上海贝岭
SHANGHAI BELLING

BL8071

1.5A Linear Regulator

DESCRIPTION

The BL8071 is a positive voltage output, high precision, low power consumption regulator. The output voltage is selectable in 100mV steps from 1.2V to 5.0V. It also can be customized on command.

The BL8071 has 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 ±2%.

The BL8071 is available in SOT-223 package, which is lead(Pb)-free.

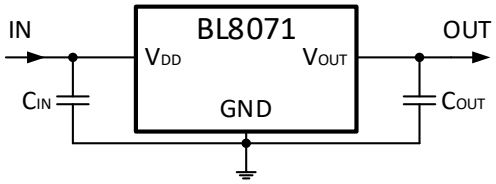
FEATURES

- 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: ±2%
- Low ESR ceramic capacitor compatible

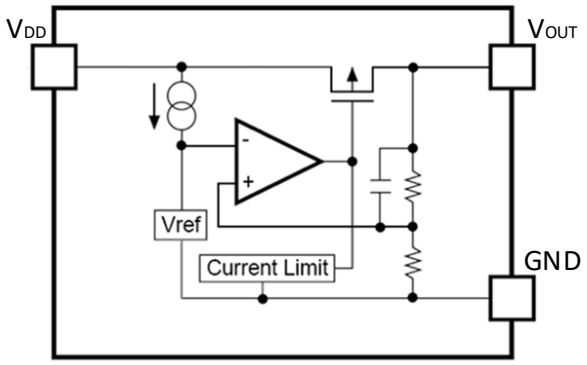
APPLICATIONS

- Reference voltage source
- Battery powered equipment
- PC peripherals
- Wireless devices
- Instrumentation

TYPICAL APPLICATION



BLOCK DIAGRAM



ORDERING INFORMATION

BL8071 1 2 3 4 5

Code	Description
1	Temperature&Rohs: C: -40~85°C, Pb Free Rohs Std.
2	Package type: LA: SOT-223 (A) LB: SOT-223 (B)
3	Packing type: TR: Tape&Reel (Standard)
4	Output voltage: e.g., 12=1.2V 15=1.5V 18=1.8V 25=2.5V 33=3.3V 50=5.0V
5	Voltage accuracy: 1=±1% (Customized) Blank (default)=±2%

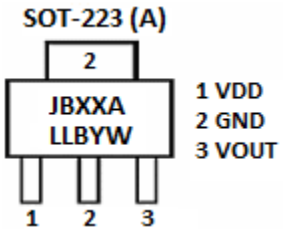
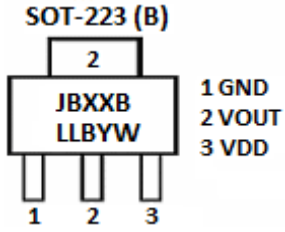
ABSOLUTE MAXIMUM RATING

Parameter		Value
Max input voltage		8V
Max operating junction temperature (T_J)		145°C
Ambient temperature (T_A)		-40°C to 85°C
Power dissipation	SOT-223	1W
Package thermal resistance (θ_{JC})	SOT-223	20°C/W
Package thermal resistance (θ_{JA})	SOT-223	60°C/W
Storage temperature (T_S)		-40°C to 150°C
Lead temperature & time		260°C, 10s

RECOMMENDED WORK CONDITIONS

Parameter	Value
Input voltage range	Max. 6V
Ambient temperature	-40°C to 85°C
Operating junction temperature (T_J)	-40°C to 125°C

PIN CONFIGURATION

Product classification		BL8071CLATR☐☐
JBXXA LLBYW	JB: Product code XX: Output voltage A: A type LL: Lot No. B: FAB code YW: Date code	
Product classification		BL8071CLBTR☐☐
JBXXB 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	
VOUT	Output voltage	

Y: The Year of manufacturing, "1" stands for year 20X1, "2" stands for year 20X2, and "8" stands for year 20X8. (X=0,1,2,…,9)

W: The 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.

