

# LH532000B

CMOS 2M (256K × 8/128K × 16) MROM

## FEATURES

- 262,144 words × 8 bit organization (Byte mode)  
131,072 words × 16 bit organization (Word mode)
- $\overline{\text{BYTE}}$  input pin selects bit configuration
- Access times: 120/150 ns (MAX.)
- Low-power consumption:  
Operating: 275 mW (MAX.)  
Standby: 550  $\mu\text{W}$  (MAX.)
- Programmable  $\text{OE}/\overline{\text{OE}}$  and  $\text{OE}_1/\overline{\text{OE}}_1/\text{DC}$
- Static operation
- TTL compatible I/O
- Three-state outputs
- Single +5 V power supply
- Packages:
  - 40-pin, 600-mil DIP
  - 40-pin, 525-mil SOP
  - 48-pin,  $12 \times 18 \text{ mm}^2$  TSOP (Type I)
- ×16 word-wide pinout

## DESCRIPTION

The LH532000B is a 2M-bit mask-programmable ROM with two programmable memory organizations, byte and word modes. It is fabricated using silicon-gate CMOS process technology.

## PIN CONNECTIONS

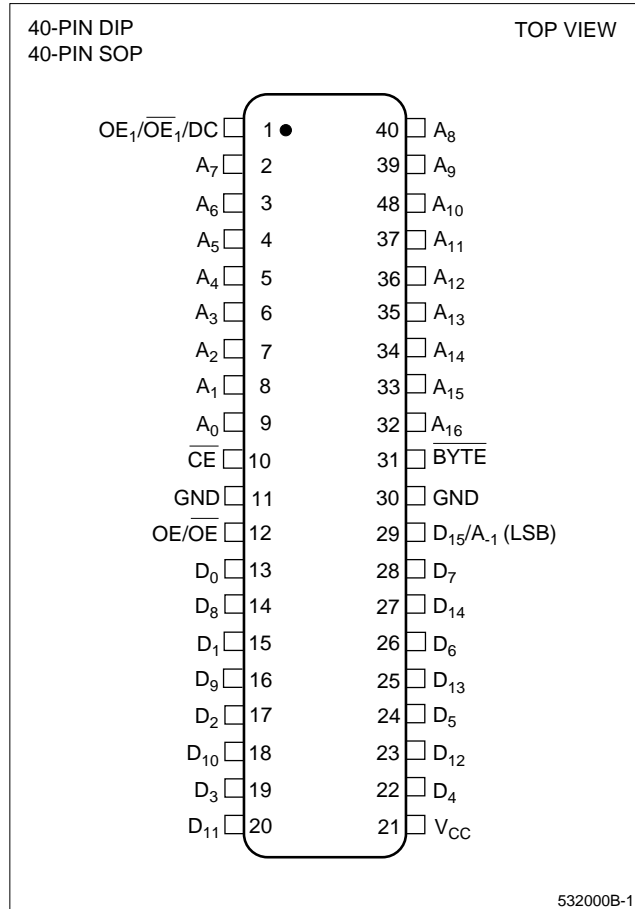


Figure 1. Pin Connections for DIP and SOP Packages

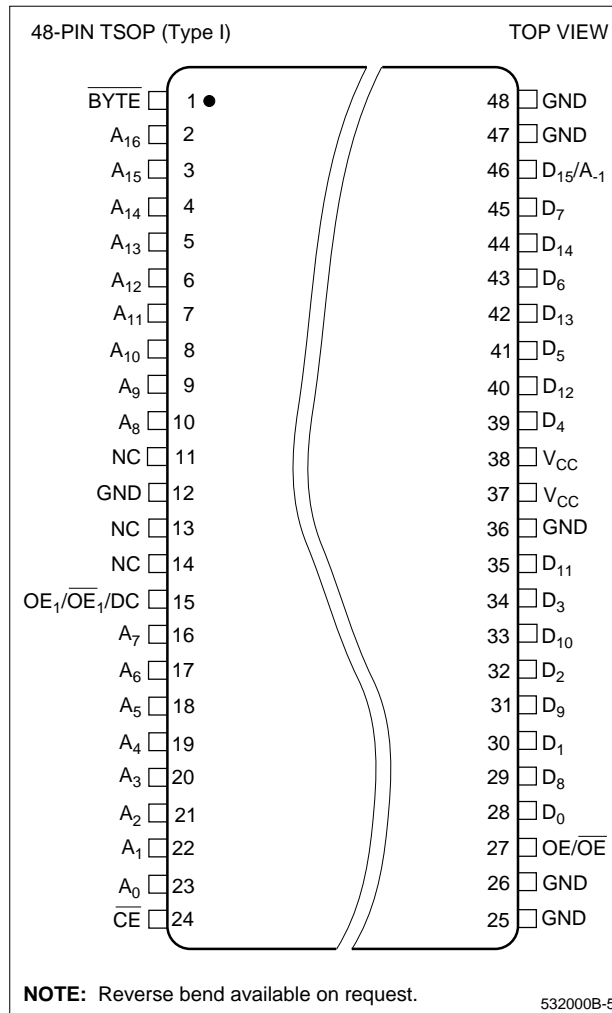


Figure 2. Pin Connections for TSOP Package

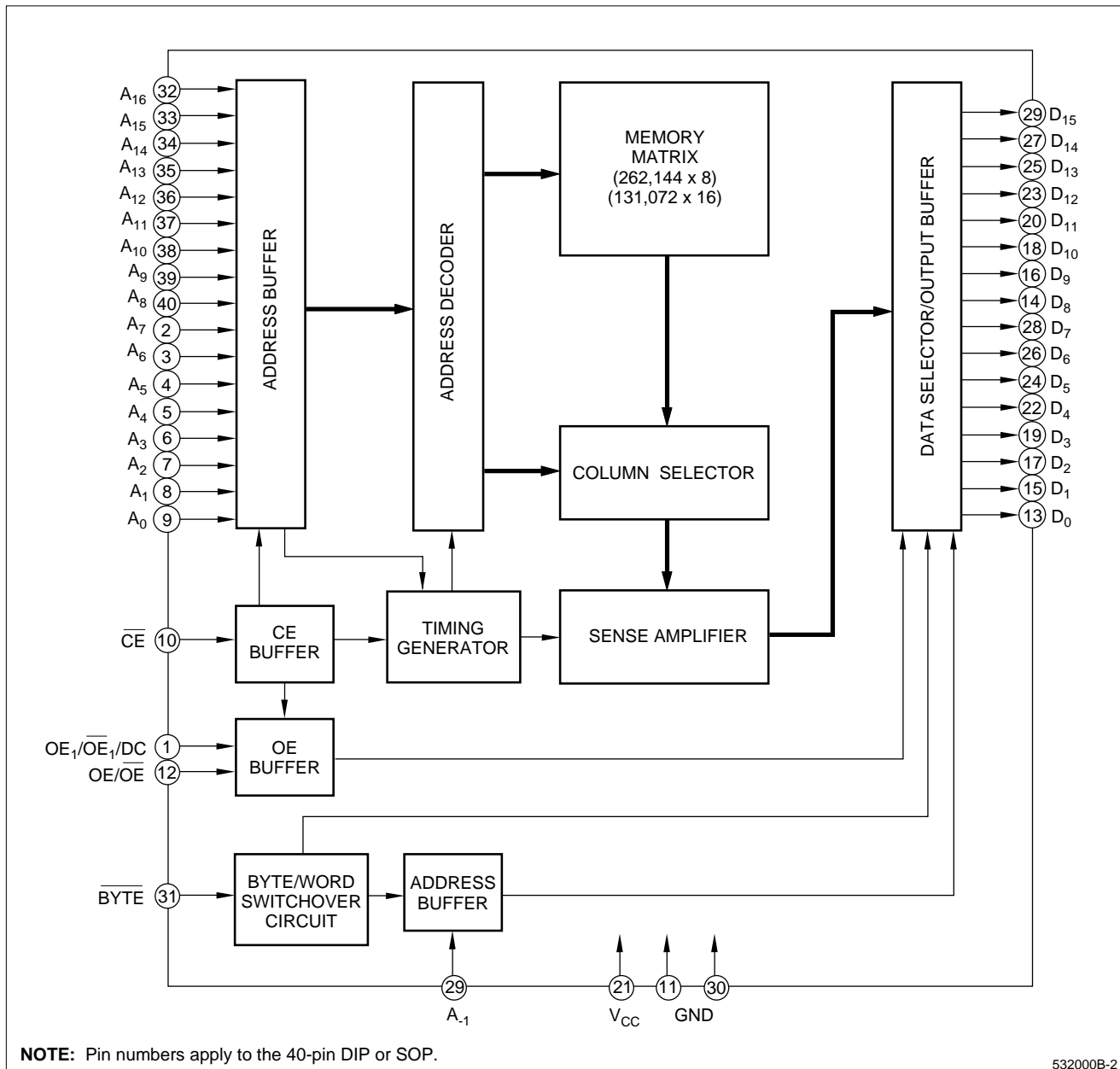


Figure 3. LH532000B Block Diagram

