

# HD74HC08

## Quad. 2-input AND Gates

REJ03D0536-0200  
 (Previous ADE-205-408)  
 Rev.2.00  
 Oct 06, 2005

### Features

- High Speed Operation:  $t_{pd} = 9 \text{ ns typ}$  ( $C_L = 50 \text{ pF}$ )
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage:  $V_{CC} = 2 \text{ to } 6 \text{ V}$
- Low Input Current:  $1 \mu\text{A max}$
- Low Quiescent Supply Current:  $I_{CC} \text{ (static)} = 1 \mu\text{A max}$  ( $T_a = 25^\circ\text{C}$ )
- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74HC08P	DILP-14 pin	PRDP0014AB-B (DP-14AV)	P	—
HD74HC08FPEL	SOP-14 pin (JEITA)	PRSP0014DF-B (FP-14DAV)	FP	EL (2,000 pcs/reel)
HD74HC08RPEL	SOP-14 pin (JEDEC)	PRSP0014DE-A (FP-14DNV)	RP	EL (2,500 pcs/reel)
HD74HC08TELL	TSSOP-14 pin	PTSP0014JA-B (TTP-14DV)	T	ELL (2,000 pcs/reel)

Note: Please consult the sales office for the above package availability.

### Function Table

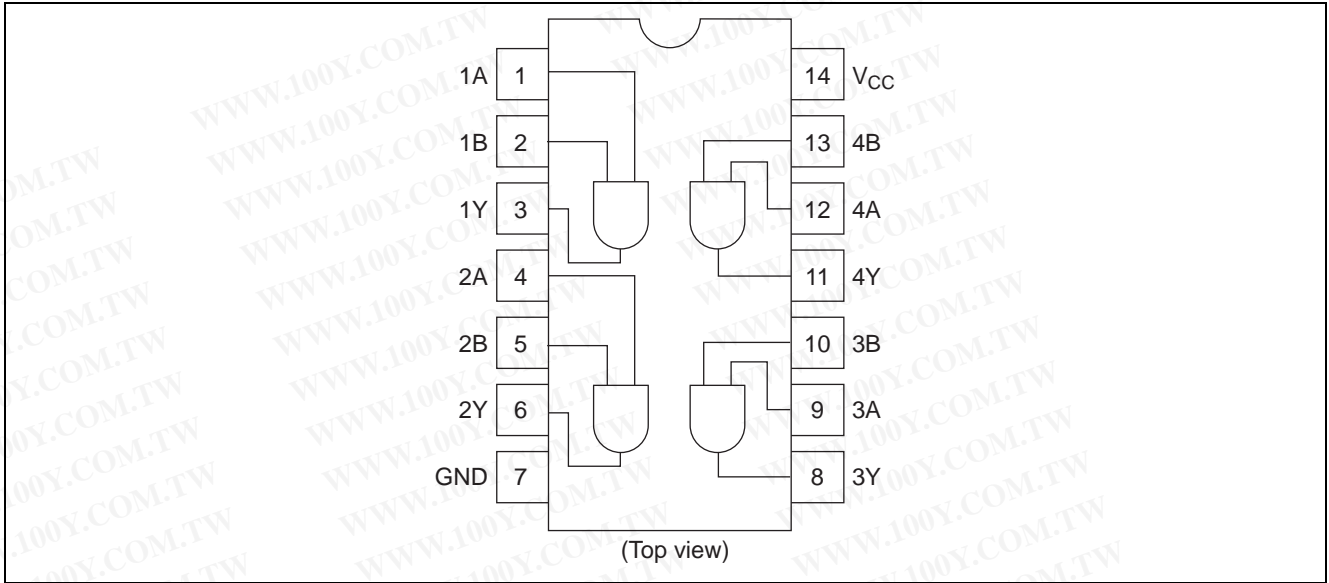
Inputs		Output
A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

H: High level

L: Low level

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Pin Arrangement



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage range	$V_{CC}$	-0.5 to 7.0	V
Input / Output voltage	$V_{in}, V_{out}$	-0.5 to $V_{CC} + 0.5$	V
Input / Output diode current	$I_{IK}, I_{OK}$	$\pm 20$	mA
Output current	$I_o$	$\pm 25$	mA
$V_{CC}, GND$ current	$I_{CC}$ or $I_{GND}$	$\pm 50$	mA
Power dissipation	$P_T$	500	mW
Storage temperature	$T_{stg}$	-65 to +150	$^{\circ}C$

Note: The absolute maximum ratings are values, which must not individually be exceeded, and furthermore, no two of which may be realized at the same time.

