

LH532000B-1

CMOS 2M (256K × 8/128K × 16) MROM

FEATURES

- 262,144 words × 8 bit organization (Byte mode)
131,072 words × 16 bit organization (Word mode)
- Access time: 120 ns (MAX.)
- Power consumption:
Operating: 275 mW (MAX.)
Standby: 550 μW (MAX.)
- Mask-programmable control pin (for 40-pin DIP/40-pin SOP):
Pin 1 = OE₁/OE₁/DC
Pin 12 = OE/OE
- 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 × 18 mm² TSOP (Type I)

DESCRIPTION

The LH532000B-1 is a CMOS 2M-bit mask-programmable ROM organized as 262,144 × 8 bits (Byte mode) or 131,072 × 16 bits (Word mode) that can be selected by BYTE input pin. It is fabricated using silicon-gate CMOS process technology.

PIN CONNECTIONS

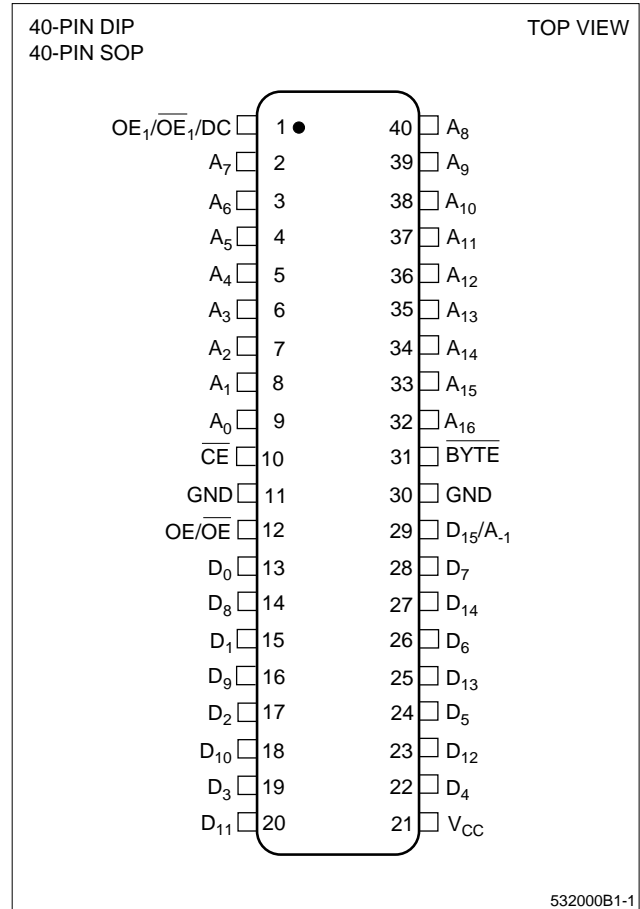


Figure 1. Pin Connections for DIP and SOP Packages

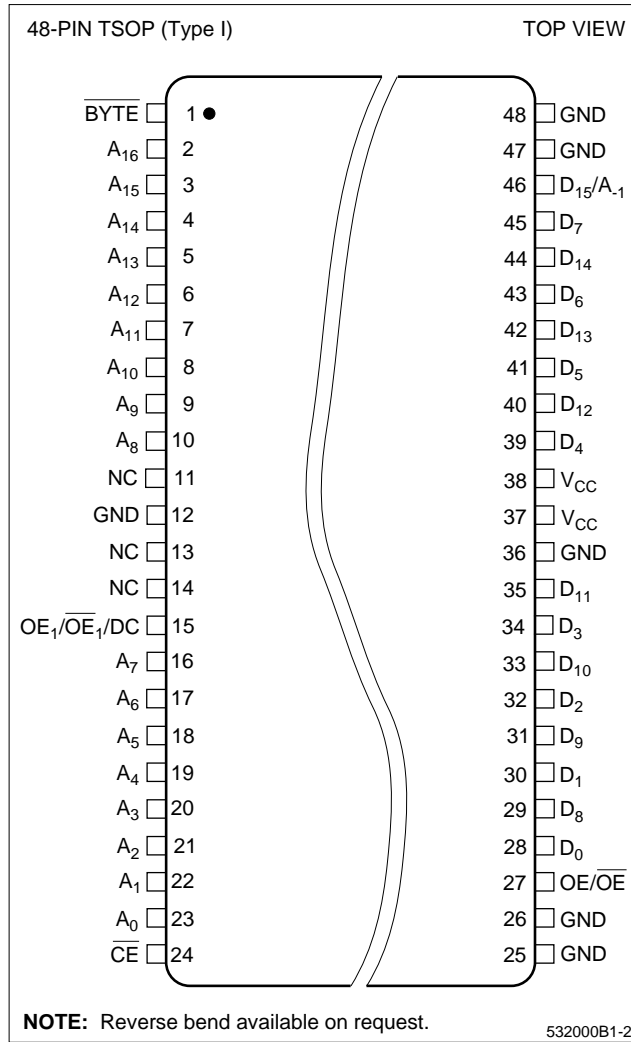


Figure 2. Pin Connections for TSOP Package

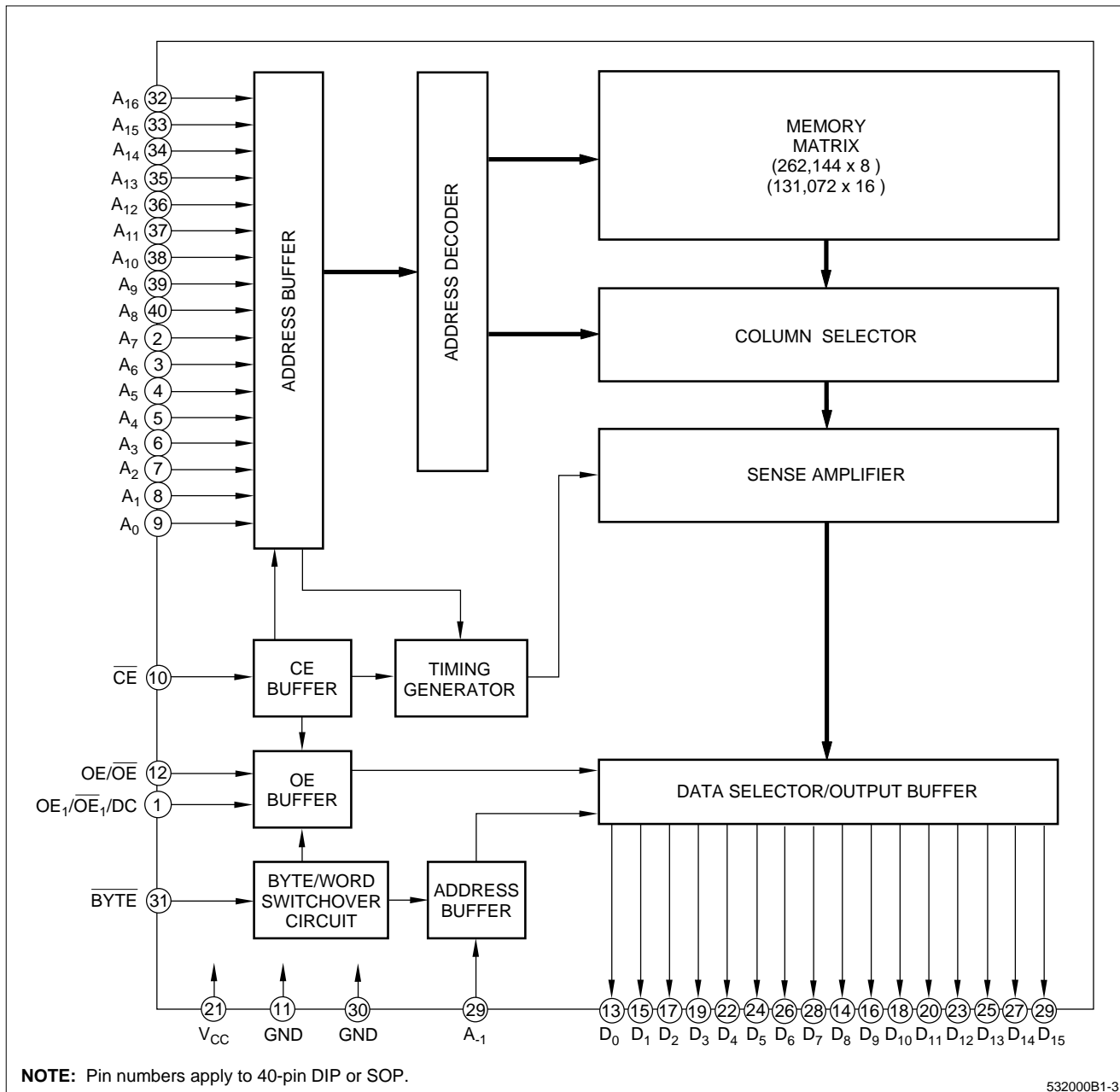


Figure 3. LH532000B-1 Block Diagram

PIN DESCRIPTION

| SIGNAL | PIN NAME | NOTE |
|-----------------------------------|-----------------------|------|
| A ₋₁ – A ₁₆ | Address input | 1 |
| D ₀ – D ₁₅ | Data output | 1 |
| BYTE | Byte/word mode switch | 1 |
| CE | Chip enable input | |

| SIGNAL | PIN NAME | NOTE |
|--------------------------------------|---------------------|------|
| OE/OE | Output enable input | 2 |
| OE ₁ /OE ₁ /DC | Output enable input | 2 |
| V _{CC} | Power supply (+5 V) | |
