# SK6017 300mA, Low Consumption, CMOS LDO

## GENERAL DESCRIPTION

The SK6017 series are low dropout linear regulators and optimized to provide a high performance solution for battery power system to deliver low quiescent current. The devices offer a new level of cost effective performance in cellular phones, laptop and notebook computers, and other portable devices.

The SK6017 series are designed to make use of low cost ceramic capacitors which ensure the stability of the output current, and enhance the efficiency in order to prolong the battery life of those portable devices.

SK6017 can provide product selections of output value in the range of 1.2V~3.6V by every 0.1V step. The SK6017 regulators are available in SOT23-5L packages. Standard products are Pb-free and Halogen free products.
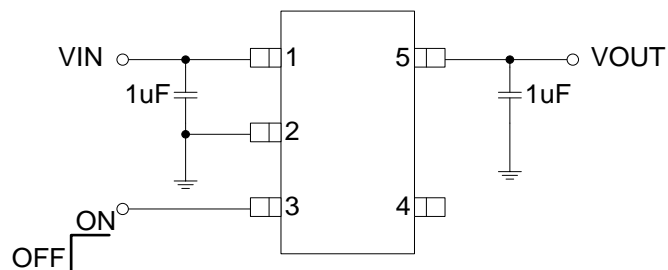
## FEATURES

- Input voltage : 2.5V~6.5V
- Output range: 1.2V~3.6V
  (customized by every 0.1V step)
- Output current: 300mA @ $V_{OUT}$>2V
- Dropout voltage: 100mV @ $I_{OUT}$=100mA
- Quiescent current : 1µA Typ.
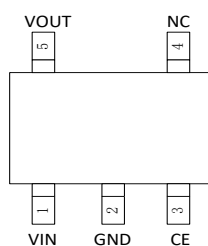- Shut-down current: < 0.1µA
- Recommend capacitor: 1µF

## APPLICATIONS

- Reference voltage source
- Toys
- Bluetooth, wireless handsets
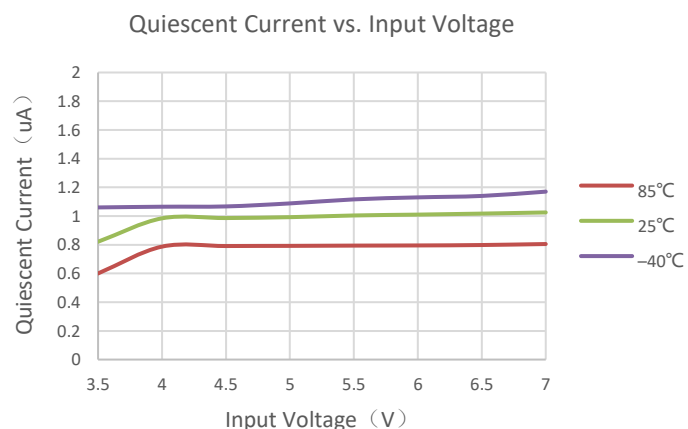- Others portable electronic device

## TYPICAL APPLICATION CIRCUIT



## PIN ASSIGNMENT



（**Top View**）

## TYPICAL PERFORMANCE



Quiescent Current vs. Input Voltage

## ORDER INFORMATION

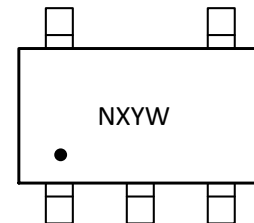| PART NO | ACCURACY | PACAKGE | TEMPERATURE | TAPE & REEL |
|---------|----------|---------|-------------|-------------|
| SK6017S5-XX | 2% | SOT23-5L | -40 ~ +85℃ | 3000/REEL |

*Note: XX indicates 1.2V~3.6V by 0.1V step. For example, 33 means product outputs 3.3V.*

## PART NUMBER RULES

**SK6017**①-②

| Code | Description |
|------|-------------|
| ① | Package:<br>S5: SOT23-5L |
| ② | Voltage version:<br>XX: 1.2V~3.6V by 0.1V step<br>Example:<br>33: 3.3V |

## MARKING DESCRIPTION:

NXYW

"N": product code, here use "F" stands for "SK6017".

"X": Voltage Code

"Y": Internal Control Code

"W": week of manufacturing. "A" stands for week 1,
  "Z" stands for week 26, "$\bar{A}$" stands for week
  27, "$\bar{Z}$" stands for week 52.

