1. DESCRIPTION

The XD4066 is a quad bilateral switch intended for the transmission or multiplexing of analog or digital signals. Has a much lower “ON” resistance, and “ON” resistance is relatively constant over the input-signal range.

2. FEATURES

- Wide supply voltage range 3V to 15V
- High noise immunity0.45 V_{DD}(typ.)
- Wide range of digital and±7.5VPEAK analog switching
- "ON" resistance for 15V operation 80Ω
- Matched“ON”resistance △R_{ON}=5Ω (typ.) over 15V signal input
- "ON”resistance fat over peak-to-peak signal range
- High “ON"/"OFF”65 dB (typ.)

  output voltage ratio @f_{is}=10 kHz,R_L=10 kΩ
- Control Line Biasing:

  Switch On (Logic 1),V_C=V_{DD}

  Switch Off (Logic 0),V_C=V_{SS}
- High degree linearity 0.1% distortion (typ.)

  High degree linearity f_{is}=1kHz,V_{is}=5V_{p-p}'

  High degree linearity V_{DD}-V_{SS}=10V,R_L=10kΩ
- Extremely low"OFF”0.1nA (typ.)

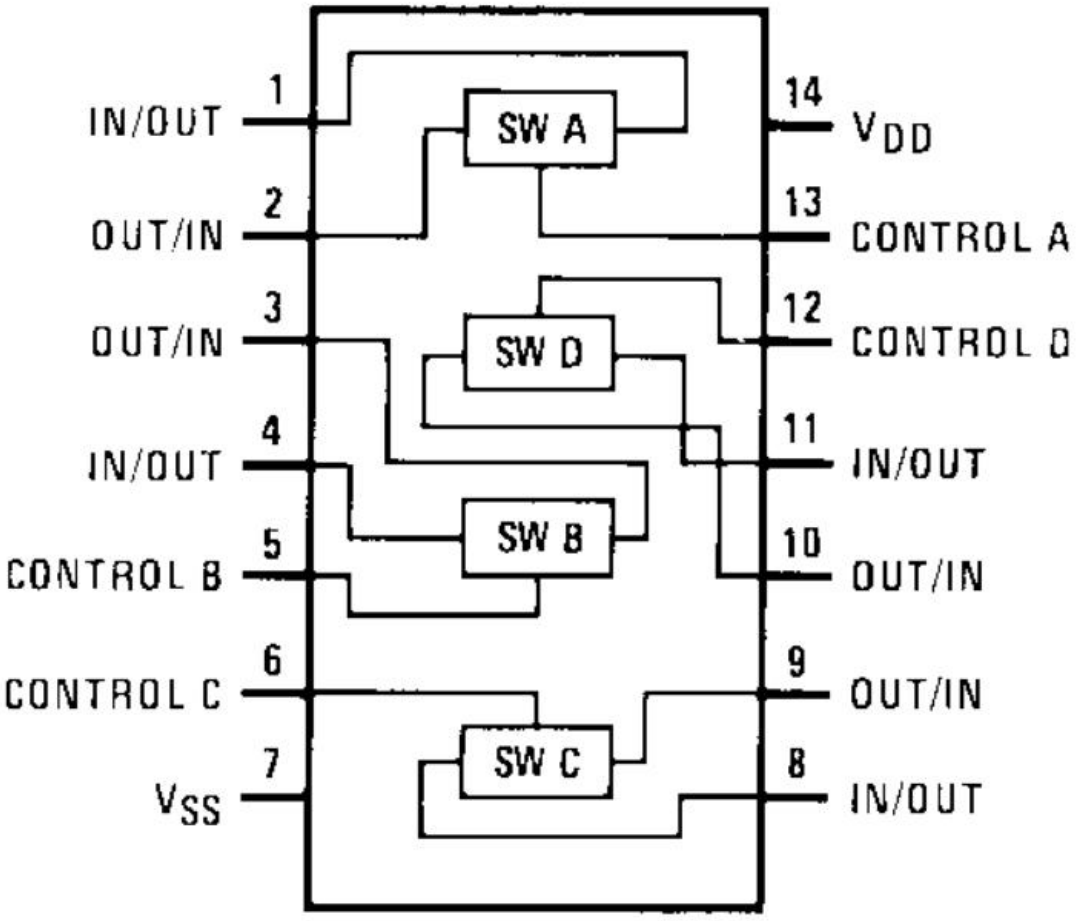
  switch leakage:V_{DD}-V_{SS}=10V,T_A=25℃
- Extremely high control input impedance1 0^{12}Ω(typ.)
- Low crosstalk-50 dB(typ.) between switches

  f_{is}= 0.9 MHz,R_L =1kΩ
- Frequency response, switch“ON”40MHz (typ.)

