

FCC ID: XUY0YX0YU02087

EMI - TEST REPORT

- FCC Part 15.225 -



Test Report No. :	T36119-00-01KG	28. June 2012 Date of issue
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Type / Model Name : USB Reader v2 MultiReader HFProduct Description : Card reader 13,56 MHzApplicant : Y SOFT CorporationAddress : Czech Technology Park, Podnikatelska 2902/4
612 00 BRNO, Czech RepublicManufacturer : Y SOFT CorporationAddress : Czech Technology Park, Podnikatelska 2902/4
612 00 BRNO, Czech RepublicLicence holder : Y SOFT CorporationAddress : Czech Technology Park, Podnikatelska 2902/4
612 00 BRNO, Czech Republic

Test Result according to the standards listed in clause 1 test standards:	POSITIVE
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The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test results
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1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15 Subpart A - General (September, 2011)

Part 15, Subpart A, Section 15.31	Measurement standards
Part 15, Subpart A, Section 15.33	Frequency range of radiated measurements
Part 15, Subpart A, Section 15.35	Measurement detector functions and bandwidths

FCC Rules and Regulations Part 15 Subpart C- Intentional Radiators (September, 2011)

Part 15, Subpart C, Section 15.225	Operation within the band 13.110-14.010 MHz
Part 15, Subpart C, Section 15.207(c)	Conducted limits
Part 15, Subpart C, Section 15.209(a)	Radiated emissions, general requirements

ANSI C63.4: 2009

Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

CISPR 16-4-2: 2003

Uncertainty in EMC measurement

CISPR 22: 2005
EN 55022: 2006

Information technology equipment

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2 SUMMARY

GENERAL REMARKS:

The EuT is working at frequency of 13.56 MHz.

FINAL ASSESSMENT:

The equipment under test **fulfills** the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 13. June 2012

Testing concluded on : 28. June 2012

Checked by:

Tested by:

Thomas Weise
Dipl.-Ing.(FH)
Laboratory Manager

Klaus Gegenfurtner
Dipl.-Ing. (FH)

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3 EQUIPMENT UNDER TEST

3.1 Photo documentation of the EuT

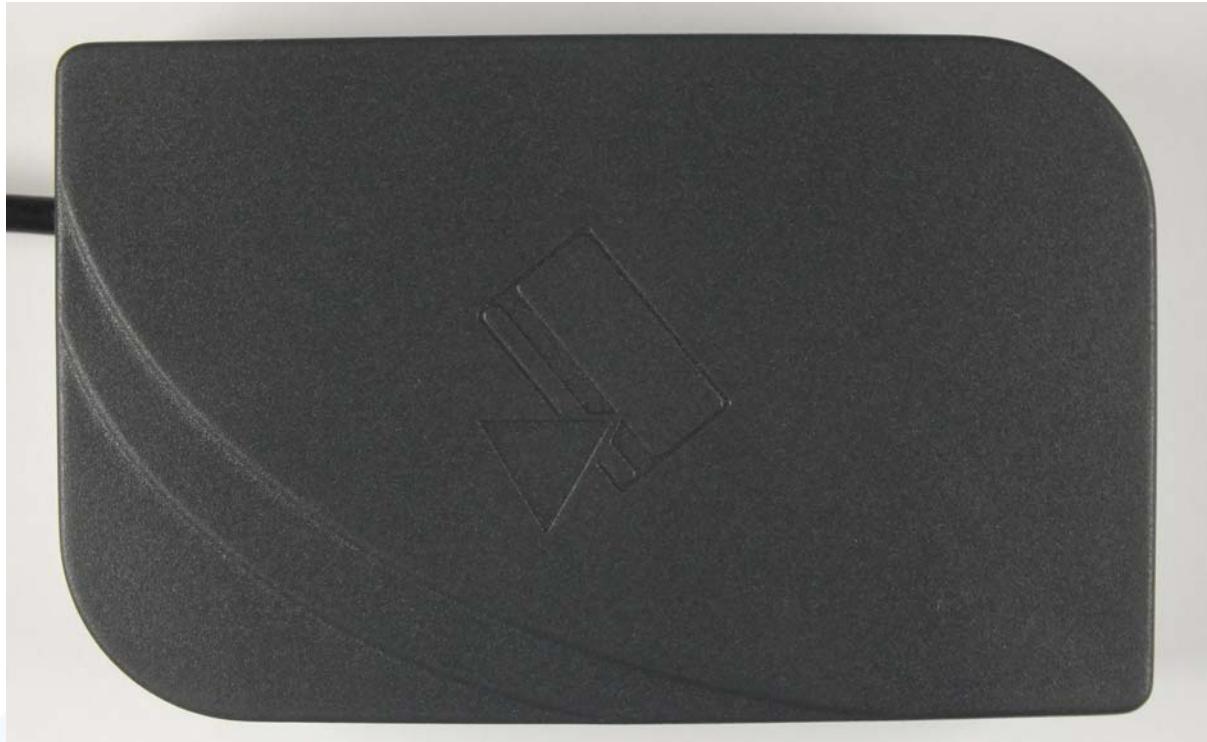


Side view



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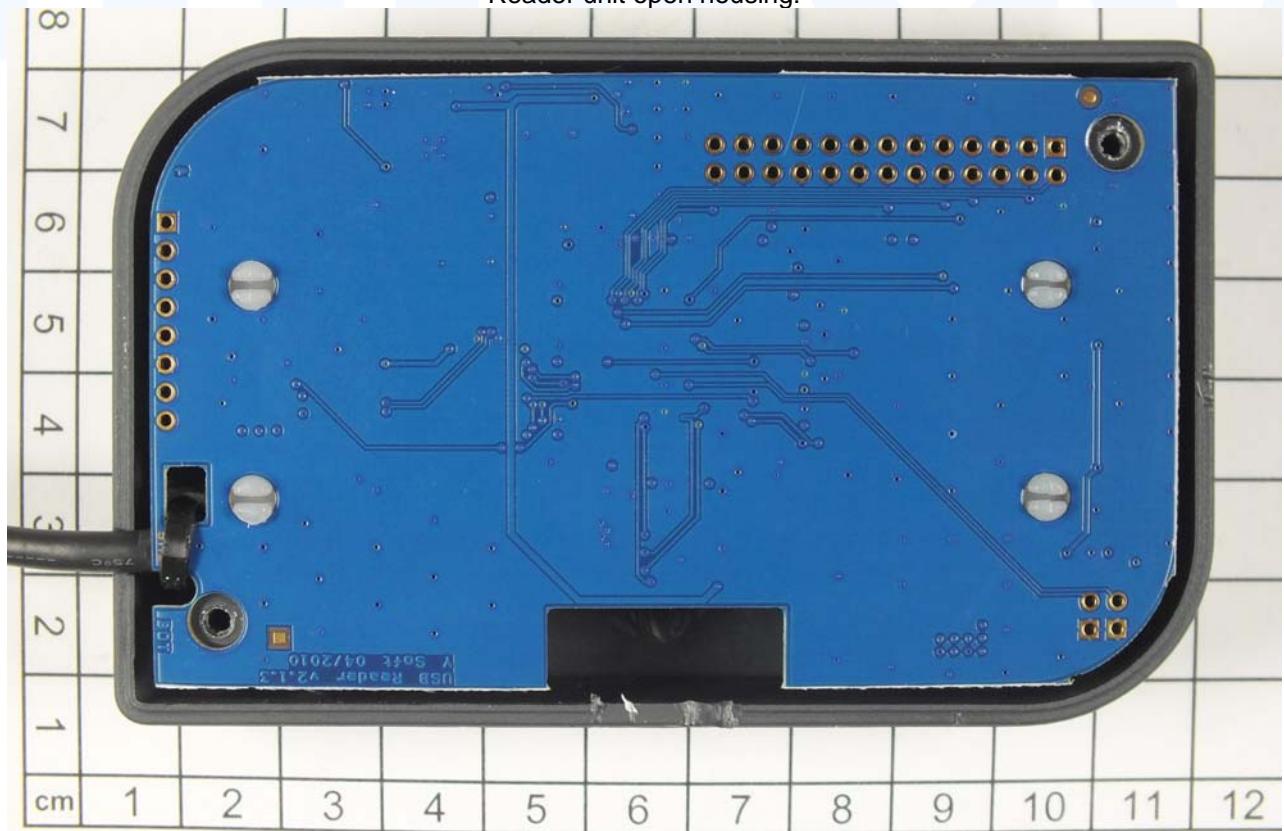
Front view



