



ESD
Resistance
8kV
Now available

High temperature
operating
125°C
Now available



Pb Free all through the Series

High reliability series with ROHM's confidence

Serial EEPROMs



SIGNATURE SERIES



ADVANTAGE SERIES



HIGH RELIABILITY SERIES

Ver.1.0



SELECTION CATALOG

General-Purpose



LSIs

Excellence in Electronics

ROHM

UNIVERSAL STANDARD Specification SERIAL EEPROMs

S SIGNATURE SERIES

Please refer to
P.3~

Three supply
voltage ranges:

1.8V ~ 5.5V

2.5V ~ 5.5V

4.5V ~ 5.5V

Three operating
temperature ranges:

-40°C ~ +85°C

-40°C ~ +105°C

-40°C ~ +125°C

Three package types:

SO8 narrow

TSSOP8

TSSOP8 3x3mm²

UNIVERSAL STANDARD Specification SERIAL EEPROMs

A ADVANTAGE SERIES

Please refer to
P.11~

Two supply
voltage ranges:

1.8V ~ 5.5V

2.7V ~ 5.5V

Two operating
temperature ranges:

-40°C ~ +85°C

-40°C ~ +125°C

Two package types:

8-lead JEDEC SOIC

8-lead TSSOP

HIGH GRADE Specification SERIAL EEPROMs

H HIGH RELIABILITY SERIES

Please refer to
P.19~

Double Cell Structure

In an EEPROM, data is written by passing electrons through a tunnel-oxide film. However, this process has a detrimental effect on the film, causing erosion and, eventually, memory bit failures. In order to prevent this, ROHM's EEPROMs possess redundant cells that operate in the event of memory failure.

8kV ESD Resistance

The BR93H, BR24H, and BR25H series EEPROMs possess 8kV of ESD resistance – twice the resistance of conventional products, ensuring greater reliability.

Double Reset Function

Two prevention circuits – power ON reset and low voltage erroneous write prevention – are built in that reset the IC once power failures or low voltage conditions are detected during power ON and power OFF in order to guard against writing errors.

Au-Au Connection

Unlike normal wire bonding using aluminum (Al) pads and gold (Au) wires, ROHM EEPROMs are constructed using gold pads and gold wires, resulting in a stronger connection and, therefore, greater reliability.



**UNIVERSAL STANDARD
Specification**

Microwire BUS	BR93C□□ family	P.3
I²C BUS*	BR24C□□ family	P.5
SPI BUS	BR95□□0 family	P.7

SIGNATURE SERIES



**UNIVERSAL STANDARD
Specification**

Microwire BUS	BR93C□□ family	P.11
I²C BUS*	BR24C□□ family	P.13
SPI BUS	BR25□□0 family	P.15

ADVANTAGE SERIES



**HIGH GRADE
Specification**

Microwire BUS	BR93□□□ family	P.19
I²C BUS*	BR24□□□ family	P.21
SPI BUS	BR25□□□0 family	P.23

HIGH RELIABILITY SERIES



Microwire BUS

BR93C family

- Three-wire serial communication interface consisting of two control inputs (chip select and serial clock), plus one serial data input line and one serial data output line
- 2MHz clock frequency
- Fast speed write possible [write time 5ms. (Max.)]
- Identical package and pin configuration from 1Kbit to 16Kbit, to simplify design

Supply voltage **2.5v ~ 5.5v** Operating temperature **-40°C ~ +85°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SO8 narrow	TSSOP8	TSSOP8 3X3mm ²
BR93C46-W□□6TP	1Kbit	64×16	2.5V ~ 5.5V	-40°C ~ +85°C	BR93C46-WMN6TP (BR93C46-TWMN6TP)	BR93C46-WDW6TP	BR93C46-WDS6TP
BR93C56-W□□6TP	2Kbit	128×16			BR93C56-WMN6TP (BR93C56-TWMN6TP)	BR93C56-WDW6TP	BR93C56-WDS6TP
BR93C66-W□□6TP	4Kbit	256×16			BR93C66-WMN6TP (BR93C66-TWMN6TP)	BR93C66-WDW6TP	BR93C66-WDS6TP
BR93C76-W□□6TP	8Kbit	512×16			BR93C76-WMN6TP (BR93C76-TWMN6TP)	BR93C76-WDW6TP	BR93C76-WDS6TP
BR93C86-W□□6TP	16Kbit	1K×16			BR93C86-WMN6TP (BR93C86-TWMN6TP)	BR93C86-WDW6TP	BR93C86-WDS6TP

Products put in () have different pin assignment. Please see the pin assignment in page 4.

Supply voltage **4.5v ~ 5.5v** Operating temperature **-40°C ~ +85°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SO8 narrow	TSSOP8	TSSOP8 3X3mm ²
BR93C46-□□6TP	1Kbit	64×16	4.5V ~ 5.5V	-40°C ~ +85°C	BR93C46-MN6TP (BR93C46-TMN6TP)	BR93C46-DW6TP	BR93C46-DS6TP
BR93C56-□□6TP	2Kbit	128×16			BR93C56-MN6TP (BR93C56-TMN6TP)	BR93C56-DW6TP	BR93C56-DS6TP
BR93C66-□□6TP	4Kbit	256×16			BR93C66-MN6TP (BR93C66-TMN6TP)	BR93C66-DW6TP	BR93C66-DS6TP
BR93C76-□□6TP	8Kbit	512×16			BR93C76-MN6TP (BR93C76-TMN6TP)	BR93C76-DW6TP	BR93C76-DS6TP
BR93C86-□□6TP	16Kbit	1K×16			BR93C86-MN6TP (BR93C86-TMN6TP)	BR93C86-DW6TP	BR93C86-DS6TP

Products put in () have different pin assignment. Please see the pin assignment in page 4.

Supply voltage **2.5v ~ 5.5v** Operating temperature **-40°C ~ +105°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SO8 narrow	TSSOP8	TSSOP8 3X3mm ²
BR93C46-W□□7TP	1Kbit	64×16	2.5V ~ 5.5V	-40°C ~ +105°C	BR93C46-WMN7TP (BR93C46-TWMN7TP)	—	—
BR93C56-W□□7TP	2Kbit	128×16			BR93C56-WMN7TP (BR93C56-TWMN7TP)	—	—
BR93C66-W□□7TP	4Kbit	256×16			BR93C66-WMN7TP (BR93C66-TWMN7TP)	—	—
BR93C76-W□□7TP	8Kbit	512×16			BR93C76-WMN7TP (BR93C76-TWMN7TP)	—	—
BR93C86-W□□7TP	16Kbit	1K×16			BR93C86-WMN7TP (BR93C86-TWMN7TP)	—	—

Products put in () have different pin assignment. Please see the pin assignment in page 4.

Supply voltage **4.5v ~ 5.5v** Operating temperature **-40°C ~ +105°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SO8 narrow	TSSOP8	TSSOP8 3X3mm ²
BR93C46-□□7TP	1Kbit	64×16	4.5V ~ 5.5V	-40°C ~ +105°C	BR93C46-MN7TP (BR93C46-TMN7TP)	—	—
BR93C56-□□7TP	2Kbit	128×16			BR93C56-MN7TP (BR93C56-TMN7TP)	—	—
BR93C66-□□7TP	4Kbit	256×16			BR93C66-MN7TP (BR93C66-TMN7TP)	—	—
BR93C76-□□7TP	8Kbit	512×16			BR93C76-MN7TP (BR93C76-TMN7TP)	—	—
BR93C86-□□7TP	16Kbit	1K×16			BR93C86-MN7TP (BR93C86-TMN7TP)	—	—

Products put in () have different pin assignment. Please see the pin assignment in page 4.


☆ Supply voltage **2.5v ~ 5.5v** Operating temperature **-40°C ~ +125°C** type

☆ Under Development


Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SO8 narrow	TSSOP8	TSSOP8 3X3mm ²
BR93C46-W□□3TP	1Kbit	64×16	2.5V ~ 5.5V	-40°C ~ +125°C	BR93C46-WMN3TP	—	—
BR93C56-W□□3TP	2Kbit	128×16			BR93C56-WMN3TP	—	—
BR93C66-W□□3TP	4Kbit	256×16			BR93C66-WMN3TP	—	—
BR93C76-W□□3TP	8Kbit	512×16			BR93C76-WMN3TP	—	—
BR93C86-W□□3TP	16Kbit	1K×16			BR93C86-WMN3TP	—	—

Package Lineup

SO8 narrow




Actual size

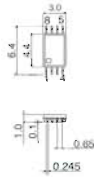


[Unit : mm]

TSSOP8




Actual size

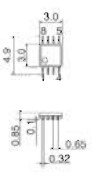


[Unit : mm]

TSSOP8
3×3mm²

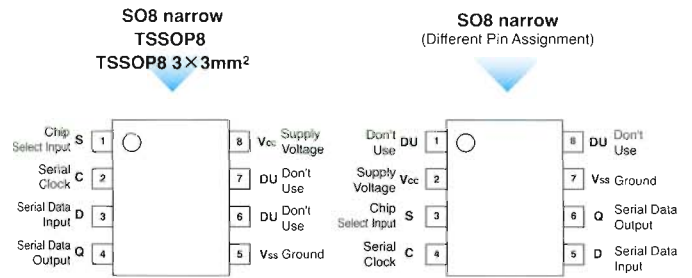


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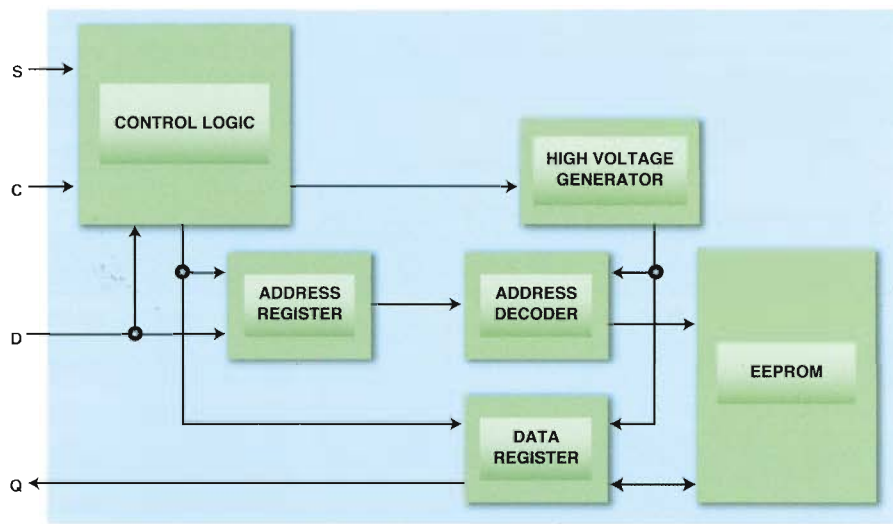


[Unit : mm]

Pin Assignment



Block Diagram



Electrical Characteristics

BR93C□□ family	Endurance	Data retention	Supply current	Supply current (Stand-by)	Clock frequency	Delay to output valid	Erase / Write cycle time
BR93C46-W□□6TP BR93C56-W□□6TP BR93C66-W□□6TP BR93C76-W□□6TP BR93C86-W□□6TP	1,000,000	40 years	1mA Vcc=2.5V	5μA	2MHz	200ns	5ms
2mA Vcc=5V							
BR93C46-□□6TP BR93C56-□□6TP BR93C66-□□6TP BR93C76-□□6TP BR93C86-□□6TP	1,000,000	40 years	2mA Vcc=5V	15μA	2MHz	200ns	5ms
BR93C46-W□□7TP BR93C56-W□□7TP BR93C66-W□□7TP BR93C76-W□□7TP BR93C86-W□□7TP	1,000,000	40 years	1mA Vcc=2.5V	5μA	2MHz	200ns	5ms
2mA Vcc=5V							
BR93C46-□□7TP BR93C56-□□7TP BR93C66-□□7TP BR93C76-□□7TP BR93C86-□□7TP	1,000,000	40 years	2mA Vcc=5V	15μA	2MHz	200ns	5ms
☆ BR93C46-W□□3TP BR93C56-W□□3TP BR93C66-W□□3TP BR93C76-W□□3TP BR93C86-W□□3TP	1,000,000	40 years	1mA Vcc=2.5V	5μA	2MHz	200ns	5ms
2mA Vcc=5V							

☆ Under Development



I²C BUS

SIGNATURE SERIES

BR24C family

- 100% compatible with the I²C BUS. All controls are available by two ports, serial clock (SCL) and serial data (SDA)
- Devices other than EEPROMs can be connected to the same port, reducing the number of ports required.
- Low current consumption
- Page write mode for high-speed writing

