



FCC Class II Permissive Change Test Report
For the
Checkpoint Systems Inc.
Liberty PX with Emerald electronics

FCC IDs:
DO4EMRLDUP &
DO4EMRLDPX

WLL JOB# 9576
April 17, 2007

Prepared for:

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Abstract

This report has been prepared on behalf of Checkpoint Systems Inc. to support Application for a Class II Permissive Change to existing certified equipment. The test report and application are submitted for an Anti-Pilferage Device under Part 15 Subpart C of the FCC Rules and Regulations. This Certification Test Report documents the test configuration and test results for a Checkpoint Systems Inc. Liberty PX with Emerald electronics. The Liberty PX with Emerald electronics certified under FCC ID: DO4EMRLDPX is the same as FCC ID: DO4EMRLDUP with the exception of a Symbol CB3000 Wireless bridge and a 5/12 Vdc power adapter module added.

Testing was performed on an Open Area Test Site (OATS) of Washington Laboratories, Ltd, 7560 Lindbergh Drive, Gaithersburg, MD 20879. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by NIST NVLAP (NVLAP Lab Code: 200066-0) as an independent FCC test laboratory.

The Checkpoint Systems Inc. Liberty PX with Emerald electronics complies with the limits for an Anti-Pilferage Device under FCC Part 15 Subpart C.

Table of Contents

Abstract.....	ii
1 Introduction.....	1
1.1 Compliance Statement	1
1.2 Test Scope.....	1
1.3 Contract Information.....	1
1.4 Test Dates	2
1.5 Test and Support Personnel	2
1.6 Abbreviations.....	2
2 Equipment Under Test.....	3
2.1 EUT Identification & Description	3
2.2 Test Configuration	3
2.3 Testing Algorithm.....	3
2.4 Test Location	3
2.5 Measurements	3
2.5.1 References.....	3
2.6 Measurement Uncertainty.....	4
3 Test Equipment.....	4
4 Test Results.....	5
4.1 AC Powerline Conducted Emissions: (FCC Part §15.207)	5
4.2 Radiated Emissions: (FCC Parts §2.1053, 15.223)	6
4.2.1 Test Procedure	6

List of Tables

Table 1. Device Summary.....	3
Table 2: Test Equipment List.....	4
Table 3: Conducted Emissions Test Results.....	5
Table 4: Peak Radiated Emission Test Data, Low Frequency Data (<30MHz).....	7
Table 5: Average Radiated Emission Test Data, Low Frequency Data (<30MHz).....	8
Table 6: Radiated Emission Test Data, High Frequency Data (>30MHz).....	9

1 Introduction

1.1 Compliance Statement

The Checkpoint Systems Inc. Liberty PX with Emerald electronics complies with the limits for an Anti-Pilferage Device under FCC Part 15 Subpart C. The Liberty PX with Emerald electronics certified under FCC ID: DO4EMRLDPX is the same as FCC ID: DO4EMRLDUP with the exception of a Symbol CB3000 Wireless bridge and a 5/12 Vdc power adapter module added.

1.2 Test Scope

Tests for radiated and conducted emissions were performed. All measurements were performed in accordance with the 2003 version of ANSI C63.4. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation.

The testing was performed to determine the effect of the changes made to the unit. The changes are as follows:

- 1) 4 turn bifilar wire turns on toroid cores (Fair Rite P/N 5943000601) installed as extension to each Liberty PX antenna leads; Fair-Rite P/N 2861-000-202 cores installed on originally certified system has been removed.
- 2) CheckPro Manager VisiPlus modules attached to Liberty PX antenna, instead of one in approved system. Wiring to Visiplus modules is up the center of the Liberty PX antenna, instead of along sides of the antenna in originally certified system.
- 3) External power supply used for system is Energy Star compliant equivalent of Checkpoint P/N 7375794, instead of pre-Energy star version of Checkpoint P/N 7375794 power supply in originally certified system.
- 4) Emerald *61 electronics, with 2/12/07 firmware version is used in the new system, instead of Emerald *40 electronics with 10/13/06 firmware in originally certified system. Note that Emerald electronics comprises the Main PCB and CPU PCB. The most significant changes to Emerald *61 Main PCB relative to Emerald *40 Main PCB is that Tuning capacitor values are revised in TX and RX circuits:
 - In TX circuit, C2, C17 changed from 220 pF to 120 pF or 100 pF. C11, C23 changed from 220 pF to 150 pF or 68 pF. In RX circuit, C504, C505 changed from 68 pF to 56 pF or 12 pF. Other Main board changes are:
 - Pullup added to global alarm disable (J48 pin 8);
 - Added connection from CPU FPGAs to voltage supervisor master reset (U6 pin 3);
 - Revised pinout of modem connector (J51).

