CORINEX COMMUNICATIONS CORP.
IN-SITU TEST REPORT

FOR THE

CORINEX BPL ACCESS GATEWAY

FCC PART 15, SUBPART G
SECTIONS 15.209 AND 15.109 CLASS A

COMPLIANCE

VOLUME 1: SUMMARY

DATE OF ISSUE: MAY 19, 2006

PREPARED FOR:

Corinex Communications Corp.
789 West Pender Street, Suite 670
Vancouver BC V6C 1H2 Canada

P.O. No.: 2006/SS/0018
W.O. No.: 84818

PREPARED BY:

Joyce Walker & Mary Ellen Clayton
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Date of test: March 16 - May 2, 2006

Report No.: FC06-025 Volume 1 of 9

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	March 16 - May 2, 2006
DATE OF RECEIPT:	March 16, 2006
FREQUENCY RANGE TESTED:	2 MHz-1000 MHz
MANUFACTURER:	Corinex Communications Corp. 789 West Pender Street, Suite 670 Vancouver BC V6C 1H2 Canada
REPRESENTATIVE:	Brian Donnelly
TEST LOCATION:	6 different sites in Houston, TX* 6 different sites in Katy, TX* *See page 7 for specific addresses and descriptions.
TEST METHOD:	FCC Part 15, Subpart G and FCC 04-245 Appendix C
PURPOSE OF TEST:	To demonstrate the compliance of the BPL MV Gateway, MV Gateway with the requirements for FCC Part 15, Subpart G devices.

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply. Conducted emissions not required for this device.

APPROVALS

QUALITY ASSURANCE:

Steve Behm, Director of Engineering Services

Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:

Christine Nicklas, Project Manager & Principal Consultant

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The Corinex BPL Medium Voltage (MV) Access Gateway allows utilities to use their existing powerline infrastructure to provide high-speed broadband signals to commercial and residential buildings in urban or rural areas. The system additionally contains a low voltage option. The MV Access Gateway operates on a frequency range of 2-34 MHz with an input power of 85 to 265 VAC, 50/60 Hz. Backbone speeds are up to 85 Mbps (FDD). The Medium Voltage interface uses a F-type coax connector and the Low Voltage uses a custom interface. The MV Access Gateway operates on Overhead or Underground powerlines.

The customer declares the EUT tested by CKC Laboratories was representative of a production unit.

EQUIPMENT UNDER TEST

BPL MV Gateway

Manuf:	Corinex
Model:	MV Gateway
Serial:	6749420821, ENG1, 6213625658, ENG2, 6749420821
FCC ID:	pending

Overhead Coupler

Manuf:	Arteche
Model:	Overcap-S-17
Serial:	0517347/51, 0517347/61, 0517347/78

Underground Coupler

Manuf:	Arteche
Model:	UNIC
Serial:	0516632/26

Combiner

Manuf:	Corinex
Model:	CXP-MVA-COM
Serial:	NA

Medium Voltage Power Line Filter Mode 1

Manuf:	Corinex
Model:	CXF-MVA-M1
Serial:	NA

Medium Voltage Power Line Filter Mode 2

Manuf:	Corinex
Model:	CXF-MVA-M2
Serial:	NA

Medium Voltage Power Line Filter Mode 3

Manuf:	Corinex
Model:	CXF-MVA-M3
Serial:	NA

PERIPHERAL DEVICES

The EUT was not tested with peripheral devices.

CERTIFICATION REQUIREMENTS & TEST PLAN

The FCC requires direct filing to OET for equipment authorization under Certification pursuant to 47 CFR Part 2 Subpart J.

Draft copy of CKC Laboratories, Inc. Test Plan TP05-84818-3 was approved by Andy Leimer (FCC) on 2/24/06 for MV testing. The commission made several recommendations which were subsequently incorporated into the test plan. Due to size limitations, Test Plan TP05-84818-3 will be provided to the FCC as a separate document from this test report.

