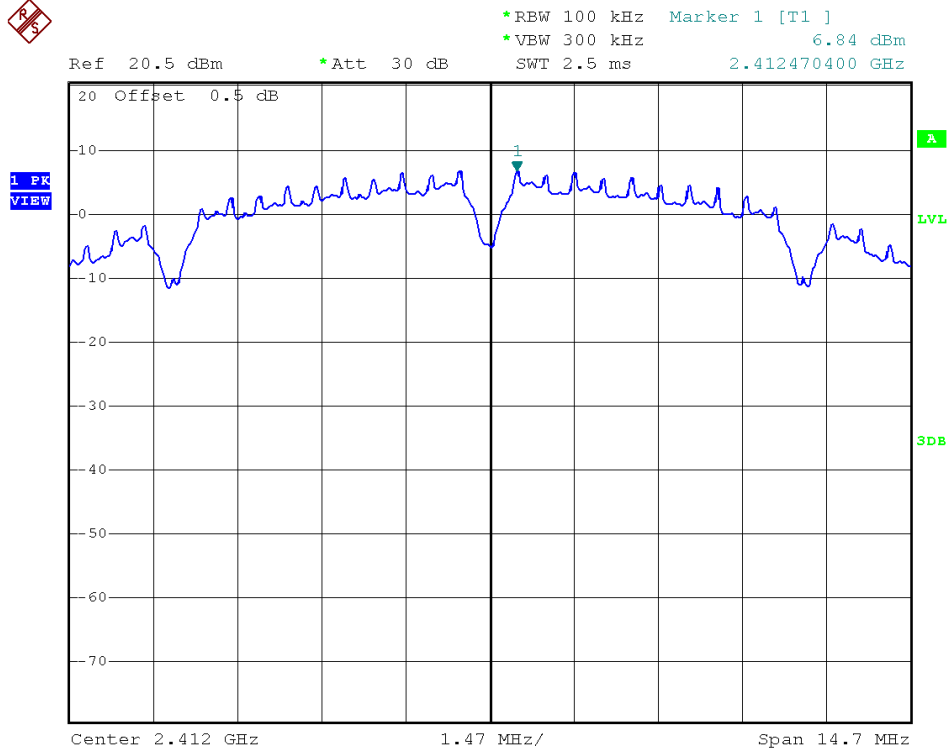
IEEE 802.11n-HT40 SISO (BPSK, 13.5Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2422	-0.92
2437	1.62
2452	-1.35

IEEE 802.11n-HT40 MIMO(BPSK, 27Mbps)			
Frequency (MHz)	Power Density with RBW 100KHz		
	ANT 1	ANT 3	Total
2422	-4.03	-3.21	-0.60
2437	-1.07	-1.20	1.88
2452	-4.27	-2.95	-0.56

The test plots are attached as below.

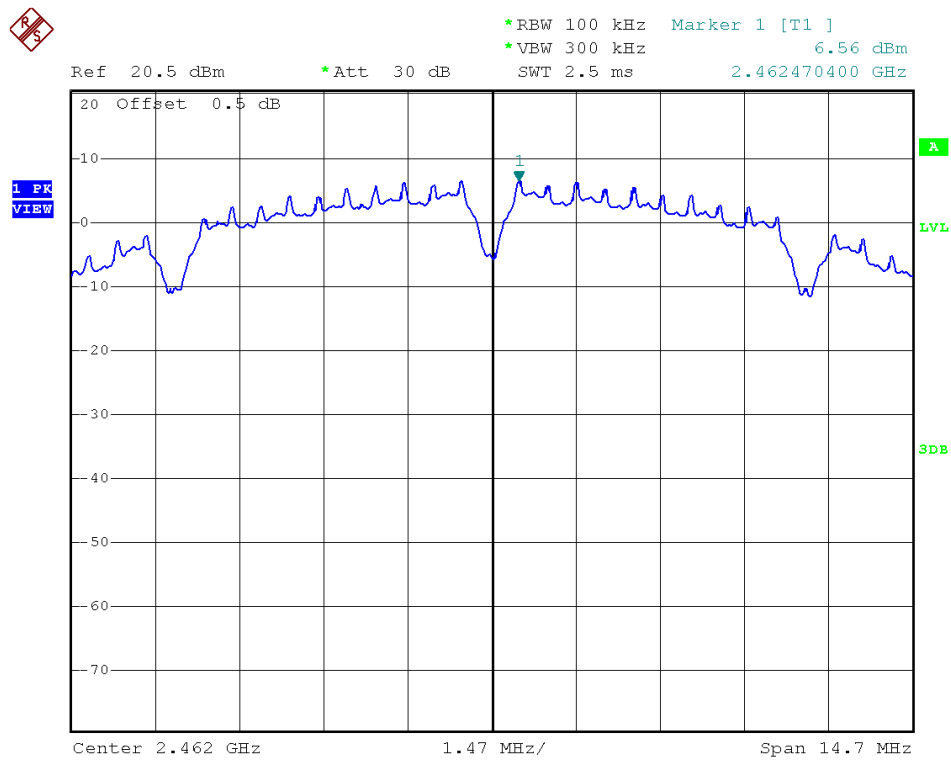
INTERTEK TESTING SERVICES

802.11b



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

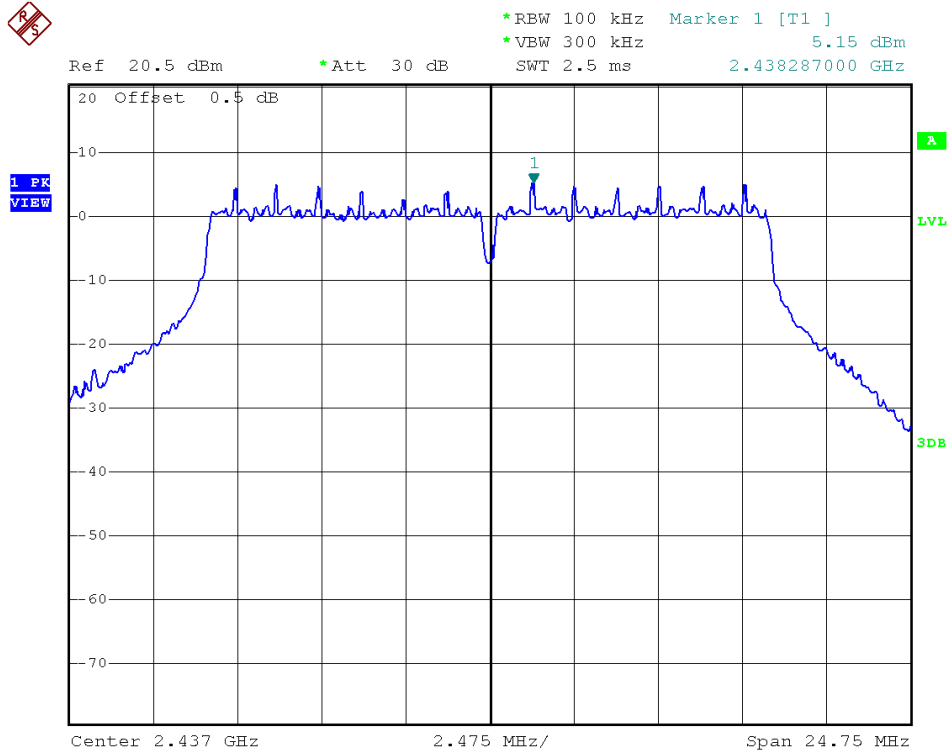
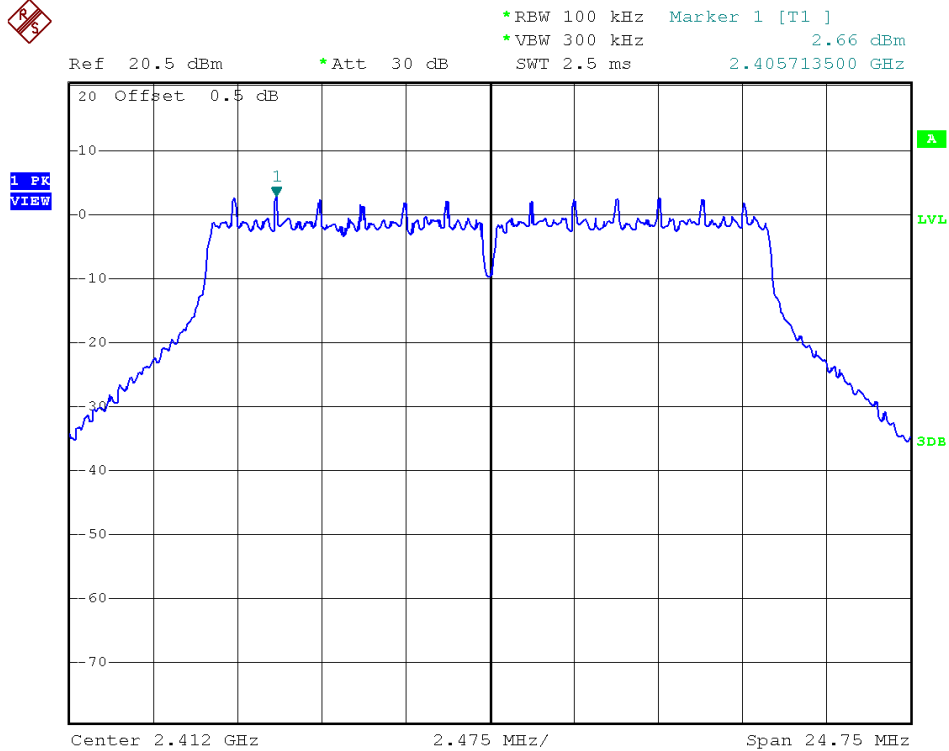
INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

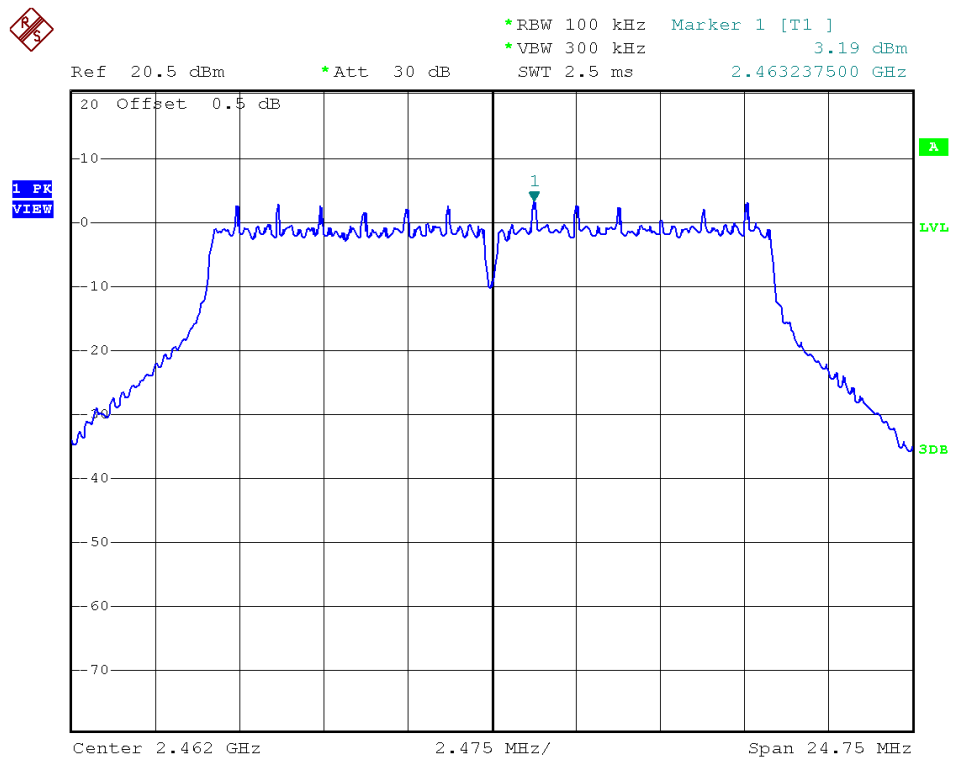
INTERTEK TESTING SERVICES

802.11g



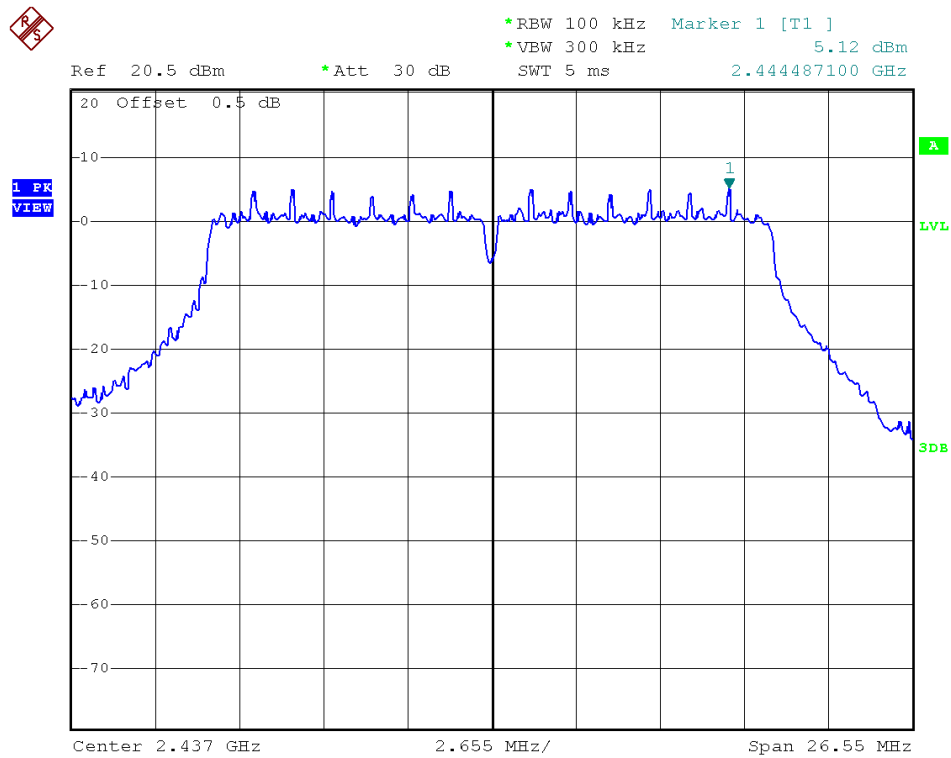
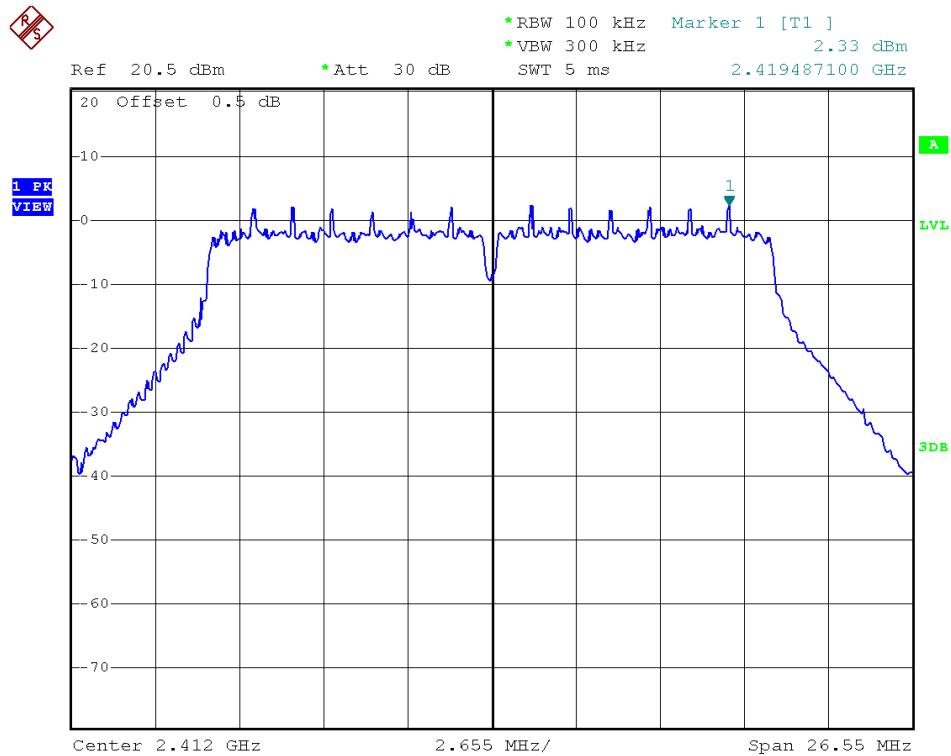
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



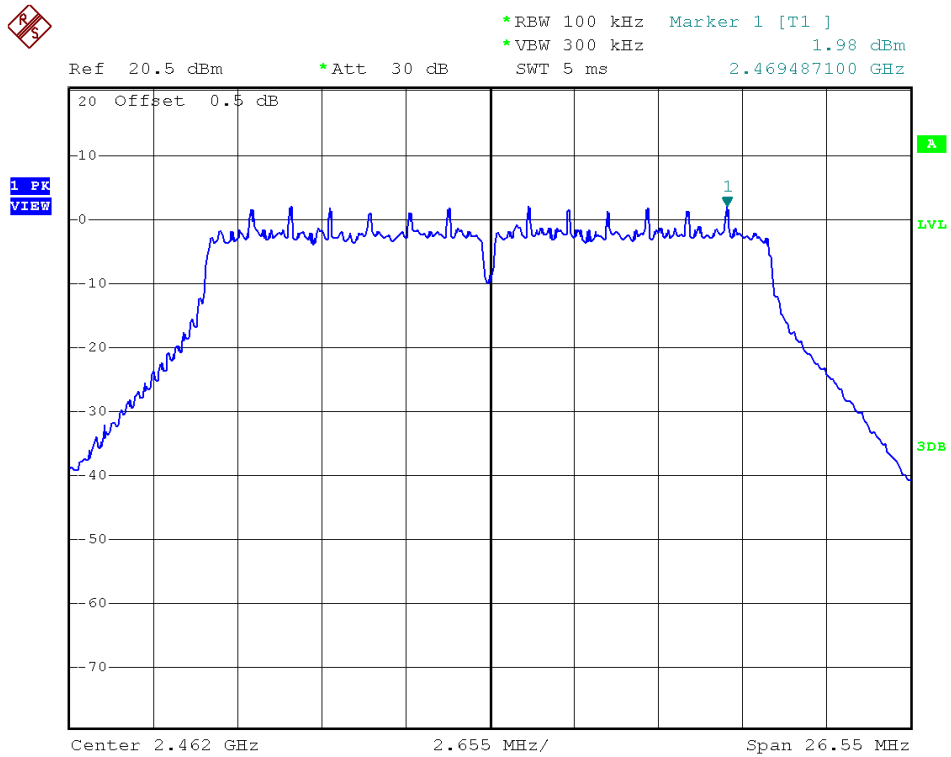
INTERTEK TESTING SERVICES

802.11n-HT20 SISO



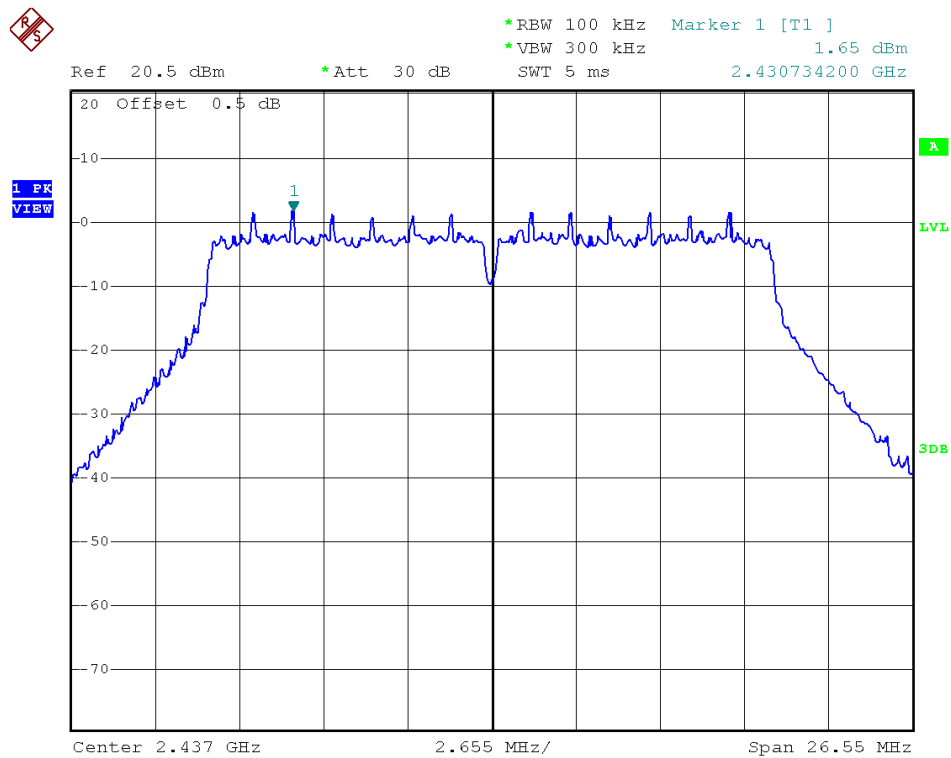
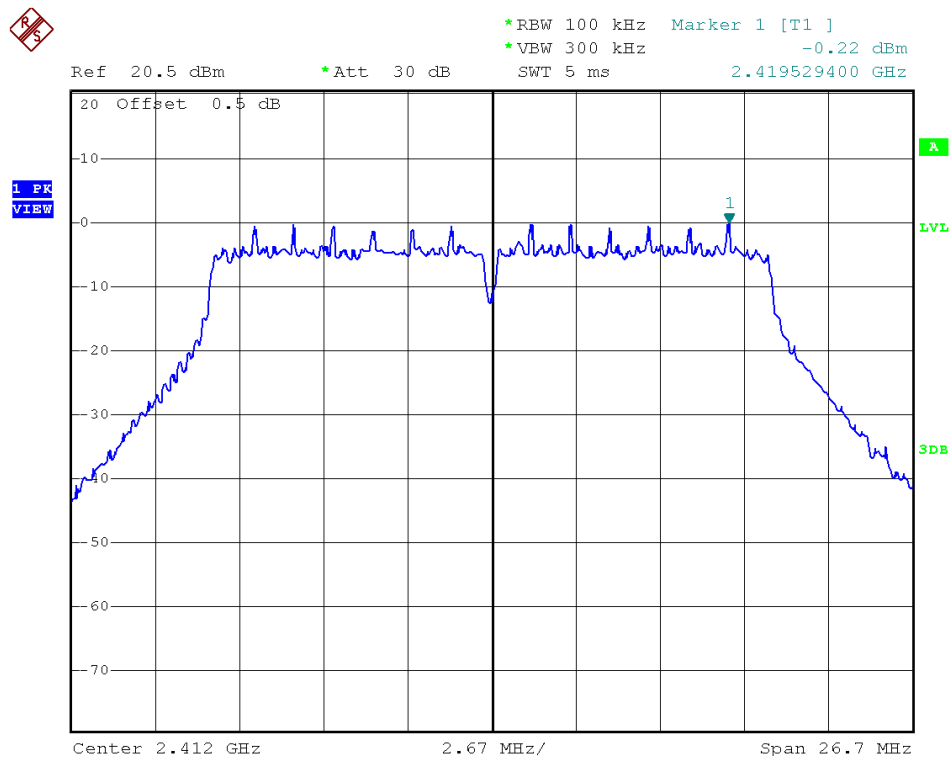
TRF no.: FCC 15C_TX_b
 FCC ID: QISHG658V2
 Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



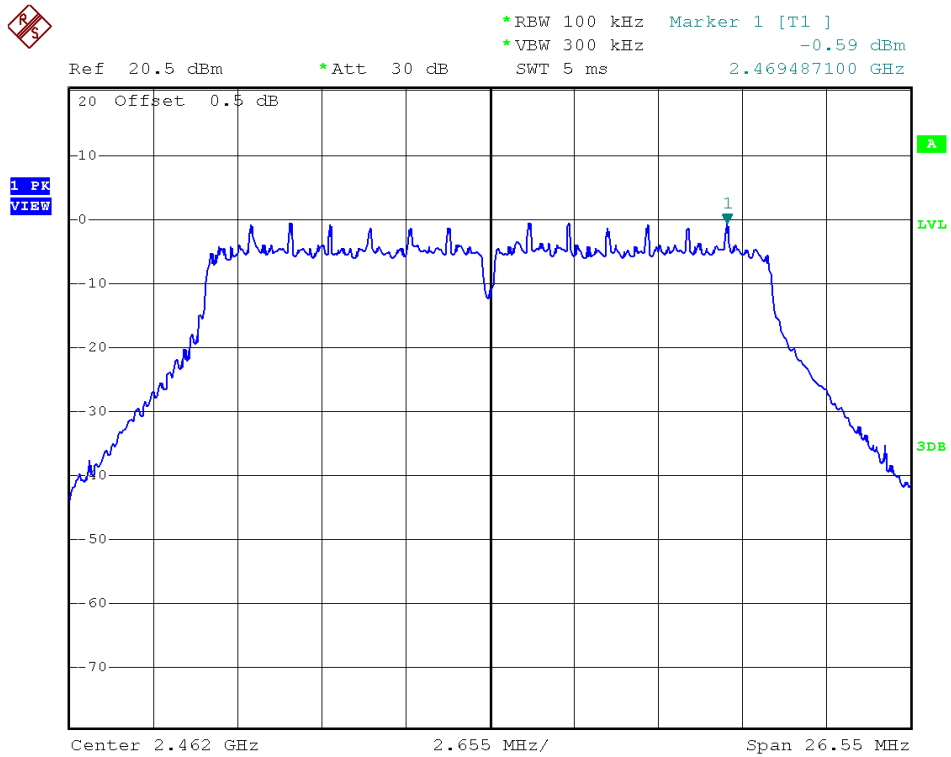
INTERTEK TESTING SERVICES

802.11n-HT20 MIMO Ant1



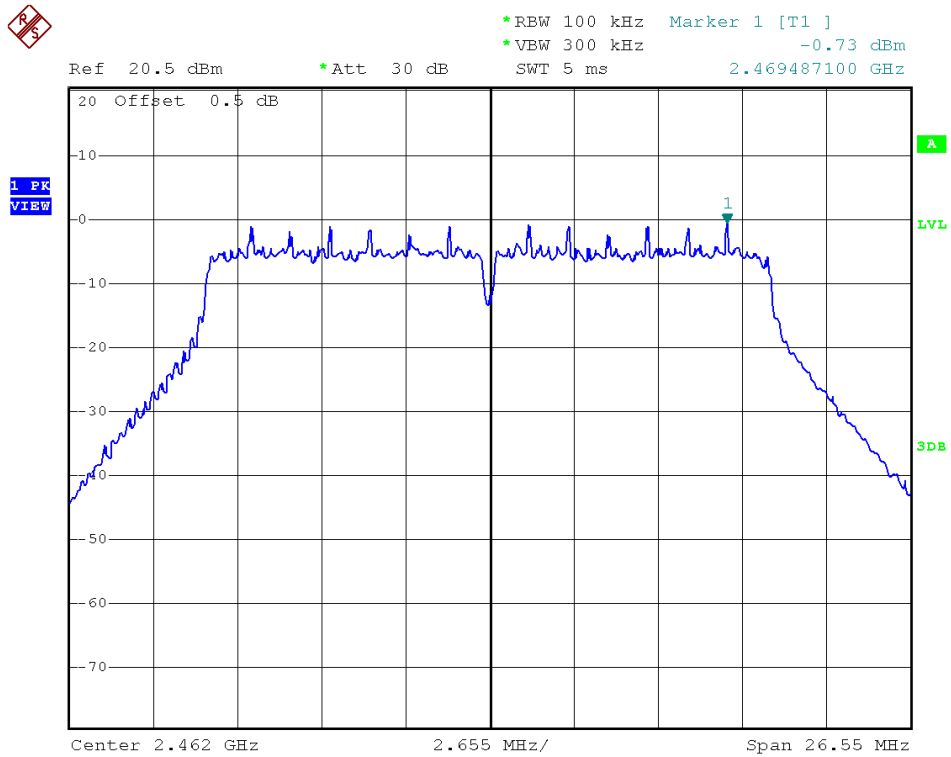
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

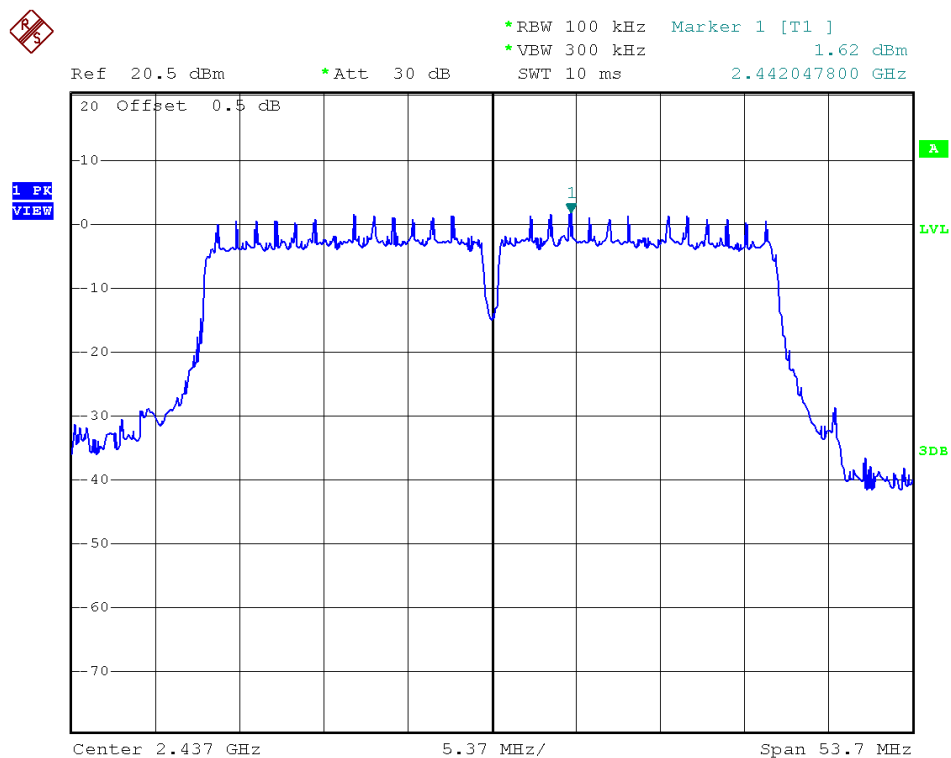
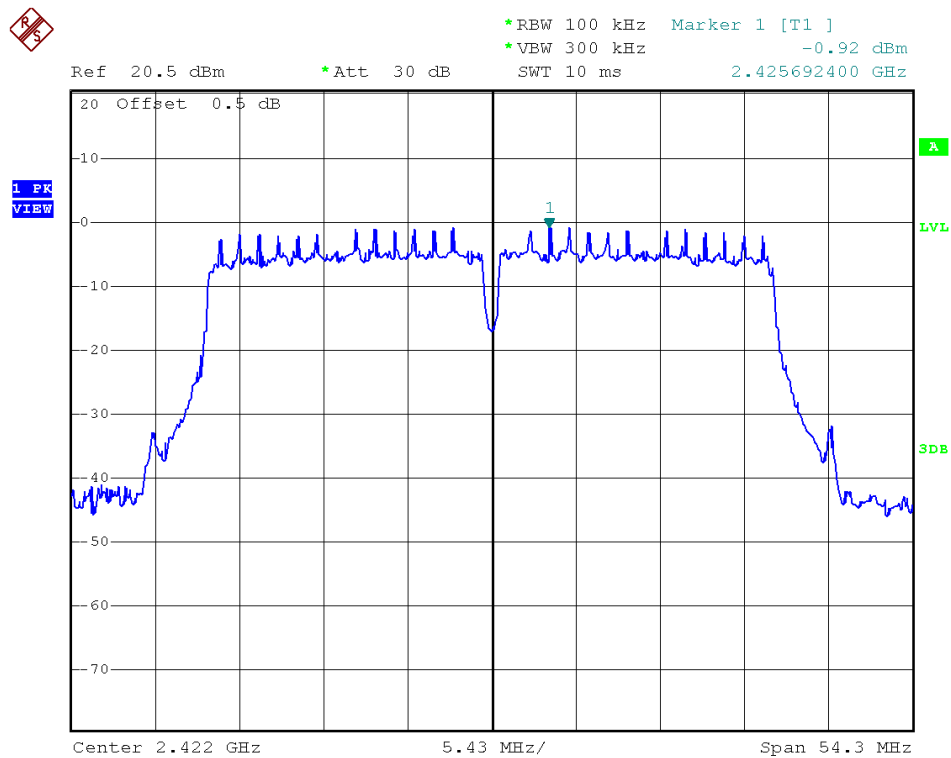
INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

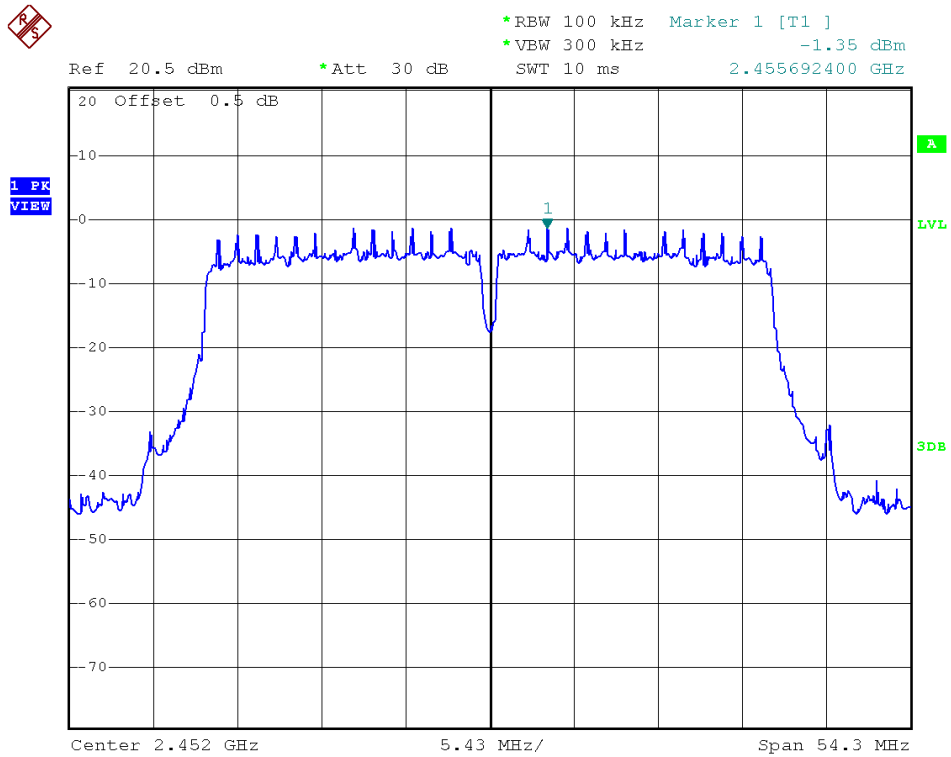
INTERTEK TESTING SERVICES

802.11n-HT40 SISO



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

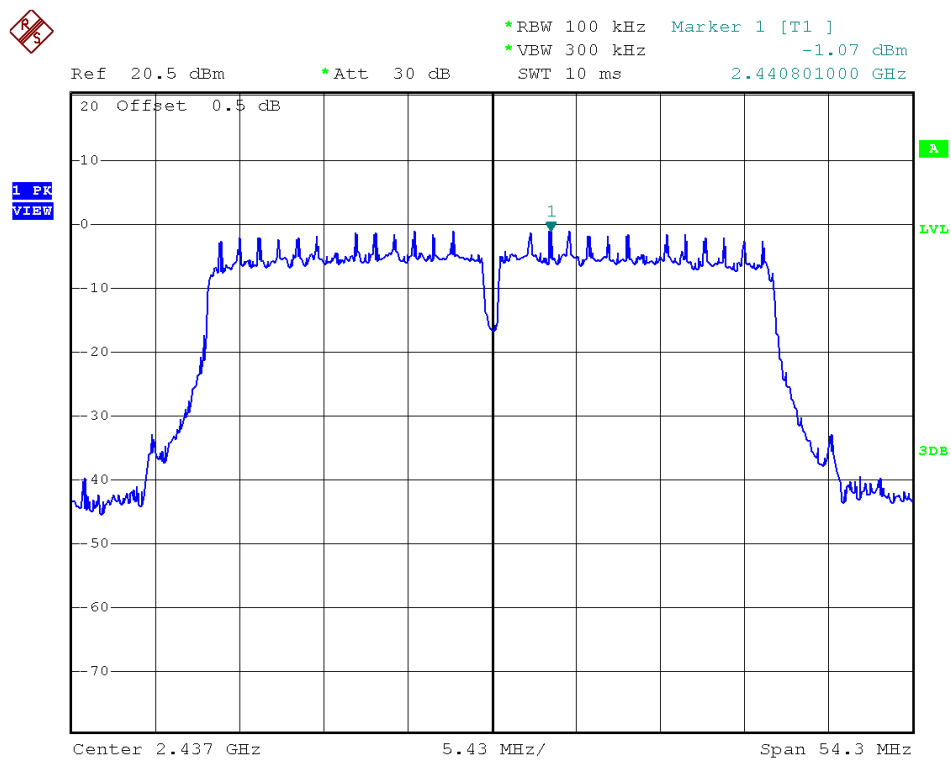
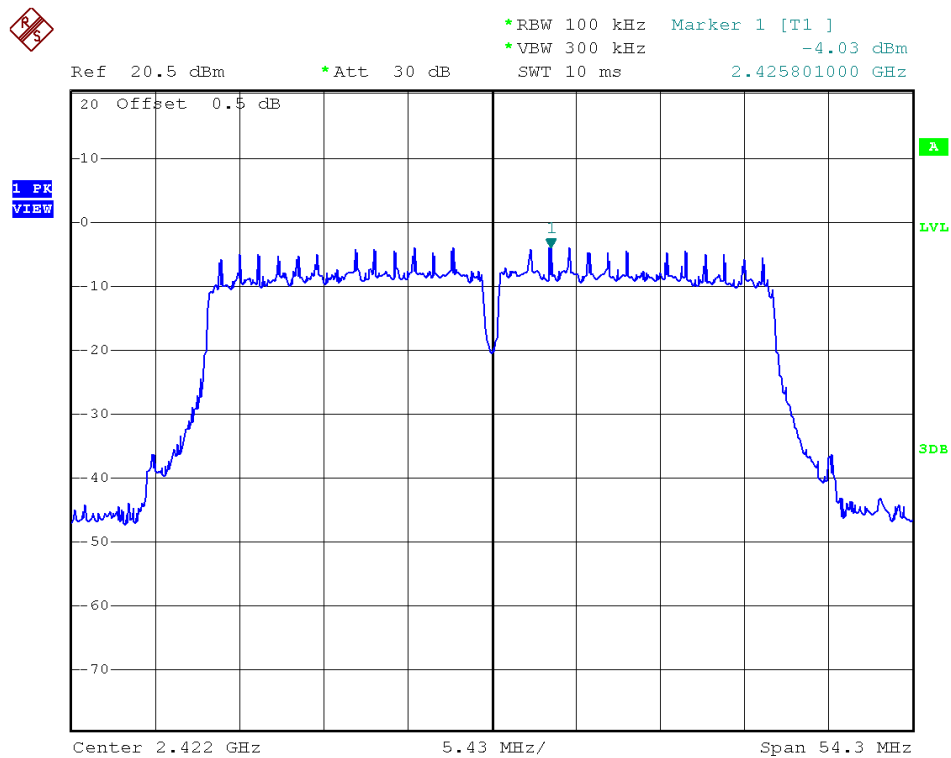
INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

