

## 16V 500mA Low Consumption Linear Regulator

### DESCRIPTION

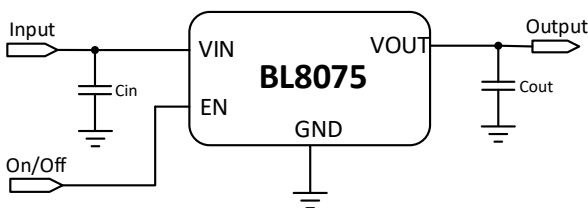
BL8075 series is a group of positive voltage output, low power consumption, low dropout voltage regulator. It can provide 300mA output current when input / output voltage differential drops to 600mV ( $V_{OUT}=3.3V$ ), and it also provides foldback short-circuit protection, thermal protection and output current limit function. The very low power consumption of BL8075 ( $I_Q=10\mu A$ ) can greatly improve natural life of batteries.

BL8075 can provide output value in the range of 1.2V~5.0V in 0.1V steps. It also can customize on command.

BL8075 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

BL8075 has well load transient response and good temperature characteristic, And it uses trimming technique to guarantee output voltage accuracy within  $\pm 2\%$ .

### TYPICAL APPLICATION



**Note:** Input capacitor ( $C_{IN}=1\mu F$ ) and output capacitor ( $C_{OUT}=1\mu F$ ) are recommended in all application circuit. Ceramic capacitor is recommended.

### FEATURES

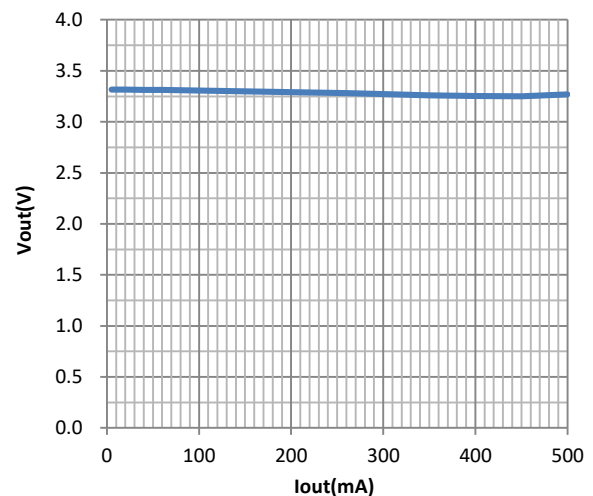
- Low power consumption: 10 $\mu A$ (Typ.)
- Maximum output current: 500mA
- Small dropout voltage  
600mV@300mA ( $V_{OUT}=3.3V$ )  
1.2V@500mA ( $V_{OUT}=3.3V$ )
- Input voltage range: 3V~16V
- Output voltage range: 1.2V~5.0V (customized on command in 0.1V steps)
- Highly accurate:  $\pm 2\%$  ( $\pm 1\%$  customized)
- Output current limit: 650mA

### APPLICATIONS

- Battery powered equipment
- Power management of MP3、PDA、DSC、Mouse、PS2 games
- Reference voltage source regulation after switching power

### ELECTRICAL CHARACTERISTICS

#### Load Regulation



## ORDERING INFORMATION

BL8075 12345

Code	Description
1	Temperature&Rohs: C:-40~85°C ,Pb Free Rohs Std.
2	Package type: B5:SOT-23-5 C3:SOT-89-3
3	Packing type: TR:Tape&Reel (Standard)
4	Output voltage: e.g. 12=1.2V 15=1.5V 50=5.0V
5	Voltage accuracy: 1= ± 1% Blank(default)= ± 2%

## ABSOLUTE MAXIMUM RATING

Parameter	Value	
Max input voltage	20V	
Operating junction temperature(T <sub>j</sub> )	125°C	
Ambient temperature(T <sub>A</sub> )	-40°C -85°C	
Power dissipation (P <sub>D</sub> @T <sub>A</sub> =25°C)	SOT-23-5	400mW
	SOT-89-3	500mW
Storage temperature(T <sub>s</sub> )	-40°C -150°C	
Lead temperature & time	260°C,10S	

### Note:

Exceed these limits to damage to the device.  
Exposure to absolute maximum rating conditions may affect device reliability.

## PIN CONFIGURATION

Product classification		BL8075CB5TR□□□	
Marking		SOT-23-5	
PXYW	P:Product code	VIN 1 5 VOUT	
	X:Output voltage	GND 2 PXYW 4 NC	
	YW:Date code	EN 3	
Product classification		BL8075CC3TR□□□	
Marking		SOT-89-3	
PXX LLXYW	P:Product code	1 GND	
	XX:Output voltage	2 VIN	
	LL:LOT NO.	3 VOUT	
	X:FAB code	1 2 3	
	YW:Date code		

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.

