



# Advanced Low Power Schottky Logic – 54ALS08

## Quad 2-Input AND Gate in bare die form

Rev 1.1  
23/01/24

### Description

The 54ALS08 quad 2-input AND gate is fabricated using a 2µm 40V Bipolar process. The device consists of four independent 2-input AND gates with standard push-pull outputs and performs the Boolean function  $Y = A \bullet B$  or  $Y = \overline{A + B}$ . All inputs are protected against ESD and excess voltage transients.

### Features:

- High speed – 2ns (Min) propagation delay
- Full Military Temperature Range
- Direct drop-in replacement for obsolete components in long term programs.

### Ordering Information

The following part suffixes apply:

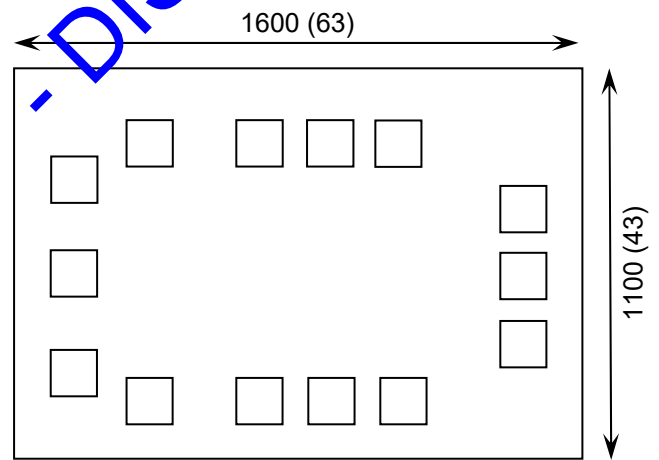
- No suffix - MIL-STD-883 /2010B Visual Inspection
- "H" - MIL-STD-883 /2010B Visual Inspection + MIL-PRF-38534 Class H LAT
- "K" - MIL-STD-883 /2010A Visual Inspection (Space) + MIL-PRF-38534 Class K LAT

LAT = Lot Acceptance Test.

For further information on LAT process flows see below.

[www.siliconsupplies.com/quality/bare-die-lot-qualification](http://www.siliconsupplies.com/quality/bare-die-lot-qualification)

### Die Dimensions in µm (mils)



### Supply Formats:

- Default – Die in Waffle Pack (300 per tray capacity)
- ~~Sawn Wafer on Tape~~ – On request
- Unsawn Wafer – On request
- Die Thickness <=> 350µm(14 Mils) – On request
- Assembled into Ceramic Package – On request

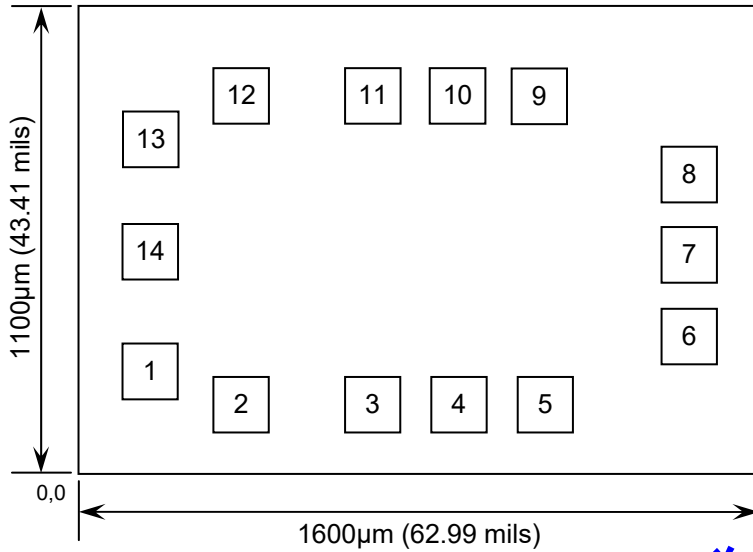
### Mechanical Specification

Die Size (Unsawn)	1600 x 1100 63 x 43	µm mils
Minimum Bond Pad Size	130 x 130 5.12 x 5.12	µm mils
Die Thickness	350 (±20) 13.78 (±0.79)	µm mils
Top Metal Composition	Al 1%Si 1.1µm	
Back Metal Composition	N/A – Bare Si	





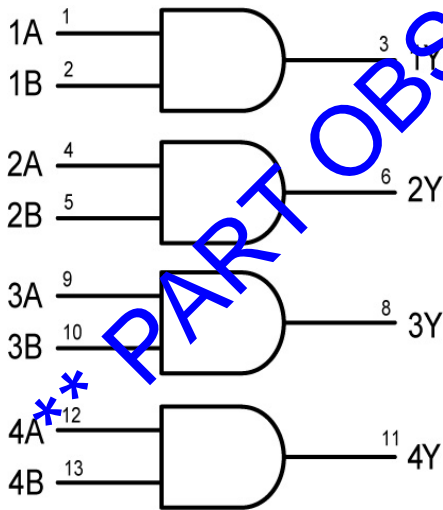
## Pad Layout and Functions



PAD	FUNCTION	COORDINATES (mm)	
		X	Y
1	1A	0.100	0.180
2	1B	0.315	0.100
3	1Y	0.625	0.100
4	2A	0.825	0.100
5	2B	1.025	0.100
6	2Y	1.370	0.260
7	GND	1.370	0.450
8	3Y	1.370	0.640
9	3A	1.015	0.825
10	3B	0.825	0.825
11	4Y	0.625	0.825
12	4A	0.425	0.825
13	4B	0.100	0.725
14	V <sub>CC</sub>	0.100	0.460

CONNECT CHIP BACK TO GND

## Logic Diagram



Pad 14 = V<sub>CC</sub>  
Pad 7 = GND

## Function Table

INPUTS		OUTPUT
A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

H = High level (steady state)  
L = Low level (steady state)





## Absolute Maximum Ratings<sup>1</sup>

PARAMETER	SYMBOL	VALUE	UNIT
DC Supply Voltage	$V_{CC}$	7.0	V
DC Input Voltage	$V_{IN}$	7.0	V
Storage Temperature Range	$T_{STG}$	-65 to 150	°C

1. Operation above the absolute maximum rating may cause device failure. Operation at the absolute maximum ratings, for extended periods, may reduce device reliability.

