

Electromagnetic Compatibility Test Report

Prepared in accordance with

FCC Part 15: October 2007, RSS-210: June 2007

On

Electronic Article Surveillance Detection System Slimline (Top Fed and Bottom Fed)

Prepared for:

Checkpoint Systems Inc.



101 Wolf Drive

Thorofare, NJ 08086

Prepared by:

TUV Rheinland of North America, Inc.

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<i>Auftraggeber:</i> <i>Client:</i>		Checkpoint Systems Inc. 101 Wolf Drive Thorofare, NJ 08086	Gregory Sleet (856) 384-2339 / (856) 384-2366 GREG.SLEET@checkpt.com
Bezeichnung: <i>Identification:</i>	Electronic Article Surveillance Detection System	Serien-Nr.: <i>Serial No.</i>	7365919CiU01148002, 7365919CiU01228006, 7365919CiU01228010, 7365919CiU01148004
Gegenstand der Prüfung: <i>Test item:</i>	Slimline (Top Fed and Bottom Fed)	Prüfdatum: <i>Date tested:</i>	May 12th -22nd, 2008
Prüfort: <i>Testing location:</i>	TUV Rheinland of North America 12 Commerce Road Newtown, CT 06470-1607 U.S.A.		
Prüfgrundlage: <i>Test specification:</i>	Emissions: FCC Part 15 Subpart C: October 2007 / RSS-210: June 2007 FCC Part 15 Subpart 15.223/RSS-210 Annex A2.3 FCC Part 15 Subpart 15.205 and 15.209		
Prüfergebnis: <i>Test Result</i>	Der vorstehend beschriebene Prüfgegenstand wurde geprüft und entspricht oben genannter Prüfgrundlage. The above product was found to be Compliant to the above test standard(s)		
geprüft / tested by: Dieter Baldamus		kontrolliert / reviewed by: Bruce Fagley	
26 June 2008 Datum <i>Date</i>		26 June 2008 Datum <i>Date</i>	
Name <i>Name</i>		Name <i>Name</i>	
Unterschrift <i>Signature</i>		Unterschrift <i>Signature</i>	
Sonstiges : <i>Other Aspects:</i>	None		
Abkürzungen: OK, Pass, Compliant, Complies = entspricht Prüfgrundlage Fail, Not Compliant, Does not Comply = entspricht nicht Prüfgrundlage N/A = nicht anwendbar	Abbreviations: OK, Pass, Compliant, Complies = passed Fail, Not Compliant, Does Not Comply = failed N/A = not applicable		
		Industry Canada	
US5112	200111-0	3466D-1	

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1 General Information

1.1 Scope

This report is intended to document the status of conformance with the requirements of the FCC Part 15: October 2007, RSS-210: June 2007 based on the results of testing performed on May 12th -22nd, 2008 on the Electronic Article Surveillance Detection System, Model No. Slimline (Top Fed and Bottom Fed), manufactured by Checkpoint Systems Inc.. This report only applies to the specific samples tested under the stated test conditions. It is the responsibility of the manufacturer to assure that additional production units of this model are manufactured with identical or EMI equivalent electrical and mechanical components. This report is further intended to document changes and modifications to the EUT throughout its life cycle. All documentation will be included as a supplement.

Note that where mentioned in this report, Slimline refers to the Checkpoint product, **EVOLVE S10**.

1.2 Purpose

Testing was performed to evaluate the EMC performance of the EUT (Equipment Under Test) in accordance with the applicable requirements, procedures, and criteria defined in the application of regulations and application of standards listed in this report.

1.3 Summary of Test Results

Applicant	Checkpoint Systems Inc. 101 Wolf Drive Thorofare, NJ 08086	Tel	(856) 384-2339	Contact	Gregory Sleet
		Fax	(856) 384-2366	e-mail	GREG.SLEET@checkpt.com
Description	Electronic Article Surveillance Detection System	Model Number	Slimline (Top Fed and Bottom Fed)		
Serial Number	7365919CiU01148002, 7365919CiU01228006, 7365919CiU01228010, 7365919CiU01148004	Test Voltage/Freq.	120V/60Hz		
Test Date Completed:	May 12th -22nd, 2008	Test Engineer	Dieter Baldamus		
Standards	Description	Severity Level or Limit		Criteria	Test Result
FCC Part 15 Subpart C: October 2007 / RSS-210: June 2007	Intentional Radiators / Low Power Licenced Exempt Radiocommunication Devices	See called out sections below		See Below	Complies
FCC Part 15 Subpart 15.223/RSS-210 Annex A2.3	Operation in the band 1.705- 10 MHz	100µV/m @30m		Limit	Complies
FCC Part 15 Subpart 15.207	Conducted limits	Per table in section 207, 150kHz - 30MHz		Limit	Complies
FCC Part 15 Subpart 15.205 and 15.209	Radiated emission limits; general requirements	Class B and per table in section 205 From Fundamental - 1000MHz		Limit	Complies

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2 Laboratory Information

2.1 Accreditations & Endorsements

2.1.1 US Federal Communications Commission

TUV Rheinland of North America located at 12 Commerce Road, Newtown CT is accredited by the commission for performing testing services for the general public on a fee basis. This laboratory test facilities have been fully described in reports submitted to and accepted by the FCC (Registration No US5112). The laboratory scope of accreditation includes: Title 47 CFR Part 15, and 18. The accreditation is updated every 3 years.

2.1.2 NIST / NVLAP

Program, which is administered under the auspices of the National Institute of Standards and Technology. The laboratory has been assessed and accredited in accordance with ISO Standard 17025:2005 (Lab code: 200111-0). The scope of laboratory accreditation includes emission and immunity testing. The accreditation is updated annually.

2.1.3 Industry Canada

Registration No.: 3466D-1. The OATS has been accepted by Industry Canada to perform testing to 3 and to 10m, based on the test procedures described in ANSI C63.4-2003.

2.2 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions measurements is ± 3.2 dB
The estimated combined standard uncertainty for conducted emissions measurements is ± 1.2 dB

2.3 Calibration Traceability

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Measurement method complies with ANSI/NCSL Z540-1-1994 and ISO Standard 17025:2005. Equipment calibration records are kept on file at the test facility.

2.4 Measurement Equipment Used

Equipment	Manufacturer	Model #	Serial/Inst #	Last Cal dd/mm/yy	Next Cal dd/mm/yy	Test
Power Supply	California Instruments	5001iX	HK53766	12/04/2007	12/04/2008	All
Antenna, Log. Periodic	Emco	3146	9309-3691	06/26/2006	06/26/2008	RE, RI
Antenna, Bicon	Emco	3108	2234	06/26/2006	06/26/2008	RE, RI
Receiver	Hewlett Packard	HP 8546A, 85460A	3330A00125, 3325A00134	03/14/2008	03/14/2009	CE, DP, CE
Antenna, Bilog	Schaffner	CBL6112D	22238	04/04/2008	04/04/2010	RE
LISN	Schwarzbeck	NSLK 8126A (4 x 25A)	8126278	08/07/2007	08/07/2009	CE
Magnetic Field Loop Antenna	Schwarzbeck	FMZB 1516	151600/94	09/11/2007	09/11/2009	RE<30MHz

Note: CE = Conducted Emissions, CI= Conducted Immunity, DP=Disturbance Power, EFT=Electrical Fast Transients, ESD = Electrostatic Discharge, FLI=Flicker, HAR=Harmonics, MF=Magnetic Field Immunity, RE=Radiated Emissions, RI=Radiated Immunity, SI=Surge Immunity, VDSI=Voltage Dips and Short Interruptions

3 Product Information

3.1 Equipment Under Test (EUT) Description

The Evolve Antenna’s with Emerald Electronic are 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 Evolve Antenna’s with Emerald Electronic monitors an area 3-feet 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.

3.2 Engineering Judgment on Selected Models

Evolve S10 is a member of the Evolve antenna family (which consists of P10, P20, G10, G20, and PX models), but is different than other models, given that it’s mounting is on the doorframe in end installations unlike other models that are floor standing. It also has a remote electronics chassis, with each chassis containing two Emerald electronics that are powered from a single external power supply. There are two main configurations of the antennas tested for compliance, each configuration wired differently to each antenna – the Slimline Top-Fed, and Slimline Bottom-Fed.

3.3 General Product Information

Antenna: Transmitter-Receiver Type	Inductive Loop Antennas		
Antenna	Slimline Top Fed	Slimline Bottom Fed	
Width	12.95 cm [5.10 in]	12.95 cm [5.10 in]	
Height	10.00 cm [3.94 in]	10.00 cm [3.94 in]	
Length	174.75 cm [68.80 in]	174.75 cm [68.80 in]	
Power supply of the transmitter: Type:	GS 599ES(R)	Nominal voltage:	24.0 V
		Lowest voltage:	18.0 V
		Highest voltage:	25.0 V
		Current consumption	0.5 A

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Configuration 1: Slimline Bottom Fed

FCC/IC System Setup				
Antenna Aisles, 200 cm hor. Center to hor. Center	Serial Number	PSU	Max Tx Pwr Setting In DMS (Ant1, Ant2)	Frequency Band in DMS
Controller Horizontal Mount (ver. 2.84 firmware installed)	7365919CiU01148002, 7365919CiU01228006, 7365919CiU01228010, 7365919CiU01148004	GS 599ES(R)	31	8.2
			31	9.0(dual band)
Controller Vertical Mount (ver. 2.84 firmware installed)	7365919CiU01148002, 7365919CiU01228006, 7365919CiU01228010, 7365919CiU01148004	GS 599ES(R)	31	8.2
			31	9.0(dual band)

Configuration 2: Slimline Top Fed

FCC/IC System Setup				
Antenna Aisles, 200 cm hor. Center to hor. Center	Serial Number	PSU	Max Tx Pwr Setting In DMS (Ant1, Ant2)	Frequency Band in DMS
Controller Horizontal Mount (ver. 2.84 firmware installed)	7365919CiU01148002, 7365919CiU01228006, 7365919CiU01228010, 7365919CiU01148004	GS 599ES(R)	31	8.2
			31	9.0(dual band)
Controller Vertical Mount (ver. 2.84 firmware installed)	7365919CiU01148002, 7365919CiU01228006, 7365919CiU01228010, 7365919CiU01148004	GS 599ES(R)	31	8.2
			31	9.0(dual band)

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3.4 EUT Modes of Operation

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

- Continuous sweep mode at 8.2 MHz Band
- Continuous sweep mode at 9.0 MHz Dual Band

3.5 EUT Test Configurations

The equipment under test was tested in the following configurations:

Configuration 1:

This is the bottom-fed Slimline antenna configuration. Tests were performed on both horizontal and vertical mounting of the electronics chassis at this configuration.

Micrometals P/N BLN12461-263/BU, or Checkpoint P/N 7235629 inductive transformer cores were installed on the Slimline antenna match pcb during this test.

One CheckPro Manager Visplus module was removed from the Slimline antenna during testing, and connected to port J72 on the master Emerald pcb.

The control electronics chassis was elevated to about 6 ft height from the ground plane during testing to simulate mounting of the chassis in the ceiling in end installations.

Configuration 2:

This is the top-fed Slimline antenna configuration. Tests were performed on both horizontal and vertical mounting of the electronics chassis at this configuration.

Two Checkpro Manager Visiplus modules were mounted to one Slimline antenna during testing, with connection to port J72 on the mater Emerald pcb inside the electronics chassis. Fair Rite P/N 2861-000-202, or Checkpoint P/N 919618 inductive transformer cores were installed on the Slimline antenna match pcb during testing.

The control electronics chassis was elevated to about 6 ft height from the ground plane during testing to simulate mounting of this chassis in the ceiling in end installations.

3.6 Electrical Support Equipment

- 1) Laptop: IBM A22m
- 2) Phone simulator: Viking model DLE-200B (SM) with Viking model PS-1 PSU
- 3) Modem: Smart One Model 56 SPX-2 / 56SX-2 modem with TL Part #A091ooUS PSU
- 4) RJ-11 cable from phone simulator to Smart One modem and then to Checkpoint modem module.

3.7 Non - Electrical Support Equipment

None

3.8 EUT Equipment/Cabling Information

EUT Port	Connected To	Location	Cable Type	
			Length	Shielded
J72	Checkpro Manager Visiplus (Configuration 1)	Controller	0.5 m	Yes
J72	Checkpro Manager Visiplus (Configuration 2)	Controller	30 m	Yes
J20/J22	Master-Submaster pcbs for Synchron.	Controller	0.3m	Yes
J48	Badge	Controller	30 m	Yes
J18 or J31	Pedestal Main Power	Controller	0.3m	Yes
J41	External Counter External Alarm Lights	Controller	4.2 m	No
J9	Alarm Group External Alarm Group (to Voice Alarm)	Controller	4.2 m	Yes
J14	Inter pedestal Network Com.	Controller	0.3 m	Yes
J51	Internal Modem	Controller	0.5m	No
DC Power	DC Power	Controller	2.4m	No
J2/J3	A1084 Coax Filter pcb to which antenna antenna coax cables are connected	Controller	30 m	Yes

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3.9 Modifications

- One clip-on ferrite - Fair Rite P/N 0443806406, Checkpoint P/N 284760 (4 turns) was installed on both ends of the SYNC cable between master and sub-master PCB's inside the electronics chassis.
- One clip-on ferrite - Fair Rite P/N 0443806406, Checkpoint P/N 284760 (4 turns) was installed at the end of this power supply's dc cable connection to the dc line filter pcb. This ferrite may be installed directly at the entry point of this dc cable into the chassis.
- One clip-on ferrite - Wurth 74271131 (1 turn) was installed on all Cat 5E cables at the entry point of these cables into the electronics chassis. There are two Cat 5E cables from each Slimline antenna to each of the two Emerald boards in the electronics chassis: Cat 5-1 connects to the Badge board (port J48), and Cat 5-2 connects to the LED (port J11), Sounder (port J42), and Visiplus (port J72).

When a single, remoted CheckPro Manager Visiplus is connected to the electronics chassis (for Slimline bottom fed), one Wurth 7427113 ferrite is installed on this Visiplus cable at the entry point of the cable into the chassis.

3.10 Modification Pictures

Ferrite Modification and Location				
Figure	Component / Sub-Assembly	Part No. & Description	Config.1	Config.2
1	Ferrite	Checkpoint P/N 284760(Fair Rite P/N 0443806406) – Add one ferrite (4 turns) on each end of Cat 5E SYNC cable run between Master and Submaster PCB's inside the electronics chassis.	Yes	Yes
2	Ferrite	DC side of Power Supply. Checkpoint P/N 284760(Fair Rite P/N 0443806406) – Add one ferrite (4 turns) on end of this dc cable connection to the dc line filter. May be installed directly at entry point of this cable into the electronics chassis.	Yes	Yes
3	Ferrite	Ferrites on all Cat 5E cables -- Add one ferrite Wurth 74271131 (1 turn) at exit point of this cable from the chassis.	Yes	Yes

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Figure 1 – Fair Rite P/N 0443806406 installed on Sync Cable; Configuration 1



Figure 2 – Ferrite on DC side of Power Supply

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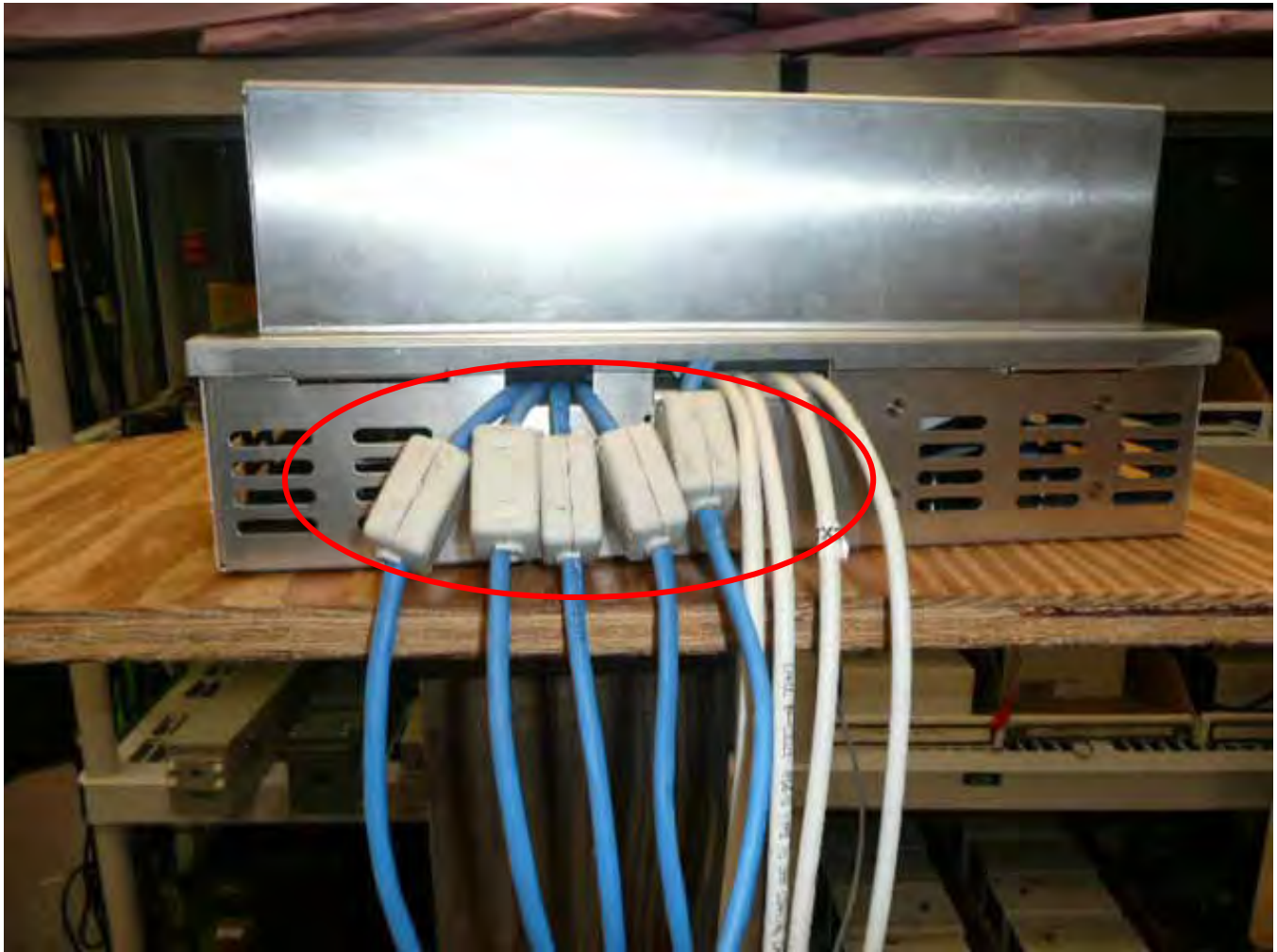


