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April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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HD74HCT244

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

REJ03D0664-0200
(Previous ADE-205-553)
Rev.2.00
Mar 30, 2006

Description

The HD74HCT244 is a non-inverting buffer and has two active low enable ($\overline{1G}$ and $\overline{2G}$). 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: $1 \mu\text{A}$ max
- Low Quiescent Supply Current: I_{CC} (static) = $4 \mu\text{A}$ max ($T_a = 25^\circ\text{C}$)
- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74HCT244P	DILP-20 pin	PRDP0020AC-B (DP-20NEV)	P	—
HD74HCT244FPEL	SOP-20 pin (JEITA)	PRSP0020DD-B (FP-20DAV)	FP	EL (2,000 pcs/reel)
HD74HCT244RPEL	SOP-20 pin (JEDEC)	PRSP0020DC-A (FP-20DBV)	RP	EL (1,000 pcs/reel)
HD74HCT244TELL	TSSOP-20 pin	PTSP0020JB-A (TTP-20DAV)	T	ELL (2,000 pcs/reel)

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

Function Table

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

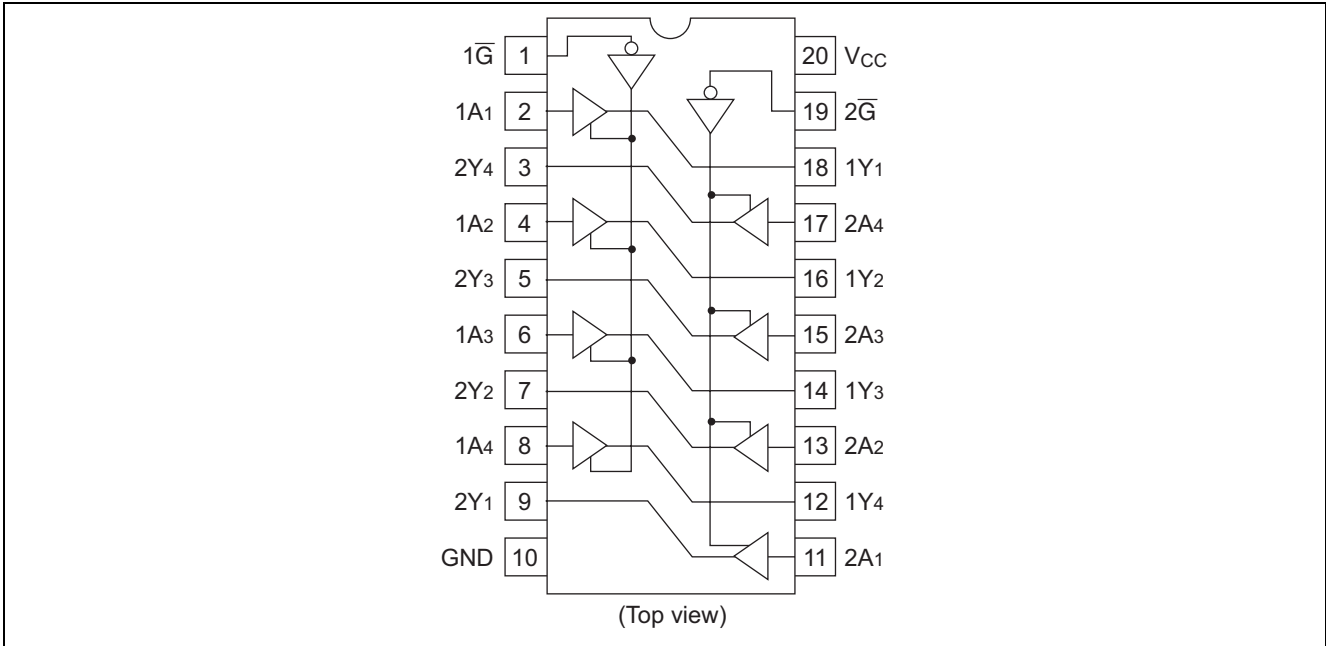
