

74HC08

DATASHEET

Specification Revision History:

Version	Date	Description
V1.0	2019/11	New
V1.1	2021/07	Modify Ordering Information
V1.2	2025/02	Modify Ordering Information
V1.3	2025/03	Add application precautions and overall typesetting.

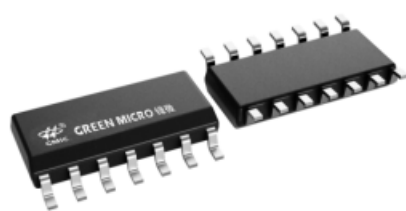
Description

The 74HC08 contains four independent 2-input AND gates, perform the Boolean function $Y = \overline{\overline{A} \cdot \overline{B}}$ or $Y = A + B$ in positive logic.

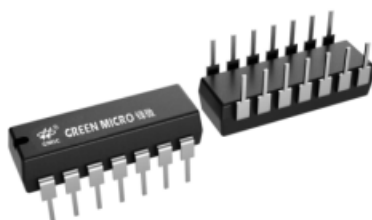
FEATURES

- Operation Voltage Range: 2~6V
- Low Quiescent Current: $I_{CC} = 2\mu A$ (Max)
- High Speed: $t_{PD} = 8ns$ (Typ)
- Low Input Current: 100nA (Max)
- ESD protection:
 - HBM: ANSI/ESDA/JEDEC JS-001 2023 exceeds 1000V
 - CDM: ANSI/ESDA/JEDEC JS-002 2022 exceeds 2000V
- Latch-up performance $\leq 250mA$
- Package Option: DIP-14, SOP-14 and TSSOP-14

The appearance of the product



SOP-14



DIP-14

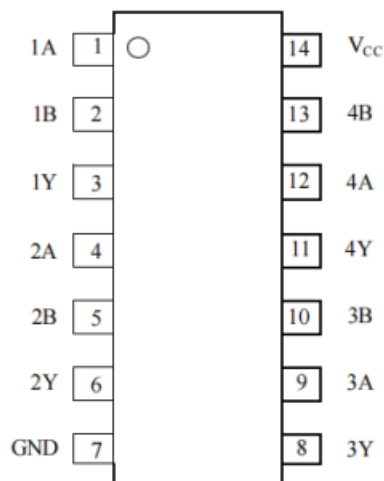


TSSOP-14

Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
SN74HC08DS	SOP-14	74HC08 323	REEL	4000PCS/REEL
SN74HC08NCD	DIP-14	74HC08 323	TUBE	1000PCS/BOX
SN74HC08PJS	TSSOP-14	74HC08 323	REEL	2500PCS/REEL

PIN CONFIGURATION



FUNCTION TABLE(Each Gate)

INPUT(A)	OUTPUT(Y)
H	H
H	L
L	H
L	L

LOGIC DIAGRAM(positive logic)



ABSOLUTE MAXIMUM RATING ($T_A = 25^\circ\text{C}$, unless otherwise specified) (Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ 7	V
Input Clamp Current	I_{IK}	± 20	mA
Output Clamp Current	I_{OK}	± 20	mA
Output Current	I_{OUT}	± 25	mA
VCC or GND Current	I_{CC}	± 50	mA
Storage Temperature	T_{STG}	-65 ~ +150	$^\circ\text{C}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

RECOMMENDED OPERATING COMDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	-	2	-	6	V
Input Voltage	V_{IN}	-	0	-	V_{CC}	V
Output Voltage	V_{OUT}	-	0	-	V_{CC}	V
Input Transition Rise or Fall Rate	t_R, t_F	$V_{CC}=2V$	-	-	1000	ns
		$V_{CC}=4.5V$	-	-	500	
		$V_{CC}=6V$	-	-	400	
Operating Temperature	T_A	-	-40	-	+125	°C

THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	DIP-14	θ_{JA}	100	°C/W
	SOP-14		125	°C/W
	TSSOP-14		150	°C/W

STATIC CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise specified)

