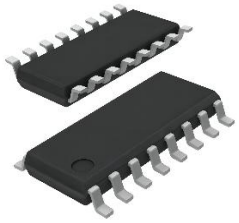
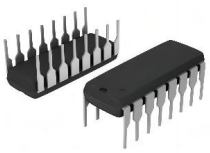
HX4051-S 8 Select an analog switch

The HX4051-S analog switch is a multi-modulated/ selective analog switch 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. HX4051 is an eight-choice analog switch, with A, B, C three binary control input and INH input, these three binary signals can be set to any of the 8 analog channels as on-state, INH input "1" power level will be set to all channels of the analog switch as off state. Enter "0" power level to set all channels of the analog switch to the on-state.



SOP-16



DIP-16

Main feature

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)

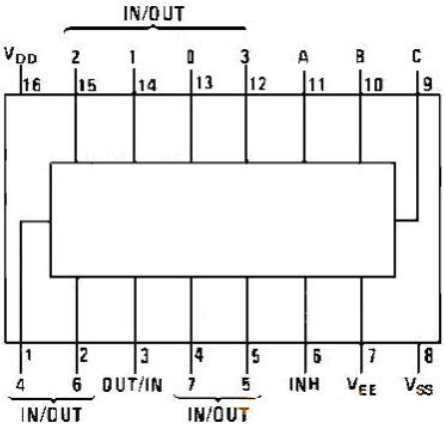
Very low static voltage consumption

High off resistance

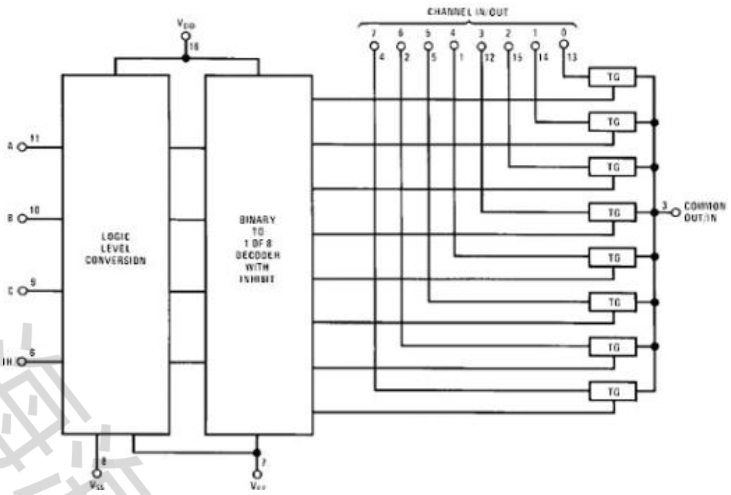
Digital address signal 4.5V ~ 18V logic level conversion to switch analog signal 18Vpp

Built-in binary address decoder

Leg specification



Logic diagram



Truth table

Input state				Output situation
INH	C	B	A	
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	×	×	×	None

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Limiting parameter

Symbol	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	℃
Ptot	Power dissipation	DIP	700	mW
		SOP	500	mW
TL	Welding temperature		260	℃

Parameter name	Parameter symbol	Test condition		TA=+25℃			Unit
				Min	Typ	Max	
Contact test	OS	-100uA test OS GND		-1.0	-0.55	-0.3	V
Collector turn-off current	I_{CEX}	V_{CE}=50V; I_I=0				15	μA
Input turn on current	$I_{I\ (ON)}$	V_I=3.85V		0.6	0.9	1.2	mA
Input open voltage	$V_{I\ (ON)}$	V_{CE}=2V	I_C=200mA	0.6	1.0	1.4	V
			I_C=250mA	1.0	1.4	1.8	
			I_C=300mA	1.2	1.6	2.0	
CE saturation pressure drop	$V_{CE\ (SAT)}$	I_I=250uA	I_C=100mA	0.6	0.9	1.2	V
		I_I=350uA	I_C=200mA	0.7	1.0	1.4V	
		I_I=500uA	I_C=350mA	0.9	1.3	1.7	
Reverse leakage of the embedded diode	I_R	V_R=50V				15	μA
Inline diode forward voltage drop	VF	I_F=350mA		1.0	1.6	1.9	V

Recommended working environment

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

Direct current parameters (Tamp=25℃,Special cases are explained separately)

Symbol	Item	Conditions		+25℃			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 value VEE≦VIS≦VDD)	RL=10KΩ (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	
			VDD=2.5V VEE=-2.5V or VDD=5V VEE=0V	—	10	—	

△RON	The on-resistance gain between either channel	RL=10KΩ (Any channel)	VDD=5V VEE=-5V or VDD=10V VEE=0V	—	10	—	Ω
			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		—	±0.01	±50	nA
	Off channel Leakage current. All channels are in Off state	INH=7.5V		—	±0.08	±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	

