



**EPSMA TC2 2019
Technical Committee Meeting
Monday 11th November 2019**

Held at SIQ Ljubljana, Masera-Spasicева ulica 10, 1000 Ljubljana.

EPSMA Technical Committee Meeting 11th November 2019

Date: Monday, 11th November 2019
 Time: Arrive from 12:30 for meeting 13:00 ~ 17:00.
 Venue: SIQ Ljubljana, Masera-Spasicева ulica 10, 1000 Ljubljana. Reception: +386 1 4778 000
 Logistics: Andrej Lange, +386 1 4778 201, Mobile: +386 41 728 196, andrej.lange@siq.si
 TC Chair: Paul Conway: +44 7814183450 (mobile).

12:30	Arrival for light buffet lunch at SIQ.	All
13:00 - 13:45	Tour of SIQ Laboratories including a stop at the Cyber Security department	Gregor Schoss
13:45	Open meeting, introductions and brief review of agenda	Paul
14:00 - 14:20	General TC status review <ul style="list-style-type: none"> Update on current and possible future TC member's status. Brief review of projects and actions Approval of TC1-19 minutes 	Paul Paul TC1-19 Attendees
14:20 - 14:35	Safety of Low-Voltage Switch Mode Power Supplies (The new standard IEC 61204-7, 2nd edition: proposed in 22E/142/NP). <ul style="list-style-type: none"> Review of developments - ppt from Clemens Klemm, member IEC SC 22E. Have the TC noticed an increase in customers referencing 61204-7? 	Paul/All All
14:35 - 15:10	Guidelines for Lifetime Prediction for Power Supplies <ul style="list-style-type: none"> Review of report structure and progress. Plan work needed to release the draft 1Q2020 i.e. by 31 March 2020. 	Hubert / Esa, Dave, Francesco
15:10 - 15:25	Refreshment break	All
15:25 - 16:05	Guidelines for Embedded software Validation in Power Supplies <ul style="list-style-type: none"> Work Proposal clarified by the MC: the purpose of the report is to explain to customers why firmware validation is necessary. Base it on written version of the mind-map already prepared but add 'Cyber Security'. Which EPSMA TC member companies validate embedded software? Team and project leader selection, decide draft report structure. 	Vlad, Benjamin / All
16:05 - 16:35	Presentation: 'Silicon Super Junction vs SiC Mosfet vs GaN'	Francesco DiDomenico
16:35 - 16:50	Review of other areas of interest – Reports from monitoring “champions” <ul style="list-style-type: none"> Energy Efficiency/Savings External Power Supplies (2.9.2019) Energy Efficiency/Savings Battery Charging Systems (2012_09_03) Solar & Wind Power: Any new topics/presentations? Future Trends in Semiconductors: New topics/presentations? JEDEC? 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 ? - was Friwo All Francesco, Jürgen All (Previously Markus) ? ? (Previously Armin, Friwo) All All
16:50 - 17:00	Other? <ul style="list-style-type: none"> 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
17:00 - 17:10	Summary of actions from the meeting. Set next meeting and adjourn Monday 4 th May 2020, at Siemens, Nuremberg. Hotel reservation – Ringhotel Loew's Merkur, Approx 93 € including breakfast, parking 60 cars @ 14 € per night https://www.guestreservations.com/ringhotel-loews-merkur/booking?msclid=196e1fbdc4b1157c8e2342c2419511aa Note: PCIM is being held from 5 th to the 7 th May 2020	Paul Paul
<i>Evening: Social/meal – Axe-throwing followed by a meal at Kratochwill brewery Kratochwill</i>		

Present at the Meeting:

Name	Company	Tel No.	Mail address
<u>TC Members</u>			
Bernhard Grub (BG)	XP-Power	+49 151 12748545	bgrub@xppower.com
Bostjan Glavic (BnG)	SIQ Ljubljana	+386 1 4778 265	bostjan.glavic@siq.si
Dave Collins (DC)	Artesyn	+353 87 6470711	david.collins@artesy.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
Matej Šmidovnik (MS)	SIQ Ljubljana	+386 1 4778 267	matej.smidovnik@siq.si
Milos Luptak (ML)	Bel Power	+421 918392880	milos.luptak@psbel.com
Vlad Grigore (VG)	Efore	+358 9 4784 6422	vlad.grigore@efore.fi
Wolfgang Paul (WP)	Siemens	+43 664 8011783756	wolfgang.paul@siemens.com
<u>Guests</u>			
Gregor Schoss	SIQ Ljubljana	+386 1 4778 231	gregor.schoss@siq.si
Matthias Eschle-Reinold	TDK-Lambda	+49 173 1876704	matthias.eschle@de.tdk-lambda.com
Dr Rolf Winter (RW)	ZVEI	+49 162 266 49 37	winter@zvei.org
<u>TC Chairman</u>			
Paul Conway (PC)	EPSMA	+44 7814183450	conwaypk@gmail.com
<u>Apologies:</u>			
Andreas Blaut (AB)	FRIWO	+49 2532 81 424	andreas.blaut@friwo.com
Benjamin Stoll (BS)	inpotron	+49 7731 9757-225	B.Stoll@inpotron.com
Clemens Klemm (CK)	Siemens	+49 911 895-3664	clemens.klemm@siemens.com
Dominique Hessmann (DMH)	Delta Energy Sys.	+49 7641 455 315	Dominique.Hessmann@deltaww.com
David Bourner (DB)	Vicor	+978 7493327	dbourner@vicr.com
Diarmuid Hogan (DH)	Excelsys	+353 21 4520936	diarmuid.hogan@aei.com
Jürgen Schneider (JS)	Texas Instruments	+49 8161 80 3652	j-schneider1@ti.com
Matti Kulmala (MK)	Salcomp	+358 400 267 578	Matti.Kulmala@salcomp.com
Michael Raspotnig (MR)	PULS	+49 (89) 9278 160	Michael.Raspotnig@pulspower.com

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

Tour of SIQ Laboratories including a discussion about the Cyber Security Department

The TC were taken on an interesting tour of SiQ led by Gregor Schoss. On return to the meeting room the TC met Andrej Rakar, Head of IT Security, SIQ, and a short discussion followed about cyber security (IEC 62443 'Security for industrial automation and control systems', in the CB Scheme).

The tour included shock and vibration facilities - contact Dr Miha Otrin, miha.otrin@siq.si

Open meeting, introduction and review of agenda

PC opened by welcoming the TC members and guests to the second EPSMA TC meeting in 2019 and thanked SIQ for hosting the TC.

There were brief introductions from everyone.

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

General TC status review

The membership status, Appendix 1, was reviewed and PC explained that following the retirement of Armin Wegener, FRIWO now say they will not be renewing their membership.

Brief Review of Projects and Actions

The TC viewed the previous minutes to check the accuracy and the status of actions.

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

Approval of TC1-19 Minutes

The previous minutes of TC1-19 held Monday 6th May 2019 at Siemens AG, Nürnberg, were approved by VG seconded by EV.

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

PC showed the TC the PowerPoint prepared by CK of the current status, appendix 2, regarding IEC 61204-7 ed 2.

PC asked whether the TC have noticed an increase in customers referencing 61204-7?

None of the TC present reported requirements for IEC 61204-7 edition 2.0, except Bostjan Glavic who said that it had been discussed at a recent IEC ACOS meeting. (IEC Advisory Committee on Safety).

BnG said that the US and Canada were working on the requirement for harmonisation of standard IEC 62477-1 2nd edition which is a reference standard for IEC 61204-7, and until we get confirmation that the US and Canada adopt it, use of standard IEC 61204-7 edition 2 in the US and Canada is unlikely.

Also, BnG had checked the CB certificates issued up to a month ago and could not find use of IEC 61204-7.

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. (JS was not at the TC in Nov 2019)

Steve Tom, guest presenter from TI, Dallas, explained at the TC held 12th November 2018, 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.

DH was not present at the TC 6 May 2019, or the TC 11 November 2019 and PC has not received an update yet.

