FCC PART 15, SUBPART B and C
TEST REPORT

for

EASYTOUCH WIRELESS 2 HANDHELD

MODEL: 520546-520547

Prepared for

PENTAIR AQUATIC SYSTEMS
10951 WEST LOS ANGELES AVENUE
MOORPARK, CALIFORNIA 93021

Prepared by:_____

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DATE: MAY 16, 2012

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
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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 without the written permission of Compatible Electronics, unless done so in full.

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

Device Tested:	EasyTouch Wireless 2 Handheld Model: 520546-520547 S/N: N/A
Product Description:	See Expository Statement.
Modifications:	The EUT was not modified during the testing.
Manufacturer:	Pentair Aquatic Systems 10951 West Los Angeles Avenue Moorpark, CA 93021
Test Dates:	April 18 and 19, 2012
Test Specifications:	Emission requirements CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.247
Test Procedure:	ANSI C63.4
Test Deviations:	The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	This test was not performed because the EUT is battery powered only.
2	Spurious Radiated RF Emissions, 30 MHz – 9300 MHz	Complies with the **Class B** limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.209
3	Spurious Radiated RF Emissions, 10 kHz – 30 MHz and 1000 MHz – 9300 MHz	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.247(d)
4	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 10 kHz – 9.3 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(d)
5	Emissions produced by the intentional radiator in restricted bands, 10 kHz – 9.3 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, and section 15.247 (d)
6	20 dB Bandwidth	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (a)(1)(i)
7	Peak Power Output	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (b)(2)
8	RF Conducted Antenna Test	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (d)
9	Carrier Frequency Separation	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1)
10	Average Time of Occupancy	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1)(i)
11	Peak Power Spectral Density from the Intentional Radiator to the Antenna	This test was not performed because the EUT is a frequency hopper only.

1. PURPOSE

This document is a qualification test report based on the emission tests performed on the EasyTouch Wireless 2 Handheld, Model: 520546-520547. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the Class B specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California 92823.

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

Pentair Aquatic Systems

Kevin Murphy	Senior Electrical Engineer
Christian Smith	Continuation Enginner – Controls /Automation

Compatible Electronics Inc.

Kyle Fujimoto	Test Engineer
David Tran	Test Technician
Michael Christensen	Lab Manager, Brea Division

2.4 Date Test Sample was Received

The test sample was received prior to the date of testing.

2.5 Disposition of the Test Sample

The test sample has not been returned to Pentair Aquatic Systems as of May 16, 2012

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
N/A	Not Applicable

3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
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
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - Emissions

The EasyTouch Wireless 2 Handheld, Model: 520546-520547 (EUT) was tested as a stand alone unit and tested in three orthogonal axis. The EUT was continuously transmitting and receiving.

Operation of the EUT during the testing:

For the intentional radiator portion of the test: The EUT was placed in a special test mode so that the low, middle, and high channels could be tested for both transmit and receive mode.

For the unintentional radiator portion of the test: The EUT was continuously transmitting and receiving on a continuous basis in normal frequency hopping mode.

It was determined that the emissions were at their highest level when the EUT was operating in the above configuration. The final emissions data was taken in this mode of operation and any cables were maximized. All initial investigations were performed with the measurement receiver in manual mode scanning the frequency range continuously. Photographs of the test setup are in Appendix D of this report.

4.1.1 Cable Construction and Termination

The EUT had no external cables.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
EASYTOUCH WIRELESS 2 HANDHELD (EUT)	PENTAIR AQUATIC SYSTEMS	520546-520547	N/A	P4HEASYTOUCH2A
DISPLAY PCB (INSIDE THE EUT)	EMERGING DISPLAY TECHNOLOGY	EW16400GLY	N/A	N/A

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
GENERAL TEST EQUIPMENT USED FOR ALL RF EMISSIONS TESTS					
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	2637A03618	May 27, 2011	May 27, 2012
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	2648A13404	May 27, 2011	May 27, 2012
Quasi-Peak Adapter	Hewlett Packard	85650A	2430A00424	May 27, 2011	May 27, 2012
EMI Receiver	Rohde & Schwarz	ESIB40	100194	November 19, 2010	November 19, 2012
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
RF RADIATED EMISSIONS TEST EQUIPMENT					
Loop Antenna	Com-Power	AL-130	17089	January 21, 2011	January 21, 2013
Biconical Antenna	Com Power	AB-900	15250	June 8, 2011	June 8, 2012
Log Periodic Antenna	Com Power	AL-100	16252	June 8, 2011	June 8, 2012
Horn Antenna	Com-Power	AH-118	071175	February 29, 2012	March 1, 2014
Preamplifier	Com-Power	PA-102	1017	December 28, 2011	December 28, 2012
Microwave Preamplifier	Com-Power	PA-118	181656	December 28, 2011	December 28, 2012
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Transmitter Power

Transmit power is herein defined as the power delivered to a 50 ohm load at the RF output of the EUT.

Power	Channel
9.40 dBm	LOW
9.40 dBm	MIDDLE
9.40 dBm	HIGH

7.2 Channel Number and Frequencies

There are a total of 26 channels. The low channel is at 902.21 MHz and the high channel is at 915.38 MHz. There is a 526.80 kHz separation between channels.

Channel 1: 902.21 MHz
Channel 26: 915.38 MHz
(Etc.)

7.3 Antenna Gain

The antenna has a maximum gain of -0.5 dBi.

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 spectrum analyzer was used as a measuring meter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A transient limiter was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. 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 was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 2009. 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 Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

Test Results:

This test was not performed because the EUT is battery powered.

8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer and EMI Receiver were used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz, the Com Power Microwave Preamplifier Model: PA-118 was used for frequencies above 1 GHz. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps.

The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets.

After the readings above 1 GHz were average manually, the reading was further adjusted by a “duty cycle correction factor”, derived from 20 log (dwell time / 100 ms).

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

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 9.3 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 2009. 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 by the Radiated Emission Manual Test software. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

Radiated Emissions (Spurious and Harmonics) Test (con't)

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance from 10 kHz to 9.3 GHz to obtain the final test data.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.209 and 15.247 (d) for radiated emissions. Please see Appendix E for the data sheets.

7.1.3 RF Emissions Test Results

Table 1.0 RADIATED EMISSION RESULTS
EasyTouch Wireless 2 Handheld, Model: SB505-W

Frequency MHz	Corrected Reading* dBuV	Specification Limit dBuV	Delta (Cor. Reading – Spec. Limit) dB
4511.40 (X-Axis) (Vertical)	52.54 (**A**)	54.00	-1.46
4542.5 (Y-Axis) (Vertical)	52.19 **(A)**	54.00	-1.81
4576.95 (X-Axis) (Vertical)	52.17 **(A)**	54.00	-1.83
4511.40 (Y-Axis) (Vertical)	51.73 **(A)**	54.00	-2.23
4513.65 (Z-Axis) (Vertical)	51.67 **(A)**	54.00	-2.33
4513.65 (X-Axis) (Horizontal)	51.54 **(A)**	54.00	-2.46

Notes:
* The complete emissions data is given in Appendix E of this report.
A Average Reading

7.2 20 dB Bandwidth

The 20 dB Bandwidth was measured using the EMI Receiver. The bandwidth was measured using a direct connection from the RF output of the EUT. The resolution bandwidth was 50 kHz and the video bandwidth was 200 kHz.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1)(i).

7.3 Peak Output Power

The Peak Output Power was measured using the EMI Receiver. The peak output power was measured using a direct connection from the RF output of the EUT. The resolution bandwidth was 3 MHz and the video bandwidth was 10 MHz. The cable loss was also added back into the reading using the reference level offset.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (b)(2). The maximum peak output power is less than 1 watt. Please see the data sheets located in Appendix E.

7.4 RF Antenna Conducted Test

The RF antenna conducted test was performed using the EMI Receiver. The RF antenna conducted test measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The resolution bandwidth was 100 kHz, and the video bandwidth was 300 kHz. The spans were wide enough to include all the harmonics and emissions that were produced by the intentional radiator.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). The RF power that is produced by the intentional radiator is at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of desired power. Please see the radiated emission data sheets located in Appendix E.

7.5 RF Band Edges

The RF band edges were performed using the EMI Receiver. The RF band edges were measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The resolution bandwidth was 100 kHz, and the video bandwidth was 300 kHz. The RF band edges were taken at the edges of the ISM spectrum (902 MHz when the EUT was on the low channel and 928 MHz when the EUT was on the high channel) using the EMI Receiver.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). The RF power at the band edges at 902 MHz and 928 MHz meet the requirements of FCC Title 47, Part 15, Subpart C section 15.247(d). Please see the data sheets located in Appendix E.

7.6 Carrier Frequency Separation

The Channel Hopping Separation Test was measured using the EMI Receiver. The EUT was operating in its normal operating mode. The resolution bandwidth was 100 kHz, and the video bandwidth 300 kHz. The frequency span was wide enough to include the peaks of two adjacent channels.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1). The Channel Hopping Separation is greater than the 20 dB bandwidth. Please see the data sheets located in Appendix D.

7.7 Number of Hopping Frequencies

The Channel Hopping Separation Test was measured using the EMI Receiver. The EUT was operating in its normal operating mode. The resolution bandwidth was 100 kHz, and the video bandwidth was 300 kHz. The frequency span was wide enough to include all of the peaks in the frequency band of operation.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 15.247 (a)(1)(i). The number of hopping frequencies is 26. Please see the data sheets located in Appendix E.

7.8 Average Time of Occupancy Test

The Average Time of Occupancy Test was measured using the EMI Receiver. The EUT was operating in normal operating mode. The frequency span was taken to 0 Hz with a sweep time of 100 msec to determine the time for each transmission.

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 10 seconds.

The sweep time was then changed to 10 seconds and the number of pulses taken. The number of pulses was then multiplied by the time for each one to determine the time of occupancy.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1)(i). The EUT does not transmit for more than 400 msec in a 10 second period on any frequency. Please see the data sheets located in Appendix E.

7.9 Spectral Density Test

The spectrum density output was measured using the EMI Receiver. The spectral density output was measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The resolution bandwidth 3 kHz, and the video bandwidth was 10 kHz. The highest 1.5 MHz of the signal was used as the frequency span with the sweep rate being 1 second for every 3 kHz of span.

Test Results:

This test was not performed because the EUT is a frequency hopper.

8. CONCLUSIONS

The EasyTouch Wireless 2 Handheld, Model: 520546-520547 meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

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, Japan, Taiwan, Korea, and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025. Please follow the link to the NIST/NVLAP site for each of our facilities' NVLAP certificate and scope of accreditation

NVLAP listing links

Agoura Division / **Brea Division** / **Silverado/Lake Forest Division**

.Quote from ISO-ILAC-IAF Communiqué on 17025:

"A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 Quality Management Systems — Requirements."

ANSI listing CETCB

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

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).
APEC MRA list NIST MRA site

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

VCCI Support member: Please visit http://www.vcci.jp/vcci_e/

FCC Listing, from FCC OET site
FCC test lab search 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

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.247 specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modifications were made to the EUT during the testing.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST	EasyTouch Wireless 2 Handheld Model: 520546-520547 S/N: N/A

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

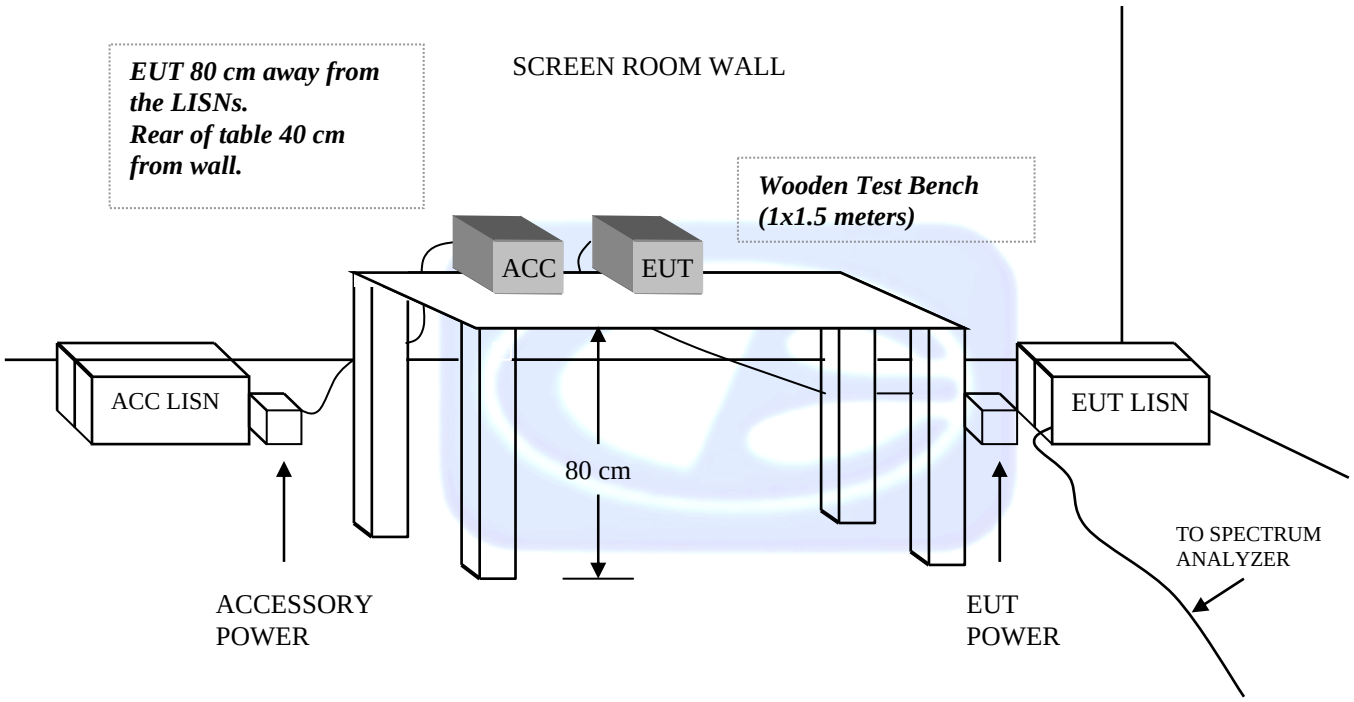
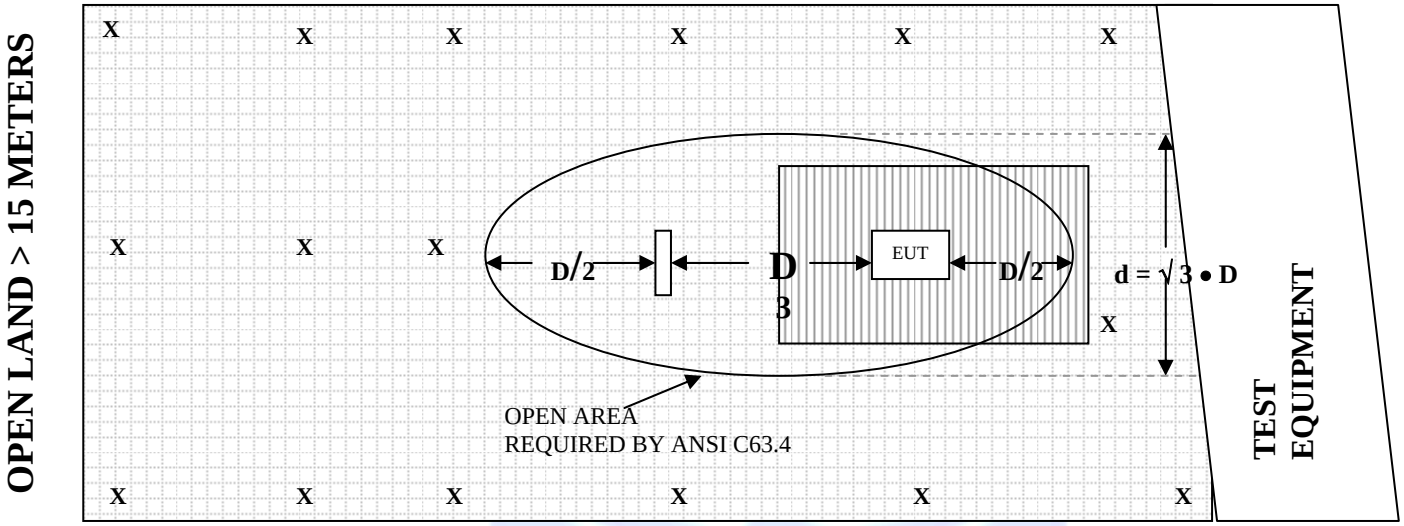


