CD4069 CMOS hex inverter

1. General Description

1.1 Description

The CD4069 device consist of six CMOS inverter circuits. These devices are intended for all general-purpose inverter applications where the medium power TTL-drive and logic-level-conversion capabilities of circuits such as the CD4009 and CD4049 hex inverter and buffers are not required.

1.2 Features

- Standardized symmetrical output characteristics
- 5V-10V-15V parametric rating
- Maximum input current of 2 uA at 15V and 25℃

1.3 Device Information

PART NUMBER	PACKAGE
CD4069	DIP
	SOP
	TSSOP

2. Pin Description and Functional Diagram

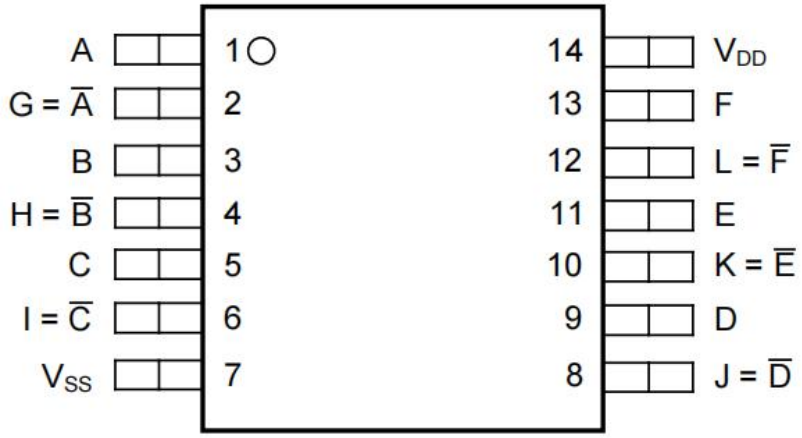


Figure 2.1 Top View

PIN No.	NAME	I/O	FUNCTION
1	A	I	A Input
3	B	I	B Input
5	C	I	C Input
9	D	I	D Input
11	E	I	E Input
13	F	I	F Input
2	G=$\overline{A}$	O	G Output
4	H=$\overline{B}$	O	H Output
6	I=$\overline{C}$	O	I Output
8	J=$\overline{D}$	O	J Output
10	K=$\overline{E}$	O	K Output
12	L=$\overline{F}$	O	L Output
14	VDD	-	Positive supply
7	VSS	-	Negative supply

3. System Diagram

3.1 Logic Diagram

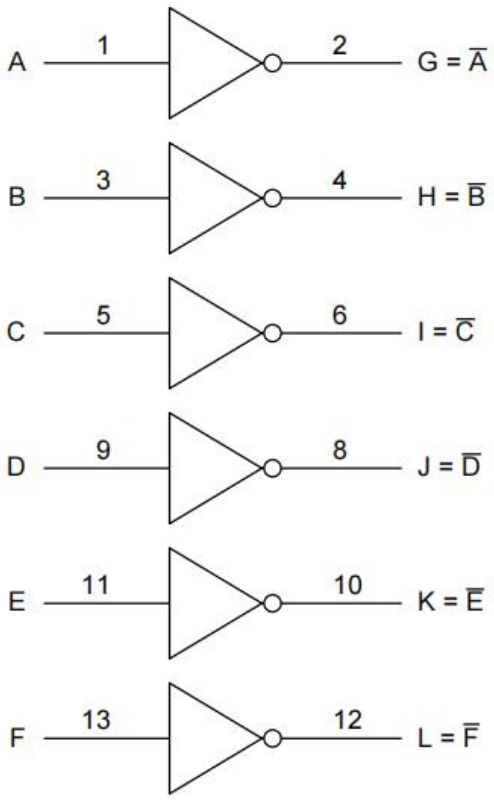


Figure 3.1：CD4069 Logic Diagram

3.2 Truth table

INPUT A,B,C,D,E,F	OUTPUT G,H,I,J,K,L
1	0
0	1

4. Specifications

4.1 Absolute Maximum Ratings

Symbol	Parameter	MIN	MAX	Unit
V_{DD}	DC Supply Voltage Range (Voltage Referenced to VSS Terminals)	-0.5	20	V
V_I	Input Voltage Range, All Inputs	0.5	VDD+0.5	V
P_D	Power Dissipation		500	mW
T_J	Junction Temperature		125	℃
T_{OP}	Operating Temperature	-40	85	℃

Absolute maximum ratings are those values beyond which the device could be permanently damaged,These are stress ratings only,which do not imply functional operation of the device at these or any other conditions beyond those indicated under normal operating conditions.

