EPSMA TC2 2018
Technical Committee Meeting
Monday 12th November 2018

Held at PULS GmbH, Elektrastraße 6, 81925 Munich.

EPSMA Technical Committee Meeting 12th November 2018

Date: Monday, 12th November 2018
Time: Arrive from 11:30 for meeting 12:00 ~ 16:00.
Venue: PULS GmbH, Elektrastraße 6, 81925 Munich. The nearest U-Bahn now is Arabellapark.
Please report to reception on your arrival.
Tel: Mrs. Ulrike Baur, PA to PULS MD, Direct: +49 89 9278 121
PULS Head Office: +49 89 9278 0, Directions: http://www.pulspower.com/contact/how-to-get-to-puls/

11:30	**Arrival for light buffet lunch at PULS GmbH.**	All
12:00	**Open meeting, introductions and brief review of agenda**	Paul
12:20 - 12:45	**General TC status review** • Update on current and possible future TC member's status. • Brief review of projects and actions Approval of TC1-18 minutes	 Paul Paul TC1-18 Attendees
12:45 - 12:55	**Safety of Low-Voltage Switch Mode Power Supplies** (The new standard IEC 61204-7, 2nd edition: proposed in 22E/142/NP). • Update from Clemens Klemm, member IEC SC 22E. • Questions.	 Paul All
12:55 – 13:40	**IEC62368-1 Introduction.** (Audio/video, information and communication technology equipment - Part 1: Safety requirements) **Presentation by David Collins, Artesyn** (45 mins)	David
13:40 – 14:00	**Energy/ Efficiency Savings -** **External Power Supplies, Battery Charging Systems** Change control: Decide on a method of listing what has changed each update.	Matti/Armin
14:00- 14:15	**Refreshment break**	All
14:15- 14:45	**Semiconductors: Infineon CoolGaN™ products** **Presentation by Francesco DiDomenico, Infineon** (30mins) • An overview of the new Infineon CoolGaN, which will be officially launched at Electronica 2018	Francesco
14:45- 15:00	**RoHS and WEEE flowcharts –** **Review of latest update from Friedrich Haunschild:** • ROHS changing to ROHS 3: issued in 2015, 4 substances in addition to the current 6. Becomes mandatory 22.7.2019. • WEEE - changes regarding disposal responsibility.	Paul/All
15:00 - 15:30	**Review of other areas of interest – Reports from monitoring "champions"** • **Energy Efficiency/Savings** External Power Supplies (28.07.2017) • **Energy Efficiency/Savings** Battery Charging Systems (2012_09_03) • **Solar & Wind Power:** Any new topics/presentations? • **Future Trends in Semiconductors:** Any new topics/presentations? • **Photo Voltaic -** Any update since presentation on PV-applications? • **HVDC Systems for Telecom** Need new champion to keep a watch of development of ETSI EN 301605 to report developments to the TC. • **Electronic Lighting/LED** • **International Standards and Directives** – Any issues affecting EPSMA? • **High Power Charging** - Any expertise available from the TC or their organization's? (Requested by TC/Matti)	 Matti Armin All Francesco, Jürgen All (Previously Markus) ? Armin All All
15:30 – 16:00	**Other?** • Do any EPSMA TC publications need update? • Any suggested new subjects? • Trade Barriers EU-USA. Any Alerts arising? • Any other business?	 All All All All
16:00 - 16:30	**Semiconductors: TI GaN products** **Presentation by Steve Tom, TI, USA** (30mins)	Steve Tom
16:30 - 16:40	**Summary of actions from the meeting.** **Set next meeting and adjourn** Propose Monday 6th May 2019, at Siemens, Nuremburg. Hotel reservation - Park Plaza, Bahnhofstrasse 5, 90402 Nuernberg, https://www.parkplaza.de/nuremberg-hotel-de-90402/deuppnu Note: PCIM is being held from 7th to the 9th May 2019	Paul Paul
19:30: Social/meal – Löwenbraäukeller "Wintergarten", Nymphenburger Str. 2, 80335 München *U1 at „Hauptbahnhof" (direction „Olympia-Einkaufszentrum"), --> Exit „Stiglmaierplatz" --> Walk 260 m* https://www.loewenbraeukeller.com/		

