



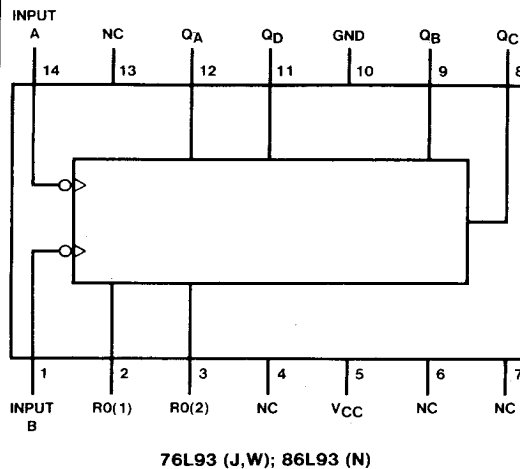
Binary Counters

General Description

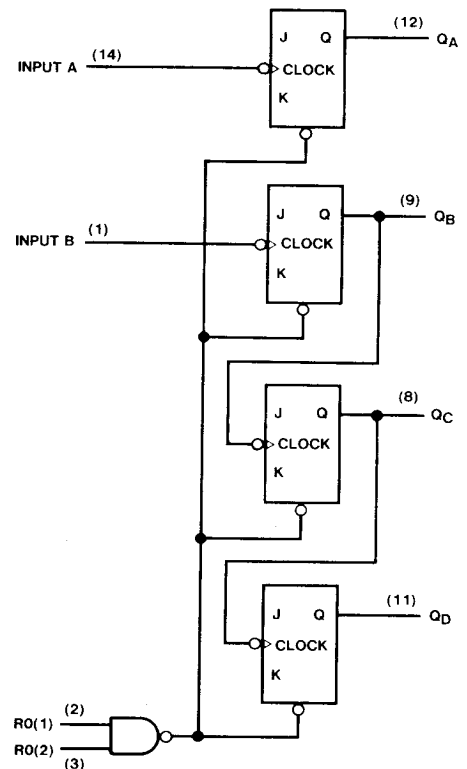
These circuits are full tenth-power versions of the popular DM5493A/DM7493A binary counters. The important feature is that they provide the same pinout as the DM5493A/DM7493A, whereas the DM54L93/DM74L93 has a completely different pinout. Otherwise they offer the

same features and electrical characteristics as the DM54L93/DM74L93. To employ the maximum count length, the B input is connected to the Q_A output. The input count pulses are applied to the A input, and the outputs are as described in the truth table.

Connection Diagram



Logic Diagram





Truth Tables

Reset/Count Truth Table

Reset Inputs		Output			
R0(1)	R0(2)	Q _D	Q _C	Q _B	Q _A
H	H	L	L	L	L
L	X	COUNT			
X	L	COUNT			

Count Sequence Table

Count	Output			
	Q _D	Q _C	Q _B	Q _A
0	L	L	L	L
1	L	L	L	H
2	L	L	H	L
3	L	L	H	H
4	L	H	L	L
5	L	H	L	H
6	L	H	H	L
7	L	H	H	H
8	H	L	L	L
9	H	L	L	H
10	H	L	H	L
11	H	L	H	H
12	H	H	L	L
13	H	H	L	H
14	H	H	H	L
15	H	H	H	H

Output Q_A is connected to Input B

Electrical Characteristics over recommended operating free-air temperature range (unless otherwise noted)

Parameter		Conditions	DM76			DM86			Units
			L93			L93			
			Min	Typ (1)	Max	Min	Typ (1)	Max	
V _{IH}	High Level Input Voltage		2			2			V
V _{IL}	Low Level Input Voltage				0.7			0.7	V
I _{OH}	High Level Output Current				−200			−200	μA
V _{OH}	High Level Output Voltage	V _{CC} = Min, V _{IH} = 2 V V _{IL} = 0.7 V, I _{OH} = −200 μA	2.4	2.8		2.4	2.8		V
I _{OL}	Low Level Output Current				2.0			3.6	mA
V _{OL}	Low Level Output Voltage	V _{CC} = Min, V _{IH} = 2 V V _{IL} = 0.7 V, I _{OL} = Max		0.15	0.3		0.2	0.4	V
I _I	Input Current at Maximum Input Voltage	V _{CC} = Max V _I = 5.5 V	Reset		100			100	μA
			A Input		200			200	
			B Input		200			200	
I _{IH}	High Level Input Current	V _{CC} = Max V _I = 2.4 V	Reset		10			10	μA
			A Input		20			20	
			B Input		20			20	
I _{IL}	Low Level Input Current	V _{CC} = Max V _I = 0.3 V	Reset		−180			−180	μA
			A Input		−360			−360	
			B Input		−360			−360	
I _{OS}	Short Circuit Output Current	V _{CC} = Max (3)	−3	−9	−15	−3	−9	−15	mA
I _{CC}	Supply Current	V _{CC} = Max (2)			5.5			5.5	mA

Note 1: All typical values are at V_{CC} = 5 V, T_A = 25°C.Note 2: I_{CC} is measured with all outputs open, both R₀ inputs grounded following momentary connection to 4.5 V, and all other inputs grounded.

Note 3: No more than one output should be shorted at a time.

**Switching Characteristics** $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$

Parameter		From (Input)	To (Output)	Conditions	DM76/86			Units
					L93			
					Min	Typ	Max	
fMAX	Maximum Clock Frequency			CL = 50 pF, RL = 4 kΩ	6	15		MHz
tPLH	Propagation Delay Time, Low-to-High Level Output	A	QD			210	400	ns
tPHL	Propagation Delay Time, High-to-Low Level Output	A	QD			230	400	ns
tW	Pulse Width (All Inputs)				200			ns
tSETUP	Reset Inactive State Setup Time				200			ns