上海贝岭 SHANGHAI BELLING

BLL1461

1A Linear Regulator

GENERAL DESCRIPTION

BLL1461 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.

BLL1461 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%.

BLL1461 series are available in SOT-223 package, which is lead (Pb)-free.

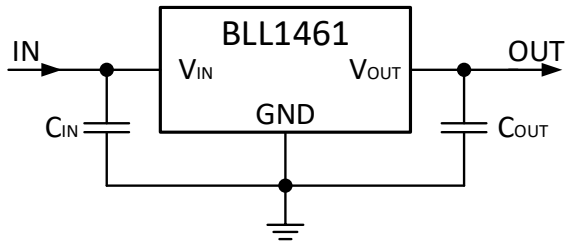
FEATURES

- Low quiescent current: 120uA (Typ.)
- Low dropout voltage: 270mV@I_{OUT}=1A, V_{OUT}=3.3V(Typ.)
- High PSRR: 65dB@1KHz (Typ.)
- Low temperature coefficient: ±100ppm/°C
- Output voltage range: 1.2V~5.0V
- High accuracy: ±2%
- Thermal shutdown
- Overcurrent protection

APPLICATIONS

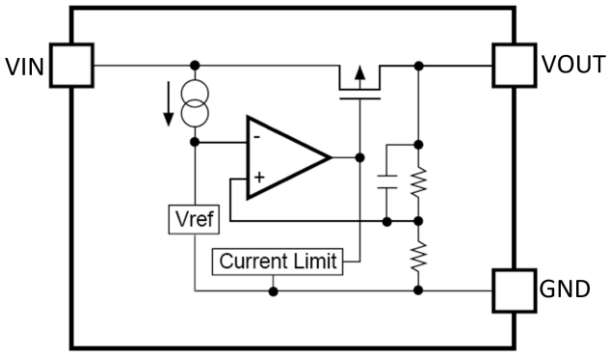
- Reference voltage source
- Battery powered equipment
- PC peripherals
- Wireless devices
- Instrumentation

TYPICAL APPLICATION



Note: *Input capacitor (C_{IN}=10uF) and output capacitor (C_{OUT}=10uF) are recommended in all application circuit.*

BLOCK DIAGRAM

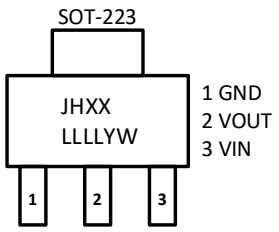


ORDERING INFORMATION

BLL1461 1 2 3 4 5

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

PIN CONFIGURATION

Product classification		BLL1461CLTR☐☐
JHXX LLLLYW	JH: Product code XX: Output voltage LLLL: Lot No. YW: Date code	
GND	Ground pin	
VOUT	Output voltage	
VIN	Supply voltage input	

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.

ABSOLUTE MAXIMUM RATING

Parameter		Value
Max input voltage		6V
Operating junction temperature (T_J)		125°C
Max output current		1A
Power dissipation	SOT-223	1W
Package thermal resistance (θ_{JA})		60°C/W
Package thermal resistance (θ_{JC})		20°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}=10uF, C_{OUT}=10uF, 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				1		A
V_{DROP}	Dropout voltage		V_{OUT}=1.8V, I_{OUT}=1A		450	670	mV
			V_{OUT}=3.3V, I_{OUT}=1A		270	400	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}≤1A		30	60	mV
I_Q	Supply current		V_{IN}=Set V_{OUT}+1V, V_{OUT} floating		120		uA
$\frac{\Delta Vout}{\Delta T \cdot Vout}$	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
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		20		°C

Note: **I_{OUT}=300mA@V_{OUT}=1.2V*

***The maximum power rating of each package is a constant, 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 BLL1461 is very large. BLL1461 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 BLL1461 could allow on itself is less than 1W. And furthermore, BLL1461 will work at junction temperature higher than 125°C under such condition and no lifetime is guaranteed.

