



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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ROHM GROUP Short Form Catalog






[ Viewing the catalog ]

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■ **New** indicates new product.

■ ☆ indicates product under development.

■ Classification by the color

- ROHM  Display with this color
- LAPIS Semiconductor  The text displays  
LAPIS Semiconductor Product
- Kionix  The text displays Kionix, Inc. Product

———— Company group ————

ROHM GROUP

**LAPIS** SEMICONDUCTOR **LAPIS Semiconductor Co., Ltd.** <http://www.lapis-semi.com/en/>

LAPIS Semiconductor excels in a number of technologies, including wireless communication, low power consumption, digital-analog mixed signals, low power microcontrollers and memory design, and provides logic LSIs, memory LSIs, display driver LSIs, and foundry services.

**Products** **LAPIS Semiconductor is the leading supplier for the Personal & Mobile Applications.**

■ **Low Power Microcontrollers**

Remarkably low power consumption contributes to significant energy savings.

■ **Wireless Communications LSIs**

Greater comfort and convenience through wireless technology

■ **Display Drivers**

Extensive lineup from TVs to cars

■ **Memory LSIs**

Reliable, stable, long-term supply



**Kionix, Inc.**

<http://www.kionix.com/>

Kionix, Inc. is a global MEMS inertial sensor manufacturer. Kionix offers high-performance, low-power accelerometers, gyroscopes, and 6-axis combination sensors plus comprehensive software libraries that support a full range of sensor combinations, operating systems and hardware platforms.

**Products** **Incorporates MEMS technology in order to provide market-leading sensors.**

■ **Accelerometers**

Offer Industry-Leading Stability and Performance.































■ **6-Axis Combo Parts**

Offer unparalleled performance.

■ **Gyroscopes**

Designed to strike a balance between current consumption and noise performance with excellent bias stability over temperature.

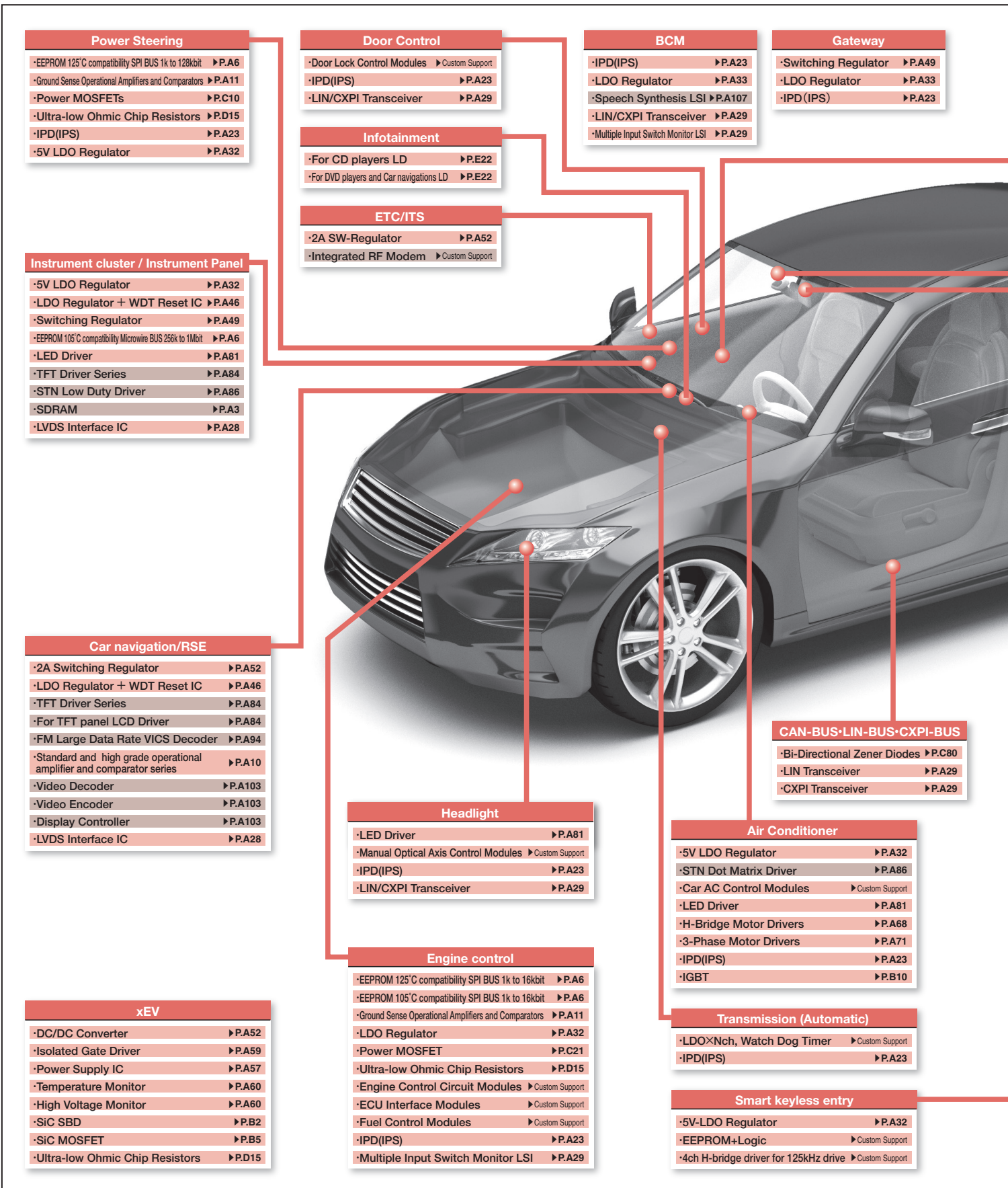
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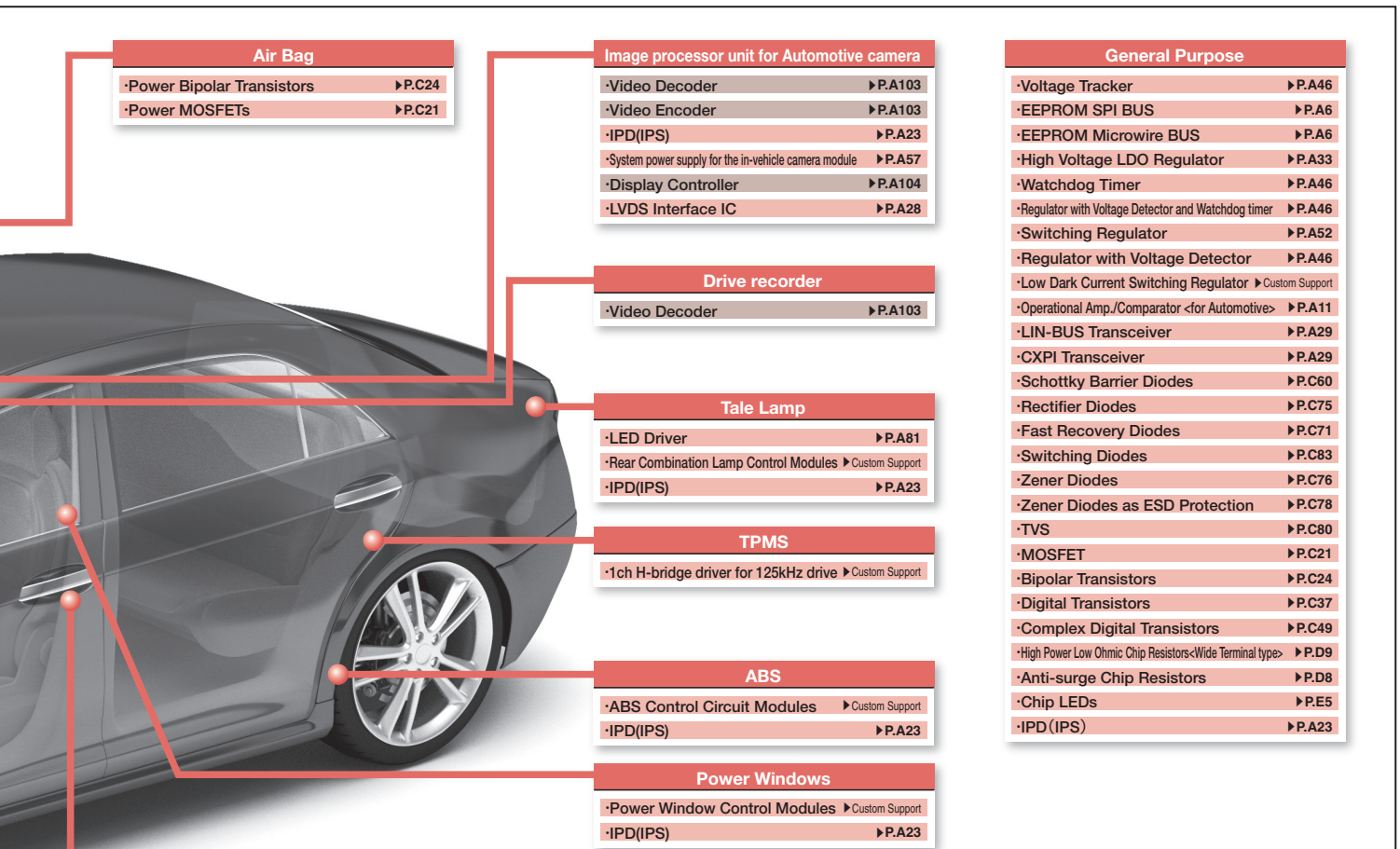
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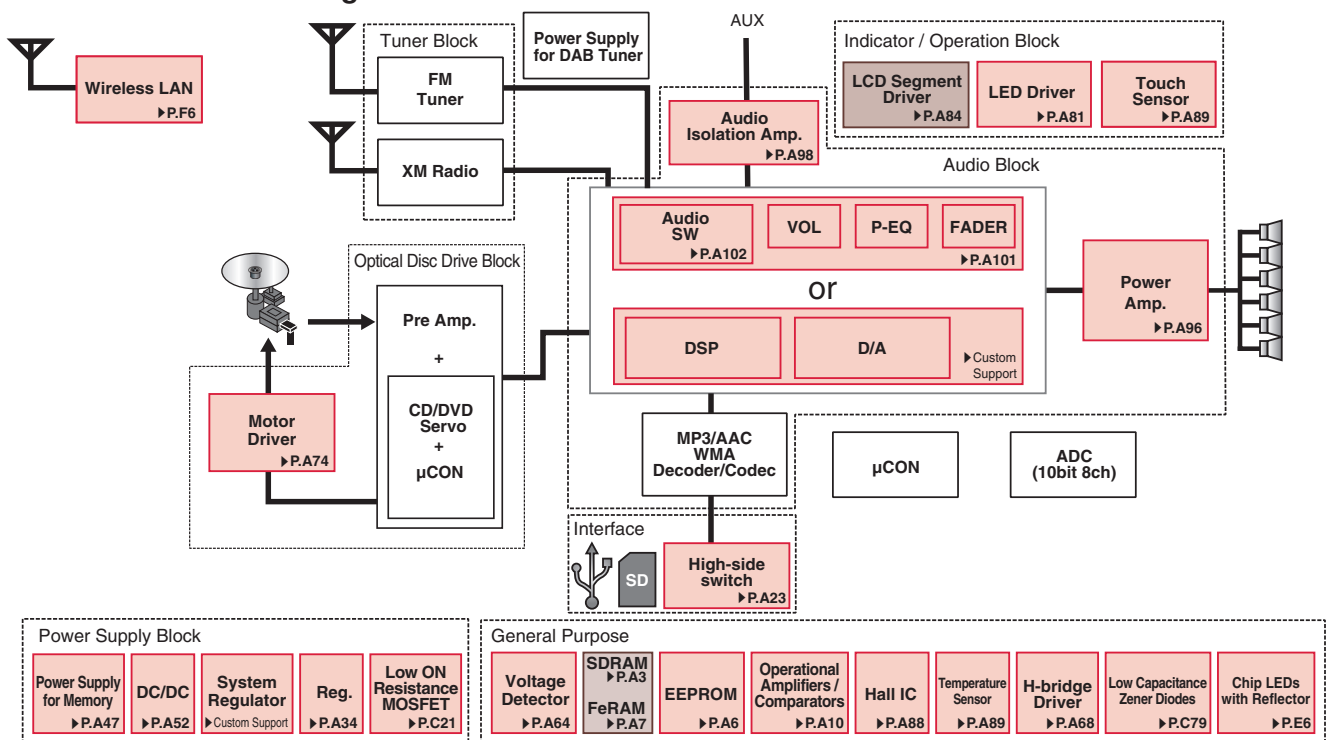


