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# HN62334B Series

524288-word  $\times$  8-bit CMOS Mask Programmable ROM

# HITACHI

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## Description

The HN62334B is a 4-Mbit CMOS mask-programmable ROM organized as 524288 words by 8 bits. Realizing low power consumption, this memory is allowed for battery operation.

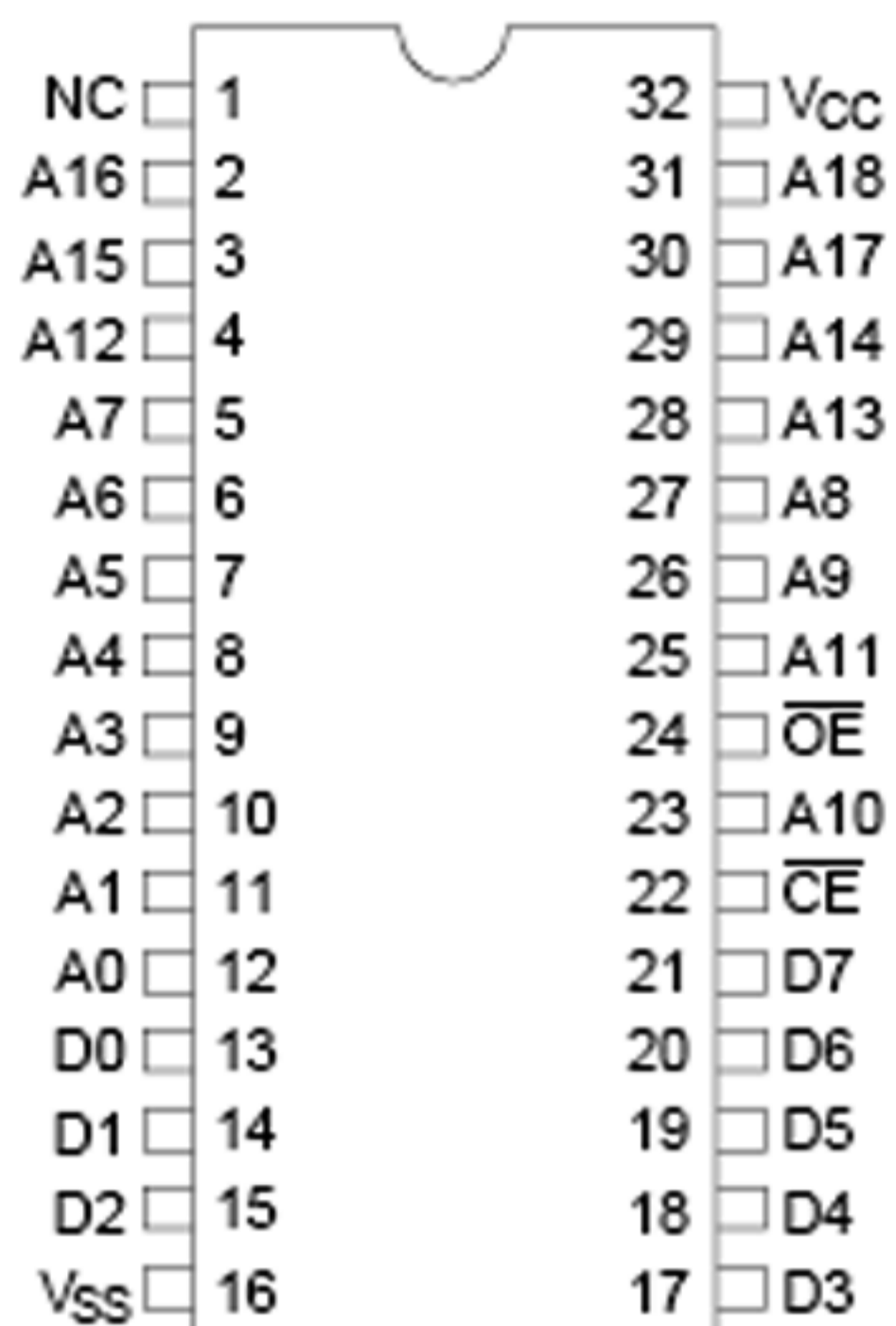
## Features

- Single +5V power supply
- Wired OR is permitted for the output in three states.
- TTL compatible
- Maximum access time: 150 ns (max)
- Low power consumption:       100 mW (typ) active  
  5  $\mu$ W (typ) standby
- Byte-wide data organization
- Pin compatible with JEDEC (EP-ROM)