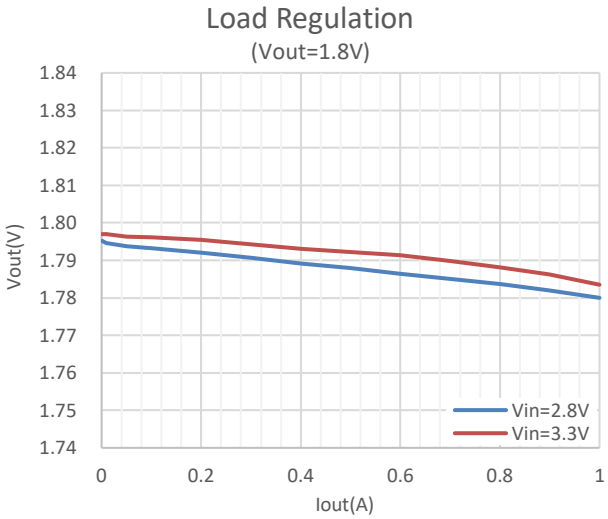
CURRENT LIMIT MODE

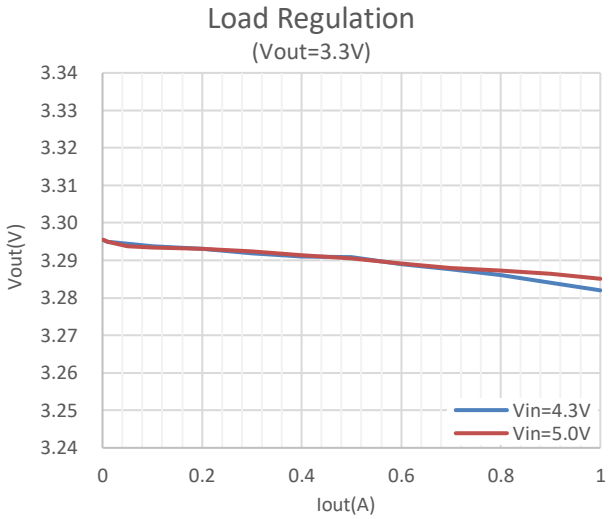
Current Limit module can keep chip and power system away from danger when the load current is higher than the current limit threshold. When V_{OUT} decrease the Short Circuit Current will fold back to a small value.

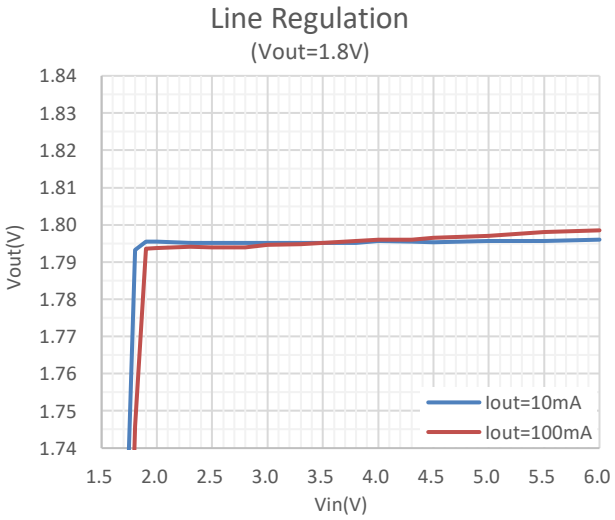
SHORT CIRCUIT PROTECTION

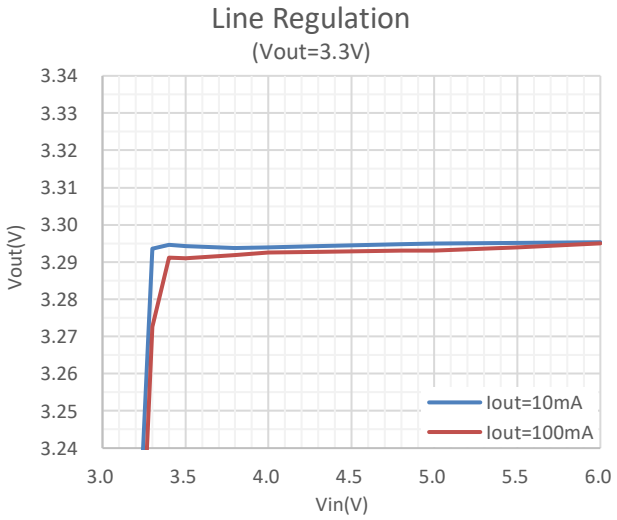
When V_{OUT} short to GND, the short circuit protection will be triggered and clamp the output current to approximately 300mA. This feature protects the regulator from over current and damage due to overheating.