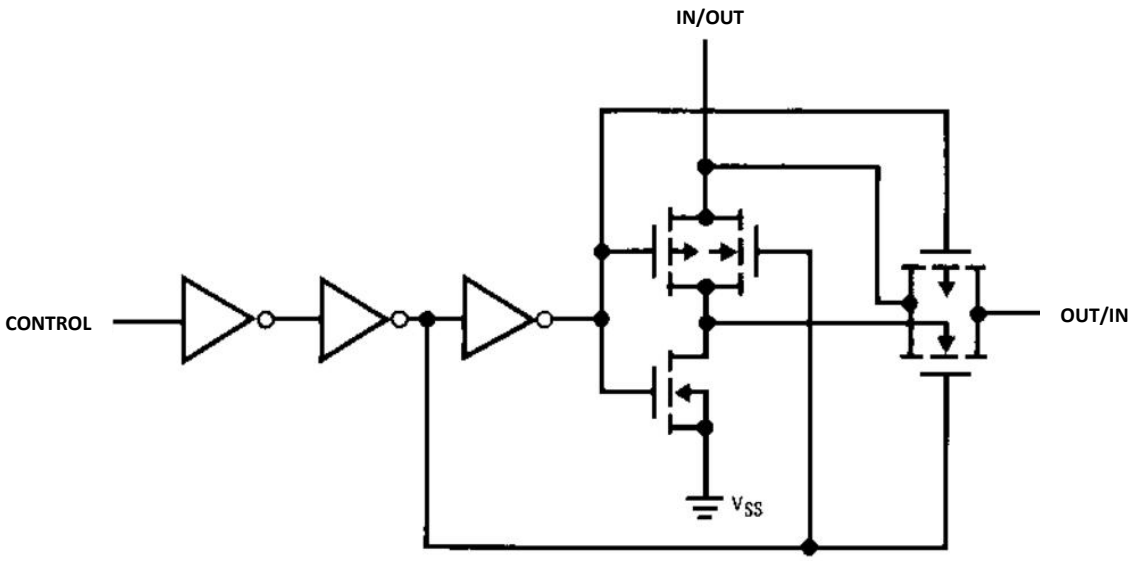
3. APPLICATIONS

- Analog signal switching/multiplexing
  - Signal gating
  - Squelch control
  - Chopper
  - Modulator/Demodulator
  - Commutating switch
- Digital signal switching/multiplexing
- Analog-to-digital/digital-to-analog conversion
- Digital control of frequency, impedance,phase, and analog-signal-gain

4. CONNECTION DIAGRAM



5. SCHEMATIC DIAGRAM



6. ABSOLUTE MAXIMUM RATINGS(Note 1.2)

- Supply Voltage (V_{DD}) .....−0.5V to +18V
- Input Voltage (V_{IN}) .....−0.5V to V_{CC}+0.5V
- Storage Temperature Range (T_S) .....−65°C to +150°C
- Power Dissipation (P_D)

  Dual-In-Line.....700 mW

  Small Outline .....500 mW
- Lead Temperature (T_L)

  (Soldering, 10 seconds) .....300°C

6.1. Recommended Operating Conditions (Note2)

- Supply Voltage (V_{DD}) .....3V to 15V
- Input Voltage (V_{IN})..... 0V to V_{DD}
- Operating Temperature Range (T_A) .....−40°C to +85°C

Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. They are not meant to imply that the devices should be operated at these limits. The tables of "Recommended Operating Conditions" and "Electrical Characteristics" provide conditions for actual device operation.

