FUJITSU

CONFIDENTIAL

Deutsche Akkreditierungsstelle D-PL-12108-01-01

EMC Compliance Report, FCC

Product: D3313-S
Model: D3313-S

Document number: 1SB13-0023+E01-02
Document title: EMC Compliance Report FCC+D3313-S

Reference Original Report: None

BSMI Authorisation No. SL2-IN-E-3001; SL2-R1/R2-E-3001, SL2-A1-E-3001
FCC Registration No. 90935
VCCI Registration No. C-2052, C-2053, C-2054, T-173, T-176, T-177, R-1907, G-186
KC Registration No. EU0061
VCCI Registration No. 1468

Fujitsu Technology Solutions GmbH
Product Compliance Center
Buergermeister-Ulrich-Str. 100
86199 Augsburg, Germany
Phone: +49 (0)821 804 3693

EUT: D3313-S (D3313-S)

TEST RESULT:	Passed

EUT	Product Name:	D3313-S
	Model:	D3313-S
	Product Category:	Sytem board
	Manufacturer:	FUJITSU TECHNOLOGY SOLUTIONS GmbH
	Serial No.:	
	Revision No.:	D3313-S32 GS5x
	Order No.:	1SB13-0023+E01

APPLICANT:	Customer:	FUJITSU TECHNOLOGY SOLUTIONS GmbH
	Name:	Mertes
	Address:	Bürgermeister-Ulrich-Strasse 100
	City:	86199 Augsburg
	Country:	Germany
	Phone:	+49 (821) 804-2339

SIGNATURE:	Release Date:	Feb 06, 2014
	Test Engineer:	Thomas Zitzelsberger
	Prepared by:	Vasilij Konovalov Technician
	Reviewed by:	Thomas Zitzelsberger Test Engineer

1 Table of content

Attachments:
Testprotocols

2 Remarks, Statements and Protocol Table

2.1 Result Statement Details

Discipline:	Protocol No.:	Result:
Radiated Disturbance Emission, CISPR 22:Edition 6.0 2008-09, class B, 30MHz - 1GHz, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded;	P7M2	Passed
Radiated Disturbance Emission, FCC, 47 CFR Part 15 :2013-04-23, class B, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded;	P24M2	Passed
Conducted Disturbances Emission, CISPR 22:Edition 6.0 2008-09, class B, Mains Voltage: 120V, 60Hz, TP: AC/DC mains delivery state;	P3M1	Passed

2.2 Remarks on the individual tests

3 General information about this document

INFORMATION

EUT CLASS	CLASS B
CERTIFICATION STANDARD	FCC VERIFICATION
LABORATORY IDENTIFICATION	Registration No. 90935
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 D3313-S (EMV / Futro Industriechassis) herein referred to as the Equipment Under Test (EUT), presented by FTS. 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 D3313-S (EMV / Futro Industriechassis) presented by FTS, 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 B Digital Devices.
APPLICABLE STANDARDS	**Applicable standards:** 47 CFR part15 :2013-04-23 ICES-003 Issue 4 :2004
REFERENCES	**References:** CISPR 22 Edition 6.0 2008-09 Sep 2008 47 CFR part15 :2013-04-23 Apr 2013

4 FCC related Data under the scope of an equipment verification:

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

FUJITSU TECHNOLOGY SOLUTIONS 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 B 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.
>
> CAN ICES-003(B) / NMB-003(B)."

Information to 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.

> NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules and meets all requirements of the Canadian Interference-Causing Equipment Standard ICES-003 for digital apparatus. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/T.V. technician for help.

FUJITSU TECHNOLOGY SOLUTIONS 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 FUJITSU TECHNOLOGY SOLUTIONS 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 FUJITSU TECHNOLOGY SOLUTIONS GmbH, in the event of inquiries by the Federal Communications Commission on the Electromagnetic Emission (EME) characteristics of the EUT.

5 General information about the test site

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.

The site is registered by

- the German accreditation body DAkkS-Registration No. D-PL-12108-01-01
- the Federal Communications Commission (FCC) Registration Number 90935
- the Bundesnetzagentur as Conformity assessment body (CAB) Registration Number BnetzA-CAB-02/21-03/4
- the Bureau of Standards, Metrology, and Inspection (BSMI) (LAB-ID: SL2-IN-E-3001, SL2-A1-E-3001, SL2-R1-E-3001, SL2-R2-E-3001)
- the National Radio Research Agency of Korea, EU lab Registration number EU0057
- the Voluntary Control Council for Interference by Information Technology Equipment (VCCI) on July 27, 2010 with member No: 1468

5.1 Measurement uncertainty

The measurement uncertainty is calculated according to CISPR 16-4-2.

Measurement	U_{cispr}	U_{lab}
Conducted disturbance (mains port) 150 kHz – 30 MHz at SK1	3,4 dB	3,0 dB
Conducted disturbance (telecom port; STP) 150 kHz – 30 MHz at SK1	5,0 dB	3,0 dB
Conducted disturbance (mains port) 150 kHz – 30 MHz at SK2	3,4 dB	3,3 dB
Conducted disturbance (telecom port; STP) 150 kHz – 30 MHz at SK2	5,0 dB	3,3 dB
Conducted disturbance (mains port) 150 kHz – 30 MHz at SK3	3,4 dB	3,0 dB
Conducted disturbance (telecom port; STP) 150 kHz – 30 MHz at SK3	5,0 dB	3,0 dB
Conducted disturbance (telecom port; UTP Cat.3) 150 kHz – 30 MHz at SK3	5,0 dB	4,9 dB
Conducted disturbance (telecom port; UTP Cat.5) 150 kHz – 30 MHz at SK3	5,0 dB	4,7 dB
Radiated disturbance 30 MHz – 1 GHz	6,3 dB	4,8 dB
Radiated disturbance 1 GHz – 6 GHz	5,2 dB	5,0 dB

Table 1: measurement uncertainty

Determining compliance with the limits in this report are based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

6 Measurement procedures and remarks FCC

6.1 Emission

6.1.1 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.

6.1.2 Radiated emission

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”. 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 above 1 GHz, the bandwidth of the EMI-receiver was set to 1 MHz and the detector was set to “peak”. During prescan all data in peak mode were accumulated automatically. During the final measurement the detector was set to “average” and values above the acceptance line were verified automatically.

Both tests were performed in a semi-anechoic chamber, measurements below 1000 MHz at a distance of 10 meters between antenna and EUT, above 1000 MHz at a distance of 3 meters between antenna and EUT. During tests the EUT was turned 360° and the receiving antenna was moved from 1 to 4 meters above ground plane and the antenna polarisation was changed from horizontal to vertical for finding the maximum emission.

30 MHz to 1 GHz	BiLog antenna
above 1 GHz	Antenna Array

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]

After automatic tests during manual verification the cables and the equipment were placed and moved within the range of position in order to find the maximum emission.

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 EUT (Equipment under test) information

7.1 Operating condition

The EUT was measured in a fully configured and functionally complete system with all ports connected to appropriate peripheral devices. The system was put on a table with a height of 80 cm above ground. The tested video modes - see test protocol - reflect the most commonly used resolutions.

The EUT exercise program used during radiated and conducted testing is representative for worst case use and able to produce system stress for the highest disturbance.

Operating system: Windows 7

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

7.2 Arrival date of the tested system

Receipt date: 28.01.2014

7.3 Configuration description

The EUT was measured in a fully configured and functionally complete system with all ports connected to appropriate peripheral devices.

Component	Manufacturer	Model	Remark
System board	FTS	D3313-S	
AC adapter	Delta	ADP-65JH AD	65 W
CPU	AMD	eKabini	2 GHz Quad core
RAM	Hynix	HMT325S6CFR8A	2 x 4 GB
Drive	Seagate	ST320L020	2,5” 320 GB HDD
Chassis	LiteOn	Futro industrial box	enclosure

Table 2: components list of EUT

7.4 Dimension of EUT

W x H x D: 249 * 52 * 180 mm

Table 3: Technical datasheet or drawing of EUT dimension

EUT: D3313-S (D3313-S)

