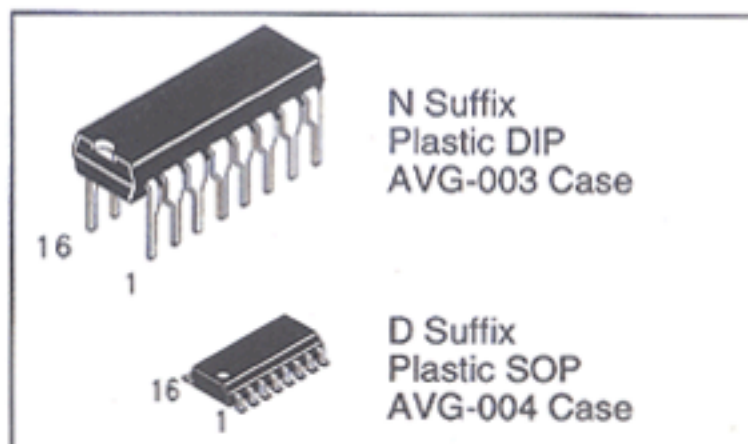


Dual BCD Up Counter Dual Binary Up Counter

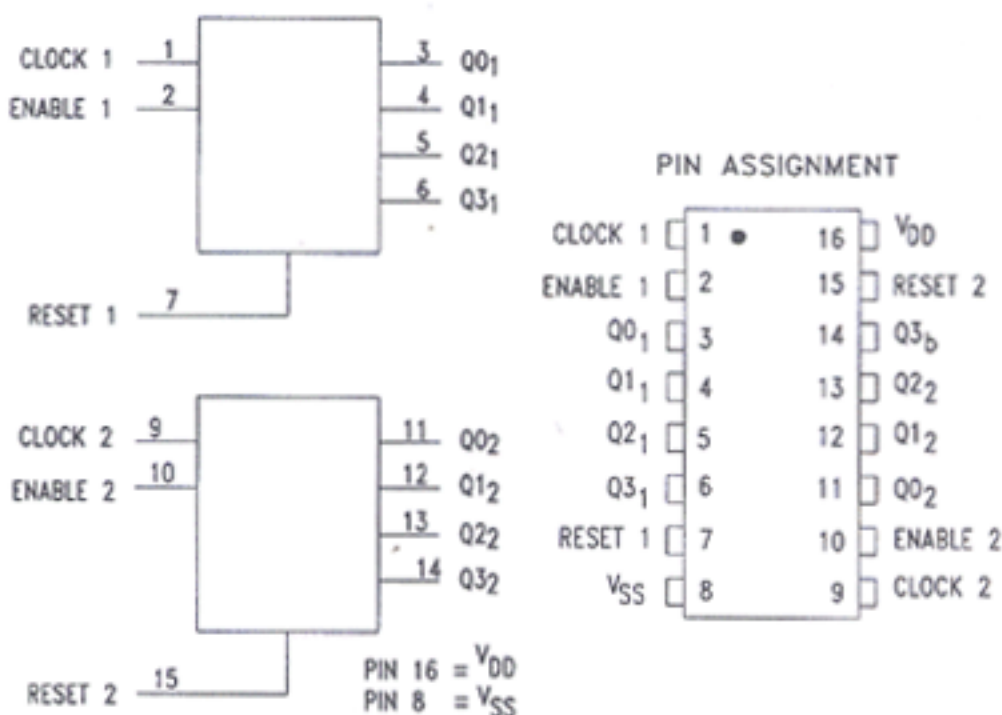
These devices are constructed with MOS P-Channel and N-Channel enhancement mode devices in a monolithic structure. They contain two identical, independent, internally synchronous 4-stage counters. The counter stages are type D flip-flops, with interchangeable Clock and Enable lines for incrementing on either the positive-going or negative-going transition as required when cascading multiple stages. The counters can be cleared by applying a high level on the Reset line.

- Supply voltage range = 3.0 Vdc to 18 Vdc
- All outputs buffered
- Capable of driving 4 Low Power TTL loads or one LS TTL load over the rated temperature range
- Diode protection on all inputs
- Highest noise immunity at 12V supply

DV4518B
DV4520B



4518B, 4520B



TRUTH TABLE

Clock	Enable	Reset	Action
↑	1	0	Increment Counter
0	↓	0	Increment Counter
↓	X	0	No Change
X	↑	0	No Change
↑	0	0	No Change
1	↓	0	No Change
X	X	1	Q0 thru Q3=0

↑=Low to High Transition
↓=High to Low Transition
X=Don't Care

ABSOLUTE MAXIMUM RATINGS

Maximum ratings are those values beyond which damage to the device may occur.

