

GENERAL DESCRIPTION

The HP6017 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 HP6017 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.

HP6017 can provide product selections of output value in the range of 1.2V~3.6V by every 0.1V step. The HP6017 regulators are available in SOT23-5L packages. Standard products are Pb-free and Halogen free products.

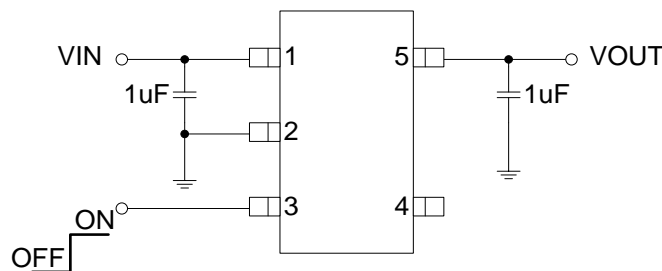
FEATURES

- 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 : 1 μ A Typ.
- Shut-down current: < 0.1 μ A
- Recommend capacitor: 1 μ F

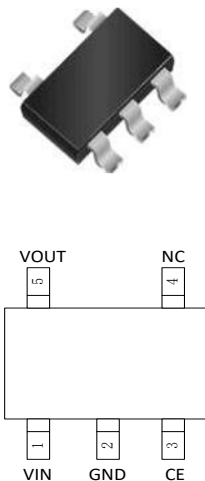
APPLICATIONS

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

TYPICAL APPLICATION CIRCUIT

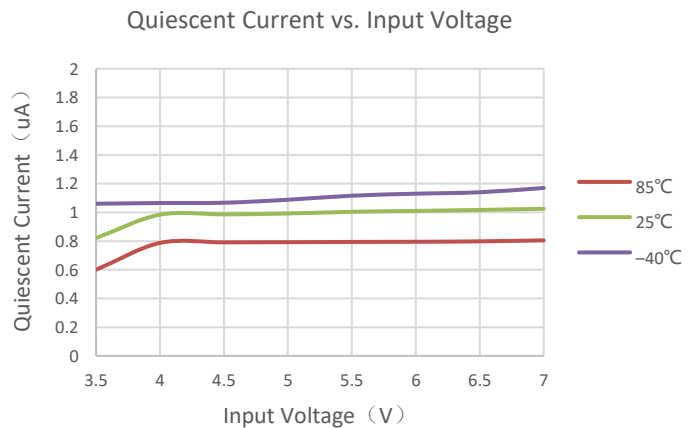


PIN ASSIGNMENT



(Top View)

TYPICAL PERFORMANCE



ORDER INFORMATION

| PART NO | ACCURACY | PACAKGE | TEMPERATURE | TAPE & REEL |
|-------------|----------|----------|-------------|-------------|
| HP6017S5-XX | 2% | SOT23-5L | -40 ~ +85°C | 3000/REEL |

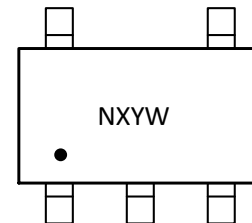
Note: XX indicates 1.2V~3.6V by 0.1V step. For example, 33 means product outputs 3.3V.

PART NUMBER RULES

HP6017 [1] - [2]

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

MARKING DESCRIPTION:



“N”: product code, here use “F” stands for “HP6017”.

“X”: Internal Control Code

“Y”: Internal Control Code

“W”: week of manufacturing. “A” stands for week 1,

“Z” stands for week 26, “Ā” stands for week

27, “Z̄” stands for week 52.

