上海贝岭 SHANGHAI BELLING

BL8071G

1.5A Linear Regulator

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 ±2%.

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

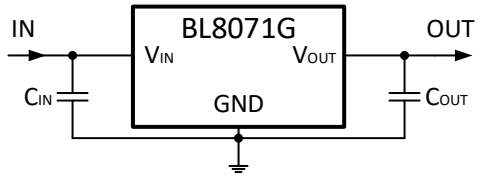
FEATURES

- 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: ±100ppm/°C
- Output voltage range: 1.1V~5.0V
- Highly accurate: ±2%
- Thermal shutdown
- Overcurrent protection

APPLICATIONS

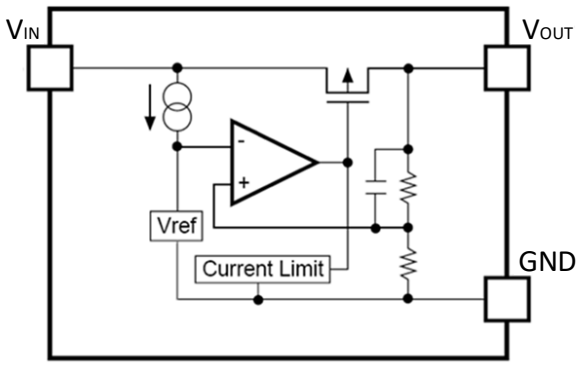
- Reference voltage source
- Battery powered equipment
- PC peripherals
- Wireless devices
- Instrumentation

TYPICAL APPLICATION



Note: *Input capacitor (C_{IN}=4.7uF) and output capacitor (C_{OUT}=4.7uF) are recommended in all application circuit.*

BLOCK DIAGRAM



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, "$\bar{A}$" 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.

PIN CONFIGURATION

Product classification		BL8071GCLATR☐☐
JBXXA LLLLYW	JB: Product code XX: Output voltage A: A type LLLL: Lot No. YW: Date code	SOT-223(A) JBXXA LLLLYW 1 VIN 2 GND 3 VOUT 1 2 3
Product classification		BL8071GCLBTR☐☐
JBXXB LLLLYW	JB: Product code XX: Output voltage B: B type LLLL: Lot No. YW: Date code	SOT-223(B) JBXXB LLLLYW 1 GND 2 VOUT 3 VIN 1 2 3
Product classification		BL8071GCOTR☐☐
JBXXA LLLLYW	JB: Product code XX: Output voltage A: A type LLLL: Lot No. YW: Date code	TO-252 JBXXA LLLLYW 1 VIN 2 GND 3 VOUT 2 1 3
Product classification		BL8071GCKPTR☐☐
JBXX LLLLYW	JB: Product code XX: Output voltage LLLL: Lot No. YW: Date code	DFN3x3-6 VOUT 1 VOUT 2 EN 3 6 VIN 5 VIN 4 GND JBXX LLLLYW 7 Thermal PAD
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
$\frac{\Delta Vout}{\Delta Vin \cdot Vout}$	Line regulation		I_{OUT}=10mA Set V_{OUT}+1V≤V_{IN}≤6V		0.05	0.2	%/V
$\Delta Vout$	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
$\frac{\Delta Vout}{\Delta T \cdot Vout}$	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°C/W. And the copper area of application board can affect the total thermal resistance. If 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 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°C/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

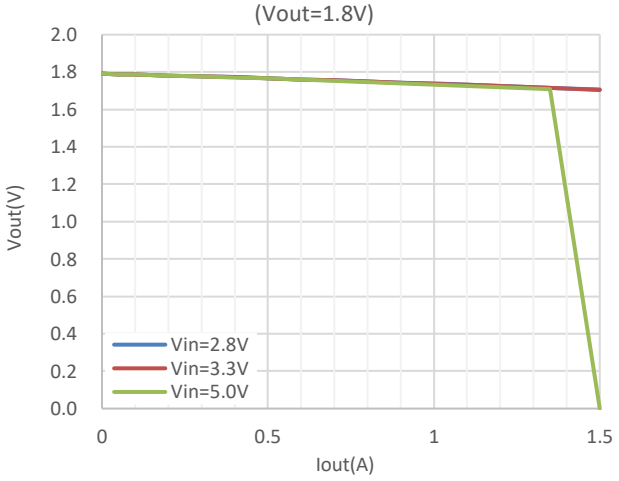
Current Limit module can keep chip and power system away from danger when the load current is higher than the current limit threshold. When V_{OUT} decrease the Short Circuit Current will fold back to a small value.

