

DM74LS533

Octal Transparent Latch with 3-STATE Outputs

General Description

The 'LS533 consists of eight latches with 3-STATE outputs for bus organized system applications. The flip-flops appear transparent to the data when Latch Enable (LE) is HIGH. When LE is LOW, the data that meets the setup times is latched. Data appears on the bus when the Output Enable ($\overline{OE}$) is LOW. When $\overline{OE}$ is HIGH the bus output is in the high impedance state. The 'LS533 is the same as the 'LS373, ex-

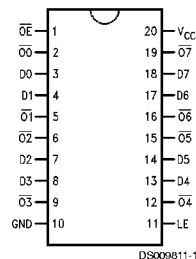
cept that the outputs are inverted. For detailed specifications please see the 'LS373 data sheet, but note that the propagation delays from data to output are 5.0 ns longer for the 'LS533 than for the 'LS373.

Features

- Eight latches in a single package
- 3-STATE outputs for bus interfacing

Connection Diagram

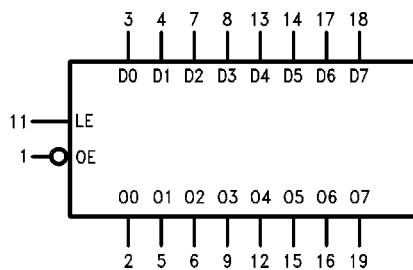
Dual-In-Line Package



DS009811-1

Order Number DM74LS533WM or DM74LS533N
See Package Number M20B or N20A

Logic Symbol



DS009811-2

VCC = Pin 20
GND = Pin 10

Pin Names	Description
D0, D7	Data Inputs
LE	Latch Enable Input (Active HIGH)
$\overline{OE}$	Output Enable Input (Active LOW)
$\overline{O0}-\overline{O7}$	Complementary 3-STATE Outputs

Function Table

OUTPUT Enable	Latch Enable	D	Output $\overline{O}$
L	H	H	L
L	H	L	H
L	L	X	$\overline{Q_0}$
H	X	X	Z

L = Low State, H = High State, X = Don't Care
Z = High Impedance State
 $\overline{Q_0}$ = Previous Condition of $\overline{O}$

Absolute Maximum Ratings (Note 1)Supply Voltage
Input Voltage7V
7V

Operating Free Air Temperature Range

DM74LS

0°C to +70°C

Storage Temperature Range

–65°C to +150°C

Recommended Operating Conditions

Symbol	Parameter	DM74LS533			Units
		Min	Nom	Max	
V _{CC}	Supply Voltage	4.75	5	5.25	V
V _{IH}	High Level Input Voltage	2			V
V _{IL}	Low Level Input Voltage			0.8	V
I _{OH}	High Level Output Current			–2.6	mA
I _{OL}	Low Level Output Current			24	mA
T _A	Free Air Operating Temperature	0		70	°C

Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Electrical Characteristics

Over recommended operating free air temperature range (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 2)	Max	Units
V _I	Input Clamp Voltage	V _{CC} = Min, I _I = –18 mA			–1.5	V
V _{OH}	High Level Output Voltage	V _{CC} = Min, I _{OH} = Max, V _{IL} = Max	DM74 2.4	3.4		V
V _{OL}	Low Level Output Voltage	V _{CC} = Min, I _{OL} = Max, V _{IH} = Min	DM74	0.35	0.5	V
		I _{OL} = 12 mA, V _{CC} = Min	DM74		0.4	
I _I	Input Current @ Max Input Voltage	V _{CC} = Max, V _I = 7V			0.1	mA
I _{IH}	High Level Input Current	V _{CC} = Max, V _I = 2.7V			20	μA
I _{IL}	Low Level Input Current	V _{CC} = Max, V _I = 0.4V			–0.4	mA
I _{OS}	Short Circuit Output Current	V _{CC} = Max (Note 3)	DM74 –20		–100	mA
I _{CCZ}	Supply Current	V _{CC} = Max			46	mA
I _{OZL}	3-STATE Output Off Current LOW	V _{CC} = V _{CCH} V _{OZL} = 0.4V			–20.0	μA
I _{OZH}	3-STATE Output Off Current HIGH	V _{CC} = V _{CCH} V _{OZH} = 2.7V			20.0	μA

Note 2: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 3: Not more than one output should be shorted at a time, and the duration should not exceed one second.

