

HD74HCT241

Octal Buffers/Line Drivers/Line Receivers (with inverted 3-state outputs)

REJ03D0663-0200
(Previous ADE-205-551)
Rev.2.00
Mar 30, 2006

Description

The HD74HCT241 is a noninverting buffer and has one active low enable and one active high enable. Each enable independently controls 4 buffers.

This device does not have schmitt trigger inputs.

Features

- LSTTL Output Logic Level Compatibility as well as CMOS Output Compatibility
- High Speed Operation: t_{pd} (A to Y) = 10 ns typ ($C_L = 50$ pF)
- High Output Current: Fanout of 15 LSTTL Loads
- Wide Operating Voltage: $V_{CC} = 4.5$ to 5.5 V
- Low Input Current: 1 μ A max
- Low Quiescent Supply Current: I_{CC} (static) = 4 μ A max ($T_a = 25^\circ\text{C}$)
- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74HCT241P	DILP-20 pin	PRDP0020AC-B (DP-20NEV)	P	—
HD74HCT241FPEL	SOP-20 pin (JEITA)	PRSP0020DD-B (FP-20DAV)	FP	EL (2,000 pcs/reel)
HD74HCT241RPEL	SOP-20 pin (JEDEC)	PRSP0020DC-A (FP-20DBV)	RP	EL (1,000 pcs/reel)

