FCC PART 15, SUBPART B
FCC 15.247 TEST REPORT
TEST METHOD: ANSI C63.4: 2009

For

STAR 3000 SYSTEM RFID READER

Models: STAR-3000-F (RFID Reader)
EMX-1004 (eMux)
ENM-1004-FW (4 Port eNode)

Prepared for

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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 endorsement by NVLAP, NIST or any other agency of the U.S. Government.

Device Tested:	Star 3000 System RFID Reader Models: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode) S/N: NONE
Product Description:	Please see the expository statement.
Modifications:	The EUT was not modified during the testing.
Manufacturer:	Mojix, Inc. 11075 Santa Monica Boluevard, Suite 350 Los Angeles, California 90025
Test Date:	September 23 and 26, 2011; and October 24, 25, and 26, 2011
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.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz - 30 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 15.207.
2	Radiated RF Emissions, 10 kHz – 9300 MHz	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; the limits of CFR Title 47, Part 15 Subpart C, 15.209 and 15.247 (d)
3	Radiated RF Emissions for the Digital Portion 30 MHz – 1000 MHz	Complies with the **Class A** limits of CFR Title 47, Part 15, Subpart B.
4	20 dB Bandwidth	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1)(i)
5	Peak Power Output	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (b)(2)
6	RF Conducted Antenna Test	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (d)
7	Carrier Frequency Separation	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1)
8	Average Time of Occupancy	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1)(i)
9	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 Star 3000 System RFID Reader, Models: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode). The emissions measurements were performed according to the measurement procedure described in ANSI C63.4: 2009. 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

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

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

Mojix, Inc.

Shawn Manesh	Senior VP Operations
Hassan Syed	Manger RF Design Group
Gus Mendoza	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 was returned to Mojix Inc. prior to 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

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration – (Emissions)

The EUT consists of an RFID Reader, 4 Port eNode, and eMux and was setup as follows:

eNode with eMux Configuration:

The RFID Reader was connected to a laptop, eMux, and power supply via its ethernet, transmit and DC in ports, respectively.

The eMux was also connected to the 4 Port eNode and power supply vita its CH-1 and power ports, respectively. The CH-2, CH-3, and CH-4 ports were connected to 25-foot cables that were terminated to 50 ohms via terminators.

The 4 Port eNode was also connected to the sensor and antenna via its sense and ANT-2 ports, respectively. The ANT-1, ANT-3, ANT-4, an output ports were connected to 25-foot cables that were terminated to 50 ohms via terminators. The antenna was connected to the ANT-2 port because that was the port the produced the highest emission level.

A program on the laptop allowed the EUT to transmit and/or receive at the low, middle, or high channel. The EUT was continuously transmitting and receiving during the test.

eNode Configuration with no eMux:

The RFID Reader was connected to a laptop, eNode, and power supply via its ethernet, transmit and DC in ports, respectively.

The 4 Port eNode was also connected to the sensor and antenna via its sense and ANT-2 ports, respectively. The ANT-1, ANT-3, ANT-4, an output ports were connected to 25-foot cables that were terminated to 50 ohms via terminators. The antenna was connected to the ANT-2 port because that was the port the produced the highest emission level.

A program on the laptop allowed the EUT to transmit and/or receive at the low, middle, or high channel. The EUT was continuously transmitting and receiving during the test.

Note: The eNode has no power supply and does not get its power from the AC public mains for either configuration.

The antennas that will be used on the RFID reader will be ½ wave center-fed dipole antennas (ANT-916-CW-HWR-RPS) with reverse polarity SMA connector. The RFID reader will include reverse polarity TNC to reverse polarity SMA adapters so that these antennas can be connected to the RFID reader.

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 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

eNode with eMux Configuration:

Cables 1-3 These are 25-foot braid shielded cables connecting the ANT-1, ANT-3, and ANT-4 ports of the 4 Port eNode to 50 ohm terminators. The cables have reverse polarity SMA connectors at the 4 Port eNode end and regular SMA connectors at the 50 ohm terminator ends. The cables were coiled so that they were 40-centimeters above the ground plane. The shield of the cables was grounded to the chassis via the connectors.

Cable 4 This is a 6.1-meter braid and foil shielded cable connecting the 4 Port eNode to the antenna. The cable has a reverse SMA connector at the 4 Port eNode end and a reverse TNC connector at the antenna end. The cable was bundled to a length of 1-meter. The shield of the cable was grounded to the chassis via the connectors.

Cable 5 This is a 25-foot braid shielded cable connecting the output port of the 4 Port eNode to a 50 ohm terminator. The cable has an SMA connector at each end. The cable was coiled so that it was 40-centimeters above the ground plane. The shield of the cable was grounded to the chassis via the connectors.

Cable 6 This is a 25-foot braid shielded cable connecting the eMux to the 4 Port eNode. The cable has an SMA connector at the 4 Port eNode end and a TNC connector at the eMux end. The cable was coiled so that it was 40-centimters above the ground plane. The shield of the cable was grounded to the chassis via the connectors.

Cables 7-9 These are 25-foot braid shielded cables connecting the CH-2, CH-3, and CH-4 ports of the eMux to 50 ohm terminators. The cables have SMA connectors at each end. The cables were coiled so that they were 40-centimeters above the ground plane. The shield of the cables was grounded to the chassis via the connectors.

Cable 10 This is a 50-foot braid shielded cable connecting the eMux to the RFID Reader. The cable has a TNC connector at the eMux end and a reverse polarity TNC connector at the RFID Reader end. The shield of the cable was grounded to the chassis via the connectors.

Cable 11 This is a 40-centimeter foil shielded cable connecting the 4 port eNode to the sensor. The cable has a D-26 connector at the 4 port eNode end and is hard wired into the sensor. The shield of the cable was grounded to the chassis via the connector.

Cable 12 This is a 1-meter unshielded cable connecting the eMux to the power supply. The cable has a 5-pin DIN connector on the eMux end and is hard wired into the switching power supply. The cable has a molded ferrite on the eMux side.

Cable 13 This is a 50-foot unshielded cable connecting the RFID reader to the laptop. The cable has an RJ-45 connector at each end.

Cable 14 This is a 5-meter braid shielded cable connecting the RFID reader to the DC power supply. The cable has a Positronics FR11FP822LM5 connector at the RFID reader end and a Positronics P/N: 9942170007 connector at the DC power supply end. The cable was bundled to a length of 1-meter. The shield of the cable was grounded to the chassis via the connectors.

4.1.3 Cable Construction and Termination (continued)

eNode Configuration with no eMux:

Cables 1-3 These are 25-foot braid shielded cables connecting the ANT-1, ANT-3, and ANT-4 ports of the 4 Port eNode to 50 ohm terminators. The cables have reverse polarity SMA connectors at the 4 Port eNode end and regular SMA connectors at the 50 ohm terminator ends. The cables were coiled so that they were 40-centimeters above the ground plane. The shield of the cables was grounded to the chassis via the connectors.

Cable 4 This is a 6.1-meter braid and foil shielded cable connecting the 4 Port eNode to the antenna. The cable has a reverse SMA connector at the 4 Port eNode end and a reverse TNC connector at the antenna end. The cable was bundled to a length of 1-meter. The shield of the cable was grounded to the chassis via the connectors.

Cable 5 This is a 25-foot braid shielded cable connecting the output port of the 4 Port eNode to a 50 ohm terminator. The cable has an SMA connector at each end. The cable was coiled so that it was 40-centimeters above the ground plane. The shield of the cable was grounded to the chassis via the connectors.

Cable 6 This is a 50-foot braid shielded cable connecting the eNode to the RFID Reader. The cable has a TNC connector at the eMux end and a reverse polarity TNC connector at the RFID Reader end. The shield of the cable was grounded to the chassis via the connectors.

Cable 7 This is a 40-centimeter foil shielded cable connecting the 4 port eNode to the sensor. The cable has a D-26 connector at the 4 port eNode end and is hard wired into the sensor. The shield of the cable was grounded to the chassis via the connector.

Cable 8 This is a 50-foot unshielded cable connecting the RFID reader to the laptop. The cable has an RJ-45 connector at each end.

Cable 9 This is a 5-meter braid shielded cable connecting the RFID reader to the DC power supply. The cable has a Positronics FR11FP822LM5 connector at the RFID reader end and a Positronics P/N: 9942170007 connector at the DC power supply end. The cable was bundled to a length of 1-meter. The shield of the cable was grounded to the chassis via the connectors.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NUMBER	FCC ID
EMUX (PART OF EUT)	MOJIX, INC.	EMX-1004	11114018E164	N/A
4 PORT ENODE (PART OF EUT)	MOJIX, INC.	ENM-1004-FW	N/A	VEDCBLENODE
RFID READER (PART OF EUT)	MOJIX, INC.	STAR-3000-F	9164022A1076	VEDSTAR3000
ANTENNA (4 PORT ENODE)	MTI WIRELESS EDGE	MT-262006/TRH/A	01471	N/A
(2) ANTENNAS (RFID READER)	ANTENNA FACTOR	ANT-916-CW-HWR-RPS	N/A	N/A
POWER SUPPLY FOR EMUX	ASTRODYNE	SPU130-108	06437827	N/A
SENSOR	BANNER	Q60BB6AF2000	N/A	N/A
POWER SUPPLY FOR RFID READER	TRACO POWER	TEX 120-124	N/A	N/A
LAPTOP	DELL	PP19L	N/A	DoC
(7) 50 OHM TERMINATORS	MINI-CIRCUITS	VAT-2W	N/A	N/A

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					
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08784	May 27, 2011	May 27, 2012
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	2648A14530	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					
Radiated Emissions Data Capture Program	Compatible Electronics	2.0	N/A	N/A	N/A
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
Loop Antenna	Com-Power	AL-130	17089	January 21, 2011	January 21, 2012
Preamplifier	Com-Power	PA-102	1017	January 11, 2011	January 11, 2012
Microwave Preamplifier	Com-Power	PA-118	181656	December 22, 2010	December 22, 2011
Horn Antenna	Com-Power	AH-118	071175	March 18, 2010	March 18, 2012
Antenna Mast	Com-Power	AM-100	N/A	N/A	N/A

5.3 Emissions Test Equipment (Continued)

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
RF CONDUCTED EMISSIONS TEST EQUIPMENT					
Emissions Program	Compatible Electronics	2.3 (SR19)	N/A	N/A	N/A
Transient Limiter	Seaward	252A910	1	November 2, 2010	November 2, 2011
LISN	Com Power	LI-215	12078	June 20, 2011	June 20, 2012
LISN	Com Power	LI-215	12082	June 20, 2011	June 20, 2012

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 eNode was grounded to the chassis of the RFID Reader via its interconnect cable.
The RFID Reader was grounded to earth ground via the DC power supply.
The eMux was grounded to the chassis of the eNode via its interconnect cable.

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:

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, Section 15.207 for conducted emissions.

7.1.2 Radiated Emissions 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 and the Com Power Microwave Preamplifier Model: PA-118 was used for frequencies above 1 GHz. The spectrum analyzer and EMI Receiver were used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer or 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 frequencies above 1 GHz were adjusted by a “duty cycle correction factor”, derived from 20 log (dwell time / 100 ms). Since the duty cycle was below 10%, the maximum allowed 20 dB was subtracted from the peak reading.

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 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 10-meter test distance from 10 kHz to 30 MHz, and at a 3 meter test distance from 30 MHz 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

Note: The RFID Reader for the digital portion complies with the **Class A** limits of CFR Title 47, Part 15, Subpart B.

7.1.3 RF Emissions Test Results

Table 1.0 CONDUCTED EMISSION RESULTS (120V)
STAR 3000 SYSTEM RFID READER

Frequency MHz	Emission Level* dBuV	Specification Limit dBuV	Delta dB
1.184 (Black Lead)	42.44 (A)	46.00	-3.56
1.184 (White Lead)	42.38 (A)	46.00	-3.62
0.324 (White Lead)	45.51	49.62	-4.11
0.373 (Black Lead)	44.15	48.43	-4.28
0.627 (Black Lead)	41.67	46.00	-4.33
0.322 (Black Lead)	45.26	49.66	-4.41

Table 2.0 RADIATED EMISSION RESULTS
STAR 3000 SYSTEM RFID READER

Frequency MHz	Emission Level* dBuV	Specification Limit dBuV	Delta dB
187.492	41.65 (QP)	43.50	-1.85
374.980	44.38 (QP)	46.40	-2.02
62.473	36.62	40.00	-3.38
124.992	40.11	43.50	-3.39
136.702	40.11	43.50	-3.39
156.232	40.07	43.50	-3.43

Notes:

* The complete emissions data is given in Appendix E of this report.

** The factors for the antennas and preamplifier gain are attached in Appendix D 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 30 kHz and the video bandwidth was 100 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 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 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 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 (a)(1) and 15.247 (a)(1)(i). The number of hopping frequencies is 50. 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 20 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 5 seconds and the number of pulses taken. The number of pulses was then multiplied by 2 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 Star 3000 System RFID Reader, Model: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode), 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

Note #1: For the unintentional radiator portion of the test except for the RFID Reader, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

Note #2: The RFID Reader for the unintentional radiator portion was within the **Class A** 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, Taiwan and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025 an ISO 9002 equivalent. Please follow the link to the NIST site for each of our facilities NVLAP certificate and scope of accreditation.

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

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

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

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

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

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

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

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

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.247 and/or FCC **Class A** and/or FCC **Class B** 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.

- On the STAR 3000 side – Add a ferrite to the power supply cable on the STAR 3000 side (FairRite P/N: 0461164281)
- Ground the Ethernet Connector on the EUT to chassis ground via copper tape on the STAR 3000 side.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST	Star 3000 System RFID Reader S/N: NONE

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

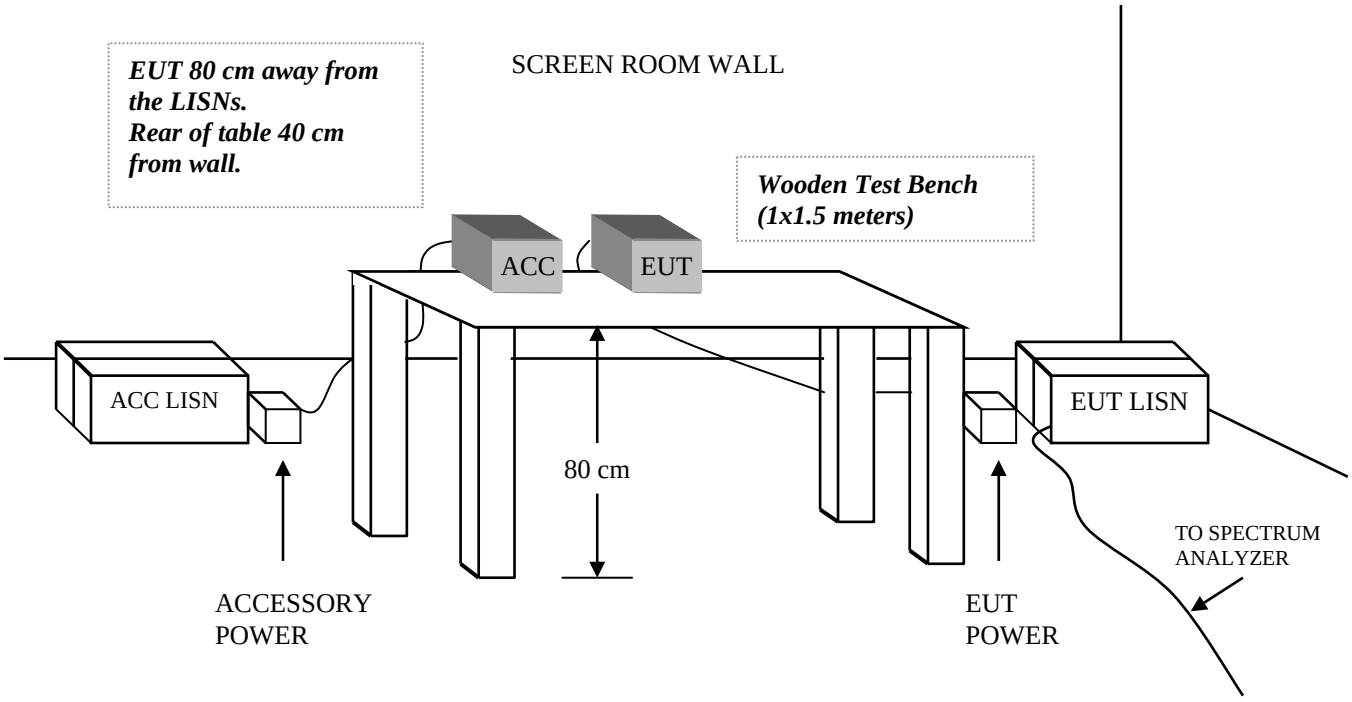


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE

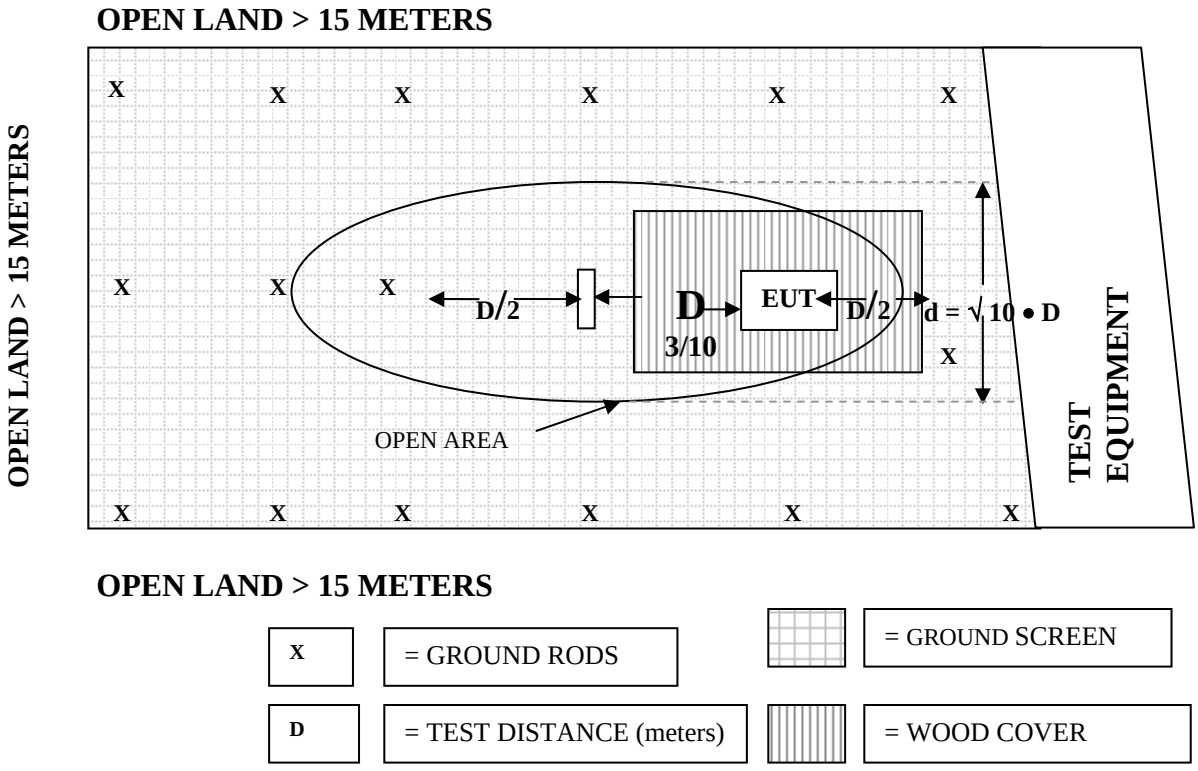
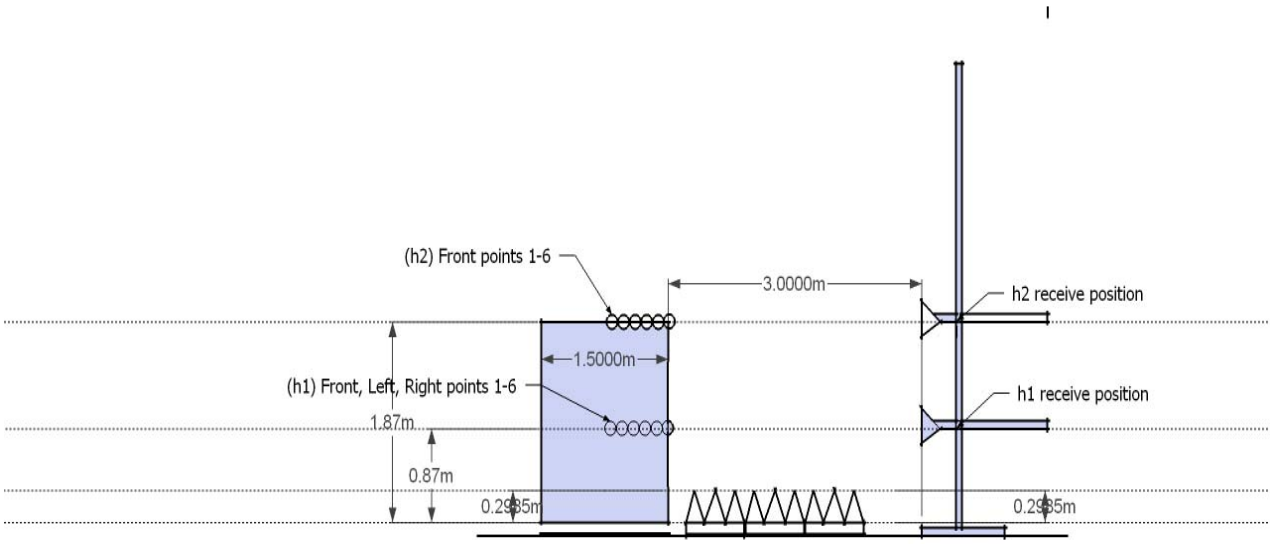


FIGURE 3: HIGH FREQUENCY TEST VOLUME



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: MARCH 18, 2010

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	22.2	10.0	39.8
1.5	24.2	10.5	40.2
2.0	27.2	11.0	39.7
2.5	27.8	11.5	39.9
3.0	30.5	12.0	41.7
3.5	30.9	12.5	42.7
4.0	31.9	13.0	42.3
4.5	33.2	13.5	40.3
5.0	33.6	14.0	42.6
5.5	36.2	14.5	43.4
6.0	35.8	15.0	41.9
6.5	36.1	15.5	40.8
7.0	37.9	16.0	41.0
7.5	37.4	16.5	41.5
8.0	38.0	17.0	44.5
8.5	38.8	17.5	47.6
9.0	38.0	18.0	50.8
9.5	39.2		

COM-POWER PA-102

PREAMPLIFIER

S/N: 1017

CALIBRATION DATE: JANUARY 11, 2011

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	38.1	300	38.1
40	38.2	350	38.0
50	38.2	400	37.9
60	38.2	450	37.7
70	38.2	500	37.6
80	38.2	550	37.9
90	38.2	600	37.9
100	38.1	650	37.7
125	38.2	700	37.9
150	38.2	750	37.5
175	38.2	800	37.6
200	38.2	850	37.6
225	38.2	900	37.0
250	38.2	950	37.2
275	38.2	1000	36.8

COM-POWER PA-118

PREAMPLIFIER

S/N: 181656

CALIBRATION DATE: DECEMBER 22, 2010

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.90	10.0	26.07
1.5	26.50	10.5	24.97
2.0	26.79	11.0	24.79
2.5	26.90	11.5	24.33
3.0	27.03	12.0	24.24
3.5	26.94	12.5	24.92
4.0	27.18	13.0	24.52
4.5	26.79	13.5	24.33
5.0	26.25	14.0	24.56
5.5	26.16	14.5	24.99
6.0	25.52	15.0	26.06
6.5	25.29	15.5	26.87
7.0	24.45	16.0	25.95
7.5	24.18	16.5	24.69
8.0	24.02	17.0	24.20
8.5	24.54	17.5	25.12
9.0	24.91	18.0	26.03
9.5	25.42		

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

FRONT VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
Models: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode)
RADIATED EMISSIONS – STAR 3000 SIDE – FCC CLASS B

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
Model: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode)
RADIATED EMISSIONS – STAR 3000 SIDE – FCC CLASS B

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
Models: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode)
RADIATED EMISSIONS – STAR 3000 SIDE – FCC CLASS A

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
Models: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode)
RADIATED EMISSIONS – STAR 3000 SIDE – FCC CLASS A

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
Models: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode)
RADIATED EMISSIONS – ENODE SIDE (ENODE ONLY) – FCC CLASS B

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
Models: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode)
RADIATED EMISSIONS – ENODE SIDE (ENODE ONLY) – FCC CLASS B

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
Models: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode)
RADIATED EMISSIONS – ENODE SIDE (ENODE with EMUX) – FCC CLASS B

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
Models: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode)
RADIATED EMISSIONS – ENODE SIDE (ENODE with EMUX) – FCC CLASS B

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
Models: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode)
CONDUCTED EMISSIONS – ENODE SIDE (ENODE with EMUX) – FCC CLASS B

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
Models: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode)
CONDUCTED EMISSIONS – ENODE SIDE (ENODE with EMUX) – FCC CLASS B

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
Models: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode)
CONDUCTED EMISSIONS – STAR 3000 SIDE – FCC CLASS B

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

MOJIX, INC.
STAR 3000 SYSTEM RFID READER
Models: STAR-3000-F (RFID Reader), EMX-1004 (eMux), ENM-1004-FW (4 Port eNode)
CONDUCTED EMISSIONS – STAR 3000 SIDE – FCC CLASS B

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

RADIATED EMISSION

DATA SHEETS

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode by itself)

Date: 10/24/2011
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
902.73								**N/A - Done via Conducted**
1805.46	45.21	V	74	-28.79	Peak	1.25	155	
1805.46	25.21	V	54	-28.79	Avg	1.25	155	
2708.19	41.83	V	74	-32.17	Peak	1.25	315	
2708.19	21.83	V	54	-32.17	Avg	1.25	315	
3610.92	39.89	V	74	-34.11	Peak	1.15	225	
3610.92	19.89	V	54	-34.11	Avg	1.15	225	
4513.65	42.56	V	74	-31.44	Peak	1.18	235	
4513.65	22.56	V	54	-31.44	Avg	1.18	235	
5416.38								**no emissions found**
5416.38								
6319.11								**no emissions found**
6319.11								
7221.84								**no emissions found**
7221.84								
8124.57								**no emissions found**
8124.57								
9027.3								**no emissions found**
9027.3								

FCC 15.249

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode by itself)

Date: 10/24/2011
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
902.73								**N/A - Done via Conducted**
1805.46	45.07	H	74	-28.93	Peak	2	45	
1805.46	25.07	H	54	-28.93	Avg	2	45	
2708.19	39.93	H	74	-34.07	Peak	1.25	315	
2708.19	19.93	H	54	-34.07	Avg	1.25	315	
3610.92	39.84	H	74	-34.16	Peak	1.55	325	
3610.92	19.84	H	54	-34.16	Avg	1.55	325	
4513.65	41.42	H	74	-32.58	Peak	1.25	155	
4513.65	21.42	H	54	-32.58	Avg	1.25	155	
5416.38								**no emissions found**
5416.38								
6319.11								**no emissions found**
6319.11								
7221.84								**no emissions found**
7221.84								
8124.57								**no emissions found**
8124.57								
9027.3								**no emissions found**
9027.3								

FCC 15.249

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode by itself)

Date: 10/24/2011
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
915.22								**N/A - Done via Conducted**
1830.44	46.39	V	74	-27.61	Peak	1.25	155	
1830.44	26.39	V	54	-27.61	Avg	1.25	155	
2745.66	39.23	V	74	-34.77	Peak	1.25	145	
2745.66	19.23	V	54	-34.77	Avg	1.25	145	
3660.88	39.17	V	74	-34.83	Peak	1.35	155	
3660.88	19.17	V	54	-34.83	Avg	1.35	155	
4576.1	40.22	V	74	-33.78	Peak	1.25	155	
4576.1	20.22	V	54	-33.78	Avg	1.25	155	
5491.32								**no emissions found**
5491.32								
6406.54								**no emissions found**
6406.54								
7321.76								**no emissions found**
7321.76								
8236.98								**no emissions found**
8236.98								
9152.2								**no emissions found**
9152.2								

FCC 15.249

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode by itself)

Date: 10/24/2011
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
915.22								**N/A - Done via Conducted**
1830.44	47.68	H	74	-26.32	Peak	1.25	135	
1830.44	27.68	H	54	-26.32	Avg	1.25	135	
2745.66	39.89	H	74	-34.11	Peak	1.25	125	
2745.66	19.89	H	54	-34.11	Avg	1.25	125	
3660.88	40.61	H	74	-33.39	Peak	1.25	135	
3660.88	20.61	H	54	-33.39	Avg	1.25	135	
4576.1	40.89	H	74	-33.11	Peak	1.35	145	
4576.1	20.89	H	54	-33.11	Avg	1.35	145	
5491.32								**no emissions found**
5491.32								
6406.54								**no emissions found**
6406.54								
7321.76								**no emissions found**
7321.76								
8236.98								**no emissions found**
8236.98								
9152.2								**no emissions found**
9152.2								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode by itself)

Date: 10/24/2011
Labs: B and D
Tested By: Kyle Fujimoto

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
927.23								**N/A - Done via Conducted**
1854.46	46.41	V	74	-27.59	Peak	1.25	135	
1854.46	26.41	V	54	-27.59	Avg	1.25	135	
2781.69	39.54	V	74	-34.46	Peak	1.25	135	
2781.69	19.54	V	54	-34.36	Avg	1.25	135	
3708.92	38.51	V	74	-35.49	Peak	1.15	145	
3708.92	18.51	V	54	-35.49	Avg	1.15	145	
4636.15	43.01	V	74	-30.99	Peak	1.25	135	
4636.15	23.01	V	54	-30.99	Avg	1.25	135	
5563.38								**no emissions found**
5563.38								
6490.61								**no emissions found**
6490.61								
7417.84								**no emissions found**
7417.84								
8345.07								**no emissions found**
8345.07								
9272.3								**no emissions found**
9272.3								

FCC 15.249

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode by itself)

Date: 10/24/2011
Labs: B and D
Tested By: Kyle Fujimoto

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
927.36								**N/A - Done via Conducted**
1854.72	46.87	H	74	-27.13	Peak	1.25	155	
1854.72	26.87	H	54	-27.13	Avg	1.25	155	
2782.08	40.07	H	74	-33.93	Peak	1.25	165	
2782.08	20.07	H	54	-33.93	Avg	1.25	165	
3709.44	43.77	H	74	-30.23	Peak	1.25	175	
3709.44	23.77	H	54	-30.23	Avg	1.25	175	
4636.8	43.52	H	74	-30.48	Peak	1.25	185	
4636.8	23.52	H	54	-30.48	Avg	1.25	185	
5564.16								**no emissions found**
5564.16								
6491.52								**no emissions found**
6491.52								
7418.88								**no emissions found**
7418.88								
8346.24								**no emissions found**
8346.24								
9273.6								**no emission found**
9273.6								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode by itself)

Date: 10/25/2011
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
902.73								**N/A - Done via Conducted**
1805.46	63.18	V	74	-10.82	Peak	1.55	180	
1805.46	43.18	V	54	-10.82	Avg	1.55	180	
2708.19	54.53	V	74	-19.47	Peak	1.25	225	
2708.19	34.53	V	54	-19.47	Avg	1.25	225	
3610.92	52.36	V	74	-21.64	Peak	1.25	225	
3610.92	32.36	V	54	-21.64	Avg	1.25	225	
4513.65	45.01	V	74	-28.99	Peak	1.25	235	
4513.65	25.01	V	54	-28.99	Avg	1.25	235	
5416.38	48.34	V	74	-25.66	Peak	1.25	235	
5416.38	28.34	V	54	-25.66	Avg	1.25	235	
6319.11								**no emissions found**
6319.11								
7221.84								**no emissions found**
7221.84								
8124.57								**no emissions found**
8124.57								
9027.3								**no emissions found**
9027.3								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode by itself)

Date: 10/25/2011
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
902.73								**N/A - Done via Conducted**
1805.46	58.15	H	74	-15.85	Peak	1.25	135	
1805.46	38.15	H	54	-15.85	Avg	1.25	135	
2708.19	56.09	H	74	-17.91	Peak	1.25	155	
2708.19	36.09	H	54	-17.91	Avg	1.25	155	
3610.92	53.78	H	74	-20.22	Peak	2.25	225	
3610.92	33.78	H	54	-20.22	Avg	2.25	225	
4513.65	46.31	H	74	-27.69	Peak	1.25	135	
4513.65	26.31	H	54	-27.69	Avg	1.25	135	
5416.38	49.98	H	74	-24.02	Peak	1.25	135	
5416.38	29.98	H	54	-24.02	Avg	1.25	135	
6319.11								**no emissions found**
6319.11								
7221.84								**no emissions found**
7221.84								
8124.57								**no emissions found**
8124.57								
9027.3								**no emissions found**
9027.3								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode by itself)

Date: 10/25/2011
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
915.22								**N/A - Done via Conducted**
1830.44	52.32	V	74	-21.68	Peak	1.25	135	
1830.44	32.32	V	54	-21.68	Avg	1.25	135	
2745.66	57.05	V	74	-16.95	Peak	1.25	0	
2745.66	37.05	V	54	-16.95	Avg	1.25	0	
3660.88	51.56	V	74	-22.44	Peak	1.35	155	
3660.88	31.56	V	54	-22.44	Avg	1.35	155	
4576.1	46.73	V	74	-27.27	Peak	1.25	165	
4576.1	26.73	V	54	-27.27	Avg	1.25	165	
5491.32	48.52	V	74	-25.48	Peak	1.25	165	
5491.32	28.52	V	54	-25.48	Avg	1.25	165	
6406.54								**no emissions found**
6406.54								
7321.76								**no emissions found**
7321.76								
8236.98								**no emissions found**
8236.98								
9152.2								**no emissions found**
9152.2								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode by itself)

Date: 10/25/2011
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
915.22								**N/A - Done via Conducted**
1830.44	46.11	H	74	-27.89	Peak	1.25	45	
1830.44	26.11	H	54	-27.89	Avg	1.25	45	
2745.66	37.77	H	74	-36.23	Peak	1.25	315	
2745.66	17.77	H	54	-36.23	Avg	1.25	315	
3660.88	38.96	H	74	-35.04	Peak	1.25	115	
3660.88	18.96	H	54	-35.04	Avg	1.25	115	
4576.1	41.09	H	74	-32.91	Peak	1.25	135	
4576.1	21.09	H	54	-32.91	Avg	1.25	135	
5491.32								**no emissions found**
5491.32								
6406.54								**no emissions found**
6406.54								
7321.76								**no emissions found**
7321.76								
8236.98								**no emissions found**
8236.98								
9152.2								**no emissions found**
9152.2								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode by itself)

Date: 10/25/2011
Labs: B and D
Tested By: Kyle Fujimoto

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
927.23								**N/A - Done via Conducted**
1854.46	55.41	V	74	-18.59	Peak	1.25	315	
1854.46	35.41	V	54	-18.59	Avg	1.25	315	
2781.69	59.27	V	74	-14.73	Peak	1.35	225	
2781.69	39.27	V	54	-14.73	Avg	1.35	225	
3708.92	50.63	V	74	-23.37	Peak	1.25	225	
3708.92	30.63	V	54	-23.37	Avg	1.25	225	
4636.15	45.26	V	74	-28.74	Peak	1.25	155	
4636.15	25.26	V	54	-28.74	Avg	1.25	155	
5563.38								**no emissions found**
5563.38								
6490.61								**no emissions found**
6490.61								
7417.84								**no emissions found**
7417.84								
8345.07								**no emissions found**
8345.07								
9272.3								**no emissions found**
9272.3								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode by itself)