Figure 3 – Ferrite installed on each I/O lines

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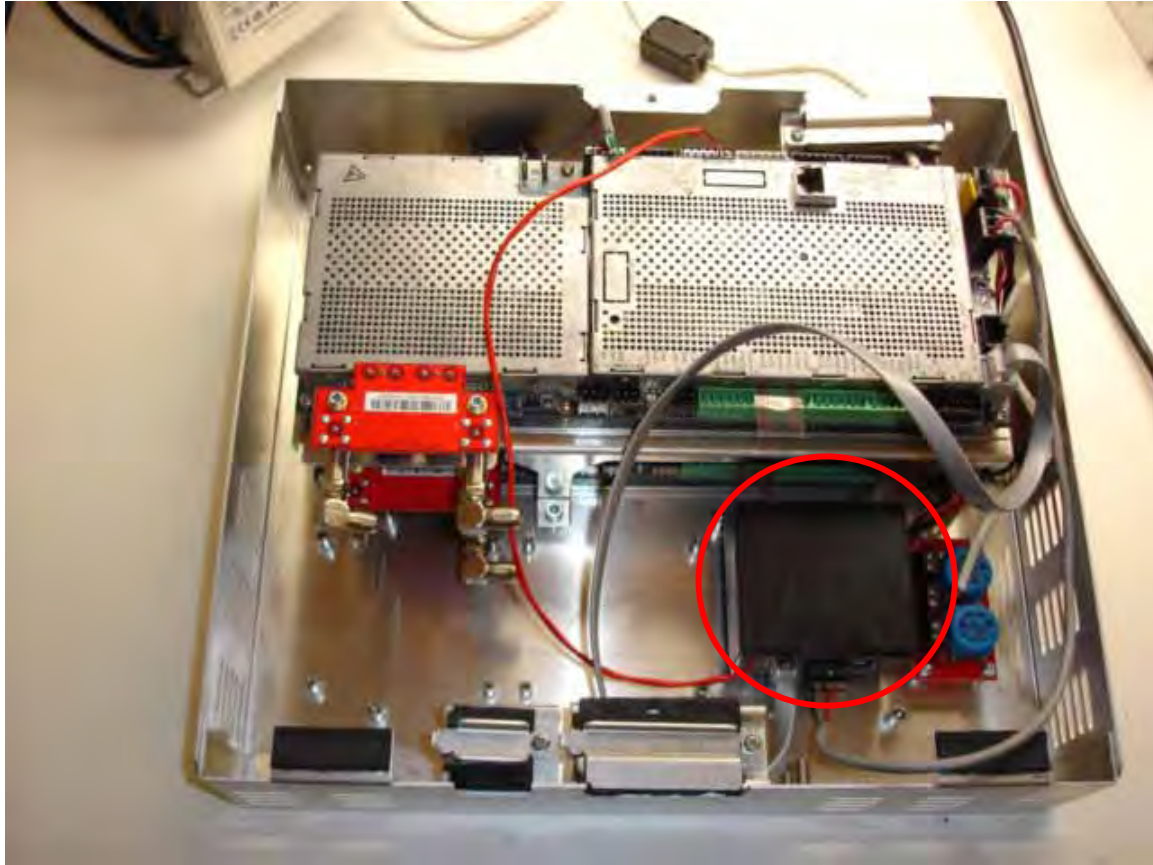


Figure 4 – Internal modem



Figure 5 – Internal modem (internal Picture)

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Figure 6 – CheckPro Manager Visiplus (Configuration 1)

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Figure 7 – Integrated CheckPro Manager Visiplus (configuration 2)

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Figure 8 –EAS Voice alarm Configuration 1 and 2

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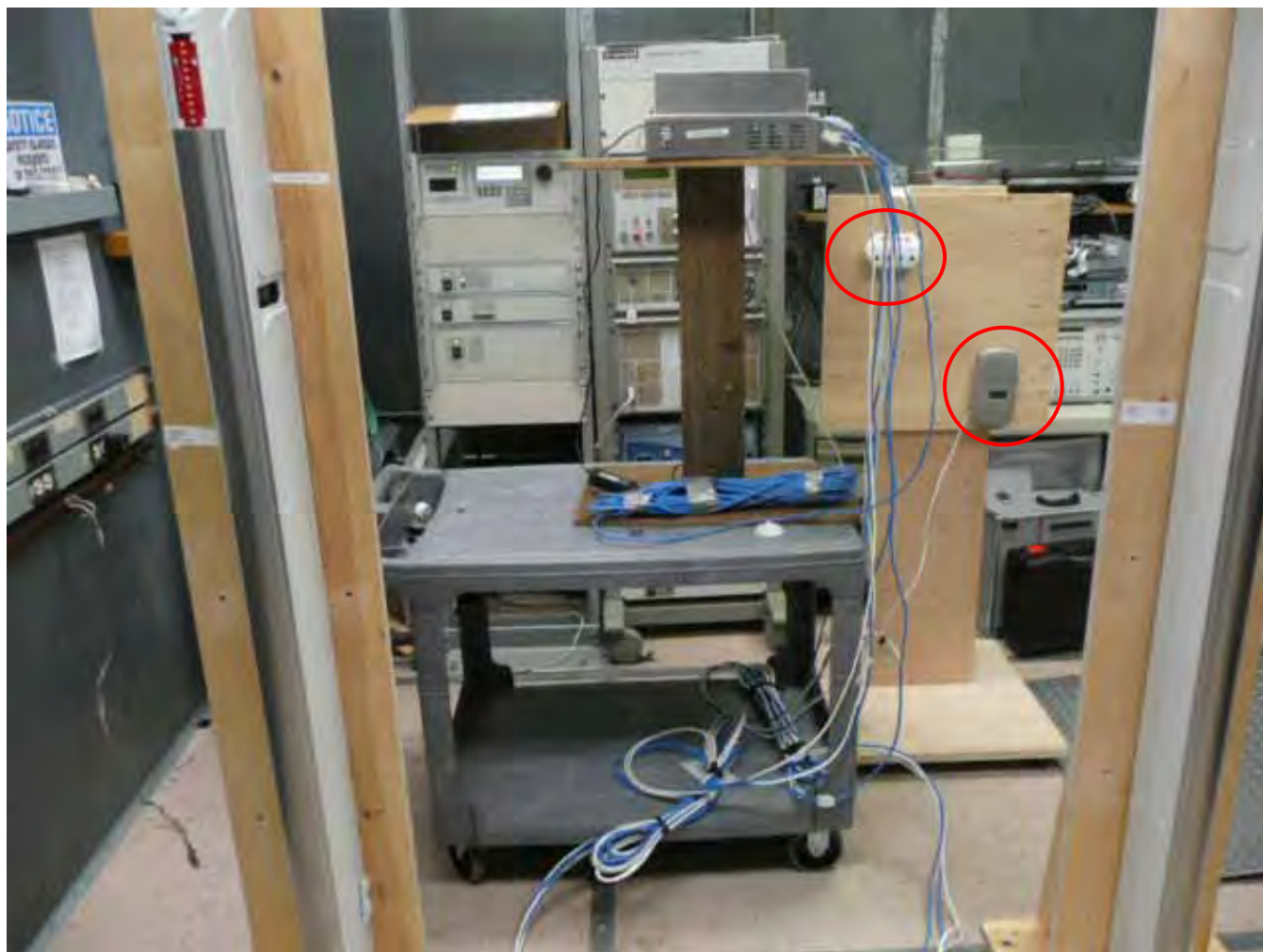


Figure 9 – Remote CheckPro Manager Visiplus and EAS Voice alarm. Configuration 1

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Figure 10 – Integrated CheckPro Manager Visiplus and EAS Voice alarm. Configuration 2

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4 Measurements

4.1 Operation in the band 1.705-10MHz

This test measures the electromagnetic levels of spurious signals generated by the EUT that radiated from the EUT and may affect the performance of other nearby electronic equipment.

4.1.1 Over View of Test

Results	Complies (as tested per this report)			Date	05/13/2008		
Standard	FCC Part 15 Subpart 15.223/RSS-210 Annex A2.3						
Product Model	Slimline (Top Fed and Bottom Fed)		Serial#	7365919CiU01148002, 7365919CiU01228006, 7365919CiU01228010, 7365919CiU01148004			
Configuration	See test plan for details						
Test Set-up	Tested on a 10m O.A.T.S. placed on turn-table, see test plans for details						
EUT Powered By	120V/60Hz	Temp	22°C	Humidity	45%	Pressure	1001mbar
Frequency Range	100µV @ 30m (see Note)						
Perf. Criteria	Below Limit		Perf. Verification	Readings Under Limit			
Mod. to EUT	None		Test Performed By	Dieter Baldamus			

Note: The limits were adjusted in dBµV for a 10m testing resulting in a peak limit of 80dBµV/m. Measurements have been made in all three orthogonal axes of loop antenna and the EUT was rotated to locate the maximum emissions.

4.1.2 Test Procedure

The emissions tests on the fundamental signal were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

The frequency range from 1.705 – 10MHz was investigated for this test using a magnetic field loop antenna.

4.1.3 Deviations

Measurement of the fundamental emissions – 1.705 to 10.0 MHz – was performed by setting a spectrum analyzer to “max-hold”, peak detector, 300 kHz bandwidth and a span from 7.4 MHz to 10 MHz. A resolution bandwidth of 300 kHz was used in performing the “true peak” measurements, 15, because increasing the bandwidth above 300 kHz did not increase the detected peak of the fundamental. The pulse desensitization correction factor was taken into account by using the alternate measurement basin the up-note HP 150-2.

4.1.4 Final Test

All final radiated emissions measurements were below (in compliance) the limits.

4.1.5 Final Measurement Data

Configuration 1: Horizontal Mount

Radiated Emissions Measurements													
Standard:	47 CFR FCC Part 15.223									PRESCAN or FINAL:	Final	Date	5/20/2008
Device Tested:	Checkpoint - Slimline Bottom Fed									Distance:	10m	FileName:	08052001 Fundame
Mode:	9.0 Tx and 8.2 Tx Band (31Tx)												
Mount:	Horizontal												
Modifications:	Power Supply elevated 1m from Groundplane												
Measured Level													
Meas #	Freq (MHz)	Measured Peak (dBµV/m)	Antenna + Cable Correction Factor	Final Peak (dBµV/m)	Peak Limit	Peak Margin	Final Average (dBµV/m)	Average Limit	Average Margin	Result	Orientation (X,Y,Z)	Comment	
RBW = 300kHz VBW=300kHz (FCC Settings)													
9.0 Tx Band													
1	9.3500	58.04	18.50	76.54	80.00	-3.46	48.54	60.00	-11.46	Complied	X Orientation		
2	8.3360	57.07	18.50	75.57	80.00	-4.43	47.57	60.00	-12.43	Complied	X Orientation		
3	9.0770	59.11	18.50	77.61	80.00	-2.39	49.61	60.00	-10.39	Complied	Y Orientation		
4	8.3230	60.27	18.50	78.77	80.00	-1.23	50.77	60.00	-9.23	Complied	Y Orientation		
5	9.2850	53.78	18.50	72.28	80.00	-7.72	44.28	60.00	-15.72	Complied	Z Orientation		
6	8.3230	56.70	18.50	75.20	80.00	-4.80	47.20	60.00	-12.80	Complied	Z Orientation		
RBW = 300kHz VBW=300kHz (FCC Settings)													
8.2 Tx Band													
7	8.4600	55.81	18.50	74.31	80.00	-5.69	46.31	60.00	-13.69	Complied	X Orientation		
8	8.4920	61.28	18.50	79.78	80.00	-0.22	51.78	60.00	-8.22	Complied	Y Orientation		
9	8.3170	58.79	18.50	77.29	80.00	-2.71	49.29	60.00	-10.71	Complied	Z Orientation		
Tested by:	Dieter Baldamus												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009													
Example:													
Freq:	Measured Level + (Antenna + Cable Correction Factor) = Final Peak												
8.317:	56.22 + 18.50 + 74.72												
	Peak Limit = Average Limit + 20dB = 60dBµV/m + 20dB = 80dBµV/m												
	Average limit = 100µV/m @ 30m												
	Average Limit = 20*log(100µV) = 40dBµV/m @ 30m												
	For 10m measurement the average limit was adjusted = 40log(10/30) = 20dB												
	Average limit = 60dBµV/m@10m												
	Average Value = Peak Value - 20*log (Duty Cycle) = Peak Value - 20Log (3)												
	Average Value = Peak Value-28dB												

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Configuration 1: Vertical Mount

Radiated Emissions Measurements												
Standard:		47 CFR FCC Part 15.223				PRESCAN or FINAL:		Final		Date		5/20/2008
Device Tested:		Checkpoint - Slimline Bottom Fed				Distance:		10m		FileName:		08052001 Fundame
Mode:		9.0 Tx and 8.2 Tx Band (31Tx)										
Mount:		Vertical										
Modifications:		Power Supply elevated 1m from Groundplane										
Measured Level												
Meas #	Freq (MHz)	Measured Peak (dBµV/m)	Antenna + Cable Correction Factor	Final Peak (dBµV/m)	Peak Limit	Peak Margin	Final Average (dBµV/m)	Average Limit	Average Margin	Result	Orientation (X,Y,Z)	Comment
RBW = 300kHz VBW=300kHz (FCC Settings)												
9.0 Tx Band												
1	9.3130	56.95	18.50	75.45	80.00	-4.55	47.45	60.00	-12.55	Complied	X Orientation	
2	8.3690	55.10	18.50	73.60	80.00	-6.40	45.60	60.00	-14.40	Complied	X Orientation	
3	9.3700	57.85	18.50	76.35	80.00	-3.65	48.35	60.00	-11.65	Complied	Y Orientation	
4	8.3360	59.11	18.50	77.61	80.00	-2.39	49.61	60.00	-10.39	Complied	Y Orientation	
5	9.3370	53.01	18.50	71.51	80.00	-8.49	43.51	60.00	-16.49	Complied	Z Orientation	
6	8.3100	60.43	18.50	78.93	80.00	-1.07	50.93	60.00	-9.07	Complied	Z Orientation	
RBW = 300kHz VBW=300kHz (FCC Settings)												
8.2 Tx Band												
7	8.4600	55.95	18.50	74.45	80.00	-5.55	46.45	60.00	-13.55	Complied	X Orientation	
8	8.3300	61.05	18.50	79.55	80.00	-0.45	51.55	60.00	-8.45	Complied	Y Orientation	
9	8.0500	58.65	18.50	77.15	80.00	-2.85	49.15	60.00	-10.85	Complied	Z Orientation	
Tested by:		Dieter Baldamus										
		TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009										
Example:												
Freq:		Measured Level + (Antenna + Cable Correction Factor) = Final Peak										
8.317:		56.22 + 18.50 + 74.72										
		Peak Limit = Average Limit + 20dB = 60dBµV/m + 20dB = 80dBµV/m										
		Average limit = 100µV/m @ 30m										
		Average Limit = 20*log(100µV) = 40dBµV/m @ 30m										
		For 10m measurement the average limit was adjusted = 40log(10/30) = 20dB										
		Average limit = 60dBµV/m@10m										
		Average Value = Peak Value - 20*log (Duty Cycle) = Peak Value - 20Log (3.848%)										
		Average Value = Peak Value-28dB										

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Configuration 2: Horizontal Mount

Radiated Emissions Measurements													
Standard:		47 CFR FCC Part 15.223					PRESCAN or FINAL:		Final		Date:		5/20/2008
Device Tested:		Checkpoint - Slimline Top Fed					Distance:		10m		File Name:		08052001 Fundamental
Mode:		9.0 Tx and 8.2 Tx Band (31Tx)											
Mount:		Horizontal											
Modifications:		Power Supply elevated 1m from Groundplane											
Measured Level													
Meas #	Freq (MHz)	Measured Peak (dBuV/m)	Antenna + Cable Correction Factor	Final Peak (dBuV/m)	Peak Limit	Peak Margin	Final Average (dBuV/m)	Average Limit	Average Margin	Result	Orientation (X,Y,Z)	Comment	
RBW = 300kHz VBW=300kHz (FCC Settings)													
9.0 Tx Band													
1	9.0120	60.90	18.50	79.40	80.00	-0.60	51.40	60.00	-8.60	Complied	X Orientation		
2	8.2780	60.32	18.50	78.82	80.00	-1.18	50.82	60.00	-9.18	Complied	X Orientation		
3	9.0380	61.39	18.50	79.89	80.00	-0.11	51.89	60.00	-8.11	Complied	Y Orientation		
4	8.3360	55.70	18.50	74.20	80.00	-5.80	46.20	60.00	-13.80	Complied	Y Orientation		
5	9.3440	49.37	18.50	67.87	80.00	-12.13	39.87	60.00	-20.13	Complied	Z Orientation		
6	8.4010	54.47	18.50	72.97	80.00	-7.03	44.97	60.00	-15.03	Complied	Z Orientation		
RBW = 300kHz VBW=300kHz (FCC Settings)													
8.2.Tx Band													
7	8.0630	59.48	18.50	77.98	80.00	-2.02	49.98	60.00	-10.02	Complied	X Orientation		
8	8.4600	61.09	18.50	79.59	80.00	-0.41	51.59	60.00	-8.41	Complied	Y Orientation		
9	8.3230	59.38	18.50	77.88	80.00	-2.12	49.88	60.00	-10.12	Complied	Z Orientation		
Tested by:		Dieter Baldamus											
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009													
Example:													
Freq:		Measured Level + (Antenna + Cable Correction Factor) = Final Peak											
8.317:		56.22 + 18.50 + 74.72											
		Peak Limit = Average Limit + 20dB = 60dBuV/m + 20dB = 80dBuV/m											
		Average limit = 100uV/m @ 30m											
		Average Limit = 20*log(100uV) = 40dBuV/m @ 30m											
		For 10m measurement the average limit was adjusted = 40log(10/30) = 20dB											
		Average limit = 60dBuV/m@10m											
		Final Average Value = Peak Value - 20*log (Duty Cycle) = Peak Value - 20Log (3.84%)											
		Final Average Value = Peak Value-28dB											

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Configuration 2: Vertical Mount

Radiated Emissions Measurements												
Standard:		47 CFR FCC Part 15.223						PRESCAN or FINAL:		Final		Date: 5/20/2008
Device Tested:		Checkpoint - Slimline Top Fed						Distance:		10m		File Name: 08052001 Fundamental
Mode:		9.0 Tx and 8.2 Tx Band (31Tx)										
Mount:		Vertical										
Modifications:		Power Supply elevated 1m from Groundplane										
Measured Level												
Meas #	Freq (MHz)	Measured Peak (dBµV/m)	Antenna + Cable Correction Factor	Final Peak (dBµV/m)	Peak Limit	Peak Margin	Final Average (dBµV/m)	Average Limit	Average Margin	Result	Orientation (X,Y,Z)	Comment
RBW = 300kHz VBW=300kHz (FCC Settings)												
9.0 Tx Band												
1	9.3440	58.56	18.50	77.06	80.00	-2.94	49.06	60.00	-10.94	Complied	X Orientation	
2	8.3100	56.42	18.50	74.92	80.00	-5.08	46.92	60.00	-13.08	Complied	X Orientation	
3	9.0240	61.42	18.50	79.92	80.00	-0.08	51.92	60.00	-8.08	Complied	Y Orientation	
4	8.3820	58.11	18.50	76.61	80.00	-3.39	48.61	60.00	-11.39	Complied	Y Orientation	
5	9.2820	51.31	18.50	69.81	80.00	-10.19	41.81	60.00	-18.19	Complied	Z Orientation	
6	8.3560	58.32	18.50	76.82	80.00	-3.18	48.82	60.00	-11.18	Complied	Z Orientation	
RBW = 300kHz VBW=300kHz (FCC Settings)												
8.2 Tx Band												
7	8.4730	58.69	18.50	77.19	80.00	-2.81	49.19	60.00	-10.81	Complied	X Orientation	
8	8.4730	60.95	18.50	79.45	80.00	-0.55	51.45	60.00	-8.55	Complied	Y Orientation	
9	8.4730	60.27	18.50	78.77	80.00	-1.23	50.77	60.00	-9.23	Complied	Z Orientation	
Tested by:		Dieter Baldamus										
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												
Example:												
Freq:		Measured Level + (Antenna + Cable Correction Factor) = Final Peak										
8.317:		56.22 + 18.50 + 74.72										
Peak Limit = Average Limit + 20dB = 60dBµV/m + 20dB = 80dBµV/m												
Average limit = 100µV/m @ 30m												
Average Limit = 20*log(100µV) = 40dBµV/m @ 30m												
For 10m measurement the average limit was adjusted = 40log(10/30) = 20dB												
Average limit = 60dBµV/m @ 10m												
Final Average Value = Peak Value - 20*log (Duty Cycle) = Peak Value - 20Log (3.84%)												
Final Average Value = Peak Value-28dB												

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TUV Rheinland test mark. This report must not be used by the applicant to claim product endorsement by TUV Rheinland, NVLAP or any agency of the United States Government.

