February 1998

FAIRCHILD SEMICONDUCTOR™

DM74ALS245A
Octal 3-STATE Bus Transceiver

General Description

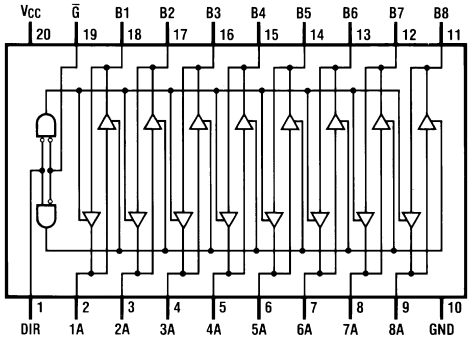
This advanced low power Schottky device contains 8 pairs of 3-STATE logic elements configured as octal bus transceivers. These circuits are designed for use in memory, microprocessor systems and in asynchronous bidirectional data buses. Two way communication between buses is controlled by the (DIR) input. Data transmits either from the A bus to the B bus or from the B bus to the A bus. Both the driver and receiver outputs can be disabled via the ($\overline{G}$) enable input which causes outputs to enter the high impedance mode so that the buses are effectively isolated.

Features

- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Non-inverting logic output
- Glitch free bus during power up and down
- 3-STATE outputs independently controlled on A and B buses
- Low output impedance to drive terminated transmission lines to 133Ω
- Switching response specified into 500Ω/50 pF
- Specified to interface with CMOS at $V_{OH} = V_{CC} - 2V$
- PNP inputs to reduce input loading
- Switching specifications guaranteed over full temperature and V_{CC} range

Connection Diagram

Dual-In-Line Package



DS006213-1

Order Number DM74ALS245MSA, DM74ALS245AWM, DM74ALS245AN or DM74ALS245ASJ
See Package Number M20B, M20D, MQA20 or N20A

Function Table

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

H = High Logic Level
L = Low Logic Level
X = Either High or Low 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	
DM74ALS	0˚C to +70˚C
Storage Temperature Range	−65˚C to +150˚C
Typical θ_{JA}	
N Package	53.0˚C/W
M Package	72.0˚C/W

Recommended Operating Conditions

Symbol	Parameter	DM74ALS245A			Units
		Min	Typ	Max	
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	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.*

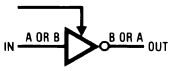
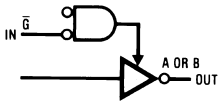
Electrical Characteristics

over recommended operating free air temperature range. All typical values are measured at V_{CC} = 5V, T_A = 25˚C.

Symbol	Parameter	Conditions			Min	Typ	Max	Units
V_{IK}	Input Clamp Voltage	V_{CC} = 4.5V, I_{IN} = −18 mA					−1.5	V
V_{OH}	High Level Output Voltage	V_{CC} = 4.5V, I_{OH} = −3 mA			2.4	3.2		V
		V_{CC} = 4.5V, I_{OH} = Max			2	2.3		V
		I_{OH} = −0.4 mA, V_{CC} = 4.5V to 5.5V			V_{CC} − 2			V
V_{OL}	Low Level Output Voltage	V_{CC} = 4.5V	I_{OL} = 24 mA			0.35	0.5	V
I_I	Input Current at Max Input Voltage	V_{CC} = 5.5V	V_{IN} = 7V	Control Inputs			0.1	mA
			V_{IN} = 5.5V	A or B Ports			0.1	
I_{IH}	High Level Input Current	V_{CC} = 5.5V, V_{IN} = 2.7V					20	µA
I_{IL}	Low Level Input Current	V_{CC} = 5.5V, V_{IN} = 0.4V					−0.1	mA
I_O	Output Drive Current	V_{CC} = 5.5V, V_{OUT} = 2.25V			−30		−112	mA
I_{CC}	Supply Current	V_{CC} = 5.5V	Outputs High			30	45	mA
			Outputs Low			36	55	mA
			3-STATE			38	58	mA

