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Report on the
General Meeting 2023

Section Electronic Components and Systems
Section PCB and Electronic Systems

General Meeting of the Sections ECS and PCB-ES

Board of Directors of the Section ECS

Chairman Harting	From the Groups Bronold Scheer	From the Commissions Boelitz Conti-Geitner	From the Commissions Enser Feiner
Advisory Board			
Management Dehnert			

Board of Directors of the Section PCB-ES

Chairman Schweizer	From the Groups Moser Schönherr Velmeden
Management Dehnert Dr. Weiß	

Semiconductor Devices Group Boelitz	Passive Components Group Bronold	Electro-mechanical Components Group Scheer	Microsystems Technology - Sensors/ Actuators Group Conti-Geitner	Technical Commission with Working Groups Enser	Electronics Manufacturing and Services Group Velmeden	Printed Circuit Boards Group Moser	Ceramic Microcircuit Group Schönherr
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Technical Commission Integrated Circuits N. N. Market Commission Binder Working Groups Political Lobbying and Public Relations Work Sturm Test Benchmark Automotive Dannenfeld Design-/ Entwicklungs-Benchmark Automotive Freitag Promotion of Young talent Bölk	Market Commission Sauer Technical Commission Paulwitz	Connectors Department Beneke Technical Commission Beneke Market Commission Dorscht Working Groups AK Additive Manufacturing Dr. Althoff Input and Protective Elements Department Körber Technical Commission Körber PCF Connectors Hornung	Projects/ Topics Working Groups Foundries for MEMS Schwarz Robustness Validation for MEMS Knoll	Quality Trojok Technology Platform Dr. Lock Environmental Protection and Occupational Safety in Semiconductor Manufacturing Dr. Jantschak Environment and Packaging Völkl Design Chain Biener, M. Component Cleanliness Nikolussi Supply Chain Management Ehm Market Commission Feiner International Cooperation Working Group Standardisation Enser Working Group Politics Moser Traceability Weber	Working Groups Technology & Test Engineering Franke AK Market Feiner Repair/Rework Lauer Core Team EMS Sales Days Feiner Services in EMS Velmeden EMS Marketing Team Velmeden	Market Commission Wachtel Working Groups Manufacturing Technology Bandel Quality Bönitz Market Analysis Beck Environment Linz Environmental Protection Kimpfel Reliability of Printed Circuit Boards Atak UL Soldering Parameters Deutschmann/Mückl Marketing Team Printed Circuit Boards Beck	Technical Commission Krieger Market Commission Schönherr
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Joint Foreword by the Chairmen

Dear members, dear readers,

the European Commission's Green Deal stands for the transformation of our economy and society towards more sustainability. Climate protection, biodiversity and the prohibition of child labour are important elements of our everyday business. They are firmly anchored in our corporate goals, strategies and processes.

A secure energy supply is an important building block of the transformation. Energy needs to be generated in a CO₂-neutral manner today and in the future so that electrification and digitalisation can go hand in hand without affecting the climate negatively. This is made possible by the hardworking hands and minds of our industry. After all, we are driving the crucial innovations and social progress towards realising the All Electric Society with our components and solutions.

We create space for exchange and bundle our interests in our sections and groups because taking new paths also requires reliable framework conditions. This is why we take a stand and represent our positions and demands vis-à-vis politicians and society. Each and every individual contributes with his or her expertise so that we can create the transformation for the sustainability of our work and actions together.

We would like to take this opportunity to thank you for your commitment, your knowledge and your time. You shape the future of our industry and together we set the necessary framework conditions in our trade associations in the ZVEI.

Every now and then, the path also gets rocky. We take that sportingly and see challenges, not hurdles. And yet we must warn against excessive regulatory requirements. Even Commission President Ursula von der Leyen shows insight and presented the prospect of a 25 percent reduction in reporting requirements for companies in March 2023. A great promise, which is taking on CSRD forms with the drastic revision of European sustainability reporting. Let's take advantage of this tailwind! Let's point out where bureaucracy is an obstacle to our competitiveness and what new course needs to be set. Let's get involved more actively!

Let us shape the future by engaging in a mutual exchange and continue to work together in such a trusting and motivated manner.

Sincerely yours,

Philip Harting
Chairman of the Section
Electronic Components and Systems

Nicolas Fabian Schweizer
Chairman of the Section
Printed Circuit Boards and Electronic Systems



**Chairman of the Professional
Section Electronic Components
and Systems**
Philip F. W. Harting



**Chairman of the Professional
Section Printed Circuit Boards
and Electronic Systems**
Nicolas Fabian Schweizer

Management Report

The past year was a positive one for the companies in our industry. Despite a difficult market environment with the ongoing armed conflicts in Ukraine and the changing political world climate, most companies were able to achieve positive economic results. As a strong representative of their interests, the ZVEI was a sought-after discussion partner vis-à-vis national, but also international politicians. This enabled the rapidly changing requirements from technology, politics, the market and the economy to be recorded, bundled in the interests of all members and communicated accordingly to support them. Despite the many challenges, many projects were carried out successfully and valuable results were achieved for our members.

Development of the electronic components industry

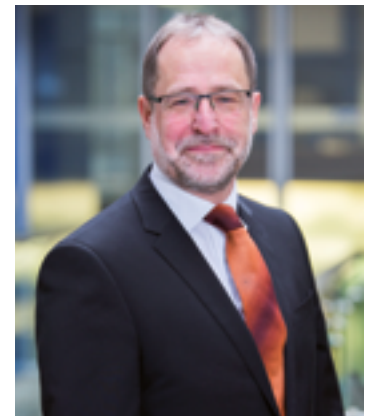
As in 2021, the markets for electronic components were able to grow in the lower double-digit range last year. This development was driven by the increasing demand for the production of electronic devices in the industrial electronics sectors, such as the use of renewable energies and the automotive industry with the switch to electric mobility and the corresponding peripherals, such as the installation of charging stations. However, this positive development is counteracted not only by higher material and energy costs, but also by the prevailing shortage of skilled workers. It therefore remains to be seen how companies will master these challenges and whether the positive market development in the electronic components and assemblies markets will continue.

Lobbying and international cooperation

The work in the inter-association subgroups Standardisation and Politics was continued in order to further expand international cooperation. The Standardisation group compiled an overview of the most important standards in the industry and expanded their networking with specialists. The fact that the group, together with the IPC and individual representatives from the industry, made themselves heard at the European Commission (DG GROW) was a success in the area of lobbying. A survey is being conducted to record the special needs of the PCB and EMS industry and this information will be provided to the EU Commission.



Michael Dehnert



Dr. Christoph Weiß



Dr. Marcus Dietrich

Trade fair appearances at electronica and SMTconnect

Last year, our trade sections once again participated in the trade fair electronica. In addition to the participation of the President of the ZVEI in the opening press conference, the sections ECS and PCB-ES presented the latest market figures. At the PCB and Components Market Place, representatives of the “Services in EMS” initiative discussed the importance of the EMS sector for the industry. On the main topic of sustainability, reports were given on the conservation of resources in PCBs, the recycling of solders and cables and the reworking of electronic assemblies. In addition, our member companies were able to present themselves by holding their own presentations.

At the trade fair SMTconnect, which took place in May 2023, the trade association PCB-ES was on site with a trade fair office and presented the topics of UL soldering parameters, roadmap solder resist and resilient value chain semiconductors at the trade fair forum.

Top-level meeting of the executives of our member companies

After the break caused by the COVID pandemic, the decision-makers of our member companies met again in person in February 2023 in Frankfurt/Oberursel for the 18th top management meeting. The evening speaker, Jacob Gunter, Mercator Institute for China Studies, MERICS, shed light on German-Chinese economic relations against the backdrop of the current political situation. On the second day, the topics of “Climate Protection Targets and Security of Supply” by Prof. Dr. Manfred Fishedick, Wuppertal Institute for Climate Research, and “Mobility of the Future – the Transport Turnaround is More than Electrification” by Prof. Dr.-Ing. Peter Urban, Future Mobility Center at RWTH Aachen University, were on the agenda.

Thanks and recognition

We would like to express our sincere thanks to all the volunteers from the member companies who were active in the ZVEI last year and in prior years. An industry association thrives on the commitment and participation of its members. This is not something that can be taken for granted in such demanding and fast-moving times. This year, too, our top priority is to ensure the sustainable success of the projects brought to us and to work for our members and the future of our industry.

Electronic Components and Systems

Semiconductor Devices Group

Structure and work of the Semiconductor Devices group

The Semiconductor Devices group sees itself as the competent voice of the semiconductor industry, communicating and optimising its benefits to society. It sees itself as a platform for identifying and solving common challenges, as an interface to other organisations and committees etc. (for the exchange of information), as an open industry circle for all semiconductor manufacturers represented in Germany and as an information base externally and internally (ZVEI).

The following committees set up by the group currently exist:

The working group "Political Lobbying and Public Relations" deals on the one hand with the challenge of ensuring that the importance of the semiconductor industry as such and in particular within industrial value chains is understood not only by experts but also by political decision-makers and the general public. To this end, the positions and needs of the semiconductor industry and its products must be repeatedly presented and explained in order to highlight the social and economic value of this key technology for the global goals of digitalisation, decarbonisation and electrification. The working group presents to the public how microelectronics have already changed life sustainably and will continue to do so in the future. It also seeks to take a political position on issues that support or hinder the semiconductor industry. Since the topics of environmental protection and skilled workers or young talent also play a major role in the current global political situation, the chairpersons of the working groups "Environmental Protection and Occupational Safety in German Semiconductor Manufacturing" and "Promotion of Young Talent" also actively participate in the "Political Lobbying and Public Relations" working group.