## PIN DESCRIPTION

| PIN NO<br>SOT23-5L | SYMBOL | I/O | DESCRIPTTION |
|---------|--------|-----|--------------|
| 1 | VIN | Power | Input |
| 2 | GND | Ground | Ground |
| 3 | CE | I | Chip Enable(Active high, do not float) |
| 4 | NC | / | Not Connected |
| 5 | VOUT | O | Output |

## ABSOLUTE MAXIMUM RATINGS (Note)

| SYMBOL | ITEMS | | VALUE | UNIT |
|--------|-------|--|-------|------|
| $V_{IN}$ | Input Voltage | | -0.3~8 | V |
| $I_{OUT}$ | Output Current | | 350 | mA |
| $P_{DMAX}$ | Power Dissipation | SOT23-5L | 0.3 | W |
| $T_J$ | Junction Temperature | | -40~125 | ℃ |
| $T_A$ | Ambient Temperature | | -40~85 | ℃ |
| $T_{STG}$ | Storage Temperature | | -55~150 | ℃ |
| $T_{SOLDER}$ | Package Lead Soldering Temperature | | 260℃, 10s | |

*Note: Exceed these limits to damage to the device. Exposure to absolute maximum rating conditions may affect device reliability.*

# RECOMMANDED OPERATING RANGE

| SYMBOL | ITEMS | VALUE | UNIT |
|---|---|---|---|
| $V_{IN}$ | $V_{IN}$ Supply Voltage | 2.5 to 6.5 | V |
| $I_{OUT}$ | Output Current | <300 | mA |
| $T_{OPT}$ | Operating Temperature | -40 to +85 | ℃ |

# ELECTRICAL CHARACTERISTICS

The following specifications apply for $V_{OUT}$=3.3V $T_A$=25℃, unless specified otherwise.

| SYMBOL | ITEMS | CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| $V_{IN}$ | Input Voltage | | | | 6.5 | V |
| $V_{OUT}$ | Output Range | $I_{OUT}$=1mA | -2 | $V_{OUT}$ | 2 | % |
| $I_Q$ | Quiescent Current | $V_{OUT}$=3.3V, $I_{OUT}$=0 | | 1 | 2 | µA |
| $I_{LIMIT}$ | Current Limit | $V_{IN}$=$V_{CE}$, $V_{IN}$=3.8V, $V_{OUT}$=3.3V | | 300 | | mA |
| $V_{DROP}$ | Dropout Voltage | $V_{OUT}$=3.3V, $I_{OUT}$=200mA | | 170 | 200 | mV |
| | | $V_{OUT}$=3.3V, $I_{OUT}$=250mA | | 250 | 300 | |
| $\triangle V_{LINE}$ | Line Regulation | $V_{IN}$=2.7~5.5V, $I_{OUT}$=1mA | | 0.01 | 0.15 | %/V |
| $\triangle V_{LOAD}$ | Load Regulation | $V_{OUT}$=2.8V, $I_{OUT}$=1~300mA | | 20 | 30 | mV |
| $I_{SHORT}$ | Short Current | $V_{CE}$=$V_{IN}$, $V_{OUT}$ Short to GND with 1Ω | | 90 | | mA |
| $I_{SHDN}$ | Shut-down Current | $V_{CE}$=0V | | 0.1 | 1 | µA |
| $V_{CEH}$ | CE Logic High Voltage | $V_{IN}$=5.5V, $I_{OUT}$=1mA | 1.2 | | $V_{IN}$ | V |
| $V_{CEL}$ | CE Logic Low Voltage | $V_{IN}$=5.5V, $V_{OUT}$=0V | | | 0.4 | V |
| $I_{CE}$ | CE Input Current | $V_{CE}$= 0 to 5.5V | | | 1.0 | µA |