## RECOMMENDED WORK CONDITIONS

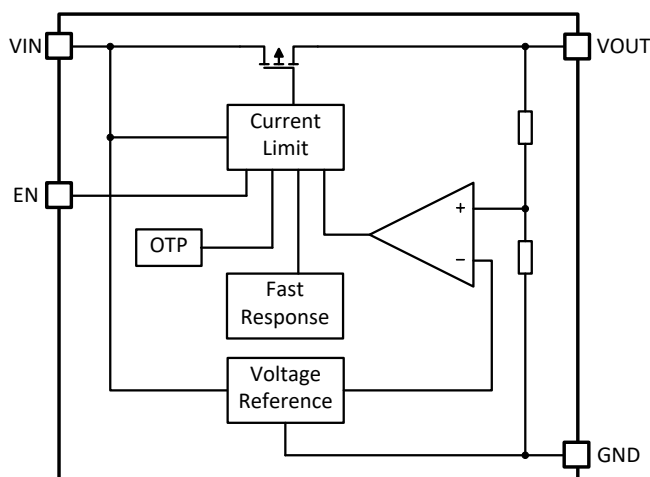
Item	Min	Recom- mended	Max.	Unit
Input voltage range	3		16	V
Ambient temperature	-40		85	°C

## ELECTRICAL CHARACTERISTICS

(Test conditions:  $C_{IN}=1\mu F$ ,  $C_{OUT}=1\mu F$ ,  $T_A=25^\circ C$ , unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
$V_{IN}$	Input voltage		3		16	V
$V_{OUT}$	Output voltage	$V_{IN}-V_{OUT}=1.2V$ $1mA \leq I_{OUT} \leq 30mA$	$V_{OUT} > 1.5V$	$V_{OUT}$	$V_{OUT} \times 1.02$	V
			$V_{OUT} \leq 1.5V$		$V_{OUT} - 0.03$	
$I_{OUT} (Max.)$	Maximum output current	$V_{IN}-V_{OUT}=1.2V$	500			mA
Dropout Voltage	Input-output voltage differential	$I_{OUT}=300mA$ , $V_{OUT} = 3.3V$		600		mV
$\frac{\Delta V_{out}}{\Delta V_{in} \cdot V_{out}}$	Line regulation	$I_{OUT}=10mA$ , $4V \leq V_{IN} \leq 16V$		0.2	0.3	%/V
$\Delta V_{out}$	Load regulation	$V_{IN} = \text{Set } V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 100mA$		20	40	mV
$I_Q$	Quiescent current	$V_{IN} = \text{Set } V_{OUT} + 1V$ , $V_{EN} = "H"$		10	20	$\mu A$
		$V_{IN} = 12V$ , $V_{EN} = 0V$		0.1	1	$\mu A$
$\frac{\Delta V_{out}}{\Delta T \cdot V_{out}}$	Output voltage temperature coefficient	$I_{OUT}=10mA$		$\pm 100$		ppm/ $^\circ C$
$V_{ENH}$	EN input voltage "H"		1.5		$V_{IN}$	V
$V_{ENL}$	EN input voltage "L"		0		0.4	V
	Thermal shutdown			150		$^\circ C$

## BLOCK DIAGRAM



## EXPLANATION

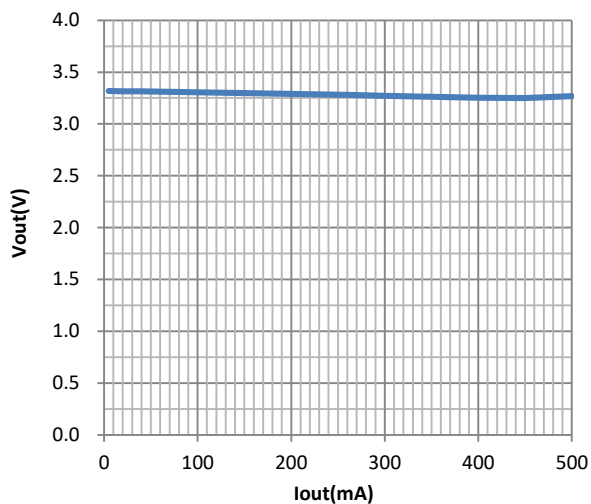
BL8075 is a series of low dropout voltage and low power consumption regulator. Its application circuit is very simple, which only needs two outside capacitors. It is composed of these modules: high accuracy voltage reference, current limit circuit, error amplifier, output driver and power transistor.

