

CMOS 14-STAGE RIPPLE-Carry Binary Counter/Divider and Oscillator

High-Voltage Types (20-Volt Rating)

■ XD4060 consists of an oscillator section and 14 ripple carry binary counter stages. The oscillator configuration allows design of either RC or crystal oscillator circuits. A RESET input is provided which resets the counter to the all-O's state and disables the oscillator. A high level on the RESET line accomplishes the reset function. All counter stages are master-slave flip-flops.

The state of the counter is advanced one step in binary order on the negative transition of $\phi 1$ (and $\phi 0$). All inputs and outputs are fully buffered. Schmitt trigger action on the input-pulse line permits unlimited input-pulse rise and fall times.

Applications

- Control counters
- Timers
- Frequency dividers
- Time-delay circuits

Features:

- 12 MHz clock rate at 15 V
- Common reset
- Fully static operation
- Buffered inputs and outputs
- Schmitt trigger input-pulse line
- 100% tested for quiescent current at 20 V
- Standardized, symmetric output characteristics
- 5-V, 10-V, and 15-V parametric ratings

Oscillator Features:

- All active components on chip
- RC or crystal oscillator configuration
- RC oscillator frequency of 690 kHz
- min. at 15 V

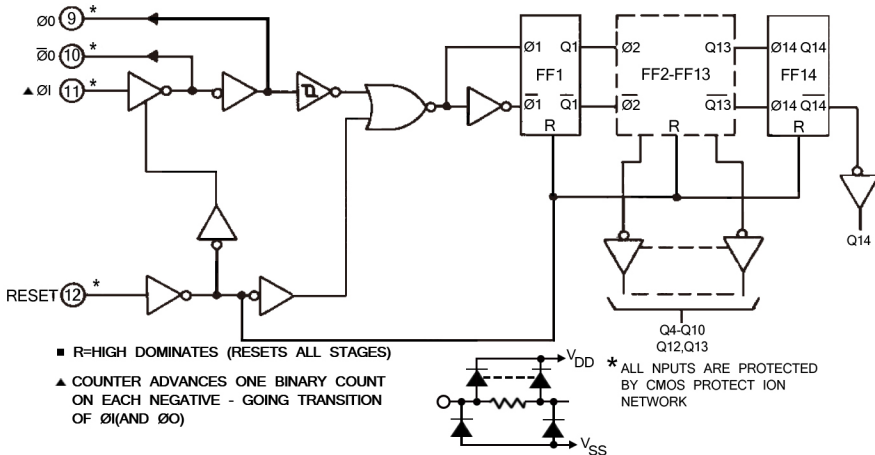
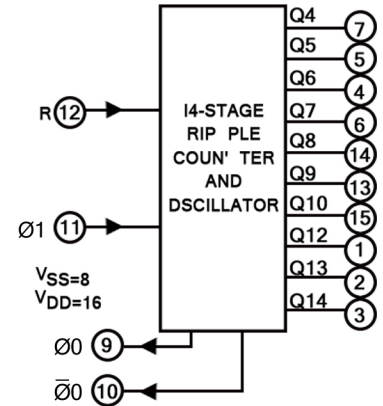


Fig.1 - Logic diagram.

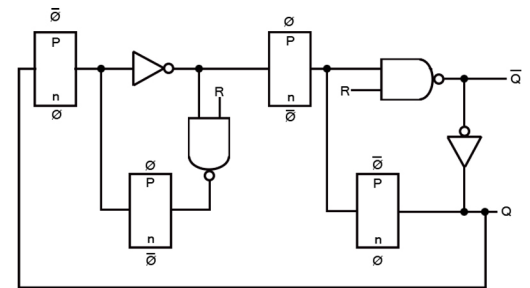


Fig.2 - Detail of typical flip-flop stage.

MAXIMUM RATINGS, Absolute-Maximum Values:

DC SUPPLY-VOLTAGE RANGE, (VDD)

Voltage is referenced to Vss Terminal)-0.5V to + 20V

INPUT VOLTAGE RANGE, ALL INPUTS-0.5V to VDD + 0.5V

DC INPUT CURRENT, ANY ONE INPUT±10mA

POWER DISSIPATION PER PACKAGE (PD):

For TA = -55°C to +100°C500mW

For TA = +100°C to +125°CDerate Linearly at 12mW/°C to 200mW

DEVICE DISSIPATION PER OUTPUT TRANSISTOR

FOR TA = FULL PACKAGE-TEMPERATURE RANGE (All Package Types)100mW

OPERATING-TEMPERATURE RANGE-55°C to +125°C

STORAGE TEMPERATURE RANGE-65°C to +150°C

LEAD TEMPERATURE (DURING SOLDERING):