As for Emerald *61 CPU PCB relative to Emerald *40 CPU PCB, changes implemented are:

- Revised crystal (Y3) from 7168499 to 7222795, and
- Added connection from FPGAs (U1 pin C1, U7 pin D9) to Min board voltage supervisor

5) On Emerald end of CheckPro Manager VisiPlus cable pair, 2 turns (1 pass) of Fair Rite P/N 0431167281 installed instead of one Fair Rite P/N 0431167281 installed on one CheckPro Manager VisiPlus cable with 4 turns (or 3 passes) in originally certified system.

1.3 Contract Information

Customer:	Checkpoint Systems Inc. 101 Wolf Drive Thorofare, NJ, 08086
Purchase Order Number:	291961
Quotation Number:	63372A

1.4 Test Dates

Testing was performed on the following date(s): March 1 & 2, 2007

1.5 Test and Support Personnel

Washington Laboratories, LTD

John Repella

Client Representative

Greg Sleet, Bayode Olabisi

1.6 Abbreviations

A	A mpere
ac	a lternating current
AM	A mplitude Modulation
Amps	A mperes
b/s	b its per second
BW	B andWidth
CE	C onducted E mission
cm	c entimeter
CW	C ontinuous W ave
dB	d eci B el
dc	d irect current
EMI	E lectromagnetic I nterference
EUT	E quipment U nder T est
FM	F requency M odulation
G	g iga - prefix for 10^9 multiplier
Hz	H ertz
IF	I ntermediate F requency
k	k ilo - prefix for 10^3 multiplier
LISN	L ine I mpedance S tabilization N etwork
M	M ega - prefix for 10^6 multiplier
m	m eter
μ	m icro - prefix for 10^{-6} multiplier
NB	N arrow b and
QP	Q uasi- P eak
RE	R adiated E missions
RF	R adio F requency
rms	r oot- m ean- s quare
SN	S erial N umber
S/A	S pectrum A nalyzer
V	V olt

2 Equipment Under Test

2.1 EUT Identification & Description

The Checkpoint Systems Inc. Liberty PX with Emerald electronics is an Electronic Article Surveillance System (EAS). The system detects target tags attached to merchandise. The targets resonate in the region of 8.2 MHz or 9.5 MHz. When an article of merchandise is purchased, the target is deactivated which causes it to no longer resonate. The Liberty PX with Emerald electronics monitors a 3-foot area on either side of the antenna in the 7.4 to 10.0 MHz range and triggers an alarm when a non-deactivated target is detected. The Liberty PX with Emerald electronics certified under FCC ID: DO4EMRLDPX is the same as FCC ID: DO4EMRLDUP with the exception of a Symbol CB3000 Wireless bridge and a 5/12 Vdc power adapter module added.

Table 1. Device Summary

ITEM	DESCRIPTION
Manufacturer:	Checkpoint Systems Inc.
FCC ID:	DO4EMRLDUP
Model:	Liberty PX with Emerald electronics
FCC Rule Parts:	§15 Subpart C
Frequency Range:	7.4 – 10MHz
Keying:	Automatic
Power Output Level	Fixed
Power Source & Voltage:	120VAC

2.2 Test Configuration

The Liberty PX was configured with an Emerald *61 with 2/12/07 firmware.

2.3 Testing Algorithm

The Liberty PX with Emerald electronics was tested in a sweep operational mode.

Worst case emission levels are provided in the test results data.

2.4 Test Location

All measurements herein were performed at Washington Laboratories, Ltd. test center in Gaithersburg, MD. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by NIST NVLAP (NVLAP Lab Code: 200066-0) as an independent FCC test laboratory.

2.5 Measurements

2.5.1 References

ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation

ANSI C63.4 American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

2.6 Measurement Uncertainty

All results reported herein relate only to the equipment tested. For the purposes of the measurements performed by Washington Laboratories, the measurement uncertainty is ± 2.3 dB. This has been calculated for a *worst-case situation* (radiated emissions measurements performed on an open area test site).