The expert group also carries out an annual design development benchmarking for the automotive industry, in which productivity and throughput are used as comparison parameters. With the help of the results of the benchmarking, a white paper was created that can be downloaded from the ZVEI homepage.

Using the same comparison parameters, the expert group also carries out an annual test development benchmark for the automotive industry in addition to the aforementioned design benchmark. A white paper for this benchmark has also been prepared for downloading from the ZVEI homepage.

The ad-hoc working group that goes by the same name deals with the topic of promoting talented young people. Its goals are to improve the current negative image of engineering – from "electrical engineering equals electromog" to "electrical engineering equals energy efficiency/environmental engineering," the promotion of interest and fun in science and technology from an early age as well as the support of training such as electrical engineering or physics. The working group regularly obtains an overview of current activities and exchanges the companies' own experiences in the area of promoting young talent.



**Chairwoman
Anja Boelitz**

Together with the Federation of German Industries (BDI), the working group prepared a skilled labour study for the semiconductor sector that can be downloaded from the ZVEI homepage.

To maintain and expand the network between industry and research institutions, the expert group regularly invites representatives from academia to its meetings. Along the guest lectures held, the expert group constantly and actively obtains first-hand information on the status of current research and development activities at the university and institute level.

Furthermore, the expert group offers interested semiconductor companies the opportunity to introduce themselves during the meetings and at the same time get to know the association work within the ZVEI.

Since the inception of the Silicon Germany network, the ZVEI, and here in addition to the management of the ZVEI, in particular the expert group Semiconductors, has been very actively involved at the respective network levels. By intensifying the work of Silicon Germany, the ZVEI continues to demonstrate the unity of the semiconductor industry and is perceived both within the Silicon Germany network and vis-à-vis politics and the public as the representation that bundles the interests of this industry.

The cooperation of the Semiconductor Devices expert group with the European association ESIA within EECA is well established. Due to the close links between the individual countries and the European Union on the one hand and the global positioning of the semiconductor industry on the other, the topics of the semiconductor industry can be considered less and less exclusively on a national level. As a result, the expert group works together with the European association ESIA to jointly improve the European framework conditions for the semiconductor industry, among other tasks. At the same time, it also maintains a close exchange with other international associations, such as the American semiconductor association SIA.

The press conference on microelectronics traditionally takes place once a year. The situation of global, European and German microelectronics is presented and discussed with representatives of the trade and daily press.

The ZVEI, together with the VDE, has held the "Microelectronics for Future Summit (until 2021 "VDE/ZVEI Symposium on Microelectronics") in Berlin since 2010. The microelectronics industry organised in the ZVEI invites politicians to inform themselves about the technological development of the semiconductor industry and its own role in the value chain of the electrical and digital industry, to present the social benefits of the chip industry for Europe as a business location and to discuss the future of microelectronics in Europe together with politicians.

Finally, the ZVEI, together with the BDI and many other partners, organises so-called BDI-ZVEI microelectronics workshops once or twice a year. In addition to the two associations, these roundtables are attended by the Federal Chancellery, the Federal Ministries of Climate Protection and Economics as well as Education and Research, the Federal Foreign Office as well as companies and other associations. They discuss pressing and competition-critical issues for the targeted further development of the semiconductor ecosystem.



Source:
TDK-Micronas GmbH

Passive Components Group

In the ECS trade association, the manufacturers of capacitors, inductors, EMC filters and resistors are united in the Passive Components Group. Together, they pursue relevant topics from the field of passive components, the maintenance and continuous development of a market statistics database, for example. By including their own statistical evaluations, detailed market trends can be derived from the European statistics for passive components "EPC-eStat" at the product and segment level for Germany, EMEA as well as at the global level - via the world statistics - in strict compliance with the legal requirements regarding compliance rules, of course. The broad base of participating member companies leads to representative and meaningful market information.

In addition, the expert group serves as an important platform for the exchange of information among members on all issues relevant to the sector. This exchange is - and will remain - valuable and brings useful insights for the members.

Embedded in the comprehensive network of the ZVEI, the members of the expert group benefit from the expertise available in the five lead markets of the electrical industry - energy, buildings, health, Industry 4.0 and mobility - as well as the most diverse fields of application, for whose functional fulfilment passive components are indispensable.



Chairman
Ralph Bronold



Source:
Mersen S.A./ftcap GmbH



Source:
Vacuumschmelze GmbH & Co KG

European activities

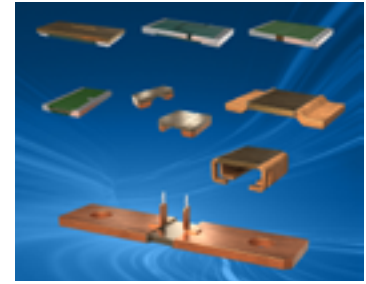
Due to the immense importance of the European Economic Area for the member companies of the expert group, there is an increasingly close content-related interlocking with the EPCIA (European Passive Components Industry Association), through which the activities for the joint World Statistics on Passive Components (WPTS) are also coordinated. Many of the members of the expert group are therefore also active in the EPCIA.

Other key areas of work

Besides constantly observing market developments, many cross-company tasks were worked on and completed again in specific projects in the committees and working groups of the trade association in the past year:

1. Product-related environmental protection

Environmentally relevant topics are important topics at the meetings of the expert groups. In addition to the subject of "Conflict Minerals," the focus is on the directives of the European Commission and their national implementation, such as the RoHS-Recast (Restriction of the use of certain Hazardous Substances), the chemicals regulation REACH (Registration, Evaluation, Authorisation of Chemicals) and the material data declaration. In order to anticipate a possible complete ban on the use of PFAS (per- and polyfluoroalkyl substances) under REACH, the expert group set up its own task force on this topic at the beginning of the year. Together with the manufacturers of passive components, it is working on a common position for the preservation of the use of the chemicals of this substance group, as they are contained in nearly every product and no substitutes are available. This position will be communicated to the representatives of the authority via the EU stakeholder consultation in the fall of 2023. Members of the expert group are also involved in the working group "Substance Policy, Working Group Environment and Packaging" and the Core Team Passive Components.



Source:
Isabellenhütte Heusler GmbH & Co KG



Source:
TDK Electronics AG

2. Marketing / Public Relations

The market figures for passive components determined by means of the common European e-statistics – the “EPC-eStat” – are published in aggregated form as graphics for the joint General Meeting and for the press conferences of the trade associations ECS and PCB-ES.



Source:
EBG Elektronische Bauelemente GmbH

3. ZVEI Automotive Association

The expert group is represented in the respective working groups and actively supports the individual main topics: Consumer Components for Automotive (Applications), High-Temperature and Power Electronics, Functional Safety / ISO 26262, Zero-Defect-Strategy, Defective Part Analysis Field and Robustness Validation.

4. Standardisation and norming

Through active participation in the Working Group of the ZVEI Executive Board “Innovation Policy” and in the working group “Technical Regulation and Conformity Assessment,” important work content received attention and results were achieved with regard to standardisation.

5. Penalty duties on aluminium foil (EU – Case AD668)

In 2021, the EU Commission imposed anti-dumping duties (AD 668) on aluminium foils from Chinese manufacturers for imports into the EU at the request of European aluminium foil manufacturers. This has led to competitive disadvantages for European manufacturers of aluminium electrolytic capacitors, as they are dependent on the respective special foils from China. This is because no comparable foils can currently be obtained from European manufacturers. Together with the manufacturers of aluminium electrolytic capacitors organised in the association, the expert group achieved a postponement of the levying of the punitive duties by nine months (October 2021 to June 2022). This has given the European manufacturers of aluminium electrolytic capacitors organised in ZVEI and EPCIA time to take further measures to prevent the planned punitive duties. For example, the EU Commission launched a stakeholder consultation in March 2022 in which the companies concerned participated and explained that there were no suitable European foil



Source:
Vishay Electronic GmbH

manufacturers on the market. However, they have not yet been able to convince the representatives of the authority to suspend the EU anti-dumping duties on the special films used in the EU in small quantities. They will therefore make another attempt to convince the authorities at both the European and national level of the necessity of abolishing the anti-dumping duties in October 2023. The infosheet created by the ZVEI for this purpose is intended to provide support.



Source:
Taiyo Yuden Europe GmbH

Future work priorities and challenges

In these difficult times, caused among other events by the ongoing war in Ukraine, the expert group will continue to face new demands from technology, politics, the market and the economy. As a strong representative of interests vis-à-vis national and international politics, forces are bundled in the interest of all members and demands and results are communicated accordingly.



Source:
SUMIDA Components & Modules GmbH

Electromechanical Components Group

The Electromechanical Components group represents the manufacturers of connectors and input and protective elements on the German market and represents the interests of a total of around 65 member companies in the ECS trade association in the ZVEI.

Electromechanical components comprise a broad and dynamic product portfolio. Embedded in the five main markets of the electrical industry – Industry 4.0, energy, mobility, health and buildings – they can be found in a wide variety of application fields.

The activities of the expert group and the two expert departments mainly involve observing the dynamic market, which is characterised by globalisation, as well as technological issues for early detection of trends. They thus actively promote the digital transformation. Embedded in the comprehensive network of the ZVEI, the members of the expert group benefit from the skills and topics available there, including cyber security, society & the environment and education & research. In addition to the application and macroeconomic presentations and discussions, topics on technological developments as well as standardisation or certification are discussed at the meetings and conferences. Guest lectures on current topics round off the meetings and web conferences that are always well-attended.