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

Function Table

Inputs			Output
$\overline{1G}$	2G	A	Y
H	L	X	Z
L	H	H	H
L	H	L	L

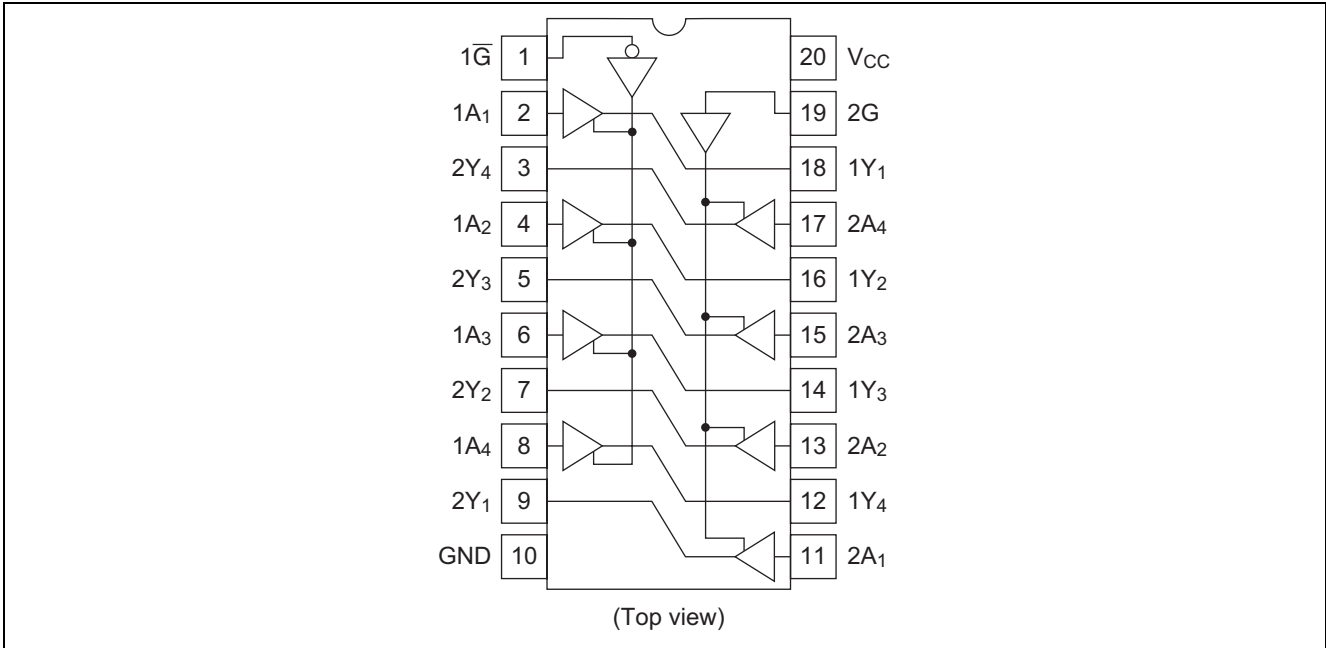
H : high level

L : low level

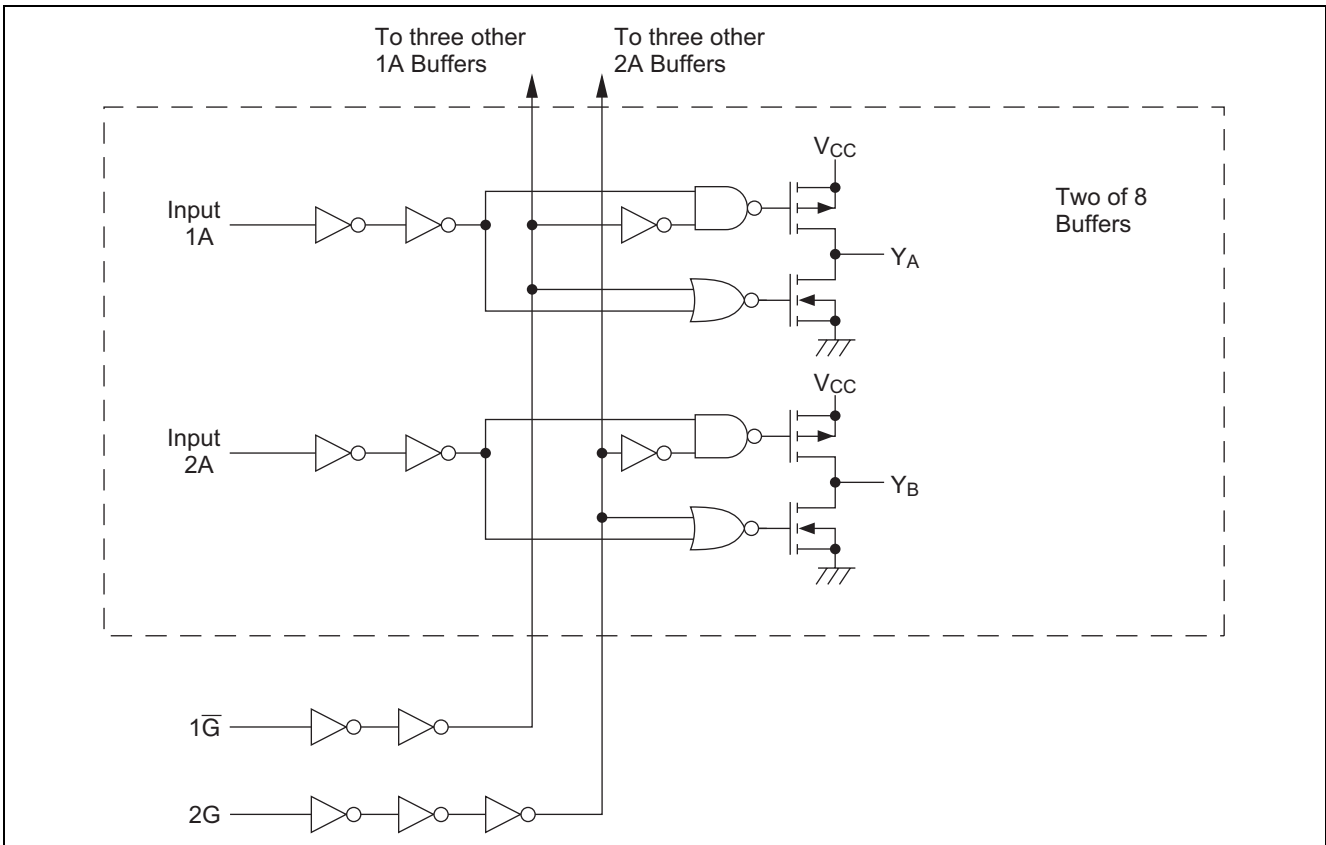
X : irrelevant

Z : off (high-impedance) state of a 3-state output

Pin Arrangement



Logic Diagram



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}	± 20	mA
Output current	I_O	± 35	mA
V_{CC} , GND current	I_{CC} or I_{GND}	± 75	mA
Power dissipation	P_T	500	mW
Storage temperature	T_{stg}	-65 to +150	°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}	4.5 to 5.5	V	
Input / Output voltage	V_{IN}, V_{OUT}	0 to V_{CC}	V	
Operating temperature	T_a	-40 to 85	°C	
Input rise / fall time ^{*1}	t_r, t_f	0 to 500	ns	$V_{CC} = 4.5$ V

Notes: 1. This item guarantees maximum limit when one input switches.