The following measurement uncertainty calculation is provided:

$$\text{Total Uncertainty} = (A^2 + B^2 + C^2)^{1/2}/(n-1)$$

where:

A = Antenna calibration uncertainty, in dB = 2 dB

B = Spectrum Analyzer uncertainty, in dB = 1 dB

C = Site uncertainty, in dB = 4 dB

n = number of factors in uncertainty calculation = 3

Thus, Total Uncertainty = $0.5 (2^2 + 1^2 + 4^2)^{1/2} = \pm 2.3$ dB.

3 Test Equipment

Table 2 shows a list of the test equipment used for measurements along with the calibration information.

Table 2: Test Equipment List

Site 1 List:

WLL Asset #	Manufacturer Model/Type	Function	Cal. Due
00031	EMCO, 6502	ANTENNA, ACTIVE LOOP	2/12/2008
00068	HP, 85650A	ADAPTER, QP	7/3/2007
00072	HP, 8568B	ANALYZER, SPECTRUM	7/3/2007
00070	HP, 85685A	PRESELECTOR, RF W/OPT 8ZE	7/3/2007
00528	AGILENT, E4446A	ANALYZER, SPECTRUM	2/15/2008
00545	WLL, RG214	COAXIAL CABLE, 10-METER	9/27/2007
00612	WLL - RG 223	CABLE, COAXIAL, BNC, 7-M	9/22/2007
0125	SOLAR 8028-50-TS-BNC	LISN	2/01/2008
0126	SOLAR 8028-50-TS-BNC	LISN	2/01/2008

4 Test Results

4.1 AC Powerline Conducted Emissions: (FCC Part §15.207)

The EUT was placed on an 80 cm high 1 x 1.5 m non-conductive table above a ground plane. Power to the EUT was provided through a Solar Corporation 50 Ω/50 μH Line Impedance Stabilization Network bonded to a 3 x 2 meter ground plane. The LISN has its AC input supplied from a filtered AC power source. Power and data cables were moved about to obtain maximum emissions.

The 50 Ω output of the LISN was connected to the input of the spectrum analyzer and the emissions in the frequency range of 150 kHz to 30 MHz were measured. The detector function was set to quasi-peak or peak, as appropriate, and the resolution bandwidth during testing was at least 9 kHz, with all post-detector filtering no less than 10 times the resolution bandwidth.

Data is recorded in Table 3.

Table 3: Conducted Emissions Test Results

LINE 1 - NEUTRAL

Frequency (MHz)	Level QP (dBμV)	Cable Loss (dB)	LISN Corr (dB)	Limit QP (dBμV)	Level Corr (dBμV)	Margin QP (dB)	Level AVG (dBμV)	Cable Loss (dB)	Level Corr (dBμV)	Limit AVG (dBμV)	Margin AVG (dB)
0.184	35.3	10.2	0.3	64.3	45.8	-18.5	28.2	10.2	38.7	54.3	-15.6
0.369	28.3	10.1	0.2	58.5	38.7	-19.9	27.3	10.1	37.6	48.5	-10.9
5.351	31.9	10.9	1.2	60.0	43.9	-16.1	30.2	10.9	42.2	50.0	-7.8
5.413	29.9	10.9	1.2	60.0	41.9	-18.1	29.5	10.9	41.5	50.0	-8.5
8.119	34.5	11.1	1.4	60.0	47.0	-13.0	14.7	11.1	27.2	50.0	-22.8
9.289	31.2	11.2	1.5	60.0	43.9	-16.1	12.7	11.2	25.4	50.0	-24.6

LINE 2 - PHASE

Frequency (MHz)	Level QP (dBμV)	Cable Loss (dB)	LISN Corr (dB)	Limit QP (dBμV)	Level Corr (dBμV)	Margin QP (dB)	Level AVG (dBμV)	Cable Loss (dB)	Level Corr (dBμV)	Limit AVG (dBμV)	Margin AVG (dB)
0.184	31.7	10.2	0.6	64.3	42.6	-21.7	24.4	10.2	35.3	54.3	-19.1
0.369	24.6	10.1	0.3	58.5	35.0	-23.5	23.1	10.1	33.6	48.5	-15.0
5.349	29.4	10.9	0.8	60.0	41.1	-18.9	28.5	10.9	40.2	50.0	-9.8
5.411	28.4	10.9	0.8	60.0	40.1	-19.9	27.8	10.9	39.5	50.0	-10.5
8.117	33.4	11.1	1.0	60.0	45.5	-14.5	14.1	11.1	26.2	50.0	-23.8
9.286	33.1	11.2	1.1	60.0	45.3	-14.7	11.4	11.2	23.6	50.0	-26.4

