

## WL2863B

**Ultra-Low Noise, High PSRR LDO, 250mA Linear Regulator for RF and Analog Circuits**

[Http://www.ovt.com](http://www.ovt.com)

### Descriptions

The WL2863B is a linear regulator capable of supplying 250-mA output current. Designed to meet the requirements of RF and analog circuits, the WL2863B device provides low noise, high PSRR, low quiescent current and very good load /line transients.

The device is designed to work with a 1 $\mu$ F input and 1 $\mu$ F output ceramic capacitor (no separate noise Operation bypass capacitor is required).

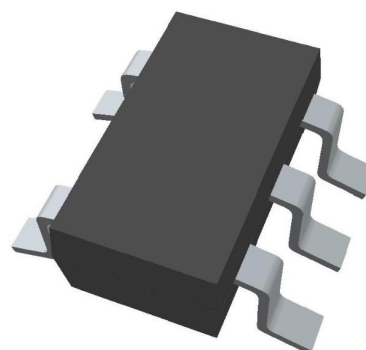
The WL2863B regulators are available in standard SOT-23-5L Package. Standard products are Pb-free and Halogen-free.

### Features

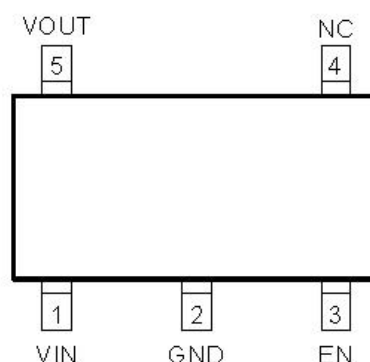
- Input Voltage Range :2.2V~5.5V
- Output Voltage Range :1.2V~4.3V
- Output current :250mA
- PSRR :Typ.101dB at 10mA , f =1KHz  
:Typ. 45dB at 10mA , f =1MHz
- Low Dropout :Typ. 115mV at 250mA
- Quiescent current :Typ. 21 $\mu$ A
- Low Output Voltage Noise:Typ. 7 $\mu$ VRMS
- Output Voltage Tolerance : $\pm$ 2%
- Shutdown Current :Typ. 0.01 $\mu$ A
- UVLO Threshold(V) :Typ. 1.90V
- Recommend capacitor :1 $\mu$ F
- Stable with 1 $\mu$ F Ceramic Input and Output capacitor
- No Noise Bypass Capacitor Required
- Thermal-Overload Protection

### Applications

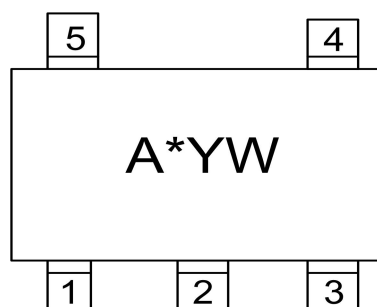
- Cell phones , radiophone, digital cameras
- Bluetooth, wireless handsets
- HiFi products
- Others portable electronics device



**SOT-353**



**Pin Configuration (Top View)**



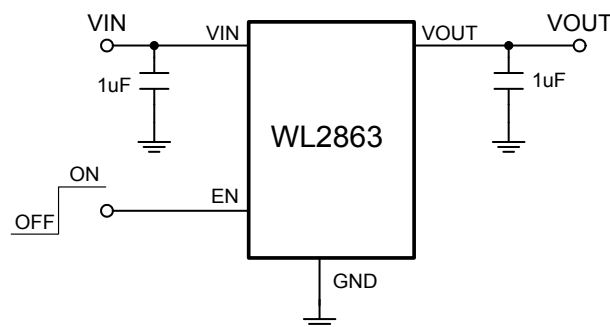
### Marking

- A** : Device Code  
**\*** : Voltage Code  
**Y** : Year Code  
**W** : Week Code

