



Engineering Solutions & Electromagnetic Compatibility Services

FCC & IC Class 2 Permissive Change Report

**Harris Corporation
RF Communications Division
1680 University Avenue
Rochester, NY 14610**

Model: M7300 VHF Mobile Radio

**FCC ID: OWDTR-0056-E
IC: 3636B-0056**

May 3, 2013

Standards Referenced for this Report	
Part 2: 2012	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Part 22: 2012	Public Mobile Services
Part 90: 2012	Private Land Mobile Radio Services
TIA-102.CCAA August 2011	Two-Slot Time Division Multiple Access Transceiver Measurement Methods
TIA-102.CCAB October 2011	Two - Slot Time Division Multiple Access Transceiver Performance Recommendations
SRSP-500	Technical Requirements for Land Mobile and Fixed Radio Services Operating in the Bands 138-851.0125 MHz and 862.0000-174 MHz
RSS-119, Issue 11; June 2011	Radio Transmitters and Receivers Operating in the Land Mobile and Fixed Services in the Frequency Range 27.41-960 MHz
TIA-EIA-603-C August 2004	Land Mobile FM or PM Communications Equipment – Measurement and Performance Standards

Report Prepared By: Daniel Baltzell

Document Number: 2013007

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These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by ANSI-ASQ National Accreditation Board/ACLASS. Refer to certificate and scope of accreditation AT-1445.

Frequency Range (MHz)	Rated Transmit Power (W) (Conducted)	Frequency Tolerance (ppm)	Emission Designator (Transmit Mode)
136-150 (Federal) 150-174 (FCC Part 22/90) 138-174 (IC)	110.0	0.18	8K10DXW
136-150 (Federal) 150-174 (FCC Part 22) 138-174 (IC)	110.0	0.18	16K0F3E (WB Analog Voice)
136-150 (Federal) 150-174 (FCC Part 22/90) 138-174 (IC)	110.0	0.18	11K0F3E (NB Analog Voice)
136-150 (Federal) 150-174 (FCC Part 22/90) 138-174 (IC)	110.0	0.18	9K90F1D (2 level NB 9600 FSK)
136-150 (Federal) 150-174 (FCC Part 22/90) 138-174 (IC)	110.0	0.18	9K90F1E (2 level NB 9600 FSK)
136-150 (Federal) 150-174 (FCC Part 22/90) 138-174 (IC)	110.0	0.18	7K10F1D (2 level NB 4800 FSK)
136-150 (Federal) 150-174 (FCC Part 22/90) 138-174 (IC)	110.0	0.18	7K10F1E (2 level NB 4800 FSK)
136-150 (Federal) 150-174 (FCC Part 22/90) 138-174 (IC)	110.0	0.18	8K40F1D (OpenSky/TDMA)
136-150 (Federal) 150-174 (FCC Part 22/90) 138-174 (IC)	110.0	0.18	8K40F1E (OpenSky/TDMA)
136-150 (Federal) 150-174 (FCC Part 22/90) 138-174 (IC)	110.0	0.18	8K40F1D (P25)
136-150 (Federal) 150-174 (FCC Part 22/90) 138-174 (IC)	110.0	0.18	8K40F1E (P25)

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1 Test Result Summary

Test	FCC Reference	IC Reference	Result
RF Power Output	2.1046(a), 90.541(b), 90.542(a)(6), 22.659	RSS-119 5.4	Complies
Conducted Spurious Emissions	2.1046(a), 90.541(b), 90.542(a)(6), 22.359	RSS-119 5.4	Complies
Occupied Bandwidth/Emission Masks	2.1049(c)(1), 90.543(d), 22.359(b)	RSS-119 5.5, 5.8	Complies

2 General Information

The following Class 2 Permissive Change Report is prepared on behalf of Harris Corporation in accordance with the Federal Communications Commission and Industry Canada rules and regulations. The Equipment Under Test (EUT) was M7300 VHF Radio; FCC ID: OWDTR-0056-E, IC: 3636B-0056.

The purpose of this Class 2 Permissive Change is to add emission designator 8K10DXW (H-CPM TDMA) and FCC Part 22 operations.

All measurements contained in this application were conducted in accordance with the applicable sections of FCC Rules and Regulations CFR 47 Parts 2 and 90. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

2.1 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the parking lot of Rhein Tech Laboratories, Inc. 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report submitted to, and approved by, the Federal Communications Commission to perform AC line conducted and radiated emissions testing.

2.2 Related Submittal(s)/Grant(s)

The original FCC and IC certifications were granted on February 1, 2012; FCC Class II permissive changes were granted on June 27, 2012 and August 1, 2012. The model name as registered with IC is M7300, 136-174 MHz, 110 W.

2.3 Grant Notes

Power is continuously variable from 50 - 110 W. The grant listed power is rated power.

2.4 Tested System Details

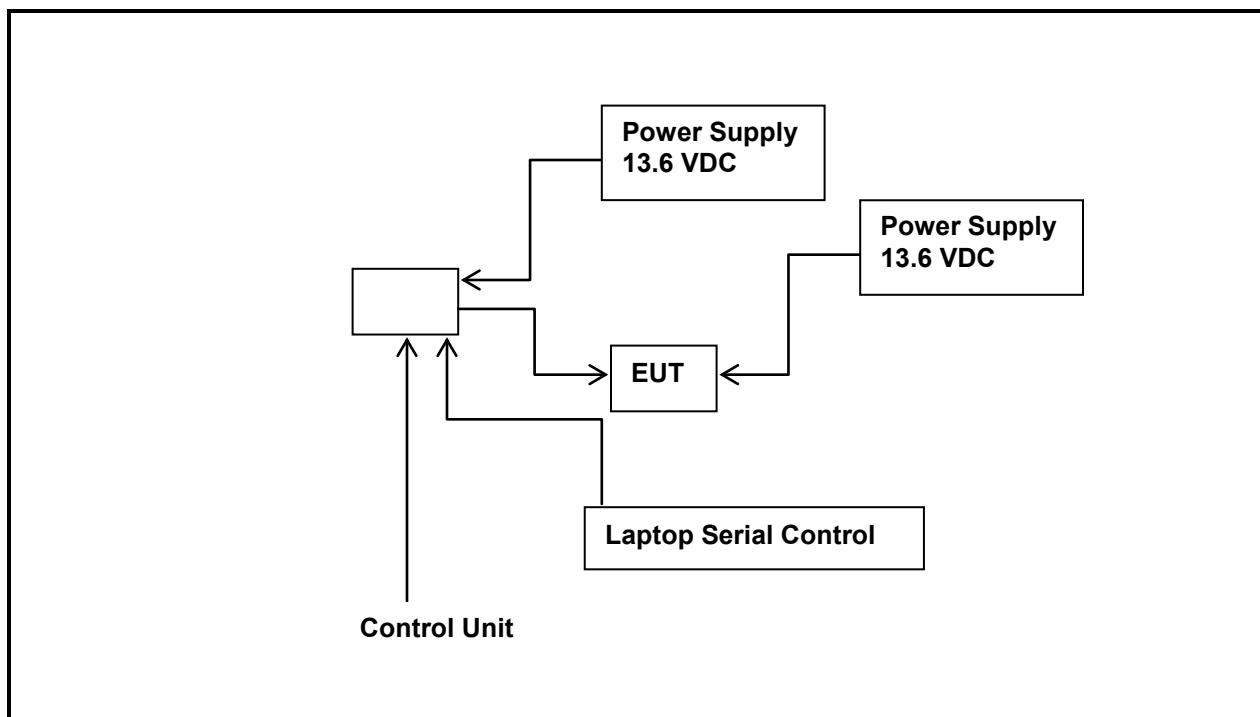
The test sample was received on January 14, 2013. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

The device was programmed for multiple test patterns using the H-CPM TDMA mode. All test patterns were investigated and found to be nearly identical from an emissions perspective. Modes for Part 22 operation were also provided.

Table 2-1: Equipment Under Test (EUT)

Part	Manufacturer	Model	PN/SN	FCC ID	RTL Bar Code
M7300 VHF Radio	Harris Corporation	MAMW-SHHXX	RU144750-051	OWDTR-0056-E	20963

Figure 2-1: Configuration of Tested System



3 FCC §2.1046(a); §22.659; §90.1215(a); IC RSS-119 5.4: Peak Output Power

3.1 Test Procedure

TIA-102.CCAA August 2011, section 2.2.1, TIA-102.CCAB October 2011, section 3.2.1

The EUT was connected via an appropriate 50 ohm attenuator to a signal analyzer. Attenuator loss was accounted for.

3.2 Test Data

Table 3-1: RF Power Output: Modulated Carrier Output Power

Frequency (MHz)	High Power (dBm)	High Power (W)	Low Power (dBm)	Low Power (W)
136.0125	50.6	113.4	47.3	53.7
152.015	49.6	91.2	47.2	52.5
154.0125	50.6	114.0	47.3	53.7
158.710	50.1	102.3	47.3	53.7
173.0125	50.4	110.2	47.3	53.7

Table 3-2: RF Power Output (Rated Power)

Frequency (MHz)	High Power Rated (W)
136-174	110

Table 3-3: Test Equipment Used for Testing RF Power Output – Conducted

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	1166.1660.50	Spectrum Analyzer	2001006	6/3/13
901593	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36"	NA	8/16/13
901291	Pasternack	PE7031-20	300W Attenuator, DC - 1 GHz, 20 dB	NA	7/15/13
901536	Aeroflex	48-40-34	40 dB Attenuator	CB6627	10/14/13

Test Personnel:

Daniel Baltzell
EMC Test Engineer



Signature

March 14, 2013
Date of Test

4 FCC §2.1051: Conducted Spurious Emissions; §90.210: Emissions Masks; §22.359: Emissions Limitations; RSS-119 §4.2: Transmitter Unwanted Emissions

4.1 Test Procedure

TIA-102.CCAA August 2011, section 2.2.7, TIA-102.CCAB October 2011, section 3.2.7

The transmitter was interfaced with a spectrum analyzer through an appropriate 50 ohm attenuator. The transmitter was operated at maximum power. Attenuator losses were accounted for.

4.2 Test Data

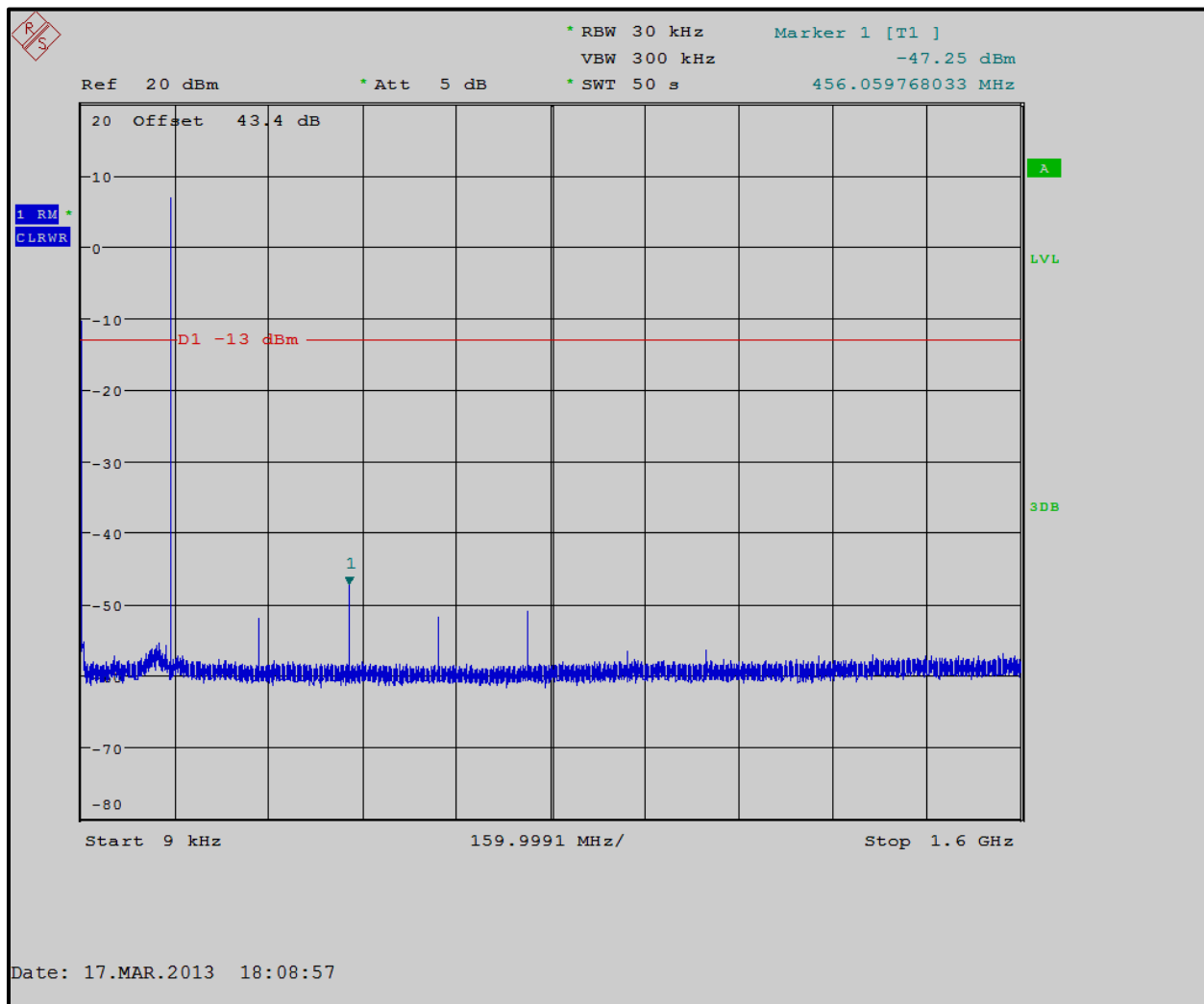
Frequency range of measurement per Part 2.1057: 9 kHz to $10 \times F_c$.

Limit: $P(\text{dBm}) - (50 + 10 \times \text{LOG } P(\text{W}))$

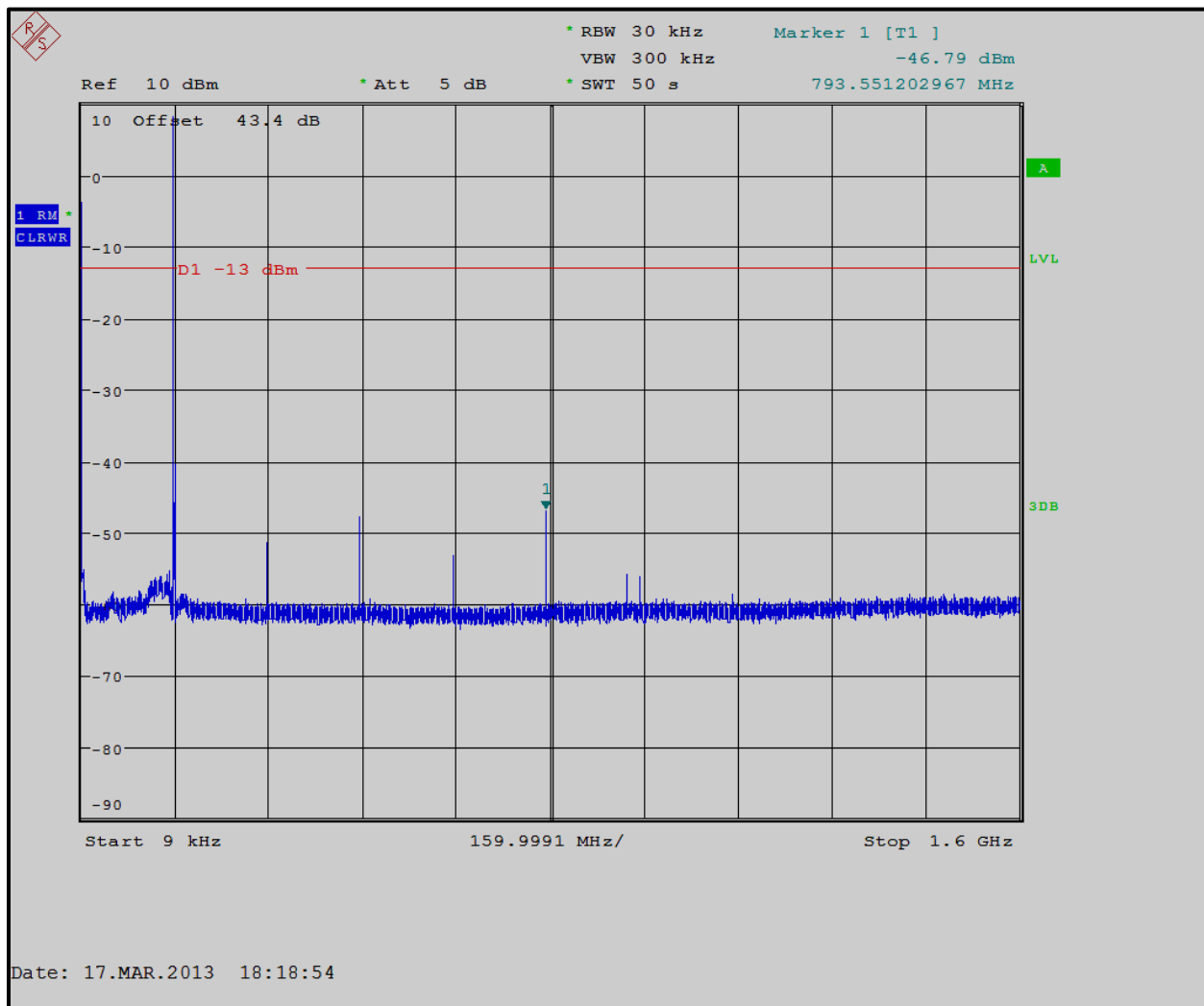
Limit = $43 + 10 \text{ Log } (P) \text{ dB}$ or 70 dB, whichever is greater (Part 22)

The worst case (unwanted emissions) channels are shown. Per FCC 2.1051, the magnitude of emissions attenuated more than 20 dB below the FCC limit need not be recorded.