Waveform: Refer to test circuit of switching characteristics.

Electrical Characteristics

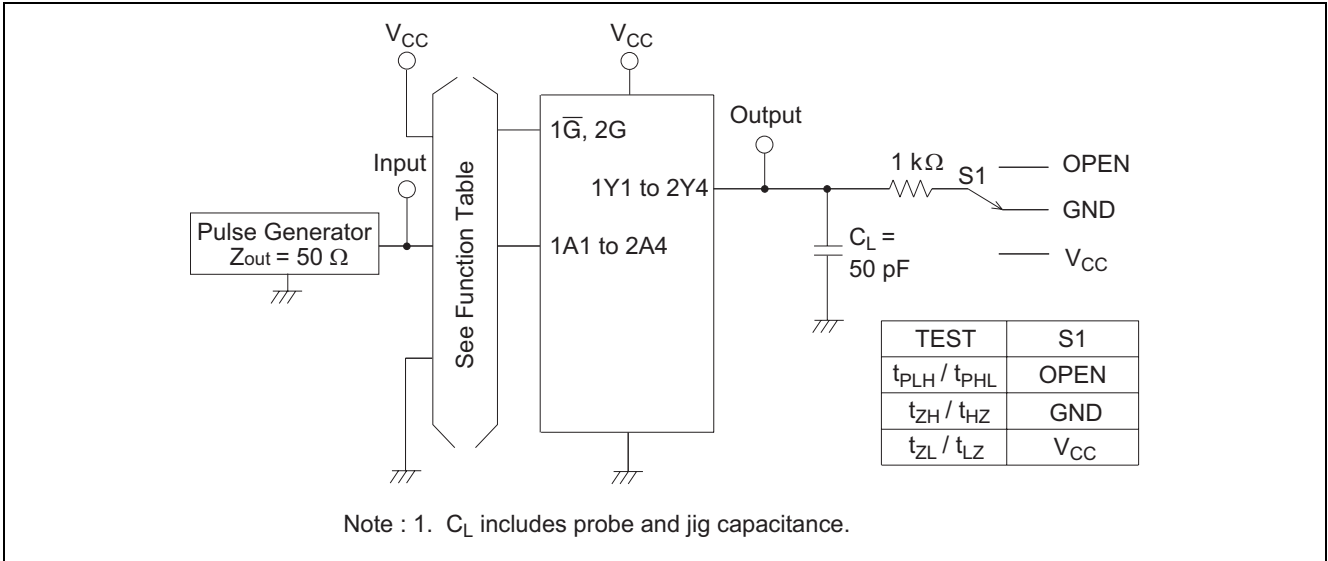
Item	Symbol	V_{CC} (V)	$T_a = 25^\circ\text{C}$			$T_a = -40 \text{ to } +85^\circ\text{C}$		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Input voltage	V_{IH}	4.5 to 5.5	2.0	—	—	2.0	—	V		
	V_{IL}	4.5 to 5.5	—	—	0.8	—	0.8	V		
Output voltage	V_{OH}	4.5	4.4	—	—	4.4	—	V	$V_{in} = V_{IH}$ or V_{IL}	$I_{OH} = -20 \mu\text{A}$
		4.5	4.18	—	—	4.13	—	V		$I_{OH} = -6 \text{ mA}$
	V_{OL}	4.5	—	—	0.1	—	0.1	V	$V_{in} = V_{IH}$ or V_{IL}	$I_{OL} = 20 \mu\text{A}$
		4.5	—	—	0.26	—	0.33	V		$I_{OL} = 6 \text{ mA}$
Off-state output current	I_{OZ}	5.5	—	—	± 0.5	—	± 5.0	μA	$V_{in} = V_{IH}$ or V_{IL} , $V_{out} = V_{CC}$ or GND	
Input current	I_{in}	5.5	—	—	± 0.1	—	± 1.0	μA	$V_{in} = V_{CC}$ or GND	
Quiescent current	I_{CC}	5.5	—	—	4.0	—	40	μA	$V_{in} = V_{CC}$ or GND, $I_{out} = 0 \mu\text{A}$	