H : high level

L : low level

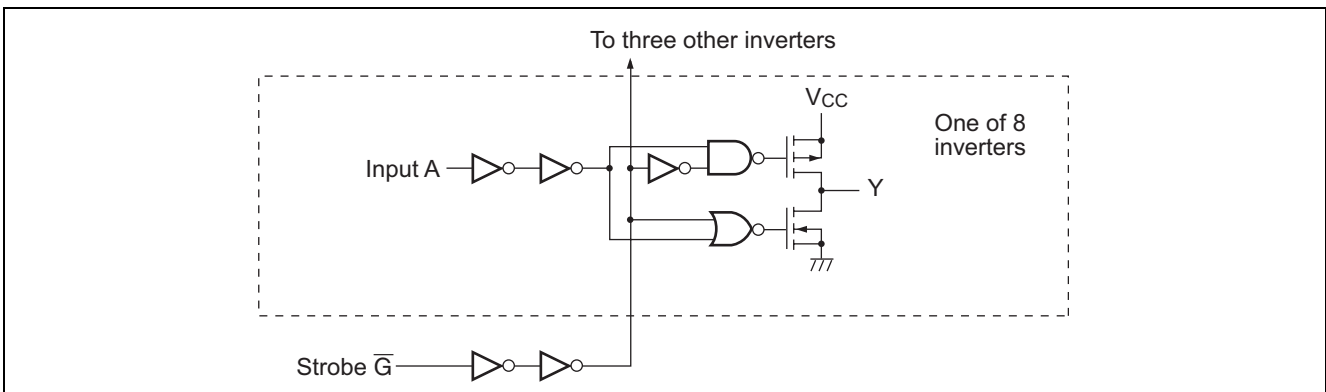
X : irrelevant

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	$^{\circ}C$

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}	4.5 to 5.5	V	
Input / Output voltage	V _{IN} , V _{OUT}	0 to V _{CC}	V	
Operating temperature	Ta	-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

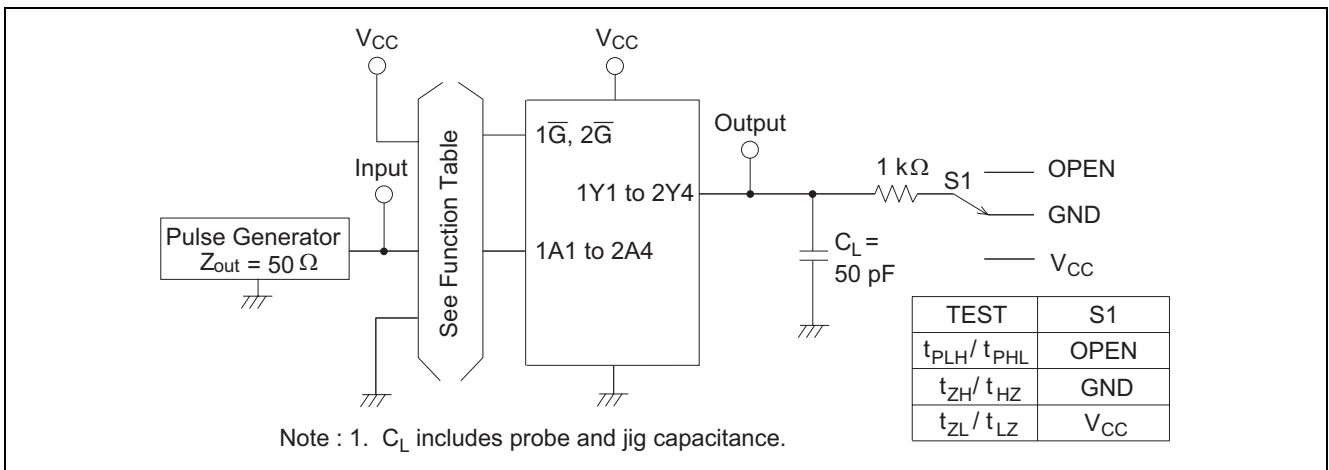
Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = -40 to+85°C		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Input voltage	V _{IH}	4.5 to 5.5	2.0	—	—	2.0	—	V		
	V _{IL}	4.5 to 5.5	—	—	0.8	—	0.8	V		
Output voltage	V _{OH}	4.5	4.4	—	—	4.4	—	V	Vin = V _{IH} or V _{IL}	I _{OH} = -20 μA
		4.5	4.18	—	—	4.13	—	V		I _{OH} = -6 mA
	V _{OL}	4.5	—	—	0.1	—	0.1	V	Vin = V _{IH} or V _{IL}	I _{OL} = 20 μA
		4.5	—	—	0.26	—	0.33	V		I _{OL} = 6 mA
Off-state output current	I _{OZ}	5.5	—	—	±0.5	—	±5.0	μA	Vin = V _{IH} or V _{IL} , Vout = V _{CC} or GND	
Input current	I _{in}	5.5	—	—	±0.1	—	±1.0	μA	Vin = V _{CC} or GND	
Quiescent current	I _{CC}	5.5	—	—	4.0	—	40	μA	Vin = V _{CC} or GND, Iout = 0 μA	

