

# TND321VD



ON Semiconductor®

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## Excellent Power Device Dual inverter driver for general purpose

### Features

- Dual inverter
- Monolithic structure (High voltage CMOS process adopted)
- Withstand voltage of 25V is assured
- Wide range of operating voltage : 4.5V to 25V
- Peak output current :  $I_{O+}/I_{O-}=0.8A/1A$
- Fast switching time (30ns typical at 1000pF load)
- Fully compatible input to TTL / CMOS ( $V_{IH}$ =up to 2.6V, at  $V_{DD}$ =4.5 to 25V)
- Built-in input pull-down resistance

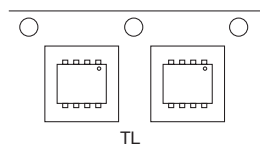
### Specifications

**Absolute Maximum Ratings** at  $T_a=25^{\circ}C$

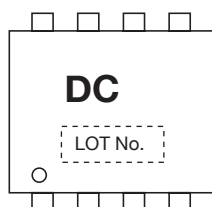
| Parameter                   | Symbol    | Conditions | Ratings                 | Unit        |
|-----------------------------|-----------|------------|-------------------------|-------------|
| Supply Voltage              | $V_{DD}$  |            | 0 to 25                 | V           |
| Input Voltage               | $V_{IN}$  |            | GND-0.3 to $V_{DD}+0.3$ | V           |
| Allowable Power Dissipation | $P_D$ max |            | 0.2                     | W           |
| Junction Temperature        | $T_j$     |            | -55 to +150             | $^{\circ}C$ |
| Storage Temperature         | $T_{stg}$ |            | -55 to +150             | $^{\circ}C$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

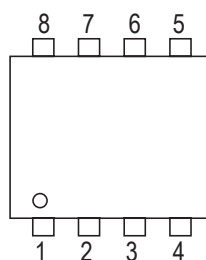
### Packing Type : TL



### Marking



### Pin Assignment



Top View

SOT-28FL / VEC8

TND321VD-TL-E  
TND321VD-TL-H

- 1 : INA
- 2 : OUTA
- 3 : OUTB
- 4 : INB
- 5 : GND
- 6 : VDD
- 7 : VDD
- 8 : VDD

### ORDERING INFORMATION

See detailed ordering and shipping information on page 7 of this data sheet.

# TND321VD

## Recommend Operating Conditions at Ta=25°C

| Parameter                | Symbol          | Conditions | Ratings     | Unit |
|--------------------------|-----------------|------------|-------------|------|
| Operating Supply Voltage | V <sub>DD</sub> |            | 4.5 to 25   | V    |
| Operating Temperature    | Topr            |            | -40 to +125 | °C   |

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

## Electrical Characteristics (AC Characteristics) at Ta=25°C, V<sub>DD</sub>=18V, V<sub>IN</sub>=5V

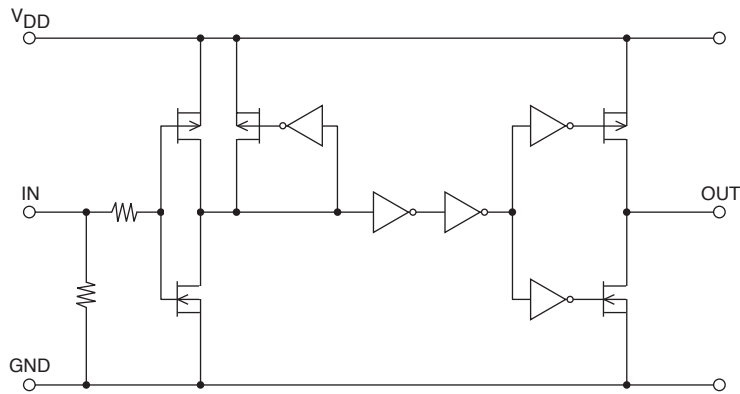
| Parameter          | Symbol          | Conditions             | Ratings |     |     | Unit |
|--------------------|-----------------|------------------------|---------|-----|-----|------|
|                    |                 |                        | min     | typ | max |      |
| Turn-On Rise Time  | t <sub>r</sub>  | C <sub>L</sub> =1000pF |         | 35  | 50  | ns   |
| Turn-Off Fall Time | t <sub>f</sub>  | C <sub>L</sub> =1000pF |         | 30  | 45  | ns   |
| Delay Time         | t <sub>D1</sub> | C <sub>L</sub> =1000pF |         | 30  | 45  | ns   |
|                    | t <sub>D2</sub> | C <sub>L</sub> =1000pF |         | 45  | 60  | ns   |

