



YJ Automotive Application

YJ 市场部.
2019年1月



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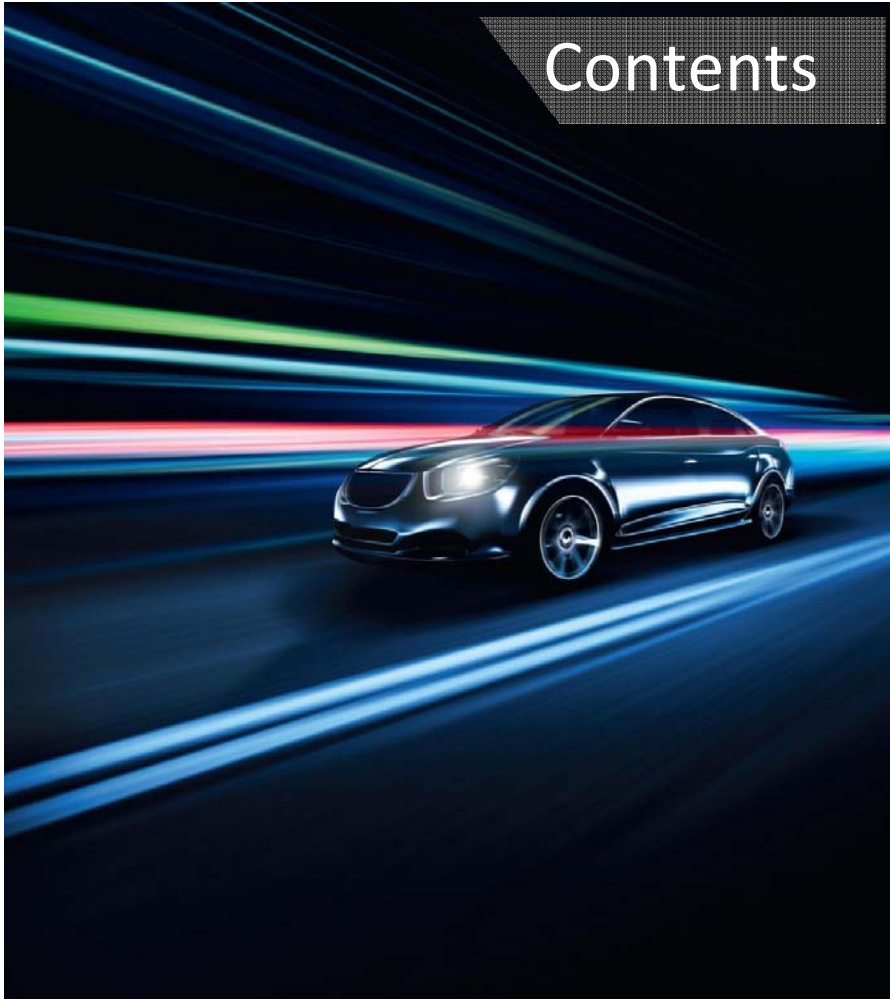
Automotive Application

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Automotive Quality Control





01

Introduction

Company Profile



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Foundation: 2000 Yangzhou

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Products: Bridges, Diodes, Modules, Chips, Small Signal, Mosfet

3

Employee: around 3200

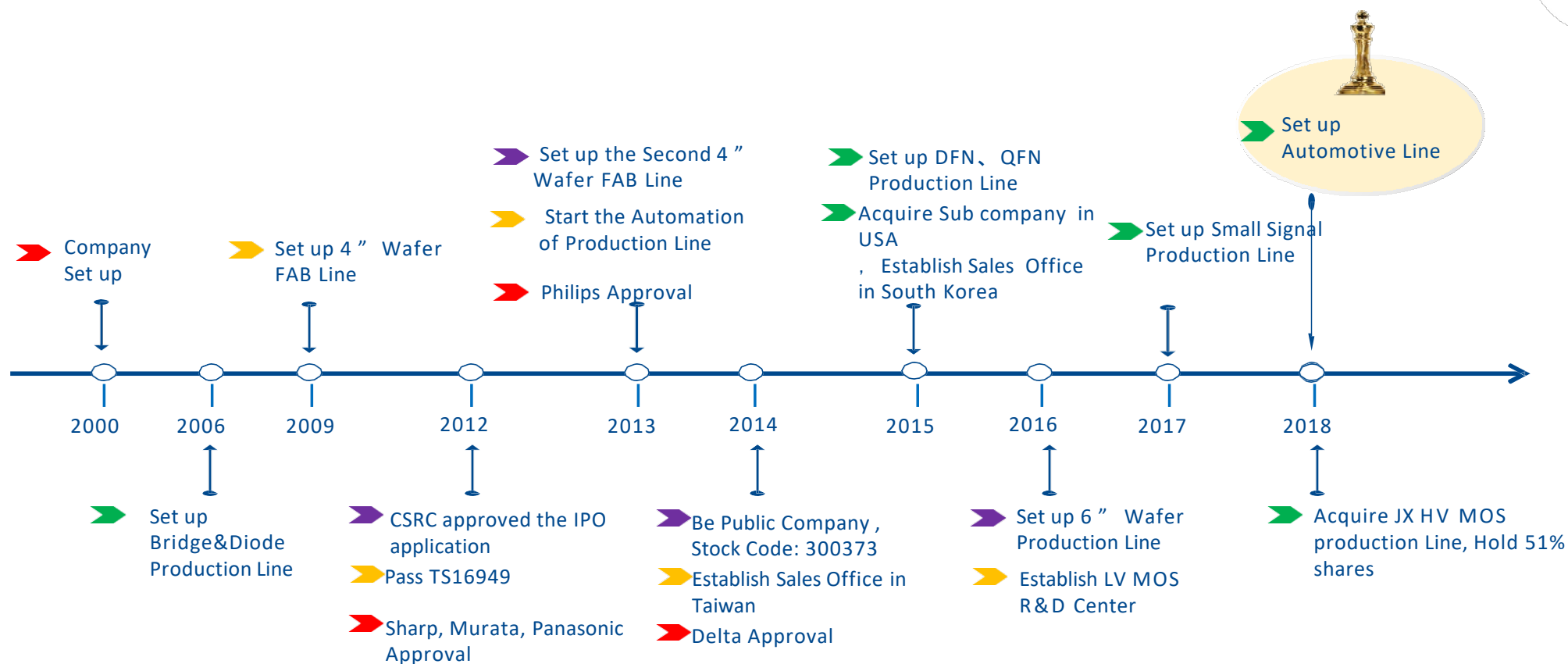
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Sales Revenue: 225 Million USD(2017)