Switching Characteristics

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

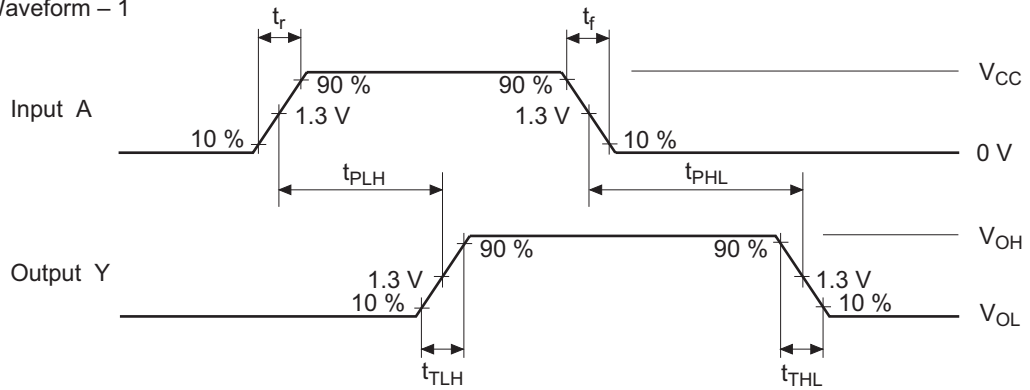
Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Propagation delay time	t _{PHL}	4.5	—	11	20	—	25	ns		
	t _{PLH}	4.5	—	9	20	—	25			
Output enable time	t _{ZL}	4.5	—	13	30	—	38	ns		
	t _{ZH}	4.5	—	12	30	—	38			
Output disable time	t _{LZ}	4.5	—	14	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