Switching Characteristics

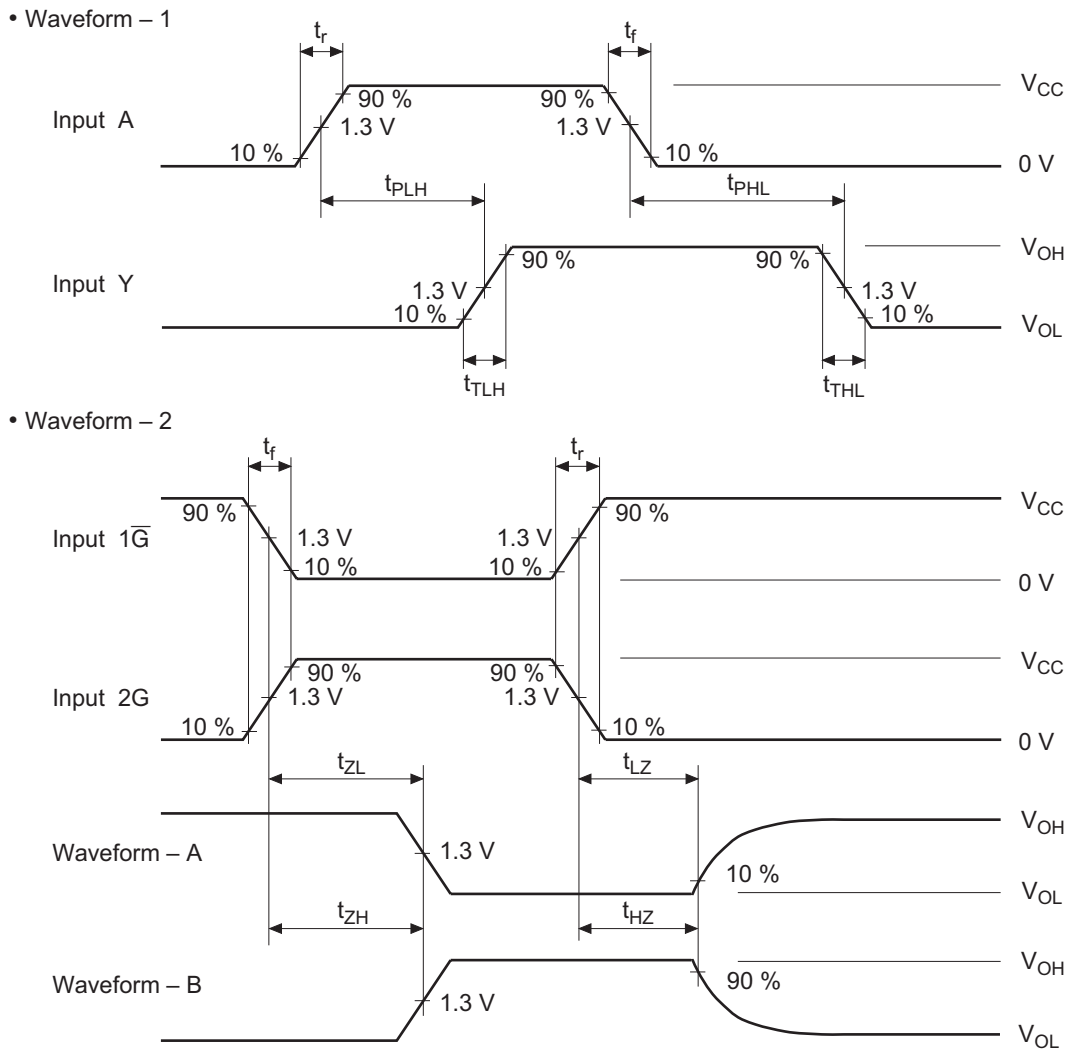
($C_L = 50$ pF, Input $t_r = t_f = 6$ ns)

