

EMC TEST REPORT

FCC 47 CFR Part 15B Industry Canada RSS-Gen

Electromagnetic compatibility - Unintentional radiators

Report Reference No. G0M-1107-1261 – C-1

Testing Laboratory: Eurofins Product Service GmbH

Address: Storkower Str. 38c

15526 Reichenwalde

Germany

Accreditation FCC Filed Test Laboratory, Reg.-No.: 96970

A2LA Accredited Testing Laboratory, Certificate No.: 1983.01

ACCREDITED
TESTING CERTH 1983 01

Applicant's name: HACH LANGE GmbH

Address: Königsweg 10

14163 Berlin Germany

Test specification:

Standard.....: 47 CFR Part 15 Subpart B

RSS-Gen, Issue 3, 2010-12

ANSI C63.4:2009

Equipment under test (EUT):

Product description Measurement probe for water analysis

Model No. LXG440

Hardware version XMF785-E

Firmware / Software version DD 0.7 / AC 0.11

Contains FCC-ID: YCB-LXG440 IC: 5879A-LXG440

Test result Passed



Possible test case verdicts:

- not applicable to test object N/A

- test object does meet the requirement P (Pass)

- test object does not meet the requirement..... F (Fail)

Testing:

Compiled by Christian Weber

Tested by (+ signature)...... Matthias Handrik

Approved by (+ signature)...... Jens Zimmermann

Date of issue 28.07.2011

Total number of pages 26

General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

Additional comments:

Two Models have been tested:

<u>EUT A:</u> (SN:1386816) with new DC/DC Converter Model: <u>Peak PC10CU-0505 ZLF</u> <u>EUT B:</u> (SN:1386813) with old DC/DC Converter Model: <u>Traco TMH0505D (XMU624)</u>



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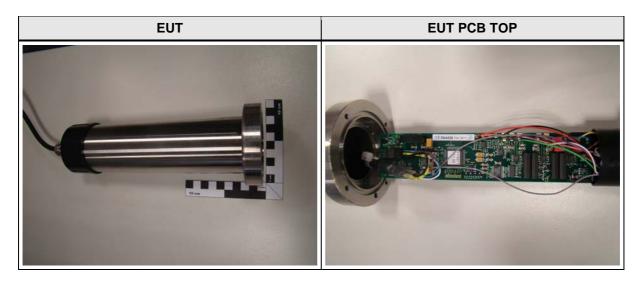


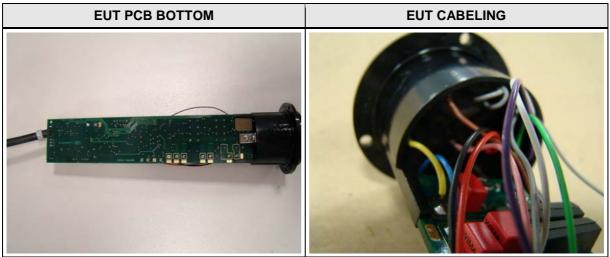
1 Equipment (Test item) Description:

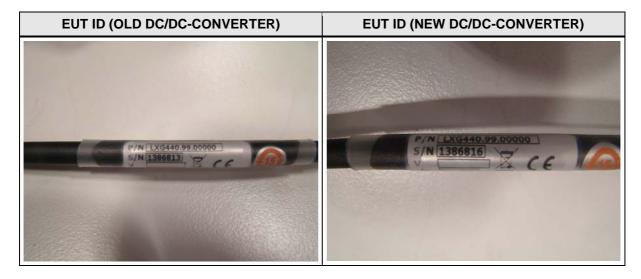
Description	Measurement probe for water analysis
Model	LXG440
Serial number	1386813 (old DC/DC-Converter Traco TMH0505D (XMU624)) 1386816 (new DC/DC-Converter Peak PC10CU-0505 ZLF)
Hardware version	XMF785-E
Software / Firmware version	DD 0.7 / AC 0.11
Contains FCC-ID	YCB-LXG440
Contains IC	5879A-LXG440
Power supply	12VDC (powered via controller device)
AC/DC-Adaptor	None
Highest emission frequency	Fmax [MHz] = 16
Device classification	Class B
Equipment type	Tabletop
Number of tested samples	1



1.1 Equipment photos













1.2 Supporting Equipment Used During Testing:

Product Type* Device		Manufacturer	Model No.	Comments	
AE	SC200	Hach Lange GmbH	LXG404		

*Note: Use the following abbreviations:

AE : Auxiliary/Associated Equipment, or SIM : Simulator (Not Subjected to Test)

CABL: Connecting cables



1.3 Operating Modes:

Mode #	Description
1	EUT with old DC/DC-Converter (S/N: 1386813) connected to controller device SC200.
2	EUT with new DC/DC-Converter (S/N: 1386816) connected to controller device SC200.