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 includes two new chapters – '3-Phase Power Factor' and 'Power Sources' added to the First Edition issued on 21 June 2015.

The TC would still like to include the **Power Circulation Method** in the report. ML said at the May 2019 TC that 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.)

At the TC of 11 November 2019, ML said there was no take up of the project for September 2019. The students choose a new project two months before they start in February and September.

Action: ML to contact the Head of Engineering, University of Zilema, in January 2020 to ask again whether their Power faculty would be interested in contributing a section on Power Circulation Method.

ML will then email PC to say whether anyone has chosen the project.

‘Guidelines to lifetime prediction for power supplies’

[Hubert Schoenenberger (Champ), Esa Väkeväinen, Dave Collins and Francesco Di Domenico]

The document structure exists with all chapters numbered and with a title. Workshare has been agreed, and several chapters written direct to a shared Dropbox workspace. HS showed the TC the progress to date and wondered whether the document was becoming too long. The decision was made to focus on components which were the major causes of shortened lifetime particularly elcaps. Further agreement was made on workshare: Fans – DC. Semiconductors – FD. Elcaps – DC. Metal oxide barriers – EV.

Timescales:

Input from DC by 24 Dec 2019.

Ready for distribution by 1Q 2020

Action: HS to lead the project to meet the above.

‘Guidelines to Embedded software Validation in Power Supplies

[Vlad Grigore, Benjamin Stoll]

PC explained some of the background to the project as described in the TC report to the MC:

The project has not started as the objective was not clear especially regarding possible duplication of a project of similar title in progress with a PSMA Software Reliability Committee. An EPSMA representative Pasi Lauronen, Efore, subsequently became a contributor to the PSMA report which is now available for purchase via the PSMA website <https://www.pdma.com/publications>

The MC May 2019 clarified that the EPSMA objective is to explain to customers why validation is necessary.

Initial team members are Vlad Grigore, Efore, supported by Pasi Lauronen, Efore, and Benjamin Stoll, Inpotron. Support to review the report has come from Rami Abraham, manager of Vicor’s Firmware Development team. Also Mathias Emsermann, Phoenix Contact, offered his company to review the report.

Action: DMH to ask Delta management to support her time on the project.

Action closed. Delta management decided that Delta support will not be provided for this project.

At the November 2019 TC, VG asked for the SoW to be reworked (Include Cyber Security and clarify that the objective is to explain to customers why validation is necessary.)

Also, Gregor Schoss offered the support of Andrej Rakar, Head of IT Security, SIQ, to write a section on cyber security (IEC 62443 'Security for industrial automation and control systems').

Action: PC to rework the SoW.

Action: PC to contact Andrej Rakar to ask his support to the project to add a section on cyber security.

Bostjan Glavic alerted his concerns about firmware disabling overheat sensors and he will refer these to TC108.

Post meeting Bostjan informed 'Ad hoc was established within TC 108 WG HBSDT to deal with Safety related control circuit (Example IC LM5017 – protection circuit implemented inside the IC). Ad hoc is preparing requirements for IEC 62368-1 4th Ed., similar to IEC 60730 annex H. Maybe they will refer to IEC 61508.'

Action: BnG: To send the results of consultation with TC108 on the above to PC to forward to the TC.

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

General Requirement of Energy Efficiency for External Power Supplies

[Matti Kulmala]

The database is now at issue 2.9.19. The change is to the EU ErP (Ecodesign Directive for Energy related products 2009/125/EC) and this becomes effective 1/4/2020.

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

Energy Efficiency Standards for Battery Charging Systems

[Was Armin Wegener, FRIWO]

FRIWO have not renewed their membership and currently we have no one to update the database at issue 3 Sept 2012 with any new directives and their revisions.

Action: PC inform the MC at the AGM that the TC have no expertise able to keep the database up to date and reach a decision with the MC on how best to proceed.

Future Trends in Semiconductors

Action: FD to give a presentation at next TC, Nov 2019 titled e.g. 'Silicon Super Junction vs SiC Mosfet vs GaN'.