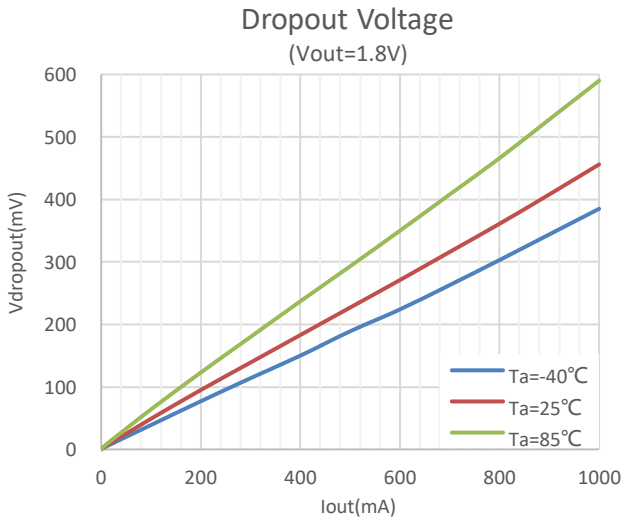
TYPICAL PERFORMANCE CHARACTERISTICS

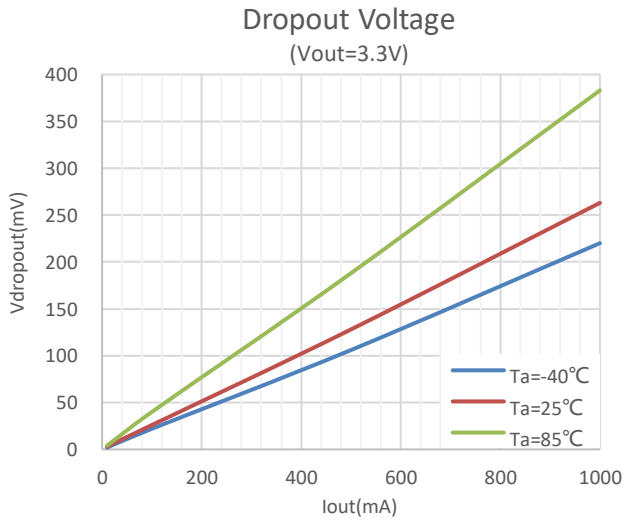


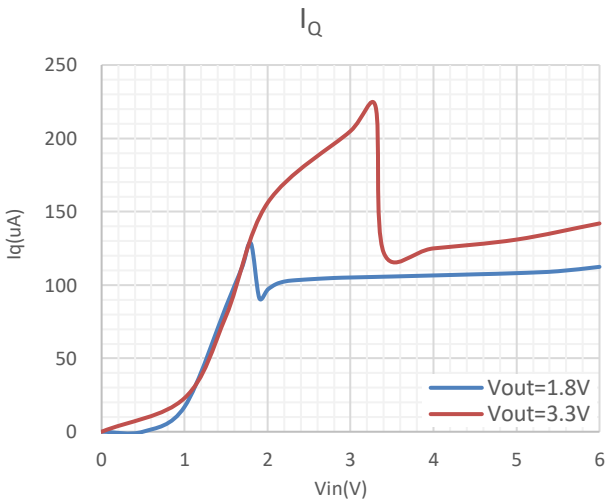


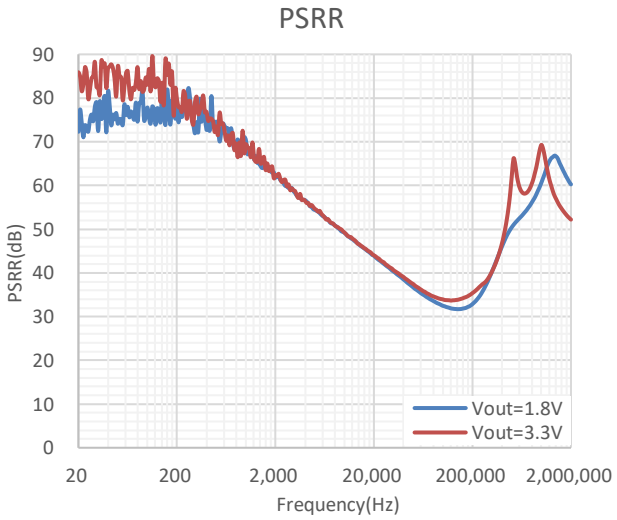






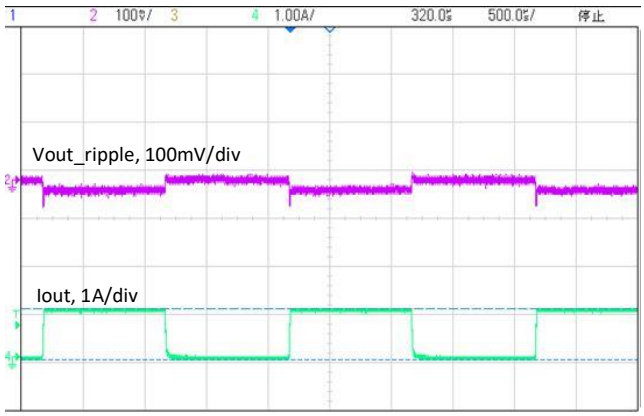






Load Transient Response

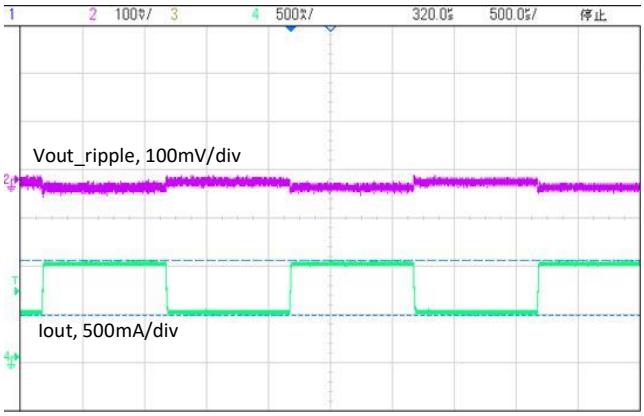
(Vin=5V, Vout=3.3V, Iout=10mA-1A)