**PIN DESCRIPTION**

SIGNAL	PIN NAME	NOTE
A <sub>-1</sub>	Address input (BYTE mode)	1
A <sub>0</sub> – A <sub>16</sub>	Address input	
D <sub>0</sub> – D <sub>15</sub>	Data output	1
$\overline{CE}$	Chip enable input	
OE/OE	Output enable input	2

SIGNAL	PIN NAME	NOTE
OE <sub>1</sub> /OE <sub>1</sub> /DC	Output enable input or Don't care	2
BYTE	Byte/word mode switch	
V <sub>CC</sub>	Power supply (+5 V)	
GND	Ground	

**NOTES:**

1. D<sub>15</sub>/A<sub>-1</sub> pin becomes LSB address input (A<sub>-1</sub>) when the bit configuration is set in byte mode, and data output (D<sub>15</sub>) when in word mode. BYTE input pin selects bit configuration.
2. The active levels of OE/OE and OE<sub>1</sub>/OE<sub>1</sub>/DC are mask-programmable. Selecting DC allows the outputs to be active for both high and low levels applied to this pin. It is recommended to apply either a HIGH or a LOW to the DC pin.

## TRUTH TABLE

$\overline{CE}$	OE/ $\overline{OE}$	OE <sub>1</sub> / $\overline{OE}$ <sub>1</sub>	$\overline{BYTE}$	A <sub>-1</sub> (D <sub>15</sub> )	DATA OUTPUT		ADDRESS INPUT		SUPPLY CURRENT