Recommended Operating Conditions

Item	Symbol	Ratings	Unit	Conditions
Supply voltage	$V_{CC}$	2 to 6	V	
Input / Output voltage	$V_{IN}, V_{OUT}$	0 to $V_{CC}$	V	
Operating temperature	$T_a$	-40 to 85	$^{\circ}C$	
Input rise / fall time <sup>*1</sup>	$t_r, t_f$	0 to 1000	ns	$V_{CC} = 2.0 V$
		0 to 500		$V_{CC} = 4.5 V$
		0 to 400		$V_{CC} = 6.0 V$

Note: 1. This item guarantees maximum limit when one input switches.  
Waveform: Refer to test circuit of switching characteristics.

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## Electrical Characteristics

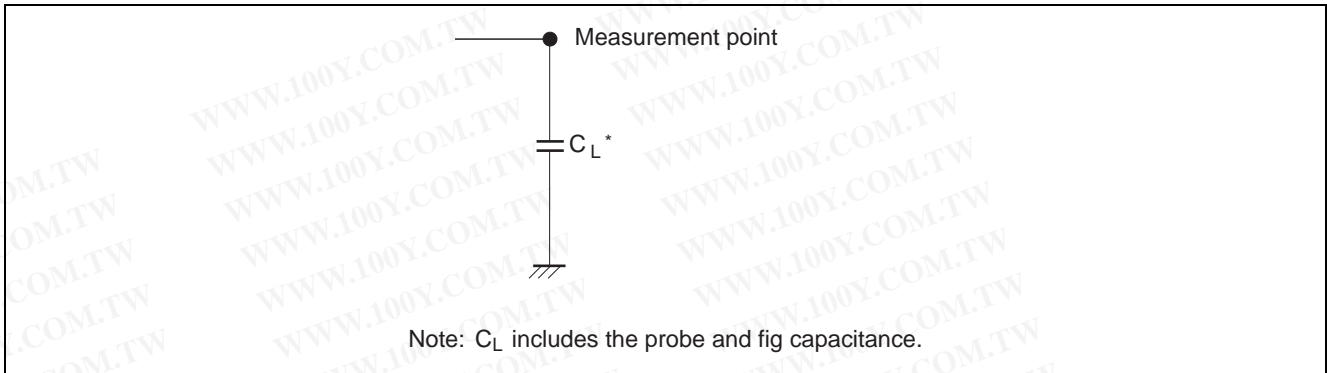
Item	Symbol	V <sub>CC</sub> (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions				
			Min	Typ	Max	Min	Max						
Input voltage	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V					
		4.5	3.15	—	—	3.15	—						
		6.0	4.2	—	—	4.2	—						
	V <sub>IL</sub>	2.0	—	—	0.5	—	0.5				V		
		4.5	—	—	1.35	—	1.35						
		6.0	—	—	1.8	—	1.8						
Output voltage	V <sub>OH</sub>	2.0	1.9	2.0	—	1.9	—	V	V <sub>in</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OH</sub> = -20 μA			
		4.5	4.4	4.5	—	4.4	—			I <sub>OH</sub> = -4 mA			
		6.0	5.9	6.0	—	5.9	—			I <sub>OH</sub> = -5.2 mA			
		4.5	4.18	—	—	4.13	—						
		6.0	5.68	—	—	5.63	—						
	V <sub>OL</sub>	2.0	—	0.0	0.1	—	0.1		V	V <sub>in</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OL</sub> = 20 μA		
		4.5	—	0.0	0.1	—	0.1						
		6.0	—	0.0	0.1	—	0.1						
		4.5	—	—	0.26	—	0.33				I <sub>OL</sub> = 4 mA		
		6.0	—	—	0.26	—	0.33				I <sub>OL</sub> = 5.2 mA		
Input current	I <sub>in</sub>	6.0	—	—	±0.1	—	±1.0	μA		V <sub>in</sub> = V <sub>CC</sub> or GND			
Quiescent supply current	I <sub>CC</sub>	6.0	—	—	1.0	—	10	μA		V <sub>in</sub> = V <sub>CC</sub> or GND, I <sub>out</sub> = 0 μA			

Switching Characteristics (C<sub>L</sub> = 50 pF, Input t<sub>r</sub> = t<sub>f</sub> = 6 ns)