4.1.6 Photos



Figure 11 - Fundamental Emissions Test Setup - Configuration 1: Horizontal Mount

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Figure 12 - Fundamental Emissions Test Setup - Configuration 1: Vertical Mount

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. This report must not be used by the applicant to claim product endorsement by TÜV Rheinland, NVLAP or any agency of the United States Government.



Figure 13 – Fundamental Emissions Test Setup - Configuration 2: Horizontal Mount

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. This report must not be used by the applicant to claim product endorsement by TÜV Rheinland, NVLAP or any agency of the United States Government.



Figure 14 – Fundamental Emissions Test Setup - Configuration 2: Vertical Mount

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4.2 Conducted Limits

This test measures the electromagnet levels of spurious signals generated by the EUT on the AC power line that may affect the performance of other near by electronic equipment.

4.2.1 Over View of Test

Results	Complies (as tested per this report)				Date	05/20/2008	
Standard	FCC Part 15 Subpart 15.223/RSS-210 Annex A2.3						
Product Model	Slimline (Top Fed and Bottom Fed)			Serial#	7365919CiU01148002, 7365919CiU01228006, 7365919CiU01228010, 7365919CiU01148004		
Configuration	See test plan for details						
Test Set-up	Tested in shielded room		EUT placed on table		see test plans for details		
EUT Powered By	120V/60Hz	Temp	22° C	Humidity	45%	Pressure	1004mbar
Frequency Range	150kHz - 30MHz						
Perf. Criteria	Per table in section 207 (Bellow Limit)			Perf. Verification	Readings Under Limit for L1 and L2		
Mod. to EUT	None			Test Performed By	Dieter Baldamus		

4.2.2 Test Procedure

Conducted and FCC emissions tests were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

The frequency range from 150kHz - 30MHz was investigated for conducted emissions.

Conducted Emissions measurements were performed in the shielded room using procedures specified in the test plan and standard.

4.2.3 Deviations

There were no deviations from the test methodology listed in the test plan for the conducted emission test.

4.2.4 Final Test

All final conducted emissions measurements were below (in compliance) the limits.

4.2.5 Final Measurement Data

NOTES:

Conducted Emissions @ 120V/60Hz
8.2Tx Band Configuration 1
Line / Neutral

16:09:59 MAY 20, 2008 120V/60Hz TX(31) HORIZONTAL
CHECKPOINT MODEL SLIMLINE BOTTOM FED TX 8.2
MARKER 8.43 MHz 57.37 dBμV
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 8.43 MHz
57.37 dBμV

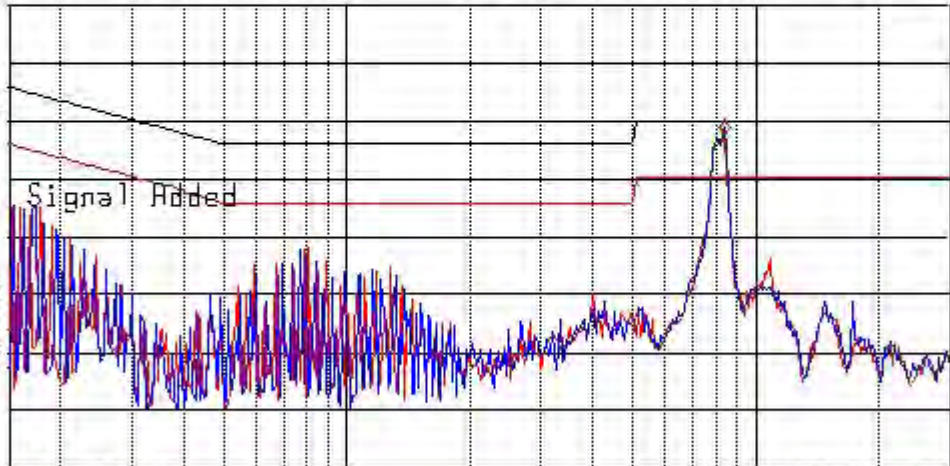
LDO REF 60.0 dBμV

10
dB/
RTN
10 dB

Signal Added

VA VB
SC FC
ACDRR

CENTER 15.00 MHz SPAN 29.85 MHz
L #1F BW 9.0 kHz AVG BW 30 kHz SWP 2.49 sec



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Conducted Emissions Measurements												
Standard: FCC Part 15										Date: 5/20/2008		
Device Tested: Checkpoint - Slimline										File: .xls 08052003 CE Slimline 120V.xls		
Mode: 8.2 TX Band (31Tx)												
Mount: Horizontal												
Voltage: 120V/50Hz												
PS Model:												
Signal Num	Freq	Peak Amp	QP Amp	Avg Amp	QP Limit	Avg Limit	Conductor	QP ≡	QP Result	Avg ≡	Average Result	Mode
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV		dB		dB		
1	0.1806	46.99	40.06	27.57	64.46	54.46	Line	-24.40	Complied	-26.89	Complied	
2	0.7753	23.19	20.04	17.73	56.00	46.00	Line	-35.96	Complied	-28.27	Complied	
3	8.4443	57.25	54.65	44.43	60.00	50.00	Line	-5.35	Complied	-5.57	Complied	Maximum Emissions
4	10.3422	34.55	30.91	20.80	60.00	50.00	Line	-29.09	Complied	-29.20	Complied	
5	0.1915	43.10	36.77	12.14	63.97	53.97	Neutral	-27.20	Complied	-41.83	Complied	
6	0.8254	39.86	32.15	6.30	56.00	46.00	Neutral	-23.85	Complied	-39.70	Complied	
7	8.4430	57.03	54.05	44.54	60.00	50.00	Neutral	-5.95	Complied	-5.46	Complied	
Tested by: Dieter Baldamus												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												

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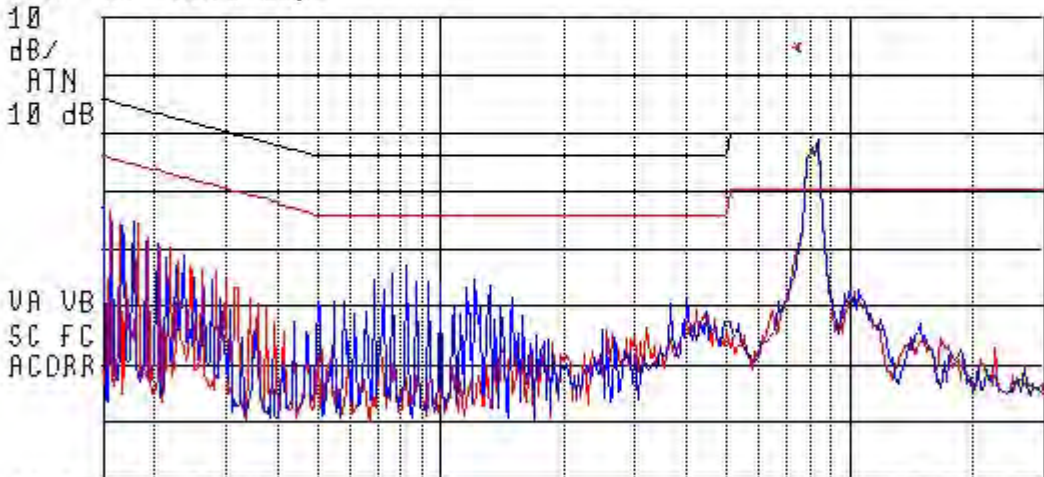
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NOTES:

Conducted Emissions @ 120V/60Hz
8.2Tx Band Configuration 1
Line / Neutral

16:17:36 MAY 20, 2008 40V/60Hz TX(31) VERTICAL
CHECKPOINT MODEL SLIMLINE BOTTOM FED TX 8.2
MARKER 200 kHz 16.99 dBμV
ACTV DET: PEAK MEAS DET: PEAK QP AVG
MKR 200 kHz 16.99 dBμV

LOG REF 60.0 dBμV



CENTER 15.00 MHz SPAN 29.85 MHz
#1F BW 9.0 kHz AVG BW 30 kHz SWP 2.49 sec

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Conducted Emissions Measurements												
Standard: FCC Part 15										Date: 5/20/2008		
Device Tested: Checkpoint - Slimline										File: .xls 08052003 CE Slimline 120V.xls		
Mode: 8.2 TX Band (31Tx)												
Mount: Vertical												
Voltage: 120V/50Hz												
PS Model: P/N 7116509												
Signal Num	Freq	Peak Amp	QP Amp	Avg Amp	QP Limit	Avg Limit	Conductor	QP ∠	QP Result	Avg ∠	Average Result	Mode
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV		dB		dB		
1	0.1800	46.01	38.68	24.81	64.49	54.49	Line	-25.81	Complied	-29.68	Complied	
2	0.8384	40.44	31.49	18.99	56.00	46.00	Line	-24.51	Complied	-27.01	Complied	
3	8.4225	61.98	57.12	44.34	60.00	50.00	Line	-2.88	Complied	-5.66	Complied	
4	14.4955	27.58	23.99	14.23	60.00	50.00	Line	-36.01	Complied	-35.77	Complied	
5	0.1870	48.44	42.01	11.45	64.17	54.17	Neutral	-22.16	Complied	-42.72	Complied	
6	0.8778	25.45	21.45	17.45	56.00	46.00	Neutral	-34.55	Complied	-28.55	Complied	
7	8.3470	61.88	52.40	35.99	60.00	50.00	Neutral	-7.60	Complied	-14.01	Complied	
9	14.9700	26.84	24.02	17.86	60.00	50.00	Neutral	-35.98	Complied	-32.14	Complied	
Tested by: Dieter Baldamus												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												

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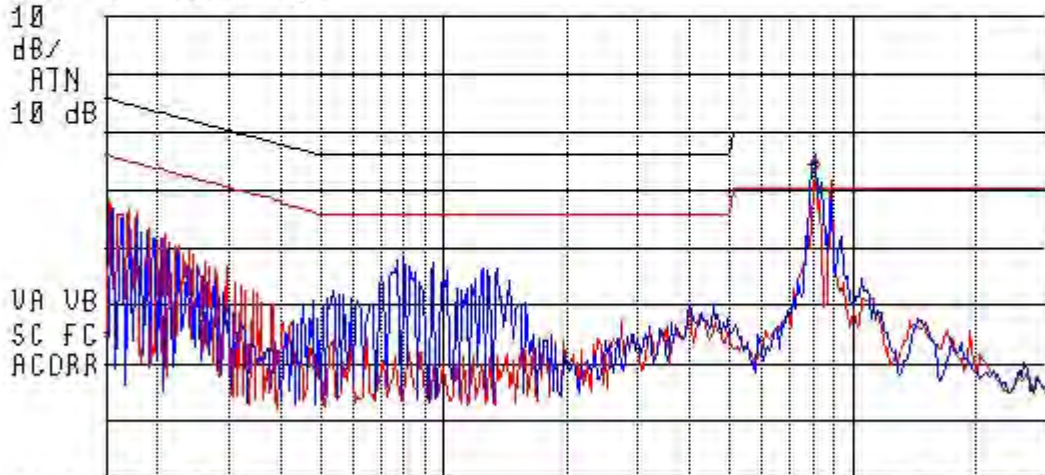
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NOTES:

Conducted Emissions @ 120V/60Hz
9.0Tx Band Configuration 1
Line / Neutral

16:23:42 MAY 20, 2008 120V/60Hz TX(31) VERTICAL
CHECKPOINT MODEL SLIMLINE BOTTOM FED TX 9.0
MARKER 8.06 MHz 52.76 dBμV
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 8.06 MHz
52.76 dBμV

LOG REF 60.0 dBμV



VA VB SC FC ACORR
CENTER 15.00 MHz SPAN 29.85 MHz
#1F BW 9.0 kHz AVG BW 30 kHz SWP 2.49 sec

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Conducted Emissions Measurements												
Standard: FCC Part 15										Date: 5/20/2008		
Device Tested: Checkpoint - Slimline										File: .xls 08052003 CE Slimline 120V.xls		
Mode: TX 9.0 TX Band (31Tx)												
Mount: Vertical												
Voltage: 120V/50Hz												
PS Model: P/N 7116509												
Signal Num	Freq	Peak Amp	QP Amp	Avg Amp	QP Limit	Avg Limit	Conductor	QP ∠	QP Result	Avg ∠	Average Result	Mode
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV		dB		dB		
1	0.1511	48.03	41.89	12.77	65.94	55.94	Line	-24.05	Complied	-43.17	Complied	
2	0.8333	24.52	20.48	17.72	56.00	46.00	Line	-35.52	Complied	-28.28	Complied	
3	8.3873	63.54	51.45	35.95	60.00	50.00	Line	-8.55	Complied	-14.05	Complied	
5	9.0780	54.55	45.78	20.78	60.00	50.00	Line	-14.22	Complied	-29.22	Complied	
6	0.1811	45.51	37.77	23.28	64.43	54.43	Neutral	-26.66	Complied	-31.15	Complied	
7	0.8407	38.53	30.31	11.92	56.00	46.00	Neutral	-25.69	Complied	-34.08	Complied	
8	8.3115	62.47	45.82	34.19	60.00	50.00	Neutral	-14.18	Complied	-15.81	Complied	
9	9.0479	53.68	45.05	20.59	60.00	50.00	Neutral	-14.95	Complied	-29.41	Complied	
Tested by: Dieter Baldamus												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												

CE22_B.xls Revised 21OCT2005

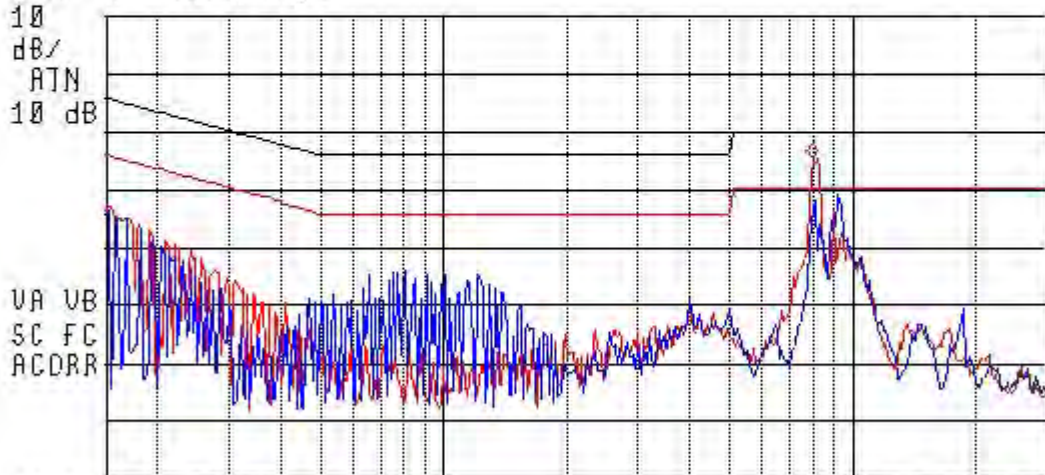
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NOTES:

Conducted Emissions @ 120V/60Hz
9.0 Tx Band Configuration 1
Line / Neutral

16:30:36 MAY 20, 2008 120V/60Hz TX(31) HORIZONTAL
CHECKPOINT MODEL SLIMLINE BOTTOM FED TX 9.0
MARKER 7.93 MHz 55.30 dBμV
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 7.93 MHz
55.30 dBμV

LOG REF 60.0 dBμV



CENTER 15.00 MHz SPAN 29.85 MHz
#1F BW 9.0 kHz AVG BW 30 kHz SWP 2.49 sec

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Conducted Emissions Measurements													
Standard:											FCC Part 15	Date:	5/20/2008
Device Tested:											Checkpoint - Slimline	File: .xls	08052003 CE Slimline 120V.xls
Mode:											TX 9.0 TX Band (31Tx)		
Mount:											Horizontal		
Voltage:											120V/50Hz		
PS Model:											P/N 7116509		
Signal Num	Freq	Peak Amp	QP Amp	Avg Amp	QP Limit	Avg Limit	Conductor	QP ∠	QP Result	Avg ∠	Average Result	Mode	
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV		dB		dB			
1	0.1824	46.54	38.71	22.83	64.38	54.38	Line	-25.67	Complied	-31.55	Complied		
2	0.9562	22.86	16.97	13.50	56.00	46.00	Line	-39.03	Complied	-32.50	Complied		
3	0.1402	50.18	43.82	14.12	60.00	50.00	Line	-16.18	Complied	-35.88	Complied		
4	8.3322	61.21	54.15	25.78	60.00	50.00	Line	-5.85	Complied	-24.22	Complied		
5	9.3605	54.10	44.15	27.45	60.00	50.00	Line	-15.85	Complied	-22.55	Complied		
6	0.8354	39.91	31.48	21.02	56.00	46.00	Neutral	-24.52	Complied	-24.98	Complied		
7	0.1806	46.40	38.41	22.76	64.46	54.46	Neutral	-26.05	Complied	-31.70	Complied		
8	1.0976	36.88	28.35	5.33	56.00	46.00	Neutral	-27.65	Complied	-40.67	Complied		
9	8.3322	60.06	54.05	25.39	60.00	50.00	Neutral	-5.95	Complied	-24.61	Complied		
10	9.3605	54.46	44.38	27.75	60.00	50.00	Neutral	-15.62	Complied	-22.25	Complied		
Tested by: Dieter Baldamus													
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009													