					D <sub>0</sub> – D <sub>7</sub>	D <sub>8</sub> – D <sub>15</sub>	LSB	MSB	
H	X	X	X	X	High-Z	High-Z	–	–	Standby (I <sub>SB</sub> )
L	L/H	X	X	X	High-Z	High-Z	–	–	Operating (I <sub>CC</sub> )
L	X	L/H	X	X	High-Z	High-Z	–	–	Operating (I <sub>CC</sub> )
L	H/L	H/L	H	Input inhibit	D <sub>0</sub> – D <sub>7</sub>	D <sub>8</sub> – D <sub>15</sub>	A <sub>0</sub>	A <sub>16</sub>	Operating (I <sub>CC</sub> )
L	H/L	H/L	L	L	D <sub>0</sub> – D <sub>7</sub>	High-Z	A <sub>-1</sub>	A <sub>16</sub>	Operating (I <sub>CC</sub> )
L	H/L	H/L	L	H	D <sub>8</sub> – D <sub>15</sub>	High-Z	A <sub>-1</sub>	A <sub>16</sub>	Operating (I <sub>CC</sub> )

## NOTE:

1. X = H or L, High-Z = High-impedance.

## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATING	UNIT
Supply voltage	V <sub>CC</sub>	–0.3 to +7.0	V
Input voltage	V <sub>IN</sub>	–0.3 to V <sub>CC</sub> + 0.3	V
Output voltage	V <sub>OUT</sub>	–0.3 to V <sub>CC</sub> + 0.3	V
Operating temperature	T <sub>opr</sub>	0 to +70	°C
Storage temperature	T <sub>stg</sub>	–65 to +150	°C

RECOMMENDED OPERATING CONDITIONS (T<sub>A</sub> = 0 to +70°C)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply voltage	V <sub>CC</sub>	4.5	5.0	5.5	V

