FCC PART 15 SUBPART B & C
TEST REPORT

for

HUBZ

Model: HUSBZB-1

Prepared for

NORTEK SECURITY & CONTROL
1950 CAMINO VIDA ROBLE
CARLSBAD, CA 92008

Prepared by: _____

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DATE: JULY 21, 2015

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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form unless done so in full with the written permission of Compatible Electronics.

This report must not be used to claim product endorsement by NVLAP, NIST, or any other agency of the U.S. Government or other governments.

Device Tested:	HubZ Model: HUSBZB-1 S/N: None
Product Description:	HubZ is a USB v2.0 full speed low power CDC-ACM compliant Z-Wave/Zigbee adapter in a thumb drive form factor. When plugged into computer or similar host device, it appears as a serial port so no additional drivers are required. HubZ is an independently controlled Z-Wave/Zigbee hub that requires an application from a third party to operate. The application will control such function as Inclusion, Exclusion and Replication.
Modifications:	The EUT was not modified in order to comply with specifications.
Manufacturer:	Nortek Security & Control 1950 Camino Roble Carlsbad, CA 92008
Test Dates:	May 29, June 3, 2015
Test Specifications:	EMI requirements CFR Title 47, Part 15 Subpart B Section 15.109, & Subpart C Sections 15.205, 15.209 & 15.247.
Test Procedure:	ANSI C63.4 & C63.10, and KDB 558074 D01 v03R01.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz - 30 MHz	Complies with the limits of CFR Title 47 Part 15 Subpart C Section 15.207
2	Radiated RF Emissions & Harmonics, 9 kHz – 25,000 MHz	Complies with the limits of CFR Title 47 Part 15 Subpart B, Section 15.109 and Subpart C Sections 15.205, 15.209
3	DTS Bandwidth	Complies with CFR Title 47 Part 15 Subpart C Section 15.247
4	Maximum Peak Conducted Output Power	Complies with CFR Title 47 Part 15 Subpart C Section 15.247
5	Maximum Peak Power Spectral Density Level In The Fundamental Emission	Complies with CFR Title 47 Part 15 Subpart C Section 15.247
6	Emissions in Non-Restricted Frequency Bands (in 100kHz Bandwidth)	Complies with CFR Title 47 Part 15 Subpart C Section 15.247
7	Emissions in the Restricted Bands	Complies with CFR Title 47 Part 15 Subpart C Section 15.205

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the HubZ Model: HUSBZB-1. The EMI measurements were performed according to the measurement procedure described in ANSI C63.10 & C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT (equipment under test) hereafter, are within the specification limits defined by the Code of Federal Regulations Title 47, Part 15 Subpart B sections 15.107, 15.109, & Subpart C sections 15.205, 15.207, 15.209 and 15.247.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The tests described herein were performed at the test facility of Compatible Electronics, 20621 Pascal Way Lake Forest, California 92630.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Nortek Security & Control

Josh Hansen	Regulatory Engineer

Compatible Electronics Inc.

Matt Harrison	Test Engineer
Joey Madlangbayan	Product Safety Manager
Jeff Klinger	Director of Engineering

2.4 Date Test Sample was Received

The test sample was received on May 27, 2015.

2.5 Disposition of the Test Sample

The test sample remains at Compatible Electronics as of the date of this test report.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
NVLAP	National Voluntary Laboratory Accreditation Program
CFR	Code of Federal Regulations
PCB	Printed Circuit Board
TX	Transmit
RX	Receive

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this Test Report.

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4 2009	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz.
ANSI C63.10: 2009	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz
KDB 558074 D01 v03r02	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

4. DESCRIPTION OF TEST CONFIGURATION

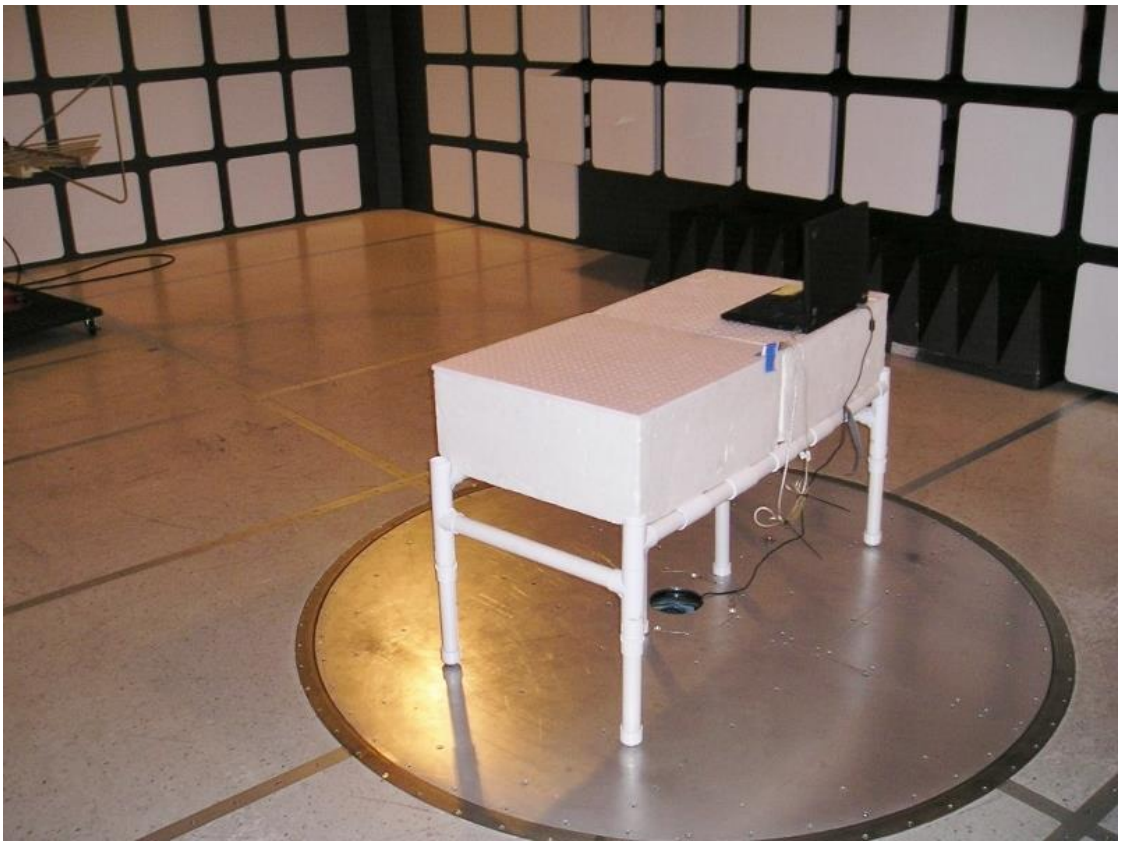
4.1 Description of Test Configuration

The HubZ Model: HUSBZB-1 (EUT) was setup in a tabletop configuration. The EUT was connected to the Laptop Computer USB port. The EUT was checked all 3 axis. The worst case was found to be the Z-Axis. The EUT was continuously transmitting a data stream during transmit tests and constantly receiving during receiver tests.

The voltage was varied ±15%; the transmitting signal amplitude and frequency did not vary.

It was determined that the emissions were at their highest level when the EUT was transmitting in the configuration described above for Radiated Emissions. The final radiated data was taken in the above configuration. Please see Appendix E for the test data.

4.1.1 Photograph Test Configuration



4.1.2 Cable Construction and Termination

Cable 1

This is a 2-meter, braid shielded USB cable. It is connecting the EUT to the Laptop Computer. It has a USB Type A connector at both ends of the cable. The cable was bundled to a length of 1 meter.

Cable 2

This is a 2-meter, unshielded cable. It is connecting the Laptop to the Laptop Power Supply. It is hardwired at the EUT end. The cable was not bundled.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

#	EQUIPMENT TYPE	MANU-FACTURER	MODEL	SERIAL NUMBER
1	HUBZ (EUT)	NORTEK SECURITY & CONTROL	HUSBZB-1	1
2	LAPTOP	LENOVO	W530	R9-WRFYR 13/01
3	LAPTOP POWER SUPPLY	LENOVO	45N0113	11S45M0113Z1ZHX82CB1M9

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Computer	Hewlett Packard	s5250t	NONE	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100219	09/19/2014	09/05/2015
Antenna, Loop	Com Power	AL-130	121049	12/06/2013	12/06/2015
Antenna, CombiLog	Com Power	AC-220	25857	5/21/2014	5/21/2016
Antenna, Horn 1-18GHz	Com Power	AH-118	071250	07/03/2014	07/03/2016
Antenna, Horn 18-26GHz	Com Power	AH-826	081033	N.C.R.	N.C.R.
Pre-Amp, 1-18GHz	Com Power	PAM-118	443013	04/24/2014	04/24/2016
Pre-Amp, 1-18GHz	Com Power	PAM-118	443011	04/24/2014	04/24/2016
Pre-Amp, 18-40GHz	Com Power	PA-840	181289	06/16/2014	06/16/2016
High Pass Filter	AMTI Microwave Circuits	H3G020G4	481230	06/04/2014	06/04/2016
Mast, Antenna Positioner	Sunol Science Corporation	TWR 95-4	081309-3	N/A	N/A
Turntable	Sunol Science Corporation	FM 2011VS	None	N/A	N/A
Mast and Turntable Controller	Sunol Science Corporation	SC104V	081309-1	N/A	N/A
LISN	Com-Power	LI-150	191935	3/17/2014	3/17/2016

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and the figures in Appendix D of this report for test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 by 0.8 meter high non-conductive table, which was placed on the ground plane.

The EUT was not grounded.

6.3 Facility Environmental Characteristics

When applicable refer to the data sheets in Appendix E for the relative humidity, air temperature, and barometric pressure.

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Channel Number and Frequencies

There are a total of 16 channels. The low channel is at 2405.0 MHz and the high channel is at 2480.0 MHz. There is a 5 MHz separation between channels.

11 == 2405 MHz
12 == 2410 MHz
13 == 2415 MHz
14 == 2420 MHz
15 == 2425 MHz
16 == 2430 MHz
17 == 2435 MHz
18 == 2440 MHz
19 == 2445 MHz
20 == 2450 MHz
21 == 2455 MHz
22 == 2460 MHz
23 == 2465 MHz
24 == 2470 MHz
25 == 2475 MHz
26 == 2480 MHz

7.2 Antenna

The antenna is made up of a trace located on the PCB.

8. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

8.1 RF Emissions

8.1.1 Conducted Emissions Test

The EMI receiver was used as a measuring meter. A quasi-peak and/or average reading was taken only where indicated in the data sheets. The LISN output was measured using the EMI receiver. The output of the second LISN was terminated by a 50-ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding, and grounding of the EUT. The EUT received its power through the LISN, which was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI 63.4. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the computer software. The final qualification data is located in Appendix E.

Test Results:

The EUT complies with the limits of CFR Title 47 Part 15 Subpart B section 15.107 & Subpart C section 15.207.

8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The Receiver was used as a measuring meter. The Receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the receiver records the highest measured reading over all the sweeps. Amplifiers were used to increase the sensitivity of the instrument. There was one Microwave Preamplifier used for frequencies above 1 GHz.

For spurious emissions the quasi-peak detector was used for frequencies below 1GHz and the average detector was used for frequencies above 1 GHz.

For the radiated Harmonic emissions and Band Edges a linear average detector was used.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE (MHz)	TRANSDUCER	EFFECTIVE MEASUREMENT BANDWIDTH
.009 to .150	Active Loop Antenna	200 Hz
.150 to 30	Active Loop Antenna	9 kHz
30 to 1000	Combilog Antenna	100 kHz
1000 to 25000	Horn Antenna	1 MHz

The TDK FAC-3 shielded test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is in full compliance with ANSI C63.4, EN 50147-2, and CISPR 22. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters in both vertical and horizontal polarizations (for E field radiated field strength).

Test Results:

The EUT complies with the limits of CFR Title 47 Part 15 Subpart B section 15.109, & Subpart C sections 15.205, 15.209 and 15.247.

8.1.3 DTS Bandwidth

The DTS Bandwidth was measured directly connected to the EMI Receiver using a RBW of 100 kHz and a VBW of 300 kHz. A peak detector and a max hold trace were used with auto sweep time. The trace was allowed to fully maximize. We measured the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with Part 15, Subpart C, Section 15.247.

8.1.4 Maximum Peak Conducted Output Power

The maximum peak conducted output power was measured using an EMI Receiver. The Receiver used a resolution bandwidth that is greater than the DTS bandwidth and a video bandwidth greater than 3 x RBW. Sweep time was set to auto with a peak detector using the max hold function of the EMI Receiver. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with Part 15 Subpart C, Section 15.247.

8.1.5 Maximum Peak Power Spectral Density Level In The Fundamental Emission

The Maximum Peak Power Spectral Density Level in the Fundamental Emission was measured directly connected to the EMI Receiver. Tuned to the center frequency of the DTS channel and set the span to 1.5 times the DTS bandwidth. RBW was set to 3 kHz and VBW 10 kHz. A peak detector was used with the sweep time set to auto. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the maximum amplitude level within the RBW. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with Part 15, Subpart C, Section 15.247.

8.1.6 Emissions in Non-Restricted Frequency Bands (in 100kHz Bandwidth)

The Emissions in Non-Restricted Frequency Bands (in 100kHz Bandwidth) measurements were performed using the EMI Receiver directly connected to the EUT. A reference level was established by setting the instrument center frequency to DTS channel center frequency. The span was set to ≥ 1.5 times the DTS bandwidth. The RBW was 100 kHz and VBW 300 kHz. A peak detector was used with a sweep time set to auto. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the level and 20dB below that was the reference level. For Emission Level Measurement the center frequency and span were set to encompass the frequency range to be measured. RBW was set to 100 kHz and VBW to 300 kHz. A peak detector was used with a sweep time set to auto. The number of measurement points were greater than span/RBW. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the maximum amplitude level. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with Part 15, Subpart C, Section 15.247.

8.1.7 Emissions in the Restricted Bands (Radiated)

The Emissions in the Restricted Bands measurement was performed using the EMI Receiver at a 3-meter test distance to obtain the final test data. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with Part 15 Subpart C, Section 15.247.

8.1.8 Emissions Radiated Outside of the Fundamental Frequency Band

The Band Edge measurement was performed using the EMI Receiver at a 3-meter test distance to obtain the final test data. The low and high channels were tuned to during the low and high band edge tests. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with Part 15 Subpart C, Section 15.247.

9. TEST PROCEDURE DEVIATIONS

The test procedures were not deviated from throughout all tests.

10. CONCLUSIONS

The HubZ Model: HUSBZB-1 meets all of the relevant specification requirements defined in the Code of Federal Regulations Title 47, Part 15 Subpart B sections 15.107, 15.109, & Subpart C sections 15.205, 15.207, 15.209 and 15.247.

APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP LAB CODES 200063-0, 200528-0, 200527-0

For US, Canada, Australia/New Zealand, Taiwan and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025 an ISO 9002 equivalent. Please follow the link to the NIST site for each of our facilities NVLAP certificate and scope of accreditation.

NVLAP listing links

Agoura Division - http://ts.nist.gov/Standards/scopes/2000630.htm
Brea Division - http://ts.nist.gov/Standards/scopes/2005280.htm
Silverado/Lake Forest Division - http://ts.nist.gov/Standards/scopes/2005270.htm

ANSI listing
CETCB
https://www.ansica.org/wwwversion2/outside/ALLdirectoryDetails.asp?menuID=1&prgID=3&orgID=123&status=4

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA).

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA).

We are also certified/listed for IT products by the following country/agency:

VCCI Listing, from VCCI site
Enter "Compatible" in search form http://www.vcci.or.jp/vcci_e/activity/registration/setsubi.html

FCC Listing, from FCC OET site
FCC test lab search https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm

Industry Canada Industrie Canada Compatible Electronics IC listing can be found at:
http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

There were no modifications made to the EUT during the tests.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST	HubZ Model: HUSBZB-1 S/N: 1

No additional models were tested.

