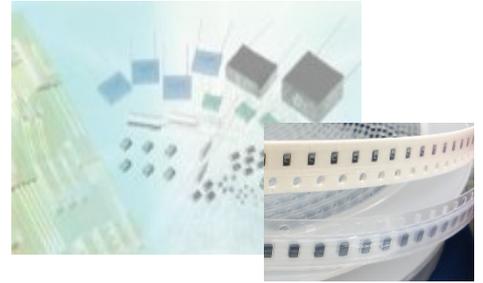




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# Matsuo Electric Co., Ltd. Company Profile

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Jun. 2018



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# Matsuo Brand recognized by customers

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Founded in 1949  
Started with Paper Capacitors.  
Since then, we developed  
Film Capacitors,  
Tantalum Capacitors,  
And Circuit Protection Components  
By responding to customer's needs.





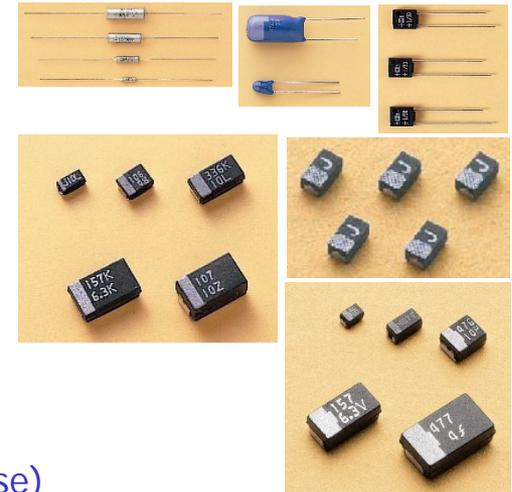
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# Matsuo Products

developed from market and customer's needs

## ◆ Tantalum capacitors

- Solid tantalum electrolytic capacitors (manganese dioxide)
- Manganese dioxide chip tantalum electrolytic capacitors
- Conductive polymer chip tantalum electrolytic capacitors



## ◆ Circuit protection components

- Circuit protection components (micro fuse, high currency fuse)
- Surge absorber (ESD protection)  
(ESD: electrostatic discharge)



## ◆ Film capacitors

- Polyethylene terephthalate (metallized, foil) film capacitors
- Polypropylene (metallized, foil) film capacitors
- Polyphenylene sulfide (foil) film capacitors





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# Matsuo's History

- 1949 Company founded in Toyonaka-shi, Osaka
- 1957 \*Plastic film capacitor
- 1959 \*The Japan's first tantalum capacitors (metal encased)
- 1970 Shimane Matsuo Electronic Co., Ltd. founded
- 1972 Matsuo Electronics of America, Inc. founded
- 1974 Listed in the second section on the Osaka Stock Exchange
- 1983 Fukuchiyama Plant founded in Fukuchiyama City, Kyoto
- 1995 Awarded ISO9002 (the international standards of quality management system)
- 1996 \*Chip circuit protectors
- 1999 Awarded QS9000 (the US's automobile Big Three's Quality System Requirements)
- 2000 Built the annex to Fukuchiyama Plant (the main plant of chip tantalum capacitors)
- 2000 \*Ultra miniature chip tantalum capacitors with face-down terminals
- 2000 Awarded ISO14001:1996 (the international standards of environmental management system)
- 2003 Awarded ISO9001:2000 (the international standards of quality management system)

\* manufacture and sales started in



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# Matsuo's History

- 2005 Awarded ISO14001:2004 (the international standards of environmental management system)
- 2006 \*Conductive polymer chip tantalum/aluminum capacitors
- 2006 Awarded TS-16949:2002 (automobile industry's international standard)
- 2007 \*Surge absorber for ESD protection
- 2010 \*Chip tantalum capacitors for automobile (conform to AEC-Q200)
- 2010 Awarded TS-16949:2009 (automobile industry's international standard)
- 2012 \*Chip tantalum capacitors for Japan Aerospace Exploration Agency
- 2013 \*High current micro fuse
- 2018 Awarded IATF16949:2016 (automobile industry's international standard)



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# Matsuo Profile

- Company Name : Matsuo Electric Co., Ltd.
- Established : 1949
- Headquarters : Toyonaka city, Osaka, Japan
- Paid-up Capital : ¥2.2 billion (current March 31,2018)
- Employees : 257 (current March 31, 2018 )
- Sales : ¥4,733 million (2017)
- Business : Manufacture and marketing of tantalum capacitors, film capacitors, and circuit protection components
- Plants : Osaka Plant  
Fukuchiyama Plant  
Shimane Matsuo Electronic Co., Ltd (subsidiary)
- Sales Office : Domestic Sales Division  
East Japan Sales Department (Tokyo)  
Central Japan Sales Department (Aichi)  
West Japan Sales Department (Osaka)  
Sales Promotion Department (Tokyo,Osaka)  
Overseas Sales Division (Osaka)





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# Matsuo Corporate Philosophy

