RHEIN TECH LABORATORIES, INC.

Engineering Solutions & Electromagnetic Compatibility Services

FCC & IC Class 2 Permissive Change Report

Harris Corporation
221 Jefferson Ridge Parkway
Lynchburg, VA 24501

Model: XG-75 700/800 MHZ Portable Radio

FCC ID: OWDTR-0074-E
IC: 3636B-0074

January 11, 2013

Standards Referenced for this Report	
Part 2: 2012	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
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

Frequency Range (MHz)	Rated Transmit Power (W) (Conducted)	Frequency Tolerance (ppm)	Mode	Emission Designator (Transmit Mode)
764 - 776 768 - 776 (IC)	0.5 – 3.0	0.2	H-CPM TDMA	8K10DXW
794 - 806 798 - 806 (IC)	0.5 – 3.0	0.2	H-CPM TDMA	8K10DXW
806 - 824	0.5 – 3.0	0.2	H-CPM TDMA	8K10DXW
851 - 869	0.5 – 3.0	0.2	H-CPM TDMA	8K10DXW

Report Prepared By: Daniel Baltzell

Document Number: 2012372

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.

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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)	RSS-119 5.4	Complies
Spurious Emissions at Antenna Terminals	2.1046(a), 90.541(b), 90.542(a)(6)	RSS-119 5.4	Complies
Occupied Bandwidth/Emission Masks	2.1049(c)(1), 90.543(d)	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 XG-75 700/800 MHZ Radio Family; FCC ID: OWDTR-0074-E, IC: 3636B-0074.

The purpose of this Class 2 Permissive Change is to add emission designator 8K10DXW (H-CPM).

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 January 12, 2012; a Class II permissive change was granted on January 24, 2012. The Harris model numbers included in this IC family certification are EVXG-PF78B, EVXG-PF78Y, EVXG-PB78B and EVXG-PB78Y.

2.3 Grant Notes

Power continuously variable from 0.5W to 3W.

3 Tested System Details

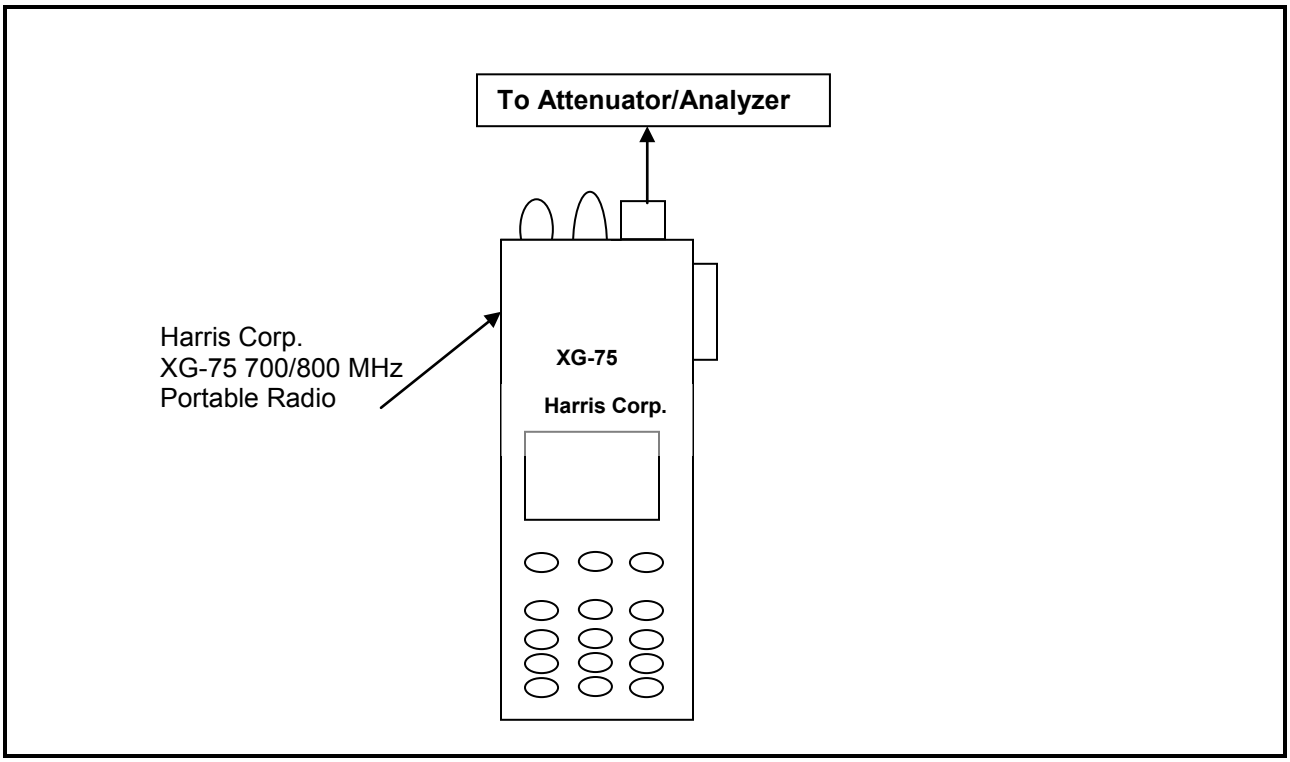
The test sample was received on December 20, 2012. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

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.

Table 3-1: Equipment Under Test (EUT)

Part	Manufacturer	Model	PN/SN	FCC ID	RTL Bar Code
XG-75 700/800 MHZ Radio	Harris Corporation	EVXG-PF78B	A40205000B13	OWDTR-0074-E	20927

Figure 3-1: Configuration of Tested System



4 FCC Rules and Regulations §90.1215(a) and §2.1046(a), IC RSS-119 5.4: Peak Output Power

4.1 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.

4.2 Test Data

Table 4-1: RF Power Output: Modulated Carrier Output Power

Frequency (MHz)	High Power (dBm)	High Power (W)	Low Power (dBm)	Low Power (W)
764.01250	35.1	3.2	28.0	0.6
770.00625	35.0	3.2	28.0	0.6
775.98750	35.0	3.1	27.9	0.6
794.01250	35.0	3.2	27.7	0.6
800.00625	35.0	3.2	27.9	0.6
805.98750	35.3	3.4	28.0	0.6
806.01250	35.4	3.4	28.0	0.6
815.50000	35.3	3.3	27.8	0.6
823.98750	35.2	3.3	28.0	0.6
851.01250	35.1	3.2	27.9	0.6
862.00000	35.2	3.3	27.8	0.6
868.98750	35.1	3.3	27.8	0.6

Table 4-2: RF Power Output (Rated Power)

Frequency (MHz)	High Power Rated (W)
764-870	3

Table 4-3: 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
901537	Weinschel Corp	48-40-34	Attenuator, 40 dB, 100W	CB66628	12/14/13

Test Personnel:

Daniel Baltzell		January 2, 2013
EMC Test Engineer	Signature	Date of Test

5 FCC Rules and Regulations §2.1051: Spurious Emissions at Antenna Terminals; §90.210: Emissions Masks; RSS-119 §4.2: Transmitter Unwanted Emissions

5.1 Test Procedure

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

The transmitter is terminated with a 50 Ω load and interfaced with a signal analyzer. The device uses digital modulation modulated to its maximum extent using a pseudo random data sequence of 9600 bps.

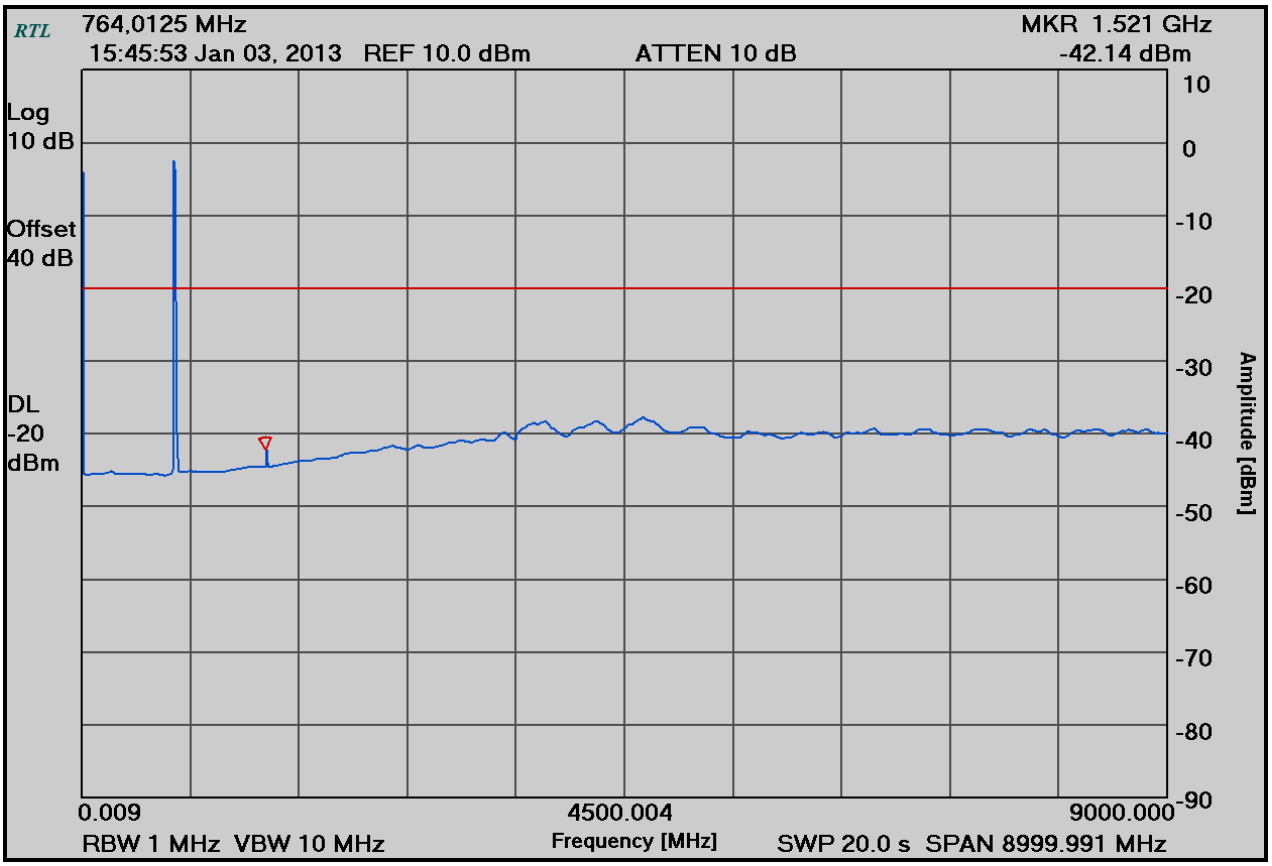
5.2 Test Data

Frequency range of measurement per Part 2.1057: 9 kHz to 10xFc.

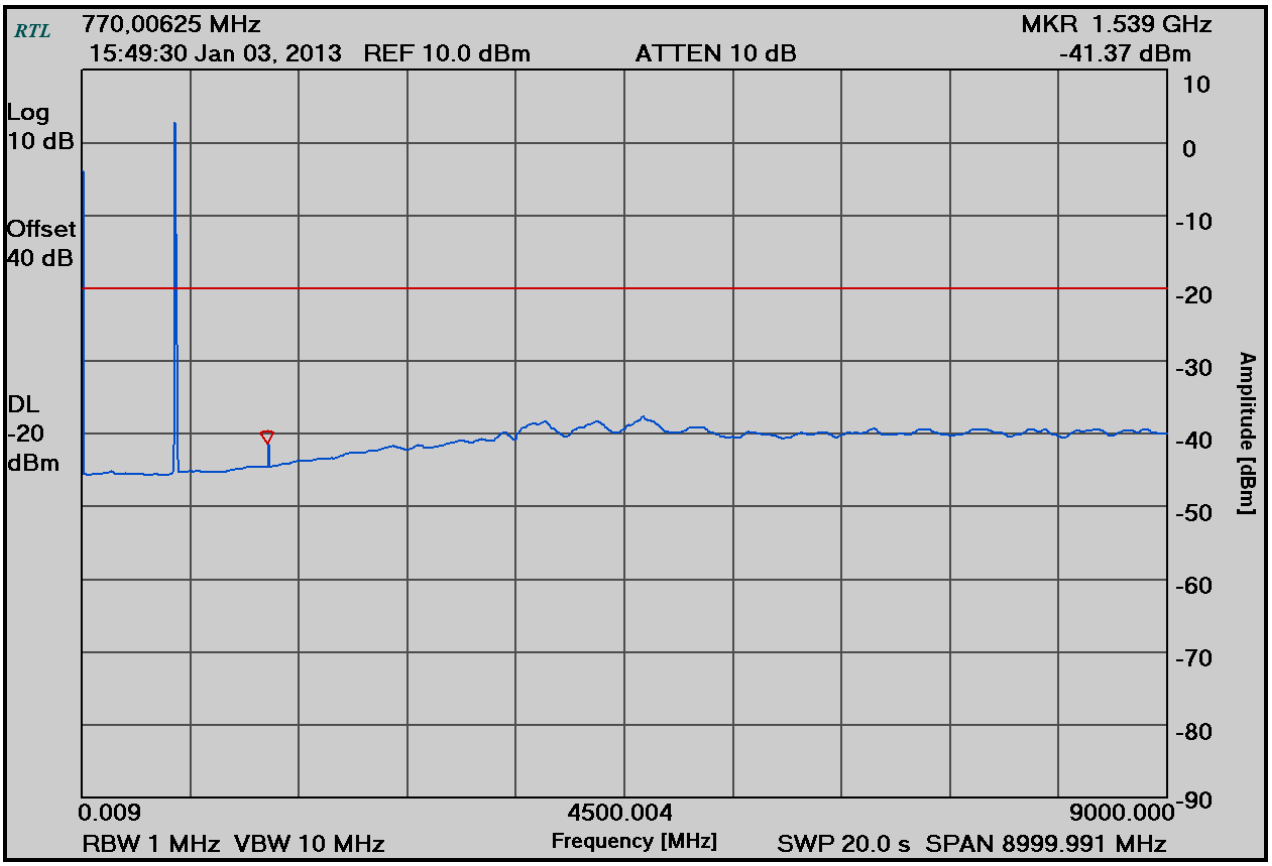
Limit: P(dBm) – (50 + 10xLOG P(W))