Present at the meeting:

Name	Company	Tel No.	Mail address
TC Members			
Benjamin Stoll (BS)	inpotron	+49 7731 9757-225	B.Stoll@inpotron.com
Bernhard Grub (BG)	XP-Power	+49 151 12748545	bgrub@xppower.com
Dave Collins (DC)	Artesyn	+353 87 6470711	david.collins@artesyn.com
David Bourner (DB)	Vicor	+978 7493327	dbourner@vicr.com
Diarmuid Hogan (DH)	Excelsys	+353 21 4520936	diarmuid.hogan@aei.com
Dominique Hessmann (DMH)	Delta Energy Sys.	+49 7641 455 315	Dominique.Hessmann@deltaww.com
Esa Väkeväinen (EV)	Murrelektronik Power	+358 20 778 9712	esa.vakevainen@murrelektronik.fi
Francesco Di Domenico (FD)	Infineon	+43 51777 3424	Francesco.DiDomenico@infineon.com
Hubert Schoenenberger (HS)	PULS	+49 89 9278 184	Hubert.Schoenenberger@pulspower.com
Jürgen Schneider (JS)	Texas Instruments	+49 8161 80 3652	j-schneider1@ti.com
Matej Šmidovnik (MS)	SIQ Ljubljana	+386 1 4778 267	matej.smidovnik@siq.si
Matti Kulmala (MK)	Salcomp	+358 400 267 578	Matti.Kulmala@salcomp.com
Michael Raspotnig (MR)	PULS	+49 (89) 9278 160	Michael.Raspotnig@pulspower.com
Vlad Grigore (VG)	Efore	+358 9 4784 6422	vlad.grigore@efore.fi
Wolfgang Paul (WP)	Siemens	+43 664 8011783756	wolfgang.paul@siemens.com
Guests			
Jens Marten (JM)	Block T-Elektronik	+49 4231 678-337	jens.marten@block.eu
Dr Rolf Winter (RW)	ZVEI	+49 162 266 49 37	winter@zvei.org
Steve Tom (ST)	TI USA	+001 214 738-3176	stom@ti.com
TC Chairman			
Paul Conway (PC)	EPSMA	+44 7814183450	conwaypk@gmail.com
Apologies:			
Armin Wegener (AW)	FRIWO	+49 2532 81301	wegener@friwo.de
Clemens Klemm (CK)	Siemens	+49 911 895-3664	clemens.klemm@siemens.com
Milos Luptak (ML)	Bel Power	+421 918392880	milos.luptak@psbel.com

Note: In the following minutes, any actions are indicated in blue after the respective item.

Open meeting, introduction and review of agenda

PC opened by welcoming the TC members and guests to the second EPSMA TC meeting in 2018 and thanked everyone for making the effort to attend.

PC thanked PULS for hosting the meeting. Separately PC has thanked Ulrike Baur and her colleagues Brunhilde and Petra for arranging for the meeting room, lunch, refreshments and restaurant, and for advice about hotels with discount with PULS rate.

There were brief introductions from everyone, especially for the guests.

The agenda was presented and there were no new items requested.

During the afternoon, Bernhard Erdl, CEO of PULS and EPSMA Chairman, joined the meeting and welcomed everyone present and thanked the TC for their valuable contribution to EPSMA.

General TC status review

The membership status, Appendix 1, was reviewed.

PC said that Armin who is retiring from FRIWO has suggested they are represented by his successor, who will be contacted soon. (He is Andreas Blaut: andreas.blaut@friwo.com acting as CTO from 1st Dec. 2018.)

Brief Review of Projects and Actions

The previous minutes were viewed by the TC both to review the accuracy of the minutes and to review projects and actions.

The status of projects and actions are summarised in the minutes.

Approval of TC1-18 Minutes

The previous minutes of TC1-18 held Monday 4th June 2018 at Siemens AG, Nürnberg, were approved by MK, with no changes.

