EUROFINS PRODUCT SERVICE GMBH

Testing Cert #1983.01

TEST - REPORT

FCC RULES PART 15 / SUBPART B
IC RSS-GEN ISSUE 2

FCC ID: TUKMIR024

portable spirometer
spirobank

Test report no.: G0M20905-2346-C-1

eurofins
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1 General Information

1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.
The tests were carried out and passed in accordance to the standards:

FCC part 15B : July 2008

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The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.
Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification (only telecommunication products).
Neither is there any guarantee that such a test sample will interwork with other genuinely open systems.
The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.6.
The test report may only be reproduced or published in full.
Reproduction or publication of extracts from the report requires the prior written approval of the Eurofins Product Service GmbH.

Important Notes:

Proper labeling is required for each device. Devices shall be labeled in accordance with labeling requirements pursuant to section 15.19 and section 2.1074 of the FCC rules.

Devices subject to a Declaration of Conformity shall be uniquely identified by the responsible party.
This identification shall not be of a format which could be confused with the FCC Identifier required on certified, notified type accepted or type approved equipment.

The responsible party shall maintain adequate identification records to facilitate positive identification for each device.

The user manual or instruction manual shall included also a warning statement that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Reference Section 15.21

Furthermore information to the user regarding to the interference potential of the device and about simple measures that can be taken to correct interference is required.

Reference Section 15.105

The responsible party must warrant that each unit of equipment marketed under a Declaration of Conformity is identical to the unit tested and found acceptable with the standards and that the records maintained by the responsible party continue to reflect the equipment being produced under the Declaration of Conformity within the variation that can be expected due to quantity production and testing on a statistical basis.

1.2 Operator:

Date	Eurofins -Lab.	Name	Signature
25.06.2009		M. Klein	

Technical responsibility for area of testing:

Date	Eurofins	Name	Signature
25.06.2009		J. Zimmermann	

1.3 Testing laboratory

1.3.1 Location

EUROFINS PRODUCT SERVICE GMBH
STORKOWER STR. 38c
D- 15526 REICHENWALDE B. BERLIN
GERMANY
Telephone: + 49 33631 888-00
Telefax: + 49 33631 888-660

1.3.2 Details of accreditation status

DAR ACCREDITED TESTING LABORATORY
DAR-REGISTRATION NUMBER: DAT-P-268/08

RECOGNIZED NOTIFIED BODY EMC
REGISTRATION NUMBER: BNetzA-bS EMV-07/61

RECOGNIZED NOTIFIED BODY R&TTE
REGISTRATION NUMBER: BNetzA-bS-02/51-53

FCC FILED TEST LABORATORY
REG.-NO. 96970

A2LA ACCREDITED TESTING LABORATORY
CERTIFICATE NO. 1983.01

BLUETOOTH QUALIFICATION TEST FACILITY (BQTF)
ACCREDITED BY BLUETOOTH QUALIFICATION REVIEW BOARD

INDUSTRY CANADA FILED TEST LABORATORY
REG. NO. IC 3470A

1.3.3 Test location, where different

Name	: ./.
Street	: ./.
Town	: ./.
Country	: ./.
Telephone	: ./.
Fax	: ./.

1.4 Details of applicant

Name	:	MIR Medical International Research
Street	:	Via del Maggiolino 125
Town	:	Roma
Country	:	Italy
Telephone	:	+39 06 22754777
Contact	:	Mr. Enrico Bordon
Telephone	:	+39 0432522588

1.5 Application details

Date of receipt of application	:	30.04.2009
Date of receipt of test item	:	30.04.2009
Date of test	:	23.06.2009

1.6 Test item

1.6.1 Description of test item

Type of product	:	portable spirometer
Type identification	:	spirobank
Serial number	:	without
Photos	:	Please find in Annex.
Power supply	:	120V AC/DC Adapter
Additional information	:	Device with USB function. The measurements were carried out in mode “USB link”.

1.6.2 Manufacturer (if different from applicant in point 1.4)

Name	: MIR Medical International Research
Street	: Via del Maggiolino 125
Town	: Roma
Country	: Italy
Contact	: Mr. Enrico Bordon
Phone	: +39 0432522588

1.6.3 Frequency behavior

Highest clock Frequency	< 200 MHz

1.7 Test standards

FCC part 15B : July 2008
IC RSS-Gen Issue 2 : June 2007

2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed. ☒

or

The deviations as specified in 2.3 were ascertained in the course of the tests performed. ☐

2.2 Test environment

Temperature	: 22 ° C
Relative humidity content	: 43 %
Air pressure	: 1007 hPa
Details of power supply	: 120V AC/DC Adapter
Other parameters	: ./.

