

RICOH

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EK-016-8905

CMOS 2k bit SRAM

(256word×8bit)

RP5B02N/W

The RP5B02 is a 2k bit high speed CMOS static RAM organized 256 words by 8 bits and operates from a single 5V supply.

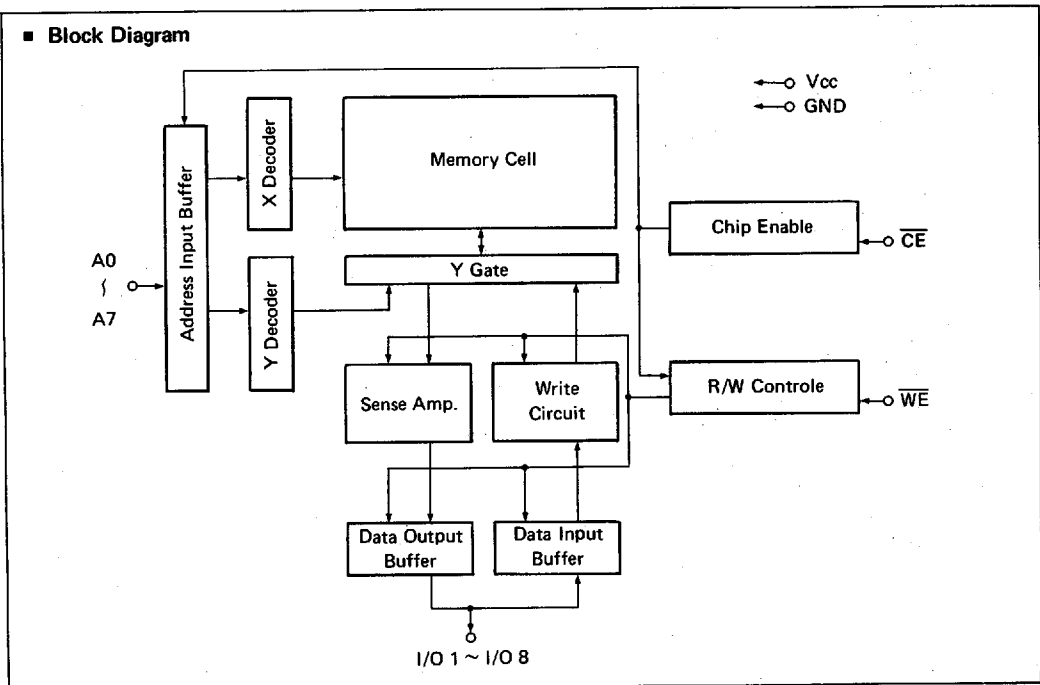
The RP5B02 has CMOS level inputs and outputs, and the outputs are 3-state output type.

The RP5B02 is suitable for use in high speed and low power applications in which battery back up is required.

■ **Features**

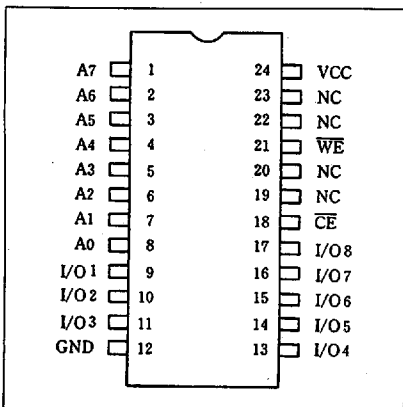
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|---------------------------------------|-----------------------------|---------------------------|--------------------|
| 1. Organization | : 2k bit 256 words × 8 bits | 6. Data retention voltage | : 2V (MIN.) |
| 2. Access time | : 200 ns (MAX.) | 7. Single 5V power supply | |
| 3. Input/Output | : CMOS level | 8. Package : | |
| 4. 3-state output | | RP5B02N ... | 24 pin 300 mil DIP |
| 5. Power consumption : data retention | : 0.6 μ W (TYP.) | RP5B02W ... | 24 pin 600 mil DIP |
| | standby : 2 μ W (TYP.) | | |
| | operation : 150 mW (TYP.) | | |

■ **Block Diagram**

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■ Pin Configuration (Top View)