| GND | Ground | |

NOTES:

1. D₁₅/A₋₁ pin becomes LSB address input (A₋₁) when the BYTE pin is set to be LOW in byte mode, and data output (D₁₅) when set to be HIGH in word mode.
2. The active levels of OE/OE and OE₁/OE₁/DC are mask-programmable.

TRUTH TABLE

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

NOTE:

- X = H or L.

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | RATING | UNIT |
|-----------------------|------------------|-------------------------------|------|
| Supply voltage | V _{CC} | –0.3 to +7.0 | V |
| Input voltage | V _{IN} | –0.3 to V _{CC} + 0.3 | V |
| Output voltage | V _{OUT} | –0.3 to V _{CC} + 0.3 | V |
| Operating temperature | T _{opr} | 0 to +70 | °C |
| Storage temperature | T _{stg} | –65 to +150 | °C |

RECOMMENDED OPERATING CONDITIONS (T_A = 0 to +70°C)

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|----------------|-----------------|------|------|------|------|
| Supply voltage | V _{CC} | 4.5 | 5.0 | 5.5 | V |

DC CHARACTERISTICS (V_{CC} = 5 V ±10%, T_A = 0 to +70°C)

| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNIT | NOTE |
|------------------------|------------------|---|------|------|-----------------------|------|------|
| Input 'Low' voltage | V _{IL} | | –0.3 | | 0.8 | V | |
| Input 'High' voltage | V _{IH} | | 2.2 | | V _{CC} + 0.3 | V | |
| Output 'Low' voltage | V _{OL} | I _{OL} = 2.0 mA | | | 0.4 | V | |
