

DM74ALS563A

Octal D-Type Transparent Latch with 3-STATE Output

Features

- Switching specifications at 50pF
- Switching specifications guaranteed over full temperature and V_{CC} range
- Advanced oxide-isolated, ion-implanted Schottky TTL process
- 3-STATE buffer-type outputs drive bus lines directly

General Description

These 8-bit registers feature totem-pole 3-STATE outputs designed specifically for driving highly-capacitive or relatively low-impedance loads. The high-impedance state and increased high-logic-level drive provide these registers with the capability of being connected directly to and driving the bus lines in a bus-organized system without need for interface or pull-up components. They are particularly attractive for implementing buffer registers, I/O ports, bidirectional bus drivers, and working registers.

The eight inverting latches of the DM74ALS563A are transparent D-type latches. While the enable (G) is HIGH the Q outputs will follow the data (D) inputs. When the enable is taken LOW the output will be latched at the complement of the level of the data that was set up.

A buffered output control input can be used to place the eight outputs in either a normal logic state (HIGH or LOW logic levels) or a high-impedance state. In the high-impedance state the outputs neither load nor drive the bus lines significantly.

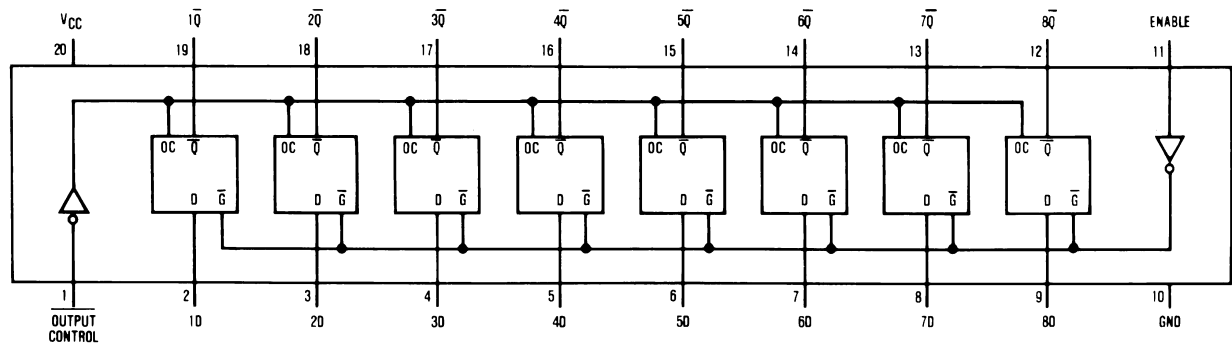
The output control does not affect the internal operation of the latches. That is, the old data can be retained or new data can be entered even while the outputs are OFF.

Ordering Information

Order Number	Package Number	Package Description
DM74ALS563AWM	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide

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

Connection Diagram

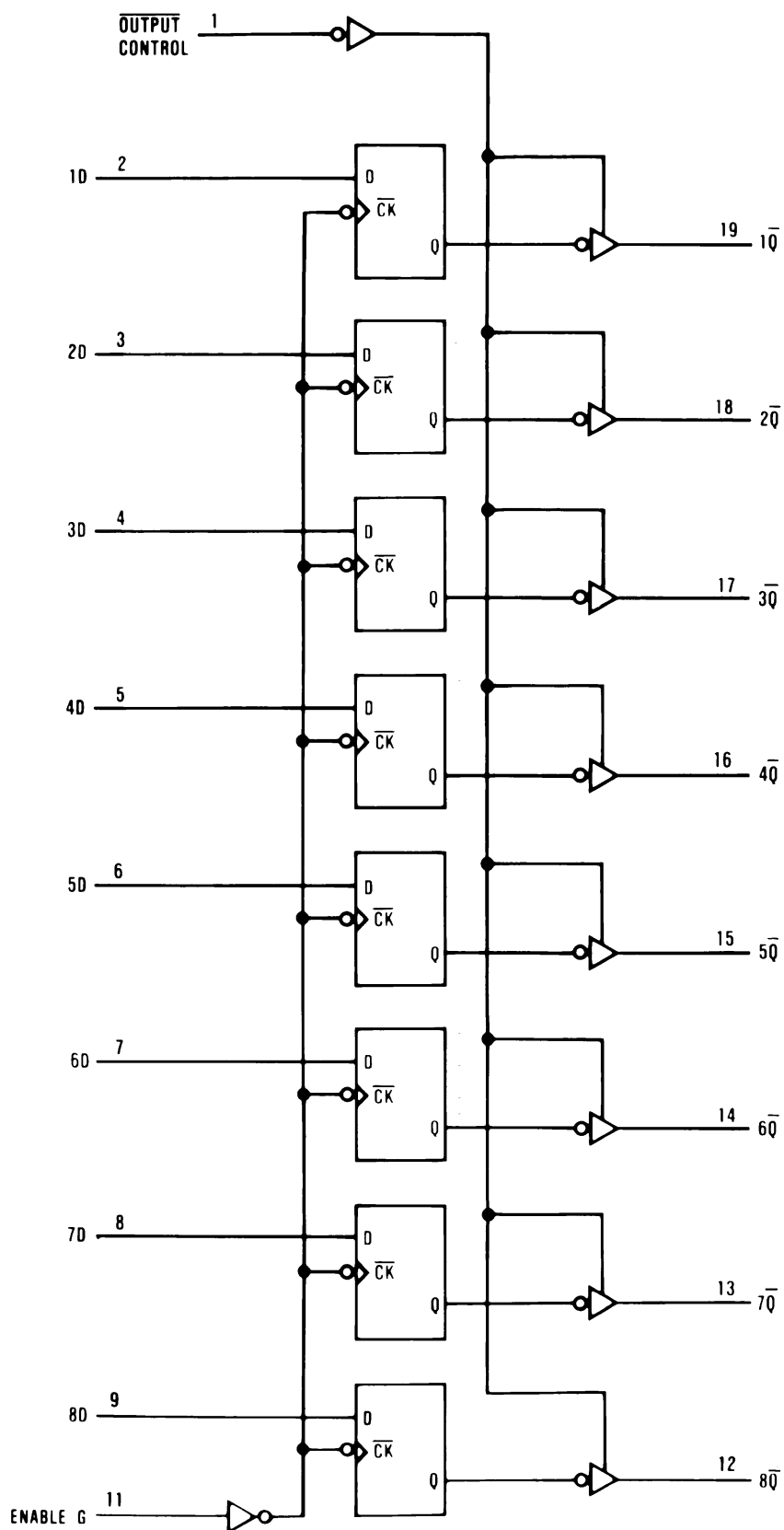


Function Table

Output Control	Enable G	D	Output $\overline{Q}$
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 $\overline{Q}$

Logic Diagram



Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter	Rating
V_{CC}	Supply Voltage	7V
V_I	Input Voltage	7V
	Voltage Applied to Disabled Output	5.5V
T_A	Operating Free Air Temperature Range	0°C to +70°C
T_{STG}	Storage Temperature Range	−65°C to +150°C
θ_{JA}	Typical Thermal Resistance	75.0°C/W

Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Fairchild does not recommend exceeding them or designing to absolute maximum ratings.

Symbol	Parameter	Min.	Nom.	Max.	Units
V_{CC}	Supply Voltage	4.5	5	5.5	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_W	Width of Enable Pulse, HIGH or LOW	15			ns
t_{SU}	Data Setup Time ⁽¹⁾	10↓			ns
t_H	Data Hold Time ⁽¹⁾	10↓			ns
T_A	Free Air Operating Temperature	0		70	°C

Note:

1. The (↓) arrow indicates the negative edge of the enable is used for reference.

Electrical Characteristics

Over recommended operating free air temperature range. All typical values are measured at $V_{CC} = 5V$, $T_A = 25^\circ C$.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_{IK}	Input Clamp Voltage	$V_{CC} = 4.5V$, $I_I = -18\text{ mA}$			-1.2	V
V_{OH}	HIGH Level Output Voltage	$V_{CC} = 4.5V$, $V_{IL} = V_{IL\text{ Max.}}$, $I_{OH} = \text{Max.}$	2.4	3.2		V
		$V_{CC} = 4.5V$ to $5.5V$, $I_{OH} = -400\mu A$	$V_{CC} - 2$			V
V_{OL}	LOW Level Output Voltage	$V_{CC} = 4.5V$, $V_{IH} = 2V$, $I_{OL} = 12\text{mA}$		0.25	0.4	V
		$I_{OL} = 24\text{mA}$		0.35	0.5	
I_I	Input Current @ Maximum Input Voltage	$V_{CC} = 5.5V$, $V_{IH} = 7V$			0.1	mA
I_{IH}	HIGH Level Input Current	$V_{CC} = 5.5V$, $V_{IH} = 2.7V$			20	μA
I_{IL}	LOW Level Input Current	$V_{CC} = 5.5V$, $V_{IL} = 0.4V$			-0.1	mA
I_O	Output Drive Current	$V_{CC} = 5.5V$, $V_O = 2.25V$	-30		-112	mA
I_{OZH}	OFF-State Output Current HIGH Level Voltage Applied	$V_{CC} = 5.5V$, $V_{IH} = 2V$, $V_O = 2.7V$			20	μA
I_{OZL}	OFF-State Output Current LOW Level Voltage Applied	$V_{CC} = 5.5V$, $V_{IH} = 2V$, $V_O = 0.4V$			-20	μA
I_{CC}	Supply Current	$V_{CC} = 5.5V$, Outputs OPEN	Outputs HIGH	10	17	mA
			Outputs LOW	16	26	
			Outputs Disabled	17	29	