Current Limit module can keep chip and power system away from danger when load current is more than 500mA.

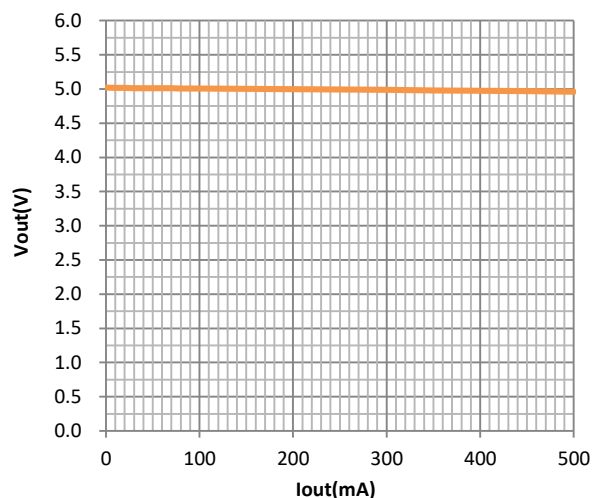
BL8075 uses trimming technique to assure the accuracy of output value within  $\pm 2\%$ , at the same time, temperature compensation is elaborately considered in this chip, which makes BL8075's temperature coefficient within  $\pm 100\text{ppm}/^\circ C$ .