## Ordering Information

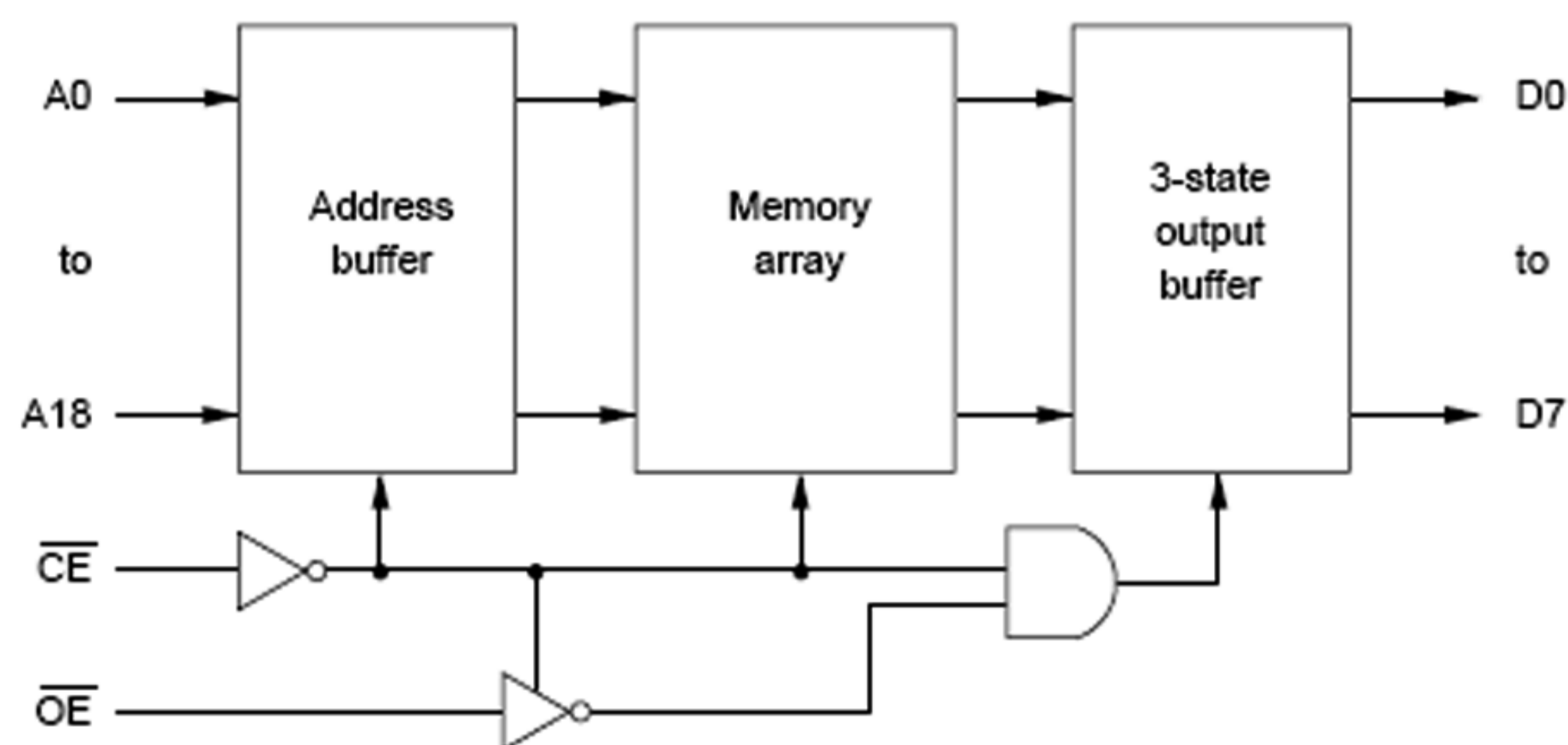
Type No.	Access Time	Package
HN62334BP-15	150 ns	600 mil 32-pin plastic DIP (DP-32)
HN62334BF-15	150 ns	32-pin plastic SOP (FP-32D)
HN62334BTT-15	150 ns	32-pin plastic TSOP-II (TTP-32DB)