4.2 Radiated Emissions: (FCC Parts §2.1053, 15.223)

The field strength of any emission within the band 1.705-10.0 MHz shall not exceed 100 microvolts/meter at a distance of 30 meters. The limit was interpolated to 10 meters per 15.31 which state that the interpolation can be at 40 dB/decade. The harmonic emissions must meet the limits specified in §15.209 and §15.35(b) for peak measurements. Peak emissions were taken and averaged using the duty cycle correction. The true peak emissions were obtained by increasing the bandwidth until there was no corresponding increase in signal amplitude. The measurement bandwidth was 300 kHz (both RBW and VBW) using this method.

4.2.1 Test Procedure

The EUT was placed on motorized turntable for radiated testing on a 10-meter open field test site. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Receiving antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. Cables were varied in position to produce maximum emissions. Both the horizontal and vertical field components were measured.

Table 4: Peak Radiated Emission Test Data, Low Frequency Data (<30MHz)

Frequency (MHz)	Polarity H/V	Azimuth Degree	Ant. Height (m)	SA Level (QP) (dBµV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Corr. Level (dBµV/m)	Corr. Level (µV/m)	Limit (µV/m)	Margin (dB)	Comments
9.203	X	332.0	1.0	55.5	10.6	1.9	68.0	2509.0	8995.0	-11.1	10m/40dB/Decade
9.090	X	332.0	1.0	55.2	10.6	1.9	67.7	2435.0	8995.0	-11.4	10m/40dB/Decade
8.899	X	332.0	1.0	55.7	10.6	1.9	68.2	2576.3	8995.0	-10.9	10m/40dB/Decade
9.008	X	332.0	1.0	54.4	10.6	1.9	66.9	2215.6	8995.0	-12.2	10m/40dB/Decade
8.925	X	332.0	1.0	55.1	10.6	1.9	67.6	2385.1	8995.0	-11.5	10m/40dB/Decade
8.241	X	332.0	1.0	55.4	10.6	1.9	67.9	2483.1	8995.0	-11.2	10m/40dB/Decade
8.938	X	332.0	1.0	55.5	10.6	1.9	68.0	2497.5	8995.0	-11.1	10m/40dB/Decade
8.977	X	332.0	1.0	55.7	10.6	1.9	68.2	2573.4	8995.0	-10.9	10m/40dB/Decade
9.133	X	332.0	1.0	54.6	10.6	1.9	67.1	2259.4	8995.0	-12.0	10m/40dB/Decade
8.951	X	332.0	1.0	57.9	10.6	1.9	70.4	3315.1	8995.0	-8.7	10m/40dB/Decade
9.081	X	332.0	1.0	54.9	10.6	1.9	67.4	2355.0	8995.0	-11.6	10m/40dB/Decade
9.064	X	332.0	1.0	54.4	10.6	1.9	66.9	2218.2	8995.0	-12.2	10m/40dB/Decade
8.189	Y	267.0	1.0	58.4	10.6	1.9	70.9	3511.6	8995.0	-8.2	10m/40dB/Decade
8.215	Y	295.0	1.0	57.7	10.6	1.9	70.2	3250.9	8995.0	-8.8	10m/40dB/Decade
8.882	Y	266.0	1.0	57.1	10.6	1.9	69.6	3023.4	8995.0	-9.5	10m/40dB/Decade
8.466	Y	267.0	1.0	57.7	10.6	1.9	70.2	3232.2	8995.0	-8.9	10m/40dB/Decade
8.397	Y	266.0	1.0	59.0	10.6	1.9	71.5	3767.0	8995.0	-7.6	10m/40dB/Decade
9.060	Y	266.0	1.0	55.6	10.6	1.9	68.1	2549.8	8995.0	-11.0	10m/40dB/Decade
8.384	Y	267.0	1.0	58.8	10.6	1.9	71.3	3668.6	8995.0	-7.8	10m/40dB/Decade
8.535	Y	267.0	1.0	57.6	10.6	1.9	70.1	3206.3	8995.0	-9.0	10m/40dB/Decade
8.184	Z	306.0	1.0	51.0	10.6	1.9	63.5	1499.7	8995.0	-15.6	10m/40dB/Decade
8.267	Z	164.0	1.0	52.6	10.6	1.9	65.1	1792.7	8995.0	-14.0	10m/40dB/Decade
8.349	Z	164.0	1.0	53.2	10.6	1.9	65.7	1925.3	8995.0	-13.4	10m/40dB/Decade
8.392	Z	164.0	1.0	51.9	10.6	1.9	64.4	1650.1	8995.0	-14.7	10m/40dB/Decade
8.479	Z	164.0	1.0	51.4	10.6	1.9	63.9	1566.8	8995.0	-15.2	10m/40dB/Decade
8.579	Z	164.0	1.0	51.1	10.6	1.9	63.6	1511.8	8995.0	-15.5	10m/40dB/Decade