SHORT CIRCUIT PROTECTION

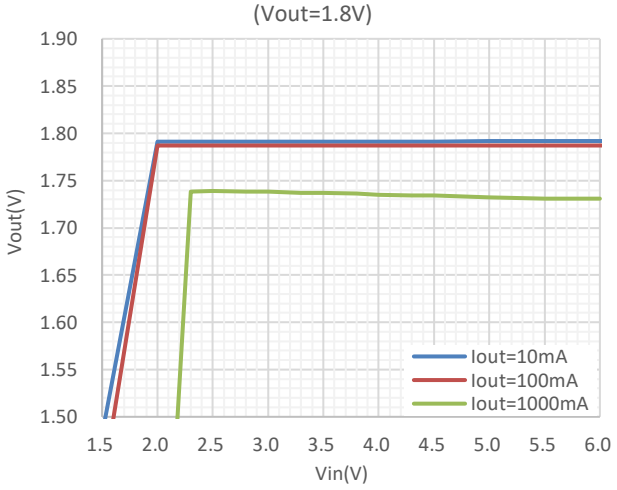
When V_{OUT} short to GND, the short circuit protection will be triggered and clamp the output current to approximately 200mA. This feature protects the regulator from over current and damage due to overheating.

TYPICAL PERFORMANCE CHARACTERISTICS

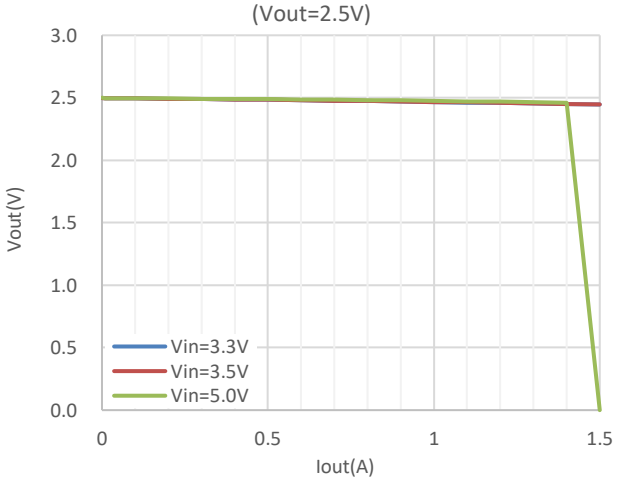
Load Regulation
(Vout=1.8V)



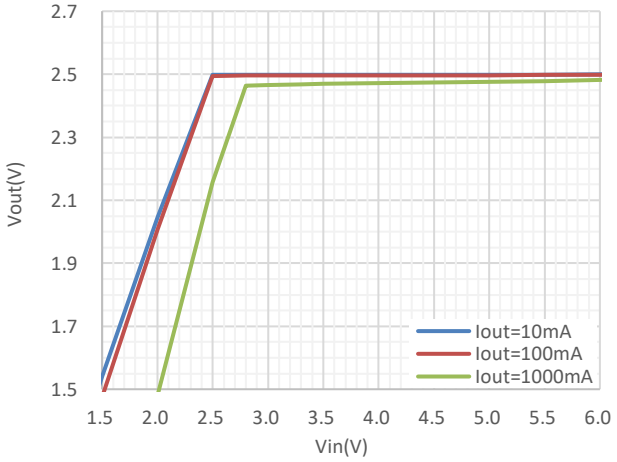
Line Regulation
(Vout=1.8V)



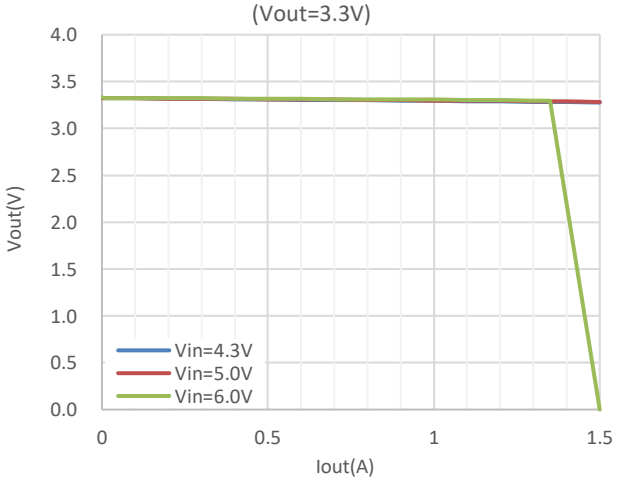
Load Regulation
(Vout=2.5V)



