

**FCC PART 15 SUBPART B & C
TEST REPORT***for***ELECTRONIC LOCK****Model: OHM ZIGBEE**

Prepared for

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Prepared by: _____

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DATE: JANUARY 9, 2014

	REPORT BODY	APPENDICES					TOTAL
		A	B	C	D	E	
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D	Diagrams, Factors, Charts, and Photos • Test Setup Diagrams • Antenna and Amplifier Factors • Radiated Emissions Photos
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FIGURE	TITLE
1	Plot Map And Layout of Test Site Below 1GHz
2	Plot Map And Layout of Test Site Above 1GHz



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: Electronic Lock
 Model: OHM ZigBee
 S/N: N/A

Product Description: The EUT is an electronic lock transmitting via ZigBee Protocol.

Modifications: The EUT was modified in order to comply with specifications. Please see the list of modifications in Appendix B.

Manufacturer: Kwikset HHI
 19701 DaVinci
 Foothill Ranch, CA 92610

Test Dates: January 6-9, 2014

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	The EUT does not connect to AC Mains; therefore this test was not performed.
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 15.247



1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Electronic Lock Model: OHM ZigBee. 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 section 15.109, & Subpart C sections 15.205, 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

Kwikset HHI

Chris Taylor Code & Compliance Program Manager

Compatible Electronics Inc.

Josh Hansen Lab Manager
Matt Harrison Test Technician
Jeff Klinger Director of Engineering

2.4 Date Test Sample was Received

The test sample was received on November 16th, 2012.

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 v03r01	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 Electronic Lock Model: OHM ZigBee (EUT) was setup in a tabletop configuration. The EUT was powered by 4-AA batteries. The EUT was continuously transmitting a data stream.

The 4-AA batteries were replaced with 4 new AA batteries; 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

There were no interconnecting cables.



5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT**5.1 EUT and Accessory List**

#	EQUIPMENT TYPE	MANU-FACTURER	MODEL	SERIAL NUMBER
1	ELECTRONIC LOCK(EUT)	KWIKSET HHI	OHM ZIGBEE	N/A
2	BATTERY	N/A	AA	N/A



5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Computer	Compatible Electronics	NONE	NONE	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100172	09/19/2013	09/19/2014
Antenna, Loop	Com Power	AL-130	121049	12/06/2013	12/06/2015
Antenna, CombiLog	Com Power	AC-220	25857	04/16/2013	04/16/2014
Antenna, Horn 1-18GHz	Com Power	AH-118	071250	07/03/2012	07/03/2014
Pre-Amp, 1-18GHz	Com Power	PAM-118	443013	04/08/2013	04/08/2014
Pre-Amp, 1-18GHz	Com Power	PAM-118	443014	04/08/2013	04/08/2014
Pre-Amp, 18-40GHz	Com Power	PA-840	181289	6/13/2013	6/13/2014
High Pass Filter	AMTI Microwave Circuits	H3G020G4	481230	06/07/2013	06/07/2014
Mast, Antenna Positioner	Sunol Science Corporation	TWR 95-4	020808-3	N/A	N/A
Antenna Mast	Sunol Science Corporation	TWR 95-4	020808-3	N/A	N/A
Turntable	Sunol Science Corporation	FM 2001	N/A	N/A	N/A
Mast and Turntable Controller	Sunol Science Corporation	SC104V	020808-1	N/A	N/A



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 Chip antenna located on the antenna board.



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

(This test was not performed)

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 does not connect to AC Mains; therefore this test was not performed.



8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The R&S 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 duty cycle average 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 automatic bandwidth measurement capability of the EMI Receiver was employed using the n dB bandwidth mode with n set to 6 dB. 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.



8.1.9 Duty Cycle

Duty Cycle Correction Factor = -18.72dB

$$\delta(\text{dB}) = 20 \log \left[\sum (nt_1 + mt_2 + \dots + \xi t_x) / T \right]$$

Where:

n is the number of pulses of duration t_1

m is the number of pulses of duration t_2

ξ is the number of pulses of duration t_x

T is the period of the pulse train or 100 ms if the pulse train length is greater than 100 ms

$$768\mu\text{s} \times 15.07840772 = 11580.21712896\mu\text{s}$$

$$11580.21712896\mu\text{s} = 11.58021712896\text{ms}$$

$$11.58021712896\text{ms} / 100\text{ms} = 0.1158021712896$$

$$20 \log (0.1158021712896) = -18.725665957\text{dB}$$

9. TEST PROCEDURE DEVIATIONS

The test procedures were not deviated from throughout all tests.

10. CONCLUSIONS

The Electronic Lock Model: OHM ZigBee meets all of the relevant specification requirements defined in the Code of Federal Regulations Title 47, Part 15 Subpart B section 15.109, & Subpart C sections 15.205, 15.209 and 15.247.



APPENDIX A***LABORATORY ACCREDITATIONS AND
RECOGNITIONS***

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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 and 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](http://www.ansica.org/wwwversion2/outside/ALLdirectoryDetails.asp?menuID=1&prgID=3&orgID=123&status=4)<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) 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) <https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm>

Compatible Electronics IC listing can be found at:

<http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home>

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APPENDIX B***MODIFICATIONS TO THE EUT***

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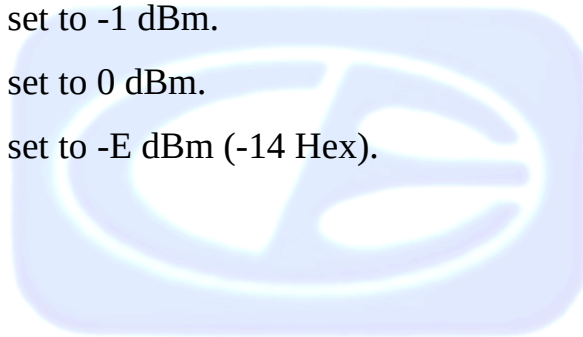
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MODIFICATIONS TO THE EUT

The following modifications were made to the EUT during the test in order to comply with FCC 15.205 & 15.209 limits for Harmonic Emissions in Restricted Bands. The modifications were made in such a way that they could be reproduced during manufacturing.

1. The following power levels were used to program the IC:
 - a. Channel 11 was set to 0 dBm.
 - b. Channel 15 was set to -1 dBm.
 - c. Channel 19 was set to 0 dBm.
 - d. Channel 20 was set to -1 dBm.
 - e. Channel 25 was set to 0 dBm.
 - f. Channel 26 was set to -E dBm (-14 Hex).



APPENDIX C***ADDITIONAL MODELS COVERED
UNDER THIS REPORT***

Brea Division
114 Olinda Drive
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19121 El Toro Road
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Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Electronic Lock
Model: OHM ZigBee
S/N: N/A

No additional models were tested.



APPENDIX D***DIAGRAMS, FACTORS, CHARTS, AND PHOTOS***

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

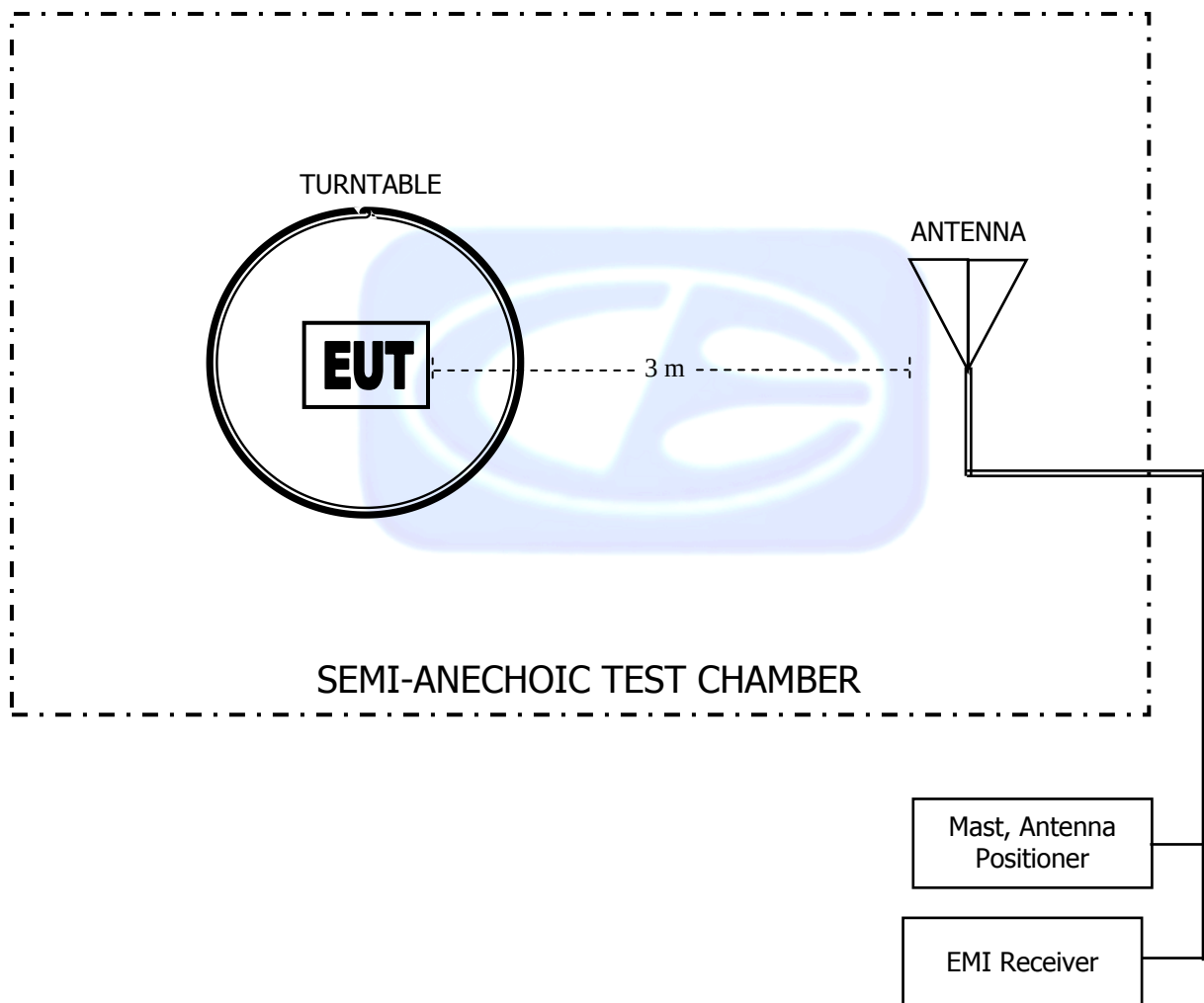
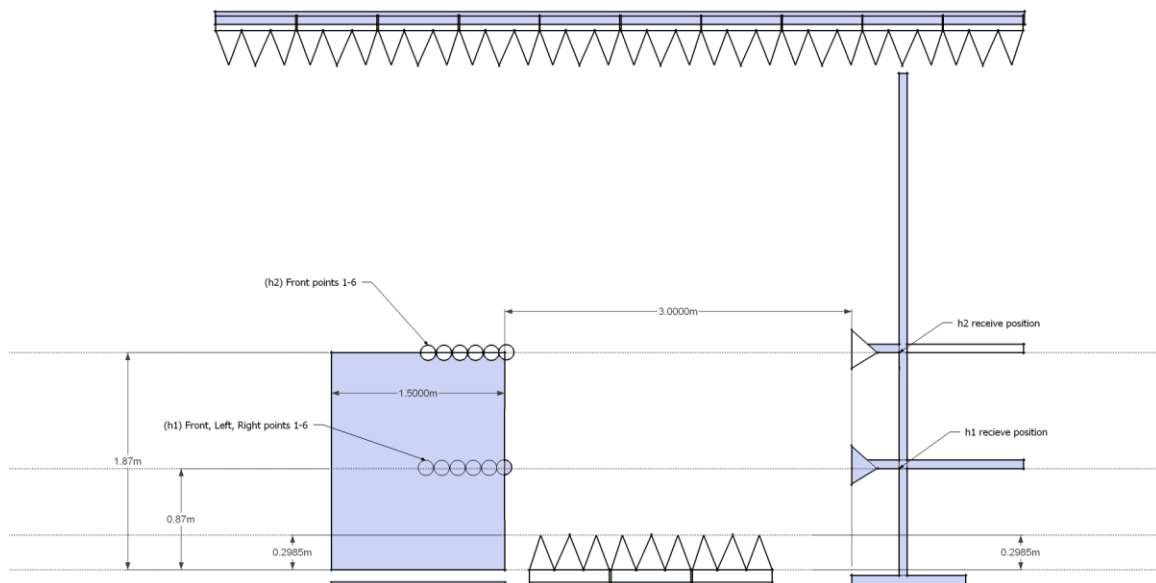


FIGURE 2: PLOT MAP AND LAYOUT OF TEST SITE ABOVE 1GHZ



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: APRIL 16, 2014**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	17.8	160	8.3
35	18.4	180	9.4
40	19.2	200	9.0
45	17.2	250	12.0
50	17.2	300	13.4
60	13.5	400	15.0
70	8.9	500	17.3
80	6.0	600	17.8
90	7.1	700	20.0
100	8.0	800	20.5
120	9.2	900	20.8
140	7.5	1000	22.4



COM-POWER AH-118**HORN ANTENNA****S/N: 071250****CALIBRATION DUE: JULY 3, 2015**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	26.5	9500	40.4
1500	27.2	10000	40.3
2000	31.5	10500	41.7
2500	31.9	11000	42.1
3000	32.7	11500	42.3
3500	34.0	12000	42.6
4000	33.5	12500	41.4
4500	34.9	13000	42.7
5000	36.2	13500	43.6
5500	36.6	14000	42.4
6000	36.8	14500	42.7
6500	37.4	15000	45.4
7000	39.4	15500	45.1
7500	39.6	16000	42.9
8000	42.4	16500	44.0
8500	40.3	17000	46.8
9000	39.6	17500	47.5
		18000	46.6



COM-POWER PAM-118**1-18GHz - PREAMPLIFIER****S/N: 443013****CALIBRATION DUE: APRIL 8, 2014**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
500	26.32	5500	25.55
1000	24.72	6000	25.54
1100	25.89	6500	24.57
1200	25.41	7000	23.51
1300	26.28	7500	23.59
1400	25.94	8000	23.32
1500	25.59	8500	22.76
1600	26.95	9000	23.15
1700	25.52	9500	24.41
1800	25.75	10000	25.71
1900	26.00	11000	26.07
2000	25.38	12000	26.17
2500	26.06	13000	24.72
3000	26.24	14000	23.19
3500	25.82	15000	25.42
4000	26.04	16000	25.07
4500	25.96	17000	24.24
5000	26.02	18000	24.92