Supply voltage **1.8V ~ 5.5V** Operating temperature **-40°C ~ +85°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SO8 narrow	TSSOP8	TSSOP8 3x3mm ²
BR24C01-R□□6TP	1Kbit	128x8	1.8V ~ 5.5V	-40°C ~ +85°C	BR24C01-RMN6TP	BR24C01-RDW6TP	BR24C01-RDS6TP
BR24C02-R□□6TP	2Kbit	256x8			BR24C02-RMN6TP	BR24C02-RDW6TP	BR24C02-RDS6TP
BR24C04-R□□6TP	4Kbit	512x8			BR24C04-RMN6TP	BR24C04-RDW6TP	BR24C04-RDS6TP
BR24C08-R□□6TP	8Kbit	1Kx8			BR24C08-RMN6TP	BR24C08-RDW6TP	BR24C08-RDS6TP
BR24C16-R□□6TP	16Kbit	2Kx8			BR24C16-RMN6TP	BR24C16-RDW6TP	BR24C16-RDS6TP

Supply voltage **2.5V ~ 5.5V** Operating temperature **-40°C ~ +85°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SO8 narrow	TSSOP8	TSSOP8 3x3mm ²
BR24C01-W□□6TP	1Kbit	128x8	2.5V ~ 5.5V	-40°C ~ +85°C	BR24C01-WMN6TP	BR24C01-WDW6TP	BR24C01-WDS6TP
BR24C02-W□□6TP	2Kbit	256x8			BR24C02-WMN6TP	BR24C02-WDW6TP	BR24C02-WDS6TP
BR24C04-W□□6TP	4Kbit	512x8			BR24C04-WMN6TP	BR24C04-WDW6TP	BR24C04-WDS6TP
BR24C08-W□□6TP	8Kbit	1Kx8			BR24C08-WMN6TP	BR24C08-WDW6TP	BR24C08-WDS6TP
BR24C16-W□□6TP	16Kbit	2Kx8			BR24C16-WMN6TP	BR24C16-WDW6TP	BR24C16-WDS6TP
BR24C32-W□□6TP	32Kbit	4Kx8			BR24C32-WMN6TP	BR24C32-WDW6TP	—
BR24C64-W□□6TP	64Kbit	8Kx8			BR24C64-WMN6TP	—	—

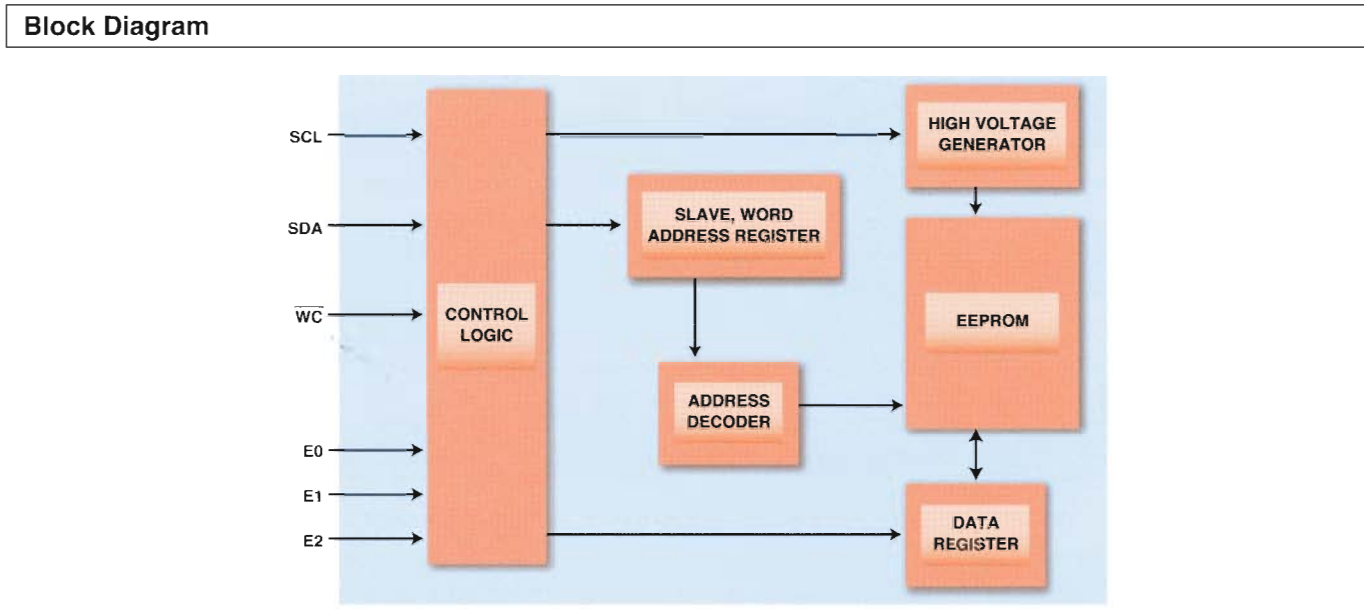
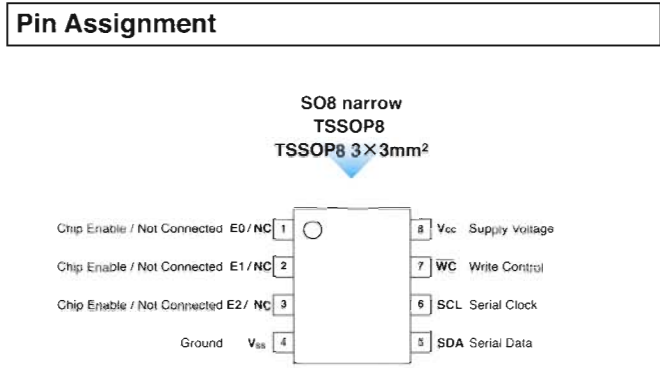
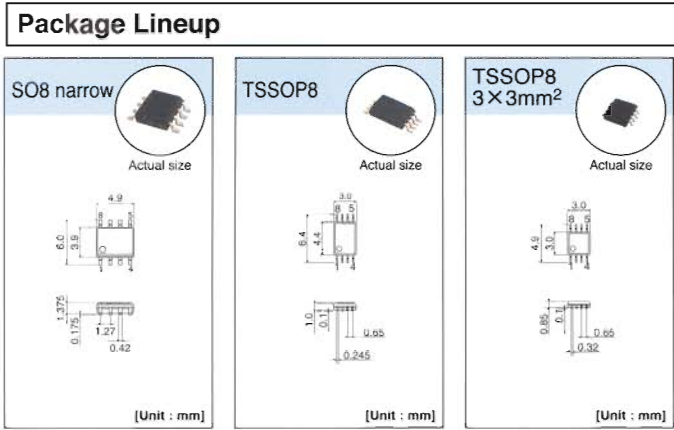
Supply voltage **4.5V ~ 5.5V** Operating temperature **-40°C ~ +85°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SO8 narrow	TSSOP8	TSSOP8 3x3mm ²
BR24C01-□□6TP	1Kbit	128x8	4.5V ~ 5.5V	-40°C ~ +85°C	BR24C01-MN6TP	BR24C01-DW6TP	BR24C01-DS6TP
BR24C02-□□6TP	2Kbit	256x8			BR24C02-MN6TP	BR24C02-DW6TP	BR24C02-DS6TP
BR24C04-□□6TP	4Kbit	512x8			BR24C04-MN6TP	BR24C04-DW6TP	BR24C04-DS6TP
BR24C08-□□6TP	8Kbit	1Kx8			BR24C08-MN6TP	BR24C08-DW6TP	BR24C08-DS6TP
BR24C16-□□6TP	16Kbit	2Kx8			BR24C16-MN6TP	BR24C16-DW6TP	BR24C16-DS6TP
BR24C32-□□6TP	32Kbit	4Kx8			BR24C32-MN6TP	BR24C32-DW6TP	—
BR24C64-□□6TP	64Kbit	8Kx8			BR24C64-MN6TP	—	—

◇ Supply voltage **2.5V ~ 5.5V** Operating temperature **-40°C ~ +125°C** type

◇ Future Release

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SO8 narrow	TSSOP8	TSSOP8 3x3mm ²
BR24C01-W□□3TP	1Kbit	128x8	2.5V ~ 5.5V	-40°C ~ +125°C	BR24C01-WMN3TP	—	—
BR24C02-W□□3TP	2Kbit	256x8			BR24C02-WMN3TP	—	—
BR24C04-W□□3TP	4Kbit	512x8			BR24C04-WMN3TP	—	—
BR24C08-W□□3TP	8Kbit	1Kx8			BR24C08-WMN3TP	—	—
BR24C16-W□□3TP	16Kbit	2Kx8			BR24C16-WMN3TP	—	—



Electrical Characteristics

BR24C□□ family	Endurance	Data retention	Supply current	Stand-by supply current	Clock frequency	Clock low to next date valid	Write time
BR24C01-R□□6TP BR24C02-R□□6TP BR24C04-R□□6TP BR24C08-R□□6TP BR24C16-R□□6TP	1,000,000	40 years	0.8mA Vcc = 1.8V	0.3µA Vcc = 1.8V	100kHz	0.2µs ~ 3.5µs	10ms
BR24C01-W□□6TP BR24C02-W□□6TP BR24C04-W□□6TP BR24C08-W□□6TP BR24C16-W□□6TP BR24C32-W□□6TP BR24C64-W□□6TP	1,000,000	40 years	1mA Vcc = 2.5V	0.5µA Vcc = 2.5V Density:1K ~ 16Kbit 2µA Vcc = 2.5V Density:32K, 64Kbit	400kHz	0.2µs ~ 0.9µs	5ms
BR24C01-□□6TP BR24C02-□□6TP BR24C04-□□6TP BR24C08-□□6TP BR24C16-□□6TP BR24C32-□□6TP BR24C64-□□6TP	1,000,000	40 years	2mA Vcc = 5V	1µA Vcc = 5V Density :1K ~ 16Kbit 10µA Vcc = 5V Density:32K, 64Kbit	400kHz	0.2µs ~ 0.9µs	5ms
BR24C01-W□□3TP BR24C02-W□□3TP BR24C04-W□□3TP BR24C08-W□□3TP BR24C16-W□□3TP	1,000,000	40 years	3mA Vcc = 2.5V	2µA Vcc = 2.5V	400kHz	0.2µs ~ 0.9µs	5ms

◇ Future Release



SPI BUS

BR95□□0
family

- Ultra-high speed clock frequency 5MHz (Max.)
- Serial communications can be paused by HOLD signal.
- The entire memory array or part of it can be set to prevent write operation (ROM).

Supply voltage **1.8v ~ 5.5v** Operating temperature **-40°C ~ +85°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SO8 narrow	TSSOP8	TSSOP8 3×3mm ²
BR95010-R□□6TP	1Kbit	128×8	1.8V ~ 5.5V	-40°C ~ +85°C	BR95010-RMN6TP	BR95010-RDW6TP	BR95010-RDS6TP
BR95020-R□□6TP	2Kbit	256×8			BR95020-RMN6TP	BR95020-RDW6TP	BR95020-RDS6TP
BR95040-R□□6TP	4Kbit	512×8			BR95040-RMN6TP	BR95040-RDW6TP	BR95040-RDS6TP
BR95080-R□□6TP	8Kbit	1K×8			BR95080-RMN6TP	BR95080-RDW6TP	—
BR95160-R□□6TP	16Kbit	2K×8			BR95160-RMN6TP	BR95160-RDW6TP	—

Supply voltage **2.5v ~ 5.5v** Operating temperature **-40°C ~ +85°C** type

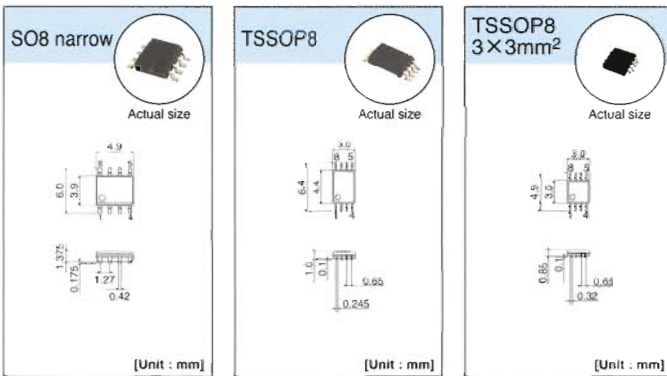
Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SO8 narrow	TSSOP8	TSSOP8 3×3mm ²
BR95010-W□□6TP	1Kbit	128×8	2.5V ~ 5.5V	-40°C ~ +85°C	BR95010-WMN6TP	BR95010-WDW6TP	BR95010-WDS6TP
BR95020-W□□6TP	2Kbit	256×8			BR95020-WMN6TP	BR95020-WDW6TP	BR95020-WDS6TP
BR95040-W□□6TP	4Kbit	512×8			BR95040-WMN6TP	BR95040-WDW6TP	BR95040-WDS6TP
BR95080-W□□6TP	8Kbit	1K×8			BR95080-WMN6TP	BR95080-WDW6TP	—
BR95160-W□□6TP	16Kbit	2K×8			BR95160-WMN6TP	BR95160-WDW6TP	—
BR95320-W□□6TP	32Kbit	4K×8			BR95320-WMN6TP	—	—
BR95640-W□□6TP	64Kbit	8K×8			BR95640-WMN6TP	—	—