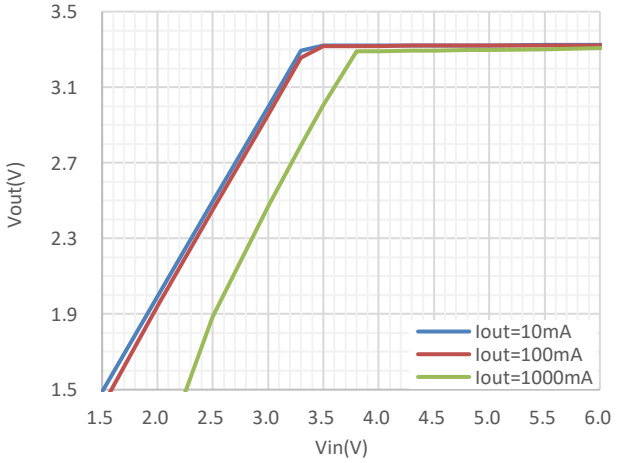
Line Regulation
(Vout=2.5V)

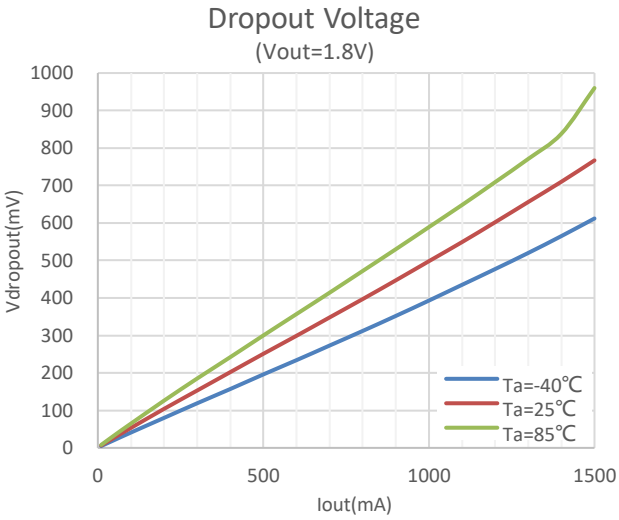


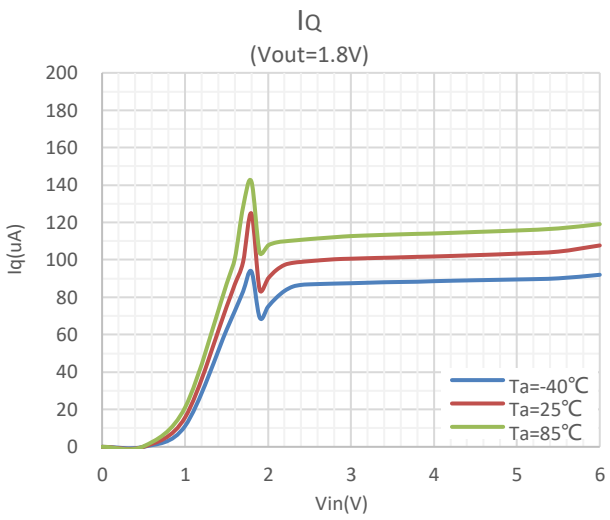
Load Regulation
(Vout=3.3V)