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NOTES:

**Conducted Emissions @ 120V/60Hz
8.2Tx Band Configuration 2
Line / Neutral**

16:22:24 MAY 20, 2008 120V/60Hz TX(31)HORIZONTAL
CHECKPOINT MODEL SLIMLINE TDP FED TX B.2
MARKER 8.43 MHz 61.76 dBµV
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 8.43 MHz
61.76 dBµV

LOG REF 60.0 dBµV

10

dB/

ATN

10 dB

VA VB

SC FC

ACDRR

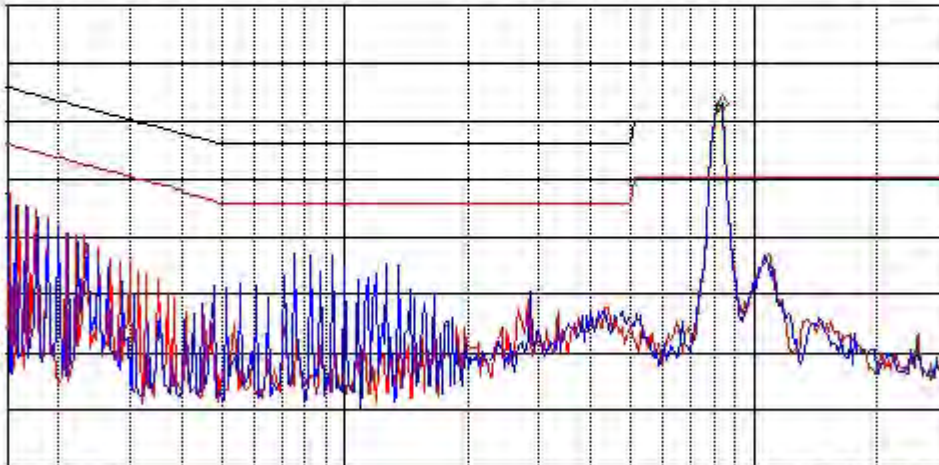
START 150 kHz

#1F BW 9.0 kHz

AVG BW 30 kHz

STOP 30.00 MHz

SWP 2.49 sec



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Conducted Emissions Measurements													
Standard:											FCC Part 15	Date:	5/20/2008
Device Tested:											Checkpoint - Slimline	File: .xls	08052003 CE Slimline 120V.xls
Mode:											8.2 TX Band (31Tx)		
Mount:											Horizontal		
Voltage:											120V/50Hz		
PS Model:													
Signal Num	Freq	Peak Amp	QP Amp	Avg Amp	QP Limit	Avg Limit	Conductor	QP ±	QP Result	Avg ±	Average Result	Mode	
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV		dB		dB			
1	0.2320	39.99	33.66	23.82	62.38	52.38	Line	-28.72	Complied	-28.56	Complied		
2	0.9616	39.33	31.83	13.19	56.00	46.00	Line	-24.17	Complied	-32.81	Complied		
3	8.4284	62.91	59.50	49.01	60.00	50.00	Line	-0.50	Complied	-0.99	Complied		
4	10.8433	38.58	34.17	24.11	60.00	50.00	Line	-25.83	Complied	-25.89	Complied		
5	0.1621	48.12	41.99	15.95	65.35	55.35	Neutral	-23.36	Complied	-39.40	Complied		
6	0.8945	25.63	21.85	18.50	56.00	46.00	Neutral	-34.15	Complied	-27.50	Complied		
7	8.4213	64.35	59.69	48.77	60.00	50.00	Neutral	-0.31	Complied	-1.23	Complied	Maximum Emissions	
8	10.3440	36.57	32.31	23.07	60.00	50.00	Neutral	-27.69	Complied	-26.93	Complied		
Tested by: Dieter Baldamus													
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009													

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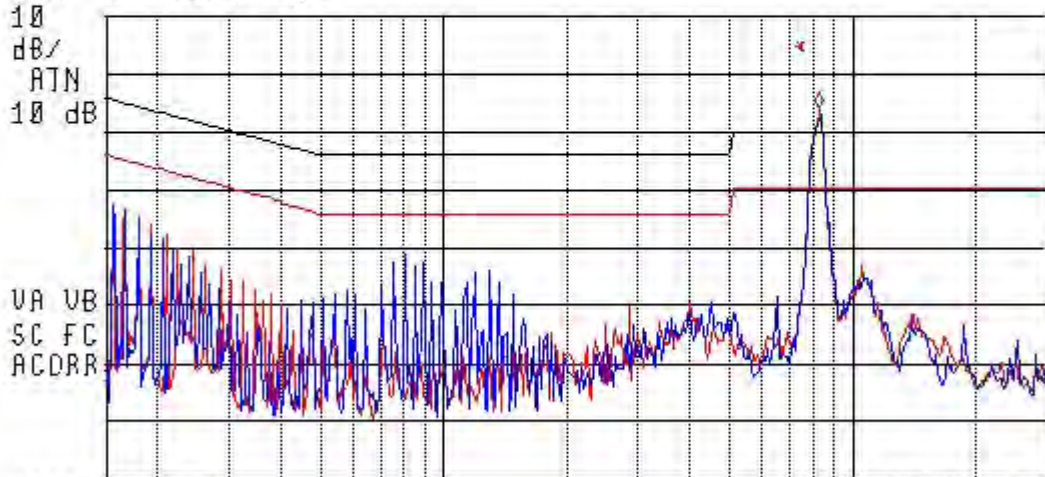
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NOTES:

Conducted Emissions @ 120V/60Hz
8.2Tx Band Configuration 2
Line / Neutral

16:27:03 MAY 20, 2008 120V/60Hz TX(31) VERTICAL
CHECKPOINT MODEL SLIMLINE TDP FED TX B.2
MARKER 8.31 MHz 64.30 dBμV
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 8.31 MHz
64.30 dBμV

LOG REF 60.0 dBμV



START 150 kHz STOP 30.00 MHz
#1F BW 9.0 kHz AVG BW 30 kHz SWP 2.49 sec

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Conducted Emissions Measurements												
Standard: FCC Part 15										Date: 5/20/2008		
Device Tested: Checkpoint - Slimline										File: .xls 08052003 CE Slimline 120V.xls		
Mode: 8.2 TX Band (31Tx)												
Mount: Vertical												
Voltage: 120V/50Hz												
PS Model: P/N 7116509												
Signal Num	Freq	Peak Amp	QP Amp	Avg Amp	QP Limit	Avg Limit	Conductor	QP ±	QP Result	Avg ±	Average Result	Mode
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV		dB		dB		
1	0.1661	46.53	40.36	12.71	65.15	55.15	Line	-24.79	Complied	-42.44	Complied	
2	0.7784	40.77	32.75	22.27	56.00	46.00	Line	-23.25	Complied	-23.73	Complied	
3	8.0910	62.35	59.31	46.98	60.00	50.00	Line	-0.69	Complied	-3.02	Complied	
4	10.8609	39.59	34.24	25.78	60.00	50.00	Line	-25.76	Complied	-24.22	Complied	
5	0.1655	46.54	40.54	12.44	65.18	55.18	Neutral	-24.64	Complied	-42.74	Complied	
6	0.7480	40.14	32.47	22.45	56.00	46.00	Neutral	-23.53	Complied	-23.55	Complied	
7	8.0970	62.10	59.55	46.98	60.00	50.00	Neutral	-0.45	Complied	-3.02	Complied	
8	10.8875	40.25	35.12	25.77	60.00	50.00	Neutral	-24.88	Complied	-24.23	Complied	
Tested by: Dieter Baldamus												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												

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NOTES:

Conducted Emissions @ 120V/60Hz
9.0Tx Band Configuration 2
Line / Neutral

16:30:33 MAY 20, 2008 120V/60Hz TX(31) VERTICAL
CHECKPOINT MODEL SLIMLINE TDP FED TX 9.0
MARKER 8.31 MHz 66.87 dBμV
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 8.31 MHz
66.87 dBμV

LDG REF 60.0 dBμV

10

dB/

ATTN

10 dB

VA VB

SC FC

ACDRR

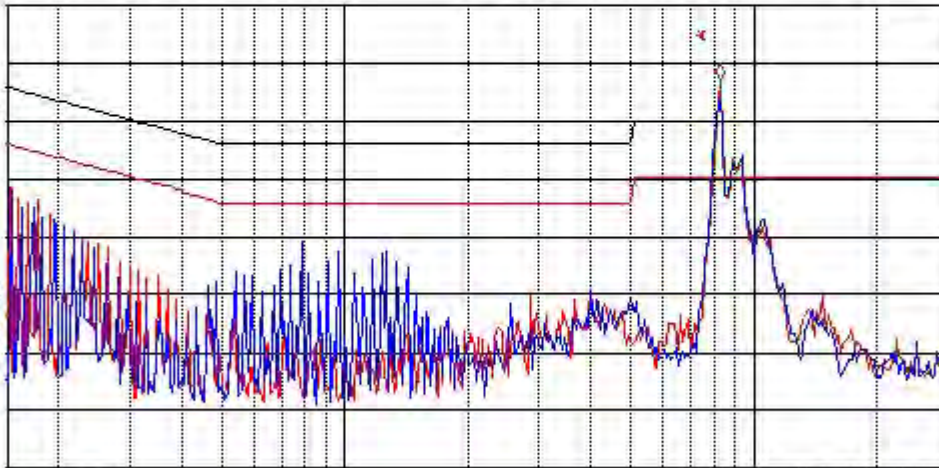
START 150 kHz

#1F BW 9.0 kHz

AVG BW 30 kHz

STOP 30.00 MHz

SWP 2.49 sec



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Conducted Emissions Measurements												
Standard: FCC Part 15										Date: 5/20/2008		
Device Tested: Checkpoint - Slimline										File: .xls 08052003 CE Slimline 120V.xls		
Mode: TX 9.0 TX Band (31Tx)												
Mount: Vertical												
Voltage: 120V/50Hz												
PS Model: P/N 7116509												
Signal Num	Freq	Peak Amp	QP Amp	Avg Amp	QP Limit	Avg Limit	Conductor	QP ÷	QP Result	Avg ÷	Average Result	Mode
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV		dB		dB		
1	0.1808	46.76	39.44	22.85	64.45	54.45	Line	-25.01	Complied	-31.60	Complied	
2	1.2551	39.62	31.85	22.58	56.00	46.00	Line	-24.15	Complied	-23.42	Complied	
3	8.3334	65.09	59.78	45.51	60.00	50.00	Line	-0.22	Complied	-4.49	Complied	
4	9.3274	56.67	51.68	35.20	60.00	50.00	Line	-8.32	Complied	-14.80	Complied	
5	10.4692	44.51	40.26	30.57	60.00	50.00	Line	-19.74	Complied	-19.43	Complied	
6	0.1594	48.22	41.53	13.60	65.49	55.49	Neutral	-23.96	Complied	-41.89	Complied	
7	0.8375	22.23	17.63	12.33	56.00	46.00	Neutral	-38.37	Complied	-33.67	Complied	
8	8.2587	63.90	59.66	46.19	60.00	50.00	Neutral	-0.34	Complied	-3.81	Complied	
9	9.3274	54.24	50.73	34.14	60.00	50.00	Neutral	-9.27	Complied	-15.86	Complied	
10	10.7189	44.12	39.88	30.04	60.00	50.00	Neutral	-20.12	Complied	-19.96	Complied	
Tested by: Dieter Baldamus												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												

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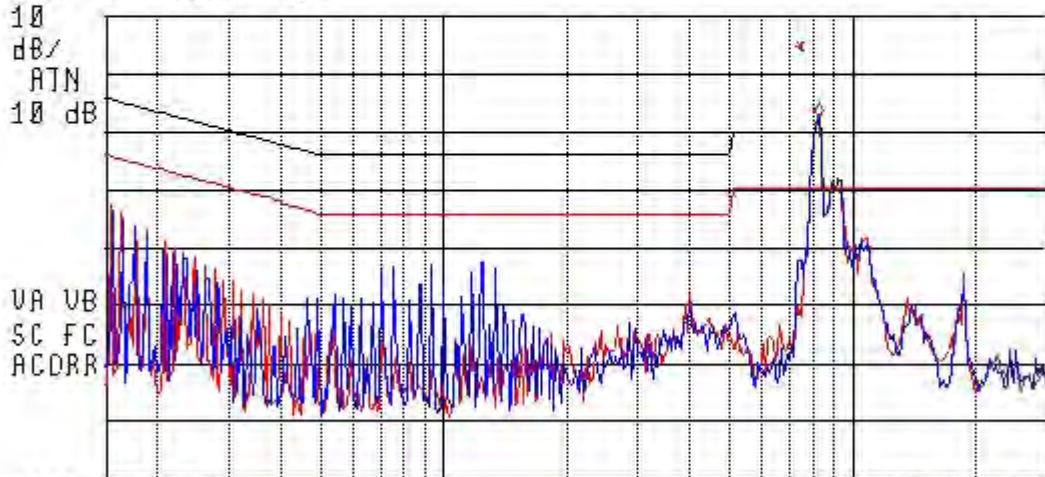
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NOTES:

Conducted Emissions @ 120V/60Hz
9.0Tx Band Configuration 2
Line / Neutral

16:36:02 MAY 20, 2008 120V/60Hz TX(31) HORIZONTAL
CHECKPOINT MODEL SLIMLINE TDP FED TX 9.0
MARKER 8.31 MHz 62.53 dBμV
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 8.31 MHz
62.53 dBμV

LOG REF 60.0 dBμV



START 150 kHz STOP 30.00 MHz
#1F BW 9.0 kHz AVG BW 30 kHz SWP 2.49 sec

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Conducted Emissions Measurements												
Standard: FCC Part 15										Date: 5/20/2008		
Device Tested: Checkpoint - Slimline										File: .xls 08052003 CE Slimline 120V.xls		
Mode: TX 9.0 TX Band (31Tx)												
Mount: Horizontal												
Voltage: 120V/50Hz												
PS Model: P/N 7116509												
Signal Num	Freq	Peak Amp	QP Amp	Avg Amp	QP Limit	Avg Limit	Conductor	QP ÷	QP Result	Avg ÷	Average Result	Mode
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV		dB		dB		
1	0.1629	47.05	40.38	14.10	65.31	55.31	Line	-24.93	Complied	-41.21	Complied	
2	0.7181	39.40	29.91	23.75	56.00	46.00	Line	-26.09	Complied	-22.25	Complied	
3	8.2649	61.96	59.29	45.78	60.00	50.00	Line	-0.71	Complied	-4.22	Complied	
4	9.3135	54.55	49.45	32.98	60.00	50.00	Line	-10.55	Complied	-17.02	Complied	
5	10.7188	43.12	39.09	29.27	60.00	50.00	Line	-20.91	Complied	-20.73	Complied	
6	0.1624	47.58	40.66	14.50	65.34	55.34	Neutral	-24.68	Complied	-40.84	Complied	
7	0.7150	38.54	30.48	23.44	56.00	46.00	Neutral	-25.52	Complied	-22.56	Complied	
8	8.2645	61.47	59.88	45.78	60.00	50.00	Neutral	-0.12	Complied	-4.22	Complied	
9	9.3140	54.88	49.65	33.90	60.00	50.00	Neutral	-10.35	Complied	-16.10	Complied	
10	10.8700	43.14	39.54	30.24	60.00	50.00	Neutral	-20.46	Complied	-19.76	Complied	
Tested by: Dieter Baldamus												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												

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4.2.6 Photos



Figure 15 –Conducted Emissions Test Setup Configuration 1

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4.3 Radiated Emissions Limits

This test measures the electromagnetic levels of spurious signals generated by the EUT that radiated from the EUT and may affect the performance of other nearby electronic equipment.

4.3.1 Test Over View

Results	Complies (as tested per this report)			Date	02/29/2008		
Standard	FCC Part 15 Subpart 15.205 and 15.209						
Product Model	Slimline (Top Fed and Bottom Fed)		Serial#	7365919CiU01148002, 7365919CiU01228006, 7365919CiU01228010, 7365919CiU01148004			
Configuration	See test plan for details						
Test Set-up	Tested on a 10m O.A.T.S. placed on turn-table, see test plans for details						
EUT Powered By	120V/60Hz	Temp	22° C	Humidity	45%	Pressure	1004mbar
Frequency Range	From Fundamental - 1000MHz						
Perf. Criteria	Below Limit		Perf. Verification	Readings under Limit			
Mod to EUT	None		Test Performed By	Dieter Baldamus			

4.3.2 Test Procedure

Radiated emissions tests were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

The frequency range from 80MHz to 1000MHz was investigated for radiated emissions.

Radiated emission testing was first performed at a distance of 3 meters in the semi-anechoic chamber in order to identify the specific frequencies for which these measurements will be made. Harmonics and spurious emissions testing <30MHz were performed at 10m distance on the OATS using a magnetic field loop antenna. Harmonics and spurious emissions test >30MHz were performed on the 3 m OATS using a Bilog antenna

4.3.3 Deviations

There were no deviations from the test methodology listed in the test plan for the harmonic current emissions test.

4.3.4 Final Test

All final radiated emissions measurements were below (in compliance) the limits.

