

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 |

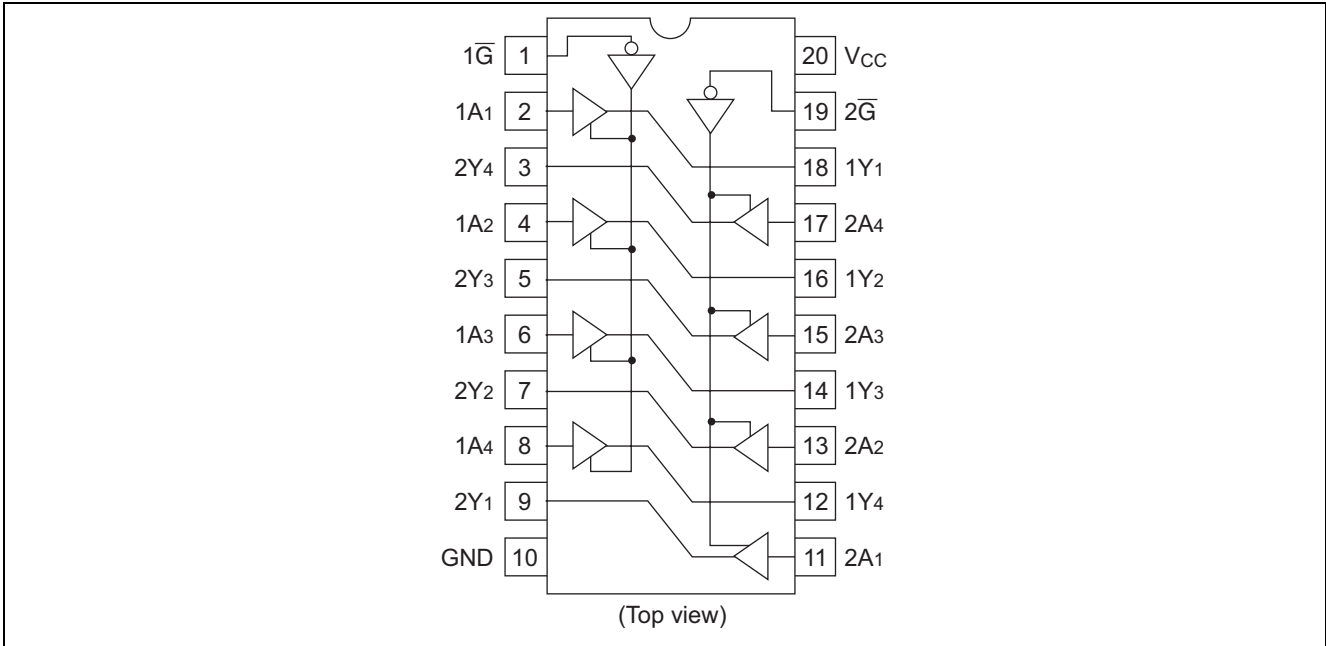
H : high level

L : low level

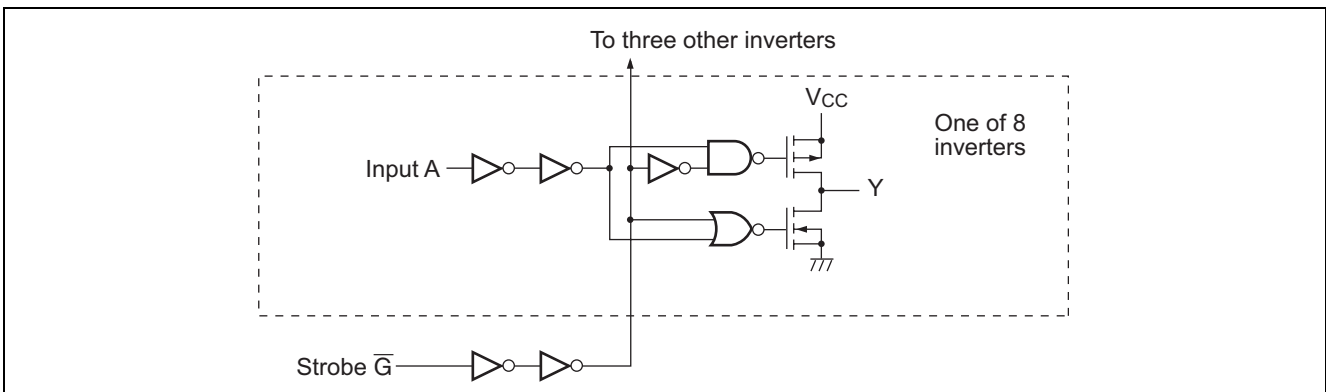
X : irrelevant

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 | 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