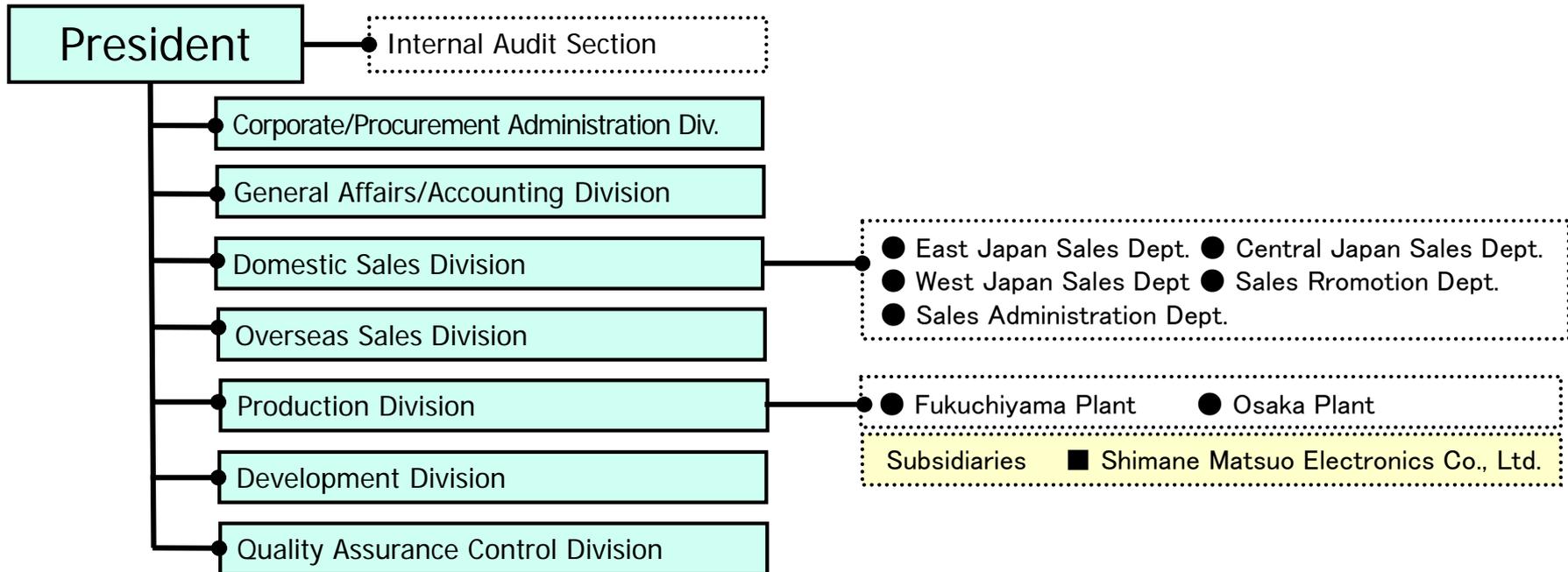
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1. Our management philosophy is to be continuous “Engineering Company” that has development/production/sales of superior quality and valuable engineering products which can get trust of customers in the world as axis of enterprise activity at the basic point of “being a customer state that permit the existence of a company”.
2. Our aim is a sustainable high quality growth economically, Environmentally, and socially.
3. Our mission is in contributing to satisfaction of people working in a company, responsibility for investors, and industry and social development through the growth of our business.



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# Organization Chart of Matsuo





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# Global Network of Matsuo

Communication network for accurate response to customer's needs

Manufacturing site: Osaka Plant (tantalum) , Fukuchiyama Plant (chip tantalum , circuit protector)  
Shimane Matsuo Electronic (film, circuit protector)

Sales site: [Domestic] Domestic Sales Division  
East Japan Sales Dept.(Tokyo), Central Japan Sales Dept.(Aichi)  
West Japan Sales Dept.(Osaka), Sales Promotion Dept.(Tokyo,Osaka)  
[Overseas] Oversea Sales Division (Osaka, Tokyo)  
[Others] Domestic (Distributor), Europe (Distributor),  
USA (Distributor, Representative), Asia (Distributor, Representative)





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# Environmental Action

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## Environmental Management Systems Certifications

- 2000 awarded ISO14001:1996
- 2005 awarded ISO14001:2004, upgraded

## Products' correspondence to Environment

- Chip tantalum capacitors have been completely lead-free since the 1984 development.
- Matsuo's products are compliant to RoHS directive (2004)
- Developed complete lead-free chip tantalum capacitor with fuse built-in Type 279 (2006)



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# Quality Assurance System Supporting Manufacture

## Certification at Fukuchiyama Plant

(the plant of our main chip tantalum capacitors , circuit protection components)

- 1995 awarded ISO9002  
the international standards of quality management system
- 1999 awarded QS9000  
the US's automobile Big Three's Quality System Requirements
- 2003 awarded ISO9001:2000  
Quality Management System, international standard
- 2006 awarded TS-16949:2002  
automobile industry's international standard
- 2010 awarded TS-16949:2009  
automobile industry's international standard
- 2018 awarded IATF16949:2016  
automobile industry's international standard



