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XD4060 DIP-16

CMOS 14-STAGE RIPPLE-Carry Binary Counter/Dividerand 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 ϕI(and ϕ0). All inputs and outputs are fully buffered. Schmitt trigger. action on the input-pulse line permits unlimited input-pulse rise and fall times.

Applications

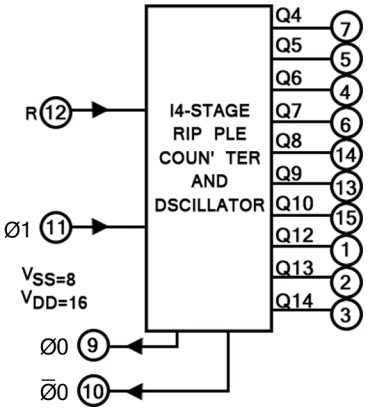
- Control counters
- Timers
- Frequency dividers
- Time-delay circuits

Fetures:

- 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, symmetricat output characteristics
- 5-V, 10-V, and 15-V parametric ratings

Oscillator Features:

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



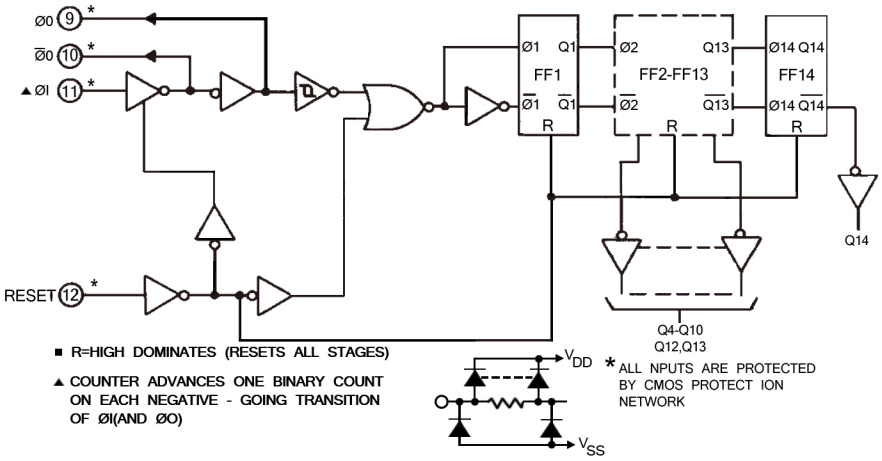


Fig.1 - Logic diagram.

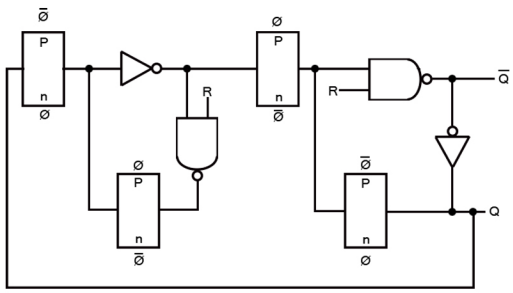


Fig.2 - Detail of tyical flip-flop stage.

MAXIMUM RATINGS,Abaolute-Maximun Vaiues:

DC SUPPLY-VOLTAGE RANGE, (VDD)
Voltagis referenced loVss 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):
ForTA = -55°C to +100°C 500mW
ForTA- +100°C to +125°C .....Derate Linearity 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

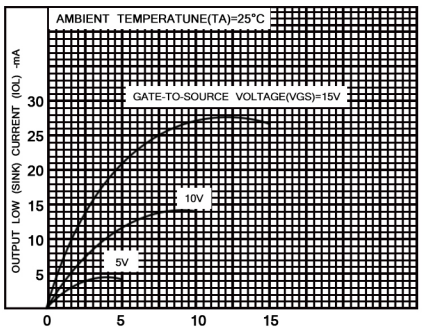


Fig.3 - Typical n-channel output low (sink) current characteristics.