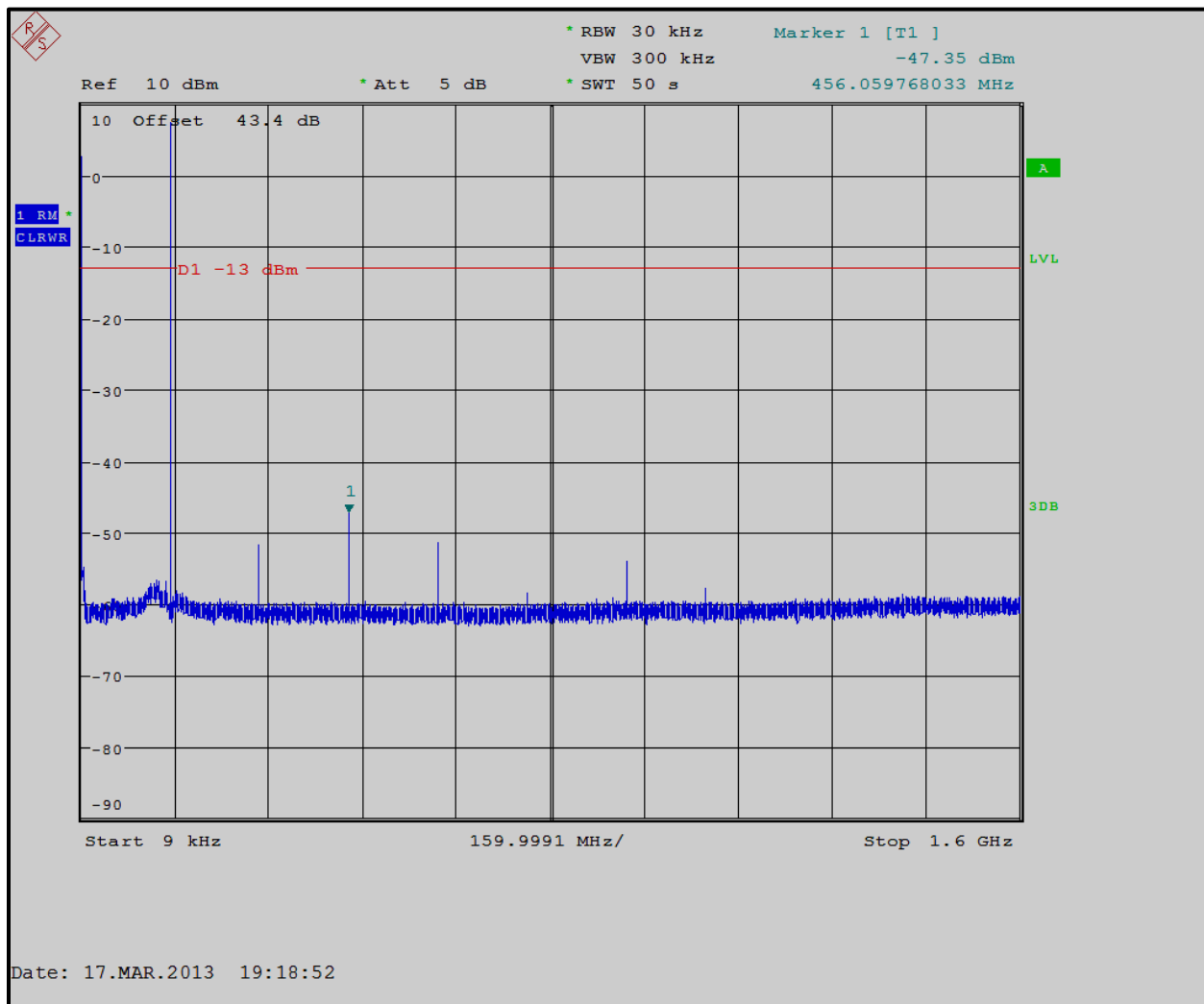
Plot 4-1: Conducted Spurious Emissions – 152.015 MHz; H-CPM TDMA (Part 22)



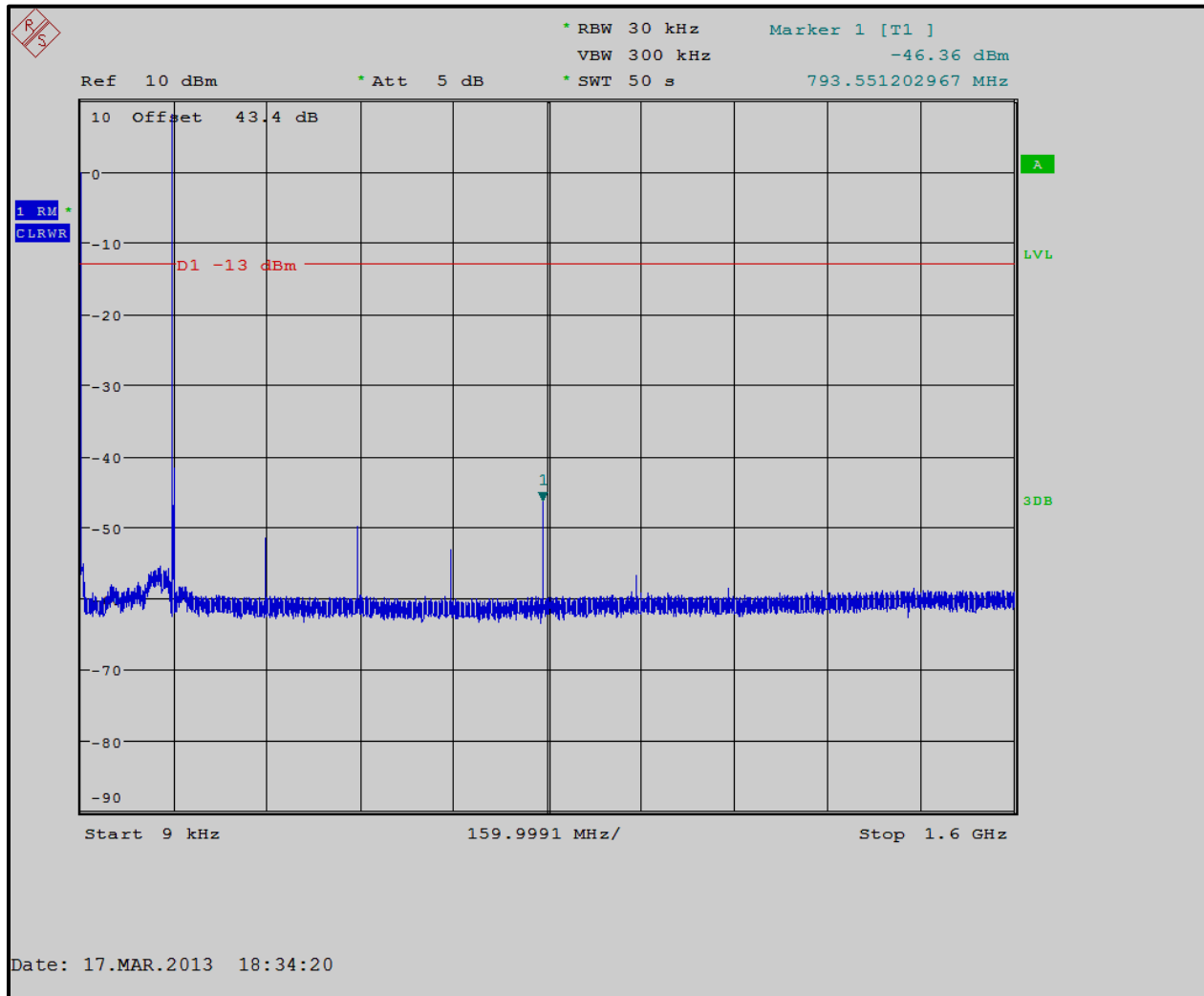
Plot 4-2: Conducted Spurious Emissions - 158.710 MHz; H-CPM TDMA (Part 22)



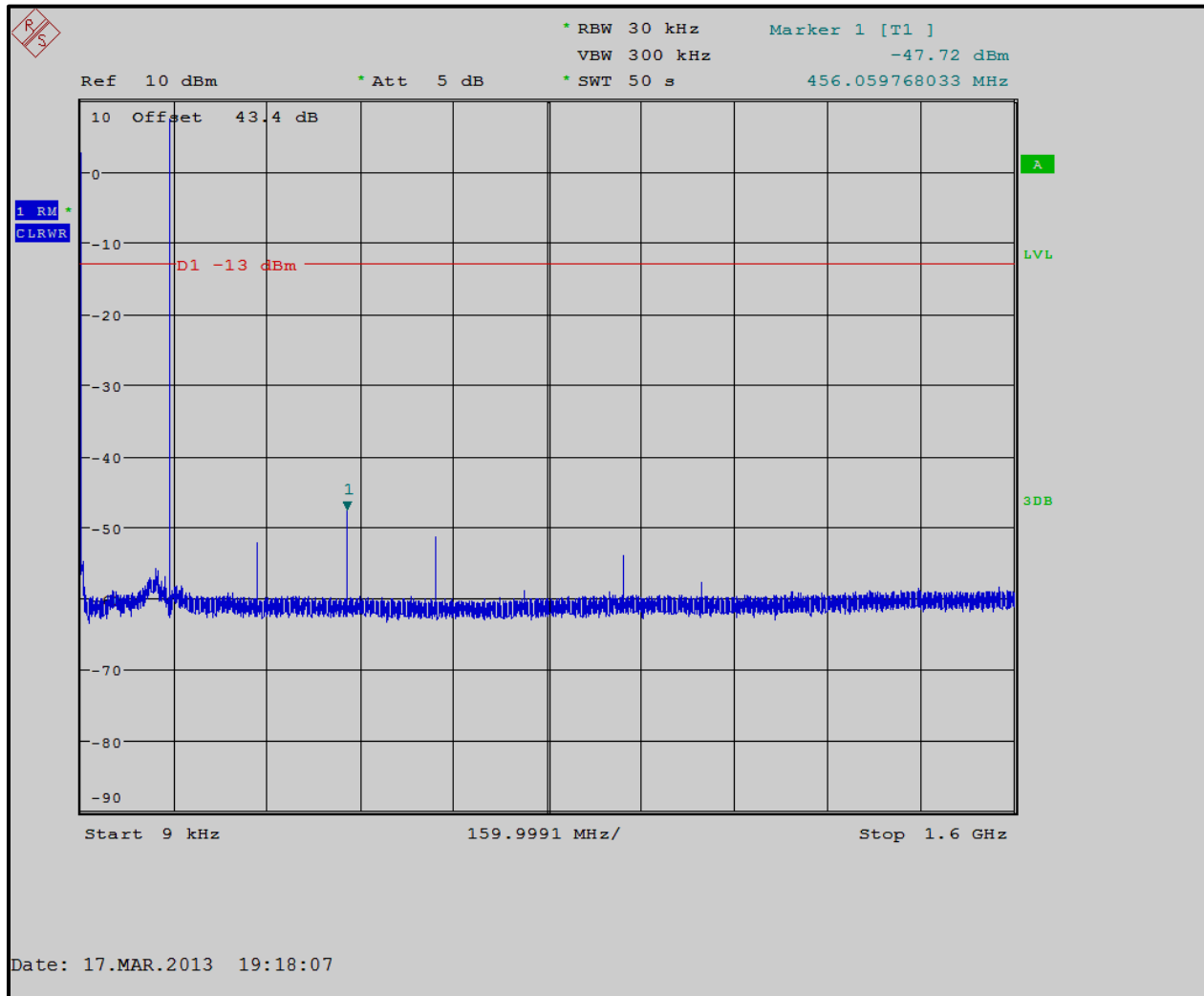
Plot 4-3: Conducted Spurious Emissions – 152.015 MHz; WB Analog (Part 22)



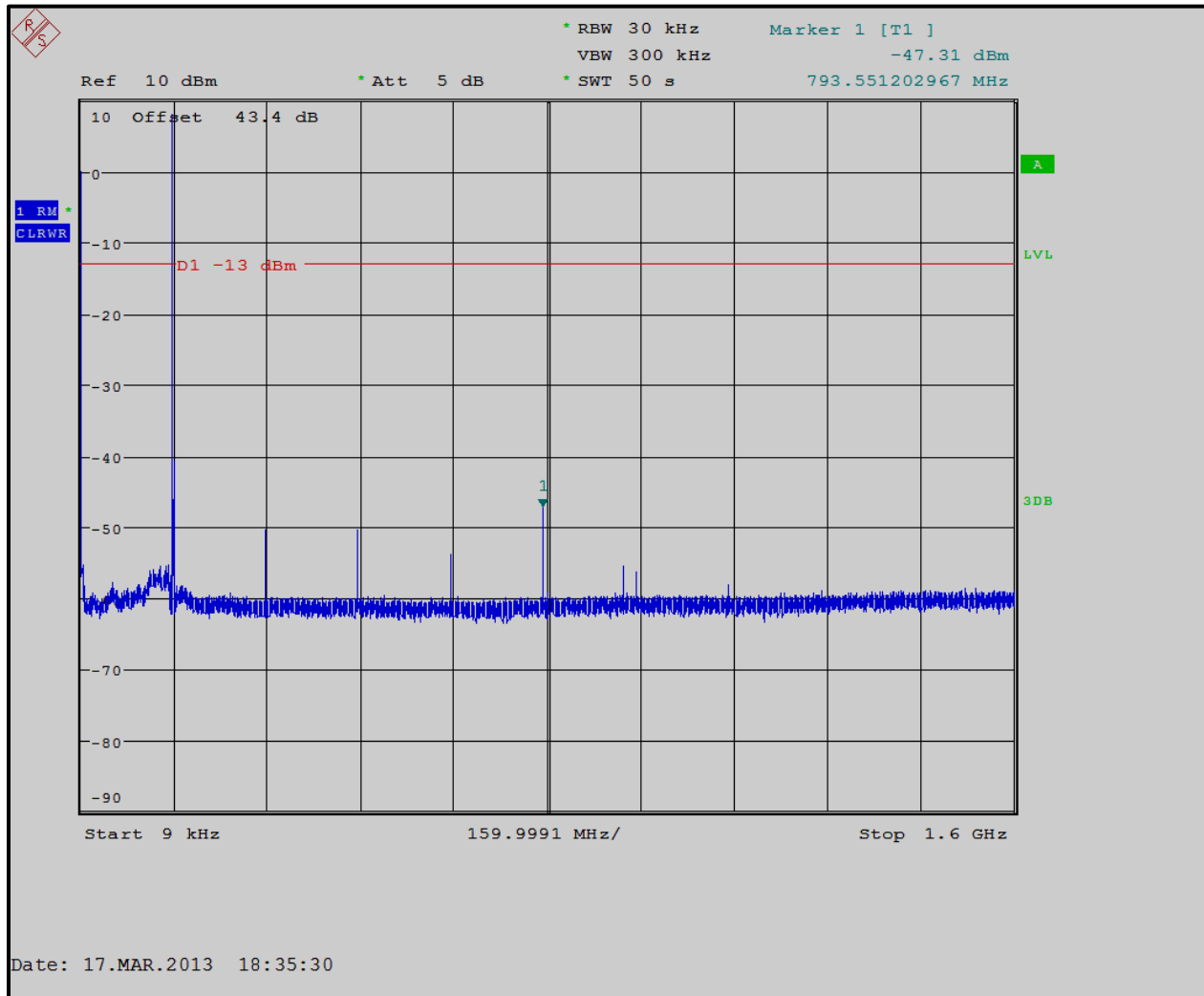
Plot 4-4: Conducted Spurious Emissions - 158.710 MHz; WB Analog (Part 22)



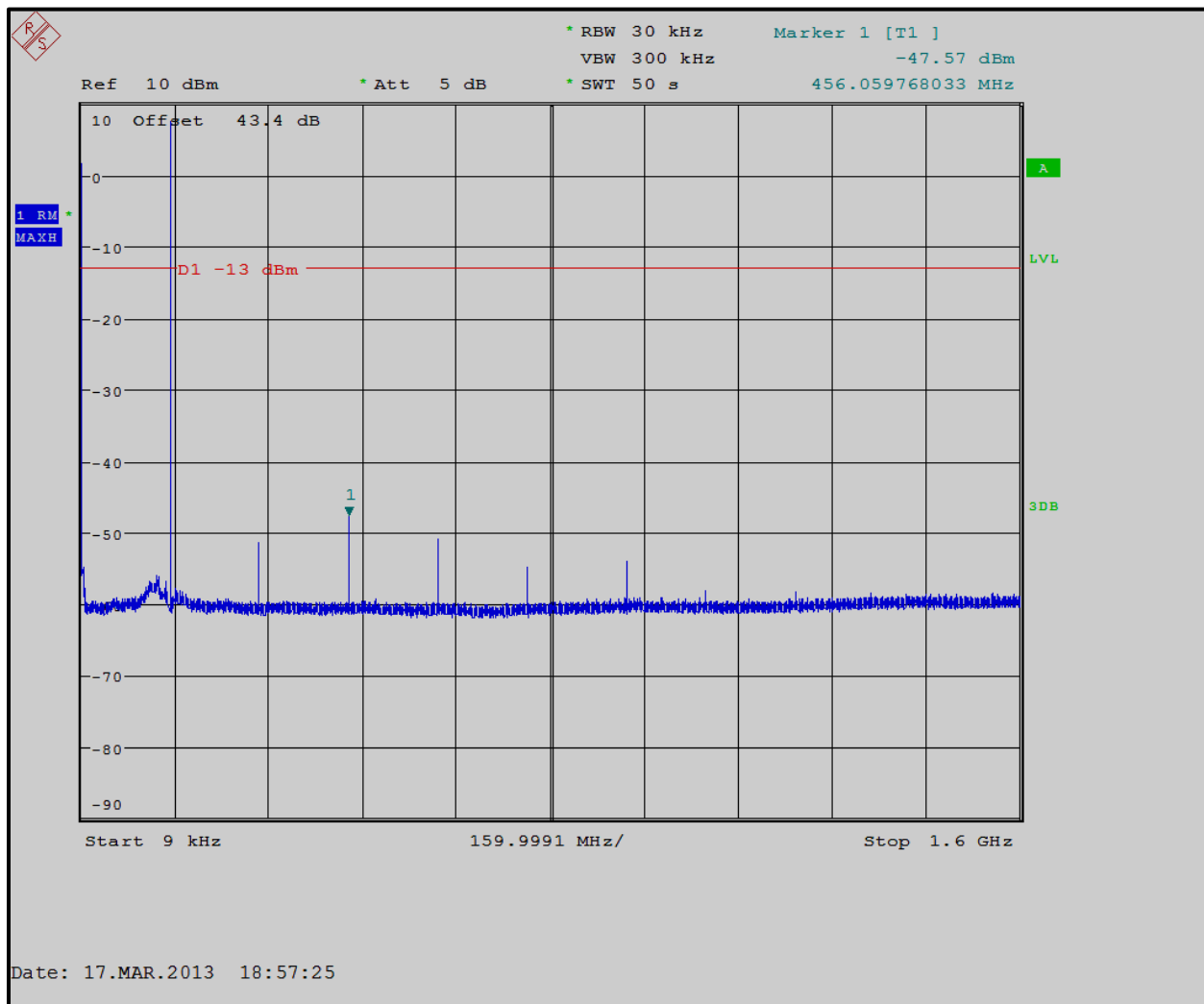
Plot 4-5: Conducted Spurious Emissions – 152.015 MHz; NB Analog (Part 22)