## Certification at Shimane Matsuo Electronic Co., Ltd

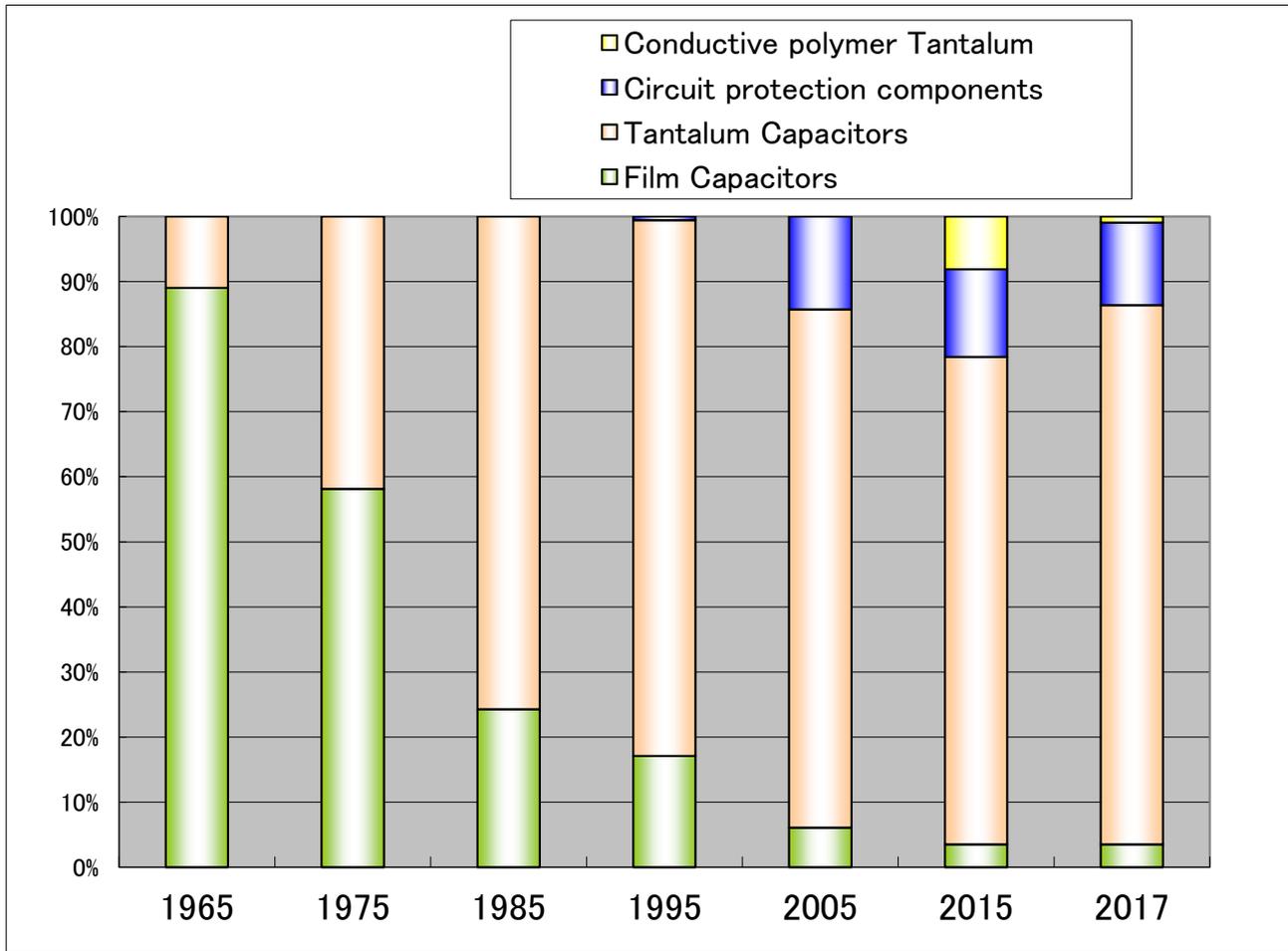
(the plant of our circuit protection components)

- 2018 awarded IATF16949:2016  
automobile industry's international standard



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# Matsuo's Product Sales Transition (by Type)