COM-POWER PAM-118
1-18GHz - PREAMPLIFIER

S/N: 443014

CALIBRATION DUE: APRIL 8, 2014

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
500	26.75	5500	26.17
1000	25.15	6000	26.28
1100	26.17	6500	25.46
1200	25.85	7000	23.93
1300	26.75	7500	23.83
1400	26.27	8000	23.86
1500	26.09	8500	23.55
1600	27.23	9000	24.39
1700	26.08	9500	25.57
1800	26.24	10000	26.24
1900	26.50	11000	26.43
2000	25.99	12000	26.79
2500	26.86	13000	25.66
3000	27.13	14000	23.50
3500	26.87	15000	25.78
4000	26.75	16000	25.45
4500	26.94	17000	26.45
5000	26.87	18000	26.70



COM-POWER PA-840**18-40 GHz PREAMPLIFIER****S/N: 181289****CALIBRATION DUE: JUNE 13, 2014**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
18000	30.33	31500	29.12
19000	29.21	32000	28.84
20000	29.33	32500	28.04
21000	31.35	33000	28.72
22000	30.81	33500	28.09
23000	28.37	34000	27.91
24000	28.77	34500	27.87
25000	29.14	35000	27.82
26000	31.88	35500	27.70
26500	31.08	36000	25.38
27000	31.47	36500	27.82
27500	30.73	37000	27.45
28000	29.87	37500	27.62
28500	30.02	38000	28.40
29000	29.78	38500	29.00
29500	29.81	39000	30.33
30000	28.82	39500	31.43
30500	28.56	39999	29.61
31000	29.78		



**FRONT VIEW**

KWIKSET HHI
ELECTRONIC LOCK
Model: OHM ZIGBEE

FCC SUBPART B & C - RADIATED EMISSIONS < 1GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

**REAR VIEW**

KWIKSET HHI
ELECTRONIC LOCK
Model: OHM ZIGBEE

FCC SUBPART B & C - RADIATED EMISSIONS < 1GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

**FRONT VIEW**

KWIKSET HHI
ELECTRONIC LOCK
Model: OHM ZIGBEE

FCC SUBPART B & C - RADIATED EMISSIONS > 1GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

**REAR VIEW**

KWIKSET HHI
ELECTRONIC LOCK
Model: OHM ZIGBEE

FCC SUBPART B & C - RADIATED EMISSIONS > 1GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

APPENDIX E***RADIATED EMISSIONS DATA SHEETS***

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

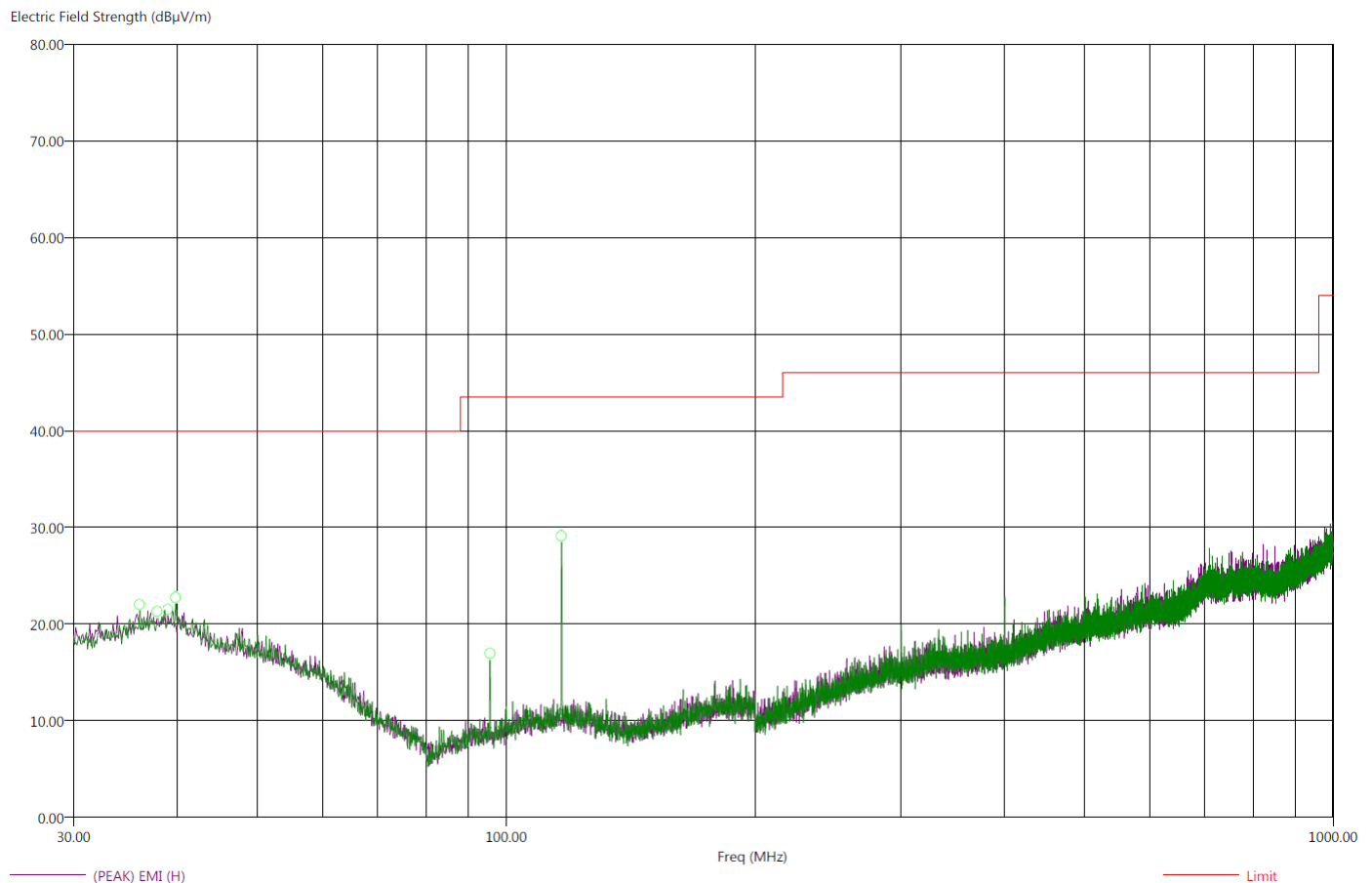
Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

Title: FCC 15.209
File: Radiated Pre-Scan 30-1000Mhz.set
Operator: Matt Harrison
EUT Type: Electronic Lock: OHM ZigBee.
EUT Condition: Transmitting 2405MHz (Worst Case).
Comments:
Temp: 74f
Hum: 34%
Battery Powered

1/9/2014 3:07:17 PM
Sequence: Preliminary Scan

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

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



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

Title: FCC 15.209
File: Radiated Final 30-1000Mhz.set
Operator: Matt Harrison
EUT Type: Electronic Lock: OHM ZigBee.
EUT Condition: Transmitting 2405MHz (Worst Case).
Comments:
Temp: 74f
Hum: 34%
Battery Powered

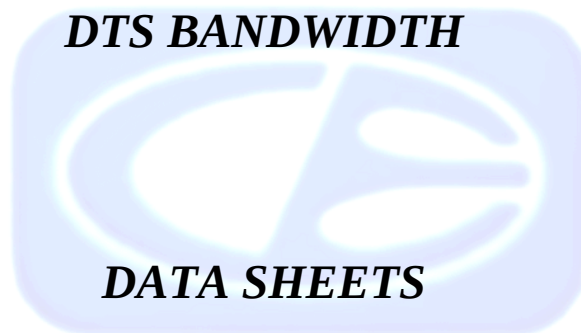
1/9/2014 3:29:32 PM
Sequence: Final Measurements

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

Freq (MHz)	(QP) Margin (dB)	(QP) EMI (dB μ V/m)	(PEAK) EMI (dB μ V/m)	Limit (dB μ V/m)	Pol	Ttbl Agl (deg)	Twr Ht (cm)	Transducer (dB)	Cable(dB)
36.10	-24.74	15.26	20.57	40.00	V	356.25	237.01	18.60	1.09
37.90	-24.52	15.48	22.02	40.00	H	128.00	120.11	18.87	1.19
39.00	-24.29	15.71	21.49	40.00	H	0.00	139.28	19.04	1.25
39.90	-23.97	16.03	21.41	40.00	V	240.25	353.19	19.17	1.29
95.70	-38.49	5.03	10.66	43.52	V	63.25	200.29	7.63	0.68
116.80	-36.77	6.75	12.23	43.52	V	1.50	157.07	9.03	0.81

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



DTS BANDWIDTH**DATA SHEETS**

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

FCC 15.247Kwikset
Electronic Lock
Model: OHM ZigBeeDate: 1/9/2014
Lab: R
Tested By: M. Harrison

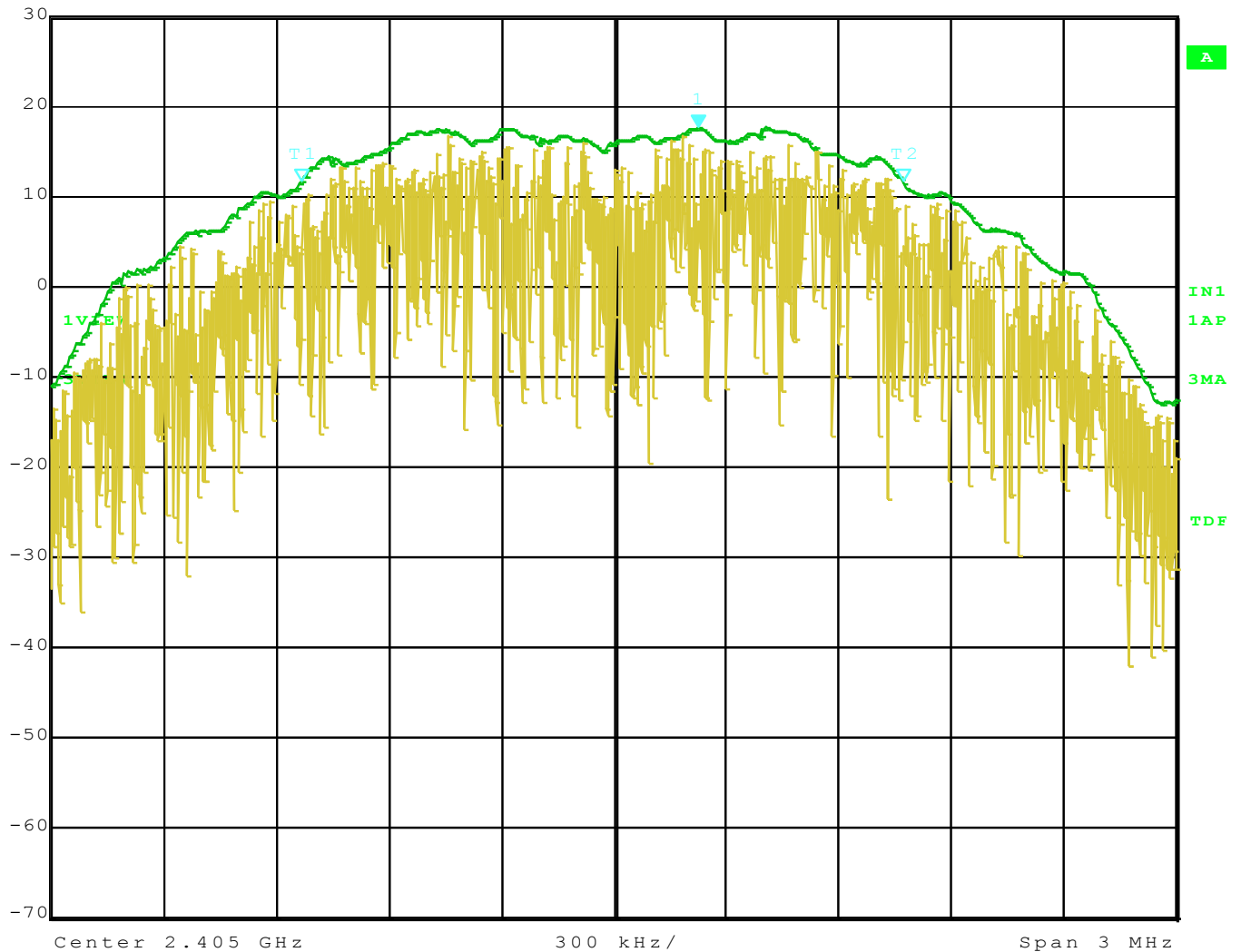
DTS Bandwidth

Freq. (GHz)	Bandwidth (kHz)	Minimum (kHz)	Margin (kHz)	Comments
2.405	1605.21	500.00	-1105.21	
2.425	1617.23	500.00	-1117.23	
2.445	1599.19	500.00	-1099.19	
2.450	1611.22	500.00	-1111.22	
2.475	1599.19	500.00	-1099.19	
2.480	1623.24	500.00	-1123.24	





Marker 1 [T3 ndB] RBW 100 kHz RF Att 60 dB
 Ref Lvl ndB 6.00 dB VBW 300 kHz
 30 dBm BW 1.60521042 MHz SWT 5 ms Unit dBm



Title: OHM ZigBee.
 Comment A: DTS Bandwidth, 2405MHz.
 Date: 9.JAN.2014 08:18:08