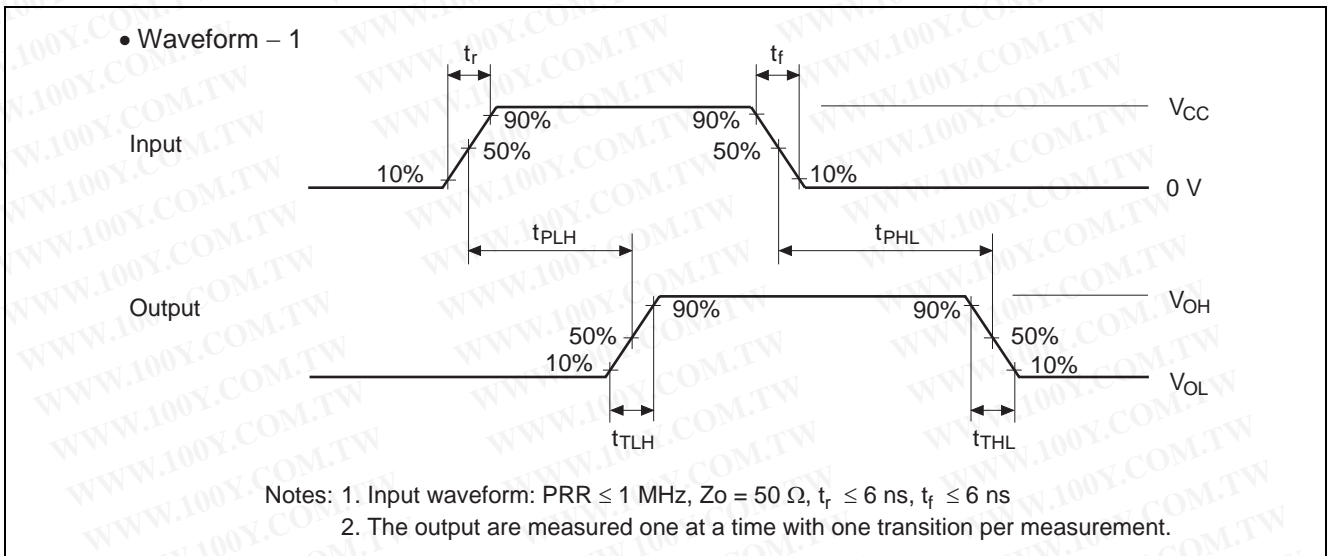
Item	Symbol	V <sub>CC</sub> (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions				
			Min	Typ	Max	Min	Max						
Propagation delay time	t <sub>PLH</sub>	2.0	—	—	90	—	115	ns					
		4.5	—	10	18	—	23						
		6.0	—	—	15	—	20						
	t <sub>PHL</sub>	2.0	—	—	90	—	115				ns		
		4.5	—	6	18	—	23						
		6.0	—	—	15	—	20						
Output rise time	t <sub>TLH</sub>	2.0	—	—	75	—	95	ns					
		4.5	—	5	15	—	19						
		6.0	—	—	13	—	16						
Output fall time	t <sub>THL</sub>	2.0	—	—	75	—	95				ns		
		4.5	—	5	15	—	19						
		6.0	—	—	13	—	16						
Input capacitance	C <sub>in</sub>	—	—	5	10	—	10	pF					