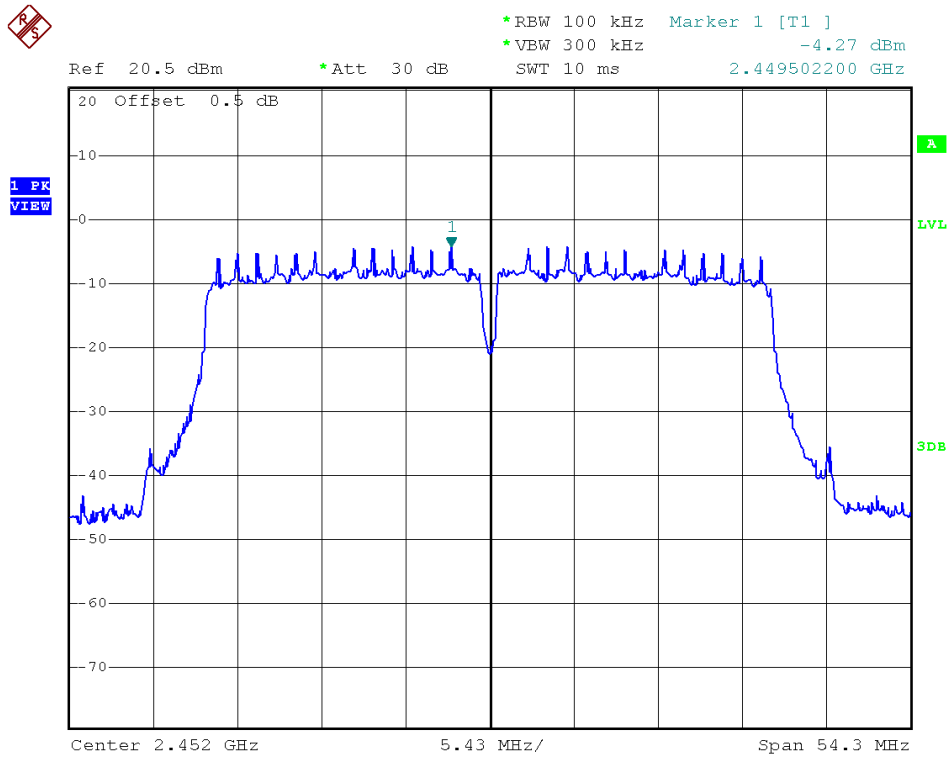
INTERTEK TESTING SERVICES

802.11n-HT40 MIMO Ant1



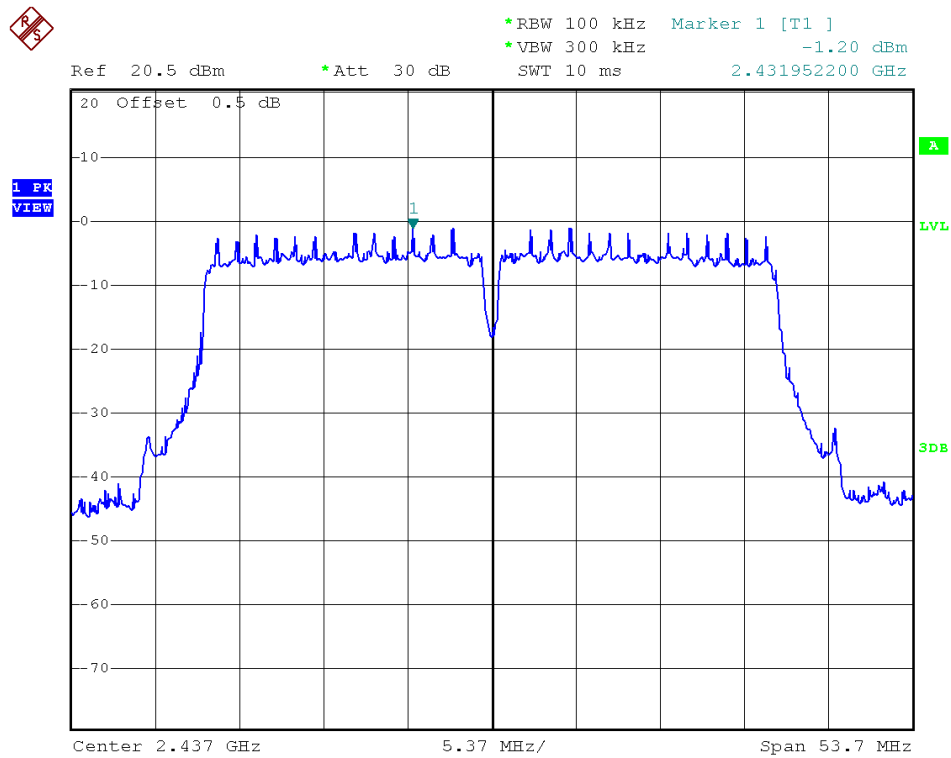
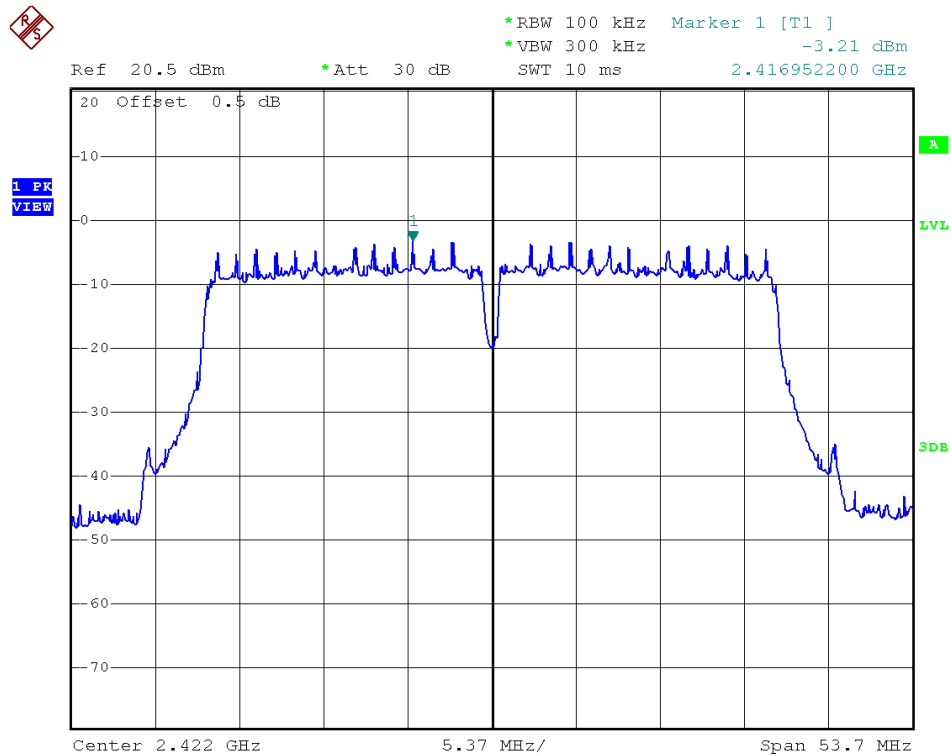
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



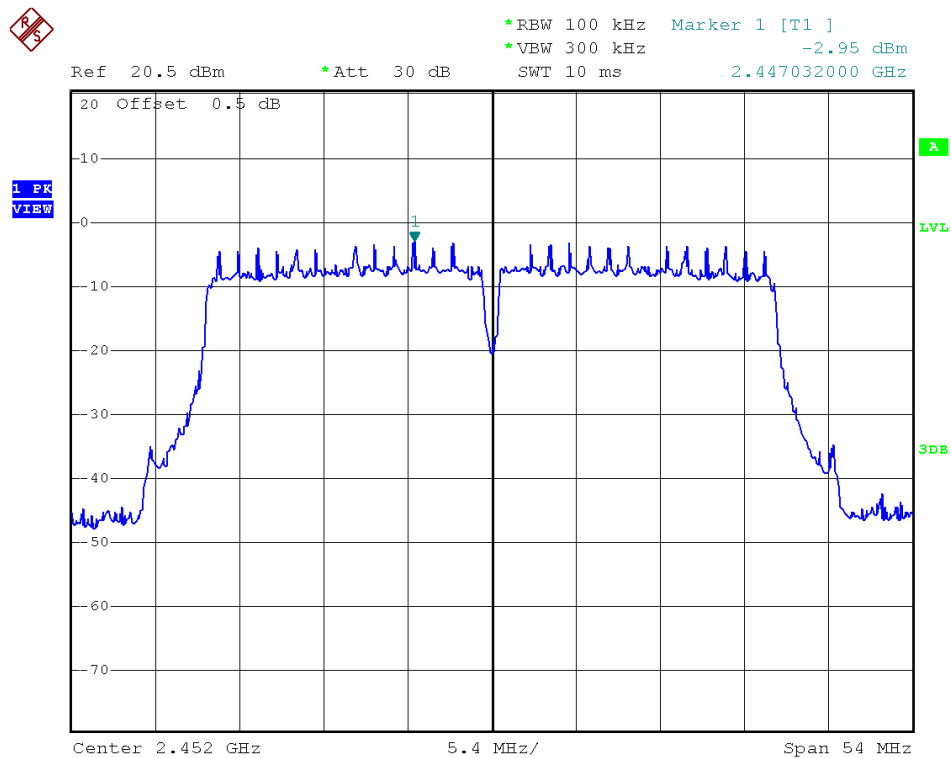
INTERTEK TESTING SERVICES

802.11n-HT40 MIMO Ant3



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd
Model: HG658 V2

Date of Test: 15 May, 2014

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.

TRF no.: FCC 15C_TX_b

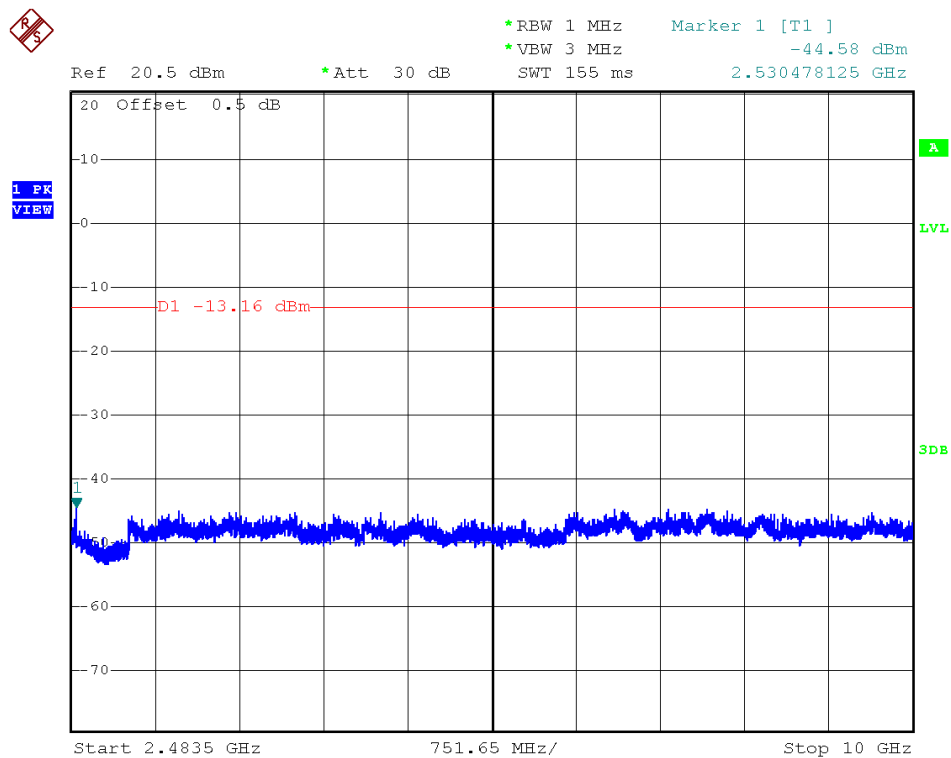
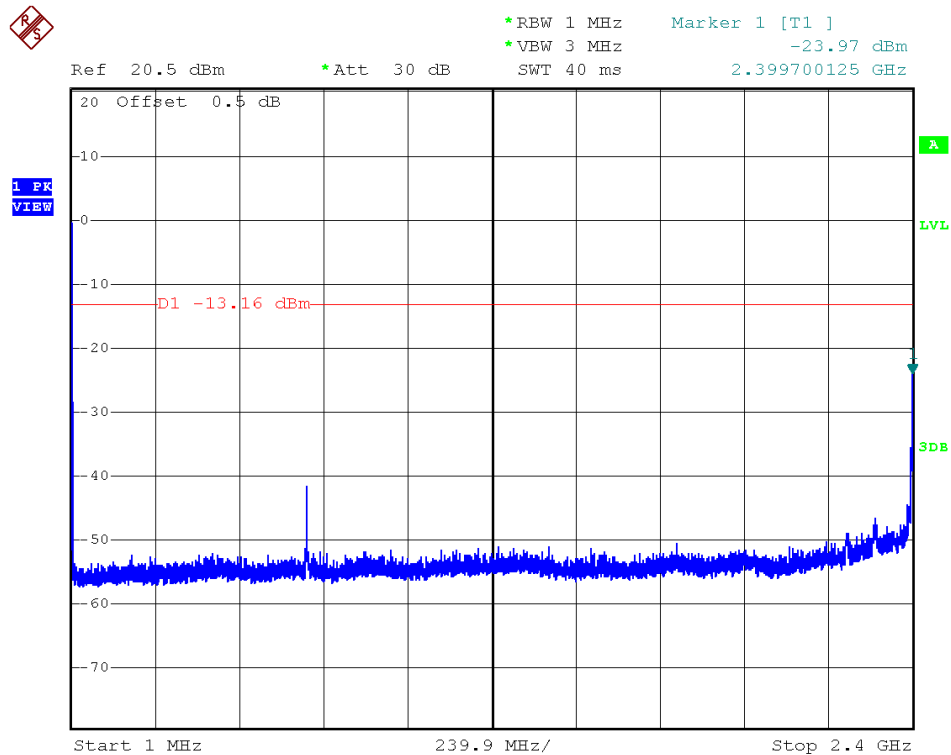
FCC ID: QISHG658V2

Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

802.11b

Channel 1 (2412MHz) Reference Level: 6.84dBm

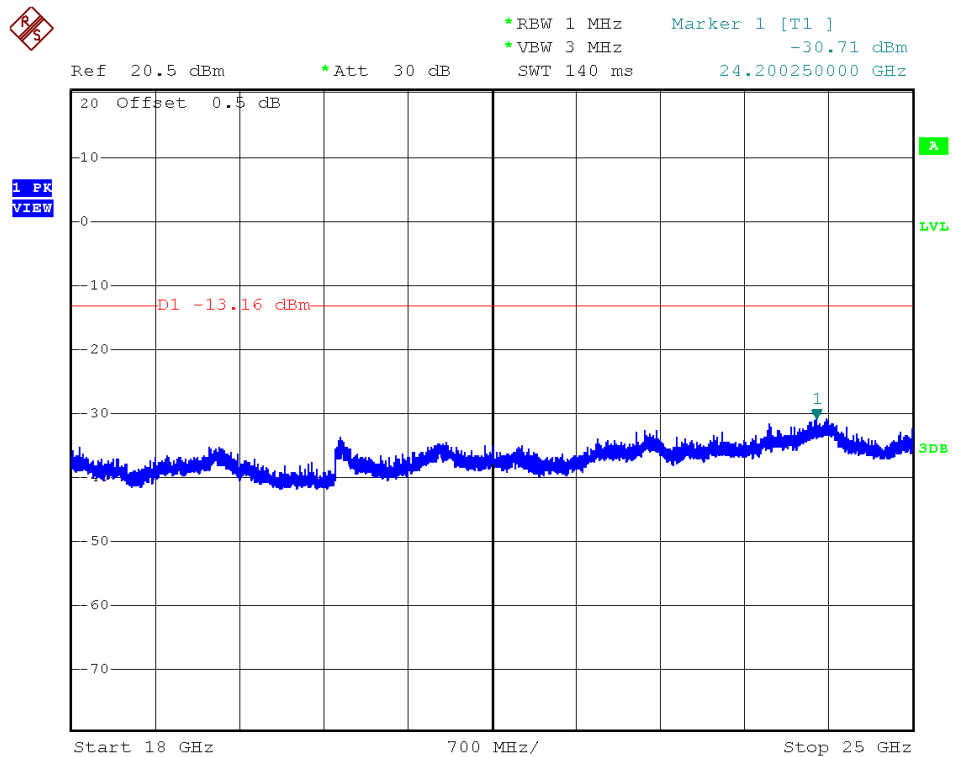
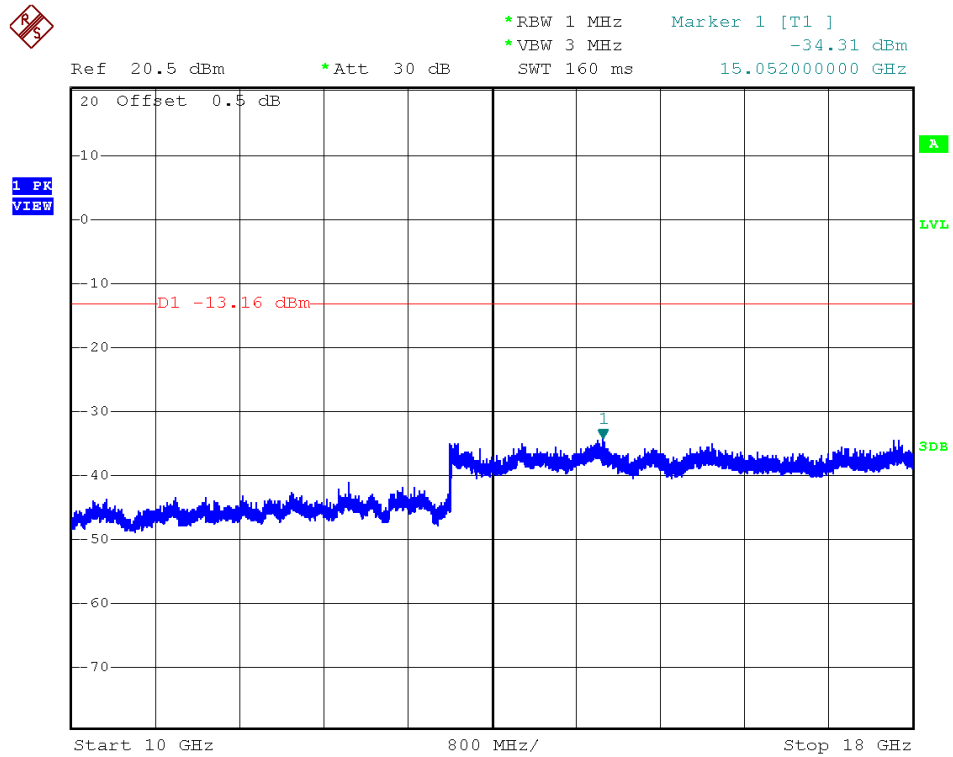


TRF no.: FCC 15C_TX_b

FCC ID: QISHG658V2

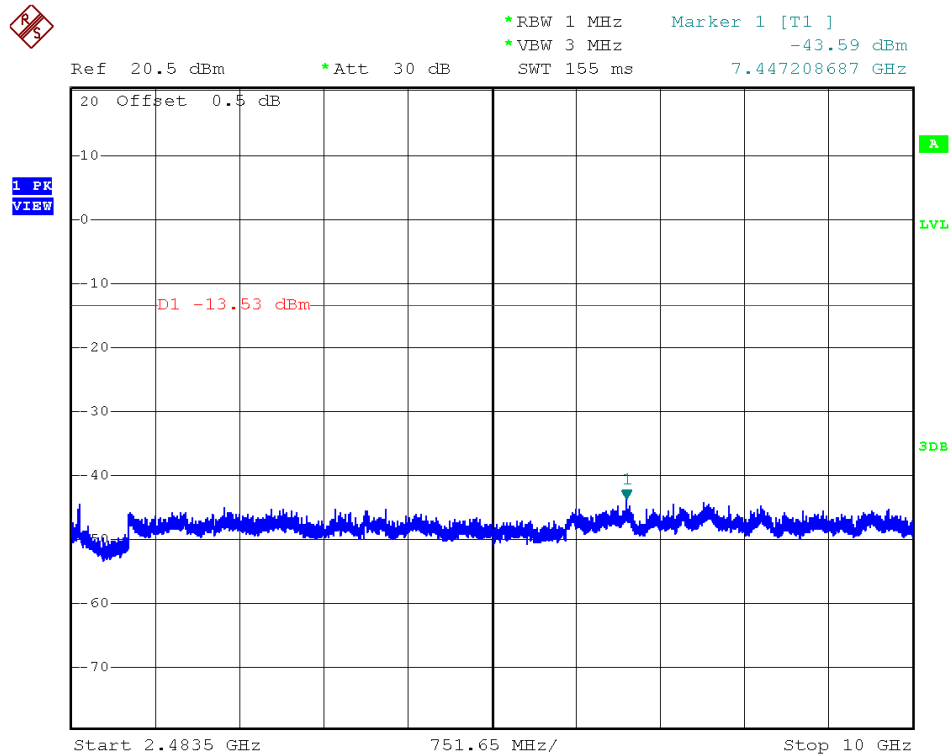
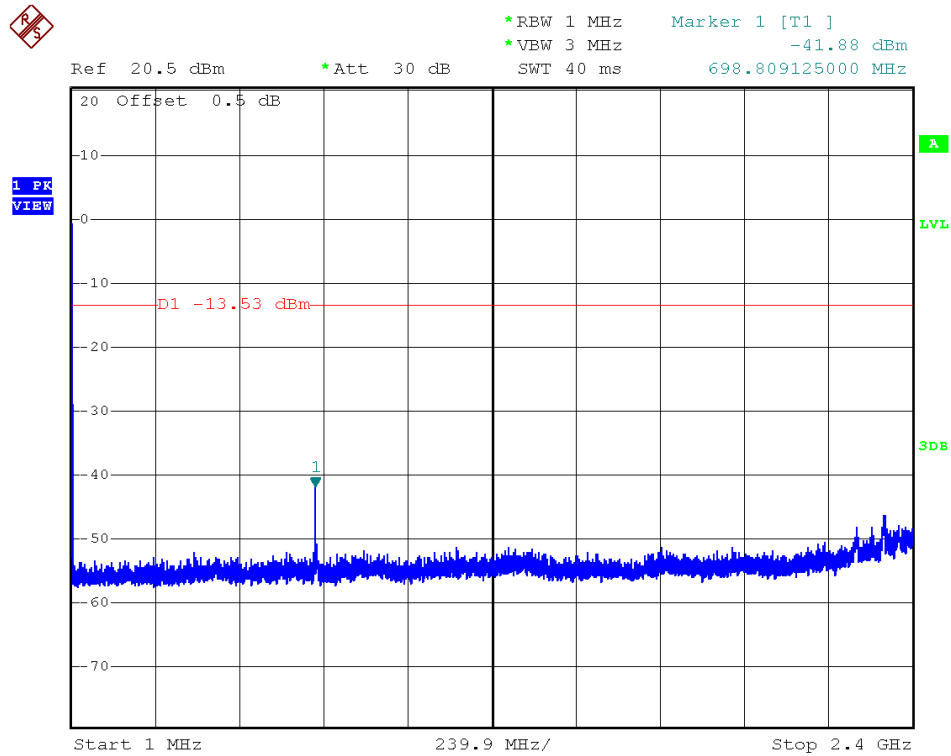
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



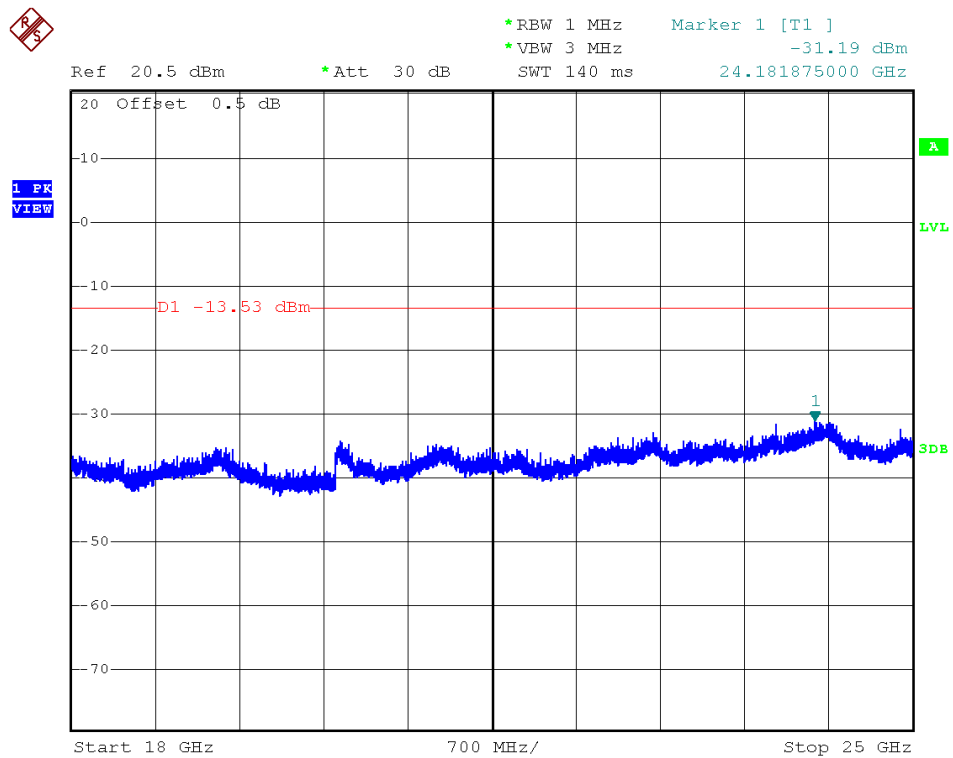
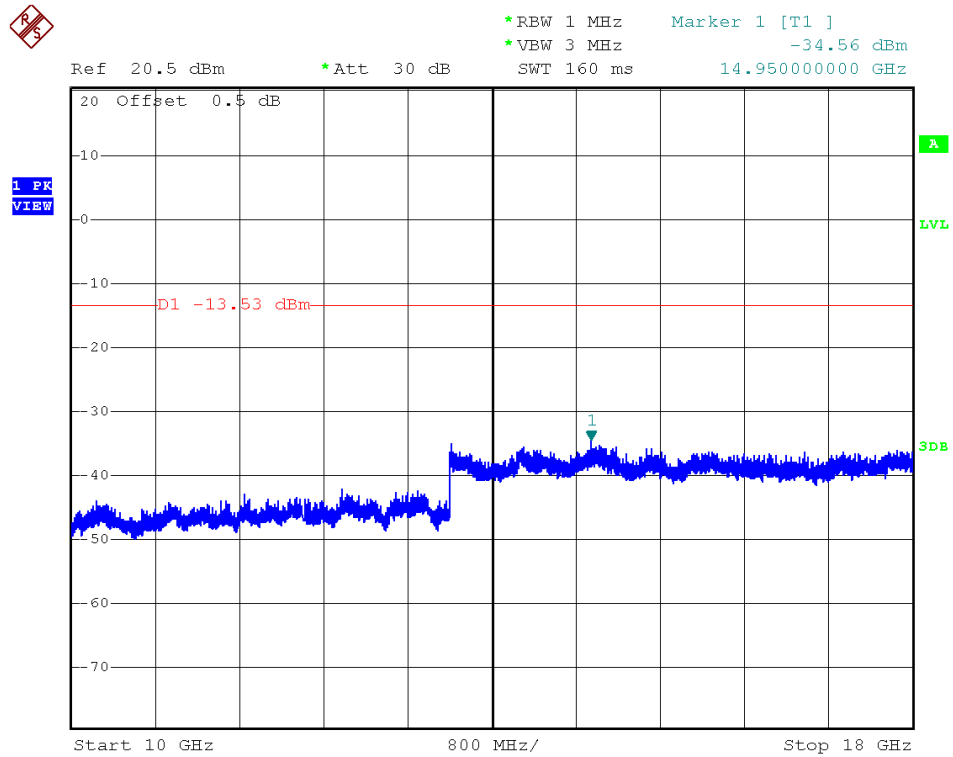
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 6.47dBm



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

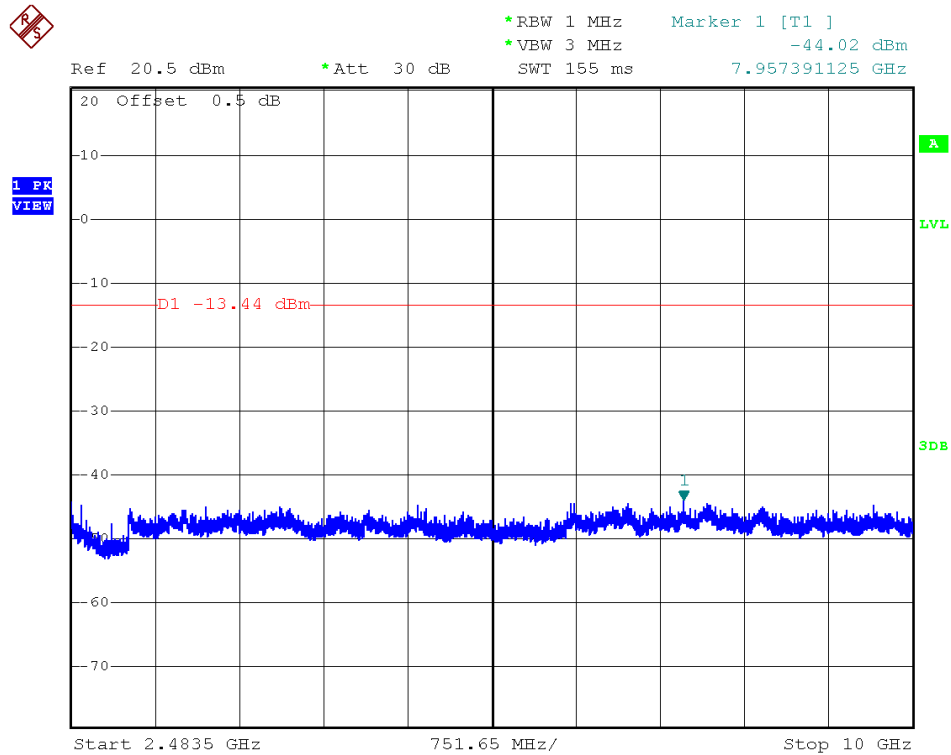
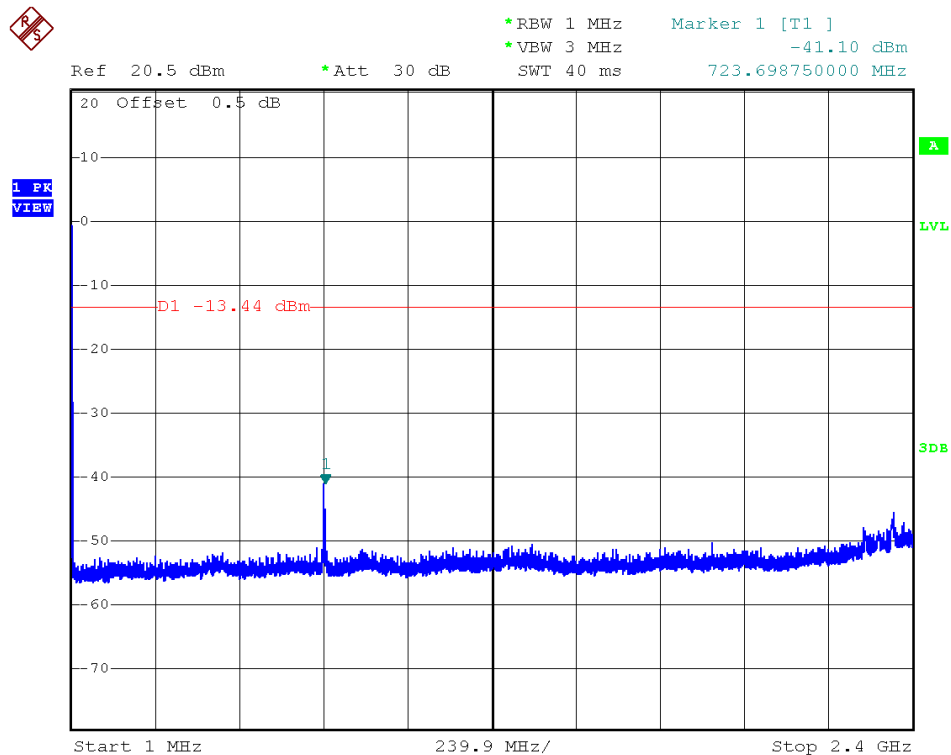
INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
 FCC ID: QISHG658V2
 Report No.: 140504020SZN-001

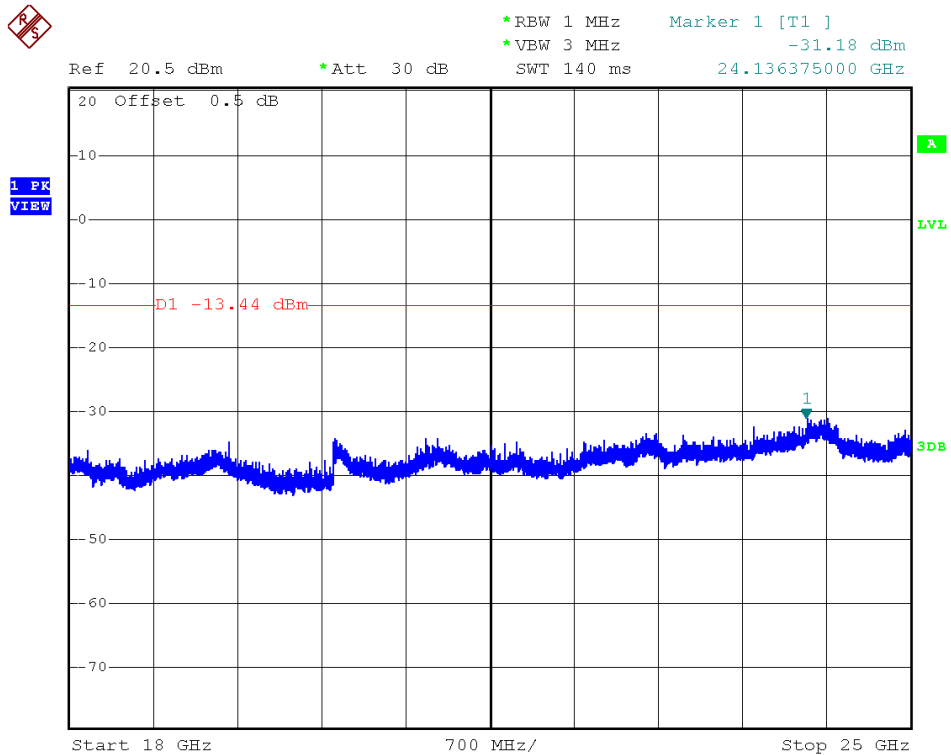
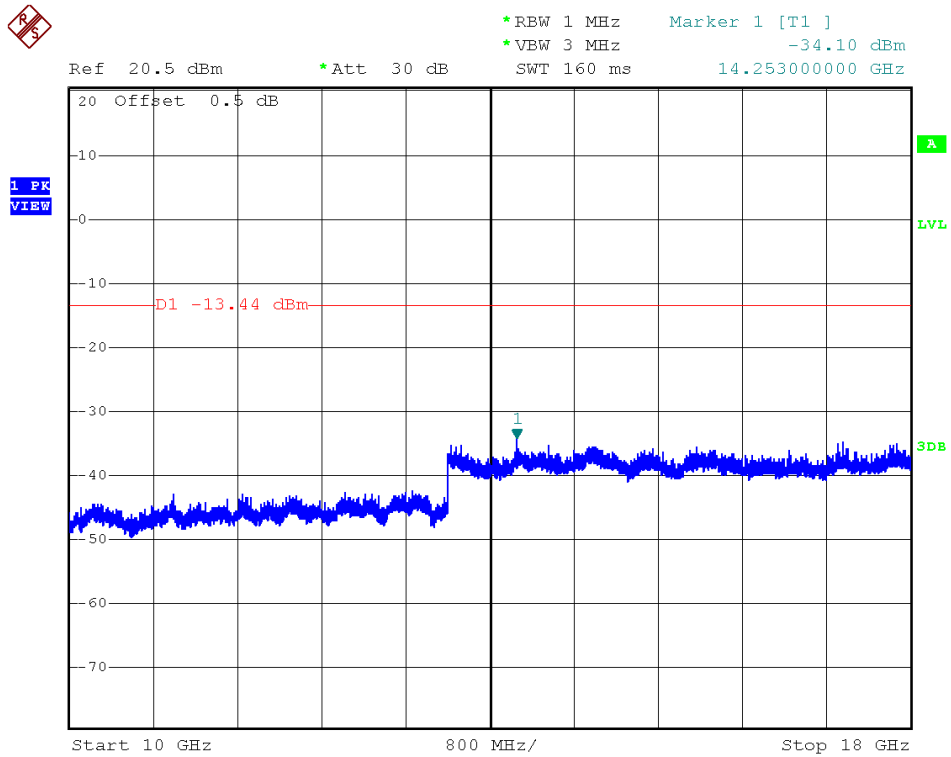
INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: 6.56dBm



