LH534R00A

CMOS 4M (512K × 8) Mask-Programmable ROM

FEATURES

- 524,288 words × 8 bit organization
- Access time: 120 ns (MAX.)
- Power consumption:
  Operating: 357.5 mW (MAX.)
  Standby: 550 µW (MAX.)
- Mask-programmable control pin:
  Pin 1 – $OE_1/\overline{OE}_1/DC$
  Pin 24 – $OE/\overline{OE}$
- Static operation
- TTL compatible I/O
- Three-state outputs
- Single +5 V power supply
- Packages:
  32-pin, 600-mil DIP
  32-pin, 525-mil SOP
  32-pin, 400-mil TSOP (Type II)

DESCRIPTION

The LH534R00A is a 4M-bit mask-programmable ROM organized as 524,288 × 8 bits. It is fabricated using silicon-gate CMOS process technology.

PIN CONNECTIONS

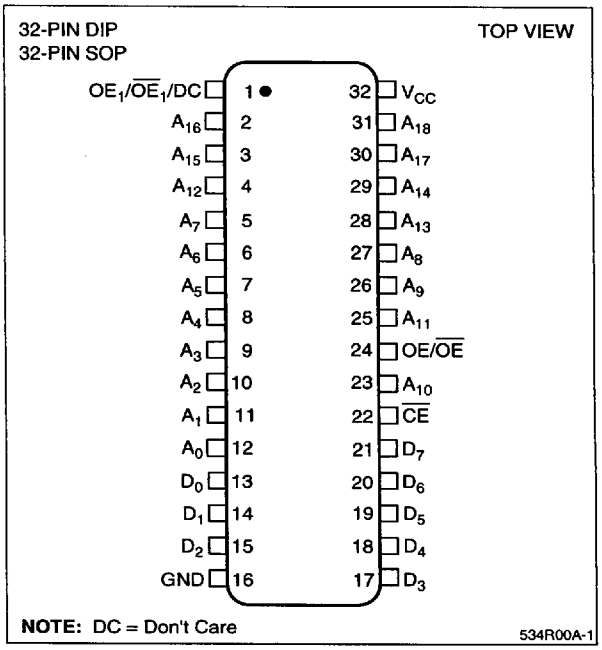


Figure 1. Pin Connections for DIP and SOP Packages

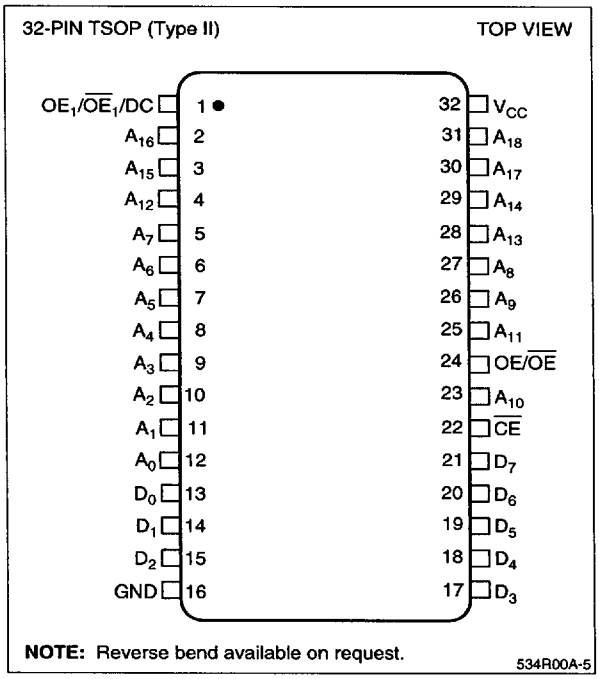


Figure 2. Pin Connections for TSOP Package

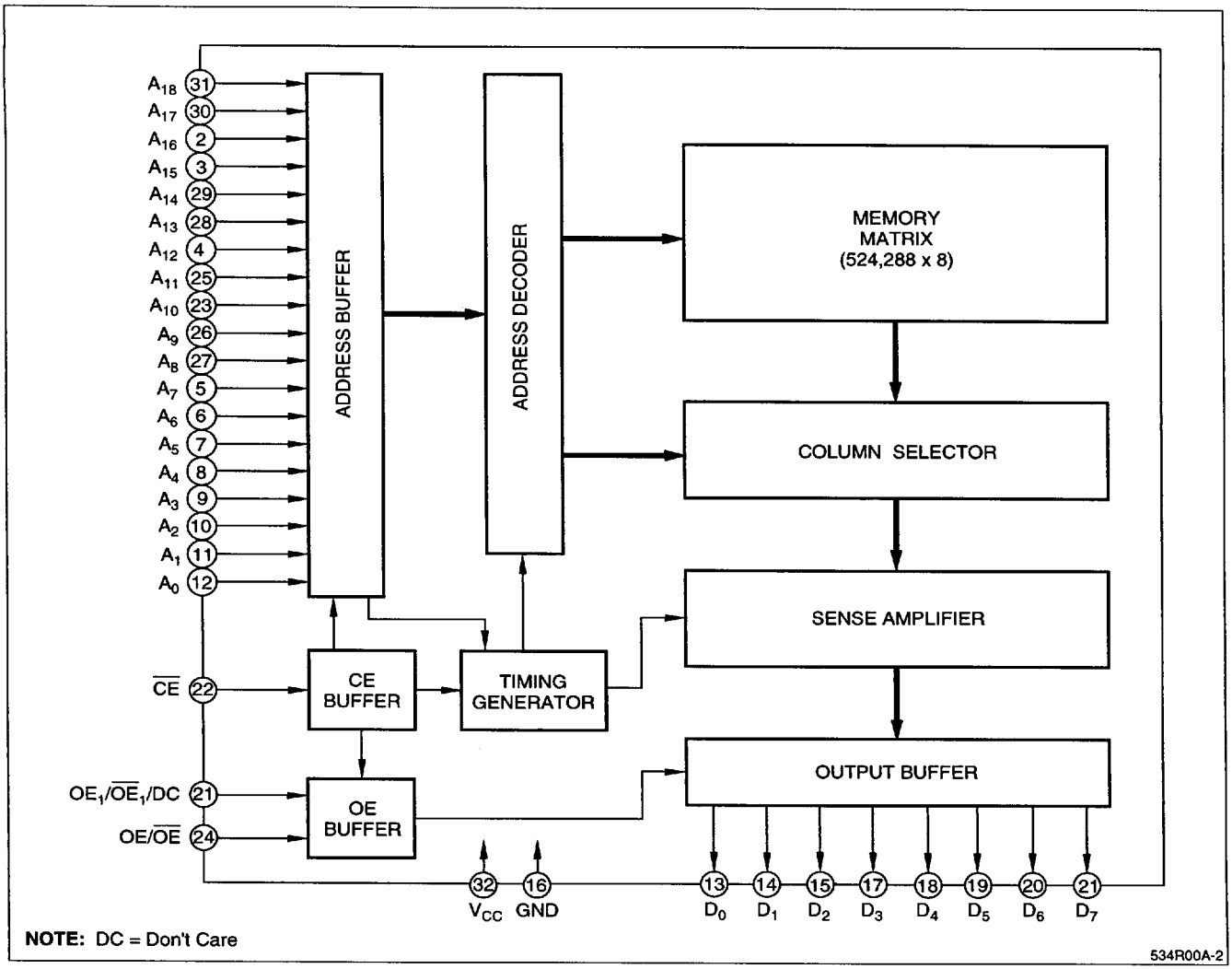


Figure 3. LH534R00A Block Diagram

PIN DESCRIPTION

SIGNAL	PIN NAME	NOTE
$A_0 - A_{18}$	Address input	
$D_0 - D_7$	Data output	
$\overline{CE}$	Chip Enable input	
$OE/\overline{OE}$	Output Enable input	1

SIGNAL	PIN NAME	NOTE
$OE_1/\overline{OE_1}/DC$	Output Enable input	1, 2
V_{CC}	Power supply (+5 V)	
