eurofins | Product Service

FCC TEST REPORT

FCC 47 CFR Part 15C
Industry Canada RSS-210

Operation within the 13.110 – 14.010 MHz band

Report Reference No. ..... :	G0M-1204-1925-TFC225D-V01
Testing Laboratory ..... :	Eurofins Product Service GmbH
Address ..... :	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation ..... :	A2LA Accredited Testing Laboratory, Certificate No.: 1983.01 FCC Filed Test Laboratory, Reg.-No.: 96970 IC OATS Filing assigned code: 3470A
Applicant's name ..... :	metraTec GmbH
Address ..... :	Werner-Heisenberg-Str. 1 39106 Magdeburg GERMANY
Test specification:	
Standard..... :	47 CFR Part 15C RSS-210, Issue 8, 2010-12 RSS-Gen, Issue 3, 2010-12 ANSI C63.4:2009
Equipment under test (EUT):	
Product description	RFID module QR15-HL built into Product VIS Spectrophotometer DR3900 / LPG440
Model No.	QR15-HL in end product VIS Spectrophotometer DR3900/LPG440
Hardware version	
Firmware / Software version	
	FCC-ID: YUH-QR15HL IC: 9278A-QR15HL
Test result	**Passed**

Possible test case verdicts:	
- neither assessed nor tested ..... :	N/N
- required by standard but not appl. to test object ..... :	N/A
- required by standard but not tested ..... :	N/T
- not required by standard for the test object ..... :	N/R
- test object does meet the requirement ..... :	P (Pass)
- test object does not meet the requirement ..... :	F (Fail)

Testing:

Date of receipt of test item..... :	2012-04-27	
Date (s) of performance of tests..... :	2012-04-27	
Compiled by.....:	Christian Weber	
Tested by (+ signature) .....: (Testing Manager)	Matthias Handrik	.....
Approved by (+ signature).....: (Test Lab Manager)	Jens Zimmermann	.....
Date of issue.....:	2012-05-11	
Total number of pages .....:	42	

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:

REPORT INDEX

1 Equipment (Test item) Description:

Description	RFID module QR15-HL built into Product VIS Spectrophotometer DR3900 / LPG440	
Model	QR15-HL in end product VIS Spectrophotometer DR3900/LPG440	
Serial number	None	
Hardware version		
Software / Firmware version		
FCC-ID	YUH-QR15HL	
IC	9278A-QR15HL	
Equipment type	End product	
Radio type	Transceiver	
Radio technology	13.56 MHz RFID	
Operating frequency range	13.56 MHz	
Assigned frequency band	13.110 - 14.010 MHz	
Frequency range	F_{MID}	13.56 MHz
Spreading	None	
Modulations	ASK	
Number of channels	1	
Channel spacing	None	
Number of antennas	1	
Antenna	Type	integrated
	Model	printed loop antenna
	Manufacturer	metraTec
Power supply	V_{NOM}	120.0 VAC
	V_{MIN}	102 VAC
	V_{MAX}	138 VAC
Temperatures	T_{NOM}	25°C
	T_{MIN}	-20°C
	T_{MAX}	+50°C
AC/DC-Adaptor	Model	N/A
	Vendor	N/A
	Input	N/A
	Output	N/A

1.1 Photos – Equipment External

EUT TOP


EUT FRONT


EUTF RONT


EUT BACK

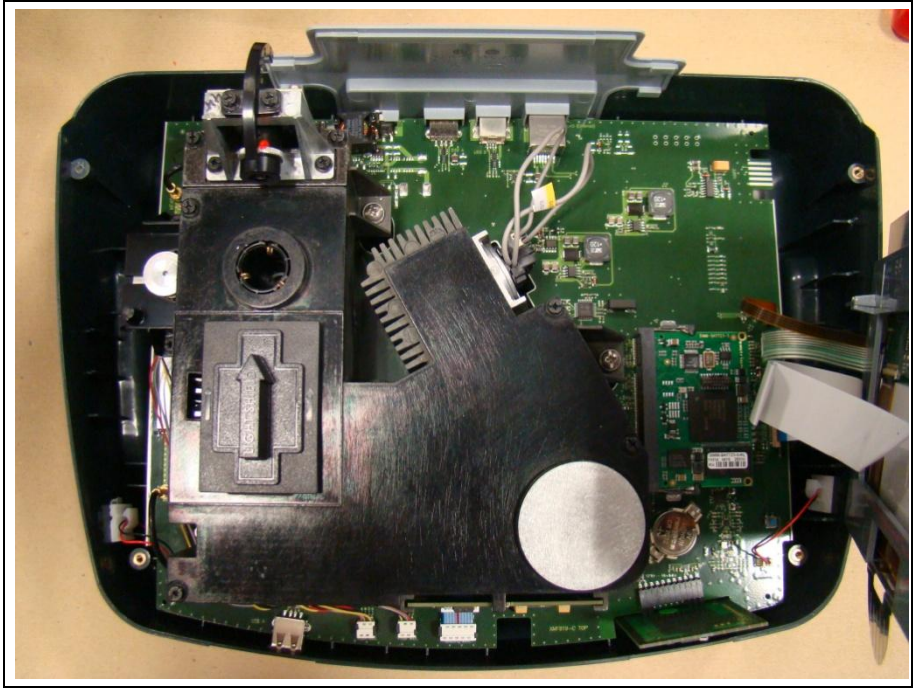

EUT ID

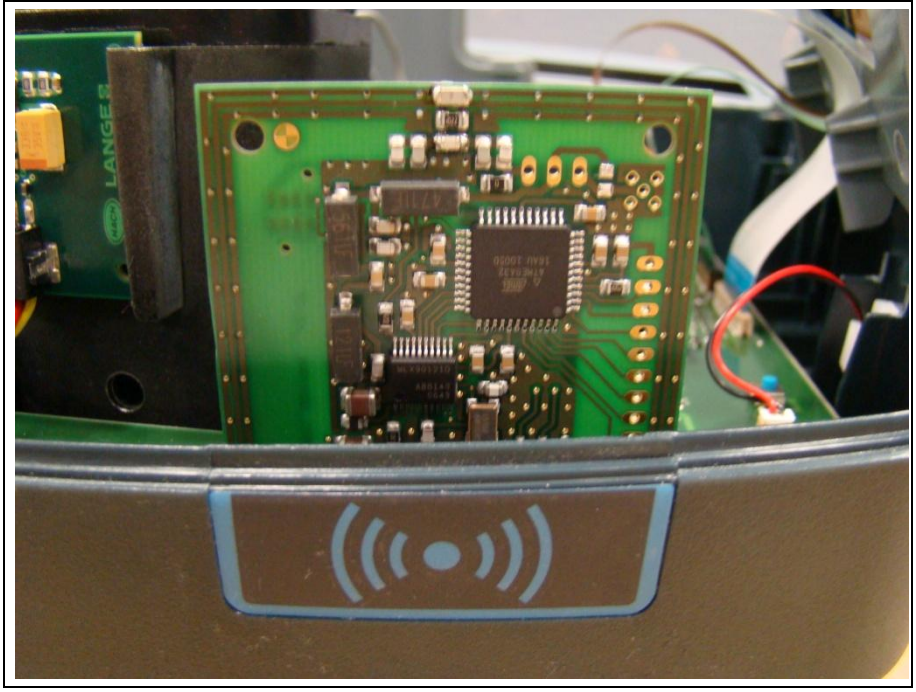

HACH
P/N LPG440.99.00012
S/N 1357416
V 15V DC
VA 40
Hz
Made in Germany
N27867
15
www.tuv.com
GS

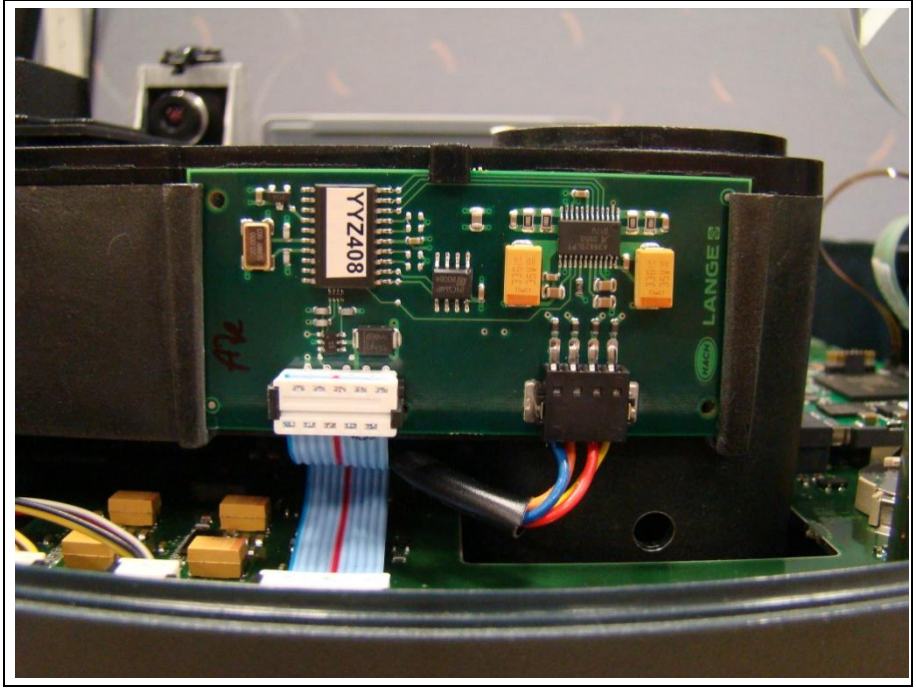
EUT ID


Contains FCC ID: YUH - QR15HL
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Contains IC: 9278A - QR15HL
CE 0681

1.2 Photos – Equipment internal

EUT OPEN TOP


EUT RFID MODULE


EUT PCB


1.3 Photos – Test setup

Test Setup Radiated Emissions

Test Setup Conducted Emissions

1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
None				

***Note:** Use the following abbreviations:

AE : Auxiliary/Associated Equipment, or

SIM : Simulator (Not Subjected to Test)

CABL : Connecting cables

1.5 Test Modes

Mode #	Description	
Single	General conditions:	EUT powered by ac-mains
	Radio conditions:	Mode = standalone transmit Modulation = ASK Power level = Maximum

1.6 Test Equipment Used During Testing

Occupied Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2011-12	2012-12

Field strength emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-anechoic chamber	Frankonia	AC 5	EF00395	-	-
Spectrum Analyzer	R&S	FSIQ26	EF00242	2011-04	2012-04
Loop Antenna	R&S	HFH2-Z2	EF00184	2011-09	2012-09
Biconical Antenna	R&S	HK 116	EF00012	2010-01	2013-01
LPD Antenna	R&S	HL 223	EF00187	2011-02	2014-02
LPD Antenna	R&S	HL 025	EF00327	2010-02	2013-02