7.5 Block diagram of tested system and Block diagram of the system board

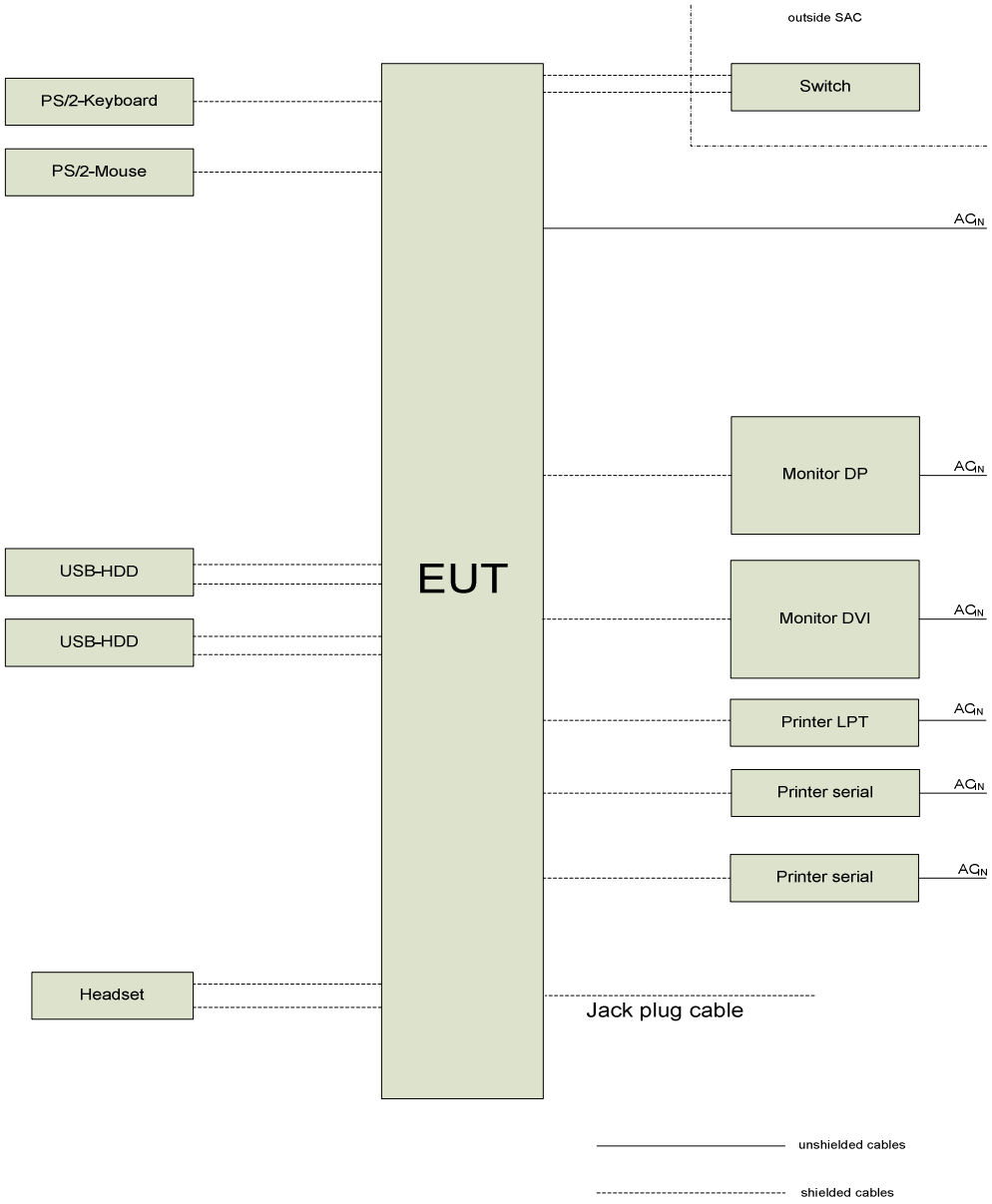


Table 4: Block diagram of tested system

EUT: D3313-S (D3313-S)

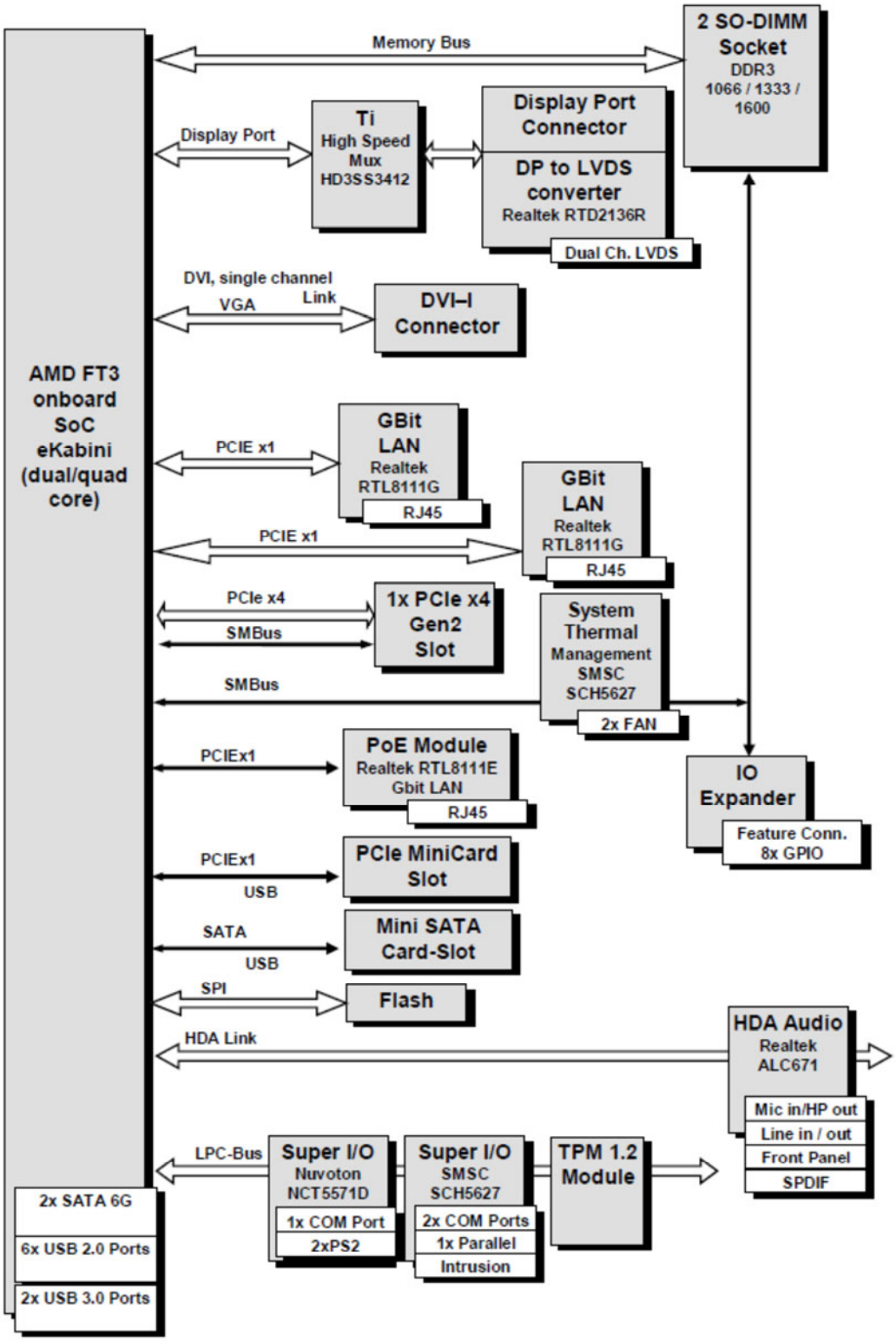


Table 5: Principle schematic of the system board

7.6 Clock frequencies of the system board

Source	Frequency / MHz	Bandwidth
AMD eKabini SOC:	2 GHz	
Memory	800 (1600MT/s)	12800MB/s
PCIe 2,0 x4	2500 (5000MT/s)	500MB/s per Lane
GPU	300 to 600	300 to 600 Mpixel/s
SATA II	1500	300 MB/s
SATA III	3000	600 MB/s
HD-Audio	24	1,536 MB/s
LPC-Bus	33	16,5 MB/s
USB (low-, full-, high-, super speed)	48 / Link:0,75/6/240/2500	1,5Mb/s \ 12Mb/s \ 480Mb/s \ 4000Mb/s
Misc:		
Real time clock	32,768kHz	
SMBus	10kHz	1,25 MB/s
Super IO	14	

Table 6: clock frequencies of the system board

EUT: D3313-S (D3313-S)

7.7 Photos of EUT

Figure 1 : Front EUT

EUT: D3313-S (D3313-S)

Figure 2 : Rear EUT

EUT: D3313-S (D3313-S)

Figure 3 : Left EUT

EUT: D3313-S (D3313-S)

Figure 4 : Right EUT

EUT: D3313-S (D3313-S)