# SIMPLIFIED BLOCK DIAGRAM
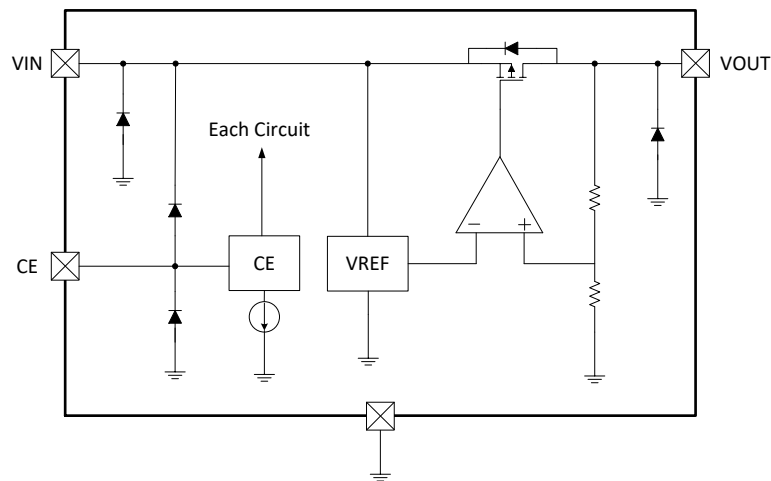
# TYPICAL PERFORMANCE CHARACTERISTICS

$C_{IN}$=1uF, $C_{OUT}$=1uF, $T_{OPT}$=25℃, $V_{IN}$=5V, $V_{OUT}$=3.3V

### Line Regulation
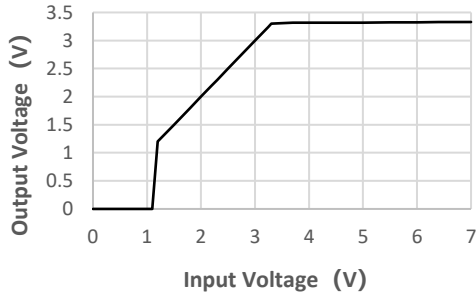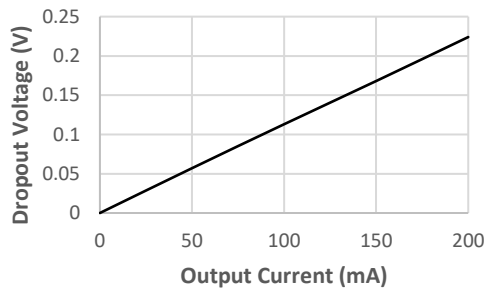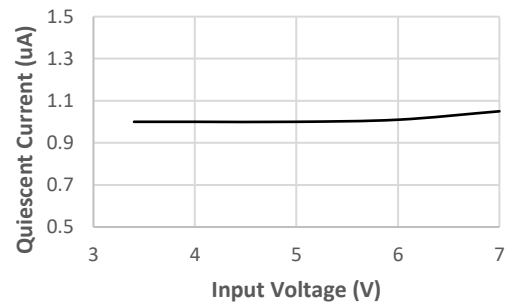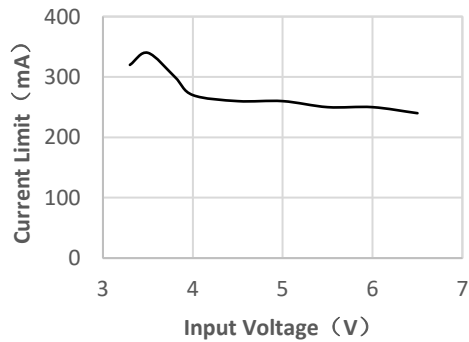
### Load Regulation
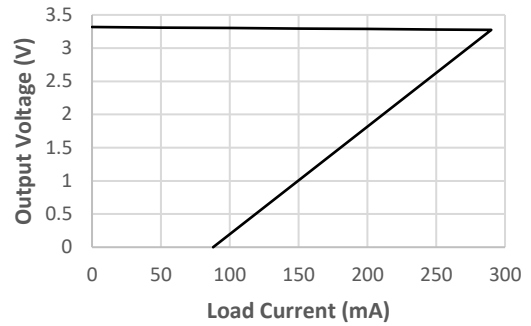
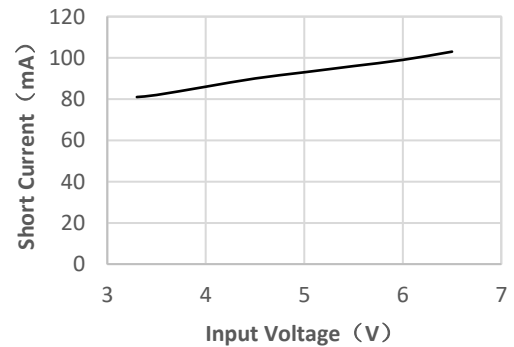### Dropout Voltage vs. Output Current
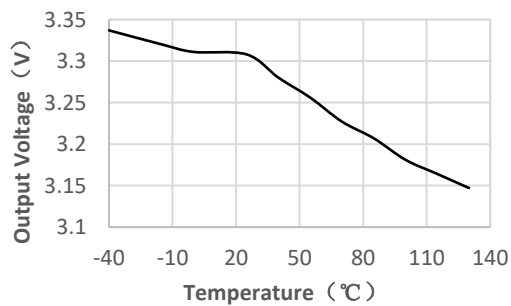
### Quiescent Current vs. Input Voltage