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

X = GROUND RODS	= GROUND SCREEN
D = TEST DISTANCE (meters)	= WOOD COVER

COM-POWER AL-130

LOOP ANTENNA

S/N: 17089

CALIBRATION DATE: JANUARY 21, 2011

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-41.9	9.6
0.01	-41.79	9.71
0.02	-41.43	10.07
0.05	-41.53	9.97
0.07	-41.47	10.03
0.1	-41.44	10.06
0.2	-41.61	9.89
0.3	-41.62	9.88
0.5	-41.66	9.84
0.7	-41.48	10.02
1	-41.13	10.37
2	-40.89	10.61
3	-41.00	10.50
4	-41.14	10.36
5	-41.02	10.48
10	-40.69	10.82
15	-40.41	11.09
20	-41.07	10.43
25	-42.10	9.40
30	-41.15	10.35

COM-POWER AB-900

BICONICAL ANTENNA

S/N: 15250

CALIBRATION DATE: JUNE 8, 2011

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	10.90	100	9.50
35	11.00	120	12.10
40	11.80	140	11.40
45	11.60	160	12.40
50	11.40	180	15.70
60	9.80	200	16.20
70	7.00	250	16.10
80	5.70	300	19.00
90	7.00		

COM-POWER AL-100

LOG PERIODIC ANTENNA

S/N: 16252

CALIBRATION DATE: JUNE 8, 2011

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	13.50	700	20.40
400	15.50	800	20.60
500	15.80	900	20.10
600	20.20	1000	22.80

COM POWER AH-118

HORN ANTENNA

S/N: 071175

CALIBRATION DATE: FEBRUARY 29, 2012

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	23.6	10.0	37.7
1.5	22.0	10.5	38.4
2.0	28.7	11.0	38.0
2.5	29.3	11.5	38.2
3.0	30.6	12.0	39.0
3.5	30.4	12.5	42.4
4.0	31.1	13.0	40.8
4.5	33.4	13.5	40.0
5.0	35.3	14.0	39.7
5.5	35.1	14.5	43.5
6.0	36.9	15.0	42.7
6.5	37.4	15.5	39.7
7.0	37.6	16.0	39.2
7.5	36.2	16.5	39.7
8.0	38.4	17.0	42.2
8.5	39.3	17.5	47.6
9.0	37.4	18.0	51.2
9.5	38.0		

COM-POWER PA-102

PREAMPLIFIER

S/N: 1017

CALIBRATION DATE: DECEMBER 28, 2011

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	38.54	300	38.45
40	38.53	350	38.47
50	38.57	400	38.36
60	38.54	450	38.07
70	38.54	500	38.31
80	38.54	550	38.37
90	38.54	600	38.28
100	38.53	650	38.19
125	38.51	700	38.24
150	38.43	750	37.88
175	38.56	800	37.94
200	38.50	850	37.65
225	38.46	900	37.50
250	38.57	950	37.47
275	38.45	1000	36.86

COM-POWER PA-118

PREAMPLIFIER

S/N: 181656

CALIBRATION DATE: DECEMBER 28, 2011

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	23.22	10.0	24.66
1.5	26.31	10.5	25.22
2.0	27.40	11.0	25.17
2.5	26.52	11.5	24.47
3.0	27.35	12.0	25.29
3.5	29.02	12.5	26.03
4.0	28.51	13.0	24.11
4.5	26.62	13.5	24.28
5.0	27.13	14.0	25.81
5.5	27.29	14.5	25.45
6.0	26.72	15.0	25.36
6.5	25.62	15.5	26.76
7.0	25.25	16.0	28.09
7.5	24.23	16.5	23.23
8.0	23.72	17.0	26.58
8.5	24.91	17.5	27.45
9.0	25.73	18.0	27.53
9.5	24.79		

FRONT VIEW

PENTAIR AQUATIC SYSTEMS
EASYTOUCH WIRELESS 2 HANDHELD
MODEL: 520546-520547
FCC SUBPART B AND C – RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

PENTAIR AQUATIC SYSTEMS
EASYTOUCH WIRELESS 2 HANDHELD
MODEL: 520546-520547
FCC SUBPART B AND C – RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

RADIATED EMISSIONS

DATA SHEETS

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - X-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
902.21								**N/A - Done via Conducted**
1804.42	44.06	V	--	--	Peak	1.25	155	Not in Restricted Band
1804.42	36.58	V	--	--	Avg	1.25	155	Not in Restricted Band
2706.63	42.91	V	74	-31.09	Peak	2.25	225	
2606.63	35.43	V	54	-18.57	Avg	2.25	225	
3608.84	47.54	V	74	-26.46	Peak	1.15	225	
3608.84	40.06	V	54	-13.94	Avg	1.15	225	
4511.05	60.02	V	74	-13.98	Peak	1.25	225	
4511.05	52.54	V	54	-1.46	Avg	1.25	225	
5413.26	49.06	V	74	-24.94	Peak	2.25	90	
5413.26	41.58	V	54	-12.42	Avg	2.25	90	
6315.47	50.89	V	--	--	Peak	2.25	90	Not in Restricted Band
6315.47	43.41	V	--	--	Avg	2.25	90	Not in Restricted Band
7218.68								**no emissions found**
7218.68								
8119.89								**no emissions found**
8119.89								
9022.10								**no emissions found**
9022.10								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - X-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
902.21								**N/A - Done via Conducted**
1804.42	47.17	H	--	--	Peak	1.25	155	Not in Restricted Band
1804.42	39.69	H	--	--	Avg	1.25	155	Not in Restricted Band
2706.63	42.74	H	74	-31.26	Peak	1.25	165	
2606.63	35.26	H	54	-18.74	Avg	1.25	165	
3608.84	49.27	H	74	-24.73	Peak	1.15	175	
3608.84	41.79	H	54	-12.21	Avg	1.15	175	
4511.05	59.02	H	74	-14.98	Peak	1.25	185	
4511.05	51.54	H	54	-2.46	Avg	1.25	185	
5413.26	49.98	H	74	-24.02	Peak	1.25	225	
5413.26	42.50	H	54	-11.50	Avg	1.25	225	
6315.47	49.07	H	--	--	Peak	1.25	225	Not in Restricted Band
6315.47	41.59	H	--	--	Avg	1.25	225	Not in Restricted Band
7218.68								**no emissions found**
7218.68								
8119.89								**no emissions found**
8119.89								
9022.10								**no emissions found**
9022.10								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - X-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
908.53								**N/A - Done via Conducted**
1817.06	43.12	V	--	--	Peak	1.25	155	Not in Restricted Band
1817.06	35.64	V	--	--	Avg	1.25	155	Not in Restricted Band
2725.59	43.22	V	74	-30.78	Peak	1.55	165	
2725.59	35.74	V	54	-18.26	Avg	1.55	165	
3634.12	47.65	V	74	-26.35	Peak	2.25	225	
3634.12	40.17	V	54	-13.83	Avg	2.25	225	
4542.65	58.36	V	74	-15.64	Peak	2.25	225	
4542.65	50.88	V	54	-3.12	Avg	2.25	225	
5451.18	46.98	V	74	-27.02	Peak	2.25	225	
5451.18	39.50	V	54	-14.50	Avg	2.25	225	
6359.71	50.73	V	--	--	Peak	1.25	225	Not in Restricted Band
6359.71	43.25	V	--	--	Avg	1.25	225	Not in Restricted Band
7268.24								**no emissions found**
7268.24								
8176.77								**no emissions found**
8176.77								
9085.30								**no emissions found**
9085.30								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - X-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
908.53								**N/A - Done via Conducted**
1817.06	44.81	H	--	--	Peak	1.25	155	Not in Restricted Band
1817.06	37.33	H	--	--	Avg	1.25	155	Not in Restricted Band
2725.59	43.08	H	74	-30.92	Peak	1.55	165	
2725.59	35.60	H	54	-18.40	Avg	1.55	165	
3634.12	49.18	H	74	-24.82	Peak	1.25	175	
3634.12	41.70	H	54	-12.30	Avg	1.25	175	
4542.65	57.58	H	74	-16.42	Peak	1.25	185	
4542.65	50.10	H	54	-3.90	Avg	1.25	185	
5451.18	43.74	H	74	-30.26	Peak	1.25	185	
5451.18	36.26	H	54	-17.74	Avg	1.25	185	
6359.71	51.82	H	--	--	Peak	1.25	175	Not in Restricted Band
6359.71	44.34	H	--	--	Avg	1.25	175	Not in Restricted Band
7268.24								**no emissions found**
7268.24								
8176.77								**no emissions found**
8176.77								
9085.30								**no emissions found**
9085.30								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

High Channel
Transmit Mode - X-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
915.38								**N/A - Done via Conducted**
1830.76	45.74	V	---	--	Peak	1.25	135	Not in Restricted Band
1830.76	38.26	V	--	--	Avg	1.25	135	Not in Restricted Band
2746.14	45.97	V	74	-28.03	Peak	1.25	155	
2746.14	38.49	V	54	-15.51	Avg	1.25	155	
3661.52	48.46	V	74	-25.54	Peak	1.25	165	
3661.52	40.98	V	54	-13.02	Avg	1.25	165	
4576.90	59.65	V	74	-14.35	Peak	2.25	175	
4576.90	52.17	V	54	-1.83	Avg	2.25	175	
5492.28	46.69	V	--	--	Peak	1.25	185	Not in Restricted Band
5492.28	39.21	V	--	--	Avg	1.25	185	Not in Restricted Band
6407.66	48.31	V	--	--	Peak	1.25	185	Not in Restricted Band
6407.66	40.83	V	--	--	Avg	1.25	185	Not in Restricted Band
7323.04								**no emissions found**
7323.04								
8238.42								**no emissions found**
8238.42								
9153.80								**no emissions found**
9153.80								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

High Channel
Transmit Mode - X-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
915.38								**N/A - Done via Conducted**
1830.76	46.09	H	--	--	Peak	1.25	225	Not in Restricted Band
1830.76	38.61	H	--	--	Avg	1.25	225	Not in Restricted Band
2746.14	42.88	H	74	-31.12	Peak	1.25	155	
2746.14	35.40	H	54	-18.60	Avg	1.25	155	
3661.52	50.08	H	74	-23.92	Peak	1.25	165	
3661.52	42.60	H	54	-11.40	Avg	1.25	165	
4576.90	57.56	H	74	-16.44	Peak	1.25	175	
4576.90	50.08	H	54	-3.92	Avg	1.25	175	
5492.28	46.56	H	--	--	Peak	1.25	175	Not in Restricted Band
5492.28	39.08	H	--	--	Avg	1.25	175	Not in Restricted Band
6407.66	49.87	H	--	--	Peak	1.25	175	Not in Restricted Band
6407.66	42.39	H	--	--	Avg	1.25	175	Not in Restricted Band
7323.04								**no emissions found**
7323.04								
8238.42								**no emissions found**
8238.42								
9153.80								**no emission found**
9153.80								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode -Y-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
902.21								**N/A - Done via Conducted**
1804.42	46.94	V	--	--	Peak	1.25	165	Not in Restricted Band
1804.42	39.46	V	--	--	Avg	1.25	165	Not in Restricted Band
2706.63	43.68	V	74	-30.32	Peak	1.15	175	
2606.63	36.20	V	54	-17.80	Avg	1.15	175	
3608.84	48.46	V	74	-25.54	Peak	1.25	185	
3608.84	40.98	V	54	-13.02	Avg	1.25	185	
4511.05	59.21	V	74	-14.79	Peak	1.35	155	
4511.05	51.73	V	54	-2.27	Avg	1.35	155	
5413.26	45.23	V	74	-28.77	Peak	1.55	185	
5413.26	37.75	V	54	-16.25	Avg	1.55	185	
6315.47	50.19	V	--	--	Peak	1.25	165	Not in Restricted Band
6315.47	42.71	V	--	--	Avg	1.25	165	Not in Restricted Band
7218.68								**no emissions found**
7218.68								
8119.89								**no emissions found**
8119.89								
9022.10								**no emissions found**
9022.10								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Y-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
902.21								**N/A - Done via Conducted**
1804.42	41.58	H	--	--	Peak	1.25	155	Not in Restricted Band
1804.42	34.10	H	--	--	Avg	1.25	155	Not in Restricted Band
2706.63	39.08	H	74	-34.92	Peak	1.25	145	
2606.63	31.60	H	54	-22.40	Avg	1.25	145	
3608.84	49.37	H	74	-24.63	Peak	1.35	155	
3608.84	41.89	H	54	-12.11	Avg	1.35	155	
4511.05	58.27	H	74	-15.73	Peak	1.25	165	
4511.05	50.79	H	54	-3.21	Avg	1.25	165	
5413.26	47.61	H	74	-26.39	Peak	1.25	185	
5413.26	40.13	H	54	-13.87	Avg	1.25	185	
6315.47	50.62	H	--	--	Peak	1.35	145	Not in Restricted Band
6315.47	43.14	H	--	--	Avg	1.35	145	Not in Restricted Band
7218.68								**no emissions found**
7218.68								
8119.89								**no emissions found**
8119.89								
9022.10								**no emissions found**
9022.10								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - Y-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
908.53								**N/A - Done via Conducted**
1817.06	46.95	V	--	--	Peak	1.25	155	Not in Restricted Band
1817.06	39.47	V	--	--	Avg	1.25	155	Not in Restricted Band
2725.59	42.16	V	74	-31.84	Peak	1.35	145	
2725.59	34.68	V	54	-19.32	Avg	1.35	145	
3634.12	48.79	V	74	-25.21	Peak	1.25	155	
3634.12	41.31	V	54	-12.69	Avg	1.25	155	
4542.65	59.67	V	74	-14.33	Peak	1.25	155	
4542.65	52.19	V	54	-1.81	Avg	1.25	155	
5451.18	44.52	V	74	-29.48	Peak	1.35	165	
5451.18	37.04	V	54	-16.96	Avg	1.35	165	
6359.71	50.14	V	--	--	Peak	1.15	175	Not in Restricted Band
6359.71	42.66	V	--	--	Avg	1.15	175	Not in Restricted Band
7268.24								**no emissions found**
7268.24								
8176.77								**no emissions found**
8176.77								
9085.30								**no emissions found**
9085.30								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - Y-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
908.53								**N/A - Done via Conducted**
1817.06	40.76	H	--	--	Peak	1.25	155	Not in Restricted Band
1817.06	33.28	H	--	--	Avg	1.25	155	Not in Restricted Band
2725.59	41.11	H	74	-32.89	Peak	1.25	145	
2725.59	33.63	H	54	-20.37	Avg	1.25	145	
3634.12	48.82	H	74	-25.18	Peak	1.15	145	
3634.12	41.34	H	54	-12.66	Avg	1.15	145	
4542.65	59.01	H	74	-14.99	Peak	1.25	165	
4542.65	51.53	H	54	-2.47	Avg	1.25	165	
5451.18	46.32	H	74	-27.68	Peak	1.35	175	
5451.18	38.84	H	54	-15.16	Avg	1.35	175	
6359.71	50.03	H	--	--	Peak	1.25	155	Not in Restricted Band
6359.71	42.55	H	--	--	Avg	1.25	155	Not in Restricted Band
7268.24								**no emissions found**
7268.24								
8176.77								**no emissions found**
8176.77								
9085.30								**no emissions found**
9085.30								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