APPENDIX D

DIAGRAMS, FACTORS, CHARTS, AND PHOTOS

FIGURE 1: PLOT MAP AND LAYOUT OF TEST SITE BELOW 1GHZ

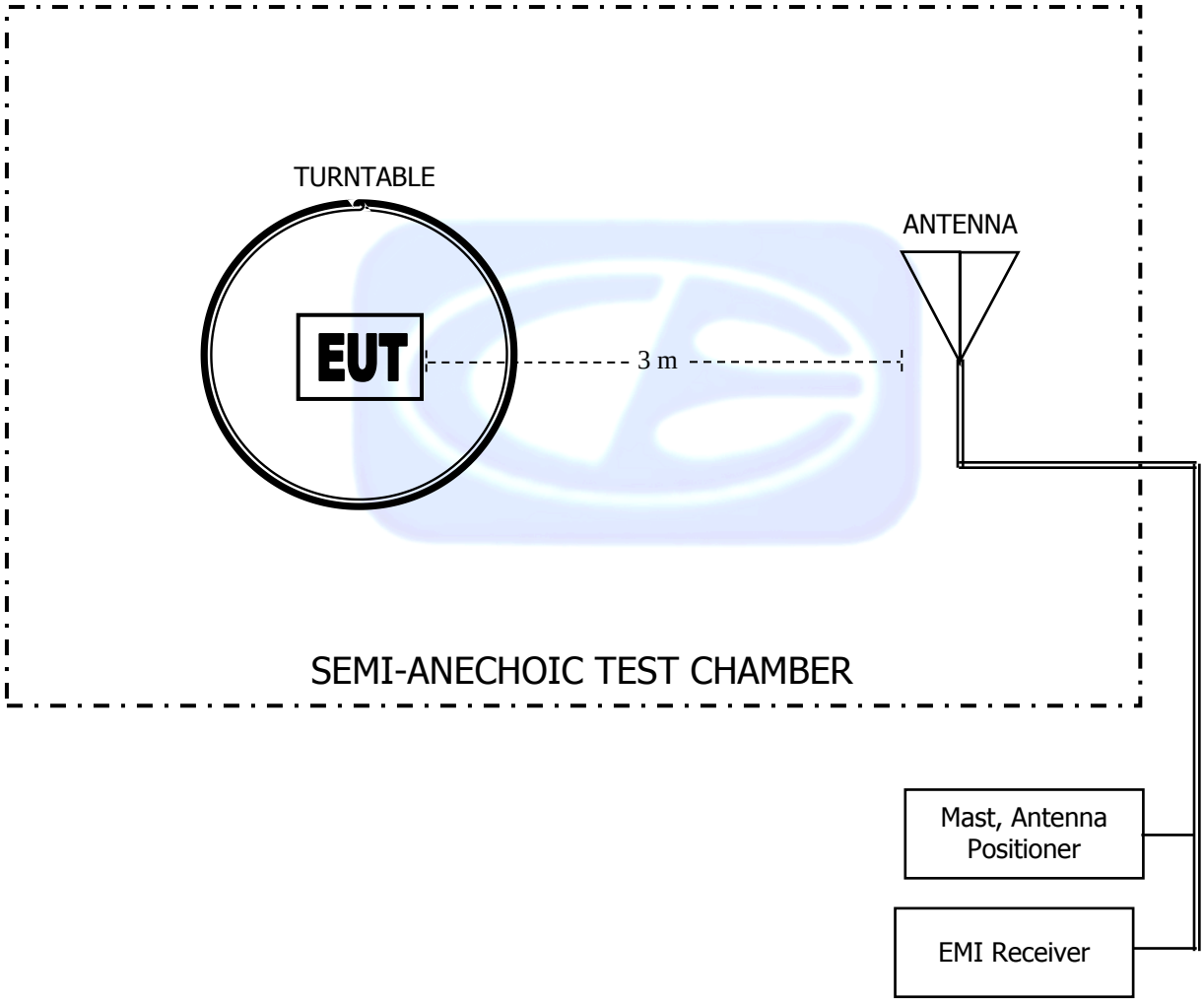


FIGURE 2: PLOT MAP AND LAYOUT OF TEST SITE ABOVE 1GHZ

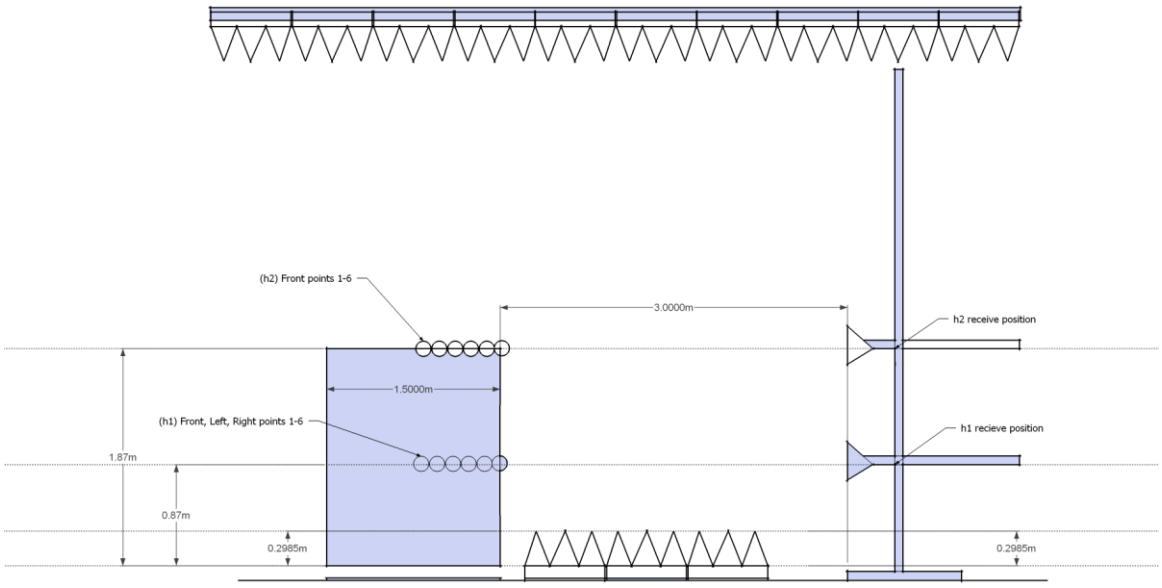
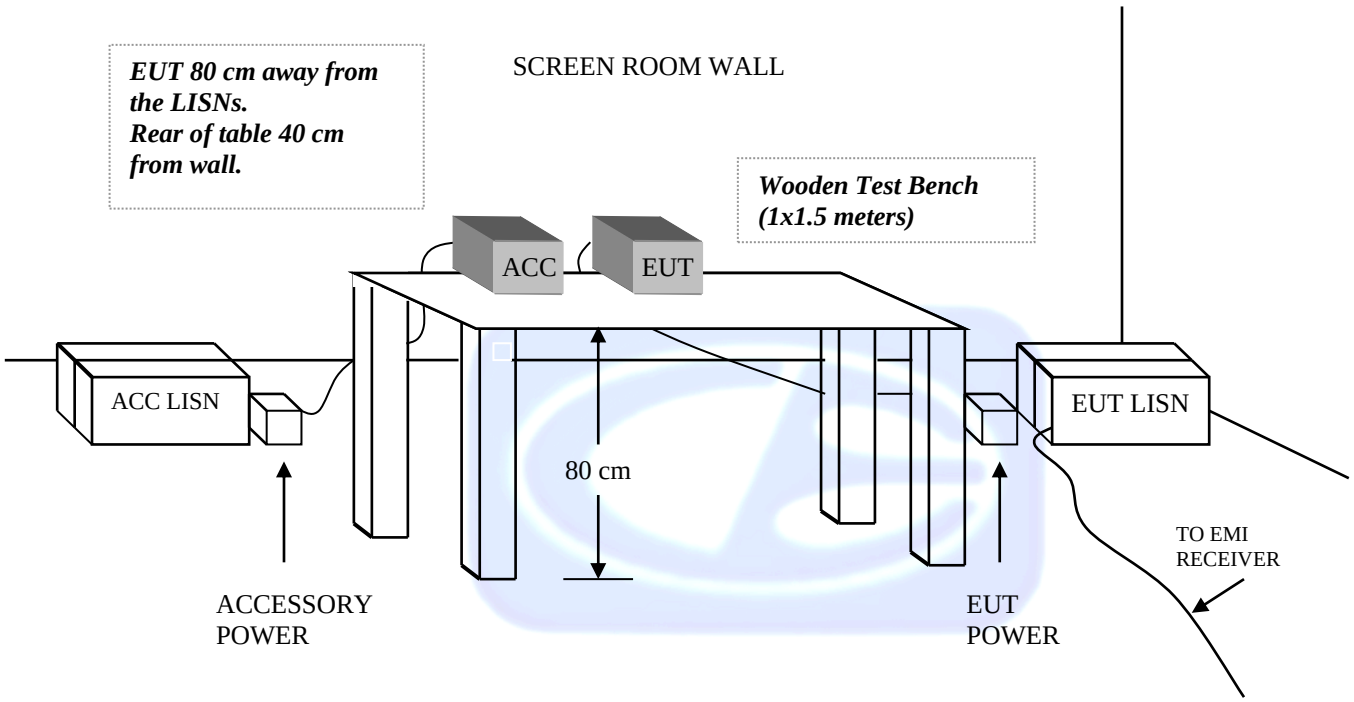


FIGURE 3: CONDUCTED EMISSIONS TEST SETUP



COM-POWER AL-130

LOOP ANTENNA

S/N: 121049

CALIBRATION DUE: DECEMBER 6, 2015

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)	FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-34.64	16.86	**0.8**	-36.32	15.18
0.01	-34.78	16.72	**0.9**	-36.22	15.28
0.02	-35.91	15.59	**1.0**	-36.22	15.28
0.03	-35.48	16.02	**2.0**	-35.91	15.59
0.04	-35.82	15.68	**3.0**	-35.91	15.59
0.05	-36.49	15.01	**4.0**	-36.01	15.49
0.06	-36.30	15.20	**5.0**	-35.80	15.70
0.07	-36.43	15.07	**6.0**	-36.00	15.50
0.08	-36.30	15.20	**7.0**	-35.90	15.60
0.09	-36.39	15.11	**8.0**	-35.70	15.80
0.1	-36.41	15.09	**9.0**	-35.70	15.80
0.2	-36.61	14.89	**10.0**	-35.60	15.90
0.3	-36.63	14.87	**15.0**	-36.52	14.98
0.4	-36.52	14.99	**20.0**	-35.75	15.75
0.5	-36.63	14.87	**25.0**	-37.78	13.72
0.6	-36.62	14.88	**30.0**	-38.62	12.88
0.7	-36.53	14.97			

COM-POWER AC-220

LAB R - COMBILOG ANTENNA

S/N: 25857

CALIBRATION DUE: MAY 21, 2016

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	22.5	**160**	13.3
35	22.5	**180**	15.0
40	23.0	**200**	14.6
45	21.5	**250**	16.5
50	21.3	**300**	18.1
60	18.2	**400**	19.4
70	13.2	**500**	21.4
80	11.6	**600**	21.6
90	11.9	**700**	23.7
100	12.6	**800**	26.0
120	15.1	**900**	26.6
140	13.6	**1000**	28.5

COM-POWER AH-118

HORN ANTENNA

S/N: 071250

CALIBRATION DUE: JULY 3, 2016

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	30.1	**9500**	44.2
1500	29.2	**10000**	43.4
2000	31.6	**10500**	44.6
2500	35.5	**11000**	45.1
3000	33.7	**11500**	45.7
3500	36.0	**12000**	46.2
4000	35.4	**12500**	45.4
4500	35.5	**13000**	44.8
5000	40.1	**13500**	46.7
5500	37.8	**14000**	47.8
6000	39.0	**14500**	46.4
6500	39.9	**15000**	47.2
7000	40.4	**15500**	45.5
7500	44.4	**16000**	45.0
8000	44.1	**16500**	44.5
8500	43.1	**17000**	47.0
9000	43.0	**17500**	47.8
		18000	44.2

COM-POWER AH-826

HORN ANTENNA

S/N: 81033

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
18000	32.8	**22500**	32.7
18500	32.2	**23000**	32.7
19000	31.9	**23500**	32.0
19500	31.5	**24000**	32.9
20000	33.3	**24500**	33.7
20500	33.2	**25000**	34.1
21000	32.6	**25500**	33.6
21500	33.2	**26000**	35.1
22000	33.0	**26500**	33.6

COM-POWER PAM-118

1-18GHz - PREAMPLIFIER

S/N: 443011

CALIBRATION DUE: APRIL 24, 2016

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
0.500	27.2	**7.000**	23.8
1.000	26.6	**7.500**	23.9
1.500	27.0	**8.000**	24.4
2.000	27.0	**8.500**	25.2
2.500	27.4	**9.500**	26.2
3.000	27.6	**10.000**	25.8
3.500	27.5	**11.000**	25.5
4.000	27.3	**12.000**	25.4
4.500	27.3	**13.000**	25.1
5.000	27.5	**14.000**	24.6
5.500	26.3	**15.000**	24.1
6.000	26.1	**16.000**	25.1
6.500	25.4	**17.000**	25.2
		18.000	24.4

COM-POWER PAM-118

1-18GHz - PREAMPLIFIER

S/N: 443013

CALIBRATION DUE: APRIL 24, 2016

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
500	26.2	**5500**	25.3
1000	25.6	**6000**	25.0
1100	25.9	**6500**	24.7
1200	25.9	**7000**	23.6
1300	26.3	**7500**	23.3
1400	26.5	**8000**	23.7
1500	26.3	**8500**	24.0
1600	26.1	**9000**	24.3
1700	26.2	**9500**	24.1
1800	26.3	**10000**	23.7
1900	25.8	**11000**	24.2
2000	26.0	**12000**	23.2
2500	26.0	**13000**	22.8
3000	25.8	**14000**	22.6
3500	25.9	**15000**	22.9
4000	26.4	**16000**	22.3
4500	26.0	**17000**	22.6
5000	25.6	**18000**	23.9

COM-POWER PA-840

18-40 GHz PREAMPLIFIER

S/N: 181289

CALIBRATION DUE: JUNE 16, 2016

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
18000	29.4	**31500**	28.2
19000	28.8	**32000**	28.6
20000	30.5	**32500**	28.8
21000	31.4	**33000**	28.2
22000	31.2	**33500**	27.7
23000	30.1	**34000**	27.2
24000	30.3	**34500**	28.2
25000	29.8	**35000**	27.3
26000	30.5	**35500**	27.2
26500	30.7	**36000**	27.2
27000	30.8	**36500**	27.5
27500	30.2	**37000**	27.0
28000	30.1	**37500**	26.7
28500	30.2	**38000**	26.2
29000	30.1	**38500**	26.5
29500	29.8	**39000**	26.3
30000	29.2	**39500**	26.9
30500	28.4	**40000**	27.6
31000	29.8		

FRONT VIEW

NORTEK SECURITY & CONTROL
HUBZ
Model: HUSBZB-1
FCC SUBPART B & C - RADIATED EMISSIONS < 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

NORTEK SECURITY & CONTROL
HUBZ
Model: HUSBZB-1
FCC SUBPART B & C - RADIATED EMISSIONS < 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

NORTEK SECURITY & CONTROL
HUBZ
Model: HUSBZB-1
FCC SUBPART B & C - RADIATED EMISSIONS > 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

NORTEK SECURITY & CONTROL
HUBZ
Model: HUSBZB-1
FCC SUBPART B & C - RADIATED EMISSIONS > 1GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

VIEW 1

NORTEK SECURITY & CONTROL
HUBZ
Model: HUSBZB-1
FCC SUBPART B & C - CONDUCTED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

VIEW 2

NORTEK SECURITY & CONTROL
HUBZ
Model: HUSBZB-1
FCC SUBPART B & C - CONDUCTED EMISSIONS

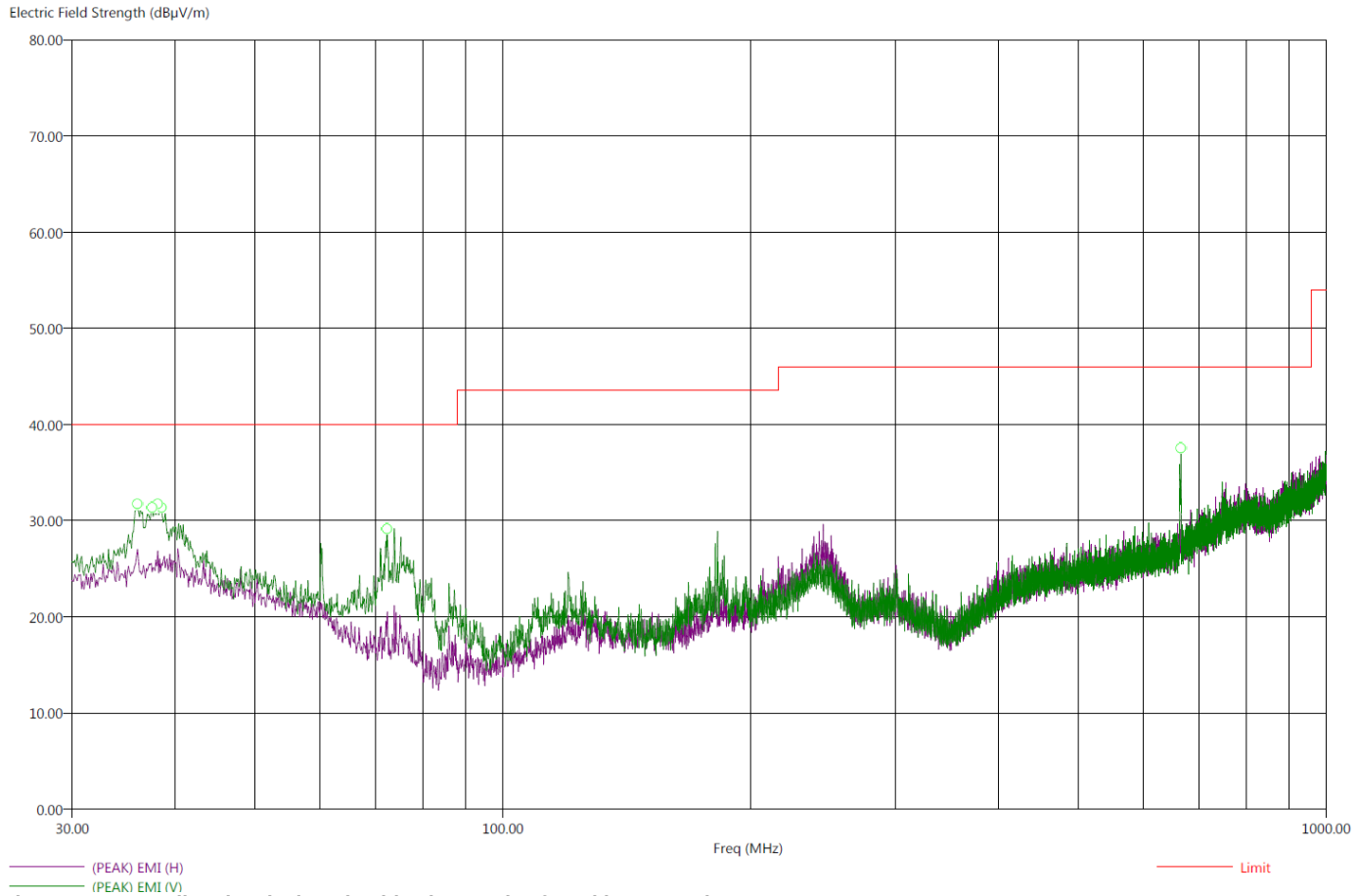
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

RADIATED EMISSIONS DATA SHEETS

Title: FCC 15.209 6/3/2015 10:46:39 AM
File: Radiated Pre-Scan 30-1000Mhz_Tx.set Sequence: Preliminary Scan
Operator: Matt Harrison
EUT Type: HUSBZB-1.
EUT Condition: Transmitting @ 2405MHz (Worst case).
Comments: Connected to Laptop Computer Via USB Extension Cable.
Temp: 70f
Hum: 46%
Host: 120V 60Hz

Compatible Electronics, Inc. FAC-3 (Lab R)



There were no radiated emissions besides harmonics found between 9kHz-30 MHz or 1GHz-25GHz.

Title: FCC 15.209 6/3/2015 11:02:55 AM
File: Radiated Final 30-1000Mhz_Tx.set Sequence: Final Measurements
Operator: Matt Harrison
EUT Type: HUSBZB-1.
EUT Condition: Transmitting @ 2405MHz (Worst case).
Comments: Connected to Laptop Computer Via USB Extension Cable.
Temp: 70f
Hum: 46%
Host: 120V 60Hz

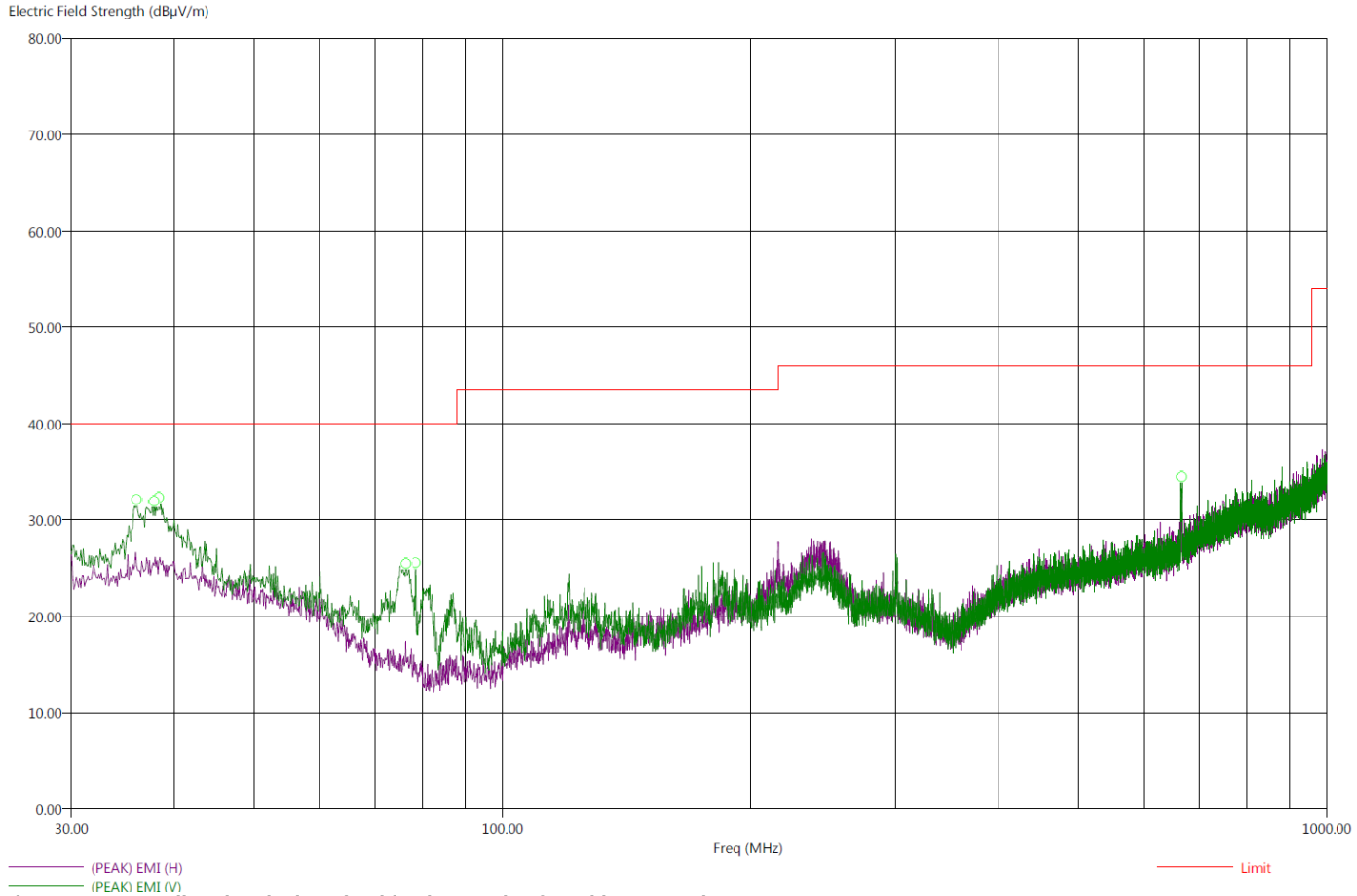
Compatible Electronics, Inc. FAC-3 (Lab R)

Freq (MHz)	(QP) Margin (dB)	(QP) EMI (dBµV/m)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable(dB)
36.00	-12.87	27.13	41.33	40.00	V	29.25	162.85	22.61	1.08
37.50	-12.97	27.03	31.78	40.00	V	1.75	113.23	22.77	1.17
38.10	-11.57	28.43	32.69	40.00	V	229.25	126.73	22.81	1.19
38.50	-14.43	25.57	30.96	40.00	V	237.75	129.41	22.87	1.23
72.30	-15.39	24.61	29.15	40.00	V	189.00	172.40	12.80	0.62
666.10	-17.21	28.79	33.48	46.00	V	359.75	100.40	23.43	2.66

There were no radiated emissions besides harmonics found between 9kHz-30 MHz or 1GHz-25GHz.

Title: FCC 15.209 6/3/2015 11:33:34 AM
File: Radiated Pre-Scan 30-1000Mhz_Rx.set Sequence: Preliminary Scan
Operator: Matt Harrison
EUT Type: HUSBZB-1.
EUT Condition: Constantly Receiving.
Comments: Connected to Laptop Computer Via USB Extension Cable.
Temp: 70f
Hum: 46%
Host: 120V 60Hz

Compatible Electronics, Inc. FAC-3 (Lab R)



There were no radiated emissions besides harmonics found between 9kHz-30 MHz or 1GHz-25GHz.