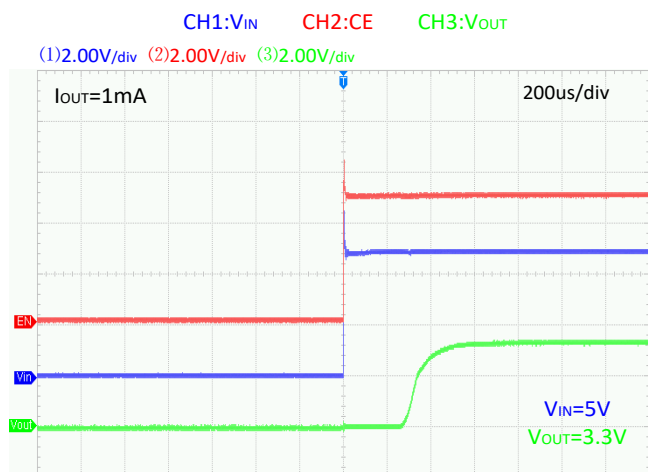### Current Limit vs. Input Voltage

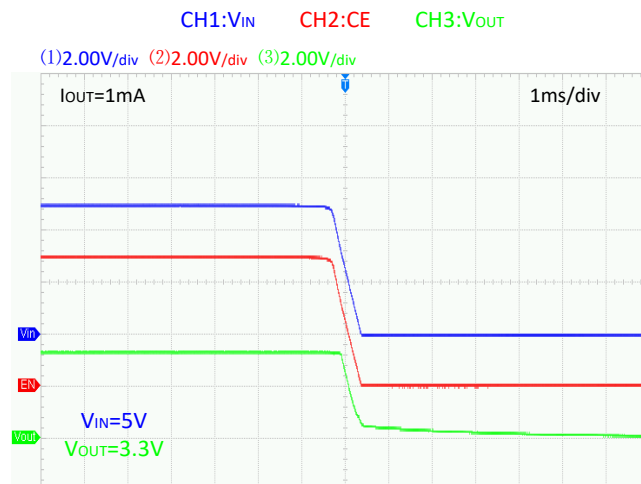### Short Current vs. Input Voltage

### Output Voltage vs. Temperature

## Power ON/OFF：

### $V_{IN}$、CE 同时上电



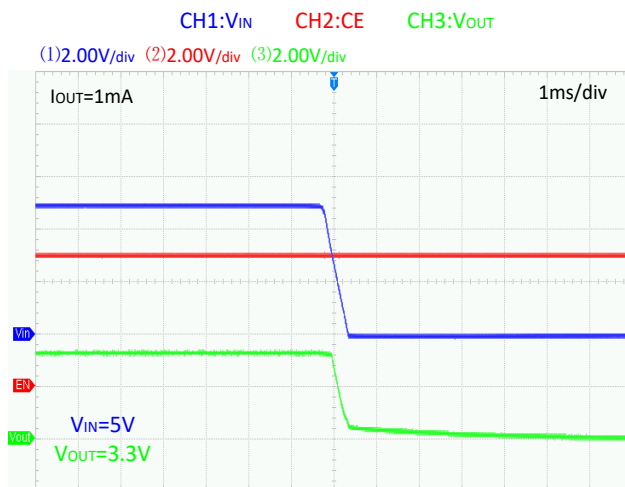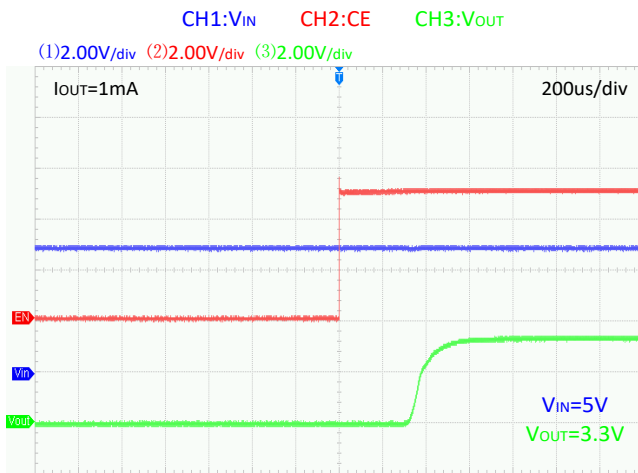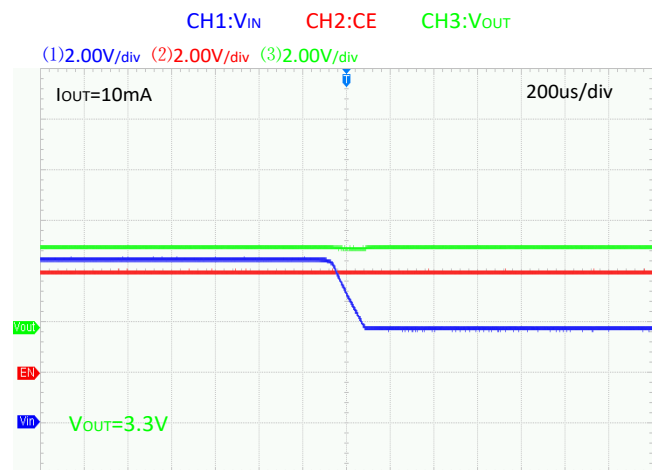### $V_{IN}$、CE 同时下电



