
HM628512AI Series

524288-word \times 8-bit High Speed CMOS Static RAM

HITACHI

ADE-203-791 (Z)

Preliminary

Rev. 0.0

Jun. 20, 1997

Description

The Hitachi HM628512AI is a 4-Mbit static RAM organized 512-kword \times 8-bit. It realizes higher density, higher performance and low power consumption by employing 0.5 μ m Hi-CMOS process technology. The device, packaged in a 525-mil SOP (foot print pitch width) or 400-mil TSOP TYPE II or 600-mil plastic DIP, is available for high density mounting. L-version is suitable for battery backup system.

Features

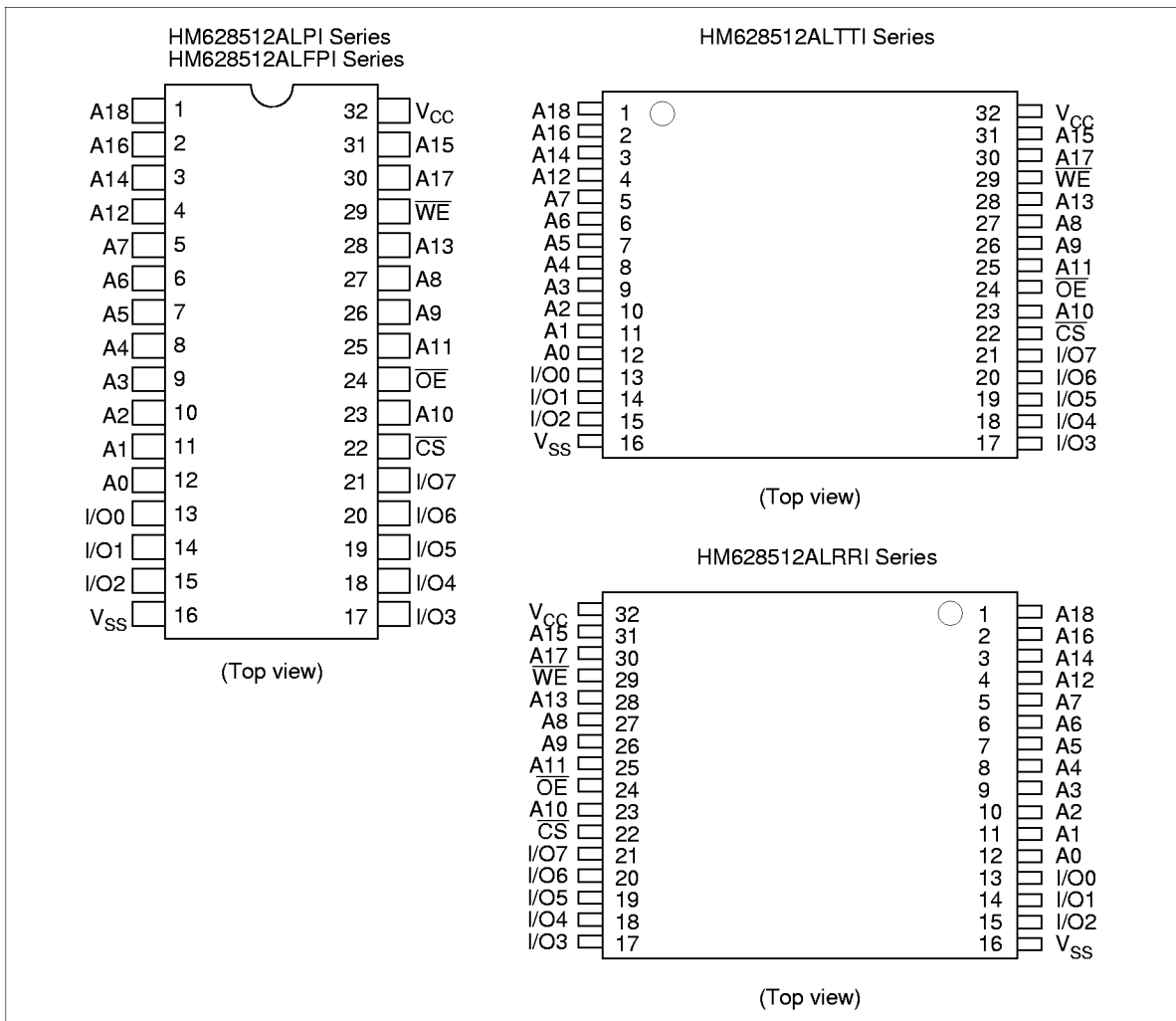
- Single 5 V supply: 5.0 V \pm 10%
- Access time: 70/85 ns (max)
- Power dissipation
 - Active: 50 mW/MHz (typ)
 - Standby: 10 μ W (typ)
- Completely static memory
 - No clock or timing strobe required
- Equal access and cycle times
- Common data input and output
 - Three state output
- Directly TTL compatible
 - All inputs and outputs
- Battery backup operation
- Operating temperature: -40 to 85°C