◇ Supply voltage **2.5v ~ 5.5v** Operating temperature **-40°C ~ +125°C** type

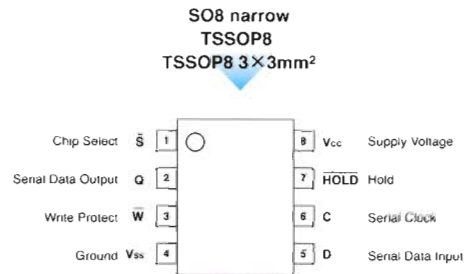
◇ Future Release

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SO8 narrow	TSSOP8	TSSOP8 3×3mm ²
BR95010-W□□3TP	1Kbit	128×8	2.5V ~ 5.5V	-40°C ~ +125°C	BR95010-WMN3TP	—	—
BR95020-W□□3TP	2Kbit	256×8			BR95020-WMN3TP	—	—
BR95040-W□□3TP	4Kbit	512×8			BR95040-WMN3TP	—	—
BR95080-W□□3TP	8Kbit	1K×8			BR95080-WMN3TP	—	—
BR95160-W□□3TP	16Kbit	2K×8			BR95160-WMN3TP	—	—

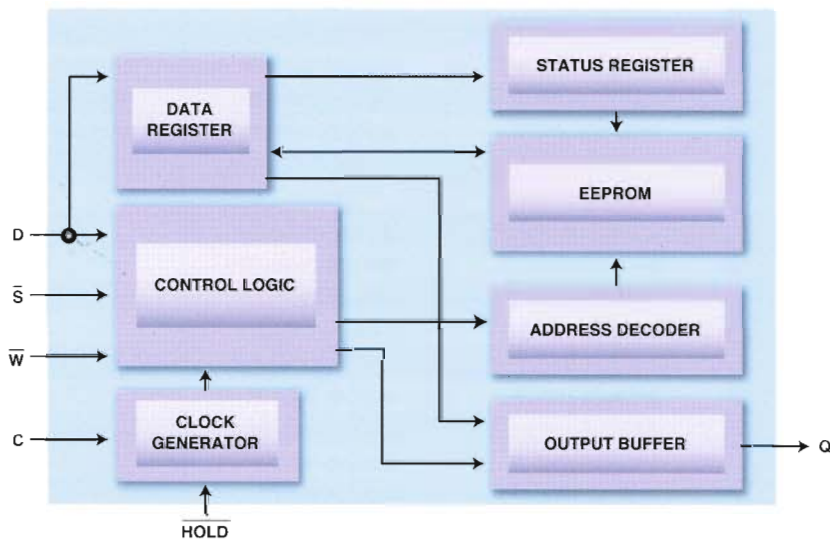
Package Lineup



Pin Assignment



Block Diagram



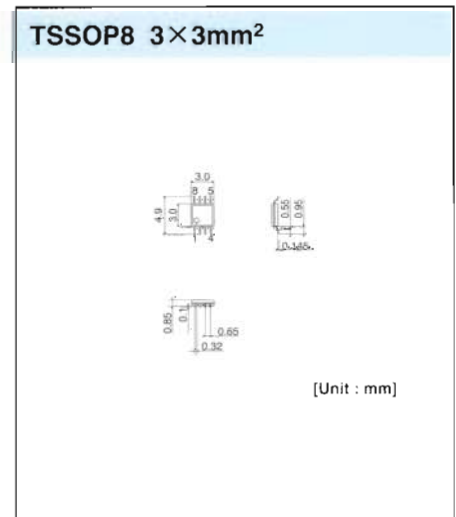
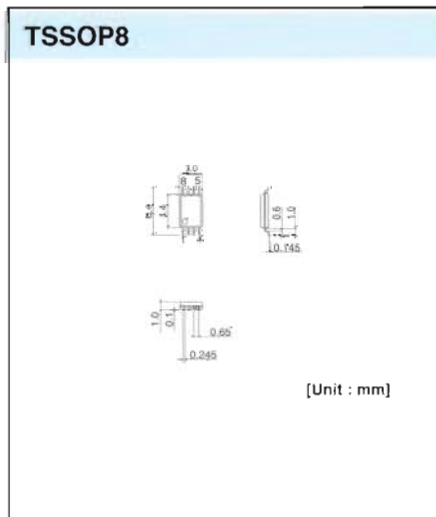
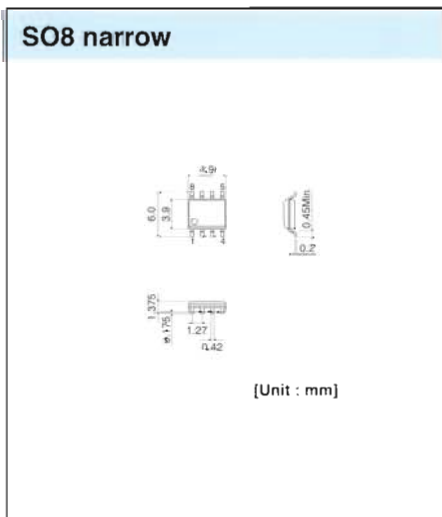
Electrical Characteristics

BR95□□0 family	Endurance	Data retention	Supply current	Supply current (Stand-by power mode)	Clock frequency	Clock Low to output valid	Write time
BR95010-R□□6TP BR95020-R□□6TP BR95040-R□□6TP BR95080-R□□6TP BR95160-R□□6TP	1,000,000	40 years	1mA Vcc=1.8V	0.5μA Vcc=1.8V	2MHz	180ns Density :1K ~ 4Kbit 150ns Density :8K,16Kbit	10ms
BR95010-W□□6TP BR95020-W□□6TP BR95040-W□□6TP BR95080-W□□6TP BR95160-W□□6TP BR95320-W□□6TP BR95640-W□□6TP	1,000,000	40 years	2mA Vcc=2.5V Density :1K ~ 16Kbit 3mA Vcc=2.5V Density : 32K,64Kbit	1μA Vcc=2.5V	5MHz	60ns	5ms
BR95010-W□□3TP BR95020-W□□3TP BR95040-W□□3TP BR95080-W□□3TP BR95160-W□□3TP	1,000,000	40 years	2mA Vcc=2.5V	2μA Vcc=2.5V	5MHz	60ns	5ms

◇ Future Release

Operating Temperature	Supply Voltage	Density	Microwire BUS				
			SO8 narrow	SO8 narrow (Different Pin Assignment)	TSSOP8	TSSOP8 3×3mm ²	
-40°C ~ +85°C	1.8V ~ 5.5V	1K	-	-	-	-	
		2K	-	-	-	-	
		4K	-	-	-	-	
		8K	-	-	-	-	
		16K	-	-	-	-	
	2.5V ~ 5.5V	1K	BR93C46-WMN6TP	BR93C46-TWMN6TP	BR93C46-WDW6TP	BR93C46-WDS6TP	
		2K	BR93C56-WMN6TP	BR93C56-TWMN6TP	BR93C56-WDW6TP	BR93C56-WDS6TP	
		4K	BR93C66-WMN6TP	BR93C66-TWMN6TP	BR93C66-WDW6TP	BR93C66-WDS6TP	
		8K	BR93C76-WMN6TP	BR93C76-TWMN6TP	BR93C76-WDW6TP	BR93C76-WDS6TP	
		16K	BR93C86-WMN6TP	BR93C86-TWMN6TP	BR93C86-WDW6TP	BR93C86-WDS6TP	
		32K	-	-	-	-	
		64K	-	-	-	-	
	4.5V ~ 5.5V	1K	BR93C46-MN6TP	BR93C46-TMN6TP	BR93C46-DW6TP	BR93C46-DS6TP	
		2K	BR93C56-MN6TP	BR93C56-TMN6TP	BR93C56-DW6TP	BR93C56-DS6TP	
		4K	BR93C66-MN6TP	BR93C66-TMN6TP	BR93C66-DW6TP	BR93C66-DS6TP	
		8K	BR93C76-MN6TP	BR93C76-TMN6TP	BR93C76-DW6TP	BR93C76-DS6TP	
		16K	BR93C86-MN6TP	BR93C86-TMN6TP	BR93C86-DW6TP	BR93C86-DS6TP	
		32K	-	-	-	-	
		64K	-	-	-	-	
	-40°C ~ +105°C	2.5V ~ 5.5V	1K	BR93C46-WMN7TP	BR93C46-TWMN7TP	-	-
			2K	BR93C56-WMN7TP	BR93C56-TWMN7TP	-	-
4K			BR93C66-WMN7TP	BR93C66-TWMN7TP	-	-	
8K			BR93C76-WMN7TP	BR93C76-TWMN7TP	-	-	
16K			BR93C86-WMN7TP	BR93C86-TWMN7TP	-	-	
4.5V ~ 5.5V		1K	BR93C46-MN7TP	BR93C46-TMN7TP	-	-	
		2K	BR93C56-MN7TP	BR93C56-TMN7TP	-	-	
		4K	BR93C66-MN7TP	BR93C66-TMN7TP	-	-	
		8K	BR93C76-MN7TP	BR93C76-TMN7TP	-	-	
		16K	BR93C86-MN7TP	BR93C86-TMN7TP	-	-	
-40°C ~ +125°C	2.5V ~ 5.5V	1K	☆ BR93C46-WMN3TP	-	-	-	
		2K	☆ BR93C56-WMN3TP	-	-	-	
		4K	☆ BR93C66-WMN3TP	-	-	-	
		8K	☆ BR93C76-WMN3TP	-	-	-	
		16K	☆ BR93C86-WMN3TP	-	-	-	

