

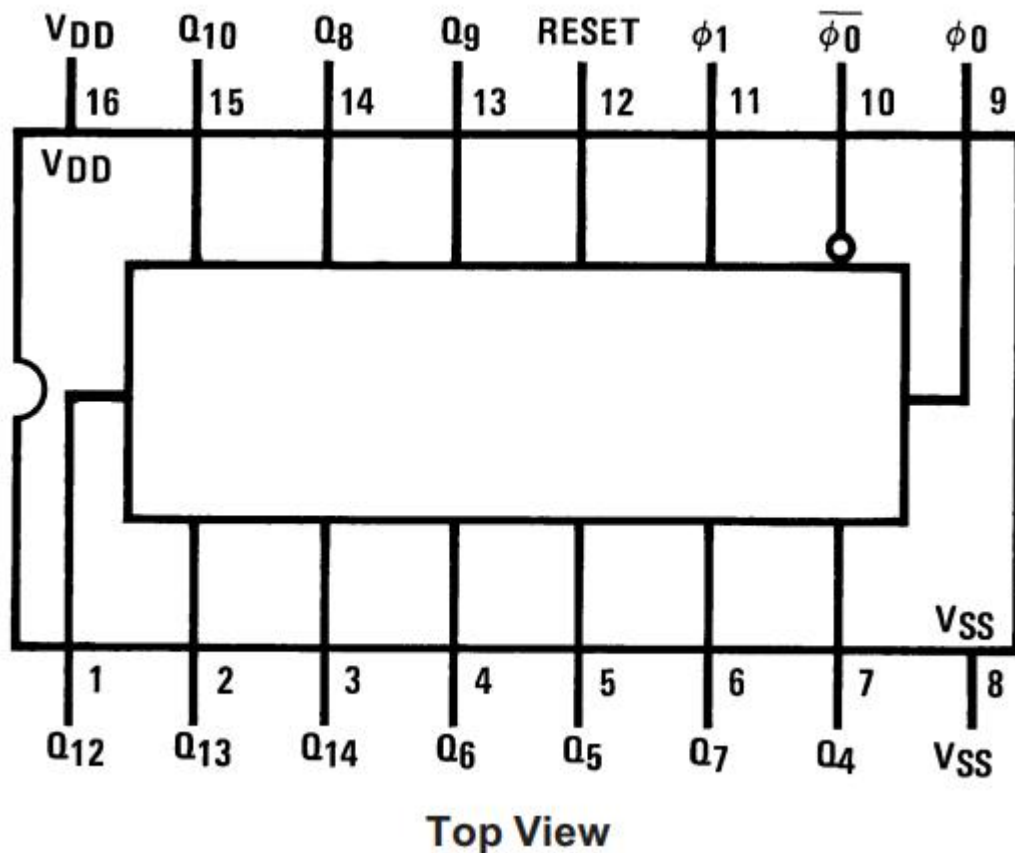
1. DESCRIPTION

The XD4060 is a 14-stage ripple carry binary counter. The counters are advanced one count on the negative transition of each clock pulse. The counters are reset to the zero state by a logical "1" at the reset input independent of clock.