## TYPICAL PERFORMANCE CHARACTERISTICS

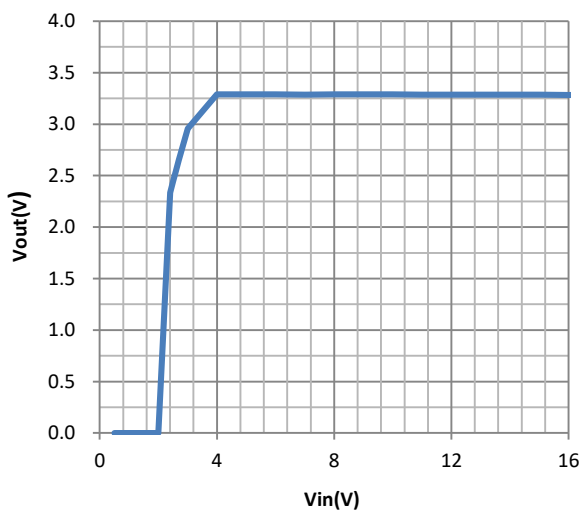
### Load Regulation



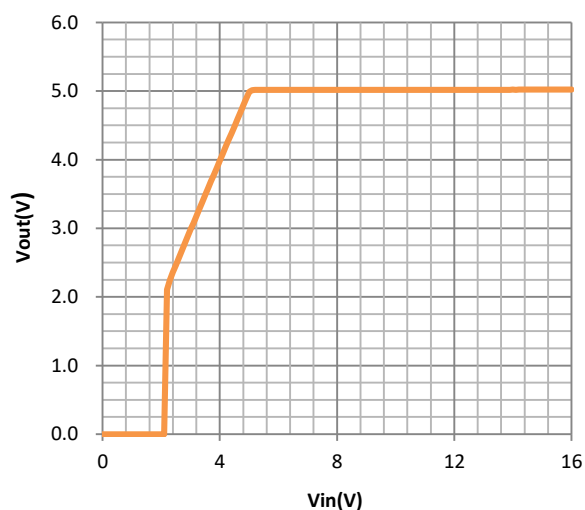
### Load Regulation



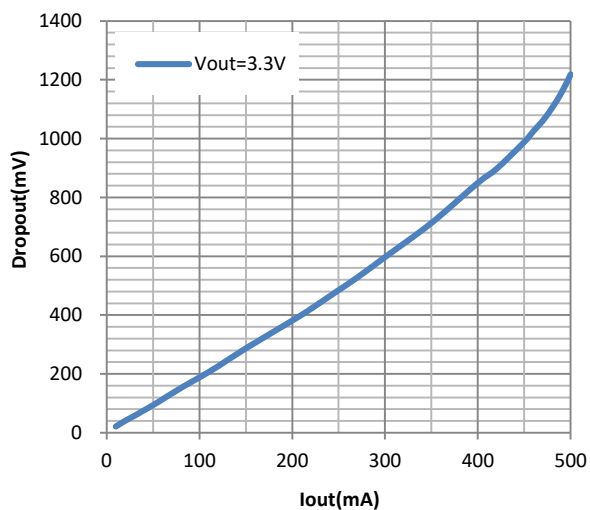
### Line Regulation



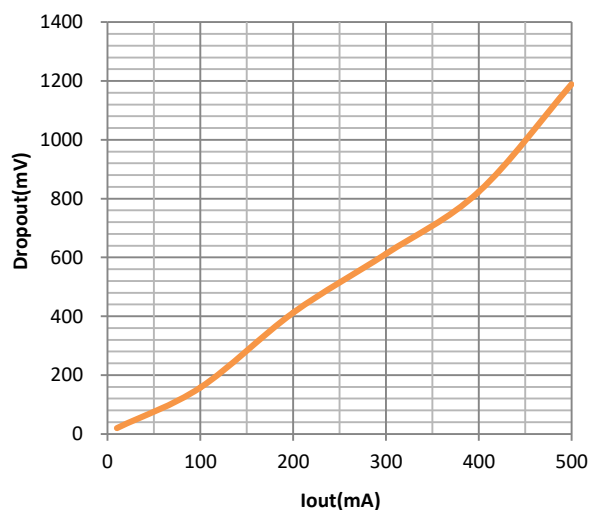
### Line Regulation

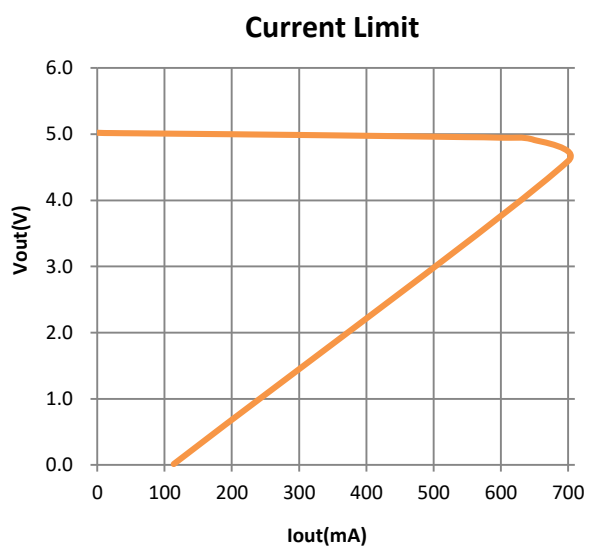
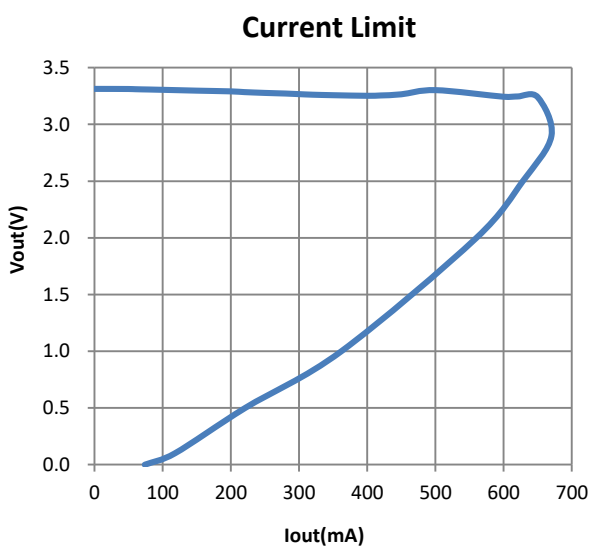
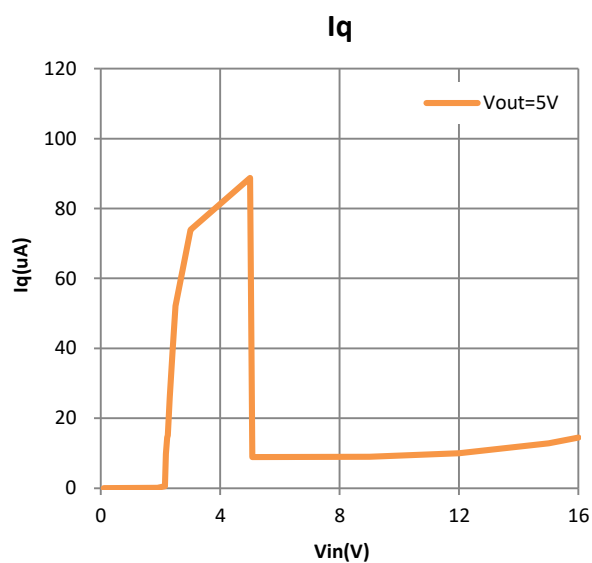
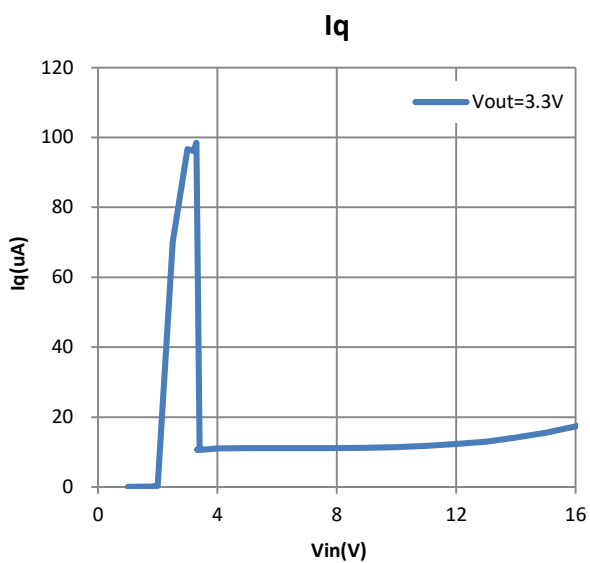