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

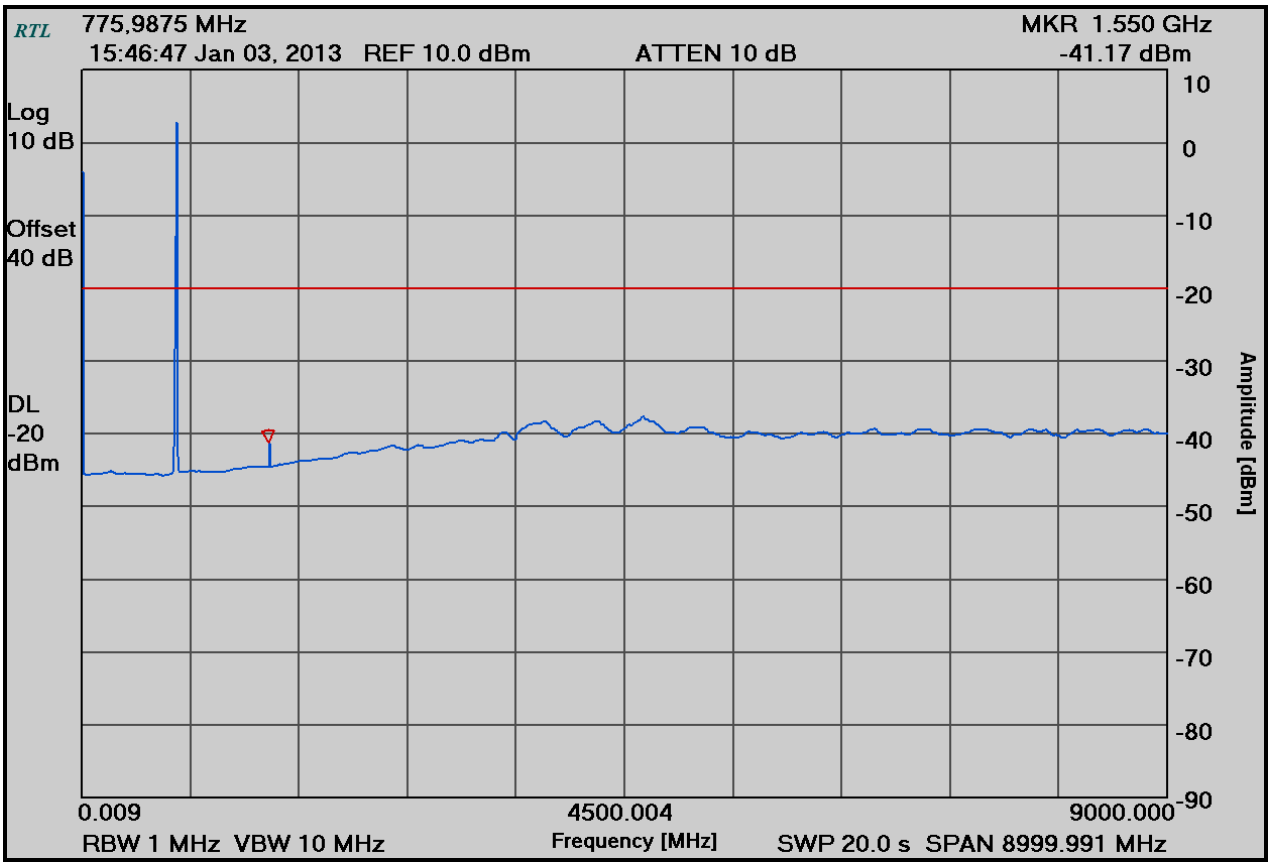
Plot 5-1: Conducted Spurious Emissions – H-CPM TDMA; 764.0125 MHz



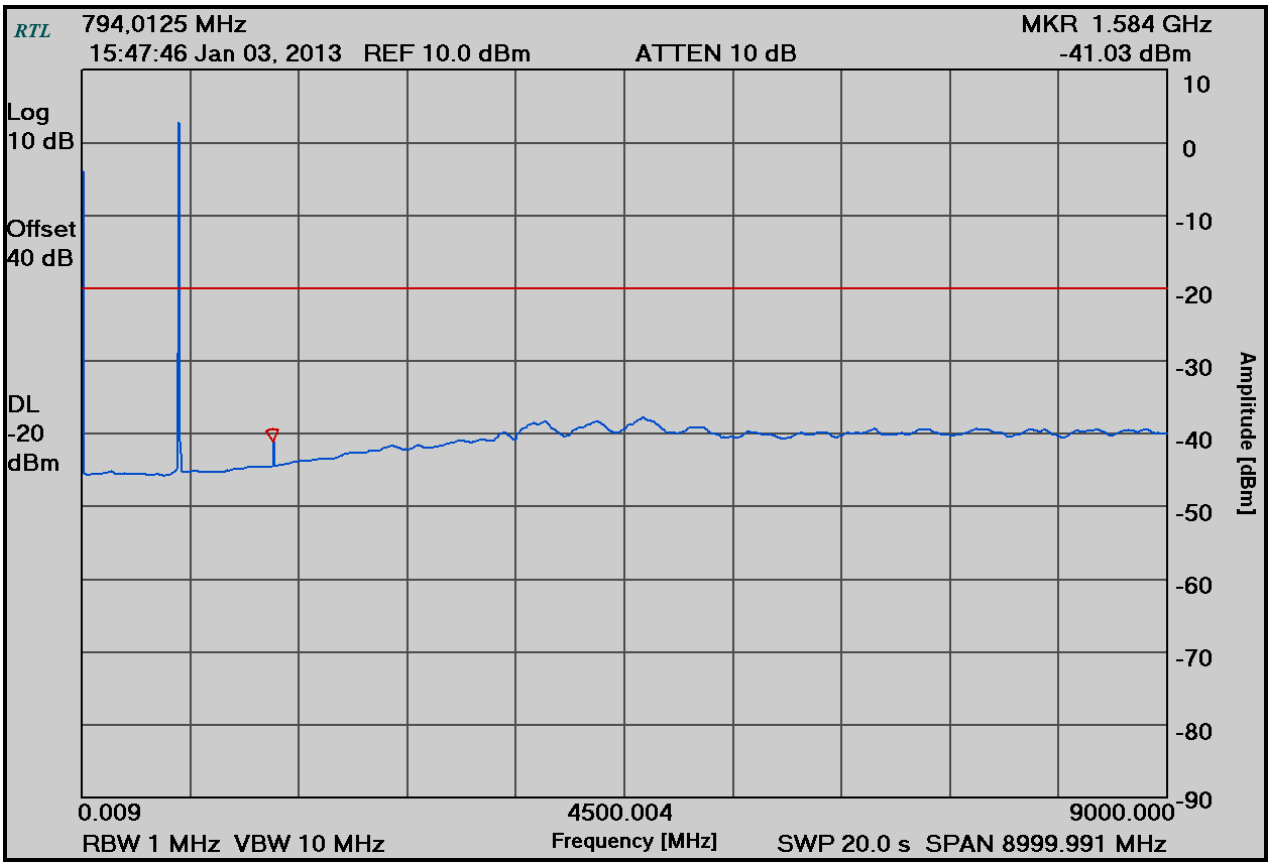
Plot 5-2: Conducted Spurious Emissions – H-CPM TDMA; 770.00625 MHz



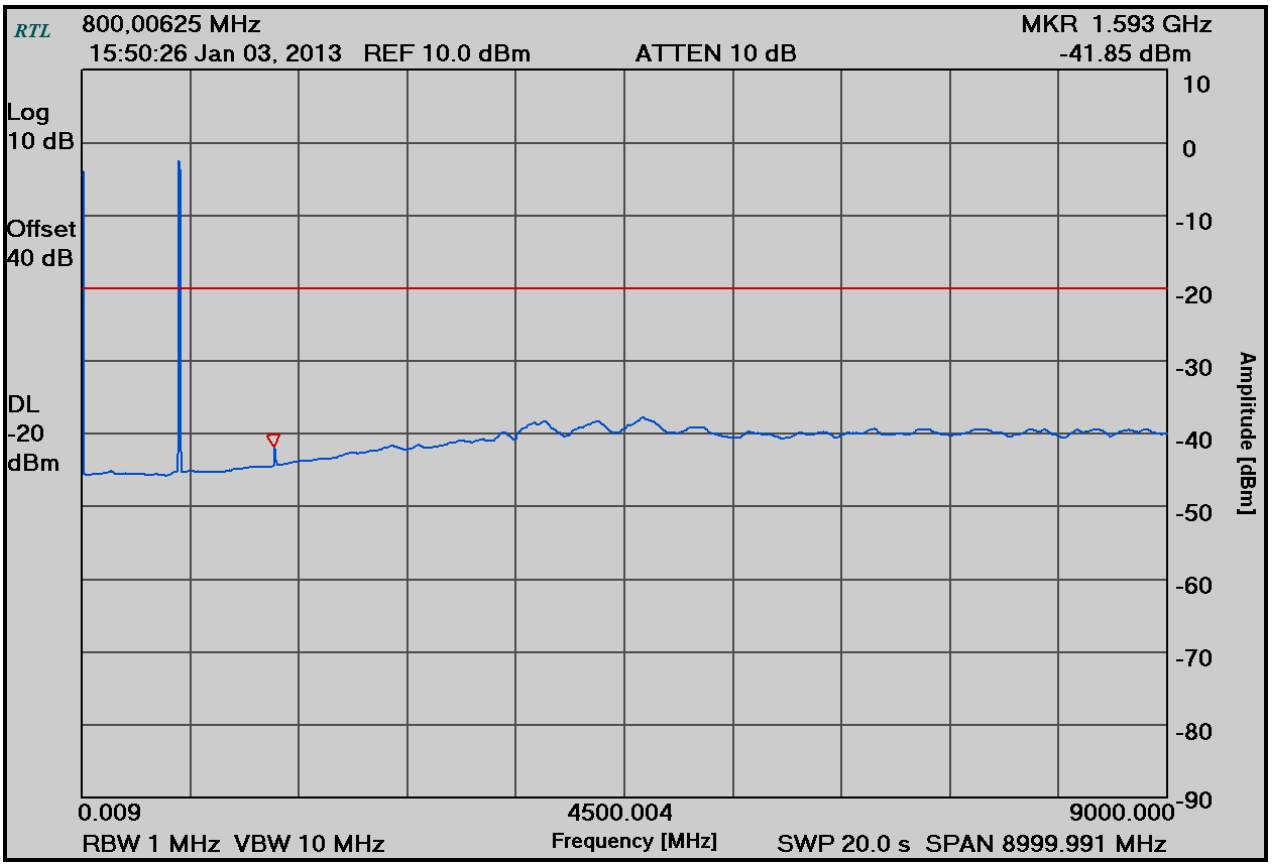
Plot 5-3: Conducted Spurious Emissions – H-CPM TDMA; 775.9875 MHz



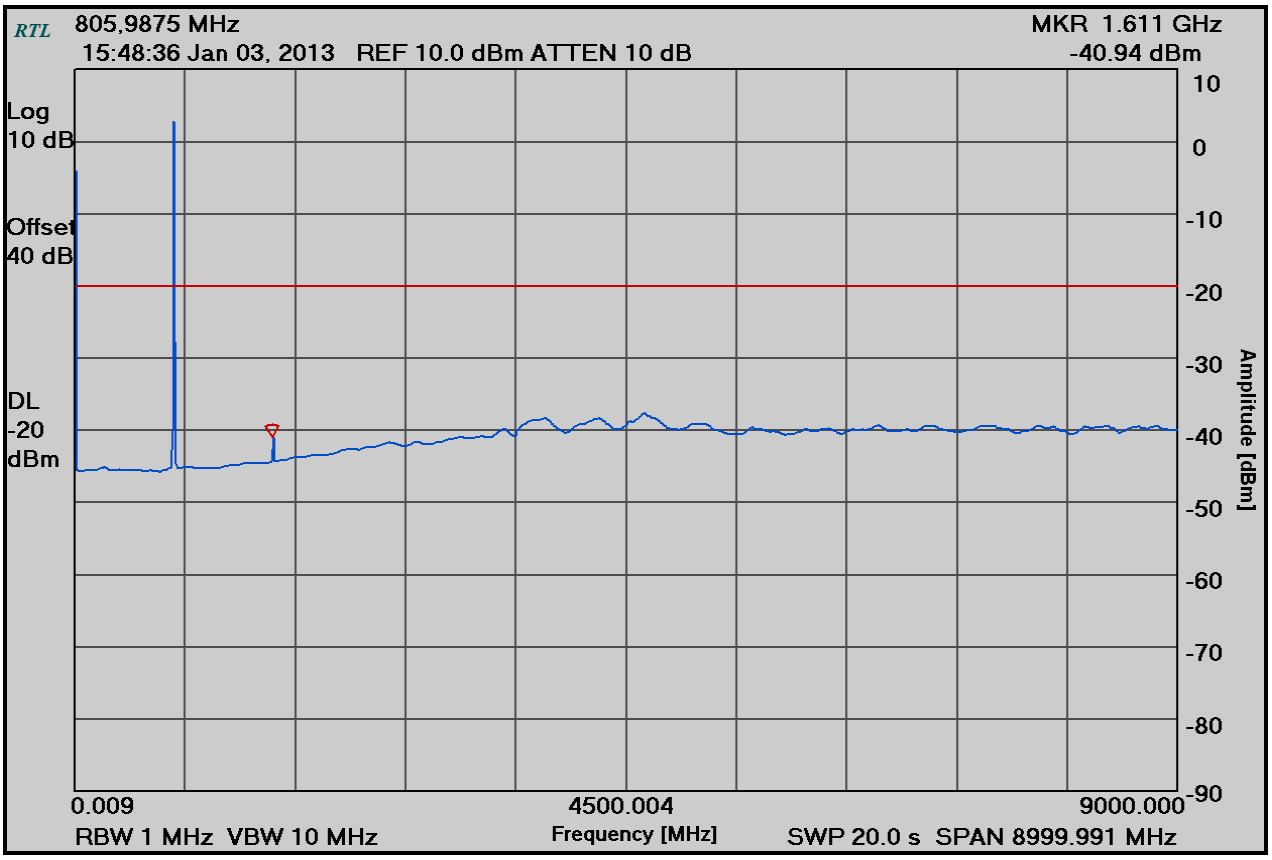
Plot 5-4: Conducted Spurious Emissions – H-CPM TDMA; 794.0125 MHz



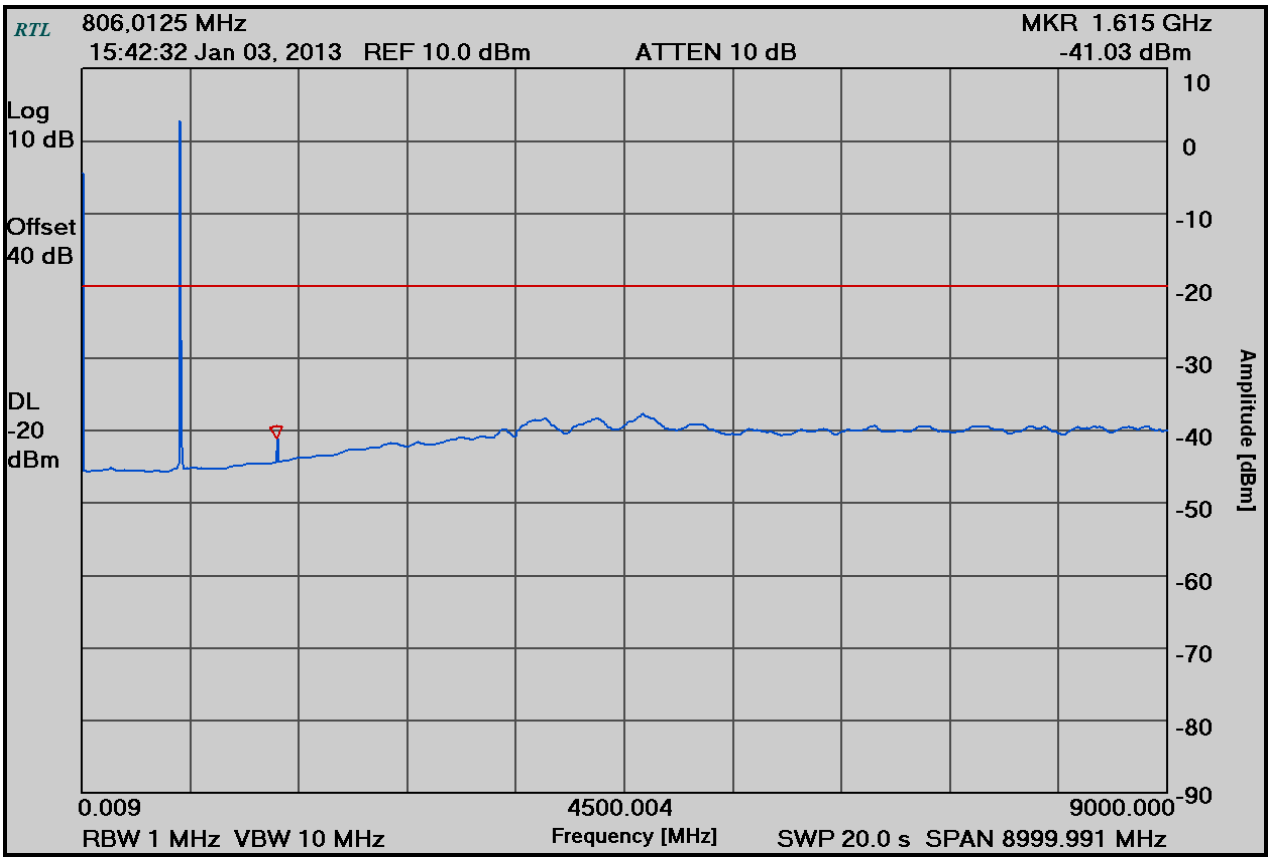
Plot 5-5: Conducted Spurious Emissions – H-CPM TDMA; 800.00625 MHz



