FAIRCHILD SEMICONDUCTOR™

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DM74AS240, 244
3-STATE Bus Driver/Receiver

General Description

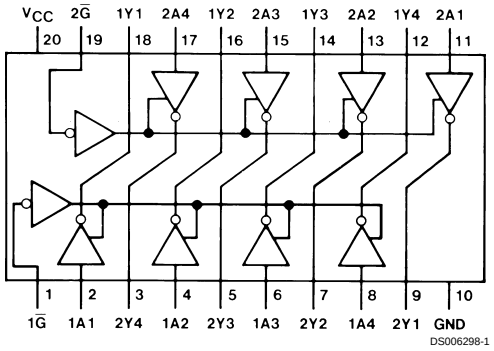
This family of Advance Schottky 3-STATE Bus circuits are designed to provide either bidirectional or unidirectional buffer interface in Memory, Microprocessor, and Communication Systems. The output characteristics of the circuits have low impedance sufficient to drive terminated transmission lines down to 133 ohms. The input characteristics of the circuits likewise have a high impedance so it will not significantly load the transmission line. The package contains eight 3-STATE buffers organized with four buffers having a common 3-STATE enable gate. The AS240 and 244 are eight wide in a 20 pin package, and may be used as a 4 wide bidirectional or eight wide unidirectional. The buffer selection includes inverting and non-inverting, with enable or disable 3-STATE control.

Features

- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Improved switching performance with less power dissipation compared with Schottky counterpart
- Functional and pin compatible with 74LS and Schottky counterpart
- Switching response specified into 500 ohm and 50 pF
- Specified to interface with CMOS at $V_{OH} = V_{CC} - 2V$

Connection Diagrams

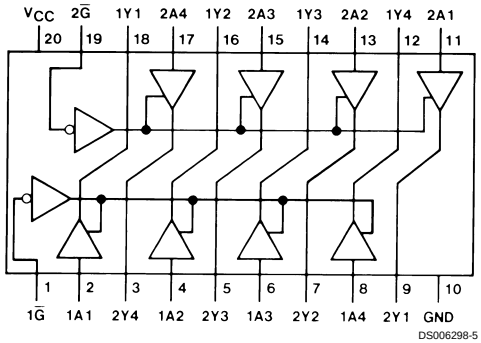
Dual-In-Line Package



DS006298-1

Order Number DM74AS240WM or DM74AS240N
See Package Number M20B or N20A

Dual-In-Line Package



DS006298-5

Order Number DM74AS244WM or DM74AS244N
See Package Number M20B or N20A

Function Tables

AS240

Inputs		Output
$\overline{G}$	A	Y
L	L	H
L	H	L
H	X	Z

AS244

Inputs		Output
$\overline{G}$	A	Y
L	L	L
L	H	H
H	X	Z

L = Low Logic Level H = High Logic Level
X = Either Low or High Logic Level
Z = High Impedance

Absolute Maximum Ratings (Note 2)

Supply Voltage, V_{CC}	7V
Input Voltage	7V
Voltage Applied to Disabled Output	5.5V
Operating Free Air Temperature Range	0˚C to +70˚C
Storage Temperature Range	−65˚C to +150˚C
Typical θ_{JA}	
AS240/244 N Package	57.0˚C/W
M Package	76.0˚C/W

Recommended Operating Conditions

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			−15	mA
I_{OL}	Low Level Output Current			64	mA
T_A	Free Air Operating Temperature	0		70	˚C

Note 1: This product meets application requirements of 500 temperature cycles from −65˚C to +150˚C.

Note 2: *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.*

Note 3: The output conditions have been chosen to produce a current that closely approximates one half the true short-circuit output current, I_{OS}.