5

**Factory Space :120,000M²
Wafer FAB: 40,000M² Assembly: 60,000M²**

Company Milestone



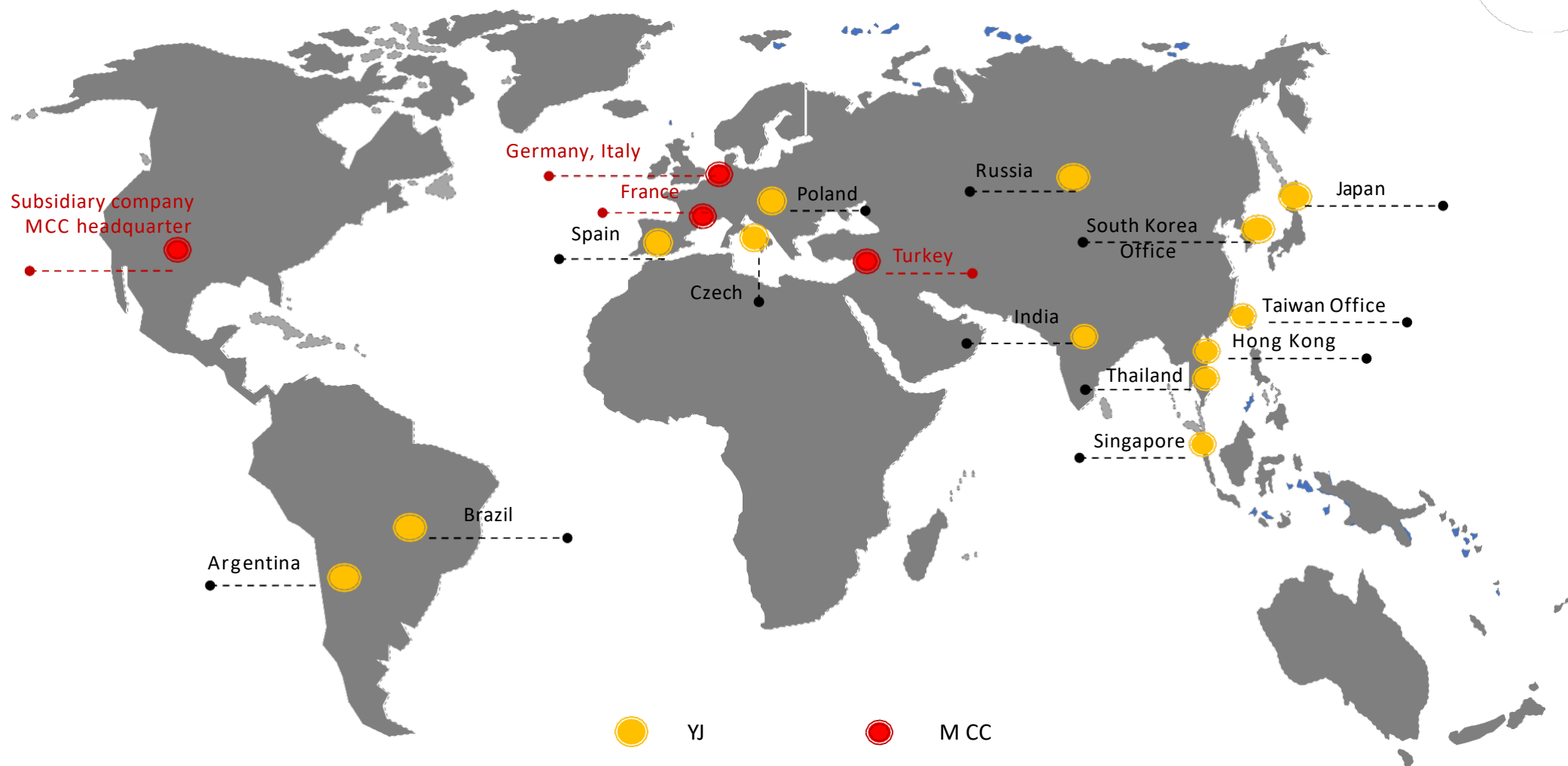


Domestic Sales Network



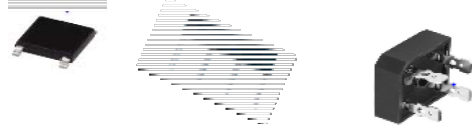
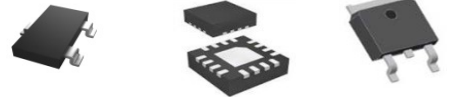
Factory	Capacity
4" STD、FRD、SF TVS、Auto Wafer	900000Pcs/M
6" SKY、FRED、 TMOS Wafer	40000Pcs/M
Bridge Rectifier	150KKpcs/M
Surface Mount	609KKpcs/M
Axial Lead	195KKpcs/M
TO, ITO	35KKpcs/M
Small Signal, TR	550KKpcs/M
Power Module	200Kpcs/M

International Sales Network





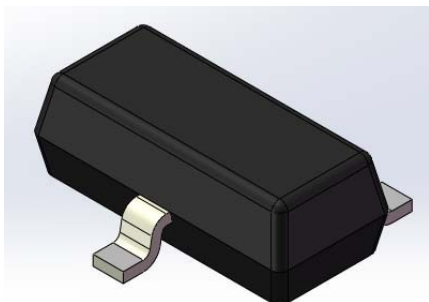
Complete Product Line :