STATIC ELECTRICAL CHARCTERISTICS

CHARAC-TERISTIC	CONDITIONS			LIMITS AT INDICATED TEMPERATURES(°C)							UNTS
Quiescent	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)Ourrent*, 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	-	
	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	-	
	-	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	-	-	
	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 relibiliy, 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 Rackgae Temperature)	-	3	18	V
Input-pulse Width,tW (f=100kHz)	5 10 15	100 40 30	-	ns
Input-Pulse Rise Time and Fall Time, $t_{r\Ø}$,$t_{f\Ø}$	5 10 15	Unlimited		
Input-Pulse Frequency, $f_{\Ø I}$ (External pulse source)	5 10 15	-	3.5 8 12	MHz
REser pilse width,tW	5 10 15	120 60 40	-	ns

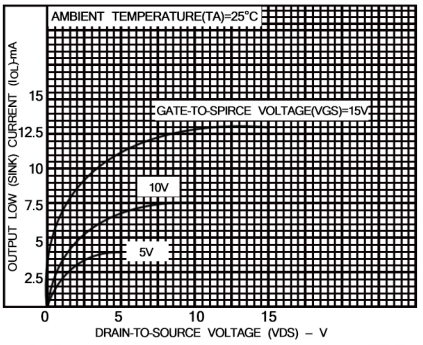


Fig.4 - Minmum n-channel output low (sink) current characteristics.

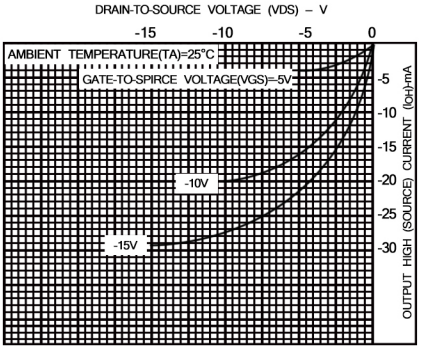


Fig.5 - Typical p-channel output high (source) current characteristics.

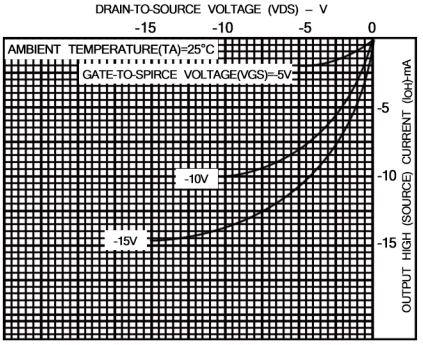


Fig.6 - Minimum p-channel output high (source) current characteristics.

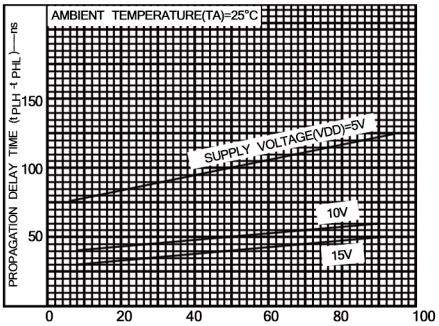


Fig.7 - Typical gation delay time (Qn to Qn+1) as a function of load capacitance.

DYNAMIC ELECTRICAL CHARSCTERISTICS at TA = 25°C, Input tr,tf = 20ns, CL = 50 pF, RL = 200 kΩ

CHARACTRISTIC	TEST CONDITIONS	V_{DD} (V)	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNITS
Input-Pulse Operation						
Propagation Delay Time,ØI 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,$t_{rØ}$,$t_{fØ}$		5	Unlimited			
		10				
		15				
Max.Input-Pulse Frequency,fØI (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	

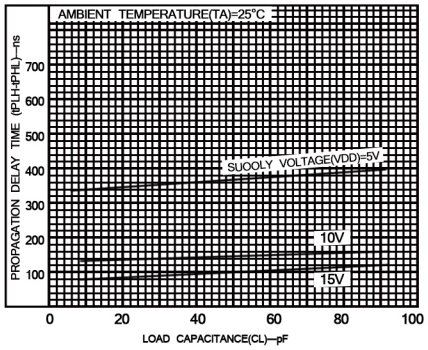


Fig.8-Typical propagation delay time (ØI to Q4 Output) as a function of load capacitance.