Brea Division
 114 Olinda Drive
 Brea, CA 92823
 (714) 579-0500

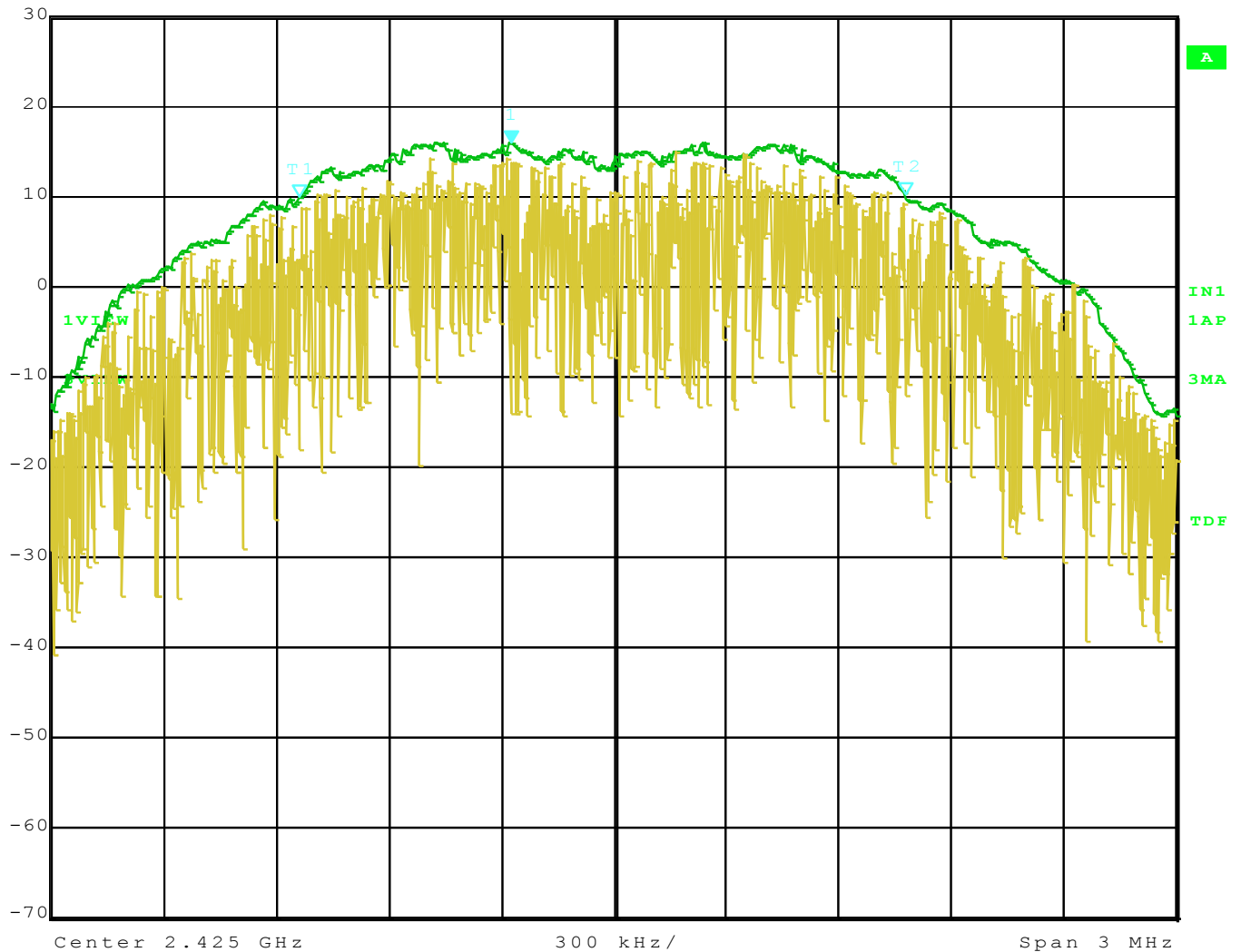
Agoura Division
 2337 Troutdale Drive
 Agoura, CA 91301
 (818) 597-0600

Silverado Division
 19121 El Toro Road
 Silverado, CA 92676
 (949) 589-0700

Lake Forest Division
 20621 Pascal Way
 Lake Forest, CA 92630
 (949) 587-0400



Marker 1 [T3 ndB] RBW 100 kHz RF Att 60 dB
Ref Lvl ndB 6.00 dB VBW 300 kHz
30 dBm BW 1.61723447 MHz SWT 5 ms Unit dBm



Title: OHM ZigBee.
Comment A: DTS Bandwidth, 2425MHz.
Date: 9.JAN.2014 08:44:15



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

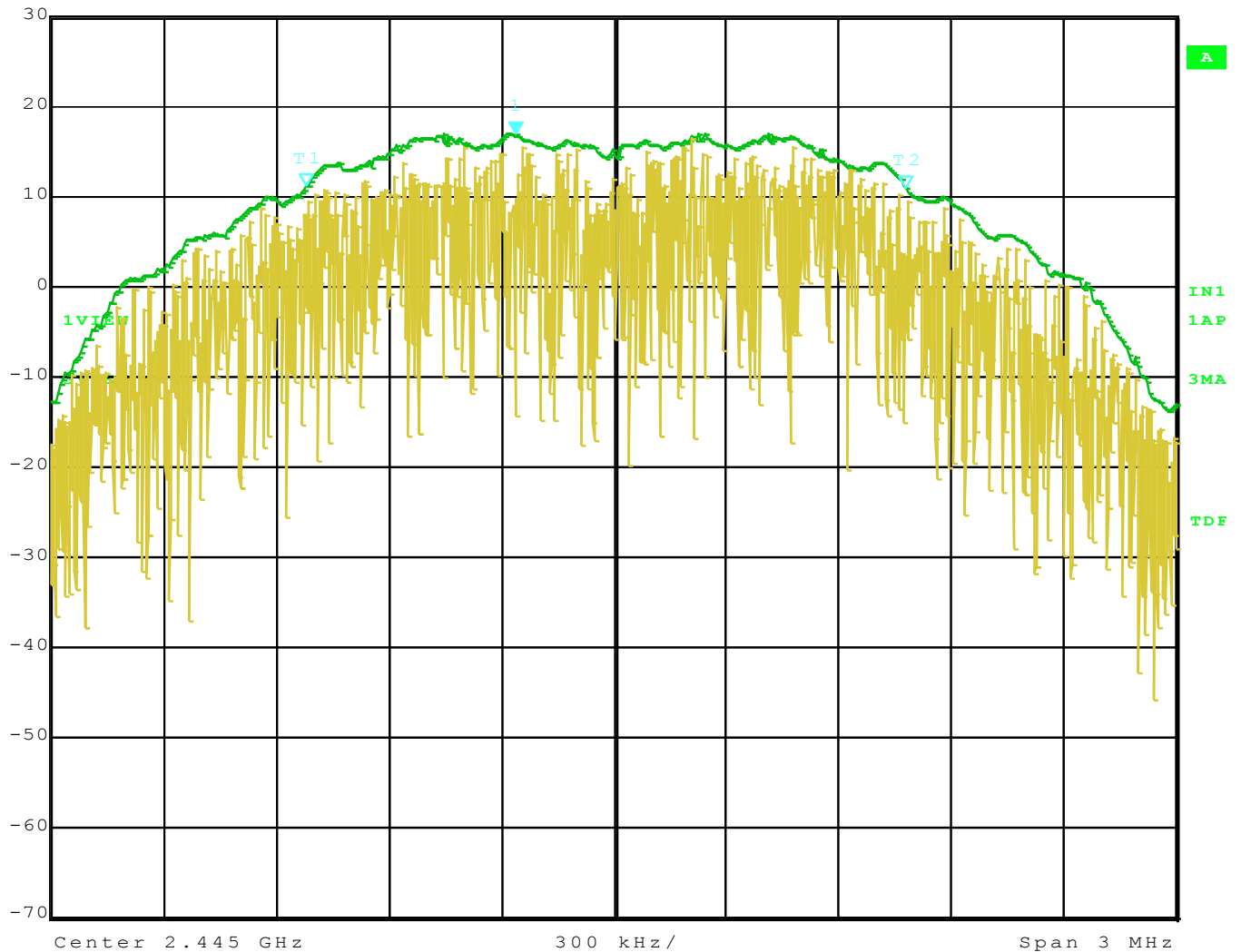
Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



Marker 1 [T3 ndB] RBW 100 kHz RF Att 60 dB
Ref Lvl ndB 6.00 dB VBW 300 kHz
30 dBm BW 1.59919840 MHz SWT 5 ms Unit dBm



Title: OHM ZigBee.
Comment A: DTS Bandwidth, 2445MHz.
Date: 9.JAN.2014 08:57:32



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

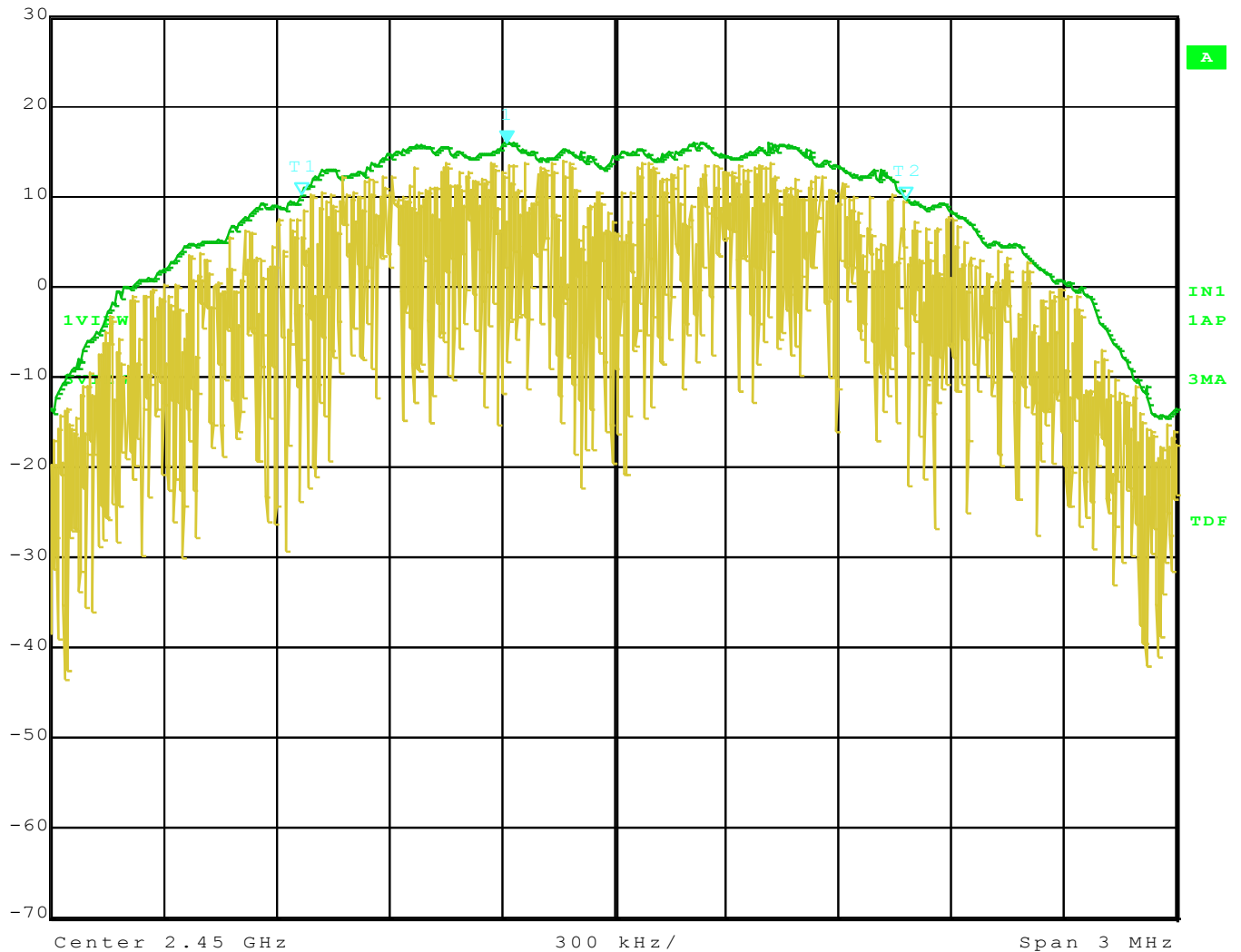
Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



Marker 1 [T3 ndB] RBW 100 kHz RF Att 60 dB
Ref Lvl ndB 6.00 dB VBW 300 kHz
30 dBm BW 1.61122244 MHz SWT 5 ms Unit dBm



Title: OHM ZigBee.
Comment A: DTS Bandwidth, 2450MHz.
Date: 9.JAN.2014 09:11:59



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

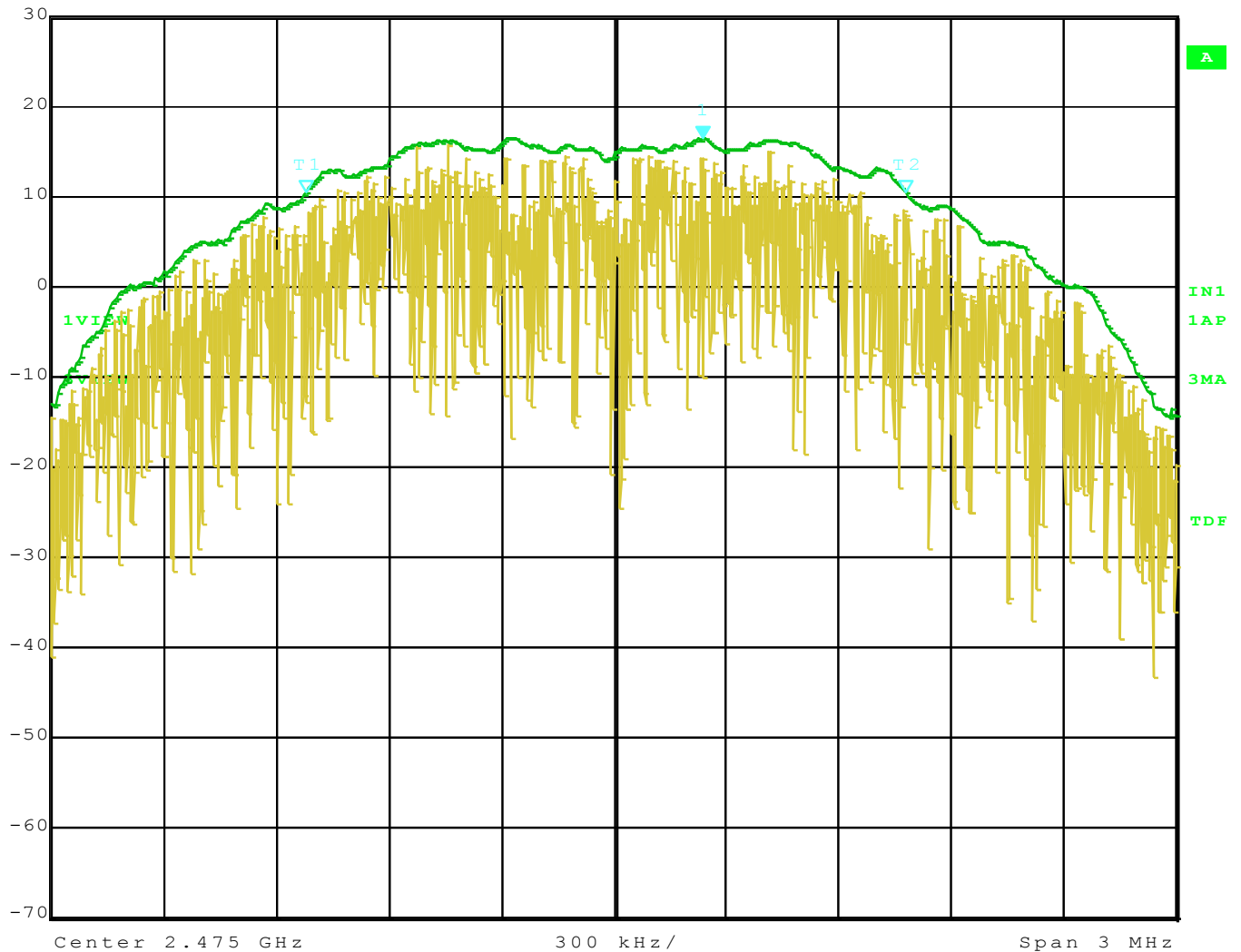
Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