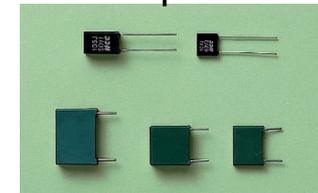
## Circuit Protectors



## Tantalum Capacitors



## Film Capacitors

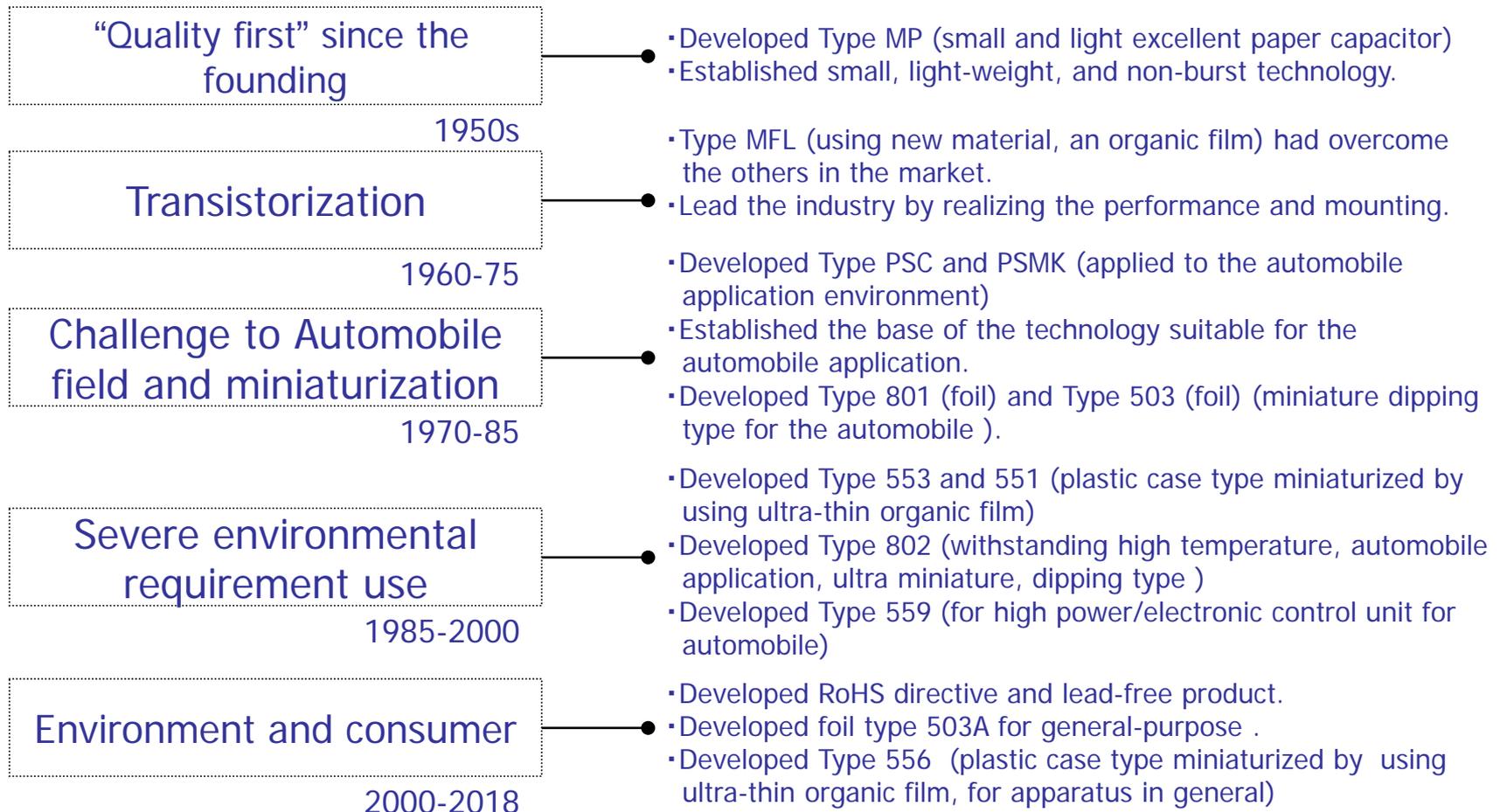




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# Challenging Time-Line of Film Capacitors

