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 µW (MAX.)
- Programmable OE/$\overline{\text{OE}}$ and $\text{OE}_1/\overline{\text{OE}_1}$/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 × 18 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

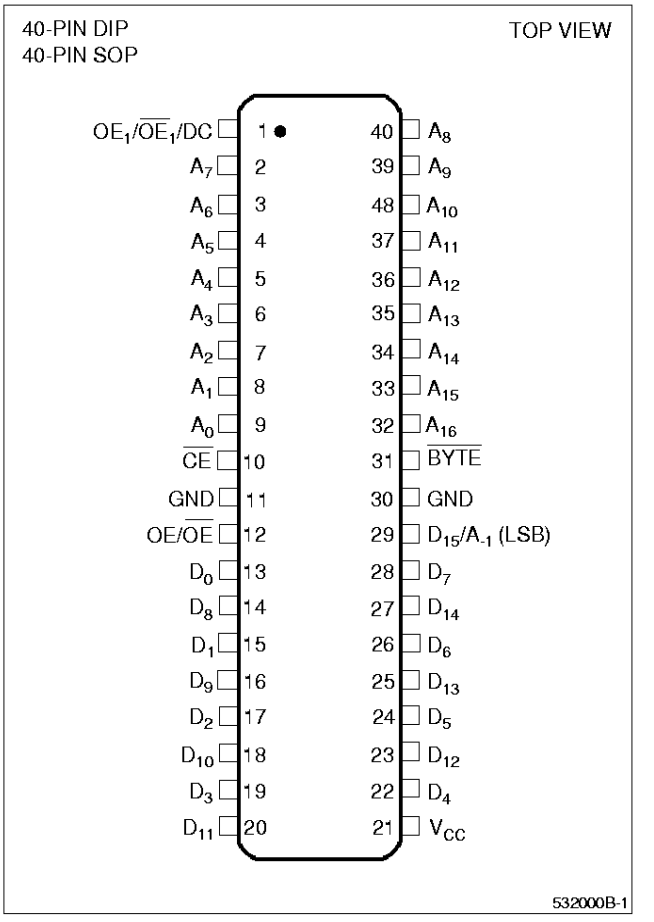


Figure 1. Pin Connections for DIP and SOP Packages

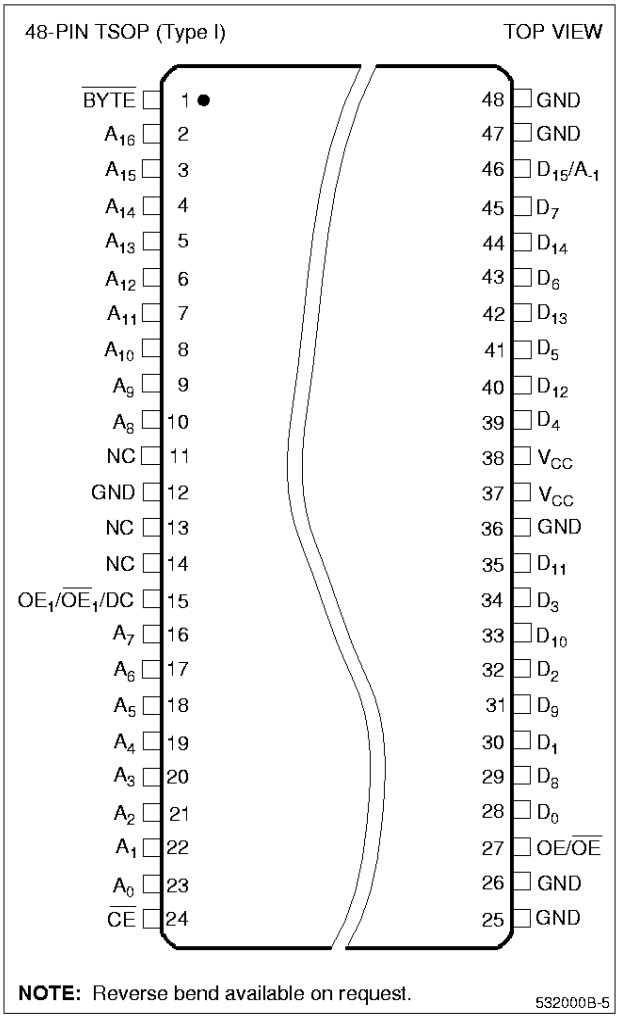


Figure 2. Pin Connections for TSOP Package

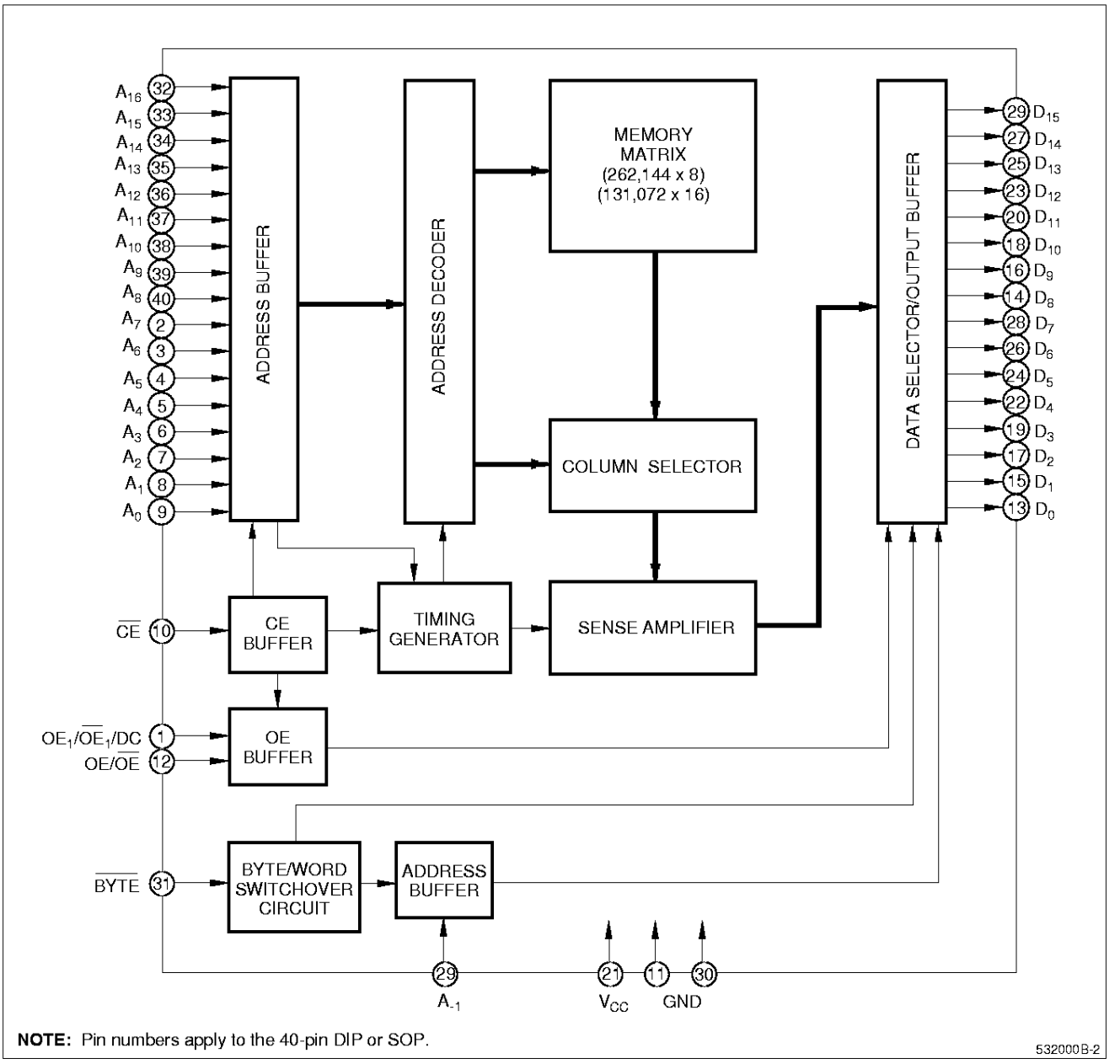


Figure 3. LH532000B Block Diagram

PIN DESCRIPTION

SIGNAL	PIN NAME	NOTE
A_{-1}	Address input (BYTE mode)	1
$A_0 - A_{16}$	Address input	
$D_0 - D_{15}$	Data output	1
$\overline{CE}$	Chip enable input	
$OE/\overline{OE}$	Output enable input	2

SIGNAL	PIN NAME	NOTE
$OE_1/\overline{OE_1}/DC$	Output enable input or Don't care	2
$\overline{BYTE}$	Byte/word mode switch	
