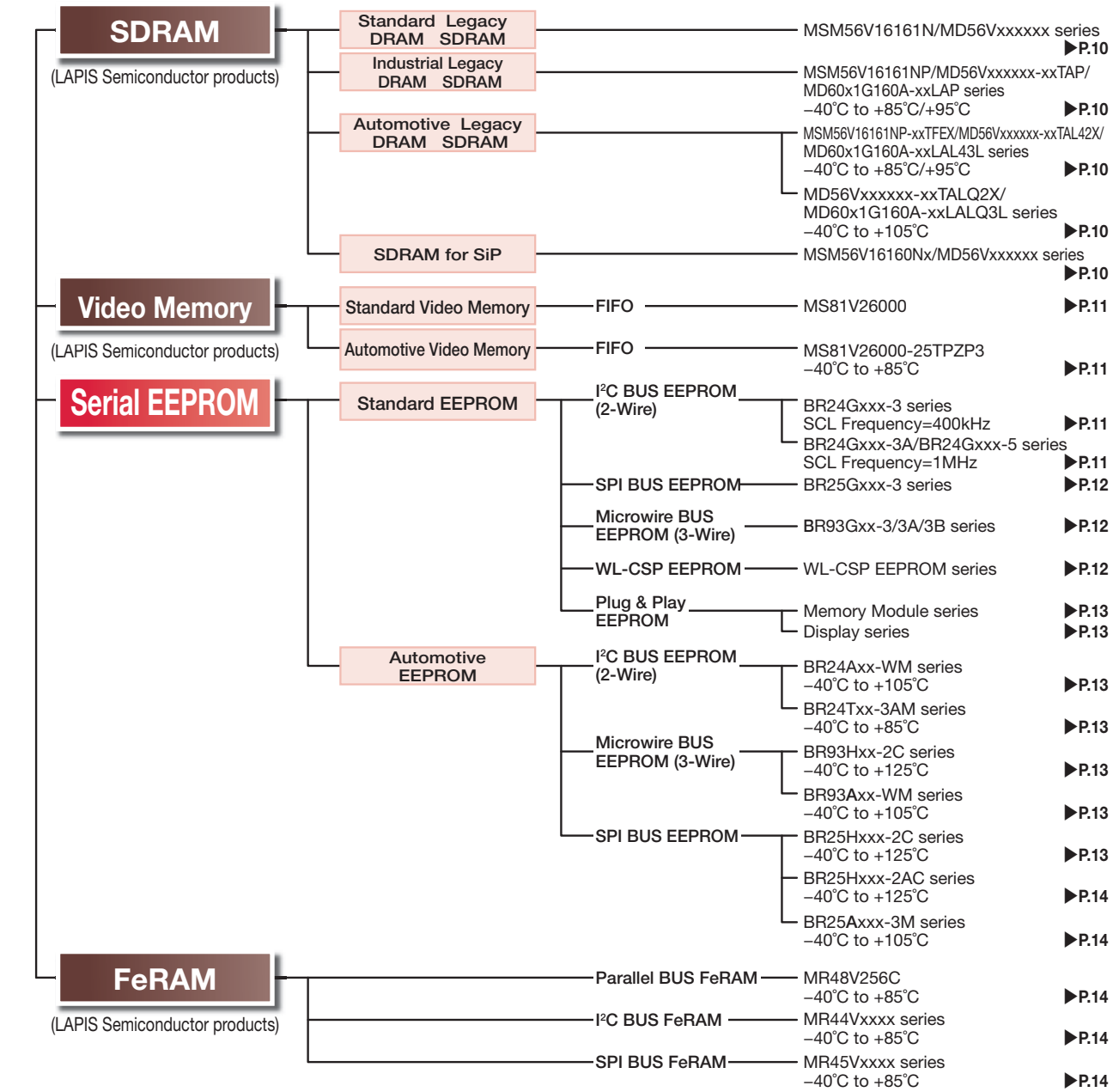
General-purpose ICs

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 T_a (°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						TSOP (2) 54-400-0.80	✓
New MD56V62161R						166		6/7/7.5/10			TSOP (2) 54-400-0.80	✓
MD56V72161C			128M		4×2M×16						TSOP (2) 54-400-0.80	✓
MD56V82161A			256M		4×4M×16		8192/64				TSOP (2) 54-400-0.80	✓
New MD56V82169A-xxLA								6	–		P-TFBGA54-0808-0.80-9	✓