Item	Symbol	V_{CC} (V)	$T_a = 25^\circ\text{C}$			$T_a = -40 \text{ to } +85^\circ\text{C}$		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Propagation delay time	t_{PHL}	4.5	—	11	20	—	25	ns		
	t_{PLH}	4.5	—	9	20	—	25			
Output enable time	t_{ZL}	4.5	—	14	30	—	38	ns		
	t_{ZH}	4.5	—	12	30	—	38			
Output disable time	t_{LZ}	4.5	—	13	30	—	38	ns		
	t_{HZ}	4.5	—	17	30	—	38			
Output rise/fall time	t_{TLH} t_{THL}	4.5	—	4	12	—	15	ns		
Input capacitance	C_{in}	—	—	5	10	—	10	pF		

Test Circuit



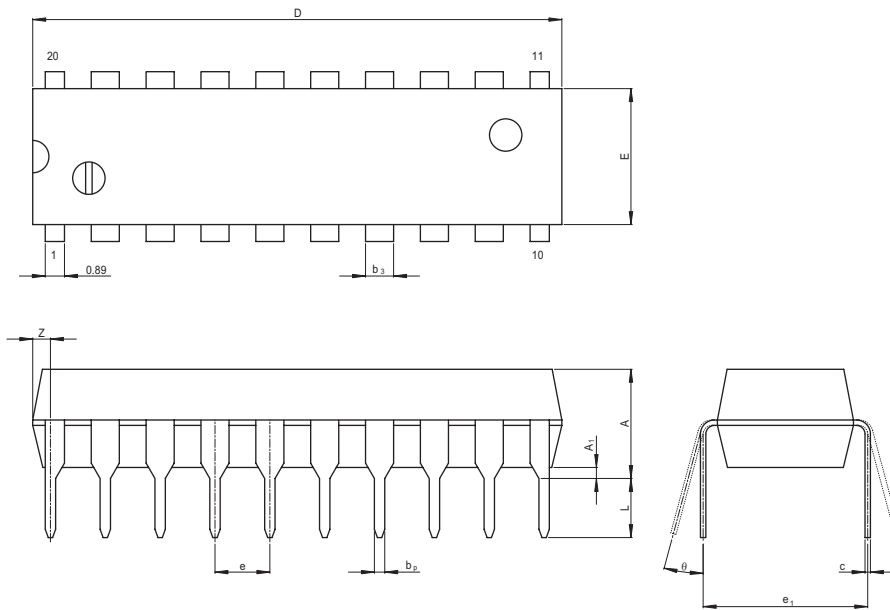
Waveforms



- Notes :
1. Input waveform : $PRR \leq 1 \text{ MHz}$, duty cycle 50%, $t_r \leq 6 \text{ ns}$, $t_f \leq 6 \text{ ns}$
 2. Waveform– A is for an output with internal conditions such that the output is low except when disabled by the output control.
 3. Waveform– B is for an output with internal conditions such that the output is high except when disabled by the output control.
 4. The output are measured one at a time with one transition per measurement.

Package Dimensions

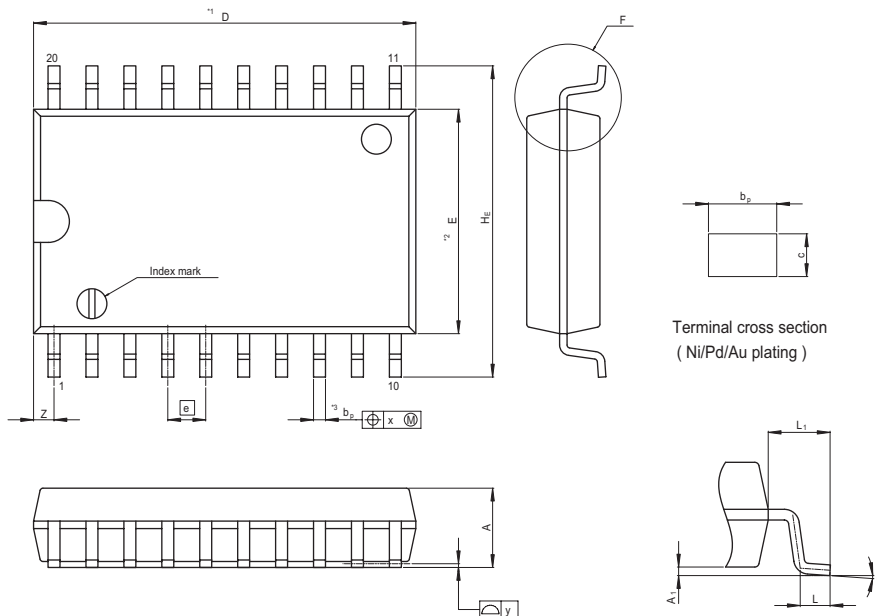
JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-DIP20-6.3x24.5-2.54	PRDP0020AC-B	DP-20NEV	1.26g