| Output 'High' voltage | V _{OH} | I _{OH} = –400 μA | 2.4 | | | V | |
| Input leakage current | I _{LI} | V _{IN} = 0 V to V _{CC} | | | 10 | μA | |
| Output leakage current | I _{LO} | V _{OUT} = 0 V to V _{CC} | | | 10 | μA | 1 |
| Operating current | I _{CC1} | t _{RC} = 120 ns | | | 50 | mA | 2 |
| | I _{CC2} | t _{RC} = 1 μs | | | 45 | mA | 2 |
| | I _{CC3} | t _{RC} = 120 ns | | | 45 | mA | 3 |
| | I _{CC4} | t _{RC} = 1 μs | | | 40 | mA | 3 |
| Standby current | I _{SB1} | CE = V _{IH} | | | 3 | mA | |
| | I _{SB2} | CE = V _{CC} – 0.2 V | | | 100 | μA | |
| Input capacitance | C _{IN} | f = 1 MHz | | | 10 | pF | |
| Output capacitance | C _{OUT} | T _A = 25°C | | | 10 | pF | |

NOTES:

- CE/OE/OE₁ = V_{IH}, OE/OE₁ = V_{IL}
- V_{IN} = V_{IH} or V_{IL}, CE = V_{IL}, outputs open
- V_{IN} = (V_{CC} – 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 | MIN. | MAX. | UNIT | NOTE |
|--------------------------|-----------|------|------|------|------|
| Read cycle time | t_{RC} | 120 | | ns | |
| Address access time | t_{AA} | | 120 | ns | |
| Chip enable access time | t_{ACE} | | 120 | ns | |
| Output enable delay time | t_{OE} | | 55 | ns | |
| Output hold time | t_{OH} | 5 | | ns | |
| CE to output in High-Z | t_{CHZ} | | 55 | ns | 1 |
| OE to output in High-Z | t_{OHZ} | | 55 | 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 | 1 TTL + 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.