### Order Information

For detail order information, please see page 8

## Typical Application

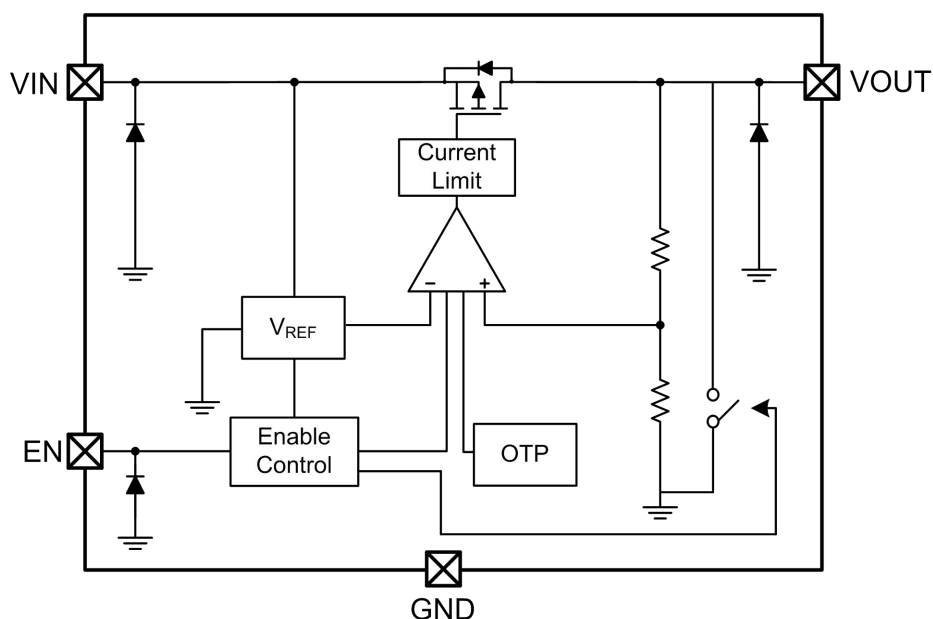


**Note :** The input and output capacitor must be located a distance of not more than 1 cm

## PIN Functions

| PIN | Symbol | Description                                                                                                            |
|-----|--------|------------------------------------------------------------------------------------------------------------------------|
| 1   | VIN    | Input voltage supply pin , 1μF capacitor should be connected at this input                                             |
| 2   | GND    | Common ground connection                                                                                               |
| 3   | EN     | Chip enable: Applying $V_{EN} < 0.4\text{ V}$ disables the regulator, Pulling $V_{EN} > 1.2\text{ V}$ enables the LDO. |
| 4   | NC     | No internal electrical connection                                                                                      |
| 5   | VOUT   | Regulated output voltage. 1μF capacitor should be connected at this input                                              |

## Block Diagram



**Absolute Maximum Ratings**

| Parameter                                       | Value                  | Unit               |
|-------------------------------------------------|------------------------|--------------------|
| Power Dissipation, $P_D@T_A=25^{\circ}\text{C}$ | Internally Limited     | mW                 |
| $V_{IN}$ Range                                  | -0.3 ~ 6.0             | V                  |
| $V_{EN}$ Range                                  | -0.3 to $V_{IN} + 0.3$ | V                  |
| $V_{OUT}$ Range                                 | -0.3 to $V_{IN} + 0.3$ | V                  |
| $I_{OUT}$                                       | 300                    | mA                 |
| Lead Temperature Range                          | 260                    | $^{\circ}\text{C}$ |
| Storage Temperature Range                       | -55 ~ 150              | $^{\circ}\text{C}$ |
| Operating Junction Temperature Range            | 150                    | $^{\circ}\text{C}$ |
| ESD Ratings                                     | HBM                    | 2000               |
|                                                 | MM                     | 200                |

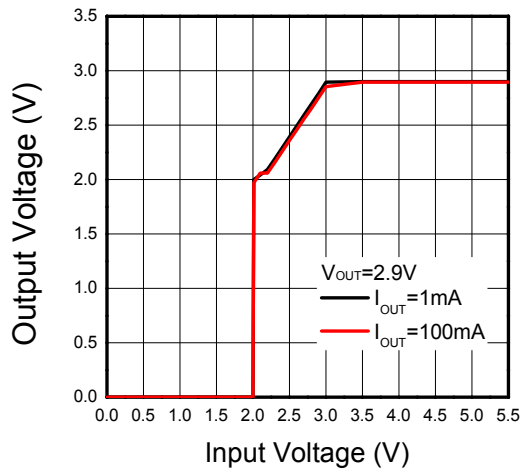
**Recommend Operating Ratings**

| Parameter                           | Value     | Unit                 |
|-------------------------------------|-----------|----------------------|
| Operating Supply voltage            | 2.2 ~ 5.5 | V                    |
| Operating Temperature Range         | -40 ~ 85  | $^{\circ}\text{C}$   |
| Thermal Resistance, $R_{\theta JA}$ | 157       | $^{\circ}\text{C/W}$ |