DC CHARACTERISTICS (V<sub>CC</sub> = 5 V ±10%, T<sub>A</sub> = 0 to +70°C)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	NOTE
Input 'Low' voltage	V <sub>IL</sub>		–0.3		0.8	V	
Input 'High' voltage	V <sub>IH</sub>		2.2		V <sub>CC</sub> + 0.3	V	
Output 'Low' voltage	V <sub>OL</sub>	I <sub>OL</sub> = 2.0 mA			0.4	V	
Output 'High' voltage	V <sub>OH</sub>	I <sub>OH</sub> = –400 μA	2.4			V	
Input leakage current	I <sub>LI</sub>	V <sub>IN</sub> = 0 V to V <sub>CC</sub>			10	μA	
Output leakage current	I <sub>LO</sub>	V <sub>OUT</sub> = 0 V to V <sub>CC</sub>			10	μA	1
Operating current	I <sub>CC1</sub>	t <sub>RC</sub> = t <sub>RC</sub> (MIN.)			50	mA	2
	I <sub>CC2</sub>	t <sub>RC</sub> = 1 μs			45		
	I <sub>CC3</sub>	t <sub>RC</sub> = t <sub>RC</sub> (MIN.)			45	mA	3
	I <sub>CC4</sub>	t <sub>RC</sub> = 1 μs			40		
Standby current	I <sub>SB1</sub>	CE = V <sub>IH</sub>			3	mA	
	I <sub>SB2</sub>	CE = V <sub>CC</sub> - 0.2 V			100		
Input capacitance	C <sub>IN</sub>	f = 1 MHz			10	pF	
Output capacitance	C <sub>OUT</sub>	T <sub>A</sub> = 25°C			10		

## NOTES:

- OE/ $\overline{OE}$ <sub>1</sub> = V<sub>IL</sub>, CE/ $\overline{OE}$ / $\overline{OE}$ <sub>1</sub> = V<sub>IH</sub>
- V<sub>IN</sub> = V<sub>IH</sub> or V<sub>IL</sub>, CE = V<sub>IL</sub>, outputs open
- V<sub>IN</sub> = (V<sub>CC</sub> - 0.2 V) or 0.2 V, CE = 0.2 V, outputs open

**AC CHARACTERISTICS ( $V_{CC} = 5\text{ V} \pm 10\%$ ,  $T_A = 0\text{ to }+70^\circ\text{C}$ )**

PARAMETER	SYMBOL	120 ns		150 ns		UNIT	NOTE
		MIN.	MAX.	MIN.	MAX.		
Read cycle time	$t_{RC}$	120		150		ns	
Address access time	$t_{AA}$		120		150	ns	
Chip enable access time	$t_{ACE}$		120		150	ns	
Output enable delay time	$t_{OE}$		55		70	ns	
Output hold time	$t_{OH}$	5		10		ns	
CE to output in High-Z	$t_{CHZ}$		55		70	ns	1
OE to output in High-Z	$t_{OHZ}$		55		70	ns	