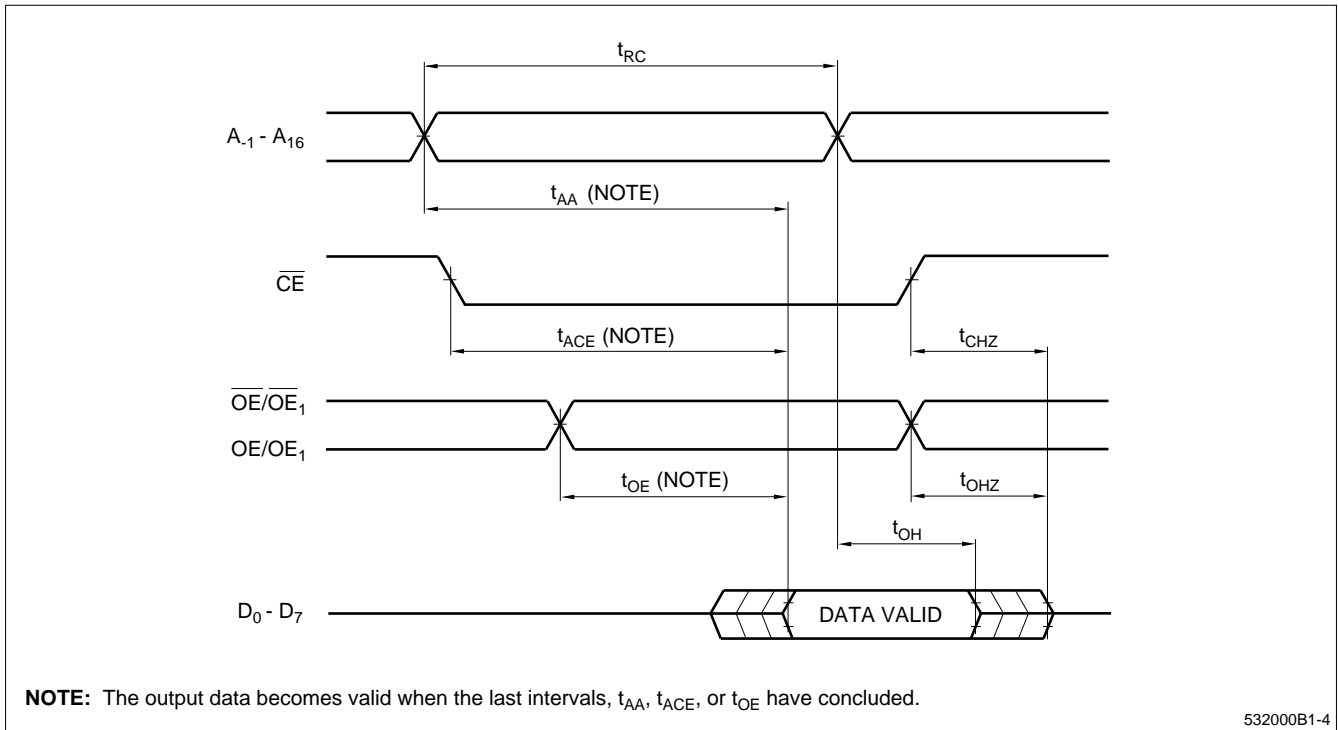


Figure 4. Byte Mode (BYTE = VIL)