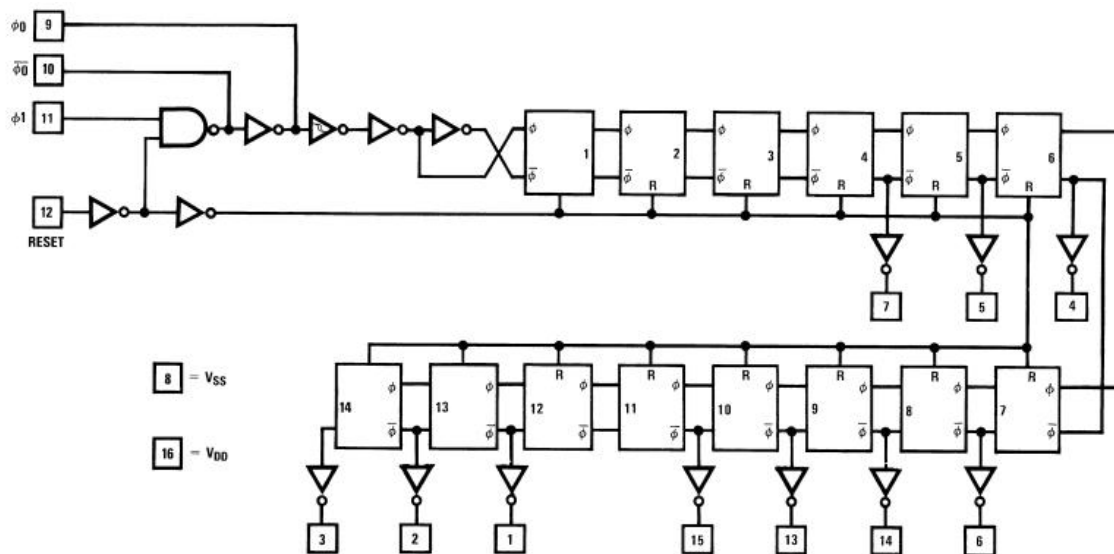
2. FEATURES

- Wide supply voltage range: 3.0V to 15V
- High noise immunity: $0.45 V_{DD}$ (Typ)
- Low power TTL compatibility: Fan out of 2 driving 74L or 1 driving 74LS
- Medium speed operation: 8MHz typ. at $V_{DD} = 10V$
- Schmitt trigger clock input