Marker 1 [T3 ndB] RBW 100 kHz RF Att 60 dB
Ref Lvl ndB 6.00 dB VBW 300 kHz
30 dBm BW 1.59919840 MHz SWT 5 ms Unit dBm



Title: OHM ZigBee.
Comment A: DTS Bandwidth, 2475MHz.
Date: 9.JAN.2014 09:24:27



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

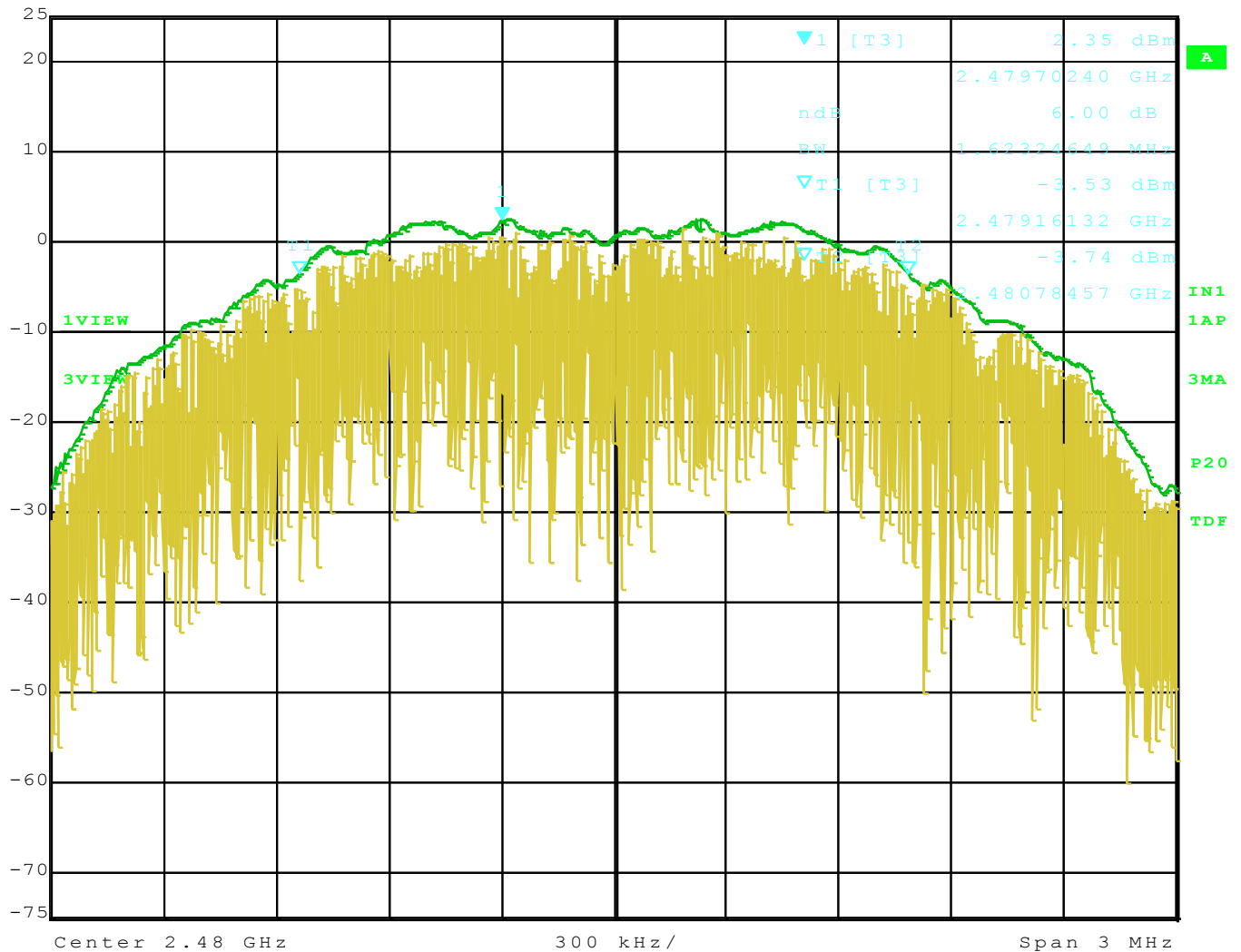
Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



Marker 1 [T3 ndB] RBW 100 kHz RF Att 60 dB
Ref Lvl ndB 6.00 dB VBW 300 kHz
25 dBm BW 1.62324649 MHz SWT 5 ms Unit dBm



Title: OHM ZigBee.
Comment A: DTS Bandwidth, 2480MHz.
Date: 6.JAN.2014 10:56:15



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

MAXIMUM PEAK CONDUCTED OUTPUT POWER
DATA SHEETS

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

MAXIMUM PEAK CONDUCTED OUTPUT POWER

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Date: 1/9/2014

Lab: R

Tested

By: M. Harrison

Freq. (GHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2.405	20.36	30.00	-9.64	Peak	
2.425	19.39	30.00	-10.61	Peak	
2.445	19.97	30.00	-10.03	Peak	
2.450	19.12	30.00	-10.88	Peak	
2.475	19.39	30.00	-10.61	Peak	
2.480	5.90	30.00	-24.10	Peak	



MAXIMUM PEAK POWER SPECTRAL DENSITY LEVEL IN THE FUNDAMENTAL EMISSION

DATA SHEETS



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

PEAK POWER SPECTRAL DENSITY

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Date: 1/9/2014

Lab: R

Tested

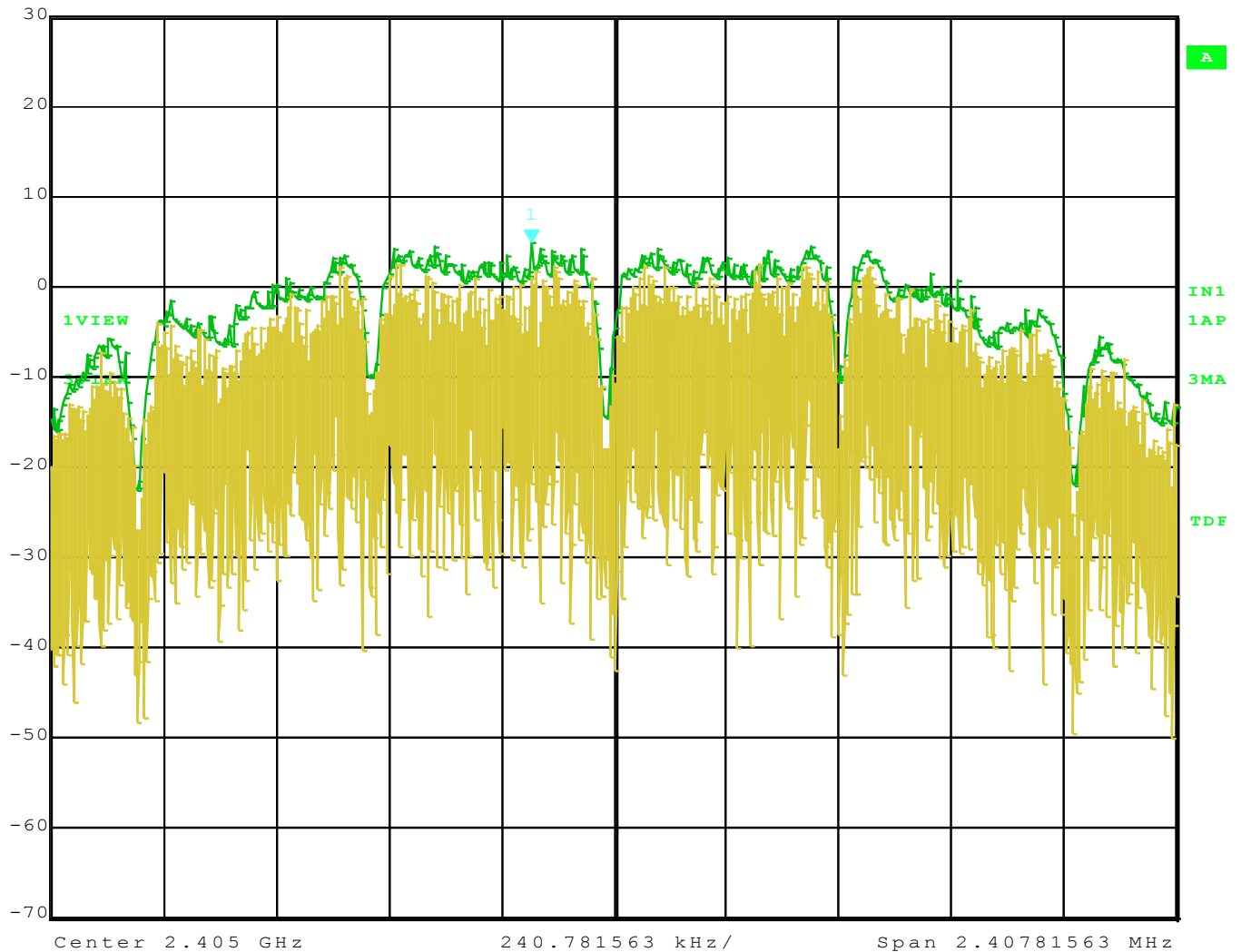
By: M. Harrison

Freq. (GHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Peak / QP / Avg	Comments
2.405	4.94	8.00	-3.06	Peak	
2.425	4.44	8.00	-3.56	Peak	
2.445	4.54	8.00	-3.46	Peak	
2.450	4.21	8.00	-3.79	Peak	
2.475	4.50	8.00	-3.50	Peak	
2.480	-9.45	8.00	-17.45	Peak	





Marker 1 [T3] RBW 3 kHz RF Att 60 dB
Ref Lvl 4.94 dBm VBW 10 kHz
30 dBm 2.40482388 GHz SWT 680 ms Unit dBm



Title: OHM ZigBee.
Comment A: Peak PSD, 2405MHz.
Date: 9.JAN.2014 08:21:31



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

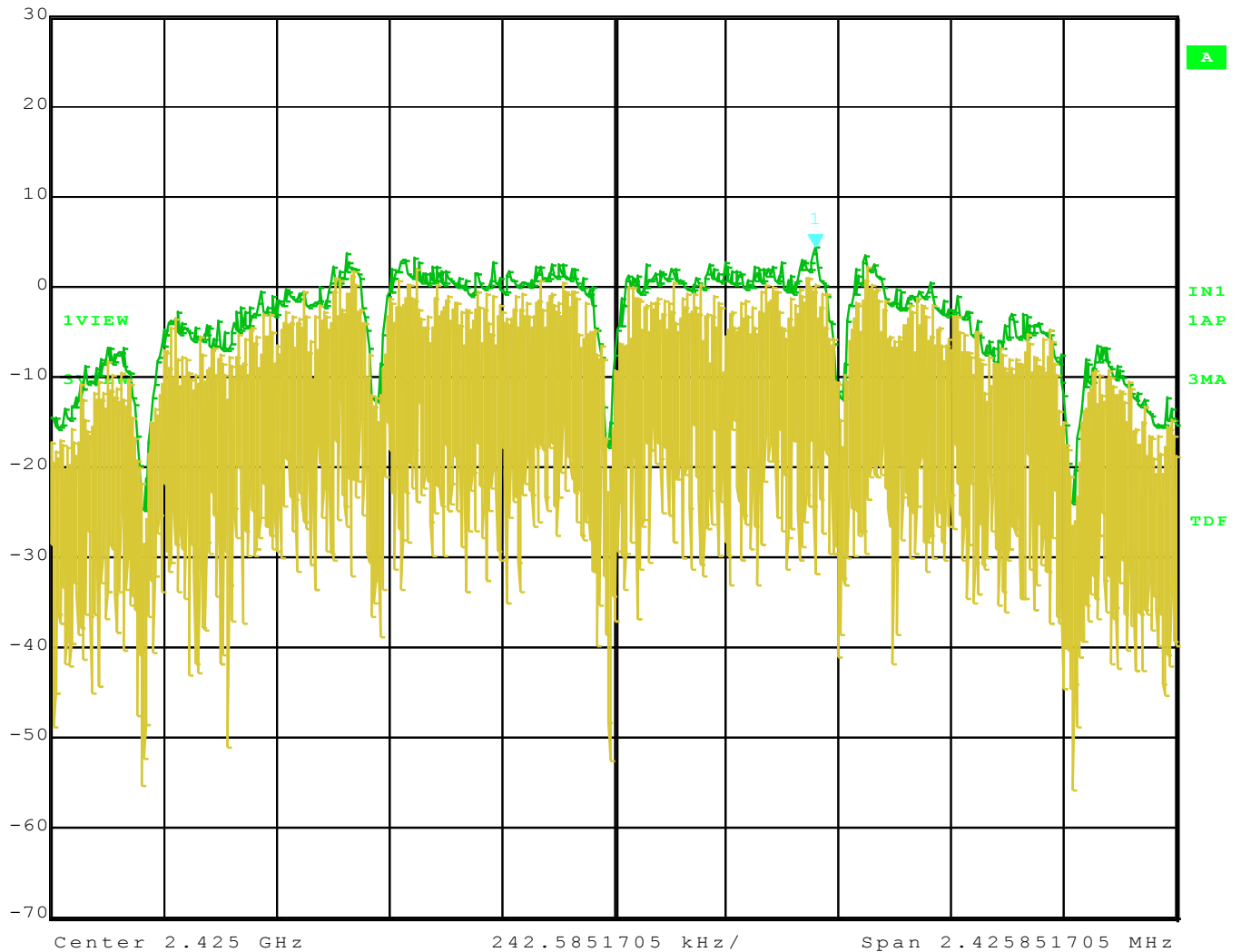
Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



