

DESCRIPTION

BL8071G 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 1.1V to 5.0V. It also can be customized on command.

BL8071G 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 $\pm 2\%$.

BL8071G series are available in SOT-223, TO-252, DFN3x3-6 packages, which are lead(Pb)-free.

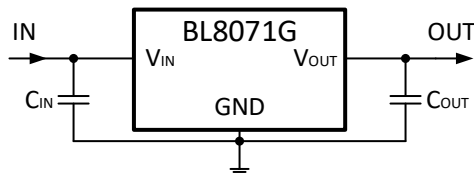
FEATURES

- Low quiescent current: 100uA (Typ.)
- Low dropout voltage:
50mV@ $I_{OUT}=0.1A$, $V_{OUT}=3.3V$ (Typ.)
550mV@ $I_{OUT}=1.5A$, $V_{OUT}=3.3V$ (Typ.)
- High PSRR: 65dB@1KHz (Typ.)
- Low temperature coefficient: $\pm 100\text{ppm}/^\circ\text{C}$
- Output voltage range: 1.1V~5.0V
- Highly accurate: $\pm 2\%$
- Thermal shutdown
- Overcurrent protection

APPLICATIONS

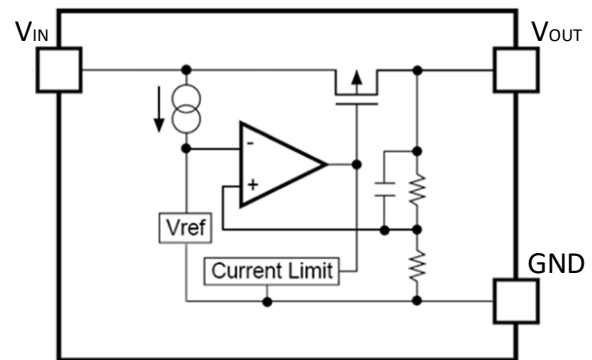
- Reference voltage source
- Battery powered equipment
- PC peripherals
- Wireless devices
- Instrumentation

TYPICAL APPLICATION



Note: Input capacitor ($C_{IN}=4.7\mu F$) and output capacitor ($C_{OUT}=4.7\mu F$) are recommended in all application circuit.

BLOCK DIAGRAM



BL8071G

ORDERING INFORMATION

BL8071G [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) O: TO-252 KP: DFN3x3-6
[3]	Packing type: TR: Tape&Reel (Standard)
[4]	Output voltage: e.g. 11=1.1V 18=1.8V 25=2.5V 33=3.3V 50=5.0V
[5]	Voltage accuracy: 1=±1% (Customized) Blank(default)=±2%

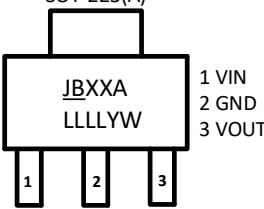
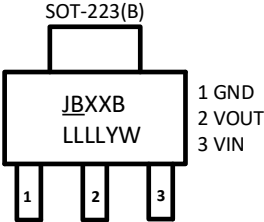
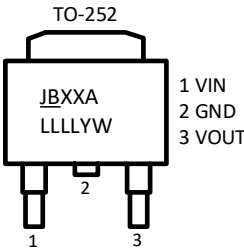
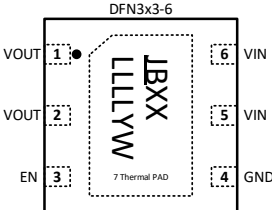
XX: Output Voltage, e.g., 18=1.8V, 33=3.3V.

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, "A" stands for week 27, "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.

PIN CONFIGURATION

Product classification		BL8071GCLATR□□
JBXXA LLLLYW	JB: Product code	
	XX: Output voltage	
	A: A type	
	LLLL: Lot No.	
	YW: Date code	
Product classification		BL8071GCLBTR□□
JBXXB LLLLYW	JB: Product code	
	XX: Output voltage	
	B: B type	
	LLLL: Lot No.	
	YW: Date code	
Product classification		BL8071GCOTR□□
JBXXA LLLLYW	JB: Product code	
	XX: Output voltage	
	A: A type	
	LLLL: Lot No.	
	YW: Date code	
Product classification		BL8071GCKPTR□□
JBXX LLLLYW	JB: Product code	
	XX: Output voltage	
	LLLL: Lot No.	
	YW: Date code	
VIN	Supply voltage input	
GND	Ground pin	
VOUT	Output voltage	
EN	Chip enable	

ABSOLUTE MAXIMUM RATING

Parameter		Value
Max input voltage		6V
Operating junction temperature (T _J)		125°C
Max Output current		1.5A
Package thermal resistance (θ _{JC})	SOT-223	20°C/W
	TO-252	10°C/W
	DFN3x3-6	15°C/W
Storage temperature (T _S)		-65°C to 150°C
Lead temperature & time		260°C, 10s
ESD (HBM)		>2000V

RECOMMENDED WORK CONDITIONS

Parameter		Value
Input voltage range		Max. 6V
Ambient temperature		-40°C to 85°C

ELECTRICAL CHARACTERISTICS

Test conditions: C_{IN}=4.7uF, C_{OUT}=4.7uF, T_A=25°C, unless otherwise specified.

