



Hex Inverting Schmitt Trigger

Description

SKCD40106 is composed of six CMOS inverters. Each input terminal of each inverter has a Schmitt trigger. The trigger switches operate at different potentials, and the output is a positive and negative signal. The difference between the positive trigger threshold voltage (V_{T+}) and the negative trigger threshold voltage (V_{T-}) is defined as the hysteresis voltage (V_H). When using this device, unused input terminals must be connected to V_{DD} , V_{SS} or other input terminals.

The SKCD40106 is available in SOP-14 and DIP-14 package types.

Features

- Wide operating voltage range: 3~15V
- Symmetric output characteristics
- Fast output response
- Low quiescent current: $I_{DD} < 1\mu A$

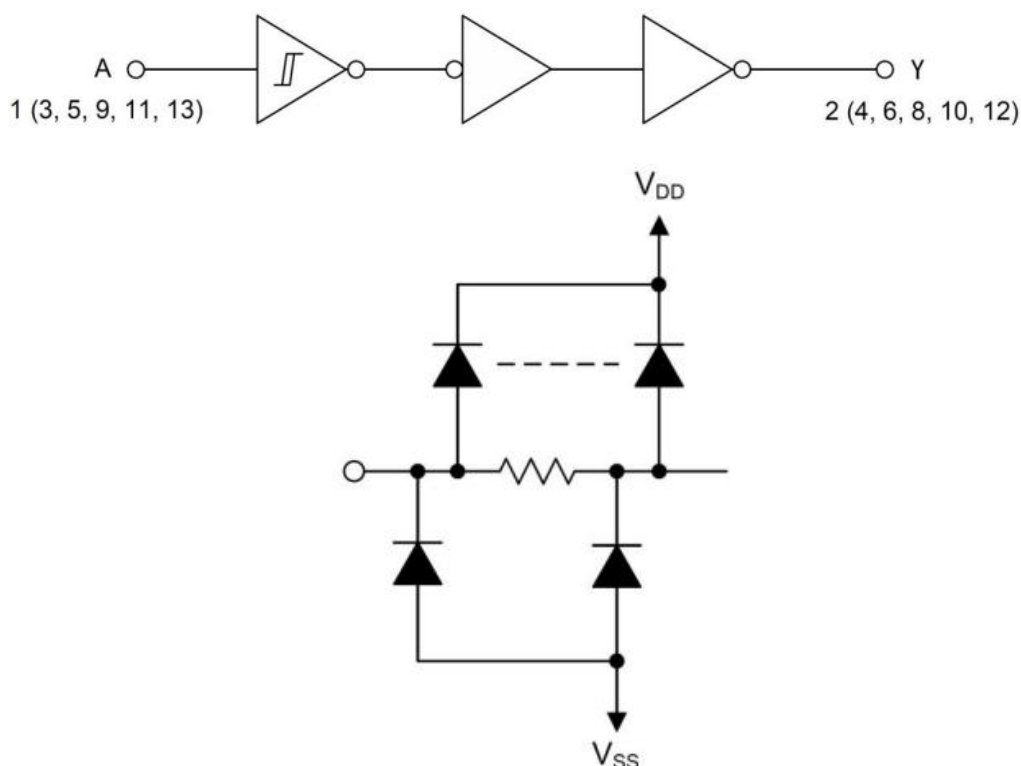
Applications

- Logic inversion
- Pulse shaping
- Oscillators
- High input impedance amplifiers

Ordering Information

Type	Marking	Package
SKCD40106-P14	CD40106	SOP-14
SKCD40106-H14	CD40106	DIP-14

Functional Block Diagram(single channel)





SKCD40106

Pin Description

Pin No.	Pin Name	I/O	Description	Pin Configuration Diagram	
1	A1	I	Channel 1 Input		
2	Y1	O	Channel 1 Output		
3	A2	I	Channel 2 Input		
4	Y2	O	Channel 2 Output		
5	A3	I	Channel 3 Input		
6	Y3	O	Channel 3 Output		
7	V _{SS}	P	Negative Power Supply		
8	Y4	O	Channel 4 Output		
9	A4	I	Channel 4 Input		
10	Y5	O	Channel 5 Output		
11	A5	I	Channel 5 Input		
12	Y6	O	Channel 6 Output		
13	A6	I	Channel 6 Input		
14	V _{DD}	P	Positive Power Supply		