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4.3.5 Final Measurement Data

Configuration 1: (8.2 and 9.0Tx Band) Final <30MHz (Harmonics);

Radiated Emissions Measurements											
Standard:		47 CFR FCC Part 15.223			PRESCAN or FINAL:		Final		Date:	5/13/2008	
Device Tested:		Checkpoint - Slimline Bottom Fed			Distance:		10m		File:		08051301 Fundamental Report Bottom fed (FCC).xls
Mode:		9.0Tx and 8.2 Tx Band (31Tx)									
Mount:		Vertical									
Modifications:											
Harmonics											
9.0 Tx Band	Freq (MHz)	Measured Peak (dBµV/m)	Quasi-Peak	Average	Antenna + Cable Correction Factor	QuaiPeak Limit	Quasi Peak °	Result	Orientation	Comments	
7	18.6200	52.65	45.54	44.10	19.00	49.54	-4.00	Complied	X Orientation		
8	16.6340	52.40	46.57	41.21	19.00	49.54	-2.97	Complied	X Orientation		
9	18.6220	52.70	47.49	42.07	19.00	49.54	-2.05	Complied	Y Orientation		
10	16.6600	52.45	47.54	42.45	19.30	49.54	-2.00	Complied	Y Orientation		
11	18.2220	52.12	47.47	42.14	19.30	49.54	-2.07	Complied	Z Orientation		
12	16.6100	51.45	47.54	42.11	19.30	49.54	-2.00	Complied	Z Orientation		
13	27.9300	52.78	47.78	42.15	19.30	49.54	-1.76	Complied	X Orientation		
14	24.9510	51.47	47.54	42.10	19.30	49.54	-2.00	Complied	X Orientation		
15	27.9330	52.78	47.12	42.82	19.30	49.54	-2.42	Complied	Y Orientation		
16	24.9900	52.47	47.45	42.54	19.30	49.54	-2.09	Complied	Y Orientation		
17	27.3330	51.05	47.52	41.54	19.30	49.54	-2.02	Complied	Z Orientation		
18	24.9150	50.40	47.50	42.15	19.30	49.54	-2.04	Complied	Z Orientation		
8.2 Tx Band											
19	16.9060	47.69	40.79	35.61	19.30	49.54	-8.75	Complied	X Orientation		
20	16.9320	47.38	40.24	36.54	19.30	49.54	-9.30	Complied	Y Orientation		
21	16.6340	47.88	40.11	36.47	19.30	49.54	-9.43	Complied	Z Orientation		
22	25.3590	47.66	40.23	35.94	19.30	49.54	-9.31	Complied	X Orientation		
23	25.3980	47.79	40.60	35.66	19.30	49.54	-8.94	Complied	Y Orientation		
24	24.9510	47.54	40.89	35.65	19.30	49.54	-8.65	Complied	Z Orientation		
Tested by:		Dieter Baldamus									
TUV Rheinland of North America, Inc.		12 Commerce Road			Newtown, CT 06470		Tel:(203) 426-0888		Fax: (203) 426-4009		

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Configuration 1: RE Final >30MHz

Radiated Emissions Measurements												
Standard:	47 CFR 15.209				PRESCAN or FINAL: Final				Date: 5/12/2008			
Device Tested:	Checkpoint - Slimline Botom Fed				Distance: 3.0m				File: 08051202 Re Prescan FCC.xls			
Firmware:	2.84											
Tx	8.2											
Chassis Mount:	Horizontal											
Measured Level												
Meas #	Freq (MHz)	Peak	Quasi-Peak	Average	Quasi-Peak Limit	Quasi-Peak °	Antenna + Cable Correction Factor (included in measured levels)	Result	Polarization	Angle (degrees)	Antenna Height (meters)	Comment
1	32.2696	35.45	30.45	23.38	40.00	-9.55	17.46	Complied	Vertical	144	1.00	
2	36.2888	36.45	32.55	32.72	40.00	-7.45	14.93	Complied	Vertical	154	1.00	
3	87.4767	43.54	38.55	30.58	40.00	-1.45	9.57	Complied	Vertical	68	1.00	
4	88.8453	44.24	35.44	23.38	43.50	-8.06	9.76	Complied	Vertical	67	1.00	
5	101.4079	43.10	35.45	32.72	43.50	-8.05	11.57	Complied	Vertical	66	1.10	
6	119.2777	35.40	32.44	23.38	43.50	-11.06	13.71	Complied	Vertical	78	1.10	
7	240.0051	37.54	35.47	32.72	46.00	-10.53	13.57	Complied	Vertical	34	1.20	
8	238.4800	36.78	33.24	30.58	46.00	-12.76	13.46	Complied	Vertical	354	1.16	
9	405.4631	44.57	42.40	34.28	46.00	-3.60	18.64	Complied	Horizontal	124	1.54	
10	421.3522	39.47	36.55	11.06	46.00	-9.45	18.87	Complied	Horizontal	124	1.54	
11	424.6142	48.78	43.45	12.31	46.00	-2.55	18.92	Complied	Horizontal	187	1.20	
12	428.0766	44.57	39.44	8.02	46.00	-6.56	18.99	Complied	Horizontal	197	1.65	
13	436.0975	50.78	44.45	7.94	46.00	-1.55	19.14	Complied	Horizontal	205	1.54	
14	444.1604	49.56	45.10	14.77	46.00	-0.90	19.30	Complied	Horizontal	122	1.55	
15	473.2487	47.50	40.12	10.62	46.00	-5.88	19.93	Complied	Horizontal	24	1.23	
16	500.9041	38.78	28.07	25.22	46.00	-17.93	19.75	Complied	Horizontal	214	1.24	
17	560.0023	39.57	37.25	35.36	46.00	-8.75	21.51	Complied	Horizontal	69	2.50	
18	897.9924	35.45	31.15	11.45	46.00	-14.85	24.72	Complied	Horizontal	124	1.10	
Tested by: Dieter Baldamus												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												
REFCC15B.xls Revised 10MAR03												

Radiated Emissions Measurements												
Standard:	47 CFR 15.209				PRESCAN or FINAL: Final				Date: 5/12/2008			
Device Tested:	Checkpoint - Slimline Botom Fed				Distance: 3.0m				File: 08051202 Re Prescan FCC.xls			
Firmware:	2.84											
Tx	9.0											
Chassis Mount:	Horizontal											
Measured Level												
Meas #	Freq (MHz)	Peak	Quasi-Peak	Average	Quasi-Peak Limit	Quasi-Peak °	Antenna + Cable Correction Factor (included in measured levels)	Result	Polarization	Angle (degrees)	Antenna Height (meters)	Comment
1	32.2720	35.29	29.27	23.38	40.00	-10.73	17.47	Complied	Vertical	356	1.00	
2	36.2768	36.42	33.95	32.72	40.00	-6.05	14.93	Complied	Vertical	2	1.00	
3	88.6960	39.72	35.27	30.58	43.50	-8.23	9.77	Complied	Vertical	350	1.00	
4	103.9450	46.75	41.38	34.28	43.50	-2.12	11.38	Complied	Vertical	220	1.00	
5	121.0664	39.58	32.65	11.06	43.50	-10.85	12.39	Complied	Vertical	21	1.15	
6	421.3517	48.42	42.53	12.31	46.00	-3.47	13.70	Complied	Vertical	187	1.47	
7	427.9649	36.18	39.83	8.02	46.00	-6.17	18.85	Complied	Horizontal	234	1.67	
8	444.1731	55.80	42.66	7.94	46.00	-3.34	19.14	Complied	Horizontal	356	1.64	
9	457.9203	48.50	43.00	14.77	46.00	-3.00	19.30	Complied	Horizontal	347	1.55	
10	515.5500	46.86	40.52	10.62	46.00	-5.48	19.87	Complied	Horizontal	224	1.45	
11	559.9995	32.60	28.07	25.22	46.00	-17.93	19.84	Complied	Vertical	214	1.78	
12	753.2535	39.57	37.25	35.36	46.00	-8.75	21.41	Complied	Vertical	108	1.49	
13	727.3489	35.45	31.15	11.45	46.00	-14.85	22.61	Complied	Horizontal	214	1.54	
Tested by: Dieter Baldamus												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												
REFCC15B.xls Revised 10MAR03												

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Radiated Emissions Measurements												
Standard:	47 CFR 15.209			PRESCAN or FINAL:				Final			Date:	5/12/2008
Device Tested:	Checkpoint - Slimline Botom Fed			Distance:				3.0m			File:	08051202 Re Prescan FCC.xls
Firmware:	2.84											
Tx	9.0											
Chassis Mount:	Vertical											
Measured Level												
Meas #	Freq (MHz)	Peak	Quasi-Peak	Average	Quasi-Peak Limit	Quasi-Peak °	Antenna + Cable Correction Factor (included in measured levels)	Result	Polarization	Angle (degrees)	Antenna Height (meters)	Comment
1	32.2432	37.70	32.28	26.53	40.00	-7.72	17.47	Complied	Vertical	356	1.00	
2	36.2912	38.32	34.94	33.68	40.00	-5.06	14.93	Complied	Vertical	5	1.00	
3	88.8379	46.04	41.47	36.70	43.50	-2.03	9.76	Complied	Vertical	28	1.00	
4	108.2380	44.25	37.79	11.78	43.50	-5.71	12.39	Complied	Vertical	32	1.00	
5	121.0000	43.78	35.90	13.94	43.50	-7.60	13.70	Complied	Vertical	29	1.20	
6	419.6260	49.27	43.63	13.47	46.00	-2.37	18.85	Complied	Horizontal	150	1.63	
7	428.0399	49.68	44.51	15.64	46.00	-1.49	18.98	Complied	Horizontal	154	1.70	
8	444.1399	50.43	45.18	14.81	46.00	-0.82	19.29	Complied	Horizontal	20	1.78	
9	460.3141	44.65	38.21	11.39	46.00	-7.79	19.64	Complied	Horizontal	14	1.30	
10	522.2247	48.68	43.86	14.21	46.00	-2.14	20.41	Complied	Vertical	279	1.21	
11	540.8832	50.64	44.56	15.10	46.00	-1.44	21.24	Complied	Vertical	253	1.88	
12	744.1238	43.17	29.69	11.66	46.00	-16.31	23.06	Complied	Horizontal	240	1.09	
Tested by: Dieter Baldamus												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												
REFCC15B.xlt Revised 10MAR03												

Radiated Emissions Measurements												
Standard:	47 CFR 15.209			PRESCAN or FINAL:				Final			Date:	5/12/2008
Device Tested:	Checkpoint - Slimline Botom Fed			Distance:				3.0m			File:	08051202 Re Prescan FCC.xls
Firmware:	2.84											
Tx	8.2											
Chassis Mount:	Vertical											
Measured Level												
Meas #	Freq (MHz)	Peak	Quasi-Peak	Average	Quasi-Peak Limit	Quasi-Peak °	Antenna + Cable Correction Factor (included in measured levels)	Result	Polarization	Angle (degrees)	Antenna Height (meters)	Comment
1	32.2590	36.54	31.11	26.40	40.00	-8.89	17.47	Complied	Vertical	356	1.00	
2	36.2923	37.87	35.90	32.54	40.00	-4.10	14.93	Complied	Vertical	4	1.00	
3	88.8510	45.44	40.15	36.64	43.50	-3.35	9.77	Complied	Vertical	354	1.00	
4	101.4452	43.21	36.55	12.70	43.50	-6.95	11.58	Complied	Vertical	207	1.10	
5	108.2224	42.15	37.45	14.40	43.50	-6.05	12.39	Complied	Vertical	187	1.00	
6	121.1337	45.45	40.10	13.40	43.50	-3.40	13.70	Complied	Vertical	215	1.15	
7	421.3760	47.45	43.21	14.67	46.00	-2.79	18.87	Complied	Vertical	154	1.50	
8	428.0419	47.55	44.77	14.80	46.00	-1.23	18.98	Complied	Vertical	115	1.50	
9	444.1181	47.44	45.21	11.42	46.00	-0.79	19.29	Complied	Horizontal	215	1.54	
10	460.3304	48.02	42.98	13.21	46.00	-3.02	19.64	Complied	Horizontal	284	1.67	
11	515.4955	46.55	43.97	14.78	46.00	-2.03	20.21	Complied	Vertical	290	1.30	
12	560.0082	43.45	35.44	11.45	46.00	-10.56	21.51	Complied	Horizontal	201	1.24	
13	754.84028	35.12	30.45	11.55	46.00	-15.55	23.23	Complied	Horizontal	222	1.55	
Tested by: Dieter Baldamus												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												
REFCC15B.xlt Revised 10MAR03												

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Configuration 2: (9.0 and 8.2Tx) Final <30MHz (Harmonics)

Radiated Emissions Measurements											
Standard:		47 CFR FCC Part 15.223				PRESCAN or FINAL:		Final			Date: 5/20/2008
Device Tested:		Checkpoint - Slimline Top Fed				Distance:		10m			File Name: 08052001 Fundamental Report Top Fed(FCC).xls
Mode:		9.0 Tx and 8.2 Tx Band (31Tx)									
Mount:		Horizontal									
Modifications:		Power Supply elevated 1m from Groundplane									
Harmonics											
9.0 Tx Band	Freq (MHz)	Measured Peak (dBµV/m)	Quasi-Peak	Average	Antenna + Cable Correction Factor	QuaiPeak Limit	Quasi Peak °	Result	Orientation	Comments	
7	18.0240	48.15	47.50	42.22	19.00	49.54	-2.04	Complied	X Orientation		
8	16.5560	48.15	47.40	42.74	19.00	49.54	-2.14	Complied	X Orientation		
9	18.0760	49.20	47.54	42.10	19.00	49.54	-2.00	Complied	Y Orientation		
10	16.6720	48.71	47.11	42.97	19.30	49.54	-2.43	Complied	Y Orientation		
11	18.6880	49.80	47.76	42.95	19.30	49.54	-1.78	Complied	Z Orientation		
12	16.8020	48.14	47.45	42.57	19.30	49.54	-2.09	Complied	Z Orientation		
13	27.0360	49.50	47.78	42.57	19.30	49.54	-1.76	Complied	X Orientation		
14	24.8340	49.45	47.45	42.77	19.30	49.54	-2.09	Complied	X Orientation		
15	27.1140	49.57	47.68	42.78	19.30	49.54	-1.86	Complied	Y Orientation		
16	25.0080	49.55	47.47	42.55	19.30	49.54	-2.07	Complied	Y Orientation		
17	28.0320	49.44	47.88	42.57	19.30	49.54	-1.66	Complied	Z Orientation		
18	25.2030	48.15	46.98	42.57	19.30	49.54	-2.56	Complied	Z Orientation		
8.2 Tx Band											
19	16.1260	48.66	46.13	42.41	19.30	49.54	-3.41	Complied	X Orientation		
20	16.9200	48.77	46.78	42.55	19.30	49.54	-2.76	Complied	Y Orientation		
21	16.6460	48.57	46.22	42.78	19.30	49.54	-3.32	Complied	Z Orientation		
22	24.1890	48.57	46.78	42.57	19.30	49.54	-2.76	Complied	X Orientation		
23	25.3800	49.05	46.78	42.97	19.30	49.54	-2.76	Complied	Y Orientation		
24	24.9690	49.44	46.78	42.11	19.30	49.54	-2.76	Complied	Z Orientation		
Tested by:		Dieter Baldamus									
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009											

Radiated Emissions Measurements											
Standard:		47 CFR FCC Part 15.223				PRESCAN or FINAL:		Final			Date: 5/20/2008
Device Tested:		Checkpoint - Slimline Top Fed				Distance:		10m			File Name: 08052001 Fundamental Report Top Fed(FCC).xls
Mode:		9.0 Tx and 8.2 Tx Band (31Tx)									
Mount:		Vertical									
Modifications:		Power Supply elevated 1m from Groundplane									
Harmonics											
9.0 Tx Band	Freq (MHz)	Measured Peak (dBµV/m)	Quasi-Peak	Average	Antenna + Cable Correction Factor	QuaiPeak Limit	Quasi Peak °	Result	Orientation	Comments	
7	18.6880	48.50	47.87	42.50	19.00	49.54	-1.67	Complied	X Orientation		
8	16.6200	48.45	46.54	42.50	19.00	49.54	-3.00	Complied	X Orientation		
9	18.0480	49.05	47.55	42.20	19.00	49.54	-1.99	Complied	Y Orientation		
10	16.7640	49.00	47.54	42.15	19.30	49.54	-2.00	Complied	Y Orientation		
11	18.5640	49.02	47.64	42.56	19.30	49.54	-1.90	Complied	Z Orientation		
12	16.7120	48.77	47.45	42.78	19.30	49.54	-2.09	Complied	Z Orientation		
13	28.0320	48.15	47.44	42.77	19.30	49.54	-2.10	Complied	X Orientation		
14	24.9300	48.15	47.44	42.78	19.30	49.54	-2.10	Complied	X Orientation		
15	27.0720	48.59	47.47	42.97	19.30	49.54	-2.07	Complied	Y Orientation		
16	25.1460	49.78	47.40	42.88	19.30	49.54	-2.14	Complied	Y Orientation		
17	27.8460	49.77	47.45	42.78	19.30	49.54	-2.09	Complied	Z Orientation		
18	25.0680	49.98	46.98	42.97	19.30	49.54	-2.56	Complied	Z Orientation		
8.2 Tx Band											
19	16.9460	49.45			19.30	49.54	-49.54	Complied	X Orientation		
20	16.9460	49.54	47.87	42.15	19.30	49.54	-1.67	Complied	Y Orientation		
21	16.9460	49.88	47.22	42.54	19.30	49.54	-2.32	Complied	Z Orientation		
22	25.4190	49.56	47.21	42.58	19.30	49.54	-2.33	Complied	X Orientation		
23	25.4190	49.78	47.64	42.45	19.30	49.54	-1.90	Complied	Y Orientation		
24	25.4190	49.87	46.66	42.11	19.30	49.54	-2.88	Complied	Z Orientation		
Tested by:		Dieter Baldamus									
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009											

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Configuration 1: Final >30MHz (Harmonics)

Radiated Emissions Measurements													
Standard:	47 CFR 15.209				PRESCAN or FINAL:				final			Date:	5/12/2008
Device Tested:	Checkpoint - Slimline Top Fed				Distance:				3.0m			File:	08051202 Re Prescan FCC.xls
Firmware:	2.84												
Tx	8.2												
Chassis Mount:	Horizontal												
Modification:	Sync cable with ferrites on each side with 3 turns												
Measured Level													
Meas #	Freq (MHz)	Peak	Quasi-Peak	Average	Quasi-Peak Limit	Quasi-Peak N	Antenna + Cable Correction Factor (included in measured levels)	Result	Polarization	Angle (degrees)	Antenna Height (meters)	Comment	
1	33.7153	39.94	26.92	20.00	40.00	-13.08	16.52	Complied	Vertical	356	1.00		
2	36.2759	39.51	37.41	36.40	40.00	-2.59	14.94	Complied	Vertical	282	1.00		
3	88.8000	40.91	37.21	31.30	43.50	-6.29	9.76	Complied	Vertical	180	1.20		
4	109.9450	36.02	28.94	20.65	43.50	-14.56	12.59	Complied	Vertical	251	1.10		
5	128.0813	39.48	19.11	26.04	43.50	-24.39	13.12	Complied	Vertical	14	1.16		
6	389.0000	23.77	17.26	9.53	46.00	-28.74	18.01	Complied	Vertical	265	1.09		
7	437.0000	25.42	16.69	9.90	46.00	-29.31	19.16	Complied	Vertical	164	1.24		
8	461.0000	30.05	25.07	16.72	46.00	-20.93	19.66	Complied	Vertical	145	1.24		
9	515.0001	42.65	35.81	13.00	46.00	-10.19	20.19	Complied	Horizontal	263	1.64		
10	560.0025	47.47	45.78	42.86	46.00	-0.22	21.51	Complied	Horizontal	274	1.22		
Tested by: Dieter Baldamus													
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009 REFC15B.xls Revised 10MAR03													

