

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 $\pm 2\%$.

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

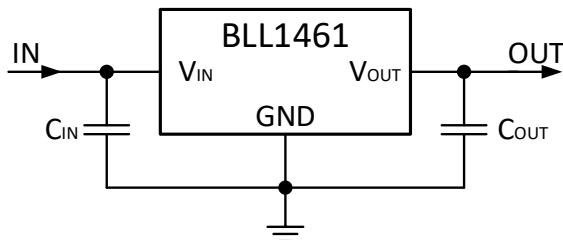
FEATURES

- 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: $\pm 100\text{ppm}/^\circ\text{C}$
- Output voltage range: 1.2V~5.0V
- High accuracy: $\pm 2\%$
- Thermal shutdown
- Overcurrent protection

APPLICATIONS

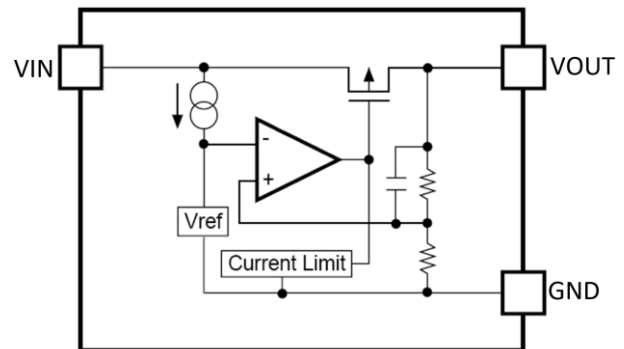
- Reference voltage source
- Battery powered equipment
- PC peripherals
- Wireless devices
- Instrumentation

TYPICAL APPLICATION



Note: Input capacitor ($C_{IN}=10\mu\text{F}$) and output capacitor ($C_{OUT}=10\mu\text{F}$) are recommended in all application circuit.

BLOCK DIAGRAM



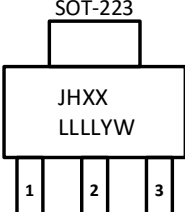
BLL1461

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		1 GND 2 VOUT 3 VIN
	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, "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.

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
$\frac{\Delta V_{out}}{\Delta V_{in} \cdot V_{out}}$	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} ≤1A		30	60	mV
I _Q	Supply current		V _{IN} =Set V _{OUT} +1V, V _{OUT} floating		120		uA
$\frac{\Delta V_{out}}{\Delta T \cdot V_{out}}$	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
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 $20^{\circ}\text{C}/\text{W}$. 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 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.