## Non-polar capacitor using film for dielectric

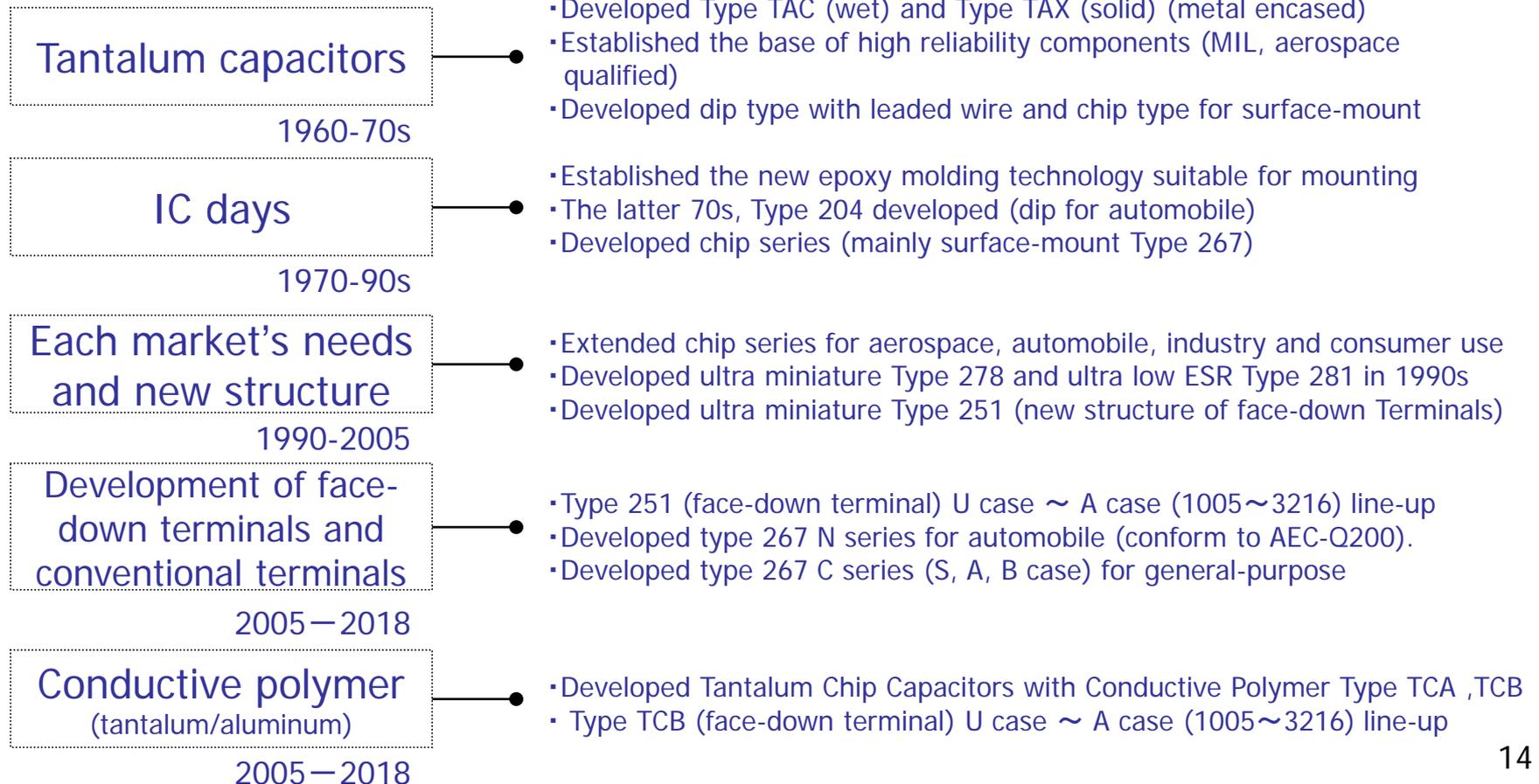




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# Challenging Time-Line of Tantalum Capacitors

Long life by using tantalum (stable characteristics chemically and thermally)

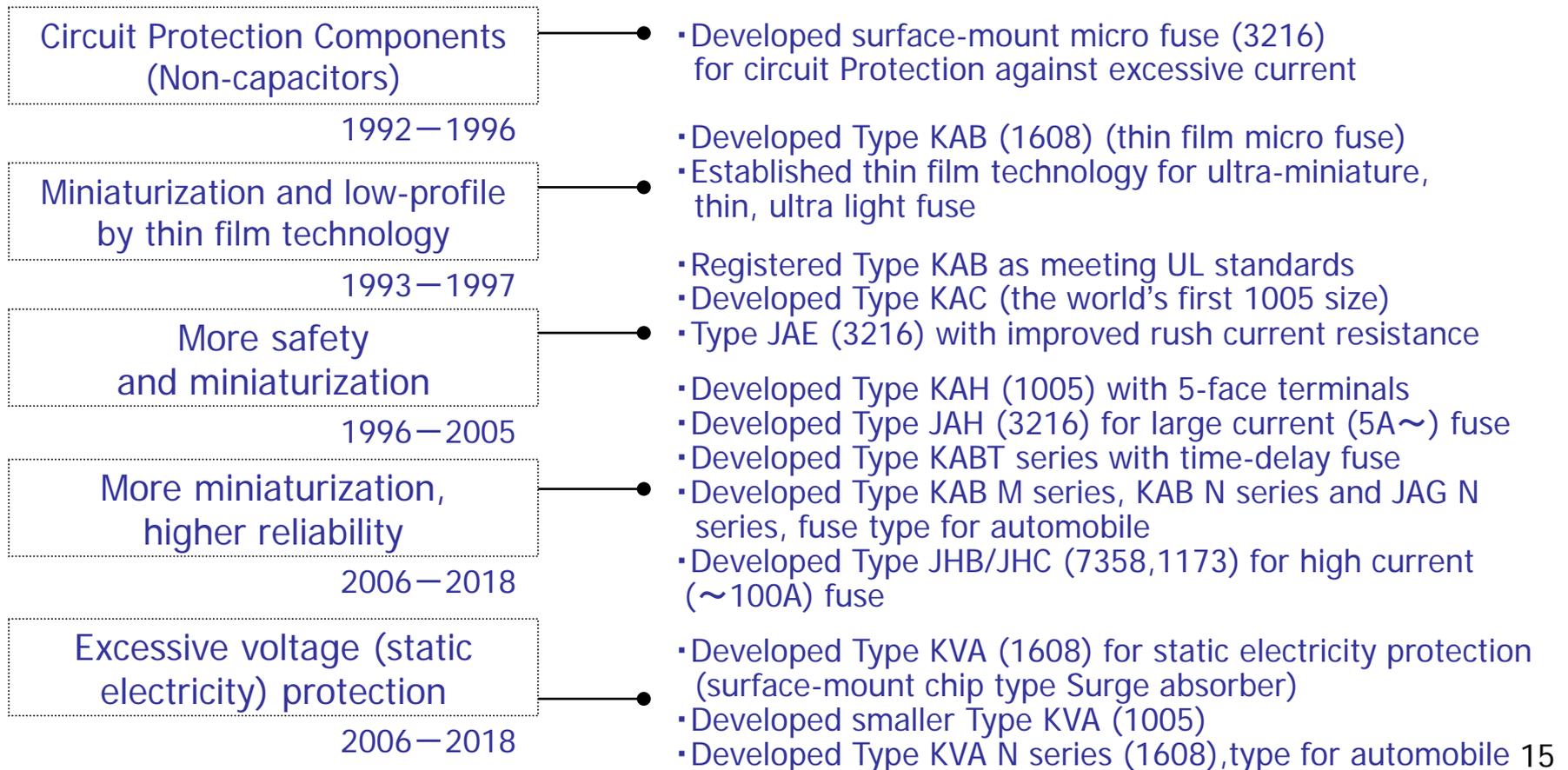




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# Challenging Time-Line of Circuit Protection Components