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

7. DC ELECTRICAL CHARACTERISTICS(Note2)

Symbol	Parameter	Conditions	+25°C			Units
			Min	Typ	Max	
I_{DD}	Quiescent Device Current	V_{DD} = 5V		0.01	0.25	μA
		V_{DD} = 10V		0.01	0.5	
		V_{DD} = 15V		0.01	1.0	
SIGNAL INPUTS AND OUTPUTS						
R_{ON}	"ON"Resistance	R_L = 10 kΩ to (V_{DD}-V_{SS}/2)				Ω
		V_C = V_{DD},V_{SS} to V_{DD}				
		V_{DD} = 5V		270	1050	
		V_{DD} =10V		120	400	
		V_{DD} =15V		80	240	
△R_{ON}	△"ON" Resistance Between Any 2 of 4 Switches	R_L = 10 kΩ to (V_{DD}-V_{SS}/2)				Ω
		V_{CC} = V_{DD},V_S=V_{SS} to V_{DD}				
		V_{DD}= 10V		10		
		V_{DD}= 15V		5		
I_{IS}	Input or Output Leakage Switch"OFF"	V_C = 0		±0.1	±50	nA
CONTROL INPUTS						
V_{ILC}	LOW Level Input Voltage	V_{IS} =V_{SS} and V_{DD}				V
		V_{OS}=V_{DD} and V_{SS}				
		I_{IS} = ± 10μA				
		V_{DD} = 5V		2.25	1.5	
		V_{DD} = 10V		4.5	3.0	
		V_{DD} = 15V		6.75	4.0	
V_{IHC}	HIGH Level Input Voltage	V_{DD} = 5V	3.5	2.75		V
		V_{DD} = 10V(Note 7)	7.0	5.5		
		V_{DD} = 15V	11.0	8.25		
I_{IN}	Input Current	V_{DD}−V_{SS} = 15V		-10^{-5}	-0.1	μA
		V_{DD}≥V_{IS}≥V_{SS}		10^{-5}	0.1	
		V_{DD}≥V_C≥V_{SS}				

8. AC ELECTRICAL CHARACTERISTICS(Note 3)

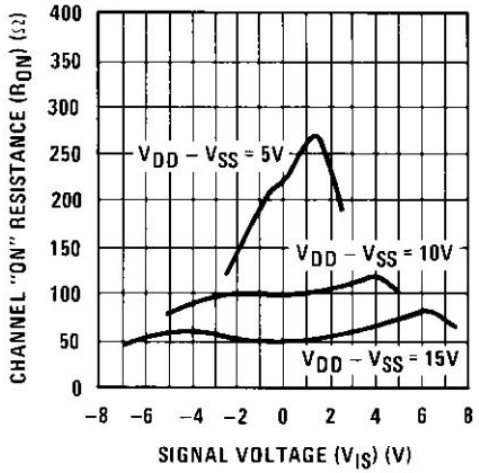
TA = 25°C, tr = tf = 20 ns and VSS = 0V unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Units
t_{PHL}, t_{PLH}	Propagation Delay Time Signal Input to Signal Output	V_C =V_{DD},C_L=50 pF(Note 1)				
		R_L=200k				
		V_{DD}=5V		25	55	ns
		V_{DD}=10V		15	35	ns
		V_{DD}=15V		10	25	ns
t_{PZH}, t_{PZL}	Propagation Delay Time Control Input to Signal Output High Impedance to Logical Level	R_L=1.0 kΩ, C_L= 50 pF (Note 2,Note 3)				
		V_{DD}=5V			125	ns
		V_{DD}=10V			60	ns
		V_{DD}=15V			50	ns
t_{PHZ}, t_{PLZ}	Propagation Delay Time Control Input to Sighal Output Logical Level to High Impedance	R_L=1.0 kΩ,C_L= 50 pF(Note 2,Note 3)				
		V_{DD}=5V			125	ns
		V_{DD}=10V			60	ns
		V_{DD}=15V			50	ns
	Sine Wave Distortion	V_C =V_{DD}=5V,V_{SS}=-5V		0.1		
		R_L = 10 kΩ,V_S =5V_{p-p},f= 1 kHz(Note 4)				
	Frequency Response-Switch "ON"(Frequency at -3dB)	V_C =V_{DD}=5V,V_{SS}=-5V,		40		MHZ
		R_L = 1 kΩ, V_S = 5V_{p-p},				
		20 Log_{10} V_{OS}/N_{OS}(1kHz)-dB(Note 4)				
	Feedthrough -Switch"OFF' (Frequency at-50 dB)	V_{DD} =5.0V,V_{CC}=V_{SS}=-5.0V,		1.25		
		R_L = 1 kΩ,V_{IS}=5.0V_{p-p},20 Log_{10},				
		V_{OS}/V_{IS}=-50 dB(Note 4)				
	Crosstalk Between Any Two Switches (Frequency at-50 dB)	V_{DD} =$V_{C(A)}$= 5.0V;V_{SS}=$V_{C(B)}$=5.0V,		0.9		MHZ
		R_L1 kΩ,$V_{IS(A)}$=5.0 V_{p-p},20 Log_{10},				
		$V_{OS(B)}$/$V_{IS(A)}$ =-50 dB (Note 5)				
	Crosstalk; Control Input to Signal Output	V_{DD} =10V, R_L = 10 kΩ,R_{IN} = 1.0 kΩ,		150		mV_{p-p}
		V_{CC}=10V Square Wave,C_L=50 pF (Note 6)				
	Maximum Control Input	R_L = 1.0 kΩ, C_L= 50 pF (Note 7)				
		$V_{OS(f)}$= ½ V_{OS}(1.0 kHz)				
		V_{DD}=5.0V		6.0		MHZ
		V_{DD}=10V		8.0		MHZ
		V_{DD}=15V		8.5		MHZ
C_{IS}	Signal Input Capacitance			8.0		pF
C_{OS}	Signal Output Capacitance	V_{DD}=10V		8.0		pF
C_{IOS}	Feedthrough Capacitance	V_C =0V		0.5		pF
C_{IN}	Control Input Capacitance			5.0	7.5	pF