### $V_{IN}$ 上电



### $V_{IN}$ 下电

CE 上电

CH1:V$_{IN}$   CH2:CE   CH3:V$_{OUT}$

(1)2.00V/div  (2)2.00V/div  (3)2.00V/div

I$_{OUT}$=1mA                          200us/div

EN

Vin

Vout

V$_{IN}$=5V
V$_{OUT}$=3.3V

CE 下电

CH1:V$_{IN}$   CH2:CE   CH3:V$_{OUT}$

(1)2.00V/div  (2)2.00V/div  (3)2.00V/div

I$_{OUT}$=1mA                          1ms/div

Vin

EN

Vout

V$_{IN}$=5V
V$_{OUT}$=3.3V
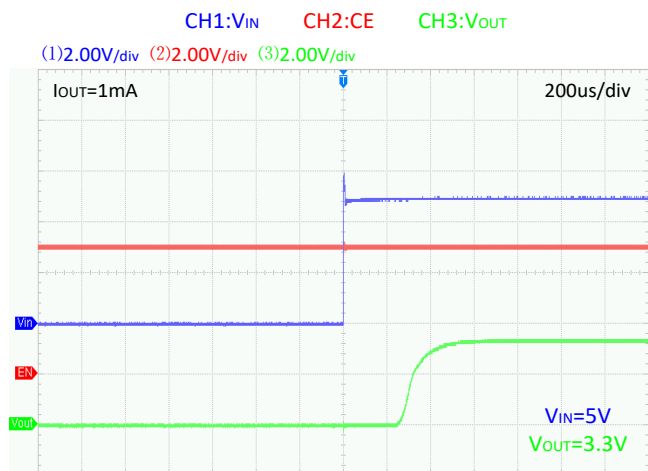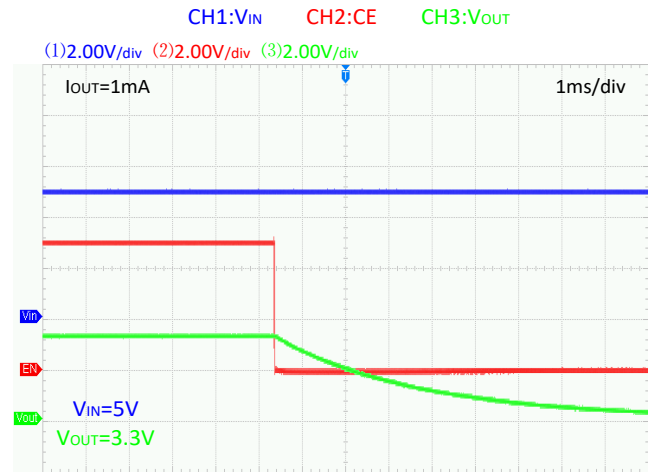
**Line transient response：**