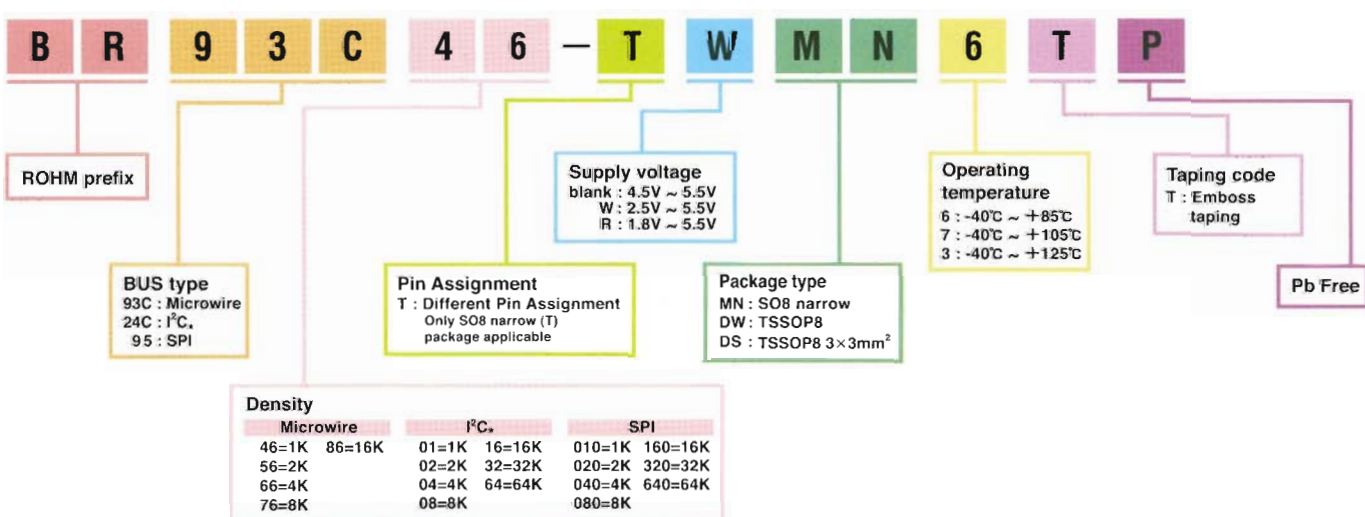
Package Outline



I ² C BUS*			SPI BUS		
SO8 narrow	TSSOP8	TSSOP8 3×3mm ²	SO8 narrow	TSSOP8	TSSOP8 3×3mm ²
BR24C01-RMN6TP	BR24C01-RDW6TP	BR24C01-RDS6TP	BR95010-RMN6TP	BR95010-RDW6TP	BR95010-RDS6TP
BR24C02-RMN6TP	BR24C02-RDW6TP	BR24C02-RDS6TP	BR95020-RMN6TP	BR95020-RDW6TP	BR95020-RDS6TP
BR24C04-RMN6TP	BR24C04-RDW6TP	BR24C04-RDS6TP	BR95040-RMN6TP	BR95040-RDW6TP	BR95040-RDS6TP
BR24C08-RMN6TP	BR24C08-RDW6TP	BR24C08-RDS6TP	BR95080-RMN6TP	BR95080-RDW6TP	-
BR24C16-RMN6TP	BR24C16-RDW6TP	BR24C16-RDS6TP	BR95160-RMN6TP	BR95160-RDW6TP	-
BR24C01-WMN6TP	BR24C01-WDW6TP	BR24C01-WDS6TP	BR95010-WMN6TP	BR95010-WDW6TP	BR95010-WDS6TP
BR24C02-WMN6TP	BR24C02-WDW6TP	BR24C02-WDS6TP	BR95020-WMN6TP	BR95020-WDW6TP	BR95020-WDS6TP
BR24C04-WMN6TP	BR24C04-WDW6TP	BR24C04-WDS6TP	BR95040-WMN6TP	BR95040-WDW6TP	BR95040-WDS6TP
BR24C08-WMN6TP	BR24C08-WDW6TP	BR24C08-WDS6TP	BR95080-WMN6TP	BR95080-WDW6TP	-
BR24C16-WMN6TP	BR24C16-WDW6TP	BR24C16-WDS6TP	BR95160-WMN6TP	BR95160-WDW6TP	-
BR24C32-WMN6TP	BR24C32-WDW6TP	-	BR95320-WMN6TP	-	-
BR24C64-WMN6TP	-	-	BR95640-WMN6TP	-	-
BR24C01-MN6TP	BR24C01-DW6TP	BR24C01-DS6TP	-	-	-
BR24C02-MN6TP	BR24C02-DW6TP	BR24C02-DS6TP	-	-	-
BR24C04-MN6TP	BR24C04-DW6TP	BR24C04-DS6TP	-	-	-
BR24C08-MN6TP	BR24C08-DW6TP	BR24C08-DS6TP	-	-	-
BR24C16-MN6TP	BR24C16-DW6TP	BR24C16-DS6TP	-	-	-
BR24C32-MN6TP	BR24C32-DW6TP	-	-	-	-
BR24C64-MN6TP	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
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◇BR24C01-WMN3TP	-	-	◇BR95010-WMN3TP	-	-
◇BR24C02-WMN3TP	-	-	◇BR95020-WMN3TP	-	-
◇BR24C04-WMN3TP	-	-	◇BR95040-WMN3TP	-	-
◇BR24C08-WMN3TP	-	-	◇BR95080-WMN3TP	-	-
◇BR24C16-WMN3TP	-	-	◇BR95160-WMN3TP	-	-

☆ Under Development
◇ Future Release

SIGNATURE series part number designation



* I²C BUS is a registered trademark of Philips.



Microwire BUS

BR93C family

- Three-wire serial communication interface consisting of two control inputs (chip select and serial clock), plus one serial data input line and one serial data output line
- 2MHz clock frequency (4.5V to 5.5V)
- Fast speed write possible [write time 10ms. (Max.)]
- Identical package and pin configuration from 1Kbit to 16Kbit, to simplify design

Supply voltage **1.8V ~ 5.5V** Operating temperature **-40°C ~ +85°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package	
					8-lead JEDEC SOIC	8-lead TSSOP
BR93C46-10□U-1.8	1Kbit	64 × 16	1.8V ~ 5.5V	-40°C ~ +85°C	BR93C46-10SU-1.8 (BR93C46R-10SU-1.8)	BR93C46-10TU-1.8
BR93C56-10□U-1.8	2Kbit	128 × 16			BR93C56-10SU-1.8	BR93C56-10TU-1.8
BR93C66-10□U-1.8	4Kbit	256 × 16			BR93C66-10SU-1.8	BR93C66-10TU-1.8

Products put in () have different pin assignment. Please see the pin assignment in page 12.

Supply voltage **2.7V ~ 5.5V** Operating temperature **-40°C ~ +85°C** type

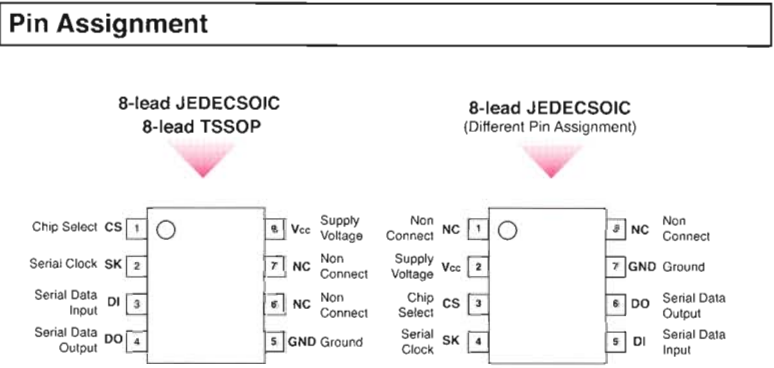
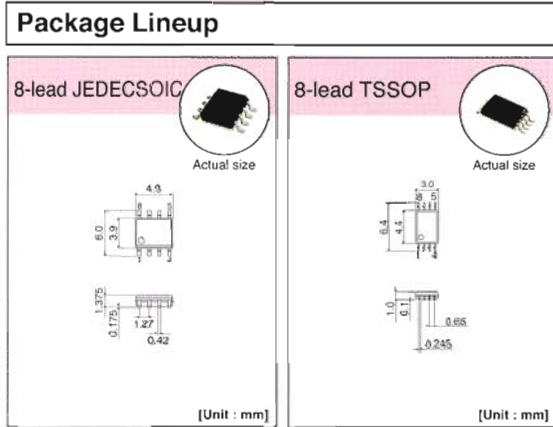
Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package	
					8-lead JEDEC SOIC	8-lead TSSOP
BR93C46-10□U-2.7	1Kbit	64 × 16	2.7V ~ 5.5V	-40°C ~ +85°C	BR93C46-10SU-2.7 (BR93C46R-10SU-2.7)	BR93C46-10TU-2.7
BR93C56-10□U-2.7	2Kbit	128 × 16			BR93C56-10SU-2.7	BR93C56-10TU-2.7
BR93C66-10□U-2.7	4Kbit	256 × 16			BR93C66-10SU-2.7	BR93C66-10TU-2.7
BR93C76-10□U-2.7	8Kbit	512 × 16			BR93C76-10SU-2.7	BR93C76-10TU-2.7
BR93C86-10□U-2.7	16Kbit	1K × 16			BR93C86-10SU-2.7	BR93C86-10TU-2.7

Products put in () have different pin assignment. Please see the pin assignment in page 12.

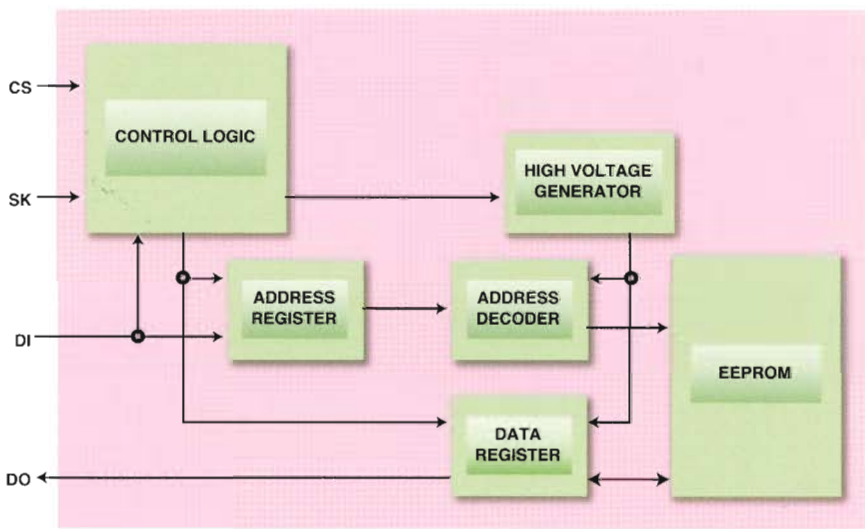
☆ Supply voltage **2.7V ~ 5.5V** Operating temperature **-40°C ~ +125°C** type

☆ Under Development

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package	
					8-lead JEDEC SOIC	8-lead TSSOP
BR93C46-10□Q-2.7	1Kbit	64 × 16	2.7V ~ 5.5V	-40°C ~ +125°C	BR93C46-10SQ-2.7	—
BR93C56-10□Q-2.7	2Kbit	128 × 16			BR93C56-10SQ-2.7	—
BR93C66-10□Q-2.7	4Kbit	256 × 16			BR93C66-10SQ-2.7	—
BR93C76-10□Q-2.7	8Kbit	512 × 16			BR93C76-10SQ-2.7	—
BR93C86-10□Q-2.7	16Kbit	1K × 16			BR93C86-10SQ-2.7	—



Block Diagram



Electrical Characteristics

BR93C□□ family	Endurance	Data retention	Supply current write	Supply current read	Stand by current	SK clock frequency	Output delay	Write cycle time
BR93C46-10□U-1.8 BR93C56-10□U-1.8 BR93C66-10□U-1.8	1,000,000	100 years (Typ.)	2mA Vcc=5V	2mA Vcc=5V	10μA Vcc=2.7V	0.25MHz 1.8V ≤ Vcc ≤ 5.5V	1000ns 1.8V ≤ Vcc ≤ 5.5V	10ms
					30μA Vcc=5V	1MHz 2.7V ≤ Vcc ≤ 5.5V	250ns 2.7V ≤ Vcc ≤ 5.5V	
						2MHz 4.5V ≤ Vcc ≤ 5.5V	250ns 4.5V ≤ Vcc ≤ 5.5V	
BR93C46-10□U-2.7 BR93C56-10□U-2.7 BR93C66-10□U-2.7 BR93C76-10□U-2.7 BR93C86-10□U-2.7	1,000,000	100 years (Typ.)	2mA Vcc=5V	2mA Vcc=5V	10μA Vcc=2.7V	1MHz 2.7V ≤ Vcc ≤ 5.5V	250ns 2.7V ≤ Vcc ≤ 5.5V	10ms
					30μA Vcc=5V	2MHz 4.5V ≤ Vcc ≤ 5.5V	250ns 4.5V ≤ Vcc ≤ 5.5V	
☆ BR93C46-10□Q-2.7 BR93C56-10□Q-2.7 BR93C66-10□Q-2.7 BR93C76-10□Q-2.7 BR93C86-10□Q-2.7	1,000,000	100 years (Typ.)	2mA Vcc=5V	2mA Vcc=5V	10μA Vcc=2.7V	1MHz 2.7V ≤ Vcc ≤ 5.5V	500ns 2.7V ≤ Vcc ≤ 5.5V	10ms
					30μA Vcc=5V	2MHz 4.5V ≤ Vcc ≤ 5.5V	250ns 4.5V ≤ Vcc ≤ 5.5V	

☆ Under Development



I²C BUS

BR24C family

- 100% compatible with the I²C BUS.
- All controls are available by two ports, serial clock (SCL) and serial data (SDA)
- Devices other than EEPROMs can be connected to the same port, reducing the number of ports required.
- Low current consumption
- Page write mode for high-speed writing

Supply voltage **1.8V ~ 5.5V** Operating temperature **-40°C ~ +85°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package	
					8-lead JEDEC SOIC	8-lead TSSOP
BR24C01A□-10□U-1.8	1Kbit	128×8	1.8V ~ 5.5V	-40°C ~ +85°C	BR24C01A-10SU-1.8	BR24C01A-10TU-1.8
BR24C02□-10□U-1.8	2Kbit	256×8			BR24C02N-10SU-1.8	BR24C02-10TU-1.8
BR24C04□-10□U-1.8	4Kbit	512×8			BR24C04N-10SU-1.8	BR24C04-10TU-1.8
BR24C08A□-10□U-1.8	8Kbit	1K×8			BR24C08AN-10SU-1.8	BR24C08A-10TU-1.8
BR24C16A□-10□U-1.8	16Kbit	2K×8			BR24C16AN-10SU-1.8	BR24C16A-10TU-1.8
BR24C32A□-10□U-1.8	32Kbit	4K×8			BR24C32AN-10SU-1.8	BR24C32A-10TU-1.8

Supply voltage **2.7V ~ 5.5V** Operating temperature **-40°C ~ +85°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package	
					8-lead JEDEC SOIC	8-lead TSSOP
BR24C01A□-10□U-2.7	1Kbit	128×8	2.7V ~ 5.5V	-40°C ~ +85°C	BR24C01A-10SU-2.7	BR24C01A-10TU-2.7
BR24C02□-10□U-2.7	2Kbit	256×8			BR24C02N-10SU-2.7	BR24C02-10TU-2.7
BR24C04□-10□U-2.7	4Kbit	512×8			BR24C04N-10SU-2.7	BR24C04-10TU-2.7
BR24C08A□-10□U-2.7	8Kbit	1K×8			BR24C08AN-10SU-2.7	BR24C08A-10TU-2.7
BR24C16A□-10□U-2.7	16Kbit	2K×8			BR24C16AN-10SU-2.7	BR24C16A-10TU-2.7
BR24C32A□-10□U-2.7	32Kbit	4K×8			BR24C32AN-10SU-2.7	BR24C32A-10TU-2.7
BR24C64A□-10□U-2.7	64Kbit	8K×8			BR24C64AN-10SU-2.7	-