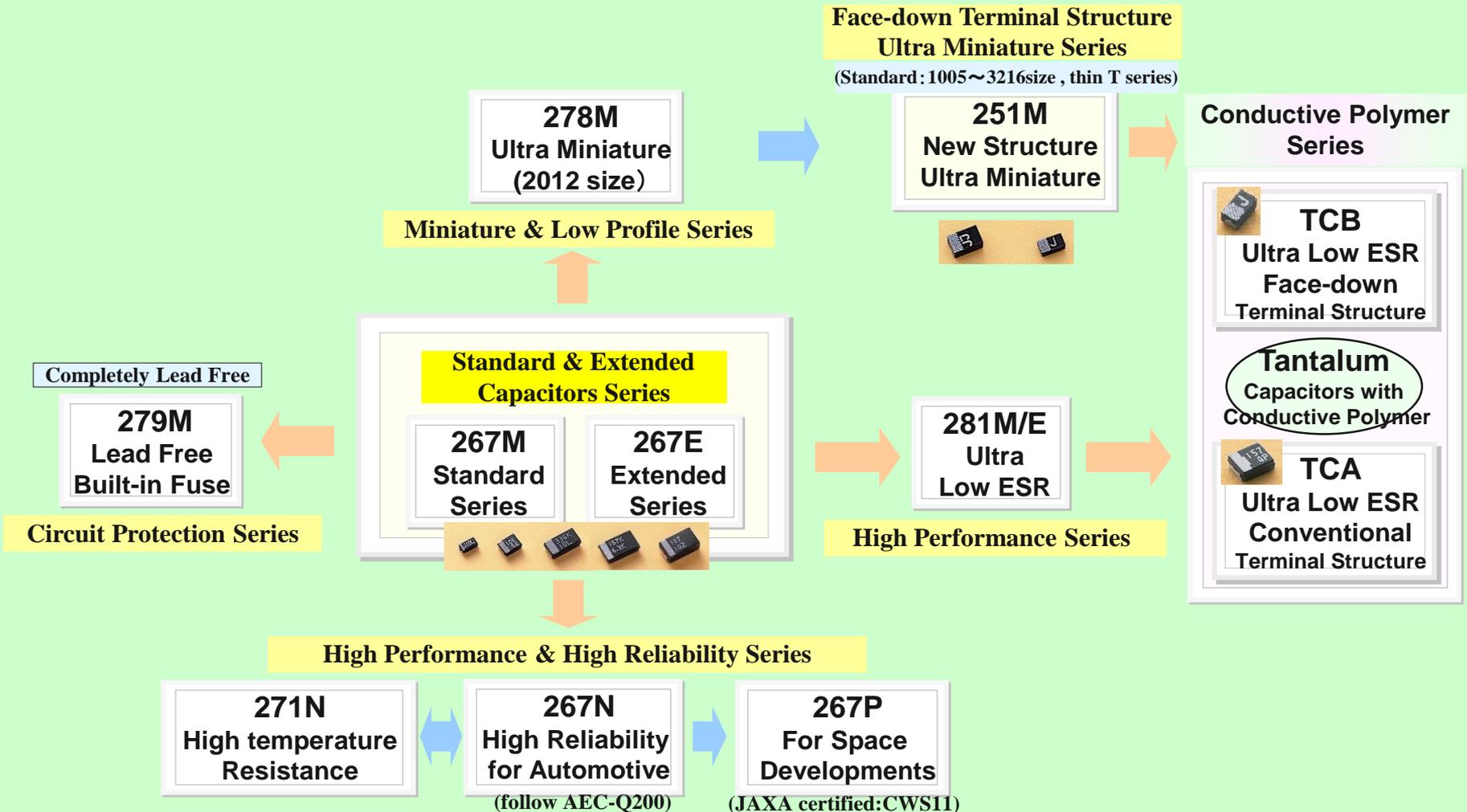
Protect the circuit from overload of electronics device





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# Process of Developing Chip Tantalum Capacitors

