FCC PART 15, SUBPART B
FCC 15.247 TEST REPORT

For

NIGHTHAWK V2 – TRANSMITTER
MODEL: 836685

Prepared for

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DATE: JULY 19, 2014

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
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GENERAL REPORT SUMMARY

This electromagnetic emission 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 except in full, without the written permission of Compatible Electronics.

This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the federal government.

Device Tested:	Nighthawk V2 – Transmitter Model: 836685
Product Description:	Please see the expository statement.
Modifications:	The EUT was not modified during the testing.
Manufacturer:	Pacific Scientific Energetic Materials Company (California), LLC 3601 Union Road Hollister, California 95023
Test Dates:	April 17 and 30, 2014
Test Specifications:	Emissions requirements CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247 Test Procedure: ANSI C63.4: 2009 and DA-00-705: 2000.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz - 30 MHz	This test was not performed because the EUT operates on battery power only and cannot be connected to the AC public mains.
2	Radiated RF Emissions, 10 kHz – 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, 15.209 and 15.247 (d)
3	20 dB Bandwidth	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1)(i)
4	Peak Power Output	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (b)(2)
5	RF Conducted Antenna Test	This test was not performed because it was performed by radiated measurements to determine compliance with FCC 15.247 (d)
6	Carrier Frequency Separation	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1)
7	Average Time of Occupancy	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1)(i)
8	Peak Power Spectral Density from the International Radiator to the Antenna	This test was not performed because the EUT is a frequency hopper.

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the Nighthawk V2 – Transmitter, Model: 836685. The emissions measurements were performed according to the measurement procedure described in ANSI C63.4: 2009 and DA00-705: 2000. 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, 15.207, 15.209, and 15.247.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The emissions 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

Pacific Scientific Energetic Materials Company (California), LLC

Michael Hathaway	Electrical Engineer

Compatible Electronics Inc.

Kyle Fujimoto	Test Engineer
James Ross	Test Engineer

2.4 Date Test Sample was Received

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

2.5 Disposition of the Test Sample

The test sample has not been returned to Pacific Scientific Energetic Materials Company (California), LLC 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

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this 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
DA 00-705: 2000	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration – (Emissions)

The Nighthawk V2 – Transmitter, Model: 836685 (EUT) was tested as a stand-alone device and placed at the center of the table. The EUT was continuously transmitting. The low, middle, and high channels were tested via pushing a button on the EUT to transmit at the low, middle, or high channel.

The highest emissions were found when the EUT was running in the above configurations. The cables were moved to maximize the emissions. The final conducted and radiated data as well as the radiated data was taken in both configuration described above. All initial investigations were performed with the measurement receiver in manual mode scanning the frequency range continuously. The cables were bundled and routed as shown in the photographs in Appendix D.

4.1.2 Cable Construction and Termination

There were no cables connected to the EUT.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT TYPE	MANU-FACTURER	MODEL	SERIAL NUMBER	FCC ID
NIGHTHAWK V2 – TRANSMITTER	PACIFIC SCIENTIFIC ENERGETIC MATERIALS COMPANY (CALIFORNIA), LLC	836685	N/A	RSJNIGHTHAWKV2

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
GENERAL TEST EQUIPMENT USED FOR ALL RF EMISSIONS TESTS					
EMI Receiver	Rohde & Schwarz	ESIB40	100194	November 19, 2012	November 19, 2014
EMI Receiver, 20 Hz to 26.5 GHz	Agilent	N9038A	MY51100115	March 6, 2014	March 6, 2015
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A
RF RADIATED EMISSIONS TEST EQUIPMENT					
TDK Emissions Lab	TDK RF Solutions, Inc.	7.8.7	N/A	N/A	N/A
Loop Antenna	Com-Power	AL-130	17089	January 29, 2013	January 29, 2015
CombiLog Antenna	Com-Power	AC-220	61060	May 29, 2013	May 29, 2014
Horn Antenna	Com-Power	AH-118	071175	February 26, 2014	February 26, 2016
Preamplifier	Com-Power	PA-118	181656	January 13, 2014	January 13, 2015
System Controller	Sunol Sciences Corporation	SC110V	112213-1	N/A	N/A
Turntable	Sunol Sciences Corporation	2011VS	N/A	N/A	N/A
Antenna-Mast	Sunol Sciences Corporation	TWR95-4	112213-3	N/A	N/A

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1.2 of this report for 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. TEST PROCEDURES

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

7.1 RF Emissions

7.1.1 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. 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 spectrum analyzer offset was adjusted accordingly to read the actual data measured. The LISN output was read by the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for the conducted emissions 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. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The initial test data was taken in manual mode while scanning the frequency ranges of 0.15 MHz to 1.6 MHz, 1.6 MHz to 5 MHz, and 5 MHz to 30 MHz. The conducted emissions from the EUT were maximized for operating mode as well as cable placement. Once a predominant frequency (within 12 dB of the limit) was found, it was more closely examined with the spectrum analyzer span adjusted to 1 MHz.

The final data was collected under program control by the computer in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The six highest emissions are listed in Table 1.

Test Results:

This test was not performed because the EUT operates on battery power only and cannot be connected to the AC public mains.

7.1.2 Radiated Emissions Test – Lab D

The EMI Receiver was used as the measuring meter. A built-in, internal preamplifier was used to increase the sensitivity of the instrument. The EMI Receiver was initially used in the Analyzer mode feature activated. In this mode, the EMI receiver can then record the actual frequency to be measured. This final reading is then taken accurately in the EMI Receiver mode, which takes into account the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit. A quasi-peak reading was taken only for those readings, which are marked accordingly on the data sheets. The effective measurement bandwidth used for the radiated emissions test was according to the frequency measured (120 kHz for 30 MHz to 1 GHz).

A broadband Combilog antenna was used as a transducer during the measurement. The Combilog antenna was used from 30 MHz to 1000 MHz. Furthermore, the frequency span was reduced during the preliminary investigations as deemed necessary.

The EMI 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 (for E field radiated field strength).

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	Loop Antenna
150 kHz to 30 MHz	9 kHz	Loop Antenna
30 MHz to 1 GHz	120 kHz	CombiLog Antenna

The EUT was tested at a 3 meter test distance. The six highest emissions are listed in Table 1.0.

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 Radiated Emissions Test – Lab B

The EMI Receiver was used as a measuring meter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Microwave Preamplifier Model: PA-118 was used for frequencies above 1 GHz. The EMI Receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the EMI Receiver 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.

The readings were averaged by a “duty cycle correction factor”, derived from 20 log (dwell time / 100 ms). This duty cycle correction factor was then subtracted from the peak reading.

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

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
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 Test (Continued)

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.

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
Nighthawk V2 – Transmitter, MODEL: 836685

Frequency MHz	Emission Level* dBuV	Specification Limit dBuV	Delta dB
4573.1 (V) (X-Axis)	48.61 (A)	54.00	-5.39
4573.1 (V) (Z-Axis)	46.45 (A)	54.00	-7.55
4573.1 (H) (Y-Axis)	46.39 (A)	54.00	-7.61
4573.1 (H) (X-Axis)	46.38 (A)	54.00	-7.62
4550.6 (V) (Y-Axis)	45.99 (A)	54.00	-8.01
4550.6 (V) (X-Axis)	45.71 (V)	54.00	-8.29

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 10 kHz and the video bandwidth was 30 kHz.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1)(i). The 20 dB bandwidth is less than the separation between channels. Please see the data sheets located in Appendix E.

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 250 mW. 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:

This test was not performed because it was performed by radiated measurements to determine compliance with FCC 15.247 (d).

7.5 RF Band Edges

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. The RBW was set to 100 kHz and the VBW was set to 300 kHz. Plots of the fundamental were taken to ensure the amplitude at the band edges were at least 20 dB down from the peak of the fundamental emission.

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 20 kHz, and the video bandwidth 100 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 E.

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 30 kHz, and the video bandwidth was 100 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 (a)(1) and 15.247 (a)(1)(i). The number of hopping frequencies is 25. 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 50 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 1 second and the number of pulses taken. The number of pulses was then multiplied by 10 to determine the number of pulses in a 10 second period. The number of pulses in a 10 second period was then multiplied by the time for each pulse to determine the average 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. DEVIATIONS FROM THE TEST PROCEDURES

There were no deviations from the test procedures.

9. CONCLUSIONS

The Nighthawk V2 -- Transmitter, Model: 836685, as tested, meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections 15.205, 15.207, 15.209, and 15.247.

APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

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

For US, Canada, Australia/New Zealand, 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 15.247 and/or FCC **Class B** specifications.

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	Nighthawk V2 -- Transmitter M/N: 836685 S/N: NONE

