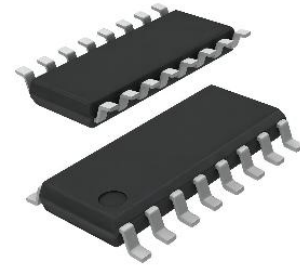


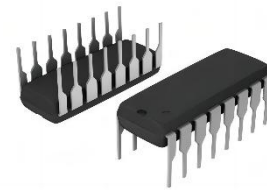
## HX4052-S dual quad one analog switch

The HX4052-S series analog switches are multi-modulated/selective analog switches controlled by digital signals, with low on-resistance and very 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.

HX4052-S is A double four-option analog switch. Each group of four-option analog switches has two binary control input terminals A and B and INH input respectively. These two binary signals can set any one of the four analog channels to the on-state. INH input "1" power level sets all channels of the two groups of four-option analog switches to the off state, and input "0" power level sets all channels of the two groups of four-option analog switches to the on-state.



SOP-16



DIP-16

### Main feature

Very wide digital control and transmission of analog signal voltage

Range: digital 4.5V ~ 18V, analog 18V

Low on-resistance: 80 Ω (VDD-VEE=15V, signal greater than 15Vpp)

Very low static voltage consumption

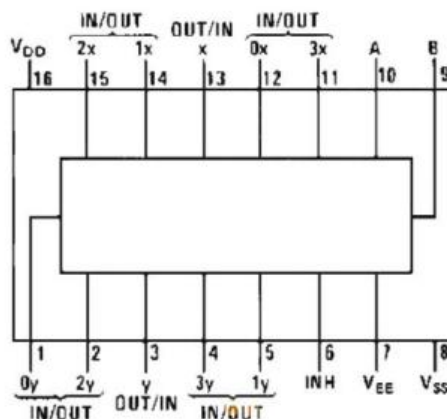
High off resistance

Digital address signal 4.5V ~ 18V logic level

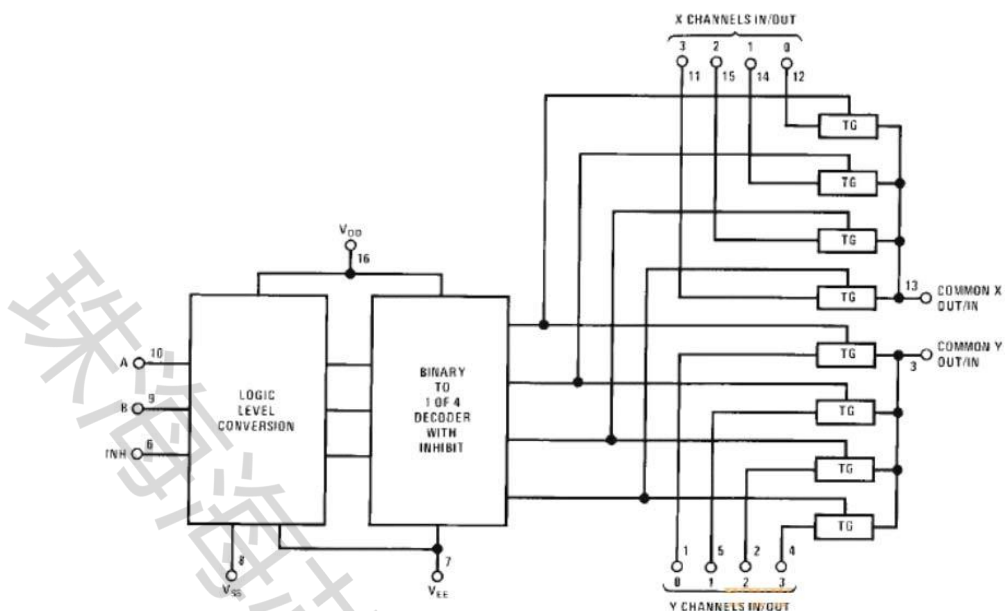
Convert to switch analog signal 18Vpp

Built-in binary address decoder

### Leg specification



## Logic diagram



## Truth table

Input state			Output situation
INH	B	A	
0	0	0	0X, 0Y
0	0	1	1X, 1Y
0	1	0	2X, 2Y
0	1	1	3X, 3Y
1	X	X	None

