

10-Bit Comparator

SN54/74LS460

Features/Benefits

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

Description

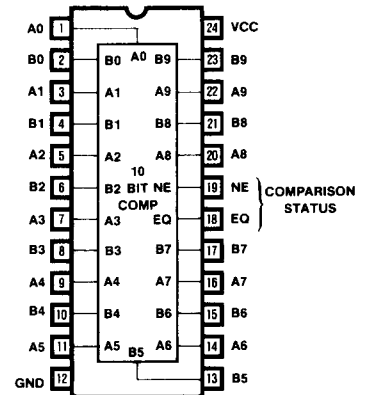
The 'LS460 is a 10-bit comparator with true and complement comparison status outputs. The device compares two 10-bit data strings (A9-A0 and B9-B0) to establish if this data is Equivalent (EQ = HIGH and NE = LOW) or Not Equivalent (EQ = LOW and NE = HIGH).

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

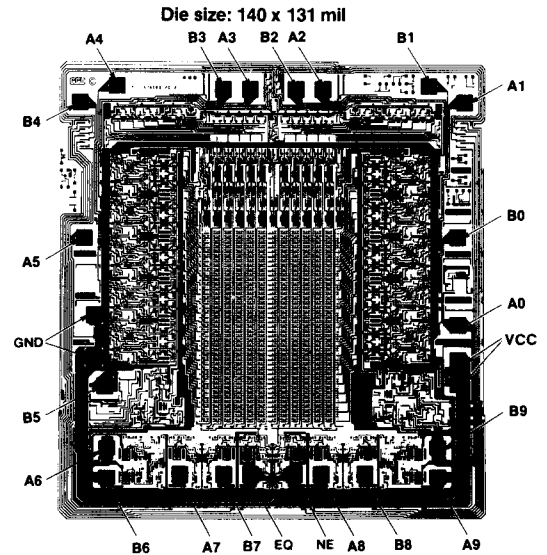
Ordering Information

PART NUMBER	PACKAGE	TEMP
SN54LS460	JS, F	MIL
SN74LS460	NS, JS	COM

Logic Symbol



Die Configuration



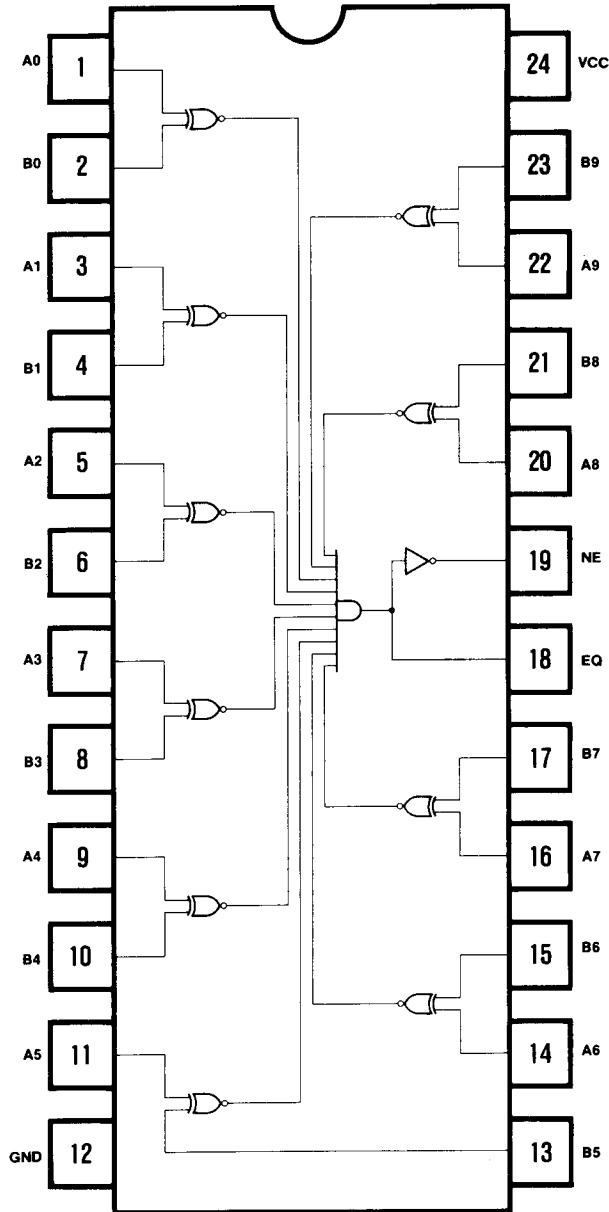
Function Table

INPUTS (A9-A0)*, (B9-B0)*	OUTPUTS		OPERATION
	EQ	NE	
(A9-A0) = (B9-B0)	1	0	Bit strings equivalent
(A9-A0) ≠ (B9-B0)	0	1	Bit strings not equivalent

* The parentheses (...) denote a 10-bit string from either Input A or B, as given by the symbols within the parentheses.