2.3 Test results

☒ 1st test ☐ test after modification ☐ production test

Test Emission / Immunity			Done	Test passed	Test failed
Conducted Emission	FCC part 15.107	RSS-Gen 7.2.2	☒	☒	☐
Radiated Emission	FCC part 15.109	RSS-Gen 7.2.3	☒	☒	☐

2.4 Test equipment utilized

No.	Test Equipmen	Type	Manufacturer
ETS 0001	ESD Gun	SESD 30000	Schlöder
ETS 0008	Antenna	Loop antenna	Siemens
ETS 0012	Biconical Antenna	HK 116	R & S
ETS 0013	LPD Antenna	HL 223	R & S
ETS 0014	Log Periodical Antenna	HL 025	R & S
ETS 0038	RF amplifier	150L	Amplifier Research
ETS 0032	Controller	HD 050	Heinrich Deisel
ETS 0039	Absorbing clamp	MDS 21	R & S
ETS 0040	Artificial Mains Network	ESH3-Z5	R & S
ETS 0041	T-Artificial Mains Network	ESH3-Z4	R & S
ETS 0042	Artificial Mains	ESH3-Z6	R & S
ETS 0045	Vehicle LISN	NNBM 8126D	Schwarzbeck
ETS 0052	Audio analyzer	UPA 4	R & S
ETS 0056	Ultra Compact Simulator	UCS 500 M4	EM Test
ETS 0057	Motor Variac	MV 2616	EM Test
ETS 0058	Capacitive coupling clamp	E 502 B	Keytek/ EMC
ETS 0059	Kikusui amplifier	PCR 2000L	Keytek/ EMC
ETS 0064	CDN IEC 61000-4-6		Keytek/ EMC
ETS 0066	EM Injection Clamp		FCC/ EMC
ETS 0076	Feeding bridge A	SBA 1000	ESP
ETS 0082	PC system		Esotronic
ETS 0085	Shielded room	SR 1	Frankonia
ETS 0086	Semi-Anechoic chamber	AC 1	Frankonia
ETS 0088	Color TV pattern Generator	PM 5518-TX VPS	Philips
ETS 0092	Power Amplifier	150W1000	AR Amplifier Research
ETS 0102	CDN	M3-801/6	MEB
ETS 0103	Magnetic field test set	MF1000	EMC-Partner
ETS 0148	RF Current Probe	F-65	FCC
ETS 0155	Signal Generator	SMG	R & S
ETS 0157	TV and Sat-Signalgenerator	VTG 700	Grundig
ETS 0161	Harmonic / Flicker Analyzer	HFA 3000	Schlöder
ETS 0178	Open area test side	10m	ETS
ETS 0233	Direction coupler	RK 100	MEB
ETS 0276	Audio Analyzer	UPL 16	R & S
ETS 0282	RF bridge 75 Ohm	86207 A	HP
ETS 0287	EMI Test receiver	ESHS10	R & S
ETS 0288	Artificial mains	ESH2-Z5	R & S
ETS 0292	RF Generator	SMHU	R & S
ETS 0348	RF Millivolt meter	URV 55	R & S
ETS 0300	RF amplifier	75 A 250	Ar
ETS 0348	RF Millivolt meter	URV 55	R & S
ETS 0401	MPEG2 Generator	DVG	R & S
ETS 0402	TV Messender	SFQ	R & S
ETS 0409	Stripline	DC220	Schwarzbeck
ETS 0428	4-WIRE ISN with B1	ENY41	R & S
ETS 0448	RF Power Amplifier	AR 60S1G3	AR Amplifier Research
ETS 0472	Antenna	BTA-H	Frankonia
ETS 0474	EMI Test Receiver	ESCS 30	R&S
ETS 0485	Radio Communication Tester	CMU 200	R&S

2.4.1 Conducted Emission

2.4.1.1 Test Equipment

- ETS 0040
- ETS 0085
- ETS 0474
- Software: ES-K1, Vers. 1.6SP2

2.4.1.2 Test Procedures

- Test configuration

The test configuration is contained inside of a shielded chamber and corresponds to the standard ANSI C.63.4: 2003. The equipment under test is placed in the facility on a wooden table 0.8m high. The equipment under test is connected with the artificial mains network (AMN) in a distance of 0,8m and also 0,8m from other subassembly and metallic area. The measurement receiver is placed in a special room adjacent to the chamber. The observation of the equipment under test is realized by 3 video cameras and by a microphone.