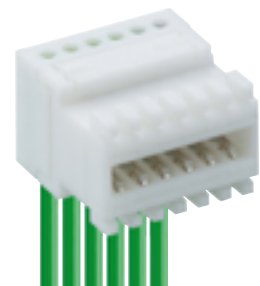
Chairman
Jörg Scheer

Connectors Department

Chairman: Andre Beneke

Technology issues, environmental legislation and market observations, as well as the consequences that can be derived from these topics, are the main elements of the Connectors Department's activities. Working groups make their contribution to the respective topics on a representative basis.

Environmental topics are a regular part of the department meetings. For example, exceptions to the RoHS or the innovations in WEEE and their influence on connectors are discussed. The REACH chemicals regulation and the resulting topics, the SCIP database and its implementation or the PFAS ban, for example, are also part of the meetings, however. Furthermore, items on standardisation and technical law are on the agenda. (In particular, the topic of sustainability with its Sustainable Development Goals is increasingly coming into focus.



Source:
Lumberg Holding GmbH & Co KG



Source:
ESKA Erich Schweizer GmbH



Source:
EAO GmbH

A sub-working group has been set up specifically on the subject of the product carbon footprint in order to develop a common understanding and a calculation approach for connectors. Initial results were presented at the connector conference organised by Vogel-Verlag in Würzburg and documented in a guide. (Guide – Calculation of a CO2 footprint (zvei.org))



Source:
ESCHA GmbH & Co KG

Additive manufacturing of individual parts and products is gaining importance in many areas of industry, including connectors, and is enabling new business models. Nevertheless, materials, printing processes and standards are only suited for the near-series use of additively manufactured connectors to a limited extent. For this reason, a specially founded working group has taken on the task of highlighting and specifying the corresponding requirements in a guide. The guide "Additive Manufacturing in Electrical Connectivity: Potentials and Requirements" has been published and has since been received very positively by customers and manufacturers. There are plans to add the topic of "processes" to the guide. Accordingly, the panel deals with the pre- and post-processes in additive manufacturing.



Source:
PHOENIX CONTACT GmbH & Co KG

Another working group deals with the requirements for validation and processing of contacts. It deals with topics ranging from contacts for low-cross-section cables to crimping standards. Based on the specifications of the OEMs, a technical guideline for the testing and validation of contacts and connectors for the automotive industry was created there. This guideline only serves as a basis for a standards process at DIN/VDE. The topic of sustainability also plays an important role here, however. A paper on the sustainable use of plastic waste (recyclate) is currently being prepared.

Based on the activities in support of the common self-image of the trade associations ECS and PCB-ES, the expert department Connectors has developed its own understanding. Derived from these demands, measures and topics are now collected in a topic matrix that serves as a basis for the committee meetings. This information is collected in an "information cockpit" in the Teams channel and made available to the expert department.



Source:
Franz Binder GmbH & Co

Input and Protective Elements Department

Chairman: Guido Körber

This expert department is home to manufacturers of everything from traditional switches to sensors and from input elements to keyboards and protective elements.

In addition to the general topics of market, technology and environmental legislation, the department also deals with broader issues such as the basics of modern company planning and social developments with their expected effects on our companies. Unfortunately, it has not been possible to organise a physical meeting the last two years, therefore the members of the expert department have only met online in a smaller circle. There are plans to bring the member companies from this area together again for a face-to-face meeting with an attractive agenda, however.



Source:
U.I. LAPP GmbH

Microsystems Technology Group – Sensors/Actuators

The microsystems technology member companies organised in the ZVEI represent the broad spectrum of microsystems technology in Germany.

The Internet of Things, Autonomous Driving, Industry 4.0, Ambient Assisted Living – all these applications would not be possible without microsystems technology.

The expert group would like to draw attention to developments in microsystems technology and their impact on German industry.

Economic situation, market

For 2022, the Market Commission's investigations into the German market for semiconductor-based sensors / actuators revealed significant growth (+36% compared to 2021) to a level of 1.48 billion euros. The overall semiconductor market was also quite strong, posting a 14% increase in sales to a market volume of 21.8 billion US dollars.

Mission statement of the expert group

The expert group has developed a new mission statement. The mission statement defines what is within the scope of the expert group's work, what its goals are, by what means and how they are to be achieved, as well as how the group works together.

Working Group Robustness Validation for MEMS

The working group has revised and expanded the manual "Robustness Validation for MEMS." It chose ARRA (Advanced Robustness Validation and Reliability Assessment) as its new name. This extended methodology is intended to enable different levels of validation (ARRA Levels).

Market statistics (Destatis)

New product categories for sensors were introduced in the official Destatis statistics. The expert group intends to develop a filling-in aid for this, which will be made available to those responsible for reporting. Here, we would like to mention the very good cooperation of the expert group with the AMA Association for Sensor and Measuring Technology e. V., which has been practised for many years. The AMA and the expert group intend to jointly prepare the filling-in aid.



Chairman
Hubert Conti-Geitner



Source:
STMicroelectronics Application GmbH

Start-up scene

During the meetings of the expert group, our members were able to listen to a presentation by Startup-Autobahn about their network and start-up scene, as well as two pitches by promising start-ups. One was about lidar systems and the other about digital twins for e-motor simulations.

Quantum sensors

During an expert group meeting, an exciting presentation was held on quantum sensors by Quantum Technologies, followed by a sensor demonstration. Afterwards, the speaker was recommended to participate in the competition for the AMA Innovation Award 2023. And, in fact, he was successful. Quantum Technologies GmbH won first prize!

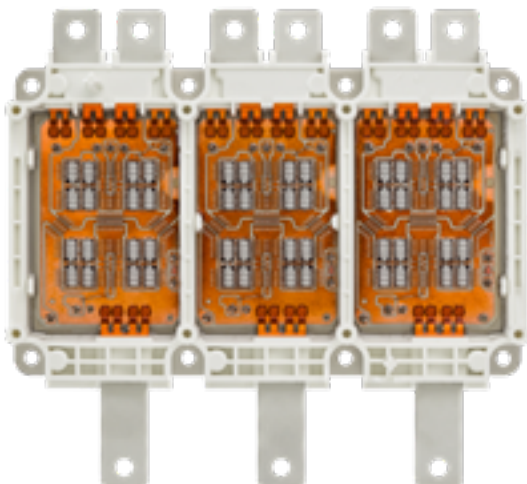
It is important to the expert group to cooperate with other specialist associations within the ZVEI, as these cooperations can lead to synergies and the ZVEI offers an excellent platform for this. For this reason, the expert group regularly exchanges ideas with the expert department "Electronic Binary and Analogue Sensors" of the Automation Association. There are also links to the expert group Semiconductors.

Funding topics

Publicly funded research projects are an important instrument for the companies in the expert group for advancing research topics across companies and with the support of the Academy. The expert group is therefore regularly informed about current funding programmes by the project management organisation VDI/VDE-IT. This took place in the two meetings of the expert group in 2022.

Sessions

The Covid-19-infection situation and the slow return to normality allowed the meetings to be held predominantly as attendance sessions. Nevertheless, the hybrid format will continue to be offered and maintained for guest lectures, among other topics.



Source:
Infineon Technologies AG

European Semiconductor Industry Association (ESIA)

Hendrik Abma, Director General of the ESIA: Progress in 2022 & Outlook for 2023

President:

Kurt Sievers, President and CEO,
NXP Semiconductors

Vice-President:

Christian Wiebus,
Senior Director New Business & Innovation,
NXP Semiconductors

Director General:

Hendrik Abma

Members:

16 companies,
three national associations,
four research and technology organisations



**Director General of the ESIA
Hendrik Abma**

In 2023, the European semiconductor industry received the attention commensurate with its strategic importance for national economies and in geopolitics. The ESIA is the voice of the semiconductor industry in Europe. It helps to ensure that EU legislation is targeted and future-proof, making the digital and green transformation a reality.

Just 15 months have passed between the presentation and adoption of the EU Chip Law. After continuous dialogue with policy makers, the ESIA welcomes this regulation as a landmark decision. Together with the IPCEI for Microelectronics and Communications Technology, it provides the necessary impetus for the expansion of European chip manufacturing. In addition, the Critical Raw Materials Regulation and the Net Zero Industrial Regulation create upstream security of supply and downstream incentives for clean energy systems.

The ESIA proactively participates in EU-level discussions and consultations on export controls, including in the EU-U.S. Trade & Technology Council, and advocates for a global level playing field. Other priorities include ensuring that no tariffs are imposed on electronic transfers worldwide. The ESIA and the World Semiconductor Council (WSC) continue to advocate for the expansion of the ITA and for duty-free treatment. The ongoing EU customs reform is expected to bring simplified and more efficient rules. Finally, the Unified Patent Court entered into force in June, allowing for simplification of procedures through a unified jurisdiction.

In May, the ESIA succeeded in reaching consensus among the six regions of the World Semiconductor Council to adopt a new voluntary agreement to reduce PFC gas emissions by 2030. This underscores the global commitment to combating climate change. In addition, the ESIA is advocating workable solutions for industry in the revision of the F-Gas Regulation. The ESIA is also working on the regulation of a variety of chemicals necessary for the manufacture of semiconductors, most notably the proposal to restrict PFAS, where the ESIA is seeking an exemption.

ESIA members are also pioneers in responsible corporate governance: issues such as corporate due diligence on sustainability and a ban on products made with forced labour have long been on their radar. In addition, the ESIA finalised a guide to the EU Taxonomy Framework in 2023, which provides guidance on the sustainability assessment of semiconductor manufacturing according to the classification system.

