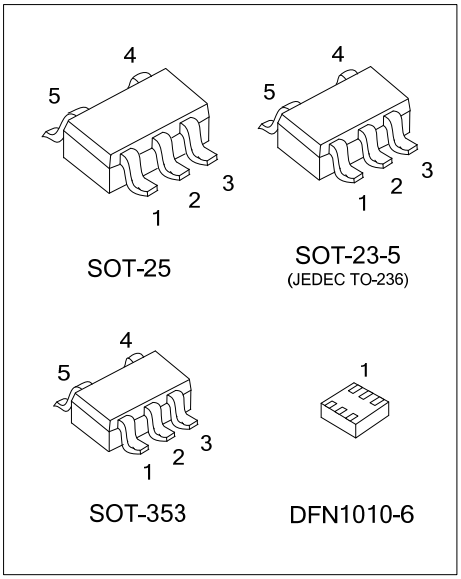
U74LVC1G08

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

* Operation Voltage Range: 1.6V ~ 5.5V
* Low Power Current: I_{CC}=10μA (Max.)
* ±24mA Output Drive (V_{CC}=3.0V)
* Power Down Protection

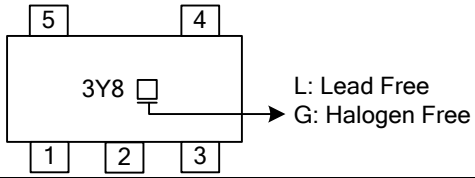
■ ORDERING INFORMATION

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-K06-1010-R	U74LVC1G08G-K06-1010-R	DFN1010-6	Tape Reel

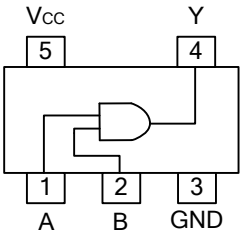
U74LVC1G08G-AE5-R
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) AE5: SOT-23-5, AF5: SOT-25, AL5: SOT-353
K06-1010: DFN1010-6
(3) G: Halogen Free and Lead Free, L: Lead Free

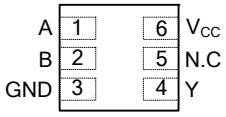
■ MARKING

SOT-23-5 / SOT-25 / SOT-353	DFN1010-6
	

■ PIN CONFIGURATION



SOT-23-5 / SOT-25 / SOT-353

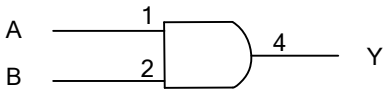


DFN-6(1.0×1.0)
(TOP VIEW)

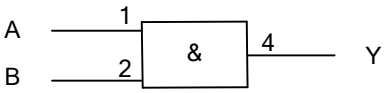
■ FUNCTION TABLE (each gate)

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

■ LOGIC DIAGRAM (positive logic)



Logic symbol



IEC logic symbol

■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified) (Note 2)

PARAMETER	SYMBOL	TEST CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5~6.5	V
Input Voltage	V_{IN}		-0.5~6.5	V
Output Voltage	V_{OUT}	Output in the high or low state	-0.5~V_{CC}+0.5	V
		Output in the power-off state	-0.5~6.5	V
Continuous V_{CC} or GND Current	I_{CC}		±100	mA
Continuous Output Current	I_{OUT}		±50	mA
Input Clamp Current	I_{IK}	V_{IN}<0	-50	mA
Output Clamp Current	I_{OK}	V_{OUT}<0	-50	mA
Storage Temperature Range	T_{STG}		-65 ~+150	°C

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

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23-5	θ_{JA}	280	°C/W
	SOT-25		230	°C/W
	SOT-353		350	°C/W
	DFN1010-6		250	°C/W

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	1.65		5.5	V
		Data retention only	1.5			V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}	High or low state	0		V_{CC}	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	V_{CC}=1.8V±0.15V V_{CC}=2.5V±0.2V			20	ns/V
		V_{CC}=3.3V±0.3V			10	ns/V
		V_{CC}=5V±0.5V			5	ns/V
Operating Temperature	T_A		-40		125	°C

■ STATIC CHARACTERISTICS (T_A=25°C, unless otherwise specified)

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			
			I_{OH}=-24mA	2.3			
		V_{CC} =4.5V, I_{OH}=-32mA		3.8			

■ STATIC CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
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	
			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

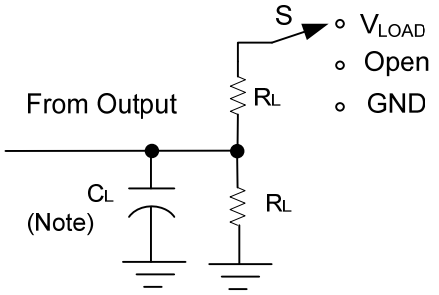
■ DYNAMIC CHARACTERISTICS (T_A=25°C, unless otherwise specified)

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

■ OPERATING CHARACTERISTICS (f=10MHz, T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	V_{CC}=1.8V		21		pF
		V_{CC}=2.5V		24		pF
		V_{CC}=3.3V		26		pF
		V_{CC}=5V		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_Δ
1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	$2\times V_{CC}$	15pF	1MΩ	0.15V
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	$2\times V_{CC}$	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	$V_{CC}/2$	$2\times V_{CC}$	15pF	1MΩ	0.3V
1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	$2V_{CC}$	30pF	1KΩ	0.15V
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	$2\times V_{CC}$	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	$V_{CC}/2$	$2\times V_{CC}$	50pF	500Ω	0.3V