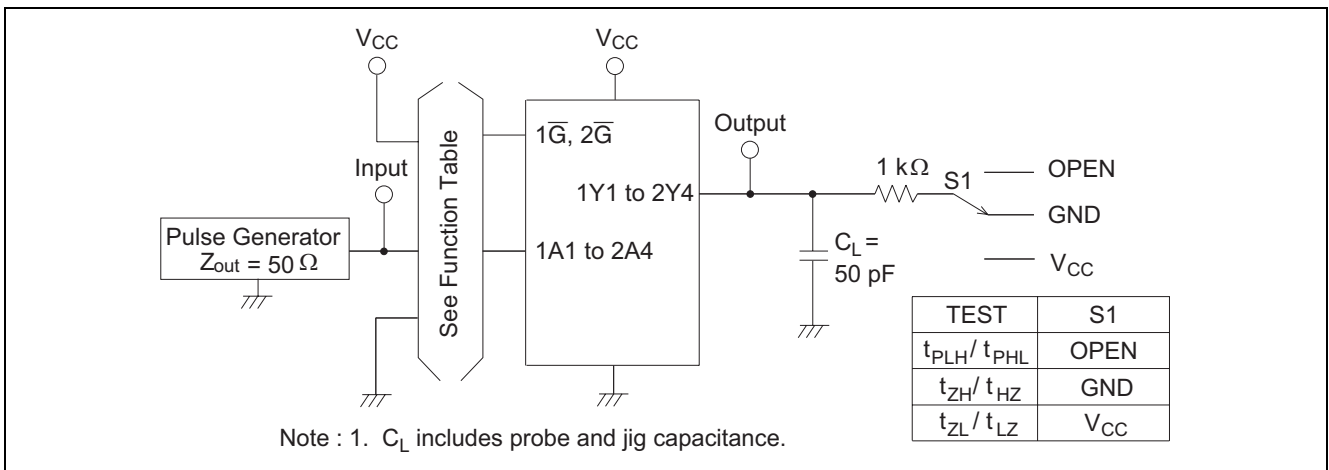
| Item | Symbol | V _{CC} (V) | Ta = 25°C | | | Ta = -40 to+85°C | | Unit | Test Conditions | |
|--------------------------|-----------------|---------------------|-----------|-----|------|------------------|------|------|---|--------------------------|
| | | | Min | Typ | Max | Min | Max | | | |
| Input 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 | V _{in} = 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 | V _{in} = 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 | 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 μA | |

Switching Characteristics

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

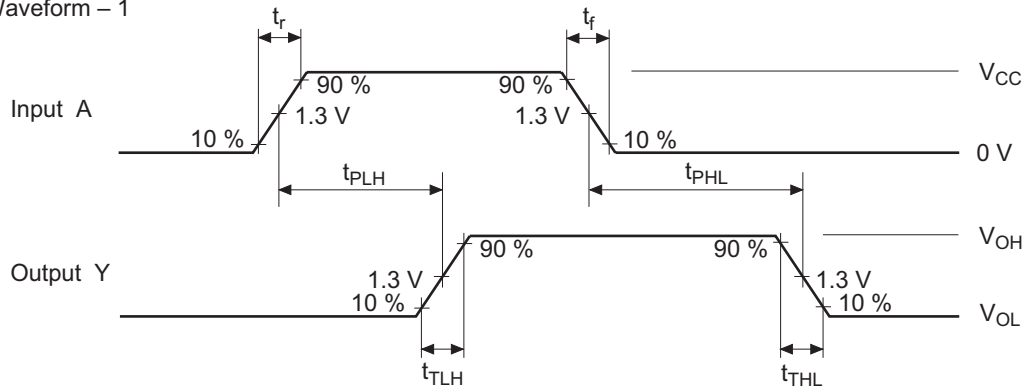
| Item | Symbol | V _{CC} (V) | Ta = 25°C | | | Ta = -40 to +85°C | | Unit | Test Conditions | |
|------------------------|-------------------------------------|---------------------|-----------|-----|-----|-------------------|-----|------|-----------------|--|
| | | | Min | Typ | Max | Min | Max | |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