## Limiting parameter

Glyphsign	Description		Limiting value	Unit
VDD	Dc supply voltage		-0.5~+18	V
VIN	Input voltage		-0.5~VDD+0.5	V
Ta	Operating temperature range		-20~85	°C
Ptot	Power dissipation	DIP	700	mW
		SOP	500	mW

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TL	Welding temperature	260	°C
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## Recommended working environment

Glyphsign	Describe	Limiting value	Unit
VDD	DC supply voltage	+5~+15	V
VIN	Input voltage	0~VDD	V

## Direct current parameters (T<sub>amp</sub>=25°C, Special cases are explained separately)

Symbol	Item	Conditions	+25°C			Unit	
			Min	Typ	Max		
IDD	Static current	VDD=5V	—	—	5	uA	
		VDD=10V	—	—	10		
		VDD=15V	—	—	20		
Signal input VIS and output VOS							
RON	On-resistance (peak VEE ≅ VIS ≅ VDD)	RL=10K Ω (Any 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	

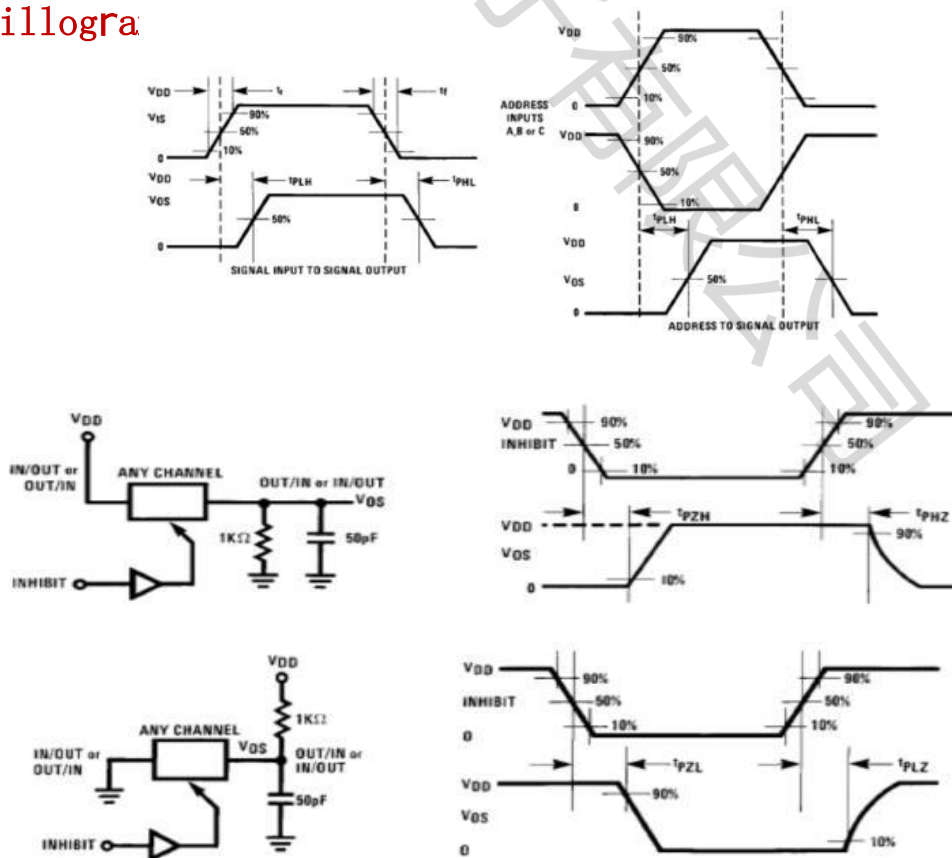
$\Delta$ RON	The on-resistance gain between either channel	RL=10K $\Omega$ (Any channel)	VDD=2.5V VEE=-2.5V or VDD=5V VEE=0V	—	10	—	$\Omega$
			VDD=5V VEE=-5V or VDD=10V VEE=0V	—	10	—	
			VDD=7.5V VEE=-7.5V or VDD=15V VEE=0V	—	5	—	
Off channel Leakage current, any channel is in the off state	Off channel Leakage current. All channels are in Off state	VDD=7.5V, VEE=-7.5V I/O=±7.5V, I/O=0V	—	±0.01	±50	nA	
							INH=7.5V
Control inputs A, B, C and INH							
VIL	Low-level input voltage	VEE=VSS RL=1K $\Omega$ 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	

