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Compliance test report ID 223019-1R1TRFEMC

Date of issue
November 2, 2012

- FCC 47 CFR Part 15, Subpart B – Verification
- ICES-003 Issue 5 August 2012

Applicant	Research In Motion Limited
Product	BlackBerry Multimedia Pod
Rim part number	HDW-45069-001
Model	6694-100D-0183

Nemko Canada Inc., a testing laboratory, is accredited by the Standards Council of Canada. The tests included in this report are within the scope of this accreditation

SCC Accredited LAB
LAB Accrédité CCN

Test location

Nemko Canada Inc.
303 River Road
Ottawa, ON, K1V 1H2
Canada

Telephone +1 613 737 9680
Facsimile +1 613 737 9691
Toll free +1 800 563 6336
Website www.nemko.com

Tested by David Duchesne, Senior EMC/Wireless Specialist and Predrag Golic, EMC Specialist

Reviewed by Daniel Hynes, Senior EMC Specialist — November 2, 2012 **Date**

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contained in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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Table of Contents

Section 1 Report summary

1.1 Test specifications

- FCC 47 CFR Part 15, Subpart B – Verification
- ICES-003 Issue 5 August 2012

1.2 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See "Summary of test results" for full details.

1.3 Exclusions

None

1.4 Test report revision history

R1: Report updated to include radiated emissions testing above 1 GHz as well as cosmetic changes requested by the customer.

Section 2 Summary of test results

2.1 Test results

Table 2.1-1: FCC 47 CFR Part 15, Subpart B for Digital Devices results

Test description	Verdict
Radiated disturbance	Pass [1]
Conducted disturbance at mains port	Pass [1]
Notes: [1] Product classification B	

Table 2.1-2: ICES-003 Issue 5 August 2012 results

Test description	Verdict
Radiated disturbance	Pass [1]
Conducted disturbance at mains port	Pass [1]
Notes: [1] Product classification B	

Section 3 Equipment under test (EUT) details

3.1 Applicant

Company name	Research In Motion Limited
Company address	295 Phillip Street Waterloo, ON, Canada N2L 3W8

3.2 Sample information

Receipt date	October 9, 2012
Nemko sample ID number	Items # 1, 2

3.3 EUT information

Product name	BlackBerry Multimedia Pod
Rim part number	HDW-45069-001
Model	6694-100D-0183
Serial number	None
Power requirements	5 V_{DC} (Powered via external AC-DC adapter)
Manufacturer	Foxlink Chenguei Industry District, Dong Keng, Dong Guan Guang Dong China

Product description and theory of operation

The Multimedia Pod is a docking station for the BlackBerry Smartphones.

It is a charging cradle which enhances the use of Smartphone as competent multimedia devices in the home environment, and to showcase their competitive capabilities in this arena.

The product goal is to “extend and enhance the BlackBerry user experience”. This solution accomplishes that goal by extending the BlackBerry user experience into the home, and enhancing it by providing a new use case for users to enjoy.

3.4 EUT exercise and monitoring details

The EUT was connected to a monitor and was additionally charging a phone. A video stream was playing form the phone and being displayed on the AE monitor.

3.5 EUT setup details

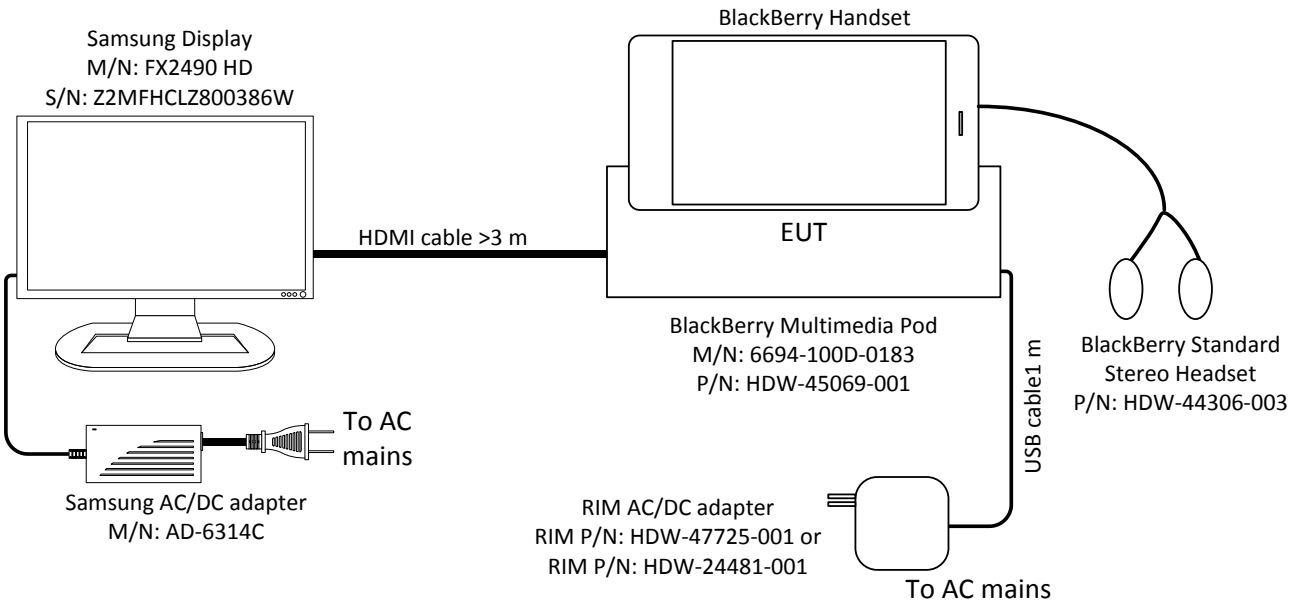


Diagram 3.5-1: Setup diagram Configuration 1

Table 3.5-1: Handheld details for Configuration 1

Device	Certification	FCC ID.	IC Number
BlackBerry phone	RFA91LW	L6ARFA90LW	2503A-RFA90LW

Hardware:	PIN: 332F85FB IMEI: 990001240062158 CPR: 23129 Rev E PRD-45183-700 ASY-46132-001 Rev T POP-44885-908 Rev A
Battery:	BAT-47277-001 (T9 02195 L) 1ICP5/33/81
Accessory setup:	View **Setup diagram 3.5–1** above.
Serial number:	0858-7525-0765
OS	443-329927 (2012-09-28)

3.5 EUT setup details, continued

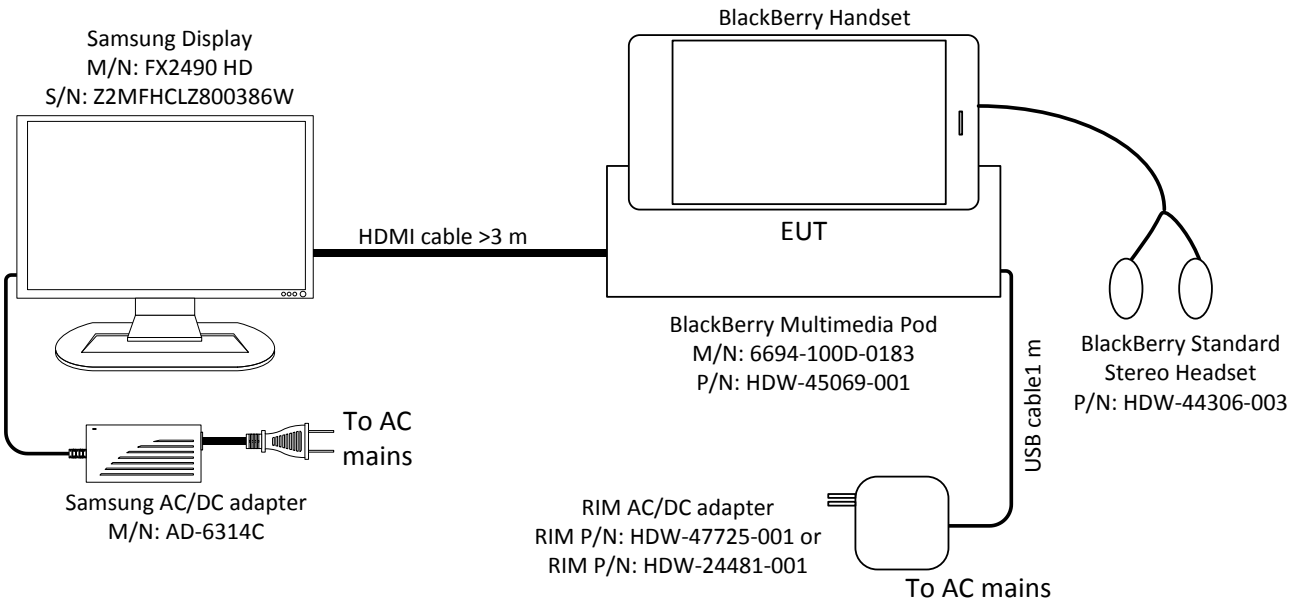


Diagram 3.5-2: Setup diagram Configuration 2

Table 3.5-2: Handheld details for Configuration 2

Device	Certification	FCC ID.	IC Number
BlackBerry phone	RFG81UW	L6ARFG80UW	2503A-RFG80UW
Hardware:	PIN: 2A8C7A31 IMEI: 004402241836646 CPR: 23286 Rev B PRD-46163-700 ASY-46297-001 Rev R		
Battery:	BAT-47277-001 (T9 00450 L) 1ICP5/33/81		
Accessory setup:	View **Setup diagram 3.5–2** above.		
Serial number:	0713-8493-9342		
OS	443-329927 (2012-09-28)		

3.5 EUT setup details, continued

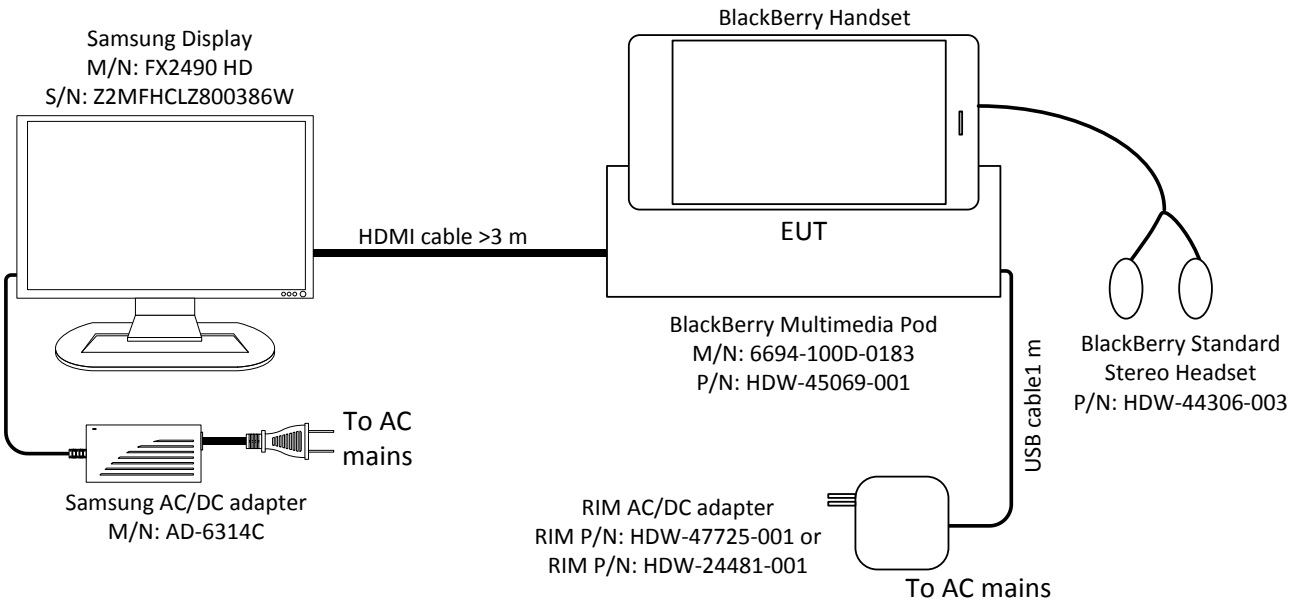


Diagram 3.5-3: Setup diagram Configuration 3

Table 3.5-3: Handheld details for Configuration 3

Device	Certification	FCC ID.	IC Number
BlackBerry phone	RFK121LW	L6ARFK120LW	2503A-RFK120LW
BlackBerry phone	RFF91LW	L6RFF90LW	2503A-RFF90LW