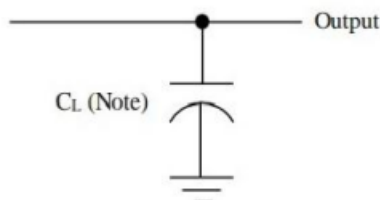
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	$V_{CC}=2V$	1.5	-	-	V
		$V_{CC}=4.5V$	3.15	-	-	V
		$V_{CC}=6V$	4.2	-	-	V
Low-Level Input Voltage	V_{IL}	$V_{CC}=2V$	-	-	0.5	V
		$V_{CC}=4.5V$	-	-	1.35	V
		$V_{CC}=6V$	-	-	1.8	V
High-Level Output Voltage	V_{OH}	$V_{CC}=2V, I_{OH}=-20\mu\text{A}$	1.9	1.998	-	V
		$V_{CC}=4.5V, I_{OH}=-20\mu\text{A}$	4.4	4.499	-	V
		$V_{CC}=6V, I_{OH}=-20\mu\text{A}$	5.9	5.999	-	V
		$V_{CC}=4.5V, I_{OH}=-4\text{mA}$	3.98	4.32	-	V
		$V_{CC}=6V, I_{OH}=-5.2\text{mA}$	5.48	5.81	-	V
Low-Level Output Voltage	V_{OL}	$V_{CC}=2V, I_{OL}=20\mu\text{A}$	-	0.002	0.1	V
		$V_{CC}=4.5V, I_{OL}=20\mu\text{A}$	-	0.001	0.1	V
		$V_{CC}=6V, I_{OL}=20\mu\text{A}$	-	0.001	0.1	V
		$V_{CC}=4.5V, I_{OL}=4\text{mA}$	-	0.15	0.26	V
		$V_{CC}=6V, I_{OL}=5.2\text{mA}$	-	0.16	0.26	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=6V, V_{IN}=V_{CC}$ or GND	-	± 0.1	± 100	nA
Quiescent Supply Current	I_Q	$V_{CC}=6V, V_{IN}=V_{CC}$ or GND $I_{OUT}=0$	-	-	8	μA
Input Capacitance	C_{IN}	$V_{CC}=2V$ to $6V$	-	3	10	pF

DYNAMIC CHARACTERISTICS ($T_A=25^\circ\text{C}$, Input: $t_R, t_F=6\text{ns}$, unless otherwise specified)

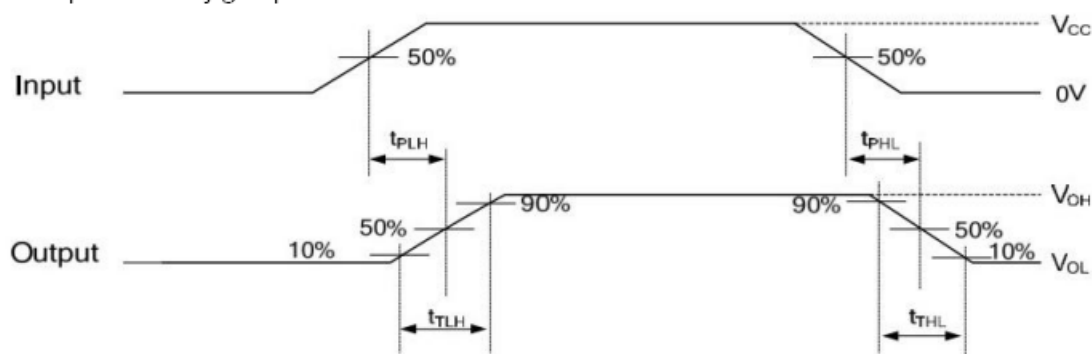
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from Input(A or B) to Output(Y)	t_{PLH}, t_{PHL}	$V_{CC}=2V, C_L=50\text{pF}$	-	25	90	ns
		$V_{CC}=4.5V, C_L=50\text{pF}$	-	9	18	ns
		$V_{CC}=6V, C_L=50\text{pF}$	-	7	15	ns
Output Transition Time	t_T	$V_{CC}=2V$	-	19	75	ns
		$V_{CC}=4.5V$	-	7	15	ns
		$V_{CC}=6V$	-	6	13	ns

OPERATING CHARACTERISTICS (TA=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	RATINGS	UNIT
Power Dissipation Capacitance	C_{PD}	No Load	20	pF