## Electrical Characteristics (DC Characteristics) at Ta=25°C, V<sub>DD</sub>=4.5 to 25V

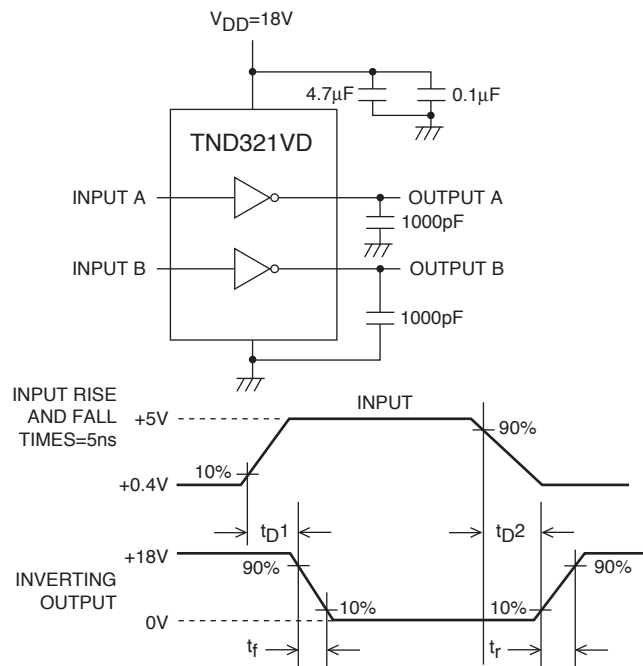
| Parameter                                | Symbol            | Conditions                                                           | Ratings              |     |      | Unit |
|------------------------------------------|-------------------|----------------------------------------------------------------------|----------------------|-----|------|------|
|                                          |                   |                                                                      | min                  | typ | max  |      |
| Logic "1" Input Voltage                  | V <sub>IH</sub>   |                                                                      | 2.6                  |     |      | V    |
| Logic "0" Input Voltage                  | V <sub>IL</sub>   |                                                                      |                      |     | 0.8  | V    |
| Logic "1" Input Bias Current             | I <sub>IN+</sub>  | V <sub>IN</sub> =V <sub>DD</sub> =25V                                |                      | 40  | 100  | μA   |
| Logic "0" Input Bias Current             | I <sub>IN-</sub>  | V <sub>IN</sub> =0V                                                  | -1                   |     | 1    | μA   |
| High-level Output Voltage                | V <sub>OH</sub>   | I <sub>O</sub> =0A                                                   | V <sub>DD</sub> -0.1 |     |      | V    |
| Low-level Output Voltage                 | V <sub>OL</sub>   | I <sub>O</sub> =0A                                                   |                      |     | 0.1  | V    |
| V <sub>DD</sub> Supply Current           | I <sub>supp</sub> | V <sub>DD</sub> =10V, V <sub>IN</sub> =3V, (both inputs)             |                      | 1.0 | 4.5  | mA   |
|                                          |                   | V <sub>DD</sub> =10V, V <sub>IN</sub> =0V, (both inputs)             |                      |     | 0.2  | mA   |
| Output High Short Circuit Pulsed Current | I <sub>O+</sub>   | V <sub>DD</sub> =18V, PW≤10μs, V <sub>OUT</sub> =0V                  |                      | 0.8 |      | A    |
| Output Low Short Circuit Pulsed Current  | I <sub>O-</sub>   | V <sub>DD</sub> =18V, PW≤10μs, V <sub>OUT</sub> =18V                 |                      | 1.0 |      | A    |
| Output On Resistance                     | R <sub>OUT</sub>  | V <sub>DD</sub> =18V, I <sub>load</sub> =10mA, V <sub>OUT</sub> ="H" |                      | 11  | 16.5 | Ω    |
|                                          |                   | V <sub>DD</sub> =18V, I <sub>load</sub> =10mA, V <sub>OUT</sub> ="L" |                      | 6   | 10   | Ω    |

