EMC Compliance Report, FCC

EMC Product Testing

Product Name:	KISS 4U V2 KTQ87-A
Model Name:	
Document Number:	KON-15014-PR04-E01-01
Document Title:	EMC Compliance Report FCC+KISS 4U V2 KTQ87-A
Test Result:	Passed
Test Conclusion:	Additional result statements see chapter 'Result statement'.
Update Reference:	
-original report name:	
-original report number:	
Update Reason:	None
Accreditation References of Product Compliance Center:	BSMI Authorization No.: SL2-IN-E-3001; SL2-R1/R2-E-3001, SL2-A1-E-3001 FCC Registration No.: 90935 VCCI Registration No.: 1468, C-2052, C-2053, C-2054, T-173, T-176, T-177, R-1907, G-186 KC Registration No.: EU0061 Deutsche Akkreditierungsstelle DAkkS
Notice:	This result relates only to the above mentioned EUT. Application to other systems of configurations is not permitted. The test configuration and the test results of the individual tests are shown on the following pages. Tests outside the scope of the accreditation are respectively marked out in the test coverage. This test report shall not be reproduced except in full without the written approval of the test laboratory.
Contact:	Fujitsu Technology Solutions GmbH, Product Compliance Center, D-86199 Augsburg, Bürgermeister-Ulrich-Str. 100, Germany Phone +49 (821) 804-3693, http://ts.fujitsu.com/testcenter

1. Project Overview

1.1 Equipment under test

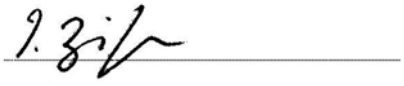
Product Name:	KISS 4U V2 KTQ87-A
Model:	
Product Category:	Industrial Computer
Manufacturer	Kontron Europe GmbH
Trademark	Not available
Serial No.:	123456789
Revision No.:	10

1.2 Applicant

Company Name:	Kontron Europe GmbH
Customer Name:	Mr. Andreas Liebert
Address:	Lise-Meitner-Str. 3 - 5
City:	86156 Augsburg
Country:	Germany

1.3 Documentation Approval

Release Date:	Nov 03, 2015
Test Engineer:	Thomas Zitzelsberger

Report prepared by:	Oliver Barth Technician	
Report reviewed by:	Thomas Zitzelsberger Test Engineer	

2. Table of Content

1. Project Overview 2
1.1 Equipment under test 2
1.2 Applicant 2
1.3 Documentation Approval 2
2. Table of Content 3
3. Result Overview 4
3.1 Result Statement Details 4
3.2 Remarks on the individual tests 4
4. Applicable Standards and References 5
4.1 Standards 5
4.2 References 5
5. Certification statements 6
5.1 Class A Device 6
6. FCC Verification 7
6.1 Information for the user 8
7. General information about the test site 9
7.1 Test facility 9
7.1.1 Test site Augsburg 9
7.2 Measurement Procedures 9
7.2.1 Conducted emission 9
7.2.2 Radiated emission (Semi Anechoic Chamber) 9
7.2.3 Harmonic current emission 10
7.2.4 Voltage fluctuations and flicker 10
7.2.5 Immunity testing 10
7.2.6 Test equipment 11
7.2.7 Measurement uncertainty 11
8. EUT information 12
8.1 Component Description 12
8.2 Operating condition 12
8.3 Configuration description 12
8.4 Configuration – Modification History 12
8.4.1 Block Diagram 13
8.4.2 Dimension of EUT 15
8.5 Product Rating Label 15
8.6 Photos of EUT 16
9. List of attached test protocols 20

Attachments: Testprotocols

3. Result Overview

3.1 Result Statement Details

Result Statement:

Discipline:	Protocol No.:	Result:
Radiated Disturbance Emission, CISPR 22:Edition 6.0 2008-09, class A, 30MHz - 1GHz, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded;	P2M1	Passed
Radiated Disturbance Emission, FCC, 47 CFR Part 15 :2014-01-14, class A, 1GHz - 26GHz, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded;	P1M1	Passed
Conducted Disturbances Emission, CISPR 22:Edition 6.0 2008-09, class A, Mains Voltage: 120V, 60Hz, TP: AC/DC mains delivery state;	P3M1	Passed

Additional result explanation:

- Not applicable, see remarks on the individual test
- Not performed, see remarks on the individual test
- Passed*, see remarks on the individual test
- Passed with modification, see necessary modification described in the corresponding short report (e.g. P1M1, PxMx) in this report

3.2 Remarks on the individual tests

Test and Remarks:

Radiated Disturbance Emission, FCC, 47 CFR Part 15 :2014-01-14, class A, 18GHz - 26GHz, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded

Not relevant for AGB.

Radiated Disturbance Emission, FCC, 47 CFR Part 15 :2014-01-14, class A, 1GHz - 18GHz, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded

Not relevant for AGB.

Radiated Disturbance Emission, FCC, 47 CFR Part 15 :2014-01-14, class A, 26GHz - 40GHz, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded

No such high internal frequency of the EUT.

4. Applicable Standards and References

The test results show that the EUT as described in this test report is in compliance with the applicable standard referenced in this report.

4.1 Standards

Standard:	Title:
47 CFR part15 :2015-01-12	Part 15 of FCC rules, regulations under which an unintentional radiator may be operated, administrative requirements and other conditions relating to the marketing of part 15 devices
ICES-003 :Issue 5 August 2012	Interference-Causing Equipment Standard, Digital Apparatus

4.2 References

References:

CISPR 22 :Edition 6.0 2008-09

47 CFR part15 :2014-01-14

5. Certification statements

5.1 Class A Device

The test results reported herein apply only to the units actually tested and to substantially identical units.

The EUT was classified as a class A device.

WARNING: Remark for CE class A products: Class A products may be used in residential environment but with the condition that the end user is informed about the possible consequence with a warning information in the user manual:

This is a class A device. This equipment may cause interference in a residential installation. In this case the user is encouraged to perform appropriate measures to correct the interference.

6. FCC Verification

The evaluation of the EUT, configured as described herein, presented by:

Kontron Europe GmbH Germany indicated that the radiated emission of the EUT complies with the requirements set forth in Subpart B of Part 15 of the Federal Communication Commission (FCC) rules for Class A devices and the Canadian Interference-Causing Equipment Standard ICES-003 for digital apparatus.

Labeling requirements:

In accordance with the FCC Rules, a permanently attached label is applied to the EUT in a conspicuous location with the following statement:

"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.

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada."

Purpose of Test:

To evaluate the Electromagnetic Emission (EME) characteristics of the Equipment Under Test (EUT) with respect to the standards and classifications of the product mentioned above.

Test Procedure:

This document is a report of tests to determine the EME characteristics of the KISS 4U V2 KTQ87-A herein referred to as the Equipment Under Test (EUT), presented by Kontron Europe GmbH.

All test procedures used meet the requirements of the American National Standard ANSI C63.4-2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz".

Statement:

The test results reported herein apply only to the units actually tested and to substantially identical units.

Conclusion of Tests:

The KISS 4U V2 KTQ87-A presented by Kontron Europe GmbH, configured as described herein, fully complies with the requirements set forth in Subpart B of Part 15 of the Federal Communications Commission (FCC) Rules for Class A Digital Devices.

6.1 Information for the user

In addition, the following statement will be included into the manual in accordance with 15.105 of the FCC Rules, Part 15, Subpart B:

The following statement applies to the products covered in this manual, unless otherwise specified herein. The statement for other products will appear in the accompanying documentation.