HM628512AI Series

Ordering Information

Type No.	Access time	Package
HM628512ALPI-7	70 ns	600-mil 32-pin plastic DIP (DP-32)
HM628512ALPI-8	85 ns	
HM628512ALFPI-7	70 ns	525-mil 32-pin plastic SOP (FP-32D)
HM628512ALFPI-8	85 ns	
HM628512ALTTI-7	70 ns	400-mil 32-pin plastic TSOP II (TTP-32D)
HM628512ALTTI-8	85 ns	
HM628512ALRRI-7	70 ns	400-mil 32-pin plastic TSOP II reverse (TTP-32DR)
HM628512ALRRI-8	85 ns	

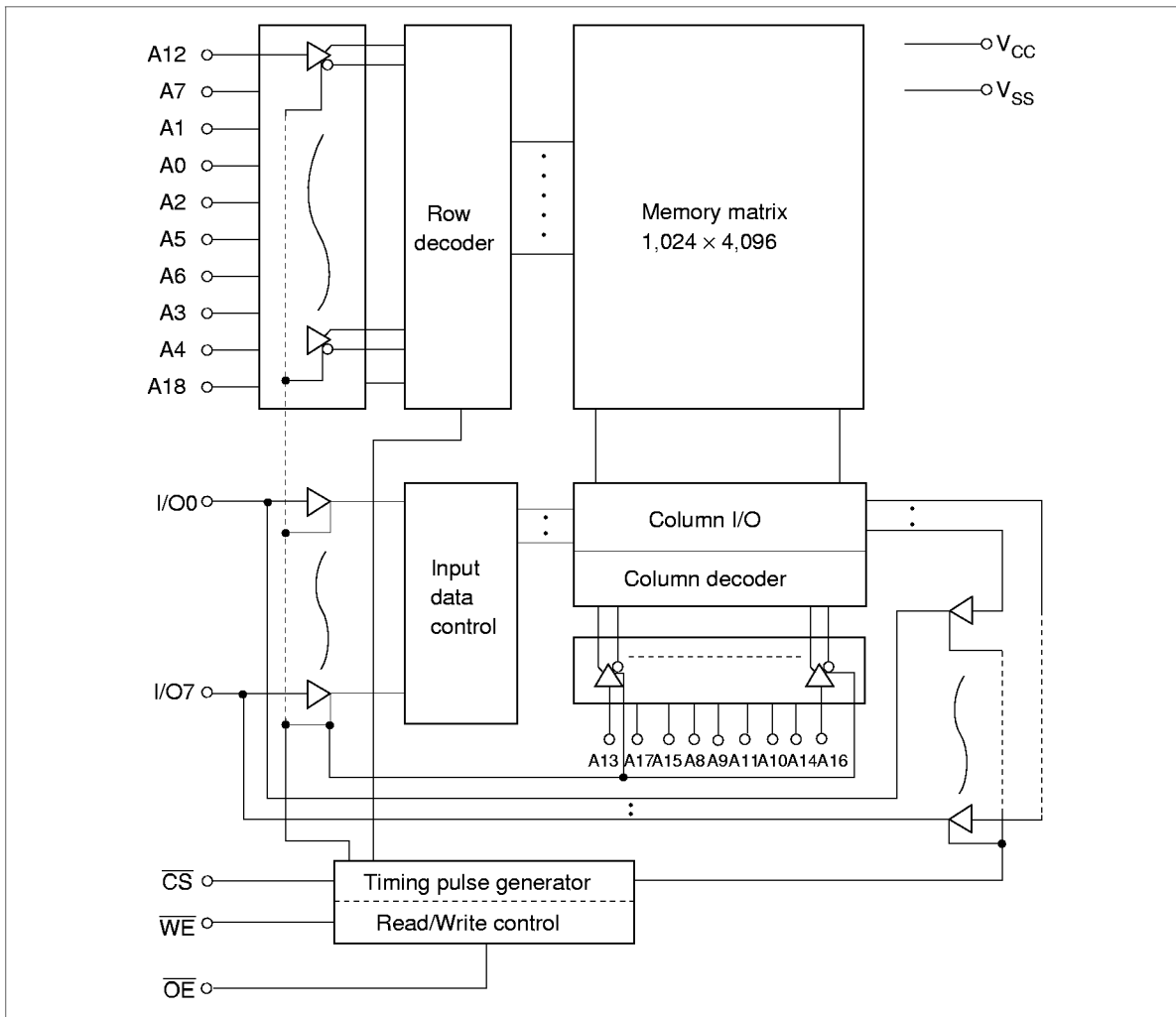
Pin Arrangement



Pin Description

Pin name	Function
A0 to A18	Address input
I/O0 to I/O7	Data input/output
\overline{CS}	Chip select
\overline{OE}	Output enable
\overline{WE}	Write enable
V_{CC}	Power supply
V_{SS}	Ground

Block Diagram



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Function Table

\overline{WE}	\overline{CS}	\overline{OE}	Mode	V_{CC} current	Dout pin	Ref. cycle
×	H	×	Not selected	I_{SB}, I_{SB1}	High-Z	—
H	L	H	Output disable	I_{CC}	High-Z	—
H	L	L	Read	I_{CC}	Dout	Read cycle