Radiated Emissions Measurements													
Standard:	47 CFR 15.209				PRESCAN or FINAL:				Final			Date:	5/12/2008
Device Tested:	Checkpoint - Slimline Top Fed				Distance:				3.0m			File:	08051202 Re Prescan FCC.xls
Firmware:	2.84												
Tx	9.0												
Chassis Mount:	Horizontal												
Modification:	Sync cable with ferrites on each side with 3 turns												
Measured Level													
Meas #	Freq (MHz)	Peak	Quasi-Peak	Average	Quasi-Peak Limit	Quasi-Peak N	Antenna + Cable Correction Factor (included in measured levels)	Result	Polarization	Angle (degrees)	Antenna Height (meters)	Comment	
1	36.2880	34.64	31.43	28.76	40.00	-8.57	14.93	Complied	Vertical	354	1.00		
2	389.5352	32.32	28.81	11.58	46.00	-17.19	18.04	Complied	Horizontal	345	1.00		
3	428.0330	42.65	36.88	11.54	46.00	-9.12	19.16	Complied	Horizontal	89	1.20		
4	437.2535	42.12	39.93	11.80	46.00	-6.07	20.85	Complied	Horizontal	124	1.20		
5	471.9353	41.86	38.50	12.03	46.00	-7.50	21.51	Complied	Horizontal	45	1.25		
6	526.4244	51.80	42.30	13.25	46.00	-3.70	22.51	Complied	Vertical	55	1.24		
7	532.3832	44.28	43.43	13.43	46.00	-2.57	18.98	Complied	Vertical	157	1.16		
8	540.8624	52.32	44.79	16.89	46.00	-1.21	19.90	Complied	Vertical	124	1.60		
9	559.5007	35.94	27.54	11.03	46.00	-18.46	20.56	Complied	Horizontal	67	1.45		
10	560.0071	34.23	31.19	28.91	46.00	-14.81	21.24	Complied	Horizontal	59	1.33		
11	720.0115	27.15	20.36	13.63	46.00	-25.64	21.52	Complied	Horizontal	109	1.10		
Tested by: Dieter Baldamus													
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009 REFC15B.xls Revised 10MAR03													

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Radiated Emissions Measurements													
Standard:	47 CFR 15.209			PRESCAN or FINAL:				Final			Date:	5/12/2008	
Device Tested:	Checkpoint - Slimline Top Fed							Distance:	3.0m			File:	08051202 Re Prescan FCC.xls
Firmware:	2.84												
Tx	9.0												
Chassis Mount:	Vertical												
Modification:	Sync cable with ferrites on each side with 3 turns												
Measured Level													
Meas #	Freq (MHz)	Peak	Quasi-Peak	Average	Quasi-Peak Limit	Quasi-Peak N	Antenna + Cable Correction Factor (included in measured levels)	Result	Polarization	Angle (degrees)	Antenna Height (meters)	Comment	
1	32.2850	36.53	33.26	31.36	40.00	-6.74	17.45	Complied	Vertical	354	1.00		
2	36.2843	39.79	33.95	27.32	40.00	-6.05	14.93	Complied	Vertical	344	1.00		
3	88.8728	42.87	37.63	35.51	43.50	-5.87	9.77	Complied	Vertical	254	1.00		
4	96.9204	45.38	37.34	26.66	43.50	-6.16	10.94	Complied	Vertical	68	1.00		
5	121.0810	45.51	38.99	13.39	43.50	-4.51	13.70	Complied	Vertical	77	1.12		
6	411.8376	46.53	40.40	10.58	46.00	-5.60	18.73	Complied	Horizontal	69	1.20		
7	457.9466	43.96	37.23	11.04	46.00	-8.77	19.59	Complied	Horizontal	154	1.64		
8	503.6153	50.83	44.70	14.72	46.00	-1.30	19.84	Complied	Horizontal	122	1.44		
9	503.6355	50.79	44.78	14.65	46.00	-1.22	19.84	Complied	Horizontal	124	1.78		
10	540.8666	51.54	45.16	14.38	46.00	-0.84	21.24	Complied	Horizontal	109	1.20		
11	720.0196	35.23	32.34	27.80	46.00	-13.66	22.51	Complied	Horizontal	114	1.44		
12	783.3275	29.46	20.43	13.20	46.00	-25.57	23.35	Complied	Horizontal	147	1.78		
Tested by: Dieter Baldamus													
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009													
REFCC15B.xls Revised 10MAR03													

Radiated Emissions Measurements													
Standard:	47 CFR 15.209			PRESCAN or FINAL:				Final			Date:	5/12/2008	
Device Tested:	Checkpoint - Slimline Top Fed							Distance:	3.0m			File:	08051202 Re Prescan FCC.xls
Firmware:	2.84												
Tx	8.2												
Chassis Mount:	Vertical												
Modification:	Sync cable with ferrites on each side with 3 turns												
Measured Level													
Meas #	Freq (MHz)	Peak	Quasi-Peak	Average	Quasi-Peak Limit	Quasi-Peak N	Antenna + Cable Correction Factor (included in measured levels)	Result	Polarization	Angle (degrees)	Antenna Height (meters)	Comment	
1	33.7153	30.95	24.71	17.53	40.00	-15.29	16.52	Complied	Vertical	354	1.00		
2	36.2759	37.08	34.30	32.92	40.00	-5.70	14.94	Complied	Vertical	36	1.00		
3	88.8000	48.33	40.50	33.15	43.50	-3.00	9.76	Complied	Vertical	354	1.00		
4	121.1373	40.68	29.91	13.62	43.50	-13.59	13.70	Complied	Vertical	55	1.24		
5	152.9268	27.77	21.83	14.25	43.50	-21.67	11.86	Complied	Vertical	154	1.16		
6	411.2364	30.02	23.05	9.00	46.00	-22.95	18.72	Complied	Horizontal	69	1.67		
7	444.1847	28.10	21.56	8.72	46.00	-24.44	19.30	Complied	Horizontal	55	1.20		
8	498.5191	48.97	42.40	13.05	46.00	-3.60	19.74	Complied	Horizontal	57	1.54		
9	500.6845	46.02	39.34	12.92	46.00	-6.66	19.75	Complied	Horizontal	157	1.55		
10	541.1278	49.42	45.84	18.45	46.00	-0.16	21.26	Complied	Horizontal	154	1.87		
11	560.0080	42.77	41.73	36.97	46.00	-4.27	21.51	Complied	Horizontal	111	1.62		
Tested by: Dieter Baldamus													
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009													
REFCC15B.xls Revised 10MAR03													

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4.3.6 Operation in Restricted Bands

The EUT is a digital swept frequency hopping transmitter. The EUT hops on discrete frequencies. The discrete frequencies that can be transmitted by the EUT are as follows:

Original Emerald frequency tables

/* Center frequency 8.2MHz +/- 410KHz */

Value CT_8200_300[] = {8610, 8555, 8500, 8446, 8391, 8337, 8282, 8227, 8173, 8118, 8063, 8009, 7954, 7899, 7845, 7790};

/* Center frequency 8.6MHz +/- 430KHz */

Value CT_8600_300[] = {9030, 8973, 8915, 8858, 8801, 8743, 8686, 8629, 8571, 8514, 8457, 8399, 8342, 8285, 8227, 8170};

/* Center frequency 9.0MHz +/- 450KHz */

Value CT_9000_300[] = {9450, 9390, 9330, 9270, 9210, 9150, 9090, 9030, 8970, 8910, 8850, 8790, 8730, 8670, 8610, 8550};

/* Center frequency 9.2MHz +/- 460KHz */

Value CT_9200_300[] = {9660, 9599, 9537, 9476, 9415, 9353, 9292, 9231, 9169, 9108, 9047, 8985, 8924, 8863, 8801, 8740}; /* Center frequency 9.5MHz +/- 480KHz */ Value CT_9500_300[] = {9980, 9916, 9852, 9788, 9724, 9660, 9596, 9532, 9468, 9404, 9340, 9276, 9212, 9148, 9084, 9020};

/* Mult tag with bins 0-7 center frequency 9.2MHz and bins 8-16 center frequency 8.2MHz each range +/- 300KHz */

Value CTMult_9200_8200_300[] = {9500, 9404, 9329, 9243, 9157, 9071, 8986, 8900, 8500, 8414, 8329, 8243, 8157, 8071, 7986, 7900}; Skinny Pulse frequency tables.....

/* This table is used for mult band (8.2/9.2) skinny pulse, using PW of 4us JRG_SP */

Value CTMult_sp[] = {9325, 9325, 9325, 9325, 9075, 9075, 9075, 9075, 8325, 8325, 8325, 8325, 8075, 8075, 8075, 8075};

/* This table is used for 8.2 band skinny pulse, using PW of 4us JRG_SP */ Value CT_8200_sp[] = {8450, 8450, 8450, 8450, 8325, 8325, 8325, 8325, 8075, 8075, 8075, 8075, 7950, 7950, 7950, 7950};

The restricted frequency bands (per FCC Part 15 Clause 15.205) in the operating frequency band of the EUT are as follows:

8.291 – 8.294 MHz

8.362 – 8.366 MHz

8.37625 – 8.38675 MHz

8.41425 – 8.41475 MHz

The transmitter is not capable of hopping into, or operating, in the restricted frequency bands and therefore complies with the restriction.

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4.3.7 Photos

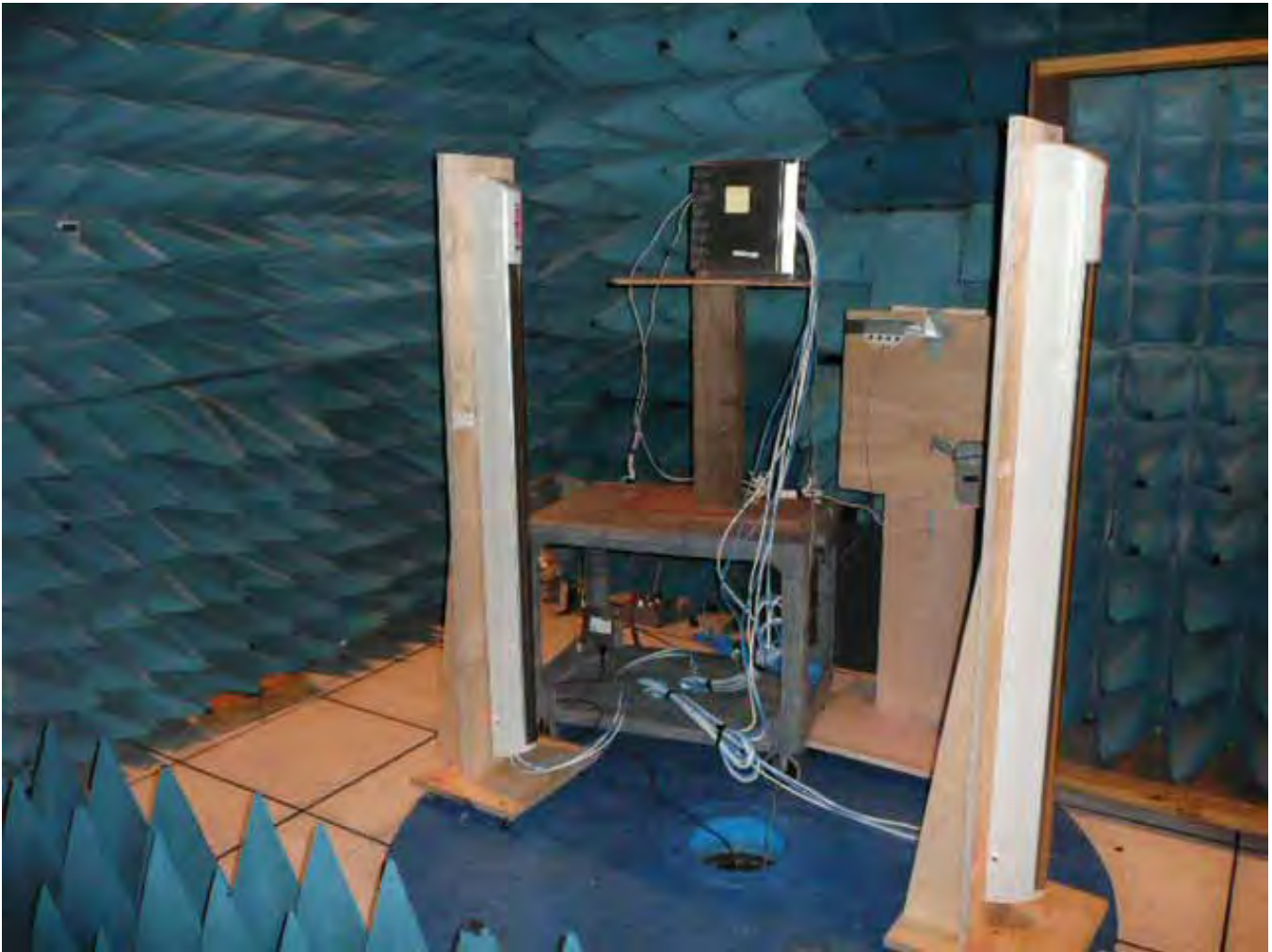


Figure 16 – Radiated Emissions Pre-scan Test Set-Up. Configuration 1

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Figure 17 - Radiated Emissions (3m OATS) Test Setup. Configuration 1

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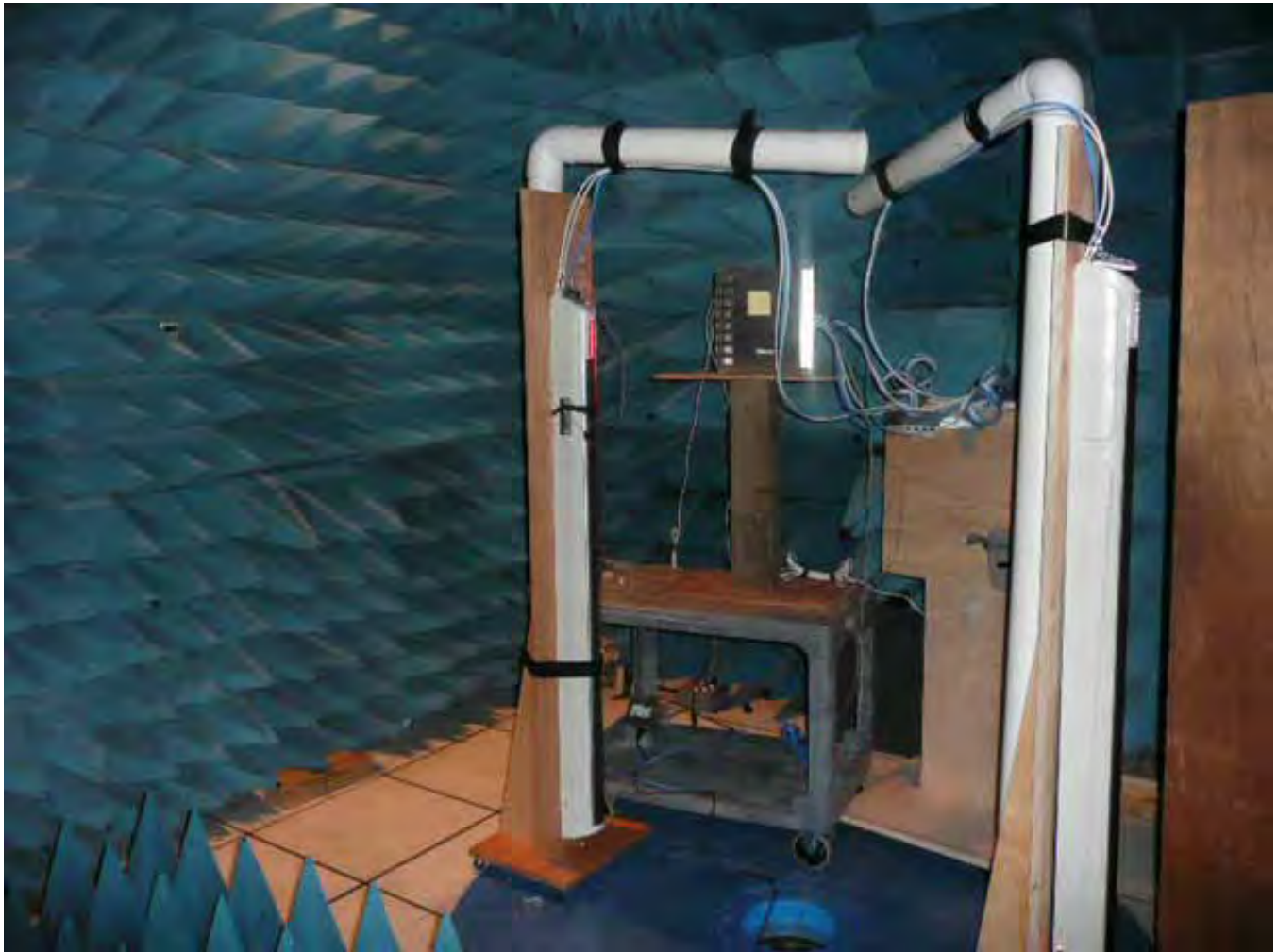


Figure 18 – Radiated Emissions Pre-scan Test Set-Up. Configuration 2

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Figure 19 - Radiated Emissions (3m OATS) Test Setup. Configuration 2

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4.4 Emissions Bandwidth

This test measures the emission bandwidth of the fundamental frequency generated by the EUT that may be outside the allowed transmission frequency

4.4.1 Test Over View

Results	Complies (as tested per this report)			Date	02/29/2008		
Standard	FCC Part 15 Subpart 15.215 and RSS-210						
Product Model	Slimline (Top Fed and Bottom Fed)		Serial#	7365919CiU01148002, 7365919CiU01228006, 7365919CiU01228010, 7365919CiU01148004			
Configuration	See test plan for details						
Test Set-up	Tested on a 10m O.A.T.S. placed on turn-table, see test plans for details						
EUT Powered By	120V/60Hz	Temp	22° C	Humidity	45%	Pressure	1004mbar
Frequency Range	8.2MHz and 9.0MHz Band						
Perf. Criteria	Within Frequency Range		Perf. Verification	Readings under Limit			
Mod to EUT	None		Test Performed By	Dieter Baldamus			

4.4.2 Test Procedure

The emissions of the fundamental was measured with a loop antenna in 3 orthogonal orientation. The measurement of the bandwidth was done at -6db and -20dB on each side of the fundamental frequency. The test method includes signal maximizations of EUT configuration, by turning the turntable 360degrees and recording the highest emissions. The photos included with the report show the EUT in its maximized configuration.

4.4.3 Deviations

There were no deviations from the test methodology listed in the test plan for the Bandwidth Emissions test.

