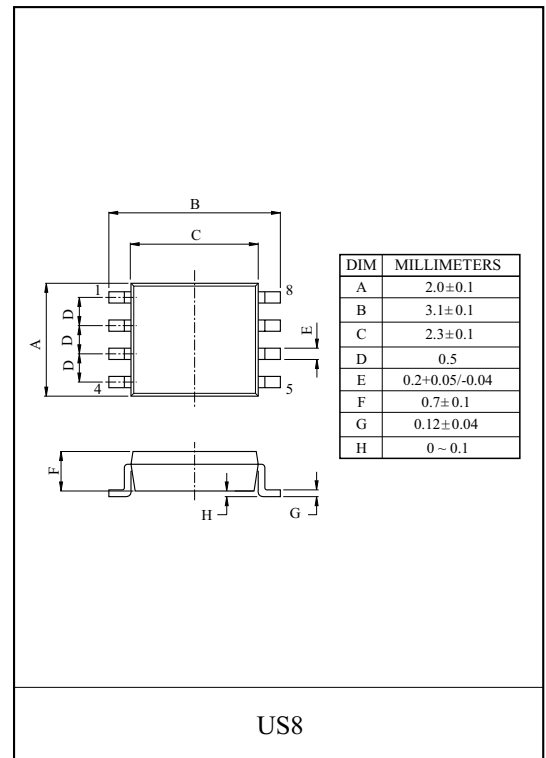
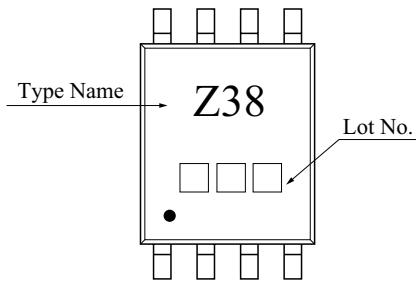


DUAL 2 INPUT NAND GATE (OPEN DRAIN)

FEATURES

- High output drive : 24mA(min.) @ $V_{CC}=3V$.
- Super high speed operation : tp_{ZL} 2.2ns(typ.) @ $V_{CC}=5V$, 50pF.
- Operation voltage range : $V_{CC(opr)}=1.65\sim 5.5V$.
- Latch-up performance : $\pm 500mA$ or more
- ESD performance : $\pm 200V$ or more (EIAJ)
 $\pm 2000V$ or more (MIL)
- Power down protection is provided on all inputs and outputs.

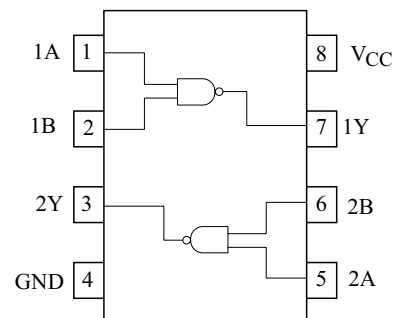
MARKING



MAXIMUM RATINGS (Ta=25 °C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Power Supply Voltage	V_{CC}	-0.5~6	V
DC Input Voltage	V_{IN}	-0.5~6	V
DC Output Voltage	V_{OUT}	-0.5~6	V
Input Diode Current	I_{IK}	-20	mA
Output Diode Current	I_{OK}	-20	mA
DC Output Current	I_{OUT}	50	mA
DC V_{CC} /ground Current	I_{CC}	±50	mA
Power Dissipation	P_D	200	mW
Storage Temperature Range	T_{stg}	-65 ~ 150	°C
Lead Temperature (10s)	T_L	260	°C

PIN CONNECTION(TOP VIEW)



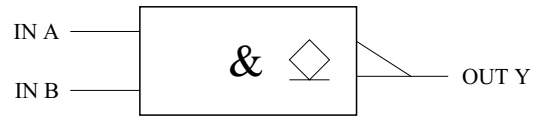
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Truth Table

A	B	Y
L	L	H*
L	H	H*
H	L	H*
H	H	L

* : High impedance

Logic Diagram



Recommended Operating Conditions

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	1.65~5.5	V
		1.5~5.5 (Note1)	
Input Voltage	V_{IN}	0~5.5	V
Output Voltage	V_{OUT}	0~5.5 (Note2)	V
		0~ V_{CC} (Note3)	
Operating Temperature	T_{opr}	-40~85	°C
Input Rise and Fall Time	d_i/d_v	0~20 ($V_{CC}=1.8V \pm 0.15V$, 2.5V $\pm 0.2V$)	ns/V
		0~10 ($V_{CC}=3.3V \pm 0.3V$)	
		0~5 ($V_{CC}=5.5V \pm 0.5V$)5	