Title: FCC 15.209 6/3/2015 11:44:27 AM
File: Radiated Final 30-1000Mhz_Rx.set Sequence: Final Measurements
Operator: Matt Harrison
EUT Type: HUSBZB-1.
EUT Condition: Constantly Receiving.
Comments: Connected to Laptop Computer Via USB Extension Cable.
Temp: 70f
Hum: 46%
Host: 120V 60Hz

Compatible Electronics, Inc. FAC-3 (Lab R)

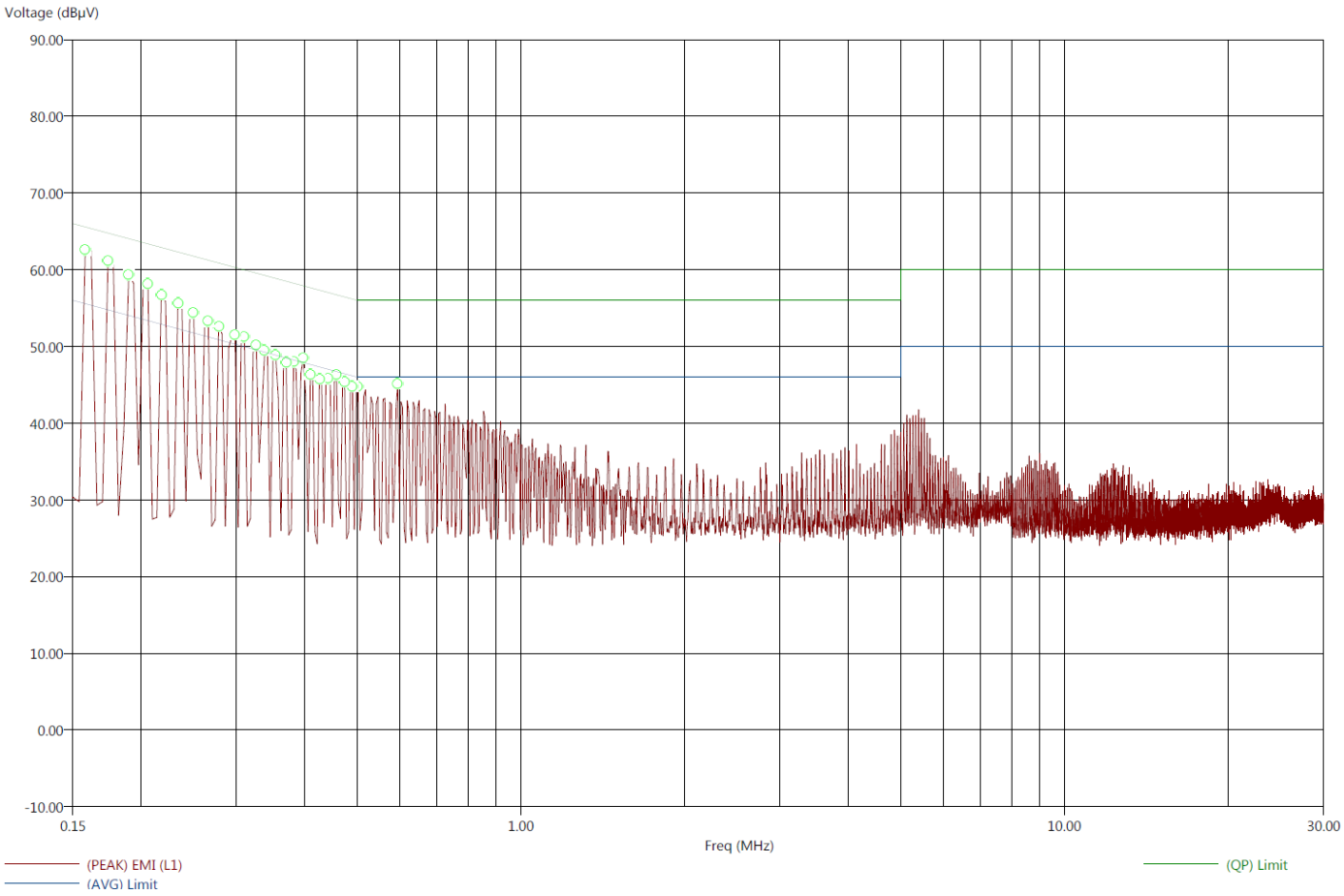
Freq (MHz)	(QP) Margin (dB)	(QP) EMI (dBµV/m)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable(dB)
36.00	-11.51	28.49	41.75	40.00	V	304.25	101.35	22.60	1.08
37.80	-13.17	26.83	31.79	40.00	V	65.25	123.86	22.78	1.18
38.30	-13.72	26.28	31.38	40.00	V	203.00	112.22	22.85	1.21
76.50	-19.35	20.65	25.78	40.00	V	196.25	113.29	12.13	0.50
78.40	-25.09	14.91	23.15	40.00	V	360.00	196.58	11.83	0.44
666.10	-14.04	31.96	35.87	46.00	V	355.75	109.17	23.43	2.66

There were no radiated emissions besides harmonics found between 9kHz-30 MHz or 1GHz-25GHz.

Title: FCC 15.207
File: Conducted Pre-Line.set
Operator: Matt Harrison
EUT Type: HUSBZB-1.
EUT Condition: Transmitting Zigbee @ 2405 MHz.
Comments: Connected to Laptop Computer.
Temp: 73f
Hum: 44%
Host: 120V 60Hz

5/29/2015 10:06:40 AM
Sequence: Preliminary Scan

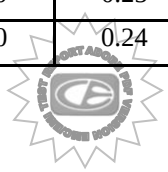
Compatible Electronics, Inc. FAC- 3 (LAB P)



Title: FCC 15.207 5/29/2015 10:14:38 AM
File: Conducted Final-Line.set Sequence: Final Measurements
Operator: Matt Harrison
EUT Type: HUSBZB-1.
EUT Condition: Transmitting Zigbee @ 2405 MHz.
Comments: Connected to Laptop Computer via USB Extension Cable.
Temp: 73f
Hum: 44%
Host: 120V 60Hz

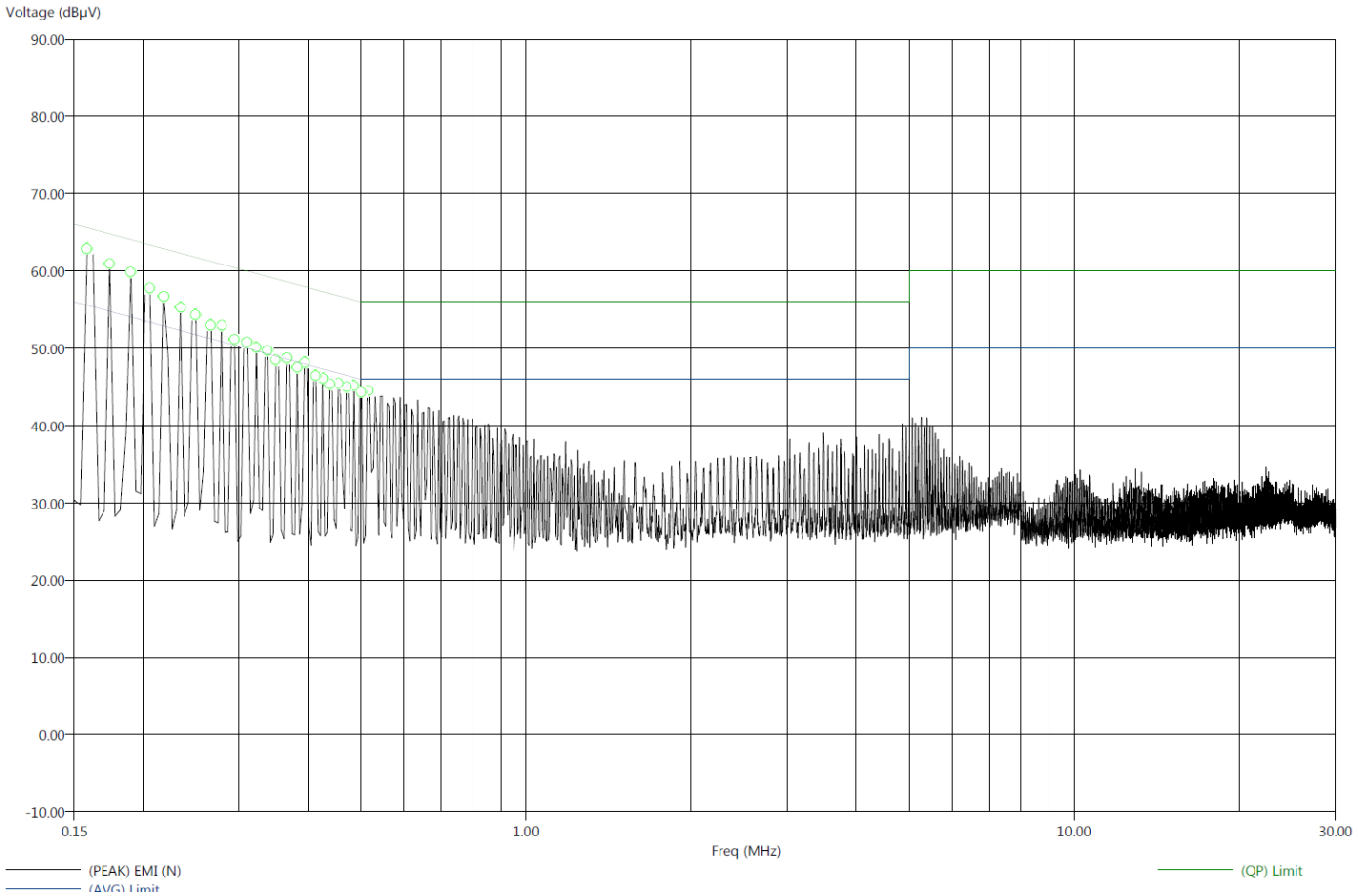
Compatible Electronics, Inc. FAC- 3 (LAB P)

Freq (MHz)	(AVG) Margin AVL (dB)	(QP) Margin QPL (dB)	(AVG) EMI (dBuV)	(QP) EMI (dBuV)	(PEAK) EMI (dBuV)	(AVG) Limit (dBuV)	(QP) Limit (dBuV)	Transducer (dB)	Cable(dB)
0.16	-30.20	-8.91	25.36	56.66	63.45	55.57	65.57	0.59	0.20
0.17	-30.07	-9.82	24.70	54.94	61.55	54.77	64.77	0.55	0.24
0.19	-25.75	-10.74	28.29	53.30	60.47	54.04	64.04	0.51	0.28
0.21	-27.75	-11.69	25.61	51.68	58.94	53.37	63.37	0.47	0.29
0.22	-32.63	-12.18	20.26	50.72	57.36	52.89	62.89	0.45	0.27
0.23	-33.62	-12.69	18.69	49.62	55.88	52.31	62.31	0.41	0.25
0.25	-32.63	-13.48	19.12	48.28	54.75	51.76	61.76	0.38	0.23
0.27	-21.60	-14.20	29.64	47.04	54.47	51.24	61.24	0.36	0.21
0.28	-34.75	-14.59	16.13	46.29	53.01	50.88	60.88	0.34	0.19
0.30	-35.65	-15.16	14.65	45.14	51.97	50.30	60.30	0.30	0.17
0.31	-35.47	-15.53	14.50	44.44	51.02	49.97	59.97	0.29	0.16
0.33	-20.79	-15.86	28.76	43.70	51.00	49.55	59.55	0.26	0.14
0.34	-31.56	-16.13	17.69	43.12	49.89	49.25	59.25	0.25	0.13
0.35	-36.58	-16.32	12.28	42.55	49.04	48.87	58.87	0.23	0.11
0.37	-36.89	-16.66	11.61	41.84	48.38	48.50	58.50	0.23	0.10
0.38	-31.89	-16.76	16.35	41.48	48.27	48.24	58.24	0.23	0.09
0.40	-17.11	-16.84	30.79	41.05	49.20	47.90	57.90	0.23	0.07
0.41	-36.19	-17.15	11.46	40.50	47.09	47.65	57.65	0.23	0.06
0.43	-37.58	-17.25	9.75	40.08	46.65	47.33	57.33	0.23	0.05
0.44	-36.85	-17.44	10.17	39.59	46.29	47.02	57.02	0.23	0.04
0.46	-23.64	-17.52	23.08	39.21	46.68	46.73	56.73	0.23	0.03
0.47	-36.44	-17.60	10.00	38.84	45.75	46.44	56.44	0.24	0.02
0.49	-37.08	-17.69	9.08	38.48	45.02	46.17	56.17	0.25	0.01
0.50	-35.67	-17.61	10.33	38.39	44.76	46.00	56.00	0.25	0.00
0.59	-14.67	-18.69	31.33	37.31	44.96	46.00	56.00	0.24	0.00



Title: FCC 15.207 5/29/2015 10:32:26 AM
File: Conducted Pre-Neutral.set Sequence: Preliminary Scan
Operator: Matt Harrison
EUT Type: HUSBZB-1.
EUT Condition: Transmitting Zigbee @ 2405 MHz.
Comments: Connected to Laptop Computer via USB Extension Cable.
Temp: 73f
Hum: 44%
Host: 120V 60Hz

Compatible Electronics, Inc. FAC- 3 (LAB R)



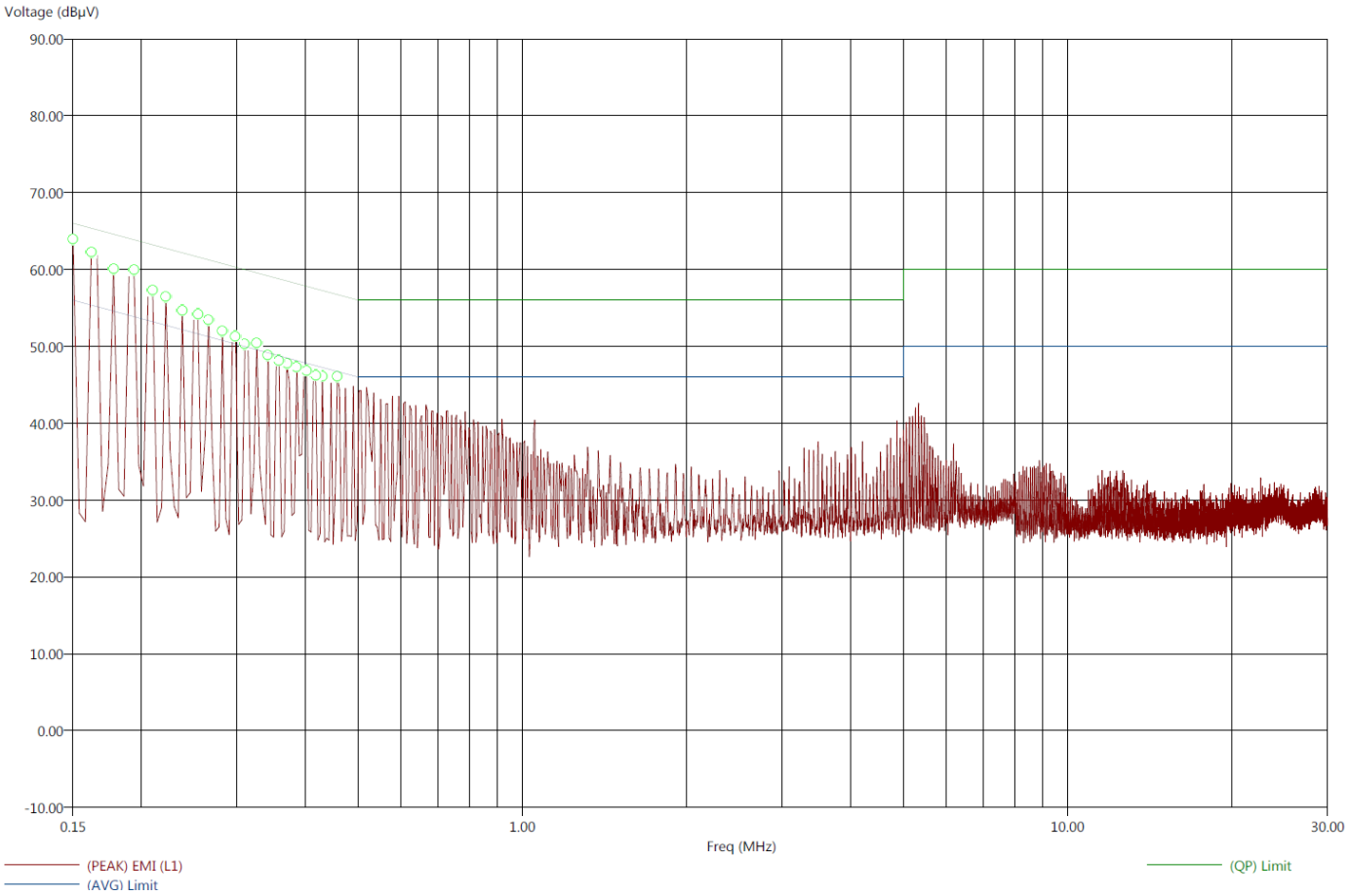
Title: FCC 15.207 5/29/2015 10:38:16 AM
File: Conducted Final-Neutral.set Sequence: Final Measurements
Operator: Matt Harrison
EUT Type: HUSBZB-1.
EUT Condition: Transmitting Zigbee @ 2405 MHz.
Comments: Connected to Laptop Computer via USB Extension Cable.
Temp: 73f
Hum: 44%
Host: 120V 60Hz

Compatible Electronics, Inc. FAC- 3 (LAB P)

Freq (MHz)	(AVG) Margin AVL (dB)	(QP) Margin QPL (dB)	(AVG) EMI (dBuV)	(QP) EMI (dBuV)	(PEAK) EMI (dBuV)	(AVG) Limit (dBuV)	(QP) Limit (dBuV)	Transducer (dB)	Cable(dB)
0.16	-28.93	-8.60	26.64	56.97	63.98	55.57	65.57	0.38	0.20
0.17	-29.14	-9.47	25.63	55.30	61.89	54.77	64.77	0.34	0.24
0.19	-27.13	-10.43	26.91	53.61	60.35	54.04	64.04	0.30	0.28
0.21	-28.24	-11.32	25.12	52.04	59.00	53.37	63.37	0.26	0.29
0.22	-30.68	-11.83	22.21	51.06	57.61	52.89	62.89	0.23	0.27
0.23	-31.32	-12.69	20.98	49.62	56.31	52.31	62.31	0.20	0.25
0.25	-31.07	-13.11	20.69	48.65	55.24	51.76	61.76	0.17	0.23
0.27	-21.37	-13.70	29.88	47.54	54.73	51.24	61.24	0.14	0.21
0.28	-32.30	-14.16	18.57	46.72	53.37	50.88	60.88	0.12	0.19
0.29	-32.98	-14.75	17.43	45.66	52.43	50.41	60.41	0.10	0.17
0.31	-33.14	-15.14	16.83	44.83	52.02	49.97	59.97	0.07	0.16
0.32	-31.33	-15.37	18.32	44.28	51.25	49.66	59.66	0.06	0.14
0.34	-32.92	-15.86	16.33	43.39	50.22	49.25	59.25	0.04	0.13
0.35	-34.38	-16.01	14.59	42.95	49.91	48.96	58.96	0.02	0.12
0.37	-34.56	-16.26	14.03	42.33	49.01	48.59	58.59	0.02	0.10
0.38	-31.99	-16.56	16.25	41.68	48.74	48.24	58.24	0.02	0.09
0.39	-23.46	-16.52	24.52	41.46	49.03	47.98	57.98	0.02	0.08
0.41	-34.82	-16.91	12.75	40.65	47.68	47.57	57.57	0.02	0.06
0.43	-34.97	-17.12	12.36	40.21	47.06	47.33	57.33	0.02	0.05
0.44	-34.32	-17.26	12.78	39.84	46.66	47.10	57.10	0.02	0.04
0.45	-24.99	-17.43	21.81	39.37	46.76	46.80	56.80	0.02	0.03
0.47	-30.53	-17.52	15.99	39.00	46.15	46.51	56.51	0.02	0.02
0.49	-34.92	-17.58	11.32	38.66	45.46	46.24	56.24	0.03	0.01
0.50	-34.32	-17.54	11.68	38.46	45.31	46.00	56.00	0.03	0.00
0.51	-33.56	-17.93	12.44	38.07	45.03	46.00	56.00	0.03	0.00

Title: FCC 15.207 5/29/2015 10:48:06 AM
File: Conducted Pre-Line_Rx.set Sequence: Preliminary Scan
Operator: Matt Harrison
EUT Type: HUSBZB-1.
EUT Condition: Transmitting Zigbee @ 2405 MHz.
Comments: Connected to Laptop Computer via USB Extension Cable.
Temp: 73f
Hum: 44%
Host: 120V 60Hz

Compatible Electronics, Inc. FAC- 3 (LAB P)