Hardware:	PIN: 2A8C717 IMEI: 004401139111427 CPR: 23181 Rev F PRD-45184-700 ASY-47365-001 Rev U POP-44900-908 Rev B
Battery:	BAT-47277-001 (T9 02183 L) 1ICP5/33/81
Accessory setup:	View **Setup diagram 3.5–3** above.
Serial number:	0713-8471-5450
OS	443-329927 (2012-09-28)

3.5 EUT setup details, continued

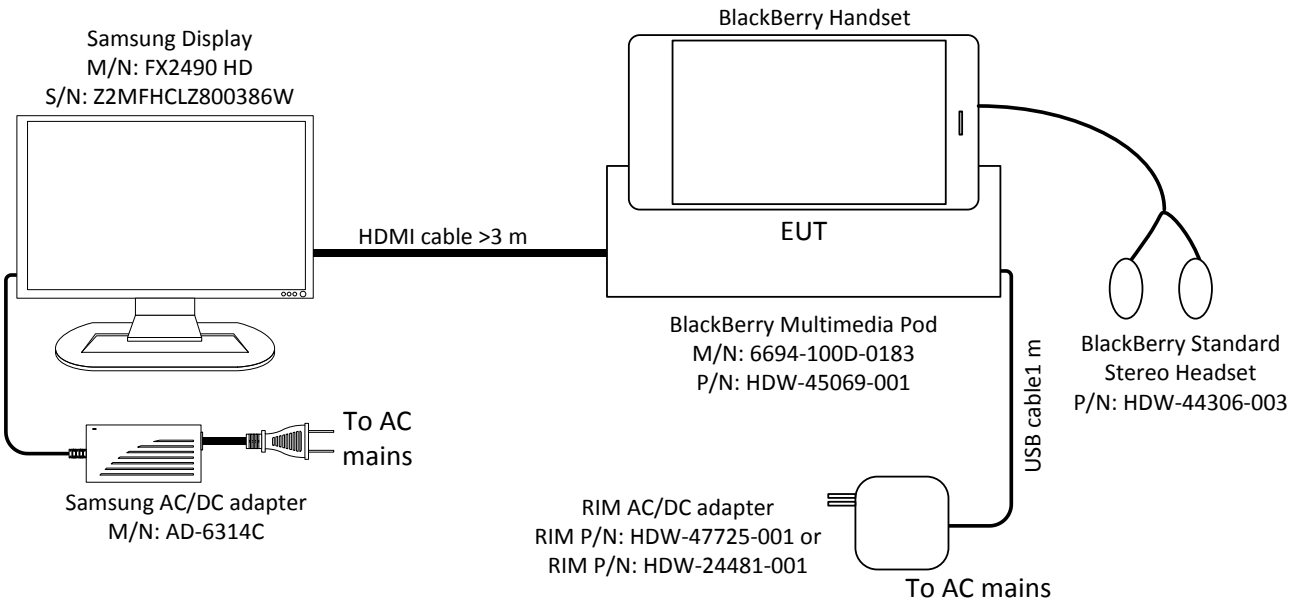


Diagram 3.5-4: Setup diagram Configuration 4

Table 3.5-4: Handheld details for Configuration 4

Device	Certification	FCC ID.	IC Number
BlackBerry phone	RFH121LW	L6ARFH120LW	2503A-RFH120LW
Hardware:	PIN: 2A780F7C IMEI: 004402241812928 CPR: 23051 PRD-4937-700 ASY-49904-001 Rev L POP-49255-904 Rev D		
Battery:	BAT-47277-001 (T4 01470) 1ICP5/33/81		
Accessory setup:	View **Setup diagram 3.5–4** above.		
Serial number:	0712-5113-5668		
OS	554-337172 (2012-10-08)		

Section 4 Engineering considerations

4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

4.2 Technical judgment

None

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5 Test conditions

5.1 Atmospheric conditions

Temperature: 15–30 °C
Relative humidity: 20–75 %
Air pressure: 86–106 kPa

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

Section 6 Measurement uncertainty

6.1 Uncertainty of measurement

Nemko Canada Inc. has calculated measurement uncertainty and is documented in EMC/MUC/001 “Uncertainty in EMC measurements.” Measurement uncertainty was calculated using the methods described in CISPR 16-4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC measurements; as well as described in UKAS LAB34: The expression of Uncertainty in EMC Testing. Measurement uncertainty calculations assume a coverage factor of K=2 with 95% certainty.

Section 7 Terms and definitions

7.1 Product classifications definitions

Title 47: Telecommunication – Part 15-Radio Frequency devices, Subpart A – General

Class A digital device. A digital device that is marketed for use in a commercial, industrial or business environment, exclusive of a device which is marketed for use by the general public or is intended to be used in the home.

Class B digital device. A digital device that is marketed for use in a residential environment notwithstanding use in commercial, business and industrial environments. Examples of such devices include, but are not limited to, personal computers, calculators, and similar electronic devices that are marketed for use by the general public.

Note: The responsible party may also qualify a device intended to be marketed in a commercial, business or industrial environment as a Class B device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B digital device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B digital device, regardless of its intended use.

ICES-003

ICES-003 prescribes two Classes of limits of radio noise for ITE: Class A limits for non-residential operation and the more stringent Class B limits for residential operation, as set out in section 5 of ICES-003 issue 5.

Only ITE intended strictly for non-residential use in commercial, industrial or business environments, and whose design or other characteristics strongly preclude the possibility of its use in a residential environment, shall be permitted to comply with the less stringent Class A limits.

All ITE that cannot meet the conditions for Class A operation shall comply with the Class B limits.

7.2 General definitions

Title 47: Telecommunication – Part 15-Radio Frequency devices, Subpart A – General

Digital device. (Previously defined as a computing device). An unintentional radiator (device or system) that generates and uses timing signals or pulses at a rate in excess of 9,000 pulses (cycles) per second and uses digital techniques; inclusive of telephone equipment that uses digital techniques or any device or system that generates and uses radio frequency energy for the purpose of performing data processing functions, such as electronic computations, operations, transformations, recording, filing, sorting, storage, retrieval, or transfer. A radio frequency device that is specifically subject to an emanation requirement in any other FCC Rule part or an intentional radiator subject to subpart C of this part that contains a digital device is not subject to the standards for digital devices, provided the digital device is used only to enable operation of the radio frequency device and the digital device does not control additional functions or capabilities.

Note: Computer terminals and peripherals that are intended to be connected to a computer are digital devices.

Section 8 Testing data

8.1 Radiated disturbance

8.1.1 References

ANSI C63.4-2003

8.1.2 Test summary

Verdict Pass

8.1.3 Observations/special notes

- The EUT was set up as table top configuration.
- The EUT was tested with external AC adapter HDW-47725-001 (850 mA Cobra) and HDW-24481-001 (750 mA Cobra). The EUT was compliant with both adapters. Results with AC adapter HDW-47725-001 (850 mA Cobra) have been included to demonstrate compliance.
- All four configurations were scanned. Results included.

8.1.4 Test equipment list

Table 8.1-1: Radiated disturbance equipment list

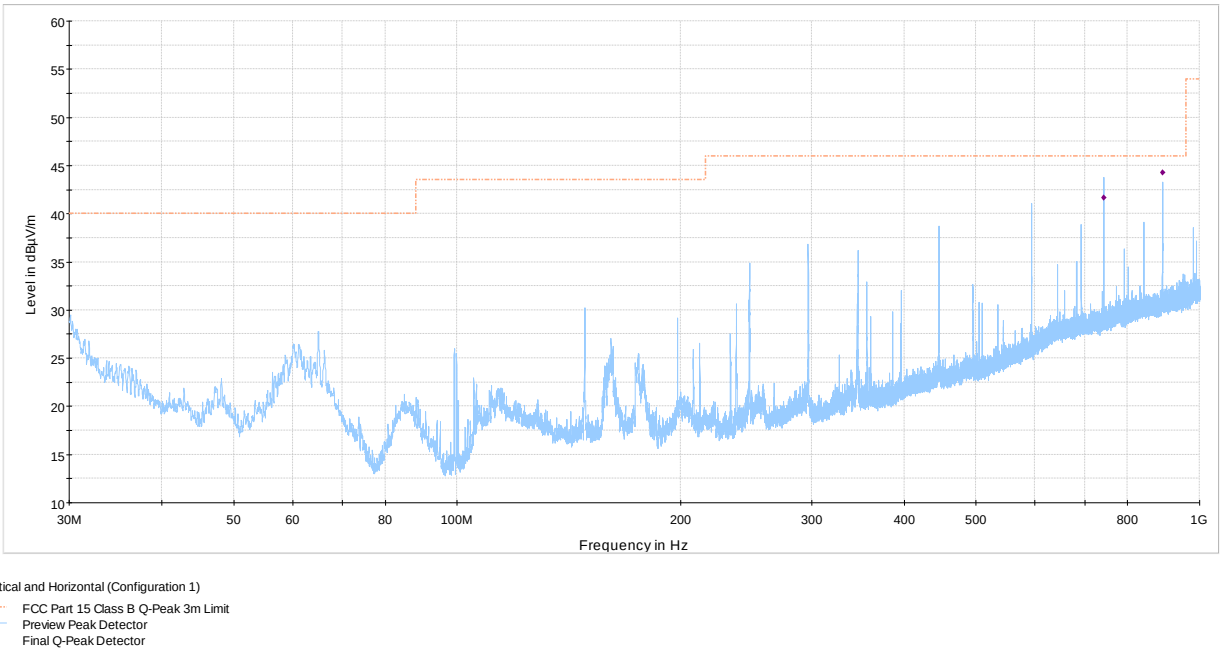
Equipment	Manufacturer	Model no.	Asset no.	Cal./Ver. cycle	Next Cal./Ver.
3 m EMI test chamber	TDK	SAC-3	FA002047	1 year	Mar. 09/13
Power Source	California Instruments	5001ix	FA001770	1 year	June 13/13
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 26	FA002043	1 year	May 16/13
Bilog antenna	Sunol	JB3	FA002108	1 year	Feb. 07/13
Horn antenna #2	EMCO	3115	FA000825	1 year	Feb. 24/13
1–18 GHz pre-amplifier	JCA	JCA118-503	FA002091	1 year	July 03/13
50 coax cable	Huber + Suhner	None	FA002392	1 year	June. 27/13
50 coax cable	Huber + Suhner	None	FA002074	1 year	Aug. 23/13
Notes: None					

8.1.5 Test data

Test date	October 9, 2012 and October 23, 2012	**Test engineer**	David Duchesne and Predrag Golic		
Temperature	21.6 °C 25.7 °C	**Air pressure**	1010 mbar 1009 mbar	**Relative humidity**	30 % 28 %

Port under test	Enclosure
Test facility	3 m Semi anechoic chamber
Measuring distance (m)	3
Antenna height variation (m)	1–4
Turn table position (°)	0–360
Receiver/spectrum analyzer settings	30 MHz to 1 GHz: Preview measurements – Receiver: Peak detector (Max hold), RBW = 120 kHz, VBW = 300 kHz, Measurement time = 100 ms Final measurements – Receiver: Q-Peak detector, RBW = 120 kHz, VBW = 300 kHz, Measurement time = 100 ms 1 GHz to 6 GHz: Preview measurements – Spectrum Analyzer: Peak detector (Max hold), RBW = 1 MHz, VBW = 3 MHz, Measurement time = 100 ms Final measurements – Receiver: Peak and average detector, RBW = 1 MHz, VBW = 3 MHz, Measurement time = 100 ms
Measurement details	A preview measurement was generated with receiver in continuous scan or sweep mode while the EUT was rotated and antenna adjusted to maximize radiated emission. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

8.1.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

Plot 8.1-1: Radiated disturbance – Configuration 1 and AC adapter HDW-47725-001 (30 to 1000 MHz)

