

### GENERAL DESCRIPTION

BL8071 series are a group of positive voltage output, high precise, and low power consumption voltage regulator. Voltages are selectable in 100mV steps within a range of 1.2V to 5.0V. It also can be customized on command.

BL8071 series have excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within  $\pm 2\%$ .

BL8071 series are available in SOT-223 package, which are lead (Pb)- free.

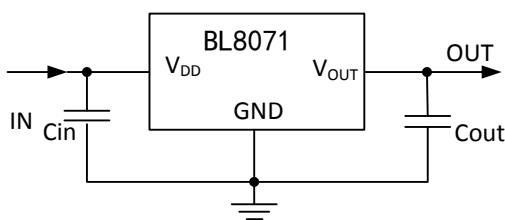
### FEATURES

- Low Quiescent Current: 100uA at 5V
- High PSRR: 70dB range to 1KHz
- Low Output Noise: 44uVRMS
- Low Dropout: 300mV at 1A load
- Maximum output current: 1.5A
- Highly Accurate:  $\pm 2\%$
- Low ESR Ceramic Capacitor Compatible

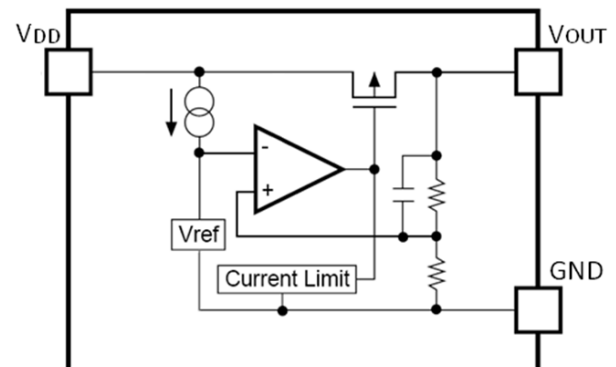
### APPLICATIONS

- Reference Voltage Source
- Battery Powered Equipment
- PC Peripherals
- Wireless Devices
- Instrumentation

### TYPICAL APPLICATION



### BLOCK DIAGRAM



## ORDERING INFORMATION

BL8071 ①②③④⑤

| Code | Description   |
|------|---|
| ①    | Temperature&Rohs:<br>C:-40~85°C ,Pb Free Rohs Std.                    |
| ②    | Package type:<br>LA: SOT-223 (A)<br>LB: SOT-223 (B)                   |
| ③    | Packing type:<br>TR:Tape&Reel (Standard)                              |
| ④    | Output voltage:<br>e.g. 12=1.2V 18=1.8V<br>25=2.5V 33=3.3V<br>50=5.0V |
| ⑤    | Voltage accuracy:<br>1=±1%(Customized)<br>Blank(default)=±2%          |

## PIN CONFIGURATION

| Product Classification |                      | BL8071CLATR□□ |
|------------------------|----------------------|---------------|
| JBXX<br>LLBYW          | JB:Product Code      |               |
|                        | XX:Output Voltage    |               |
|                        | A: A type            |               |
|                        | LL:LOT NO.           |               |
|                        | B:FAB Code           |               |
| YW:Date Code           |                      |               |
| Product Classification |                      | BL8071CLBTR□□ |
| JBXX<br>LLBYW          | JB:Product Code      |               |
|                        | XX:Output Voltage    |               |
|                        | B: B type            |               |
|                        | LL:LOT NO.           |               |
|                        | B:FAB Code           |               |
| YW:Date Code           |                      |               |
| VDD                    | Supply Voltage Input |               |
| GND                    | Ground Pin           |               |
| VOUT                   | Output Voltage       |               |

## ABSOLUTE MAXIMUM RATING

| Parameter  |         | Value         |
|--|---------|---------------|
| Max Input Voltage                                    |         | 8V            |
| Max Operating Junction Temperature (T <sub>J</sub> ) |         | 145°C         |
| Ambient Temperature (T <sub>A</sub> )                |         | -40°C~85°C    |
| Package Thermal Resistance                           | SOT-223 | 20°C / W      |
| Storage Temperature (T <sub>S</sub> )                |         | -40°C~150°C   |
| Lead Temperature & Time                              |         | 260°C, 10 Sec |

Y: The Year of manufacturing, "1" stands for year 2011, "2" stands for year 2012, and "8" stands for year 2018.  
W: The week of manufacturing. "A" stands for week 1, "Z" stands for week 26, "A" stands for week 27, "Z" stands for week 52.