Symbol	Parameter		Conditions	Min	Typ	Max	Units
V _{IN}	Input voltage			1.5*		6	V
V _{OUT}	Output voltage	V _{OUT} >1.5V	V _{IN} =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 _{IN} =Set V _{OUT} +1V	1.5			A
V _{DROP}	Dropout voltage		V _{OUT} =1.8V, I _{OUT} =1.5A		780	930	mV
			V _{OUT} =2.5V, I _{OUT} =1.5A		600	720	mV
			V _{OUT} =3.3V, I _{OUT} =1.5A		450	540	mV
$\frac{\Delta V_{out}}{\Delta V_{in} \cdot V_{out}}$	Line regulation		I _{OUT} =10mA Set V _{OUT} +1V≤V _{IN} ≤6V		0.05	0.2	%/V
ΔV _{out}	Load regulation		V _{IN} =Set V _{OUT} +1V 1mA≤I _{OUT} ≤1.5A		30	60	mV
I _Q	Supply current		V _{IN} =Set V _{OUT} +1V, V _{OUT} floating		100	150	uA
I _{SHORT}	Short current		V _{IN} =5V, V _{OUT} =0V		200		mA
$\frac{\Delta V_{out}}{\Delta T \cdot V_{out}}$	Output voltage temperature coefficient		I _{OUT} =10mA		±100		ppm/°C
PSRR	Ripple rejection		f=1KHz, ripple=0.5Vp-p, V _{IN} =Set V _{OUT} +1V		65		dB
V _{EN_H}	EN input voltage "H"			1.5			V
V _{EN_L}	EN input voltage "L"					0.4	V
R _{PD}	EN pull down resistance				800K		Ω
T _{SD}	Thermal shutdown temp		V _{IN} =Set V _{OUT} +1V, I _{OUT} =10mA		150		°C
T _{SH}	Thermal shutdown hysteresis		V _{IN} =Set V _{OUT} +1V, I _{OUT} =10mA		30		°C

Note: *I_{OUT}=500mA@V_{OUT}=1.2V

**The actual heat dissipation capability of each package and pin configuration is different, so along with the change of I_{LOAD}, the V_{IN}-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 BL8071G is very large. BL8071G series uses SOT-223 package type and its thermal resistance is about $20^{\circ}\text{C}/\text{W}$. And the copper area of application board can affect the total thermal resistance. If copper area is $5\text{cm} \times 5\text{cm}$ (two sides), the resistance is about $30^{\circ}\text{C}/\text{W}$. So the total thermal resistance is about $20^{\circ}\text{C}/\text{W} + 30^{\circ}\text{C}/\text{W}$. 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 $120^{\circ}\text{C}/\text{W}$, then the power dissipation of BL8071G could allow on itself is less than 1W. And furthermore, BL8071G will work at junction temperature higher than 125°C under such condition and no lifetime is guaranteed.