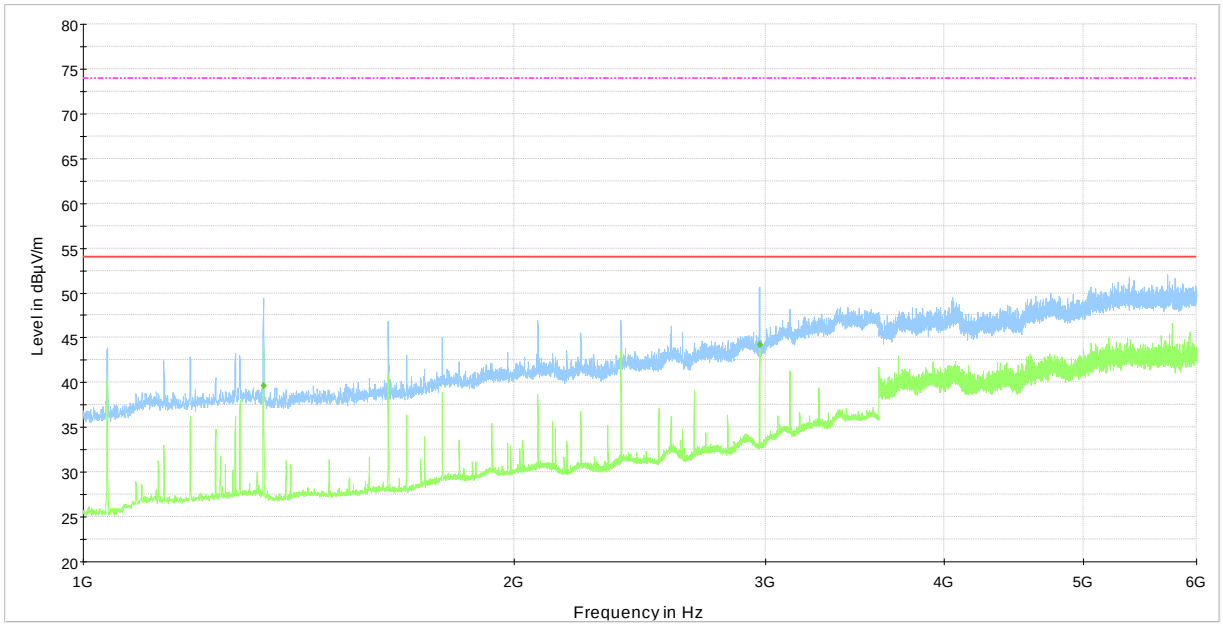
Table 8.1-2: Radiated disturbance – Configuration 1 and AC adapter HDW-47725-001 results for FCC and ICES

Freq. (MHz)	Q-peak field strength[1] (dBµV/m)	Meas. time (ms)	Bandwidth (kHz)	Ant. height (cm)	Pol.	Turn table position (°)	Correction factor[2] (dB)	Margin (dB)	Limit (dBµV/m)
742.50	41.7	100	120	116	H	58	23.7	4.3	46.0
891.00	44.3	100	120	100	H	30	25.5	1.7	46.0

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) − amplifier gain (dB)

Sample calculation: 41.7 dBµV/m (field strength) = 18 dBµV (receiver reading) + 23.7 dB (Correction factor)

8.1.5 Test data, continued

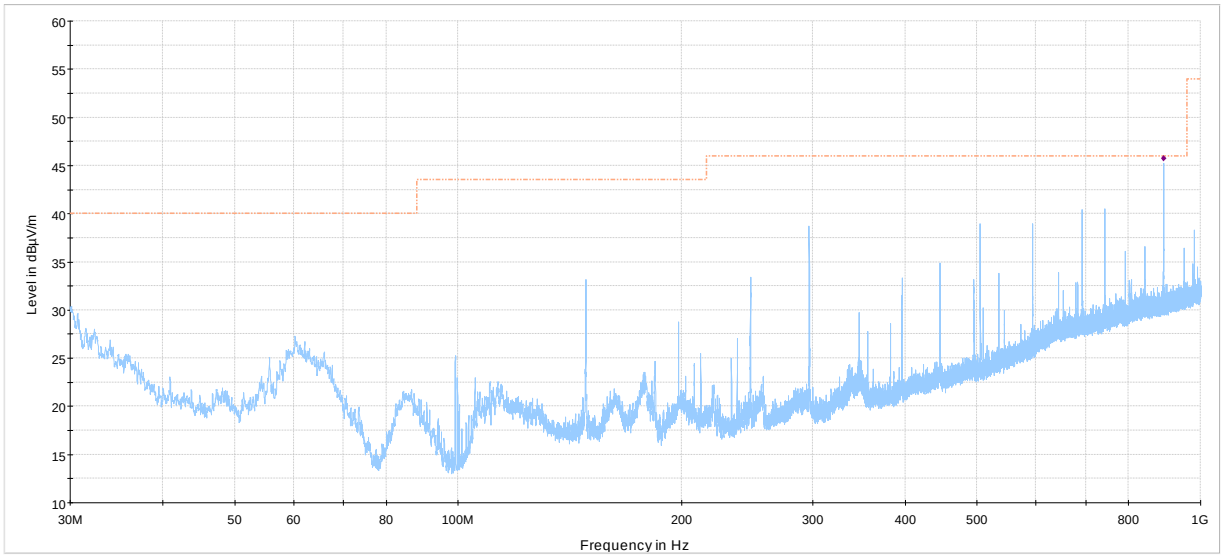


Vertical and Horizontal (Configuration 1)
- FCC Part 15 Class B 3m Average Limit
- FCC Part 15 Class B 3m Peak Limit
- Preview Peak Detector
- Preview Average Detector
- Final Average Detector

The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

Plot 8.1-2: Radiated disturbance – Configuration 1 and AC adapter HDW-47725-001 (1 to 6 GHz)

8.1.5 Test data, continued



Vertical and Horizontal (Configuration 2)
FCC Part 15 Class B Q-Peak 3m Limit
Preview Peak Detector
Final Q-PEak Detector

The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

Plot 8.1-3: Radiated disturbance – Configuration 2 and AC adapter HDW-47725-001 (30 to 1000 MHz)

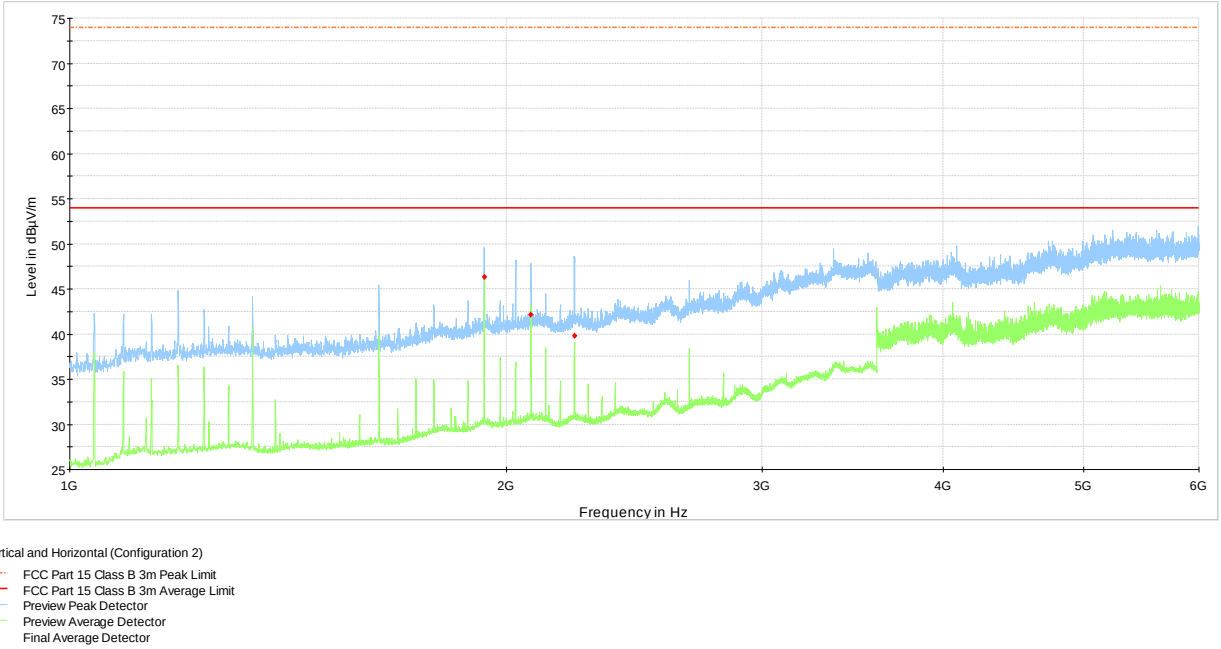
Table 8.1-3: Radiated disturbance – Configuration 2 and AC adapter HDW-47725-001 results for FCC and ICES

Freq. (MHz)	Q-peak field strength[1] (dBµV/m)	Meas. time (ms)	Bandwidth (kHz)	Ant. height (cm)	Pol.	Turn table position (°)	Correction factor[2] (dB)	Margin (dB)	Limit (dBµV/m)
742.50	45.9	100	120	126	H	144.0	23.7	0.1	46.0
891.03	42.3	100	120	182	H	28.0	25.5	3.7	46.0

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) − amplifier gain (dB)

Sample calculation: 45.9 dBµV/m (field strength) = 22.2 dBµV (receiver reading) + 23.7 dB (Correction factor)

8.1.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

Plot 8.1-4: Radiated disturbance – Configuration 2 and AC adapter HDW-47725-001 (1 to 6 GHz)

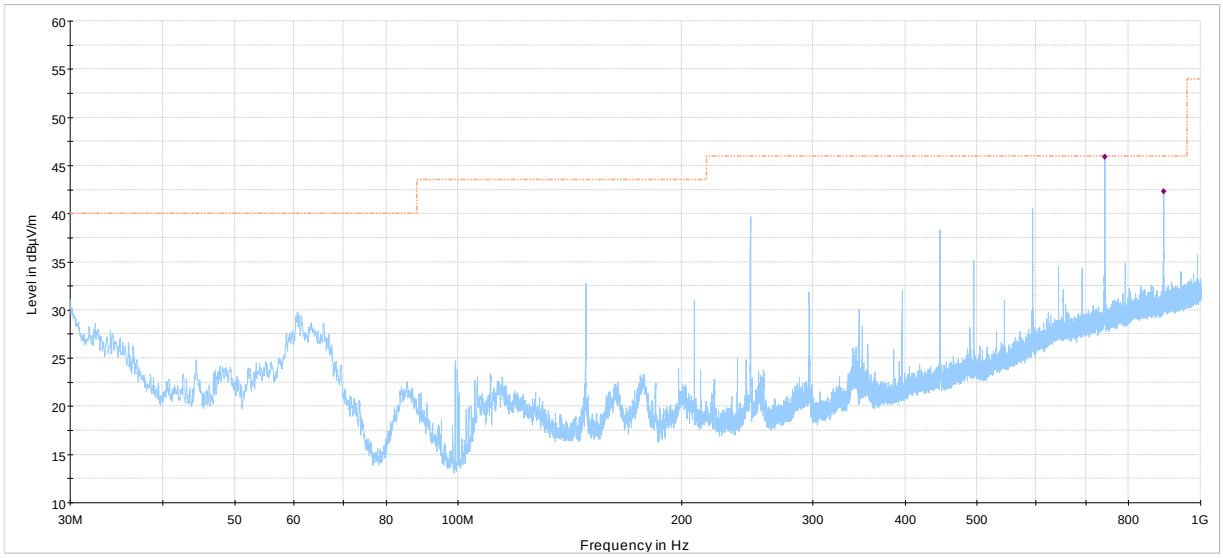
Table 8.1-4: Radiated disturbance – Configuration 2 and AC adapter HDW-47725-001 results for FCC and ICES

Freq. (MHz)	Average field strength[1] (dBµV/m)	Meas. time (ms)	Bandwidth (kHz)	Ant. height (cm)	Pol.	Turn table position (°)	Correction factor[2] (dB)	Margin (dB)	Limit (dBµV/m)
1930.564	46.3	100	1000	119.0	H	27.0	-14.7	7.7	54.0
2078.868	42.1	100	1000	100.0	H	16.0	-13.9	11.9	54.0
2227.456	39.8	100	1000	99.9	H	28.0	-13.6	14.2	54.0