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Test Circuit

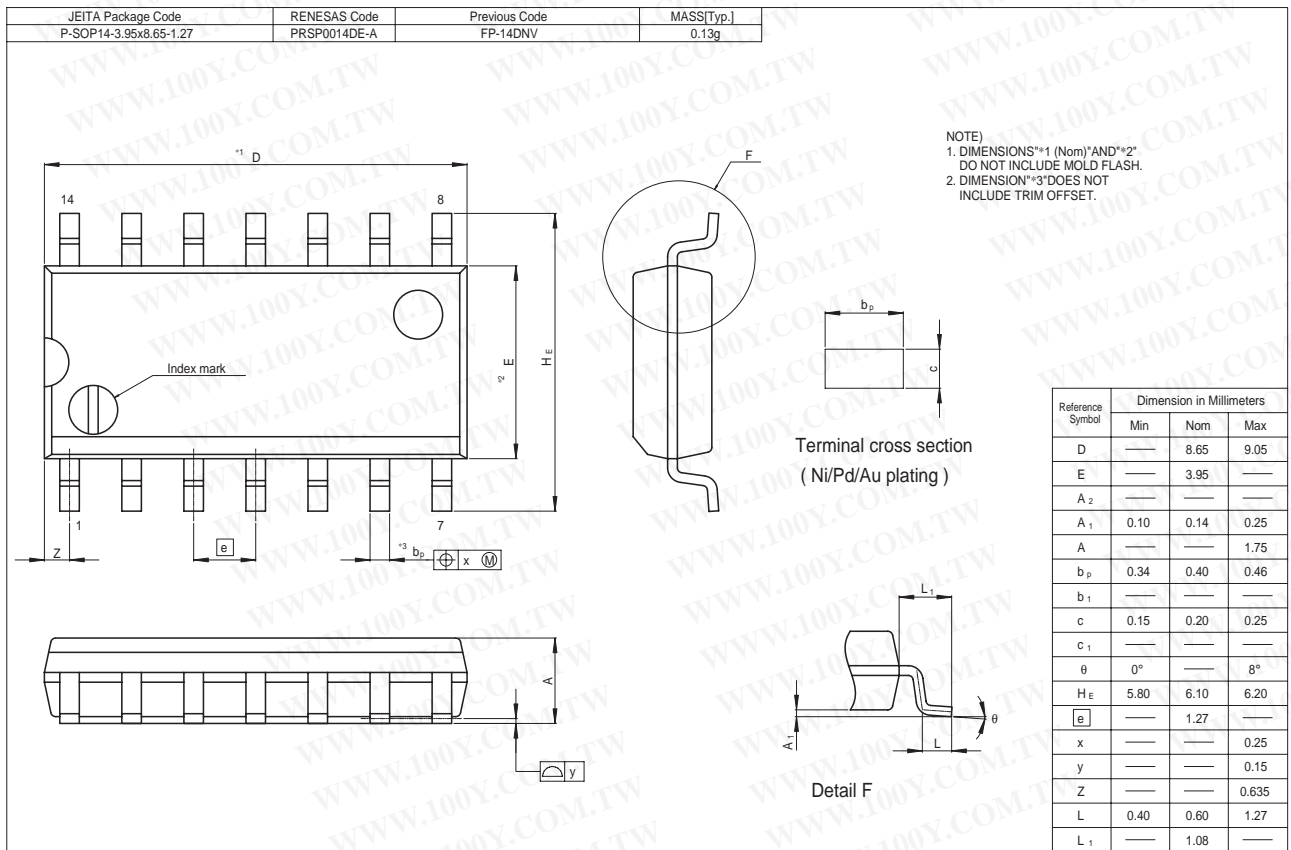
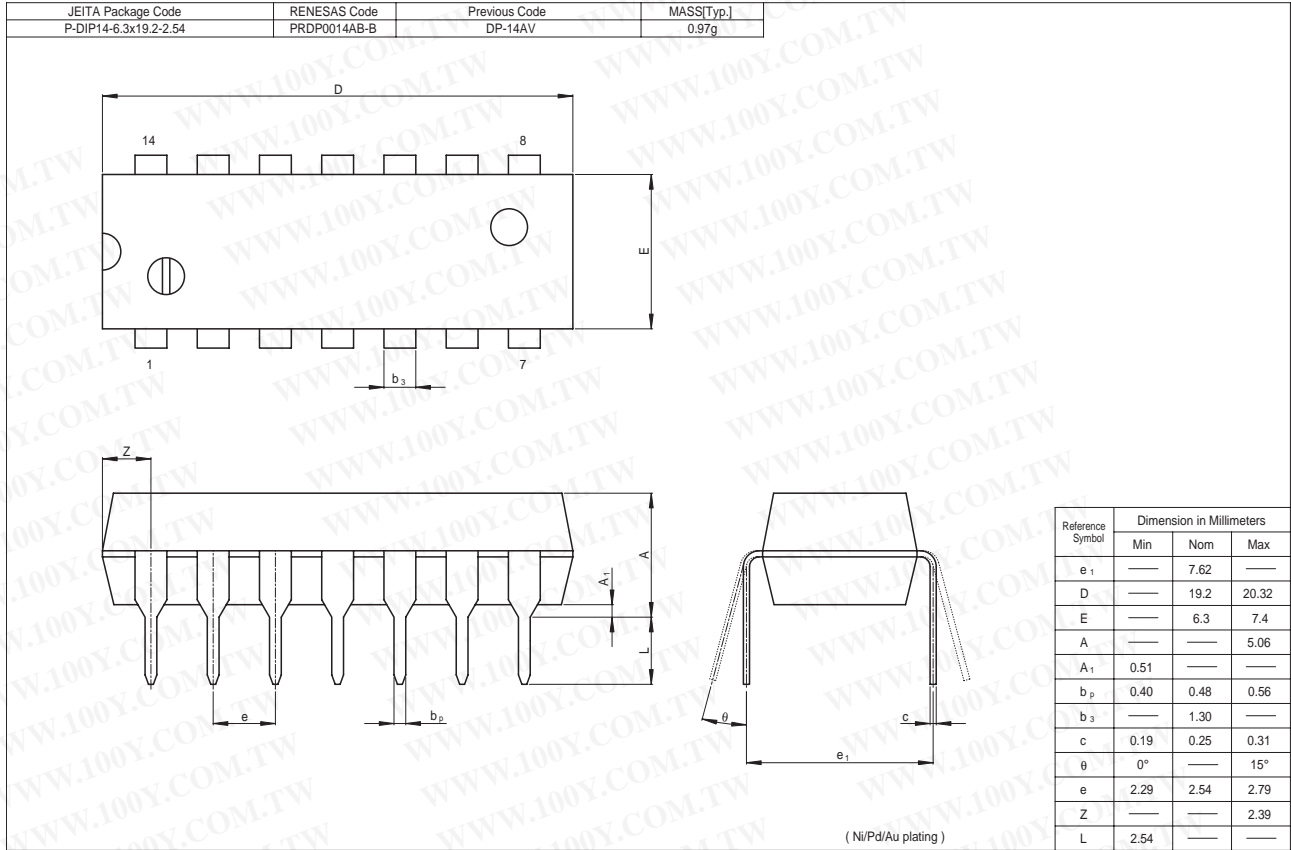