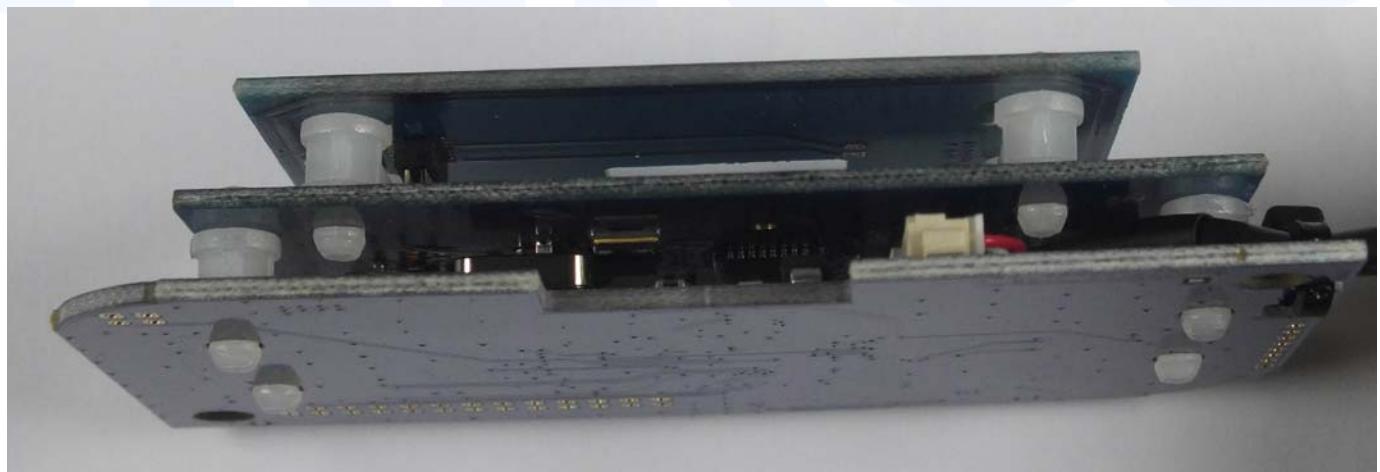
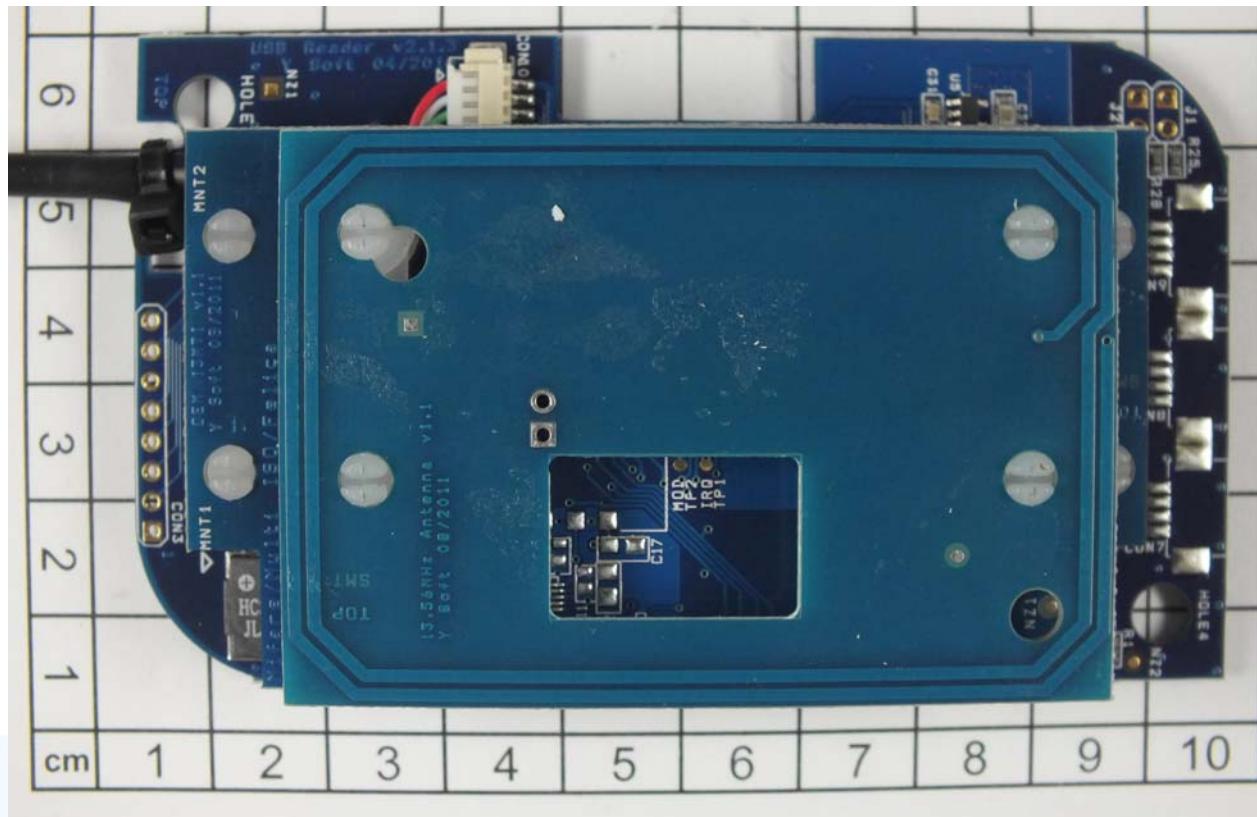
Rear view



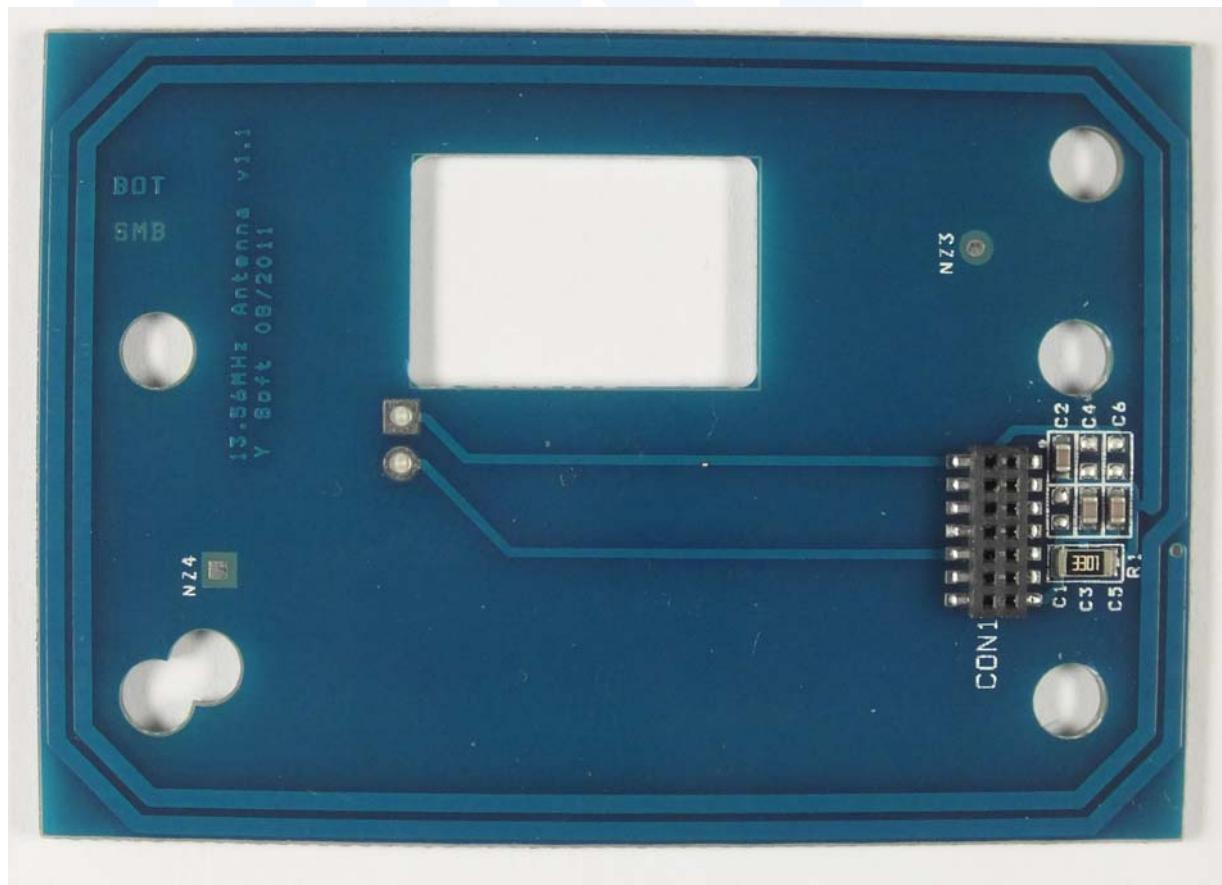
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Reader unit open housing:


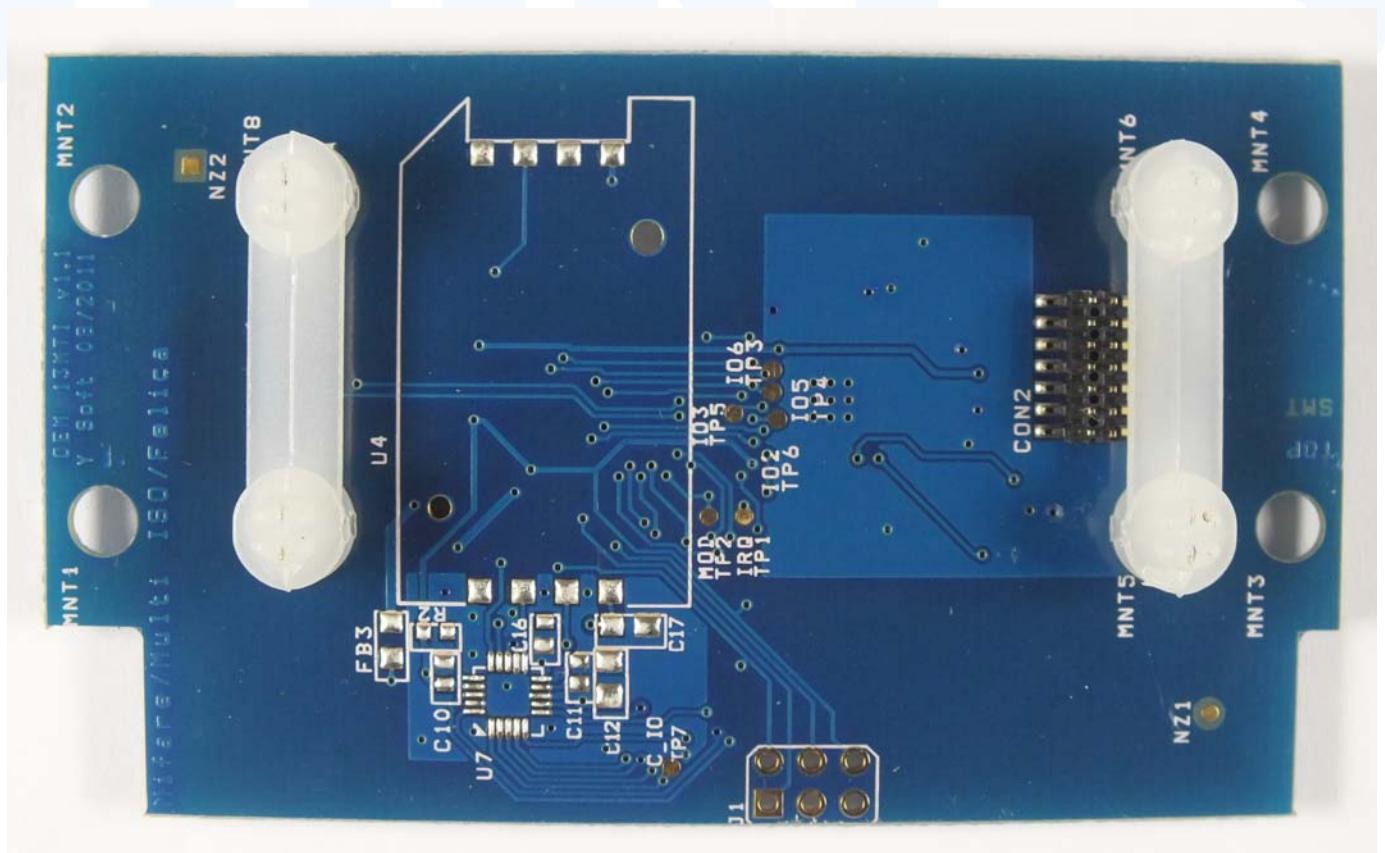
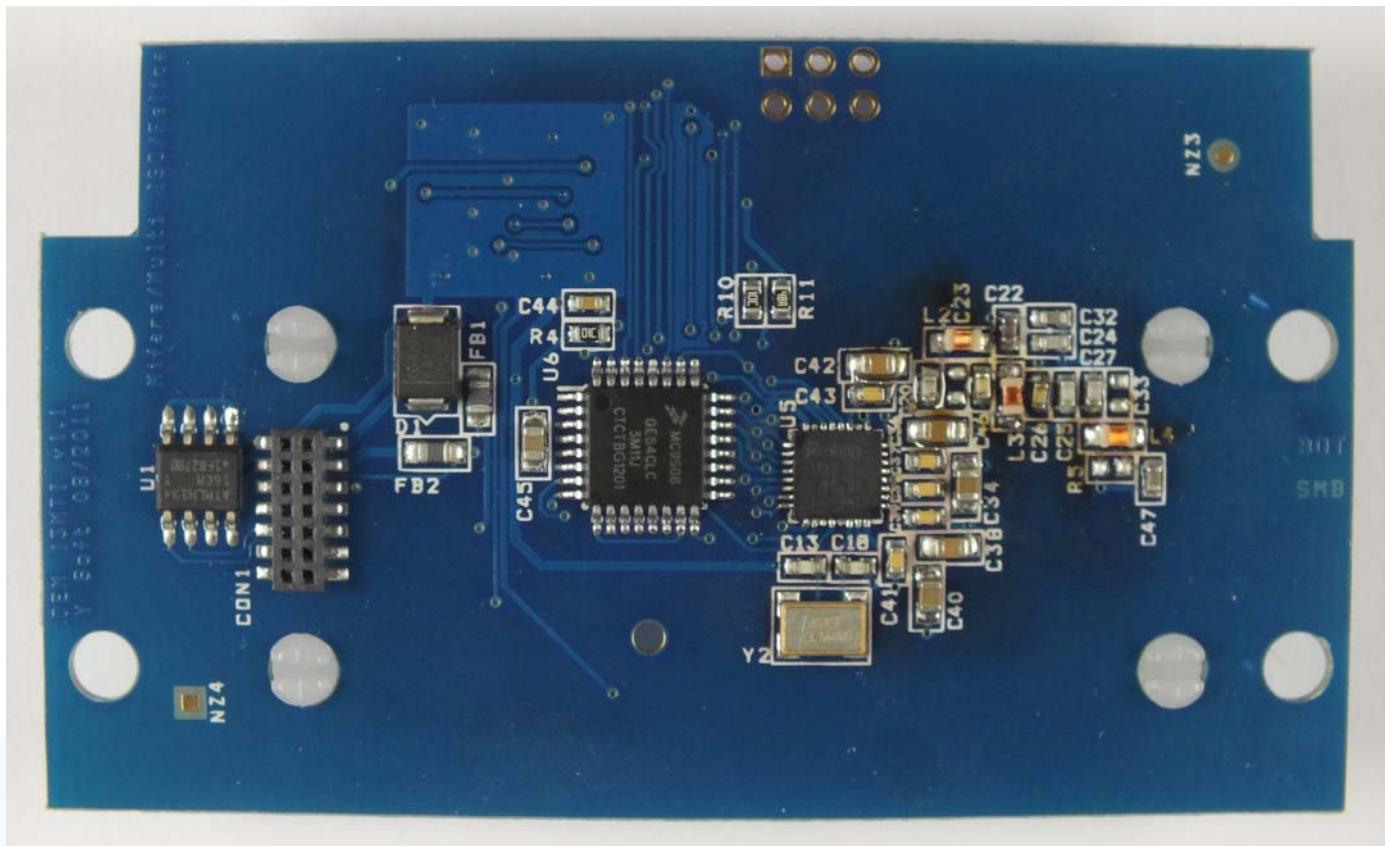
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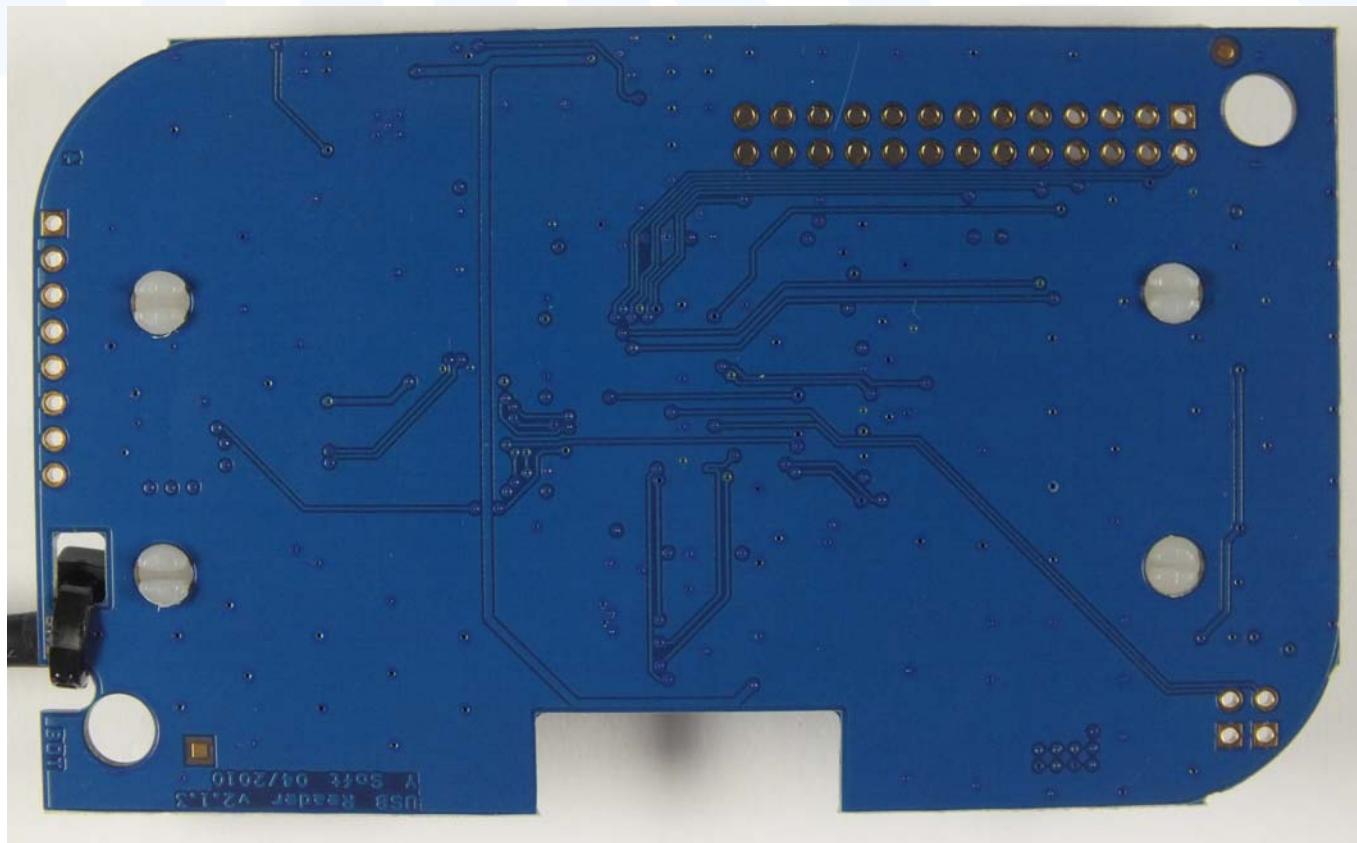