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) − amplifier gain (dB)

Sample calculation: 46.3 dBµV/m (field strength) = 61 dBµV (receiver reading) + (-14.7) dB (Correction factor)

8.1.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

Plot 8.1-5: Radiated disturbance – Configuration 3 and AC adapter HDW-47725-001 (30 to 1000 MHz)

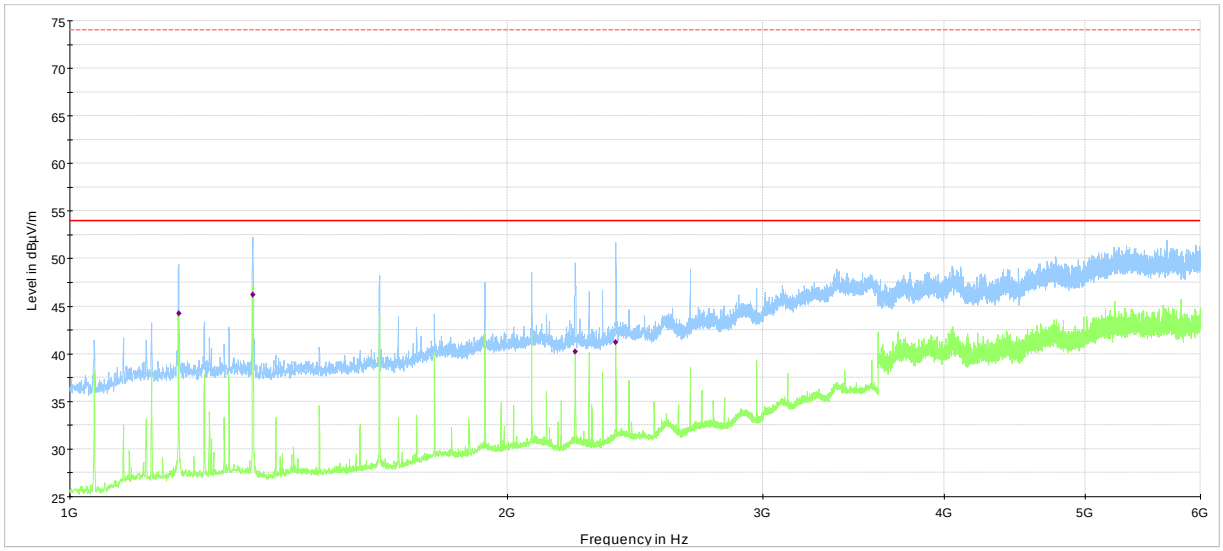
Table 8.1-5: Radiated disturbance – Configuration 3 and AC adapter HDW-47725-001 results for FCC and ICES

Freq. (MHz)	Q-peak field strength[1] (dBµV/m)	Meas. time (ms)	Bandwidth (kHz)	Ant. height (cm)	Pol.	Turn table position (°)	Correction factor[2] (dB)	Margin (dB)	Limit (dBµV/m)
891.00	45.7	100	120	107	H	208	25.5	0.3	46.0

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) − amplifier gain (dB)

Sample calculation: 45.7 dBµV/m (field strength) = 20.2 dBµV (receiver reading) + 25.5 dB (Correction factor)

8.1.5 Test data, continued



Vertical and Horizontal (Configuration 3)
Preview Peak Detector
Preview Average Detector
Final Average Detector
FCC Part 15 Class B 3m Peak Limit
FCC Part 15 Class B 3m Average Limit

The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

Plot 8.1-6: Radiated disturbance – Configuration 3 and AC adapter HDW-47725-001 (1 to 6 GHz)

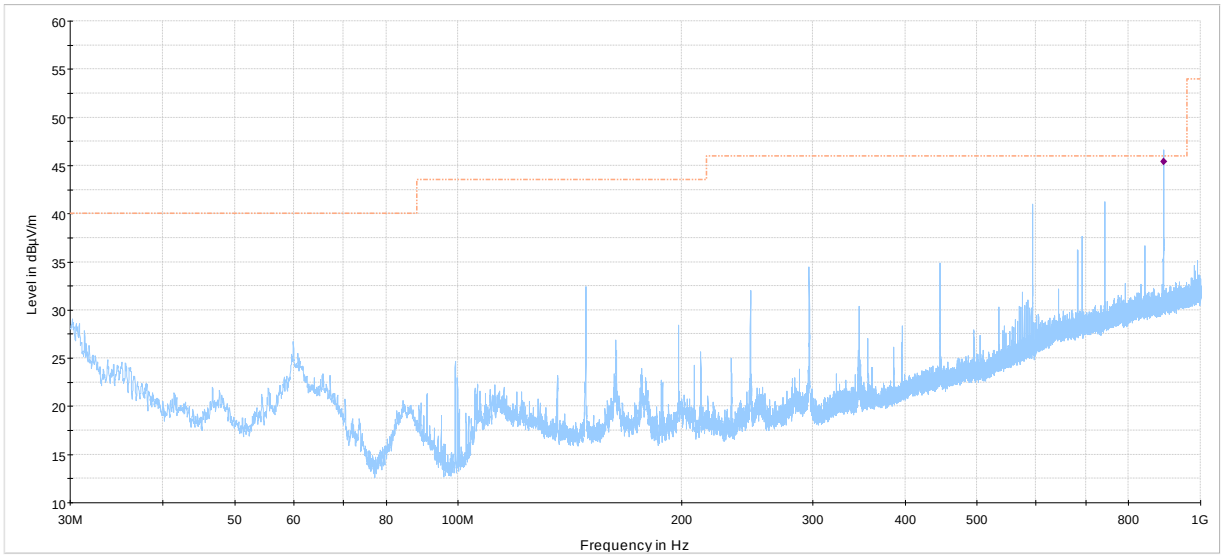
Table 8.1-6: Radiated disturbance – Configuration 3 and AC adapter HDW-47725-001 results for FCC and ICES

Freq. (MHz)	Average field strength[1] (dBµV/m)	Meas. time (ms)	Bandwidth (kHz)	Ant. height (cm)	Pol.	Turn table position (°)	Correction factor[2] (dB)	Margin (dB)	Limit (dBµV/m)
1187.860	44.2	100	1000	103.9	H	17.0	-17.6	9.8	54.0
1336.440	46.2	100	1000	99.0	V	252.0	-17.5	7.8	54.0
2227.468	40.2	100	1000	99.0	H	21.0	-13.6	13.8	54.0
2376.008	41.2	100	1000	130.0	H	7.0	-12.8	12.8	54.0

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) − amplifier gain (dB)

Sample calculation: 44.2 dBµV/m (field strength) = 61.8 dBµV (receiver reading) + (-17.6) dB (Correction factor)

8.1.5 Test data, continued



Vertical and Horizontal (Configuration 4)
FCC Part 15 Class B 3m Q-Peak Limit
Preview Peak Detector
Final Q-Peak Detector

The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

Plot 8.1-7: Radiated disturbance – Configuration 4 and AC adapter HDW-47725-001 (30 to 1000 MHz)

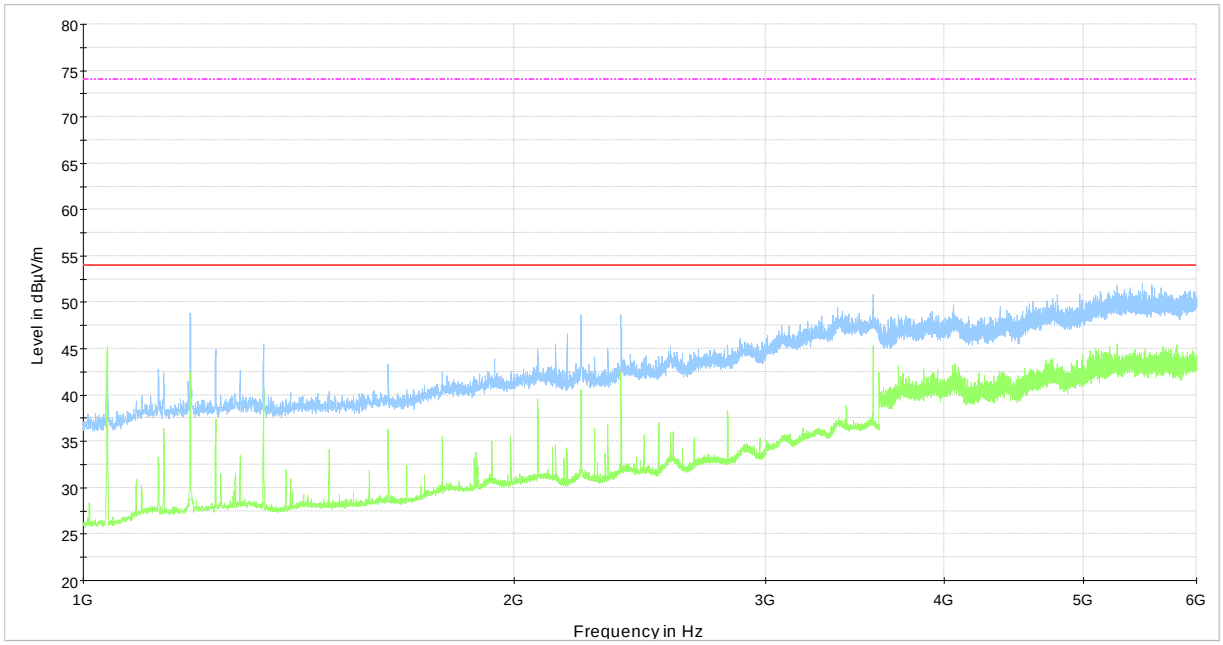
Table 8.1-7: Radiated disturbance – Configuration 4 and AC adapter HDW-47725-001 results for FCC and ICES

Freq. (MHz)	Q-peak field strength[1] (dBµV/m)	Meas. time (ms)	Bandwidth (kHz)	Ant. height (cm)	Pol.	Turn table position (°)	Correction factor[2] (dB)	Margin (dB)	Limit (dBµV/m)
891.00	45.4	100	120	306	H	24	25.5	0.6	46.0

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB) − amplifier gain (dB)

Sample calculation: 45.4 dBµV/m (field strength) = 19.9 dBµV (receiver reading) + 25.5 dB (Correction factor)

8.1.5 Test data, continued

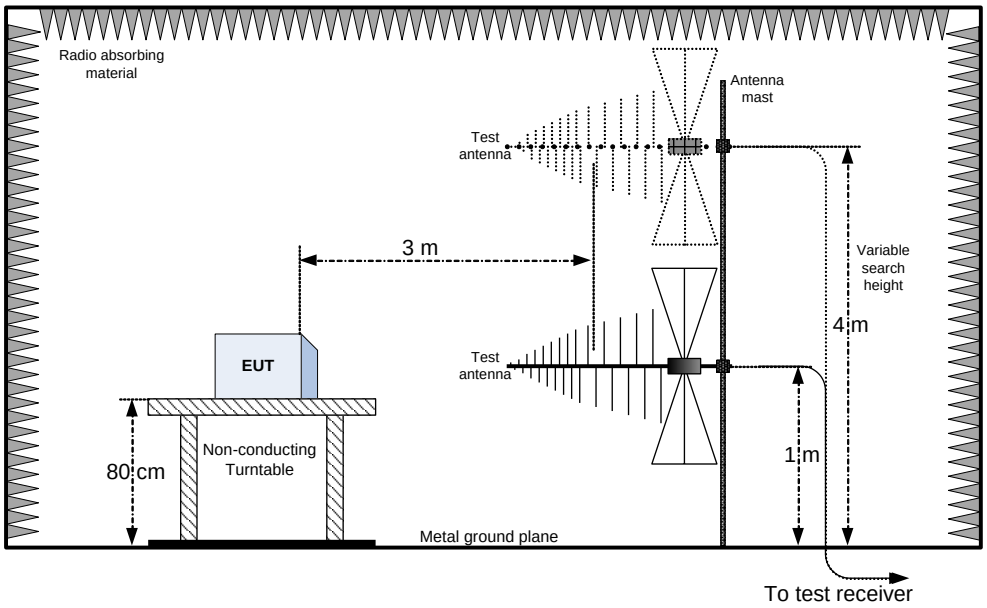


Vertical and Horizontal (Configuration 4)
FCC Part 15 Class B 3m Average Limit
FCC Part 15 Class B 3m Peak Limit
Preview Peak Detector
Preview Average Detector

The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

Plot 8.1-8: Radiated disturbance – Configuration 4 and AC adapter HDW-47725-001 (1 to 6 GHz)

8.1.6 Setup diagram



Setup diagram 8.1-1: Radiated disturbance setup

8.2 Conducted disturbance at mains port

8.2.1 References

ANSI C63.4-2003

8.2.2 Test summary

Verdict Pass

8.2.3 Observations/special notes

- The EUT was set up as table top configuration.
- The EUT was tested with external AC adapter HDW-47725-001 (850 mA Cobra) and HDW-24481-001 (750 mA Cobra). The EUT was compliant with both adapters. Results with AC adapter HDW-47725-001 (850 mA Cobra) have been included to demonstrate compliance.
- All four configurations were scanned. Results included.