The date code of the 53rd week is the same as that of the first week of the next year. For example, the date code of the 53rd week of 2017 is the same as that of the first week of 2018, which are 1801 and 8A.

ELECTRICAL CHARACTERISTICS

Test condition: C_{IN}=4.7uF, C_{OUT}=4.7uF, T_A=25°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}>1.5V	V_{DD}=Set V_{OUT}+1V 1mA≤I_{OUT}≤10mA	V_{OUT} X0.98	V_{OUT}	V_{OUT} X1.02	V
		V_{OUT}≤1.5V		V_{OUT} -0.03		V_{OUT} +0.03	
I_{OUT} (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
$\frac{\Delta Vout}{\Delta Vdd \cdot Vout}$	Line regulation		I_{OUT}=10mA Set V_{OUT}+1V≤V_{DD}≤6V		0.05	0.2	%/V
$\Delta Vout$	Load regulation		V_{DD}=Set V_{OUT}+1V 1mA≤I_{OUT}≤1.5A		30	60	mV
I_Q	Supply current		V_{DD}=Set V_{OUT}+1V, V_{OUT} Floating		100	150	uA
$\frac{\Delta Vout}{\Delta T \cdot Vout}$	Output voltage temperature coefficient		I_{OUT}=10mA		±100		ppm/°C
PSRR	Ripple rejection		f=100Hz, Ripple=0.5Vp-p, V_{DD}=Set V_{OUT}+1V		70		dB
V_N	Output noise		BW=10Hz~100KHz		44		uVrms

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 the output current or the voltage difference between the input and output voltages is large. Because in such cases, the power dissipation consumed by BL8071 is very large. The BL8071 uses SOT-223 package type with a thermal resistance of about 20°C/W. The copper area of the application board can affect the total thermal resistance. If the copper area is 5cm*5cm (two sides), the resistance is about 30°C/W. So the total thermal resistance is about 20°C/W + 30°C/W. In this case, the power dissipation should be limited to less than 1.2W. We can decrease the total thermal resistance by increasing the copper area in the application board. When there is no good heat dissipation copper in the PCB, the total thermal resistance will be as high as 120°C/W, then the power dissipation allowed by BL8071 is less than 1W. Moreover, when BL8071 works at junction temperature higher than 125°C under such condition, no lifetime is guaranteed.

CURRENT LIMIT MODE

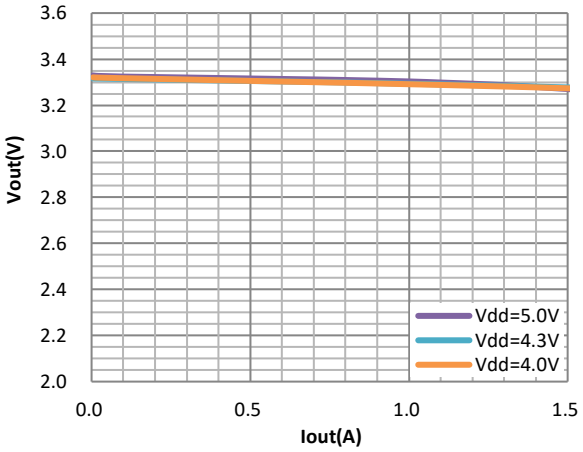
The current limit module can keep chip and power system away from danger when the load current is higher than the current limit threshold. When Vout decreases, the short circuit current will fold back to a small value.

SHORT CIRCUIT PROTECTION

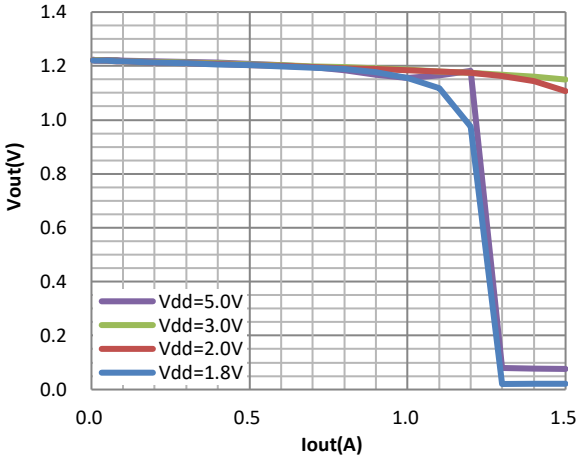
When Vout is shorted to GND, the short circuit protection will be triggered and clamp the output current to approximately 400mA. This feature protects the regulator from damage due to overcurrent and overheating.