At distance 1/16±1/32 inch (1.59±0.79mm) from case for 10s max+265°C

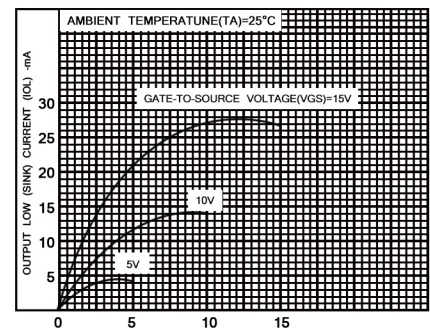


Fig.3 - Typical n-channel output low (sink) current characteristics.

STATIC ELECTRICAL CHARACTERISTICS

CHARACTERISTIC Quiescent	CONDITIONS			LIMITS AT INDICATED TEMPERATURES(°C)							U N I T S
	V _O (V)	V _{IN} (V)	V _{DD} (V)					+25			
Device Current, I _{DD} Max.	-	0,5	5	5	5	150	150	-	0.04	5	μA
	-	0,5	10	10	10	300	300	-	0.04	10	
	-	0,15	15	20	20	600	600	-	0.04	20	
	-	0,20	20	100	100	3000	3000	-	0.08	100	
Output Low (Sink)Current*, I _{OL} Min.	0.4	0,5	5	0.64	0.61	0.42	0.36	0.51	1	-	mA
	0.5	0,10	10	1.6	1.5	1.1	0.9	1.3	2.6	-	
	1.5	0,15	15	4.2	4	2.8	2.4	3.4	6.8	-	
Output High (Source) Current*, I _{OH} Min.	4.6	0,5	5	-0.64	-0.61	-0.42	-0.36	-0.51	-1	-	mA
	2.5	0,5	5	-2	-1.8	-1.3	-1.15	-1.6	-3.2	-	
	9.5	0,10	10	-1.6	-1.5	-1.1	-0.9	-1.3	-2.6	-	
	13.5	0,15	15	-4.2	-4	-2.8	-2.4	-3.4	-6.8	-	
Output Voltage: Low-Level, V _{OL} Max.	-	0,5	5					-	0	0.05	V
	-	0,10	10					-	0	0.05	
	-	0,15	15					-	0	0.05	
Output Voltage: High-Level, V _{OL} Min.	-	0,5	5					4.95	5	-	V
	-	0,10	10					9.95	10	-	
	-	0,15	15					14.95	15	-	
Input Low Voltage V _{IL} Max.	0,5,4,5	-	5					-	-	1.5	V
	1,9	-	10					-	-	3	
	1,5,13,5	-	15					-	-	4	
Input High Voltage V _{IH} Min.	0,5,4,5	-	5					3.5	-	-	V
	1,9	-	10					7	-	-	
	1,5,13,5	-	15					11	-	-	
Input Current I _{IN} Max.	-	0,18	0,18	±0.1	±0.1	±1	±1	-	±10 ⁵	±0.1	μA

*Data not applicable to terminal 9 or 10.

RECOMMENDED OPERATING CONDITIONS

For maximum reliability, nominal operating conditions should be selected so that operation is always within the following ranges

CHARACTERISTIC	V _{DD}	LIMITS		UNITS
		MIN	MAX	
Supply-Voltage Range(For TA = Full Rackgag Temperature)	-	3	18	V
Input-pulse Width,tW (f=100kHz)	5 10 15	100 40 30	-	ns
Input-Pulse Rise Time and Fall Time, t _{rd} ,t _{fd}	5 10 15	Unlimited		
Input-Pulse Frequency, f _o (External pulse source)	5 10 15	-	3.5 8 12	MHz
REser pilse width,tW	5 10 15	120 60 40	-	ns

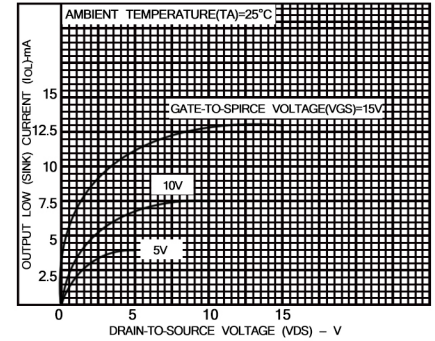


Fig.4 - Minimum n-channel output low (sink) current characteristics.