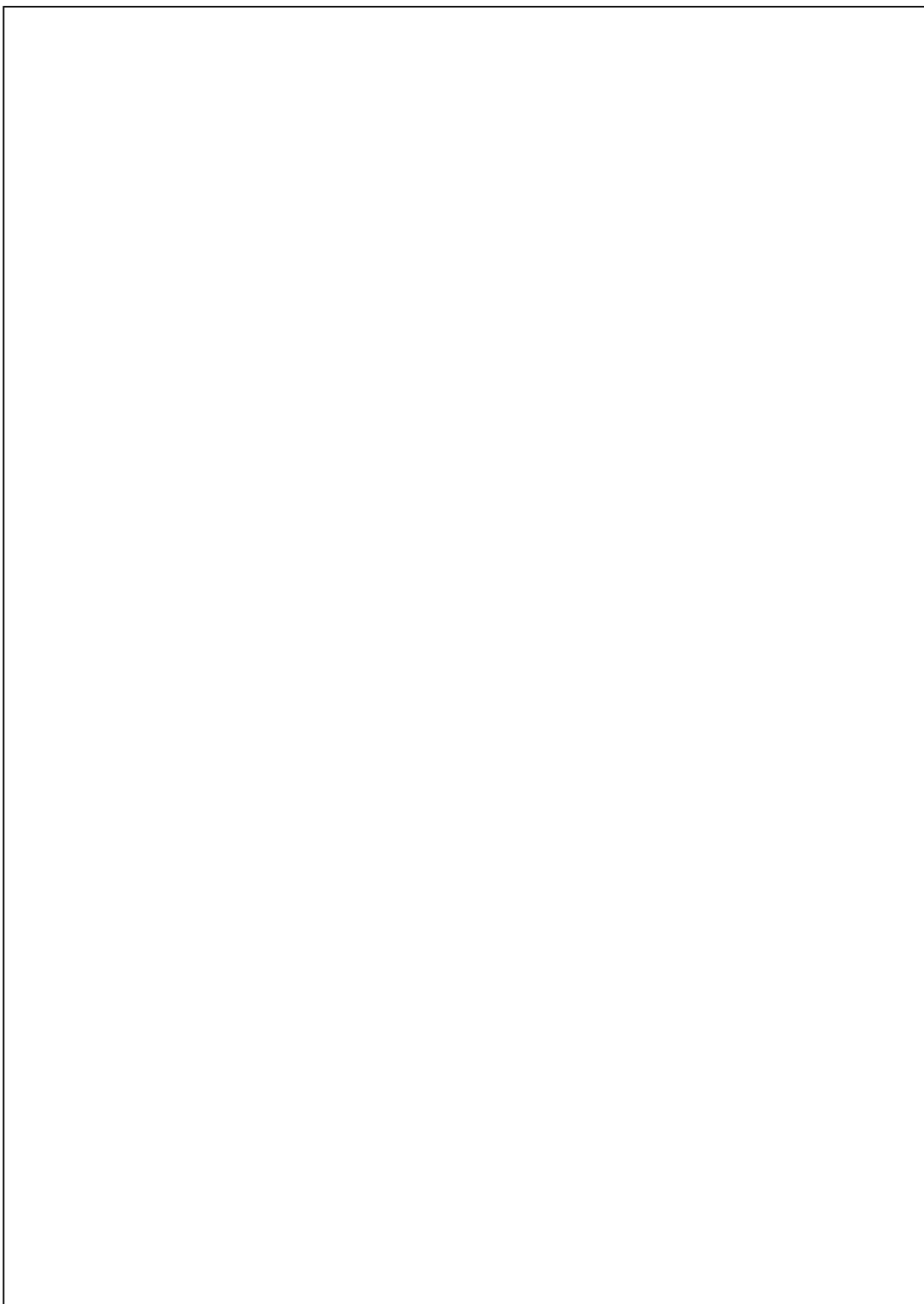
Switching CharacteristicsV_{CC} = +5.0V, T_A = +25°C (See Section 1 for waveforms and load configurations)

Symbol	Parameter	C _L = 50 pF R _L = 2 kΩ		Units
		Min	Max	
t _{PLH}	Propagation Delay Data to $\bar{Q}_x$		23	ns
t _{PHL}	Propagation Delay LE to $\bar{Q}_x$		25	ns