Date: 10/25/2011
Labs: B and D
Tested By: Kyle Fujimoto

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
927.36								**N/A - Done via Conducted**
1854.72	56.15	H	74	-17.85	Peak	1.25	225	
1854.72	36.15	H	54	-17.85	Avg	1.25	225	
2782.08	61.57	H	74	-12.43	Peak	1.25	225	
2782.08	41.57	H	54	-12.43	Avg	1.25	225	
3709.44	53.54	H	74	-20.46	Peak	1.25	135	
3709.44	33.54	H	54	-20.46	Avg	1.25	135	
4636.8	46.08	H	74	-27.92	Peak	1.35	145	
4636.8	26.08	H	54	-27.92	Avg	1.35	145	
5564.16	48.81	H	74	-25.19	Peak	1.35	145	
5564.16	28.81	H	54	-25.19	Avg	1.35	145	
6491.52								**no emissions found**
6491.52								
7418.88								**no emissions found**
7418.88								
8346.24								**no emissions found**
8346.24								
9273.6								**no emission found**
9273.6								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode with eMux)

Date: 10/25/2011
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
902.73								**N/A - Done via Conducted**
1805.46	59.42	V	74	-14.58	Peak	1.25	135	
1805.46	39.42	V	54	-14.58	Avg	1.25	135	
2708.19	57.82	V	74	-16.18	Peak	1.25	315	
2708.19	37.82	V	54	-16.18	Avg	1.25	315	
3610.92	61.26	V	74	-12.74	Peak	1.25	135	
3610.92	41.26	V	54	-12.74	Avg	1.25	135	
4513.65	53.77	V	74	-20.23	Peak	1.25	135	
4513.65	33.77	V	54	-20.23	Avg	1.25	135	
5416.38	52.11	V	74	-21.89	Peak	1.25	135	
5416.38	32.11	V	54	-21.89	Avg	1.25	135	
6319.11	52.48	V	74	-21.52	Peak	1.25	135	
6319.11	32.48	V	54	-21.52	Avg	1.25	135	
7221.84								**no emissions found**
7221.84								
8124.57								**no emissions found**
8124.57								
9027.3								**no emissions found**
9027.3								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode with eMux)

Date: 10/25/2011
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
902.73								**N/A - Done via Conducted**
1805.46	58.06	H	74	-15.94	Peak	1.25	225	
1805.46	38.06	H	54	-15.94	Avg	1.25	225	
2708.19	55.96	H	74	-18.04	Peak	2.25	225	
2708.19	35.96	H	54	-18.04	Avg	2.25	225	
3610.92	57.47	H	74	-16.53	Peak	1.25	135	
3610.92	37.47	H	54	-16.53	Avg	1.25	135	
4513.65	51.02	H	74	-22.98	Peak	1.25	155	
4513.65	31.02	H	54	-22.98	Avg	1.25	155	
5416.38	52.89	H	74	-21.11	Peak	1.25	135	
5416.38	32.89	H	54	-21.11	Avg	1.25	135	
6319.11	49.34	H	74	-24.66	Peak	1.25	155	
6319.11	29.34	H	54	-24.66	Avg	1.25	155	
7221.84								**no emissions found**
7221.84								
8124.57								**no emissions found**
8124.57								
9027.3								**no emissions found**
9027.3								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode with eMux)

Date: 10/25/2011
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
915.22								**N/A - Done via Conducted**
1830.44	58.06	V	74	-15.94	Peak	1.25	225	
1830.44	38.06	V	54	-15.94	Avg	1.25	225	
2745.66	60.43	V	74	-13.57	Peak	2.25	225	
2745.66	40.43	V	54	-13.57	Avg	2.25	225	
3660.88	59.78	V	74	-14.22	Peak	1.25	135	
3660.88	39.78	V	54	-14.22	Avg	1.25	135	
4576.1	53.44	V	74	-20.56	Peak	1.25	135	
4576.1	33.44	V	54	-20.56	Avg	1.25	135	
5491.32	51.71	V	74	-22.29	Peak	1.25	135	
5491.32	31.71	V	54	-22.29	Avg	1.25	135	
6406.54	50.92	V	74	-23.08	Peak	1.25	135	
6406.54	30.92	V	54	-23.08	Avg	1.25	135	
7321.76	51.57	V	74	-22.43	Peak	1.25	180	
7321.76	31.57	V	54	-22.43	Avg	1.25	180	
8236.98								**no emissions found**
8236.98								
9152.2								**no emissions found**
9152.2								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode with eMux)

Date: 10/25/2011
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
915.22								**N/A - Done via Conducted**
1830.44	58.75	H	74	-15.25	Peak	1.25	225	
1830.44	38.75	H	54	-15.25	Avg	1.25	225	
2745.66	56.89	H	74	-17.11	Peak	1.25	315	
2745.66	36.89	H	54	-17.11	Avg	1.25	315	
3660.88	58.95	H	74	-15.05	Peak	1.25	135	
3660.88	38.95	H	54	-15.05	Avg	1.25	135	
4576.1	49.89	H	74	-24.11	Peak	1.25	180	
4576.1	29.89	H	54	-24.11	Avg	1.25	180	
5491.32	49.93	H	74	-24.07	Peak	1.25	180	
5491.32	29.93	H	54	-24.07	Avg	1.25	180	
6406.54	49.07	H	74	-24.93	Peak	1.25	180	
6406.54	29.07	H	54	-24.93	Avg	1.25	180	
7321.76								**no emissions found**
7321.76								
8236.98								**no emissions found**
8236.98								
9152.2								**no emissions found**
9152.2								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode with eMux)

Date: 10/25/2011
Labs: B and D
Tested By: Kyle Fujimoto

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
927.23								**N/A - Done via Conducted**
1854.46	58.71	V	74	-15.29	Peak	1.25	135	
1854.46	38.71	V	54	-15.29	Avg	1.25	135	
2781.69	54.73	V	74	-19.27	Peak	1.25	155	
2781.69	34.73	V	54	-19.27	Avg	1.25	155	
3708.92	56.62	V	74	-17.38	Peak	1.25	225	
3708.92	36.62	V	54	-17.38	Avg	1.25	225	
4636.15	48.88	V	74	-25.12	Peak	1.25	180	
4636.15	28.88	V	54	-25.12	Avg	1.25	180	
5563.38	49.51	V	74	-24.49	Peak	1.25	180	
5563.38	29.51	V	54	-24.49	Avg	1.25	180	
6490.61	49.18	V	74	-24.82	Peak	1.25	180	
6490.61	29.18	V	54	-24.82	Avg	1.25	180	
7417.84	48.34	V	74	-25.66	Peak	1.35	90	
7417.84	28.34	V	54	-25.66	Avg	1.35	90	
8345.07								**no emissions found**
8345.07								
9272.3								**no emissions found**
9272.3								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode with eMux)

Date: 10/25/2011
Labs: B and D
Tested By: Kyle Fujimoto

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
927.36								**N/A - Done via Conducted**
1854.72	55.91	H	74	-18.09	Peak	2.25	180	
1854.72	35.91	H	54	-18.09	Avg	2.25	180	
2782.08	60.24	H	74	-13.76	Peak	1.25	225	
2782.08	40.24	H	54	-13.76	Avg	1.25	225	
3709.44	49.81	H	74	-24.19	Peak	1.25	270	
3709.44	29.81	H	54	-24.19	Avg	1.25	270	
4636.8	48.75	H	74	-25.25	Peak	1.25	180	
4636.8	28.75	H	54	-25.25	Avg	1.25	180	
5564.16	48.82	H	74	-25.18	Peak	1.35	175	
5564.16	28.82	H	54	-25.18	Avg	1.35	175	
6491.52	48.21	H	74	-25.79	Peak	1.25	45	
6491.52	28.21	H	54	-25.79	Avg	1.25	45	
7418.88								**no emissions found**
7418.88								
8346.24								**no emissions found**
8346.24								
9273.6								**no emissions found**
9273.6								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode with eMux)

Date: 10/25/2011
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
902.73								**N/A - Done via Conducted**
1805.46	62.54	V	74	-11.46	Peak	1.55	180	
1805.46	42.54	V	54	-11.46	Avg	1.55	180	
2708.19	53.21	V	74	-20.79	Peak	1.25	225	
2708.19	33.21	V	54	-20.79	Avg	1.25	225	
3610.92	51.74	V	74	-22.26	Peak	1.25	225	
3610.92	31.74	V	54	-22.26	Avg	1.25	225	
4513.65	42.69	V	74	-31.31	Peak	1.25	235	
4513.65	22.69	V	54	-31.31	Avg	1.25	235	
5416.38	47.52	V	74	-26.48	Peak	1.25	235	
5416.38	27.52	V	54	-26.48	Avg	1.25	235	
6319.11	48.68	V	74	-25.32	Peak	1.25	235	
6319.11	28.68	V	54	-25.32	Avg	1.25	235	
7221.84								**no emissions found**
7221.84								
8124.57								**no emissions found**
8124.57								
9027.3								**no emissions found**
9027.3								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode with eMux)

Date: 10/25/2011
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
902.73								**N/A - Done via Conducted**
1805.46	56.48	H	74	-17.52	Peak	1.25	135	
1805.46	36.48	H	54	-17.52	Avg	1.25	135	
2708.19	55.21	H	74	-18.79	Peak	1.25	155	
2708.19	35.21	H	54	-18.79	Avg	1.25	155	
3610.92	52.14	H	74	-21.86	Peak	2.25	225	
3610.92	32.14	H	54	-21.86	Avg	2.25	225	
4513.65	45.85	H	74	-28.15	Peak	1.25	135	
4513.65	25.85	H	54	-28.15	Avg	1.25	135	
5416.38	47.64	H	74	-26.36	Peak	1.25	135	
5416.38	27.64	H	54	-26.36	Avg	1.25	135	
6319.11	50.35	H	74	-23.65	Peak	1.25	135	
6319.11	30.35	H	54	-23.65	Avg	1.25	135	
7221.84								**no emissions found**
7221.84								
8124.57								**no emissions found**
8124.57								
9027.3								**no emissions found**
9027.3								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode with eMux)

Date: 10/25/2011
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
915.22								**N/A - Done via Conducted**
1830.44	51.41	V	74	-22.59	Peak	1.25	135	
1830.44	31.41	V	54	-22.59	Avg	1.25	135	
2745.66	56.24	V	74	-17.76	Peak	1.25	0	
2745.66	36.24	V	54	-17.76	Avg	1.25	0	
3660.88	49.57	V	74	-24.43	Peak	1.35	155	
3660.88	29.57	V	54	-24.43	Avg	1.35	155	
4576.1	47.52	V	74	-26.48	Peak	1.25	165	
4576.1	27.52	V	54	-26.48	Avg	1.25	165	
5491.32	48.91	V	74	-25.09	Peak	1.25	165	
5491.32	28.91	V	54	-25.09	Avg	1.25	165	
6406.54	46.58	V	74	-27.42	Peak	1.25	165	**no emissions found**
6406.54	26.58	V	54	-27.42	Avg	1.25	165	
7321.76								**no emissions found**
7321.76								
8236.98								**no emissions found**
8236.98								
9152.2								**no emissions found**
9152.2								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode with eMux)

Date: 10/25/2011
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
915.22								**N/A - Done via Conducted**
1830.44	53.16	H	74	-20.84	Peak	1.25	155	
1830.44	33.16	H	54	-20.84	Avg	1.25	155	
2745.66	60.73	H	74	-13.27	Peak	1.55	135	
2745.66	40.73	H	54	-13.27	Avg	1.55	135	
3660.88	56.01	H	74	-17.99	Peak	1.25	135	
3660.88	36.01	H	54	-17.99	Avg	1.25	135	
4576.1	48.05	H	74	-25.95	Peak	1.25	125	
4576.1	28.05	H	54	-25.95	Avg	1.25	125	
5491.32	50.09	H	74	-23.91	Peak	1.25	165	
5491.32	30.09	H	54	-23.91	Avg	1.25	165	
6406.54	48.92	H	74	-25.08	Peak	1.15	175	
6406.54	28.92	H	54	-25.08	Avg	1.15	175	
7321.76								**no emissions found**
7321.76								
8236.98								**no emissions found**
8236.98								
9152.2								**no emissions found**
9152.2								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode with eMux)

Date: 10/25/2011
Labs: B and D
Tested By: Kyle Fujimoto

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
927.23								**N/A - Done via Conducted**
1854.46	54.02	V	74	-19.98	Peak	1.25	315	
1854.46	34.02	V	54	-19.98	Avg	1.25	315	
2781.69	57.45	V	74	-16.55	Peak	1.35	225	
2781.69	37.45	V	54	-16.55	Avg	1.35	225	
3708.92	48.12	V	74	-25.88	Peak	1.25	225	
3708.92	28.12	V	54	-25.88	Avg	1.25	225	
4636.15	46.21	V	74	-27.79	Peak	1.25	155	
4636.15	26.21	V	54	-27.79	Avg	1.25	155	
5563.38								**no emissions found**
5563.38								
6490.61								**no emissions found**
6490.61								
7417.84								**no emissions found**
7417.84								
8345.07								**no emissions found**
8345.07								
9272.3								**no emissions found**
9272.3								

FCC 15.247

Mojix, Inc.
STAR 3000 System RFID Reader
Configuration: eNode Side (eNode with eMux)

Date: 10/25/2011
Labs: B and D
Tested By: Kyle Fujimoto

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
927.36								**N/A - Done via Conducted**
1854.72	54.29	H	74	-19.71	Peak	1.25	225	
1854.72	34.29	H	54	-19.71	Avg	1.25	225	
2782.08	60.74	H	74	-13.26	Peak	1.25	225	
2782.08	40.74	H	54	-13.26	Avg	1.25	225	
3709.44	52.59	H	74	-21.41	Peak	1.25	135	
3709.44	32.59	H	54	-21.41	Avg	1.25	135	
4636.8	45.14	H	74	-28.86	Peak	1.35	145	
4636.8	25.14	H	54	-28.86	Avg	1.35	145	
5564.16	47.21	H	74	-26.79	Peak	1.35	145	
5564.16	27.21	H	54	-26.79	Avg	1.35	145	
6491.52								**no emissions found**
6491.52								
7418.88								**no emissions found**
7418.88								
8346.24								**no emissions found**
8346.24								
9273.6								**no emission found**
9273.6								

Test Location : Compatible Electronics
Customer : Mojix_Inc.
Manufacturer : Mojix_Inc.
Eut name : Star 3000 System RFID Reader
Model : N/A
Serial # : N/A
Specification : FCC Class B
Distance correction factor (20 * log(test/spec) : 0.00
Test Mode : Radiated Emissions - eNode Side - Tx Mode (Worst Case)
Without the Emux
Vertical and Horizontal Polarization
Test Engineer: Kyle Fujimoto

Page : 1/1
Date : 9/22/2011
Time : 15:14:12
Lab : D
Test Distance : 3

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	Limit = L dBuV/m	Delta R-L dB
1V	39.065	61.50	0.57	11.66	38.19	35.53	40.00	-4.47
2H	62.473	64.70	1.05	9.07	38.20	36.62	40.00	-3.38
3V	62.477	62.90	1.05	9.07	38.20	34.82	40.00	-5.18
4V	62.500	59.20	1.05	9.06	38.20	31.11	40.00	-8.89
5V	78.120	62.20	1.20	5.93	38.20	31.13	40.00	-8.87
6V	78.125	61.60	1.20	5.93	38.20	30.53	40.00	-9.47
7V	97.639	67.60	1.08	8.93	38.12	39.49	43.50	-4.01
8V	97.640	69.20	1.08	8.93	38.12	41.09	43.50	-2.41
9V	100.000	62.70	1.10	9.50	38.10	35.20	43.50	-8.30
10V	100.000	63.30	1.10	9.50	38.10	35.80	43.50	-7.70
11V	124.971	64.00	1.10	11.92	38.20	38.82	43.50	-4.68
12V	125.000	61.20	1.10	11.91	38.20	36.01	43.50	-7.49
13V	125.005	49.70	1.10	11.91	38.20	24.51	43.50	-18.99
14H	125.007	58.30	1.10	11.91	38.20	33.11	43.50	-10.39
15V	136.686	58.30	1.15	11.51	38.20	32.76	43.50	-10.74
16V	136.715	50.50	1.15	11.51	38.20	24.96	43.50	-18.54
17V	156.216	51.80	1.23	12.22	38.20	27.05	43.50	-16.45
18V	156.245	59.00	1.23	12.22	38.20	34.25	43.50	-9.25
19V	249.988	51.10	1.70	16.10	38.20	30.70	46.00	-15.30
20V	250.000	47.90	1.70	16.10	38.20	27.50	46.00	-18.50
21V	250.000	40.90	1.70	16.10	38.20	20.50	46.00	-25.50
22V	250.005	43.30	1.70	16.10	38.20	22.90	46.00	-23.10
23H	289.014	53.10	1.81	18.41	38.14	35.18	46.00	-10.82
24V	312.480	50.10	1.95	13.78	38.07	27.76	46.00	-18.24
25H	312.481	54.10	1.95	13.78	38.07	31.76	46.00	-14.24
26H	374.980	55.00	2.00	15.05	37.95	34.10	46.00	-11.90
27V	374.980	51.50	2.00	15.05	37.95	30.60	46.00	-15.40
28H	410.131	48.40	1.98	15.53	37.86	28.06	46.00	-17.94
29V	437.480	49.60	2.20	15.62	37.75	29.68	46.00	-16.32
30H	499.980	48.40	2.40	15.80	37.60	29.00	46.00	-17.00

Test Location : Compatible Electronics **Page** : 1/1
Customer : Mojix_Inc. **Date** : 9/23/2011
Manufacturer : Mojix_Inc. **Time** : 10:39:53
Eut name : Star 3000 System RFID Reader **Lab** : D
Model : N/A **Test Distance** : 3
Serial # : N/A
Specification : FCC Class B
Distance correction factor (20 * log(test/spec) : 0.00
Test Mode : Radiated Emissions - eNode Side - Tx Mode (Worst Case)
With the Emux
Vertical and Horizontal Polarization
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
1H	62.491	52.80	1.05	9.06	38.20	24.71	40.00	-15.29
2V	62.492	64.60	1.05	9.06	38.20	36.51	40.00	-3.49
3V	78.112	60.30	1.20	5.93	38.20	29.23	40.00	-10.77
4V	97.642	64.60	1.08	8.93	38.12	36.49	43.50	-7.01
5V	97.642	68.20	1.08	8.93	38.12	40.09	43.50	-3.41
6H	97.651	47.70	1.08	8.94	38.12	19.59	43.50	-23.91
7V	97.651	61.60	1.08	8.94	38.12	33.49	43.50	-10.01
8V	117.172	52.60	1.10	11.76	38.17	27.29	43.50	-16.21
9V	124.992	56.20	1.10	11.91	38.20	31.01	43.50	-12.49
10V	136.720	52.00	1.15	11.51	38.20	26.46	43.50	-17.04
11V	156.232	50.80	1.23	12.22	38.20	26.05	43.50	-17.45
12V	195.301	42.60	1.38	16.09	38.20	21.87	43.50	-21.63
13V	249.992	43.60	1.70	16.10	38.20	23.20	46.00	-22.80
14V	257.840	51.70	1.70	16.59	38.20	31.79	46.00	-14.21
15H	273.421	43.90	1.70	17.52	38.20	24.92	46.00	-21.08
16H	300.000	51.10	1.90	13.50	38.10	28.40	46.00	-17.60
17V	312.470	53.40	1.95	13.78	38.07	31.06	46.00	-14.94
18H	312.516	50.50	1.95	13.78	38.07	28.16	46.00	-17.84
19H	351.564	43.50	2.09	14.60	38.00	22.20	46.00	-23.80
20V	374.970	54.30	2.00	15.05	37.95	33.40	46.00	-12.60
21H	375.018	58.30	2.00	15.05	37.95	37.40	46.00	-8.60
22H	410.154	52.00	1.99	15.53	37.86	31.66	46.00	-14.34
23H	414.078	40.30	2.02	15.55	37.84	20.02	46.00	-25.98
24H	437.474	60.30	2.20	15.62	37.75	40.38	46.00	-5.62
25V	437.492	53.90	2.20	15.62	37.75	33.98	46.00	-12.02
26H	453.138	57.20	2.31	15.67	37.69	37.48	46.00	-8.52
27H	453.138	61.70	2.31	15.67	37.69	41.98	46.00	-4.02
28V	499.992	54.80	2.40	15.80	37.60	35.40	46.00	-10.60

FCC 15.247 and FCC Class B

Mojix, Inc. Date: 09/23/11

Star 3000 System RFID Reader Lab: B

Configuration: eNode Side (eNode by itself) Tested By: Kyle Fujimoto

10 kHz to 30 MHz and 1 to 9.3 GHz – Vert. and Horiz. Polar.

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
								No Emissions
								Detected from the Receive
								Mode from 10 kHz to
								30 MHz
								No Emissions Detected
								from the Digital Portion from
								10 kHz to 30 MHz
								No Emissions Detected for
								the Non-Harmonic Tx
								Emissions from
								10 kHz to 30 MHz

FCC 15.247 and FCC Class B

Mojix, Inc.
Star 3000 System RFID Reader
Configuration: eNode Side (eNode with eMux)

Date: 09/23/11
Lab: B
Tested By: Kyle Fujimoto

10 kHz to 30 MHz and 1 to 9.3 GHz – Vert. and Horiz. Polar.

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
								No Emissions
								Detected from the Receive
								Mode from 10 kHz to
								30 MHz
								No Emissions Detected
								from the Digital Portion from
								10 kHz to 30 MHz
								No Emissions Detected for
								the Non-Harmonic Tx
								Emissions from
								10 kHz to 30 MHz

Test Location : Compatible Electronics
Customer : Mojix_Inc.
Manufacturer : Mojix_Inc.
Eut name : STAR 3000 System RFID Reader
Model : N/A
Serial # : N/A
Specification : FCC Class A
Distance correction factor (20 * log(test/spec) : 0.00
Test Mode : Radiated Emissions - Star 3000 Side
Emissions from the Digital Portion
Vertical and Horizontal Polarization
Test Engineer: Kyle Fujimoto

Page : 1/2
Date : 9/23/2011
Time : 13:34:13
Lab : D
Test Distance : 10

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	39.072	49.70	1.28	11.66	38.19	24.45	39.10	-14.65
2V	58.578	61.00	1.40	10.01	38.20	34.21	39.10	-4.89
3H	58.596	40.20	1.40	10.01	38.20	13.41	39.10	-25.69
4V	62.477	61.50	1.48	9.07	38.20	33.84	39.10	-5.26
5H	62.520	42.80	1.48	9.05	38.20	15.13	39.10	-23.97
6V	78.112	63.80	1.70	5.93	38.20	33.23	39.10	-5.87
7V	97.642	66.60	1.88	8.93	38.12	39.29	43.50	-4.21
8V	117.172	61.80	2.04	11.76	38.17	37.43	43.50	-6.07
9H	117.200	49.80	2.04	11.76	38.17	25.43	43.50	-18.07
10V	124.992	64.30	2.10	11.91	38.20	40.11	43.50	-3.39
11V	136.702	64.60	2.20	11.51	38.20	40.11	43.50	-3.39
12H	136.729	58.40	2.20	11.51	38.20	33.91	43.50	-9.59
13H	136.736	61.20	2.20	11.51	38.20	36.71	43.50	-6.79
14V	156.232	63.70	2.35	12.22	38.20	40.07	43.50	-3.43
15H	156.266	52.00	2.35	12.22	38.20	28.38	43.50	-15.12
16V	175.762	55.40	2.50	15.03	38.20	34.74	43.50	-8.76
17V	187.492	61.70	2.55	15.89	38.20	41.95	43.50	-1.55
18V	187.492Qp	61.40	2.55	15.89	38.20	41.65	43.50	-1.85
19V	195.292	49.90	2.58	16.09	38.20	30.37	43.50	-13.13
20H	195.326	41.50	2.58	16.09	38.20	21.97	43.50	-21.53
21H	195.329	43.50	2.58	16.09	38.20	23.97	43.50	-19.53
22V	234.352	42.30	2.74	16.13	38.20	22.97	46.40	-23.43
23V	249.992	54.60	2.80	16.10	38.20	35.30	46.40	-11.10
24V	253.882	36.40	2.86	16.35	38.20	17.41	46.40	-28.99
25V	292.942	40.60	3.20	18.62	38.13	24.29	46.40	-22.11
26H	300.003	47.00	3.20	13.50	38.10	25.60	46.40	-20.80
27H	312.477	55.40	3.28	13.78	38.07	34.39	46.40	-12.01
28V	312.552	45.20	3.28	13.78	38.07	24.19	46.40	-22.21
29H	332.007	43.40	3.40	14.20	38.03	22.97	46.40	-23.43
30V	332.194	34.50	3.40	14.21	38.03	14.07	46.40	-32.33
31H	371.067	36.20	3.63	14.98	37.96	16.85	46.40	-29.55
32V	374.980	63.90	3.65	15.05	37.95	44.66	46.40	-1.74
33V	374.980Qp	63.62	3.65	15.05	37.95	44.38	46.40	-2.02
34H	375.048	62.00	3.66	15.05	37.95	42.76	46.40	-3.64
35H	390.606	39.90	3.75	15.33	37.92	21.06	46.40	-25.34

Test Location	: Compatible Electronics	**Page**	: 2/2
Customer	: Mojix_Inc.	**Date**	: 9/23/2011
Manufacturer	: Mojix_Inc.	**Time**	: 13:34:13
Eut name	: STAR 3000 System RFID Reader	**Lab**	: D
Model	: N/A	**Test Distance**	: 10
Serial #	: N/A		
Specification	: FCC Class A		

Distance correction factor (20 * log(test/spec) : 0.00

Test Mode : Radiated Emissions - Star 3000 Side
Emissions from the Digital Portion
Vertical and Horizontal Polarization
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
36H	410.136	54.90	3.84	15.53	37.86	36.42	46.40	-9.98
37H	429.666	47.70	3.92	15.60	37.78	29.44	46.40	-16.96
38H	437.480	55.80	3.95	15.62	37.75	37.62	46.40	-8.78
39V	449.017	39.80	4.00	15.66	37.70	21.75	46.40	-24.65
40H	468.726	39.50	4.15	15.71	37.66	21.71	46.40	-24.69
41H	500.048	47.00	4.40	15.80	37.60	29.60	46.40	-16.80
42H	507.846	42.70	4.45	16.18	37.65	25.68	46.40	-20.72
43H	511.758	33.80	4.47	16.36	37.67	16.96	46.40	-29.44
44V	625.031	40.00	5.16	20.25	37.80	27.61	46.40	-18.79

Test Location : Compatible Electronics **Page** : 1/1
Customer : Mojix_Inc. **Date** : 9/22/2011
Manufacturer : Mojix_Inc. **Time** : 11:06:51
Eut name : STAR 3000 System RFID Reader **Lab** : D
Model : N/A **Test Distance** : 3
Serial # : N/A
Specification : FCC Class B
Distance correction factor (20 * log(test/spec) : 0.00
Test Mode : Star 3000 Side
Emissions from the Transmitter
Radiated Emissions
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	36.834	55.80	0.49	11.31	38.17	29.42	40.00	-10.58
2H	36.885	43.90	0.49	11.31	38.17	17.53	40.00	-22.47
3V	47.455	58.50	0.75	11.50	38.20	32.55	40.00	-7.45
4H	47.506	54.90	0.75	11.50	38.20	28.95	40.00	-11.05
5V	83.326	65.60	1.13	6.15	38.20	34.68	40.00	-5.32
6H	121.112	53.70	1.10	12.06	38.19	28.67	43.50	-14.83
7V	121.117	60.80	1.10	12.06	38.19	35.77	43.50	-7.73
8H	140.618	60.00	1.16	11.43	38.20	34.40	43.50	-9.10
9V	162.153	55.40	1.25	12.77	38.20	31.23	43.50	-12.27
10H	162.158	50.20	1.25	12.78	38.20	26.03	43.50	-17.47
11H	200.006	56.70	1.40	16.20	38.20	36.10	43.50	-7.40
12V	300.003	51.60	1.90	13.50	38.10	28.90	46.00	-17.10
13H	312.478	64.80	1.95	13.78	38.07	42.46	46.00	-3.54
14V	312.501	49.40	1.95	13.78	38.07	27.06	46.00	-18.94
15H	366.694	51.40	2.03	14.90	37.97	30.36	46.00	-15.64
16V	366.697	50.20	2.03	14.90	37.97	29.16	46.00	-16.84

FCC 15.247 and FCC Class B

Mojix, Inc.
Star 3000 System RFID Reader
Configuration: STAR 3000 Side

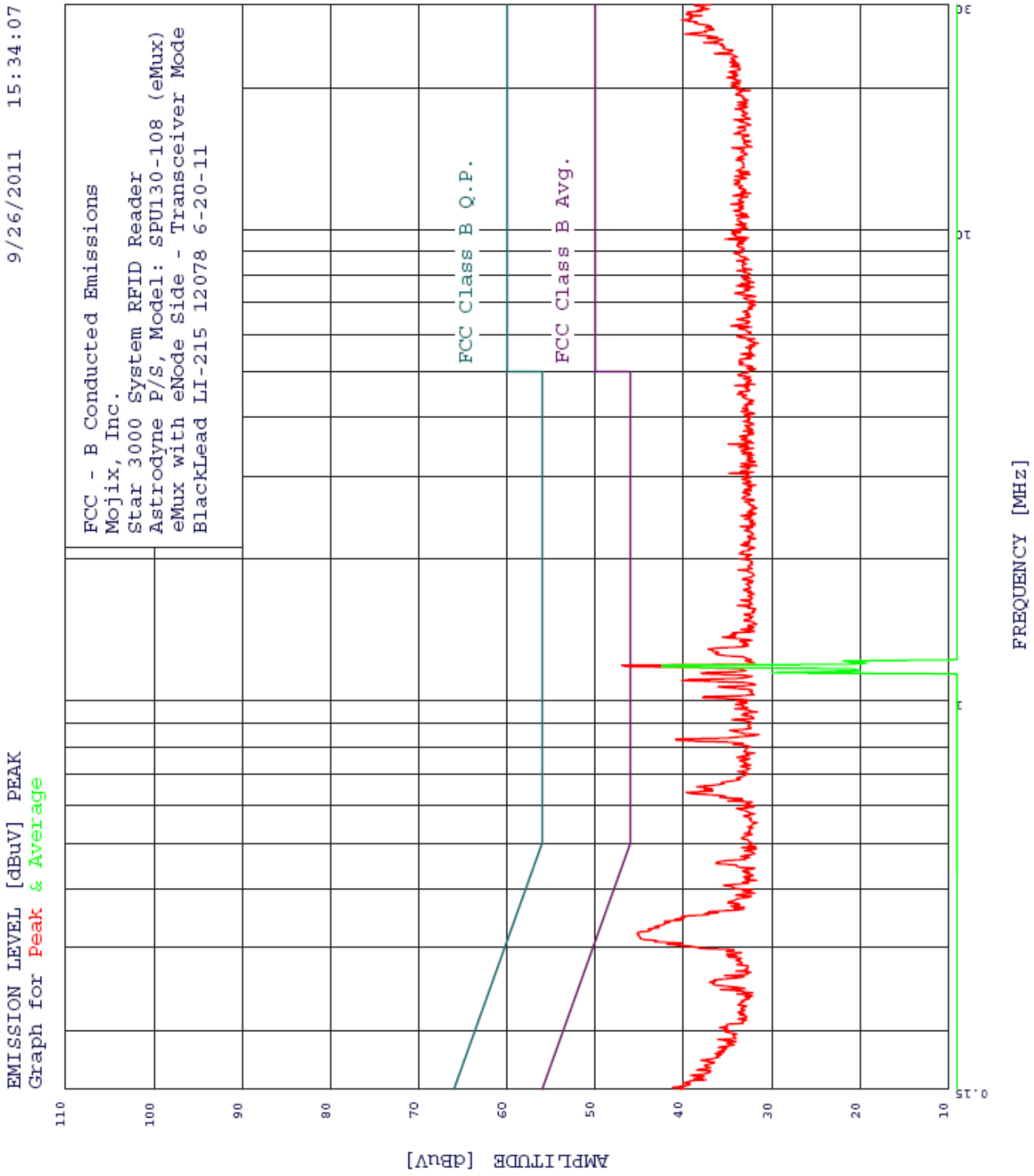
Date: 09/23/11
Lab: B
Tested By: Kyle Fujimoto

10 kHz to 30 MHz and 1 to 9.3 GHz – Vert. and Horiz. Polar.