High Channel
Transmit Mode - Y-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
915.38								**N/A - Done via Conducted**
1830.76	48.22	V	---	--	Peak	1.25	155	Not in Restricted Band
1830.76	40.74	V	--	--	Avg	1.25	155	Not in Restricted Band
2746.14	43.55	V	74	-30.45	Peak	1.55	165	
2746.14	36.07	V	54	-17.93	Avg	1.55	165	
3661.52	47.49	V	74	-26.51	Peak	1.25	175	
3661.52	40.01	V	54	-13.99	Avg	1.25	175	
4576.90	57.34	V	74	-16.66	Peak	1.15	185	
4576.90	49.86	V	54	-4.14	Avg	1.15	185	
5492.28	44.73	V	--	--	Peak	1.15	190	Not in Restricted Band
5492.28	37.25	V	--	--	Avg	1.15	190	Not in Restricted Band
6407.66	50.74	V	--	--	Peak	1.25	185	Not in Restricted Band
6407.66	43.26	V	--	--	Avg	1.25	185	Not in Restricted Band
7323.04								**no emissions found**
7323.04								
8238.42								**no emissions found**
8238.42								
9153.80								**no emissions found**
9153.80								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

High Channel
Transmit Mode - Y-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
915.38								**N/A - Done via Conducted**
1830.76	42.81	H	--	--	Peak	1.25	155	Not in Restricted Band
1830.76	35.33	H	--	--	Avg	1.25	155	Not in Restricted Band
2746.14	43.28	H	74	-30.72	Peak	1.55	165	
2746.14	35.80	H	54	-18.20	Avg	1.55	165	
3661.52	48.15	H	74	-25.85	Peak	1.25	175	
3661.52	40.67	H	54	-13.33	Avg	1.25	175	
4576.90	57.78	H	74	-16.22	Peak	1.25	155	
4576.90	50.30	H	54	-3.70	Avg	1.25	155	
5492.28	45.96	H	--	--	Peak	1.35	145	Not in Restricted Band
5492.28	38.48	H	--	--	Avg	1.35	145	Not in Restricted Band
6407.66	49.16	H	--	--	Peak	1.25	145	Not in Restricted Band
6407.66	41.68	H	--	--	Avg	1.25	145	Not in Restricted Band
7323.04								**no emissions found**
7323.04								
8238.42								**no emissions found**
8238.42								
9153.80								**no emission found**
9153.80								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Z-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
902.21								**N/A - Done via Conducted**
1804.42	44.42	V	--	--	Peak	1.25	165	Not in Restricted Band
1804.42	36.94	V	--	--	Avg	1.25	165	Not in Restricted Band
2706.63	41.78	V	74	-32.22	Peak	1.35	175	
2606.63	34.30	V	54	-19.70	Avg	1.35	175	
3608.84	45.61	V	74	-28.39	Peak	1.25	180	
3608.84	38.13	V	54	-15.87	Avg	1.25	180	
4511.05	59.15	V	74	-14.85	Peak	1.15	115	
4511.05	51.67	V	54	-2.33	Avg	1.15	115	
5413.26								**no emissions found**
5413.26								
6315.47								**no emissions found**
6315.47								
7218.68								**no emissions found**
7218.68								
8119.89								**no emissions found**
8119.89								
9022.10								**no emissions found**
9022.10								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Z-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
902.21								**N/A - Done via Conducted**
1804.42	43.54	H	--	--	Peak	1.25	155	Not in Restricted Band
1804.42	36.06	H	--	--	Avg	1.25	155	Not in Restricted Band
2706.63	45.05	H	74	-28.95	Peak	1.35	165	
2606.63	37.57	H	54	-16.43	Avg	1.35	165	
3608.84	49.57	H	74	-24.43	Peak	1.25	175	
3608.84	42.09	H	54	-11.91	Avg	1.25	175	
4511.05	57.31	H	74	-16.69	Peak	1.25	185	
4511.05	49.83	H	54	-4.17	Avg	1.25	185	
5413.26	46.35	H	74	-27.65	Peak	1.25	185	
5413.26	38.87	H	54	-15.13	Avg	1.25	185	
6315.47	48.82	H	--	--	Peak	1.25	185	Not in Restricted Band
6315.47	40.98	H	--	--	Avg	1.25	185	Not in Restricted Band
7218.68								**no emissions found**
7218.68								
8119.89								**no emissions found**
8119.89								
9022.10								**no emissions found**
9022.10								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - Z-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
908.53								**N/A - Done via Conducted**
1817.06	45.45	V	--	--	Peak	1.25	165	Not in Restricted Band
1817.06	37.97	V	--	--	Avg	1.25	165	Not in Restricted Band
2725.59	42.11	V	74	-31.89	Peak	1.35	175	
2725.59	34.63	V	54	-19.37	Avg	1.35	175	
3634.12	45.57	V	74	-28.43	Peak	1.45	185	
3634.12	38.09	V	54	-15.91	Avg	1.45	185	
4542.65	56.94	V	74	-17.06	Peak	1.25	195	
4542.65	49.46	V	54	-4.54	Avg	1.25	195	
5451.18	44.16	V	74	-29.84	Peak	1.25	155	
5451.18	36.32	V	54	-17.68	Avg	1.25	155	
6359.71	49.46	V	--	--	Peak	1.25	165	Not in Restricted Band
6359.71	41.62	V	--	--	Avg	1.25	165	Not in Restricted Band
7268.24								**no emissions found**
7268.24								
8176.77								**no emissions found**
8176.77								
9085.30								**no emissions found**
9085.30								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - Z-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
908.53								**N/A - Done via Conducted**
1817.06	44.81	H	--	--	Peak	1.25	155	Not in Restricted Band
1817.06	37.33	H	--	--	Avg	1.25	155	Not in Restricted Band
2725.59	43.92	H	74	-30.08	Peak	1.15	165	
2725.59	36.44	H	54	-17.56	Avg	1.15	165	
3634.12	49.17	H	74	-24.83	Peak	2.25	175	
3634.12	41.69	H	54	-12.31	Avg	2.25	175	
4542.65	54.11	H	74	-19.89	Peak	1.25	185	
4542.65	46.63	H	54	-7.37	Avg	1.25	185	
5451.18	49.11	H	74	-24.89	Peak	1	90	
5451.18	41.27	H	54	-12.73	Avg	1	90	
6359.71	52.58	H	--	--	Peak	1	90	Not in Restricted Band
6359.71	44.74	H	--	--	Avg	1	90	Not in Restricted Band
7268.24								**no emissions found**
7268.24								
8176.77								**no emissions found**
8176.77								
9085.30								**no emissions found**
9085.30								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

High Channel
Transmit Mode - Z-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
915.38								**N/A - Done via Conducted**
1830.76	47.63	V	--	--	Peak	1.25	155	Not in Restricted Band
1830.76	40.15	V	--	--	Avg	1.25	155	Not in Restricted Band
2746.14	45.96	V	74	-28.04	Peak	1.35	165	
2746.14	38.48	V	54	-15.52	Avg	1.35	165	
3661.52	47.19	V	74	-26.81	Peak	1.25	165	
3661.52	39.71	V	54	-14.29	Avg	1.25	165	
4576.90	54.21	V	74	-19.79	Peak	1.55	175	
4576.90	46.73	V	54	-7.27	Avg	1.55	175	
5492.28	52.63	V	--	--	Peak	1.25	155	Not in Restricted Band
5492.28	44.79	V	--	--	Avg	1.25	155	Not in Restricted Band
6407.66	49.27	V	--	--	Peak	1.25	155	Not in Restricted Band
6407.66	41.43	V	--	--	Avg	1.25	155	Not in Restricted Band
7323.04								**no emissions found**
7323.04								
8238.42								**no emissions found**
8238.42								
9153.80								**no emissions found**
9153.80								

FCC 15.247

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

High Channel
Transmit Mode - Z-Axis
Duty Cycle: 42.28%

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
915.38								**N/A - Done via Conducted**
1830.76	45.16	H	--	--	Peak	1	150	Not in Restricted Band
1830.76	37.68	H	--	--	Avg	1	150	Not in Restricted Band
2746.14	44.57	H	74	-29.43	Peak	1	180	
2746.14	37.09	H	54	-16.91	Avg	1	180	
3661.52	45.54	H	74	-28.46	Peak	1	150	
3661.52	38.06	H	54	-15.94	Avg	1	150	
4576.90	56.06	H	74	-17.94	Peak	1	180	
4576.90	48.58	H	54	-5.42	Avg	1	180	
5492.28	44.61	H	--	--	Peak	1	180	Not in Restricted Band
5492.28	36.77	H	--	--	Avg	1	180	Not in Restricted Band
6407.66	41.25	H	--	--	Peak	1	180	Not in Restricted Band
6407.66	33.41	H	--	--	Avg	1	180	Not in Restricted Band
7323.04								**no emissions found**
7323.04								
8238.42								**no emissions found**
8238.42								
9153.80								**no emission found**
9153.80								

FCC 15.247, RSS-GEN, and FCC Class B

Pentair Aquatic Systems
EasyTouch Wireless 2 Handheld
Model: 520546-520547

Date: 04/18/2012
Labs: B and D
Tested By: Kyle Fujimoto

1 GHz to 9.3 GHz - Vertical and Horizontal Polarization

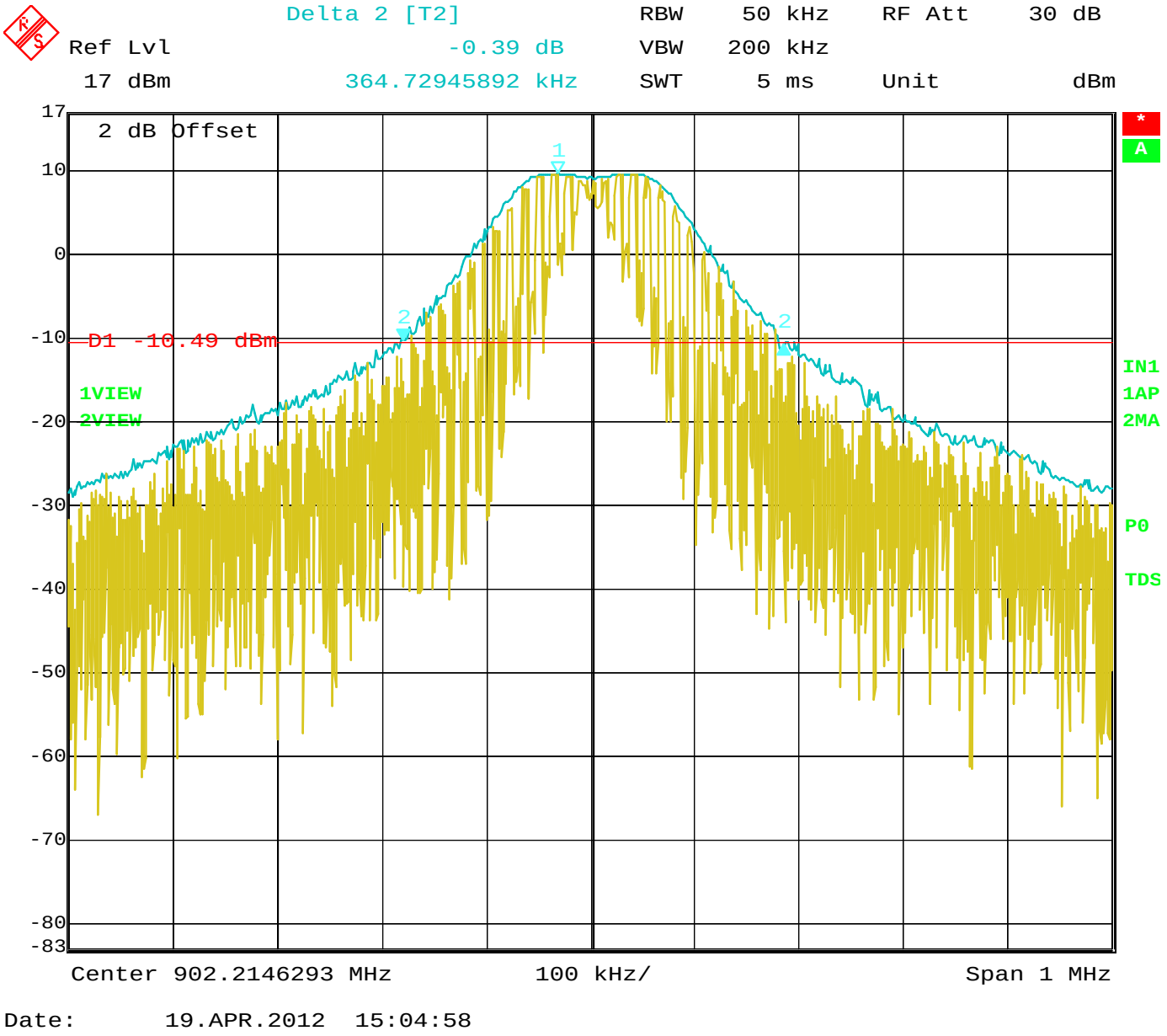
Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions
								Detected from the Receive
								Mode from 1 GHz to 9.3 GHz
								No Emissions Detected
								from the Digital Portion from
								1 GHz to 9.3 GHz
								No Emissions Detected for
								the Non-Harmonic Tx
								Emissions from
								1 GHz to 9.3 GHz
								Investigated in the X-Axis,
								Y-Axis, and Z-Axis

Test Location : Compatible Electronics **Page** : 1/1
Customer : Pentair Water Pool and Spa **Date** : 4/19/2012
Manufacturer : Pentair Water Pool and Spa **Time** : 9:59:16
Eut name : Easytouch Wireless 2 Handheld **Lab** : D
Model : 520546-520547 **Test Distance** : 3
Serial # : N/A
Specification : FCC Class B
Distance correction factor (20 * log(test/spec) : 0.00
Test Mode : Test Type: Spurious Emissions Qualification
Test Range: 10 kHz to 1000 MHz
Generated Frequencies (MHz): 16 MHz
Test Engineer: Kyle Fujimoto