Kontron Europe GmbH is not responsible for any radio television interference caused by unauthorized modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Kontron Europe GmbH. The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

The use of shielded I/O cables is required when connecting this equipment to any and all optional peripheral or host devices. Failure to do so may violate FCC and ICES rules.

This report should be maintained by Kontron Europe GmbH, in the event of inquiries by the Federal Communications Commission on the Electromagnetic Emission (EME) characteristics of the EUT.

7. General information about the test site

7.1 Test facility

7.1.1 Test site Augsburg

The test site is located at Fujitsu Technology Solutions GmbH, Bürgermeister – Ulrich Str. 100, 86199 Augsburg, Germany. This site consists of a 10 m semi anechoic chamber and a 3 m fully anechoic chamber for radiated emission testing, and of three shielded rooms for conducted emission testing. The 10 m semi anechoic chamber is conforming to the NSA-limits described in CISPR22, CISPR16 and ANSI C63.4-2003. The measurement facility was found to be in compliance with the requirements to Section 2.948 of the FCC Rules

Due to the Mutual Recognition Agreement (MRA) between the European Community and the USA the EMC test lab located as described above has been approved as a Conformity Assessment Body (CAB) designated by the EU member states through the conclusion of the MRA on the basis of Article 133 of the treaty.

7.2 Measurement Procedures

7.2.1 Conducted emission

The conducted emission was measured in a fully configured system. These measurements were performed according to the standards mentioned before. Line to ground radio noise voltages were measured at phase and neutral lines using an Artificial Mains Network (AMN). The other peripheral devices power cables were connected to the mains via a second LISN.

Preliminary scans were performed with the EMI-receiver detector set to PEAK and AVERAGE to determine the conducted EMI-profile of the EUT. During the final measurement, the noise frequencies producing emission with the highest level relative to the limit line, were measured again using the QUASI PEAK and AVERAGE detector of the EMI receiver.

The conducted emission was measured in the frequency range from 0,150 MHz to 30 MHz. The bandwidth of the EMI-Receiver was set to 9 kHz and the detector was set to “peak”. During the final measurement the detector was set to “average” respectively to “CISPR quasi-peak”.

The measurements were done on the phase and neutral line of the EUT’s power cable.

During the final measurement the cables and the equipment were placed and moved within the range of positions likely to find the maximum emission.

All measurements were done inside the shielded rooms.

For further data as well as the used power source for the EUT see enclosed test results.

7.2.2 Radiated emission (Semi Anechoic Chamber)

The radiated emission was measured in a fully configured system. These measurements were performed according to the standards mentioned before.

The radiated emission was measured in two parts:

- In the frequency range from 30 MHz to 1000 MHz, the bandwidth of the EMI-receiver was set to 120 kHz and the detector was set to “peak”. These tests were performed at a distance of 10 meters between antenna and EUT in a Semi Anechoic Chamber. In a first step preview tests with PEAK detector were performed to collect all critical frequencies. To find also the maximum emission during tests, the EUT was turned 360°, the receiving antenna was moved from 1 to 4 meters above ground plane and the polarization was changed from horizontal to vertical. During prescan all data in peak mode were accumulated automatically. During the final measurement the detector was set to “CISPR quasi-peak” and values above the acceptance line were measured automatically.

- In the frequency range 1 GHz to 6 GHz, the bandwidth of the EMI-receiver was set to 1 MHz and the detector was set to "peak". These tests were performed at a distance of 3 meters between antenna and EUT in a Fully Anechoic Chamber. During prescan all data in peak mode were accumulated automatically. During the final measurement the detector was set to "CISPR average" and values above the acceptance line were verified automatically.

For both parts: After automatic tests manual verification took place the cables and the equipment were placed and moved within the range of position in order to find the maximum emission. The selected frequency points were those with less than 3 dB margin to the applicable limit.

Field strength calculation:

The field strength level is calculated automatically by the test system which uses the following equations:

LEVEL [dBµV/m] = Meter-Reading [dBµV] + TRANSDUCER [dB/m]

TRANSDUCER [dB/m] = Antenna factor [dB/m] + Cable Loss [dB]

Radiated disturbance emission is always performed with vertical and horizontal polarization.

In the final result table the worst cases values are listed.

In case if the result table contains only vertical or horizontal measurements that means the worst cases is within this polarization.

7.2.3 Harmonic current emission

The harmonic current emission was measured in the frequency range from 0,1 kHz - 2 kHz. The measurements were done on the phase and the neutral line of the EUT's power cord. The EUT has been tested in operating modes as recorded on the measurements protocols.

7.2.4 Voltage fluctuations and flicker

The flickering values have been measured on the EUT's power cord. The observation time for each measurement cycle is 10 min (short time flicker). During this period all system routines are passed at least once.

7.2.5 Immunity testing

During immunity tests the EUT was set to continuous standard testing operation. The tests were carried out using test programs which could repeat the sequences of functions of equipment. In case of failure, the operator was able to recognize the type of failure by monitoring. For testing immunity to radiated field the tests were done in a semi-anechoic chamber and the effects were controlled on a monitor via a video camera and/or by a microphone.

Performance criteria:

- Criteria A: Normal performance within the specification limit
- Criteria B: Temporary degradation or loss of function or performance which is self recoverable
- Criteria C: Temporary degradation or loss of function or performance which requires operator intervention or system reset

7.2.6 Test equipment

For detailed information of used test equipment and calibration due to the test equipment refer to the relevant protocols in the attachment.

7.2.7 Measurement uncertainty

The expanded uncertainty of the measurements is stated as the standard uncertainty of the measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

The standard uncertainty of the measurements has been determined in accordance to CISPR 16-4-2.

Measurement uncertainty is covered by UCispr.

8. EUT information

EUT Receipt date: 30.10.2015

Condition of EUT: Ready for Test

No additional EUT description of tested EUT available.

8.1 Component Description

No additional components available.

03.11.2015

8.2 Operating condition

Operating Condition: No additional information available.

Operating system: Microsoft Windows 7, 64 Bit.

