

100166



Not Intended For New Designs

T-45-17

100166 9-Bit Comparator

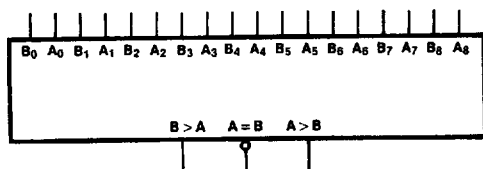
General Description

The 100166 is a 9-bit magnitude comparator which compares the arithmetic value of two 9-bit words and indicates whether one word is greater than, or equal to, the other.

Other functions can be generated by the wire-OR of the outputs. All inputs have 50 kΩ pulldown resistors.

Ordering Code: See Section 6

Logic Symbol

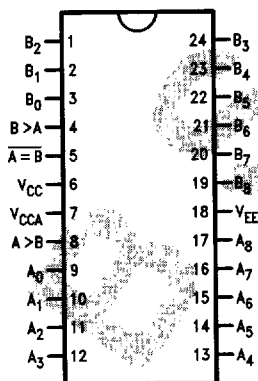


TL/F/9867-3

Pin Names	Description
A ₀ -A ₈	A Data Inputs
B ₀ -B ₈	B Data Inputs
A > B	A Greater than B Output
B > A	B Greater than A Output
$\overline{A = B}$	Complement A Equal to B Output (Active LOW)