V_{CC}	Power supply (+5 V)	
GND	Ground	

NOTES:

1. D_{15}/A_{-1} pin becomes LSB address input (A_{-1}) when the bit configuration is set in byte mode, and data output (D_{15}) when in word mode. $\overline{BYTE}$ input pin selects bit configuration.
2. The active levels of $OE/\overline{OE}$ and $OE_1/\overline{OE_1}/DC$ 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/$\overline{OE}$	$OE_1/\overline{OE_1}$	$\overline{BYTE}$	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	Input inhibit	$D_0 - D_7$	$D_8 - D_{15}$	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:
1. X = H or L, High-Z = High-impedance.

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	Topr	0 to +70	°C
Storage temperature	Tstg	−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	$\lvert I_{LI} \rvert$	V_{IN} = 0 V to V_{CC}			10	µA	
Output leakage current	$\lvert I_{LO} \rvert$	V_{OUT} = 0 V to V_{CC}			10	µA	1
Operating current	I_{CC1}	t_{RC} = t_{RC} (MIN.)			50	mA	2
	I_{CC2}	t_{RC} = 1 µs			45		
	I_{CC3}	t_{RC} = t_{RC} (MIN.)			45	mA	3
	I_{CC4}	t_{RC} = 1 µs			40		
Standby current	I_{SB1}	$\overline{CE}$ = V_{IH}			3	mA	
	I_{SB2}	$\overline{CE}$ = V_{CC} - 0.2 V			100	µA	
Input capacitance	C_{IN}	f = 1 MHz, T_A = 25°C			10	pF	
Output capacitance	C_{OUT}				10	pF	

NOTES:
1. $OE/OE_1 = V_{IL}$, $\overline{CE}/\overline{OE}/\overline{OE_1} = V_{IH}$
2. $V_{IN} = V_{IH}$ or V_{IL}, $\overline{CE} = V_{IL}$, outputs open
3. $V_{IN} = (V_{CC} - 0.2\ V)$ or 0.2 V, $\overline{CE}$ = 0.2 V, outputs open

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

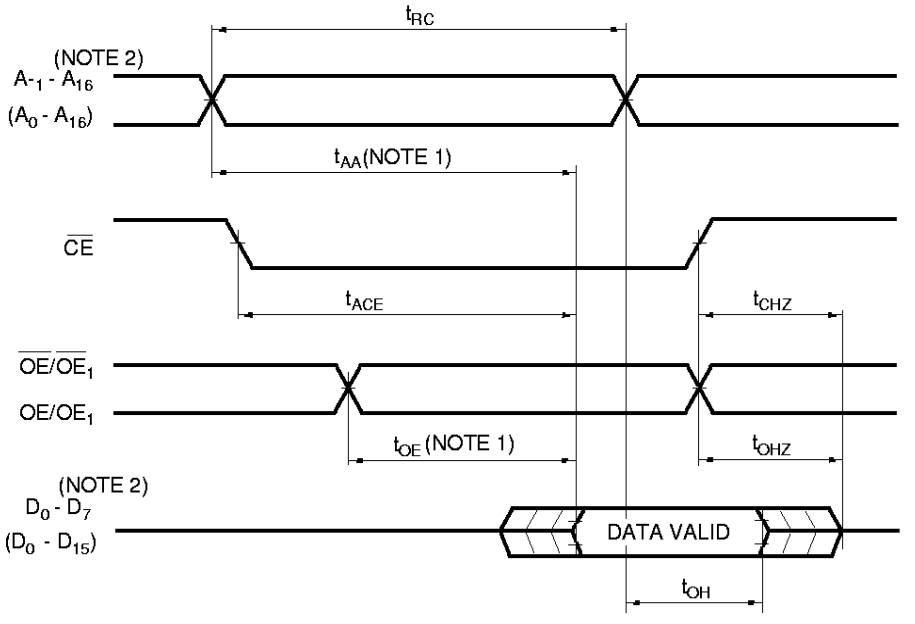
NOTE:
1. This is the time required for the output to become high-impedance.