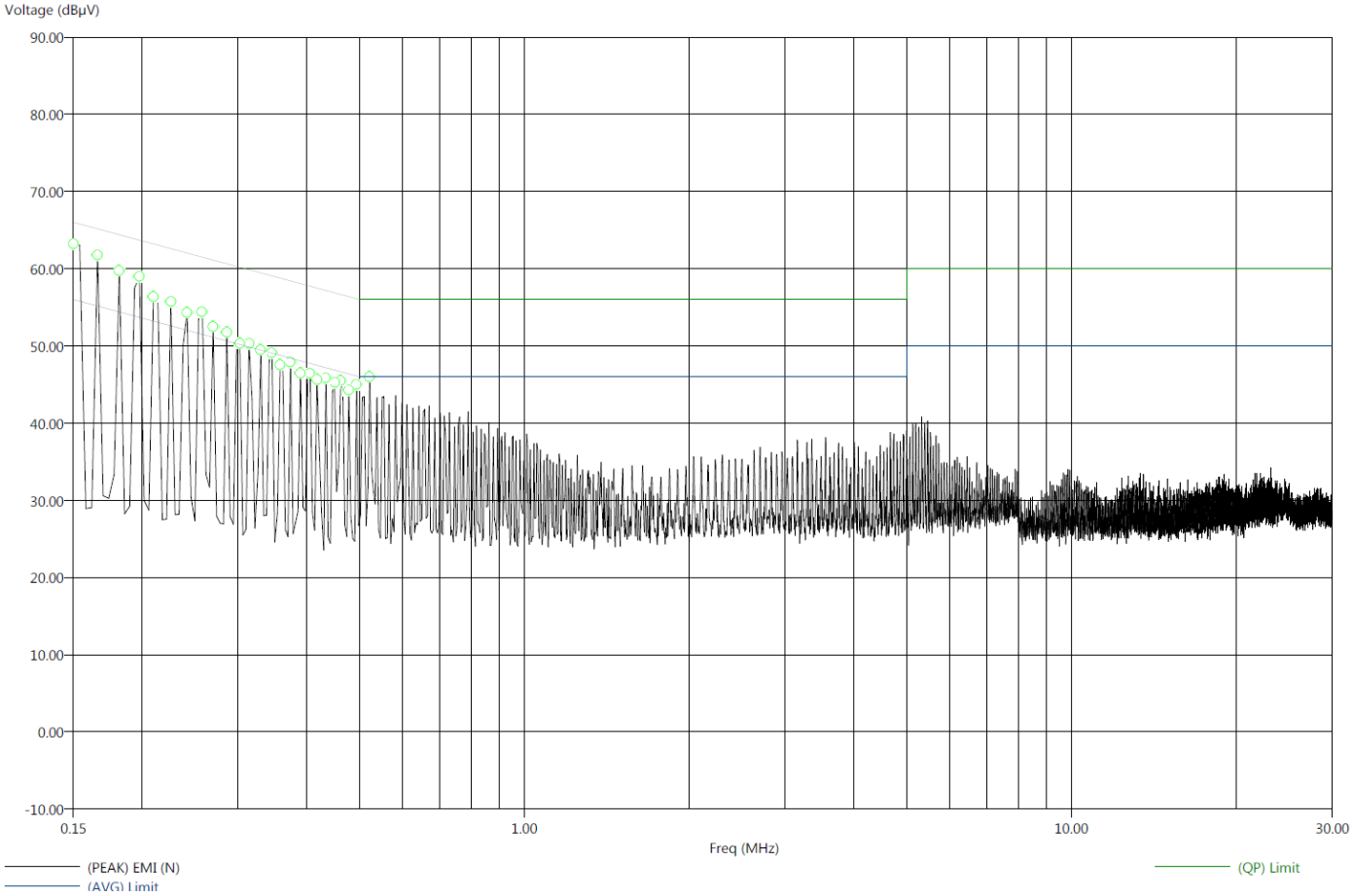
Title: FCC 15.207 5/29/2015 10:51:30 AM
File: Conducted Final-Line_Rx.set Sequence: Final Measurements
Operator: Matt Harrison
EUT Type: HUSBZB-1.
EUT Condition: Constantly Receiving.
Comments: Connected to Laptop Computer via USB Extension Cable.
Temp: 73f
Hum: 44%
Host: 120V 60Hz

Compatible Electronics, Inc. FAC- 3 (LAB R)

Freq (MHz)	(AVG) Margin AVL (dB)	(QP) Margin QPL (dB)	(AVG) EMI (dBuV)	(QP) EMI (dBuV)	(PEAK) EMI (dBuV)	(AVG) Limit (dBuV)	(QP) Limit (dBuV)	Transducer (dB)	Cable(dB)
0.15	-29.87	-8.56	26.13	57.44	64.12	56.00	66.00	0.62	0.18
0.16	-30.52	-9.20	24.84	56.16	62.65	55.36	65.36	0.58	0.21
0.18	-30.71	-10.22	23.87	54.35	61.27	54.58	64.58	0.54	0.25
0.19	-19.00	-10.85	34.86	53.01	60.03	53.86	63.86	0.50	0.29
0.21	-31.33	-11.79	21.87	51.42	58.05	53.21	63.21	0.46	0.28
0.22	-33.12	-12.27	19.62	50.47	56.89	52.74	62.74	0.44	0.27
0.24	-33.08	-13.03	19.09	49.14	55.68	52.17	62.17	0.41	0.24
0.25	-31.32	-13.67	20.31	47.96	54.95	51.63	61.63	0.38	0.22
0.27	-21.73	-14.33	29.51	46.91	54.21	51.24	61.24	0.36	0.21
0.28	-34.99	-14.70	15.76	46.06	52.51	50.76	60.76	0.33	0.19
0.30	-35.54	-15.14	14.76	45.16	51.90	50.30	60.30	0.30	0.17
0.31	-35.63	-15.39	14.34	44.58	51.05	49.97	59.97	0.29	0.16
0.33	-21.02	-15.74	28.53	43.81	51.29	49.55	59.55	0.26	0.14
0.34	-35.49	-16.11	13.66	43.04	49.87	49.15	59.15	0.24	0.12
0.36	-36.98	-16.46	11.80	42.31	48.80	48.77	58.77	0.23	0.11
0.37	-36.97	-16.66	11.53	41.84	48.34	48.50	58.50	0.23	0.10
0.39	-27.91	-16.74	20.24	41.41	48.00	48.15	58.15	0.23	0.08
0.40	-25.28	-17.03	22.53	40.78	47.78	47.81	57.81	0.23	0.07
0.42	-37.13	-17.24	10.36	40.24	46.79	47.49	57.49	0.23	0.06
0.43	-37.54	-17.21	9.71	40.04	46.36	47.25	57.25	0.23	0.05
0.46	-25.28	-17.51	21.45	39.22	46.52	46.73	56.73	0.23	0.03

Title: FCC 15.207 5/29/2015 10:58:56 AM
File: Conducted Pre-Neutral_Rx.set Sequence: Preliminary Scan
Operator: Matt Harrison
EUT Type: HUSBZB-1.
EUT Condition: Constantly Receiving.
Comments: Connected to Laptop Computer via USB Extension Cable.
Temp: 73f
Hum: 44%
Host: 120V 60Hz

Compatible Electronics, Inc. FAC- 3 (LAB P)



Title: FCC 15.207 5/29/2015 11:05:00 AM
File: Conducted Final-Neutral_RX.set Sequence: Final Measurements
Operator: Matt Harrison
EUT Type: HUSBZB-1.
EUT Condition: Constantly Receiving.
Comments: Connected to Laptop Computer via USB Extension Cable.
Temp: 73f
Hum: 44%
Host: 120V 60Hz

Compatible Electronics, Inc. FAC- 3 (LAB R)

Freq (MHz)	(AVG) Margin AVL (dB)	(QP) Margin QPL (dB)	(AVG) EMI (dBuV)	(QP) EMI (dBuV)	(PEAK) EMI (dBuV)	(AVG) Limit (dBuV)	(QP) Limit (dBuV)	Transducer (dB)	Cable(dB)
0.15	-29.30	-8.88	26.70	57.12	64.00	56.00	66.00	0.40	0.18
0.17	-29.93	-9.90	25.23	55.26	61.91	55.16	65.16	0.36	0.22
0.18	-30.35	-10.76	24.05	53.63	60.31	54.39	64.39	0.31	0.26
0.20	-19.37	-11.63	34.32	52.06	59.48	53.69	63.69	0.28	0.30
0.21	-30.85	-12.53	22.35	50.67	57.44	53.21	63.21	0.25	0.28
0.23	-31.75	-13.27	20.85	49.32	56.30	52.60	62.60	0.22	0.26
0.24	-30.61	-13.95	21.42	48.08	54.78	52.03	62.03	0.19	0.24
0.26	-25.70	-14.37	25.80	47.12	54.22	51.50	61.50	0.16	0.22
0.27	-28.48	-14.96	22.64	46.16	52.88	51.12	61.12	0.14	0.20
0.29	-33.22	-15.48	17.42	45.16	51.88	50.64	60.64	0.11	0.18
0.30	-33.67	-15.88	16.52	44.30	50.94	50.19	60.19	0.09	0.17
0.31	-33.91	-16.12	15.95	43.74	50.74	49.86	59.86	0.07	0.15
0.33	-23.95	-16.38	25.50	43.07	50.25	49.45	59.45	0.05	0.14
0.35	-34.81	-16.85	14.24	42.21	49.08	49.06	59.06	0.03	0.12
0.36	-35.08	-17.09	13.70	41.69	48.56	48.77	58.77	0.02	0.11
0.37	-35.22	-17.29	13.19	41.12	47.88	48.41	58.41	0.02	0.10
0.39	-27.61	-17.55	20.45	40.51	48.11	48.06	58.06	0.02	0.08
0.41	-34.90	-17.79	12.83	39.94	46.82	47.73	57.73	0.02	0.07
0.42	-35.42	-17.86	12.07	39.63	46.44	47.49	57.49	0.02	0.06
0.43	-35.19	-18.01	11.98	39.16	46.09	47.18	57.18	0.02	0.05
0.45	-31.97	-18.13	14.91	38.74	45.72	46.88	56.88	0.02	0.03
0.46	-15.49	-17.37	31.16	39.29	46.80	46.66	56.66	0.02	0.03
0.48	-35.39	-18.36	10.99	38.01	44.88	46.37	56.37	0.03	0.01
0.49	-35.41	-18.08	10.69	38.02	44.49	46.10	56.10	0.03	0.00
0.52	-19.60	-18.71	26.40	37.29	45.69	46.00	56.00	0.03	0.00

DTS BANDWIDTH

DATA SHEETS

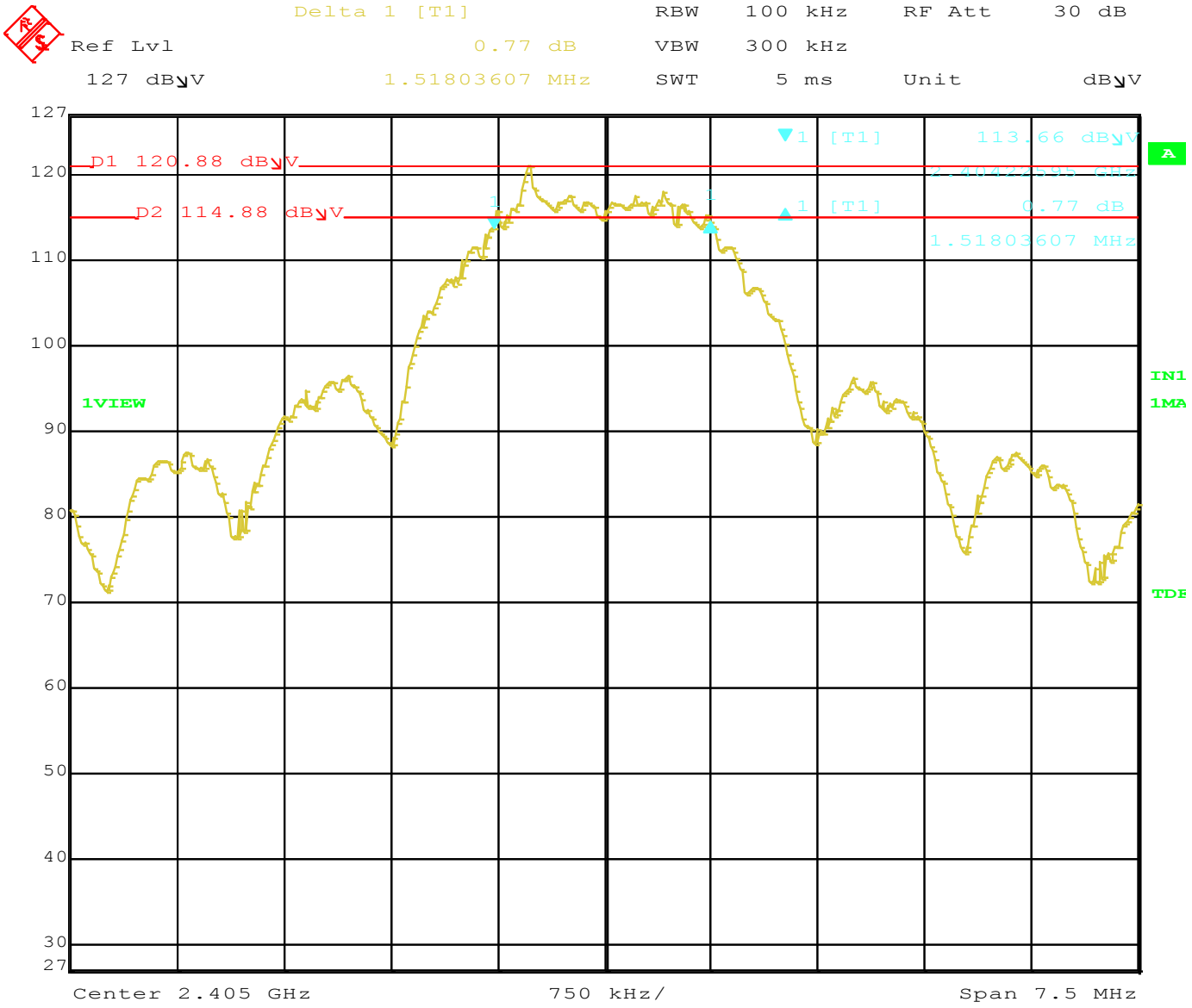
FCC 15.247

Nortek Security & Control
HubZ
Model: HUSBZB-1
Mode: Zigbee

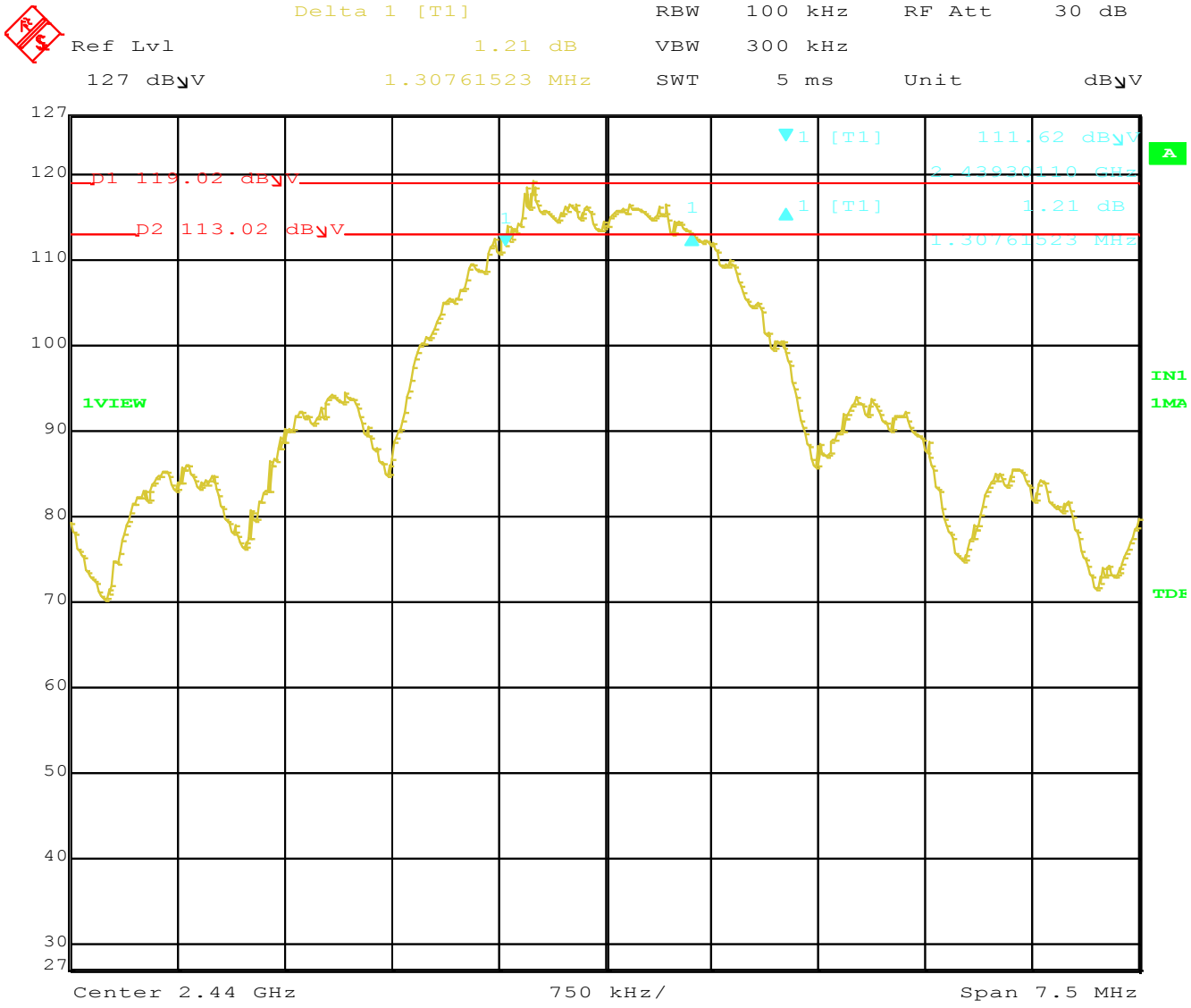
Date: 6/3/2015
Lab: R
Tested By: M. Harrison

DTS Bandwidth

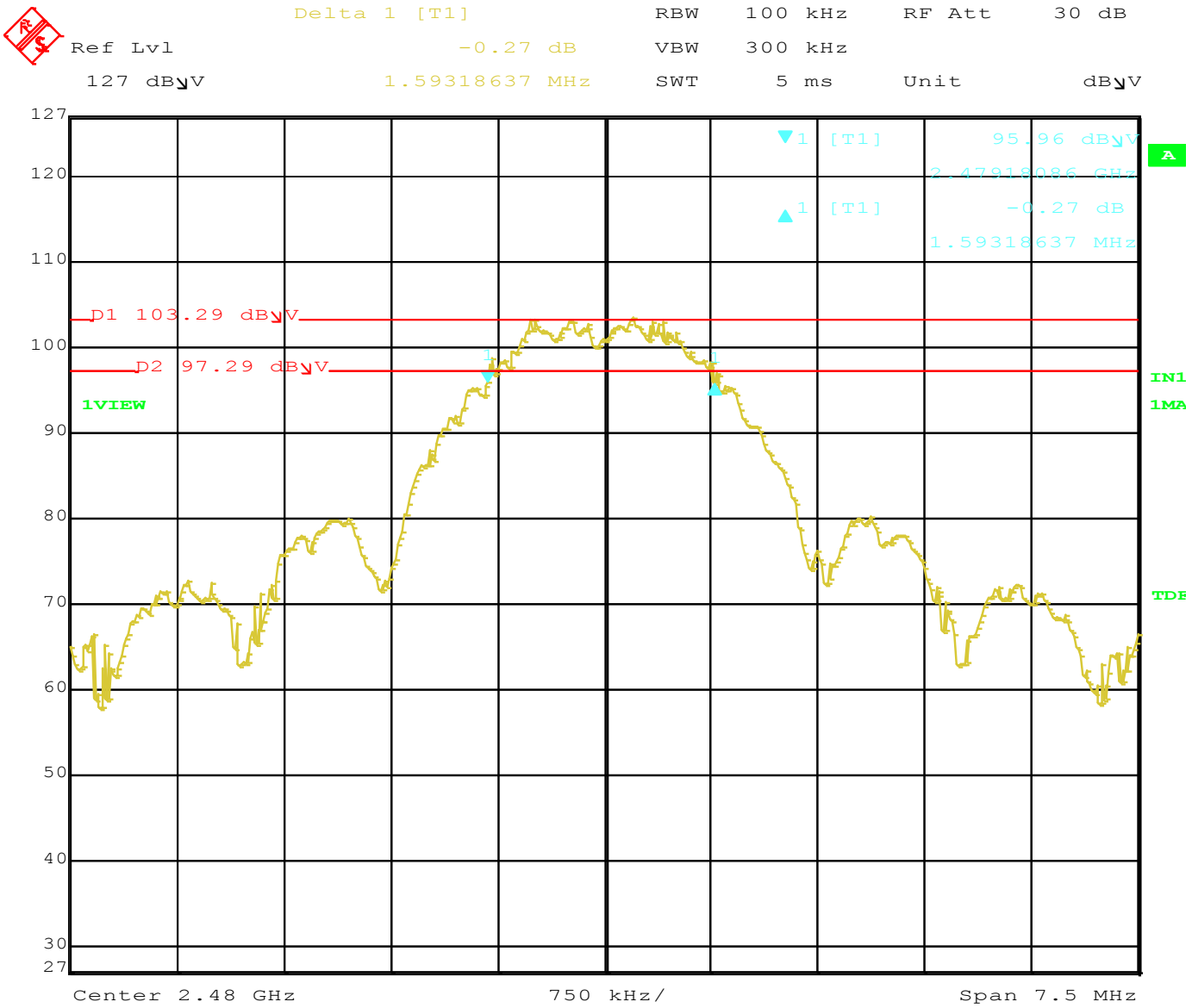
Freq. (GHz)	Bandwidth (kHz)	Minimum (kHz)	Margin (kHz)	Comments
2.405	1518.04	500.00	1018.04	
2.440	1307.62	500.00	807.62	
2.480	1593.19	500.00	1093.19	