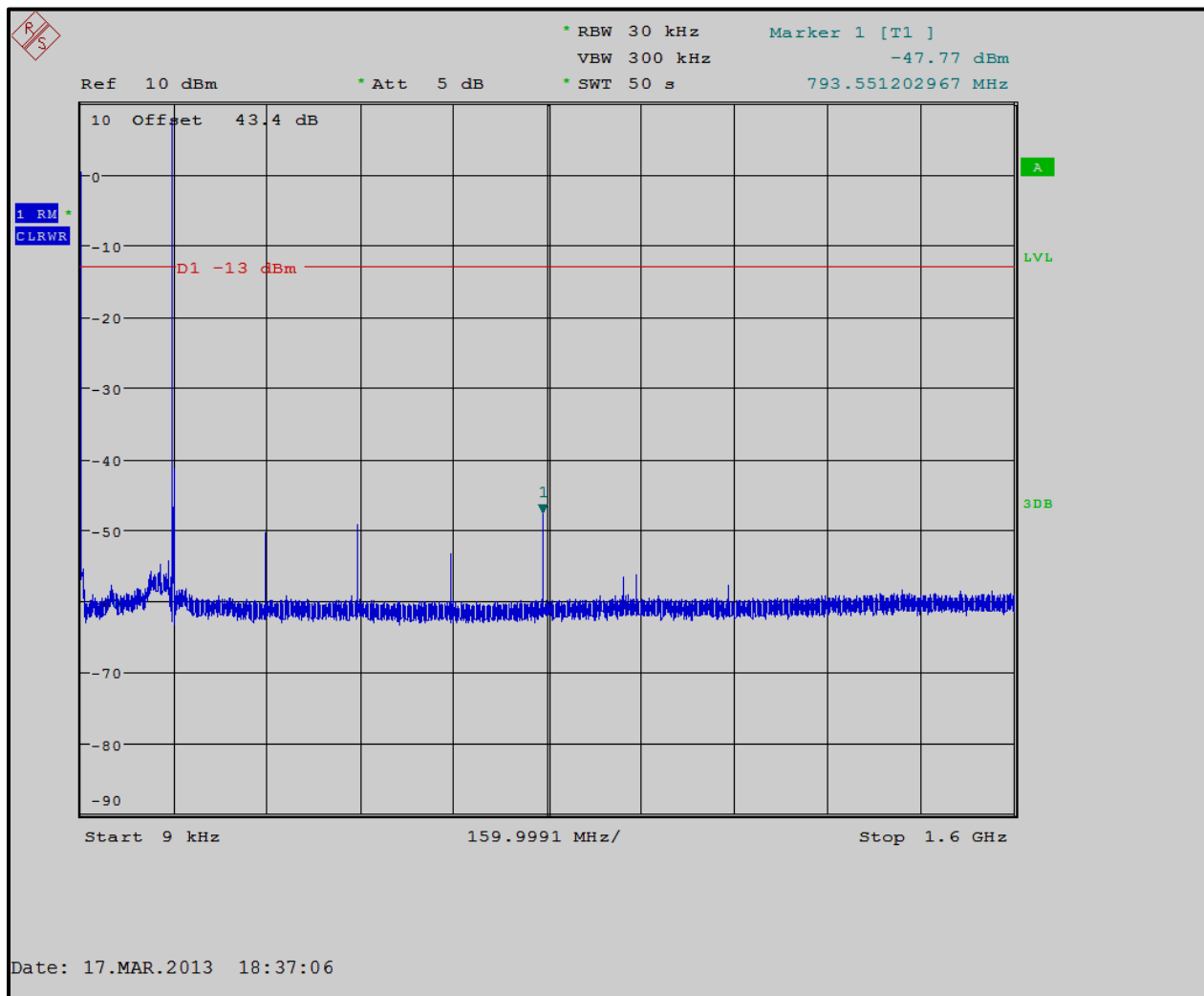
Plot 4-6: Conducted Spurious Emissions - 158.710 MHz; NB Analog (Part 22)



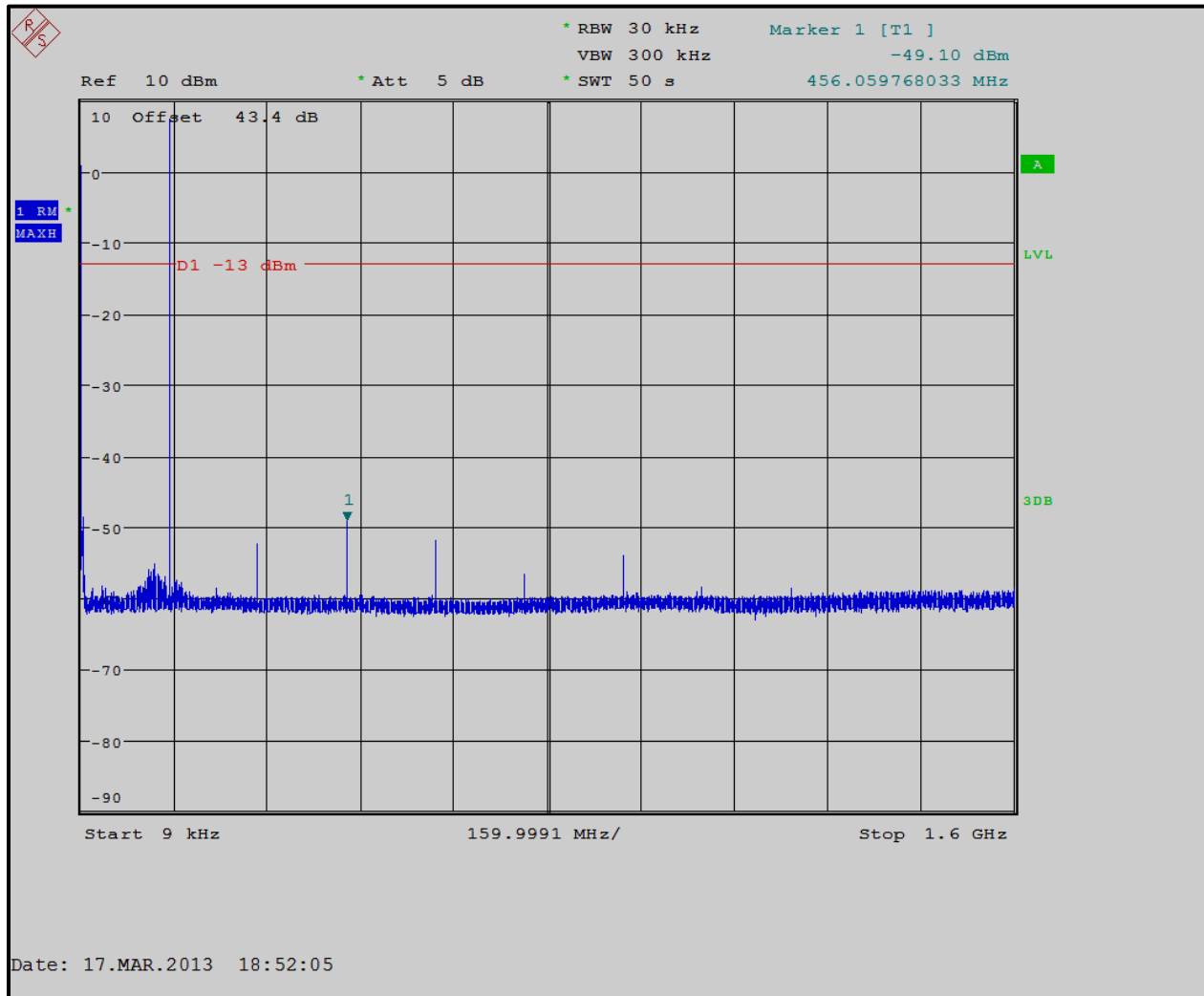
Plot 4-7: Conducted Spurious Emissions – 152.015 MHz; 2 Level NB 4800 FSK (Part 22)



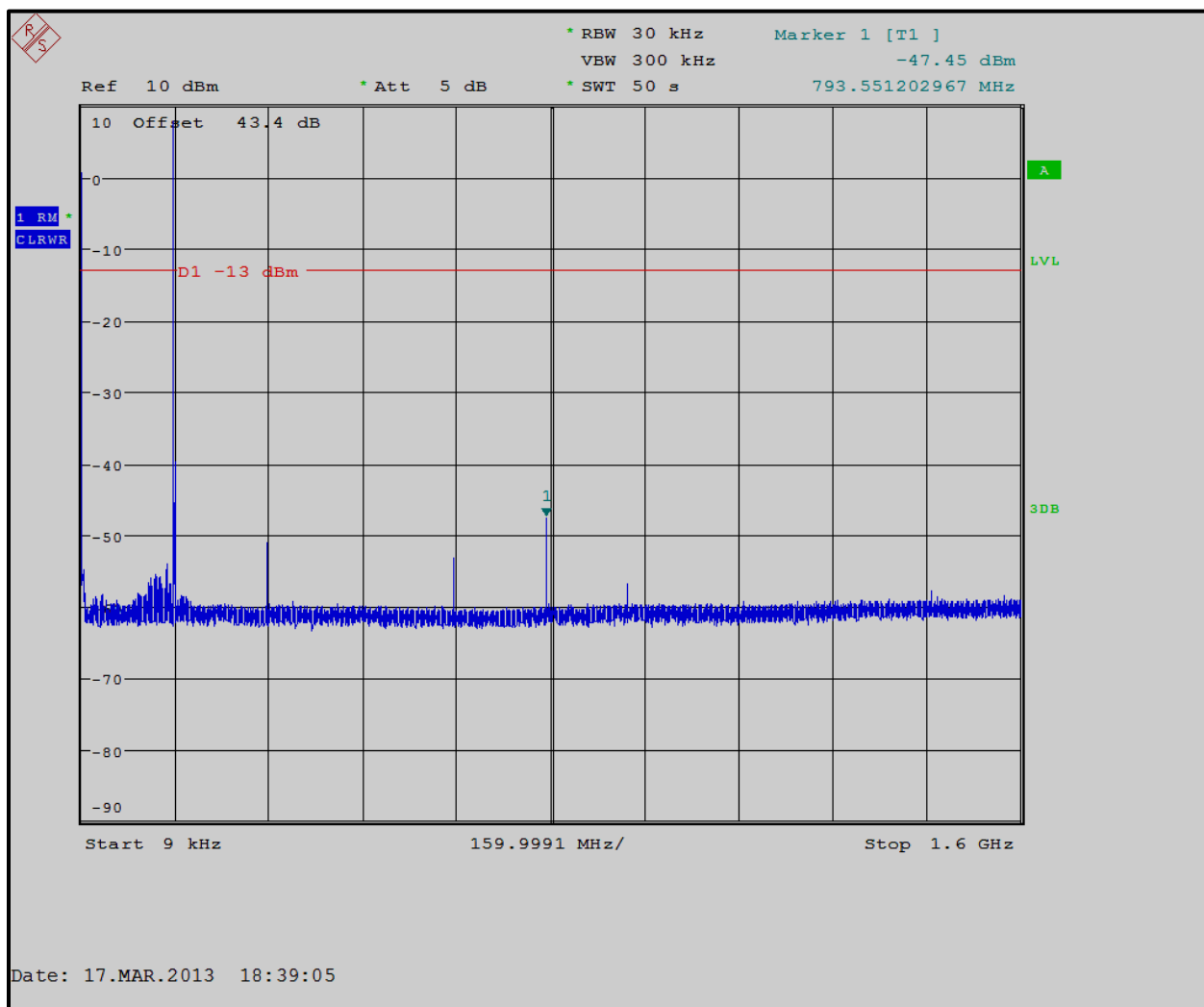
Plot 4-8: Conducted Spurious Emissions - 158.710 MHz; 2 Level NB 4800 FSK (Part 22)



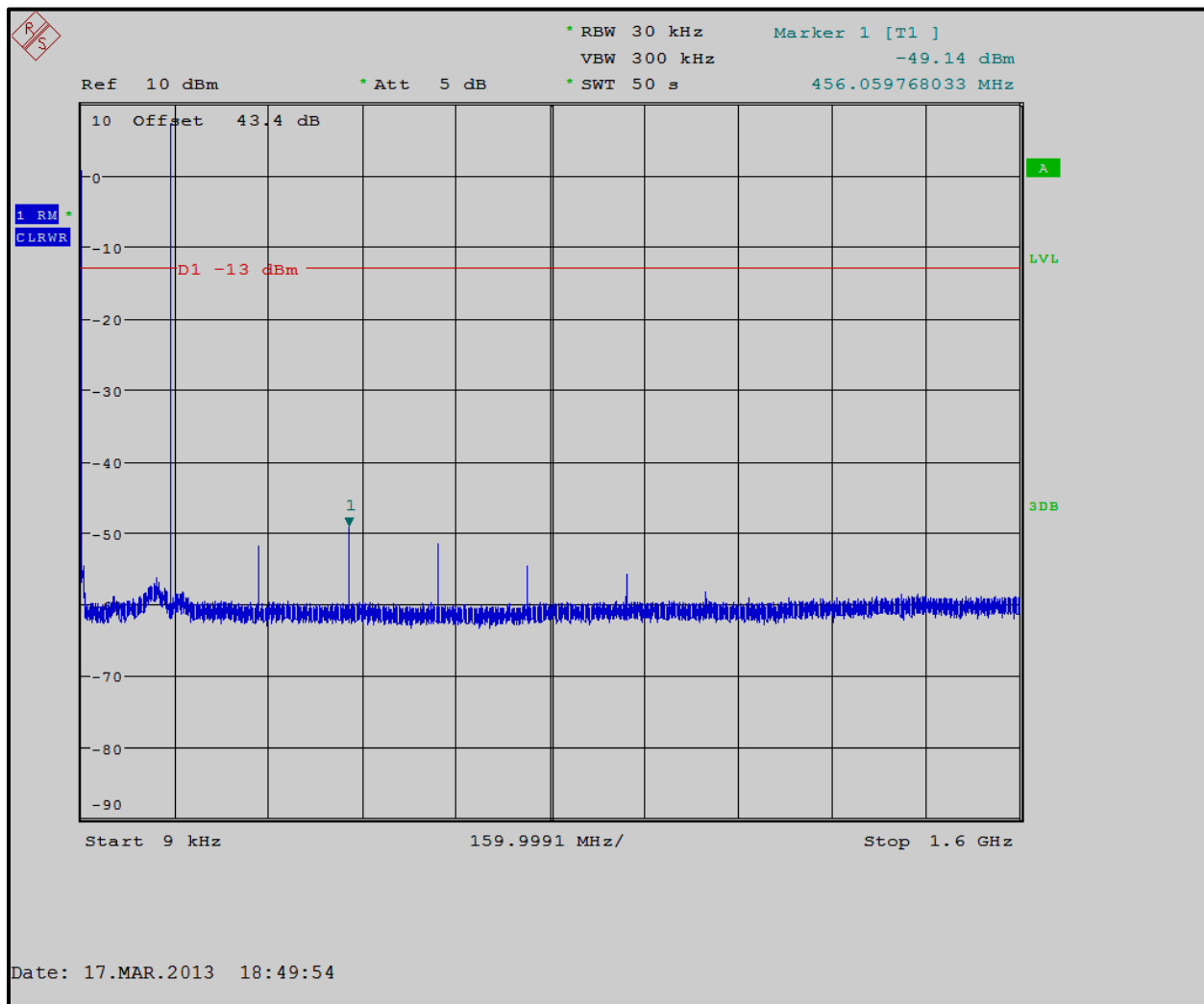
Plot 4-9: Conducted Spurious Emissions – 152.015 MHz; NB Open Sky/TDMA (Part 22)



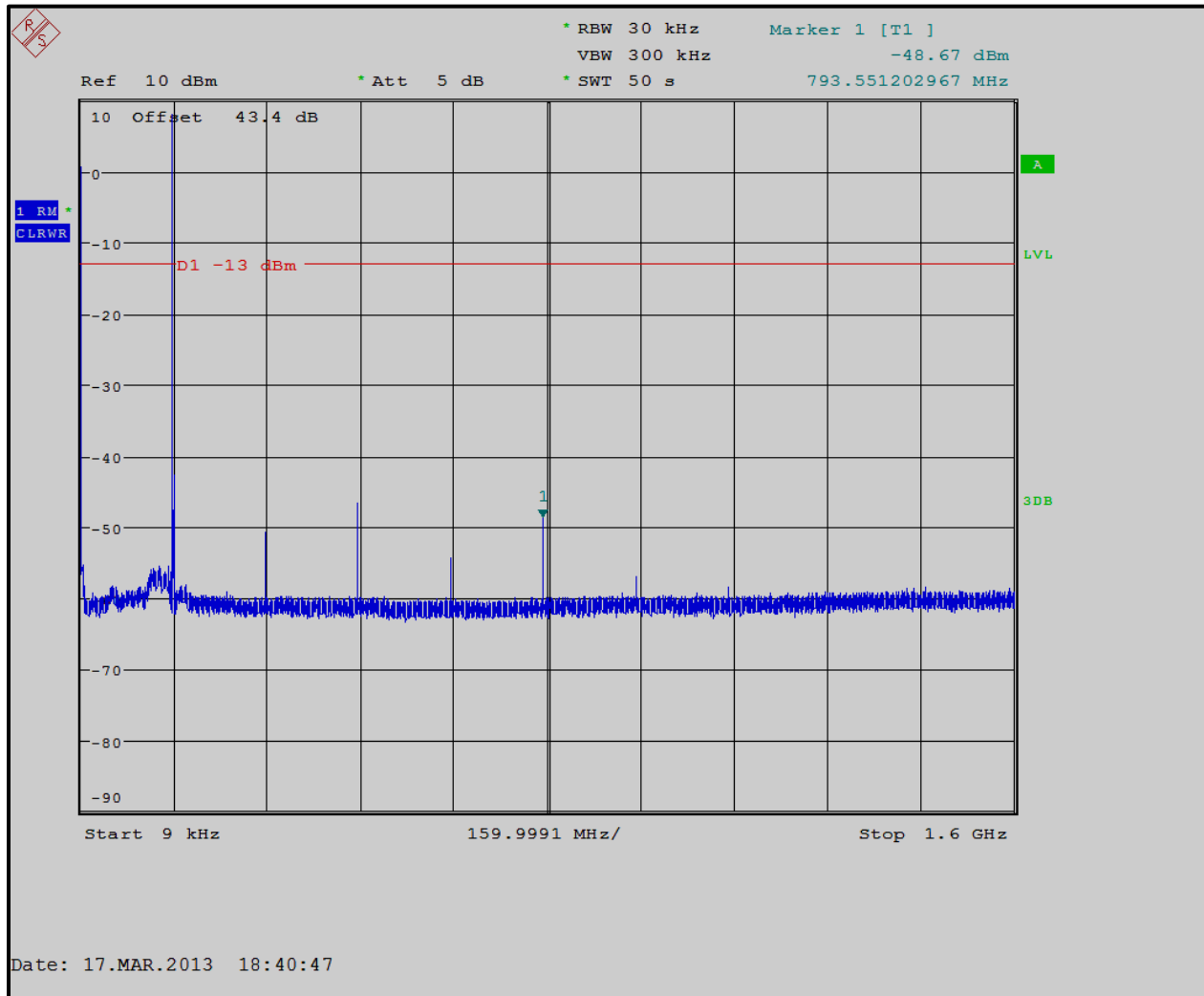
Plot 4-10: Conducted Spurious Emissions - 158.710 MHz; NB Open Sky/TDMA (Part 22)