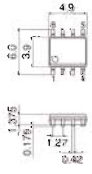
◇ Supply voltage **2.7V ~ 5.5V** Operating temperature **-40°C ~ +125°C** type

◇ Future Release

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package	
					8-lead JEDEC SOIC	8-lead TSSOP
BR24C01A□-10□Q-2.7	1Kbit	128×8	2.7V ~ 5.5V	-40°C ~ +125°C	BR24C01A-10SQ-2.7	-
BR24C02□-10□Q-2.7	2Kbit	256×8			BR24C02N-10SQ-2.7	-
BR24C04□-10□Q-2.7	4Kbit	512×8			BR24C04N-10SQ-2.7	-
BR24C08A□-10□Q-2.7	8Kbit	1K×8			BR24C08AN-10SQ-2.7	-
BR24C16A□-10□Q-2.7	16Kbit	2K×8			BR24C16AN-10SQ-2.7	-

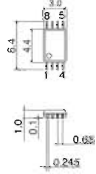
Package Lineup

8-lead JEDEC SOIC



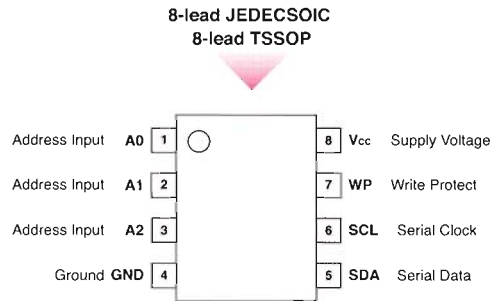
[Unit : mm]

8-lead TSSOP

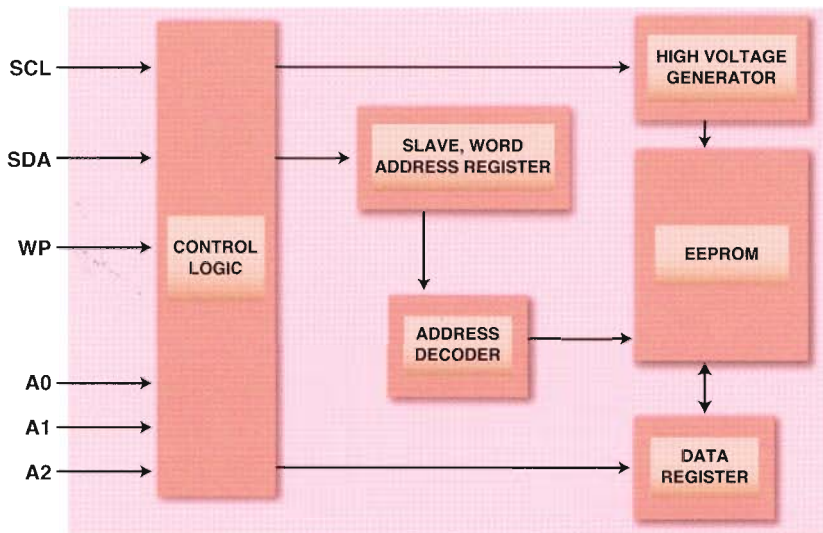


[Unit : mm]

Pin Assignment



Block Diagram



Electrical Characteristics

BR24C□□ family	Endurance	Data retention	Supply current write	Supply current read	Standby current	SCL clock frequency	Clock Low to date out valid	Write cycle time
BR24C01A□-10□U-1.8 BR24C02□-10□U-1.8 BR24C04□-10□U-1.8 BR24C08A□-10□U-1.8 BR24C16A□-10□U-1.8 BR24C32A□-10□U-1.8	1,000,000	100years (Typ.)	3mA Vcc= 5V	1mA Vcc= 5V	3μA Vcc = 1.8V 4μA Vcc = 2.5V 4μA Vcc = 2.7V 18μA Vcc = 5V Density :1K ~ 16Kbit	100kHz Vcc=1.8V	0.1μs ~ 4.5μs Vcc = 1.8V	5ms
BR24C01A□-10□U-2.7 BR24C02□-10□U-2.7 BR24C04□-10□U-2.7 BR24C08A□-10□U-2.7 BR24C16A□-10□U-2.7 BR24C32A□-10□U-2.7 BR24C64A□-10□U-2.7	1,000,000	100years (Typ.)	3mA Vcc= 5V	1mA Vcc= 5V	4μA Vcc = 2.7V 18μA Vcc = 5V Density :1K ~ 16Kbit 2μA Vcc = 2.7V 6μA Vcc = 4.5V ~ 5.5V Density : 32K,64Kbit	400kHz Vcc=2.5V,2.7V,5.5V	0.1μs ~ 0.9μs Vcc=2.5V,2.7V,5V	5ms
◇ BR24C01A□-10□Q-2.7 BR24C02□-10□Q-2.7 BR24C04□-10□Q-2.7 BR24C08A□-10□Q-2.7 BR24C16A□-10□Q-2.7	1,000,000	100years (Typ.)	3mA Vcc= 5V	1mA Vcc= 5V	4μA Vcc = 2.7V 18μA Vcc = 5V	400kHz	0.1μs ~ 0.9μs	5ms

◇ Future Release



SPI BUS

BR25□□0
family

- Ultra-high speed clock frequency 5MHz (Max.)
- Serial communications can be paused by HOLD signal.
- The entire memory array or part of it can be set to prevent write operation (ROM).

Supply voltage **1.8v ~ 5.5v** Operating temperature **-40°C ~ +85°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package	
					8-lead JEDEC SOIC	8-lead TSSOP
BR25010-10□U-1.8	1Kbit	128×8	1.8V ~ 5.5V	-40°C ~ +85°C	BR25010N-10SU-1.8	BR25010-10TU-1.8
BR25020-10□U-1.8	2Kbit	256×8			BR25020N-10SU-1.8	BR25020-10TU-1.8
BR25040-10□U-1.8	4Kbit	512×8			BR25040N-10SU-1.8	BR25040-10TU-1.8
BR25080-10□U-1.8	8Kbit	1K×8			BR25080N-10SU-1.8	BR25080-10TU-1.8
BR25160-10□U-1.8	16Kbit	2K×8			BR25160N-10SU-1.8	BR25160-10TU-1.8
BR25320-10□U-1.8	32Kbit	4K×8			BR25320N-10SU-1.8	—

Supply voltage **2.7v ~ 5.5v** Operating temperature **-40°C ~ +85°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package	
					8-lead JEDEC SOIC	8-lead TSSOP
BR25010-10□U-2.7	1Kbit	128×8	2.7V ~ 5.5V	-40°C ~ +85°C	BR25010N-10SU-2.7	BR25010-10TU-2.7
BR25020-10□U-2.7	2Kbit	256×8			BR25020N-10SU-2.7	BR25020-10TU-2.7
BR25040-10□U-2.7	4Kbit	512×8			BR25040N-10SU-2.7	BR25040-10TU-2.7
BR25080-10□U-2.7	8Kbit	1K×8			BR25080N-10SU-2.7	BR25080-10TU-2.7
BR25160-10□U-2.7	16Kbit	2K×8			BR25160N-10SU-2.7	BR25160-10TU-2.7
BR25320-10□U-2.7	32Kbit	4K×8			BR25320N-10SU-2.7	—
BR25640-10□U-2.7	64Kbit	8K×8			BR25640N-10SU-2.7	—

◇ Supply voltage **2.7v ~ 5.5v** Operating temperature **-40°C ~ +125°C** type

◇ Future Release

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package	
					8-lead JEDEC SOIC	8-lead TSSOP
BR25010-10□Q-2.7	1Kbit	128×8	2.7V ~ 5.5V	-40°C ~ +125°C	BR25010AN-10SQ-2.7	—
BR25020-10□Q-2.7	2Kbit	256×8			BR25020AN-10SQ-2.7	—
BR25040-10□Q-2.7	4Kbit	512×8			BR25040AN-10SQ-2.7	—
BR25080-10□Q-2.7	8Kbit	1K×8			BR25080AN-10SQ-2.7	—
BR25160-10□Q-2.7	16Kbit	2K×8			BR25160AN-10SQ-2.7	—

Package Lineup

8-lead JEDEC SOIC

Actual size

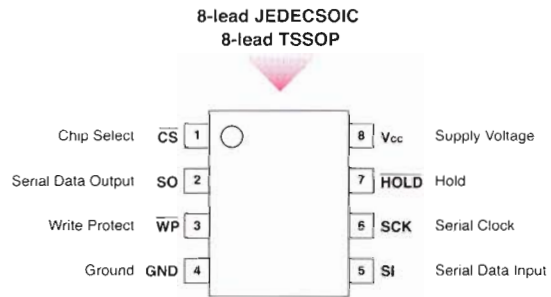
[Unit : mm]

8-lead TSSOP

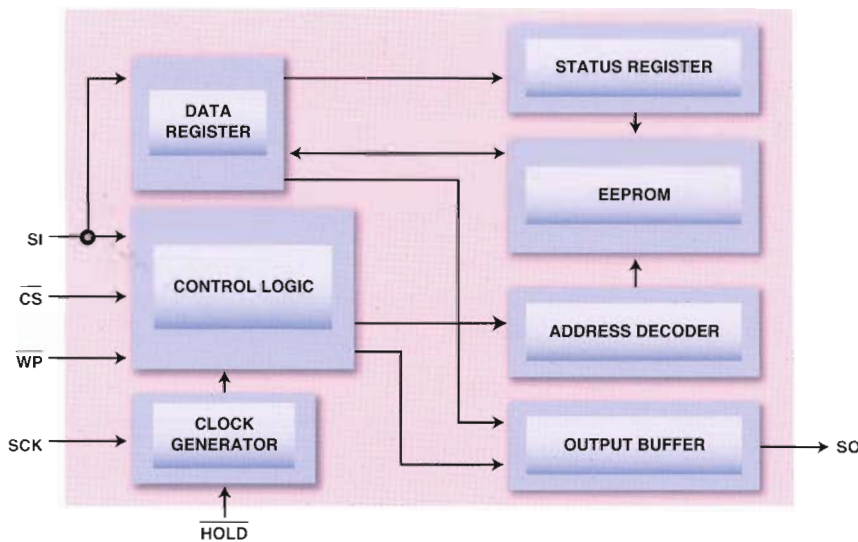
Actual size

[Unit : mm]

Pin Assignment



Block Diagram



Electrical Characteristics

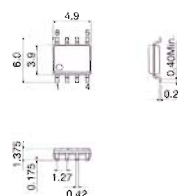
BR25□□0 family	Endurance	Data retention	Supply current	Standby current	SCK clock frequency	output valid	Write cycle time
BR25010-10□U-1.8 BR25020-10□U-1.8 BR25040-10□U-1.8 BR25080-10□U-1.8 BR25160-10□U-1.8 BR25320-10□U-1.8	1,000,000	100years (Typ.)	5mA Vcc= 5V	1µA Vcc= 1.8V	0.5MHz	800ns	20ms
BR25010-10□U-2.7 BR25020-10□U-2.7 BR25040-10□U-2.7 BR25080-10□U-2.7 BR25160-10□U-2.7 BR25320-10□U-2.7 BR25640-10□U-2.7	1,000,000	100years (Typ.)	6mA Vcc= 5V Density : 1K ~ 4K	10µA Vcc= 5V Density : 1K ~ 4K	2.1MHz	200ns	10ms
BR25010-10□Q-2.7 BR25020-10□Q-2.7 BR25040-10□Q-2.7 BR25080-10□Q-2.7 BR25160-10□Q-2.7	1,000,000	100years (Typ.)	3mA Vcc=5V	5µA Vcc= 5V Density : 1K ~ 4K 13µA Vcc=5V Density : 8K ~ 64K	5MHz	40ns	5ms

◇ Future Release

Operating Temperature	Supply Voltage	Density	Microwire BUS		
			8-lead JEDEC SOIC	8-lead JEDEC SOIC (Different pin assignment)	8-lead TSSOP
-40°C ~ +85°C	1.8V ~ 5.5V	1K	BR93C46-10SU-1.8	BR93C46R-10SU-1.8	BR93C46-10TU-1.8
		2K	BR93C56-10SU-1.8	-	BR93C56-10TU-1.8
		4K	BR93C66-10SU-1.8	-	BR93C66-10TU-1.8
		8K	-	-	-
		16K	-	-	-
		32K	-	-	-
	2.7V ~ 5.5V	1K	BR93C46-10SU-2.7	BR93C46R-10SU-2.7	BR93C46-10TU-2.7
		2K	BR93C56-10SU-2.7	-	BR93C56-10TU-2.7
		4K	BR93C66-10SU-2.7	-	BR93C66-10TU-2.7
		8K	BR93C76-10SU-2.7	-	BR93C76-10TU-2.7
		16K	BR93C86-10SU-2.7	-	BR93C86-10TU-2.7
		32K	-	-	-
		64K	-	-	-
		-40°C ~ +125°C	2.7V ~ 5.5V	1K	☆ BR93C46-10SQ-2.7
2K	☆ BR93C56-10SQ-2.7			-	-
4K	☆ BR93C66-10SQ-2.7			-	-
8K	☆ BR93C76-10SQ-2.7			-	-
16K	☆ BR93C86-10SQ-2.7			-	-

