SECTION 3

Test Equipment Used

3.1 Test Equipment

Table 1 (18-29 Nov 2004)

Item	Serial No.	Last Cal	Next Cal
Receivers			
Rohde & Schwarz ESVS20	827131/006	22-Jan-04	21-Jan-05
Rohde & Schwarz ESHS20	862026/008	14-Sep-04	14-Sep-05
Hewlett Packard RX system 8574A	001	01-Oct-04	01-Oct-05
Rohde & Schwarz ESH3-Z5	827729/005	31-Aug-05	28-Feb-07
Antennae			
Chase Bilog CBL6112A	2262	11-Jul-03	10-Jul-05
Chase Bilog CBL6112A ref	2263	23-Aug-04	21-Feb-06
Schaffner Active loop HLA6120 ref	1162	04-Aug-04	04-Aug-05
EATON 94605-1 Loop	344	na	See note 1
Miscellaneous			
Datron 1061	10973	11-Jun-04	11-Mar-05
Rubidium frequency standard	RIC1793	12-Aug-03	12-Aug-05
Davis Digital thermometer	PC50525A31	11-Nov-03	11-Nov-04
Mountford environmental chamber	2552/K5136	na	See note 2

Note 1: No calibration required this item used for relative measurements only in conjunction with ESH20 receiver.

Note 2: No calibration required temperature set using Digital thermometer.

Table 2 (14-15 Feb 2006)

Item	Serial No.	Last Cal	Next Cal
Receivers			
Hewlett Packard RX system 8574A	001	06-Oct-05	06-Oct-06
Rohde & Schwarz ESH3-Z5	827729/005	31-Aug-05	28-Feb-07

SECTION 4

Test Conditions

4.1 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	15 - 35 degrees C
Humidity range	25 - 75%
Pressure	860-1060 mbar

4.2 Test Areas

The Radiated Emission tests were performed initially in a screened room (SR1) to obtain a pre-compliance emission profile and then transferred to a 10m Open Area Test Site (OATS) for the formal test measurement.

4.3 EUT Power

Farnell LT30-1 Linear Power Supply Supplied the 18VDC required by the EUT. (18-29 Nov 2004)

PAC202 Door Controller containing an AC power supply was used for the conducted emission test (14-15 Feb 2006)

SECTION 5

Test Sample Operation And Monitoring

A Block Diagram of the EUT is contained in Appendix F.

5.1 EUT Configuration, as defined by the client *(ANSI C63.4: 1992 Para 10.1.9)*

The reader is typically connected to an access 'controller' unit. This unit provides power to the reader, and monitors the signal line for user ID codes.

When an ID code is detected, the code is checked against access rights for the holder of the ID card, and access is granted if the holder is authorised, e.g. by removing power to a lock (not part of the reader). When access is granted, the controller will generally pull the reader 's 'LED-IN' input low, so that the reader's LED changes from red to green – indicating to the user that the code has been validated.

The readers were tested in pairs, as this is a representation of how the readers may be installed in a building i.e. in relatively close proximity to each other on different sides of a door, which requires access control.

The readers can be connected to any compatible third party equipment that may contribute to the emissions from the access control system as a whole, over which the manufacturer of the reader has no control. The readers radiated and conducted emissions were measured while being powered from a linear power supply as this gives a representation of the emissions from the readers only.

The AC power supply support equipment used for the conducted emission test for issue 3 of this report was: Model: PS41/13.8/PA, Ser No: 03320776 Iss. 003 Mod Level: 1. The readers were as defined in the previous version of this report.

5.2 Modes of Operation, as defined by the client *(ANSI C63.4: 1992 Para 10.1.9)*

Previous testing on this type of reader has shown that the worst-case emissions occur when a card or tag is in the reader field. In this mode the micro controller software and reader electronic circuits are exercised fully. The EUT has been tested in this mode on this occasion.

5.3 EUT Exercise Software, as defined by the client *(ANSI C63.4: 1992 Para 10.1.9)*

The embedded software is concerned with gathering the unique raw data code from the card or tag when present in the field of the reader. The demodulated digital signal is acquired by the micro controller under software control; this digital code is then packaged in to a proprietary message format and then output to a peripheral device such as an access controller at 4800 BAUD.

The software also monitors inputs such as the LED-IN and will execute an action when the input changes state, such as change the colour of the LED.

The software runs continuously in the device in the form of a simple 'round robin' task scheduler.

5.4 EUT Monitoring, as defined by the client

During the EMC tests the Engineer monitored the EUT at all times.

5.5 Special Accessories

RFID Tag representative of tags usable with the EUT.
The tags used to support the readers during testing were standard 125KHz proximity tags manufactured by Sokymat under their part number 914103.
Each tag has a unique serial number that is communicated to the reader by means of transformer action performed by loading an alternating magnetic field generated by the reader. The tags are passive and derive their power from the magnetic field produced from the reader. The power is picked up from a coil in the tag and across that coil is a capacitor and micro chip. When the chip is activated it switches in and out an extra resistive load across the coil in such a way as to produce a Manchester encoded representation of the serial number and other header information. The tags do not radiate any RF field but simply place a varying load on the reader's exciting field.

5.6 Equipment Modifications

None.

SECTION 6

Test Results

Photographs of the EUT cabling are contained in Appendix E.

6.1 Conducted Emissions Test (DC Power Lines), 150kHz to 30MHz

The relevant specifications were 15.207 (a) and 15.107 (b) (CISPR22: 1997 with class A limits applying).

This test was applied to the EUT's 18V DC Positive and Negative lines. The EUT was configured in the screened room on an 80cm high table and was positioned 40cm from the room wall. The EUT was then powered from the 18VDC Linear supply via a Line Impedance Stabilisation Network (LISN).The measurements were performed using a receiver system with in built transducer factor and cable insertion loss correction. As a result the measurements taken were true values and so tester performed no calculations.

6.1.1 Designer Standard with Classic Mullion 18VDC Negative line

A test measurement was made over the specified frequency range using Peak detection mode.

As no Peak emissions exceeding the Quasi Peak or Average specification limits were recorded, the power line under test was deemed to have complied with both specifications.

6.1.2 Designer Standard with Classic Mullion 18VDC Positive line

A test measurement was made over the specified frequency range using Peak detection mode.

As no Peak emissions exceeding or approaching the Quasi Peak or Average specification limits were recorded, the power line under test was deemed to have complied with both specifications.

6.1.3 Low Profile Standard with Vandal Standard 18VDC Negative line

A test measurement was made over the specified frequency range using Peak detection mode.

As Peak emissions exceeding or approaching the Average specification limits were recorded, further measurements were required to be made using Quasi Peak and Average detection modes.

It was then found that the emissions were non compliant with the Quasi Peak and / or Average specification limits of 15.207 (a) when the appropriate detector was used.

It was then found that the emissions were compliant with the Quasi Peak and / or Average specification limits of 15.107 (b) when the appropriate detector was used.

6.1.4 Low Profile Standard with Vandal Standard 18VDC Positive line

A test measurement was made over the specified frequency range using Peak detection mode.

It was found that the emissions were non compliant with the Quasi Peak and / or Average specification limits of 15.207 (b).

It was found that the emissions were compliant with the Quasi Peak and / or Average specification limits of 15.107 (b).

6.1.5 Panel Standard with Standard Plus 18VDC Negative line

A test measurement was made over the specified frequency range using Peak detection mode.

As no Peak emissions exceeding or approaching the Quasi Peak or Average specification limits were recorded, the power line under test was deemed to have complied with both specifications.

6.1.6 Panel Standard with Standard Plus 18VDC Positive line

A test measurement was made over the specified frequency range using Peak detection mode.

It was found that the emissions were non compliant with the Quasi Peak and / or Average specification limits of 15.207 (a).

It was found that the emissions were compliant with the Quasi Peak and / or Average specification limits of 15.107 (b).

6.1.7 Universal 18VDC Negative line

A test measurement was made over the specified frequency range using Peak detection mode.

As no Peak emissions exceeding or approaching the Quasi Peak or Average specification limits were recorded, the power line under test was deemed to have complied with both specifications.

6.1.8 Universal 18VDC Positive line

A test measurement was made over the specified frequency range using Peak detection mode.

As no Peak emissions exceeding or approaching the Quasi Peak or Average specification limits were recorded, the power line under test was deemed to have complied with both specifications.

A graphical presentation of the above results is contained in Appendix A of this Test Report

6.2 Conducted Emissions Test (AC Power Lines), 150kHz to 30MHz

The relevant specifications were 15.207 (a) (CISPR22: 1997 with class B limits applying).

For issue 3 of this report, the test was applied to the EUT's 110V AC Line and Neutral lines. The EUT was configured in the screened room on an 80cm high table and was positioned 40cm from the room wall. The EUT was then powered from the 110VAC supply via a Line Impedance Stabilisation Network (LISN).

The measurements were performed using a receiver system with in built transducer factor and cable insertion loss correction. As a result the measurements taken were true values and so tester performed no calculations.

6.2.1 Designer Standard with Classic Mullion and Universal 110VAC Neutral line

A test measurement was made over the specified frequency range using Peak detection mode.

As Peak emissions exceeding or approaching the Average specification limits were recorded, further measurements were required to be made using Average detection modes.

It was then found that the emissions were compliant with the Average specification limits of 15.207 (a) when the appropriate detector was used.

6.2.2 Designer Standard with Classic Mullion and Universal 110VAC Live line

A test measurement was made over the specified frequency range using Peak detection mode.

As Peak emissions exceeding or approaching the Average specification limits were recorded, further measurements were required to be made using Average detection modes.

It was then found that the emissions were compliant with the Average specification limits of 15.207 (a) when the appropriate detector was used.

6.2.3 The LPR/Vandal, Panel standard/Standard PLVS 110VAC Neutral line

A test measurement was made over the specified frequency range using Peak detection mode.

As Peak emissions exceeding or approaching the Average specification limits were recorded, further measurements were required to be made using the Average detection modes.

It was then found that the emissions were non compliant with the Average specification limits of 15.207 (a) when the appropriate detector was used.

6.2.4 The LPR/Vandal, Panel standard/Standard PLVS 110VAC Live line

A test measurement was made over the specified frequency range using Peak detection mode.

As Peak emissions exceeding or approaching the Average specification limits were recorded, further measurements were required to be made using the Average detection modes

It was found that the emissions were non compliant with the Average specification limits of 15.207 (a).

A graphical presentation of the above results is contained in Appendix A of this Test Report

6.3 Radiated Emissions Test, 9kHz to 30MHz (Not UKAS Accredited)

The relevant specification was 15.209 (a)

6.3.1 Pre-compliance Measurement

The EUT was configured in the test room on an 80cm high table and powered from an 18VDC Linear Supply.

The measurement was performed with an antenna to EUT separation distance of 3m. The pre-compliance measurement was used to obtain a Radiated Emission profile thus allowing the OATS measurements to be performed without the danger of overlooking any potential non-compliant emissions. This measurement was performed using peak detection.

The plots were performed in a screened room to avoid external ambients. There is little correlation between the 10m readings and the screened room readings. The Screened Room plots were taken to identify emission frequencies and for relative measurements only.

A graphical presentation of the above results is contained in Appendix B of this Test Report

6.3.2 OATS Measurement

The EUT was then installed in an Open Area Test Site (OATS) on an 80cm high table, powered from an 18VDC Linear Supply and measurements performed at an antenna to EUT separation distance of 10m.

The frequencies at which the measured level in the screened room (pre-compliance measurement) were greater than -6dB of the limit line were measured individually using a manually tuned receiver in accordance with ANSI C63.4: 2000.

6.3.3 Transposition of Results

CFR47 Pt 15 Sub Pt C Clause 15.209 states that the field strength should be measured in dBuV/m. The actual test was carried out in the H field giving dBuA/m. This result was transposed using the calculation shown below.

E = H + Z

Where E = Electric Field strength dBuV/m

H = Magnetic Field strength dBµA/m

Z = Wave Impedance dBΩ

= 20Log (120ð(2 ð R/ë))

For information an example calculation on the fundamental is shown below.

At 133kHz the measured field strength was 34.4dBìA/m at 10m EUT to antenna separation.

R= 10m ë= 300/0.133 = 2255m

Therefore wave impedance = (120*3.142)*(2*3.12*(10/2255)) = 10.52Ù = 20.4dBΩ.

Therefore Electric Field Strength E=34.4+20.4 = 54.84 dBuV/m

6.3.4 Unwanted emissions relative to fundamental.

The values of unwanted emissions and fundamental obtained during pre compliance measurement as described in Para 6.2.1 were compared. These measured values were reported as H field units (dBµA/m) but the differences between unwanted emissions and fundamental were dimensionless (dB).

All unwanted emissions were found to be below the fundamental and hence compliant with CFR47 Pt 15 Sub Pt C Clause 15.209 (c)

Results sheets for the compliance tests are contained in Appendix B of this test report

6.4 Radiated Emissions Test, 30MHz to 1000MHz

The relevant specifications were 15.207 (a) and 15.107 (b)

6.4.1 Pre-compliance Measurement

The EUT was configured in the test room on an 80cm high table and powered from an 18VDC Linear Supply.

The measurement was performed with an antenna to EUT separation distance of 3m. The Quasi peak limits of CFR 47 Part 15 Sub Part B clause 15.109 (b) Class A are therefore increased by 10dB (from the 10m values), as defined in clause 15.109(g)(2) of the regulations, to allow for the reduction in the measurement distance. The pre-compliance measurement was used to obtain a Radiated Emission profile thus allowing the OATS measurements to be performed without the danger of overlooking any potential non-compliant emissions. This measurement was performed using peak detection.

A graphical presentation of the above results is contained in Appendix C of this Test Report

6.4.2 OATS Measurement

The EUT was then installed in the Open Area Test Site (OATS) on an 80cm high table, powered from an 18VDC Linear Supply and measurements performed at an antenna to EUT separation distance of 10m.

The frequencies at which the measured level in the screened room (pre-compliance measurement) were greater than -6dB of the limit line were measured individually using a manually tuned receiver in accordance with ANSI C63.4: 2000

6.4.3 Field strength calculation

The Rohde & Schwarz receiver automatically applies antenna factors and cable correction by means of firmware. The results reported in this document are therefore corrected values. For information, an example calculation on the highest recorded emission is shown below.

Fs = Vr + AF + Cl

Where	Fs = Field strength	dBuV/m
	Vr = Receiver voltage	dBuV
	AF = Antenna Factor	dB/m
	Cl = Antenna cable loss	dB

Fs = 27.4 + 6.8 + 1 = 35.2dBuV/m

6.4.4 Unwanted emissions relative to fundamental.

The values of unwanted emissions obtained during compliance measurement as described in Para 6.3.2 and fundamental as described in Para 6.2.2 were normalised to a 10m measurement distance then compared.

All unwanted emissions were found to be below the fundamental and hence compliant with CFR47 Pt 15 Sub Pt C Clause 15.209 (c)

Results sheets for the compliance test are contained in Appendix C of this test report

6.5 Fundamental supply voltage stability. (Not UKAS Accredited)

The relevant specification was CFR47 Part 15 Sub Part A clause 15.31 (e) but testing was performed to the requirements of EN 300 330-2: V1.1.1. This test was applied to the Low Profile Standard Reader and its associated cabling.

The Farnell LT30-1 Linear Supply produced the 18VDC supply.

The EUT was set-up in the environmental chamber with the Eaton Passive loop lying parallel to it. The ambient temperature was then recorded. Using a Receiver a frequency span from 132kHz – 135kHz was swept to find the EUT's transmitter peak. This test was carried out at various voltages and temperatures as follows:

A variation of 3.2dB over the voltage range +71% to –53% of nominal was measured.

The supply voltage range was in excess of the requirements of 15.31 (e), furthermore there is no acceptance criterion stated so no compliance statement can be made.

Results sheets for this test are contained in Appendix D of this test report.