GND	Ground	

NOTE:

1. Active levels of $OE_1/\overline{OE_1}/DC$ and $OE/\overline{OE}$ 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.
2. DC = Don't care.

TRUTH TABLE

$\overline{CE}$	$OE_1/\overline{OE_1}$	$OE/\overline{OE}$	$D_0 - D_7$	SUPPLY CURRENT
H	X	X	High-Z	Standby (I_{SB})
L	L/H	X	High-Z	Operating (I_{CC})
L	X	L/H	High-Z	
L	H/L	H/L	Output	

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	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} = 120 ns			65	mA	2
	I_{CC2}	t_{RC} = 1 µs			50		
	I_{CC3}	t_{RC} = 120 ns			60	mA	3
	I_{CC4}	t_{RC} = 1 µs			45		
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. $\overline{CE}/\overline{OE}/\overline{OE_1}$ = V_{IH}, OE/OE_1 = V_{IL}
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	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}		60	ns	
Output hold time	t_{OH}	0		ns	
CE to output in High-Z	t_{CHZ}		60	ns	1
OE to output in High-Z	t_{OHZ}		60	ns	

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

AC TEST CONDITIONS

PARAMETER	RATING
Input voltage amplitude	0.4 V to 2.6 V
Input rise/fall time	10 ns
Input/output reference level	1.5 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.