Test Circuit

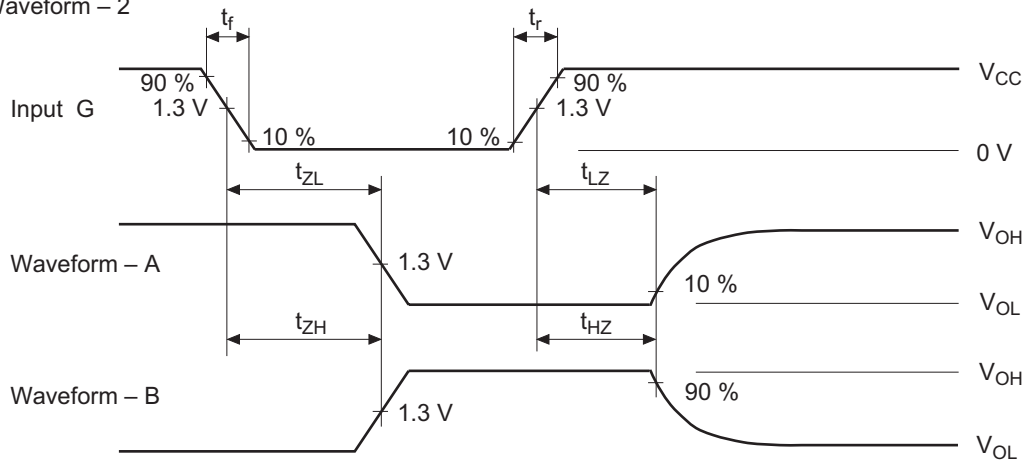


Waveforms

• Waveform – 1