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					−1.2	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			2.4			
		I_{OH} = −2 mA, V_{CC} = 4.5V to 5.5V			V_{CC}−2			
V_{OL}	Low Level Output Voltage	V_{CC} = 4.5V, I_{OL} = Max				0.35	0.55	V
I_I	Input Current at Max Input Voltage	V_{CC} = 5.5V	V_{IN} = 7V	Others			100	µA
I_{IH}	High Level Input Current	V_{CC} = 5.5V, V_{IN} = 2.7V		Others			20	µA
I_{IL}	Low Level Input Current	V_{CC} = 5.5V, V_{IN} = 0.4V		AS240, (G, $\overline{G}$), (Control Inputs), 244 ($\overline{G}$)			−500	µA
				244 (A)			−1000	
I_{OZH}	High Level 3-STATE Output Current	V_{CC} = 5.5V, V= 2.7V					50	µA
I_{OZL}	Low Level 3-STATE Output Current	V_{CC} = 5.5V, V = 0.4V		AS240, AS244			−50	µA
I_O (Note 3)	Output Drive Current	V_{CC} = 5.5V, V_{OUT} = 2.25V			−50	−115	−150	mA
I_{CC}	AS240 Supply Current	V_{CC} = 5.5V	Outputs High			11	17	mA
			Outputs Low			51	75	
			3-STATE			24	38	
I_{CC}	AS244 Supply Current	V_{CC} = 5.5V	Outputs High			22	34	mA
			Outputs Low			60	90	
			3-STATE			34	54	

'AS240 Switching Characteristics

over recommended operating free air temperature range (Note 4)

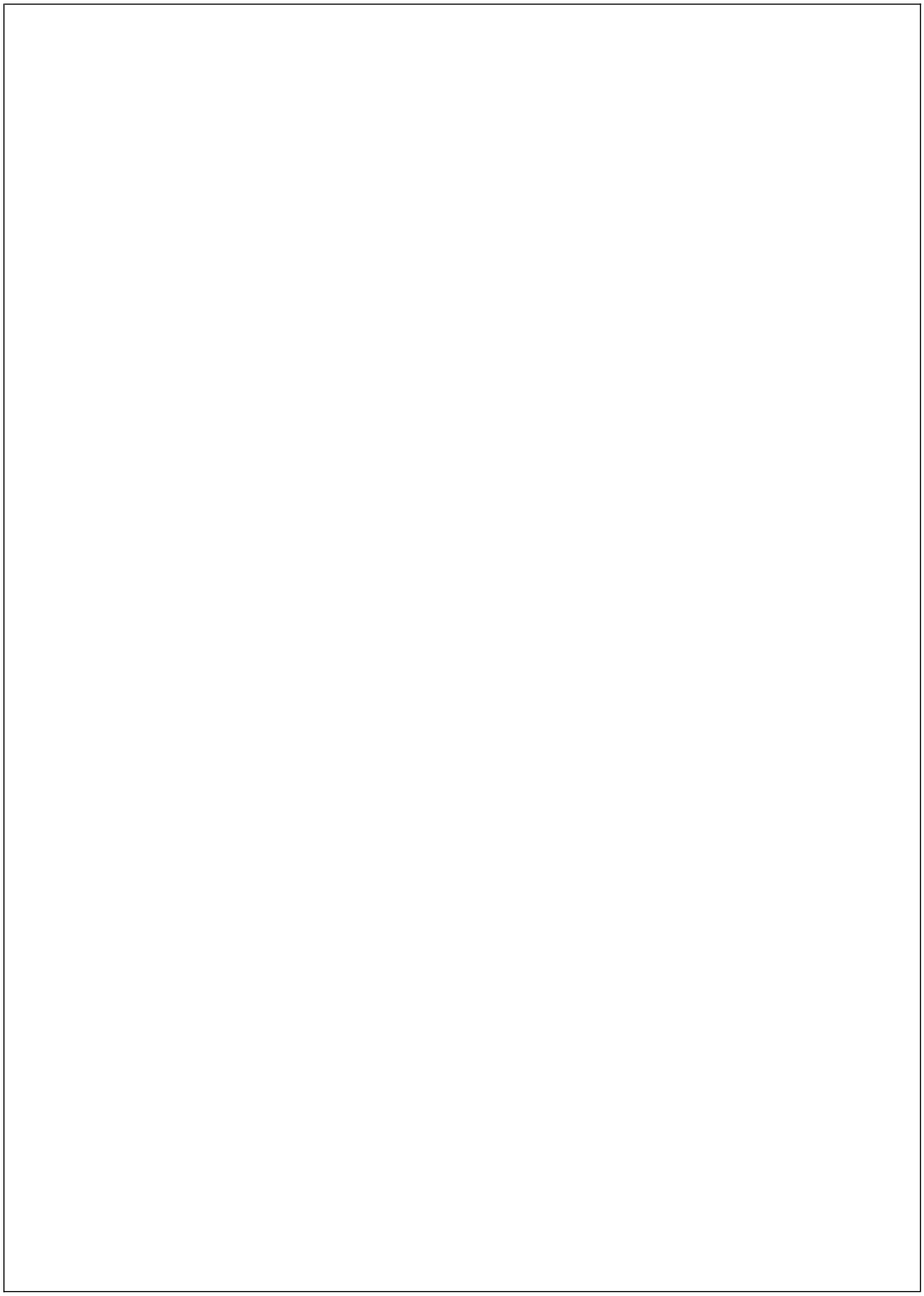
Symbol	Parameter	Conditions	From (Input)	To (Output)	Min	Max	Units
t_{PLH}	Propagation Delay Time Low-to-High Level Output	V_{CC} = 4.5V to 5.5V $R_1 = R_2 = 500\Omega$	A	Y	2	6.5	ns
t_{PHL}	Propagation Delay Time High-to-Low Level Output	C_L = 50 pF	A	Y	2	5.7	ns
t_{PZL}	Output Enable to Low Level		$\overline{G}$	Y	2	9	ns
t_{PZH}	Output Enable to High Level		$\overline{G}$	Y	2	6.4	ns
t_{PLZ}	Output Disable from Low Level		$\overline{G}$	Y	2	9.5	ns
t_{PHZ}	Output Disable from High Level		$\overline{G}$	Y	2	5	ns