	Chip	- GPP Chips: STD FRD TVS Auto Electronics High Voltage Module - SKY Chips: SBD SKY TSBD SKY
	Small Signal	- SOD123 SOD323 SOD523 SOT23 SOT323 (Switching Diode, SKY Diode, Zener Diode, ESD, Triode)
	Diode	- Axial: R-1 A-405 DO-41 DO-15 DO-201AD R-6 TO220AB TO220AC ITO220AB ITO220AC TO-252 - SMD: SMA/B/C SMAF SOD123FL TO-277 (Rectifier, FRD, HER, SFR, TVS, Zener)
	PV Diode	- Axial R-6 - SMD TO263 GF004 TO220AB TO220AC ITO220AB ITO220AC - Module GF008 GF009 GF010
	Bridge	- SMD Bridge ABS LLB MBS/MBLS HDS/HDLS YBS DB/DBS/DBLS - Wire Bridge KBP KBLKBU - Frame Bridge 2KBJ/4KBJ/6KBJ JA/JB GBP GBLGBU D3K - Square Bridge K1 K6 K8/K10 KBPC GBPC GBPCW BR SKBPC
	Power Module	- Rectifier FRED Thyristor - Schottky MOSFET & IGBT
	MOS	SOT23 SOP-8 DFN5*6 TO-252 TO-263

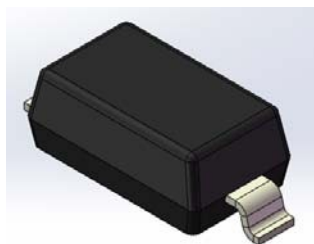


Automotive Application

SOT23



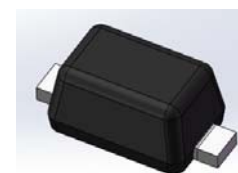
SOD123



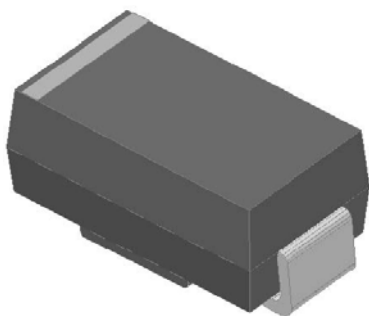
SOD323



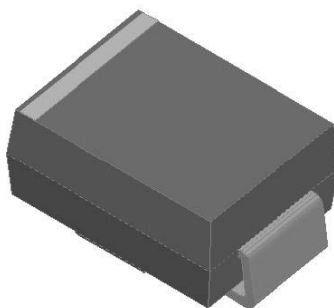
SOD523



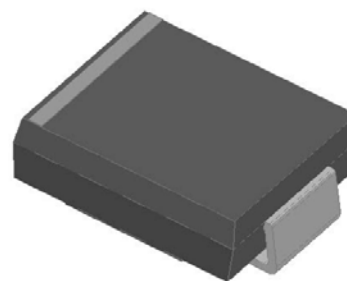
SMA(DO-214AC)



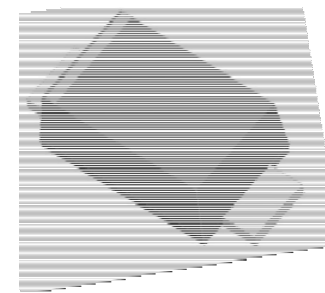
SMB(DO-214AA)



SMC(DO-214AB)

