

DESCRIPTION

The AL2G08 provides a dual 2-input positive-AND gate function. Input can be driven from either 3.3V or 5V devices This feature allows the use of the AL2G08 as a translator in a mixed 3.3 and 5V environment.

The AL2G08 is designed for 1.65V to 5.5V V_{CC} operation.

The AL2G08 device performs the Boolean function $Y=A \cdot B$ or $Y=\overline{A \cdot B}$ 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 AL2G08 is available in MSOP8 package.

ORDERING INFORMATION

Package Type	Part Number				
MSOP8	MS8	AL2G08MS8R			
SPQ: 4,000pcs/Reel	IVISO	AL2G08MS8VR			
Note	V: Halogen free Package R: Tape & Reel				
AiT provides all RoHS products					

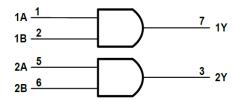
FEATURES

- Wide Supply Range from 1.65V to 5.5V
- 5V Tolerant Outputs for interfacing with 5V logic
- High Noise Immunity
- Low Power Consumption:1µA (Max)
- Operating Temperature Range: -40°C to +125°C
- Inputs Accept Voltage to 5.5V
- High Output Drive: ±24mA at Vcc=3.0V
- Available in MSOP8 package

APPLICATION

- Voltage Level Shifting
- General Purpose Logic
- Power Down Signal Isolation
- Computers, E-readers, PDAs
- Computer Peripherals, Hard Drives, CD/DVD ROMs
- TVs, DVDs, DVRs, Set Top Boxes
- Cell Phones, Personal Nagivations/GPS
- MP3 Players, Cameras, Video Recorders
- Active Noise Elimination
- Bar Code Scanner
- Blood Pressure Monitor
- CPAP Machine
- Fingerprint identification
- IP Phone: Wired and Wireless
- Network attached storage (NAS)
- Private Branch Exchange (PBX)

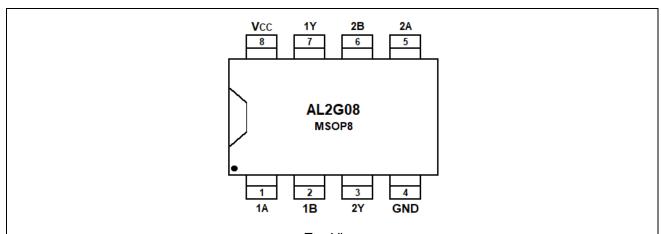
LOGIC SYMBOL



REV1.0 - MAY 2021 RELEASED - -1



PIN DESCRIPTION



Top View

Pin#	Symbol	I/O	Function
1	1A	1	Channel 1 logic input
2	1B	I	Channel 1 logic input
3	2Y	0	Logic level output
4	GND	-	Ground
5	2A	I	Channel 2 logic input
6	2B	I	Channel 2 logic input
7	1Y	0	Logic level output
8	Vcc	-	Power Pin

FUNCTION TABLE

Inp	Output	
Α	В	Υ
Н	Н	Н
L	Н	L
Н	L	L
L	L	L

Y=A•B

H=High Voltage Level

L=Low Voltage Level

REV1.0 - MAY 2021 RELEASED - -2 -



ABSOLUTE MAXIMUM RATINGS

over operating free-air temperature range, unless otherwise noted^{NOTE1}

over operating free-air temperature range, unless otherwise noted.							
Vcc, Supply Voltage Range	-0.5V ~ 6.5V						
V _I , Input Voltage Range ^{NOTE1}		-0.5V ~ 6.5V					
V _O , Voltage range applied to any output	in the high	i-impedance or power-off stateNOTE1	-0.5V ~ 6.5V				
Vo, Voltage range applied to any output	in the high	or low state ^{NOTE1, 2}	-0.5V ~ V _{CC} +0.5V				
I _{IK} , Input Clamp Current	I _{IK} , Input Clamp Current V _I <0						
Іок, Output Clamp Current	-50mA						
Io, Continuous Output Current	±50mA						
Continuous Current Through Vcc or GN	±100mA						
T _J , Junction Temperature	150°C						
T _{STG} , Storage Temperature	-65°C ~ 150°C						
ESD Ratings							
V Floatroatatio Discharge	Human-body model (HBM)		±8000V				
V _(ESD) , Electrostatic Discharge	Machine	model (MM)	±500V				

Stress beyond above listed "Absolute Maximum Ratings" may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1: The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.