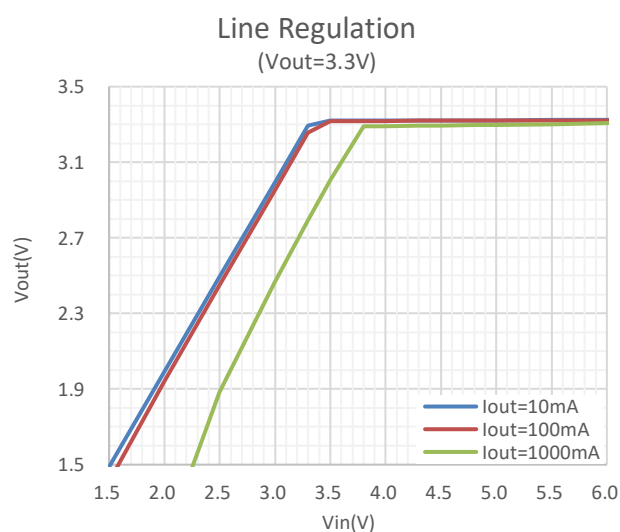
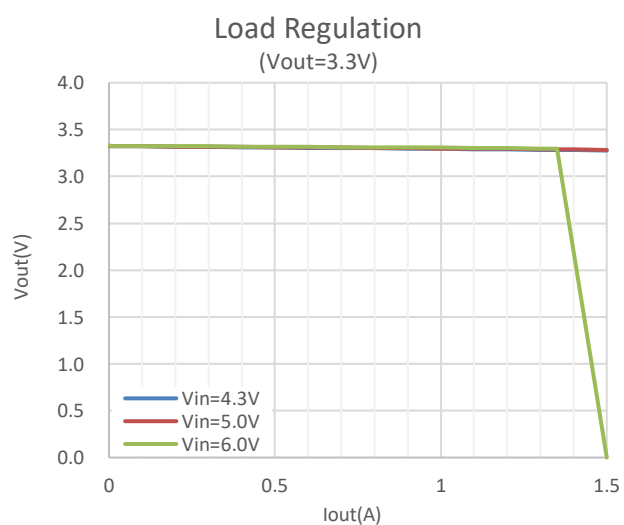
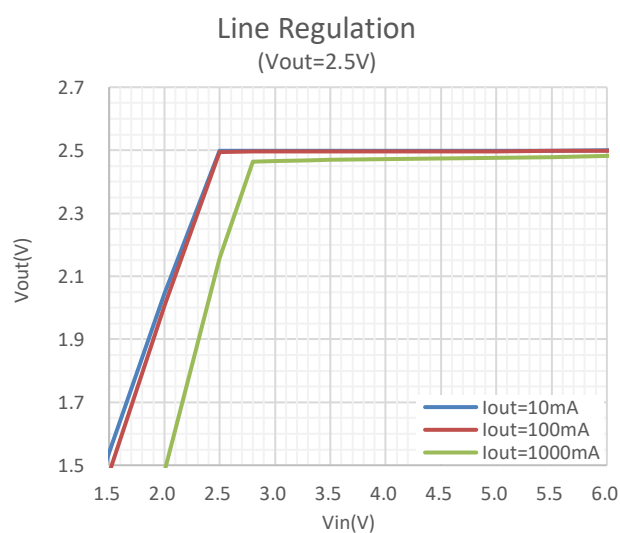
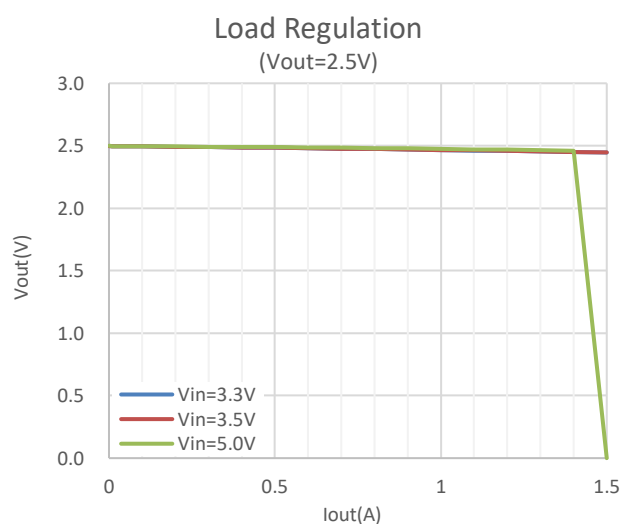
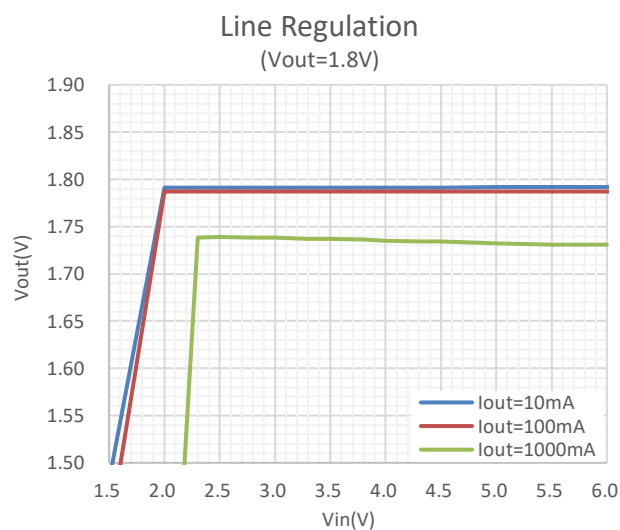
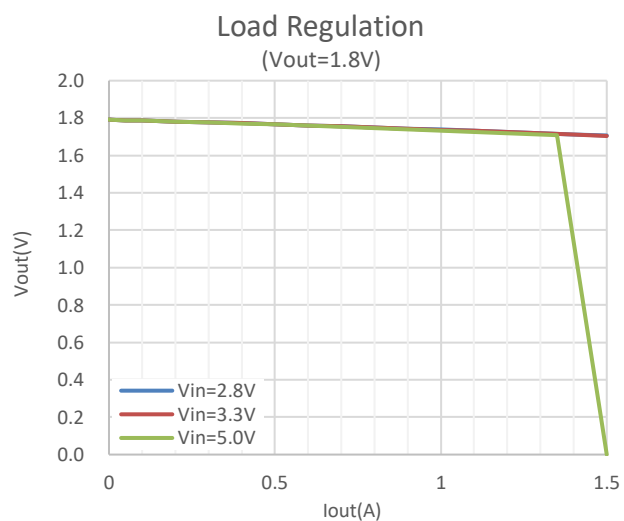
CURRENT LIMIT MODE

Current Limit module can keep chip and power system away from danger when the load current is higher than the current limit threshold. When V_{OUT} decrease the Short Circuit Current will fold back to a small value.

