
PART NUMBER**SN74L192N**

**Rochester Electronics
Manufactured Components**

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All re-creations are done with the approval of the Original Component Manufacturer. (OCM)

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceeds the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-38535
 - Class Q Military
 - Class V Space Level

Qualified Suppliers List of Distributors (QSLD)

- Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OCM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

54192/74192 Synchronous Decade Up/Down Counter (Dual clock with Clear)

	Schottky TTL					High-Speed TTL					Low-Power Schottky TTL					Standard TTL					Low-Power TTL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Electrical Characteristics SN54LS192/SN74LS192
absolute maximum ratings over operating free-air temperature range

Supply voltage, V_{CC}	7V	Operating free-air temperature range	SN54LS	-55°C to 125°C
Input voltage	7V	Storage temperature range	SN74LS	0°C to 70°C
				-65°C to 150°C

recommended operating conditions

	SN54LS192			SN74LS192			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V_{CC}	4.5	5	5.5	4.75	5	5.25	V
High-level output current, I_{OH}			-400			-400	μ A
Low-level output current, I_{OL}			4			8	mA
Count frequency, f_{count}	0		25	0		25	MHz
Width of any input pulse, t_w	20			20			ns
Data setup time, t_{setup}	20			20			ns
Data hold time, t_{hold}	0			0			ns
Operating free-air temperature, T_A	-55		125	0		70	°C

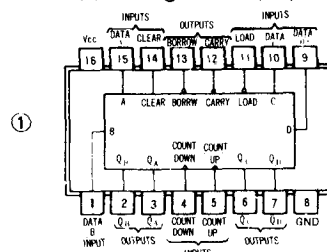
electrical characteristics over recommended operating free-air temperature range

PARAMETER*	TEST CONDITIONS†	MIN	TYP‡	MAX	UNIT
V_{IH} High-level input voltage		2			V
V_{IL} Low-level input voltage			0.8		V
V_I Input clamp voltage	$V_{CC} = \text{MIN.}, I_I = -18 \text{ mA}$			-1.5	V
V_{OH} High-level output voltage	$V_{CC} = \text{MIN.}, V_{IH} = 2 \text{ V}, V_{IL} = 0.8 \text{ V}, I_{OH} = -400 \mu\text{A}$	2.7	3.4		V
V_{OL} Low-level output voltage	$V_{CC} = \text{MIN.}, V_{IH} = 2 \text{ V}, V_{IL} = 0.8 \text{ V}, I_{OL} = 8 \text{ mA}$	0.35	0.5		V
I_I Input current at maximum input voltage	$V_{CC} = \text{MAX.}, V_I = 7 \text{ V}$		0.1		mA
I_{IH} High-level input current	$V_{CC} = \text{MAX.}, V_I = 2.7 \text{ V}$		20		μ A
I_{IL} Low-level input current	$V_{CC} = \text{MAX.}, V_I = 0.4 \text{ V}$		0.4		mA
I_{OS} Short-circuit output current*	$V_{CC} = \text{MAX.}$	SN54LS	-20	100	mA
	See Note 1	SN74LS	-20	100	mA
I_{CC} Supply current	$V_{CC} = \text{MAX.}$	SN54LS	19	34	mA
		SN74LS	19	34	mA
f_{max} maximum clock frequency		25	32		MHz
t_{PLH} from Count-up to output Carry	$V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$		17	26	ns
t_{PLH} from Count-down to output Borrow			18	24	ns
t_{PLH} from Either Count to output Q	$C_L = 15 \text{ pF}$		16	24	ns
t_{PHL} from Load to output Q	$R_L = 2 \text{ k}\Omega$		15	24	ns
t_{PHL} from Clear to output Q			27	38	ns
			30	47	ns
			24	40	ns
			25	40	ns
			23	35	ns

NOTES: 1. I_{CC} is measured with all outputs open, clear and load inputs grounded, and all other inputs at 4.5V.

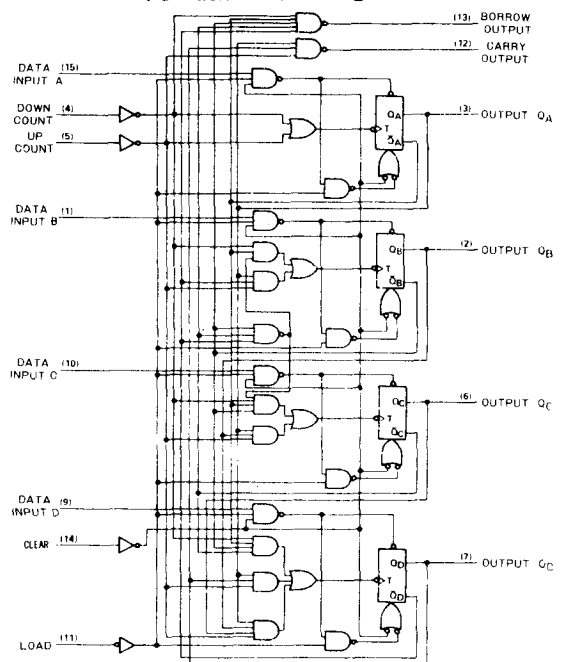
A. Clear overrides load, data, and count inputs.

B. When counting up, count-down input must be high, when counting down, count-up input must be high.

Pin Assignment. (Top View)


Positive logic:

Low input to load sets $Q_A = A$, $Q_B = B$, $Q_C = C$, and $Q_D = D$

Functional Block Diagram


... Dynamic input activated by a transition from a high level to a low level.

192, L192, LS192 SYNCHRONOUS 4-BIT UP/DOWN COUNTER

†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.

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

*Not more than one output should be shorted at a time.

* t_{PLH} = propagation delay time, low-to-high-level output

t_{PHL} = propagation delay time, high-to-low-level output

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