1.4 Test Equipment Used During Testing

Radiated emissions						
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due	
Biconical Antenna	R&S	HK 116	Inv. No. 0012	Jan 10	Jan 13	
LPD-Antenne	R&S	HL 223	Inv. No. 0295	Feb 11	Feb 13	
LPD-Antenna	R&S	HL 025	Inv. No. 0512	Feb 10	Feb 13	
EMI Test Receiver	R&S	ESCS30	Inv. No. 0474	Jun 11	Jun 12	

Conducted emissions						
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due	
AMN	R&S	ESH2-Z5	Inv. No. 0288	Sep 10	Sep 12	
AMN	R&S	ESH3-Z5	Inv. No. 0040	Nov 10	Nov 12	
EMI Test Receiver	R&S	ESCS 30	Inv. No. 0474	Jun 11	Jun 12	



2 Result Summary

FCC 47 CFR Part 15B, Industry Canada RSS-Gen						
Product Specific Standard	Requirement – Test	Reference Method	Result	Remarks		
47 CFR 15.107 RSS-Gen 4.9 & 4.10	Radiated emissions	ANSI C 63.4	PASS			
47 CFR 15.109 RSS-Gen 7.2.4	AC power line conducted emissions	ANSI C63.4	PASS			
Remarks:						



3 Test Conditions and Results

3.1 Test Conditions and Results – Radiated emissions

Radiated emission	ons acc. FCC 47 C	FR 15.10	9 / IC RSS	-Gen	Ver	dict: PASS
Laboratory Parameters:		Required prior to the test		During the test		
Ambient To	emperature		15 to 35°C		23°C	
Relative	Humidity		30 to 60%		52%	
Test according	ng referenced			Referenc	e Method	
stand	dards			ANSI	C63.4	
Sample is tested	with respect to the			Equipme	ent class	
	e equipment class			Clas	ss B	
Test frequency ran	ge determined from		Hiç	ghest emiss	sion frequency	
	sion frequency			Fmax [M	Hz] = 16	
Fully configured sample scanned over the following frequency range		Frequency range				
		30MHz to 1GHz				
	Limits and r	esults Cla	ass B – Mod	lel S/N: 138	6813	
Frequency [MHz]	Quasi-Peak [dB _k	ıV/m]	Result	Ave	erage [dBµV/m]	Result
30 – 88	40		PASS		-	-
88 – 216	43.5		PASS		-	-
216 – 960	46		PASS		-	-
960 – 1000	54		PASS		-	-
	Limits and r	esults Cla	ass B – Mod	el S/N: 138	6816	•
Frequency [MHz]	Quasi-Peak [dB _l	ıV/m]	Result	Ave	erage [dBµV/m]	Result
30 – 88	40		PASS		-	-
88 – 216	43.5		PASS		-	-
216 – 960	46		PASS		-	-
960 – 1000	54		PASS			



Product Service





Order number: G0M-1107-1261

Manufacturer: HACH LANGE GmbH

32,58 dBµV/m

EUT Name: Measurement probe for water analysis

Model: LXG440

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

Test Conditions: Tnom: 23°C, Unom: 12 V DC => controller

Antenna: Rohde & Schwarz HK 116, Vertical

Measurement distance: 3m

96 MHz

Mode: SC200 Controller:LXG404+ANISE probe: LXG440, Ser.: 1386813

(DC-DC Converter TRACO)

Test Date: 20.07.2011 Note: PASS

FCC part 15B Class B QP RBW: 120 kHz, Vertical Max Peak -- RBW: 120 kHz, Vertical Max Quasi Peak 55 50 45 40 Electrical Field (dBµV/m) 25 20 15 10 30 M 40 M 60 M 80 M 100 M 120 M 140 M 160 M 200 M Frequency (Hz) Quasi-Peak Quasi-Peak Limit Quasi-Peak Difference Status Frequency 40,92 MHz 27,98 dBµV/m 40 dBµV/m -12,02 dB Pass 79,77 MHz -10,97 dB Pass $29{,}03\;dB\mu V/m$ $40\;dB\mu V/m$ 81,492 MHz 30,13 dBµV/m 40 dBµV/m -9,87 dB **Pass** 32,72 dBµV/m -7,28 dB 85,752 MHz 40 dBµV/m Pass