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

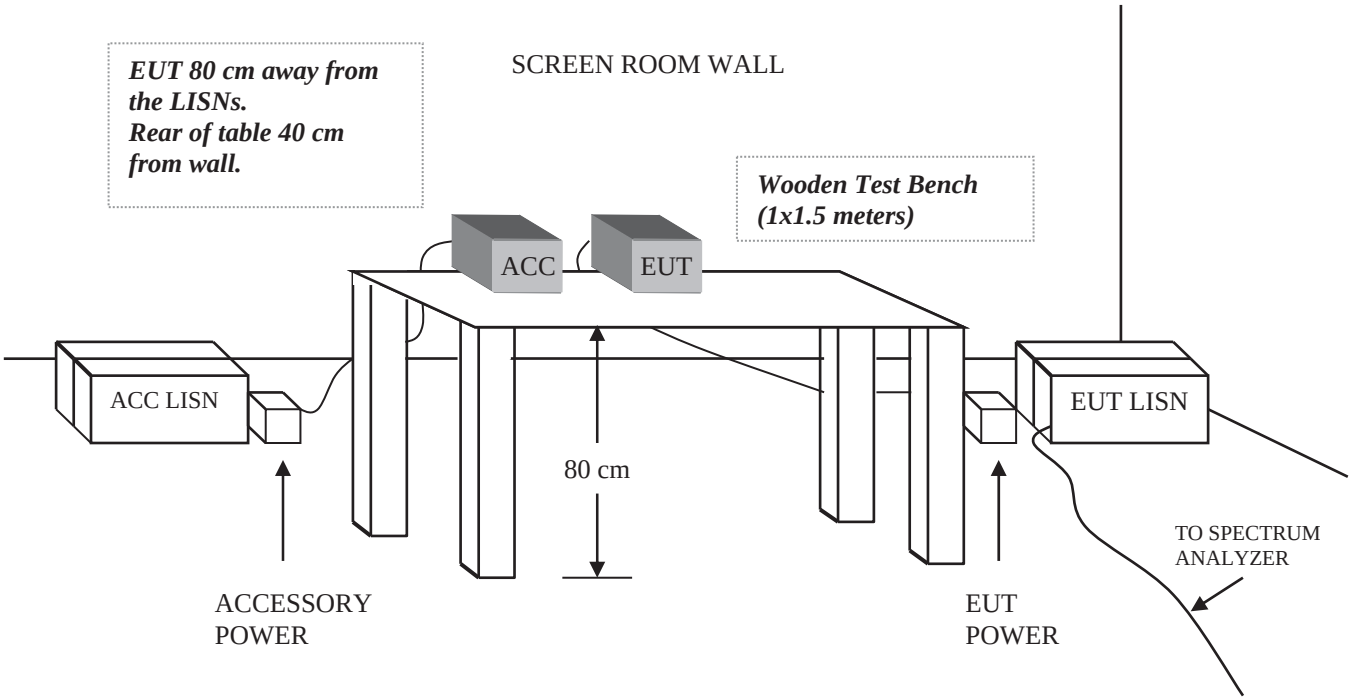
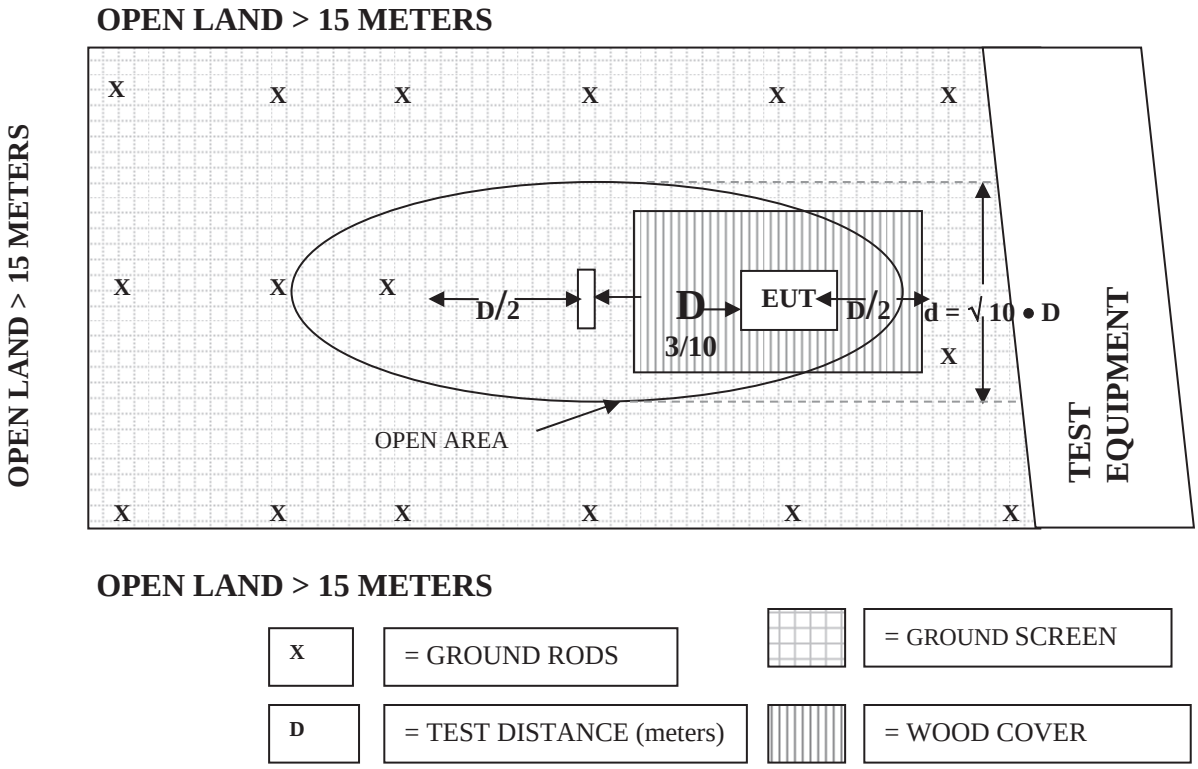
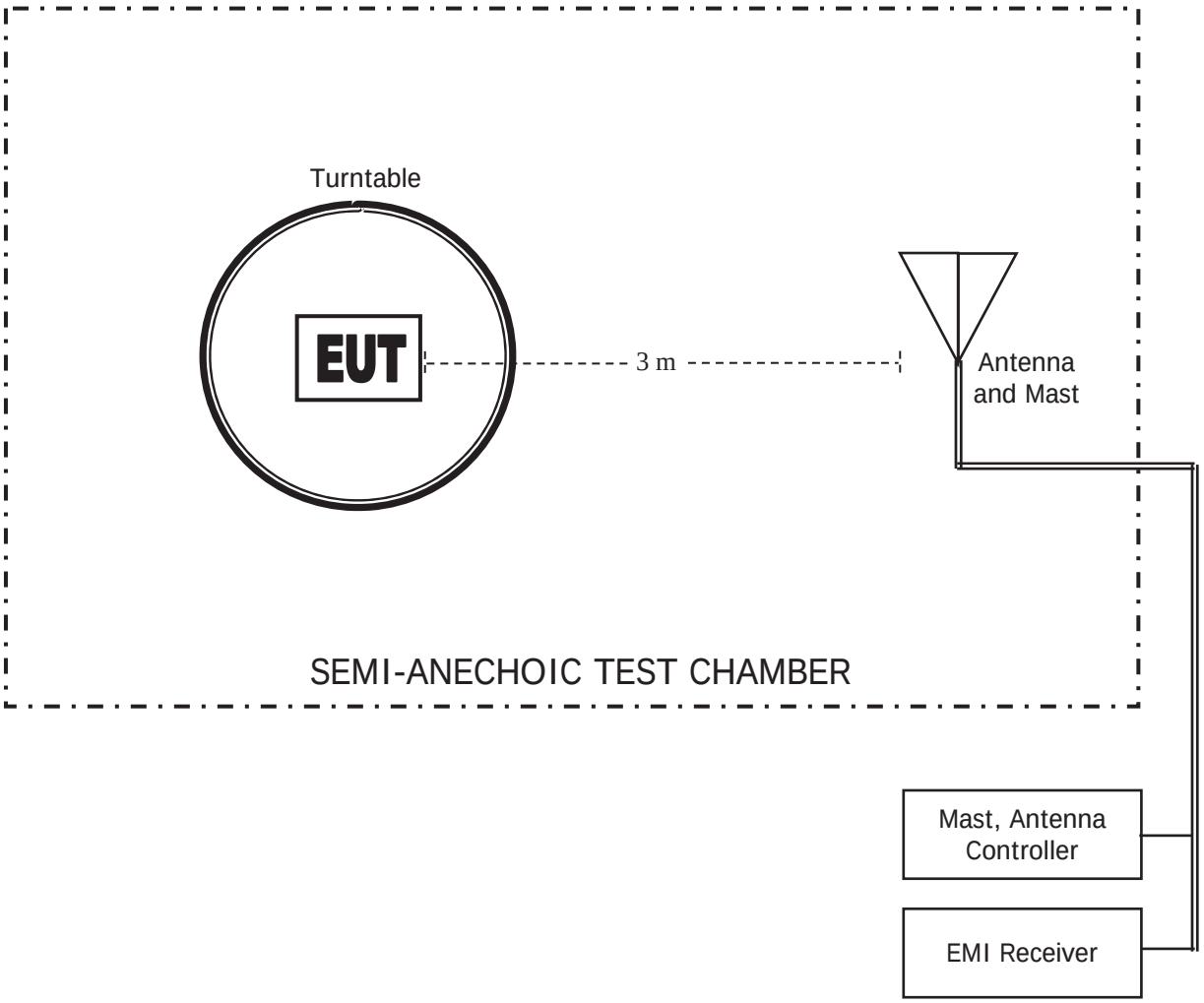


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE



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

FIGURE 3: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER



COM-POWER AC-220

COMBILOG ANTENNA

S/N: 61060

CALIBRATION DATE: MAY 29, 2013

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	19.40	200	9.10
35	19.10	250	11.40
40	19.70	300	11.90
45	18.00	350	14.20
50	16.80	400	15.20
60	12.50	450	16.50
70	7.30	500	17.10
80	4.40	550	16.20
90	8.00	600	17.70
100	8.80	650	19.10
120	10.50	700	20.00
125	10.60	750	21.50
140	8.60	800	21.50
150	11.20	850	21.70
160	8.90	900	22.70
175	9.60	950	22.10
180	8.50	1000	22.90

COM POWER AH-118

HORN ANTENNA

S/N: 071175

CALIBRATION DATE: FEBRUARY 26, 2014

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.23	10.0	38.43
1.5	25.84	10.5	40.19
2.0	28.14	11.0	40.49
2.5	29.51	11.5	41.39
3.0	31.20	12.0	42.02
3.5	32.17	12.5	43.30
4.0	31.40	13.0	42.77
4.5	31.86	13.5	40.18
5.0	34.82	14.0	42.59
5.5	34.38	14.5	41.74
6.0	36.31	15.0	41.84
6.5	34.81	15.5	38.48
7.0	37.48	16.0	39.52
7.5	36.98	16.5	37.85
8.0	36.66	17.0	41.33
8.5	38.47	17.5	44.96
9.0	37.22	18.0	48.50
9.5	37.86		

COM-POWER AL-130

LOOP ANTENNA

S/N: 17089

CALIBRATION DATE: JANUARY 29, 2013

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-42.5	9
0.01	-42.3	9.2
0.02	-42.1	9.4
0.03	-41.4	10.1
0.04	-41.8	9.7
0.05	-42.4	9.1
0.06	-42.3	9.2
0.07	-42.5	9
0.08	-42.4	9.1
0.09	-42.5	9
0.1	-42.5	9
0.2	-42.7	8.8
0.3	-42.6	8.9
0.4	-42.5	9
0.5	-42.7	8.8
0.6	-42.7	8.8
0.7	-42.5	9
0.8	-42.3	9.2
0.9	-42.2	9.3
1	-42.2	9.3
2	-41.8	9.7
3	-41.7	9.8
4	-41.7	9.8
5	-41.5	10
6	-41.6	9.9
7	-41.4	10.1
8	-41	10.5
9	-40.8	10.7
10	-41.3	10.2
15	-41.4	10.1
20	-41.2	10.3
25	-42.6	8.9
30	-41.7	9.8

COM-POWER PA-118

PREAMPLIFIER

S/N: 181656

CALIBRATION DATE: JANUARY 13, 2014

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.90	6.0	25.40
1.1	25.30	6.5	25.20
1.2	26.00	7.0	24.40
1.3	26.20	7.5	24.00
1.4	26.30	8.0	23.90
1.5	26.40	8.5	24.50
1.6	26.50	9.0	25.20
1.7	26.60	9.5	24.80
1.8	26.50	10.0	24.90
1.9	26.60	11.0	25.40
2.0	26.70	12.0	24.50
2.5	26.90	13.0	24.30
3.0	27.00	14.0	25.20
3.5	27.10	15.0	25.90
4.0	26.60	16.0	25.60
4.5	26.10	17.0	23.70
5.0	26.40	18.0	25.80
5.5	25.80		

FRONT VIEW

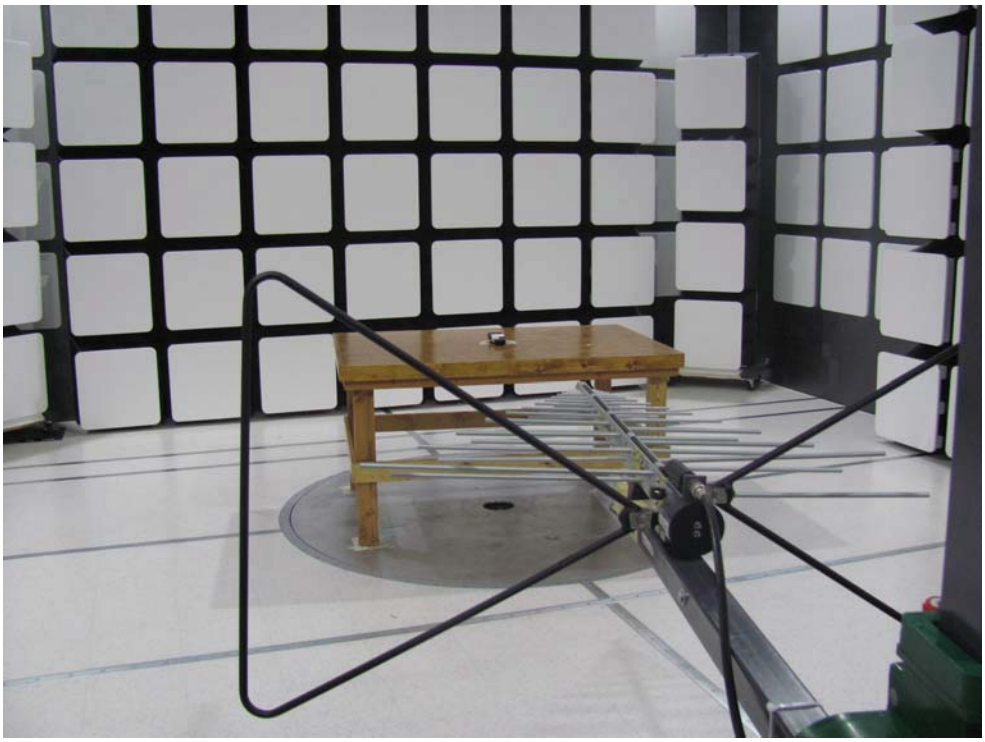
PACIFIC SCIENTIFIC ENERGETIC MATERIALS COMPANY (CALIFORNIA), LLC
NIGHTHAWK V2 – TRANSMITTER
MODEL: 836685
RADIATED EMISSIONS – ABOVE 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

PACIFIC SCIENTIFIC ENERGETIC MATERIALS COMPANY (CALIFORNIA), LLC
NIGHTHAWK V2 – TRANSMITTER
MODEL: 836685
RADIATED EMISSIONS – ABOVE 1 GHz

