

AmZ8140 • AmZ8144

Octal Three-State Buffers

DISTINCTIVE CHARACTERISTICS

- Three-state outputs drive bus lines directly
- Hysteresis at inputs improves noise margin
- PNP inputs reduce DC loading on bus lines
- Data-to-output propagation delay times – 16ns MAX
- Enable-to-output – 20ns MAX
- 48mA output current
- 20-pin hermetic and molded DIP packages
- 100% product assurance testing to MIL-STD-883 requirements

FUNCTIONAL DESCRIPTION

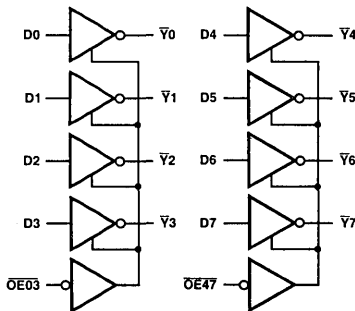
The AmZ8140 and AmZ8144 are octal buffers fabricated using advanced low-power Schottky technology. The 20-pin package provides improved printed circuit board density for use in memory address and clock driver applications.

Three-state outputs are provided to drive bus lines directly. The AmZ8140 and AmZ8144 are specified at 48mA and 24mA output sink current. Four buffers are enabled from one common line and the other four from a second enable line. The AmZ8140 and AmZ8144 enables are of similar polarity for use as a unidirectional buffer in which both halves are enabled simultaneously.

Improved noise rejection and high fan-out are provided by input hysteresis and low current PNP inputs.

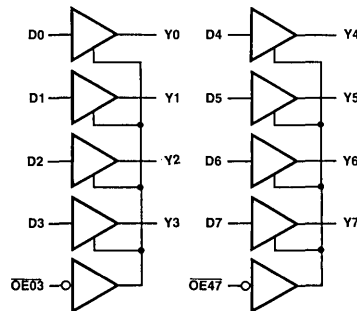
LOGIC DIAGRAMS

AmZ8140



INPUTS		OUTPUT
$\overline{OE}$	D	Y
H	X	Z
L	H	L
L	L	H

AmZ8144



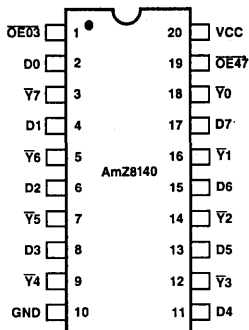
INPUTS		OUTPUT
$\overline{OE}$	D _i	Y
H	X	Z
L	H	H
L	L	L

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Note: All devices have input hysteresis.

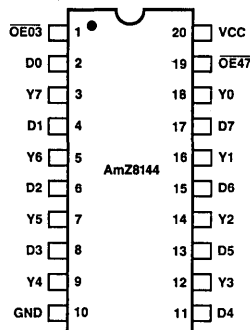
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CONNECTION DIAGRAMS Top Views



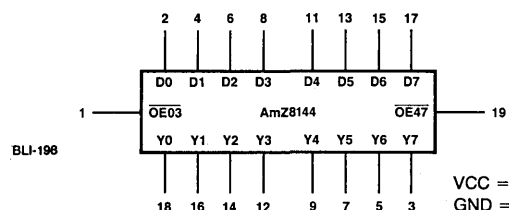
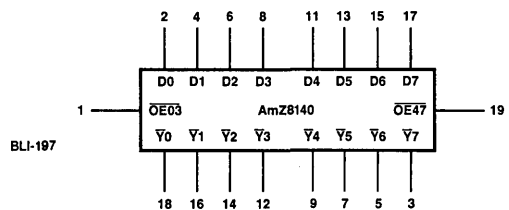
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Note: Pin 1 is marked for orientation.



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LOGIC SYMBOLS



VCC = Pin 20
GND = Pin 10

ELECTRICAL CHARACTERISTICS

The Following Conditions Apply Unless Otherwise Specified:

COM'L	$T_A = 0 \text{ to } 70^\circ\text{C}$	$V_{CC} = 5.0\text{V} \pm 5\%$	(MIN = 4.75V MAX = 5.25V)
MIL	$T_A = -55 \text{ to } +125^\circ\text{C}$	$V_{CC} = 5.0\text{V} \pm 10\%$	(MIN = 4.50V MAX = 5.50V)

DC CHARACTERISTICS OVER OPERATING RANGE

Parameters		Description	Test Conditions (Note 1)		Min	Typ (Note 2)	Max	Units
VOH	High-Level Output Voltage		VCC = MIN, VIH = 2.0V IOH = -3.0mA, VIL = VIL MAX		2.4	3.4		Volts
			VCC = MIN, VIL = 0.5V	MIL, IOH = -12mA	2.0			
				COM'L, IOH = -15mA	2.0			
VOL	Low-Level Output Voltage		VCC = MIN	All IOL = 12mA		0.25	0.4	Volts
				All IOL = 24mA		0.35	0.5	
				COM'L, IOL = 48mA			0.55	
VIH	High-Level Input Voltage		Guaranteed input logical HIGH voltage for all inputs		2.0			Volts
VIL	Low-Level Input Voltage	COM'L					0.8	Volts
		MIL					0.7	
VIK	Input Clamp Voltage		VCC = MIN, II = -18mA				-1.5	Volts
	Hysteresis (VT+ - VT-)		VCC = MIN		0.2	0.4		Volts
IOZH	Off-State Output Current, High-Level Voltage Applied		VCC = MAX VIH = 2.0V VIL = VIL MAX	VO = 2.7V			20	μA
IOZL	Off-State Output Current, Low-Level Voltage Applied			VO = 0.4V			-20	
II	Input Current at Maximum Input Voltage		VCC = MAX, VI = 7.0V				0.1	mA
IIH	High-Level Input Current, Any Input		VCC = MAX, VIH = 2.7V				20	μA
IIL	Low-Level Input Current		VCC = MAX, VIL = 0.4V				-200	μA
ISC	Short Circuit Output Current (Note 3)		VCC = MAX		-50		-225	mA
ICC	Supply Current VCC = MAX Outputs Open	AmZ8140	All Outputs HIGH			13	23	mA
			All Outputs LOW			26	44	
			Outputs at Hi-Z			29	50	
ICC		AmZ8144	All Outputs HIGH			13	23	mA
			All Outputs LOW			27	46	
			Outputs at Hi-Z			32	54	