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
								No Emissions
								Detected from the Receive
								Mode from 10 kHz to 30 MHz
								No Emissions Detected
								from the Digital Portion from
								10 kHz to 30 MHz
								No Emissions Detected for
								the Non-Harmonic Tx
								Emissions from
								10 kHz to 30 MHz

CONDUCTED EMISSION

DATA SHEETS


9/26/2011 15:34:07
FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Astrodyne P/S, Model: SPU130-108 (eMux)
eMux with eNode Side - Transceiver Mode
BlackLead LI-215 12078 6-20-11
FCC Class B Q.P.
FCC Class B Avg.
EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15

FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Astrodyne P/S, Model: SPU130-108 (eMux)
eMux with eNode Side - Transceiver Mode
BlackLead LI-215 12078 6-20-11
TEST ENGINEER : Kyle Fujimoto

48 highest peaks above -50.00 dB of FCC Class B Avg. limit line
Peak criteria : 1.00 dB, Curve : Peak

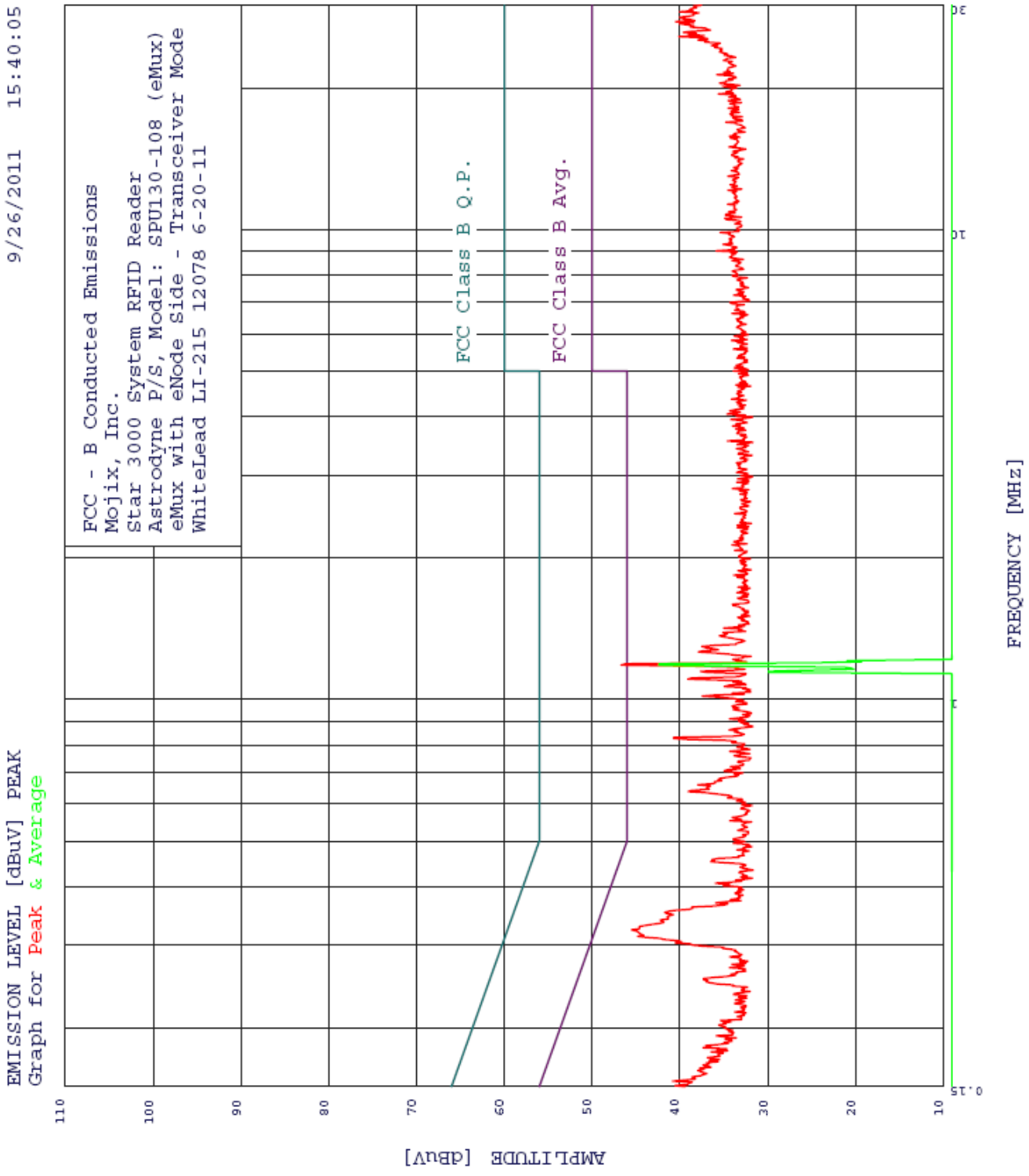
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	1.191	47.00	46.00	1.00**
2	0.322	45.26	49.66	-4.41
3	0.826	40.83	46.00	-5.17
4	1.106	40.20	46.00	-5.80
5	0.641	39.68	46.00	-6.32
6	0.658	38.47	46.00	-7.53
7	1.148	38.00	46.00	-8.00**
8	1.016	37.80	46.00	-8.20
9	0.305	41.85	50.10	-8.25
10	1.290	37.20	46.00	-8.80
11	27.864	40.21	50.00	-9.79
12	1.072	36.10	46.00	-9.90
13	26.009	39.83	50.00	-10.17
14	28.615	39.70	50.00	-10.30
15	1.367	35.60	46.00	-10.40
16	0.454	36.30	46.80	-10.50
17	0.614	34.99	46.00	-11.01
18	3.511	34.95	46.00	-11.05
19	3.043	34.87	46.00	-11.13
20	0.867	34.73	46.00	-11.27
21	29.851	38.68	50.00	-11.32
22	0.914	34.52	46.00	-11.48
23	0.358	37.17	48.78	-11.61
24	0.809	34.34	46.00	-11.66
25	4.672	34.21	46.00	-11.79
26	0.963	34.21	46.00	-11.79
27	0.984	34.10	46.00	-11.90
28	0.592	33.99	46.00	-12.01
29	0.759	33.95	46.00	-12.05
30	4.480	33.92	46.00	-12.08
31	1.000	33.90	46.00	-12.10
32	1.594	33.90	46.00	-12.10
33	0.709	33.86	46.00	-12.14
34	4.928	33.80	46.00	-12.20
35	1.899	33.80	46.00	-12.20
36	0.406	35.50	47.72	-12.23
37	3.456	33.75	46.00	-12.25
38	24.933	37.74	50.00	-12.26
39	2.055	33.70	46.00	-12.30
40	0.747	33.65	46.00	-12.35
41	3.644	33.65	46.00	-12.35
42	2.346	33.59	46.00	-12.41
43	3.141	33.56	46.00	-12.44
44	0.728	33.55	46.00	-12.45
45	1.419	33.50	46.00	-12.50
46	1.637	33.50	46.00	-12.50
47	2.002	33.50	46.00	-12.50
48	2.145	33.50	46.00	-12.50

** Please See the Average Readings on the Next Page and on the Plot

FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Astrodyne P/S, Model: SPU130-108 (eMux)
eMux with eNode Side - Transceiver Mode
BlackLead LI-215 12078 6-20-11
TEST ENGINEER : Kyle Fujimoto

3 highest peaks above -50.00 dB of FCC Class B Avg. limit line
Peak criteria : 0.00 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	1.184	42.44	46.00	-3.56
2	1.148	30.01	46.00	-15.99
3	1.217	21.89	46.00	-24.11


9/26/2011 15:40:05
FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Astrodyne P/S, Model: SPU130-108 (eMux)
eMux with eNode Side - Transceiver Mode
WhiteLead LI-215 12078 6-20-11
EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
FCC Class B Q.P.
FCC Class B Avg.
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15

FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Astrodyne P/S, Model: SPU130-108 (eMux)
eMux with eNode Side - Transceiver Mode
WhiteLead LI-215 12078 6-20-11
TEST ENGINEER : Kyle Fujimoto

48 highest peaks above -50.00 dB of FCC Class B Avg. limit line
Peak criteria : 0.00 dB, Curve : Peak

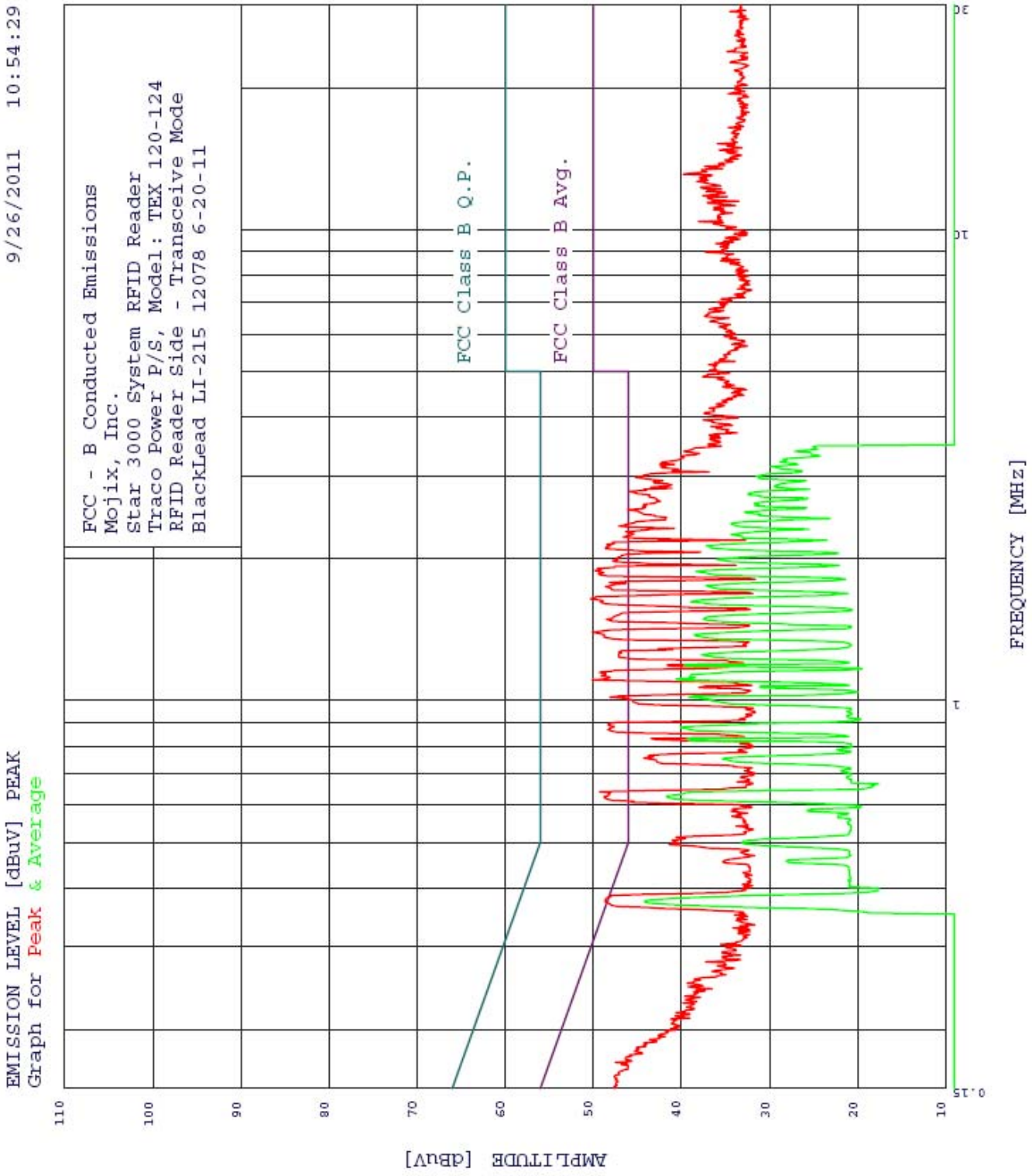
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	1.184	46.68	46.00	0.68**
2	0.324	45.51	49.62	-4.11
3	0.329	44.61	49.48	-4.87
4	0.313	44.81	49.88	-5.07
5	0.826	40.69	46.00	-5.31
6	1.106	39.06	46.00	-6.94
7	0.637	39.04	46.00	-6.96
8	0.339	42.22	49.22	-7.00
9	0.352	41.72	48.91	-7.19
10	0.345	41.42	49.09	-7.67
11	0.658	37.94	46.00	-8.06
12	1.262	37.89	46.00	-8.11
13	1.148	37.67	46.00	-8.33**
14	1.297	37.49	46.00	-8.51
15	1.016	37.43	46.00	-8.57
16	0.648	36.94	46.00	-9.06
17	27.720	40.50	50.00	-9.50
18	0.304	40.50	50.14	-9.64
19	25.740	40.11	50.00	-9.89
20	0.669	36.04	46.00	-9.96
21	27.431	40.00	50.00	-10.00
22	28.306	40.00	50.00	-10.00
23	29.078	39.99	50.00	-10.01
24	0.362	38.62	48.69	-10.07
25	0.676	35.63	46.00	-10.37
26	0.452	36.46	46.85	-10.38
27	0.457	36.37	46.76	-10.39
28	26.278	39.61	50.00	-10.39
29	1.367	35.50	46.00	-10.50
30	1.389	35.10	46.00	-10.90
31	26.009	39.01	50.00	-10.99
32	1.419	35.00	46.00	-11.00
33	1.066	34.95	46.00	-11.05
34	0.705	34.93	46.00	-11.07
35	29.387	38.89	50.00	-11.11
36	26.999	38.81	50.00	-11.19
37	4.050	34.62	46.00	-11.38
38	3.547	34.58	46.00	-11.42
39	0.618	34.55	46.00	-11.45
40	28.770	38.50	50.00	-11.50
41	29.851	38.39	50.00	-11.61
42	0.862	34.38	46.00	-11.62
43	0.909	34.36	46.00	-11.64
44	0.552	34.33	46.00	-11.67
45	4.114	34.32	46.00	-11.68
46	0.775	34.31	46.00	-11.69
47	0.720	34.22	46.00	-11.78
48	3.945	34.22	46.00	-11.78

** Please See the Average Readings on the Next Page and on the Plot

FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Astrodyne P/S, Model: SPU130-108 (eMux)
eMux with eNode Side - Transceiver Mode
WhiteLead LI-215 12078 6-20-11
TEST ENGINEER : Kyle Fujimoto

3 highest peaks above -50.00 dB of FCC Class B Avg. limit line
Peak criteria : 0.00 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	1.184	42.38	46.00	-3.62
2	1.148	29.91	46.00	-16.09
3	1.210	20.95	46.00	-25.05


9/26/2011 10:54:29
FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Traco Power P/S, Model: TEX 120-124
RFID Reader Side - Transceive Mode
BlackLead LI-215 12078 6-20-11
FCC Class B Q.P.
FCC Class B Avg.
EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30

FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Traco Power P/S, Model: TEX 120-124
RFID Reader Side - Transceive Mode
BlackLead LI-215 12078 6-20-11
TEST ENGINEER : Kyle Fujimoto

48 highest peaks above -50.00 dB of FCC Class B Avg. limit line
Peak criteria : 1.00 dB, Curve : Peak

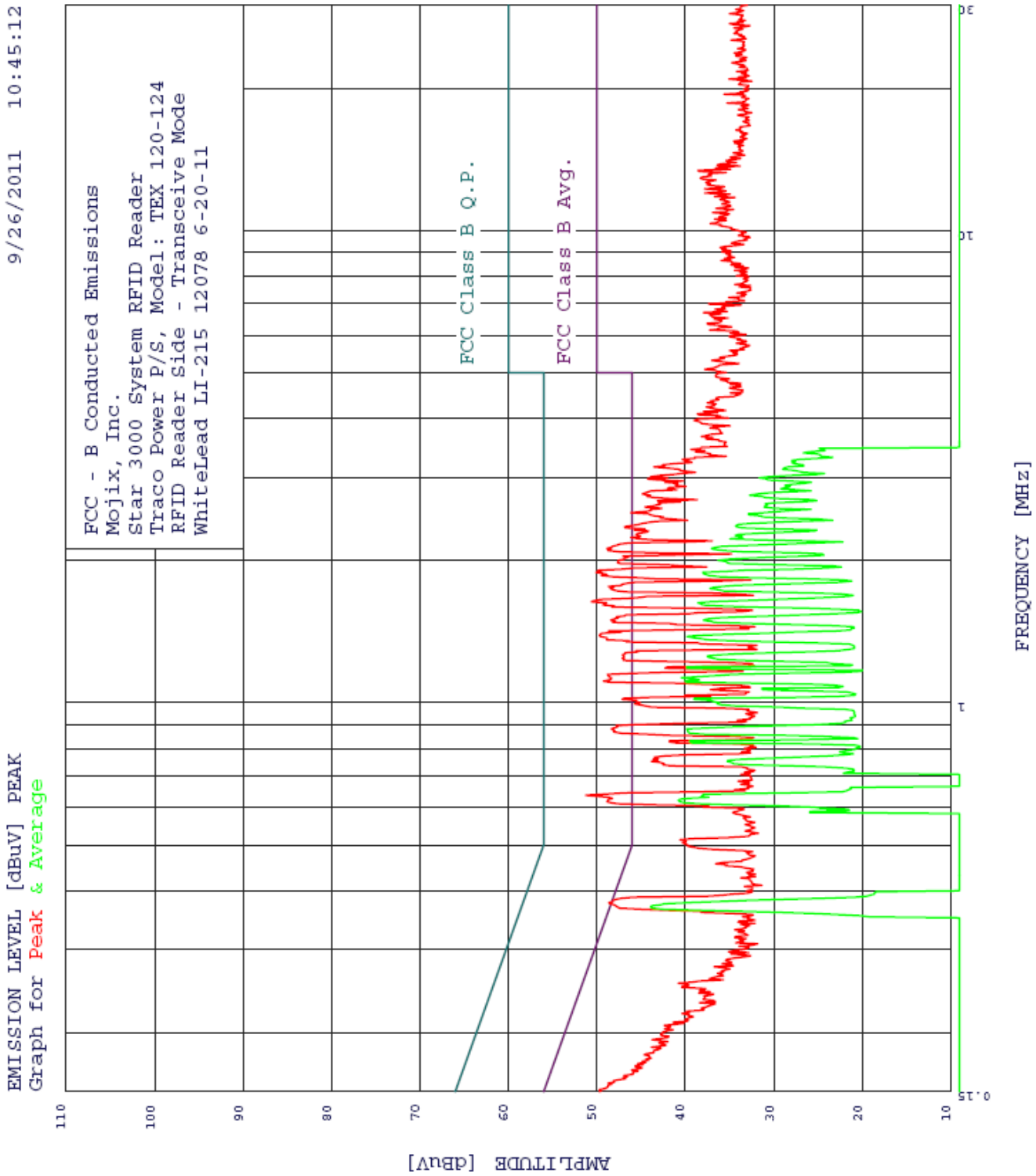
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	1.646	50.30	46.00	4.30**
2	1.106	50.10	46.00	4.10**
3	1.397	50.10	46.00	4.10**
4	1.889	49.80	46.00	3.80**
5	1.148	49.30	46.00	3.30**
6	0.641	49.28	46.00	3.28**
7	1.745	48.60	46.00	2.60**
8	2.100	48.60	46.00	2.60**
9	1.488	48.50	46.00	2.50**
10	0.867	48.33	46.00	2.33**
11	1.781	48.20	46.00	2.20**
12	1.016	48.10	46.00	2.10**
13	1.981	47.80	46.00	1.80**
14	1.236	47.10	46.00	1.10**
15	2.346	47.09	46.00	1.09**
16	2.226	46.59	46.00	0.59**
17	0.375	48.68	48.38	0.30**
18	2.540	46.08	46.00	0.08**
19	2.781	45.87	46.00	-0.13**
20	2.979	45.17	46.00	-0.83**
21	0.755	44.25	46.00	-1.75**
22	2.840	43.47	46.00	-2.53**
23	0.831	43.43	46.00	-2.57**
24	2.916	43.17	46.00	-2.83**
25	1.290	42.60	46.00	-3.40**
26	3.158	42.46	46.00	-3.54**
27	3.192	42.36	46.00	-3.64**
28	1.191	41.60	46.00	-4.40**
29	0.494	41.41	46.09	-4.69**
30	0.513	40.61	46.00	-5.39**
31	3.383	39.75	46.00	-6.25**
32	0.170	47.52	54.94	-7.42
33	1.066	38.00	46.00	-8.00**
34	4.877	37.60	46.00	-8.40
35	3.945	37.54	46.00	-8.46
36	4.071	37.43	46.00	-8.57
37	3.492	36.95	46.00	-9.05
38	3.663	36.84	46.00	-9.16
39	3.585	36.75	46.00	-9.25
40	3.624	36.75	46.00	-9.25
41	3.820	36.64	46.00	-9.36
42	13.129	39.78	50.00	-10.22
43	4.648	35.31	46.00	-10.69
44	0.454	35.30	46.80	-11.50**
45	0.583	34.39	46.00	-11.61**
46	4.504	34.32	46.00	-11.68
47	0.567	34.30	46.00	-11.70**
48	12.656	38.24	50.00	-11.76

** Please See the Average Readings on the Next Page and on the Plot

FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Traco Power P/S, Model: TEX 120-124
RFID Reader Side - Transceive Mode
BlackLead LI-215 12078 6-20-11
TEST ENGINEER : Kyle Fujimoto

48 highest peaks above -50.00 dB of FCC Class B Avg. limit line
Peak criteria : 0.00 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.373	44.15	48.43	-4.28
2	0.627	41.67	46.00	-4.33
3	1.112	40.63	46.00	-5.37
4	0.876	40.10	46.00	-5.90
5	1.184	39.62	46.00	-6.38
6	0.831	39.24	46.00	-6.76
7	1.016	39.16	46.00	-6.84
8	1.124	39.05	46.00	-6.95
9	1.620	38.94	46.00	-7.06
10	1.136	38.90	46.00	-7.10
11	1.382	38.53	46.00	-7.47
12	1.879	38.32	46.00	-7.68
13	1.249	37.71	46.00	-8.29
14	1.488	37.53	46.00	-8.47
15	1.754	37.22	46.00	-8.78
16	2.134	37.16	46.00	-8.84
17	2.111	36.75	46.00	-9.25
18	1.000	36.66	46.00	-9.34
19	1.992	35.91	46.00	-10.09
20	0.751	35.34	46.00	-10.66
21	2.371	34.39	46.00	-11.61
22	2.250	34.37	46.00	-11.63
23	2.214	33.09	46.00	-12.91
24	0.500	33.07	46.01	-12.94
25	2.514	32.81	46.00	-13.19
26	2.736	32.45	46.00	-13.55
27	2.624	31.71	46.00	-14.29
28	2.596	31.68	46.00	-14.32
29	2.995	31.50	46.00	-14.50
30	2.963	31.23	46.00	-14.77
31	2.475	31.21	46.00	-14.79
32	2.707	31.12	46.00	-14.88
33	1.066	31.10	46.00	-14.90
34	3.141	29.81	46.00	-16.19
35	2.855	29.42	46.00	-16.58
36	3.209	28.79	46.00	-17.21
37	3.260	28.42	46.00	-17.58
38	0.457	28.08	46.76	-18.67
39	3.383	27.15	46.00	-18.85
40	0.583	25.73	46.00	-20.27
41	3.456	25.10	46.00	-20.90
42	0.788	22.38	46.00	-23.62
43	0.564	22.27	46.00	-23.73
44	0.709	21.88	46.00	-24.12
45	0.686	21.24	46.00	-24.76
46	0.924	21.20	46.00	-24.80
47	0.948	21.19	46.00	-24.81
48	0.552	21.18	46.00	-24.82


9/26/2011 10:45:12
FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Traco Power P/S, Model: TEX 120-124
RFID Reader Side - Transceive Mode
WhiteLead LI-215 12078 6-20-11
FCC Class B Q.P.
FCC Class B Avg.
EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
30

FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Traco Power P/S, Model: TEX 120-124
RFID Reader Side - Transceive Mode
WhiteLead LI-215 12078 6-20-11
TEST ENGINEER : Kyle Fujimoto

48 highest peaks above -50.00 dB of FCC Class B Avg. limit line
Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.637	51.24	46.00	5.24**
2	1.637	50.60	46.00	4.60**
3	1.889	50.07	46.00	4.07**
4	1.389	49.70	46.00	3.70**
5	1.112	49.26	46.00	3.26**
6	2.123	48.86	46.00	2.86**
7	1.419	48.70	46.00	2.70**
8	1.763	48.68	46.00	2.68**
9	1.496	48.41	46.00	2.41**
10	0.881	48.37	46.00	2.37**
11	1.981	47.66	46.00	1.66**
12	1.016	47.13	46.00	1.13**
13	1.262	47.09	46.00	1.09**
14	2.358	46.86	46.00	0.86**
15	0.377	48.62	48.34	0.29**
16	2.238	46.16	46.00	0.16**
17	2.527	46.15	46.00	0.15**
18	2.322	45.76	46.00	-0.24**
19	2.766	44.84	46.00	-1.16**
20	2.596	44.55	46.00	-1.45**
21	2.979	44.23	46.00	-1.77**
22	3.011	43.93	46.00	-2.07**
23	0.751	43.81	46.00	-2.19**
24	3.158	43.54	46.00	-2.46**
25	2.679	43.14	46.00	-2.86**
26	2.932	42.33	46.00	-3.67**
27	1.184	42.28	46.00	-3.72**
28	2.840	42.04	46.00	-3.96**
29	0.826	41.79	46.00	-4.21**
30	0.513	40.61	46.00	-5.39
31	3.277	40.35	46.00	-5.65**
32	1.038	40.04	46.00	-5.96**
33	3.438	39.37	46.00	-6.63**
34	3.966	39.02	46.00	-6.98
35	3.401	38.87	46.00	-7.13**
36	4.092	38.62	46.00	-7.38
37	3.663	38.19	46.00	-7.81
38	4.137	37.92	46.00	-8.08
39	4.227	37.62	46.00	-8.38
40	3.820	37.21	46.00	-8.79
41	1.066	37.15	46.00	-8.85**
42	4.928	36.59	46.00	-9.41
43	4.825	36.00	46.00	-10.00
44	0.194	43.76	53.88	-10.13
45	0.457	36.57	46.76	-10.19
46	0.186	43.86	54.19	-10.34
47	0.255	40.79	51.60	-10.81
48	0.207	42.36	53.31	-10.95

** Please See the Average Readings on the Next Page and on the Plot

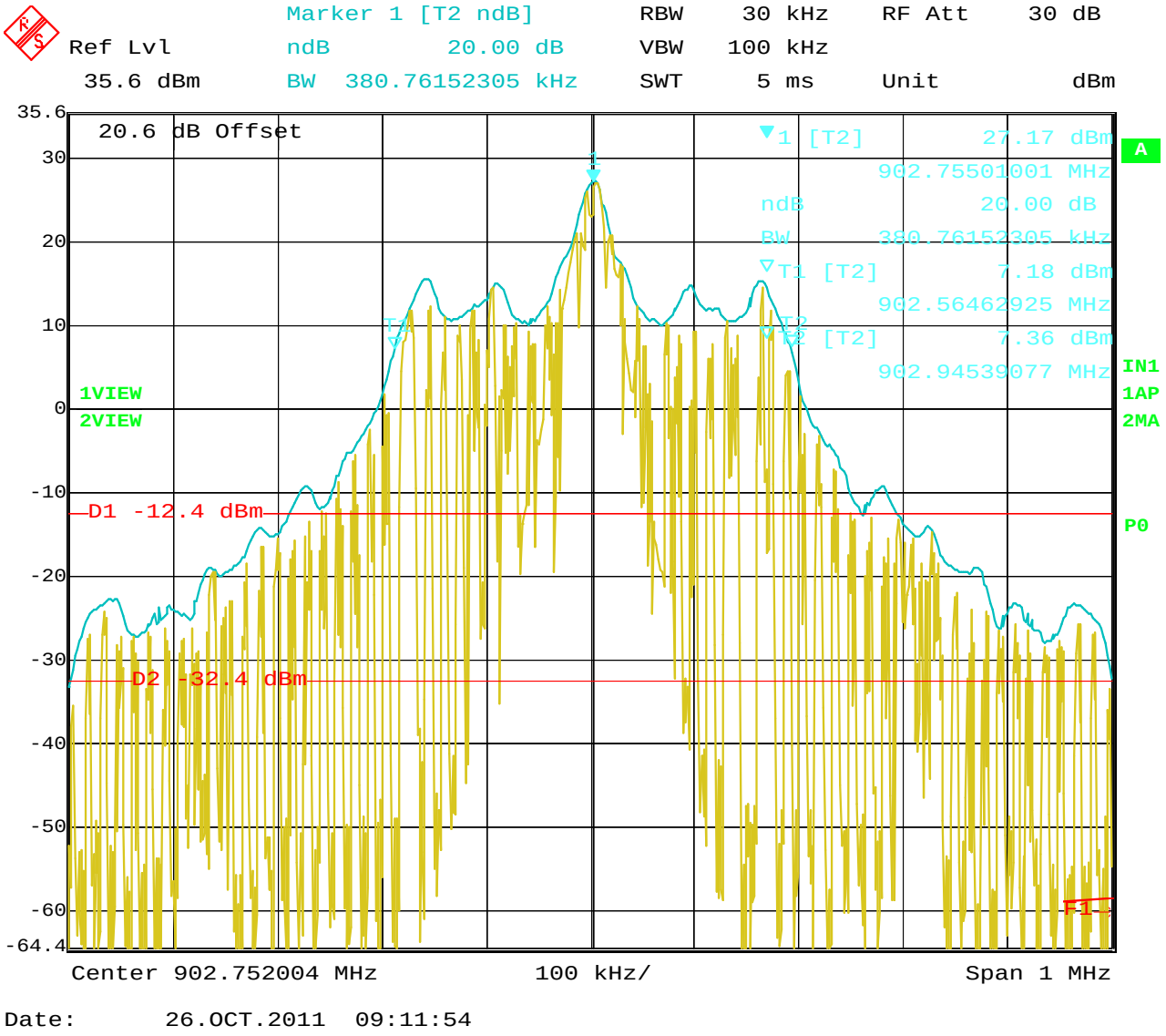
FCC - B Conducted Emissions
Mojix, Inc.
Star 3000 System RFID Reader
Traco Power P/S, Model: TEX 120-124
RFID Reader Side - Transceive Mode
WhiteLead LI-215 12078 6-20-11
TEST ENGINEER : Kyle Fujimoto

45 highest peaks above -50.00 dB of FCC Class B Avg. limit line
Peak criteria : 0.00 dB, Curve : Average

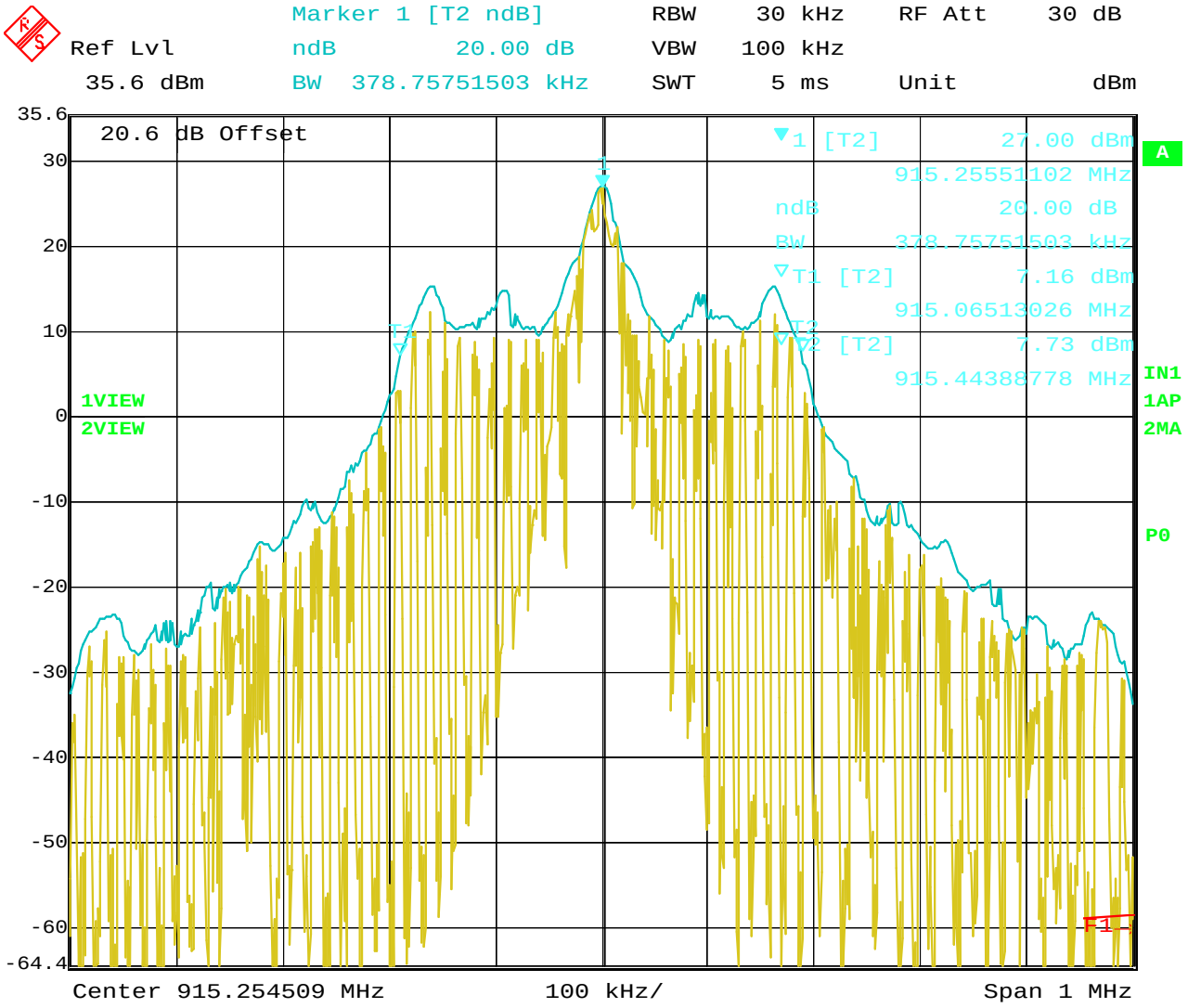
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.369	43.90	48.52	-4.61
2	0.621	40.78	46.00	-5.22
3	1.130	40.45	46.00	-5.55
4	1.112	40.00	46.00	-6.00
5	0.881	39.85	46.00	-6.15
6	1.191	39.83	46.00	-6.17
7	1.382	39.82	46.00	-6.18
8	0.867	39.69	46.00	-6.31
9	0.826	39.49	46.00	-6.51
10	1.016	39.01	46.00	-6.99
11	1.629	38.56	46.00	-7.44
12	0.634	38.17	46.00	-7.83
13	1.889	38.00	46.00	-8.00
14	1.496	37.94	46.00	-8.06
15	1.256	37.50	46.00	-8.50
16	1.745	37.23	46.00	-8.77
17	2.123	37.04	46.00	-8.96
18	0.995	36.38	46.00	-9.62
19	2.002	36.27	46.00	-9.73
20	0.751	35.22	46.00	-10.78
21	2.226	34.93	46.00	-11.07
22	2.262	34.34	46.00	-11.66
23	2.371	34.30	46.00	-11.70
24	2.514	32.88	46.00	-13.12
25	2.751	32.74	46.00	-13.26
26	2.995	31.60	46.00	-14.40
27	1.072	31.37	46.00	-14.63
28	2.596	31.07	46.00	-14.93
29	2.637	31.00	46.00	-15.00
30	2.840	29.21	46.00	-16.79
31	3.124	28.97	46.00	-17.03
32	2.885	28.72	46.00	-17.28
33	3.260	27.96	46.00	-18.04
34	3.226	27.96	46.00	-18.04
35	3.383	26.66	46.00	-19.34
36	0.586	25.93	46.00	-20.07
37	3.456	24.88	46.00	-21.12
38	0.788	22.54	46.00	-23.46
39	0.709	22.14	46.00	-23.86
40	0.914	21.98	46.00	-24.02
41	0.929	21.33	46.00	-24.67
42	0.662	21.32	46.00	-24.68
43	1.434	21.28	46.00	-24.72
44	0.948	20.94	46.00	-25.06
45	0.396	18.61	47.95	-29.33

-20 dB BANDWIDTH

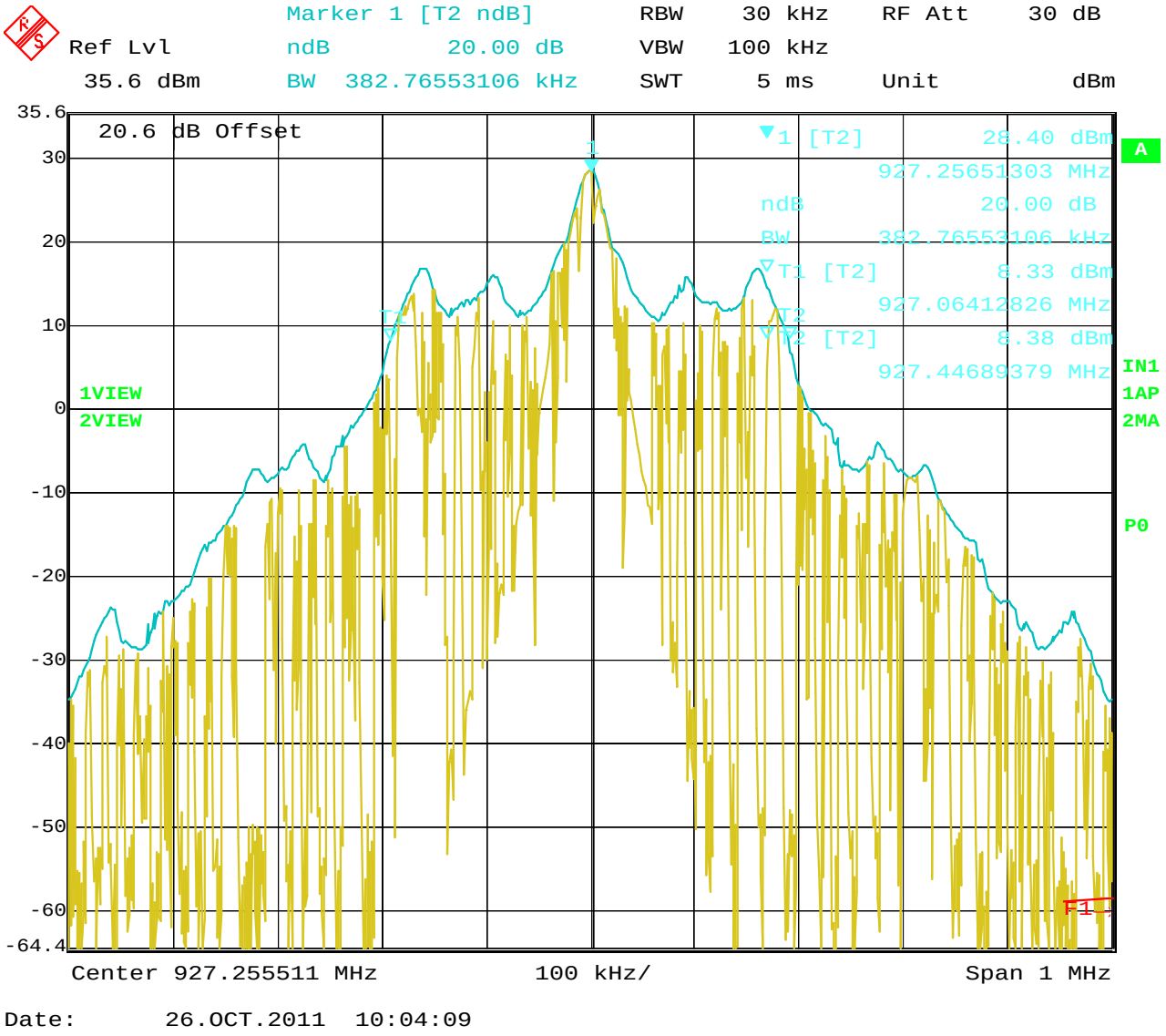
DATA SHEETS



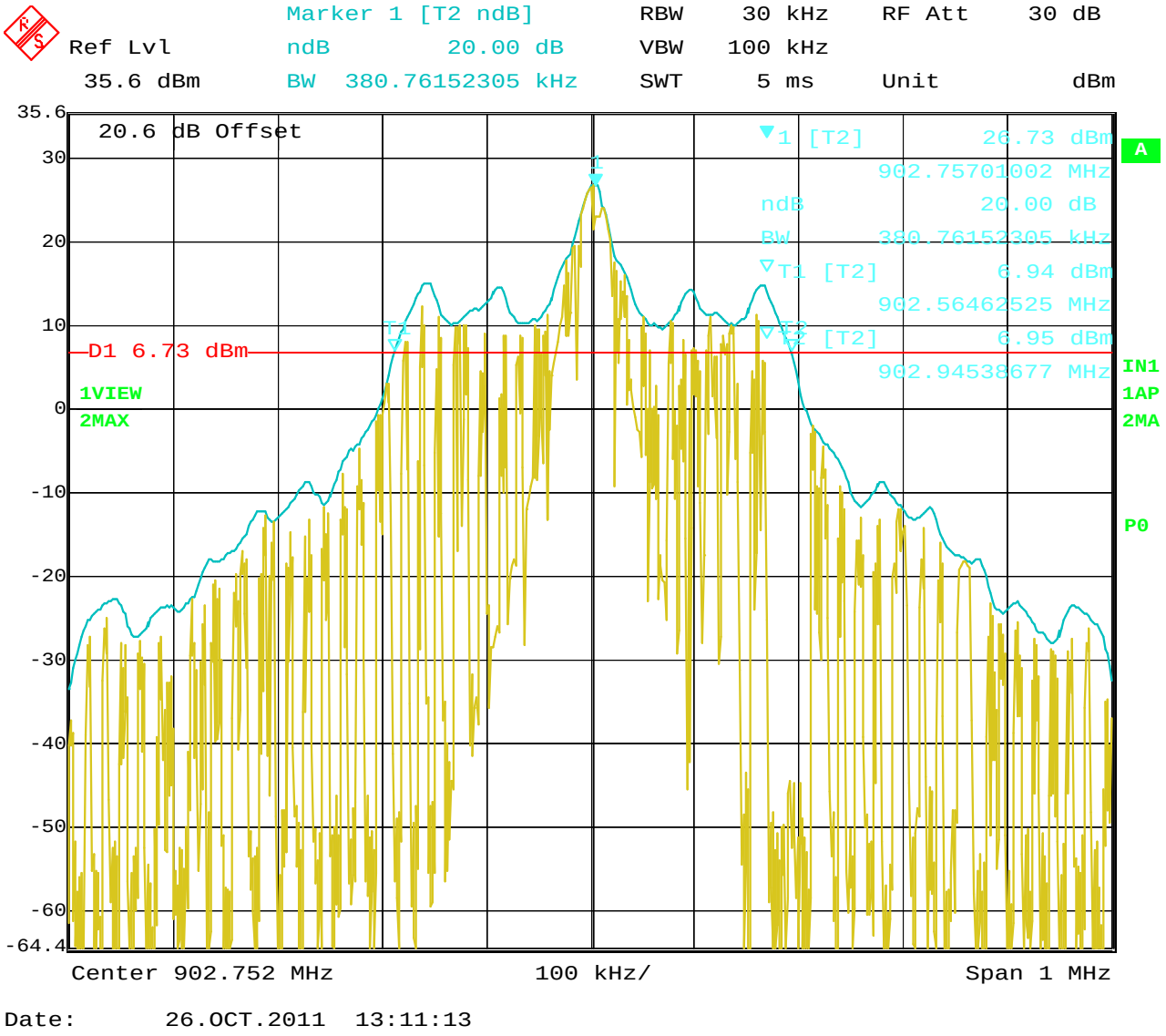
20 dB Bandwidth of Fundamental – Low Channel – eNode Only