Appendix A

Conducted Emissions

EUT: RFID Readers

Specification: CFR 47 Pt 15 Sub Pt C

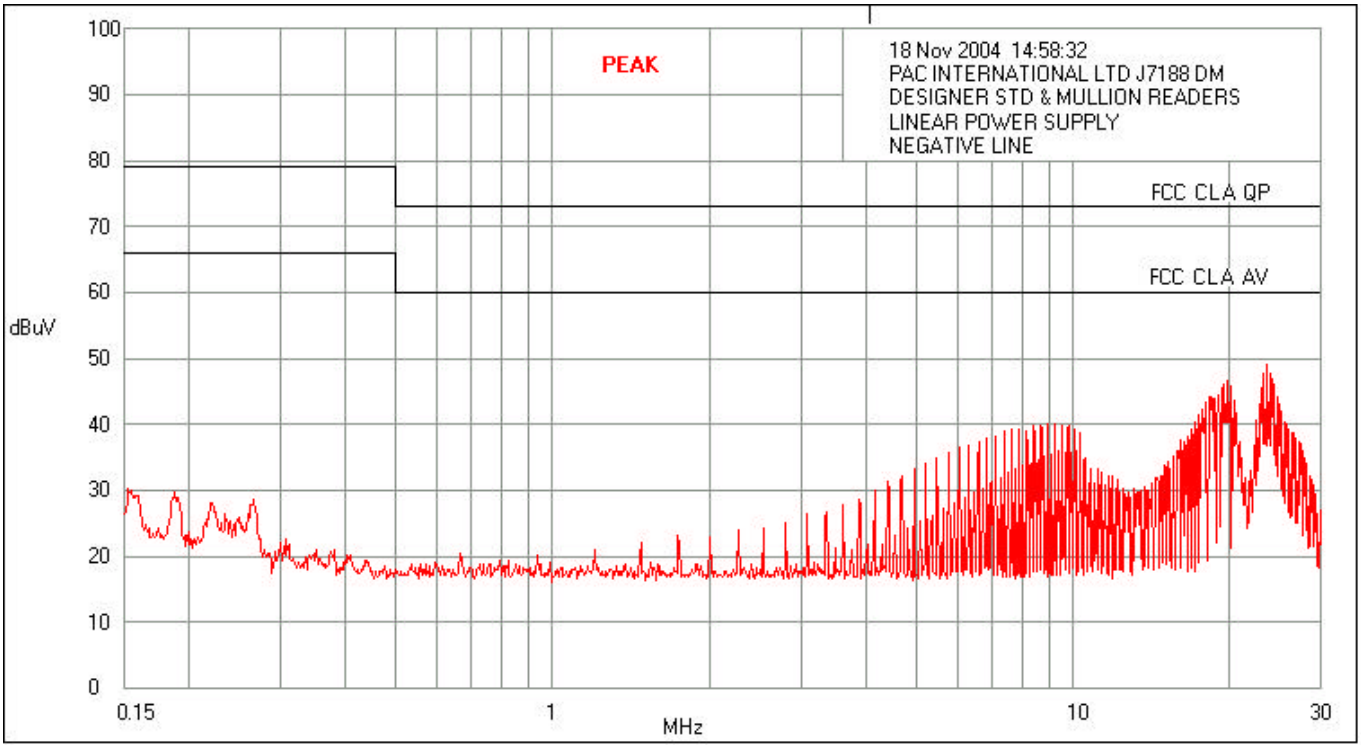
Test Area: Donibristle Screened Room 1 **Tested by: D. Meade/H Boyle**

Table 1. Plot Log

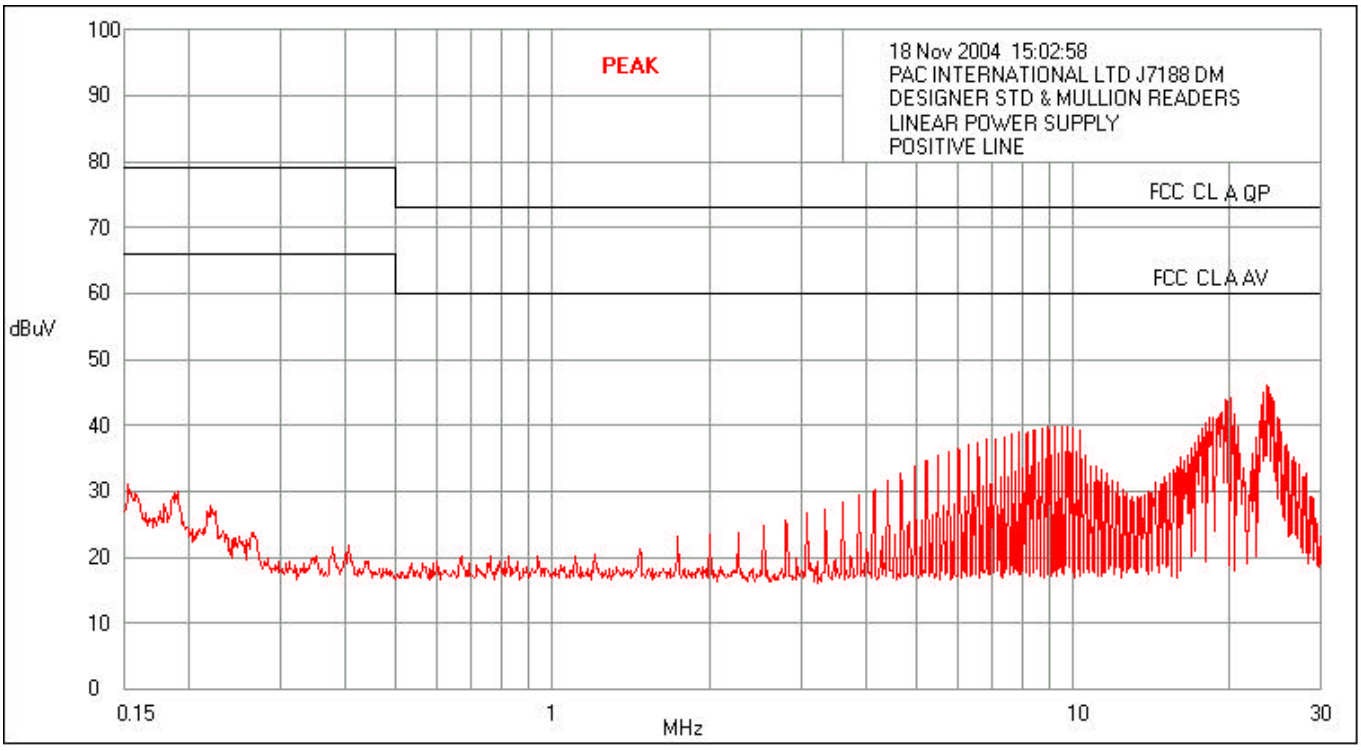
Plot	Time	Comments
		18/11/04
01	14:58:32	Negative Line, Designer Standard & Mullion Readers with Linear Power Supply
02	15:02:58	Positive Line, Designer Standard & Mullion Readers with Linear Power Supply
		19/11/04
03	13:28:29	Negative Line With LPR & VANDAL Powered From Linear Supply
04	13:32:44	Positive Line With LPR & VANDAL Powered From Linear Supply
		23/11/04
05	09:40:05	Negative Line With Panel Std & Std PLVS Powered From Linear Supply
06	09:49:28	Positive Line With Panel Std & Std PLVS Powered From Linear Supply
07	10:01:44	Negative Line With Universal Standard Powered From Linear Supply
08	10:09:01	Positive Line With Universal Standard Powered From Linear Supply
		14/02/06
09	15:37:40	Neutral Line: Designer Standard, Mullion & Universal Readers Powered From AC Supply
10	15:57:07	Live Line: Designer Standard, Mullion & Universal Readers Powered From AC Supply
		15/02/06
11	08:28:54	Neutral Line: LPR/Vandal, Panel standard/Standard PLVS Powered From AC Supply
12	09:14:42	Live Line LPR/Vandal, Panel standard/Standard PLVS Powered From AC Supply

Comments:

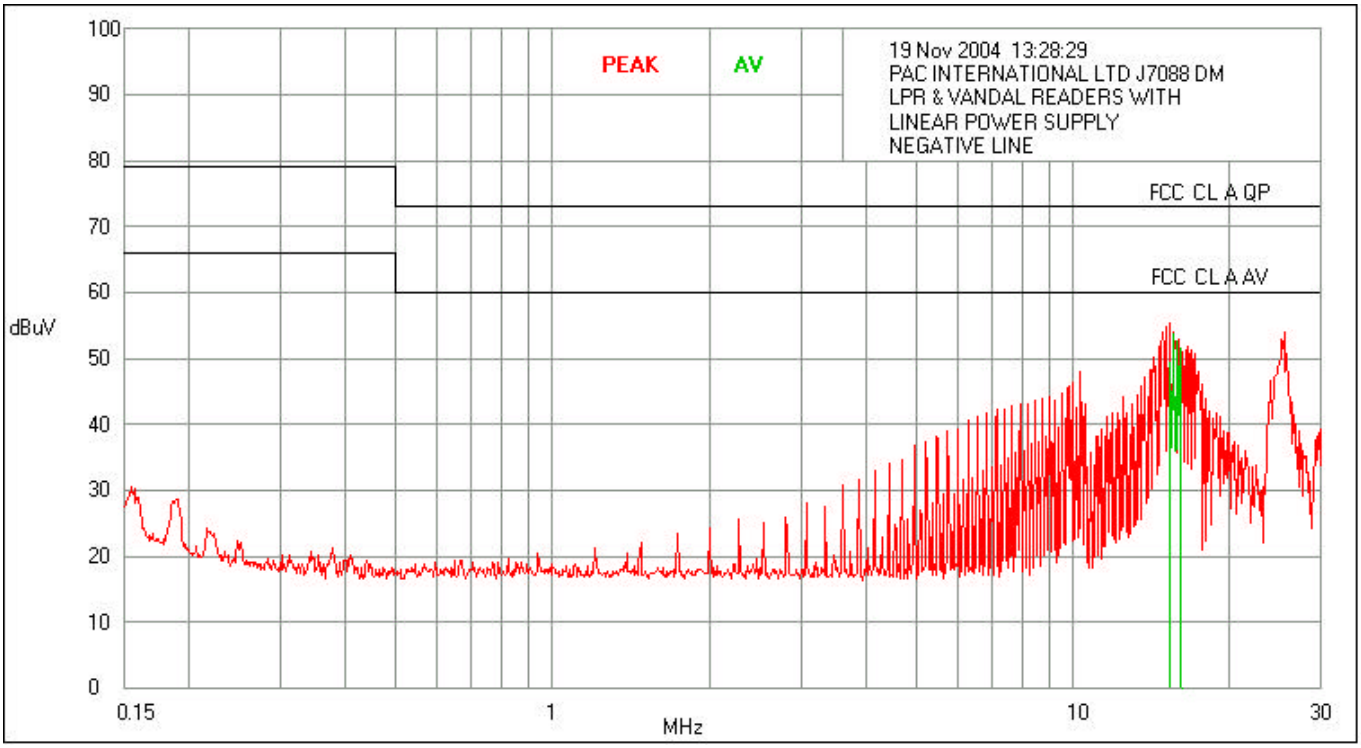
None.



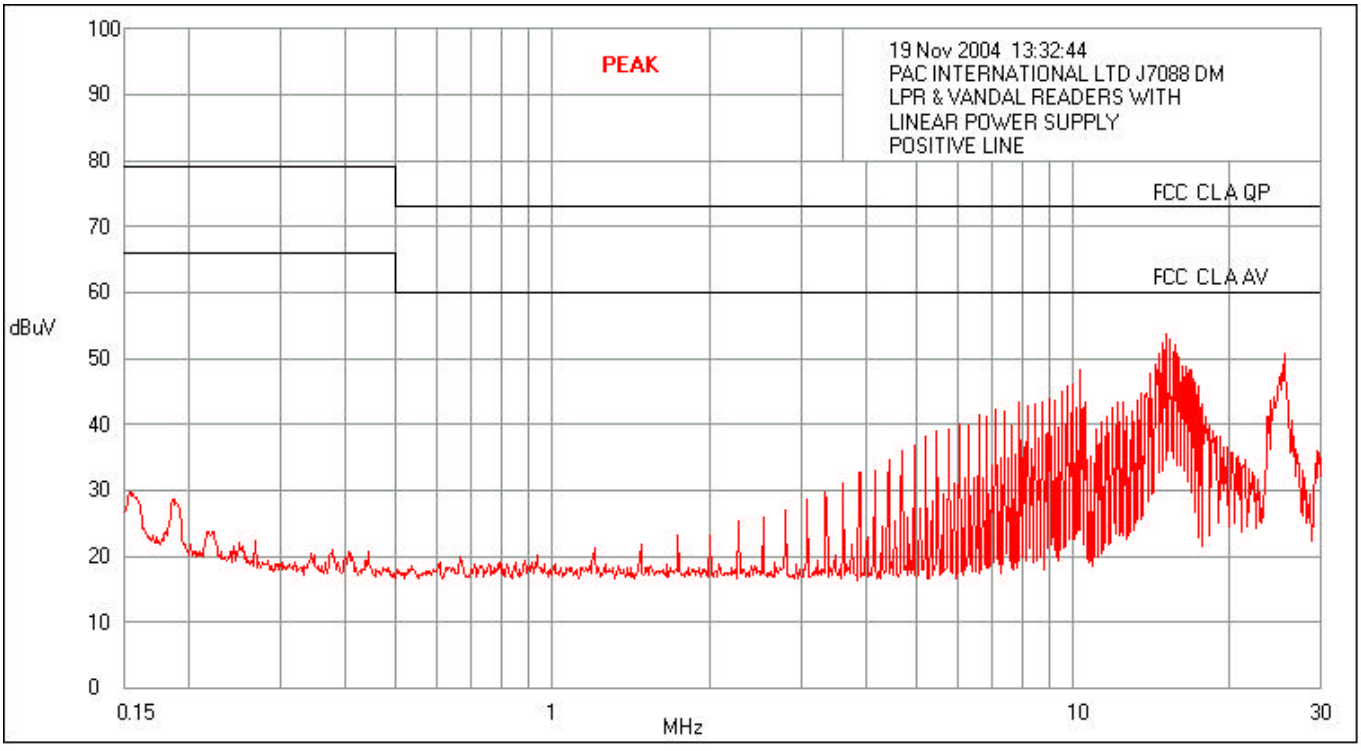
Plot 01



Plot 02



Plot 03



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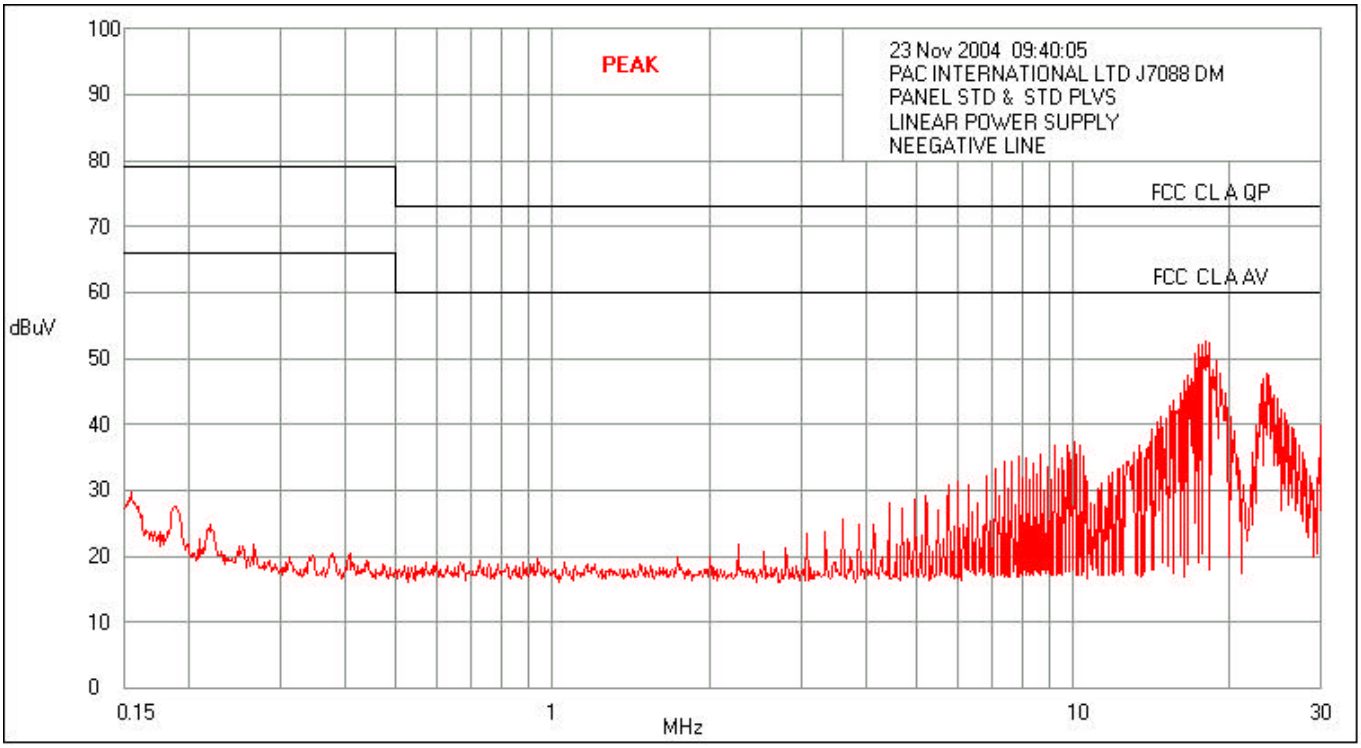

