

1. DESCRIPTION

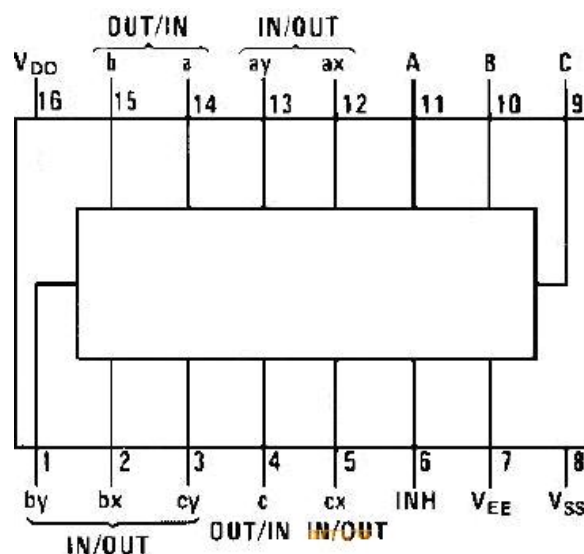
The XD/XL4053 series analog switches are multi-modulated/selective analog switches controlled by digital signals with low on-resistance and low cut-off leakage current. The digital signal with amplitude of 4.5V ~ 18V can control the analog signal with peak-to-peak value of 18V. For example, if VDD=+5V, VSS=0V, VEE=-13.5V, the digital signal from 0 to 5V can control the analog signal from -13.5 to 4.5V, and these switching circuits have very low static power consumption in the entire VDD-VSS and VDD-VEE power supply range.

XD/XL4053 is a three-group 2-select 1 bidirectional analog switch, equivalent to three groups of single-pole double-throw switches. It has three independent sets of binary digital control inputs A, B, C and INH suppression inputs, and the binary digital control signal can set either of the two analog channels to the on-state. INH input "1" power to set all channels of the 3 groups of 2 optional 1 analog switches to the Off state, and input "0" power to set all channels of the 3 groups of 2 optional 1 analog switches to the on-state.

2. FEATURES

- Very wide digital control and transmission analog signal voltage range: digital 4.5V ~ 18V, analog 18V
- Low on-resistance: 80Ω (VDD-VEE=15V, signal greater than 15Vpp)
- Very low static voltage consumption
- High off resistance
- Digital address signal 4.5V ~ 18V logic level conversion to switch analog signal 18Vpp
- Built-in binary address decoder