Symbol	Parameter	Value	Unit
V _{DD}	Supply Voltage (Referenced to V _{SS})	-0.5 to +18.0	V
V _{IN} , V _{OUT}	Input or Output Voltage	-0.5 to V _{DD} +0.5	V
I _{IN} , I _{OUT}	DC Current Into or Out of Any Pin	± 10	mA
P _D	Power Dissipation in Still Air, Derating: 12 mW/°C from 65° to 85°C	500	mW
T _{STG}	Storage Temperature Range	-65 to +150	°C
TL	Lead Temperature, (8 Second Soldering)	260	°C

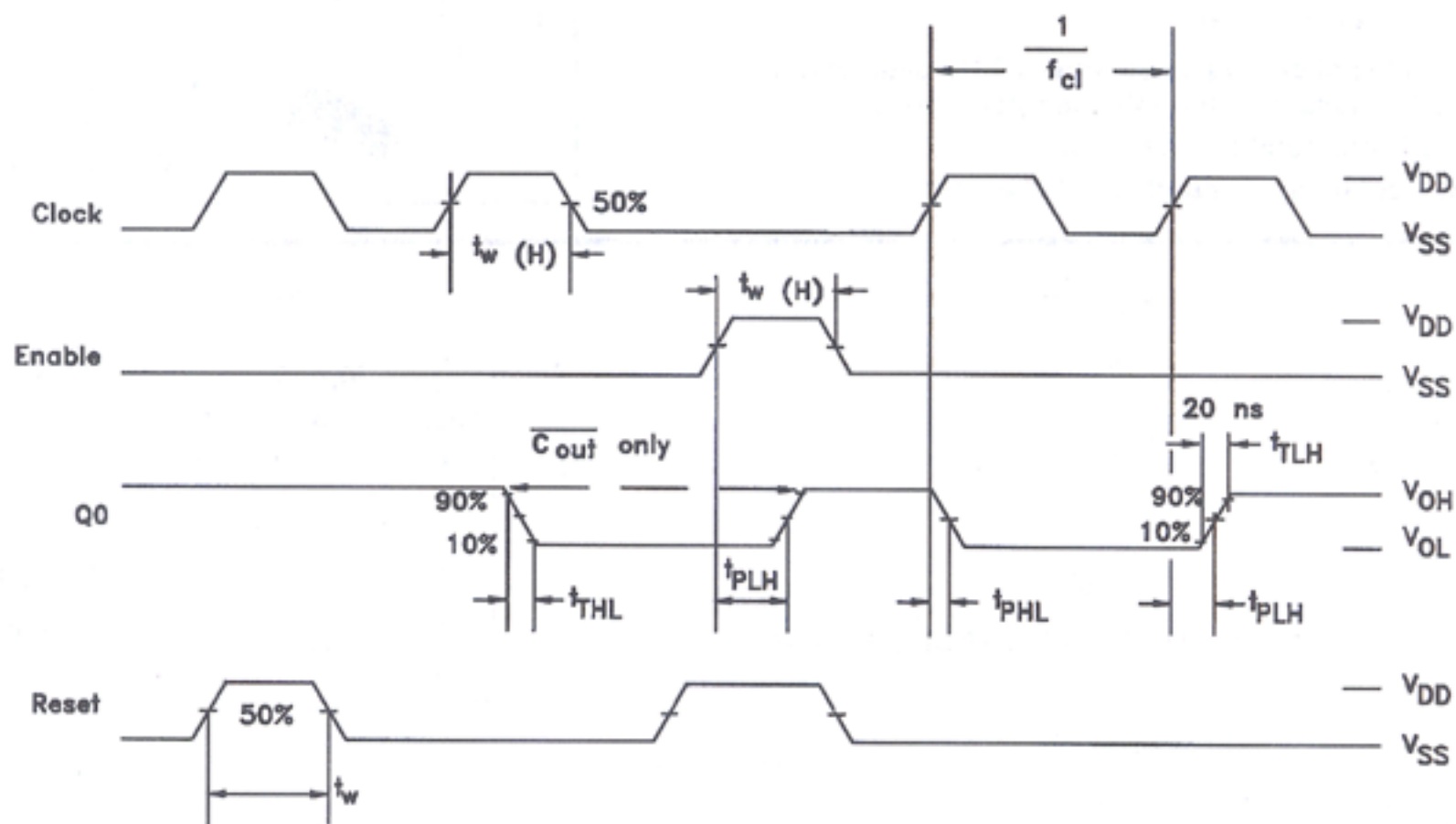
ELECTRICAL CHARACTERISTICS (Voltages Referenced to V_{SS})