L	L	H	Write	I_{CC}	Din	Write cycle (1)
L	L	L	Write	I_{CC}	Din	Write cycle (2)

Note: ×: H or L

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Power supply voltage relative to V_{SS}	V_{CC}	-0.5 to +7.0	V
Terminal voltage on any pin relative to V_{SS}	V_T	-0.5* ¹ to $V_{CC} + 0.3$ * ²	V
Power dissipation	P_T	1.0	W
Operating temperature	T_{opr}	-40 to +85	°C
Storage temperature	T_{stg}	-55 to +125	°C
Storage temperature under bias	T_{bias}	-40 to +85	°C

Notes: 1. -3.0 V for pulse half-width ≤ 30 ns
 2. Maximum voltage is 7.0 V

Recommended DC Operating Conditions ($T_a = -40$ to +85°C)

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltage	V_{CC}	4.5	5.0	5.5	V
	V_{SS}	0	0	0	V
Input high voltage	V_{IH}	2.4	—	$V_{CC} + 0.3$	V
Input low voltage	V_{IL}	-0.3* ¹	—	0.6	V

Note: 1. -3.0 V for pulse half-width ≤ 30 ns

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DC Characteristics (Ta = -40 to +85°C, V_{CC} = 5 V ±10% , V_{SS} = 0 V)