NOTE2: The value of V_{CC} is provided in the Recommended Operating Conditions table.

REV1.0 - MAY 2021 RELEASED - - 3 -



RECOMMENDED OPERATING CONDITIONS

 T_A = +25°C, unless otherwise noted. NOTE3

Parameter	Symbol	Conditions	Min.	Тур.	Max.	Unit	
Complex Vallages	V _{CC}	Operating	1.65	-	5.5	W	
Supply Voltage	VCC	Data retention only	1.5	-	5.5	V	
		V _{CC} =1.65V to 1.95V	0.65xV _{CC}	-	-		
18.1.1	Mari	Vcc=2.3V to 2.7V	1.7	-	-		
High-Level Input Voltage	ViH	Vcc=3V to 3.6V	2.2	-	-	V	
		V _{CC} =4.5V to 5.5V	0.7xV _{CC}	-	-		
	VıL	Vcc=1.65V to 1.95V	-	-	0.15xV _{CC}		
		Vcc=2.3V to 2.7V	-	-	0.3		
Low-Level Input Voltage		Vcc=3V to 3.6V	-	-	0.4	V	
		Vcc=4.5V to 5.5V	-	-	0.15xV _{CC}		
Input Voltage	Vı		0	-	5.5	٧	
Output Voltage	Vo		0	-	Vcc	٧	
Input Transition Rise or Fall	tr, tr	Vcc=1.8V±0.15V, 2.5V±0.2V	-	-	20	ns/V	
		V _{CC} =3.3V±0.3V	-	-	10		
		Vcc=5V±0.5V	-	-	5		
Operating Temperature	TA		-40	-	+125	°C	

REV1.0 - MAY 2021 RELEASED - -4-

DC ELECTRICAL CHARACTERISTICS

T_A = +25°C, unless otherwise noted. NOTE3

P	Parameter	Conditions	Temp	Min.	Тур.	Max.	Unit
		I _{OH} =-100μA, V _{CC} =1.65V to 5.5V		Vcc-0.1	-	-	
		I _{OH} =-4mA, V _{CC} =1.65V		1.2	-	-	
Mari		I _{OH} =-8mA, V _{CC} =2.3V	-40°C to	1.9	ı	-	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Vон		I _{OH} =-16mA, V _{CC} =3V	+125°C	2.4	-	-	V
		I _{OH} =-24mA, V _{CC} =3V		2.3	ı	-	
		I _{OH} =-32mA, V _{CC} =4.5V		3.8	ı	-	
		Іон=100μA, V _{CC} =1.65V to 5.5V		ı	ı	0.1	
		I _{OH} =4mA, V _{CC} =1.65V		ı	ı	0.45	
Mar.		I _{OH} =8mA, V _{CC} =2.3V	-40°C to	ı	ı	0.3	V
VOL	VoL	I _{OH} =16mA, V _{CC} =3V	+125°C	ı	ı	0.4	
		I _{OH} =24mA, V _{CC} =3V		ı	1	0.55	
		I _{OH} =32mA, V _{CC} =4.5V		-	-	0.55	
		V _i =5.5V or GND, V _{CC} =0V to 5.5V	+25°C	-	±0.1	±1	
I	A or B inputs		-40°C to	_	_	±5	μΑ
			+125°C			13	
			+25°C		±0.1	±1	
l _{off}		V _I or V _O =5.5V, V _{CC} =0V	-40°C to			±10	μΑ
			+125°C			±10	
Icc		V _I =5.5V or GND, I _O =0,	+25°C	-	0.1	1	
		V _{CC} =1.65V to 5.5V	-40°C to	_	_	10	μΑ
		VCC-1.00V to 0.0V	+125°C		_	10	
		One input at Vcc-0.6V,	-40°C to				
Δlcc		Other inputs at Vcc or GND,	+125°C	-	-	500	μΑ
		V _{CC} =3V to 5.5V					.