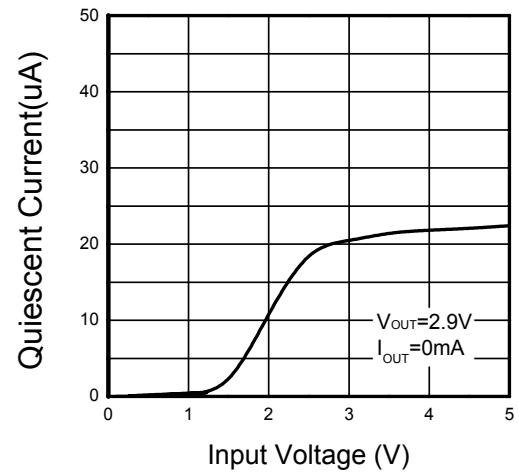
**Electronics Characteristics** ( $V_{IN}=V_{OUT(NOM)}+1V$ ,  $C_{IN}=C_{OUT}=1\mu F$ ,  $V_{EN} = 1.2 V$ . Typical values are at  $T_a = +25^{\circ}C$ , unless otherwise noted)

| Parameter                          | Symbol            | Condition                                                                            |                                      | Min. | Typ.   | Max. | Unit        |
|------------------------------------|-------------------|--------------------------------------------------------------------------------------|--------------------------------------|------|--------|------|-------------|
| Operating Input Voltage            | $V_{IN}$          |                                                                                      |                                      | 2.2  |        | 5.5  | V           |
| Output Voltage Accuracy            | $V_{OUT}$         | $V_{IN} = V_{OUT(NOM)} + 1 V$<br>$I_{OUT}=1mA$                                       |                                      | -2   |        | +2   | %           |
| Output Current Limit               | $I_{LIM}$         | $V_{OUT} = 90\% V_{OUT(NOM)}$                                                        |                                      | 250  |        |      | mA          |
| Dropout Voltage                    |                   | $V_{OUT}=2.9V_{(NOM)}$ , $I_{OUT}=250mA$                                             |                                      |      | 115    | 150  | mV          |
| Line Regulation                    | $\Delta V_{LINE}$ | $V_{IN}=2.2V\sim 5V$ , $I_{OUT}=1mA$                                                 |                                      |      | 0.1    |      | mV          |
| Load Regulation                    | $\Delta V_{Load}$ | $I_{OUT}=1\sim 200mA$                                                                |                                      |      | 15     |      | mV          |
| Quiescent Current                  | $I_Q$             | $I_{OUT}=0mA$                                                                        |                                      |      | 21     | 25   | $\mu A$     |
| Short Current                      | $I_{SHORT}$       | $V_{OUT}=0V$                                                                         |                                      |      | 390    |      | mA          |
| Shut-down Current                  | $I_{SHDN}$        | $V_{EN} = 0.4 V$ , $V_{IN} = 4.8 V$                                                  |                                      |      | 0.01   | 1.0  | $\mu A$     |
| Power Supply Rejection Rate        | PSRR              | $I_{OUT} = 10mA$                                                                     | $f=100Hz$                            |      | 96     |      | dB          |
|                                    |                   |                                                                                      | $f=1KHz$                             |      | 101    |      |             |
|                                    |                   |                                                                                      | $f=100KHz$                           |      | 60     |      |             |
|                                    |                   |                                                                                      | $f=1MHz$                             |      | 45     |      |             |
| EN logic high voltage              | $V_{ENH}$         | $V_{IN}=5.5V$ , $I_{OUT}=1mA$                                                        |                                      | 1.2  |        |      | V           |
| EN logic low voltage               | $V_{ENL}$         | $V_{IN}=5.5V$ , $V_{OUT}=0V$                                                         |                                      |      |        | 0.4  | V           |
| EN Input Current                   | $I_{EN}$          | $V_{EN} = 0$ to $5.5V$                                                               |                                      |      |        | 1    | $\mu A$     |
| Turn-On Time                       |                   | $C_{OUT} = 1\mu F$ , From assertion of $V_{EN}$ to $V_{OUT} = 95\% V_{OUT (NOM)}$    |                                      |      | 1.5    |      | mS          |
| Output Voltage Noise               | $e_{NO}$          | 10Hz to 100KHz,                                                                      | $I_{OUT} = 1mA$<br>$I_{OUT} = 200mA$ |      | 7<br>5 |      | $\mu VRMS$  |
| Thermal shutdown threshold         | $T_{SDH}$         | Temperature rising                                                                   |                                      |      | 150    |      | $^{\circ}C$ |
|                                    | $T_{SDL}$         | Temperature falling                                                                  |                                      |      | 120    |      | $^{\circ}C$ |
| Under voltage lock out threshold   | $V_{UVLO}$        |                                                                                      |                                      |      | 1.9    |      | V           |
| Active Output Discharge Resistance | $R_{LOW}$         | $V_{EN}<0.4V$                                                                        |                                      |      | 300    |      | $\Omega$    |
| Line Transient                     | $Tran_{LINE}$     | $V_{IN} = (V_{OUT(NOM)} + 2 V)$ to $(V_{OUT(NOM)} + 1 V)$ in 30 us, $I_{OUT} = 1 mA$ |                                      | -1   |        |      | mV          |
|                                    |                   | $V_{IN} = (V_{OUT(NOM)} + 1 V)$ to $(V_{OUT(NOM)} + 2 V)$ in 30 us, $I_{OUT} = 1 mA$ |                                      |      |        | +1   |             |
| Load Transient                     | $Tran_{LOAD}$     | $I_{OUT} = 1 mA$ to $200 mA$ in 10 us                                                |                                      | -10  |        |      | mV          |
|                                    |                   | $I_{OUT} = 200 mA$ to $1 mA$ in 10 us                                                |                                      |      |        | +10  |             |