## RECOMMENDED WORK CONDITIONS

| Parameter  | Value      |
|--|------------|
| Input Voltage Range                              | Max. 6V    |
| Ambient Temperature                              | -40°C~85°C |
| Operating Junction Temperature (T <sub>J</sub> ) | 125°C      |

## ELECTRICAL CHARACTERISTICS

Test Conditions:  $C_{IN}=4.7\mu F, C_{OUT}=4.7\mu F, T_A=25^\circ C$ , unless otherwise specified.

| Symbol   | Parameter                              | Conditions   | Min   | Typ       | Max                   | Units           |
|--|--|--|---|-----------|-----------------------|-----------------|
| $V_{DD}$   | Input Voltage                          |  | 1.5*  |           | 6                     | V               |
| $V_{OUT}$  | Output Voltage                         | $V_{OUT}>1.5$  | $V_{DD}=\text{Set } V_{OUT}+1V$<br>$1mA \leq I_{OUT} \leq 10mA$ | $V_{OUT}$ | $V_{OUT} \times 1.02$ | V               |
|  |  | $V_{OUT} \leq 1.5$   |   |           | $V_{OUT} - 0.03$      |                 |
| $I_{OUT} (\text{Max.})^{**}$                         | Maximum Output Current                 | $V_{DD}-V_{OUT}=1V$  | 1.5   |           |                       | A               |
| $V_{DROP}$   | Dropout Voltage                        | $V_{OUT} = 3.3V, I_{OUT}=1A$   |   | 300       | 500                   | mV              |
| $\frac{\Delta V_{out}}{\Delta V_{in} \cdot V_{out}}$ | Line Regulation                        | $I_{OUT}=10mA, 4V \leq V_{DD} \leq 6V$                               |   | 0.05      | 0.2                   | %/V             |
| $\Delta V_{out}$                                     | Load Regulation                        | $V_{DD}=\text{Set } V_{OUT}+1V$<br>$1mA \leq I_{OUT} \leq 2.5A$      |   | 30        | 60                    | mV              |
| $I_s$  | Supply Current                         | $V_{DD}=\text{Set } V_{OUT}+1V, V_{OUT}$ Floating                    |   | 100       | 150                   | $\mu A$         |
| $\frac{\Delta V_{out}}{\Delta T \cdot V_{out}}$      | Output Voltage Temperature Coefficient | $I_{OUT}=10mA$   |   | $\pm 100$ |                       | ppm/ $^\circ C$ |
| PSRR   | Ripple Rejection                       | $f=100Hz, \text{Ripple}=0.5Vp-p,$<br>$V_{DD}=\text{Set } V_{OUT}+1V$ |   | 70        |                       | dB              |
| en   | Output Noise                           | $BW=10Hz \sim 100KHz$  |   | 44        |                       | $\mu V_{rms}$   |

**Note:** \* $I_{out}=500mA @ V_{out}=1.2V$

\*\*The maximum power rating of each package is a constant, so along with the change of  $I_{LOAD}$ , the  $V_{DD}-V_{OUT}$  should be controlled to a certain range to ensure the normal operation.