- Test parameters and marginal conditions

The tests are carried out with nominal impedance by 50 Ω / 50 µH of the AMN in a frequency range 150 kHz to 30 MHz. This measurement was transacted first with instrumentation using an average and peak detector and a 10 kHz bandwidth. If the peak detector achieves a calculated level, the measurement is repeated by an instrumentation using a quasi-peak detector,
Further information please find in test report.

2.4.2 Spurious Emission

2.4.2.1 Test Equipment

- ETS 0012
- ETS 0013
- ETS 0086
- ETS 0474
- Software: ES-K1, Vers. 1.6SP2

2.4.2.2 Test Procedures

- Test configuration

The test configuration corresponds to the standard ANSI C 63.4: 2003. The equipment under test is placed on a non metallic table with 0,8 m height. The power supply and the RF connection points are close to the equipment under test at the floor inside a connection box. The cables to this connection box are shielded and below the double floor. The receiving antenna is placed in a height at 1,0 to 4,0 m, in a distance of 3 m. The measurement receiver is placed in a special room. The observation of the equipment under test is realized by 3 video cameras and by a microphone.

- Test parameters and marginal conditions

The test are carried out with horizontal and vertical polarization of the antenna in a frequency range of 30 MHz to 5 000 MHz. Further information please find in the test protocol.

2.5 Test protocols

Conducted Emission

Emission

Standard : FCC part 15.107; RSS-Gen 7.2.2

Reg.-no. : G0M20905-2346-C-1

Device : spirobank

Date : 25.06.2009

Class : B

Frequency Range	Limit dBµV		Passed	Failed	Number of rechecks
	Quasi-peak	Average			
150 kHz - 500 kHz AC	66 to 56*	56 to 46*	☒	☐	0
500 kHz - 5 MHz AC	56	46	☒	☐	0
5 MHz - 30 MHz AC	60	50	☒	☐	0

* Decreases with logarithm of the frequency

Uncertainty: $U_{lab(cond)}$ = 3.8 dB.

Comment: See attached diagrams in Annex B.
The measurements were carried out in mode “USB link”.

Radio Noise Field Strength

Emission

Standard : FCC part 15.109; RSS-Gen 7.2.3

Reg.-no. : G0M20905-2346-C-1

Device : SPIROBANK

Date : 25.06.2009

Class : B

Frequency Range Polarization	Limit µV/m	Passed	Failed	Number of rechecks
30 MHz - 88 MHz	90	☒	☐	0
88 MHz - 216 MHz	150	☒	☐	0
216 MHz - 960 MHz	210	☒	☐	0
960 MHz - 1000 MHz	300	☒	☐	0

Uncertainty: $U_{lab(rad)}$ = 5.3 dB

Comment: Above 1 GHz no relevant disturbances.
See attached diagrams in Annex B.
The measurements were carried out in mode “USB link”.

2.6 Equipment Modification

No modifications were installed by Eurofins Product Service GmbH.

3 Normative references

/1/ FCC part 15: July 2008
Radio Frequency Devises

/2/ CISPR 22: 2006
Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment

/3/ ANSI C 63.4: 2003
American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

/4/ IC RSS-Gen Issue 2 June 2007
General Requirements and Information for the Certification of Radio communication Equipment