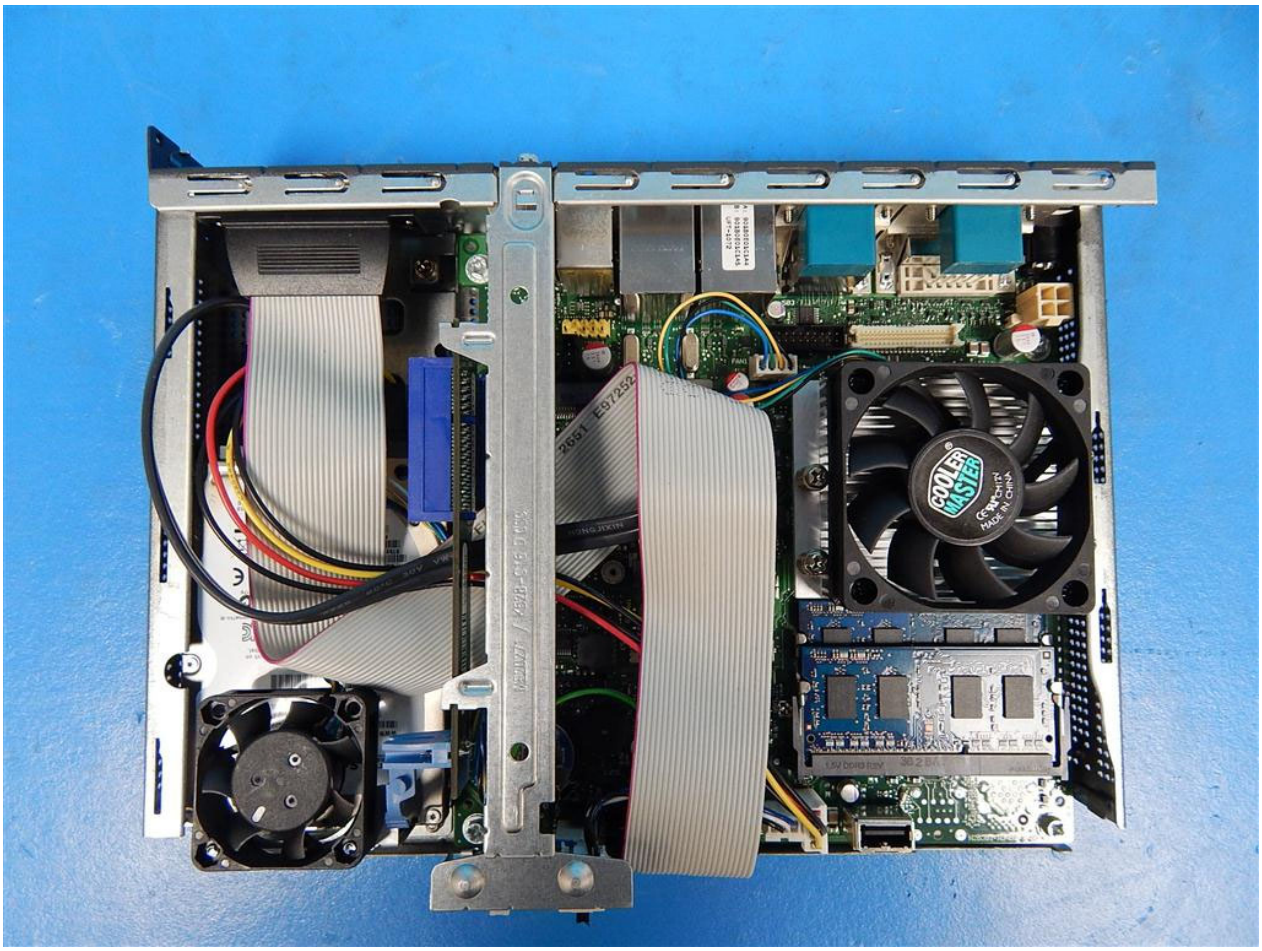


Figure 5 : D3313-S inside view

EUT: D3313-S (D3313-S)

Figure 6 : Systemboard D3313-S

EUT: D3313-S (D3313-S)

Figure 7 : Bottom Systemboard D3313-S

EUT: D3313-S (D3313-S)

Figure 8 : Interfaces Systemboard D3313-S

EUT: D3313-S (D3313-S)

Figure 9 : Front AC adapter

EUT: D3313-S (D3313-S)

Figure 10 : Label AC adapter

EUT: D3313-S (D3313-S)

Figure 11 : Top RAM

EUT: D3313-S (D3313-S)

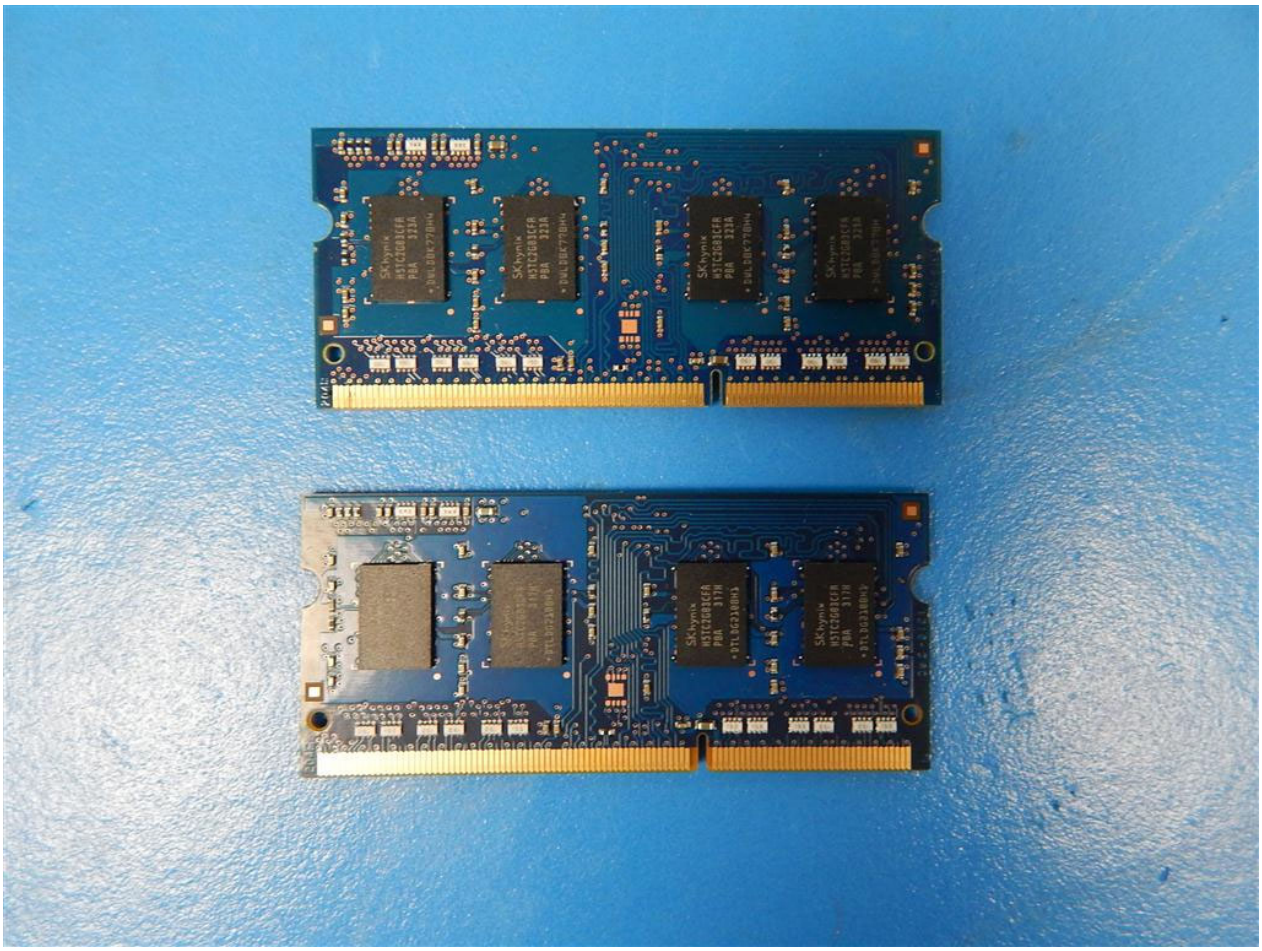


Figure 12 : Bottom RAM

EUT: D3313-S (D3313-S)

Figure 13 : Top HDD

EUT: D3313-S (D3313-S)

Figure 14 : Bottom HDD

EUT: D3313-S (D3313-S)