**NOTE:**

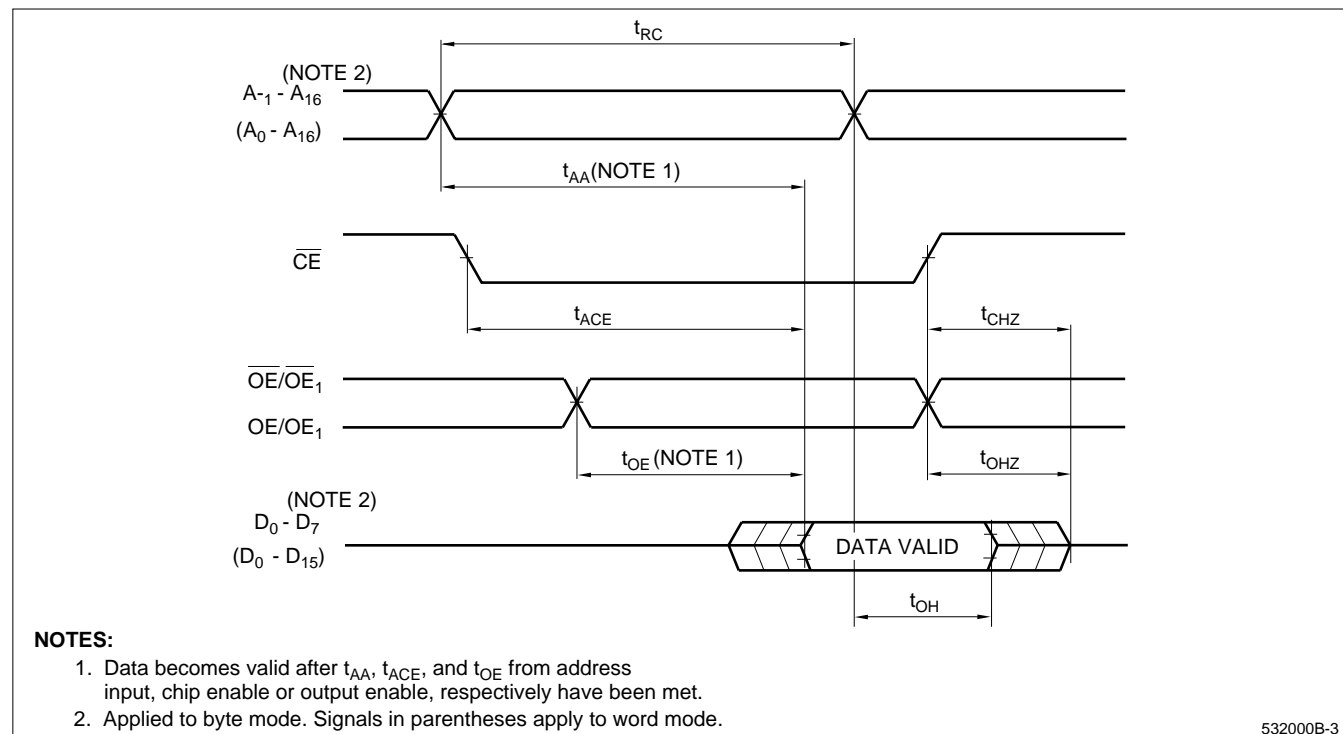
1. This is the time required for the output to become high-impedance.

**AC TEST CONDITIONS**

PARAMETER	RATING
Input voltage amplitude	0.6 V to 2.4 V
Input rise/fall time	10 ns
Input reference level	1.5 V
Output reference level	0.8 V and 2.2 V
Output load condition	1TTL +100 pF