'AS244 Switching Characteristics

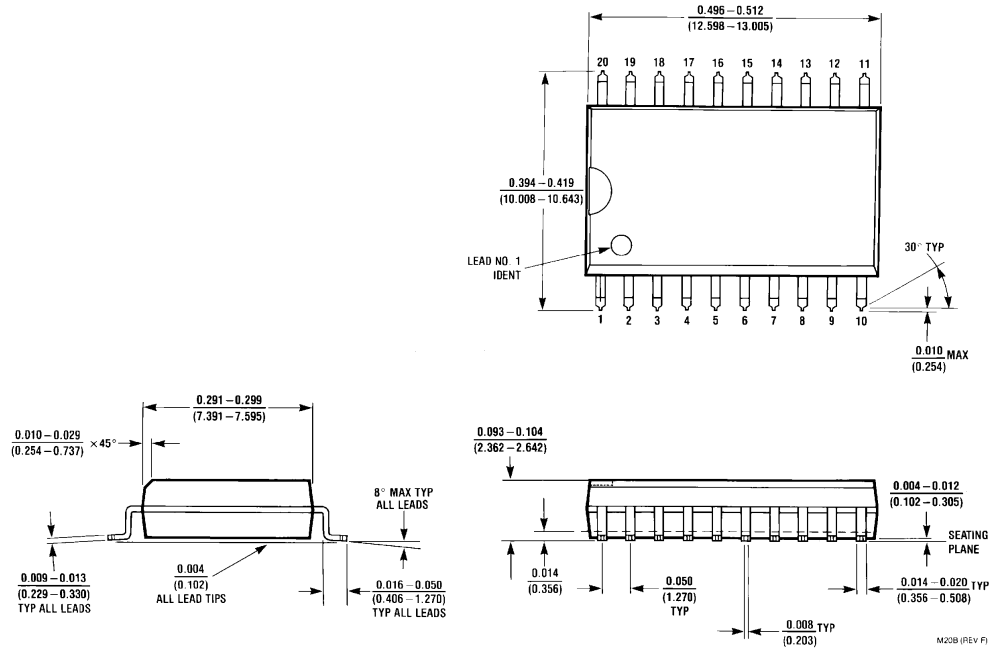
over recommended operating free air temperature range (Note 4)