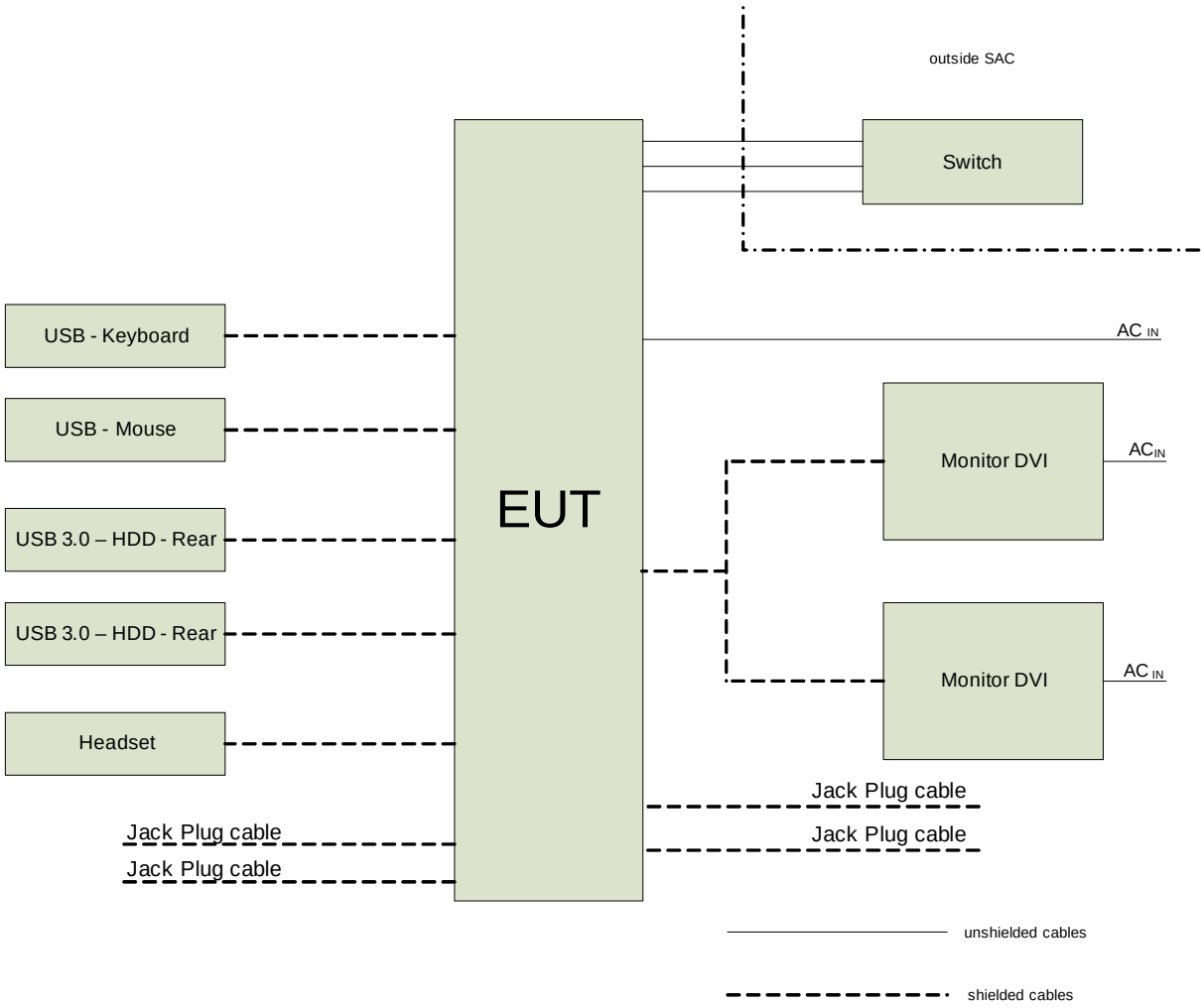
Additional operating conditions, configuration and comments see the attached test protocols.

8.3 Configuration description

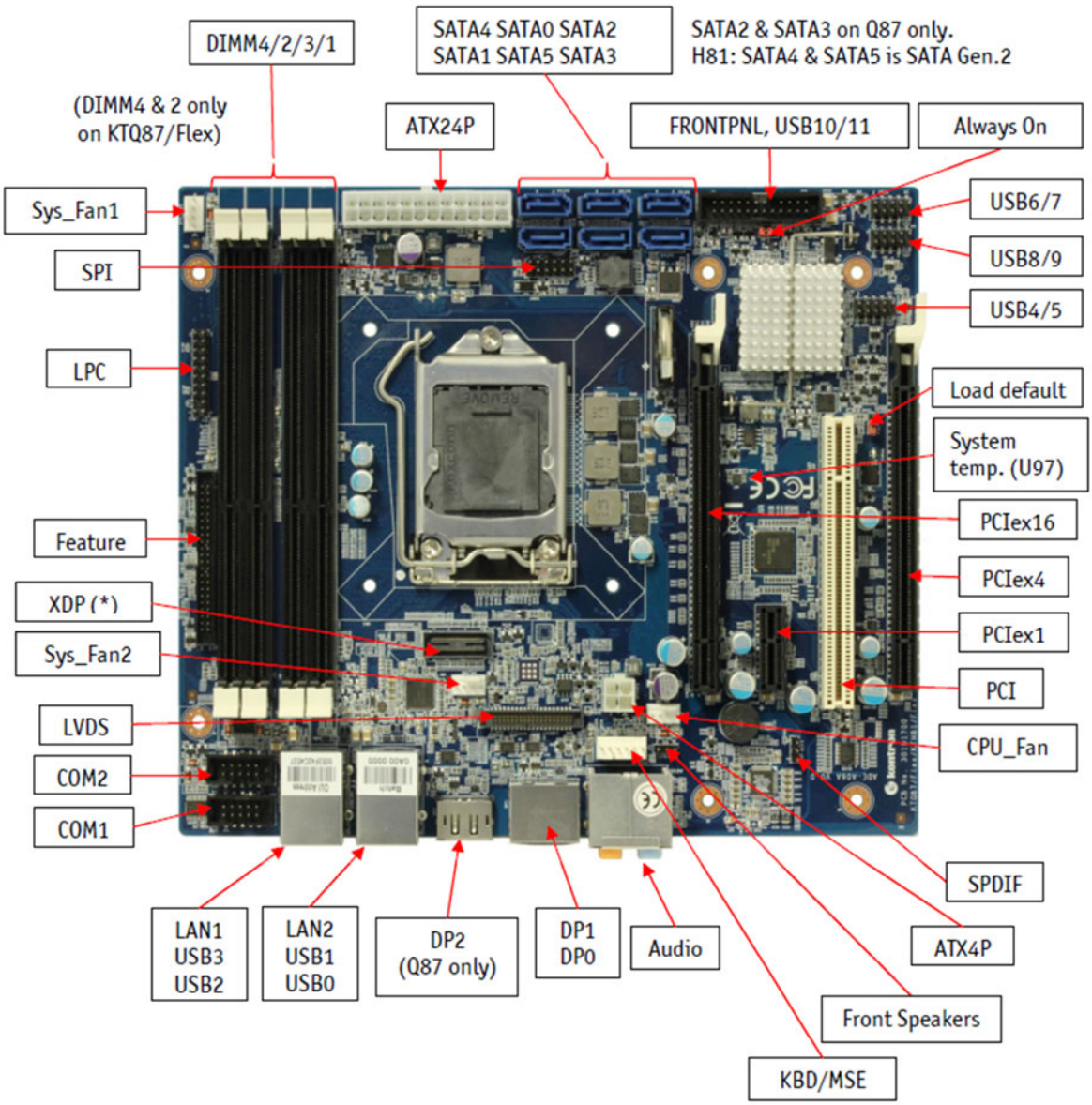
Component	Manufacturer	Model
	Kontron Europe GmbH	KISS 4U V2 KTQ87-A

8.4 Configuration – Modification History

8.4.1 Block Diagram



Block Diagram of Test Setup



Block Diagram of Systemboard

8.4.2 Dimension of EUT

177 x 482 x 472 mm (4U x 19" x 18.58")

8.5 Product Rating Label

8.6 Photos of EUT

Figure 1 : Front closed KISS 4U V2 KTQ87-A

Figure 2 : Front open KISS 4U V2 KTQ87-A

Figure 3 : Left KISS 4U V2 KTQ87-A

Figure 4 : Right KISS 4U V2 KTQ87-A

Figure 5 : Rear KISS 4U V2 KTQ87-A

Figure 6 : Overview 1 KISS 4U V2 KTQ87-A

Figure 7 : Overview 2 KISS 4U V2 KTQ87-A

Figure 8 : Label KISS 4U V2 KTQ87-A

9. List of attached test protocols

Description:	Protocol No.:
Radiated Disturbance Emission, CISPR 22:Edition 6.0 2008-09, class A, 30MHz - 1GHz, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded	P2M1
Radiated Disturbance Emission, FCC, 47 CFR Part 15 :2014-01-14, class A, 1GHz - 26GHz, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded	P1M1
Conducted Disturbances Emission, CISPR 22:Edition 6.0 2008-09, class A, Mains Voltage: 120V, 60Hz, TP: AC/DC mains delivery state	P3M1