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Supply Voltage(referenced to VSS pin)	V _{DD}	-0.5~18	V
Input Voltage(all pins)	V _{IN}	-0.5~V _{DD} +0.5	V
Input Current(any input)	I _{IN}	±10	mA
Operating Temperature	T _A	-20~+85	°C
Maximum Operating Junction Temperature	T _J	150	°C
Storage Temperature	T _S	-65~+150	°C
Soldering Temperature(10s)	T _W	260	°C

Recommended Operating Conditions(V_{SS}=0, V_TA=25°C unless otherwise specified)

Parameter	Symbol	Min	Max	Unit
Supply Power	V _{DD}	3	15	V
Input Voltage	V _{IN}	0	V _{DD}	V

DC Electrical Characteristics (V_{SS}=0V, T_A=25°C unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Quiescent Current	I _{DD}	V _{DD} =5V, V _{IN} =0V or 5V	-	-	1	μA
		V _{DD} =10V, V _{IN} =0V or 10V	-	-	1	
		V _{DD} =15V, V _{IN} =0V or 15V	-	-	1	



SKCD40106

Low Level Output Current	I_{OL}	$V_{DD}=5V, V_O=0.4V$	0.5	1.6	-	mA
		$V_{DD}=10V, V_O=0.5V$	2.5	5	-	
		$V_{DD}=15V, V_O=1.5V$	3.5	16	-	
High Level Output Current	I_{OH}	$V_{DD}=5V, V_O=4.6V$	-	-1	-0.5	mA
		$V_{DD}=10V, V_O=9.5V$	-	-2.6	-1.3	
		$V_{DD}=15V, V_O=13.5V$	-	-7.2	-3.5	
Low Level Output Voltage	V_{OL}	$V_{DD}=5V, V_{IN}=5V$	-	0	0.05	V
		$V_{DD}=10V, V_{IN}=10V$	-	0	0.05	
		$V_{DD}=15V, V_{IN}=15V$	-	0	0.05	
High Level Output Voltage	V_{OH}	$V_{DD}=5V, V_{IN}=0V$	4.95	5	-	V
		$V_{DD}=10V, V_{IN}=0V$	9.95	10	-	
		$V_{DD}=15V, V_{IN}=0V$	14.95	15	-	
Input Current	I_{IN}	$V_{DD}=15V, V_{IN}=0\sim 15V$	-1	-	1	μA

AC Electrical Characteristics ($V_{SS}=0V, T_A=25^\circ C, C_L=50pF, R_L=200K\Omega$ unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Propagation Delay Time (input-output)	t_{PHL}	$V_{DD}=5V$	-	35	110	ns
		$V_{DD}=10V$	-	22	60	
		$V_{DD}=15V$	-	32	50	
Propagation Delay Time (input-output)	t_{PLH}	$V_{DD}=5V$	-	46	110	ns
		$V_{DD}=10V$	-	30	60	
		$V_{DD}=15V$	-	20	50	
Output Transition Time	t_{THL}	$V_{DD}=5V$	-	52	200	ns
		$V_{DD}=10V$	-	26	100	
		$V_{DD}=15V$	-	54	80	
Output Transition Time	t_{TLH}	$V_{DD}=5V$	-	75	200	ns
		$V_{DD}=10V$	-	40	100	
		$V_{DD}=15V$	-	36	80	
Input Capacitance	C_{IN}	Any Input	-	-	15	pF

Transmission Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Positive-going Threshold Voltage	V_{T+}	$V_{DD}=5V$	2.9	3.6	4.3	V
		$V_{DD}=10V$	5.5	6.9	8.2	
		$V_{DD}=15V$	8.5	10.5	12.5	
Negative-going Threshold Voltage	V_{T-}	$V_{DD}=5V$	0.7	1.7	2.7	V
		$V_{DD}=10V$	2.0	3.4	4.8	
		$V_{DD}=15V$	3.4	5.2	7.2	
Hysteresis Voltage	V_H	$V_{DD}=5V$	0.9	1.9	2.8	V
		$V_{DD}=10V$	1.8	3.5	4.0	
		$V_{DD}=15V$	3.2	5.3	7.2	



AC Testing Circuit

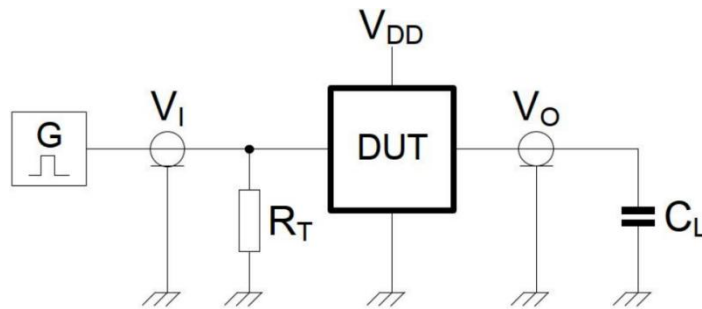


Figure 1. Test circuit for switching times

Definitions for test circuit:

DUT = Device Under Test.

