National Semiconductor

DM54LS460/DM74LS460 10-Bit Comparator

General Description

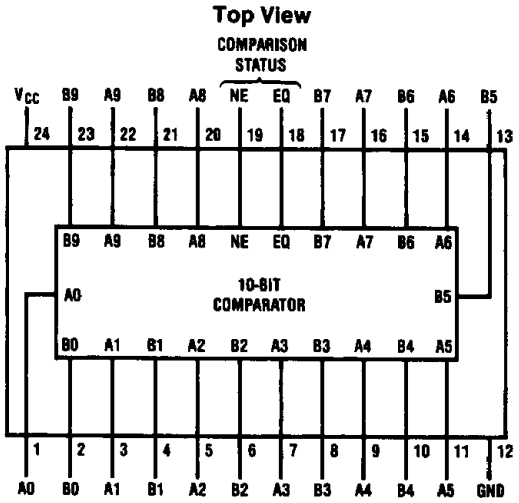
The 'LS460 is a 10-bit comparator with true and complement comparison status outputs. The device compares two 10-bit data strings (A_9-A_0 and B_9-B_0) to establish if this data is Equivalent (EQ = HIGH and NE = LOW) or Not Equivalent (EQ = LOW and NE = HIGH).

Outputs conform to the usual 8 mA LS totem-pole drive standard.

Features/Benefits

- True and complement comparison status outputs
- 24-pin SKINNYDIP saves space
- Low current PNP inputs reduce loading
- Expandable in 10-bit increments

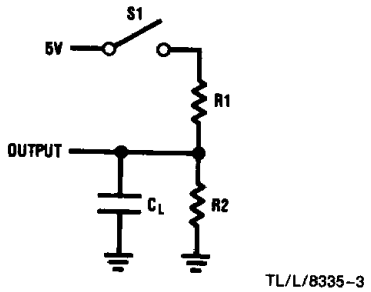
Connection Diagram



TL/L/8335-1

Order Number DM54LS460J, DM74LS460J, or DM74LS460N
See NS Package Number J24F or N24C

Standard Test Load



TL/L/8335-3

Function Table

A9 − A0	B9 − B0	EQ	NE	Operation
A	A	H	L	Equivalent (A = B)
B	B	H	L	
A	B	L	H	Not Equivalent (A ≠ B)

Absolute Maximum Ratings

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage V_{CC} 7V

Input Voltage 5.5V

Off-State Output Voltage 5.5V

Storage Temperature −65° to +150°C

Operating Conditions

Symbol	Parameter	Military			Commercial			Units
		Min	Typ	Max	Min	Typ	Max	
V_{CC}	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
T_A	Operating Free-Air Temperature	−55		125*	0		75	°C

*Case Temperature

Electrical Characteristics Over Operating Conditions

Symbol	Parameter	Test Conditions			Min	Typ†	Max	Units
V_{IL}	Low-Level Input Voltage						0.8	V
V_{IH}	High-Level Input Voltage				2			V
V_{IC}	Input Clamp Voltage	V_{CC} = MIN	I_I = −18 mA				−1.5	V
I_{IL}	Low-Level Input Current	V_{CC} = MAX	V_I = 0.4V				−0.25	mA
I_{IH}	High-Level Input Current	V_{CC} = MAX	V_I = 2.4V				25	μA
I_I	Maximum Input Current	V_{CC} = MAX	V_I = 5.5V				1	mA
V_{OL}	Low-Level Output Voltage	V_{CC} = MIN V_{IL} = 0.8V V_{IH} = 2V		I_{OL} = 8 mA			0.5	V
V_{OH}	High-Level Output Voltage	V_{CC} = MIN V_{IL} = 0.8V V_{IH} = 2V	MIL	I_{OH} = −2 mA	2.4			V
			COM	I_{OH} = −3.2 mA				
I_{OS}	Output Short-Circuit Current*	V_{CC} = 5.0V		V_O = 0V	−30		−130	mA
I_{CC}	Supply Current	V_{CC} = MAX				60	100	mA

*No more than one output should be shorted at a time and duration of the short-circuit should not exceed one second

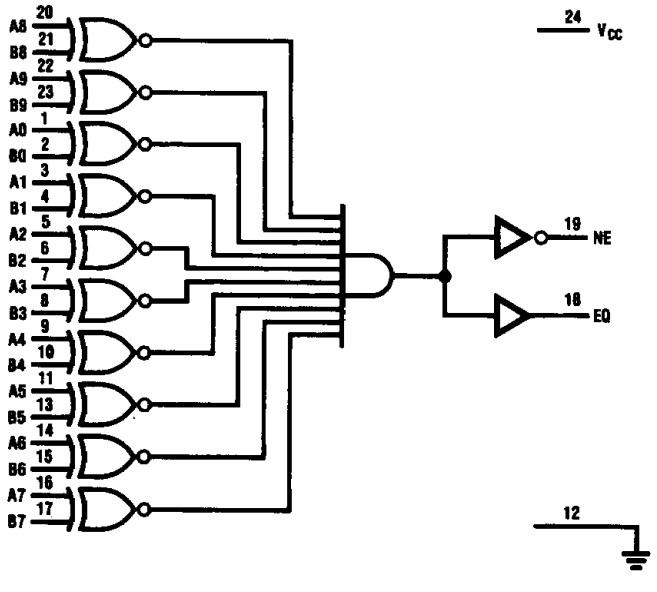
†All typical values are at V_{CC} = 5V, T_A = 25°C

Switching Characteristics Over Operating Conditions

Symbol	Parameter	Test Conditions (See Test Load)	Military			Commercial			Units
			Min	Typ	Max	Min	Typ	Max	
t_{PD}	Any Input to EQ or NE	C_L = 50 pF R_1 = 560Ω R_2 = 1.1 kΩ		25	45		25	40	ns

Logic Diagram

LS460



TL/L/8335–2