Protocol: P2M1, Radiated Disturbance Emission

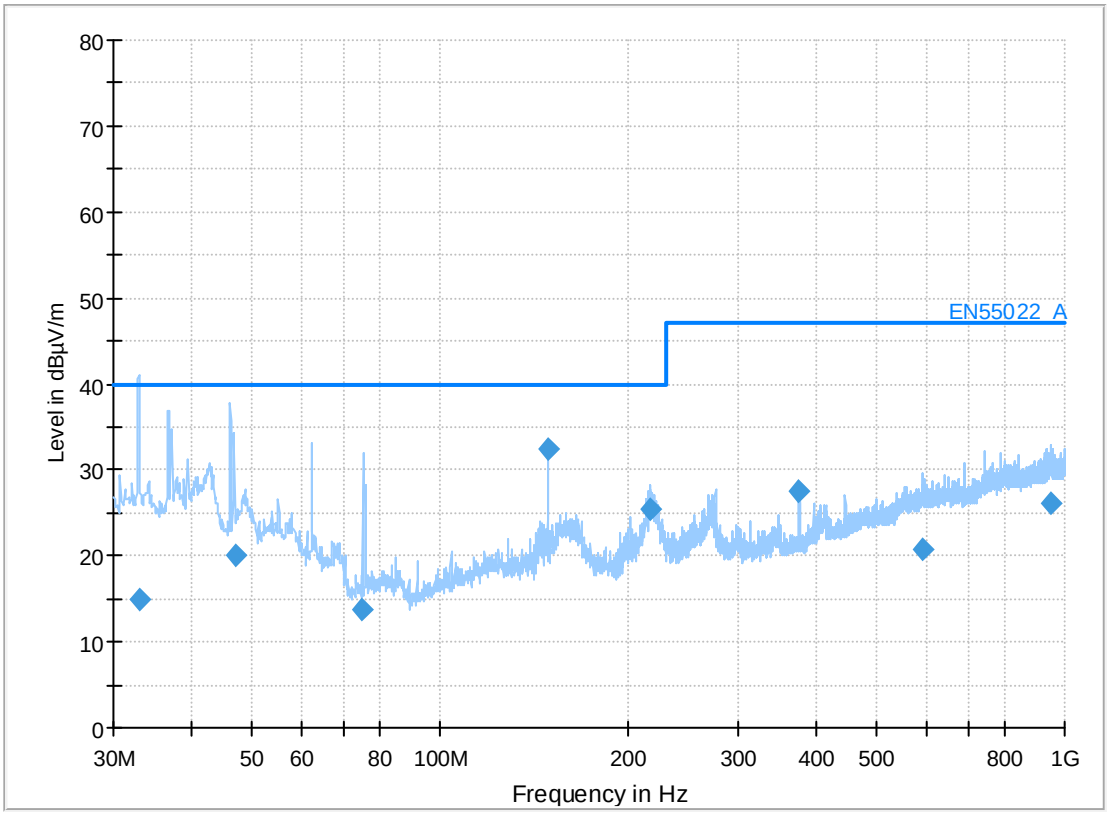
Test Result:	Passed
Result Statement:	
Product Name:	KISS 4U V2 KTQ87-A
Model:	
Product Category:	
Test Description:	Radiated Disturbance Emission, CISPR 22:Edition 6.0 2008-09, class A, 30MHz - 1GHz Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded
Tested by:	Oliver Barth
Tested Date & Time:	22.10.2015 - 13:18
Operating conditions	CPU-, HDD-, Display (Scr.H)-, ODD-, LAN - Test
Graphic resolution:	1920x1080, 60Hz
Test program:	Kerberos
Test configuration:	full; without front USB (Door closed)
Comment:	Test location: SAC
Humidity:	32 %
Temperature:	24 °C
Air Pressure:	958 hPa
Test methods:	Default

Detailed Results

Common Information

ProjectNr.:	KON-15014-PR04-E01; P2M1
Comments:	120V/60Hz; unshielded LAN

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
33.090000	15.02	40.00	24.98	120.000	355.0	H	97.0	17.8
46.980000	20.16	40.00	19.84	120.000	272.0	V	82.0	10.5
75.060000	13.88	40.00	26.12	120.000	385.0	V	237.0	7.5
148.500000	32.45	40.00	7.55	120.000	110.0	V	232.0	12.3
217.320000	25.48	40.00	14.52	120.000	109.0	V	-3.0	11.1
375.930000	27.43	47.00	19.57	120.000	214.0	H	330.0	17.5
592.200000	20.85	47.00	26.15	120.000	282.0	V	53.0	22.1
949.980000	26.21	47.00	20.79	120.000	115.0	H	272.0	25.5

Table of used instruments

Type	Manufacturer	Serial No.	Last Cal.	Next Cal.
Radiated Emission SAC <1GHz (R-1907)				
EMI Receiver ESCI3	ROH - Rohde & Schwarz Vertriebs GmbH	100672	Jun 2015	Jun 2016
Antenna CBL 6112B	Chase, Chase	2790	Jul 2014	Jul 2016
Cable CP1X1-X1 (30-MHz - 2GHz)			Jun 2015	Jun 2016
Semi Anechoic Chamber (R-1907)	Albatross Projects GmbH, Albatross Projects		Mar 2015	Mar 2018
Software EMC32	ROH - Rohde & Schwarz Vertriebs GmbH	V 9.15		
Tools used in 'P2M1'				

Table of used peripherals

Description:	Manufacturer:	Model:	Serial No.:	Certification:
DVI cable 130				
DVI cable 135				
LAN cable UTP 09		CAT. 5e		
LAN cable UTP 107		CAT. 6		
LAN cable UTP 115		CAT. 6		
USB cable 3.0 207				
USB cable 3.0 214				
Mouse 25	Logitech	M-U0011-O	LZ933230220	BSMI No. T41126
Keyboard 40	Fujitsu	KB400 PS/2	YKKB091007R98509	BSMI No: R33073
Monitor 100	Fujitsu	B23T-6	YV4E212369	BSMI No. R33073
Monitor 56	Fujitsu	P23T-6	Y3VQ000001	BSMI No.: R33073
Headset 36	Fujitsu	HS E2000 Communicator		
Switch 03 (100/1000)	SysKonnect	SK-8T24	0512DN0240201	
HDD 217	Samsung / ICY	SSD 840 Pro /	2023814340621	D33475

Description:	Manufacturer:	Model:	Serial No.:	Certification:
	Box	232STU3		
HDD 262	Samsung / ICY Box	SSD 850 Pro / 232STU3		D33475

Peripherals used in 'P2M1'

