



EMISSION -- TEST REPORT

Test Report File No. : T22691-05-01HU Date : June 30, 2004
of issue

Type Designation : Liberty P2

Family variations : GX TX, GX RX, PX TX, PX RX, QX TX, QX RX,
ILX-C TX, ILX-C RX, ILX-C Short TX, ILX-C Short RX
SX-Wide TX, SX-Wide RX

Kind of Product : Electronic Article Surveillance Detection System

Applicant : Checkpoint Systems, Inc.

Manufacturer : Pikatron Feinwerktechnik GmbH&Co. KG

Licence holder : Checkpoint Systems, Inc.

Address : 101 Wolf Drive, Thorofare
New Jersey 08086

Test result accdg. to the : regulation(s) at page 3

Positive

This test report with attachment consists of **89** pages.
The test result only corresponds to the tested sample. It is not permitted
to copy this report, in part or in full, without the permission of the test laboratory.

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TEST REGULATIONS

The tests were performed according to following regulations :

- o - EN 50081-1 / 2.1991
- o - EN 50081-2 / 7.1993

- o - EN 55011 / 3.1991
 - o - Group 1
 - o - class A
 - o - Group 2
 - o - class B
- o - EN 55014 / 4.1993
 - o - Household appliances and similar
 - o - tools
 - o - Semiconductor devices
- o - EN 55014 / A2:1990
- o - EN 55104 / 5.1995
 - Category: Produktnorm Haushaltsgeräte
- o - EN 55015 / A1:1990
- o - EN 55015 / 12.1993
- o - EN 55022 / 5.1995
 - o - class A
 - o - class B
- o - prEN 55103-1 / 3.1995
- o - prEN 50121-3-2 / 3.1995 Produktnorm Rollwagen
- o - EN 60601-1-2 / 4.1994 Produktnorm Medizingeräte
- o - VCCI
 - o - class 1
 - o - class 2
- - Part 15 Subpart C (15.223)
- o - Part 15 Subpart C (15.231)

MEASUREMENT PROTOCOL FOR FCC, VCCI AND AUSTEL

Test Methodology

Conducted and radiated emission testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22 (1993), European Standard EN 55022 and Australian Standard AS 3548 (which are based on CISPR 22).

The Japanese standard, "Voluntary Control Council for Interference (VCCI) by Data Processing Equipment and Electronic Office Machines, Technical Requirements" is technically equivalent to CISPR 22 (1993). For official compliance, a conformance report must be sent to and accepted by the VCCI.

In compliance with FCC Docket 92-152, "Harmonization of Rules for Digital Devices Incorporate International Standards", testing for FCC compliance may be done following the ANSI C63.4-1992 procedures and using the FCC limits or the CISPR 22 Limits.

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. These test systems have a measurement uncertainty of ± 4.5 dB. The equipment comprising the test systems are calibrated on an annual basis.

Justification

The Equipment Under Test (EuT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

General Standard Information

The test methods used comply with CISPR Publication 22 (1993), EN 55022 (1987) and AS 3548 (1992) - "Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment" and with ANSI C63.4-1992 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

For detailed description of each measurement please refer to section test results.

DISCOVERY OF WORST CASE MEASUREMENT CONDITION:

The model Liberty P2 consists of 6 different versions
LIBERTY GX, LIBERTY PX, LIBERTY QX, LIBERTY ILX-C, LIBERTY ILX-C Short, LIBERTY SX-Wide
All 6 versions are technically identical expect the following items:

- different type of antennas GX, PX, QX, ILX-C, ILX-C Short, SX-Wide
- four different type of power supply units (Worldwide 224 Module, Worldwide 425 Module, EOS, Glob Tek)
- ILX-C, ILX-C Short have additional a matching board. For more detailed information, please see technical documentation set.

To find out the worst case conditions for the complete measurements the following tests have been performed:

- Measurement of the conducted emissions of the SX-Wide version. This measurement have been performed in order to find out the maximum spurious emissions of the transmitter (antenna) with Glob Tek PSU.
- Measurement of the radiated fieldstrength of the operating frequency of the 3 versions. This measurement have been performed in order to find out the transmitter (antenna) with the maximum fieldstrength.
- Measurement of the radiated spurious emissions of the 3 versions. This measurement have been performed in order to find out the maximum spurious emissions of the transmitter (antenna).

Summarizing:

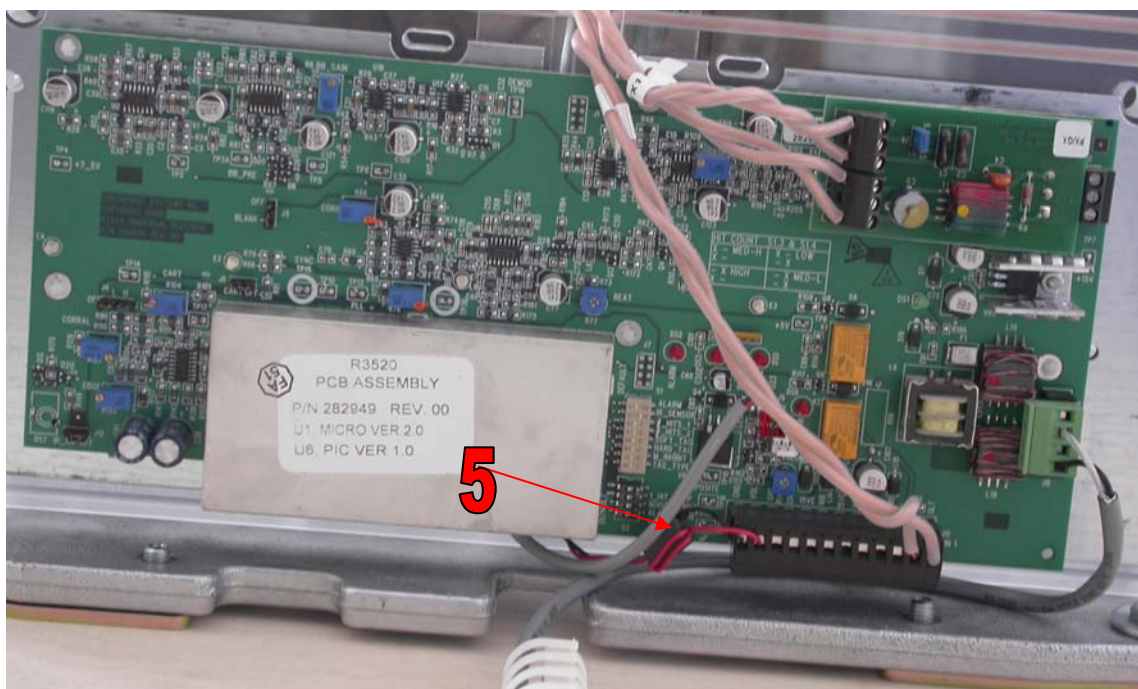
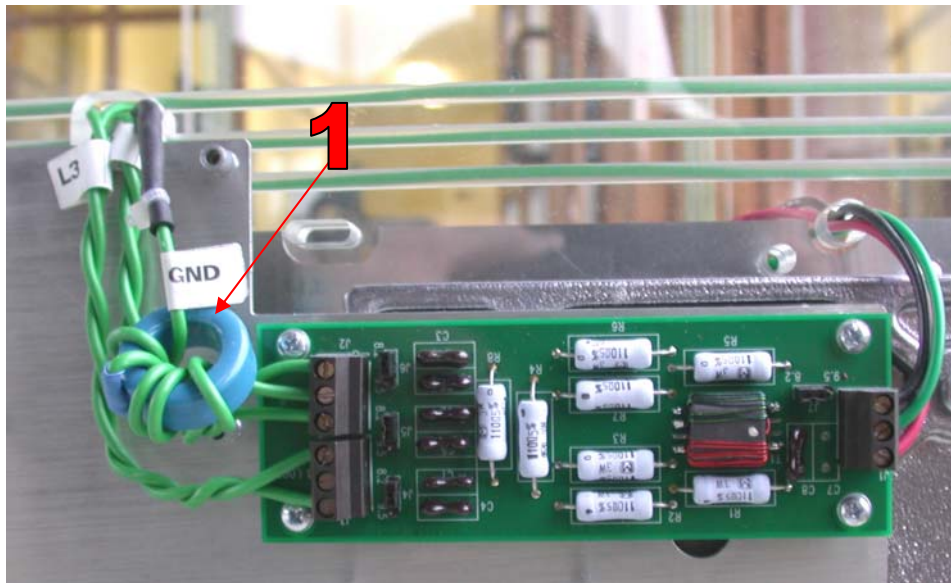
- ⇒ conducted emission: LIBERTY SX-Wide
- ⇒ maximum fieldstrength: LIBERTY PX (difference to LIBERTY SX-Wide: -0.4 dB)
- ⇒ maximum spurious emission: LIBERTY SX-Wide
- ⇒ bandwidth plots: no essential differences on the 3 versions

Based on this test results, the measurements have been performed completely on the version:
LIBERTY SX-Wide with power supply worldwide 425 Module. The conducted measurements are performed with Glob Tek power supply. This test results are documented in the following sections of the testreport.