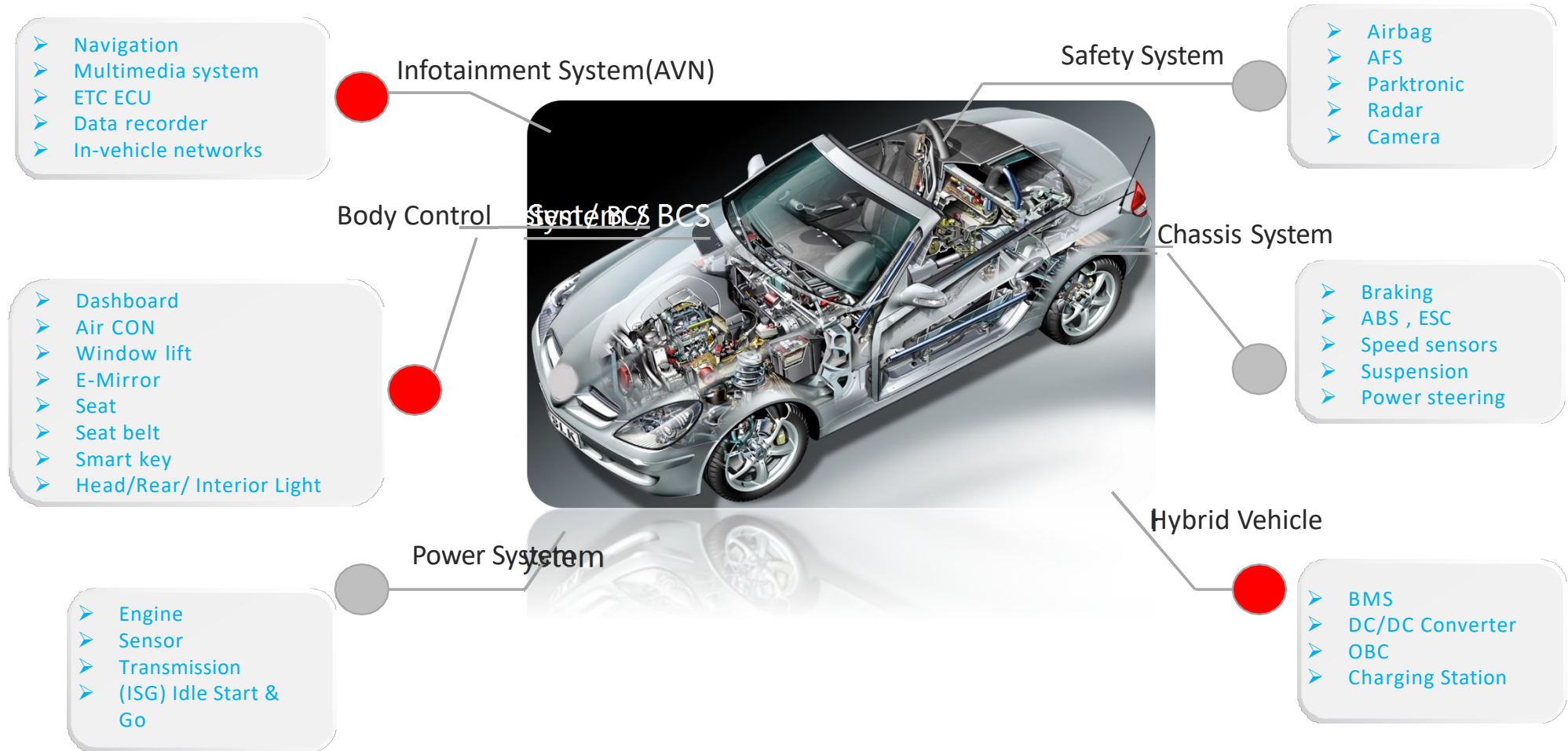


SOD-123FL



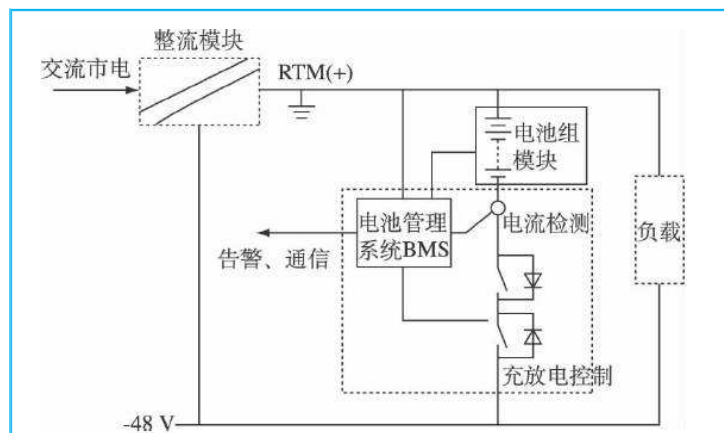
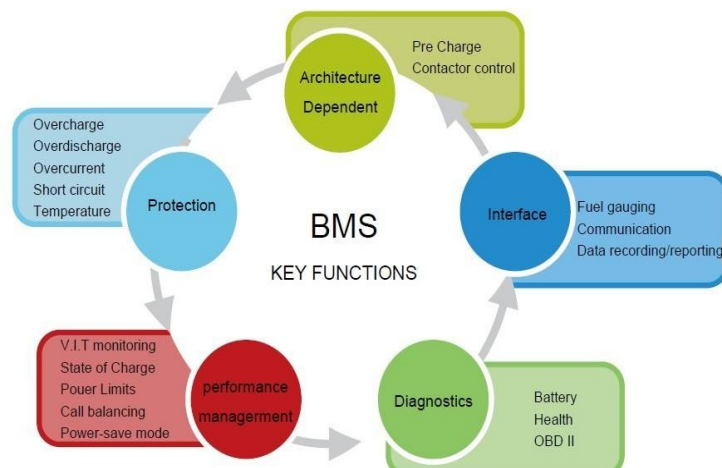
Catalogue	Products	Current	Voltage	Package
Schottky Barrier	Small Signal Schottky Diodes	0.1 - 0.75A	7 - 100V	SOD123, SOD323, SOD523, SOT23
	Schottky Rectifiers	1 - 5A	30 - 100V	SMA, SMB, SMC
Diodes	Small Signal Switching Diodes	0.15 - 0.5W	75 - 250V	SOD123, SOD323, SOD523, SOT23
	General Purpose Rectifiers	1 - 8A	50 - 1000V	SMA, SMB, SMC
	Fast Recovery Rectifiers	1 - 3A	50 - 1000V	SMA, SMB, SMC
	High Efficient Rectifier	1 - 3A	50 - 1000V	SMA, SMB, SMC
	Ultra Fast Recovery Rectifiers	1 - 3A	50 - 600V	SMA, SMB, SMC
Zener	Small Signal Zener Diodes	0.2 - 0.5W	2.4 - 47V	SOD123, SOD323, SOD523, SOT23, SOT323
Protection	Transient Voltage Suppressors	400W - 6.6KW	6.8 - 220V	SMA, SMB, SMC, DO-218AB(Planned)
	ESD Diode(Planned)	200W~300W	24V	SOD323, SOD523, SOT23
Transistor	Small Signal Transistors	0.2 - 0.35W	30 - 180V	SOD123, SOD323, SOD523, SOT23