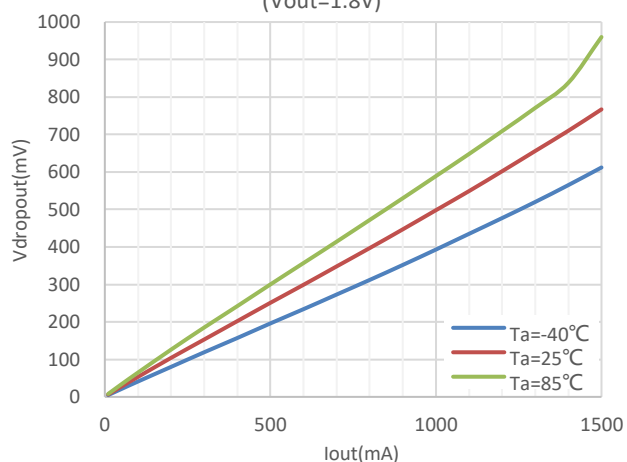
SHORT CIRCUIT PROTECTION

When V_{OUT} short to GND, the short circuit protection will be triggered and clamp the output current to approximately 200mA. This feature protects the regulator from over current and damage due to overheating.

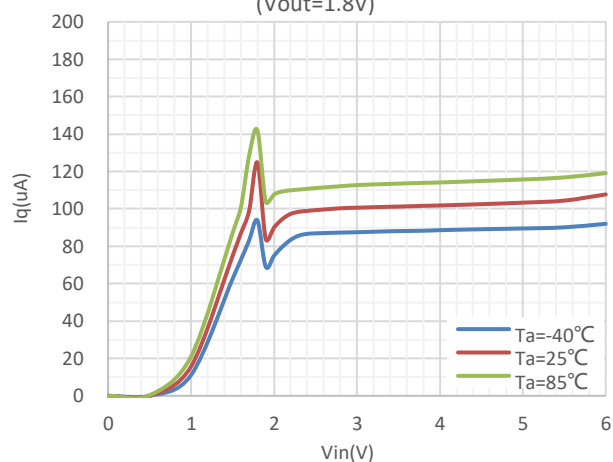
TYPICAL PERFORMANCE CHARACTERISTICS



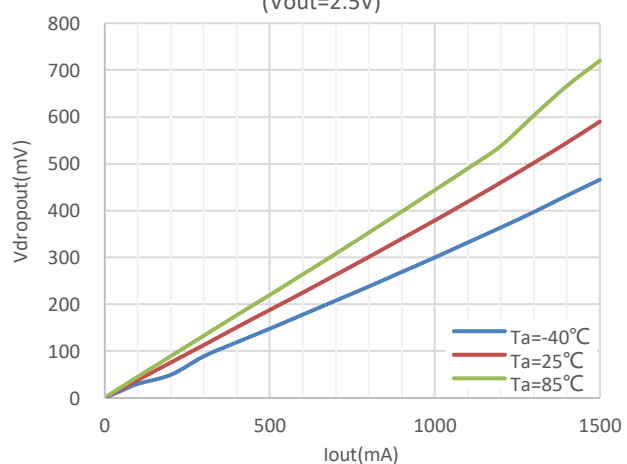
Dropout Voltage
(Vout=1.8V)



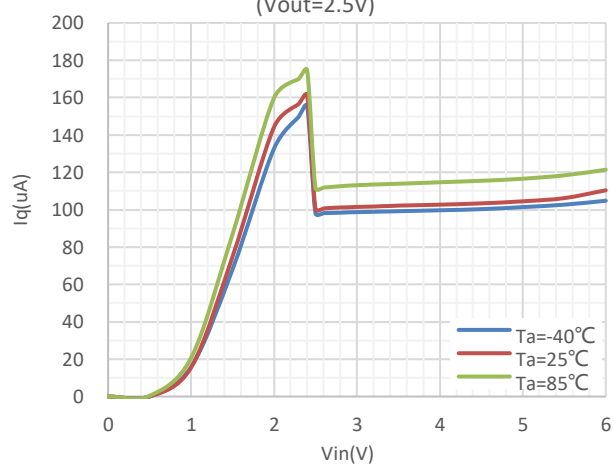
Iq
(Vout=1.8V)



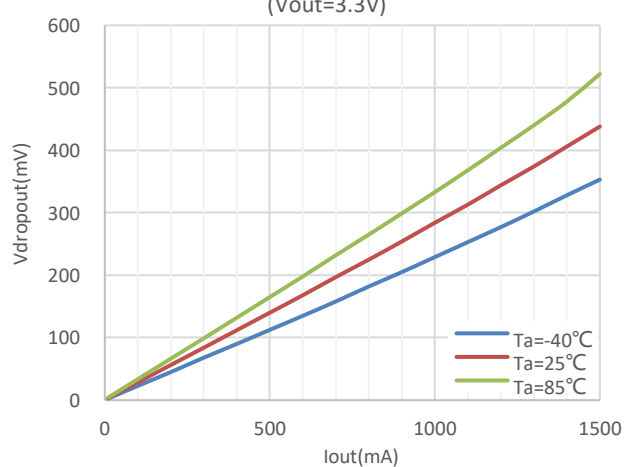
Dropout Voltage
(Vout=2.5V)