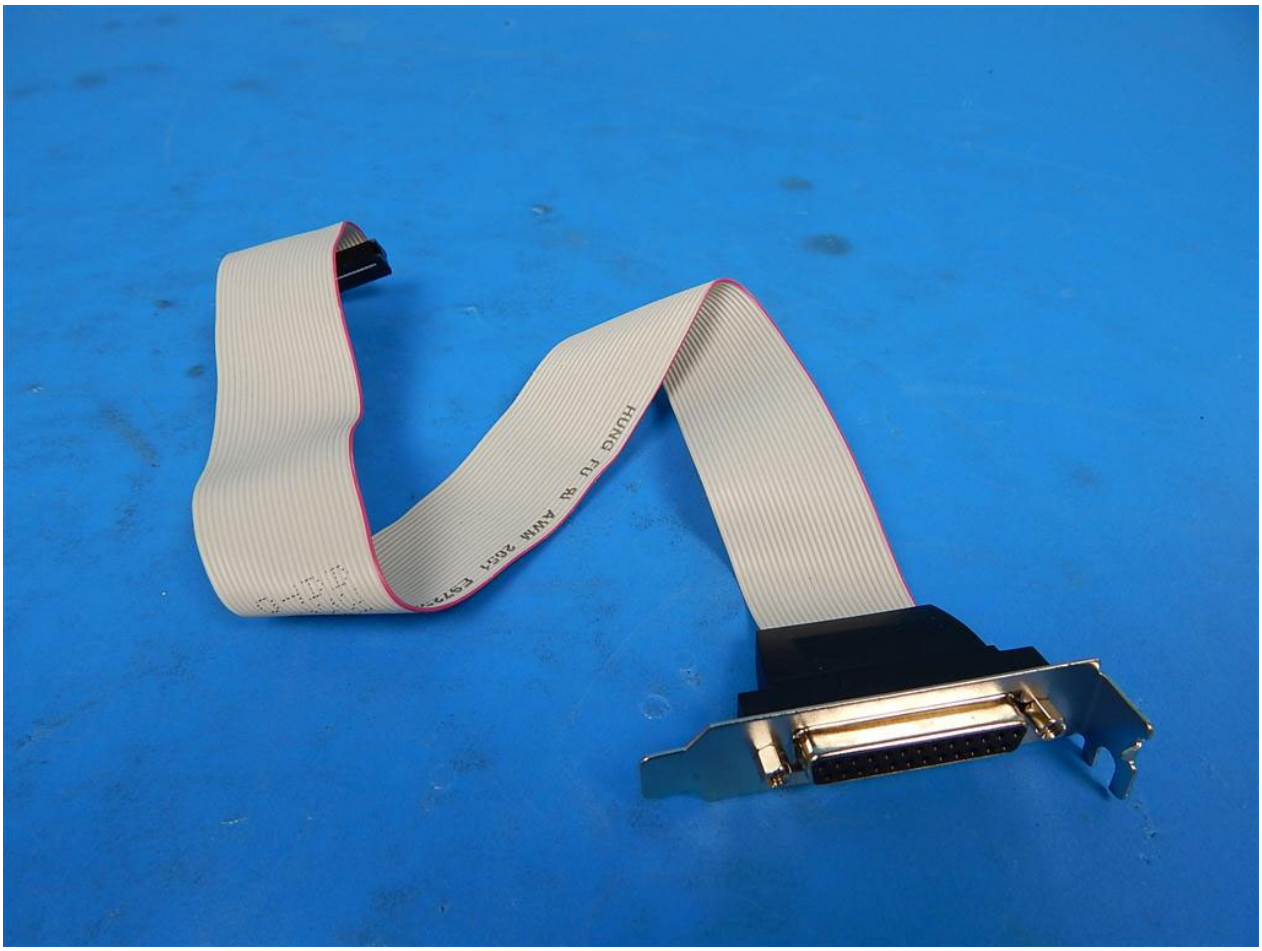


Figure 15 : LPT Cable/Connector.

EUT: D3313-S (D3313-S)

8 List of Attached Test Protocols

Description:	Protocol No.:
Radiated Disturbance Emission, CISPR 22:Edition 6.0 2008-09, class B, 30MHz - 1GHz, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded	P7M2
Radiated Disturbance Emission, FCC, 47 CFR Part 15 :2013-04-23, class B, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded	P24M2
Conducted Disturbances Emission, CISPR 22:Edition 6.0 2008-09, class B, Mains Voltage: 120V, 60Hz, TP: AC/DC mains delivery state	P3M1

TEST RESULT OF SINGLE PROTOCOL:	Passed

1. P7M2, Radiated Disturbance Emission

ORDER	Order No.:	1SB13-0023+E01
	Protocol No.:	P7M2
	Tested by:	Vasilij Konovalov
	Measurement Date - Time:	10.01.2014 - 13:17

TEST SITE	Address:	Fujitsu Technology Solutions GmbH Product Compliance Center Buergermeister-Ulrich-Str. 100 86199 Augsburg, Germany

EUT	Product Name:	D3313-S
	Model:	D3313-S
	Manufacturer:	FUJITSU TECHNOLOGY SOLUTIONS GmbH
	Product Category:	Personal Computer

TEST	Description:	Radiated Disturbance Emission, CISPR 22:Edition 6.0 2008-09, class B, 30MHz - 1GHz Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded

CONDITIONS	Operating conditions:	scr. H; clone; HD/LAN/CPU-Test
	Supply voltage:	120V / 60Hz
	Graphic resolution:	1920x1080, 60Hz
	Test program:	Kerberos
	Test configuration:	full;
	Comment:	Test location: SAC
	Humidity:	44 %
	Temperature:	25 °C
	Air Pressure:	1009 hPa

MEASUREMENT RESULTS

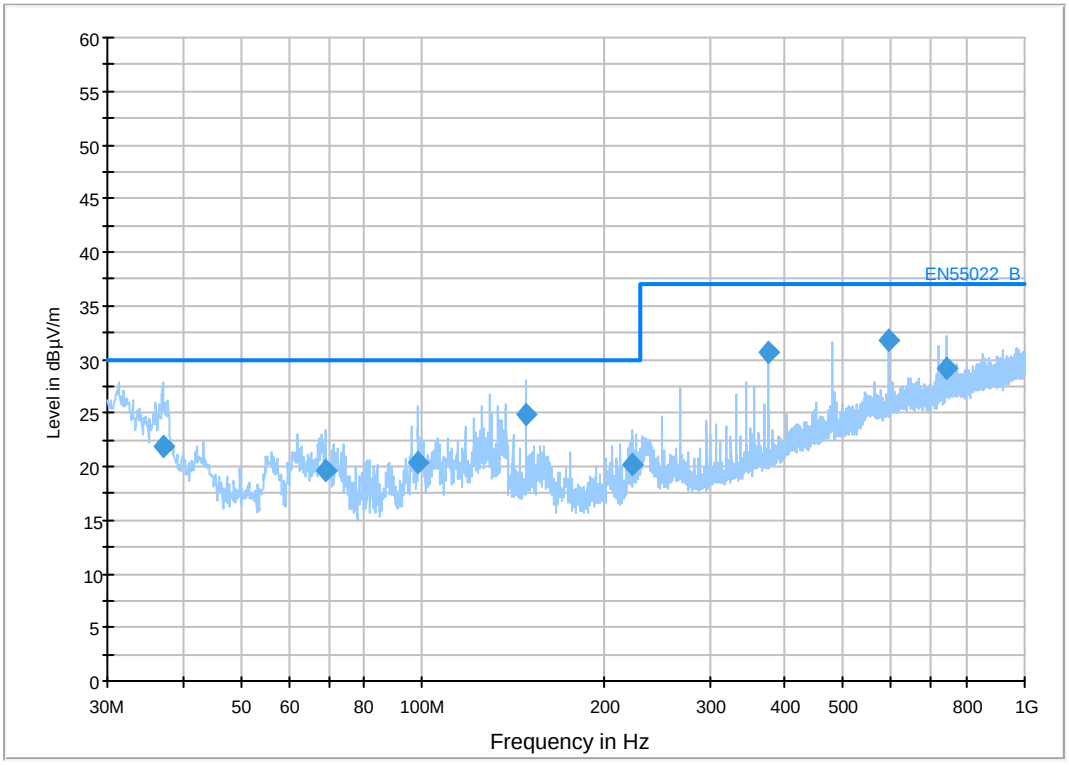
EUT Information

Category:	Personal Computer
Product:	D3313-S
Model:	D3313-S
Detail:	
Manufacturer:	FTS

Common Information

ProjectNr.:	1SB13-0023+E01;P7M2
Comments:	

EN 55022 class B



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV /m)
37.140000	21.9	15000.0	120.000	100.0	V	217.0	15.5	8.10	30.00
69.240000	19.6	15000.0	120.000	163.0	V	97.0	7.3	10.40	30.00
98.130000	20.4	15000.0	120.000	145.0	V	82.0	11.9	9.60	30.00
148.500000	24.9	15000.0	120.000	115.0	V	7.0	12.2	5.10	30.00
223.230000	20.2	15000.0	120.000	115.0	V	2.0	11.5	9.80	30.00
375.930000	30.7	15000.0	120.000	100.0	V	202.0	17.5	6.30	37.00
594.000000	31.7	15000.0	120.000	175.0	H	307.0	22.0	5.30	37.00
742.500000	29.2	15000.0	120.000	325.0	V	187.0	23.5	7.80	37.00