IEC 61204-7 edition 2.0 'Safety of Low-Voltage Switch Mode Power Supplies'

Background

The TC endeavours to keep up to date with developments:

Thierry Pelikan of TDK-Lambda, Member of French mirror TC22X (Cenelec) and TC22 (IEC), has helped keep the TC and MC informed of developments. Also, TDK-Lambda safety experts raised questions about IEC 61204-7 Ed 2 and the implications to the industry of its issue soon.

The chairman of IEC-SC22E, Holger Laible, has kept EPSMA informed with presentations and answering questions at every April/May TC from 2013 to 2017 (MC present at 2015 TC).

Update on the Status of IEC 61204-7, 2nd edition from Clemens Klemm

At the TC1 2018, CK said there would be a meeting at the IEC Advisory Committee on Safety (ACOS) on 26th June 2018 to discuss the difficulties in standardization to decide which should be applied.

Three TC members were expected to receive the minutes of the ACOS meeting and all agreed to forward the minutes to PC to distribute to the TC.

Action: CK, MS or MK to forward the ACOS meeting minutes for PC to distribute to the TC.

Action Complete: MS sent the ACOS meeting minutes to PC and these were distributed to the TC 23 August 2018.

PC showed the latest update from CK, appendix 2, regarding 61204-7 and the Low Voltage Directive and that it had been assessed to both CENELEC and IEC Guidelines for safety related risk assessment and risk reduction for low voltage equipment and accepted by the EU.

Continuing Action: PC to keep contact with Holger Laible, Chairman of IEC SC22E committee or Clemens Klemm, member of the IEC SC22E, and Thierry Pelikan to keep the TC up to date with IEC61204-7 developments.

MOSFET and GaN Body Diode Reverse Recovery Parameters

Background
Diarmuid sent an email to the TC chairman which included a section, Appendix 2 in minutes of 7 November 2016, regarding MOSFET and GaN failures attributed to body diode.
Diarmuid recommended that manufacturers include data sheet parameters of Softness Factor & Qrr with realistic current e.g. 10% of Id rated, di/dt = (10% Id rated)/(20 to 50ns).

Infineon and Texas Instruments were invited to comment and find a solution.

Francesco and Jurgen both agreed to work with their specialists to try to understand the failures and consider appropriate parameters.

Action Continues: JS to send DH info to the TI team and arrange a conference call with DH.

Steve Tom, guest presenter from TI, Dallas, explained that data sheet parameters are now listed in JEDEC committee JC-70 documents which semiconductor companies are expected to follow. [TG701-2; Data Sheet Elements and Parameters]

Post meeting: From https://www.jedec.org/committees/jc-70

'New JC-70 committee has two subcommittees: JC-70.1 Subcommittee for GaN Power Electronic Conversion Semiconductor Standards, and JC-70.2 Subcommittee for SiC Power Electronic Conversion Semiconductor Standards. Focus areas are Reliability and Qualification Procedures; Datasheet Elements and Parameters; and Test and Characterization Methods'.

Action Post Meeting: PC to follow email discussions and review at the next TC as to whether the specific parameters DH believes should be included in data sheets are stated in the JEDEC Standards.

EPSMA Guideline 'Accurate Efficiency Measurements'
[Hubert Schoenenberger(Champ), Vlad Grigore, Milos Luptak and previously Andi Stiedl]

The Second Edition was released to www.epsma.org in July 2018.
It is an update from EN 61000-3-2: 2006 to IEC 61000-3-2:201.
It explains the changes since the First Edition and has sections on EMI, EMC, Harmonics, and PFC Topologies.

The TC would still like to include the **Power Circulation Method** in the report. ML says he now has new contacts at the University of Zilema and could try again to see whether their Power faculty would be interested in contributing a section on Power Circulation Method.
(Note: The secretariat has contacted EPSMA University Members e.g. Nottingham University,

to ask whether they could contribute to DC/AC and AC/AC conversion and the Power Circulation Method however no material is forthcoming.
Similarly, the secretariat has attempted to contact Zimmer but no response though Hannes Schachenmayr may supply a contact at Zimmer.)