TEST CIRCUIT AND WAVEFORMS


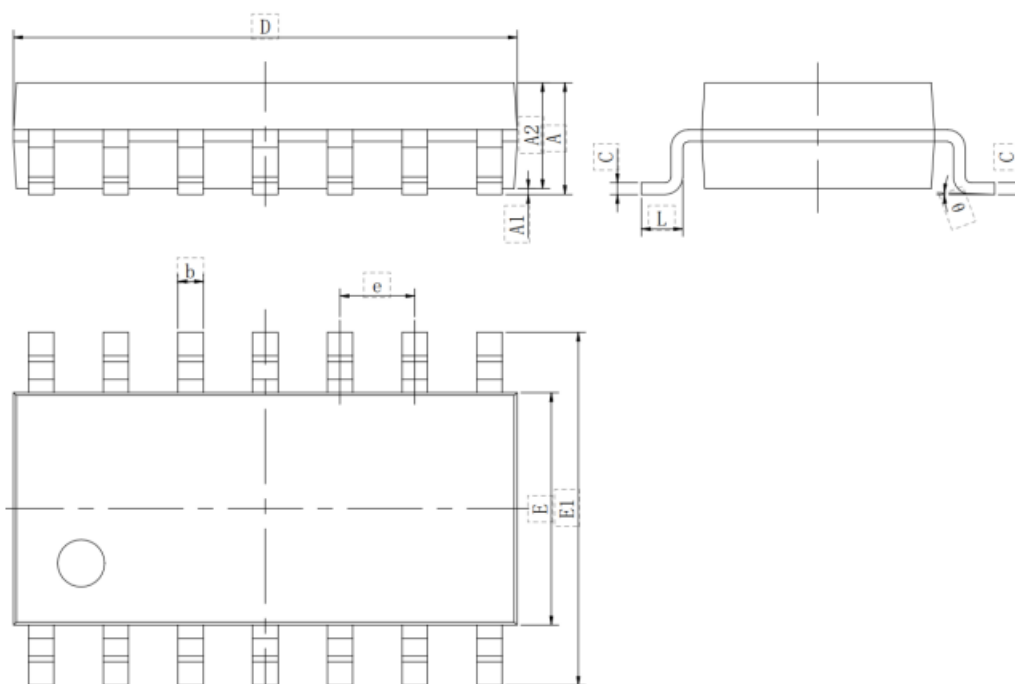
Note: C_L includes probe and jig capacitance.



Outline Dimensions

SOP-14

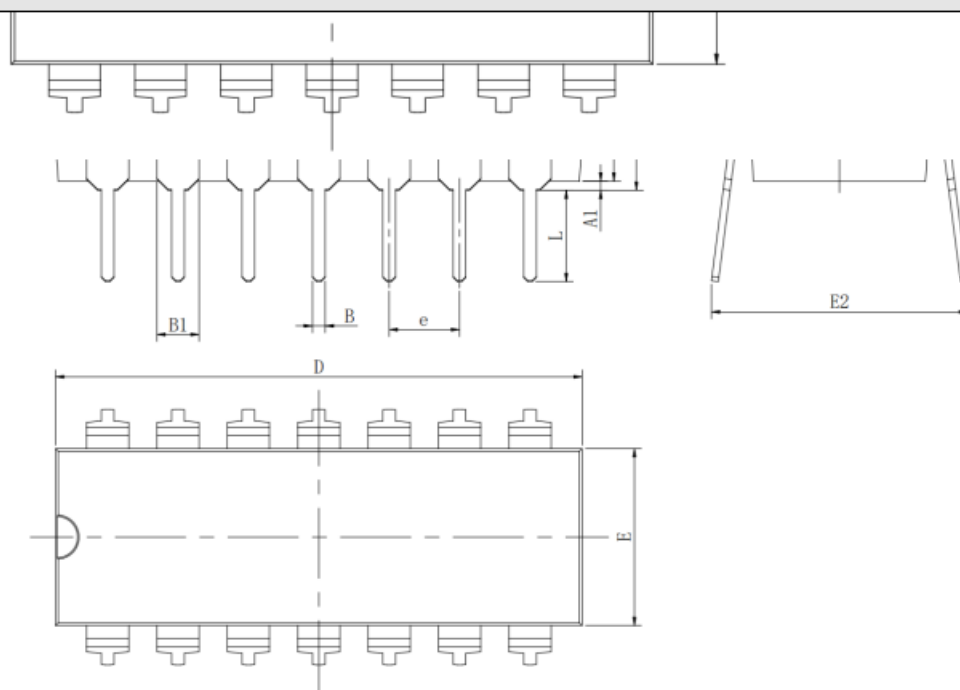
Unit : mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	8.360	8.760	0.329	0.345
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0 °	8 °	0 °	8 °