MEASUREMENT PHOTOS OF TEST SETUP

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

MEASUREMENT PHOTOS OF TEST SETUP

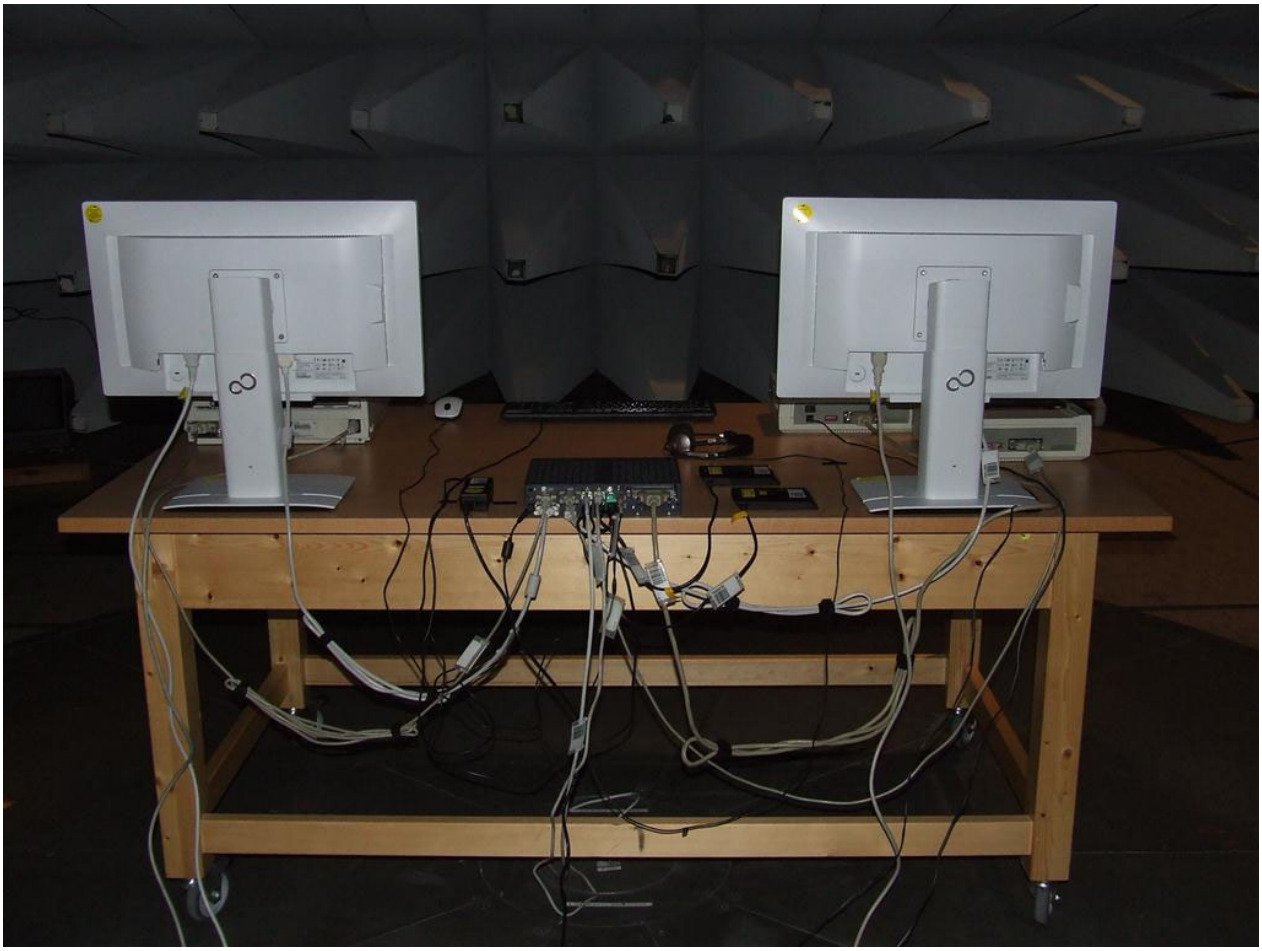


Figure 2 : Test set up Radiated Disturbance Emission - rear view

TABLE OF USED INSTRUMENTS AND TOOLS

Type	Manufacturer	Serial No.	Last Cal.	Next Cal.
Radiated Emission SAC <1GHz (R-1907)				
EMI Receiver ESCI3	ROH - Rohde & Schwarz Vertriebs GmbH	100021	Jun 2013	Jun 2014
Antenna CBL 6112B	Chase, Chase	2790	Jul 2012	Jul 2014
Cable CP1X1-X1 (30-MHz - 2GHz)			Jul 2013	Jul 2014
Cable 30-2000MHz		1.5-2	Jul 2013	Jul 2014
Semi Anechoic Chamber (R-1907)	Albatross Projects GmbH, Albatross Projects		Mar 2012	Mar 2015
Software EMC32	ROH - Rohde & Schwarz Vertriebs GmbH, Rohde & Schwarz	V 8.40		

Tools used in 'P7M2'

TABLE OF USED PERIPHERALS

Description:	Manufacturer:	Model:	Serial No.:	Certification:
DP cable 39				
DVI cable 117				
LAN cable UTP 04		CAT. 5e		
Parallel cable 18				
Serial cable 07				
Serial cable 37				
USB cable 2xA/miniB 76				
USB cable 2xA/miniB 97				
Mouse 117	Logitech	M-U0011-O	LZ2263300P1	BSMI No. T41126
Keyboard 55	Fujitsu	KB410 G	YKKB120830663375	BSMI No: R33073
Printer 05	HP	2225D	3124S91350	
Printer 08	HP	2225C	3011S70627	
Printer 14	Epson	P170A	CLCY296660	
Monitor 68	Fujitsu	B23T-6	YV4E030825	BSMI No. R33073
Monitor 74	Fujitsu	B23T-6	YV4E012019	BSMI No. R33073
HDD 63	Seagate	Expansion Portable 2,5" 250GB	2GH4043L	BSMI No: D33027
HDD 71	Seagate	Expansion Portable 2,5" 250GB	2GH3ZB63	BSMI No: D33027

Peripherals used in 'P7M2'

IMPLEMENTED MODIFICATION

Modifications for Radiated Disturbance Emission, CISPR 22:Edition 6.0 2008-09, class B, 30MHz - 1GHz, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded:

Cause: Modifications for Radiated Disturbance Emission, Radiated Disturbance Emission, CISPR 22:Edition 6.0 2008-09, class B, 30MHz - 1GHz, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded

Cause:

Countermeasure: Modifications for Radiated Disturbance Emission, Radiated Disturbance Emission, CISPR 22:Edition 6.0 2008-09, class B, 30MHz - 1GHz, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded

Countermeasure:

Install Gasket to the ground pin
Install Gasket to the ground pin
Install Gasket to the ground pin

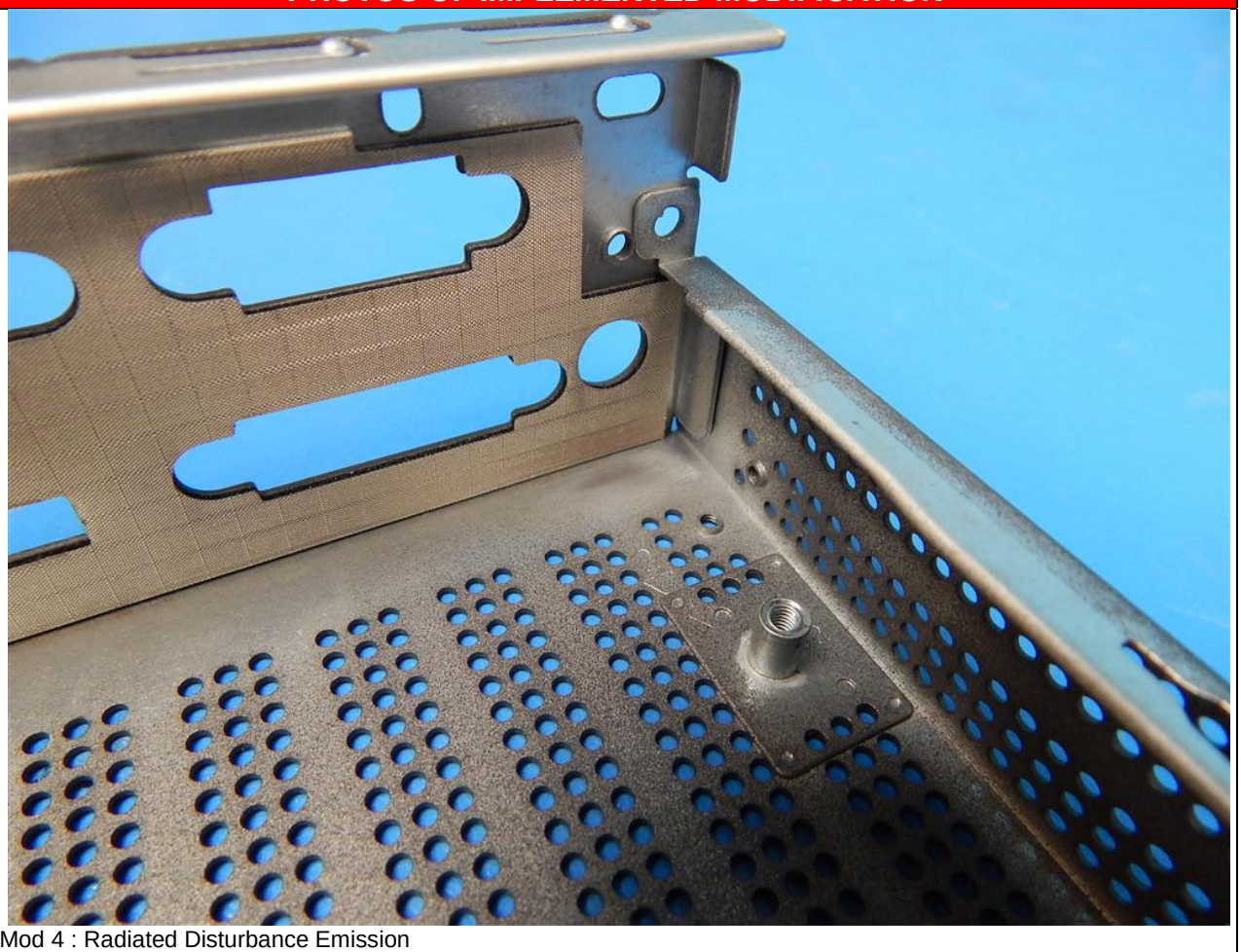
Comments: Modifications for Radiated Disturbance Emission, Radiated Disturbance Emission, CISPR 22:Edition 6.0 2008-09, class B, 30MHz - 1GHz, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded

Comments:

PHOTOS OF IMPLEMENTED MODIFICATION

Mod 3 : Radiated Disturbance Emission

PHOTOS OF IMPLEMENTED MODIFICATION



Mod 4 : Radiated Disturbance Emission

TEST RESULT OF SINGLE PROTOCOL:	Passed

1. P24M2, Radiated Disturbance Emission

ORDER	Order No.:	1SB13-0023+E01
	Protocol No.:	P24M2
	Tested by:	Vasilij Konovalov
	Measurement Date - Time:	17.01.2014 - 06:42

TEST SITE	Address:	Fujitsu Technology Solutions GmbH Product Compliance Center Buergermeister-Ulrich-Str. 100 86199 Augsburg, Germany

EUT	Product Name:	D3313-S
	Model:	D3313-S
	Manufacturer:	FUJITSU TECHNOLOGY SOLUTIONS GmbH
	Product Category:	Personal Computer

TEST	Description:	Radiated Disturbance Emission, FCC, 47 CFR Part 15 :2013-04-23, class B Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded

CONDITIONS	Operating conditions:	scr. H; clone; HD/LAN/CPU-Test
	Supply voltage:	120V / 60Hz
	Graphic resolution:	1920x1080, 60Hz
	Test program:	Kerberos
	Test configuration:	full;
	Comment:	Test location: SAC
	Humidity:	44 %
	Temperature:	25 °C
	Air Pressure:	1009 hPa

MEASUREMENT RESULTS

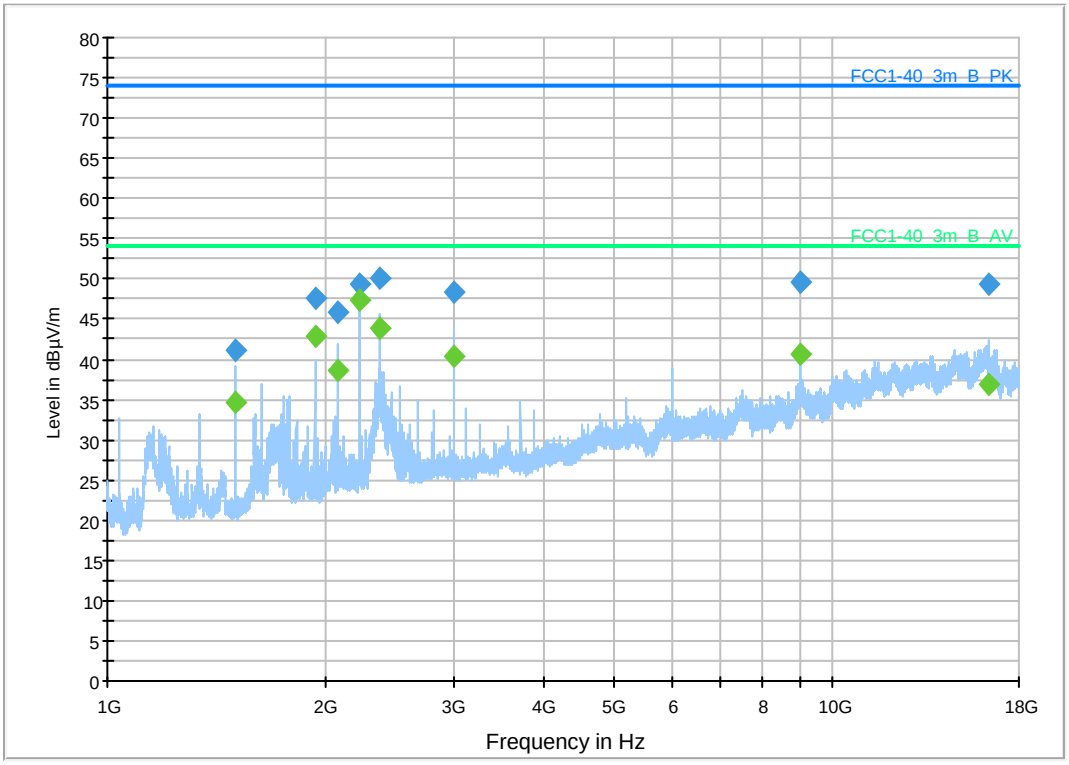
EUT Information

Category:	Personal Computer
Product:	D3313-S
Model:	D3313-S
Detail:	
Manufacturer:	FTS

Common Information

ProjectNr.:	1SB13-0023+E01; P24M2
Comments:	

FCC part15 classB 1-40GHz



Final Result 1

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV /m)
1500.036600	41.2	2000.0	1000.000	105.0	H	15.0	-29.3	32.80	74.00
1930.517200	47.7	2000.0	1000.000	155.0	V	339.0	-27.2	26.30	74.00
2078.985600	45.9	2000.0	1000.000	100.0	V	331.0	-26.2	28.10	74.00
2227.447800	49.2	2000.0	1000.000	100.0	V	145.0	-25.2	24.80	74.00
2376.011600	50.0	2000.0	1000.000	115.0	V	325.0	-24.3	24.00	74.00
3000.004600	48.3	2000.0	1000.000	195.0	V	38.0	-22.3	25.70	74.00
9000.021200	49.7	2000.0	1000.000	165.0	V	180.0	-7.7	24.30	74.00
16328.289400	49.3	2000.0	1000.000	195.0	H	105.0	-3.6	24.70	74.00

Final Result 2

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV /m)
1500.036600	34.7	2000.0	1000.000	105.0	H	15.0	-29.3	19.30	54.00
1930.517200	43.0	2000.0	1000.000	155.0	V	339.0	-27.2	11.00	54.00
2078.985600	38.7	2000.0	1000.000	100.0	V	331.0	-26.2	15.30	54.00
2227.447800	47.5	2000.0	1000.000	100.0	V	145.0	-25.2	6.50	54.00
2376.011600	43.8	2000.0	1000.000	115.0	V	325.0	-24.3	10.20	54.00
3000.004600	40.3	2000.0	1000.000	195.0	V	38.0	-22.3	13.70	54.00
9000.021200	40.7	2000.0	1000.000	165.0	V	180.0	-7.7	13.30	54.00
16328.289400	36.9	2000.0	1000.000	195.0	H	105.0	-3.6	17.10	54.00