Symbol	Parameter	Conditions	From (Input)	To (Output)	Min	Max	Units
t_{PLH}	Propagation Delay Time Low-to-High Level Output	V_{CC} = 4.5V to 5.5V $R_1 = R_2 = 500\Omega$	A	Y	2	6.2	ns
t_{PHL}	Propagation Delay Time High-to-Low Level Output	C_L = 50 pF	A	Y	2	6.2	ns
t_{PZL}	Output Enable to Low Level		$\overline{G}$	Y	2	7.5	ns
t_{PZH}	Output Enable to High Level		$\overline{G}$	Y	2	9	ns
t_{PLZ}	Output Disable from Low Level		$\overline{G}$	Y	2	9	ns
t_{PHZ}	Output Disable from High Level		$\overline{G}$	Y	2	6	ns

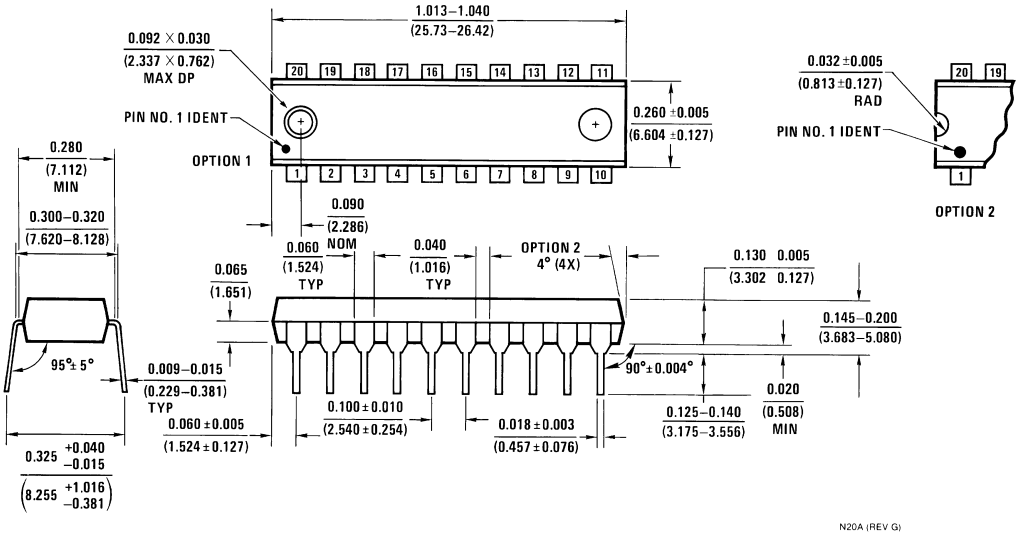
Note 4: See Section 5 for test waveforms and output load.



Physical Dimensions inches (millimeters) unless otherwise noted



S.O. Package (M)
Order Number DM74AS240WM or DM74AS244WM
Package Number M20B



Molded Dual-In-Line Package (N)
Order Number DM74AS240N or DM74AS244N
Package Number N20A

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Fairchild Semiconductor Corporation
Americas
Customer Response Center
Tel: 1-888-522-5372

www.fairchildsemi.com

Fairchild Semiconductor Europe
Fax: +49 (0) 1 80-530 85 86
Email: europe.support@nsc.com
Deutsch Tel: +49 (0) 8 141-35-0
English Tel: +44 (0) 1 793-85-68-56
Italy Tel: +39 (0) 2 57 5631

Fairchild Semiconductor Hong Kong Ltd.
13th Floor, Straight Block,
Ocean Centre, 5 Canton Rd.
Tsimshatsui, Kowloon
Hong Kong
Tel: +852 2737-7200
Fax: +852 2314-0061

National Semiconductor Japan Ltd.
Tel: 81-3-5620-6175
Fax: 81-3-5620-6179