Action Continues: ML to contact the University of Zilema to see whether their Power faculty would be interested in contributing a section on Power Circulation Method.

Review of Other Areas of Interest – Reports from monitoring 'champions'

General Requirement of Energy Efficiency for External Power Supplies
[Matti Kulmala].

MK had sent an update, Appendix 3, and has updated the database to comply.
Also MK has also incorporated an extra sheet which provide revision details with content taking account of proposals in Appendix 4 and discussions by the TC.

The database will be updated with new directives and their revisions by Matti as they occur.

Action: MK to keep a watch of the EPS standards and update the database when changes arise.

Energy Efficiency Standards for Battery Charging Systems
[Armin Wegener (Author)]

Armin was not present at the meeting due to his imminent retirement. A new representative from FRIWO has been suggested by Armin.

Action: PC to encourage a new FRIWO representative to keep a watch of the BCS standards and update the database when changes arise.

Future Trends in Semiconductors

There were two presentations at the TC:

'Infineon CoolGaN™' by Francesco DiDomenico, Infineon
'Power of GaN' by Steve Tom, TI

Post meeting these were circulated to the TC and added to the EPSMA Members area. The Infineon CoolGaN™ presentation circulated is a CoolGaN™ introduction. The new Infineon 650V SiC MOSFET we were shown at the TC is still in development phase and Francesco is unable to share all the slides we saw; however, he hopes to present the final version of his technical guidelines at our May 2019 TC.

Photo Voltaics
[Previously Markus Hallenberger]

No TC activity needed currently. The TC suggested previously that if this project needs to be activated a contributor from a Solar Inverter company should be recruited to the TC.

HVDC Systems for Telecom (380Vdc):
(Previously "High Voltage DC Systems for Tele - Datacom and Data Handler Applications" *[Previously Andreas Stiedl and Anders Petersson)]*

[Background;
At the November 2011 TC, Anders said that Intelec, The International Telecommunications Energy Conference, held October 2011, probably revealed details on the subject. Also ETSI is looking into this area and obstacles foreseen are e.g. Infrastructure/Fuses/Security issues.
A driving application for the higher voltage is Blade Servers.
At the November 2012 TC, AP said there is a new draft to cover HVDC:

ETSI EN 301605: 'Environmental Engineering Earthing and Bonding of 400VDC Data and Telecom ICT Equipment'.

There is also ETSI EN 300132-3-1 V2.1.1 2012-0: 'Environmental Engineering.'

The TC previously decided that we should keep a watch of development of ETSI EN 301605.
AS commented at the November 2013 TC that demand for HVDC is coming from customers especially for power back-up. AS also explained that lightning strikes at outstations is a problem to HVDC when it results in arcing that is difficult to stop as there is no zero crossing as with AC power.

At the November 2014 TC, AS commented that interest seems to have decreased within equipment racks as distances are short and DC power losses in wiring are low. HVDC is used for outside installations and Data Centres where longer distances are involved. Problems with HVDC are lightning, as mentioned earlier, also corrosion.

At the November 2015 TC, Arthur Jordan said he may be interested in working on this as Vicor are looking into HVDC. Vlad commented that Eltek has new products for HVDC and the EU has granted money to universities for work on the Microgrid.

The May 2016 TC alerted to the evolving 48VDC bus supported by OCP, the Open Compute Project, with members including Google, Facebook, Microsoft, AT & T, Deutsche Telekom.
http://www.opencompute.org/about/membership-organizational-directory/

FD suggested EPSMA could contact Eric Persson, ex International Rectifier and Infineon USA, and involved with PSMA Roadmap Committee. This was raised with the MC but no follow-up taken.]

TC does not currently have good enough expertise in HVDC.

Action DC: Continues. DC will check to see if he can find something related to HVDC.

Electric Lighting – LED applications
[Armin Wegener]

PC commented that with the retirement of Armin, we need a new representative for LED applications. No volunteer was found.