TEST LOCATIONS

Test sites were selected by the manufacturer based on sites that best represented actual installation conditions. The MV Access Gateway will be installed in both overhead and underground conditions. The test sites were selected to minimize ambient levels and to maximize personnel safety. Refer to Test Plan TP05-84818-3 Section 6.1.5 for more information about the selection of sites. Note: It was necessary to change some test sites from those listed in the test plan to avoid excessive ambient conditions which would have precluded accurate testing. The following is the list of actual test site locations:

LV Overhead Test Site #1: one pole west of Streetlight Pole # 289600, Frisco St west of Winchell St, Houston, TX
LV Overhead Test Site #2: Squatty Lyons Park on East Hardy Streetlight Pole #488951, Houston, TX
LV Overhead Test Site #3: Squatty Lyons Park on East Hardy Streetlight Pole #502700 on Cromwell St, Houston, TX

LV Underground Test Site #1: Grayson Lakes Section 9, Transformer #5, Katy, TX
LV Underground Test Site #2: Grayson Lakes Section 9, Transformer #6, Katy, TX
LV Underground Test Site #3: Grayson Lakes Section 9, Transformer #7, Katy, TX

MV Overhead Test Site #1: 3rd pole from end of street on the north side of the street, Post St East of Cochran St, Houston, TX
MV Overhead Test Site #2: Westford St west of Cochran St Streetlight Pole #465477, Houston, TX
MV Overhead Test Site #3: Bennington St west of Cochran St at 4th pole from Cochran St on the north side, Houston, TX

MV Underground Test Site #1: Grayson Lakes Section 9, Transformer #4, Katy, TX
MV Underground Test Site #2: Grayson Lakes Section 9, Transformer #5, Katy, TX
MV Underground Test Site #3: Grayson Lakes Section 9, Transformer #3, Katy, TX

SUMMARY REPORT OF MEASUREMENTS

The following tables report the worst case emissions levels recorded during the tests performed on the EUT. All readings taken were peak readings unless otherwise stated. The data sheets from which the emissions tables were compiled are contained in Volumes 2-5.

Table 1: Summary of Worst Case Readings from all Sites

FREQUENCY MHz	MARGIN dB	PASS/FAIL	LOCATION	NOTES
2-30 MHz FCC 15.209				
10.156	-0.1	Pass	Low Voltage Overhead - 2-30MHz	S1-PEQ-6
2.043	-1.0	Pass	Low Voltage Underground - 2-30MHz	S3-PEQ-1
16.405	-0.1	Pass	Medium Voltage Overhead - 2-30MHz	SPAQ-3X
29.800	-2.6	Pass	Medium Voltage Underground - 2-30MHz	SPE-15
30-1000 MHz FCC 15.109 Class A				
240.080	-0.1	Pass	Low Voltage Overhead – 30-1000MHz	S2-HQ-9
49.863	-1.1	Pass	Low Voltage Underground – 30-1000MHz	S1-VQ-5
30.890	-0.1	Pass	Medium Voltage Overhead – 30-1000MHz	S1-HQ-1
30.078	-0.1	Pass	Medium Voltage Underground – 30-1000MHz	S2-VQ-16

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.209
Test Distance: 10 Meters

NOTES:
PA = Parallel
PE = Perpendicular
H = Horizontal Polarization
V = Vertical Polarization
Q = Quasi Peak Reading
#= Test Position
X = Mode 1/Mode 2
Y = Mode 2/Mode 3
S1 = Site 1
S2 = Site 2
S3 = Site 3

Table 2: Low Voltage Overhead Site 1 Six Highest Radiated Emission Levels: 2-30 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB	Ant dB		Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
2.237	35.2	0.2	9.4		-15.9	28.9	29.5	-0.6	PAQ-2
10.937	35.9	0.3	9.0		-15.9	29.3	29.5	-0.2	PEQ-1
10.156	35.9	0.3	9.1		-15.9	29.4	29.5	-0.1	PEQ-6
10.157	35.9	0.3	9.1		-15.9	29.4	29.5	-0.1	PEQ-7
19.532	36.7	0.5	8.1		-15.9	29.4	29.5	-0.1	PEQ-3
19.690	36.6	0.5	8.1		-15.9	29.3	29.5	-0.2	PEQ-3

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.209
Test Distance: 10 Meters

NOTES: PA = Parallel
PE = Perpendicular
Q = Quasi Peak Reading
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 2.