V$_{IN}$=4V to 6.5V

CH1:V$_{IN}$   CH2:CE   CH3:V$_{OUT}$

(1)2.00V/div  (2)2.00V/div  (3)2.00V/div

I$_{OUT}$=10mA                         200us/div

Vout

EN

Vin   V$_{OUT}$=3.3V

V$_{IN}$=6.5V to 4V

CH1:V$_{IN}$   CH2:CE   CH3:V$_{OUT}$

(1)2.00V/div  (2)2.00V/div  (3)2.00V/div

I$_{OUT}$=10mA                         200us/div

Vout

EN
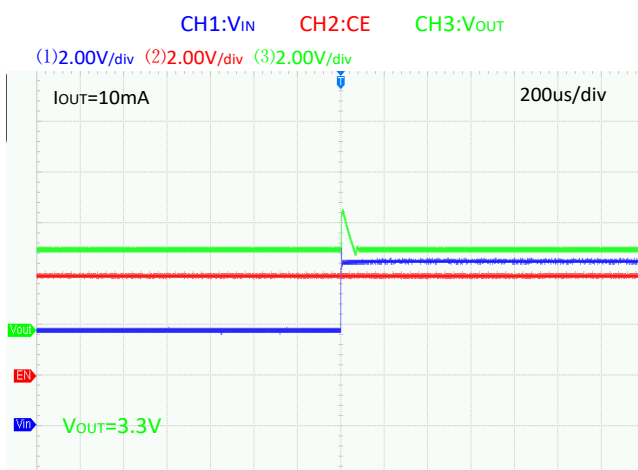
Vin   V$_{OUT}$=3.3V

## Load transient response：
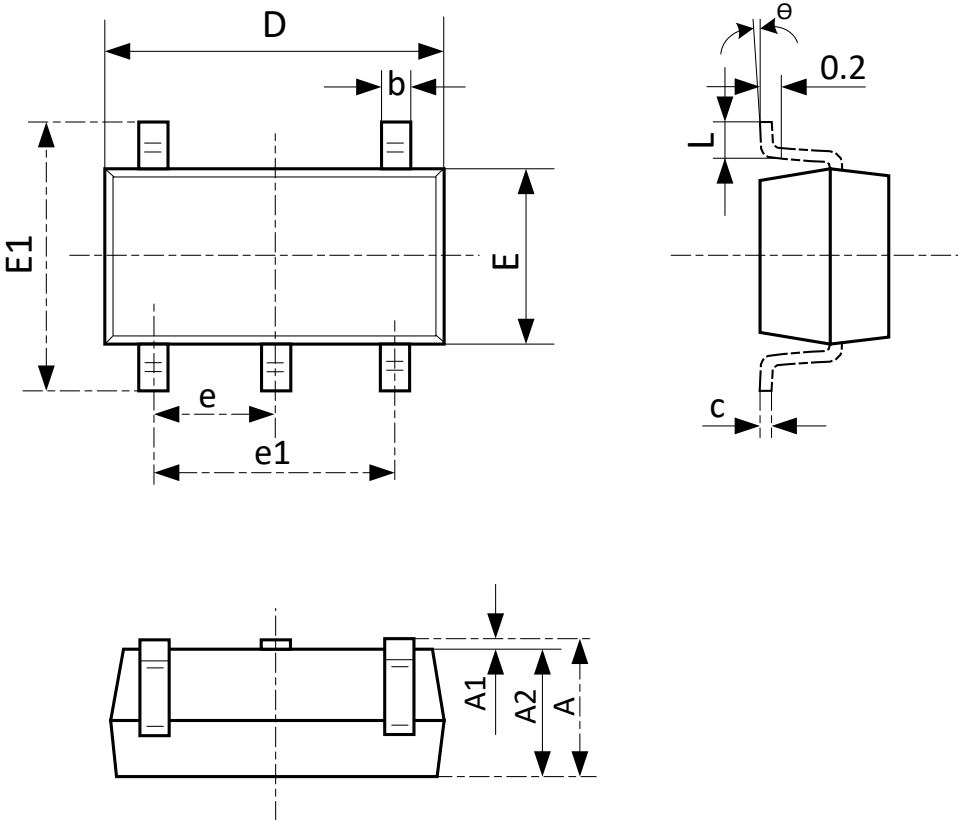
$I_{OUT}$=50mA to 200mA
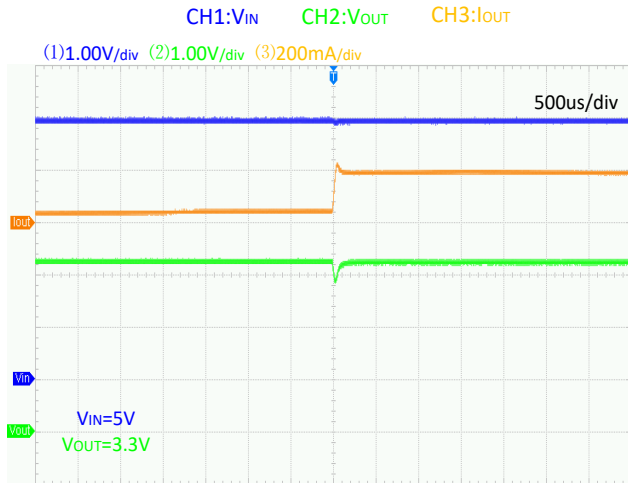