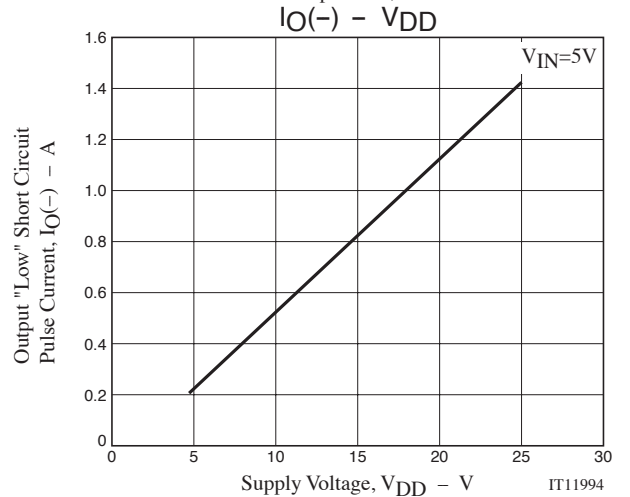
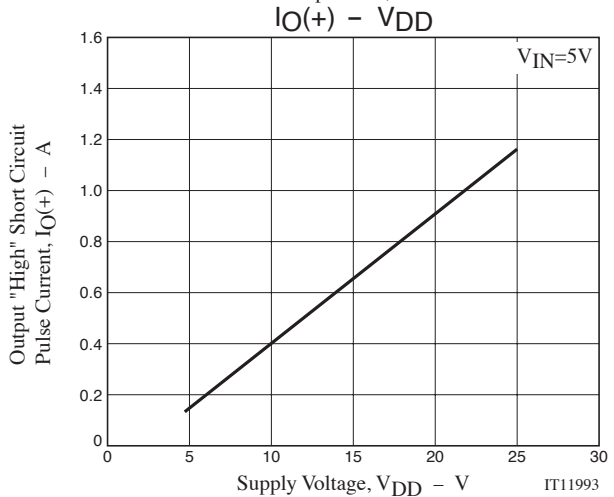
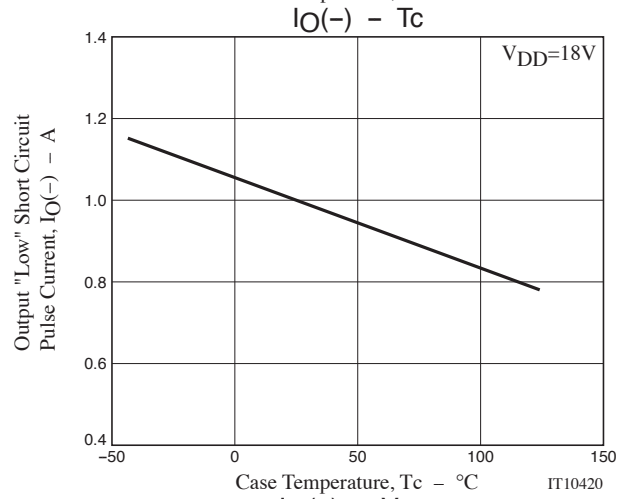
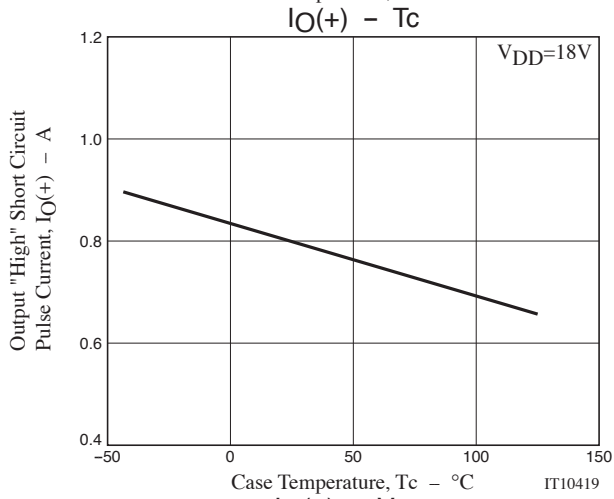
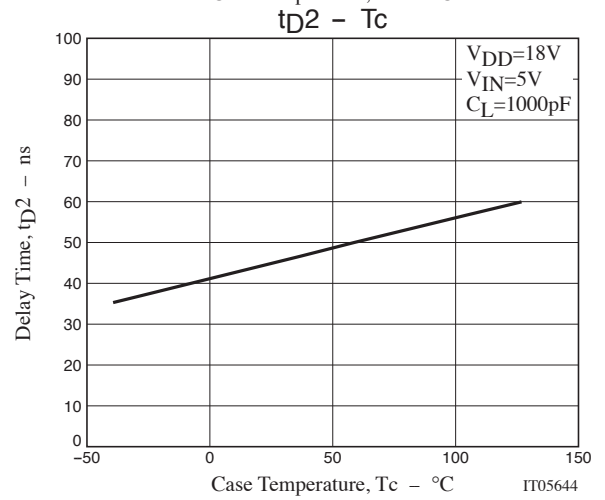