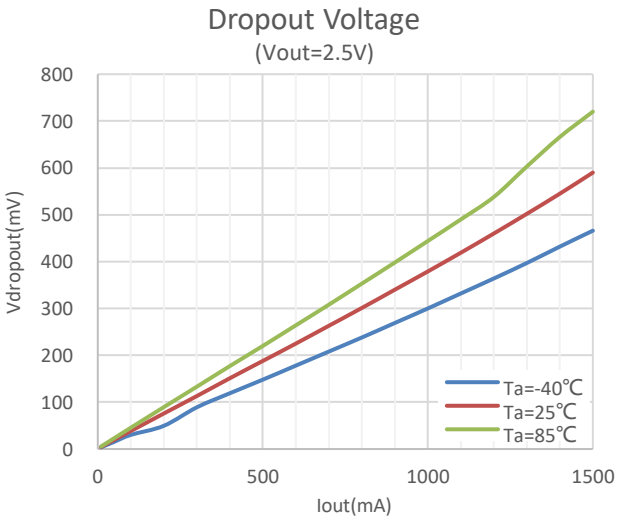


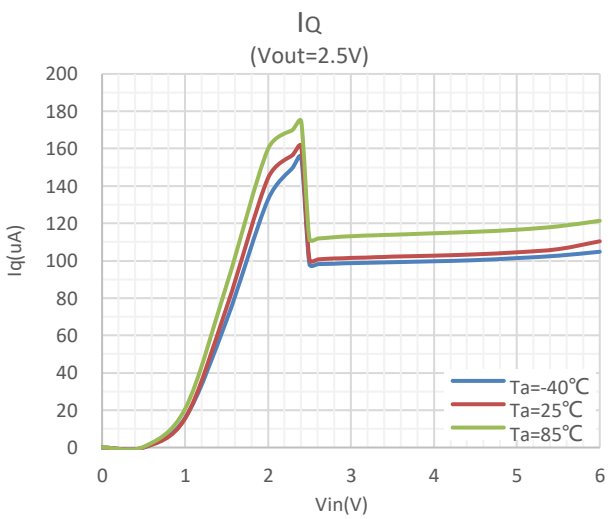
Line Regulation
(Vout=3.3V)