4.4.4 Final Test

All final radiated emissions measurements were below (in compliance) the limits.

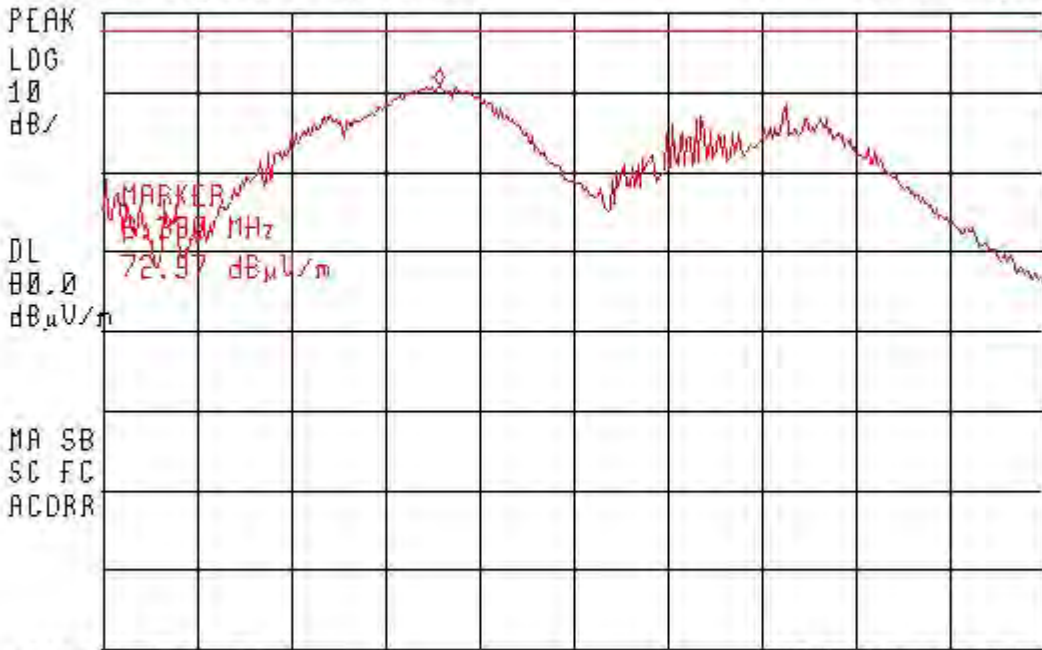
The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. This report must not be used by the applicant to claim product endorsement by TÜV Rheinland, NVLAP or any agency of the United States Government.

4.4.5 Final Measurement Data

NOTES:

Emission Bandwidth
9.0Tx Band Configuration 2
Z Orientation /Horizontal Mount

09:32:11 MAY 20, 2008 Z ORIENTATION TX(31)
CHECKPOINT MODEL SLIMLINE TDP FED TX 9.01KR 8.330 MHz
REF 82.0 dB μ V/m #AT 0 dB 72.97 dB μ V/m



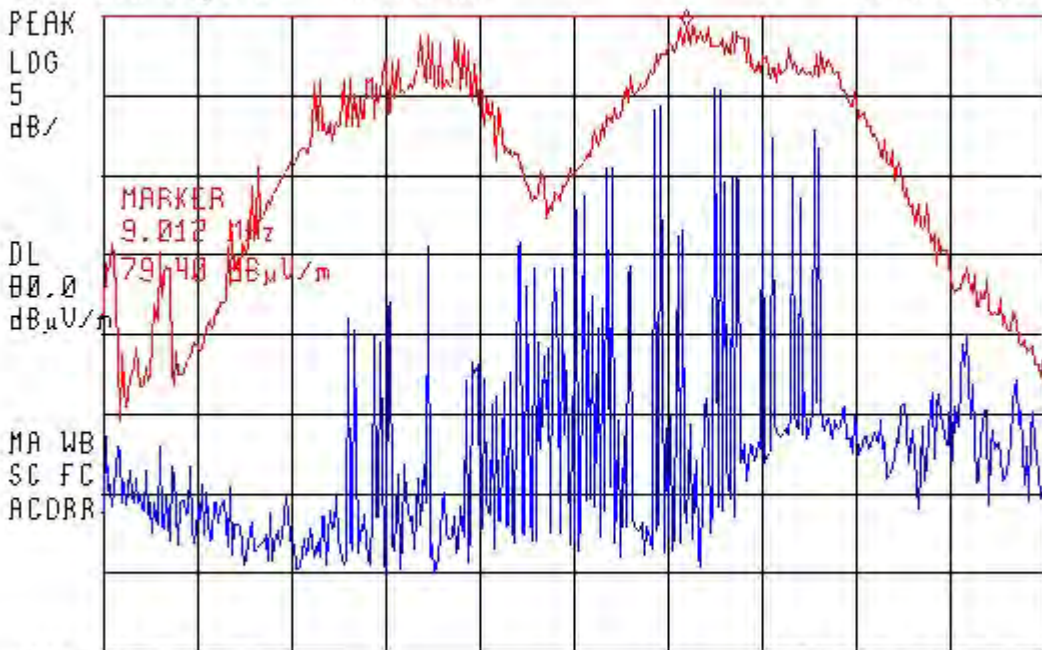
START 7.400 MHz STOP 10.000 MHz
#RES BW 300 kHz VBW 300 kHz SWP 20.0 msec

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NOTES:

Emission Bandwidth
9.0Tx Band Configuration 2
X-Orientation/Horizontal Mount

10:31:00 MAY 20, 2008 X ORIENTATION TX(31)
CHECKPOINT MODEL SLIMLINE TDP FED TX 9.01KR 9.012 MHz
REF 80.0 dB μ V/m AT 10 dB 79.40 dB μ V/m



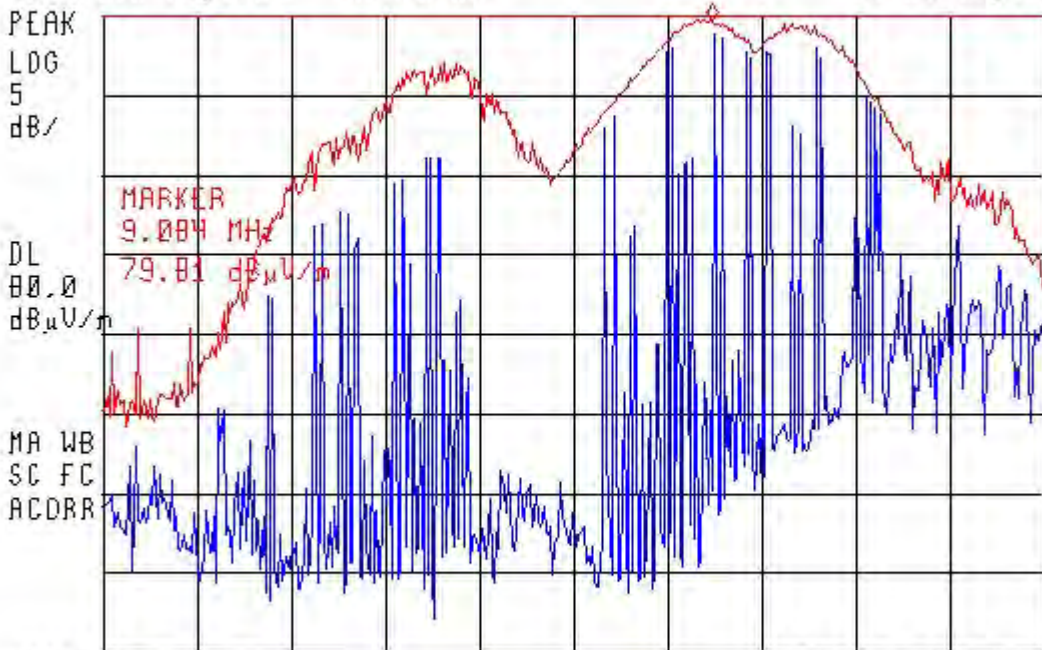
START 7.400 MHz STOP 10.000 MHz
#RES BW 300 kHz #VBW 300 kHz SWP 20.0 msec

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NOTES:

Emission Bandwidth
9.0Tx Band Configuration 2
Y-Orientation/Horizontal Mount

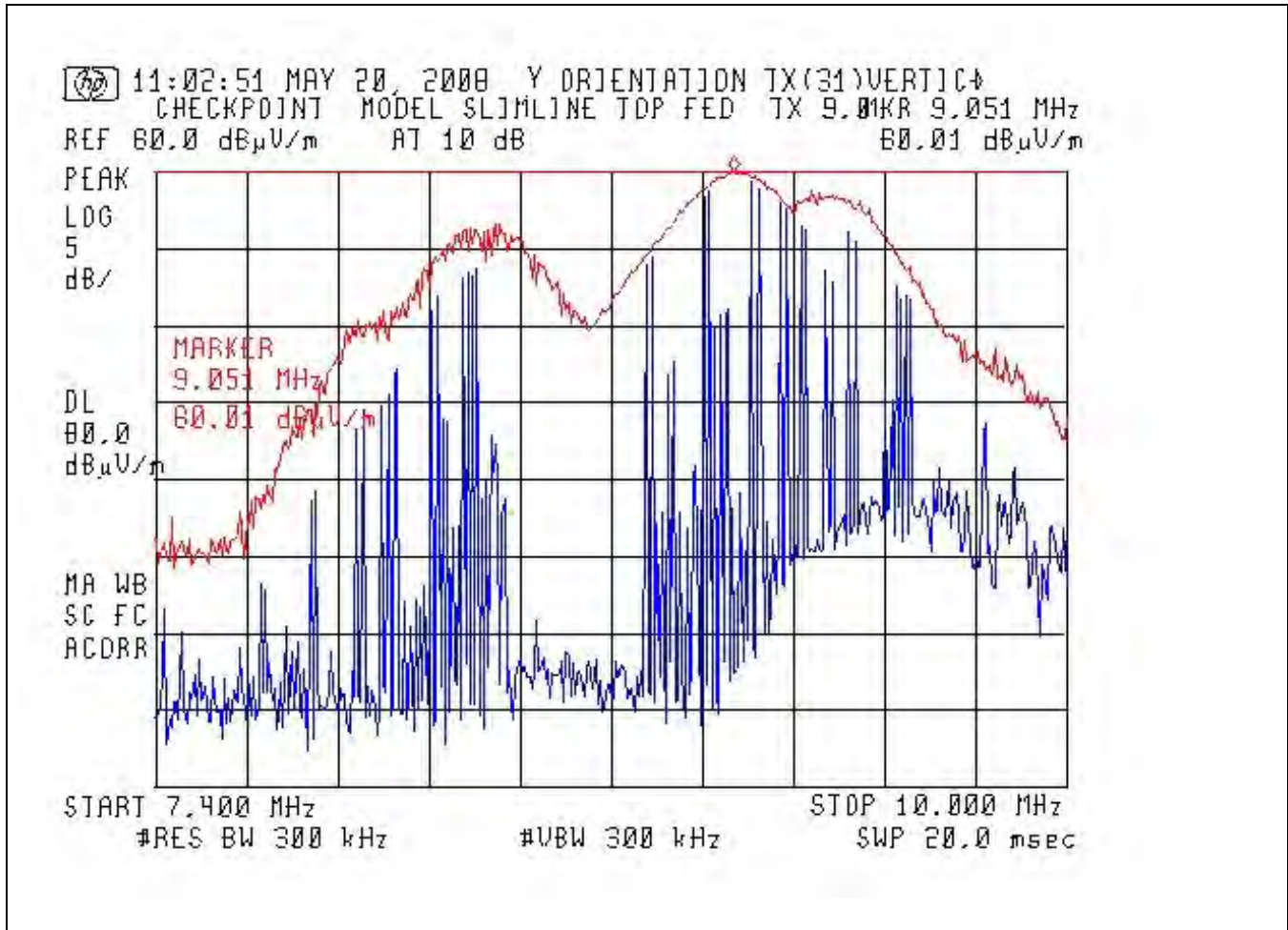
10:37:15 MAY 20, 2008 Y ORIENTATION TX(31)
CHECKPOINT MODEL SLIMLINE TDP FED TX 9.01KR 9.064 MHz
REF 60.0 dB μ V/m AT 10 dB 79.81 dB μ V/m



START 7.400 MHz #RES BW 300 kHz #VBW 300 kHz SWP 20.0 msec
STOP 10.000 MHz

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NOTES:
**Emission Bandwidth
9.0Tx Band Configuration 2
Y-Orientation/Vertical Mount**

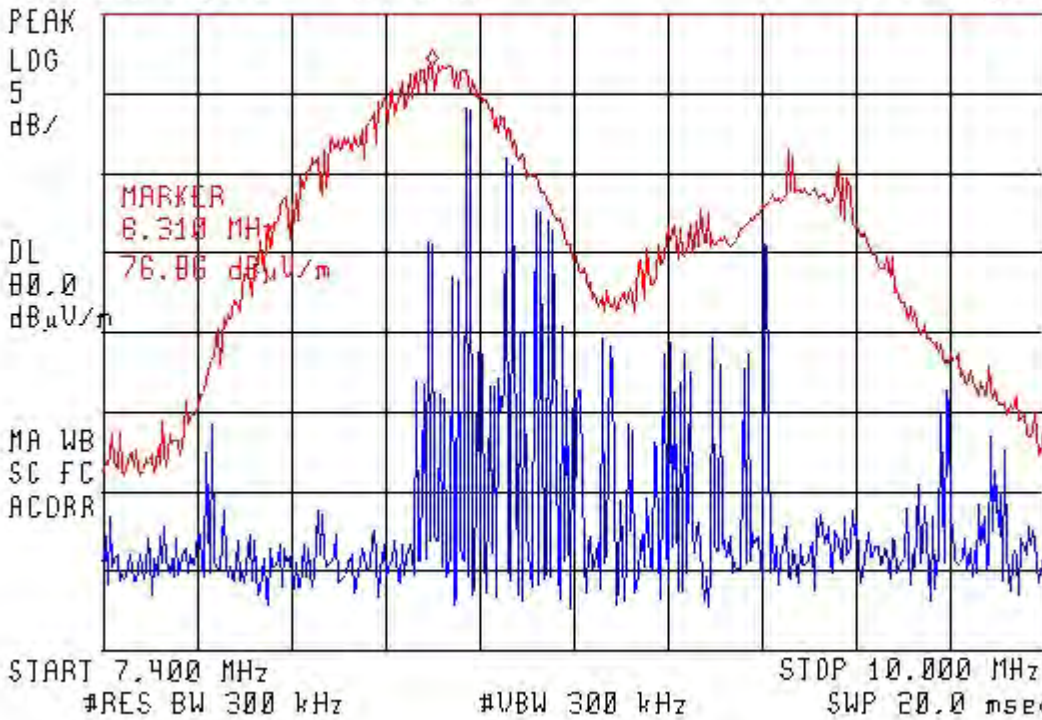


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NOTES:

**Emission Bandwidth
9.0Tx Band Configuration 2
Z-Orientation/Vertical Mount**

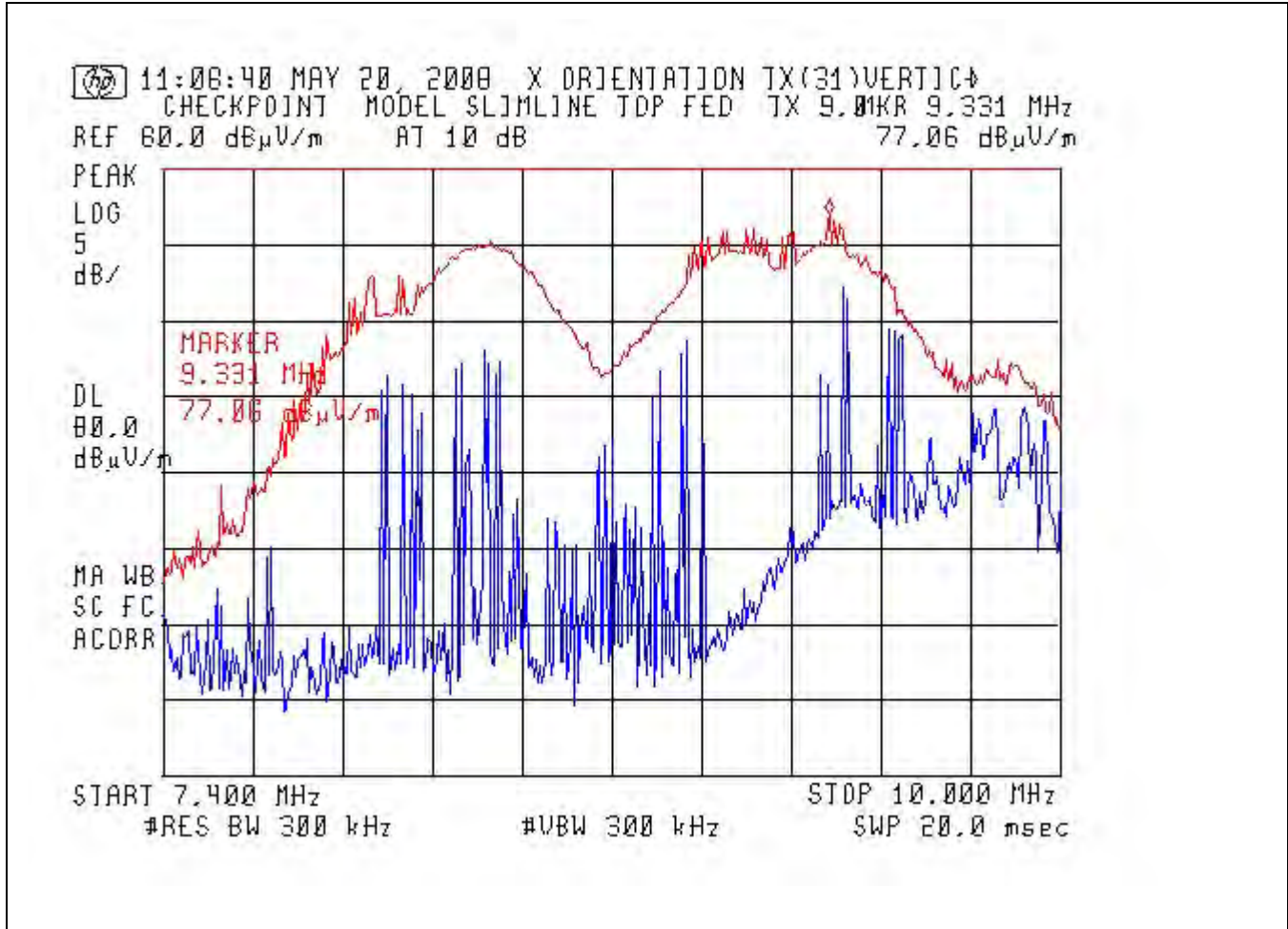
11:06:16 MAY 20, 2008 ZX ORIENTATION TX(31)VERT14
CHECKPOINT MODEL SLIMLINE TDP FED TX 9.01KR 8.310 MHz
REF 80.0 dB μ V/m AT 10 dB 76.86 dB μ V/m