Switching Characteristics

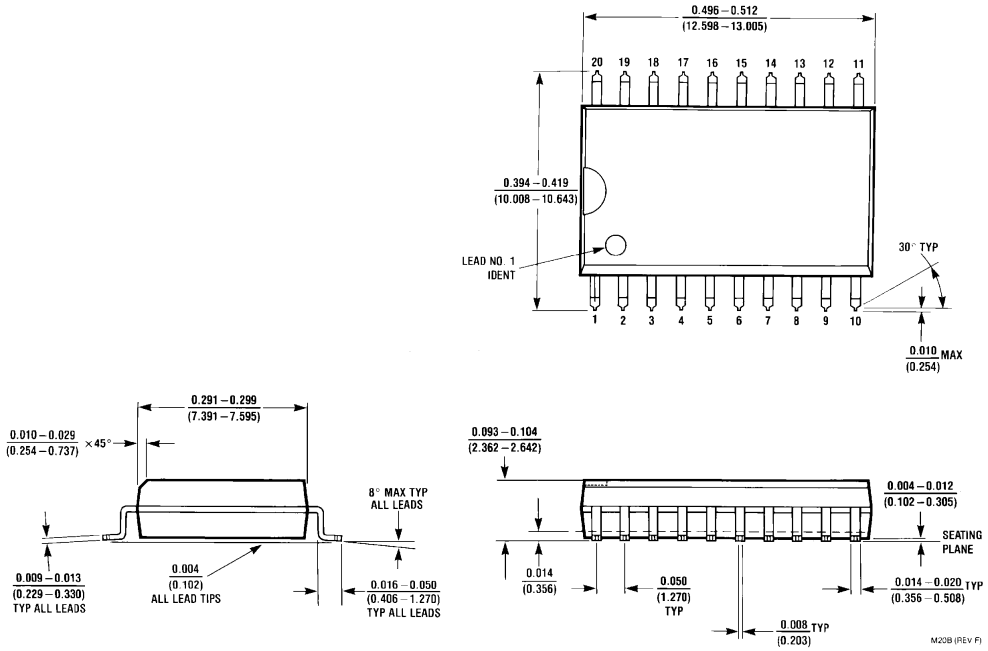
over recommended operating free air temperature range (Notes 2, 3)

Symbol	Parameter	Circuit Configuration	DM74ALS245A		Units
			Min	Max	
t_{PLH}	Propagation Delay Time Low-to-High Level Output		3	10	ns
t_{PHL}	Propagation Delay Time High-to-Low Level Output		3	10	ns
t_{PZL}	Output Enable Time to Low Level		5	20	ns
t_{PZH}	Output Enable Time to High Level		5	20	ns
t_{PLZ}	Output Disable Time from Low Level		4	15	ns
t_{PHZ}	Output Disable Time from High Level		2	10	ns

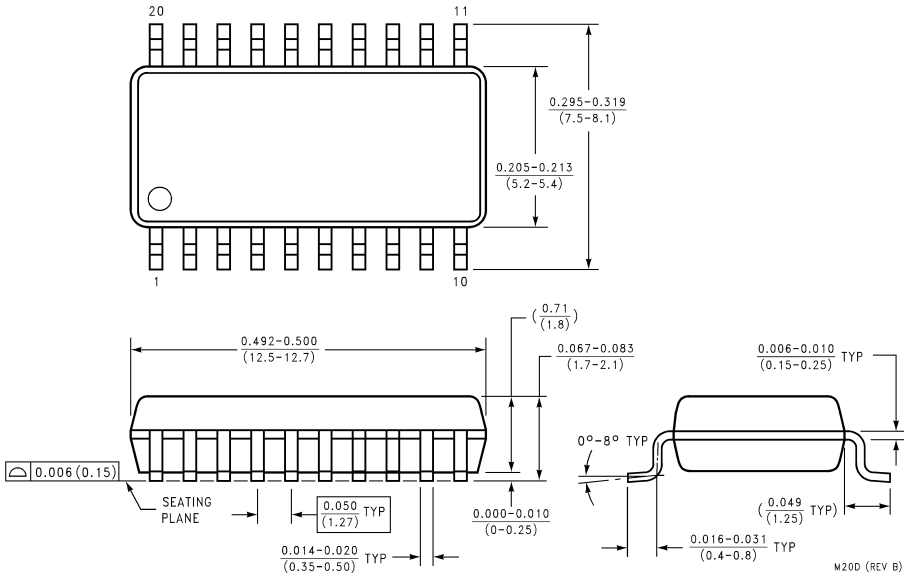
Note 2: See Section 1 for test waveforms and output load.

Note 3: Switching characteristic conditions are V_{CC} = 4.5V to 5.5V, R_L = 500Ω, C_L = 50 pF.