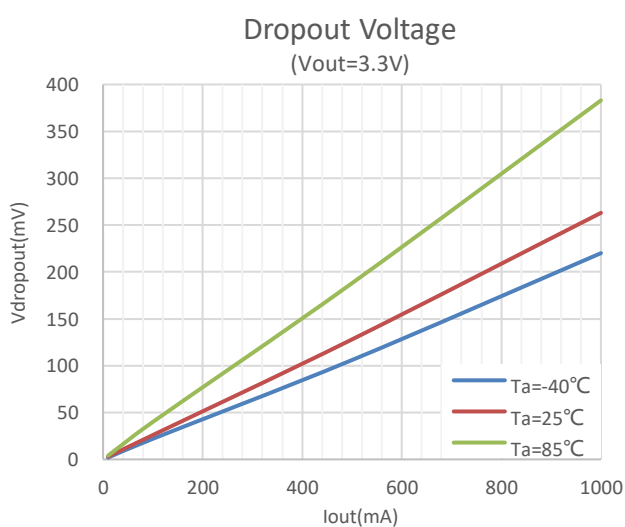
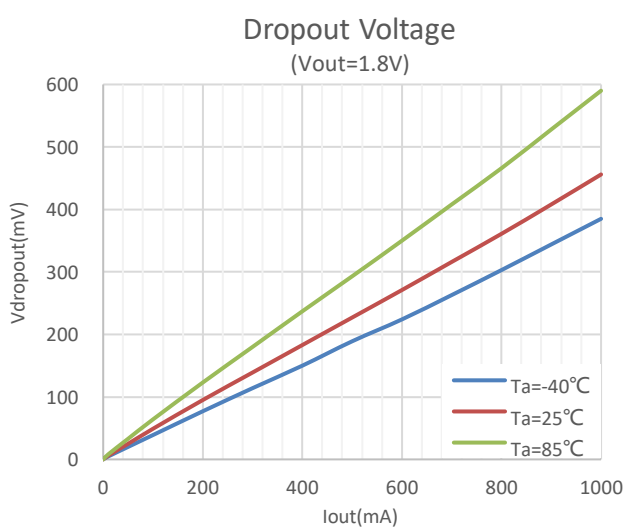
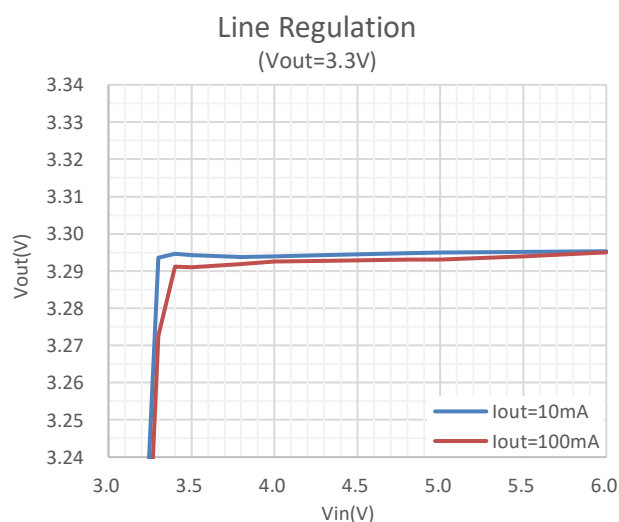
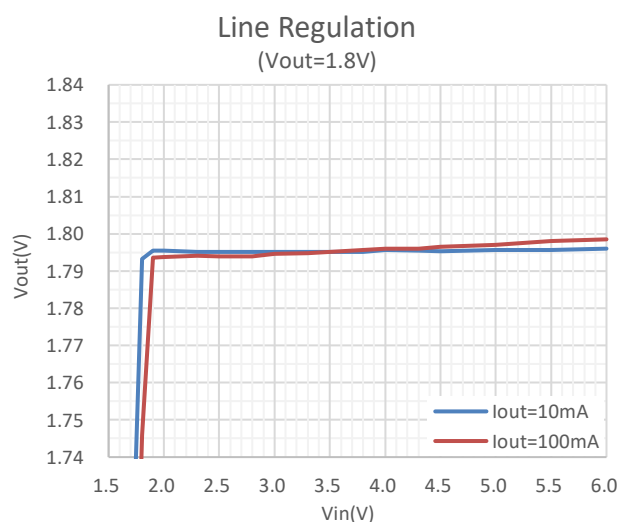
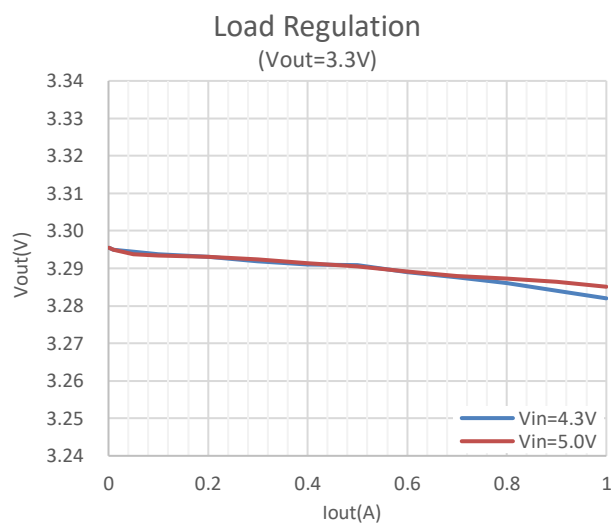
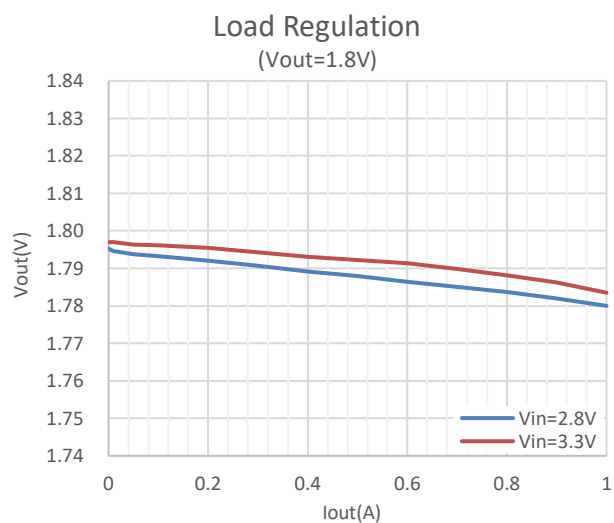
CURRENT LIMIT MODE