Marker 1 [T3] RBW 3 kHz RF Att 60 dB
Ref Lvl 4.44 dBm VBW 10 kHz
30 dBm 2.42543510 GHz SWT 680 ms Unit dBm



Title: OHM ZigBee.
Comment A: Peak PSD, 2425MHz.
Date: 9.JAN.2014 08:45:56



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

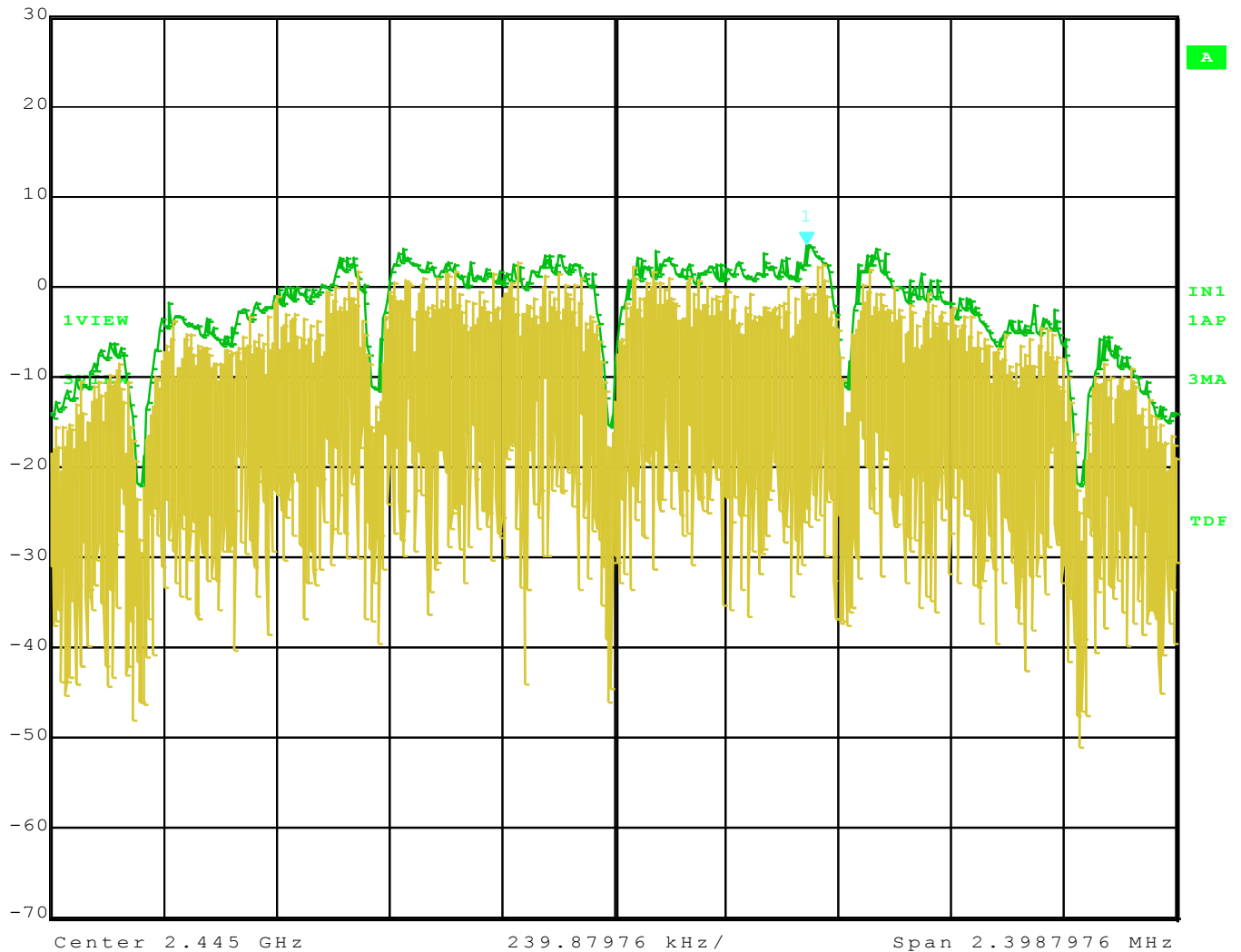
Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



Marker 1 [T3] RBW 3 kHz RF Att 60 dB
Ref Lvl 4.54 dBm VBW 10 kHz
30 dBm 2.44541102 GHz SWT 680 ms Unit dBm



Title: OHM ZigBee.
Comment A: Peak PSD, 2445MHz.
Date: 9.JAN.2014 08:59:20



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

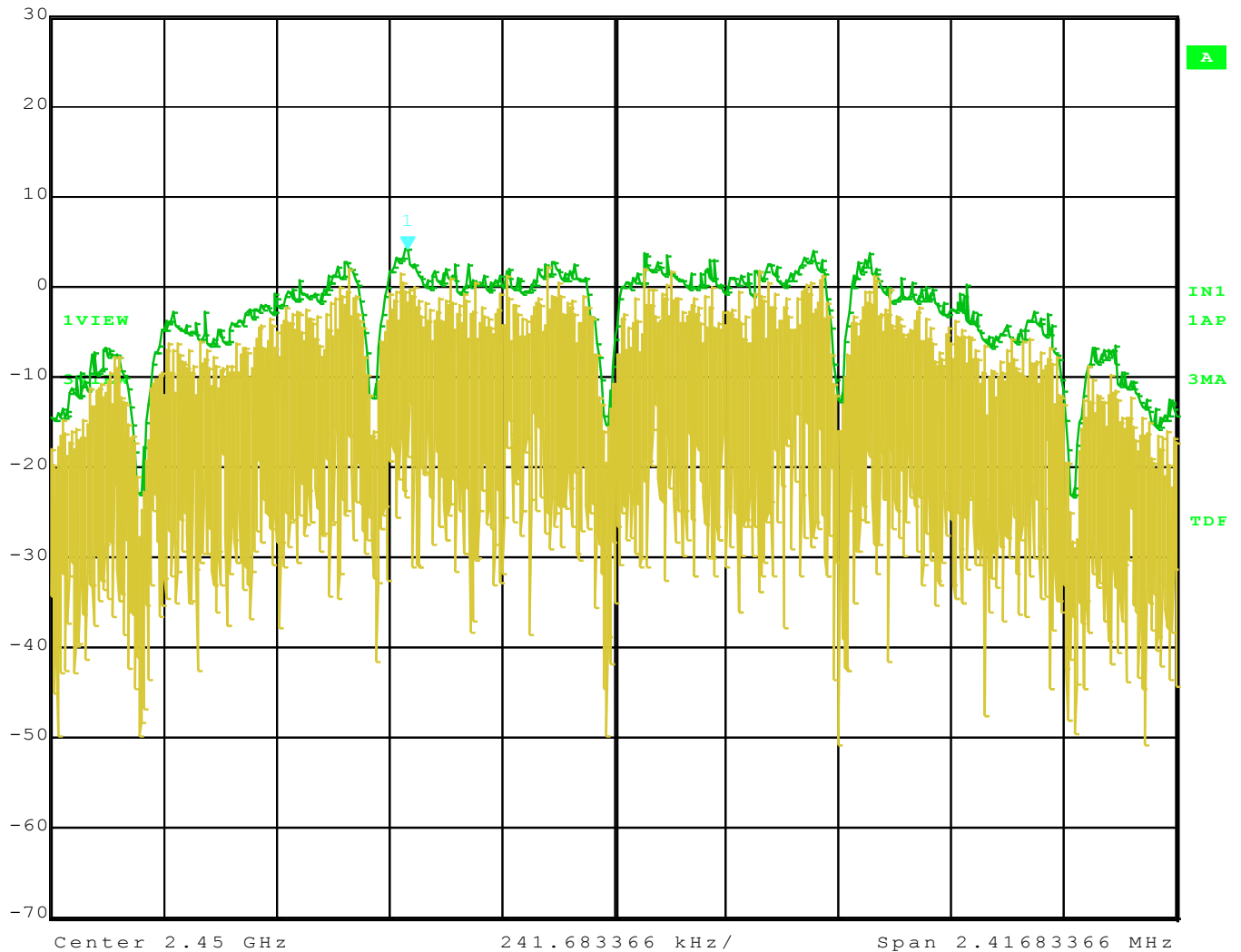
Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



Marker 1 [T3] RBW 3 kHz RF Att 60 dB
Ref Lvl 4.21 dBm VBW 10 kHz
30 dBm 2.44955683 GHz SWT 680 ms Unit dBm



Title: OHM ZigBee.
Comment A: Peak PSD, 2450MHz.
Date: 9.JAN.2014 09:14:33



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

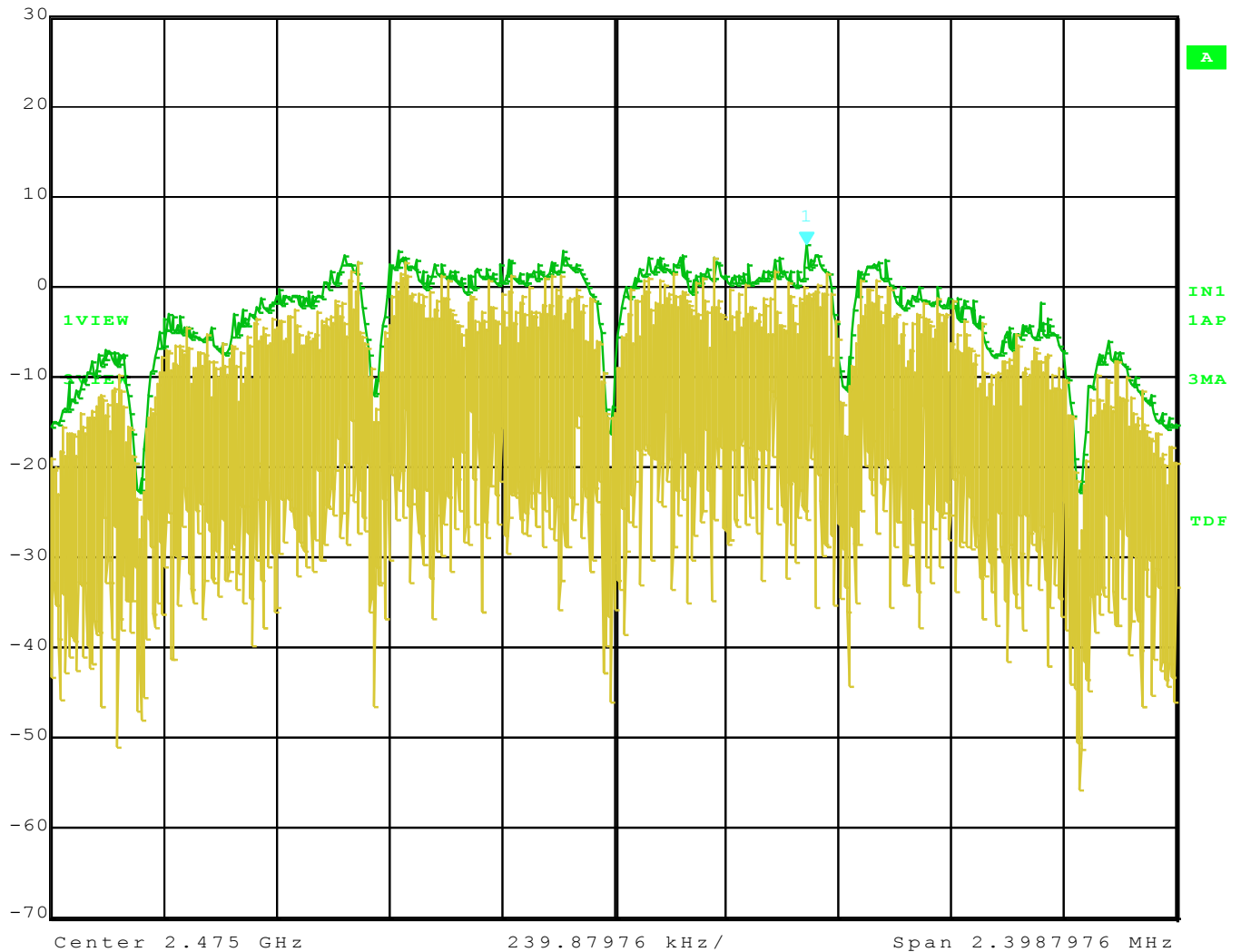
Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



Marker 1 [T3] RBW 3 kHz RF Att 60 dB
Ref Lvl 4.50 dBm VBW 10 kHz
30 dBm 2.47541102 GHz SWT 680 ms Unit dBm