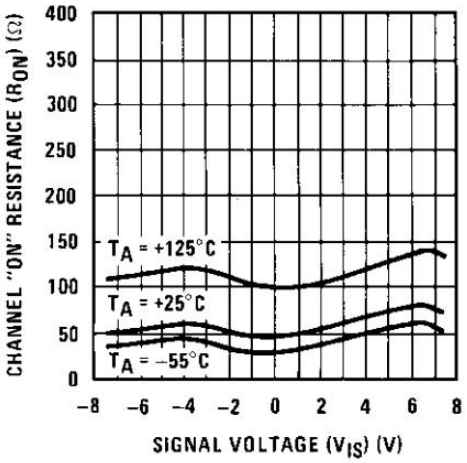
Note 3: AC Parameters are guaranteed by DC correlated testing.
Note 4: These devices should not be connected to circuits with the power "ON".
Note 5: In all cases, there is approximately 5 pF of probe and jig capacitance in the output; however, this capacitance is included in C_L wherever it is specified.
Note 6: V_{IS} is the voltage at the in/out pin and VOS is the voltage at the out/in pin. V_C is the voltage at the control input.
Note 7: Conditions for V_{IHC}: a) V_{IS} = V_{DD}, I_{OS} = standard B series I_{OH} b) V_{IS} = 0V, I_{OL} = standard B series I_{OL}.

9. TYPICAL PERFORMANCE CHARACTERISTICS

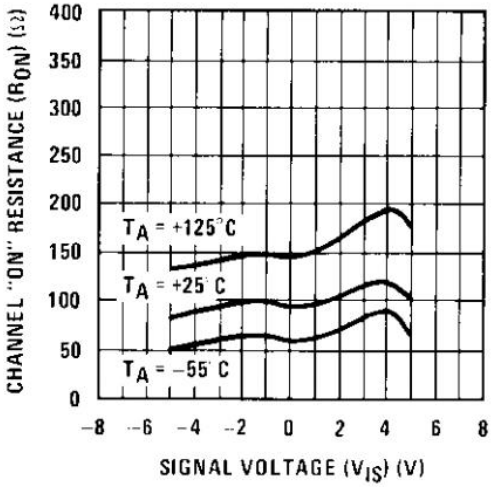
"ON" Resistance vs Signal Voltage for $T_A = 25°C$



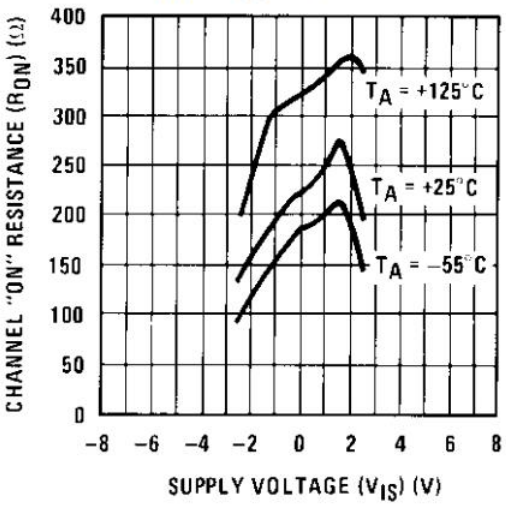
"ON" Resistance as a Function of Temperature for $V_{DD}–V_{SS} = 15V$