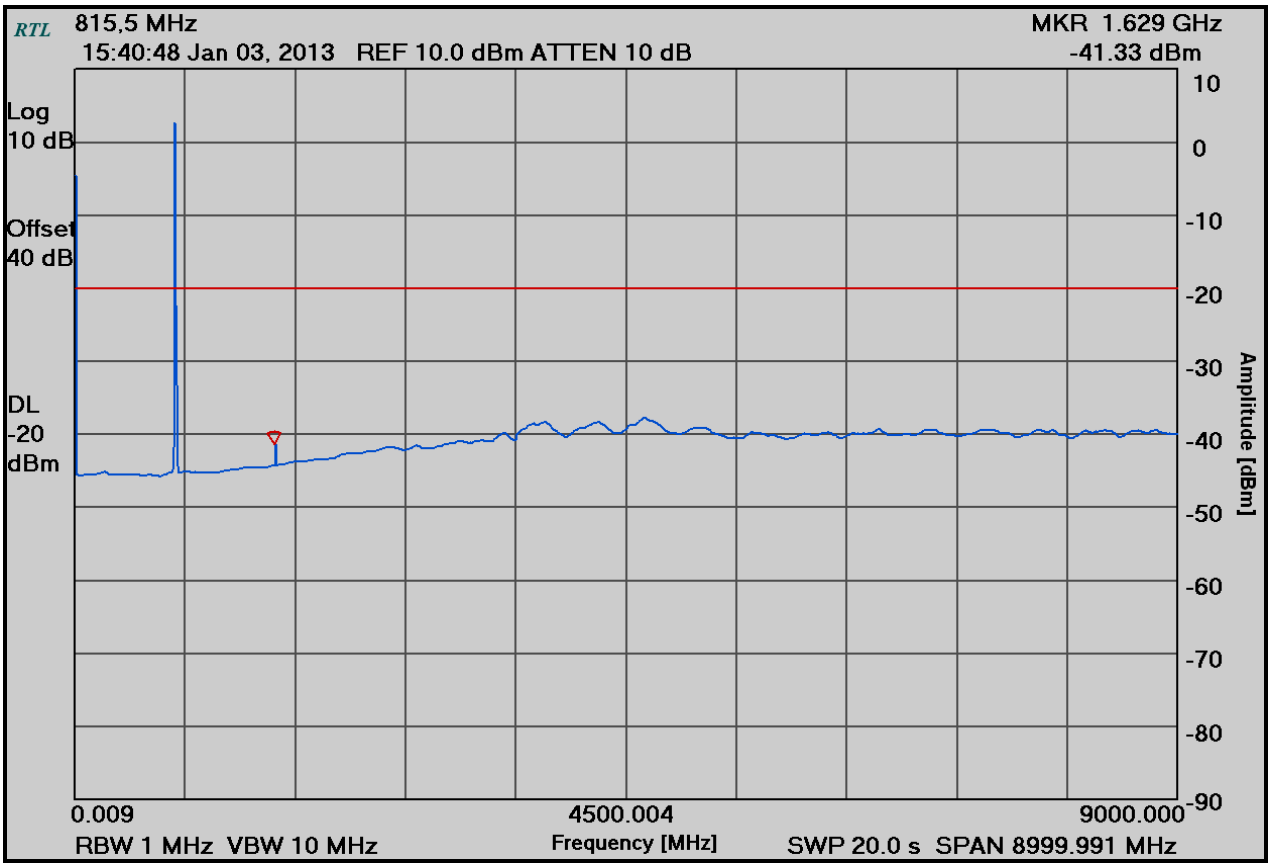
Plot 5-6: Conducted Spurious Emissions – H-CPM TDMA; 805.9875 MHz



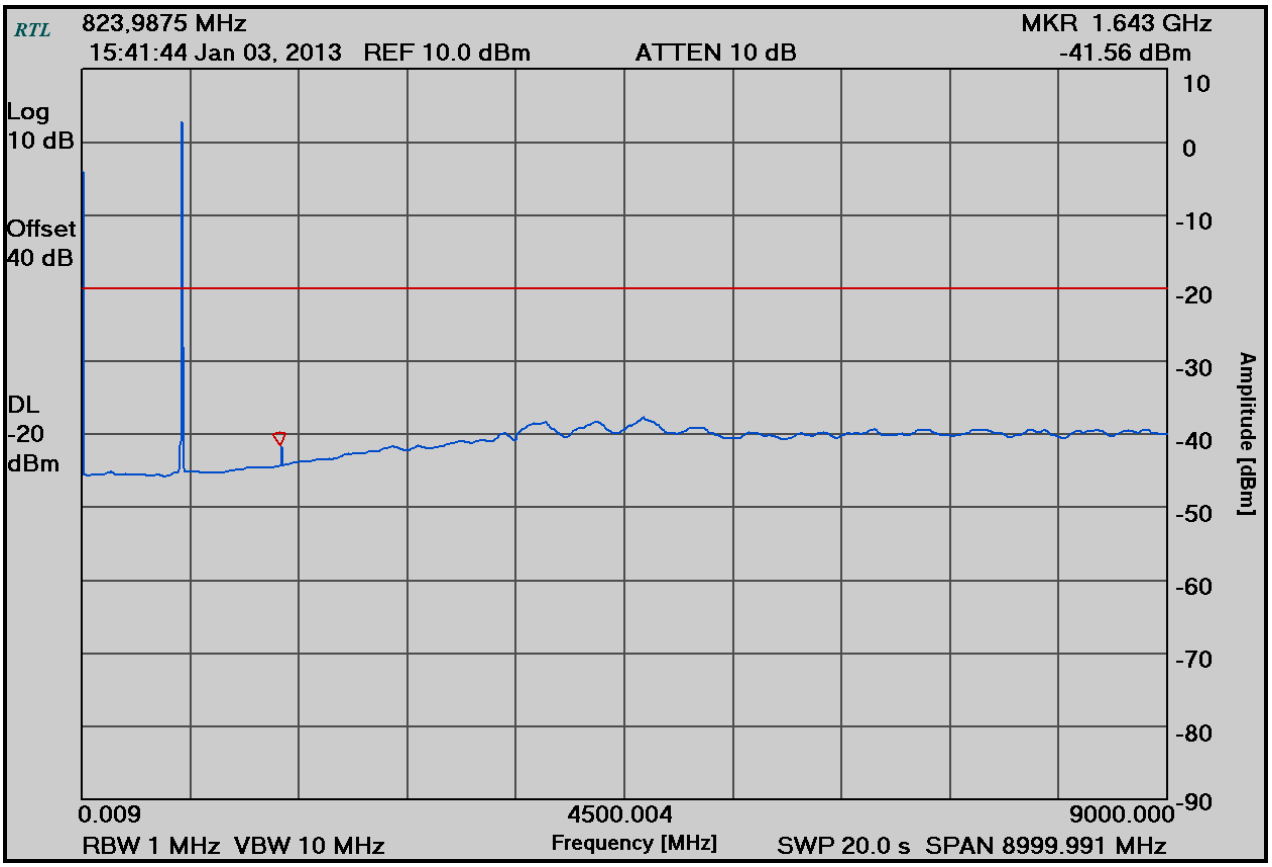
Plot 5-7: Conducted Spurious Emissions – H-CPM TDMA; 806.0125 MHz



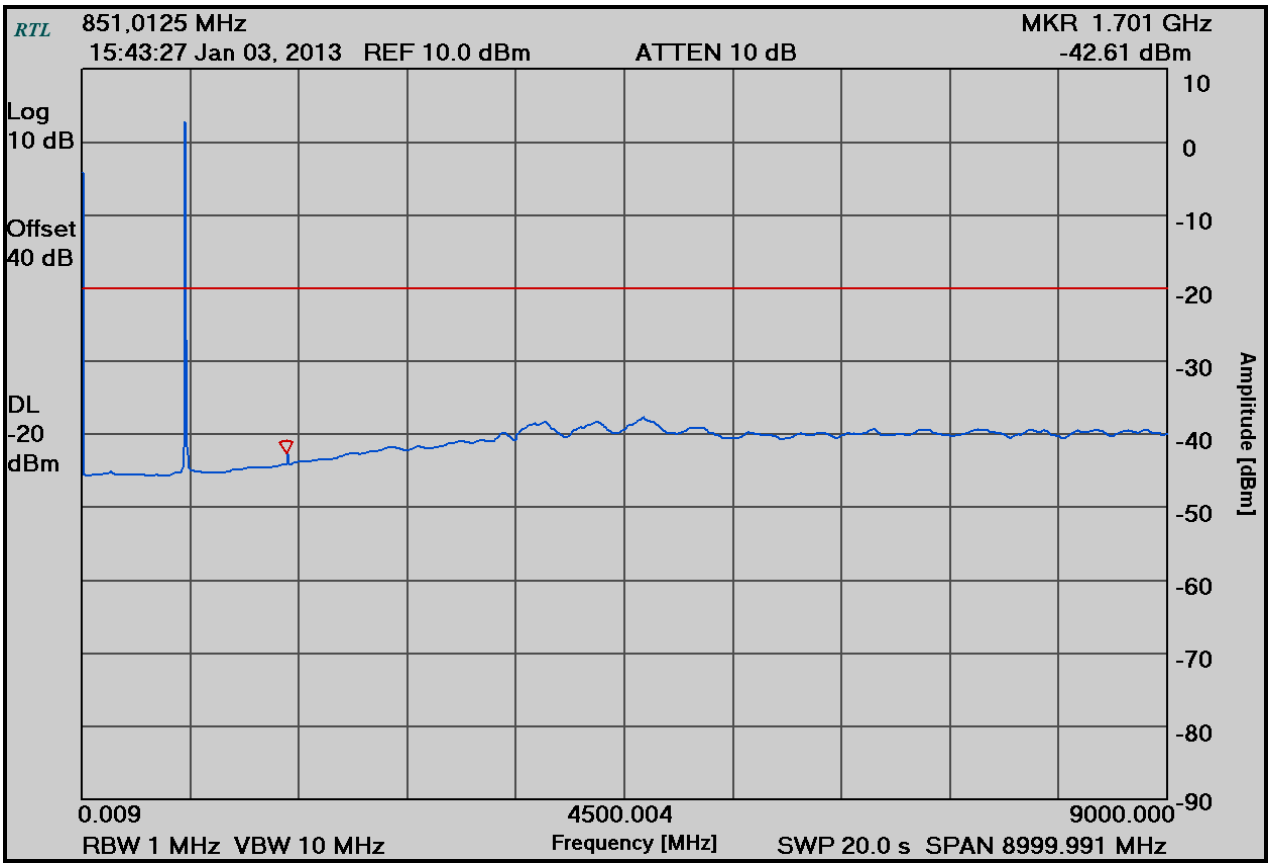
Plot 5-8: Conducted Spurious Emissions – H-CPM TDMA; 815.5000 MHz



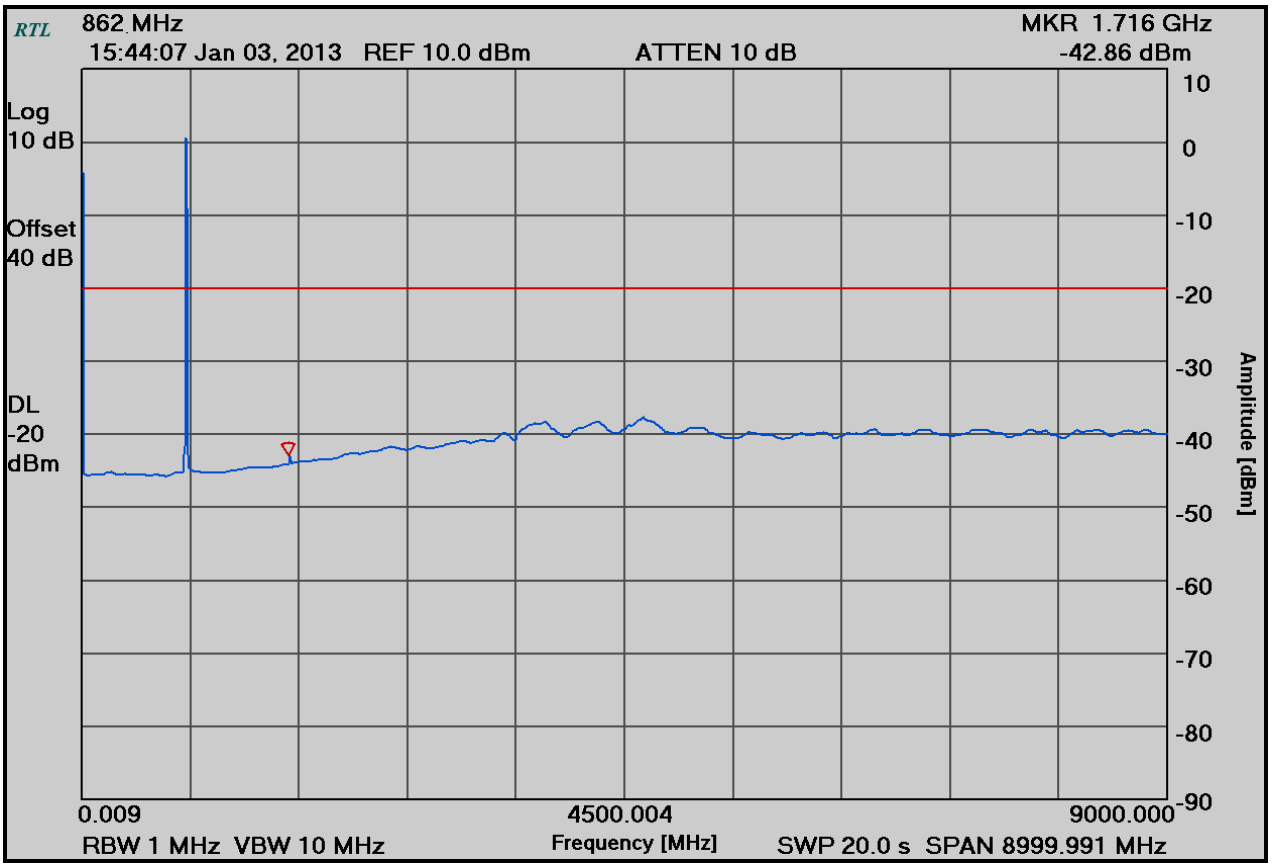
Plot 5-9: Conducted Spurious Emissions – H-CPM TDMA; 823.9875 MHz