4.2 Electrical Characteristics

(T_a=25℃, voltages are referenced to GND (ground=0V), unless otherwise specified)

Symbol	Parameter	Test Condition			MIN	TYP	MAX	Unit
		VO	VIN	VDD				
I_{DD}	Supply Current	--	0,5	5	--	0	2	uA
		--	0,10	10	--	0	2	uA
		--	0,15	15	--	0	2	uA
I_{OL}	Low(sink) Level Output Current	0.4	0,5	5	0.5	2	--	mA
		0.5	0,10	10	2	4.5	--	mA
		1.5	0,15	15	9	18	--	mA
I_{OH}	Output high (source) current	4.6	0,5	5	-0.5	-1	--	mA
		2.5	0,5	5	-3	-6	--	mA
		9.5	0,10	10	-1.5	-3	--	mA
		13.5	0,15	15	-5	-12	--	mA
V_{OL}	Low Level Output Voltage	--	5	5	--	0	0.05	V
		--	10	10	--	0	0.05	V
		--	15	15	--	0	0.05	V
V_{OH}	High Level Output Voltage	--	0	5	4.95	5	--	V
		--	0	10	9.95	10	--	V
		--	0	15	14.95	15	--	V
V_{IL}	Low Level Input Voltage	4.5	--	5	--	--	1	V
		9	--	10	--	--	2	V
		13.5	--	15	--	--	2.5	V
V_{IH}	High Level Input Voltage	0.5	--	5	4	--	--	V
		1	--	10	8	--	--	V
		1.5	--	15	12.5	--	--	V
I_{IN}	Input Leakage Current	--	0,15	15	--	0	±1	uA