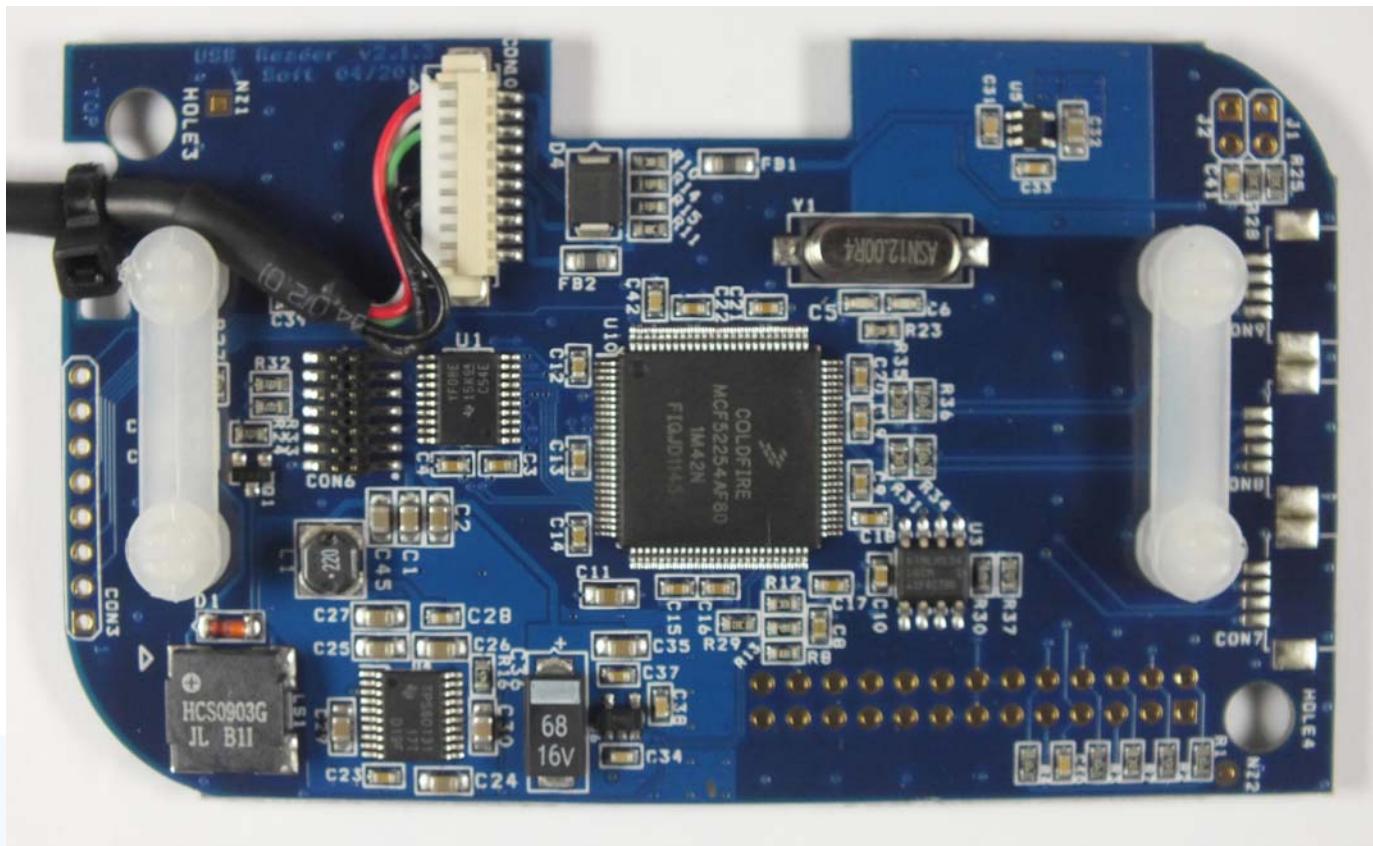
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Peripheral Device for Conducted emission test



