



ICs

Memory

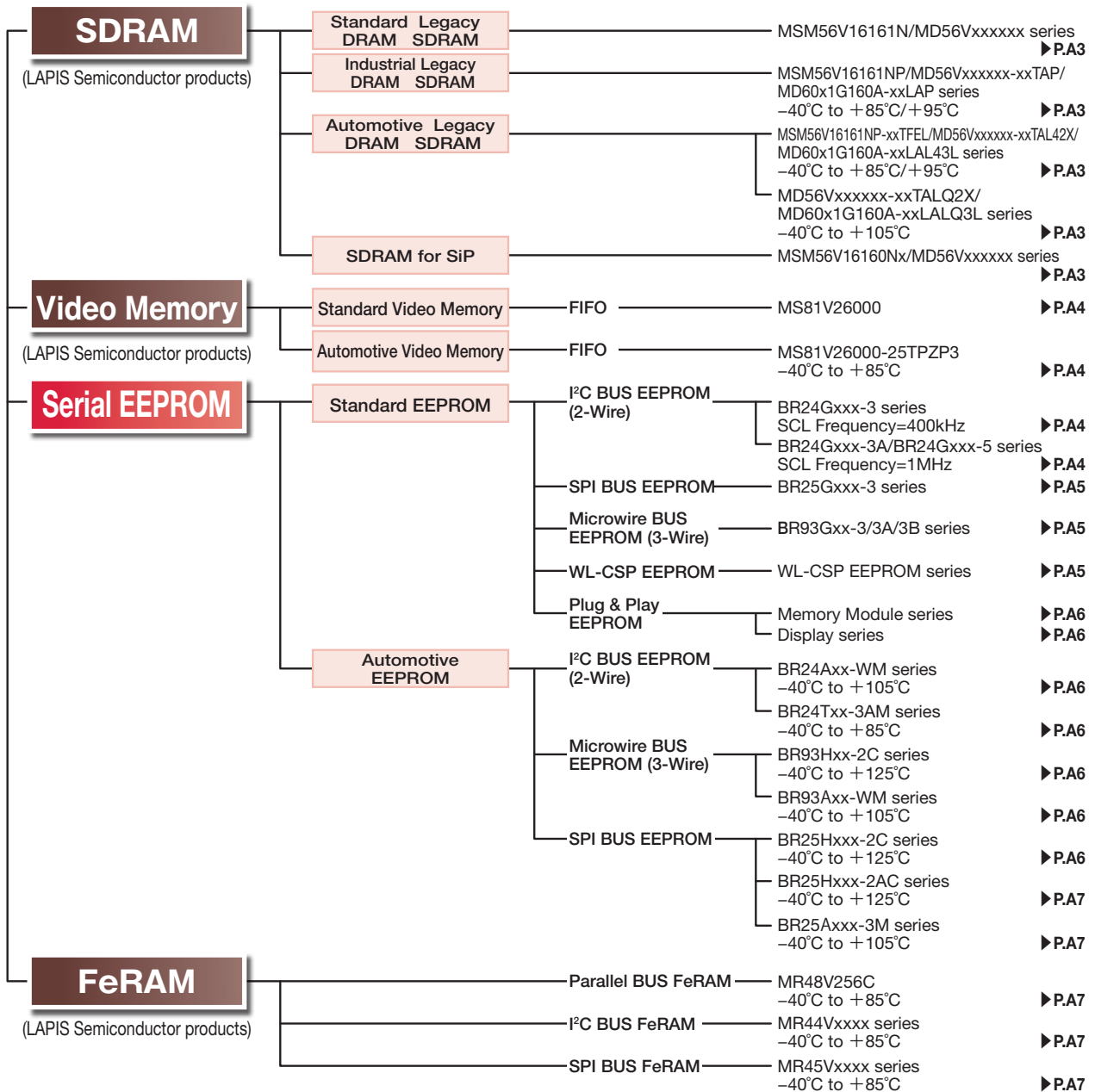
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General-purpose ICs

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(2)50-400-0.80	✓
MD56V62161M			64M		4×1M×16	143		7/7.5/10				✓
MD56V72161C			128M		4×2M×16	166	6/7/7.5/10	✓				
MD56V82161A			256M		4×4M×16	166	8192/64	6/7/7.5/10				✓

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.

