AOS SEMICONDUCTOR

产品规格说明书

Product Data Sheet

AOS2G00xx

WEB | www.aossemi.cn

AOS2G00 Dual 2-Input Positive-NAND Gate

DESCRIPTIONS

The AOS2G00 dual 2-input positive-NAND gate is designedfor 1.65V to 5.5V V_{CC} operation. The AOS2G00 device performs the Boolean function $Y=\overline{A \bullet B}$ or $Y=\overline{A}+\overline{B}$ in positive logic.The device is fully specified for partial-power-down applications using I_{off}. The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

The AOS2G00 is available in Green MSOP-8 packages.It operates over an ambient temperature range of -40℃ to +125℃.

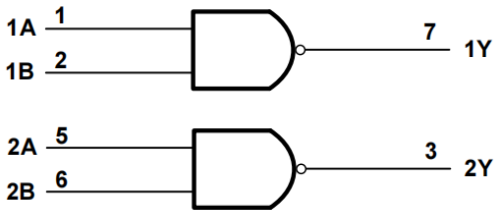
FEATURES

★ Operating Voltage Range: 1.65V to 5.5V
★ Low Power Consumption: 1μA (Max)
★ Operating Temperature Range:-40℃ to +125℃
★ Inputs Accept Voltage to 5.5V
★ High Output Drive: ±24mA at V_{CC}=3.0V
★ PACKAGE:MSOP-8

APPLICATIONS

★ Active Noise Elimination
★ Bar Code Scanner
★ Blood Pressure Monitor
★ CPAP Machine
★ Fingerprint identification
★ Network attached storage (NAS)

LOGIC SYMBOL



Device Information(1)

PART NUMBER	PACKAGE	BODY SIZE (NOM)
AOS2G00	MSOP-8	3.00mm×3.00mm

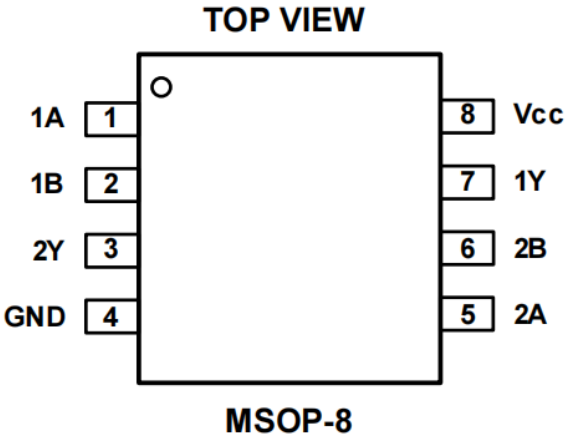
(1) For all available packages, see the orderable addendum at the end of the data sheet.

FUNCTION TABLE

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

H=High Voltage Level
L=Low Voltage Level

PIN CONFIGURATIONS



PIN DESCRIPTION

PIN	NAME	I/O TYPE	FUNCTION
MSOP-8			
1	1A	I	Channel 1 logic input
2	1B	I	Channel 1 logic input
3	2Y	O	Logic level output
4	GND	-	Ground
5	2A	I	Channel 2 logic input
6	2B	I	Channel 2 logic input
7	1Y	O	Logic level output
8	V_{CC}	-	Power Supply

Specifications

Absolute Maximum Ratings(1)

Over operating free-air temperature range (unless otherwise noted)(1)(2)

			MIN	MAX	UNIT
V_{CC}	Supply voltage range		-0.5	6.5	V
V_I	Input voltage range(2)		-0.5	6.5	
V_O	Voltage range applied to any output in the high-impedance or power-off state(2)		-0.5	6.5	
V_O	Voltage range applied to any output in the highor lowstate(2)(3)		-0.5	V_{CC} ± 0.5	
I_{IK}	Input clamp current	V_I<0		-50	mA
I_{OK}	Output clamp current	V_O<0		-50	
I_O	Continuous output current			± 50	
	Continuous current through V_{CC} or GND			± 100	
T_J	Junction temperature		-65	150	℃
T_{stg}	Storage temperature		-65	150	

(1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

(2) The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.

(3) The value of V_{CC} is provided in the R*ecommended Operating Conditions table*.

ESD Ratings

The following ESD information is provided for handling of ESD-sensitive devices in an ESD protected area only.