TYPICAL PERFORMANCE CHARACTERISTICS

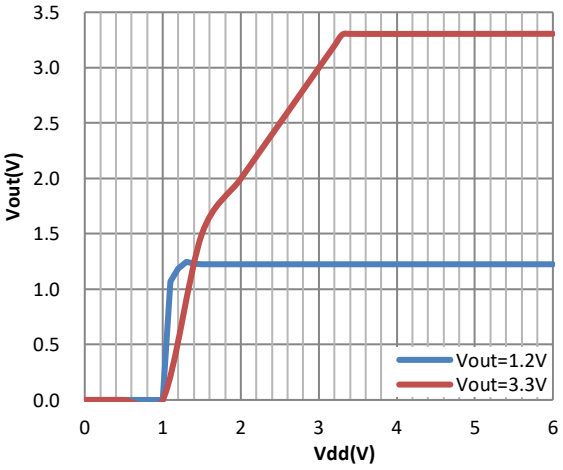
Load Regulation (Vout=3.3V)



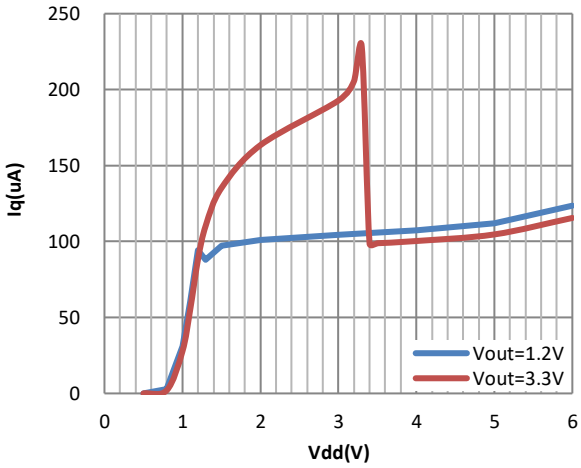
Load Regulation (Vout=1.2V)