As EU Commissioner Thierry Breton said: "Without chips, no digital transformation, no green transformation, no technological leadership." The ESIA helps Europe achieve its goals and look forward to a green and sovereign future

European Passive Components Industry Association (EPCIA)

European Interest Group for Manufacturers of Passive Components

www.eusemiconductors.eu/epcia/epcia-home

President:

Ralph M. Bronold,
TDK Electronics AG

Vice-President:

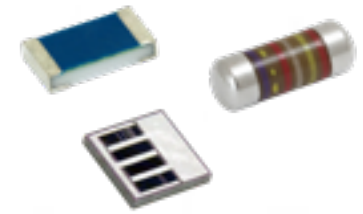
Christophe Pottier,
Murata Electronics Europe

Secretariat:

Dr. Marcus Dietrich, ZVEI

Members:

Twelve companies, three national associations, two research institutions



Source:
Vishay Electronic GmbH

Objective of the EPCIA

“To represent and promote the common interests of the Passive Components Manufacturers active in Europe to ensure an open and transparent market for passive Components in Europe as part of the global marketplace.”

Focal points of activities in 2023

- Active participation of member companies in the now firmly established European statistics for passive components “EPC-eStat.”
- Extended and more intensive cooperation with the WPTS (World Passive Components Trade Statistics): The statements on the market development of passive components could thus be placed on an even broader, international basis.
- Organisation and hosting of the WPTS meeting in Lisbon in May 2023
- Publication of the “European Market for Passives” newsletter
- Development of a comprehensive award programme for outstanding diploma and doctoral theses in the field of passive components, also to improve the visibility of the association and the passive components industry in the university environment.
- Initiate and financially support university research in the field of passive components: This is intended to increase the attractiveness of our industry for young professionals from the E&E field.

- Punitive duties on aluminium foils (Case AD668) imported into the EU from China: Joint lobbying with the ZVEI and the manufacturers of aluminium electrolytic capacitors organised in the association to avert EU punitive duties on special aluminium foils required for production; thus avoiding competitive disadvantages for European manufacturers of aluminium electrolytic capacitors.
- Observation and discussion of technological trends and standardisation issues
- Regulated exchange of opinions of the member companies in the meetings on current topics of the market, legislation and the political situation in Europe and the world
- Networking at the European level
- Environmental legislation and lobbying

In close partnership with the EECA/ESIA, the EPCIA strives to continue to work on cross-market issues in order to be able to meet the common challenges even better. The opportunities offered by the cooperation with the ZVEI will be used wisely.

As the most important interest group for manufacturers of passive components active in Europe, the members have set themselves the goal of further strengthening and expanding the EPCIA. Thus, further research institutions in the field of passive components are to be won as members to strengthen the EPCIA, universities, for example.



Source:
TDK Electronics AG

PCB and Electronic Systems

Electronics Manufacturing and Services Group

The Electronics Manufacturing and Services group has around 80 members from the field of manufacturers of electronic assemblies (both in-house manufacturers and EMS providers – Electronic Manufacturing Services Providers – and their suppliers). The group is characterised by medium-sized companies that operate predominantly in the German-speaking market; there are also a few global players among the members.

Market development

The global market for electronic assemblies grew by 3 percent to nearly 1.2 trillion US dollars in 2022, following above-average growth in 2021 (22%). Except for China (-4.9%), all regions were able to grow, America even by close to 14%. Expectations for 2023 are cautious, especially due to the declining figures in China. A slight decline is even expected worldwide.

The market in Germany continued to grow by 2.7 percent, following strong growth in the previous year (22.7%). Stronger growth in the double-digit range is expected again in 2023.

The turnover of electronic assemblies in euros shows a somewhat different picture due to the exchange rate. For 2022, global growth in euros is significantly higher at around 16 percent. Global turnover will reach 1.3 trillion euros for the first time. Sales growth for Germany in euros is around 15 percent with a sales value of more than 33.4 billion euros. This exceeds the peak value from 2018 (32.9 billion euros).

Focal points of the members' meetings

In the past year, the Electronics Manufacturing and Services group discussed current topics and informed itself in two face-to-face meetings. The members intensively exchanged views on the current situation, the market situation, technological trends and developments. In the process, the name of the group was adapted in the fall of 2022 to make it clear that the manufacturers of electronic assemblies do much more than simply place components on a circuit carrier.

In the Market working group chaired by Xaver Feiner, information was provided on supply chain management and the challenge of the material situation, company succession and generation change were discussed, and there was an exchange on the practical implementation of due diligence in the supply chain. There were also presentations on the EMS industry in the DACH region and in Europe.

The agenda of the Technology & Test Engineering working group chaired by Martin Franke focused on the detection of counterfeit electronic components (labelling, inline detection, security layers), recycling of solders and new normal working models. Information was also provided on the use of open source software on the shop floor.

In the Services in EMS initiative chaired by Michael Velmeden around 30 EMS companies provide information about their capabilities and present their range of services.



Chairman
Michael Velmeden



Source:
Melecs EWS GmbH

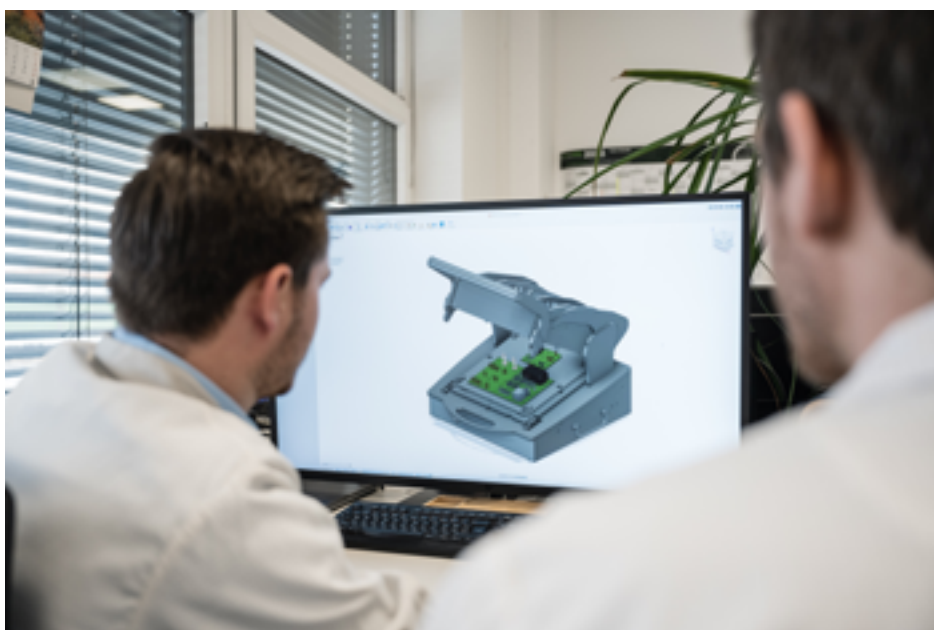
The initiative drew attention to its services in 2022 with an image campaign on Twitter and LinkedIn as well as on the website. To this end, articles on the importance of an underestimated industry, resilient value chains / value chain security and electronics in DACH (supply) security, consistency, know-how and SMEs were published on the website. In addition, the initiative organised a moderated roundtable panel discussion at electronica entitled "The Importance of the EMS Sector for the Industry" with a very good response. The opinion piece "The Backbone of the SME Sector" was published in the overall ZVEI newsletter and the EMS sector was featured in the expert knowledge section of Ampere magazine. In addition, a marketing campaign is being prepared to make the industry known beyond professional circles.



Source:
PRETTL Electronics Lübeck GmbH

The third and fourth editions of the EMS Sales Days took place as face-to-face sessions at the ZVEI in Frankfurt. The topics of the third edition were the market and business cycle of the electrical industry, CO₂ neutrality of companies, products, supply chains, sales strategy and sales performance, competitive analyses, escalation management, controlling and offers. At the fourth EMS Sales Days, the agenda included rework of electronic assemblies, technical cleanliness in electrical engineering, power assemblies versus miniaturisation and recycling of solders. Geopolitics and the economy were also highlighted. The focus was on AI (artificial intelligence) in electronics manufacturing. In addition to the presentations, a networking session was also integrated into the programme.

The members of the group Assembly will continue to focus on the entire supply chain and contribute to supporting each other through their joint activities.



Source:
cms electronics GmbH

Printed Circuit Boards Group

Artificial intelligence was one of the most frequently used buzzwords in technology magazines in recent months. The direct connection with the microelectronics necessary for this was discussed in each of these articles. The increased use of renewable energies is another trend that affects the electronics industry. Europe has set ambitious goals to increase the share of renewable energies in the energy mix. This has led to increased use of solar and wind energy, which in turn has increased demand for power electronics and the respective printed circuit boards. With the increasing interconnectivity of devices and the fear of data leaks and cyber-attacks, companies have started to focus more on safety-critical electronics. This includes the use of encryption and authentication technologies to ensure the integrity and security of data. The ongoing miniaturisation of electronic components and the increased demand for performance and speed require smaller and more densely packed PCBs to meet the increasing requirements. This development leads to an increased demand for high-speed PCBs and complex HDI multilayers.