5. Application Information

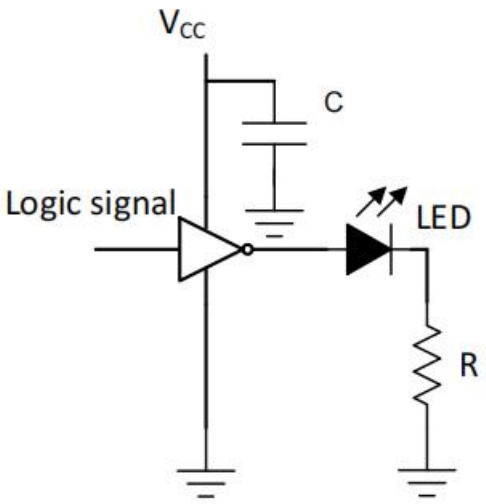


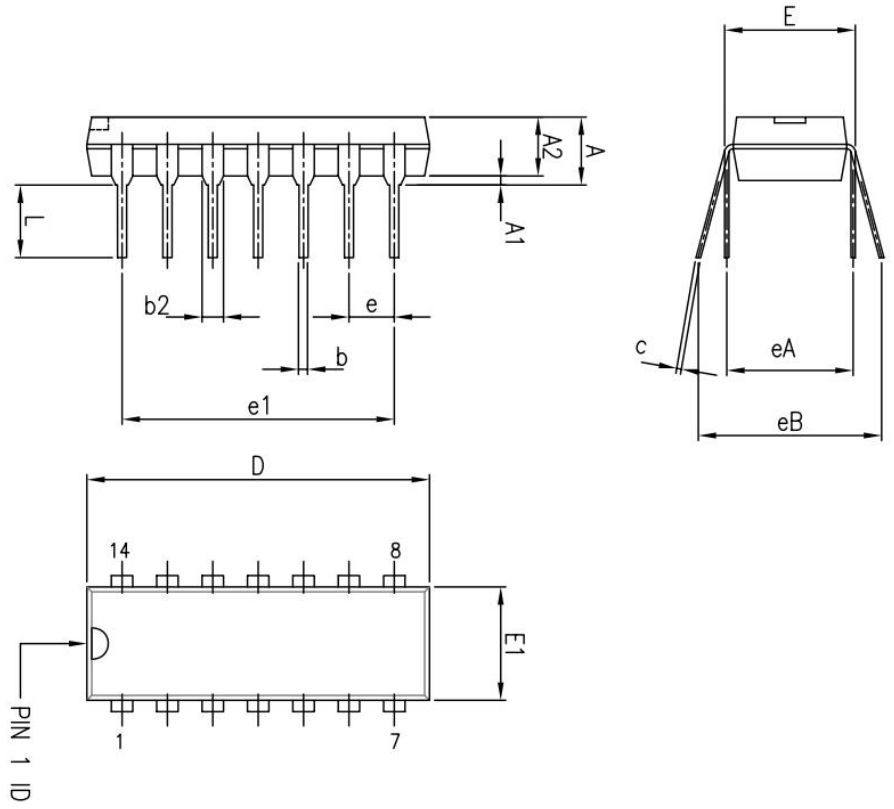
Figure 5.1：Typical Circuit

6. Ordering Information

Orderable Device	Package Type	Pins	Packing	Package Qty
CD4069ND14ATBE	DIP	14	Tube	25
CD4069NS14ARDQ	SOP	14	Tape & Reel	4000
CD4069TS14ARDQ	TSSOP	14	Tape & Reel	4000