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(2)50-400-0.80	✓
MD56V62161M-xxTAP			64M		4×1M×16	143		7/7.5/10				✓
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-xxLAP7AL	DDR3	1.5±0.075	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period: 7.8µs(Tc≤85°C), 3.9µs(Tc>85°C)	1.25/1.5	—	-40 to +95	TFBGA96-9.0x13.0-0.80	✓
☆MD60S1G160A-xxLAP7AL	DDR3L	1.35 +0.1, -0.067	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period: 7.8µs(Tc≤85°C), 3.9µs(Tc>85°C)	1.25/1.5	—	-40 to +95	TFBGA96-9.0x13.0-0.80	✓

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

Automotive Legacy DRAM SDRAM

(LAPIS Semiconductor products)

Automotive(85°C/95°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-xxTFEX	SDR	3.3±0.3	16M	×16	2×512K×16	143	4096/64	7/7.5/10	Drivability Control	-40 to +85	TSOP(2)50-400-0.80	✓	YES
MD56V62161M-xxTAL42X			64M		4×1M×16	143		7/7.5/10				✓	
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(Tc≤85°C), 3.9µs(Tc>85°C)	1.25/1.5	—	-40 to +95	TFBGA96-9.0x13.0-0.80	✓	YES
☆MD60S1G160A-xxLAL43L	DDR3L	1.35 +0.1, -0.067	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period: 7.8µs(Tc≤85°C), 3.9µs(Tc>85°C)	1.25/1.5	—	-40 to +95	TFBGA96-9.0x13.0-0.80	✓	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(2)54-400-0.80	✓	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(Tc≤85°C), 3.9µs(Tc>85°C)	1.25/1.5	—	-40 to +105	TFBGA96-9.0x13.0-0.80	✓	YES
☆MD60S1G160A-xxLALQ3L	DDR3L	1.35 +0.1, -0.067	1G	×16	8×8M×16	800 (1600Mbps)	Average refresh period: 7.8µs(Tc≤85°C), 3.9µs(Tc>85°C)	1.25/1.5	—	-40 to +105	TFBGA96-9.0x13.0-0.80	✓	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	Automotive Grade*1
MSM56V16160N-xxWBP	3.3±0.3	16M	×16	2×512K×16	143	4096/16	7/7.5/10	-40 to +125	KGD	YES
MD56V62160M-xxWBP		64M		4×1M×16	143		7/7.5/8/10			
MD56V72160C-xxWBP		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*1
MSM56V16160NP	3.3±0.3	16M	×16	2×512K×16	143	4096/16	7/7.5/10	-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			

*1 : 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	TQFP100-1414-0.50	Asynchronous serial read/write, Write mask function, Output data control, Cascade, The top address can be specified	✓

*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.

