

## 40V 150mA Low Consumption Linear Regulator

### DESCRIPTION

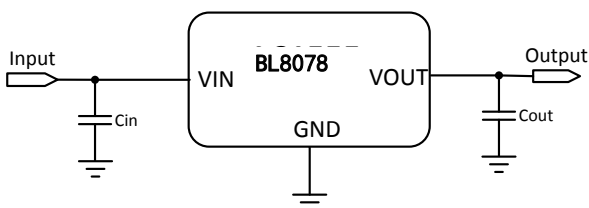
BL8078 series is a group of positive voltage output, low power consumption, low dropout voltage regulator. It can provide 150mA output current when input / output voltage differential drops to 400mV ( $V_{out}=5V$ ), and it also provides foldback short-circuit protection, thermal protection and output current limit function. The very low power consumption of BL8078 ( $I_q=2.5\mu A$ ) can greatly improve natural life of batteries.

BL8078 can provide output value in the range of 1.2V~5.0V in 0.1V steps. It also can customize on command.

BL8078 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

BL8078 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

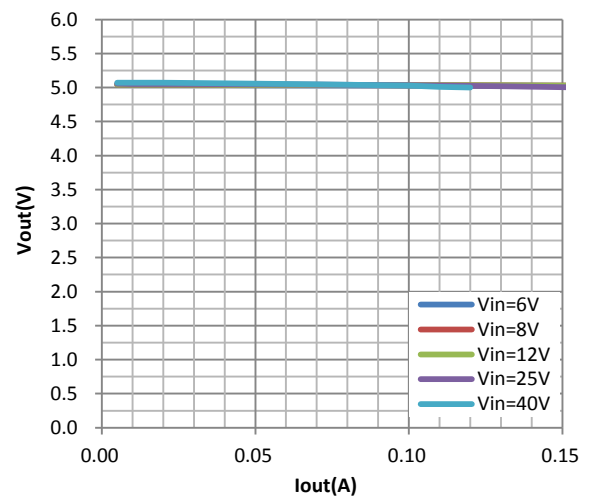
- Low Power Consumption: 2.5 $\mu A$ (Typ.)
- Maximum Output Current: 150mA
- Small Dropout Voltage  
400mV@100mA ( $V_{out}=5V$ )
- Input Voltage Range: 3V~40V
- Output Voltage Range: 1.2V~5.0V ( $V_{out}>5V$  customized)
- Highly Accurate:  $\pm 2\%$ ( $\pm 1\%$  customized)
- Output Current Limit: 180mA

### 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

BL8078 ①②③④⑤

Code	Description
①	Temperature&Rohs: C:-40~85°C ,Pb Free Rohs Std.
②	Package type: C3:SOT-89-3 C3B:SOT-89-3(B)
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	50V
Operating Junction Temperature(Tj)	125°C
Ambient Temperature(Ta)	-40°C -85°C
Power Dissipation (P <sub>D</sub> @Ta=25°C)	SOT-89-3 500mW
Storage Temperature(Ts)	-40°C -150°C
Lead Temperature & Time	260°C,10S

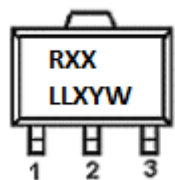
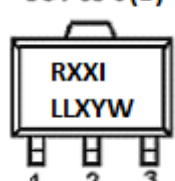
### Note:

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

## RECOMMENDED WORK CONDITIONS

Item	Min	Recom- mended	Max.	Unit
Input Voltage Range	3		40	V
Ambient Temperature	-40		85	°C

## PIN CONFIGURATION

Product Classification		BL8078CC3TR□□□
Marking		SOT-89-3
RXX LLXYW	R:Product Code	
	XX:Output Voltage	
	LL:LOT NO.	
	X:FAB Code	
	YW:Date Code	
Product Classification		BL8078CC3BTR□□□
Marking		SOT-89-3(B)
RXXI LLXYW	R:Product Code	
	XX:Output Voltage	
	LL:LOT NO.	
	X:FAB Code	
	YW:Date Code	
VIN	Supply Voltage Input	
GND	Ground Pin	
VOUT	Output Voltage	