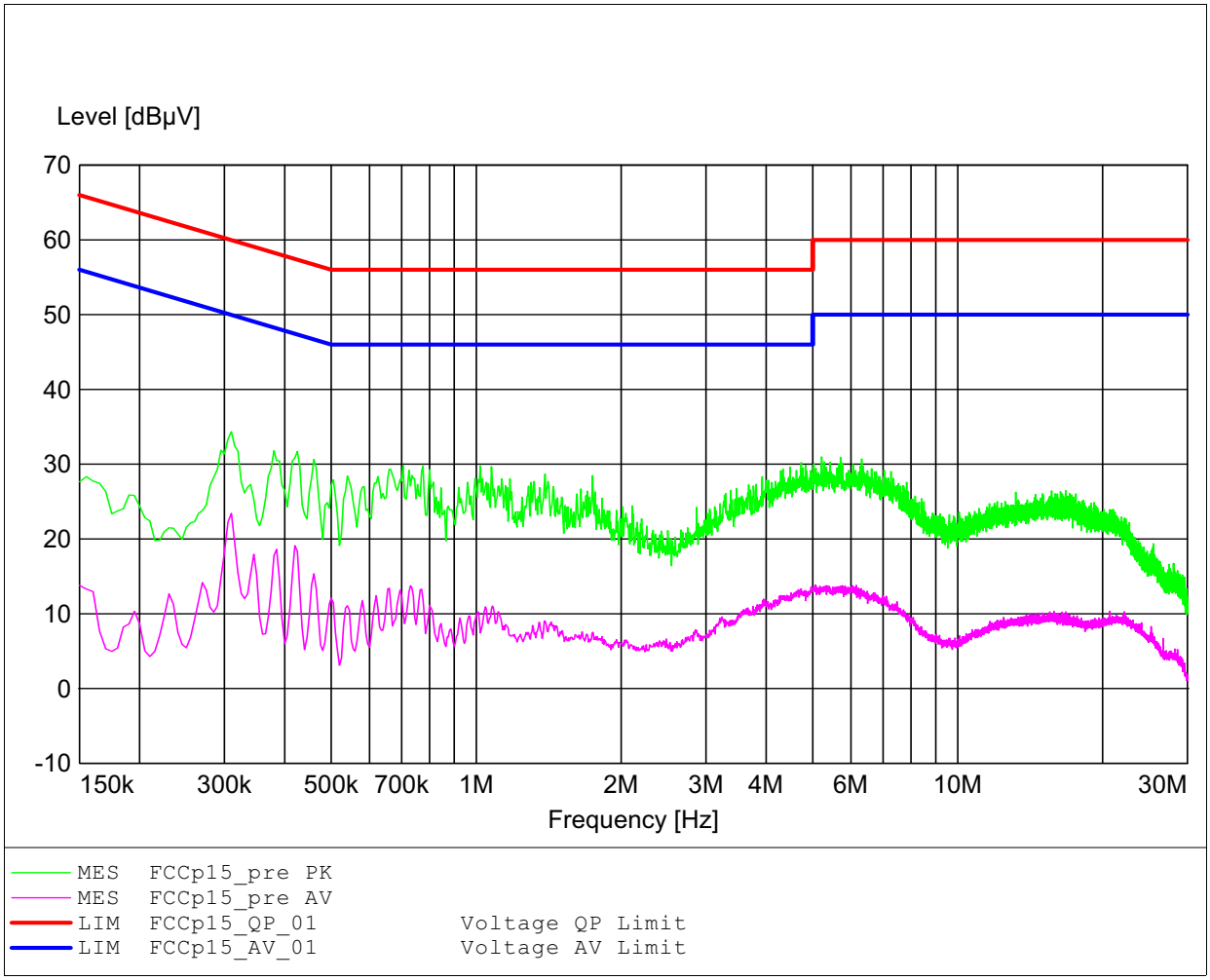
Annex B

Diagrams

EMI voltage test in the ac-mains according to FCC part 15

Order NO.: G0M20905-2346

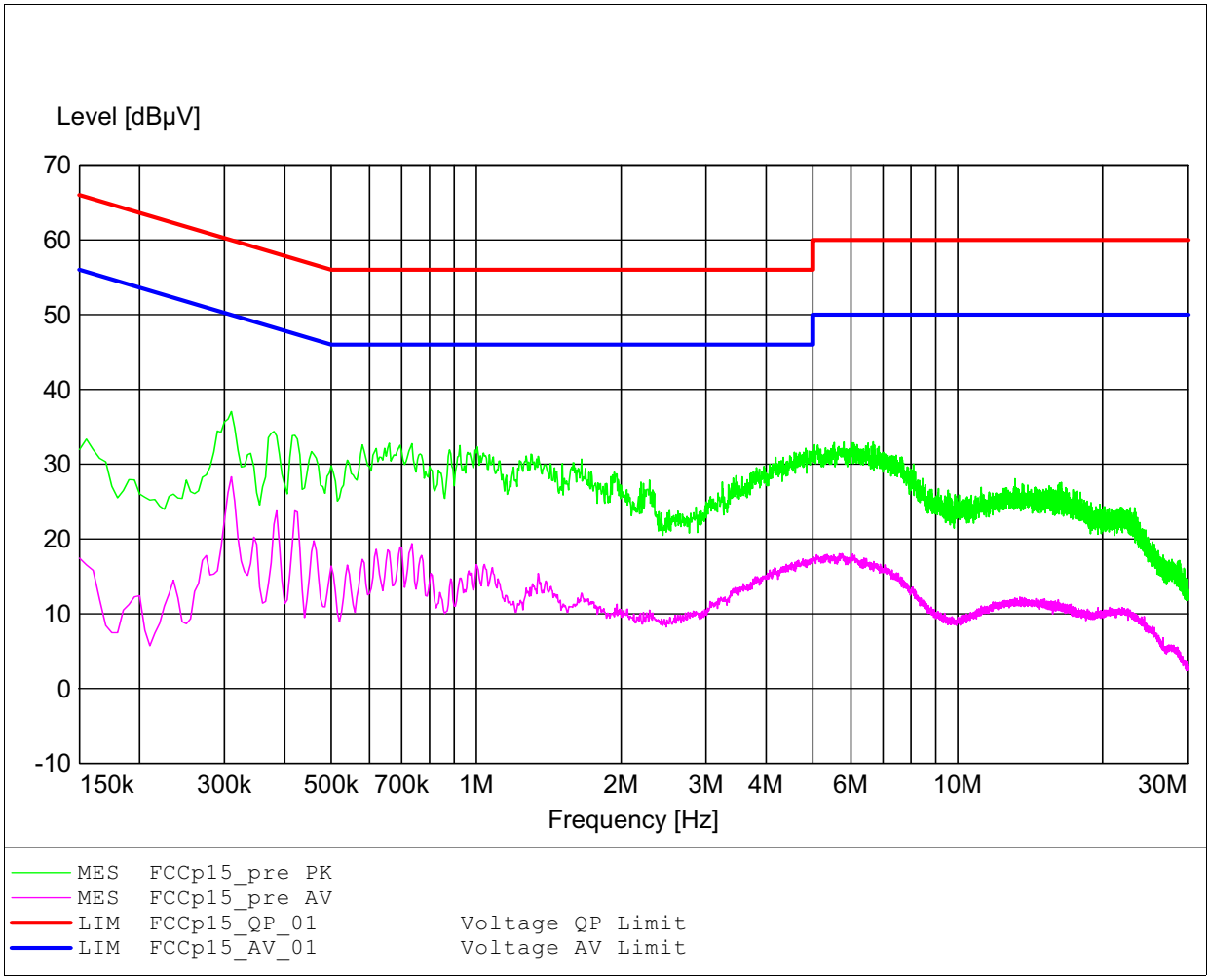
Approval Holder:	MIR Medical International Research
EUT:	portable spirobank
Model:	spirobank
Test Site / Operator:	Eurofins Production Service GmbH / Mr. Klein
Test Conditions:	Unom: 120 V/AC (AC/DC adaptor), Tnom: 23°C
Test Specification:	V-Network: ESH2-Z5 (L)
Comment 1:	mode: USB link
Comment 2:	mode:



EMI voltage test in the ac-mains according to FCC part 15

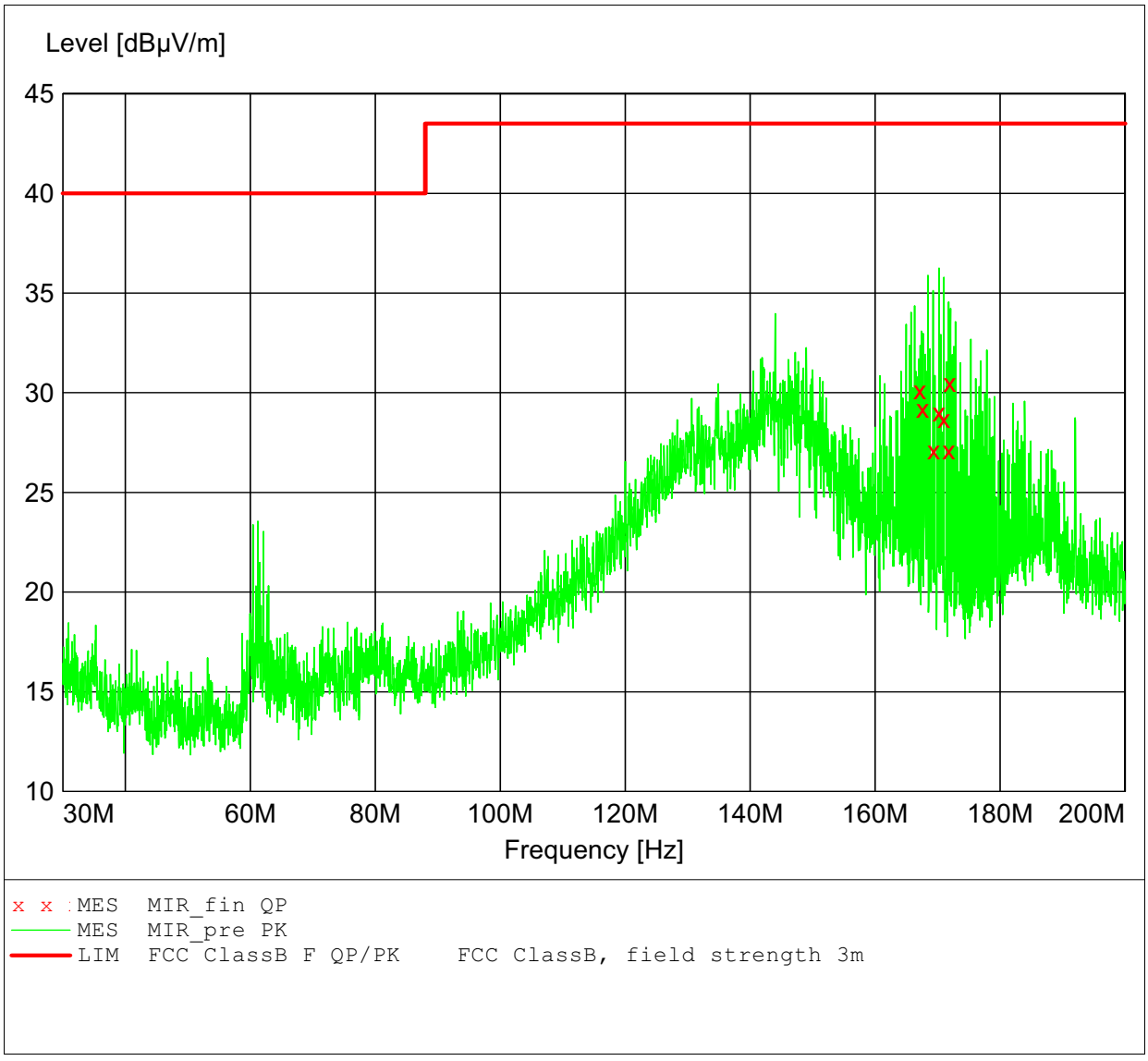
Order NO.: G0M20905-2346

Approval Holder:	MIR Medical International Research
EUT:	spirobank
Model:	portable spirobank
Test Site / Operator:	Eurofins Production Service GmbH / Mr. Klein
Test Conditions:	Unom: 120 V/AC (AC/DC adaptor), Tnom: 23°C
Test Specification:	V-Network: ESH2-Z5 (N)
Comment 1:	mode: USB link
Comment 2:	mode:



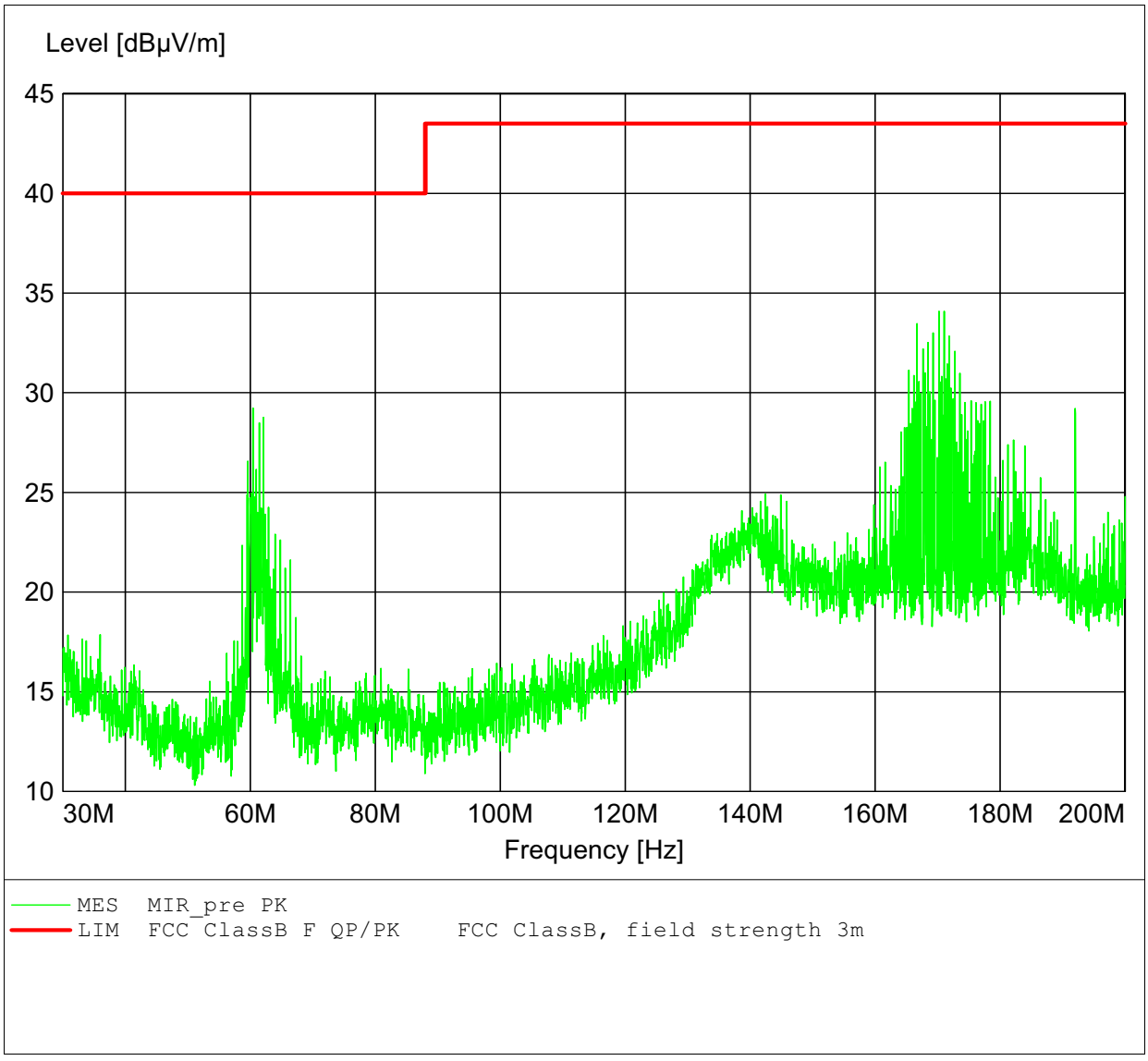
Spurious emission under normal conditions according to FCC part 15 ***Ordernumber: G0M20905-2346***

Approval Holder:	MIR Medical International Research
EUT:	portable spirometer
Model:	spirometer
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Klein
Test Conditions:	Unorm: 9 VDC (Batt.) VDC, Tnom: 23°C
Test Specification:	Ant: HK116, vertical
Comment 1:	mode: USB link
Comment 2:	mode: measurement