Photos of test setup

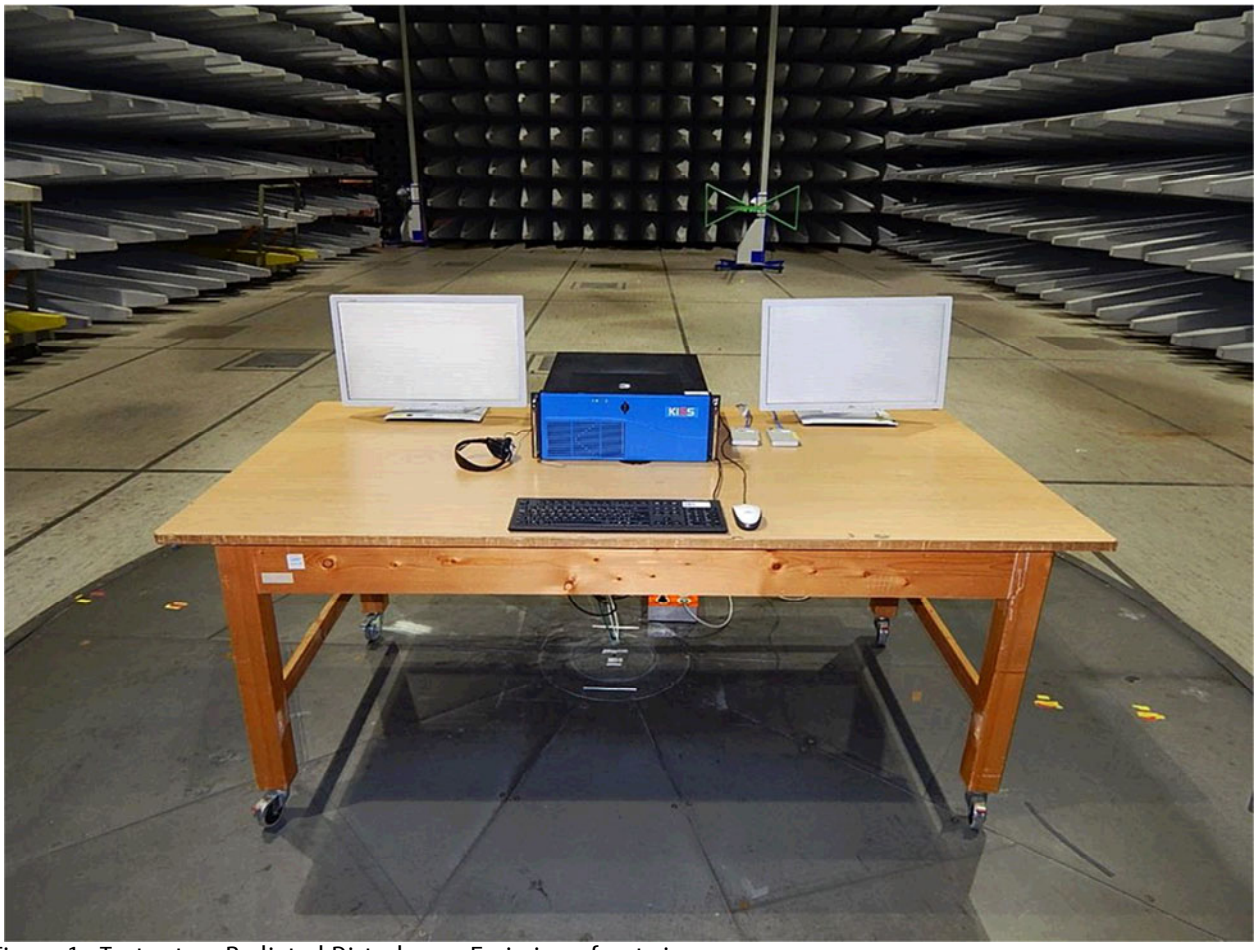


Figure 1 : Test set up Radiated Disturbance Emission - front view

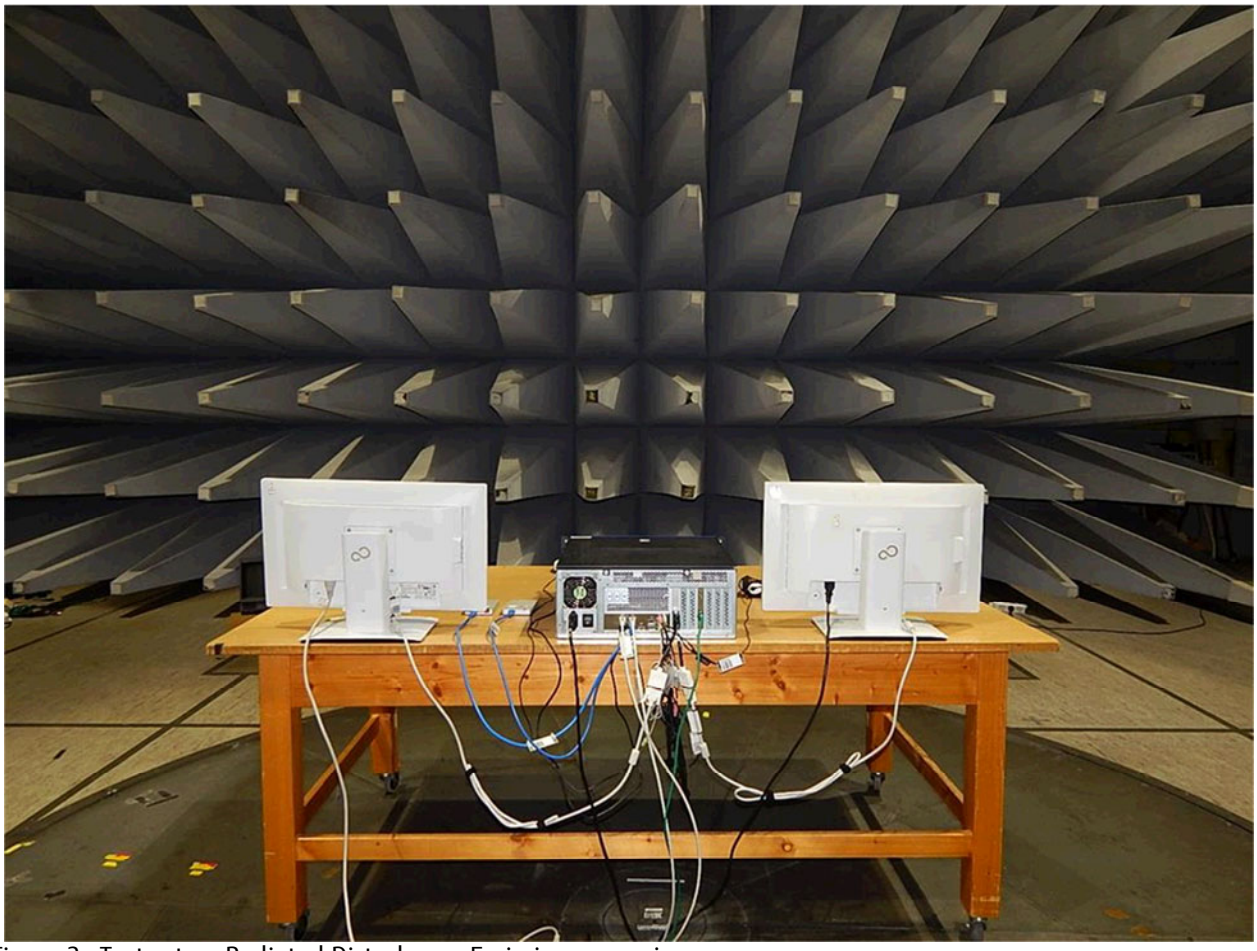


Figure 2 : Test set up Radiated Disturbance Emission - rear view

Protocol: P1M1, Radiated Disturbance Emission

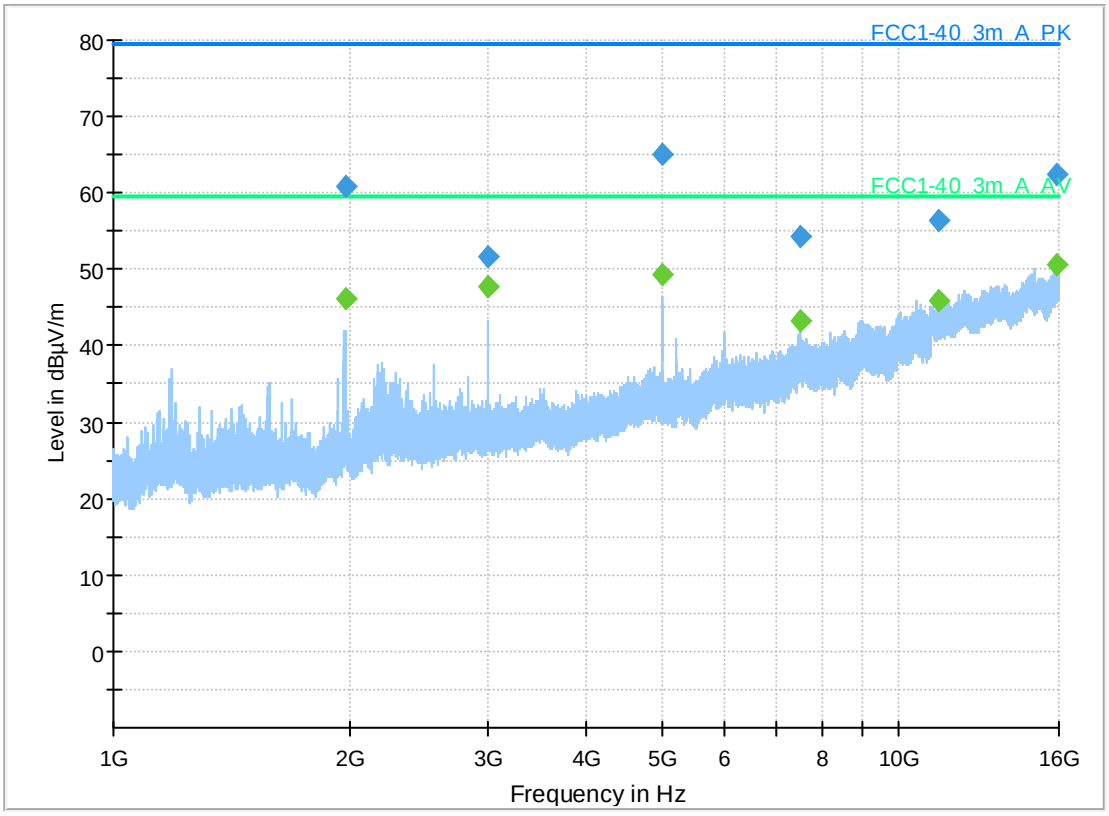
Test Result:	Passed
Result Statement:	-
Product Name:	KISS 4U V2 KTQ87-A
Model:	-
Product Category:	-
Test Description:	Radiated Disturbance Emission, FCC, 47 CFR Part 15 :2014-01-14, class A, 1GHz - 26GHz Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded
Tested by:	Oliver Barth
Tested Date & Time:	19.10.2015 - 12:20
Operating conditions	CPU-, HDD-, Display (Scr.H)-, ODD-, LAN - Test
Graphic resolution:	1920x1080, 60Hz
Test program:	Kerberos
Test configuration:	full; without front USB (Door closed)
Comment:	Test location: SAC
Humidity:	32 %
Temperature:	24 °C
Air Pressure:	958 hPa
Test methods:	Default

Detailed Results

Common Information

ProjectNr.	KON-15014-PR04-E01; P1M1
Comments:	120V/60Hz; unshielded LAN

Full Spectrum



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1971.019467	60.76	---	79.50	18.74	2000.0	1000.000	205.0	H	31.0	1.4
1971.019467	---	46.12	59.50	13.38	2000.0	1000.000	205.0	H	31.0	1.4
3000.068650	51.66	---	79.50	27.84	2000.0	1000.000	100.0	H	2.0	5.5
3000.068650	---	47.82	59.50	11.68	2000.0	1000.000	100.0	H	2.0	5.5
4988.480200	---	49.32	59.50	10.18	2000.0	1000.000	160.0	H	264.0	9.5
4988.480200	65.13	---	79.50	14.37	2000.0	1000.000	160.0	H	264.0	9.5
7501.701283	---	43.23	59.50	16.27	2000.0	1000.000	145.0	V	335.0	15.1
7501.701283	54.41	---	79.50	25.09	2000.0	1000.000	145.0	V	335.0	15.1