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.



NOTES:
1. Data becomes valid after t_{AA}, t_{ACE}, and t_{OE} from address input, chip enable or output enable, respectively have been met.
2. Applied to byte mode. Signals in parentheses apply to word mode.

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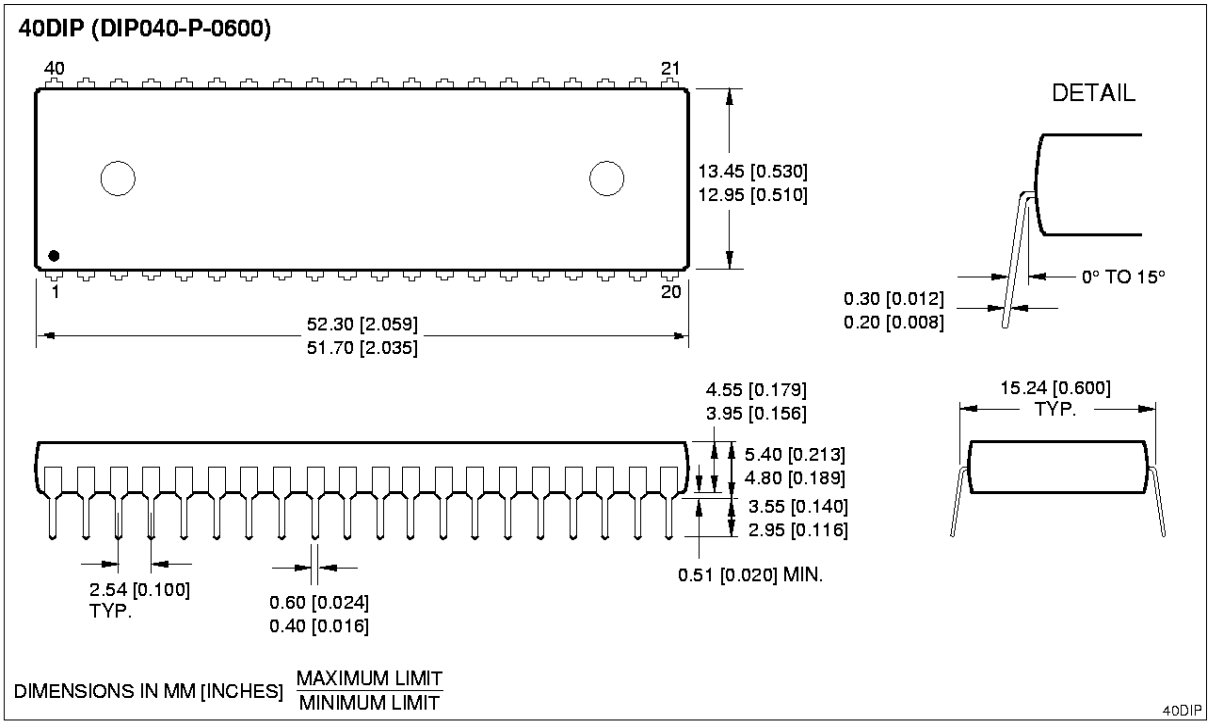
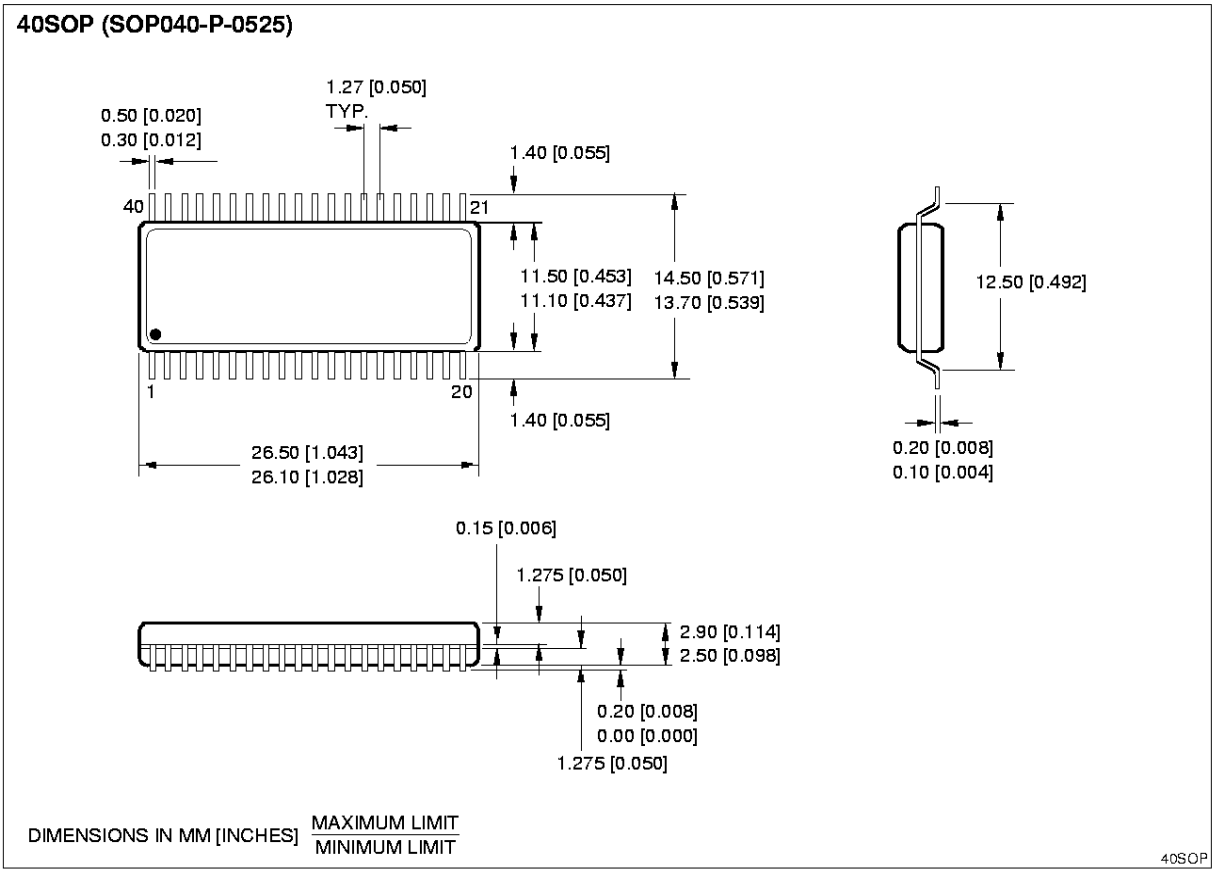
Figure 4. Timing Diagram