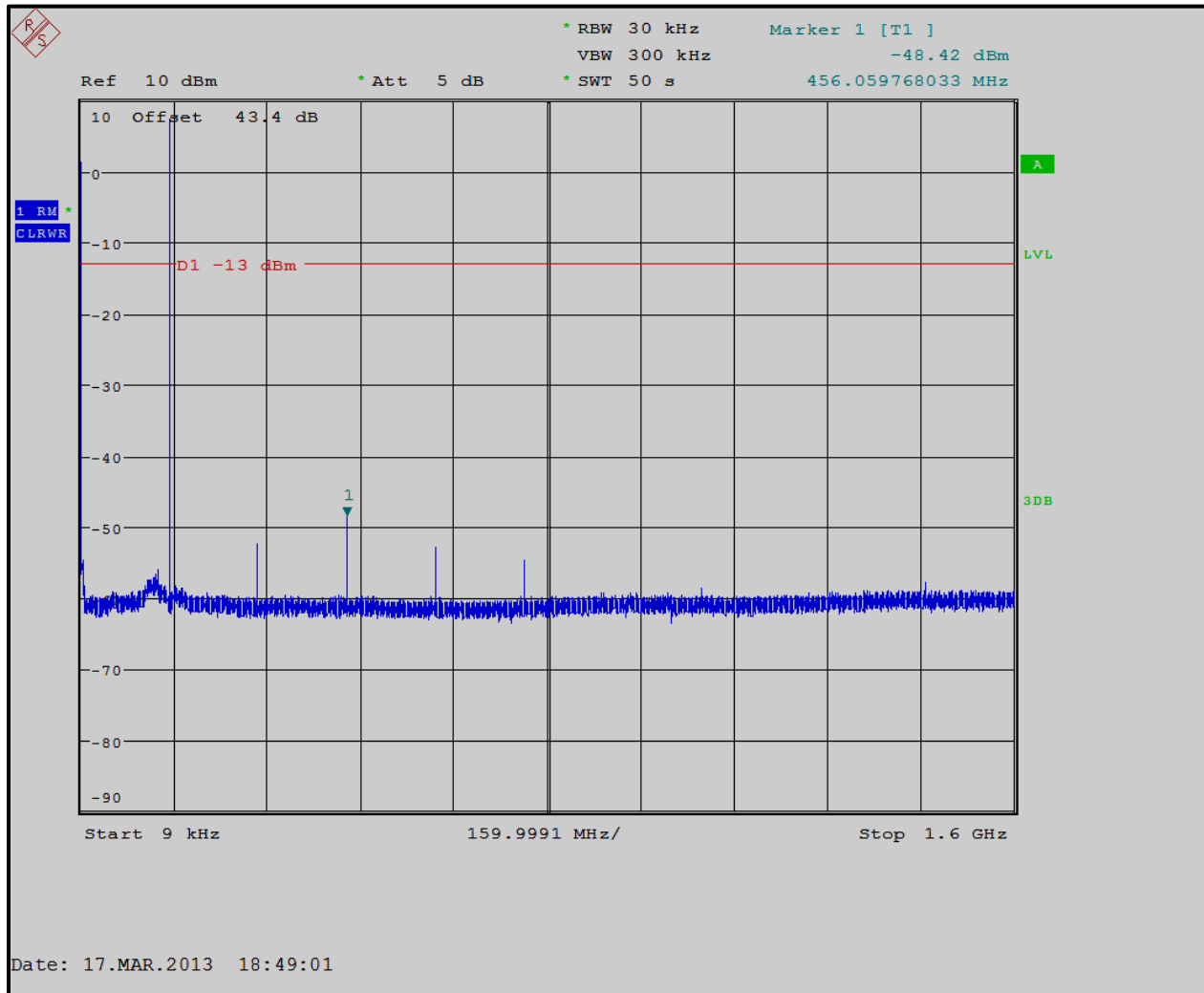
Plot 4-11: Conducted Spurious Emissions – 152.015 MHz; P25 (Part 22)



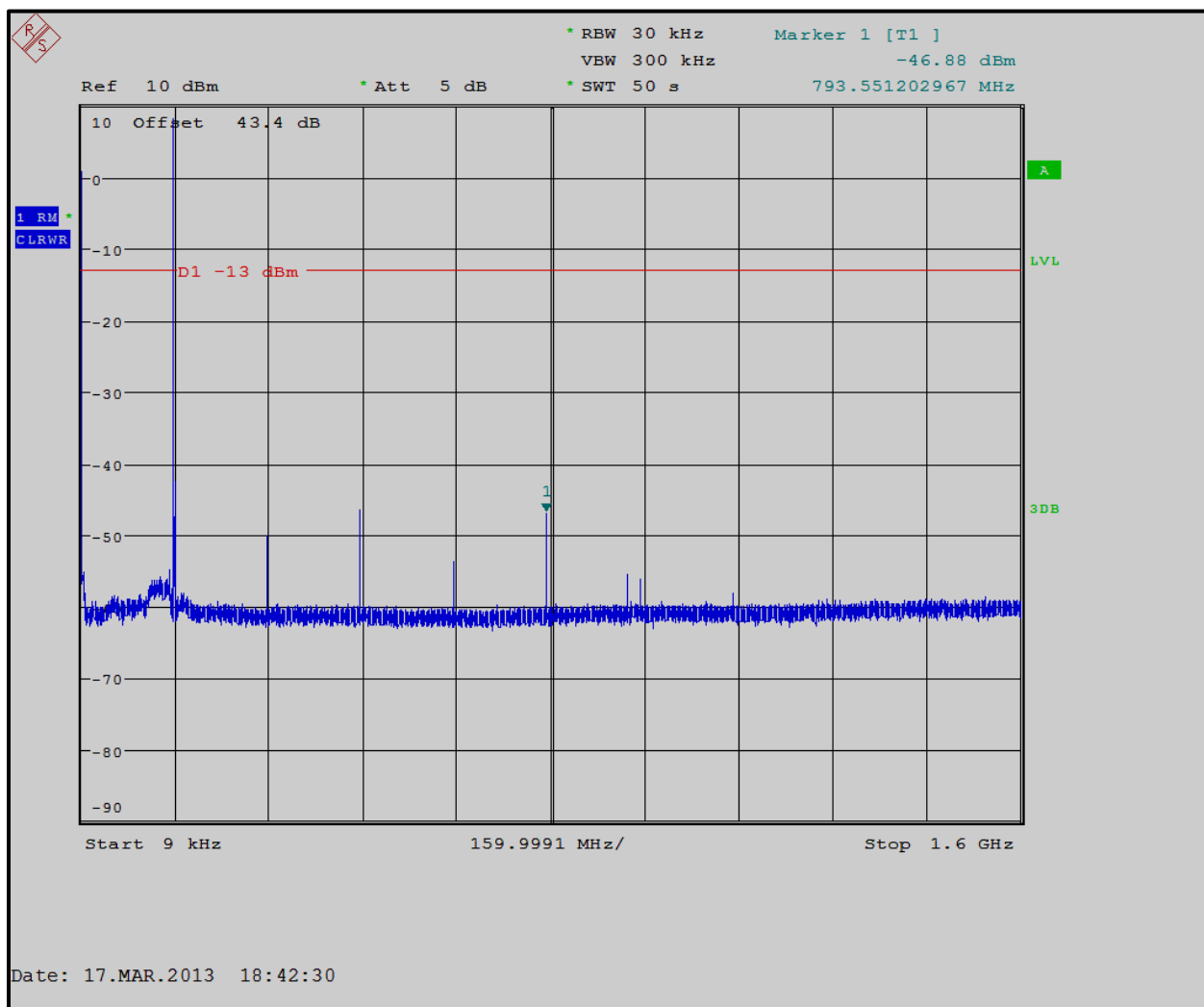
Plot 4-12: Conducted Spurious Emissions - 158.710 MHz; P25 (Part 22)



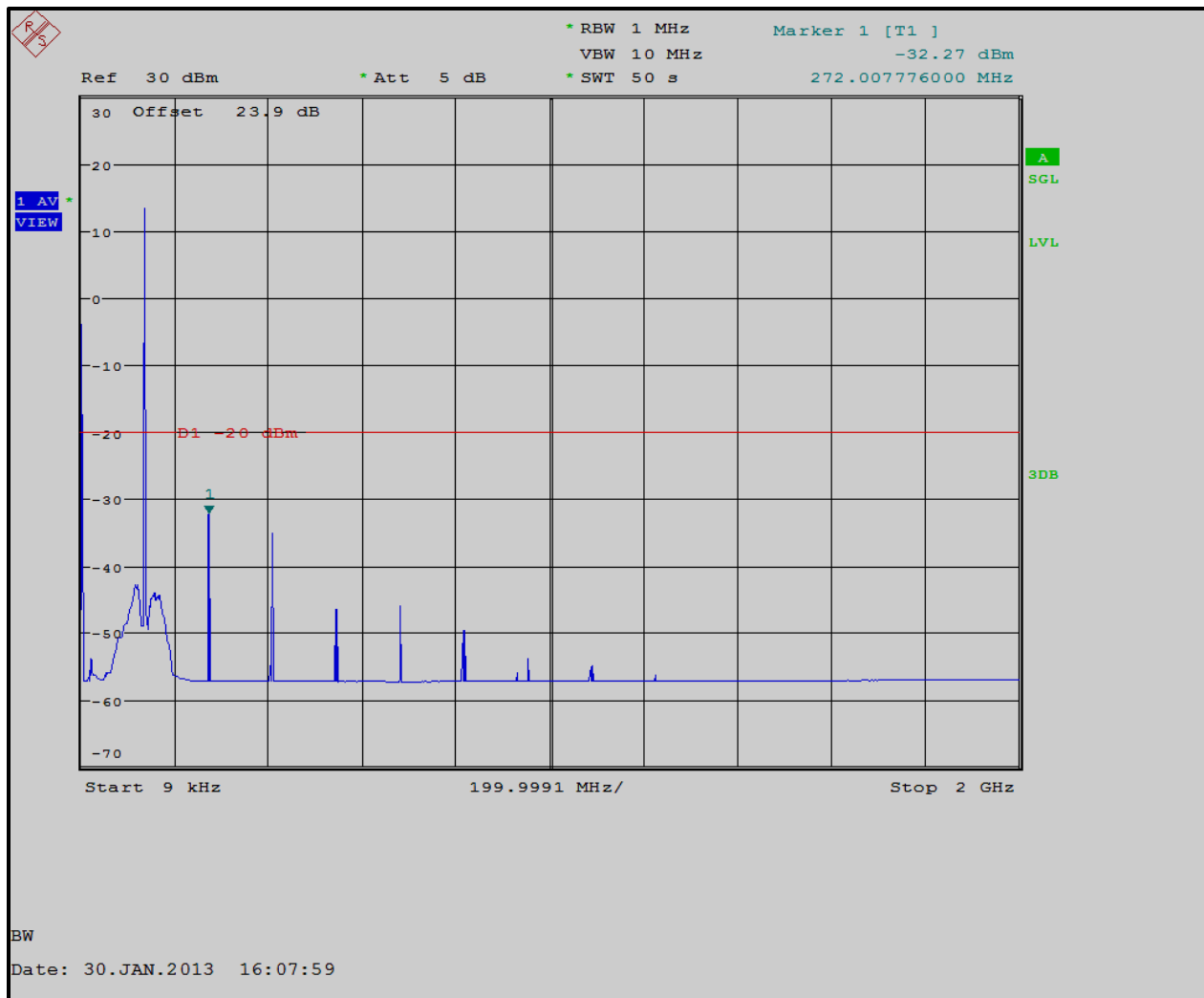
Plot 4-13: Conducted Spurious Emissions – 152.015 MHz; 2 Level NB 9600 FSK (Part 22)



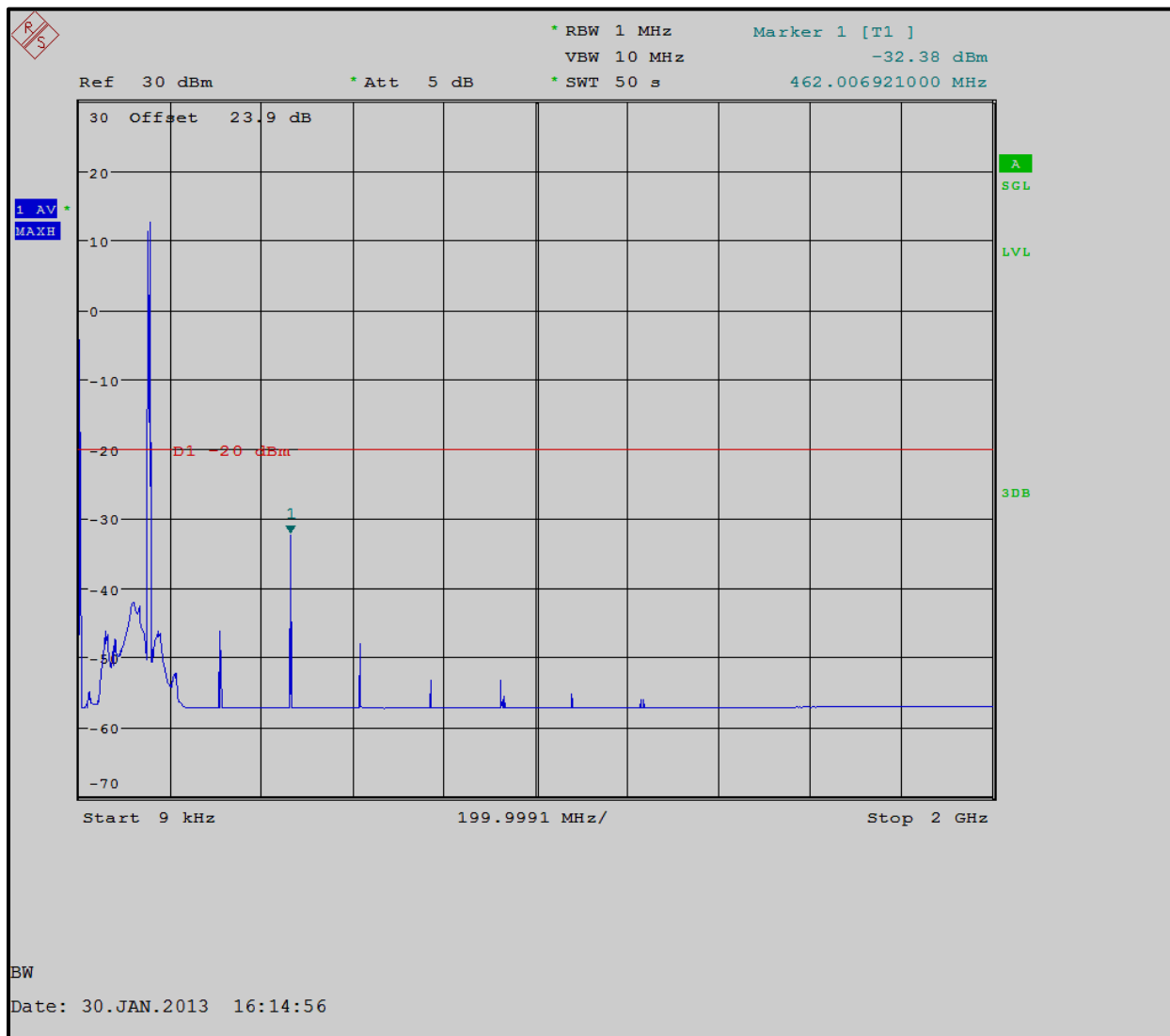
Plot 4-14: Conducted Spurious Emissions - 158.710 MHz; 2 Level NB 9600 FSK (Part 22)



Plot 4-15: Conducted Spurious Emissions – H-CPM TDMA; 136.0125 MHz



Plot 4-16: Conducted Spurious Emissions – H-CPM TDMA; 154.0125 MHz



Plot 4-17: Conducted Spurious Emissions – H-CPM TDMA; 173.0125 MHz

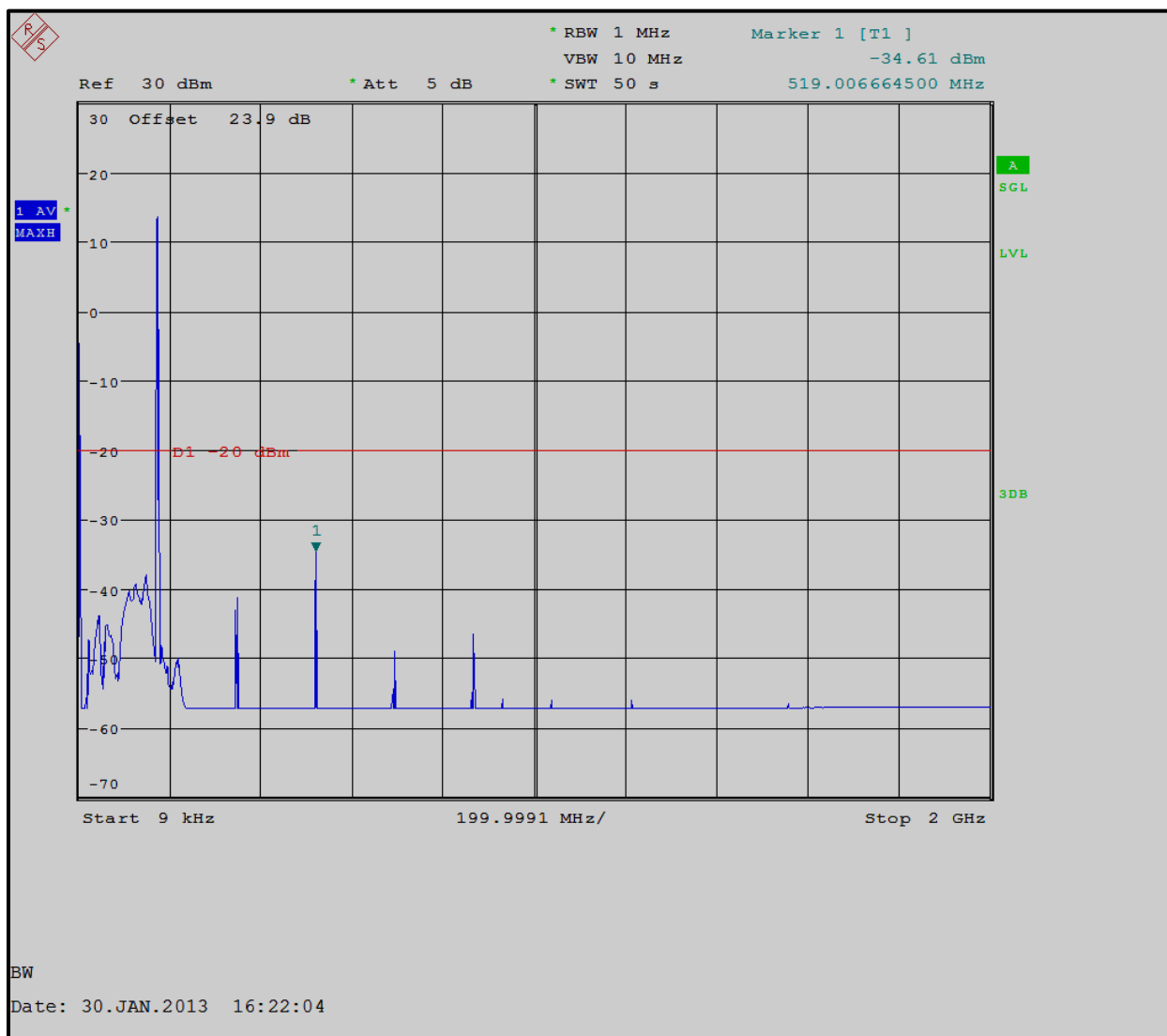


Table 4-1: Test Equipment Used for Testing Spurious Emissions

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	1166.1660.50	Spectrum Analyzer	2001006	6/3/13
901594	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36"	NA	8/16/13
901131	Par Electronics	118-174 (25W)	VHF Notch Filter	N/A	2/29/14
901291	Pasternack	PE7031-20	300W Attenuator, DC - 1 GHz, 20 dB	NA	7/15/13
901355	JFW Industries	50FH-003-300	300W 3DB DC1000 MHz Attenuator	N/A	7/15/13
901536	Aeroflex	48-40-34	40 dB Attenuator	CB6627	10/14/13

Test Personnel:



Daniel Baltzell
 EMC Test Engineer

Signature

January 30 & March 17, 2013
 Dates of Test

5 FCC §2.1049(c)(1); §90.210; §22.359(b): Emission Limitations; RSS-119 §5.8: Bandwidth

5.1 Test Procedure

§22.359(a) *Out of band emissions*. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

(b) *Measurement procedure*: In the 60 kHz bands immediately outside and adjacent to the authorized frequency range or channel, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e., 30 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

TIA-102.CCAA August 2011, section 2.2.5, TIA-102.CCAB October 2011, section 3.2.5

Notes: FCC 90.210 specifies mask D for equipment without an audio low pass filter in the VHF band; IC RSS-119 and TIA-102.CCAB October 2011 section 3.2.5.1 specify mask D as well; data is presented on the following pages.