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	-45 to +85	TQFP100-1414-0.50	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 ² 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-B&J	VSON008X2030	VMMP008Z1830				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	-40 to +85	10 ⁵	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				
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				
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				
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				
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				
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				
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				
BR24G256	F-3	FJ-3	FV-3	FVT-3	—	—	—	—	256K	32K × 8	1.6 to 5.5	2.5	2	5				
1 ² 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	-40 to +85	10 ⁵	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				
BR24G04	F-3A	FJ-3A	—	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	—	4K	512 × 8	1.7 to 5.5	2	2	5				
BR24G08	F-3A	FJ-3A	—	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	—	8K	1K × 8	1.7 to 5.5	2	2	5				
BR24G16	F-3A	FJ-3A	—	FVT-3A	FVM-3A	FVJ-3A	NUX-3A	—	16K	2K × 8	1.7 to 5.5	2	2	5				
BR24G512	F-3A	FJ-3A	—	FVT-3A	—	—	—	—	512K	64K × 8	1.7 to 5.5	4.5	3	5				
BR24G1M	F-3A	FJ-3A	—	—	—	—	—	—	1M	128K × 8	1.7 to 5.5	4.5	3	5				
1 ² C BUS EEPROM(2-Wire) BR24Gxxx-5 series(SCL Frequency = 1MHz)																		
New BR24G32	F-5	FJ-5	—	FVT-5	FVM-5	—	NUX-5	—	32K	4K × 8	1.6 to 5.5	2	2.5	5	-40 to +85	4 × 10 ⁶	200	
New BR24G64	F-5	FJ-5	—	FVT-5	FVM-5	—	NUX-5	—	64K	8K × 8	1.6 to 5.5	2	2.5	5				
New BR24G128	F-5	FJ-5	—	FVT-5	FVM-5	—	NUX-5	—	128K	16K × 8	1.6 to 5.5	2	2.5	5				
New BR24G256	F-5	FJ-5	—	FVT-5	FVM-5	—	NUX-5	—	256K	32K × 8	1.6 to 5.5	2	2.5	5				

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 ⁶	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.	F-3*1/ F-3A*2/ F-3B*3	FJ-3*1/ FJ-3A*2/ FJ-3B*3	FVT-3*1/ FVT-3A*2/ FVT-3B*3	FVM-3*1/ FVM-3A*2/ FVM-3B*3	NUX-3*1/ NUX-3A*2/ NUX-3B*3	Density (bit)	Bit Format (word × bit)	Supply Voltage (V)	Operating (mA)	Standby (µA)	Write Cycle Time (Max.)(ms)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)
BR93G46	F-3*1/ F-3A*2/ F-3B*3	FJ-3*1/ FJ-3A*2/ FJ-3B*3	FVT-3*1/ FVT-3A*2/ FVT-3B*3	FVM-3*1/ FVM-3A*2/ FVM-3B*3	NUX-3*1/ NUX-3A*2/ NUX-3B*3	1K	64 × 16 (128 × 8)	1.7 to 5.5	3	2	5	-40 to +85	10 ⁶	40
BR93G56	F-3*1/ F-3A*2/ F-3B*3	FJ-3*1/ FJ-3A*2/ FJ-3B*3	FVT-3*1/ FVT-3A*2/ FVT-3B*3	FVM-3*1/ FVM-3A*2/ FVM-3B*3	NUX-3*1/ NUX-3A*2/ NUX-3B*3	2K	128 × 16 (256 × 8)	1.7 to 5.5	3	2	5			
BR93G66	F-3*1/ F-3A*2/ F-3B*3	FJ-3*1/ FJ-3A*2/ FJ-3B*3	FVT-3*1/ FVT-3A*2/ FVT-3B*3	FVM-3*1/ FVM-3A*2/ FVM-3B*3	NUX-3*1/ NUX-3A*2/ NUX-3B*3	4K	256 × 16 (512 × 8)	1.7 to 5.5	3	2	5			
BR93G76	F-3*1/ F-3A*2/ F-3B*3	FJ-3*1/ FJ-3A*2/ FJ-3B*3	FVT-3*1/ FVT-3A*2/ FVT-3B*3	FVM-3*1/ FVM-3A*2/ FVM-3B*3	NUX-3*1/ NUX-3A*2/ NUX-3B*3	8K	512 × 16 (1K × 8)	1.7 to 5.5	3	2	5			
BR93G86	F-3*1/ F-3A*2/ F-3B*3	FJ-3*1/ FJ-3A*2/ FJ-3B*3	FVT-3*1/ FVT-3A*2/ FVT-3B*3	FVM-3*1/ FVM-3A*2/ FVM-3B*3	NUX-3*1/ NUX-3A*2/ NUX-3B*3	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(16bit or 8bit) and it is selected the input of ORG PIN. *2 : 1PIN : CS PIN *3 : 3PIN : CS PIN