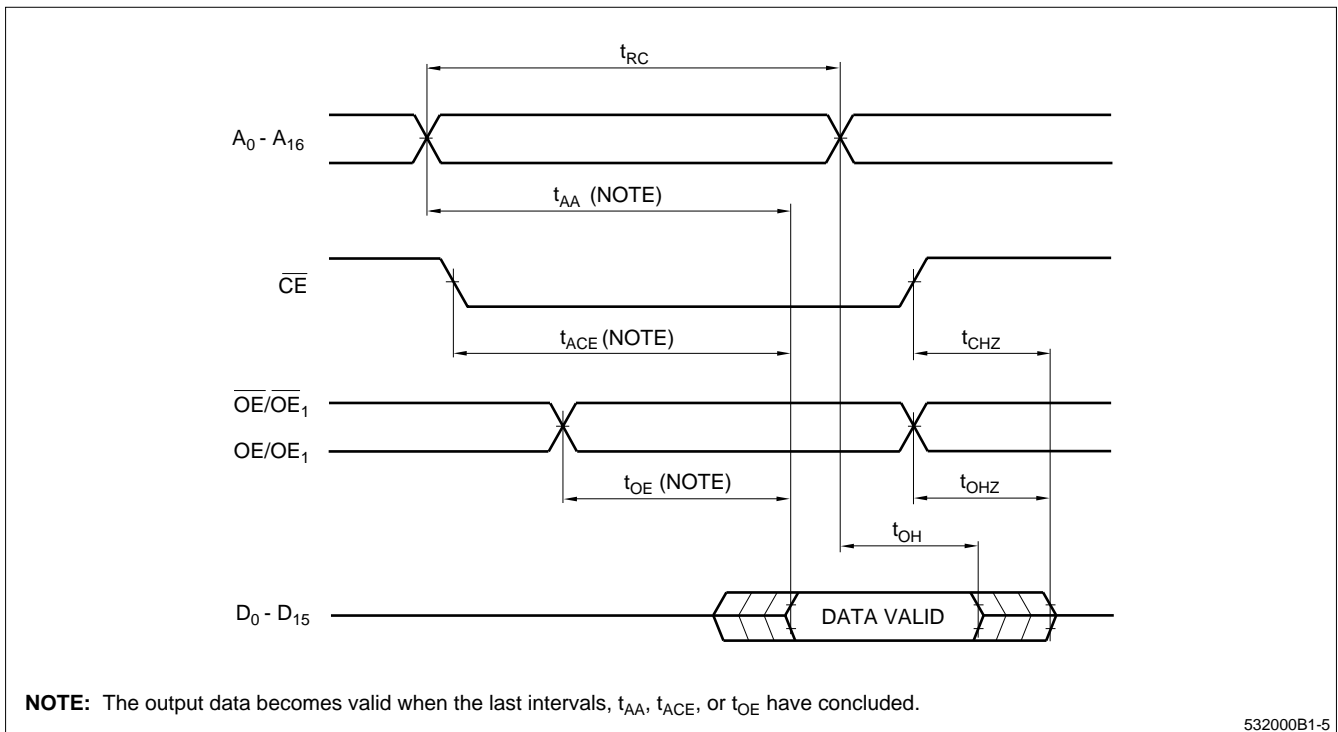
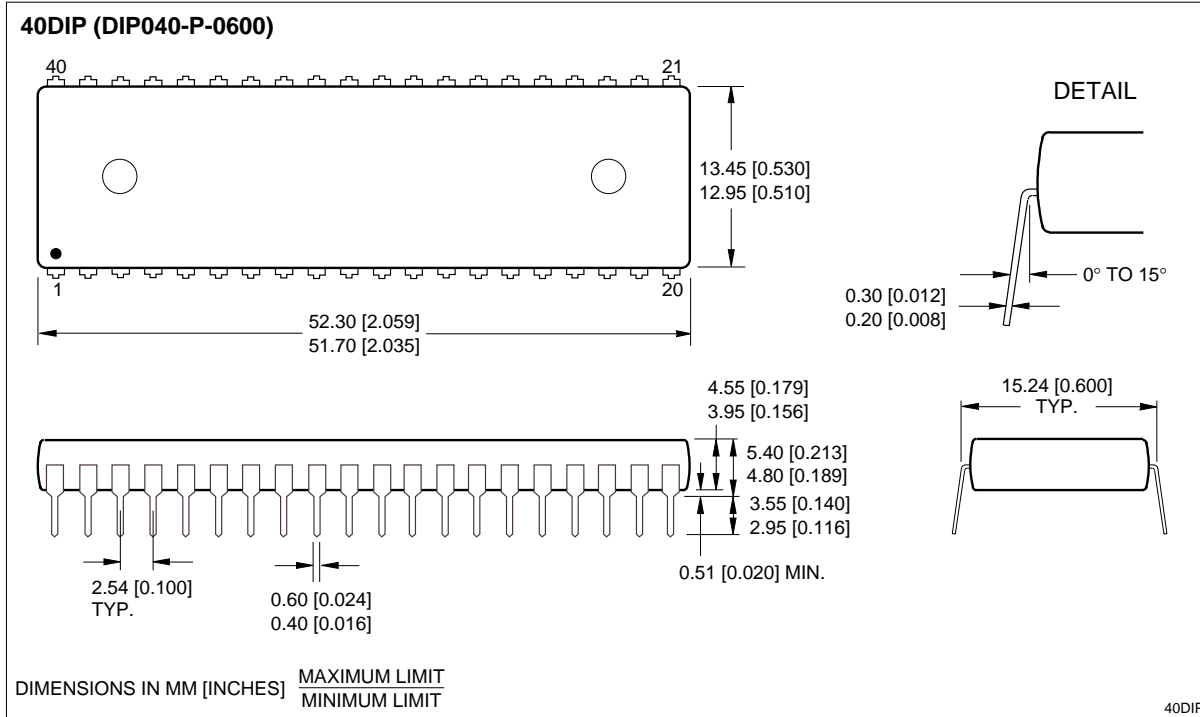