Note1 : Data retention only, Note2 : $V_{CC}=0V$, Note3 : Low state

ELECTRICAL CHARACTERISTICS

DC Characteristics

CHARACTERISTIC	SYMBOL	TEST CONDITION	$T_a=25^\circ C$			$T_a=-40\sim 85^\circ C$		UNIT		
			$V_{CC}(V)$	MIN.	TYP.	MAX.	MIN.		MAX.	
Input Voltage	High Level	-	1.65~1.95	$0.75 \times V_{CC}$	-	-	$0.75 \times V_{CC}$	V		
			2.3~5.5	$0.7 \times V_{CC}$	-	-	$0.7 \times V_{CC}$			
	Low Level	-	1.65~1.95	-	-	$0.25 \times V_{CC}$	$0.25 \times V_{CC}$			
			2.3~5.5	-	-	$0.3 \times V_{CC}$	$0.3 \times V_{CC}$			
Output Voltage	Low Level	$V_{IN}=V_{IL}$	$I_{OH}=100\mu A$	1.65	-	0	0.1	-	0.1	V
				2.3	-	0	0.1	-	0.1	
				3.0	-	0	0.1	-	0.1	
				4.5	-	0	0.1	-	0.1	
			$I_{OH}=4mA$	1.65	-	0.08	0.24	-	0.24	
			$I_{OH}=8mA$	2.3	-	0.1	0.3	-	0.3	
			$I_{OH}=16mA$	3.0	-	0.15	0.4	-	0.4	
			$I_{OH}=24mA$	3.0	-	0.22	0.55	-	0.55	
$I_{OH}=32mA$	4.5	-	0.22	0.55	-	0.55				
Input Leakage Current	I_{IN}	$V_{IN}=5.5V$ or GND	0~5.5	-	-	± 1	-	± 10	μA	
Off-state Current	I_{OZ}	$V_{IN}=V_{IL}$, $V_{OUT}=V_{CC}$ or GND	5.5	-	-	± 5	-	± 10	μA	
Power Off Leakage Current	I_{OFF}	V_{IN} or $V_{OUT}=5.5V$	0.0	-	-	1	-	10	μA	
Quiescent Supply Current	I_{CC}	$V_{IN}=5.5V$ or GND	1.65~5.5	-	-	1	-	10	μA	

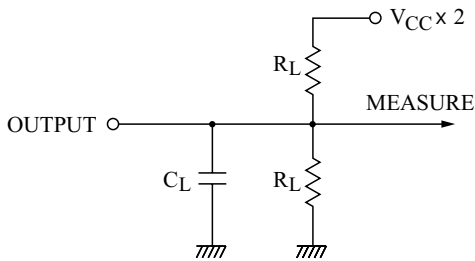
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AC Characteristics (unless otherwise specified, Input : $t_r=t_f=3\text{ns}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	Ta=25 °C			Ta=-40~85 °C		UNIT	
			V _{CC} (V)	MIN.	TYP.	MAX.	MIN.		MAX.
Propagation delay time	t _{pZL}	C _L =50pF, R _L =500 Ω	1.8 ±0.15	2.0	5.2	9.2	2.0	9.6	ns
			2.5 ±0.2	1.5	3.5	5.7	1.5	6.1	
			3.3 ±0.3	1.0	2.8	4.1	1.0	4.5	
			5.0 ±0.5	0.5	2.2	3.4	0.5	3.6	
	t _{pLZ}	C _L =50pF, R _L =500 Ω	1.8 ±0.15	2.0	4.6	9.2	2.0	9.6	ns
			2.5 ±0.2	1.5	3.2	5.7	1.5	6.1	
			3.3 ±0.3	1.0	2.4	4.1	1.0	4.5	
			5.0 ±0.5	0.5	1.6	3.4	0.5	3.6	
Input Capacitance	C _{IN}	-	0~5.5	-	3.0	-	-	-	pF
Output Capacitance	C _{OUT}	-	0~5.5	-	2.5	-	-	-	pF
Power Dissipation Capacitance	C _{PD}	(Note)	3.3	-	6.9	-	-	-	pF
			5.5	-	13	-	-	-	

Note : C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation : $I_{CC(opt)}=C_{PD} \cdot V_{CC} \cdot f_{IN}+I_{CC}/2$

TEST CIRCUIT



AC Waveform

