LH531V00

CMOS 1M (128K × 8) MROM

FEATURES

- 131,072 words × 8 bit organization
- Access time: 100 ns (MAX.)
- Power consumption:
  Operating: 275 mW (MAX.)
  Standby: 550 µW (MAX.)
- Mask-programmable $OE_1/\overline{OE_1}/DC$
- Fully-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, 8 × 20 mm^2 TSOP (Type I)

DESCRIPTION

The LH531V00 is a 1M-bit mask-programmable ROM organized as 131,072 × 8 bits. It is fabricated using silicon-gate CMOS process technology.

PIN CONNECTIONS

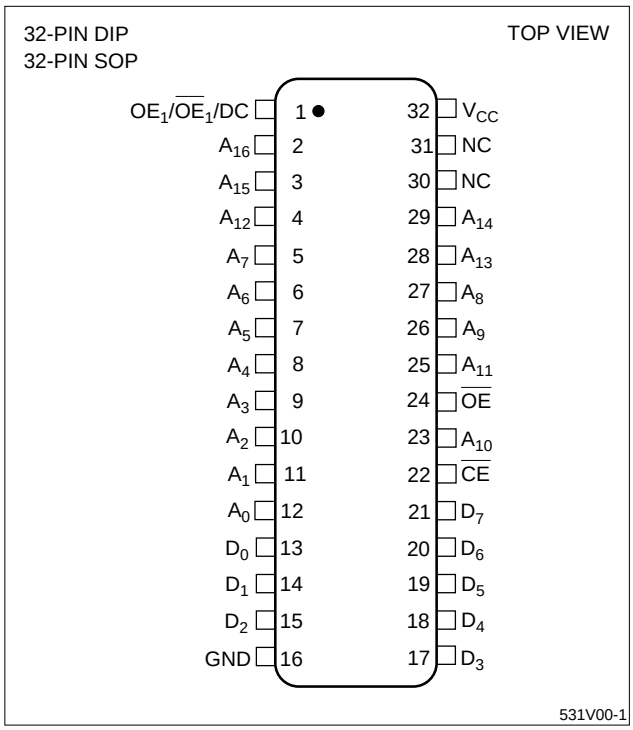


Figure 1. Pin Connections for DIP and SOP Packages