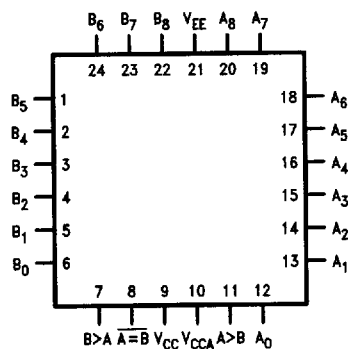
Connection Diagrams

24-Pin DIP



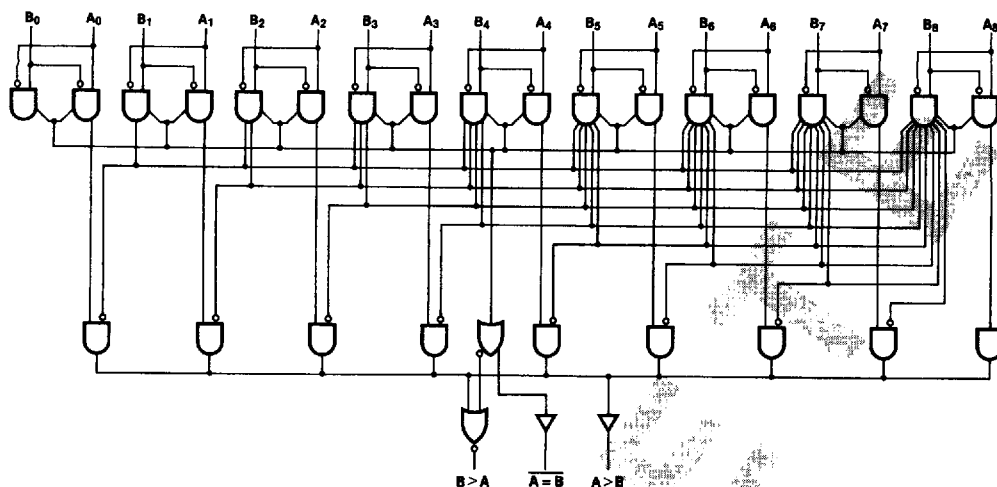
TL/F/9867-1

24-Pin Quad Cerpak



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Logic Diagram



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Truth Table

Inputs									Outputs		
A ₈ B ₈	A ₇ B ₇	A ₆ B ₆	A ₅ B ₅	A ₄ B ₄	A ₃ B ₃	A ₂ B ₂	A ₁ B ₁	A ₀ B ₀	A > B	B > A	A = B
H L L H A ₈ = B ₈ A ₈ = B ₈	H L L H								H L L	L H L	H H H
A ₈ = B ₈ A ₈ = B ₈ A ₈ = B ₈ A ₈ = B ₈	A ₇ = B ₇ A ₇ = B ₇ A ₇ = B ₇ A ₇ = B ₇	H L L H A ₆ = B ₆ A ₆ = B ₆	H L L H						H L H L	L H L H	H H H H
A ₈ = B ₈ A ₈ = B ₈ A ₈ = B ₈ A ₈ = B ₈	A ₇ = B ₇ A ₇ = B ₇ A ₇ = B ₇ A ₇ = B ₇	A ₆ = B ₆ A ₆ = B ₆ A ₆ = B ₆ A ₆ = B ₆	A ₅ = B ₅ A ₅ = B ₅ A ₅ = B ₅ A ₅ = B ₅	H L L H A ₄ = B ₄ A ₄ = B ₄					H L H L	L H L H	H H H H
A ₈ = B ₈ A ₈ = B ₈ A ₈ = B ₈ A ₈ = B ₈	A ₇ = B ₇ A ₇ = B ₇ A ₇ = B ₇ A ₇ = B ₇	A ₆ = B ₆ A ₆ = B ₆ A ₆ = B ₆ A ₆ = B ₆	A ₅ = B ₅ A ₅ = B ₅ A ₅ = B ₅ A ₅ = B ₅	A ₄ = B ₄ A ₄ = B ₄ A ₄ = B ₄ A ₄ = B ₄	A ₃ = B ₃ A ₃ = B ₃ A ₃ = B ₃ A ₃ = B ₃	H L L H A ₂ = B ₂ A ₂ = B ₂			H L H L	L H L H	H H H H
A ₈ = B ₈ A ₈ = B ₈ A ₈ = B ₈ A ₈ = B ₈	A ₇ = B ₇ A ₇ = B ₇ A ₇ = B ₇ A ₇ = B ₇	A ₆ = B ₆ A ₆ = B ₆ A ₆ = B ₆ A ₆ = B ₆	A ₅ = B ₅ A ₅ = B ₅ A ₅ = B ₅ A ₅ = B ₅	A ₄ = B ₄ A ₄ = B ₄ A ₄ = B ₄ A ₄ = B ₄	A ₃ = B ₃ A ₃ = B ₃ A ₃ = B ₃ A ₃ = B ₃	A ₂ = B ₂ A ₂ = B ₂ A ₂ = B ₂ A ₂ = B ₂	A ₁ = B ₁ A ₁ = B ₁ A ₁ = B ₁ A ₁ = B ₁	H L L H A ₀ = B ₀ A ₀ = B ₀	H L H L	L H L H	H H H L

H = HIGH Voltage Level
L = LOW Voltage Level
Blank = Don't Care

Absolute Maximum Ratings

Above which the useful life may be impaired. (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.Storage Temperature -65°C to $+150^{\circ}\text{C}$ Maximum Junction Temperature (T_J) $+150^{\circ}\text{C}$ Case Temperature under Bias (T_C) 0°C to $+85^{\circ}\text{C}$ V_{EE} Pin Potential to Ground Pin -7.0V to $+0.5\text{V}$ Input Voltage (DC) V_{EE} to $+0.5\text{V}$ Output Current (DC Output HIGH) -50mA Operating Range (Note 2) -5.0V to -4.2V **DC Electrical Characteristics** $V_{EE} = -4.5\text{V}$, $V_{CC} = V_{CCA} = \text{GND}$, $T_C = 0^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ (Note 3)

Symbol	Parameter	Min	Typ	Max	Units	Conditions (Note 4)	
V_{OH}	Output HIGH Voltage	-1025	-955	-880	mV	$V_{IN} = V_{IH}(\text{Max})$ or $V_{IL}(\text{Min})$	Loading with 50Ω to -2.0V
V_{OL}	Output LOW Voltage	-1810	-1705	-1620			
V_{OHC}	Output HIGH Voltage	-1035			mV	$V_{IN} = V_{IH}(\text{Min})$ or $V_{IL}(\text{Max})$	Loading with 50Ω to -2.0V
V_{OLC}	Output LOW Voltage			-1610			
V_{IH}	Input HIGH Voltage	-1165		-880	mV	Guaranteed HIGH Signal for All Inputs	
V_{IL}	Input LOW Voltage	-1810		-1475	mV	Guaranteed LOW Signal for All Inputs	
I_{IL}	Input LOW Current	0.50			μA	$V_{IN} = V_{IL}(\text{Min})$	

DC Electrical Characteristics $V_{EE} = -4.2\text{V}$, $V_{CC} = V_{CCA} = \text{GND}$, $T_C = 0^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ (Note 3)

Symbol	Parameter	Min	Typ	Max	Units	Conditions (Note 4)	
V_{OH}	Output HIGH Voltage	-1020		-870	mV	$V_{IN} = V_{IH}(\text{Max})$ or $V_{IL}(\text{Min})$	Loading with 50Ω to -2.0V
V_{OL}	Output LOW Voltage	-1810		-1605			
V_{OHC}	Output HIGH Voltage	-1030			mV	$V_{IN} = V_{IH}(\text{Min})$ or $V_{IL}(\text{Max})$	Loading with 50Ω to -2.0V
V_{OLC}	Output LOW Voltage			-1595			
V_{IH}	Input HIGH Voltage	-1150		-870	mV	Guaranteed HIGH Signal for All Inputs	
V_{IL}	Input LOW Voltage	-1810		-1475	mV	Guaranteed LOW Signal for All Inputs	
I_{IL}	Input LOW Current	0.50			μA	$V_{IN} = V_{IL}(\text{Min})$	

DC Electrical Characteristics $V_{EE} = -4.8\text{V}$, $V_{CC} = V_{CCA} = \text{GND}$, $T_C = 0^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ (Note 3)