			VALUE	UNIT
$V_{(ESD)}$	Electrostatic discharge	Human-Body Model(HBM)	±8000	V
		Machine Model(MM)	±500	

Thermal Information:

THERMAL METRIC		AOS2G00 8PINS MSOP-8	UNIT
$R_{\theta JA}$	Junction-to-ambient thermal resistance	165	℃/W
$R_{\theta JC(top)}$	Junction-to-case(top) thermal resistance	53	
$R_{\theta JB}$	Junction-to-board thermal resistance	87	
ψ_{JT}	Junction-to-top characterization parameter	4.9	
ψ_{JB}	Junction-to-board characterization parameter	85	
$R_{\theta JC(bot)}$	Junction-to-case(bottom) thermal resistance	N/A	

PACKAGE/ORDERING INFORMATION

PRODUCT	ORDERING NUMBER	TEMPERATURE RANGE	PACKAGE LEAD	PACKAGE MARKING(1)	PACKAGE OPTION
AOS2G00	AOS2G00XM	-40℃~+125℃	MSOP-8	AOS2G00	Tape and Reel,4000

NOTE:

(1) There may be additional marking, which relates to the lot trace code information(data code and vendor code),the logo or the environmental category on the device.

ELECTRICAL CHARACTERISTICS

over recommended operating free-air temperature range(TYP values are at T_A=+25℃, unless otherwise noted.) (1)

Recommended Operating Conditions(1)

PARAMETER	SYMBOL	Vcc	MIN	MAX	UNIT
Supply voltage	V_{CC}	Operating	1.65	5.5	V
		Data retention only	1.5	5.5	
High-level input voltage	V_{IH}	V_{CC}=1.65V to 1.95V	0.65×V_{CC}		
		V_{CC}=2.3V to 2.7V	1.7		
		V_{CC}=3V to 3.6V	2.2		
		V_{CC}=4.5V to 5.5V	0.7×V_{CC}		
Low-level input voltage	V_{IL}	V_{CC}=1.65V to 1.95V		0.15×V_{CC}	
		V_{CC}=2.3V to 2.7V		0.3	
		V_{CC}=3V to 3.6V		0.4	
		V_{CC}=4.5V to 5.5V		0.15×V_{CC}	
Input voltage	V_I		0	5.5	
Output voltage	V_O		0	V_{CC}	
Input transition rise or fall	t_t,t_f	V_{CC}=1.8V±0.15V, 2.5V±0.2V		20	ns/V
		V_{CC}=3.3V±0.3V		10	
		V_{CC}=5V±0.5V		5	
Operating temperature	T_A		-40	+125	℃

(1)All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

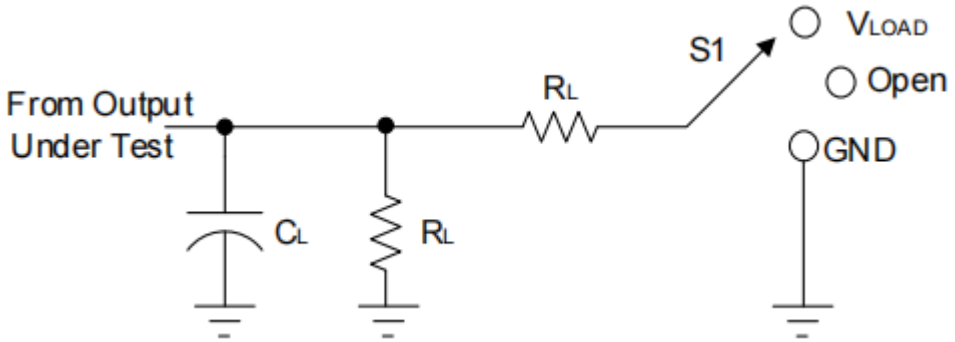
DC Characteristics

PARAMETER		CONDITIONS	Vcc	TEMP	MIN	TYP	MAX	UNIT
V_{OH}		I_{OH}=-100μA	1.65V to 5.5V	Full	Vcc-0.1			V
		I_{OH}=-4mA	1.65V		1.2			
		I_{OH}=-8mA	2.3V		1.9			
		I_{OH}=-16mA	3V		2.4			
		I_{OH}=-24mA			2.3			
		I_{OH}=-32mA	4.5V		3.8			
V_{OL}		I_{OH}=100μA	1.65V to 5.5V	Full			0.1	
		I_{OH}=4mA	1.65V				0.45	
		I_{OH}=8mA	2.3V				0.3	
		I_{OH}=16mA	3V				0.4	
		I_{OH}=24mA					0.55	
		I_{OH}=32mA	4.5V				0.55	
I_I	A or B inputs	V_I=5.5V or GND	0V to 5.5V	+25℃		±0.1	±1	μA
				Full			±5	
I_{off}		V_I or V_O=5.5V	0	+25℃		±0.1	±1	
				Full			±10	
I_{CC}		V_I=5.5V or GND, I_O=0	1.65V to 5.5V	+25℃		0.1	2	
				Full			10	
ΔI_{CC}		One input at Vcc-0.6V, Other inputs at Vcc or GND	3V to 5.5V	Full			500	