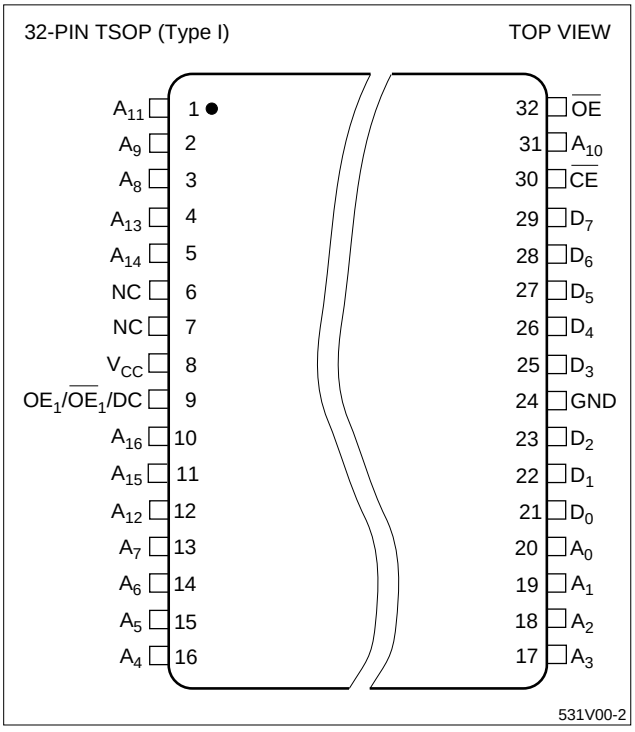


Figure 2. Pin Connections for TSOP Package

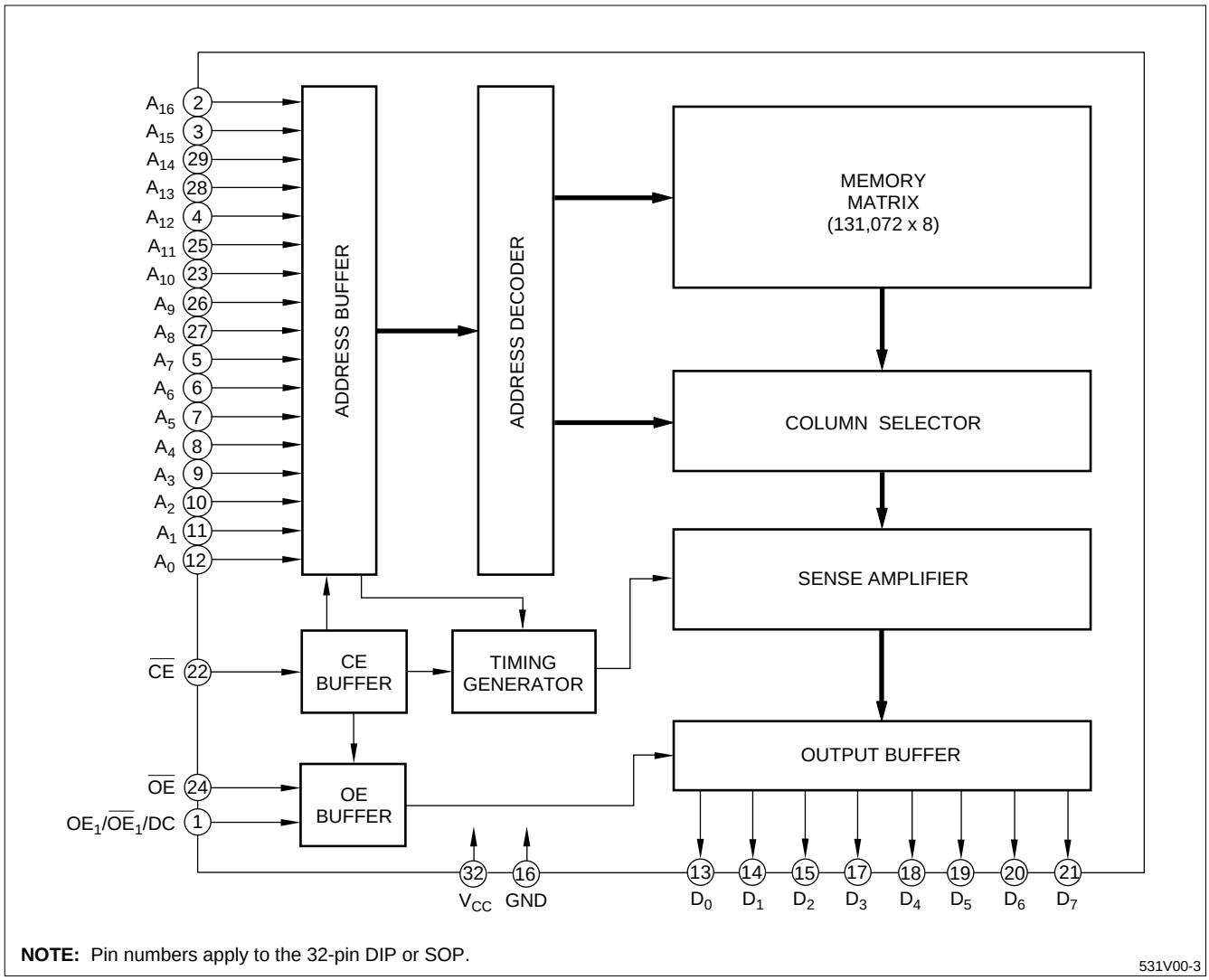


Figure 3. LH531V00 Block Diagram

PIN DESCRIPTION

SIGNAL	PIN NAME	NOTE
$A_0 – A_{16}$	Address input	
$D_0 – D_7$	Data output	
$\overline{CE}$	Chip Enable input	
$\overline{OE}$	Output Enable input	

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

NOTE:
1. Active level of $OE_1/\overline{OE_1}/DC$ is mask-programmable. When DC is selected out of $OE_1/\overline{OE_1}/DC$, it is fixed to an active level. Then it is recommended to apply either HIGH or LOW to the DC pin.