■ Pin Description

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Pin No.	Pin Name	Function
1 ~ 8	A7 ~ A0	Address Input
9 ~ 11	I/O1 ~ I/O3	Data Input/Output
12	GND	GND
13 ~ 17	I/O4 ~ I/O8	Data Input/Output
18	CE	Chip Enable Input
19	NC	No Connection
20	NC	No Connection
21	WE	Write Enable Input
22	NC	No Connection
23	NC	No Connection
24	Vcc	Power Supply

■ Truth Table

CE	WE	Mode	Power Supply Current	I/O
H	X	Chip not selected	I _{ss}	Hi-Z
L	H	Read	I _{cc}	Dout
L	L	Write	I _{cc}	Din

L: Low Level, H: High Level, X: "L" or "H", Hi-Z: Output high impedance

■ Absolute Maximum Ratings

Symbol	Parameter	Condition	Limit	Unit
V _{cc}	Supply Voltage	with respect to GND	-0.3 to 7	V
V _i	Input Voltage		-0.3 to V _{cc} + 0.3	V
V _o	Output Voltage		-0.3 to V _{cc} + 0.3	V
P _d	Maximum Consumption Power	T _a = 25°C	500	mW
T _{opr}	Operating Temperature		0 to 70	°C
T _{stg}	Storage Temperature		-40 to 125	°C

■ Recommended Operating Conditions (T_a = 0 to 70°C)

Symbol	Parameter	Specified Value			Unit
		MIN.	TYP.	MAX.	
V _{cc}	Supply Voltage	4.5		5.5	V
V _{iH}	"H" Input Voltage	V _{cc} x 0.7		V _{cc} + 0.3	V
V _{iL}	"L" Input Voltage	-0.3		V _{cc} x 0.3	V

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■ Electrical Characteristics

- DC Electrical Characteristics ($T_a = 0$ to 70°C , $V_{cc} = 5V \pm 10\%$)

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Symbol	Parameter	Condition	Specified Value			Unit
			MIN.	TYP.	MAX.	
I _{SB}	Supply Current (standby)	CE = V _{cc}		0.4	20	μA
I _{CC}	Supply Current (operation)	I _{out} = 0 mA (MIN. Cycle)		30	60	mA
V _{OH}	"H" Output Voltage	I _{OH} = -1 μA	V _{cc} -0.05			V
V _{OL}	"L" Output Voltage	I _{OL} = 1 μA			0.05	V
I _{OH}	"H" Output Current	V _{OH} = V _{cc} - 0.4V	-0.6			mA
I _{OL}	"L" Output Current	V _{OL} = 0.4V	1.4			mA
V _{IH}	"H" Input Voltage		V _{cc} × 0.7		V _{cc} +0.3	V
V _{IL}	"L" Input Voltage		-0.3		V _{cc} ×0.3	V
I _{LI}	Input Leak Current	V _I = 0V to V _{cc}	-10		10	μA
I _{LO}	Output Leak Current	V _O = 0V to V _{cc} , Output = Hi-Z	-10		10	μA

- Capacitance ($T_a = 25^\circ\text{C}$)

Symbol	Parameter	Condition	Specified Value			Unit
			MIN.	TYP.	MAX.	
C _i	Input Capacitance	f = 1 MHz			8	pF
C _o	Output Capacitance	f = 1 MHz			12	pF

- AC Electrical Characteristics

Notes * Input pulse level: 0.5V, V_{cc}-0.5V * Input rise, fall time: 10 nsec

* Output load: 50 pF

* Timing measurement: Input 0.7V, V_{cc}-0.7V/Output 0.7V, V_{cc}-0.7V

- Read Mode ($T_a = 0$ to 70°C , $V_{cc} = 5V \pm 10\%$)

Symbol	Parameter	MIN.	MAX.	Unit
t _{RC}	Read cycle time	200		ns
t _{ACC}	Address access time		200	ns
t _{CE}	CE access time		200	ns
t _{OH}	Output hold time	0		ns
t _{CHZ}	CE-Output floating time	0	60	ns

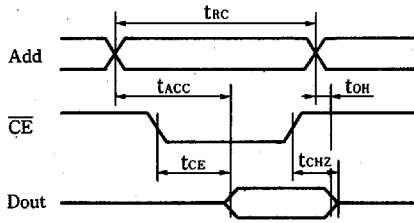
- Write Mode ($T_a = 0$ to 70°C , $V_{cc} = 5V \pm 10\%$)