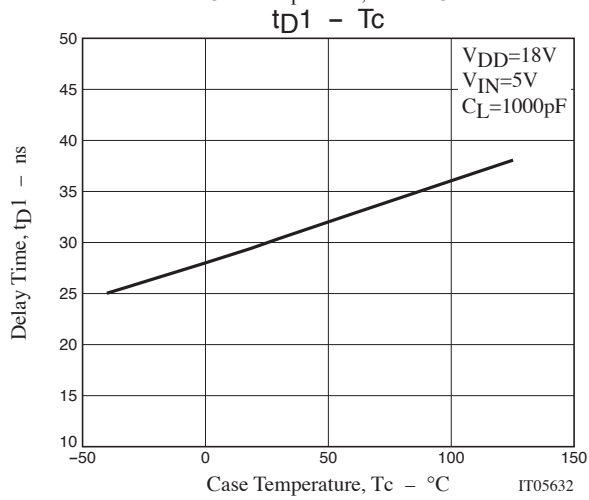
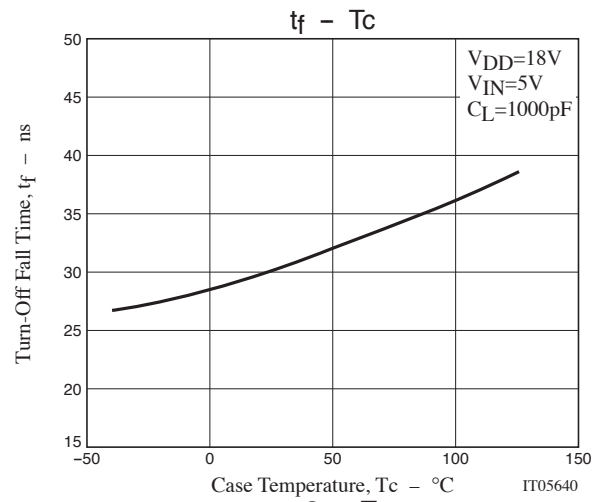
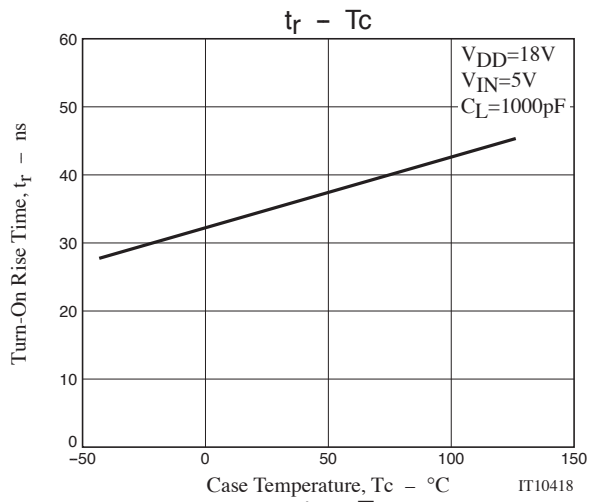
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