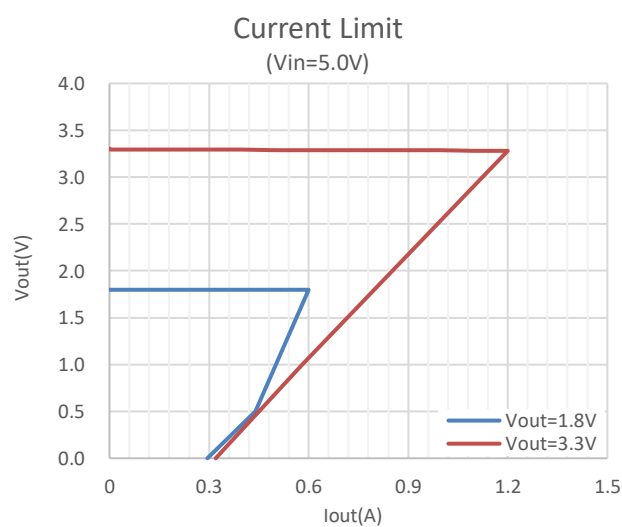
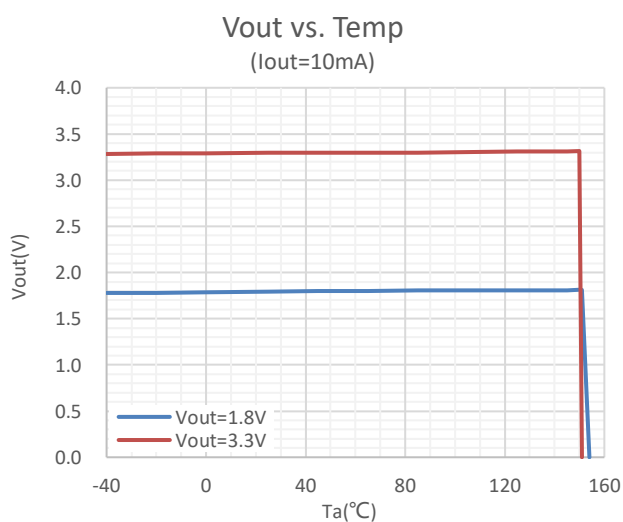
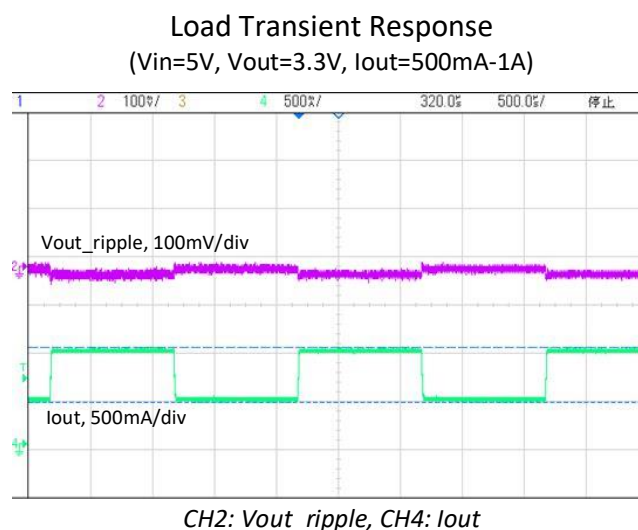
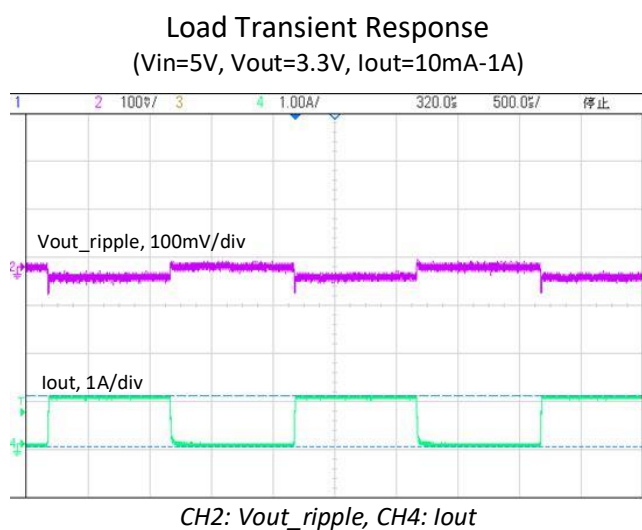
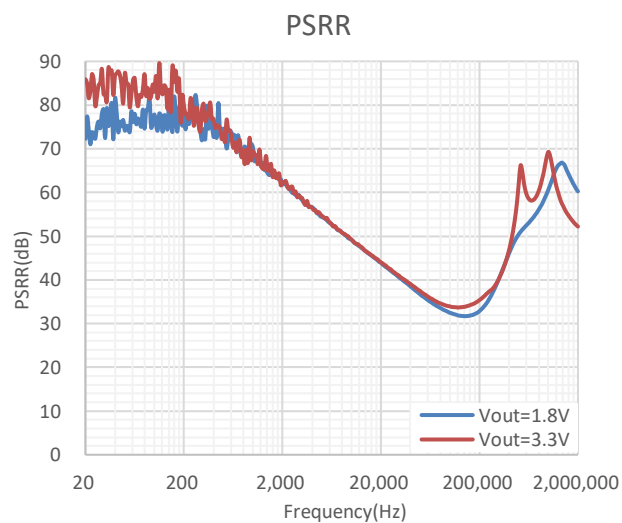
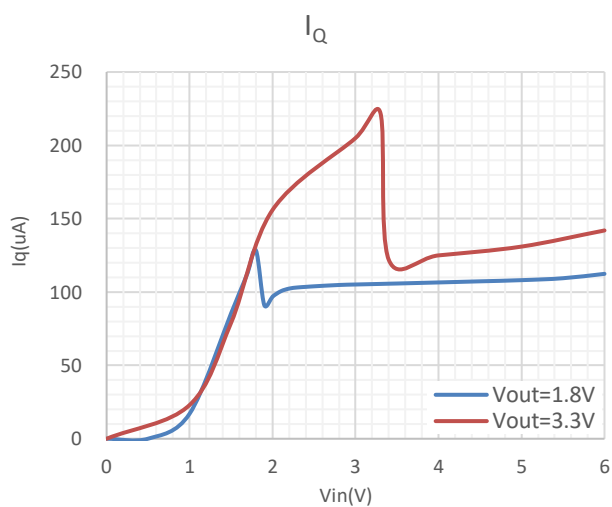
Current Limit module can keep chip and power system away from danger when the load current is higher than the current limit threshold. When V_{OUT} decrease the Short Circuit Current will fold back to a small value.

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





PACKAGE OUTLINE