- Notes: 1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
2. All typical values are $V_{CC} = 5.0\text{V}$, $T_A = 25^\circ\text{C}$.
3. Not more than one output should be shorted at a time, and duration of the short-circuits should not exceed one second.

MAXIMUM RATINGS above which the useful life may be impaired

Storage Temperature	-65°C to +150°C
Temperature (Ambient) Under Bias	-55°C to +125°C
Supply Voltage to Ground Potential	-0.5V to +7.0V
DC Voltage Applied to Outputs for HIGH Output State	-0.5V to $+V_{CC \text{ max.}}$
DC Input Voltage	-0.5V to +7.0V
DC Output Current	150mA
DC Input Current	-30mA to +5.0mA

AmZ8140 • AmZ8144**AmZ8140 • AmZ8144****SWITCHING CHARACTERISTICS**(T_A = +25°C, VCC = 5.0V)

Parameters	Description	AmZ8140			AmZ8144			Units	Test Conditions (Notes 1-5)
		Min	Typ	Max	Min	Typ	Max		
tPLH	Propagation Delay Time, Low-to-High-Level Output		6	10		9	13	ns	CL = 45pF RL = 667Ω
tPHL	Propagation Delay Time, High-to-Low-Level Output		9	13		11	16	ns	
tPZL	Output Enable Time to Low Level		13	20		13	20	ns	
tPZH	Output Enable Time to High Level		8	14		8	14	ns	
tPLZ	Output Disable Time from Low Level		13	20		13	20	ns	CL = 5.0pF RL = 667Ω
tPHZ	Output Disable Time from High Level		12	18		12	18	ns	

AmZ8140**SWITCHING CHARACTERISTICS****OVER OPERATING RANGE***

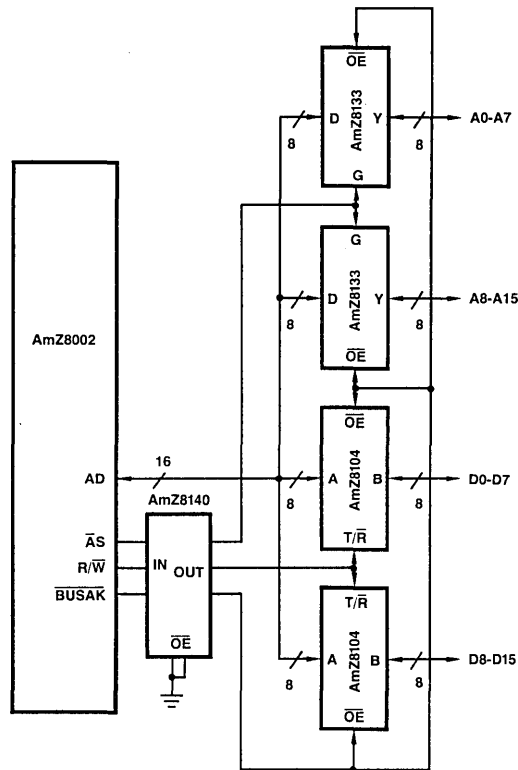
Parameters	Description	COM'L T _A = 0 to 70°C VCC = 5.0V ±5%		MIL T _A = -55 to +125°C VCC = 5.0V ±10%		Units	Test Conditions
		Min	Max	Min	Max		
tPLH	Propagation Delay Time, Low-to-High-Level Output		13		15	ns	CL = 45pF RL = 667Ω
tPHL	Propagation Delay Time, High-to-Low-Level Output		15		18	ns	
tPZL	Output Enable Time to Low Level		25		30	ns	
tPZH	Output Enable Time to High Level		18		21	ns	
tPLZ	Output Disable Time from Low Level		25		30	ns	CL = 5.0pF RL = 667Ω
tPHZ	Output Disable Time from High Level		21		25	ns	

AmZ8144**SWITCHING CHARACTERISTICS****OVER OPERATING RANGE***

Parameters	Description	COM'L T _A = 0 to 70°C VCC = 5.0V ±5%		MIL T _A = -55 to +125°C VCC = 5.0V ±10%		Units	Test Conditions
		Min	Max	Min	Max		
tPLH	Propagation Delay Time, Low-to-High-Level Output		15		16	ns	CL = 45pF RL = 667Ω
tPHL	Propagation Delay Time, High-to-Low-Level Output		18		20	ns	
tPZL	Output Enable Time to Low Level		25		30	ns	
tPZH	Output Enable Time to High Level		18		21	ns	
tPLZ	Output Disable Time from Low Level		25		30	ns	CL = 5.0pF RL = 667Ω
tPHZ	Output Disable Time from High Level		21		25	ns	

*AC performance over the operating temperature range is guaranteed by testing defined in Group A, Subgroup 9.

APPLICATION



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METALLIZATION AND PAD LAYOUTS