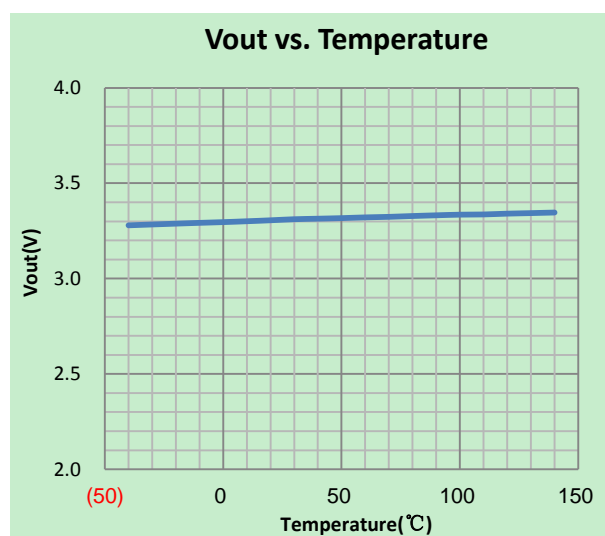
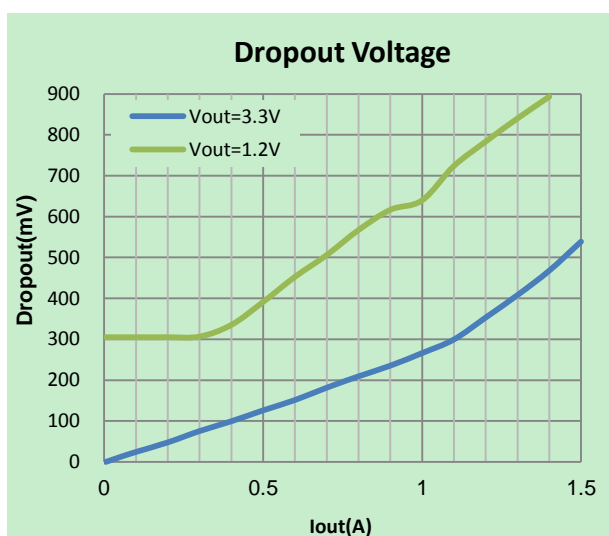
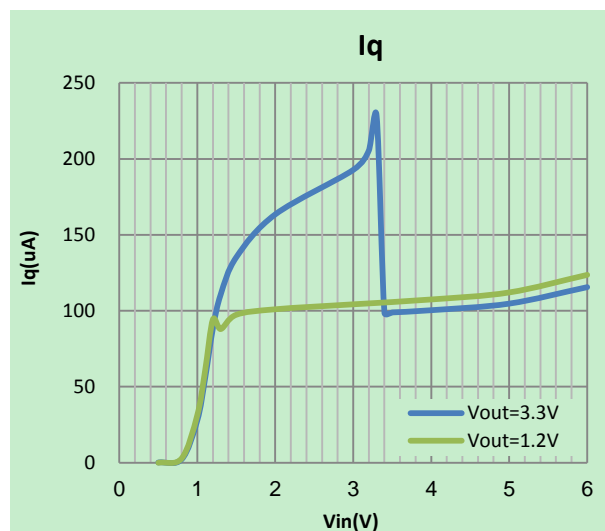
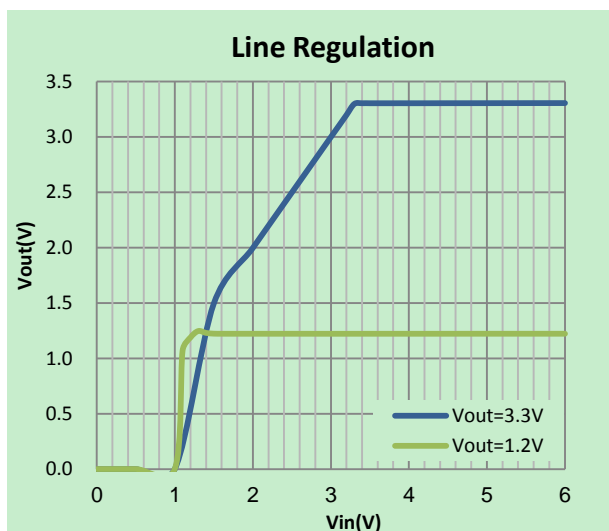
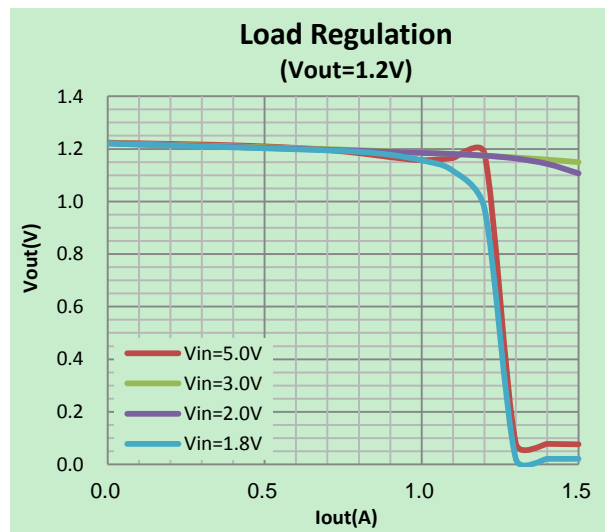
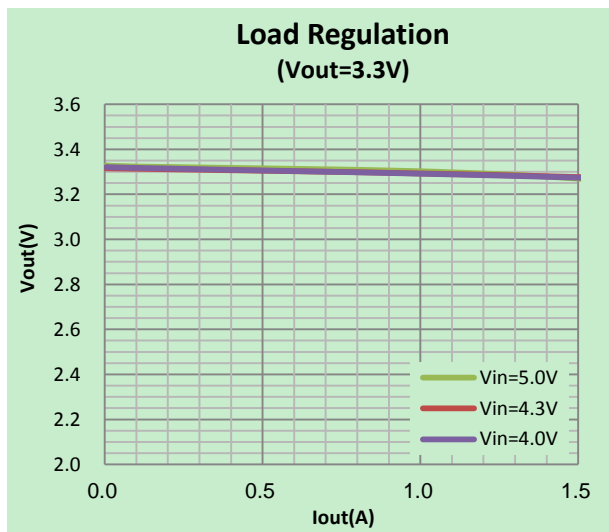
## THERMAL CONSIDERATIONS

We have to take heat dissipation into great consideration when output current or differential voltage of input and output voltage is large. Because in such cases, the power dissipation consumed by BL8071 is very large. BL8071 series uses SOT-223 package type and its thermal resistance is about  $20^\circ C/W$ . And the copper area of application board can affect the total thermal resistance. If copper area is  $5cm \times 5cm$  (two sides), the resistance is about  $30^\circ C/W$ . So the total thermal resistance is about  $20^\circ C/W + 30^\circ C/W$ . In this case, the power dissipation should be limited less than 1.2W. We can decrease total thermal resistance by increasing copper area in application board. When there is no good heat dissipation copper are in PCB, the total thermal resistance will be as high as  $120^\circ C/W$ , then the power dissipation of BL8071 could allow on itself is less than 1W. And furthermore, BL8071 will work at junction temperature higher than  $125^\circ C$  under such condition and no lifetime is guaranteed.