Table 3: Low Voltage Overhead Site 2 Six Highest Radiated Emission Levels: 2-30 MHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Cable dB	Ant dB		Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
11.163	30.4	0.5	9.0		-13.9	26.0	29.5	-3.5	PAQ-2
11.200	31.8	0.5	9.0		-13.9	27.4	29.5	-2.1	PAQ-3
11.225	30.3	0.5	9.0		-13.9	25.9	29.5	-3.6	PAQ-5
11.250	30.2	0.5	9.0		-13.9	25.8	29.5	-3.7	PAQ-4
12.728	30.6	0.6	8.8		-13.9	26.1	29.5	-3.4	PEQ-3
20.157	30.9	0.5	8.1		-13.9	25.7	29.5	-3.8	PAQ-4

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.209
Test Distance: 10 Meters

NOTES:
PA = Parallel
PE = Perpendicular
Q = Quasi Peak Reading
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 2.

Table 4: Low Voltage Overhead Site 3 Six Highest Radiated Emission Levels: 2-30 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB	Ant dB		Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
9.440	28.9	0.5	9.1		-13.4	25.1	29.5	-4.4	PE-7
11.830	28.9	0.5	8.9		-13.4	24.9	29.5	-4.6	PE-7
14.860	29.2	0.6	8.6		-13.4	25.0	29.5	-4.5	PE-7
15.243	29.7	0.6	8.6		-13.4	25.5	29.5	-4.0	PE-5
17.551	29.7	0.6	8.3		-13.4	25.2	29.5	-4.3	PE-5
19.690	30.8	0.6	8.1		-13.4	26.1	29.5	-3.4	PEQ-1

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.209
Test Distance: 10 Meters

NOTES: PA = Parallel
PE = Perpendicular
Q = Quasi Peak Reading
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 2.

Table 5: Low Voltage Underground Site 1 Six Highest Radiated Emission Levels: 2-30 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB	Ant dB		Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
2.036	34.5	0.2	9.4		-19.1	25.0	29.5	-4.5	PEQ-1
2.184	34.7	0.2	9.4		-19.1	25.2	29.5	-4.3	PA-16
2.189	35.6	0.2	9.4		-19.1	26.1	29.5	-3.4	PEQ-1
2.272	34.5	0.2	9.4		-19.1	25.0	29.5	-4.5	PA-16
2.502	36.8	0.2	9.3		-19.1	27.2	29.5	-2.3	PEQ-1
2.662	36.8	0.2	9.3		-19.1	27.1	29.5	-2.4	PEQ-1

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.209
Test Distance: 10 Meters

NOTES:
PA = Parallel
PE = Perpendicular
Q = Quasi Peak Reading
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 2.

Table 6: Low Voltage Underground Site 2 Six Highest Radiated Emission Levels: 2-30 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB	Ant dB		Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
2.375	32.6	0.2	9.4		-19.1	23.1	29.5	-6.4	PA-16
2.603	31.8	0.2	9.3		-19.1	22.2	29.5	-7.3	PA-16
2.661	31.6	0.2	9.3		-19.1	22.0	29.5	-7.5	PA-4
2.786	31.6	0.2	9.3		-19.1	22.0	29.5	-7.5	PA-16
3.036	31.6	0.2	9.3		-19.1	22.0	29.5	-7.5	PA-16
4.065	31.4	0.3	9.2		-19.1	21.8	29.5	-7.7	PA-16

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.209
Test Distance: 10 Meters

NOTES: PA = Parallel
PE = Perpendicular
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 2.

Table 7: Low Voltage Underground Site 3 Six Highest Radiated Emission Levels: 2-30 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB	Ant dB		Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
2.035	34.6	0.2	9.4		-19.1	25.1	29.5	-4.4	PE-16
2.043	38.0	0.2	9.4		-19.1	28.5	29.5	-1.0	PEQ-1
2.500	36.2	0.2	9.3		-19.1	26.6	29.5	-2.9	PEQ-1
3.129	36.8	0.2	9.3		-19.1	27.2	29.5	-2.3	PEQ-1
3.278	37.4	0.2	9.3		-19.1	27.8	29.5	-1.7	PEQ-1
3.444	35.3	0.2	9.3		-19.1	25.7	29.5	-3.8	PEQ-1

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.209
Test Distance: 10 Meters

NOTES:
PA = Parallel
PE = Perpendicular
Q = Quasi Peak Reading
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 2.

