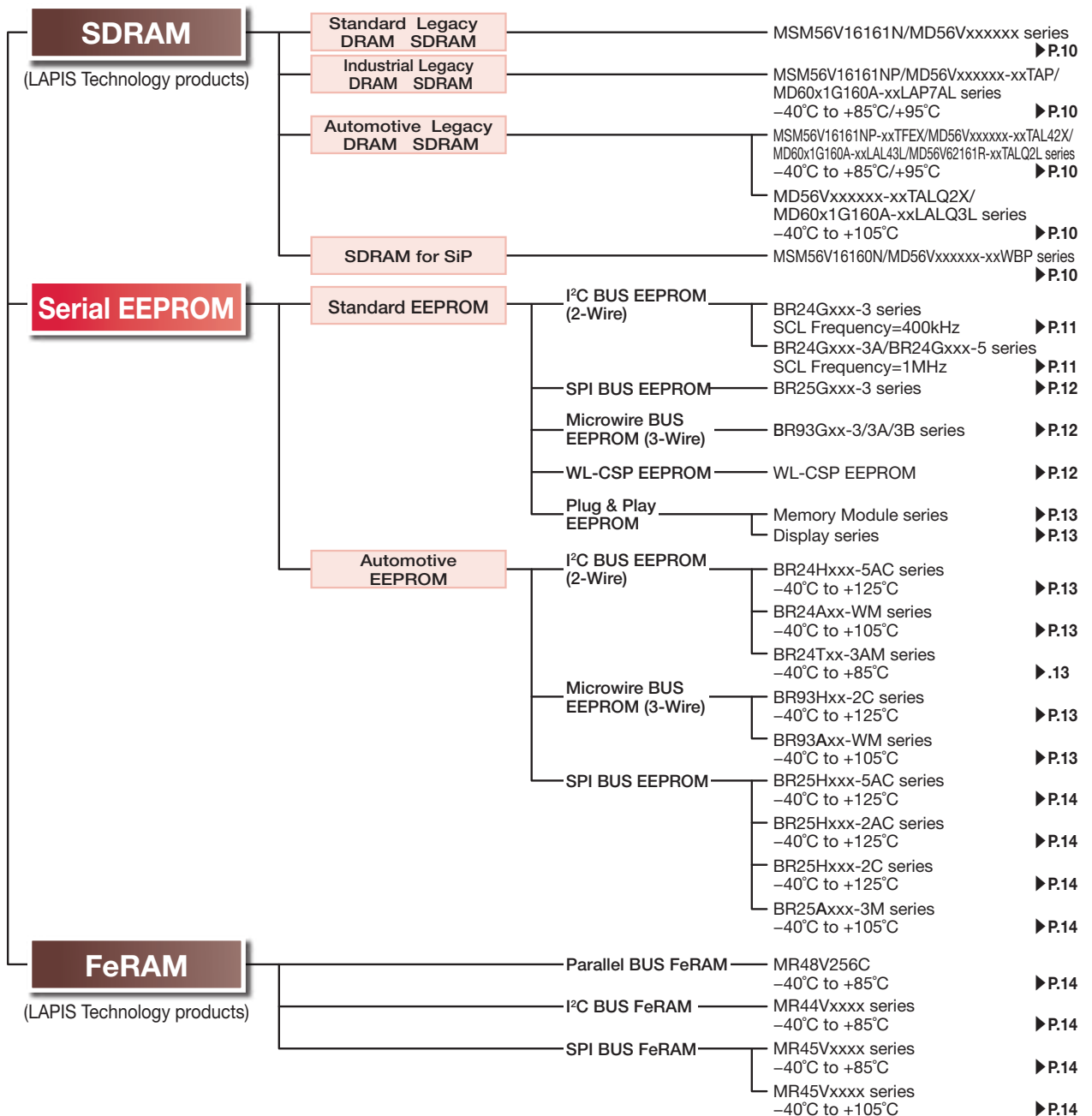


Memory

Memory



SDRAM

Standard Legacy DRAM SDRAM

(LAPIS Technology 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	✓
New MD56V62161R			64M		4×1M×16	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		TSOP (2) 54-400-0.80				✓	
New MD56V82168A-xxLA							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 Technology 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	for Industrial Equipment
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	✓	✓
New MD56V62161R-xxTAP			64M		4×1M×16	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		TSOP (2) 54-400-0.80				✓	✓	
New MD56V82168A-xxLAP							P-TFBGA54-0808-0.80-9	✓			✓		
New 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	✓	✓
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 Technology 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*2
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	✓	YES
New MD56V62161R-xxTALQ2L	SDR	3.3±0.3	64M	16	4×1M×16	166	4096/16	6/7/7.5/10	Drivability Control	-40 to +85	TSOP (2) 54	✓	YES
MD56V72161C-xxTALQ2X	SDR	3.3±0.3	128M	16	4×2M×16	166	4096/64	6/7/7.5/10	Drivability Control	-40 to +85	TSOP (2) 54	✓	YES
MD56V82161A-xxTALQ2X	SDR	3.3±0.3	256M	16	4×4M×16	166	8192/64	6/7/7.5/10	Drivability Control	-40 to +85	TSOP (2) 54	✓	YES
New 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	✓	YES
New 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	✓	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*2