## Pin Arrangement



(Top view)

## Block Diagram



## Absolute Maximum Ratings

Parameter	Symbol	Value	Unit	Note
Supply voltage	$V_{CC}$	-0.3 to +7.0	V	1
All input and output voltage	$V_T$	-0.3 to $V_{CC} + 0.3$	V	1
Operating temperature range	$T_{opr}$	0 to +70	°C	
Storage temperature range	$T_{stg}$	-55 to +125	°C	
Temperature under bias	$T_{bias}$	-20 to +85	°C	

Note: 1. With respect to  $V_{SS}$ .

Recommended Operating Conditions ( $V_{SS} = 0$  V,  $T_a = 0$  to +70°C)

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltage	$V_{CC}$	4.5	5.0	5.5	V
Input voltage	$V_{IH}$	2.2	—	$V_{CC} + 0.3$	V
	$V_{IL}$	-0.3	—	0.8	V

DC Characteristics ( $V_{CC} = 5$  V  $\pm$  10%,  $V_{SS} = 0$  V,  $T_a = 0$  to +70°C)

Parameter		Symbol	Min	Max	Unit	Test Conditions
Supply current	Active	$I_{CC}$	—	50	mA	$V_{CC} = 5.5$ V, $I_{DOUT} = 0$ mA, $t_{RC} = \min$
	Standby	$I_{SB}$	—	30	$\mu$ A	$V_{CC} = 5.5$ V, $\overline{CE} \geq V_{CC} - 0.2$ V
Input leakage current		$ I_{IL} $	—	10	$\mu$ A	$V_{in} = 0$ to $V_{CC}$
Output leakage current		$ I_{OL} $	—	10	$\mu$ A	$\overline{CE} = 2.4$ V, $V_{OUT} = 0$ to $V_{CC}$
Output voltage		$V_{OH}$	2.4	—	V	$I_{OH} = -205$ $\mu$ A
		$V_{OL}$	—	0.4	V	$I_{OL} = 1.6$ mA

Capacitance ( $V_{CC} = 5$  V  $\pm$  10%,  $V_{SS} = 0$  V,  $T_a = 25$ °C,  $V_{DN} = 0$  V,  $f = 1$  MHz)

Parameter	Symbol	Min	Max	Unit
Input capacitance	$C_{in}$	—	15	pF
Output capacitance	$C_{out}$	—	15	pF

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

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### AC Characteristics ( $V_{CC} = 5\text{ V} \pm 10\%$ , $V_{SS} = 0\text{ V}$ , $T_a = 0\text{ to }+70^\circ\text{C}$ )

