

AmZ8121

Eight-Bit Equal-To Comparator

DISTINCTIVE CHARACTERISTICS

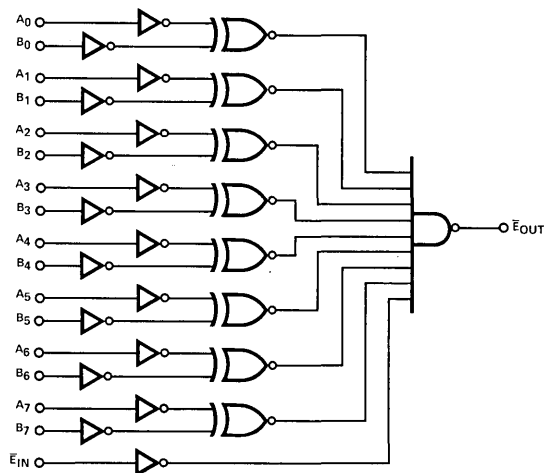
- 8-bit byte oriented equal-to comparator
- Cascadable using $\bar{E}_{IN}$
- High-speed, Low-Power Schottky technology
- $t_{pd} A \odot B$ to $\bar{E}_{OUT}$ in 9ns
- Standard 20-pin package
- 100% product assurance screening to MIL-STD-883 requirements

FUNCTIONAL DESCRIPTION

The AmZ8121 is an 8-bit "equal to" comparator capable of comparing two 8-bit words for "equal to" with provision for expansion or external enabling. The matching of the two 8-bit inputs plus a logic LOW on the $\bar{E}_{IN}$ produces an active LOW on the output $\bar{E}_{OUT}$.

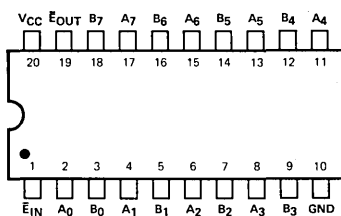
The logic expression for the device can be expressed as:
 $\bar{E}_{OUT} = (A_0 \odot B_0) (A_1 \odot B_1) (A_2 \odot B_2) (A_3 \odot B_3) (A_4 \odot B_4) (A_5 \odot B_5) (A_7 \odot B_7) \bar{E}_{IN}$. It is obvious that the expression is valid where $A_0 - A_7$ and $B_0 - B_7$ are expressed as either assertions or negations. This is also true for pair of terms i.e. A_0 can be compared with B_0 at the same time $\bar{A}_1$ is compared with B_1 . It is only essential that the polarity of the paired terms be maintained.

LOGIC DIAGRAM



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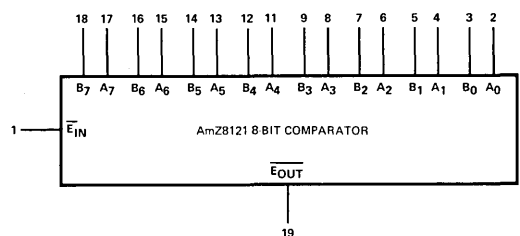
CONNECTION DIAGRAM



Note: Pin 1 is marked for orientation

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LOGIC SYMBOL



V_{CC} = Pin 20

GND = Pin 10

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ELECTRICAL CHARACTERISTICS

The Following Conditions Apply Unless Otherwise Specified:

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

DC CHARACTERISTICS OVER OPERATING RANGE

Parameters	Description	Test Conditions (Note 1)	Min.	Typ. (Note 2)	Max.	Units
V_{OH}	Output HIGH Voltage	$V_{CC} = \text{MIN.}$ $V_{IN} = V_{IH} \text{ or } V_{IL}$ $I_{OH} = -440\mu\text{A}$	MIL	2.5		Volts
			COM'L	2.7		
V_{OL}	Output LOW Voltage	$V_{CC} = \text{MIN.}$ $V_{IN} = V_{IH} \text{ or } V_{IL}$	$I_{OL} = 4.0\text{mA}$		0.4	Volts
			$I_{OL} = 8.0\text{mA}$		0.45	
			$I_{OL} = 12\text{mA}$		0.5	
V_{IH}	Input HIGH Level	Guaranteed input logical HIGH voltage for all inputs		2.0		Volts
V_{IL}	Input LOW Level	Guaranteed input logical LOW voltage for all inputs	MIL		0.7	Volts
			COM'L		0.8	
V_I	Input Clamp Voltage	$V_{CC} = \text{MIN.}, I_{IN} = -18\text{mA}$			-1.5	Volts
I_{IL}	Input LOW Current	$V_{CC} = \text{MAX.}, V_{IN} = 0.4\text{V}$	A_i, B_i		-0.36	mA
			$\bar{E}$		-0.72	
I_{IH}	Input HIGH Current	$V_{CC} = \text{MAX.}, V_{IN} = 2.7\text{V}$	A_i, B_i		20	μA
			$\bar{E}$		40	
I_I	Input HIGH Current	$V_{CC} = \text{MAX.}, V_{IN} = 7.0\text{V}$	A_i, B_i		0.1	mA
			$\bar{E}$		0.2	
I_{SC}	Output Short Circuit Current (Note 3)	$V_{CC} = \text{MAX.}$		-15	-85	mA
I_{CC}	Power Supply Current (Note 4)	$V_{CC} = \text{MAX.}$		27	40	mA

Notes: 1. For conditions shown as MIN. or MAX., use the appropriate value specified under Electrical Characteristics for the applicable device type.

2. Typical limits are at $V_{CC} = 5.0\text{V}$, 25°C ambient and maximum loading.

3. Not more than one output should be shorted at a time. Duration of the short circuit test should not exceed one second.