Waveforms



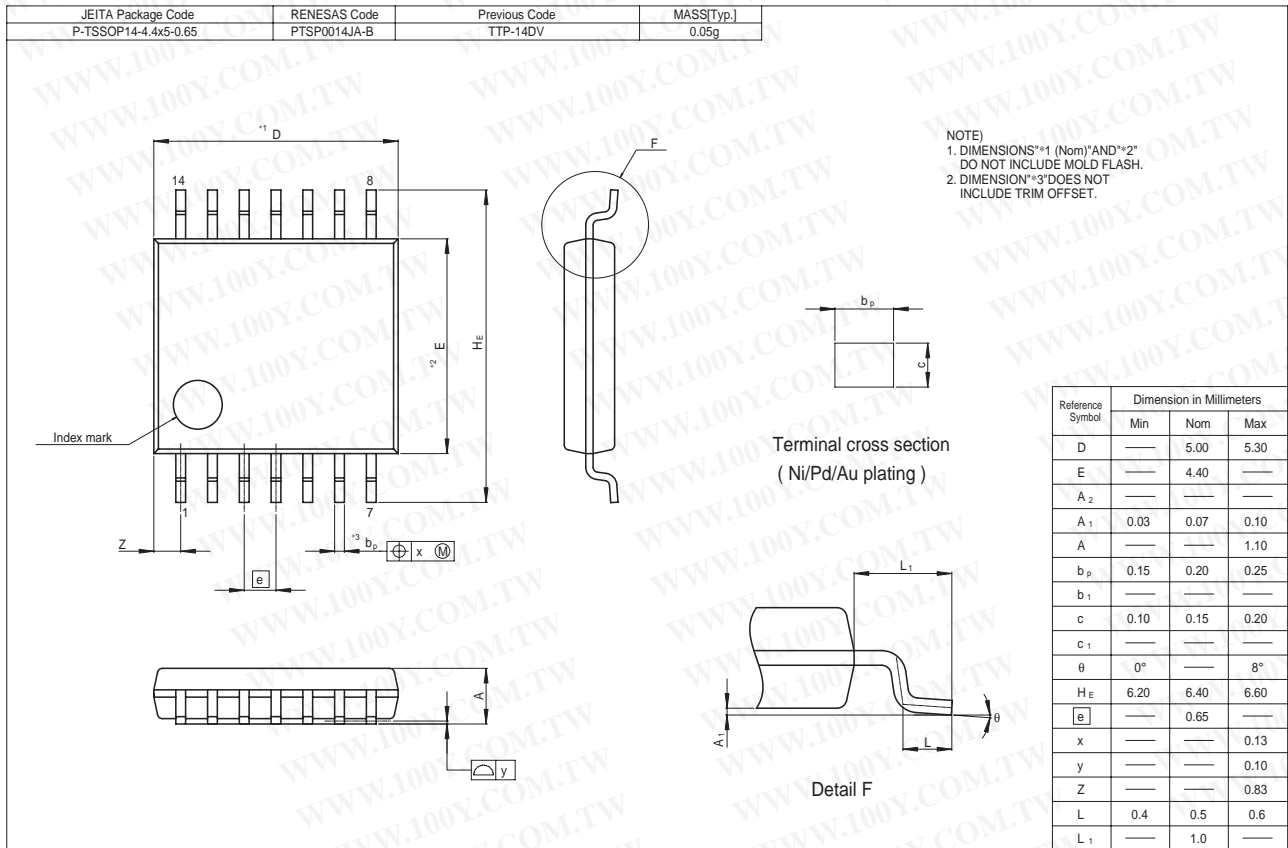
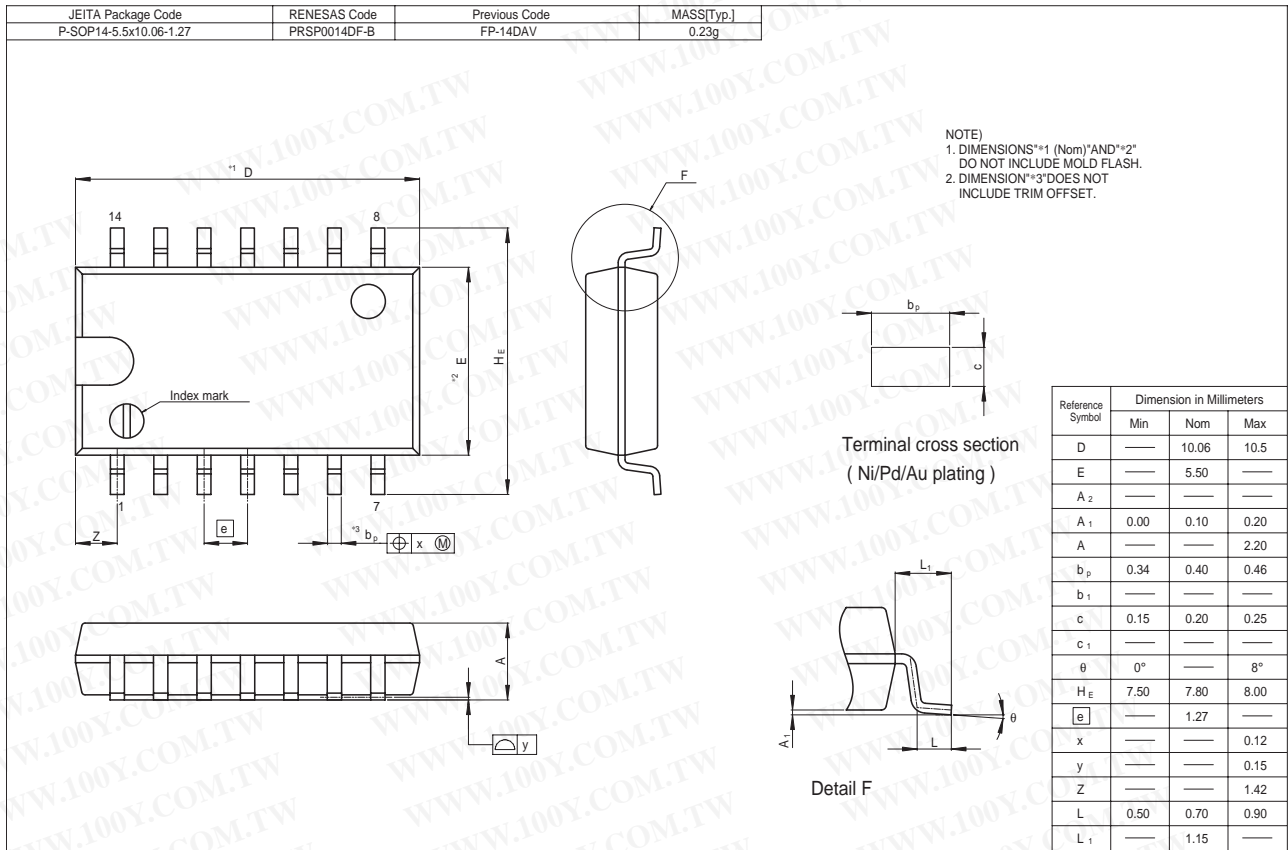
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Package Dimensions





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