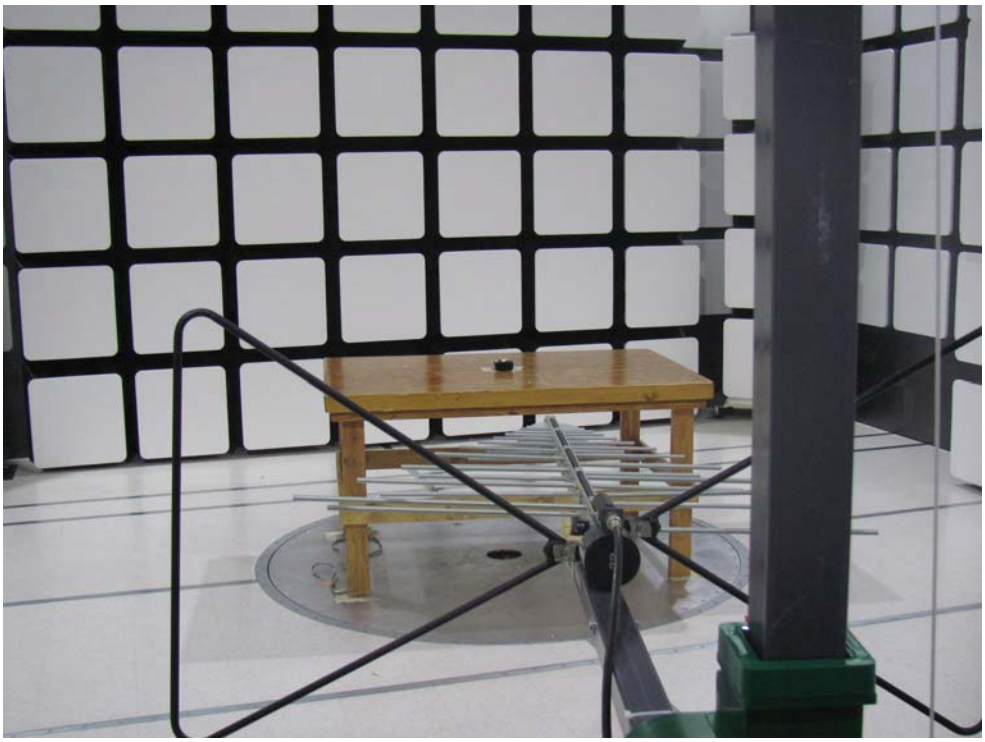
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



FRONT VIEW

PACIFIC SCIENTIFIC ENERGETIC MATERIALS COMPANY (CALIFORNIA), LLC
NIGHTHAWK V2 – TRANSMITTER
MODEL: 836685
RADIATED EMISSIONS – BELOW 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

PACIFIC SCIENTIFIC ENERGETIC MATERIALS COMPANY (CALIFORNIA), LLC
NIGHTHAWK V2 – TRANSMITTER
MODEL: 836685
RADIATED EMISSIONS – BELOW 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

RADIATED EMISSIONS

DATA SHEETS

FCC 15.247
Pacific Scientific
Nighthawk V2 - Transmitter
Model: 836685

Date: 04/17/2014
Lab: D
Tested By: Kyle Fujimoto

Low Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
902.62	93.25	V	--	--	Peak	1.25	225	**X-Axis**
902.62	73.25	V	--	--	Avg	1.25	225	**Vertical Polarization**
902.62	104.45	H	--	--	Peak	1.25	225	**X-Axis**
902.62	84.45	H	--	--	Avg	1.25	225	**Horizontal Polarization**
902.62	103.26	V	--	--	Peak	1.25	155	**Y-Axis**
902.62	83.26	V	--	--	Avg	1.25	155	**Vertical Polarization**
902.62	92.54	H	--	--	Peak	2.25	180	**Y-Axis**
902.62	72.54	H	--	--	Avg	2.25	180	**Horizontal Polarization**
902.62	97.21	V	--	--	Peak	1.25	155	**Z-Axis**
902.62	77.21	V	--	--	Avg	1.25	155	**Vertical Polarization**
902.62	102.76	H	--	--	Peak	1.25	45	**Z-Axis**
902.62	82.76	H	--	--	Avg	1.25	45	**Horizontal Polarization**

FCC 15.247
Pacific Scientific
Nighthawk V2 - Transmitter
Model: 836685

Date: 04/17/2014
Lab: D
Tested By: Kyle Fujimoto

Middle Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
908.62	94.01	V	--	--	Peak	1	180	**X-Axis**
908.62	74.01	V	--	--	Avg	1	180	**Vertical Polarization**
908.62	105.38	H	--	--	Peak	1	45	**X-Axis**
908.62	85.38	H	--	--	Avg	1	45	**Horizontal Polarization**
908.62	105.01	V	--	--	Peak	1	45	**Y-Axis**
908.62	85.01	V	--	--	Avg	1	45	**Vertical Polarization**
908.62	93.52	H	--	--	Peak	1.25	335	**Y-Axis**
908.62	73.52	H	--	--	Avg	1.25	335	**Horizontal Polarization**
908.62	98.24	V	--	--	Peak	1.25	135	**Z-Axis**
908.62	78.24	V	--	--	Avg	1.25	135	**Vertical Polarization**
908.62	103.68	H	--	--	Peak	2.25	45	**Z-Axis**
908.62	83.68	H	--	--	Avg	2.25	45	**Horizontal Polarization**

FCC 15.247
Pacific Scientific
Nighthawk V2 - Transmitter
Model: 836685

Date: 04/17/2014
Lab: D
Tested By: Kyle Fujimoto

High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
914.62	92.24	V	--	--	Peak	1.25	155	**X-Axis**
914.62	72.24	V	--	--	Avg	1.25	155	**Vertical Polarization**
914.62	105.18	H	--	--	Peak	1.25	0	**X-Axis**
914.62	85.18	H	--	--	Avg	1.25	0	**Horizontal Polarization**
914.62	104.68	V	--	--	Peak	1.65	155	**Y-Axis**
914.62	84.68	V	--	--	Avg	1.65	155	**Vertical Polarization**
914.62	95.21	H	--	--	Peak	1.25	165	**Y-Axis**
914.62	75.21	H	--	--	Avg	1.25	165	**Horizontal Polarization**
914.62	98.26	V	--	--	Peak	1.25	155	**Z-Axis**
914.62	78.26	V	--	--	Avg	1.25	155	**Vertical Polarization**
914.62	103.05	H	--	--	Peak	1.35	145	**Z-Axis**
914.62	83.05	H	--	--	Avg	1.35	145	**Horizontal Polarization**

FCC 15.247
Pacific Scientific
Nighthawk V2 - Transmitter
Model: 836685

Date: 04/17/2014
Labs: B and D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.24	58.24	V	73.25	-15.01	Peak	1.45	175	**Not in Restricted Band**
1805.24	38.24	V	53.25	-15.01	Avg	1.45	175	
2707.86	46.25	V	74	-27.75	Peak	1.25	165	
2707.86	26.25	V	54	-27.75	Avg	1.25	165	
3610.48	49.05	V	74	-24.95	Peak	1.25	155	
3610.48	29.05	V	54	-24.95	Avg	1.25	155	
4513.1	62.71	V	74	-11.29	Peak	1.25	135	
4513.1	42.71	V	54	-11.29	Avg	1.25	135	
5415.72								**No Emissions**
5415.72								**Detected**
6318.34	53.28	V	73.25	-19.97	Peak	1.55	185	**Not in Restricted Band**
6318.34	33.28	V	53.25	-19.97	Avg	1.55	185	
7220.96	51.59	V	73.25	-21.66	Peak	1.55	195	**Not in Restricted Band**
7220.96	31.59	V	53.25	-21.66	Avg	1.55	195	
8123.58	52.85	V	74	-21.15	Peak	1.55	165	
8123.58	32.85	V	54	-21.15	Avg	1.55	165	
9026.2	55.25	V	74	-18.75	Peak	1.25	155	
9026.2	35.25	V	54	-18.75	Avg	1.25	155	

FCC 15.247
Pacific Scientific
Nighthawk V2 - Transmitter
Model: 836685

Date: 04/17/2014
Labs: B and D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.24	59.13	V	83.26	-24.13	Peak	1.25	225	**Not in Restricted Band**
1805.24	39.13	V	63.26	-24.13	Avg	1.25	225	
2707.86	58.95	V	74	-15.05	Peak	1.25	135	
2707.86	38.95	V	54	-15.05	Avg	1.25	135	
3610.48	48.91	V	74	-25.09	Peak	1.25	155	
3610.48	28.91	V	54	-25.09	Avg	1.25	155	
4513.1	64.46	V	74	-9.54	Peak	1.35	165	
4513.1	44.46	V	54	-9.54	Avg	1.35	165	
5415.72								**No Emissions**
5415.72								**Detected**
6318.34	51.01	V	83.26	-32.25	Peak	1.65	145	**Not in Restricted Band**
6318.34	31.01	V	63.26	-32.25	Avg	1.65	145	
7220.96	50.08	V	83.26	-33.18	Peak	1.65	235	**Not in Restricted Band**
7220.96	30.08	V	63.26	-33.18	Avg	1.65	235	
8123.58	53.11	V	74	-20.89	Peak	1.25	175	
8123.58	33.11	V	54	-20.89	Avg	1.25	175	
9026.2	55.47	V	74	-18.53	Peak	1.35	185	
9026.2	35.47	V	54	-18.53	Avg	1.35	185	

FCC 15.247
Pacific Scientific
Nighthawk V2 - Transmitter
Model: 836685

Date: 04/17/2014
Labs: B and D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.24	57.24	V	77.21	-19.97	Peak	1.45	135	**Not in Restricted Band**
1805.24	37.24	V	57.21	-19.97	Avg	1.45	135	
2707.86	51.99	V	74	-22.01	Peak	1.25	155	
2707.86	31.99	V	54	-22.01	Avg	1.25	155	
3610.48	46.29	V	74	-27.71	Peak	1.55	135	
3610.48	26.29	V	54	-27.71	Avg	1.55	135	
4513.1	61.53	V	74	-12.47	Peak	1.25	225	
4513.1	41.53	V	54	-12.47	Avg	1.25	225	
5415.72								**No Emissions**
5415.72								**Detected**
6318.34	50.45	V	77.21	-26.76	Peak	1.25	175	**Not in Restricted Band**
6318.34	30.45	V	57.21	-26.76	Avg	1.25	175	
7220.96	53.29	V	77.21	-23.92	Peak	1.35	185	**Not in Restricted Band**
7220.96	33.29	V	57.21	-23.92	Avg	1.35	185	
8123.58	53.91	V	74	-20.09	Peak	1.25	155	
8123.58	33.91	V	54	-20.09	Avg	1.25	155	
9026.2	55.87	V	74	-18.13	Peak	1.25	155	
9026.2	35.87	V	54	-18.13	Avg	1.25	155	

FCC 15.247
Pacific Scientific
Nighthawk V2 - Transmitter
Model: 836685

Date: 04/17/2014
Labs: B and D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.24	57.68	H	84.45	-26.77	Peak	1.35	225	**Not in Restricted Band**
1805.24	37.68	H	64.45	-26.77	Avg	1.35	225	
2707.86	51.23	H	74	-22.77	Peak	1.25	90	
2707.86	31.23	H	54	-22.77	Avg	1.25	90	
3610.48	50.08	H	74	-23.92	Peak	1.25	165	
3610.48	30.08	H	54	-23.92	Avg	1.25	165	
4513.1	62.64	H	74	-11.36	Peak	1.25	165	
4513.1	42.64	H	54	-11.36	Avg	1.25	165	
5415.72								**No Emissions**
5415.72								**Detected**
6318.34	52.23	H	84.45	-32.22	Peak	1.45	235	**Not in Restricted Band**
6318.34	32.23	H	64.45	-32.22	Avg	1.45	235	
7220.96	54.28	H	84.45	-30.17	Peak	1.55	245	**Not in Restricted Band**
7220.96	34.28	H	64.45	-30.17	Avg	1.55	245	
8123.58	52.61	H	74	-21.39	Peak	1.25	155	
8123.58	32.61	H	54	-21.39	Avg	1.25	155	
9026.2	53.25	H	74	-20.75	Peak	1.35	165	
9026.2	33.25	H	54	-20.75	Avg	1.35	165	

FCC 15.247
Pacific Scientific
Nighthawk V2 - Transmitter
Model: 836685

Date: 04/17/2014
Labs: B and D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.24	56.28	H	72.54	-16.26	Peak	1.45	125	**Not in Restricted Band**
1805.24	36.28	H	52.54	-16.26	Avg	1.45	125	
2707.86	50.95	H	74	-23.05	Peak	1.35	155	
2707.86	30.95	H	54	-23.05	Avg	1.35	155	
3610.48	47.99	H	74	-26.01	Peak	1.25	165	
3610.48	27.99	H	54	-26.01	Avg	1.25	165	
4513.1	63.24	H	74	-10.76	Peak	1.25	165	
4513.1	43.24	H	54	-10.76	Avg	1.25	165	
5415.72								**No Emissions**
5415.72								**Detected**
6318.34	55.68	H	72.54	-16.86	Peak	1.26	135	**Not in Restricted Band**
6318.34	35.68	H	52.54	-16.86	Avg	1.26	135	
7220.96	52.58	H	72.54	-19.96	Peak	1.28	135	**Not in Restricted Band**
7220.96	32.58	H	52.54	-19.96	Avg	1.28	135	
8123.58	54.52	H	74	-19.48	Peak	1.25	165	
8123.58	34.52	H	54	-19.48	Avg	1.25	165	
9026.2	53.66	H	74	-20.34	Peak	1.35	175	
9026.2	33.66	H	54	-20.34	Avg	1.35	175	