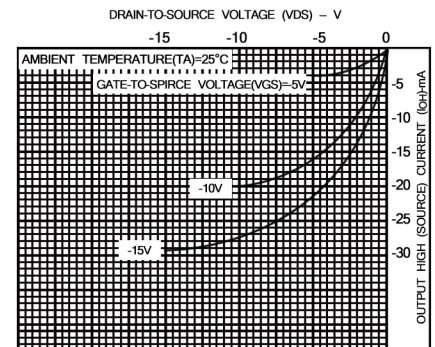


Fig.5 - Typical p-channel output high (source) current characteristics.

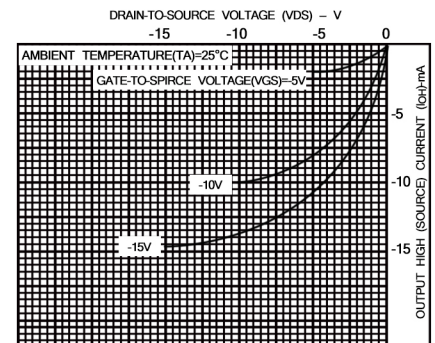


Fig.6 - Minimum p-channel output high (source) current characteristics.

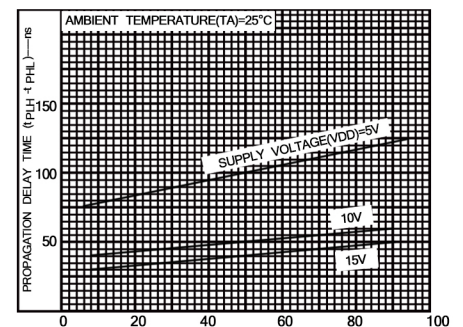


Fig.7 - Typical gation delay time (Qn to Qn+1) as a function of load capacitance.

DYNAMIC ELECTRICAL CHARACTERISTICS at $T_A = 25^\circ\text{C}$, Input $t_r, t_f = 20\text{ns}$,
 $C_L = 50\text{pF}$, $R_L = 200\text{k}\Omega$

CHARACTRISTIC	TEST CONDITIONS	V _{DD} (V)	LIMITS			UNITS
			MIN	TYP	MAX	
Input-Pulse Operation						
Propagation Delay Time,Q1 to Q4 Out; tPHL,tPLH		5	–	370	740	ns
		10	–	150	300	
		15	–	100	200	
Propagation Delay Time,Qn to Qn +1; tPHL,tPLH		5	–	100	200	
		10	–	50	100	
		15	–	40	80	
Transition time, tTHL,tTLH		5	–	100	200	
		10	–	50	100	
		15	–	40	80	
Min.Input-Pulse Width,tW	f = 100kHz	5	–	50	100	
		10	–	20	40	
		15	–	15	30	
Input-Pulse Rise&Fall Time,tr0,tf0		5	Unlimited			
		10				
		15				
Max.Input-Pulse Frequency,f01 (External pulse source)		5	3.5	7	–	MHz
		10	8	16	–	
		15	12	24	–	
Input Capacitance,C1	Any Input		–	8	7.5	pF
Reset Operation						
Propagation Delay Time,tPHL		5	–	180	360	ns
		10	–	80	160	
		15	–	50	100	
Minimum Reset Pulse Width,tW		5	–	60	120	
		10	–	30	60	
		15	–	20	40	

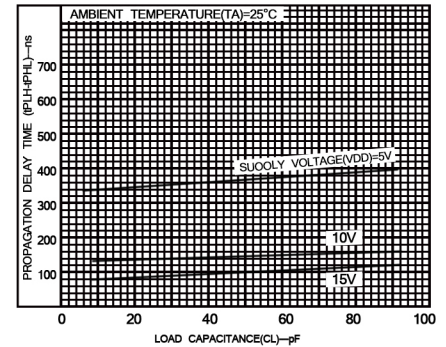


Fig.8-Typical propagation delay time (Q_1 to Q_4 Output) as a function of load capacitance.

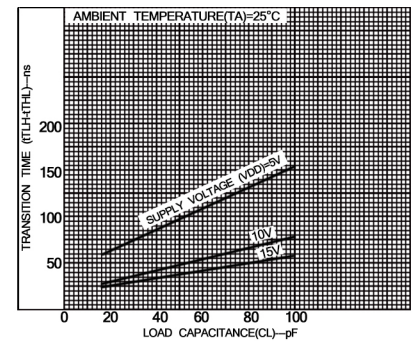


Fig.9-Typical transition time as a function of load capacitance.