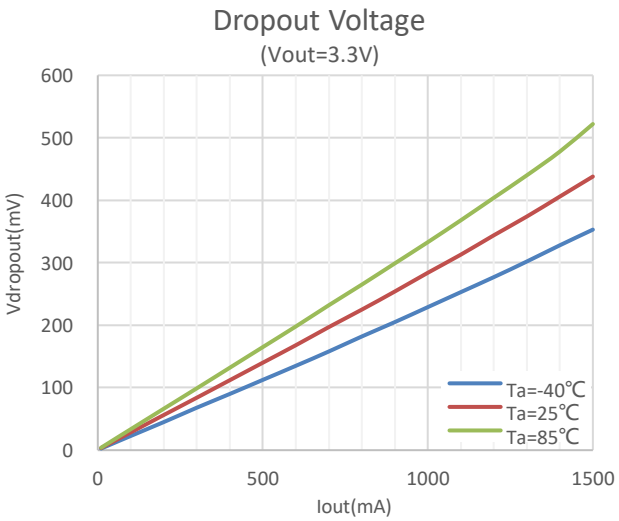


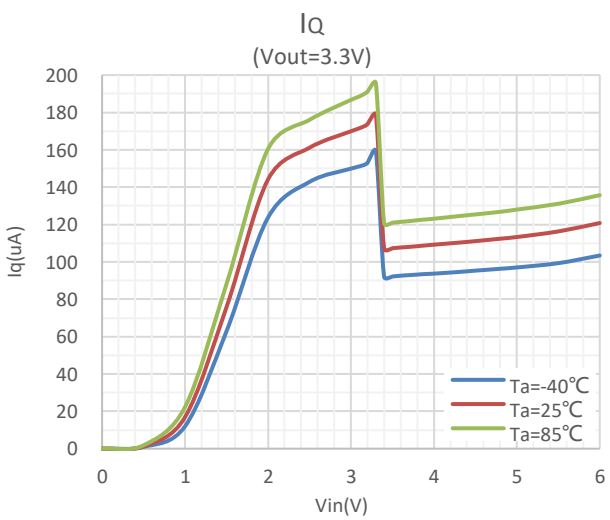

Dropout Voltage
(Vout=1.8V)
Vdropout(mV)
Iout(mA)
Ta=-40℃
Ta=25℃
Ta=85℃


IQ
(Vout=1.8V)
Iq(uA)
Vin(V)
Ta=-40℃
Ta=25℃
Ta=85℃

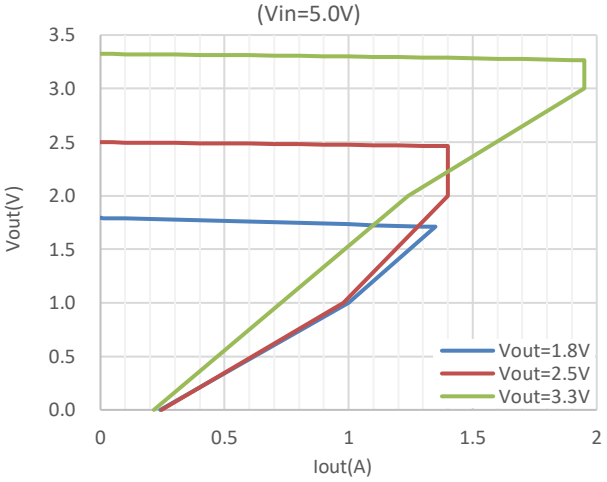

Dropout Voltage
(Vout=2.5V)
Vdropout(mV)
Iout(mA)
Ta=-40℃
Ta=25℃
Ta=85℃


IQ
(Vout=2.5V)
Iq(uA)
Vin(V)
Ta=-40℃
Ta=25℃
Ta=85℃

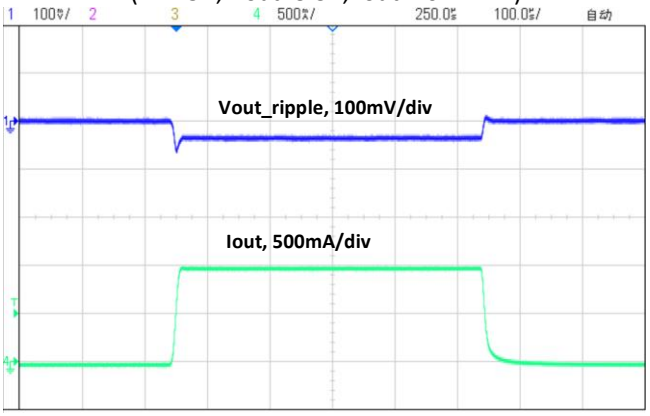

Dropout Voltage
(Vout=3.3V)
Vdropout(mV)
Iout(mA)
Ta=-40℃
Ta=25℃
Ta=85℃


IQ
(Vout=3.3V)
Iq(uA)
Vin(V)
Ta=-40℃
Ta=25℃
Ta=85℃

Current Limit
(Vin=5.0V)

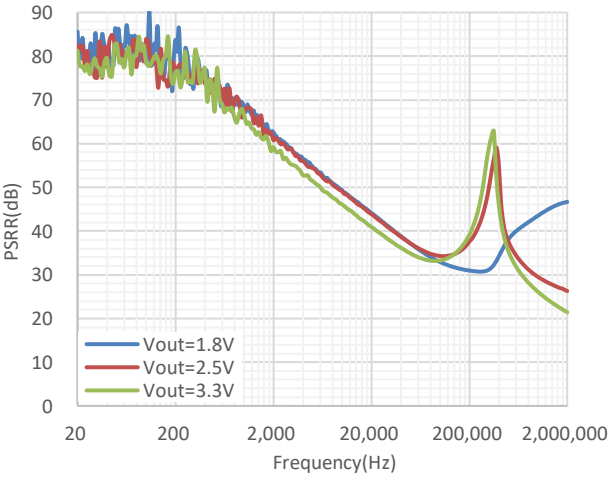


Load Transient Response
(Vin=5V, Vout=3.3V, Iout=10mA-1A)