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NOTES:

**Emission Bandwidth
9.07Tx Band Configuration 2
X-Orientation/Vertical Mount**

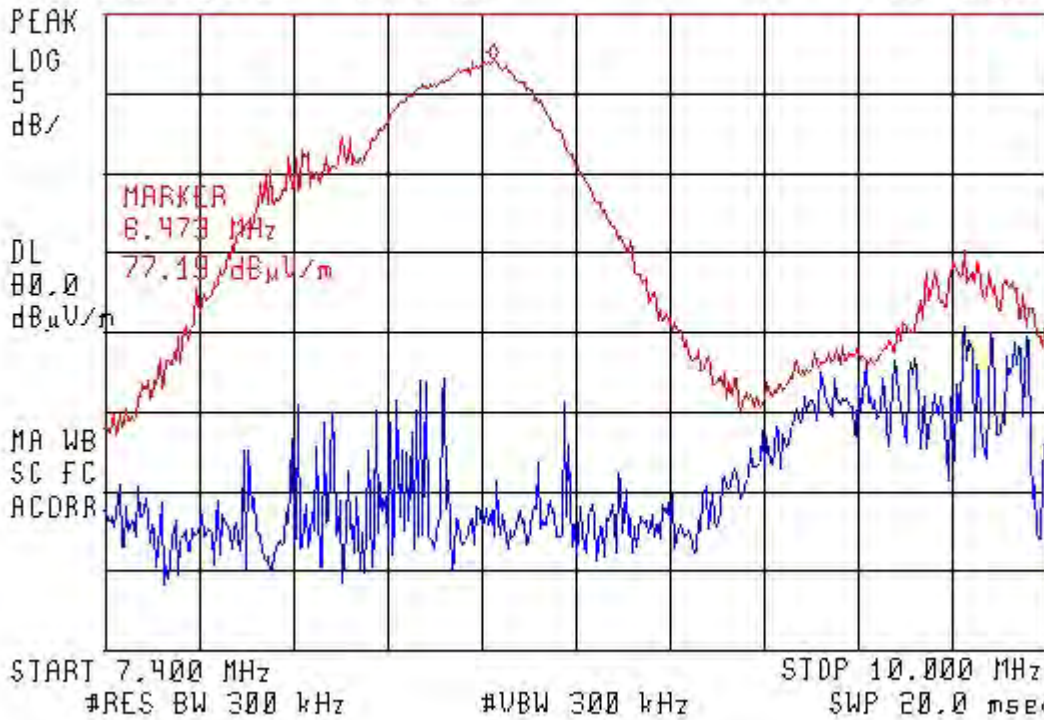


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NOTES:

**Emission Bandwidth
8.2Tx Band Configuration 2
X-Orientation/Vertical Mount**

12:41:24 MAY 20, 2008 X ORIENTATION TX(31)VERTICAL
CHECKPOINT MODEL SLIMLINE TDP FED TX B.21KR 8.473 MHz
REF 80.0 dB μ V/m AT 10 dB 77.19 dB μ V/m

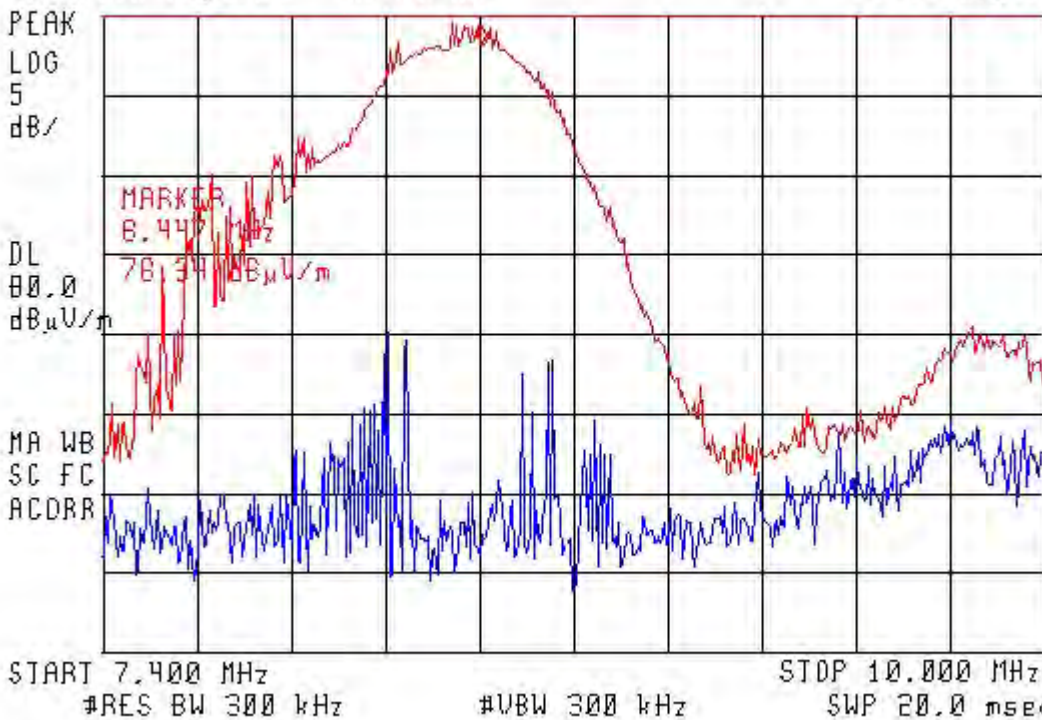


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NOTES:

**Emission Bandwidth
8.2Tx Band Configuration 2
Z-Orientation/Vertical Mount**

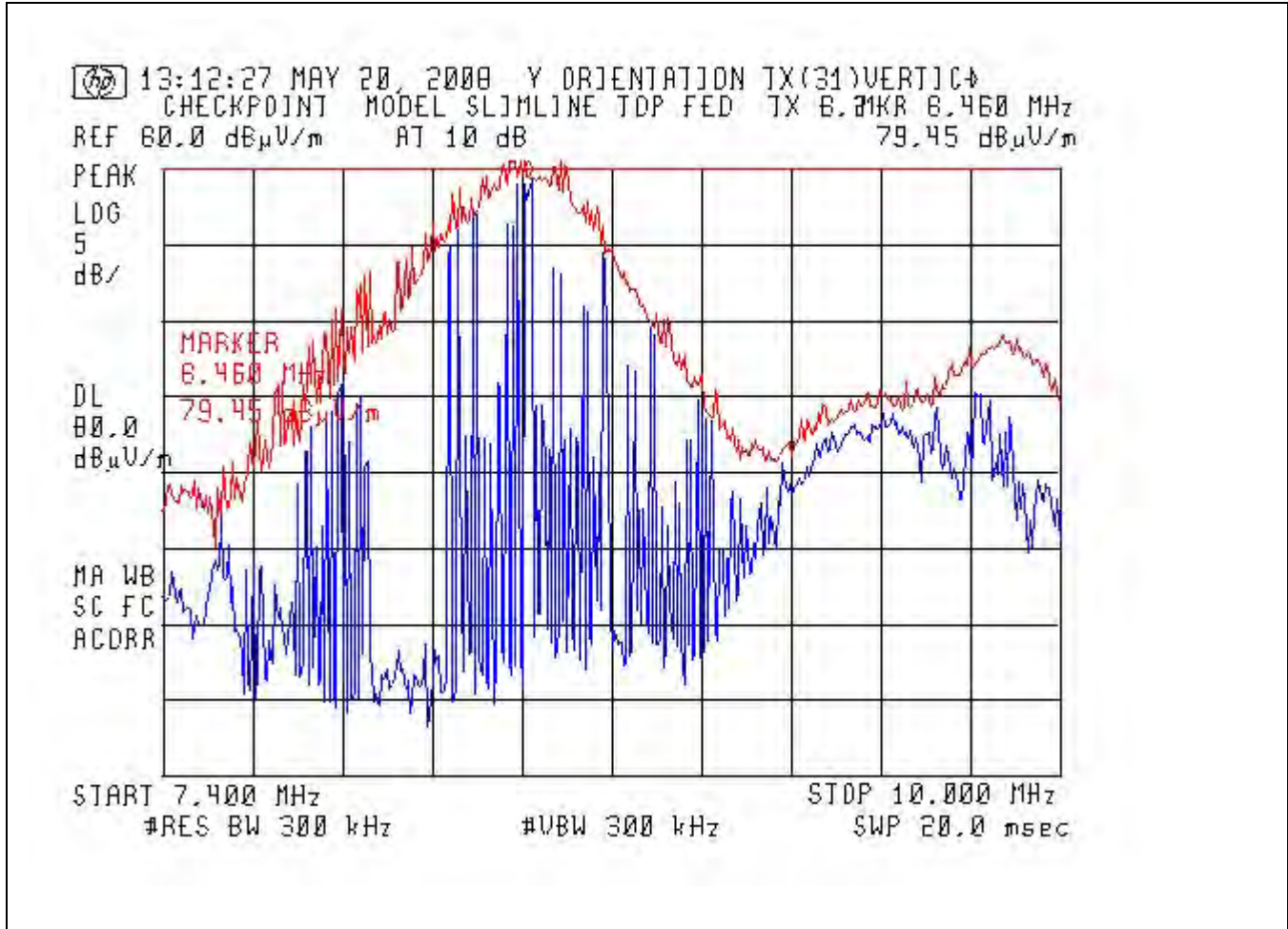
12:59:38 MAY 20, 2008 Z ORIENTATION TX(31)VERTIC4
CHECKPOINT MODEL SLIMLINE TDP FED TX B.21KR 8.447 MHz
REF 80.0 dB μ V/m AT 10 dB 78.34 dB μ V/m



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NOTES:

**Emission Bandwidth
8.2Tx Band Configuration 2
Y-Orientation/Vertical Mount**

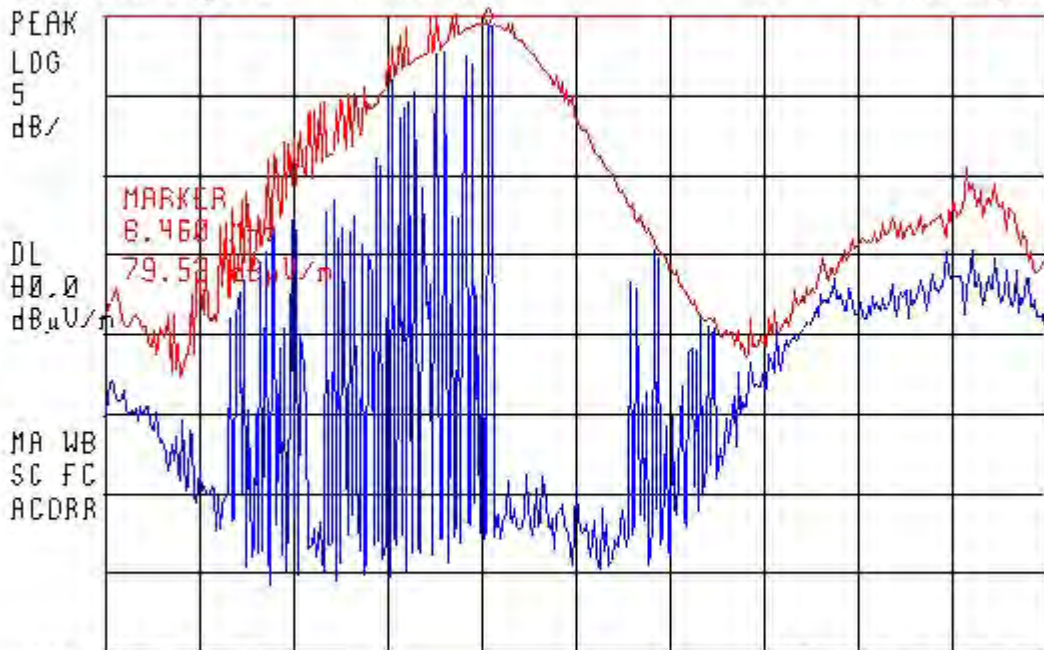


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NOTES:

**Emission Bandwidth
8.2Tx Band Configuration 2
Y-Orientation/Horizontal Mount**

13:15:12 MAY 20, 2008 ANTATION TX(31) HORIZONTAL
CHECKPOINT MODEL SLIMLINE TDP FED TX B. 8.460 MHz
REF 80.0 dB μ V/m AT 10 dB 79.52 dB μ V/m



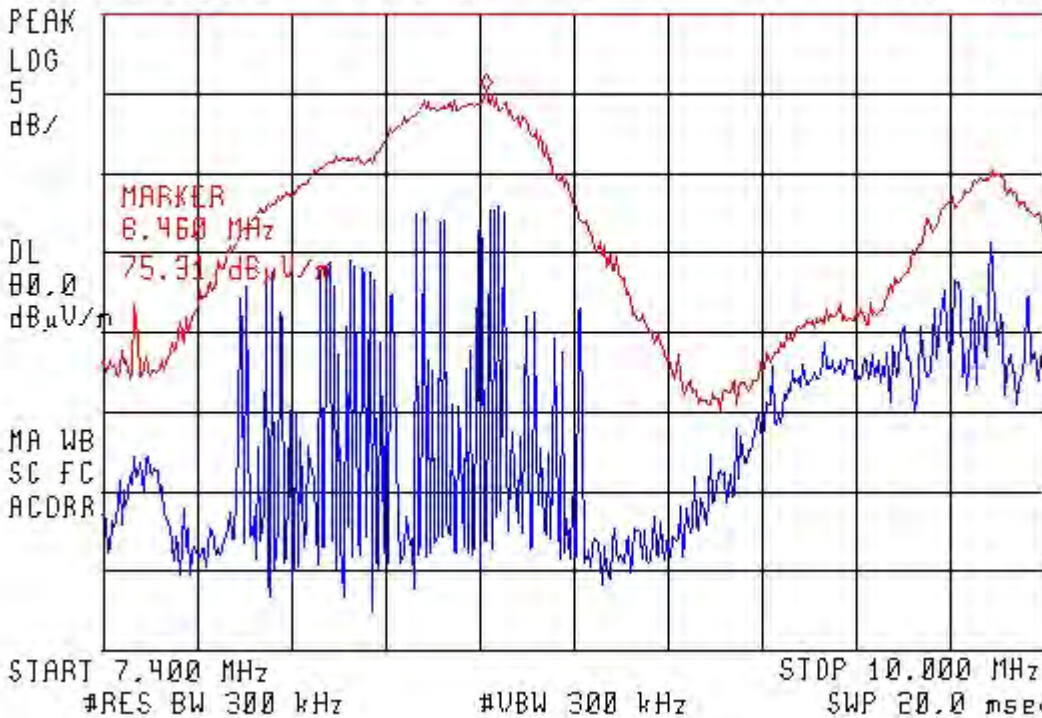
START 7.400 MHz STOP 10.000 MHz
#RES BW 300 kHz #VBW 300 kHz SWP 20.0 msec

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NOTES:

**Emission Bandwidth
8.2Tx Band Configuration 2
Z-Orientation/Horizontal Mount**

13:24:47 MAY 20, 2008 Z ORIENTATION TX(31) HPR014
CHECKPOINT MODEL SLIMLINE TDP FED TX B.01KR 8.460 MHz
REF 60.0 dB μ V/m AT 10 dB 75.31 dB μ V/m



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Band Edge Measurement									
Standard:	47 CFR FCC Part 15.215 /RSS-210				PRESCAN or FINAL:	Final	Date:	6/5/2008	
Device Tested:	Checkpoint - Slimline				Distance:	10m	File:	08060504 Bandedge.xls	
Measured Level									
Meas #	TX Band	-6dB Low End (MHz)	-6dB High End (MHz)	Measured Bandwidth (MHz)	-20dB Low End (MHz)	-20dB High End (MHz)	Measured Bandwidth (MHz)	Orientation (X,Y,Z)	Comment
RBW = 300kHz VBW=300kHz (FCC Settings)									
Slimline Bottom Fed/Horizontal Mount									
1	8.2&9.0	8.17	9.65	1.48	7.69	9.89	2.20	X Orientation	
2	8.2&9.0	8.24	9.64	1.40	7.64	9.87	2.23	X Orientation	
3	8.2&9.0	8.22	9.56	1.34	7.65	9.88	2.23	Y Orientation	
Slimline Bottom Fed/Vertical Mount									
4	8.2&9.0	8.26	9.49	1.23	7.54	9.90	2.36	Y Orientation	
5	8.2&9.0	8.45	9.60	1.15	7.64	9.85	2.21	Z Orientation	
6	8.2&9.0	8.19	9.61	1.42	7.69	9.88	2.19	Z Orientation	
Slimline Bottom Fed/Horizontal Mount									
7	8.20	8.11	8.67	0.56	7.54	8.98	1.44	X Orientation	
8	8.20	8.11	8.65	0.54	7.67	8.80	1.13	X Orientation	
9	8.20	8.14	8.65	0.51	7.69	8.76	1.07	Y Orientation	
Slimline Bottom Fed/Vertical Mount									
10	8.20	8.05	8.67	0.62	7.61	8.90	1.29	Y Orientation	
11	8.20	8.17	8.77	0.60	7.64	8.87	1.23	Z Orientation	
12	8.20	8.11	8.65	0.55	7.67	8.84	1.17	Z Orientation	
Slimline Top Fed/Horizontal Mount									
13	8.2&9.0	8.22	9.67	1.45	7.69	9.90	2.21	X Orientation	
14	8.2&9.0	8.21	9.63	1.42	7.64	9.81	2.17	X Orientation	
15	8.2&9.0	8.26	9.58	1.32	7.65	9.91	2.26	Y Orientation	
Slimline Top Fed/Vertical Mount									
16	8.2&9.0	8.22	9.57	1.35	7.68	9.96	2.28	Y Orientation	
17	8.2&9.0	8.36	9.64	1.28	7.74	9.89	2.15	Z Orientation	
18	8.2&9.0	8.32	9.48	1.16	7.65	9.95	2.30	Z Orientation	
Slimline Top Fed/Horizontal Mount									
19	8.20	8.24	8.71	0.47	7.61	8.99	1.38	X Orientation	
20	8.20	8.16	8.61	0.45	7.65	8.95	1.30	X Orientation	
21	8.20	8.23	8.65	0.42	7.71	8.96	1.25	Y Orientation	
Slimline Top Fed/Vertical Mount									
22	8.20	8.15	8.65	0.50	7.65	8.78	1.13	Y Orientation	
23	8.20	8.05	8.62	0.57	7.62	8.89	1.27	Z Orientation	
24	8.20	8.04	8.71	0.67	7.68	8.85	1.17	Z Orientation	
Tested by: Dieter Baldamus									

TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009

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