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 T_a (°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						TSOP (2) 54-400-0.80	✓
New MD56V62161R-xxTAP						166		6/7/7.5/10			TSOP (2) 54-400-0.80	✓
MD56V72161C-xxTAP			128M		4×2M×16						TSOP (2) 54-400-0.80	✓
MD56V82161A-xxTAP			256M		4×4M×16		8192/64				TSOP (2) 54-400-0.80	✓
New MD56V82169A-xxLAP								6	–		P-TFBGA54-0808-0.80-9	✓
New MD60Y1G160A-xxLAP7AL	DDR3	1.5±0.075	1G		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	✓
New MD60S1G160A-xxLAP7AL	DDR3L	1.35 +0.1, –0.067									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.

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 T_a (°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						TSOP (2) 54-400-0.80	✓	YES
MD56V72161C-xxTAL42X			128M		4×2M×16	166		6/7/7.5/10			TSOP (2) 54-400-0.80	✓	YES
MD56V82161A-xxTAL42X			256M		4×4M×16		8192/64				TSOP (2) 54-400-0.80	✓	YES
New MD60Y1G160A-xxLAL43L	DDR3	1.5±0.075	1G		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
New MD60S1G160A-xxLAL43L	DDR3L	1.35 +0.1, –0.067									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 T_a (°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
New MD56V62161R-xxTALQ2L						166		6/7/7.5/10			TSOP (2) 54-400-0.80	✓	YES
MD56V72161C-xxTALQ2X			128M		4×2M×16						TSOP (2) 54-400-0.80	✓	YES
MD56V82161A-xxTALQ2X			256M		4×4M×16		8192/16				TSOP (2) 54-400-0.80	✓	YES
New MD60Y1G160A-xxLALQ3L	DDR3	1.5±0.075	1G		8×8M×16	800 (1600Mbps)	Average refresh period: 7.8µs (TC≤85°C), 3.9µs (TC>85°C)	1.25/1.5	–		TFBGA96-9.0x13.0-0.80	✓	YES
New MD60S1G160A-xxLALQ3L	DDR3L	1.35 +0.1, –0.067									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.

SDRAM for SiP

(LAPIS Semiconductor products)

Standard

Part No.	Supply Voltage (V)	Density (bit)	Number of Data bits	Configuration (bank×word×bit)	MaxOperating Frequency (MHz)	Refresh Cycle (cycles/ms)	Cycle Time (ns)	Operating Temperature T_j (°C)	Features
MSM56V16160N-xxWBP	3.3±0.3	16M	×16	2×512K×16	143	4096/16	7/7.5/10	–40 to +125	KGD
MD56V62160M-xxWBP		64M		4×1M×16			7/7.5/8/10		
New MD56V62160R-xxWBP					166	4096/32	6/7		
MD56V72160C-xxWBP		128M		4×2M×16		4096/16	6/7/7.5/10		

Automotive

Part No.	Supply Voltage (V)	Density (bit)	Number of Data bits	Configuration (bank×word×bit)	MaxOperating Frequency (MHz)	Refresh Cycle (cycles/ms)	Cycle Time (ns)	Operating Temperature T_j (°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			7/7.5/8/10			YES
MD56V72160C		128M		4×2M×16	166		6/7/7.5/10			YES

*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	MaxOperating Frequency (MHz)	Access Time (ns)	Cycle Time (ns)	Power Consumption (mW)		Operating Temperature T_a (°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	MaxOperating Frequency (MHz)	Access Time (ns)	Cycle Time (ns)	Power Consumption (mW)		Operating Temperature T_a (°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

I²C 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	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	400k	−40 to +85	10^6	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			
I²C 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	10^6	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			
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			
I²C BUS EEPROM (2-Wire) BR24Gxxx-5 series (SCL Frequency=1MHz)																		
BR24G32	F-5	FJ-5	—	FVT-5	FVM-5	—	NUX-5	—	32K	4K×8	1.6 to 5.5	2	2.5	5	1M	−40 to +85	$4×10^6$	200
BR24G64	F-5	FJ-5	—	FVT-5	FVM-5	—	NUX-5	—	64K	8K×8	1.6 to 5.5	2	2.5	5	1M			
BR24G128	F-5	FJ-5	—	FVT-5	FVM-5	—	NUX-5	—	128K	16K×8	1.6 to 5.5	2	2.5	5	1M			
BR24G256	F-5	FJ-5	—	FVT-5	FVM-5	—	NUX-5	—	256K	32K×8	1.6 to 5.5	2	2.5	5	1M			