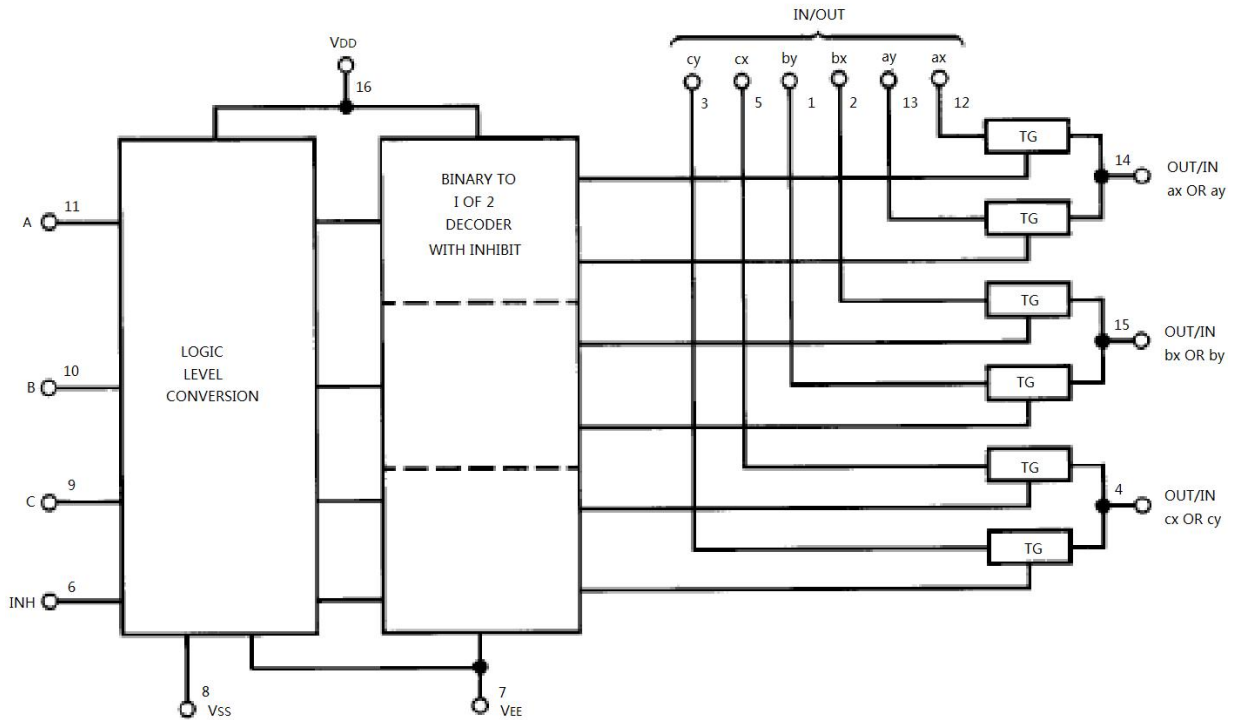
3. PIN CONFIGURATIONS



4. FUNCTION TRUTH TABLE

Input state	A or B or C	Output situation
INH	A or B or C	Output situation
0	0	ax or bx or cx
0	1	ay or by or cy
1	x	None

5. LOGIC BLOCK DIAGRAM



6. DC ELECTRICAL PARAMETER

6.1 Absolute Maximum Ratings (Ta = 25°C) :

Symbol	Description	Limiting value	Units
VDD	Dc supply voltage	-0.5~+18	V
VIN	Input voltage	-0.5~VDD+0.5	V
Ta	Operating temperature range	-40~85	°C
Ptot	Power dissipation	DIP	700
		SOP	500
TL	Welding temperature	260	°C

6.2 Recommended Operating Conditions

Symbol	Description	Limiting value	Units
VDD	Dc supply voltage	+5~+15	V
VIN	Input voltage	0~VDD	V

6.3 Dc characteristic :T=25°C

Symbol	Item	Conditions	+25°C			Units	
			Min	Typ.	Max		
IDD		VDD=5V	—	—	5	uA	
		VDD=10V	—	—	10		
		VDD=15V	—	—	20		
Signal input VIS and output VOS							
RON	On-resistance (peak VEE ≅ VIS ≅ VDD)	RL=10KΩ (either channel)	VDD=2.5V VEE=-2.5V or VDD=5V VEE=0V	—	270	1050	Ω
			VDD=5V VEE=-5V or VDD=10V VEE=0V	—	120	400	
			VDD=7.5V VEE=-7.5V or VDD=15V VEE=0V	—	80	240	
△RON	The on-resistance gain between either channel	RL=10KΩ (either channel)	VDD=2.5V VEE=-2.5V or VDD=5V VEE=0V	—	10	—	Ω
			VDD=5V VEE=-5V or VDD=10V VEE=0V	—	10	—	
			VDD=7.5V VEE=-7.5V or VDD=15V VEE=0V	—	5	—	
	Off channel Leakage current, any channel is in the off state	VDD=7.5V, VEE=-7.5V O/I=± 7.5V, I/O=0V	—	±0.0 1	±50	nA	