Ferrite Locations:

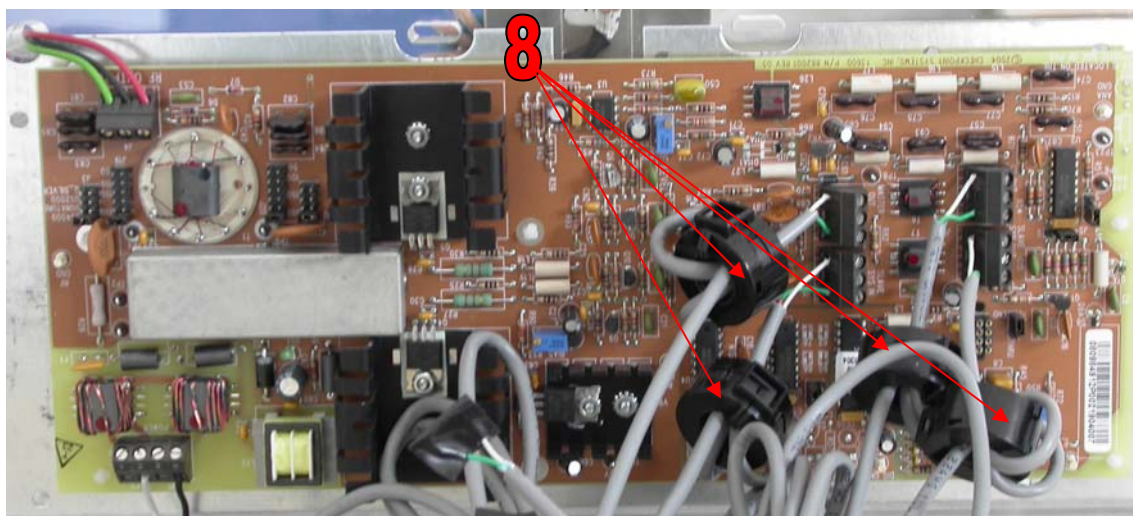
1. Fair Rite P/N 7118986 (Order No B64290-L618-X35) – Add a ferrite on GND of L1 with 6 turns of the primary side of the matching board.
2. Fair Rite P/N 734020 (Order No 2865-000-202) – Add 2 ferrites on L1, L2, L3 with 1 turn of the primary side of the matching board.
3. Fair Rite P/N 7118986 (Order No B64290-L618-X35) or
Fair Rite P/N 284760 (Order No 0443806406) – Add a ferrite on the connecting conduit (from matching board to main unit) with 4 turns of the secondary side of the matching board
4. Fair Rite P/N 284760 (Order No 0443806406) or
Fair Rite P/N 7118986 (Order No B64290-L618-X35) – Add a ferrite on the connecting conduit (from matching board to main unit) with 4 turns of the secondary side of the matching board
5. Fair Rite P/N 734020 (Order No 2865-000-202) – Add a ferrite on the end of the buzzer connection with 3 turns.
6. Fair Rite P/N 734020 (Order No 2865-000-202) – Add a ferrite on the end of the lamp connection with 2 turns.
7. Fair Rite P/N 284760 (Order No 0443806406) – Add a ferrite on each ground loop with two turns.
8. Fair Rite P/N 284760 (Order No 0443806406) – Add a ferrite on each SYNC and DATACOMM-cable with 3 turns.
9. Fair Rite P/N 734020 (Order No 2865-000-202) – Add each 2 ferrites on the end of the loop connection with one turn.

Liberty GX:

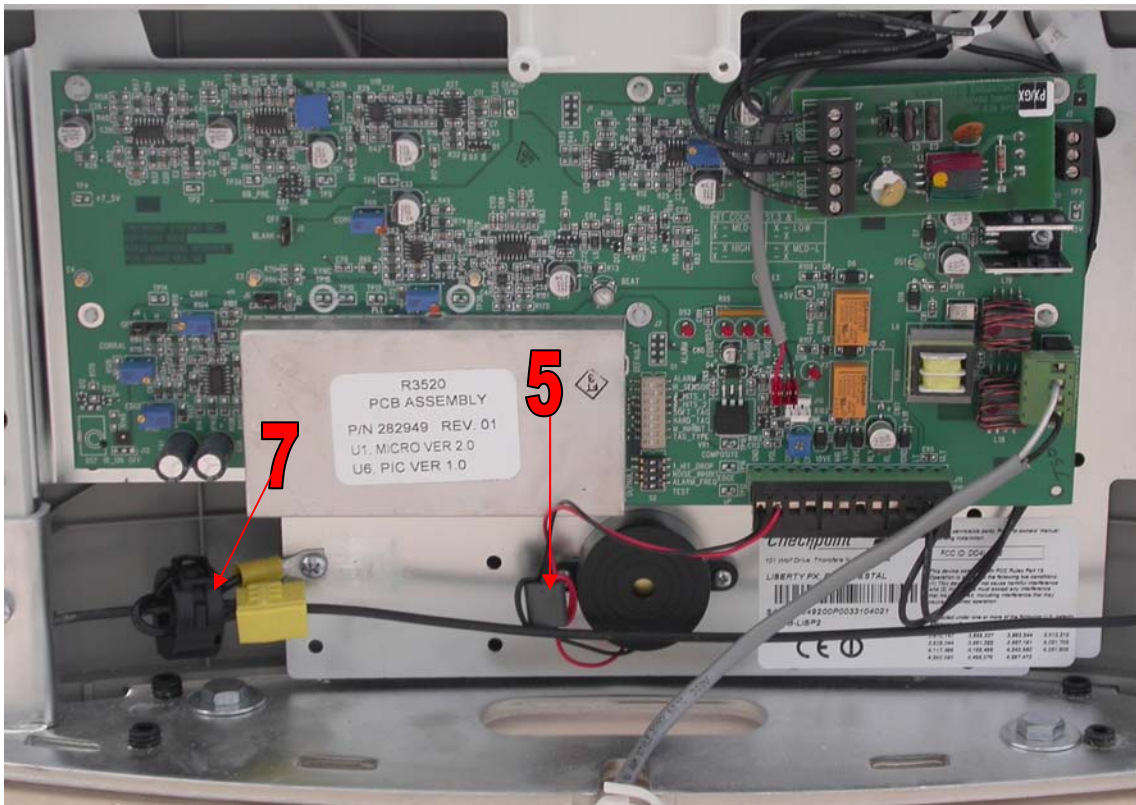
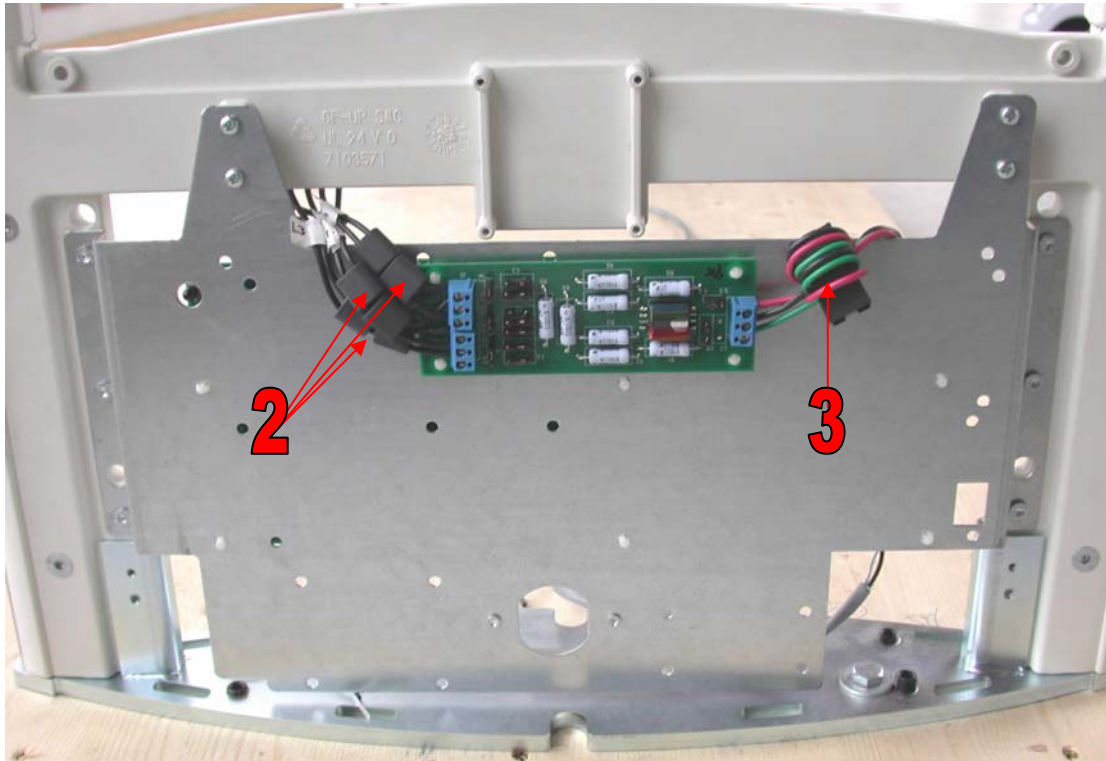