Action Complete: PC distributed to the TC a copy of the DALI presentation from the June TC and a copy is now in the EPSMA Members Area.

RoHS and WEEE
These flowcharts are at issue November 2012 and they were revised by Friedrich Haunschild of PULS.
Changes are needed to them to meet these revisions:

ROHS changing to ROHS 3: issued in 2015, 4 substances in addition to the current 6. Becomes mandatory 22.7.2019.

WEEE - changes regarding disposal responsibility.

The TC were shown briefly the updates to incorporate the above changes and PC will circulate these to the TC for review.

Action: HS to ask PULS QA specialist, Friedrich Haunschild, to update the flowcharts.
Action Complete: Draft flowcharts from Friedrich Haunschild (FH) were shown at the TC.
Action: PC to circulate the revised flowcharts to the TC for review.
Action: FH to complete the update of the flowcharts.

International Standards

The TC was asked whether they knew of any developments affecting members.

DC mentioned IEC61000-1-2*, EMC, that the FDA and Europe are asking for product compliance. DC believes compliance must be confirmed after Dec 2019. There was a short discussion, but questions remain, and DC agreed to find out more and email the TC with his findings.
** IEC 61000-1-2:2016 establishes a methodology for the achievement of functional safety only with regard to electromagnetic phenomena.*

Action: DC to email the TC by the end of November more about the requirements for IEC61000-1-2.

High Power Wireless Charging - Any expertise available from the TC or their organization's? (Requested by TC/Matti)

NEW PROJECTS
[To be formally approved/ assigned]

EPSMA Publications
The TC reviewed all TC publications, Appendix 4 and 5, to remind members of projects completed and to consider whether any released projects need revision.

The review/update of the two Database EPS and BCS recorded earlier in the minutes is ongoing.

'Guidelines to Understanding Reliability Prediction (June 2005)'

It was noted ate the June 2018 TC that this is still valid, except for example, the SR332 Method base-rates have improved, said DH, so any reliability calculations shown in the report to compare with other methods is likely to be out of date.

POSSIBLE NEW TOPICS REQUESTED BY THE MC

- **Quality Assurance of Firmware in Digital Power Supplies.**
  The TC was asked May 2016 whether they have any knowledge of this subject.
  At the TC Nov 2016, Christian said Siemens had not yet managed to recruit a person with responsibilities for firmware QA.
  An appointment has been made recently in 2017 and this issue may be followed up.

At the June 2018 TC, DH presented 'An Introduction to IEC62304 –Software Life Cycle Processes for Medical Device Software'.

Action: DC will check what Artesyn does in this area.

- **UL/EN62368 Guideline requested earlier by MC**
  Participants of the November 2017 TC noted that it is very useful to exchange experiences about the transition to the new standard, but a guideline may be very difficult to issue. That meeting noted in discussion: edition 3 will be released in 2018. Edition 1 and 2 backwards compatible with 60950. Edition 3 to be checked.

Action Complete: DC to do a presentation at the June 2018 TC - postponed to the November 2018 TC because DC was unable to attend the June TC.

DC presented 'IEC62368-1 an Introduction'. This was also shown at the MC/AGM the following day and is now in the EPSMA members area.

- **Trade Barriers EU-USA. Any Alerts arising?**

  DH made comments at the May 2017 TC with respect to Trade Barriers that it seems some agencies are not recognising the NRTL mark, or are making it difficult to agree recognition of the NRTL mark from other agencies, and asked whether any other EPSMA members are experiencing this?

Action: DH to send more information to the TC if he receives written confirmation from an agency.

Low Power Wireless charging:

MK made a presentation on low power wireless charging to the TC in June 2018.

Action Complete: MK sent the presentation to PC and this has been distributed and a copy added to the EPSMA Members Area.

Any other Business

Some new members need access to the EPSMA Members Area
Action: PC arrange for access to EPSMA members area for Dave Bourner, Steve Tom, Rolf Winter and Wolfgang Paul.
Action Complete: The secretariat had sent them passwords by 21 November 2018.