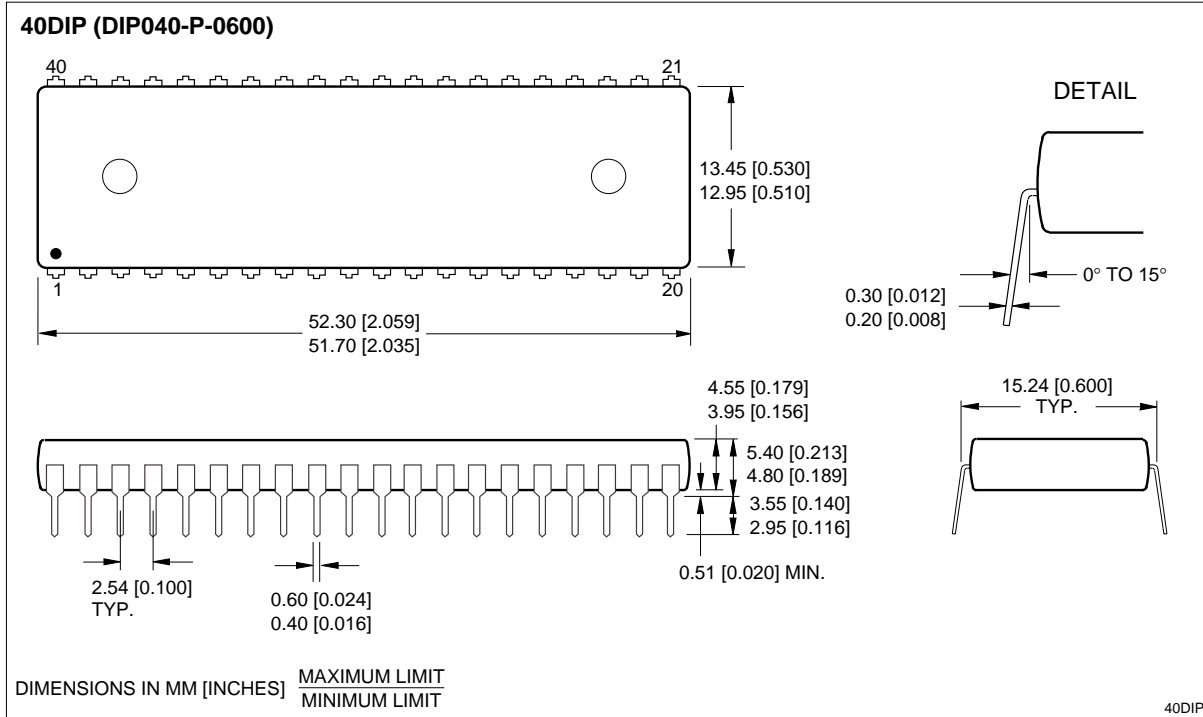
**CAUTION**

To stabilize the power supply, it is recommended that a high-frequency bypass capacitor be connected between the  $V_{CC}$  pin and the GND pin.