## Automotive Block Diagram



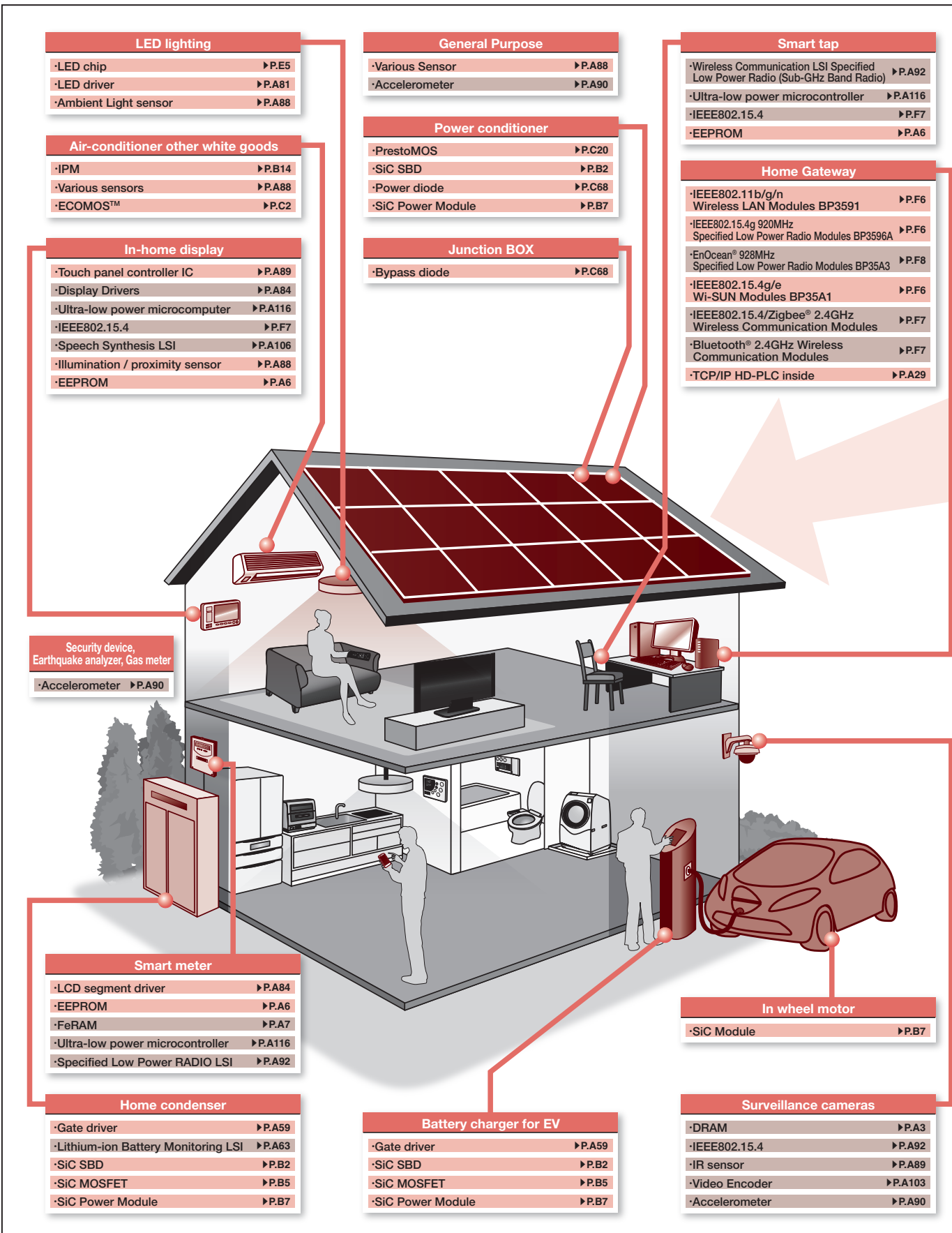


## ●Car Audio Block Diagram

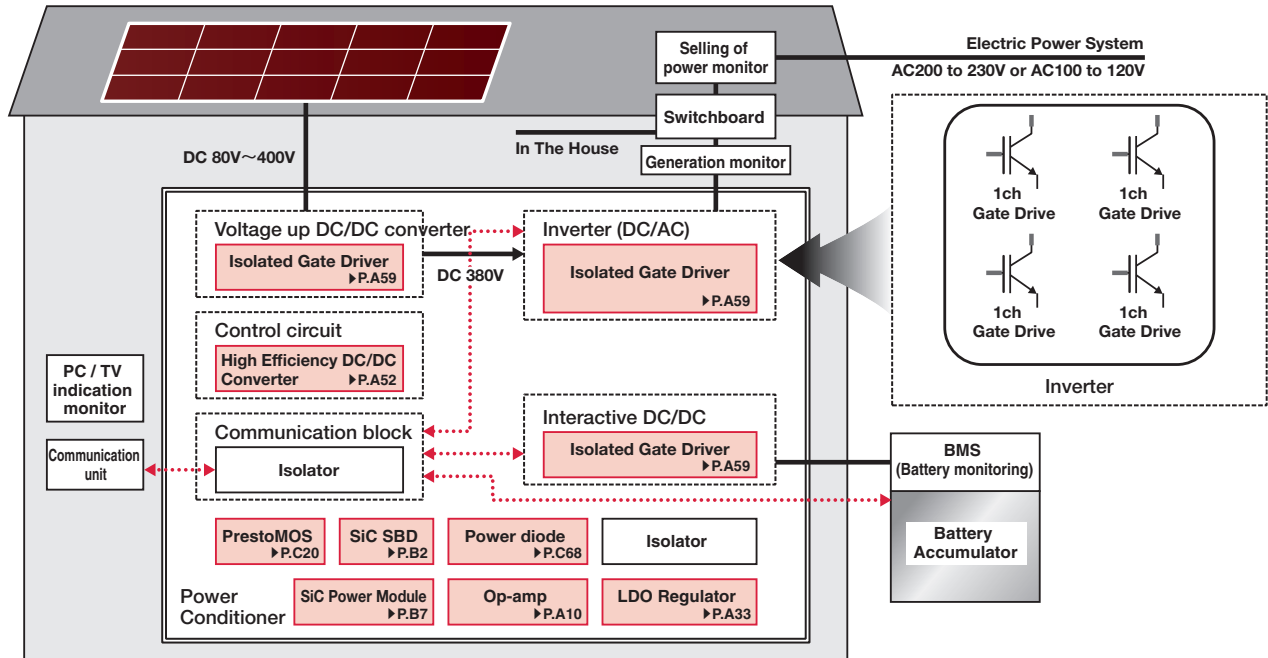




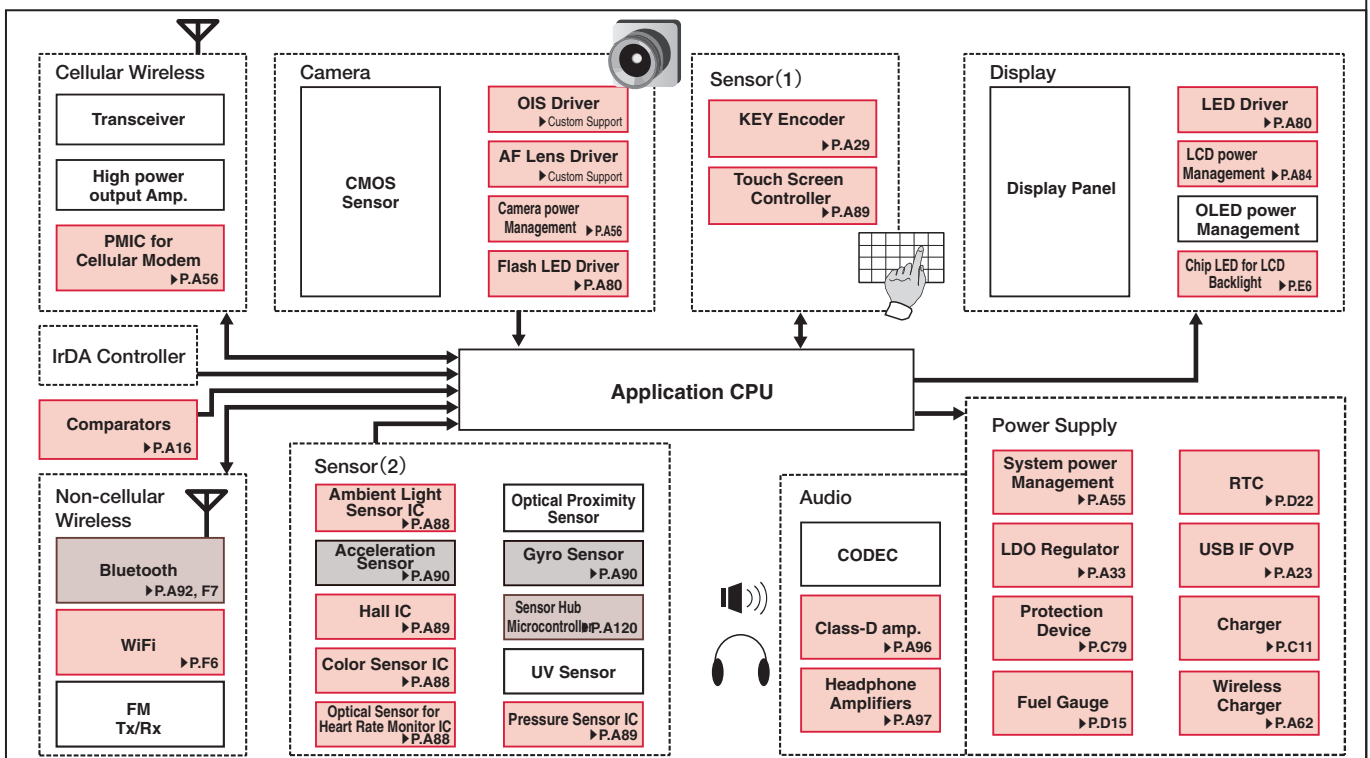