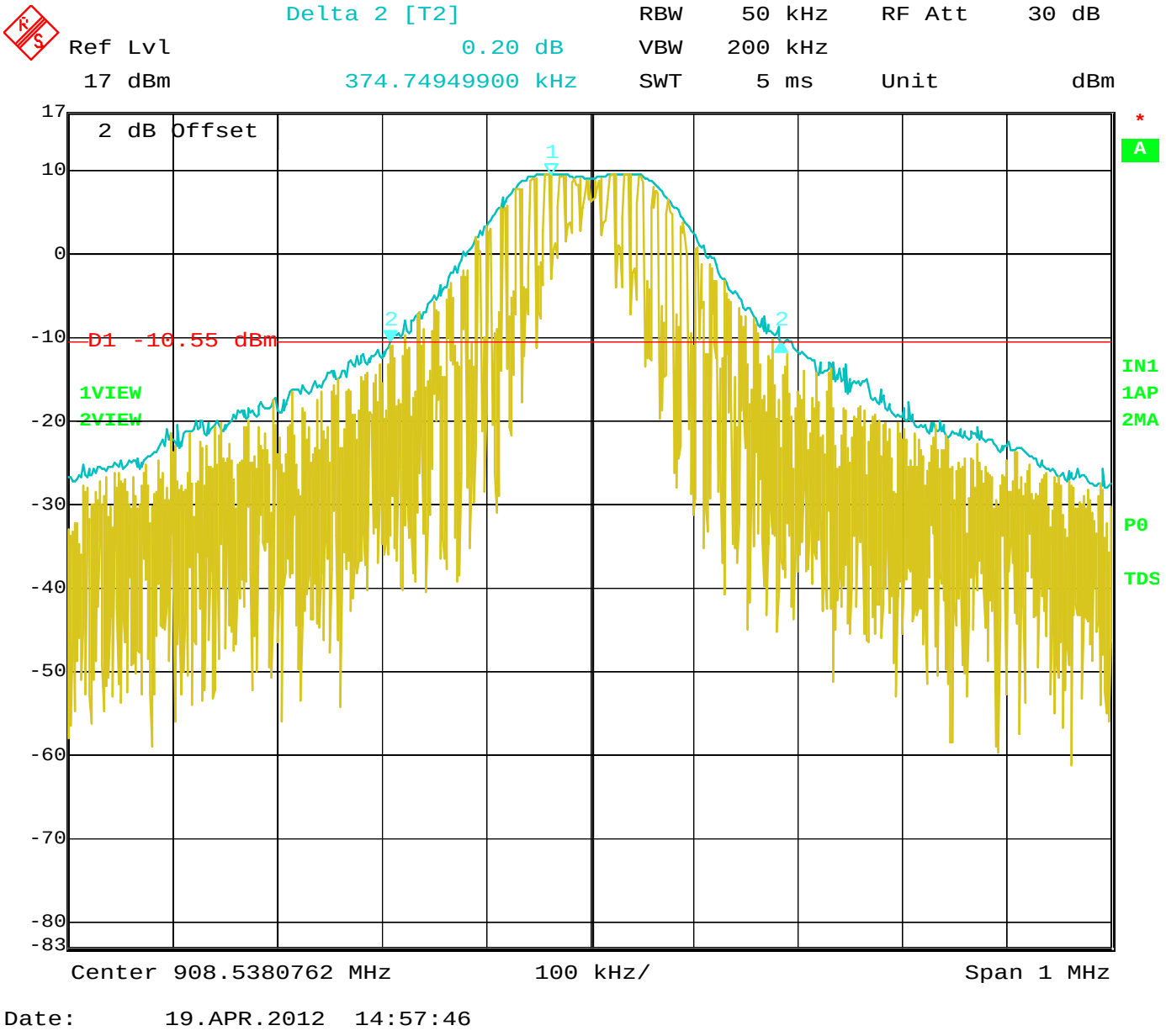
Pol	Freq	Rdng	Cable loss	Ant factor	Amp gain	Cor'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV	dBuV/m	dB
1V	33.918	56.60	0.79	10.98	38.54	29.83	40.00	-10.17
2H	49.152	49.20	0.81	11.43	38.57	22.87	40.00	-17.13
3H	66.847	48.70	1.04	7.84	38.54	19.04	40.00	-20.96
4V	72.693	57.30	1.13	6.63	38.54	26.52	40.00	-13.48
5H	72.939	55.40	1.13	6.60	38.54	24.59	40.00	-15.41
6V	78.556	59.10	1.19	5.88	38.54	27.62	40.00	-12.38
7V	81.579	57.20	1.22	5.92	38.54	25.79	40.00	-14.21
8H	110.759	59.00	1.25	10.96	38.52	32.68	43.50	-10.82
9H	133.263	49.40	1.41	11.62	38.48	23.95	43.50	-19.55
10V	241.900	54.70	2.04	16.11	38.54	34.32	46.00	-11.68
11H	260.883	44.50	2.14	16.78	38.52	24.91	46.00	-21.09
12V	274.978	43.10	2.20	17.62	38.45	24.46	46.00	-21.54
13V	294.946	49.00	2.20	18.73	38.45	31.48	46.00	-14.52
14V	302.286	46.60	2.21	13.55	38.45	23.91	46.00	-22.09
15H	305.500	56.60	2.22	13.63	38.45	34.00	46.00	-12.00
16V	309.664	51.30	2.24	13.72	38.45	28.81	46.00	-17.19
17H	336.043	50.10	2.35	14.29	38.46	28.27	46.00	-17.73
18V	380.180	50.20	2.52	15.15	38.40	29.47	46.00	-16.53
19H	386.150	56.80	2.55	15.26	38.39	36.21	46.00	-9.79
20H	398.094	51.20	2.59	15.47	38.36	30.90	46.00	-15.10
21V	412.877	48.20	2.60	15.54	38.28	28.06	46.00	-17.94
22H	412.901	50.80	2.60	15.54	38.28	30.66	46.00	-15.34
23H	457.148	54.70	2.63	15.68	38.11	34.90	46.00	-11.10
24H	486.611	58.00	2.75	15.76	38.25	38.26	46.00	-7.74
25H	501.327	55.00	2.80	15.86	38.31	35.36	46.00	-10.64
26V	508.996	44.60	2.82	16.23	38.32	25.33	46.00	-20.67
27H	516.071	54.80	2.83	16.56	38.33	35.87	46.00	-10.13
28H	545.604	45.10	2.89	17.91	38.36	27.53	46.00	-18.47
29H	625.550	51.70	3.15	20.25	38.23	36.87	46.00	-9.13
30H	658.654	40.60	3.24	20.32	38.20	25.96	46.00	-20.04
31V	810.987	44.40	3.83	20.54	37.87	30.90	46.00	-15.10

-20 dB BANDWIDTH

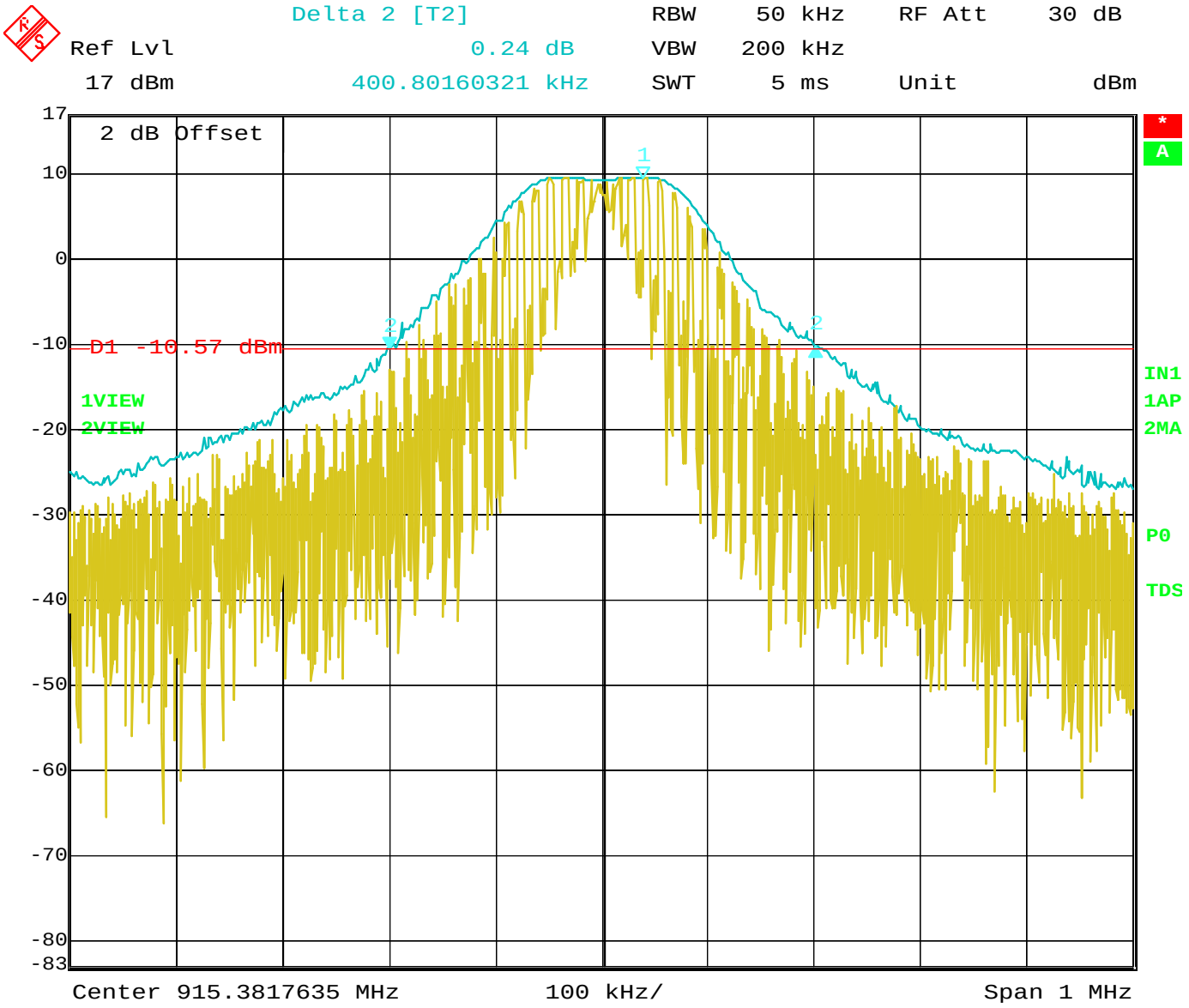
DATA SHEETS



20 dB Bandwidth of Fundamental – Low Channel



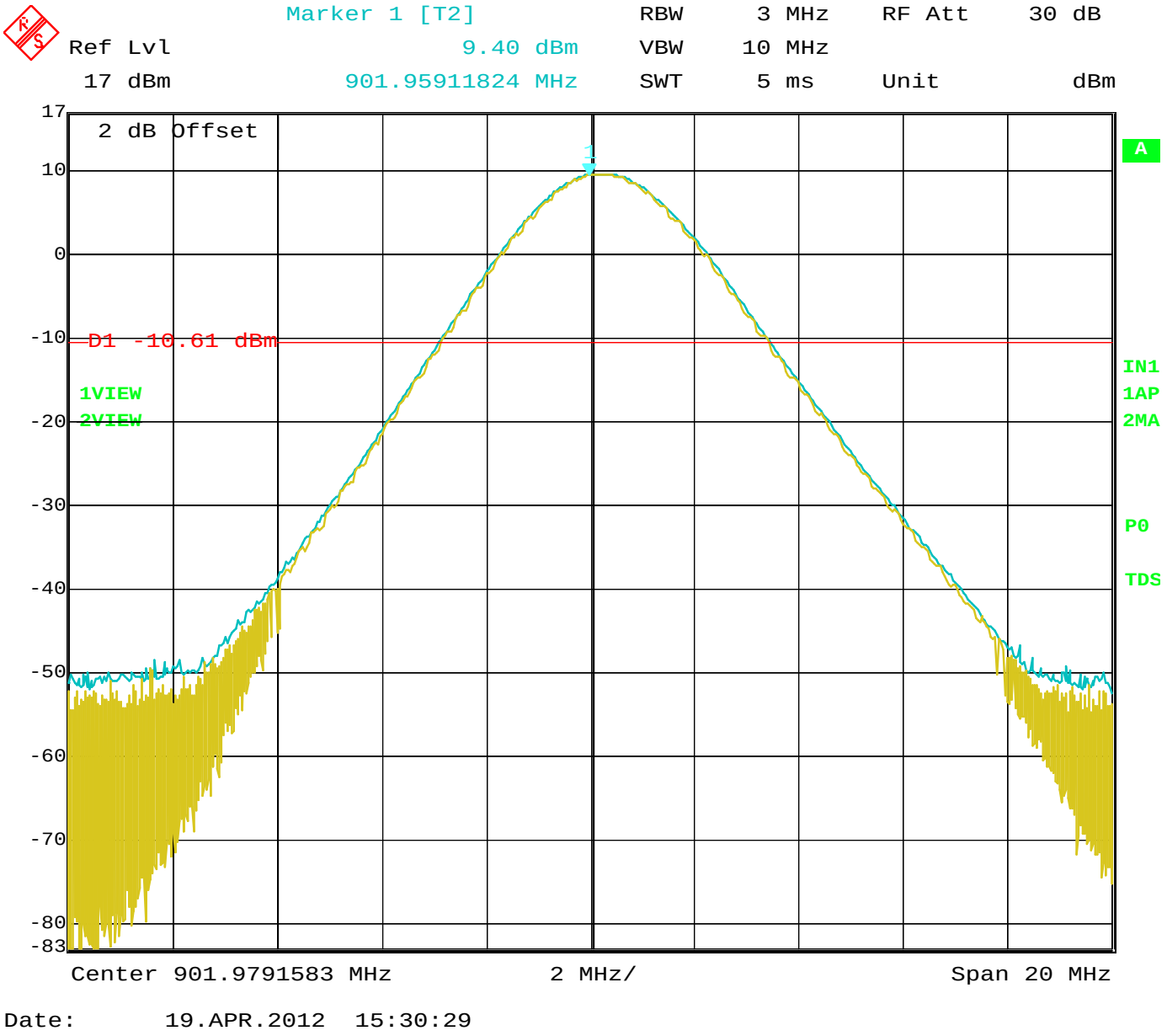
20 dB Bandwidth of Fundamental – Middle Channel



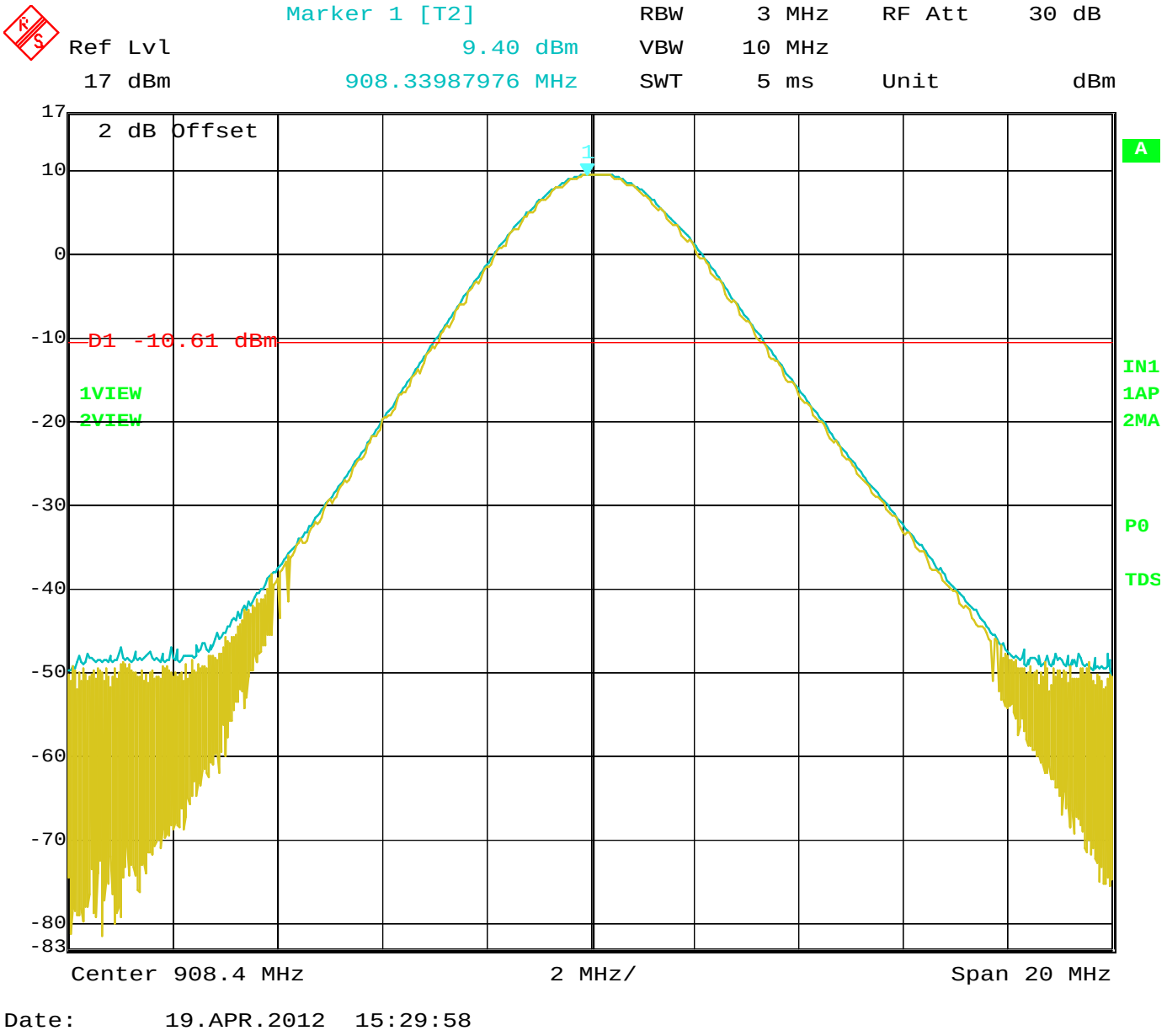
20 dB Bandwidth of Fundamental – High Channel