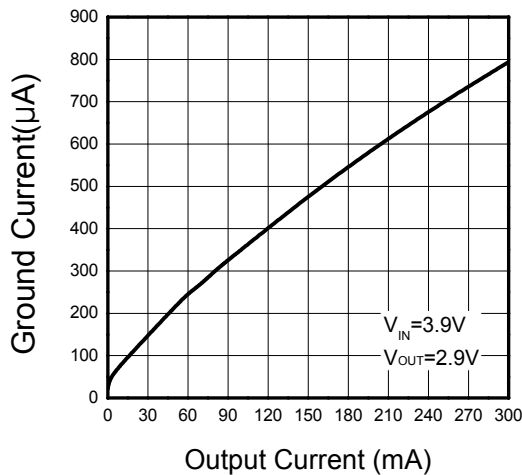
Typical characteristics ( $T_a=25^\circ\text{C}$ ,  $V_{IN}=V_{OUT}+1\text{ V}$ ,  $C_{IN}=C_{OUT}=1\mu\text{F}$ , unless otherwise noted)



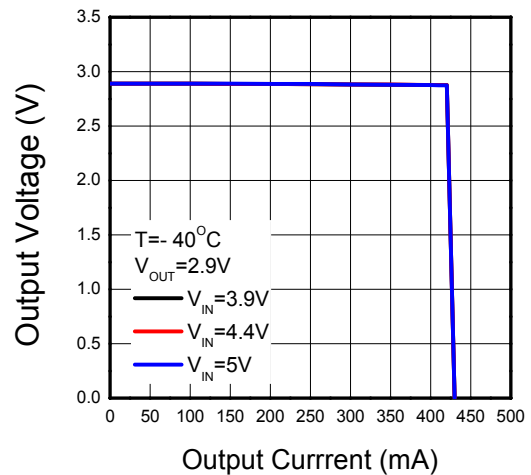
Output voltage vs. Supply voltage



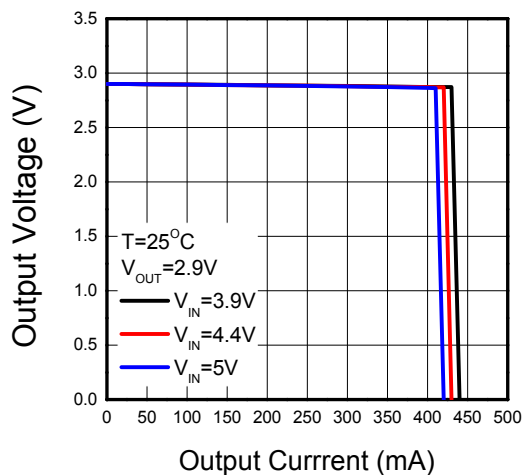
Input Voltage vs. Quiescent Current



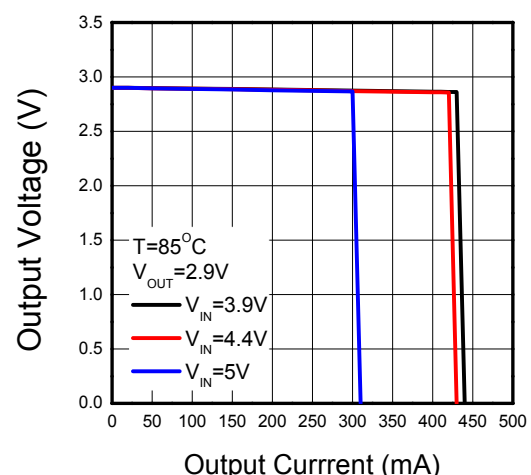
Ground Current vs. Output Current



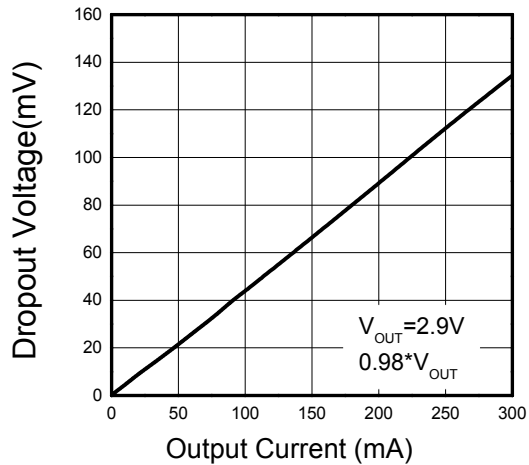
Output Voltage vs. Output Current



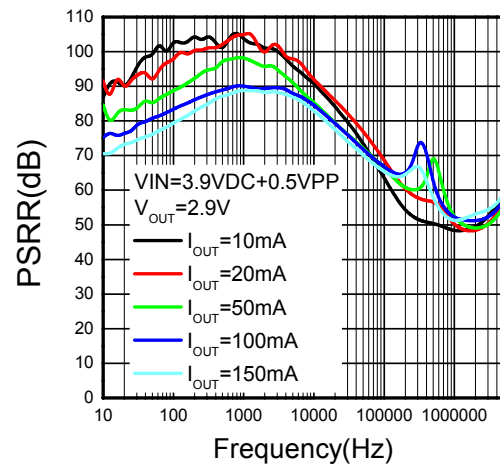
Output Voltage vs. Output Current



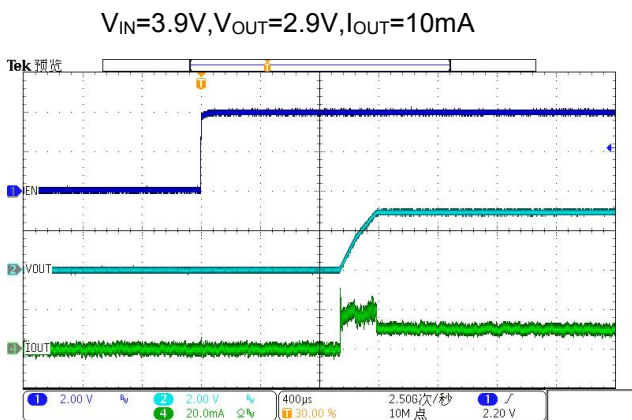
Output Voltage vs. Output Current



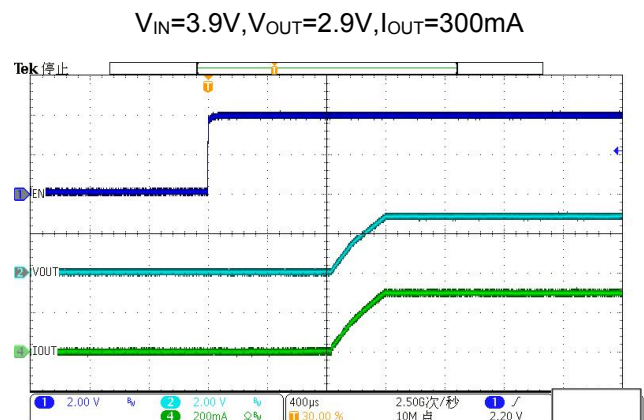
Output Voltage vs. Dropout Current



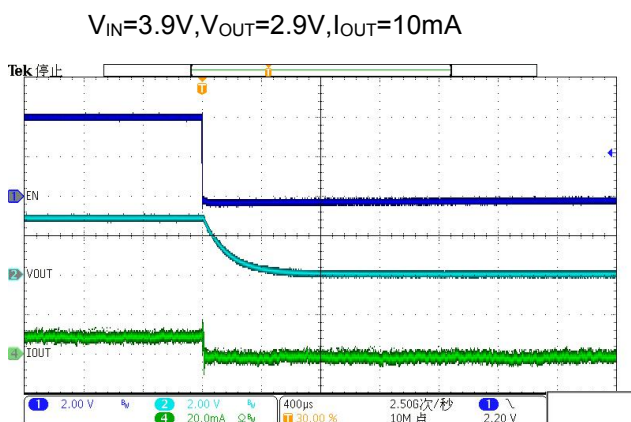
PSRR vs. Frequency



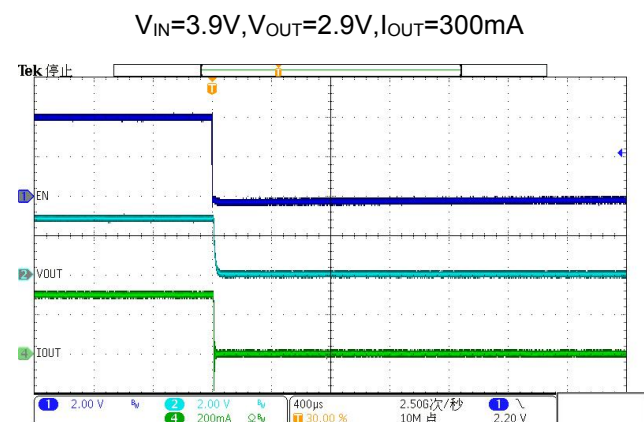
Soft-Start From EN



Soft-Start From EN