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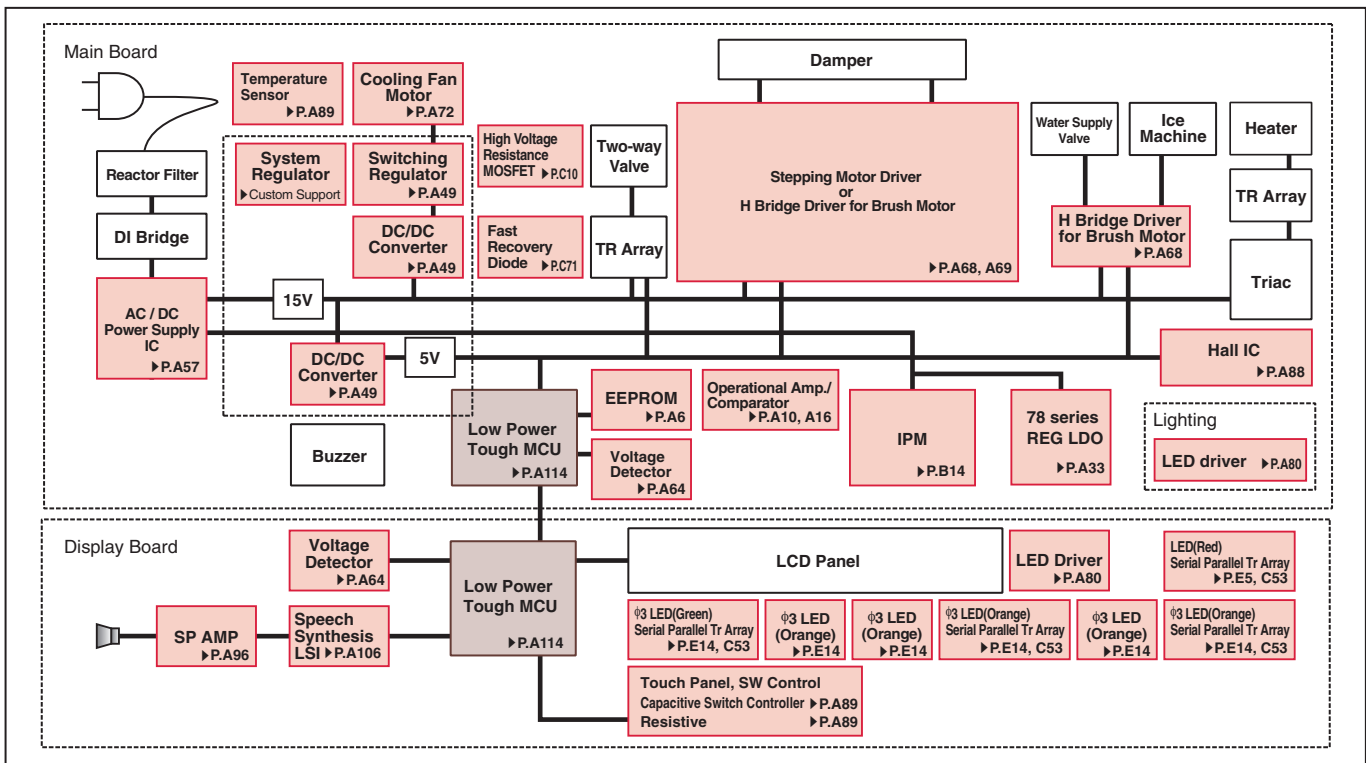


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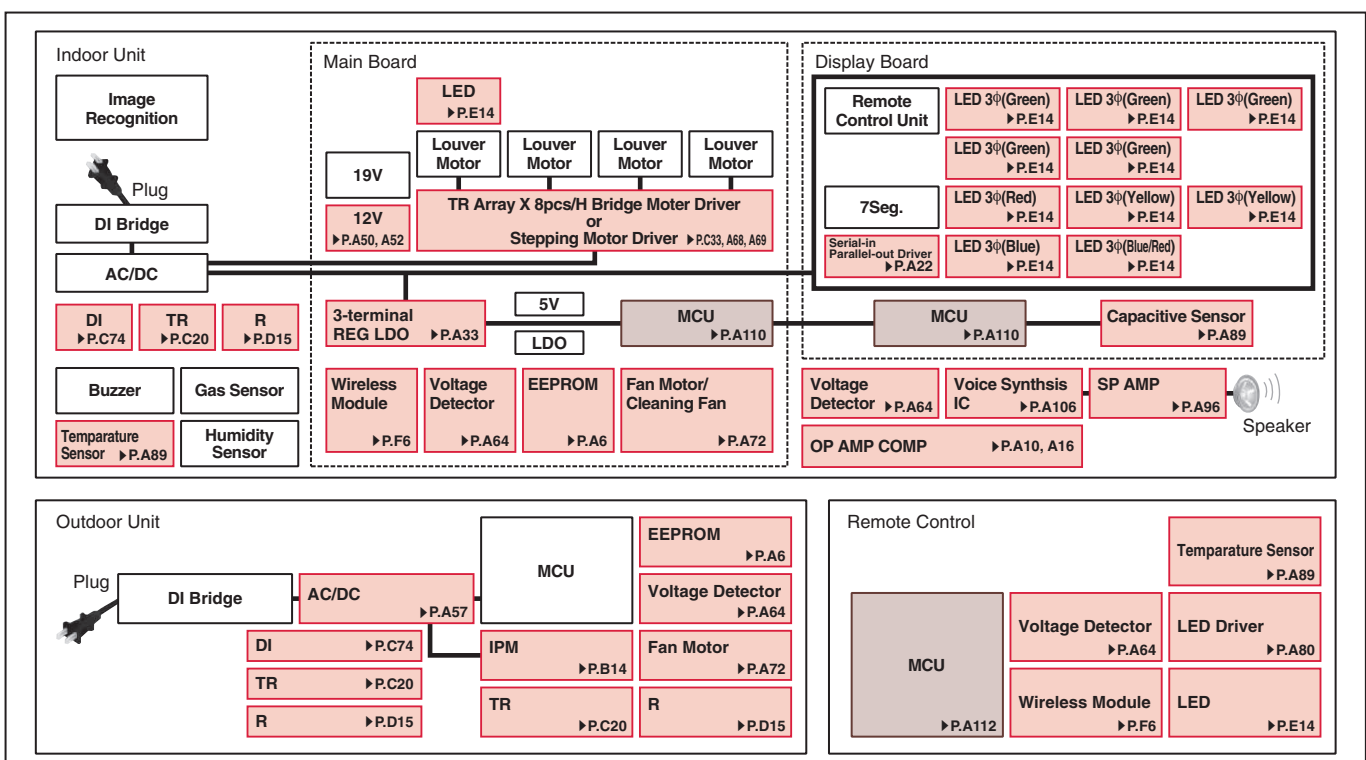