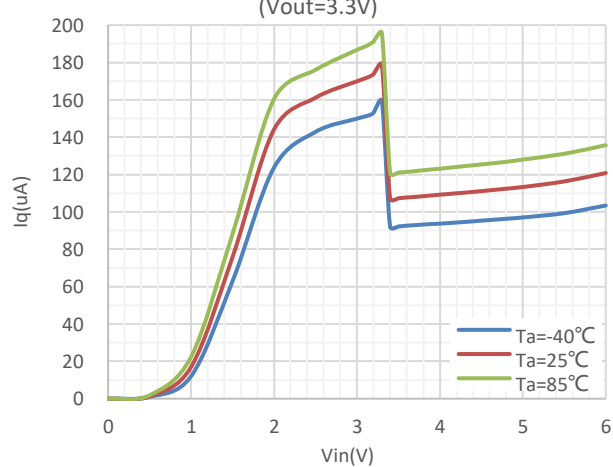
Iq
(Vout=2.5V)



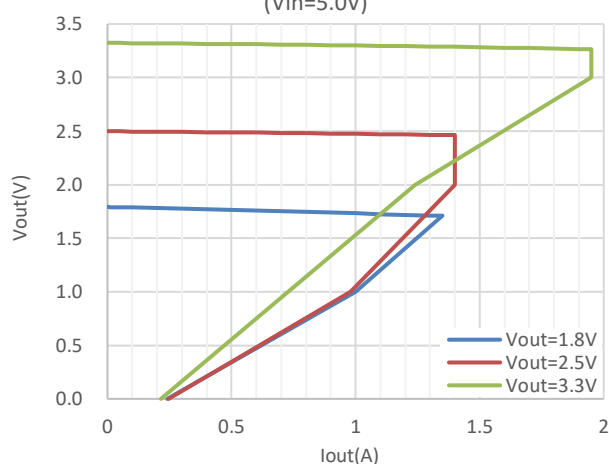
Dropout Voltage
(Vout=3.3V)



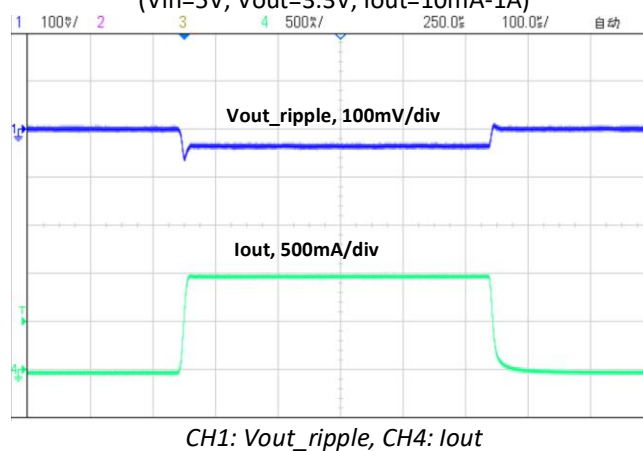
Iq
(Vout=3.3V)



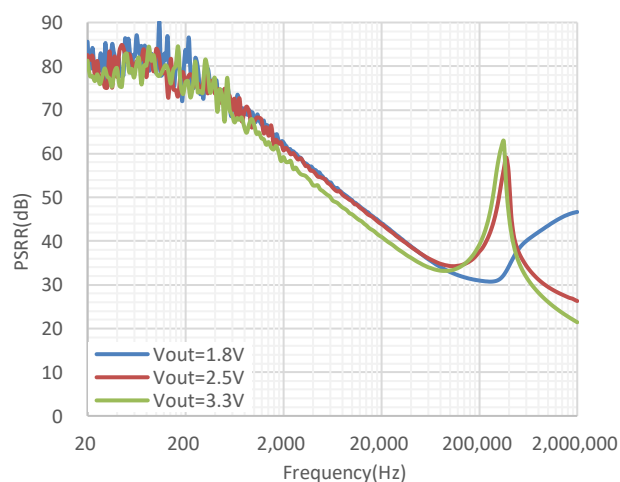
Current Limit
($V_{in}=5.0V$)