DH asked whether anyone knew of solutions to component lead-time problems. This has been discussed at a previous MC and was again raised at the MC/AGM on 13 November 2018 and several suggestions made but no practical solution found.

Next meeting

Monday 6th May 2019, at Siemens AG, Gleiwitzer Str. 555, 90475 Nürnberg.
http://web2.cylex.de/anfahrt/siemens-ag-a_d-pt-5-2603756-anfahrt.html

Hotel reservation - Park Plaza, Bahnhofstrasse 5, 90402 Nuernberg,
https://www.parkplaza.de/nuremberg-hotel-de-90402/deuppnu conditions
PC alerted the TC to the new cancellation policy, Appendix 6, and the room rates.
Because of the new cancellation policy, the last day for reservation by Siemens is Friday 1st March 2019. **Everyone to be aware of their liability in the event of cancellation.**

The MC is to be held the following day on Tuesday 7th May also at Siemens AG, Gleiwitzer Str.
Note: PCIM is being held from 7th to the 9th May 2019.

Action Complete: PC to send invitations. These were sent 18 November 2018.

Action: All to put the next TC meeting date in their calendar and please reply to the invites promptly to make it easier to book hotel rooms, catering and restaurant reservation for the TC meal/social.

Adjourn

The meeting was concluded with thanks to all members for attending, and thanks again to PULS for hosting the meeting.

Later at 19:30, sixteen from the TC enjoyed a social/meal at Löwenbraäukeller "Wintergarten", Nymphenburger Str. 2, 80335 München. https://www.loewenbraeukeller.com/

Appendix 1

TC Member Status, November 2018
A total of 17 members from 7 countries:

- Armin Wegener - FRIWO, Germany. (1/7)*
- Benjamin Stoll – inpotron, Germany. (2/7)*
- Bernhard Grub – XP-Power, Germany. (3/7)*
- Christian Hoesch/Clemens Klemm – Siemens, Austria/(Germany). (1/2)/(4/7)*
- Diarmuid Hogan, Excelsys, Ireland. (1/2)*
- Dave Bourner – Vicor, England. (1/1)*
- Dave Collins - Artesyn, Ireland. (2/2)*
- Dominique Hessmann – Delta Energy Systems, Germany. (5/7)*
- Esa Väkeväinen - Murrelektronik Power Oy, Finland (1/3)*
- Francesco Di Domenico - Infineon, Austria. (2/2)*
- Hubert Schoenenberger - PULS, Germany (6/7)*
- Jürgen Schneider - Texas Instruments, Germany. (7/7)*
- Matjek Šmidovnik - SIQ Ljubljana, Slovenia. (1/1)*
- Matti Kulmala - Salcomp, Finland. (2/3)*
- Milos Luptak - Bel Power Solutions, Slovakia. (1/1)*
- Vlad Grigore - Efore, Finland. (3/3)*

- Jens Marten, Block Transformatoren-Elektronik, joins the TC as a guest in November.
- Rolf Winter, ZVEI, joins the TC as a guest in November.

* Key: (x/n) = (Member # from each country / Number of members from same country)

10 November 2018 TC2 2018 at PULS, Munich 7

Appendix 2

IEC 61204-7, 2nd edition: Safety of Low-Voltage Switch Mode Power Supplies

- Annex ZZ of EN IEC 61204-7:2018
- The standard justifies the presumption of conformity with the corresponding objectives of the The Low Voltage Directive (LVD) (2014/35/EU)
- CENELEC guide 32 (Guidelines for Safety Related Risk Assessment and Risk Reduction for Low Voltage Equipment) / IEC Guide 116 (Guidelines for safety related risk assessment and risk reduction for low voltage equipment) was executed for the standard and confirmed by EU

10 November 2018 TC2 2018 at PULS, Munich 10

IEC 61204-7, 2nd edition: Safety of Low-Voltage Switch Mode Power Supplies

- A test report template is available from SGS Fimko Ltd for test to IEC 61204-7 as part of the CB Scheme.
- References to IEC 61204-7 are planned for the next revision of:

  - IEC 61010-series (Measurement and Control)
  - IEC 60601-1 (Medical products)
  - Further references to IEC 61204-7 are likely in other standards

10 November 2018 TC2 2018 at PULS, Munich 11

IEC 61204-7, 2nd edition: Safety of Low-Voltage Switch Mode Power Supplies

Test Report issued under the responsibility of:

TEST REPORT
IEC 61204-7
Low-voltage switch mode power supplies – Part 7: Safety requirements

Report Number: .....
Date of issue: .....
Total number of pages: .....