TRUTH TABLE

$\overline{CE}$	$\overline{OE}$	$OE_1/\overline{OE_1}$	$D_0 – D_7$	SUPPLY CURRENT	NOTE
H	X	X	High-Z	Standby (I_{SB})	1
L	H	X	High-Z	Operating (I_{CC})	1
L	X	L/H	High-Z	Operating (I_{CC})	1
L	L	H/L	$D_0 – D_7$	Operating (I_{CC})	

NOTE:
1. 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°C 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°C 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} = 100 ns			50	mA	2
	I_{CC2}	t_{RC} = 1 µs			45	mA	
	I_{CC3}	t_{RC} = 100 ns			45	mA	3
	I_{CC4}	t_{RC} = 1 µs			40	mA	
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. $\overline{CE}/\overline{OE}$ = 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°C to +70°C)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Read cycle time	t_{RC}	100			ns	
Address access time	t_{AA}			100	ns	
Chip enable access time	t_{ACE}			100	ns	
Output enable delay time	t_{OE}			50	ns	
Output hold time	t_{OH}	0			ns	
CE to output in High-Z	t_{CHZ}			50	ns	1
OE to output in High-Z	t_{OHZ}			50	ns	

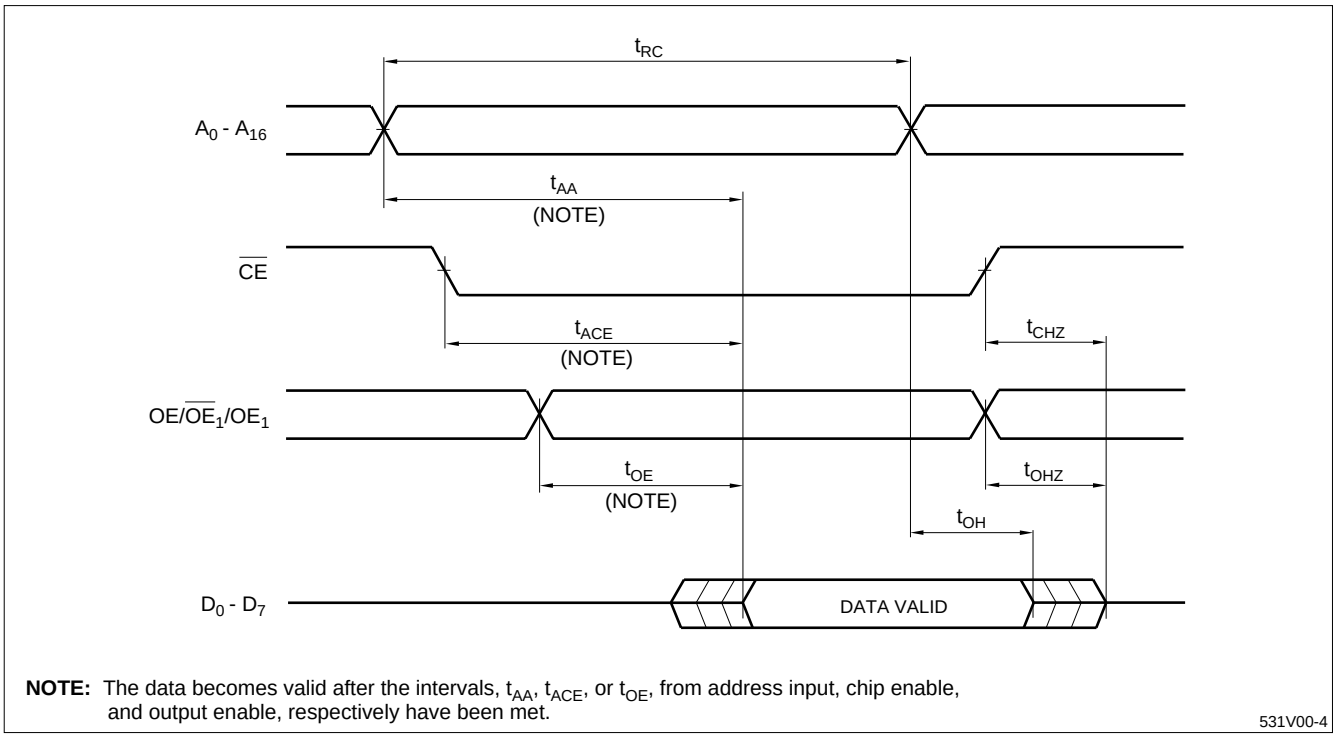
NOTE:
1. This is the time required for the outputs to become high-impedance.

AC TEST CONDITIONS

PARAMETER	RATING
Input voltage amplitude	0.6 V to 2.4 V
Input rise/fall time	10 ns
Input/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.



NOTE: The data becomes valid after the intervals, t_{AA}, t_{ACE}, or t_{OE}, from address input, chip enable, and output enable, respectively have been met.