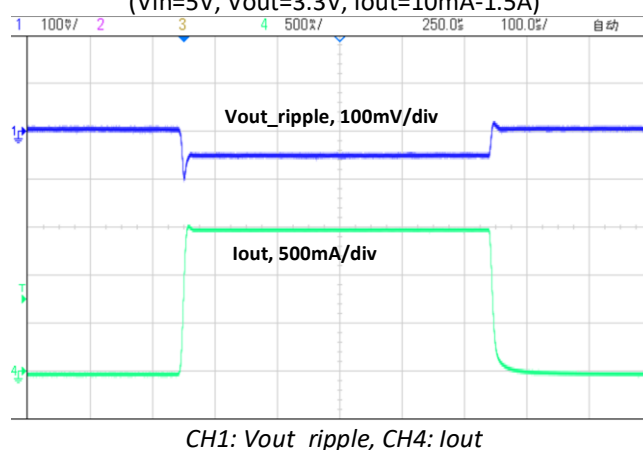
Load Transient Response
($V_{in}=5V$, $V_{out}=3.3V$, $I_{out}=10mA-1A$)



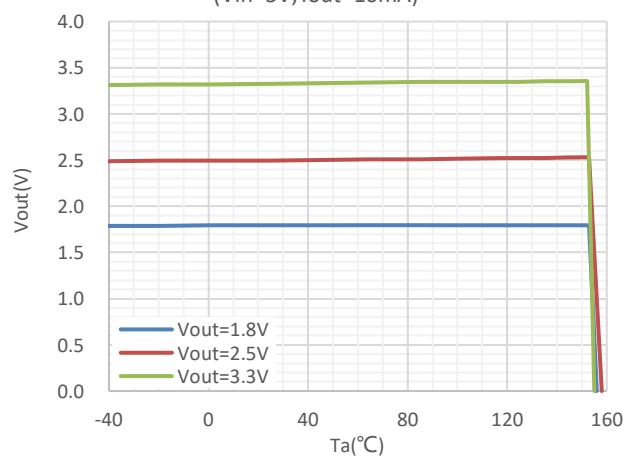
PSRR



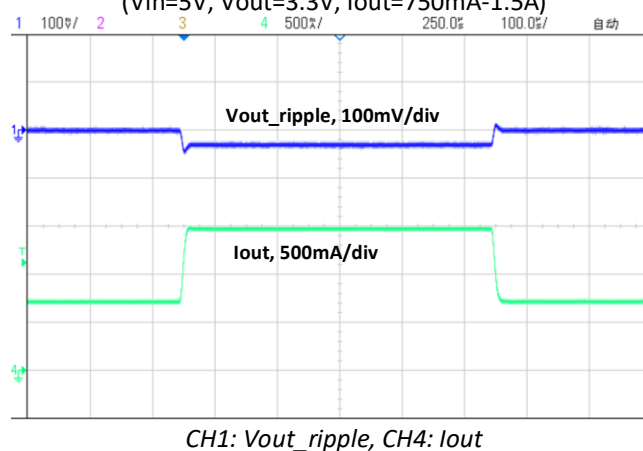
Load Transient Response
($V_{in}=5V$, $V_{out}=3.3V$, $I_{out}=10mA-1.5A$)



Vout vs. Temp
($V_{in}=5V$, $I_{out}=10mA$)



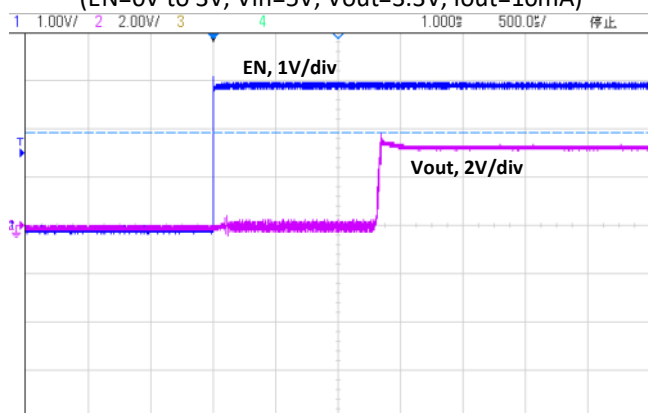
Load Transient Response
($V_{in}=5V$, $V_{out}=3.3V$, $I_{out}=750mA-1.5A$)



BL8071G

EN Power On

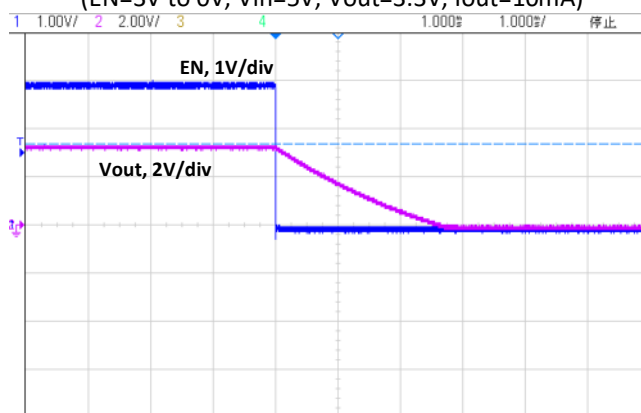
(EN=0V to 3V, Vin=5V, Vout=3.3V, Iout=10mA)