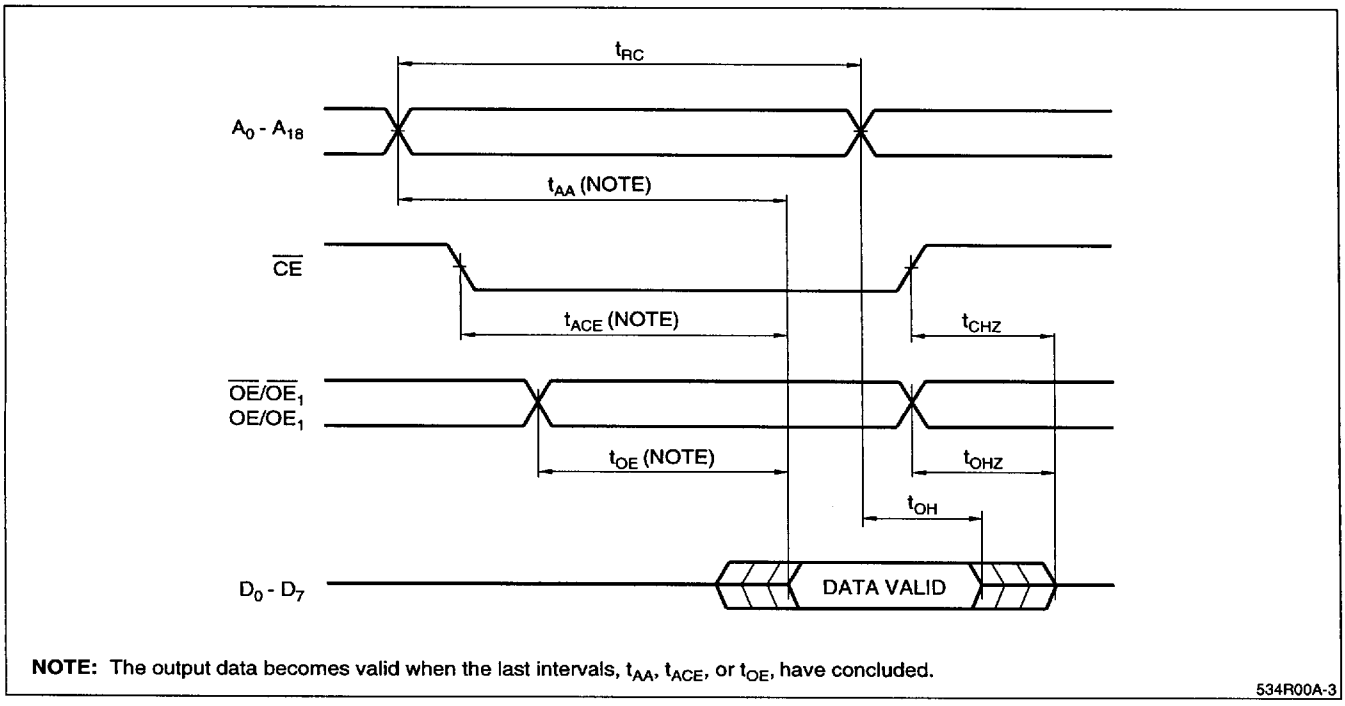
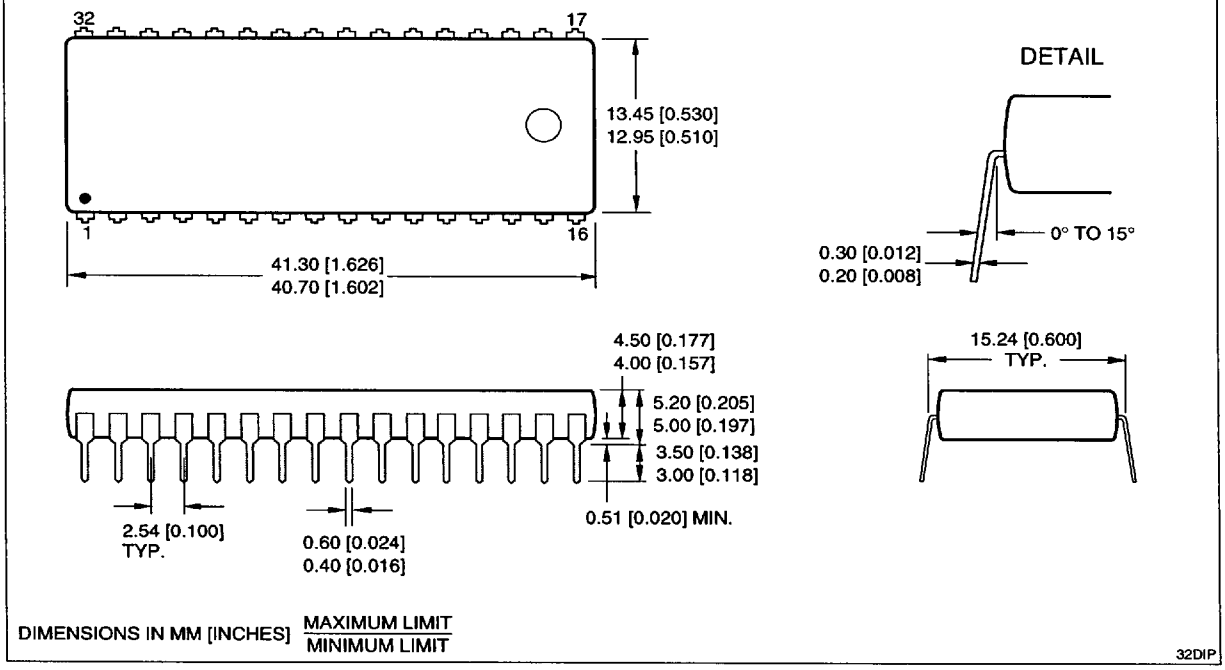