Plot 5-10: Conducted Spurious Emissions – H-CPM TDMA; 851.0125 MHz



Plot 5-11: Conducted Spurious Emissions – H-CPM TDMA; 862.0000 MHz



Plot 5-12: Conducted Spurious Emissions – H-CPM TDMA; 868.9875 MHz

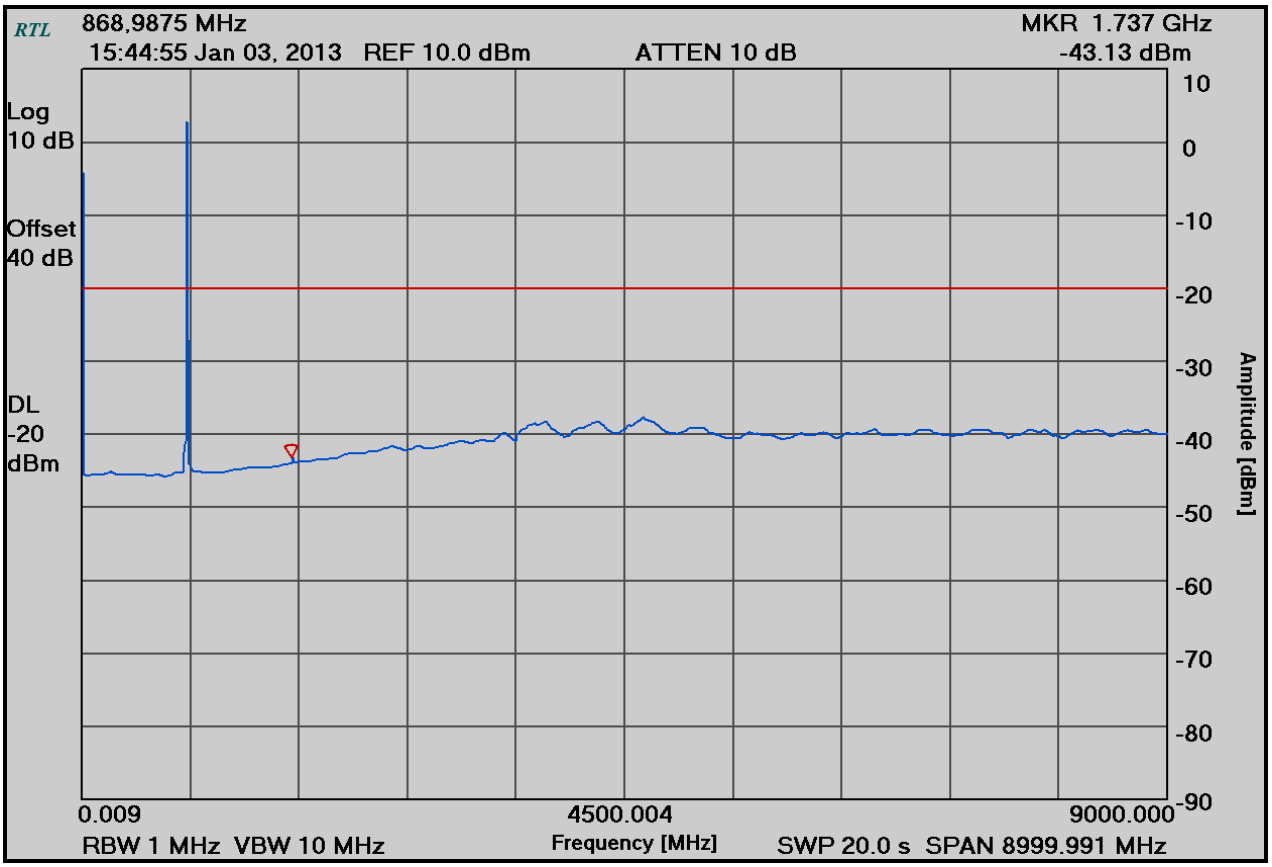


Table 5-1: Test Equipment Used for Testing Spurious Emissions

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

Test Personnel:

Daniel Baltzell		January 3, 2013
EMC Test Engineer	Signature	Date of Test

6 FCC Rules and Regulations §2.1049(c)(1); §90.210; RSS-119 §5.8: Occupied Bandwidth

6.1 Test Procedure

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

Notes: FCC 90.210 specifies masks G and H for the 800 MHz band operation of this equipment, RSS-119 and TIA-102.CCAB October 2011 section 3.2.5.1 specify mask D; all data is presented on the following pages

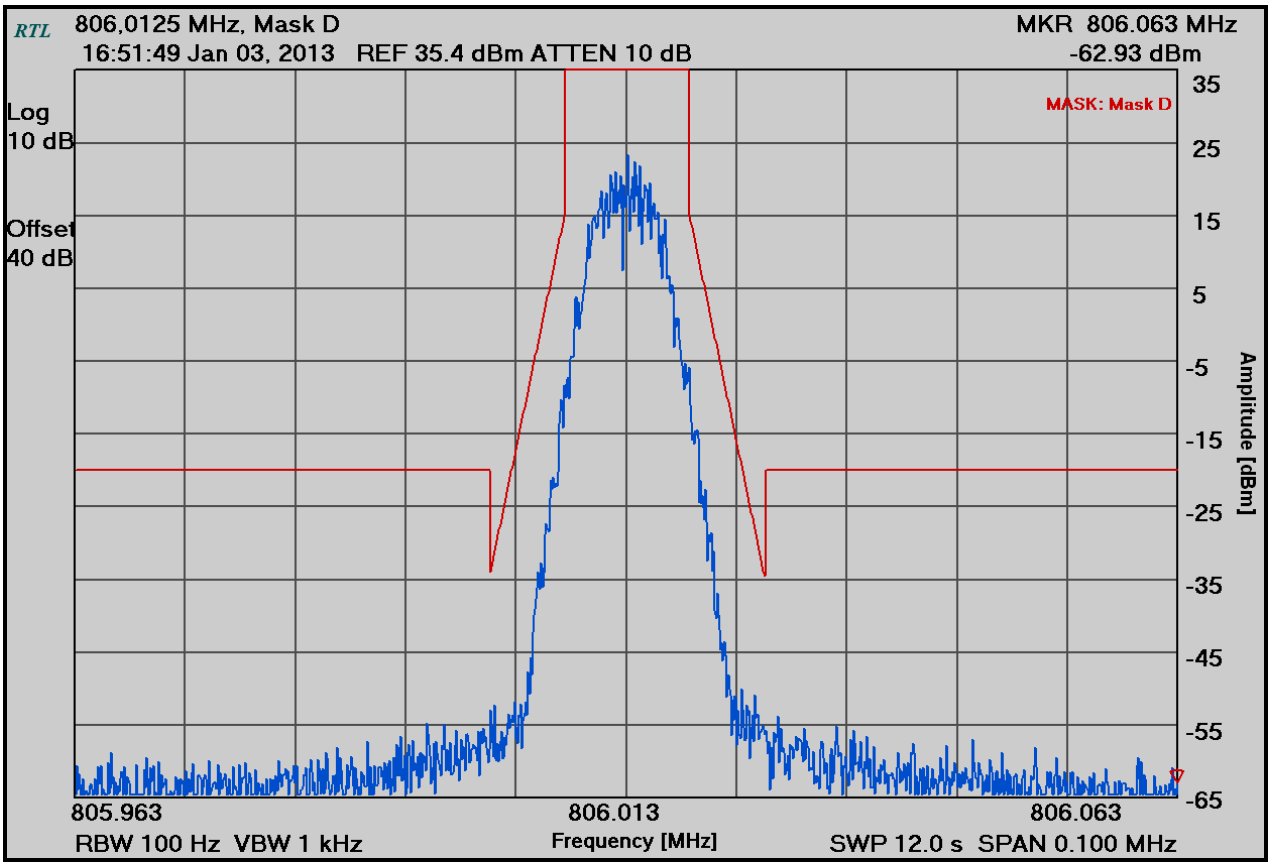
FCC §90.210

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

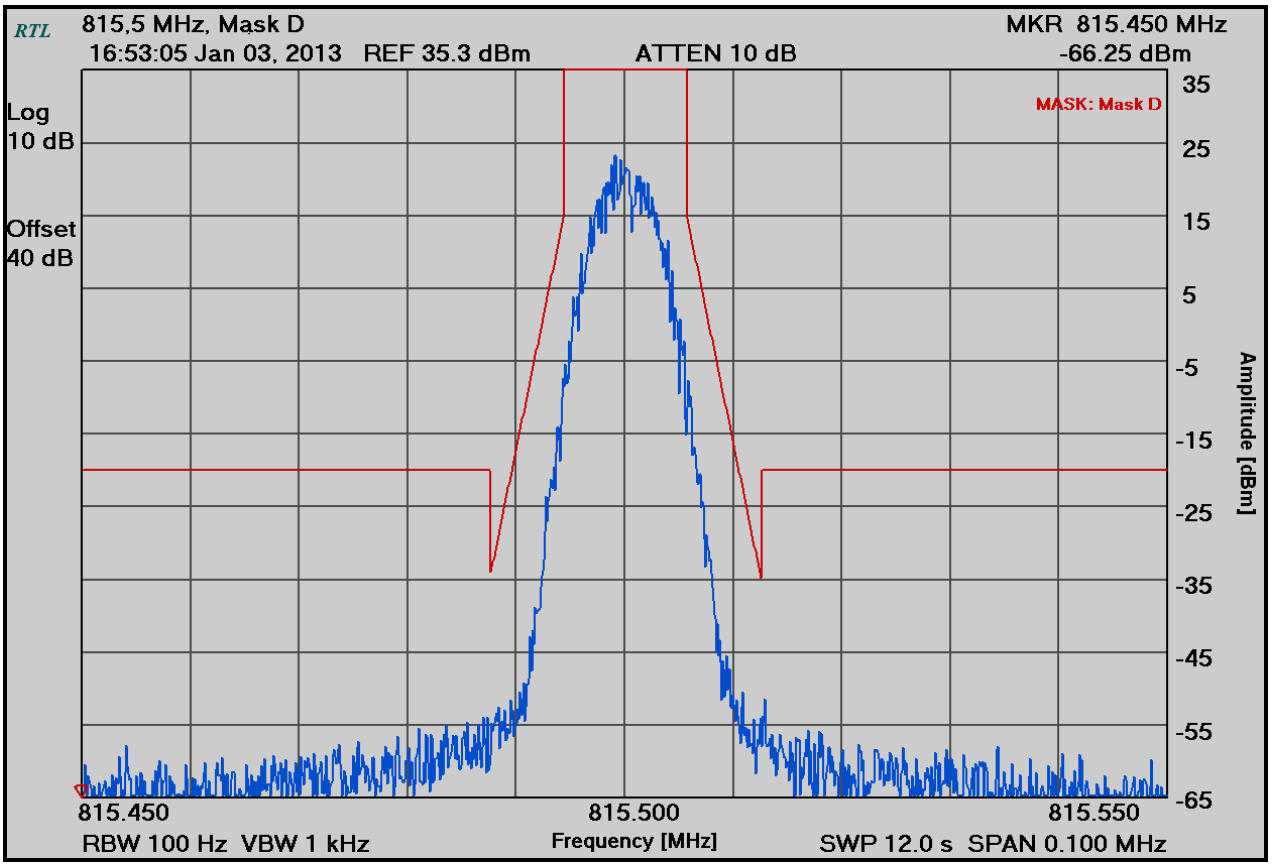
[1] Equipment using single sideband J3E emission must meet the requirements of Emission Mask A. Equipment using other emissions must meet the requirements of Emission Mask B or C, as applicable.
[2] Equipment designed to operate with a 25 kHz channel bandwidth must meet the requirements of Emission Mask 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.

6.2 Test Data

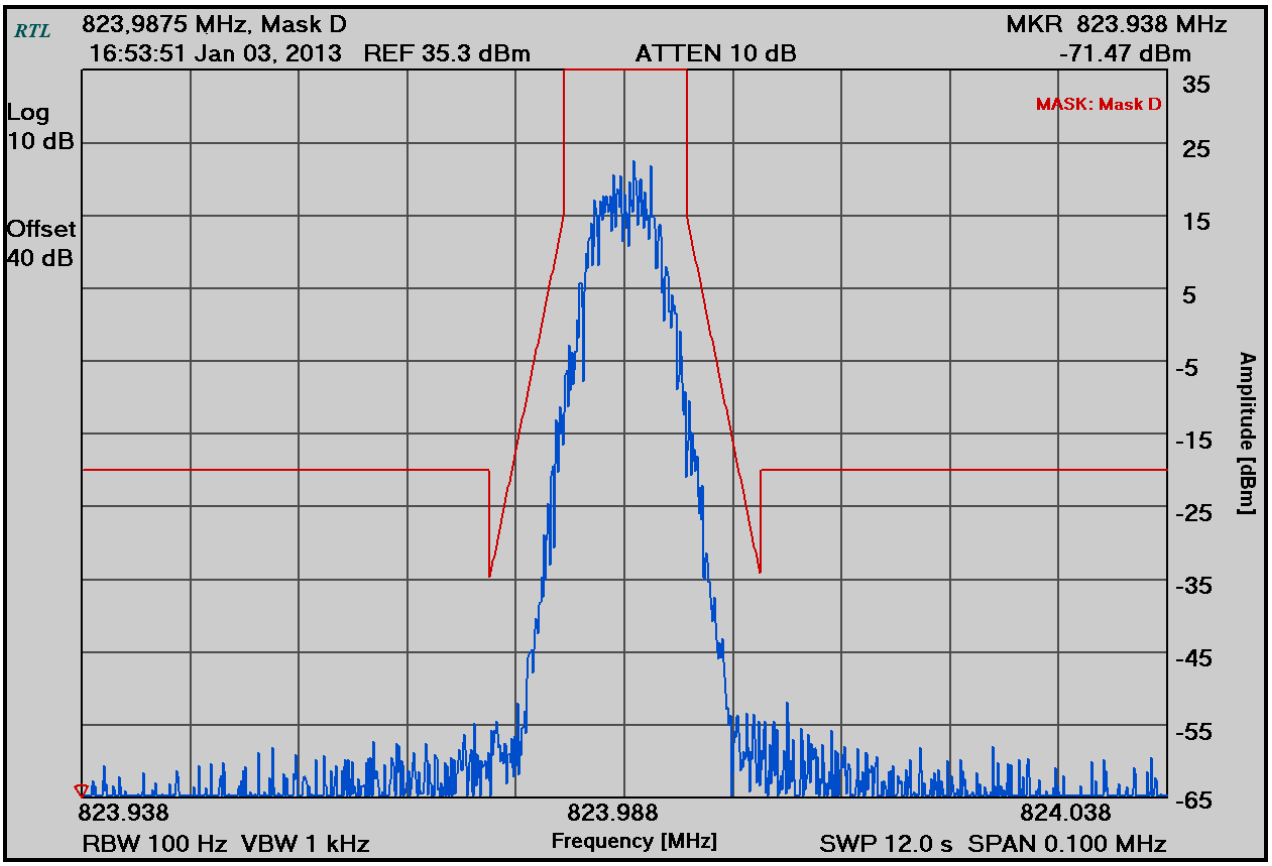
Plot 6-1: Occupied Bandwidth – H-CPM TDMA; 806.0125 MHz; Mask D