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

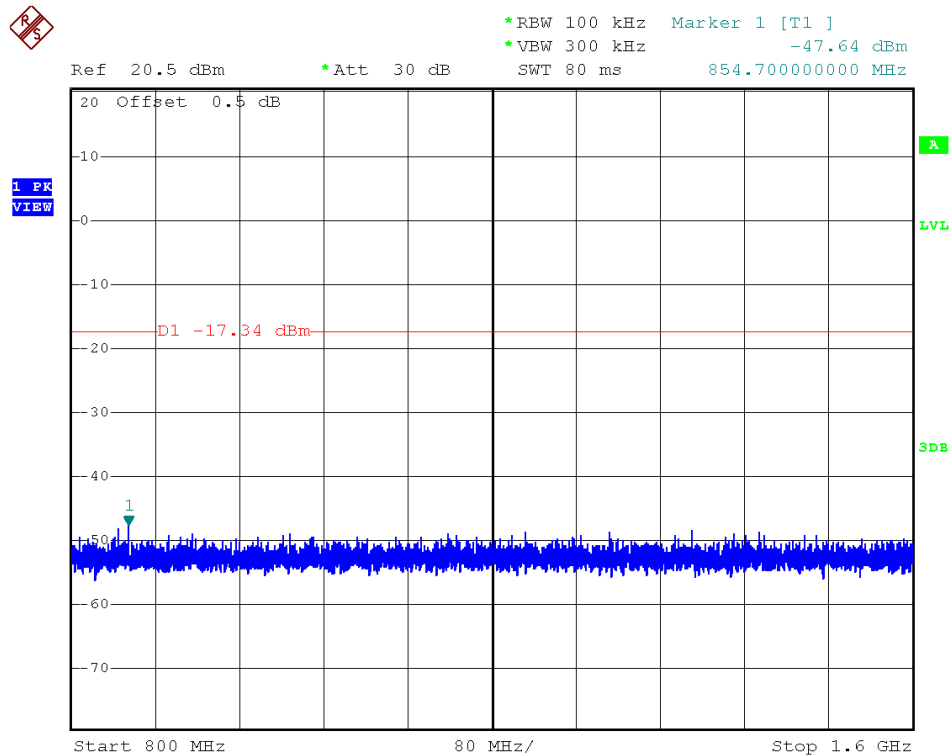
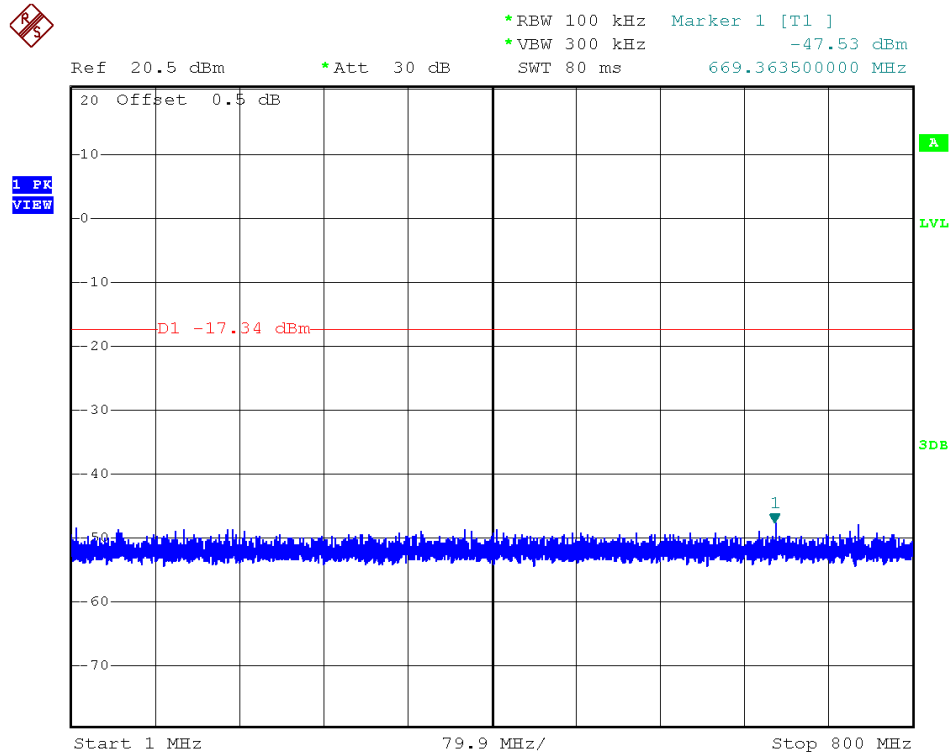
INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

802.11g

Channel 1 (2412MHz) Reference Level: 2.66dBm

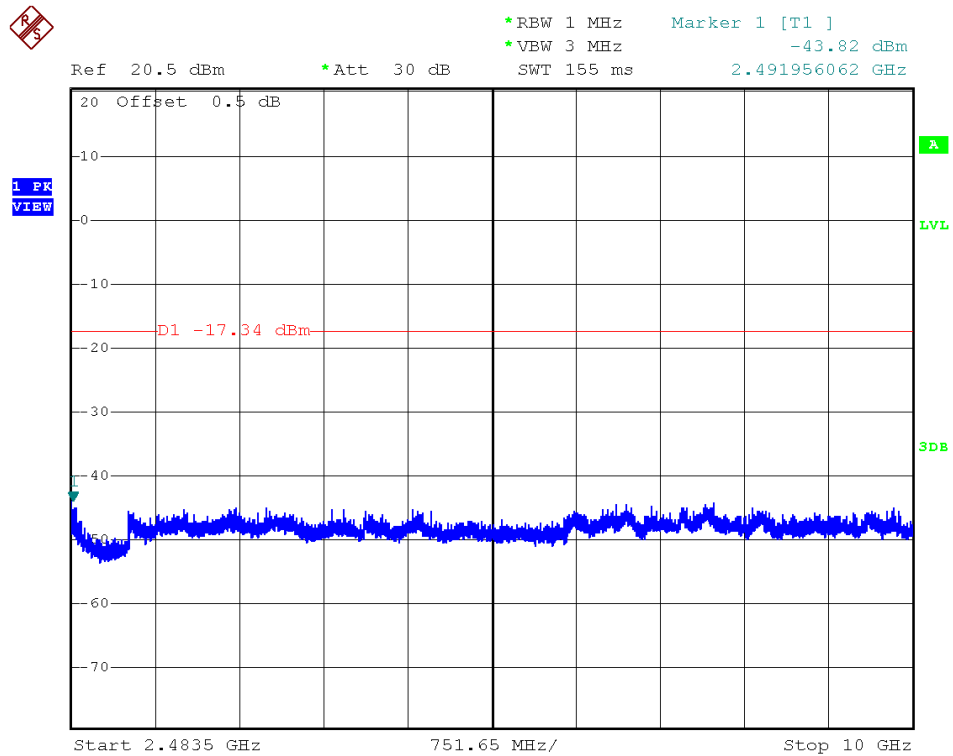
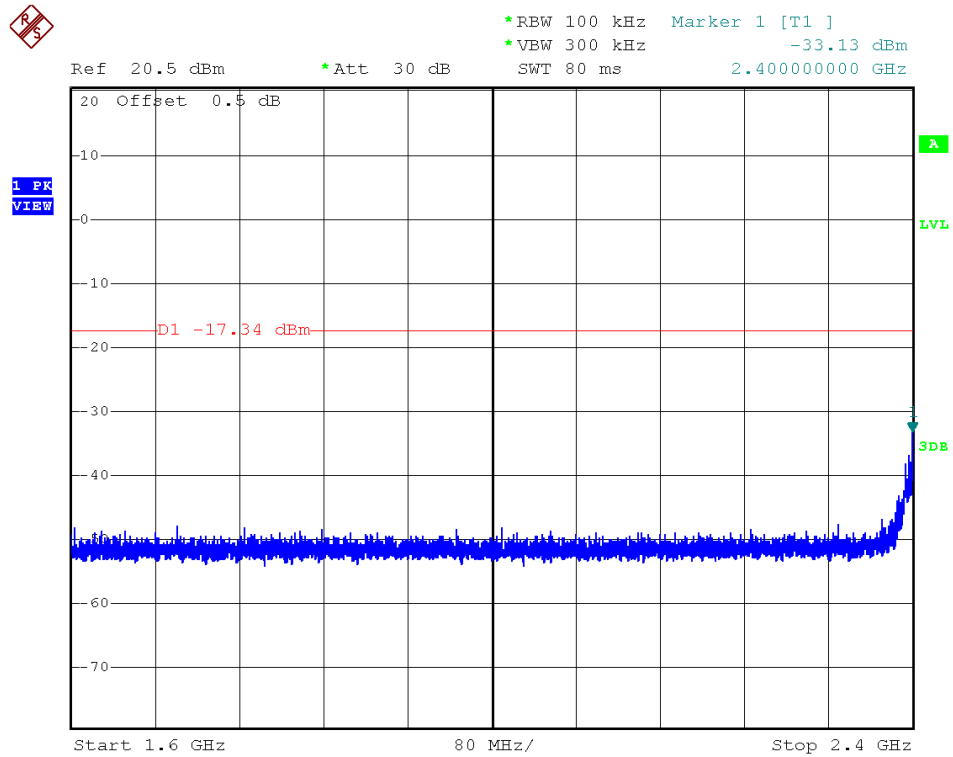


TRF no.: FCC 15C_TX_b

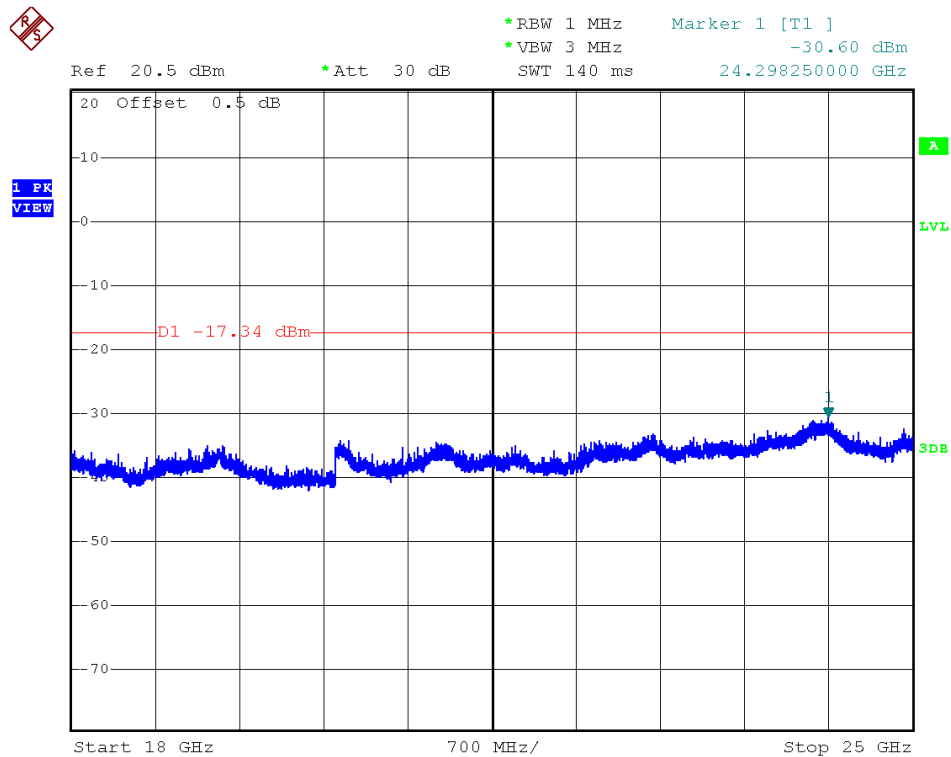
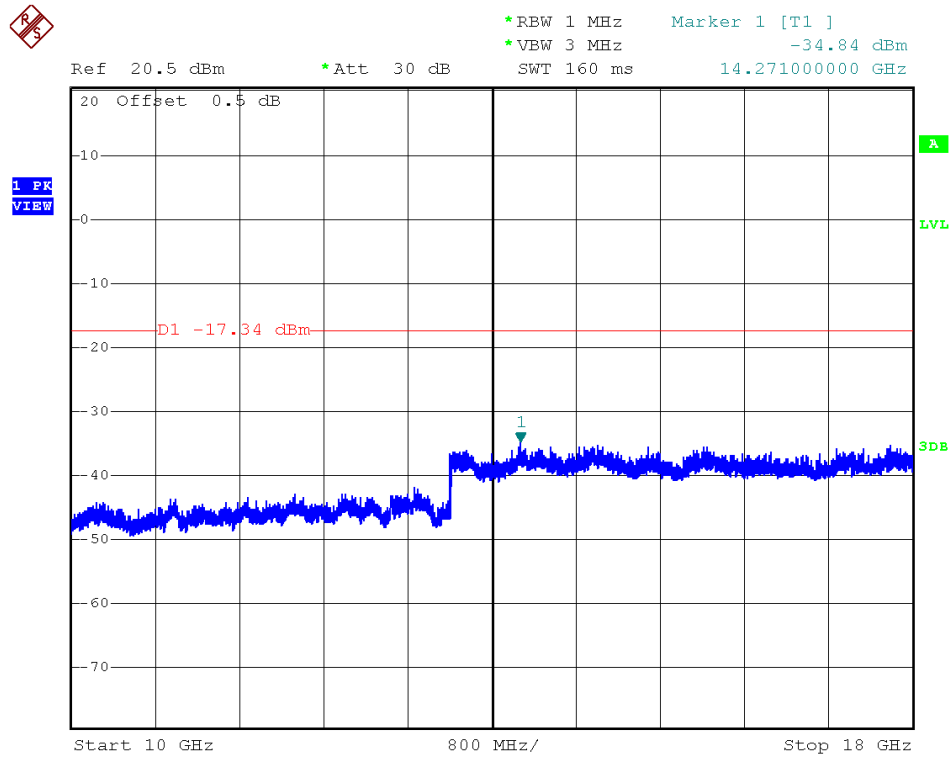
FCC ID: QISHG658V2

Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

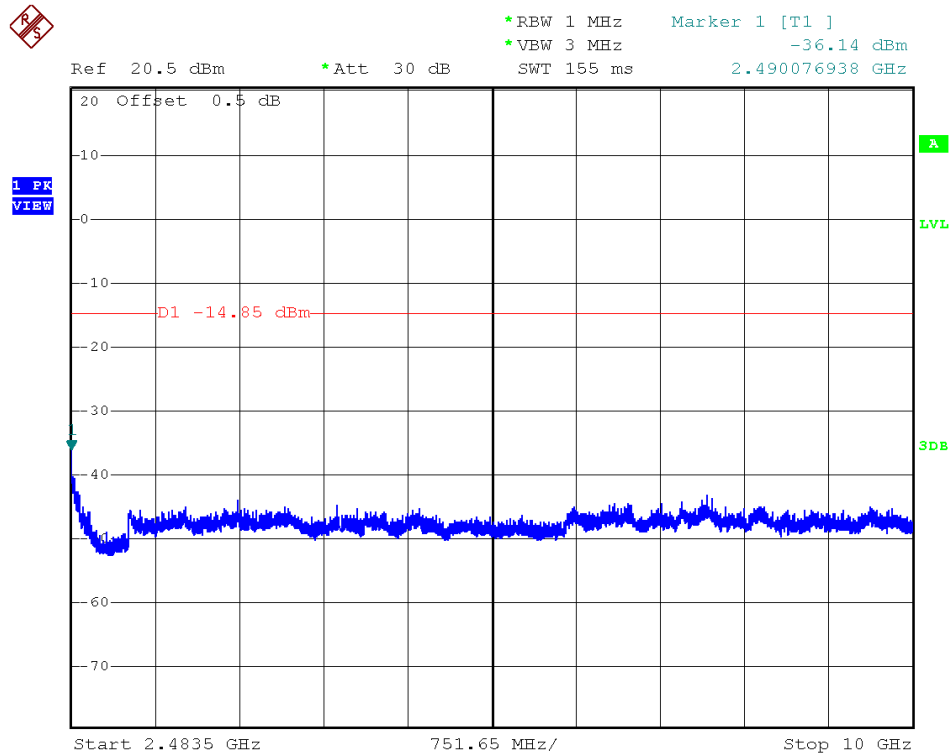
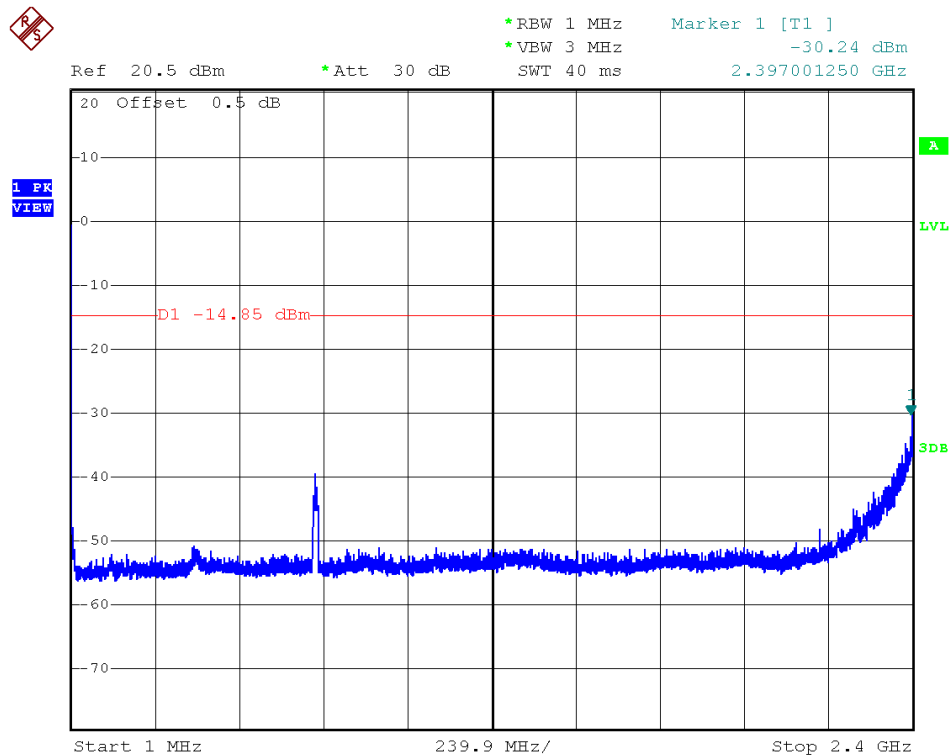


INTERTEK TESTING SERVICES



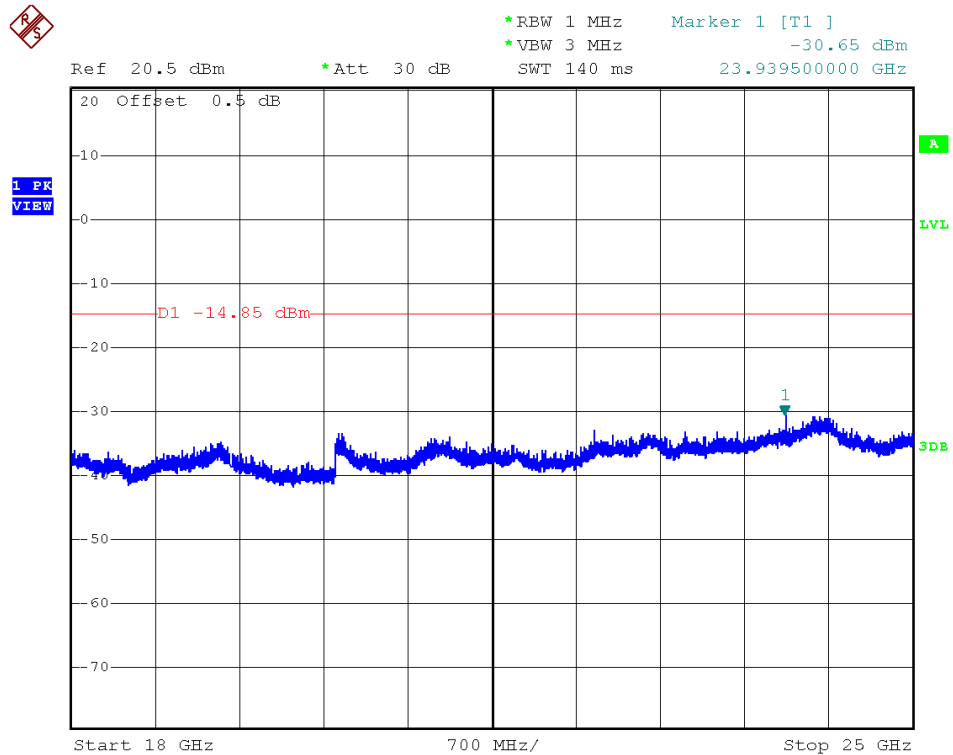
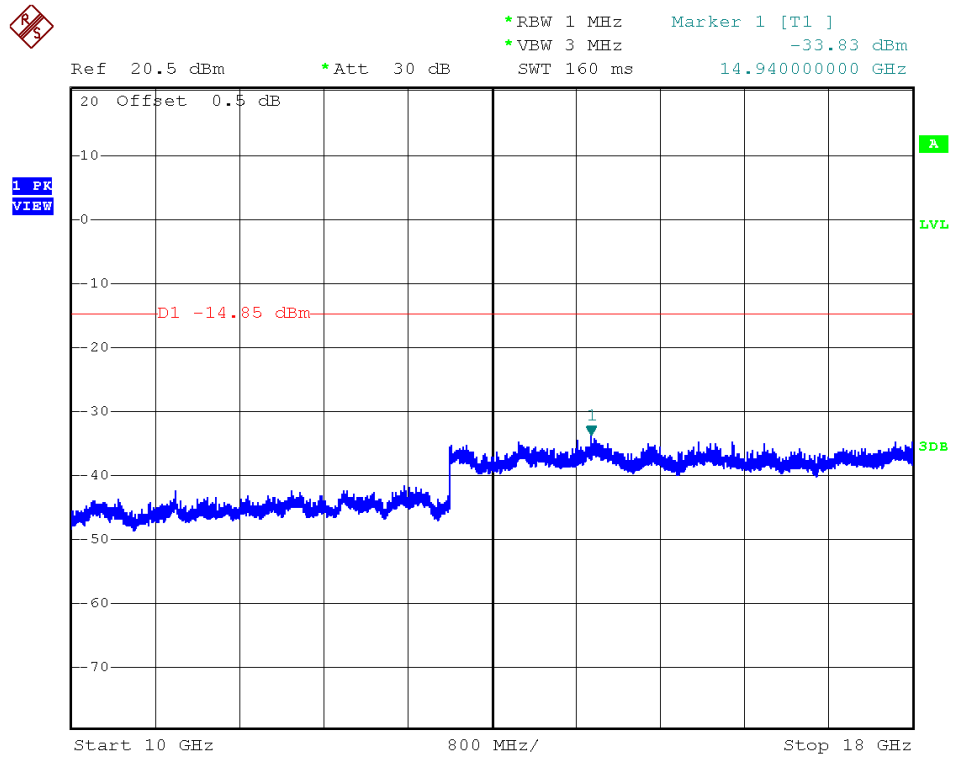
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 5.15dBm



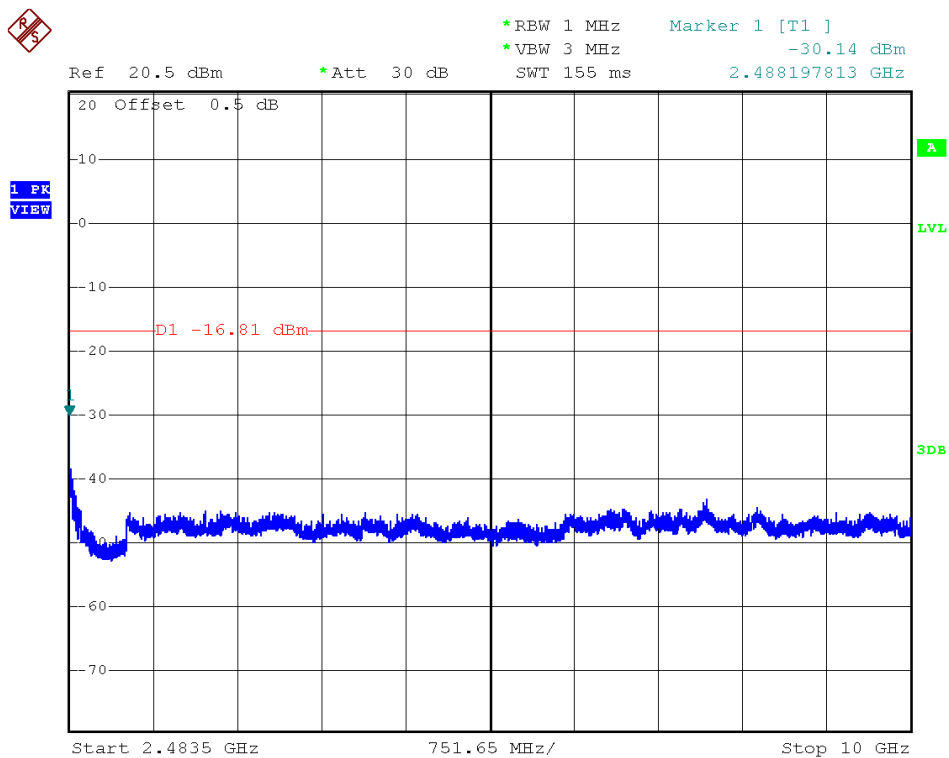
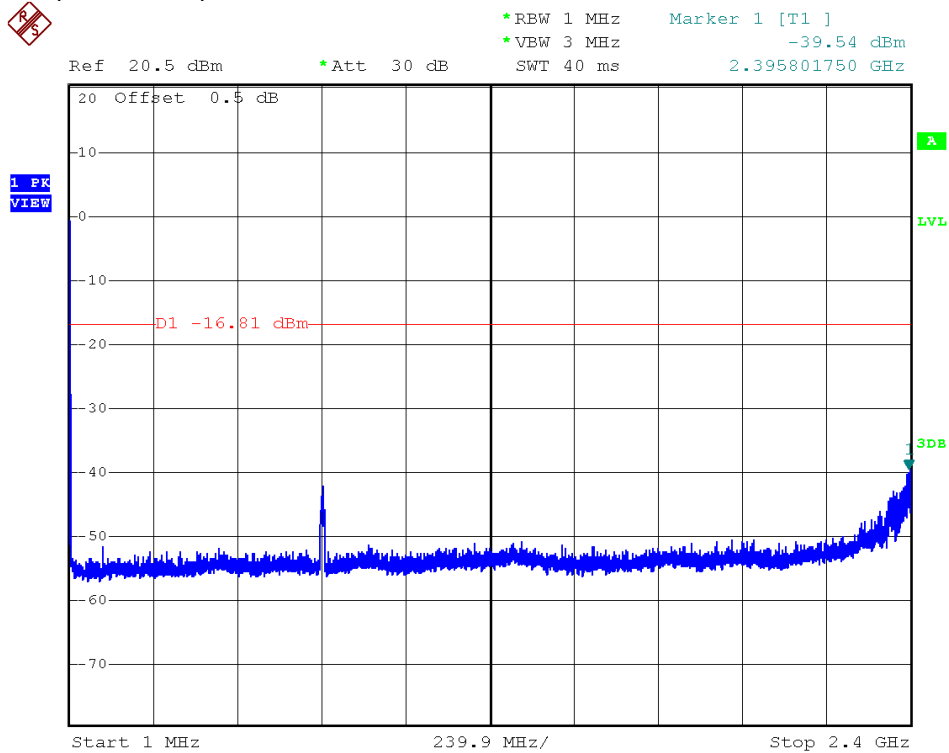
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



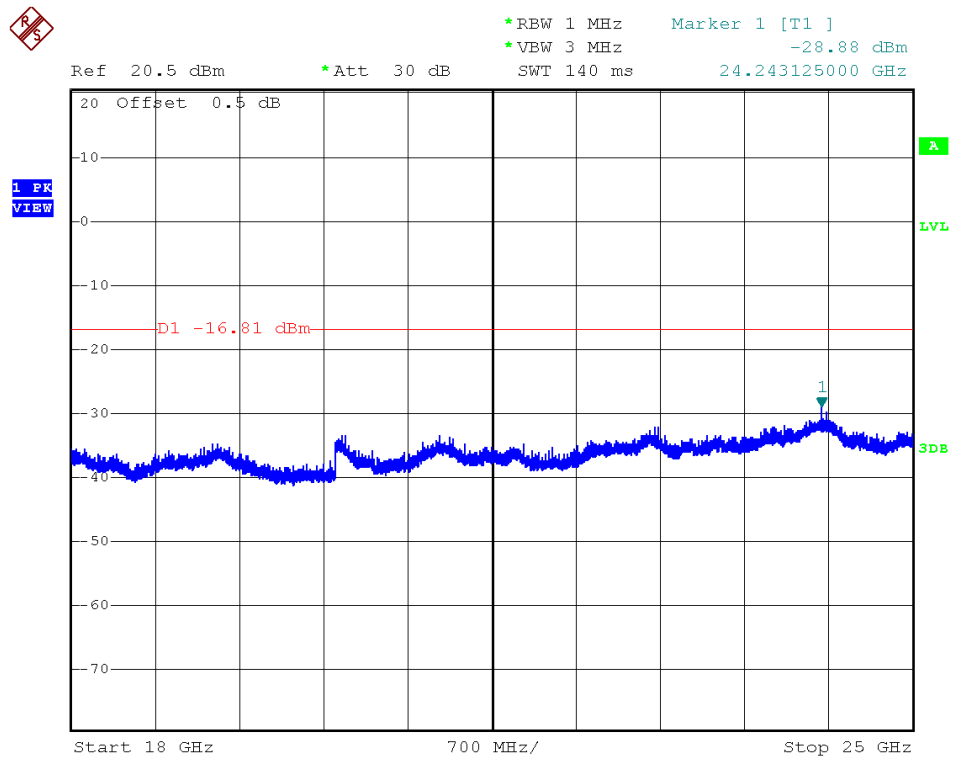
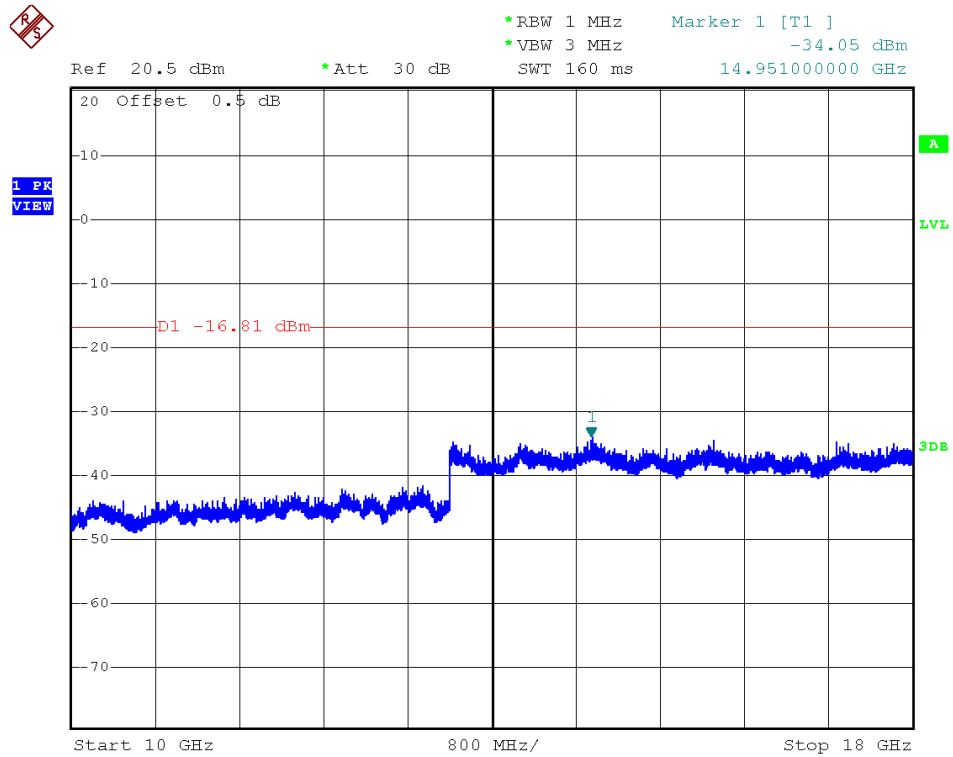
INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: 3.19dBm



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

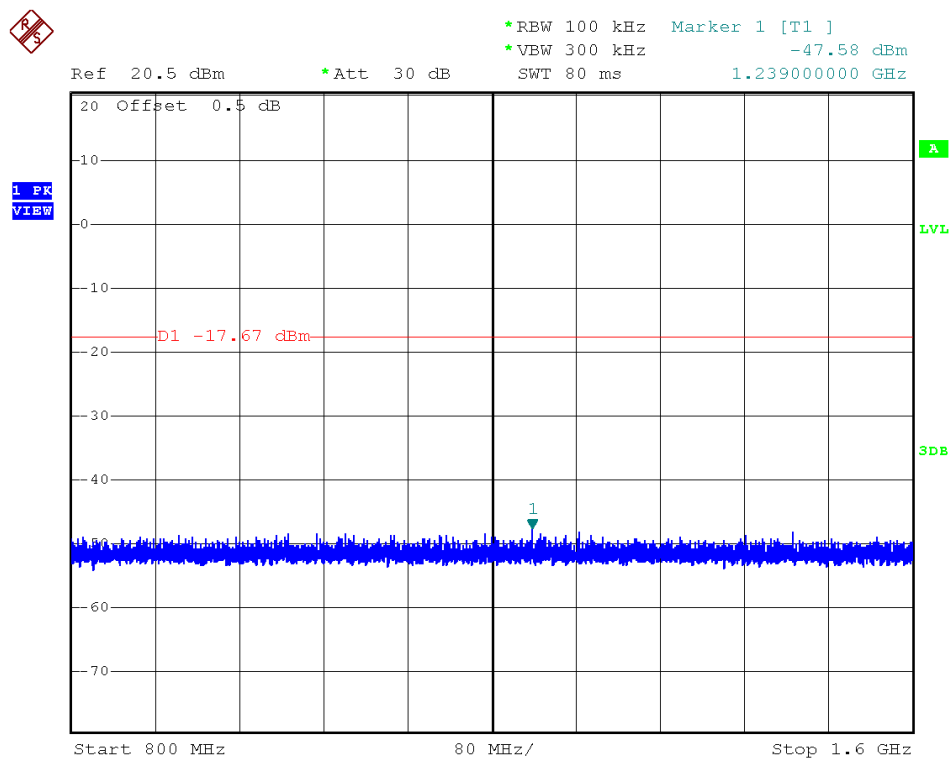
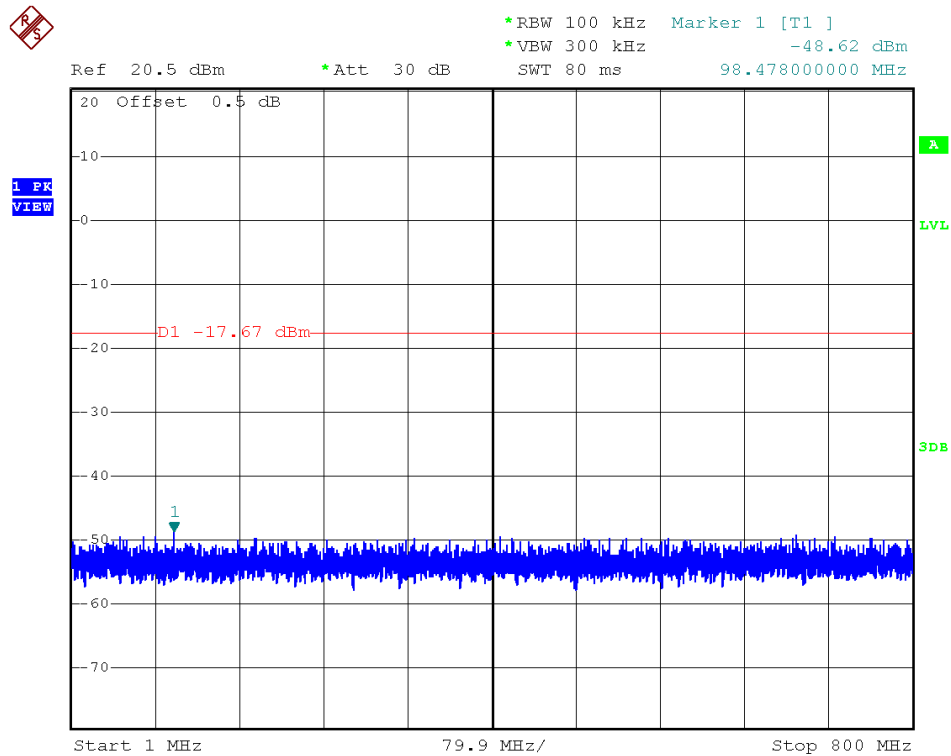
INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

