Low-Power 2-Input Positive-AND Gate With Open-Drain Outputs

Description

This single 2-input AND gate with open-drain output is designed for 0.8-V to 3.6-V VCC operation.

The FLG74AUP1G09 device performs the Boolean function Y=AxB in positive logic.

The CMOS device has high output drive while maintaining low static power dissipation over a broad VCC operating range.

The FLG74AUP1G09 is available in a variety of packages, including SOT23-5, SC70.

Features

- Inputs Accept Voltages 0.8V to 3.6 V
- Max Tpd of 7.5 ns at 3.3 V
- Low Static-Consumption, 0.5- μ A Max I_{CC}
- Low Noise Overshoot and Undershoot < 10% of V_{CC}
- Ioff Supports Live Insertion,Partial-Power-Down Mode, and Back-Drive Protection
- Input Hysteresis Allows Slow Input Transition and Better Switching Noise Immunity at Input(V_{hys}= 250mV Typical 3.3V)
- 3.6V I/O Tolerant to Support Mixed-Mode Signal Operation
- Suitable for Point-to-Point Applications
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 1000-V Charged-Device Model (C101)

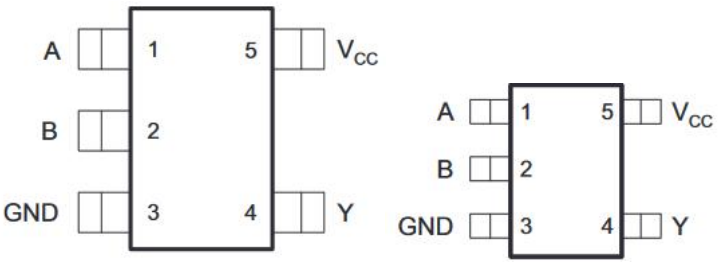
Applications

- AV Receiver
- Audio Dock: Portable
- Blu-ray Player and Home Theater
- Embedded PC
- MP3 Player/Recorder (Portable Audio)
- Personal Digital Assistant (PDA)
- Power: Telecom/Server AC/DC Supply: Single
- Controller: Analog and Digital
- Solid State Drive (SSD): Client and Enterprise
- TV: LCD/Digital and High-Definition (HDTV)
- Tablet: Enterprise
- Video Analytics: Server
- Wireless Headset, Keyboard, and Mouse

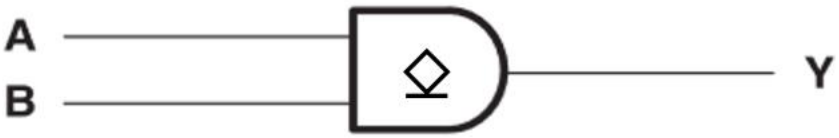
Order information

Mode	Package	Ordering Number	Packing Option
FLG74AUP1G09	SOT23-5	FLG74AUP1G09YSOT235G/TR	Tape and Reel,3000
	SC70	FLG74AUP1G09YSC07G/TR	Tape and Reel,3000

Pin Configuration



Simplified Schematic



Pin Assignment

Pin Name	Pin No.	Pin Function
A	1	Input
B	2	Input
GND	3	Ground
Y	4	Output
VCC	5	Power Pin

Absolute Maximum Ratings (Note1)

- V_{CC} ---------- -0. 5V to + 4.6V
- V_I ---------- - 0. 5V t o + 4. 6V
- V_O (Voltage range applied to any output in the high-impedance or power-off state) ---------- - 0. 3V to + 4. 6V
- V_O(Voltage range applied to any output in the high or slow state)---------- -0.3V to V_{CC}+0.3V
- Input clamp current ---------- -50mA
- Output clamp current ---------- -50mA
- Continuous output current ---------- ±20mA
- Storage Temperature ---------- -65℃ to 150℃