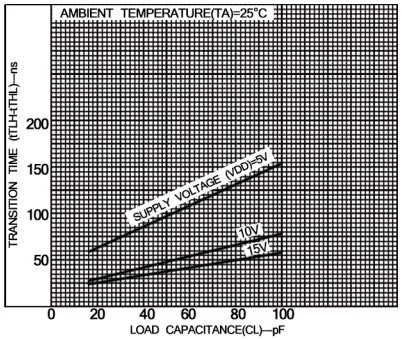


Fig.9-Typical teansition time as a function of load capacotance.

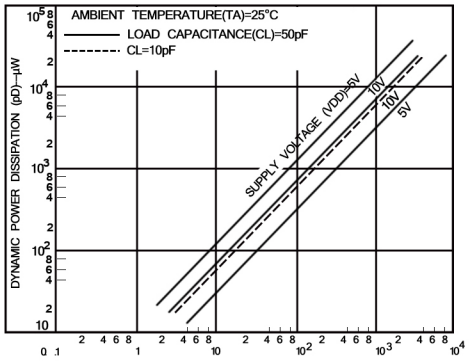


Fig.10-Typical dynamic power dissipation as a function of input frequency.

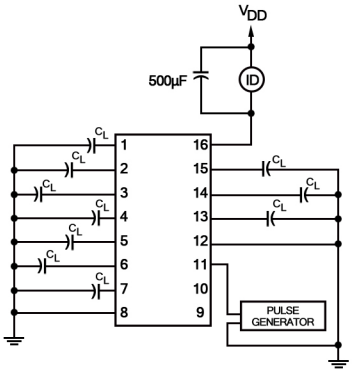


Fig.11-Dynamic power dissipation test cirucit.

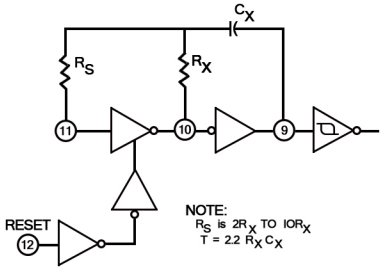


Fig.12-Typical RC circuit.

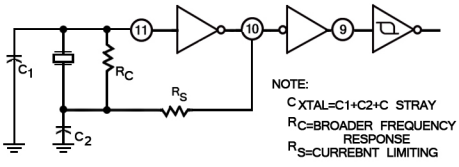


Fig.13-Typical crystal circuit.

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

CHARACTERISTIC	TEST CONDITIONS	V_{DD} (V)	LIMITS Min	Typ	Max	UNITS
RC Operation						
Variation of Frequency(Unit-to-Unit)	C_X=200pF, R_S=560kΩ, R_X=50kΩ	5	-	23±10%	-	kHz
		10	-	24±10%	-	
		15	-	25±10%	-	
Variation of Frequency 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)						mA
I_{OL}	V_O=0.4V	5	0.16	0.35	-	
	=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 RX <50 kΩ.

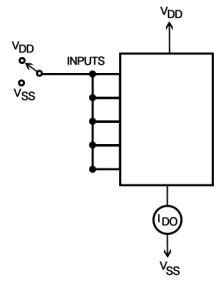


Fig.14-Quiescent device current.

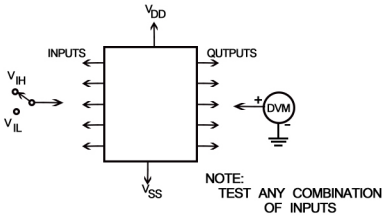


Fig.15-Input voltage.