Parameter	Symbol	Min	Typ* ¹	Max	Unit	Test conditions
Input leakage current	I _L	—	—	1	μA	V _{in} = V _{SS} to V _{CC}
Output leakage current	I _{LO}	—	—	1	μA	$\overline{CS} = V_{IH}$ or $\overline{OE} = V_{IH}$ or $\overline{WE} = V_{IL}$, V _{I/O} = V _{SS} to V _{CC}
Operating current	I _{CC}	—	8	15	mA	$\overline{CS} = V_{IL}$, others = V _{IH} /V _{IL} , I _{I/O} = 0 mA
Average operating current	I _{CC1}	—	45	70	mA	Min cycle, duty = 100% CS = V _{IL} , others = V _{IH} /V _{IL} I _{I/O} = 0 mA
	I _{CC2}	—	10	20	mA	Cycle time = 1 μs, duty = 100% I _{I/O} = 0 mA, $\overline{CS} \leq 0.2$ V V _{IH} ≥ V _{CC} - 0.2 V, V _{IL} ≤ 0.2 V
Standby current	I _{SB}	—	1	3	mA	$\overline{CS} = V_{IH}$
	I _{SB1}	—	2	100	μA	V _{in} ≥ 0 V, $\overline{CS} \geq V_{CC} - 0.2$ V
Output low voltage	V _{OL}	—	—	0.4	V	I _{OL} = 2.1 mA
Output high voltage	V _{OH}	2.4	—	—	V	I _{OH} = -1.0 mA

Notes: 1. Typical values are at V_{CC} = 5.0 V, Ta = +25°C and specified loading, and not guaranteed.

Capacitance (Ta = 25°C, f = 1 MHz)

Parameter	Symbol	Typ	Max	Unit	Test conditions
Input capacitance* ¹	C _{in}	—	8	pF	V _{in} = 0 V
Input/output capacitance* ¹	C _{I/O}	—	10	pF	V _{I/O} = 0 V

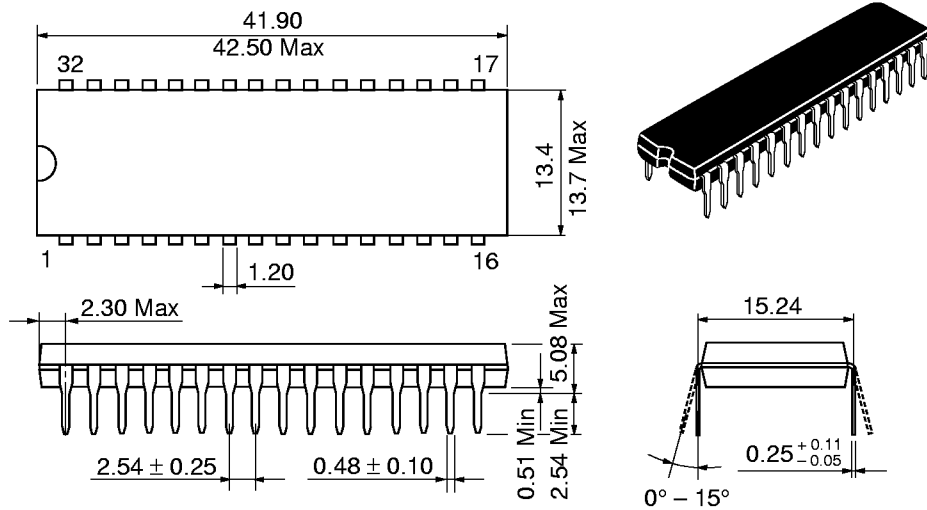
Note: 1. This parameter is sampled and not 100% tested.

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Package Dimensions

HM628512ALPI Series (DP-32)

Unit: mm

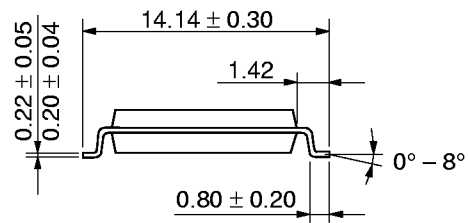
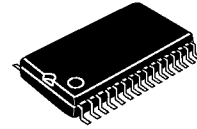
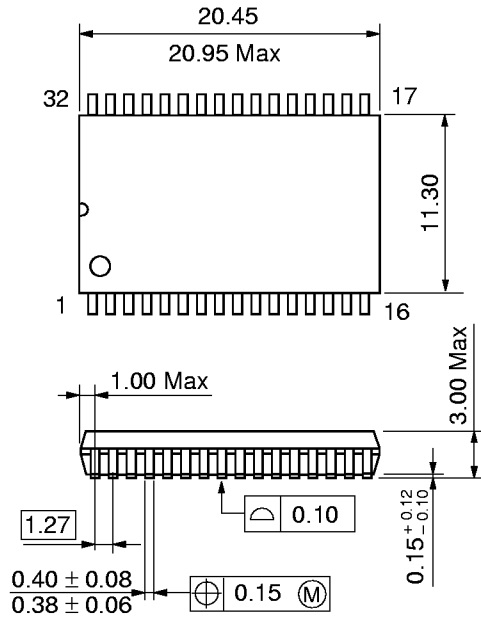