11228.182817	---	45.77	59.50	13.73	2000.0	1000.000	165.0	V	84.0	20.1
11228.182817	56.45	---	79.50	23.05	2000.0	1000.000	165.0	V	84.0	20.1
15885.852917	---	50.62	59.50	8.88	2000.0	1000.000	145.0	V	258.0	22.5
15885.852917	62.30	---	79.50	17.20	2000.0	1000.000	145.0	V	258.0	22.5

Table of used instruments

Type	Manufacturer	Serial No.	Last Cal.	Next Cal.
Radiated Emission SAC >1GHz (40GHz)				
Spectrum Analyzer FSU 46	ROH - Rohde & Schwarz Vertriebs GmbH	100014	Jun 2015	Jun 2016
Cable SMA	RHT - Rosenberger Hochfrequenztechnik	4-1	Jun 2015	Jun 2016
Semi Anechoic Chamber (R-1907)	Albatross Projects GmbH, Albatross Projects		Mar 2015	Mar 2018
Antenna HL025	ROH - Rohde & Schwarz GmbH & Co. KG	100213	May 2014	May 2016
Preamplifier	MiTeq	1872179/1872183	Jun 2015	Jun 2016
Software EMC32	ROH - Rohde & Schwarz Vertriebs GmbH	V 9.15		
Tools used in 'P1M1'				

Table of used peripherals

Description:	Manufacturer:	Model:	Serial No.:	Certification:
DVI cable 130				
DVI cable 135				
LAN cable UTP 09		CAT. 5e		
LAN cable UTP 107		CAT. 6		
LAN cable UTP 115		CAT. 6		
USB cable 3.0 207				
USB cable 3.0 214				
Mouse 25	Logitech	M-U0011-O	LZ933230220	BSMI No. T41126

Description:	Manufacturer:	Model:	Serial No.:	Certification:
Keyboard 40	Fujitsu	KB400 PS/2	YKKB091007R98509	BSMI No: R33073
Monitor 100	Fujitsu	B23T-6	YV4E212369	BSMI No. R33073
Monitor 56	Fujitsu	P23T-6	Y3VQ000001	BSMI No.: R33073
Headset 36	Fujitsu	HS E2000 Communicator		
Switch 03 (100/1000)	SysKonnect	SK-8T24	0512DN0240201	
HDD 217	Samsung / ICY Box	SSD 840 Pro / 232STU3	2023814340621	D33475
HDD 262	Samsung / ICY Box	SSD 850 Pro / 232STU3		D33475

Peripherals used in 'P1M1'