### Dropout



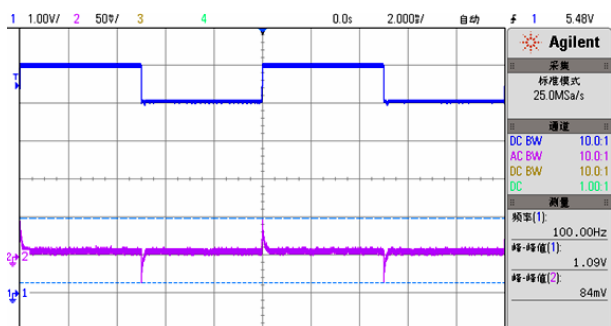
### Dropout



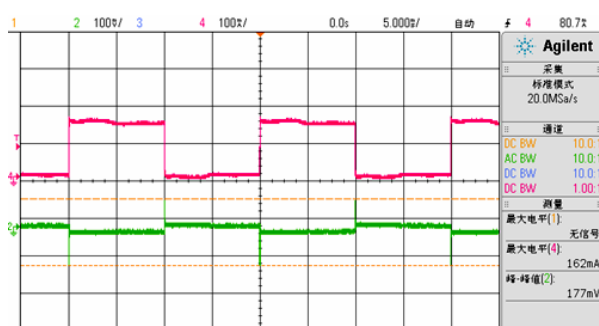


Line transient response  
(Vin=5V~6V, Iout=10mA)

Load transient response  
(Vin=5V, Iout=5mA~150mA)



Ch1—Vin, Ch2—Vout



Ch2—Vout, Ch4—Iout

## PACKAGE OUTLINE

Package	SOT-23-5	Devices per reel	3000Pcs
Package dimension:			
<p>Technical drawing of the SOT-23-5 package. The top view shows a width of <math>2.9 \pm 0.2</math> mm and a lead spacing of <math>1.9 \pm 0.2</math> mm, divided into two <math>0.95</math> mm segments. Lead widths are <math>0.4 \pm 0.1</math> mm. The side view shows a maximum height of <math>2.8 \pm 0.3</math> mm, a lead height of <math>1.6 \pm 0.1</math> mm, and a lead thickness of <math>0.15 \pm 0.05</math> mm. A detail view shows a lead width of <math>1.1 \pm 0.2</math> mm, a lead thickness of <math>0.8 \pm 0.1</math> mm, and a lead angle of <math>0</math> to <math>0.1</math> degrees. A perspective view shows the package with leads numbered 1 through 5.</p>			
Unit: mm			

Package	SOT-89-3	Devices per reel	1000Pcs
Package dimension:			
<p>Technical drawing of the SOT-89-3 package. The top view shows a width of <math>4.5 \pm 0.1</math> mm and a lead spacing of <math>1.6 \pm 0.2</math> mm. The lead height is <math>0.4</math> mm. The side view shows a maximum height of <math>4.25</math> mm, a lead height of <math>2.5 \pm 0.1</math> mm, and a lead thickness of <math>0.8</math> mm minimum. A detail view shows a lead width of <math>1.5 \pm 0.1</math> mm and a lead thickness of <math>0.4 \pm 0.1</math> mm. A perspective view shows the package with leads numbered 1 through 3 and a circular feature with a diameter of <math>\varnothing 1.0</math> mm. Lead widths are <math>0.42 \pm 0.2</math> mm and lead spacing is <math>1.5 \pm 0.1</math> mm.</p>			
Unit: mm			