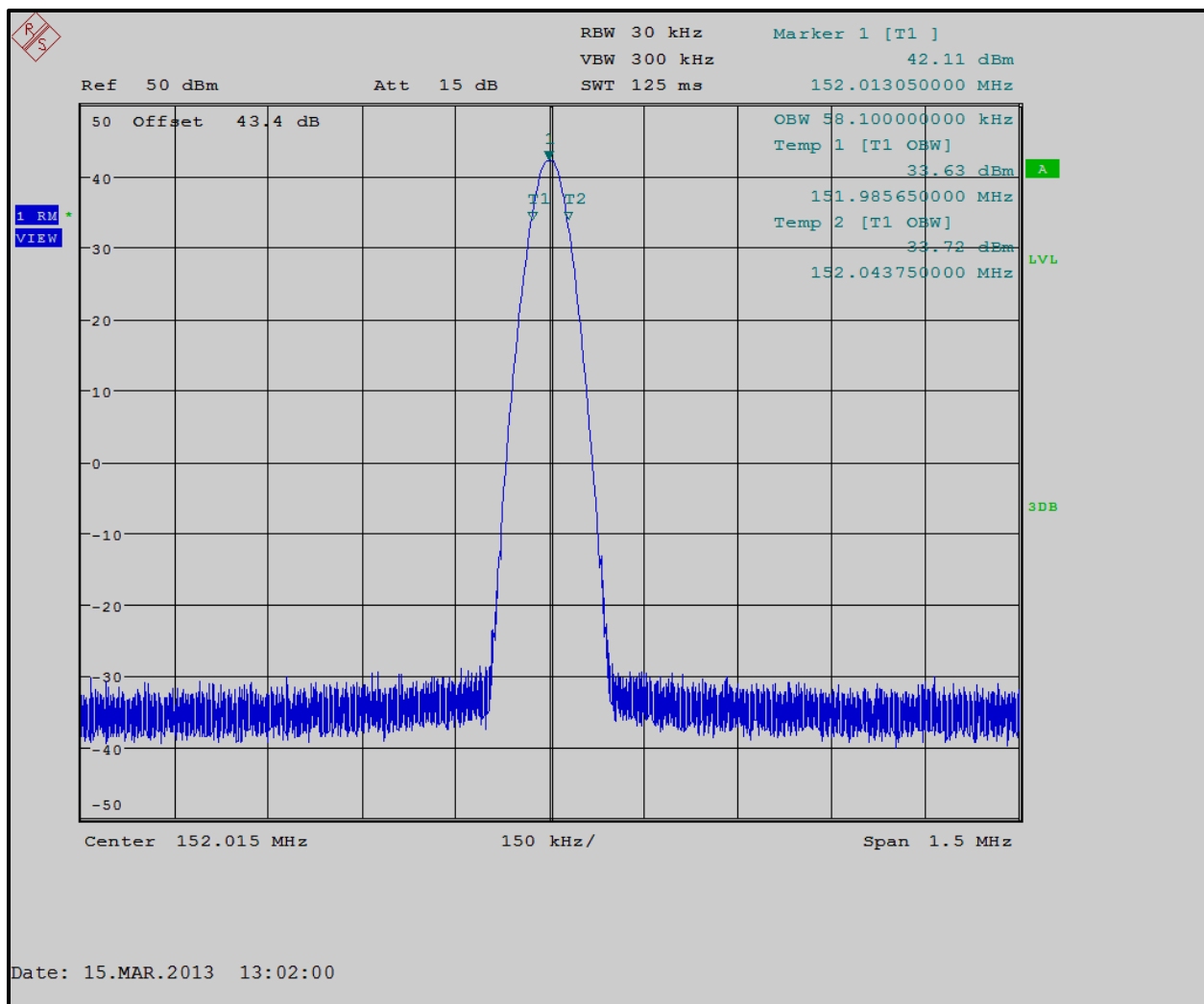
FCC §90.210

Applicable Emission Masks		
Frequency Band (MHz)	Mask for Equipment with Audio Low Pass Filter	Mask for Equipment without Audio Low Pass Filter
Below 25 ¹	A or B	A or C
25–50.....	B	C
72–76.....	B	C
150–174 ²	B, D, or E	C, D, or E
150 Paging-only	B	C
220–222	F	F
421–512 ²	B, D, or E	C, D, or E
450 Paging-only	B	G
806–809/851–854	B	H
809–824/854–869 ³	B	G
896–901/935–940	I	J
902–928	K	K
929–930	B	G
4940–4990 MHz	L or M	L or M
5850–5925 ⁴		
All other bands	B	C

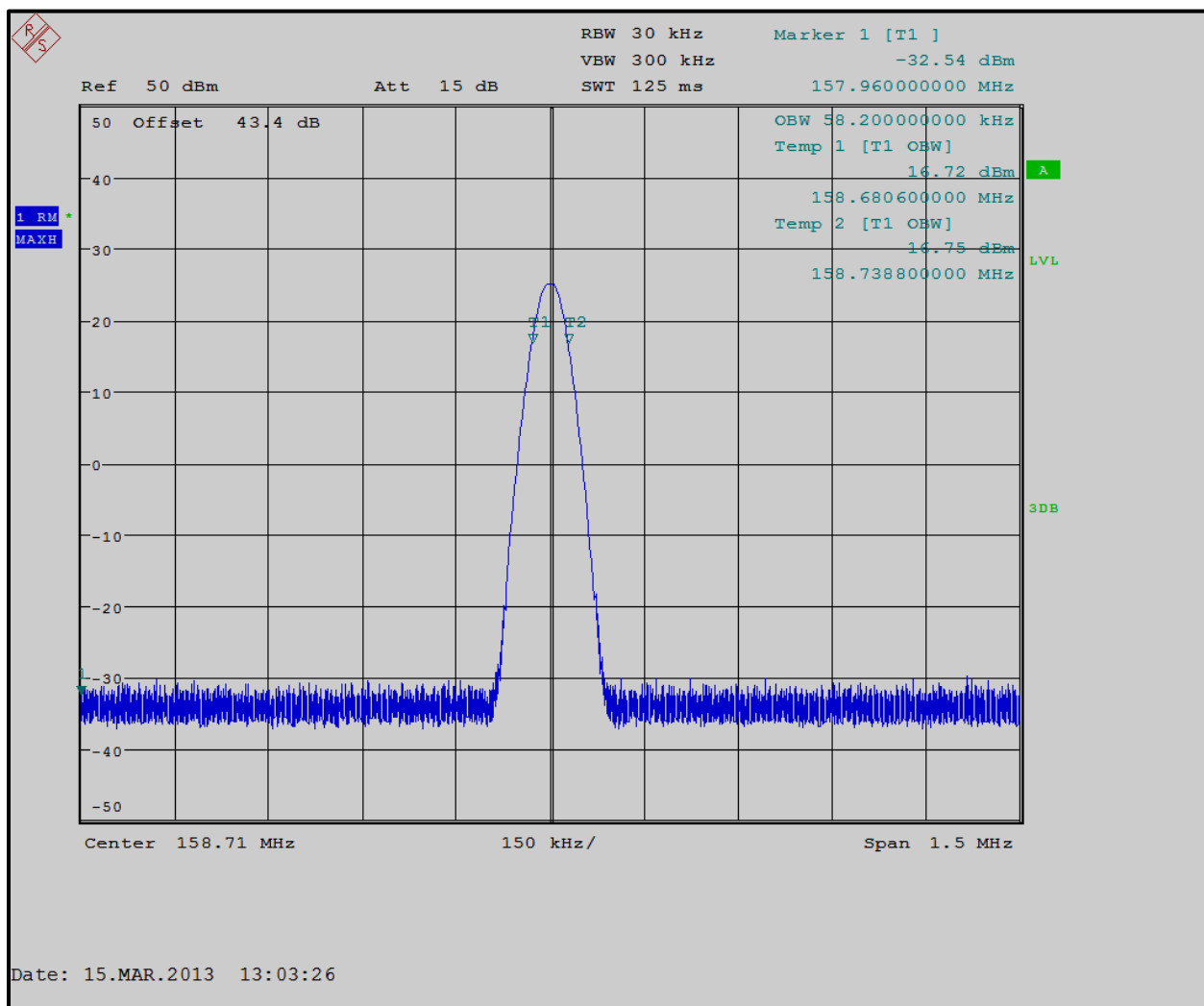
¹ Equipment using single sideband J3E emission must meet the requirements of Emission Mask A. Equipment using other emissions must meet the requirements of Emission Mask B or C, as applicable.
² Equipment designed to operate with a 25 kHz channel bandwidth must meet the requirements of Emission Mask B or C, as applicable. Equipment designed to operate with a 12.5 kHz channel bandwidth must meet the requirements of Emission Mask D, and equipment designed to operate with a 6.25 kHz channel bandwidth must meet the requirements of Emission Mask E.
³ Equipment used in this licensed to EA or non-EA systems shall comply with the emission mask provisions of §90.691.
⁴ DSRCS Roadside Unit equipment in the 5850–5925 MHz band is governed under subpart M of this part.

5.2 Test Data

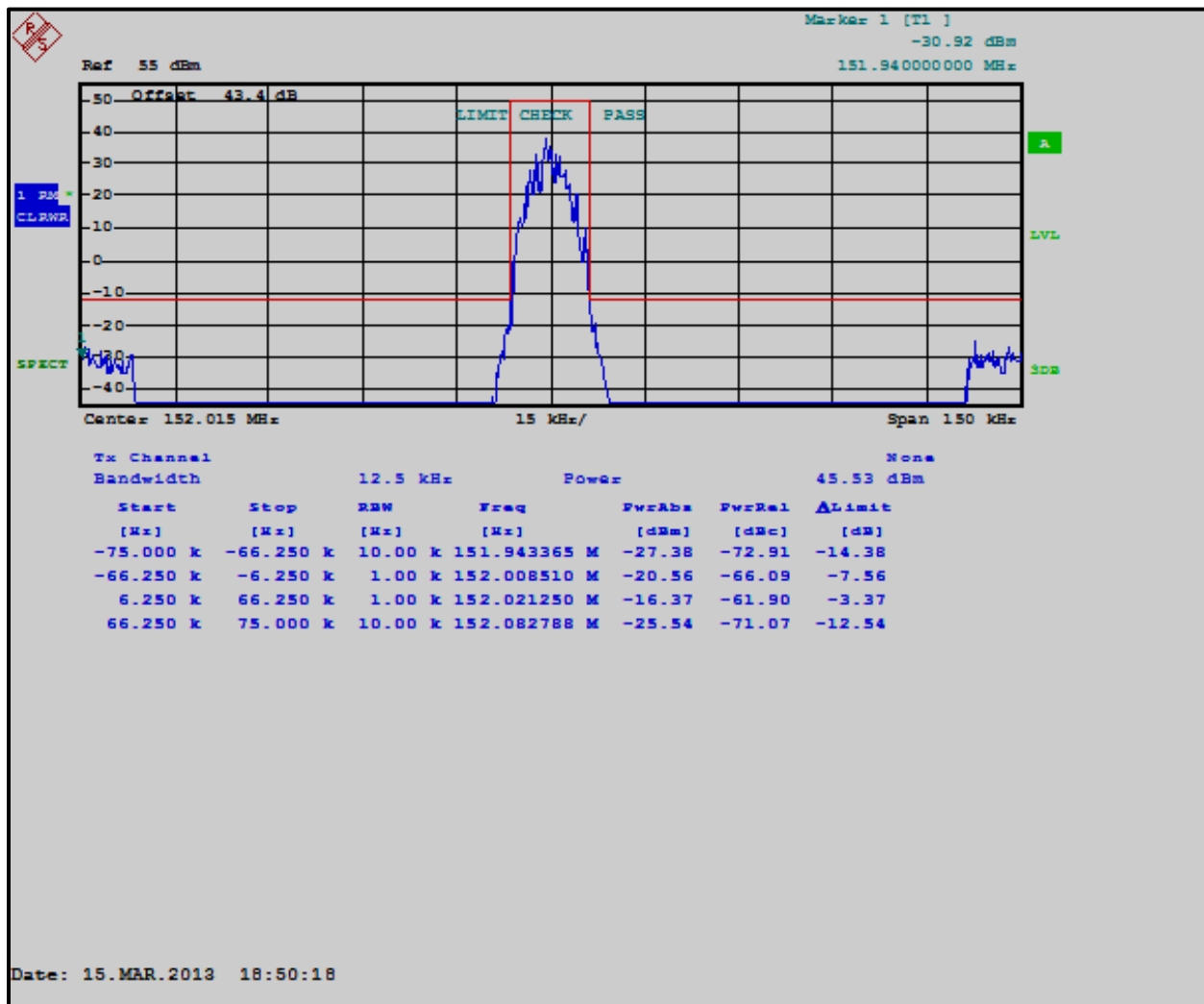
Plot 5-1: Occupied Bandwidth – 152.015 MHz; (FCC Part 22) H-CPM TDMA



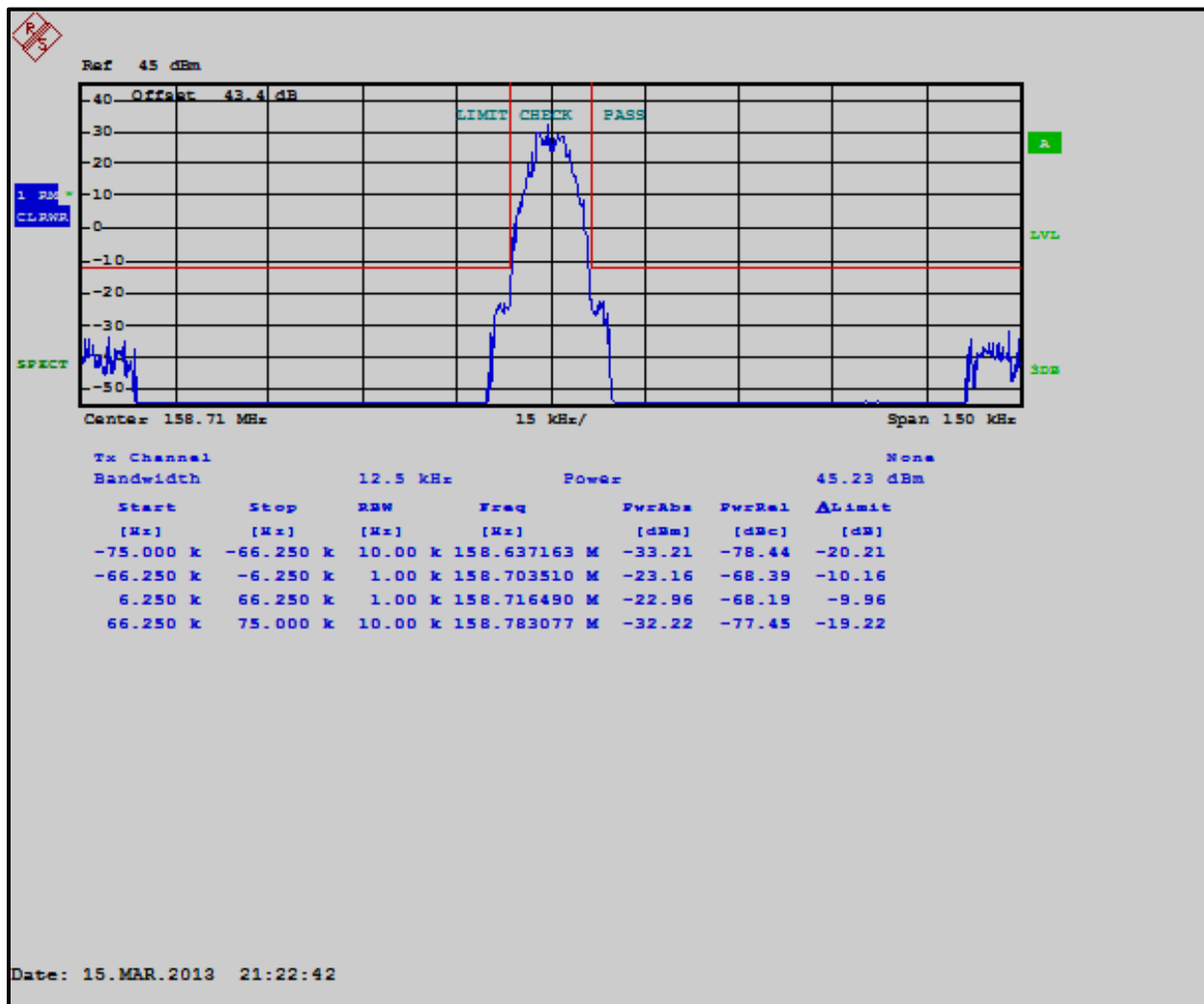
Plot 5-2: Occupied Bandwidth – 158.710 MHz; (FCC Part 22) H-CPM TDMA