Table 5: Average Radiated Emission Test Data, Low Frequency Data (<30MHz)

Freq. (MHz)	Polarity H/V	Az Deg	Ant. Hght (m)	SA Level (QP) (dBµV)	Ant. Corr (dB/m)	Cable Corr (dB)	Peak Corr. Level (dBµV/m)	Peak Corr. Level (µV/m)	Peak Limit (µV/m)	Peak Margin (dB)	Duty Cycle Corr (dB)	Avg Corr Level (dBµV/m)	Avg Corr. Level (µV/m)	Avg Limit (µV/m)	Avg Margin (dB)
9.203	X	332.0	1.0	55.5	10.6	1.9	68.0	2509.0	10000	-12.0	-20.0	48.0	250.9	899.5	-11.1
9.090	X	332.0	1.0	55.2	10.6	1.9	67.7	2435.0	10000	-12.3	-20.0	47.7	243.5	899.5	-11.4
8.899	X	332.0	1.0	55.7	10.6	1.9	68.2	2576.3	10000	-11.8	-20.0	48.2	257.6	899.5	-10.9
9.008	X	332.0	1.0	54.4	10.6	1.9	66.9	2215.6	10000	-13.1	-20.0	46.9	221.6	899.5	-12.2
8.925	X	332.0	1.0	55.1	10.6	1.9	67.6	2385.1	10000	-12.5	-20.0	47.6	238.5	899.5	-11.5
8.241	X	332.0	1.0	55.4	10.6	1.9	67.9	2483.1	10000	-12.1	-20.0	47.9	248.3	899.5	-11.2
8.938	X	332.0	1.0	55.5	10.6	1.9	68.0	2497.5	10000	-12.1	-20.0	48.0	249.7	899.5	-11.1
8.977	X	332.0	1.0	55.7	10.6	1.9	68.2	2573.4	10000	-11.8	-20.0	48.2	257.3	899.5	-10.9
9.133	X	332.0	1.0	54.6	10.6	1.9	67.1	2259.4	10000	-12.9	-20.0	47.1	225.9	899.5	-12.0
8.951	X	332.0	1.0	57.9	10.6	1.9	70.4	3315.1	10000	-9.6	-20.0	50.4	331.5	899.5	-8.7
9.081	X	332.0	1.0	54.9	10.6	1.9	67.4	2355.0	10000	-12.6	-20.0	47.4	235.5	899.5	-11.6
9.064	X	332.0	1.0	54.4	10.6	1.9	66.9	2218.2	10000	-13.1	-20.0	46.9	221.8	899.5	-12.2
8.189	Y	267.0	1.0	58.4	10.6	1.9	70.9	3511.6	10000	-9.1	-20.0	50.9	351.2	899.5	-8.2
8.215	Y	295.0	1.0	57.7	10.6	1.9	70.2	3250.9	10000	-9.8	-20.0	50.2	325.1	899.5	-8.8
8.882	Y	266.0	1.0	57.1	10.6	1.9	69.6	3023.4	10000	-10.4	-20.0	49.6	302.3	899.5	-9.5
8.466	Y	267.0	1.0	57.7	10.6	1.9	70.2	3232.2	10000	-9.8	-20.0	50.2	323.2	899.5	-8.9
8.397	Y	266.0	1.0	59.0	10.6	1.9	71.5	3767.0	10000	-8.5	-20.0	51.5	376.7	899.5	-7.6
9.060	Y	266.0	1.0	55.6	10.6	1.9	68.1	2549.8	10000	-11.9	-20.0	48.1	255.0	899.5	-11.0
8.384	Y	267.0	1.0	58.8	10.6	1.9	71.3	3668.6	10000	-8.7	-20.0	51.3	366.9	899.5	-7.8
8.535	Y	267.0	1.0	57.6	10.6	1.9	70.1	3206.3	10000	-9.9	-20.0	50.1	320.6	899.5	-9.0
8.184	Z	306.0	1.0	51.0	10.6	1.9	63.5	1499.7	10000	-16.5	-20.0	43.5	150.0	899.5	-15.6
8.267	Z	164.0	1.0	52.6	10.6	1.9	65.1	1792.7	10000	-14.9	-20.0	45.1	179.3	899.5	-14.0
8.349	Z	164.0	1.0	53.2	10.6	1.9	65.7	1925.3	10000	-14.3	-20.0	45.7	192.5	899.5	-13.4
8.392	Z	164.0	1.0	51.9	10.6	1.9	64.4	1650.1	10000	-15.7	-20.0	44.4	165.0	899.5	-14.7
8.479	Z	164.0	1.0	51.4	10.6	1.9	63.9	1566.8	10000	-16.1	-20.0	43.9	156.7	899.5	-15.2
8.579	Z	164.0	1.0	51.1	10.6	1.9	63.6	1511.8	10000	-16.4	-20.0	43.6	151.2	899.5	-15.5