-10,92 dB

 $43,5 dB\mu V/m$

Pass



Order number: G0M-1107-1261

HACH LANGE GmbH Manufacturer:

EUT Name: Measurement probe for water analysis

Model: **LXG440**

Test Site: **Eurofins Product Service GmbH**

Operator: Mr. Handrik

Tnom: 23°C, Unom: 12 V DC => controller **Test Conditions:** Antenna: Rohde & Schwarz HK 116, Horizontal

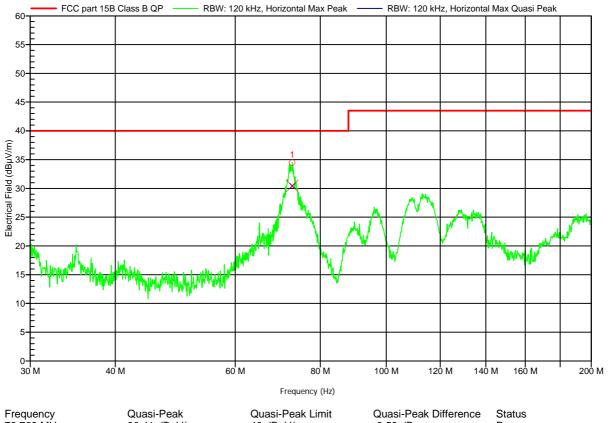
Measurement distance:

SC200 Controller:LXG404+ANISE probe: LXG440, Ser.: 1386813 Mode:

(DC-DC Converter TRACO)

20.07.2011 Test Date: Note: **PASS**

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72,768 MHz

30,41 dBµV/m

40 dBµV/m

-9,59 dB

Pass



Order number: G0M-1107-1261

Manufacturer: HACH LANGE GmbH

EUT Name: Measurement probe for water analysis

Model: LXG440

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

Test Conditions: Tnom: 23°C, Unom: 12 V DC => controller

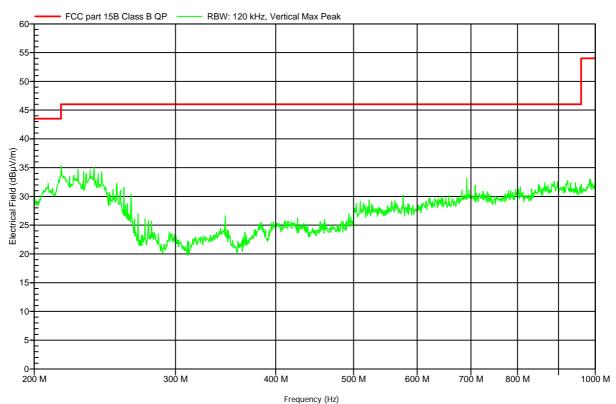
Antenna: Rohde & Schwarz HL 223, Vertical

Measurement distance: 3m

Mode: SC200 Controller:LXG404+ANISE probe: LXG440, Ser.: 1386813

(DC-DC Converter TRACO)

Test Date: 20.07.2011 Note: PASS





Order number: G0M-1107-1261

Manufacturer: HACH LANGE GmbH

EUT Name: Measurement probe for water analysis

Model: LXG440

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

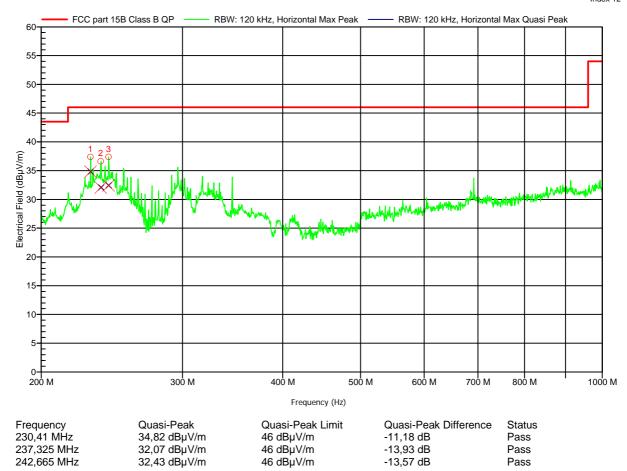
Test Conditions: Tnom: 23°C, Unom: 12 V DC => controller Antenna: Rohde & Schwarz HL 223, Horizontal