Photos of test setup

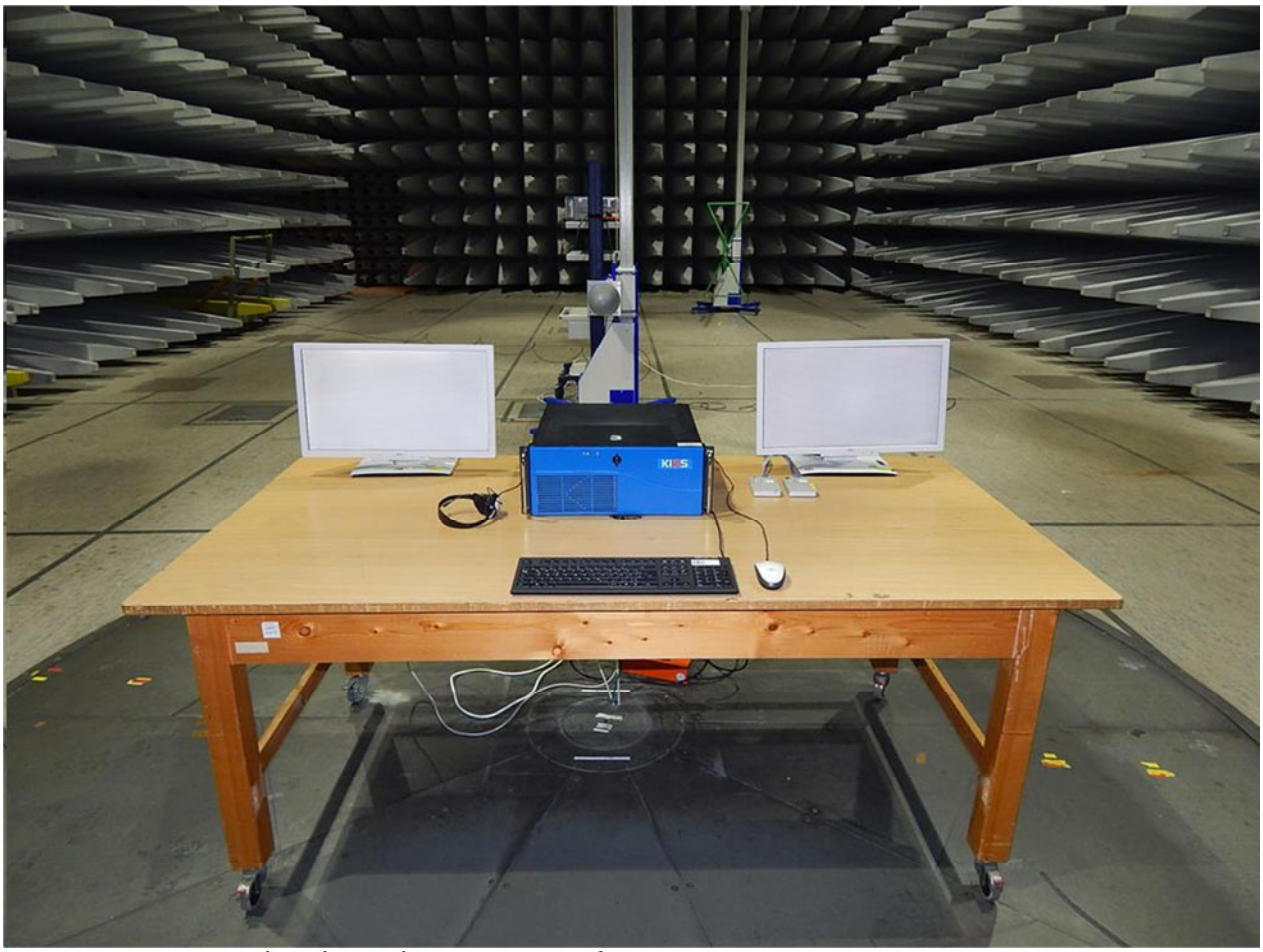


Figure 1 : Test set up Radiated Disturbance Emission - front view

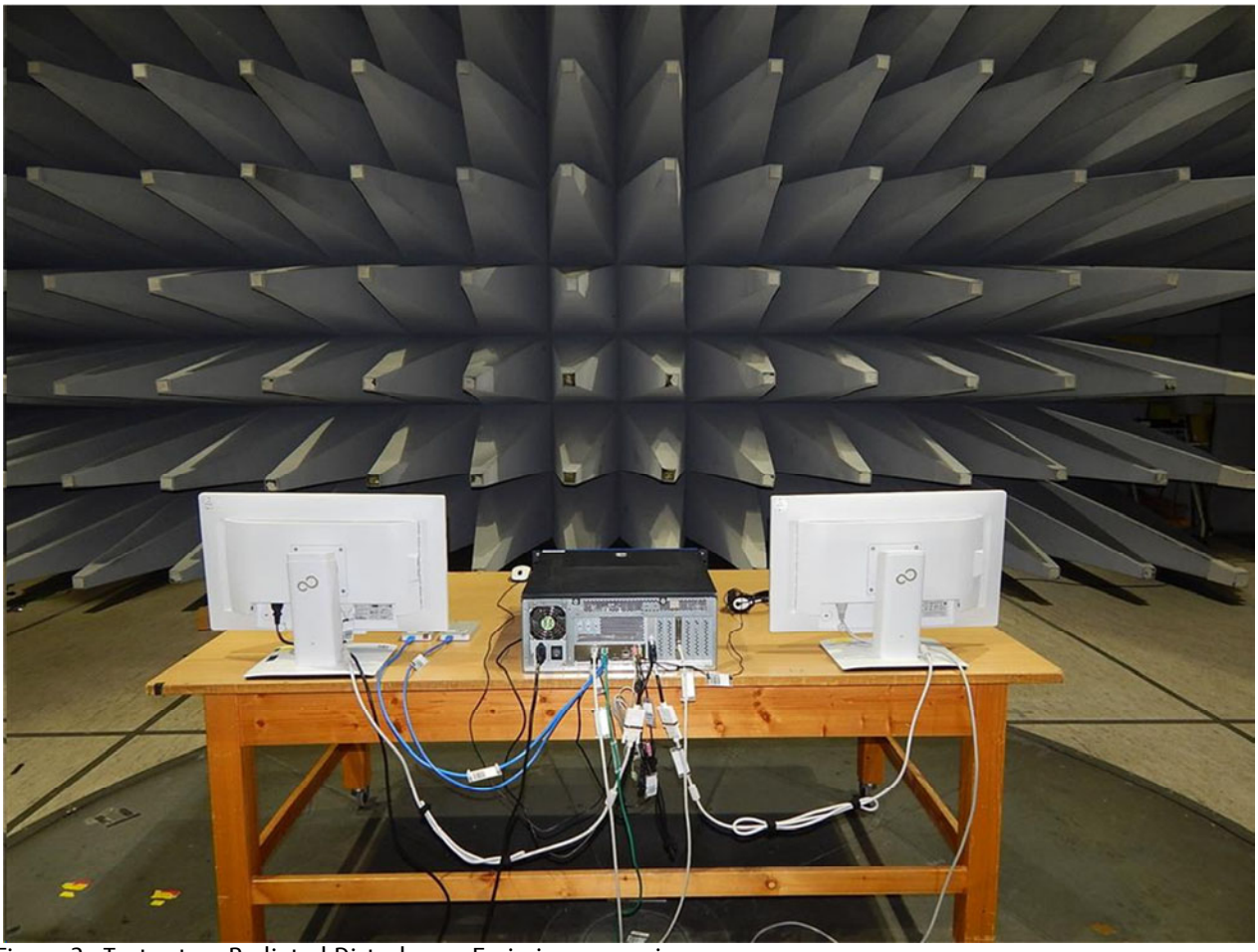


Figure 2 : Test set up Radiated Disturbance Emission - rear view

Protocol: P3M1, Conducted Disturbances Emission

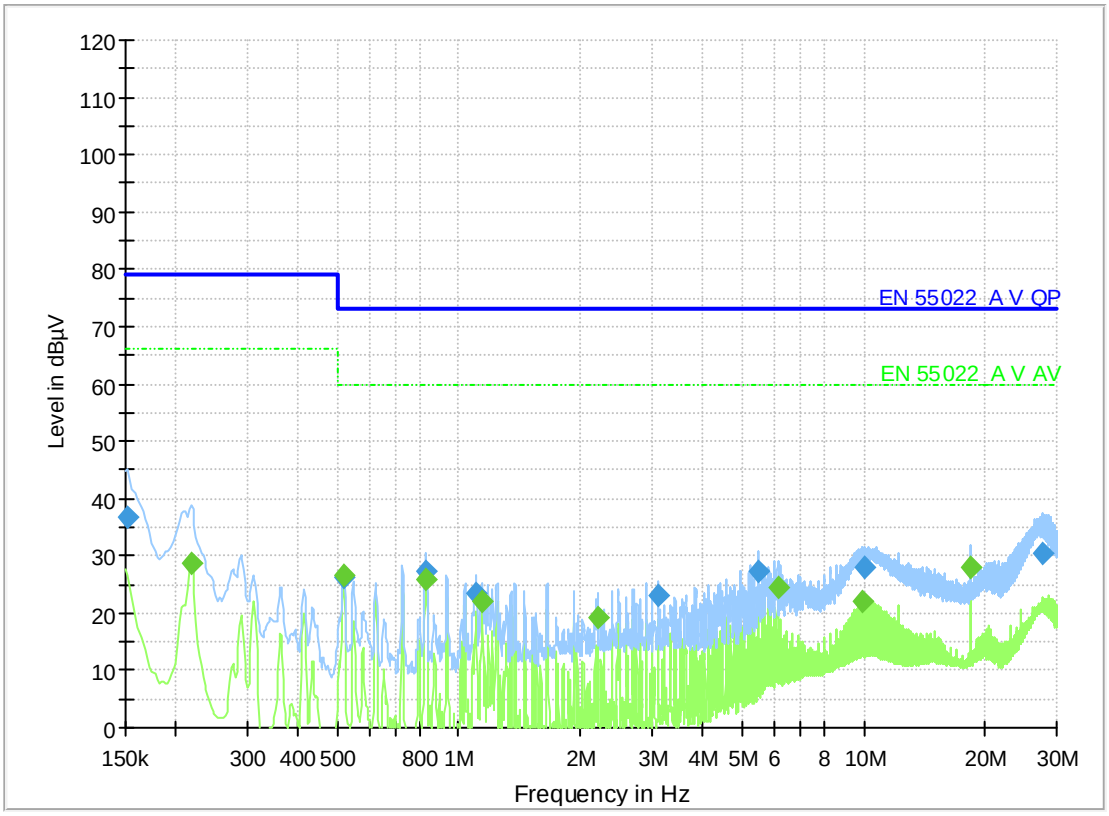
Test Result:	Passed
Result Statement:	-
Product Name:	KISS 4U V2 KTQ87-A
Model:	-
Product Category:	-
Test Description:	Conducted Disturbances Emission, CISPR 22:Edition 6.0 2008-09, class A Mains Voltage: 120V, 60Hz, TP: AC/DC mains delivery state
Tested by:	Oliver Barth
Tested Date & Time:	30.10.2015 - 10:50
Operating conditions	CPU-, HDD-, Display (Scr.H)-, ODD-, LAN - Test
Graphic resolution:	1920x1080, 60Hz
Test program:	Kerberos
Test configuration:	full; without front USB (Door closed)
Comment:	Test location: Shielded Chamber 2
Humidity:	32 %
Temperature:	24 °C
Air Pressure:	958 hPa
Test methods:	Default

Detailed Results

Common Information

ProjectNr.: KON-15014-PR04-E01; P3M1
Comments: 120V/60Hz; mains; Delivery State

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.152250	36.76	---	79.00	42.24	2000.0	9.000	L1	GN	10.4
0.217500	---	28.70	66.00	37.30	2000.0	9.000	L1	GN	10.4
0.519000	---	26.54	60.00	33.46	2000.0	9.000	N	GN	10.3
0.519000	26.39	---	73.00	46.61	2000.0	9.000	L1	GN	10.4
0.827250	27.40	---	73.00	45.60	2000.0	9.000	L1	GN	10.4
0.829500	---	26.03	60.00	33.97	2000.0	9.000	L1	GN	10.4
1.101750	23.38	---	73.00	49.62	2000.0	9.000	N	GN	10.3
1.140000	---	21.95	60.00	38.05	2000.0	9.000	L1	GN	10.4
2.202000	---	19.41	60.00	40.59	2000.0	9.000	N	GN	10.5
3.111000	22.99	---	73.00	50.01	2000.0	9.000	L1	GN	10.7
5.498250	27.39	---	73.00	45.61	2000.0	9.000	L1	GN	11.0