Title: HUSBZB-1.
Comment A: DTS Bandwidth, 2405MHz.
Date: 3.JUN.2015 13:13:46



Title: HUSBZB-1.
Comment A: DTS Bandwidth, 2440MHz.
Date: 3.JUN.2015 13:17:18



Title: HUSBZB-1.
Comment A: DTS Bandwidth, 2480MHz.
Date: 3.JUN.2015 13:21:33

CONDUCTED OUTPUT POWER

DATA SHEETS

CONDUCTED OUTPUT POWER

FCC 15.247
Nortek Security & Control
HubZ
Model: HUSBZB-1
Mode: Zigbee

Date: 6/3/2015
Lab: R
Tested By: M. Harrison

Freq. (GHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2405	15.49	30.00	-14.51	Peak	Power Level Set to -3
2440	14.60	30.00	-15.40	Peak	Power Level Set to -5
2480	5.12	30.00	-24.88	Peak	Power Level Set to -13

POWER SPECTRAL DENSITY

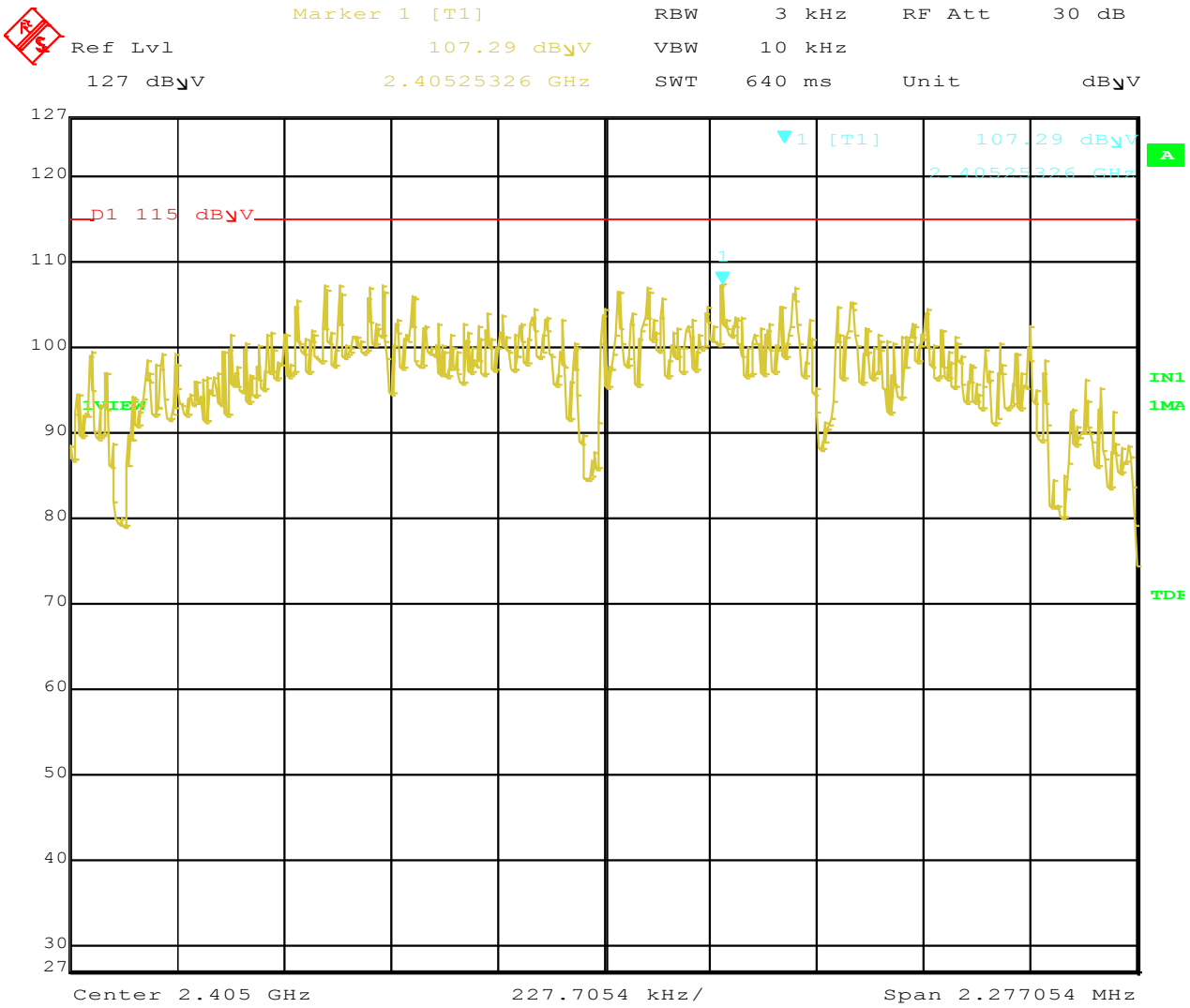
DATA SHEETS

POWER SPECTRAL DENSITY

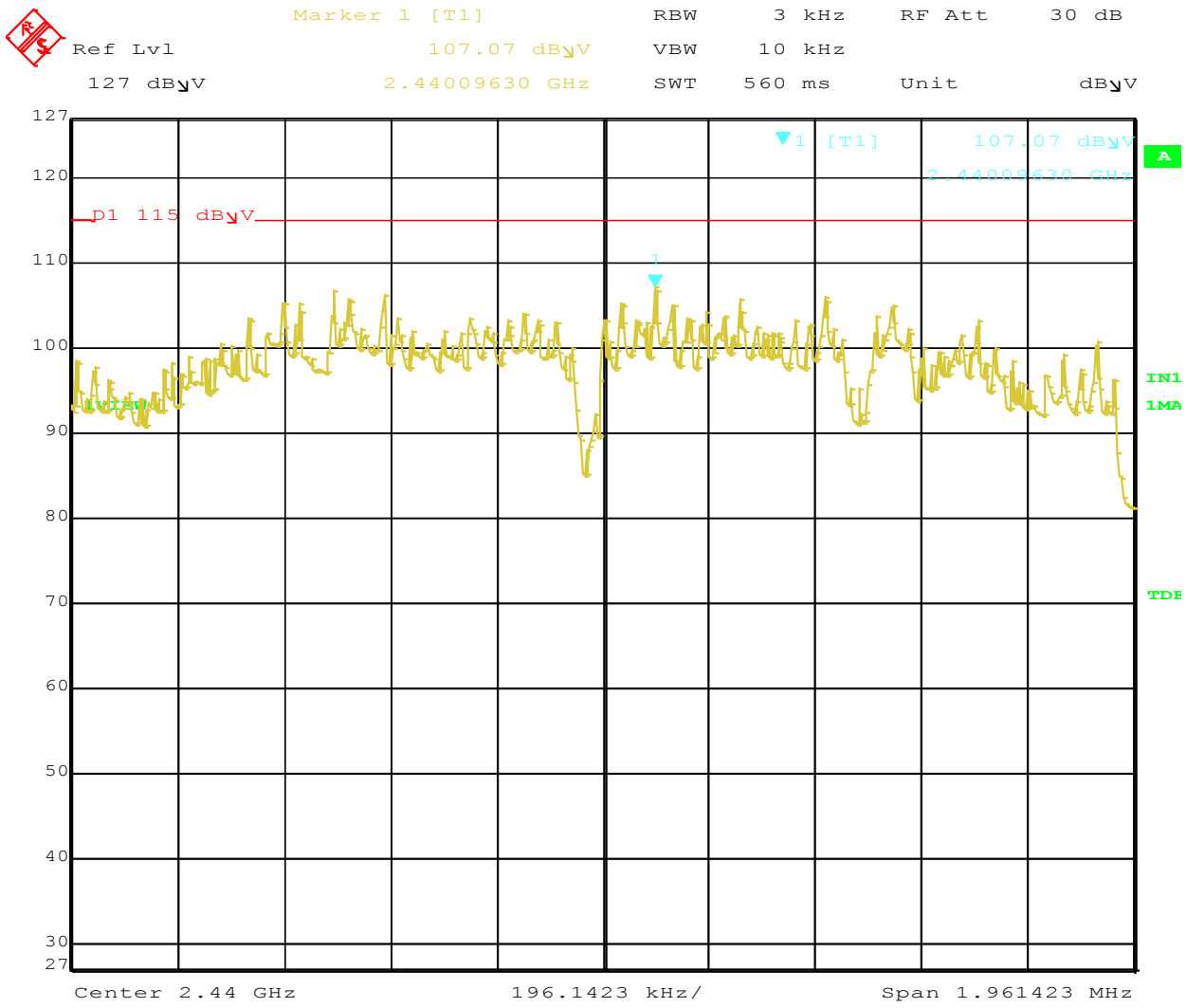
FCC 15.247
Nortek Security & Control
HubZ
Model: HUSBZB-1
Mode: Zigbee

Date: 6/3/2015
Lab: R
Tested By: M. Harrison

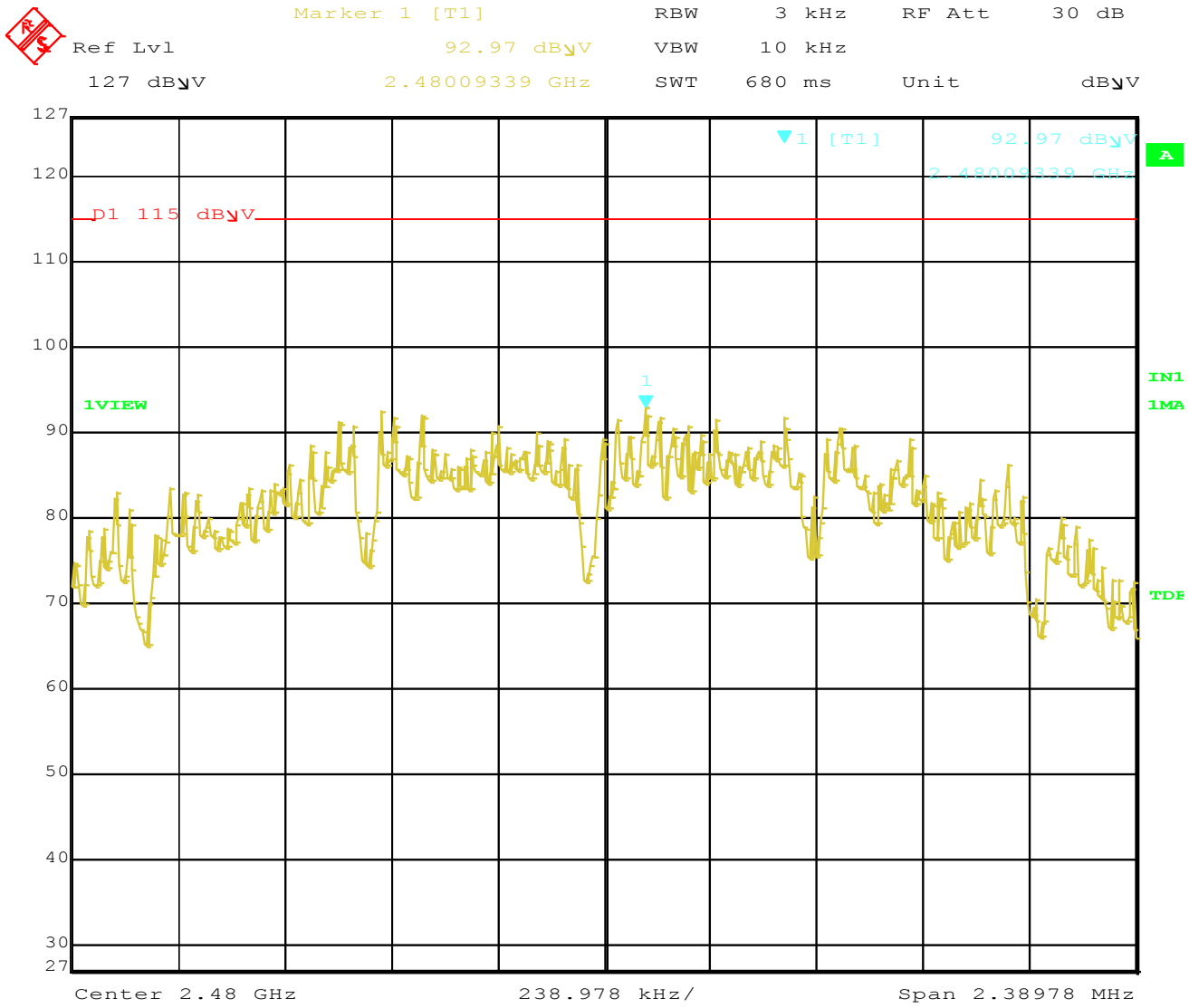
Freq. (GHz)	Level (dBµV)	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Comments
2.405	107.29	115.00	-7.71	Peak	Power Set to -3
2.440	107.07	115.00	-7.93	Peak	Power Level Set to -5
2.480	92.97	115.00	-22.03	Peak	Power Level Set to -13



Title: HUSBZB-1.
Comment A: PSD, 2405MHz.
Date: 3.JUN.2015 13:32:54



Title: HUSBZB-1.
Comment A: PSD, 2440MHz.
Date: 3.JUN.2015 13:30:54



Title: HUSBZB-1.
Comment A: PSD, 2480MHz.
Date: 3.JUN.2015 13:25:22

HARMONIC EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS (IN 100KHZ BANDWIDTH) / CONDUCTED

DATA SHEETS

HARMONIC EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

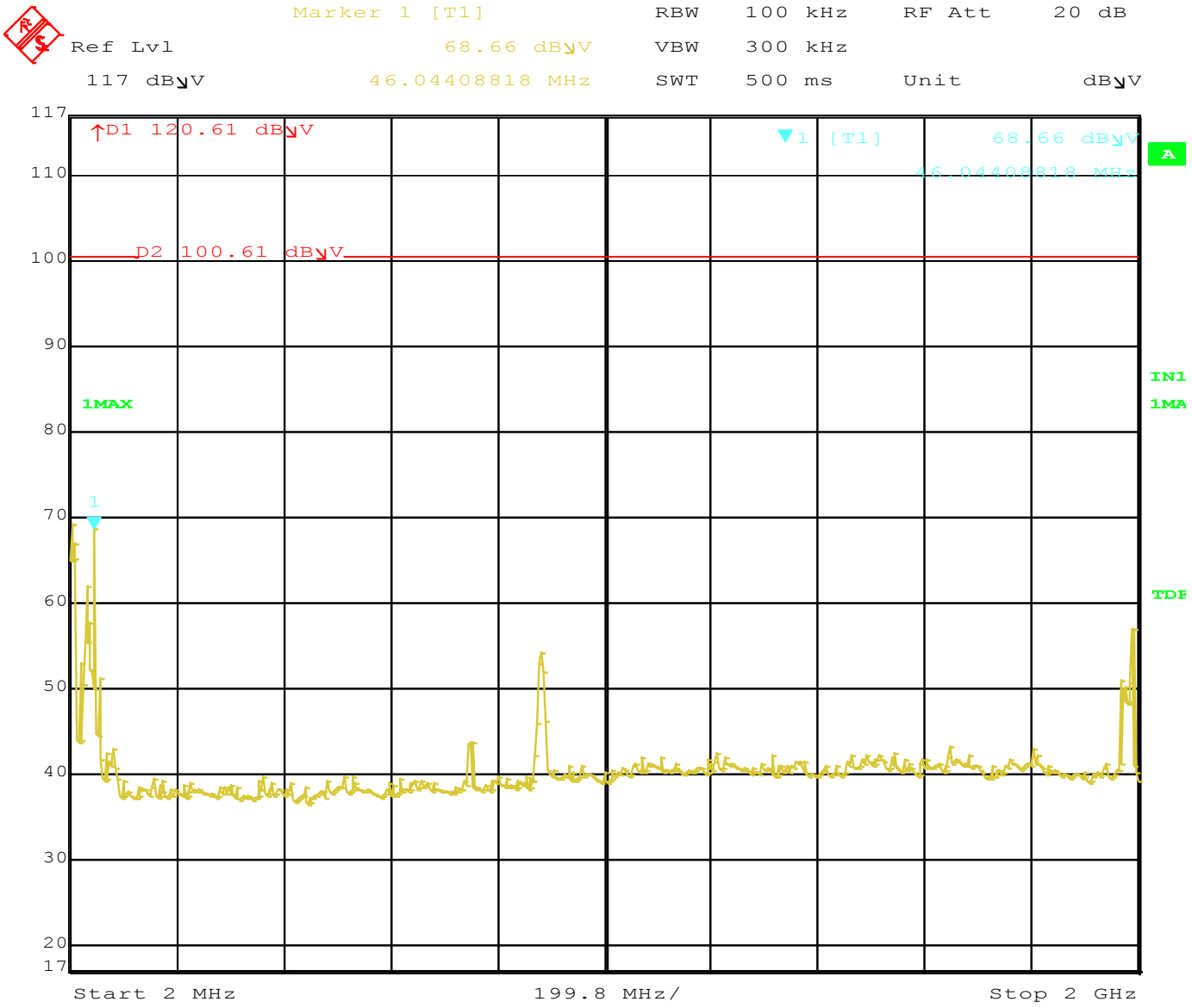
FCC 15.247
Nortek Security & Control
HubZ
Model: HUSBZB-1
Mode: Zigbee

Date: 5/29/2015
Lab: R
Tested By: M. Harrison

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No radio emissions found within 20dB of Limit