Physical Dimensions inches (millimeters) unless otherwise noted

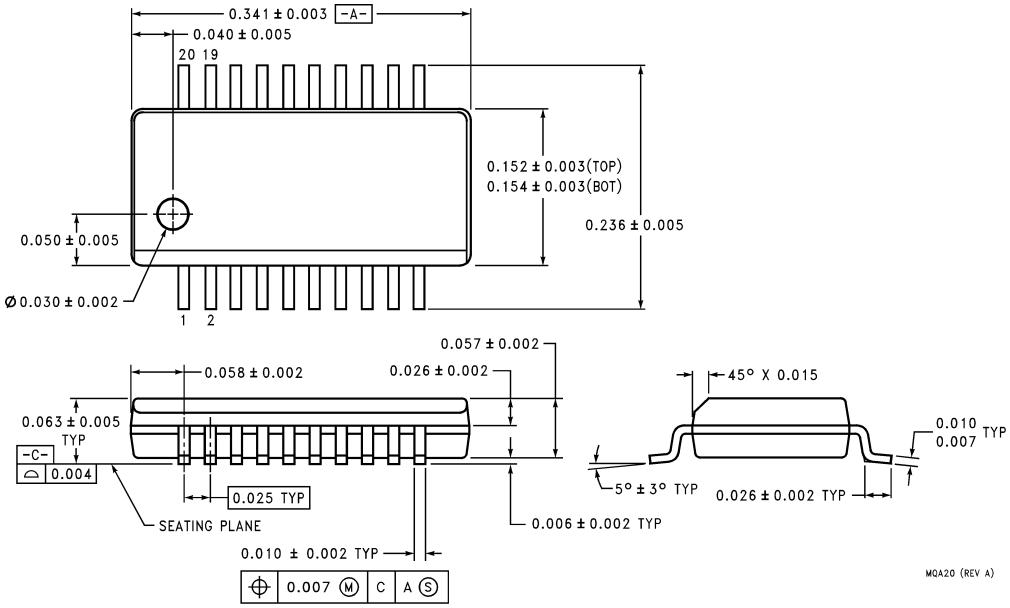


20-Lead (0.300" Wide) Small Outline Package (M)
Order Number DM74ALS245MSA or DM74ALS245AWM
Package Number M20B

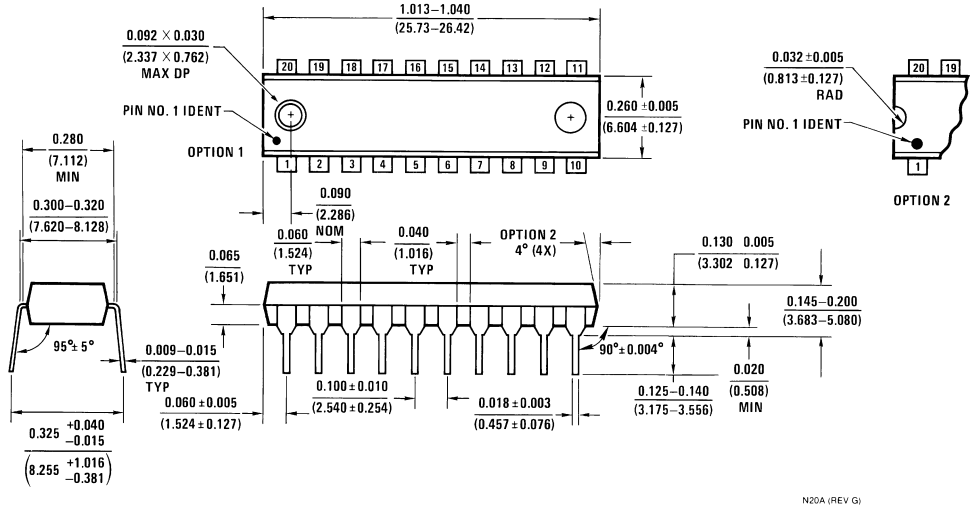


20-Lead Small Output Package-EIAJ (SJ)
Order Number DM74ALS245ASJ
Package Number M20D

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



20-Lead (0.150" Wide) Shrink Small Outline Package, JEDEC
Package Number MQA20



Molded Dual-In-Line Package (N)
Order Number DM74ALS245AN
Package Number N20A

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