YJ Automotive Application





Hybrid Vehicles---Battery Management System BMS

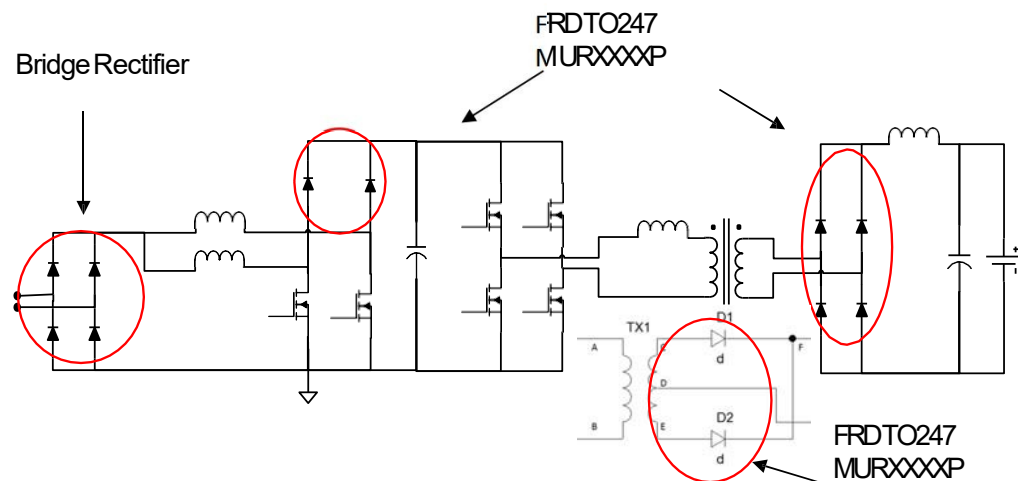


Application	Catalogue	Electric Property	Recommend Item	Package
BMS	Switching Diode	150~250mA 75~250V	1N4148WQ,BAS16WSQ, BAS21Q,BAV70Q, BAV99Q	SOD-123,SOD-323,SOT-23
BMS	Rectifier Diode	1A,2A,3A 600V,800V,1000V	GS1MQ,GS2MQ,GS3MQ	SMA,SMB,SMC
BMS	Zener	0.5W 2V4~47V	BZT52CXXQ, BZT52BXXQ	SOD-123, SOD323
BMS	SKY	0.2~1A 30V,40V,60V	BAS70Q,BAT54AQ/CQ/SQ, RB521S-30Q	SOT-23,SOD523
BMS	SKY	1A,2A,3A 40V,60V,100V	SS110Q,SS24Q,SS36BQ,SS310Q	SMA,SMB,SMC
BMS	TVS	400W,600W,1500W 6.8~220V	SMAJQ,SMBJQ, SMCJQ	SMA, SMB,SMC
BMS	TVS	6600W 22~36V	SM8SXXAQ	DO-218AB
BMS	ESD	24V 300W	ESD24VQ	SOT-23
BMS	Transistor	300mW	MMBT3904Q,MMBT3906Q, MMBT5401Q,MMBT5551Q	SOT-23

Hybrid Vehicles---On-Board Charger & Charging Pile



Application	Catalogue	Electric Property	Recommend Item	Package
On-Board Charger & Charging Pile	Super Fast Diode	600V/30A/2300mv/10uA/35ns	MUR3060BQ	TO-247
On-Board Charger & Charging Pile	Super Fast Diode	600V/60A/1700mv/10uA/70ns	MUR6060BQ	TO-247
On-Board Charger & Charging Pile	Super Fast Diode	1200V/30A/2400mv/10uA/75ns	MUR30120BQ	TO-247
On-Board Charger & Charging Pile	Super Fast Diode	1200V/60A/2800mv/10uA/80ns	MUR60120BQ	TO-247
On-Board Charger & Charging Pile	Bridge Rectifier	35A/50A 600/1000V/1200V	GBJ3506Q, GBJ3510Q, GBJ3512Q, GBJ5006Q, GBJ5010Q, GBJ5012Q	6KBJ
On-Board Charger & Charging Pile	Bridge Rectifier	35A/50A 600V/1000V/1200V	DF35NA06Q, DF35NA10Q, DF35NA12Q, DFN50NA06Q, DF50NA10Q, DF50NA12Q	TSB-5
DC-DC Invertor	TVS	400W,600W,1500W	SMAJQ, SMBJQ, SMCJQ	SMA, SMB, SMC
DC-DC Invertor	SKY	3A 40V	SS34Q	SMC

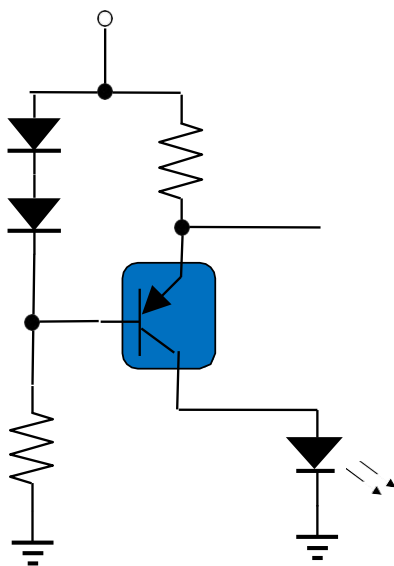


Body Control System / BCS---Self-adaptive LED Head Lamp



Application	Catalogue	Electric Property	Recommend Item	Package
Self-adaptive LED Head Lamp	Switching Diode	150~250mA 75~250V	1N4148WQ,BAS16WSQ, BAS21Q,BAV70Q, BAV99Q	SOD-123,SOD-323,SOT-23
Self-adaptive LED Head Lamp	Rectifier Diode	1A,2A,3A 600V,800V,1000V	GS1MQ,GS2MQ,GS3MQ	SMA,SMB,SMC
Self-adaptive LED Head Lamp	Zener	0.5W 2V4~47V	BZT52CXXQ, BZT52BXXQ	SOD-123, SOD323
Self-adaptive LED Head Lamp	SKY	1A,2A,3A 40V,60V,100V	SS110Q,SS24Q,SS36BQ,SS310Q	SMA,SMB,SMC
Self-adaptive LED Head Lamp	TVS	400W,600W,1500W 6.8~220V	SMAJQ,SMBJQ, SMCJQ	SMA, SMB,SMC
Self-adaptive LED Head Lamp	TVS	6600W 22~36V	SM8SXXAQ	DO-218AB
Self-adaptive LED Head Lamp	ESD	24V 300W	ESD24VQ	SOT-23
Self-adaptive LED Head Lamp	Transistor	300mW	MMBT3904Q,MMBT3906Q,MMBT5401Q, MMBT5551Q	SOT-23

Body Control System / BCS---Interior LED Lighting Constant Current



Application	Catalogue	Electric Property	Recommend Item	Package
Interior LED Lighting Constant Current	Switching Diode	150~250mA 75~250V	1N4148WQ,BAS16WSQ, BAS21Q,BAV70Q, BAV99Q	SOD-123,SOD-323,SOT-23
Interior LED Lighting Constant Current	Rectifier Diode	1A,2A,3A 600V,800V,1000V	GS1MQ,GS2MQ,GS3MQ	SMA,SMB,SMC
Interior LED Lighting Constant Current	Zener	0.5W 2V4~47V	BZT52CXXQ, BZT52BXXQ	SOD-123, SOD323
Interior LED Lighting Constant Current	SKY	1A,2A,3A 40V,60V,100V	SS110Q,SS24Q,SS36BQ, SS310Q	SMA,SMB,SMC
Interior LED Lighting Constant Current	TVS	400W,600W,1500W 6.8~220V	SMAJQ,SMBJQ, SMCJQ	SMA, SMB,SMC
Interior LED Lighting Constant Current	ESD	24V 300W	ESD24VQ	SOT-23
Interior LED Lighting Constant Current	Transistor	300mW	MMBT3904Q,MMBT3906Q,MMBT540 1Q,MMBT5551Q	SOT-23