Symbol	Parameter	Min	Typ	Max	Units	Conditions (Note 4)	
V_{OH}	Output HIGH Voltage	-1035		-880	mV	$V_{IN} = V_{IH}(\text{Max})$ or $V_{IL}(\text{Min})$	Loading with 50Ω to -2.0V
V_{OL}	Output LOW Voltage	-1830		-1620			
V_{OHC}	Output HIGH Voltage	-1045			mV	$V_{IN} = V_{IH}(\text{Min})$ or $V_{IL}(\text{Max})$	Loading with 50Ω to -2.0V
V_{OLC}	Output LOW Voltage			-1610			
V_{IH}	Input HIGH Voltage	-1165		-880	mV	Guaranteed HIGH Signal for All Inputs	
V_{IL}	Input LOW Voltage	-1830		-1490	mV	Guaranteed LOW Signal for All Inputs	
I_{IL}	Input LOW Current	0.50			μA	$V_{IN} = V_{IL}(\text{Min})$	

Note 1: Absolute maximum ratings are those values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.**Note 2:** Parametric values specified at -4.2V to -4.8V **Note 3:** The specified limits represent the "worst case" value for the parameter. Since these "worst case" values normally occur at the temperature extremes, additional noise immunity and guard banding can be achieved by decreasing the allowable system operating ranges.**Note 4:** Conditions for testing shown in the tables are chosen to guarantee operation under "worst case" conditions.

$V_{EE} = -4.2\text{V to } -4.8\text{V}$ unless otherwise specified, $V_{CC} = V_{CCA} = \text{GND}$, $T_C = 0^\circ\text{C to } +85^\circ\text{C}$

Ceramic Dual-In-Line Package AC Electrical Characteristics

 $V_{EE} = -4.2V \text{ to } -4.8V, V_{CC} = V_{CCA} = GND$

Cerpak AC Electrical Characteristics

 $V_{EE} = -4.2V \text{ to } -4.8V, V_{CC} = V_{CCA} = GND$

The diagram shows a 24-pin integrated circuit (IC) with the following connections:

- V_{EE}** (Pin 24): Connected to a 0.1 μF capacitor to ground.
- V_{CC}** (Pin 12): Connected to a 25 μF capacitor to ground and a 0.1 μF capacitor to ground.
- Pin 10**: Connected to a 50 Ω resistor to ground and a 50 Ω resistor to the input of a PULSE GENERATOR.
- Pin 11**: Connected to a 50 Ω resistor to ground and a 50 Ω resistor to the input of a PULSE GENERATOR.
- Pin 13**: Connected to a 50 Ω resistor to ground and a 50 Ω resistor to the input of a PULSE GENERATOR.
- Pin 14**: Connected to a 50 Ω resistor to ground and a 50 Ω resistor to the input of a PULSE GENERATOR.
- Pin 15**: Connected to a 50 Ω resistor to ground and a 50 Ω resistor to the input of a PULSE GENERATOR.
- Pin 16**: Connected to a 50 Ω resistor to ground and a 50 Ω resistor to the input of a PULSE GENERATOR.
- Pin 17**: Connected to a 50 Ω resistor to ground and a 50 Ω resistor to the input of a PULSE GENERATOR.
- Pin 18**: Connected to a 50 Ω resistor to ground and a 50 Ω resistor to the input of a PULSE GENERATOR.
- Pin 19**: Connected to a 50 Ω resistor to ground and a 50 Ω resistor to the input of a PULSE GENERATOR.
- Pin 20**: Connected to a 50 Ω resistor to ground and a 50 Ω resistor to the input of a PULSE GENERATOR.
- Pin 21**: Connected to a 50 Ω resistor to ground and a 50 Ω resistor to the input of a PULSE GENERATOR.
- Pin 22**: Connected to a 50 Ω resistor to ground and a 50 Ω resistor to the input of a PULSE GENERATOR.
- Pin 23**: Connected to a 50 Ω resistor to ground and a 50 Ω resistor to the input of a PULSE GENERATOR.
- Pin 24**: Connected to a 50 Ω resistor to ground and a 50 Ω resistor to the input of a PULSE GENERATOR.

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$V_{CC}, V_{CCA} = +2V, V_{EE} = -2.5V$

L1 and L2 = equal length 50Ω impedance lines

$R_T = 50\Omega$ terminator internal to scope

Decoupling 0.1 μF from GND to V_{CC} and

Decoupling 0.1 μ F from GND to V_{CC} and V_{EE}
All unused outputs are loaded with 50 Ω to GND

C_L = Fixture and stray capacitance ≤ 3 pF

Pin numbers shown are for flatpak, for DIP see logic symbol

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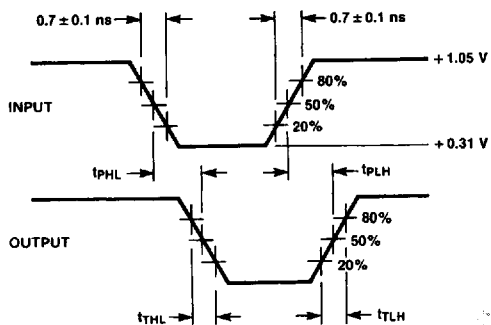


FIGURE 2. Propagation Delay and Transition Times

TL/F/9867-7