$I_{OUT}$=200mA to 50mA
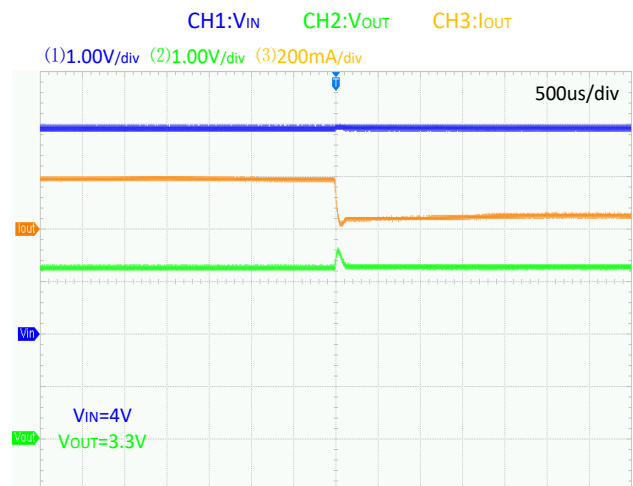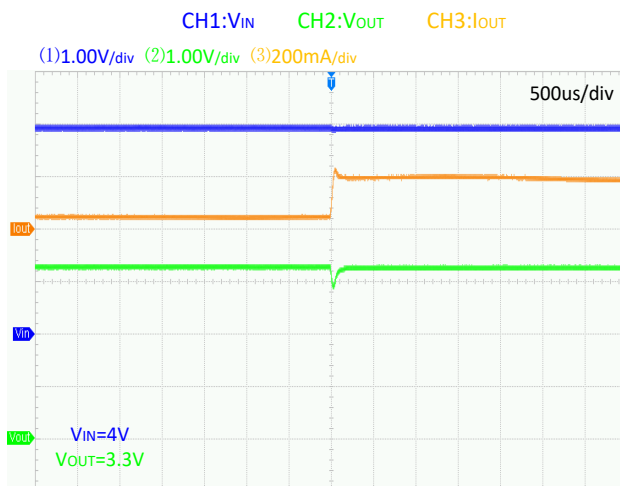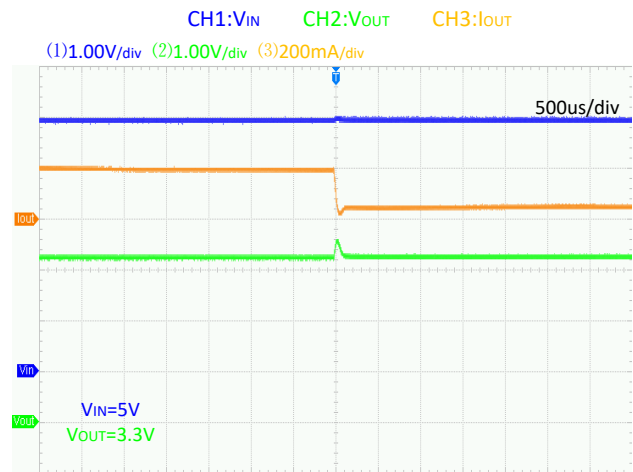
## PACKAGE OUTLINE

| Package | SOT23-5L | Devices per reel | 3000Pcs | Unit | mm |
|---------|----------|------------------|---------|------|-----|

Package Dimension：



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|------|------|------|------|
| | Min | Max | Min | Max |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E | 1.500 | 1.700 | 0.059 | 0.067 |
| E1 | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0℃ | 8℃ | 0℃ | 8℃ |

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