Body Control System / BCS---High Power , High Efficiency DC Converter



Application	Catalogue	Electric Property	Recommend Item	Package
High Power , High Efficiency DC Converter	Switching Diode	150~250mA 75~250V	1N4148WQ,BAS16WSQ, BAS21Q,BAV70Q, BAV99Q	SOD-123,SOD-323,SOT-23
High Power , High Efficiency DC Converter	Rectifier Diode	1A,2A,3A 600V,800V,1000V	GS1MQ,GS2MQ,GS3MQ	SMA,SMB,SMC
High Power , High Efficiency DC Converter	Zener	0.5W 2V4~47V	BZT52CXXQ, BZT52BXXQ	SOD-123, SOD323
High Power , High Efficiency DC Converter	SKY	1A,2A,3A 40V,60V,100V	SS110Q,SS24Q,SS36BQ,SS310Q	SMA,SMB,SMC
High Power , High Efficiency DC Converter	TVS	400W,600W,1500W 6.8~220V	SMAJQ,SMBJQ, SMCJQ	SMA, SMB,SMC
High Power , High Efficiency DC Converter	TVS	6600W 22~36V	SM8SXXAQ	DO-218AB
High Power , High Efficiency DC Converter	ESD	24V 300W	ESD24VQ	SOT-23
High Power , High Efficiency DC Converter	Transistor	300mW	MMBT3904Q,MMBT3906Q,MMBT5401Q,MMBT 5551Q	SOT-23

Body Control System / BCS---Voltage Reduction DC Convertor



Application	Catalogue	Electric Property	Recommend Item	Package
Voltage Reduction DC Convertor	Switching Diode	150~250mA 75~250V	1N4148WQ,BAS16WSQ, BAS21Q,BAV70Q,BAV99Q	SOD-123,SOD-323,SOT-23
Voltage Reduction DC Convertor	Rectifier Diode	1A,2A,3A 600V,800V,1000V	GS1MQ,GS2MQ,GS3MQ	SMA,SMB,SMC
Voltage Reduction DC Convertor	Zener	0.5W 2V4~47V	BZT52CXXQ, BZT52BXXQ	SOD-123, SOD323
Voltage Reduction DC Convertor	SKY	1A,2A,3A 40V,60V,100V	SS110Q,SS24Q,SS36BQ,SS310Q	SMA,SMB,SMC
Voltage Reduction DC Convertor	TVS	400W,600W,1500W 6.8~220V	SMAJQ,SMBJQ, SMCJQ	SMA, SMB,SMC
Voltage Reduction DC Convertor	TVS	6600W 22~36V	SM8SXXAQ	DO-218AB
Voltage Reduction DC Convertor	ESD	24V 300W	ESD24VQ	SOT-23
Voltage Reduction DC Convertor	Transistor	300mW	MMBT3904Q,MMBT3906Q,MMBT5401Q,MMBT 5551Q	SOT-23

Body Control System / BCS---Constant Current Source



Application	Catalogue	Electric Property	Recommend Item	Package
Constant Current Source	Switching Diode	150~250mA 75~250V	1N4148WQ,BAS16WSQ, BAS21Q,BAV70Q, BAV99Q	SOD-123,SOD-323,SOT-23
Constant Current Source	Rectifier Diode	1A,2A,3A 600V,800V,1000V	GS1MQ,GS2MQ,GS3MQ	SMA,SMB,SMC
Constant Current Source	Zener	0.5W 2V4~47V	BZT52CXXQ, BZT52BXXQ	SOD-123, SOD323
Constant Current Source	SKY	1A,2A,3A 40V,60V,100V	SS110Q,SS24Q,SS36BQ,SS310Q	SMA,SMB,SMC
Constant Current Source	TVS	400W,600W,1500W 6.8~220V	SMAJQ,SMBJQ, SMCJQ	SMA, SMB,SMC
Constant Current Source	TVS	6600W 22~36V	SM8SXXAQ	DO-218AB
Constant Current Source	ESD	24V 300W	ESD24VQ	SOT-23
Constant Current Source	Transistor	300mW	MMBT3904Q,MMBT3906Q,MMBT5401Q,MMBT5551Q	SOT-23

Body Control System / BCS---HVAC-BLDC Blower Motor & Cool Fan



Application	Catalogue	Electric Property	Recommend Item	Package
HVAC-BLDC Blower Motor & Cool Fan	Switching Diode	150~250mA 75~250V	1N4148WQ,BAS16WSQ, BAS21Q,BAV70Q, BAV99Q	SOD-123,SOD-323,SOT-23
HVAC-BLDC Blower Motor & Cool Fan	Rectifier Diode	1A,2A,3A 600V,800V,1000V	GS1MQ,GS2MQ,GS3MQ	SMA,SMB,SMC
HVAC-BLDC Blower Motor & Cool Fan	Zener	0.5W 2V4~47V	BZT52CXXQ, BZT52BXXQ	SOD-123, SOD323
HVAC-BLDC Blower Motor & Cool Fan	SKY	1A,2A,3A 40V,60V,100V	SS110Q,SS24Q,SS36BQ,SS310Q	SMA,SMB,SMC
HVAC-BLDC Blower Motor & Cool Fan	TVS	400W,600W,1500W 6.8~220V	SMAJQ,SMBJQ,SMCJQ	SMA, SMB,SMC
HVAC-BLDC Blower Motor & Cool Fan	TVS	6600W 22~36V	SM8SXXAQ	DO-218AB
HVAC-BLDC Blower Motor & Cool Fan	ESD	24V 300W	ESD24VQ	SOT-23
HVAC-BLDC Blower Motor & Cool Fan	Transistor	300mW	MMBT3904Q,MMBT3906Q,MMBT5401Q,MM BT5551Q	SOT-23