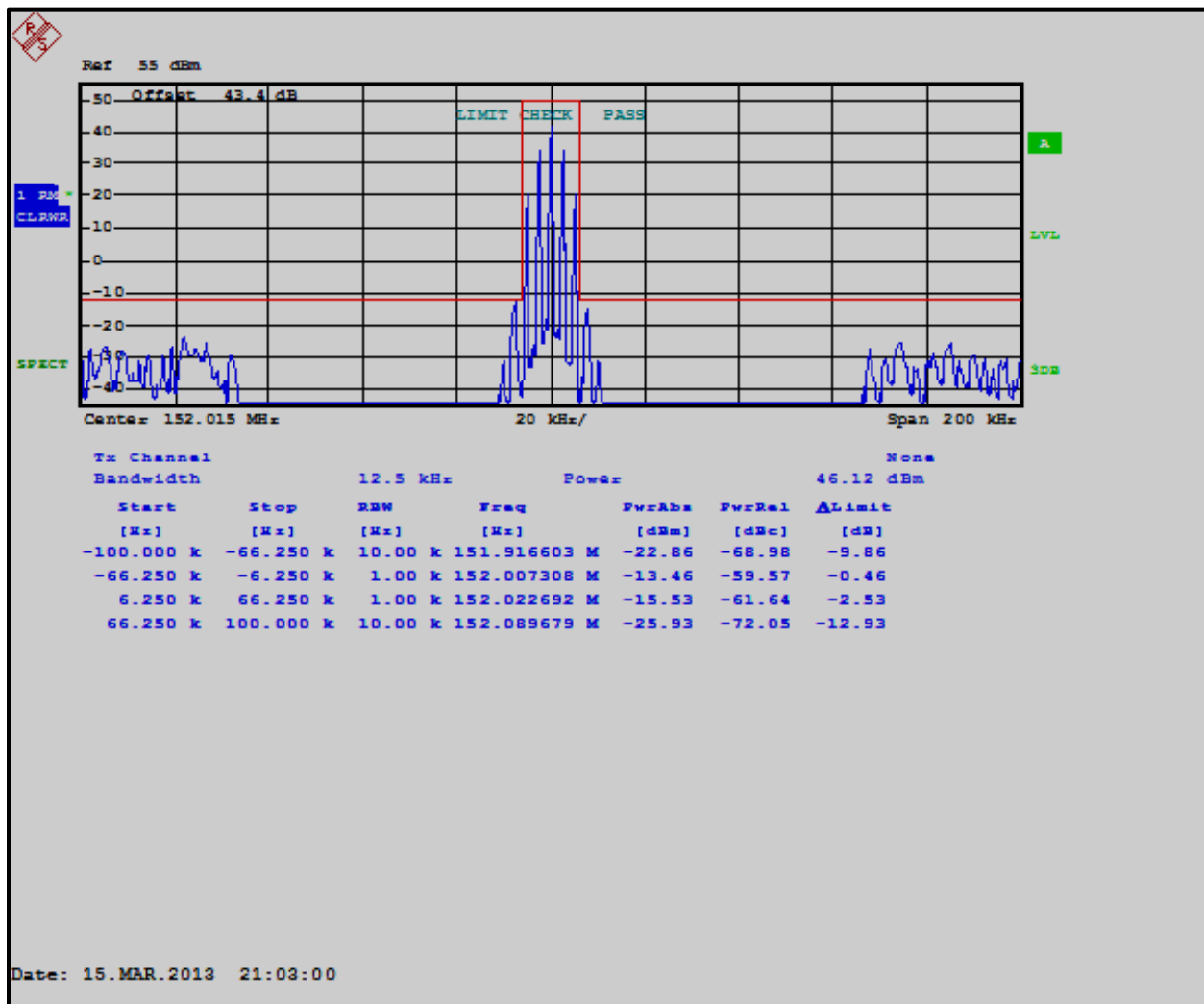
Plot 5-3: Occupied Bandwidth – 152.015 MHz; Mask; (FCC Part 22); H-CPM TDMA



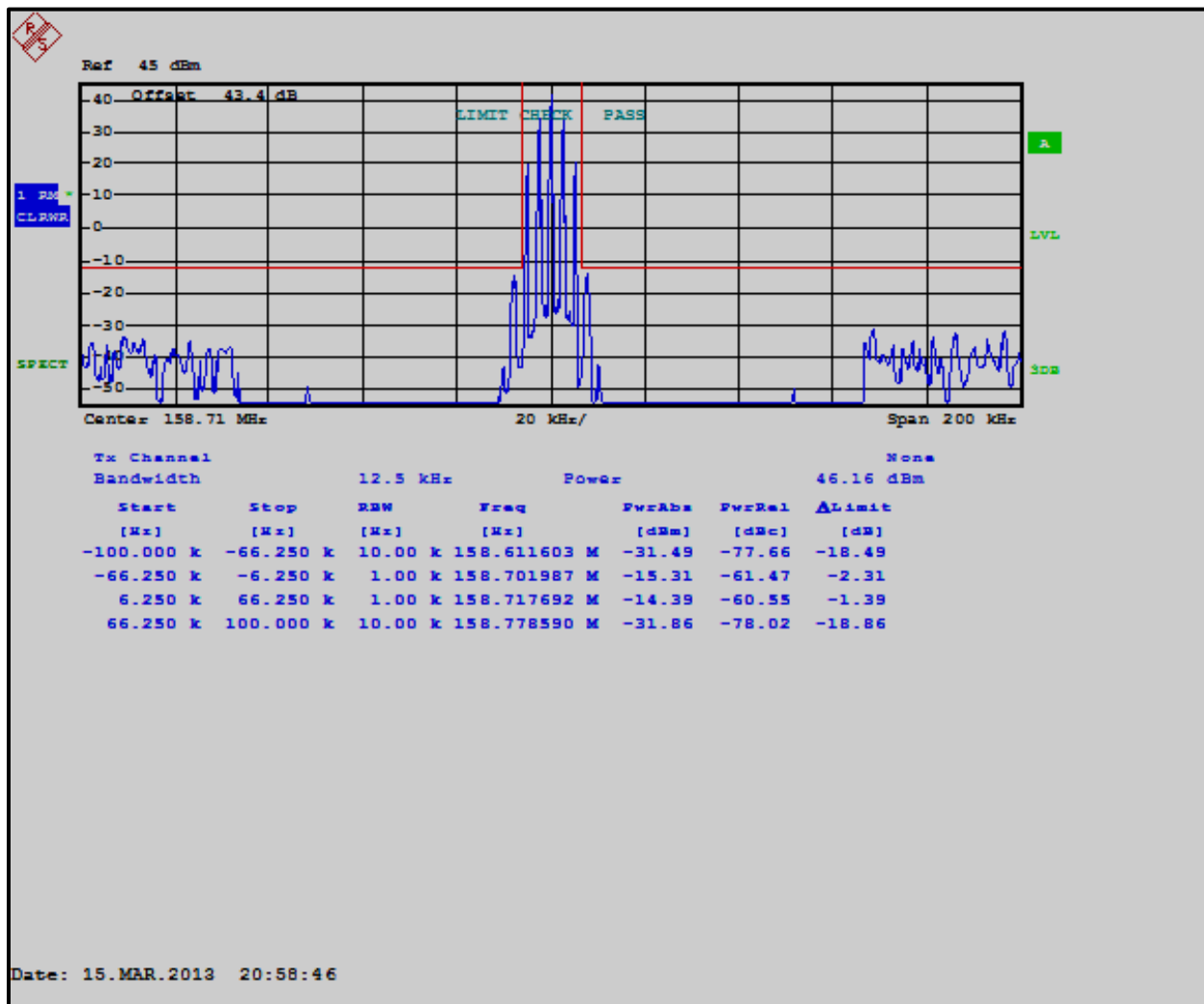
Plot 5-4: Occupied Bandwidth – 158.710 MHz; Mask; (FCC Part 22); H-CPM TDMA



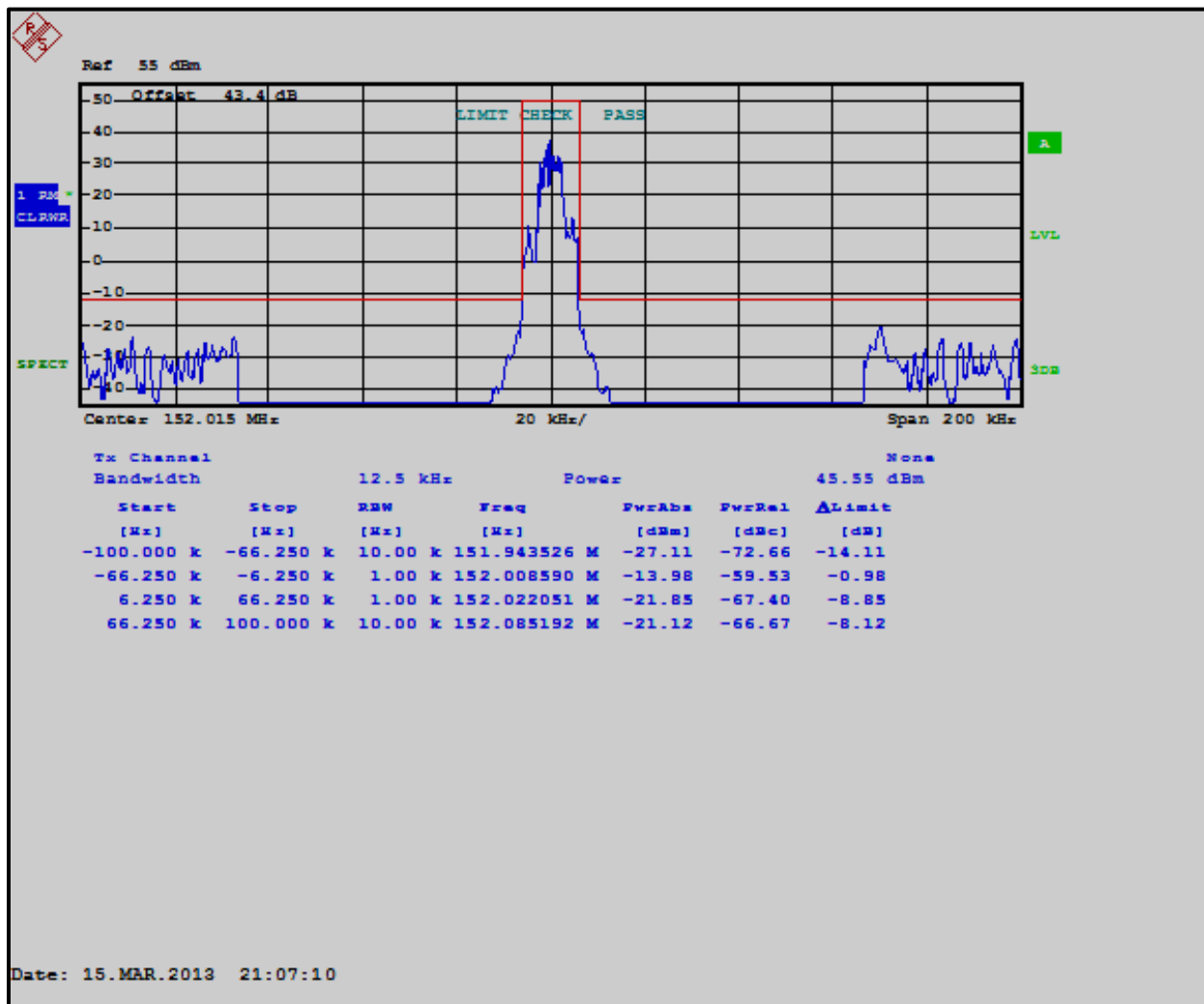
Plot 5-5: Occupied Bandwidth – 152.015 MHz; Mask; (FCC Part 22); NB Analog Voice



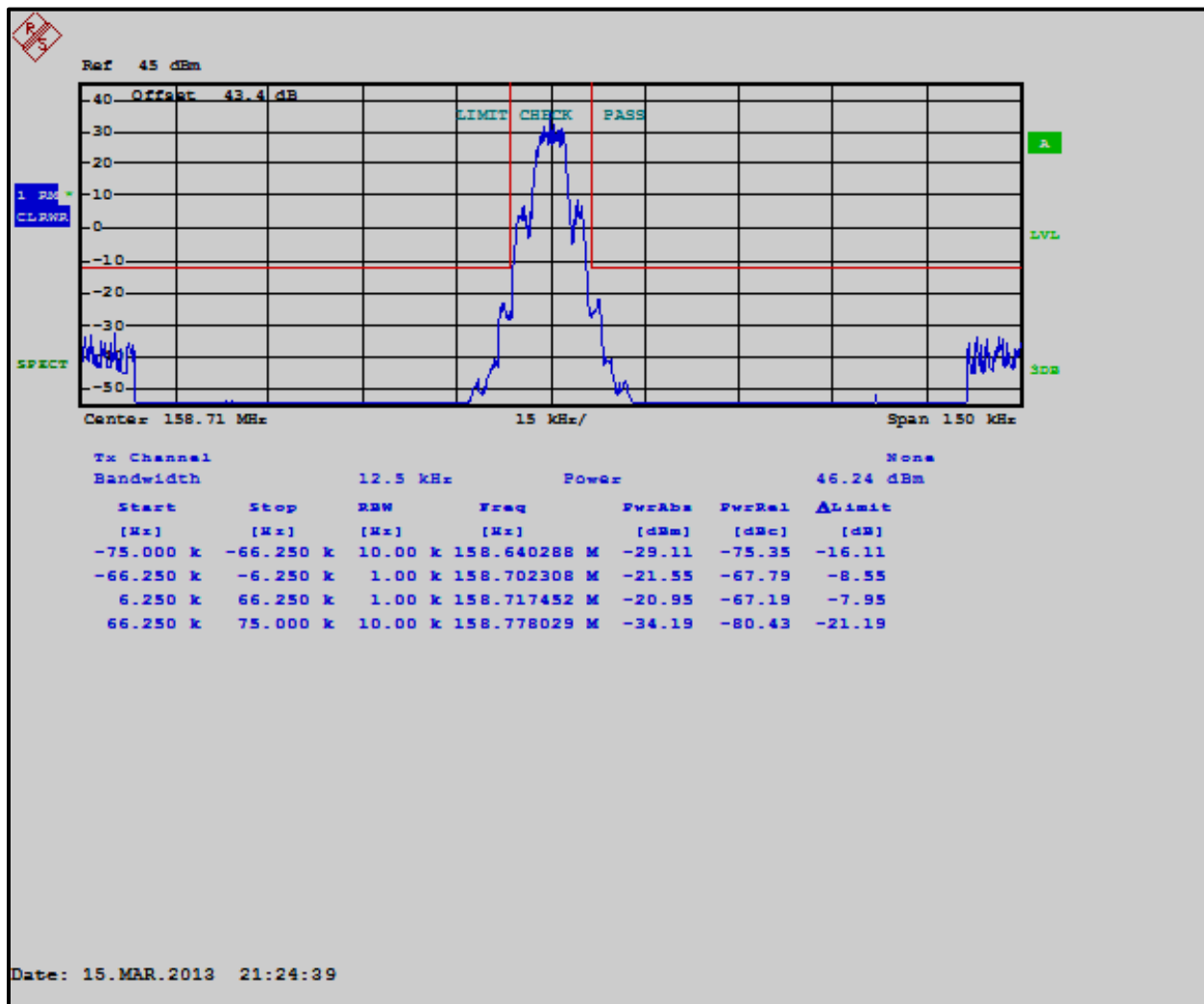
Plot 5-6: Occupied Bandwidth – 158.710 MHz; Mask; (FCC Part 22); NB Analog Voice



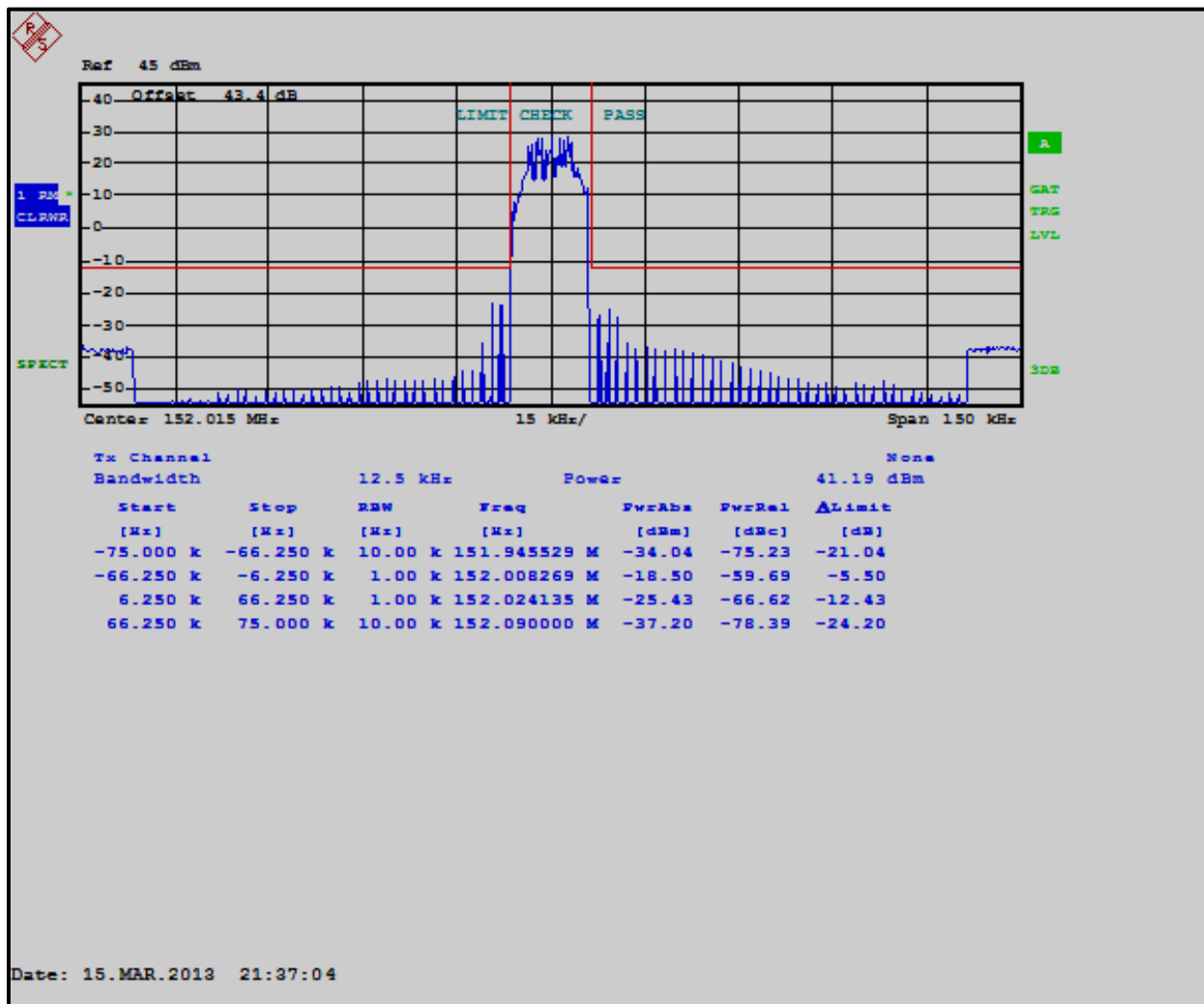
Plot 5-7: Occupied Bandwidth – 152.015 MHz; Mask; (FCC Part 22); 2 Level NB 4800 FSK