Action complete: FD presented 'Si, SiC and GaN technologies in switch-mode power supplies' and after the meeting sent the pdf for distribution to the TC and to add to the 'Members Area' <http://www.epsma.org/page23.html>.

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 (380Vdc)

(Renamed from '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 Intel, 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: DC will check to see if he can find something related to HVDC.

Action Complete: DC said there is no HVDC activity at Artesyn.

ML said Data Centres use HVDC, however, apart from custom power supplies, Bel Power have not seen much interest in HVDC.

Electric Lighting – LED applications

[Previously Armin Wegener]

The expected new representative from Friwo, Andreas Blaut, did not join the TC and as FRIWO have not renewed their EPSMA membership, the TC does not have a representative for LED applications.

RoHS and WEEE

The flowcharts now in the members area are dated September 2019.

They are derived from the previous issue, November 2012, with these updates:

- RoHS - updated to RoHS 3: issued in 2015; four new substances in addition to the current six. Became mandatory 22.7.2019.
- WEEE - changes regarding disposal responsibility.

Comments on RoHS from Claudia Wild, Murrelektronik Power, sent by Esa (EV), have been reviewed by Friedrich and passed back to EV asking for agreement of changes. No other comments received.

Action: FH to complete the update of the flowcharts when agreement is reached with Claudia Wild, Murrelektronik Power.

Action Complete.

International Standards

The TC was asked whether they knew of any developments affecting members. There were no new issues raised at the TC.

The Transition from EN 60950-1 to Other Norms

Guideline prepared by a ZVEI working group led by Michael Raspotnig

MR gave a presentation on 'Selection of Safety Standards for Power Supplies' to the TC in May 2019. This guideline was produced by several ZVEI member companies and RW offered the electronic version to EPSMA to be made available in the public area.

Action: RW to send the document to the EPSMA secretariat, copy PC, when it is ready for publication expected soon.

Action Complete: This is now available at the home page, 'Latest Publications', <http://www.epsma.org/>

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

No expertise was offered so this request continues.

NEW PROJECTS

[To be formally approved/ assigned]

EPSMA Publications

The TC reviewed all TC publications, Appendix 3 and 4, 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 at 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.

No other documents were suggested.

Any new subjects suggested by the TC?

No projects were suggested however the MC AGM on 12 November 2019 said it will be an agenda item at the next meeting expected in February.

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 was made in 2017.

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

Action Continues: [DC will check what Artesyn does in this 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.](#)

Trade Barriers Other. Any Alerts arising?

No issues reported at the TC however prior to the TC, HS asked to inquire/discuss the acceptance of a standard material classification/characterization according to [eClass](#) in the TC.

eClass was familiar to Infineon and TDK.

Any other Business

No other business.

Next meeting:

Monday 4th May 2020, at Siemens, Nuremburg.

Hotel reservation – Ringhotel Loew's Merkur, Post meeting cost is confirmed as 94.50 € including breakfast, parking 60 cars @ 14 € per night

<https://www.guestreservations.com/ringhotel-loews-merkur/booking?msclkid=196e1fbdc4b1157c8e2342c2419511aa>

Note: PCIM is being held from 5th to the 7th May 2020

Action: PC to send invitations.

Adjourn

The meeting was concluded with thanks to all members for attending, and thanks again to SIQ for hosting the meeting and arranging the evening entertainment and dinner reservation.

Following the meeting, eleven of the TC went in transport arranged by SIQ to Axe-throwing at Axe Throwing Europe™, At Kajuhova 35, <https://axe-throwing.si/en/> followed by a meal at Kratochwill, [brewery Kratochwill](#)

Appendix 1

TC Member Status, November 2019

16 member companies from 7 countries:



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

- Rolf Winter, ZVEI, attended as a guest November 2018, May 2019 and Nov 2019.
- Jens Marten, Block Transformatoren-Elektronik, attended as a guest November 2018

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

Appendix 2

Standardization of power electronic systems and equipment

IEC 61204-7

Low-voltage switch mode power supplies – Part 7: Safety requirements

Update September 2019

Clemens Klemm

Siemens AG

Appendix 2 continued

IEC 61204-7 and IEC 62477-1 (group safety standard)

Acceptance as CSA/UL

Harmonization SA 22.2 No. 62477-1/UL 62477-1

- parallel process for the development of IEC Ed 2 and CSA/UL version
- IEC 62477-1 Ed 2 is considering demands from CSA/UL
- Final publication planned middle of 2020 for CSA No. 62477-1/UL 62477-1

Harmonization of related product standards (e.g. SPMS, UPS) in US/CAN mainly depending on the progress of the harmonization of the group safety standard IEC 62477-1 in US/CAN.