PACKAGE DIAGRAMS

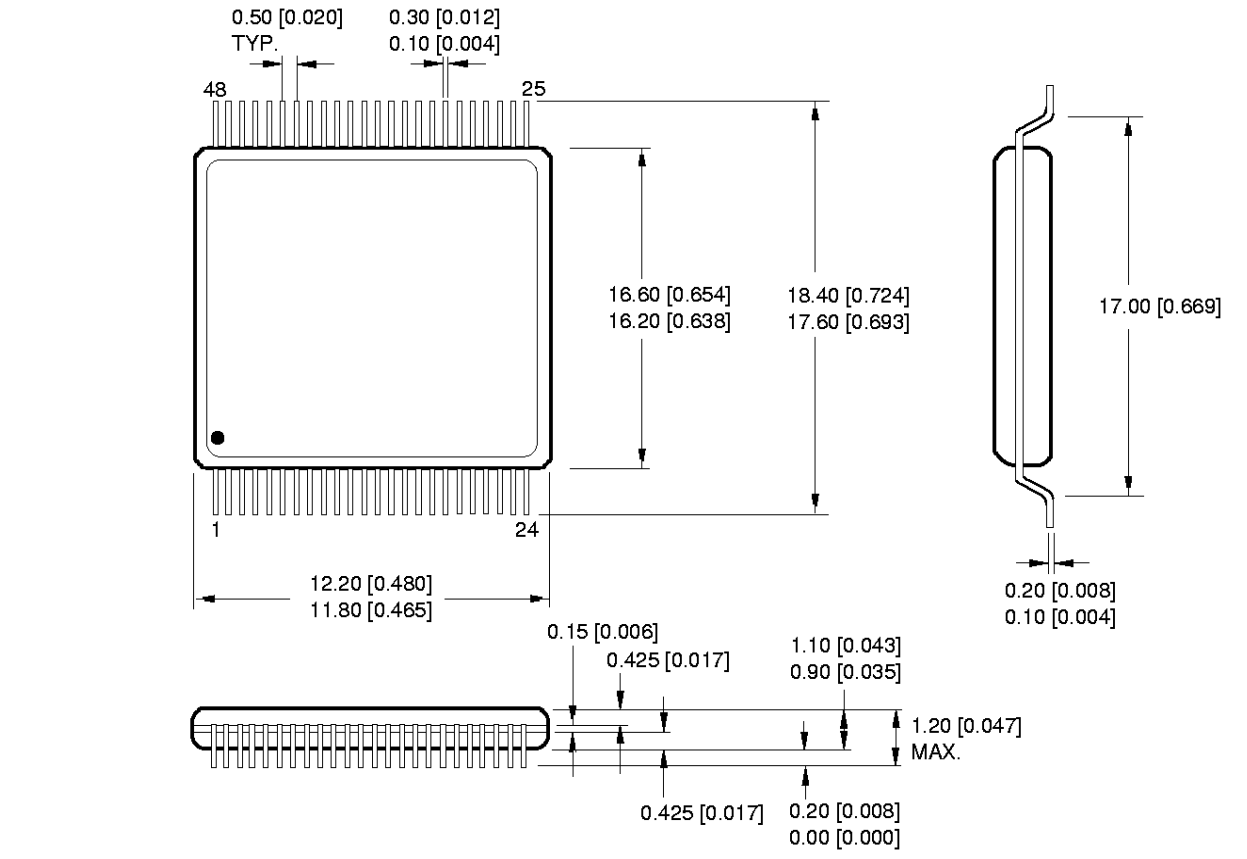


40-pin, 600-mil DIP



40-pin, 525-mil SOP

48TSOP (TSOP048-P-1218)



48-pin, 12 × 18 mm^2 TSOP (Type I)

ORDERING INFORMATION

LH532000B — Device Type

X — Package

- D 40-pin, 600-mil DIP (DIP040-P-0600)
- N 40-pin, 525-mil SOP (SOP040-P-0525)
- T 48-pin, 12 x 18 mm^2 TSOP (Type I) (TSOP048-P-1218)
- TR 48-pin, 12 x 18 mm^2 TSOP (Type I) Reverse bend (TSOP048-P-1218)

CMOS 2M (256K x 8 or 128K x 16) Mask Programmable ROM

Example: LH532000BD (CMOS 2M (256K x 8 or 128K x 16) Mask Programmable ROM, 40-pin, 600-mil DIP)

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