802.11n-HT20 SISO

Channel 1 (2412MHz) Reference Level: 2.33dBm

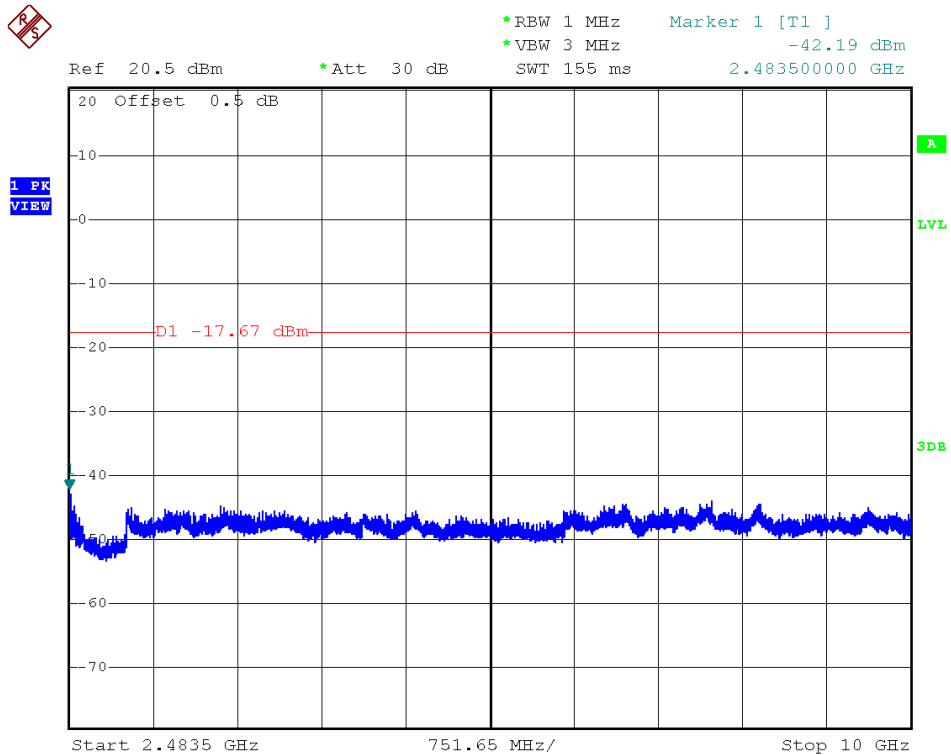
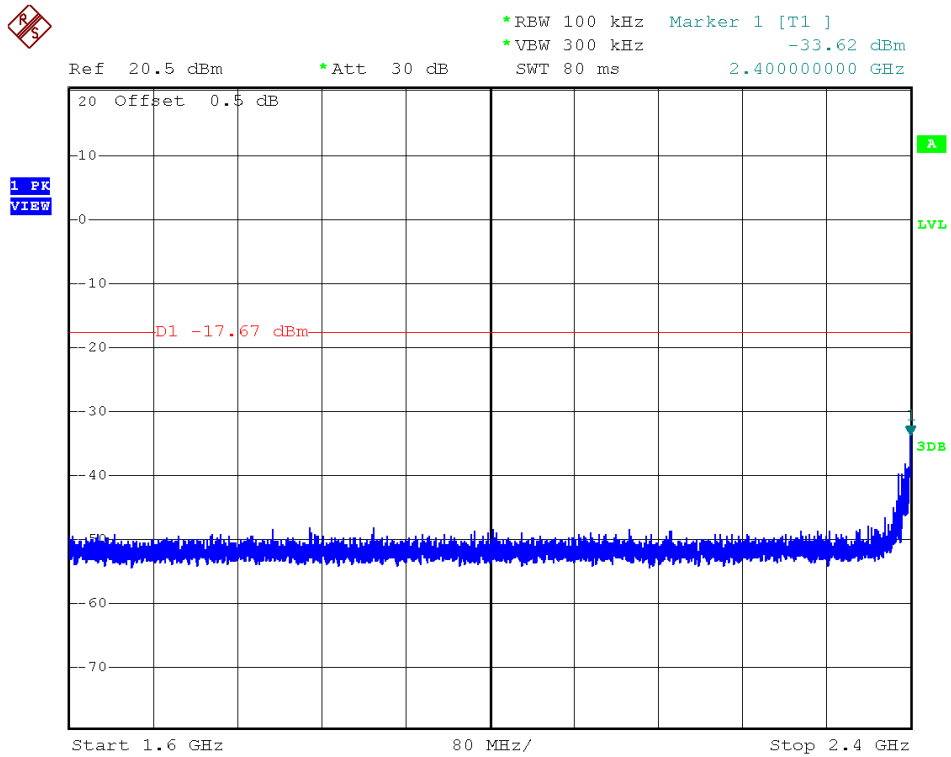


TRF no.: FCC 15C_TX_b

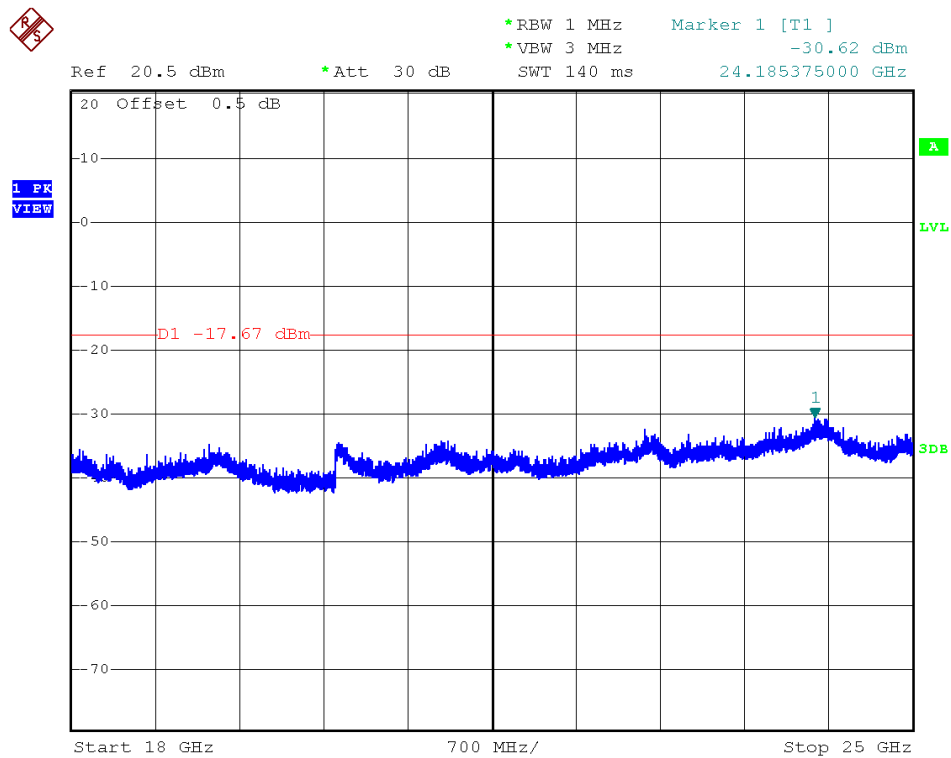
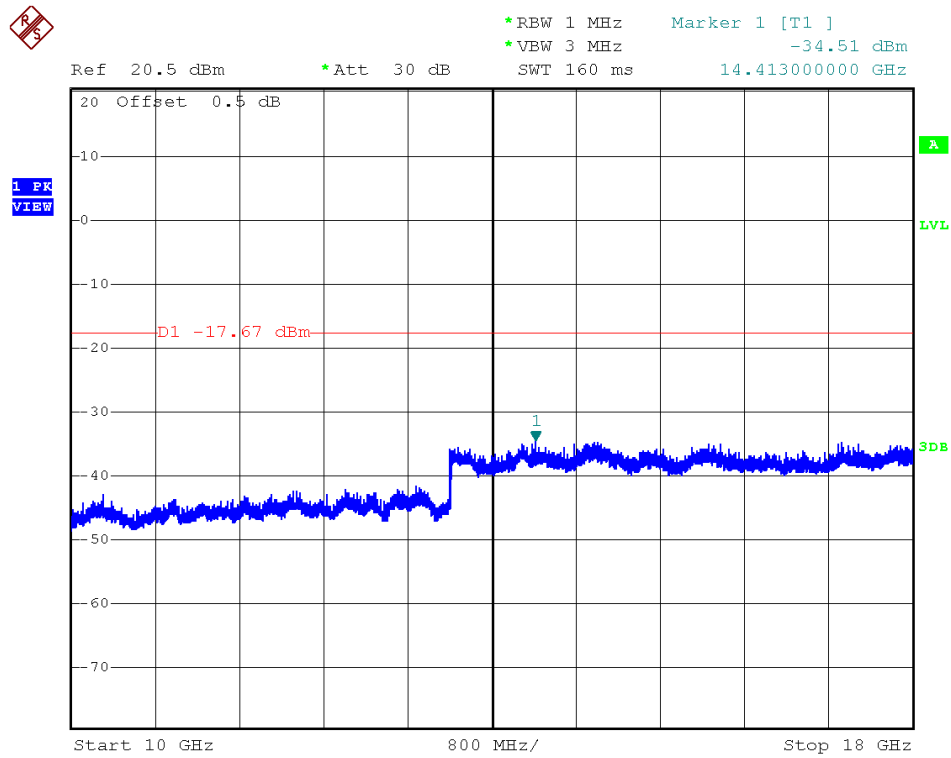
FCC ID: QISHG658V2

Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

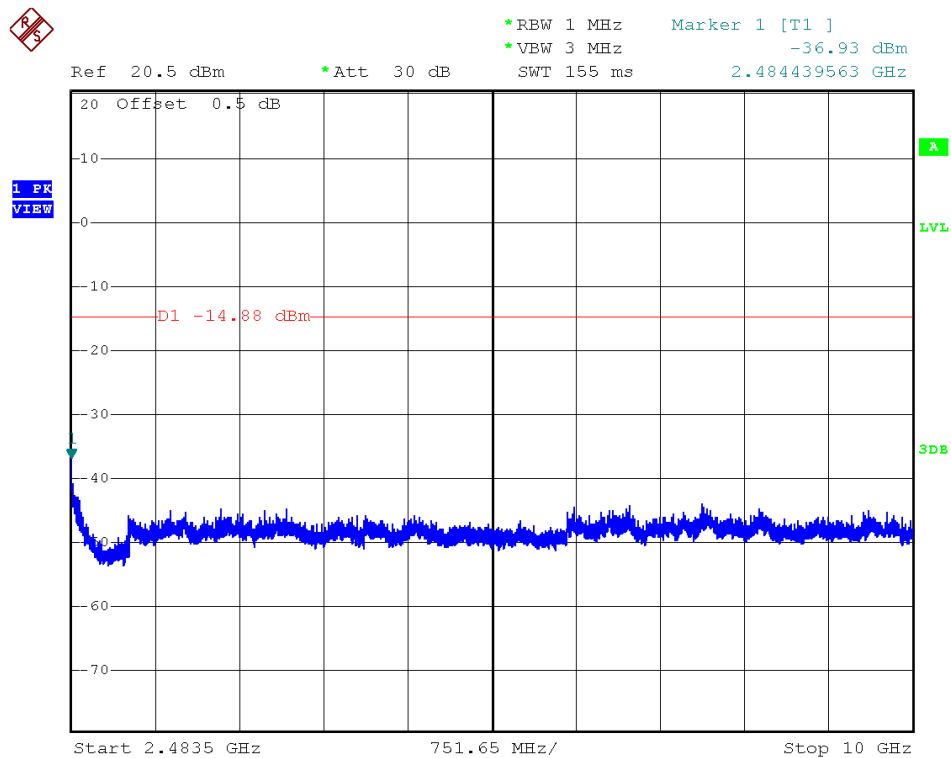
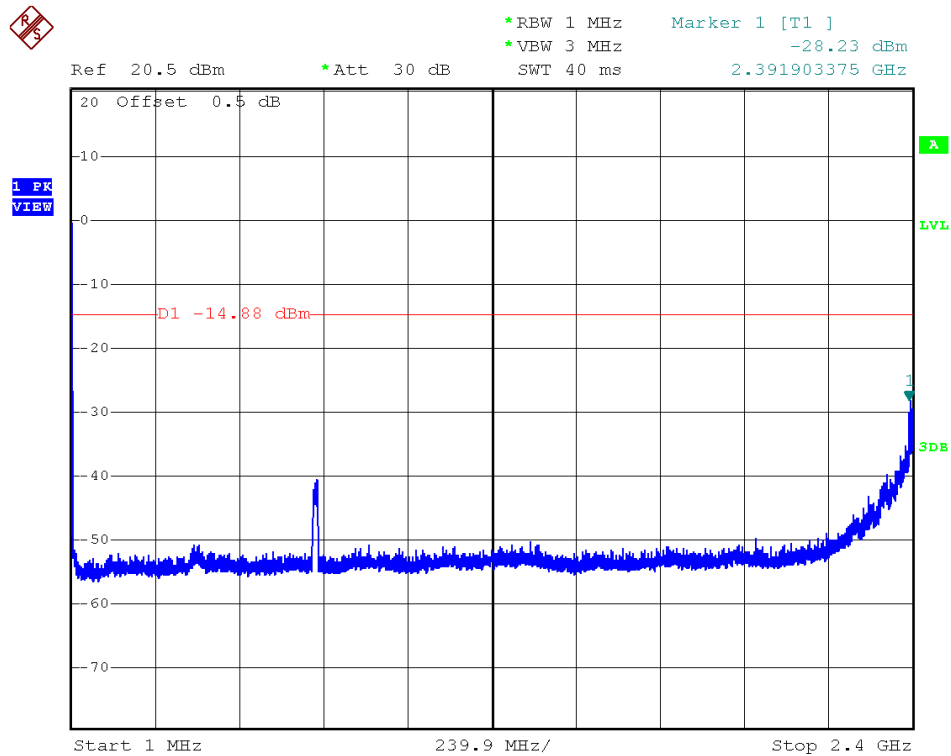


INTERTEK TESTING SERVICES



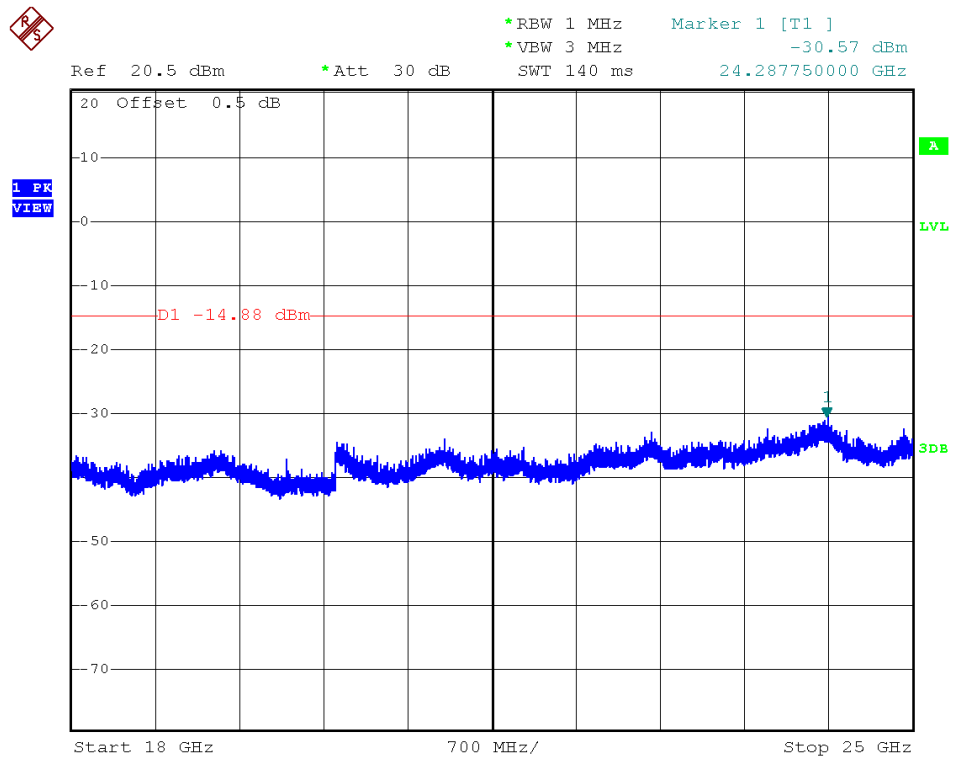
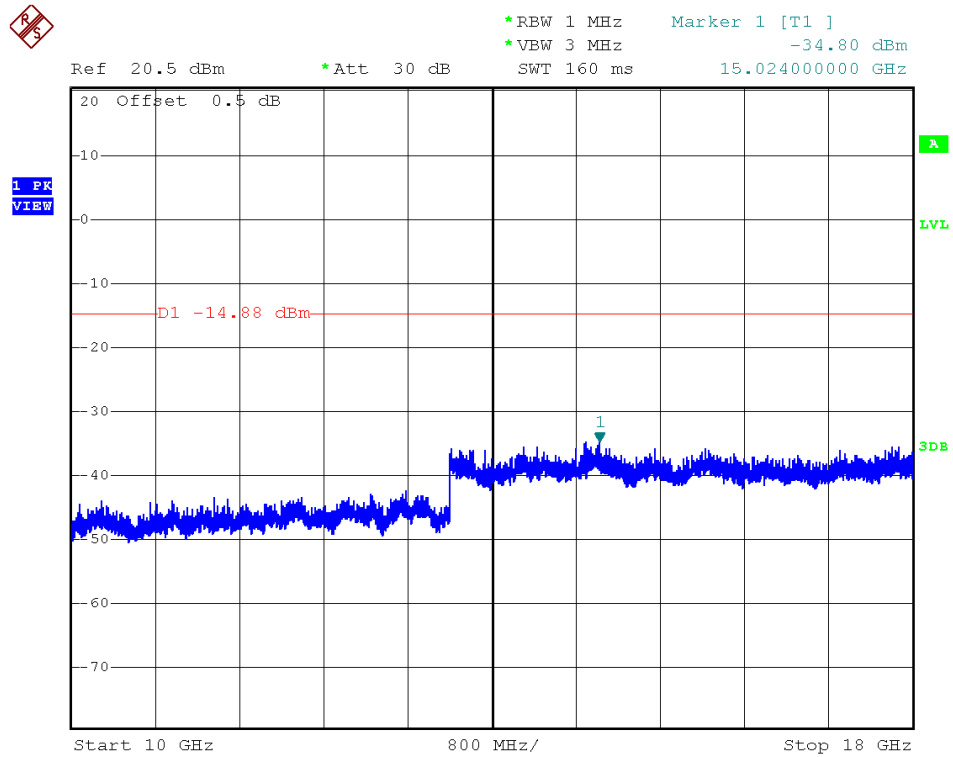
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 5.12dBm



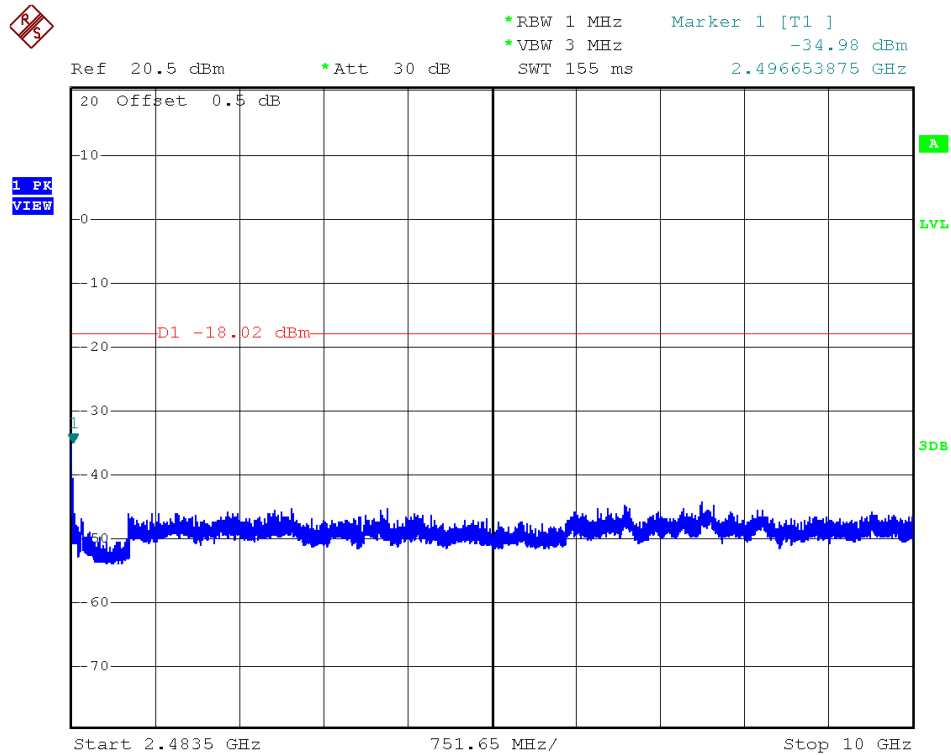
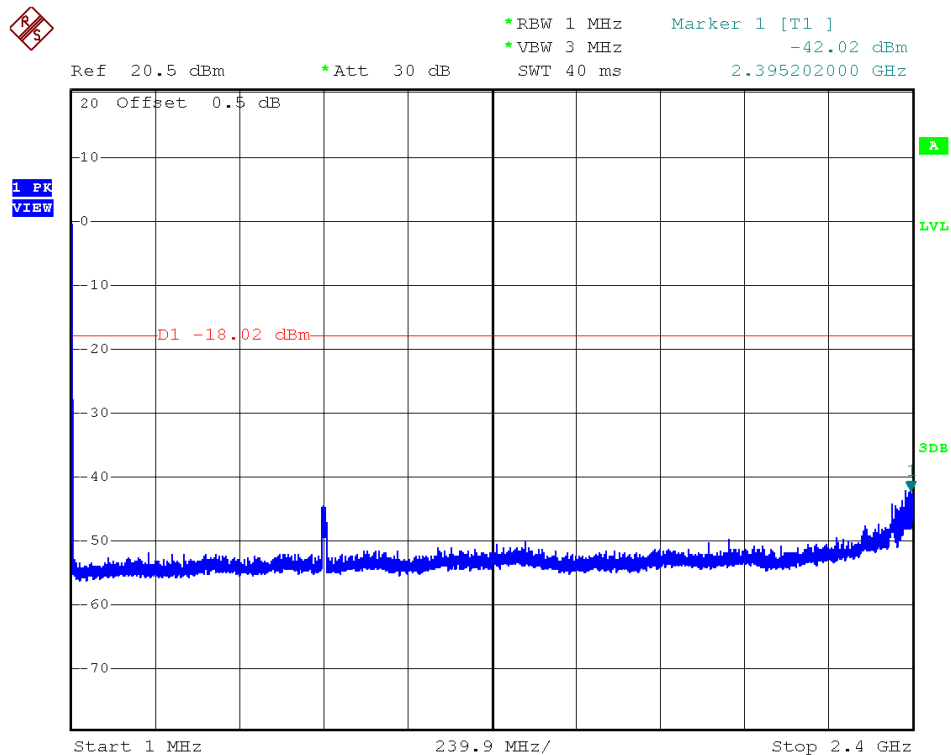
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



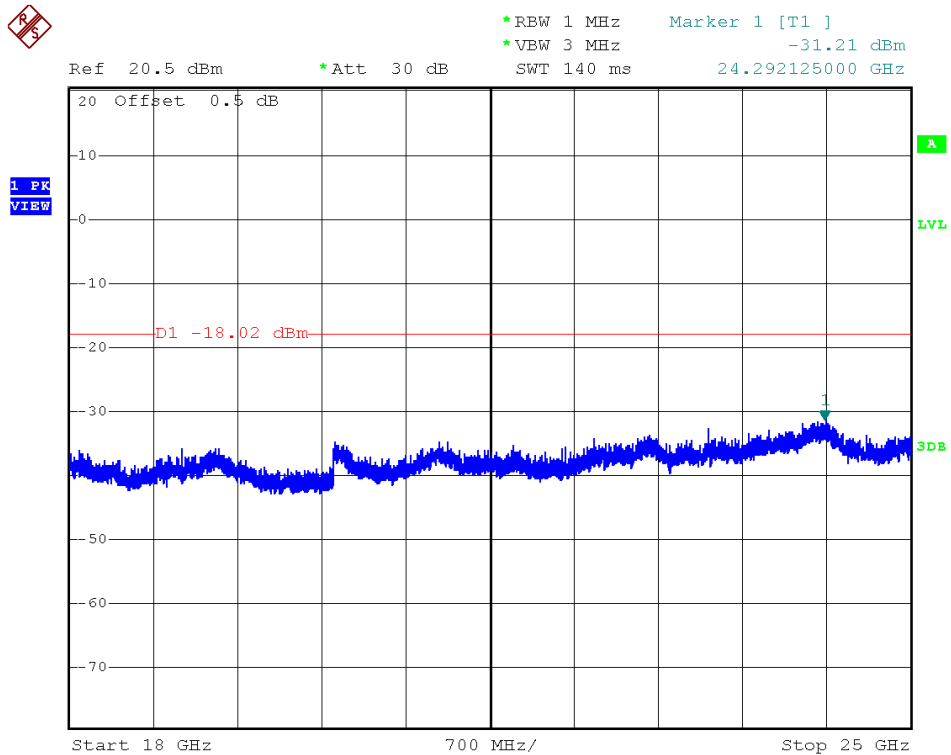
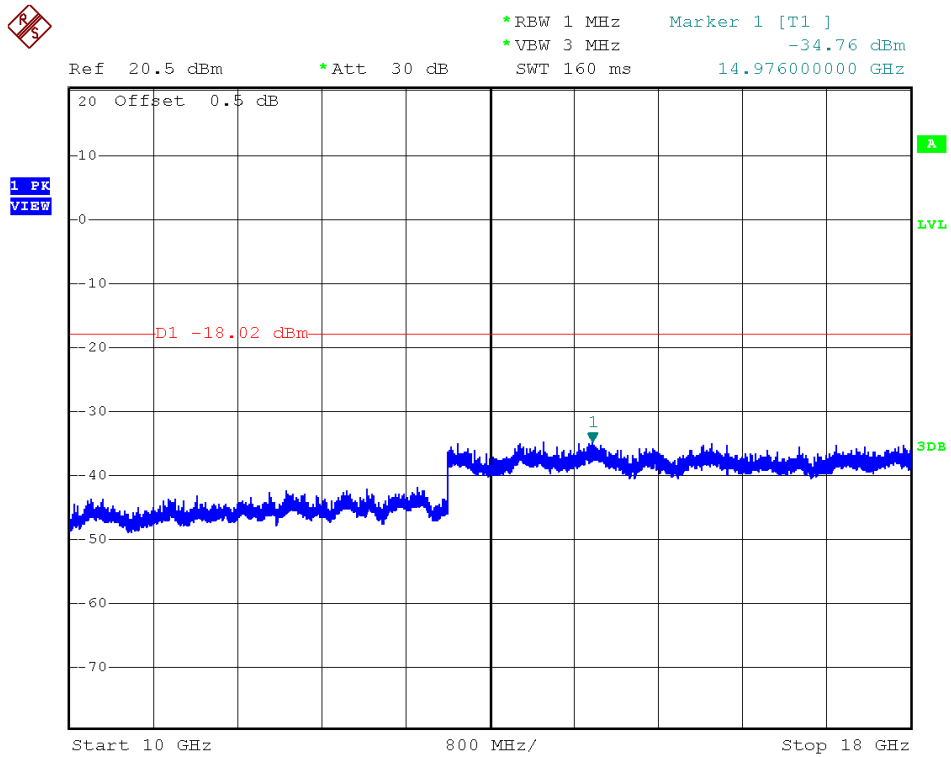
INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: 1.98dBm



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

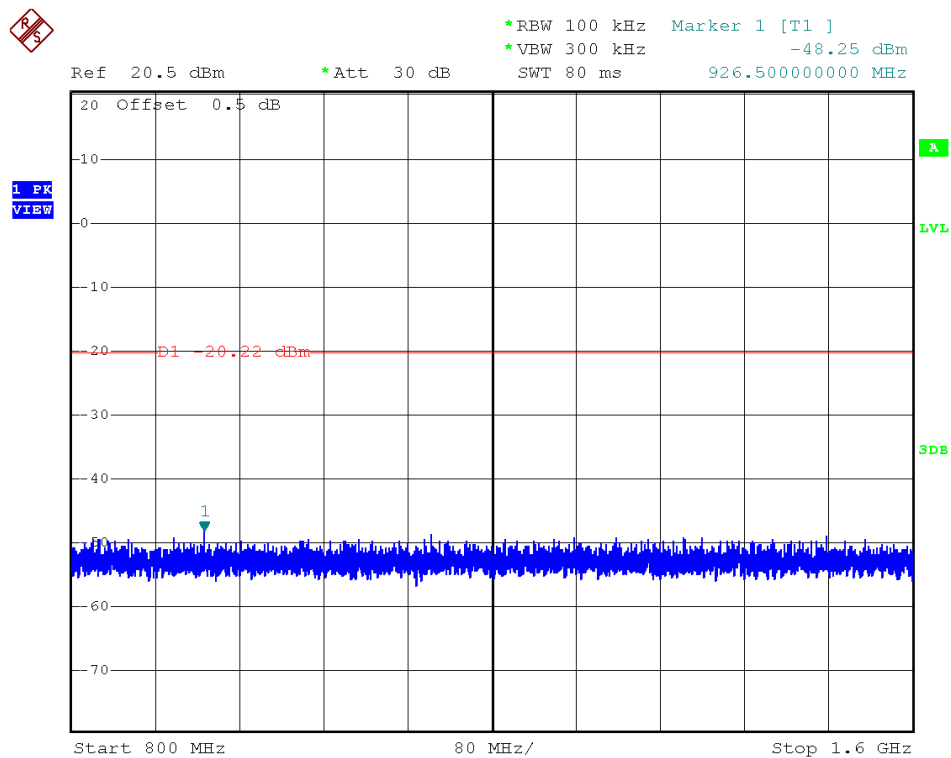
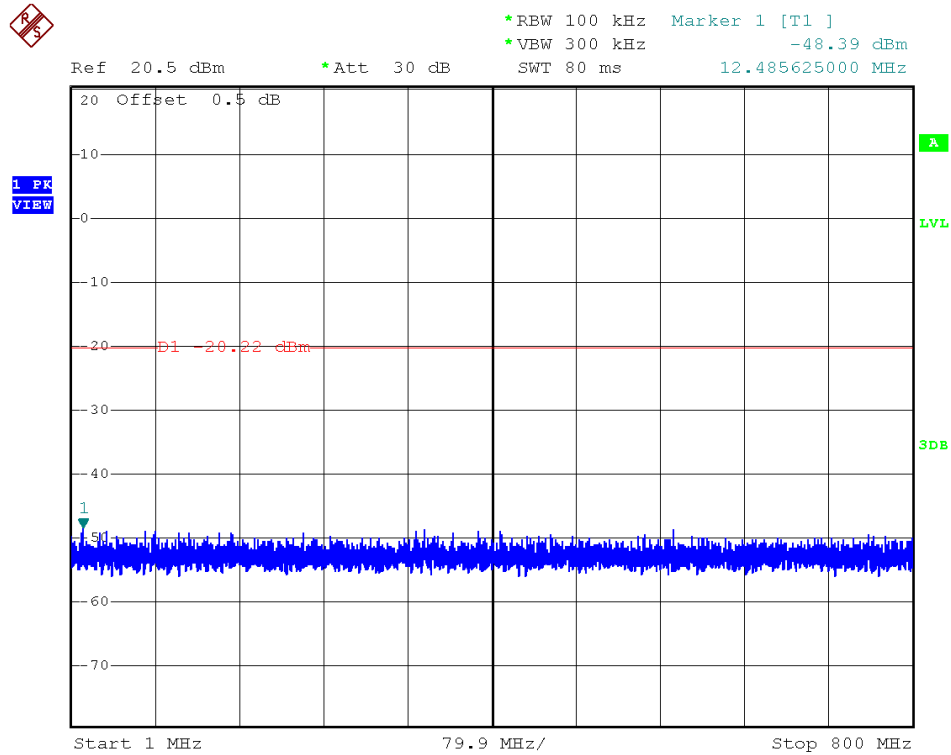
INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

802.11n-HT20 MIMO

Channel 1 (2412MHz) Reference Level: -0.22dBm ANT 1

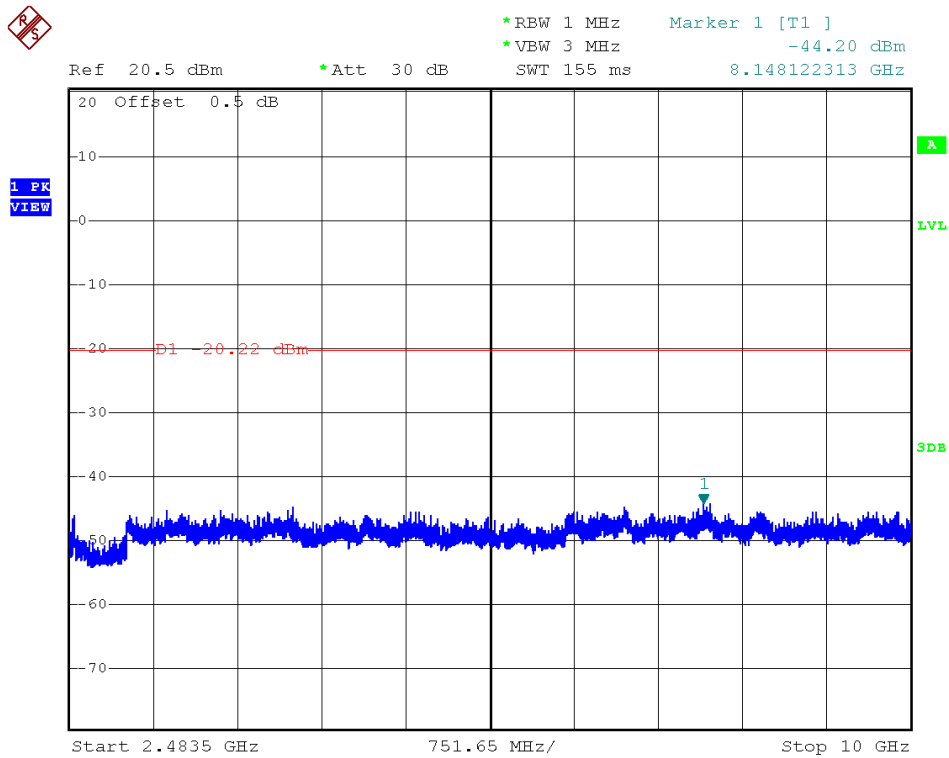
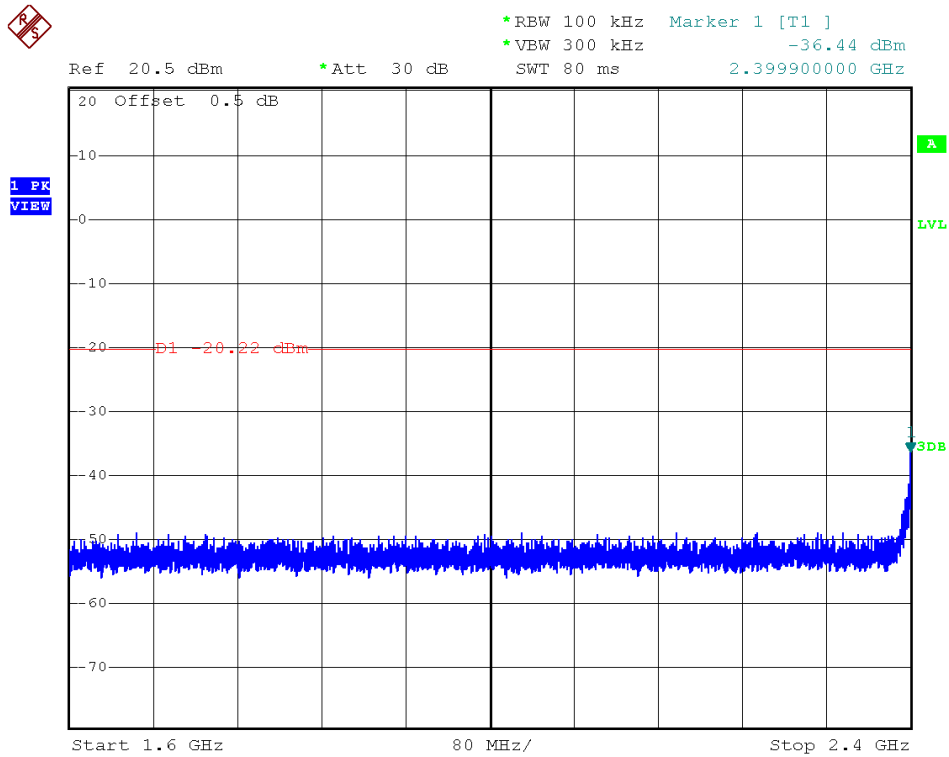


TRF no.: FCC 15C_TX_b

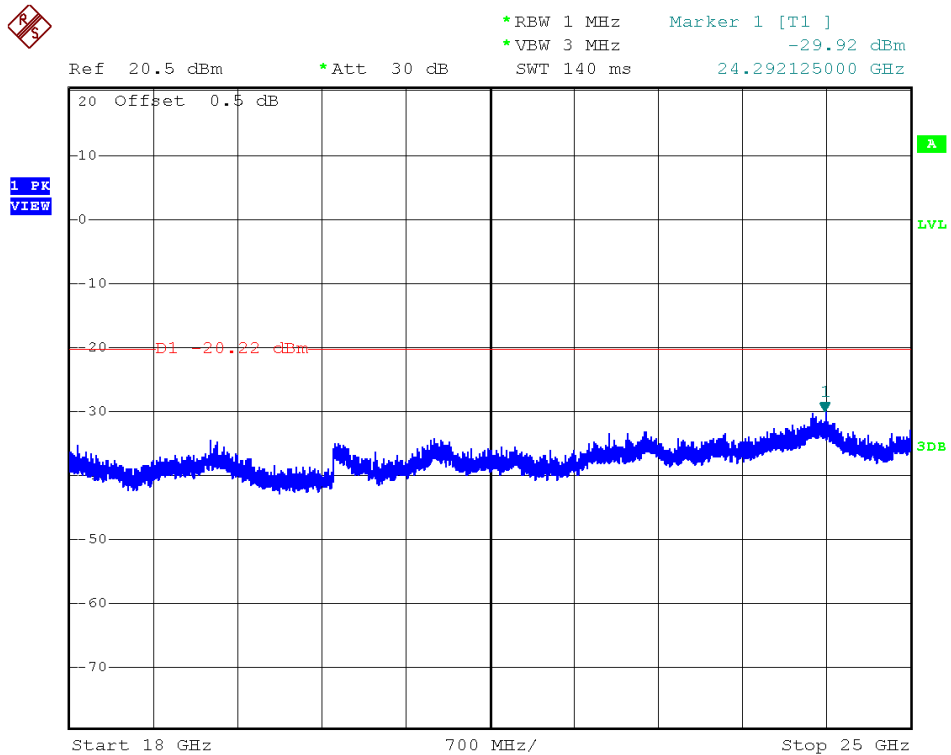
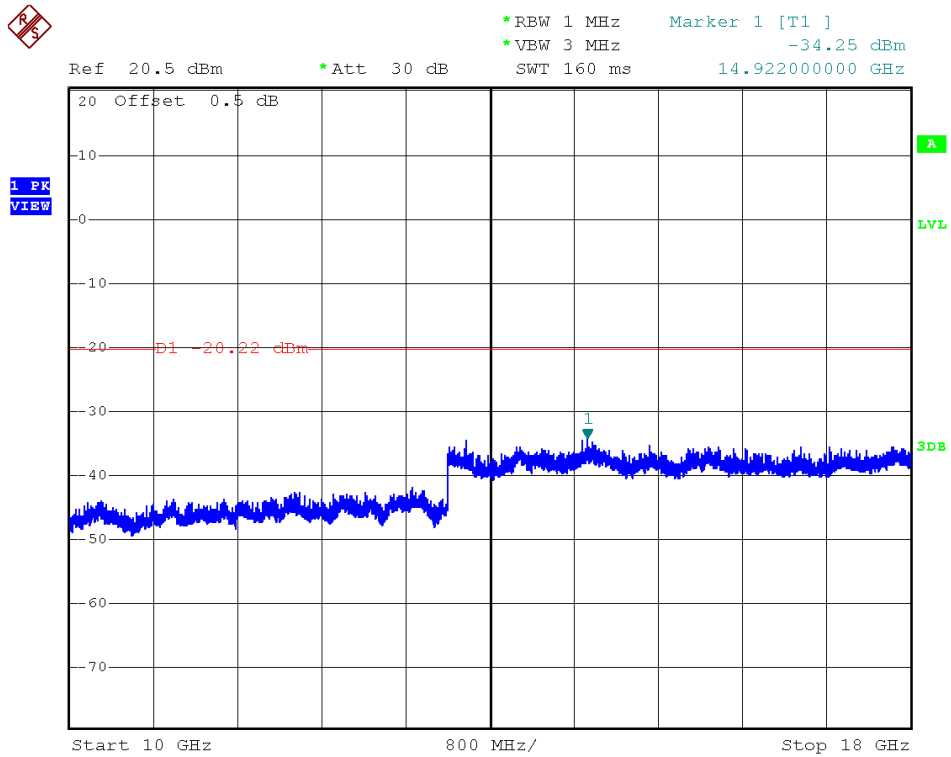
FCC ID: QISHG658V2

Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



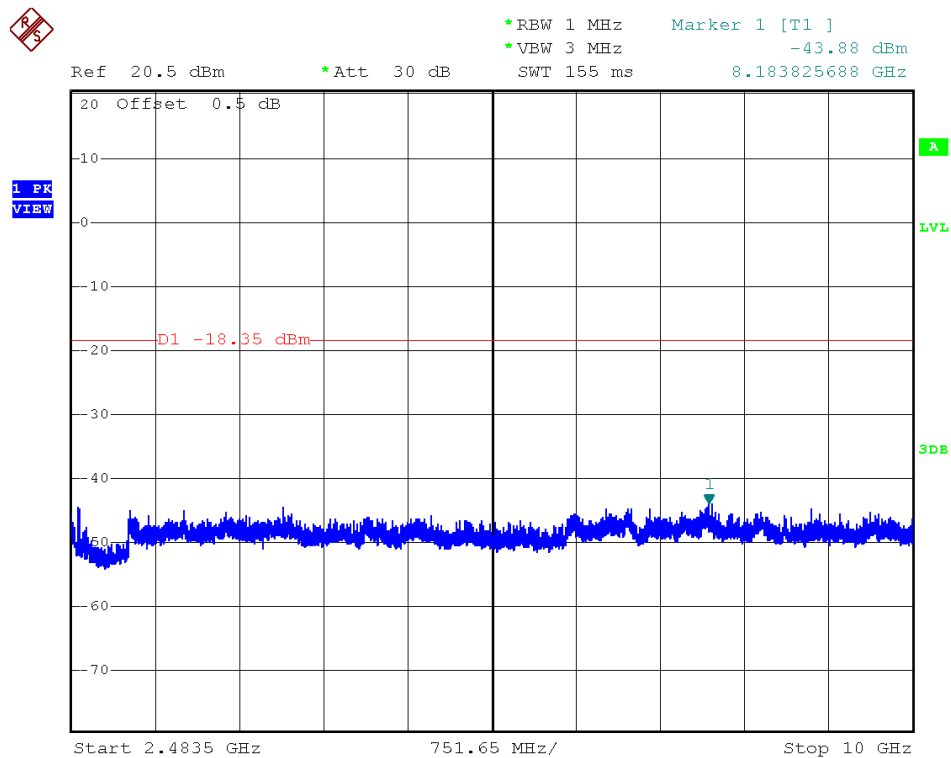
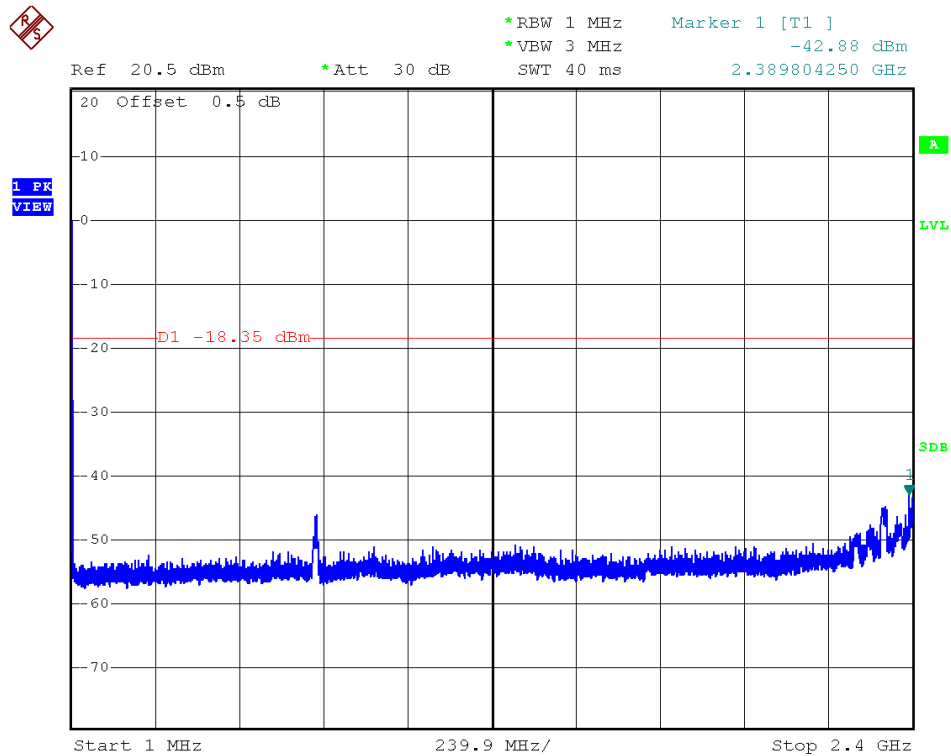
INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

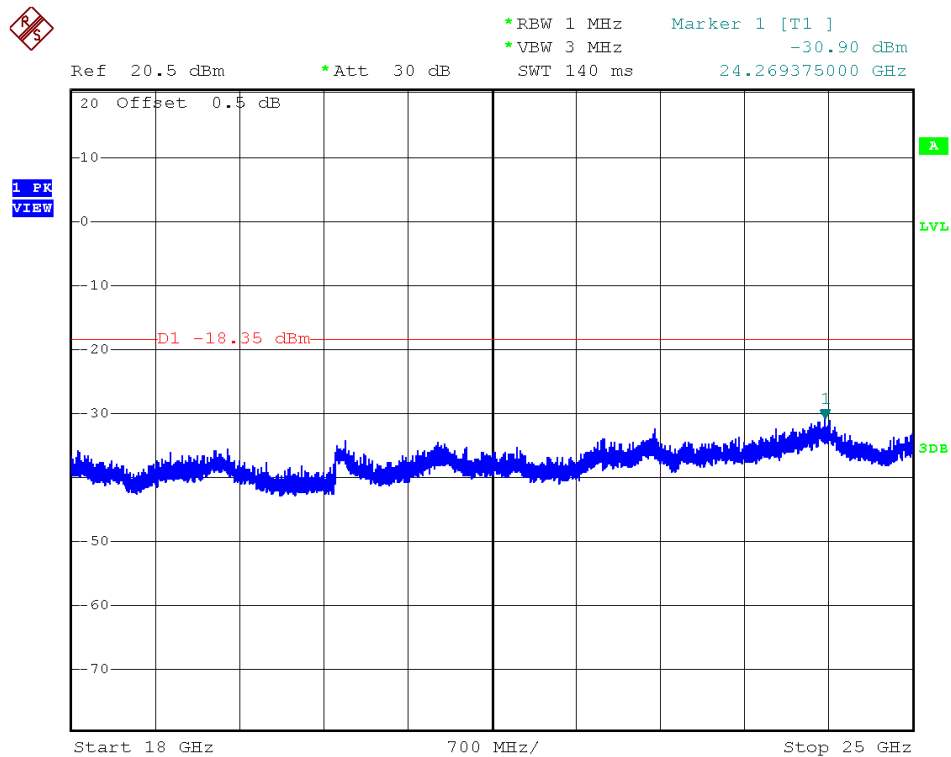
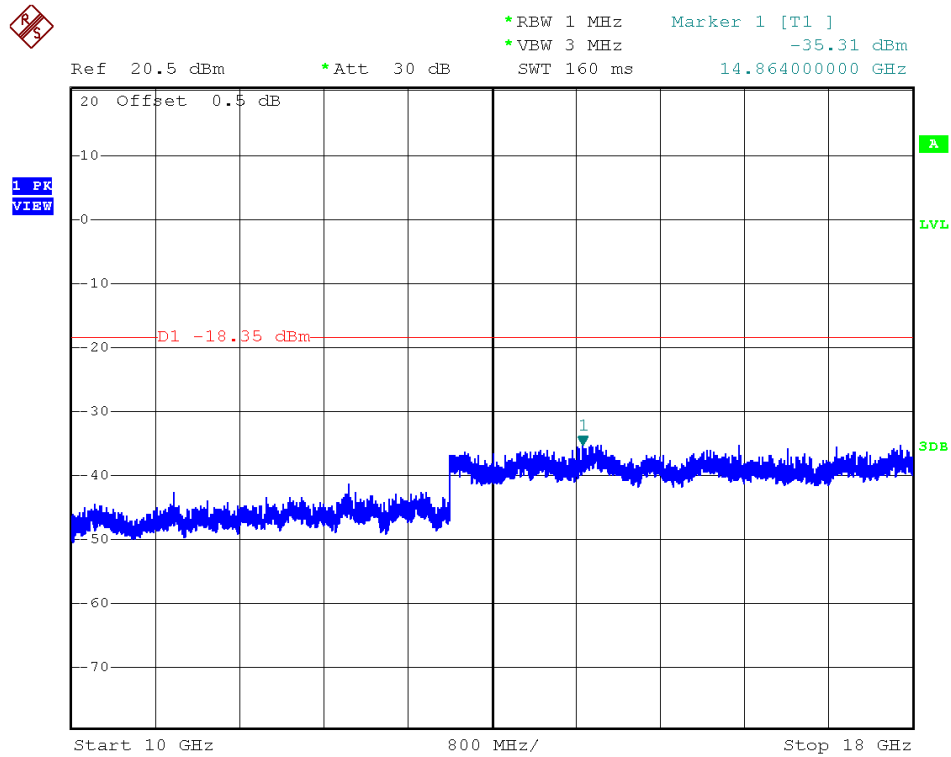
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 1.65dBm ANT 1



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

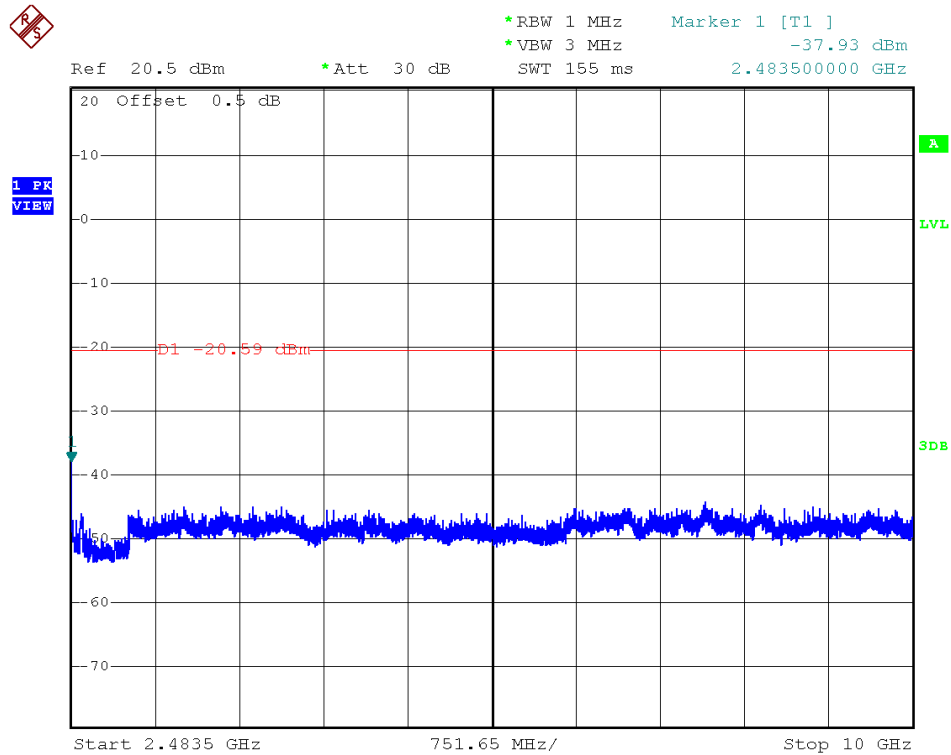
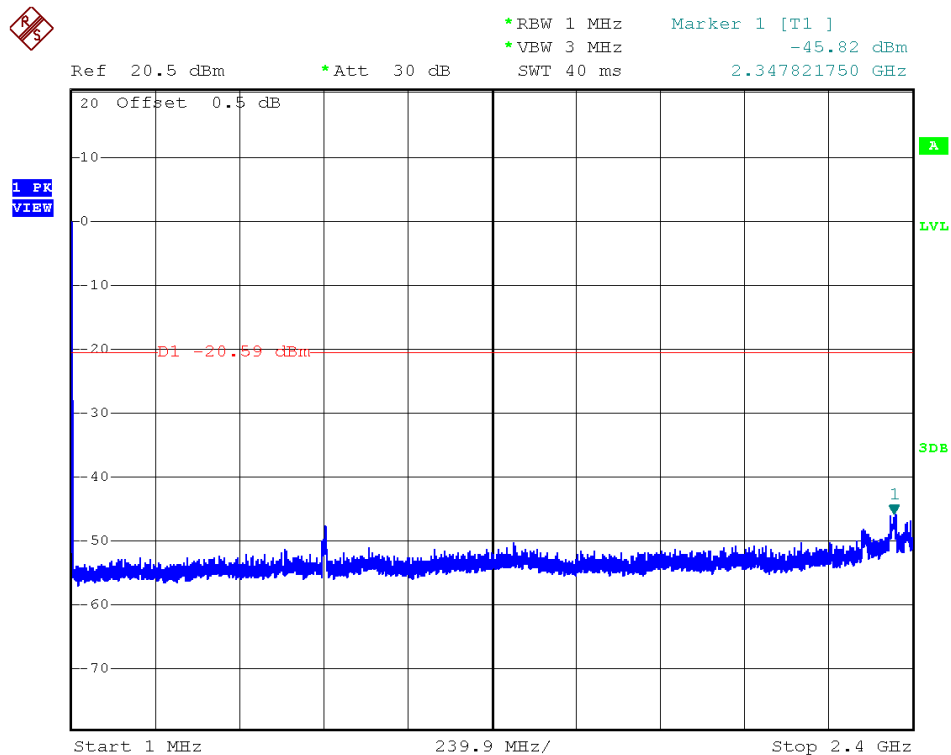
INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
 FCC ID: QISHG658V2
 Report No.: 140504020SZN-001

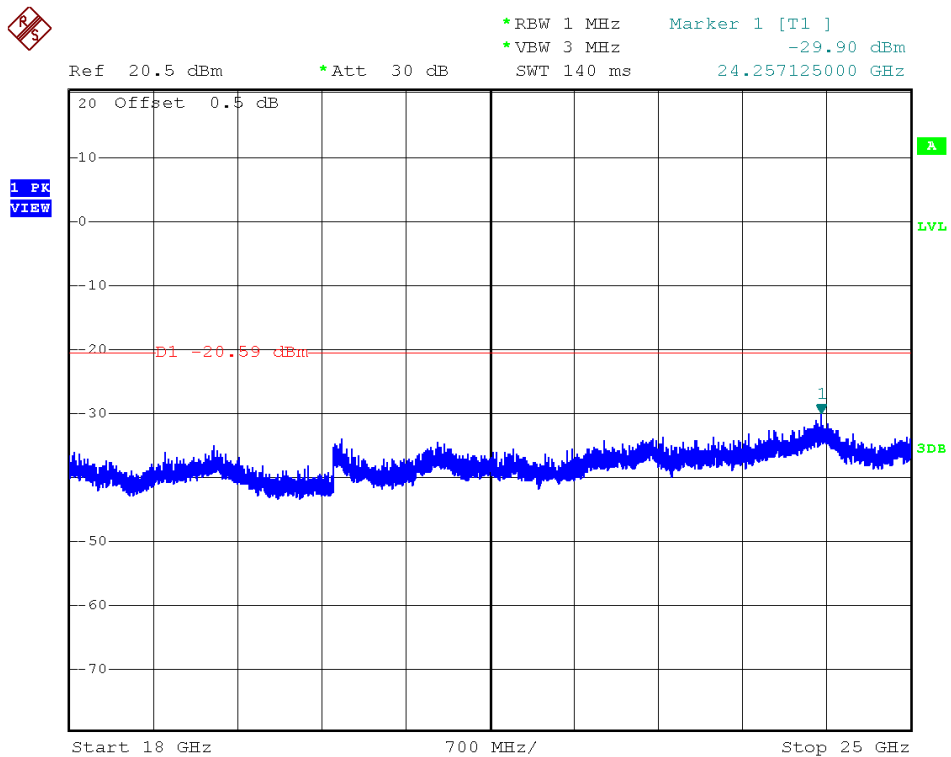
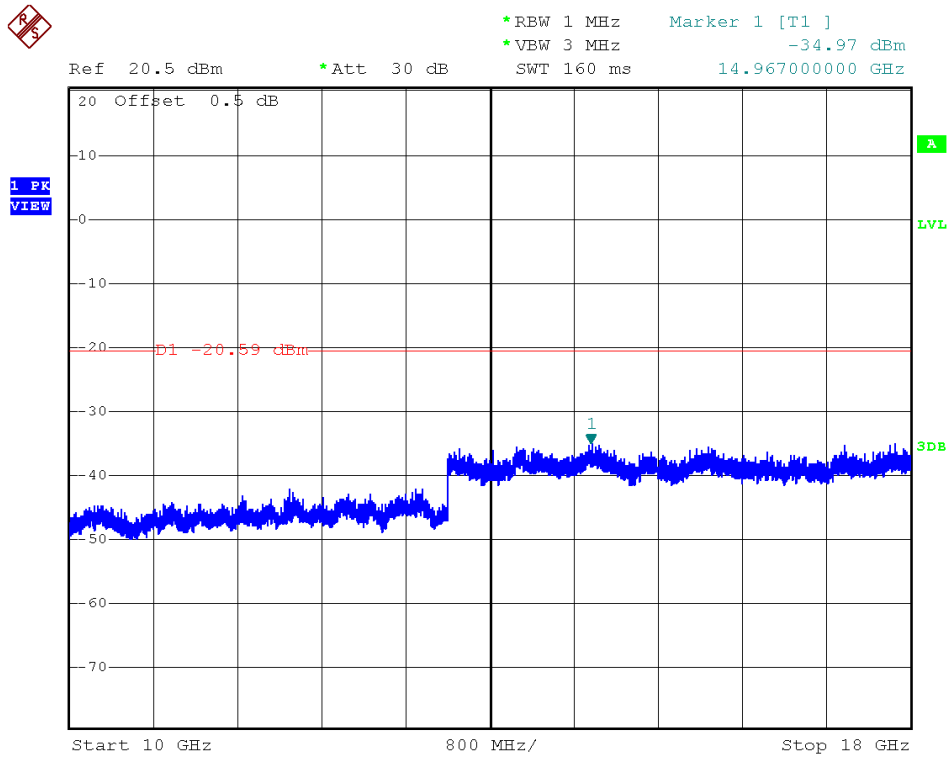
INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: -0.59dBm ANT 1

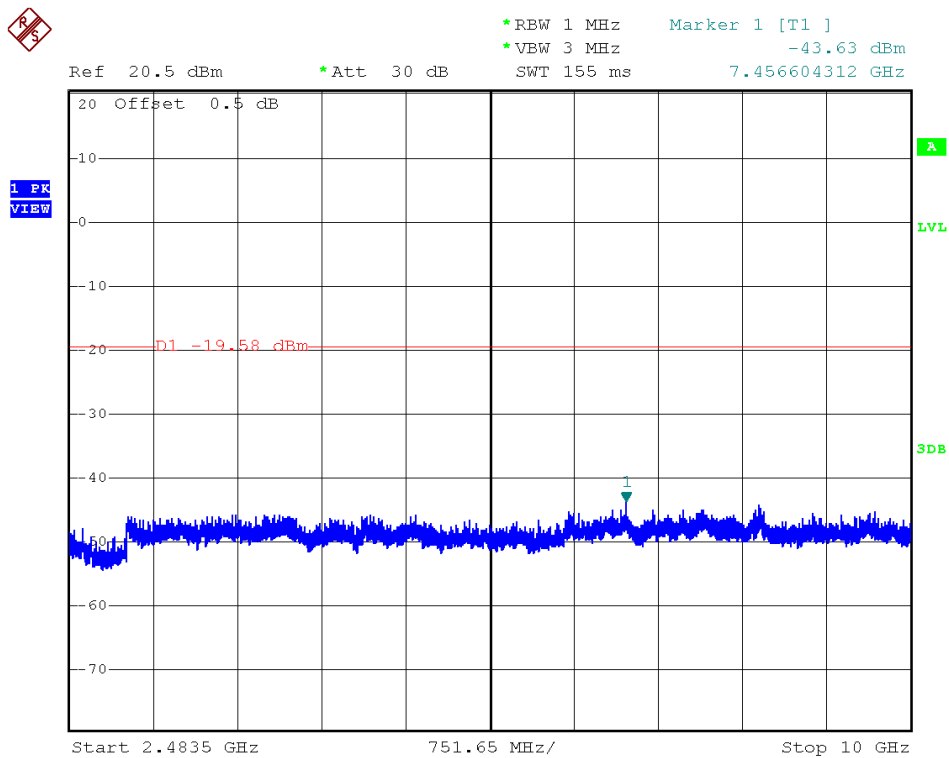
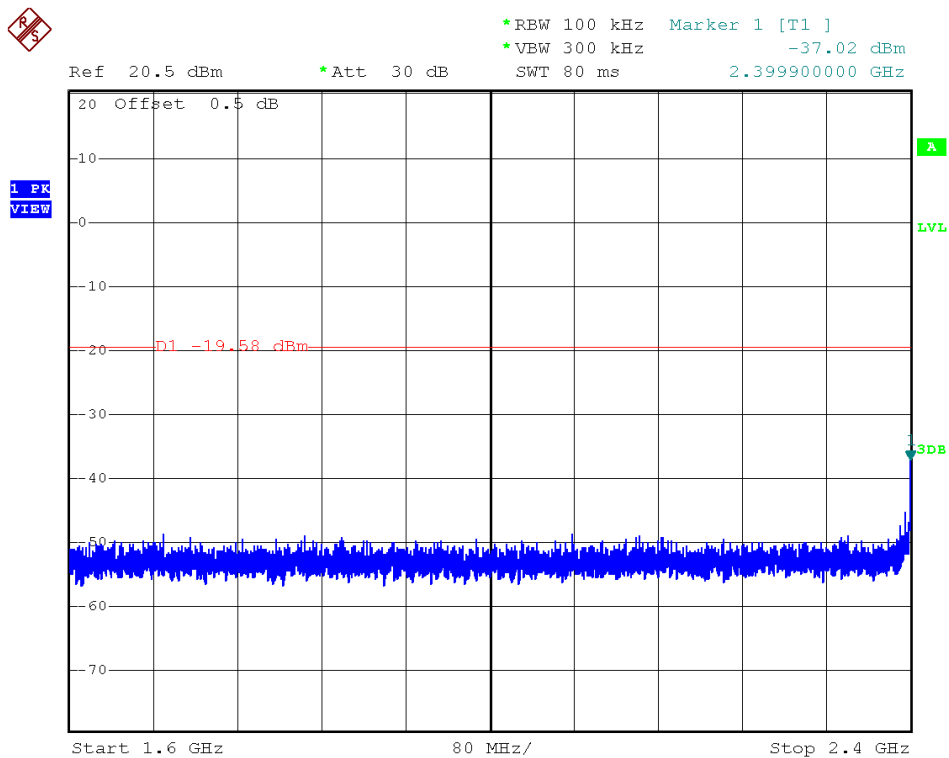


TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

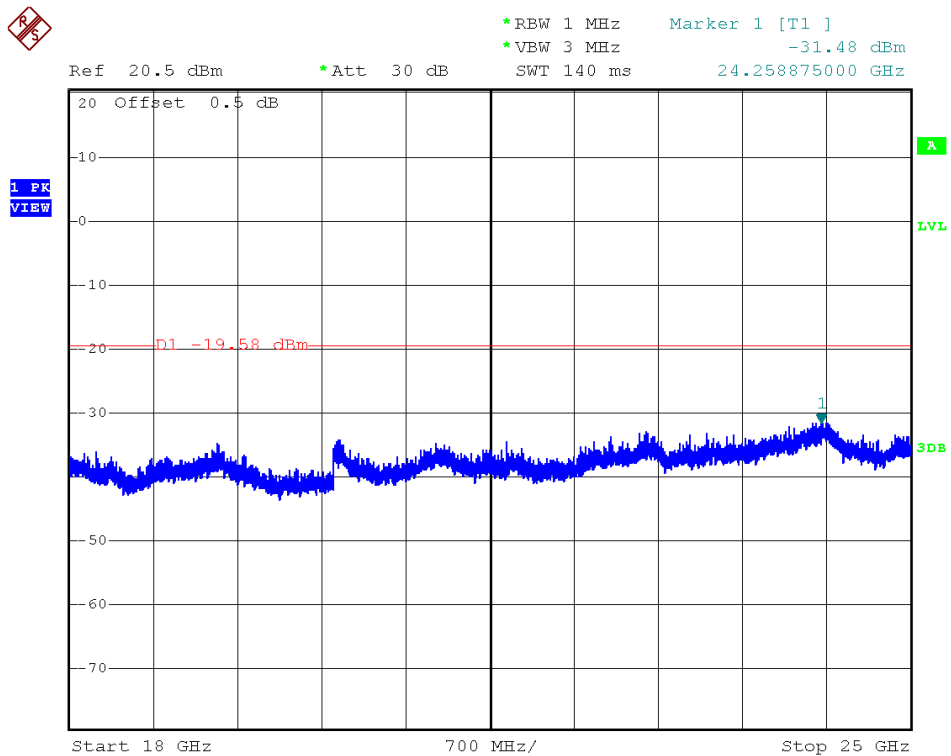
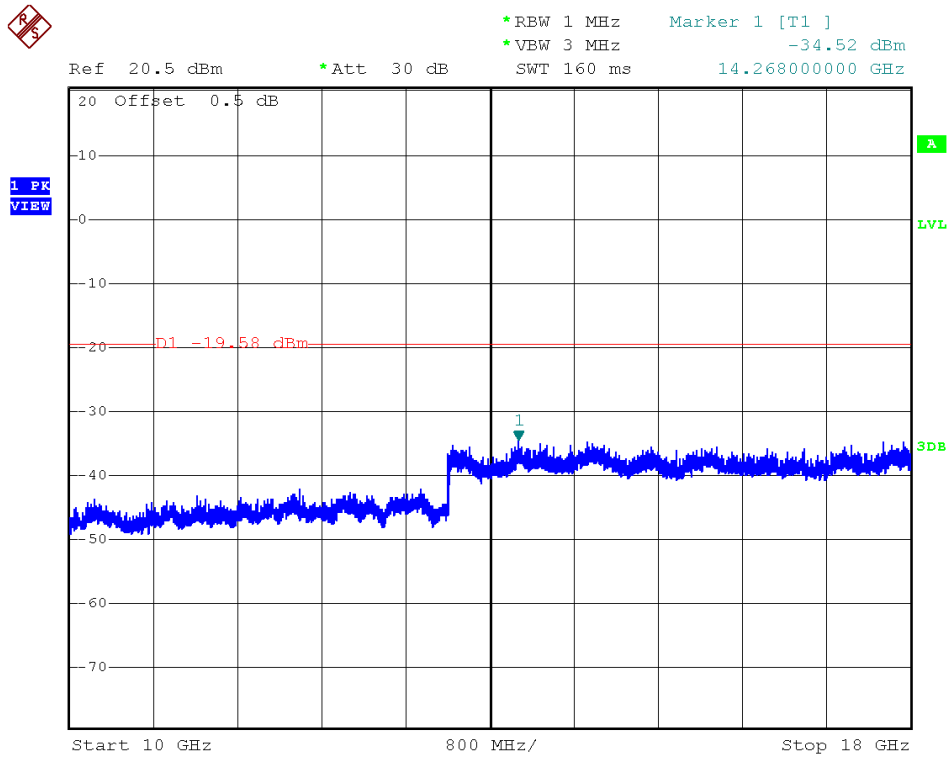
INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES



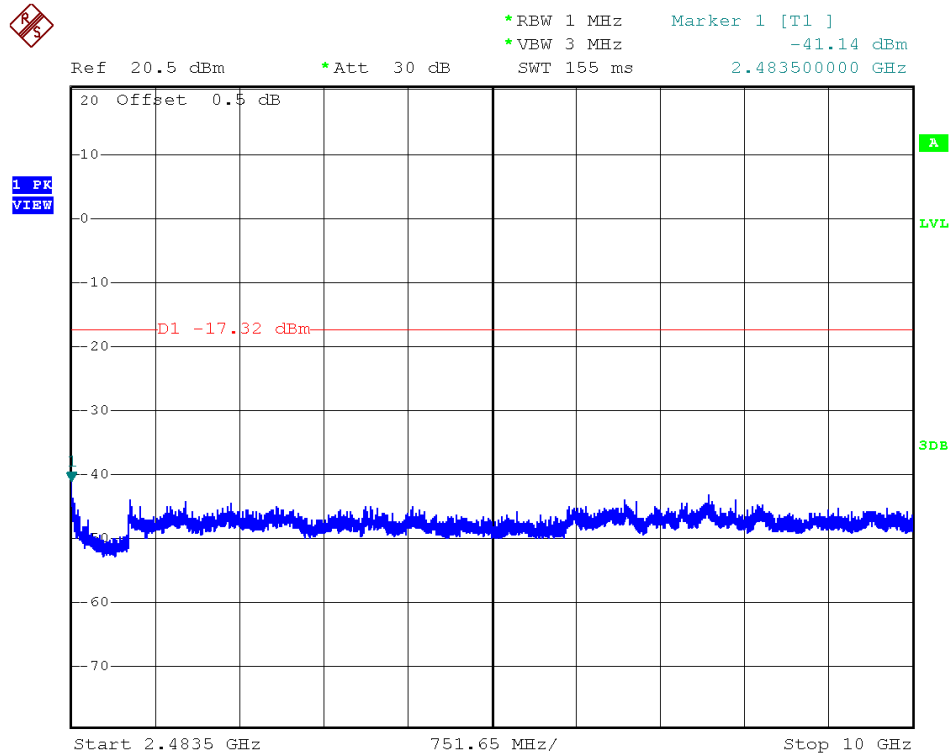
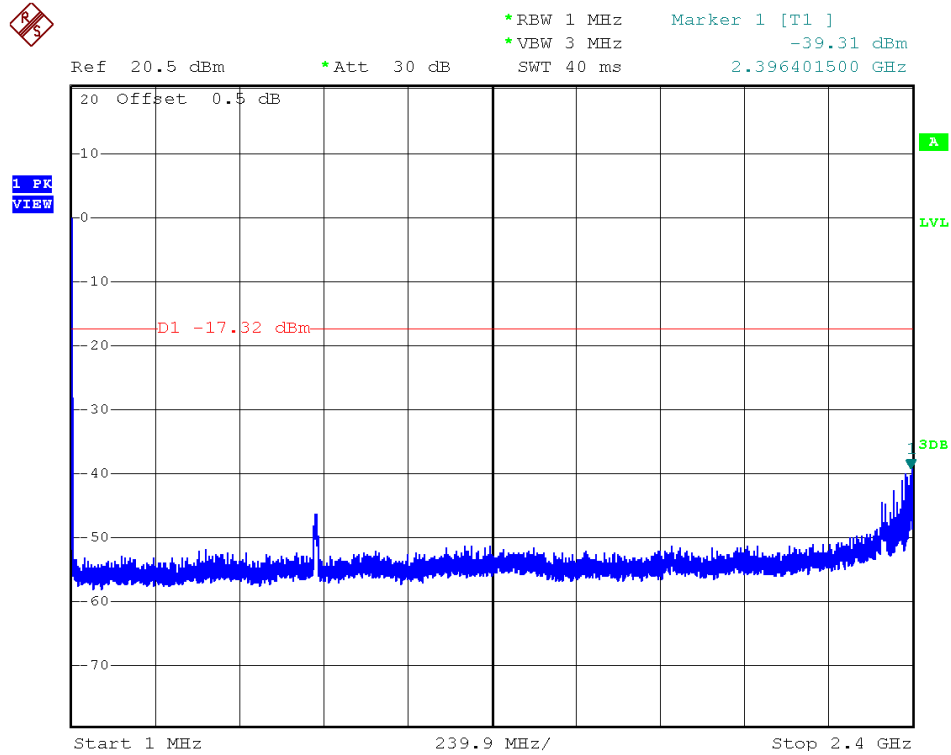
INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
 FCC ID: QISHG658V2
 Report No.: 140504020SZN-001

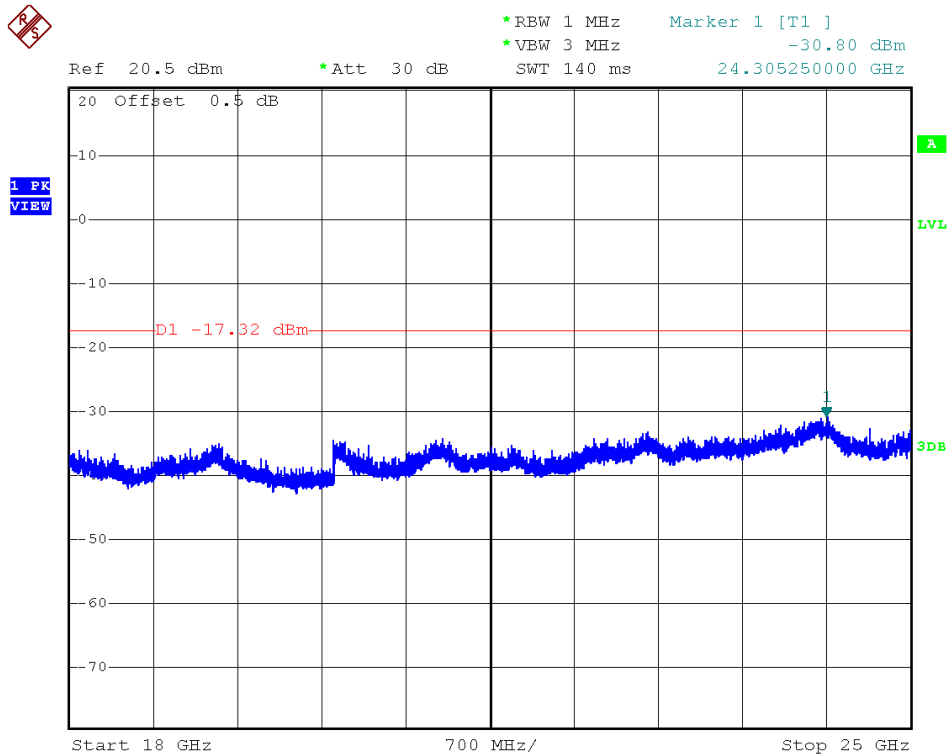
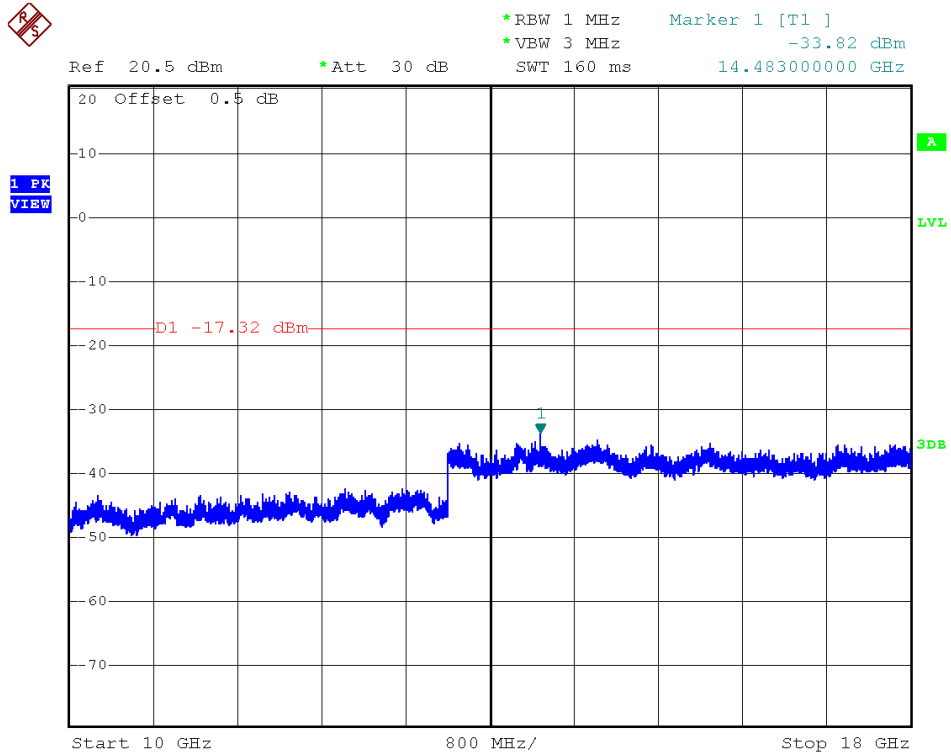
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 2.68dBm ANT 3