FCC ID: DO4LIBP2

Liberty GX:

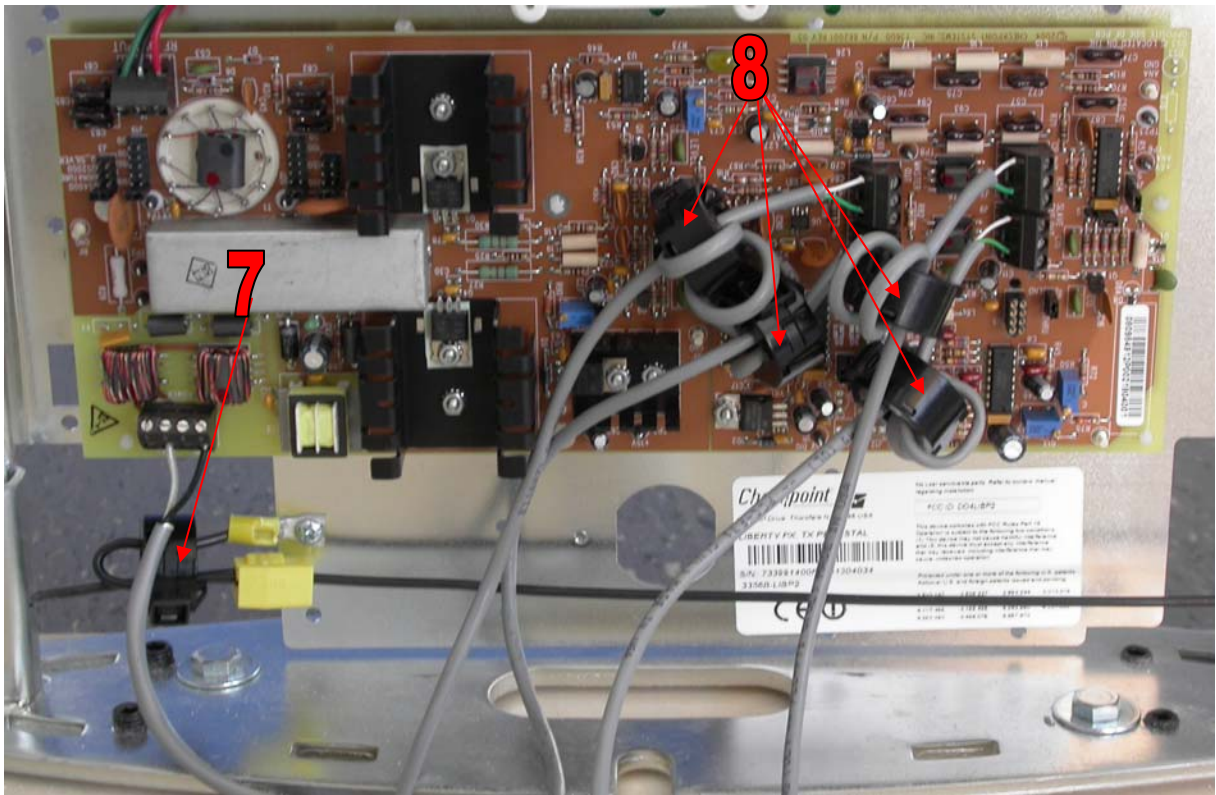


Liberty PX:

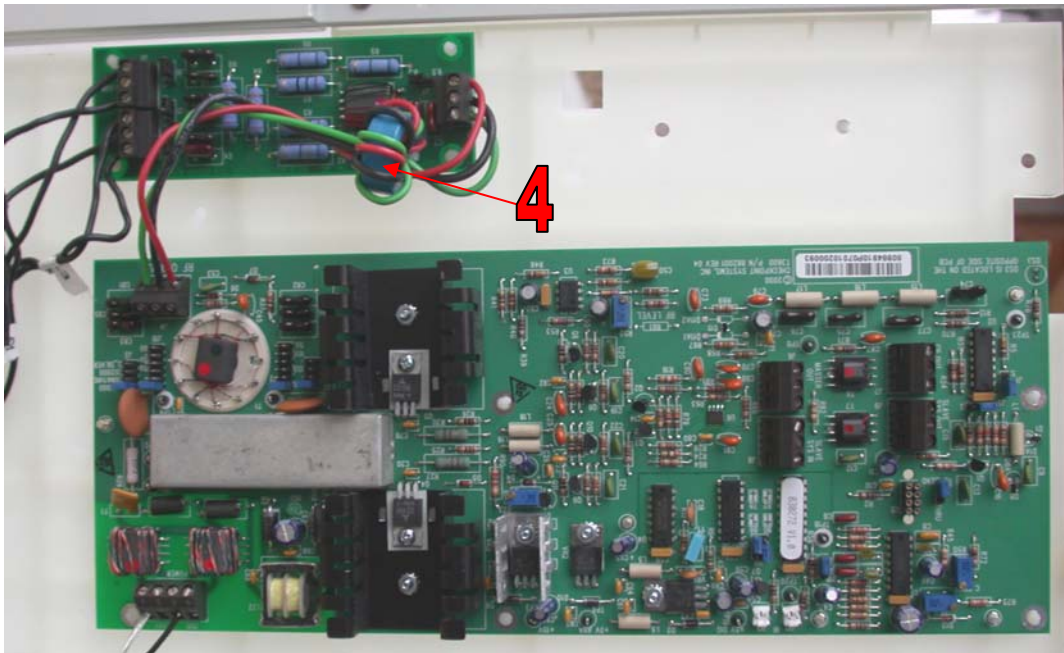


FCC ID: DO4LIBP2

Liberty PX:

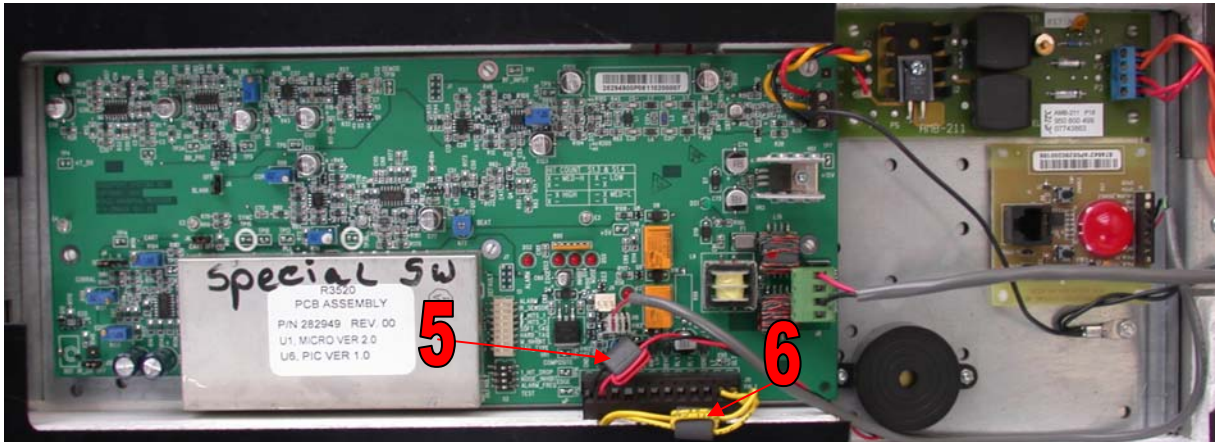


Liberty QX:

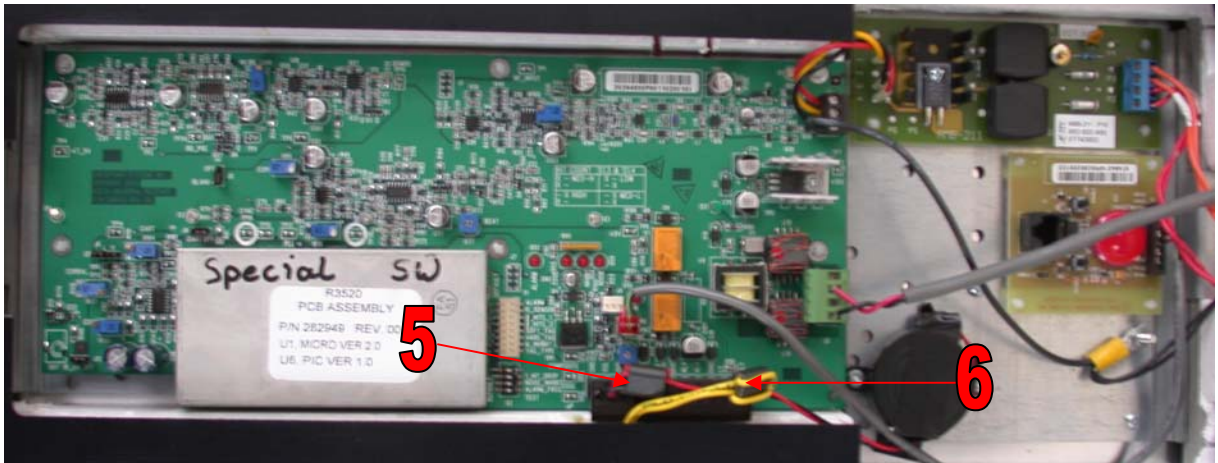


FCC ID: DO4LIBP2

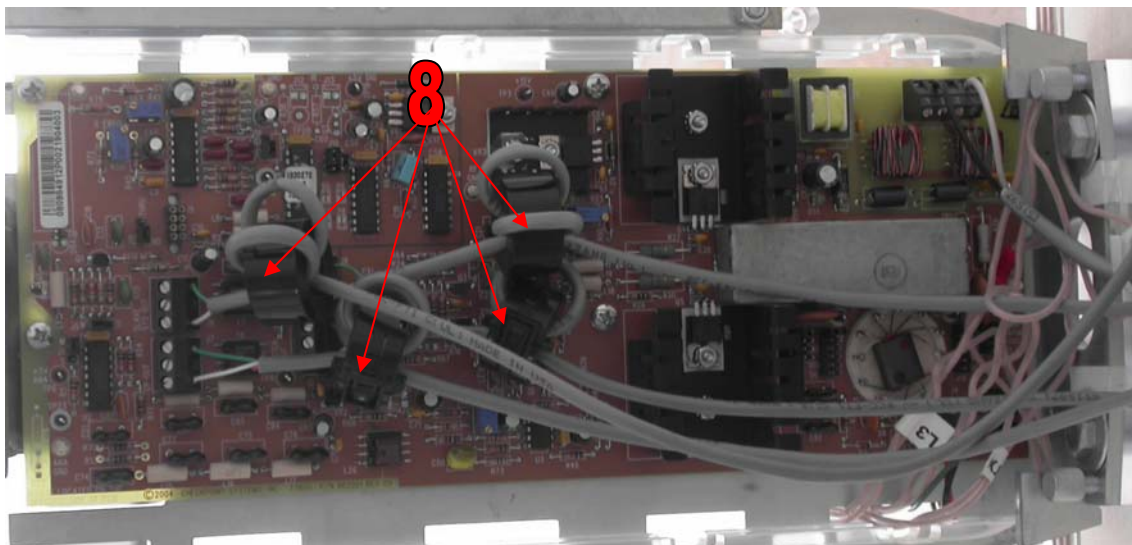
Liberty ILX C:



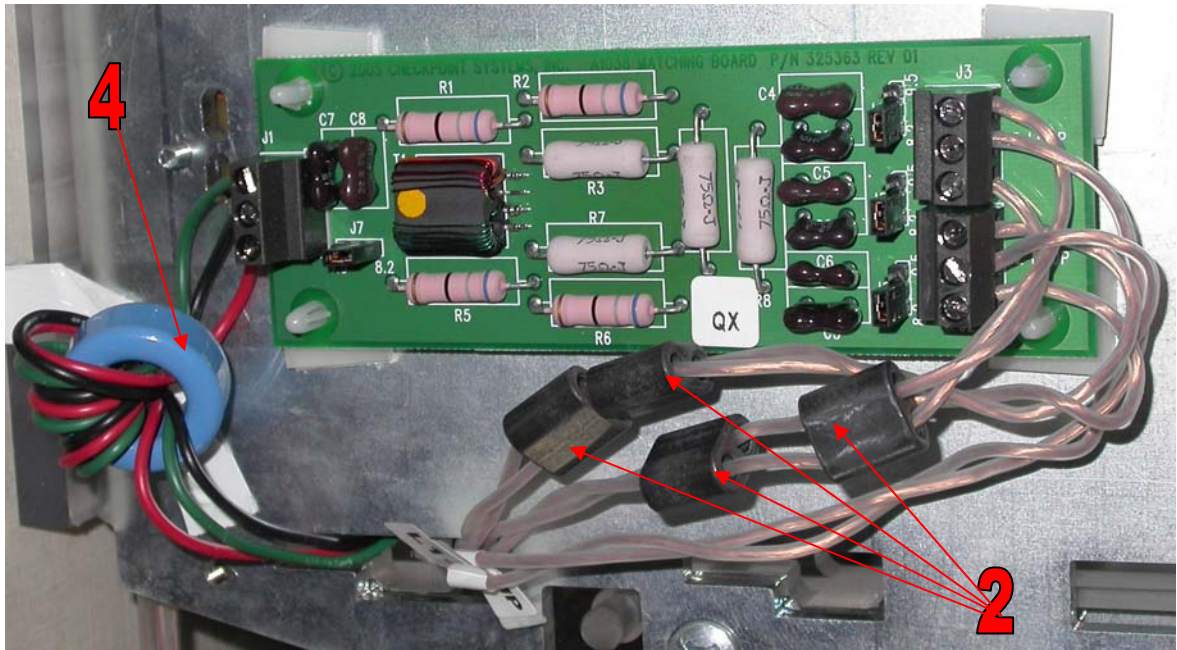
Liberty ILX C Short:



Liberty SX-Wide:



FCC ID: DO4LIBP2



TEST RESULT

CONDUCTED EMISSIONS - 10/150 kHz - 30 MHz

- Test not applicable

Test location :

- Shielded room no. 1
- Shielded room no. 2
- Shielded room no. 3
- Shielded room no. 4 kleine Siemens - Funk
- Shielded room no. 5 erste neue Kabine
- Shielded room no. 6 zweite neue Kabine
- Shielded room no. 7 große Siemens - A/V
- Anechoic chamber
- Full compact chamber

For test instruments and test accessories used please see attachment B A4

Description of Measurement

The final level, expressed in dBµV, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC Limit or to the CISPR limit, which is equivalent to the Australian AS 3548 limit.

To convert between dBµV and µV, the following conversions apply:

$$\text{dB}\mu\text{V} = 20(\log \mu\text{V})$$

$$\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$$

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EuT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50Ω/50 µH (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeter's above the floor and is positioned 40 centimeter's from the vertical ground plane (wall) of the screen room. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

Test result:

The requirements are

■ - MET

○ - NOT MET

Min. limit margin

1.2 dB at 8.81 MHz

Max. limit exceeding

_____ dB at _____ MHz

Remarks: The limits are met.

Fore more detailed informations, please see page A1 to A2.

SPURIOUS EMISSION

Spurious emissions from the EuT are measured in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions.

Spurious emissions from the EuT are measured in the frequency range of 30 MHz to 10 times the highest used frequency using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection, remeasurement of results which may be critical will be repeated in average mode. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization`s and the EuT are rotated 360 degrees.

SPURIOUS EMISSION (MAGNETIC FIELD) 9 kHz - 30 MHz

- Test not applicable

- in a shielded room
 - Open-site 1
- and
- in a test distance of 3 meters.
 - in a test distance of 30 meters.

For test instruments and test accessories used please see attachment B SER1

Description of Measurement

The final level, expressed in dBµV/m, is arrived at by taking the reading from the EMI receiver (Level dBµV) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit.

The resolution bandwidth during the measurement is as follows:

- 9 kHz – 150 kHz: ResBW: 200 Hz
- 150 kHz – 30 MHz: ResBW: 10 kHz

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	Limit (dBµV/m)	=	Delta (dB)
1.705	5	+	20	=	25	30	=	5

Testresult in detail:

Liberty SX-Wide – 8.2 MHz

Distance: 30m

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]
-	-	-	-	20	-	-	-	-

Liberty SX-Wide – 9.5 MHz

Distance: 30m

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]
-	-	-	-	20	-	-	-	-

The requirements are

■ - MET

○ - NOT MET

Min. limit margin

>20 dB at 0.009-30 MHz

Max. limit exceeding

_____ dB at _____ MHz

Remarks: The limits are kept.
Measurement has been performed up to the 10th harmonic

SPURIOUS EMISSIONS (electric field) 30 MHz - 1000 MHz

- Test not applicable

Test location :

- - Open-site 1
- o - Open-site 2
- - 3 meters
- o - 10 meters
- o - 30 meters

For test instruments and test accessories used please see attachment B SER2

Description of Measurement

The final level, expressed in dBµV/m, is arrived by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at this page. The CISPR 22 limit is equivalent to the Australian AS 3548 limit.