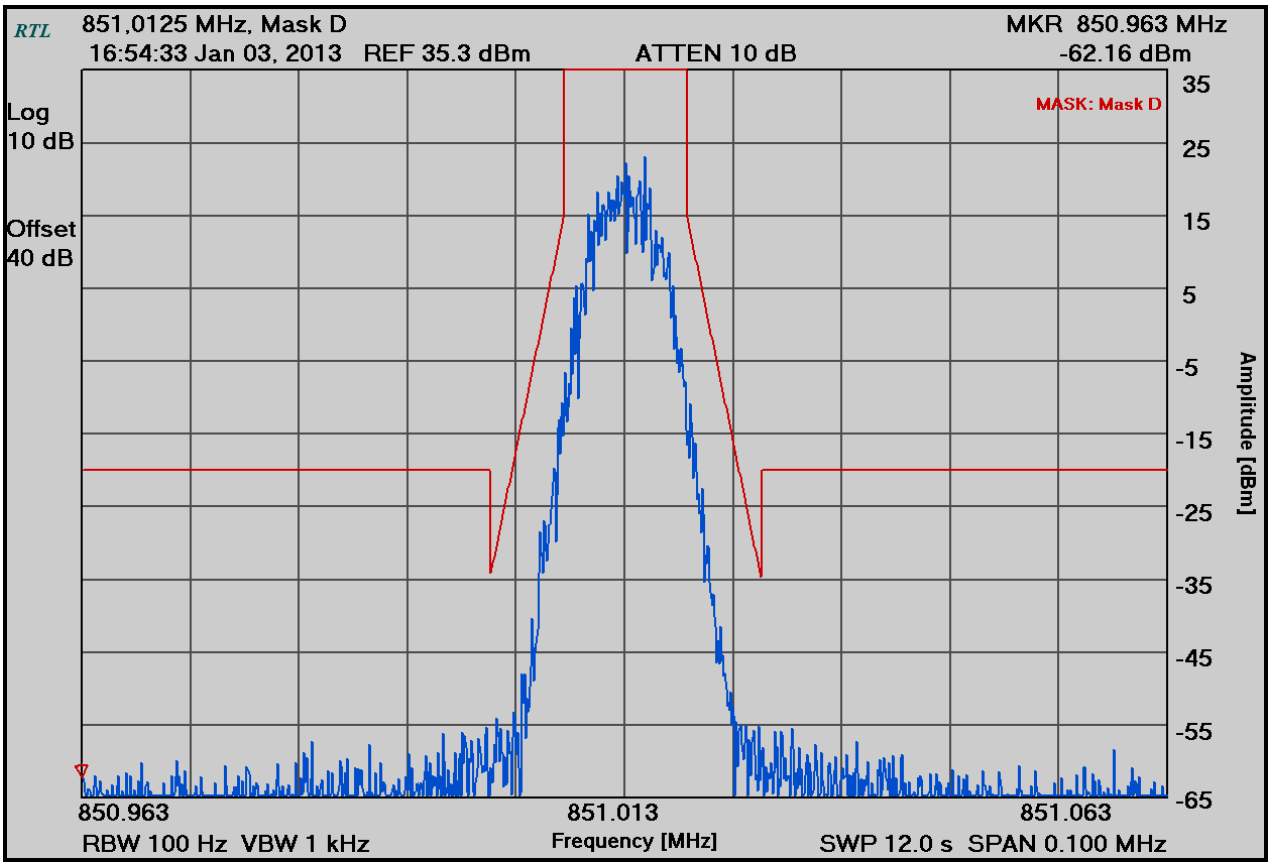
Plot 6-2: Occupied Bandwidth – H-CPM TDMA; 815.5000 MHz; Mask D



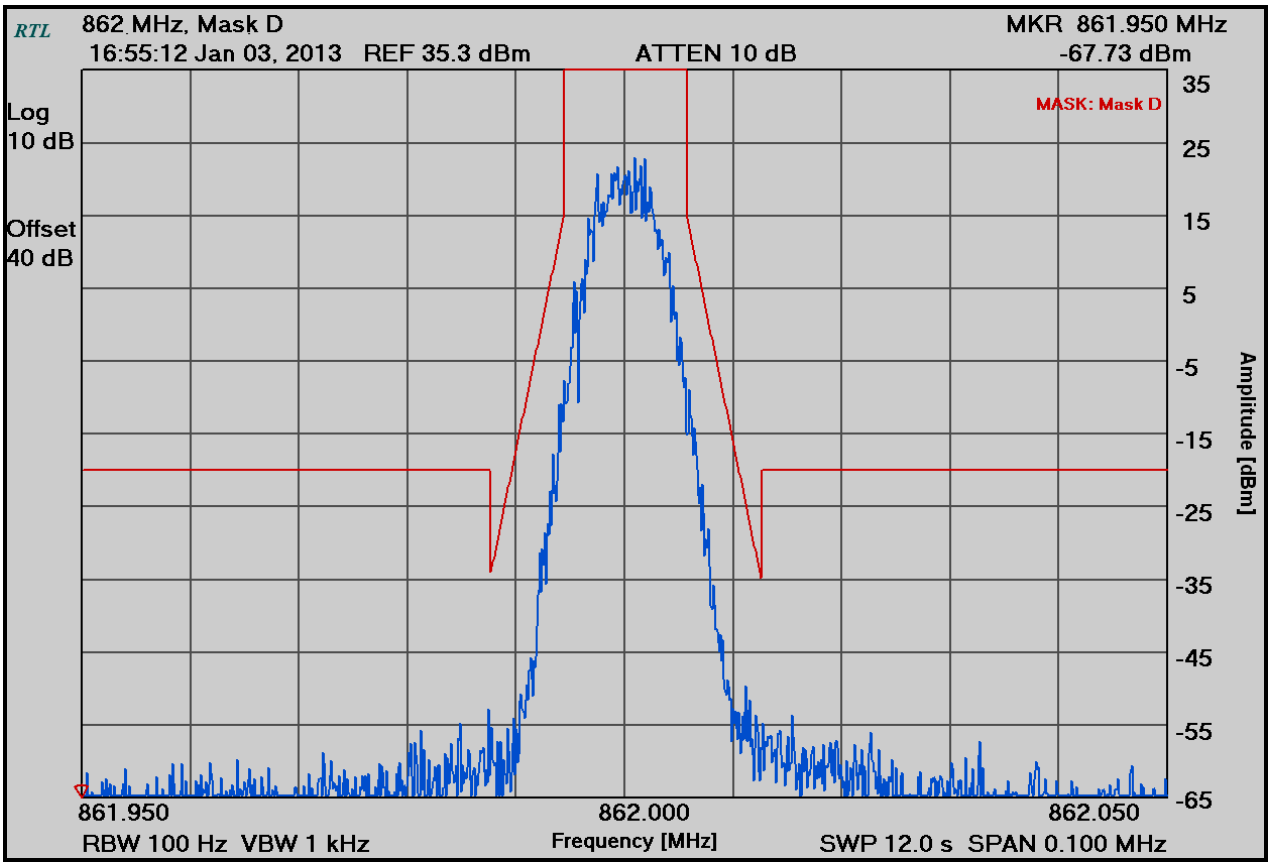
Plot 6-3: Occupied Bandwidth – H-CPM TDMA; 823.9875 MHz; Mask D



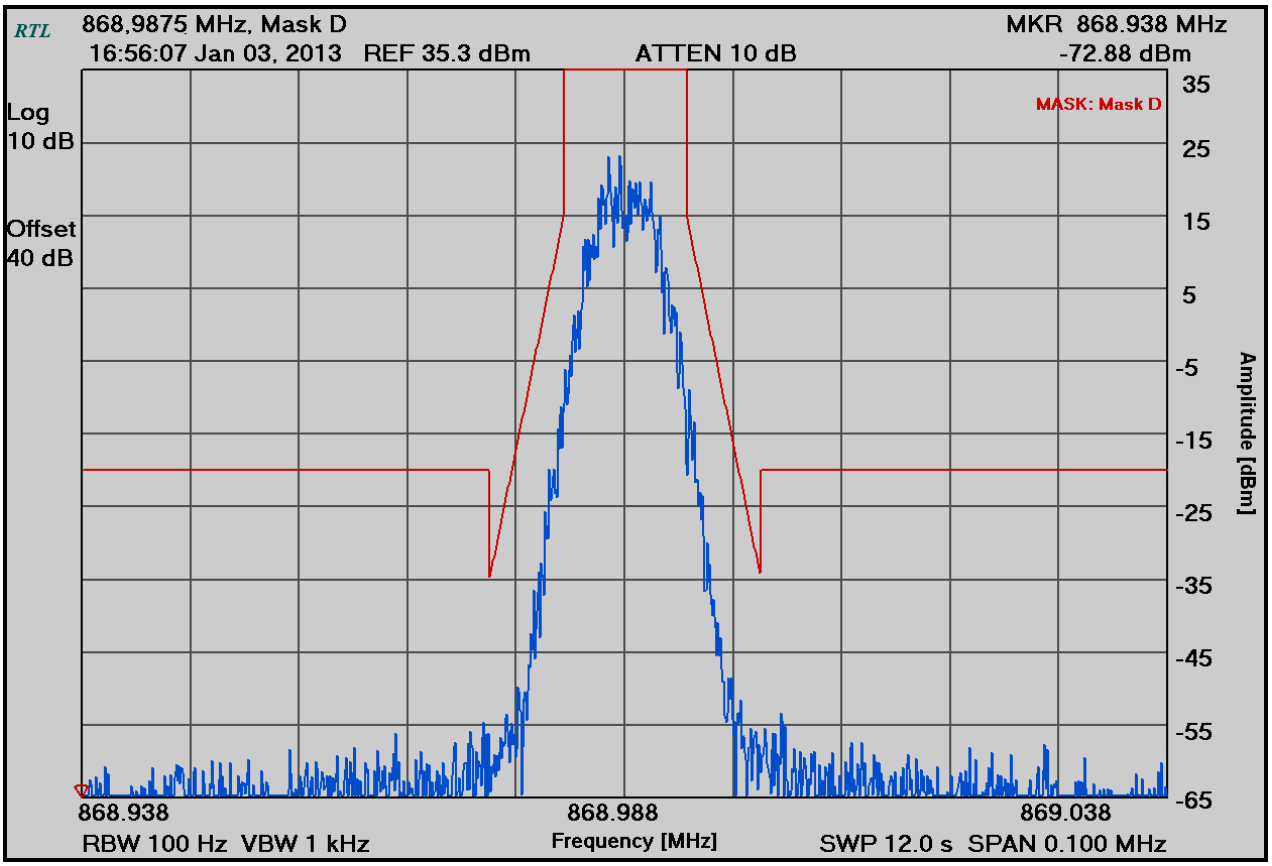
Plot 6-4: Occupied Bandwidth – H-CPM TDMA; 851.0125 MHz; Mask D



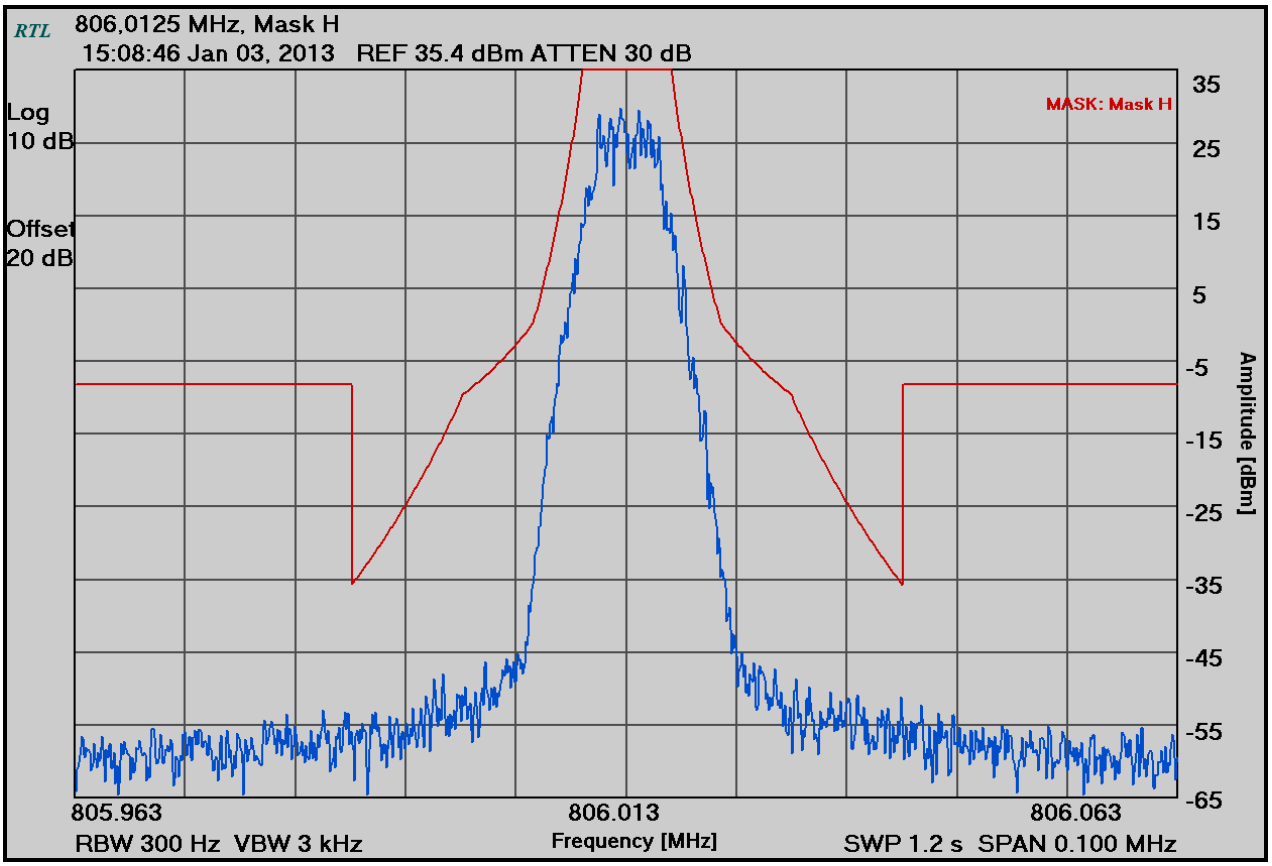
Plot 6-5: Occupied Bandwidth – H-CPM TDMA; 862.0000 MHz; Mask D