Table 8: Low Voltage Overhead Site 1 Six Highest Radiated Emission Levels: 30-1000 MHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Cable dB	Amp dB	Ant dB	Dist dB	Corr dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
160.000	43.1	0.9	-27.7	15.6	1.6	5.0	38.5	43.5	-5.0	VQ-6
240.005	45.8	1.3	-27.7	17.9	1.6	5.0	43.9	46.4	-2.5	HQ-8
240.015	42.9	1.3	-27.7	17.9	1.6	5.0	41.0	46.4	-5.4	HQ-6
240.019	43.4	1.3	-27.7	17.9	1.6	5.0	41.5	46.4	-4.9	HQ-11
240.020	43.5	1.3	-27.7	17.9	1.6	5.0	41.6	46.4	-4.8	H-10
240.020	43.0	1.3	-27.7	17.9	1.6	5.0	41.1	46.4	-5.3	HQ-9

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.109 Class A
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
Q = Quasi Peak Reading
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 3.

Table 9: Low Voltage Overhead Site 2 Six Highest Radiated Emission Levels: 30-1000 MHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Cable dB	Amp dB	Ant dB	Dist dB	Corr dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
150.000	43.4	2.0	-27.6	15.2	2.6	5.0	40.6	43.5	-2.9	HQ-1
240.000	42.3	2.7	-27.7	17.9	2.6	5.0	42.8	46.4	-3.6	HQ-6
240.005	41.0	2.7	-27.7	17.9	2.6	5.0	41.5	46.4	-4.9	H-2
240.063	44.1	2.7	-27.7	17.9	2.6	5.0	44.6	46.4	-1.8	HQ-1
240.080	45.8	2.7	-27.7	17.9	2.6	5.0	46.3	46.4	-0.1	HQ-9
240.085	45.7	2.7	-27.7	17.9	2.6	5.0	46.2	46.4	-0.2	HQ-10

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.109 Class A
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
Q = Quasi Peak Reading
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 3.

Table 10: Low Voltage Overhead Site 3 Six Highest Radiated Emission Levels: 30-1000 MHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Cable dB	Amp dB	Ant dB	Dist dB	Corr dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
159.980	37.4	2.1	-27.7	15.6	2.9	5.0	35.3	43.5	-8.2	H-9
159.985	37.6	2.1	-27.7	15.6	2.9	5.0	35.5	43.5	-8.0	H-3
160.000	42.8	2.1	-27.7	15.6	2.9	5.0	40.7	43.5	-2.8	HQ-1
160.000	41.0	2.3	-27.7	15.6	2.9	5.0	38.9	43.5	-4.6	HQ-2
160.005	39.1	2.3	-27.7	15.6	2.9	5.0	37.0	43.5	-6.5	V-2
160.005	37.8	2.3	-27.7	15.6	2.9	5.0	35.7	43.5	-7.8	H-8

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.109 Class A
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
Q = Quasi Peak Reading
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 3.

Table 11: Low Voltage Underground Site 1 Six Highest Radiated Emission Levels: 30-1000 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB	Amp dB	Ant dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
49.853	46.6	1.0	-27.9	11.7	5.0	36.4	39.1	-2.7	VQ-7
49.863	48.2	10.0	-27.9	11.7	5.0	38.0	39.1	-1.1	VQ-5
160.000	47.2	16	-27.7	15.6	5.0	41.7	43.5	-1.8	HQ-7
160.010	44.4	1.6	-27.7	15.6	5.0	38.9	43.5	-4.6	V-1
240.000	43.7	2.2	-27.7	17.9	5.0	41.1	46.4	-5.3	H-14
240.010	45.3	2.2	-27.7	17.9	5.0	42.7	46.4	-3.7	HQ-15

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.109 Class A
Test Distance: 10 Meters

NOTES:
H = Horizontal Polarization
V = Vertical Polarization
Q = Quasi Peak Reading
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 3.

Table 12: Low Voltage Underground Site 2 Six Highest Radiated Emission Levels: 30-1000 MHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Cable dB	Amp dB	Ant dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
159.990	42.0	1.6	-27.7	15.6	5.0	36.5	43.5	-7.0	V-10
159.995	41.2	1.6	-27.7	15.6	5.0	35.7	43.5	-7.8	V-9
160.000	43.0	1.6	-27.7	15.6	5.0	37.5	43.5	-6.0	H-9
160.010	39.9	1.6	-27.7	15.6	5.0	34.4	43.5	-9.1	V-11
160.040	41.2	1.6	-27.7	15.6	5.0	35.7	43.5	-7.8	V-8
240.035	40.1	2.2	-27.7	17.9	5.0	37.5	46.4	-8.9	H-9

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.109 Class A
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 3.