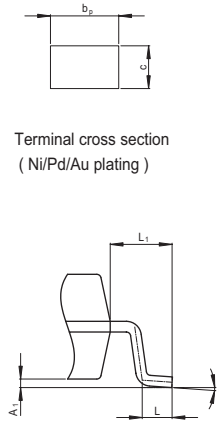
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
e ₁	—	7.62	—
D	—	24.50	25.40
E	—	6.30	7.00
A	—	—	5.08
A ₁	0.51	—	—
b _p	0.40	0.48	0.56
b ₃	—	1.30	—
c	0.19	0.25	0.31
θ	0°	—	15°
e	2.29	2.54	2.79
Z	—	—	1.27
L	2.54	—	—

(Ni/Pd/Au plating)

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP20-7.5x12.8-1.27	PRSP0020DC-A	FP-20DBV	0.52g



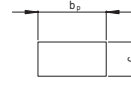
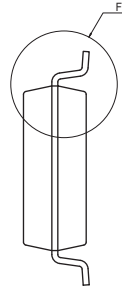
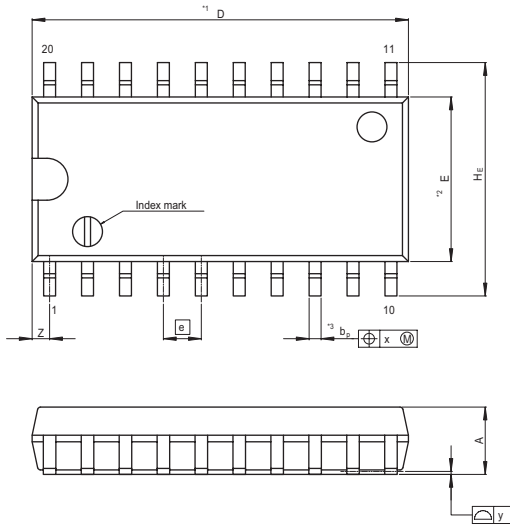
NOTE)
 1. DIMENSIONS**1 (Nom)**AND**2*
 @ DO NOT INCLUDE MOLD FLASH.
 2. DIMENSION**3*DOES NOT
 @ INCLUDE TRIM OFFSET.



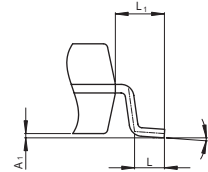
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	12.80	13.2
E	—	7.50	—
A ₂	—	—	—
A ₁	0.10	0.20	0.30
A	—	—	2.65
b _p	0.34	0.40	0.46
b ₁	—	—	—
c	0.20	0.25	0.30
c ₁	—	—	—
θ	0°	—	8°
HE	10.00	10.40	10.65
@	—	1.27	—
x	—	—	0.12
y	—	—	0.15
Z	—	—	0.935
L	0.40	0.70	1.27
L ₁	—	1.45	—

HD74HCT241

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP20-5.5x12.6-1.27	PRSP0020DD-B	FP-20DAV	0.31g



Terminal cross section
(Ni/Pd/Au plating)



Detail F

NOTE)
1. DIMENSIONS**1 (Nom)**AND**2*
DO NOT INCLUDE MOLD FLASH.
2. DIMENSION**3*DOES NOT
INCLUDE TRIM OFFSET.

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	12.60	13.0
E	—	5.50	—
A ₂	—	—	—
A ₁	0.00	0.10	0.20
A	—	—	2.20
b _p	0.34	0.40	0.46
b ₁	—	—	—
c	0.15	0.20	0.25
c ₁	—	—	—
θ	0°	—	8°
H _E	7.50	7.80	8.00
Ⓜ	—	1.27	—
x	—	—	0.12
y	—	—	0.15
Z	—	—	0.80
L	0.50	0.70	0.90
L ₁	—	1.15	—

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