3. CONNECTION DIAGRAMS

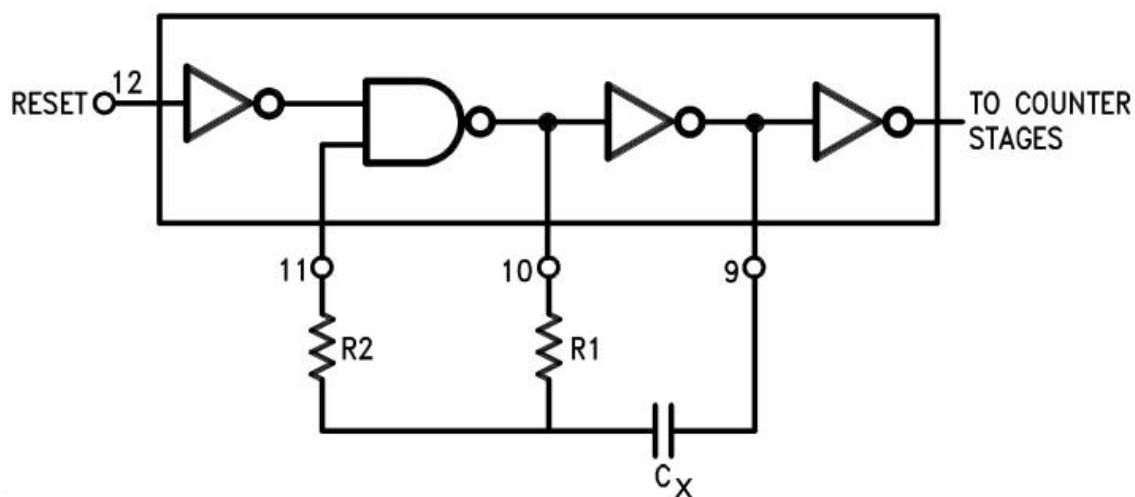


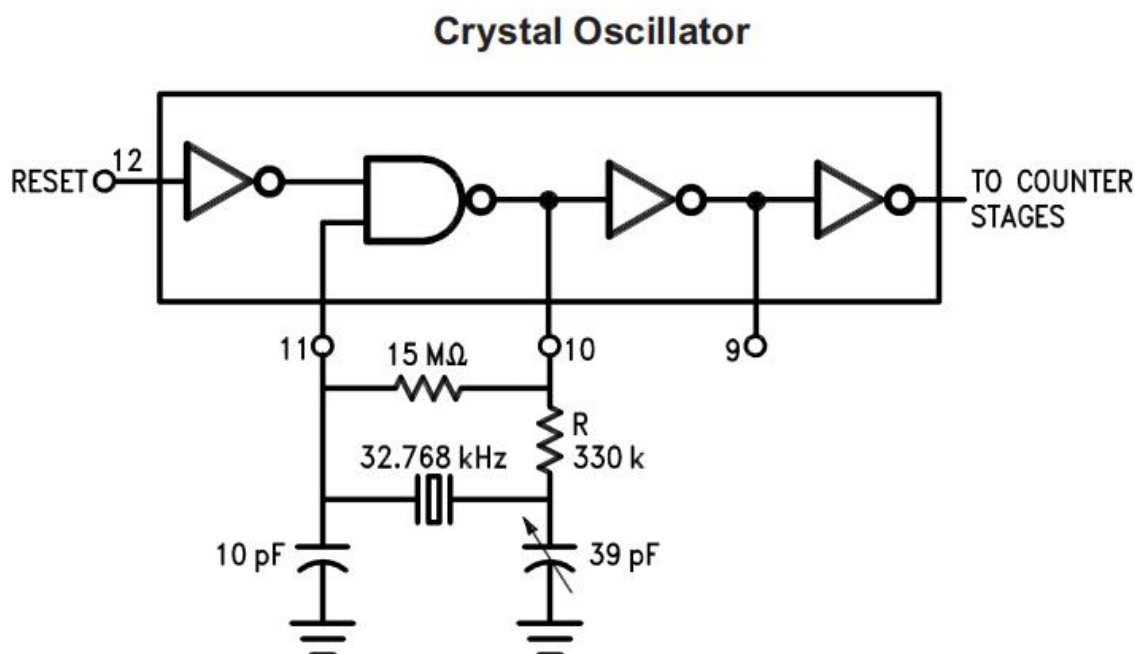
4. SCHEMATIC DIAGRAMS



5. TYPICAL OSCILLATOR CONNECTIONS

RC Oscillator





6. ABSOLUTE MAXIMUM RATINGS⁽¹⁾

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only

Symbol	Parameter	Rating
V_{DD}	Supply Voltage	-0.5V to +18V
V_{IN}	Input Voltage	-0.5V to $V_{DD} + 0.5V$
T_S	Storage Temperature Range	-65°C to +150°C
P_D	Package Dissipation N Package M Package	700mW 500 mW
T_L	Lead Temperature (Soldering, 10 seconds)	260°C

Note 1: $V_{SS} = 0V$ unless otherwise specified.

7. REMCOMMENDED OPERATING CONDITIONS

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Does not recommend exceeding them or designing to absolute maximum ratings.

Symbol	Parameter	Rating
V_{DD}	Supply Voltage	+3V to +15V
V_{IN}	Input Voltage	0V to V_{DD}
T_A	Operating Temperature Range	-40°C to +85°C

8. DC ELECTRICAL CHARACTERISTICS⁽²⁾

Symbol	Parameter	Conditions	+25°C			Units
			Min	Typ	Max	
I_{DD}	Quiescent Device Current	$V_{DD}=5V, V_{IN}=V_{DD} \text{ or } V_{SS}$			5	μA
		$V_{DD}=10V, V_{IN}=V_{DD} \text{ or } V_S$			10	
		$V_{DD}=15V, V_{IN}=V_{DD} \text{ or } V_S$			20	
V_{OL}	LOW Level Output Voltage	$V_{DD}=5V$		0	0.05	V
		$V_{DD}=10V$		0	0.05	
		$V_{DD}=15V$		0	0.05	
V_{OH}	HIGH Level Output Voltage	$V_{DD}=5V$	4.95	5		V
		$V_{DD}=10V$	9.95	10		
		$V_{DD}=15V$	14.95	15		
V_{IL}	LOW Level Input Voltage	$V_{DD}=5V, V_O=0.5V \text{ or } 4.5V$		2	1.5	V
		$V_{DD}=10V, V_O=1.0V \text{ or } 9.0V$		4	3.0	
		$V_{DD}=15V, V_O=1.5V \text{ or } 13.5V$		6	4.0	
V_{IH}	HIGH Level Input Voltage	$V_{DD}=5V, V_O=0.5V \text{ or } 4.5V$	3.5	3		V
		$V_{DD}=10V, V_O=1.0V \text{ or } 9.0V$	7.0	6		
		$V_{DD}=15V, V_O=1.5V \text{ or } 13.5V$	11.0	9		
I_{OL}	LOW Level Output Current ⁽³⁾	$V_{DD}=5V, V_O=0.4V$	0.51	0.88		mA
		$V_{DD}=10V, V_O=0.5V$	1.3	2.25		
		$V_{DD}=15V, V_O=1.5V$	3.4	8.8		
I_{OH}	HIGH Level Output Current ⁽³⁾	$V_{DD}=5V, V_O=4.6V$	-0.51	-0.88		mA
		$V_{DD}=10V, V_O=9.5V$	-1.3	-2.25		
		$V_{DD}=15V, V_O=13.5V$	-3.4	-8.8		
I_{IN}	Input Current	$V_{DD}=15V, V_{IN}=0V$		-10^{-5}	-0.1	μA
		$V_{DD}=15V, V_{IN}=15V$		10^{-5}	0.1	