8.2.4 Test equipment list

Table 8.2-1: Conducted disturbance at mains port equipment list

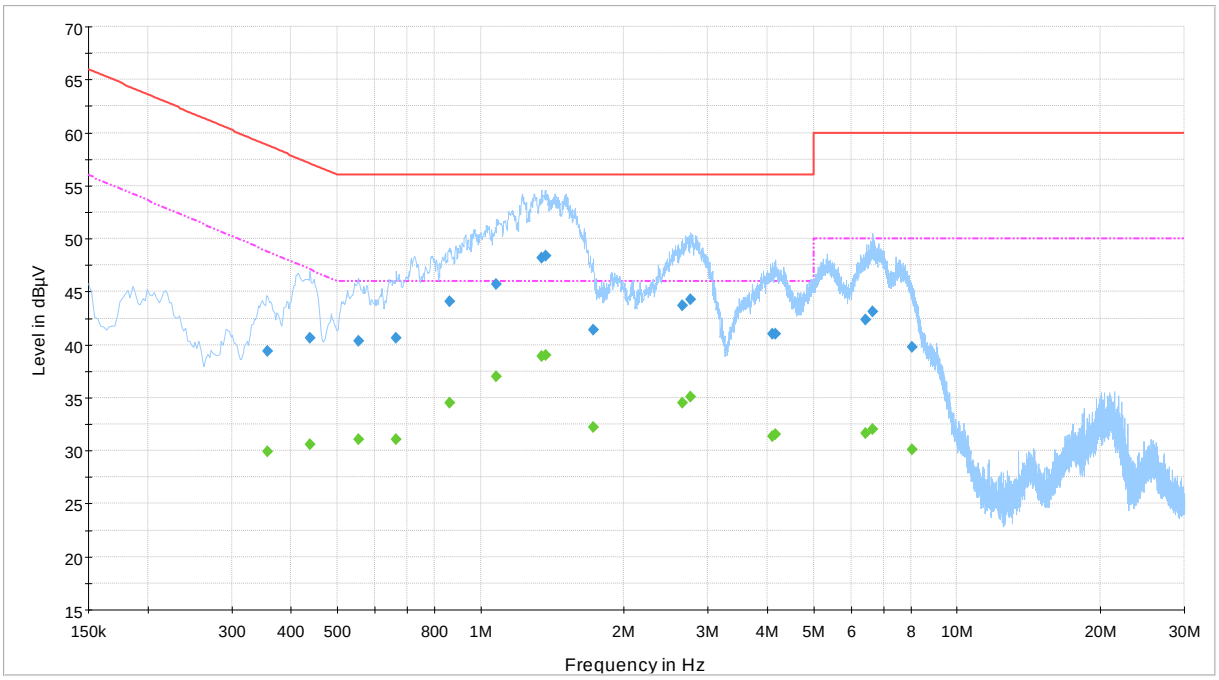
Equipment	Manufacturer	Model no.	Asset no.	Cal./Ver. cycle	Next Cal./Ver.
Power Source	California Instruments	5001ix	FA001770	1 year	June 13/13
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 26	FA002043	1 year	May 16/13
LISN	Rohde & Schwarz	ENV216	FA002023	1 year	Nov. 18/12
50 coax cable	Huber + Suhner	None	FA002394	1 year	June. 27/13
Notes: None					

8.2.5 Test data

Test date	October 9, 2012	**Test engineer**	David Duchesne		
Temperature	21.6 °C	**Air pressure**	1010 mbar	**Relative humidity**	30 %

Port under test	AC input of external AC-DC adapter
Receiver/spectrum analyzer settings	Preview measurements – Receiver: Peak detector (Max hold), RBW = 9 kHz, VBW = 30 kHz, Measurement time = 100 ms Final measurements – Receiver: Q-Peak and Average detector, RBW = 9 kHz, VBW = 30 kHz, Measurement time = 100 ms
Measurement details	A preview measurement was generated with the receiver in continuous scan mode. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

8.2.5 Test data, continued



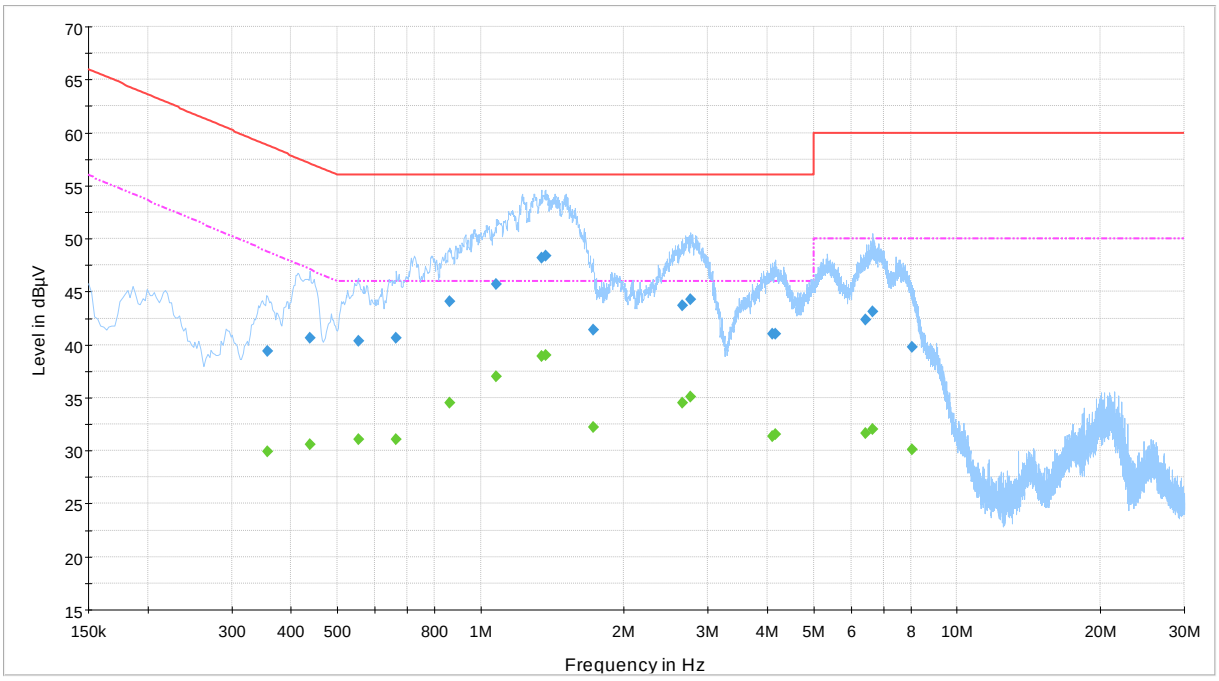
120VAC/60Hz, Phase (Configuration 1)

- CISPR 22 Mains QP Class B
- CISPR 22 Mains AV Class B
- Preview Result 1-PK+
- Final Result 1-QPK
- Final Result 2-AVG

The spectral plot has been corrected with transducer factors. (i.e. cable loss, LISN factors, and attenuators)

Plot 8.2-1: Conducted disturbance on phase line – Configuration 1 and AC adapter HDW-47725-001

8.2.5 Test data, continued



120VAC/60Hz, Phase (Configuration 1)

- CISPR 22 Mains QP Class B
- CISPR 22 Mains AV Class B
- Preview Result 1-PK+
- Final Result 1-QPK
- Final Result 2-AVG

The spectral plot has been corrected with transducer factors. (i.e. cable loss, LISN factors, and attenuators)

Plot 8.2-2: Conducted disturbance on neutral line – Configuration 1 and AC adapter HDW-47725-001

8.2.5 Test data, continued

Table 8.2-2: Conducted disturbance (Quasi-Peak) results – Configuration 1 and AC adapter HDW-47725-001

Freq. (MHz)	Q-Peak result[1] (dBµV)	Meas. time (ms)	Bandwidth (kHz)	Filter	Conductor	Correction factor[2] (dB)	Margin (dB)	Limit (dBµV)
0.35700	39.4	100	9	On	L1	10.0	19.4	58.8
0.43800	40.7	100	9	On	L1	10.0	16.4	57.1
0.55275	40.3	100	9	On	L1	10.1	15.7	56.0
0.66525	40.6	100	9	On	L1	10.1	15.4	56.0
0.86100	44.1	100	9	On	L1	10.1	11.9	56.0
1.07925	45.7	100	9	On	L1	10.0	10.3	56.0
1.34025	48.2	100	9	On	L1	10.0	7.8	56.0
1.36950	48.3	100	9	On	L1	10.0	7.7	56.0
1.72275	41.4	100	9	On	L1	10.1	14.6	56.0
2.64975	43.7	100	9	On	L1	10.2	12.3	56.0
2.76225	44.3	100	9	On	L1	10.2	11.7	56.0
4.09650	41.0	100	9	On	L1	10.3	15.0	56.0
4.15500	41.0	100	9	On	L1	10.3	15.0	56.0
6.41400	42.4	100	9	On	L1	10.2	17.6	60.0
6.63450	43.1	100	9	On	L1	10.2	16.9	60.0
8.04975	39.8	100	9	On	L1	10.3	20.2	60.0
0.41325	40.4	100	9	On	N	10.0	17.2	57.6
0.54825	37.4	100	9	On	N	10.1	18.6	56.0
0.56850	37.9	100	9	On	N	10.1	18.1	56.0
0.87675	40.9	100	9	On	N	10.1	15.1	56.0
1.08375	43.6	100	9	On	N	10.0	12.4	56.0
1.36725	45.2	100	9	On	N	10.0	10.8	56.0
1.44825	45.0	100	9	On	N	10.0	11.0	56.0
1.96575	38.0	100	9	On	N	10.1	18.0	56.0
2.64525	40.6	100	9	On	N	10.2	15.4	56.0
2.69925	41.0	100	9	On	N	10.2	15.0	56.0
4.11225	37.2	100	9	On	N	10.2	18.8	56.0
4.20000	37.2	100	9	On	N	10.2	18.8	56.0
5.37000	36.1	100	9	On	N	10.2	23.9	60.0
6.71775	38.9	100	9	On	N	10.2	21.1	60.0

Notes: [1] Result (dBµV) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)

Sample calculation: 48.3 dBµV (result) = 38.3 dBµV (receiver reading) + 10.0 dB (Correction factor)