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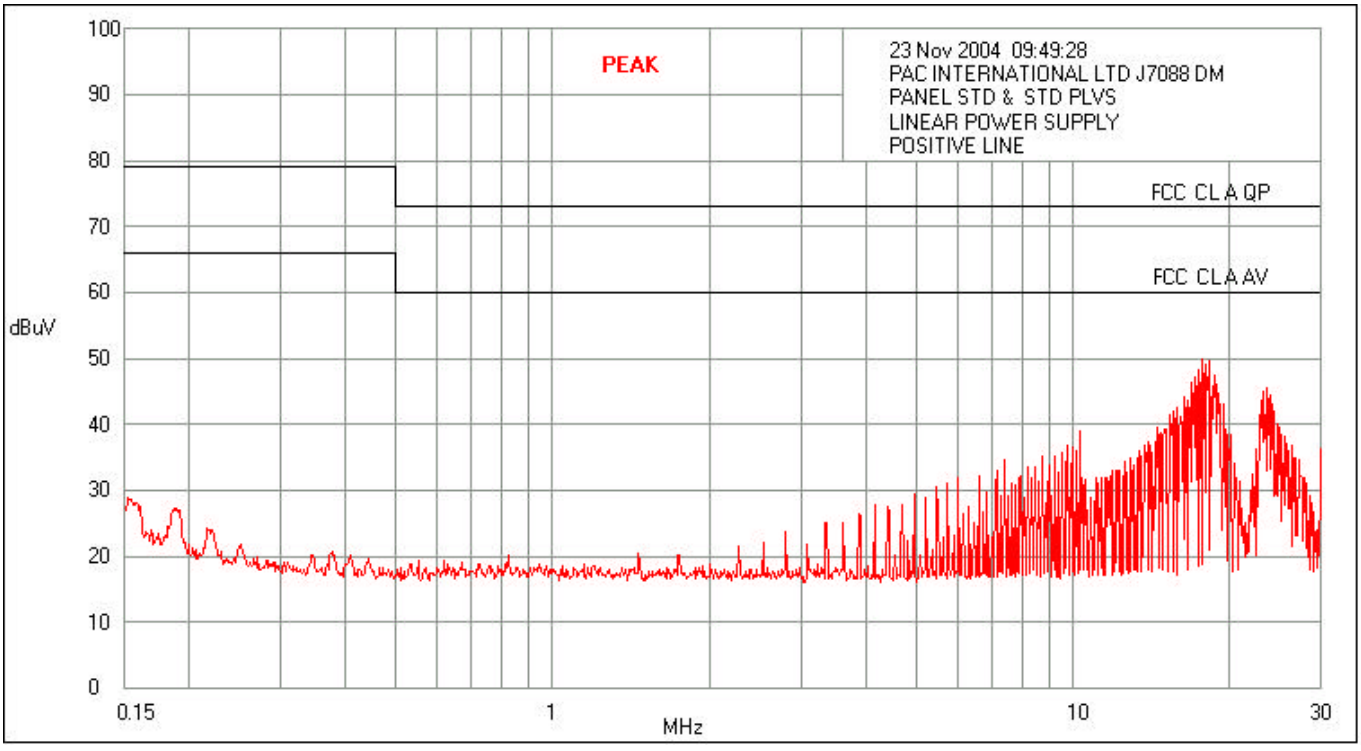

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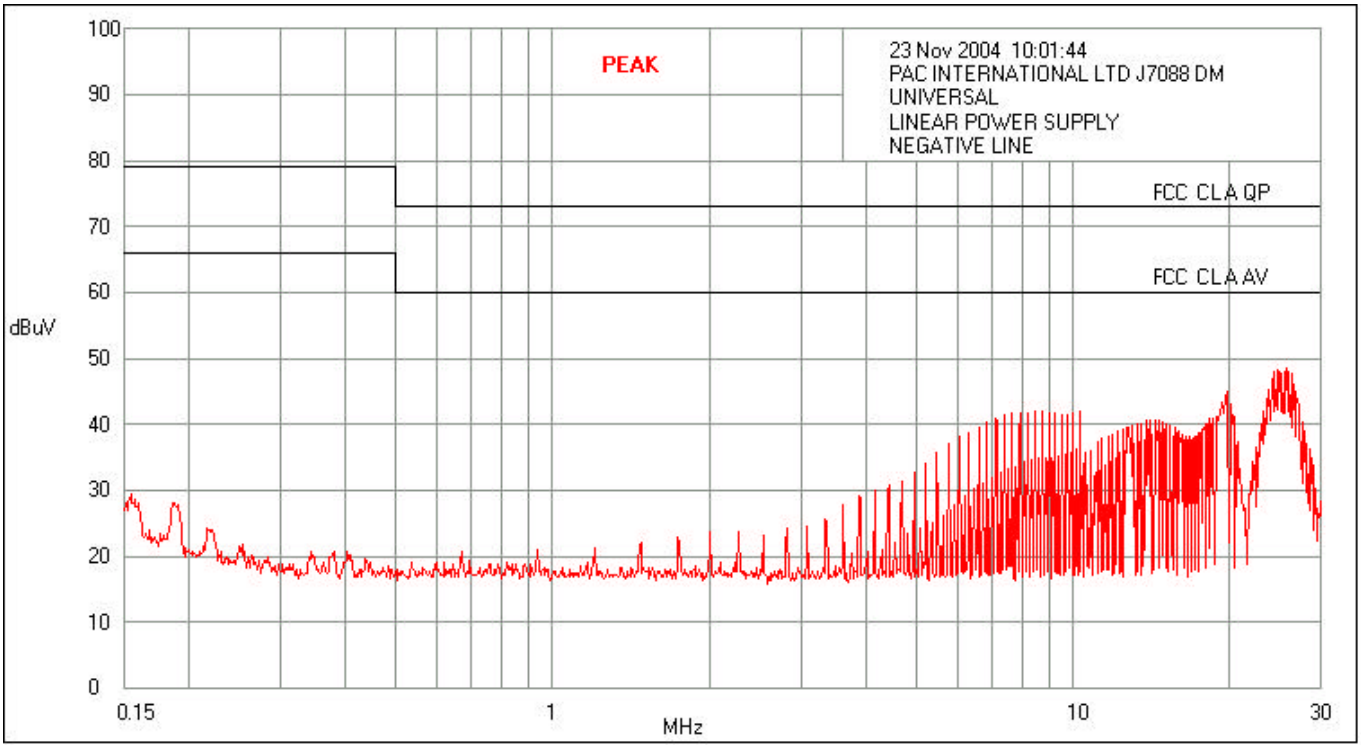
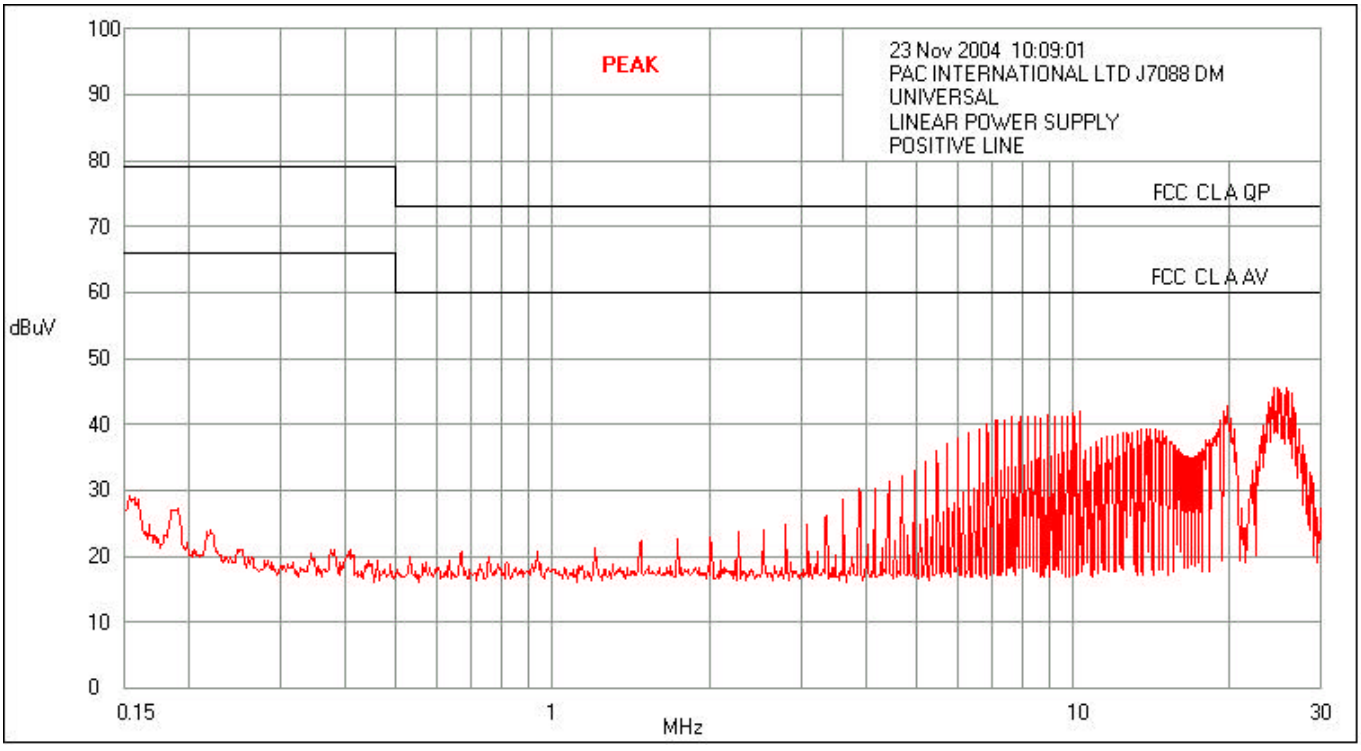
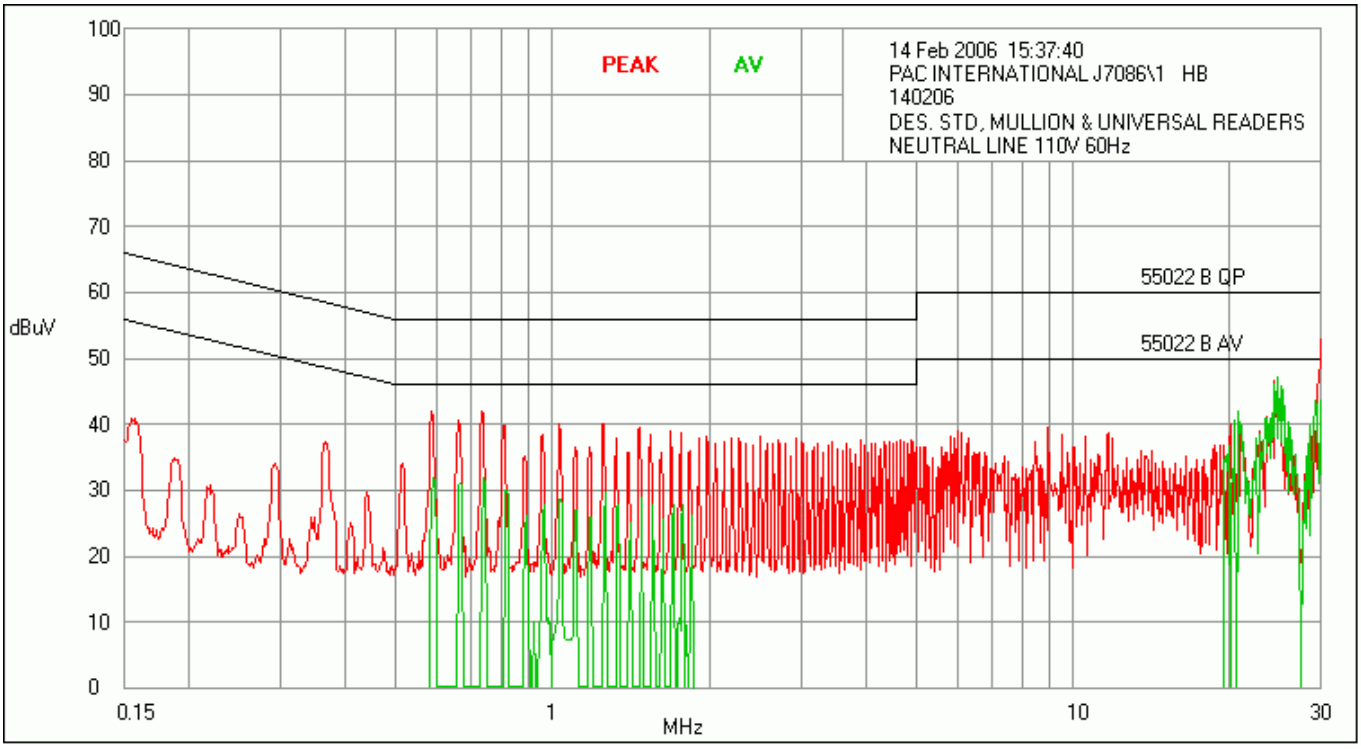