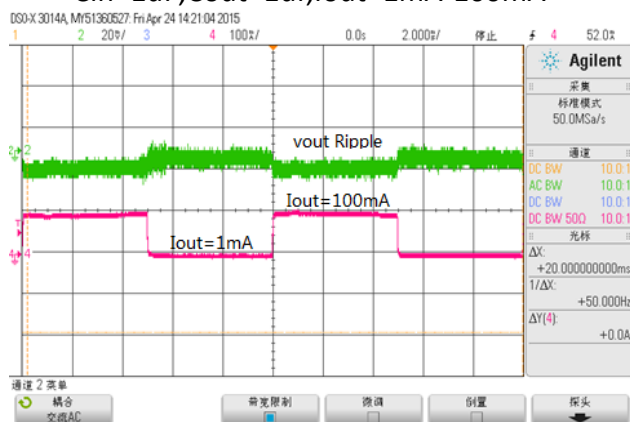
## CURRENT LIMIT MODE

Current Limit module can keep chip and power system away from danger when load current is too large. When  $V_{out}$  decrease the Short Circuit Current will fold back to a small value.

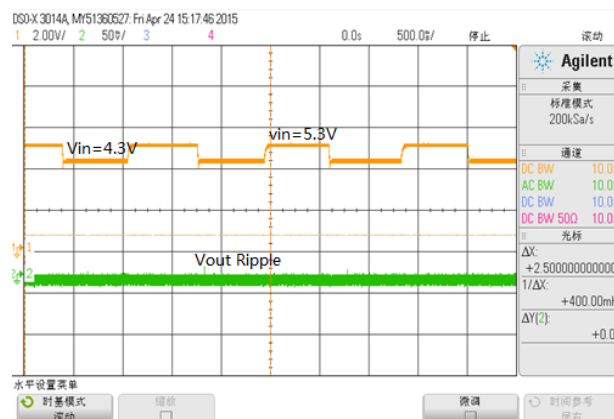
## TYPICAL PERFORMANCE CHARACTERISTICS



## Load Transient Response (Vin=5V, Vout=3.3V) Cin=1uF, Cout=1uF, Iout=1mA-100mA



## Line Transient Response (Vin=5V, Vout=3.3V) Cin=1uF, Cout=1uF, Iout=10mA, Vin=4.3V-5.3V



## PACKAGE LINE

| Package | SOT-223 | Devices per reel | 2500Pcs | Unit | mm |
|---------|---------|------------------|---------|------|----|
|---------|---------|------------------|---------|------|----|

Package specification:

SECTION C-C

SECTION D-D

COMMON DIMENSIONS  
(UNITS OF MEASURE=MILLIMETER)

| SYMBOL  | MIN     | NOM  | MAX  |
|---------|---------|------|------|
| A       | -       | -    | 1.80 |
| A1      | 0.02    | -    | 0.10 |
| A2      | 1.50    | 1.60 | 1.70 |
| A3      | 0.80    | 0.90 | 1.00 |
| b       | 0.67    | -    | 0.80 |
| b1      | 0.66    | 0.71 | 0.76 |
| b2      | 2.96    | -    | 3.09 |
| b3      | 2.95    | 3.00 | 3.05 |
| c       | 0.30    | -    | 0.35 |
| c1      | 0.29    | 0.30 | 0.31 |
| D       | 6.48    | 6.53 | 6.58 |
| D1      | 6.55    | 6.60 | 6.65 |
| D2      | -       | -    | 7.05 |
| E       | 6.80    | -    | 7.20 |
| E1      | 3.40    | 3.50 | 3.60 |
| E2      | 3.33    | 3.43 | 3.53 |
| e       | 2.30BSC |      |      |
| e1      | 4.60BSC |      |      |
| L       | 0.80    | 1.00 | 1.20 |
| L1      | 1.75REF |      |      |
| L2      | 0.25BSC |      |      |
| R       | 0.10    | -    | -    |
| R1      | 0.10    | -    | -    |
| theta   | 0°      | -    | 8°   |
| theta 1 | 10°     | 12°  | 14°  |

NOTES:  
ALL DIMENSIONS REFER TO JEDEC STANDARD TO261-AA