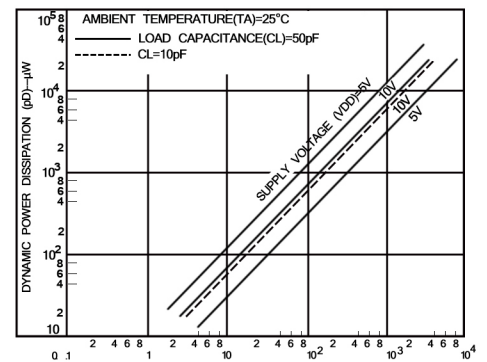


Fig.10-Typical dynamic power dissipation as a function of input frequency.

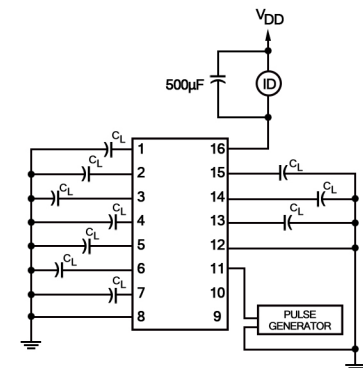


Fig.11-Dynamic power dissipation test circuit.

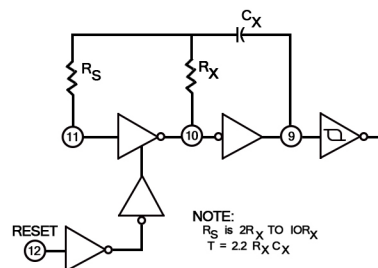


Fig.12-Typical RC circuit.

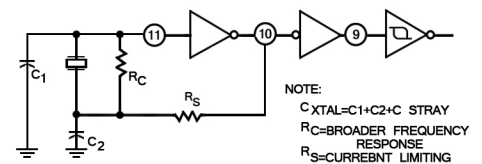


Fig.13-Typical crystal circuit.

XD4060 DIP-16

DYNAMIC ELECTRICAL CHARACTERISTICS at TA = 25°C, Input t_f, t_r = 20 ns,
CL = 50pF, RL=200kΩ [cont'd]

CHARACTERISTIC	TEST CONDITIONS	V _{DD} (V)	LIMITS			UNITS
			Min	Typ	Max	
RC Operation						
Variation of Fre- quency(Unit-to-Unit)	C _X =200pF, R _S =560kΩ, R _X =50kΩ	5	-	23±10%	-	kHz
		10	-	24±10%	-	
		15	-	25±10%	-	
Variation of Fre- quency with voltage change(Same Unit)	C _X =200pF, R _S =560kΩ, R _X =50kΩ	5V to 10V 10V to 15V	-	1.5 0.5	- -	
R _X max.	C _X =10μF, =50μF, =10μF	5	-	-	20	MΩ
		10	-	-	20	
		15	-	-	10	
C _X max.	R _X =500kΩ =300kΩ =300kΩ	5	-	-	1000	μF
		10	-	-	50	
		15	-	-	50	
Maximum Oscillator Frequency*	R _X =5kΩ R _S =30kΩ C _X =15pF	10	530	650	810	kHz
		15	690	800	940	
Drive Current at Pin 9(For Oscillator Design)	I _{OL}	V _O =0.4V	5	0.16	0.35	mA
		=0.5V	10	0.42	0.8	
		=1.5V	15	1	2	
	I _{OH}	V _O =4.6V	5	-0.16	-0.35	
		=9.5V	10	-0.42	-0.8	
		=13.5V	15	-1	-2	

*RC oscillator applications are not recommended at supply voltages below 7V for R_X <50 kΩ.

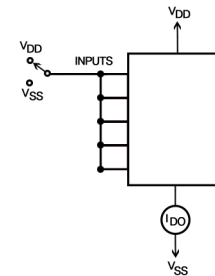


Fig.14-Quiescent device current.

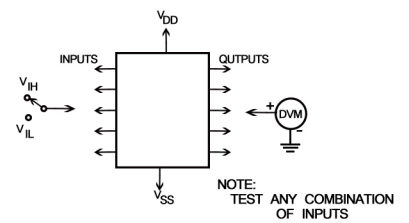


Fig.15-Input voltage.