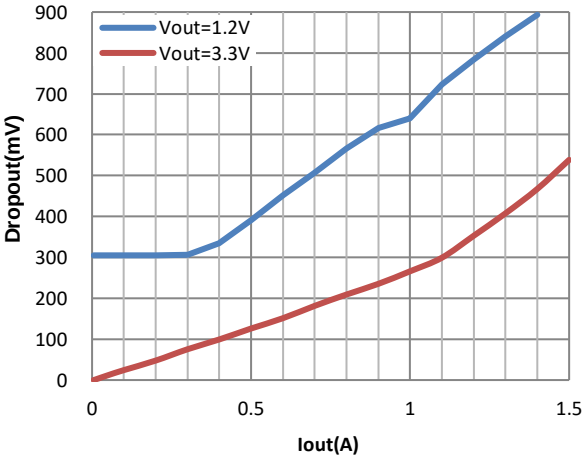
Line Regulation



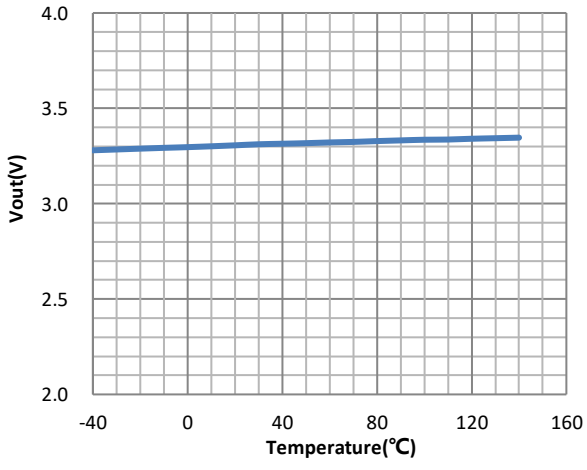
Iq



Dropout Voltage



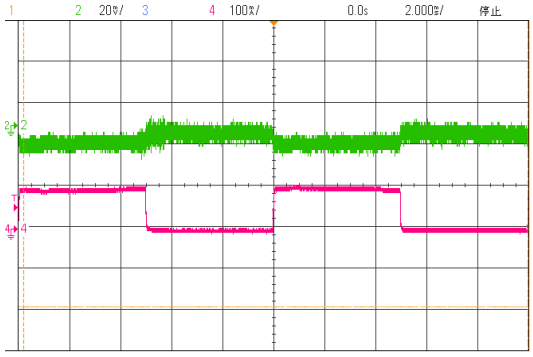
Vout vs. Temperature



Load Transient Response

(Vdd=5V, Vout=3.3V)

(Cin=1uF, Cout=1uF, Iout=1mA-100mA)

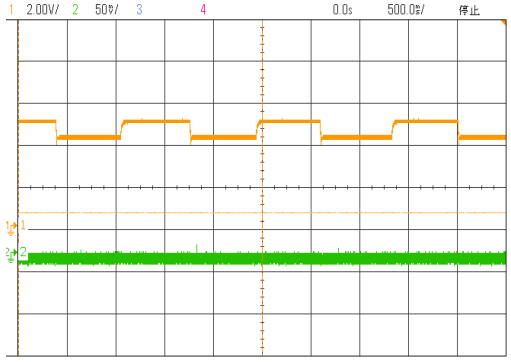


CH2: Vout_ripple, CH4: Iout

Line Transient Response

(Vout=3.3V)

(Cin=1uF, Cout=1uF, Iout=10mA, Vdd=4.3V-5.3V)

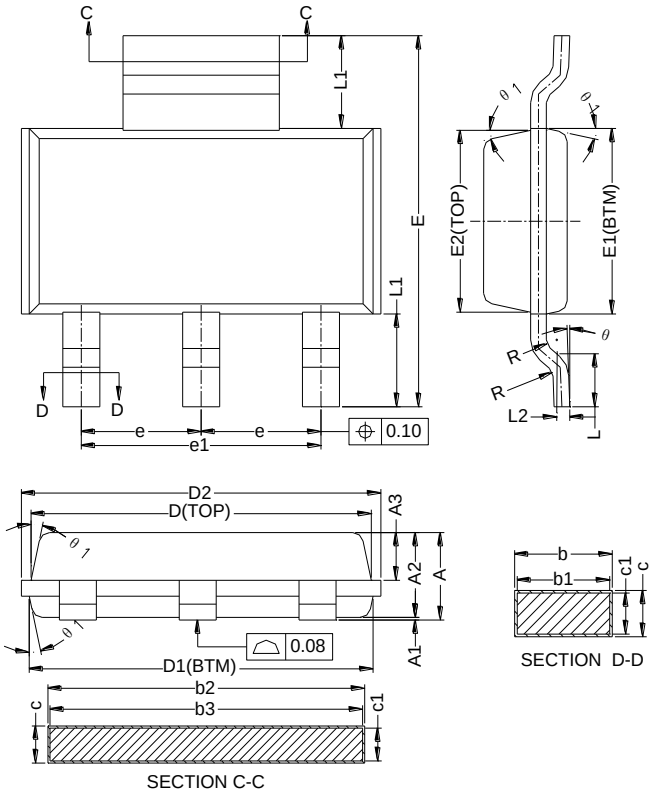


CH1: Vdd, CH2: Vout_ripple

PACKAGE OUTLINE

Package	SOT-223	Devices per reel	2500pcs	Unit	mm

Package dimension:



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	-	-
θ	0°	-	8°
θ 1	10°	12°	14°

NOTES:

ALL DIMENSIONS REFER TO JEDEC STANDARD TO261-AA