Measurement distance: 3m

Mode: SC200 Controller:LXG404+ANISE probe: LXG440, Ser.: 1386813

(DC-DC Converter TRACO)

Test Date: 20.07.2011 Note: PASS





Order number: G0M-1107-1261

Manufacturer: HACH LANGE GmbH

EUT Name: Measurement probe for water analysis

Model: LXG440

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

Test Conditions: Tnom: 23°C, Unom: 12 V DC => controller

Antenna: Rohde & Schwarz HK 116, Vertical

Measurement distance: 3m

87,504 MHz

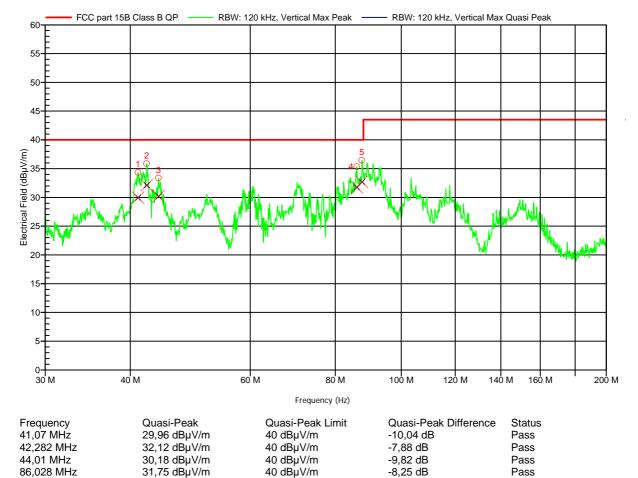
32,7 dBµV/m

Mode: SC200 controller: LXG404+ANISE probe: LXG440, Ser.: 1386816

(DC-DC Converter PEAK)

Test Date: 20.07.2011 Note: PASS

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Test Report No.: G0M-1107-1261-C-1

-7,3 dB

 $40 dB\mu V/m$

Pass



Order number: G0M-1107-1261

Manufacturer: HACH LANGE GmbH

EUT Name: Measurement probe for water analysis

Model: LXG440

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

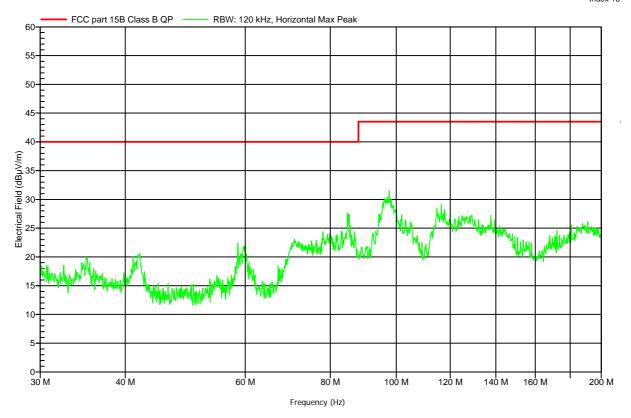
Test Conditions: Tnom: 23°C, Unom: 12 V DC => controller Antenna: Rohde & Schwarz HK 116, Horizontal

Measurement distance: 3m

Mode: SC200 controller: LXG404+ANISE probe: LXG440, Ser.: 1386816

(DC-DC Converter PEAK)

Test Date: 20.07.2011 Note: PASS





Order number: G0M-1107-1261

Manufacturer: HACH LANGE GmbH

EUT Name: Measurement probe for water analysis

Model: LXG440

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

Test Conditions: Tnom: 23°C, Unom: 12 V DC => controller

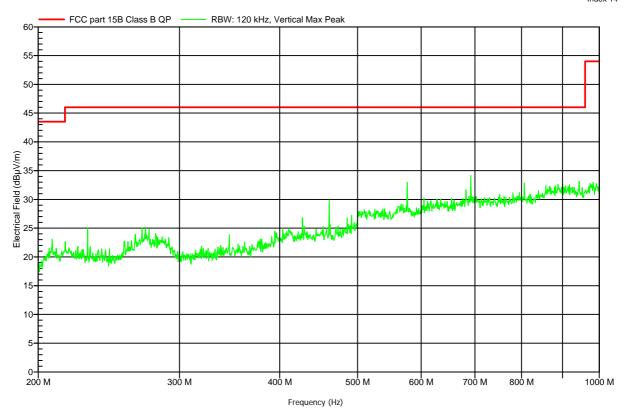
Antenna: Rohde & Schwarz HL 223, Vertical