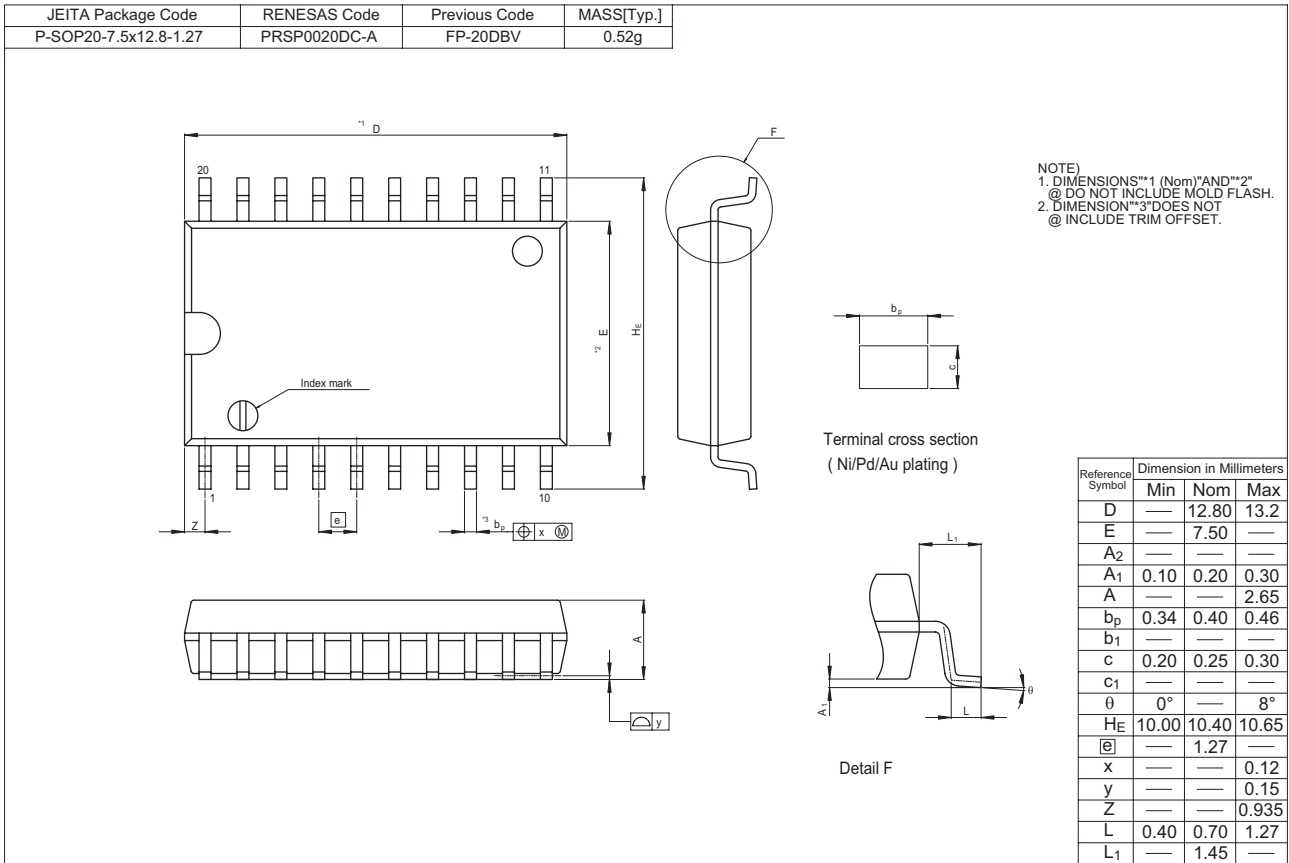
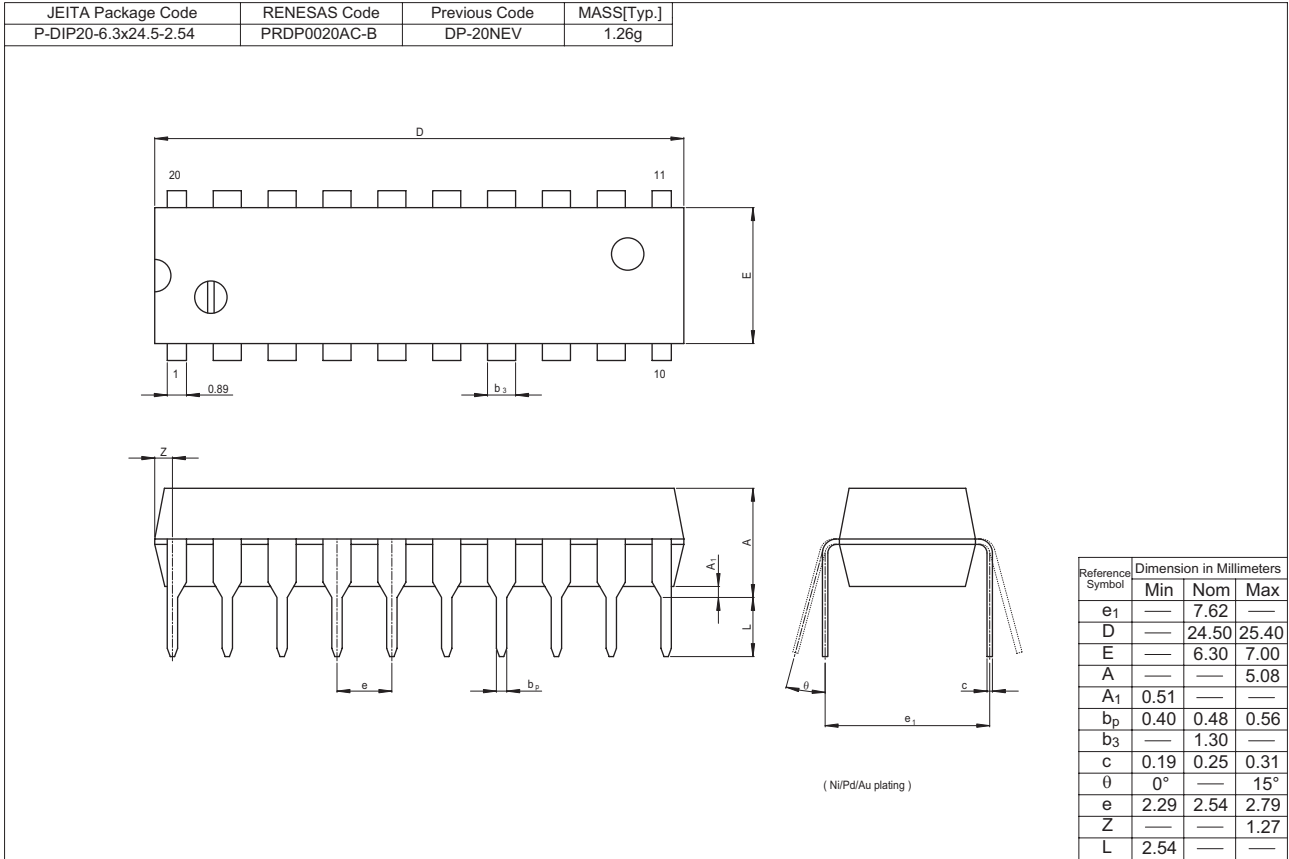