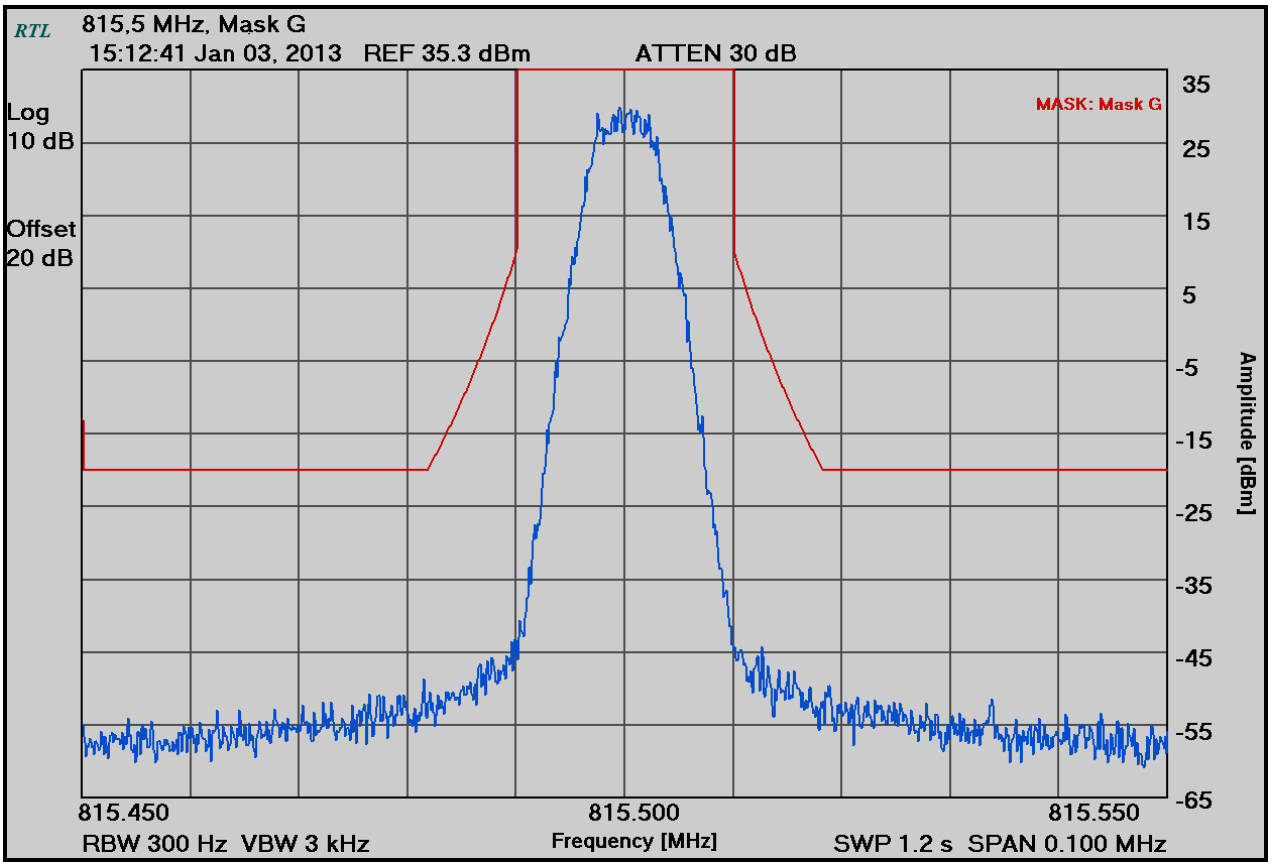
Plot 6-6: Occupied Bandwidth – H-CPM TDMA; 868.9875 MHz; Mask D



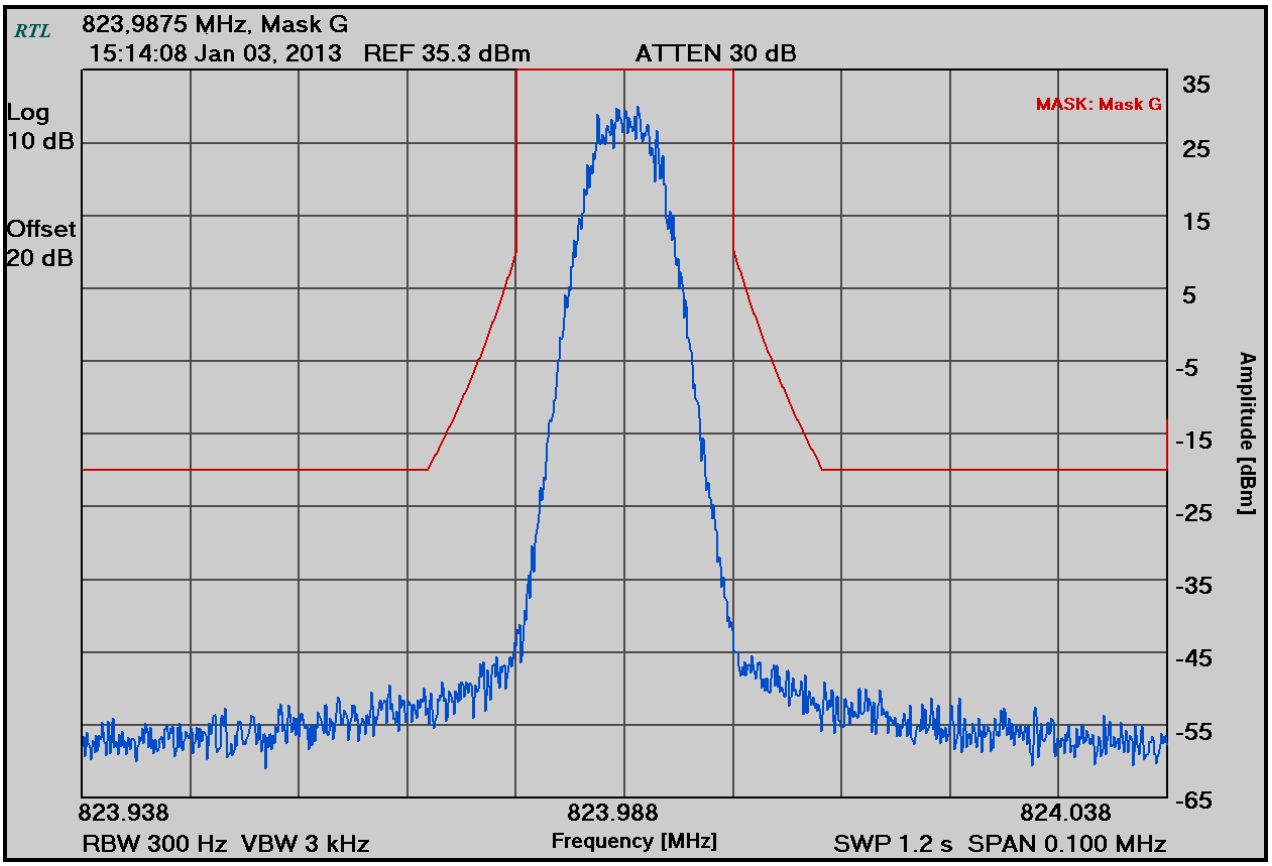
Plot 6-7: Occupied Bandwidth – H-CPM TDMA; 806.0125 MHz; Mask H



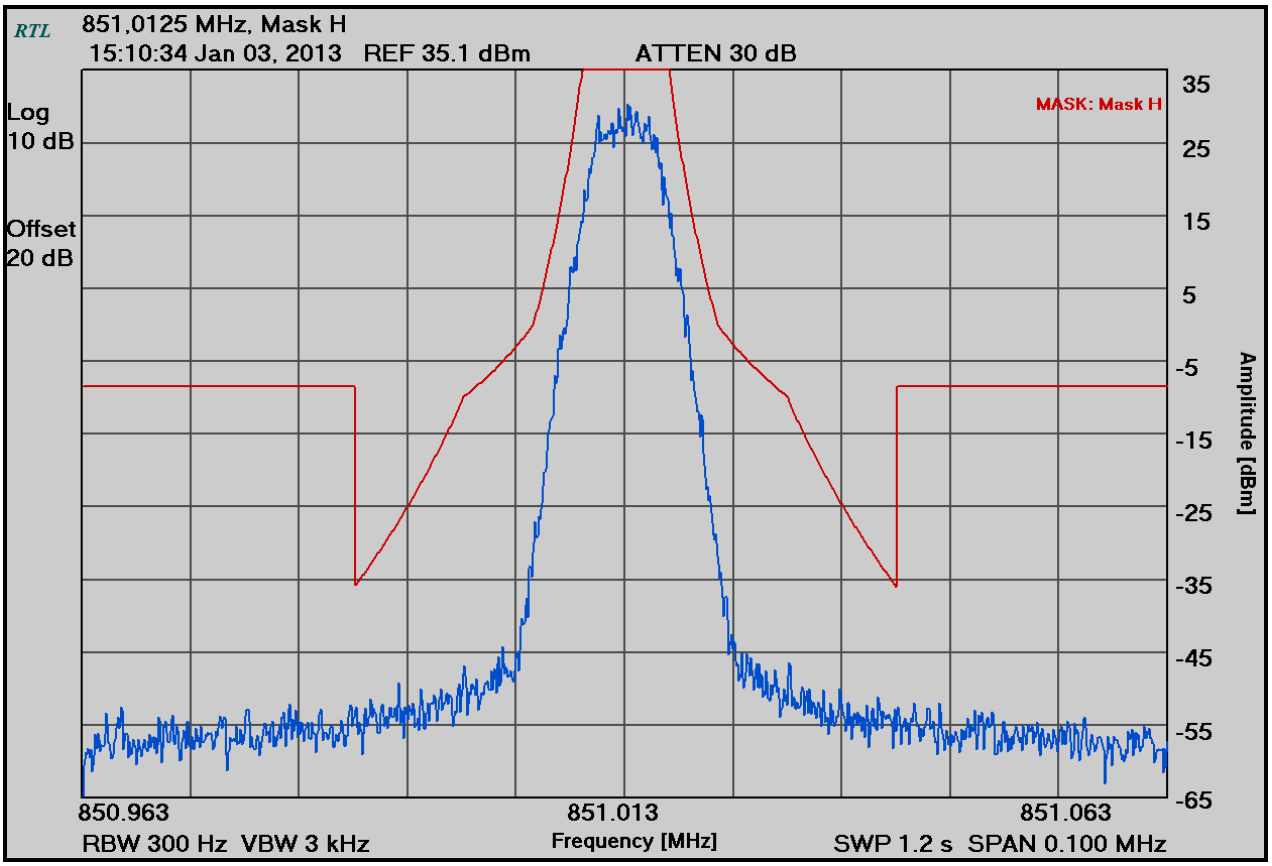
Plot 6-8: Occupied Bandwidth – H-CPM TDMA; 815.5000 MHz; Mask G



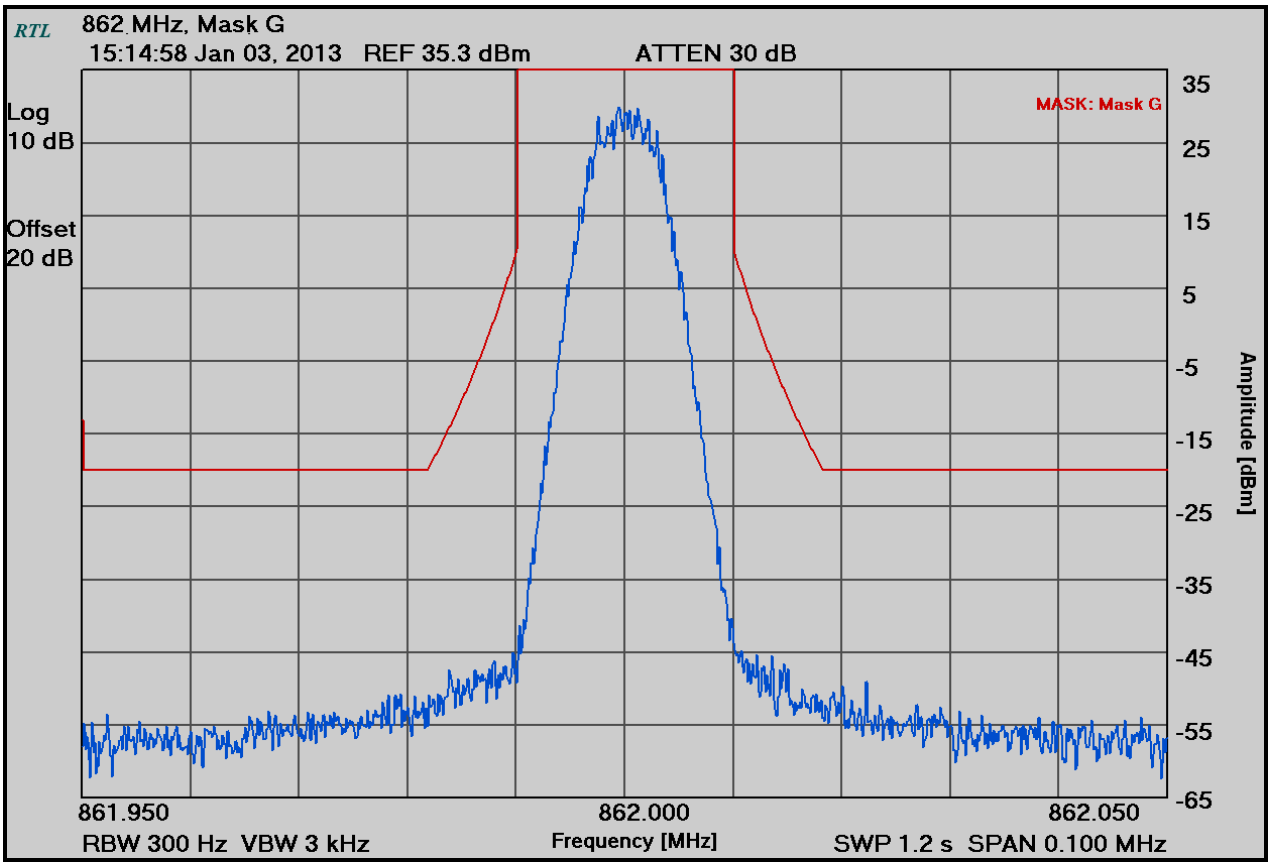
Plot 6-9: Occupied Bandwidth – H-CPM TDMA; 823.9875 MHz; Mask G



Plot 6-10: Occupied Bandwidth – H-CPM TDMA; 851.0125 MHz; Mask H



Plot 6-11: Occupied Bandwidth – H-CPM TDMA; 862.0000 MHz; Mask G



Plot 6-12: Occupied Bandwidth – H-CPM TDMA; 868.9875 MHz; Mask G

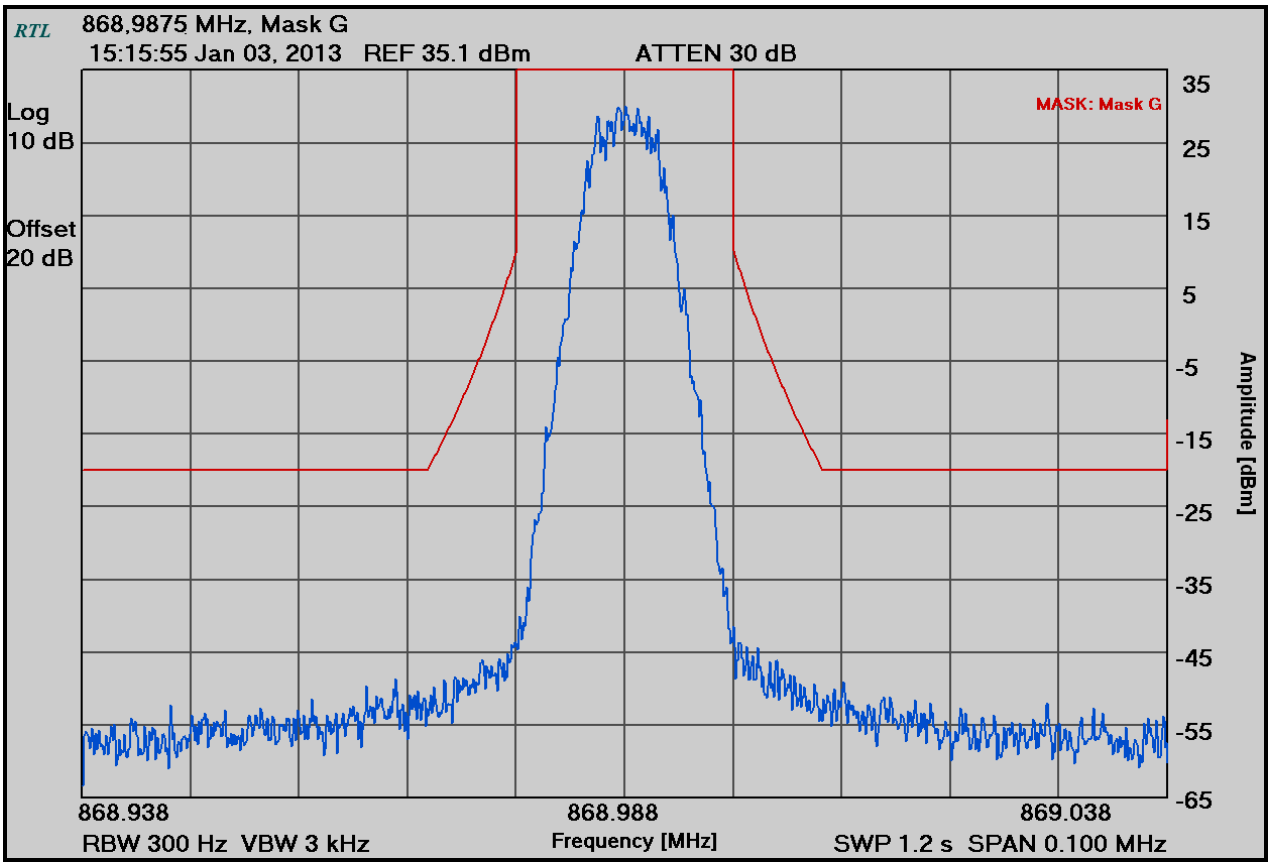


Table 6-1: Test Equipment Used for Testing Occupied Bandwidth

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
901337	Narda Microline	766-10	Attenuator (DC-4GHz, 10 dB, 20W)	6242	8/17/13

Test Personnel:

Daniel Baltzell		January 3, 2013
Test Engineer	Signature	Date of Test

7 FCC Rules and Regulations Part §90.543(a): Emission Limitations: ACP Requirements; IC RSS-119 §4.3 Adjacent Channel Power (ACP) Measurement for Equipment in the Bands 764-776 MHz and 794-806 MHz

Effective October 23, 2007, transmitters designed to operate in the 769–775 MHz and 799–805 MHz frequency bands must meet the emission limitations in paragraphs (a) through (d) of this section. Transmitters operating in the 763–768 MHz and 793–798 MHz bands must meet the emission limitations in (e) of this section.