FCC 15.247
Pacific Scientific
Nighthawk V2 - Transmitter
Model: 836685

Date: 04/17/2014
Labs: B and D
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Low Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.24	58.76	H	82.76	-24	Peak	1.15	135	**Not in Restricted Band**
1805.24	38.76	H	62.76	-24	Avg	1.15	135	
2707.86	60.24	H	74	-13.76	Peak	1.45	165	
2707.86	40.24	H	54	-13.76	Avg	1.45	165	
3610.48	50.77	H	74	-23.23	Peak	1.25	165	
3610.48	30.77	H	54	-23.23	Avg	1.25	165	
4513.1	61.93	H	74	-12.07	Peak	1.25	165	
4513.1	41.93	H	54	-12.07	Avg	1.25	165	
5415.72								**No Emissions**
5415.72								**Detected**
6318.34	52.92	H	82.76	-29.84	Peak	1.65	145	**Not in Restricted Band**
6318.34	32.92	H	62.76	-29.84	Avg	1.65	145	
7220.96	51.68	H	82.76	-31.08	Peak	1.55	145	**Not in Restricted Band**
7220.96	31.68	H	62.76	-31.08	Avg	1.55	145	
8123.58	52.95	H	74	-21.05	Peak	1.25	165	
8123.58	32.95	H	54	-21.05	Avg	1.25	165	
9026.2	52.11	H	74	-21.89	Peak	1.35	175	
9026.2	32.11	H	54	-21.89	Avg	1.35	175	

FCC 15.247
Pacific Scientific
Nighthawk V2 - Transmitter
Model: 836685

Date: 04/17/2014
Labs: B and D
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1817.24	59.96	V	74.01	-14.05	Peak	1.65	235	**Not in Restricted Band**
1817.24	39.96	V	54.01	-14.05	Avg	1.65	235	
2725.86	52.56	V	74	-21.44	Peak	1.25	155	
2725.86	32.56	V	54	-21.44	Avg	1.25	155	
3634.48	44.72	V	74	-29.28	Peak	1.35	165	
3634.48	24.72	V	54	-29.28	Avg	1.35	165	
4543.1	65.71	V	74	-8.29	Peak	1.25	180	
4543.1	45.71	V	54	-8.29	Avg	1.25	180	
5451.72								**No Emissions**
5451.72								**Detected**
6360.34	51.29	V	74.01	-22.72	Peak	1.75	245	**Not in Restricted Band**
6360.34	31.29	V	54.01	-22.72	Avg	1.75	245	
7268.96	50.65	V	74	-23.35	Peak	1.85	255	
7268.96	30.65	V	54	-23.35	Avg	1.85	255	
8177.58	52.52	V	74	-21.48	Peak	1.55	145	
8177.58	32.52	V	54	-21.48	Avg	1.55	145	
9086.2	53.31	V	74	-20.69	Peak	1.45	165	
9086.2	33.31	V	54	-20.69	Avg	1.45	165	

FCC 15.247
Pacific Scientific
Nighthawk V2 - Transmitter
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Date: 04/17/2014
Labs: B and D
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1817.24	58.83	V	85.01	-26.18	Peak	1.05	145	**Not in Restricted Band**
1817.24	38.83	V	65.01	-26.18	Avg	1.05	145	
2725.86	63.06	V	74	-10.94	Peak	1.25	315	
2725.86	43.06	V	54	-10.94	Avg	1.25	315	
3634.48	51.99	V	74	-22.01	Peak	1.55	325	
3634.48	31.99	V	54	-22.01	Avg	1.55	325	
4543.1	65.99	V	74	-8.01	Peak	1.25	335	
4543.1	45.99	V	54	-8.01	Avg	1.25	335	
5451.72								**No Emissions**
5451.72								**Detected**
6360.34	52.1	V	85.01	-32.91	Peak	1.25	155	**Not in Restricted Band**
6360.34	32.1	V	65.01	-32.91	Avg	1.25	155	
7268.96	53.28	V	74	20.72	Peak	1.35	155	
7268.96	33.28	V	54	-20.72	Avg	1.35	155	
8177.58	53.61	V	74	-20.39	Peak	1.25	155	
8177.58	33.61	V	54	-20.39	Avg	1.25	155	
9086.2	53.06	V	74	-20.94	Peak	1.35	165	
9086.2	33.06	V	54	-20.94	Avg	1.35	165	

FCC 15.247
Pacific Scientific
Nighthawk V2 - Transmitter
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Date: 04/17/2014
Labs: B and D
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Middle Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1817.24	59.98	V	78.24	-18.26	Peak	1.48	156	**Not in Restricted Band**
1817.24	39.98	V	58.24	-18.26	Avg	1.48	156	
2725.86	53.24	V	74	-20.76	Peak	1.25	155	
2725.86	33.24	V	54	-20.76	Avg	1.25	155	
3634.48	44.53	V	74	-29.47	Peak	1.25	165	
3634.48	24.53	V	54	-29.47	Avg	1.25	165	
4543.1	65.36	V	74	-8.64	Peak	1.25	155	
4543.1	45.36	V	54	-8.64	Avg	1.25	155	
5451.72								**No Emissions**
5451.72								**Detected**
6360.34	52.66	V	78.24	-25.58	Peak	1.68	163	**Not in Restricted Band**
6360.34	32.66	V	58.24	-25.58	Avg	1.68	163	
7268.96	51.69	V	74	-22.31	Peak	1.61	158	
7268.96	31.69	V	54	-22.31	Avg	1.61	158	
8177.58	51.81	V	74	-22.19	Peak	1.35	145	
8177.58	31.81	V	54	-22.19	Avg	1.35	145	
9086.2	55.02	V	74	-18.98	Peak	1.25	155	
9086.2	35.02	V	54	-18.98	Avg	1.25	155	

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Middle Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1817.24	59.82	H	85.38	-25.56	Peak	1.74	205	**Not in Restricted Band**
1817.24	39.82	H	65.38	-25.56	Avg	1.74	205	
2725.86	51.23	H	74	-22.77	Peak	1.25	155	
2725.86	31.23	H	54	-22.77	Avg	1.25	155	
3634.48	48.23	H	74	-25.77	Peak	1.35	175	
3634.48	28.23	H	54	-25.77	Avg	1.35	175	
4543.1	63.61	H	74	-10.39	Peak	1.25	185	
4543.1	43.61	H	54	-10.39	Avg	1.25	185	
5451.72								**No Emissions**
5451.72								**Detected**
6360.34	51.03	H	85.38	-34.35	Peak	1.79	206	**Not in Restricted Band**
6360.34	31.03	H	65.38	-34.35	Avg	1.79	206	
7268.96	52.46	H	74	-21.54	Peak	1.82	238	
7268.96	32.46	H	54	-21.54	Avg	1.82	238	
8177.58	50.27	H	74	-23.73	Peak	1.25	145	
8177.58	30.27	H	54	-23.73	Avg	1.25	145	
9086.2	51.63	H	74	-22.37	Peak	1.35	155	
9086.2	31.63	H	54	-22.37	Avg	1.35	155	

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Middle Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1817.24	57.46	H	73.52	-16.06	Peak	1.46	168	**Not in Restricted Band**
1817.24	37.46	H	53.52	-16.06	Avg	1.46	168	
2725.86	52.41	H	74	-21.59	Peak	1.71	155	
2725.86	32.41	H	54	-21.59	Avg	1.71	155	
3634.48	44.42	H	74	-29.58	Peak	1.35	165	
3634.48	24.42	H	54	-29.58	Avg	1.35	165	
4543.1	64.45	H	74	-9.55	Peak	1.25	165	
4543.1	44.45	H	54	-9.55	Avg	1.25	165	
5451.72								**No Emissions**
5451.72								**Detected**
6360.34	51.89	H	73.52	-21.63	Peak	1.23	164	**Not in Restricted Band**
6360.34	31.89	H	53.52	-21.63	Avg	1.23	164	
7268.96	53.68	H	74	-20.32	Peak	1.27	159	
7268.96	33.68	H	54	-20.32	Avg	1.27	159	
8177.58	54.41	H	74	-19.59	Peak	1.15	175	
8177.58	34.41	H	54	-19.59	Avg	1.15	175	
9086.2	52.33	H	74	-21.67	Peak	1.25	185	
9086.2	32.33	H	54	-21.67	Avg	1.25	185	

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Middle Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1817.24	59.18	H	83.68	-24.5	Peak	1.01	16	**Not in Restricted Band**
1817.24	39.18	H	63.68	-24.5	Avg	1.01	16	**Done via Conducted**
2725.86	63.41	H	74	-10.59	Peak	1.25	155	
2725.86	43.41	H	54	-10.59	Avg	1.25	155	
3634.48	51.56	H	74	-22.44	Peak	1.35	145	
3634.48	31.56	H	54	-22.44	Avg	1.35	145	
4543.1	63.17	H	74	-10.83	Peak	1.35	165	
4543.1	43.17	H	54	-10.83	Avg	1.35	165	
5451.72								**No Emissions**
5451.72								**Detected**
6360.34	54.62	H	83.68	-29.06	Peak	1.32	46	**Not in Restricted Band**
6360.34	34.62	H	63.68	-29.06	Avg	1.32	46	
7268.96	55.16	H	74	-18.84	Peak	1.29	43	
7268.96	35.16	H	54	-18.84	Avg	1.29	43	
8177.58	50.74	H	74	-23.26	Peak	1.25	155	
8177.58	30.74	H	54	-23.26	Avg	1.25	155	
9086.2	55.11	H	74	-18.89	Peak	1.25	155	
9086.2	35.11	H	54	-18.89	Avg	1.25	155	

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High Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1829.24	58.96	V	72.24	-13.28	Peak	1.5	14	**Not in Restricted Band**
1829.24	38.96	V	52.24	-13.28	Avg	1.5	14	
2743.86	52.69	V	74	-21.31	Peak	1.5	0	
2743.86	32.69	V	54	-21.31	Avg	1.5	0	
3658.48	48.54	V	74	-25.46	Peak	1.3	270	
3658.48	28.54	V	54	-25.46	Avg	1.3	270	
4573.1	68.61	V	74	-5.39	Peak	1.3	250	
4573.1	48.61	V	54	-5.39	Avg	1.3	250	
5487.72								**No Emissions**
5487.72								**Detected**
6402.34	53.77	V	72.24	-18.47	Peak	1.26	226	**Not in Restricted Band**
6402.34	33.77	V	52.24	-18.47	Avg	1.26	226	
7316.96	52.65	V	74	-21.35	Peak	1.3	250	
7316.96	32.65	V	54	-21.35	Avg	1.3	250	
8231.58	53.25	V	74	-20.75	Peak	1.3	90	
8231.58	33.25	V	54	-20.75	Avg	1.3	90	
9146.2	54.43	V	74	-19.57	Peak	1.25	270	
9146.2	34.43	V	54	-19.57	Avg	1.25	270	

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High Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1829.24	59.37	V	84.68	-25.31	Peak	1.25	225	**Not in Restricted Band**
1829.24	39.37	V	64.68	-25.31	Avg	1.25	225	
2743.86	56.53	V	74	-17.47	Peak	1.25	155	
2743.86	36.53	V	54	-17.47	Avg	1.25	155	
3658.48	46.19	V	74	-27.81	Peak	1.25	155	
3658.48	26.19	V	54	-27.81	Avg	1.25	155	
4573.1	63.01	V	74	-10.99	Peak	1.25	135	
4573.1	43.01	V	54	-10.99	Avg	1.25	135	
5487.72								**No Emissions**
5487.72								**Detected**
6402.34	55.44	V	84.68	-29.24	Peak	1.25	225	**Not in Restricted Band**
6402.34	35.44	V	64.68	-29.24	Avg	1.25	225	
7316.96	52.11	V	74	-21.89	Peak	1.25	155	
7316.96	32.11	V	54	-21.89	Avg	1.25	155	
8231.58	54.36	V	74	-19.64	Peak	1.25	155	
8231.58	34.36	V	54	-19.64	Avg	1.25	155	
9146.2	55.65	V	74	-18.35	Peak	1.25	155	
9146.2	35.65	V	54	-18.35	Avg	1.25	155	

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High Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1829.24	58.28	V	78.26	-19.98	Peak	1.35	165	**Not in Restricted Band**
1829.24	38.28	V	58.26	-19.98	Avg	1.35	165	
2743.86	54.67	V	74	-19.33	Peak	1.25	155	
2743.86	34.67	V	54	-19.33	Avg	1.25	155	
3658.48	46.22	V	74	-27.78	Peak	1.35	155	
3658.48	26.22	V	54	-27.78	Avg	1.35	155	
4573.1	66.45	V	74	-7.55	Peak	1.25	135	
4573.1	46.45	V	54	-7.55	Avg	1.25	135	
5487.72								**No Emissions**
5487.72								**Detected**
6402.34	55.93	V	78.26	-22.33	Peak	1.35	165	**Not in Restricted Band**
6402.34	35.93	V	58.26	-22.33	Avg	1.35	165	
7316.96	53.23	V	74	-20.77	Peak	1.25	150	
7316.96	33.23	V	54	-20.77	Avg	1.25	150	
8231.58	53.01	V	74	-20.99	Peak	1.35	165	
8231.58	33.01	V	54	-20.99	Avg	1.35	165	
9146.2	54.43	V	74	-19.57	Peak	1.25	175	
9146.2	34.43	V	54	-19.57	Avg	1.25	175	