Micro Wire BUS Pin Assignment

CS, SK, DI, DO, Vcc, DU, ORG, GND

Selectable Bit Format (8bit or 16bit)

CS, SK, DI, DO, Vcc, DU, NC, GND

Interchangeable with the BR93LxxRxx-W series

DU, Vcc, CS, SK, NC, GND, DO, DI

Rotated Pins

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 (Max.)(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 ² 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 ² 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 ² C	8K	VCSP50L1	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 ² 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 ² 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 ² 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
BRCG016GWZ-3	I ² 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 ² 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 ² 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 ² 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 ² 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 ² 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 ² 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 ² 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*	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 : * Vcc=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 ¹ /400 ^{*2}	5	10 ⁶	40	Onetime ROM write protect
BR34E02	FVT-3	NUX-3	256 × 8	1.7 to 5.5	400	5	10 ⁶	40	Settable write protect Onetime ROM write protect

Plug & Play EEPROM For Memory Modules : *1 : Vcc=1.7 to 5.5V *2 : Vcc=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

Automotive EEPROM
105°C Operation I²C 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)					
BR24A01A	F-WM	FJ-WM	—	1K	128 × 8	2.5 to 5.5	2	2	5	-40 to +105	10 ⁶	40	YES
BR24A02	F-WM	FJ-WM	FVM-WM	2K	256 × 8	2.5 to 5.5	2	2	5				
BR24A04	F-WM	FJ-WM	—	4K	512 × 8	2.5 to 5.5	2	2	5				
BR24A08	F-WM	FJ-WM	—	8K	1K × 8	2.5 to 5.5	2	2	5				
BR24A16	F-WM	FJ-WM	—	16K	2K × 8	2.5 to 5.5	2	2	5				
BR24A32	F-WM	—	—	32K	4K × 8	2.5 to 5.5	3	2	5				
BR24A64	F-WM	—	—	64K	8K × 8	2.5 to 5.5	3	2	5				

85°C Operation I²C 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)					
BR24T512	F-3AM	FJ-3AM	FVT-3AM	512K	64K × 8	1.7 to 5.5	4.5	3	5	-40 to +85	10 ⁶	40	YES
BR24T1M	F-3AM	FJ-3AM	—	1M	128K × 8	1.7 to 5.5	4.5	3	5	-40 to +85	10 ⁶	40	YES

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)					
BR93H46	RF-2C	RFJ-2C	RFVT-2C	RFVM-2C	1K	64 × 16	2.5 to 5.5	3	10	4	-40 to +125	10 ⁶	100	YES
BR93H56	RF-2C	RFJ-2C	RFVT-2C	RFVM-2C	2K	128 × 16	2.5 to 5.5	3	10	4				
BR93H66	RF-2C	RFJ-2C	RFVT-2C	RFVM-2C	4K	256 × 16	2.5 to 5.5	3	10	4				
BR93H76	RF-2C	RFJ-2C	RFVT-2C	RFVM-2C	8K	512 × 16	2.5 to 5.5	3	10	4				
BR93H86	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

Part No.	Package	Suffix			Density (bit)	Bit Format (word × bit)	Supply Voltage (V)	Current Consumption(Max.)		Write Cycle Time (ms)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)	Automotive Grade
		RF-WM	RFJ-WM	RFVT-WM				RFVM-WM	Operating (mA)					
BR93A46	RF-WM	RFJ-WM	RFVT-WM	RFVM-WM	1K	64 × 16	2.5 to 5.5	3	2	5	-40 to +105	10 ⁶	40	YES
BR93A56	RF-WM	RFJ-WM	RFVT-WM	RFVM-WM	2K	128 × 16	2.5 to 5.5	3	2	5				
BR93A66	RF-WM	RFJ-WM	RFVT-WM	RFVM-WM	4K	256 × 16	2.5 to 5.5	3	2	5				
BR93A76	RF-WM	RFJ-WM	RFVT-WM	RFVM-WM	8K	512 × 16	2.5 to 5.5	3	2	5				
BR93A86	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