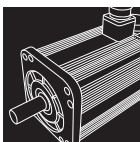


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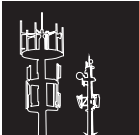
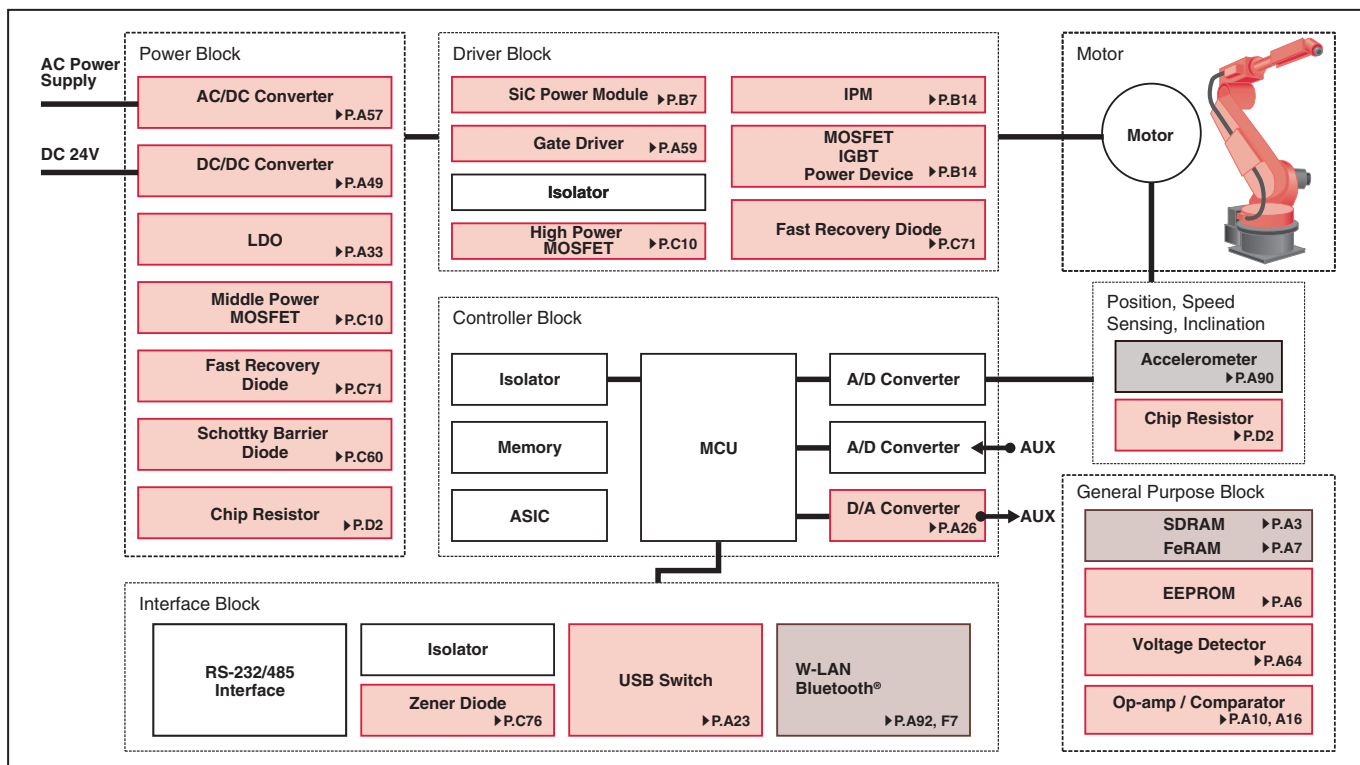


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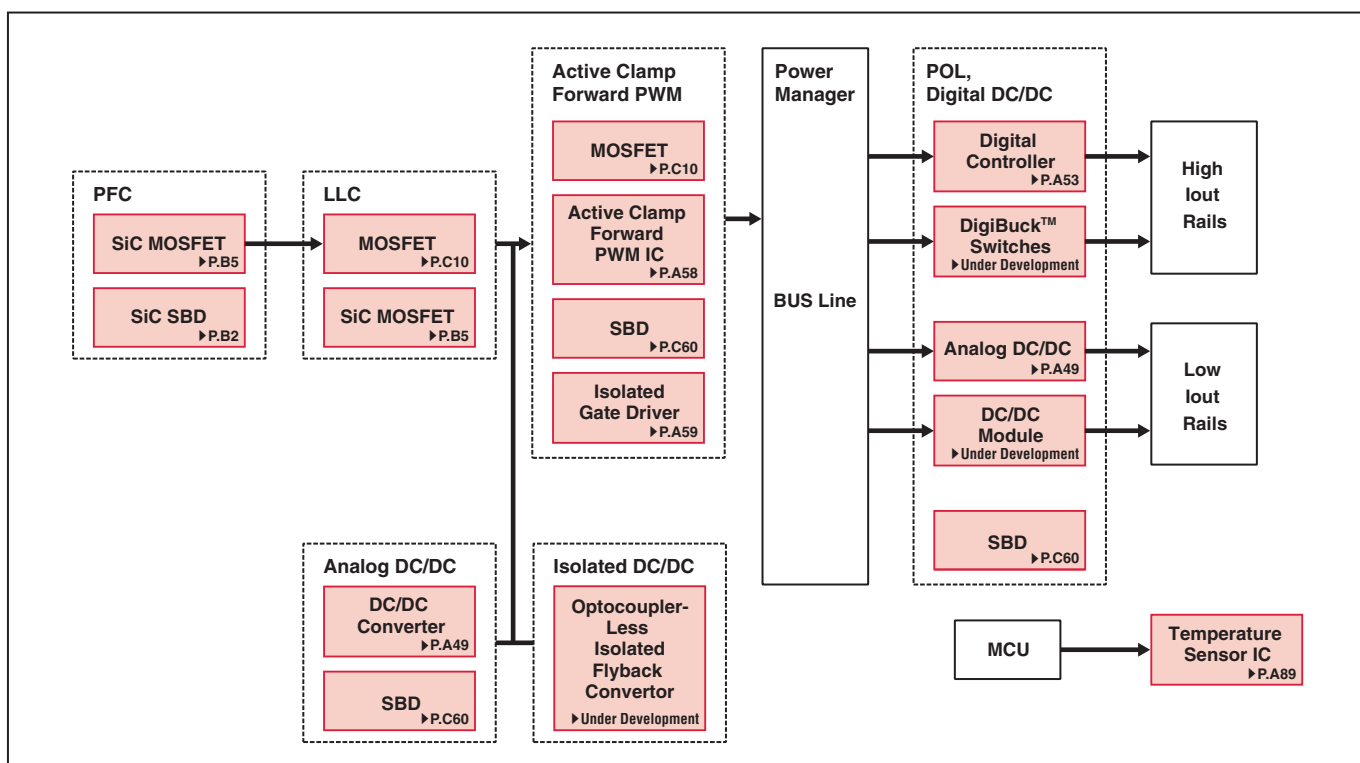