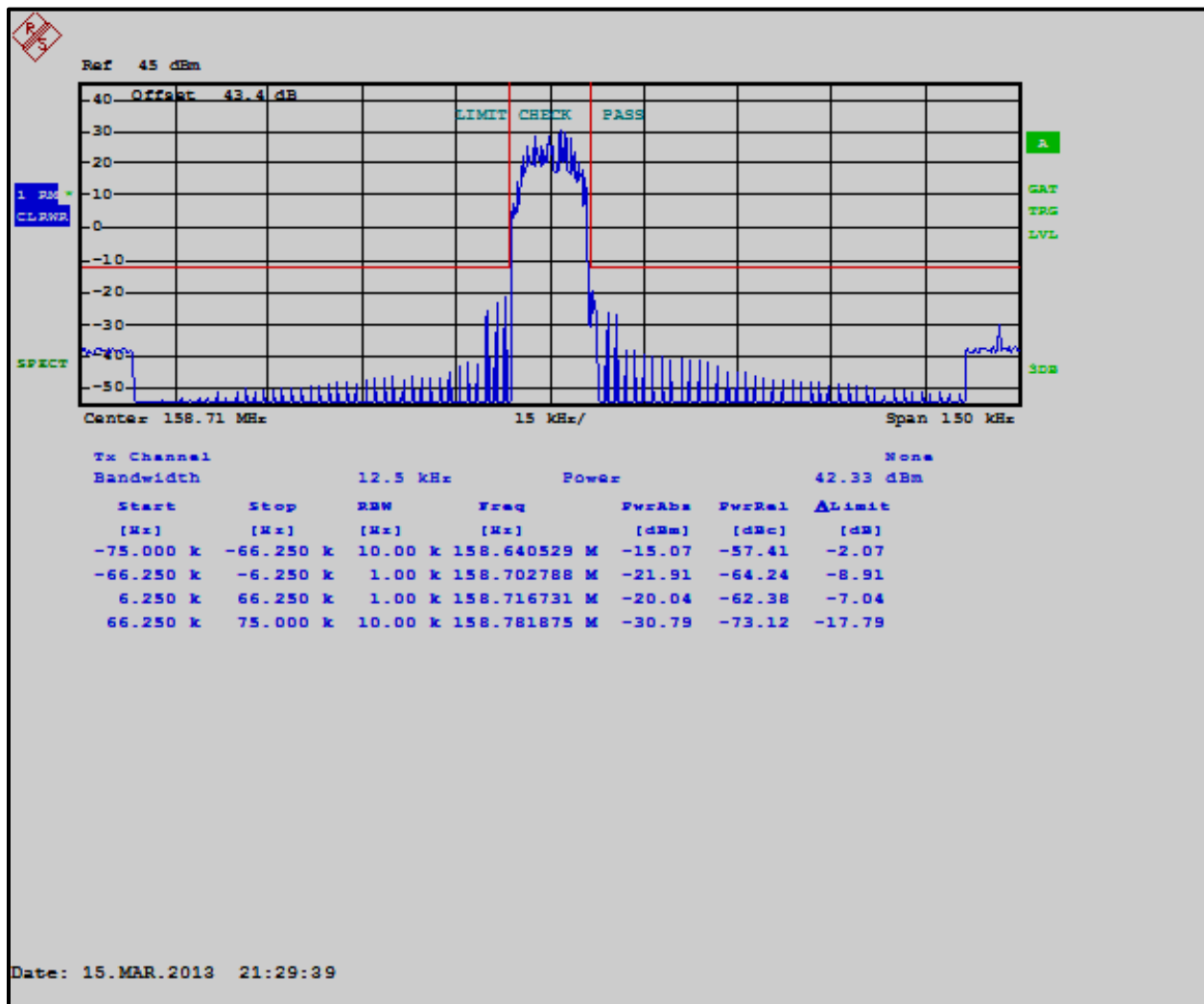
Plot 5-8: Occupied Bandwidth – 158.710 MHz; Mask; (FCC Part 22); 2 Level NB 4800 FSK



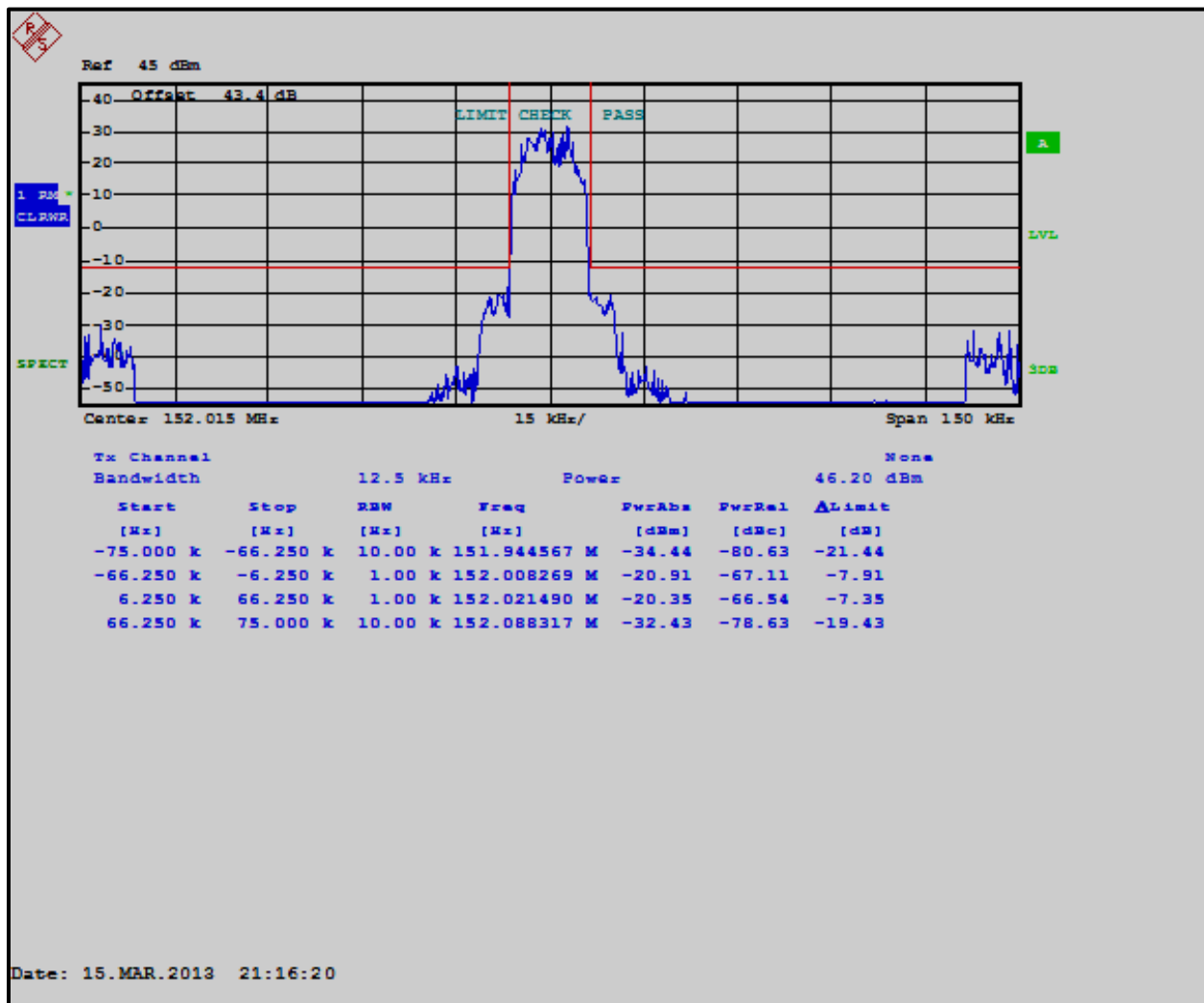
Plot 5-9: Occupied Bandwidth – 152.015 MHz; Mask; (FCC Part 22); NB Open Sky/TDMA



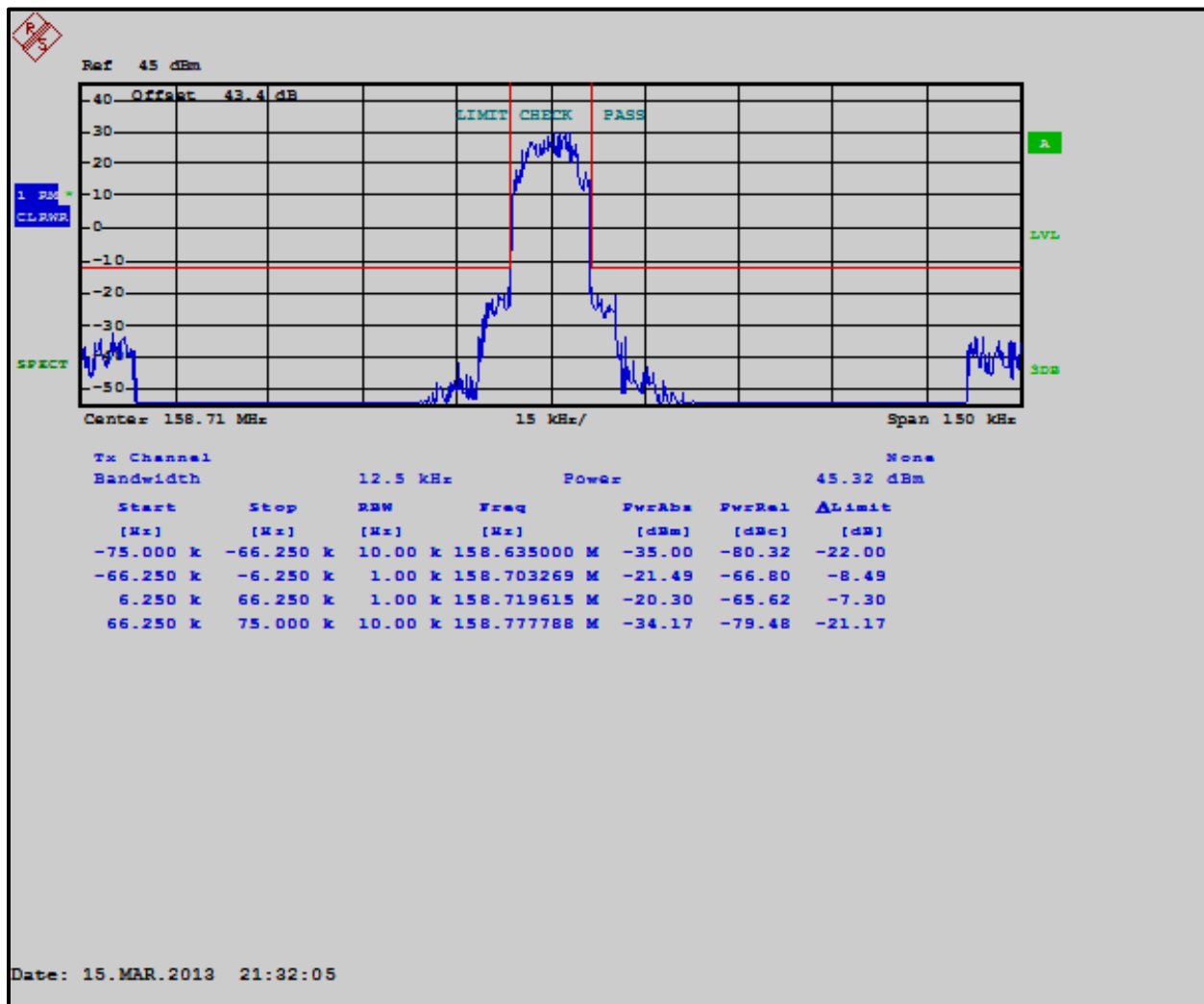
Plot 5-10: Occupied Bandwidth – 158.710 MHz; Mask; (FCC Part 22); NB Open Sky/TDMA



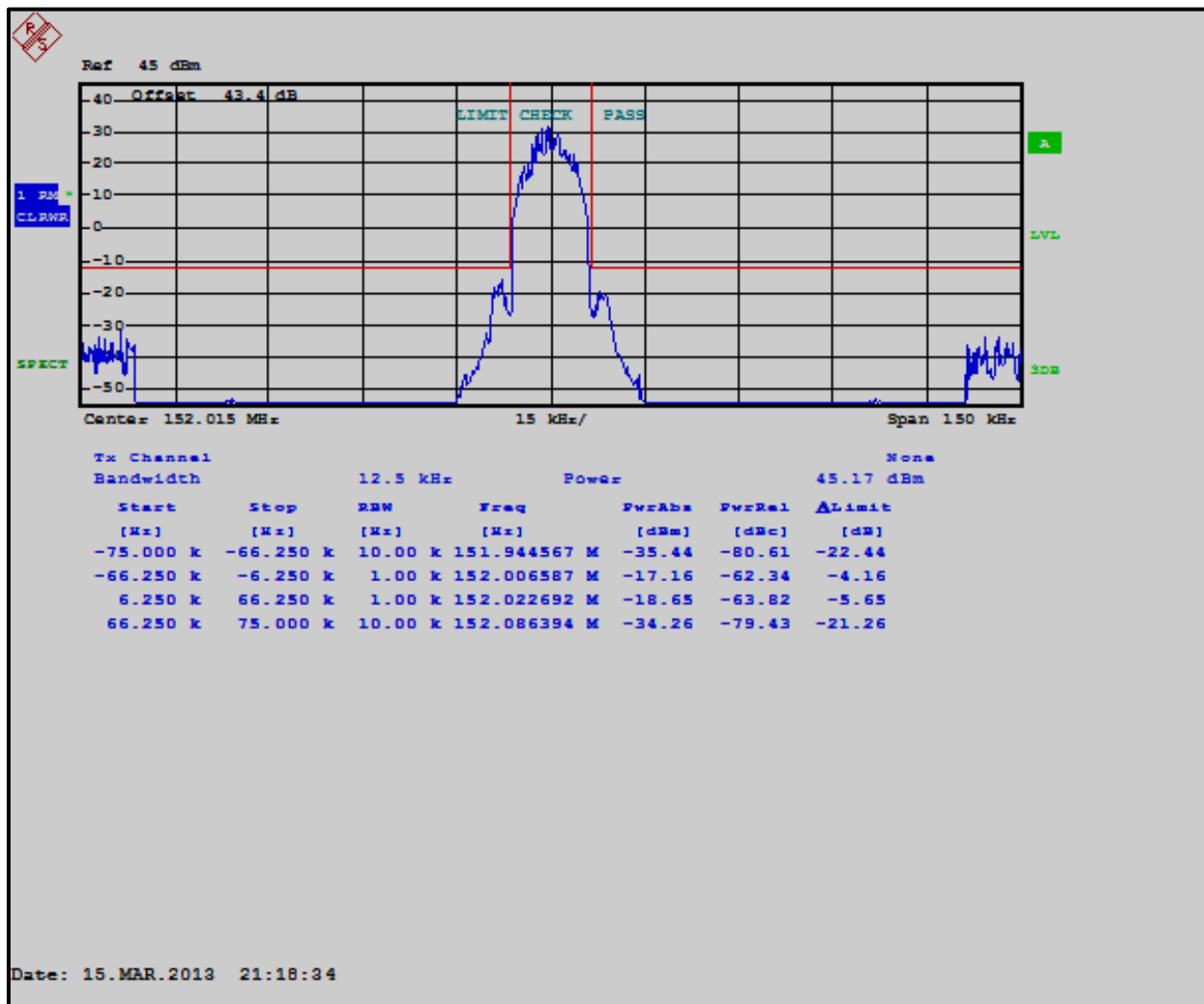
Plot 5-11: Occupied Bandwidth – 152.015 MHz; Mask; (FCC Part 22); P25



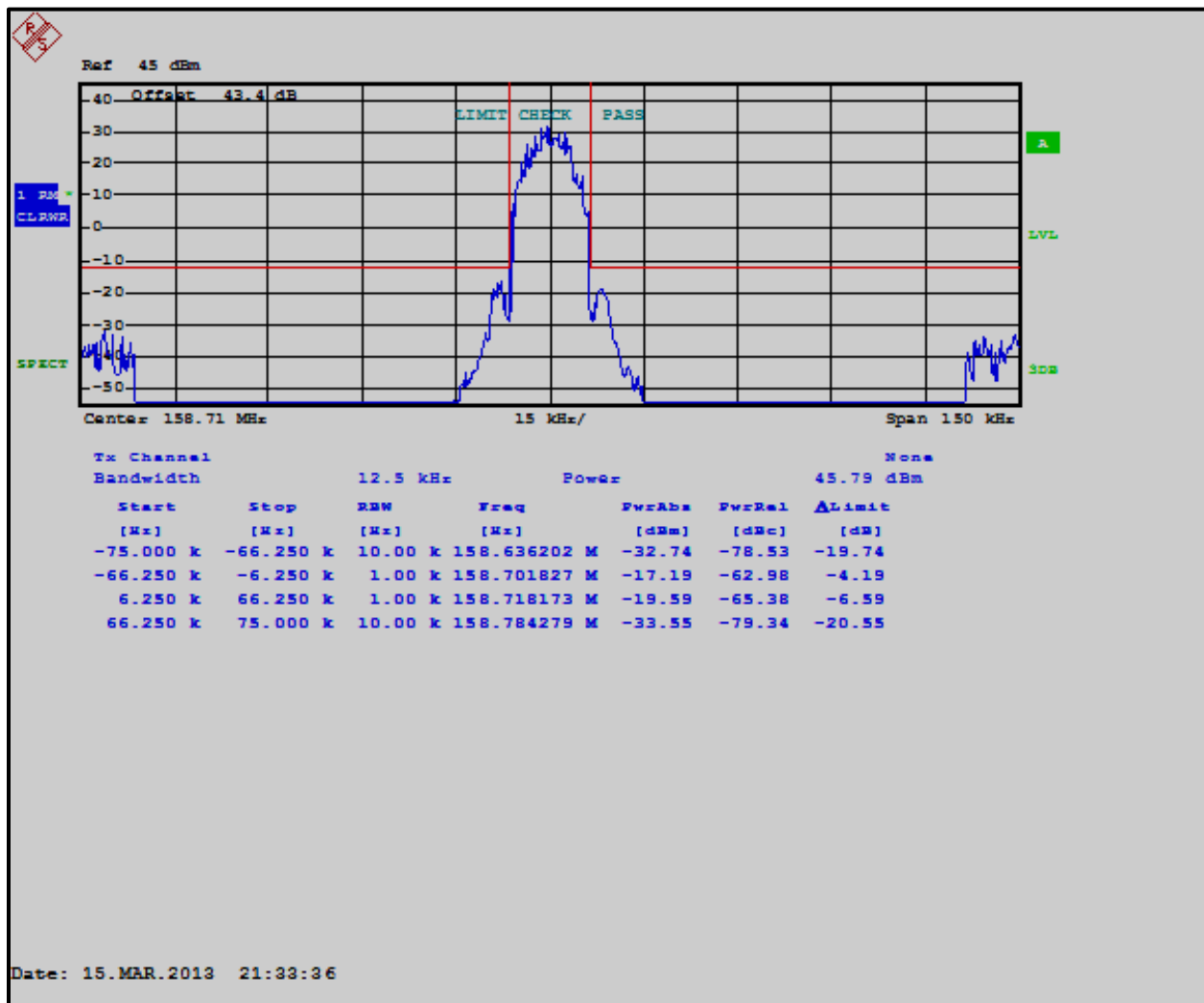
Plot 5-12: Occupied Bandwidth – 158.710 MHz; Mask; (FCC Part 22); P25