Body Control System / BCS



Application	Catalogue	Electric Property	Recommend Item	Package
Window	Rectifier Diode	1A 600V, 1000V	GS1JQ, GS1MQ	SMA
Window	Fast Diode	2A, 600V	ES2JQ	SMB
360 around View	Switching Diode	150~250mA 75~250V	BAV99Q,BAV70Q	SOT-23
360 around View	SKY	5A,60V	SS56Q	SMC
360 around View	TVS	600W	SMBJ24AQ	SMB
360 around View	Transistor	300mw	MMBT5401Q	SOT-23
Smart Key	Rectifier Diode	1A,2A,3A 600V,800V,1000V	GS1JQ, GS2GQ, GS3MQ	SMA,SMB,SMC
Smart Key	Switching Diode	150~250mA 75~250V	1N4148WQ,BAS21Q	SOD-123, SOT-23
Smart Key	Zener	0.5W 2V4~47V	BZT52CXXQ,BZX84BXXQ	SOD-123, SOT-23
Auto Seat	Switching Diode	150~250mA 75~250V	1N4148WTQ	SOD-523
Auto Seat	Zener	0.5W 2V4~47V	BZT52C7V5Q	SOD-123
Auto Seat	SKY	0.2~1A 30V,40V,60V	B5819WQ,BAT54CQ,BAT54WSQ	SOD-123, SOT-23
Auto Seat	Transistor	300mw,350mw	MMBT3904Q,MMBT3906Q,MMBT2222AQ	SOT-23

Infotainment System(AVN)

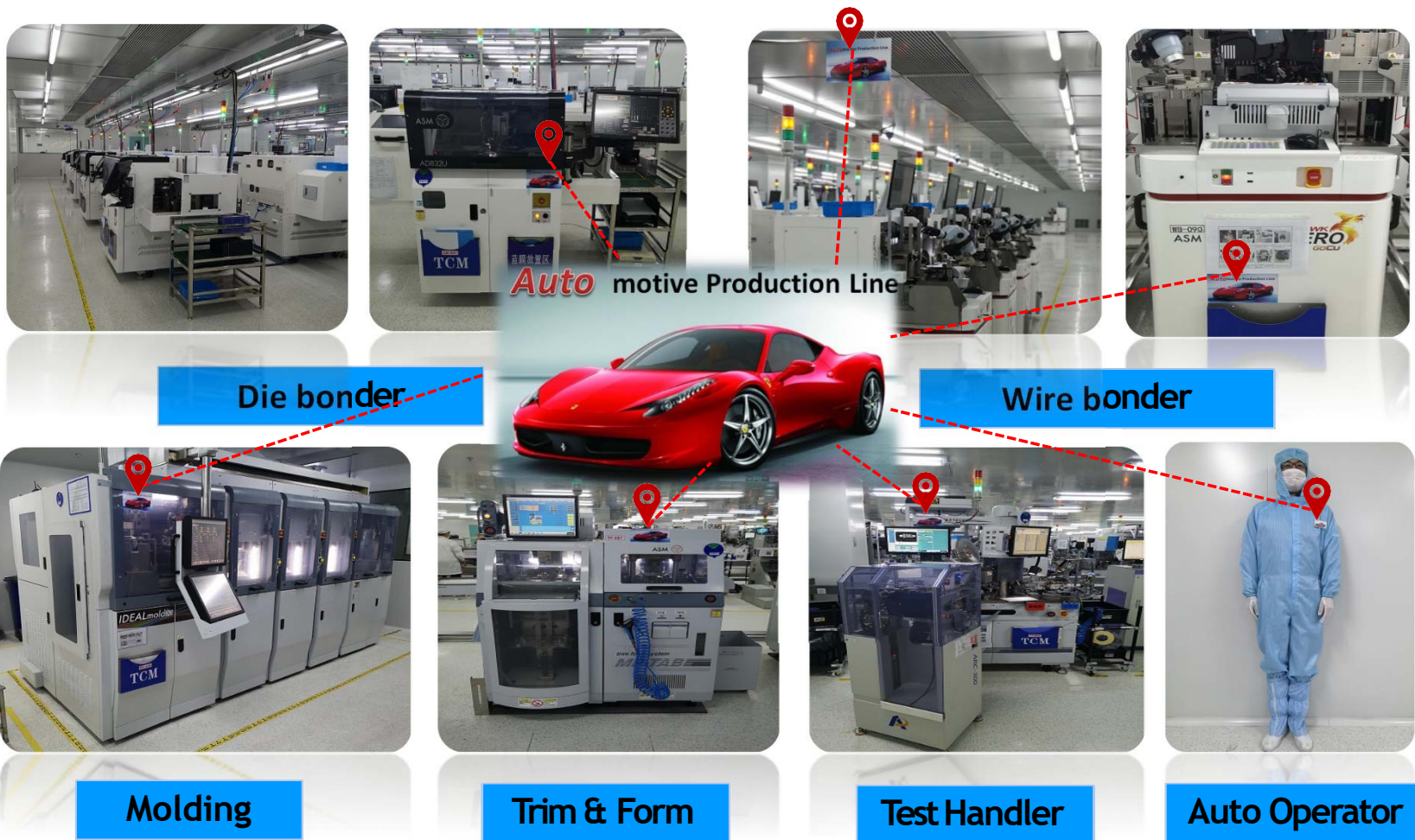


Application	Catalogue	Electric Property	Recommend Item	Package
navigation	Zener	Zener Diode 350mw, 500mw	BZX84CXXQ,BZT52CX XSQ, BZT52BXXSQ	SOT-23,SOD-323
navigation	SKY	Schokkty Diode 2A, 60V	SS26AQ,SS26Q,SS36Q	SMA,SMB,SMC
navigation	TVS	400W,600W,1500W	SMAJQ/SMBJQ/SMCJ Q	SMA,SMB,SMC
navigation	Rectifier Diode	2A,3A 600V,800V,1000V	GS2MQ, GS3MQ	SMB,SMC



Automotive Automated Line

Automotive Automated Line



Automotive Product Control



People

- Operator > 6 Months Experienced, Accreditation per 6 months
- Engineer > 12 Months Experienced, Accreditation per 6 months



Machine

- High Efficient Manufacture machine, Accreditation per 6 months
- Precision Automated Line



Material

- High level, high reliability Material
- Tight Control in assessment criteria
- Preventive Maintenance



Product Development

- APQP, PPAP
- Automotive Product FMEA



Process

- Automotive Control Plan
- Recipe management
- SPC Control, CPK > 1.67
- PAT Control



Process

- Lot track, Management Difference
- 5S Management
- Automated Error Prevention



Abnormal Control

- MRB Order, whole lot production, suspend
- Feedback within 24 hours



4 M Change

- CCB Change Control
- Change FMEA



Continuous Improvement

- Continuous Improvement Plan
- Zero Defect
- BPI (Business process improvement)





04

Automotive Quality Control

Quality and Environmental Management



- ISO & IATF16949 Certified ;
- Meet RoHS standard ;
- Pb free and halogen free ;
- QC080000 certified.