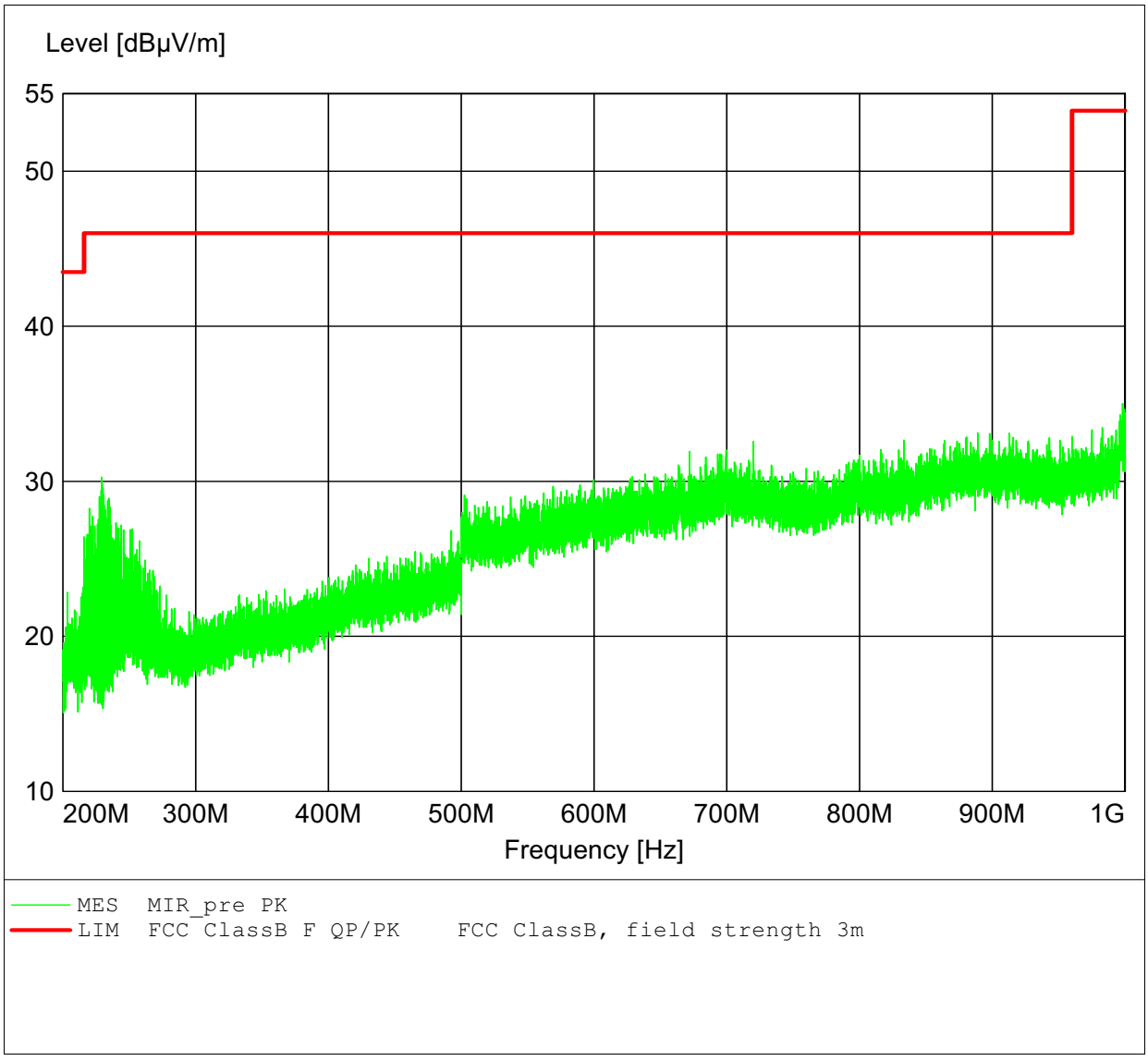
Spurious emission under normal conditions according to FCC part 15 Ordernumber: G0M20905-2346

Approval Holder:	MIR Medical International Research
EUT:	portable spirometer
Model:	spirometer
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Klein
Test Conditions:	Unorm: 9 VDC (Batt.) VDC, Tnom: 23°C
Test Specification:	Ant: HK116, horizontal
Comment 1:	mode: USB link
Comment 2:	mode: measurement



Spurious emission under normal conditions according to FCC part 15 Ordernumber: G0M20905-2346

Approval Holder:	MIR Medical International Research
EUT:	portable spirometer
Model:	spirometer
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Klein
Test Conditions:	Unorm: 9 VDC (Batt.) VDC, Tnom: 23°C
Test Specification:	Ant: HL223, vertical
Comment 1:	mode: USB link
Comment 2:	mode: measurement



Spurious emission under normal conditions according to FCC part 15 Ordernumber: G0M20905-2346

Approval Holder:	MIR Medical International Research
EUT:	portable spirometer
Model:	spirometer
Test Site / Operator:	Eurofins Product Service GmbH / Mr. Klein
Test Conditions:	Unorm: 9 VDC (Batt.) VDC, Tnom: 23°C
Test Specification:	Ant: HL223, horizontal
Comment 1:	mode: USB link
Comment 2:	mode: measurement