CH1: EN, CH2: Vout

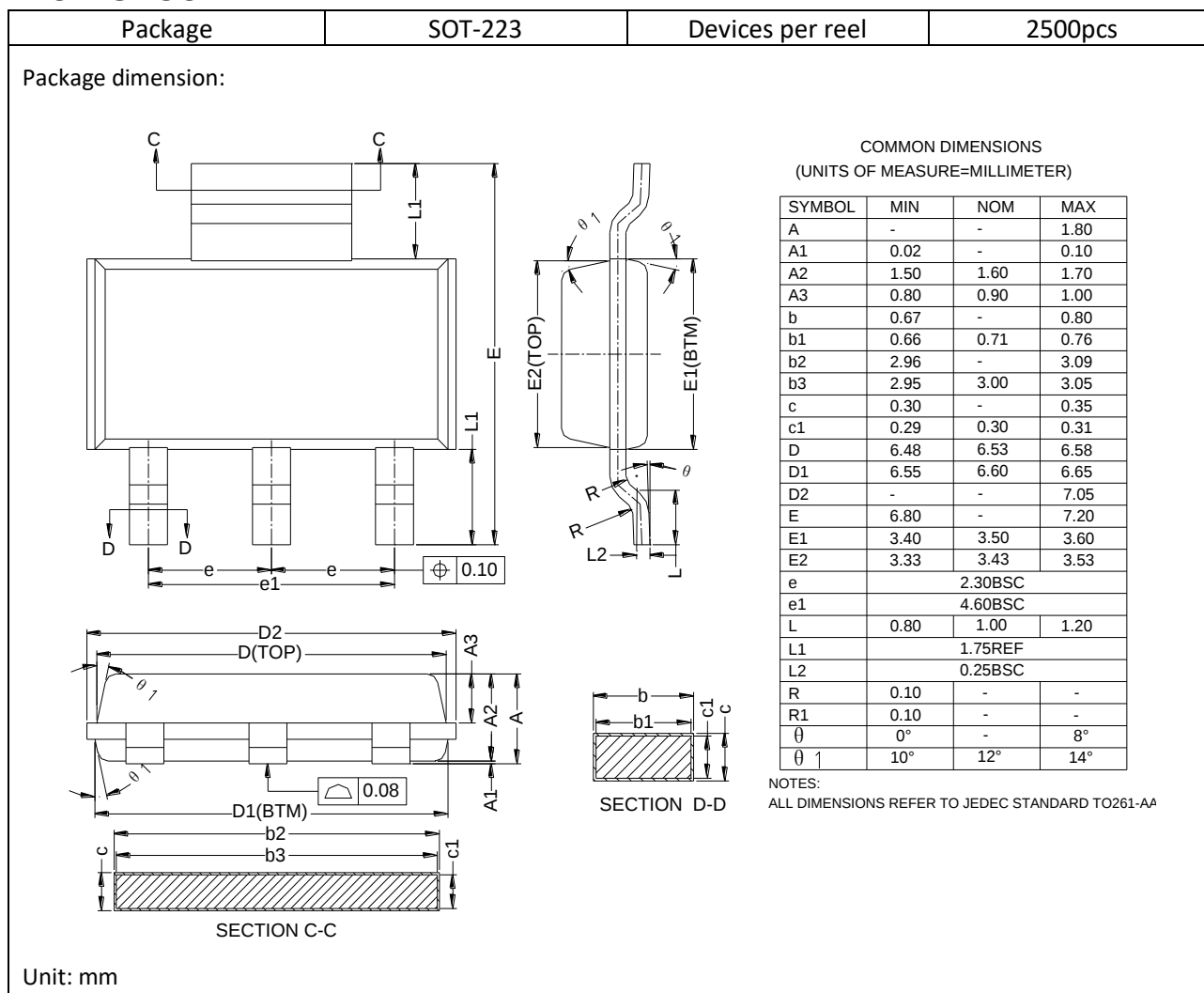
EN Power Off

(EN=3V to 0V, Vin=5V, Vout=3.3V, Iout=10mA)



CH1: EN, CH2: Vout

PACKAGE OUTLINE



BL8071G

Package	TO-252	Devices per reel	2500pcs
---------	--------	------------------	---------

Package dimension:

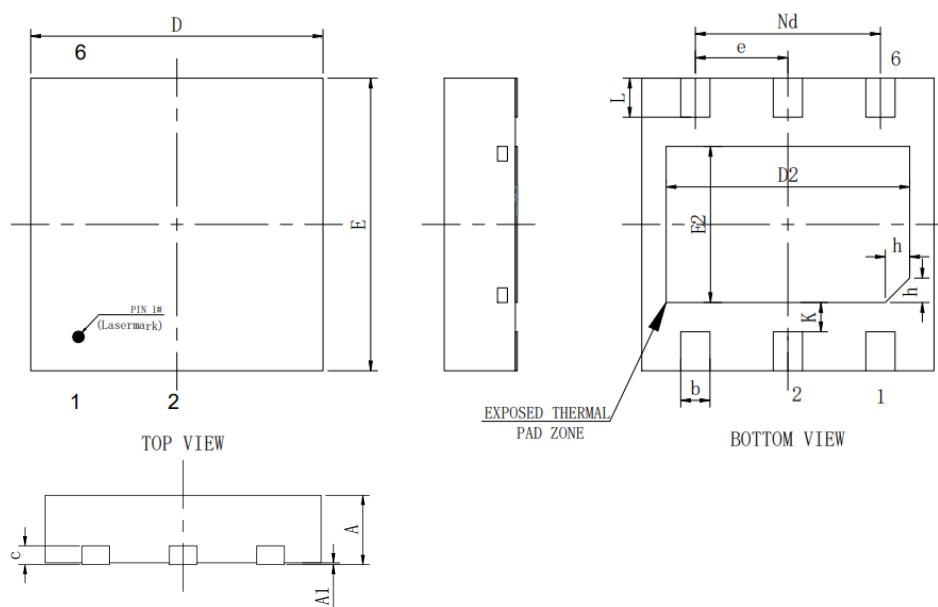
COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0	—	0.10
A2	0.90	1.00	1.10
b	0.77	—	0.89
b1	0.76	0.81	0.86
b2	0.77	—	1.10
b3	5.23	5.33	5.43
c	0.47	—	0.60
c1	0.46	0.51	0.56
c2	0.47	—	0.60
D	6.00	6.10	6.20
D1	5.25	—	—
E	6.50	6.60	6.70
E1	4.70	—	—
e	2.28BSC		
H	9.80	10.10	10.40
L	1.40	1.50	1.70
L1	2.90REF		
L2	0.51BSC		
L3	0.90	—	1.25
L4	0.60	0.80	1.00
L5	0.90	—	1.50
L6	1.80REF		
theta	0°	—	8°
theta 1	3°	5°	7°
theta 2	1°	3°	5°

NOTES:
ALL DIMENSIONS REFER TO JEDEC STANDARD
TO-252 AA DO NOT INCLUDE MOLD FLASH
OR PROTRUSIONS.

Unit: mm

BL8071G

Package	DFN3x3-6	Devices per reel	3000pcs																																																											
Package dimension:																																																														
 Unit: mm																																																														
<table border="1"> <thead> <tr> <th rowspan="2">SYMBOL</th><th colspan="3">MILLIMETER</th></tr> <tr> <th>MIN</th><th>NOM</th><th>MAX</th></tr> </thead> <tbody> <tr> <td>A</td><td>0.70</td><td>0.75</td><td>0.80</td></tr> <tr> <td>A1</td><td>0</td><td>0.02</td><td>0.05</td></tr> <tr> <td>b</td><td>0.25</td><td>0.30</td><td>0.35</td></tr> <tr> <td>c</td><td colspan="3">0.203REF</td></tr> <tr> <td>D</td><td>2.90</td><td>3.00</td><td>3.10</td></tr> <tr> <td>D2</td><td>2.40</td><td>2.50</td><td>2.60</td></tr> <tr> <td>Nd</td><td colspan="3">1.90BSC</td></tr> <tr> <td>E</td><td>2.90</td><td>3.00</td><td>3.10</td></tr> <tr> <td>E2</td><td>1.50</td><td>1.60</td><td>1.70</td></tr> <tr> <td>e</td><td colspan="3">0.95BSC</td></tr> <tr> <td>K</td><td colspan="3">0.30REF</td></tr> <tr> <td>L</td><td>0.35</td><td>0.40</td><td>0.45</td></tr> <tr> <td>h</td><td>0.20</td><td>0.25</td><td>0.30</td></tr> </tbody> </table>				SYMBOL	MILLIMETER			MIN	NOM	MAX	A	0.70	0.75	0.80	A1	0	0.02	0.05	b	0.25	0.30	0.35	c	0.203REF			D	2.90	3.00	3.10	D2	2.40	2.50	2.60	Nd	1.90BSC			E	2.90	3.00	3.10	E2	1.50	1.60	1.70	e	0.95BSC			K	0.30REF			L	0.35	0.40	0.45	h	0.20	0.25	0.30
SYMBOL	MILLIMETER																																																													
	MIN	NOM	MAX																																																											
A	0.70	0.75	0.80																																																											
A1	0	0.02	0.05																																																											
b	0.25	0.30	0.35																																																											
c	0.203REF																																																													
D	2.90	3.00	3.10																																																											
D2	2.40	2.50	2.60																																																											
Nd	1.90BSC																																																													
E	2.90	3.00	3.10																																																											
E2	1.50	1.60	1.70																																																											
e	0.95BSC																																																													
K	0.30REF																																																													
L	0.35	0.40	0.45																																																											
h	0.20	0.25	0.30																																																											