Harmonization in Europe

EN 61204-7 Ed 2 is harmonized under LVD (Low Voltage Directive).

Cenelec	EN IEC 61204-7:2018 (new)	This is the first publication	EN 61204-7:2006 + A11:2009 Note 2.1	16/03/2021
	Low-voltage switch mode power supplies - Part 7: Safety requirements IEC 61204-7:2016			

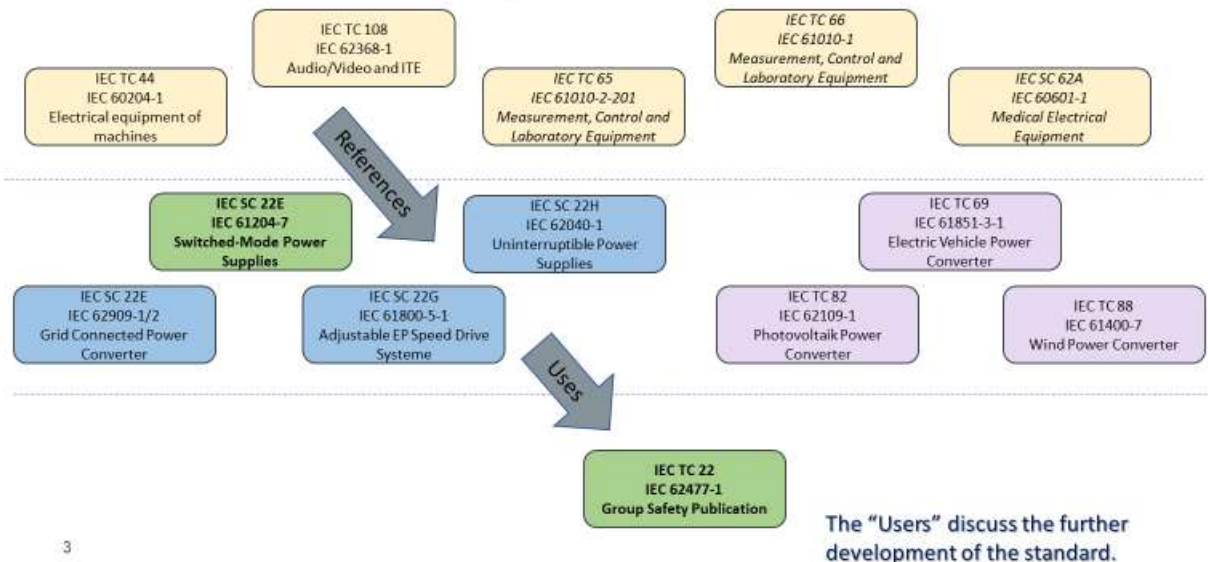
Acceptance in China (GB standard)

They voted positive on the standard. National Chinese Mirror Committee (TC 60) is investigating for national acceptance of IEC 61204-7 and group safety publication IEC 62477-1.
Plenary meeting of the IEC committee in October 2019 in Shanghai.

Acceptance in Japan

Japan is strongly participating in working groups. Local acceptance should be possible relatively easy.

Standards hierarchy related to IEC 62477-1 std.



Appendix 3

EPSMA Publications – Public

(Accessible to the general public as a free download)



- Accurate Efficiency Measurements (Second Edition, July 2018)
- WEEE Decision Tree Guidelines (Sept 2019) – revised regarding disposal responsibility.
- RoHS Decision Tree Guidelines (Sept 2019)) - revised 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)

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Appendix 4

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 (3 Sept 2012)
 - 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.

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