DIP14

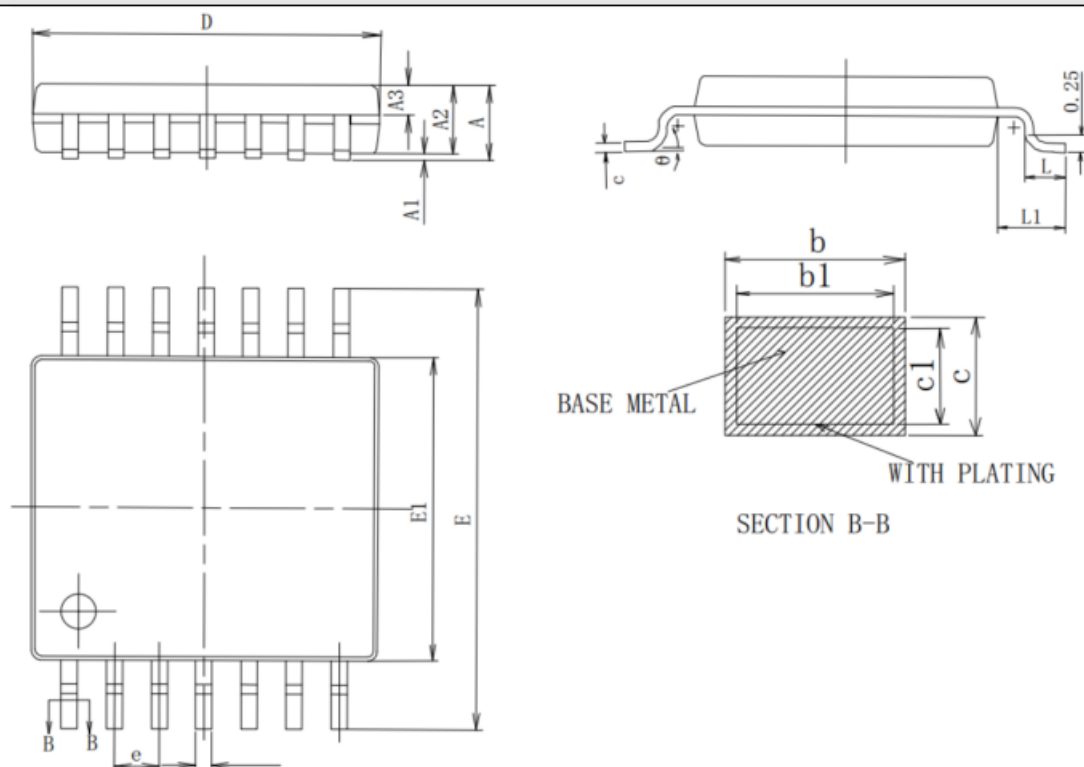
Unit:mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524(BSC)		0.060(BSC)	
C	0.204	0.360	0.008	0.014
D	18.800	19.200	0.740	0.756
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540(BSC)		0.100(BSC)	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354

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Unit:mm



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.20
A1	0.05	—	0.15
A2	0.90	1.00	1.05
A3	0.39	0.44	0.49
b	0.20	—	0.28
b1	0.19	0.22	0.25
c	0.13	—	0.17
c1	0.12	0.13	0.14
D	4.90	5.00	5.10
E1	4.30	4.40	4.50
E	6.20	6.40	6.60
e	0.65BSC		
L	0.45	0.60	0.75
L1	1.00BSC		
θ	0	—	8°

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