Part No.	Package	Suffix			Density (bit)	Bit Format (word × bit)	Supply Voltage (V)	Operating (mA)	Standby (µA)	Write Cycle Time (ms)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)	Automotive Grade
		F-2C	FJ-2C	FVT-2C										
BR25H010	F-2C	FJ-2C	FVT-2C	FVM-2C	1K	128 × 8	2.5 to 5.5	4	10	4	-40 to +125	10 ⁶	100	YES
BR25H020	F-2C	FJ-2C	FVT-2C	FVM-2C	2K	256 × 8	2.5 to 5.5	4	10	4				
BR25H040	F-2C	FJ-2C	FVT-2C	FVM-2C	4K	512 × 8	2.5 to 5.5	4	10	4				
BR25H080	F-2C	FJ-2C	FVT-2C	FVM-2C	8K	1K × 8	2.5 to 5.5	4	10	4				
BR25H160	F-2C	FJ-2C	FVT-2C	FVM-2C	16K	2K × 8	2.5 to 5.5	4	10	4				
BR25H320	F-2C	FJ-2C	FVT-2C	FVM-2C	32K	4K × 8	2.5 to 5.5	4	10	4				
BR25H640	F-2C	FJ-2C	FVT-2C	—	64K	8K × 8	2.5 to 5.5	5.5	10	4				
BR25H128	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														
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)					
BR25H640	F-2AC	FJ-2AC	FVT-2AC	FVM-2AC	64K	8K × 8	2.5 to 5.5	5.5	10	4	-40 to +125	10 ⁶	100	YES
BR25H128	F-2AC	FJ-2AC	FVT-2AC	—	128K	16K × 8	2.5 to 5.5	5.5	10	4				
BR25H256	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														
BR25A256	F-3M	FJ-3M	FVT-3M	—	256K	32K × 8	2.5 to 5.5	4	10	5	-40 to +105	10 ⁶	100	YES
BR25A512	F-3M	FJ-3M	FVT-3M	—	512K	64K × 8	2.5 to 5.5	4	10	5				
BR25A1M	F-3M	FJ-3M	—	—	1M	128K × 8	2.5 to 5.5	4	10	5				

FeRAM

Ferroelectric Memory

(LAPIS Semiconductor products)

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 ^{*1}	Automotive Grade ^{*2}
MR48V256C	256K	32K × 8	2.7 to 3.6	t _{RC} =150ns	10 ¹³	10	-40 to +85	TSOP(I)28-08134-0.55	—	YES
I ² C BUS FeRAM MR44Vxxxx series										
MR44V064B	64K	8K × 8	1.8 to 3.6	f _{clk} =3.4MHz	10 ¹³	10	-40 to +85	SOP8-200-1.27	✓	YES
MR44V100A	1M	128K × 8	1.8 to 3.6	f _{clk} =3.4MHz					✓	
SPI BUS FeRAM MR45Vxxxx series										
MR45V032A	32K	4K × 8	2.7 to 3.6	f _{clk} =15MHz	10 ¹³	10	-40 to +85	SOP8-200-1.27	✓	YES
MR45V064B	64K	8K × 8	1.8 to 3.6	f _{clk} =40MHz					✓	
MR45V256A	256K	32K × 8	3.0 to 3.6	f _{clk} =15MHz					✓	
MR45V100A	1M	128K × 8	1.8 to 3.6	f _{clk} =40MHz					✓	
MR45V200B	2M	256K × 8	2.7 to 3.6	f _{clk} =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.