Recommended Operating Conditions

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Supply voltage	V_{CC}	Operating	0.8		3.6	V
Input voltage	V_I		0		3.6	V
Output voltage	V_O		0		VCC	V
High- level input voltage	V_{IH}	V_{CC} = 0.8V	V_{CC}			V
		V_{CC} = 1.1V to 1.95V	0.65×V_{CC}			
		V_{CC} = 2.3V to 2.7V	1.6			
		V_{CC} = 3V to 3.6V	2			
Low- level input voltage	V_{IL}	V_{CC} = 0.8V			0	V
		V_{CC} = 1.1V to 1.95V			0.35×V_{CC}	
		V_{CC} = 2.3V to 2.7V			0.7	
		V_{CC} = 3V to 3.6V			0.9	
Low- level output current	I_{OL}	V_{CC} = 0.8V			20	uA
		V_{CC} = 1.1V			1.1	mA
		V_{CC} = 1.4V			1.7	
		V_{CC} = 1.65V			1.9	
		V_{CC} = 2.3V			3.1	
		V_{CC} = 3V			4	
Input transition rise or fall rate	△T/△V	V_{CC} = 0.8V to 3.6V			200	ns/V
Operating temperature	T_A		-40		85	℃

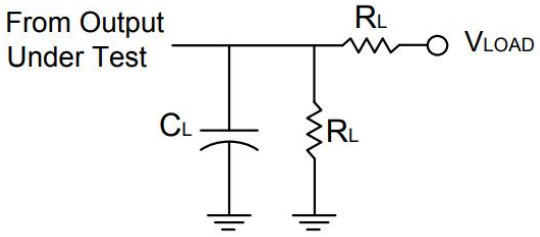
Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Low- level output voltage	V_{OL}	V_{CC} = 0.8~3.6V, I_{OL}= 20uA			0.1	V
		V_{CC} = 1.1V, I_{OL}= 1.1mA			0.3×V_{CC}	
		V_{CC} = 1.4V, I_{OL}= 1.7mA			0.31	
		V_{CC} = 1.65V, I_{OL}= 1.9mA			0.31	
		V_{CC} = 2.3V, I_{OL}= 2.3mA			0.31	
		V_{CC} = 2.3V, I_{OL}= 3.1mA			0.44	
		V_{CC} = 3V, I_{OL}= 2.7mA			0.31	
		V_{CC} = 3V, I_{OL}= 4mA			0.44	
Input leakage current	I_I	V_{IN}= 3.6V or GND, V_{CC}= 0~3.6V			0.1	uA
Power off leakage current	I_{OFF}	V_I or V_O=0V to 3.6V, V_{CC}=0V			0.2	uA
Supply current	I_{CC}	V_I= GND or (V_{CC} to 3.6V), I_{OUT}=0,V_{CC}=0.8~3.6V			0.5	uA
Additional supply current per input pin	$\triangle I_{CC}$	V_I= V_{CC}-0.6V, I_{OUT}=0			40	uA

Switching Characteristics

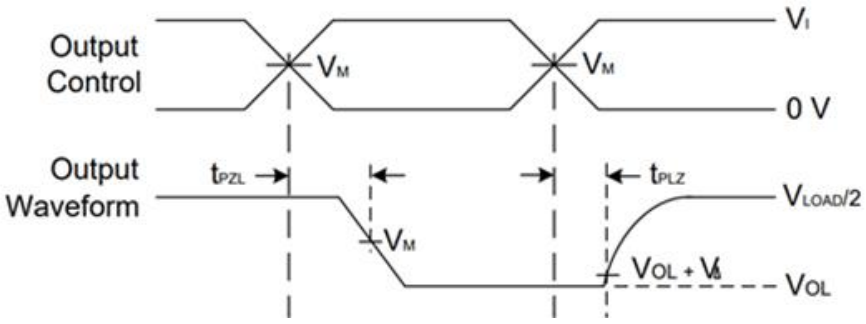
Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
Propagation delay from input(A or B) to output(Y)	T_{PD}	V_{CC} = 0.8V	C_L=15pF		19		ns
		V_{CC} = 1.2V±0.1V		2.6	7.6	14.2	
		V_{CC} = 1.5V±0.1V		2.1	6.5	12.1	
		V_{CC} = 1.8V±0.15V		1.9	5.5	9.6	
		V_{CC} = 2.5V±0.2V		1.6	4.6	8.1	
		V_{CC} = 3.3V±0.3V		1.6	4.1	7.5	