8.2.5 Test data, continued

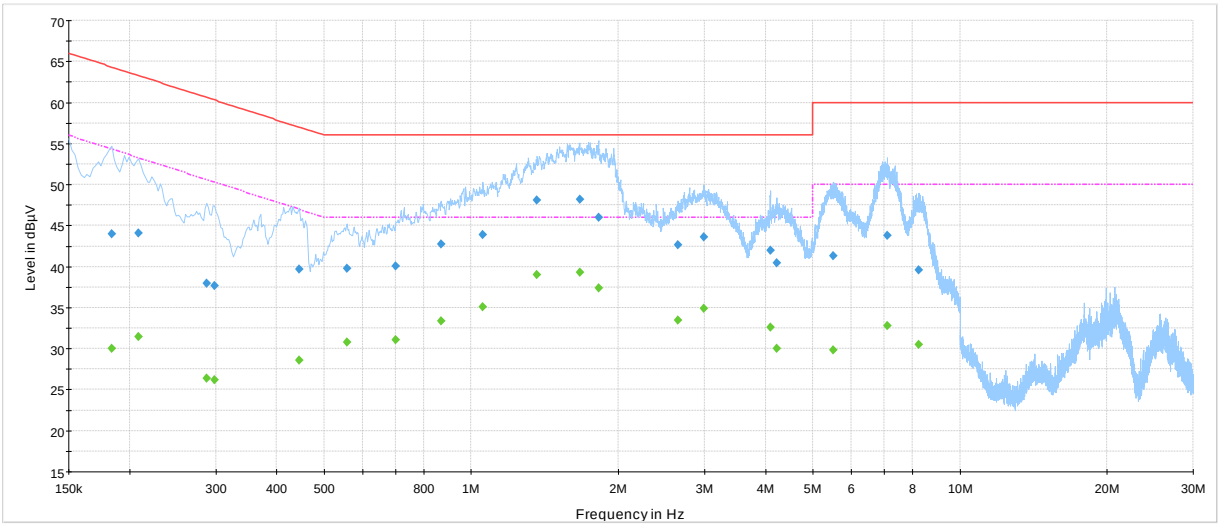
Table 8.2-3: Conducted disturbance (Average) results – Configuration 1 and AC adapter HDW-47725-001

Freq. (MHz)	Average result[1] (dBµV)	Meas. time (ms)	Bandwidth (kHz)	Filter	Conductor	Correction factor[2] (dB)	Margin (dB)	Limit (dBµV)
0.35700	29.9	100	9	On	L1	10.0	18.9	48.8
0.43800	30.6	100	9	On	L1	10.0	16.5	47.1
0.55275	31.1	100	9	On	L1	10.1	14.9	46.0
0.66525	31.0	100	9	On	L1	10.1	15.0	46.0
0.86100	34.5	100	9	On	L1	10.1	11.5	46.0
1.07925	37.0	100	9	On	L1	10.0	9.0	46.0
1.34025	38.9	100	9	On	L1	10.0	7.1	46.0
1.36950	39.0	100	9	On	L1	10.0	7.0	46.0
1.72275	32.2	100	9	On	L1	10.1	13.8	46.0
2.64975	34.5	100	9	On	L1	10.2	11.5	46.0
2.76225	35.1	100	9	On	L1	10.2	10.9	46.0
4.09650	31.4	100	9	On	L1	10.3	14.6	46.0
4.15500	31.6	100	9	On	L1	10.3	14.4	46.0
6.41400	31.7	100	9	On	L1	10.2	18.3	50.0
6.63450	32.0	100	9	On	L1	10.2	18.0	50.0
8.04975	30.1	100	9	On	L1	10.3	19.9	50.0
0.41325	34.1	100	9	On	N	10.0	13.5	47.6
0.54825	31.3	100	9	On	N	10.1	14.7	46.0
0.56850	31.2	100	9	On	N	10.1	14.8	46.0
0.87675	33.9	100	9	On	N	10.1	12.1	46.0
1.08375	36.6	100	9	On	N	10.0	9.4	46.0
1.36725	38.1	100	9	On	N	10.0	7.9	46.0
1.44825	38.1	100	9	On	N	10.0	7.9	46.0
1.96575	29.8	100	9	On	N	10.1	16.2	46.0
2.64525	33.9	100	9	On	N	10.2	12.1	46.0
2.69925	34.1	100	9	On	N	10.2	11.9	46.0
4.11225	30.0	100	9	On	N	10.2	16.0	46.0
4.20000	29.8	100	9	On	N	10.2	16.2	46.0
5.37000	26.9	100	9	On	N	10.2	23.1	50.0
6.71775	27.5	100	9	On	N	10.2	22.5	50.0

Notes: [1] Result (dBµV) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)

Sample calculation: 39 dBµV (result) = 29.0 dBµV (receiver reading) + 10.0 dB (Correction factor)

8.2.5 Test data, continued



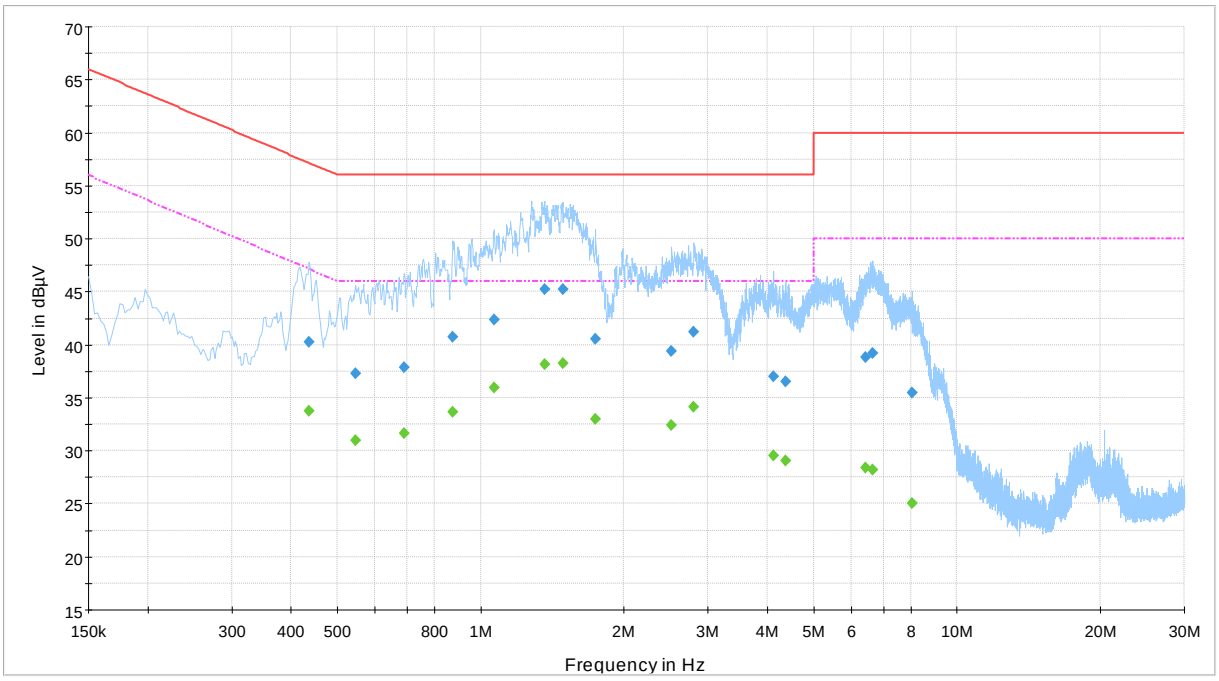
120VAC/60Hz, Phase (Configuration 2)

- CISPR 22 Mains QP Class B
- CISPR 22 Mains AV Class B
- Preview Result 1-PK+
- Final Result 1-QPK
- Final Result 2-AVG

The spectral plot has been corrected with transducer factors. (i.e. cable loss, LISN factors, and attenuators)

Plot 8.2-3: Conducted disturbance on phase line – Configuration 2

8.2.5 Test data, continued



120VAC/60Hz, Neutral (Configuration 2)

- CISPR 22 Mains QP Class B
- CISPR 22 Mains AV Class B
- Preview Result 1-PK+
- Final Result 1-QPK
- Final Result 2-AVG

The spectral plot has been corrected with transducer factors. (i.e. cable loss, LISN factors, and attenuators)

Plot 8.2-4: Conducted disturbance on neutral line – Configuration 2

8.2.5 Test data, continued

Table 8.2-4: Conducted disturbance (Quasi-Peak) results – Configuration 2 and AC adapter HDW-47725-001

Freq. (MHz)	Q-Peak result[1] (dBµV)	Meas. time (ms)	Bandwidth (kHz)	Filter	Conductor	Correction factor[2] (dB)	Margin (dB)	Limit (dBµV)
0.18375	43.9	100	9	On	L1	10.2	20.4	64.3
0.20850	44.1	100	9	On	L1	10.0	19.1	63.3
0.28725	38.0	100	9	On	L1	10.0	22.6	60.6
0.29850	37.7	100	9	On	L1	10.0	22.6	60.3
0.44475	39.7	100	9	On	L1	10.0	17.2	57.0
0.55725	39.8	100	9	On	L1	10.1	16.2	56.0
0.70125	40.1	100	9	On	L1	10.1	15.9	56.0
0.86775	42.7	100	9	On	L1	10.1	13.3	56.0
1.05675	43.9	100	9	On	L1	10.0	12.1	56.0
1.36275	48.1	100	9	On	L1	10.0	7.9	56.0
1.66650	48.2	100	9	On	L1	10.1	7.8	56.0
1.82175	46.0	100	9	On	L1	10.1	10.0	56.0
2.64975	42.6	100	9	On	L1	10.2	13.4	56.0
2.98950	43.6	100	9	On	L1	10.2	12.4	56.0
4.08975	42.0	100	9	On	L1	10.3	14.0	56.0
4.21575	40.4	100	9	On	L1	10.3	15.6	56.0
5.50500	41.3	100	9	On	L1	10.2	18.7	60.0
7.09125	43.8	100	9	On	L1	10.2	16.2	60.0
8.21850	39.6	100	9	On	L1	10.3	20.4	60.0
0.43575	40.3	100	9	On	N	10.0	16.9	57.1
0.54600	37.2	100	9	On	N	10.1	18.8	56.0
0.69000	37.9	100	9	On	N	10.1	18.1	56.0
0.87450	40.7	100	9	On	N	10.1	15.3	56.0
1.06575	42.4	100	9	On	N	10.0	13.6	56.0
1.36050	45.2	100	9	On	N	10.0	10.8	56.0
1.48425	45.2	100	9	On	N	10.0	10.8	56.0
1.74075	40.6	100	9	On	N	10.1	15.4	56.0
2.51700	39.4	100	9	On	N	10.2	16.6	56.0
2.80275	41.2	100	9	On	N	10.2	14.8	56.0
4.12350	37.0	100	9	On	N	10.2	19.0	56.0
4.36200	36.5	100	9	On	N	10.2	19.5	56.0
6.40950	38.9	100	9	On	N	10.2	21.1	60.0
6.65025	39.2	100	9	On	N	10.2	20.8	60.0
8.04750	35.4	100	9	On	N	10.3	24.6	60.0

Notes: [1] Result (dBµV) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)

Sample calculation: 48.2 dBµV (result) = 38.1 dBµV (receiver reading) + 10.1 dB (Correction factor)

8.2.5 Test data, continued

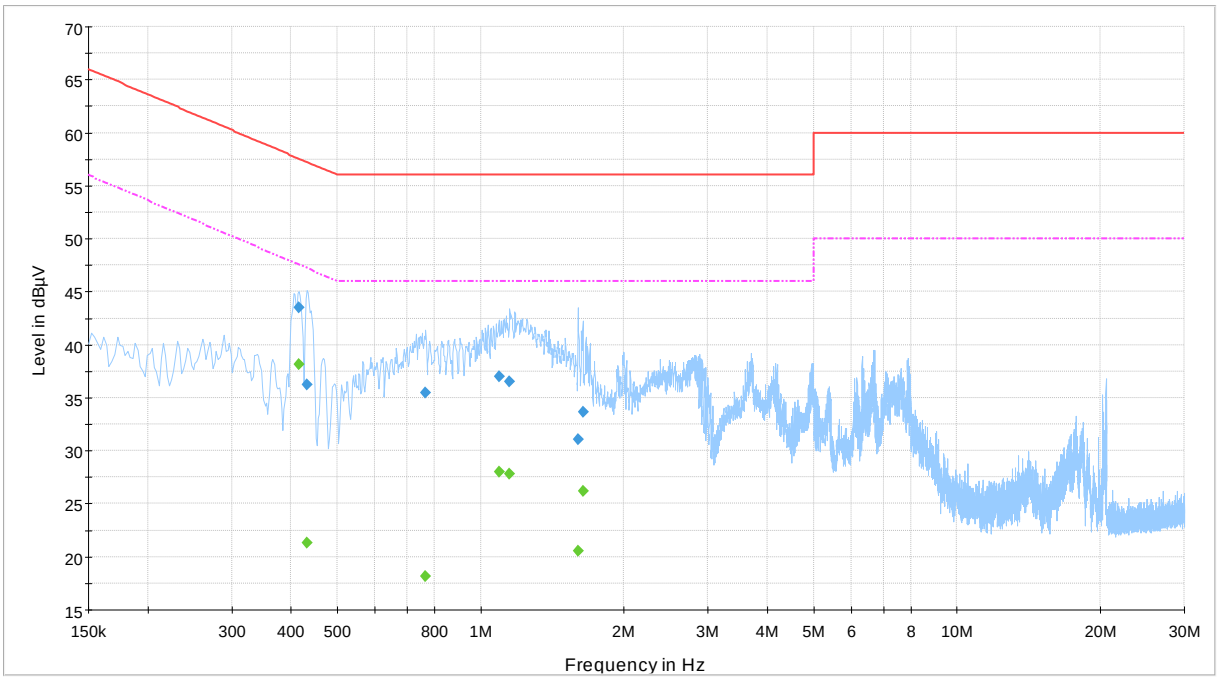
Table 8.2-5: Conducted disturbance (Average) results – Configuration 2 and AC adapter HDW-47725-001