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High Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1829.24	60.06	H	85.18	-25.12	Peak	1.49	165	**Not in Restricted Band**
1829.24	40.06	H	65.18	-25.12	Avg	1.49	165	
2743.86	62.37	H	74	-11.63	Peak	1.25	155	
2743.86	42.37	H	54	-11.63	Avg	1.25	155	
3658.48	48.96	H	74	-25.04	Peak	1.35	145	
3658.48	28.96	H	54	-25.04	Avg	1.35	145	
4573.1	66.38	H	74	-7.62	Peak	1.25	155	
4573.1	46.38	H	54	-7.62	Avg	1.25	155	
5487.72								**No Emissions**
5487.72								**Detected**
6402.34	56.28	H	85.18	-28.9	Peak	1.52	139	**Not in Restricted Band**
6402.34	36.28	H	65.18	-28.9	Avg	1.52	139	
7316.96	52.19	H	74	-21.81	Peak	1.25	155	
7316.96	32.19	H	54	-21.81	Avg	1.25	155	
8231.58	51.09	H	74	-22.91	Peak	1.55	145	
8231.58	31.09	H	54	-22.91	Avg	1.55	145	
9146.2	52.76	H	74	-21.24	Peak	1.25	155	
9146.2	32.76	H	54	-21.24	Avg	1.25	155	

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High Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1829.24	56.29	H	75.21	-18.92	Peak	1.95	145	**Not in Restricted Band**
1829.24	36.29	H	55.21	-18.92	Avg	1.95	145	
2743.86	50.25	H	74	-23.75	Peak	1.25	0	
2743.86	30.25	H	54	-23.75	Avg	1.25	0	
3658.48	46.06	H	74	-27.94	Peak	1.35	155	
3658.48	26.06	H	54	-27.94	Avg	1.35	155	
4573.1	66.39	H	74	-7.61	Peak	1.55	165	
4573.1	46.39	H	54	-7.61	Avg	1.55	165	
5487.72								**No Emissions**
5487.72								**Detected**
6402.34	55.41	H	75.21	-19.8	Peak	1.81	135	**Not in Restricted Band**
6402.34	35.41	H	55.21	-19.8	Avg	1.81	135	
7316.96	54.73	H	74	-19.27	Peak	1.25	180	
7316.96	34.73	H	54	-19.27	Avg	1.25	180	
8231.58	53.61	H	74	-20.39	Peak	1.55	175	
8231.58	33.61	H	54	-20.39	Avg	1.55	175	
9146.2	52.35	H	74	-21.65	Peak	1.45	185	
9146.2	32.35	H	54	-21.65	Avg	1.45	185	

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High Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1829.24	60.18	H	83.05	-22.87	Peak	1.26	153	**Not in Restricted Band**
1829.24	40.18	H	63.05	-22.87	Avg	1.26	153	
2743.86	59.69	H	74	-14.31	Peak	1.35	145	
2743.86	39.69	H	54	-14.31	Avg	1.35	145	
3658.48	44.72	H	74	-29.28	Peak	1.25	135	
3658.48	24.72	H	54	-29.28	Avg	1.25	135	
4573.1	65.21	H	74	-8.79	Peak	1.25	135	
4573.1	45.21	H	54	-8.79	Avg	1.25	135	
5487.72								**No Emissions**
5487.72								**Detected**
6402.34	56.81	H	83.05	-26.24	Peak	1.03	148	**Not in Restricted Band**
6402.34	36.81	H	63.05	-26.24	Avg	1.03	148	
7316.96	52.14	H	74	-21.86	Peak	1.25	225	
7316.96	32.14	H	54	-21.86	Avg	1.25	225	
8231.58	52.44	H	74	-21.56	Peak	1.35	145	
8231.58	32.44	H	54	-21.56	Avg	1.35	145	
9146.2	56.48	H	74	-17.52	Peak	1.25	135	
9146.2	36.48	H	54	-17.52	Avg	1.25	135	

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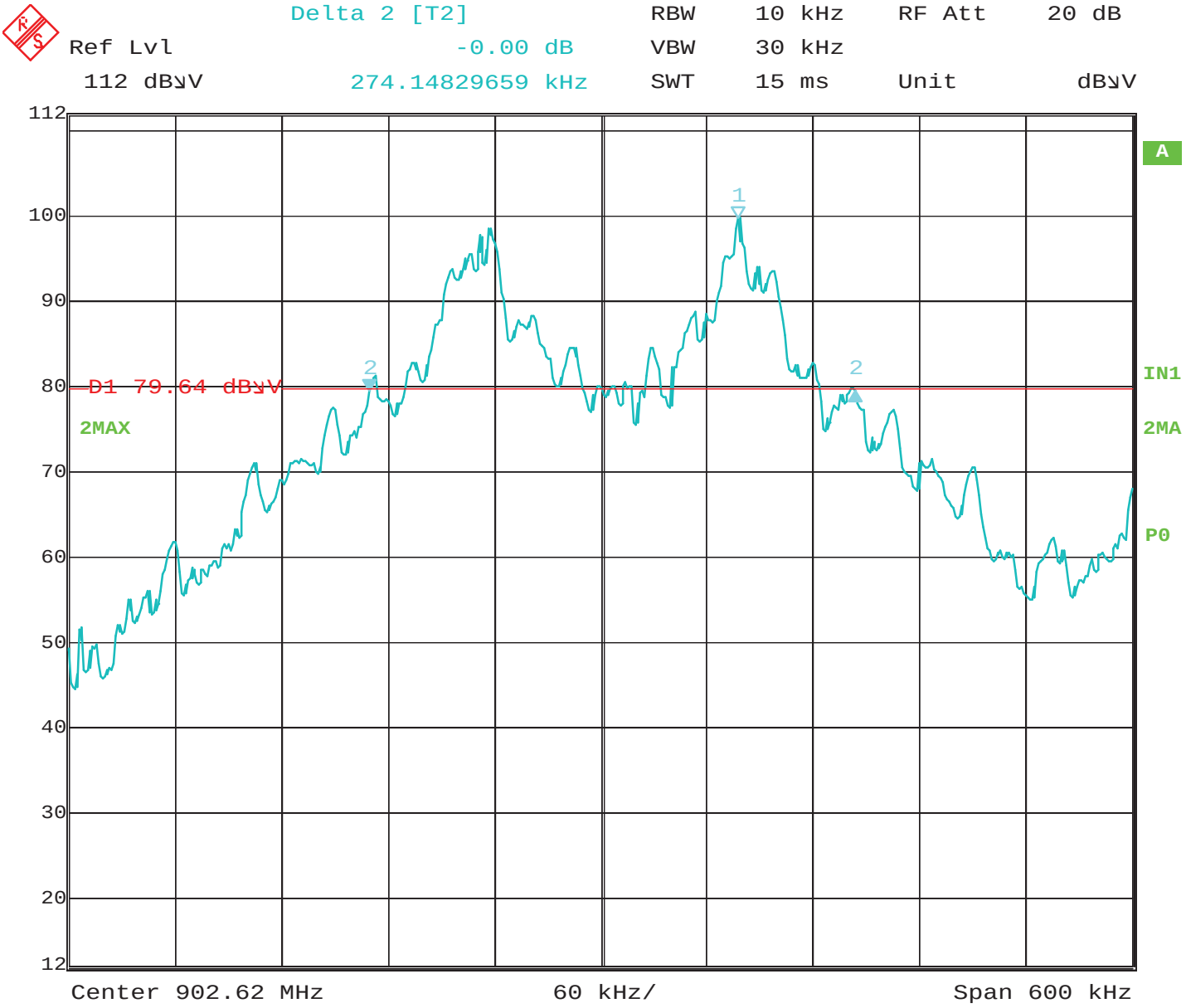
Non Harmonic Emissions from the Tx and Digital Portion -- 10 kHz to 9300 MHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Digital Portion
								from 10 kHz to 9300 MHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic Emissions Found
								for the Tx Mode
								from 10 kHz to 9300 MHz
								for both Vertical and Horizontal
								Polarizations
								Investigated in the X-Axis,
								Y-Axis, and Z-Axis