Name of Testing Laboratory preparing the Report: .....
Applicant's name: .....
Address: .....

Test specification:
Standard: ..... IEC 61204-7:2016
Test procedure: ..... CB Scheme
Non-standard test method: ..... N/A

Test Report Form No. ..... IEC61204_7A
Test Report Form(s) Originator ..... SGS Fimko Ltd
Master TRF: ..... Dated 2018-05-17

Copyright © 2018 IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components (IECEE System). All rights reserved.

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

10 November 2018 TC2 2018 at PULS, Munich 12

Appendix 3

General Requirement of Energy Efficiency for External Power Supplies *[Matti Kulmala, Salcomp]*

- The EC has just issued a draft amendment to come into effect 1 April 2020.
- Proposed limits are identical to DoE level V1.
- Commenting period ends 13.11.18.
- https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2018-5145982_en

Appendix 4

EPSMA Publications – Public

(Accessible to the general public as a free download)

- Accurate Efficiency Measurements (Second Edition, July 2018)
- WEEE Decision Tree Guidelines (Nov 2012) - needs review with regard to Disposal Responsibility.
- RoHS Decision Tree Guidelines (Nov 2012) - needs review with regard to ROHS 3.
- PFC Harmonic Current Emissions – Guide to EN61000-3-2:2014 (Second Edition, July 2018)
- Thermal Measurements of Power Converters – How and Why? (March 2009)
- Guidelines to Understanding Reliability Prediction (June 2005)
- CE-Marking on Power Supplies - Guidance from the EPSMA (Second Edition, July 2018)
- The Status of Lead-Free Electronics and its Impact on Power Electronics (Feb 2003)

Appendix 5

EPSMA Publications – Members

(Not accessible to general public but some may be purchased)

- Energy Efficiency Database: Energy Efficiency No-load Consumption for EPS (28/07/17)
- Energy Efficiency Database: Energy Efficiency BCS (28/08/18)
- Safety Guidelines for Telecom Applications (Final, 3rd September 2012) - Refers to 60950, which will soon be obsolete.
- Lead-free soldering – Concerns and Practices (Final issue 1F, 21 Feb 2012)
- * AC-DC Power Supply Safety Guidelines for Medical Applications (November 2009)
- * AC/DC Power Supply Safety Guidelines for Railway Applications (Nov 2008)
- * AC-DC Power Supply Safety Guidelines for Power in Hazardous Locations (Jan 2008)
- HDPUG Applications Guidelines for Board Mounted Power Supplies (Feb 2007)
- * AC-DC Power Supply Safety Guidelines for DIN Rail Supplies (Sept 2006)

Note * Very old and it is likely that changes to the standard have occurred.

10 November 2018 TC2 2018 at PULS, Munich 31

Appendix 6

Park Plaza, Bahnhofstrasse 5, 90402 Nuernberg

https://www.parkplaza.de/nuremberg-hotel-de-90402/deuppnu

- Sunday May 5th to 6th, 6 rooms, 119 €/ night
- Monday May 6th to 7th, 15 rooms, 189 €/ night
- Tuesday May 7th to 8th, 6 rooms, 189 €/ night

- Cancellation - **new conditions**:
  - Cancel rooms for free until March 8th.
  - Until April 5th: 25 % cancellation fee.
  - Until April 19th: 50%, but we can cancel 2 rooms for free, too.
  - Cancel later: 90 % of the price.

- Propose last day for reservation is Friday 1st March 2019

10 November 2018 TC2 2018 at PULS, Munich 38