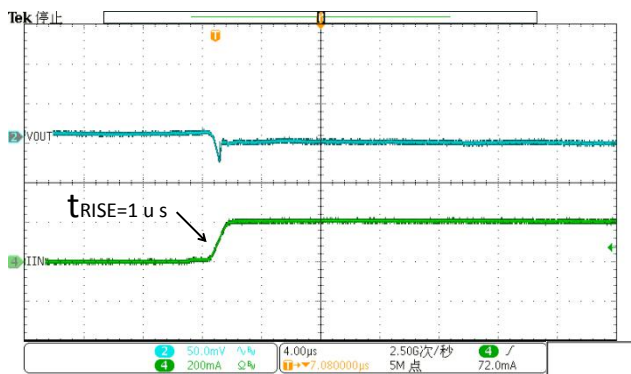


EN Shutdown



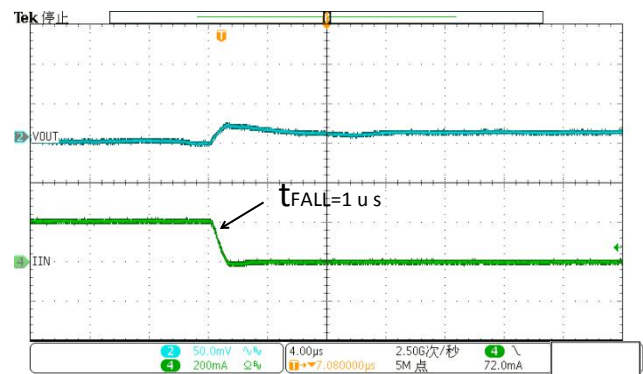
EN Shutdown

$V_{IN}=V_{EN}=3.9V, V_{OUT}=2.9V, I_{OUT}=1mA \sim 200mA$



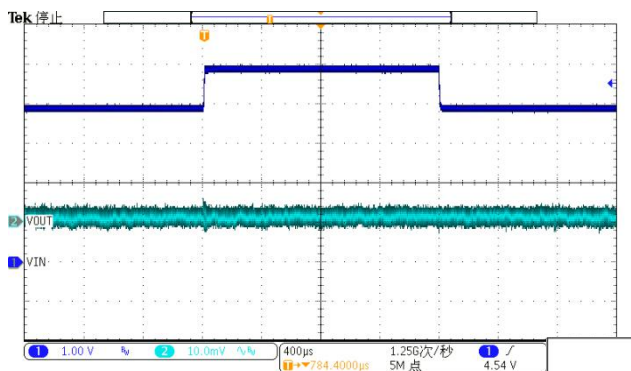
Load Transient Response

$V_{IN}=V_{EN}=3.9V, V_{OUT}=2.9V, I_{OUT}=200mA \sim 1mA$

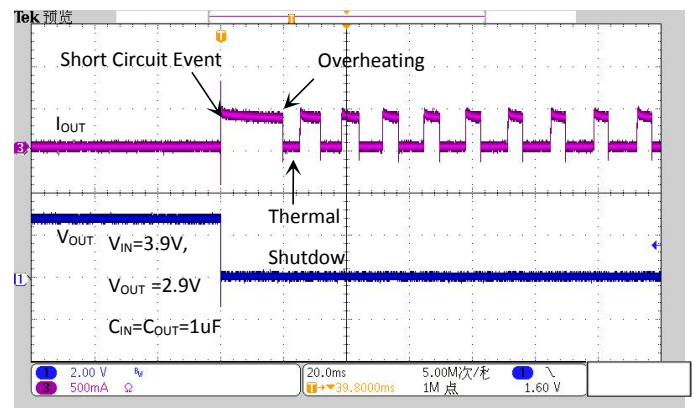


Load Transient Response

$V_{IN}=V_{EN}=3.9V \sim 4.9V, V_{OUT}=2.9V, I_{OUT}=1mA$



Line Transient Response



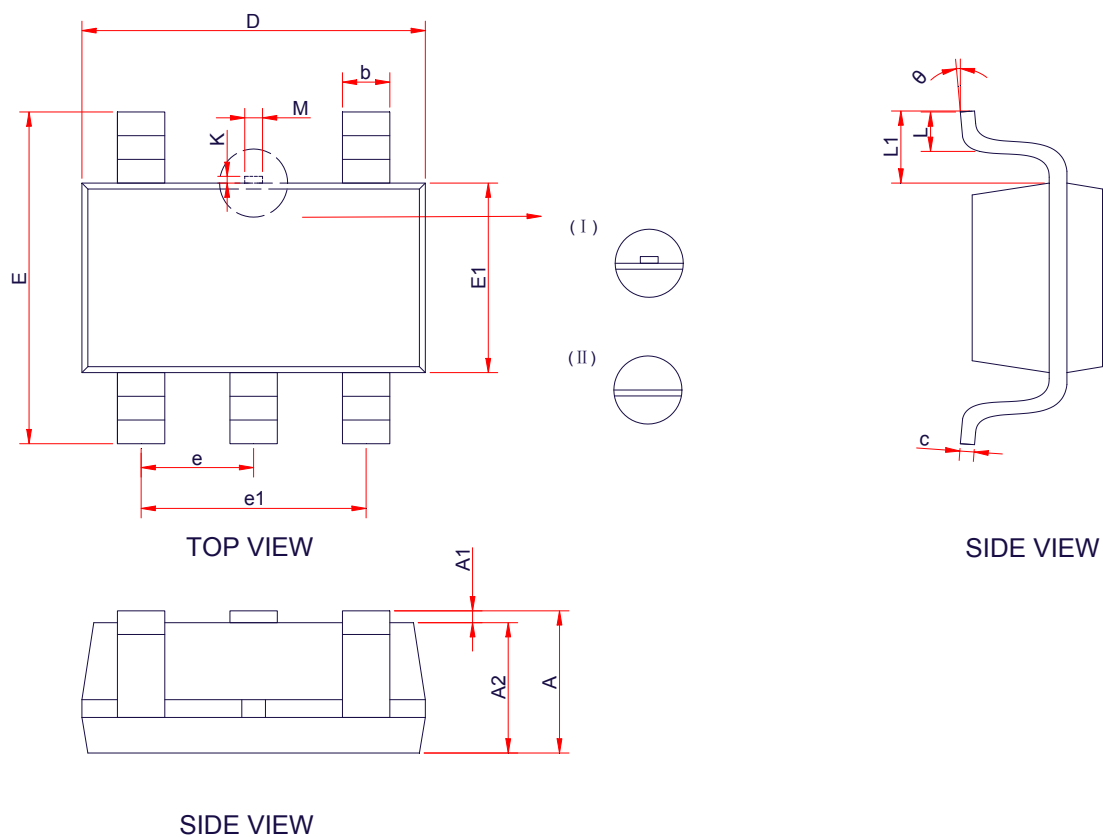
Short Circuit and Thermal Shutdown

## ORDER INFORMATION

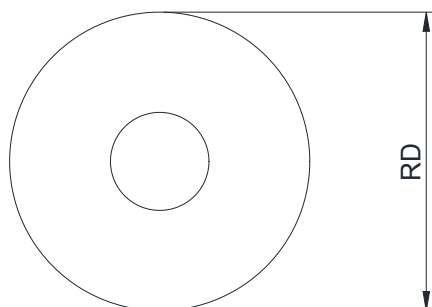
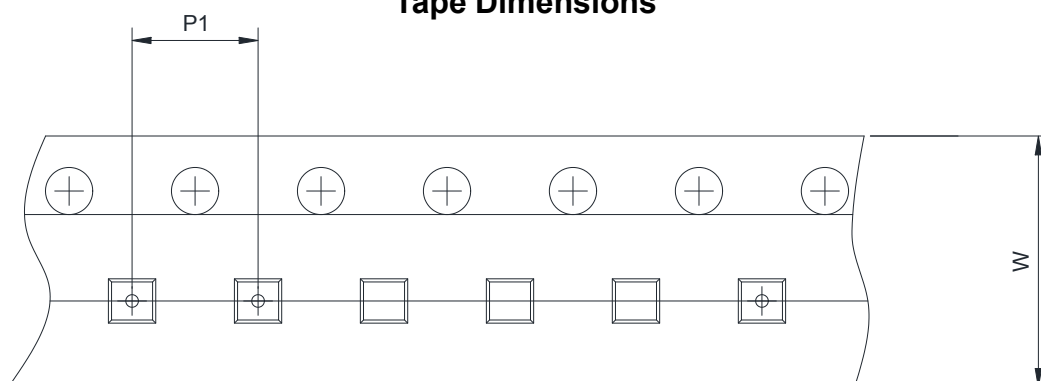
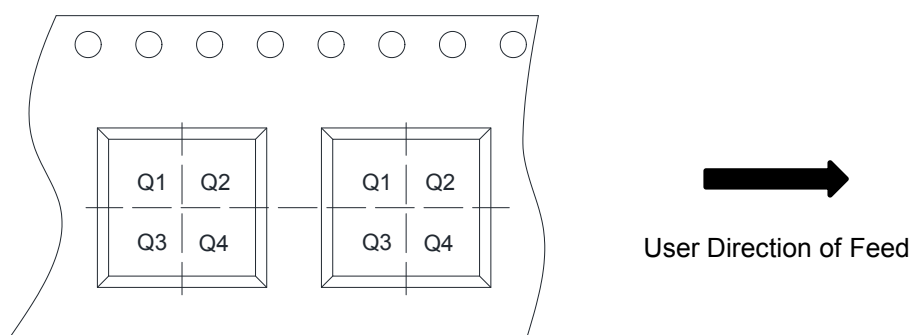
| Ordering No.   | V <sub>OUT</sub><br>(V) | Package | Operating<br>Temperature | Marking | Shipping               |
|----------------|-------------------------|---------|--------------------------|---------|------------------------|