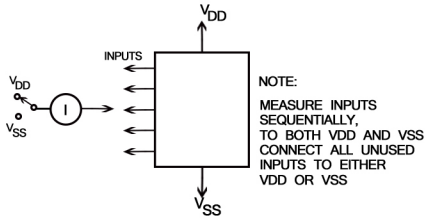
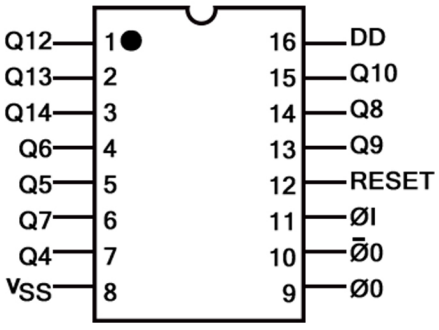
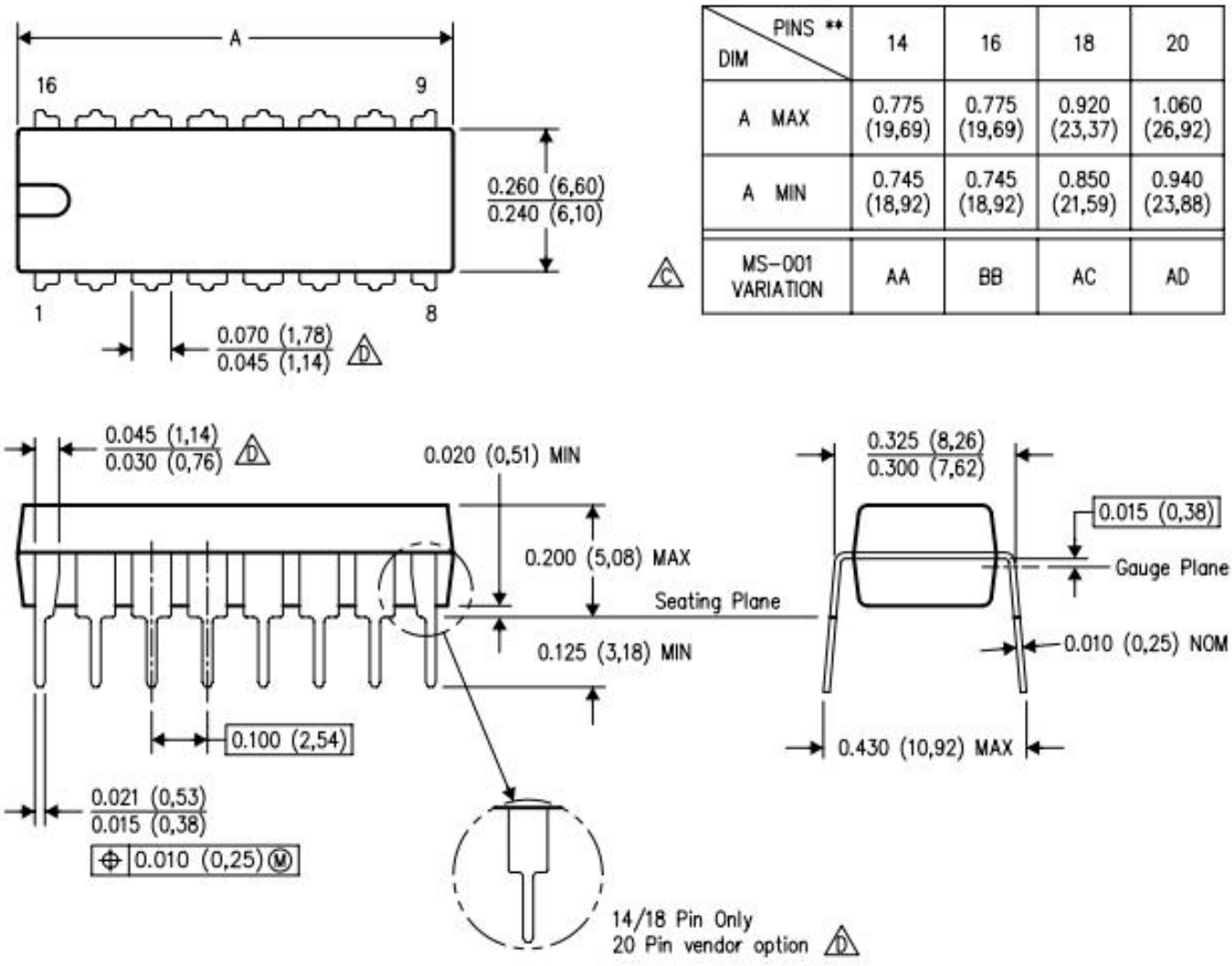


Fig.16-Input current

TERMINAL DIAGRAM



DIP



DIM \ PINS **	14	16	18	20
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