CH2: Vout_ripple, CH4: Iout

Load Transient Response

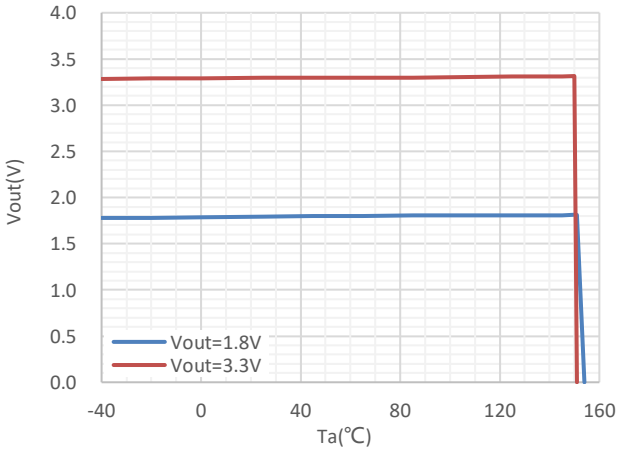
(Vin=5V, Vout=3.3V, Iout=500mA-1A)



CH2: Vout_ripple, CH4: Iout

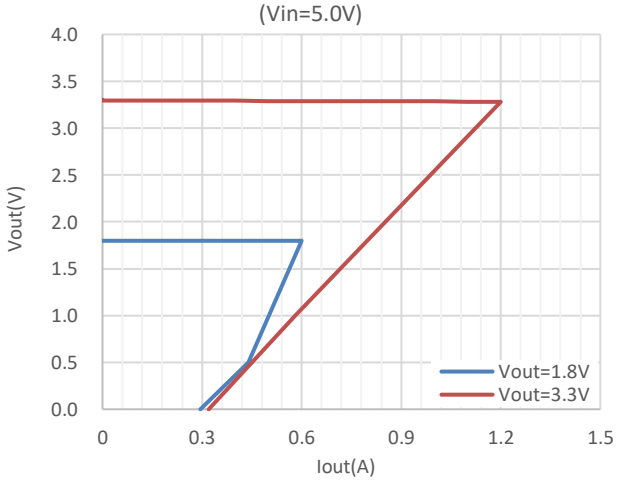
Vout vs. Temp

(Iout=10mA)



Current Limit

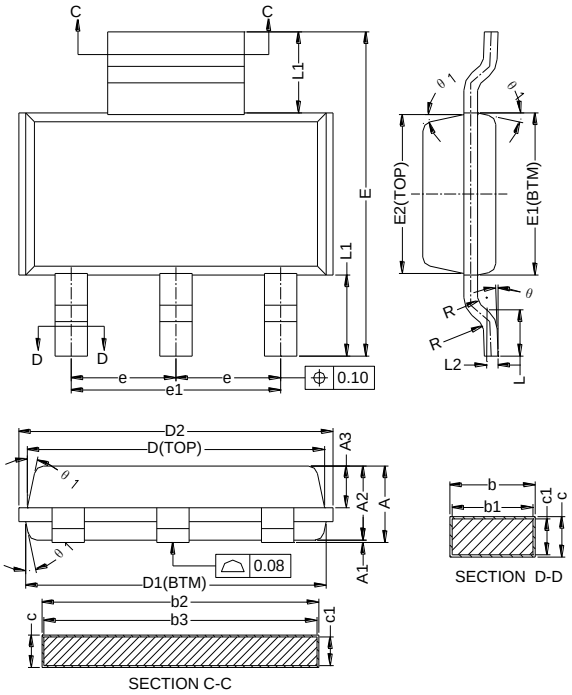
(Vin=5.0V)



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