Figure 4. Timing Diagram

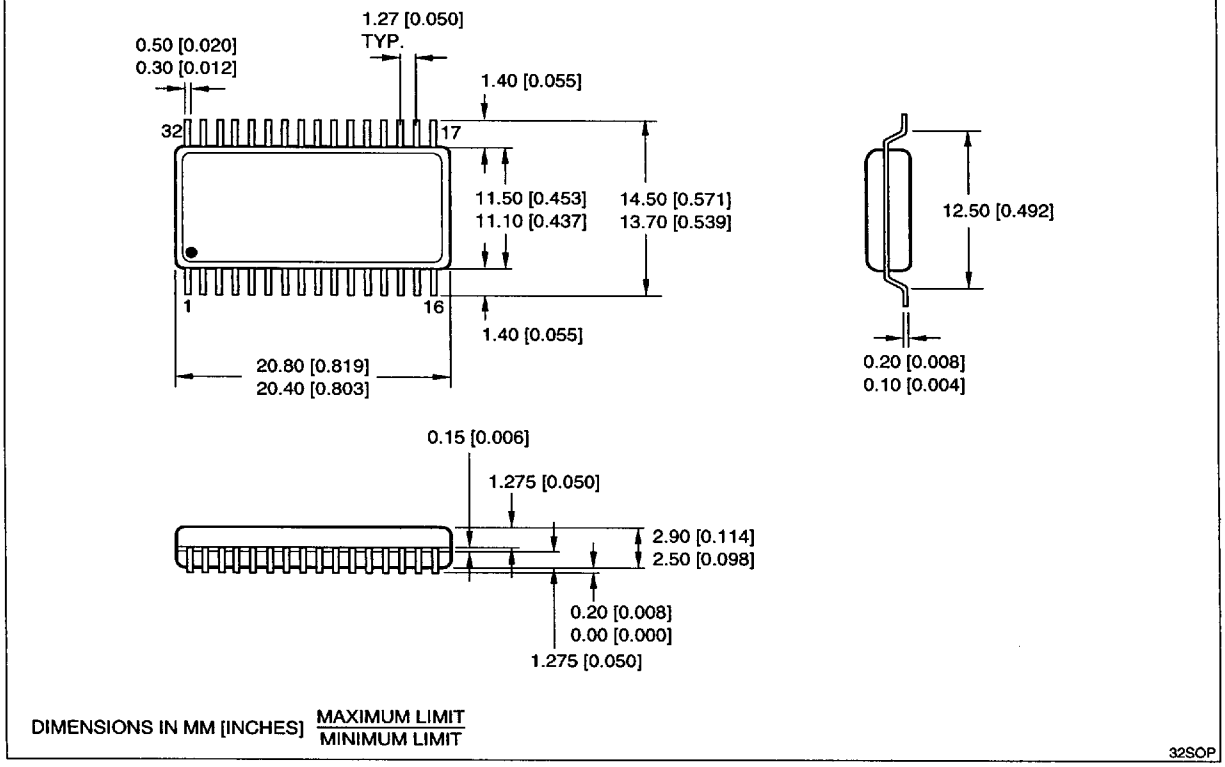
PACKAGE DIAGRAMS

32DIP (DIP032-P-0600)