MEASUREMENT PHOTOS OF TEST SETUP

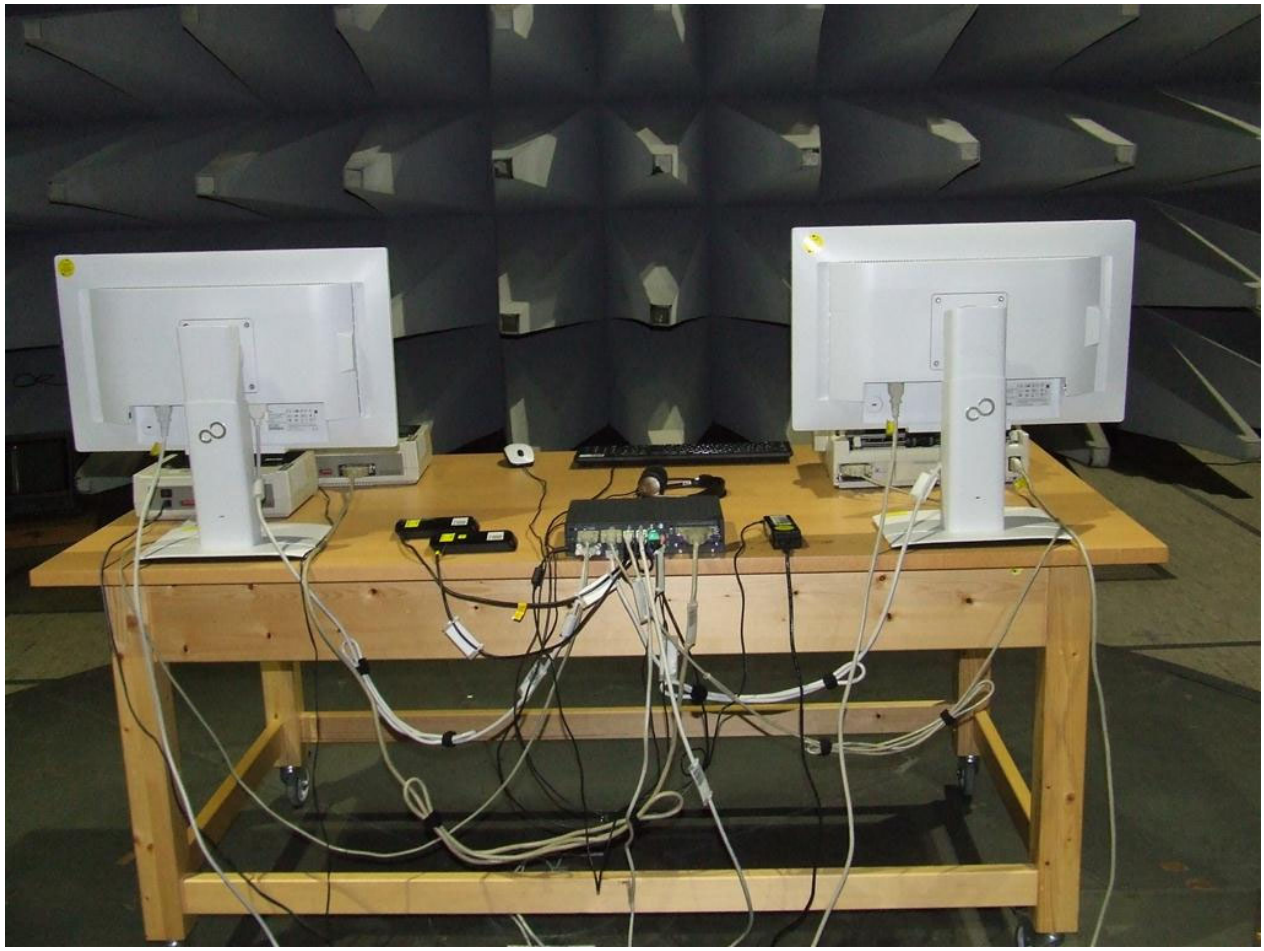


Figure 1 : Test set up Radiated Disturbance Emission - front view

MEASUREMENT PHOTOS OF TEST SETUP

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

TABLE OF USED INSTRUMENTS AND TOOLS

Type	Manufacturer	Serial No.	Last Cal.	Next Cal.
Radiated Emission SAC >1GHz (40GHz)				
Spectrum Analyzer FSU 46	ROH - Rohde & Schwarz Vertriebs GmbH	045648	Jul 2013	Jul 2014
Cable SMA	Rosenberger Hochfrequenztechnik , Rosenberger	4-1	Jul 2013	Jul 2014
Semi Anechoic Chamber (R-1907)	Albatross Projects GmbH, Albatross Projects		Mar 2012	Mar 2015
Antenna Array HL025/3160	ROH - Rohde & Schwarz Vertriebs GmbH		Oct 2012	Oct 2014
Software EMC32	ROH - Rohde & Schwarz Vertriebs GmbH, Rohde & Schwarz	V 8.40		

Tools used in 'P24M2'

TABLE OF USED PERIPHERALS

Description:	Manufacturer:	Model:	Serial No.:	Certification:
DP cable 39				
DVI cable 117				
LAN cable UTP 04		CAT. 5e		
Parallel cable 18				
Serial cable 07				
Serial cable 37				
USB cable 2xA/miniB 76				
USB cable 2xA/miniB 97				
Mouse 117	Logitech	M-U0011-O	LZ2263300P1	BSMI No. T41126
Keyboard 55	Fujitsu	KB410 G	YKKB120830663375	BSMI No: R33073
Printer 05	HP	2225D	3124S91350	
Printer 08	HP	2225C	3011S70627	
Printer 14	Epson	P170A	CLCY296660	
Monitor 68	Fujitsu	B23T-6	YV4E030825	BSMI No. R33073
Monitor 74	Fujitsu	B23T-6	YV4E012019	BSMI No. R33073
HDD 63	Seagate	Expansion Portable 2,5" 250GB	2GH4043L	BSMI No: D33027
HDD 71	Seagate	Expansion Portable 2,5" 250GB	2GH3ZB63	BSMI No: D33027

Peripherals used in 'P24M2'

IMPLEMENTED MODIFICATION

Modifications for Radiated Disturbance Emission, FCC, 47 CFR Part 15 :2013-04-23, class B, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded:

Cause: Modifications for Radiated Disturbance Emission, Radiated Disturbance Emission, FCC, 47 CFR Part 15 :2013-04-23, class B, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded

Cause:

Countermeasure: Modifications for Radiated Disturbance Emission, Radiated Disturbance Emission, FCC, 47 CFR Part 15 :2013-04-23, class B, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded

Countermeasure:

Install Gasket to the ground pin
Install Gasket to the ground pin
Install Gasket to the ground pin

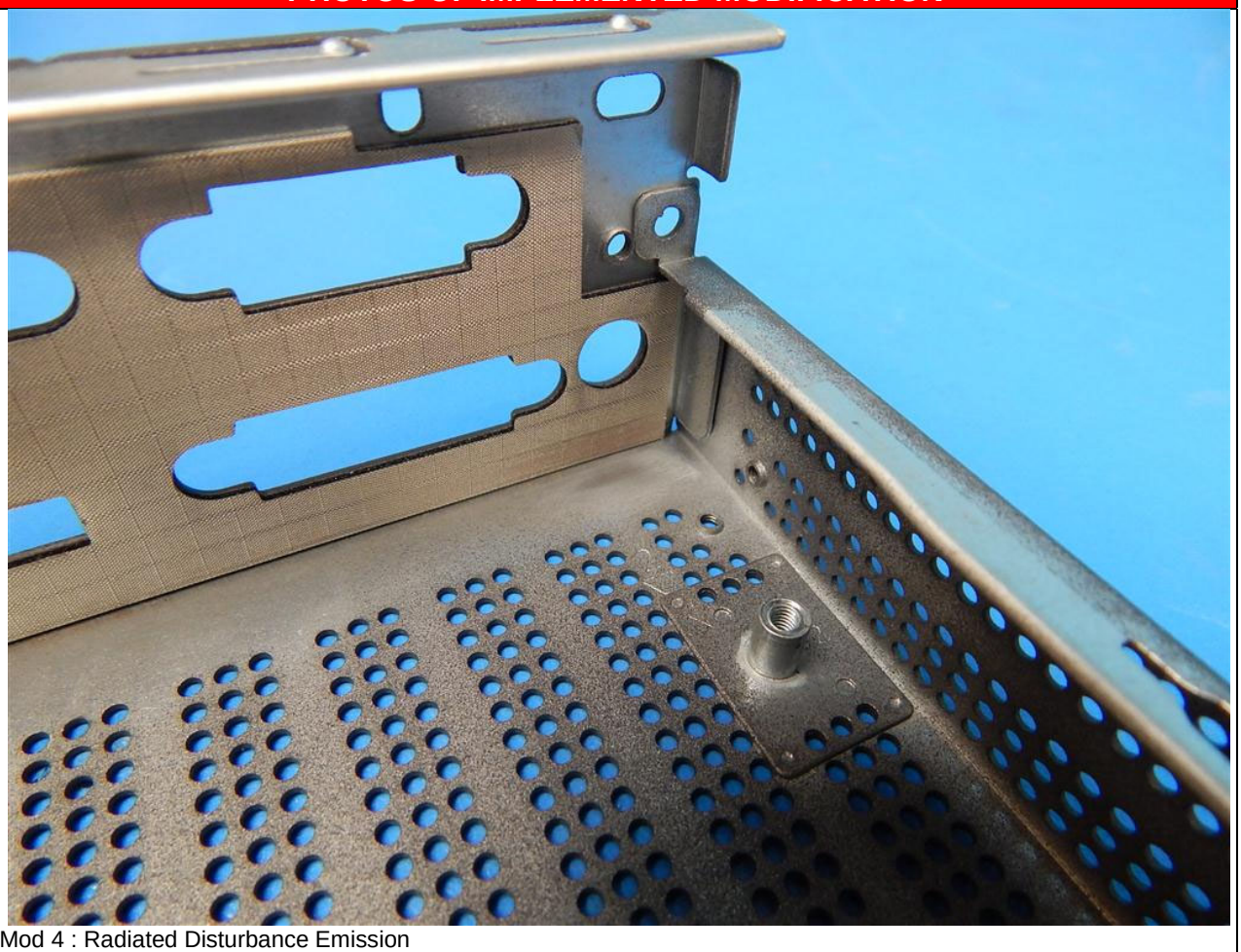
Comments: Modifications for Radiated Disturbance Emission, Radiated Disturbance Emission, FCC, 47 CFR Part 15 :2013-04-23, class B, Mains Voltage: 120V, 60Hz, TP: EUT, LAN: unshielded