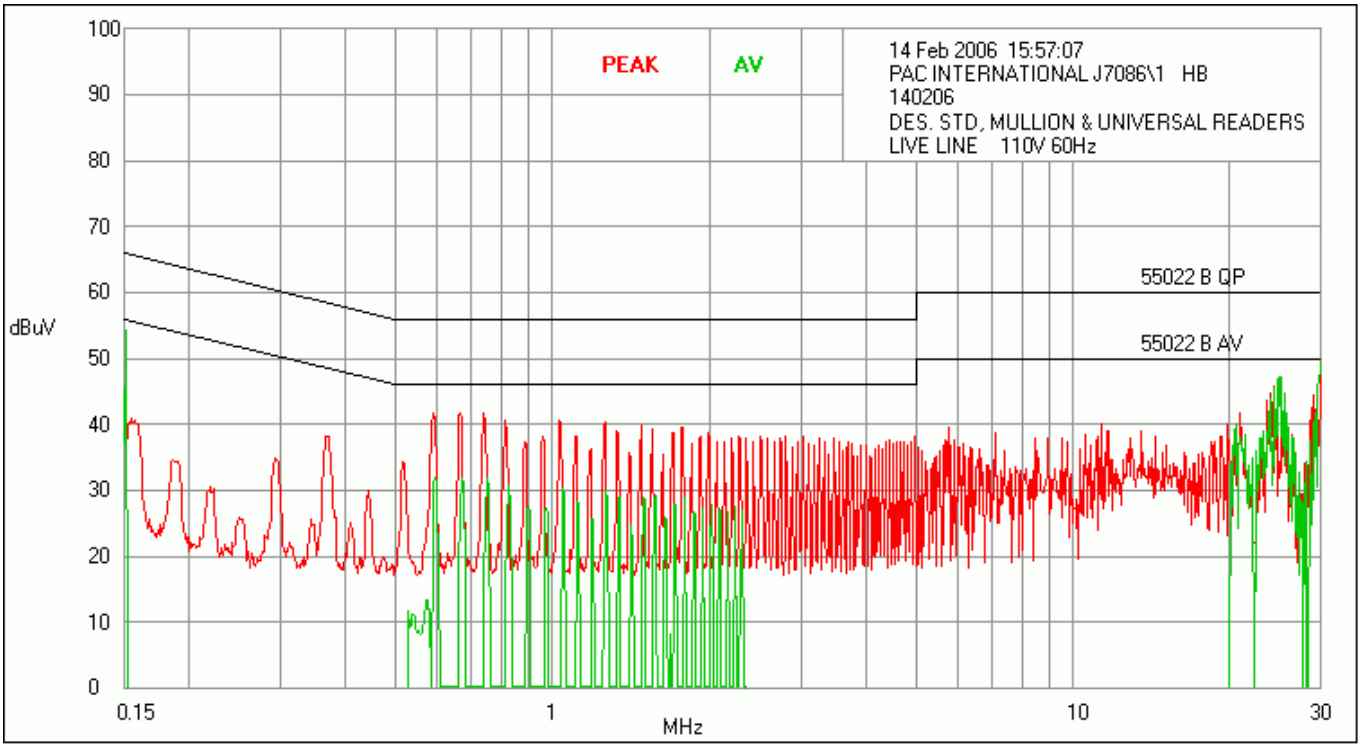
Plot 07



Plot 08



Plot 09



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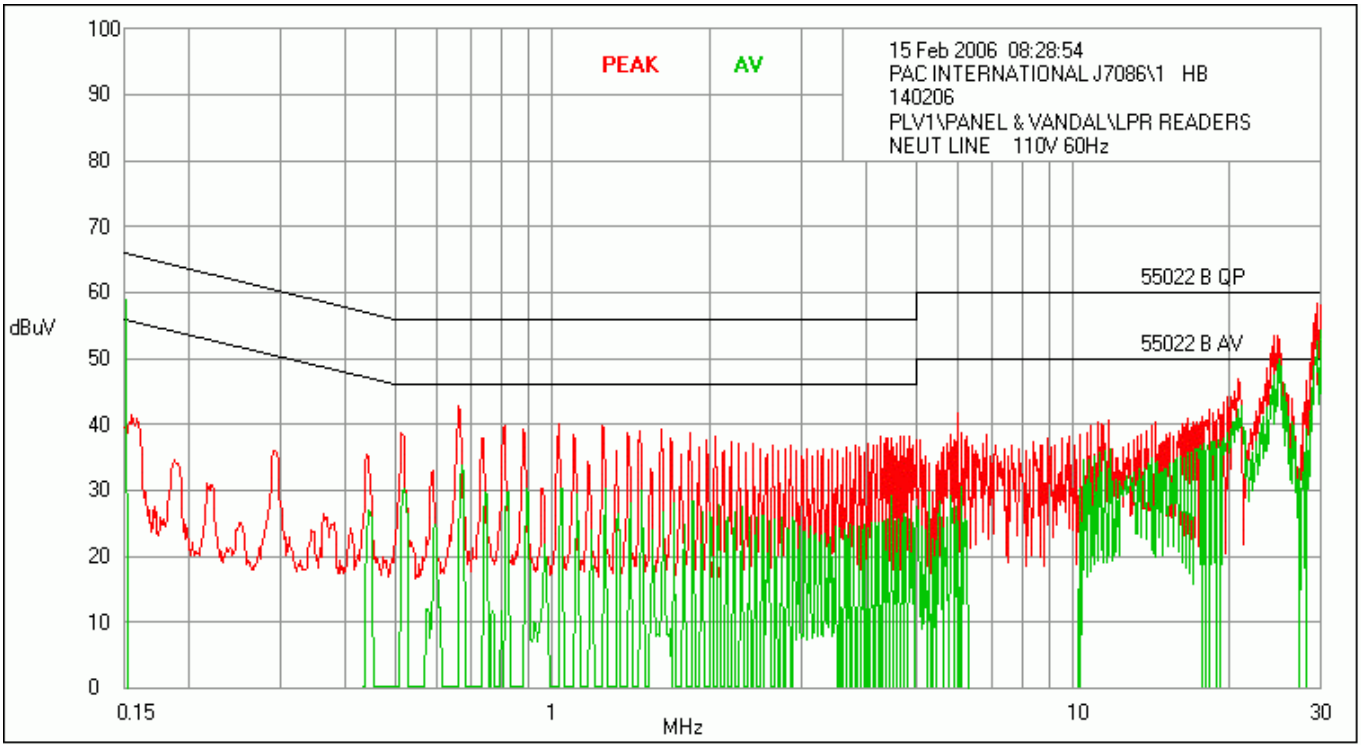
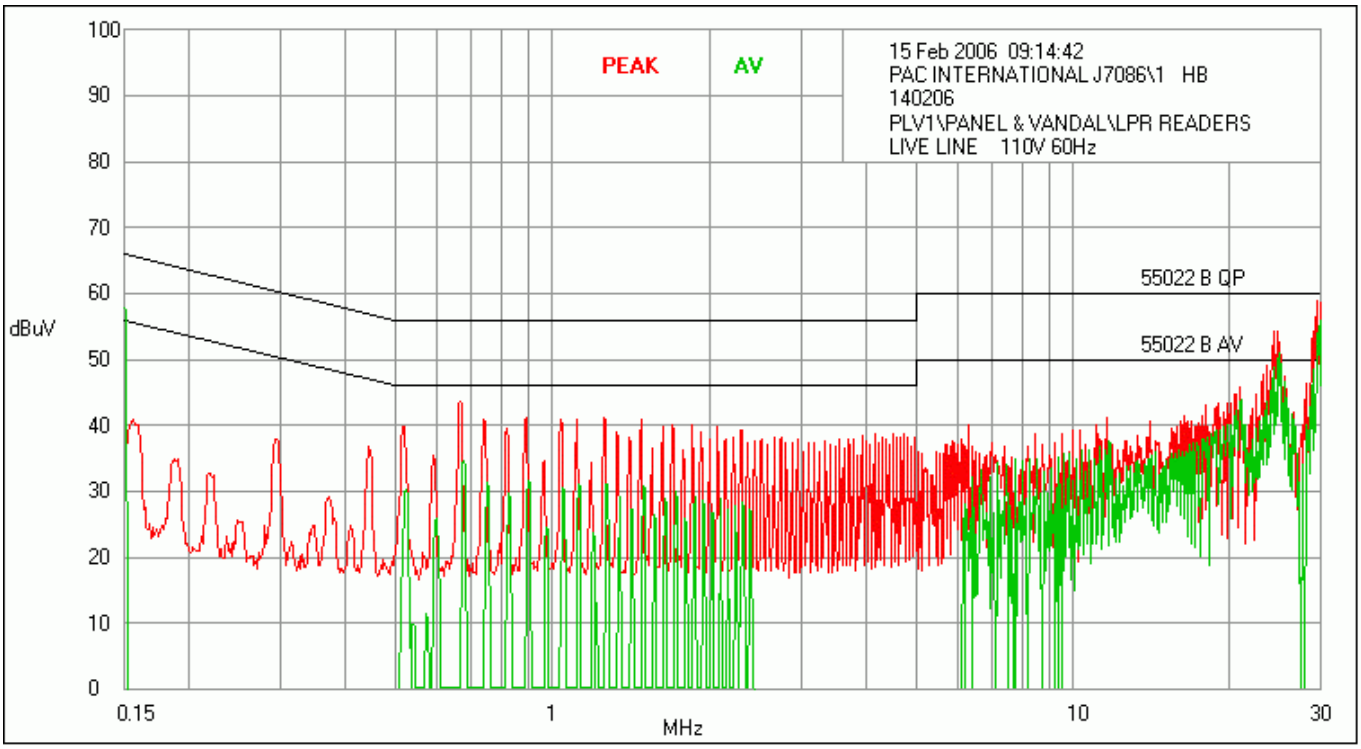


Plot 11



Plot 12

Appendix B

Radiated Emissions <30MHz Plot Log
(Not UKAS Accredited)

EUT: RFID Readers

Specification: CFR 47 Pt 15 Sub Pt C

Test Area: Donibristle Screened Room 2 **Tested by: D. Meade**

Table 1 Plot Log

Plot	Time	Comments
01	13:52	Parallel
02	14:02	Perpendicular
03	13:32	Ambient Perpendicular
04	13:46	Ambient Parallel

Test Area: Donibristle OATS **Tested by: D. Meade**

Table 2 Compliance Measurements

Frequency MHz	Limit dBmV/m	Margin dB	Comment
0.133	-4.26	-29.38	H-Field transposed to E- field
0.4	-25.19	-40.76	

Comments

Two emissions only were detectable when the EUT was tested on the OATS.

Report Number: 1926TR3
Date: 24/02/2006

EMC TEST CENTRE, Donibristle

25. Oct 04 13:52

Magnetic

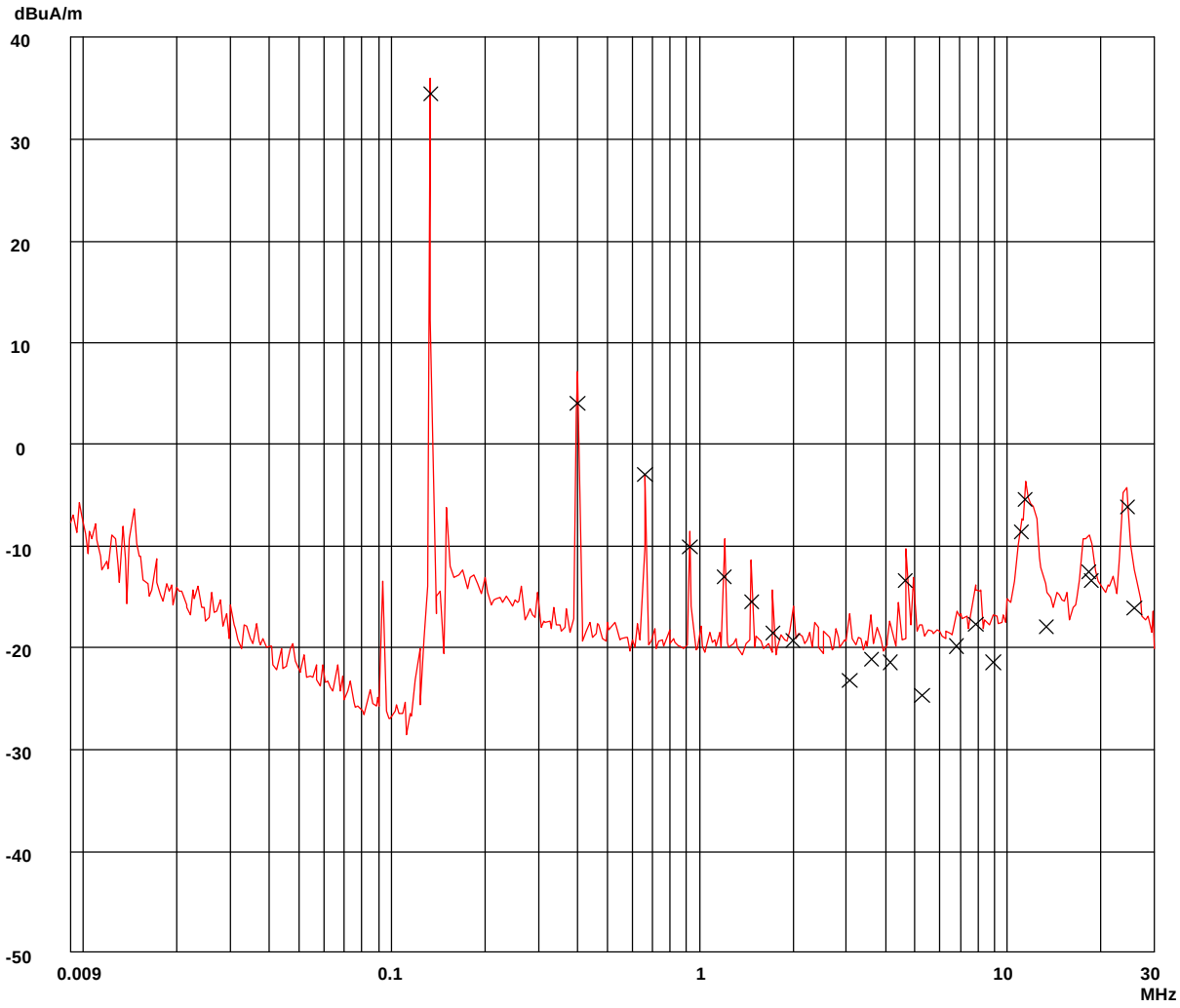
Manuf: PAC
Op Cond: Tx
Operator: GW
Test Spec: CFR 47 Pt15 Sub PtC
Comment: Para

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
9k	150k	100Hz	200Hz	PK	20ms	AUTO	LN ON	60dB
150k	30M	5k	10k	PK	20ms	AUTO	LN ON	60dB

Final Measurement: x QP
Meas Time: 1 s
Subranges: 50
Acc Margin: 10dB

Transducer No.	Start	Stop	Name
5	9k	30M	CABLE
21	9k	30M	LA1162H



Report Number: 1926TR3
Date: 24/02/2006

Plot 01

EMC TEST CENTRE, Donibristle

25. Oct 04 14:02

Magnetic

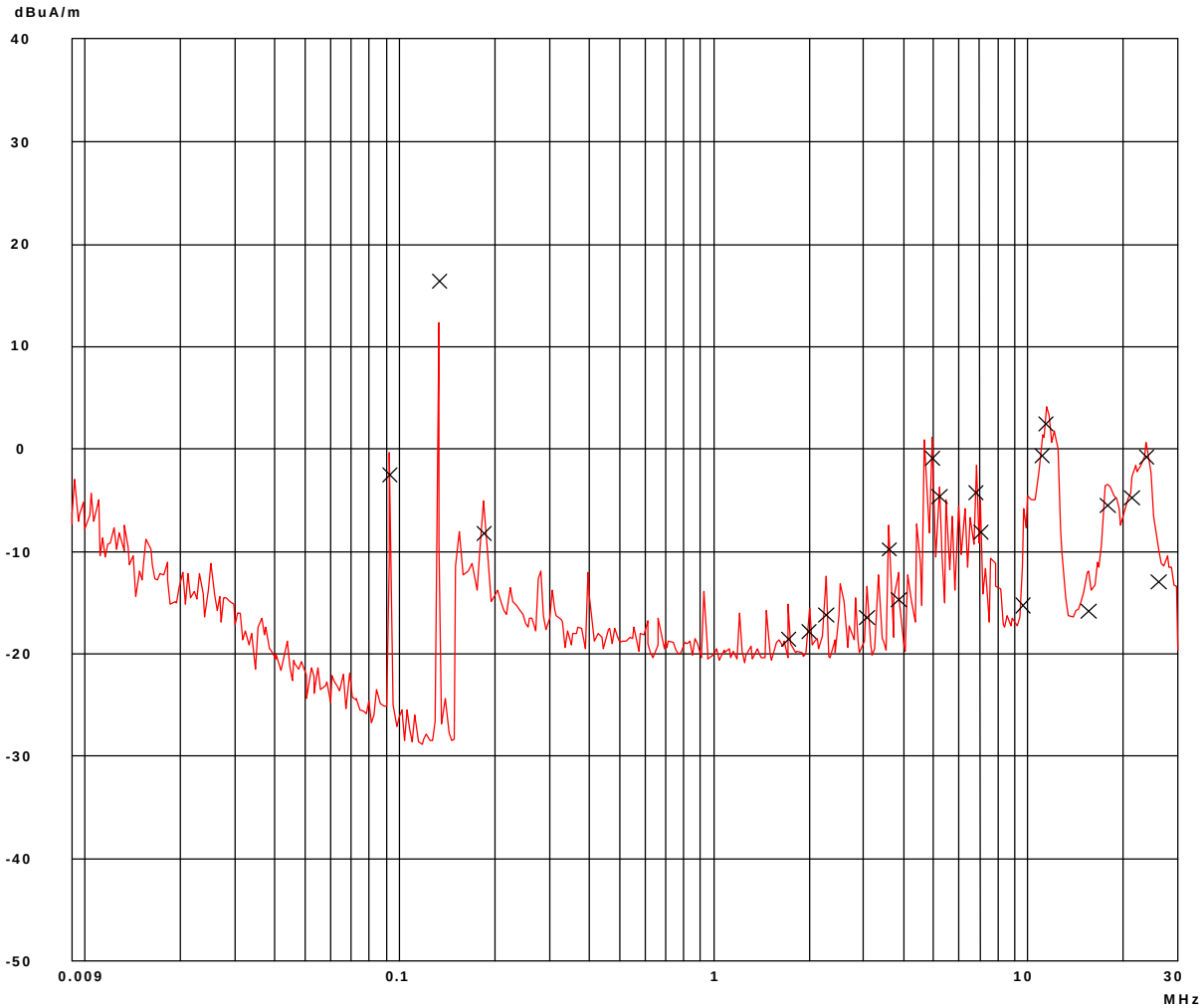
Manuf: PAC
Op Cond: Tx
Operator: GW
Test Spec: CFR 47 Pt15 Sub PtC
Comment: Perp

Scan Settings (2 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
9k	150k	100Hz	200Hz	PK	20ms	AUTO	LN ON	60dB
150k	30M	5k	10k	PK	20ms	AUTO	LN ON	60dB