Parameter Measurement Information



TEST	Condition
t_{PLZ}	V_{LOAD}
t_{PZL}	V_{LOAD}

V_{CC}	INPUTS		V_M	C_L	R_L
	V_I	t_r/t_f			
0.8V	V_{CC}	≦2ns	$V_{CC}/2$	15pF	5MΩ
1.2V ± 0.1V	V_{CC}	≦2ns	$V_{CC}/2$	15pF	5MΩ
1.5V ± 0.1V	V_{CC}	≦2ns	$V_{CC}/2$	15pF	5MΩ
1.8V ± 0.15V	V_{CC}	≦2ns	$V_{CC}/2$	15pF	5MΩ
2.5V ± 0.2V	3V	≦2.5ns	1.5V	15pF	5MΩ
3.3V ± 0.3V	V_{CC}	≦2.5ns	$V_{CC}/2$	15pF	5MΩ



Voltage Waveform Enable and DisableTimes

Low- and High-Level Enabling

Notes: A. C_L includes probe and jig capacitance

B. All pulses and supplied at pulse repetition rate ≦ 10MHz

C. The Inputs are measured one at a time with one transition per measurement

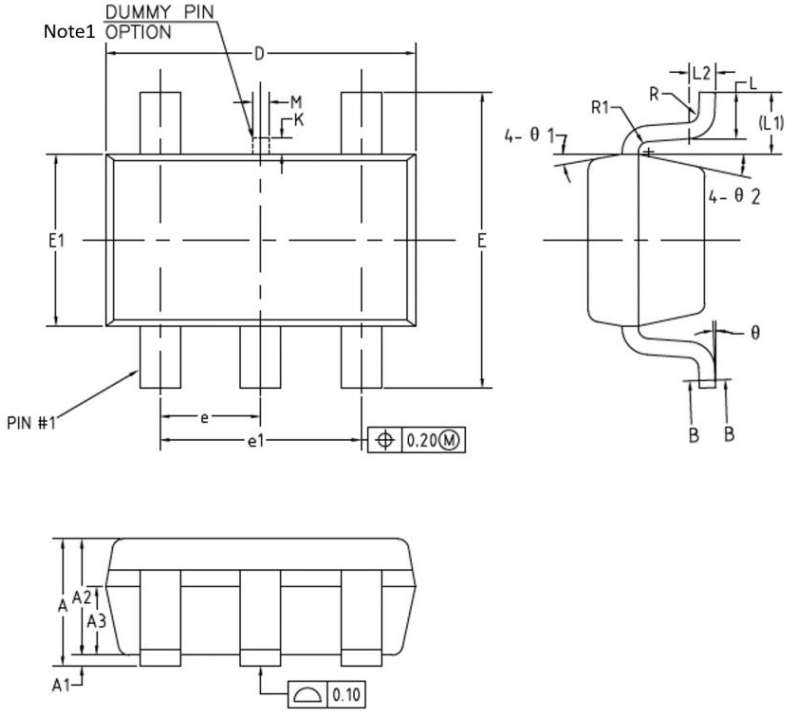
D. For the open drain device t_{PLZ} and t_{PZL} are the same as t_{PD}