Symbol	Parameter	MIN.	MAX.	Unit
t _{WC}	Write cycle time	200		ns
t _{WP}	Write pulse time	120		ns
t _{CW}	Chip select time	120		ns
t _{AS}	Address set up time	20		ns
t _{WR}	Write recovery time	10		ns
t _{DW}	Input data set time	60		ns
t _{DH}	Input data hold time	20		ns
t _{WZ}	WE-Output floating time	0	60	ns
t _{OW}	WE-Output enable time	10		ns
t _{LZ}	CE-Output enable time	10		ns

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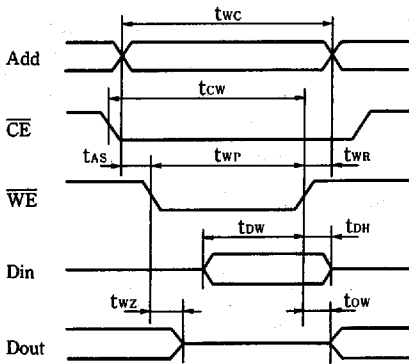
• Read Mode Timing Chart



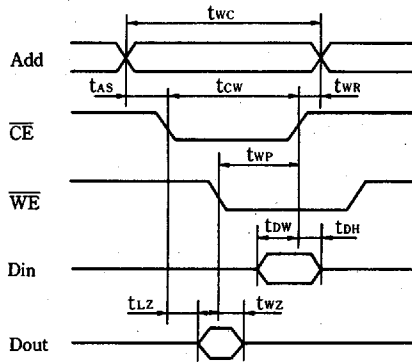
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• Write Mode Timing Chart

[WE Control]



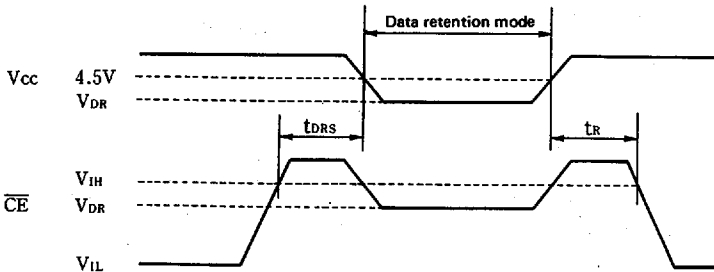
[CE Control]



• Data Retention Characteristics (Ta = 0 to 70°C)

Symbol	Parameter	Condition	Specified Value			Unit
			MIN.	TYP.	MAX.	
V_{DR}	Data retention voltage	$V_{IN} = 0V$ to V_{CC}	2.0		5.5	V
I_{DR}	Data retention current	$V_{CC} = 3.0V, CE = V_{CC}$		0.2	10	μA
t_{DRS}	Data retention set up time		0			ns
t_R	Recovery time		t_{RC}			ns

• Data Retention Timing Chart

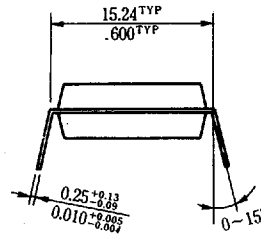
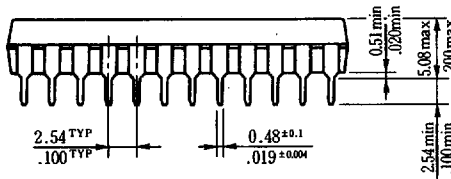
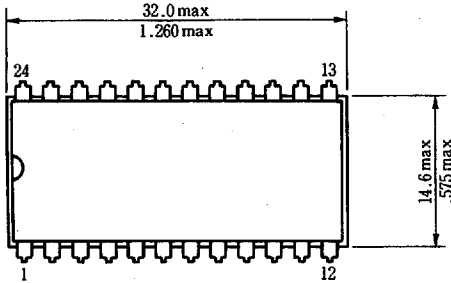


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■ Package Dimension (Unit = mm/inch)

● 24PIN 600mil DIP (RP5B02W)

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● 24PIN 300mil DIP (RP5B02N)