MD56V72161C-xxTALQ2X	SDR	3.3±0.3	128M	16	4×2M×16	166	4096/16	6/7/7.5/10	Drivability Control	-40 to +105	TSOP (2) 54	✓	YES
MD56V82161A-xxTALQ2X			256M		4×4M×16		8192/16				TSOP (2) 54	✓	YES
New 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	✓	YES
New MD60Y1G160A-xxLALQ3L	DDR3	1.5±0.075									TFBGA96	✓	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.

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

SDRAM for SiP

(LAPIS Technology 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 T _a (°C)	Features	
MSM56V16160N-xxWBP	3.3±0.3	16M	×16	2×512K×16	143	4096/32	7/7.5/10	-40 to +125	KGD	
New MD56V62160R-xxWBP		64M		4×1M×16	166		6/7			
MD56V72160C-xxWBP		128M		4×2M×16		6/7/7.5/10				

Serial EEPROM

Standard EEPROM

I 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-B8J	VSON008X2030				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	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			
I 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	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			
I ² C 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

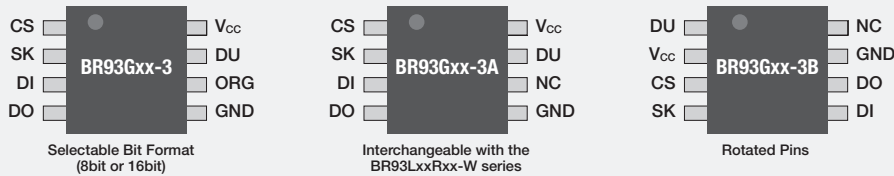
Part No.	Package and Suffix					Density (bit)	Bit Format (word×bit)	Supply Voltage (V)	Current Consumption (Max)		Write Cycle Time (Max) (ms)	Operating Temperature (°C)	Endurance (times)	Data Retention (years)
	SOP8	SOP-J8	TSSOP-B8	MSOP8	VSON008X2030				Operating (mA)	Standby (µA)				
BR25G320	F-3	FJ-3	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