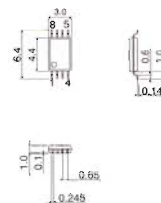
Package Outline

8-lead JEDEC SOIC



[Unit : mm]

8-lead TSSOP



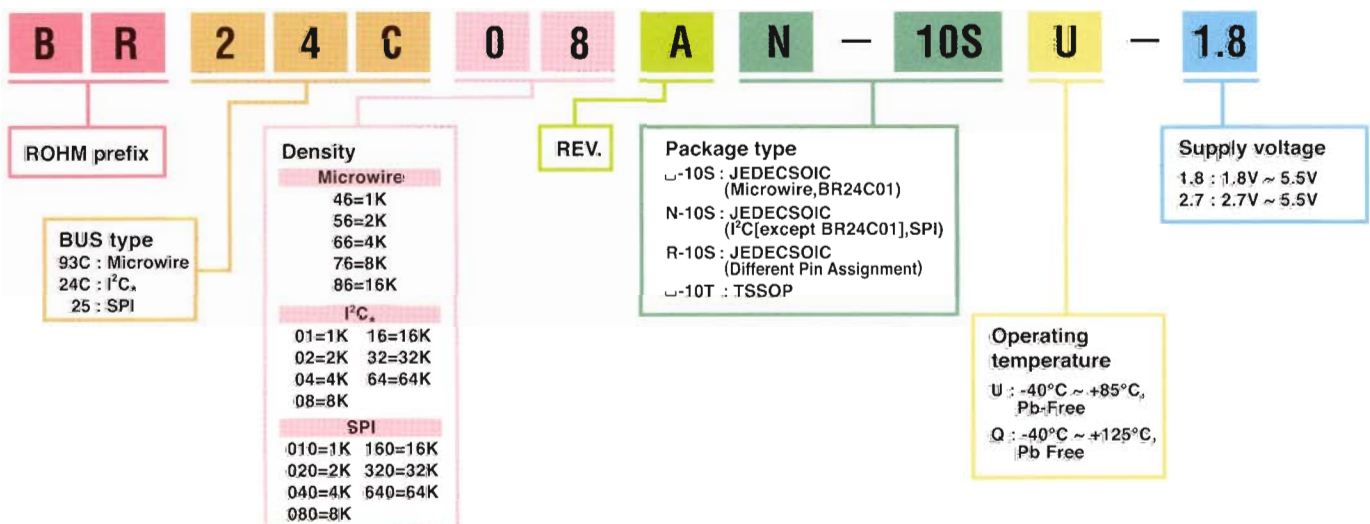
[Unit : mm]

I ² C BUS*		SPI BUS	
8-lead JEDEC SOIC	8-lead TSSOP	8-lead JEDEC SOIC	8-lead TSSOP
BR24C01A-10SU-1.8	BR24C01A-10TU-1.8	BR25010N-10SU-1.8	BR25010-10TU-1.8
BR24C02N-10SU-1.8	BR24C02-10TU-1.8	BR25020N-10SU-1.8	BR25020-10TU-1.8
BR24C04N-10SU-1.8	BR24C04-10TU-1.8	BR25040N-10SU-1.8	BR25040-10TU-1.8
BR24C08AN-10SU-1.8	BR24C08A-10TU-1.8	BR25080N-10SU-1.8	BR25080-10TU-1.8
BR24C16AN-10SU-1.8	BR24C16A-10TU-1.8	BR25160N-10SU-1.8	BR25160-10TU-1.8
BR24C32AN-10SU-1.8	BR24C32A-10TU-1.8	BR25320N-10SU-1.8	-
BR24C01A-10SU-2.7	BR24C01A-10TU-2.7	BR25010N-10SU-2.7	BR25010-10TU-2.7
BR24C02N-10SU-2.7	BR24C02-10TU-2.7	BR25020N-10SU-2.7	BR25020-10TU-2.7
BR24C04N-10SU-2.7	BR24C04-10TU-2.7	BR25040N-10SU-2.7	BR25040-10TU-2.7
BR24C08AN-10SU-2.7	BR24C08A-10TU-2.7	BR25080N-10SU-2.7	BR25080-10TU-2.7
BR24C16AN-10SU-2.7	BR24C16A-10TU-2.7	BR25160N-10SU-2.7	BR25160-10TU-2.7
BR24C32AN-10SU-2.7	BR24C32A-10TU-2.7	BR25320N-10SU-2.7	-
BR24C64AN-10SU-2.7	-	BR25640N-10SU-2.7	-
◇ BR24C01A-10SQ-2.7	-	◇ BR25010AN-10SQ-2.7	-
◇ BR24C02N-10SQ-2.7	-	◇ BR25020AN-10SQ-2.7	-
◇ BR24C04N-10SQ-2.7	-	◇ BR25040AN-10SQ-2.7	-
◇ BR24C08AN-10SQ-2.7	-	◇ BR25080AN-10SQ-2.7	-
◇ BR24C16AN-10SQ-2.7	-	◇ BR25160AN-10SQ-2.7	-

☆ Under Development
◇ Future Release

ADVANTAGE SERIES

ADVANTAGE series part number designation



* I²C BUS is a registered trademark of Philips.



Microwire BUS

BR93 family

- Serial 3-wire interface: chip select, serial clock, and serial data I/O
- High speed clock frequency – 2MHz (BR93L□□, BR93A□□)
- High speed write possible – 5ms (Max.) (BR93L□□, BR93A□□)
- Identical package and pin configuration from 1Kbit to 16Kbit, to simplify design.
- Operates on a single power source – from 1.8V to 5.5V (BR93L□□)
- High reliability Au pad-Au wire connection
- High ESD resistance: 8kV (BR93H□□)

Supply voltage **1.8v ~ 5.5v** Operating temperature **-40°C ~ +85°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SOP-J8	TSSOP-B8	TSSOP-B8J
BR93L46-W	1Kbit	64 × 16	1.8V ~ 5.5V	-40°C ~ +85°C	BR93L46RFJ-W (BR93L46FJ-W)	BR93L46RFVT-W (BR93L46FVT-W)	BR93L46RFVJ-W
BR93L56-W	2Kbit	128 × 16			BR93L56RFJ-W (BR93L56FJ-W)	BR93L56RFVT-W (BR93L56FVT-W)	BR93L56RFVJ-W
BR93L66-W	4Kbit	256 × 16			BR93L66RFJ-W (BR93L66FJ-W)	BR93L66RFVT-W (BR93L66FVT-W)	BR93L66RFVJ-W
BR93L76-W	8Kbit	512 × 16			BR93L76RFJ-W (BR93L76FJ-W)	BR93L76RFVT-W	BR93L76RFVJ-W
BR93L86-W	16Kbit	1K × 16			BR93L86RFJ-W (BR93L86FJ-W)	BR93L86RFVT-W	BR93L86RFVJ-W

Products put in () have different pin assignment. Please see the pin assignment in page 20.

Supply voltage **2.5v ~ 5.5v** Operating temperature **-40°C ~ +105°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SOP-J8	TSSOP-B8	TSSOP-B8J
BR93A46-W	1Kbit	64 × 16	2.5V ~ 5.5V	-40°C ~ +105°C	BR93A46RFJ-W	—	—
BR93A56-W	2Kbit	128 × 16			BR93A56RFJ-W	—	—
BR93A66-W	4Kbit	256 × 16			BR93A66RFJ-W	—	—
BR93A76-W	8Kbit	512 × 16			BR93A76RFJ-W	—	—
BR93A86-W	16Kbit	1K × 16			BR93A86RFJ-W	—	—

Supply voltage **2.7v ~ 5.5v** Operating temperature **-40°C ~ +125°C** type

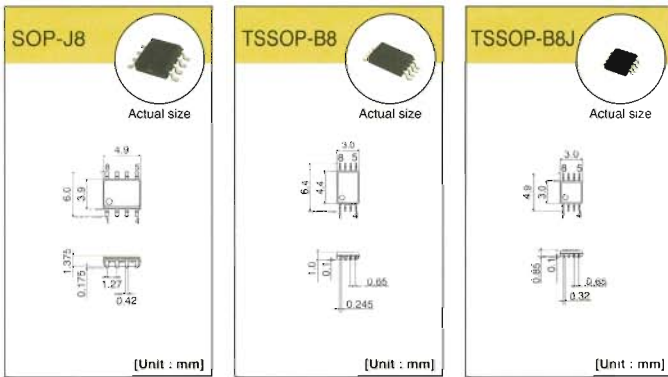


☆ Under Development

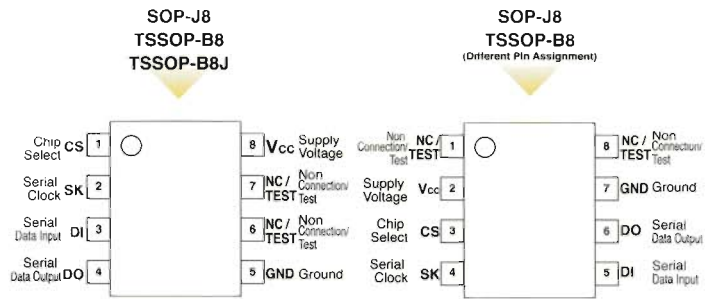
Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SOP-J8	TSSOP-B8	TSSOP-B8J
☆ BR93H46-W	1Kbit	64 × 16	2.7V ~ 5.5V	-40°C ~ +125°C	BR93H46RFJ-W	—	—
BR93H56-W	2Kbit	128 × 16			BR93H56RFJ-W	—	—
BR93H66-W	4Kbit	256 × 16			BR93H66RFJ-W	—	—
BR93H76-W	8Kbit	512 × 16			BR93H76RFJ-W	—	—
BR93H86-W	16Kbit	1K × 16			BR93H86RFJ-W	—	—

HIGH RELIABILITY SERIES

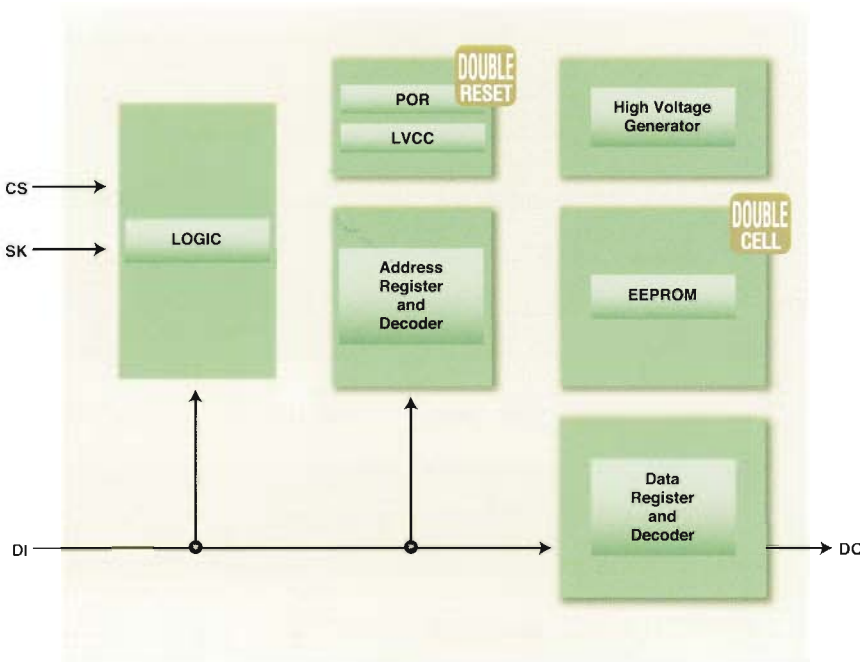
Package Lineup



Pin Assignment



Block Diagram



Highly-reliable Features

Double-cell Structure

With double-cell EEPROMs, random failure that could not be removed with conventional single-cell EEPROMs can be reduced to zero.

Double reset Function

Two protection circuits (POR / LVCC) enable to prevent from inadvertent write at low supply voltage.

Au / Au connection

Bonding by Au pad and Au wire has realized high connection reliability.

8kV ESD Resistance

BR93H□□ is designed to operate from -40°C~+125°C and 8kV ESD protection resistance, delivering high-reliability.