"ON" Resistance as a Function of Temperature for $V_{DD}–V_{SS} = 10V$



"ON" Resistance as a Function of Temperature for $V_{DD}–V_{SS} = 5V$



10. SPECIAL CONSIDERATIONS

In applications where separate power sources are used to drive V_{DD} and the signal input, the V_{DD} current capability should exceed V_{DD}/R_L (R_L = effective external load of the 4 XD4066 bilateral switches). This provision avoids any permanent current flow or clamp action of the VDD supply when power is applied or removed from XD4066.

In certain applications, the external load-resistor current may include both V_{DD} and signal-line components. Toavoid drawing V_{DD} current when switch current flows into terminals 1, 4, 8 or 11, the voltage drop across the bidirectional switch must not exceed 0.6V at $T_A \leq 25°C$, or 0.4V at $T_A > 25°C$ (calculated from RON values shown). No V_{DD} current will flow through R_L if the switch current flows into terminals 2, 3, 9 or 10.

11. AC TEST CIRCUITS AND SWITCHING TIME WAVEFORMS

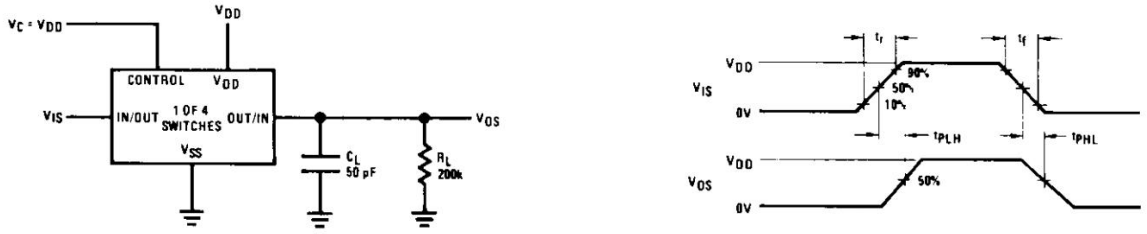


FIGURE 1. t_{PHL}, t_{PLH} Propagation Delay Time Signal Input to Signal Output

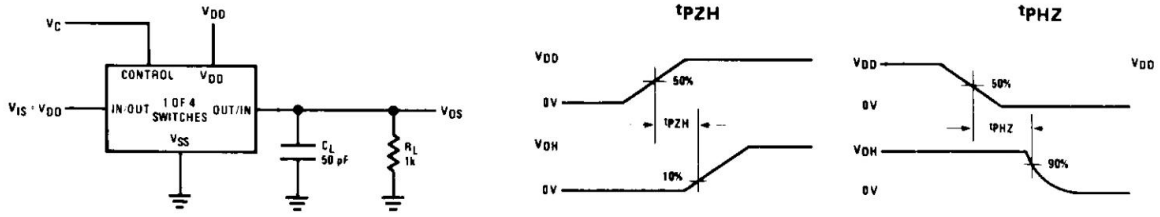


FIGURE 2. t_{PZH}, t_{PHZ} Propagation Delay Time Control to Signal Output

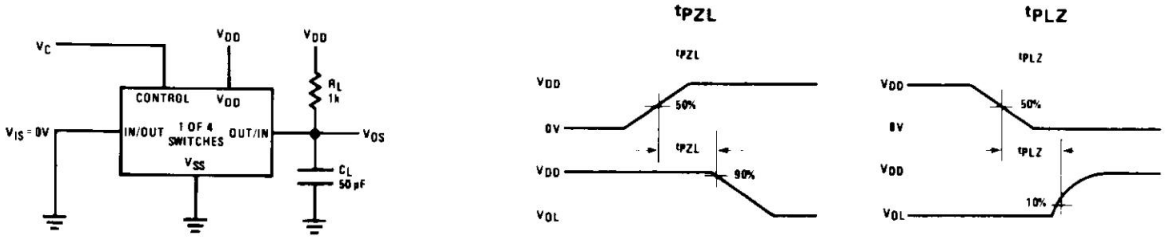
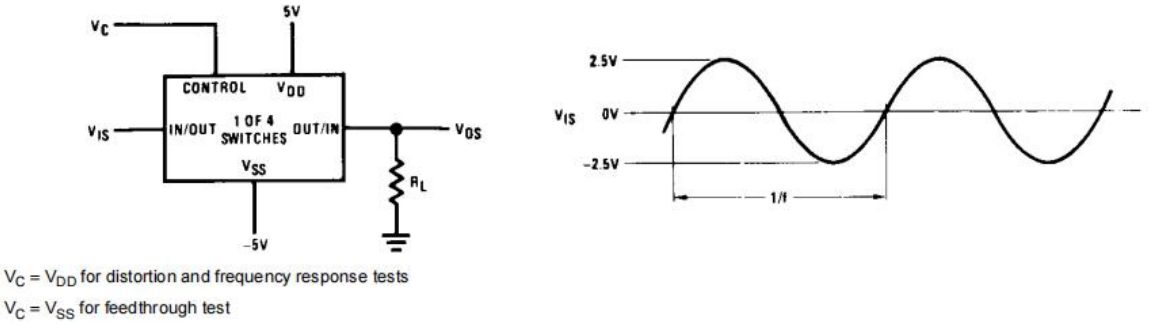