PEAK POWER OUTPUT

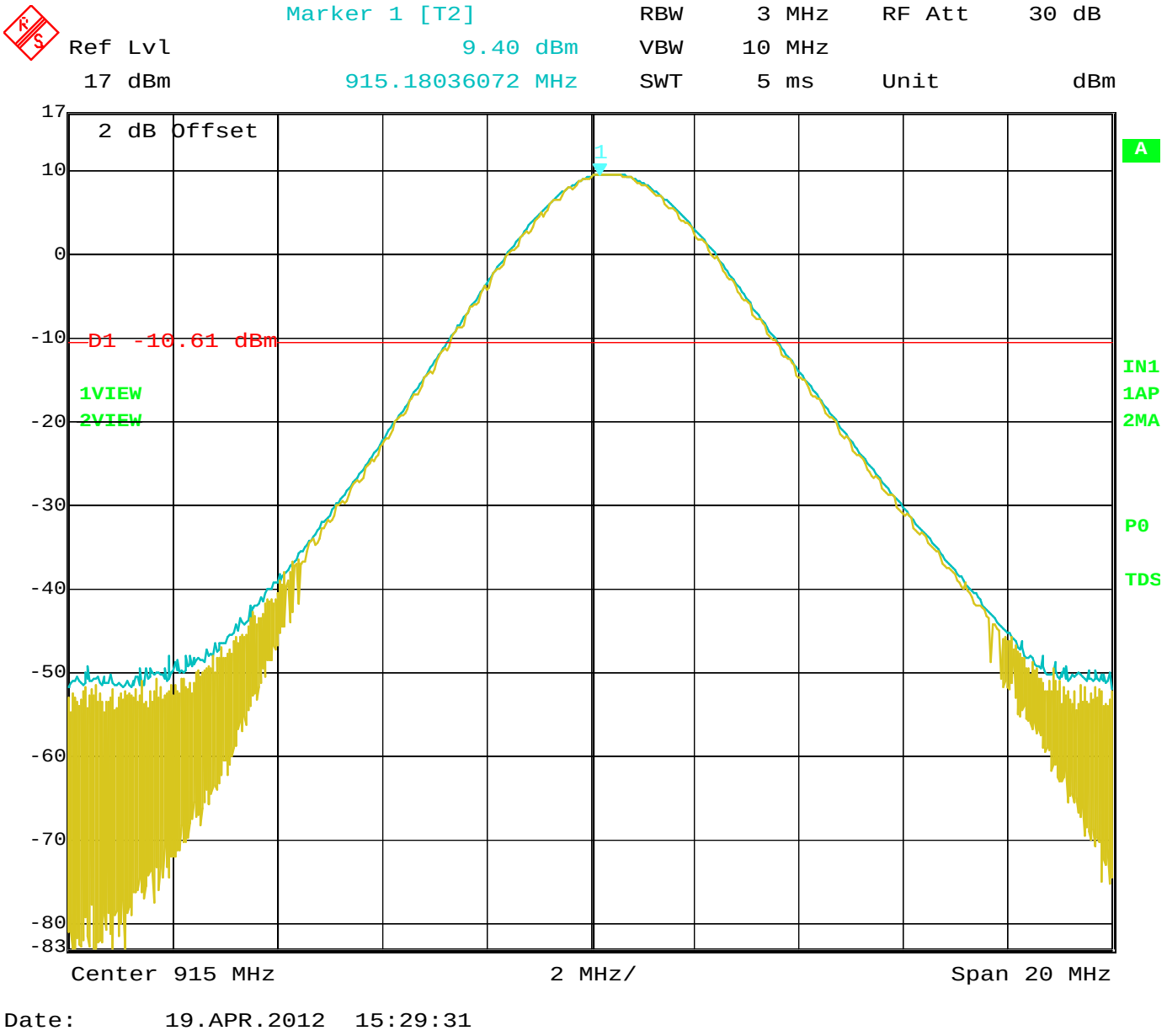
DATA SHEETS



Peak Power Output – Low Channel



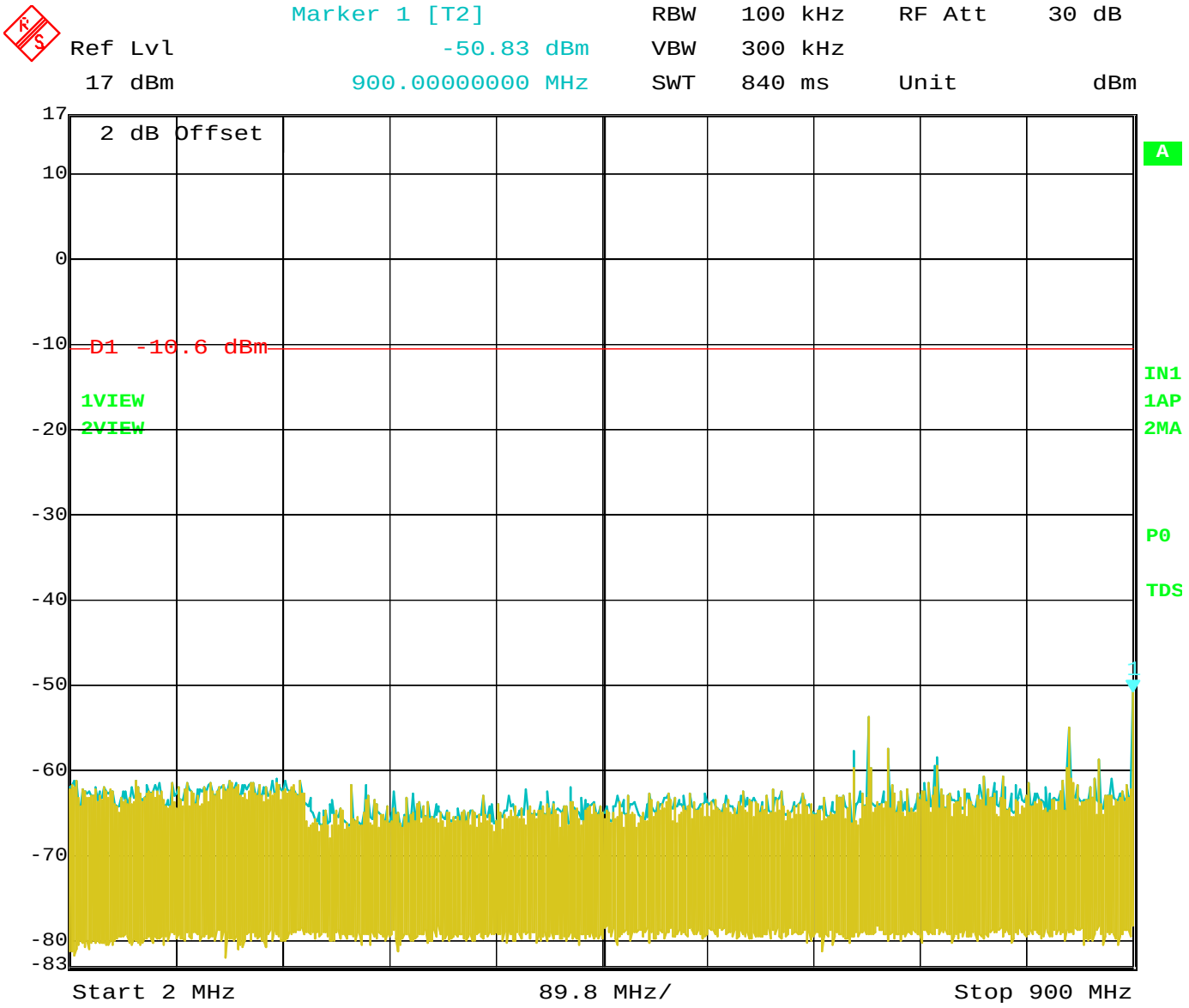
Peak Power Output –Middle Channel



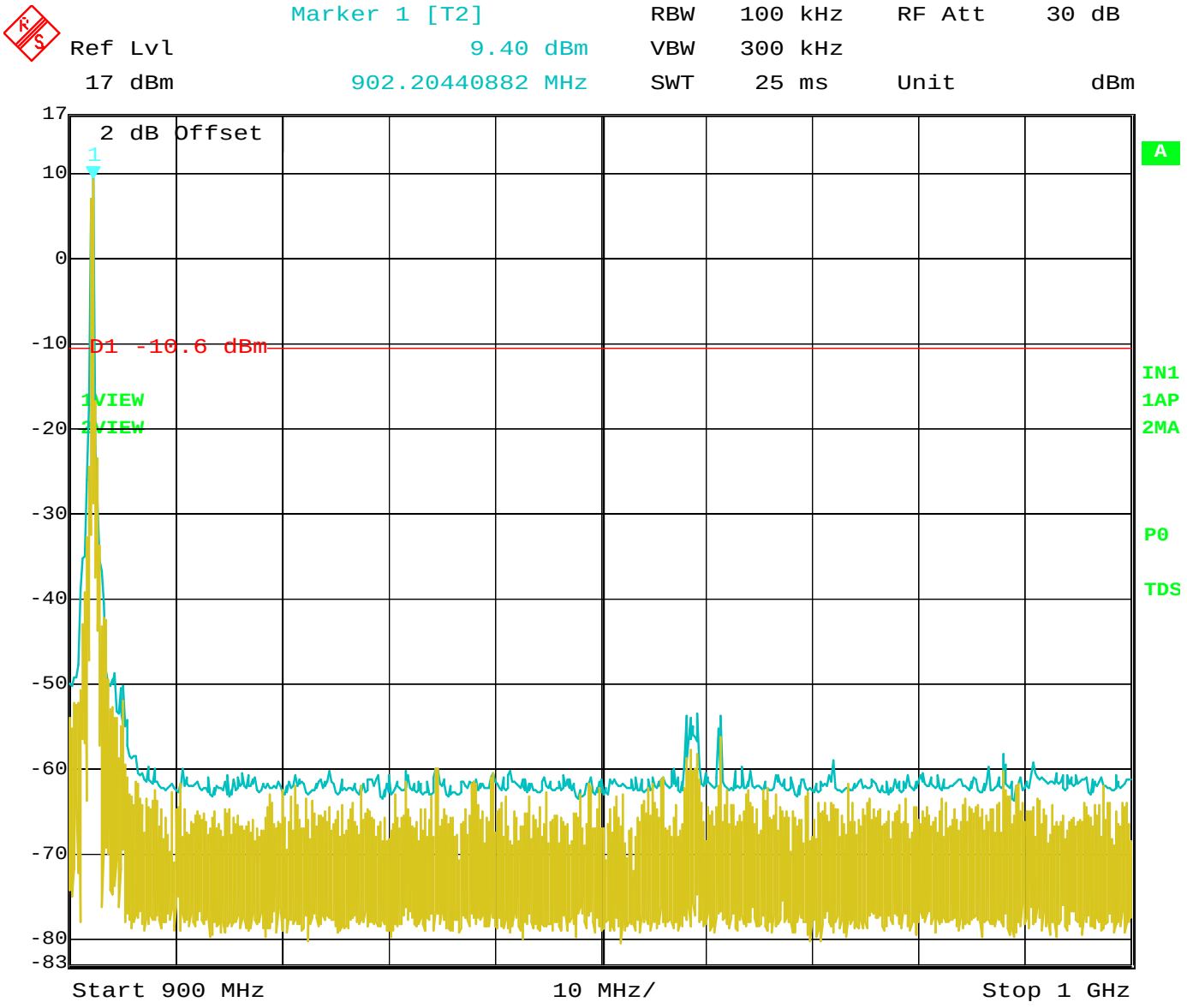
Peak Power Output – High Channel

RF CONDUCTED ANTENNA TEST

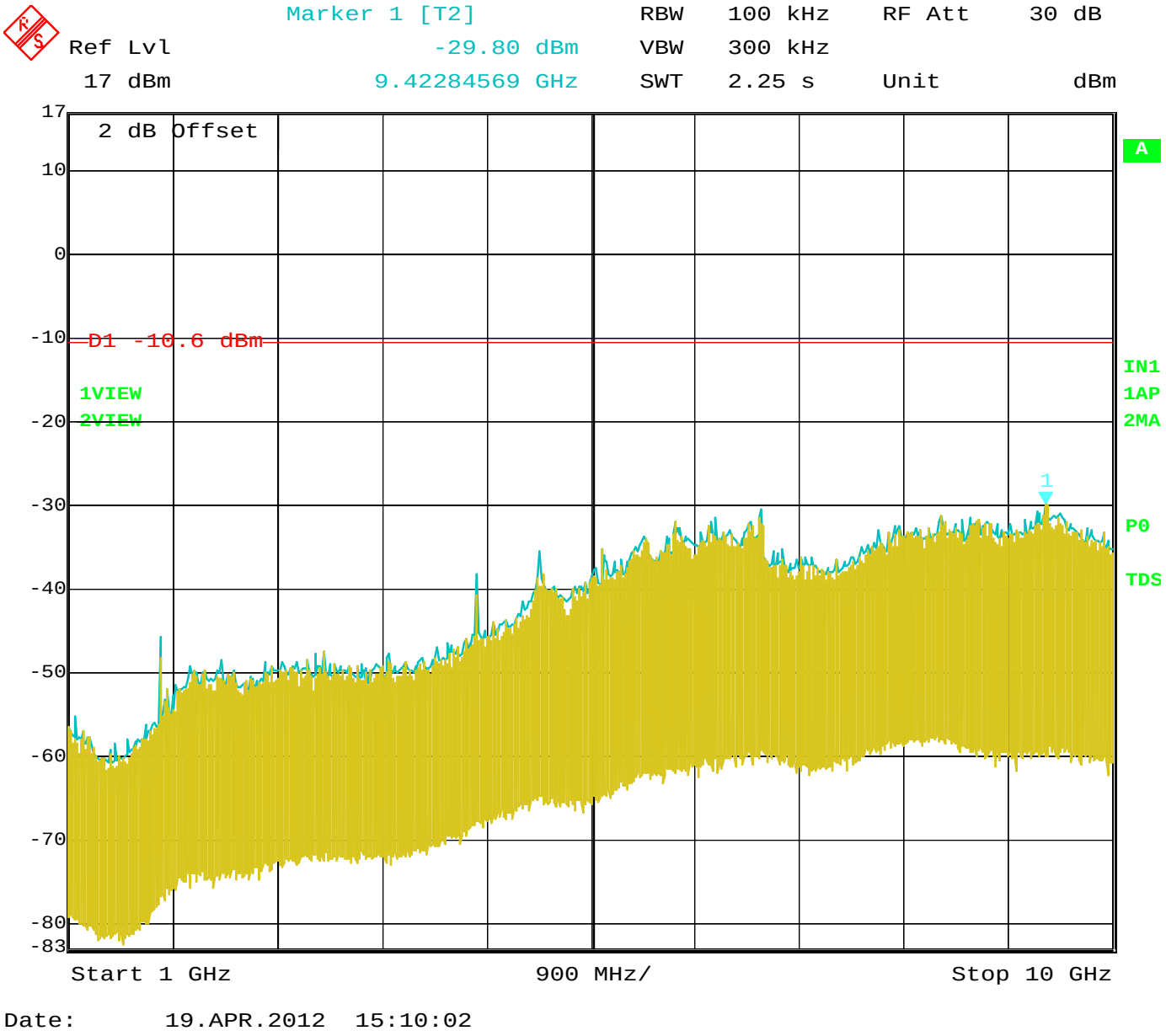
DATA SHEETS



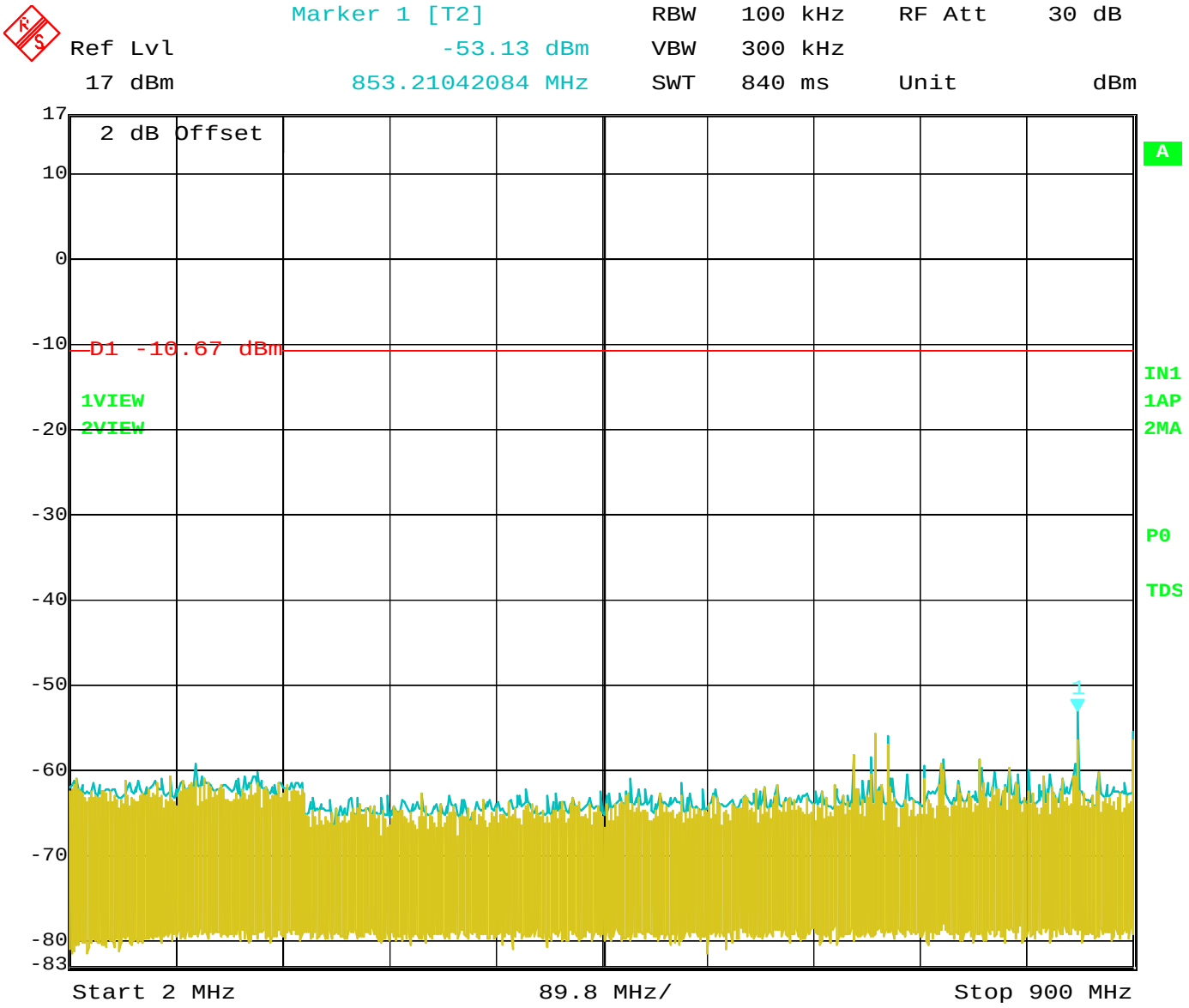