Table 13: Low Voltage Underground Site 3 Six Highest Radiated Emission Levels: 30-1000 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB	Amp dB	Ant dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
159.990	41.7	1.6	-27.7	15.6	5.0	36.2	43.5	-7.3	V-9
160.000	47.9	1.6	-27.7	15.6	5.0	42.4	43.5	-1.1	H-7
160.010	46.6	1.6	-27.7	15.6	5.0	41.1	43.5	-2.4	H-8
160.015	40.0	1.6	-27.7	15.6	5.0	34.5	43.5	-9.0	H-16
240.020	41.1	1.6	-27.7	17.9	5.0	38.5	46.4	-7.9	H-8
319.988	38.1	2.5	-28.1	19.5	5.0	37.0	46.4	-9.4	V-10

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.109 Class A
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 3.

Table 14: Medium Voltage Overhead Site 1 Six Highest Radiated Emission Levels: 2-30 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB		Ant dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
16.405	33.8	0.4		8.4	-13.2	29.4	29.5	-0.1	PQA-3X
17.954	33.9	0.5		8.3	-13.2	29.5	29.5	0.0	PQA-7Y
21.326	34.3	0.5		7.8	-13.2	29.4	29.5	-0.1	PQA-3Y
22.499	34.6	0.5		7.5	-13.2	29.4	29.5	-0.1	PQA-2X
26.874	36.0	0.5		6.1	-13.2	29.4	29.5	-0.1	PQA-3Y
28.601	36.5	0.6		5.5	-13.2	29.4	29.5	-0.1	PQA-6Y

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.209
Test Distance: 10 Meters

NOTES:
PA = Parallel
PE = Perpendicular
Q = Quasi Peak Reading
# = Test Position
X = Mode 1/Mode 2
Y = Mode 2/Mode 3

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 4.

Table 15: Medium Voltage Overhead Site 2 Six Highest Radiated Emission Levels: 2-30 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB		Ant dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
7.340	32.7	0.3		9.2	-12.8	29.4	29.5	-0.1	PEQ-4X
8.287	32.2	0.3		9.1	-12.8	28.8	29.5	-0.7	PEQ-1X
14.817	33.1	0.4		8.6	-12.8	29.3	29.5	-0.2	PAQ-4Y
14.818	33.2	0.4		8.6	-12.8	29.4	29.5	-0.1	PAQ-5Y
16.339	33.3	0.4		8.5	-12.8	29.4	29.5	-0.1	PEQ-2X
16.341	33.0	0.4		8.5	-12.8	29.1	29.5	-0.4	PAQ-2X

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.209
Test Distance: 10 Meters

NOTES:
PA = Parallel
PE = Perpendicular
Q = Quasi Peak Reading
# = Test Position
X = Mode 1/Mode 2
Y = Mode 2/Mode 3

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 4.

Table 16: Medium Voltage Overhead Site 3 Six Highest Radiated Emission Levels: 2-30 MHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Cable dB		Ant dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
16.952	31.8	0.4		8.4	-12.3	28.3	29.5	-1.2	PEQ-1X
4.378	30.8	0.3		9.2	-12.3	28.0	29.5	-1.5	PAQ-8X
4.381	30.4	0.3		9.2	-12.3	27.6	29.5	-1.9	PAQ-4X
6.963	30.4	0.3		9.2	-12.3	27.6	29.5	-1.9	PEQ-1X
16.952	31.8	0.4		8.4	-12.3	28.3	29.5	-1.2	PEQ-1X
24.687	33.0	0.5		7.0	-12.3	28.2	29.5	-1.3	PAQ-3Y

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.209
Test Distance: 10 Meters

NOTES:
PA = Parallel
PE = Perpendicular
Q = Quasi Peak Reading
# = Test Position
X = Mode 1/Mode 2
Y = Mode 2/Mode 3

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 4.