20 dB Bandwidth of Fundamental – Middle Channel – eNode Only

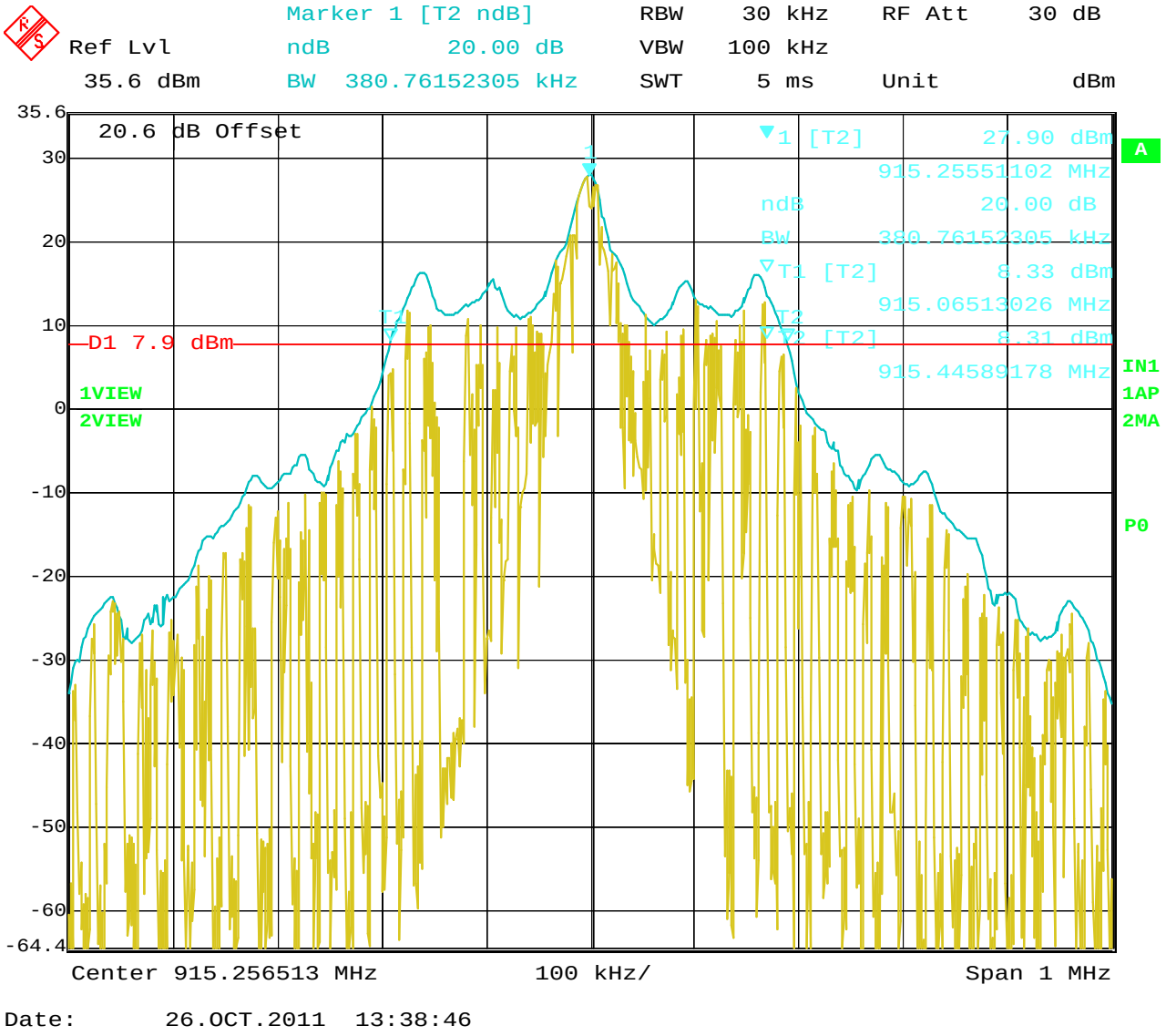


20 dB Bandwidth of Fundamental – High Channel – eNode Only

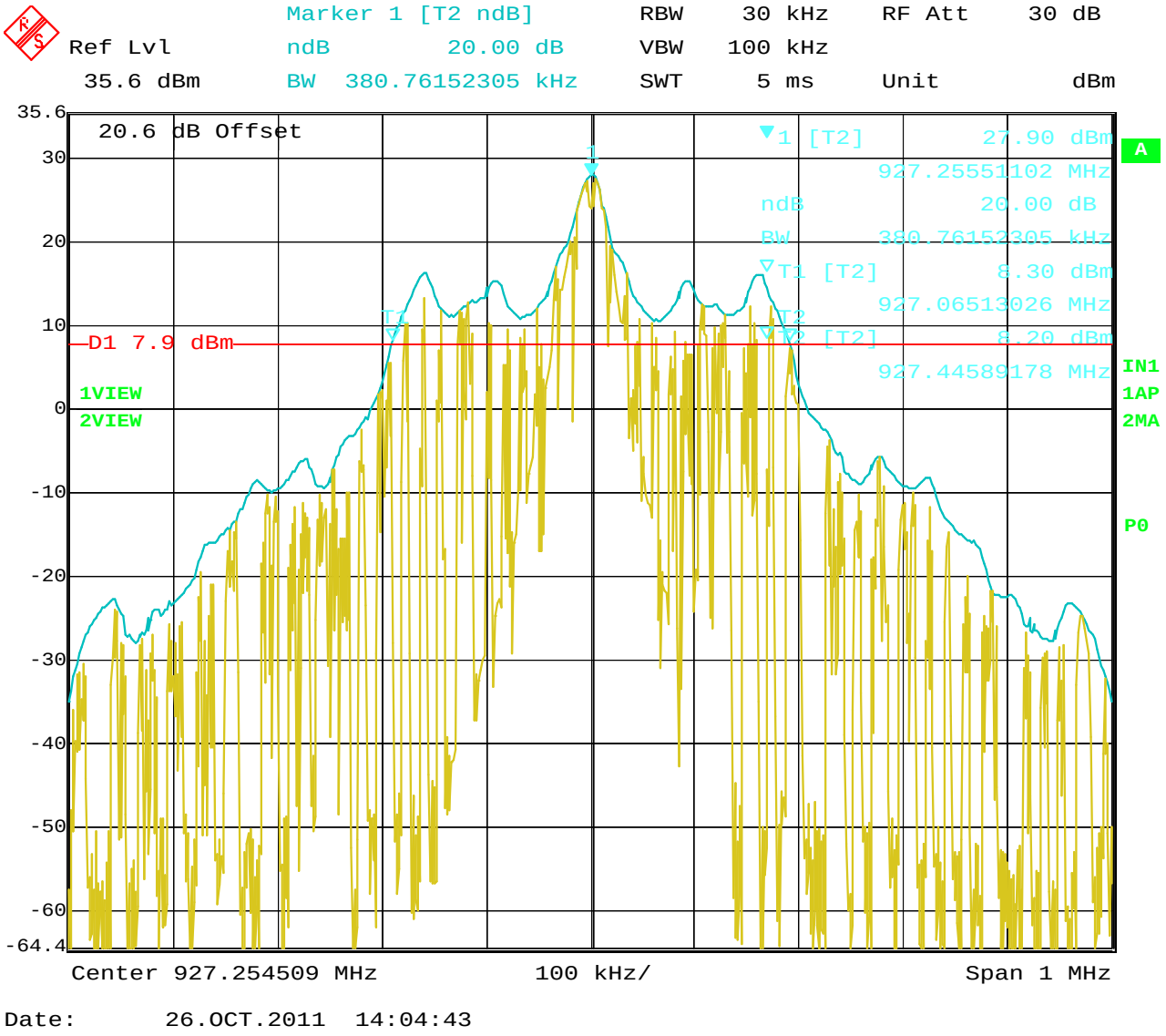


2

20 dB Bandwidth of Fundamental – Low Channel – eNode with eMux



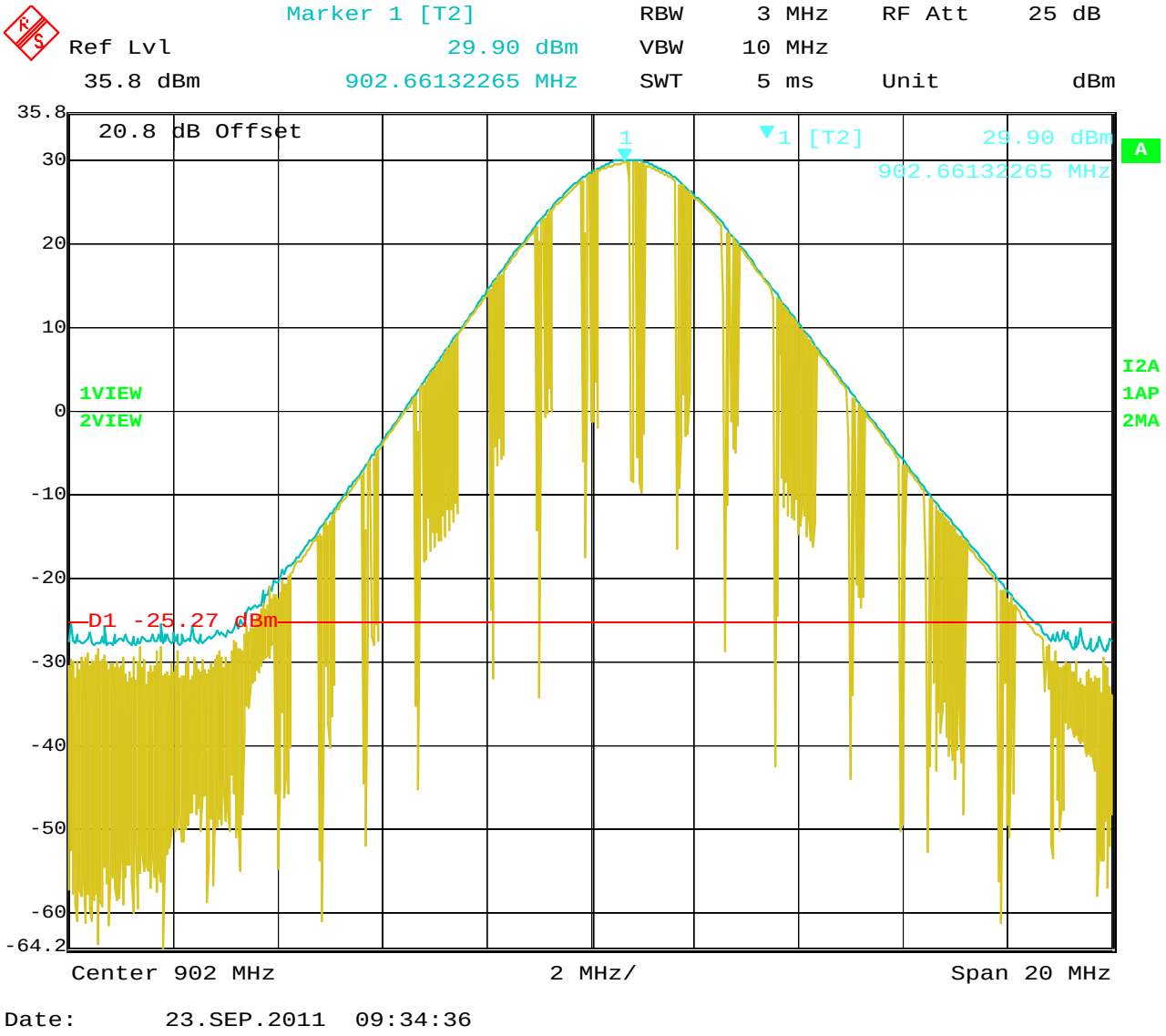
20 dB Bandwidth of Fundamental – Middle Channel – eNode with eMux



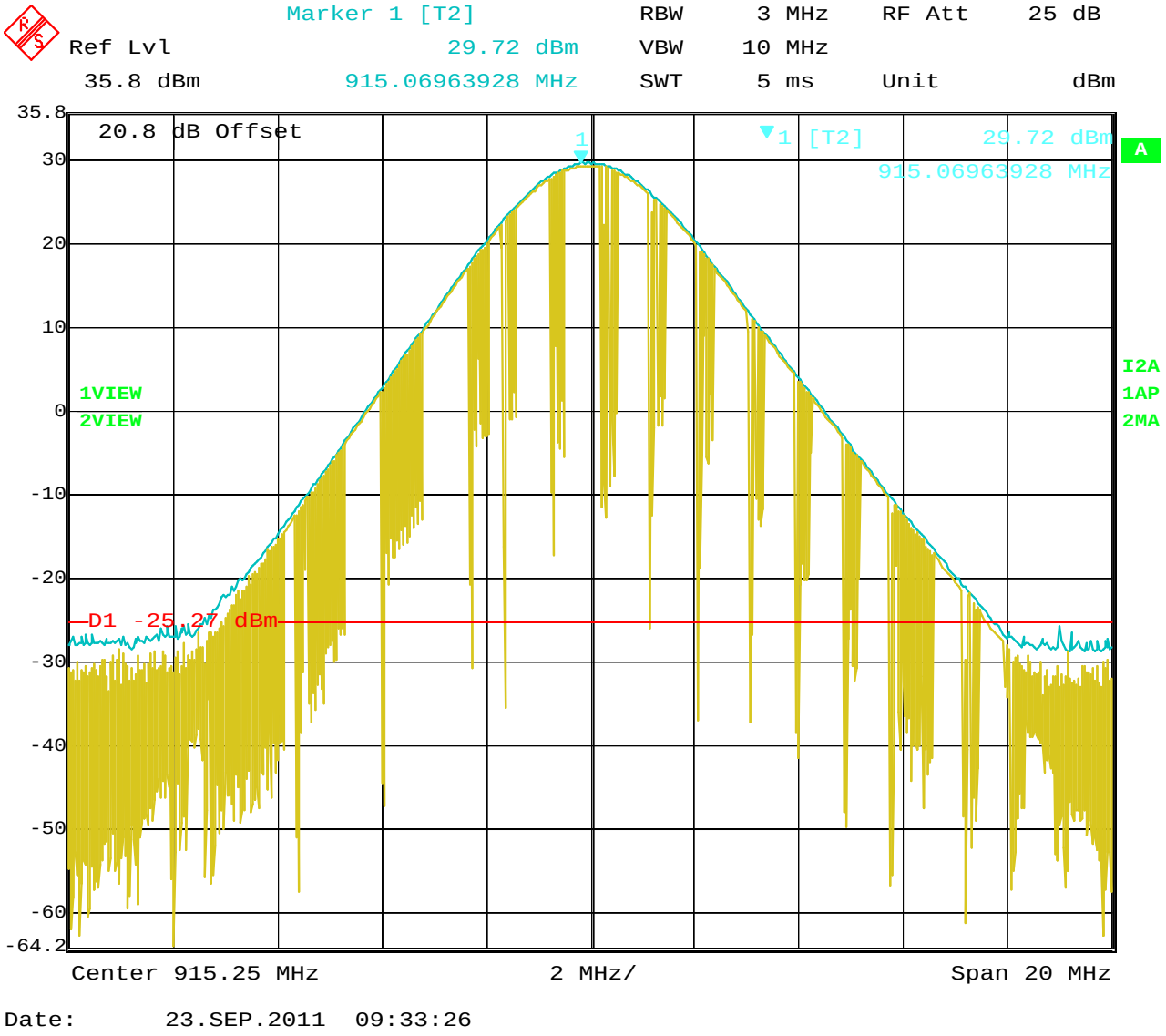
20 dB Bandwidth of Fundamental – High Channel – eNode with eMux

PEAK POWER

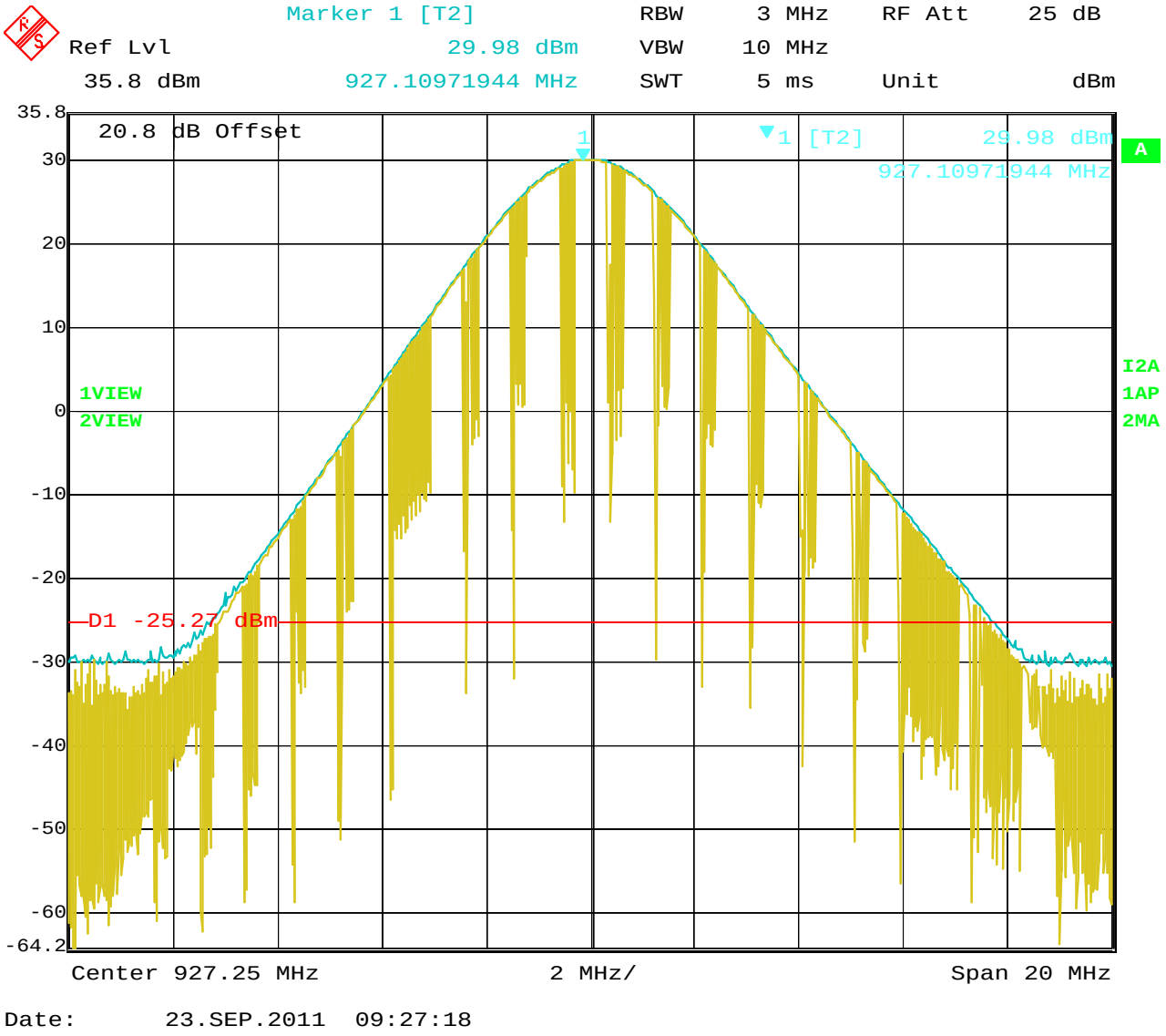
DATA SHEETS



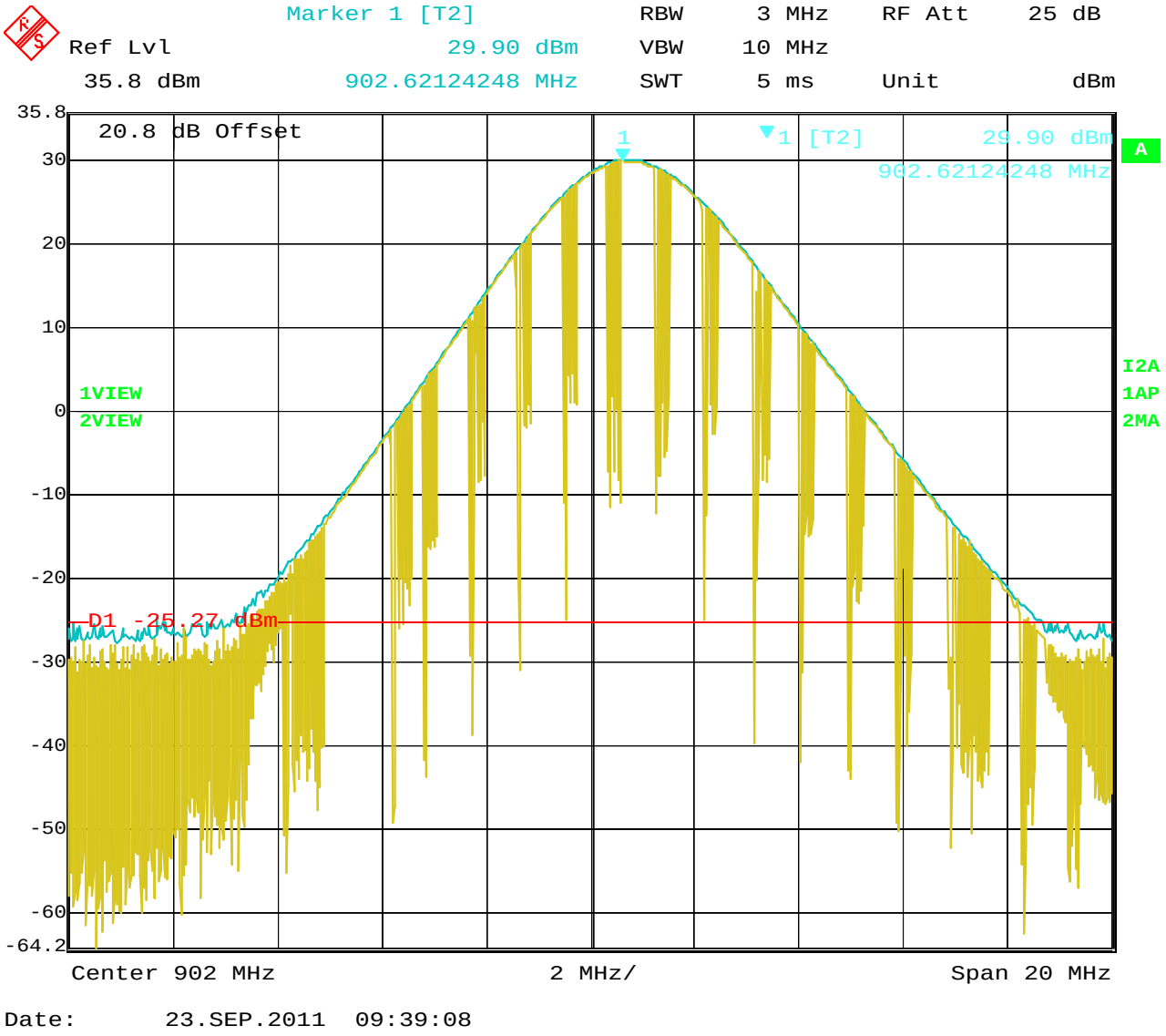
Peak Power Output – Low Channel – Antenna Port #2 – Worst Case – eNode Only



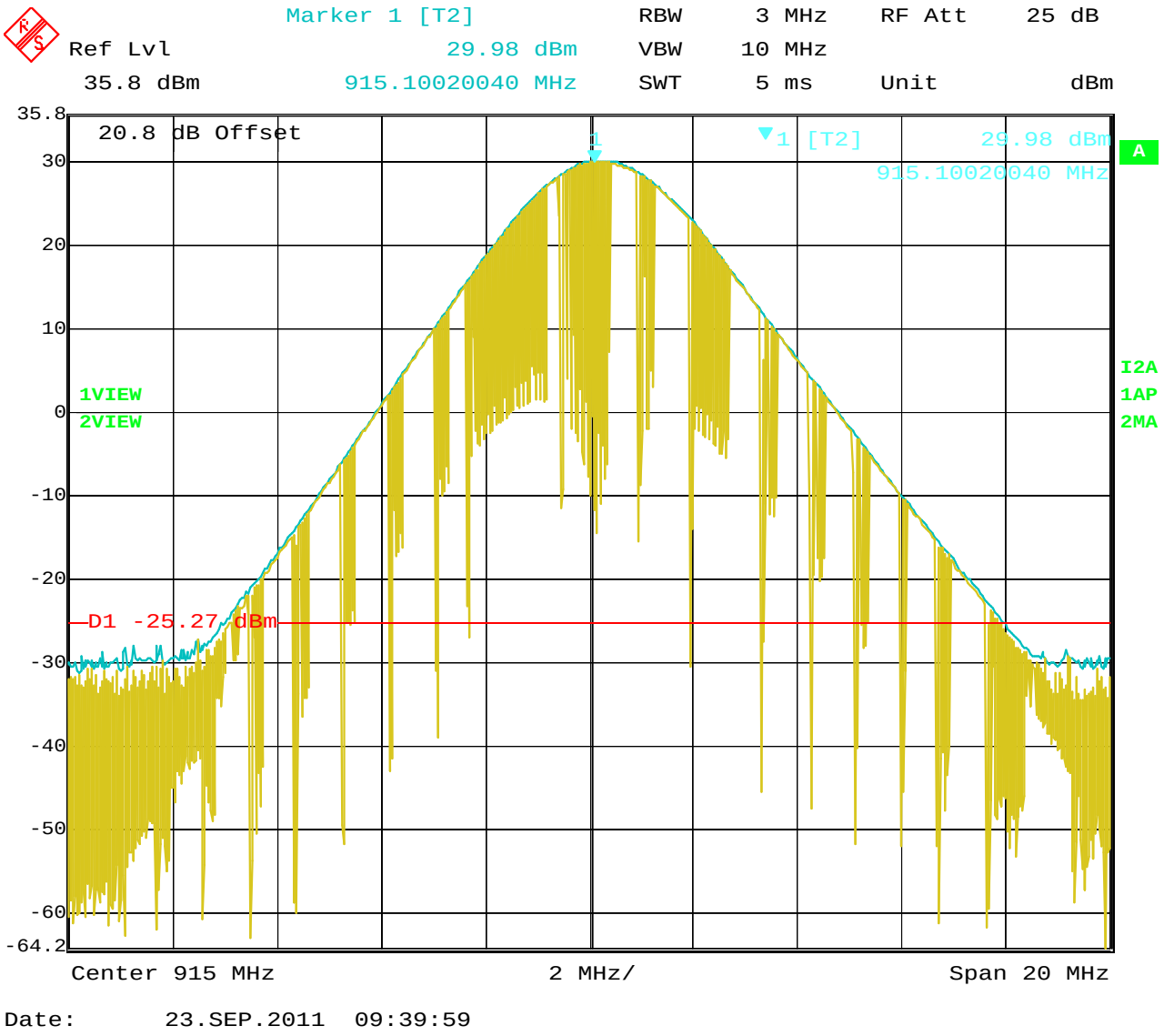
Peak Power Output – Middle Channel – Antenna Port #2 – Worst Case – eNode Only



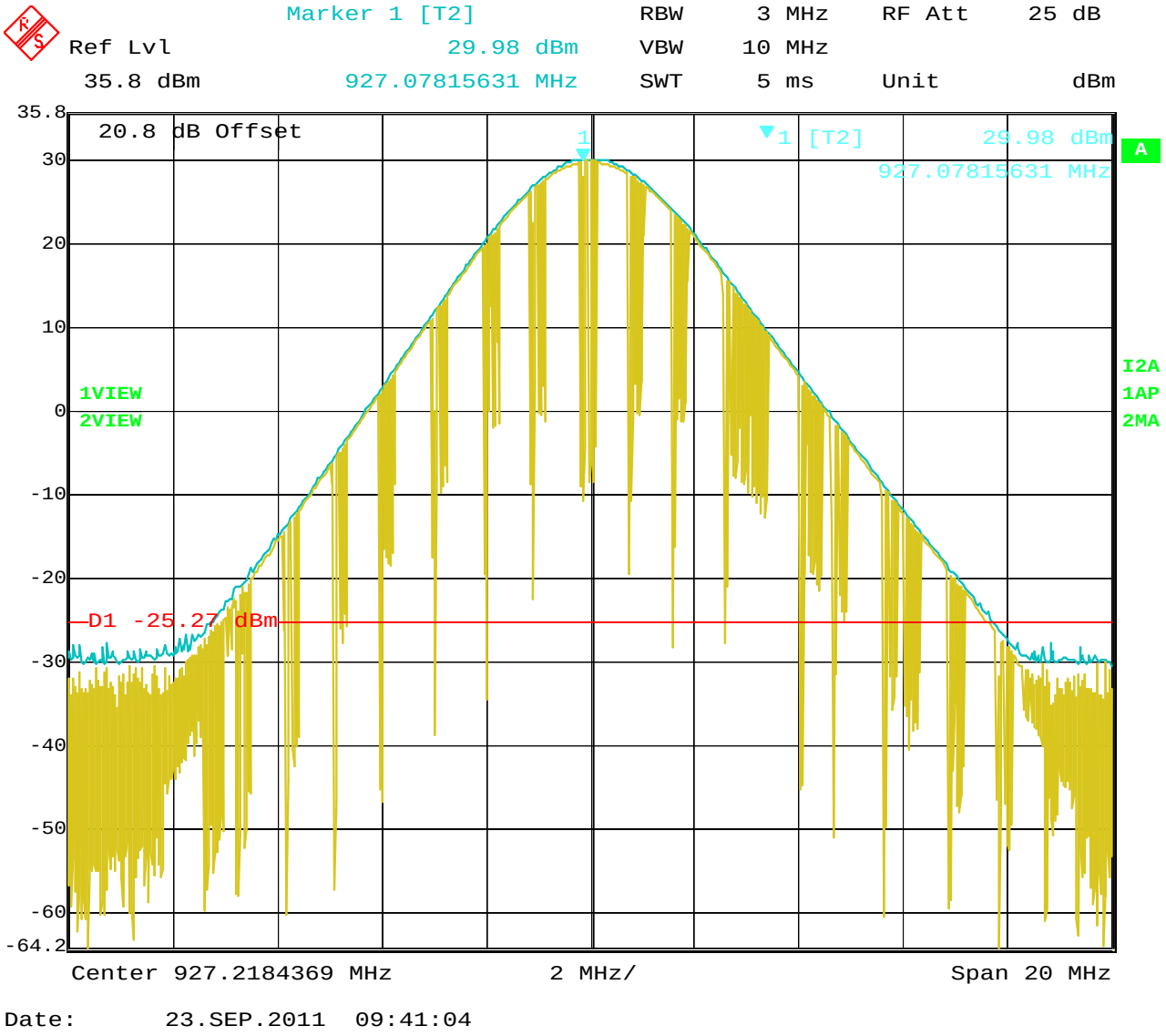
Peak Power Output – High Channel – Antenna Port #2 – Worst Case – eNode Only