AC Characteristics

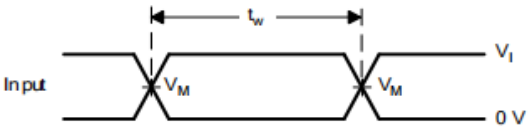
PARAMETER	SYMBOL	TEST CONDITIONS		TEMP	MIN	TYP	MAX	UNIT
Propagation Delay	t_{pd}	V_{CC}=1.8V±0.15V	C_L=30pF, R_L=500Ω	Full		21		ns
		V_{CC}=2.5V±0.2V	C_L=30pF, R_L=500Ω	Full		7.8		
		V_{CC}=3.3V±0.3V	C_L=50pF, R_L=500Ω	Full		5.7		
		V_{CC}=5V±0.5V	C_L=50pF, R_L=500Ω	Full		4.2		
Input Capacitance	C_i	V_{CC}=3.3V	V_I=V_{CC} or GND	+25℃		4		pF
Power dissipation capacitance	C_{pd}	V_{CC}=1.8V	f=10MHz	+25℃		21		
		V_{CC}=2.5V				22		
		V_{CC}=3.3V				22		
		V_{CC}=5V				25		

Parameter Measurement Information

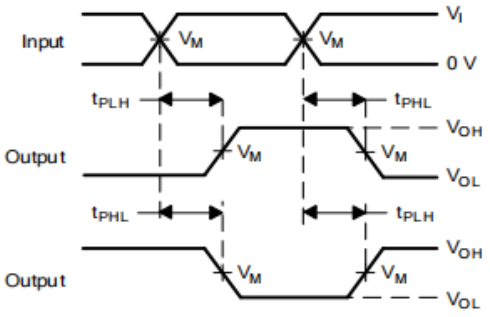


TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

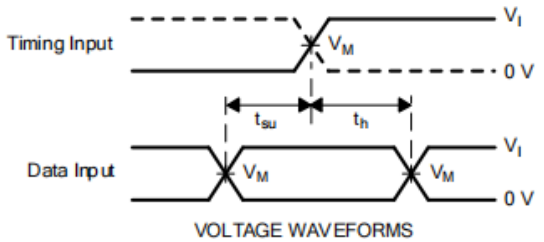
V_{CC}	INPUTS		V_M	V_{LOAD}	C_L		R_L		V_Δ
	V_I	t_r/t_f							
1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	2 x V_{CC}	15pF	30pF	1MΩ	1kΩ	0.15V
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	2 x V_{CC}	15pF	30pF	1MΩ	500Ω	0.15V
3.3V±0.3V	3V	≤2.5ns	1.5V	6V	15pF	50pF	1MΩ	500Ω	0.3V
5V±0.5V	V_{CC}	≤2.5ns	$V_{CC}/2$	2 x V_{CC}	15pF	50pF	1MΩ	500Ω	0.3V