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	Limit (dBµV/m)	=	Delta (dB)
719	75	+	32.6	=	107.6	110	=	-2.4

Testresult in detail:

Liberty SX-Wide:

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]
39.05	29.7	-3.0	24.5	12.9	42.6	9.9	37.4	40.0
42.96	27.1	-6.6	25.4	13.0	40.1	6.4	38.4	40.0
44.90	27.5	-6.8	26.8	12.9	40.4	6.1	39.7	40.0
46.69	25.5	-6.6	27.0	12.9	38.4	6.2	39.9	40.0
48.81	33.8	-5.9	26.3	13.0	46.8	7.1	39.3	40.0
50.76	30.9	-7.3	26.8	12.9	43.8	5.6	39.7	40.0
52.71	36.7	-6.2	26.3	12.6	49.3	6.4	38.9	40.0
54.65	26.7	-5.6	24.7	12.3	39.0	6.7	37.0	40.0

Test result:

The requirements are

■ - MET

o - NOT MET

Min. limit margin

0.1 dB at 46.69 MHz

Max. limit exceeding

_____ dB at _____ MHz

Remarks: The limits are met.

SPURIOUS EMISSION 1 GHz - 18 GHz

■ - Test not applicable

Testlocation :

- o - Open-site 1
- o - Open-site 2
- o - Anechoic chamber
- o - Full compact chamber

- o - 1 meters
- o - 3 meters
- o - 10 meters

For test instruments and test accessories used please see attachment B SER3

Description of Measurement

The final level, expressed in dBµV/m, is arrived by taking the reading from the Spectrumalyzer in dBµV and adding the correction factors of the test setup incl. cables.

Example of the correction value at 1.8 GHz

Level reading at 1.8 GHz	Correction EMCO 3115	correction Amplifier AWT 4534 + cable	Correction factor (summarized)	corrected level
56 dBµV	+27.3 dB	-41.2 dB	-15.8 dB	42.1 dBµV/m

Testresult in detail:

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]

Testresult

The requirements are

o - MET

o - NOT MET

Min. limit margin

_____ dB at _____ MHz

Max. limit exceeding

_____ dB at _____ MHz

Remarks: Not applicable

(Transmission frequencies: 8.2 MHz, 9.5 MHz)

FIELD STRENGTH OF THE FUNDAMENTAL WAVE

o - Test not applicable

- - Open-site 1
- o - Open-site 2
- o - 3 meters
- o - 10 meters
- - 30 meters

For test instruments and test accessories used please see attachment B CPR1

Description of Measurement

The final level, expressed in dBµV/m, is arrived by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at this page. The CISPR 22 limit is equivalent to the Australian AS 3548 limit.

Example:

$$\begin{array}{rccccccccc}
 \text{Frequency} & & \text{Level} & + & \text{Factor} & = & \text{Level} & - & \text{Limit} & = & \text{Delta} \\
 \text{(MHz)} & & \text{(dB}\mu\text{V)} & & \text{(dB)} & & \text{(dB}\mu\text{V/m)} & & \text{(dB}\mu\text{V/m)} & & \text{(dB)} \\
 315 & & 45 & + & 22.5 & = & 67.5 & - & 74.3 & = & -6.8
 \end{array}$$

Testresult in detail:

Liberty GX – 8.2 MHz
Distance: 30m

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]
8.2	22.3	19.1	19.3	20	42.3	39.1	39.3	40

Liberty GX – 9.5 MHz
Distance: 30m

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]
9.5	23.0	19.5	19.8	20	43.0	39.5	39.8	40

Testresult

The requirements are

■ - MET

o - NOT MET

Min. limit margin

0.5 dB at 9.5 MHz

Max. limit exceeding

_____ dB at _____ MHz

Remarks: The limits are kept.

CONDUCTED POWER OF THE FUNDAMENTAL WAVE MEASURED ON THE ANTENNA TERMINALS

■ - Test not applicable

Testlocation :

- o - Shielded room no. 1
- o - Shielded room no. 2
- o - Shielded room no. 3
- o - Shielded room no. 4 kleine Siemens - Funk
- o - Shielded room no. 5 erste neue Kabine
- o - Shielded room no. 6 zweite neue Kabine
- o - Shielded room no. 7 große Siemens - A/V
- o - Anechoic chamber
- o - Full compact chamber
- o - Climatic test chamber VLK

For test instruments and test accessories used please see attachment B CPC2

Description of Measurement

The conducted power of the fundamental wave measured on the antenna terminals in a climatic test chamber. The antenna jack was connected to the input of a communication test receiver. The internal batteries have been removed also and a variable DC power supply was used instead. The measurements have been made with the EuT unmodulated. During the test the supply voltage and the temperature were varied and applied simultaneously. The lower supply voltage was given by the manufacturer. In case the equipment was switching off before, the switch off voltage was used instead.

Testresult

The requirements are

o - MET

o - NOT MET

Frequency range of equipment								
Temperature °C	DC supply voltage V	Power dBm	Power dBm	Power dBm	Power dBm	Power dBm	Power dBm	Power dBm
-30								
-20								
-10								
0								
+10								
+20								
+30								
+40								
+50								

Remarks: Not applicable

EQUIPMENT UNDER TEST

Operation - mode of the EuT.: pract. operation should not been used-more details!

The equipment under test was operated during the measurement under following conditions:

- Standby
- Test program (H - Pattern)
- Test program (colour bar)
- Test program (customer specific)

- Operating mode. A security tag was swept through the field of the Liberty SX-Wide antenna every 2 seconds to initiate a verification cycle.

Configuration of the equipment under test: see attachment D

Following periphery devices and interface cables were connected during the measurement:

- PSU (Power supply unit) Type : WORLDWIDE 425 MODULE
- IMX 04 Type : Filtered and ferrite coated mains cords
- PSU (Power supply unit) Type : Glob Tek, GT-2S502D-R
- Type : _____
- Type : _____
- Type : _____

- unshielded power cable
- unshielded cables
- shielded cables MBPS.No.:
- customer specific cables
- _____
- _____

S U M M A R Y

GENERAL REMARKS:

The product Liberty SX-Wide (P2 family) has been tested on the following frequency:

TX-Mode: 8.2 MHz
9.5 MHz

This model was defined as the worst condition model of all 6 versions:

Liberty GX TX, GX RX,
Liberty PX TX, PX RX,
Liberty QX TX, QX RX,
Liberty ILX-C TX, ILX-C RX,
Liberty ILX-C Short TX, ILX-C Short RX
Liberty SX-Wide TX, SX-Wide RX

the bandwidth requirements are kept.

FINAL JUDGEMENT:

The requirements according to the technical regulations and tested operation modes are

- - met.
- - **not** met.

The Equipment Under Test

- - **Fulfils** the general approval requirements according to page 3.
- - **Does not** fulfil the general approval requirements according to page 3.

Date of receipt of test sample : accdg. to storage record of MBPS

Testing Start Date : May 24, 2004

Testing End Date : June 17, 2004

Checked by:


i. A. _____
Günter Mikes
Dipl.Ing.(FH)

Tested by:



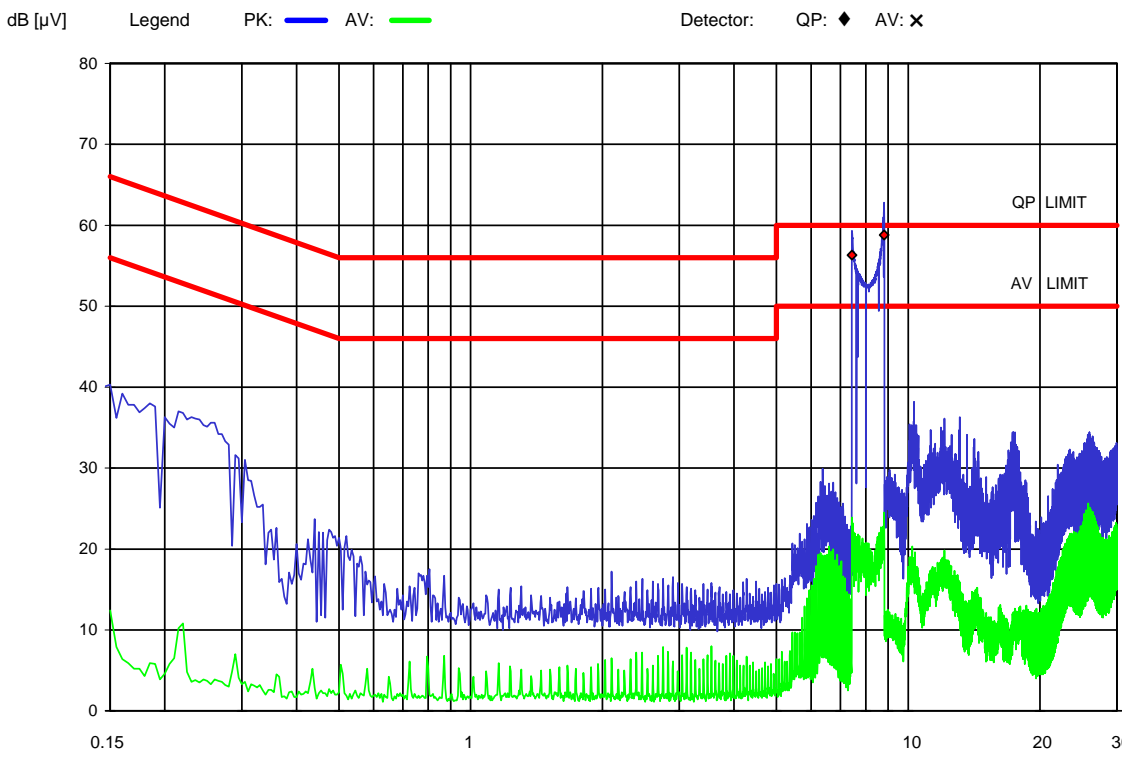
Markus Huber

FCC ID: DO4LIBP2

Liberty SX-Wide with P2 Electronic
 Glob Tek PSU with standard power cord
 Power line N

Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
7445	56,3	3,7	no Result		
8810	58,8	1,2			

Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]

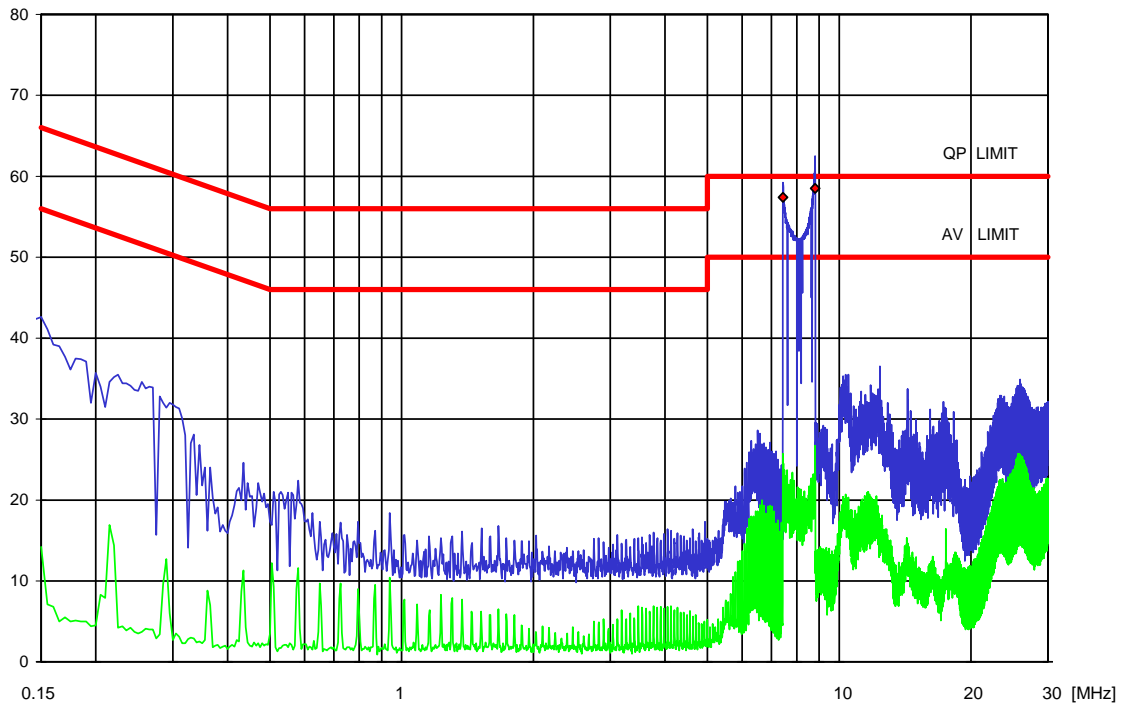


Liberty SX-Wide with P2 Electronic
 Glob Tek PSU with standard power cord
 Power line L1

Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
7440	57,4	2,6	no Result		
8810	58,5	1,5			

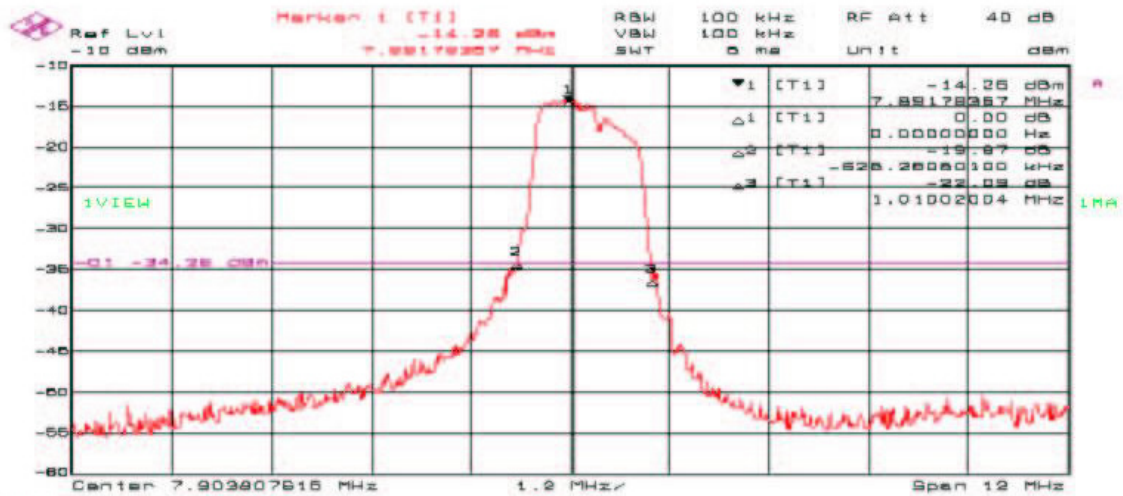
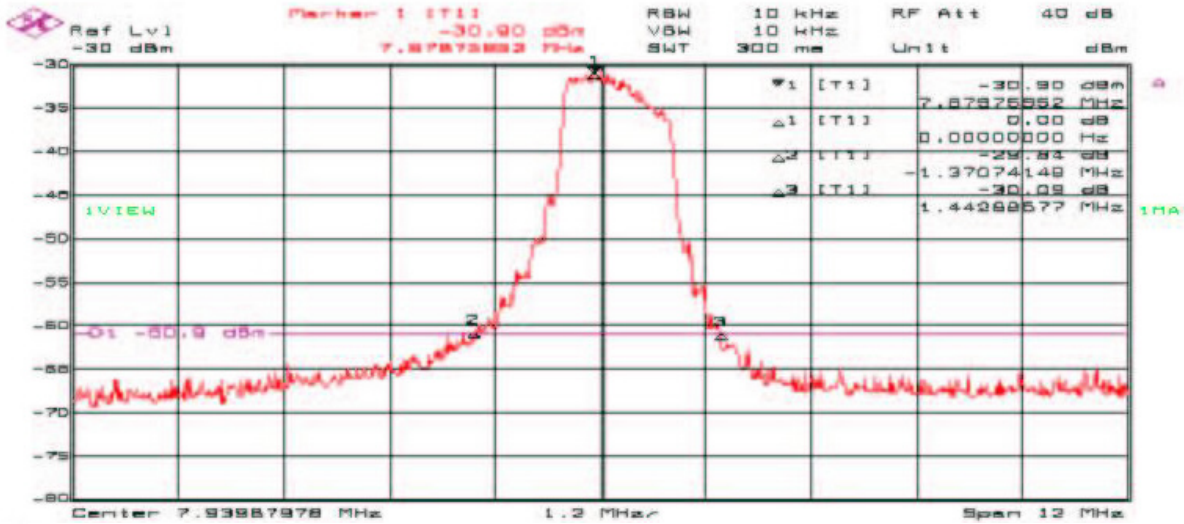
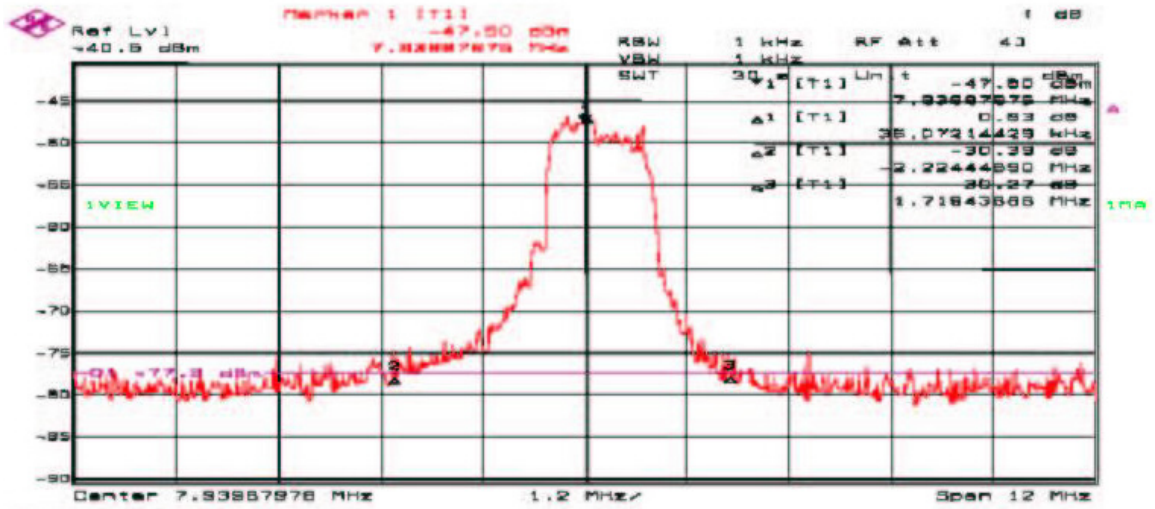
Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]