Conducted emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
AMN	R&S	ESH2-Z5	EF00182	2010-09	2012-09
AMN	R&S	ESH3-Z5	EF00036	2010-11	2012-11
EMI Test Receiver	R&S	ESCS 30	EF00295	2011-06	2012-06

1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyzer in dBµV. Any external preamplifiers used are taken into account through internal analyzer settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyzer. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

Reading on Analyzer (dBµV) + A.F. (dB) = Net field strength (dBµV/m)

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of dBµV/m). The FCC limits are given in units of µV/m. The following formula is used to convert the units of µV/m to dBµV/m:

Limit (dBµV/m) = 20*log (µV/m)

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

Reading	+	AF	=	Net Reading	:	Net reading - FCC limit	= Margin
21.5 dBµV	+	26 dB	=	47.5 dBµV/m	:	47.5 dBµV/m - 57.0 dBµV/m	= -9.5 dB

2 Result Summary

FCC 47 CFR Part 15C, IC RSS-210				
Product Specific Standard Section	**Requirement – Test**	**Reference Method**	**Result**	**Remarks**
RSS-Gen 4.6.1	Occupied Bandwidth	RSS-Gen 4.6.1	N/R	Informational only
FCC 15.225(a-c) IC RSS-210 A2.6(a-c)	Fundamental in-band field strength emissions	ANSI C63.4	PASS	
FCC 15.225(d) FCC 15.209 IC RSS-210 A2.6(d)	Emission radiated outside the specified frequency band	ANSI C63.4	PASS	
FCC 15.225(e) IC RSS-210 A2.6	Frequency stability	ANSI C63.4	PASS	
IC RSS-Gen 4.10 IC RSS-Gen 6.1	Receiver radiated spurious emissions	ANSI C 63.4	N/A	
47 CFR 15.207 RSS-Gen 7.2.4	AC power line conducted emissions	ANSI C63.4	PASS	
Remarks:				

3 Test Conditions and Results

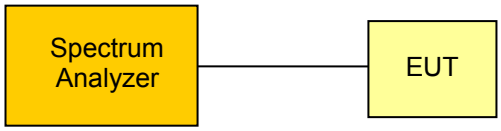
3.1 Test Conditions and Results – Occupied Bandwidth

Occupied Bandwidth acc. IC RSS-Gen	**Verdict: PASS**
Test according to measurement reference	Reference Method
	RSS-Gen 4.6.1
Test frequency range	Tested frequencies
	F_{MID}
EUT test mode	Single

Limits

None (Informational only)

Test setup



Test procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Span set to at least twice the emission spectrum
3. Resolution bandwidth set to 1 % of span
4. Occupied Bandwidth (99 %) measurement with spectrum analyzer built in measurement function

Test results

Channel	Frequency [MHz]	Occupied Bandwidth [kHz]
F_{MID}	13.56	0.460

Comments: Measurement is applicable to all variants

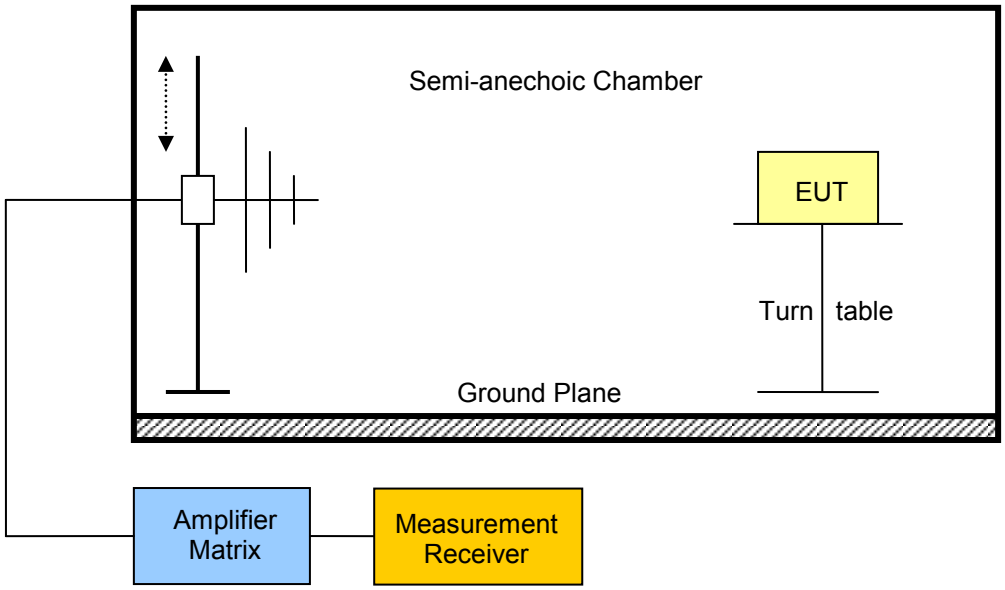
3.2 Test Conditions and Results – Fundamental in-band field strength emissions

Field strength emissions acc. FCC 47 CFR 15.225 / IC RSS-210	**Verdict: PASS**
Test according referenced standards	Reference Method
	FCC 15.225(a-c) / IC RSS-210 A2.6(a-c)
Test according to measurement reference	Reference Method
	ANSI C63.4
Test frequency range	Tested frequencies
	F_{MID}
EUT test mode	Single

Limits

Frequency range [MHz]	Limit [µV/m]	Limit [dBµV/m]	Limit Distance [m]
13.553 – 13.567	15848	84	30
13.410 – 13.553 13.567 – 13.710	334	50.5	30
13.110 – 13.410 13.710 – 14.010	50	40.5	30

Test setup



Test procedure

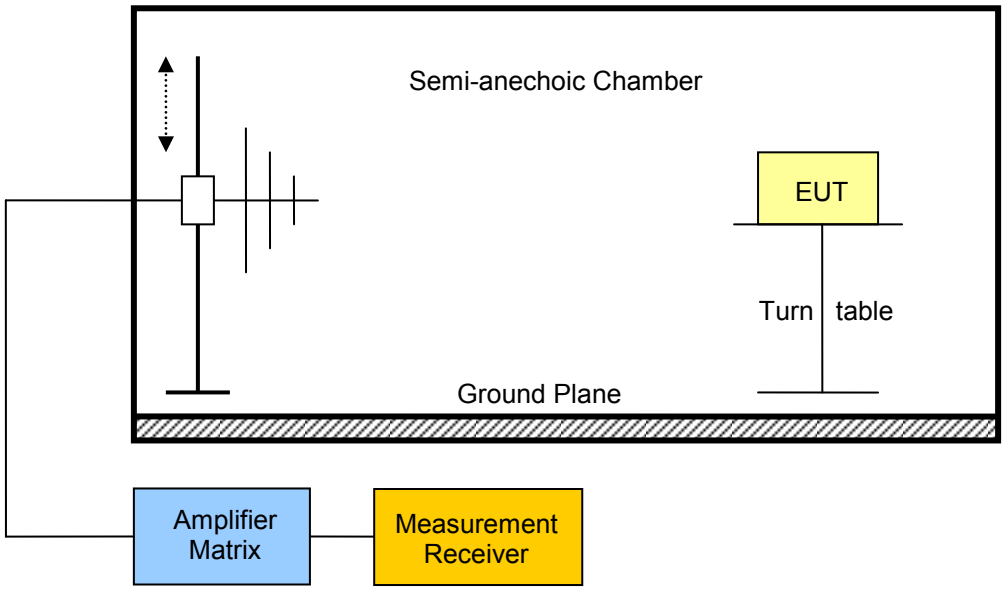
1. EUT set to test mode
2. Span it set according to measurement range
3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector
4. Below 30MHz and extrapolation factor of 40dB/decade is used and at 30MHz and above an extrapolation factor of 20dB/decade is used (47 CRF 15.31(f)).

Test results								
Channel	Frequency [MHz]	Emission [MHz]	Level @ 30m [dbµV/m]	Det.	Pol.	Limit @ 30m [dbµV/m]	Measurement distance [m]*	Margin [dB]
F_{MID}	13.56	13.56	27.56	pk	ver	84	3	-56.44
Comments: * Physical distance between EUT and measurement antenna. See Annex								

3.3 Test Conditions and Results – Emissions radiated outside the specified frequency band

Radiated out-of-band band emissions acc. FCC 47 CFR 15.225 / IC RSS-210				**Verdict: PASS**
Test according referenced standards		Reference Method		
		FCC 15.225(d) / IC RSS-210 A2.6(d)		
Test according to measurement reference		Reference Method		
		ANSI C63.4		
Test frequency range		Tested frequencies		
		9 kHz – 2 GHz		
EUT test mode		Single		
Limits				
Frequency range [MHz]	Detector	Limit [µV/m]	Limit [dBµV/m]	Limit Distance [m]
0.009 – 0.490	Quasi-Peak	2400/F[kHz]	48.5 – 13.8	300
0.490 – 1.705	Quasi-Peak	2400/F[kHz]	13.8 – 1.4	30
1.705 – 30	Quasi-Peak	30	29.5	30
30 – 88	Quasi-Peak	100	40	3
88 – 216	Quasi-Peak	150	43.5	3
216 – 960	Quasi-Peak	200	46	3
960 – 1000	Quasi-Peak	500	54	3
> 1000	Average	500	54	3
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.				