Measurement distance: 3m

Mode: SC200 controller: LXG404+ANISE probe: LXG440, Ser.: 1386816

(DC-DC Converter PEAK)

Test Date: 20.07.2011 Note: PASS





Order number: G0M-1107-1261

Manufacturer: HACH LANGE GmbH

EUT Name: Measurement probe for water analysis

Model: LXG440

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

Test Conditions: Tnom: 23°C, Unom: 12 V DC => controller Antenna: Rohde & Schwarz HL 223, Horizontal

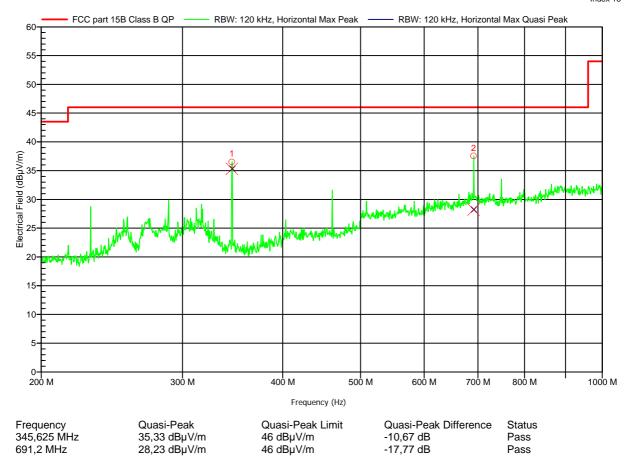
Measurement distance: 3m

Mode: SC200 controller: LXG404+ANISE probe: LXG440, Ser.: 1386816

(DC-DC Converter PEAK)

Test Date: 20.07.2011 Note: PASS

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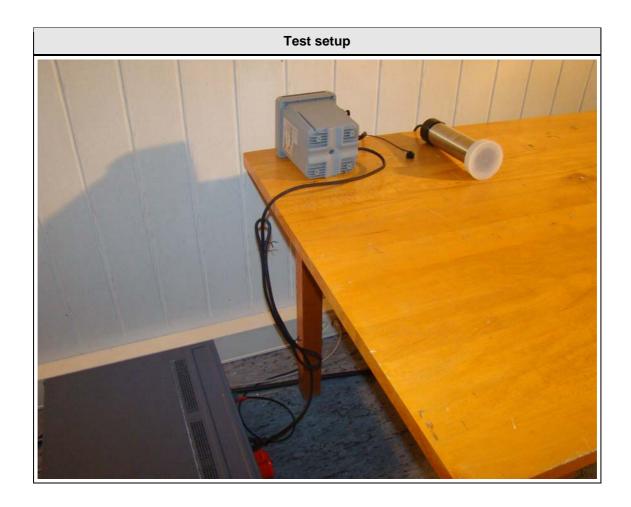


3.2 Test Conditions and Results - AC power line conducted emissions

Laborator Doro		Daa		en	Durin	Verdict: PAS
Laboratory Parameters:		Req	uired prior to the	test		g the test
Ambient Temp			15 to 35°C			23°C
Relative Hun	nidity		30 to 60%			52%
Test according re			R	eference	Method	
standard	S			ANSI C	63.4	
Fully configured sample	e scanned over		F	requency	range	
the following frequency range Sample is tested with respect to the			0.	15MHz to	30MHz	
			E	quipmen	t class	
requirements of the ed			Class	В		
Points of Appl	Application Interface					
AC Mains		LISN				
	Limits and re	esults Cl	ass B – Model S	/N: 1386	813	
Frequency [MHz]	Quasi-Peak [dBµV]	Result	Avera	age [dBµV]	Result
0.15 to 5	66 to 56	*	PASS	56	6 to 46*	PASS
0.5 to 5	56		PASS		46	PASS
5 to 30	60		PASS		50	PASS
	Limits and re	esults Cl	ass B – Model S	/N: 1386	816	
Frequency [MHz]	Quasi-Peak [dBµV]	Result	Avera	age [dBµV]	Result
0.15 to 5	66 to 56	*	PASS	56	6 to 46*	PASS
0.5 to 5	56		PASS		46	PASS
5 to 30	60		PASS		50	PASS