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ICs

# Memory

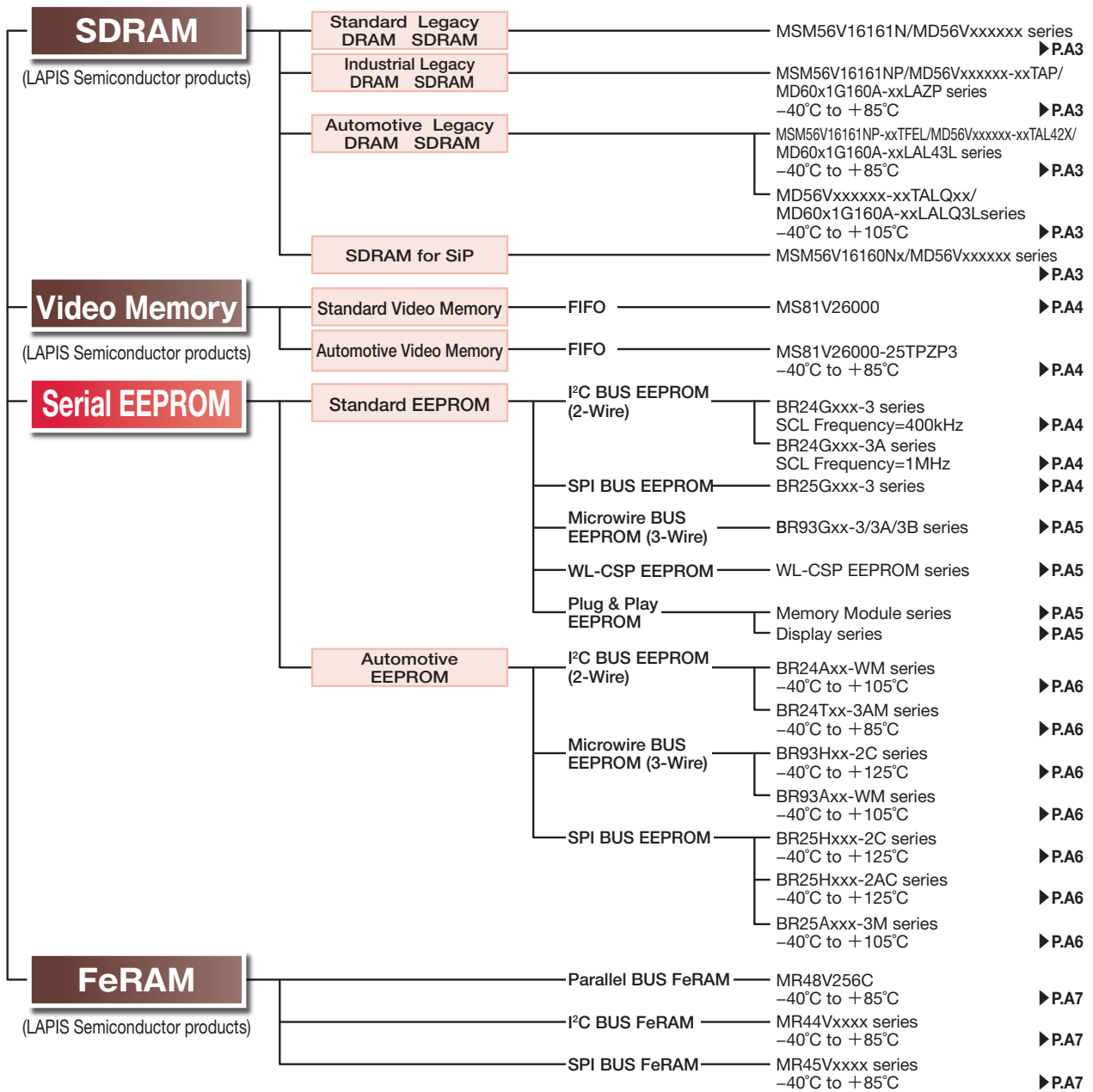
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General-purpose ICs

# Memory

## Memory



# SDRAM

## Standard Legacy DRAM SDRAM

(LAPIS Semiconductor products)

Standard												
Part No.	Data Rate Type	Supply Voltage (V)	Density (bit)	Number of Data bits	Configuration (bank×word×bit)	Max. Operating Frequency (MHz)	Refresh Cycle (cycles/ms)	Cycle Time (ns)	Features	Operating Temperature Ta(C)	Package	Halogen Free Support*1
MSM56V16161N	SDR	3.3±0.3	16M	×16	2×512K×16	143	4096/64	7/7.5/10	Drivability Control	0 to +70	TSOP(II)50	✓
MD56V62161M			64M		4×1M×16	143		7/7.5/10			TSOP(II)54	✓
MD56V72161C			128M		4×2M×16	166	6/7/7.5/10	✓				
MD56V82161A			256M		4×4M×16	166	8192/64	6/7/7.5/10				✓

## Industrial Legacy DRAM SDRAM

(LAPIS Semiconductor products)

Industrial												
Part No.	Data Rate Type	Supply Voltage (V)	Density (bit)	Number of Data bits	Configuration (bank×word×bit)	Max. Operating Frequency (MHz)	Refresh Cycle (cycles/ms)	Cycle Time (ns)	Features	Operating Temperature Ta(C)	Package	Halogen Free Support*1
MSM56V16161NP	SDR	3.3±0.3	16M	×16	2×512K×16	143	4096/64	7/7.5/10	Drivability Control	-40 to +85	TSOP(II)50	✓
MD56V62161M-xxTAP			64M		4×1M×16	143		7/7.5/10			TSOP(II)54	✓
MD56V72161C-xxTAP			128M		4×2M×16	166	6/7/7.5/10	✓				
MD56V82161A-xxTAP			256M		4×4M×16	166	8192/64	6/7/7.5/10				✓
☆MD60Y1G160A-xxLAZP	DDR3	1.5±0.075	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period : 7.8µs at Tc≤85°C, 3.9µs at Tc>85°C	1.25/1.5	—	-40 to +95	96-ball FBGA	✓
☆MD60S1G160A-xxLAZP	DDR3L	1.35 +0.1,-0.067	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period : 7.8µs at Tc≤85°C, 3.9µs at Tc>85°C	1.25/1.5	—	-40 to +95	96-ball FBGA	✓

## Automotive Legacy DRAM SDRAM

(LAPIS Semiconductor products)

Automotive(85°C)													
Part No.	Data Rate Type	Supply Voltage (V)	Density (bit)	Number of Data bits	Configuration (bank×word×bit)	Max. Operating Frequency (MHz)	Refresh Cycle (cycles/ms)	Cycle Time (ns)	Features	Operating Temperature Ta(C)	Package	Halogen Free Support*1	Automotive Grade AEC-Q100
MSM56V16161NP-xxTFEL	SDR	3.3±0.3	16M	×16	2×512K×16	143	4096/64	7/7.5/10	Drivability Control	-40 to +85	TSOP(II)50	✓	YES
MD56V62161M-xxTAL42X			64M		4×1M×16	143		7/7.5/10			TSOP(II)54	✓	YES
MD56V72161C-xxTAL42X			128M		4×2M×16	166	6/7/7.5/10	✓				YES	
MD56V82161A-xxTAL42X			256M		4×4M×16	166	8192/64	6/7/7.5/10				✓	YES
☆MD60Y1G160A-xxLAL43L	DDR3	1.5±0.075	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period : 7.8µs at Tc≤85°C, 3.9µs at Tc>85°C	1.25/1.5	—	-40 to +95	96-ball FBGA	✓	YES
☆MD60S1G160A-xxLAL43L	DDR3L	1.35 +0.1,-0.067	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period : 7.8µs at Tc≤85°C, 3.9µs at Tc>85°C	1.25/1.5	—	-40 to +95	96-ball FBGA	✓	YES

Automotive(105°C)													
Part No.	Data Rate Type	Supply Voltage (V)	Density (bit)	Number of Data bits	Configuration (bank×word×bit)	Max. Operating Frequency (MHz)	Refresh Cycle (cycles/ms)	Cycle Time (ns)	Features	Operating Temperature Ta(C)	Package	Halogen Free Support*1	Automotive Grade AEC-Q100
MD56V62161M-xxTALQ2X	SDR	3.3±0.3	64M	×16	4×1M×16	143	4096/16	7/7.5/10	Drivability Control	-40 to +105	TSOP(II)54	✓	YES
MD56V72161C-xxTALQ2X			128M		4×2M×16	166		6/7/7.5/10					
MD56V82161A-xxTALQ2X			256M		4×4M×16	166	8192/16	6/7/7.5/10					
☆MD60Y1G160A-xxLALQ3L	DDR3	1.5±0.075	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period : 7.8µs at Tc≤85°C, 3.9µs at Tc>85°C	1.25/1.5	—	-40 to +105	96-ball FBGA	✓	YES
☆MD60S1G160A-xxLALQ3L	DDR3L	1.35 +0.1,-0.067	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period : 7.8µs at Tc≤85°C, 3.9µs at Tc>85°C	1.25/1.5	—	-40 to +105	96-ball FBGA	✓	YES

DDR3 : Double Data Rate3 Synchronous DRAM, SDR : Single Data Rate Synchronous DRAM

\*1:A check mark of halogen free support means that we will be able to ship out the halogen free products.  
 For details, please inquire to the sales.

☆ : Under Development

## SDRAM for SiP

(LAPIS Semiconductor products)

Standard										
Part No.	Supply Voltage (V)	Density (bit)	Number of Data bits	Configuration (bank×word×bit)	Max. Operating Frequency (MHz)	Refresh Cycle (cycles/ms)	Cycle Time (ns)	Operating Temperature Tj(C)	Features	
MSM56V16160N	3.3±0.3	16M	×16	2×512K×16	166	4096/32	6/7/7.5/8/10	-40 to +125	KGD	
MD56V62160M		64M		4×1M×16	143		7/7.5/8/10			
MD56V72160C		128M		4×2M×16	166		6/7/7.5/10			

Automotive										
Part No.	Supply Voltage (V)	Density (bit)	Number of Data bits	Configuration (bank×word×bit)	Max. Operating Frequency (MHz)	Refresh Cycle (cycles/ms)	Cycle Time (ns)	Operating Temperature Tj(C)	Features	Automotive Grade*2
MSM56V16160NP	3.3±0.3	16M	×16	2×512K×16	166	4096/16	6/7/7.5/8/10	-40 to +125	KGD	YES
MD56V62160M		64M		4×1M×16	143		7/7.5/8/10			
MD56V72160C		128M		4×2M×16	166		6/7/7.5/10			

\*2:Please inquire to the sales for AEC-Q100.