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

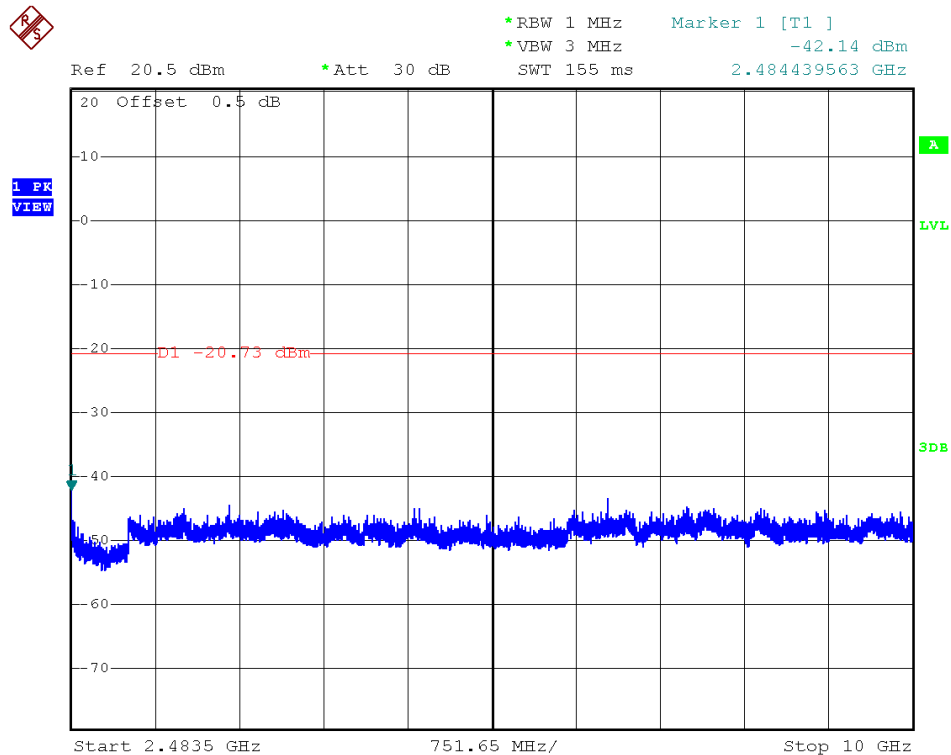
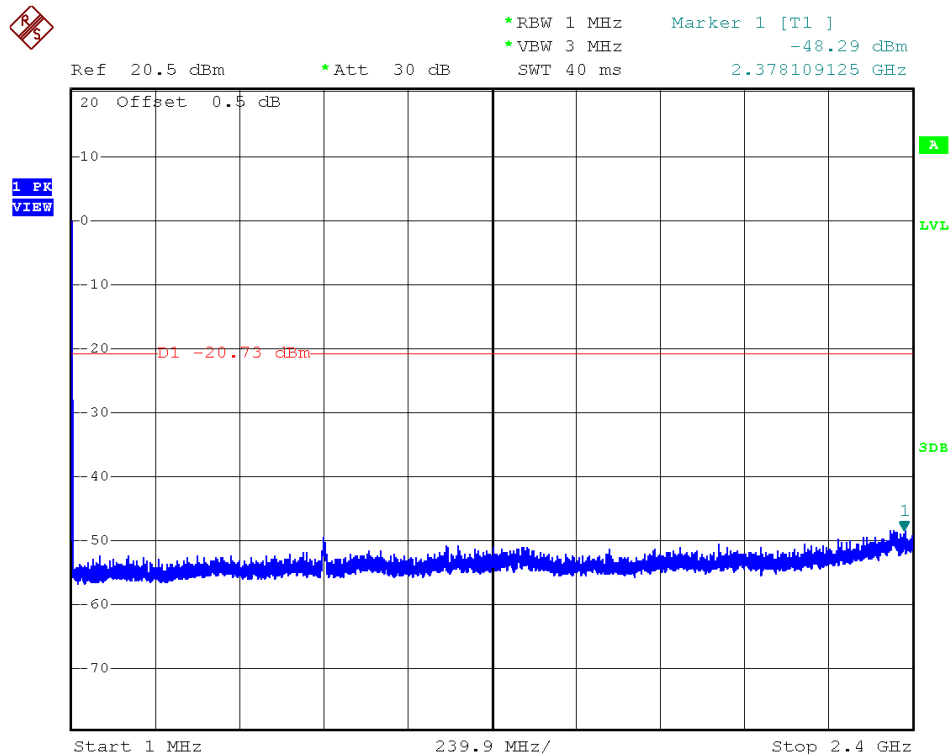
INTERTEK TESTING SERVICES



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

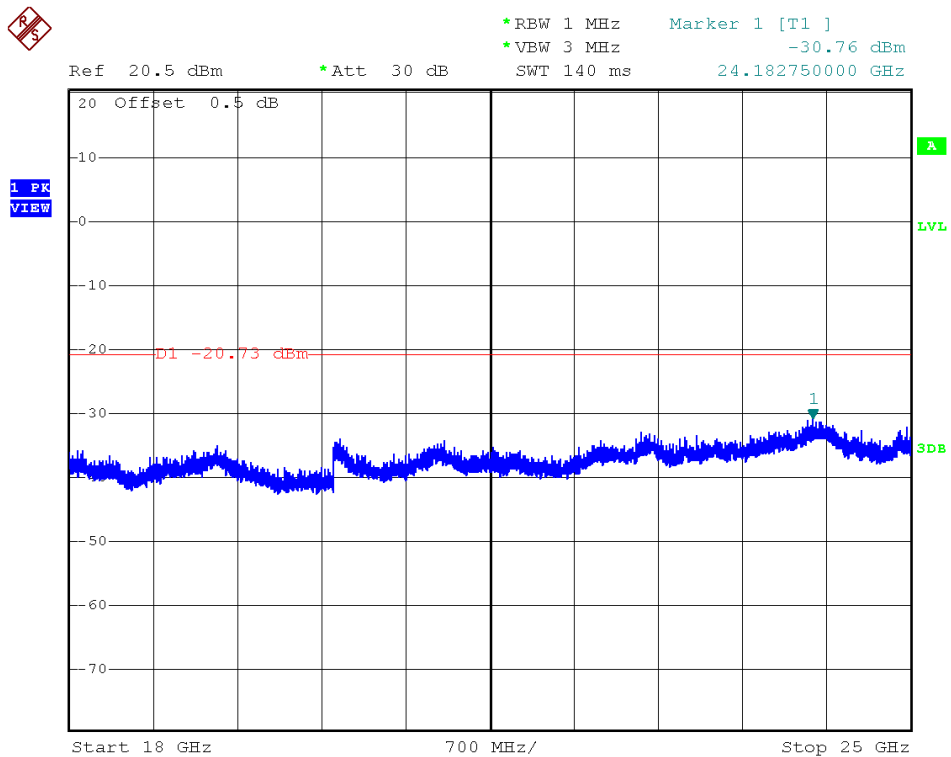
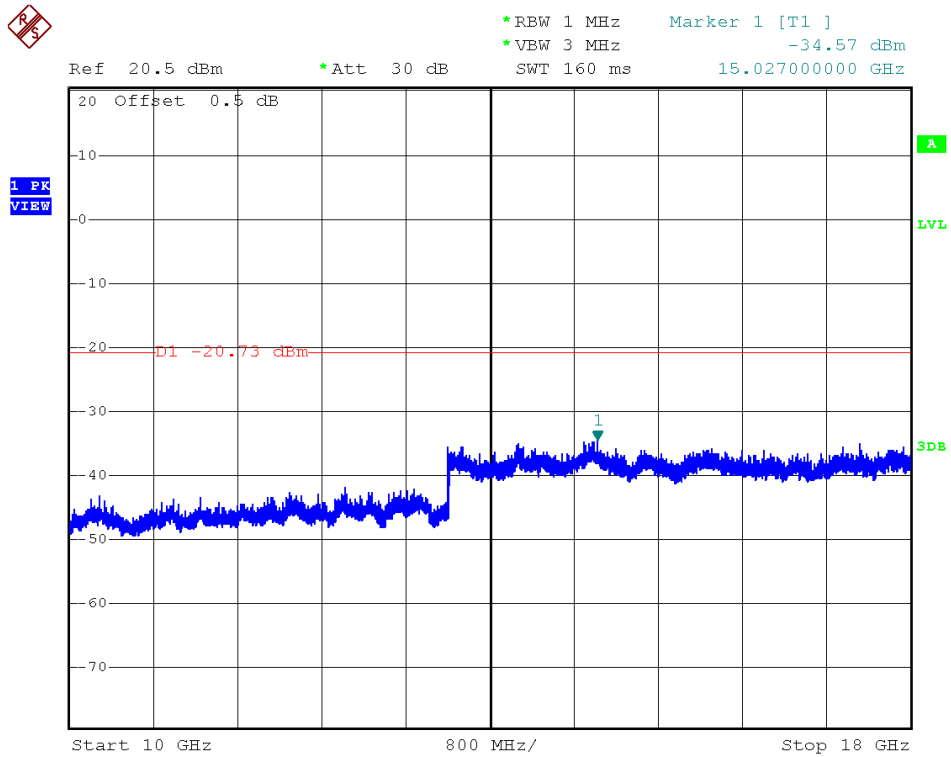
INTERTEK TESTING SERVICES

Channel 11 (2462MHz) Reference Level: -0.73dBm ANT 3



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

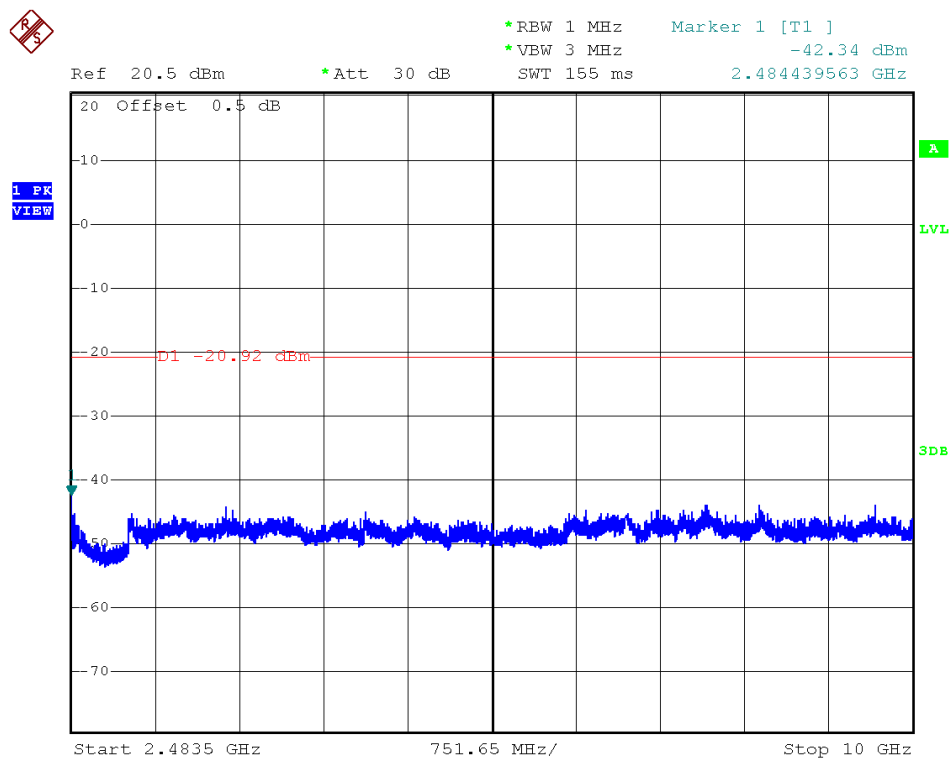
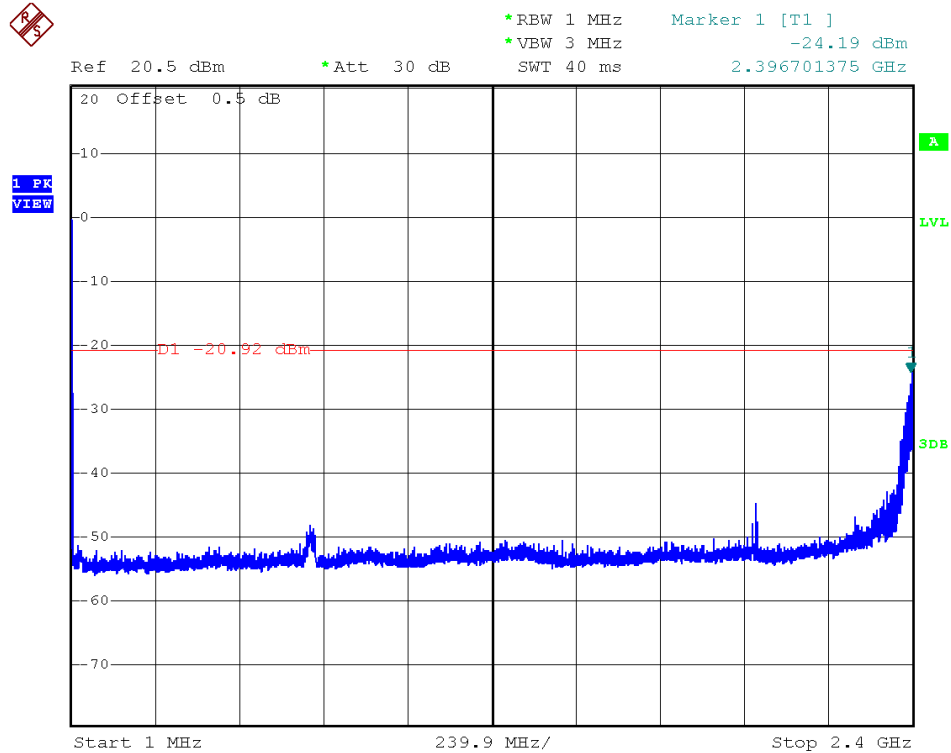
INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

802.11n-HT40 SISO

Channel 3 (2422MHz) Reference Level: -0.92dBm

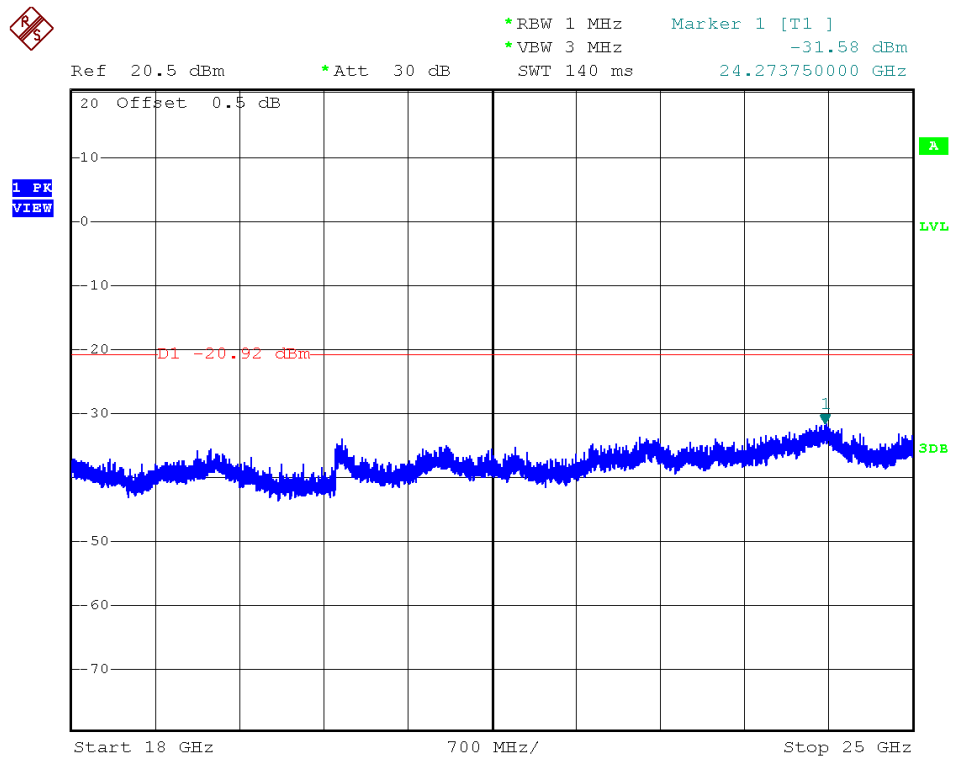
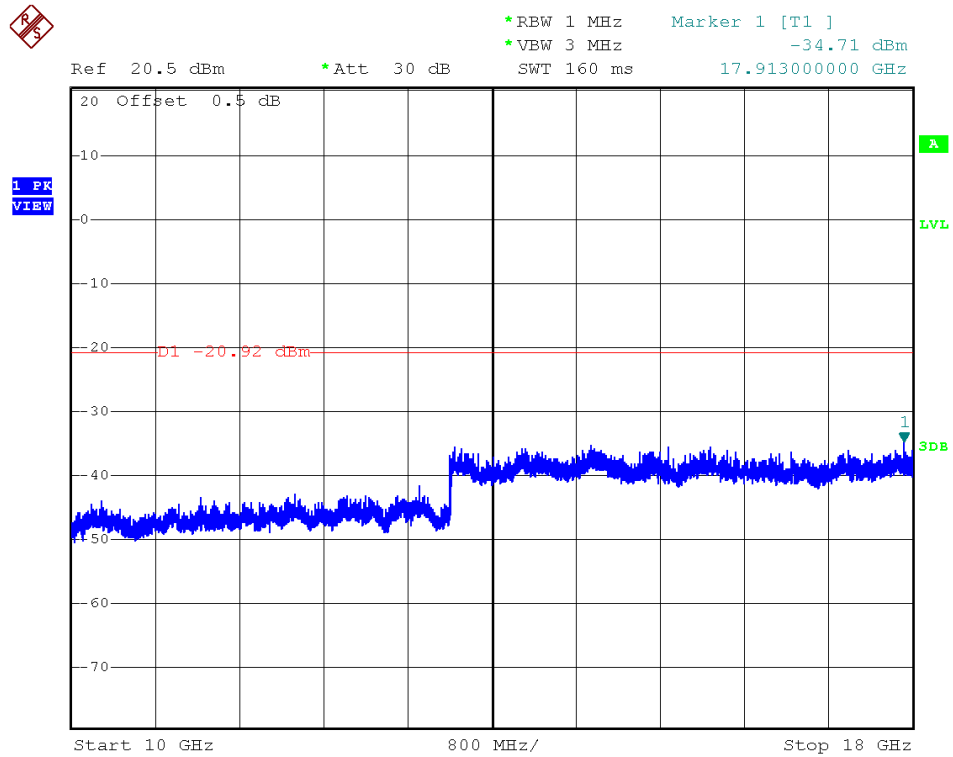


TRF no.: FCC 15C_TX_b

FCC ID: QISHG658V2

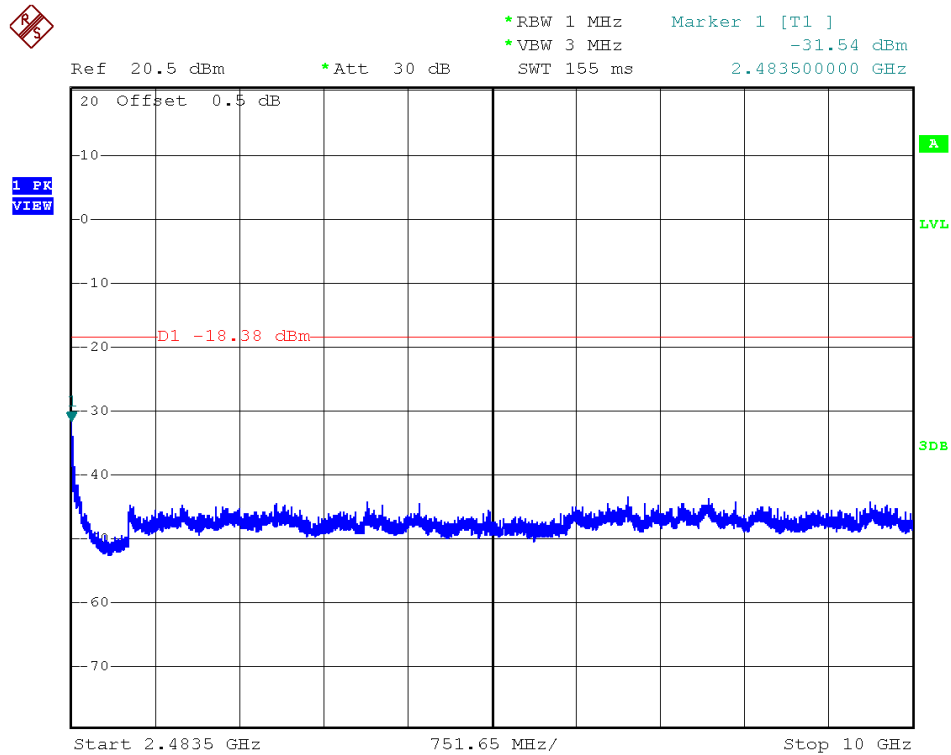
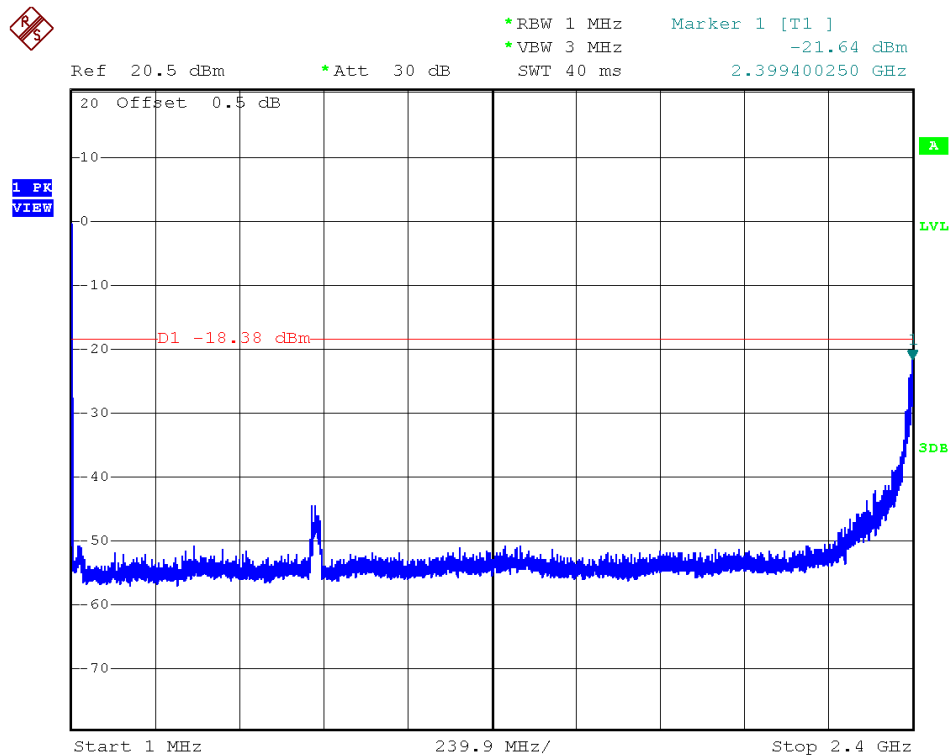
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



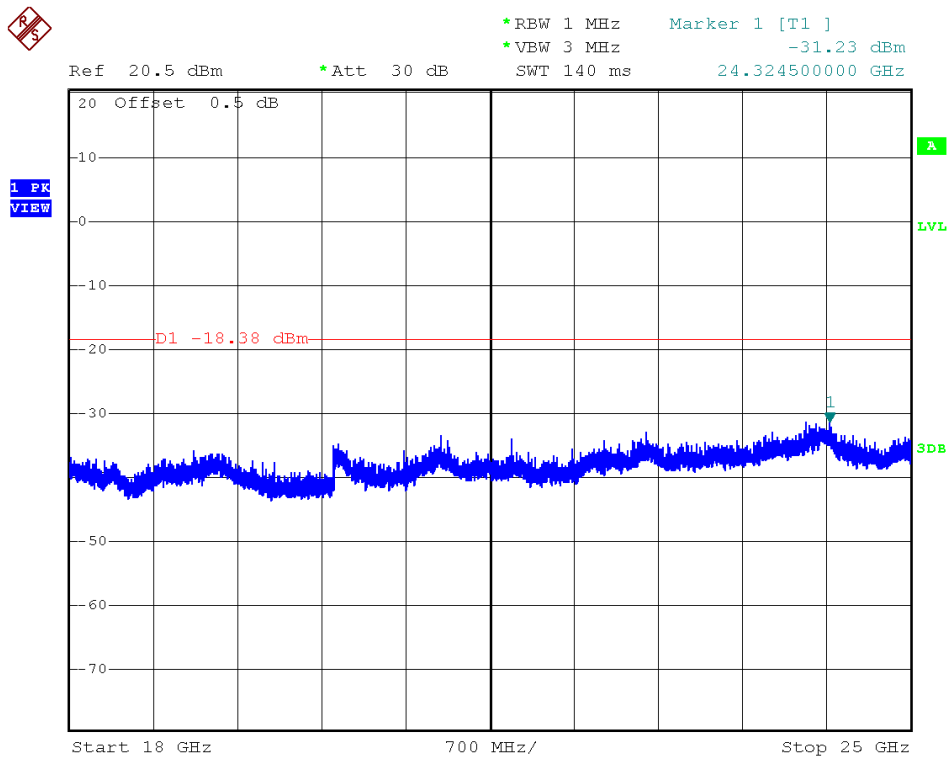
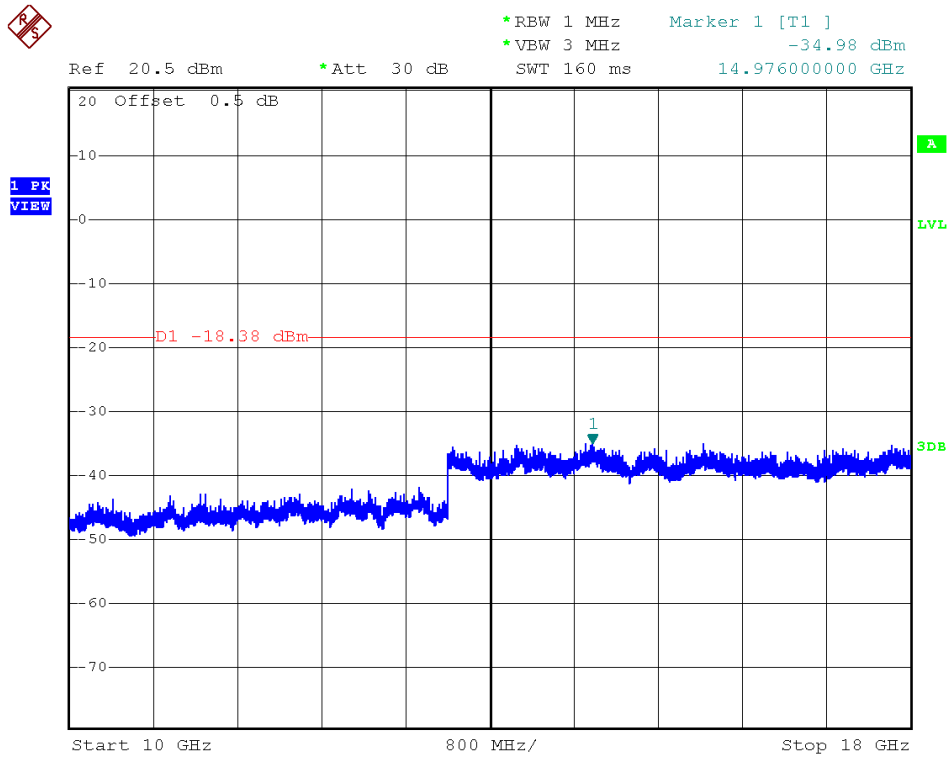
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: 1.62dBm



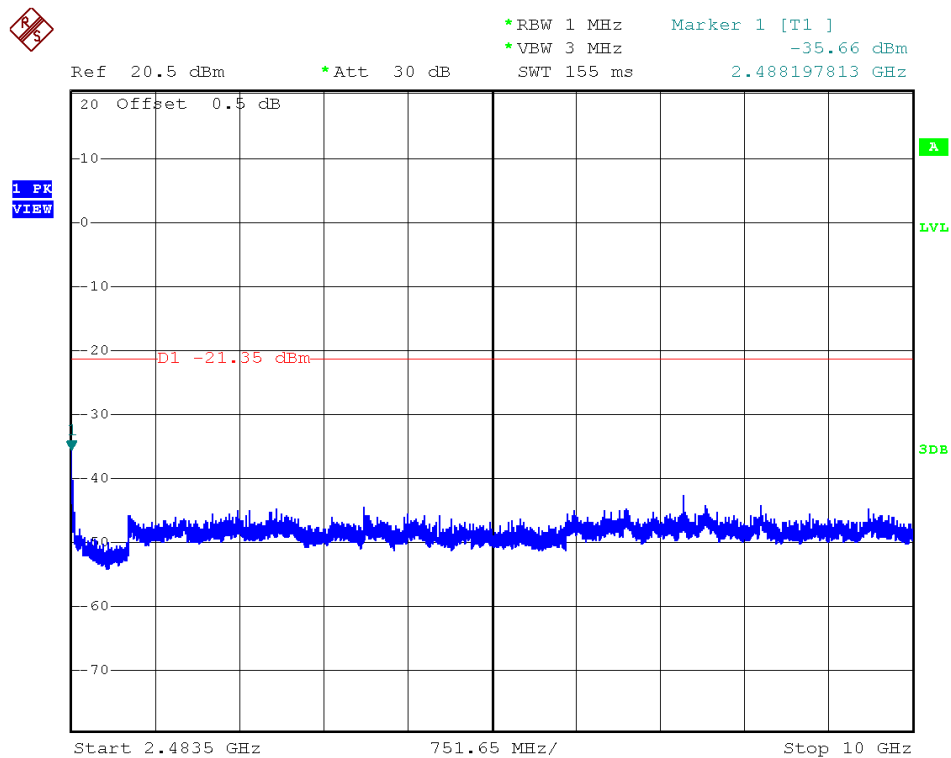
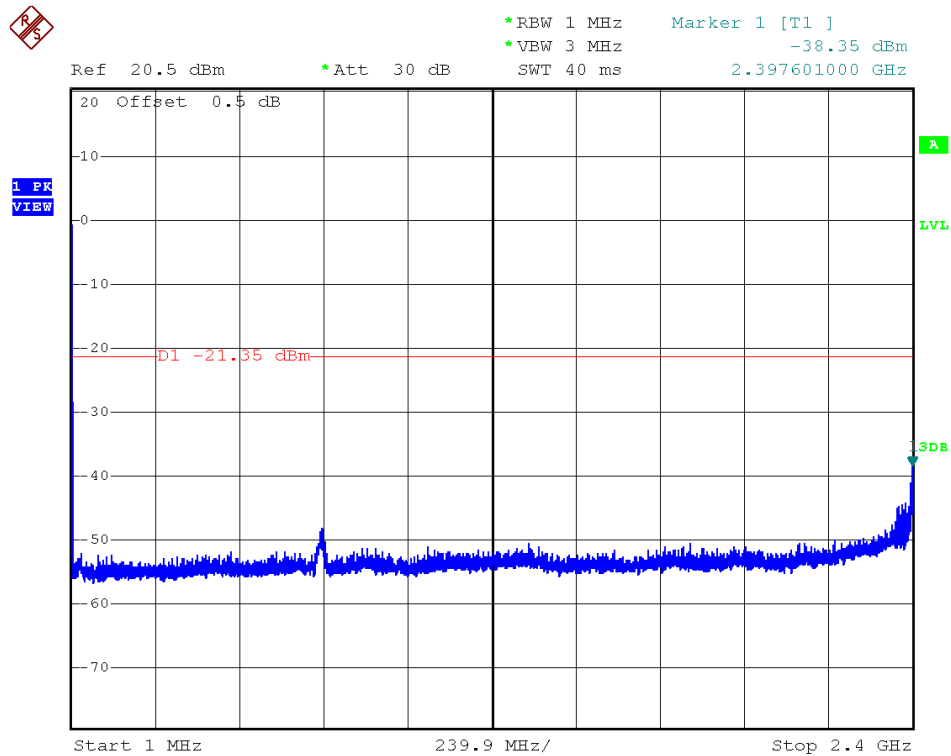
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



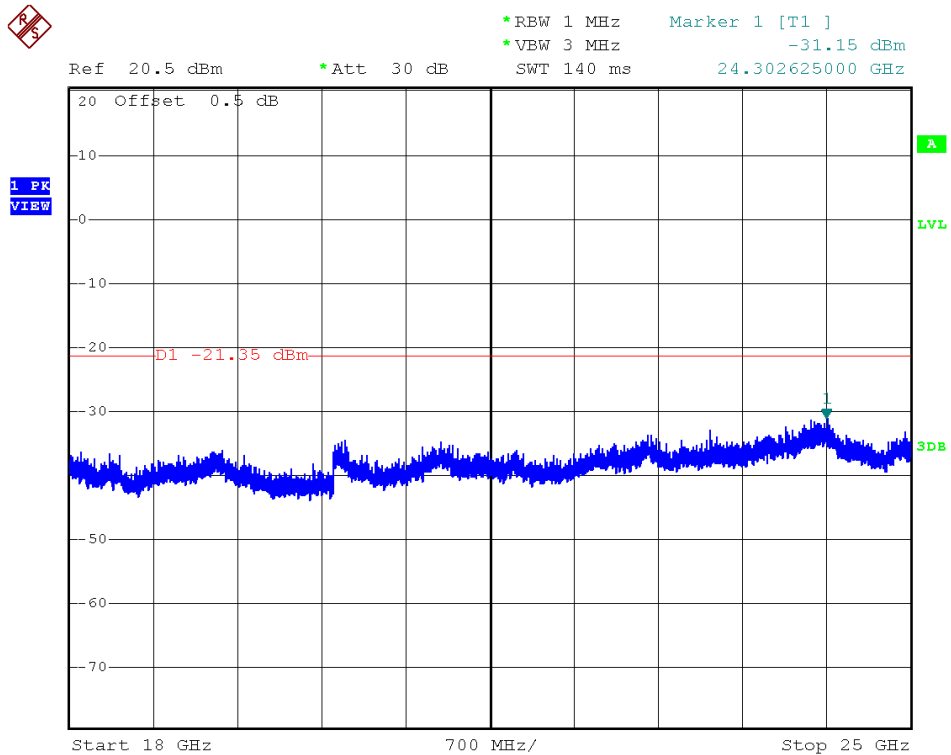
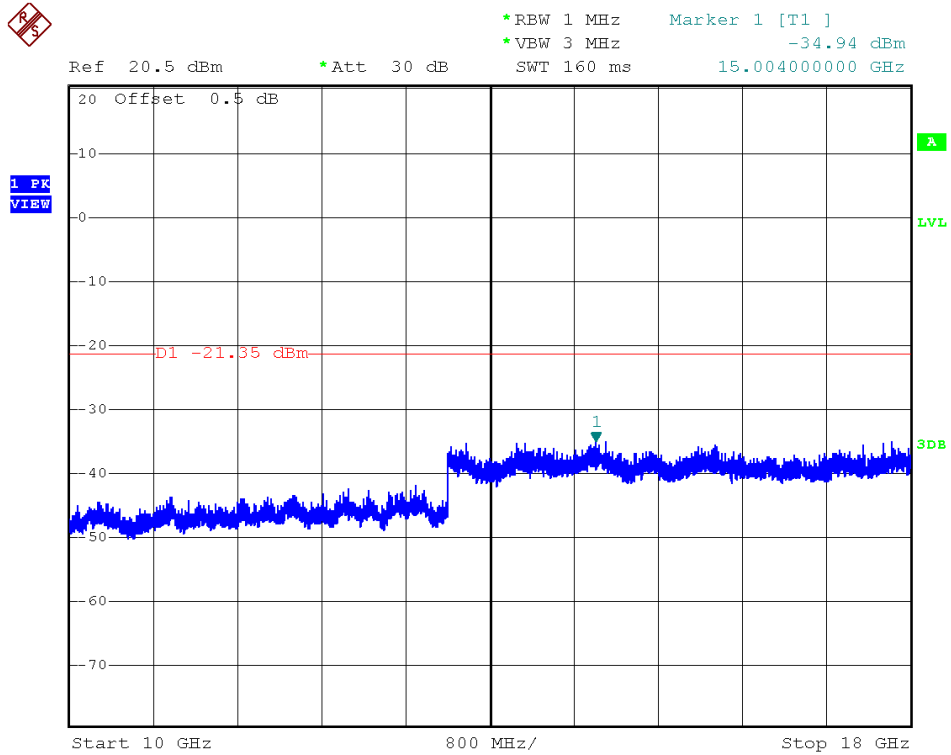
INTERTEK TESTING SERVICES