Final Measurement: x QP
Meas Time: 1 s
Subranges: 50
Acc Margin: 10dB

Transducer No.	Start	Stop	Name
5	9k	30M	CABLE
21	9k	30M	LA1162H



Plot 02

EMC TEST CENTRE, Donibristle

25. Oct 04 13:32

Magnetic

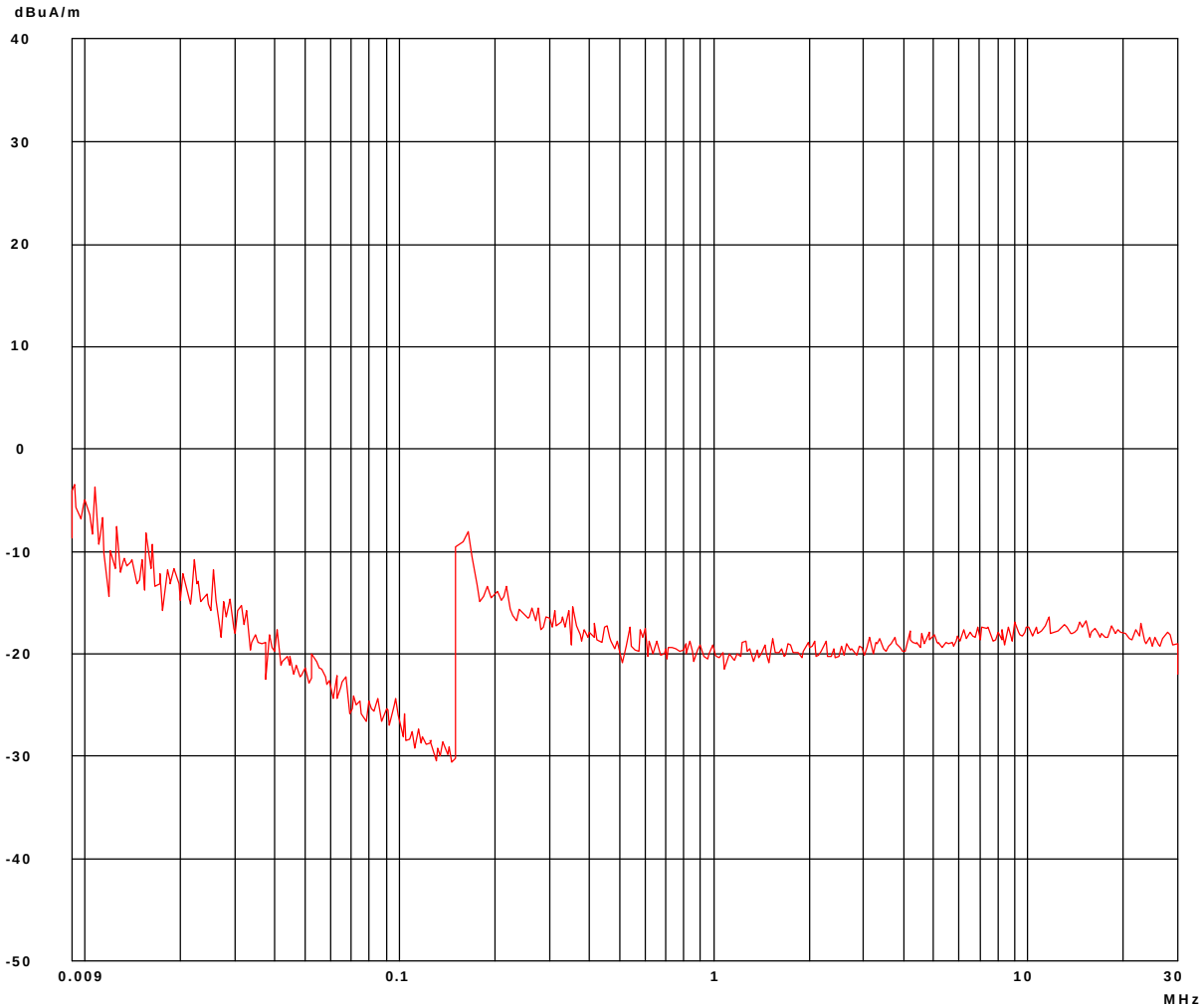
Manuf: PAC
Op Cond: Ambient
Operator: GW
Test Spec: CFR 47 Pt15 Sub PtC
Comment: Perp

Scan Settings (2 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
9k	150k	100Hz	200Hz	PK	20ms	AUTO	LN ON	60dB
150k	30M	5k	10k	PK	20ms	AUTO	LN ON	60dB

Final Measurement: x QP
Meas Time: 1 s
Subranges: 50
Acc Margin: 10dB

Transducer	No.	Start	Stop	Name
5	5	9k	30M	CABLE
	21	9k	30M	LA1162H



Plot 03

Report Number: 1926TR3
Date: 24/02/2006

EMC TEST CENTRE, Donibristle

25. Oct 04 13:46

Magnetic

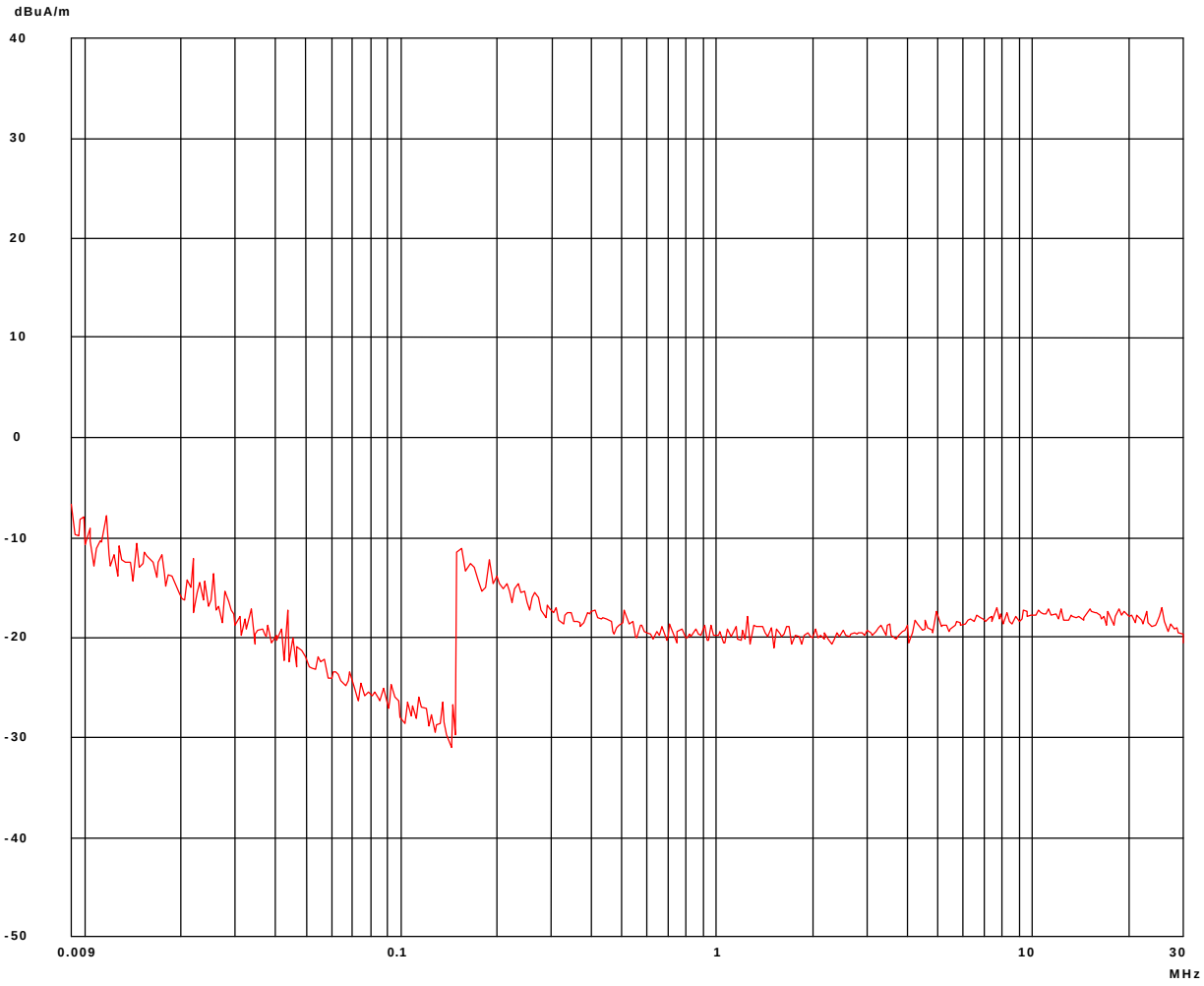
Manuf:	PAC
Op Cond:	Ambient
Operator:	GW
Test Spec:	CFR 47 Pt15 Sub PtC
Comment:	Para

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
9k	150k	100Hz	200Hz	PK	20ms AUTO LN	ON	60dB	
150k	30M	5k	10k	PK	20ms AUTO LN	ON	60dB	

Final Measurement: x QP
Meas Time: 1 s
Subranges: 50
Acc Margin: 10dB

Transducer No.	Start	Stop	Name
5	9k	30M	CABLE
21	9k	30M	LA1162H



Plot 04

Appendix C

Radiated Emissions >30MHz

EUT: RFID Readers

Specification: CFR 47 Pt 15 Sub Pt C

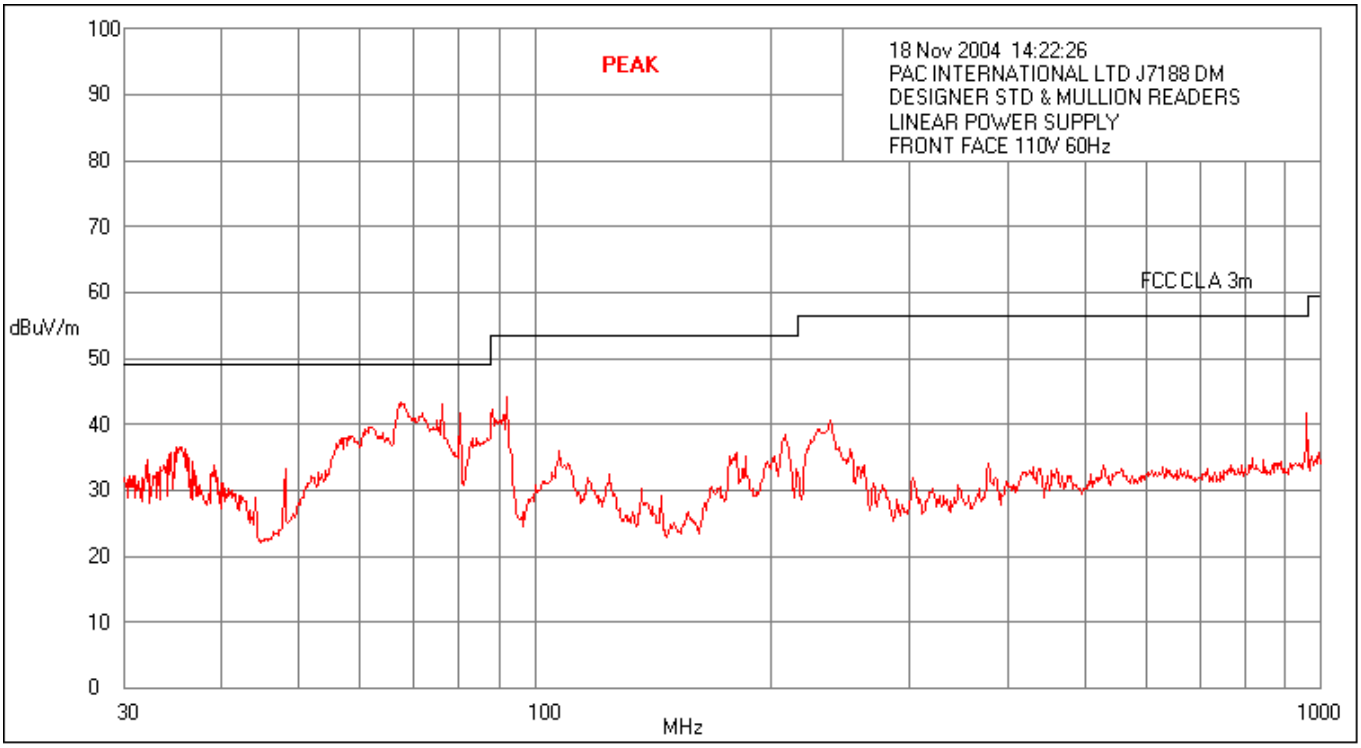
Test Area: Donibristle Screened Room 1 **Tested by: D. Meade**

Table 1 Plot Log

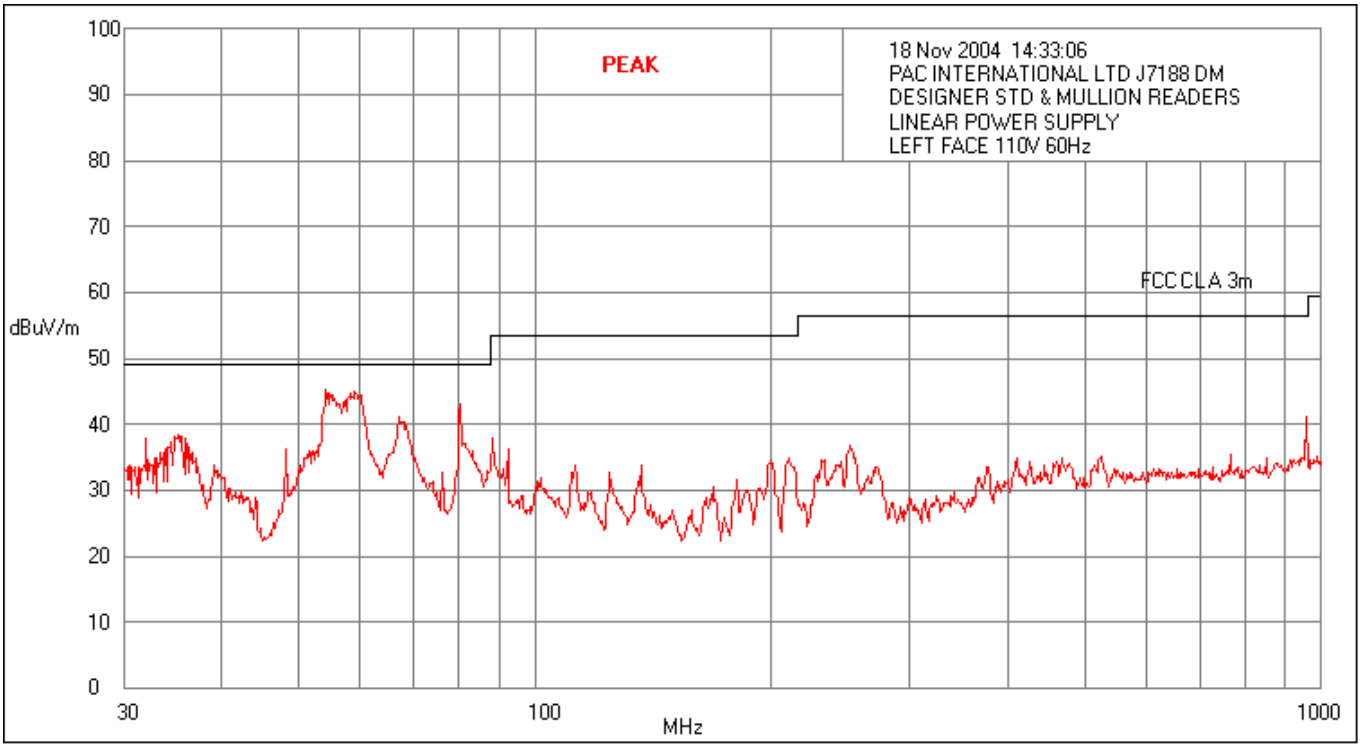
Plot	Time	Comments
		18/11/04
01	14:22:26	Front Face With Designer Standard & Mullion Readers Powered by the Linear Power Supply
02	14: 33:06	Left Face With Designer Standard & Mullion Readers Powered by the Linear Power Supply
03	14:39:14	Rear Face With Designer Standard & Mullion Readers Powered by the Linear Power Supply
04	14:44:22	Right Face With Designer Standard & Mullion Readers Powered by the Linear Power Supply
		19/11/04
05	11:47:59	Front Face With LPR & VANDAL Powered From Linear Supply
06	12:46:18	Left Face With LPR & VANDAL Powered From Linear Supply
07	12:53:46	Rear Face With LPR & VANDAL Powered From Linear Supply
08	12:59:08	Right Face With LPR & VANDAL Powered From Linear Supply
		23/11/04
09	09:14:51	Front Face With Panel Standard & Standard Plus Powered From Linear Supply
10	09:19:09	Left Face With Panel Standard & Standard Plus Powered From Linear Supply
11	09:24:24	Rear Face With Panel Standard & Standard Plus Powered From Linear Supply
12	09:31:38	Right Face With Panel Standard & Standard Plus Powered From Linear Supply
13	10:16:05	Front Face With UNIVERSAL Powered From Linear Supply
14	10:21:21	Left Face With UNIVERSAL Powered From Linear Supply
15	110:25:17	Rear Face With UNIVERSAL Powered From Linear Supply
16	10:29:58	Right Face With UNIVERSAL Powered From Linear Supply