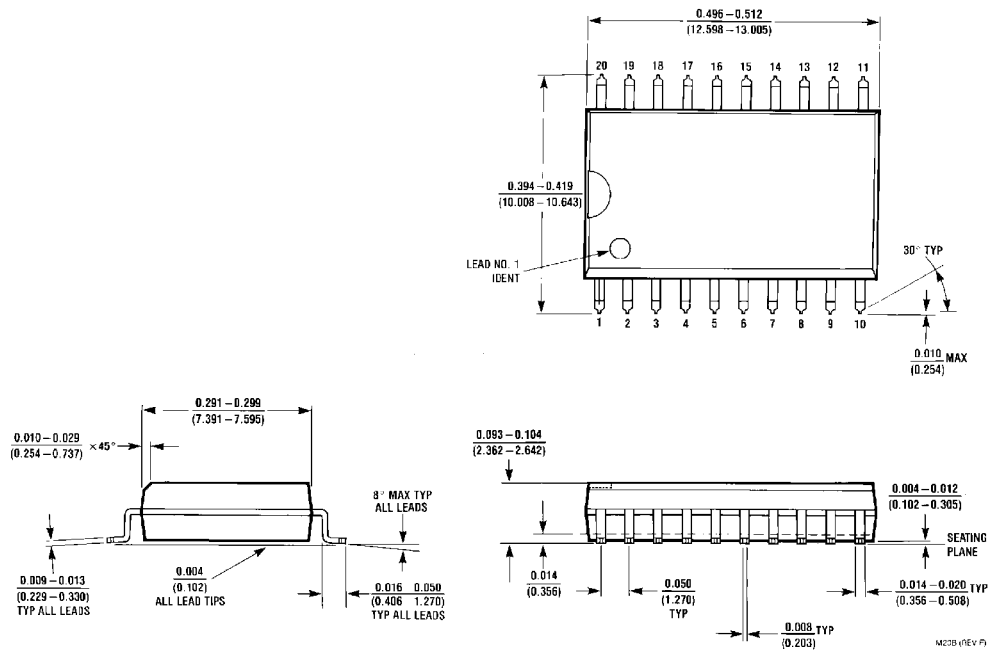
Switching Characteristics (Continued)

$V_{CC} = +5.0V$, $T_A = +25^\circ C$ (See Section 1 for waveforms and load configurations)

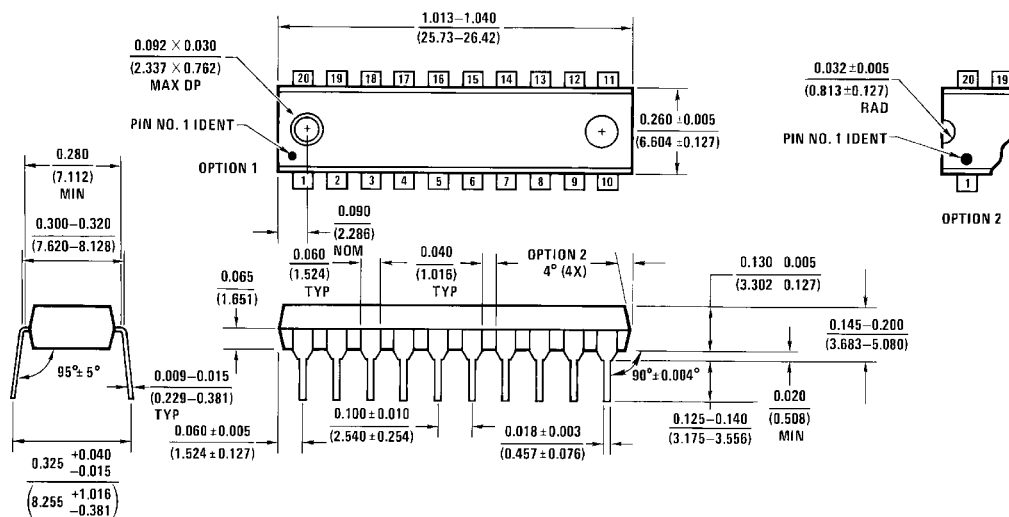
Symbol	Parameter	$C_L = 50\text{ pF}$ $R_L = 2\text{ k}\Omega$		Units
		Min	Max	
t_{PZL}	Output Enable Time $\overline{OE}$ to $\overline{Q}_x$		22	ns
t_{PZH}			20	
t_{PHZ}	Output Enable Time $\overline{OE}$ to $\overline{Q}_x$		20	ns
t_{PLZ}			25	



Physical Dimensions inches (millimeters) unless otherwise noted



20-Lead Wide Small Outline Molded Package (M)
Order Number DM74LS533WM
Package Number M20B



20-Lead Molded Dual-In-Line Package (N)
Order Number DM74LS533N
Package Number N20A