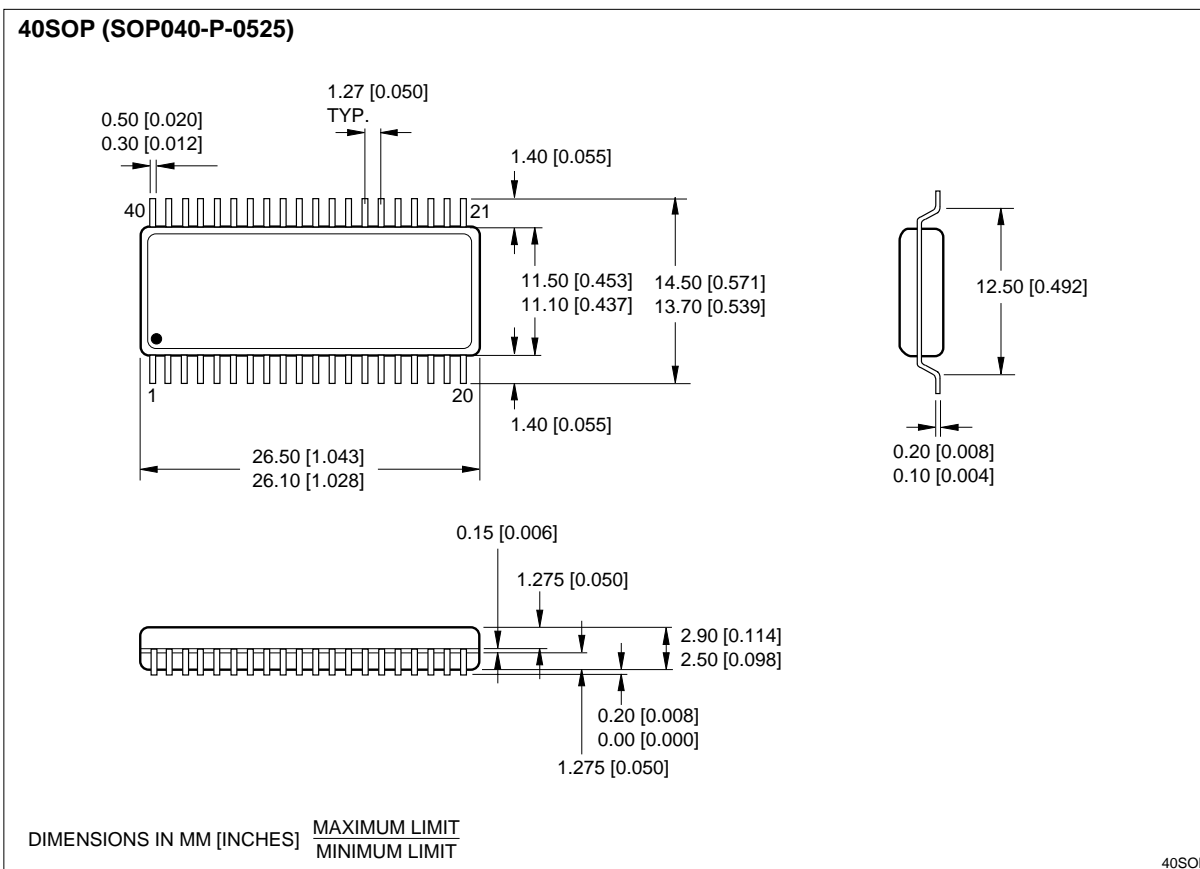