7.1 Test Procedure

TIA-102.CCAA August 2011, section 2.2.8, TIA-102.CCAB October 2011, section 3.2.8

For a Portable transmitter designed to operate with a 12.5 kHz channel bandwidth, the ACP shall be in accordance with the values in the following table:

Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Maximum ACP Relative (dBc)
(+/-)9.375	6.25	-40
(+/-)15.625	6.25	-60
(+/-)21.875	6.25	-60
(+/-)37.5	25	-60
(+/-)62.5	25	-65
(+/-)87.5	25	-65
(+/-)150	100	-65
(+/-)250	100	-65
(+/-)350	100	-65
>400 kHz to 12 MHz	30(s)	-75
12 MHz to paired receive band	30(s)	-75
In the paired receive band	30(s)	-100

For a Portable transmitter designed to operate with a 25 kHz channel bandwidth, the ACP shall be in accordance with the values in the following table:

Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Maximum ACP Relative (dBc)
(+/-)15.625	6.25	-40
(+/-)21.875	6.25	-60
(+/-)37.5	25	-60
(+/-)62.5	25	-65
(+/-)87.5	25	-65
(+/-)150	100	-65
(+/-)250	100	-65
(+/-)350	100	-65
>400 kHz to 12 MHz	30(s)	-75
12 MHz to paired receive band	30(s)	-75
In the paired receive band	30(s)	-100

FCC Rules and Regulations §90.543(b)

Setting Reference Level - 90.543(b)(1): Using a spectrum analyzer capable of ACP measurements, set the measurement bandwidth to the channel size. Set the frequency offset of the measurement to zero and adjust the center frequency of the spectrum analyzer to give the power level in the measurement bandwidth. Record this power as the reference power level.

Measuring the power level at the frequency offset <600 kHz - §90.543(b)(2): Using a spectrum analyzer capable of adjacent channel power (ACP) measurements, set the measurement bandwidth as shown in the table. Measure ACP in dBm. These measurements are made at maximum power. Calculate the coupled power by subtracting the measurements made in this step from the reference power level. The absolute ACP values must be less than the values given in the table for each condition.

Measuring the power level at the frequency offset >600 kHz - §90.543(b)(3): Set the spectrum analyzer to 30 kHz resolution bandwidth, 1 MHz video bandwidth and sample detection mode. Sweep +/-6 MHz from the carrier frequency. Set the reference level to the RMS value of the transmitter power and note the power. The response at frequencies >600 kHz must be less than the values listed in the table.

7.2 Test Data

Plot 7-1: ACP - 764.0125 MHz; H-CPM TDMA Mode (9.375 kHz - 350 kHz)

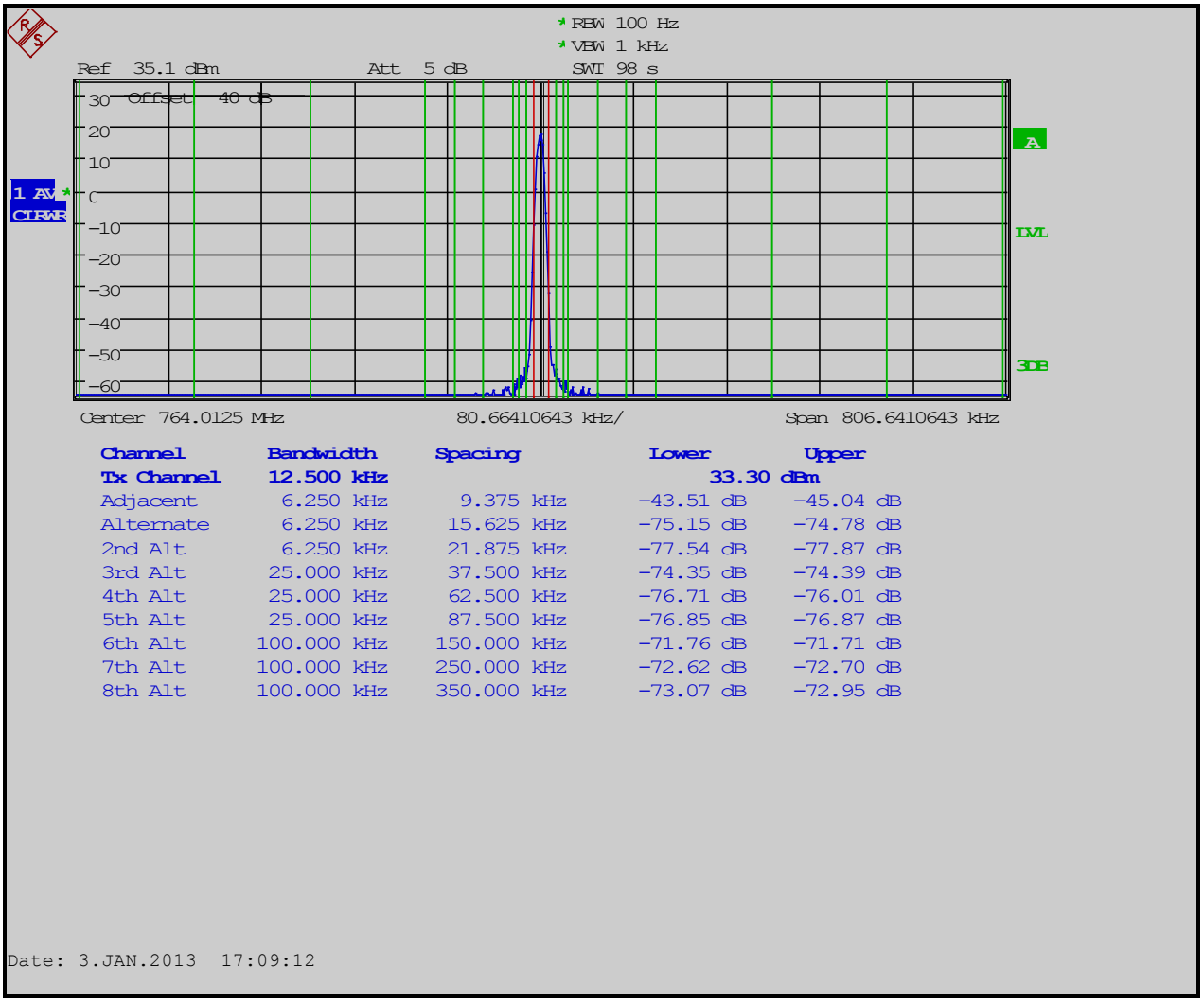


Table 7-1: ACP - 764.0125 MHz; H-CPM TDMA Mode (>400 kHz - RX Band)

Offset from Center Frequency	Measurement BW (kHz)	Max ACP (dBc)	Measured ACP (dBc)
>400 kHz to 12 MHz	30(s)	-75	-76.55
12 MHz to receive band	30(s)	-75	-81.35
In receive band	30(s)	-100	-107.85

Plot 7-2: ACP - 770.00625 MHz; H-CPM TDMA Mode (9.375 kHz - 350 kHz)

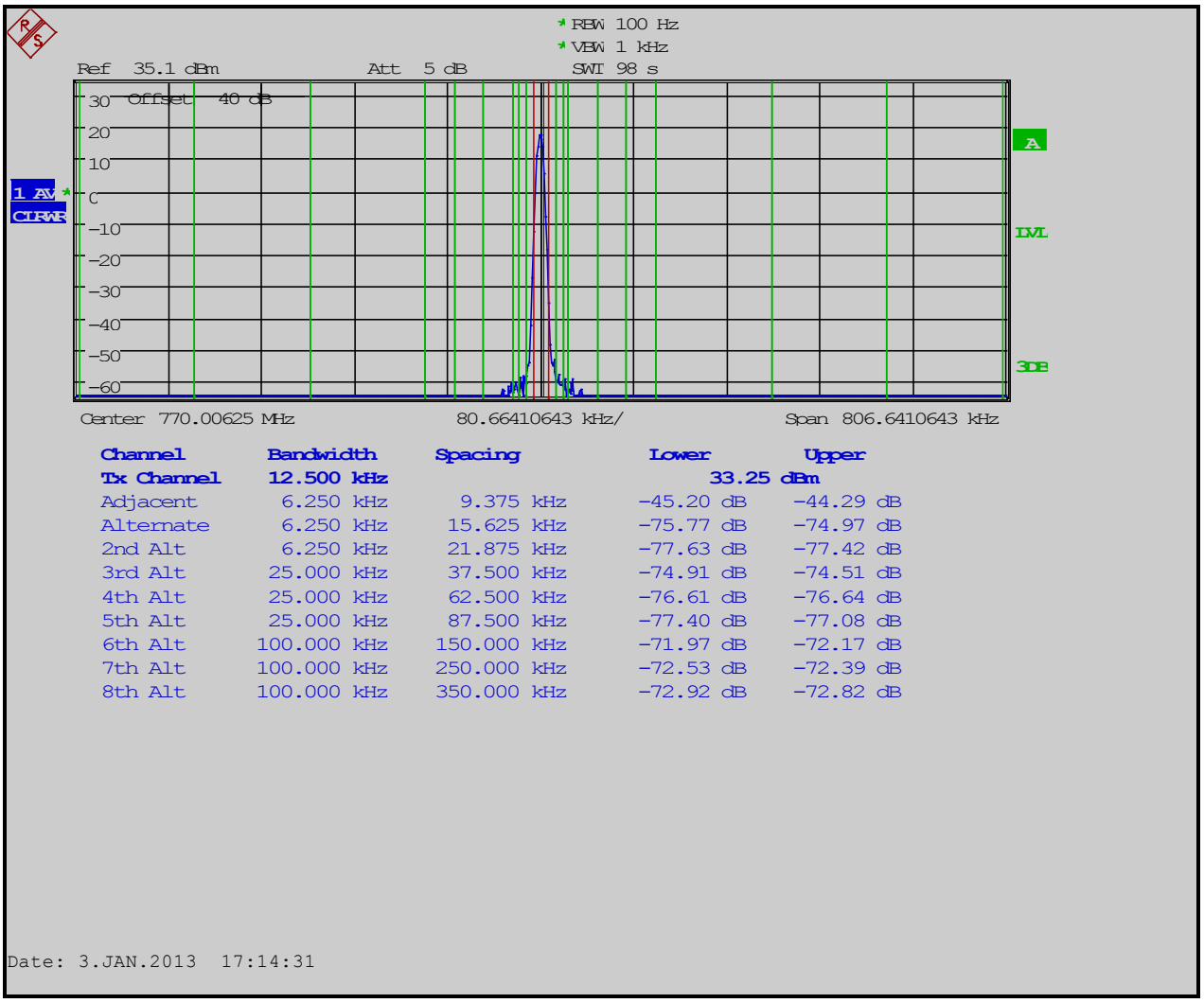


Table 7-2: ACP – 770.00625 MHz; H-CPM TDMA Mode (>400 kHz - RX Band)

Offset from Center Frequency	Measurement BW (kHz)	Max ACP (dBc)	Measured ACP (dBc)
>400 kHz to 12 MHz	30(s)	-75	-81.61
12 MHz to receive band	30(s)	-75	-84.71
In receive band	30(s)	-100	-109.61

Plot 7-3: ACP – 775.9875 MHz; H-CPM TDMA Mode (9.375 kHz - 350 kHz)

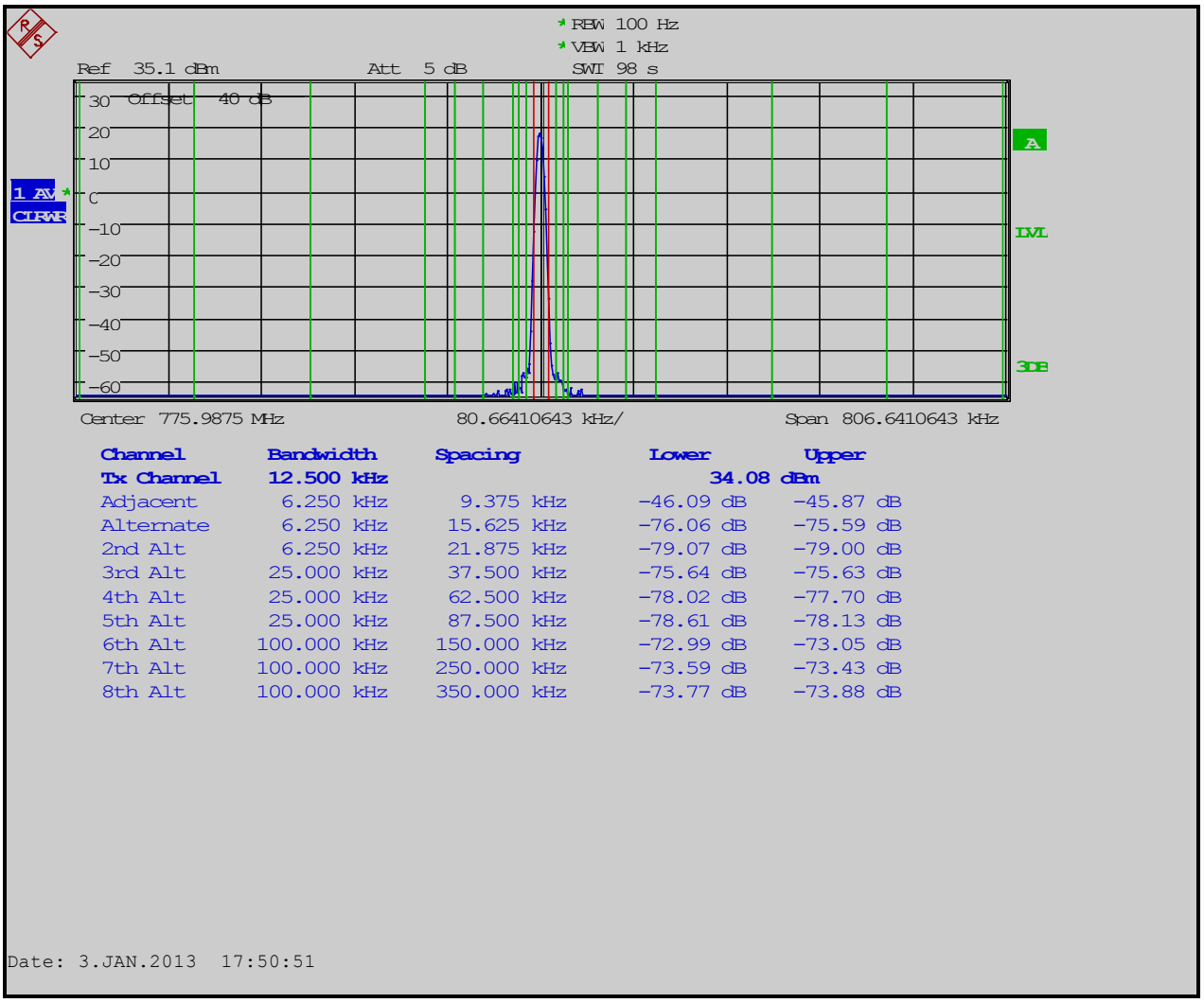


Table 7-3: ACP - 775.9875 MHz; H-CPM TDMA Mode (>400 kHz - RX Band)