| WL2863B29-5/TR | 2.9                     | SOT-353 | -40~+85°C                | AgYW    | Tape and Reel,<br>3000 |

### Marking

**A** : Device Code  
**\*** : Voltage Code  
**Y** : Year Code  
**W** : Week Code

**PACKAGE OUTLINE DIMENSIONS**
**SOT-353**


| Symbol | Dimensions in Millimeters |      |      |
|--------|---------------------------|------|------|
|        | Min.                      | Typ. | Max. |
| A      | 0.80                      | 0.95 | 1.10 |
| A1     | 0.00                      | -    | 0.10 |
| A2     | 0.80                      | 0.90 | 1.00 |
| b      | 0.15                      | 0.25 | 0.35 |
| c      | 0.08                      | -    | 0.20 |
| D      | 2.00                      | 2.10 | 2.20 |
| E1     | 1.15                      | 1.25 | 1.35 |
| E      | 2.15                      | 2.30 | 2.45 |
| e      | 0.65 Typ.                 |      |      |
| e1     | 1.20                      | 1.30 | 1.40 |
| L1     | 0.50 Ref.                 |      |      |
| L      | 0.26                      | 0.36 | 0.46 |
| M      | 0.10                      | 0.15 | 0.25 |
| K      | 0.00                      | -    | 0.25 |
| θ      | 0 °                       | -    | 14 ° |

**TAPE AND REEL INFORMATION**
**Reel Dimensions**

**Tape Dimensions**

**Quadrant Assignments For PIN1 Orientation In Tape**


|      |                                         |                                           |                                         |                                        |                             |
|------|-----------------------------------------|-------------------------------------------|-----------------------------------------|----------------------------------------|-----------------------------|
| RD   | Reel Dimension                          | <input checked="" type="checkbox"/> 7inch | <input type="checkbox"/> 13inch         |                                        |                             |
| W    | Overall width of the carrier tape       | <input checked="" type="checkbox"/> 8mm   | <input type="checkbox"/> 12mm           |                                        |                             |
| P1   | Pitch between successive cavity centers | <input type="checkbox"/> 2mm              | <input checked="" type="checkbox"/> 4mm | <input type="checkbox"/> 8mm           |                             |
| Pin1 | Pin1 Quadrant                           | <input type="checkbox"/> Q1               | <input type="checkbox"/> Q2             | <input checked="" type="checkbox"/> Q3 | <input type="checkbox"/> Q4 |