AC ELECTRICAL CHARACTERISTICS

 T_A = +25°C, unless otherwise noted. NOTE3

Parameter	Symbol	Con	Min.	Тур.	Max.	Unit		
Propagation Delay	t _{pd}	V _{CC} =1.8V±0.15V	C _L =30pF, R _L =1kΩ	-	11.2	-		
		V _{CC} =2.5V±0.2V	C _L =30pF, R _L =500Ω	-	6.5	ı		
		V _{CC} =3.3V±0.3V		-	5.4	ı	ns	
		V _{CC} =5V±0.5V	C _L =50pF, R _L =500Ω	-	4.3	ı		
Input Capacitance	Ci	V _{CC} =0V		-	4	ı	pF	
Power Dissipation	(V _{CC} =3.3V	f=10MHz	-	26	ı	۲.	
Capacitance	C_{pd}	V _{CC} =5V	I=TUIVITZ	-	31	-	pF	

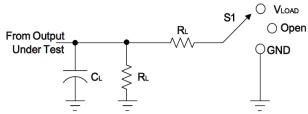
NOTE3: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

REV1.0 - MAY 2021 RELEASED - - 5 -



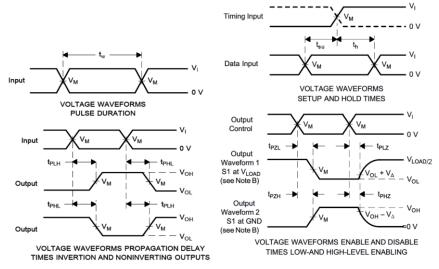
DETAILED INFORMATION

Parameter Measurement Information



TEST	S1
t _{PLH} /t _{PHL}	Open
t _{PLZ} /t _{PZL}	V _{LOAD}
tpHz/tpzH	GND

Vos	Inp	outs V _M V _{LOAD} C _L		. .		VΔ			
Vcc	Vı	t _r /t _f	V _M	VLOAD		/L	Г	₹ L	VΔ
1.8V±0.15V	Vcc	≤2ns	Vcc/2	2 x Vcc	15pF	30pF	1ΜΩ	1kΩ	0.15V
2.5V±0.2V	Vcc	≤2ns	Vcc/2	2 x Vcc	15pF	30pF	1ΜΩ	500Ω	0.15V
3.3V±0.3V	3V	≤2.5ns	1.5V	6V	15pF	50pF	1ΜΩ	500Ω	0.3V
5V±0.5V	Vcc	≤2.5ns	Vcc/2	2 x Vcc	15pF	50pF	1ΜΩ	500Ω	0.3V



NOTE A: C_L includes probe and jig capacitance.

NOTE 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.

NOTE C: All input pulses are supplied by generators having the following characteristics: PRR \leq 10 MHz, $Z_0 = 50\Omega$.

NOTE D: The outputs are measured one at a time, with one transition per measurement.

NOTE E: t_{PLZ} and t_{PHZ} are the same as t_{dis} .

NOTE F: $t_{\mbox{\scriptsize PZL}}$ and $t_{\mbox{\scriptsize PZH}}$ are the same as $t_{\mbox{\scriptsize en}}.$

NOTE G: t_{PLH} and t_{PHL} are the same as t_{pd} .

NOTE H: All parameters and waveforms are not applicable to all devices.

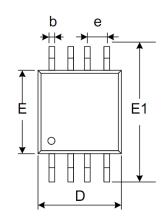
Figure 1. Load Circuit and Voltage Waveforms

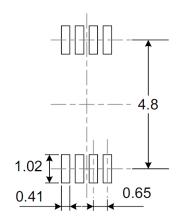
REV1.0 - MAY 2021 RELEASED - - 6 -



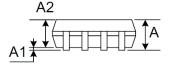
PACKAGE INFORMATION

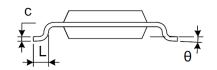
Dimension in MSOP8 (Unit: mm)





RECOMMENDED LAND PATTERN (Unit: mm)





Cumbal	Millim	eters	Inches		
Symbol	Min	Max	Min	Max	
Α	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	
С	0.090	0.230	0.004	0.009	
D	2.900	3.100	0.014	0.122	
е	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°	

REV1.0 - MAY 2021 RELEASED - - 7



IMPORTANT NOTICE

AiT Semiconductor Inc. (AiT) reserves the right to make changes to any its product, specifications, to discontinue any integrated circuit product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

AiT Semiconductor Inc.'s integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life support applications, devices or systems or other critical applications. Use of AiT products in such applications is understood to be fully at the risk of the customer. As used herein may involve potential risks of death, personal injury, or servere property, or environmental damage. In order to minimize risks associated with the customer's applications, the customer should provide adequate design and operating safeguards.

AiT Semiconductor Inc. assumes to no liability to customer product design or application support. AiT warrants the performance of its products of the specifications applicable at the time of sale.

REV1.0 - MAY 2021 RELEASED - -8 -