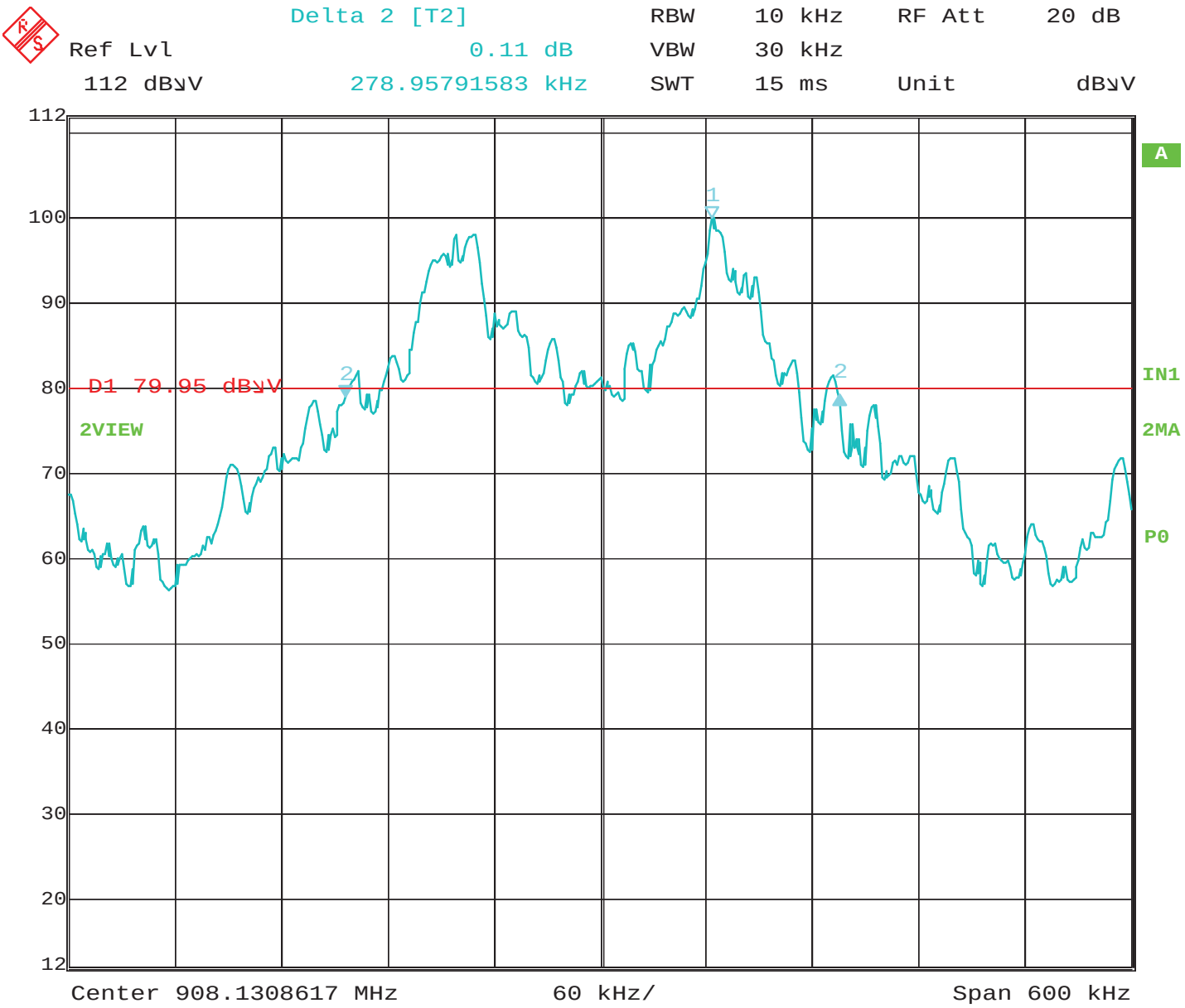
-20 dB BANDWIDTH

DATA SHEETS



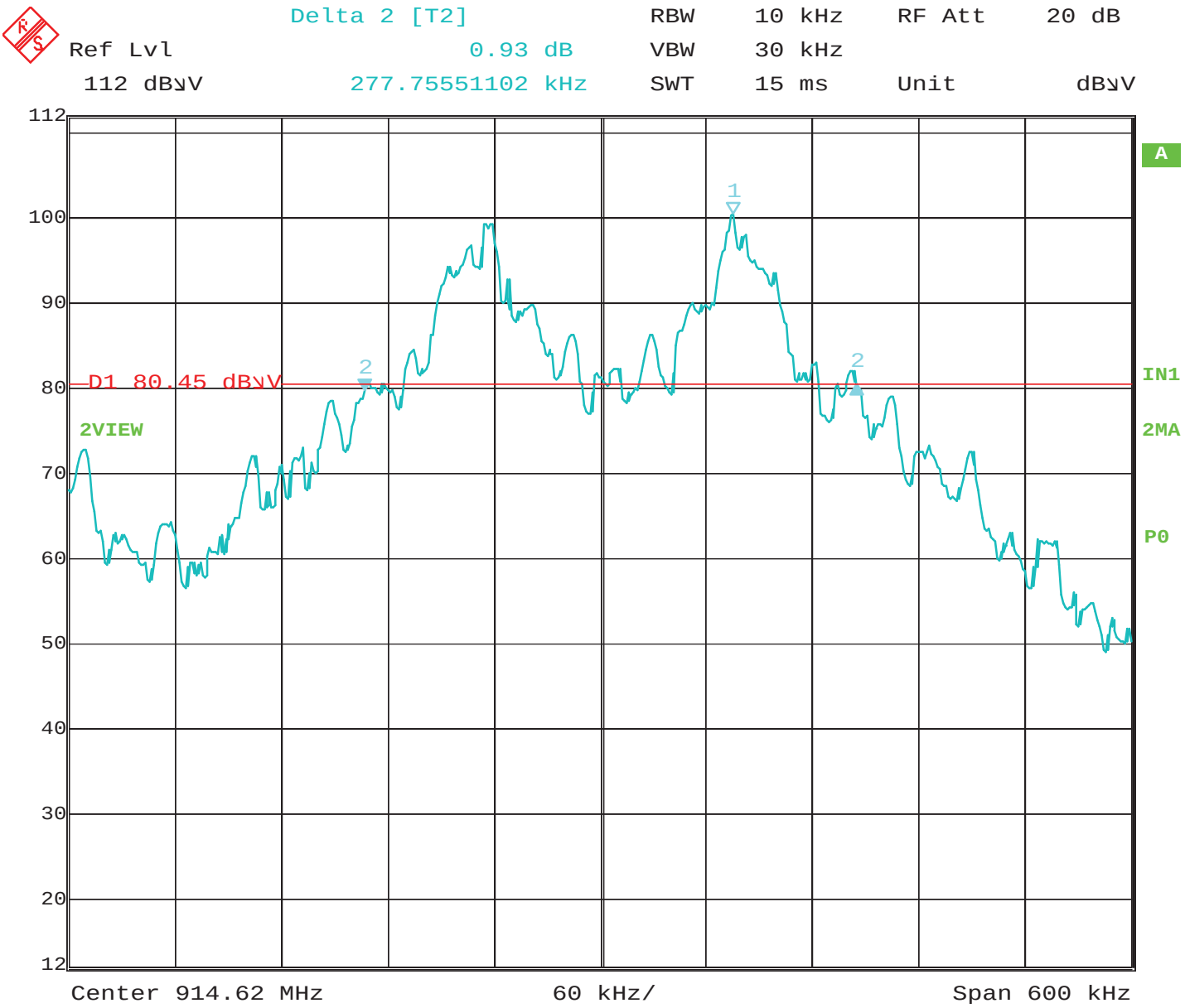
Date: 17.APR.2014 10:59:32

20 dB Bandwidth of Fundamental – Low Channel



Date: 17.APR.2014 11:07:02

20 dB Bandwidth of Fundamental – Middle Channel

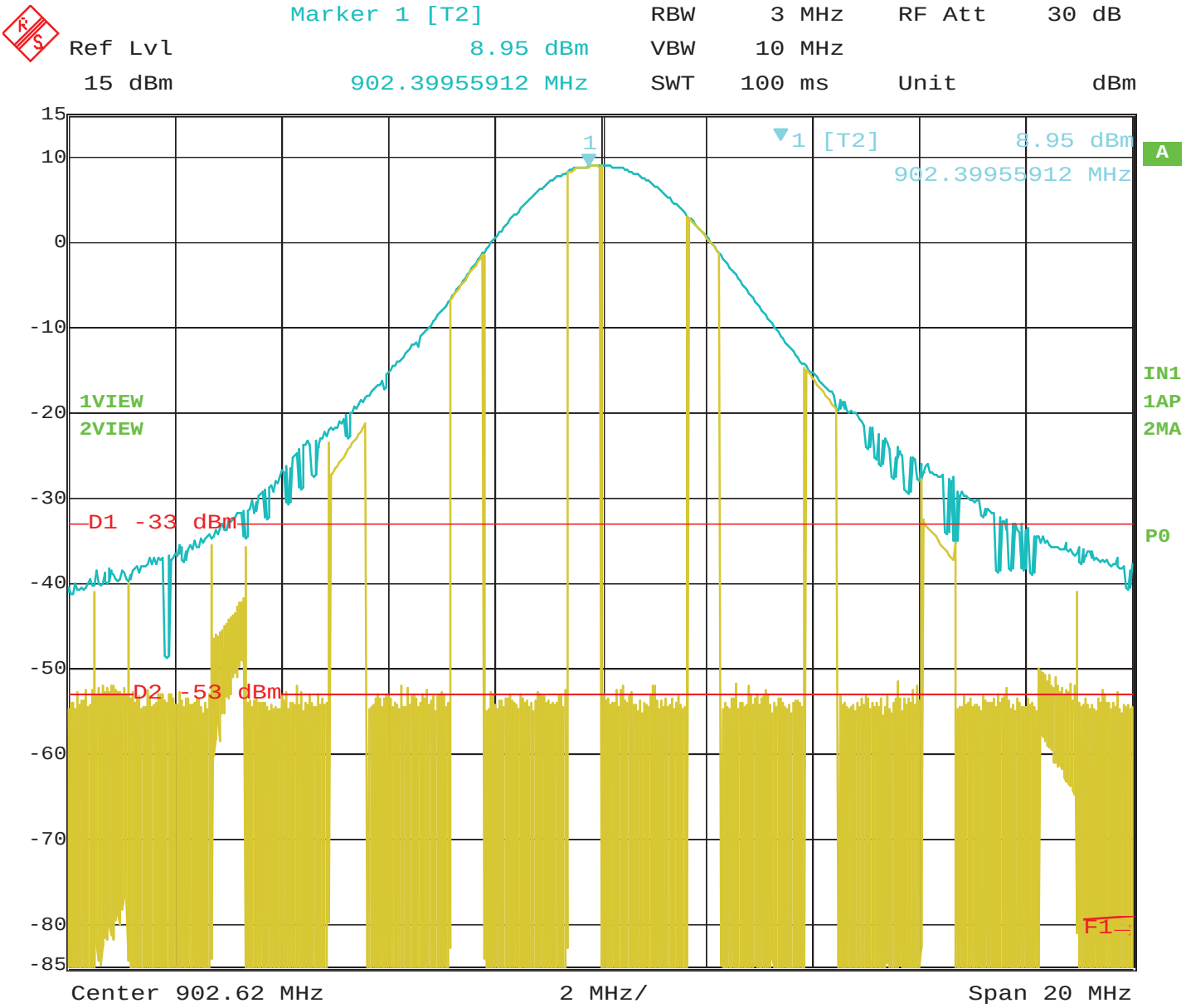


Date: 17.APR.2014 11:11:02

20 dB Bandwidth of Fundamental – High Channel

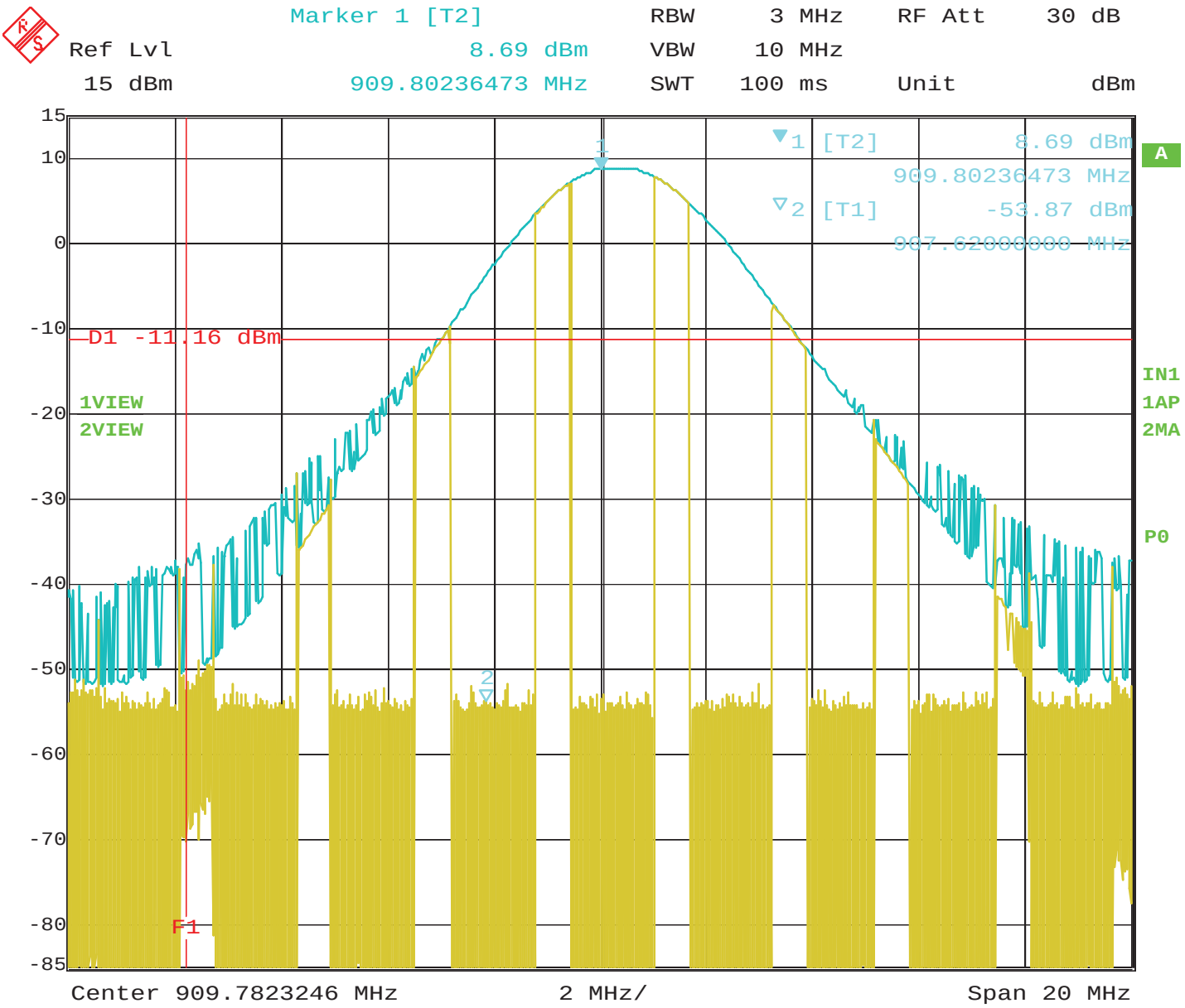
PEAK POWER

DATA SHEETS



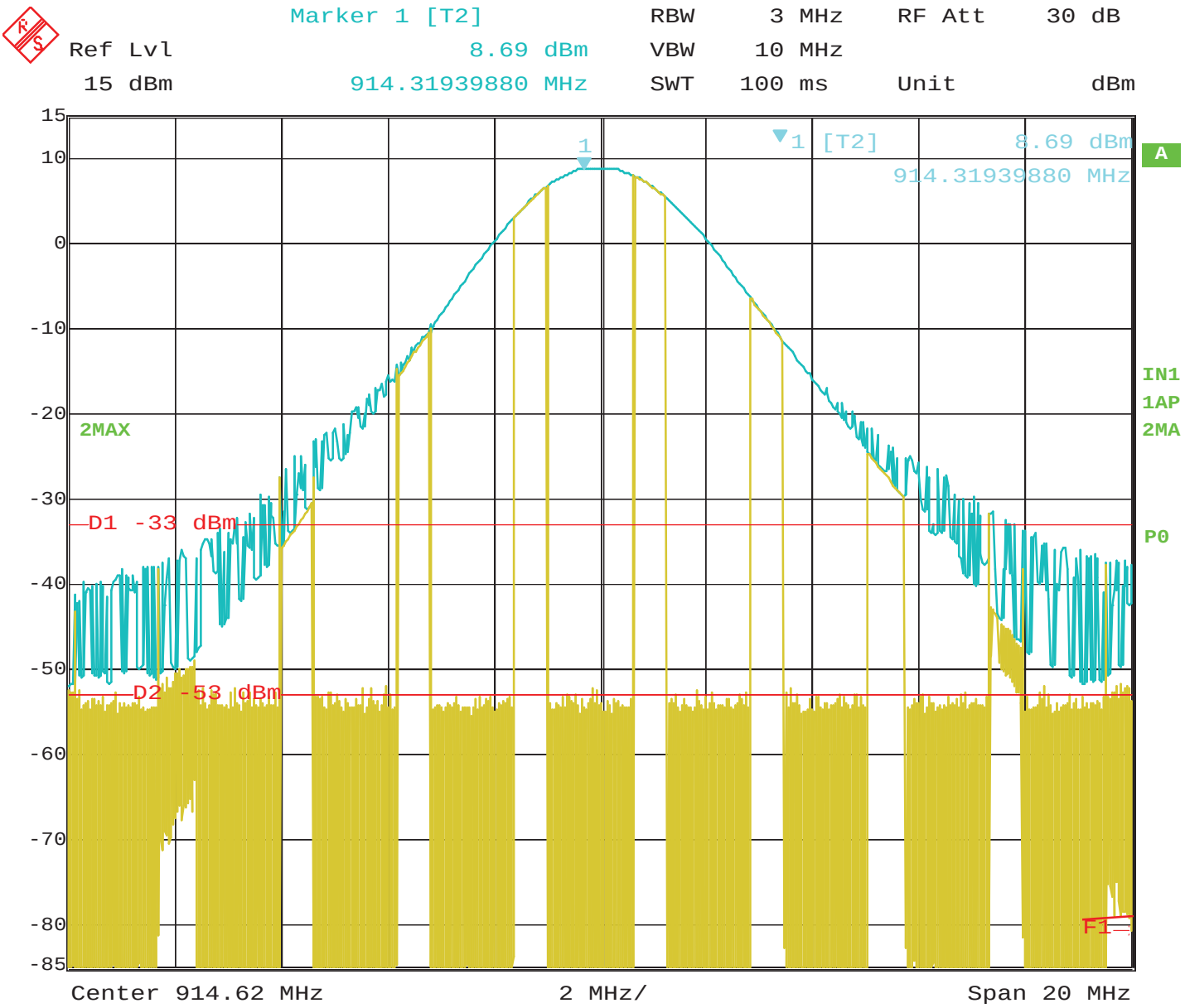