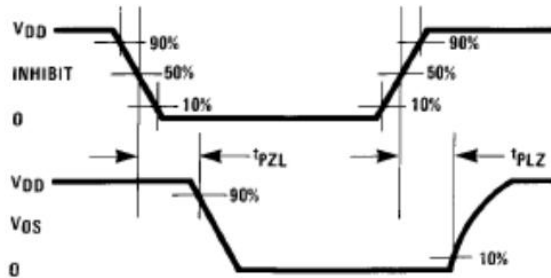
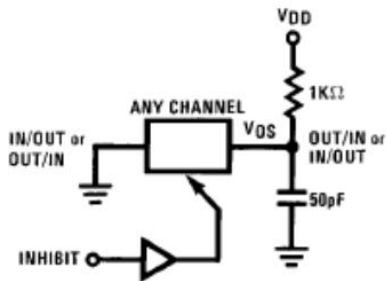
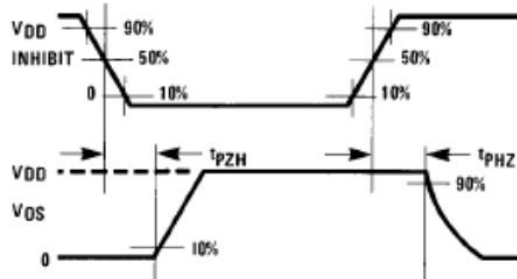
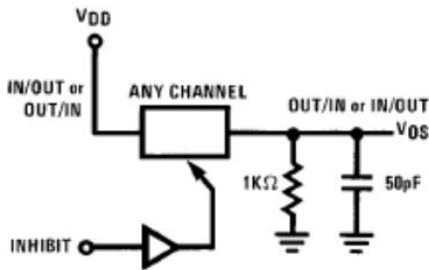
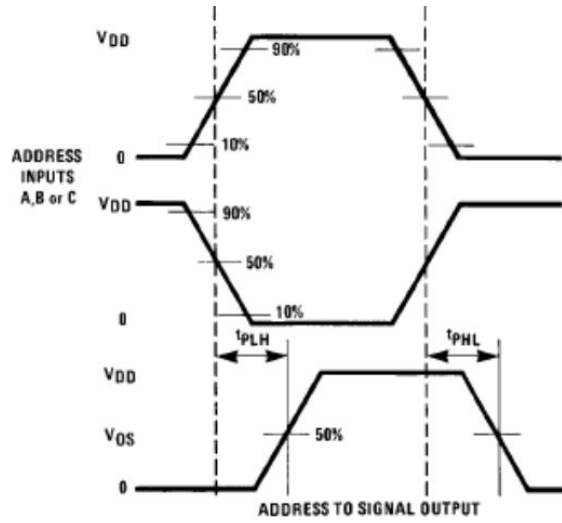
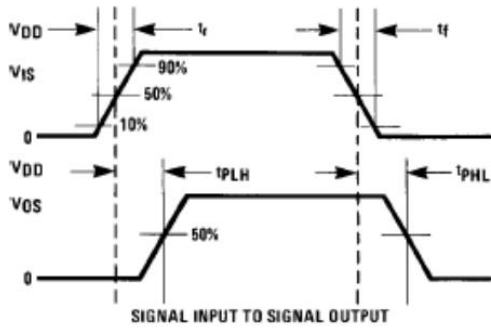
	Off channel Leakage current. All channels are in Off state	INH=7.5V		—	±0.02	±200	nA
Control inputs A, B, C and INH							
VIL	Low-level input voltage	VEE=VSS RL=1KΩ All channels are off	VDD=5V	—	—	1.5	V
			VDD=10V	—	—	3.0	
			VDD=15V	—	—	4.0	
VIH	High level input voltage	VDD=5V		3.5	—	—	V
		VDD=10V		7	—	—	
		VDD=15V		11	—	—	
IIN	Input current	VDD=15V VEE=0V	VIN=0V	—	-10 ⁻⁵	-0.1	uA
			VIN=15V	—	10 ⁻⁵	0.1	

6.4 Ac characteristic: T=25°C

Symbol	Item	Conditions	VDD	Min	Typ.	Max	Units
tPZH tPZL	Transmission delay time from disable to signal output (open channel)	VEE=VSS=0V RL=1KΩ CL=50pF	5V	—	600	1200	ns
			10V	—	225	450	
			15V	—	160	320	
tPHZ tPLZ	Transmission delay time from disable to signal output (closed channel)	VEE=VSS=0V RL=1KΩ CL=50pF	5V	—	210	420	ns
			10V	—	100	200	
			15V	—	75	150	
Cin	Input capacitance	Control input	10V	—	5	7.5	pF
		Signal input	10V	—	10	15	
Cout	Output capacitance (total input/output) VEE=VSS=0V	—	10V	—	8	—	pF
CIOS	Bypass capacitance	—	10V	—	0.2	—	pF
CPO	Power dissipation capacitance	—	10V	—	70	—	pF
Signal input VIS and output VOS							
	Degree of sine wave distortion	RL=10KΩ fIS=1KHz VIS=5Vp-p VEE=VSI=0V	10V	—	0.04	—	%