Test setup



Test procedure

1. EUT set to test mode
2. Span it set according to measurement range
3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz
4. Markers are set to maximum emission levels

Test results

see Annex

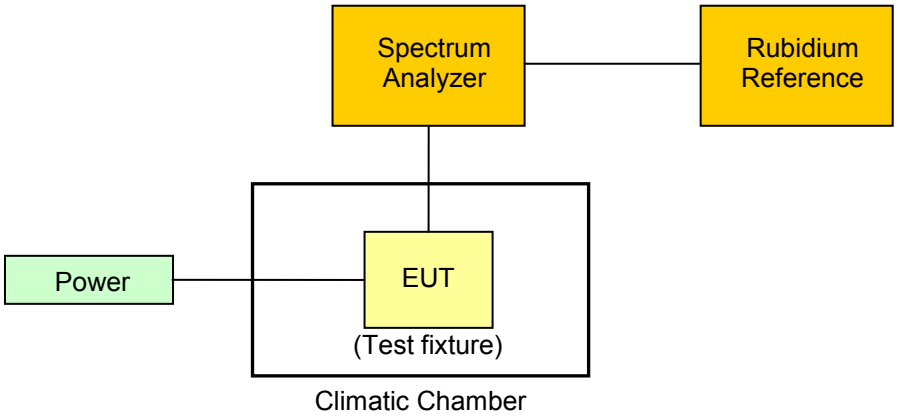
3.4 Test Conditions and Results – Frequency stability

Occupied Bandwidth acc. FCC 15.225 / IC RSS-210	**Verdict: PASS**
Test according referenced standards	Reference Method
	FCC 15.225(e) / IC RSS-210 A2.6
Test according to measurement reference	Reference Method
	ANSI C63.4
Test frequency range	Tested frequencies
	F_{MID}
EUT test mode	Single

Limits

Frequency error limit
±0.01% (±100ppm)

Test setup



Test procedure

1. EUT set to test mode
2. The ambient temperature and supply voltage is set according to measurement conditions
3. Span is set to capture fundamental emission
4. Frequency error is measured with frequency counter measurement function

Test results					
Channel	Frequency [MHz]	Temp.	Voltage	Measured Frequency [MHz]	Error [ppm]
F_{MID}	13.56	T_{nom} = 20°C	V_{nom} = 120.0 VAC	13.5604617	34.05
F_{MID}	13.56	T_{min} = -20°C	V_{min} = 102 VAC	13.5605074	37.42
F_{MID}	13.56	T_{min} = -20°C	V_{max} = 138 VAC	13.5605075	37.43
F_{MID}	13.56	T_{min} = +50°C	V_{min} = 102 VAC	13.5604869	35.91
F_{MID}	13.56	T_{min} =+50°C	V_{max} = 138 VAC	13.5605872	43.30
Comments: Measurement is applicable to all variants					

3.5 Test Conditions and Results – AC power line conducted emissions

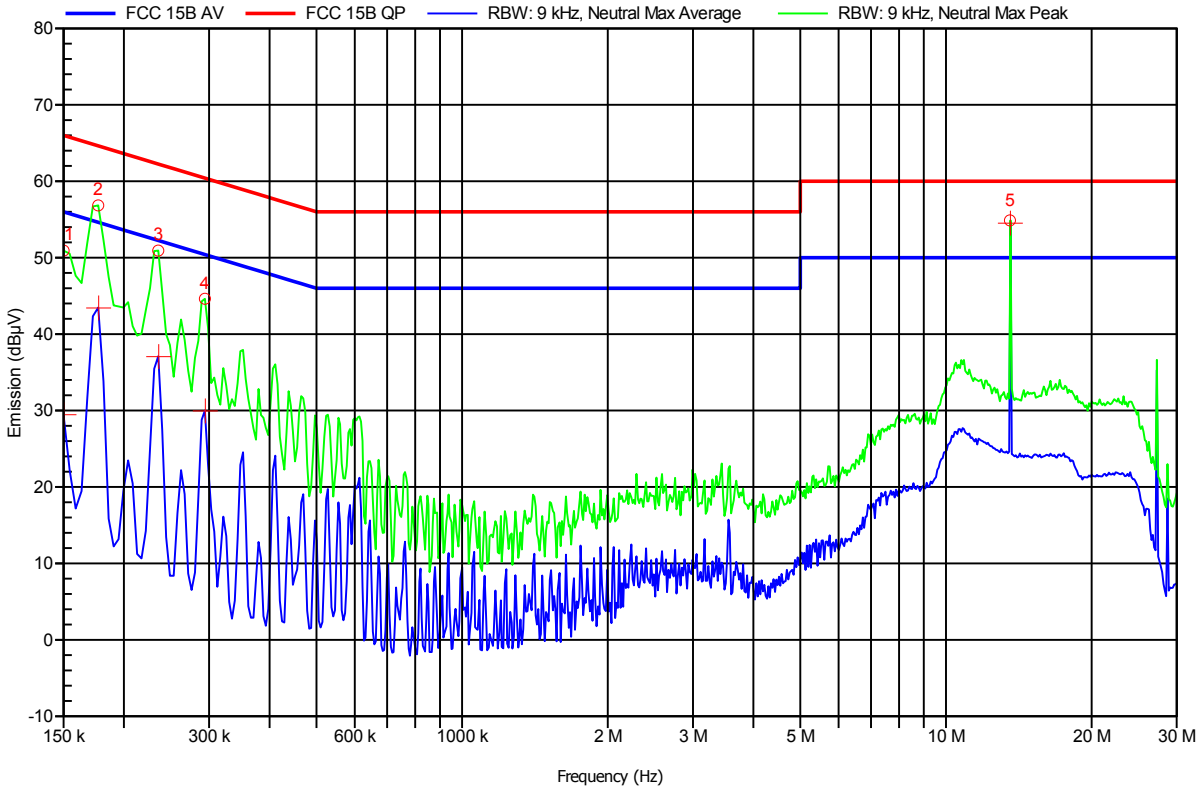
Power line conducted emissions acc. FCC 47 CFR 15.207 / IC RSS-Gen				**Verdict: PASS**
Test according referenced standards	Reference Method			
	ANSI C63.4			
Fully configured sample scanned over the following frequency range	Frequency range			
	0.15 MHz to 30 MHz			
Points of Application	Application Interface			
AC Mains	LISN			
EUT test mode	AC-Powerline			
Limits and results				
Frequency [MHz]	Quasi-Peak [dBµV]	Result	Average [dBµV]	Result
0.15 to 5	66 to 56*	PASS	56 to 46*	PASS
0.5 to 5	56	PASS	46	PASS
5 to 30	60	PASS	50	PASS
Comments: * Limit decreases linearly with the logarithm of the frequency.				

Conducted Emissions

Spurious emissions under normal conditions according to FCC15B/C

Order number: G0M21011-3932

Manufacturer:	Hach Lange GmbH
EUT Name:	VIS Spectrophotometer
Model:	LPG440
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Klein
Test Conditions:	Tnom: 23°C, Unom: 120VAC
LISN:	Rohde & Schwarz ESH2-Z5 N
Mode:	Gerät #416 Testmode, Lampe, RFID, Kamera an, Ethernet Datentransfer
Test Date:	01.12.2010

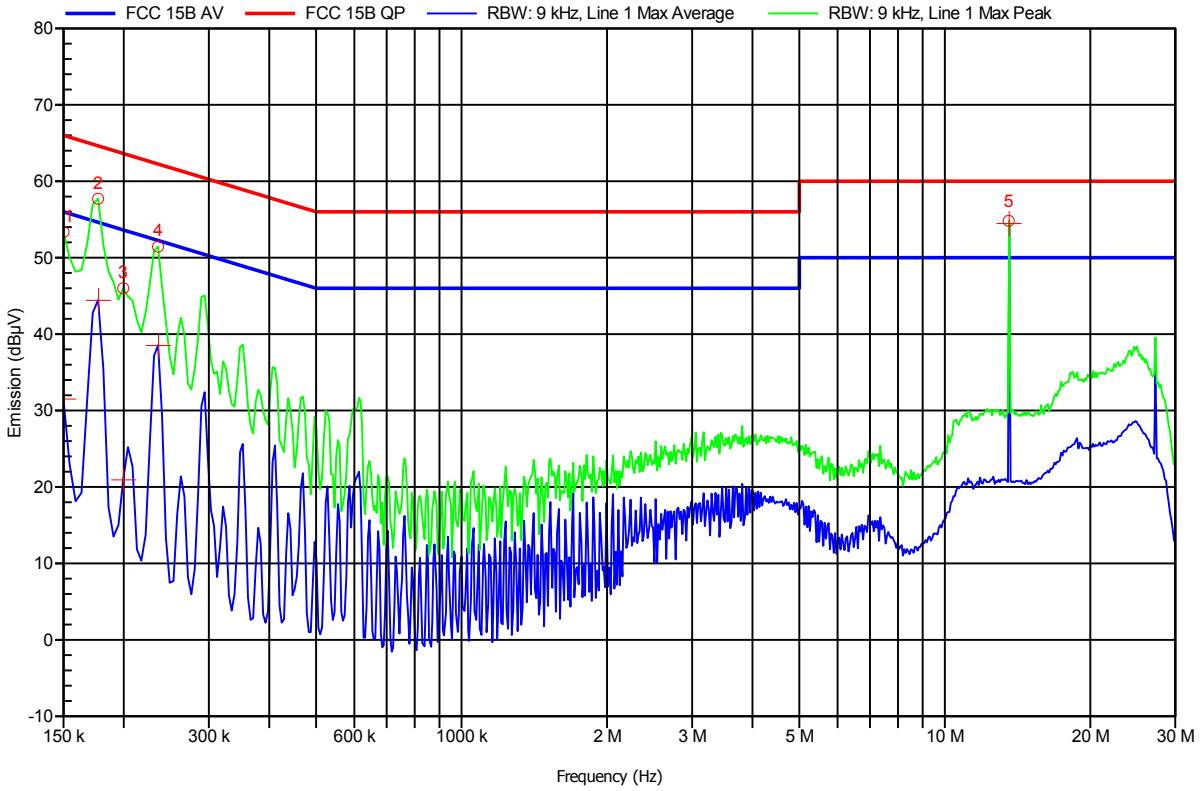


Conducted Emissions

Spurious emissions under normal conditions according to FCC15B/C

Order number: G0M21011-3932

Manufacturer:	Hach Lange GmbH
EUT Name:	VIS Spectrophotometer
Model:	LPG440
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Klein
Test Conditions:	Tnom: 23°C, Unom: 120VAC
LISN:	Rohde & Schwarz ESH2-Z5 L
Mode:	Gerät #416 Testmode, Lampe, RFID, Kamera an, Ethernet Datentransfer
Test Date:	01.12.2010