Date: 30.APR.2014 08:25:50

Peak Power Output – Low Channel



Date: 30.APR.2014 08:41:12

Peak Power Output – Middle Channel

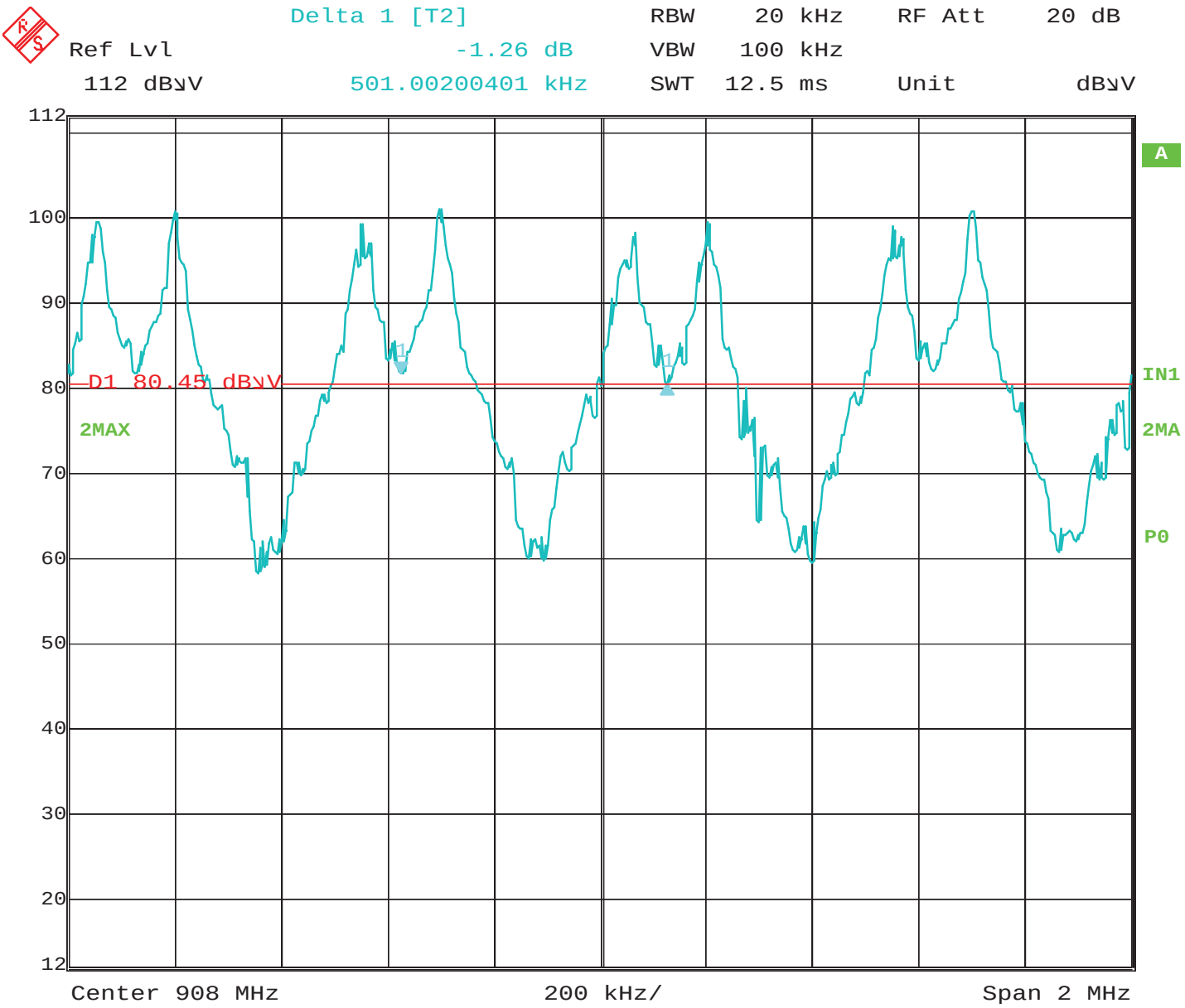


Date: 30.APR.2014 08:26:33

Peak Power Output – High Channel

CHANNEL SEPARATION TEST

DATA SHEET

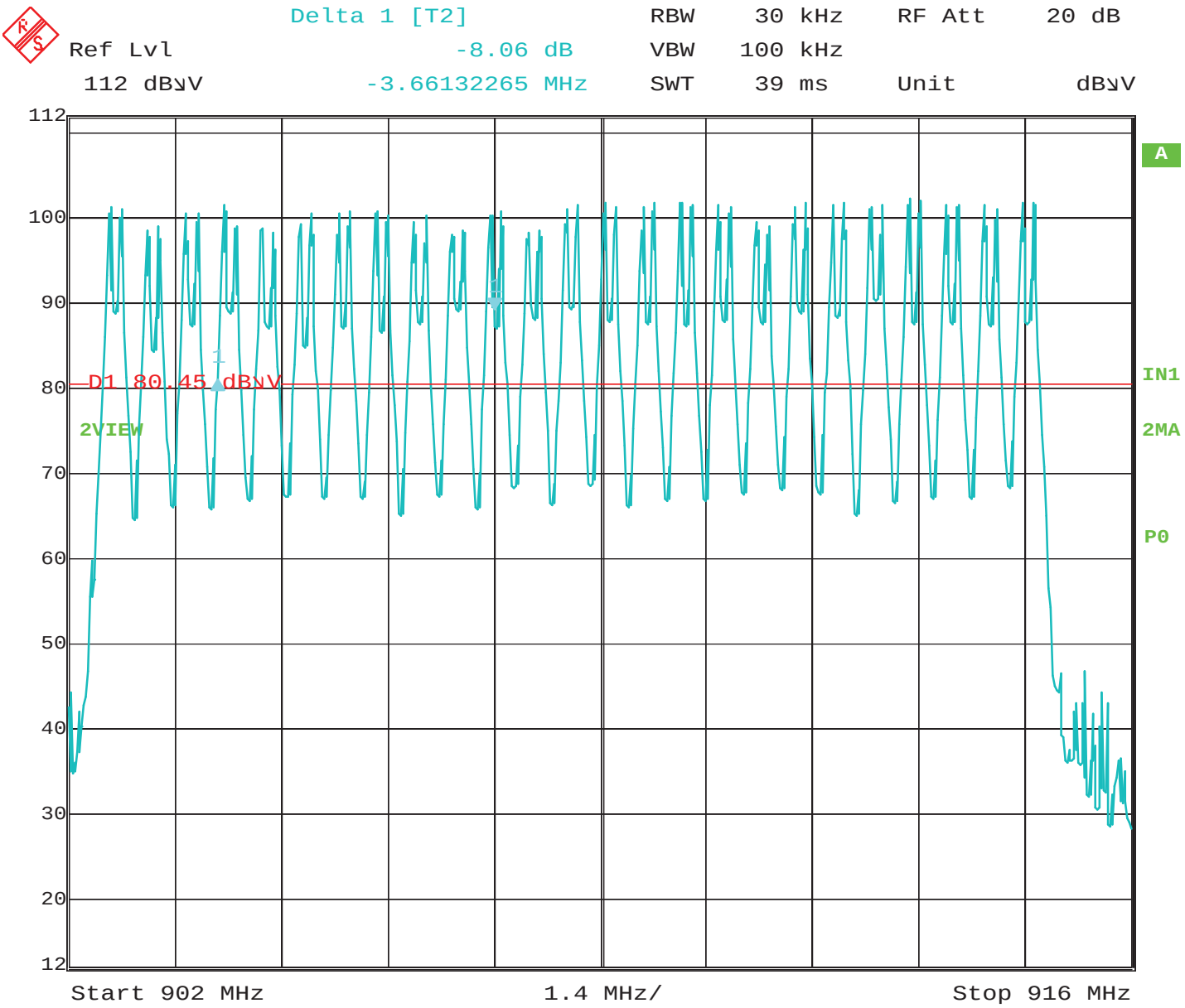


Date: 17.APR.2014 12:25:01

Channel Frequency Separation Test

NUMBER OF FREQUENCIES

DATA SHEETS

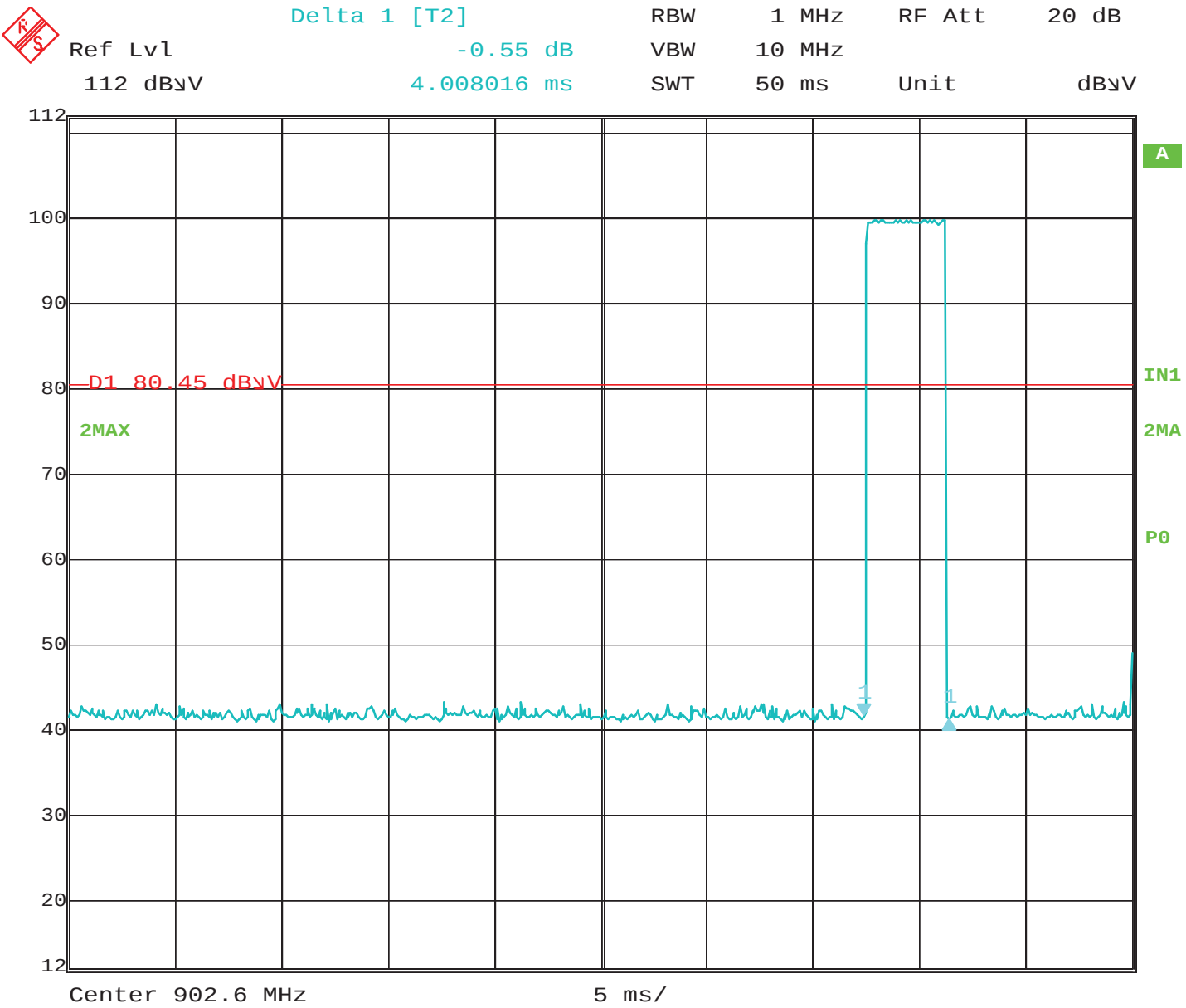


Date: 17.APR.2014 12:37:07

Number of Frequencies (25 Total)