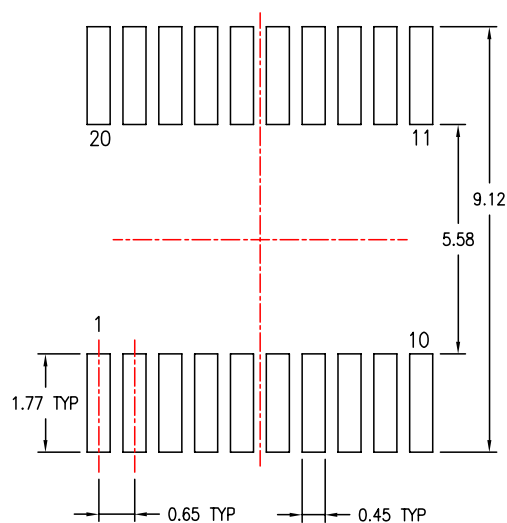
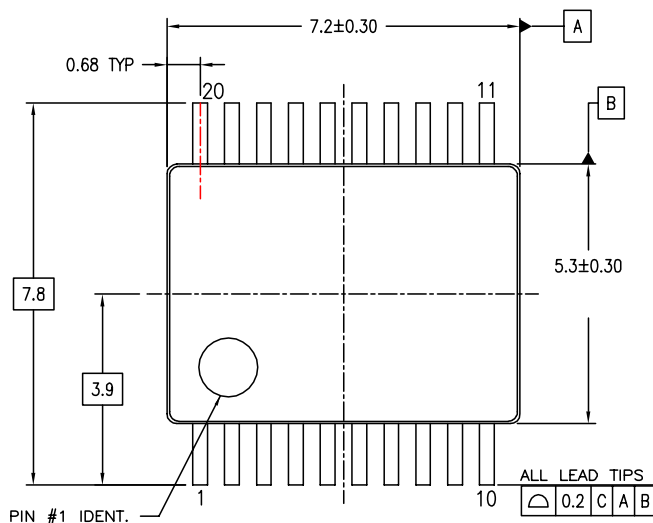
Switching Characteristics

Over recommended operating free air temperature range.

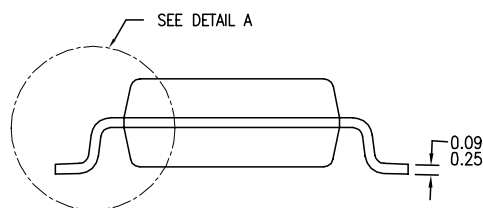
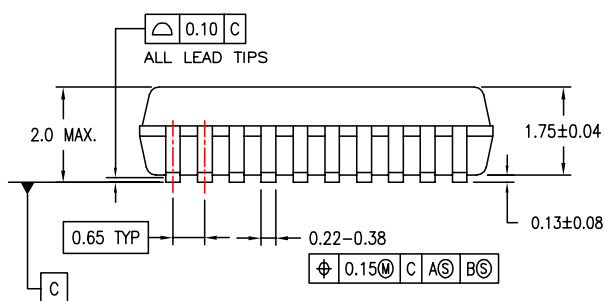
Symbol	Parameter	Conditions	From	To	Min.	Max.	Units
t_{PLH}	Propagation Delay Time, LOW-to-HIGH Level Output	$V_{CC} = 4.5V$ to $5.5V$ $R_L = 500\Omega$ $C_L = 50\text{pF}$	Data	Any $\overline{Q}$	3	18	ns
t_{PHL}	Propagation Delay Time, HIGH-to-LOW Level Output		Data	Any $\overline{Q}$	3	14	ns
t_{PLH}	Propagation Delay Time, LOW-to-HIGH Level Output		Enable	Any $\overline{Q}$	8	22	ns
t_{PHL}	Propagation Delay Time, HIGH-to-LOW Level Output		Enable	Any $\overline{Q}$	8	21	ns
t_{PZH}	Output Enable Time to HIGH Level Output		Output Control	Any $\overline{Q}$	4	18	ns
t_{PZL}	Output Enable Time to LOW Level Output		Output Control	Any $\overline{Q}$	4	18	ns
t_{PHZ}	Output Disable Time from HIGH Level Output		Output Control	Any $\overline{Q}$	2	10	ns
t_{PLZ}	Output Disable Time from LOW Level Output		Output Control	Any $\overline{Q}$	3	15	ns

Physical Dimensions

Dimensions are in millimeters unless otherwise noted.



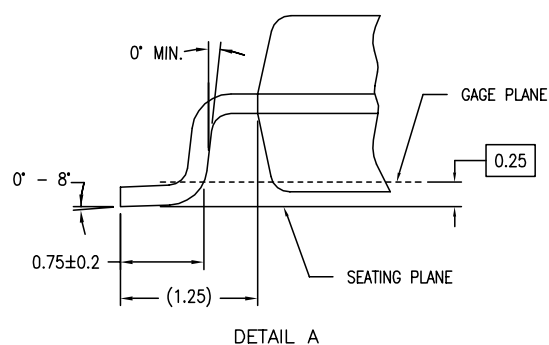
LAND PATTERN RECOMMENDATIONS



DIMENSIONS ARE IN MILLIMETERS

NOTES:

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- DIMENSIONS ARE IN MILLIMETERS.
- DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
- DIMENSIONS AND TOLERANCES PER ASME Y14.5M - 1994.



MSA20REVB

Figure 1. 20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide Package Number M20B

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