Peak Power Output – Low Channel – Antenna Port #2 – Worst Case – eNode with eMux



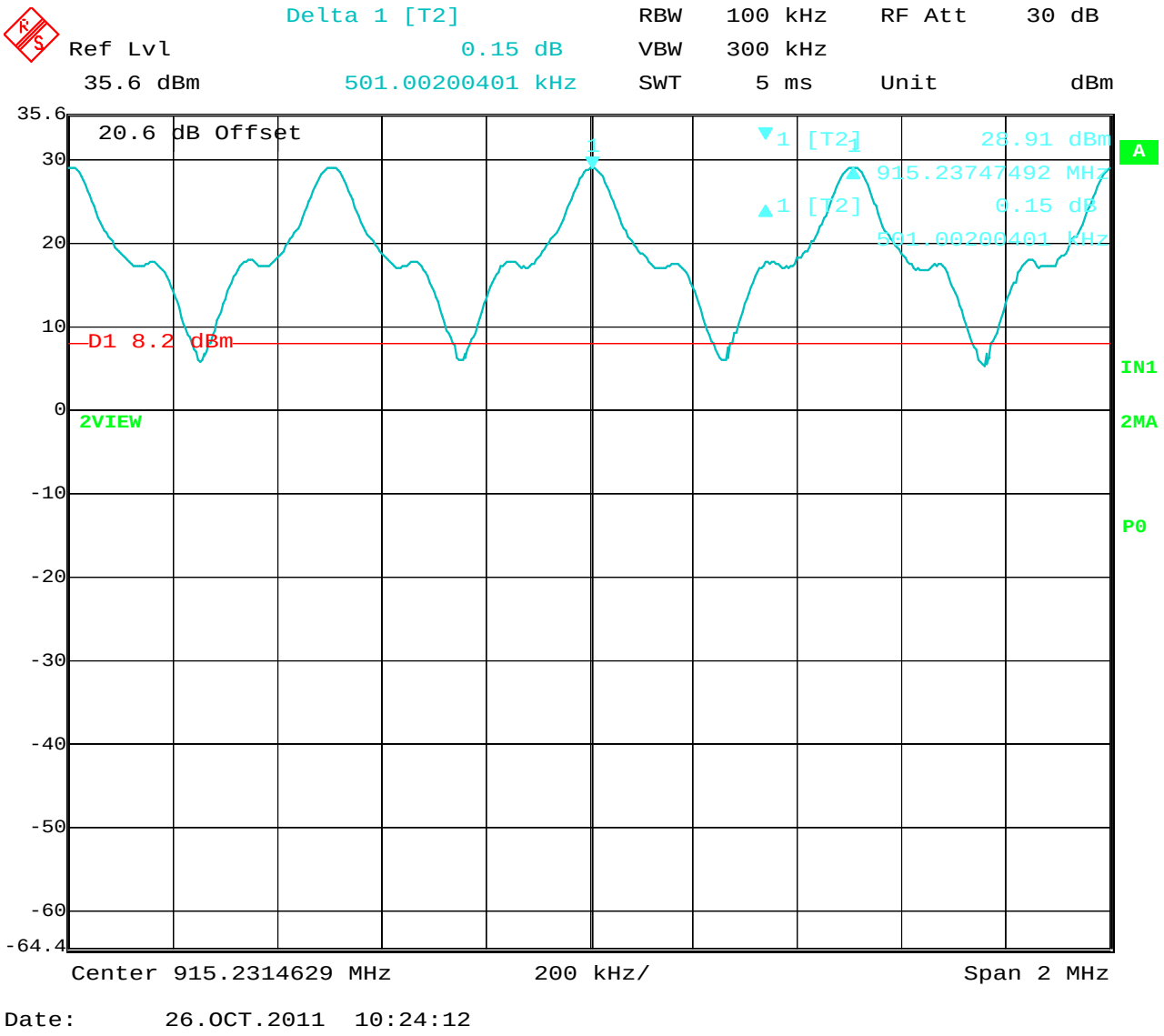
Peak Power Output – Middle Channel – Antenna Port #2 – Worst Case – eNode with eMux



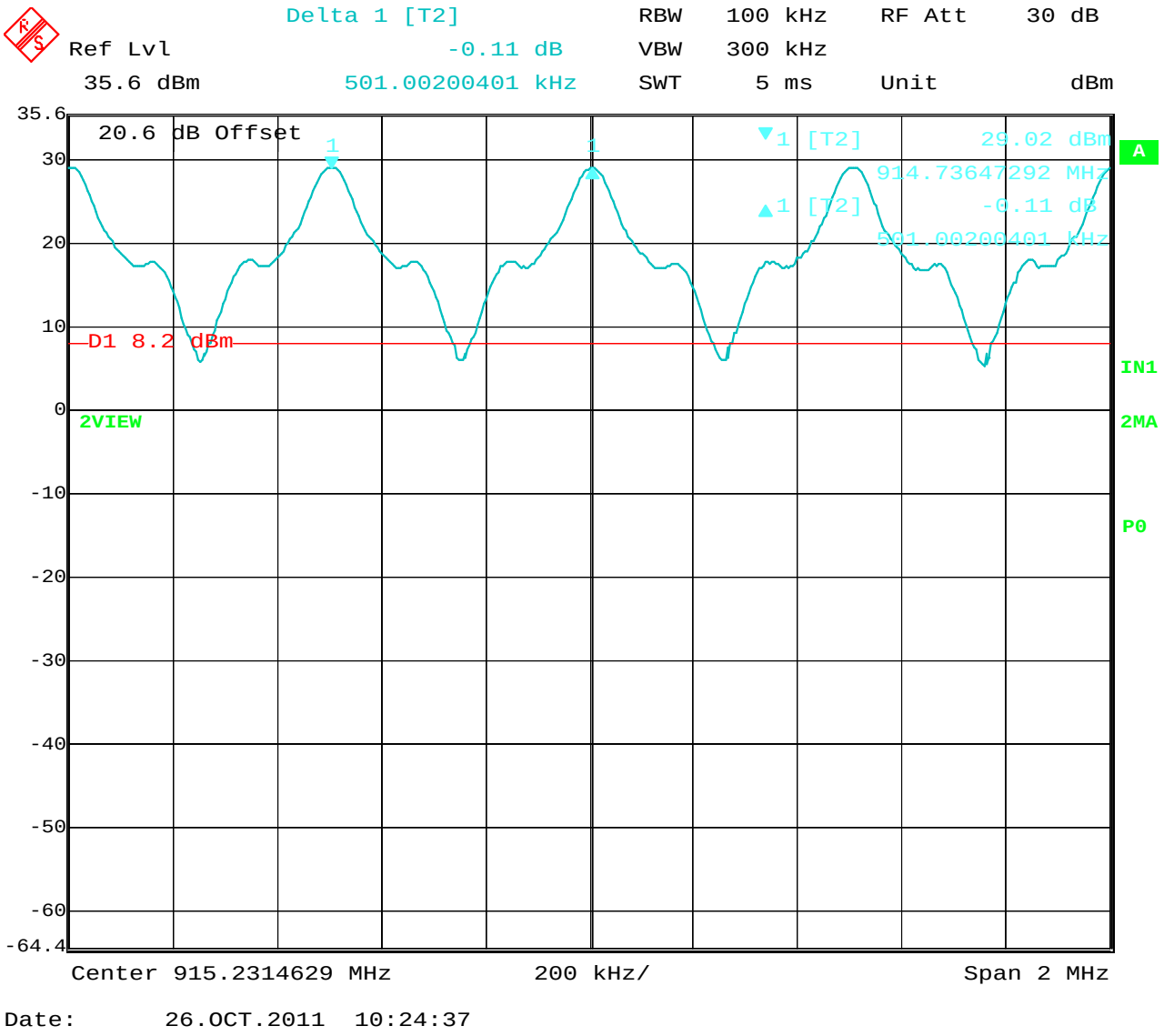
Peak Power Output – High Channel – Antenna Port #2 – Worst Case – eNode with eMux

CHANNEL SEPARATION TEST

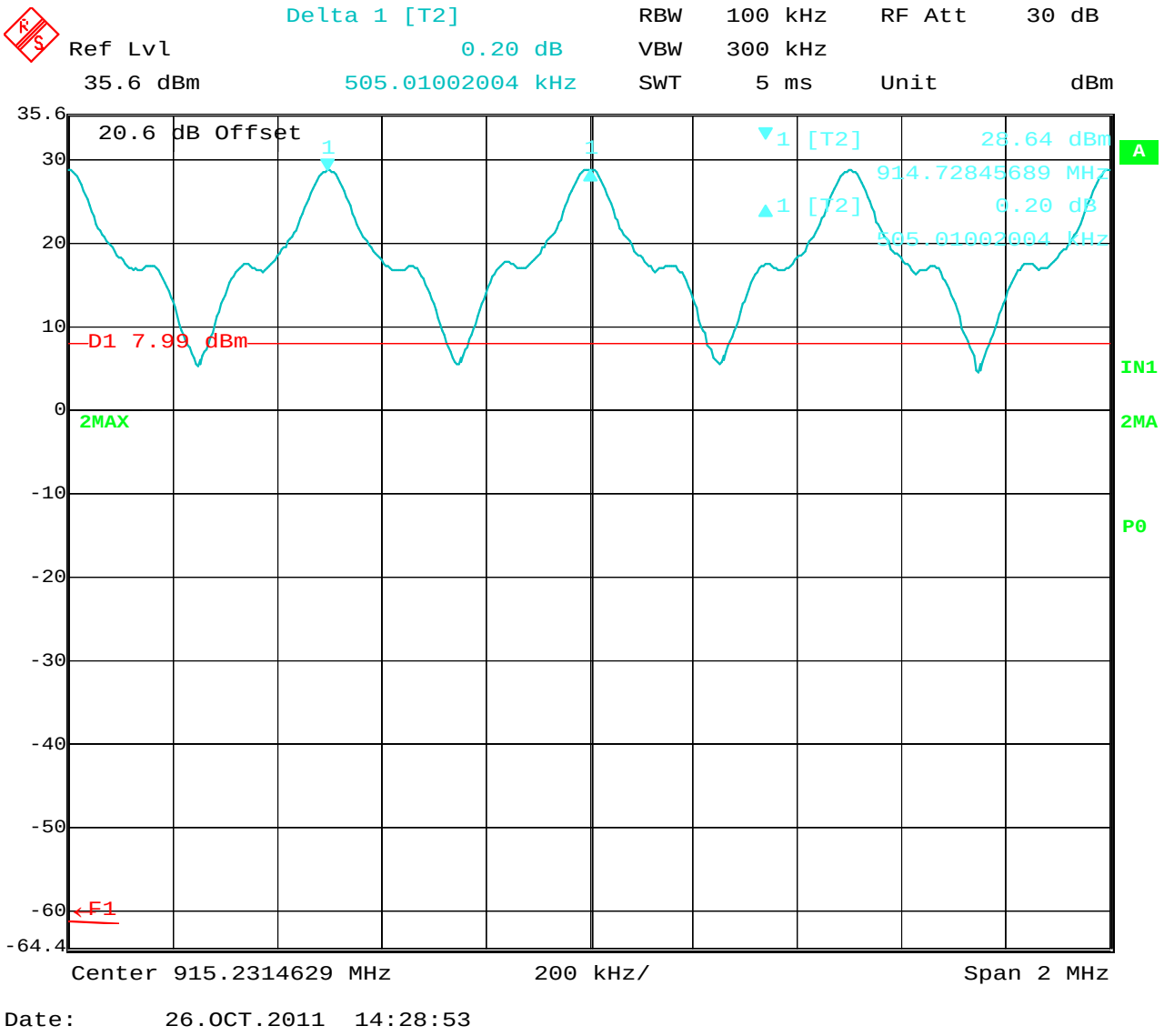
DATA SHEET



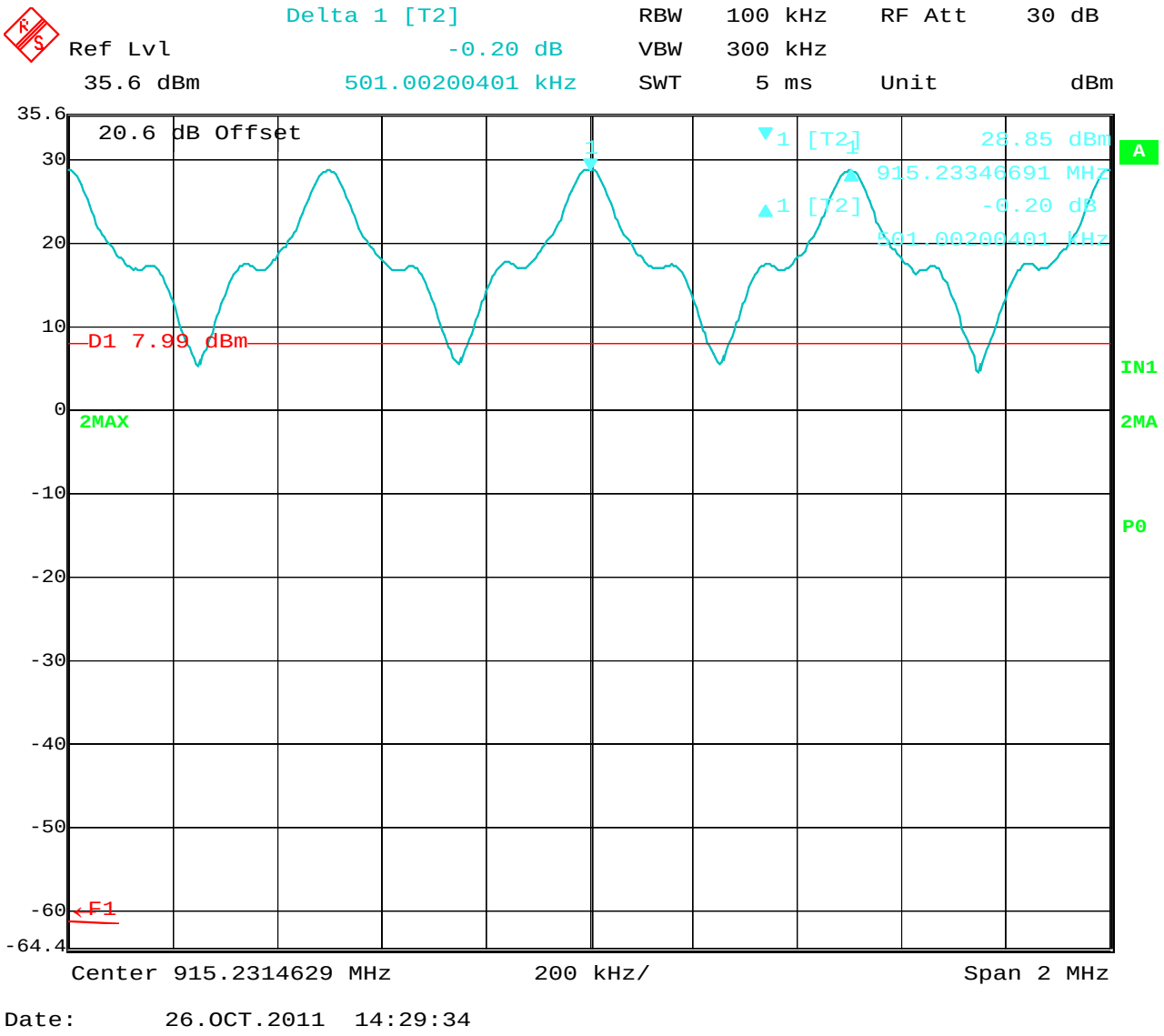
Channel Frequency Separation Test – Plot #1 – eNode Only



Channel Frequency Separation Test – Plot #2 – eNode Only



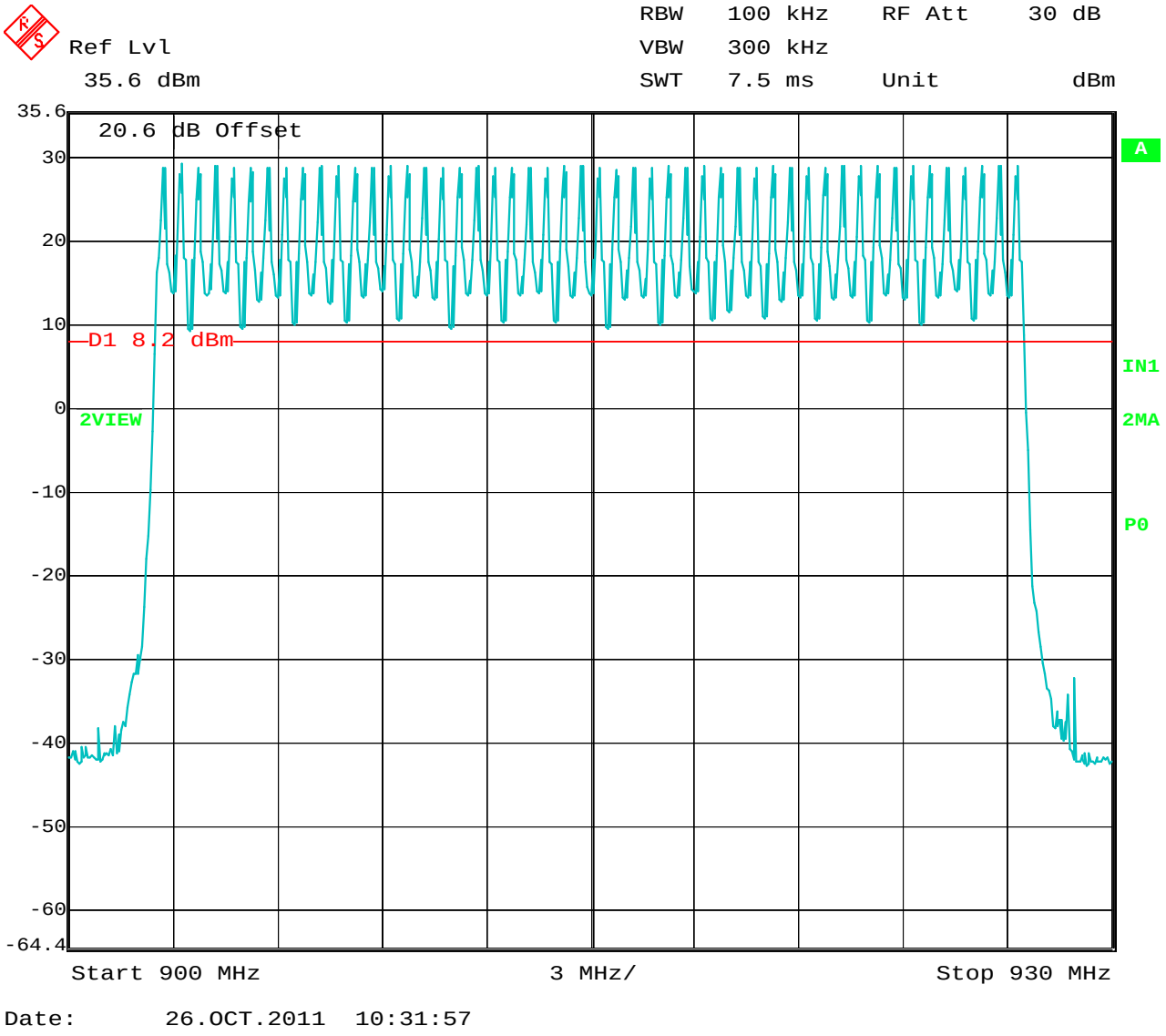
Channel Frequency Separation Test – Plot #1 – eNode with eMux



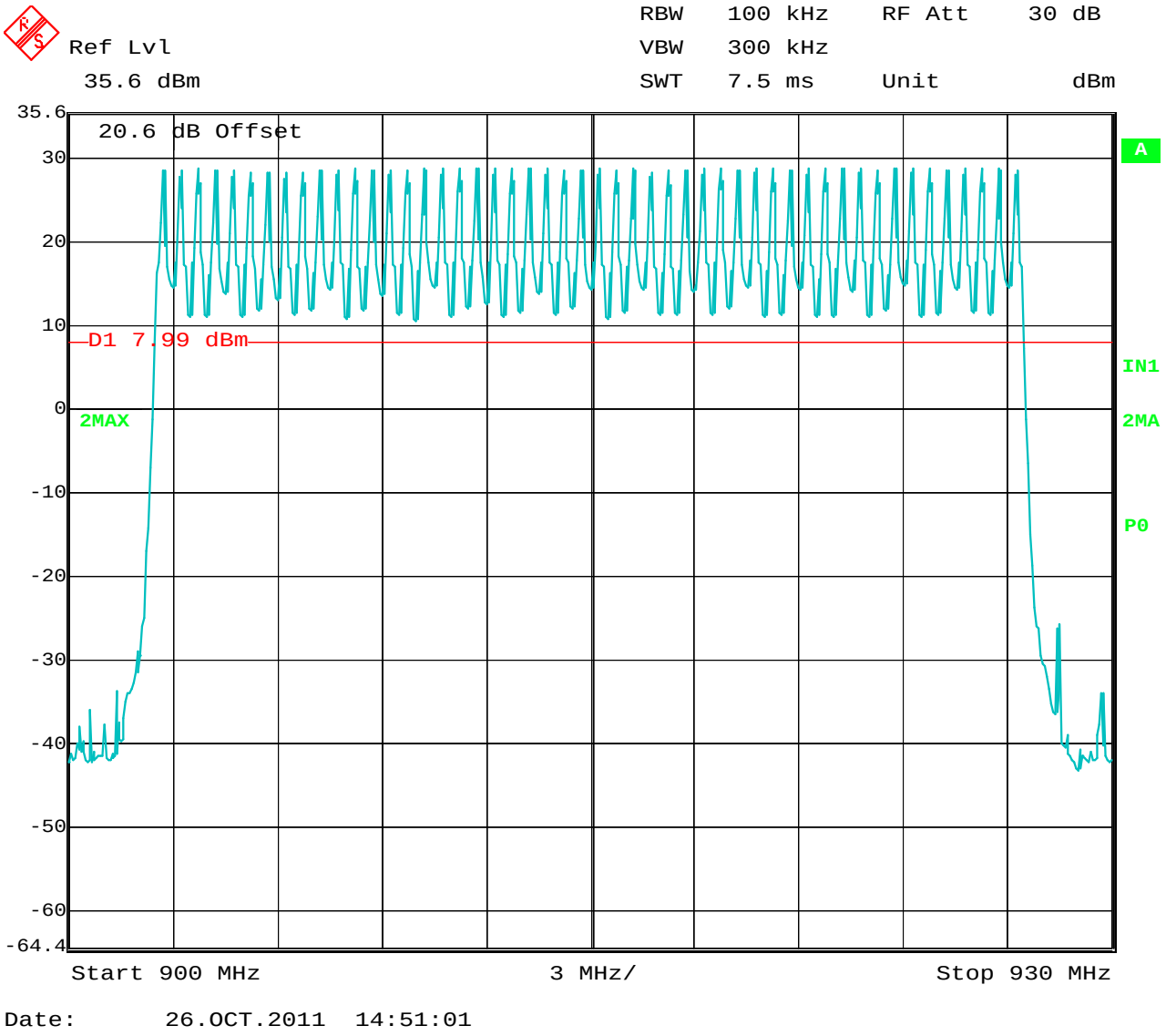
Channel Frequency Separation Test – Plot #2 – eNode with eMux

NUMBER OF FREQUENCIES

DATA SHEETS



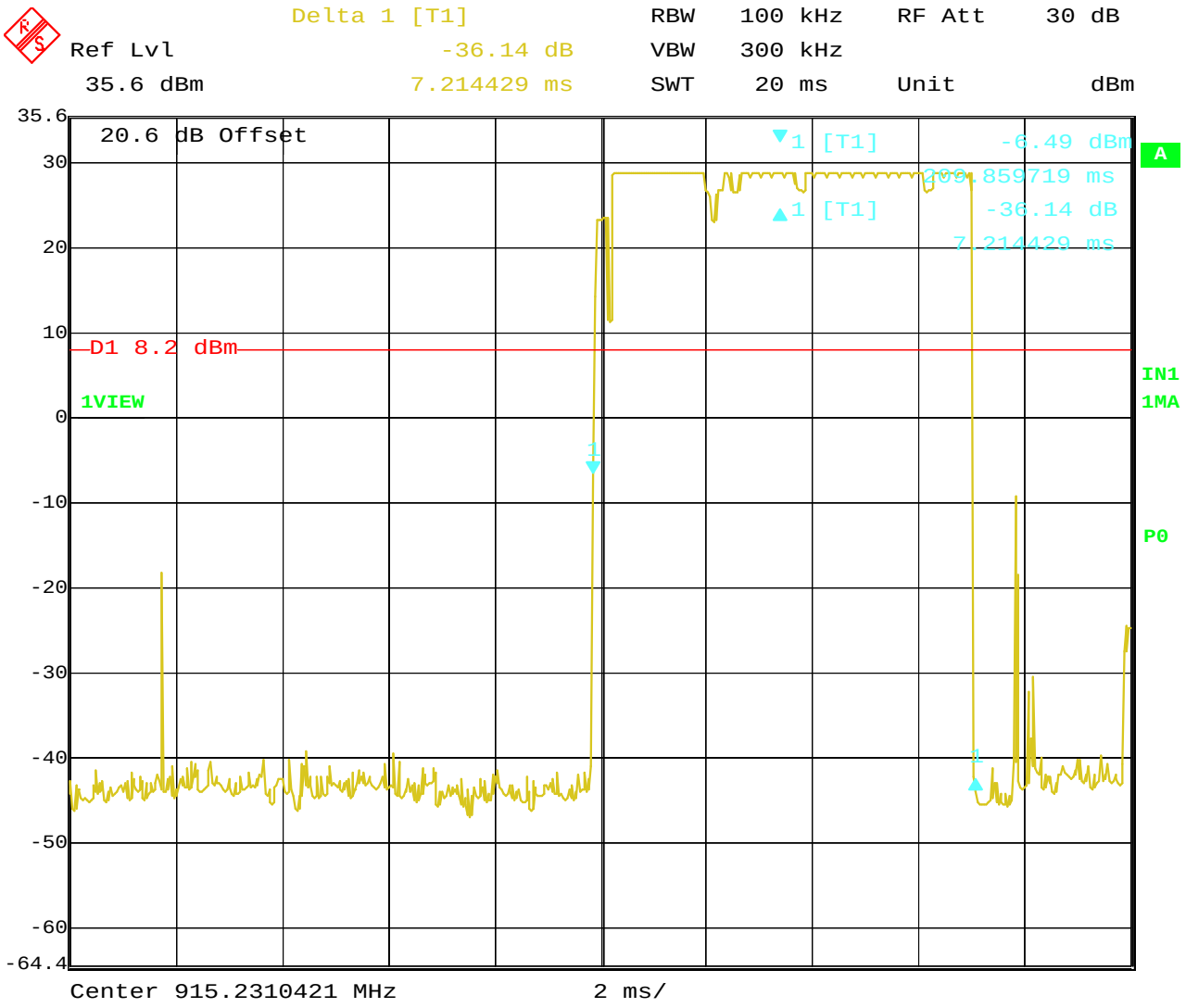
Number of Frequencies (50 Total) – eNode Only



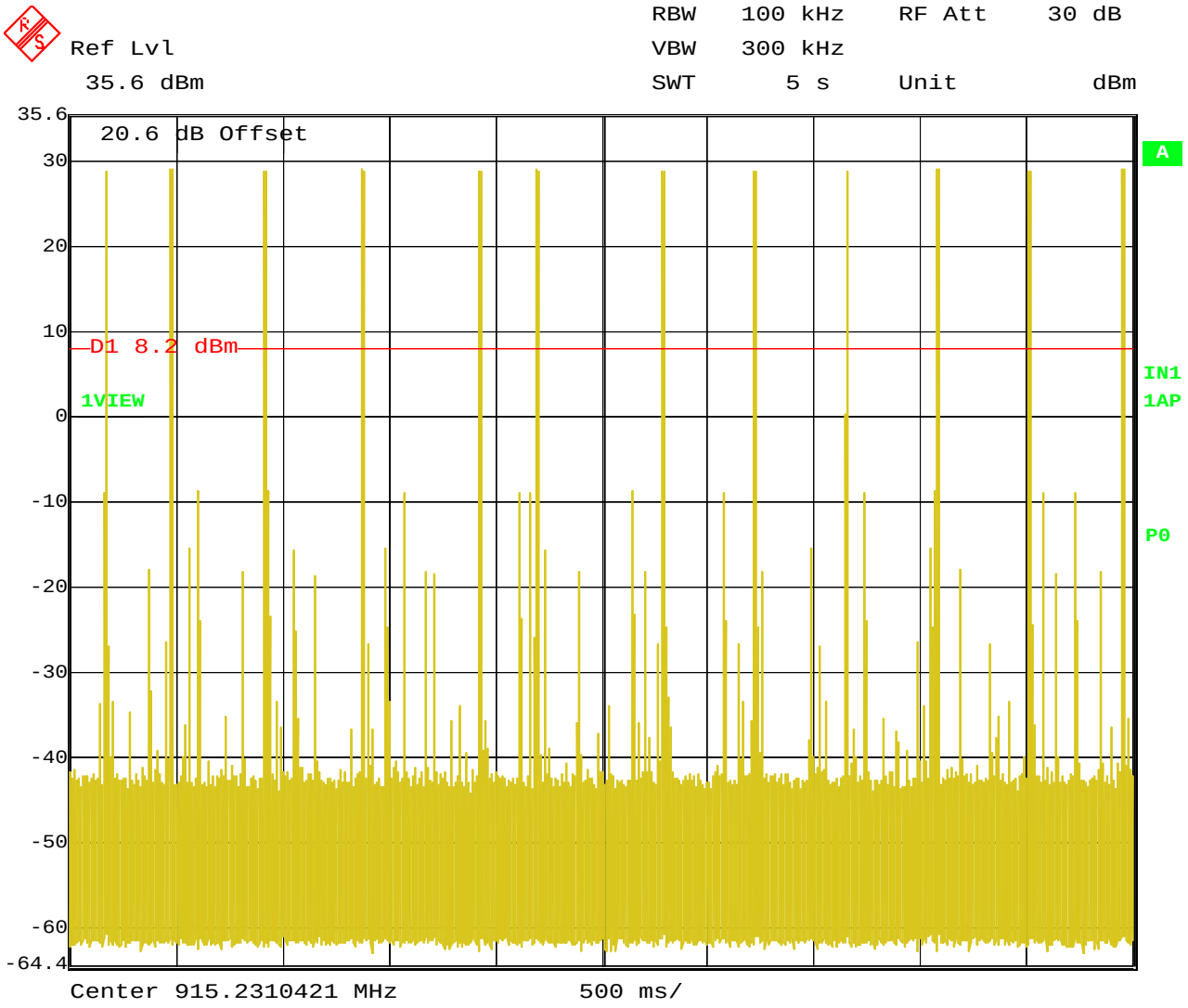
Number of Frequencies (50 Total) – eNode with eMux

TIME OF OCCUPANCY

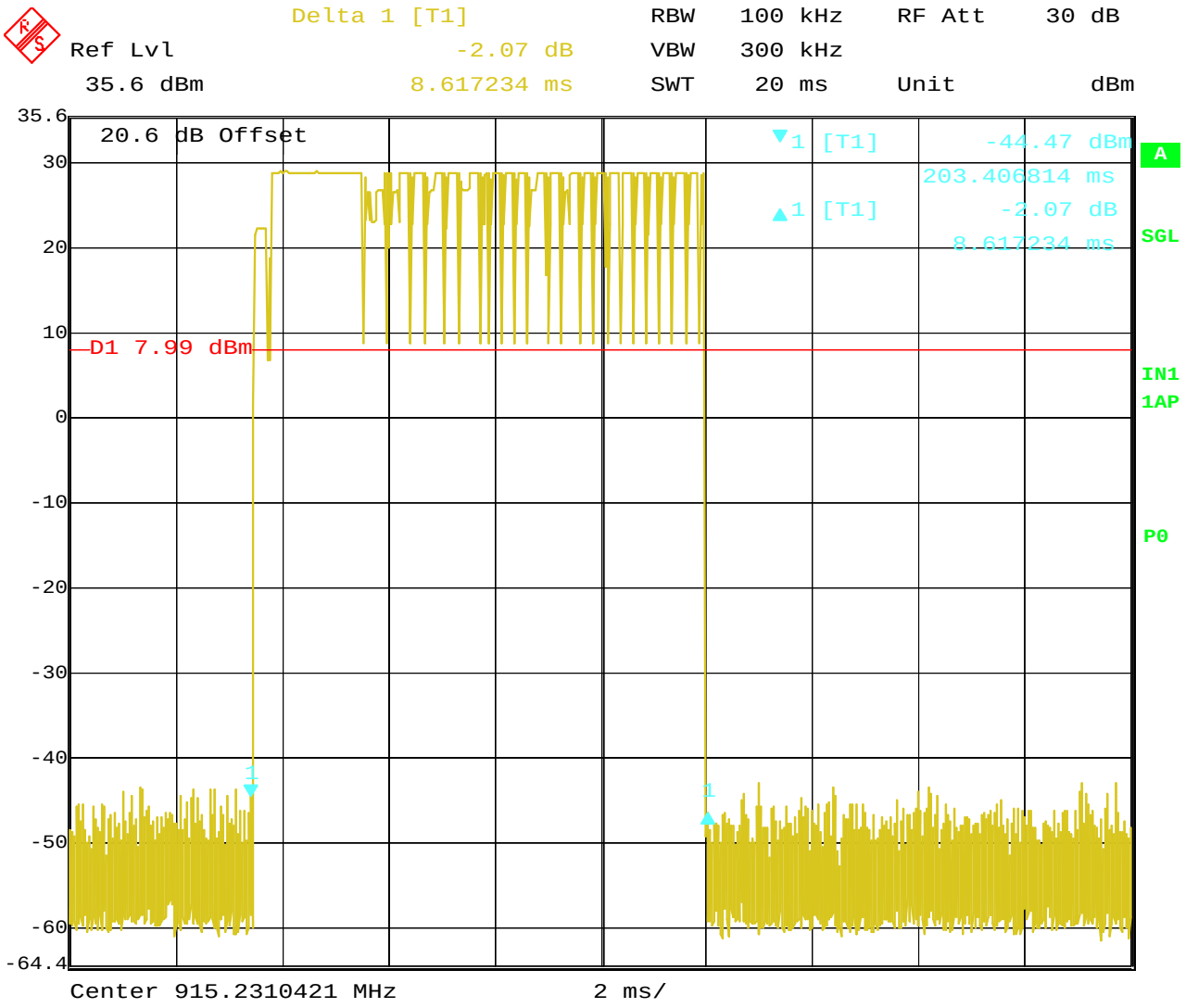
DATA SHEETS



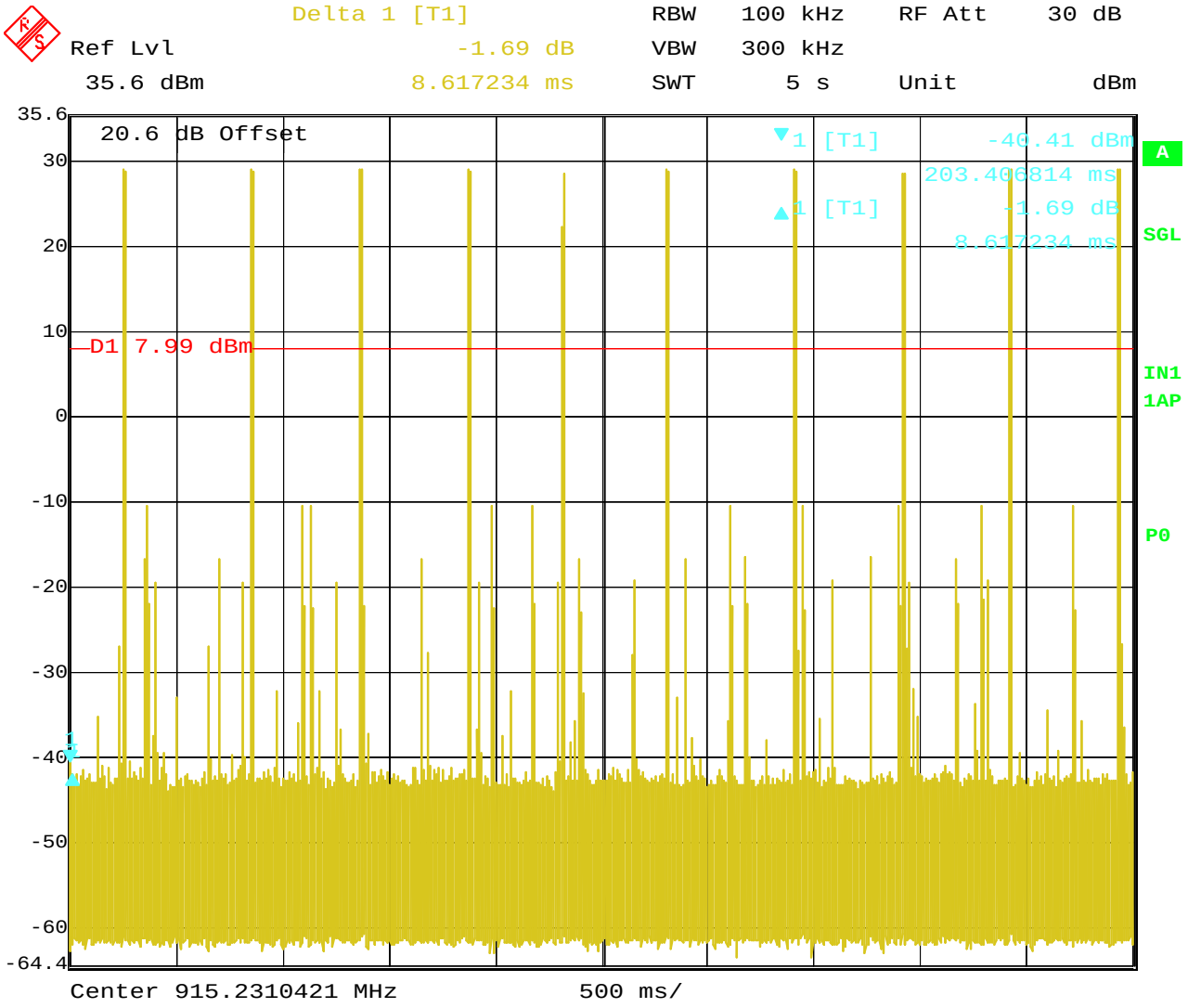
Time of One Pulse = 7.214429 mS – eNode Only