Table 6: Radiated Emission Test Data, High Frequency Data (>30MHz)

Frequency (MHz)	Polarity H/V	Azimuth Degree	Ant. Height (m)	SA Level (QP) (dBµV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Corr. Level (dBµV/m)	Corr. Level (µV/m)	Limit (µV/m)	Margin (dB)
44.520	V	258.0	1.0	19.8	11.0	1.3	32.0	39.9	100.0	-8.0
44.938	V	258.0	1.0	22.6	10.7	1.3	34.6	53.6	100.0	-5.4
45.352	V	258.0	1.0	22.5	10.5	1.3	34.3	51.8	100.0	-5.7
45.798	V	258.0	1.0	22.8	10.3	1.3	34.3	52.0	100.0	-5.7
46.206	V	239.0	1.0	24.5	10.0	1.3	35.8	61.7	100.0	-4.2
46.661	V	239.0	1.0	27.4	9.8	1.3	38.5	83.9	100.0	-1.5
47.030	V	239.0	1.0	28.7	9.6	1.3	39.6	95.3	100.0	-0.4
47.500	V	239.0	1.0	28.8	9.4	1.3	39.4	93.8	100.0	-0.6
53.425	V	90.0	1.0	25.9	7.8	1.4	35.1	57.1	100.0	-4.9
53.930	V	90.0	1.0	29.1	7.8	1.4	38.3	81.8	100.0	-1.7
54.430	V	90.0	1.0	30.4	7.8	1.4	39.5	94.8	100.0	-0.5
62.887	V	90.0	1.0	22.2	7.6	1.5	31.3	36.7	100.0	-8.7
63.500	V	90.0	1.0	23.4	7.7	1.5	32.5	42.4	100.0	-7.5
64.098	V	90.0	1.0	22.6	7.7	1.5	31.8	38.9	100.0	-8.2
64.705	V	90.0	1.0	22.3	7.7	1.5	31.5	37.8	100.0	-8.5
65.300	V	90.0	1.0	20.9	7.8	1.5	30.2	32.3	100.0	-9.8
65.836	V	90.0	1.0	20.1	7.8	1.5	29.4	29.6	100.0	-10.6
83.971	V	260.0	1.0	19.3	7.8	1.7	28.8	27.6	100.0	-11.2
84.998	V	260.0	1.0	20.5	7.8	1.7	30.0	31.7	100.0	-10.0
108.810	V	90.0	1.0	21.5	12.6	1.9	36.0	63.4	150.0	-7.5
109.430	V	90.0	1.0	17.4	12.8	1.9	32.1	40.3	150.0	-11.4
109.612	V	90.0	1.0	16.4	12.8	1.9	31.1	36.1	150.0	-12.4
110.828	V	90.0	1.0	16.0	13.0	2.0	30.9	35.2	150.0	-12.6
111.620	V	90.0	1.0	15.8	13.1	2.0	30.8	34.8	150.0	-12.7
125.025	V	90.0	1.9	12.7	13.8	2.1	28.6	26.9	150.0	-14.9
138.404	V	90.0	1.0	12.4	13.1	2.2	27.7	24.3	150.0	-15.8
160.028	V	0.0	1.0	7.9	12.2	2.4	22.5	13.3	150.0	-21.1
200.026	V	73.0	1.5	13.3	12.2	2.6	28.1	25.4	150.0	-15.4
240.033	V	268.0	1.3	20.4	11.3	2.9	34.6	54.0	200.0	-11.4
250.042	V	300.0	1.5	18.9	11.5	3.0	33.4	46.9	200.0	-12.6
300.025	V	85.0	1.0	10.3	13.3	3.4	27.0	22.3	200.0	-19.1
375.038	V	275.0	1.5	14.9	14.9	3.8	33.6	47.8	200.0	-12.4
400.034	V	318.0	1.5	7.5	15.5	3.9	26.9	22.1	200.0	-19.1
500.046	V	338.0	1.4	12.0	17.7	4.5	34.2	51.3	200.0	-11.8
560.045	V	338.0	1.6	15.0	18.4	4.8	38.2	81.3	200.0	-7.8
800.040	V	275.0	1.9	4.1	21.3	5.9	31.3	36.8	200.0	-14.7
44.520	H	0.0	3.5	11.2	11.0	1.3	23.4	14.8	100.0	-16.6