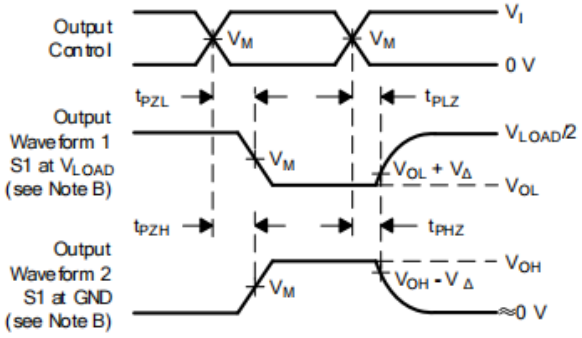
VOLTAGE WAVEFORMS
PULSE DURATION



VOLTAGE WAVEFORMS PROPAGATION DELAY
TIMES INVERTION AND NONINVERTING OUTPUTS



VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES

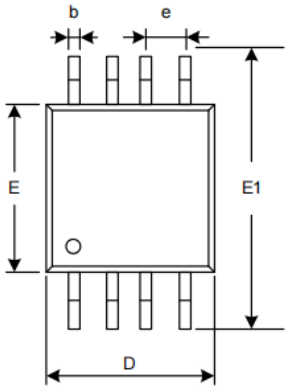


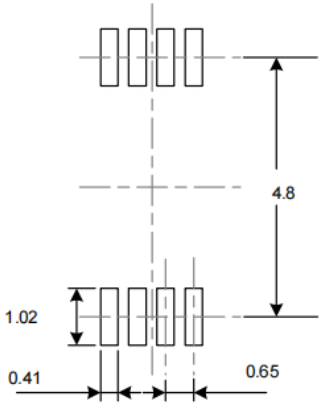
VOLTAGE WAVEFORMS ENABLE AND DISABLE
TIMES LOW-AND HIGH-LEVEL ENABLING

NOTES: A. CL includes probe and jig capacitance.
B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control.
Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
C. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10MHz, Z_O = 50Ω.
D. The outputs are measured one at a time, with one transition per measurement.
E. t_{PLZ} and t_{PHZ} are the same as t_{dis}.
F. t_{PZL} and t_{PZH} are the same as t_{en}.
G. t_{PLH} and t_{PHL} are the same as t_{pd}.
H. All parameters and waveforms are not applicable to all devices.

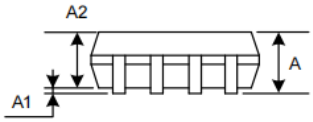
Figure 1. Load Circuit and Voltage Waveforms

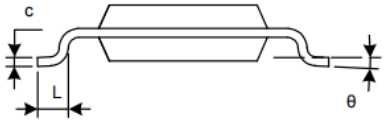
PACKAGE OUTLINE DIMENSIONS
MSOP-8





RECOMMENDED LAND PATTERN (Unit: mm)



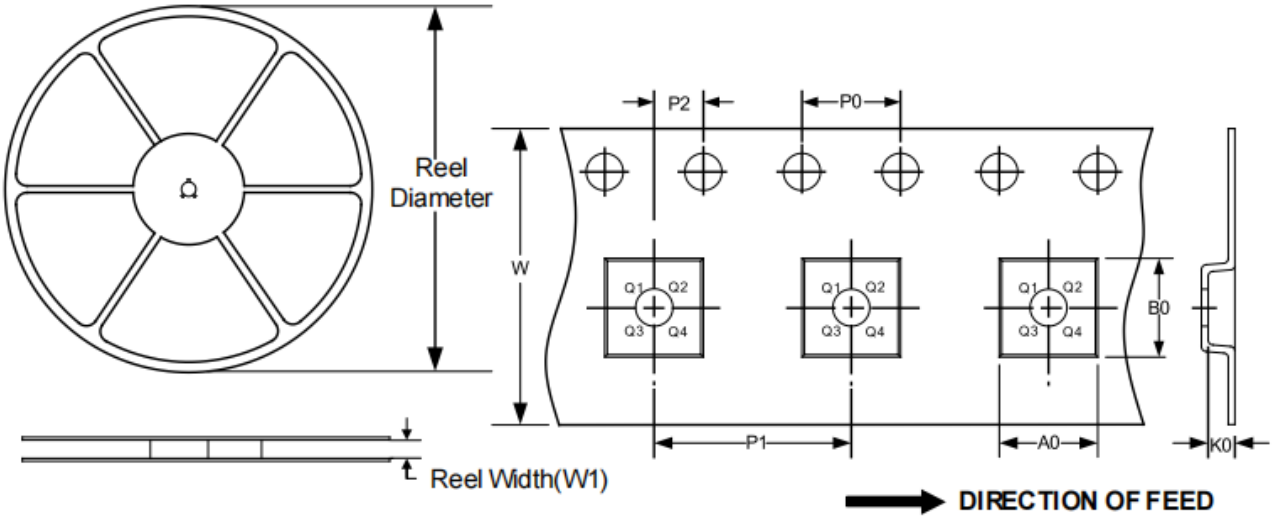


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.820	1.100	0.032	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.250	0.380	0.010	0.015
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
e	0.650(BSC)		0.026(BSC)	
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
L	0.400	0.800	0.016	0.031
θ	0 °	6 °	0 °	6 °

TAPE AND REEL INFORMATION

REEL DIMENSIONS

TAPE DIMENSION



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width(mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
MSOP	13''	12.4	5.20	3.30	1.50	4.0	8.0	2.0	12.0	Q1

NOTE:

1. All dimensions are nominal.
2. Plastic or metal protrusions of 0.15mm maximum per side are not included.