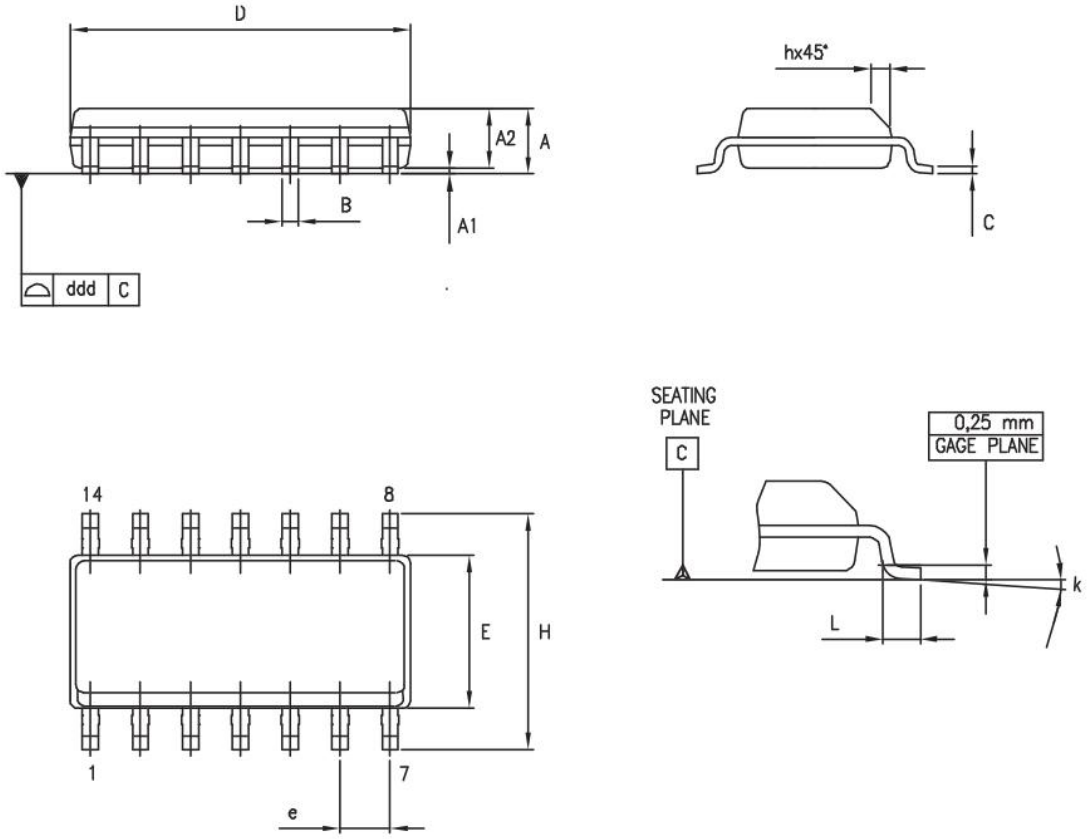
7. Package Information

7.1 DIP14



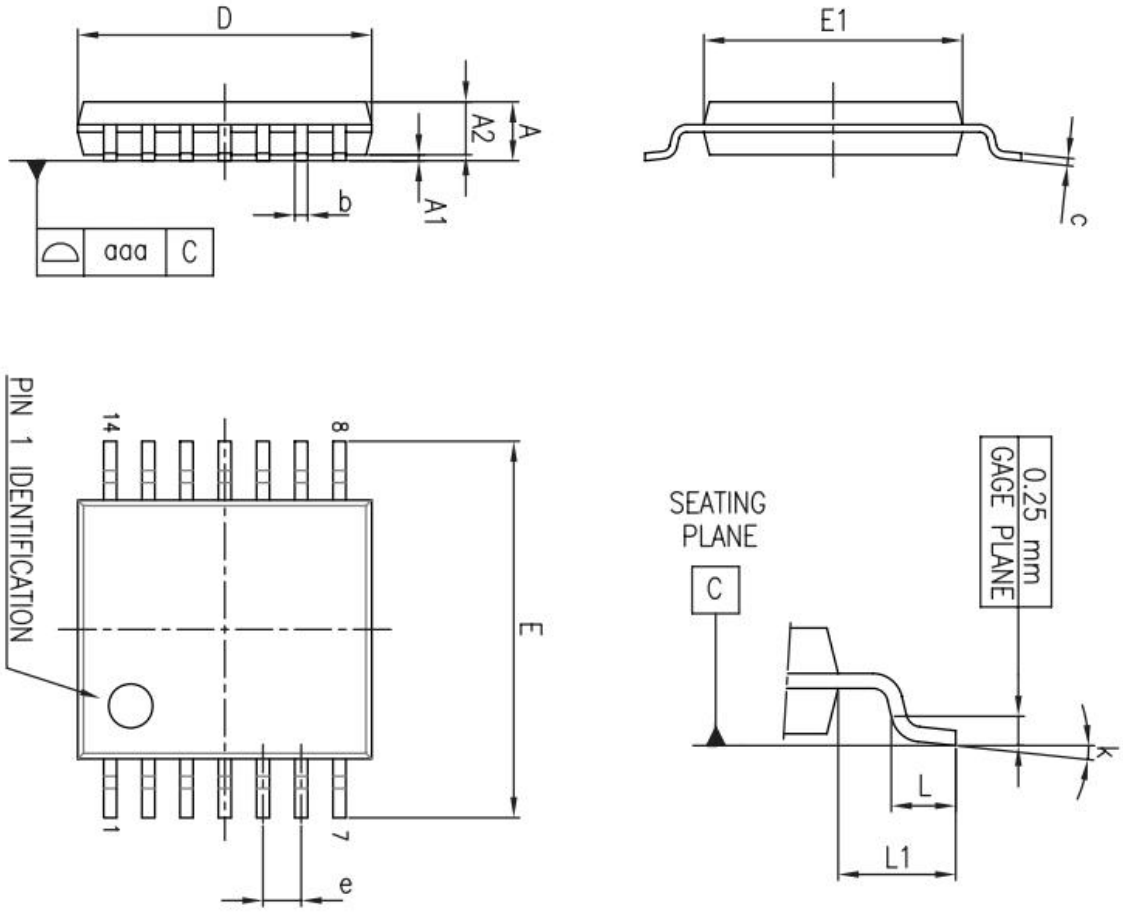
Dimensions						
Ref.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			5.33			0.21
A1	0.38			0.015		
A2	2.92	3.30	4.95	0.11	0.13	0.19
b	0.36	0.46	0.56	0.014	0.018	0.022
b2	1.14	1.52	1.78	0.04	0.06	0.07
c	0.20	0.25	0.36	0.007	0.009	0.01
D	18.67	19.05	19.69	0.73	0.75	0.77
E	7.62	7.87	8.26	0.30	0.31	0.32
E1	6.10	6.35	7.11	0.24	0.25	0.28
e		2.54			0.10	
e1		15.24			0.60	
eA		7.62			0.30	
eB			10.92			0.43
L	2.92	3.30	3.81	0.11	0.13	0.15

7.2 SOP14



Dimensions						
Ref.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.35		1.75	0.05		0.068
A1	0.10		0.25	0.004		0.009
A2	1.10		1.65	0.04		0.06
B	0.33		0.51	0.01		0.02
C	0.19		0.25	0.007		0.009
D	8.55		8.75	0.33		0.34
E	3.80		4.0	0.15		0.15
e		1.27			0.05	
H	5.80		6.20	0.22		0.24
h	0.25		0.50	0.009		0.02
L	0.40		1.27	0.015		0.05
k	8° (max.)					
ddd			0.10			0.004

7.3 TSSOP14



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.20			0.047
A1	0.05		0.15	0.002	0.004	0.006
A2	0.80	1.00	1.05	0.031	0.039	0.041
b	0.19		0.30	0.007		0.012
c	0.09		0.20	0.004		0.0089
D	4.90	5.00	5.10	0.193	0.197	0.201
E	6.20	6.40	6.60	0.244	0.252	0.260
E1	4.30	4.40	4.50	0.169	0.173	0.176
e		0.65			0.0256	
L	0.45	0.60	0.75	0.018	0.024	0.030
L1		1.00			0.039	
k	0°		8°	0°		8°
aaa			0.10			0.004