Table 17: Medium Voltage Underground Site 1 Six Highest Radiated Emission Levels: 2-30 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB		Ant dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
23.600	36.1	0.5		7.2	-19.1	24.7	29.5	-4.8	PE-12
24.400	38.3	0.5		7.0	-19.1	26.7	29.5	-2.8	PE-12
25.180	38.0	0.5		6.8	-19.1	26.2	29.5	-3.3	PE-12
29.830	38.8	0.6		5.1	-19.1	25.4	29.5	-4.1	PE-11
29.830	38.7	0.6		5.1	-19.1	25.3	29.5	-4.2	PE-12
29.980	37.8	0.6		5.0	-19.1	24.3	29.5	-5.3	PE-9

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.209
Test Distance: 10 Meters

NOTES: PA = Parallel
PE = Perpendicular
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 5.

Table 18: Medium Voltage Underground Site 2 Six Highest Radiated Emission Levels: 2-30 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB		Ant dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
29.980	40.4	0.6		5.0	-19.1	26.9	29.5	-2.6	PE-16
29.800	40.3	0.6		5.1	-19.1	26.9	29.5	-2.6	PE-15
29.800	39.1	0.6		5.1	-19.1	25.7	29.5	-3.8	PE-14
29.800	38.1	0.6		5.1	-19.1	24.7	29.5	-4.9	PE-12
29.800	37.8	0.6		5.1	-19.1	24.4	29.5	-5.2	PE-13
29.030	36.7	0.6		5.2	-19.1	23.5	29.5	-6.0	PE-16

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.209
Test Distance: 10 Meters

NOTES: PA = Parallel
PE = Perpendicular
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 5.

Table 19: Medium Voltage Underground Site 3 Six Highest Radiated Emission Levels: 2-30 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB		Ant dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
2.713	27.2	0.2		9.3	-19.1	17.6	29.5	-11.9	PA-16
23.900	26.8	0.5		7.1	-19.1	15.3	29.5	-14.3	PE-2
26.590	26.5	0.5		6.2	-19.1	14.2	29.5	-15.3	PE-2
28.000	26.8	0.6		5.7	-19.1	14.0	29.5	-15.5	PE-2
29.650	27.5	0.6		5.1	-19.1	14.1	29.5	-15.4	PE-16
29.650	30.0	0.6		5.1	-19.1	16.6	29.5	-12.9	PE-2

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.209
Test Distance: 10 Meters

NOTES: PA = Parallel
PE = Perpendicular
# = Test position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 5.

Table 20: Medium Voltage Overhead Site 1 Six Highest Radiated Emission Levels: 30-1000 MHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Cable dB	Amp dB	Ant dB	Dist dB	Corr dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
30.890	48.9	0.6	-27.9	15.8	0.0	1.6	39.0	39.1	-0.1	HQ-1
31.812	49.1	0.6	-27.9	15.3	0.0	1.6	38.7	39.1	-0.4	HQ-1
33.860	50.1	0.7	-27.9	14.4	0.0	1.6	38.9	39.1	-0.2	HQ-1
33.999	50.2	0.7	-27.9	14.3	0.0	1.6	38.9	39.1	-0.2	VQ-2
30.918	47.7	0.6	-27.7	15.8	1.6	0.0	37.8	37.1	-1.3	VQ-4
160.008	44.7	1.6	-27.9	15.6	3.0	5.0	42.2	43.5	-1.3	VQ-4

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.109 Class A
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
Q = Quasi Peak Reading
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 3.

Table 21: Medium Voltage Overhead Site 2 Six Highest Radiated Emission Levels: 30-1000 MHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Cable dB	Amp dB	Ant dB	Dist dB	Corr dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
33.880	47.8	0.7	-27.9	14.4	1.9	0.0	36.9	39.1	-2.2	HQ-1
149.770	44.2	1.6	-27.6	15.2	3.2	5.0	41.6	43.5	-1.9	VQ-1
240.017	44.3	2.4	-27.7	17.9	3.2	5.0	46.7	46.4	0.3	VQ-1
240.021	44.5	2.4	-27.7	17.9	3.2	5.0	45.3	46.4	-1.1	VQ-6
240.024	44.2	2.4	-27.7	17.9	3.2	5.0	45.0	46.4	-1.4	VQ-5
240.034	42.5	2.4	-27.7	17.9	3.2	5.0	43.3	46.4	-3.1	VQ-8

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.109 Class A
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
Q = Quasi Peak Reading
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 3.