# Video Memory

## Video Memory for Standard

(LAPIS Semiconductor products)

Standard													
Part No.	Supply Voltage (V)	Density (bit)	Configuration (word × bit) × port	Number of Data bits	Max. Operating Frequency (MHz)	Access Time (ns)	Cycle Time (ns)	Power Consumption(mW)		Operating Temperature Ta(°C)	Package	Notes	Halogen Free Support*1
								Operating	Standby				
MS81V26000	3.3±0.3	26M	1,114,112×24	×24	100	8/9	10/12	648/576	18	0 to +70	TQFP100	Asynchronous serial read/write, Write mask function, Output data control, Cascade, The top address can be specified	✓

## Video Memory for Automotive

(LAPIS Semiconductor products)

Automotive														
Part No.	Supply Voltage (V)	Density (bit)	Configuration (word × bit) × port	Number of Data bits	Max. Operating Frequency (MHz)	Access Time (ns)	Cycle Time (ns)	Power Consumption(mW)		Operating Temperature Ta(°C)	Package	Notes	Halogen Free Support*1	Automotive Grade*2
								Operating	Standby					
MS81V26000-25TPZP3	3.3±0.3	26M	1,114,112×24	×24	40	12	25	576	18	-40 to +85	TQFP100	Asynchronous serial read/write, Write mask function, Output data control, Cascade, The top address can be specified	✓	YES

\*1:A check mark of halogen free support means that we will be able to ship out the halogen free products.  
 For details, please inquire to the sales.

\*2:Please inquire to the sales for AEC-Q100.

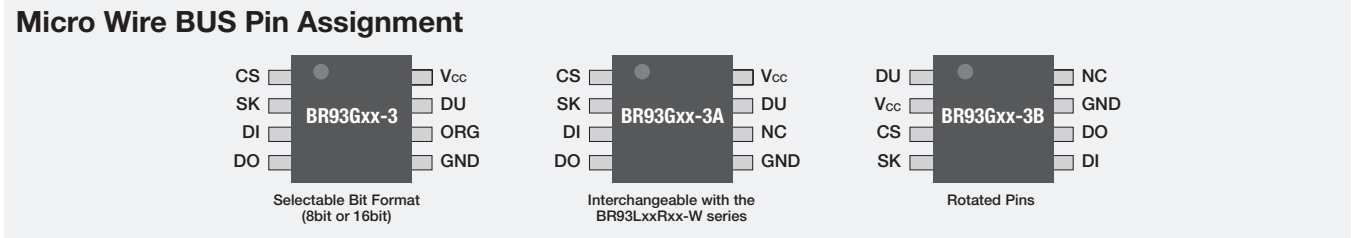
# Serial EEPROM

## Standard EEPROM

1 <sup>2</sup> C BUS EEPROM (2-Wire) BR24Gxxx-3 series (SCL Frequency = 400kHz)																		
Part No.	Package and Suffix								Density (bit)	Bit Format (word × bit)	Supply Voltage (V)	Current Consumption(Max.)		Write Cycle Time (Max.)(ms)	SCL Frequency (Hz)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)
	SOP8	SOP-J8	SSOP-B8	TSSOP-B8	MSOP8	TSSOP-B8J	VSON008X2030	VMMPO08Z1830				Operating (mA)	Standby (µA)					
BR24G01	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	—	1K	128 × 8	1.6 to 5.5	2	2	5	400K	-40 to +85	10 <sup>6</sup>	40
BR24G02	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	—	2K	256 × 8	1.6 to 5.5	2	2	5	400K			
BR24G04	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	—	4K	512 × 8	1.6 to 5.5	2	2	5	400K			
BR24G08	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	—	8K	1K × 8	1.6 to 5.5	2	2	5	400K			
BR24G16	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	QUZ-3	16K	2K × 8	1.6 to 5.5	2	2	5	400K			
BR24G32	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	—	32K	4K × 8	1.6 to 5.5	2	2	5	400K			
BR24G64	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	—	64K	8K × 8	1.6 to 5.5	2	2	5	400K			
BR24G128	F-3	FJ-3	FV-3	FVT-3	FVM-3	FVJ-3	NUX-3	—	128K	16K × 8	1.6 to 5.5	2.5	2	5	400K			
BR24G256	F-3	FJ-3	FV-3	FVT-3	—	—	—	—	256K	32K × 8	1.6 to 5.5	2.5	2	5	400K			
1 <sup>2</sup> C BUS EEPROM (2-Wire) BR24Gxxx-3A series (SCL Frequency = 1MHz)																		
BR24G01	F-3A	FJ-3A	—	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	—	1K	128 × 8	1.7 to 5.5	2	2	5	1M	-40 to +85	10 <sup>6</sup>	40
BR24G02	F-3A	FJ-3A	—	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	—	2K	256 × 8	1.7 to 5.5	2	2	5	1M			
BR24G04	F-3A	FJ-3A	—	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	—	4K	512 × 8	1.7 to 5.5	2	2	5	1M			
BR24G08	F-3A	FJ-3A	—	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	—	8K	1K × 8	1.7 to 5.5	2	2	5	1M			
BR24G16	F-3A	FJ-3A	—	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	—	16K	2K × 8	1.7 to 5.5	2	2	5	1M			
BR24G32	F-3A	FJ-3A	FV-3A	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	QUZ-3A	32K	4K × 8	1.7 to 5.5	2	2	5	1M			
BR24G64	F-3A	FJ-3A	FV-3A	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	QUZ-3A	64K	8K × 8	1.7 to 5.5	2	2	5	1M			
BR24G128	F-3A	FJ-3A	FV-3A	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	—	128K	16K × 8	1.7 to 5.5	2.5	2	5	1M			
BR24G256	F-3A	FJ-3A	FV-3A	FVT-3A	—	—	—	—	256K	32K × 8	1.7 to 5.5	2.5	2	5	1M			
BR24G512	F-3A	FJ-3A	—	FVT-3A	—	—	—	—	512K	64K × 8	1.7 to 5.5	4.5	3	5	1M			
BR24G1M	F-3A	FJ-3A	—	—	—	—	—	—	1M	128K × 8	1.7 to 5.5	4.5	3	5	1M			
SPI BUS EEPROM BR25Gxxx-3 series																		
Part No.	Package and Suffix					Density (bit)	Bit Format (word × bit)	Supply Voltage (V)	Current Consumption(Max.)		Write Cycle Time (Max.)(ms)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)				
	SOP8	SOP-J8	TSSOP-B8	MSOP8	VSON008X2030				Operating (mA)	Standby (µA)								
BR25G320	F-3	FJ-3	FVT-3	FVM-3	NUX-3	32K	4K × 8	1.6 to 5.5	8	2	5	-40 to +85	10 <sup>6</sup>	100				
BR25G640	F-3	FJ-3	FVT-3	FVM-3	NUX-3	64K	8K × 8	1.6 to 5.5	8	2	5							
BR25G128	F-3	FJ-3	FVT-3	FVM-3	NUX-3	128K	16K × 8	1.6 to 5.5	8	2	5							
BR25G256	F-3	FJ-3	FVT-3	—	—	256K	32K × 8	1.6 to 5.5	8	2	5							
BR25G512	F-3	FJ-3	FVT-3	—	—	512K	64K × 8	1.8 to 5.5	4	1	5							
BR25G1M	F-3	FJ-3	—	—	—	1M	128K × 8	1.8 to 5.5	4	1	5							