RF Antenna Conducted Test – Low Channel – 2 MHz to 900 MHz



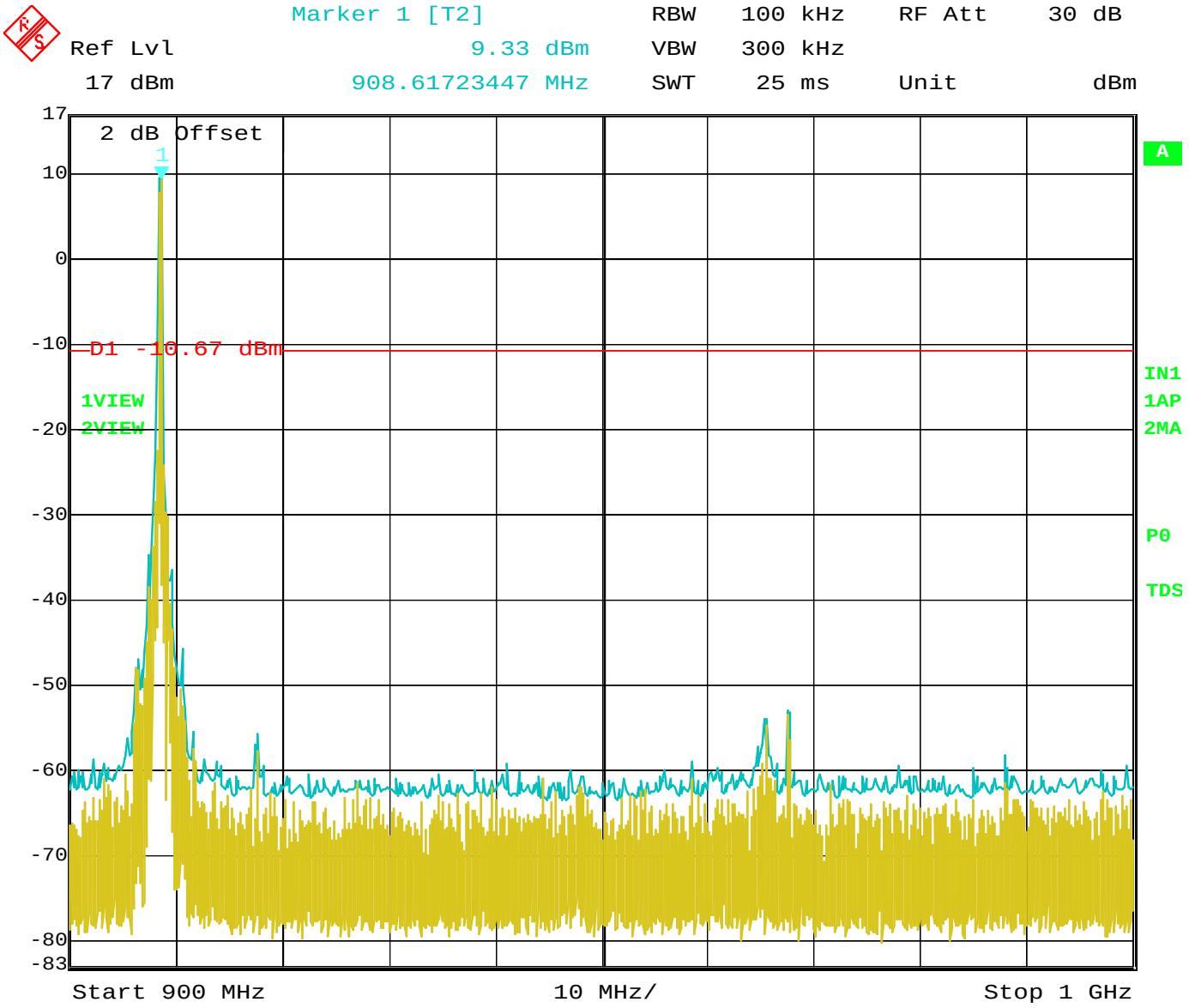
RF Antenna Conducted Test – Low Channel – 900 MHz to 1 GHz



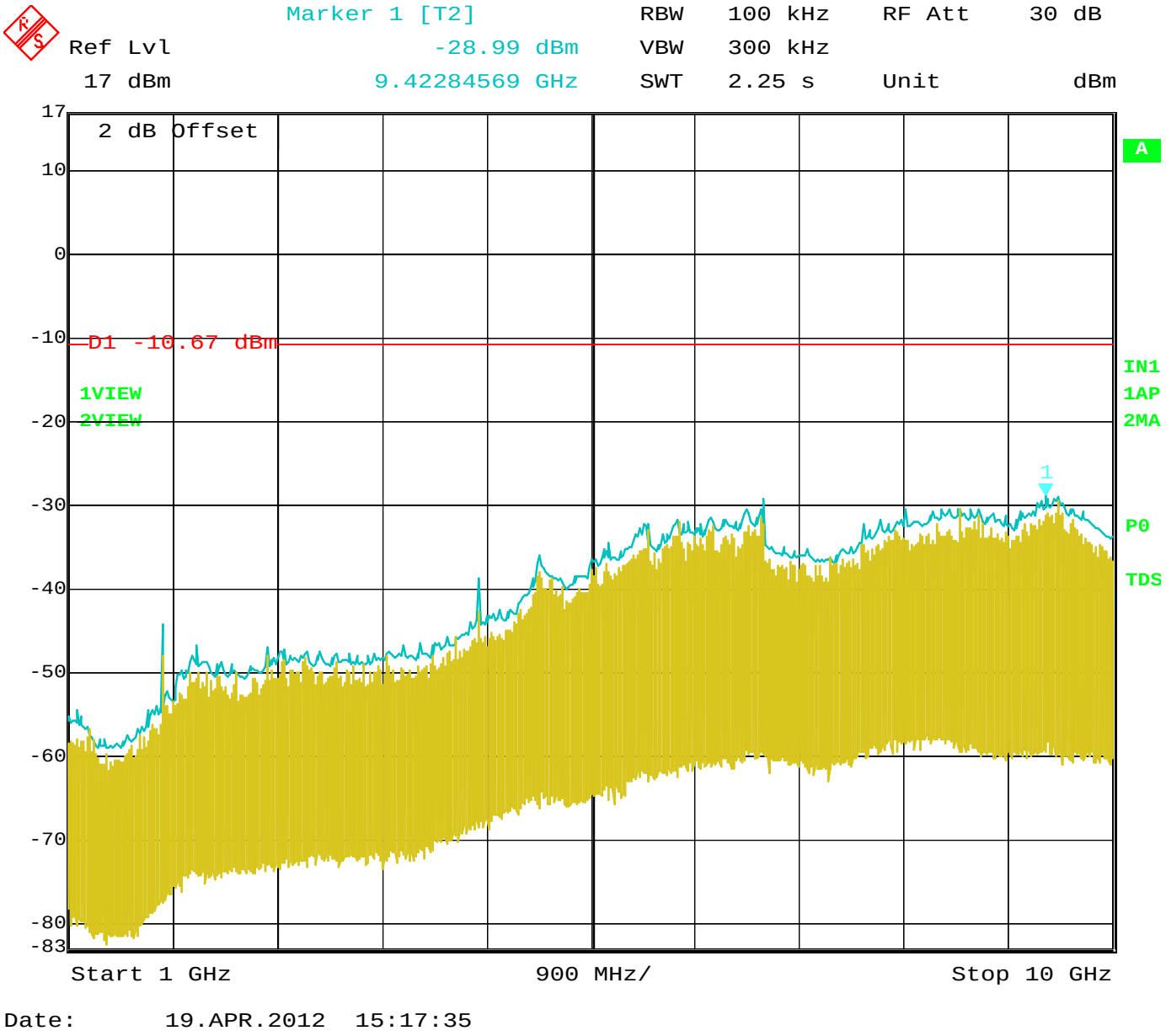
RF Antenna Conducted Test – Low Channel – 1 GHz to 10 GHz



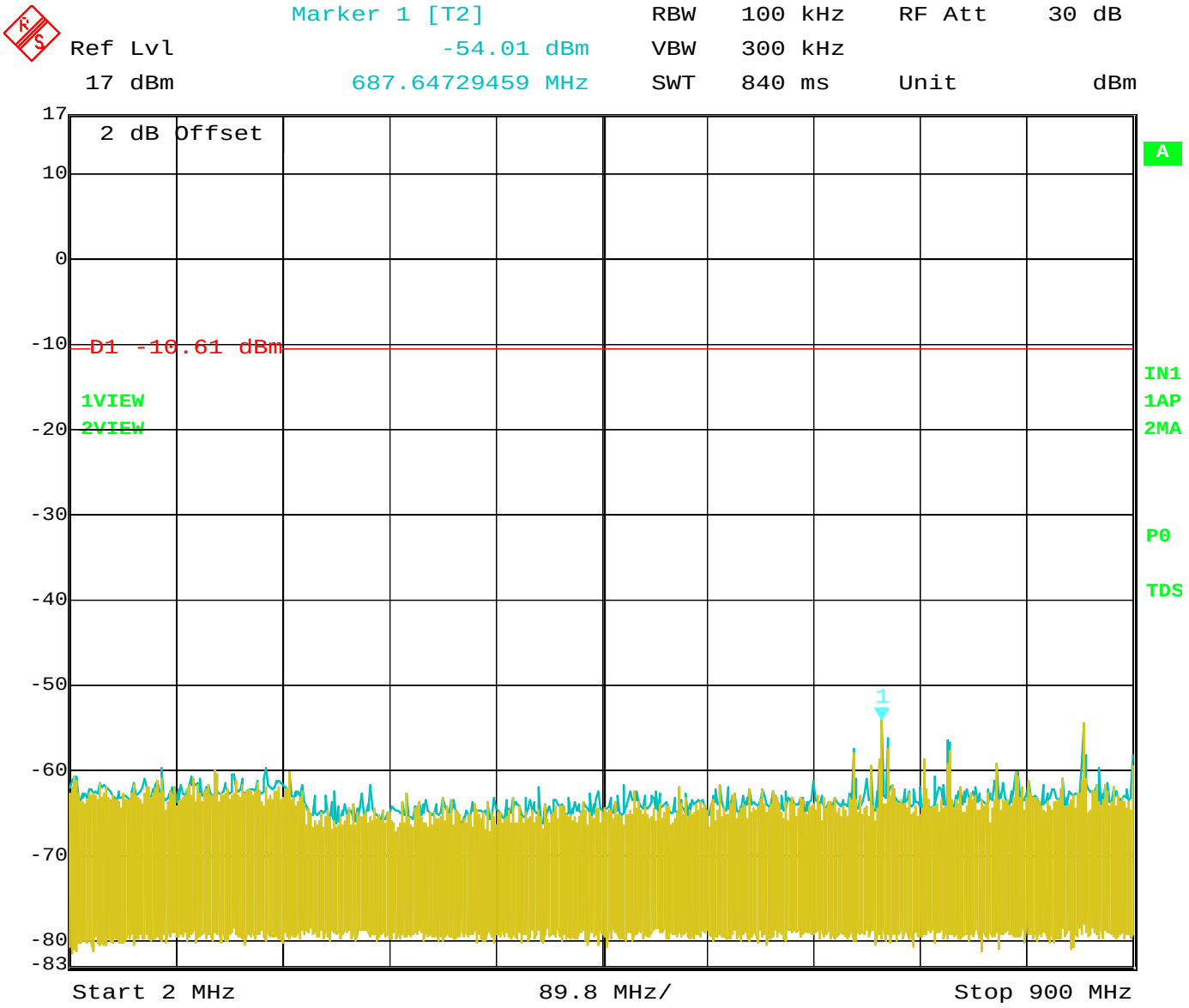
RF Antenna Conducted Test – Low Channel – 2 MHz to 900 MHz