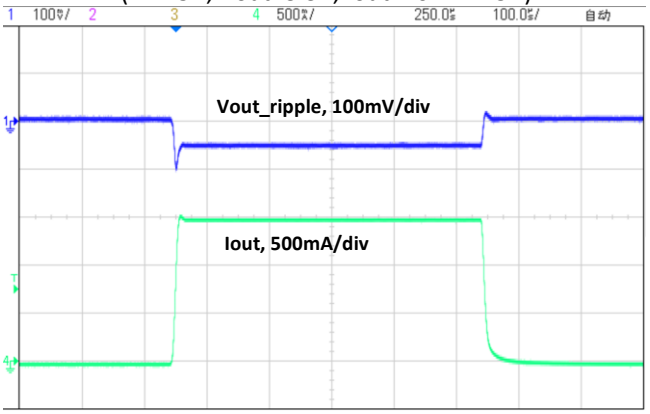


CH1: Vout_ripple, CH4: Iout

PSRR

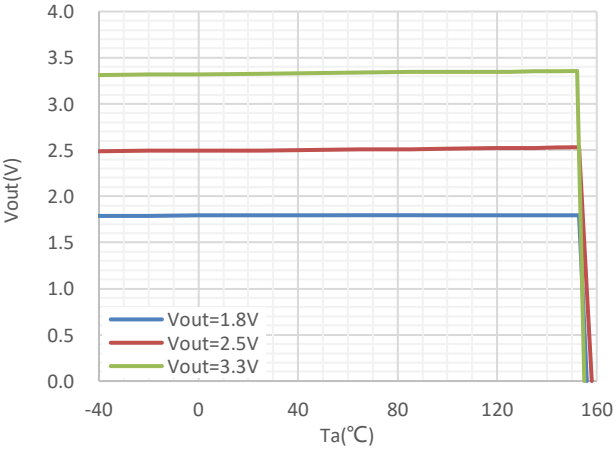


Load Transient Response
(Vin=5V, Vout=3.3V, Iout=10mA-1.5A)

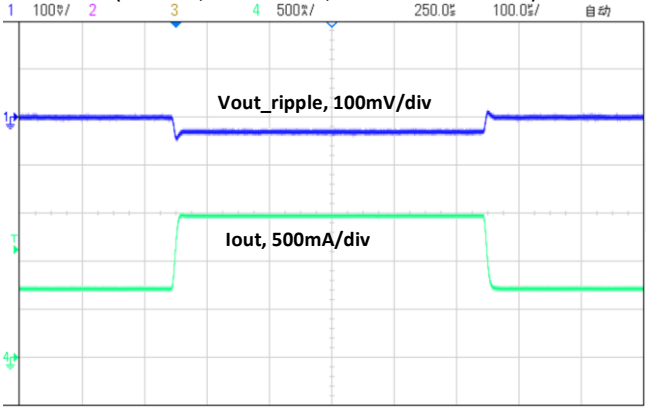


CH1: Vout_ripple, CH4: Iout

Vout vs. Temp
(Vin=5V, Iout=10mA)



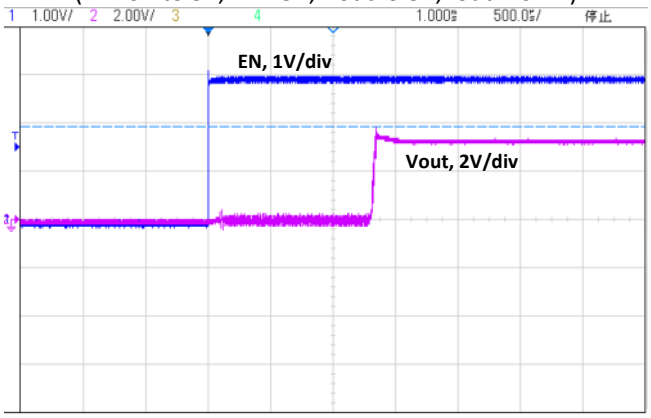
Load Transient Response
(Vin=5V, Vout=3.3V, Iout=750mA-1.5A)



CH1: Vout_ripple, CH4: Iout

EN Power On

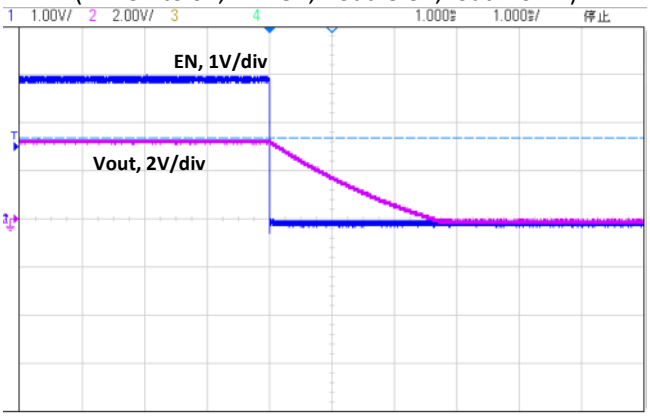
(EN=0V to 3V, Vin=5V, Vout=3.3V, Iout=10mA)