Title: OHM ZigBee.
Comment A: Peak PSD, 2475MHz.
Date: 9.JAN.2014 09:32:20



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

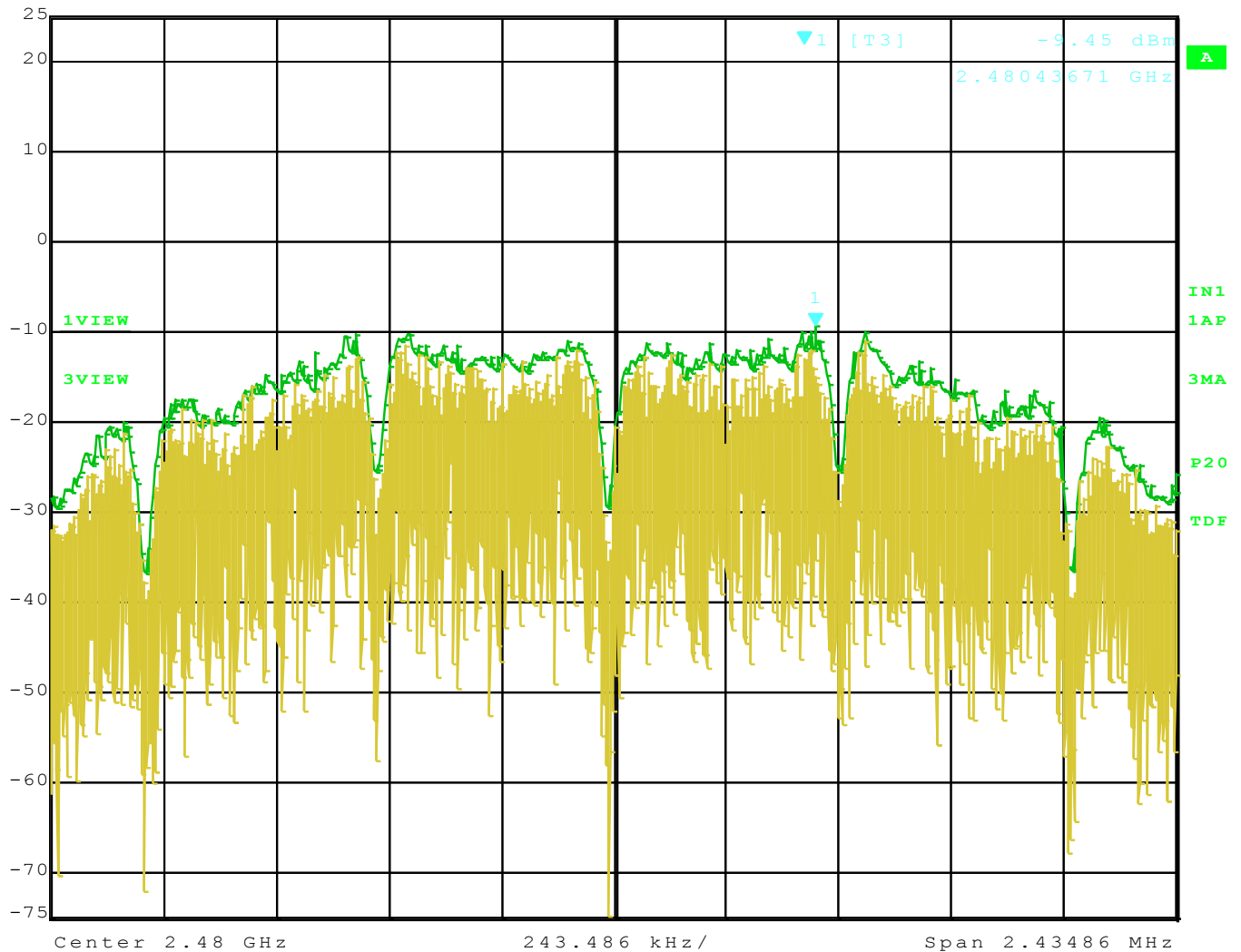
Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



Marker 1 [T3] RBW 3 kHz RF Att 60 dB
Ref Lvl -9.45 dBm VBW 10 kHz
25 dBm 2.48043671 GHz SWT 680 ms Unit dBm



Title: OHM ZigBee.
Comment A: Peak PSD, 2480MHz.
Date: 6.JAN.2014 10:58:17



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

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

DATA SHEETS



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

HARMONIC EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

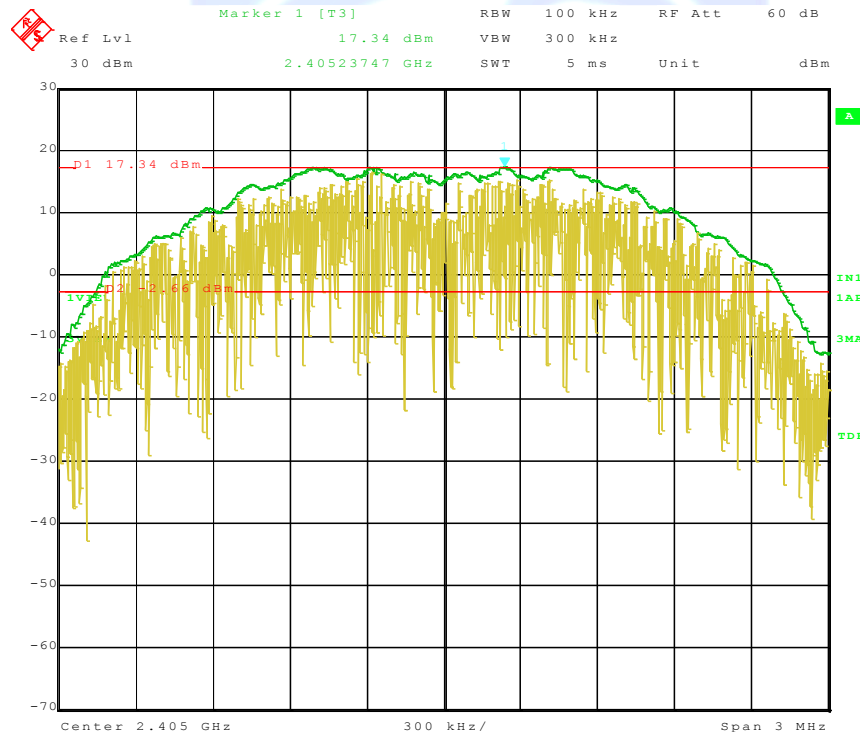
FCC 15.247

Kwikset
Electronic Lock
Model: OHM ZigBee

Date: 1/8/2014
Lab: R
Tested By: Matt Harrison

Freq. (MHz)	Level (dBm)	Measurement Type	Limit (dBm)	Margin	Peak / QP / Avg	Comments
7215	-44.00	Conducted	-2.66	-41.24	Peak	Channel 11
9620	-46.64	Conducted	-2.66	-43.98	Peak	Channel 11
9700	-47.59	Conducted	-2.66	-44.93	Peak	Channel 15

Reference Level Measurement



Title: OHM ZigBee.
Comment A: Emissions in Non Restricted Band Reference Level.
Date: 21.JAN.2014 08:53:38



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

***EMISSIONS IN RESTRICTED FREQUENCY BANDS (RADIATED
FIELD STRENGTH)***

DATA SHEETS



Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
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(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

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

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Duty Cycle Correction Factor: -18.72

Date: 1/8/2014

Lab: R

Tested By: Matt Harrison

Ch11**2405**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4810	67.04	V	73.98	-6.94	Peak	1.15	352	Restricted Band
4810	48.32	V	53.98	-5.66	Avg	1.15	352	3m Test Distance (dBuV)
12025	64.70	V	73.98	-9.28	Peak	1.7	341	Restricted Band
12025	45.98	V	53.98	-8.00	Avg	1.7	341	3m Test Distance (dBuV)
19240		V	--	--	Peak			Restricted Band
19240		V	--	--	Avg			No Emission Found



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

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Duty Cycle Correction Factor: -18.72

Date: 1/7/2014

Lab: R

Tested By: Matt Harrison

Low Channel**2405**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4810	68.30	H	73.98	-5.68	Peak	1.15	48	Restricted Band
4810	49.58	H	53.98	-4.40	Avg	1.15	48	3m Test Distance (dBuV/m)
12025	62.56	H	73.98	-11.42	Peak	1.35	30	Restricted Band
12025	43.84	H	53.98	-10.14	Avg	1.35	30	3m Test Distance (dBuV/m)
19240		H	--	--	Peak			Restricted Band
19240		H	--	--	Avg			No Emission Found



HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS (Channel 15-Vertical)

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Duty Cycle Correction Factor: -18.72

Date: 1/8/2014

Lab: R

Tested By: Matt Harrison

Ch. 15**2425**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4850	65.29	V	73.98	-8.69	Peak	1	0	Restricted Band
4850	46.57	V	53.98	-7.41	Avg	1	0	3m Test Distance (dBuV/m)
7275	71.82	V	73.98	-2.16	Peak	1.9	10	Restricted Band
7275	53.10	V	53.98	-0.88	Avg	1.9	10	3m Test Distance (dBuV/m)
12125	53.49	V	73.98	-20.49	Peak	1.3	353	Restricted Band
12125	34.77	V	53.98	-19.21	Avg	1.3	353	3m Test Distance (dBuV/m)
19400		V	--	--	Peak			Restricted Band
19400		V	--	--	Avg			No Emission Found



HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS (Channel 15-Horizontal)

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Duty Cycle Correction Factor: -18.72

Date: 1/8/2014

Lab: R

Tested By: Matt Harrison

Ch. 15**2425**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4850	60.85	H	73.98	-13.13	Peak	1	50	Restricted Band
4850	42.13	H	53.98	-11.85	Avg	1	50	3m Test Distance (dBuV/m)
7275	68.87	H	73.98	-5.11	Peak	1	40	Restricted Band
7275	50.15	H	53.98	-3.83	Avg	1	40	3m Test Distance (dBuV/m)
12125	53.58	H	73.98	-20.40	Peak	1.4	30	Restricted Band
12125	34.86	H	53.98	-19.12	Avg	1.4	30	3m Test Distance (dBuV/m)
19400		V	--	--	Peak			Restricted Band
19400		V	--	--	Avg			No Emission Found



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

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Duty Cycle Correction Factor: -18.72

Date: 1/8/2014

Lab: R

Tested By: Matt Harrison

Ch 19**2445**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4890	67.13	V	73.98	-6.85	Peak	1	20	Restricted Band
4890	48.41	V	53.98	-5.57	Avg	1	20	3m Test Distance (dBuV/m)
7335	72.25	V	73.98	-1.73	Peak	1.8	0	Restricted Band
7335	53.53	V	53.98	-0.45	Avg	1.8	0	3m Test Distance (dBuV/m)
12225		V	73.98	-73.98	Peak			Restricted Band
12225		V	53.98	-53.98	Avg			No Emission Found
14670		V	73.98	-73.98	Peak			Restricted Band
14670		V	53.98	-53.98	Avg			No Emission Found
19560		V	73.98	-73.98	Peak			Restricted Band
19560		V	53.98	-53.98	Avg			No Emission Found



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

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Duty Cycle Correction Factor: -18.72

Date: 1/8/2014

Lab: R

Tested By: Matt Harrison

Ch 19**2445**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4890	56.52	H	73.98	-17.46	Peak	1	50	Restricted Band
4890	37.80	H	53.98	-16.18	Avg	1	50	3m Test Distance (dBuV/m)
7335	69.10	H	73.98	-4.88	Peak	1	41	Restricted Band
7335	50.38	H	53.98	-3.60	Avg	1	41	3m Test Distance (dBuV/m)
12225		H	73.98	-73.98	Peak			Restricted Band
12225		H	53.98	-53.98	Avg			No Emission Found
14670		H	73.98	-73.98	Peak			Restricted Band
14670		H	53.98	-53.98	Avg			No Emission Found
19560		H	73.98	-73.98	Peak			Restricted Band
19560		H	53.98	-53.98	Avg			No Emission Found



HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS (Channel 20-Vertical)

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Duty Cycle Correction Factor: -18.72

Date: 1/8/2014

Lab: R

Tested By: Matt Harrison

Ch 20**2450**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4900	66.17	V	73.98	-7.81	Peak	1	0	Restricted Band
4900	47.45	V	53.98	-6.53	Avg	1	0	3m Test Distance (dBuV/m)
7350	71.66	V	73.98	-2.32	Peak	1.9	10	Restricted Band
7350	52.94	V	53.98	-1.04	Avg	1.9	10	3m Test Distance (dBuV/m)
12250		V	73.98	-73.98	Peak			Restricted Band
12250		V	53.98	-53.98	Avg			No Emission Found
19600		V	73.98	-73.98	Peak			Restricted Band
19600		V	53.98	-53.98	Avg			No Emission Found
22050		V	73.98	-73.98	Peak			Restricted Band
22050		V	53.98	-53.98	Avg			No Emission Found



HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS (Channel 20-Horizontal)

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Duty Cycle Correction Factor: -18.72

Date: 1/8/2014

Lab: R

Tested By: Matt Harrison

Ch 20**2450**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4900	58.08	H	73.98	-15.90	Peak	1	50	Restricted Band
4900	39.36	H	53.98	-14.62	Avg	1	50	3m Test Distance (dBuV/m)
7350	65.81	H	73.98	-8.17	Peak	1.23	38	Restricted Band
7350	47.09	H	53.98	-6.89	Avg	1.23	38	3m Test Distance (dBuV/m)
12250		H	73.98	-73.98	Peak			Restricted Band
12250		H	53.98	-53.98	Avg			No Emission Found
19600		H	73.98	-73.98	Peak			Restricted Band
19600		H	53.98	-53.98	Avg			No Emission Found
22050		H	73.98	-73.98	Peak			Restricted Band
22050		H	53.98	-53.98	Avg			No Emission Found



HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS (Channel 25-Vertical)

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Duty Cycle Correction Factor: -18.72

Date: 1/8/2014

Lab: R

Tested By: Matt Harrison

Ch.25**2475**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4950	66.17	V	73.98	-7.81	Peak	1.3	30	Restricted Band
4950	47.45	V	53.98	-6.53	Avg	1.3	30	3m Test Distance (dBuV/m)
7425	70.31	V	73.98	-3.67	Peak	1.37	324	Restricted Band
7425	51.59	V	53.98	-2.39	Avg	1.37	324	3m Test Distance (dBuV/m)
12375	54.13	V	73.98	-19.85	Peak	1.2	0	Restricted Band
12375	35.41	V	53.98	-18.57	Avg	1.2	0	3m Test Distance (dBuV/m)
19800		V	73.98	-73.98	Peak			Restricted Band
19800		V	53.98	-53.98	Avg			No Emission Found
22275		V	73.98	-73.98	Peak			Restricted Band
22275		V	53.98	-53.98	Avg			No Emission Found



HARMONIC EMISSIONS IN RESTRICTED FREQUENCY BANDS (Channel 25-Horizontal)

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Duty Cycle Correction Factor: -18.72

Date: 1/8/2014

Lab: R

Tested By: Matt Harrison

Ch.25**2475**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4950	63.71	H	73.98	-10.27	Peak	1	120	Restricted Band
4950	44.99	H	53.98	-8.99	Avg	1	120	3m Test Distance (dBuV/m)
7425	68.50	H	73.98	-5.48	Peak	1.3	50	Restricted Band
7425	49.78	H	53.98	-4.20	Avg	1.3	50	3m Test Distance (dBuV/m)
12375	52.14	H	73.98	-21.84	Peak	1	310	Restricted Band
12375	33.42	H	53.98	-20.56	Avg	1	310	3m Test Distance (dBuV/m)
19800		H	73.98	-73.98	Peak			Restricted Band
19800		H	53.98	-53.98	Avg			No Emission Found
22275		H	73.98	-73.98	Peak			Restricted Band
22275		H	53.98	-53.98	Avg			No Emission Found