Number of Pulses in 5 Seconds = 12
Total Number of Pulses in 10 Seconds = 24
Time of Occupancy = 7.214429 mS * 24 = 173.146296 mS
Limit = 400 mS in a 10 Second Period
eNode Only



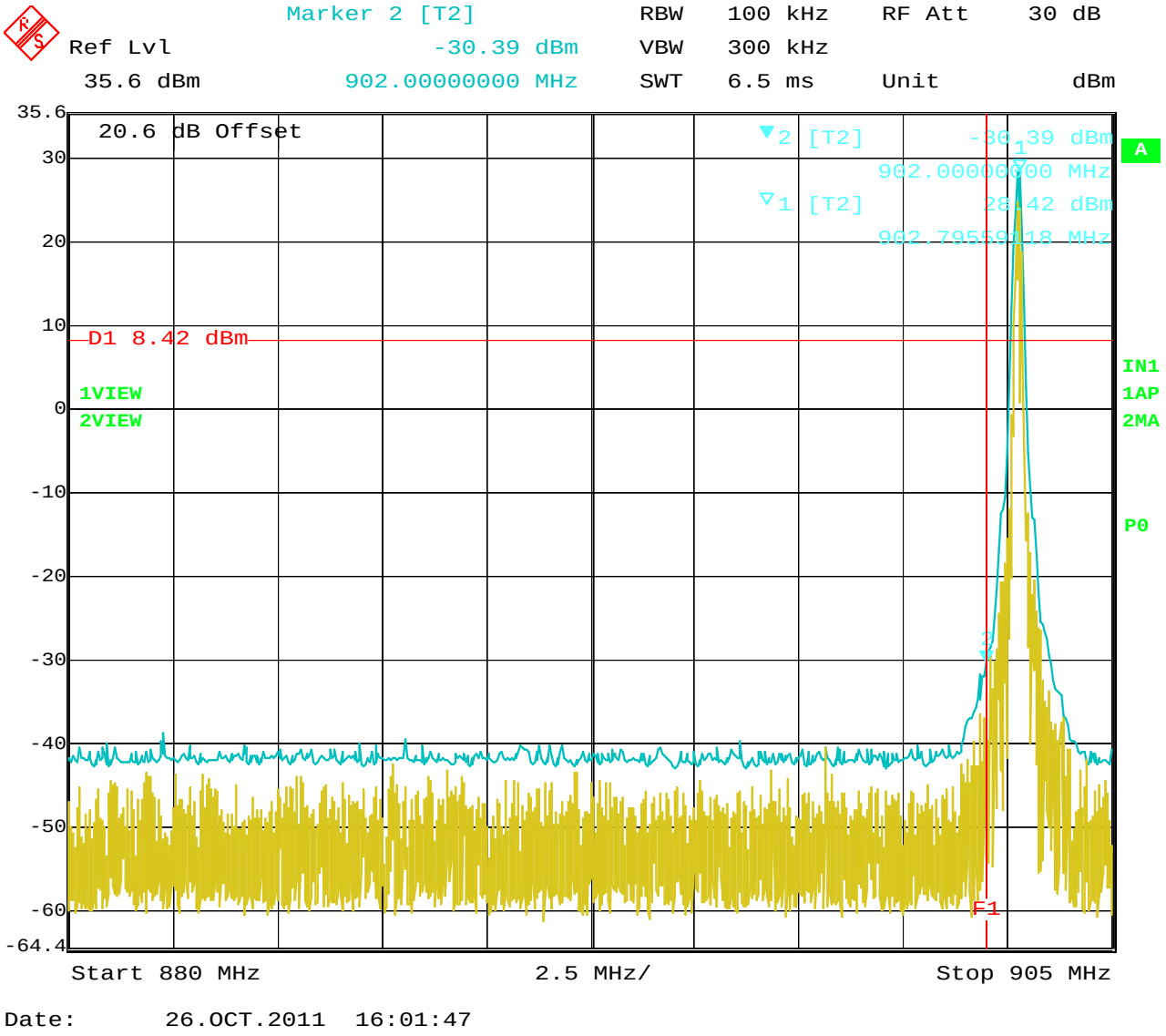
Time of One Pulse = 8.617234 mS – eNode with eMux



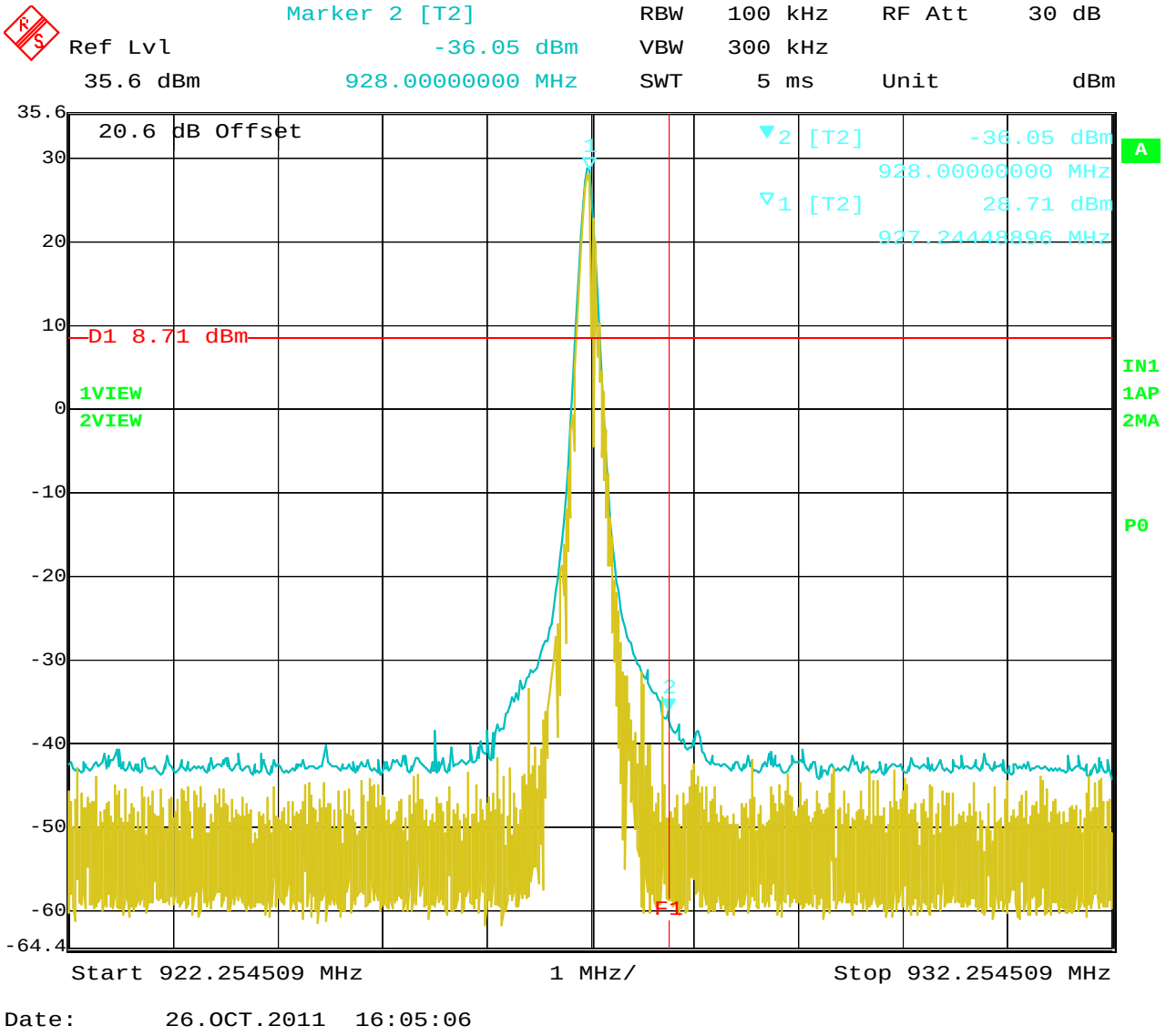
Number of Pulses in 5 Seconds = 10
Total Number of Pulses in 10 Seconds = 20
Time of Occupancy = 8.617234 mS * 20 = 172.34468 mS
Limit = 400 mS in a 10 Second Period
eNode with eMux

BAND EDGES

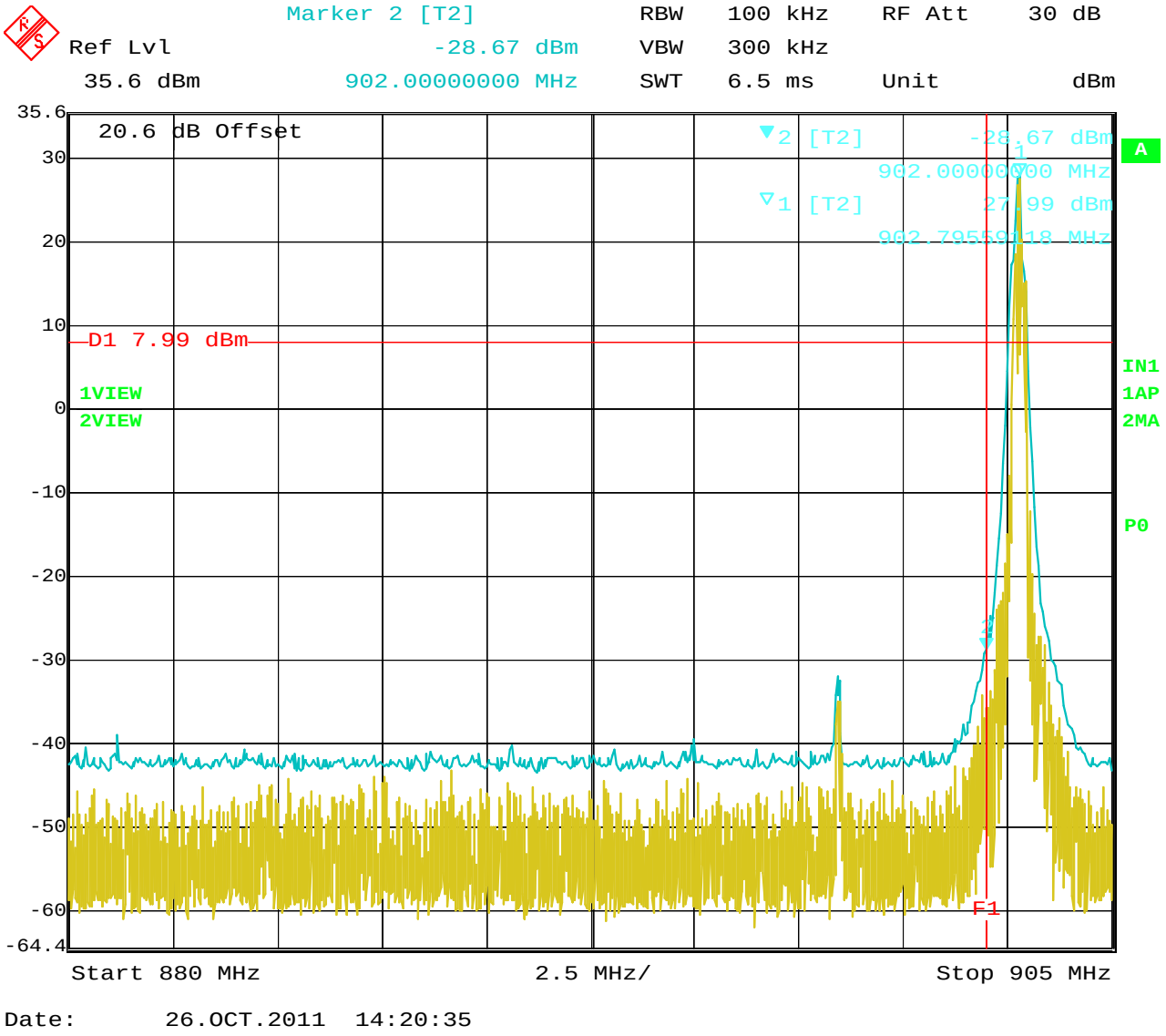
DATA SHEETS



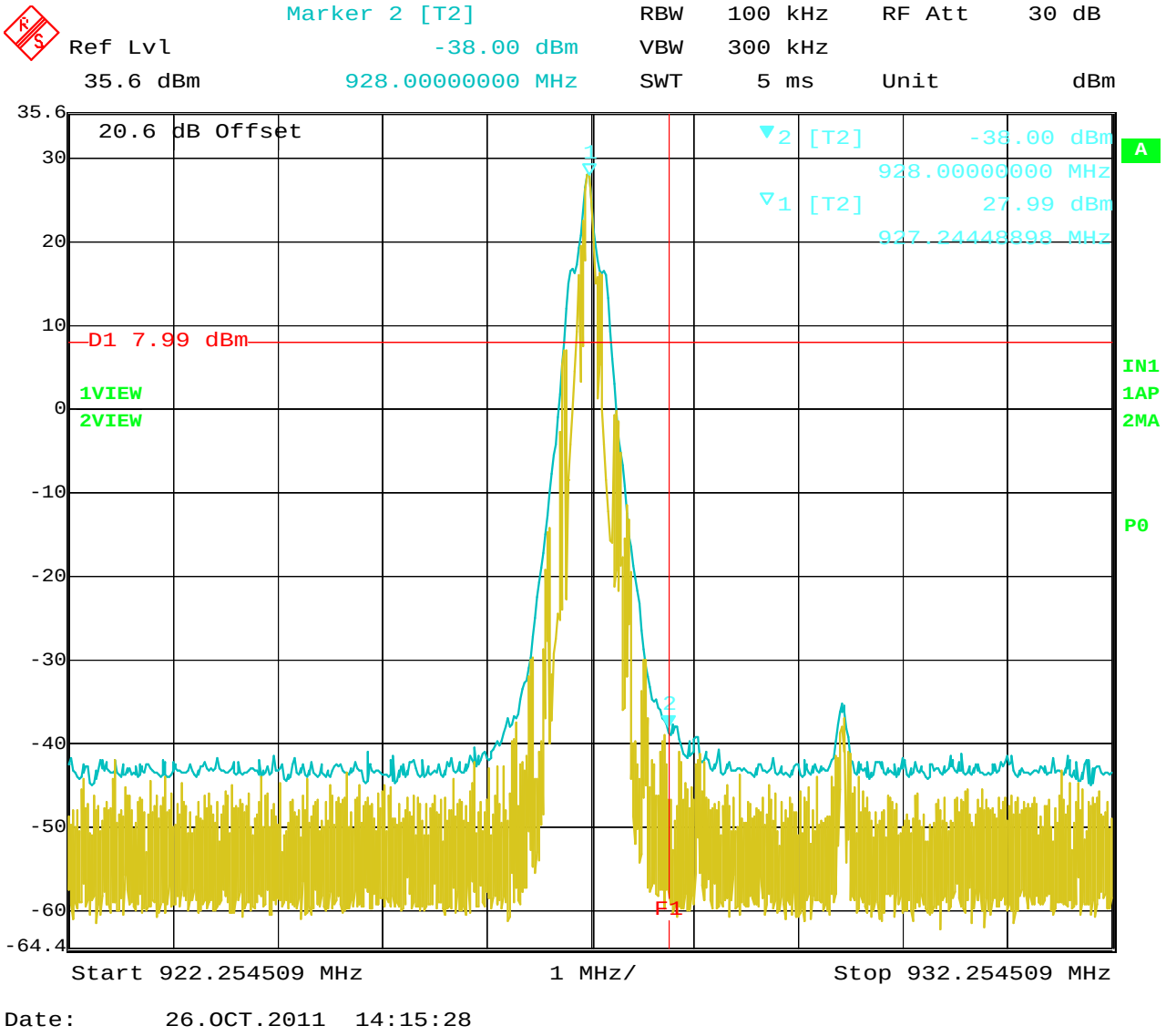
Band Edge – Low Channel – eNode Only



Band Edge – High Channel – eNode Only



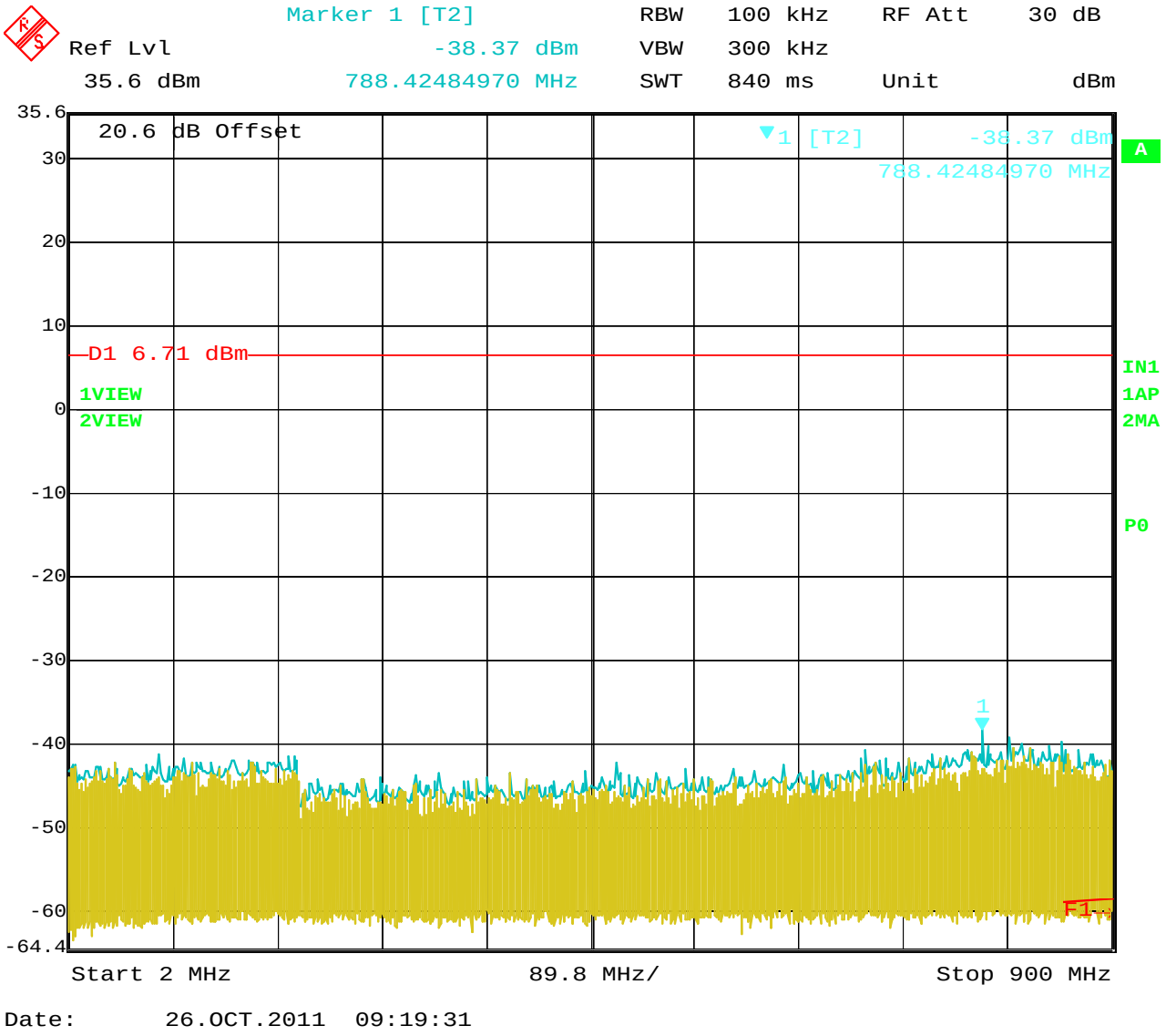
Band Edge – Low Channel – eNode with eMux



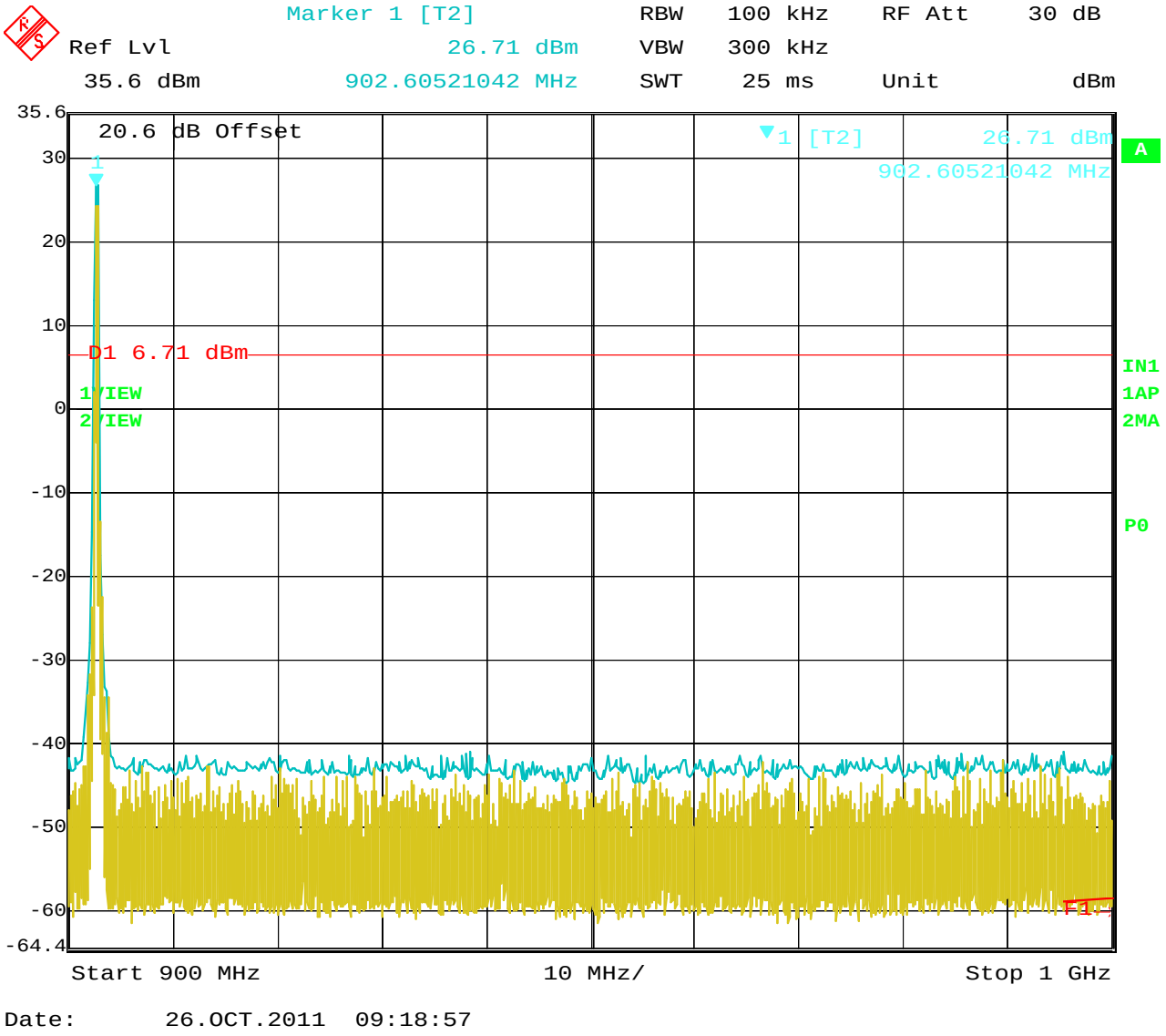
Band Edge – High Channel – eNode with eMux

RF ANTENNA CONDUCTED

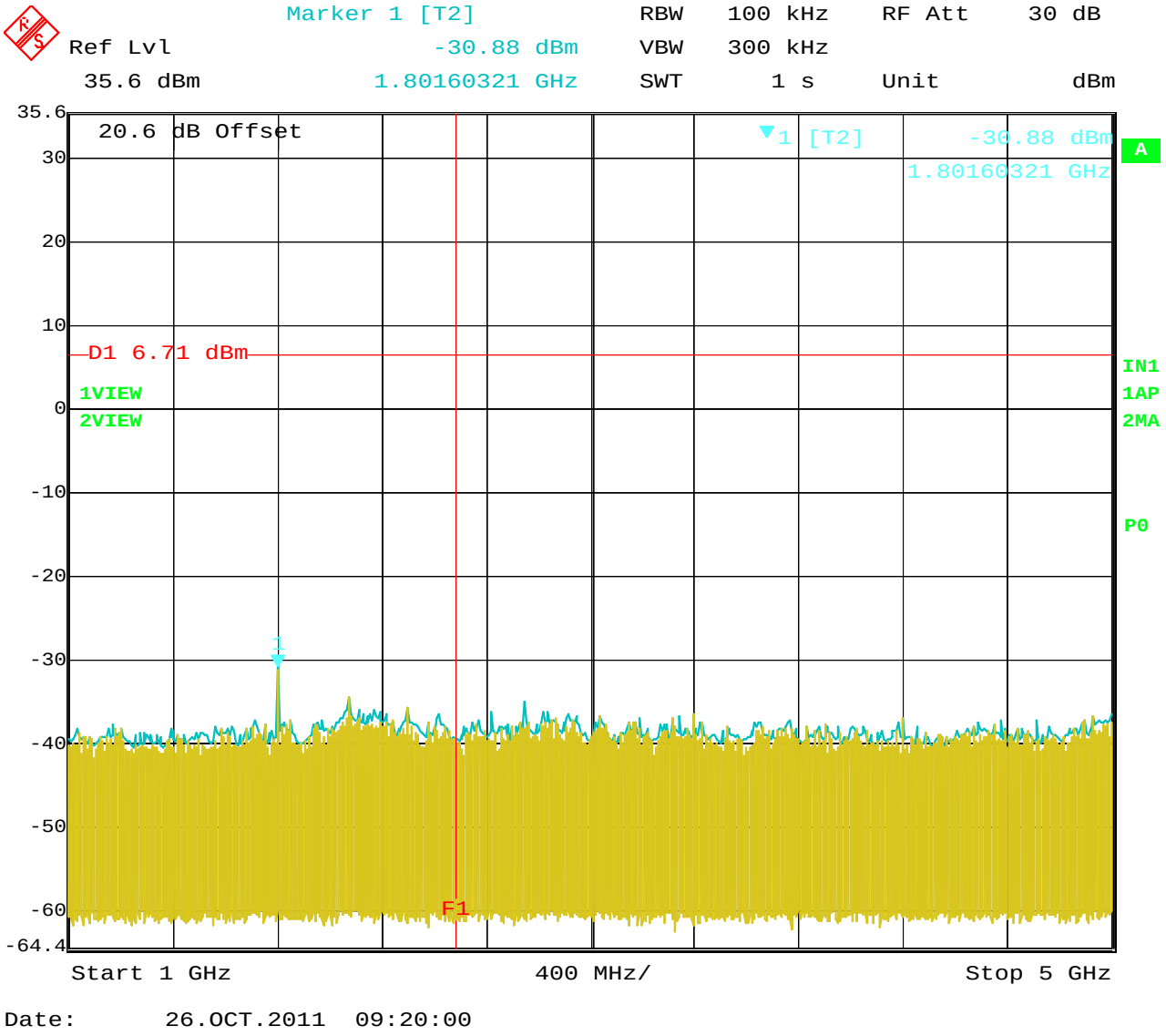
DATA SHEETS



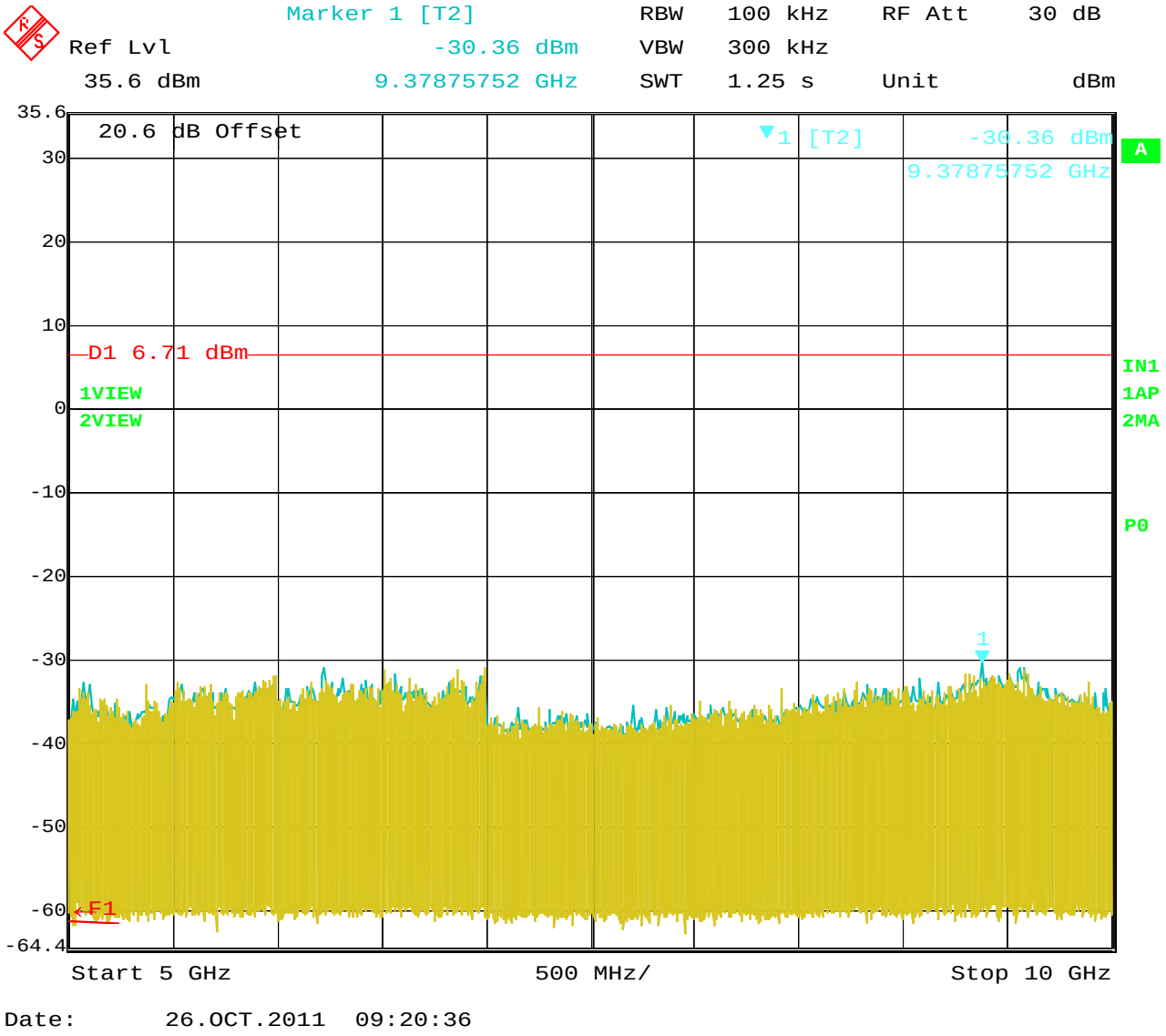
RF Antenna Conducted Test – Low Channel – 2 MHz to 900 MHz – eNode Only



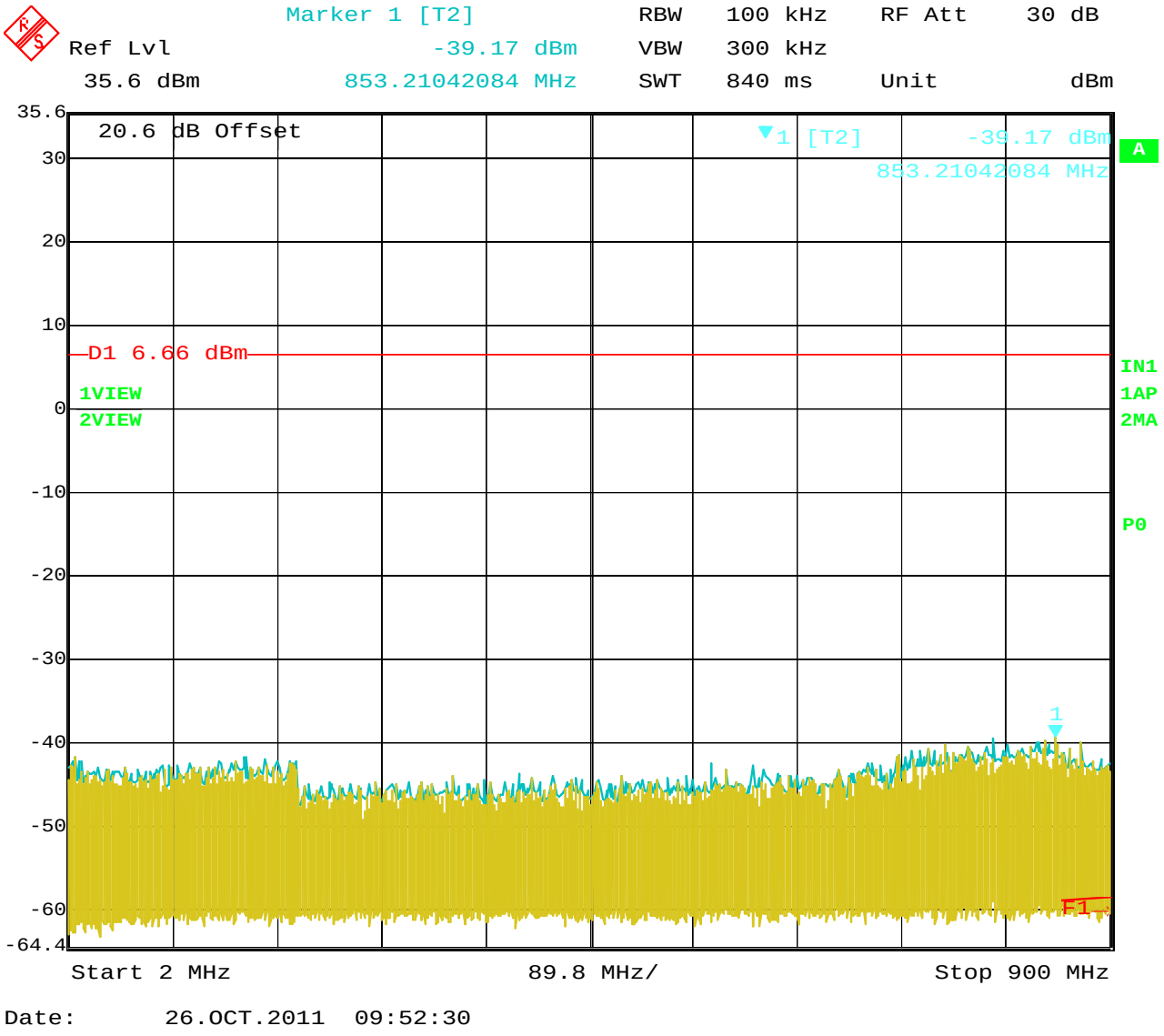
RF Antenna Conducted Test – Low Channel – 900 MHz to 1 GHz – eNode Only