Figure 5. Word Mode (BYTE = VIH)

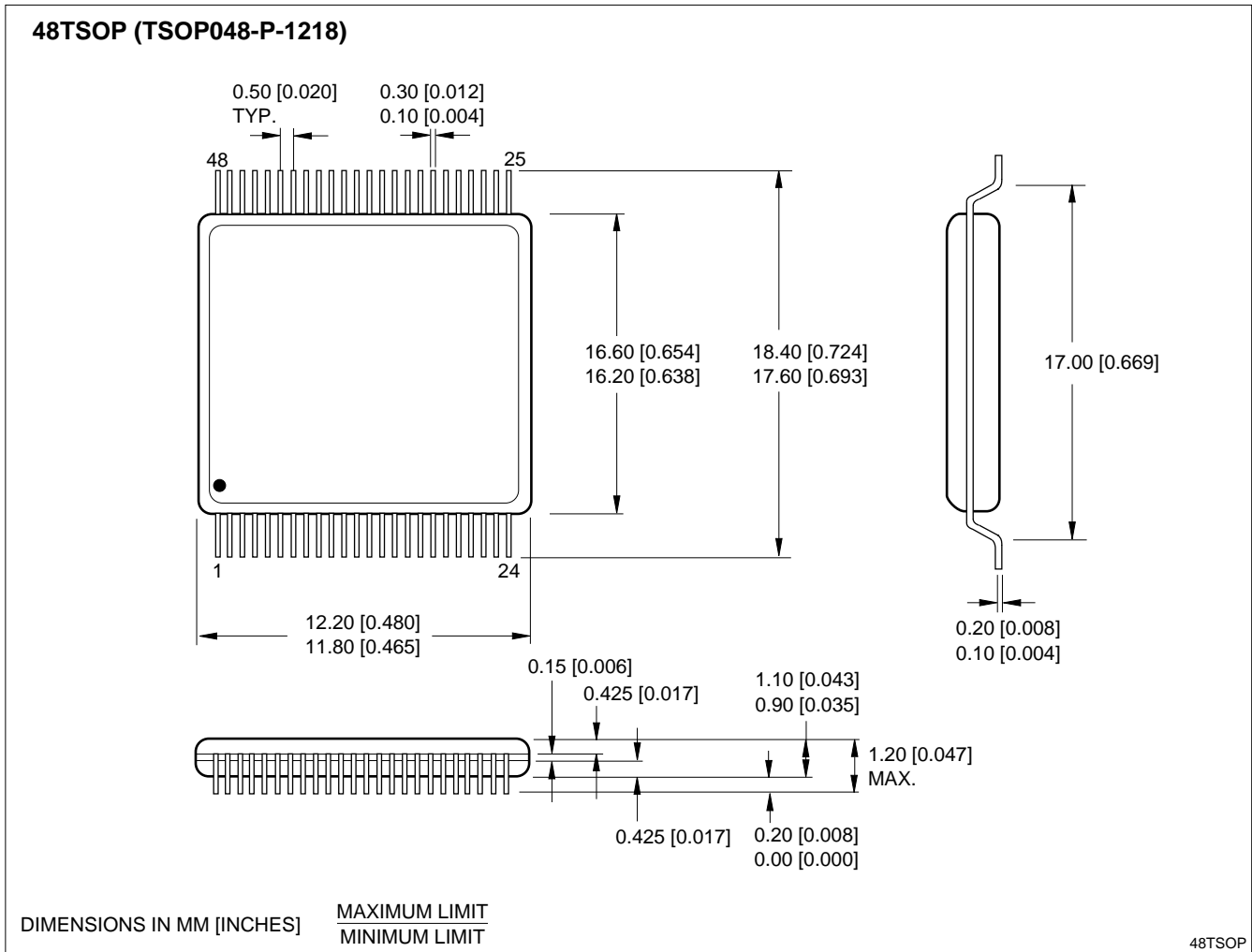
PACKAGE DIAGRAMS



40-pin, 600-mil DIP



40-pin, 525-mil SOP



48-pin, 12 × 18 mm² TSOP (Type I)

ORDERING INFORMATION