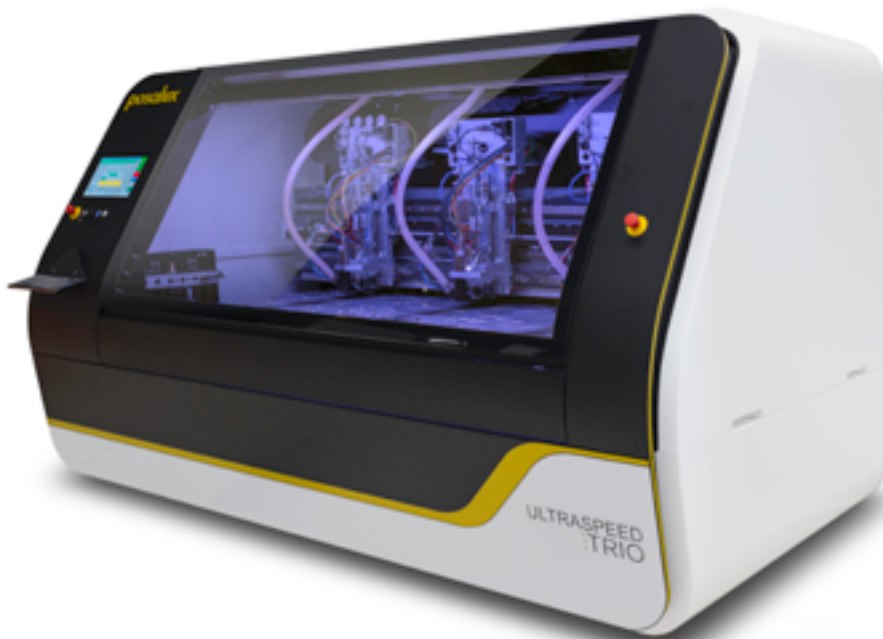
Investments will be necessary if we don't want to miss out on these developments, especially in innovative processes and production facilities. In view of the aggressive subsidy policies of the USA, China and other Asian countries, many of our member companies face tough competition from manufacturers in these regions and thus important economic decisions. To remain competitive, European PCB manufacturers must also invest in research and development to develop innovative technologies and solutions.



Chairman
Walter Moser



Source:
HPTec GmbH



Source:
Posalux GmbH

The PCB industry in Europe is not only shaped by technological developments, however, but also by regulatory and environmental aspects. While necessary, the REACH regulation and the Supply Chain Act further exacerbate the situation for European manufacturers. In order to remain competitive in the high-tech sector, the European Union has pushed ahead with the European Chips Act and is thus facing up to the funding competition from the USA and Asia. An important and correct step. Unfortunately, the awareness that these chips cannot be further processed without the interconnection technology of the printed circuit board does not have the same level of attention in Europe as has been achieved in the USA. There are also explicit subsidies for the printed circuit board. If one wants to continue to play a role in the international competition for the technologies listed above, the understanding of supply chains in electronics must be broadened and communicated more intensively. Above all, however, bureaucratic hurdles in the funding landscape must be eliminated and access for SMEs to the programmes must be made easier.

The tireless work of the working groups in our expert groups continuously contributes to strengthening the competitiveness of our industry through your commitment, expertise and dedication. Through your participation in the working groups, we have discussed important developments and challenges of the industry, developed innovative solutions and advanced groundbreaking standards. A heartfelt thank you to all those who, in addition to their professional duties, have taken it upon themselves to work in the working groups and, of course, to the full-time staff of the ZVEI for their outstanding support for this.



Source:
Unimicron Germany GmbH



Source:
CICOR RHe Microsystems GmbH

Ceramic Microcircuit Group

The activities of the manufacturers of thick-film, thin-film, LTCC and DCB modules are brought together in the Ceramic Microcircuits Group.

The members of the ZVEI had an average of 2,000 employees per year. These firms are predominantly integrated into efficient and technology-oriented groups of companies, are increasingly defining themselves as full-range suppliers of electronic microsystem solutions or are serving needs primarily in the field of automotive electronics.

The past year was characterised by significant growth in demand volume, which is reflected among other ways in a 19 percent increase in sales for the German market. The main driver of sales was again automotive electronics at 70 percent, followed by industrial electronics at 20 percent and telecommunications technology at about 5 percent. The German share of the total European volume for ISS is about 50 percent. The growth for the European economic area is stated at +17 percent for 2022. The global market for ISS can only be estimated due to limited sources and a lack of market studies and is valued at approximately 6.2 billion US dollars.

Growth was driven by demand in the areas of industrial automation, medical technology, sensor technology, the automotive industry and aerospace & defence. The companies in the division are participating to a large extent in global developments with regard to the digitalisation of the industrial landscape, changing forms of mobility and developments in the energy sector, as well as in the expansion of the infrastructure required for this.

Due to bottlenecks in the supplier market and limitations in the companies' own capacity, demand could not be fully met in 2022. The sufficient availability of skilled workers in production technology and development is repeatedly cited as a brake on growth. In order to solve this persistent deficit on the labour market and in the area of young skilled workers, support from politics at the municipal and national level is required in addition to the activities of the companies.

Ceramic circuit carriers are an important prerequisite for the realisation of electronic systems with high functional density or power assemblies. The excellent material properties with regard to thermal conductivity and insulation strength, the suitability of the ceramic carrier for high-temperature applications and the thermomechanical properties optimally matched to semiconductor components and MEMS elements are key advantages. Besides microstructuring for applications in the RF range and for sensor systems, the focus of implementation is increasingly shifting to power applications. The predicted growth in the development and production of power semiconductors in SiC technology will give the use of ceramic circuit carriers a significant boost in the years to come. The scope of new projects that have been realised is proof of the attractiveness of these layer-integrative wiring carriers.



Chairman
Dirk Schönherr



Source:
Kolektor Siebert GmbH

The structuring of the ceramic carriers is differentiated according to thick-film technology (screen printing), thin-film technology (sputtering/vapour deposition process), LTCC technology (multilayer structures in screen printing technology) and DCB technology (Cu foil laminated on ceramic).

An important part of the meetings of the expert group in 2022 was the discussion and debate on the market situation as well as the assessment of the European and global market for ISS. The intensive technical exchange of ideas within the expert group is seen by the members as an important motivation to work together. One focus was on the qualitative assessment of technological developments with regard to thin-film, thick-film, LTCC and DCB technology. This exchange is being actively accompanied by companies from the supplier industry. No relocations from Germany took place in 2022. The member companies have noted the first corrections in development strategy and purchasing policy. They are again increasingly looking for spatial and cultural proximity to their business partners.

Participation in public events, especially at trade fairs, has changed in the wake of the recent pandemic. Our member companies currently assess the prospects for generating new business through active participation in industry trade fairs for the area of ISS to be predominantly low. The success of new projects is determined by intensive preliminary discussions in direct contact with business partners at a very early stage of development. For the presentation of our services to potentially interested parties, the presence at trade symposia and conferences is gaining in importance and is in the foreground. There are intensive contacts with research institutions.

The members of the Ceramic Microcircuit Group are involved in the Market Commission, in the development of the technology roadmap and in the technical commission of the association and make an important contribution to the association as a whole.

Cross sectional topics of ECS and PCB-ES

Technical Commission

In the two trade associations ECS and PCB-ES as well as in close exchange with the trade association Automotive, the Technical Commission (TC) serves as the joint platform for discussion and exchange of relevant technical topics. This includes, among other topics, the intensive discussion of all technological and environmental issues and trends, current and sector-specific topics of the electronic component, PCB and assembly industry as well as support on technically oriented issues. Furthermore, the TC coordinates the main topics of the expert groups and in this context also represents the mirror committee.

The Technical Commission currently comprises eight active working groups with various ad hoc groups that take on specific tasks. The main topics of the basic material and component manufacturers up to the assembly producers can thus be covered in one committee of the Technical Commission. In addition, more and more topic-oriented working groups have been formed in recent years that use the basic knowledge and prepare it in a targeted manner based on the application.

The high level of representation and networking of all product groups of electronic components represented in the two trade associations form the basis for the strength and expertise of this body. The work in the Technical Commission is not limited exclusively to the activities in the ZVEI. At the European level, the interests of the member companies are also represented through contacts to the European partner associations ORGALIME and EECA (European Electronic Component Manufacturer's Association) as well as to JEDEC (Solid State Technology Association) or SAE (Society of Automotive Engineers). This network helps to achieve the goals of representing the members' interests in the long term and creating added value for them. There is also a lively industry-specific exchange with the VDA (German Association of the Automotive Industry), for example.

In this context, it makes sense to highlight the most recent publications in addition to the already permanently established and very important topics. In the follow-up to the public relations work initiated in 2022 to improve the level of awareness and acceptance of our publications, further discussions were held with other (trade) associations as well as organisations that follow the market.



Chairman
Bernd Enser



Source:
Würth Elektronik GmbH & Co KG



Source:
EBG Elektronische Bauelemente GmbH



Source:
Panasonic Industry Europe GmbH

Here, not only the considerable knowledge advantage of our trade associations was evaluated positively, but also the willingness to share this and thus support the entire field of the electrical / electronics industry. The task now is to continue to pursue the tried and tested and to be open to new ideas.

In this context, it became clear that the member companies need to become more involved in standardisation with the support of the ZVEI in order to ensure that the technical guidelines and references created in the two trade associations find their way into standardisation in the future. Therefore, various meetings and workshops have been held with the member companies and the main office of the ZVEI in recent months to address this issue and take the necessary steps to strengthen the standardisation activities.

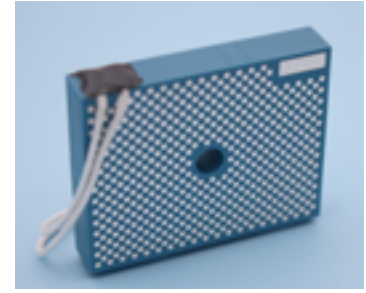
Our guideline on "traceability" continues to be tried and tested. Here, too, the need for adaptation and possible reorientation has become apparent over the years. This adaptation was implemented despite the difficult conditions, so that a concrete implementation orientation could be worked out based on the guideline. This also laid a foundation for today's digitalisation at a very early stage. In addition, the question of what possibilities, but also solutions, are possible was examined extensively, especially with regard to the tracing of product and process data.