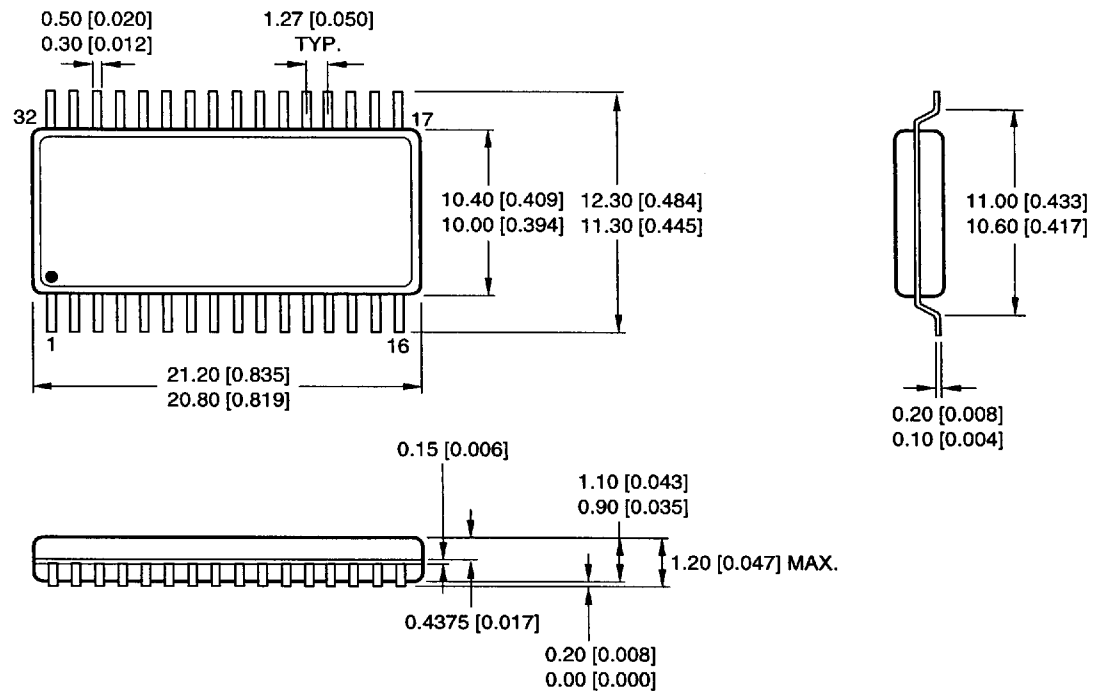
32-pin, 600-mil DIP

32SOP (SOP032-P-0525)



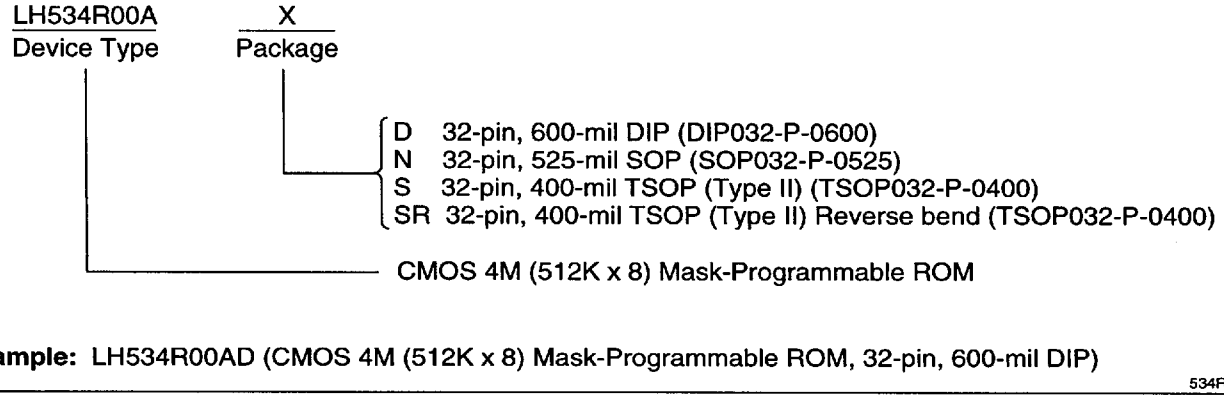
32-pin, 525-mil SOP

32TSOP (Type II) (TSOP032-P-0400)



32-pin, 400-mil TSOP (Type II)

ORDERING INFORMATION



Example: LH534R00AD (CMOS 4M (512K x 8) Mask-Programmable ROM, 32-pin, 600-mil DIP)

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