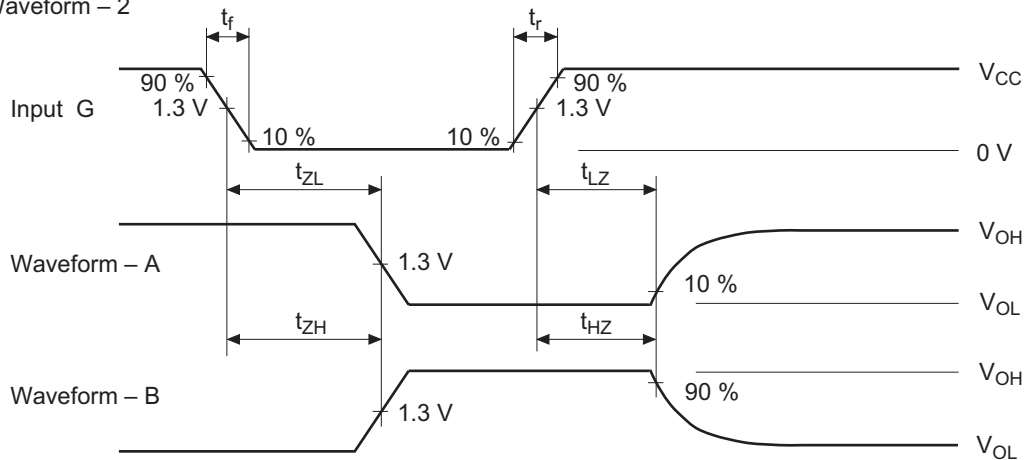


Waveforms

• Waveform – 1