	Sine wave frequency response	RL=1KΩ VEE=0V VIS=5Vp-p 20log10VOS/VIS=-40dB	10V	—	40	—	MHz
	Off state crosstalk frequency	RL=1KΩ VEE=0V VIS=5Vp-p 20log10VOS/VIS=-40dB	10V	—	10	—	MHz
	Signal crosstalk frequency	RL=1KΩ VEE=0V VIS=5Vp-p 20log10VOS/VIS=-40dB	10V	—	3	—	MHz
tPHL tPLH	The transmission delay of a signal from input to output	VEE=VSS=0V CL=50pF	5V	—	25	55	ns
			10V	—	15	35	
			15V	—	10	25	
Control inputs A, B, C and INH							
	Control input to signal response	VEE=VSS=0V RL=10KΩ Input square wave amplitude 10V at the end of all channels	10V	—	65	—	mV
tPHL tPLH	The transmission delay time from the access to the signal output channel is on or off	VEE=VSS=0V CL=50pF	5V	—	500	100 0	ns
			10V	—	160	350	
			15V	—	120	240	

7. WAVEFORM DIAGRAM

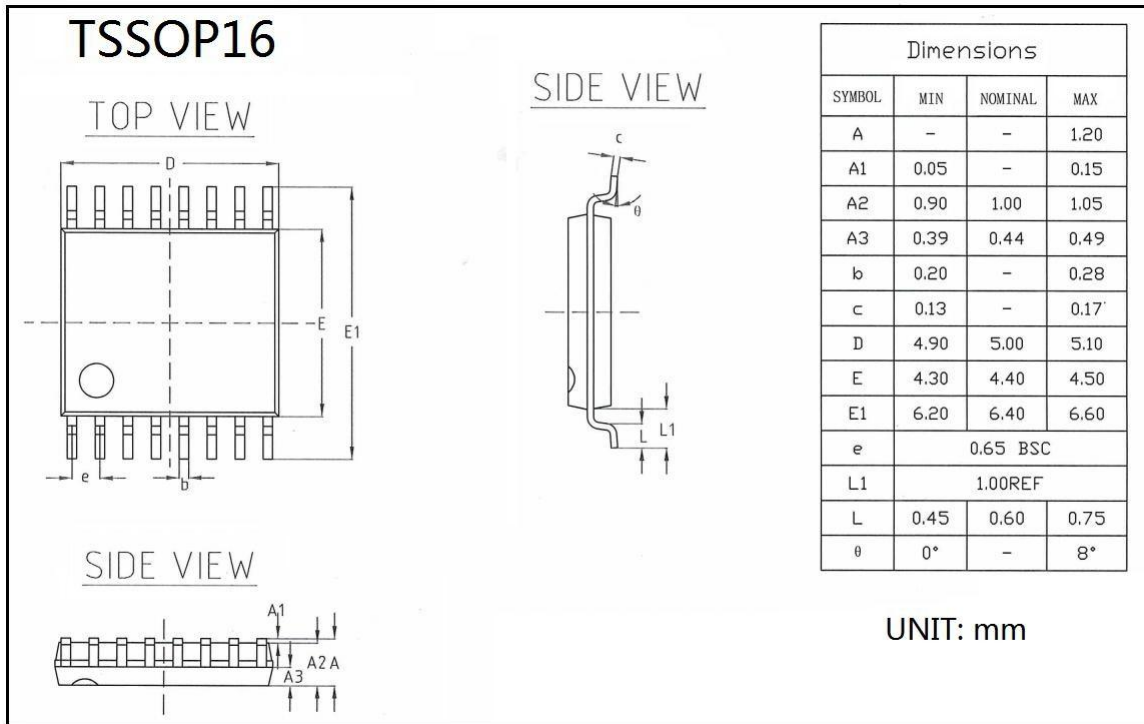


8. ORDERING INFORMATION

Ordering Information

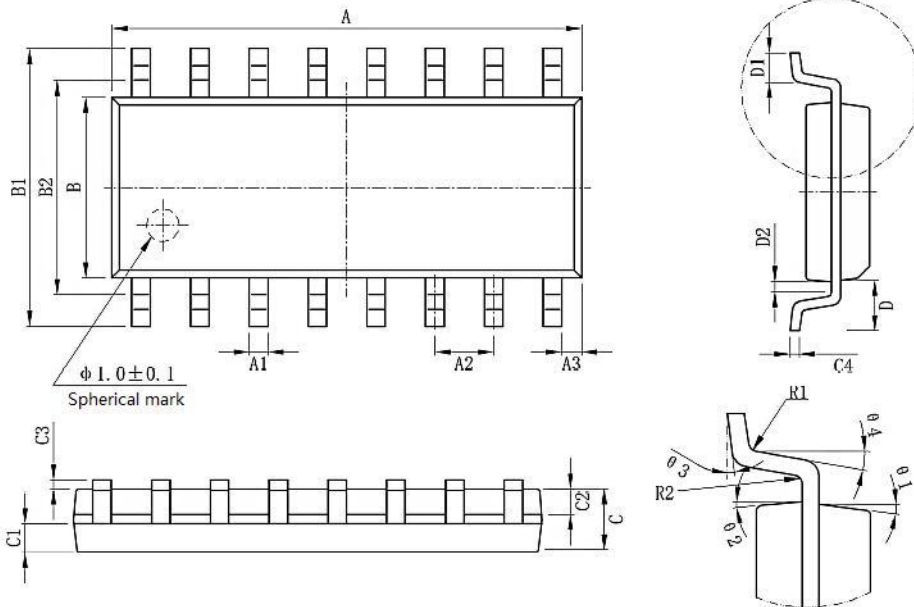