Freq. (MHz)	Average result[1] (dBµV)	Meas. time (ms)	Bandwidth (kHz)	Filter	Conductor	Correction factor[2] (dB)	Margin (dB)	Limit (dBµV)
0.18375	30.0	100	9	On	L1	10.2	24.3	54.3
0.20850	31.5	100	9	On	L1	10.0	21.8	53.3
0.28725	26.4	100	9	On	L1	10.0	24.2	50.6
0.29850	26.2	100	9	On	L1	10.0	24.1	50.3
0.44475	28.6	100	9	On	L1	10.0	18.4	47.0
0.55725	30.8	100	9	On	L1	10.1	15.2	46.0
0.70125	31.1	100	9	On	L1	10.1	14.9	46.0
0.86775	33.4	100	9	On	L1	10.1	12.6	46.0
1.05675	35.0	100	9	On	L1	10.0	11.0	46.0
1.36275	39.0	100	9	On	L1	10.0	7.0	46.0
1.66650	39.3	100	9	On	L1	10.1	6.7	46.0
1.82175	37.4	100	9	On	L1	10.1	8.6	46.0
2.64975	33.5	100	9	On	L1	10.2	12.5	46.0
2.98950	34.9	100	9	On	L1	10.2	11.1	46.0
4.08975	32.6	100	9	On	L1	10.3	13.4	46.0
4.21575	30.0	100	9	On	L1	10.3	16.0	46.0
5.50500	29.8	100	9	On	L1	10.2	20.2	50.0
7.09125	32.8	100	9	On	L1	10.2	17.2	50.0
8.21850	30.5	100	9	On	L1	10.3	19.5	50.0
0.43575	33.8	100	9	On	N	10.0	13.4	47.1
0.54600	31.0	100	9	On	N	10.1	15.0	46.0
0.69000	31.6	100	9	On	N	10.1	14.4	46.0
0.87450	33.6	100	9	On	N	10.1	12.4	46.0
1.06575	36.0	100	9	On	N	10.0	10.0	46.0
1.36050	38.1	100	9	On	N	10.0	7.9	46.0
1.48425	38.2	100	9	On	N	10.0	7.8	46.0
1.74075	33.0	100	9	On	N	10.1	13.0	46.0
2.51700	32.4	100	9	On	N	10.2	13.6	46.0
2.80275	34.1	100	9	On	N	10.2	11.9	46.0
4.12350	29.5	100	9	On	N	10.2	16.5	46.0
4.36200	29.1	100	9	On	N	10.2	16.9	46.0
6.40950	28.4	100	9	On	N	10.2	21.6	50.0
6.65025	28.2	100	9	On	N	10.2	21.8	50.0
8.04750	25.1	100	9	On	N	10.3	24.9	50.0

Notes: [1] Result (dBµV) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)

Sample calculation: 39.3 dBµV (result) = 29.2 dBµV (receiver reading) + 10.1 dB (Correction factor)

8.2.5 Test data, continued



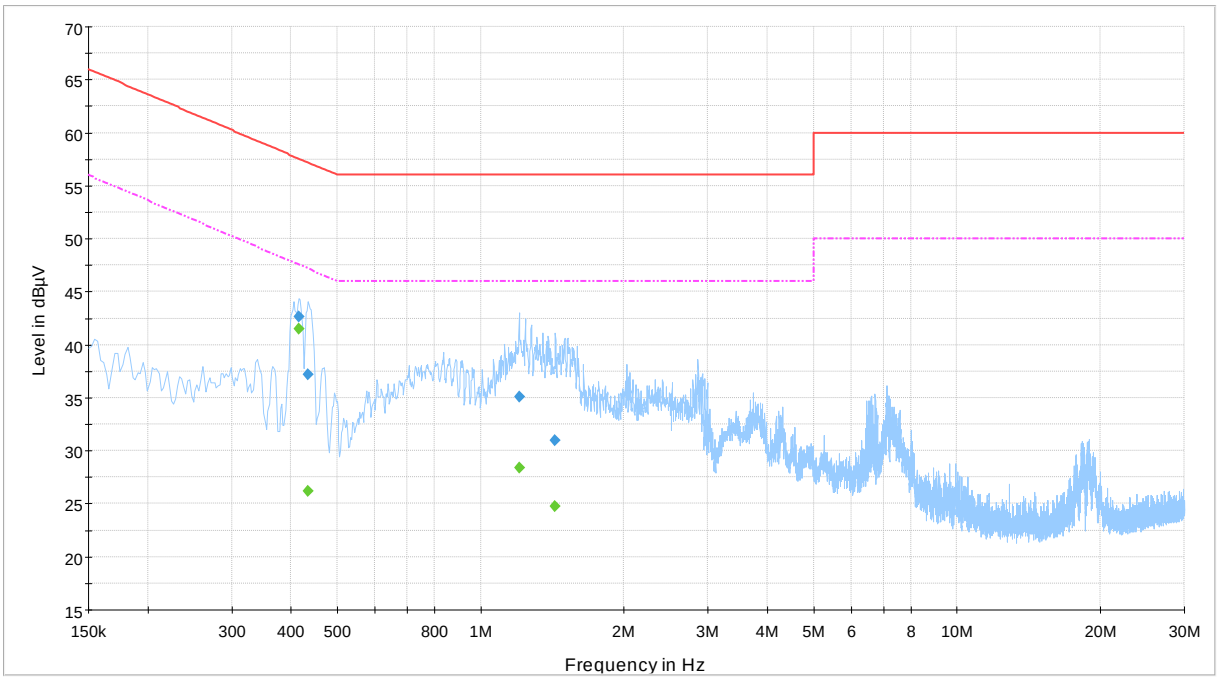
120VAC/60Hz, Phase (Configuration 3)

- CISPR 22 Mains QP Class B
- CISPR 22 Mains AV Class B
- Preview Result 1-PK+
- Final Result 1-QPK
- Final Result 2-AVG

The spectral plot has been corrected with transducer factors. (i.e. cable loss, LISN factors, and attenuators)

Plot 8.2-5: Conducted disturbance on phase line – Configuration 3

8.2.5 Test data, continued



120VAC/60Hz, Neutral (Configuration 3)

- CISPR 22 Mains QP Class B
- CISPR 22 Mains AV Class B
- Preview Result 1-PK+
- Final Result 1-QPK
- Final Result 2-AVG

The spectral plot has been corrected with transducer factors. (i.e. cable loss, LISN factors, and attenuators)

Plot 8.2-6: Conducted disturbance on neutral line – Configuration 3

8.2.5 Test data, continued

Table 8.2-6: Conducted disturbance (Quasi-Peak) results – Configuration 3 and AC adapter HDW-47725-001

Freq. (MHz)	Q-Peak result[1] (dBµV)	Meas. time (ms)	Bandwidth (kHz)	Filter	Conductor	Correction factor[2] (dB)	Margin (dB)	Limit (dBµV)
0.41550	43.5	100	9	On	L1	10.0	14.0	57.5
0.43125	36.3	100	9	On	L1	10.0	21.0	57.2
0.76650	35.5	100	9	On	L1	10.1	20.5	56.0
1.09275	37.0	100	9	On	L1	10.0	19.0	56.0
1.14900	36.5	100	9	On	L1	10.0	19.5	56.0
1.59900	31.1	100	9	On	L1	10.1	24.9	56.0
1.63725	33.6	100	9	On	L1	10.1	22.4	56.0
0.4155	42.7	100	9	On	N	10.0	14.9	57.5
0.4335	37.2	100	9	On	N	10.0	20.0	57.2
1.2030	35.1	100	9	On	N	10.0	20.9	56.0
1.4325	31.0	100	9	On	N	10.0	25.0	56.0

Notes: [1] Result (dBµV) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)

Sample calculation: 43.5 dBµV (result) = 33.5 dBµV (receiver reading) + 10.0 dB (Correction factor)

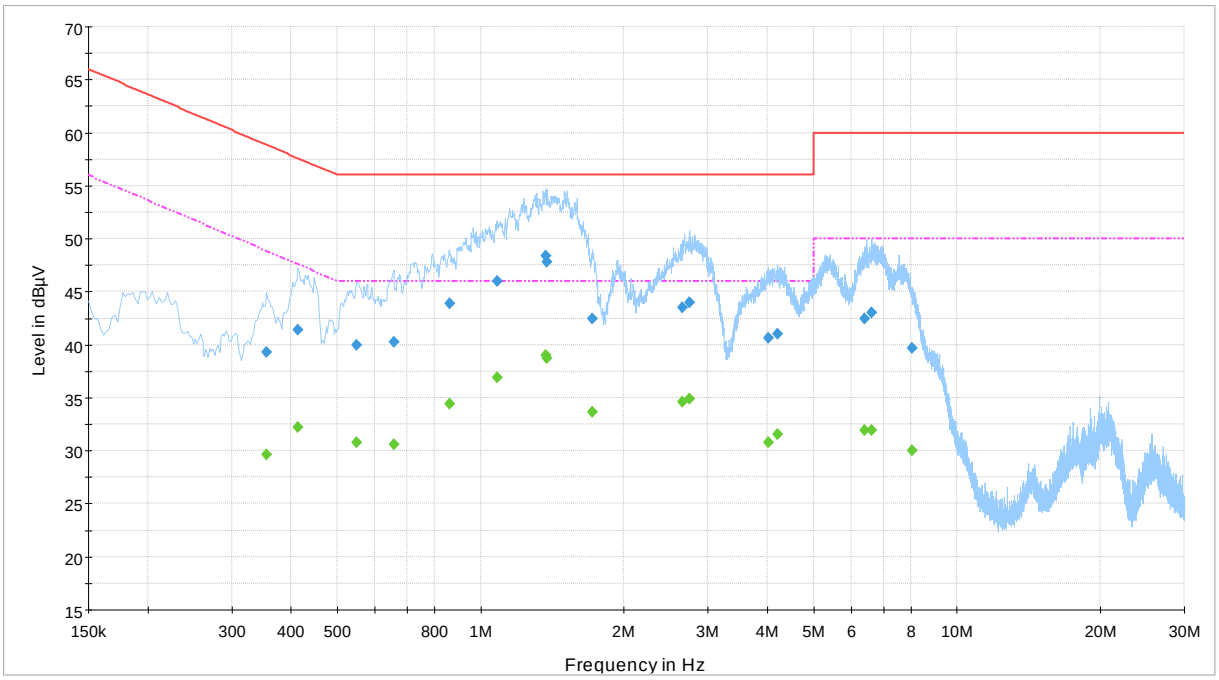
Table 8.2-7: Conducted disturbance (Average) results – Configuration 3 and AC adapter HDW-47725-001