Electrical Characteristics

BR93□□□ family	Endurance	Data retention	Operating current consumption write	Operating current consumption read	Standby current consumption	SK frequency	Data output delay time	Write cycle time
BR93L46-W BR93L56-W BR93L66-W BR93L76-W BR93L86-W	1,000,000	40 years	3mA	1.5mA	2μA	0.5MHz 1.8V ≤ V _{CC} < 2.5V 2MHz 2.5V ≤ V _{CC} ≤ 5.5V	700ns 1.8V ≤ V _{CC} < 2.5V 200ns 2.5V ≤ V _{CC} ≤ 5.5V	5ms
BR93A46-W BR93A56-W BR93A66-W BR93A76-W BR93A86-W	1,000,000	40 years	3mA	1.5mA	2μA	2MHz	200ns	5ms
☆ BR93H46-W BR93H56-W BR93H66-W BR93H76-W BR93H86-W	1,000,000	40years	3mA	1.5mA	10μA	1.25MHz	300ns	10ms

☆ Under Development



I²C BUS*

BR24 family

- 100% compatible with the I²C BUS* interface, which utilizes two ports: serial clock (SCL) and serial data (SDA)
- Devices other than EEPROMs can be connected to the same port, reducing the number of ports required.
- Operates on a single power source – from 1.8V to 5.5V (BR24L□□)
- High speed page-write mode
- Low current consumption
- High reliability Au pad-Au wire connection
- High ESD resistance: 8kV (BR24H□□)

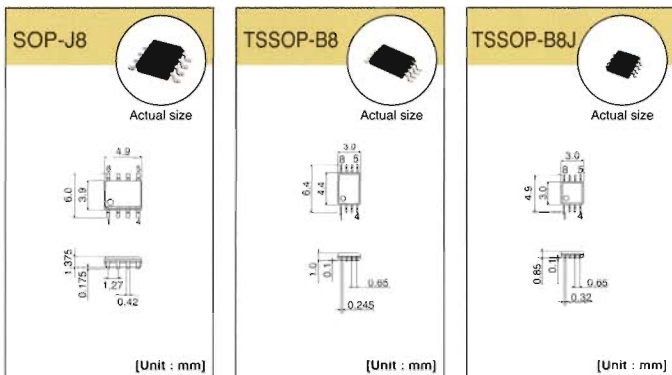
Supply voltage **1.8v ~ 5.5v** Operating temperature **-40°C ~ +85°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SOP-J8	TSSOP-B8	TSSOP-B8J
BR24L01A-W	1Kbit	128×8	1.8V ~ 5.5V	-40°C ~ +85°C	BR24L01AFJ-W	BR24L01AFVT-W	BR24L01AFVJ-W
BR24L02-W	2Kbit	256×8			BR24L02FJ-W	BR24L02FVT-W	BR24L02FVJ-W
BR24L04-W	4Kbit	512×8			BR24L04FJ-W	BR24L04FVT-W	BR24L04FVJ-W
BR24L08-W	8Kbit	1K×8			BR24L08FJ-W	BR24L08FVT-W	BR24L08FVJ-W
BR24L16-W	16Kbit	2K×8			BR24L16FJ-W	BR24L16FVT-W	BR24L16FVJ-W
BR24L32-W	32Kbit	4K×8			BR24L32FJ-W	BR24L32FVT-W	—
BR24L64-W	64Kbit	8K×8			BR24L64FJ-W	—	—

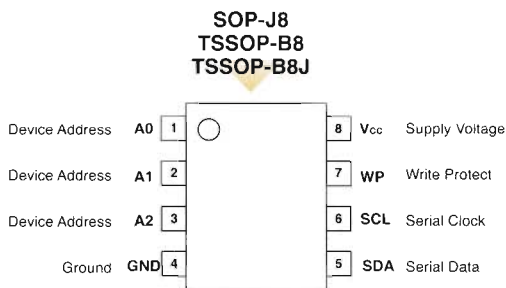
☆ Supply voltage **2.5v ~ 5.5v** Operating temperature **-40°C ~ +125°C** type **8kV** High ESD resistance ☆ Under Development

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SOP-J8	TSSOP-B8	TSSOP-B8J
BR24H01-W	1Kbit	128×8	2.5V ~ 5.5V	-40°C ~ +125°C	BR24H01FJ-W	—	—
BR24H02-W	2Kbit	256×8			BR24H02FJ-W	—	—
BR24H04-W	4Kbit	512×8			BR24H04FJ-W	—	—
BR24H08-W	8Kbit	1K×8			BR24H08FJ-W	—	—
BR24H16-W	16Kbit	2K×8			BR24H16FJ-W	—	—

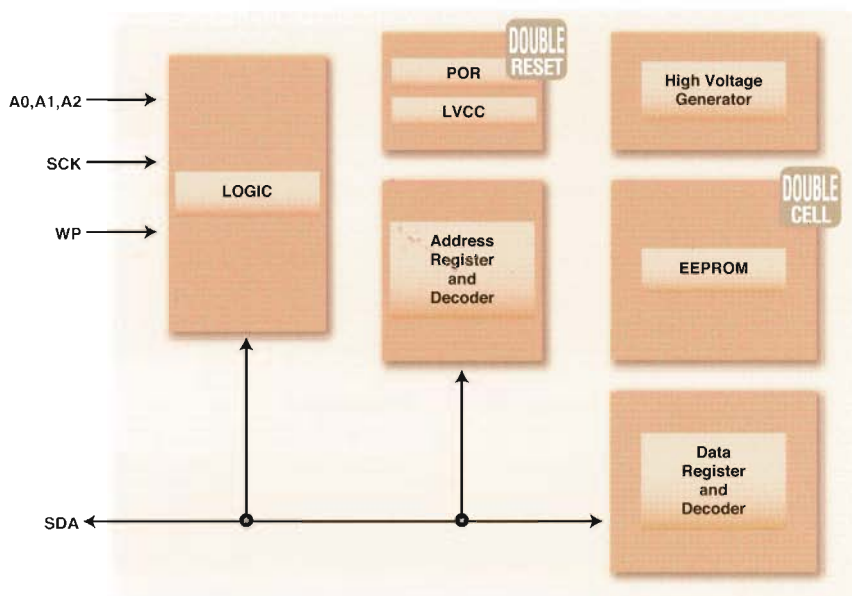
Package Lineup



Pin Assignment



Block Diagram



Highly-reliable Features

Double-cell Structure

With double-cell EEPROMs, random failure that could not be removed with conventional single-cell EEPROMs can be reduced to zero.

Double reset Function

Two protection circuits (POR / LVCC) enable to prevent from inadvertent write at low supply voltage.

Au / Au connection

Bonding by Au pad and Au wire has realized high connection reliability.

8kV ESD Resistance

BR24H□□ is designed to operate from -40°C~+125°C and 8kV ESD protection resistance, delivering high-reliability.

Electrical Characteristics

BR24□□□ family	Endurance	Data retention	Operating current consumption write	Operating current consumption read	Standby current consumption	SCL frequency	Data output delay time	Write cycle time
BR24L01A-W BR24L02-W BR24L04-W BR24L08-W BR24L16-W BR24L32-W BR24L64-W	1,000,000	40 years	2mA Density:1K~16Kbit	0.5mA	2μA	100kHz 1.8V ≤ Vcc ≤ 5.5V	0.2~3.5μs 1.8V ≤ Vcc ≤ 5.5V	5ms
3mA Density:32K,64Kbit			400kHz 2.5V ≤ Vcc ≤ 5.5V			0.1~0.9μs 2.5V ≤ Vcc ≤ 5.5V		
☆ BR24H01A-W BR24H02-W BR24H04-W BR24H08-W BR24H16-W	1,000,000	40 years	3mA	0.5mA	10μA	400kHz	0.1~0.9μs	10ms

☆ Under Development



SPI BUS

BR25□□□0 family

- Ultra-high speed clock frequency 5MHz (Max.)
- Hold terminal enables delay functionality.
- Part or all of the memory array can be designated Read Only (ROM).
- Operates on a single power supply – from 1.8V to 5.5V (BR25L□□0)
- High speed page-write mode
- High reliability Au pad-Au wire connection
- High ESD resistance: 8kV (BR25H□□0)

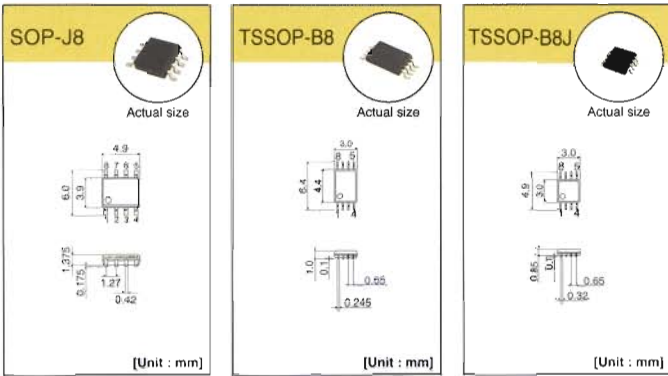
Supply voltage **1.8v ~ 5.5v** Operating temperature **-40°C ~ +85°C** type

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SOP-J8	TSSOP-B8	TSSOP-B8J
BR25L010-W	1Kbit	128×8	1.8V ~ 5.5V	-40°C ~ +85°C	BR25L010FJ-W	BR25L010FVT-W	BR25L010FVJ-W
BR25L020-W	2Kbit	256×8			BR25L020FJ-W	BR25L020FVT-W	BR25L020FVJ-W
BR25L040-W	4Kbit	512×8			BR25L040FJ-W	BR25L040FVT-W	BR25L040FVJ-W
BR25L080-W	8Kbit	1K×8			BR25L080FJ-W	BR25L080FVT-W	—
BR25L160-W	16Kbit	2K×8			BR25L160FJ-W	BR25L160FVT-W	—
BR25L320-W	32Kbit	4K×8			BR25L320FJ-W	—	—
BR25L640-W	64Kbit	8K×8			BR25L640FJ-W	—	—

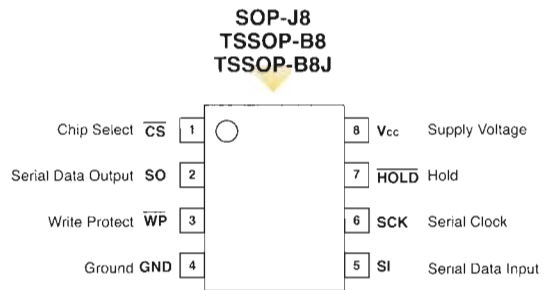
☆ Supply voltage **2.5v ~ 5.5v** Operating temperature **-40°C ~ +125°C** type **8kV** High ESD resistance ☆ Under Development

Part Number	Density	Bit configuration	Supply voltage	Operating temperature	Package		
					SOP-J8	TSSOP-B8	TSSOP-B8J
BR25H010-W	1Kbit	128×8	2.5V ~ 5.5V	-40°C ~ +125°C	BR25H010FJ-W	—	—
BR25H020-W	2Kbit	256×8			BR25H020FJ-W	—	—
BR25H040-W	4Kbit	512×8			BR25H040FJ-W	—	—
BR25H080-W	8Kbit	1K×8			BR25H080FJ-W	—	—
BR25H160-W	16Kbit	2K×8			BR25H160FJ-W	—	—

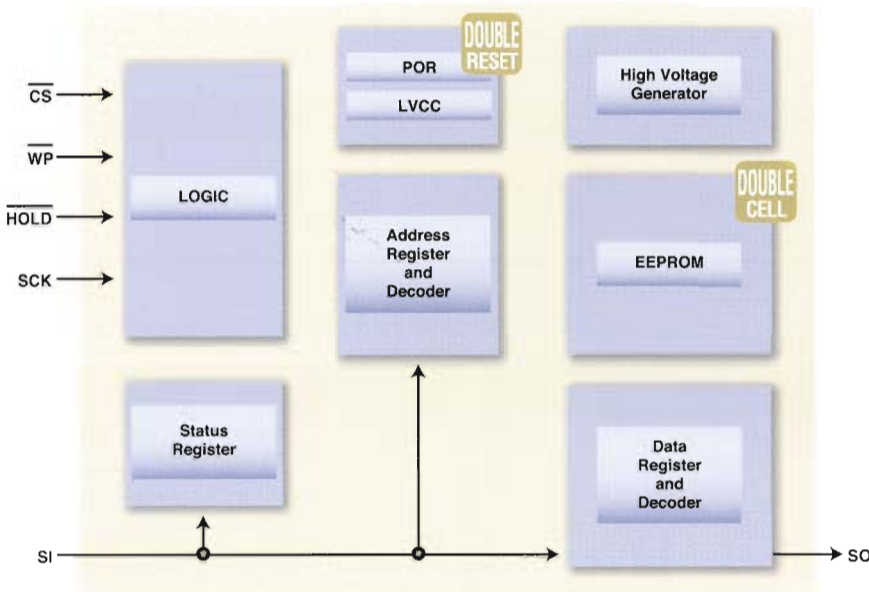
Package Lineup



Pin Assignment



Block Diagram



Highly-reliable Features

Double-cell Structure

With double-cell EEPROMs, random failure that could not be removed with conventional single-cell EEPROMs can be reduced to zero.