Part Number	Device Marking	Package Type	Body size (mm)	Temperature (°C)	MSL	Transport Media	Package Quantity
XL4053BPWR	XL4053	TSSOP16	5.00 * 4.40	- 40 to +85	MSL3	T&R	2500
XL4053BM	XL4053BM	SOP16	10.00 * 3.95	- 40 to +85	MSL3	T&R	2500
XD4053	XD4053	DIP16	19.05 * 6.35	- 40 to +85	MSL3	Tube 25	1000

9. DIMENSIONAL DRAWINGS

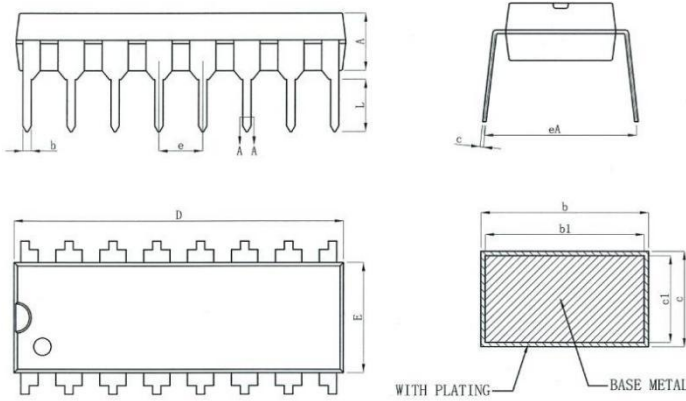


SOP16

MARK	SYM	MIN (mm)	MAX (mm)	MARK	SYM	MIN (mm)	MAX (mm)
A		9.80	10.00	C4		0.203	0.233
A1		0.356	0.456	D		1.05TYP	
A2		1.27TYP		D1		0.40	0.70
A3		0.302TYP		D2		0.15	0.25
B		3.85	3.95	R1		0.20TYP	
B1		5.84	6.24	R2		0.20TYP	
B2		5.00TYP		θ 1		8° ~ 12° TYP4	
C		1.40	1.60	θ 2		8° ~ 12° TYP4	
C1		0.61	0.71	θ 3		0° ~ 8°	
C2		0.54	0.64	θ 4		4° ~ 12°	
C3		0.05	0.25				



DIP16



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	---	---

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