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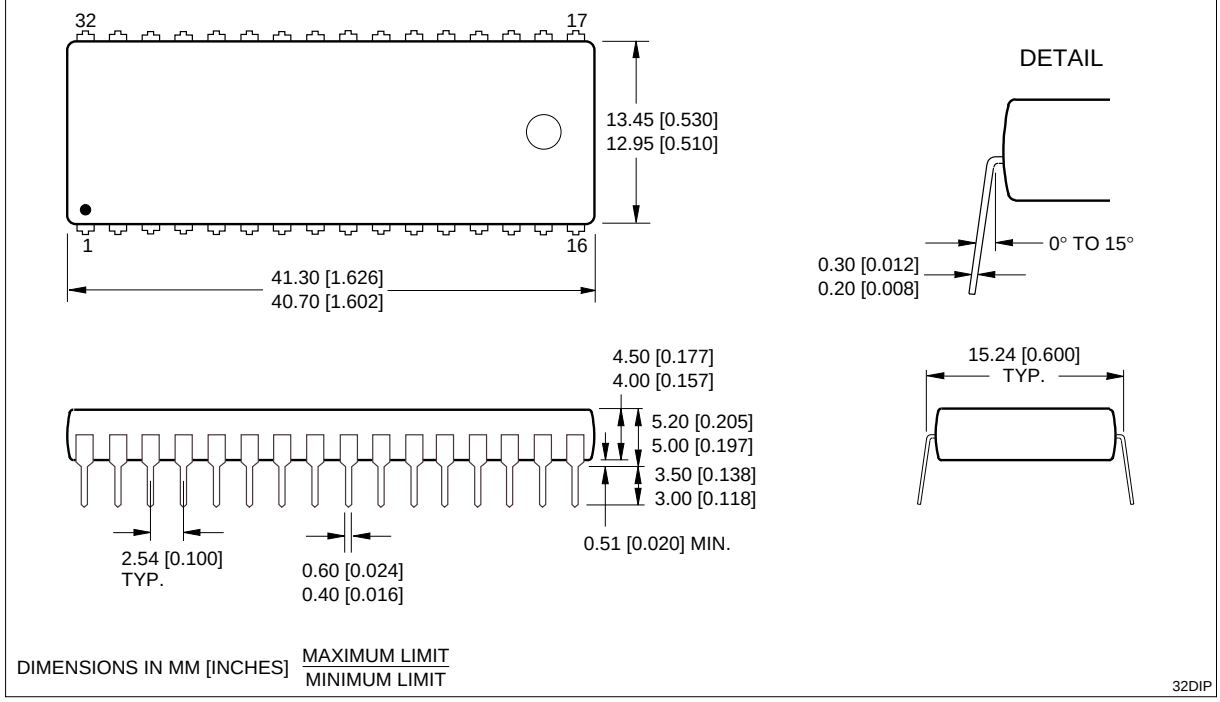
Figure 4. Timing Diagram