## Recommended Operating Conditions

PARAMETER	SYMBOL	MIN	MAX	UNITS
Supply Voltage	$V_{CC}$	4.5	5.5	V
High-Level Input Voltage	$V_{IH}$	2	-	V
Low-Level Input Voltage	$V_{IL}$	-	0.5	V
High-Level Output Current	$I_{OH}$	-	-0.4	mA
Low-Level Output Current	$I_{OL}$	-	4	mA
Operating Temperature Range	$T_J$	-55	+125	°C

## DC Electrical Characteristics<sup>2</sup> $T_J = -55^{\circ}\text{C}$ to $125^{\circ}\text{C}$ unless otherwise specified

PARAMETER	SYMBOL	CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
Minimum High-Level Input Voltage	$V_{IH}$	-	2	-	-	V
Maximum Low-Level Input Voltage	$V_{IL}$	-	-	-	0.7	V
Input Clamp Diode Voltage	$V_{IK}$	$V_{CC} = \text{MIN}$ $I_{IN} = -18\text{mA}$	-	-	-1.5	V
Output Voltage High	$V_{OH}$	$V_{CC} = 4.5\text{V}$ to $5.5\text{V}$ , $I_{OH} = -0.4\text{mA}$	$V_{CC}-2$	-	-	V
Output Voltage Low	$V_{OL}$	$V_{CC} = 4.5\text{V}$   $I_{OL} = 4\text{mA}$	-	0.25	0.4	V
Input Current	$I_{IN}$	$V_{CC} = 5.5\text{V}$ , $V_{IN} = 7\text{V}$	-	-	0.1	mA
Input High Current	$I_{IH}$	$V_{CC} = 5.5\text{V}$ , $V_{IN} = 2.7\text{V}$	-	-	20	$\mu\text{A}$
Input Low Current	$I_{IL}$	$V_{CC} = 5.5$ , $V_{IN} = 0.4\text{V}$	-	-	-0.1	mA
Output Current <sup>3</sup>	$I_O$	$V_{CC} = 5.5$ , $V_{OUT} = 2.25\text{V}$	-20	-	-112	mA
Power Supply Current (Total)	$I_{CCH}$	$V_{CC} = 5.5\text{V}$ , $V_{IN} = 4.5\text{V}$	-	1.3	2.4	mA
	$I_{CCL}$	$V_{CC} = 5.5\text{V}$ , $V_{IN} = 0\text{V}$	-	2.2	4	

2. All typical values @  $V_{CC} = 5\text{V}$ ,  $T_J = 25^{\circ}\text{C}$ .

3. Output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current,  $I_{OS}$



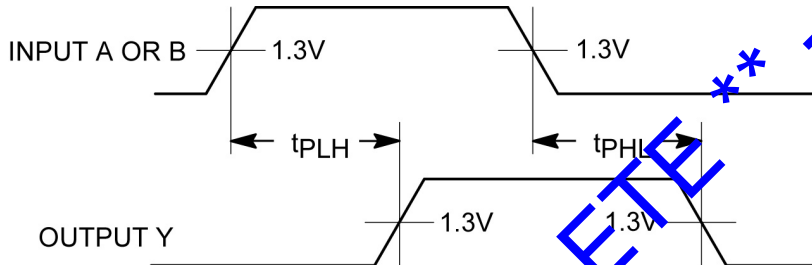


## AC Electrical Characteristics<sup>4</sup> $T_J = -55^{\circ}\text{C}$ to $125^{\circ}\text{C}$ unless otherwise specified

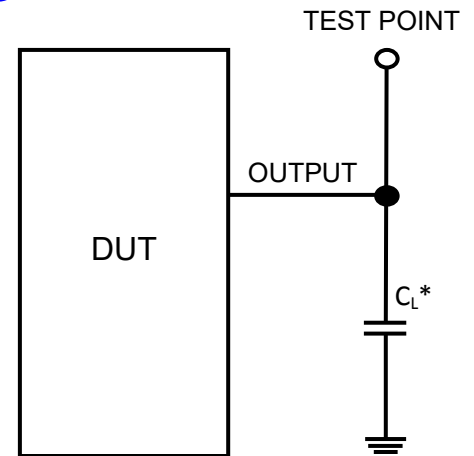
PARAMETER	SYMBOL	CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
Propagation Delay, A or B to output Y	$t_{PLH}$	$V_{CC} = 4.5$ to $5.5\text{V}$ , $C_L = 50\text{pF}$ , $R_L = 500\Omega$	2	-	14	ns
	$t_{PHL}$		2	-	12.5	

4. Not production tested in die form, characterized by chip design and tested in package.

### Switching Waveform



### Test Circuit



\* Includes all probe and jig capacitance

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