

# DM74ALS640A

## Inverting Octal Bus Transceiver

## General Description

This inverting octal bus transceiver is designed for asynchronous two-way communication between data busses. This device transmits data from the A bus to the B bus or from the B bus to the A bus depending upon the level at the direction control (DIR) input. The enable input (G) can be used to disable the device so the busses are effectively isolated.

## Features

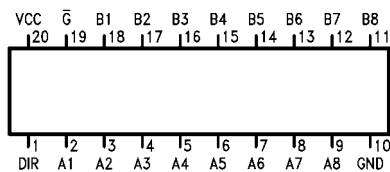
- Advanced Oxide-isolated Ion-implanted Schottky TTL process
- Switching performance is guaranteed over full temperature and  $V_{CC}$  supply range
- Switching performance specified at 50 pF
- PNP input design reduces input loading

**Ordering Code:**

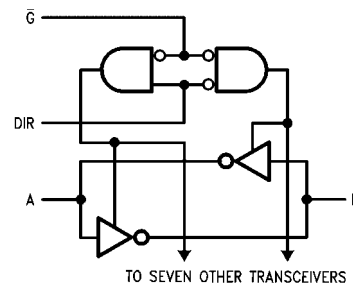
Order Number	Package Number	Package Description
DM74ALS640AWM	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
DM74ALS640AN	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide

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

### Connection Diagram



### Logic Diagram



## Function Table

Control Inputs		Operation
$\overline{G}$	DIR	
L	L	$\overline{B}$ Data to A Bus
L	H	$\overline{A}$ Data to B Bus
H	X	Isolation

L = LOW Logic Level  
H = HIGH Logic Level  
X = Either LOW or HIGH Logic Level

**Absolute Maximum Ratings**(Note 1)

Supply Voltage	7V
Input Voltage	
Control Inputs	7V
I/O ports	5.5V
Operating Free Air Temperature Range	0°C to +70°C
Storage Temperature Range	–65°C to +150°C
Typical $\theta_{JA}$	
N Package	53.0°C/W
M Package	72.0°C/W

**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	Typ	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			–15	mA
$I_{OL}$	LOW Level Output Current			24	mA
$T_A$	Operating Free Air Temperature Range	0		70	°C

**Electrical Characteristics**

Over Recommended Free Air Temperature Range

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
$V_{IC}$	Input Clamp Voltage	$V_{CC} = \text{Min}$ , $I_I = -18 \text{ mA}$			–1.5	V
$V_{OH}$	HIGH Level Output Voltage	$V_{CC} = 4.5 \text{ to } 5.5 \text{ V}$	$I_{OH} = -0.4 \text{ mA}$	$V_{CC} - 2$		V
		$V_{CC} = \text{Min}$	$I_{OH} = -3 \text{ mA}$	2.4	2.9	
			$I_{OH} = \text{Max}$	2		
$V_{OL}$	LOW Level Output Voltage	$V_{CC} = \text{Min}$	$I_{OL} = 12 \text{ mA}$	0.25	0.4	V
			$I_{OL} = 24 \text{ mA}$	0.35	0.5	
$I_I$	Input Current at Maximum Input Voltage	$V_{CC} = \text{Max}$	I/O Ports, $V_I = 5.5 \text{ V}$		100	$\mu\text{A}$
			Control Inputs, $V_I = 7 \text{ V}$		100	
$I_{IH}$	HIGH Level Input Current	$V_{CC} = \text{Max}$ , $V_I = 2.7 \text{ V}$ (Note 2)			20	$\mu\text{A}$
$I_{IL}$	LOW Level Input Current	$V_{CC} = \text{Max}$ , $V_I = 0.4 \text{ V}$ (Note 2)			–100	$\mu\text{A}$
$I_O$	Output Drive Current	$V_{CC} = \text{Max}$ , $V_O = 2.25 \text{ V}$	–30		–112	mA
$I_{CC}$	Supply Current	$V_{CC} = \text{Max}$	Outputs HIGH	19	45	mA
			Outputs LOW	23	55	
			Outputs Disabled	17	50	