Offset from Center Frequency	Measurement BW (kHz)	Max ACP (dBc)	Measured ACP (dBc)
>400 kHz to 12 MHz	30(s)	-75	-79.56
12 MHz to receive band	30(s)	-75	-91.26
In receive band	30(s)	-100	-105.46

Plot 7-4: ACP – 794.0125 MHz; H-CPM TDMA Mode (9.375 kHz - 350 kHz)

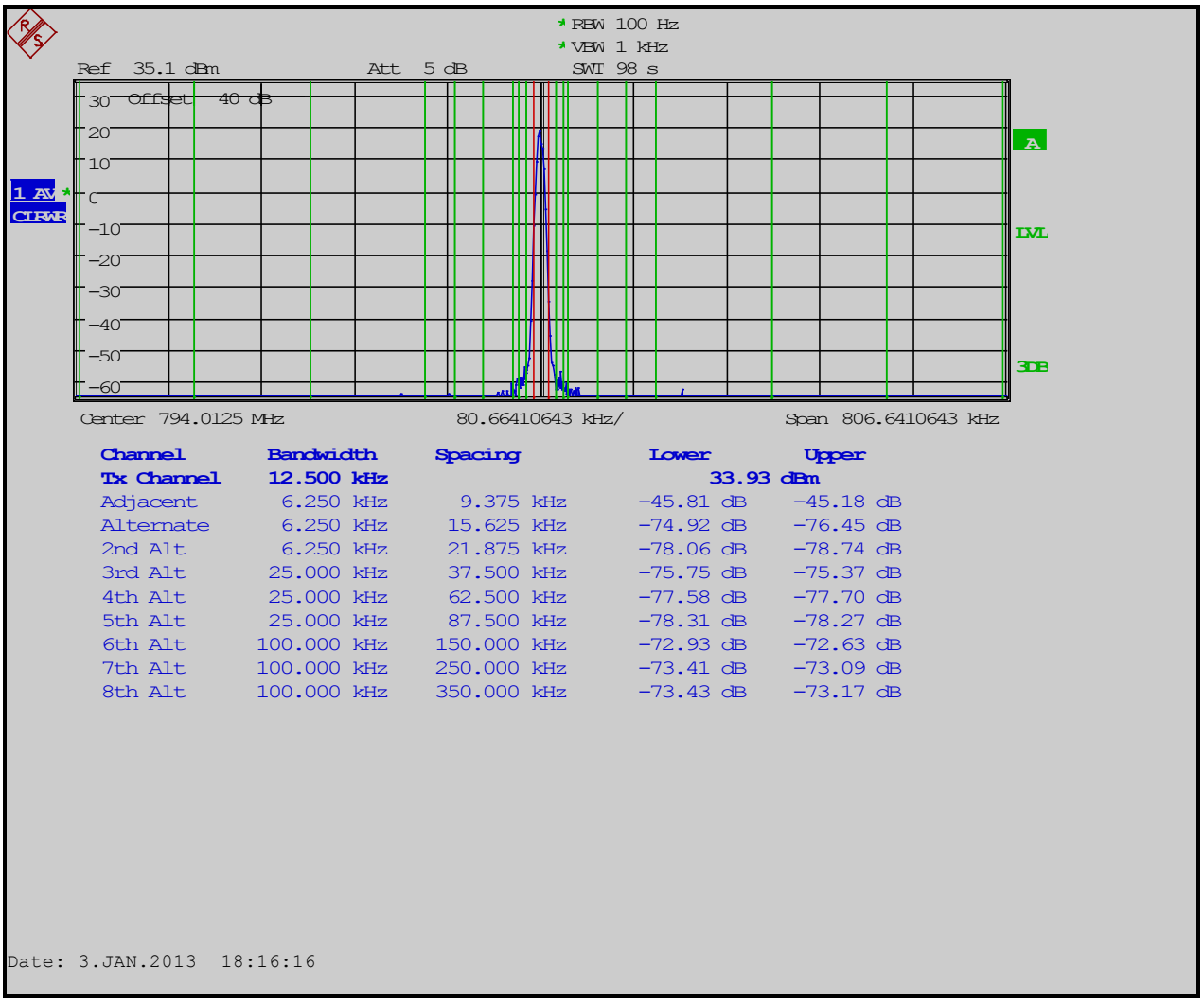


Table 7-4: ACP – 794.0125 MHz; H-CPM TDMA Mode (>400 kHz - RX Band)

Offset from Center Frequency	Measurement BW (kHz)	Max ACP (dBc)	Measured ACP (dBc)
>400 kHz to 12 MHz	30(s)	-75	-81.8
12 MHz to receive band	30(s)	-75	-90.7
In receive band	30(s)	-100	-102.5

Plot 7-5: ACP – 800.00625 MHz; H-CPM TDMA Mode (9.375 kHz - 350 kHz)

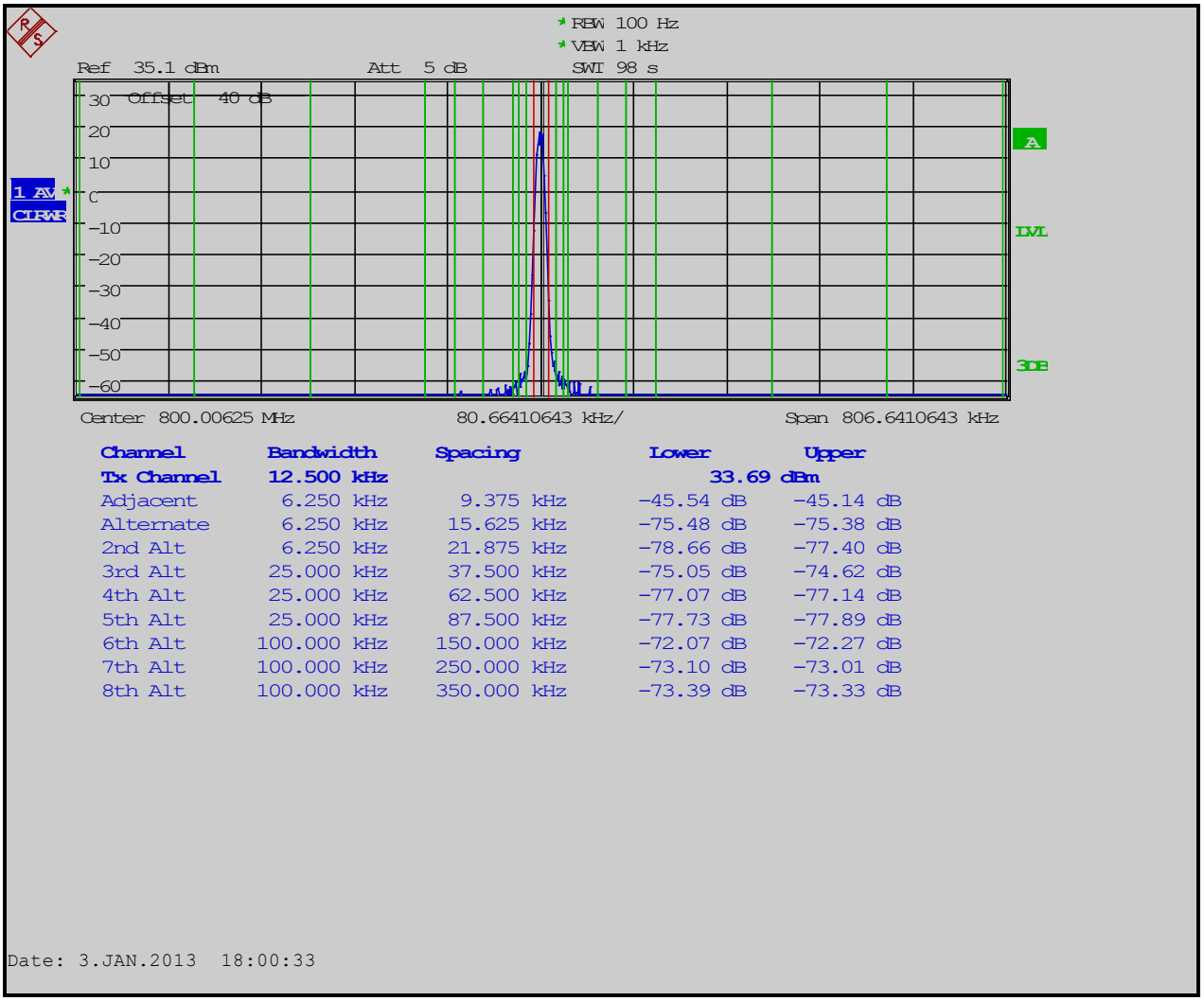


Table 7-5: ACP - 800.00625 MHz; H-CPM TDMA Mode (>400 kHz - RX Band)

Offset from Center Frequency	Measurement BW (kHz)	Max ACP (dBc)	Measured ACP (dBc)
>400 kHz to 12 MHz	30(s)	-75	-82.84
12 MHz to receive band	30(s)	-75	-87.44
In receive band	30(s)	-100	-106.54

Plot 7-6: ACP – 805.9875 MHz; H-CPM TDMA Mode (9.375 kHz - 350 kHz)

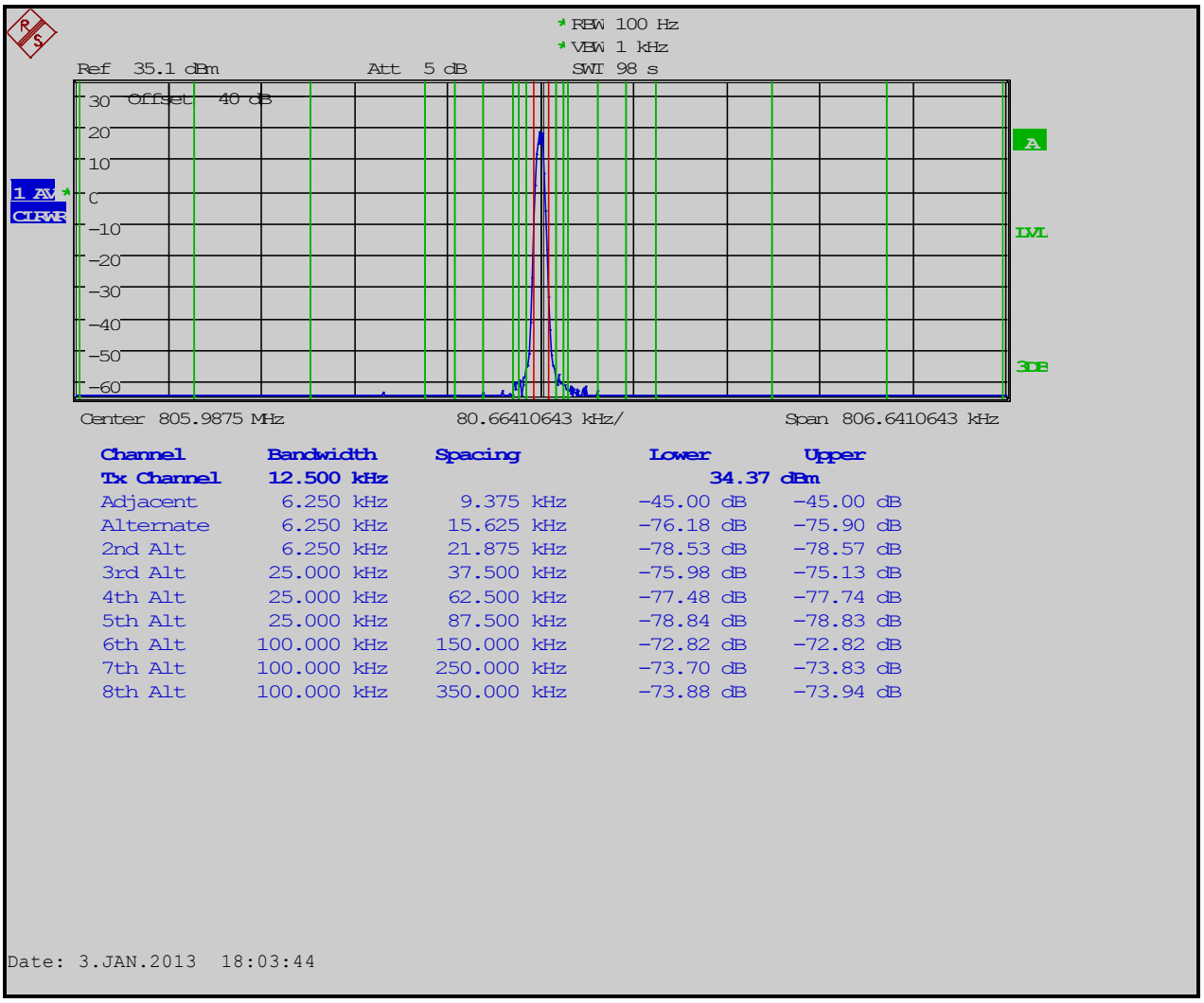


Table 7-6: ACP – 805.9875 MHz; H-CPM TDMA Mode (>400 kHz - RX Band)

Offset from Center Frequency	Measurement BW (kHz)	Max ACP (dBc)	Measured ACP (dBc)
>400 kHz to 12 MHz	30(s)	-75	-83.43
12 MHz to receive band	30(s)	-75	-84.83
In receive band	30(s)	-100	-105.93

Table 7-7: Test Equipment Used for Testing ACP Requirements

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901583	Agilent Technologies	N9010A	EXA Signal Analyzer (10 Hz-26.5 GHz)	MY51250846	3/13/13
900948	Weinschel Corporation	47-10-43	Attenuator, DC-18GHz, 10 dB, 50W	BH1487	2/29/13
901384	Aeroflex/ Weinschel	2	Attenuator, DC-18GHz, 1 dB, 5W, 50 ohm	BS5330	8/17/13
900816	Weinschel Corp.	2	Attenuator, 3 dB, 5W	BG1273	8/17/13
901373	Aeroflex/ Weinschel	2	Attenuator, 1 dB	BS4952	2/28/13
901337	Narda Microline	766-10	Attenuator, DC-4GHz, 10 dB, 20W	6242	8/17/13

Test Personnel:

Daniel Baltzell		January 3, 2013
EMC Test Engineer	Signature	Date of Tests

8 Conclusion

The data in this Class 2 measurement report shows that the Harris Corporation Model XG-75 700/800 MHz; FCC ID: OWDTR-0074-E, IC: 3636B-0074, complies with all the applicable requirements of FCC Parts 90 and 2, and Industry Canada RSS-119.