6.126000	---	24.53	60.00	35.47	2000.0	9.000	N	GN	10.8
9.987000	---	22.04	60.00	37.96	2000.0	9.000	L1	GN	11.3
10.059000	27.92	---	73.00	45.08	2000.0	9.000	L1	GN	11.3
18.375000	---	27.89	60.00	32.11	2000.0	9.000	L1	GN	11.8
27.784500	30.35	---	73.00	42.65	2000.0	9.000	L1	GN	12.2

Table of used instruments

Type	Manufacturer	Serial No.	Last Cal.	Next Cal.

Type	Manufacturer	Serial No.	Last Cal.	Next Cal.
Conducted Emission SK2/1 Mains (C-2053)				
EMI Receiver ESR7	ROH - Rohde & Schwarz Vertriebs GmbH	101158	Jun 2015	Jun 2016
LISN ESH3-Z5	ROH - Rohde & Schwarz Vertriebs GmbH	100226	Jun 2015	Jun 2016
Filter Highpass	ROH - Rohde & Schwarz Vertriebs GmbH	100053	Jun 2015	Jun 2016
Shielded Chamber 2; (T-176) (C-2053)	Albatross Projects GmbH, Albatross Projects			
Software EMC32	ROH - Rohde & Schwarz Vertriebs GmbH	V 9.15		

Tools used in 'P3M1'

Table of used peripherals

Description:	Manufacturer:	Model:	Serial No.:	Certification:
DVI cable 130				
DVI cable 135				
LAN cable UTP 09		CAT. 5e		
LAN cable UTP 107		CAT. 6		
LAN cable UTP 115		CAT. 6		
USB cable 3.0 207				
USB cable 3.0 214				
Mouse 25	Logitech	M-U0011-O	LZ933230220	BSMI No. T41126
Keyboard 40	Fujitsu	KB400 PS/2	YKKB091007R98509	BSMI No: R33073
Monitor 100	Fujitsu	B23T-6	YV4E212369	BSMI No. R33073
Monitor 56	Fujitsu	P23T-6	Y3VQ000001	BSMI No.: R33073
Headset 36	Fujitsu	HS E2000 Communicator		
Switch 03 (100/1000)	SysKonnect	SK-8T24	0512DN0240201	
HDD 217	Samsung / ICY Box	SSD 840 Pro / 232STU3	2023814340621	D33475
HDD 262	Samsung / ICY Box	SSD 850 Pro / 232STU3		D33475

Peripherals used in 'P3M1'

Photos of test setup

Figure 1 : Test setup for Conducted Disturbances Emission - front view

Figure 2 : Test setup for Conducted Disturbances Emission - side view