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3.2 Power supply system utilised

Power supply voltage : Reader 5V DC
USB-Hub 115V AC / 60Hz

3.3 Short description of the Equipment under Test (EuT)

The EuT is a card reader for reading of authentication cards.

Number of tested samples: 1
Serial number: see Photo documentation of the EuT under Point 3 / Equipment Under Test

EuT operation mode:

The equipment under test was operated during the measurement under the following conditions:

- Tx mode at 13.56 MHz

EuT configuration:

(The CDF filled by the applicant can be viewed at the test laboratory.)

The following peripheral devices and interface cables were connected during the measurements:

- Laptop Mikes Intern Model : 02-01/01-07-007
- USB-Hub Model : Trust
- _____ Model : _____
- customer specific cables

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4 TEST ENVIRONMENT

4.1 Address of the test laboratory

mikes-testingpartners gmbh
Ohmstrasse 2-4
94342 Strasskirchen
Germany

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 /11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

4.4 Measurement Protocol for FCC, VCCI and AUSTEL

4.4.1 GENERAL INFORMATION

4.4.1.1 Test Methodology

Conducted and radiated disturbance testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22, European Standard EN 55022 as shown under section 1 of this report.

In compliance with 47 CFR Part 15 Subpart A Section 15.38 testing for FCC compliance may be done following the ANSI C63.4-2009 procedures and using the CISPR 22 Limits.

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4.4.1.2 Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral using the appropriate impedance characteristic or left unterminated. Where appropriate, cables are manually manipulated with respect to each other thus obtaining maximum disturbances from the unit.

4.4.2 DETAILS OF TEST PROCEDURES

General Standard Information

The test methods used comply with CISPR Publication 22, EN 55022 - "Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement" and with ANSI C63.4-2009 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

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5 TEST CONDITIONS AND RESULTS

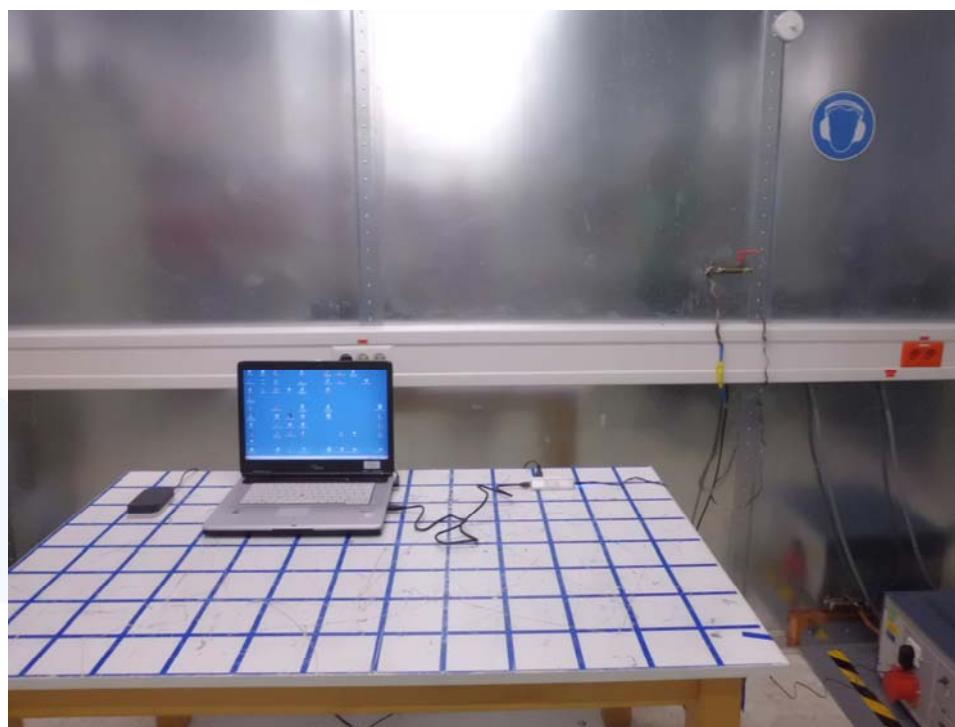
5.1 Conducted emissions

For test instruments and accessories used see section 6 Part A 4.

5.1.1 Description of the test location

Test location: Shielded room S2

5.1.2 Photo documentation of the test set-up



5.1.3 Applicable standard

According to FCC Part 15, Section 15.207(a):

Except as shown in paragraphs (b) and (c) of this Section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the given limits.

5.1.4 Description of Measurement

The measurements are performed following the procedures set out in ANSI C63.4 described under item 4.4.3. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

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Frequency range: 0.15 MHz - 30 MHz

Min. limit margin 3.0 dB at 13.56 MHz

Limit according to FCC Part 15, Section 15.207(a):

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency

The requirements are **FULFILLED**.

Remarks: To show the compliance with the FCC requirements the reader was connected to a standard

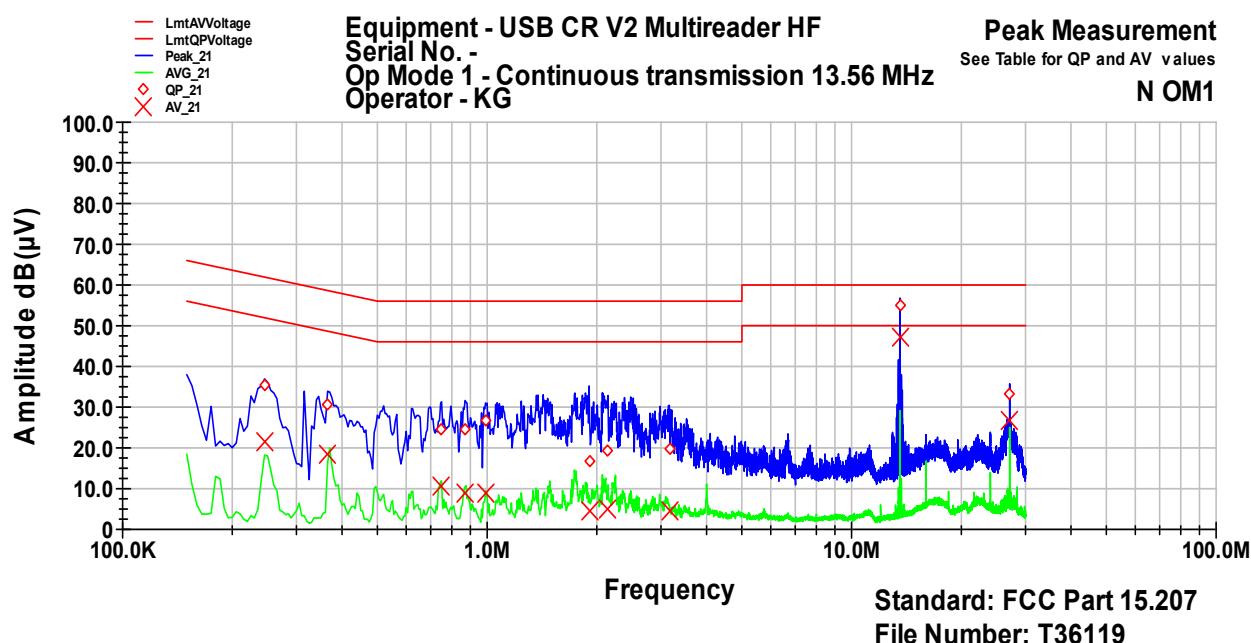
USB-Hub of company Trust.

For detailed test result please refer to following test protocol

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5.1.6 Test protocol

Test point N Result: Passed
 Operation mode: Tx mode at 13.56 MHz
 Remarks: 115V AC / 60Hz

Frequency MHz	QP Level dB(µV)	QP Margin dB	QP Limit dB	AV Level dB(µV)	AV Margin dB	AV Limit dB
0.245	35.3	-26.6	61.9	21.7	-30.3	51.9
0.365	30.6	-28.0	58.6	18.4	-30.2	48.6
0.75	24.4	-31.6	56.0	10.4	-35.6	46.0
0.87	24.5	-31.5	56.0	9.0	-37.0	46.0
0.99	26.8	-29.2	56.0	8.7	-37.3	46.0
1.905	16.7	-39.3	56.0	4.3	-41.7	46.0
2.145	19.5	-36.5	56.0	5.1	-40.9	46.0
3.16	20.0	-36.0	56.0	4.4	-41.6	46.0
13.56	55.0	-5.0	60.0	47.0	-3.0	50.0
27.12	33.2	-26.8	60.0	26.6	-23.4	50.0