Note 2: $V_{SS} = 0V$ unless otherwise specified.

Note 3: Data does not apply to oscillator points ϕ_0 and ϕ_0 of XD4060. I_{OH} and I_{OL} are tested one output at a time.

9. AC ELECTRICAL CHARACTERISTICS⁽⁴⁾

XD4060 T_A = 25°C, C_L = 50pF, R_L = 200k, t_r = t_f = 20 ns, unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Units
t _{PHL4} , t _{PLH4}	Propagation Delay Time to Q ₄	V _{DD} = 5V		550	1300	ns
		V _{DD} = 10V		250	525	
		V _{DD} = 15V		200	400	
t _{PHL} , t _{PLH}	Interstage Propagation Delay Time from Q _n to Q _{n+1}	V _{DD} = 5V		150	330	ns
		V _{DD} = 10V		60	125	
		V _{DD} = 15V		45	90	
t _{THL} , t _{TLH}	Transition Time	V _{DD} = 5V		100	200	ns
		V _{DD} = 10V		50	100	
		V _{DD} = 15V		40	80	
t _{WL} , t _{WH}	Minimum Clock Pulse Width	V _{DD} = 5V		170	500	ns
		V _{DD} = 10V		65	170	
		V _{DD} = 15V		50	125	
t _{rCL} , t _{fCL}	Maximum Clock Rise and Fall Time	V _{DD} = 5V			No Limit	ns
		V _{DD} = 10V			No Limit	
		V _{DD} = 15V			No Limit	
f _{CL}	Maximum Clock Frequency	V _{DD} = 5V	1	3		MHZ
		V _{DD} = 10V	3	8		
		V _{DD} = 15V	4	10		
t _{PHL(R)}	Reset Propagation Delay	V _{DD} = 5V		200	450	ns
		V _{DD} = 10V		100	210	
		V _{DD} = 15V		80	170	
t _{WH(R)}	Minimum Reset Pulse Width	V _{DD} = 5V		200	450	ns
		V _{DD} = 10V		100	210	
		V _{DD} = 15V		80	170	
C _{IN}	Average Input Capacitance	Any Input		5	7.5	pF
C _{PD}	Power Dissipation Capacitance			50		pF

Note 4: AC Parameters are guaranteed by DC correlated testing.

10. RC Oscillator Notes

1. R₂ = 2 R₁ to 10 R₁
2. RC Oscillator applications are not recommended at supply voltages below 7.0V for R₁ < 50kΩ
3. $f \approx \frac{1}{2.2 R_1 C_X}$ at V_{CC} = 10V

11. ORDERING INFORMATION

Ordering Information

Part Number	Device Marking	Package Type	Body size (mm)	Temperature (°C)	MSL	Transport Media	Package Quantity
XD4060	XD4060	DIP16	19.05*6.35	- 40 to 85	MSL3	Tube 25	1000

12. DIMENSIONAL DRAWINGS