4. $\bar{E}$ = GND, all other inputs and outputs open.**MAXIMUM RATINGS** (Above which the useful life may be impaired)

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

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SWITCHING CHARACTERISTICS

(T_A = +25°C, V_{CC} = 5.0V)

Parameters	Description	Min.	Typ.	Max.	Units	Test Conditions
t _{PLH}	A _i or B _i to $\overline{\text{Equal}}$		9	15	ns	C _L = 15pF R _L = 2.0kΩ
t _{PHL}			9	15		
t _{PLH}	$\overline{\text{E}}$ to $\overline{\text{Equal}}$		5	7	ns	
t _{PHL}			6	8		

SWITCHING CHARACTERISTICS
OVER OPERATING RANGE*

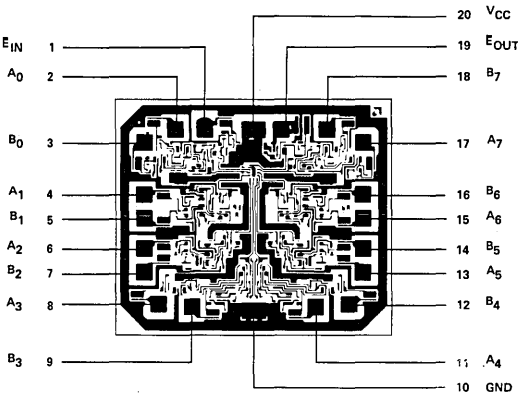
SWITCHING CHARACTERISTICS OVER OPERATING RANGE*		COM'L		MIL		Units	Test Conditions
		T _A = 0°C to +70°C V _{CC} = 5.0V ±5%		T _A = -55°C to +125°C V _{CC} = 5.0V ±10%			
Parameters	Description	Min.	Max.	Min.	Max.		
t _{PLH}	A _i or B _i to		20		22	ns	C _L = 50pF R _L = 2.0kΩ
t _{PHL}	Equal Output		19		21		
t _{PLH}	$\overline{\text{E}}$ to $\overline{\text{Equal}}$ Output		10.5		12	ns	
t _{PHL}				12.5			

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

DEFINITION OF FUNCTIONAL TERMS

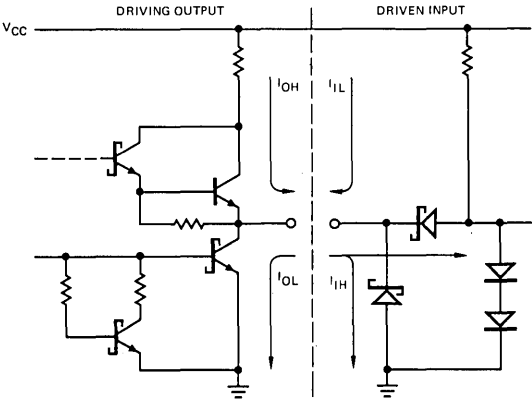
- A₀–A₇ A input to comparator
- B₀–B₇ B input to comparator
- $\overline{\text{E}}_{\text{IN}}$ Enable active LOW
- $\overline{\text{E}}_{\text{OUT}}$ EQUAL output active LOW

METALLIZATION AND PAD LAYOUT



DIE SIZE 0.063" x 0.074"

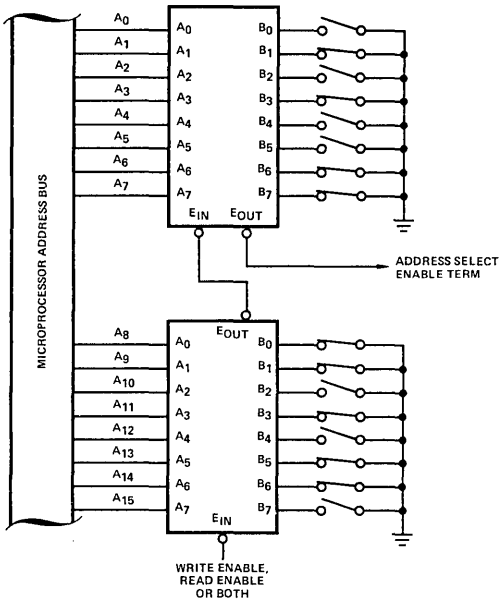
LOW-POWER SCHOTTKY INPUT/OUTPUT
CURRENT INTERFACE CONDITIONS



Note: Actual current flow direction shown.

APPLICATIONS

MICROPROCESSOR ENABLE CONTROLLED,
SELECTABLE, ADDRESS DECODER

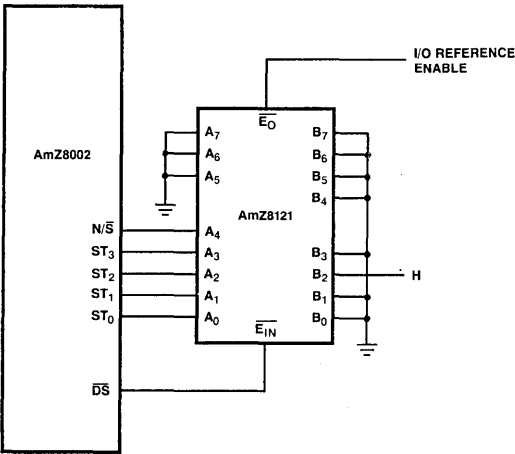


MAX. $\overline{\text{ENABLE}}$ (HIGH-to-LOW) DELAY
OVER 16-BITS
(Commercial Range)

t_{PHL}	A_i or B_i to $\overline{\text{E}}_{\text{OUT}}$	19ns
t_{PHL}	$\overline{\text{E}}_{\text{IN}}$ to $\overline{\text{E}}_{\text{OUT}}$	12.5ns
Total		31.5ns

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STATUS LINE DECODING



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