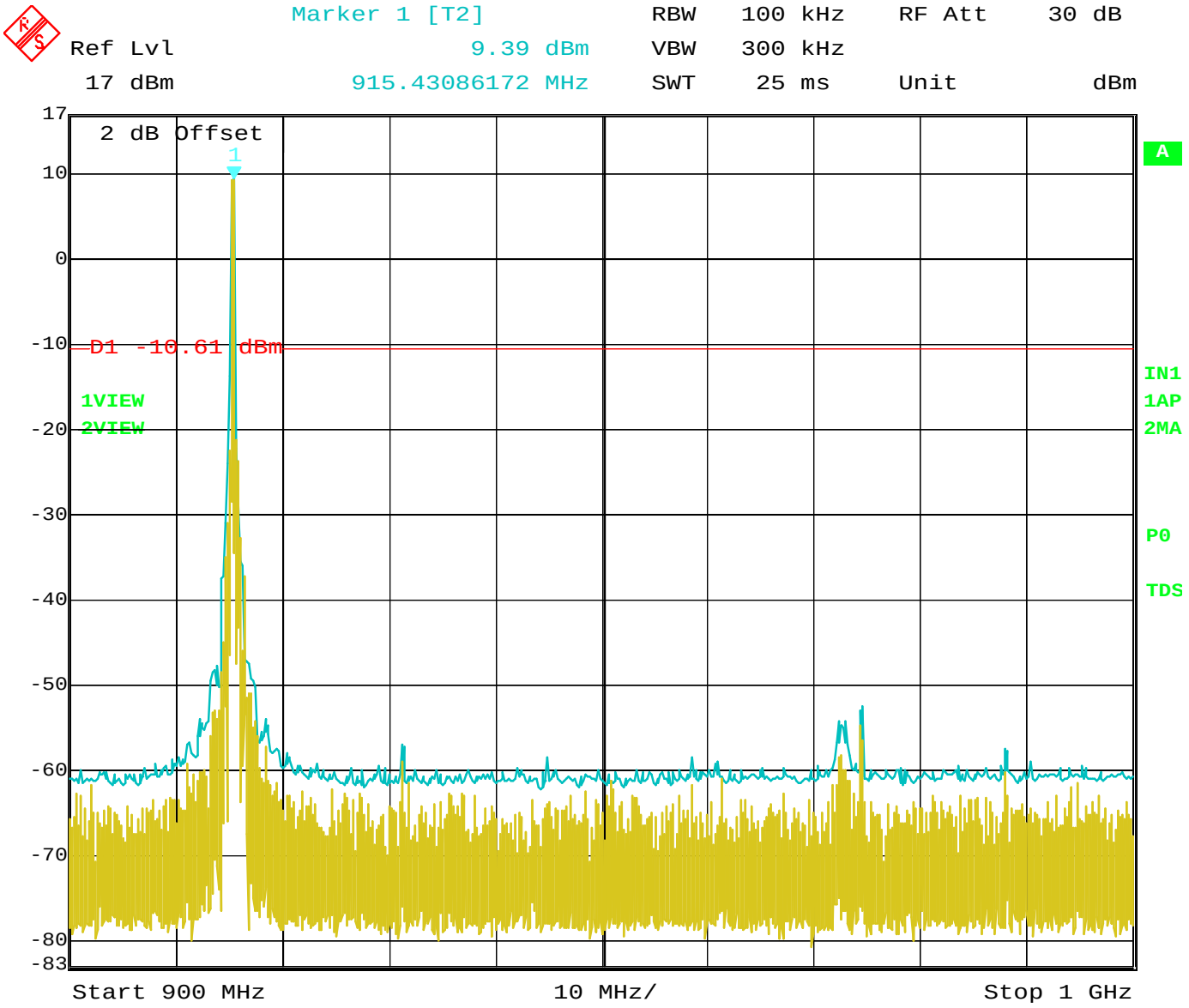
RF Antenna Conducted Test – Middle Channel – 900 MHz to 1 GHz



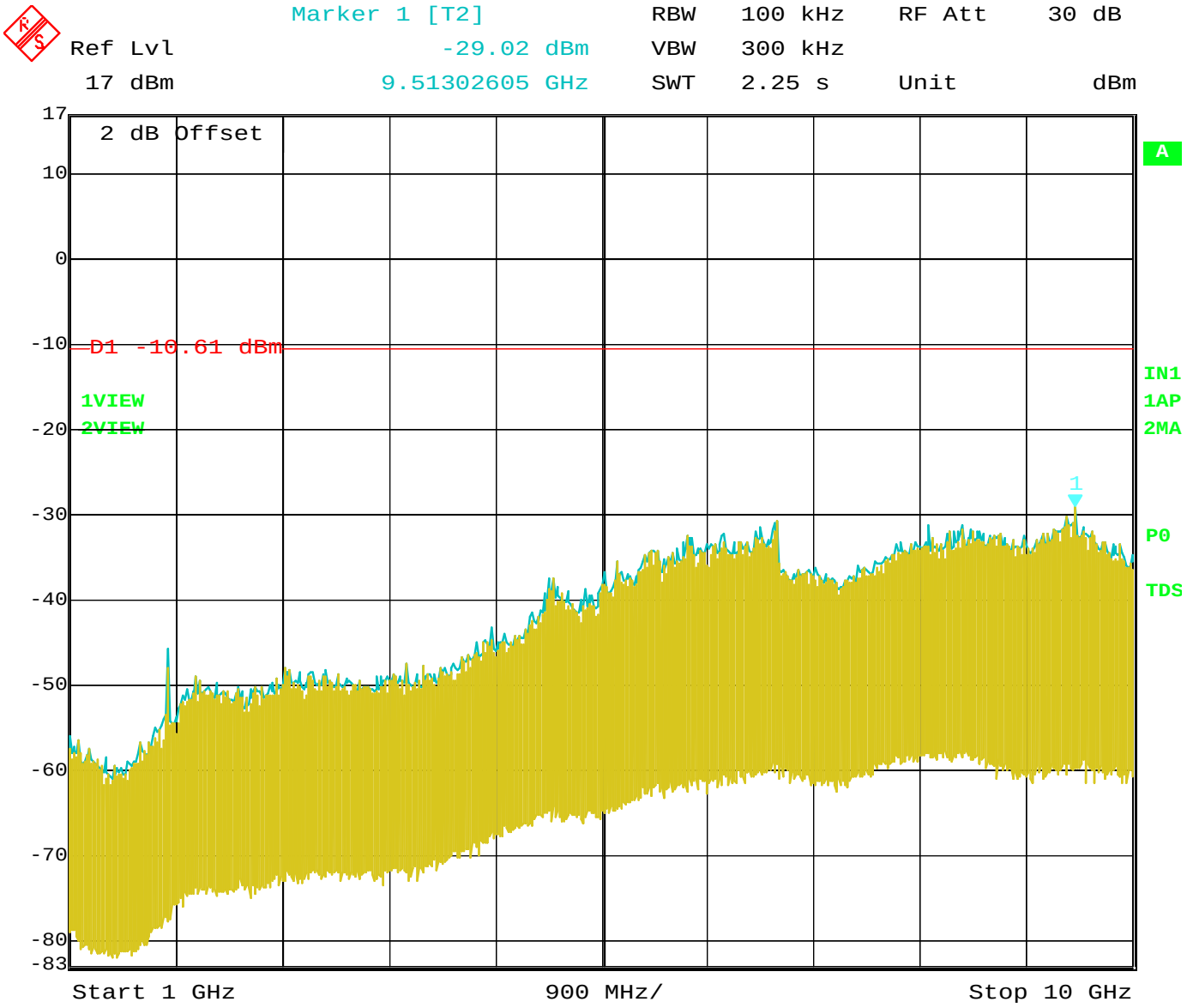
RF Antenna Conducted Test – Middle Channel – 1 GHz to 10 GHz



RF Antenna Conducted Test – High Channel – 2 MHz to 900 MHz



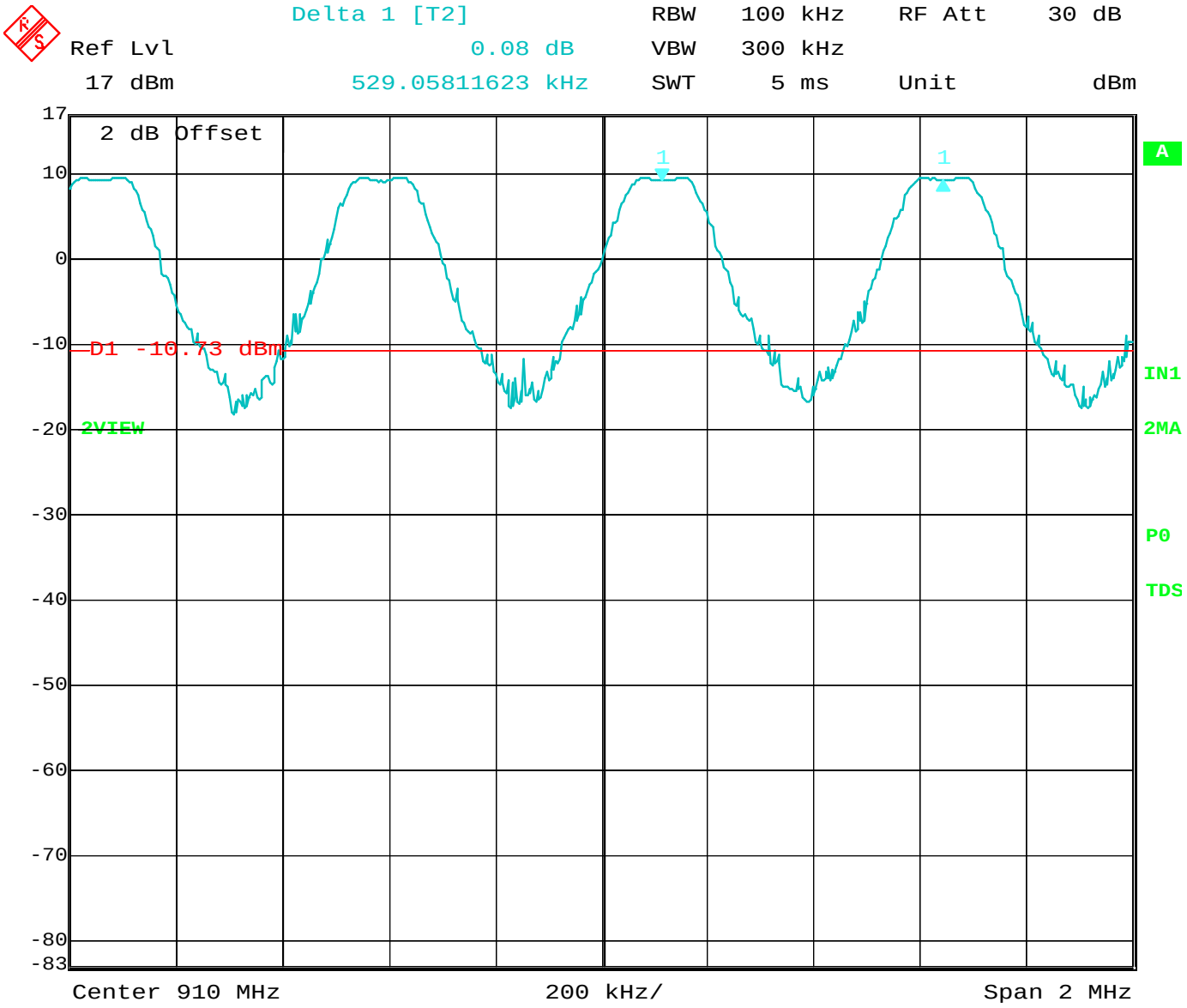
RF Antenna Conducted Test – High Channel – 900 MHz to 1 GHz