E. t_{PZL} is measured at V_M

F. t_{PLZ} is measured at V_{OL} + V△

Package Information

(1) Package Type: SOT23-5

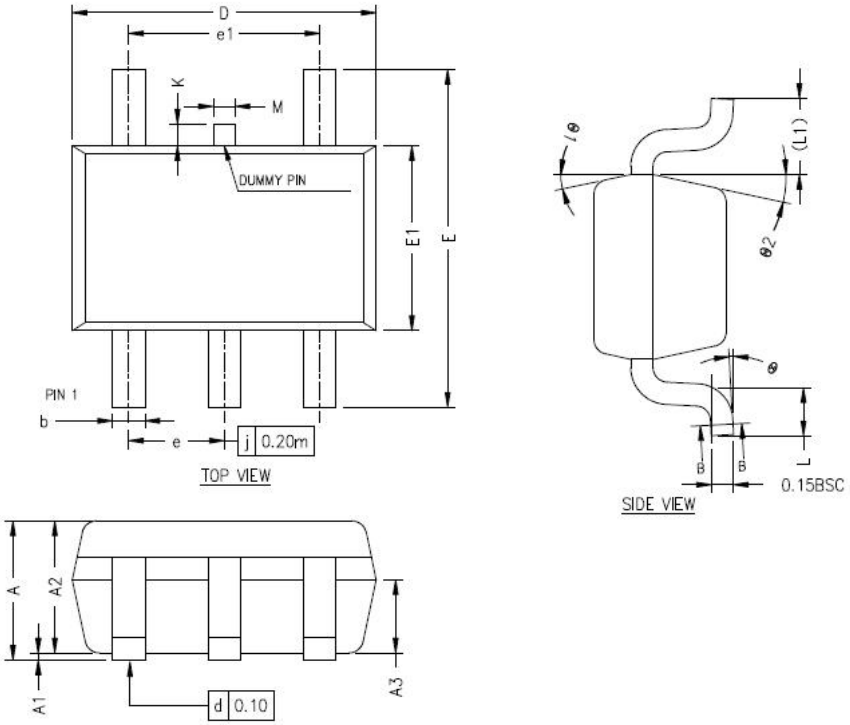


COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

	SYMBOL	MIN	NOM	MAX
	A	–	–	1.25
	A1	0	–	0.15
	A2	1.00	1.10	1.20
	A3	0.60	0.65	0.70
4	b	0.34	–	0.45
4	b1	0.34	0.38	0.41
4	c	0.12	–	0.20
4	c1	0.12	0.15	0.16
	D	2.826	2.926	3.026
	E	2.60	2.80	3.00
3	E1	1.526	1.626	1.700
	e	0.90	0.95	1.00
	e1	1.80	1.90	2.00
2	K	0	–	0.20
	L	0.30	0.40	0.60
	L1		0.59REF	
	L2		0.25BSC	
2	M	0.10	0.15	0.20
	R	0.05	–	0.20
	R1	0.05	–	0.20
	θ	0°	–	8°
	θ 1	8°	10°	12°
	θ 2	10°	12°	14°

Notes: 1. Dummy pin may differ or may not be present.

(2) Package Type: SC70



COMMON DIMENSIONS

(UNITS OF MEASURE=MILLIMETER)

	SYMBOL	MIN	NOM	MAX
	A	0.80	–	1.10
	A1	0	–	0.10
	A2	0.80	0.90	1.00
	A3	0.40	0.50	0.60
	b	0.17	–	0.30
	b1	0.17	0.22	0.25
3	c	0.12	–	0.20
3	c1	0.12	0.15	0.16
	D	2.02	2.07	2.12
	E	2.20	2.30	2.40
	E1	1.21	1.26	1.31
	e	0.60	0.65	0.70
	e1	1.20	1.30	1.40
	L	0.26	0.33	0.46
	L1	0.52REF		
2	M	0.10	0.15	0.20
2	K	0	–	0.20
	θ	0°	–	8°
	θ1	10°	12°	14°
	θ2	10°	12°	14°

Important Notice And Disclaimer

- We reserves the right to change the instruction manual without prior notice.
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