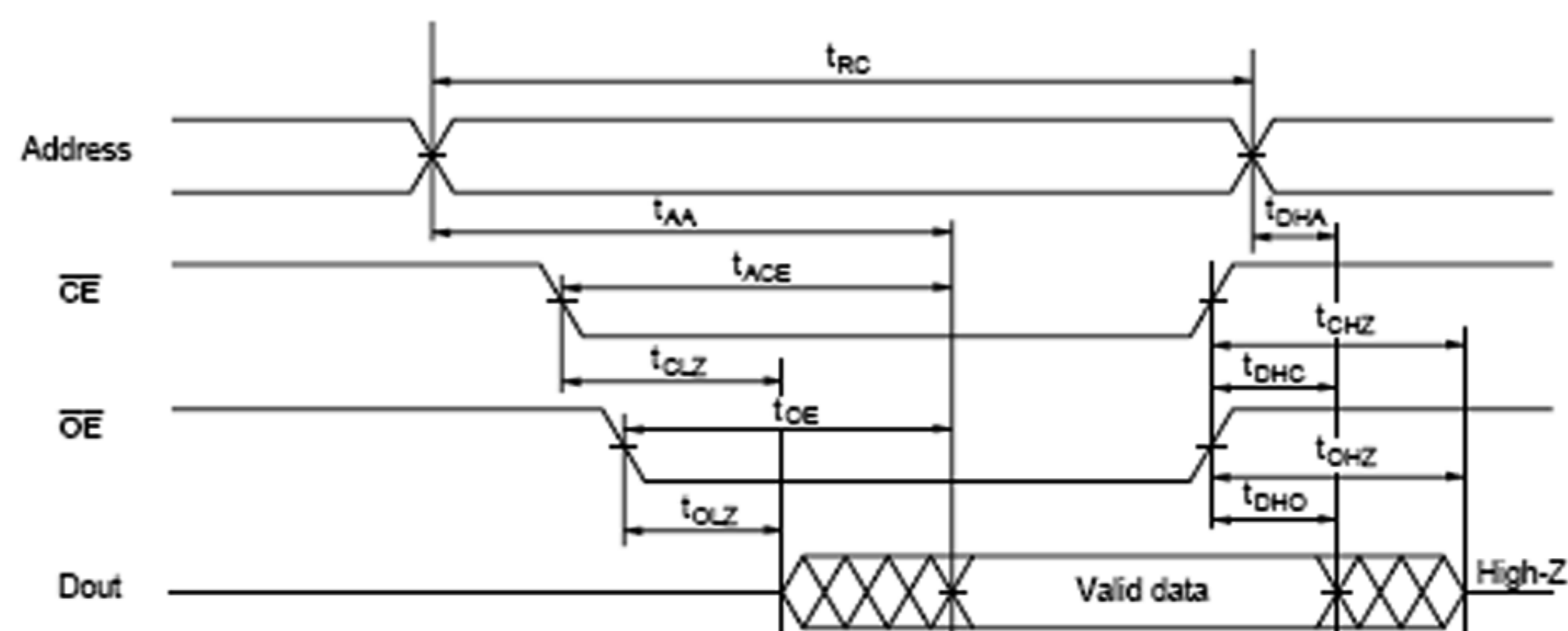
- Output load: 1TTL gate +  $C_L = 100\text{ pF}$   
(including jig capacitance)
- Input pulse level: 0.8 to 2.4 V
- Input and output timing reference levels: 1.5 V
- Input rise and fall time: 10 ns

Parameter	Symbol	HN62334B		Unit
		Min	Max	
Read cycle time	$t_{RC}$	150	—	ns
Address access time	$t_{AA}$	—	150	ns
$\overline{CE}$ access time	$t_{ACE}$	—	150	ns
$\overline{OE}$ access time	$t_{OE}$	—	70	ns
Output hold time from address change	$t_{DHA}$	0	—	ns
Output hold time from $\overline{CE}$	$t_{DHC}$	0	—	ns
Output hold time from $\overline{OE}$	$t_{DHO}$	0	—	ns
$\overline{CE}$ to output in high-Z	$t_{CHZ}^{**}$	—	70	ns
$\overline{OE}$ to output in high-Z	$t_{OHZ}^{**}$	—	70	ns
$\overline{CE}$ to output in low-Z	$t_{CLZ}$	10	—	ns
$\overline{OE}$ to output in low-Z	$t_{OLZ}$	10	—	ns

Note: 1.  $t_{CHZ}$  and  $t_{OHZ}$  are defined as the time at which the output achieves the open circuit conditions and are not referred to output voltage levels.