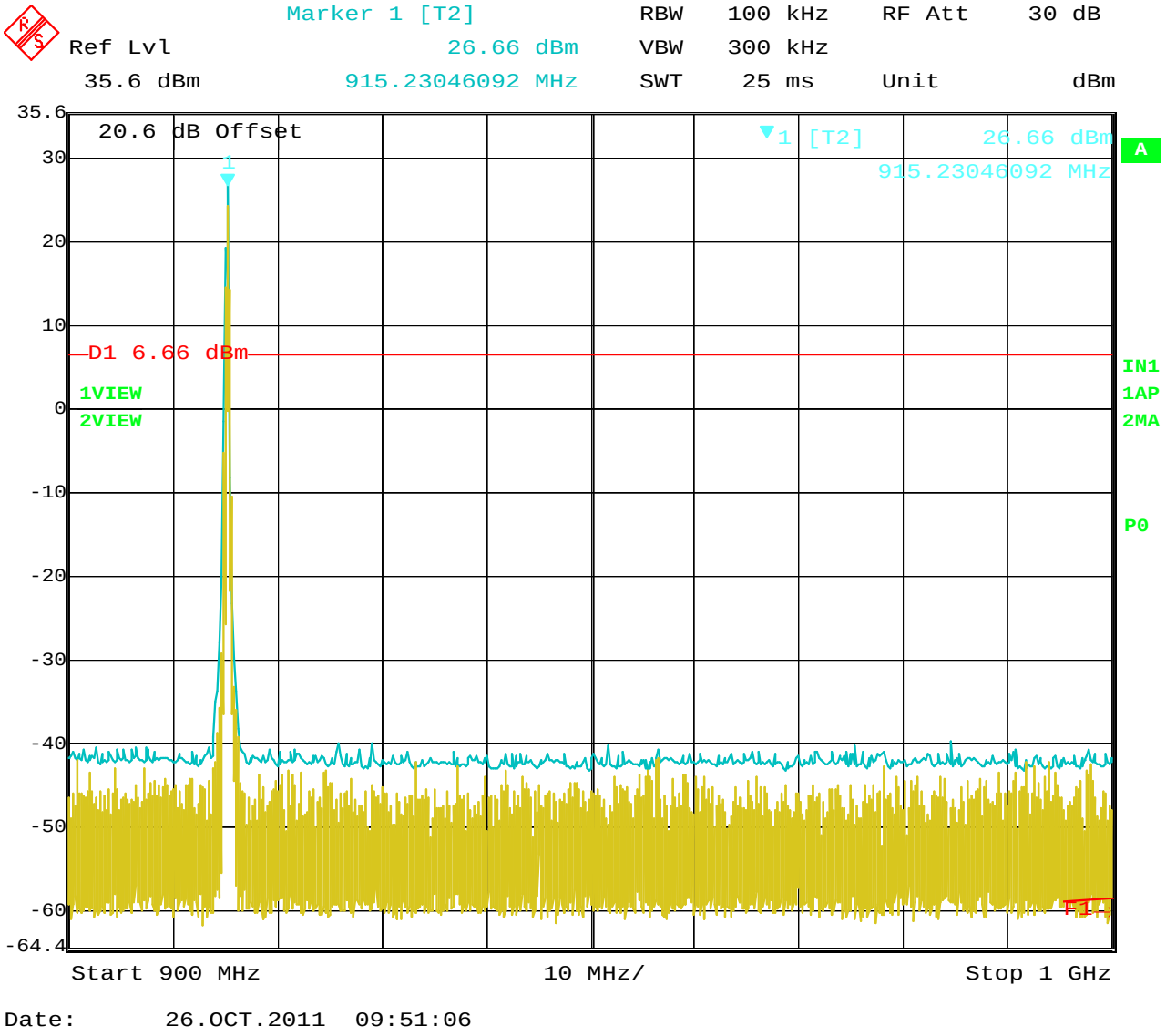
RF Antenna Conducted Test – Low Channel – 1 GHz to 5 GHz – eNode Only



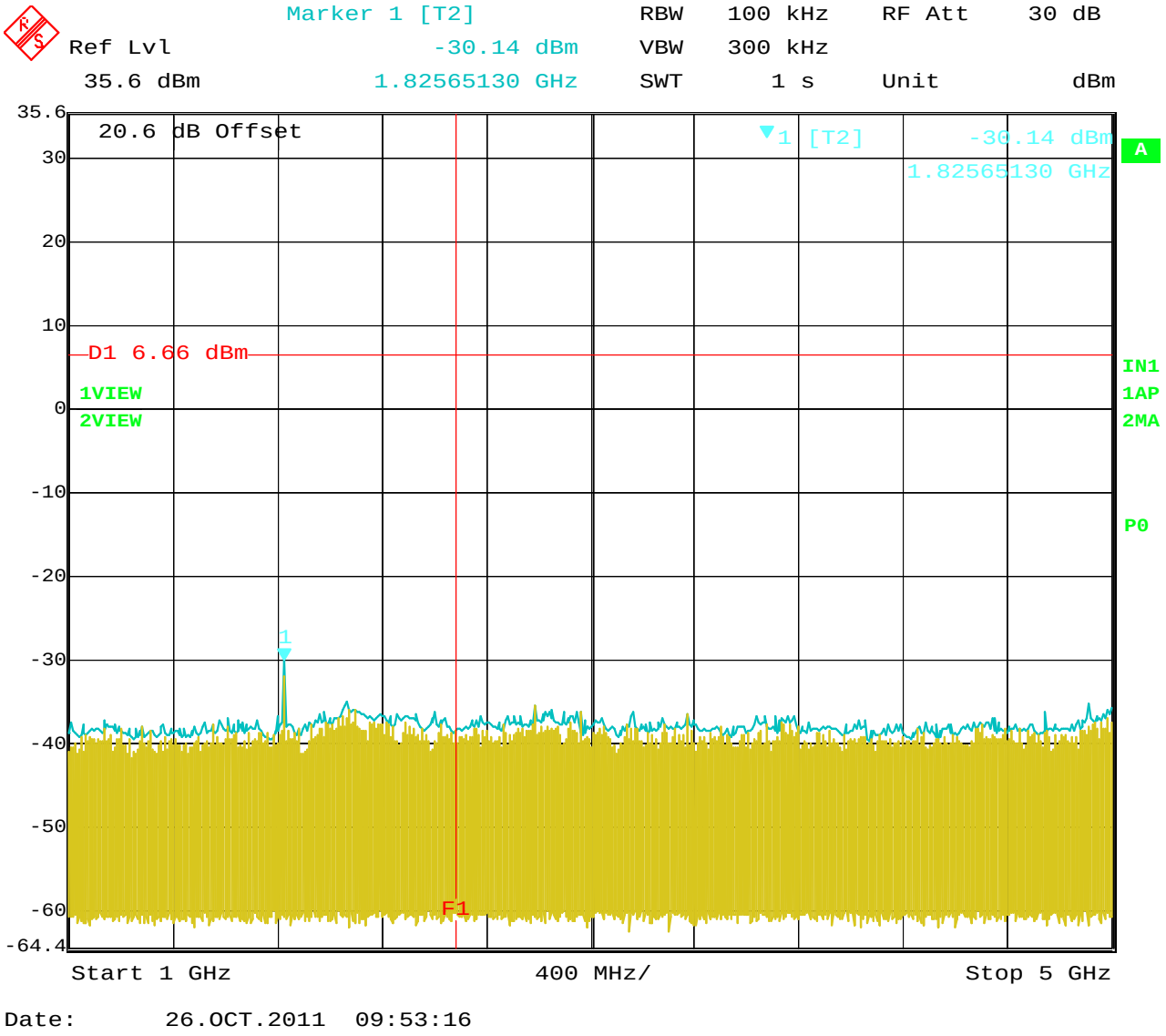
RF Antenna Conducted Test – Low Channel – 5 GHz to 10 GHz – eNode Only



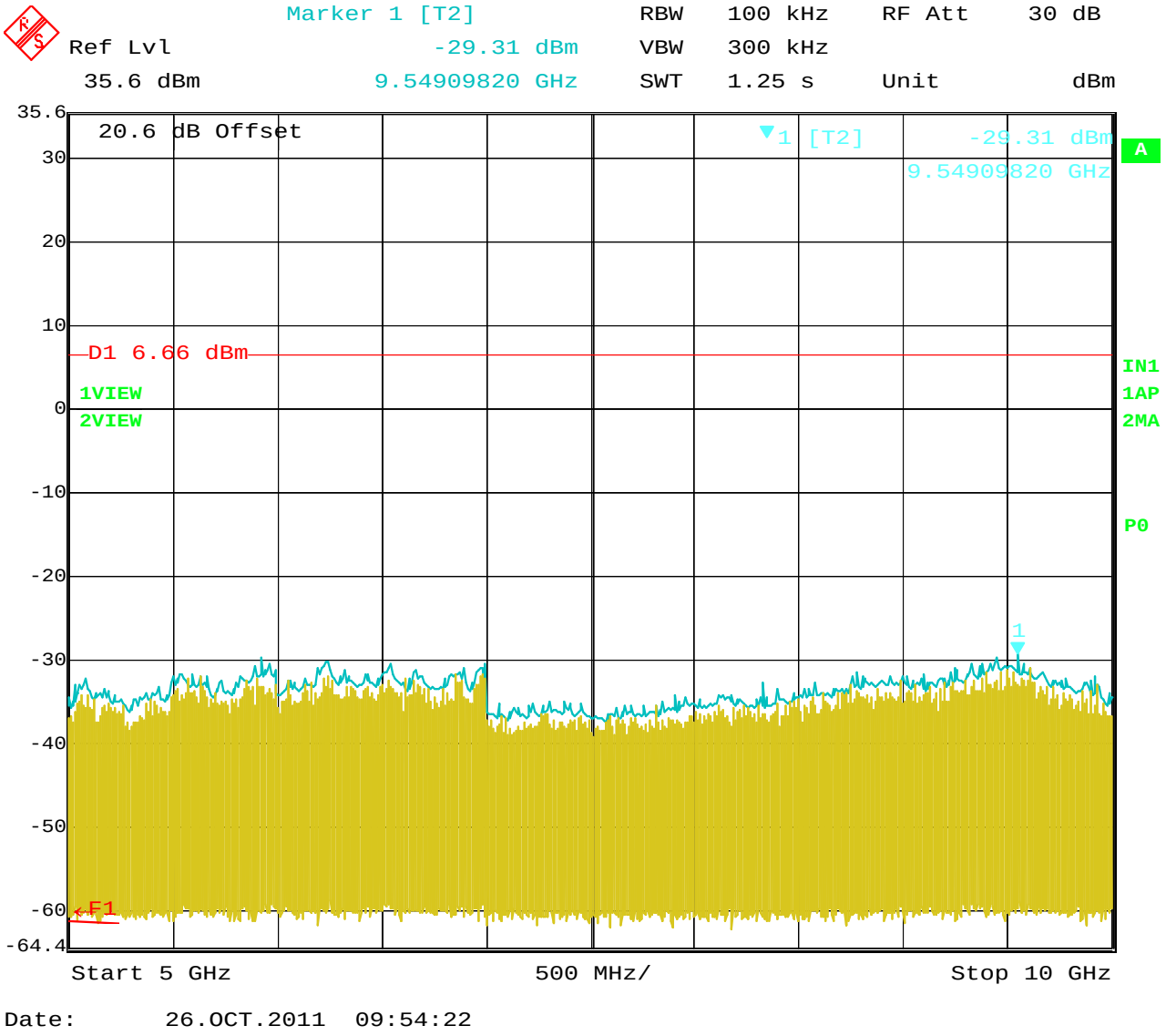
RF Antenna Conducted Test – Middle Channel – 2 MHz to 900 MHz – eNode Only



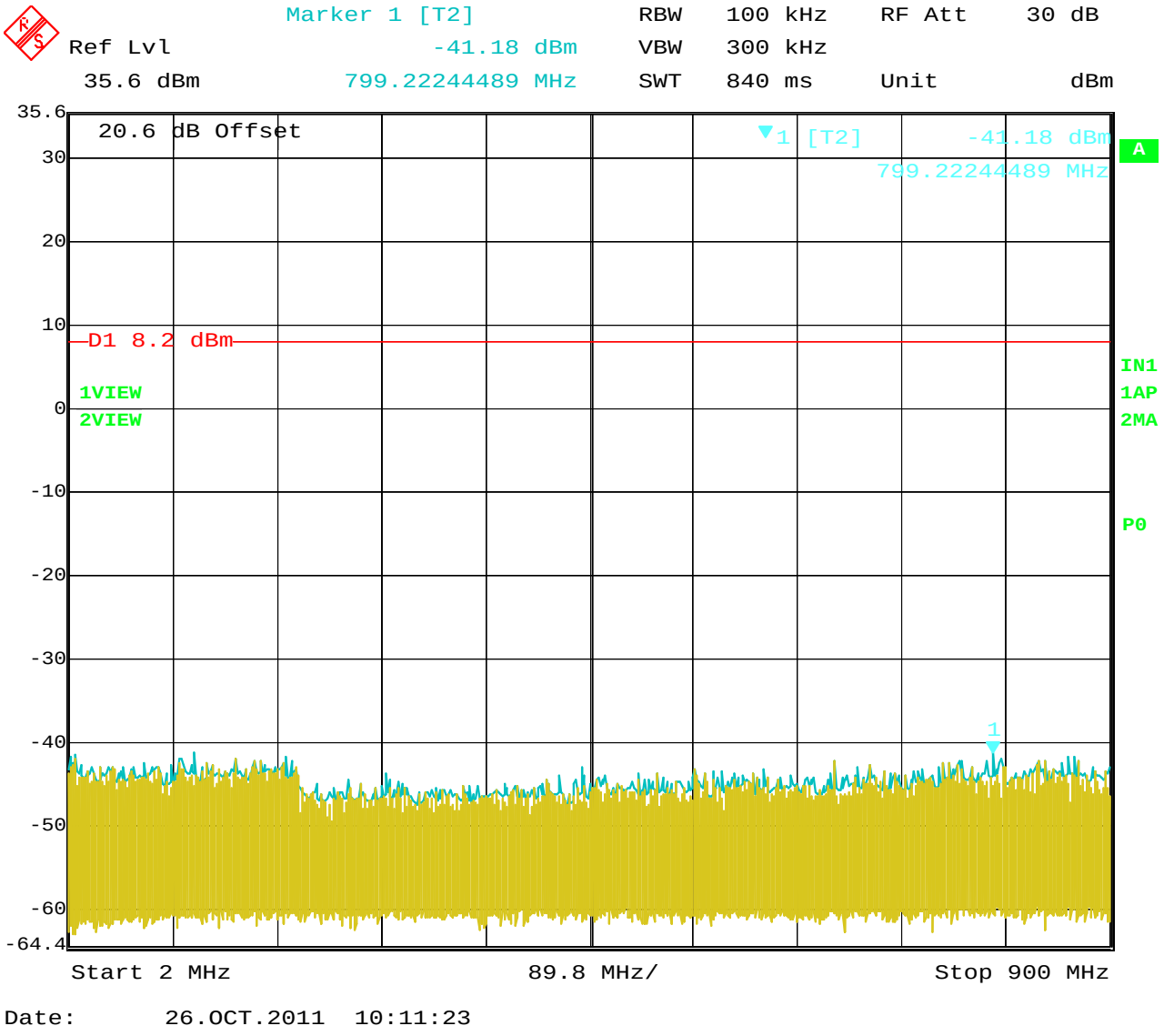
RF Antenna Conducted Test – Middle Channel – 900 MHz to 1 GHz – eNode Only



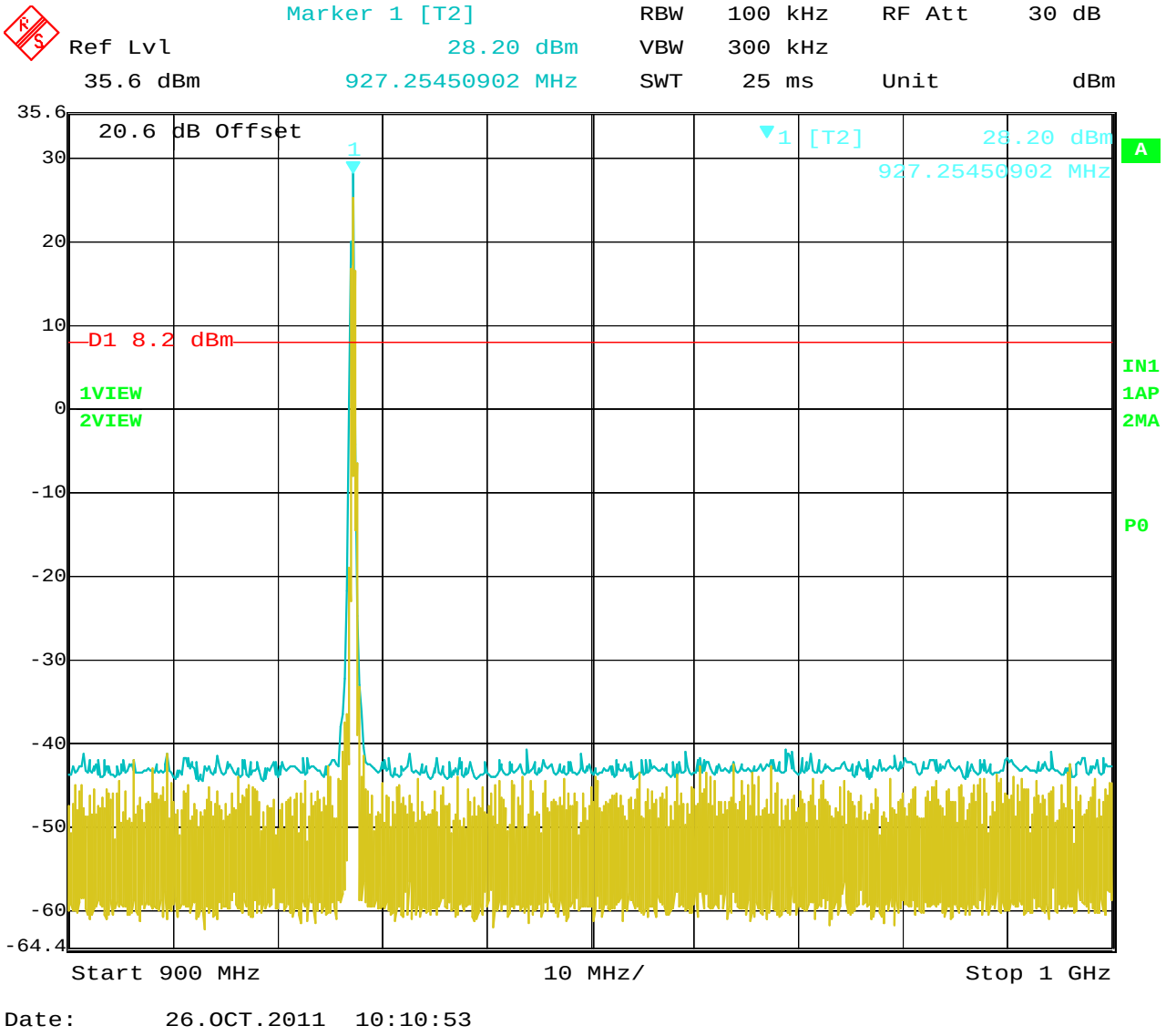
RF Antenna Conducted Test – Middle Channel – 1 GHz to 5 GHz – eNode Only



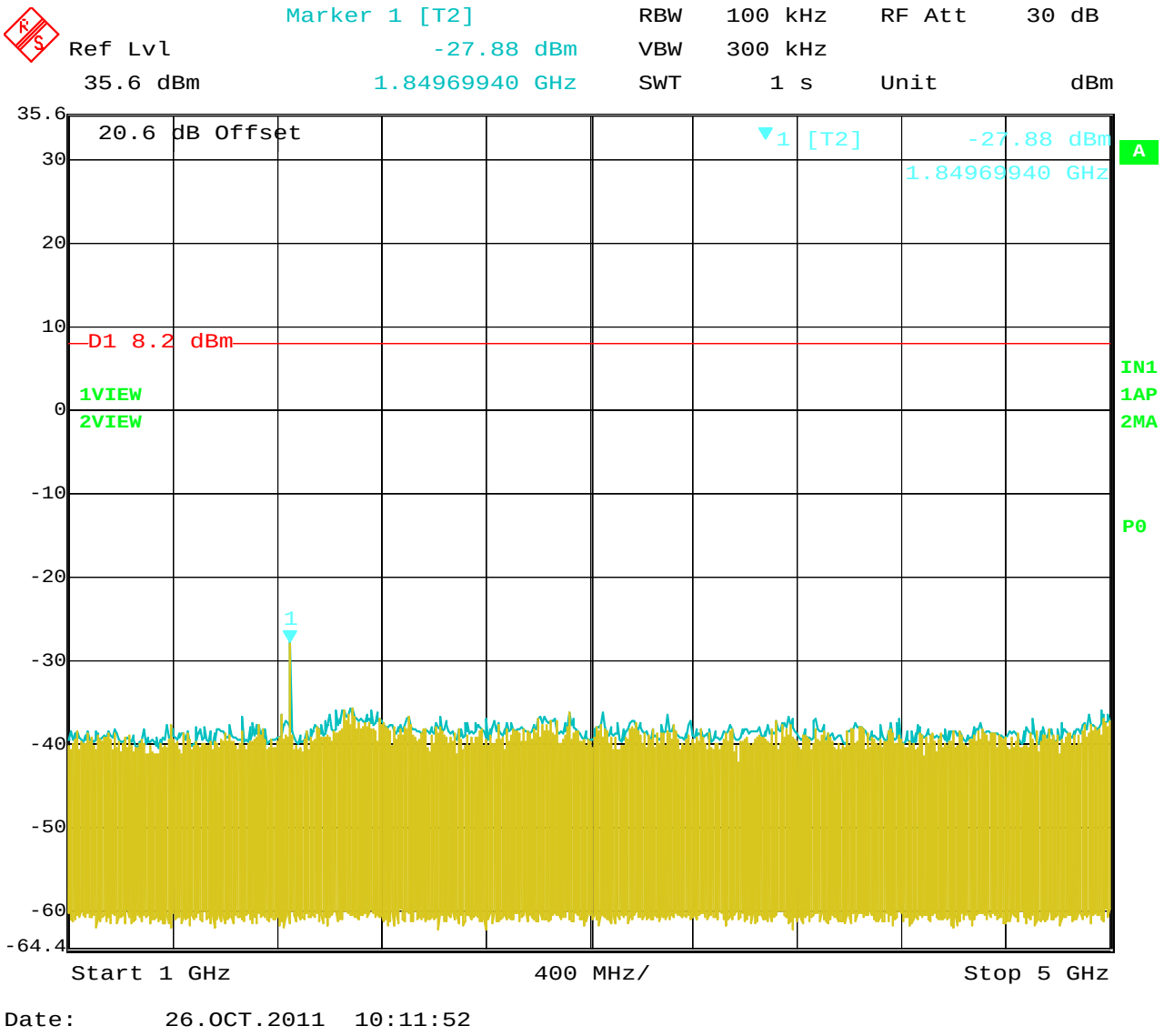
RF Antenna Conducted Test – Middle Channel – 5 GHz to 10 GHz – eNode Only



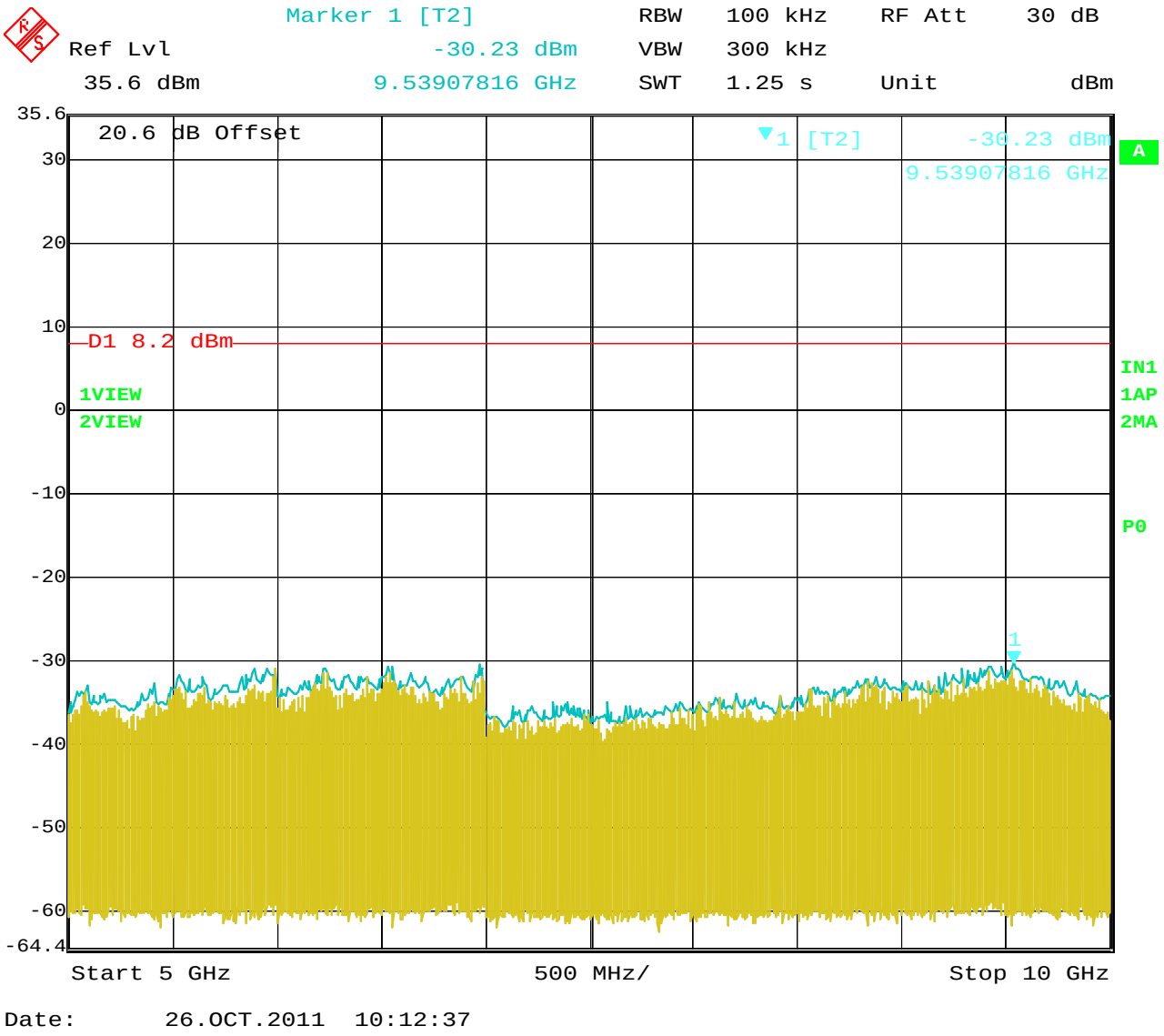
RF Antenna Conducted Test – High Channel – 2 MHz to 900 MHz – eNode Only



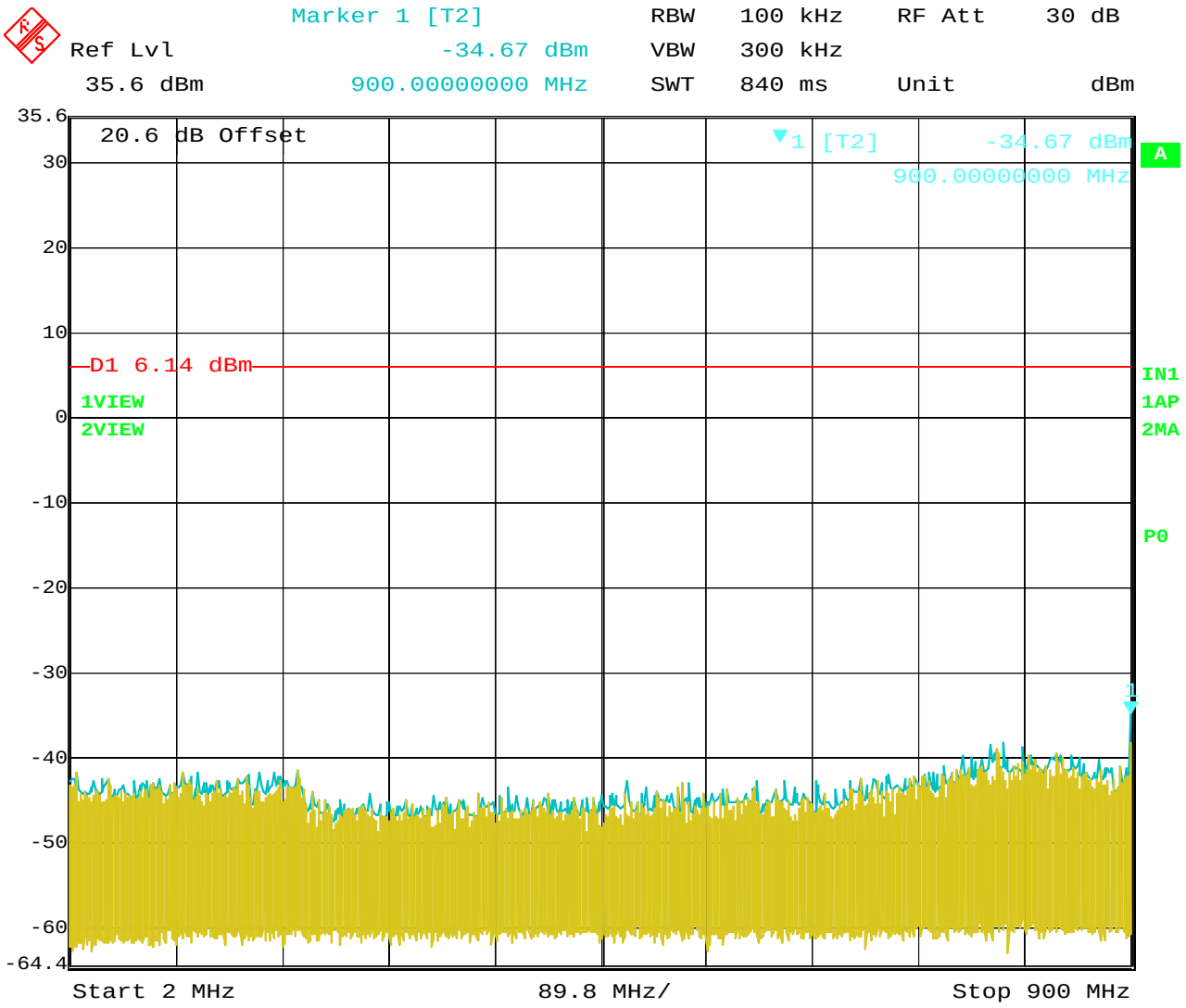
RF Antenna Conducted Test – High Channel – 900 MHz to 1 GHz – eNode Only



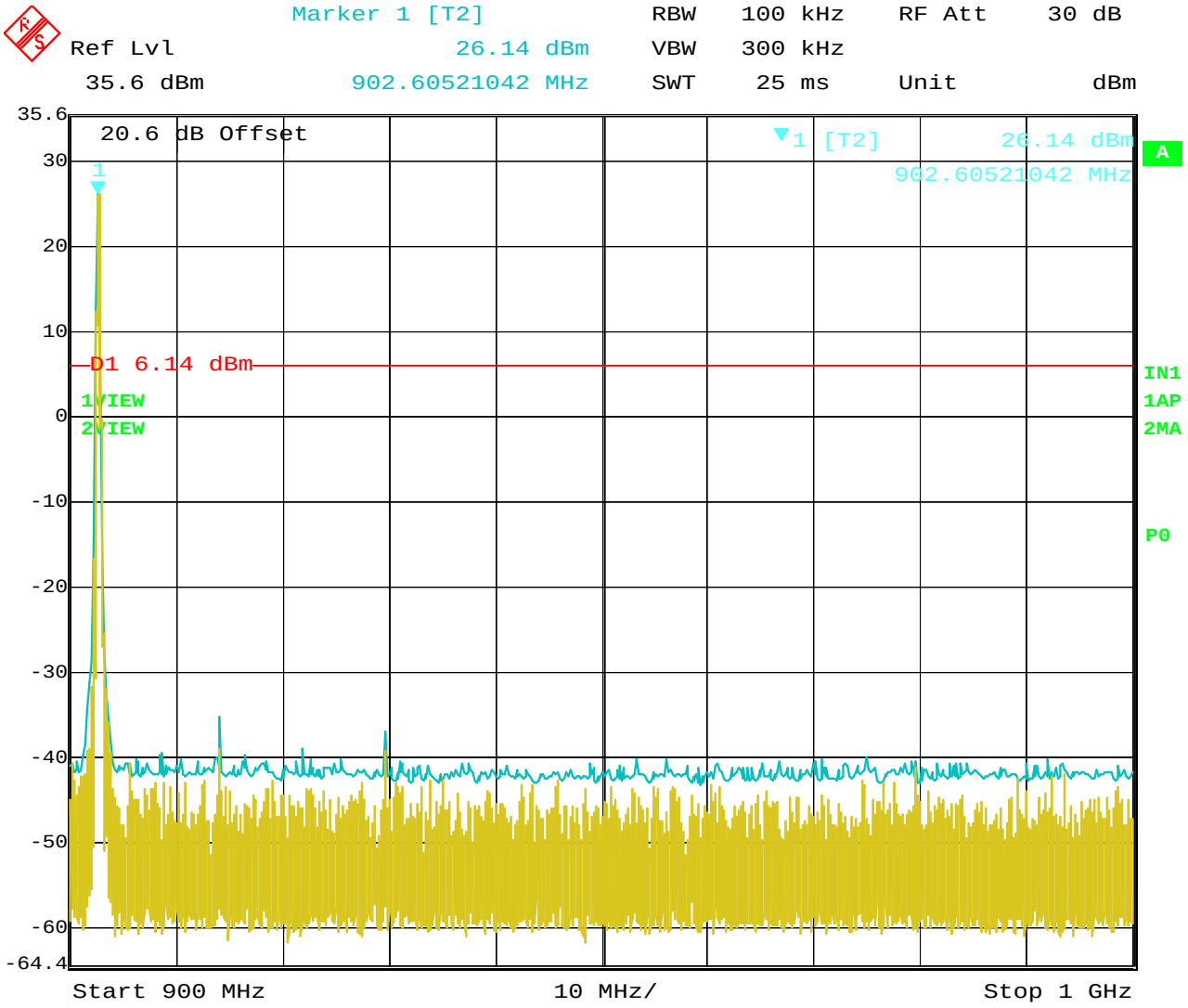
RF Antenna Conducted Test – High Channel – 1 GHz to 5 GHz – eNode Only



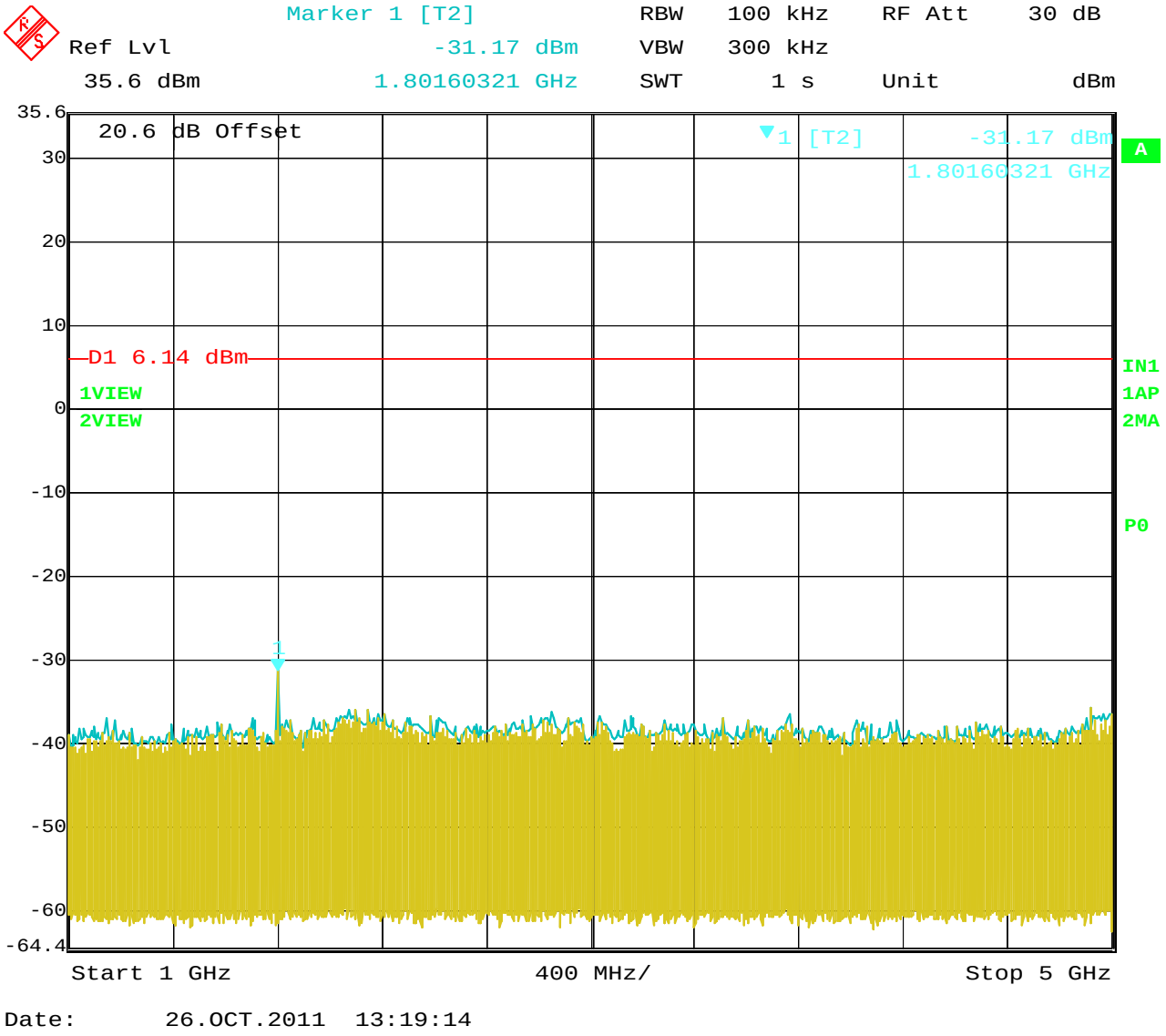
RF Antenna Conducted Test – High Channel – 5 GHz to 10 GHz – eNode Only