Table 22: Medium Voltage Overhead Site 3 Six Highest Radiated Emission Levels: 30-1000 MHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Cable dB	Amp dB	Ant dB	Dist dB	Corr dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
30.985	44.5	0.6	-27.9	15.7	2.1	0.0	35.0	39.1	-4.1	V-3
31.220	46.4	0.6	-27.9	15.6	2.1	0.0	36.8	39.1	-2.3	VQ-2
33.523	49.6	0.7	-27.9	14.5	2.1	0.0	39.0	39.1	-0.1	VQ-1
160.000	41.9	1.6	-27.7	15.6	3.4	5.0	39.8	43.5	-3.7	VQ-5
160.000	41.9	1.6	-27.7	15.6	3.4	5.0	39.8	43.5	-3.7	HQ-7
160.000	44.2	1.6	-27.7	15.6	3.4	5.0	42.1	43.5	-1.4	V-7

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.109 Class A
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
Q = Quasi Peak Reading
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 3.

Table 23: Medium Voltage Underground Site 1 Six Highest Radiated Emission Levels: 30-1000 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB	Amp dB	Ant dB		READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
30.109	49.5	0.6	-27.9	16.1		38.3	39.1	-0.8	HQ-7
30.297	49.6	0.6	-27.9	16.1		38.4	39.1	-0.7	HQ-5
32.138	50.3	0.6	-27.9	15.2		38.2	39.1	-0.9	HQ-8
32.563	50.8	0.7	-27.9	15.0		38.6	39.1	-0.5	VQ-9
32.872	51.0	0.7	-27.9	14.8		38.6	39.1	-0.5	HQ-8
33.475	50.9	0.7	-27.9	14.6		38.3	39.1	-0.8	HQ-7

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.109 Class A
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
Q = Quasi Peak Reading
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 3.

Table 24: Medium Voltage Underground Site 2 Six Highest Radiated Emission Levels: 30-1000 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB	Amp dB	Ant dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
30.078	50.1	0.6	-27.9	16.2	0.0	39.0	39.1	-0.1	VQ-16
30.325	49.5	0.6	-27.9	16.0	0.0	38.2	39.1	-0.9	VQ-15
31.850	50.9	0.6	-27.9	15.3	0.0	38.9	39.1	-0.2	VQ-16
31.985	50.6	0.6	-27.9	15.2	0.0	38.5	39.1	-0.6	VQ-15
49.855	48.9	1.0	-27.9	11.7	5.0	38.7	39.1	-0.4	VQ-7
49.864	48.5	1.0	-27.9	11.7	5.0	38.3	39.1	-0.8	VQ-8

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.109 Class A
Test Distance: 10 Meters

NOTES: Q = Quasi Peak Reading
V = Vertical Polarization
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 3.

Table 25: Medium Voltage Underground Site 3 Six Highest Radiated Emission Levels: 30-1000 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB	Amp dB	Ant dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
49.850	44.1	1.0	-27.9	11.7	5.0	33.9	39.1	-5.2	V-9
49.860	44.4	1.0	-27.9	11.7	5.0	34.2	39.1	-4.9	V-15
150.025	45.3	1.6	-27.6	15.2	5.0	39.5	43.5	-4.0	H-14
160.015	45.3	1.6	-27.7	15.6	5.0	39.8	43.5	-3.7	H-12
240.000	44.4	2.4	-27.7	17.9	5.0	42.0	46.4	-4.4	V-11
480.235	43.7	3.4	-28.1	17.9	5.0	41.2	46.4	-5.2	H-9

Test Method: ANSI C63.4 (2003) & FCC 04-245 Appendix C
Spec Limit: FCC Part 15 Subpart G Section 15.109 Class A
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
# = Test Position

COMMENTS: See individual data sheets for test conditions. Data sheets are in Volume 3.

TESTING

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available I/O ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. I/O cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The EUT was tested at maximum compliant operational power. Equipment is capable of notch filtering; all filtering was disabled during testing. Low voltage coupling is through input AC mains. Medium voltage coupling is through separate RF couplers attached to Type F output ports. During low voltage operation, medium voltage couplers are disconnected. During medium voltage operation, low voltage transmission is disabled.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the photographs in Volumes 5-9. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables. The corrected data was then compared to the applicable emission limits to determine compliance.

The radiated emissions data was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in Table A.

From 2-30MHz, the magnetic loop antenna was setup at an antenna height of 1 meter. Measurements were made with the magnetic loop antenna both parallel and perpendicular to the power lines for overhead power line testing and to the transformer for underground power line testing.