Product Service





Order number: G0M-1107-1261

Manufacturer: HACH LANGE GmbH

EUT Name: Measurement probe for water analysis

Model: LXG440

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

Test Conditions: Tnom: 23°C, Unom: 12 V DC => controller

LISN: ESH2-Z5 N

Mode: SC200 controller: LXG404+ANISE probe: LXG440, Ser.: 1386816,

(DC-DC Converter PEAK)

Test Date: 20.07.2011 Note: PASS

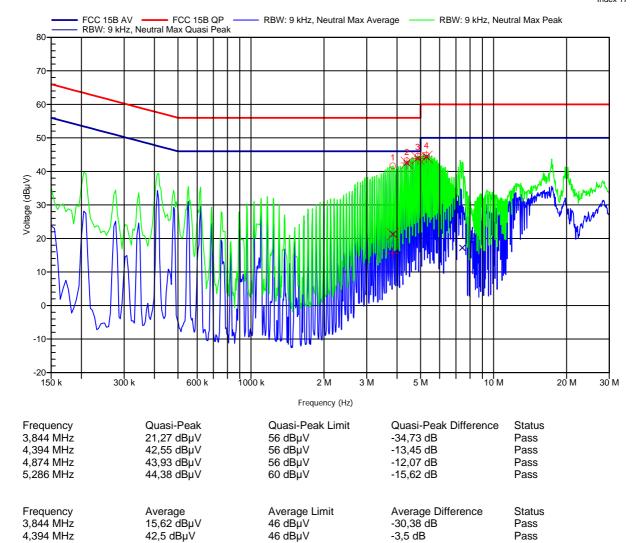
4,874 MHz

5,286 MHz

43,85 dBµV

44,35 dBµV

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Test Report No.: G0M-1107-1261-C-1

-2,15 dB

-5,65 dB

 $46 dB\mu V$

50 dBµV

Pass

Pass



Order number: G0M-1107-1261

Manufacturer: HACH LANGE GmbH

EUT Name: Measurement probe for water analysis

Model: LXG440

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

Test Conditions: Tnom: 23°C, Unom: 12 V DC => controller

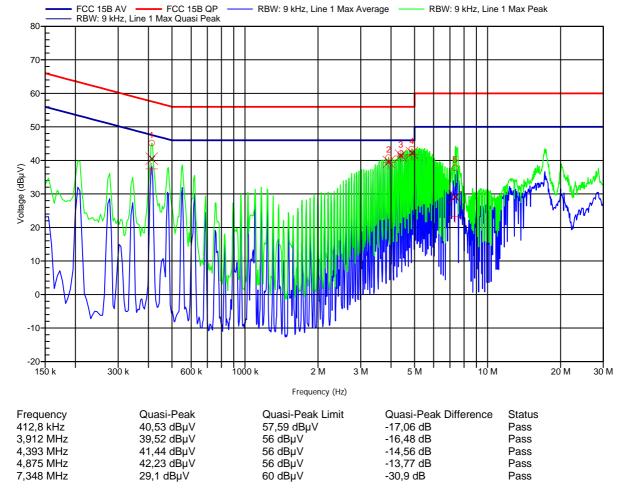
LISN: ESH2-Z5 L

Mode: SC200 controller: LXG404+ANISE probe: LXG440, Ser.: 1386816,

(DC-DC Converter PEAK)

Test Date: 20.07.2011 Note: PASS

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Frequency Average Average Limit Average Difference Status 37,44 dBµV 47,59 dBµV Pass 412,8 kHz -10,15 dB 3,912 MHz 39,32 dBµV $46 dB\mu V$ -6,68 dB Pass 4,393 MHz 41,35 dBµV 46 dBµV -4,65 dB Pass 46 dBµV 4,875 MHz 41,71 dBµV -4,29 dB Pass -26,81 dB 7,348 MHz 23,19 dBµV 50 dBµV **Pass**