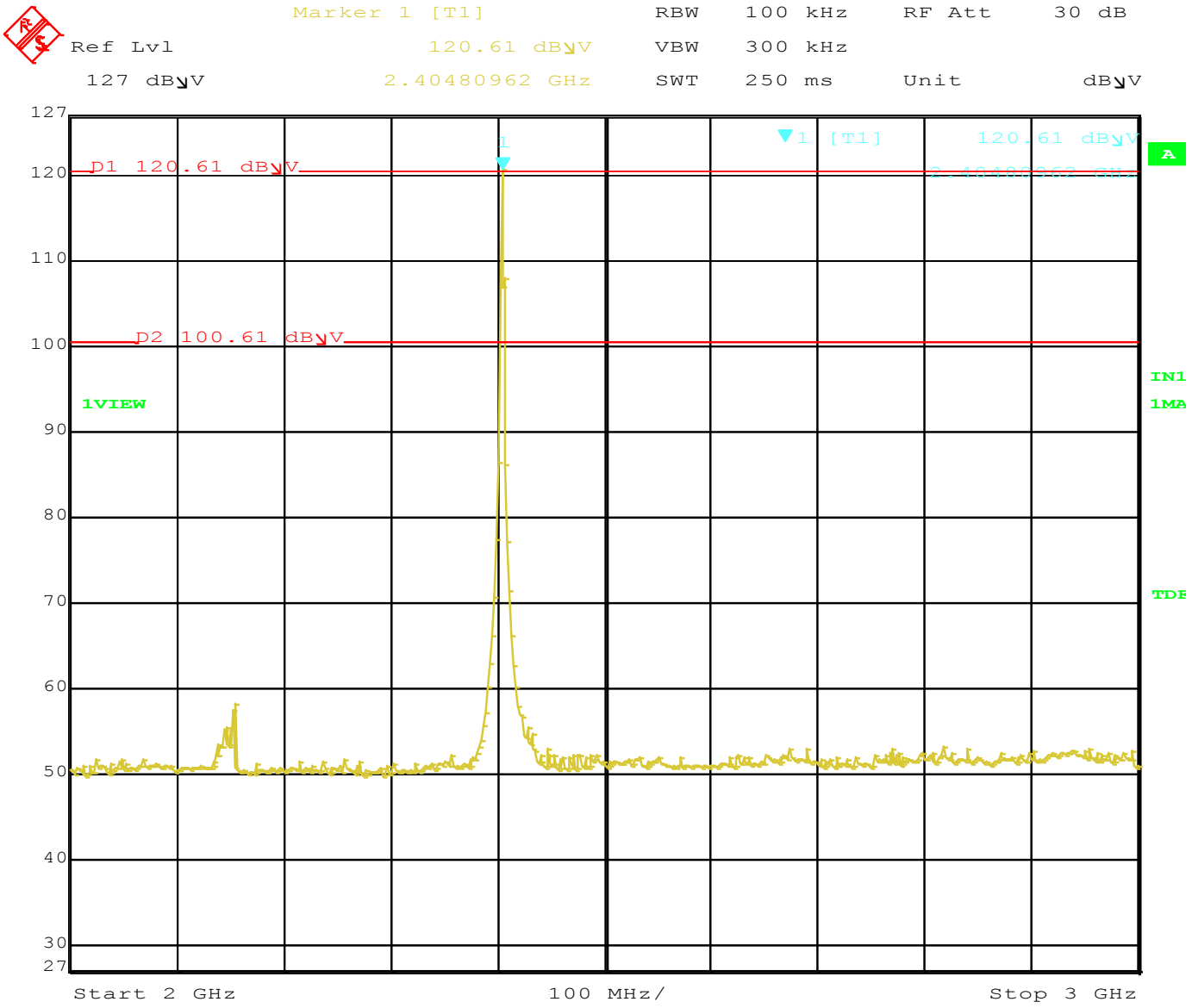
Test distance
3 meter

LOW CHANNEL



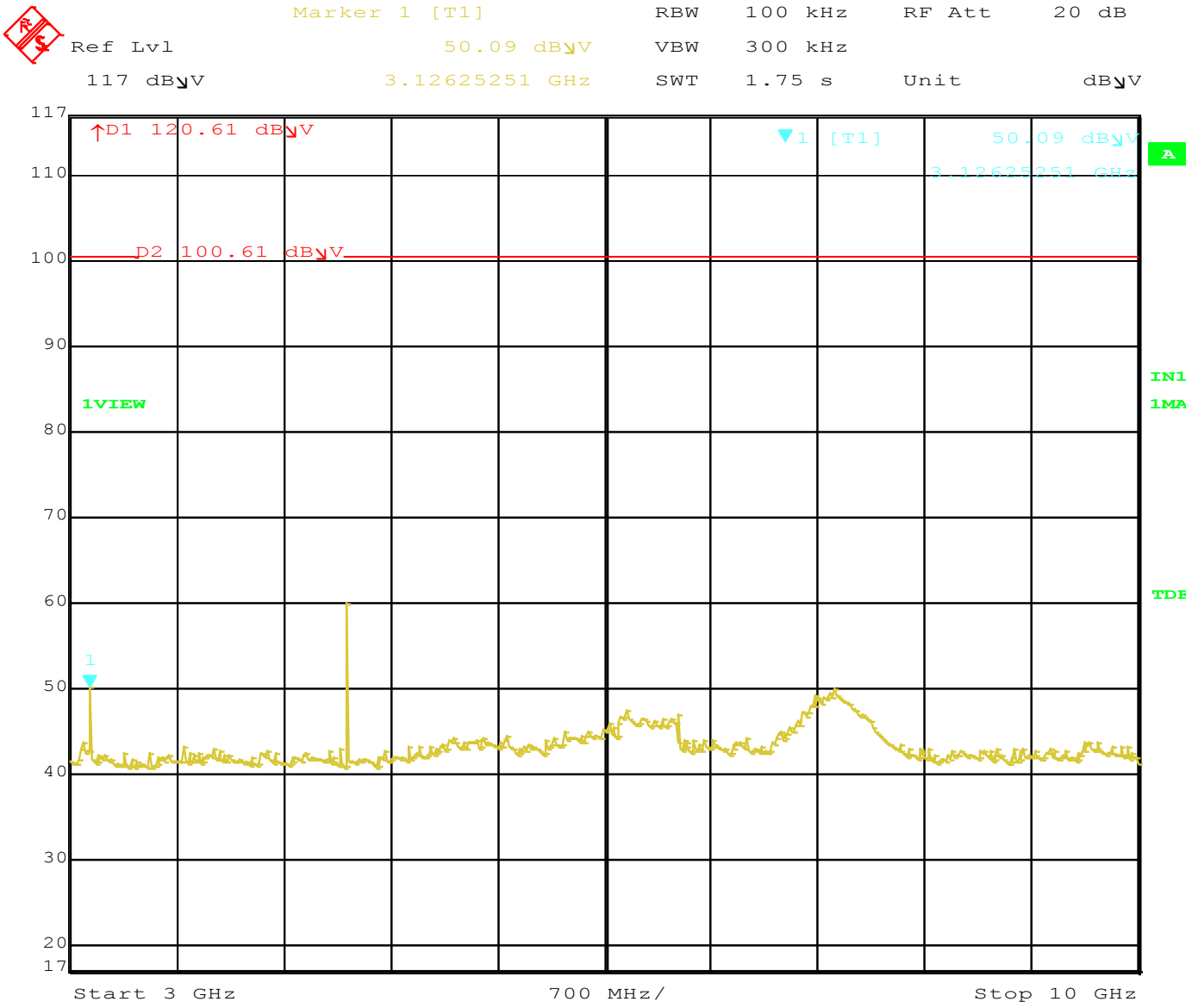
Title: HUSBZB-1.
Comment A: Conducted Spurious, 2405MHz.
Date: 3.JUN.2015 13:40:00

LOW CHANNEL



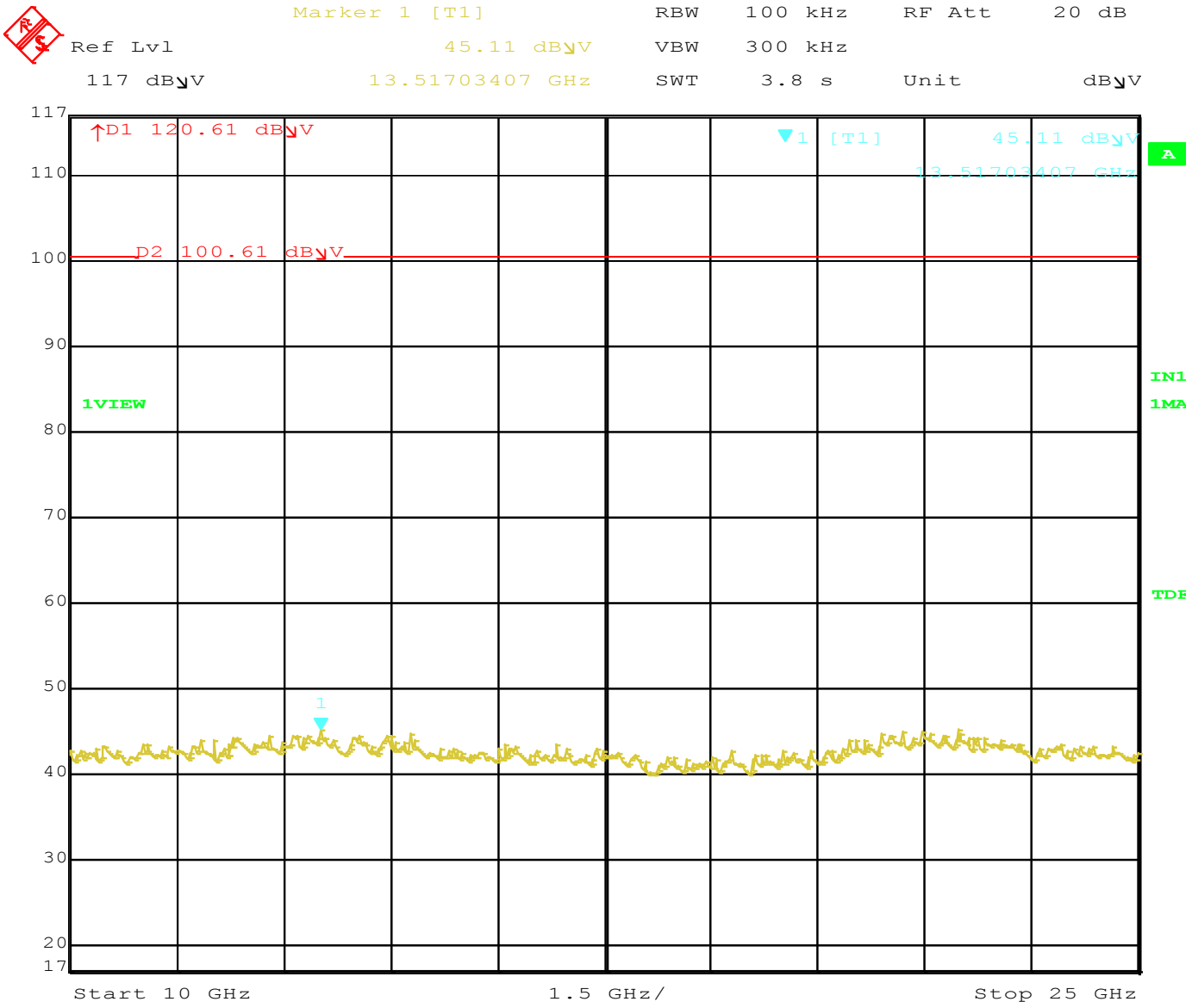
Title: HUSBZB-1.
Comment A: Conducted Spurious, 2405MHz.
Date: 3.JUN.2015 13:36:14

LOW CHANNEL



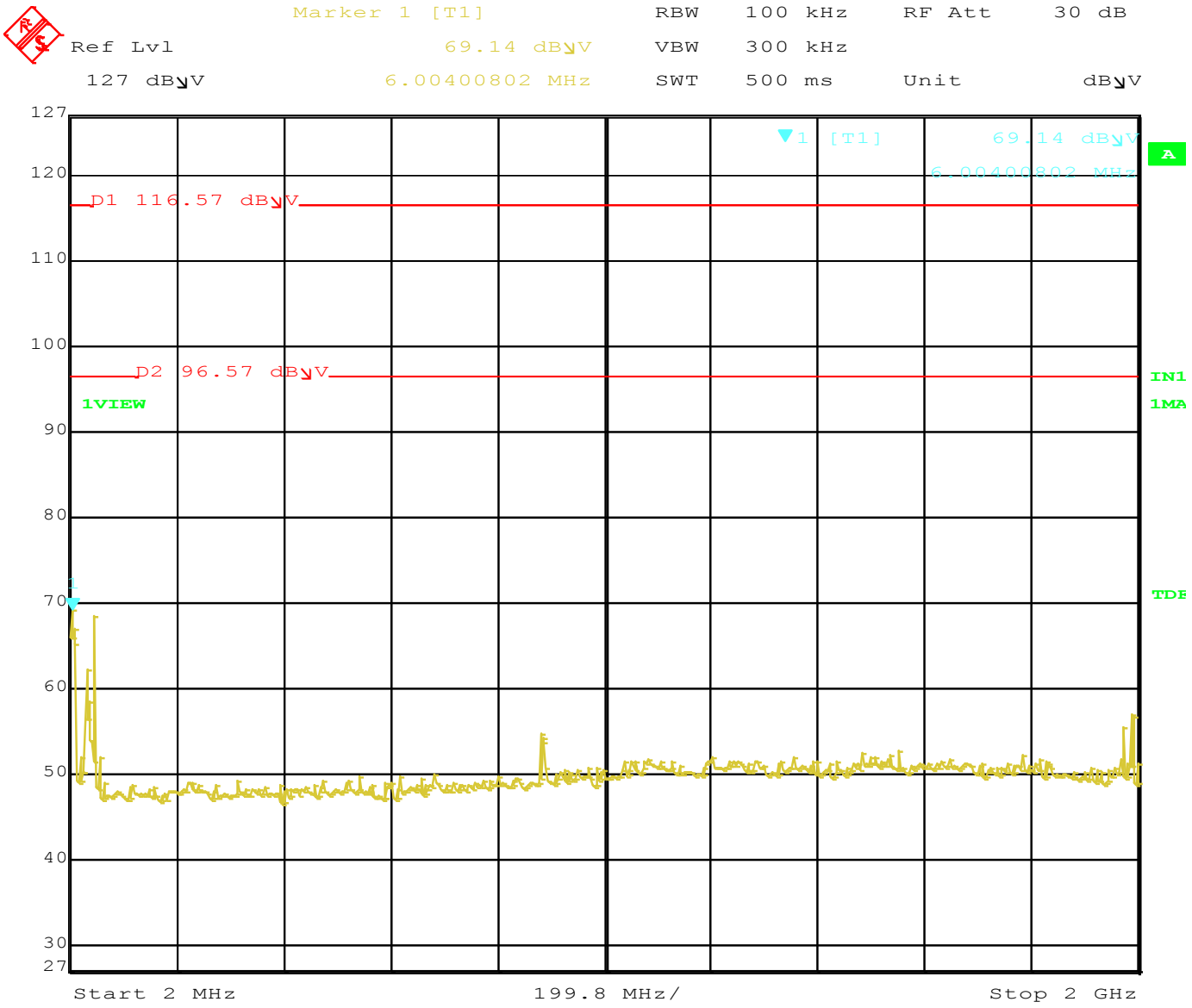
Title: HUSBZB-1.
Comment A: Conducted Spurious, 2405MHz.
Date: 3.JUN.2015 13:41:18

LOW CHANNEL



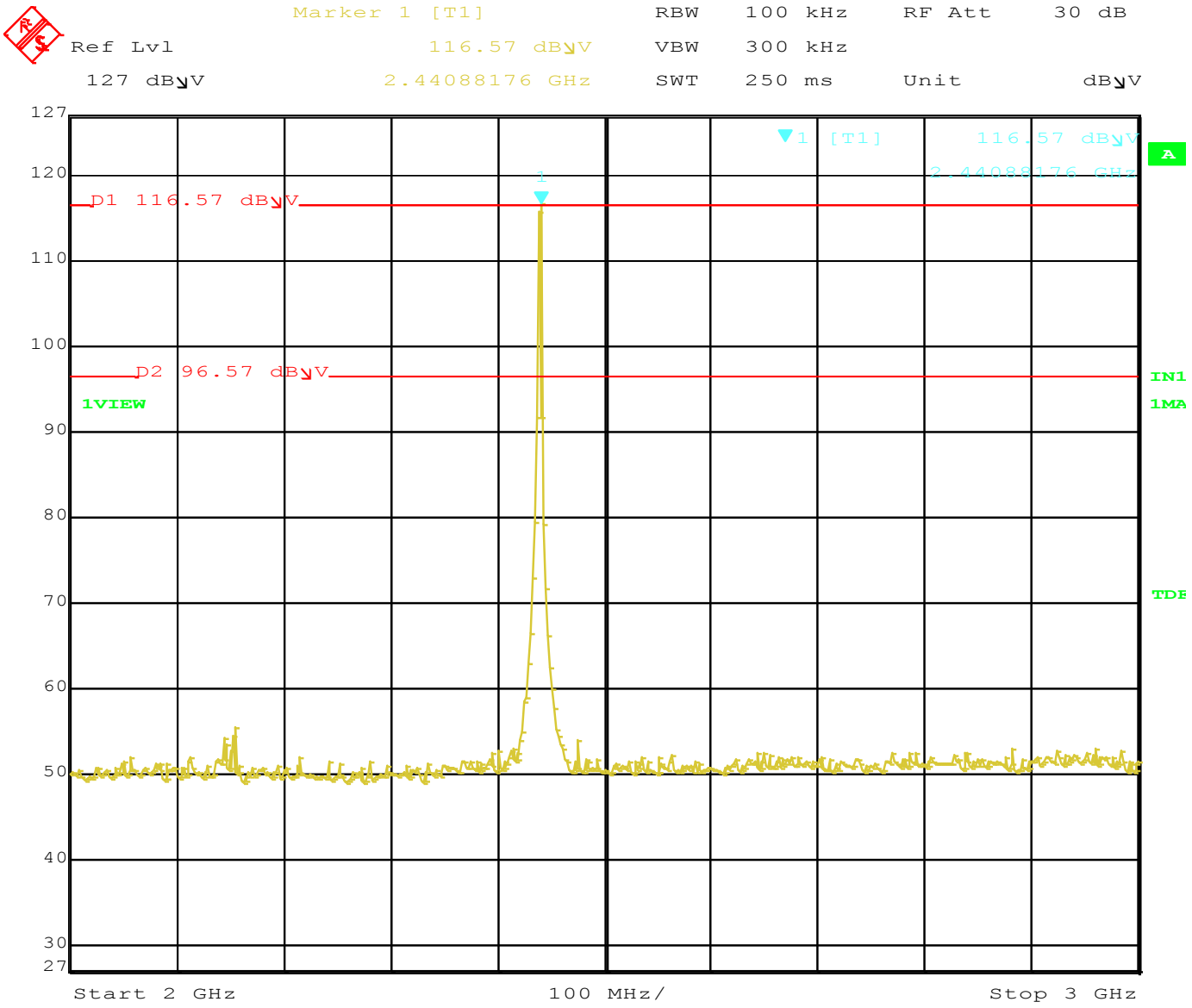
Title: HUSBZB-1.
Comment A: Conducted Spurious, 2405MHz.
Date: 3.JUN.2015 13:42:01

MID CHANNEL



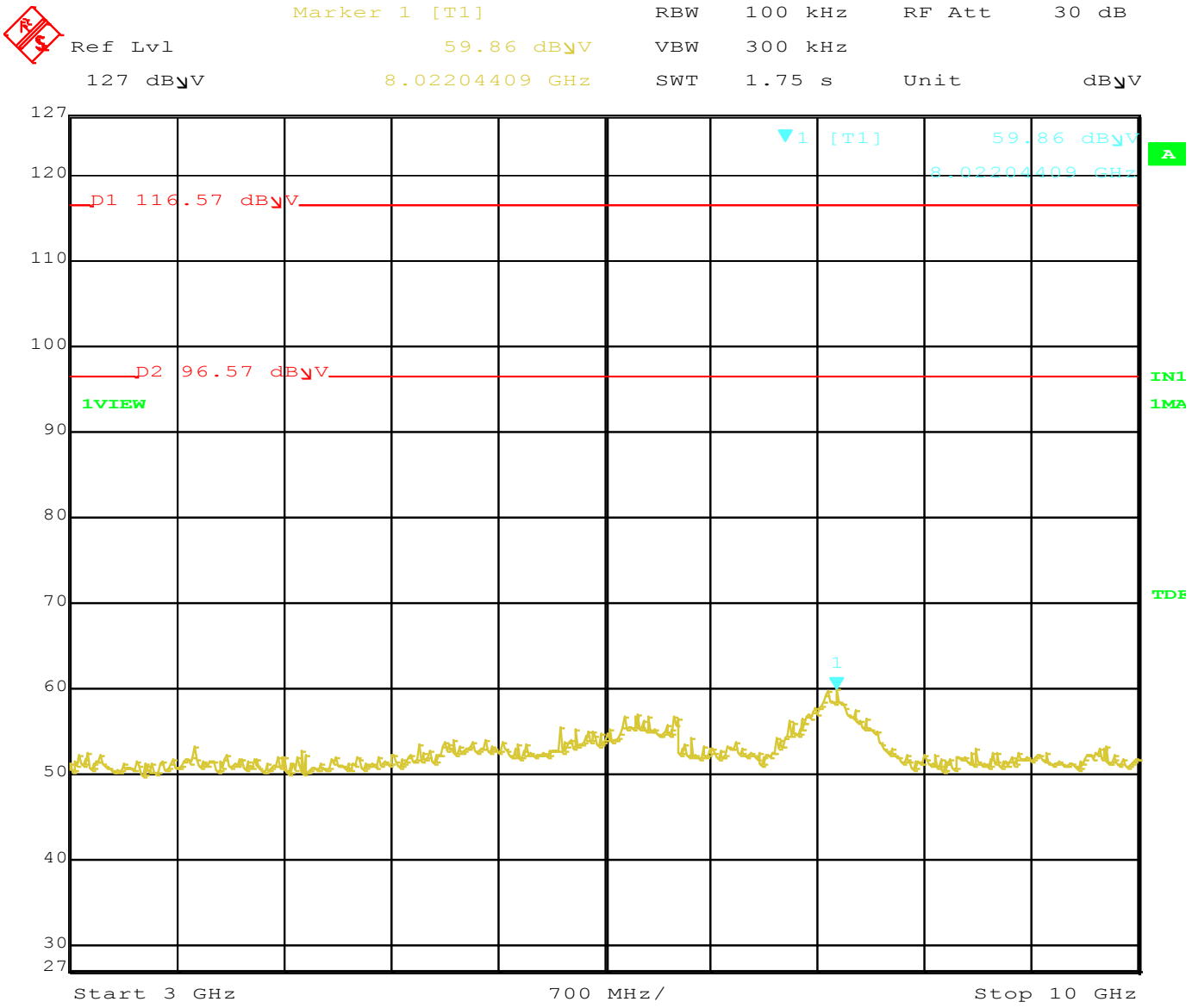
Title: HUSBZB-1.
Comment A: Conducted Spurious, 2440MHz.
Date: 3.JUN.2015 13:45:29

