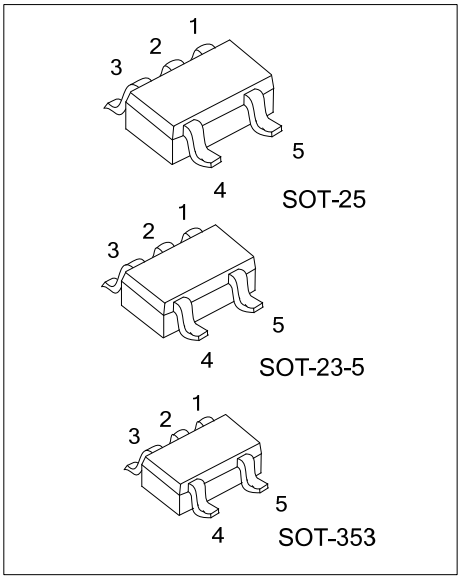
U74AHC1G09

CMOS IC

2-INPUT AND GATE WITH OPEN DRAIN OUTPUT



■ DESCRIPTION

The U74AHC1G09 is a 2-input AND gate with open-drain output. And it provides the function Y=A*B

■ FEATURES

* Operation Voltage Range: 2~5.5V
* Low Quiescent Current: I_{CC}=1μA(Max)
* High Speed: t_{PD}=6ns@5V(Max)

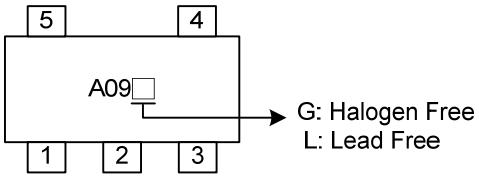
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC1G09L-AE5-R	U74AHC1G09G-AE5-R	SOT-23-5	Tape Reel
U74AHC1G09L-AF5-R	U74AHC1G09G-AF5-R	SOT-25	Tape Reel
U74AHC1G09L-AL5-R	U74AHC1G09G-AL5-R	SOT-353	Tape Reel

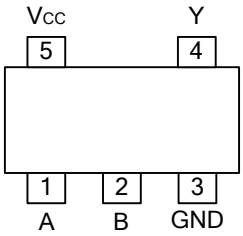
U74AHC1G09L-AE5-R
(1)Packing Type
(2)Package Type
(3)Lead Free

(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

INPUT		OUTPUT
A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H(Z) (Note)

Note: High impedance output state. Requires a pull-up resistor to get a high.

■ LOGIC DIAGRAM (positive logic)

IEC logic symbol

■ ABSOLUTE MAXIMUM RATING (unless otherwise specified) (Note 1 Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5~7	V
Input Voltage	V_{IN}	-0.5~7	V
Output Voltage	V_{OUT}	-0.5~V_{CC}+0.5	V
Input Clamp Current	I_{IK}	-20	mA
Output Clamp Current	I_{OK}	±20	mA
Output Current	I_{OUT}	±25	mA
V_{CC} or GND Current	I_{CC}	±50	mA
Storage Temperature	T_{STG}	-65 ~ +150	℃

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 COMDITIONS

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	2 ~ 5.5	V
Input Voltage		V_{IN}	0 ~ 5.5	V
Output Voltage		V_{OUT}	0 ~ V_{CC}	V
Input Transition Rise or Fall Rate	V_{CC}=3.3+0.3V	Δt/Δv	100	ns/V
	V_{CC}=5.0+0.5V		20	
Operating Temperature		T_A	-40 ~ 125	℃

■ ELECTRICAL CHARACTERISTICS(T_A=25℃)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	V_{CC}=2.0V		1.5			V
		V_{CC}=3.0V		2.1			
		V_{CC}=5.5V		3.85			
Low-Level Input Voltage	V_{IL}	V_{CC}=2.0V				0.5	V
		V_{CC}=3.0V				0.9	
		V_{CC}=5.5V				1.65	
Low-Level Output Voltage	V_{OL}	I_{OL}=50μA	V_{CC}=2.0V			0.1	V
			V_{CC}=3.0V			0.1	
			V_{CC}=4.5V			0.1	
		I_{OH}=4mA, V_{CC}=3.0V				0.36	
		I_{OH}=8mA, V_{CC}=4.5V				0.36	
Input Leakage Current	$I_{I(LEAK)}$	V_{IN}=V_{CC} or GND, V_{CC}=0V to 5.5V				±0.1	μA
Quiescent Supply Current	I_Q	V_{IN}=V_{CC} or GND, I_{OUT}=0, V_{CC}=5.5V				1	μA
Input Capacitance	C_{IN}	V_{IN}=V_{CC} or GND, V_{CC}=5.0V			4	10	pF

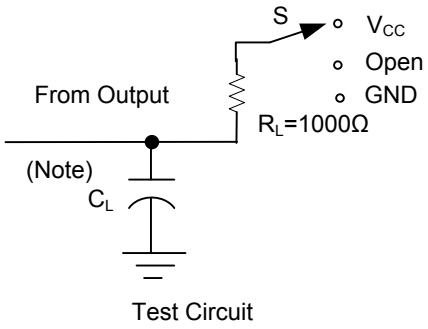
■ SWITCHING CHARACTERISTICS (Input: t_R, t_F≤3ns; PRR≤1MHz)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Propagation delay from input (A or B)to output(Y)	t_{PZL}	V_{CC} =3.3±0.3 V	C_L=15 pF		3.6	7.0	ns
			C_L=50 pF		6.5	11.0	
	t_{PLZ}		C_L=15 pF		3.6	7.0	
			C_L=50 pF		6.5	11.0	
	t_{PZL}	V_{CC} =5±0.5 V	C_L=15 pF		2.5	5.0	ns
			C_L=50 pF		4.6	7.5	
	t_{PLZ}		C_L=15 pF		2.5	5.0	
			C_L=50 pF		4.6	7.5	

■ OPERATING CHARACTERISTICS(T_A=25℃)

PARAMETER	SYMBOL	TEST CONDITIONS	RATINGS	UNIT
Power Dissipation Capacitance	C_{PD}	No load, f=1MHz, V_{CC}=5V	5	pF

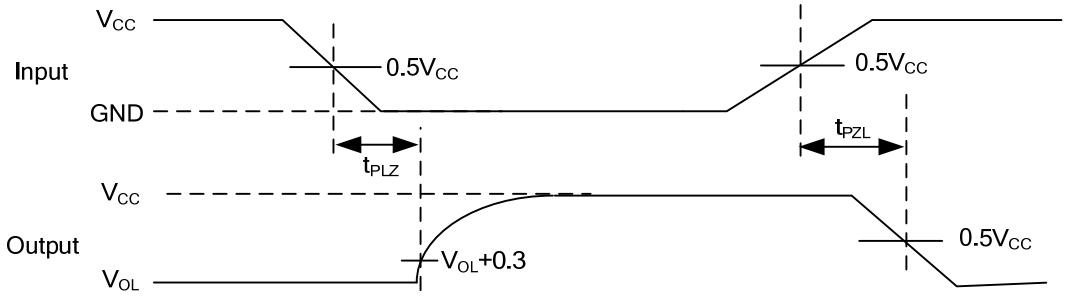
■ TEST CIRCUIT AND WAVEFORMS



Test Circuit

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

Note: C_L includes probe and jig capacitance.



Propagation Delay Times