Double reset Function

Two protection circuits (POR / LVCC) enable to prevent from inadvertent write at low supply voltage.

Au / Au connection

Bonding by Au pad and Au wire has realized high connection reliability.

8kV ESD Resistance

BR25H□□0 is designed to operate from $-40^{\circ}C \sim +125^{\circ}C$ and 8kV ESD protection resistance, delivering high-reliability.

Electrical Characteristics

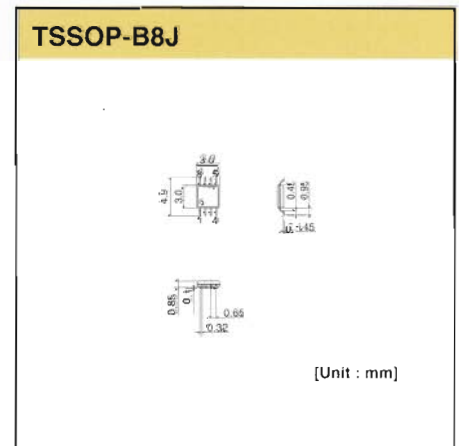
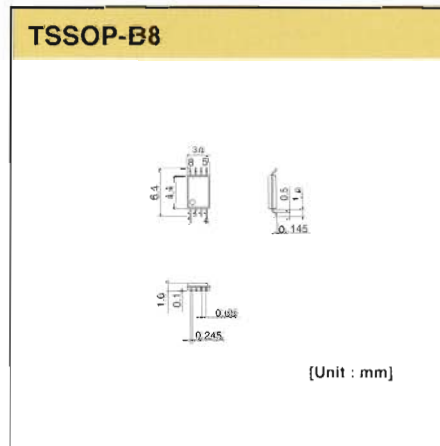
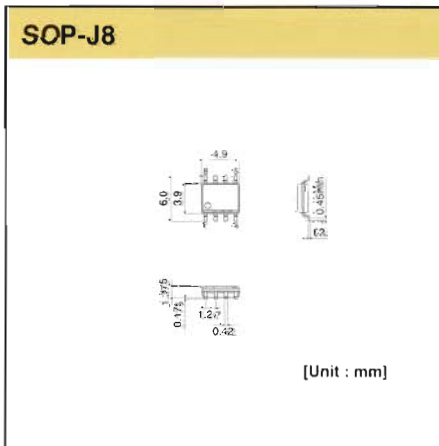
BR25□□□0 family	Endurance	Data retention	Operating current consumption write	Operating current consumption read	Standby current consumption	SCK frequency	Data output delay time	Write cycle time
BR25L010-W BR25L020-W BR25L040-W BR25L080-W BR25L160-W BR25L320-W BR25L640-W	1,000,000	40 years	1mA $V_{CC}=1.8V$	1.5mA $V_{CC}=2.5V$	2μA	2MHz $1.8V \leq V_{CC} \leq 2.5V$	150ns $1.8V \leq V_{CC} \leq 2.5V$	5ms
2mA $V_{CC}=2.5V$			2mA $V_{CC}=5.5V$	5MHz $2.5V \leq V_{CC} \leq 5.5V$		70ns $2.5V \leq V_{CC} \leq 5.5V$		
3mA $V_{CC}=5.5V$								
☆ BR25H010-W BR25H020-W BR25H040-W BR25H080-W BR25H160-W	1,000,000	40 years	2mA	1.5mA	10μA	5MHz	70ns	10ms

☆ Under Development

Operating Temperature	Supply Voltage	Density	Microwire BUS				
			SOP-J8	SOP-J8 (Different Pin Assignment)	TSSOP-B8	TSSOP-B8 (Different Pin Assignment)	TSSOP-B8J
-40°C ~ +85°C	1.8V ~ 5.5V	1K	BR93L46RFJ-W	BR93L46FJ-W	BR93L46RFVT-W	BR93L46FVT -W	BR93L46RFVJ-W
		2K	BR93L56RFJ-W	BR93L56FJ-W	BR93L56RFVT-W	BR93L56FVT-W	BR93L56RFVJ-W
		4K	BR93L66RFJ-W	BR93L66FJ-W	BR93L66RFVT-W	BR93L66FVT-W	BR93L66RFVJ-W
		8K	BR93L76RFJ-W	BR93L76FJ-W	BR93L76RFVT-W	-	BR93L76RFVJ-W
		16K	BR93L86RFJ-W	BR93L86FJ-W	BR93L86RFVT-W	-	BR93L86RFVJ-W
		32K	-	-	-	-	-
		64K	-	-	-	-	-
-40°C ~ +105°C	2.5V ~ 5.5V	1K	BR93A46RFJ-W	BR93A46FJ-W	-	-	-
		2K	BR93A56RFJ-W	BR93A56FJ-W	-	-	-
		4K	BR93A66RFJ-W	BR93A66FJ-W	-	-	-
		8K	BR93A76RFJ-W	BR93A76FJ-W	-	-	-
		16K	BR93A86RFJ-W	BR93A86FJ-W	-	-	-
-40°C ~ +125°C	*2.7V ~ 5.5V	1K	☆ BR93H46RFJ-W	-	-	-	-
		2K	BR93H56RFJ-W	-	-	-	-
		4K	BR93H66RFJ-W	-	-	-	-
		8K	BR93H76RFJ-W	-	-	-	-
		16K	BR93H86RFJ-W	-	-	-	-

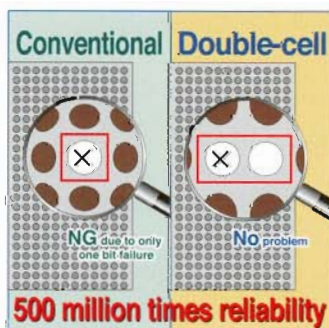
*BR24H□□ and BR25H□□□ that can be operated from 2.5V to 5.5V are under development.

Package Outline



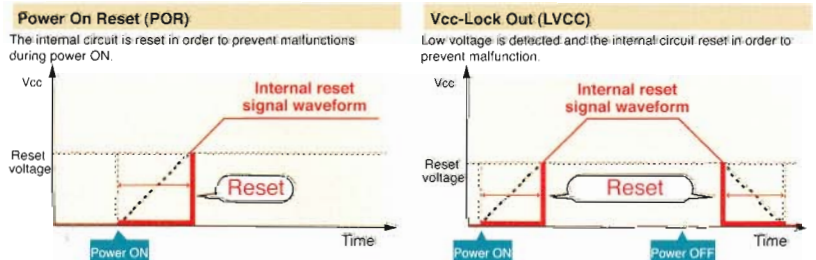
Double Cell Structure

In an EEPROM, data is written by passing electrons through a tunnel-oxide film. However, this process has a detrimental effect on the film, causing erosion and, eventually, memory bit failures. In order to prevent this, ROHM's EEPROMs possess redundant cells that operate in the event of memory failure.



Double Reset Function

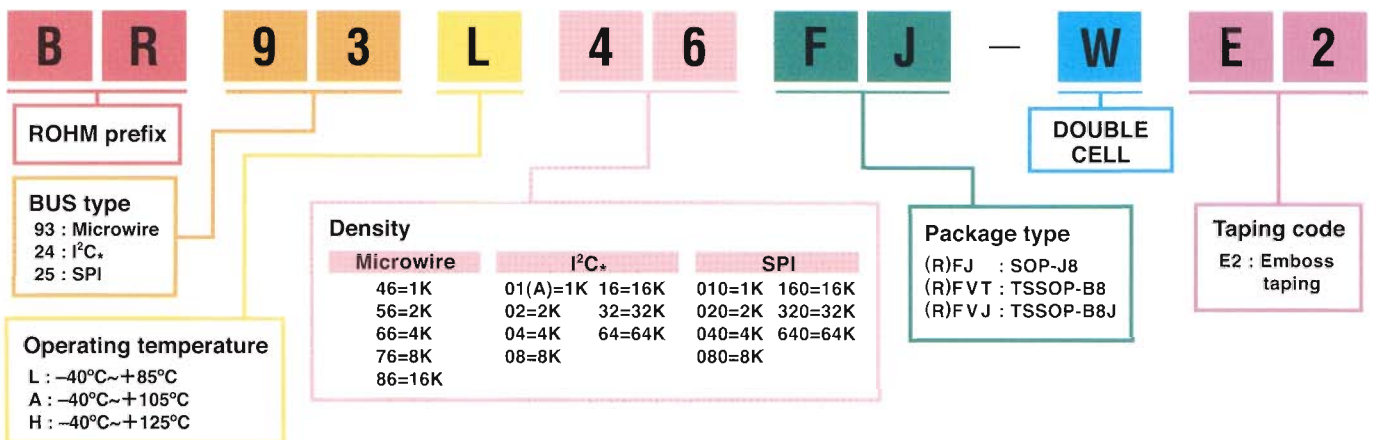
EEPROMs are particularly susceptible to environments where power is turned ON and OFF frequently, since during these situations noise can be induced at the input, which may cause bit lags, resulting in misidentification of commands and, subsequently, erroneous operation. While Op-amps and general purpose logic ICs can recover from malfunctions while the power is ON, EEPROMs will store even one malfunction in memory and be unable to recover. In order to guard against this ROHM's EEPROMs utilize two prevention circuits – power ON reset and low voltage erroneous write prevention – that reset the IC once power failures or low voltage situations are detected during power ON or power OFF.



I ² C BUS*			SPI BUS		
SOP-J8	TSSOP-B8	TSSOP-B8J	SOP-J8	TSSOP-B8	TSSOP-B8J
BR24L01AFJ-W	BR24L01AFVT-W	BR24L01AFVJ-W	BR25L010FJ-W	BR25L010FVT-W	BR25L010FVJ-W
BR24L02FJ-W	BR24L02FVT-W	BR24L02FVJ-W	BR25L020FJ-W	BR25L020FVT-W	BR25L020FVJ-W
BR24L04FJ-W	BR24L04FVT-W	BR24L04FVJ-W	BR25L040FJ-W	BR25L040FVT-W	BR25L040FVJ-W
BR24L08FJ-W	BR24L08FVT-W	BR24L08FVJ-W	BR25L080FJ-W	BR25L080FVT-W	-
BR24L16FJ-W	BR24L16FVT-W	BR24L16FVJ-W	BR25L160FJ-W	BR25L160FVT-W	-
BR24L32FJ-W	BR24L32FVT-W	-	BR25L320FJ-W	-	-
BR24L64FJ-W	-	-	BR25L640FJ-W	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
☆ BR24H01FJ-W	-	-	☆ BR25H010FJ-W	-	-
☆ BR24H02FJ-W	-	-	☆ BR25H020FJ-W	-	-
☆ BR24H04FJ-W	-	-	☆ BR25H040FJ-W	-	-
☆ BR24H08FJ-W	-	-	☆ BR25H080FJ-W	-	-
☆ BR24H16FJ-W	-	-	☆ BR25H160FJ-W	-	-

☆ Under Development

HIGH RELIABILITY series part number designation



Au-Au Connection

Unlike normal wire bonding using aluminum (Al) pads and gold (Au) wires, ROHM EEPROMs are constructed using gold pads and gold wires, resulting in a stronger connection and, therefore, greater reliability.

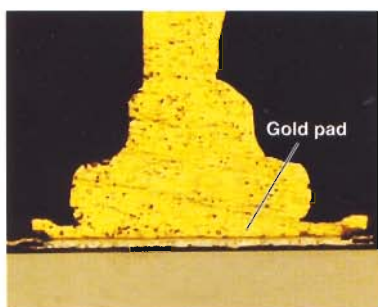
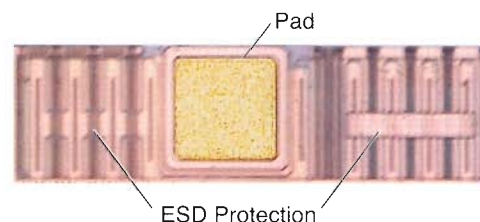


Photo of gold pad joint cross section

8kV ESD Resistance

Damage due to ESD accounts for the vast majority of LSI failures. Therefore, ROHM has developed the BR93H□□, BR24H□□, and BR25H□□□ series ICs with an ESD resistance of 8kV, ensuring higher reliability.



* I²C BUS is a registered trademark of Philips.

● The contents described herein are correct as of September, 2005 ● The contents described herein are subject to change for improvement or so without prior notice. In placing your order, consult us for confirmation. ● We believe that applied circuits and the like described in this document are precise and reliable for making the most of the product characteristics and performances. However, we shall not be responsible for any problem concerning circuits and industrial owners, arising from the use thereof.

Excellence in Electronics

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