Order number: G0M-1107-1261

Manufacturer: HACH LANGE GmbH

EUT Name: Measurement probe for water analysis

Model: LXG440

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

Test Conditions: Tnom: 23°C, Unom: 12 V DC => controller

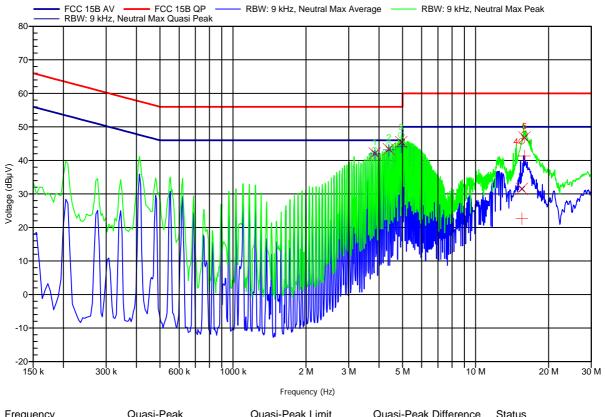
LISN: ESH2-Z5 N

Mode: SC200 controller: LXG404+ANISE probe: LXG440, Ser.: 1386813,

(DC-DC Converter TRACO)

Test Date: 20.07.2011 Note: PASS

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Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Status
3,843 MHz	42,09 dBµV	56 dBµV	-13,91 dB	Pass
4,392 MHz	43,37 dBµV	56 dBµV	-12,63 dB	Pass
4,942 MHz	45,43 dBµV	56 dBµV	-10,57 dB	Pass
15,514 MHz	31,52 dBµV	60 dBµV	-28,48 dB	Pass
15,915 MHz	46,82 dBµV	60 dBµV	-13,18 dB	Pass
Frequency	Average	Average Limit	Average Difference	Status
3,843 MHz	41,93 dBµV	46 dBµV	-4,07 dB	Pass
4,392 MHz	43,13 dBµV	46 dBµV	-2,87 dB	Pass
4,942 MHz	44,04 dBµV	46 dBµV	-1,96 dB	Pass
15,514 MHz	22,64 dBµV	50 dBµV	-27,36 dB	Pass
15,915 MHz	41,35 dBµV	50 dBµV	-8,65 dB	Pass



Order number: G0M-1107-1261

Manufacturer: HACH LANGE GmbH

EUT Name: Measurement probe for water analysis

Model: LXG440

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

Test Conditions: Tnom: 23°C, Unom: 12 V DC => controller

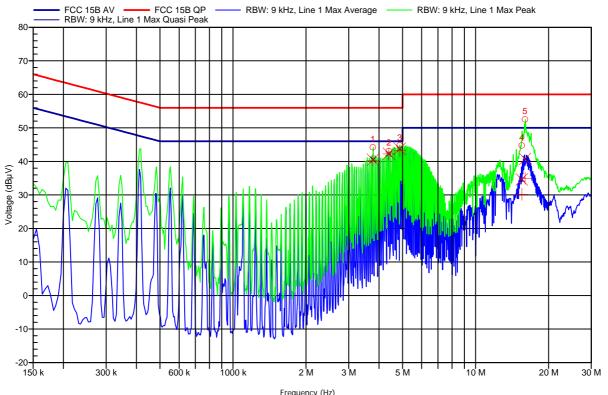
LISN: ESH2-Z5 L

Mode: SC200 controller: LXG404+ANISE probe: LXG440, Ser.: 1386813,

(DC-DC Converter TRACO)

Test Date: 20.07.2011 Note: PASS

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Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Status
3,772 MHz	40,51 dBμV	56 dBμV	-15,49 dB	Pass
4,393 MHz	42,3 dBµV	56 dBµV	-13,7 dB	Pass
4,873 MHz	43,75 dBµV	56 dBµV	-12,25 dB	Pass
15,513 MHz	34,61 dBµV	60 dBµV	-25,39 dB	Pass
15,994 MHz	40,72 dBµV	60 dBµV	-19,28 dB	Pass
Frequency	Average	Average Limit	Average Difference	Status
3,772 MHz	40,3 dBµV	46 dBµV	-5.7 dB	Pass
4,393 MHz	42,22 dBµV	46 dBµV	-3,78 dB	Pass
4,873 MHz	43,18 dBµV	46 dBµV	-2,82 dB	Pass
15,513 MHz	30,17 dBµV	50 dBµV	-19,83 dB	Pass
15,994 MHz	34,97 dBµV	50 dBµV	-15,03 dB	Pass