Logic Diagram

10-Bit Comparator



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Absolute Maximum Ratings

Supply voltage V_{CC}	7.0 V
Input voltage	5.5 V
Off-state output voltage	5.5 V
Storage temperature	-65° to +150°C

Operating Conditions

SYMBOL	PARAMETER	MILITARY			COMMERCIAL			UNIT
		MIN	NOM	MAX	MIN	NOM	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	UNIT
V_{IL}	Low-level input voltage				0.8		V
V_{IH}	High-level input voltage			2			V
V_{IC}	Input clamp voltage	$V_{CC} = \text{MIN}$	$I_I = -18\text{mA}$		-1.5		V
I_{IL}	Low-level input current	$V_{CC} = \text{MAX}$	$V_I = 0.4\text{V}$		0.25		mA
I_{IH}	High-level input current	$V_{CC} = \text{MAX}$	$V_I = 2.4\text{V}$		25		μA
I_I	Maximum input current	$V_{CC} = \text{MAX}$	$V_I = 5.5\text{V}$		1		mA
V_{OL}	Low-level output voltage	$V_{CC} = \text{MIN}$ $V_{IL} = 0.8\text{V}$ $V_{IH} = 2\text{V}$	$I_{OL} = 8\text{mA}$		0.5		V
V_{OH}	High-level output voltage	$V_{CC} = \text{MIN}$ $V_{IL} = 0.8\text{V}$ $V_{IH} = 2\text{V}$	MIL $I_{OH} = -2\text{mA}$ COM $I_{OH} = -3.2\text{mA}$	2.4			V
I_{OS}	Output short-circuit current*	$V_{CC} = 5.0\text{V}$	$V_O = 0\text{V}$	-30		-130	mA
I_{CC}	Supply current	$V_{CC} = \text{MAX}$			60	100	mA

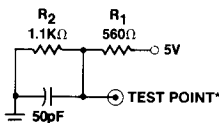
* No more than one output should be shorted at a time and duration of the short circuit should not exceed one second

† All typical values are at $V_{CC} = 5\text{V}$, $T_A = 25^\circ\text{C}$

Switching Characteristics Over Operating Conditions

SYMBOL	PARAMETER	TEST CONDITIONS (See Test Load)	MILITARY			COMMERCIAL			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
t_{pD}	Any input to EQ or NE	$C_L = 50\text{pF}$ $R_1 = 560\Omega$ $R_2 = 1.1\text{k}\Omega$		25	45		25	40	ns

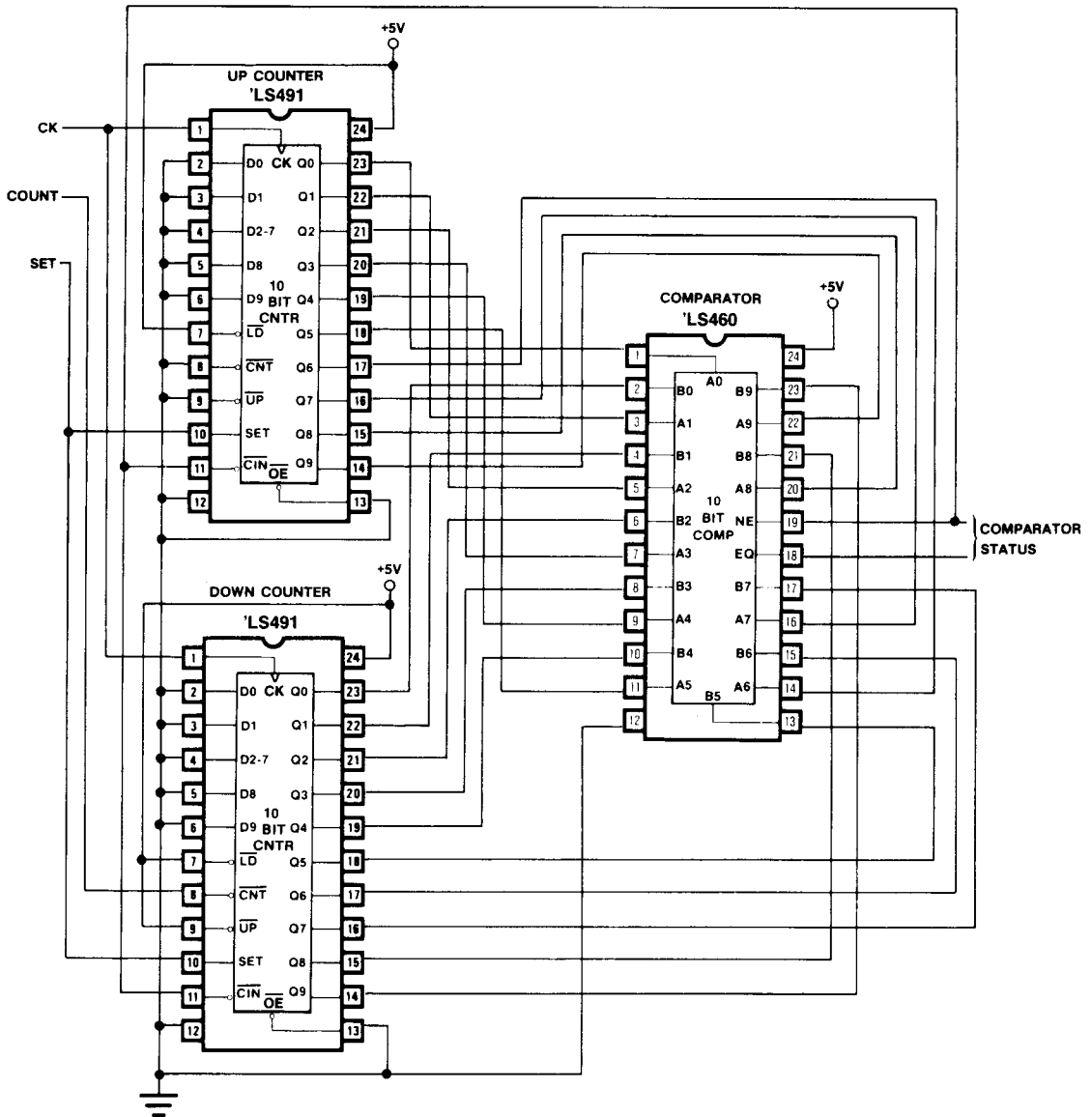
Test Load



* The "Test Point" is driven by the outputs under test, and observed by instrumentation.

Application

10-Bit Up Counter/Down Counter Comparator



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