## Timing Waveforms

## Normal Mode



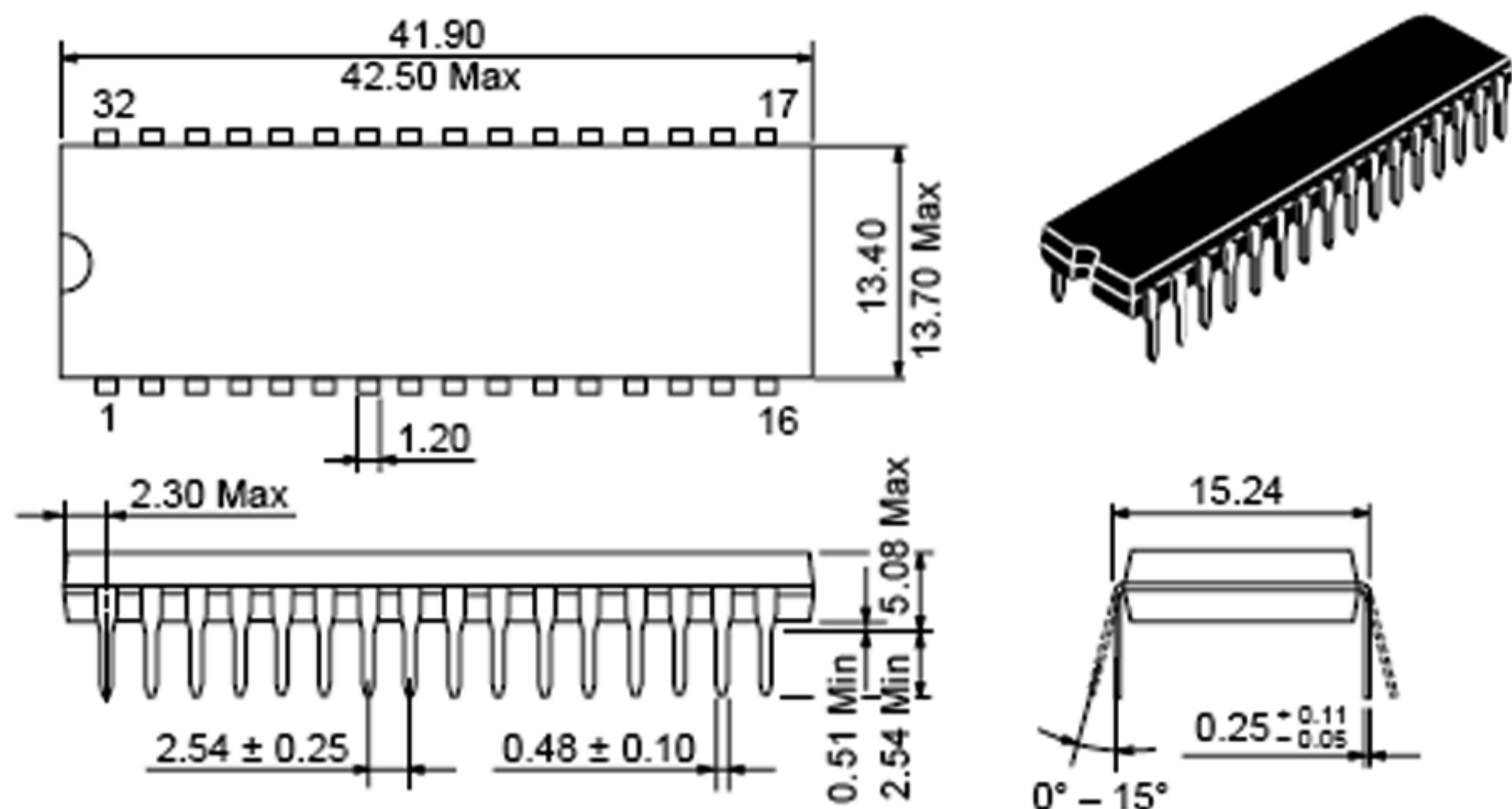
- Notes: 1.  $t_{OHA}$ ,  $t_{OHC}$ ,  $t_{DHO}$ : Determined by faster.  
 2.  $t_{AA}$ ,  $t_{ACE}$ ,  $t_{OE}$ : Determined by slower.  
 3.  $t_{OLZ}$ ,  $t_{OLZ}$ : Determined by slower.