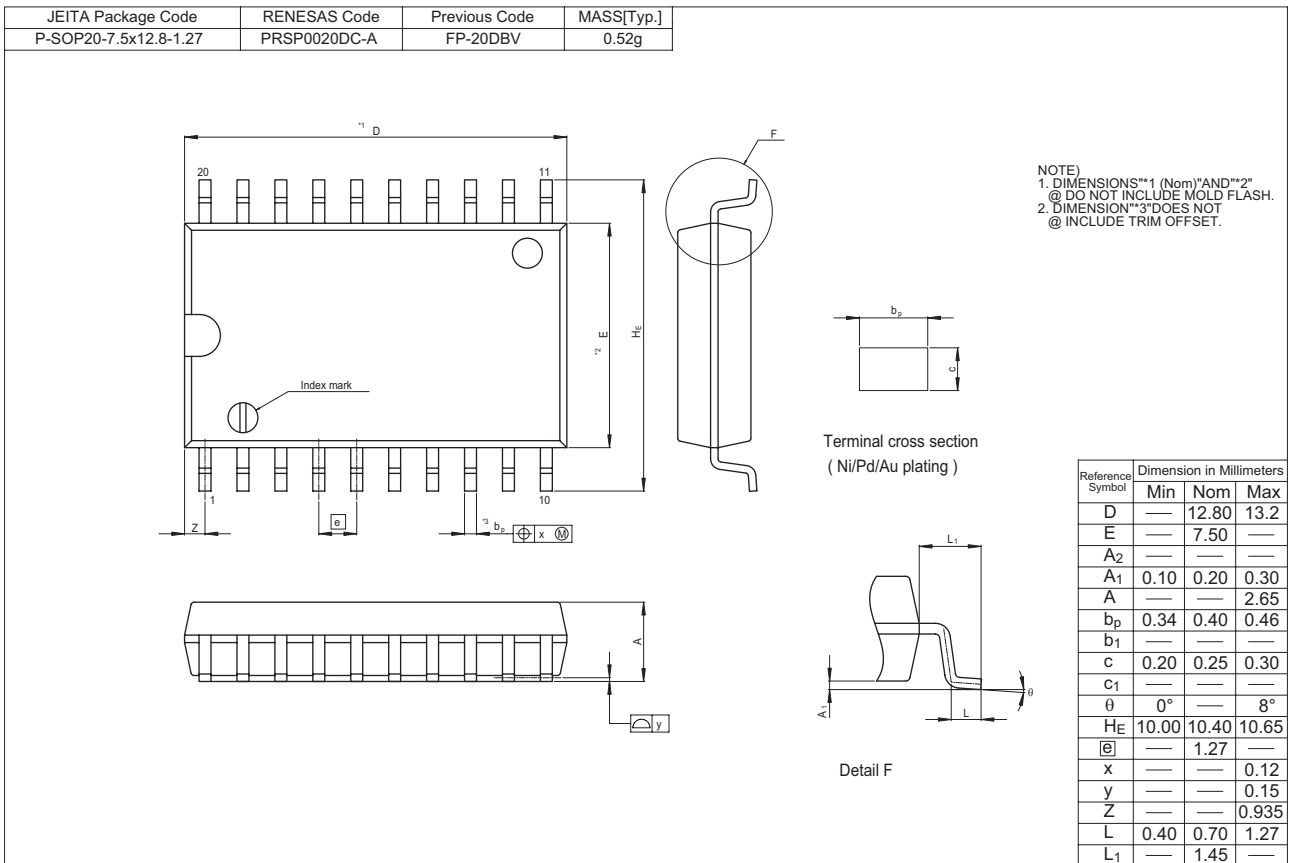
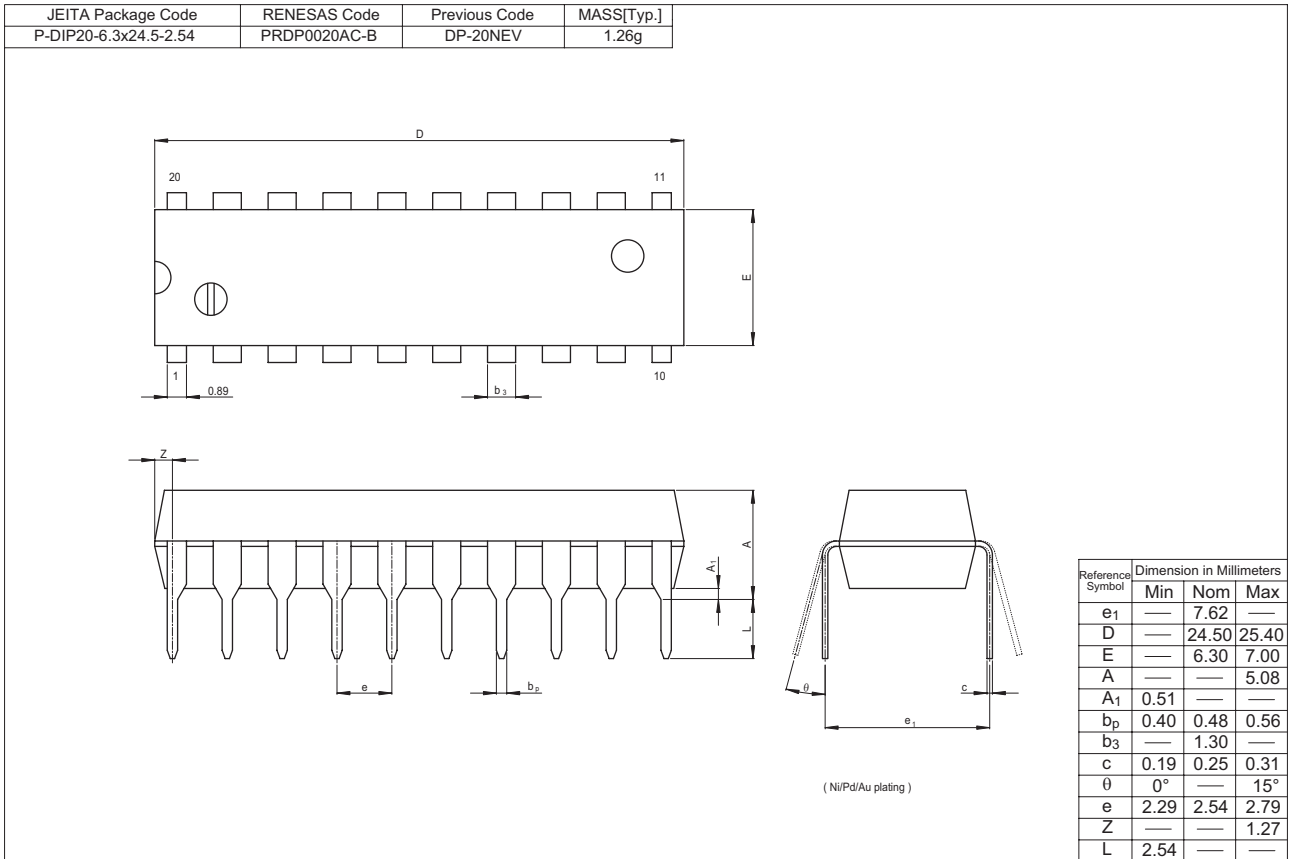