The digital transformation, also known as "Industry 4.0," nevertheless continues to present us with challenges. This is because it is not only about technical solutions, but also about data security and compliance, among other topics, but also and above all about implementation in ongoing operations - and that with an almost no longer foreseeable speed that can be set. However, it has also been shown that necessity is the mother of invention: we were not only able to roll out broadband online communication in a way that was previously difficult to imagine, but were also able to use it in a variety of ways, for online audits or remote engineering, for example.

In this context, we will not only continue to live the contents with the new Executive Board of the main association, but above all we will also continue to expand communication.

The Technical Commission was once again able to demonstrate its commitment and expertise with continued support of the activities of the Automotive Association. In this context, the Technical Commission not only acts as a cross-sectional and synergetic element between the technological basis and the market requirements, but was once again able to impressively demonstrate that the entire spectrum of topics is addressed and dealt with in a sustainable manner. In this context, not only the direct series of publications should be mentioned, but above all the very intensive discussions with all participants and the resulting sensitisation. In the spirit of the guiding principles of our professional associations, we will take up important current topics, deal with them in a structured manner and process them, as well as continue to promote the corresponding marketing in a professional manner and by using new media.

The working groups represented in the Technical Commission and their main topics are listed below:



Source:
VIA electronic GmbH

Working Group Environment and Packaging

Chairman: Hans-Jürgen Völkl

Deputy Chairman: Ralph Schimitzek

The focus is on product-related environmental protection in the components industry with topics such as REACH (PFAS), RoHS and material data declaration.

Working Group Environmental Protection and Occupational Safety in Semiconductor Manufacturing

Chairman: Dr. Andreas Jantschak

Deputy Chairman: Thomas Schön

The focus is on operational environmental protection in the semiconductor industry with the topics of waste water, exhaust air, certification, fire protection, lobbying, chemicals and occupational safety.

Working Group Technology Platform

Chairman: Dr. Andreas Lock, Robert Bosch GmbH

The focus of the working group is on the creation and updating of the new technology roadmap, which will provide a unique overview of the future requirements for electronic components and assemblies against the backdrop of the expected megatrends and the related business model innovations and process methods. In the next update, indirect topics in particular will also be considered, but these will influence the development technically possible.

We will only be able to continue to develop and implement successful technical solutions in the long term if we compare them with tasks such as the “carbon footprint,” the Supply Chain Act or topics such as the General Data Protection Regulation.

Working Group Component Cleanliness

Chairmen: Dr. Marc Nikolussi and Harald Hundt

The focus is on technical cleanliness in electrical engineering with topics such as extraction analysis, types of impurities, functional safety and standardisation.



Source:
Weidmüller Interface GmbH & Co KG

Working Group Design Chain

Chairman: Markus Biener

Vice-Chairman: Arnold Wiemers

The focus is on crystallising and illustrating all interrelationships with regard to electronics design and, in particular, the dependencies of the participants within the chain.

Working Group Quality

Chairman: Ingomar Trojok

The primary focus is on the ZVEI Zero Defect Strategy with the topics of certification of quality management systems in the automotive industry, such as the IATF-16949 standard and ISO/TS 16949.

The second focus is on the PCN methodology with the topic of changes to electronic components, which must be approved by the manufacturer and be announced by issuing a “Process/Product Change Notification” (PCN).

Working Group Technical Regulation and Conformity Assessment

Reporter: Christian Paulwitz

The focus is on conformity assessment, testing, certification and accreditation of the topics New Approach and Guidelines.

In this context, I would like to thank all partners, participants and supporters of our activities. After all, we can only face and overcome the challenges together in the sense of a sustainable future. I am already looking forward to the tasks ahead and to continuing our good working relationship.



Source:
Taiyo Yuden Europe GmbH

Market Commission

Structure and work of the Market Commission

The Market Commission is one of the cross-sectional bodies of the two trade associations ECS and PCB-ES; the market experts of the following expert groups are represented in it:

- Semiconductor Devices department
- Passive Components group
- Electromechanical Components group
- Microsystems Technology – Sensors / Actuators group
- Electronics Manufacturing and Services group
- Printed Circuit Boards group
- Integrated Layer Circuits department

The Market Commission's body collects and prepares market data, makes it available as a service to the association's members and thus supports the ZVEI's public relations work at press conferences, presentations, interviews and editorials.

The focus of the work is on the creation of market tables with current market data on electronic components and assemblies. The meetings of the delegates from the above-mentioned expert groups and departments, which take place twice a year, guarantee a reliable and consistent database.

Global economy

As in 2021, 2022 saw a significant recovery in the global electronics market and was able to emerge from the corona pandemic strengthened by a positive development. For 2023, however, the IMF forecasts global economic growth of only 2.8 percent. This is below the average of the past decades. The high inflation rates, interest rate policy and economic policy tensions in the industrialised countries are contributing to this. As of April 2023, negative growth of -0.1 percent is forecast for Germany.



Chairman
Xaver Feiner

Situation of the electronic components market

After growing by 23.6 percent in 2021, the global electronic components market grew by a further 2.7 percent last year. However, the global shortage of components and disruptions in logistics continued to cause problems in the supply chain. At the same time, the decline in demand in the consumer sector, in the semiconductor sector in particular, has prevented higher growth.

From a regional perspective, the USA showed the highest growth of 14.6 percent and China the strongest decline of -4.9 percent in 2022. The EMEA market grew by 8.7 percent in 2022. Despite already massive growth of 18.5 percent in 2021, the German market for components increased by another 15.1 percent last year.

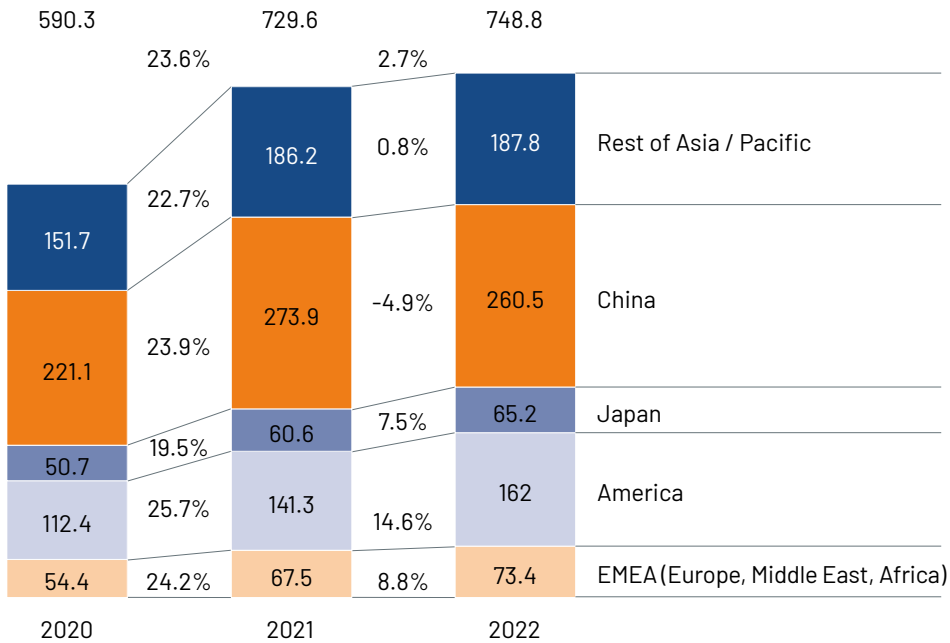
Outlook

The overall economic development is expected to weaken in the current year 2023. Russia's war on Ukraine, rising interest rates and still weak consumer electronics mean that the global downturn will continue, based on expectations.