PIN DESCRIPTION

| PIN NO | SYMBOL | I/O | DESCRIPTION |
|----------|--------|--------|--|
| SOT23-5L | | | |
| 1 | VIN | Power | Input |
| 2 | GND | Ground | Ground |
| 3 | CE | I | Chip Enable(Active high, do not float) |
| 4 | NC | / | Not Connected |
| 5 | VOOUT | 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 | °C |
| T _A | Ambient Temperature | -40~85 | °C |
| T _{STG} | Storage Temperature | -55~150 | °C |
| T _{SOLDER} | Package Lead Soldering Temperature | 260°C, 10s | |

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

RECOMMENDED OPERATING RANGE

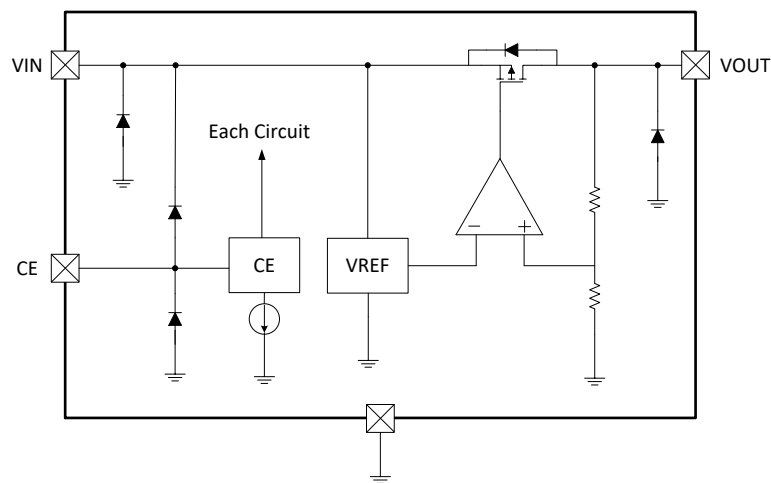
| SYMBOL | ITEMS | VALUE | UNIT |
|-----------|-------------------------|------------|------|
| V_{IN} | V_{IN} Supply Voltage | 2.5 to 6.5 | V |
| I_{OUT} | Output Current | <300 | mA |
| T_{OPT} | Operating Temperature | -40 to +85 | °C |

ELECTRICAL CHARACTERISTICS

The following specifications apply for $V_{OUT}=3.3V$ $T_A=25^{\circ}C$, 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 | |
| ΔV_{LINE} | Line Regulation | $V_{IN}=2.7\sim 5.5V, I_{OUT}=1mA$ | | 0.01 | 0.15 | %/V |
| ΔV_{LOAD} | Load Regulation | $V_{OUT}=2.8V, I_{OUT}=1\sim 300mA$ | | 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 |

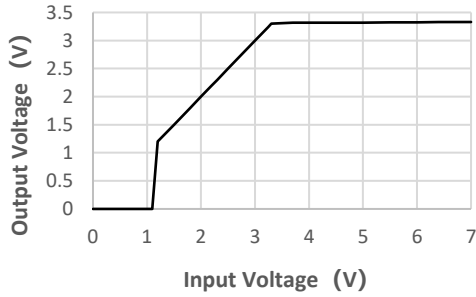
SIMPLIFIED BLOCK DIAGRAM



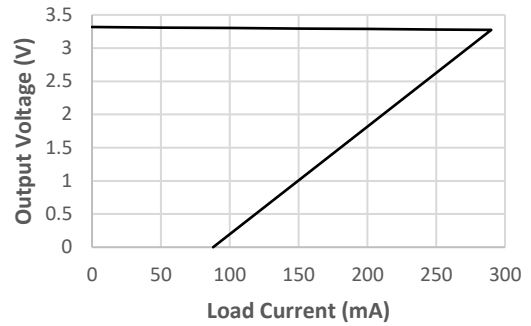
TYPICAL PERFORMANCE CHARACTERISTICS

$C_{IN}=1\mu F$, $C_{OUT}=1\mu F$, $T_{OPT}=25^{\circ}C$, $V_{IN}=5V$, $V_{OUT}=3.3V$