C_L = Load capacitance including jig and probe capacitance.

R_T = Termination resistance should be equal to the output impedance Z_O of the pulse generator.

AC Testing Waveforms

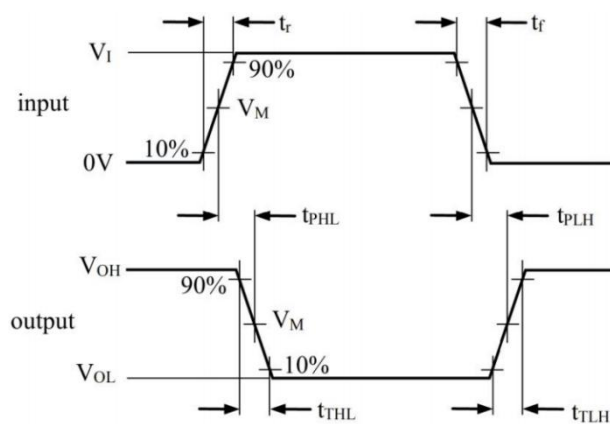


Figure 2. Propagation delay and output transition time

Transfer Characteristics Waveforms

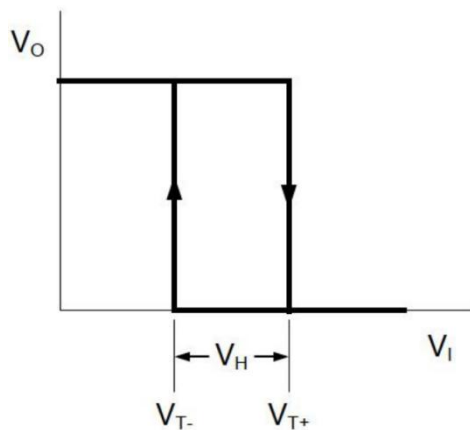


Figure 3. Schmitt transfer characteristics

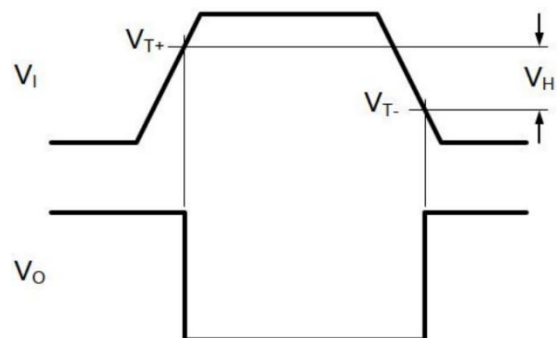


Figure 4. The definitions of V_{T+} , V_{T-} and V_H

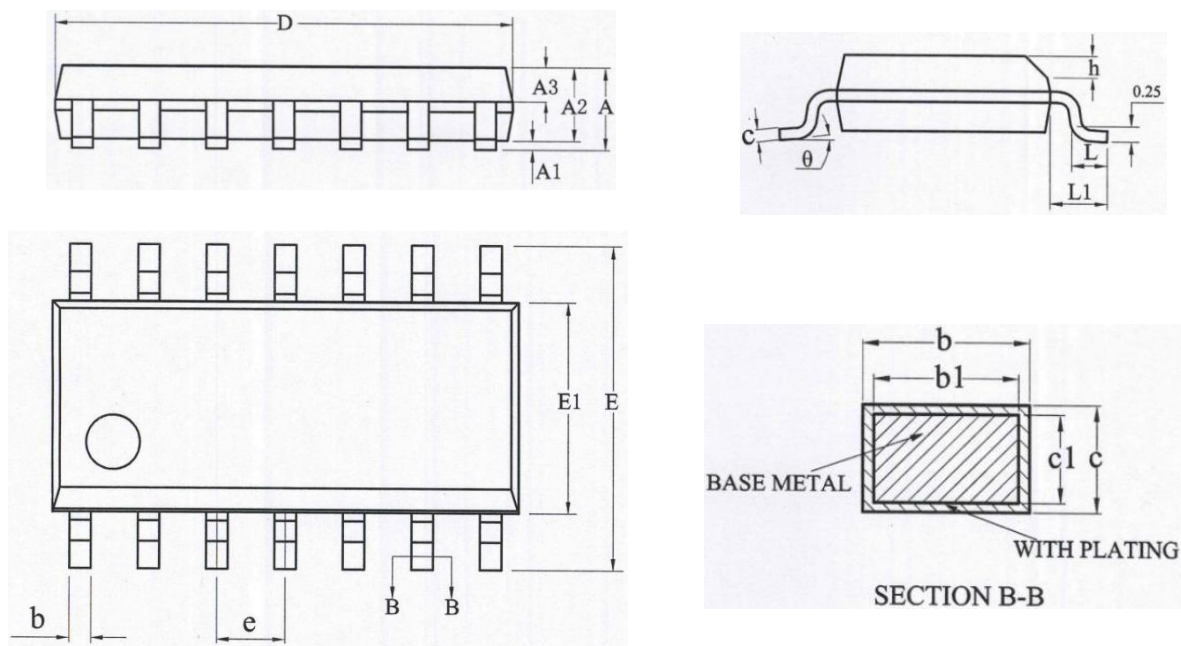


SKCD40106

Package Information

SOP-14

Dimensions in mm



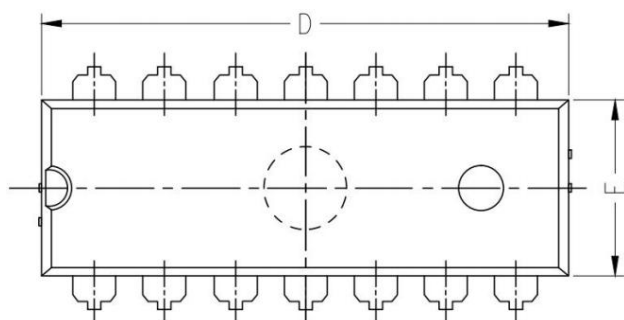
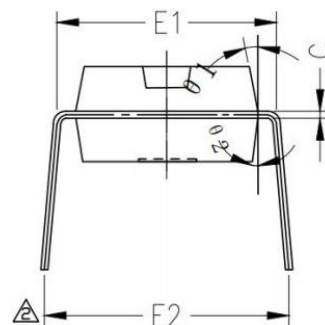
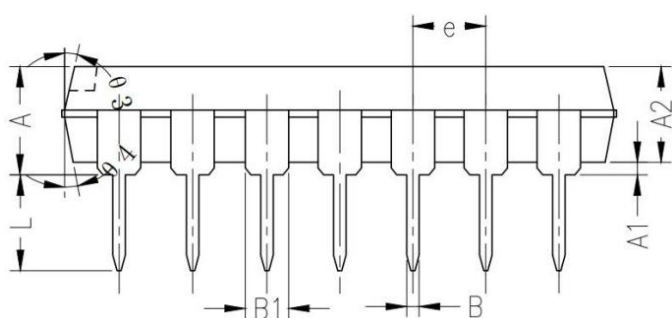
Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	-	-	1.75	D	8.55	8.65	8.75
A1	0.10	-	0.225	E	5.80	6.00	6.20
A2	1.30	1.40	1.50	E1	3.80	3.90	4.00
A3	0.60	0.65	0.70	e	1.27 (BSC)		
b	0.39	-	0.47	h	0.25	-	0.50
b1	0.38	0.41	0.44	L	0.50	-	0.80
c	0.20	-	0.24	L1	1.05 (REF)		
c1	0.19	0.20	0.21	θ	0°	-	8°



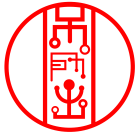
Package Information

DIP-14

Dimensions in mm



Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	3.75	3.81	3.95	E1	7.35	7.62	7.85
A1	0.51	-	-	e	2.54 (BSV)		
A2	3.20	3.30	3.45	L	3.00	3.30	3.60
B	0.38	0.48	0.56	E2	8.00	8.40	8.80
B1	1.52 (BSC)			θ1	9°	-	15°
C	0.20	0.25	0.34	θ2	7°	-	13°
D	18.80	19.05	19.30	θ3	8°	-	14°
E	6.20	6.35	6.50	θ4	5°	-	12°



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