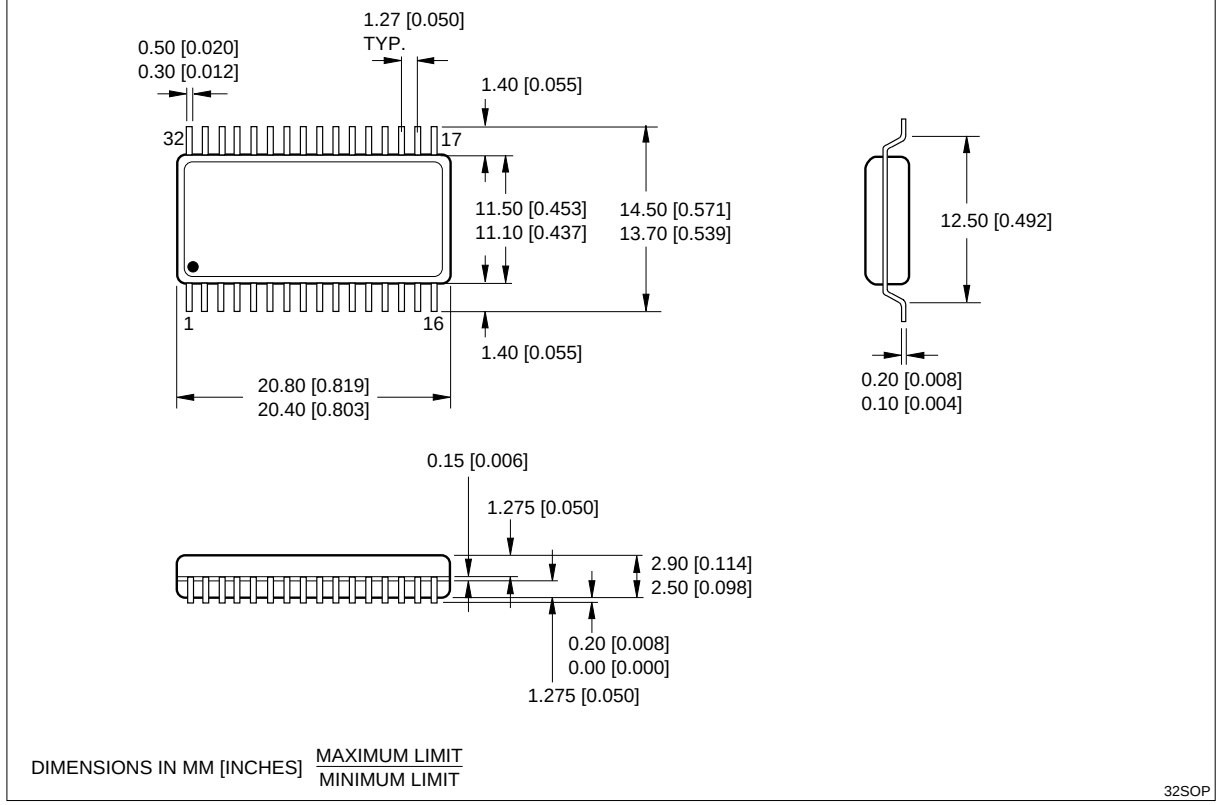
PACKAGE DIAGRAMS

32DIP (DIP032-P-0600)



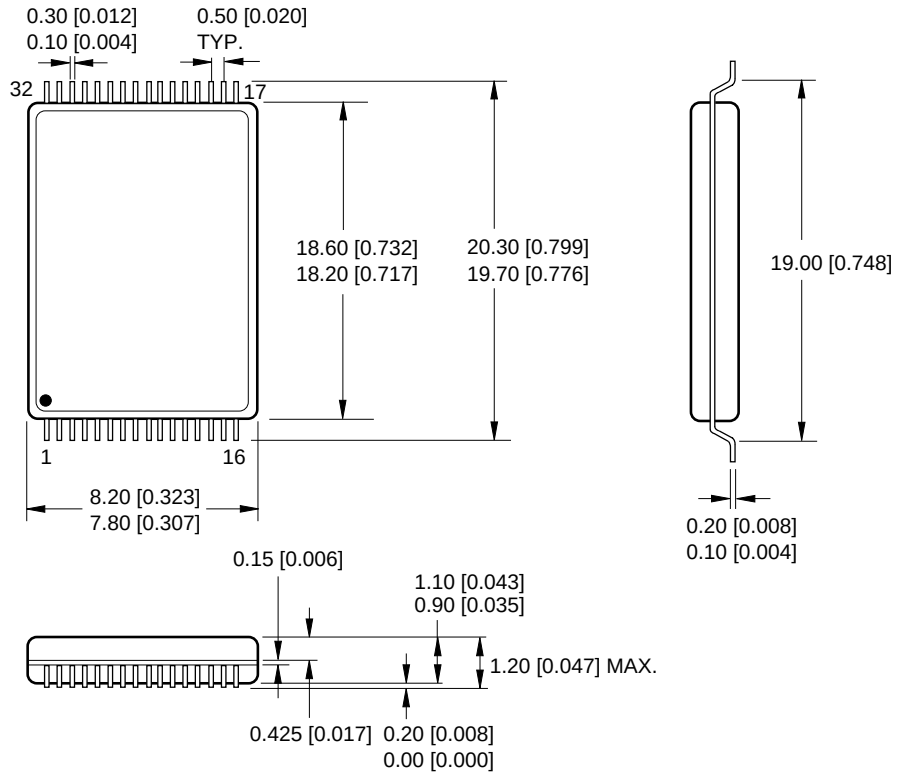
32-pin, 600-mil DIP

32SOP (SOP032-P-0525)



32-pin, 525-mil SOP

32TSOP (Type I) (TSOP032-P-0820)



32-pin, 8 × 20 mm^2 TSOP (Type I)

ORDERING INFORMATION