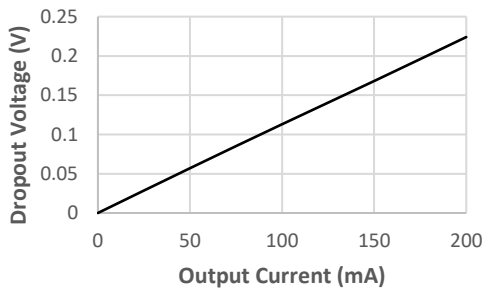
Line Regulation



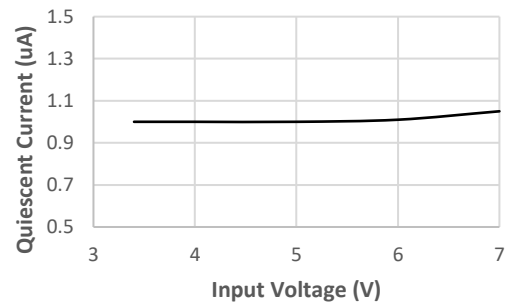
Load Regulation



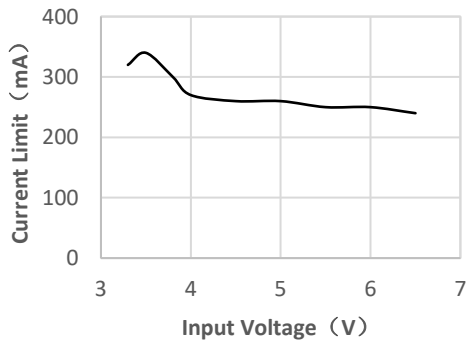
Dropout Voltage vs. Output Current



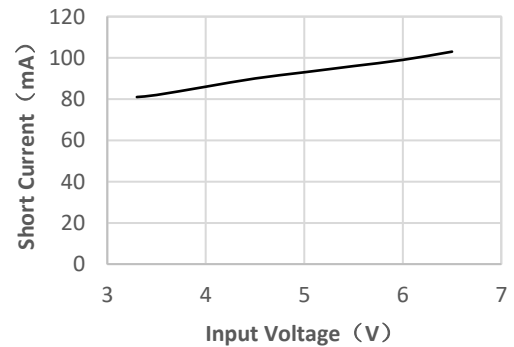
Quiescent Current vs. Input Voltage



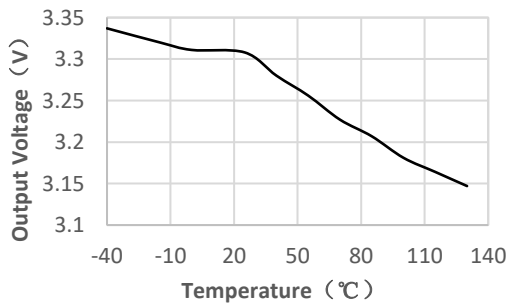
Current Limit vs. Input Voltage



Short Current vs. Input Voltage



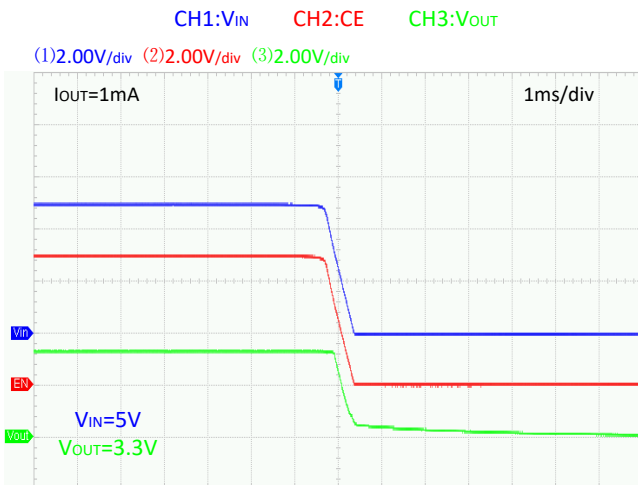
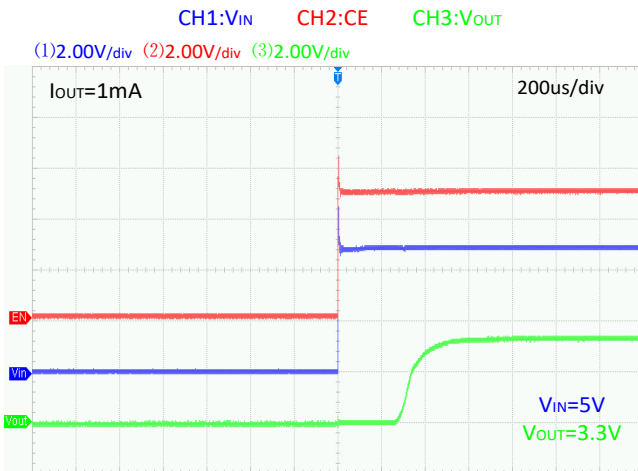
Output Voltage vs. Temperature