From 30-1000MHz, the bicon and log periodic antennas were used. Measurements were made with the antennas both horizontal and vertical to the power lines for overhead power line testing and to the transformer for underground power line testing. During the Low Voltage testing, the antenna height was 1 meter with a 5dB correction factor added to correct for the 1-4 meter antenna height per CFR47, Part 15, Subpart G. For the Medium Voltage testing, the antenna height was varied between 1 – 4 meters to maximize emissions over the transmit band of 30-34 MHz. For 34-1000 MHz, the antenna was fixed at 1 meter above the transmit band. For those readings where the antenna height was fixed at 1 meter, a 5dB correction factor for the 1-4 meter antenna height was added per CFR47, Part 15, Subpart G.

Test distance at 10 meters was lateral from the antenna to power line. Test distance correction factor was calculated from "slant range" distance as outlined in the test plan TP05-84818-3 Section 6.1.2. Line height was measured for each location using measuring tape (see photos). Sample calculations for each data sheet were provided in Volumes 2-5. Where emissions are maximized @ 1-4 meter antenna height, slant distance correction factor was calculated for 1 and 4 meter heights. Where maximized emissions occur at 1 or 4 meter heights, the appropriate distance correction factor was used. When maximization occurs at intermediate heights, the worst case factor was used (e.g. 1 meter distance correction).

The test positions are per the requirements documented in TP05-84818-3 with the following exceptions: 1) Test Position #9 for MV Overhead Test Site #1 was moved from 50 meters to 53.47 meters to keep the test antenna out of the intersection. 2) At LV Overhead Test Site #3, for all test positions, the antenna was 12 meters instead of 10 meters from the power lines under test to keep the antenna out of the street. Note: Test distance variations were minimized only to the extent necessary to ensure test personnel safety.

GRAPHICAL AND TABULAR DATA

Graphical data is provided for the frequency range of 2-30 MHz. Plots are recorded in peak mode and include both ambient and EUT emissions. Graphical data is provided for reference only; tabular data in all cases takes precedence. Preliminary investigations were performed at each location to determine suitability of ambient conditions. Test site selection was altered occasionally in order to avoid locations with excessive ambient emissions.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula in Table A. This reading was then compared to the applicable specification limit to determine compliance. For this testing, additional factors were also included depending on what testing was being performed. A "Slant Distance" factor was included for overhead power line testing. This "Slant Distance was either added or subtracted based on the formulas shown in the Test Plan. A "Height" factor was included for measurements made above 30MHz where the readings were taken at a fixed height of 1 meter. This correction factor is obtained from CFR47, Part 15, Subpart G and was added to the meter reading.

TABLE A: SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
+/-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
+	5dB Height (optional)	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Appendix A were used to collect the radiated and conducted emissions data. For radiated measurements from 2 MHz to 30 MHz, the magnetic loop antenna was used. For radiated measurements from 30 to 300 MHz, the biconilog antenna was used and the log periodic antenna was used from 300-1000MHz.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 77 dBµV, and a vertical scale of 10 dB per division.

TABLE B: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
RADIATED EMISSIONS	2 MHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" reading is listed as one of the highest readings, this is indicated as a "Q" in the appropriate table. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the Spectrum Analyzer or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the HP Quasi-Peak Adapter for the HP Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual was followed.

APPENDIX A

TEST EQUIPMENT LIST

FCC 15.109

Function	S/N	Calibration Date	Cal Due Date	Asset #
SA HP 8596E	3346A00209	11/22/2004	11/22/2006	00784
Cable	none	12/02/2005	12/02/2007	P05440
Cable	none	07/07/2004	06/07/2006	P02410
Cable	none	01/03/2005	01/03/2007	P01185
Bicon Antenna	1522	01/05/2005	01/05/2007	00503
Log Antenna	318	01/06/2005	01/06/2007	00978A
HP8447D Preamp	1937A03055	08/01/2005	08/01/2007	00567

FCC 15.209

Function	S/N	Calibration Date	Cal Due Date	Asset #
SA HP 8596E	3346A00209	11/22/2004	11/22/2006	00784
Cable	none	12/02/2005	12/02/2007	P05440
Cable	none	07/07/2004	06/07/2006	P02410
Mag Loop EMCO 6502	2078	05/13/2005	05/13/2007	00432
Cable	none	05/24/2005	05/24/2007	P05012