# HN62334B Series

## Package Dimensions

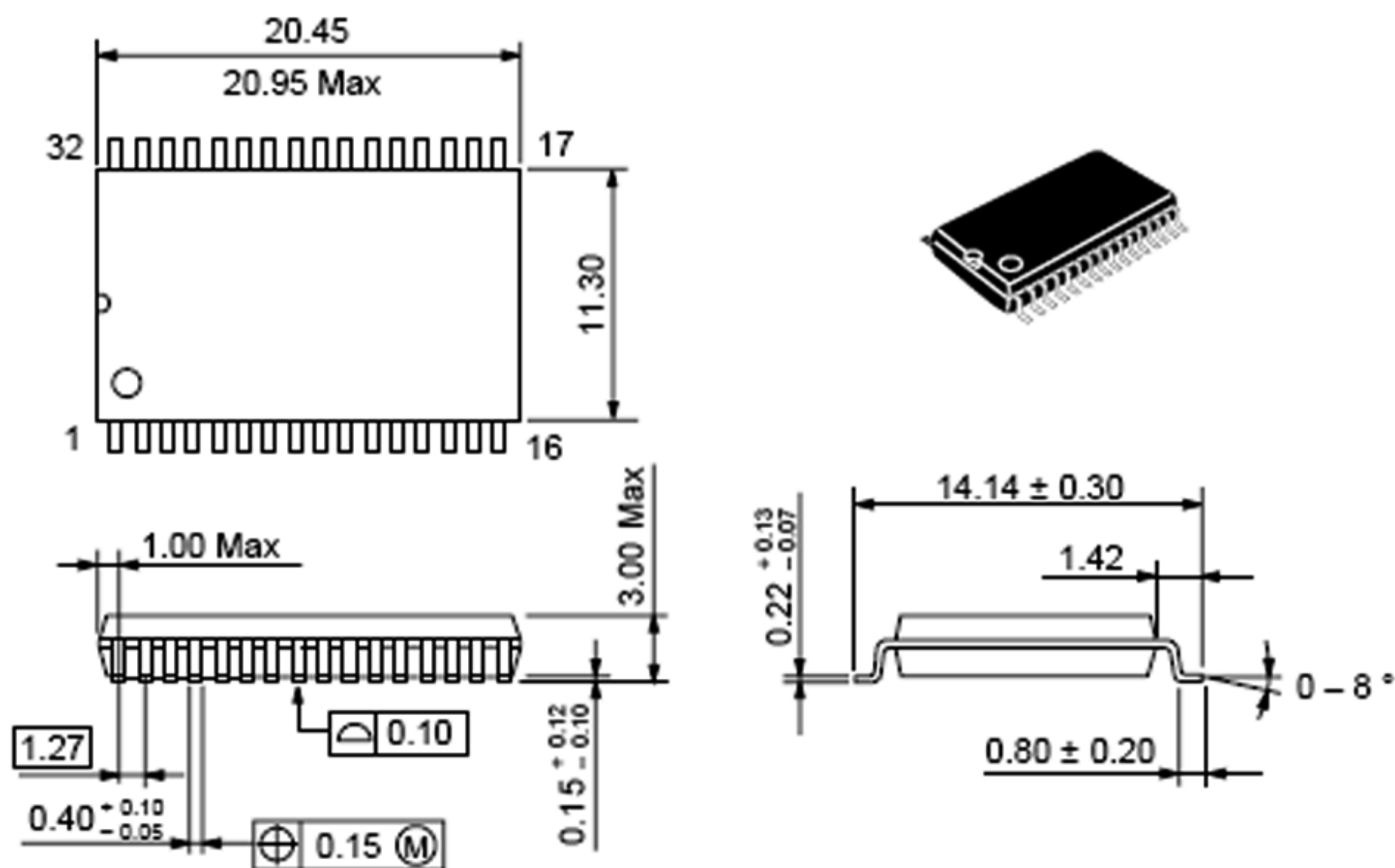
HM62334BP Series (DP-32)

Unit: mm



HM62334BF Series (FP-32D)

Unit: mm



HM62334BTT Series (TTP-32DB)

Unit: mm