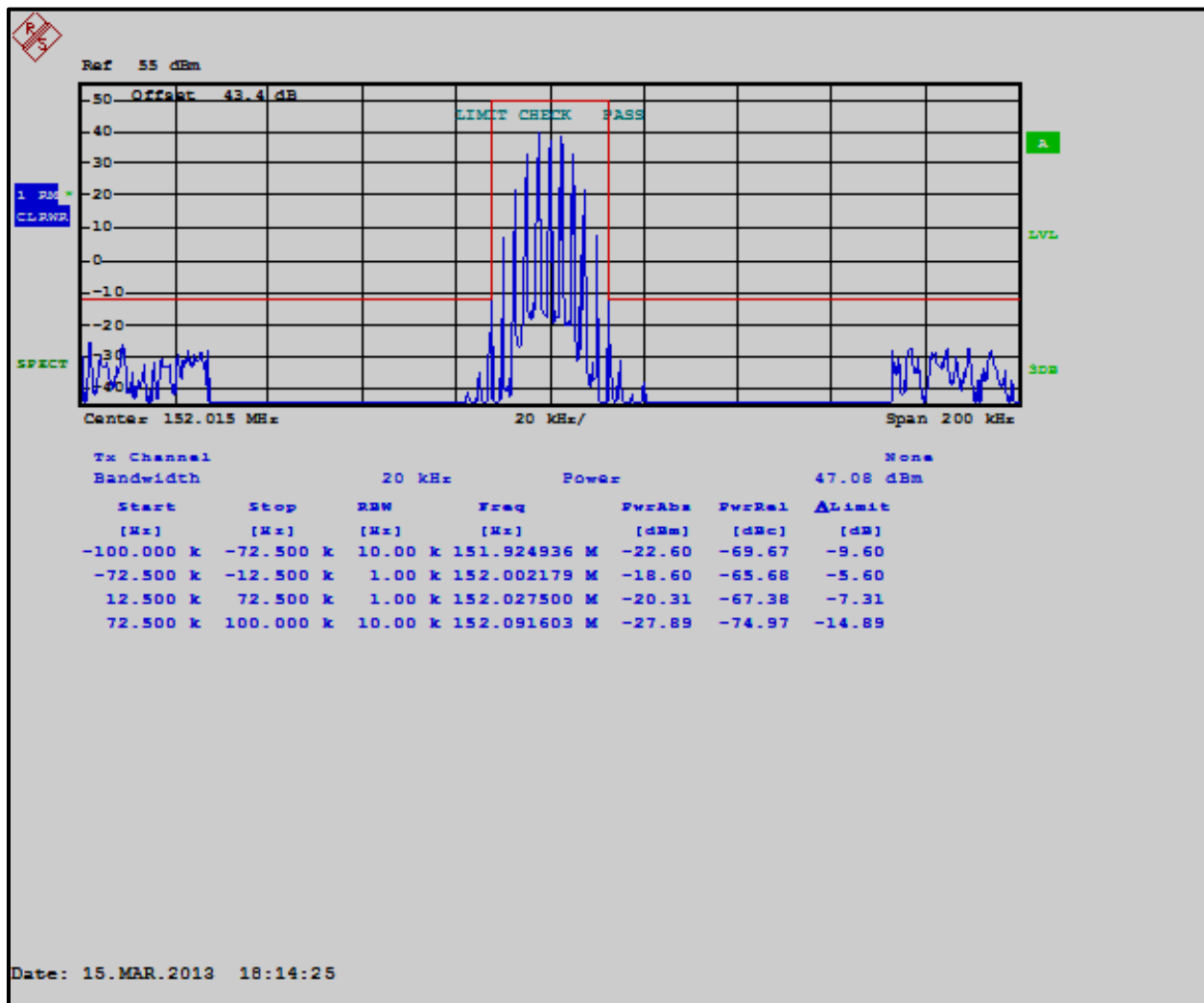
Plot 5-13: Occupied Bandwidth – 152.015 MHz; Mask; (FCC Part 22); 2 Level NB 9600 FSK



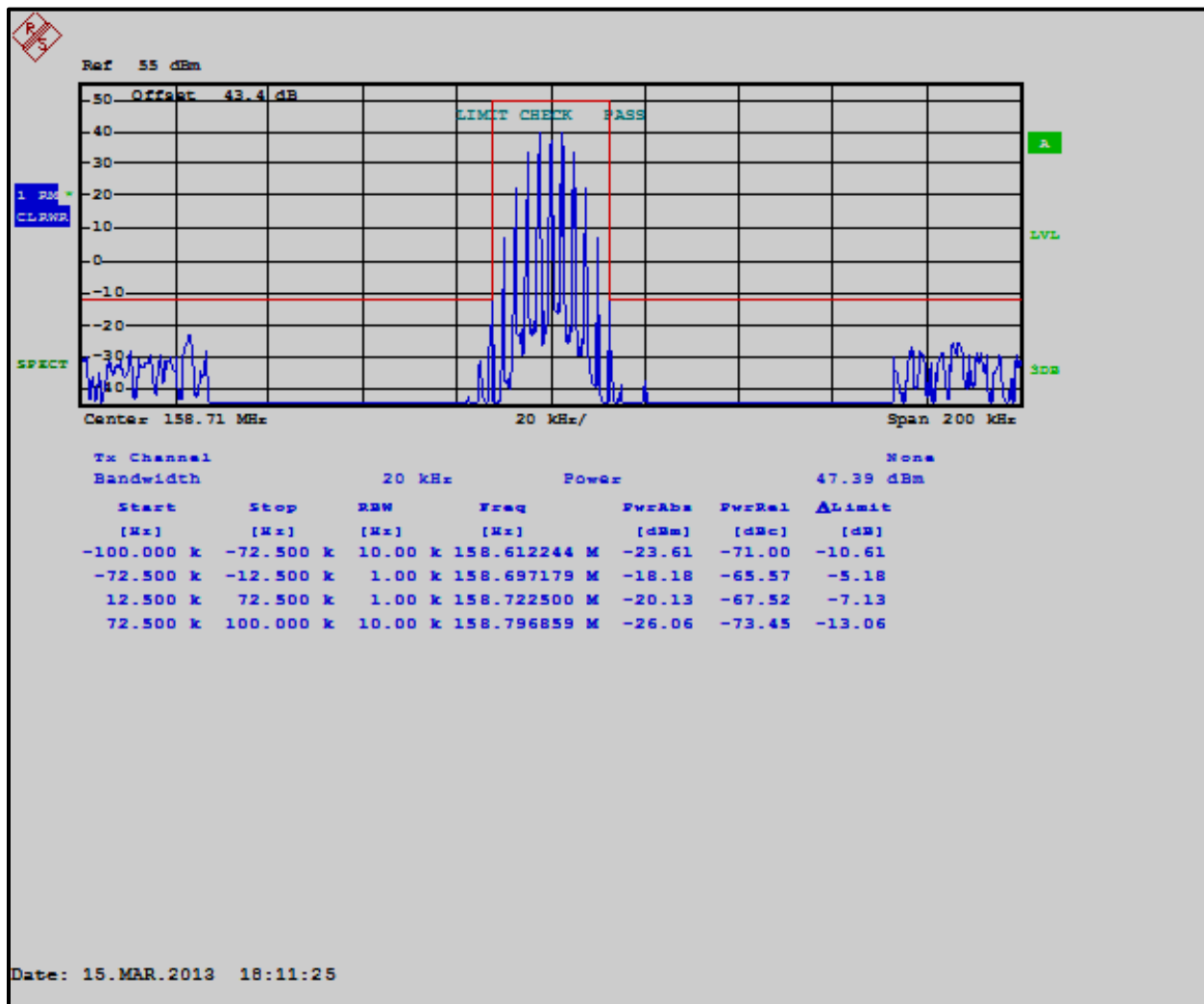
Plot 5-14: Occupied Bandwidth – 158.710 MHz; Mask; (FCC Part 22); 2 Level NB 9600 FSK



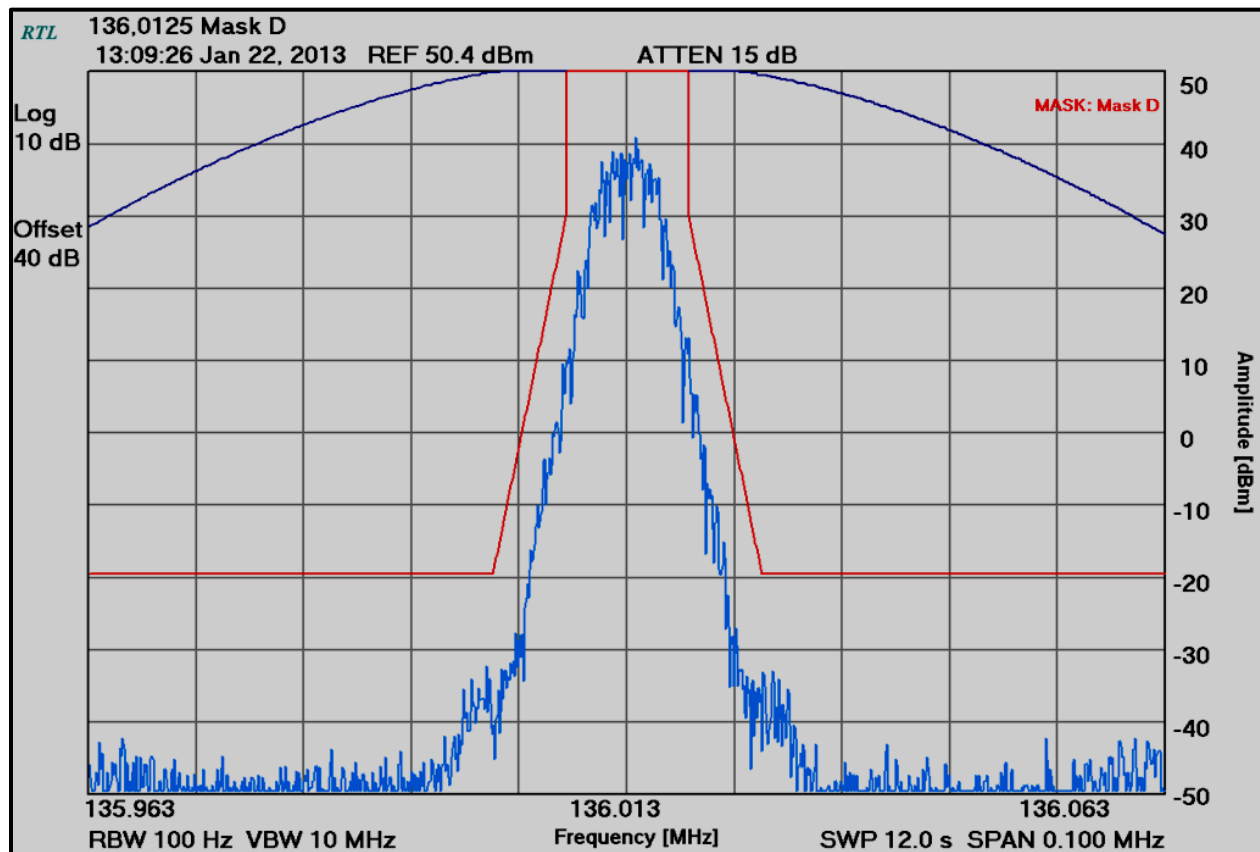
Plot 5-15: Occupied Bandwidth – 152.015 MHz; Mask; (FCC Part 22); WB Analog Voice



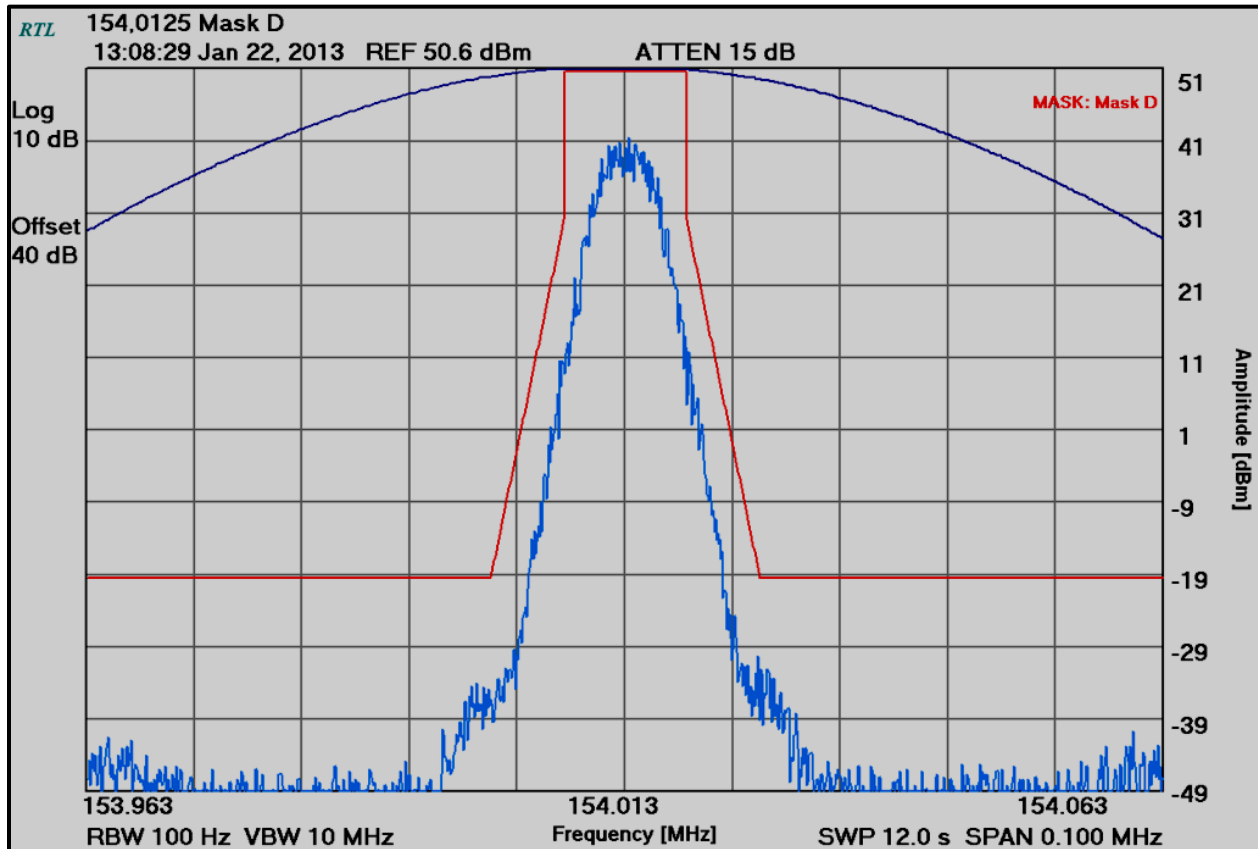
Plot 5-16: Occupied Bandwidth – 158.710 MHz; Mask; (FCC Part 22); WB Analog Voice



Plot 5-17: Occupied Bandwidth – 136.0125 MHz; H-CPM TDMA (Mask D)



Plot 5-18: Occupied Bandwidth – 154.0125 MHz; H-CPM TDMA (Mask D)



Plot 5-19: Occupied Bandwidth – 173.0125 MHz; H-CPM TDMA (Mask D)

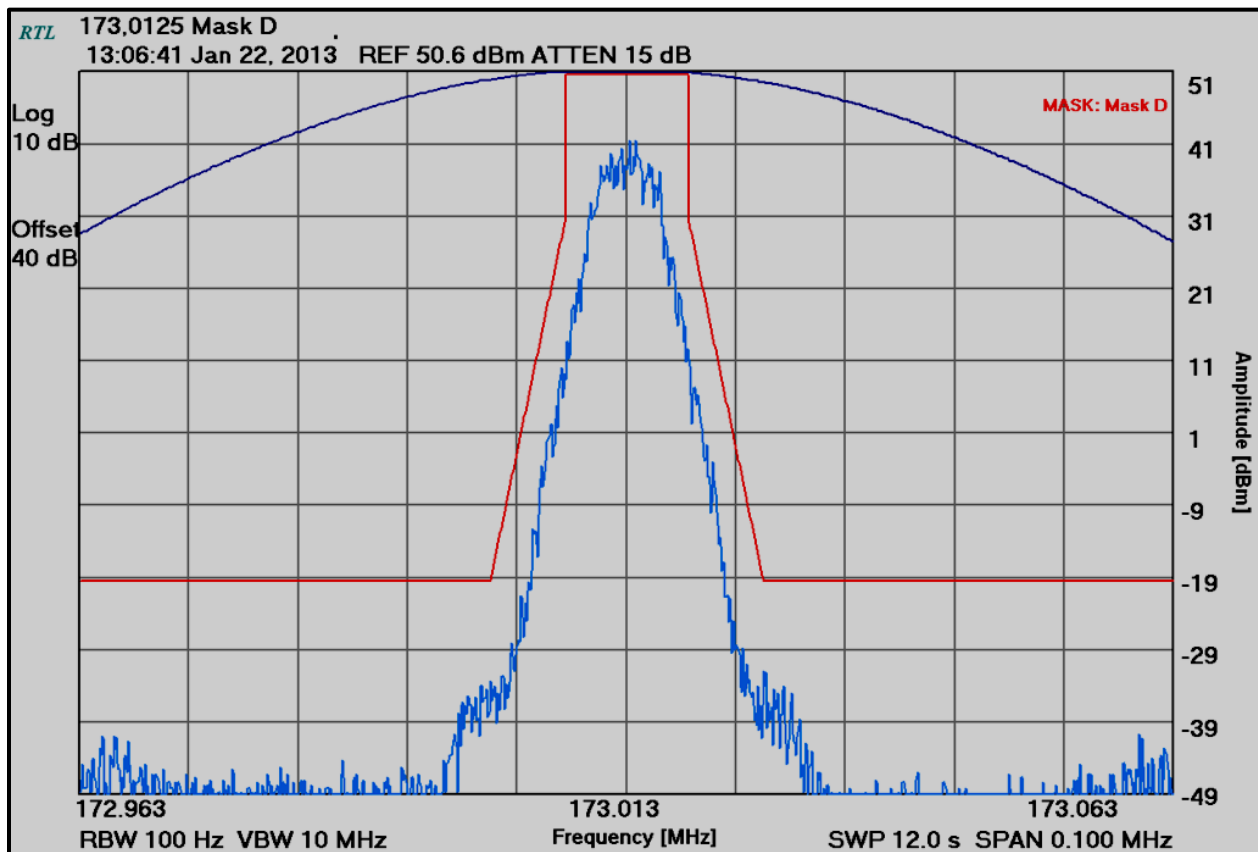
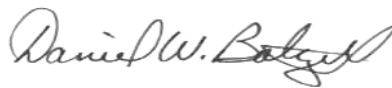


Table 5-1: Test Equipment Used for Testing Occupied Bandwidth

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	1166.1660.50	Spectrum Analyzer	2001006	6/3/13
901537	Weinschel Corp	48-40-34	Attenuator, 40 dB, 100W	CB66628	12/14/13

Test Personnel:

Daniel Baltzell
Test Engineer



Signature

January 22 & March 15, 2013
Dates of Test

6 Conclusion

The data in this Class 2 report shows that the Harris Corporation Model M7300 VHF 110W; FCC ID: OWDTR-0056-E, IC: 3636B-0056, complies with all the applicable requirements of FCC Parts 2, 22 and 90, and Industry Canada RSS-119.