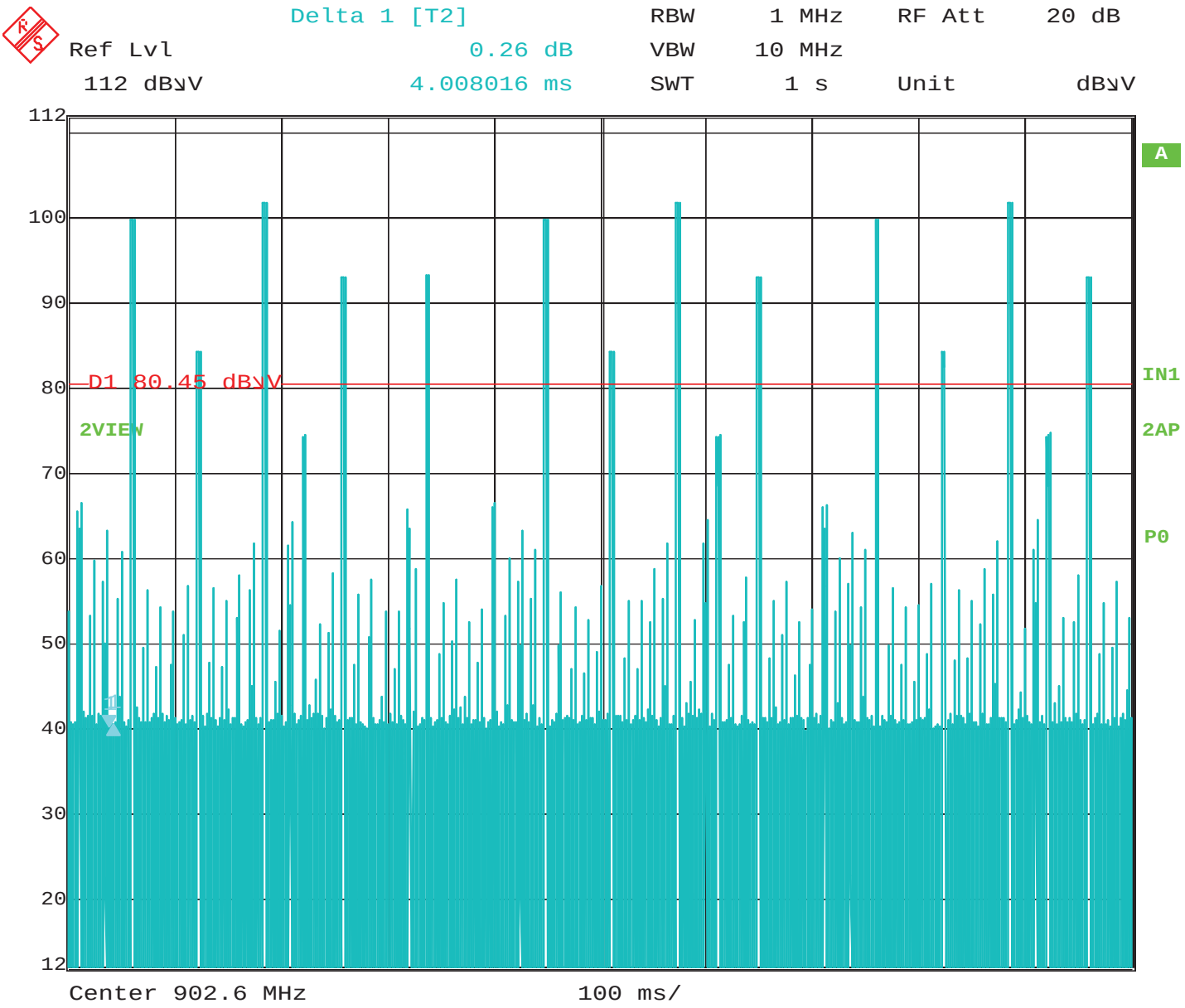
TIME OF OCCUPANCY

DATA SHEETS



Date: 17.APR.2014 12:46:32

Time of One Pulse = 4.008016 mS

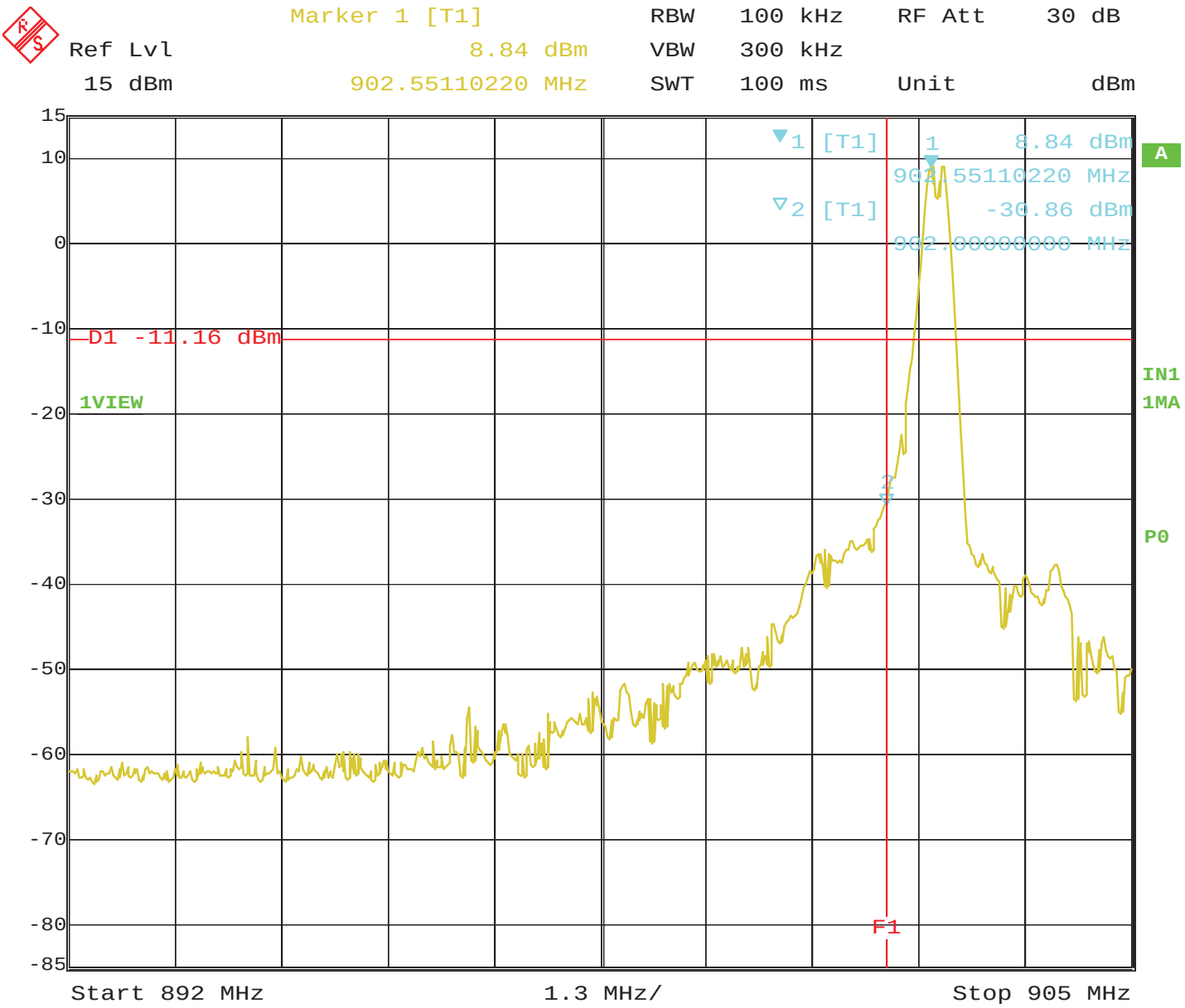


Date: 17.APR.2014 13:23:39

Number of Pulses in 1 Seconds = 6
Total Number of Pulses in 10 Seconds = 60
Time of Occupancy = 4.008016 mS * 60 = 240.48096 mS
Limit = 400 mS in a 10 Second Period

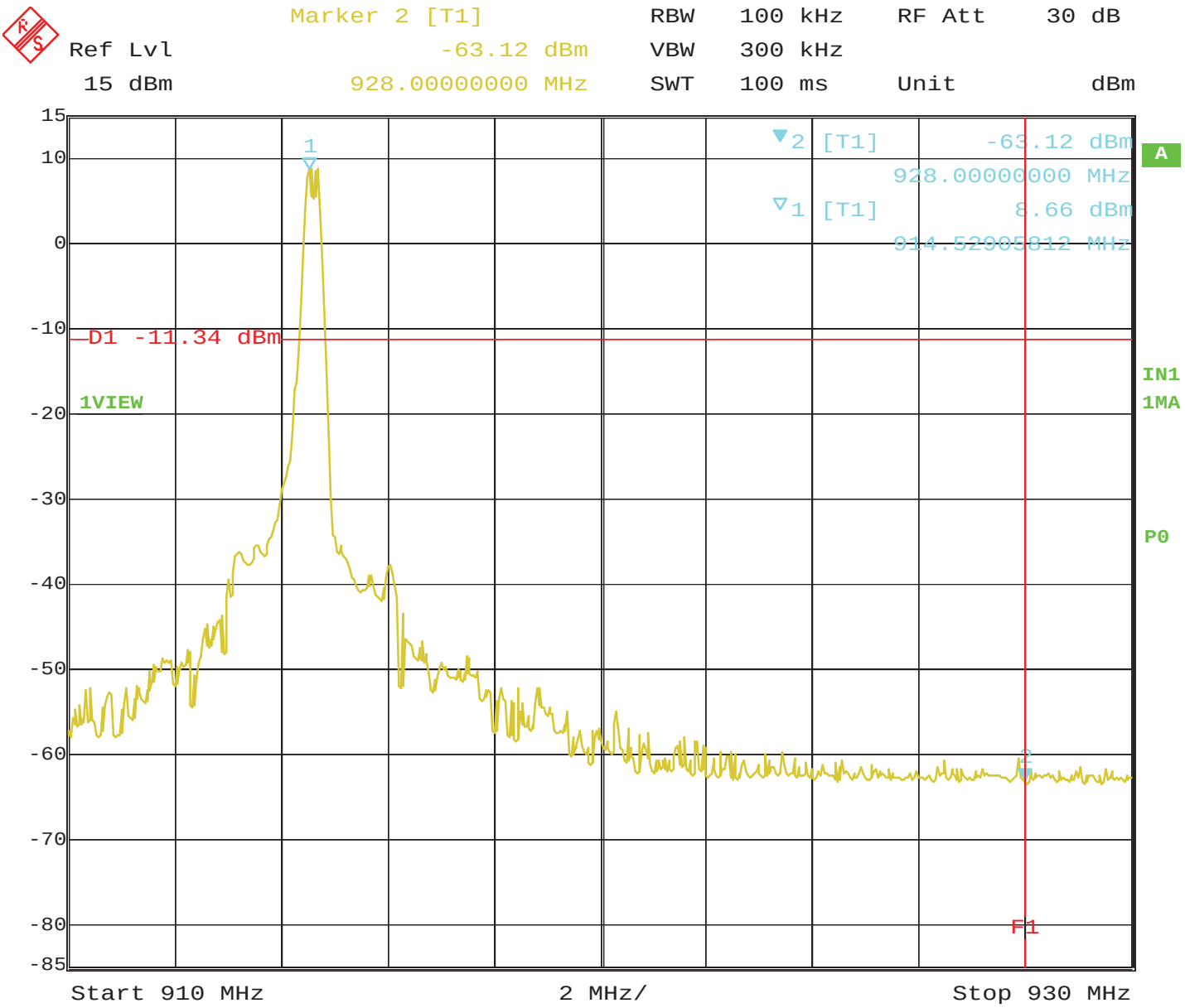
BAND EDGES

DATA SHEETS



Date: 30.APR.2014 08:34:23

Band Edge – Low Channel



Date: 30.APR.2014 08:32:44

Band Edge – High Channel