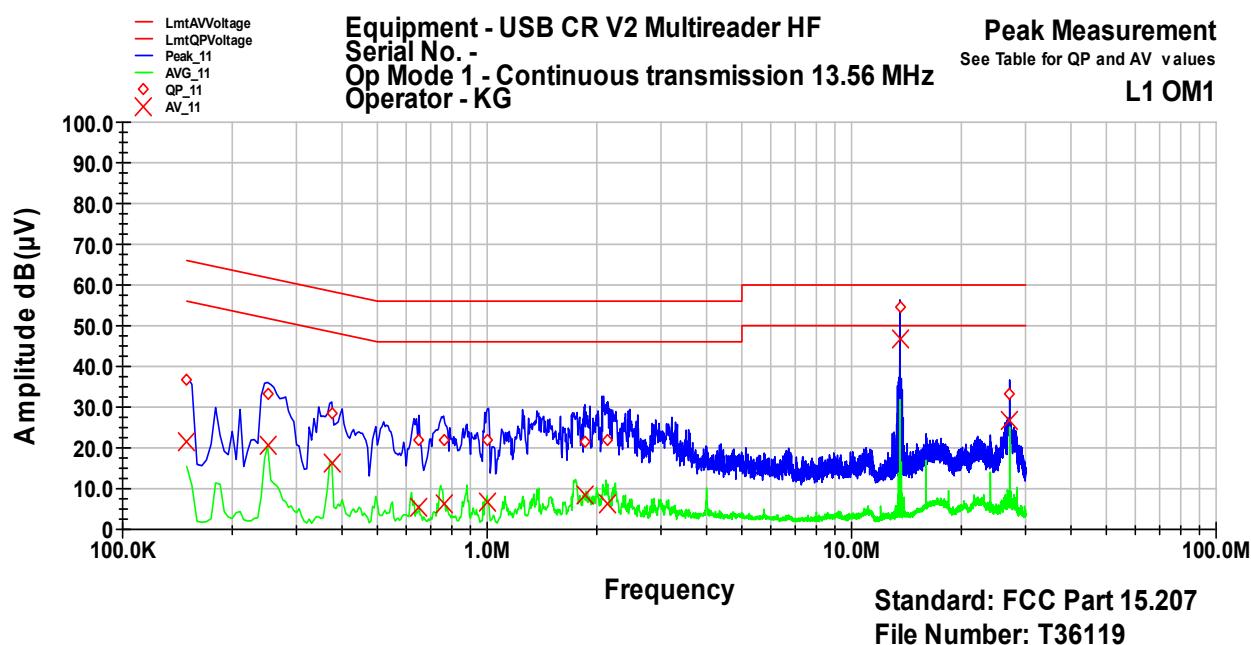


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Test point: L1
 Operation mode: Tx mode at 13.56 MHz
 Remarks: 115 V / 60Hz

Result: Passed

Frequency MHz	QP Level dB(µV)	QP Margin dB	QP Limit dB	AV Level dB(µV)	AV Margin dB	AV Limit dB
0.15	36.6	-29.4	66.0	21.7	-34.3	56.0
0.25	33.1	-28.6	61.8	20.8	-30.9	51.8
0.375	28.3	-30.1	58.4	16.2	-32.2	48.4
0.65	21.9	-34.2	56.0	5.5	-40.5	46.0
0.76	21.7	-34.3	56.0	6.1	-39.9	46.0
1	21.8	-34.2	56.0	6.8	-39.2	46.0
1.855	21.5	-34.5	56.0	8.2	-37.8	46.0
2.14	22.1	-33.9	56.0	6.2	-39.8	46.0
13.56	54.4	-5.6	60.0	46.9	-3.1	50.0
27.12	33.2	-26.8	60.0	26.7	-23.3	50.0



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5.2 Field strength of the fundamental wave

For test instruments and accessories used see section 6 Part **CPR 1**.

5.2.1 Description of the test location

Test location: OATS1

Test distance: 3 metres

5.2.2 Photo documentation of the test set-up



5.2.3 Description of Measurement

The magnetic field strength from the EuT will be measured on an open area test site in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions. In the case where larger measuring distances are required the results will be extrapolated based on the values measured on the closer distances according to Section 15.31 (f) (2) [2]. The final measurement will be performed with an EMI Receiver set to Quasi Peak detector except for the frequency bands 9 kHz to 90 kHz and 110 to 490 kHz where an average detector will be used according to Section 15.209 (d) [2].

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The final level, expressed in $\text{dB}\mu\text{V}/\text{m}$, is arrived at by taking the reading from the EMI receiver (Level $\text{dB}\mu\text{V}$) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit.

The resolution bandwidth during the measurement is as follows:

9 kHz – 150 kHz: ResBW: 200 Hz

150 kHz – 30 MHz: ResBW: 9 kHz

Example:

Frequency (MHz)	Level ($\text{dB}\mu\text{V}$)	+	Factor (dB)	=	Level ($\text{dB}\mu\text{V}/\text{m}$)	Limit ($\text{dB}\mu\text{V}/\text{m}$)	=	Delta (dB)
1.705	5	+	20	=	25	30	=	5

5.2.4 Test result
Measured value at 3m

Frequency [MHz]	L: PK [$\text{dB}\mu\text{V}$]	L: AV [$\text{dB}\mu\text{V}$]	L: QP [$\text{dB}\mu\text{V}$]	Correct. [dB]	L: PK [$\text{dB}\mu\text{V}/\text{m}$]	L: AV [$\text{dB}\mu\text{V}/\text{m}$]	L: QP [$\text{dB}\mu\text{V}/\text{m}$]	Limit [$\text{dB}\mu\text{V}/\text{m}$]	Delta [dB]
13.56	50.6	42.5	48.8	20.0	70.6	62.5	68.8	124.0	-55.2

Calculated value at 30m:

Frequency [MHz]	L: PK [$\text{dB}\mu\text{V}$]	L: AV [$\text{dB}\mu\text{V}$]	L: QP [$\text{dB}\mu\text{V}$]	Correct. [dB]	L: PK [$\text{dB}\mu\text{V}/\text{m}$]	L: AV [$\text{dB}\mu\text{V}/\text{m}$]	L: QP [$\text{dB}\mu\text{V}/\text{m}$]	Limit [$\text{dB}\mu\text{V}/\text{m}$]	Delta [dB]
13.56	10.6	2.5	8.8	20.0	30.6	22.5	28.8	84.0	-55.2

Limit according to FCC Part 15 Subpart 15.225(a)

Frequency (MHz)	Field strength of fundamental wave		Measurement distance (meters)
	($\mu\text{V}/\text{m}$)	dB ($\mu\text{V}/\text{m}$)	
13.553-13.567	15848	84	30

The requirements are **FULFILLED**.

Remarks:

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5.3 Spurious emissions (Magnetic field) 9 kHz – 30 MHz

For test instruments and accessories used see section 6 Part **SER 1**.

5.3.1 Description of the test location

Test location: OATS1

Test distance: 3 metres

5.3.2 Photo documentation of the test set-up



5.3.3 Description of Measurement

The spurious emissions from the EuT will be measured on an open area test site in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions. In the case where larger measuring distances are required the results will be extrapolated based on the values measured on the closer distances according to Section 15.31 (f) (2) [2]. The final measurement will be performed with an EMI Receiver set to Quasi Peak detector except for the frequency bands 9 kHz to 90 kHz and 110 to 490 kHz where an average detector will be used according to Section 15.209 (d) [2].

The final level, expressed in $\text{dB}\mu\text{V}/\text{m}$, is arrived at by taking the reading from the EMI receiver (Level $\text{dB}\mu\text{V}$) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit.

The resolution bandwidth during the measurement is as follows:

9 kHz – 150 kHz: ResBW: 200 Hz

150 kHz – 30 MHz: ResBW: 9 kHz

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Example:

Frequency (MHz)	Level (dB μ V)	+	Factor (dB)	=	Level (dB μ V/m)	Limit (dB μ V/m)	=	Delta (dB)
1.705	5	+	20	=	25	30	=	5

5.3.4 Test result

Frequency [MHz]	L: PK [dB μ V]	L: AV [dB μ V]	L: QP [dB μ V]	Correct. [dB]	L: PK [dB μ V/m]	L: AV [dB μ V/m]	L: QP [dB μ V/m]	Limit [dB μ V/m]	Delta [dB]
0.009 – 30.0				20				40.0	> 20

Limit according to FCC Part 15 Subpart 15.209(a)

Frequency [MHz]	Field strength of spurious emissions		Measurement distance (meters)
	(μ V/m)	dB (μ V/m)	
0.009-0.490	2400/F(kHz)	--	300
0.490-1.705	24000/F (kHz)	--	30
1.705-30.0	30	29.5	30

 The requirements are **FULFILLED**.

Remarks:

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5.4 Radiated emissions (electric field) 30 MHz – 1 GHz

For test instruments and accessories used see section 6 Part **SER 2**.

5.4.1 Description of the test location

Test location: OATS1

Test distance: 3 metres

5.4.2 Photo documentation of the test set-up



5.4.3 Description of Measurement

Spurious emissions from the EuT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003. The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization's and the EuT are rotated 360 degrees.

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The final level, expressed in dB μ V/m, is arrived by taking the reading from the EMI receiver (Level dB μ V) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page.