Market graphics

Global Market for Electronic Components 2020 – 2022

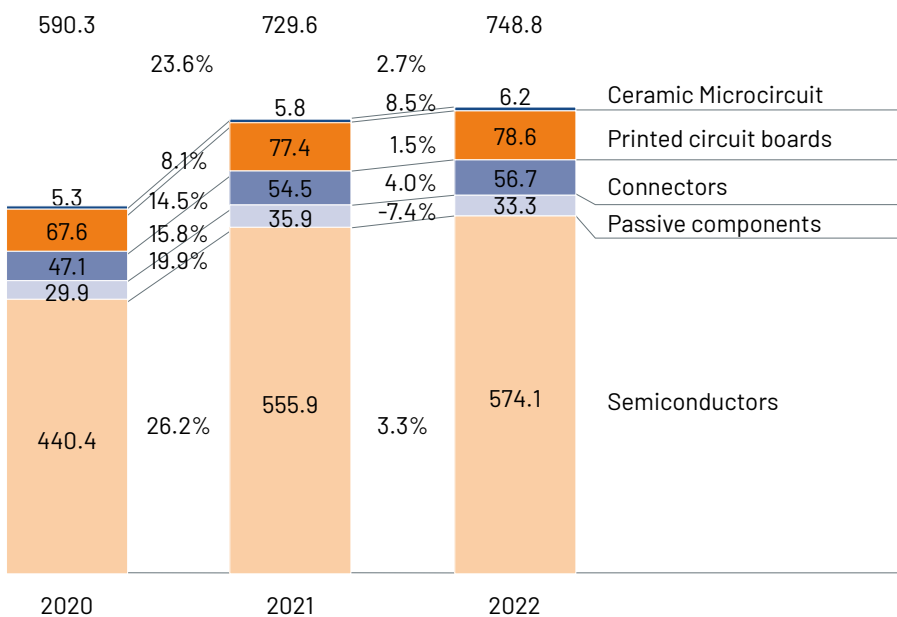
Regions in billion US dollars



Source: ZVEI

Global Market for Electronic Components 2020 – 2022

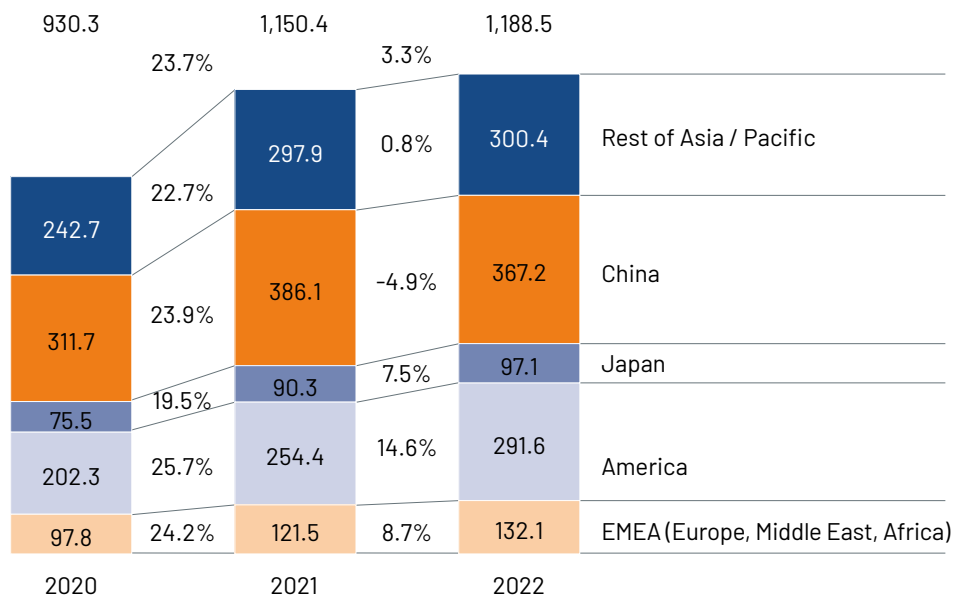
Products in billions of US dollars



Source: ZVEI

Global Market – Electronic Assemblies 2020 – 2022

Regions in billion US dollars

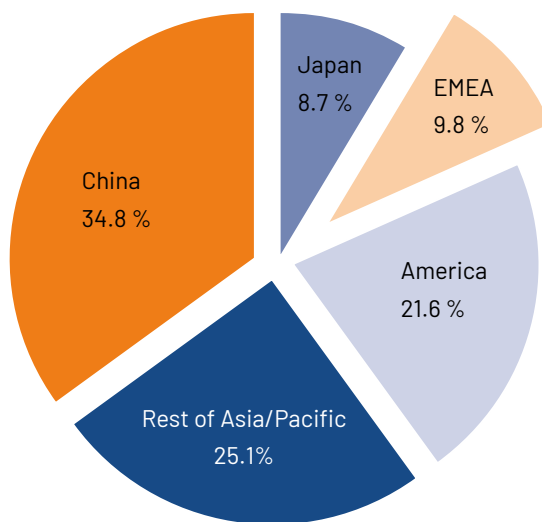


Source: ZVEI

Global Market – Electronic Components 2020-2022

Regions in shares

2022 = 748.8 billion US dollars



Source: ZVEI

Identification and Traceability in the Electrical Engineering and Electronics Industry

Traceability often gains importance when the defect has already occurred in an end product. Then it is important that the source of the defect can be reliably isolated and that targeted recall actions can take place quickly. Anyone who has developed a traceability concept for their company is quickly in a position to carry out seamless tracing and identification of the manufactured products along the entire supply chain. In addition, traceability offers the opportunity to achieve greater transparency in the cost tracking of processes in one's own company and thus enables long-term cost reductions and process optimisation.

It is often difficult for companies to get started with introducing traceability. The ZVEI Traceability Levels were therefore developed as a supplement to the ZVEI Guide to Identification and Traceability in the Electrical and Electronics Industry. They serve as an aid and are intended to describe the requirements for various product categories in greater detail. All products along the value chain are taken into account, from raw materials and electronic components to assemblies, modules, devices and systems. The Traceability Levels are supplemented by practical examples of parameters to be recorded during the manufacturing process. In addition, an overview of traceability and risk management standards and certifications is also provided.

Core elements of the ZVEI guide to identification and traceability in the electrical and electronics industry include definitions, benefit and effort considerations, data for traceability, technology of interfaces and practical examples.

In addition, the ZVEI traceability initiative has developed an identification matrix for data transfer and interfaces to the shop floor for connecting machines, devices and workplaces. Configuration files in XML format with documentation are available for this purpose that can be linked to the software systems currently available.

Benefits and advantages of the ZVEI traceability concept at a glance:

- Transparency with regard to the costs and processes
- Process optimisation inside the company
- Increased overall effectiveness
- Uniform data standard
- Cross-process standardised data interface
- Minimisation of risks
- Optimisation of quality and costs
- Avoidance of damage to one's image
- Acquisition of new customers and opening up of markets
- Holistic traceability is a foundation for digital transformation

Current information and downloads:

www.zvei-traceability.de



**Chairman
Johann Weber**

Member companies

Section Electronic Components and Systems

- A**
- Adels-Contact Elektrotechnische Fabrik GmbH & Co KG, Bergisch Gladbach
 - Advantest Europe GmbH, Böblingen
 - Agilent Technologies Deutschland GmbH, Böblingen
 - Amphenol Tuchel Industrial GmbH, Heilbronn
 - ams Sensors Germany GmbH, Jena
 - Analog Devices GmbH, Munich
- B**
- Baker Hughes Inteq GmbH, Celle
 - Franz Binder GmbH & Co Elektrische Bauelemente KG, Neckarsulm
 - Robert Bosch GmbH, Stuttgart, Reutlingen, Gerlingen
 - Bundesdruckerei GmbH, Berlin
- C**
- Code Mercenaries Hard- und Software GmbH, Schönefeld
 - Conec Elektronische Bauelemente GmbH, Lippstadt
 - Contact GmbH A Lapp Group Company, Stuttgart
 - Conti Temic Microelectronic GmbH, Nuremberg
- D**
- Display Elektronik GmbH, Nidda
 - Doduco Contacts and Refining GmbH, Pforzheim
- E**
- EAO GmbH, Essen
 - EBE Elektro-Bau-Elemente GmbH, Leinfelden-Echterdingen
 - EBG Elektronische Bauelemente GmbH, Kirchbad, Austria
 - Electronic-Bauteile Görlitz GmbH, Görlitz
 - Elmos Semiconductor SE, Dortmund
 - Elschukom GmbH, Veilsdorf
 - Enocean GmbH, Oberhaching
 - Escha GmbH & Co KG, Halver
 - Eska Erich Schweizer GmbH Elektrotechnische Fabrik, Kassel
 - Euchner GmbH + Co KG, Leinfelden-Echterdingen
- F**
- Fastron Gesellschaft für Elektronik und Bauelemente mbH, Pinsheim
 - Feinmetall GmbH, Herrenberg
 - Ferroxcube Deutschland GmbH, Hamburg
 - FTCap GmbH, Husum
- G**
- Globalfoundries Dresden Module Two LLC & Co KG, Dresden

H Harting AG, Biel, Switzerland
Harting Deutschland GmbH & Co KG, Minden
Harting Electric GmbH & Co KG, Espelkamp
Harting Stiftung & Co KG, Espelkamp
Heraeus Deutschland GmbH & Co KG, Hanau
HIK GmbH, Oberzent / Beerfelden
Hirschmann Automation and Control GmbH, Neckartenzlingen
HIS Renewables GmbH, Beerfelden
Hotec Electronic Hollenberg GmbH, Tecklenburg-Brochterbeck
Huber + Suhner GmbH, Taufkirchen

I Infineon Technologies AG, Munich, Neubiberg
Inova Semiconductors GmbH, Munich
Intel Germany GmbH & Co KG, Feldkirchen
Isabellenhütte Heusler GmbH & Co KG, Dillenburg
ITT Cannon GmbH, Weinstadt

J Johnson Electric Germany GmbH & Co KG, Halver branch office

K Kemet Electronics GmbH, Munich
Kostal Automobil Elektrik GmbH & Co KG, Lüdenscheid
Kostal Kontakt Systeme GmbH, Lüdenscheid
Kugler Maag Cie GmbH, Kornwestheim
Kyocera AVX Components (Dresden) GmbH, Klingenberg

L Lear Corporation GmbH, Remscheid
Lumberg Holding GmbH & Co KG, Schalksmühle

M Marquardt GmbH, Rietheim-Weilheim
Melexis GmbH, Erfurt
Metz Connect Tech GmbH, Blumberg
Microtech GmbH Electronic, Teltow
Molex Connectivity GmbH, Walldorf
Molex Deutschland GmbH, Walldorf
MPE-Garry GmbH, Füssen
Murata Electronics Europe B. V. Germany Branch, Nuremberg
Murata Electronics Oy, Nuremberg
Murrelektronik GmbH, Oppenweiler

N Nexperia Germany GmbH, Hamburg
NKL GmbH, Wolpertshausen
NXP Semiconductors Germany GmbH, Hamburg, Munich

