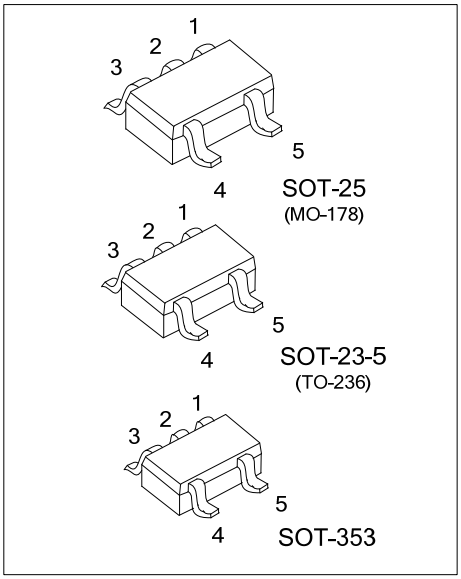
U74LVC1G08

CMOS IC

2-INPUT AND GATE



■ DESCRIPTION

The **U74LVC1G08** is a 2-input AND gate which provides the Function Y=A*B.

This device has power-down protective circuit to prevent device form destruction when it is powered down.

■ FEATURES

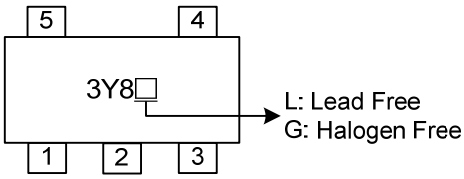
* Inputs Accept Voltage up to 5.5V
* Low Power Current: I_{CC}=10μA(Max)
* ±24mA Output Drive(V_{CC}=3.3V)
* Power Down Protection

■ ORDERING INFORMATION

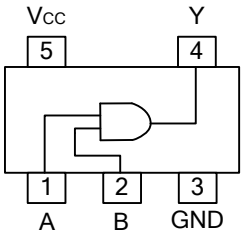
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC1G08L-AE5-R	U74LVC1G08G-AE5-R	SOT-23-5	Tape Reel
U74LVC1G08L-AF5-R	U74LVC1G08G-AF5-R	SOT-25	Tape Reel
U74LVC1G08L-AL5-R	U74LVC1G08G-AL5-R	SOT-353	Tape Reel

U74LVC1G08L-AF5-R (1)Packing Type (2)Package Type (3)Lead Free	(1) R: Tape Reel (2) AE5: SOT-23-5, AF5: SOT-25, AL5: SOT-353 (3) G: Halogen Free, L: Lead Free

■ MARKING



■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

INPUT		OUTPUT
A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

■ LOGIC DIAGRAM (positive logic)

IEC logic symbol

■ ABSOLUTE MAXIMUM RATING (unless otherwise specified)(Note 1)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	-0.5~6.5	V
Input Voltage		V_{IN}	-0.5~6.5	V
Output Voltage	active mode	V_{OUT}	-0.5~V_{CC}+0.5	V
	power-down mode	V_{OUT}	-0.5~6.5	V
Input Clamp Current (V_{IN}<0)		I_{IK}	-50	mA
Output Clamp Current (V_{OUT}<0)		I_{OK}	-50	mA
Output Current		I_{OUT}	±50	mA
V_{CC} or GND Current		I_{CC}	±100	mA
Storage Temperature		T_{STG}	-65 ~ +150	°C

Note 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
2. 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 CONDITIONS

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	Operating	V_{CC}	1.65		5.5	V
	Data retention only		1.5			V
Input Voltage		V_{IN}	0		5.5	V
Output Voltage		V_{OUT}	0		V_{CC}	V
Operating Temperature		T_A	-40		85	°C