SPI BUS EEPROM BR25Gxxx-3 series

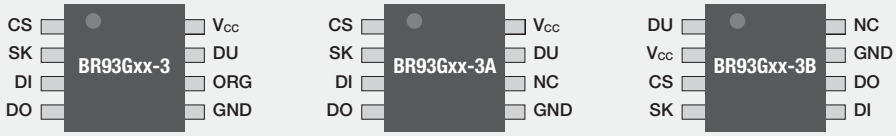
Part No.	Package and Suffix					Density (bit)	Bit Format (word×bit)	Supply Voltage (V)	Current Consumption (Max)		Write Cycle Time (Max) (ms)	Operating Temperature (˚C)	Endurance (times)	Data Retention (years)
	SOP8	SOP-J8	TSSOP-B8	MSOP8	VSON008X2030				Operating (mA)	Standby (μA)				
BR25G320	F-3	FJ-3	FVT-3	FVM-3	NUX-3	32K	4K×8	1.6 to 5.5	8	2	5	−40 to +85	10^6	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

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 (by 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



Selectable Bit Format (8bit or 16bit)

Interchangeable with the BR93LxxRxx-W series

Rotated Pins

WL-CSP EEPROM

Part No.	I/F	Density (bit)	Package					Pull-up Resister	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	I²C	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	I²C	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	I²C	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	I²C	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	I²C	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	I²C	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	I²C	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	I²C	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	I²C	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	I²C	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	I²C	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	I²C	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	I²C	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	I²C	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: * V_{CC}=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/FVT-W	NUX-3/NUX-W	256×8	1.7 to 5.5/ 1.7 to 3.6	400	5	10^6	40	Settable write protect Onetime ROM write protect

Plug & Play EEPROM For Memory Modules: *1 V_{CC}=1.7 to 5.5V *2 V_{CC}=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 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)					
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 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)					
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				

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

Part No.	Memory Density (bit)	Configuration (word×bit)	Supply Voltage (V)	Operating Speed	Read/Write Endurance (times)	Data Retention (years)	Operating Temperature T_a (°C)	Package	Halogen Free Support*1	Automotive Grade*2
Parallel BUS FeRAM										
MR48V256CTAZAAX	256K	32K×8	2.7 to 3.6	t_{RC}=150ns	10^{13}	10	−40 to +85	TSOP (I) 28-08134-0.55	–	YES
I²C BUS FeRAM MR44Vxxxx series										
MR44V064BMAZAATL	64K	8K×8	1.8 to 3.6	f_{clk}=3.4MHz	10^{13}	10	−40 to +85	SOP8-200-1.27	✓	YES
MR44V100AMAZAATL	1M	128K×8		f_{clk}=3.4MHz				SOP8-200-1.27	✓	–
SPI BUS FeRAM MR45Vxxxx series (85°C)										
MR45V032AMAZBATL	32K	4K×8	2.7 to 3.6	f_{clk}=15MHz	10^{13}	10	−40 to +85	SOP8-200-1.27	✓	YES
MR45V064BMAZAATL	64K	8K×8	1.8 to 3.6	f_{clk}=40MHz				SOP8-200-1.27	✓	YES
MR45V256AMAZAAT-L	256K	32K×8	3.0 to 3.6	f_{clk}=15MHz				SOP8-200-1.27	✓	YES
MR45V100AMAZAATL	1M	128K×8	1.8 to 3.6	f_{clk}=40MHz				SOP8-200-1.27	✓	–
SPI BUS FeRAM MR45Vxxxx series (105°C)										
New MR45V032AMAZPATL	32K	4K×8	2.7 to 3.6	f_{clk}=15MHz	10^{13}	10	−40 to +105	SOP8-200-1.27	✓	YES
New MR45V064BMAZPATL	64K	8K×8	1.8 to 3.6	f_{clk}=40MHz				SOP8-200-1.27	✓	YES
New MR45V256AMAZPATL	256K	32K×8	3.0 to 3.6	f_{clk}=15MHz				SOP8-200-1.27	✓	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.