The resolution bandwidth during the measurement is as follows:

30 MHz – 1000 MHz: ResBW: 120 kHz

Example:

Frequency (MHz)	Level (dB μ V)	+	Factor (dB)	=	Level (dB μ V/m)	Limit (dB μ V/m)	=	Delta (dB)
719	75	+	32.6	=	107.6	110	=	-2.4

5.4.4 Test result

Frequency [MHz]	L: QP [dB μ V]	Correct. [dB]	L: QP [dB μ V/m]	Limit [dB μ V/m]	Delta [dB]
40.68	17.0	14.2	31.2	40.0	-8.8
54.24	5.0	14.9	19.9	40.0	-20.1
67.80	10.0	13.7	23.7	40.0	-16.3
81.36	17.5	10.0	27.5	40.0	-12.5
94.92	27.0	9.3	36.3	43.5	-7.2
108.48	23.5	10.8	34.3	43.5	-9.2
122.04	20.0	11.7	31.7	43.5	-11.8
135.60	26.0	13.4	39.4	43.5	-4.1

Limit according to FCC Part 15 Subpart 15.209(a)

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(μ V/m)	dB (μ V/m)	
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

The requirements are **FULFILLED**.

Remarks: Measurement has been performed up to the 10th harmonics of the fundamental frequency
designed to be emitted by the intentional radiator.

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5.5 Frequency tolerance of the carrier

For test instruments and accessories used see section 6 Part **FE**.

5.5.1 Description of the test location

Test location: AREA4

5.5.2 Photo documentation of the test set-up



5.5.3 Test result

Test conditions		Test result		
		Frequency (MHz)		
T_{min} (-20)°C	V_{nom} (5.0)V	13.559916		
T (-10)°C	V_{nom} (5.0)V	13.559928		
T (0)°C	V_{nom} (5.0)V	13.559928		
T (10)°C	V_{nom} (5.0)V	13.559920		
T_{nom} (20)°C	V_{min} (4.25)V	13.559912		
	V_{nom} (5.0)V	13.559912		
	V_{max} (5.75)V	13.559916		
T (30)°C	V_{nom} (5.0)V	13.559910		
T (40)°C	V_{nom} (5.0)V	13.559916		
T_{max} (50)°C	V_{nom} (5.0)V	13.559928		
Maximum tolerance of carrier frequency (kHz)		-0.09 / +0.00		
Measurement uncertainty		± 10 Hz		

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Limit according to FCC Part 15 Subpart 15.225 (e): $\pm 0.01\%$ of carrier frequency at 13.560 MHz = ± 1.356 kHz

The requirements are **FULFILLED**.

Remarks: _____

mikes

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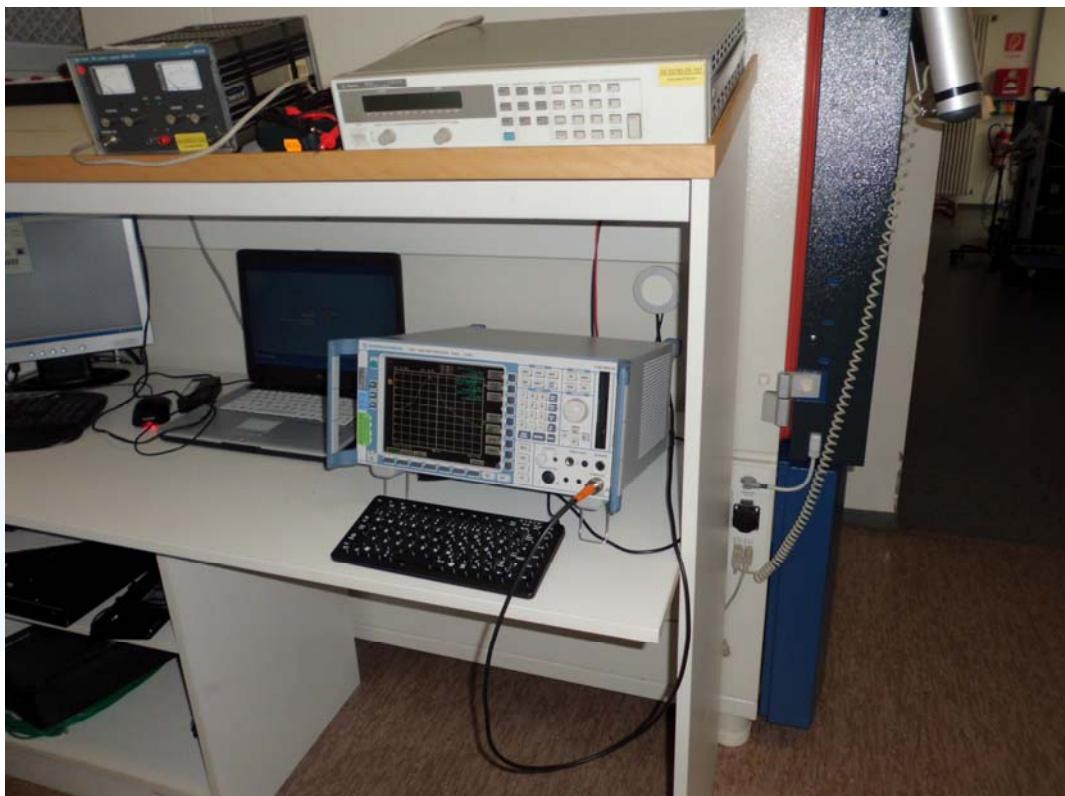
5.6 Emission Bandwidth

For test instruments and accessories used see section 6 Part **MB**.

5.6.1 Description of the test location

Test location: AREA4

5.6.2 Photo documentation of the test set-up



5.6.3 Description of Measurement

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio of -20 dB. The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or the first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.

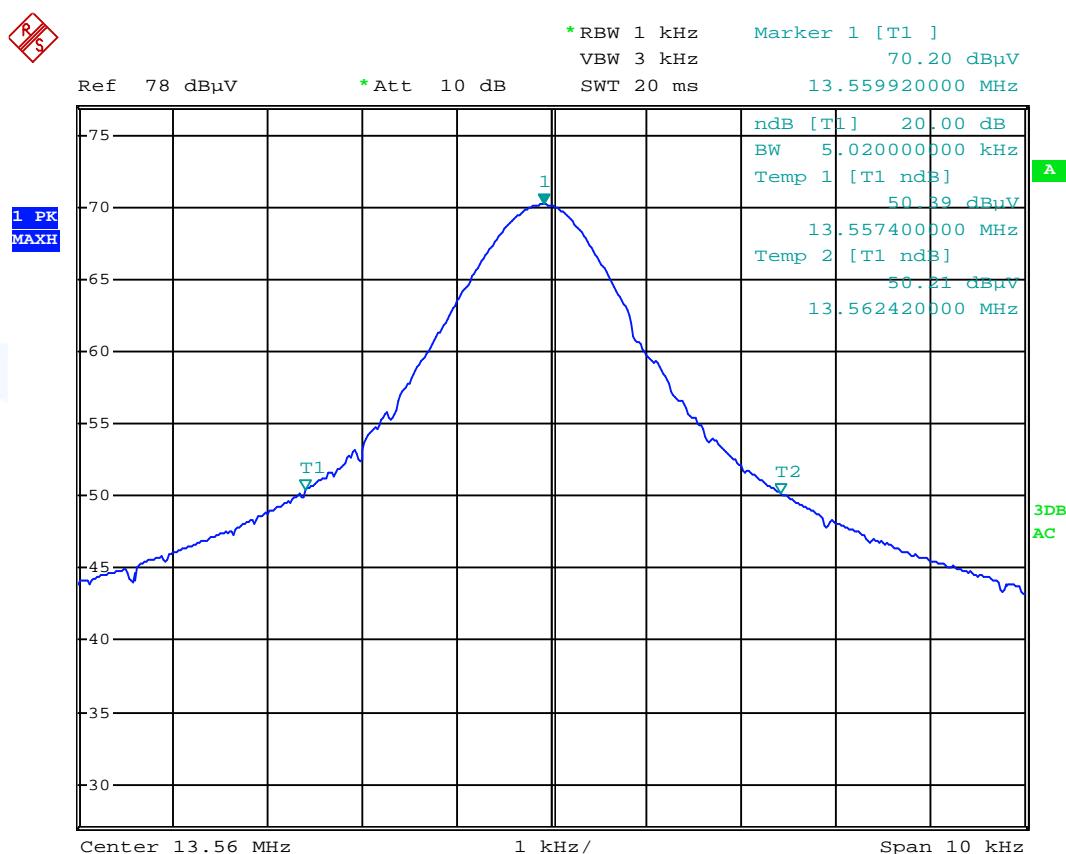
The resolution bandwidth of measuring instrument was set to a value as shown in the following table below according to ANSI C63.4-2003.