Symbol	Parameter	V _{DD}	Guaranteed Limits								Unit
			-40°C		<25°C			<85°C			
			Min	Max	Min	Typ	Max	Min	Max		
V _{OL}	Output Voltage V _{IN} =V _{DD} or 0	5.0	-	0.05	-	0	0.05	-	0.05	V _{dc}	
		10	-	0.05	-	0	0.05	-	0.05		
		15	-	0.05	-	0	0.05	-	0.05		
V _{OH}	V _{IN} = 0 or V _{DD}	5.0	4.95	-	4.95	5.0	-	4.95	-	V _{dc}	
		10	9.95	-	9.95	10	-	9.95	-		
		15	14.95	-	14.95	15	-	14.95	-		
V _{IL}	Input Voltage (V _O =4.5 or 0.5 V _{dc}) (V _O =9.0 or 1.0 V _{dc}) (V _O =13.5 or 1.5 V _{dc})	5.0	-	1.5	-	2.25	1.5	-	1.5	V _{dc}	
		10	-	3.0	-	4.50	3.0	-	3.0		
		15	-	4.0	-	6.75	4.0	-	4.0		
V _{IH}	(V _O =0.5 or 4.5 V _{dc}) (V _O =1.0 or 9.0 V _{dc}) (V _O =1.5 or 13.5 V _{dc})	5.0	3.5	-	3.5	2.75	-	3.5	-	V _{dc}	
		10	7.0	-	7.0	5.50	-	7.0	-		
		15	11	-	11	8.25	-	11	-		
I _{OH}	Output Drive Current (V _{OH} = 4.6 V _{dc}) (V _{OH} = 9.5 V _{dc}) (V _{OH} = 13.5 V _{dc})	5.0	-0.52	-	-0.44	-0.88	-	-0.36	--	mA _{dc}	
		10	-1.3	-	-1.1	-2.25	-	-0.9	-		
		15	-3.6	-	-3.0	-8.8	-	-2.4	-		
I _{OL}	(V _{OL} = 0.4 V _{dc}) (V _{OL} = 0.5 V _{dc}) (V _{OL} = 1.5 V _{dc})	5.0	0.52	-	0.44	0.88	-	0.36	-	mA _{dc}	
		10	1.3	-	1.1	2.25	-	0.9	-		
		15	3.6	-	3.0	8.8	-	2.4	-		
I _{IN}	Input Current	15	-	±0.3	-	±0.00001	±0.3	-	±1.0	μA _{dc}	
C _{IN}	Input Capacitance V _{IN} =0	-	-	-	-	5.0	7.5	-	-	pF	
I _{DD}	Quiescent Current (Per Package)	5.0	-	20	-	0.005	20	-	150	μA _{dc}	
		10	-	40	-	0.010	40	-	300		
		15	-	80	-	0.015	80	-	600		

SWITCHING CHARACTERISTICS (C_L=50 pF, T_A=25°C)

Symbol	Characteristics	V _{DD}	Min	Typ	Max	Unit
t _{TLH} , t _{THL}	Output Rise and Fall Time	5.0	-	100	200	ns
		10	-	50	100	
		15	-	40	80	
t _{PLH} , t _{PHL}	Propagation Delay Time, Clock to Q/Enable to Q	5.0	-	280	560	ns
		10	-	115	230	
		15	-	80	160	
	Reset to Q	5.0	-	330	650	
		10	-	130	230	
		15	-	90	170	
t _{WH} , t _{WL}	Clock Pulse Width	5.0	200	100	-	ns
		10	100	50	-	
		15	70	35	-	
t _w	Reset Pulse Width	5.0	375	180	-	ns
		10	100	80	-	
		15	130	65	-	
f _d	Clock Pulse Frequency	5.0	-	2.5	1.5	MHz
		10	-	6.0	3.0	
		15	-	8.0	4.0	
t _{TLH} , t _{THL}	Maximum Clock or Enable Rise and Fall Time	5.0	-	-	15	μs
		10	-	-	10	
		15	-	-	5	
t _{WH}	Enable Pulse Width	5.0	250	125	-	ns
		10	110	55	-	
		15	80	40	-	
t _{wH}	Reset Pulse Width	5.0	280	125	-	ns
		10	120	55	-	
		15	90	40	-	

SWITCHING WAVEFORMS



4518B, 4520B