CH1: EN, CH2: Vout

EN Power Off

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

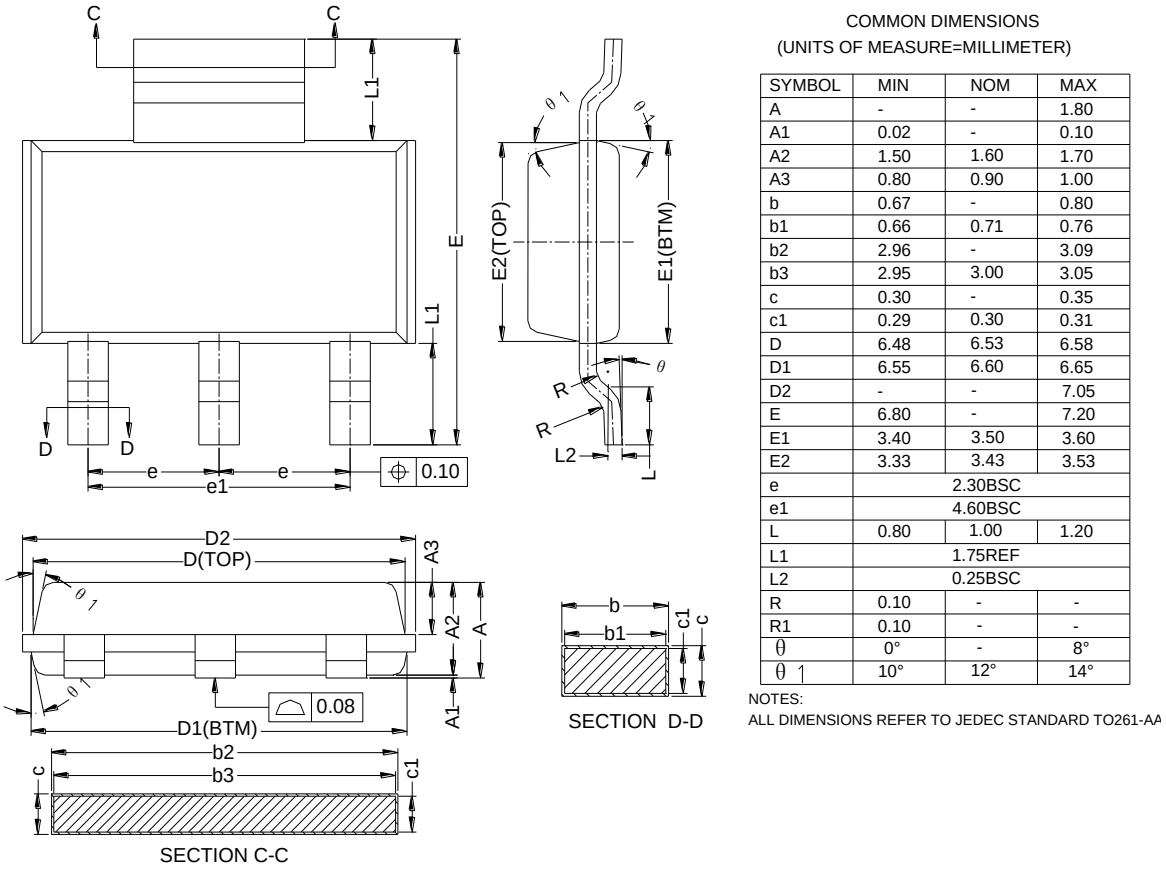


CH1: EN, CH2: Vout

PACKAGE OUTLINE

Package	SOT-223	Devices per reel	2500pcs

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°

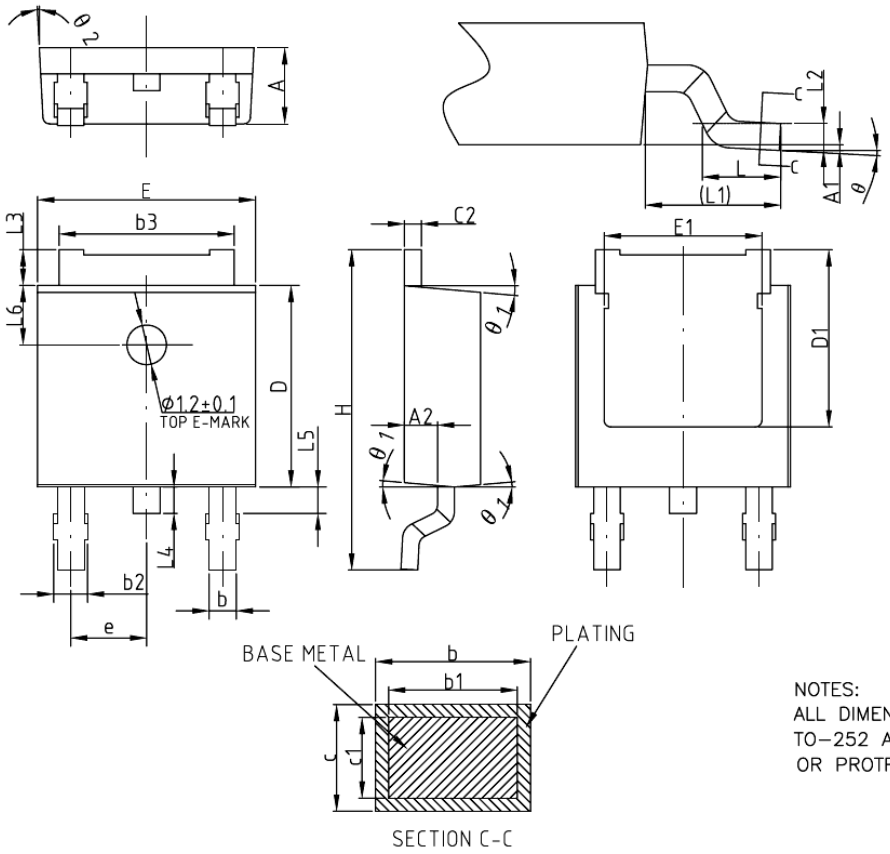
NOTES:

ALL DIMENSIONS REFER TO JEDEC STANDARD TO261-AA

Unit: mm

Package	TO-252	Devices per reel	2500pcs

Package dimension:



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

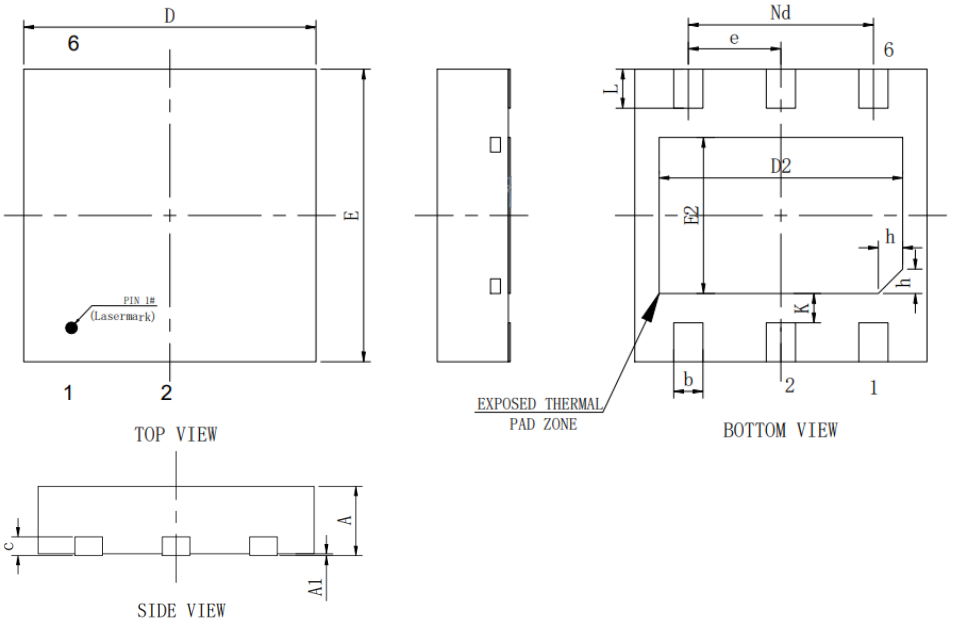
SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0	–	0.10
A2	0.90	1.00	1.10
b	0.77	–	0.89
b1	0.76	0.81	0.86
b2	0.77	–	1.10
b3	5.23	5.33	5.43
c	0.47	–	0.60
c1	0.46	0.51	0.56
c2	0.47	–	0.60
D	6.00	6.10	6.20
D1	5.25	–	–
E	6.50	6.60	6.70
E1	4.70	–	–
e	2.28BSC		
H	9.80	10.10	10.40
L	1.40	1.50	1.70
L1	2.90REF		
L2	0.51BSC		
L3	0.90	–	1.25
L4	0.60	0.80	1.00
L5	0.90	–	1.50
L6	1.80REF		
θ	0°	–	8°
θ1	3°	5°	7°
θ2	1°	3°	5°

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

Unit: mm

Package	DFN3x3-6	Devices per reel	3000pcs

Package dimension:



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

Unit: mm