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

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Duty Cycle Correction Factor: -18.72

Date: 1/7/2014

Lab: R

Tested By: Matt Harrison

Ch.26**2480**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	53.38	V	73.98	-20.60	Peak	1.5	0	Restricted Band
4960	34.66	V	53.98	-19.32	Avg	1.5	0	3m Test Distance (dBuV/m)
7440		V	73.98	-73.98	Peak			Restricted Band
7440		V	53.98	-53.98	Avg			No Emission Found
12400		V	73.98	-73.98	Peak			Restricted Band
12400		V	53.98	-53.98	Avg			No Emission Found
19840		V	73.98	-73.98	Peak			Restricted Band
19840		V	53.98	-53.98	Avg			No Emission Found
22320		V	73.98	-73.98	Peak			Restricted Band
22320		V	53.98	-53.98	Avg			No Emission Found



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

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Duty Cycle Correction Factor: -18.72

Date: 1/7/2014

Lab: R

Tested By: Matt Harrison

Ch.26**2480**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit (dBuV)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	49.82	H	73.98	-24.16	Peak	1.15	114	Restricted Band
4960	31.10	H	53.98	-22.88	Avg	1.15	114	3m Test Distance (dBuV/m)
7440		H	73.98	-73.98	Peak			Restricted Band
7440		H	53.98	-53.98	Avg			No Emission Found
12400		H	73.98	-73.98	Peak			Restricted Band
12400		H	53.98	-53.98	Avg			No Emission Found
19840		H	73.98	-73.98	Peak			Restricted Band
19840		H	53.98	-53.98	Avg			No Emission Found
22320		H	73.98	-73.98	Peak			Restricted Band
22320		H	53.98	-53.98	Avg			No Emission Found



***EMISSIONS RADIATED OUTSIDE OF THE FUNDAMENTAL
FREQUENCY BAND AT BAND EDGES
DATA SHEETS***



Brea Division
114 Olinda Drive
Brea, CA 92823
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Agoura Division
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Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

BAND EDGES- VERTICAL

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Duty Cycle Correction Factor: -18.72

Date: 1/8/2014

Lab: R

Test ENG: Matt 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		V	--	--	Peak			Fundamental of Low Channel
2405		V	--	--	Avg			@ 3 meters
2390	53.98	V	73.98	-20.00	Peak	1.62	173	No Marker Delta Method
2390	35.26	V	53.98	-18.72	Avg	1.62	173	Method Used
2475		V	--	--	Peak			Fundamental of Channel 25
2475		V	--	--	Avg			@ 3 meters
2483.5	63.87	V	73.98	-10.11	Peak	1.4	360	No Marker Delta Method
2483.5	45.15	V	53.98	-8.83	Avg	1.4	360	Method Used
2480		V	--	--	Peak			Fundamental of Channel 26
2480		V	--	--	Avg			@ 3 meters
2483.5	65.80	V	73.98	-8.18	Peak	1.4	360	No Marker Delta Method
2483.5	47.08	V	53.98	-6.90	Avg	1.4	360	Method Used

Test distance

3 meter



BAND EDGES- HORIZONTAL

FCC 15.247

Kwikset

Electronic Lock

Model: OHM ZigBee

Duty Cycle Correction Factor: -18.72

Date: 1/8/2014

Lab: R

Test ENG: Matt Harrison

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

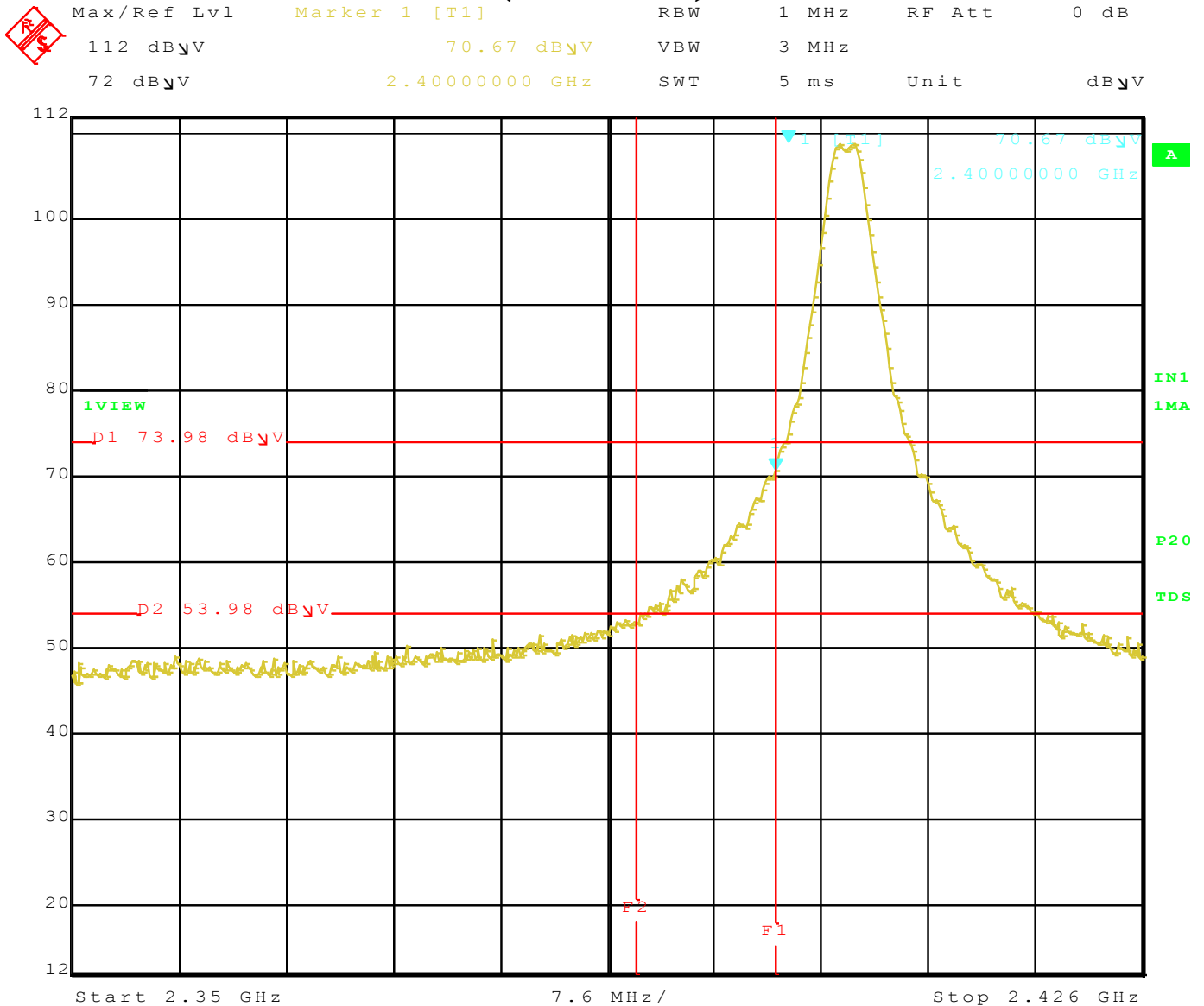
Freq. (MHz)	Level (dBµV/m)	Pol	Limit (dBµV)	Margin (dB)	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2405		H	--	--	Peak			Fundamental of Low Channel
2405		H	--	--	Avg			@ 3 meters
2390	53.70	H	73.98	-20.28	Peak	1	26	No Marker Delta Method
2390	34.98	H	53.98	-19.00	Avg	1	26	Method Used
2475		H	--	--	Peak			Fundamental of Channel 25
2475		H	--	--	Avg			@ 3 meters
2483.5	59.65	H	73.98	-14.33	Peak	1.25	36	No Marker Delta Method
2483.5	40.93	H	53.98	-13.05	Avg	1.25	36	Method Used
2480		H	--	--	Peak			Fundamental of Channel 26
2480		H	--	--	Avg			@ 3 meters
2483.5	62.98	H	73.98	-11.00	Peak	1	20	No Marker Delta Method
2483.5	44.26	H	53.98	-9.72	Avg	1	20	Method Used

Test distance

3 meter

**Brea Division**
114 Olinda Drive
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(818) 597-0600**Silverado Division**
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700**Lake Forest Division**
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

LOWER BAND EDGE (Horizontal)



Title: OHM ZigBee.

Comment A: Lower Band Edge, Ch.11, 2405MHz, Horizontal.

Date: 8.JAN.2014 16:00:16



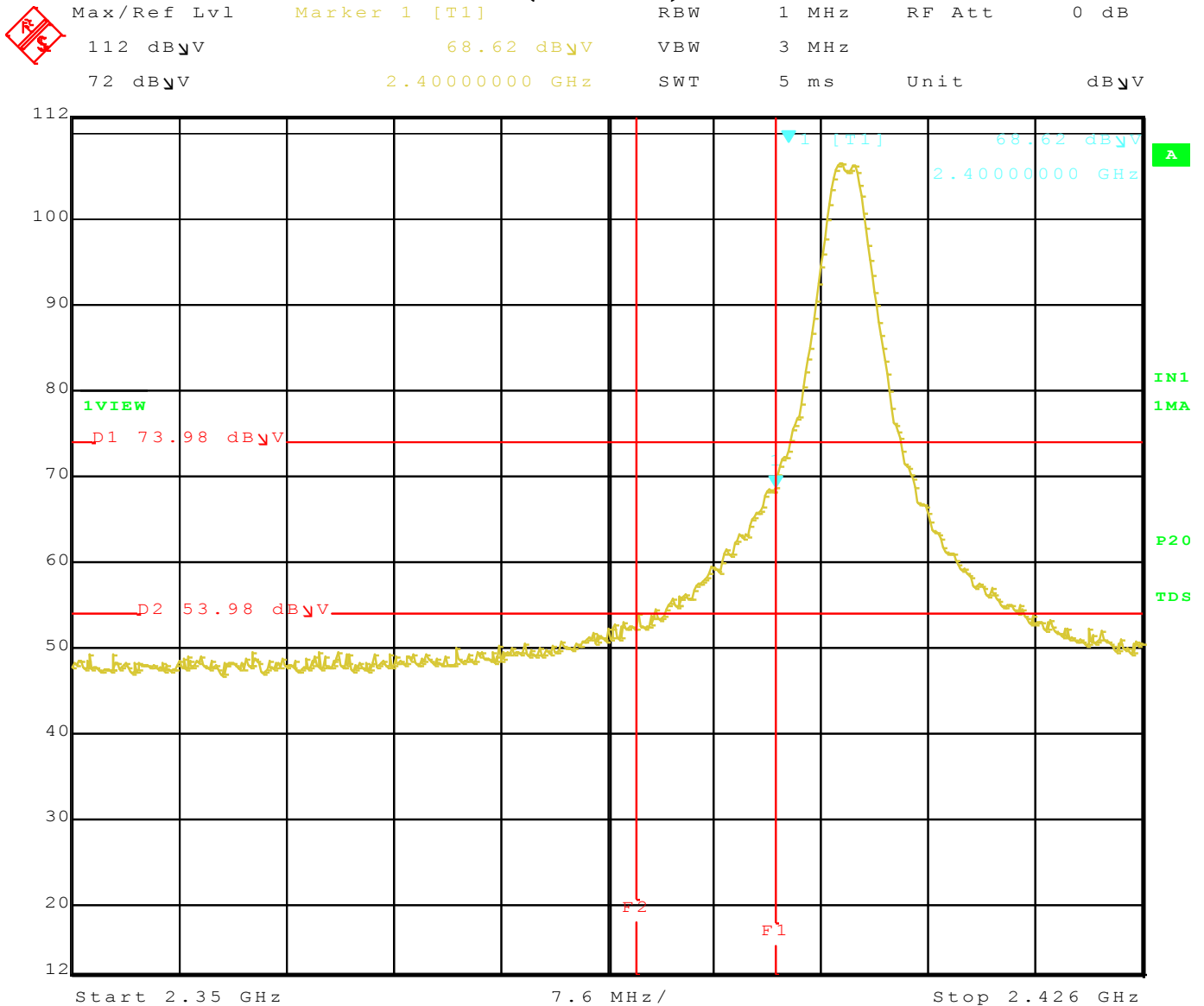
Brea Division
114 Olinda Drive
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Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
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(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

LOWER BAND EDGE (Vertical)



Title: OHM ZigBee.

Comment A: Lower Band Edge, Ch.11, 2405MHz, Vertical.