• Waveform – 2



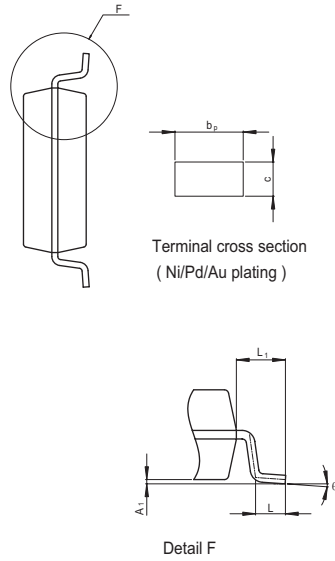
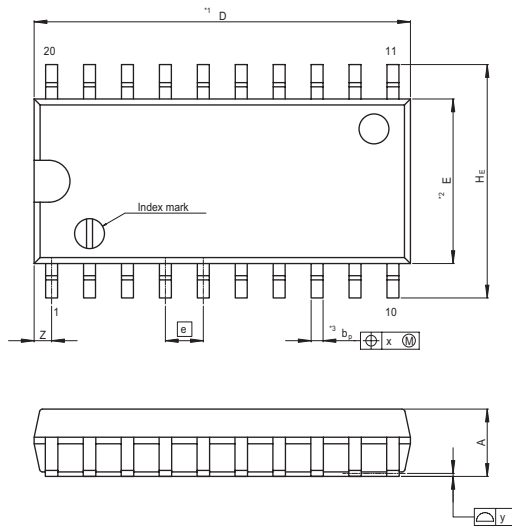
- Notes :
1. Input waveform : PRR \leq 1 MHz, duty cycle 50%, $t_r \leq$ 6 ns, $t_f \leq$ 6 ns
 2. Waveform- A is for an output with internal conditions such that the output is low except when disabled by the output control.
 3. Waveform- B is for an output with internal conditions such that the output 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



HD74HCT244

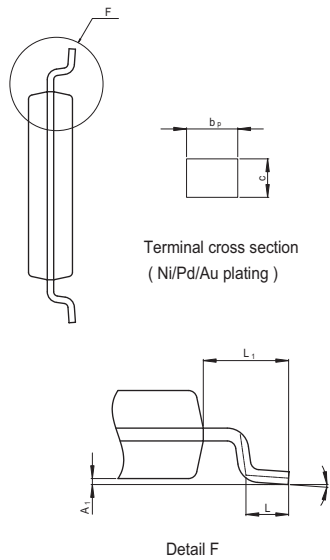
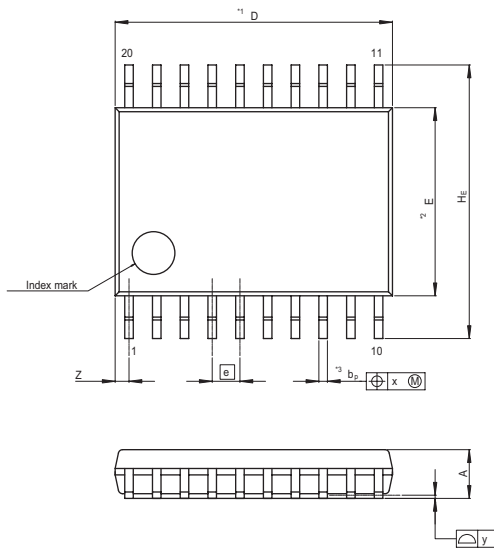
JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP20-5.5x12.6-1.27	PRSP0020DD-B	FP-20DAV	0.31g



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	—

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-TSSOP20-4.4x6.5-0.65	PTSP0020JB-A	TTP-20DAV	0.07g



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	—	6.50	6.80
E	—	4.40	—
A ₂	—	—	—
A ₁	0.03	0.07	0.10
A	—	—	1.10
b _P	0.15	0.20	0.25
b ₁	—	—	—
c	0.10	0.15	0.20
c ₁	—	—	—
θ	0°	—	8°
H _E	6.20	6.40	6.60
Ⓜ	—	0.65	—
x	—	—	0.13
y	—	—	0.10
Z	—	—	0.65
L	0.4	0.5	0.6
L ₁	—	1.0	—

Keep safety first in your circuit designs!

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