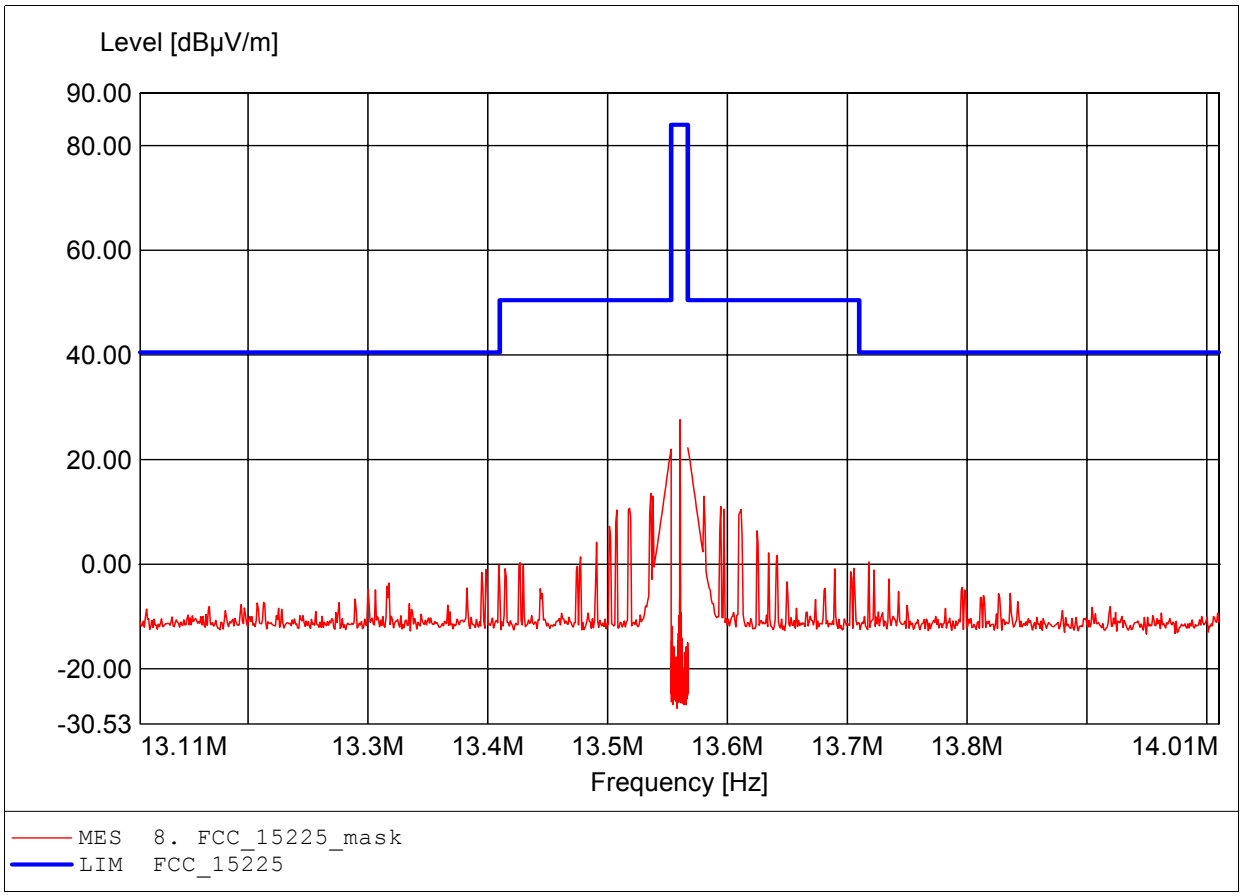


ANNEX A Transmitter in-band emissions

Spectrum mask

FCC rules part 15.225

```
Approval Holder:     metraTec GmbH / G0M-1204-1925
EUT:                 QR15-HL + Benchtop Photometer
Model:               QR15-HL + DR3900
Operator:            Eurofins Product Service GmbH   /   Mr. Handrik
Test Conditions:     Tnom: 22°C / Vnom: 120VAC (AC/DC adaptor)
Test Specification: according to §15.209, peak detector
Comment 1:           Dist.: 30m, Ant.: HFH2-Z2
Comment 2:           Freq: 13.560MHz, Emax: 27.65dBµV/m, RBW: 0.2-10kHz
```

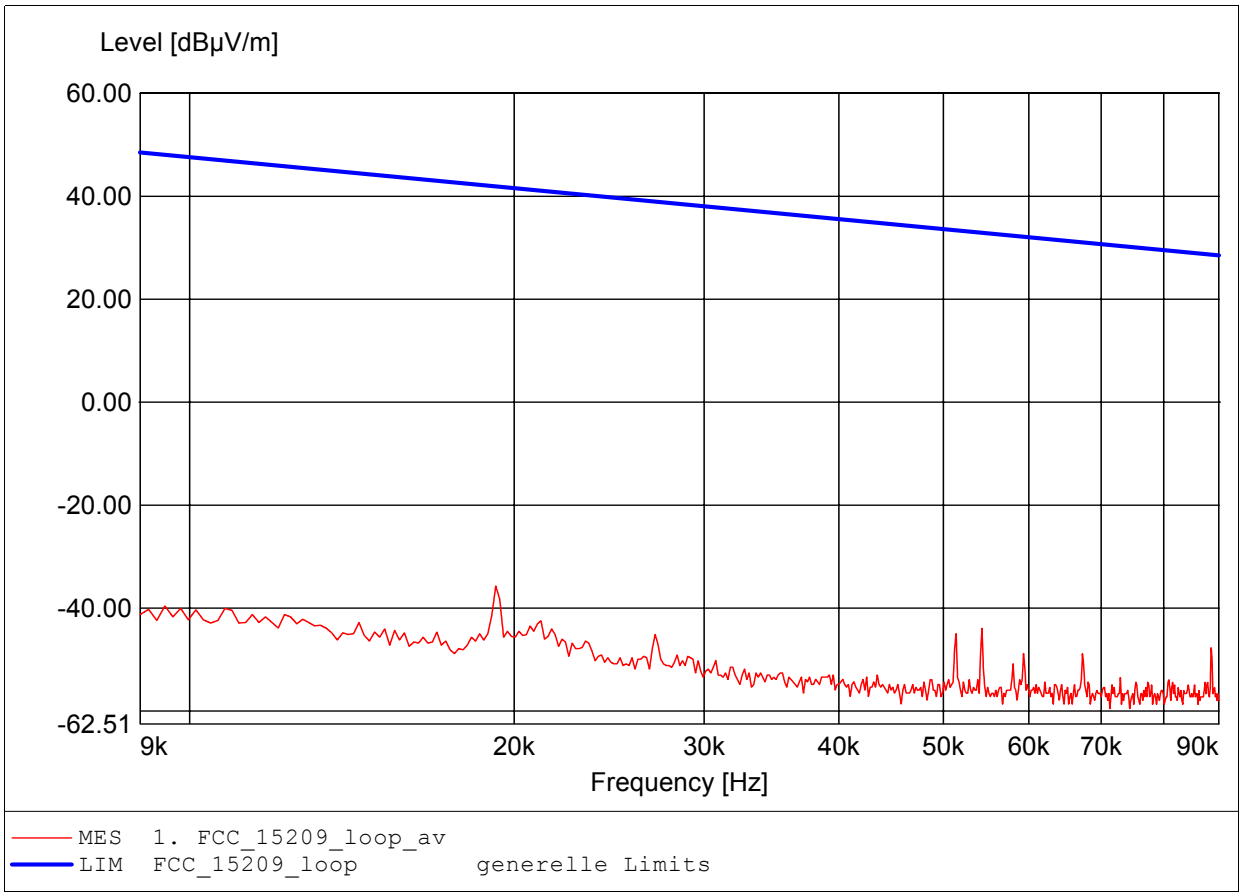


ANNEX B Transmitter radiated spurious emissions

Spurious emissions Field Strength Tx

FCC RULES PART 15, SUBPART C

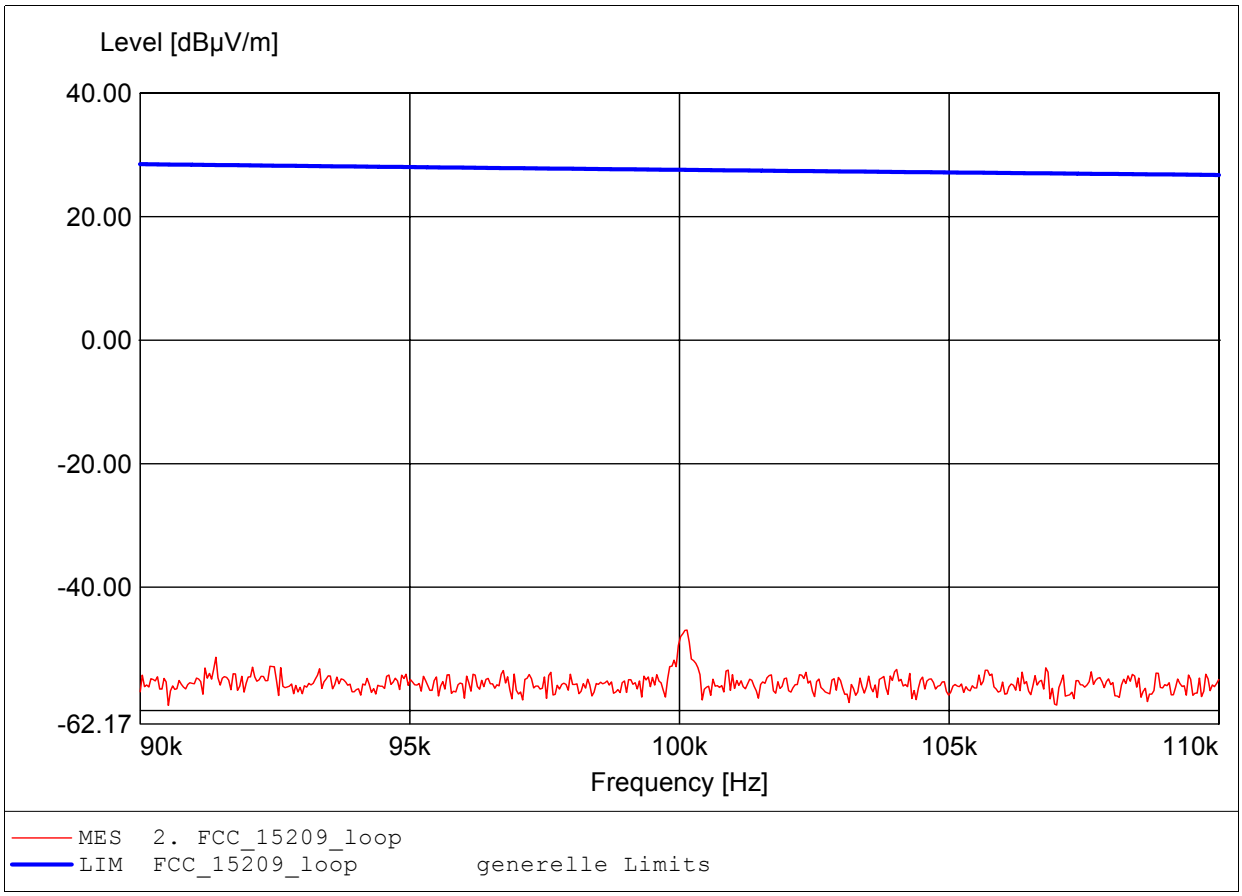
```
Approval Holder:     metraTec GmbH / G0M-1204-1925
EUT:                 QR15-HL + Benchtop Photometer
Model:               QR15-HL + DR3900
Operator:            Eurofins Product Service GmbH   /   Mr. Handrik
Test Conditions:     Tnom: 22°C / Vnom: 120VAC (AC/DC adaptor)
Test Specification: according to §15.209, average detector
Comment 1:           Dist.: 300m, Ant.: HFH2-Z2
Comment 2:           Freq: 19.226kHz, Emax: -35.72dBµV/m, RBW: 200Hz
```