## Alternating current parameter

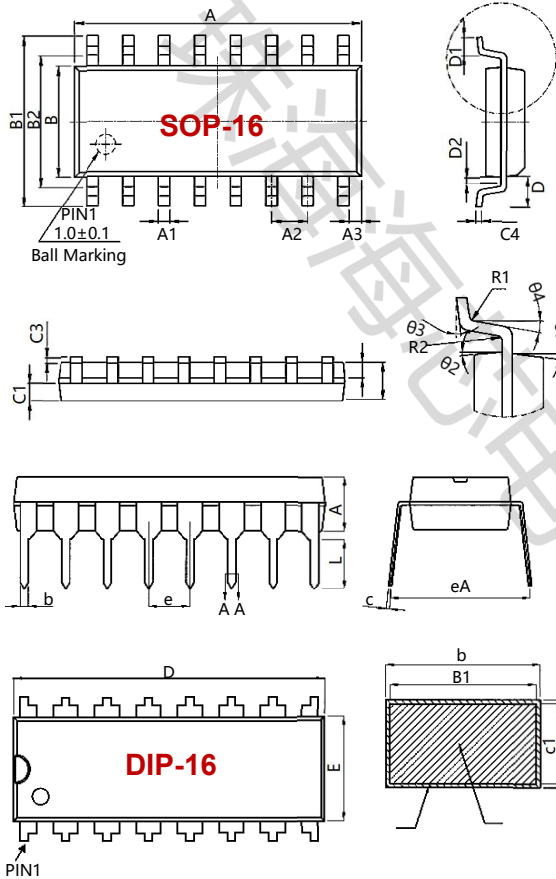
Symbol	Item	Conditions	VDD	Min	Typ	Max	Unit
tPZHtPZL	Transmission delay time from disable to signal output (open channel)	VEE=VSS=0V RL=1KΩ CL=50pF	5V	—	600	1200	ns
			10V	—	225	450	
			15V	—	160	320	
tPHZtPLZ	Transmission delay time from disable to signal output (closed channel)	VEE=VSS=0V RL=1KΩ CL=50pF	5V	—	210	420	ns
			10V	—	100	200	
			15V	—	75	150	
Cin	Input capacitance	Control input	—	—	5	7.5	pF
		Signal input	—	—	10	15	
Cout	Output capacitance (total input/output) VEE=VSS=0V	—	10V	—	30	—	pF
CIOS	Bypass capacitance	—	10V	—	0.2	—	pF
CPO	Power dissipation capacitance	—	10V	—	110	—	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	—	%
Symbol	Item	Conditions	VDD	Min	Typ	Max	Unit
	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
			5V	—	25	55	

t <sub>PHL</sub>	The transmission delay of a signal from input to output	VEE=VSS=0V CL=50pF	10V	—	15	35	ns
t <sub>PLH</sub>			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
t <sub>PHL</sub> t <sub>PLH</sub>	The transmission delay time from the access to the signal output channel is on or off	VEE=VSS=0V CL=50pF	5V	—	500	1000	ns
			10V	—	160	350	
			15V	—	120	240	

## Oscillogra



## Encapsulation information



Mark	Size	Min(mm)	Max(mm)	Mark	Size	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			θ1	8°~ 12° TYP4		
C	1.40		1.60	θ2	8°~ 12° TYP4		
C1	0.61		0.71	θ3	0°~ 8°		
Cp	0.54		0.64	θ4	4°~12°		
C3	0.05		0.25				

Symbol	millimeter		
	Min	Nom	Max
A	3.20	3.30	3.40
b	0.44		0.53
bl	0.43	0.46	0.49
C	0.25		0.30
cl	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		

Part Number	Package Type	Package	quantity
HX4052-S	SOP-16	Taping	2500