- O** ODU GmbH & Co KG, Mühldorf
ON Semiconductor Germany GmbH, Aschheim-Dornach
Osram GmbH, Munich
- P** Panasonic Industry Europe GmbH, Haar
Pancon GmbH, Bad Homburg v. d. Höhe
Panduit GmbH, Schwalbach am Taunus
Phoenix Contact GmbH & Co KG, Blomberg
Preh GmbH, Bad Neustadt a. d. Saale
ProMik Programmiersystem für die Mikroelektronik GmbH, Nuremberg
Provertha Connectors, Cables & Solutions GmbH, Pforzheim
- Q** Qualcomm CDMA Technologies GmbH, Munich
- R** Radiall GmbH, Rödermark
Rödl & Lorenzen GmbH Elektrotechn. Spezialfabrik, Oberrot
- S** Schaffner Deutschland GmbH, Karlsruhe
Schaltbau GmbH, Munich
Schleuniger GmbH, Radevormwald
Schurter GmbH Bauteile – Tastatursysteme, Endingen
Sekels GmbH, Ober-Mörlen
Semikron International GmbH, Nuremberg
Sensitec GmbH, Wetzlar
Siba GmbH, Lünen
Siemens AG, Munich, Berlin, Erlangen, Karlsruhe
Siltronic AG, Munich
Spinner GmbH, Munich
Stäubli Electrical Connectors GmbH, Weil am Rhein
STMicroelectronics Application GmbH, Aschheim-Dornach
Sumida AG, Obernzell
Sumida Components & Modules GmbH, Obernzell
Sumida Components GmbH, Neumarkt/Opf.
- T** Taiyo Yuden Europe GmbH, Fürth
TDK Electronics AG, Munich
TDK Micronas GmbH, Freiburg
TDK Sensors AG & Co KG, Berlin
TE Connectivity Germany GmbH, Bensheim
Telegärtner Karl Gärtner GmbH, Steinenbronn
Texas Instruments Deutschland GmbH, Freising
Turck Holding GmbH, Halver
- V** Vacuumschmelze GmbH & Co KG, Hanau
Vaillant Deutschland GmbH & Co KG, Remscheid
Vishay Electronic GmbH, Selb

W

Wago GmbH & Co KG, Minden
Walter-Gebhardt Verwaltungs- und Beteiligungsgesellschaft mbH, Beerfelden
Walther Werke Ferdinand Walther GmbH, Eisenberg
Weco Contact GmbH, Hanau
Weidmüller Interface GmbH & Co KG, Detmold
Hans Widmaier Fernmelde- und Feinwerktechnik, Baierbrunn
Wieland Electric GmbH, Bamberg
Wieland-Werke AG, Ulm
Wilhelm Sihm Jr. GmbH & Co KG, Niefern-Öschelbronn
Wolfspeed Europe GmbH, Unterschleißheim

X

X-FAB Semiconductor Foundries GmbH, Erfurt

Z

ZEAG Engineering GmbH, Heilbronn
Zeibina Kunststoff-Technik GmbH, Puschwitz

Section PCB and Electronic Systems

- A**
- Abatec Mikrosysteme GmbH, Hermsdorf
 - ACD Elektronik GmbH, Achstetten
 - additive electronics GmbH, Gmund am Tegernsee
 - Altix SAS, Val-de-Reui, France
 - ams Sensors Germany GmbH, Jena
 - APL Hofstetter PCB GmbH, Lörrach-Hauingen
 - ASMPT GmbH & Co KG, Munich
 - Asscon Systemtechnik-Elektronik GmbH, Königsbronn
 - AT & S Austria Technologie & Systemtechnik AG, Leoben-Hinterberg, Austria
 - Atotech Deutschland GmbH & Co KG, Berlin
- B**
- Ba-Ti-Loy Gesellschaft für Lötmiteltechnik mbH, Balve
 - Becom Electronics GmbH, Hochstrass, Austria
 - Binder Elektronik GmbH, Höpfingen-Waldstetten
 - binder introbest GmbH & Co KG, Fellbach
 - Bühler electronic GmbH, Fredersdorf
- C**
- Celus GmbH, Munich
 - Christian Koenen GmbH, Ottobrunn
 - Cicor Technologies, Bronschhofen, Switzerland
 - Cicorel SA, Boudry, Switzerland
 - CleanControlling GmbH, Emmingen-Liptingen
 - cms electronics gmbh, Klagenfurt, Austria
 - Coates Screen Inks GmbH a member of Sun Chemical, Nuremberg
- D**
- Dow Deutschland Anlagengesellschaft mbH, Schwalbach
 - Dr. Schneider EMS GmbH, Kronach
 - Drews Electronic GmbH, Kamp-Lintfort
 - duotec GmbH, Halver
 - Dyconex AG, Bassersdorf, Switzerland
- E**
- electronic service willms GmbH & Co KG, Stolberg-Breinig
 - Elekonta Marek GmbH & Co KG, Gerlingen
 - Eltroplan Engineering GmbH, Endingen
 - EPH elektronik Produktions- und Handelsgesellschaft mbH, Besigheim-Ottmarsheim
 - EPSa Elektronik & Präzisionsbau Saalfeld GmbH, Saalfeld
- G**
- Gläser GmbH, Horb am Neckar
 - Göpel electronic GmbH, Jena
 - GPV Germany GmbH, Hildesheim
 - GTS Flexible Materials GmbH, Siegen

- H**
- Hadimec AG, Mägenwil, Switzerland
 - Hanza GmbH, Remscheid
 - Hartmetallwerkzeugfabrik Andreas Maier GmbH, Schwendi-Hörenhausen
 - HE System Electronic GmbH, Veitsbronn
 - Hekatron Technik GmbH, Sulzburg
 - Heraeus Deutschland GmbH & Co KG, Hanau
 - Herkules-Resotec Elektronik GmbH, Baunatal-Rengershausen
 - Hotoprint Elektronik GmbH & Co KG, Lamspringe
 - HPTec GmbH, Ravensburg-Untereschach
- I**
- Ifm software gmbH, Fürth
 - Iftest AG, Wettingen, Switzerland
 - ILFA Industrieelektronik und Leiterplattenfertigung aller Art GmbH, Hanover
 - Insta GmbH, Lüdenscheid
 - Intectiv GmbH, Rödermark
- J**
- Jumatech GmbH, Eckental
 - Jumo GmbH & Co KG, Fulda
- K**
- Kathrein Sachsen GmbH, Mühlau
 - Kieback&Peter GmbH & Co KG, Berlin
 - Kolb Cleaning Technology GmbH, Willich
 - Kolektor Siegert GmbH, Cadolzburg
 - KRK Elektronik GmbH, Egelsbach
 - KSG Austria GmbH, Gars am Kamp Austria
 - KSG GmbH, Gornsdorf
 - Kubatronik Leiterplatten GmbH, Geislingen/Steige
- L**
- Lackwerke Peters GmbH & Co KG, Kempen
 - Lacroix Electronics GmbH, Willich
 - LaserJob GmbH, Fürstfeldbruck
 - Lenze Operations GmbH, Aenzen
 - LFG Oertel, Gera
- M**
- MacDermid Enthone GmbH, Langenfeld
 - Maschinenfabrik Lauffer GmbH Co KG, Horb
 - Mayerhofer Elektronik GmbH, Sauerlach
 - MEC Europe NV, Gent Belgium
 - Mektec Europe GmbH, Weinheim
 - Mektec Europe Sales GmbH, Weinheim
 - Mektec Manufacturing Corporation Europe DE GmbH, Weinheim
 - Melecs EWS GmbH, Siegendorf Austria
 - Micro-Hybrid Electronic GmbH, Hermsdorf
 - Miele & Cie. KG, Lehrte
 - ml&s GmbH & Co KG, Greifswald
 - MTM Ruhrzinn GmbH, Essen
 - Murata Electronics Europe B.V.Germany Branch, Nuremberg

- O** Orbotech SA, Brussels, Belgium
Osram GmbH, Munich
- P** Posalux GmbH, Neuhausen
Prettl Electronics Lübeck GmbH, Lübeck
Productware GmbH, Dietzenbach
Profectus GmbH Electronic Solutions, Suhl
- R** Rawinski GmbH, Kreuzwertheim
Reinhardt Microtech AG, Wangs, Switzerland
Reinhardt Microtech GmbH, Ulm
RHe Microsystems GmbH, Radeberg
Robert Bosch GmbH, Gerlingen-Schillerhöhe
Robert Bürkle GmbH, Freudenstadt
Rohde & Schwarz GmbH & Co KG, Munich
- S** S.C. Systronics S.R.L, Arad Romania
Sanmina-SCI Germany GmbH, Gunzenhausen
Schmoll Maschinen GmbH, Rödermark
Schweizer Electronic AG, Schramberg
Seho Systems GmbH, Kreuzwertheim
Sieb & Meyer AG, Lüneburg
Siemens AG, Munich
Siemens Industry Software GmbH, Lindau
Smyczek GmbH, Verl
Sumida AG, Obernzell
Sunshine PCB GmbH, Remscheid
Swisstronics Contract Manufacturing AG, Bronschhofen, Switzerland
- T** TQ-Systems Durach GmbH, Durach
- U** Unimicron Germany GmbH, Geldern
- V** Varioprint AG, Heiden Switzerland
VIA electronic GmbH, Hermsdorf
Viessmann Elektronik GmbH, Allendorf
Viscom AG, Hanover
Voigt electronic GmbH, Erfurt
- W** Würth Elektronik GmbH & Co KG, Niedernhall
- Z** Zevac AG Zweigniederlassung Deutschland, Grasbrunn
Zollner Elektronik AG, Zandt



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