Date: 8.JAN.2014 16:04:19



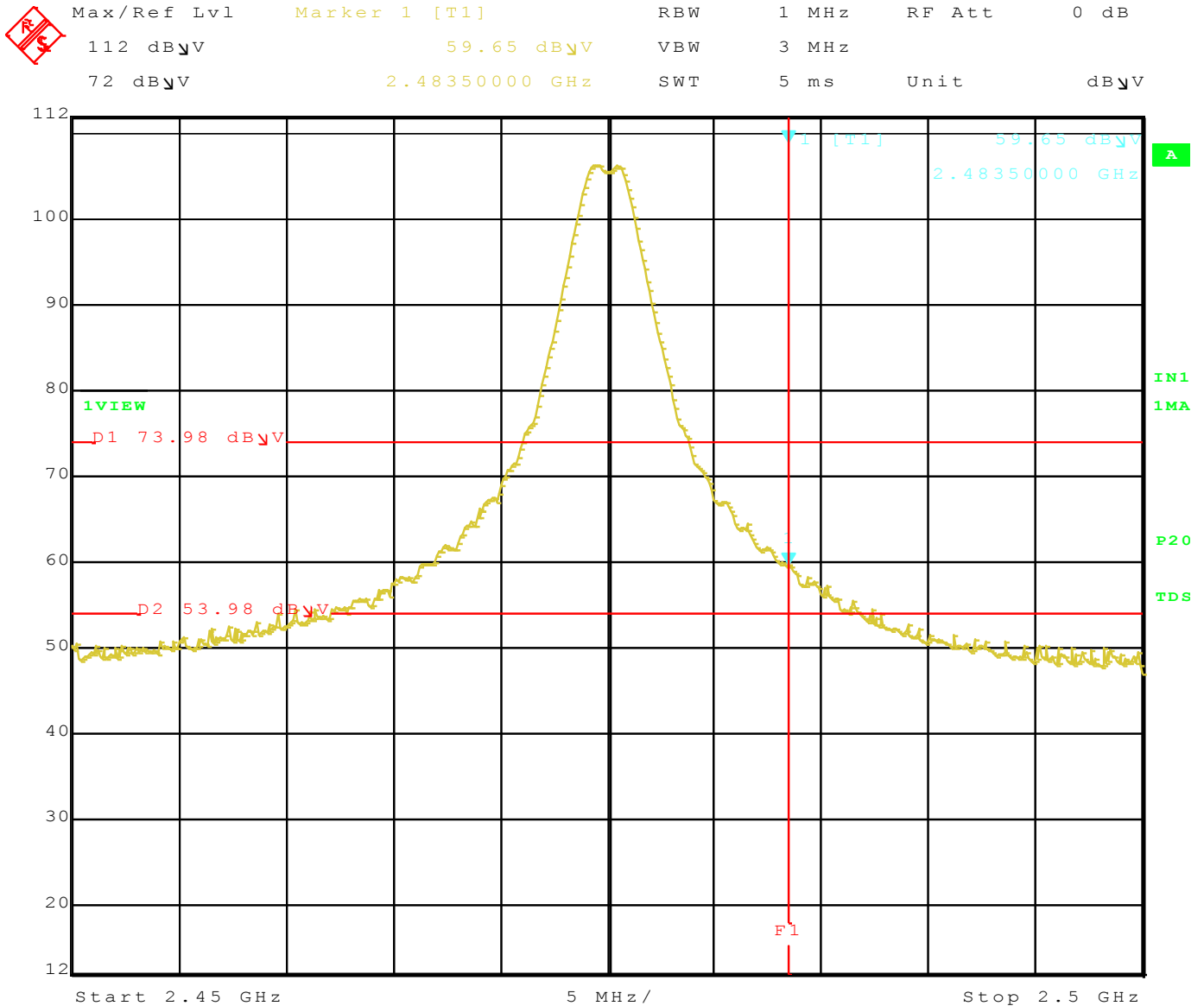
Brea Division
114 Olinda Drive
Brea, CA 92823
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Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
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Silverado Division
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(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

UPPER BAND EDGE CH 25 (Horizontal)



Title: OHM ZigBee.

Comment A: Upper Band Edge, Ch.25, 2475MHz, Horizontal.

Date: 8.JAN.2014 15:34:46



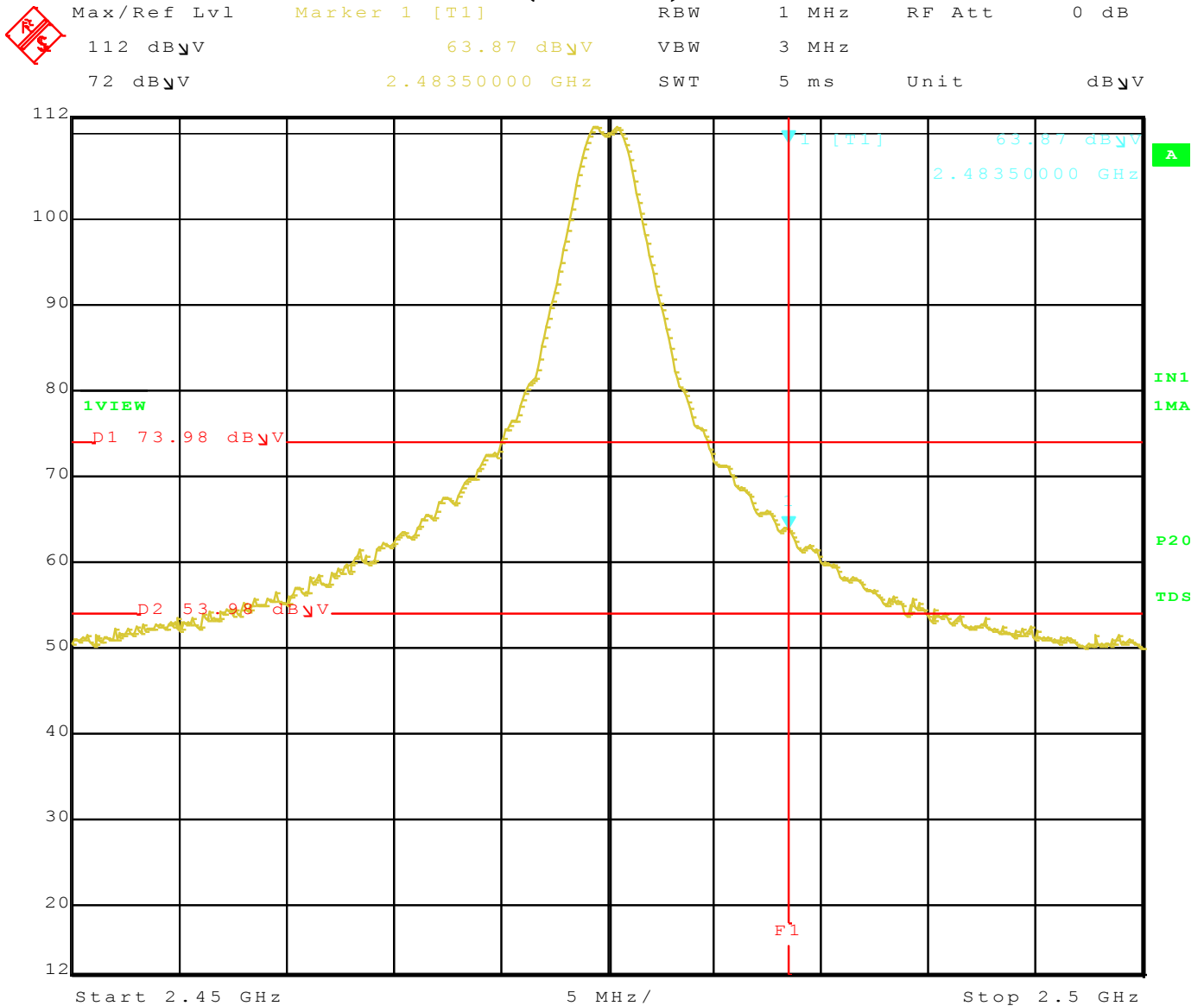
Brea Division
114 Olinda Drive
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Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
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Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

UPPER BAND EDGE CH 25 (Vertical)



Title: OHM ZigBee.

Comment A: Upper Band Edge, Ch.25, 2475MHz, Vertical.

Date: 8.JAN.2014 15:37:00



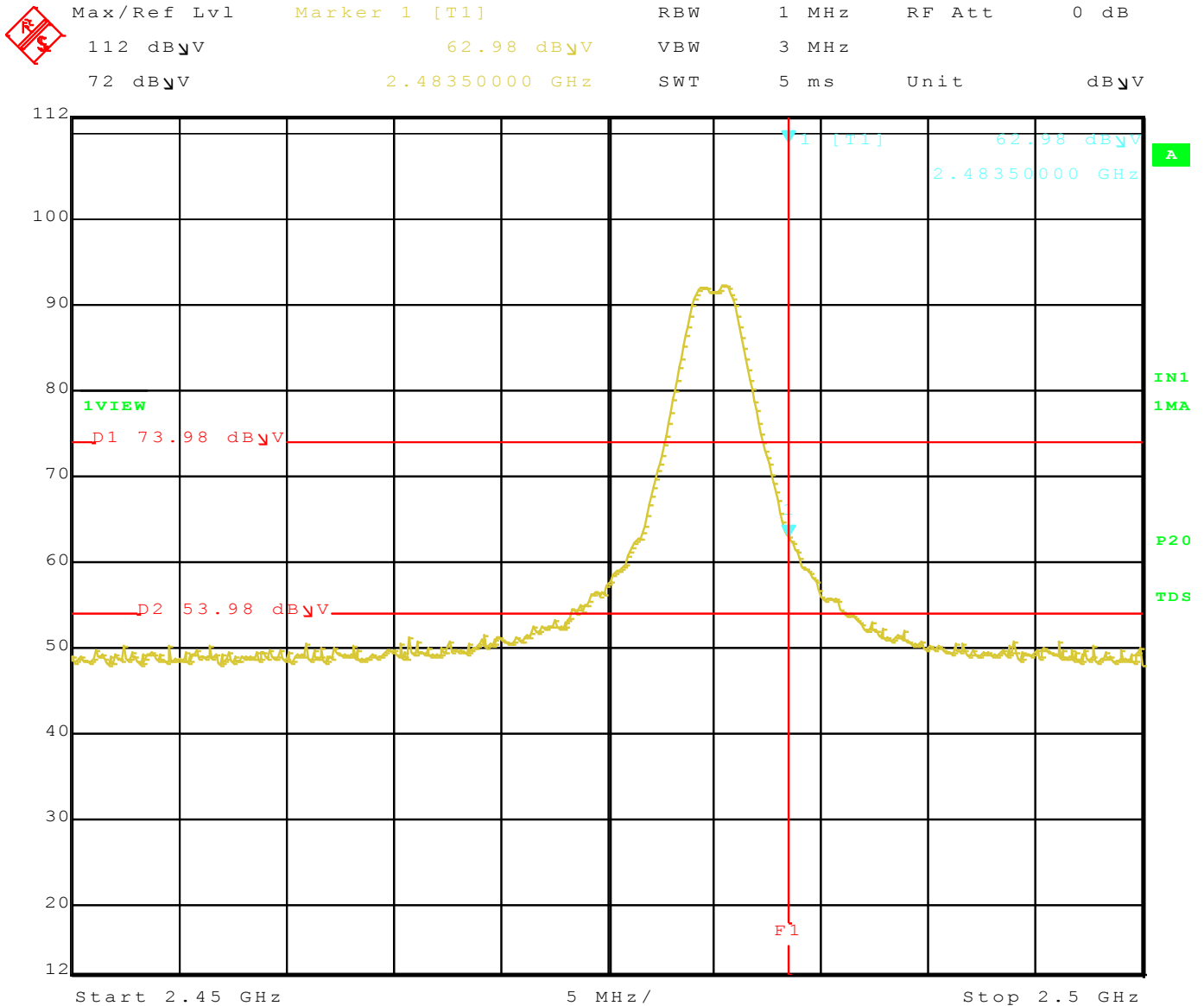
Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
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(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

UPPER BAND EDGE CH 26 (Horizontal)



Title: OHM ZigBee.

Comment A: Upper Band Edge, Ch.26, 2480MHz, Horizontal.

Date: 8.JAN.2014 16:16:21



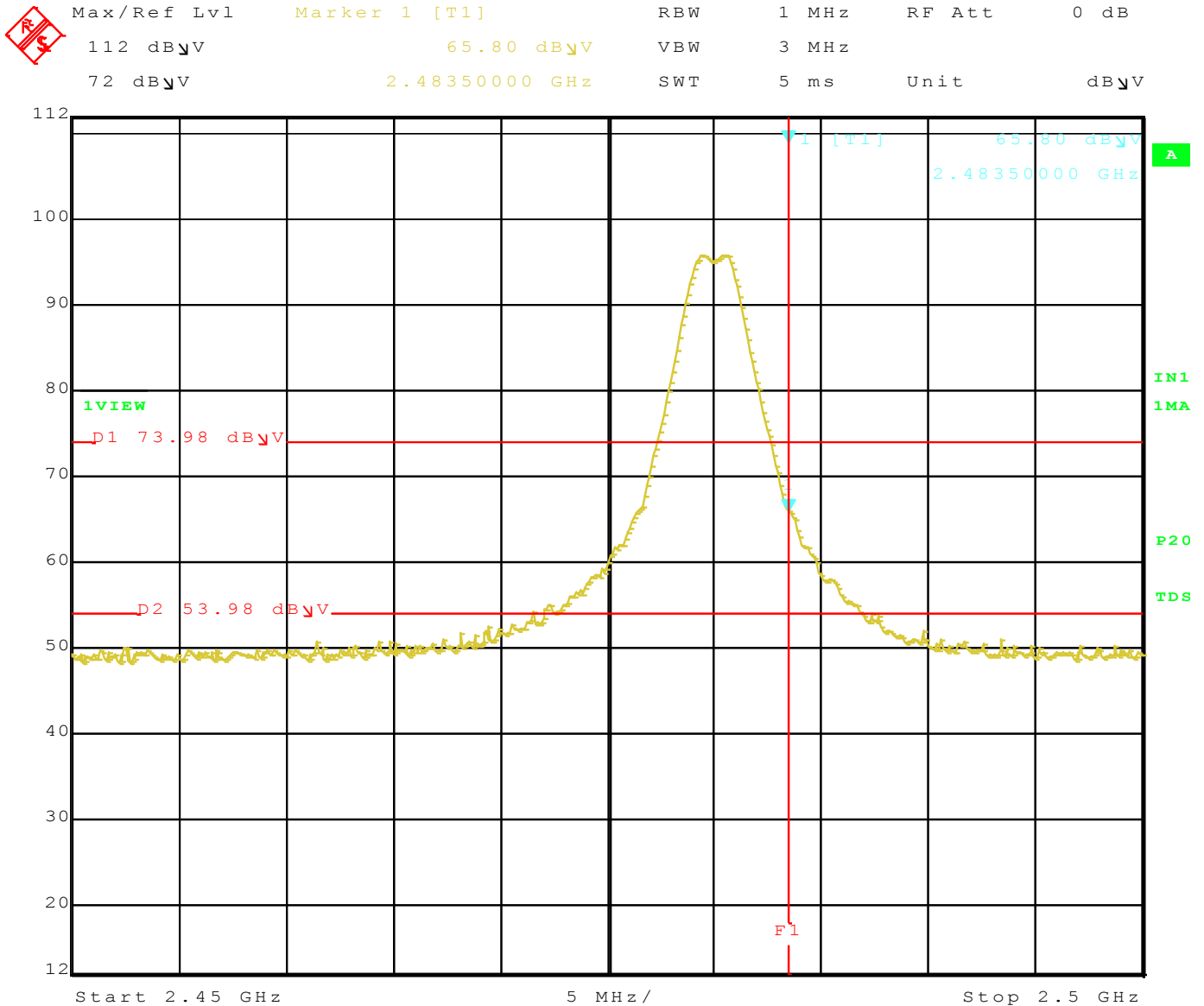
Brea Division
114 Olinda Drive
Brea, CA 92823
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Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

UPPER BAND EDGE CH 26 (Vertical)



Title: OHM ZigBee.

Comment A: Upper Band Edge, Ch.26, 2480MHz, Vertical.

Date: 8.JAN.2014 16:19:09



Brea Division
114 Olinda Drive
Brea, CA 92823
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