dB [μV] Legend PK: — AV: — Detector: QP: ◆ AV: ✕



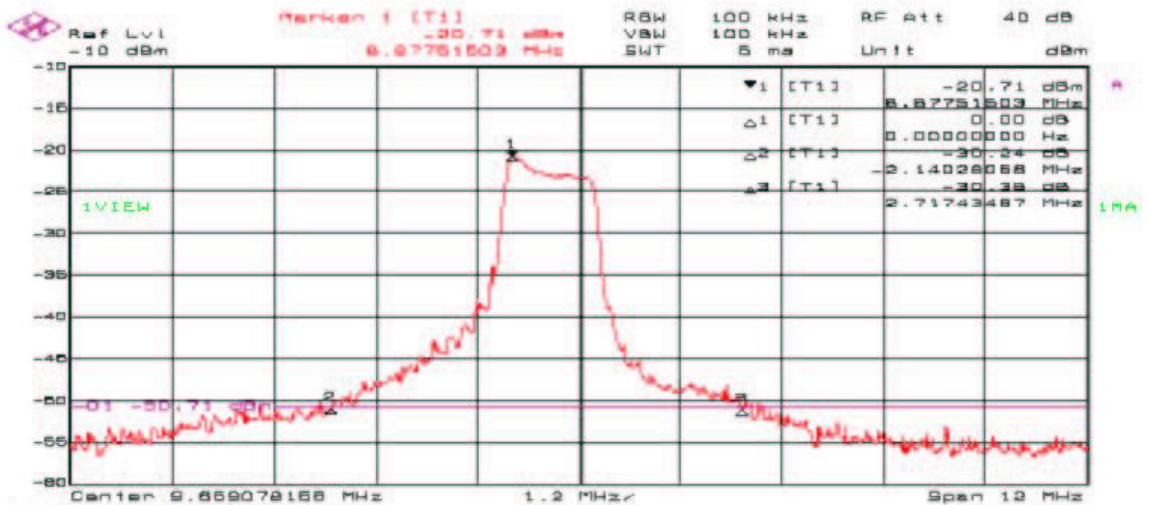
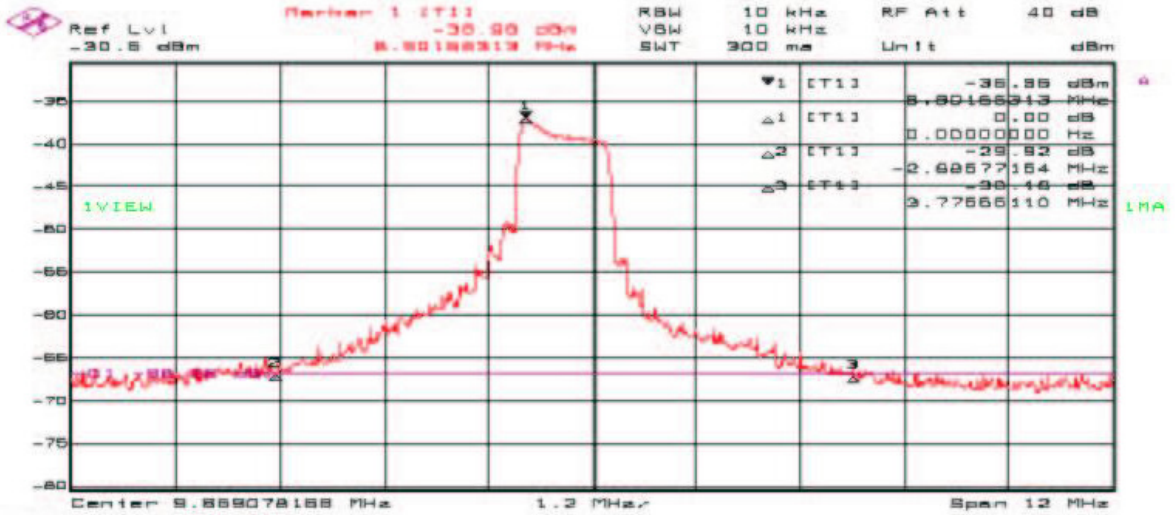
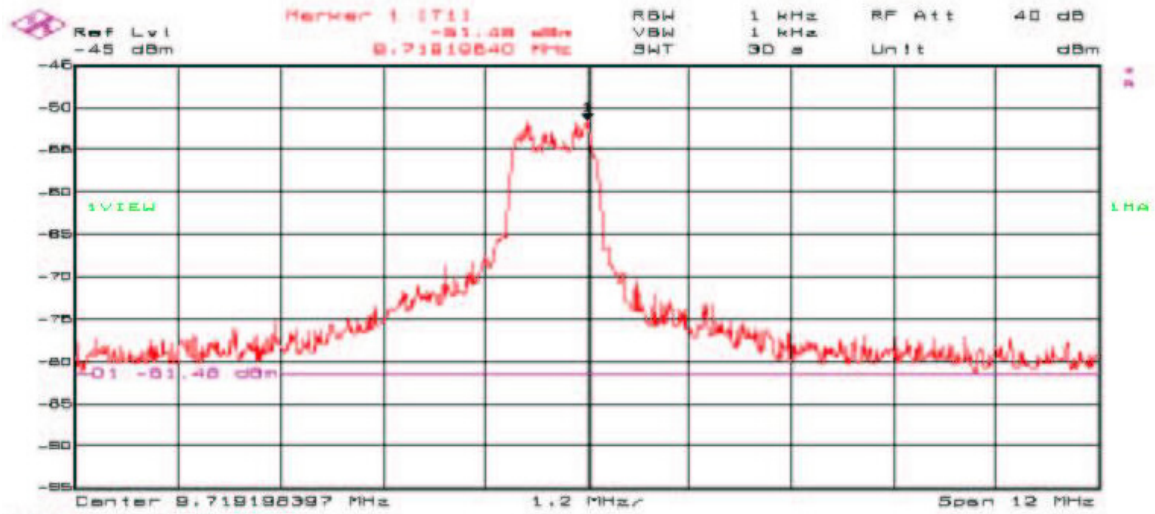
Bandwith plots

Liberty GX – TX 8.2MHz:



Bandwith plots

Liberty GX – TX 9.5MHz:



Attachment B: List of test equipment

All test instruments used, in addition to the test accessories, are calibrated and verified regularly.