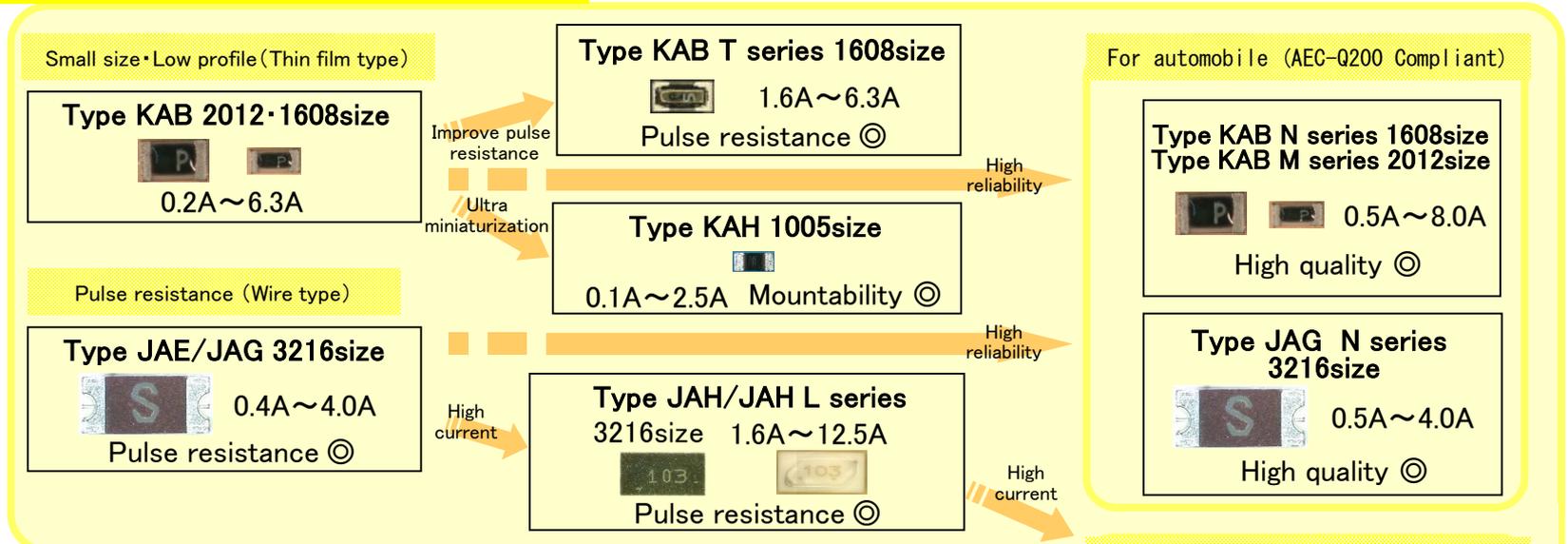




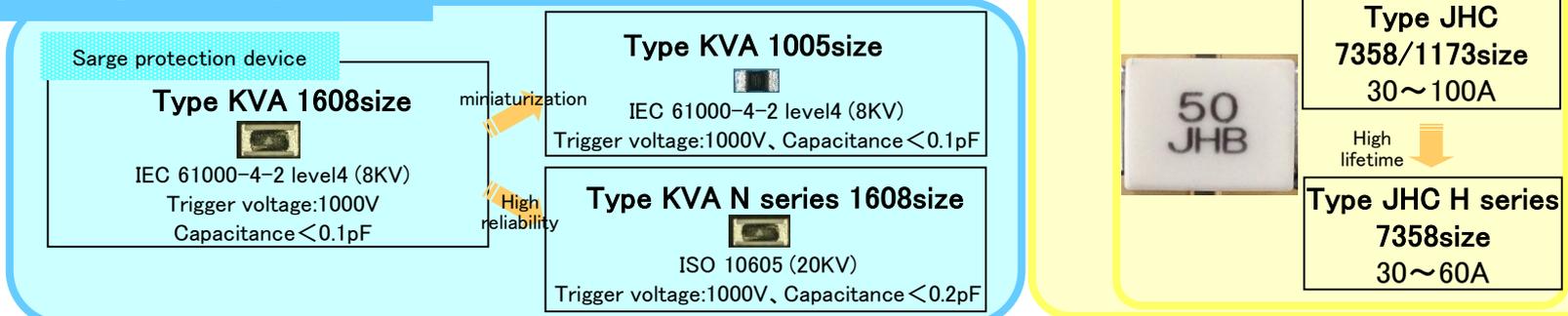
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# Process of Developing Circuit Protection Components

## Overcurrent protection (Current fuse)



## Overvoltage (ESD) protection





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# Markets and Application

(certain reliability and performance living in advanced equipment)