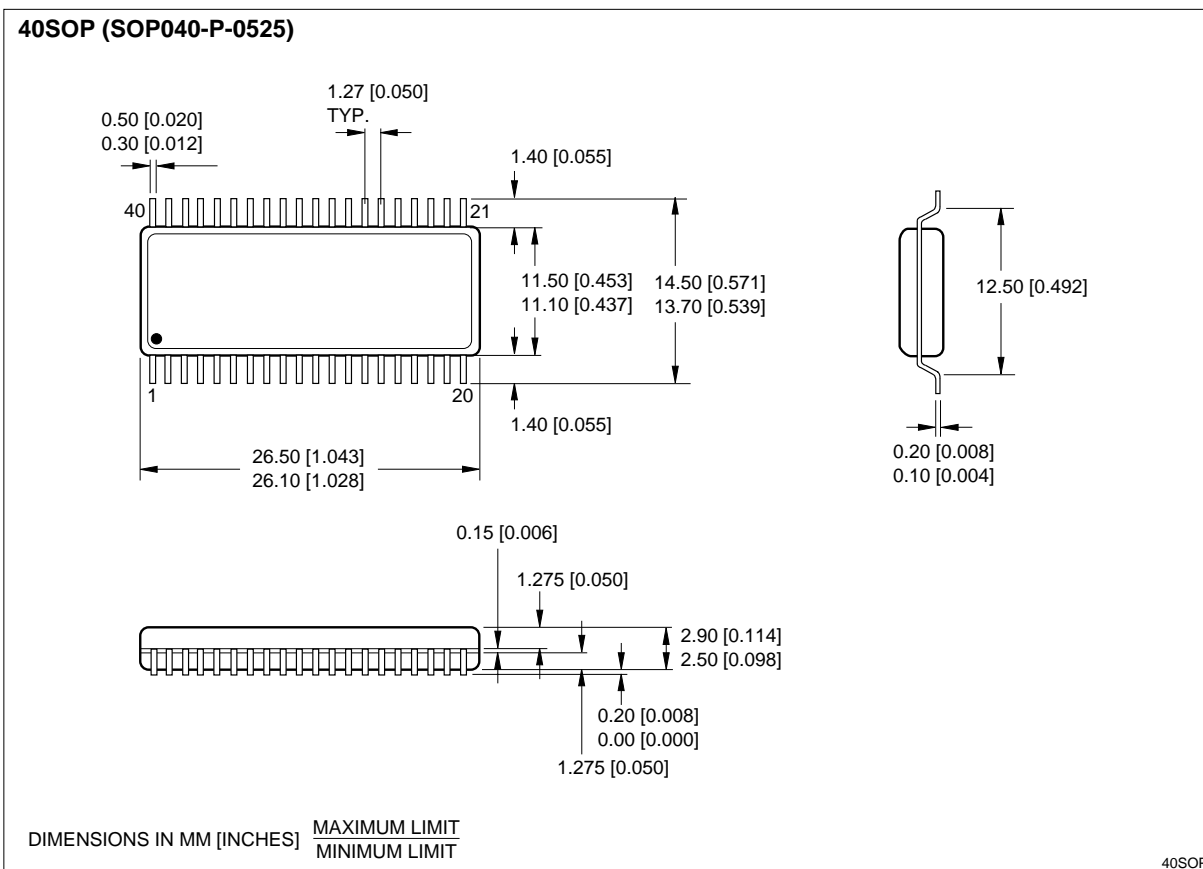


**Figure 4. Timing Diagram**

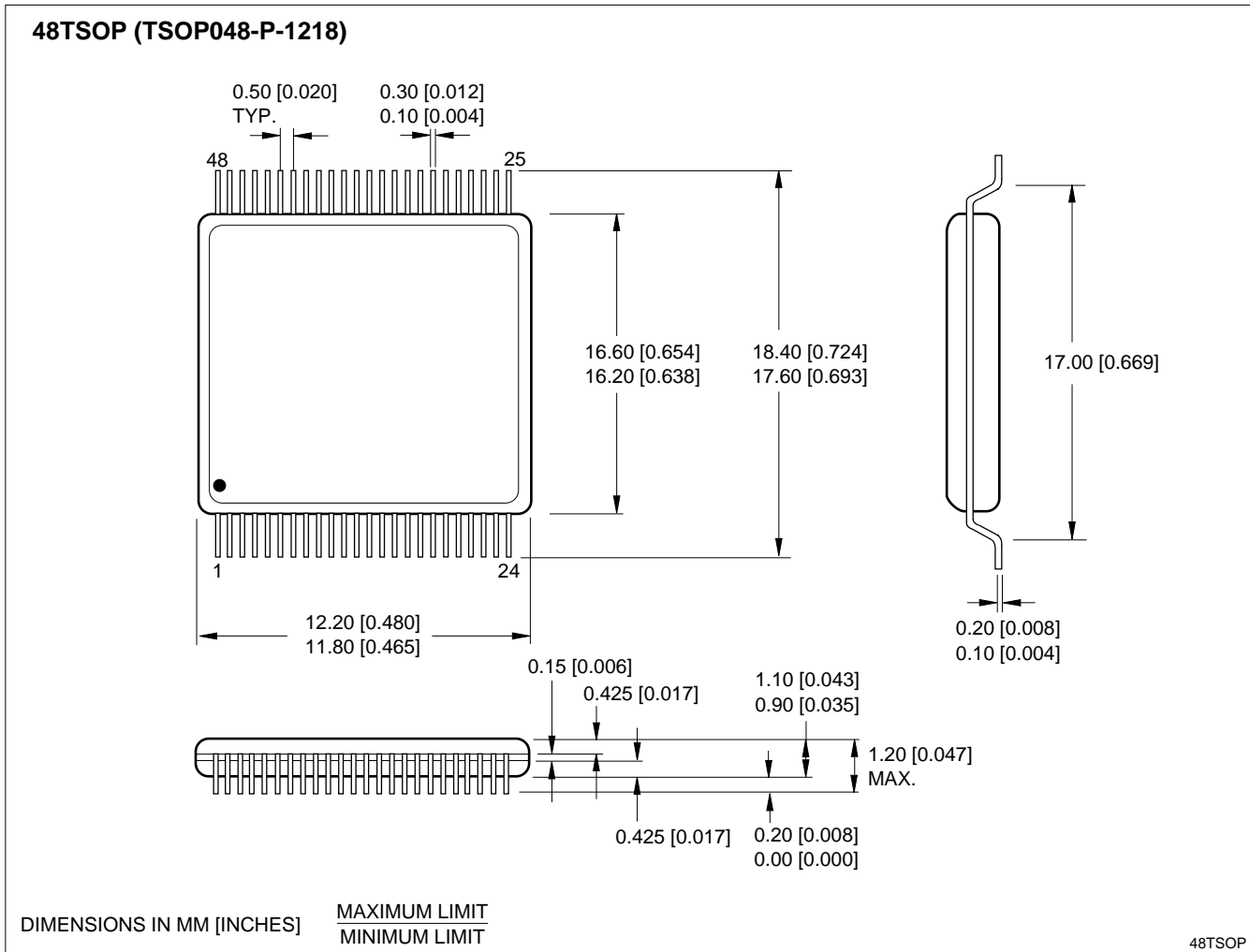
PACKAGE DIAGRAMS



40-pin, 600-mil DIP



40-pin, 525-mil SOP



**48-pin, 12 × 18 mm<sup>2</sup> TSOP (Type I)**

**ORDERING INFORMATION**