Spurious emissions Field Strength Tx

FCC RULES PART 15, SUBPART C

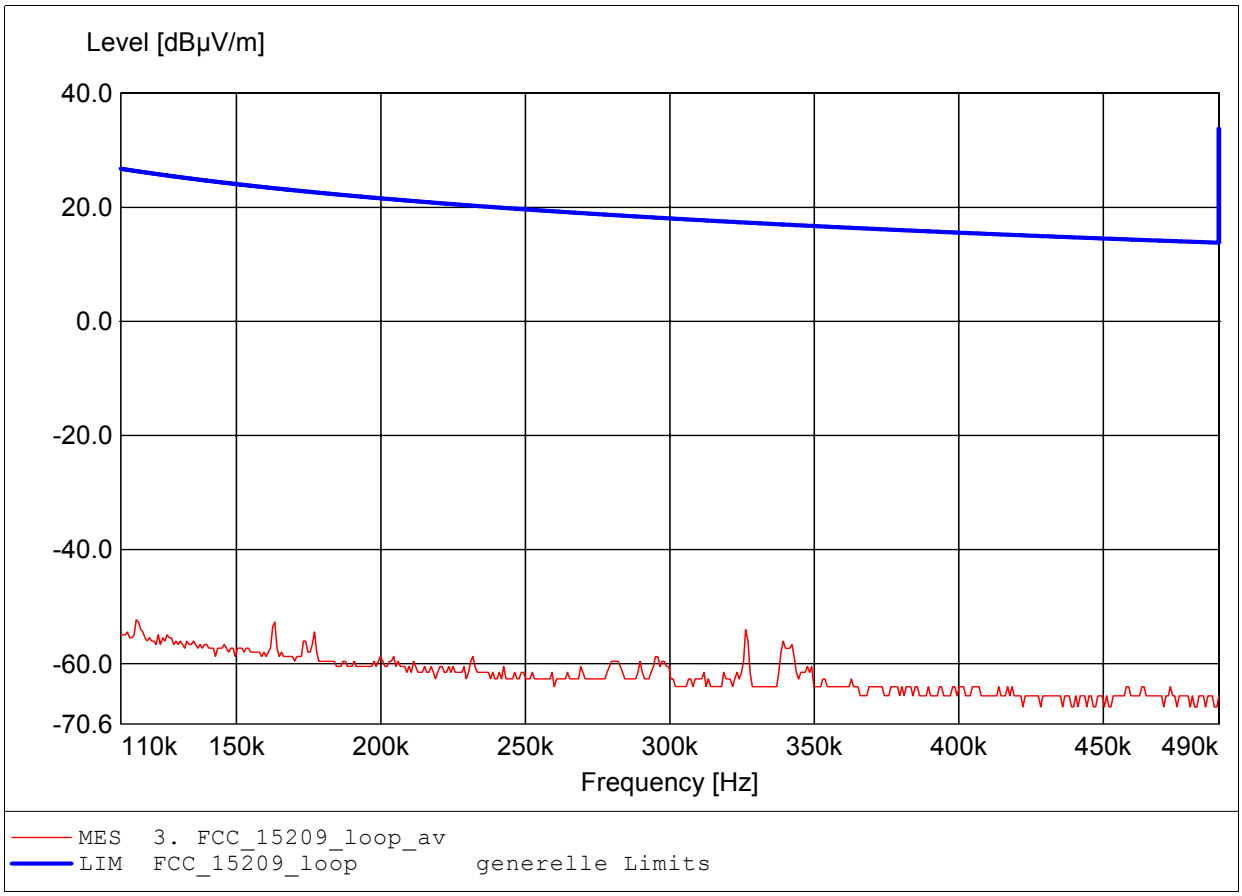
```
Approval Holder:     metraTec GmbH / G0M-1204-1925
EUT:                 QR15-HL + Benchtop Photometer
Model:               QR15-HL + DR3900
Operator:            Eurofins Product Service GmbH   /   Mr. Handrik
Test Conditions:     Tnom: 22°C / Vnom: 120VAC (AC/DC adaptor)
Test Specification: according to §15.209, peak detector
Comment 1:           Dist.: 300m, Ant.: HFH2-Z2
Comment 2:           Freq: 100.140kHz, Emax: -46.94dBµV/m, RBW: 200Hz
```



Spurious emissions Field Strength Tx

FCC RULES PART 15, SUBPART C

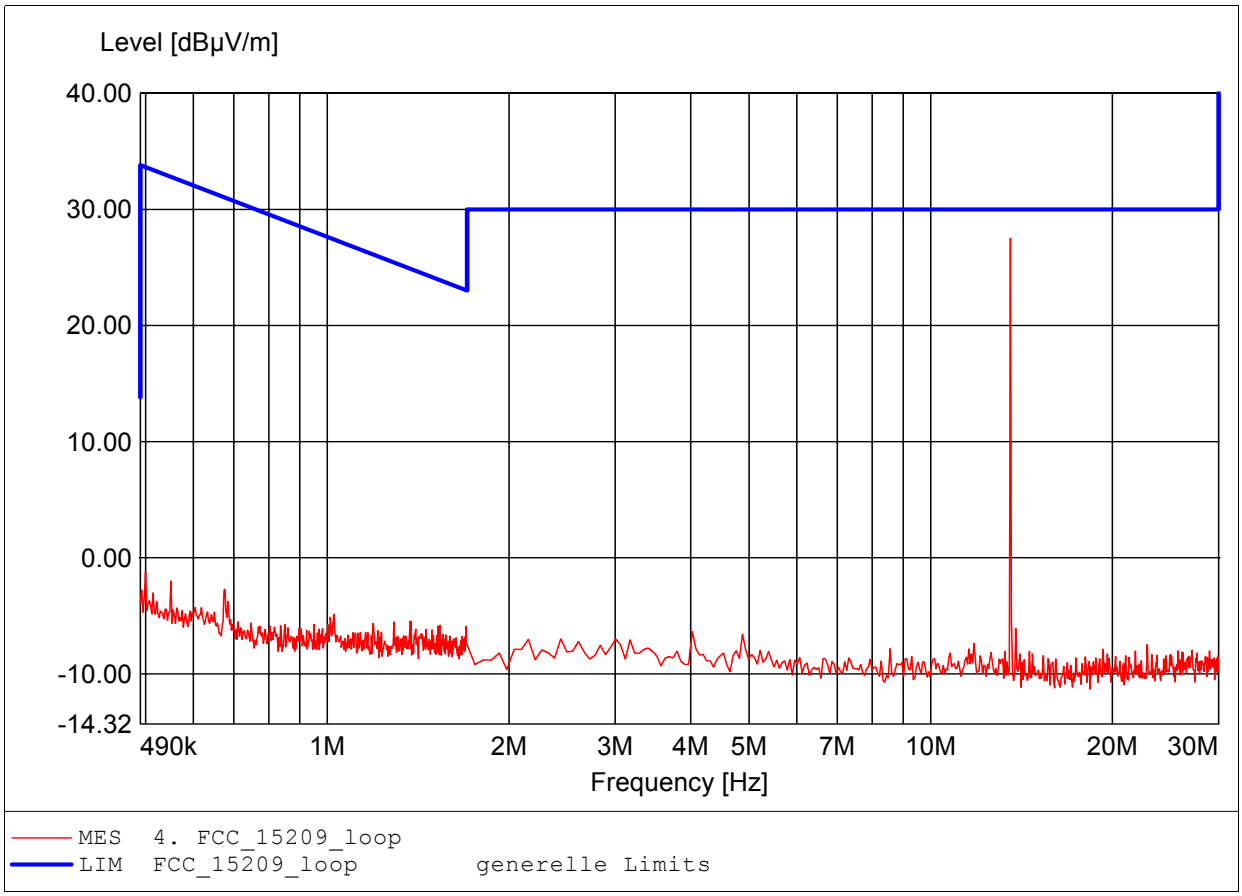
```
Approval Holder:     metraTec GmbH / G0M-1204-1925
EUT:                 QR15-HL + Benchtop Photometer
Model:               QR15-HL + DR3900
Operator:            Eurofins Product Service GmbH   /   Mr. Handrik
Test Conditions:     Tnom: 22°C / Vnom: 120VAC (AC/DC adaptor)
Test Specification: according to §15.209, average detector
Comment 1:           Dist.: 300m, Ant.: HFH2-Z2
Comment 2:           Freq: 115.331kHz, Emax: -52.33dBµV/m, RBW: 200Hz
```



Spurious emissions Field Strength Tx

FCC RULES PART 15, SUBPART C

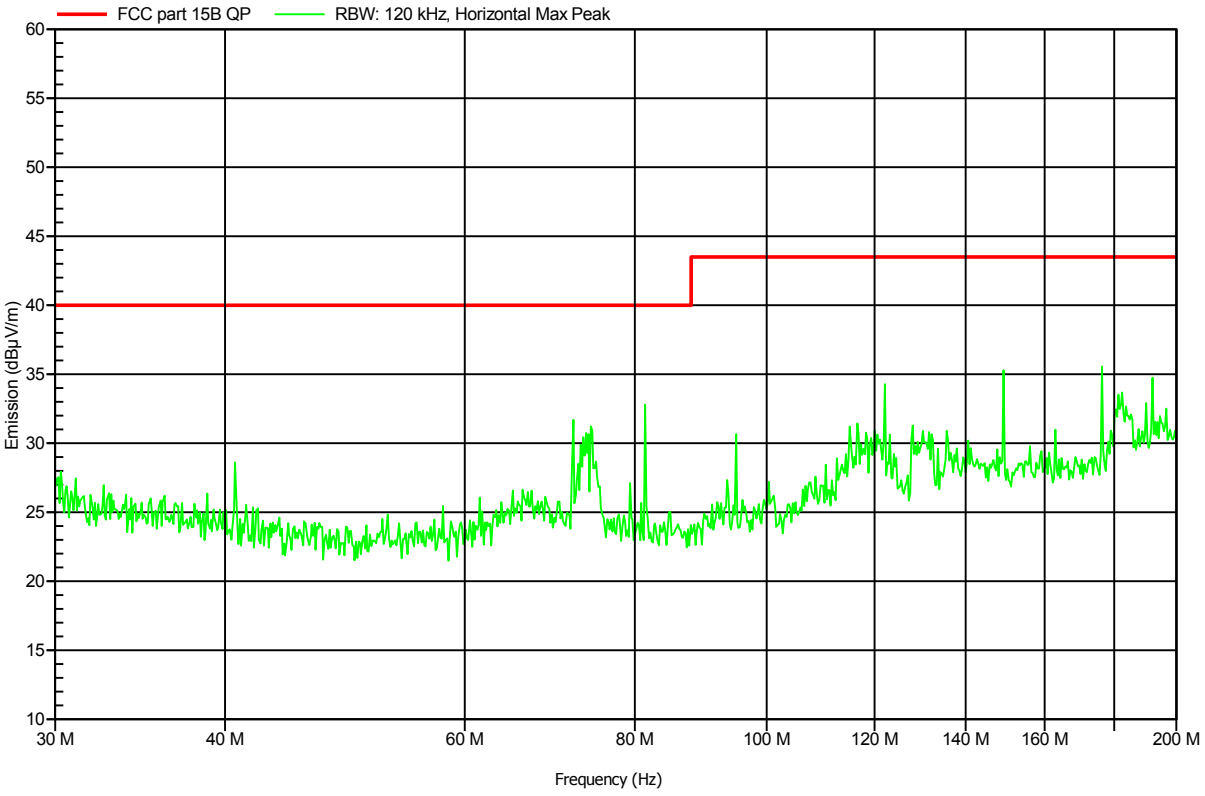
```
Approval Holder:     metraTec GmbH / G0M-1204-1925
EUT:                 QR15-HL + Benchtop Photometer
Model:               QR15-HL + DR3900
Operator:            Eurofins Product Service GmbH   /   Mr. Handrik
Test Conditions:     Tnom: 22°C / Vnom: 120VAC (AC/DC adaptor)
Test Specification: according to §15.209, peak detector
Comment 1:           Dist.: 30m, Ant.: HFH2-Z2
Comment 2:           Freq: 13.553MHz, Emax: 27.51dBµV/m, RBW: 10kHz
```