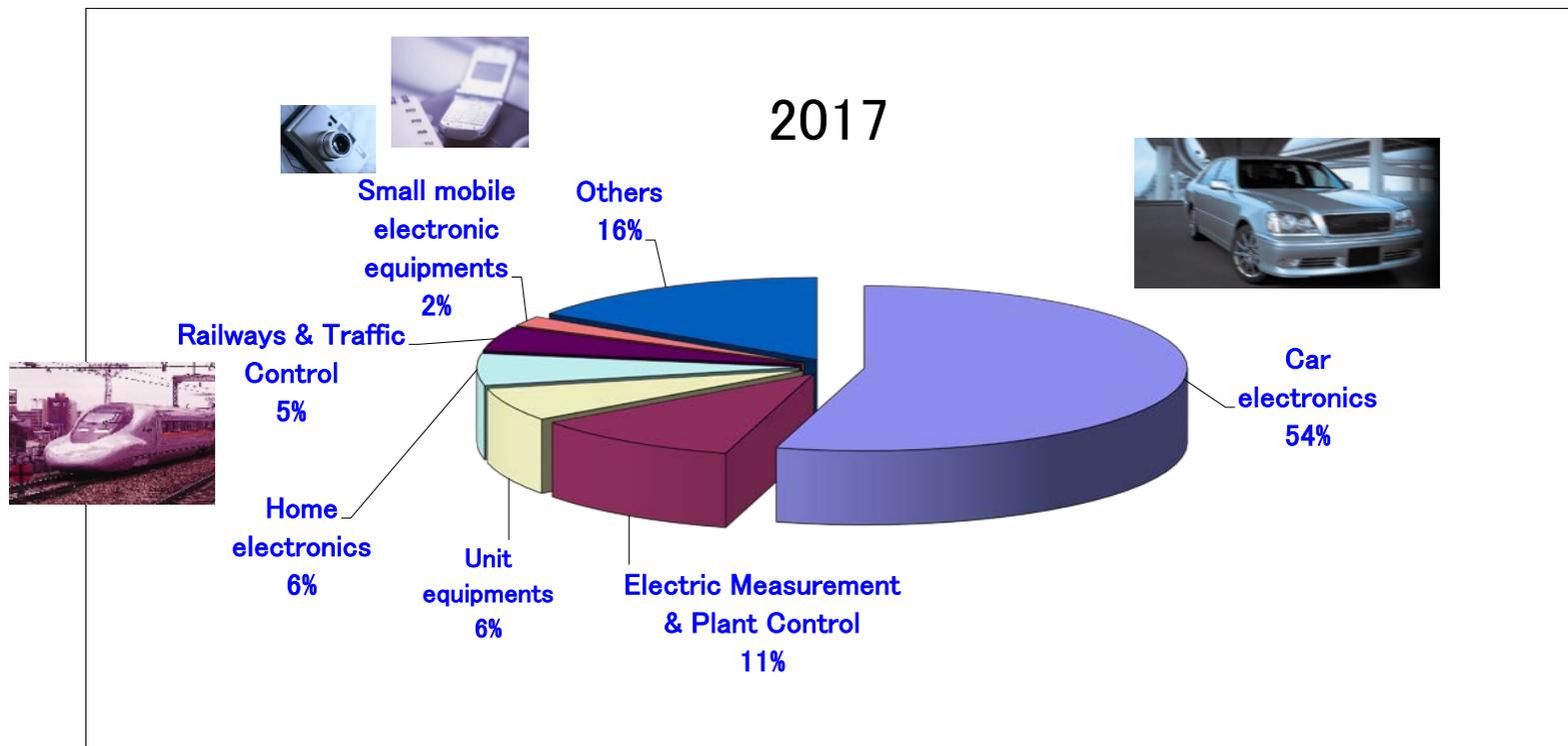
## Markets

Car electronics ... automobile electrical component (engine control unit, Hybrid EV Systems, etc.) navigation system, etc.

Electric Measurement & Plant Control ... industrial measurement control equipment, sensor, etc.

Unit equipments ... Li-ion Rechargeable Battery packs, DC/DC Converters, etc.

Consumer Electronics ... Home Fire Alarm Apparatus, Televisions, etc.





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# Our Major Customers in the World

## Major Domestic Customers (in alphabetical order)

- Advantest
- Aisin AW
- Azbil
- Canon
- Denso
- Denso Ten
- Fujitsu
- Hitachi Kokusai Electric
- Hitachi
- Japan Radio
- Kyocera
- Mitsubishi Electric
- Nippon Signal
- Nohmi bosai
- Panasonic
- Ricoh
- Sharp
- Shimadzu
- Sony
- Tokai Rika
- Toshiba
- Toyota Industries
- Toyota Motor
- Yokogawa Electric

## Major Overseas Customers (in alphabetical order)

- Ascom (Switzerland)
- Cochlear (Australia)
- Continental AG (Germany)
- Flextronics (World wide)
- Jabil (World wide)
- LG Chem (Korea)
- LG Electronics (Korea)
- Motorola (U.S.A.)
- Samsung SDI (Korea)
- Sanmina-SCI (World wide)
- Siemens (Germany)
- Sony Mobile (U.K.)
- Widex (Denmark)



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# Forward-Looking Development

## Chip tantalum capacitors

Development for  
Aerospace

- For Japan Aerospace Exploration Agency (JAXA)
- Develop JAXA-CWS11 (type 267) certified by JAXA

## Conductive polymer chip Tantalum capacitors

Smaller, thinner,  
expanding series

- Expand and low ESR series of Type TCB (face-down terminals)
- Develop 1.0mm height of Type TCB S case and A case
- Develop Type TCB U (1005) case

## Circuit protection components

Develop high voltage  
and current

- Develop high currency fuse series of Type JHB and JHC, type for voltage rating extension
- Develop fuse type for further high voltage
- Develop fuse type with high lifetime characteristics



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# Continuous Evolution of Matsuo

----- Our Aim -----

- Creative electronic components manufacturer relied on a high technology
- World's first-class quality and technology
- Customer's higher appreciation and reliability
- High quality development environmentally and socially



Thank you very much for your attention.

END