FAIRCHILD SEMICONDUCTOR™

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DM74LS533
Octal Transparent Latch with 3-STATE Outputs

General Description

The DM74LS533 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 DM74LS533 is the same as the DM74LS373, except that the outputs are inverted. For detailed specifications please see the DM74LS373 data sheet, but note that the propagation delays from data to output are 5.0 ns longer for the DM74LS533 than for the DM74LS373.

Features

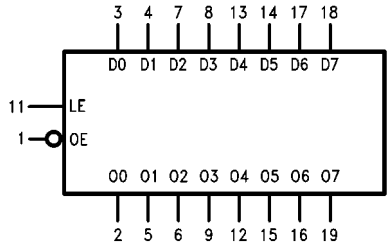
- Eight latches in a single package
- 3-STATE outputs for bus interfacing

Ordering Code:

Order Number	Package Number	Package Description
DM74LS533WM	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
DM74LS533N	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide

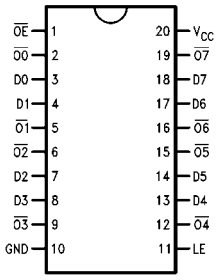
Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Logic Symbol



V_{CC} = Pin 20
GND = Pin 10

Connection Diagram



Pin Descriptions

Pin Names	Description
D0, D7	Data Inputs
LE	Latch Enable Input (Active HIGH)
$\overline{OE}$	Output Enable Input (Active LOW)
$\overline{O}0$–$\overline{O}7$	Complementary 3-STATE Outputs

Function Table

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

L = LOW State
H = HIGH State
X = Don't Care
Z = High Impedance State
$\overline{Q}_O$ = Previous Condition of $\overline{O}$

Absolute Maximum Ratings(Note 1)

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature Range	0°C to +70°C
Storage Temperature Range	−65°C to +150°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 tables are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Recommended Operating Conditions

Symbol	Parameter	Min	Nom	Max	Units
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

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	2.4	3.4		V
V_{OL}	LOW Level Output Voltage	V_{CC} = Min, I_{OL} = Max, V_{IH} = Min		0.35	0.5	V
		I_{OL} = 12 mA, V_{CC} = Min			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)	−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.

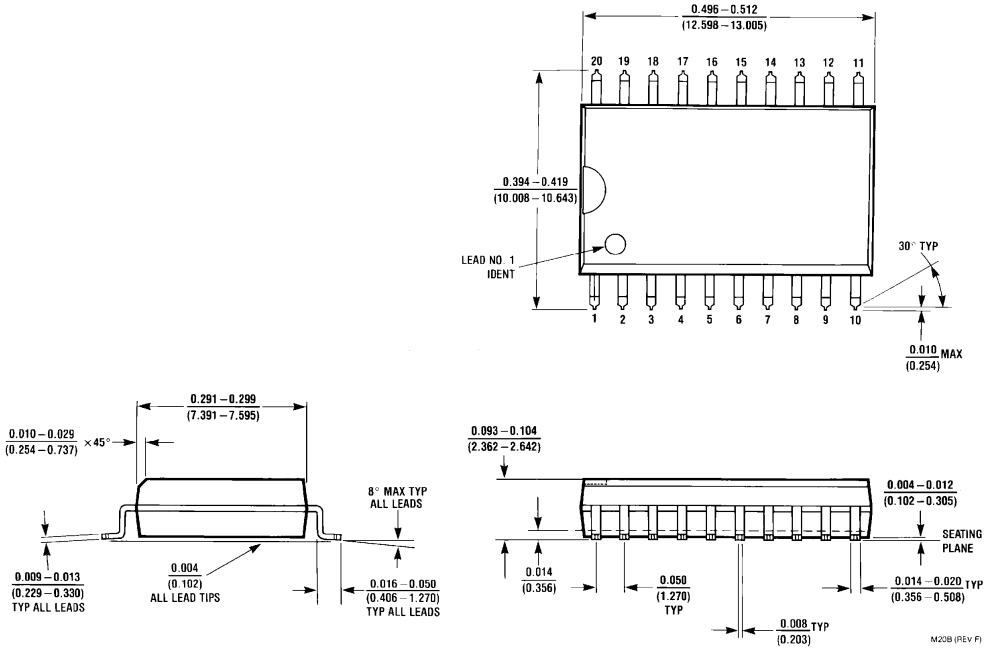
Note 3: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Switching Characteristics

V_{CC} = +5.0V, T_A = +25°C

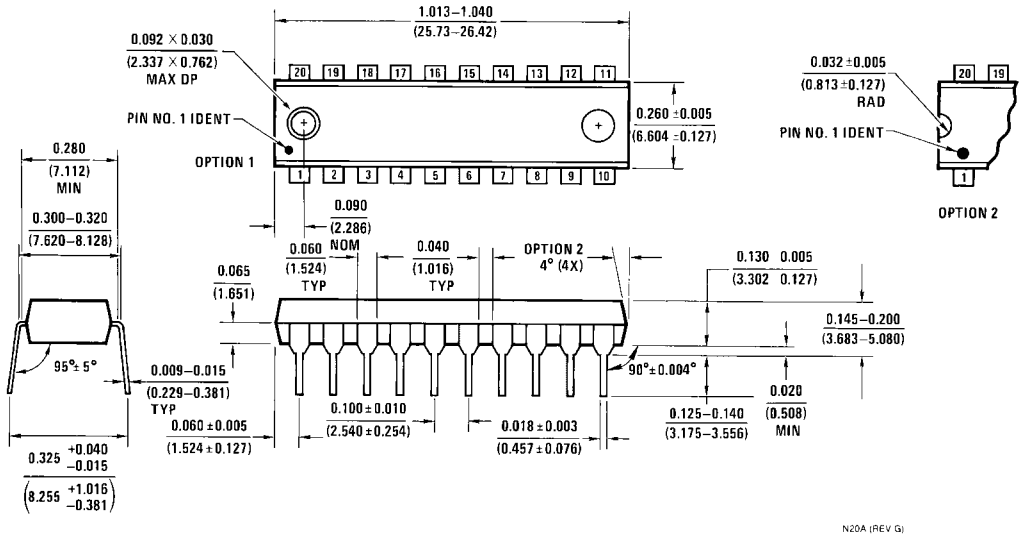
Symbol	Parameter	C_L = 50 pF, R_L = 2 kΩ		Units
		Min	Max	
t_{PLH}	Propagation Delay		23	ns
t_{PHL}	Data to $\overline{Q}_x$		23	
t_{PLH}	Propagation Delay		30	ns
t_{PHL}	LE to $\overline{Q}_x$		25	
t_{PZL}	Output Enable Time		22	ns
t_{PZH}	$\overline{OE}$ to $\overline{Q}_x$		20	
t_{PHZ}	Output Enable Time		20	ns
t_{PLZ}	$\overline{OE}$ to $\overline{Q}_x$		25	

Physical Dimensions inches (millimeters) unless otherwise noted



20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
Package Number M20B

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide
Package Number N20A