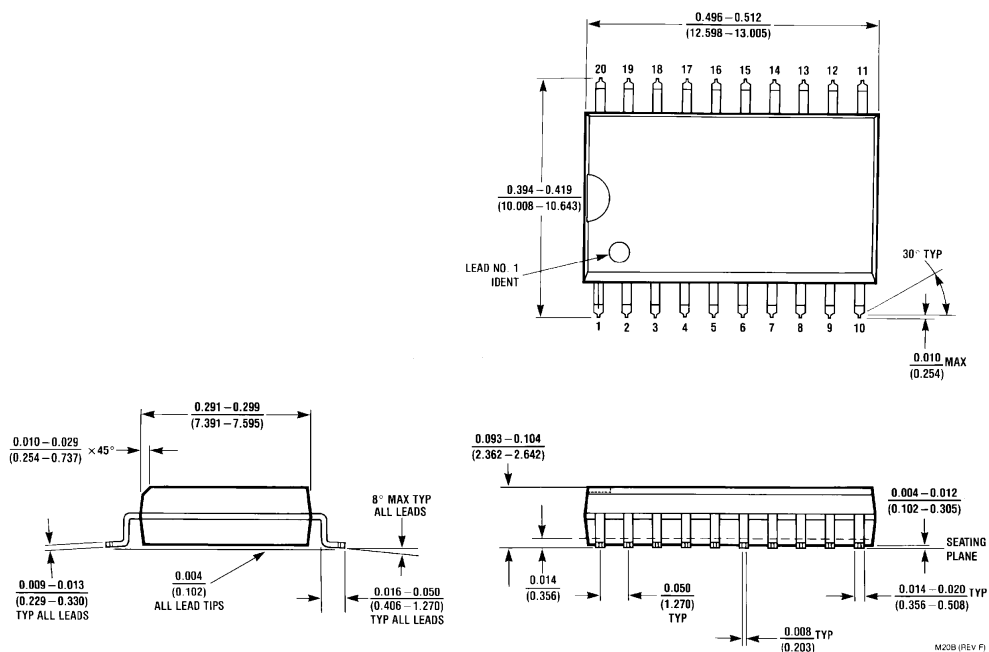
**Note 2:** For I/O ports,  $I_{IH}$  and  $I_{IL}$  parameters include the 3-STATE output current ( $I_{OZL}$  and  $I_{OZH}$ ).

**Switching Characteristics**

Over Recommended Operating Free Air Temperature Range

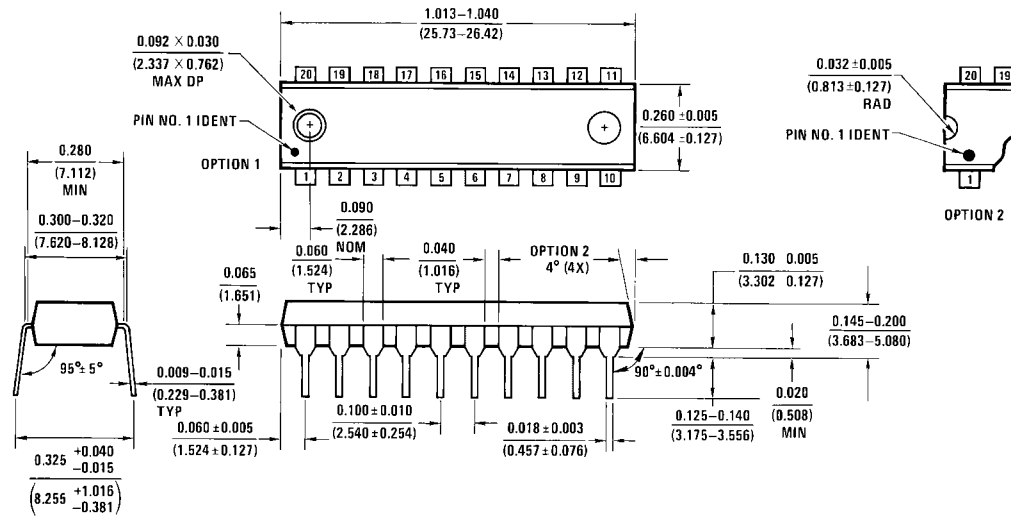
Symbol	Parameter	From (Input)	To (Output)	Conditions	Min	Max	Units
$t_{PLH}$	Propagation Delay Time LOW-to-HIGH Level Output	A or B	B or A	$V_{CC} = 4.5 \text{ to } 5.5 \text{ V}$ , $C_L = 50 \text{ pF}$ , $R1 = R2 = 500 \Omega$	1	11	ns
$t_{PHL}$	Propagation Delay Time HIGH-to-LOW Level Output	A or B	B or A		1	10	ns
$t_{PZH}$	Output Enable Time to HIGH Level Output	$\overline{G}$	A or B		4	21	ns
$t_{PZL}$	Output Enable Time to LOW Level Output	$\overline{G}$	A or B		5	24	ns
$t_{PHZ}$	Output Disable Time from HIGH Level Output	$\overline{G}$	A or B		1	10	ns
$t_{PLZ}$	Output Disable Time from LOW Level Output	$\overline{G}$	A or B		3	15	ns

**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)



N20A (REV G)

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

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