Spurious emissions under normal conditions according to FCC Part 15.225

Ordernumber: G0M21011-3932

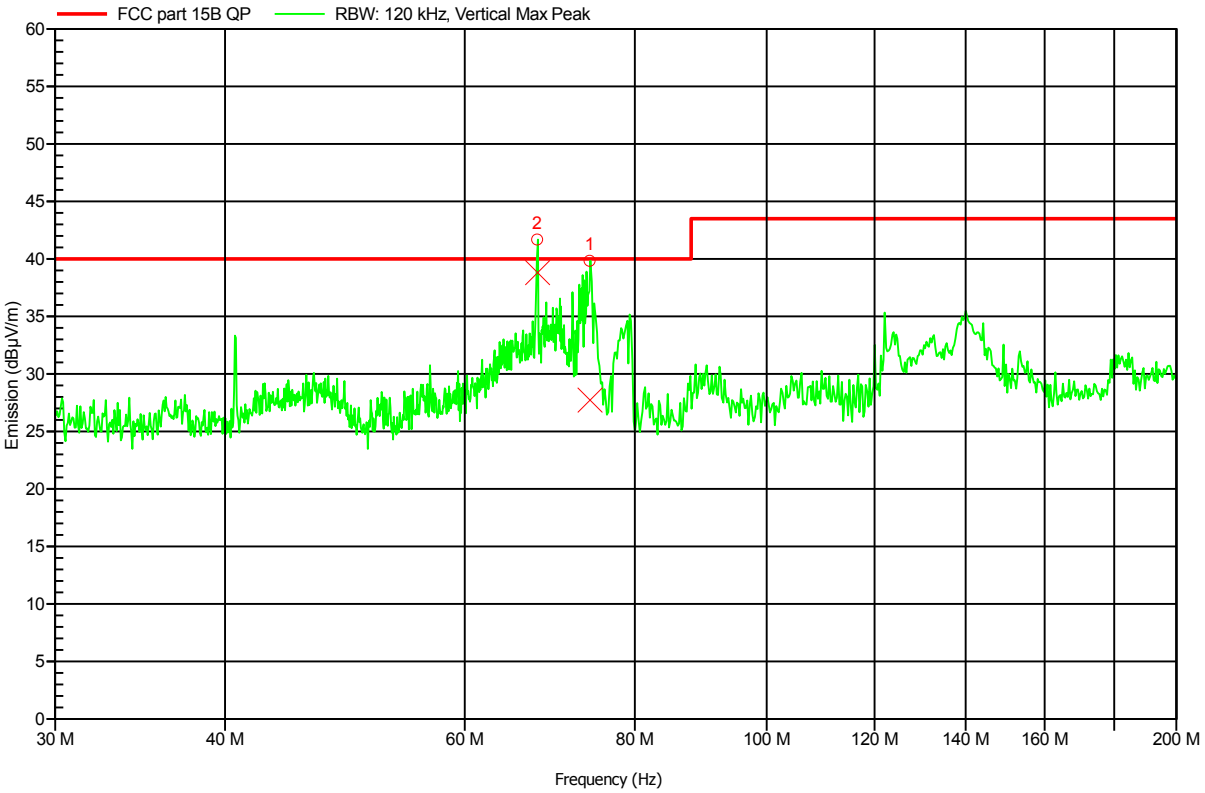
Manufacturer:	metraTec GmbH
EUT Name:	QR15-HL + VIS Spectrophotometer
Model:	QR15-HL + LPG440
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Mode:	RFID-camera-Lampe ON
Test Date:	01.12.2010
Note:	FCC



Spurious emissions under normal conditions according to FCC Part 15.225

Ordernumber: G0M21011-3932

Manufacturer:	metraTec GmbH
EUT Name:	QR15-HL + VIS Spectrophotometer
Model:	QR15-HL + LPG440
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HK 116, Vertical
Mode:	RFID-camera-Lampe ON
Test Date:	01.12.2010
Note:	FCC

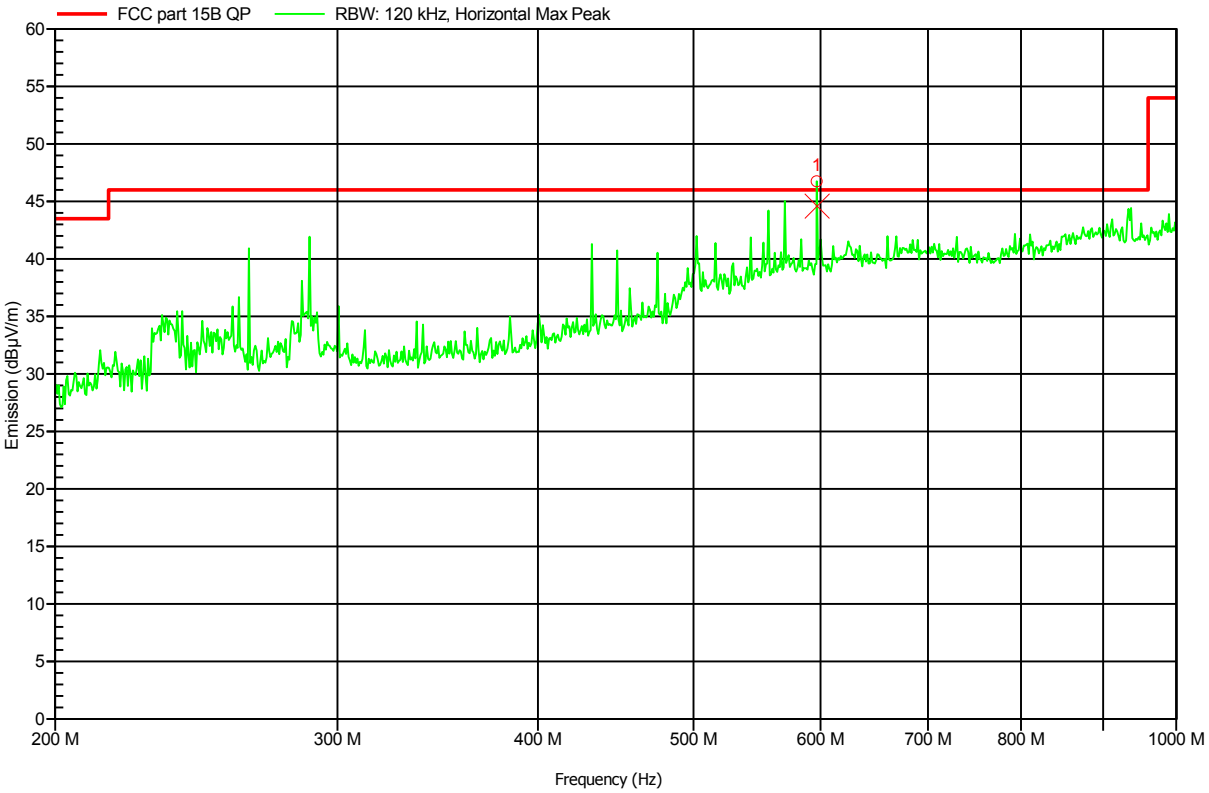


Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Status
67.821 MHz	38.85 dBµV/m	40 dBµV/m	-1.15 dB	Pass
74.114 MHz	27.77 dBµV/m	40 dBµV/m	-12.23 dB	Pass

Spurious emissions under normal conditions according to FCC Part 15.225

Ordernumber: G0M21011-3932

Manufacturer:	metraTec GmbH
EUT Name:	QR15-HL + VIS Spectrophotometer
Model:	QR15-HL + LPG440
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Mode:	RFID-camera-Lampe ON
Test Date:	01.12.2010
Note:	FCC

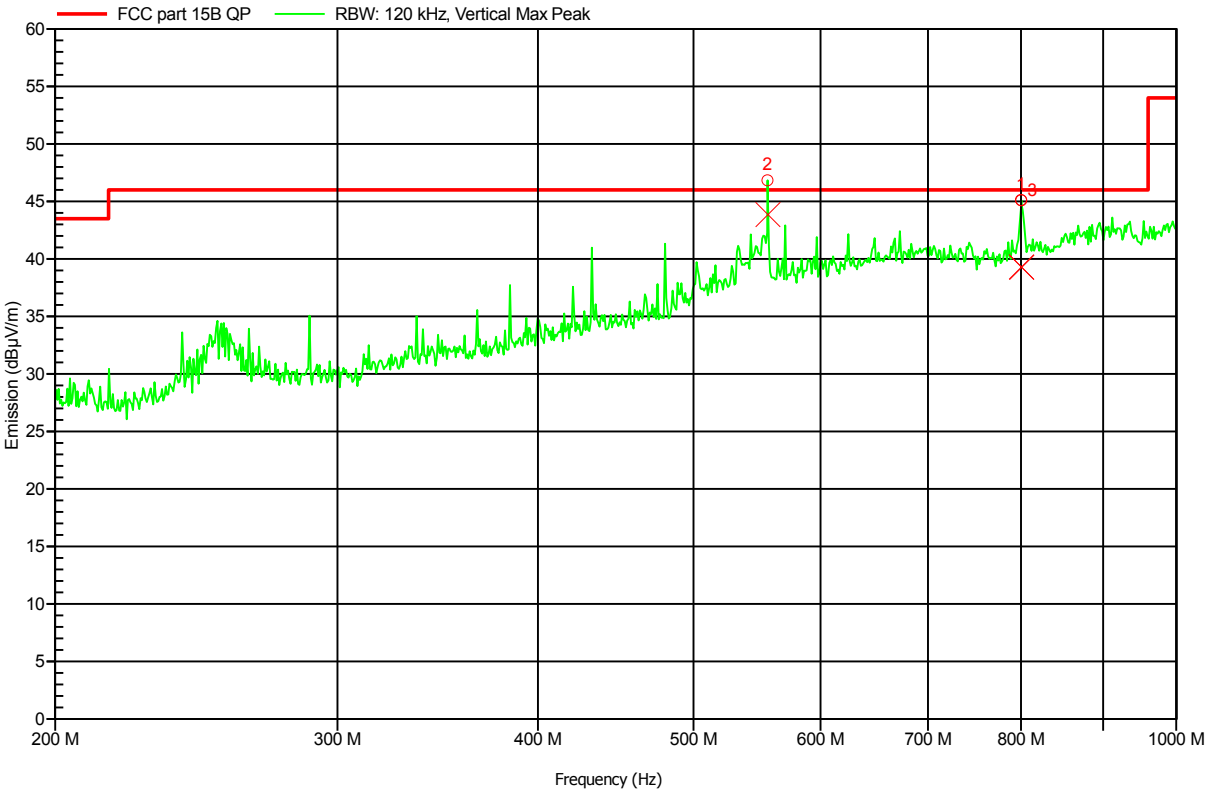


Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Status
596.688 MHz	44.63 dBµV/m	46 dBµV/m	-1.37 dB	Pass