■ STATIC CHARACTERISTICS (T_A=25℃)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	V_{CC} =1.65V~1.95V	0.65*V_{CC}			V
		V_{CC} =2.3V~2.7V	1.7			
		V_{CC} =3.0V~3.6V	2			
		V_{CC} =4.5V~5.5V	0.7*V_{CC}			
Low-Level Input Voltage	V_{IL}	V_{CC} =1.65V~1.95V			0.35*V_{CC}	V
		V_{CC} =2.3V~2.7V			0.7	
		V_{CC} =3.0V~3.6V			0.8	
		V_{CC} =4.5V~5.5V			0.3*V_{CC}	
High-Level Output Voltage	V_{OH}	V_{CC} =1.65V ~ 5.5V, I_{OH}=-100μA	V_{CC}-0.1			V
		V_{CC} =1.65V, I_{OH}=-4mA	1.2			
		V_{CC} =2.3V, I_{OH}=-8mA	1.9			
		V_{CC} =3.0V, I_{OH}=-16mA	2.4			
		V_{CC} =3.0V, I_{OH}=-24mA	2.3			
		V_{CC} =4.5V, I_{OH}=-32mA	3.8			
Low-Level Output Voltage	V_{OL}	V_{CC} =1.65V ~ 5.5V, I_{OL}=100μA			0.1	V
		V_{CC} =1.65V, I_{OL}=4mA			0.45	
		V_{CC} =2.3V, I_{OL}=8mA			0.3	
		V_{CC} =3.0V, I_{OL}=16mA			0.4	
		V_{CC} =3.0V, I_{OL}=24mA			0.55	
		V_{CC} =4.5V, I_{OL}=32mA			0.55	
Input Leakage Current	$I_{I(LEAK)}$	V_{CC} =0V ~ 5.5V, V_{IN}=5.5V or GND			±5	μA
Power OFF Leakage Current	I_{OFF}	V_{CC} =0V, V_{IN} or V_{OUT}=5.5V			±10	μA
Quiescent Supply Current	I_Q	V_{CC} =1.65V~5.5V, V_{IN}=5.5V or GND I_{OUT}=0			10	μA
Additional Quiescent Supply Current	ΔI_Q	V_{CC}=3V~5.5V,One input at V_{CC}-0.6V, other inputs at V_{CC} or GND			500	μA
Input Capacitance	C_{IN}	V_{CC} =3.3V, V_{IN}=V_{CC} or GND		4		pF

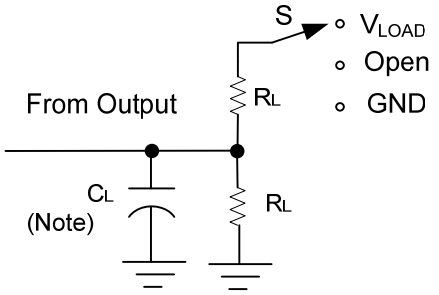
■ DYNAMIC CHARACTERISTICS (T_A=25℃)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t_{PLH}/t_{PHL}	V_{CC}=1.8V±0.15V, C_L=15pF	1.5		7.2	ns
		V_{CC}=2.5V±0.2V, C_L=15pF	0.7		4.4	ns
		V_{CC}=3.3V±0.3V, C_L=15pF	0.8		3.6	ns
		V_{CC}=5V±0.5V, C_L=15pF	0.8		3.4	ns
		V_{CC}=1.8V±0.15V, C_L=30 or 50pF	2.4		8	ns
		V_{CC}=2.5V±0.2V, C_L=30 or 50pF	1.1		5.5	ns
		V_{CC}=3.3V±0.3V, C_L=30 or 50pF	1		4.5	ns
		V_{CC}=5V±0.5V, C_L=30 or 50pF	1		4	ns

■ OPERATING CHARACTERISTICS (T_A=25℃)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	V_{CC}=1.8V, f=10MHz		21		pF
		V_{CC}=2.5V, f=10MHz		24		pF
		V_{CC}=3.3V, f=10MHz		26		pF
		V_{CC}=5V, f=10MHz		31		pF

■ TEST CIRCUIT AND WAVEFORMS



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

Note: C_L includes probe and jig capacitance.

V_{CC}	V_{IN}	t_R/t_F	V_M	V_{LOAD}	C_L	R_L	$V_\triangle$
1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	2* V_{CC}	15pF	1MΩ	0.15V
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	2* V_{CC}	15pF	1MΩ	0.15V
3.3V±0.3V	3 V	≤2.5ns	1.5V	6V	15pF	1MΩ	0.3V
5V±0.5V	V_{CC}	≤2.5ns	$V_{CC}/2$	2* V_{CC}	15pF	1MΩ	0.3V
1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	2* V_{CC}	30pF	1KΩ	0.15V
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	2* V_{CC}	30pF	500Ω	0.15V
3.3V±0.3V	3 V	≤2.5ns	1.5V	6V	50pF	500Ω	0.3V
5V±0.5V	V_{CC}	≤2.5ns	$V_{CC}/2$	2* V_{CC}	50pF	500Ω	0.3V