• Waveform – 2



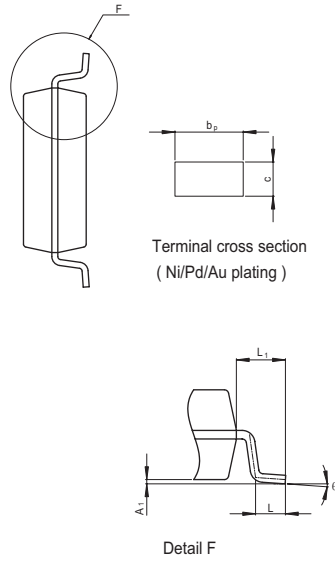
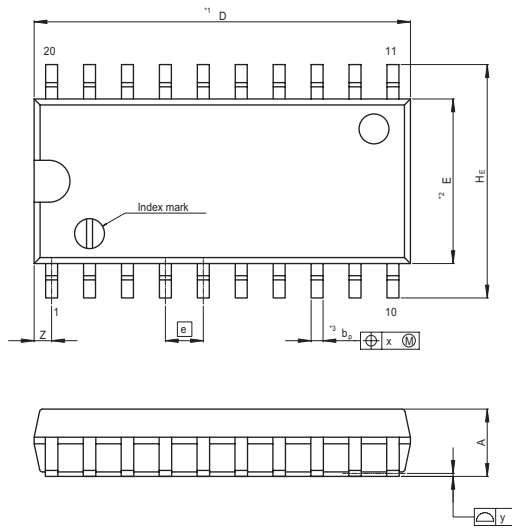
- Notes :
1. Input waveform : PRR \leq 1 MHz, duty cycle 50%, $t_r \leq$ 6 ns, $t_f \leq$ 6 ns
 2. Waveform- A is for an output with internal conditions such that the output is low except when disabled by the output control.
 3. Waveform- B is for an output with internal conditions such that the output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

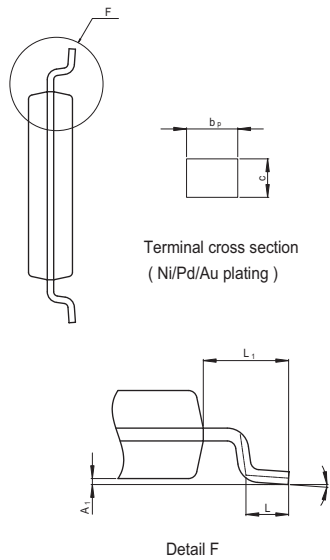
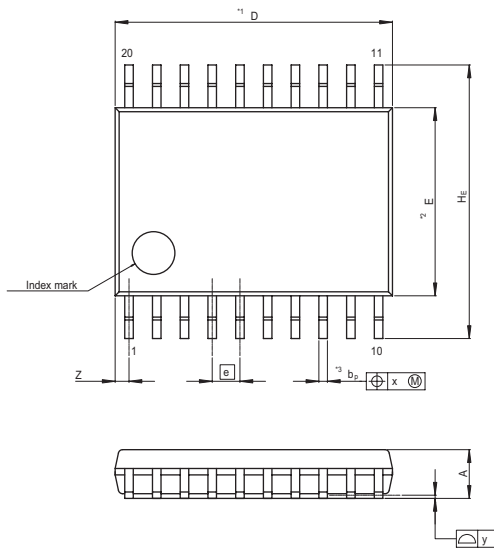
| JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|-----------------------|--------------|---------------|------------|
| P-SOP20-5.5x12.6-1.27 | PRSP0020DD-B | FP-20DAV | 0.31g |



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 | — |

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