Comments:

PHOTOS OF IMPLEMENTED MODIFICATION

Mod 3 : Radiated Disturbance Emission

PHOTOS OF IMPLEMENTED MODIFICATION



Mod 4 : Radiated Disturbance Emission

TEST RESULT OF SINGLE PROTOCOL:	Passed

1. P3M1, Conducted Disturbances Emission

ORDER	Order No.:	1SB13-0023+E01
	Protocol No.:	P3M1
	Tested by:	Vasilij Konovalov
	Measurement Date - Time:	09.01.2014 - 13:11

TEST SITE	Address:	Fujitsu Technology Solutions GmbH Product Compliance Center Buergermeister-Ulrich-Str. 100 86199 Augsburg, Germany

EUT	Product Name:	D3313-S
	Model:	D3313-S
	Manufacturer:	FTS
	Product Category:	Personal Computer

TEST	Description:	Conducted Disturbances Emission, CISPR 22:Edition 6.0 2008-09, class B Mains Voltage: 120V, 60Hz, TP: AC/DC mains delivery state

CONDITIONS	Operating conditions:	scr. H; clone; HD/LAN/CPU-Test
	Supply voltage:	120V / 60Hz
	Graphic resolution:	1920x1080, 60Hz
	Test program:	Kerberos
	Test configuration:	full;
	Comment:	Test location: Shielded Chamber 2
	Humidity:	44 %
	Temperature:	25 °C
	Air Pressure:	1009 hPa

MEASUREMENT RESULTS

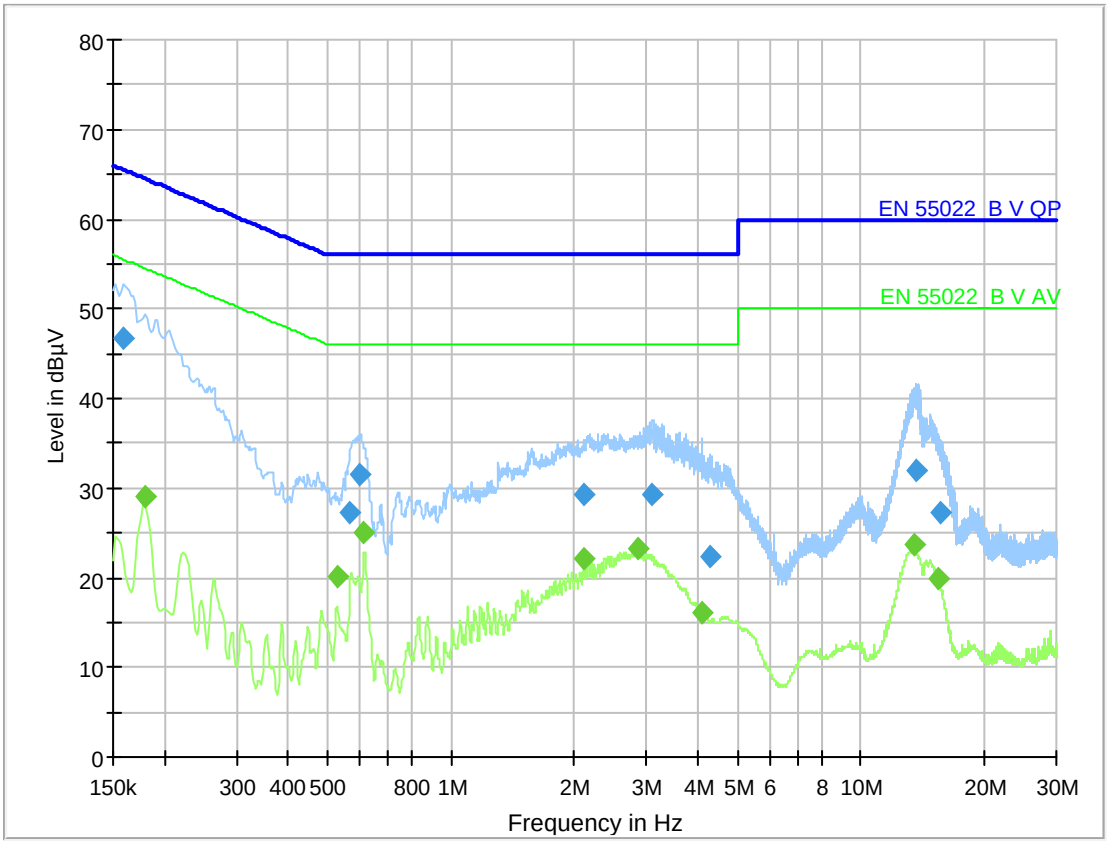
EUT Information

Category:	Personal Computer
Product:	D3313-S
Model:	D3313-S
Detail:	
Manufacturer:	FTS

Common Information

ProjectNr.:	1SB13_0023+E01;P3M1
Comments:	

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.159000	46.69	---	65.50	18.83	5000.0	9.000	N	GN	10.1
0.179250	---	29.01	54.50	25.51	5000.0	9.000	N	GN	10.1
0.528000	---	20.06	46.00	25.94	5000.0	9.000	L1	GN	10.2
0.564000	27.26	---	56.00	28.74	5000.0	9.000	L1	GN	10.1
0.600000	31.62	---	56.00	24.38	5000.0	9.000	L1	GN	10.2
0.613500	---	25.00	46.00	21.00	5000.0	9.000	N	GN	10.2
2.103000	29.31	---	56.00	26.69	5000.0	9.000	L1	GN	10.4
2.107500	---	22.07	46.00	23.93	5000.0	9.000	N	GN	10.3
2.850000	---	23.18	46.00	22.82	5000.0	9.000	N	GN	10.4
3.108750	29.19	---	56.00	26.81	5000.0	9.000	L1	GN	10.5
4.116750	---	16.08	46.00	29.92	5000.0	9.000	L1	GN	10.6
4.278750	22.37	---	56.00	33.63	5000.0	9.000	N	GN	10.5
13.481250	---	23.58	50.00	26.42	5000.0	9.000	L1	GN	11.5
13.605000	31.88	---	60.00	28.12	5000.0	9.000	N	GN	11.4
15.470250	---	19.99	50.00	30.01	5000.0	9.000	L1	GN	11.6
15.598500	27.31	---	60.00	32.69	5000.0	9.000	L1	GN	11.6

MEASUREMENT PHOTOS OF TEST SETUP

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

MEASUREMENT PHOTOS OF TEST SETUP

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

TABLE OF USED INSTRUMENTS AND TOOLS

Type	Manufacturer	Serial No.	Last Cal.	Next Cal.
Conducted Emission SK1 Mains (C-2052)				
EMI Receiver ESCS 30	ROH - Rohde & Schwarz Vertriebs GmbH	845552/013	Jul 2013	Jul 2014
LISN ESH3-Z5	ROH - Rohde & Schwarz Vertriebs GmbH	846695/027	Jul 2013	Jul 2014
Filter Highpass	ROH - Rohde & Schwarz Vertriebs GmbH	100054	Aug 2013	Aug 2014
Shielded Chamber 1; (T173) (C-2052)	Albatross Projects GmbH, Albatross Projects			
Software EMC32	ROH - Rohde & Schwarz Vertriebs GmbH	V 9.00		

Tools used in 'P3M1'

TABLE OF USED PERIPHERALS

Description:	Manufacturer:	Model:	Serial No.:	Certification:
DP cable 39				
DVI cable 117				
LAN cable UTP 04		CAT. 5e		
Parallel cable 18				
Serial cable 07				
Serial cable 37				
USB cable 2xA/miniB 76				
USB cable 2xA/miniB 97				
Mouse 117	Logitech	M-U0011-O	LZ2263300P1	BSMI No. T41126
Keyboard 55	Fujitsu	KB410 G	YKKB120830663375	BSMI No: R33073
Printer 05	HP	2225D	3124S91350	
Printer 08	HP	2225C	3011S70627	
Printer 14	Epson	P170A	CLCY296660	
Monitor 68	Fujitsu	B23T-6	YV4E030825	BSMI No. R33073
Monitor 74	Fujitsu	B23T-6	YV4E012019	BSMI No. R33073
HDD 63	Seagate	Expansion Portable 2,5" 250GB	2GH4043L	BSMI No: D33027
HDD 71	Seagate	Expansion Portable 2,5" 250GB	2GH3ZB63	BSMI No: D33027

Peripherals used in 'P3M1'

IMPLEMENTED MODIFICATION

Modifications for Conducted Disturbances Emission, CISPR 22:Edition 6.0 2008-09, class B, Mains Voltage: 120V, 60Hz, TP: AC/DC mains delivery state:

Cause:

Countermeasure:

Comments:

PHOTOS OF IMPLEMENTED MODIFICATION
No modification photos available.