Spurious emissions under normal conditions according to FCC Part 15.225

Ordernumber: G0M21011-3932

Manufacturer:	metraTec GmbH
EUT Name:	QR15-HL + VIS Spectrophotometer
Model:	QR15-HL + LPG440
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HL 223, Vertical
Mode:	RFID-camera-Lampe ON
Test Date:	01.12.2010
Note:	FCC

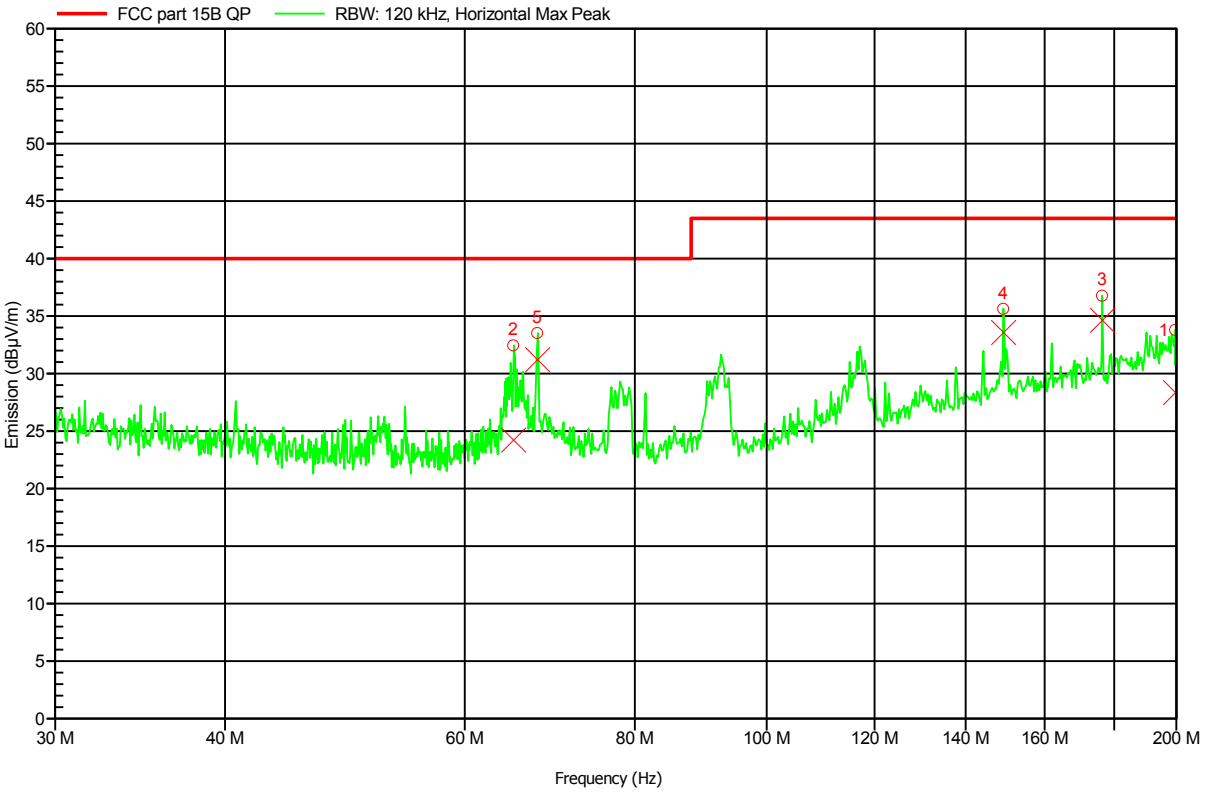


Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Status
555.992 MHz	43.89 dBµV/m	46 dBµV/m	-2.11 dB	Pass
799.952 MHz	39.34 dBµV/m	46 dBµV/m	-6.66 dB	Pass
800.306 MHz	39.3 dBµV/m	46 dBµV/m	-6.7 dB	Pass

Spurious emissions under normal conditions according to FCC Part 15.225

Ordernumber: G0M21011-3932

Manufacturer:	metraTec GmbH
EUT Name:	QR15-HL + VIS Spectrophotometer
Model:	QR15-HL + LPG440
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Mode:	RFID-Lampe ON camera OFF ethernet+usb-link
Test Date:	01.12.2010
Note:	FCC

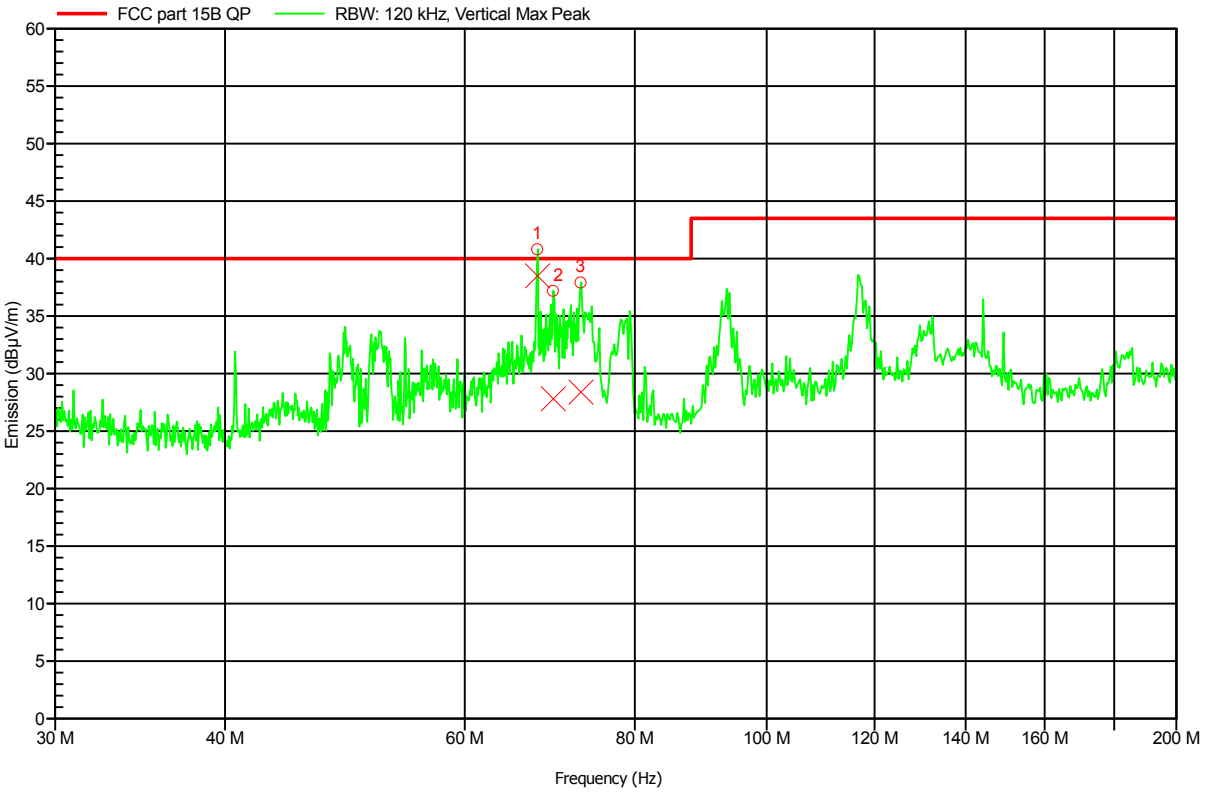


Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Status
65.127 MHz	24.26 dBµV/m	40 dBµV/m	-15.74 dB	Pass
67.821 MHz	31.25 dBµV/m	40 dBµV/m	-8.75 dB	Pass
149.18 MHz	33.61 dBµV/m	43.5 dBµV/m	-9.89 dB	Pass
176.3 MHz	34.68 dBµV/m	43.5 dBµV/m	-8.82 dB	Pass
199.496 MHz	28.39 dBµV/m	43.5 dBµV/m	-15.11 dB	Pass

Spurious emissions under normal conditions according to FCC Part 15.225

Ordernumber: G0M21011-3932

Manufacturer:	metraTec GmbH
EUT Name:	QR15-HL + VIS Spectrophotometer
Model:	QR15-HL + LPG440
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HK 116, Vertical
Mode:	RFID-Lampe ON camera OFF ethernet+usb-link
Test Date:	01.12.2010
Note:	FCC