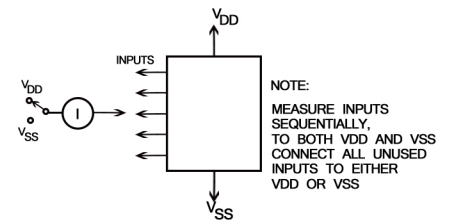
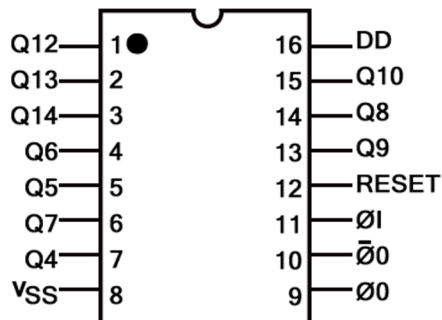


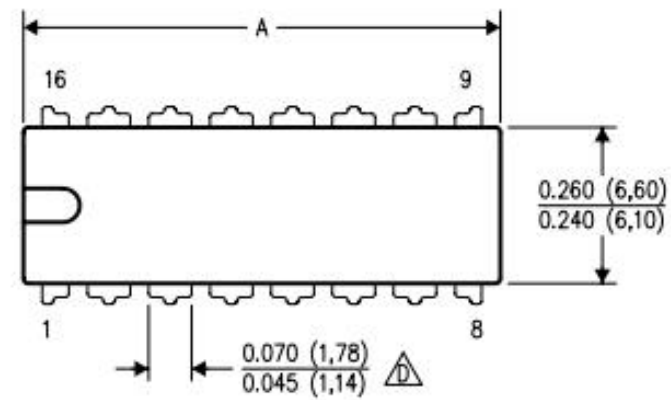
Fig.16-Input current

TERMINAL DIAGRAM

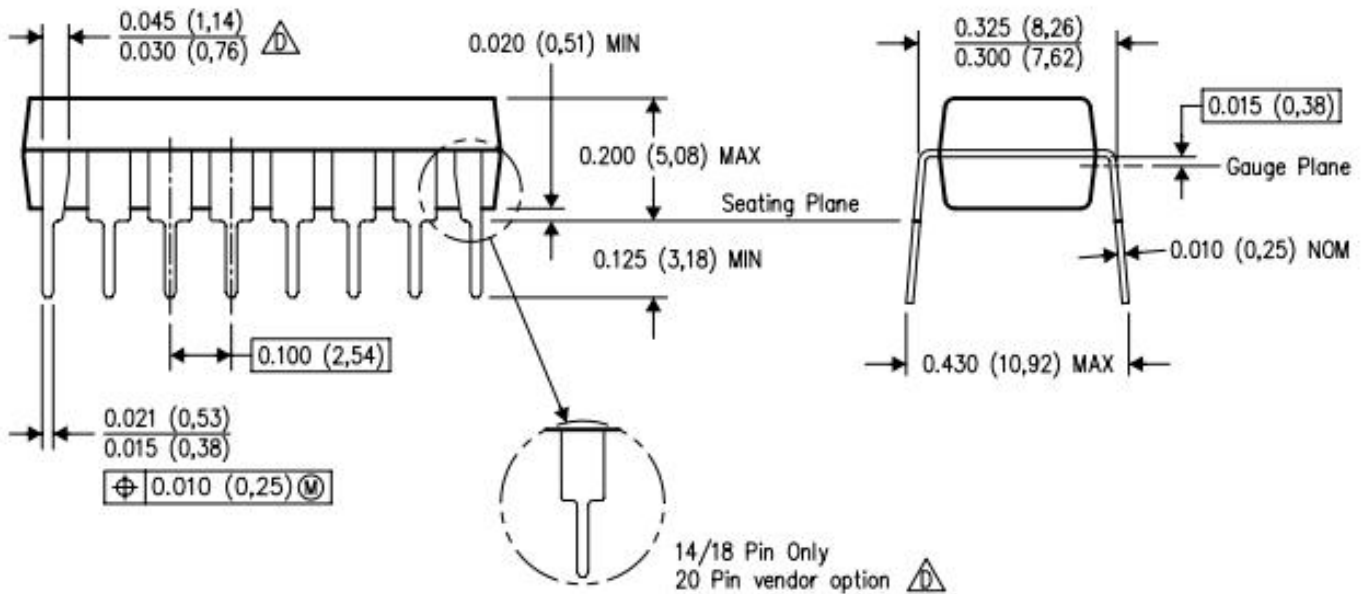


XD4060 DIP-16

DIP



PINS **	14	16	18	20
DIM				
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	1.060 (26,92)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)
MS-001 VARIATION	AA	BB	AC	AD



以上信息仅供参考. 如需帮助联系客服人员。谢谢 XINLUDA