Comments

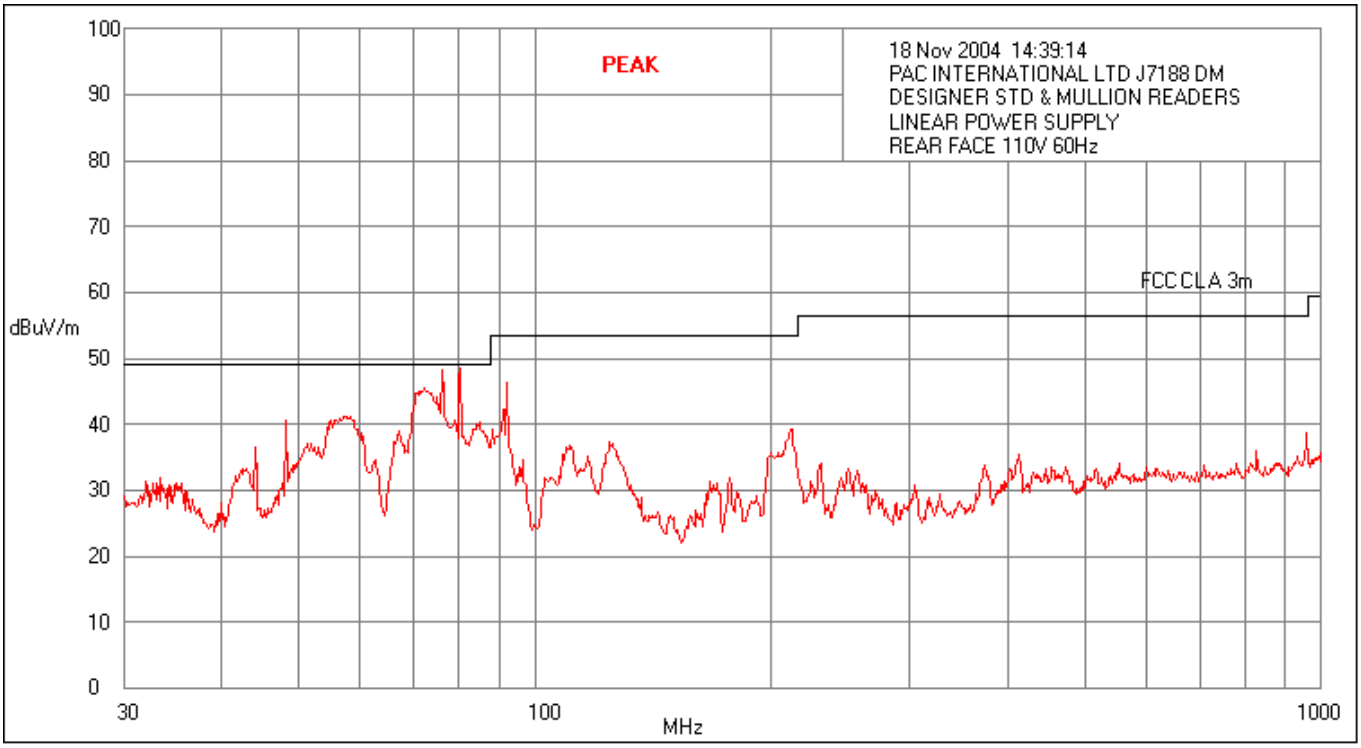
None



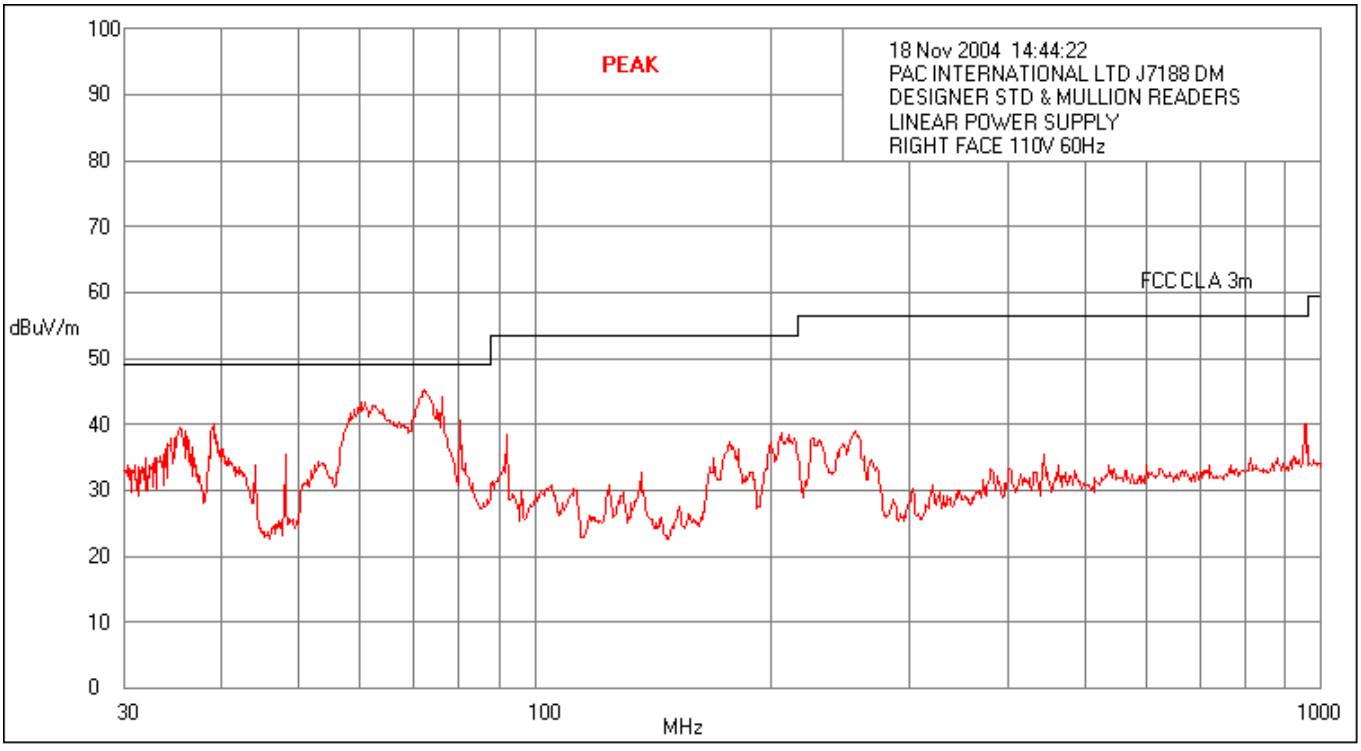
Plot 01



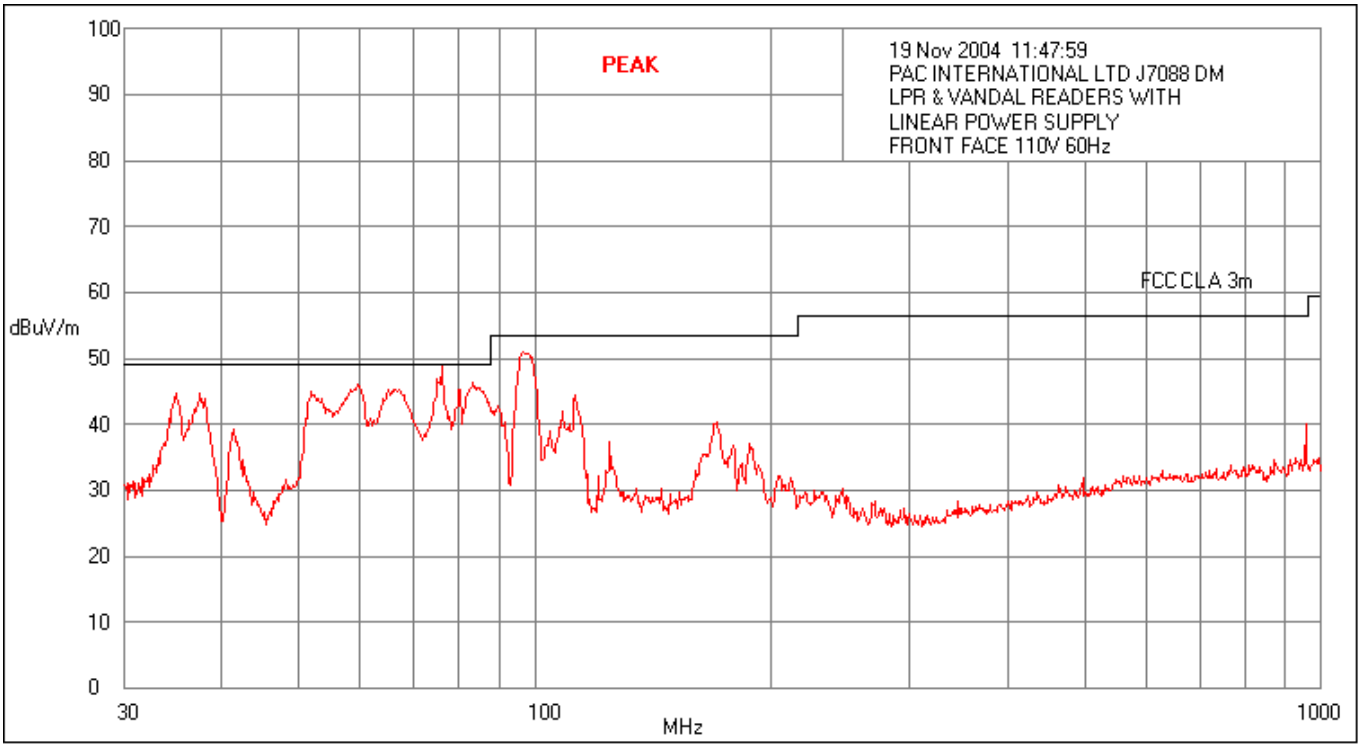
Plot 02



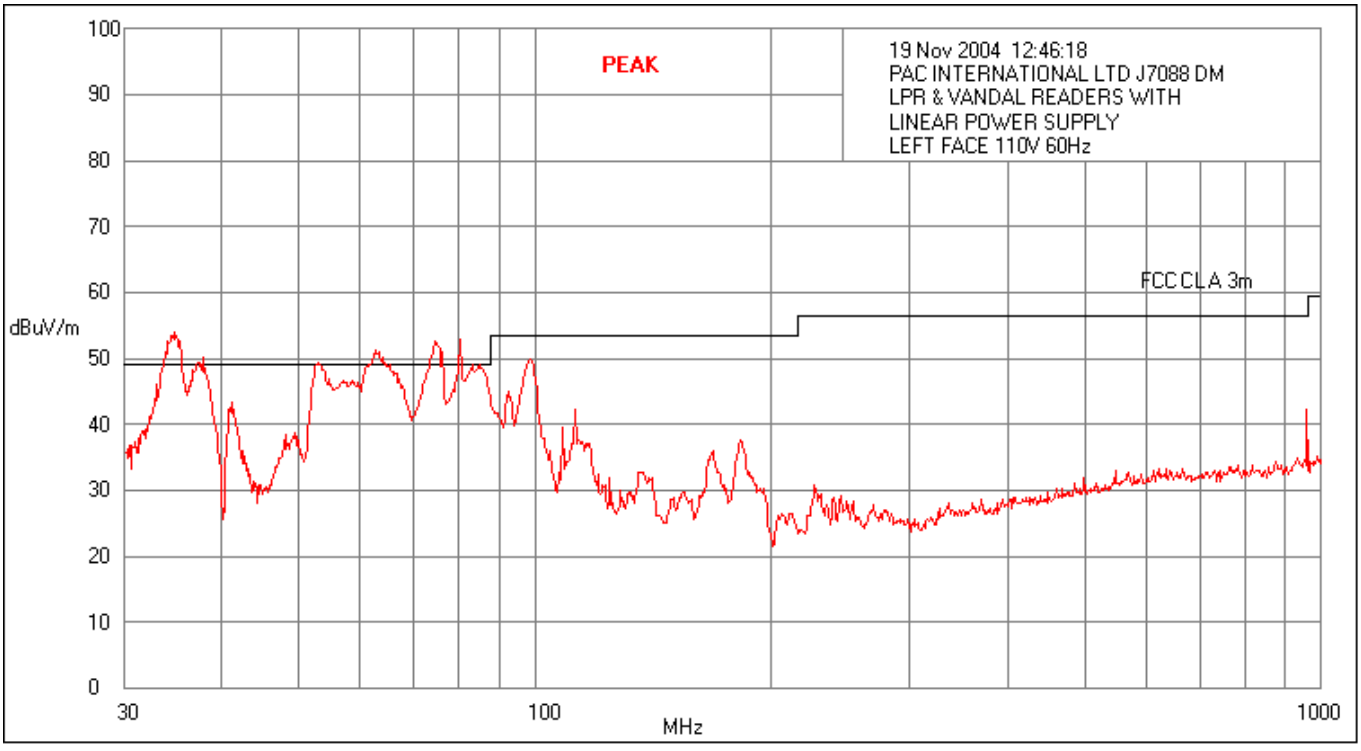
Plot 03



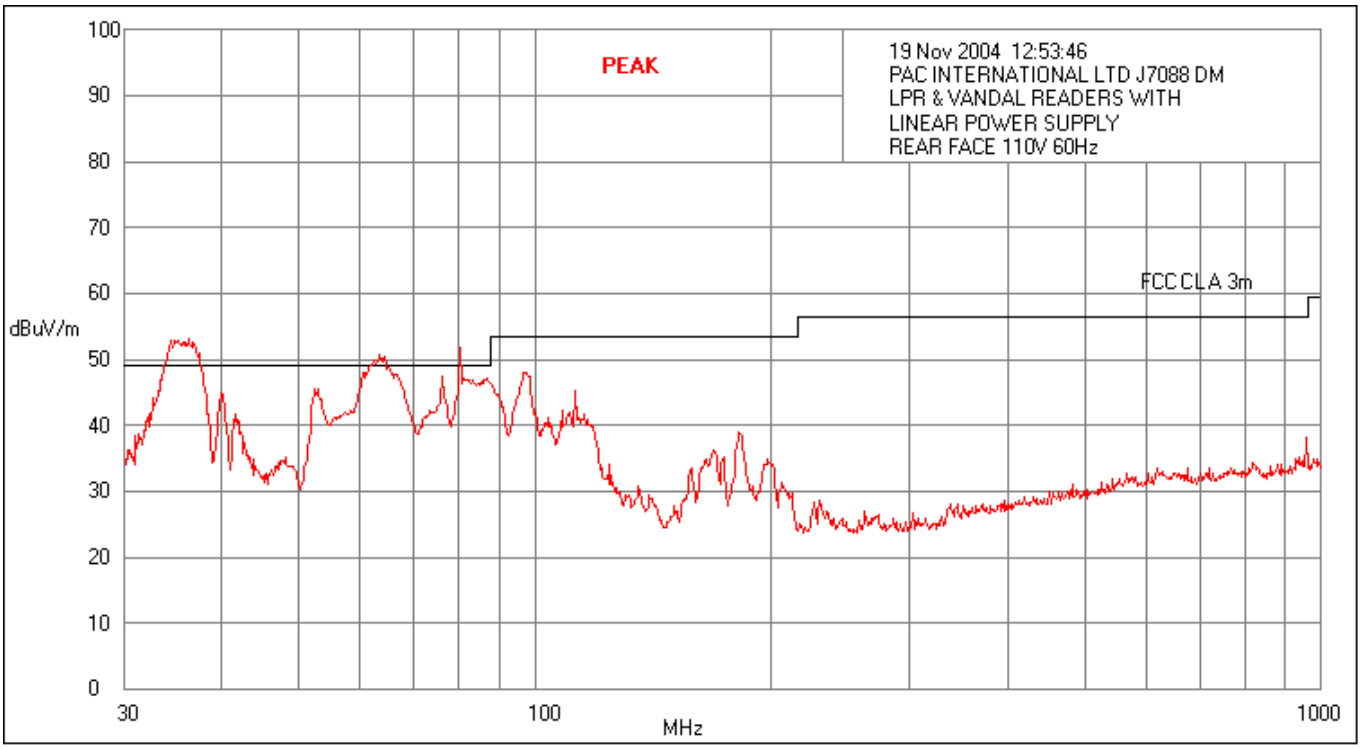
Plot 04



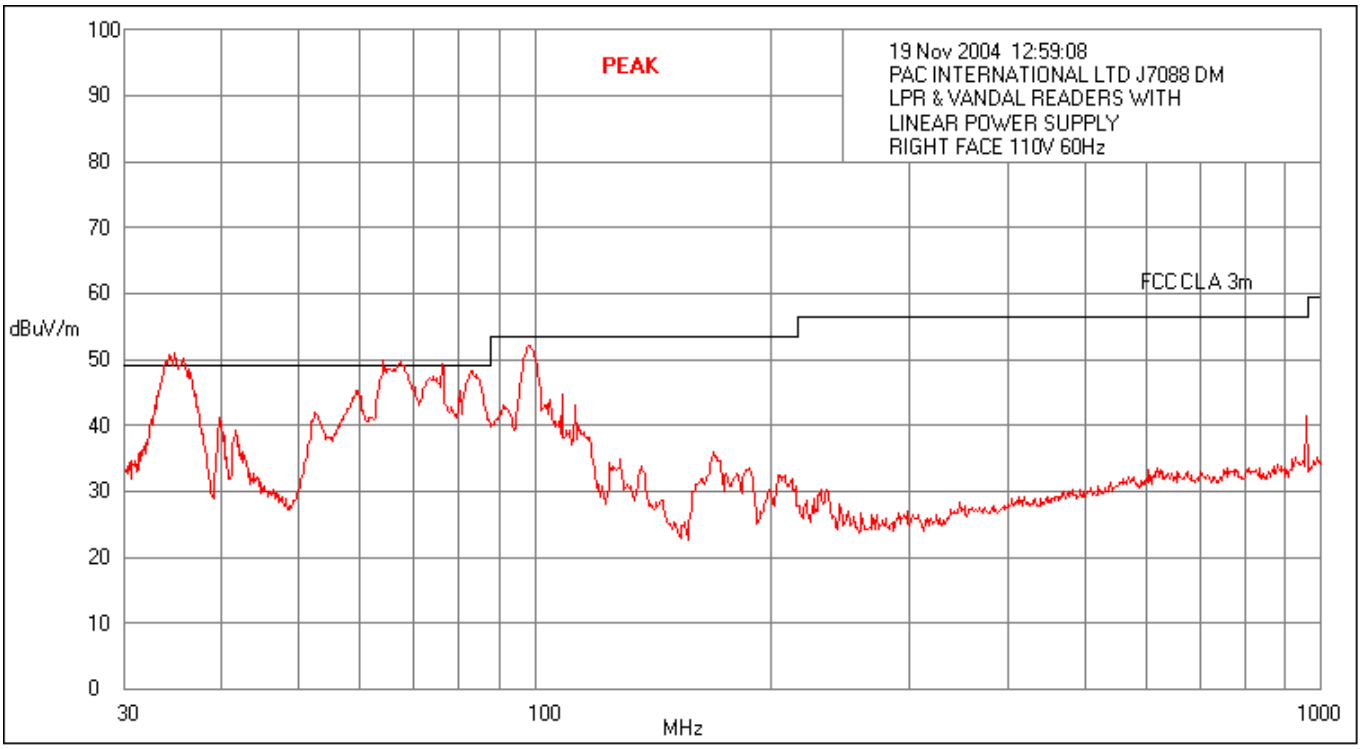
Plot 05



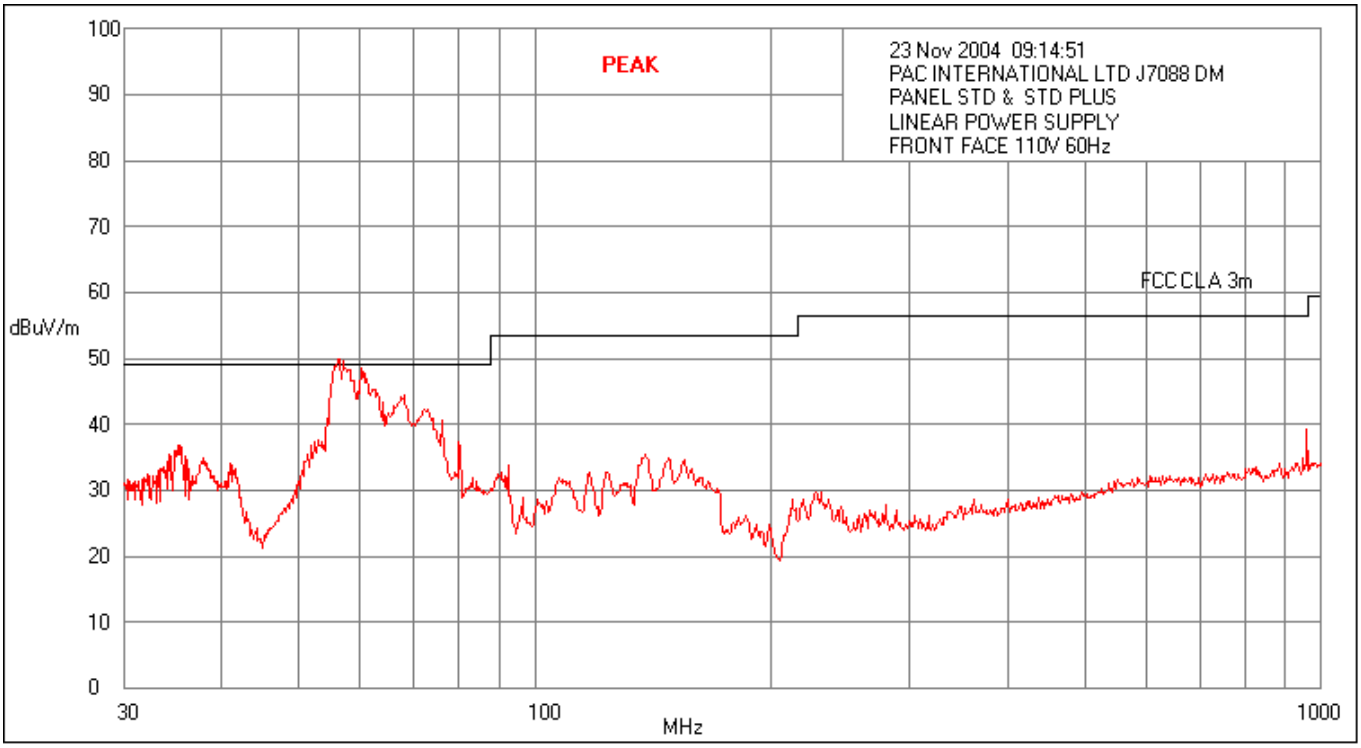
Plot 06



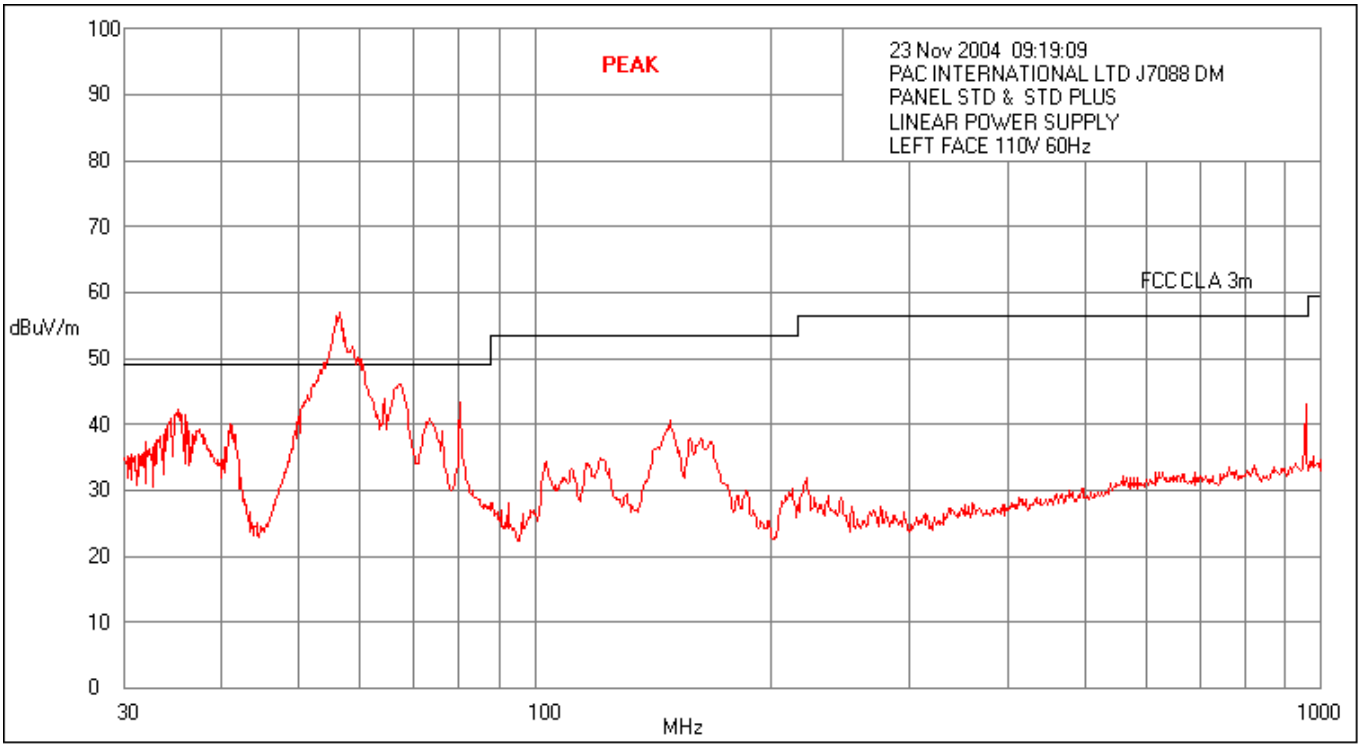
Plot 07



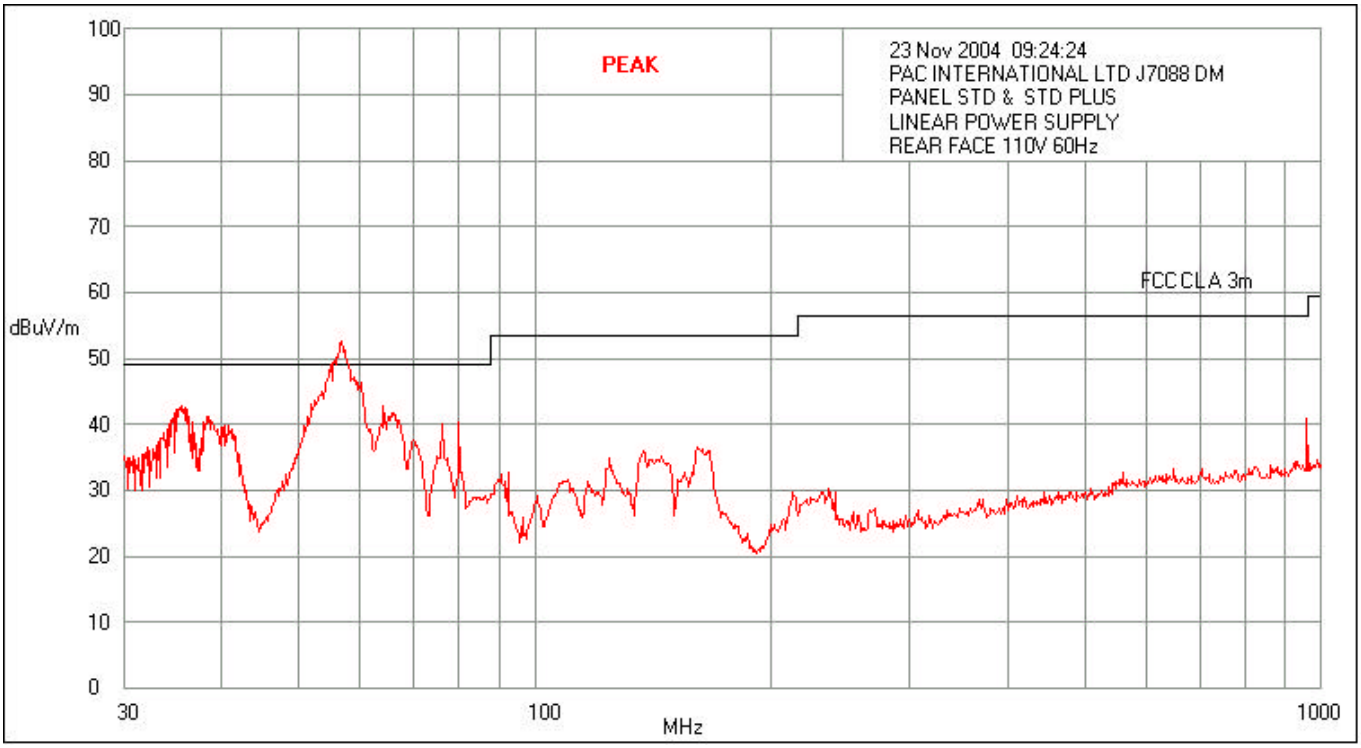
Plot 08



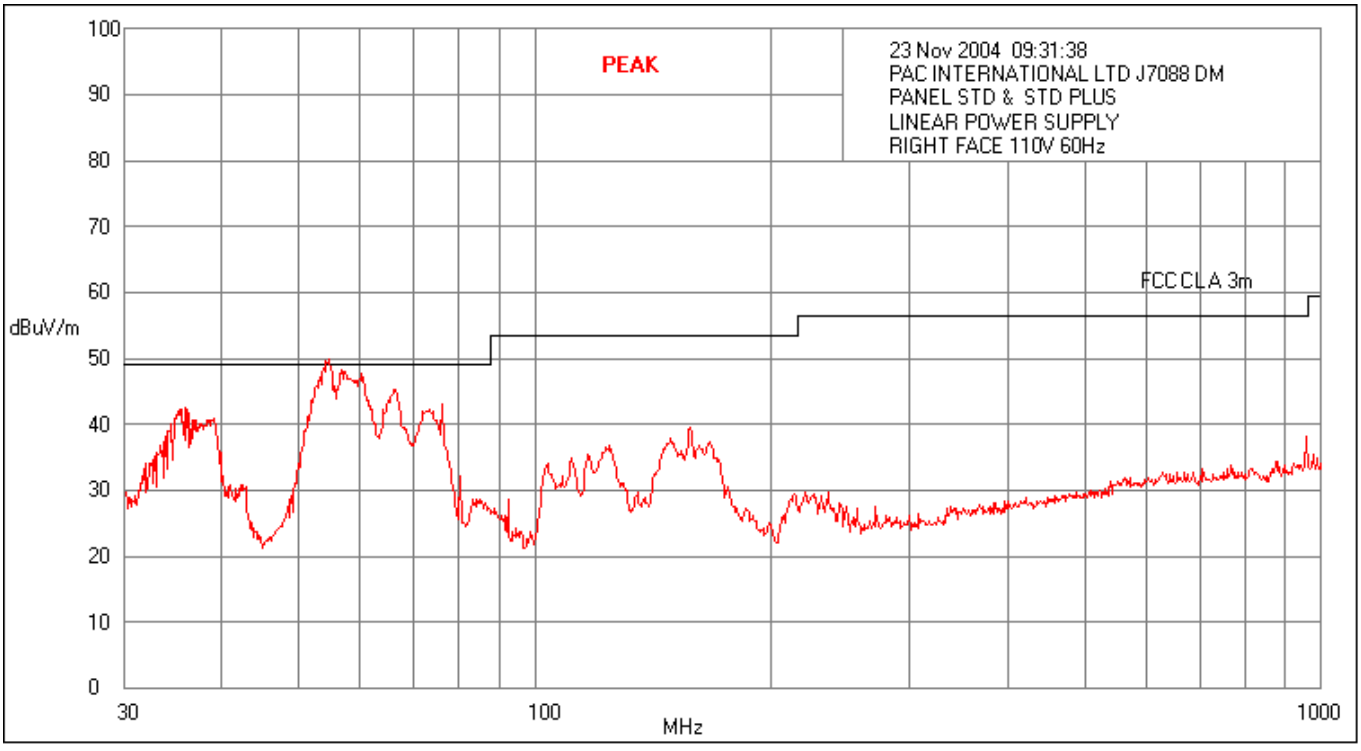
Plot 09



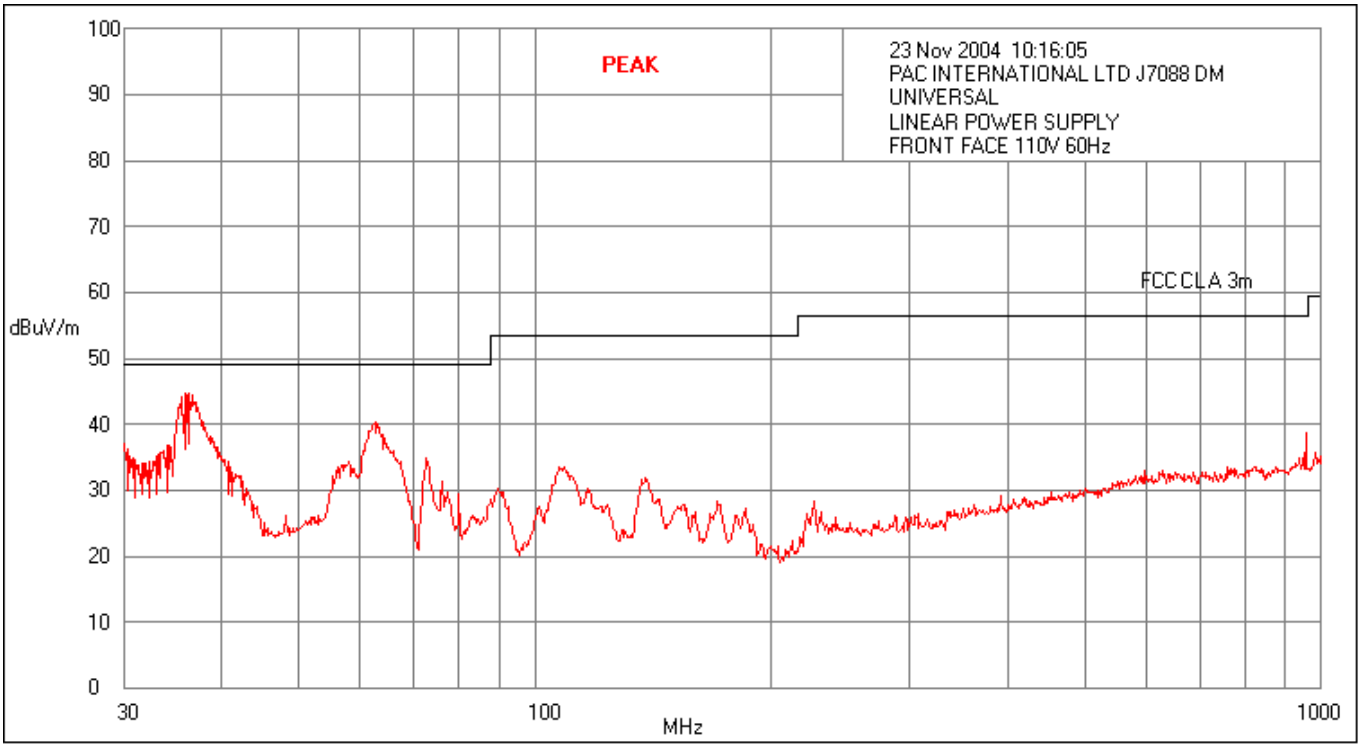
Plot 10



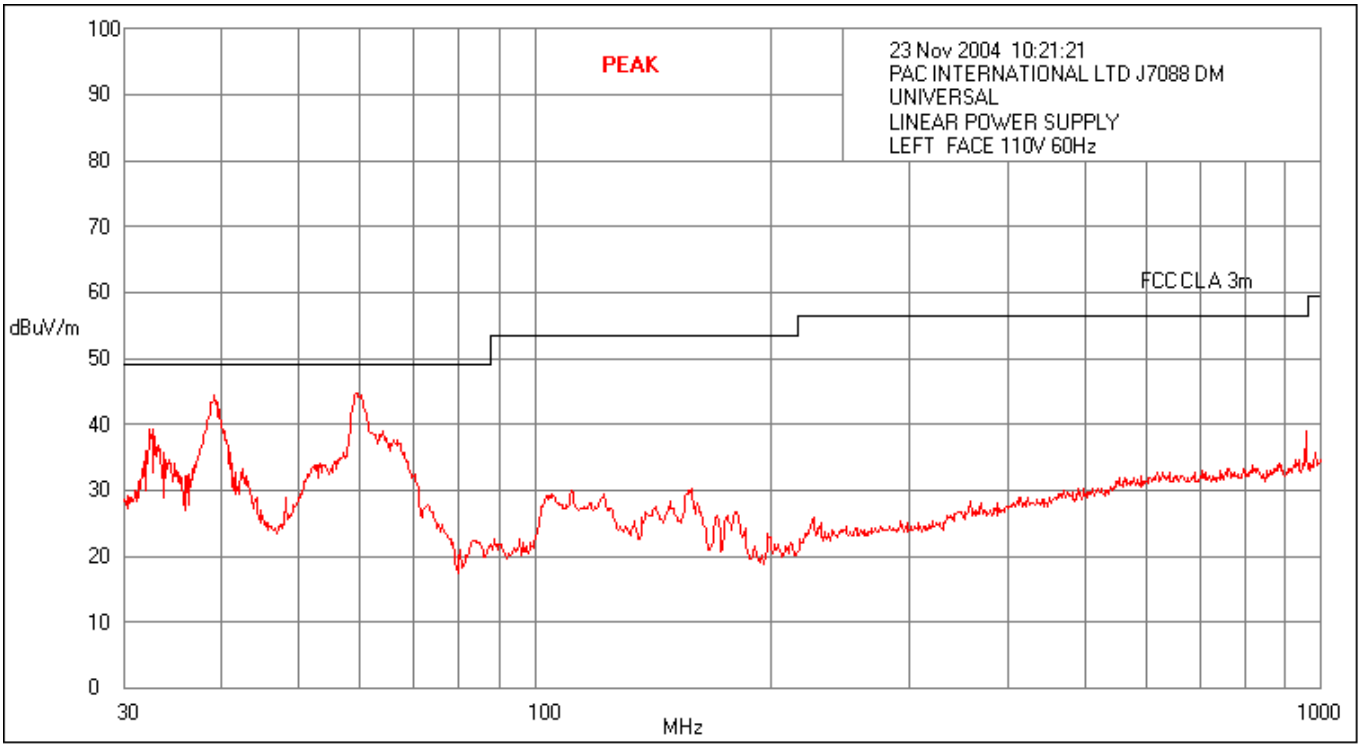
Plot 11



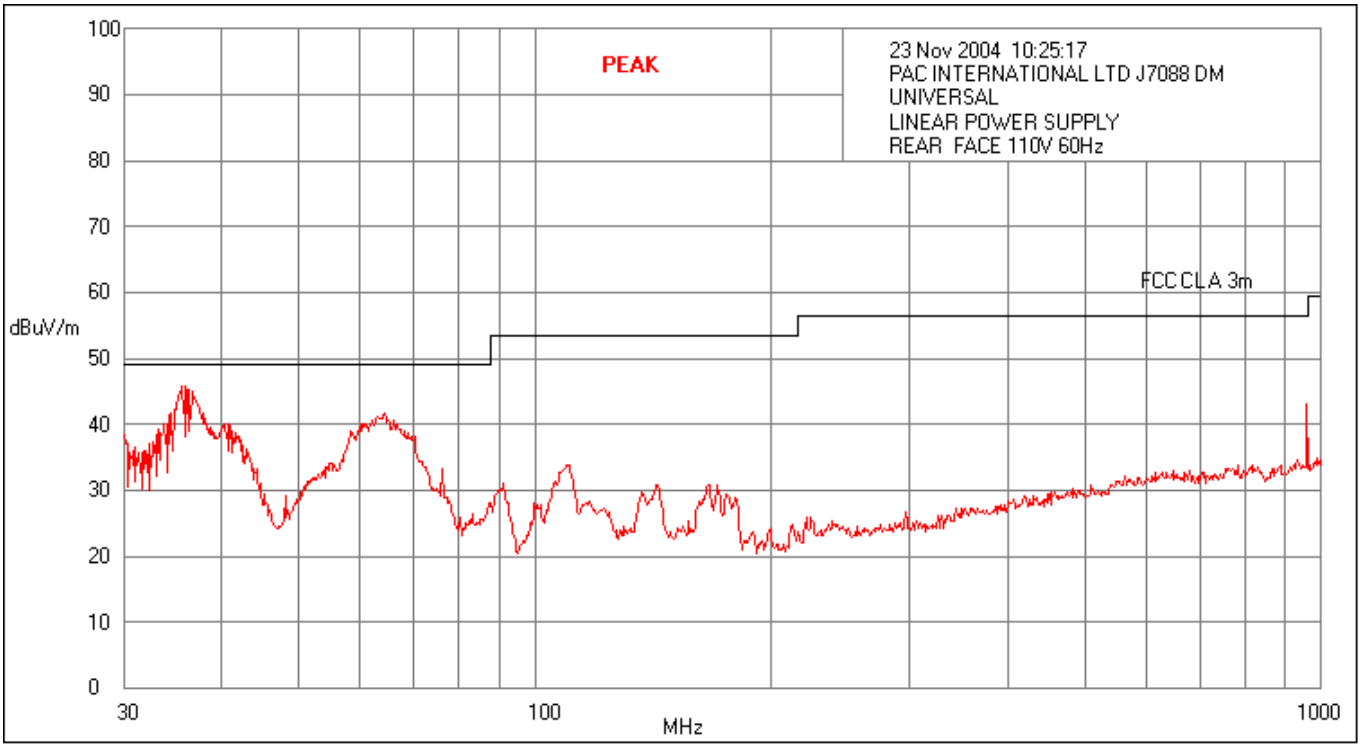
Plot 12



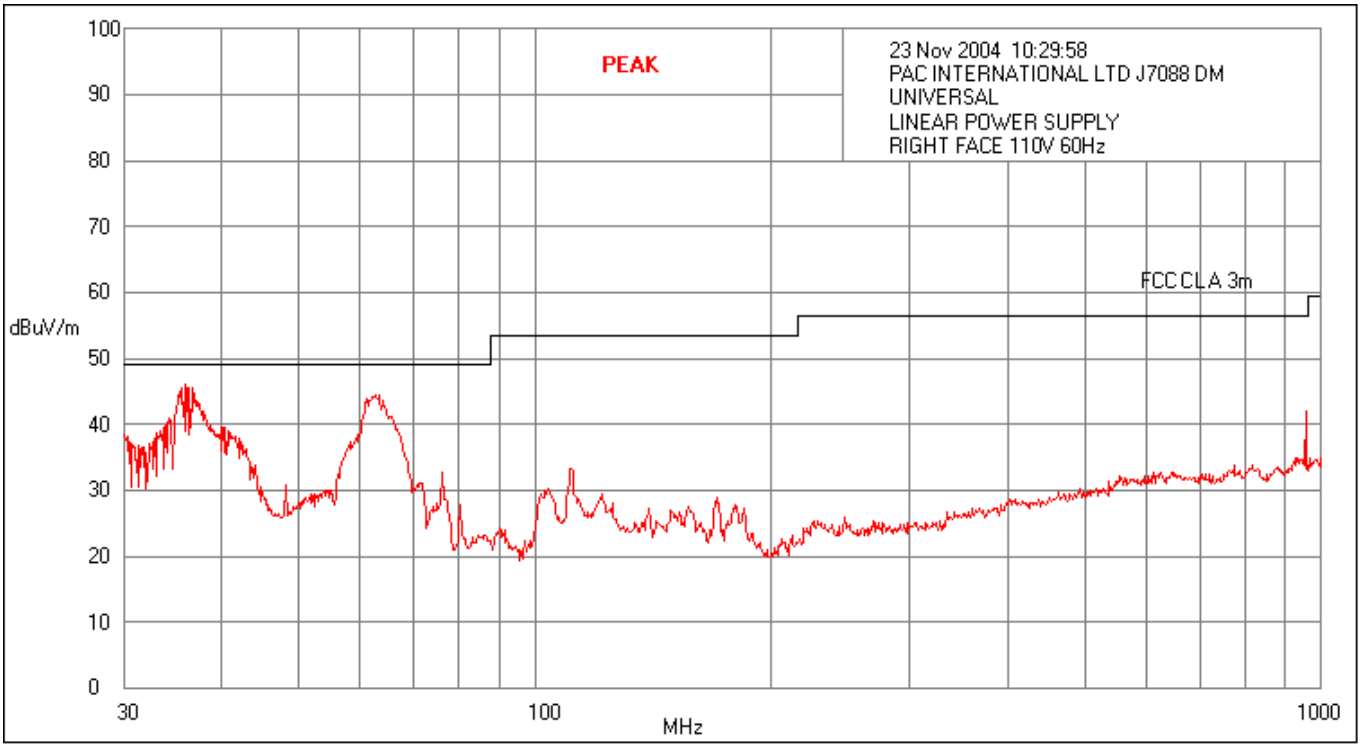
Plot 13



Plot 14



Plot 15



Plot 16

Radiated Emissions Results

Test Area: Donibristle OATS **Tested by: D. Meade**

Frequency MHz	15.209 (a) dBmV/m	Margin dB	Comment
Designer Std & Classic Mullion			
80.0131	39	-2.94	Pass: UNCER LO
76.676	39	-8.04	Pass
72.279	39	-8.84	Pass
55.0757	39	-9.34	Pass
67.3447	39	-10.74	Pass
LPR & Vandal Std			
73.9469	39	9.80	Fail