Beginning of Testing: 24 Mai 2004
End of Testing: 17 Juni 2004

Test ID	Model Type	Kind of Equipment	Manufacturer	Equipment No.
A4	ESH 2 - Z 5	LISN	Rohde & Schwarz München	04-07/60-03-078
	ESH 3 - Z 2	Pulse Limiter	Rohde & Schwarz München	04-07/60-03-079
	N2000N	RF Cable	Huber+Suhner	04-07/60-04-004
	N4000BNC	RF Cable	Huber+Suhner	04-07/60-04-005
	ESHS 30	Test Receiver	Rohde & Schwarz München	04-07/63-04-002
CPR1	N-10-BNC	RF Cable	MBPS GmbH	04-07/60-02-011
	ESCS-30	Test Receiver	Rohde & Schwarz München	04-07/63-03-001
	FMZB 1516	Magnetic Field Antenna	Schwarzbeck Mess-Elektronik	99-07/62-03-004
SER1	N-10-BNC	RF Cable	MBPS GmbH	04-07/60-02-011
	ESCS-30	Test Receiver	Rohde & Schwarz München	04-07/63-03-001
	FMZB 1516	Magnetic Field Antenna	Schwarzbeck Mess-Elektronik	99-07/62-03-004
SER2	Sucofeed 7/8	RF Cable	Huber+Suhner	04-07/60-04-089
	NW-2000-NB	RF Cable	MBPS GmbH	04-07/60-04-205
	NB-15000-NB	RF Cable	MBPS GmbH	04-07/60-04-207
	VULB 9165	Super Broadband Antenn	Schwarzbeck Mess-Elektronik	04-07/62-00-001
	ESVS 30	Test Receiver	Rohde & Schwarz München	04-07/63-04-001

Attachment D: Constructional dataform for testing of radio equipment

Licence holder:	Checkpoint Systems, Inc.		
Address:	101 Wolf Drive, Thorofare, New Jersey, USA 08086		
Manufacturer:	Pikatron Feinwerktechnik GmbH & Co. KG		
Address:	Raiffeisenstr. 10, 61250 Usingen, Germany		
Type:	Electronic Article Surveillance Detection Systems		
Model:	Liberty (P2 family) Models: GX TX, GX RX, PX TX, PX RX, QX TX, QX RX, ILX-C TX, ILX-C RX, SX-Wide TX, SX Wide RX		
Serial-No.:	Liberty GX TX and RX S/N 713267760U02250300010 S/N 713276560U02250300016	Liberty PX TX and RX S/N 733991400P0041304034 S/N 713049200U0033104021	Liberty SX-Wide TX and RX S/N Prototype S/N Prototype

Additional informations to the above named model:

Antenna: transmitter:	Type: Loop Antennas		
	Length/size: GX W: 440 mm H: 1425 mm	Length/size: PX W: 430 mm H: 1450 mm	Length/size: QX W: 270 mm H: 1545 mm
receiver:	Length/size: ILX-C W: 315 mm H: 1245 mm	Length/size: ILX-C Short W: 315 mm H: 1045 mm	Length/size: SX-Wide W: 298 mm H: 1400 mm
	Type: Same as transmitter		
Power supply of the transmitter: Type:	nominal voltage:		24.0 V
	lowest voltage:		18.0 V
	highest voltage:		25.0 V
	current consumption		0.4 A
Power supply of the receiver: Type:	Same as transmitter		nominal voltage: V
			cuurrent consumption A

Ancillary equipment:

Description: <u>PSU</u>	Type: <u>Worldwide 224 Module</u>	Serial-no.: UZ079
Description: <u>PSU</u>	Type: <u>Worldwide 425 Module</u>	Serial-no.: 195682
Description: <u>PSU</u>	Type: <u>EOS, ZVC36FS24S91</u>	Serial-no.: 2010
Description: <u>PSU</u>	Type: <u>Globtek, GT-2S5024D-R</u>	Serial-no.: 00536652/03
Description: IMX 03	Type: Filtered and mains cords	Serial-no.:

Extreme temperature range in which the approval test should be performed:

- v Category I: General (-20°C to +55°C)
- O Category II: Portable (-10°C to +55°C)
- O Category III: Equipment for normal indoor use (0°C to +55°C)

Connectable cables:

Name of the cable	Digital	Length/m	shielded
DC - Cable	O yes v no	5.0	v yes O no

Attachment D: Constructional dataform for testing of radio equipment

Type designation: Liberty (P2 family) Models: GX TX, GX RX, PX TX, PX RX, QX TX, QX RX, SX-Wide TX, SX-Wide RX, ILX-C TX, ILX-C RX			
Name and type designation of individual units comprising the radio equipment: PSU, Worldwide 224 Module, CP 683 PSU, Worldwide 425 Module, 11794XA PSU, EOS, ZVC36FS24S91 PSU, Globtek, GT-2S5024D-R			
Type of equipment:			
<input type="checkbox"/> Radiotelephone equipment	<input type="checkbox"/> Remote-control equipment	<input type="checkbox"/> Radiomaritime equipment	<input type="checkbox"/> LPD
<input type="checkbox"/> One-way radiotelephone equipment	<input checked="" type="checkbox"/> Inductive loop system	<input type="checkbox"/> Inland waterways equipment	<input type="checkbox"/> RLAN
<input type="checkbox"/> Personal paging system	<input type="checkbox"/> Radio-relay system	<input type="checkbox"/> Radionavigation equipm.	<input type="checkbox"/>
<input type="checkbox"/> Satellite earth station	<input type="checkbox"/> CB radiotelephone equipment	<input type="checkbox"/> Antenna	<input type="checkbox"/>
<input type="checkbox"/> Data transmission equipment	<input type="checkbox"/> Movement detector	<input type="checkbox"/> Aeronautical equipment	<input type="checkbox"/>
Technical characteristics:			
	Transmitter-receiver	Transmitter	Receiver
Frequency range		7.4 – 10.0 MHz	Broadband
Maximum no. of channels		1	
Channel spacing			
Class of emission (type of modulation)		FXN	
Maximum RF output power			
Maximum effective radiated power (ERP)		9 dB uA/m at 10 m	
Output power variable		Yes	
Channel switching frequency range			
Method of frequency generation	<input checked="" type="checkbox"/> Synthesizer	<input type="checkbox"/> Crystal	<input type="checkbox"/> Other
Frequency generation TX			
Frequency generation RX			
IF	1st IF	2nd IF	3rd IF
Integral selective calling			
Audio-frequency interface level at external data socket			
Modes of operation	<input type="checkbox"/> Duplex mode	<input type="checkbox"/> Semi-duplex mode	<input checked="" type="checkbox"/> Simplex mode
Power source	<input checked="" type="checkbox"/> Mains	<input type="checkbox"/> Vehicle-regulated	<input type="checkbox"/> Integral
Antenna socket	<input type="checkbox"/> BNC <input type="checkbox"/> M <input checked="" type="checkbox"/> None	<input type="checkbox"/> TNC <input type="checkbox"/> UHF <input type="checkbox"/>	<input type="checkbox"/> N <input type="checkbox"/> Adapter <input type="checkbox"/>
Test specifications:	FCC Part 15 C RSS 210		

Attachment D: Constructional dataform for testing of radio equipment

Declarations:

- We declare that the above information are correct and the named model was supplied with the maximum configuration to the accredited test laboratory.

Thursbury, NJ ,date 07/06/04
place of issue

Baopde Olobiz?
Seal and signature of applicant

Attachment D: Constructional dataform for testing of radio equipment

System Setup for FCC / IC - Tests

	Frequency	Settings TX-Power	PSU - Cable
Liberty PX	8.2 MHz	21.5 V PP	PS WW 425 - IMX 04 PS WW 224 - IMX 04
	9.5 MHz	10.8 V PP	PS EOS, ZVC36FS24S91 – PS Globtek GT-2S5024D-R
Liberty GX	8.2 MHz	16.8 V PP	PS WW 425 - IMX 04 PS WW 224 - IMX 04
	9.5 MHz	6.5 V PP	PS EOS, ZVC36FS24S91 – PS Globtek GT-2S5024D-R
Liberty SX - Wide	8.2 MHz	14.5 V PP	PS WW 425 – IMX 04 PS WW 224 - IMX 04
	9.5 MHz	7.0 V PP	PS EOS, ZVC36FS24S91 – PS Globtek GT-2S5024D-R

Cables/Connections:

AC-Cable(to PSU): Standard, unshielded for CE measurements with WW224 PSU, for measurements with the WW 425 PSU use shielded filter cordset, Eupen IMX 03.

DC-Cable: Shield not connected to the P2-Electronic, with out Ferrite.

Sync-Cables: MASTER-OUT, CP-OUT, SLAVE SYS IN and SLAVE SYS OUT are not connected.

Connecting the sync – cables to the electronic has a negative effect to the spurious emission, but it doesn't influence the Transmitter power.

Aisle width (distance between receiver and transmitter antenna) was between 1 - 2 m

EPCOS Filter (B82722-A2302-N1) could be added to the PSU cable (instead of or together with the blue ferrite) to improve the EMC characteristic.

Instead of the black clip on ferrites on the SYNC- and the DATACOMM- cables a Kitagawa SFC-10 ferrite (3002453) can be placed across the Sync and data comm (minimum 2 turns).

Modifications:

A lowpass filter comprised of C51, C57, C93, C94, L23, L24, and L25 has been added to suppress harmonics at J6 and J7 slave outputs.

A common mode choke L26 and RF choke L27 have been added along with a seperation in VCO / limiter and power amplifier ground planes. Also the 5 volt regulator VR2 has been moved to VCO / limiter ground plane. This has been done to isolate VCO / limiter harmonics from power amplifier section. We may be able to eliminate the added ferrite cores at the RF output and DC power connectors.

The obsolete final amplifier bipolar transistors Q4 and Q5 have been replaced with mosfets. In the bias circuit to Q4 and Q5 RF chokes L18 and L19 and R90 have changed value, diodes D4 and D5 have been removed, and R91, R92, and R93 have been added. In the RF output filter C32 and C37 have changed value to allow for the internal mosfet drain capacitance.