Power ON/OFF:

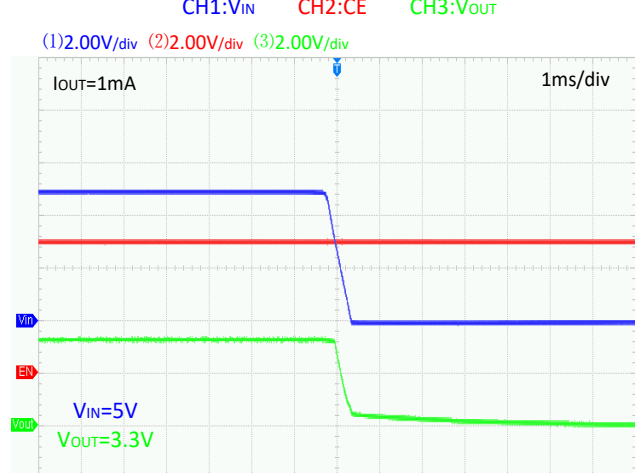
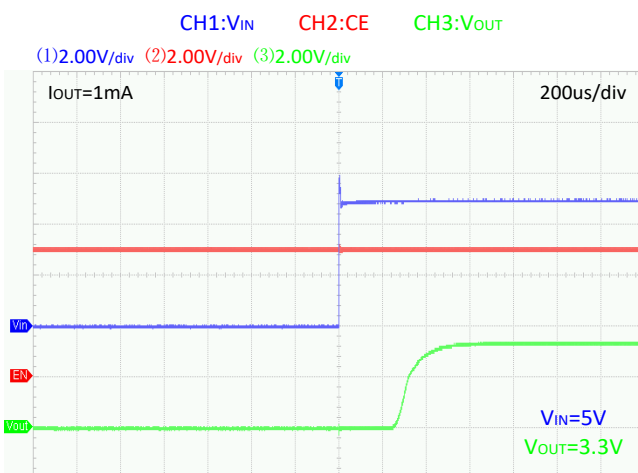
V_{IN} 、CE 同时上电