ISO9001



IATF16949



QC080000



QC080000

Automotive Reliability Test Item

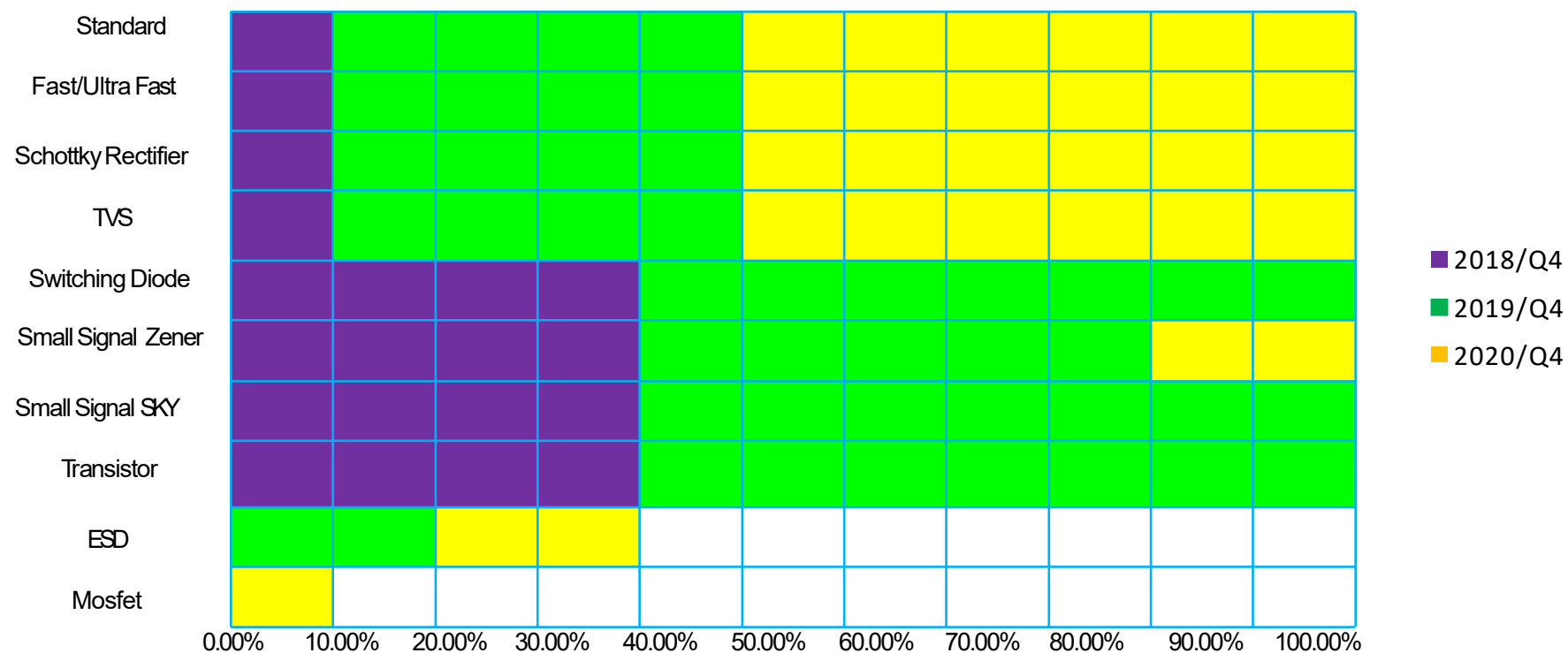


Item	Consumer/Industry	Automotive
HTRB	3x 77 units/lot; 1000 hr Tj 150 °C or specified Tj (max), 80% RV per as JA108	3x 77 units/lot; 1000 hr Tj 150 °C or specified Tj (max), 100% RV per as AEC-Q101 2x stress for robustness for Cu wire per as AEC-Q006
HTGB	3x 77 units/lot; 1000 hr Tj 150 °C or specified Tj (max) per as JA108	3x 77 units/lot; 1000 hr Tj 150 °C or specified Tj (max) 2x stress for robustness for Cu wire per as AEC-Q006
HTSL	3x 77units/lot; 1000 hr Ta= T storage max per as JA103	3x 77units/lot; 1000 hr Ta= T storage max per as JA103
PC (Precondition)	Perform moisture pre-conditioning per J-STD-020 with MSL-1 recipe	Perform moisture pre-conditioning per J-STD-020 with MSL-1 recipe
PC+TC	3x 77 units/lot 1000x cys; -55 to 150 °C per as JA104B	3x 77 units/lot 1000x cys; -55 to 150 °C per as JA104B 2x stress for robustness for Cu wire per as AEC-Q006
PC+IOL	3x 77 units/lot; 15000 cys per as MIL-STD-750	3x 77 units/lot; 15000 cys per as MIL-STD-750 / AEC-Q101 2x stress for robustness for Cu wire per as AEC-Q006
PC+AC or PC+HAST	3x 77 units/lot; 96 hr per as JA102 or JA110	3x 77 units/lot; 96 hr per as JA102 or JA110 2x stress for robustness for Cu wire per as AEC-Q006
PC+H3TRB	3x 77 units/lot; 1000 hr, per as JA101	3x 77 units/lot; 1000 hr per as JA101 2x stress for robustness for Cu wire per as AEC-Q006
CSAM	3x22; before and after PC per as J-JSD-020	3x22 before and after PC per as J-JSD-020
DPA	3x2; 50x optical inspection after TC, HAST or H3TRB	3x2; 50x optical inspection after TC, HAST or H3TRB Per as AEC-Q101-004, Section4
CDPA	NA	3x3 BS/WP; 3x1 cross section after 1x stress and 3x2 BS/WP after 2x stress, 3x1 cross section

Automotive Product Reliability Roadmap



AEC-Q101 Product Roadmap





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Thank you !