MID CHANNEL



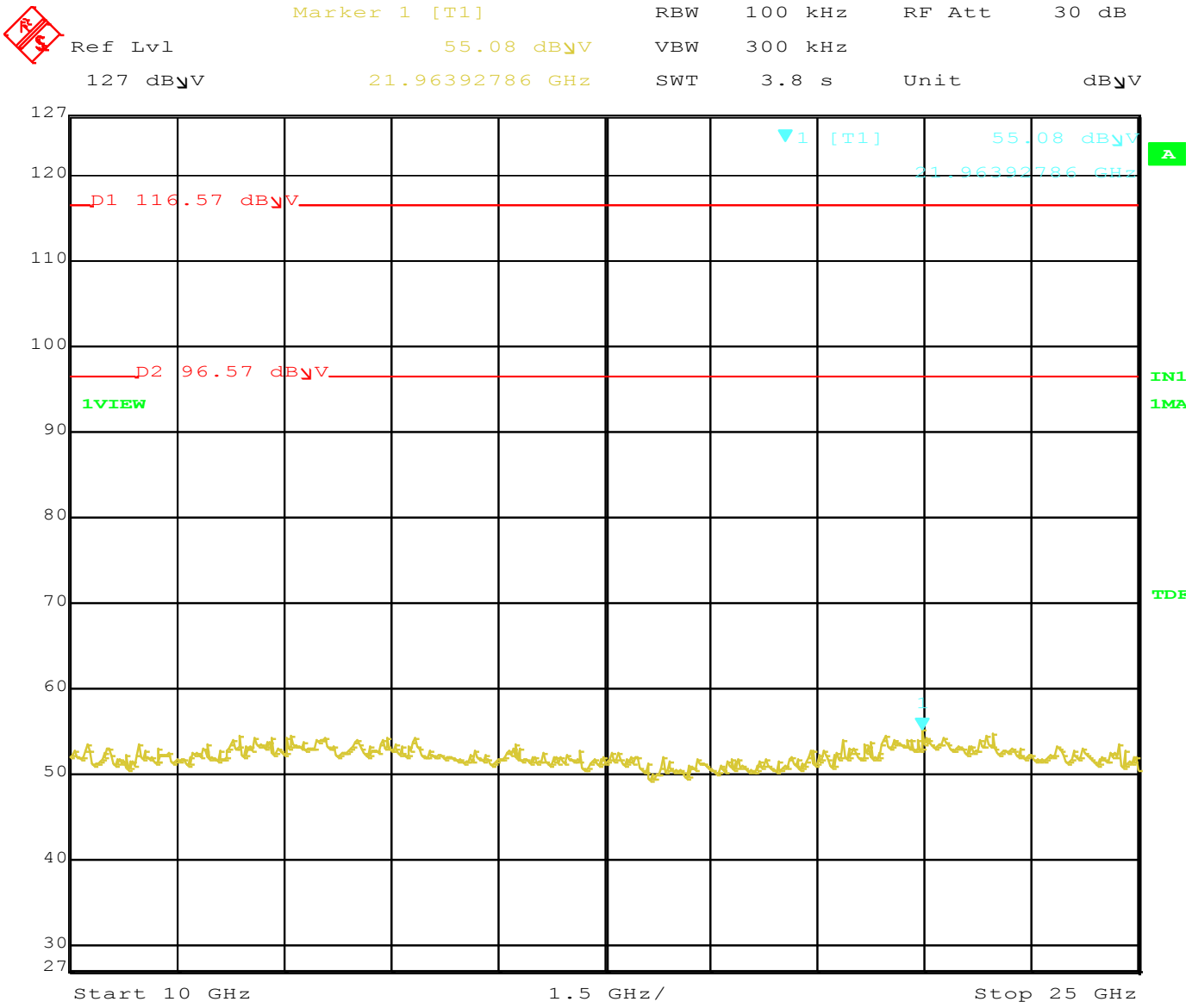
Title: HUSBZB-1.
Comment A: Conducted Spurious, 2440MHz.
Date: 3.JUN.2015 13:45:01

MID CHANNEL



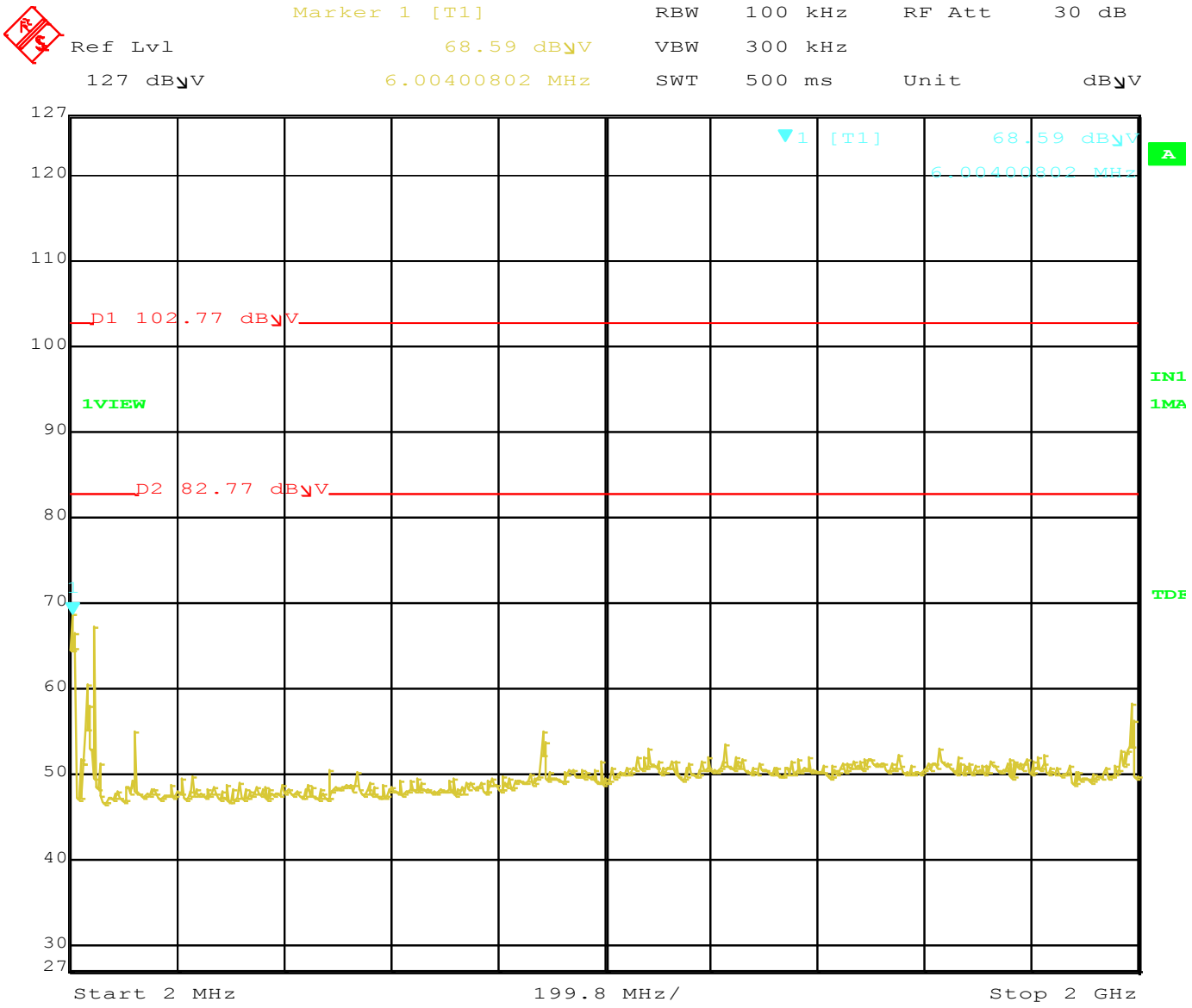
Title: HUSBZB-1.
Comment A: Conducted Spurious, 2440MHz.
Date: 3.JUN.2015 13:46:31

MID CHANNEL



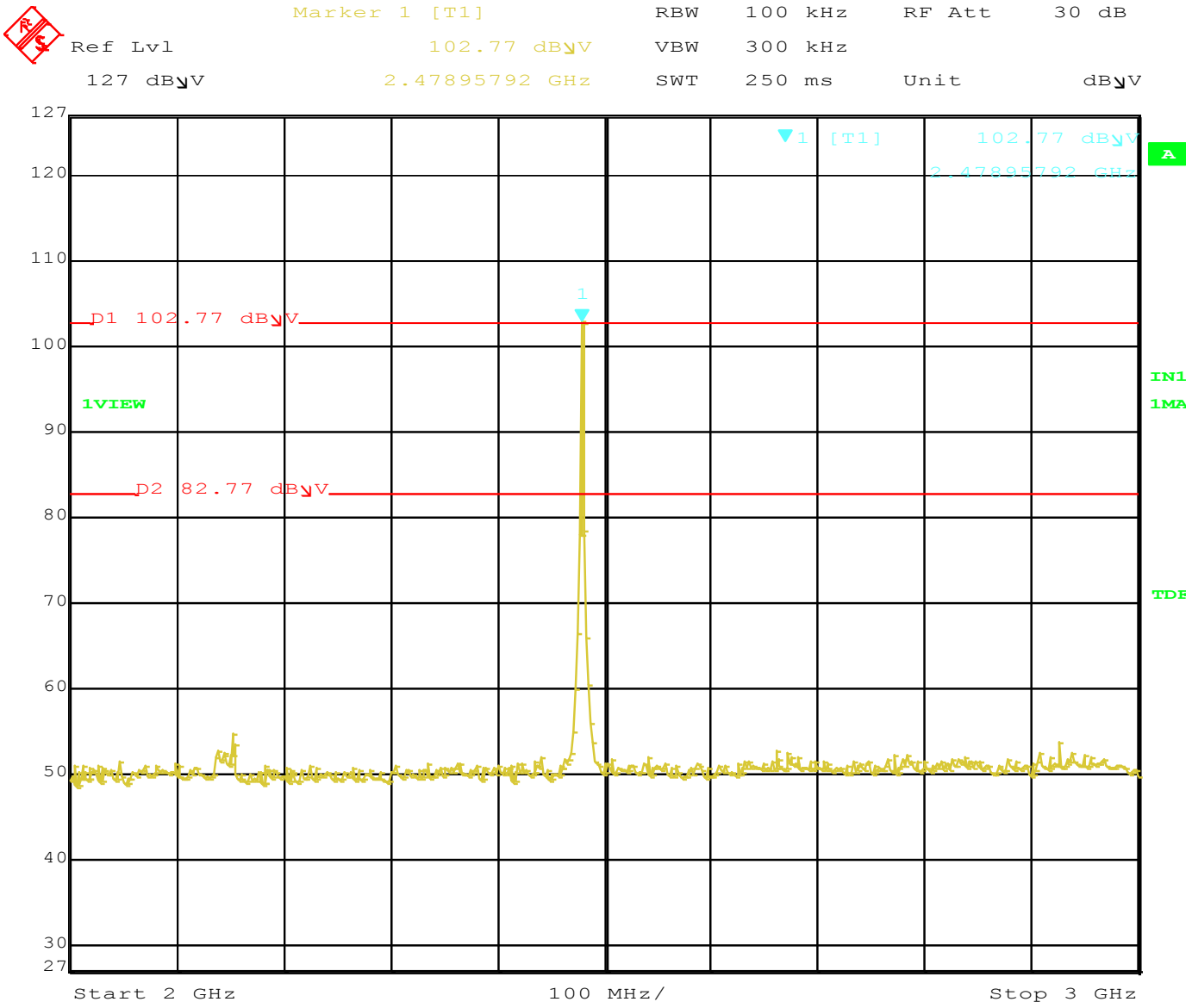
Title: HUSBZB-1.
Comment A: Conducted Spurious, 2440MHz.
Date: 3.JUN.2015 13:47:42

HIGH CHANNEL



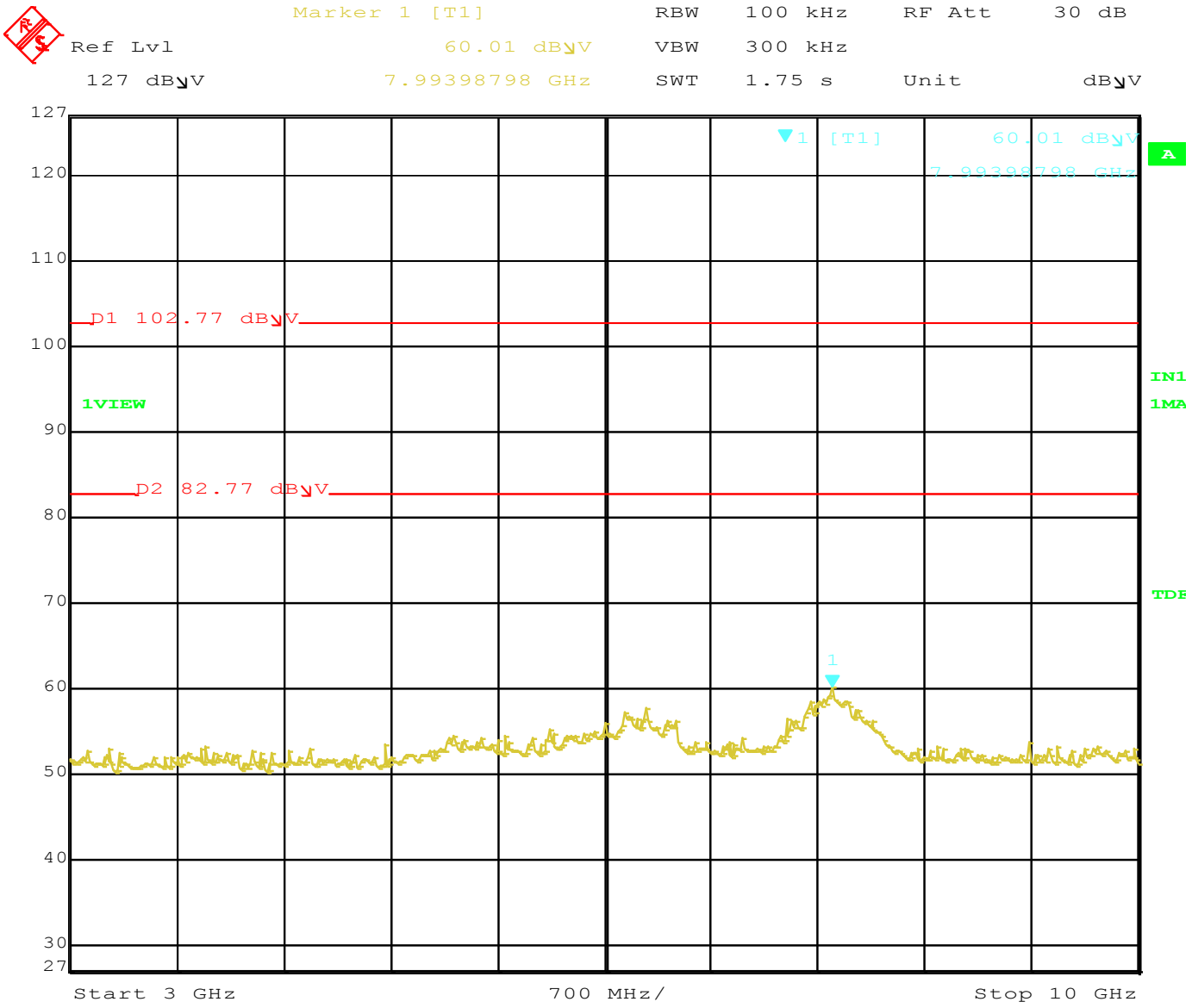
Title: HUSBZB-1.
Comment A: Conducted Spurious, 2480MHz.
Date: 3.JUN.2015 13:49:46

HIGH CHANNEL



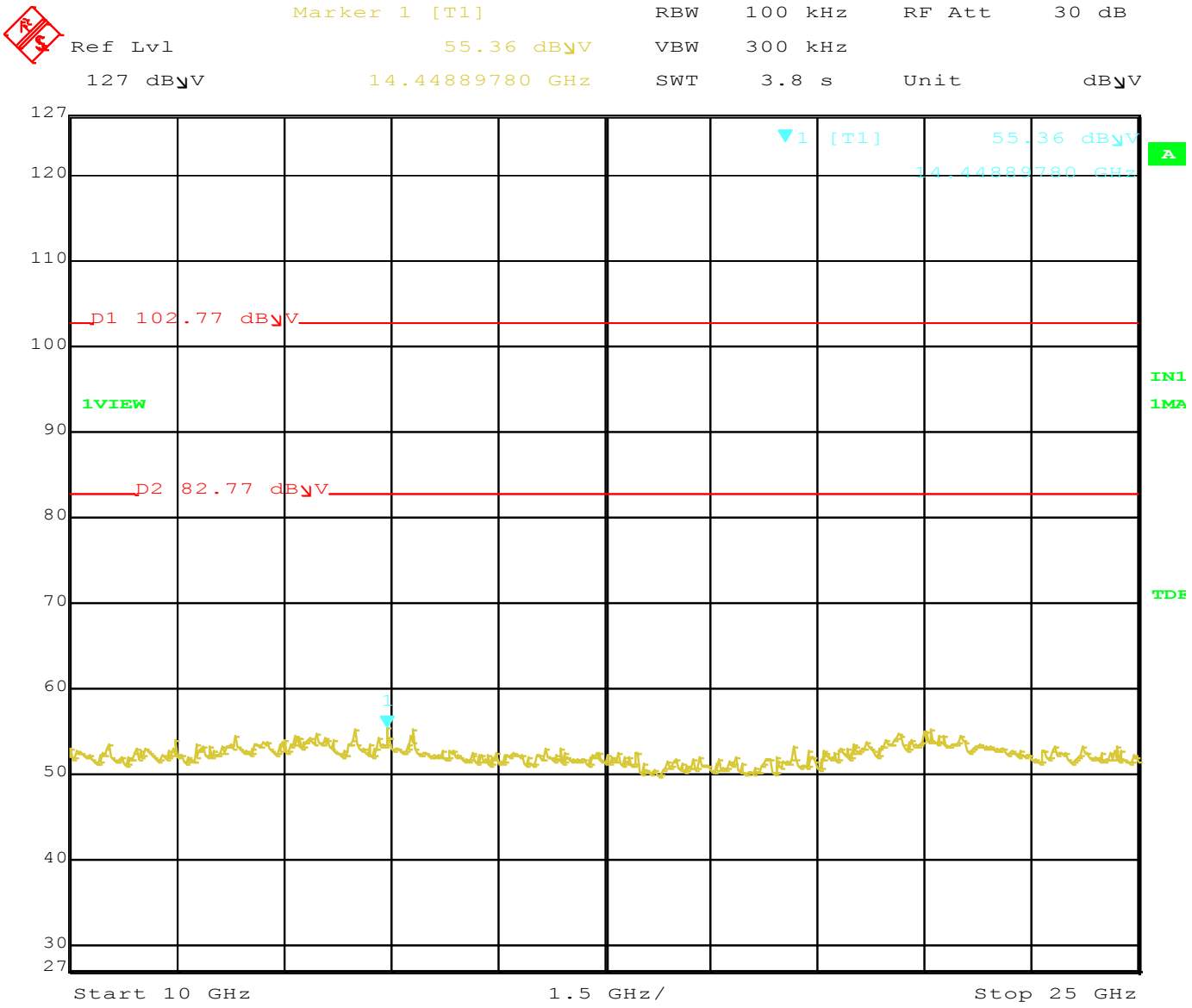
Title: HUSBZB-1.
Comment A: Conducted Spurious, 2480MHz.
Date: 3.JUN.2015 13:49:12

HIGH CHANNEL



Title: HUSBZB-1.
Comment A: Conducted Spurious, 2480MHz.
Date: 3.JUN.2015 13:50:44

HIGH CHANNEL



Title: HUSBZB-1.
Comment A: Conducted Spurious, 2480MHz.
Date: 3.JUN.2015 13:51:23

EMISSIONS IN RESTRICTED FREQUENCY BANDS (RADIATED FIELD STRENGTH)

DATA SHEETS

HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS (Low Channel-Vertical)

FCC 15.247
Nortek Security & Control
HubZ
Model: HUSBZB-1
Mode: Zigbee Pwr Set -3

Date: 5/29/2015
Lab: R
Tested By: M. Harrison

Freq. (MHz)	Level (dBµV/m)	Pol (v/h)	Limit (dBµV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4810	55.55	V	73.98	-18.43	Peak	1.01	185	Restricted Band
4810	34.12	V	53.98	-19.86	Avg	1.01	185	
12025	59.03	V	73.98	-14.95	Peak	1	175	Restricted Band
12025	40.72	V	53.98	-13.26	Avg	1	175	
19240	--	V	--	--	Peak			Restricted Band
19240	--	V	--	--	Avg			No Emission Found

HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS (Low Channel-Horizontal)

FCC 15.247
Nortek Security & Control
HubZ
Model: HUSBZB-1
Mode: Zigbee Pwr Set -3

Date: 5/29/2015
Lab: R
Tested By: M. Harrison

Freq. (MHz)	Level (dBµV/m)	Pol (v/h)	Limit (dBµV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4810	58.45	H	73.98	-15.53	Peak	1.01	170	Restricted Band
4810	37.02	H	53.98	-16.96	Avg	1.01	170	
12025	57.46	H	73.98	-16.52	Peak	1.01	178	Restricted Band
12025	39.02	H	53.98	-14.96	Avg	1.01	178	
19240	--	H	--	--	Peak			Restricted Band
19240	--	H	--	--	Avg			No Emission Found

HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS (Mid Channel-Vertical)

FCC 15.247
Nortek Security & Control
HubZ
Model: HUSBZB-1
Mode: Zigbee Pwr Set -5

Date: 5/29/2015
Lab: R
Tested By: M. Harrison

Freq. (MHz)	Level (dBµV/m)	Pol (v/h)	Limit (dBµV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880.00	57.99	V	73.98	-15.99	Peak	1.02	192	Restricted Band
4880.00	35.95	V	53.98	-18.03	Avg	1.02	192	
7320.00	67.34	V	73.98	-6.64	Peak	1.38	202	
7320.00	43.25	V	53.98	-10.73	Avg	1.38	202	In Restricted Band
12200.00	--	V	73.98	--	Peak	--	--	Restricted Band
12200.00	--	V	53.98	--	Avg	--	--	No Emission Found
19520.00	--	V	73.98	--	Peak	--	--	No Emissions Found
19520.00	--	V	53.98	--	Avg	--	--	In Restricted Band

HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS (Mid Channel-Horizontal)

FCC 15.247
Nortek Security & Control
HubZ
Model: HUSBZB-1
Mode: Zigbee Pwr Set -5

Date: 5/29/2015
Lab: R
Tested By: M. Harrison

Freq. (MHz)	Level (dBµV/m)	Pol (v/h)	Limit (dBµV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880.00	60.15	H	73.98	-13.83	Peak	1	160	Restricted Band
4880.00	38.11	H	53.98	-15.87	Avg	1	160	
7320.00	71.66	H	73.98	-2.32	Peak	1	125	
7320.00	47.57	H	53.98	-6.41	Avg	1	125	In Restricted Band
12200.00	--	H	73.98	--	Peak	--	--	Restricted Band
12200.00	--	H	53.98	--	Avg	--	--	No Emission Found
19520.00	--	H	73.98	--	Peak	--	--	No Emissions Found
19520.00	--	H	53.98	--	Avg	--	--	In Restricted Band

HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS
(High Channel-Vertical)

FCC 15.247
Nortek Security & Control
HubZ
Model: HUSBZB-1
Mode: Zigbee Pwr Set -13

Date: 5/29/2015
Lab: R
Tested By: M. Harrison

Freq. (MHz)	Level (dBµV/m)	Pol (v/h)	Limit (dBµV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960.00	--	V	73.98	--	Peak	--	--	In Restricted Band
4960.00	--	V	53.98	--	Avg	--	--	No Emissions Found
7440.00	--	V	73.98	--	Peak	--	--	In Restricted Band
7440.00	--	V	53.98	--	Avg	--	--	No Emissions Found
12400.00	--	V	73.98	--	Peak	--	--	In Restricted Band
12400.00	--	V	53.98	--	Avg	--	--	No Emissions Found
19840.00	--	V	73.98	--	Peak	--	--	In Restricted Band
19840.00	--	V	53.98	--	Avg	--	--	No Emissions Found
22320.00	--	V	73.98	--	Peak	--	--	In Restricted Band
22320.00	--	V	53.98	--	Avg	--	--	No Emissions Found

HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS (High Channel-Horizontal)

FCC 15.247
Nortek Security & Control
HubZ
Model: HUSBZB-1
Mode: Zigbee Pwr Set -13

Date: 5/29/2015
Lab: R
Tested By: M. Harrison

Freq. (MHz)	Level (dBµV/m)	Pol (v/h)	Limit (dBµV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960.00	--	H	73.98	--	Peak	--	--	In Restricted Band
4960.00	--	H	53.98	--	Avg	--	--	No Emissions Found
7440.00	--	H	73.98	--	Peak	--	--	In Restricted Band
7440.00	--	H	53.98	--	Avg	--	--	No Emissions Found
12400.00	--	H	73.98	--	Peak	--	--	In Restricted Band
12400.00	--	H	53.98	--	Avg	--	--	No Emissions Found
19840.00	--	H	73.98	--	Peak	--	--	In Restricted Band
19840.00	--	H	53.98	--	Avg	--	--	No Emissions Found
22320.00	--	H	73.98	--	Peak	--	--	In Restricted Band
22320.00	--	H	73.98	--	Peak	--	--	In Restricted Band

EMISSIONS RADIATED OUTSIDE OF THE FUNDAMENTAL FREQUENCY BAND AT BAND EDGES

DATA SHEETS

BAND EDGE – VERTICAL

FCC 15.247
Nortek Security & Control
HubZ
Model: HUSBZB-1
Mode: Zigbee

Date: 6/03/2015
Lab: R
Tested By: M. Harrison

Compatible Electronics, Inc. FAC-3 (Lab R)

Freq. (MHz)	Level (dBµV/m)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2405.00	112.81	V	--	--	Peak	1	90	Fundamental of High Channel
								Z-Axis, Power Level Set to -3
2400.00	75.66	V	92.81	-17.15	Delta	1	90	From Peak
2389.59	58.13	V	73.98	-15.85	Peak	1	90	**No** Marker Delta Method Used
2389.59	39.62	V	53.98	-14.36	Avg	1	90	**Z-Axis, Power Level Set to -3**
2480.00	99.16	V	--	--	Peak	1.11	276	Fundamental of High Channel
2483.50	69.02	V	73.98	-4.96	Peak	1.11	276	No Marker Delta Method Used
2483.50	50.26	V	53.98	-3.72	Avg	1.11	276	**Z-Axis, Power Level Set to -13**

Test distance
3 meter

BAND EDGE – HORIZONTAL

FCC 15.247
Nortek Security & Control
HubZ
Model: HUSBZB-1
Mode: Zigbee

Date: 6/03/2015
Lab: R
Tested By: M. Harrison

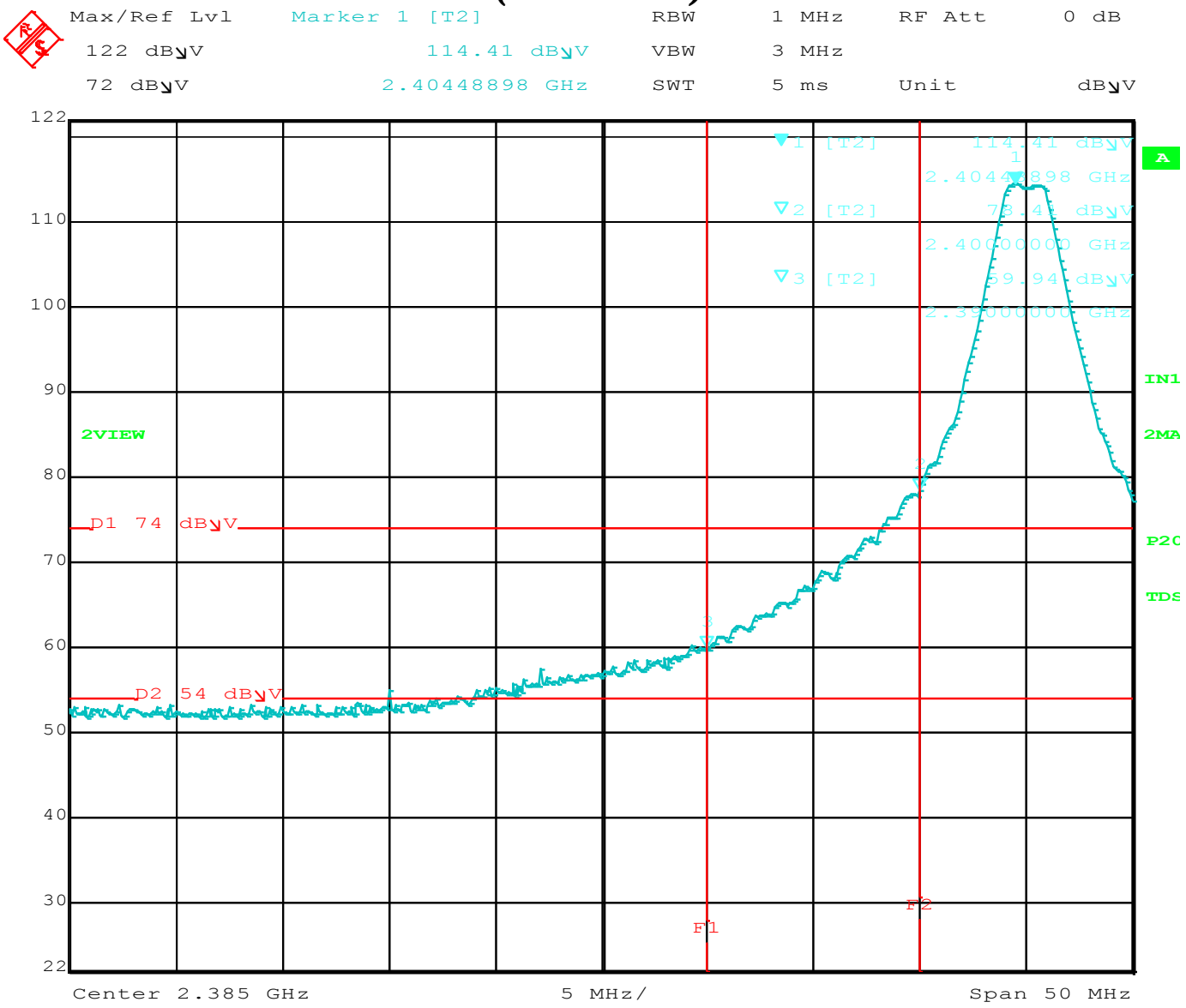
Compatible Electronics, Inc. FAC-3 (Lab R)

Freq. (MHz)	Level (dBµV/m)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2405.00	114.41	H	--	--	Peak	1.1	225	Fundamental of High Channel
								Z-Axis, Power Level Set to -3
2400.00	78.41	H	94.41	-16.00	Delta	1.1	225	From Peak
2390.00	59.94	H	73.98	-14.04	Peak	1.1	225	**No** Marker Delta Method Used
2390.00	40.22	H	53.98	-13.76	Avg	1.1	225	**Z-Axis, Power Level Set to -3**
2480.00	103.47	H	--	--	Peak	1	225	Fundamental of High Channel
2483.50	72.21	H	73.98	-1.77	Peak	1	225	No Marker Delta Method Used
2483.50	51.13	H	53.98	-2.85	Avg	1	225	**Z-Axis, Power Level Set to -13**

Test distance

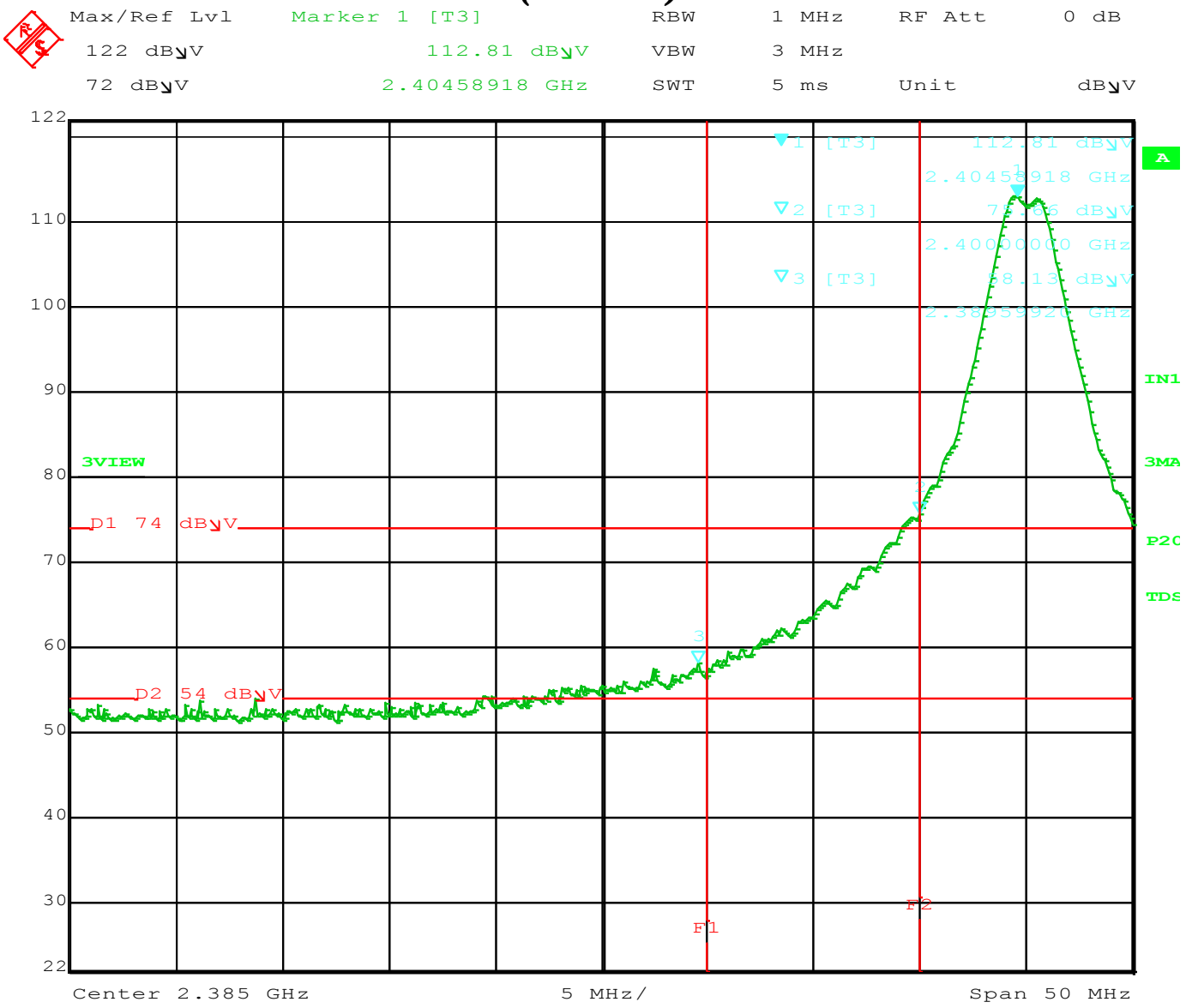
3 meter

LOWER BAND EDGE
(Horizontal)



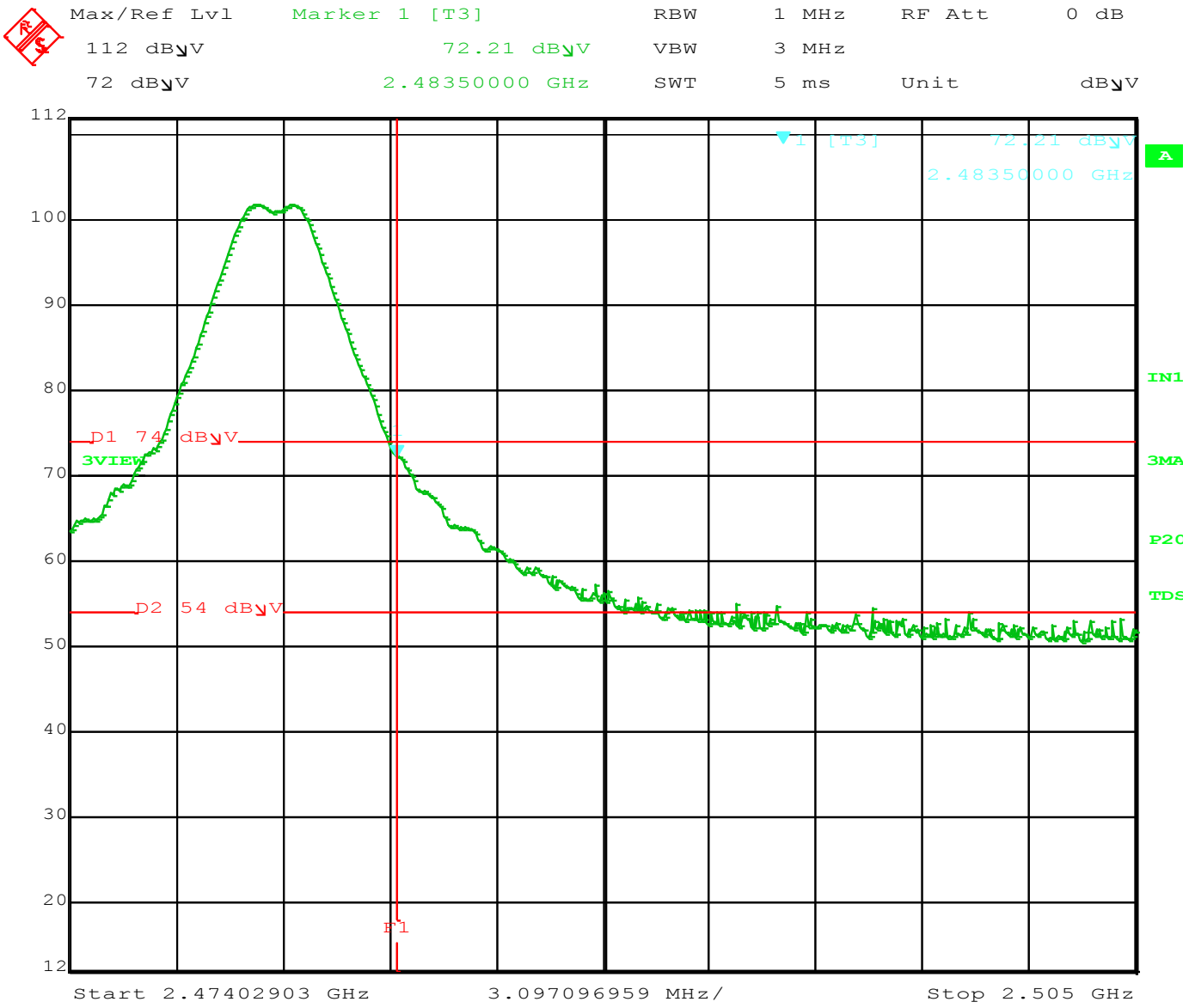
Title: HUSBZB-1.
Comment A: LBE, Horizontal.
Date: 3.JUN.2015 09:00:56

LOWER BAND EDGE
(Vertical)



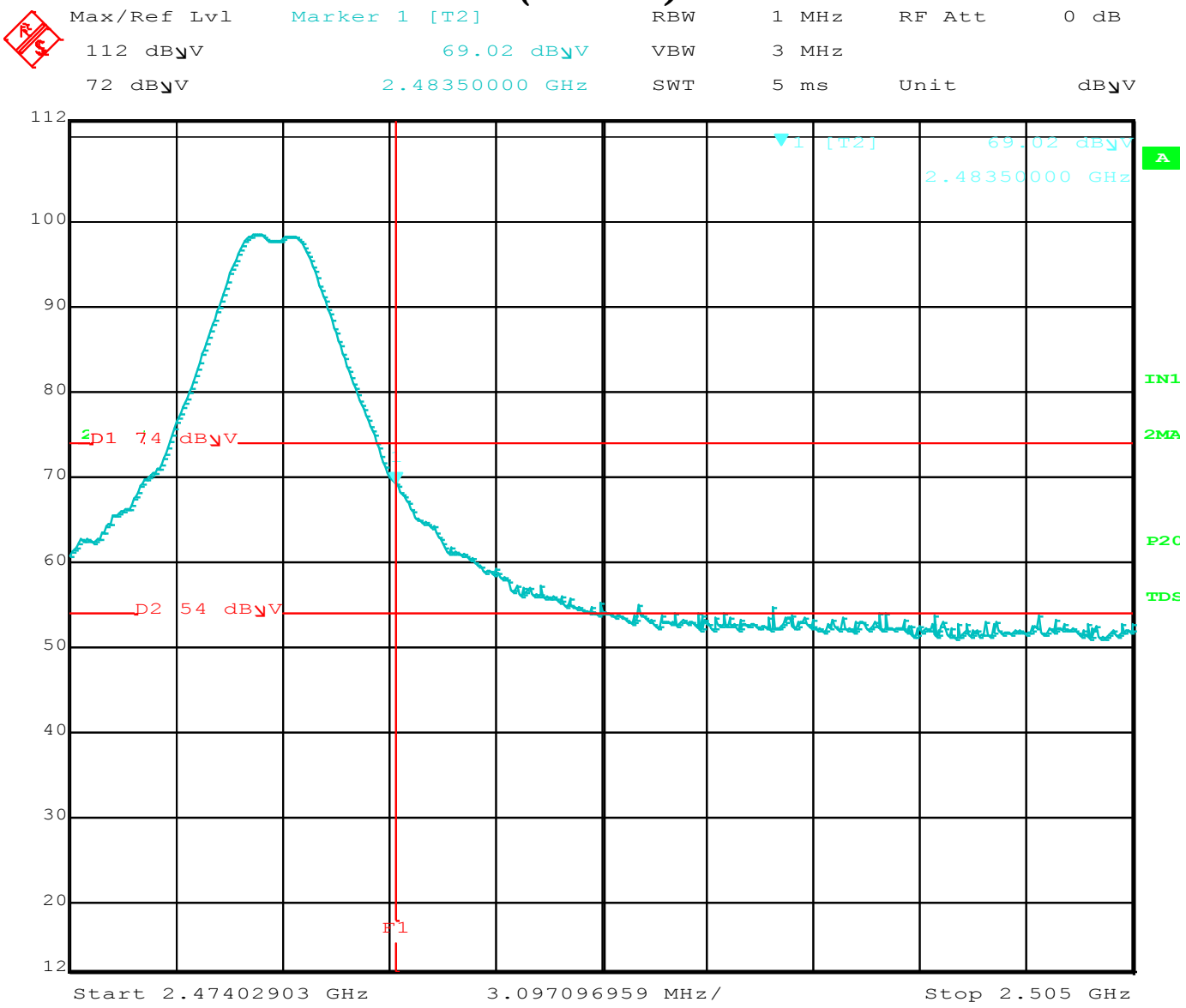
Title: HUSBZB-1.
Comment A: LBE, Vertical.
Date: 3.JUN.2015 09:05:28

UPPER BAND EDGE
(Horizontal)



Title: HUSBZB-1.
Comment A: UBE, Horizontal.
Date: 3.JUN.2015 08:37:12

UPPER BAND EDGE
(Vertical)



Title: HUSBZB-1.
Comment A: UBE, Vertical.
Date: 3.JUN.2015 08:38:06