Alternating current parameter

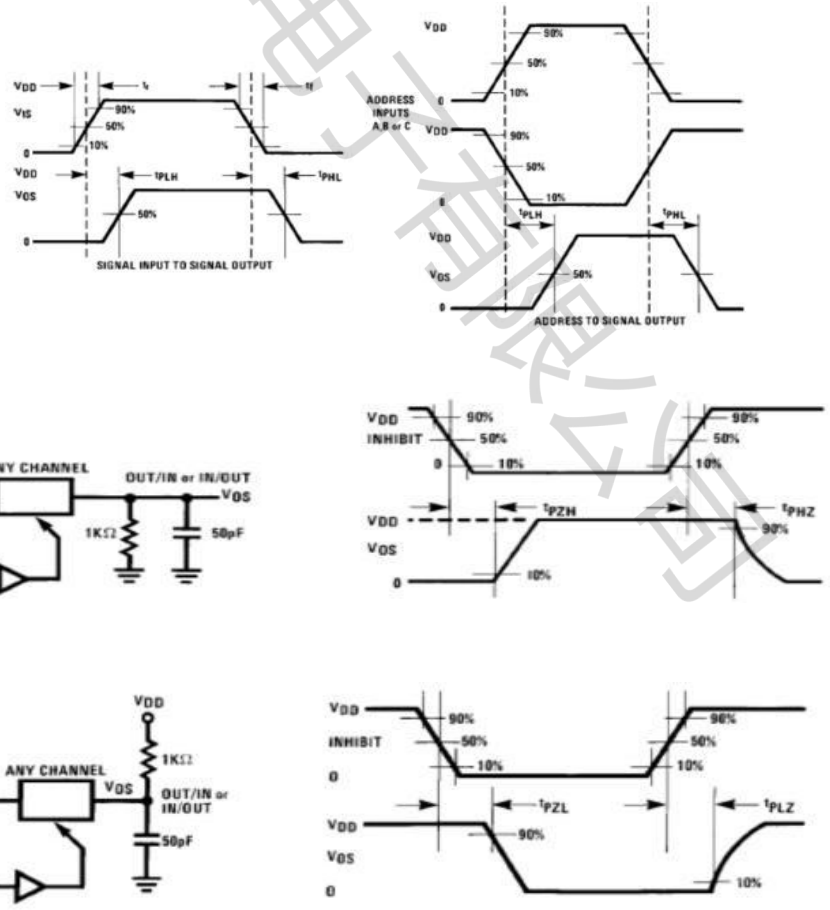
Symbol	Item	Conditions	VDD	Min	Typ	Max	Unit
		VEE=VSS=0V	5V	—	600	1200	

tPZHtPZL	Transmission delay time from disable to signal output (open channel)	RL=1KΩ CL=50pF	10V	—	225	450	ns
			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
tPHLtPLH	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							

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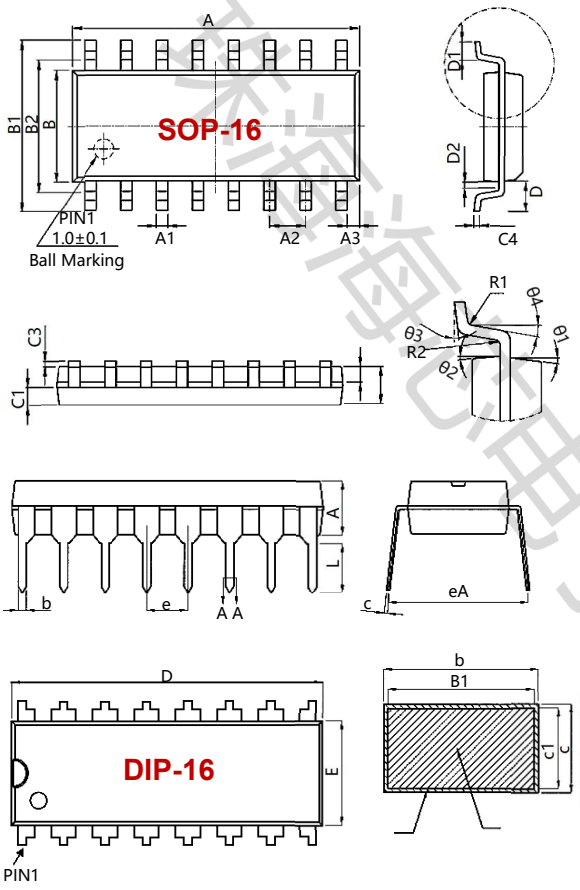
	Control input to signal response	VEE=VSS=0V RL=10KΩ Input square wave amplitudes at the ends of all channels 10V	10V	—	65	—	mV
tPHL tPLH	The transmission delay time from the access to the signal output channel is on or off	VEE=VSS=0V CL=50pF	5V	=	500	1000	ns
			10V		160	350	
			15V	—	120	240	

Oscillogram



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Encapsulation information



Mark \ Size	Min(mm)	Max(mm)	Mark \ Size	Min(mm)	Max(mm)
A	9.80	10.00	C4	0.203	0.233
Al	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	
Cl	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
HX4051-S	SOP-16	Taping	2500

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