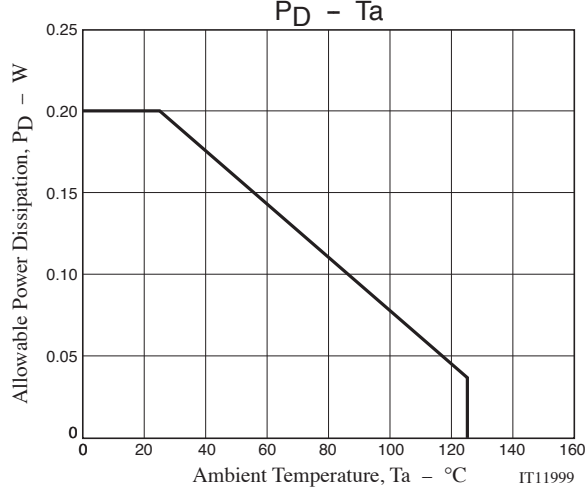
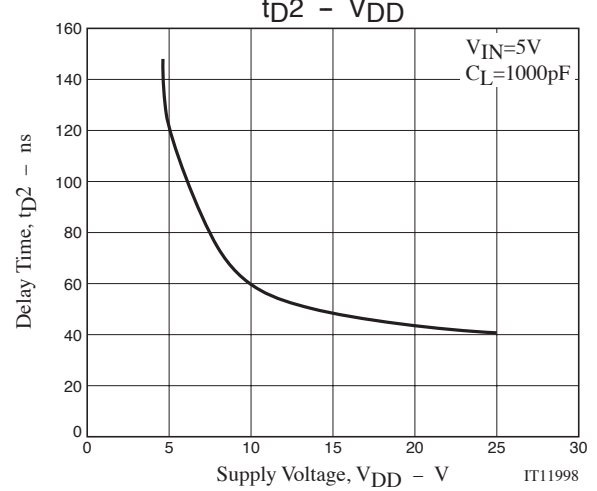
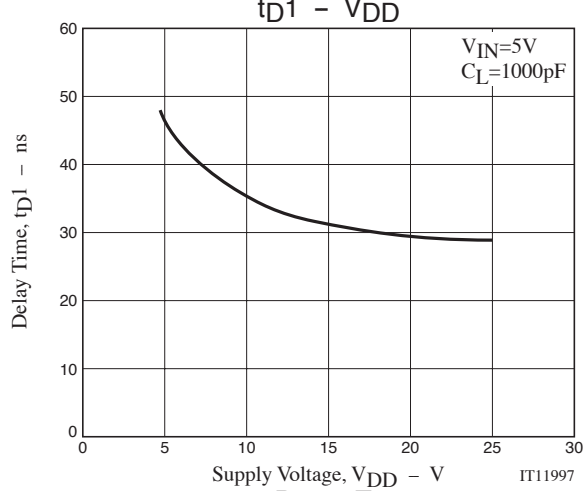
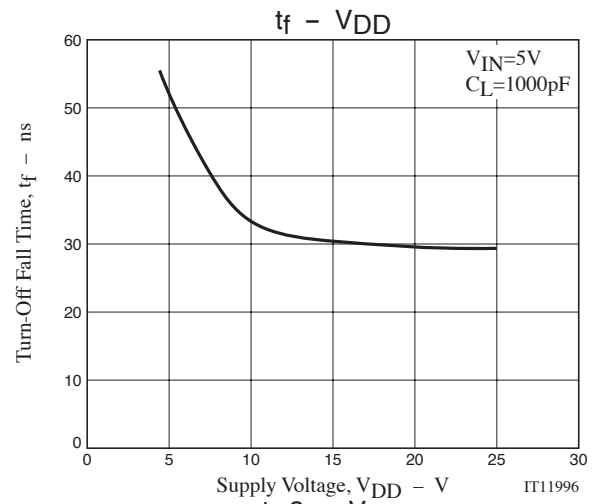
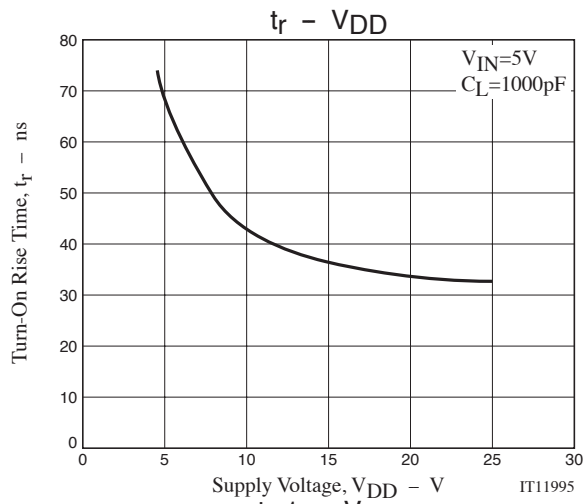
## Block Diagram