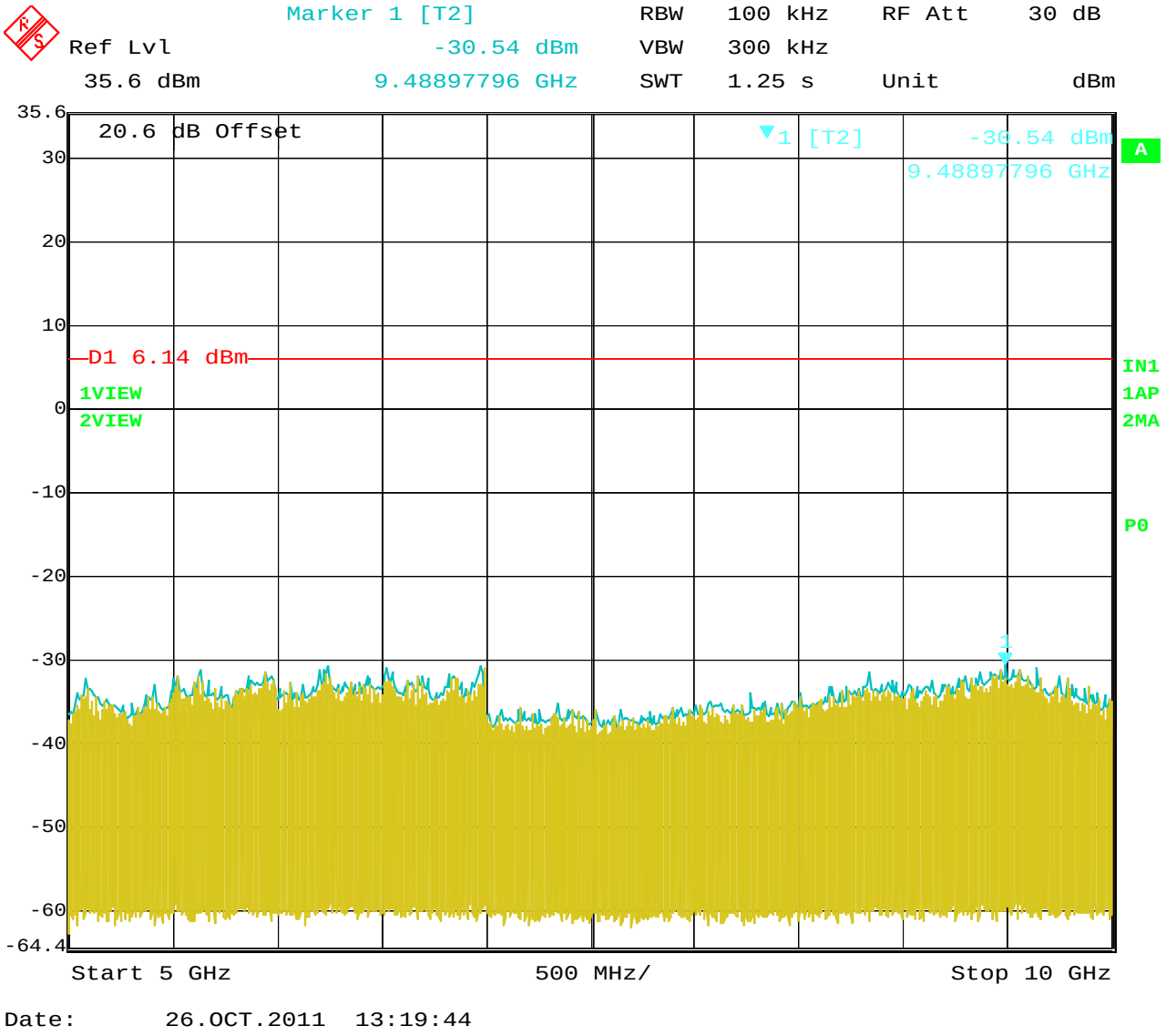
RF Antenna Conducted Test – Low Channel – 2 MHz to 900 MHz – eNode with eMux



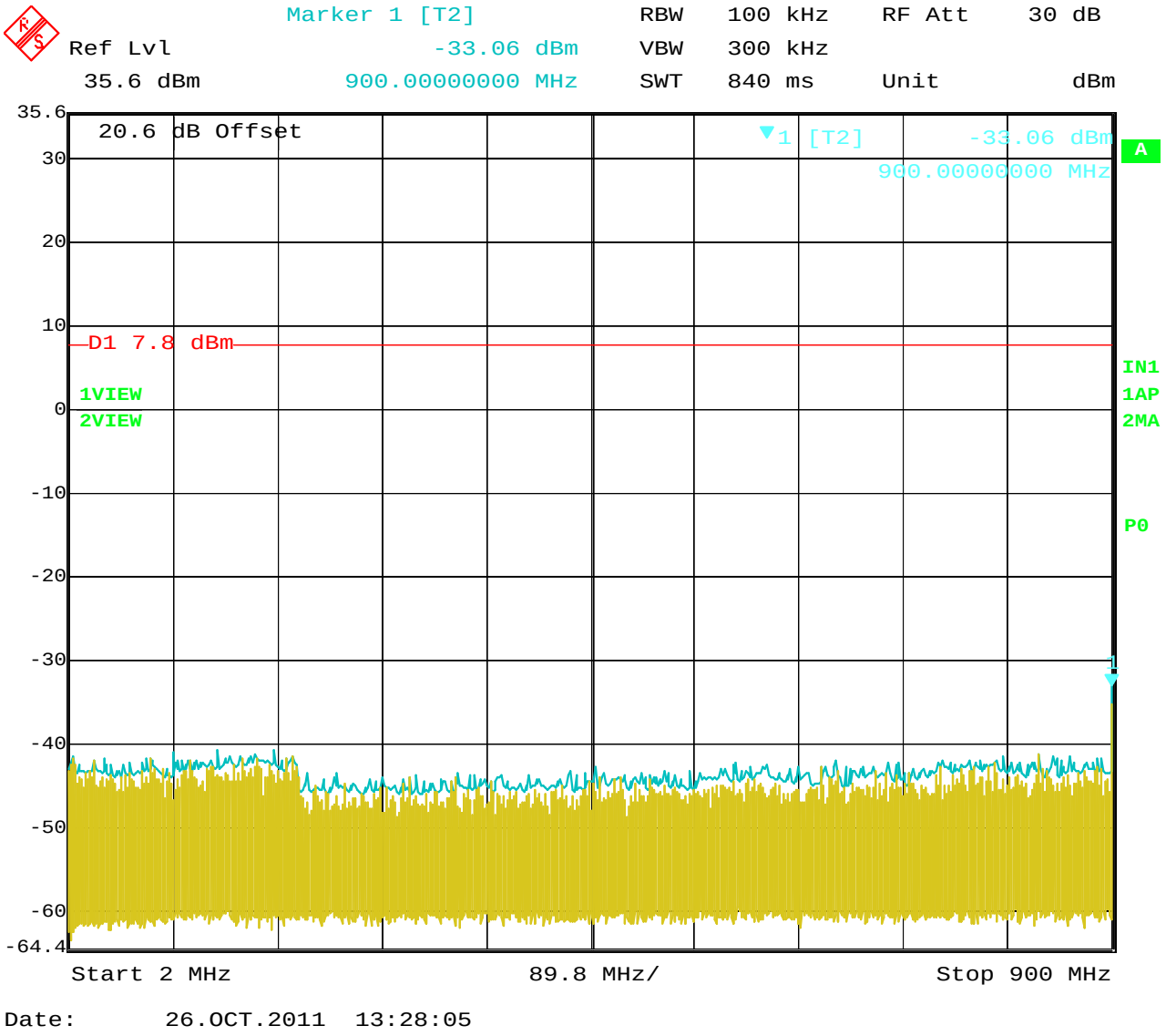
RF Antenna Conducted Test – Low Channel – 900 MHz to 1 GHz – eNode with eMux



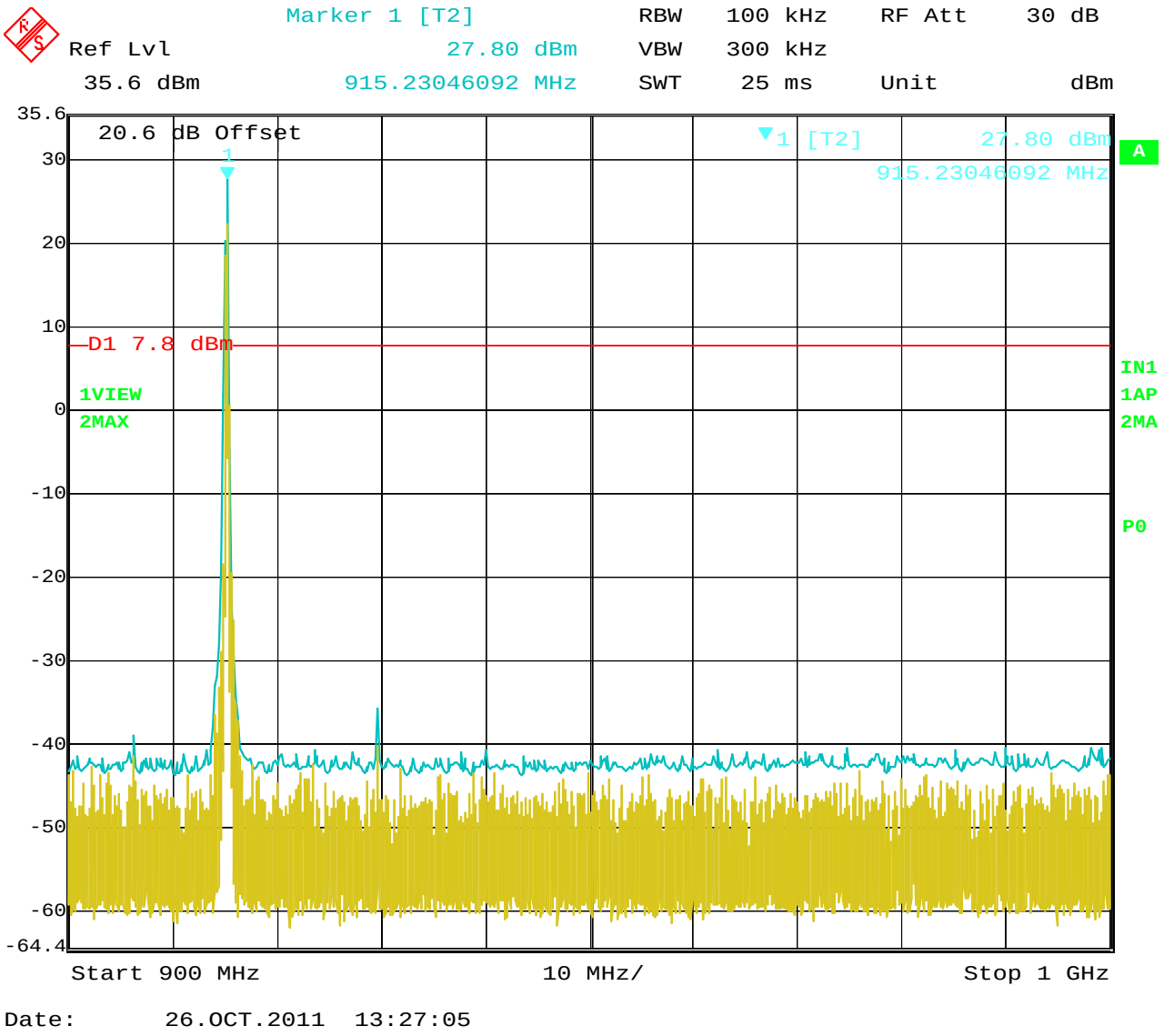
RF Antenna Conducted Test – Low Channel – 1 GHz to 5 GHz – eNode with eMux



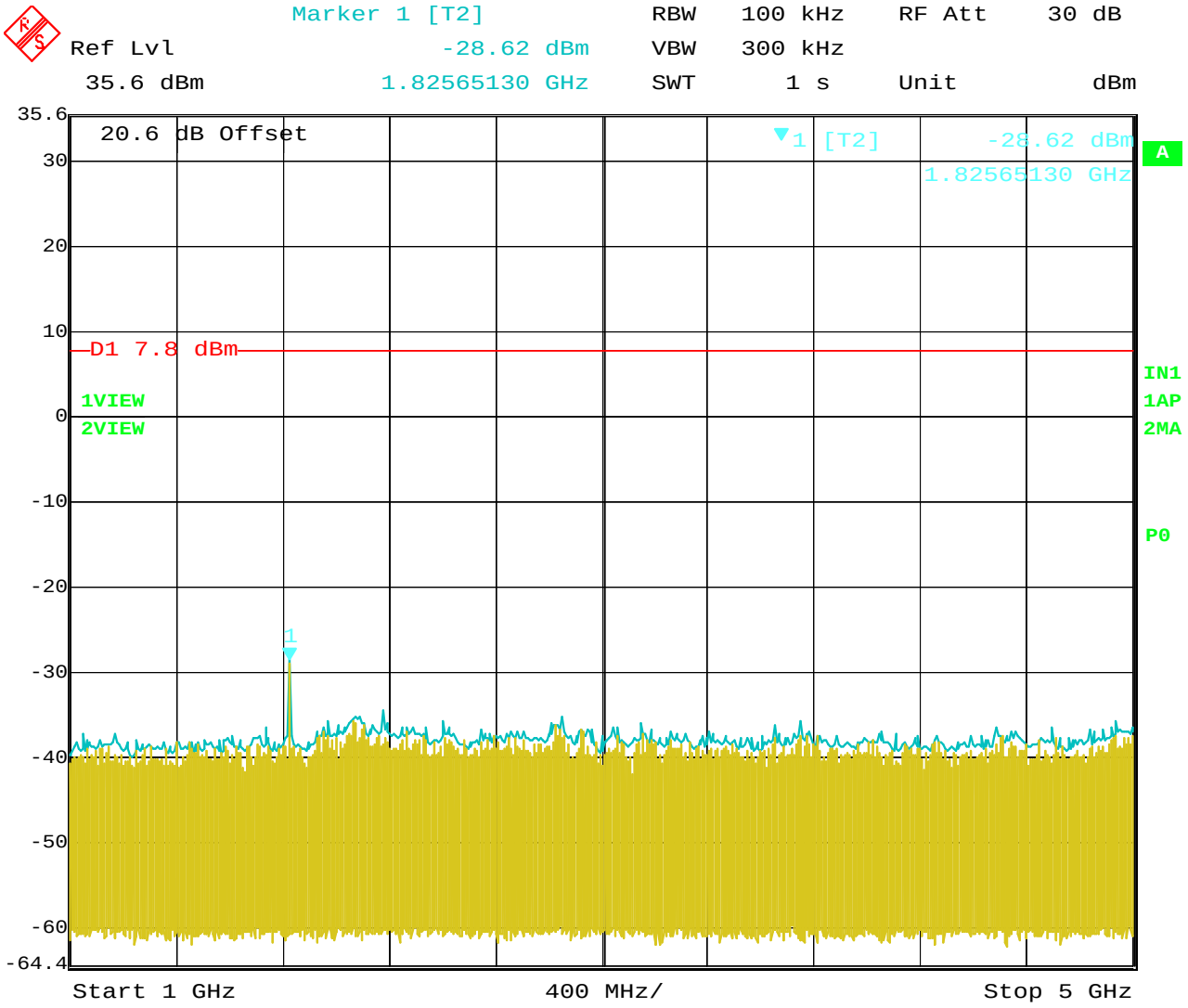
RF Antenna Conducted Test – Low Channel – 5 GHz to 10 GHz – eNode with eMux



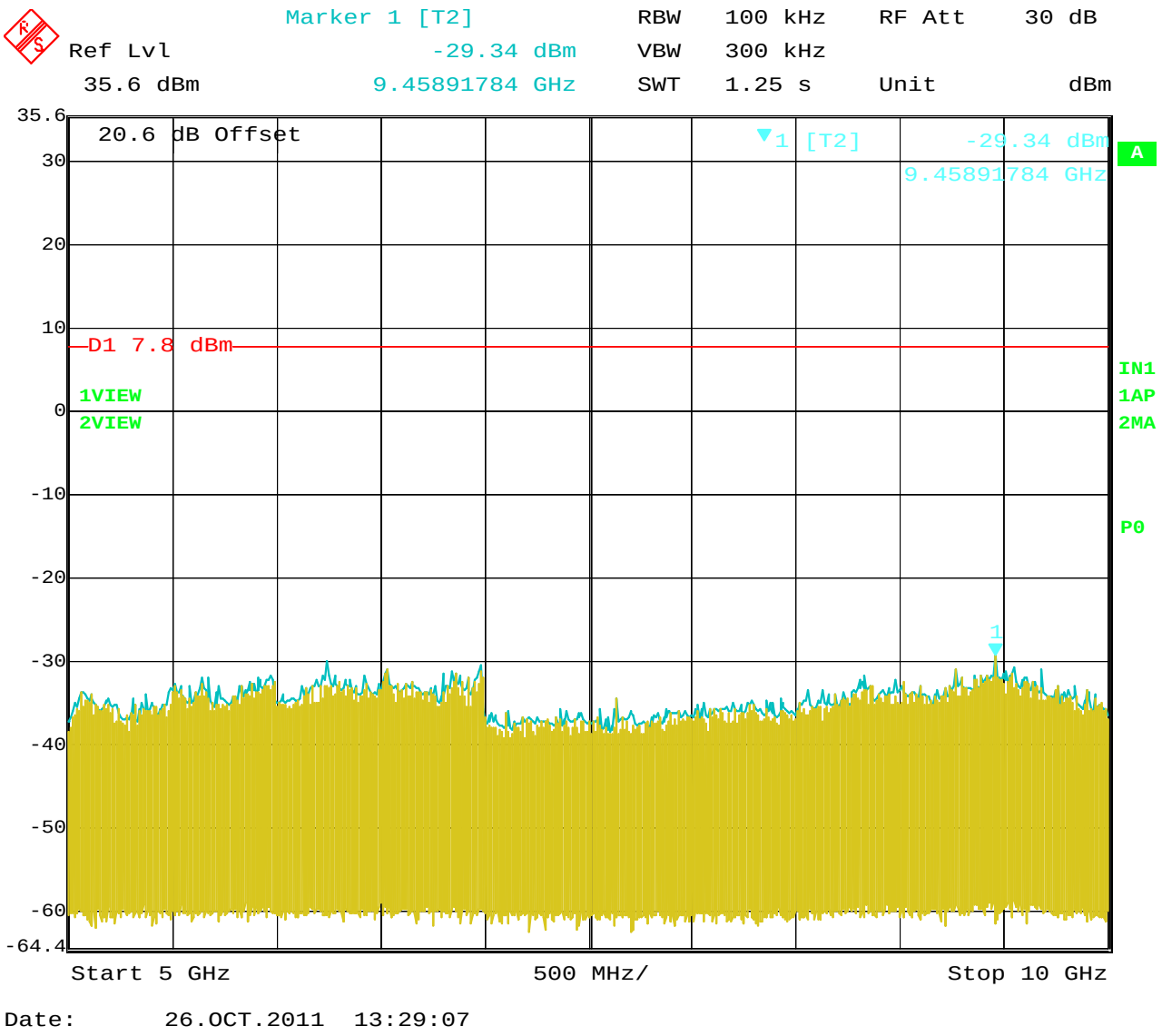
RF Antenna Conducted Test – Middle Channel – 2 MHz to 900 MHz – eNode with eMux



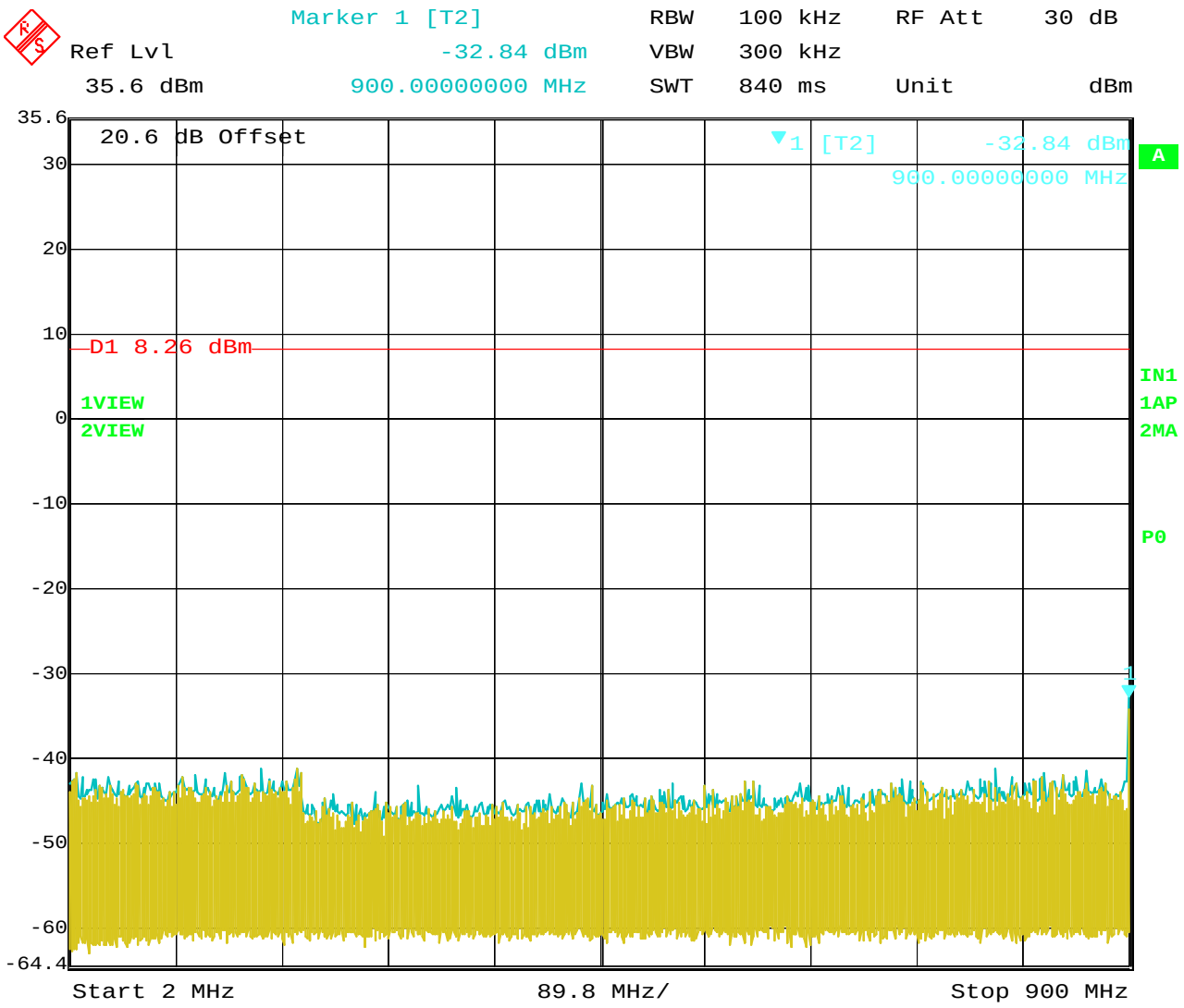
RF Antenna Conducted Test – Middle Channel – 900 MHz to 1 GHz – eNode with eMux



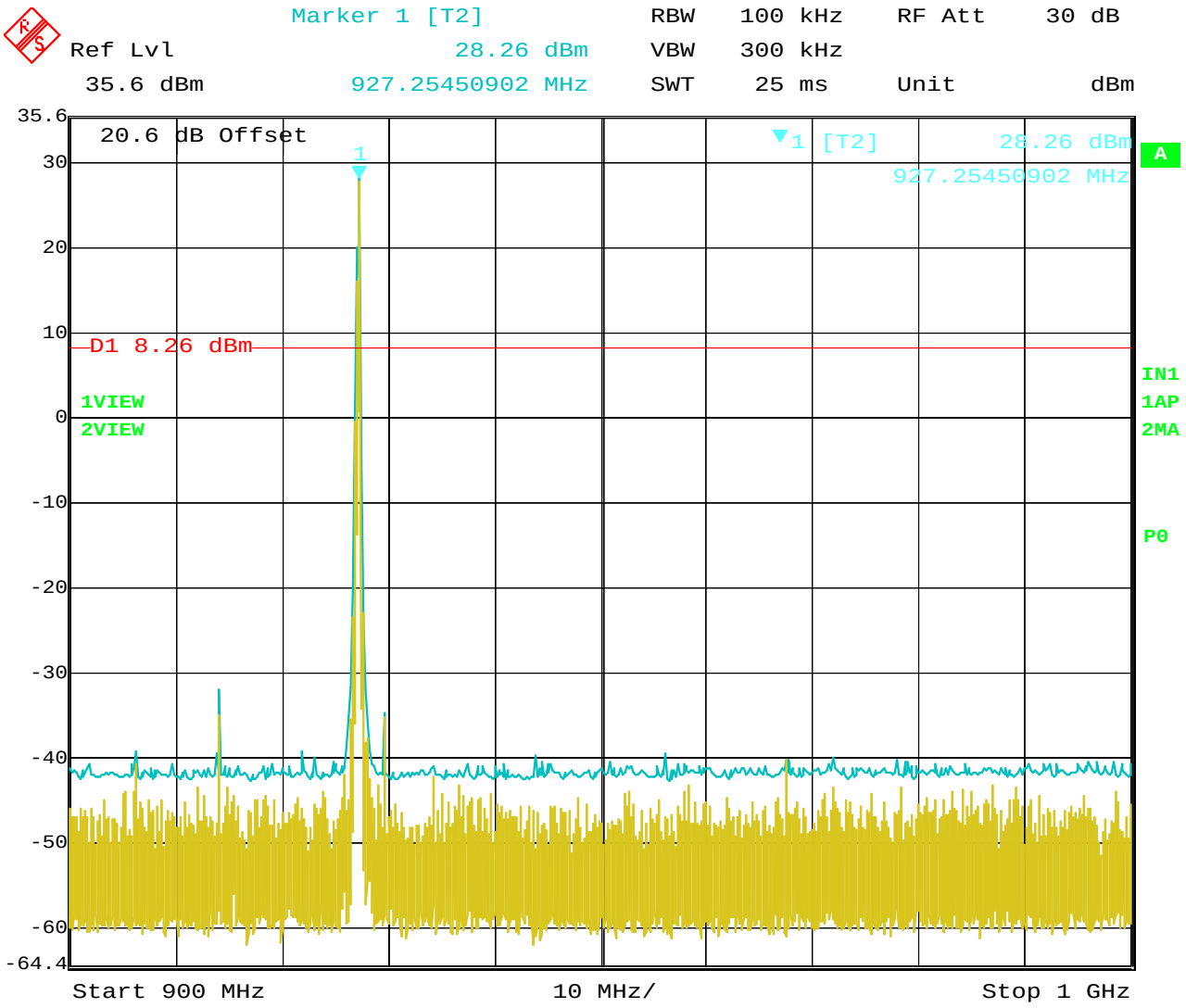
RF Antenna Conducted Test – Middle Channel – 1 GHz to 5 GHz – eNode with eMux



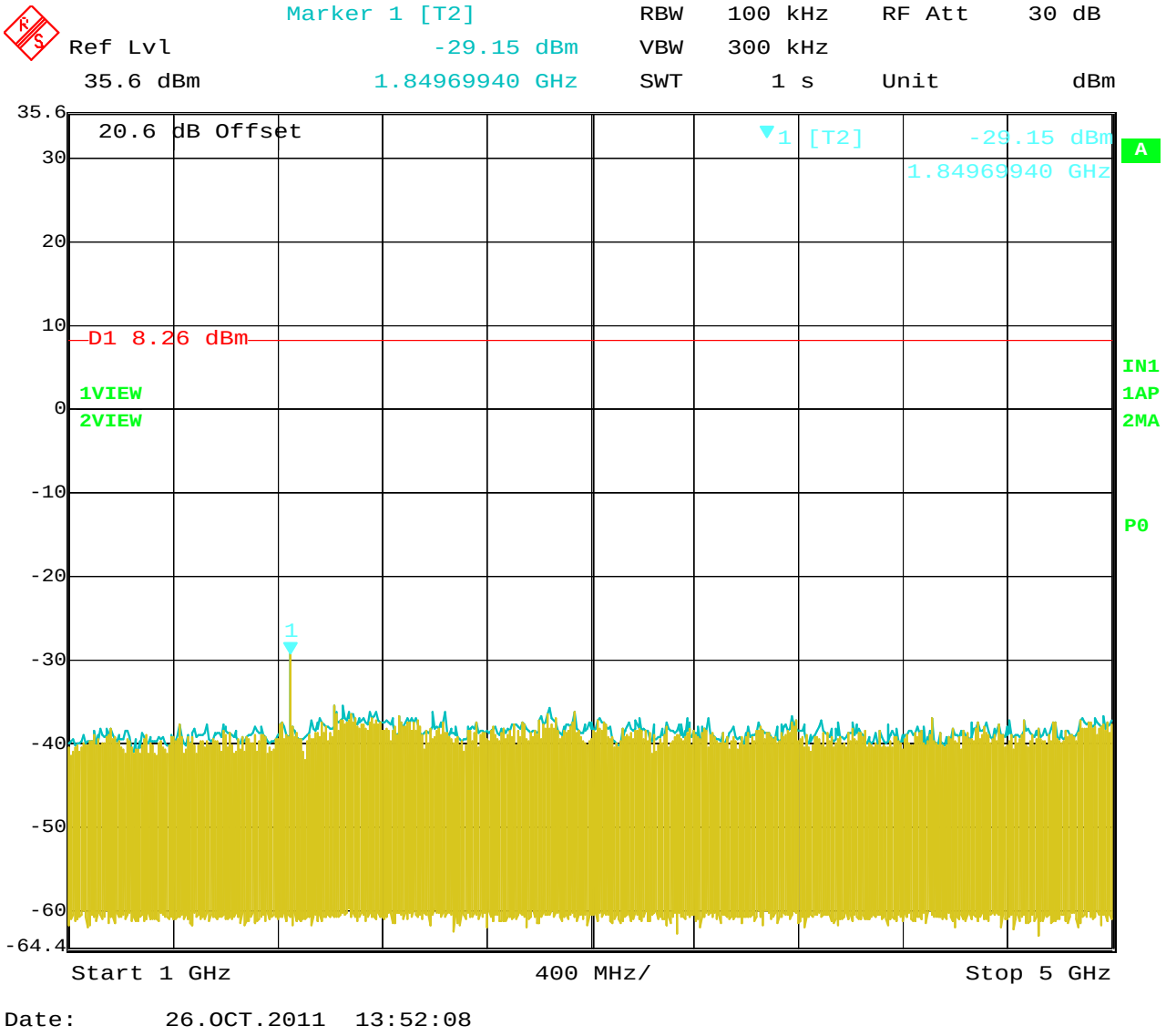
RF Antenna Conducted Test – Middle Channel – 5 GHz to 10 GHz – eNode with eMux



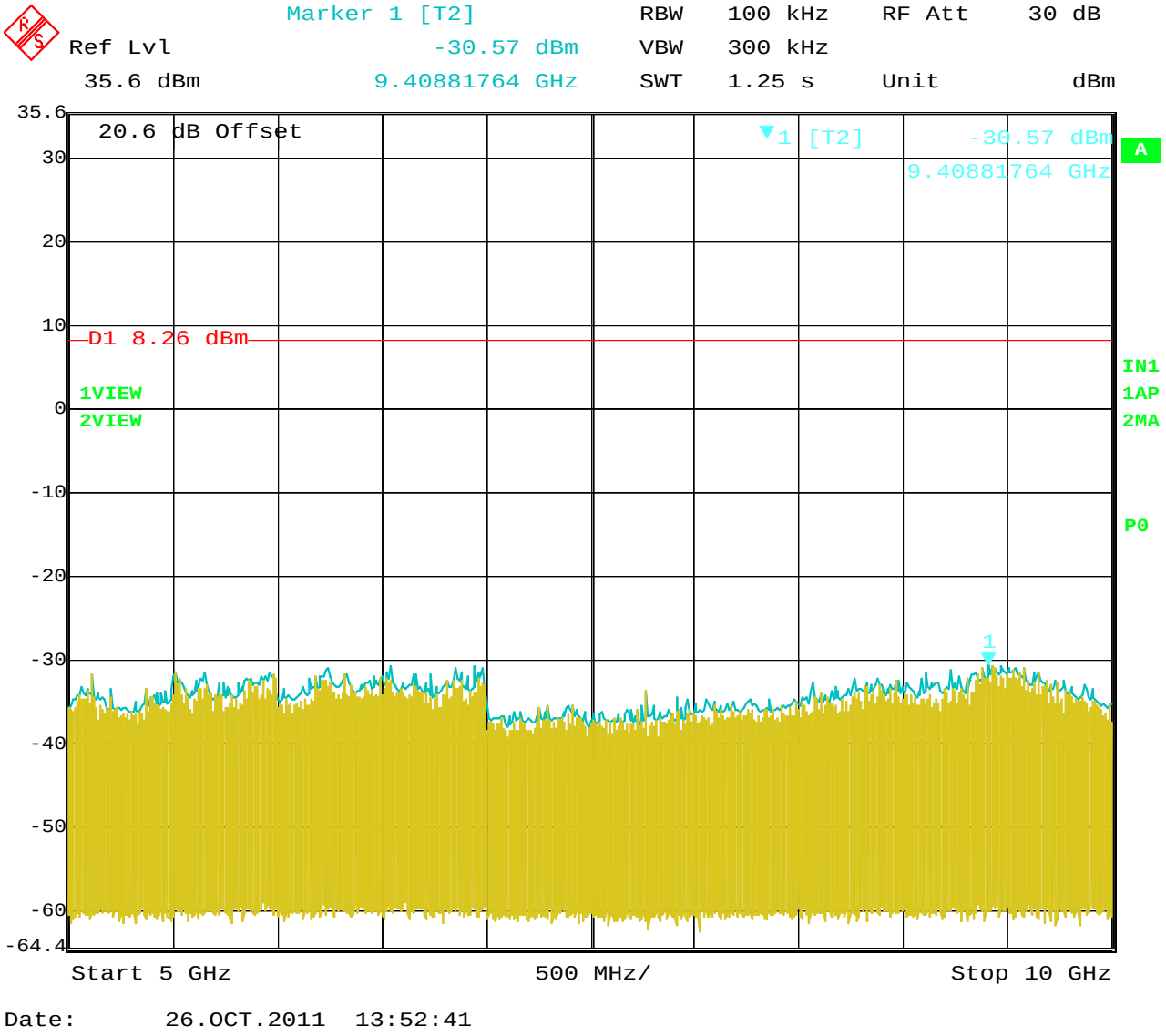
RF Antenna Conducted Test – High Channel – 2 MHz to 900 MHz – eNode with eMux



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



RF Antenna Conducted Test – High Channel – 1 GHz to 5 GHz – eNode with eMux



RF Antenna Conducted Test – High Channel – 5 GHz to 10 GHz – eNode with eMux