80.0138	39	5.69	Fail:
76.0133	39	3.99	Fail: UNCER HI
41.474	39	1.82	Fail: UNCER HI
63.8781	39	-0.99	Pass: UNCER LO
35.4728	39	-1.68	Pass: UNCER LO
Panel Std & Std Plus			
56.0082	39	-4.64	Pass: UNCER LO
55.4747	39	-4.74	Pass: UNCER LO
67.61	39	-5.44	Pass
66.2764	39	-5.64	Pass
80.0119	39	-8.54	Pass
UNIVERSAL			
40.0065	39	0.56	Fail: UNCER HI
36.8061	39	-0.84	Pass: UNCER LO
35.7393	39	-2.44	Pass: UNCER LO
62.277	39	-6.74	Pass
59.3431	39	-9.04	Pass

Frequency MHz	15.109 (b) dBmV/m	Margin dB	Comment
Designer Std & Classic Mullion			
80.0131	39	-12.48	Pass
76.676	39	-17.58	Pass
72.279	39	-18.38	Pass
55.0757	39	-18.88	Pass
67.3447	39	-20.28	Pass
LPR & Vandal Std			
80.0138	39	-3.85	Pass: UNCER LO
76.0133	39	-5.55	Pass
41.474	39	-7.72	Pass
73.9469	39	0.26	Fail: UNCER HI
63.8781	39	-10.53	Pass
35.4728	39	-11.12	Pass
Panel Std & Std Plus			
56.0082	39	-14.18	Pass
55.4747	39	-14.28	Pass

67.61	39	-14.8	Pass
66.2764	39	-15.18	Pass
80.0119	39	-18.08	Pass
UNIVERSAL			
40.0065	39	-8.98	Pass
36.8061	39	-10.38	Pass
35.7393	39	-11.98	Pass
62.277	39	-16.28	Pass
59.3431	39	-18.58	Pass

Comments:

List of the highest signal levels measured during tests.

The emissions marked UNCER LO or UNCER HI were found to fall within the uncertainty relative to the specification limit. The compliance statements above are therefore made at a lower than 95% confidence level. The measured results, however, indicate that compliance/non compliance is more probable than non compliance/compliance.

Appendix D

Tx Output Power & Frequency, H Field

EUT: RFID Readers

Specification: CFR47Part15 Subpart A (EN 300 330-2: V1.1.1) **Not UKAS Accredited**

Test Area: Donibristle Screened Room 3 **Tested by: D. Meade**

TEST RESULTS						
TEST CONDITIONS				Frequency	Pwr Pk	Pwr QP
				kHz	dBuV	dBuV
T nom	21deg C	V nom	18	133.37	112.2	112
		V min	9.5	133.37	109	108.8
		V max	30.8	133.37	112.2	112
T min	-20 deg C	V nom	18	133.37	111.6	111.4
		V min	9.5	133.37	108.3	112
		V max	30.8	133.37	111.6	111.4
T max	55 deg C	V nom	18	133.37	112.5	112.3
		V min	9.5	133.37	109.4	109.3
		V max	30.8	133.37	112.6	112.3
T nom	21deg C	V nom	18	133.37	112.3	112
		V min	9.5	133.37	109	108.9
		V max	30.8	133.37	112.2	112