Freq. (MHz)	Average result[1] (dBµV)	Meas. time (ms)	Bandwidth (kHz)	Filter	Conductor	Correction factor[2] (dB)	Margin (dB)	Limit (dBµV)
0.41550	38.1	100	9	On	L1	10.0	9.4	47.5
0.43125	21.3	100	9	On	L1	10.0	25.9	47.2
0.76650	18.1	100	9	On	L1	10.1	27.9	46.0
1.09275	28.0	100	9	On	L1	10.0	18.0	46.0
1.14900	27.8	100	9	On	L1	10.0	18.2	46.0
1.59900	20.6	100	9	On	L1	10.1	25.4	46.0
1.63725	26.2	100	9	On	L1	10.1	19.8	46.0
0.4155	41.5	100	9	On	N	10.0	6.0	47.5
0.4335	26.2	100	9	On	N	10.0	21.0	47.2
1.2030	28.4	100	9	On	N	10.0	17.6	46.0
1.4325	24.8	100	9	On	N	10.0	21.2	46.0

Notes: [1] Result (dBµV) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)

Sample calculation: 41.5 dBµV (result) = 31.5 dBµV (receiver reading) + 10.0 dB (Correction factor)

8.2.5 Test data, continued



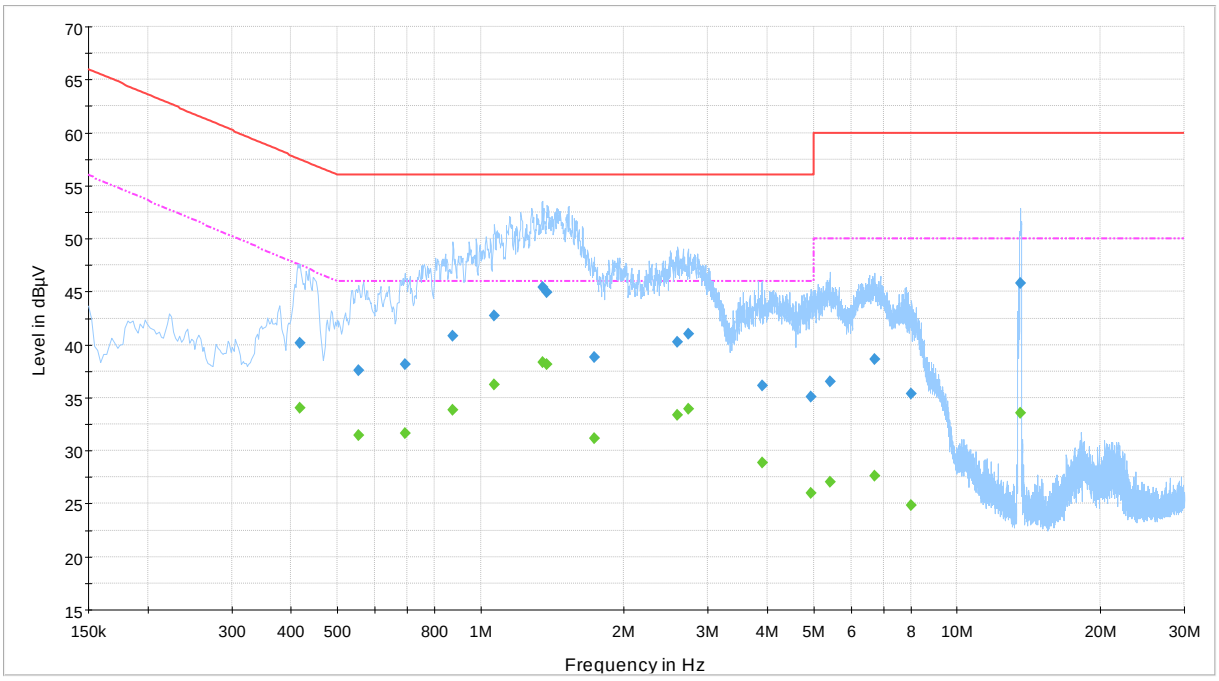
1220VAC/60Hz, Phase (Configuration 4)

- CISPR 22 Mains QP Class B
- CISPR 22 Mains AV Class B
- Preview Result 1-PK+
- Final Result 1-QPK
- Final Result 2-AVG

The spectral plot has been corrected with transducer factors. (i.e. cable loss, LISN factors, and attenuators)

Plot 8.2-7: Conducted disturbance on phase line – Configuration 4 and AC adapter HDW-47725-001

8.2.5 Test data, continued



120VAC/60Hz, Neutral (Configuration 4)
CISPR 22 Mains QP Class B
CISPR 22 Mains AV Class B
Preview Result 1-PK+
Final Result 1-QPK
Final Result 2-AVG

The spectral plot has been corrected with transducer factors. (i.e. cable loss, LISN factors, and attenuators)

Plot 8.2-8: Conducted disturbance on neutral line – Configuration 4 and AC adapter HDW-47725-001

8.2.5 Test data, continued

Table 8.2-8: Conducted disturbance (Quasi-Peak) results – Configuration 4 and AC adapter HDW-47725-001

Freq. (MHz)	Q-Peak result[1] (dBµV)	Meas. time (ms)	Bandwidth (kHz)	Filter	Conductor	Correction factor[2] (dB)	Margin (dB)	Limit (dBµV)
0.35475	39.3	100	9	On	L1	10.0	19.6	58.9
0.41325	41.4	100	9	On	L1	10.0	16.2	57.6
0.54825	39.9	100	9	On	L1	10.1	16.1	56.0
0.65625	40.3	100	9	On	L1	10.1	15.7	56.0
0.85875	43.9	100	9	On	L1	10.1	12.1	56.0
1.08375	46.0	100	9	On	L1	10.0	10.0	56.0
1.36725	48.4	100	9	On	L1	10.0	7.6	56.0
1.37850	47.8	100	9	On	L1	10.0	8.2	56.0
1.71600	42.5	100	9	On	L1	10.1	13.5	56.0
2.65200	43.5	100	9	On	L1	10.2	12.5	56.0
2.73750	44.0	100	9	On	L1	10.2	12.0	56.0
4.00875	40.6	100	9	On	L1	10.3	15.4	56.0
4.20225	41.0	100	9	On	L1	10.3	15.0	56.0
6.40725	42.5	100	9	On	L1	10.2	17.5	60.0
6.60975	43.0	100	9	On	L1	10.2	17.0	60.0
8.04300	39.7	100	9	On	L1	10.3	20.3	60.0
0.41775	40.2	100	9	On	N	10.0	17.3	57.5
0.55500	37.6	100	9	On	N	10.1	18.4	56.0
0.69225	38.1	100	9	On	N	10.1	17.9	56.0
0.87450	40.8	100	9	On	N	10.1	15.2	56.0
1.06800	42.7	100	9	On	N	10.0	13.3	56.0
1.34700	45.4	100	9	On	N	10.0	10.6	56.0
1.37850	44.9	100	9	On	N	10.0	11.1	56.0
1.72950	38.9	100	9	On	N	10.1	17.1	56.0
2.59125	40.2	100	9	On	N	10.2	15.8	56.0
2.72400	41.0	100	9	On	N	10.2	15.0	56.0
3.89175	36.1	100	9	On	N	10.2	19.9	56.0
4.94025	35.1	100	9	On	N	10.2	20.9	56.0
5.40825	36.5	100	9	On	N	10.2	23.5	60.0
6.71325	38.6	100	9	On	N	10.2	21.4	60.0
8.02500	35.4	100	9	On	N	10.3	24.6	60.0
13.55725	45.8	100	9	On	N	10.5	14.2	60.0

Notes: [1] Result (dBµV) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)

Sample calculation: 48.4 dBµV (result) = 38.4 dBµV (receiver reading) + 10.0 dB (Correction factor)

8.2.5 Test data, continued

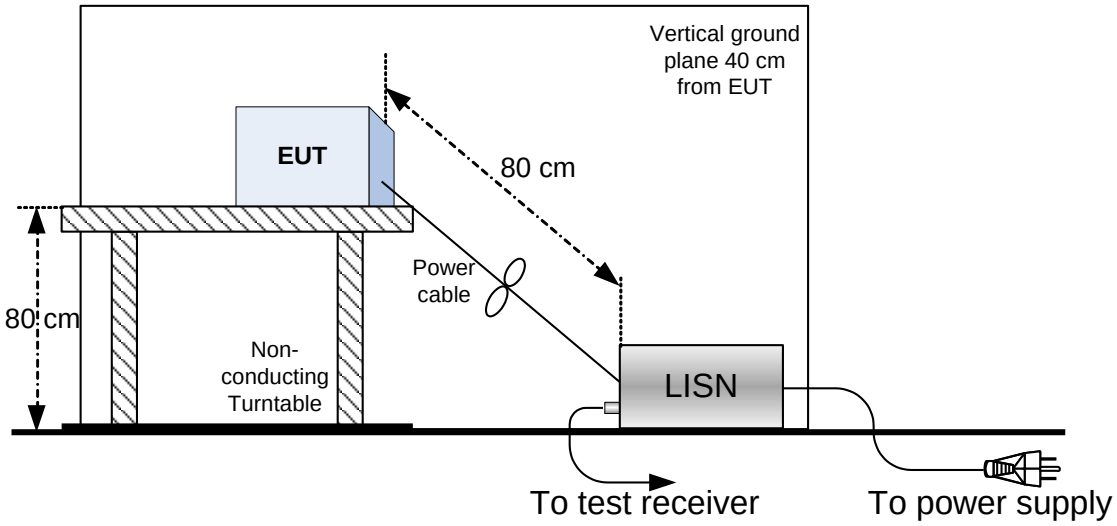
Table 8.2-9: Conducted disturbance (Average) results – Configuration 4 and AC adapter HDW-47725-001

Freq. (MHz)	Average result[1] (dBµV)	Meas. time (ms)	Bandwidth (kHz)	Filter	Conductor	Correction factor[2] (dB)	Margin (dB)	Limit (dBµV)
0.354750	29.6	100	9	On	L1	10.0	19.3	48.9
0.41325	32.3	100	9	On	L1	10.0	15.3	47.6
0.54825	30.7	100	9	On	L1	10.1	15.3	46.0
0.65625	30.6	100	9	On	L1	10.1	15.4	46.0
0.85875	34.4	100	9	On	L1	10.1	11.6	46.0
1.08375	36.9	100	9	On	L1	10.0	9.1	46.0
1.36725	39.0	100	9	On	L1	10.0	7.0	46.0
1.37850	38.8	100	9	On	L1	10.0	7.2	46.0
1.71600	33.6	100	9	On	L1	10.1	12.4	46.0
2.65200	34.6	100	9	On	L1	10.2	11.4	46.0
2.73750	34.9	100	9	On	L1	10.2	11.1	46.0
4.00875	30.8	100	9	On	L1	10.3	15.2	46.0
4.20225	31.5	100	9	On	L1	10.3	14.5	46.0
6.40725	31.9	100	9	On	L1	10.2	18.1	50.0
6.60975	32.0	100	9	On	L1	10.2	18.0	50.0
8.04300	30.0	100	9	On	L1	10.3	20.0	50.0
0.41775	34.1	100	9	On	N	10.0	13.4	47.5
0.55500	31.5	100	9	On	N	10.1	14.5	46.0
0.69225	31.6	100	9	On	N	10.1	14.4	46.0
0.87450	33.9	100	9	On	N	10.1	12.1	46.0
1.06800	36.2	100	9	On	N	10.0	9.8	46.0
1.34700	38.3	100	9	On	N	10.0	7.7	46.0
1.37850	38.1	100	9	On	N	10.0	7.9	46.0
1.72950	31.1	100	9	On	N	10.1	14.9	46.0
2.59125	33.4	100	9	On	N	10.2	12.6	46.0
2.72400	33.9	100	9	On	N	10.2	12.1	46.0
3.89175	28.9	100	9	On	N	10.2	17.1	46.0
4.94025	26.0	100	9	On	N	10.2	20.0	46.0
5.40825	27.1	100	9	On	N	10.2	22.9	50.0
6.71325	27.6	100	9	On	N	10.2	22.4	50.0
8.02500	24.9	100	9	On	N	10.3	25.1	50.0
13.55725	33.5	100	9	On	N	10.5	16.5	50.0

Notes: [1] Result (dBµV) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)

Sample calculation: 39.0 dBµV (result) = 29 dBµV (receiver reading) + 10.0 dB (Correction factor)

8.2.6 Setup diagram



Setup diagram 8.2-1: Conducted disturbance setup