FIGURE 3. t_{PZL}, t_{PLZ} Propagation Delay Time Control to Signal Output



$V_C = V_{DD}$ for distortion and frequency response tests

$V_C = V_{SS}$ for feedthrough test

FIGURE 4. Sine Wave Distortion, Frequency Response and Feedthrough

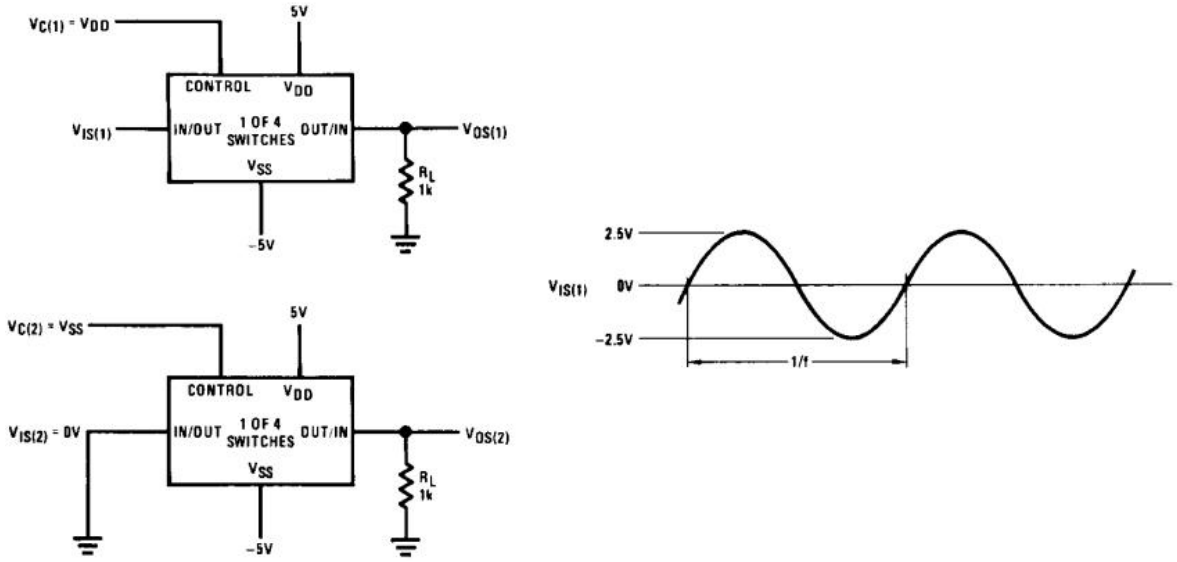


FIGURE 5. Crosstalk Between Any Two Switches

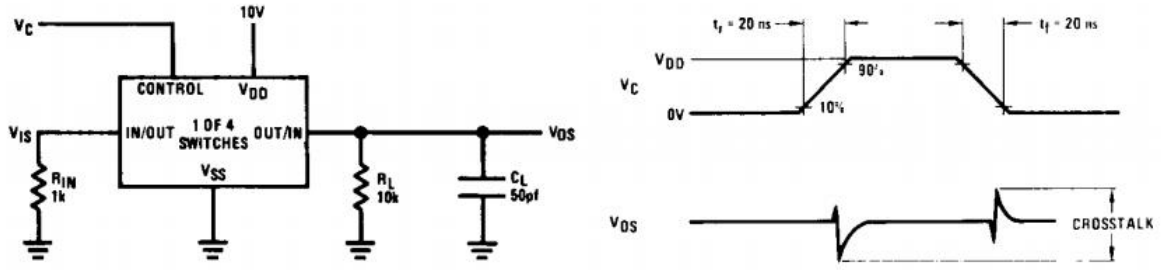


FIGURE 6. Crosstalk: Control Input to Signal Output

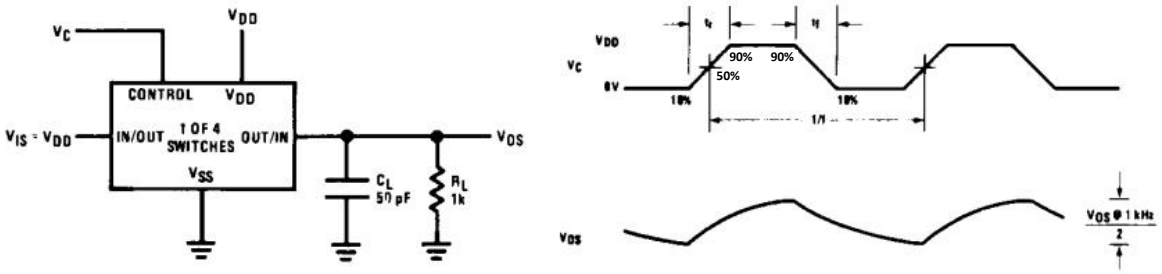


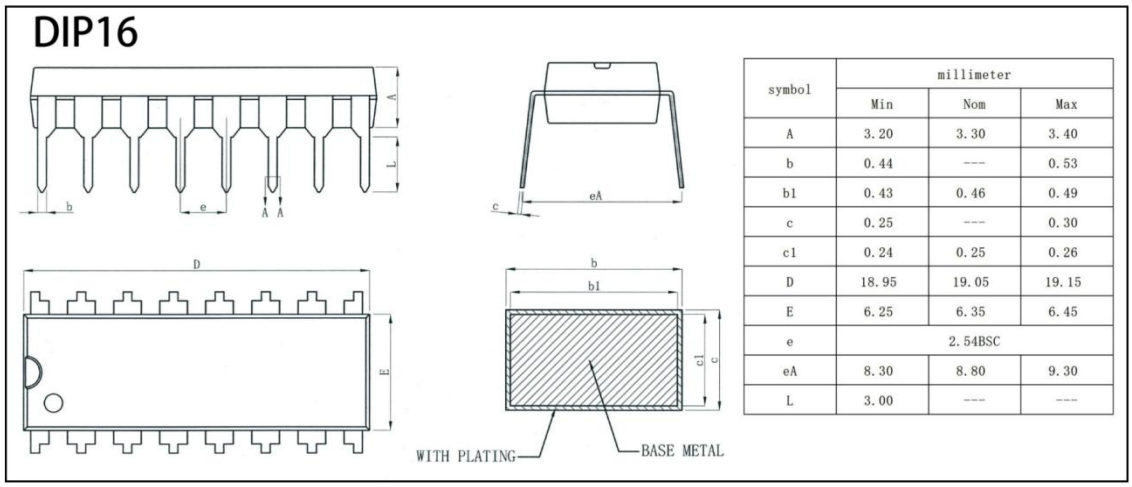
FIGURE 7. Maximum Control Input Frequency

12. ORDERING INFORMATIO

Ordering Information

Part Number	Device Marking	Package Type	Body size (mm)	Temperature (°C)	MSL	Transport Media	Package Quantity
XD4066	XD4066	DIP16	19.05*6.35	- 40 to 85	MSL3	Tube 25	1000

13. DIMENSIONAL DRAWINGS



symbol	millimeter		
	Min	Nom	Max
A	3.20	3.30	3.40
b	0.44	---	0.53
b1	0.43	0.46	0.49
c	0.25	---	0.30
c1	0.24	0.25	0.26
D	18.95	19.05	19.15
E	6.25	6.35	6.45
e	2.54BSC		
eA	8.30	8.80	9.30
L	3.00	---	---