Frequency (MHz)	Polarity H/V	Azimuth Degree	Ant. Height (m)	SA Level (QP) (dBμV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Corr. Level (dBμV/m)	Corr. Level (μV/m)	Limit (μV/m)	Margin (dB)
44.938	H	0.0	3.5	13.4	10.7	1.3	25.4	18.6	100.0	-14.6
45.352	H	0.0	3.5	14.1	10.5	1.3	25.9	19.6	100.0	-14.1
45.798	H	0.0	3.5	14.4	10.3	1.3	25.9	19.8	100.0	-14.1
46.206	H	0.0	3.5	15.5	10.0	1.3	26.8	21.9	100.0	-13.2
46.661	H	0.0	3.5	16.4	9.8	1.3	27.5	23.6	100.0	-12.5
47.030	H	0.0	3.5	17.4	9.6	1.3	28.3	26.0	100.0	-11.7
47.500	H	0.0	3.5	18.5	9.4	1.3	29.1	28.7	100.0	-10.9
62.887	H	153.0	3.0	16.2	7.6	1.5	25.3	18.4	100.0	-14.7
63.500	H	153.0	3.0	15.8	7.7	1.5	24.9	17.7	100.0	-15.1
64.098	H	153.0	3.0	15.5	7.7	1.5	24.7	17.2	100.0	-15.3
64.705	H	153.0	3.0	14.7	7.7	1.5	23.9	15.7	100.0	-16.1
65.300	H	153.0	3.0	15.9	7.8	1.5	25.2	18.2	100.0	-14.8
65.836	H	153.0	3.0	13.5	7.8	1.5	22.8	13.9	100.0	-17.2
108.810	H	203.0	3.5	14.1	12.6	1.9	28.6	27.1	150.0	-14.9
109.430	H	203.0	3.5	8.2	12.8	1.9	22.9	14.0	150.0	-20.6
109.612	H	203.0	3.5	8.1	12.8	1.9	22.8	13.9	150.0	-20.7
110.828	H	203.0	3.5	9.4	13.0	2.0	24.3	16.5	150.0	-19.2
111.620	H	203.0	3.5	9.6	13.1	2.0	24.6	17.0	150.0	-18.9
125.025	H	180.0	3.0	5.8	13.8	2.1	21.7	12.1	150.0	-21.8
138.404	H	339.0	3.5	10.8	13.1	2.2	26.1	20.2	150.0	-17.4
160.028	H	346.0	1.5	10.5	12.2	2.4	25.1	17.9	150.0	-18.5
200.026	H	180.0	1.5	21.6	12.2	2.6	36.4	66.1	150.0	-7.1
240.033	H	180.0	3.3	16.6	11.3	2.9	30.8	34.9	200.0	-15.2
250.042	H	180.0	2.9	18.5	11.5	3.0	33.0	44.8	200.0	-13.0
300.025	H	180.0	3.0	9.3	13.3	3.4	26.0	19.9	200.0	-20.1
375.038	H	109.0	2.5	11.3	14.9	3.8	30.0	31.6	200.0	-16.0
400.034	H	229.0	3.0	7.2	15.5	3.9	26.6	21.4	200.0	-19.4
500.046	H	336.0	2.2	13.3	17.7	4.5	35.5	59.6	200.0	-10.5
560.045	H	341.0	2.3	11.8	18.4	4.8	35.0	56.3	200.0	-11.0