V_{IN} 、CE 同时下电



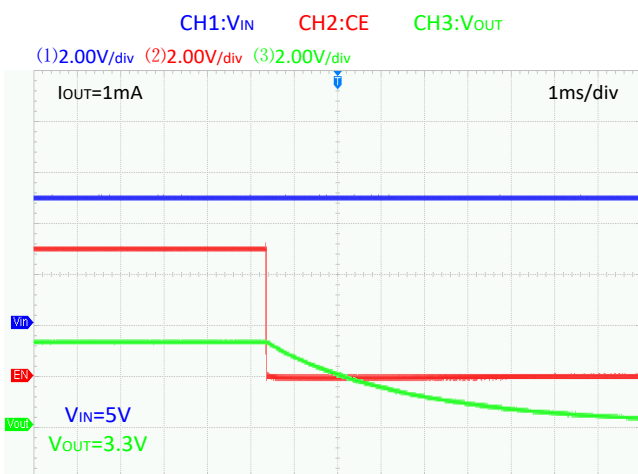
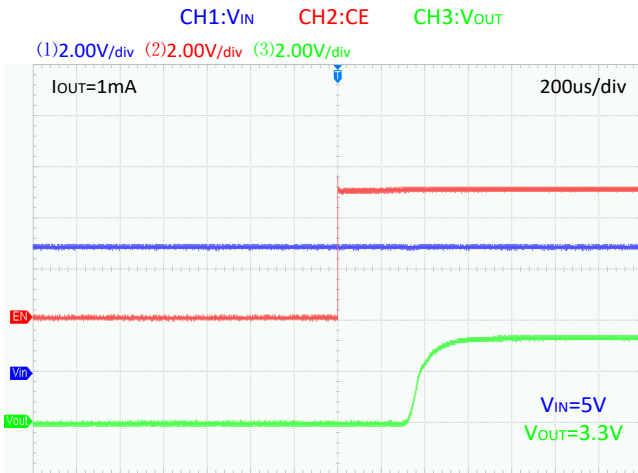
V_{IN} 上电

V_{IN} 下电



CE 上电

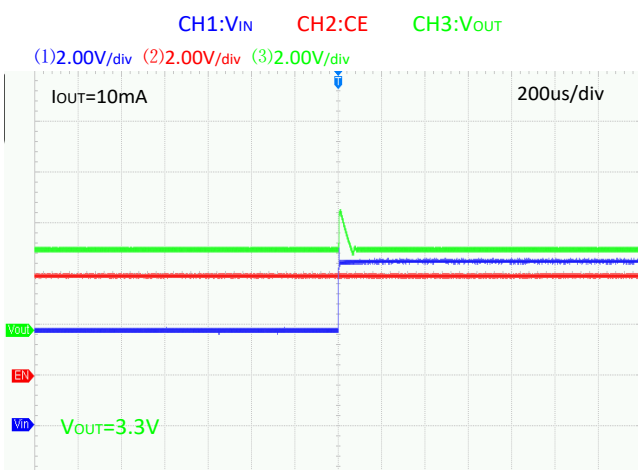
CE 下电

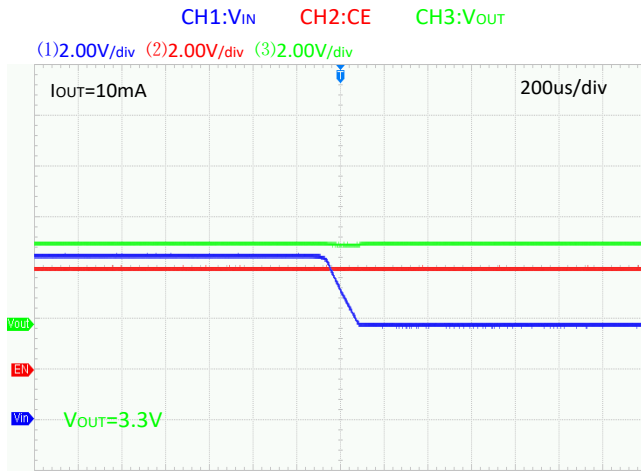


Line transient response:

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

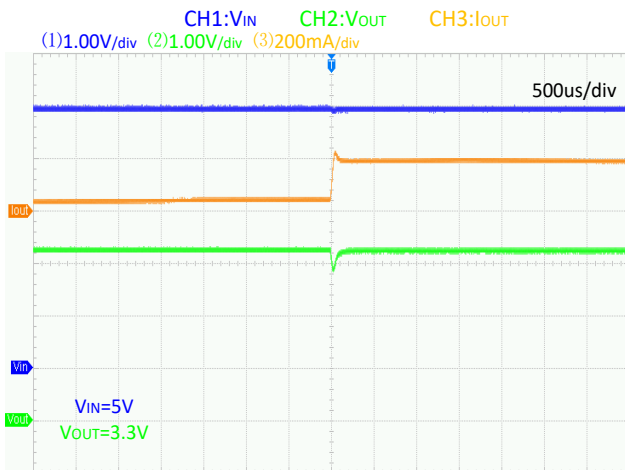
$V_{IN}=6.5V$ to 4V



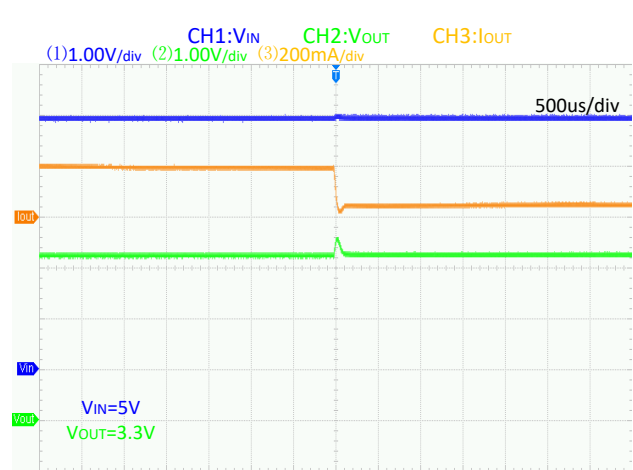


Load transient response:

$I_{OUT}=50mA$ to 200mA

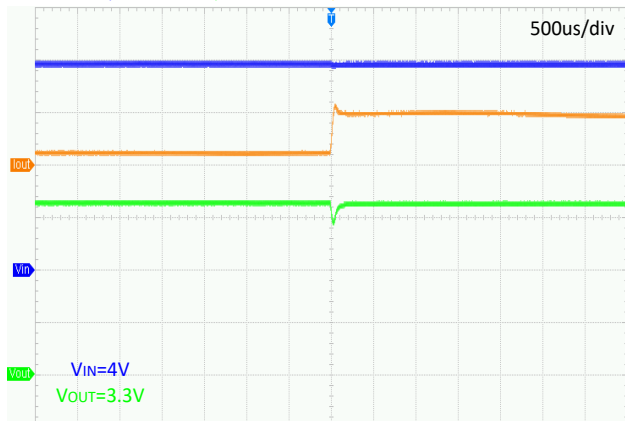


$I_{OUT}=200mA$ to 50mA



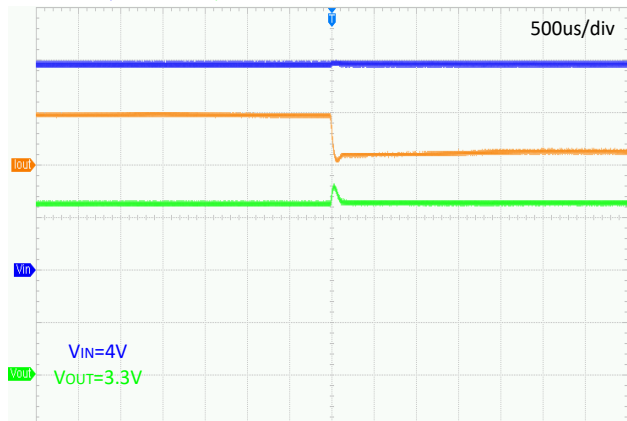
CH1:VIN CH2:Vout CH3:Iout

(1)1.00V/div (2)1.00V/div (3)200mA/div



CH1:VIN CH2:Vout CH3:Iout

(1)1.00V/div (2)1.00V/div (3)200mA/div



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°C | 8°C | 0°C | 8°C | |

REVISION HISTORY

| Version No. | Date | Description |
|-------------|------------|--|
| Preliminary | 2017-06-05 | - Initial preliminary release |
| Version 1.0 | 2017-06-15 | - Update ordering information |
| Version 1.1 | 2018-02-12 | - Update marking description |
| Version 1.2 | 2018-07-31 | - Remove 1% accuracy version and change PN rules |
| Version 1.3 | 2019-12-02 | - Update marking description |