Hitachi Code	DP-32
JEDEC Code	—
EIAJ Code	SC-613
Weight (reference value)	5.1 g

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HM628512ALFPI Series (FP-32D)

Unit: mm



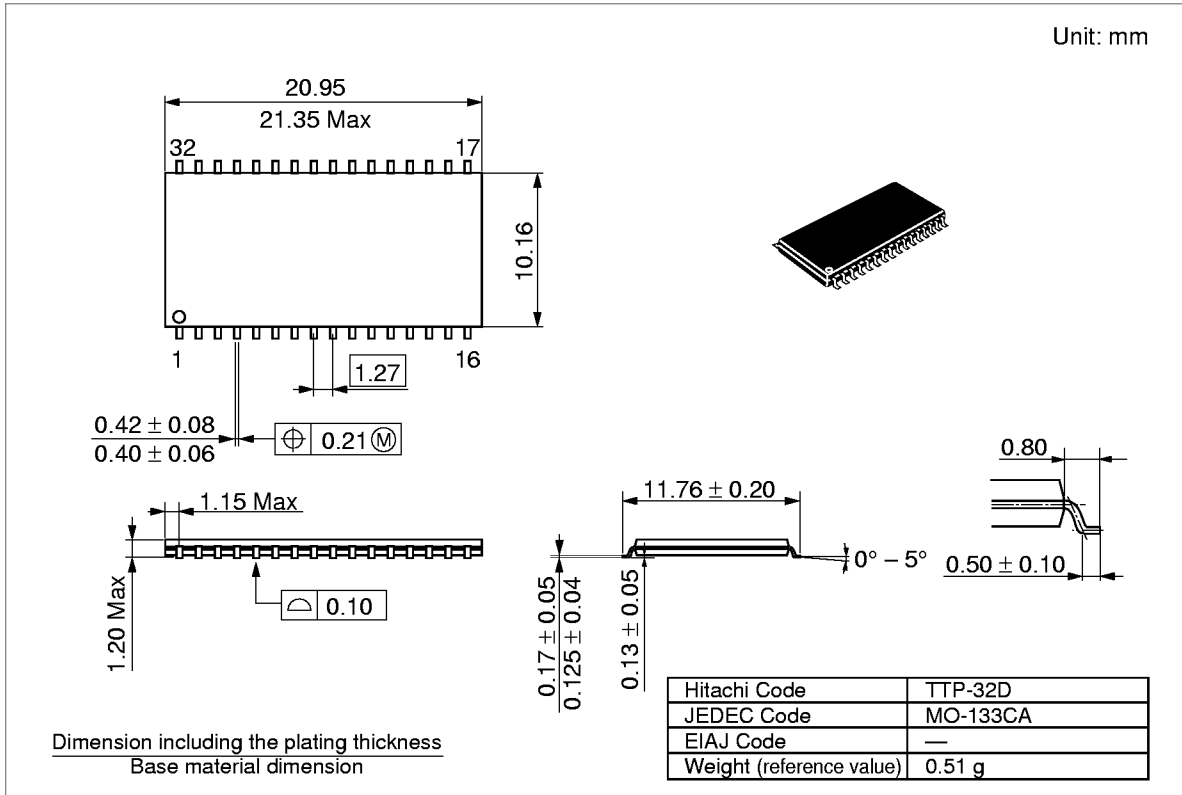
Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-32D
JEDEC Code	MO-099AB
EIAJ Code	—
Weight (reference value)	1.3 g

HM628512AI Series

HM628512ALTTI Series (TTP-32D)

Unit: mm



HM628512AI Series

HM628512ALRRI Series (TTP-32DR)

Unit: mm