Fundamental frequency	Minimum resolution bandwidth
9 kHz to 30 MHz	1kHz
30 to 1000 MHz	10 kHz
1000 MHz to 40 GHz	100 kHz

5.6.4 Test result

Channel Frequency [MHz]	20 dB Bandwidth [kHz]
13.56	5.02

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Remarks: For detailed test result please refer to following test protocol.

5.6.5 Test protocol


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5.7 Transmitter spectrum mask

For test instruments and accessories used see section 6 Part **MB**.

5.7.1 Description of the test location

Test location: AREA4

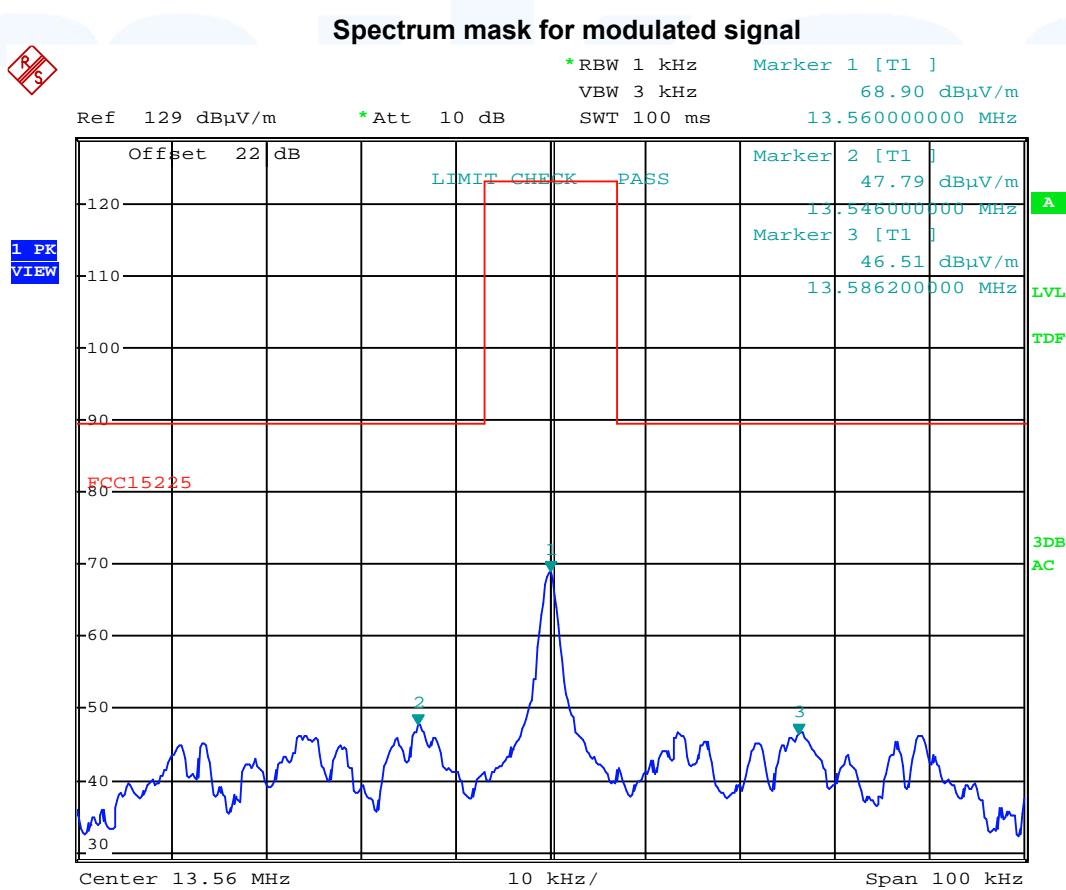
5.7.2 Test result

The absolute levels of RF power at any frequency shall not exceed the limits defined in FCC Part §15.225 a-d

The requirements are **FULFILLED**.

Remarks: _____

5.7.3 Test protocol



FCC ID: XUY0YX0YU02087

6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used, in addition to the test accessories, are calibrated and verified regularly.

The calibration intervals and the calibration history will be given out on request.

Test ID	Model Type	Kind of Equipment	Manufacturer	Equipment No.
A 4	ESH 30 ESH 2 - Z 5 N-4000-BNC N-1500-N ESH 3 - Z 2	EMI Test Receiver LISN RF Cable RF Cable Pulse Limiter	Rohde & Schwarz München Rohde & Schwarz München mikes-testingpartners gmbh mikes-testingpartners gmbh Rohde & Schwarz München	02-02/03-05-002 02-02/20-05-004 02-02/50-05-138 02-02/50-05-140 02-02/50-05-155
CPR 1	FMZB 1516 ESCI S10162-B KK-EF393-21N-16 NW-2000-NB	Magnetic Field Antenna EMI Test Receiver RF Cable 33 m RF Cable 20 m RF Cable	Schwarzbeck Mess-Elektron Rohde & Schwarz München Huber + Suhner Huber + Suhner Huber + Suhner	01-02/24-01-018 02-02/03-05-005 02-02/50-05-031 02-02/50-05-033 02-02/50-05-113
FE	ESCI HZ-10 WK-340/40 6543A	EMI Test Receiver Magnetic Field Antenna Climatic Chamber Power Supply	Rohde & Schwarz München Rohde & Schwarz München Weiss Umwelttechnik GmbH HP Hewlett-Packard	02-02/03-05-005 02-02/24-05-012 02-02/45-05-001 02-02/50-05-157
MB	ESCI HZ-10 WK-340/40 6543A	EMI Test Receiver Magnetic Field Antenna Climatic Chamber Power Supply	Rohde & Schwarz München Rohde & Schwarz München Weiss Umwelttechnik GmbH HP Hewlett-Packard	02-02/03-05-005 02-02/24-05-012 02-02/45-05-001 02-02/50-05-157
SER 1	FMZB 1516 ESCI S10162-B KK-EF393-21N-16 NW-2000-NB	Magnetic Field Antenna EMI Test Receiver RF Cable 33 m RF Cable 20 m RF Cable	Schwarzbeck Mess-Elektron Rohde & Schwarz München Huber + Suhner Huber + Suhner Huber + Suhner	01-02/24-01-018 02-02/03-05-005 02-02/50-05-031 02-02/50-05-033 02-02/50-05-113
SER 2	ESVS 30 VULB 9168 S10162-B KK-EF393-21N-16 NW-2000-NB	EMI Test Receiver Trilog Broadband Antenn RF Cable 33 m RF Cable 20 m RF Cable	Rohde & Schwarz München Schwarzbeck Mess-Elektron Huber + Suhner Huber + Suhner Huber + Suhner	02-02/03-05-006 02-02/24-05-005 02-02/50-05-031 02-02/50-05-033 02-02/50-05-113

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Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
A4				
02-02/03-05-002	30/06/2012	30/06/2011		
02-02/20-05-004	12/05/2013	12/05/2012	09/07/2012	09/01/2012
02-02/50-05-138				
02-02/50-05-140				
02-02/50-05-155			05/10/2012	05/04/2012
CPR 1				
01-02/24-01-018			16/02/2013	16/02/2012
02-02/03-05-005	21/11/2012	21/11/2011		
02-02/50-05-031				
02-02/50-05-033				
02-02/50-05-113				
FE				
02-02/03-05-005	21/11/2012	21/11/2011		
02-02/24-05-012				
02-02/45-05-001	31/05/2013	31/05/2011	22/06/2012	22/12/2011
02-02/50-05-157				
MB				
02-02/03-05-005	21/11/2012	21/11/2011		
02-02/24-05-012				
02-02/45-05-001	31/05/2013	31/05/2011	22/06/2012	22/12/2011
02-02/50-05-157				
SER 1				
01-02/24-01-018			16/02/2013	16/02/2012
02-02/03-05-005	21/11/2012	21/11/2011		
02-02/50-05-031				
02-02/50-05-033				
02-02/50-05-113				
SER 2				
02-02/03-05-006	20/06/2012	20/06/2011		
02-02/24-05-005	16/03/2012	16/03/2011	19/09/2012	16/03/2012
02-02/50-05-031				
02-02/50-05-033				
02-02/50-05-113				