Channel 9 (2452MHz) Reference Level: -1.35dBm



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

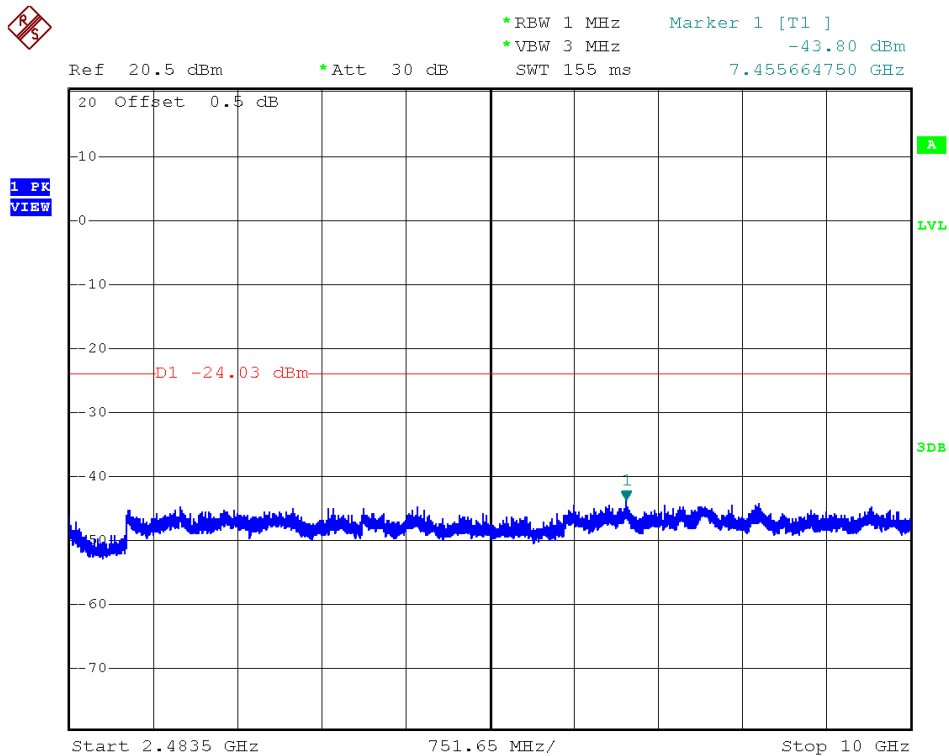
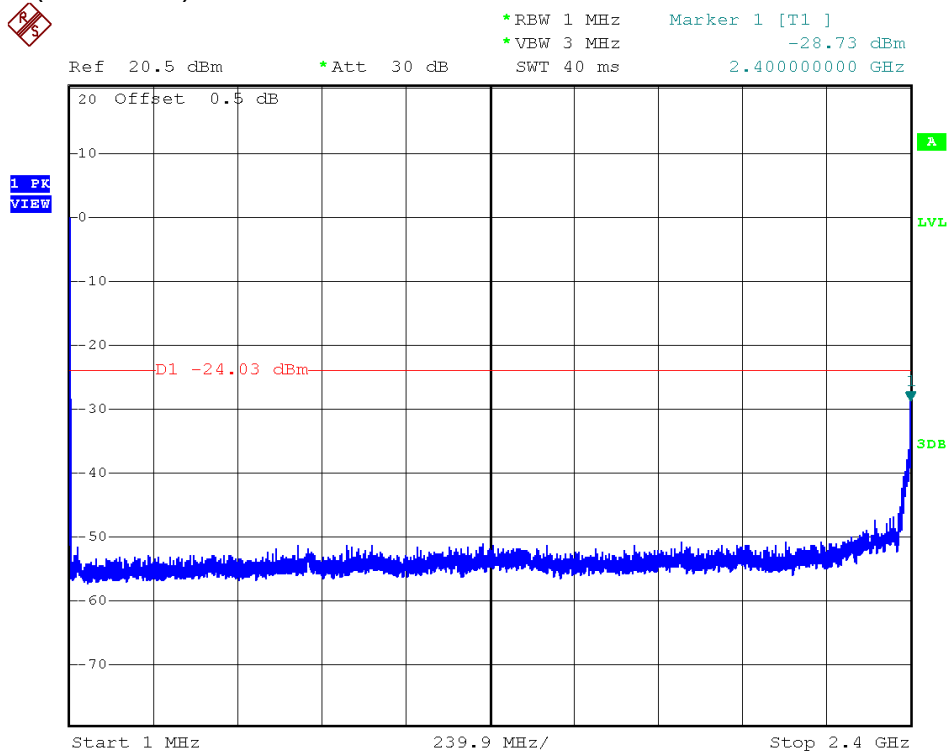


TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

802.11n-HT40 MIMO

Channel 3 (2422MHz) Reference Level: -4.03dBm ANT 1

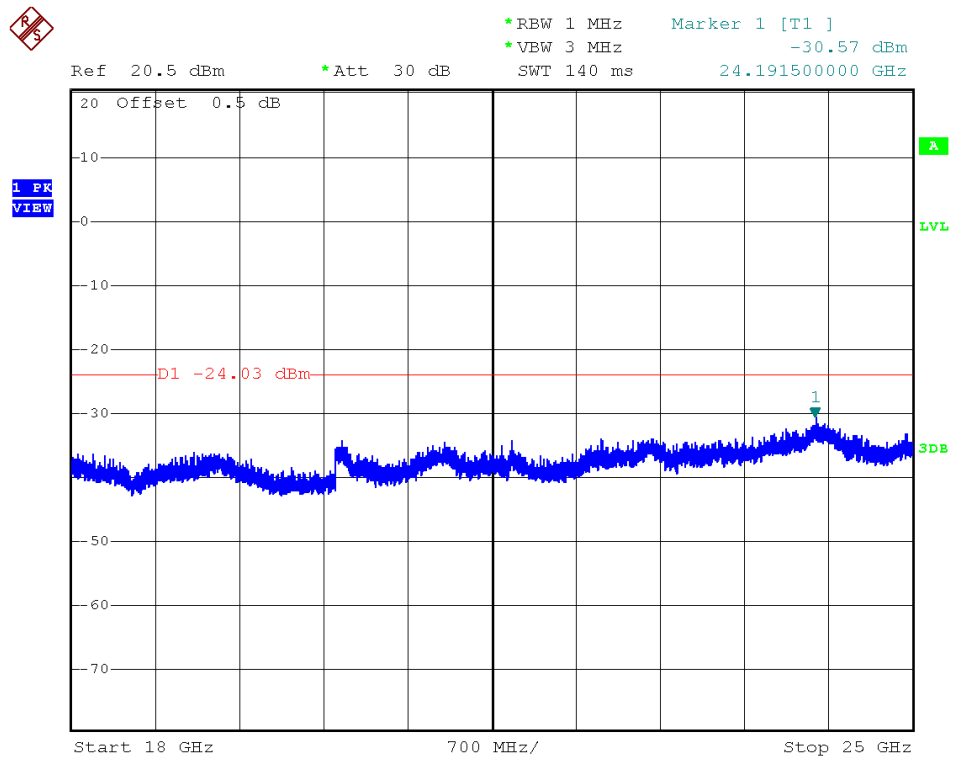
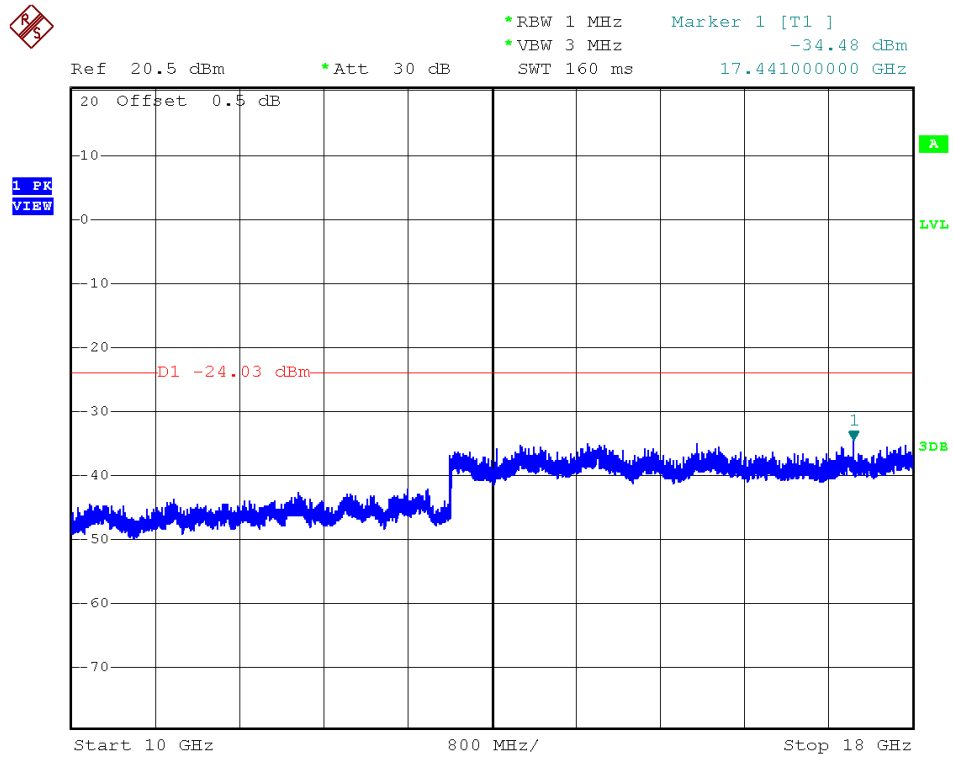


TRF no.: FCC 15C_TX_b

FCC ID: QISHG658V2

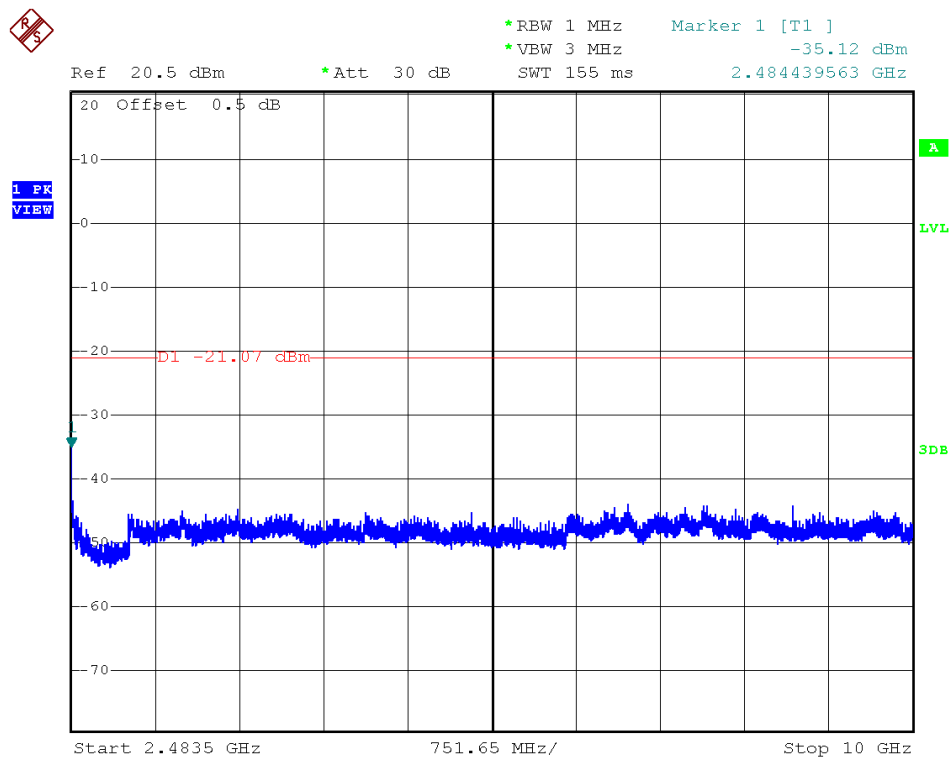
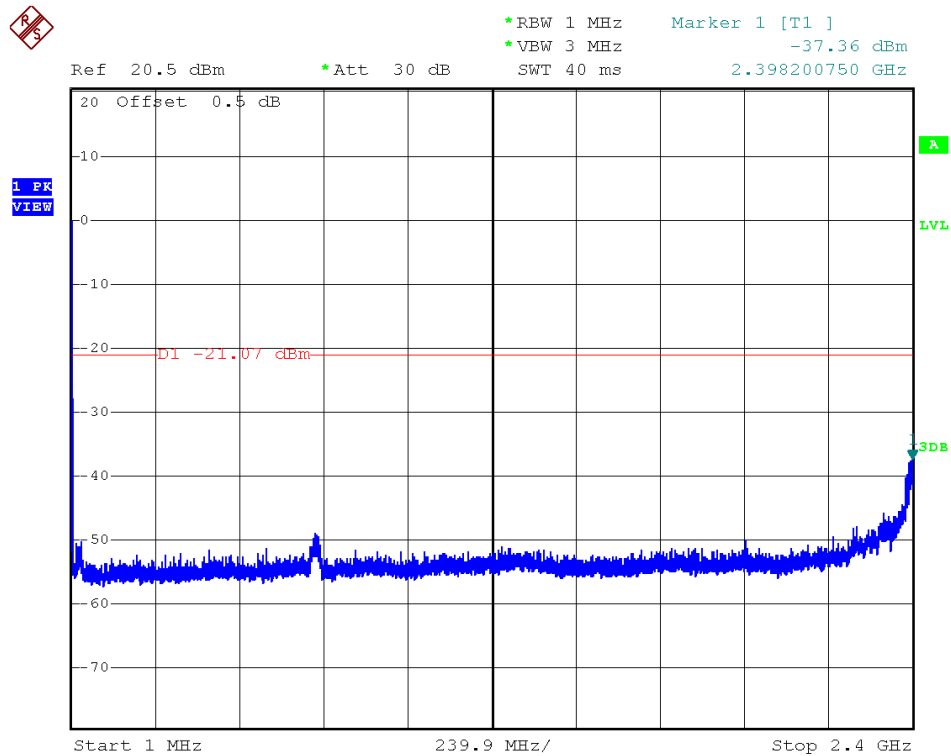
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



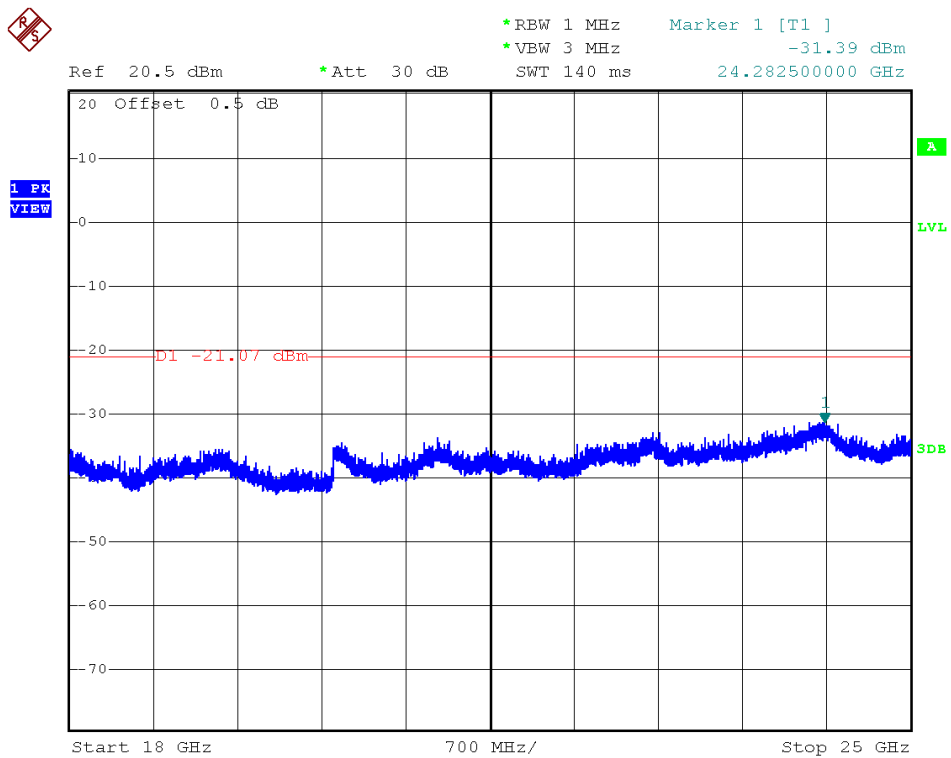
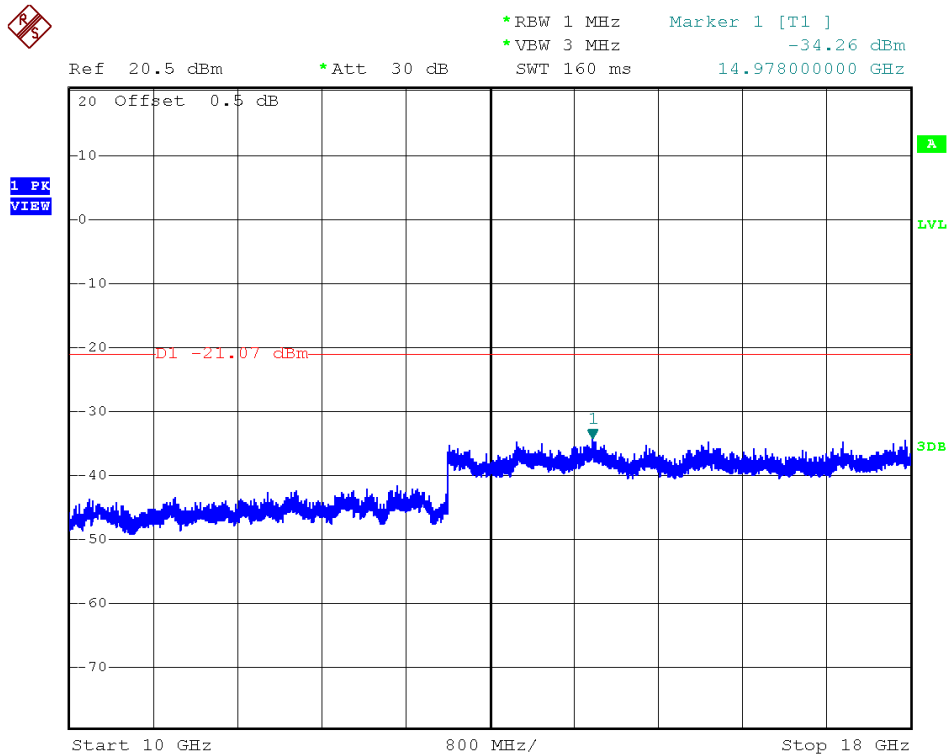
INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: -1.07dBm ANT 1



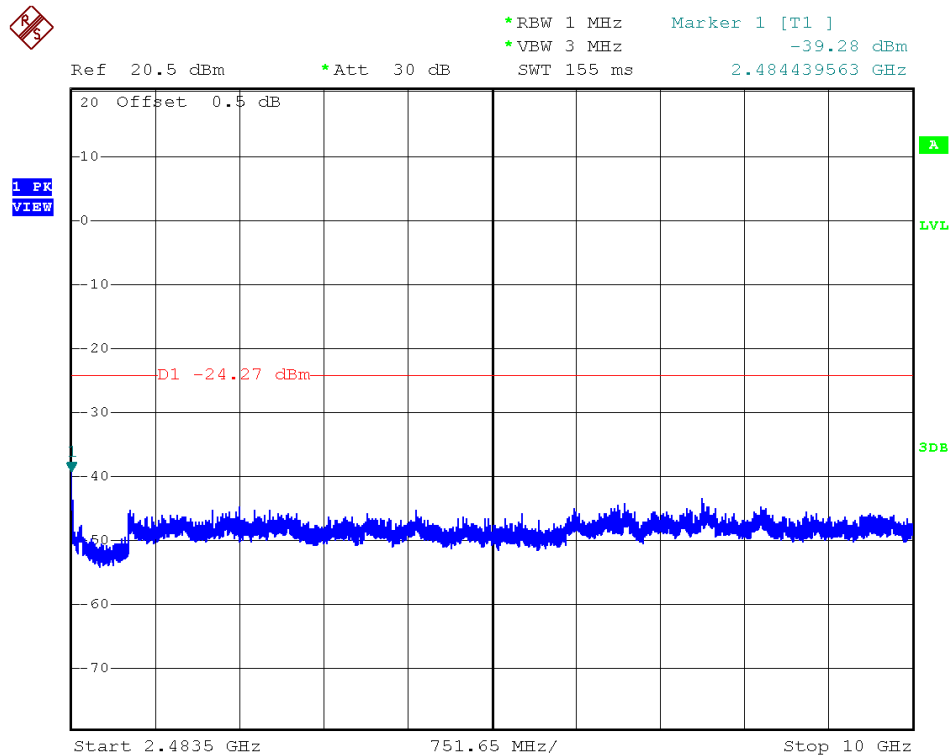
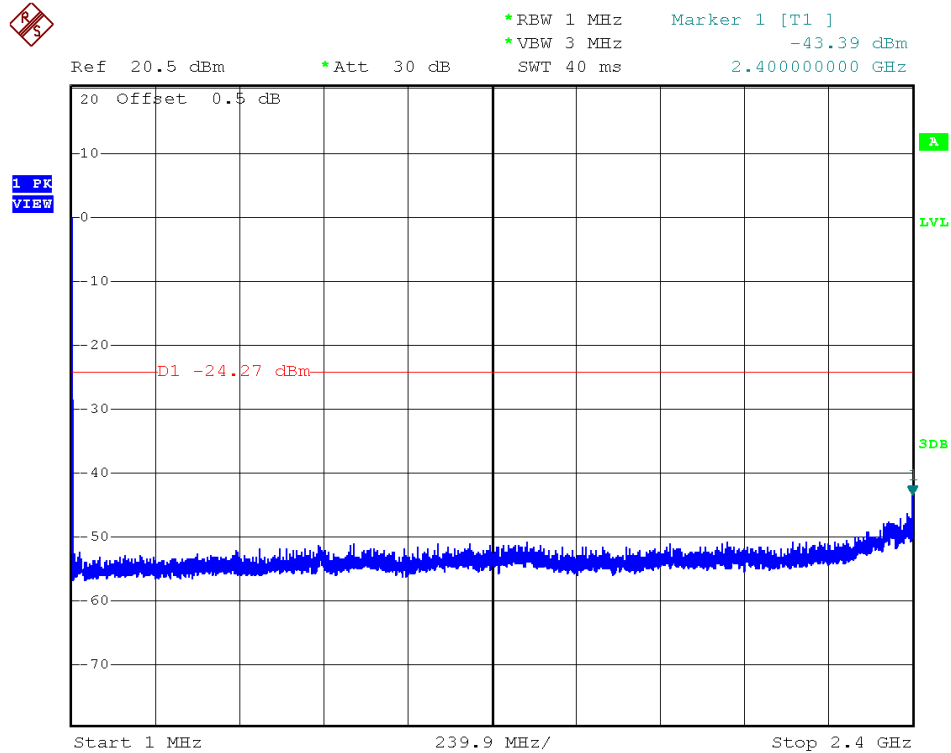
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



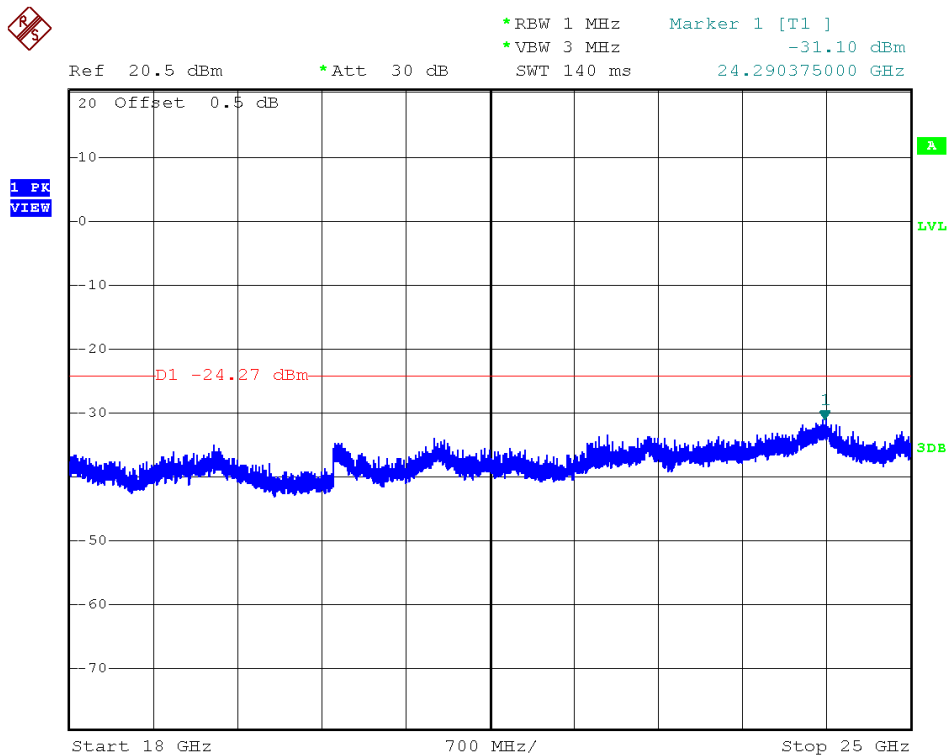
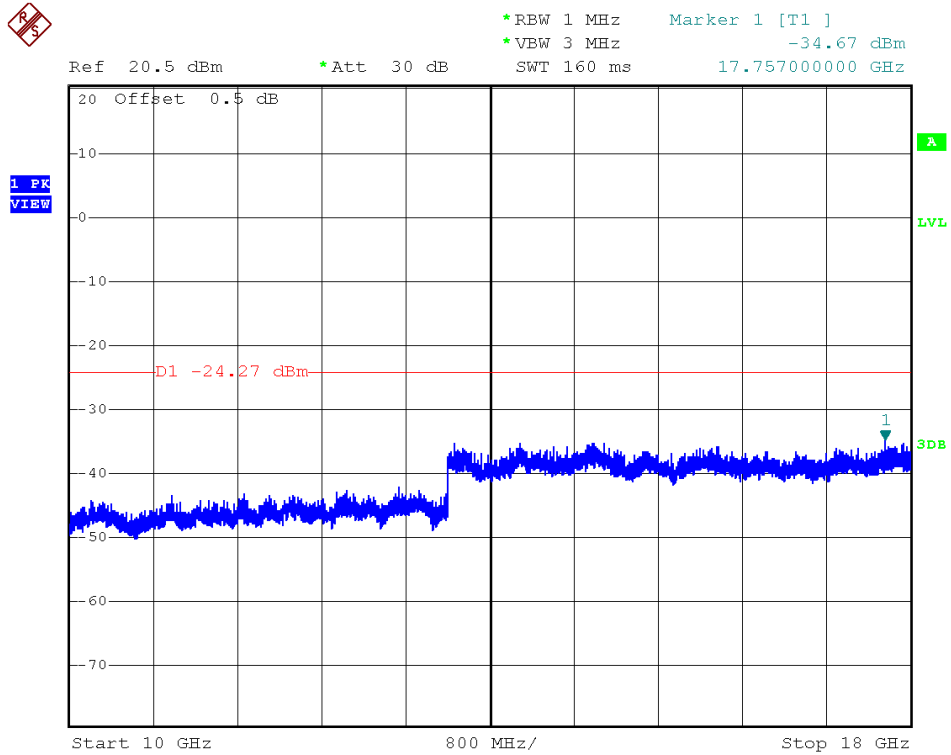
INTERTEK TESTING SERVICES

Channel 9 (2452MHz) Reference Level: -4.27dBm ANT 1



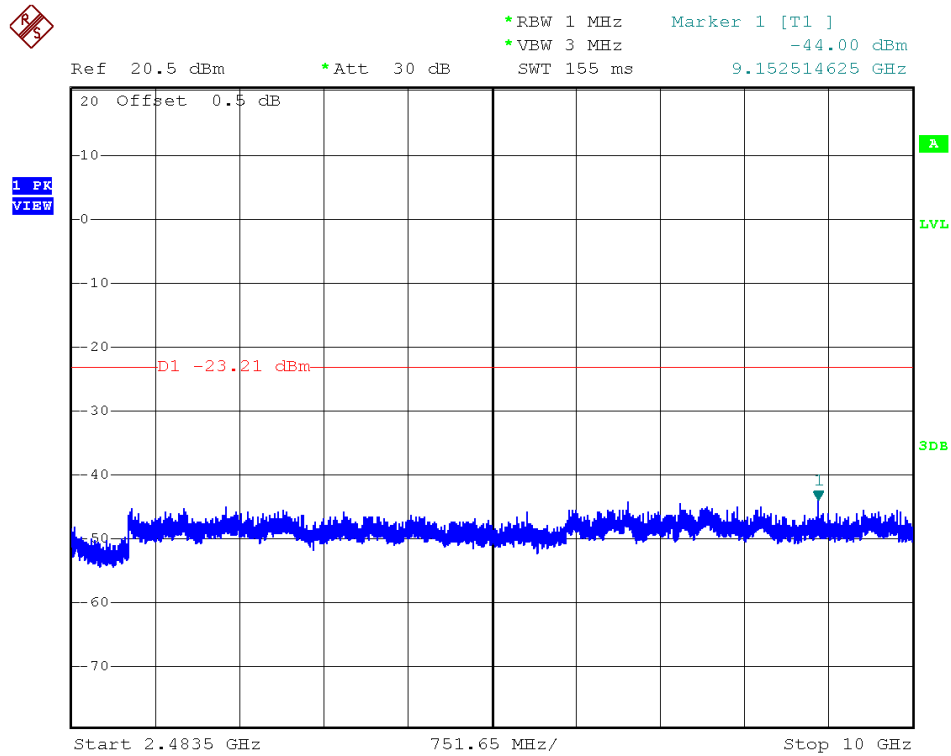
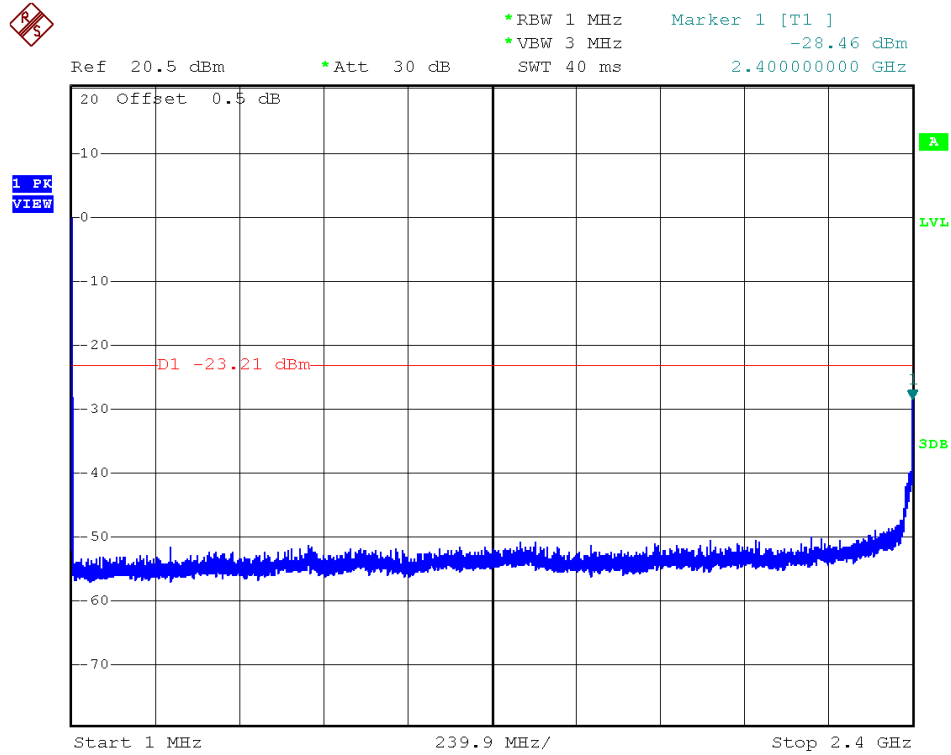
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



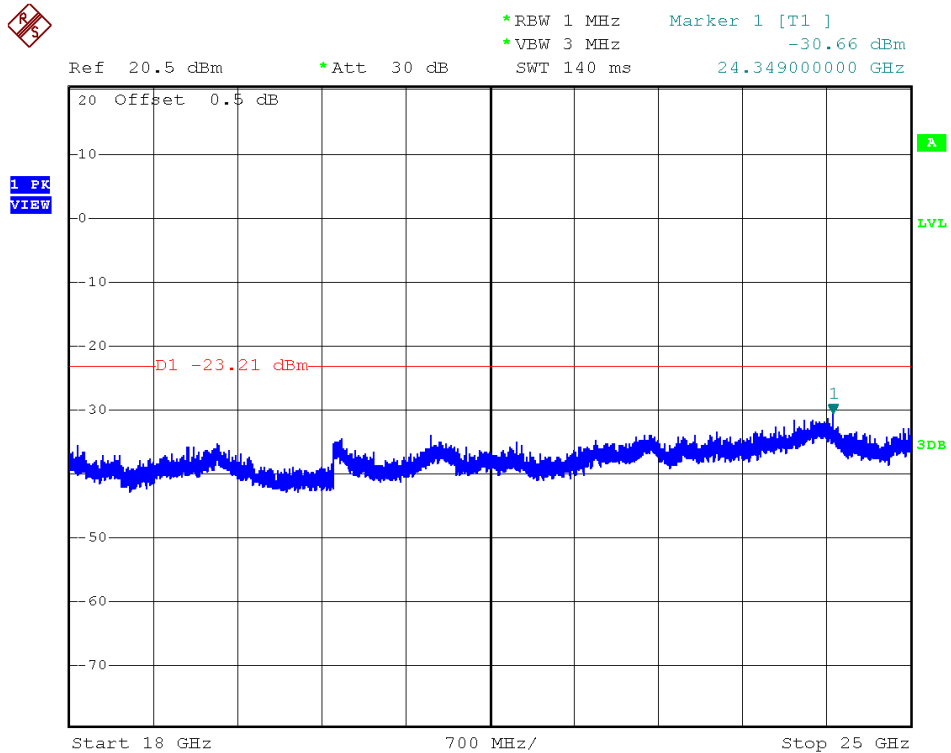
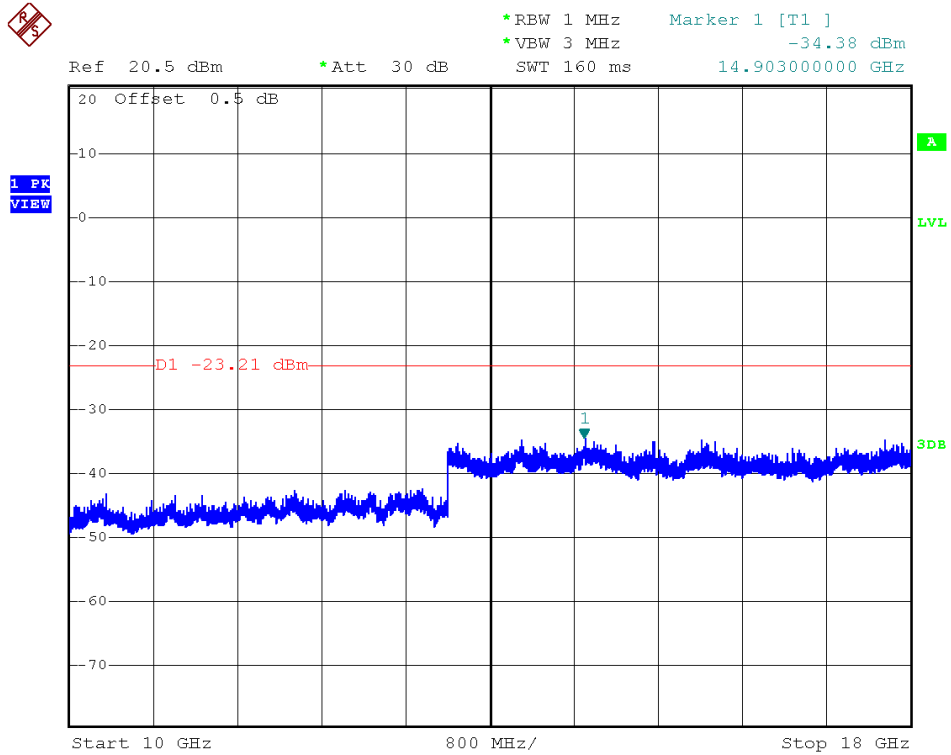
INTERTEK TESTING SERVICES

Channel 3 (2422MHz) Reference Level: -3.21dBm ANT 3



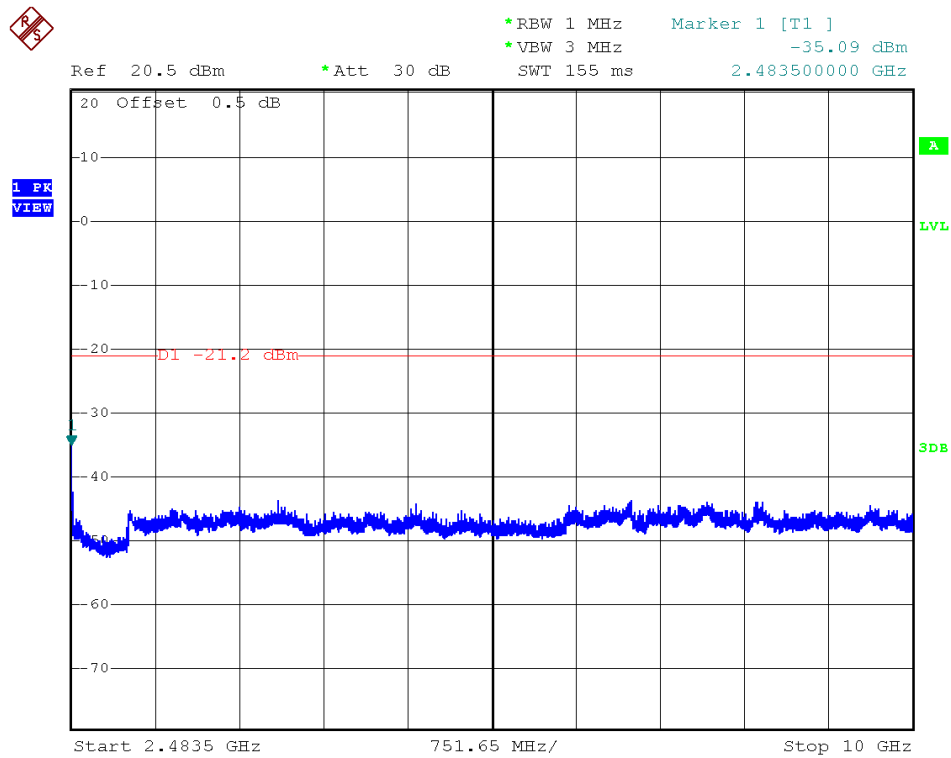
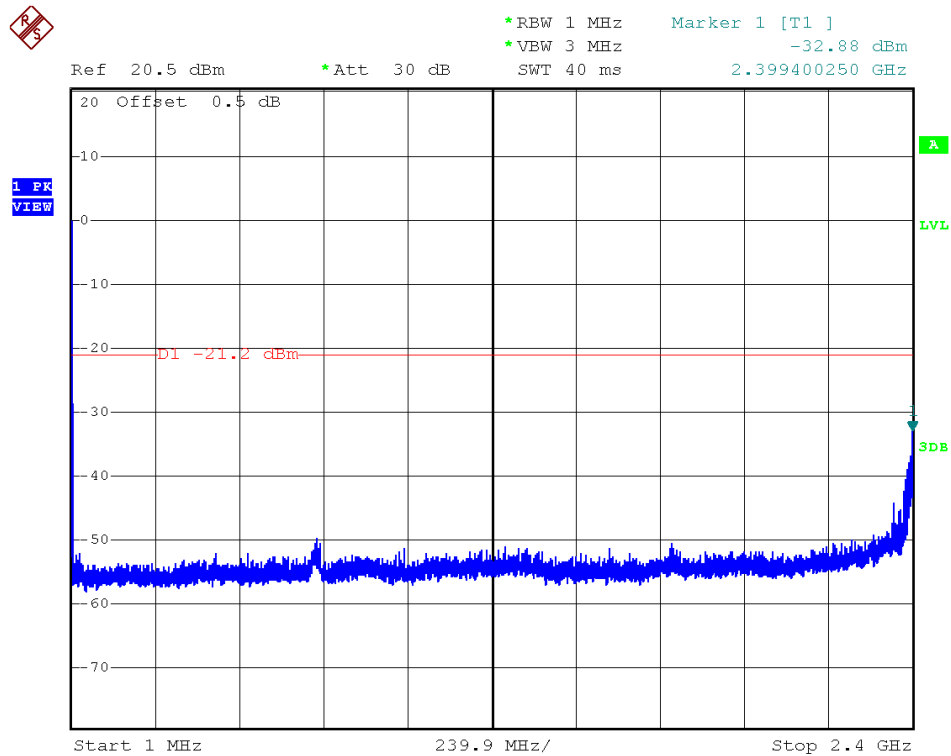
TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