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)
	F-3*/F-3A*/F-3B*	FJ-3*/FJ-3A*/FJ-3B*	FVT-3*/FVT-3A*/FVT-3B*	FVM-3*/FVM-3A*/FVM-3B*	NUX-3*/NUX-3A*/NUX-3B*				Operating (mA)	Standby (µA)				
BR93G46	F-3*/F-3A*/F-3B*	FJ-3*/FJ-3A*/FJ-3B*	FVT-3*/FVT-3A*/FVT-3B*	FVM-3*/FVM-3A*/FVM-3B*	NUX-3*/NUX-3A*/NUX-3B*	1K	64×16 (128×8)	1.7 to 5.5	3	2	5	-40 to +85	10 ⁶	40
BR93G56	F-3*/F-3A*/F-3B*	FJ-3*/FJ-3A*/FJ-3B*	FVT-3*/FVT-3A*/FVT-3B*	FVM-3*/FVM-3A*/FVM-3B*	NUX-3*/NUX-3A*/NUX-3B*	2K	128×16 (256×8)	1.7 to 5.5	3	2	5			
BR93G66	F-3*/F-3A*/F-3B*	FJ-3*/FJ-3A*/FJ-3B*	FVT-3*/FVT-3A*/FVT-3B*	FVM-3*/FVM-3A*/FVM-3B*	NUX-3*/NUX-3A*/NUX-3B*	4K	256×16 (512×8)	1.7 to 5.5	3	2	5			
BR93G76	F-3*/F-3A*/F-3B*	FJ-3*/FJ-3A*/FJ-3B*	FVT-3*/FVT-3A*/FVT-3B*	FVM-3*/FVM-3A*/FVM-3B*	NUX-3*/NUX-3A*/NUX-3B*	8K	512×16 (1K×8)	1.7 to 5.5	3	2	5			
BR93G86	F-3*/F-3A*/F-3B*	FJ-3*/FJ-3A*/FJ-3B*	FVT-3*/FVT-3A*/FVT-3B*	FVM-3*/FVM-3A*/FVM-3B*	NUX-3*/NUX-3A*/NUX-3B*	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



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	UCSP30L1A	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: *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*/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

125°C Operation I ² C BUS EEPROM (2-Wire) BR24Hxxx-5AC 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	VSON008X2030				Operating (mA)	Standby (μA)					
New BR24H32	F-5AC	FJ-5AC	FVT-5AC	FVM-5AC	NUX-5AC	128K	4K×8	1.7 to 5.5	1.7	10	3.5	-40 to +125	4×10 ⁶	100	YES
New BR24H128	F-5AC	FJ-5AC	FVT-5AC	FVM-5AC	NUX-5AC	128K	16K×8	1.7 to 5.5	1.7	10	3.5				
New BR24H256	F-5AC	FJ-5AC	FVT-5AC	FVM-5AC	NUX-5AC	256K	32K×8	1.7 to 5.5	1.7	10	3.5				

105°C Operation I ² 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)					
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 I ² 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)					
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				

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 Built-in ECC Function SPI BUS EEPROM BR25Hxxx-5AC 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	VSON008X2030				Operating (mA)	Standby (µA)					
New BR25H128	F-5AC	FJ-5AC	FVT-5AC	FVM-5AC	NUX-5AC	128K	16K×8	1.7 to 5.5	8.0	10	3.5	-40 to +125	4×10 ⁶	100	YES

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				

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				

105°C Operation SPI BUS EEPROM BR25Axxx-3M 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)					
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 Technology 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 T _s (°C)	Package	Halogen Free Support*1	Automotive Grade*2	
MR48V256CTAZAAX	256K	32K×8	2.7 to 3.6	t _{nc} =150ns	10 ¹³	10	-40 to +85	TSOP (I) 28-08134-0.55	-	YES	

I ² C BUS FeRAM MR44Vxxxx series											
Part No.	Memory Density (bit)	Configuration (word×bit)	Supply Voltage (V)	Operating Speed	Read/Write Endurance (times)	Data Retention (years)	Operating Temperature T _s (°C)	Package	Halogen Free Support*1	Automotive Grade*2	
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)											
Part No.	Memory Density (bit)	Configuration (word×bit)	Supply Voltage (V)	Operating Speed	Read/Write Endurance (times)	Data Retention (years)	Operating Temperature T _s (°C)	Package	Halogen Free Support*1	Automotive Grade*2	
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)											
Part No.	Memory Density (bit)	Configuration (word×bit)	Supply Voltage (V)	Operating Speed	Read/Write Endurance (times)	Data Retention (years)	Operating Temperature T _s (°C)	Package	Halogen Free Support*1	Automotive Grade*2	
MR45V032AMAZPATL	32K	4K×8	2.7 to 3.6	f _{clk} =15MHz	10 ¹³	10	-40 to +105	SOP8-200-1.27	✓	YES	
MR45V064BMAZPATL	64K	8K×8	1.8 to 3.6	f _{clk} =40MHz				SOP8-200-1.27	✓	YES	
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.