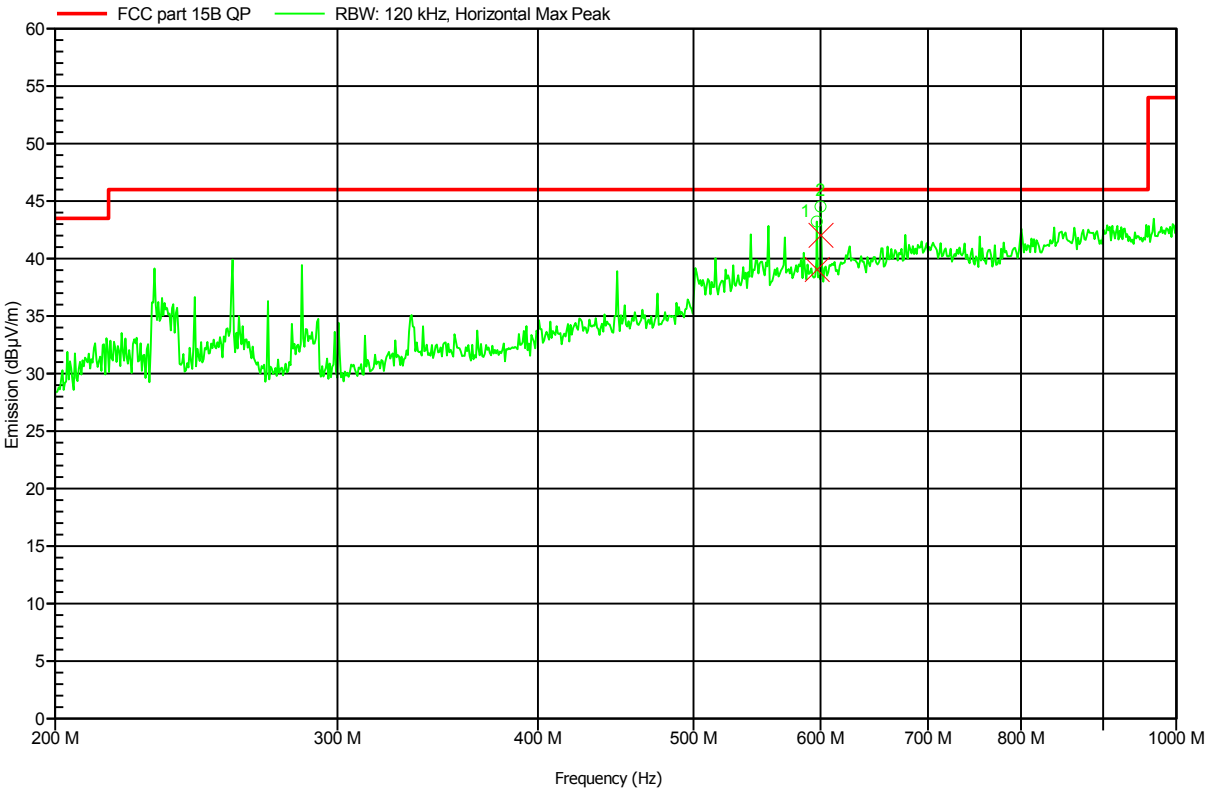


Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Status
67.815 MHz	38.54 dBµV/m	40 dBµV/m	-1.46 dB	Pass
69.651 MHz	27.85 dBµV/m	40 dBµV/m	-12.15 dB	Pass
72.98 MHz	28.43 dBµV/m	40 dBµV/m	-11.57 dB	Pass

Spurious emissions under normal conditions according to FCC Part 15.225

Ordernumber: G0M21011-3932

Manufacturer:	metraTec GmbH
EUT Name:	QR15-HL + VIS Spectrophotometer
Model:	QR15-HL + LPG440
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Mode:	RFID-Lampe ON camera OFF ethernet+usb-link
Test Date:	01.12.2010
Note:	FCC

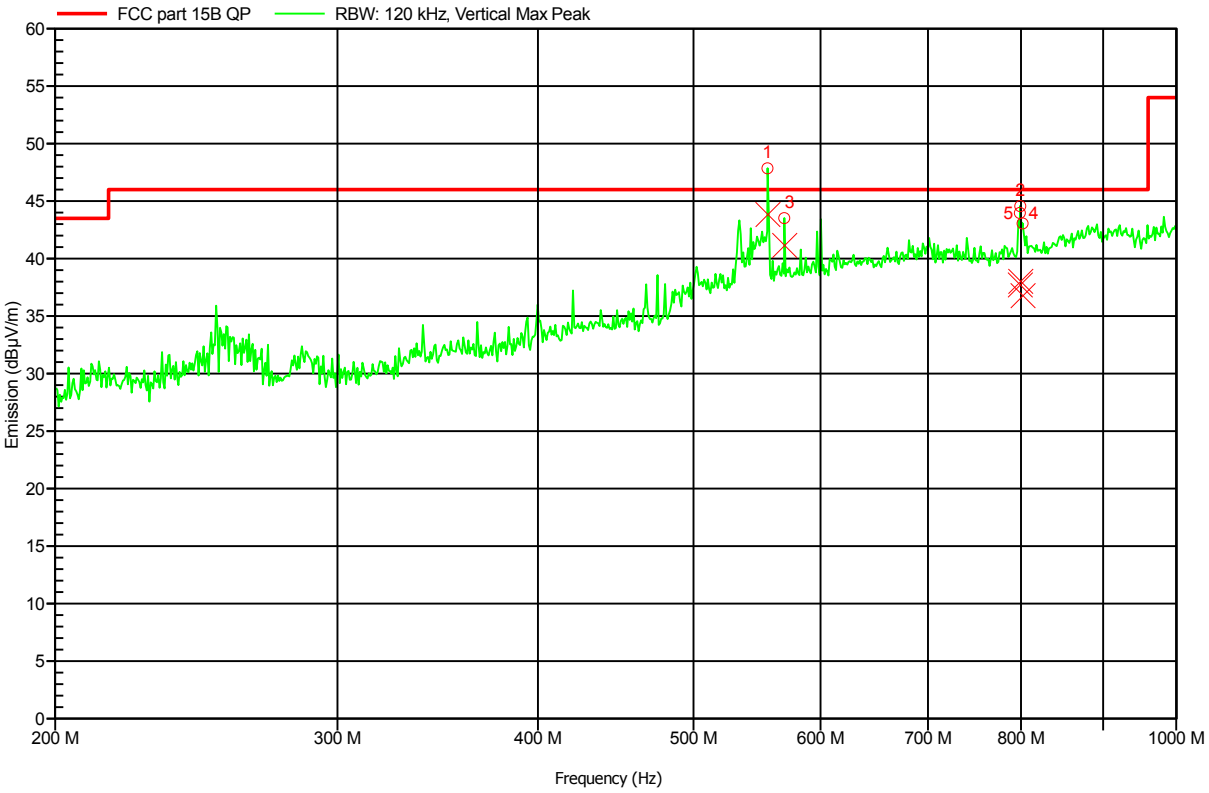


Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Status
596.718 MHz	39.09 dBµV/m	46 dBµV/m	-6.91 dB	Pass
599.994 MHz	42.06 dBµV/m	46 dBµV/m	-3.94 dB	Pass

Spurious emissions under normal conditions according to FCC Part 15.225

Ordernumber: G0M21011-3932

Manufacturer:	metraTec GmbH
EUT Name:	QR15-HL + VIS Spectrophotometer
Model:	QR15-HL + LPG440
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HL 223, Vertical
Mode:	RFID-Lampe ON camera OFF ethernet+usb-link
Test Date:	01.12.2010
Note:	FCC

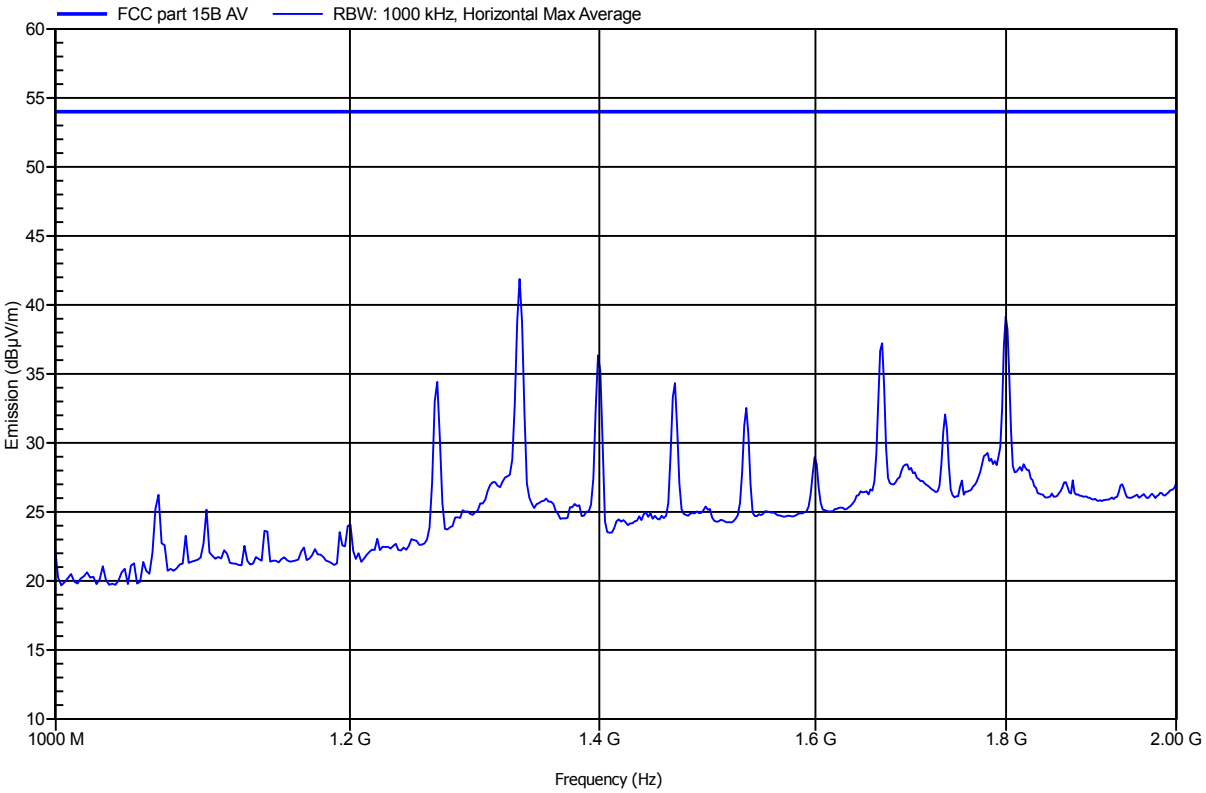


Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Status
555.986 MHz	43.87 dBµV/m	46 dBµV/m	-2.13 dB	Pass
569.552 MHz	41.18 dBµV/m	46 dBµV/m	-4.82 dB	Pass
798.71 MHz	37.75 dBµV/m	46 dBµV/m	-8.25 dB	Pass
799.118 MHz	38.06 dBµV/m	46 dBµV/m	-7.94 dB	Pass
801.746 MHz	36.82 dBµV/m	46 dBµV/m	-9.18 dB	Pass

Spurious emissions under normal conditions according to FCC Part 15.225

Ordernumber: G0M21011-3932

Manufacturer:	metraTec GmbH
EUT Name:	QR15-HL + VIS Spectrophotometer
Model:	QR15-HL + LPG440
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Mode:	RFID-Lampe ON camera OFF ethernet+usb-link
Test Date:	01.12.2010



Spurious emissions under normal conditions according to FCC Part 15.225

Ordernumber: G0M21011-3932

Manufacturer:	metraTec GmbH
EUT Name:	QR15-HL + VIS Spectrophotometer
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Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pflug
Test Conditions:	Tnom: 23°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HL 025, Vertical
Mode:	RFID-Lampe ON camera OFF ethernet+usb-link

Test Date: 01.12.2010