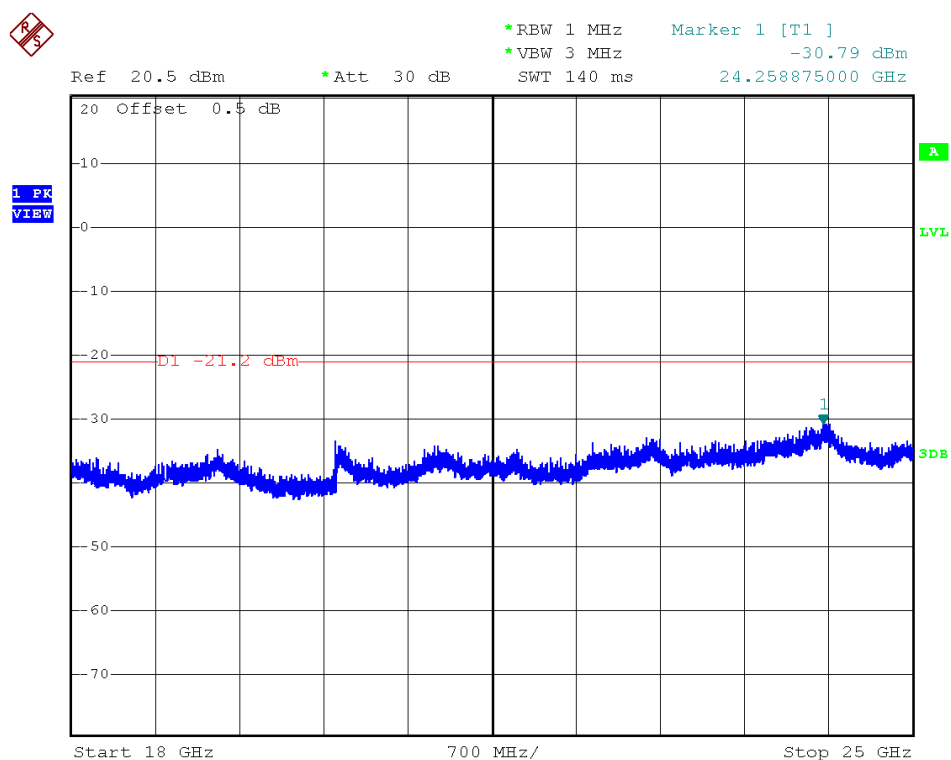
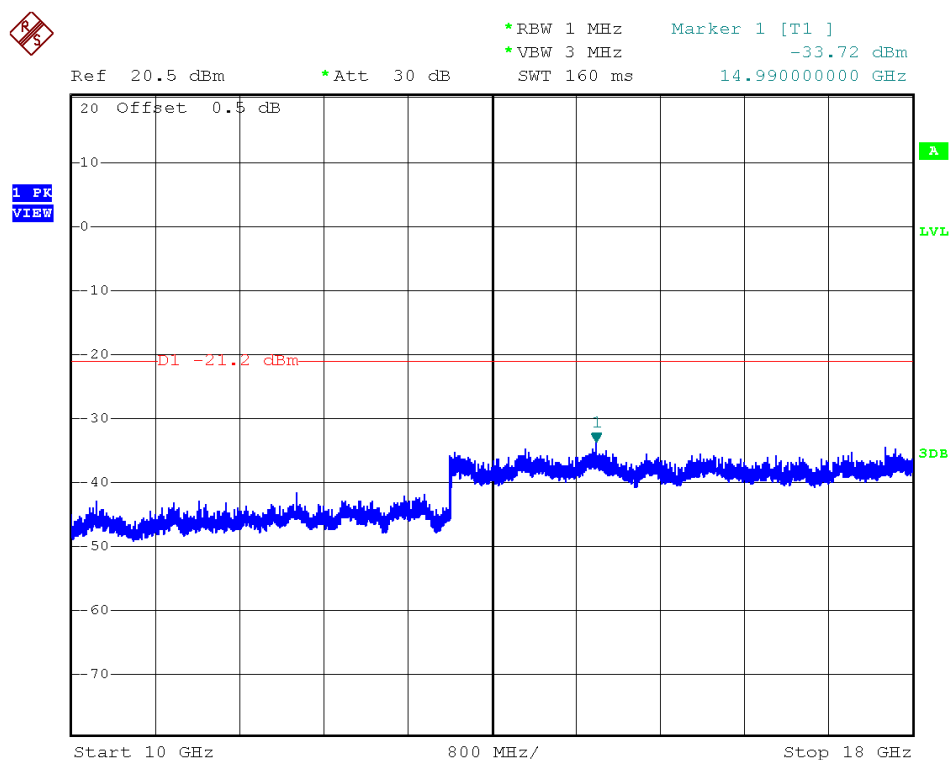


INTERTEK TESTING SERVICES

Channel 6 (2437MHz) Reference Level: -1.20dBm ANT 3

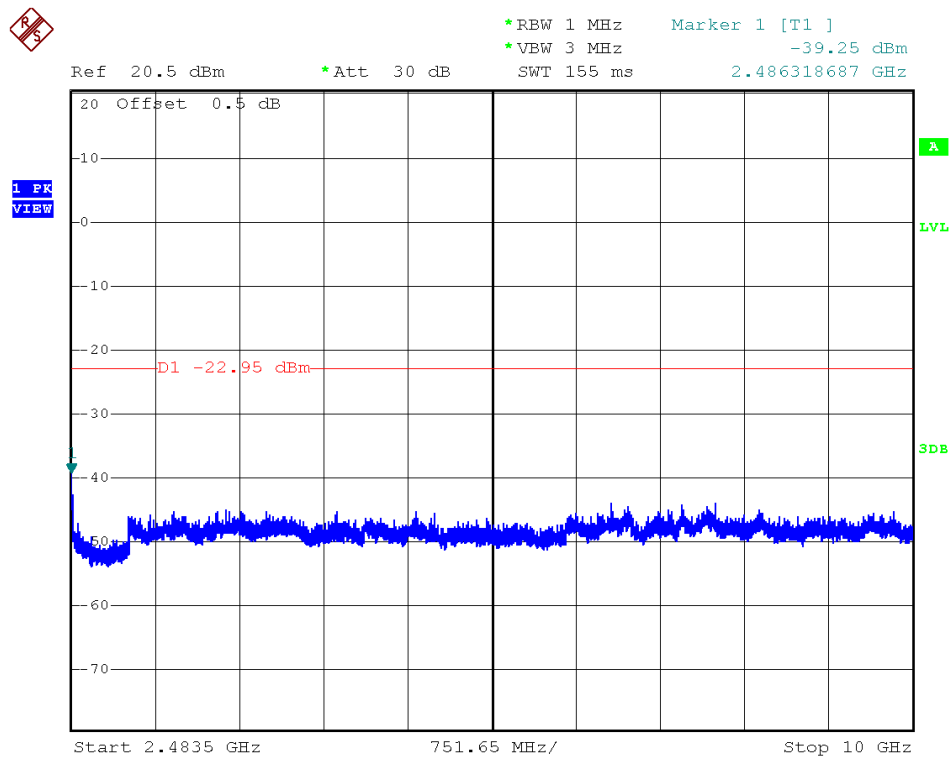
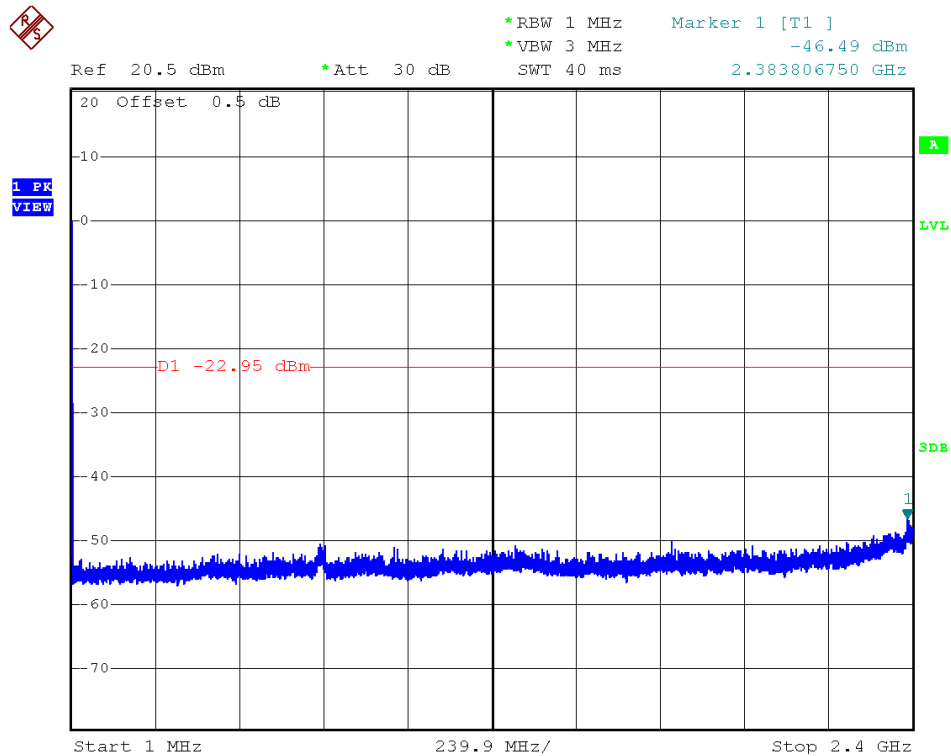


TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001



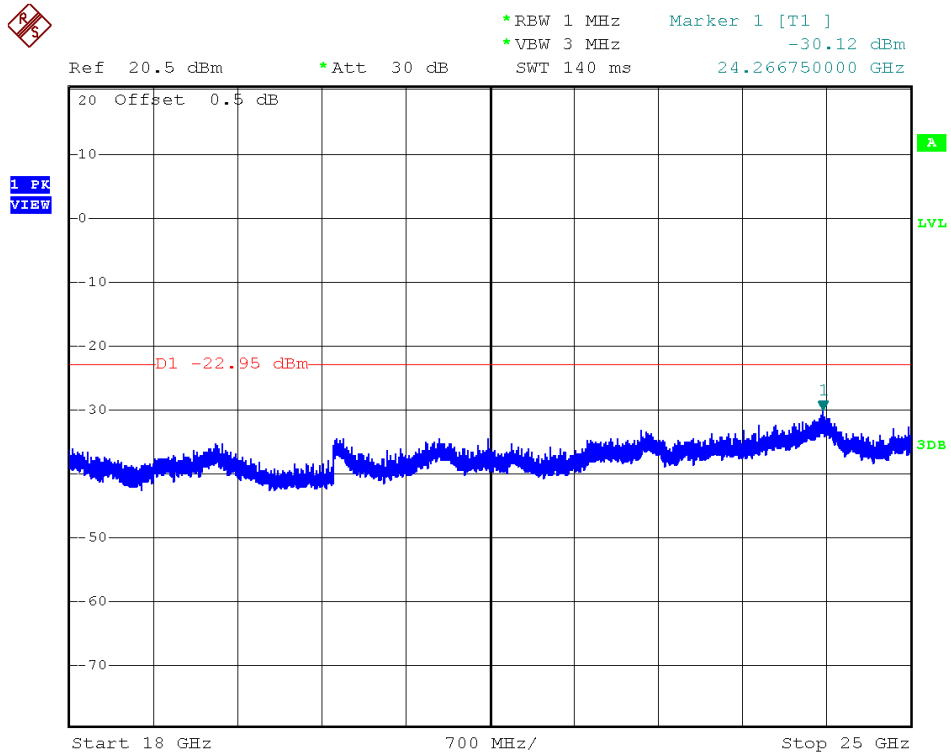
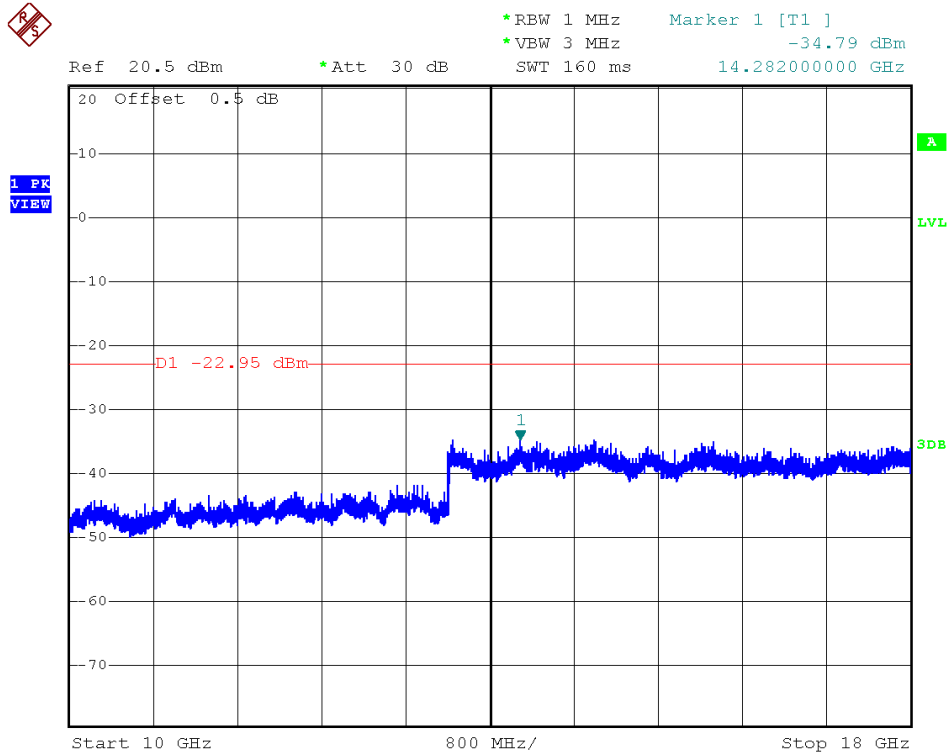
INTERTEK TESTING SERVICES

Channel 9 (2452MHz) Reference Level: -2.95dBm ANT 3



TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES



INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd
Model: HG658 V2

Date of Test: 15 May, 2014

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: HG658 V2

Date of Test: 15 May, 2014

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: HG658 V2

Date of Test: 15 May, 2014

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

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:

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

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.

RA = 62.0 dB μ V
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB

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

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

INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd
Model: HG658 V2

Date of Test: 15 May, 2014

4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission (802.11n-HT40 SISO Channel 3) at 9688MHz is passed by 1.0 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 May, 2014

Model: HG658 V2

Worst Case Operating Mode: 802.11n-HT20 MIMO Channel 6

AC/DC Adapter: Huntkey

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	30.970	36.9	20.0	8.0	24.9	40.0	-15.1
Horizontal	99.840	29.5	20.0	18.3	27.8	43.5	-15.7
Horizontal	252.120	29.1	20.0	22.1	31.2	46.0	-14.8
Vertical	39.700	38.0	20.0	7.6	25.6	40.0	-14.4
Vertical	125.040	42.2	20.0	8.0	30.2	43.5	-13.3
Vertical	599.875	39.5	20.0	18.3	34.5	46.0	-11.5

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
Model: HG658 V2
Mode: 802.11b Channel 1

Date of Test: 15 May, 2014

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4824.000	52.1	36.1	34.1	50.1	74.0	-23.9
Vertical	*7236.000	55.9	36.7	36.6	55.8	74.0	-18.2
Vertical	*9648.000	61.9	38.1	37.0	60.8	74.0	-13.2
Vertical	*2389.546	70.5	35.6	27.3	62.2	74.0	-11.8

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4824.000	37.9	36.1	34.1	35.9	54.0	-18.1
Vertical	*7236.000	43.0	36.7	36.6	42.9	54.0	-11.1
Vertical	*9648.000	53.1	38.1	37.0	52.0	54.0	-2.0
Vertical	*2389.546	59.5	35.6	27.3	51.2	54.0	-2.8

- 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: HG658 V2
 Mode: 802.11b Channel 6

Date of Test: 15 May, 2014

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4874.000	52.8	36.1	34.5	51.2	74.0	-22.8
Vertical	*7311.000	55.3	36.3	37.1	56.1	74.0	-17.9
Vertical	*9748.000	58.6	36.8	38.2	60.0	74.0	-14.0

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4874.000	37.3	36.1	34.5	35.7	54.0	-18.3
Vertical	*7311.000	41.7	36.3	37.1	42.5	54.0	-11.5
Vertical	*9748.000	50.3	36.8	38.2	51.7	54.0	-2.3

- 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: HG658 V2
 Mode: 802.11b Channel 11

Date of Test: 15 May, 2014

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4924.000	52.4	36.1	34.2	50.5	74.0	-23.5
Vertical	*7386.000	56.3	36.8	36.7	56.2	74.0	-17.8
Vertical	*9848.000	61.9	38.2	37.1	60.8	74.0	-13.2
Vertical	*2483.536	69.9	35.8	27.5	61.6	74.0	-12.4

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
vertical	*4924.000	37.9	36.1	34.2	36.0	54.0	-18.0
vertical	*7386.000	43.2	36.8	36.7	43.1	54.0	-10.9
vertical	*9848.000	53.1	38.2	37.1	52.0	54.0	-2.0
Vertical	*2483.536	61.1	35.8	27.5	52.8	54.0	-1.2

- 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: HG658 V2
 Mode: 802.11g Channel 1

Date of Test: 15 May, 2014

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4824.000	57.1	36.1	34.1	55.1	74.0	-18.9
Vertical	*7236.000	57.6	36.7	36.6	57.5	74.0	-16.5
Vertical	*9648.000	62.0	38.1	37.0	60.9	74.0	-13.1
Vertical	*2389.220	80.4	35.6	27.3	72.1	74.0	-1.9

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4824.000	41.5	36.1	34.1	39.5	54.0	-14.5
Vertical	*7236.000	43.1	36.7	36.6	43.0	54.0	-11.0
Vertical	*9648.000	51.3	38.1	37.0	50.2	54.0	-3.8
Vertical	*2389.220	60.9	35.6	27.3	52.6	54.0	-1.4

- 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: HG658 V2
 Mode: 802.11g Channel 6

Date of Test: 15 May, 2014

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4874.000	56.6	36.1	34.5	55.0	74.0	-19.0
Vertical	*7311.000	56.5	36.3	37.1	57.3	74.0	-16.7
Vertical	*9748.000	59.6	36.8	38.2	61.0	74.0	-13.0

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4874.000	40.8	36.1	34.5	39.2	54.0	-14.8
Vertical	*7311.000	43.4	36.3	37.1	44.2	54.0	-9.8
Vertical	*9748.000	50.0	36.8	38.2	51.4	54.0	-2.6

- 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: HG658 V2
Mode: 802.11g Channel 11

Date of Test: 15 May, 2014

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4924.000	56.3	36.1	34.2	54.4	74.0	-19.6
Vertical	*7386.000	60.1	36.8	36.7	60.0	74.0	-14.0
Vertical	*9848.000	61.2	38.2	37.1	60.1	74.0	-13.9
Vertical	*2483.510	80.3	35.8	27.5	72.0	74.0	-2.0

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
vertical	*4924.000	44.9	36.1	34.2	43.0	54.0	-11.0
vertical	*7386.000	43.1	36.8	36.7	43.0	54.0	-11.0
vertical	*9848.000	51.5	38.2	37.1	50.4	54.0	-3.6
Vertical	*2483.510	60.4	35.8	27.5	52.1	54.0	-1.9

- 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: HG658 V2
 Mode: 802.11n-HT20 SISO Channel 1

Date of Test: 15 May, 2014

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)
Vertical	*4824.000	57.7	36.1	34.1	55.7	74.0	-18.3
Vertical	*7236.000	56.6	36.7	36.6	56.5	74.0	-17.5
Vertical	*9648.000	62.4	38.1	37.0	61.3	74.0	-12.7
Vertical	*2389.270	78.8	35.6	27.3	70.5	74.0	-3.5

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)
Vertical	*4824.000	43.1	36.1	34.1	41.1	54.0	-12.9
Vertical	*7236.000	41.9	36.7	36.6	41.8	54.0	-12.2
Vertical	*9648.000	53.5	38.1	37.0	52.4	54.0	-1.6
Vertical	*2389.270	61.1	35.6	27.3	52.8	54.0	-1.2

- 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: HG658 V2
 Mode: 802.11n-HT20 SISO Channel 6

Date of Test: 15 May, 2014

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)
Vertical	*4874.000	57.0	36.1	34.5	55.4	74.0	-18.6
Vertical	*7311.000	55.5	36.3	37.1	56.3	74.0	-17.7
Vertical	*9748.000	60.1	36.8	38.2	61.5	74.0	-12.5

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)
Vertical	*4874.000	42.7	36.1	34.5	41.1	54.0	-12.9
Vertical	*7311.000	41.4	36.3	37.1	42.2	54.0	-11.8
Vertical	*9748.000	51.3	36.8	38.2	52.7	54.0	-1.3

- 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: HG658 V2
 Mode: 802.11n-HT20 SISO Channel 11

Date of Test: 15 May, 2014

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4924.000	57.4	36.1	34.2	55.5	74.0	-18.5
Vertical	*7386.000	56.4	36.8	36.7	56.3	74.0	-17.7
Vertical	*9848.000	62.9	38.2	37.1	61.8	74.0	-12.2
Vertical	*2483.510	76.9	35.8	27.5	68.6	74.0	-5.4

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
vertical	*4924.000	43.2	36.1	34.2	41.3	54.0	-12.7
vertical	*7386.000	42.5	36.8	36.7	42.4	54.0	-11.6
vertical	*9848.000	53.1	38.2	37.1	52.0	54.0	-2.0
Vertical	*2483.510	58.8	35.8	27.5	50.5	54.0	-3.5

- 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 May, 2014

Model: HG658 V2

Mode: 802.11n-HT20 MIMO Channel 1 (Ant1+Ant3)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4824.000	52.0	36.1	34.1	50.0	74.0	-24.0
Vertical	*7236.000	56.7	36.7	36.6	56.6	74.0	-17.4
Vertical	*9648.000	61.6	38.1	37.0	60.5	74.0	-13.5
Vertical	*2389.915	74.0	35.6	27.3	65.7	74.0	-8.3

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4824.000	38.3	36.1	34.1	36.3	54.0	-17.7
Vertical	*7236.000	42.9	36.7	36.6	42.8	54.0	-11.2
Vertical	*9648.000	53.5	38.1	37.0	52.4	54.0	-1.6
Vertical	*2389.915	59.7	35.6	27.3	51.4	54.0	-2.6

- 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: QISHG658V2

Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd

Date of Test: 15 May, 2014

Model: HG658 V2

Mode: 802.11n-HT20 MIMO Channel 6 (Ant1+Ant3)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4874.000	51.6	36.1	34.5	50.0	74.0	-24.0
Vertical	*7311.000	55.7	36.3	37.1	56.5	74.0	-17.5
Vertical	*9748.000	58.8	36.8	38.2	60.2	74.0	-13.8

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4874.000	37.8	36.1	34.5	36.2	54.0	-17.8
Vertical	*7311.000	41.7	36.3	37.1	42.5	54.0	-11.5
Vertical	*9748.000	50.9	36.8	38.2	52.3	54.0	-1.7

- 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

Date of Test: 15 May, 2014

Model: HG658 V2

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

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4924.000	51.7	36.1	34.2	49.8	74.0	-24.2
Vertical	*7386.000	56.9	36.8	36.7	56.8	74.0	-17.2
Vertical	*9848.000	61.2	38.2	37.1	60.1	74.0	-13.9
Vertical	*2483.591	75.1	35.8	27.5	66.8	74.0	-7.2

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
vertical	*4924.000	38.1	36.1	34.2	36.2	54.0	-17.8
vertical	*7386.000	43.3	36.8	36.7	43.2	54.0	-10.8
vertical	*9848.000	52.9	38.2	37.1	51.8	54.0	-2.2
Vertical	*2483.591	58.6	35.8	27.5	50.3	54.0	-3.7

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.

TRF no.: FCC 15C_TX_b

FCC ID: QISHG658V2

Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd
 Model: HG658 V2
 Mode: 802.11n-HT40 SISO Channel 3

Date of Test: 15 May, 2014

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)
Vertical	*4844.000	52.7	36.2	34.2	50.7	74.0	-23.3
Vertical	*7266.000	56.1	36.7	36.7	56.1	74.0	-17.9
Vertical	*9688.000	62.1	38.2	37.1	61.0	74.0	-13.0
Vertical	*2389.908	78.4	35.6	27.3	70.1	74.0	-3.9

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)
Vertical	*4844.000	37.8	36.2	34.2	35.8	54.0	-18.2
Vertical	*7266.000	41.4	36.7	36.7	41.4	54.0	-12.6
Vertical	*9688.000	54.1	38.2	37.1	53.0	54.0	-1.0
Vertical	*2389.908	61.1	35.6	27.3	52.8	54.0	-1.2

- 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: HG658 V2
 Mode: 802.11n-HT40 SISO Channel 6

Date of Test: 15 May, 2014

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4874.000	52.4	36.1	34.5	50.8	74.0	-23.2
Vertical	*7311.000	56.5	36.3	37.1	57.3	74.0	-16.7
Vertical	*9748.000	59.9	36.8	38.2	61.3	74.0	-12.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4874.000	37.5	36.1	34.5	35.9	54.0	-18.1
Vertical	*7311.000	41.3	36.3	37.1	42.1	54.0	-11.9
Vertical	*9748.000	51.0	36.8	38.2	52.4	54.0	-1.6

- 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: HG658 V2
 Mode: 802.11n-HT40 SISO Channel 9

Date of Test: 15 May, 2014

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4904.000	52.7	36.0	34.0	50.7	74.0	-23.3
Vertical	*7356.000	57.1	36.4	36.5	57.2	74.0	-16.8
Vertical	*9808.000	62.3	38.0	37.0	61.3	74.0	-12.7
Vertical	*2483.620	73.5	35.8	27.5	65.2	74.0	-8.8

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
vertical	*4904.000	37.4	36.0	34.0	35.4	54.0	-18.6
vertical	*7356.000	41.8	36.4	36.5	41.9	54.0	-12.1
vertical	*9808.000	52.1	38.0	37.0	51.1	54.0	-2.9
Vertical	*2483.620	57.3	35.8	27.5	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 May, 2014

Model: HG658 V2

Mode: 802.11n-HT40 MIMO Channel 3 (Ant1+Ant3)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4844.000	52.8	36.2	34.2	50.8	74.0	-23.2
Vertical	*7266.000	57.0	36.7	36.7	57.0	74.0	-17.0
Vertical	*9688.000	62.5	38.2	37.1	61.4	74.0	-12.6
Vertical	*2389.825	70.4	35.6	27.3	62.1	74.0	-11.9

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4844.000	39.0	36.2	34.2	37.0	54.0	-17.0
Vertical	*7266.000	42.8	36.7	36.7	42.8	54.0	-11.2
Vertical	*9688.000	54.0	38.2	37.1	52.9	54.0	-1.1
Vertical	*2389.825	57.2	35.6	27.3	48.9	54.0	-5.1

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: QISHG658V2

Report No.: 140504020SZN-001

130

INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd

Date of Test: 15 May, 2014

Model: HG658 V2

Mode: 802.11n-HT40 MIMO Channel 6 (Ant1+Ant3)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4874.000	52.4	36.1	34.5	50.8	74.0	-23.2
Vertical	*7311.000	56.1	36.3	37.1	56.9	74.0	-17.1
Vertical	*9748.000	59.7	36.8	38.2	61.1	74.0	-12.9

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4874.000	38.8	36.1	34.5	37.2	54.0	-16.8
Vertical	*7311.000	42.1	36.3	37.1	42.9	54.0	-11.1
Vertical	*9748.000	50.8	36.8	38.2	52.2	54.0	-1.8

- 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.

TRF no.: FCC 15C_TX_b

FCC ID: QISHG658V2

Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd

Date of Test: 15 May, 2014

Model: HG658 V2

Mode: 802.11n-HT40 MIMO Channel 9 (Ant1+Ant3)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Vertical	*4904.000	53.3	36.0	34.0	51.3	74.0	-22.7
Vertical	*7356.000	56.4	36.4	36.5	56.5	74.0	-17.5
Vertical	*9808.000	61.4	38.0	37.0	60.4	74.0	-13.6
Vertical	*2483.610	71.7	35.8	27.5	63.4	74.0	-10.6

Polarization	Frequency (MHz)	Reading (dBμV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
vertical	*4904.000	40.3	36.0	34.0	38.3	54.0	-15.7
vertical	*7356.000	43.1	36.4	36.5	43.2	54.0	-10.8
vertical	*9808.000	53.0	38.0	37.0	52.0	54.0	-2.0
Vertical	*2483.610	57.6	35.8	27.5	49.3	54.0	-4.7

- 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.

TRF no.: FCC 15C_TX_b

FCC ID: QISHG658V2

Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

4.9 Conducted Emission

Worst Case Live-Conducted emission at 2.562MHz is Passed by 11.2 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

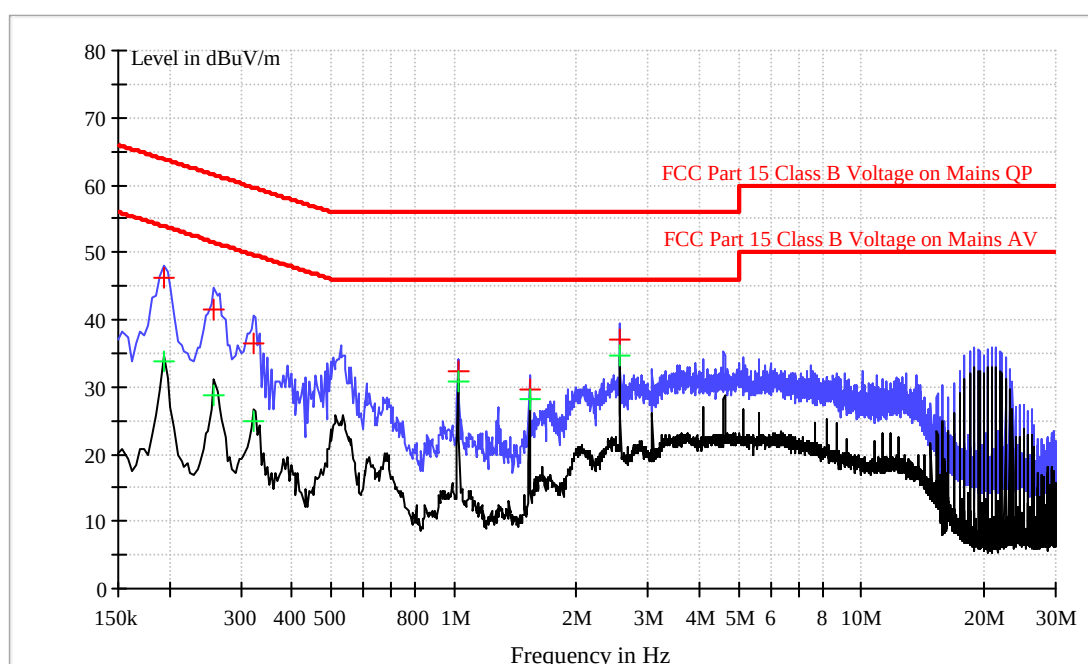
Date of Test: 15 May, 2014

Model: HG658 V2

Worst Case Operating Mode: 802.11n-HT20 MIMO 2437MHz

AC/DC Adapter: Huntkey

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.194	46.1	L1	9.8	17.8	63.9
0.258	41.4	L1	9.8	20.1	61.5
0.322	36.5	L1	9.7	23.2	59.7
1.026	32.3	L1	9.7	23.7	56.0
1.538	29.7	L1	9.8	26.3	56.0
2.562	37.0	L1	9.8	19.0	56.0

Result Table AV

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.194	33.9	L1	9.8	20.0	53.9
0.258	28.7	L1	9.8	22.8	51.5
0.322	24.8	L1	9.7	24.9	49.7
1.026	30.9	L1	9.7	15.1	46.0
1.538	28.3	L1	9.8	17.7	46.0
2.562	34.8	L1	9.8	11.2	46.0

TRF no.: FCC 15C_TX_b

FCC ID: QISHG658V2

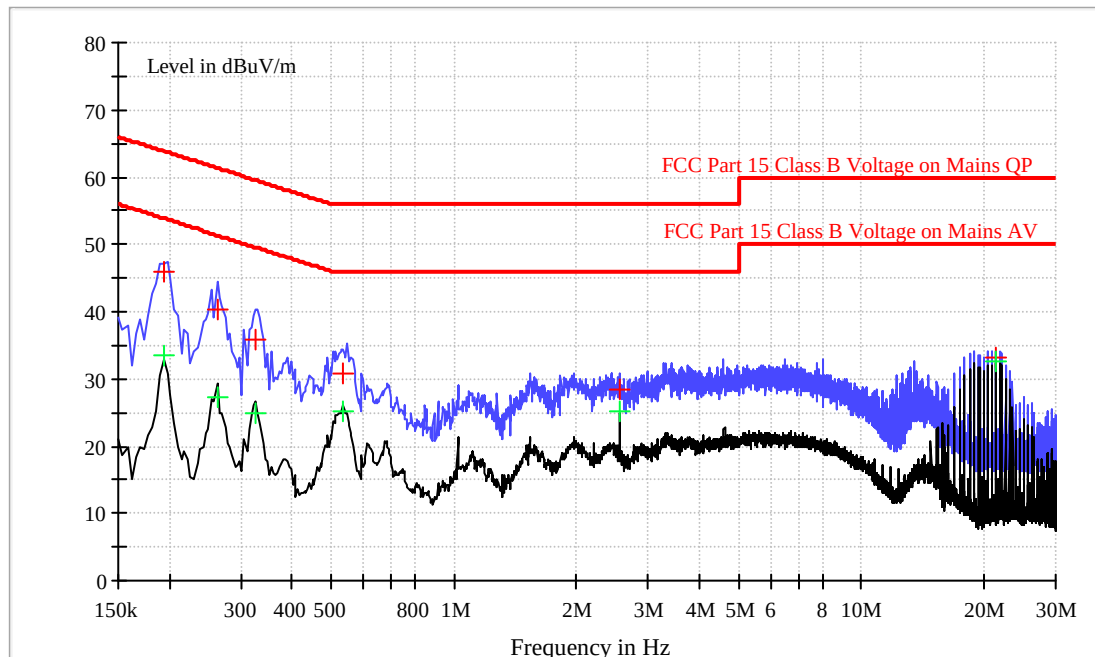
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd
Model: HG658 V2
Worst Case Operating Mode: 802.11n-HT20 MIMO 2437MHz
AC/DC Adapter: Huntkey

Date of Test: 15 May, 2014

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.194	46.0	N	9.8	17.9	63.9
0.262	40.2	N	9.7	21.2	61.4
0.326	35.8	N	9.7	23.8	59.6
0.534	30.8	N	9.5	25.2	56.0
2.558	28.6	N	9.8	27.4	56.0
21.502	33.2	N	10.6	26.8	60.0

Result Table AV

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.194	33.5	N	9.8	20.4	53.9
0.262	27.4	N	9.7	24.0	51.4
0.326	24.9	N	9.7	24.7	49.6
0.534	25.2	N	9.5	20.8	46.0
2.558	25.2	N	9.8	20.8	46.0
21.502	32.5	N	10.6	17.5	50.0

TRF no.: FCC 15C_TX_b
FCC ID: QISHG658V2
Report No.: 140504020SZN-001

INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co.,Ltd
Model: HG658 V2

Date of Test: 15 May, 2014

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: HG658 V2

Date of Test: 15 May, 2014

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.

EXHIBIT 5

EQUIPMENT PHOTOGRAPHS

5.0 Equipment Photographs

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

EXHIBIT 6

PRODUCT LABELLING

6.0 Product Labelling

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

EXHIBIT 7

TECHNICAL SPECIFICATIONS

7.0 Technical Specifications

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

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.

EXHIBIT 9
CONFIDENTIALITY REQUEST

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.

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	29-Jun-13	29-Jun-14
SZ185-01	EMI Receiver	R&S	ESCI	100547	10-Mar-14	10-Mar-15
SZ061-09	Horn Antenna	ETS	3115	00092346	16-Nov-13	16-Nov-14
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	27-Aug-13	27-Aug-14
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	29-Apr-14	29-Apr-15
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	10-Mar-14	10-Mar-15
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	10-Mar-14	10-Mar-15
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	19-Apr-14	19-Apr-15
SZ062-02	RF Cable	RADIAL	RG 213U	--	8-Jan-14	8-Jul-14
SZ062-05	RF Cable	RADIAL	0.04-26.5GHz	--	8-Jan-14	8-Jul-14
SZ062-12	RF Cable	RADIAL	0.04-26.5GHz	--	8-Jan-14	8-Jul-14
SZ067-04	Notch Filter	Micro-Tronics	BRM5070 2-02	--	21-May-13	21-May-14
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	9-Nov-13	9-Nov-14
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	9-Nov-13	9-Nov-14
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	9-Nov-13	9-Nov-14
SZ188-03	Shielding Room	ETS	RFD-100	4100	23-Aug-13	23-Aug-14