Microwire BUS EEPROM (3-Wire) BR93Gxx-3/3A/3B series														
Part No.	Package and Suffix					Density (bit)	Bit Format (word × bit)	Supply Voltage (V)	Current Consumption(Max.)		Write Cycle Time (Max.)(ms)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)
	SOP8	SOP-J8	TSSOP-B8	MSOP8	VSON008X3020				Operating (mA)	Standby (µA)				
BR93G46	F-3 <sup>*1</sup> / F-3A <sup>*2</sup> / F-3B <sup>*3</sup>	FJ-3 <sup>*1</sup> / FJ-3A <sup>*2</sup> / FJ-3B <sup>*3</sup>	FVT-3 <sup>*1</sup> / FVT-3A <sup>*2</sup> / FVT-3B <sup>*3</sup>	FVM-3 <sup>*1</sup> / FVM-3A <sup>*2</sup> / FVM-3B <sup>*3</sup>	NUX-3 <sup>*1</sup> / NUX-3A <sup>*2</sup> / NUX-3B <sup>*3</sup>	1K	64 × 16 (128 × 8)	1.7 to 5.5	3	2	5	-40 to +85	10 <sup>6</sup>	40
BR93G56	F-3 <sup>*1</sup> / F-3A <sup>*2</sup> / F-3B <sup>*3</sup>	FJ-3 <sup>*1</sup> / FJ-3A <sup>*2</sup> / FJ-3B <sup>*3</sup>	FVT-3 <sup>*1</sup> / FVT-3A <sup>*2</sup> / FVT-3B <sup>*3</sup>	FVM-3 <sup>*1</sup> / FVM-3A <sup>*2</sup> / FVM-3B <sup>*3</sup>	NUX-3 <sup>*1</sup> / NUX-3A <sup>*2</sup> / NUX-3B <sup>*3</sup>	2K	128 × 16 (256 × 8)	1.7 to 5.5	3	2	5			
BR93G66	F-3 <sup>*1</sup> / F-3A <sup>*2</sup> / F-3B <sup>*3</sup>	FJ-3 <sup>*1</sup> / FJ-3A <sup>*2</sup> / FJ-3B <sup>*3</sup>	FVT-3 <sup>*1</sup> / FVT-3A <sup>*2</sup> / FVT-3B <sup>*3</sup>	FVM-3 <sup>*1</sup> / FVM-3A <sup>*2</sup> / FVM-3B <sup>*3</sup>	NUX-3 <sup>*1</sup> / NUX-3A <sup>*2</sup> / NUX-3B <sup>*3</sup>	4K	256 × 16 (512 × 8)	1.7 to 5.5	3	2	5			
BR93G76	F-3 <sup>*1</sup> / F-3A <sup>*2</sup> / F-3B <sup>*3</sup>	FJ-3 <sup>*1</sup> / FJ-3A <sup>*2</sup> / FJ-3B <sup>*3</sup>	FVT-3 <sup>*1</sup> / FVT-3A <sup>*2</sup> / FVT-3B <sup>*3</sup>	FVM-3 <sup>*1</sup> / FVM-3A <sup>*2</sup> / FVM-3B <sup>*3</sup>	NUX-3 <sup>*1</sup> / NUX-3A <sup>*2</sup> / NUX-3B <sup>*3</sup>	8K	512 × 16 (1K × 8)	1.7 to 5.5	3	2	5			
BR93G86	F-3 <sup>*1</sup> / F-3A <sup>*2</sup> / F-3B <sup>*3</sup>	FJ-3 <sup>*1</sup> / FJ-3A <sup>*2</sup> / FJ-3B <sup>*3</sup>	FVT-3 <sup>*1</sup> / FVT-3A <sup>*2</sup> / FVT-3B <sup>*3</sup>	FVM-3 <sup>*1</sup> / FVM-3A <sup>*2</sup> / FVM-3B <sup>*3</sup>	NUX-3 <sup>*1</sup> / NUX-3A <sup>*2</sup> / NUX-3B <sup>*3</sup>	16K	1K × 16 (2K × 8)	1.7 to 5.5	3	2	5			

Microwire BUS EEPROM (3-Wire) BR93Gxx-3/3A/3B series : \*1 : They are dual organization (by 16bit or 8bit) and it is selected the input of ORG PIN. \*2 : 1PIN : CS PIN \*3 : 3PIN : CS PIN



WL-CSP EEPROM																
Part No.	I/F	Density (bit)	Package					Pull-up Resistor	Bit Format (word × bit)	Supply Voltage (V)	Current Consumption(Max.)		Write Cycle Time(ms)	Operating Temperature (°C)	Data Retention (years)	
			Package Name	Size (mm)	Thickness (mm)Max.	Ball Pitch (mm)	RESIN COATING				Operating (mA)	Standby (µA)				
BU9833GUL-W	I <sup>2</sup> C	2K	VCSP50L1	x : 1.27 y : 1.50	0.55	0.5	✓	—	256 × 8	1.7 to 5.5	2	2	5	-40 to +85	40	
BU9847GUL-W	I <sup>2</sup> C	4K	VCSP50L1	x : 1.95 y : 1.06	0.55	0.5	✓	—	512 × 8	1.7 to 5.5	2	2	5	-40 to +85	40	
BU9889GUL-W	I <sup>2</sup> C	8K	VCSP50L2	x : 1.60 y : 1.00	0.55	0.5	✓	—	1K × 8	1.7 to 5.5	2	2	5	-40 to +85	40	
BRCB008GWZ-3	I <sup>2</sup> C	8K	UCSP30L1	x : 0.94 y : 0.94	0.33	0.4	—	—	1K × 8	1.7 to 3.6	2	2	5	-40 to +85	40	
BRCB016GWL-3	I <sup>2</sup> C	16K	UCSP50L1	x : 1.10 y : 1.15	0.55	0.4	✓	—	2K × 8	1.7 to 3.6	2	2	5	-40 to +85	40	
BRCD016GWZ-3	I <sup>2</sup> C	16K	UCSP35L1	x : 1.30 y : 0.77	0.40	0.4	✓	—	2K × 8	1.7 to 3.6	2	2	5	-40 to +85	40	
<b>New</b> BRCG016GWZ-3	I <sup>2</sup> C	16K	UCSP30L1A	x : 0.82 y : 0.82	0.33	0.4	✓	—	2K × 8	1.7 to 5.5	2	2	5	-40 to +85	40	
BRCF016GWZ-3	I <sup>2</sup> C	16K	UCSP30L1	x : 0.86 y : 0.84	0.35	0.4	—	—	2K × 8	1.7 to 5.5	2	2	5	-40 to +85	40	
BRCA016GWZ-W	I <sup>2</sup> C	16K	UCSP30L1	x : 1.30 y : 0.77	0.35	0.4	—	—	2K × 8	1.7 to 3.6	2	2	5	-40 to +85	40	
BRCB032GWZ-3	I <sup>2</sup> C	32K	UCSP30L1	x : 1.45 y : 0.77	0.33	0.4	—	—	4K × 8	1.7 to 5.5	2	2	5	-40 to +85	40	
BRCH064GWZ-3	I <sup>2</sup> C	64K	UCSP35L1A	x : 1.50 y : 1.00	0.33	0.4	✓	—	8K × 8	1.6 to 5.5	2	2	5	-40 to +85	40	
BRCB064GWZ-3	I <sup>2</sup> C	64K	UCSP30L1	x : 1.50 y : 1.00	0.35	0.4	—	WP	8K × 8	1.6 to 5.5	3.9	2	5	-40 to +85	40	
BRCE064GWZ-3	I <sup>2</sup> C	64K	UCSP25L1	x : 1.50 y : 1.00	0.30	0.4	—	—	8K × 8	1.6 to 5.5	2	2	5	-40 to +85	40	
BU9897GUL-W	I <sup>2</sup> C	128K	VCSP50L2	x : 2.44 y : 1.99	0.55	0.5	✓	—	16K × 8	1.7 to 5.5	2.5	2	5	-40 to +85	40	
BU9832GUL-W	SPI	8K	VCSP50L2	x : 2.09 y : 1.85	0.55	0.5	✓	—	1K × 8	1.8 to 5.5	3	2	5	-40 to +85	40	
BU9829GUL-W	SPI	16K	VCSP50L1	x : 1.74 y : 1.65	0.55	0.5	✓	—	2K × 8	1.6 to 3.6	2	1	5	-30 to +85	10	
BR25S128GUZ-W	SPI	128K	VCSP35L2	x : 2.00 y : 2.63	0.40	0.5	✓	—	16K × 8	1.7 to 5.5	2 <sup>*</sup>	2	5	-40 to +85	40	
BU9891GUL-W	MW	4K	VCSP50L1	x : 1.60 y : 1.00	0.55	0.5	✓	—	256 × 16	1.7 to 5.5	3	2	5	-40 to +85	40	

WL-CSP EEPROM : \* V<sub>CC</sub>=2.5V

Plug & Play EEPROM For Memory Modules										
Part No.	Package and Suffix		Bit Format (word × bit)	Supply Voltage (V)	Clock Frequency (kHz)	Write Cycle Time (ms)	Endurance (times)	Data Retention (years)	Write Protect	
	TSSOP-B8	VSON008X2030								
BR34L02	FVT-W	—	256 × 8	1.7 to 5.5	100 <sup>*1</sup> /400 <sup>*2</sup>	5	10 <sup>6</sup>	40	Onetime ROM write protect	
BR34E02	FVT-3	NUX-3	256 × 8	1.7 to 5.5	400	5	10 <sup>6</sup>	40	Settable write protect Onetime ROM write protect	

Plug & Play EEPROM For Memory Modules : \*1 : V<sub>CC</sub>=1.7 to 5.5V \*2 : V<sub>CC</sub>=2.5 to 5.5V

Plug & Play EEPROM For Display												
Part No.	Package and Suffix							Function Descriptions	Bit Format (word × bit)	Supply Voltage (V)	Clock Frequency (MHz)	Write Cycle Time (ms)
	SOP8	SOP-J8	SSOP-B8	SOP14	SSOP-B14	SSOP-B16	VSON008X2030					
BR24C21	F	FJ	FV	—	—	—	—	Supports DDC1™/DDC2™ for displays	128 × 8	2.5 to 5.5	100/400	10
BU9882	—	—	—	F-W	FV-W	—	—	Dual-port type compatible with DDC2™ for displays	128 × 8 × 2ch	2.5 to 5.5	100/400	10
BU9883	—	—	—	—	—	FV-W	—	2kbit × 3ch EEPROM for HDMI ports	256 × 8 × 3ch	3.0 to 5.5	400	5
BU99022	—	—	—	—	—	—	NUX-3	2kbit × 2ch type	256 × 8 × 2ch	1.7 to 5.5	400	5