RF Antenna Conducted Test – High Channel – 1 GHz to 10 GHz

CHANNEL HOPPING SEPARATION

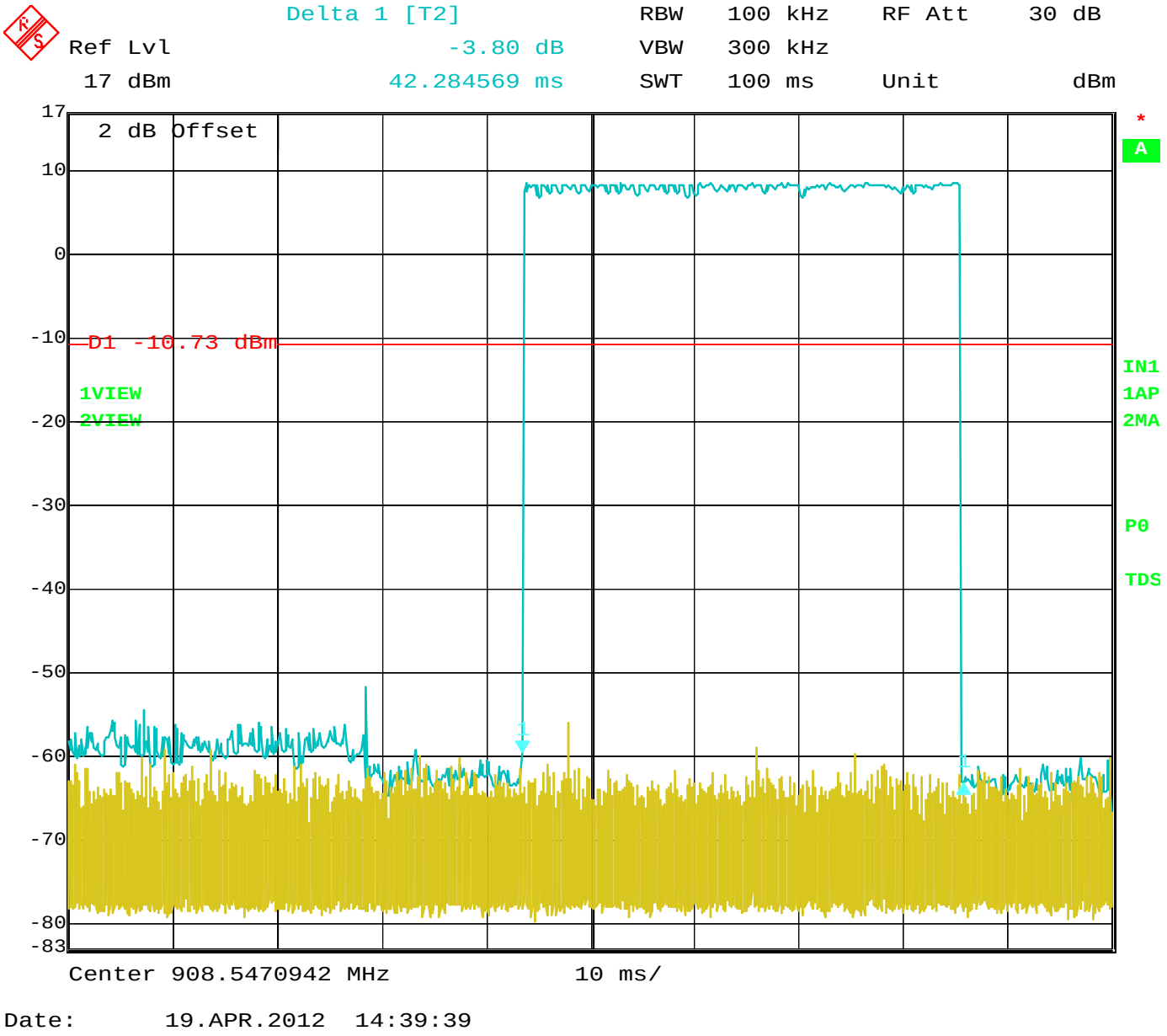
DATA SHEET



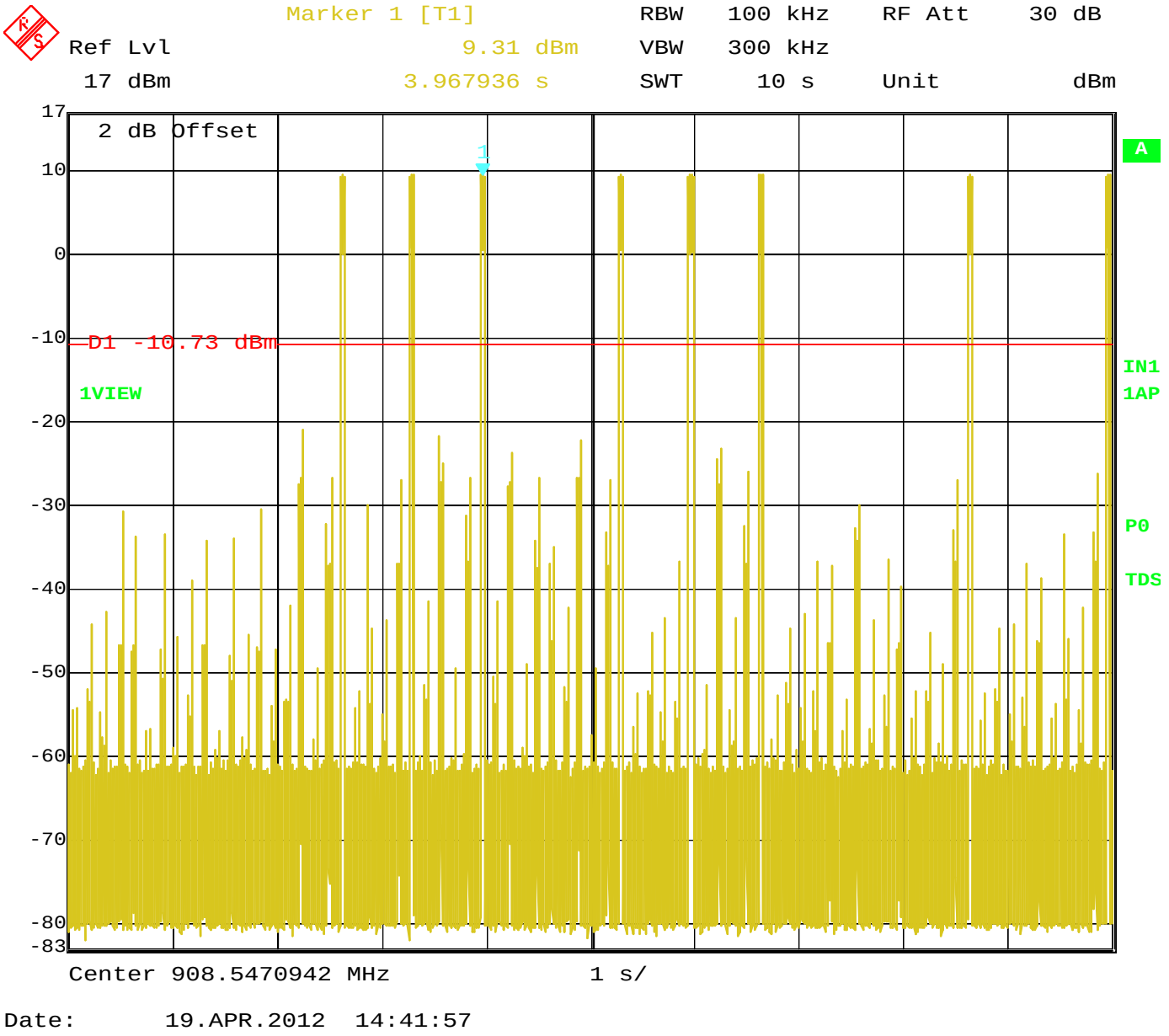
Channel Frequency Separation Test at 100 kHz RBW

AVERAGE TIME OF OCCUPANCY

DATA SHEETS



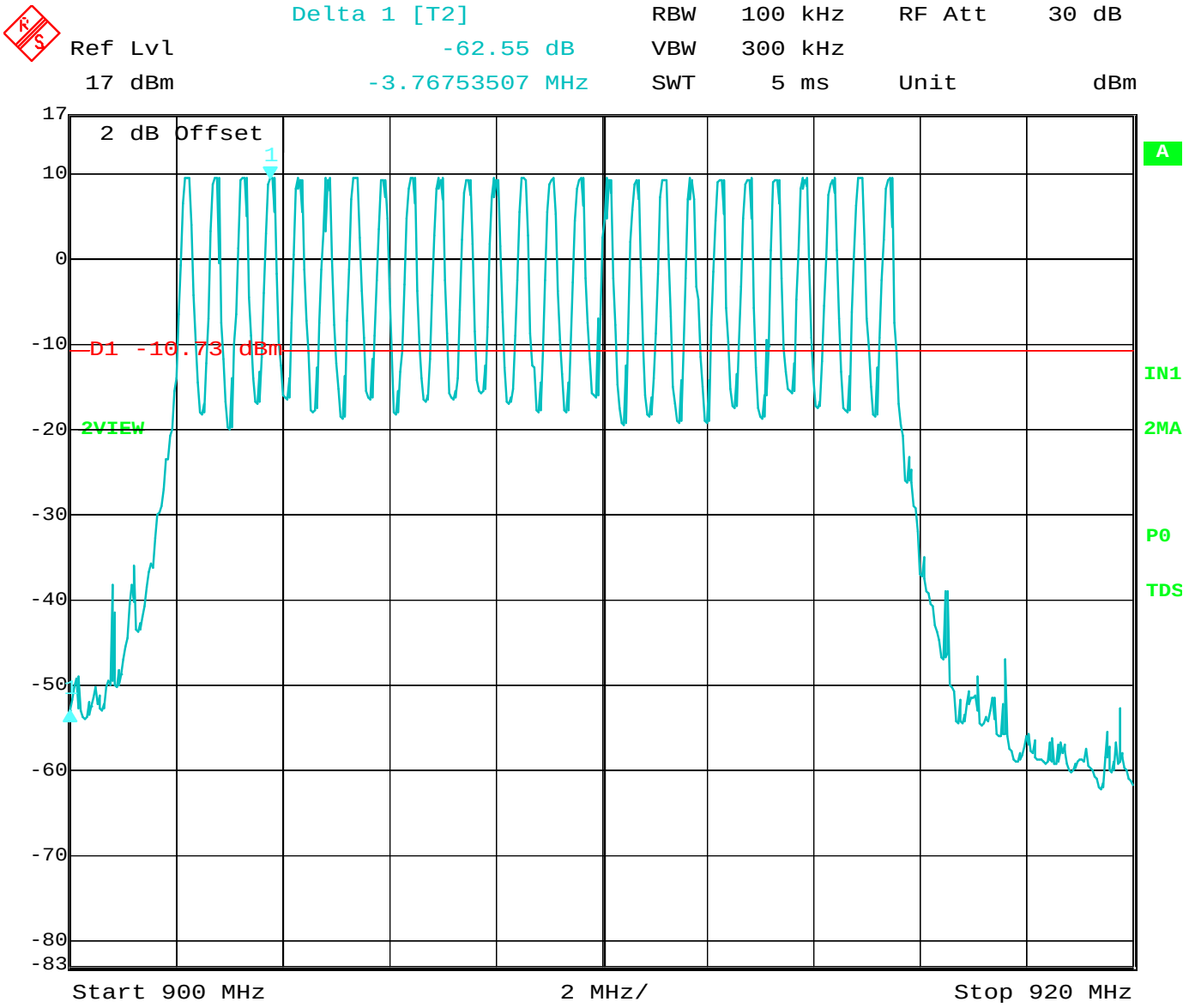
Time of 1 Pulse = 42.284569 mS



Number of Pulses in 10 Seconds = 8
Time of Occupancy = 8*42.284569 mS = 338.276552 mS per 10 Second Period
Limit = 400 mS per 10 Second Period

NUMBER OF HOPPING FREQUENCIES

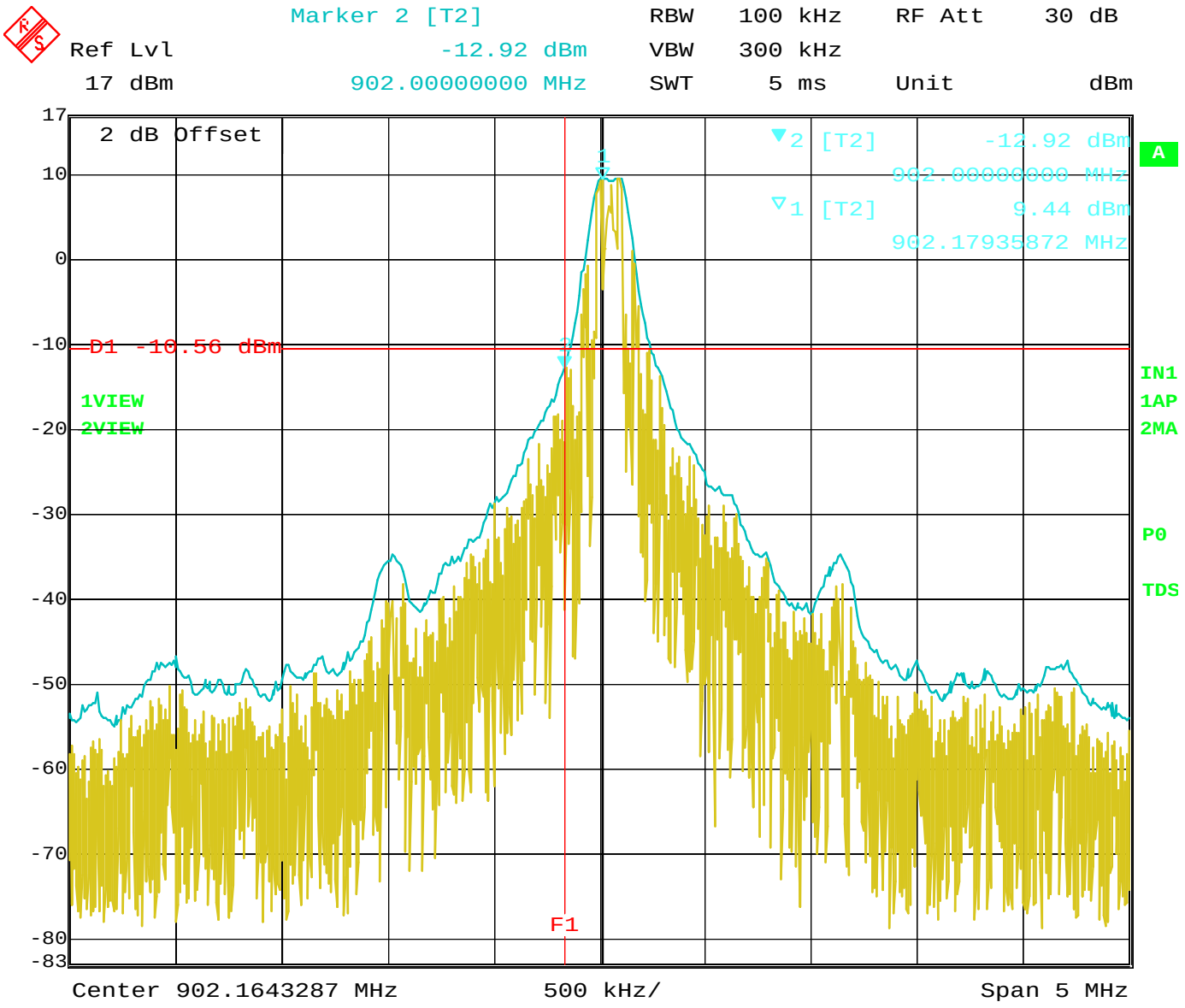
DATA SHEET



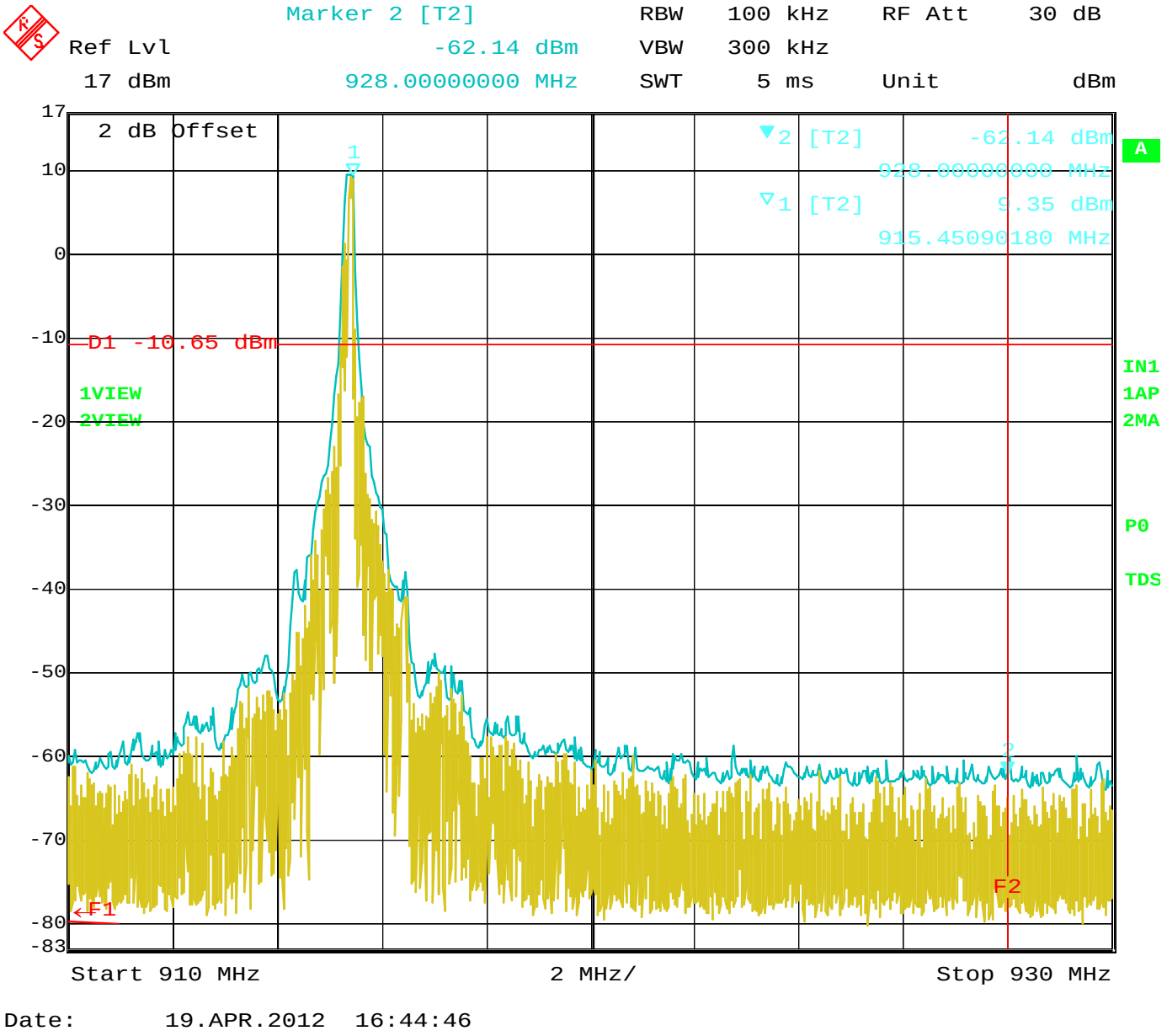
Number of Frequencies (26 Total)

BAND EDGES

DATA SHEETS



Band Edge – Low Channel



Band Edge – High Channel