## Switching Time Test Circuit







## Package Dimensions

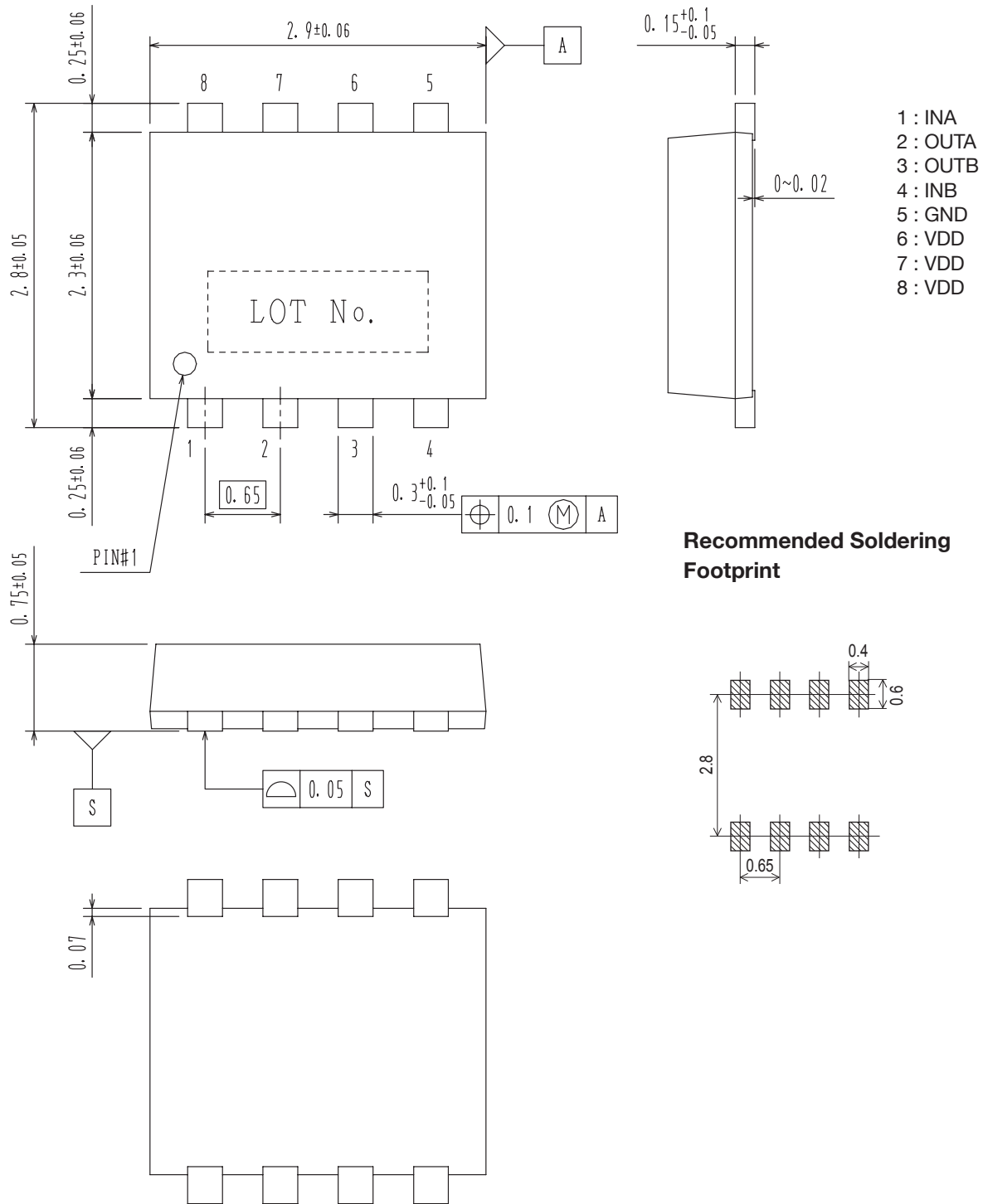
unit : mm

TND321VD-TL-E, TND321VD-TL-H

SOT-28FL / VEC8

CASE 318AH

ISSUE O



**ORDERING INFORMATION**

| Device        | Package         | Shipping                  | memo                     |
|---------------|-----------------|---------------------------|--------------------------|
| TND321VD-TL-E | SOT-28FL / VEC8 | 3,000pcs. / Tape and Reel | Pb-Free                  |
| TND321VD-TL-H | SOT-28FL / VEC8 | 3,000pcs. / Tape and Reel | Pb-Free and Halogen Free |

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