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**Automotive EEPROM**
**A**  
**Memory**
**105°C Operation I<sup>2</sup>C BUS EEPROM (2-Wire) BR24Axx-WM series**

Part No.	Package and Suffix			Density (bit)	Bit Format (word × bit)	Supply Voltage (V)	Current Consumption(Max.)		Write Cycle Time (Max.)(ms)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)	Automotive Grade AEC-Q100
	SOP8	SOP-J8	MSOP8				Operating (mA)	Standby (µA)					
<b>BR24A01A</b>	F-WM	FJ-WM	—	1K	128 × 8	2.5 to 5.5	2	2	5	-40 to +105	10 <sup>6</sup>	40	YES
<b>BR24A02</b>	F-WM	FJ-WM	FVM-WM	2K	256 × 8	2.5 to 5.5	2	2	5				
<b>BR24A04</b>	F-WM	FJ-WM	—	4K	512 × 8	2.5 to 5.5	2	2	5				
<b>BR24A08</b>	F-WM	FJ-WM	—	8K	1K × 8	2.5 to 5.5	2	2	5				
<b>BR24A16</b>	F-WM	FJ-WM	—	16K	2K × 8	2.5 to 5.5	2	2	5				
<b>BR24A32</b>	F-WM	—	—	32K	4K × 8	2.5 to 5.5	3	2	5				
<b>BR24A64</b>	F-WM	—	—	64K	8K × 8	2.5 to 5.5	3	2	5				

**85°C Operation Microwire I<sup>2</sup>C BUS EEPROM (2-Wire) BR24Txx-3AM series**

Part No.	Package and Suffix			Density (bit)	Bit Format (word × bit)	Supply Voltage (V)	Current Consumption(Max.)		Write Cycle Time (Max.)(ms)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)	Automotive Grade AEC-Q100
	SOP8	SOP-J8	TSSOP-B8				Operating (mA)	Standby (µA)					
<b>New</b> <b>BR24T512</b>	F-3AM	FJ-3AM	FVT-3AM	512K	64K × 8	1.7 to 5.5	4.5	3	5	-40 to +85	10 <sup>6</sup>	40	YES
<b>New</b> <b>BR24T1M</b>	F-3AM	FJ-3AM	—	1M	128K × 8	1.7 to 5.5	4.5	3	5				

**125°C Operation Microwire BUS EEPROM (3-Wire) BR93Hxx-2C series**

Part No.	Package and Suffix				Density (bit)	Bit Format (word × bit)	Supply Voltage (V)	Current Consumption(Max.)		Write Cycle Time (Max.)(ms)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)	Automotive Grade AEC-Q100
	SOP8	SOP-J8	TSSOP-B8	MSOP8				Operating (mA)	Standby (µA)					
<b>BR93H46</b>	RF-2C	RFJ-2C	RFVT-2C	RFVM-2C	1K	64 × 16	2.5 to 5.5	3	10	4	-40 to +125	10 <sup>6</sup>	100	YES
<b>BR93H56</b>	RF-2C	RFJ-2C	RFVT-2C	RFVM-2C	2K	128 × 16	2.5 to 5.5	3	10	4				
<b>BR93H66</b>	RF-2C	RFJ-2C	RFVT-2C	RFVM-2C	4K	256 × 16	2.5 to 5.5	3	10	4				
<b>BR93H76</b>	RF-2C	RFJ-2C	RFVT-2C	RFVM-2C	8K	512 × 16	2.5 to 5.5	3	10	4				
<b>BR93H86</b>	RF-2C	RFJ-2C	RFVT-2C	RFVM-2C	16K	1K × 16	2.5 to 5.5	3	10	4				

**105°C Operation Microwire BUS EEPROM (3-Wire) BR93Axx-WM series**

<b>BR93A46</b>	RF-WM	RFJ-WM	RFVT-WM	RFVM-WM	1K	64 × 16	2.5 to 5.5	3	2	5	-40 to +105	10 <sup>6</sup>	40	YES
<b>BR93A56</b>	RF-WM	RFJ-WM	RFVT-WM	RFVM-WM	2K	128 × 16	2.5 to 5.5	3	2	5				
<b>BR93A66</b>	RF-WM	RFJ-WM	RFVT-WM	RFVM-WM	4K	256 × 16	2.5 to 5.5	3	2	5				
<b>BR93A76</b>	RF-WM	RFJ-WM	RFVT-WM	RFVM-WM	8K	512 × 16	2.5 to 5.5	3	2	5				
<b>BR93A86</b>	RF-WM	RFJ-WM	RFVT-WM	RFVM-WM	16K	1K × 16	2.5 to 5.5	3	2	5				

**125°C Operation SPI BUS EEPROM BR25Hxxx-2C series**

<b>BR25H010</b>	F-2C	FJ-2C	FVT-2C	FVM-2C	1K	128 × 8	2.5 to 5.5	4	10	4	-40 to +125	10 <sup>6</sup>	100	YES
<b>BR25H020</b>	F-2C	FJ-2C	FVT-2C	FVM-2C	2K	256 × 8	2.5 to 5.5	4	10	4				
<b>BR25H040</b>	F-2C	FJ-2C	FVT-2C	FVM-2C	4K	512 × 8	2.5 to 5.5	4	10	4				
<b>BR25H080</b>	F-2C	FJ-2C	FVT-2C	FVM-2C	8K	1K × 8	2.5 to 5.5	4	10	4				
<b>BR25H160</b>	F-2C	FJ-2C	FVT-2C	FVM-2C	16K	2K × 8	2.5 to 5.5	4	10	4				
<b>BR25H320</b>	F-2C	FJ-2C	FVT-2C	FVM-2C	32K	4K × 8	2.5 to 5.5	4	10	4				
<b>BR25H640</b>	F-2C	FJ-2C	FVT-2C	—	64K	8K × 8	2.5 to 5.5	5.5	10	4				
<b>BR25H128</b>	F-2C	FJ-2C	—	—	128K	16K × 8	2.5 to 5.5	5.5	10	4				

**125°C Operation SPI BUS EEPROM with ECC Function BR25Hxxx-2AC series**

<b>BR25H640</b>	F-2AC	FJ-2AC	FVT-2AC	FVM-2AC	64K	8K × 8	2.5 to 5.5	5.5	10	4	-40 to +125	10 <sup>6</sup>	100	YES
<b>BR25H128</b>	F-2AC	FJ-2AC	FVT-2AC	—	128K	16K × 8	2.5 to 5.5	5.5	10	4				
<b>BR25H256</b>	F-2AC	FJ-2AC	—	—	256K	32K × 8	2.5 to 5.5	5.5	10	4				

**105°C Operation SPI BUS EEPROM BR25Axxx-3M series**

<b>BR25A256</b>	F-3M	FJ-3M	FVT-3M	—	256K	32K × 8	2.5 to 5.5	4	10	5	-40 to +105	10 <sup>6</sup>	100	YES
<b>BR25A512</b>	F-3M	FJ-3M	FVT-3M	—	512K	64K × 8	2.5 to 5.5	4	10	5				
<b>BR25A1M</b>	F-3M	FJ-3M	—	—	1M	128K × 8	2.5 to 5.5	4	10	5				

# FeRAM

## Ferroelectric Memory

(LAPIS Semiconductor products)

A

Memory

Parallel BUS FeRAM											
Part No.	Memory Density (bit)	Configuration (word×bit)	Supply Voltage (V)	Operating Speed	Read/Write Endurance (times)	Data Retention (years)	Operating Temperature Ta(°C)	Package	Halogen Free Support <sup>*1</sup>	Automotive Grade <sup>*2</sup>	
MR48V256C	256K	32K×8	2.7 to 3.6	t <sub>WC</sub> =150ns	10 <sup>12</sup>	10	-40 to +85	TSOP(I)28	—	YES	
I <sup>2</sup> C BUS FeRAM MR44Vxxxx series											
MR44V064A	64K	8K×8	2.5 to 3.6	f <sub>clk</sub> =3.4MHz	10 <sup>12</sup>	10	-40 to +85	SOP8	✓	YES	
MR44V064B	64K	8K×8	1.8 to 3.6	f <sub>clk</sub> =3.4MHz					✓		
<b>New</b> MR44V100A	1M	128K×8	1.8 to 3.6	f <sub>clk</sub> =3.4MHz					✓		
SPI BUS FeRAM MR45Vxxxx series											
MR45V032A	32K	4K×8	2.7 to 3.6	f <sub>clk</sub> =15MHz	10 <sup>12</sup>	10	-40 to +85	SOP8	✓	YES	
MR45V064B	64K	8K×8	1.8 to 3.6	f <sub>clk</sub> =40MHz					✓		
MR45V256A	256K	32K×8	3.0 to 3.6	f <sub>clk</sub> =15MHz					✓		
<b>New</b> MR45V100A	1M	128K×8	1.8 to 3.6	f <sub>clk</sub> =40MHz					✓		—
MR45V200A	2M	256K×8	2.7 to 3.6	f <sub>clk</sub> =34MHz					✓		—

\*1:A check mark of halogen free support means that we will be able to ship out the halogen free products.  
For details, please inquire to the sales.

\*2:Please inquire to the sales for AEC-Q100.







ICs

# Amplifiers & Linear

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