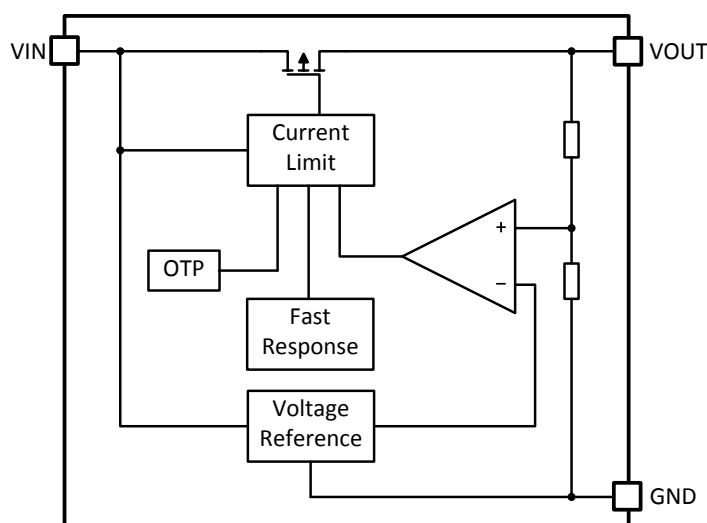
Y: The Year of manufacturing, "1" stands for year 2011, "2" stands for year 2012, and "8" stands for year 2018.  
W: The week of manufacturing. "A" stands for week 1, "Z" stands for week 26, "A" stands for week 27, "Z" stands for week 52.

## 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	Type	Max	Units
$V_{in}$	Input Voltage		3		40	V
$V_{out}$	Output Voltage	$V_{out}>1.5V$	$V_{in}-V_{out}=1V$ $1mA \leq I_{out} \leq 30mA$	Vout	$V_{out} \times 0.98$	V
		$V_{out} \leq 1.5V$			$V_{out} - 0.03$	
$I_{out(Max.)}$	Maximum Output Current	$V_{in}-V_{out}=1V$	150			mA
Dropout Voltage	Input-Output Voltage Differential	$I_{out}=100mA$ , $V_{out} = 5V$		400		mV
$\frac{\Delta V_{out}}{\Delta V_{in} \cdot V_{out}}$	Line Regulation	$I_{out}=10mA$ , $4V \leq V_{in} \leq 40V$		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	$V_{in} = \text{Set } V_{out} + 1V$		2.5	5	$\mu A$
$\frac{\Delta V_{out}}{\Delta T \cdot V_{out}}$	Output Voltage Temperature Coefficient	$I_{out}=10mA$		$\pm 100$		ppm/ $^\circ C$
	Thermal Shutdown			130		$^\circ C$

## BLOCK DIAGRAM



## EXPLANATION

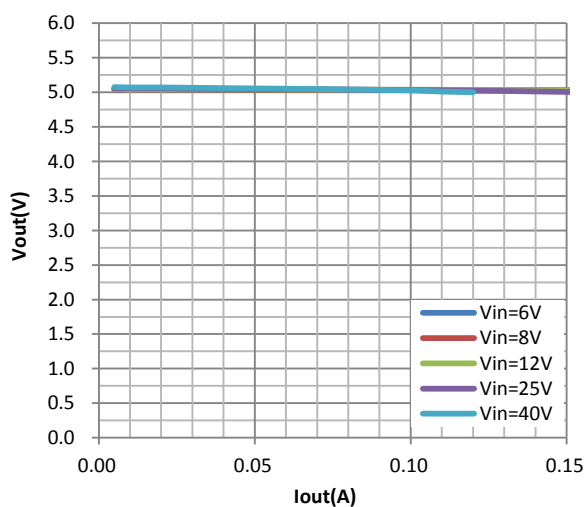
BL8078 is a series of low dropout voltage and low power consumption regulator. Its application circuit is very simple, which only needs two outside capacitors. It is composed of these modules: high accuracy voltage reference, current limit circuit, error amplifier, output driver and power transistor.

Current Limit module can keep chip and power system away from danger when load current is more than 180mA.

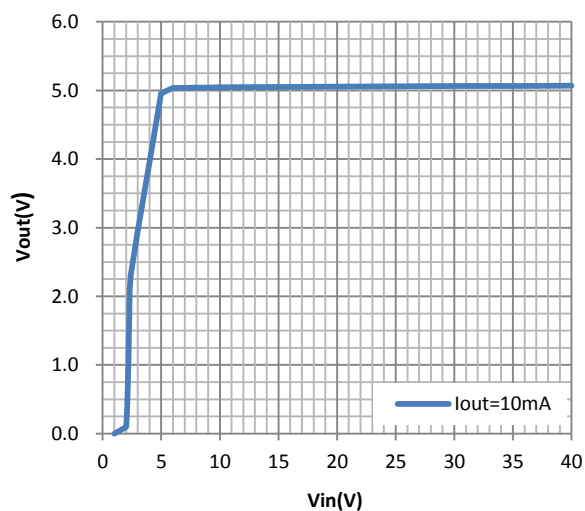
BL8078 uses trimming technique to assure the accuracy of output value within  $\pm 2\%$ , at the same time, temperature compensation is elaborately considered in this chip, which makes BL8078's temperature coefficient within  $\pm 100\text{ppm}/^\circ C$ .

## TYPICAL PERFORMANCE CHARACTERISTICS

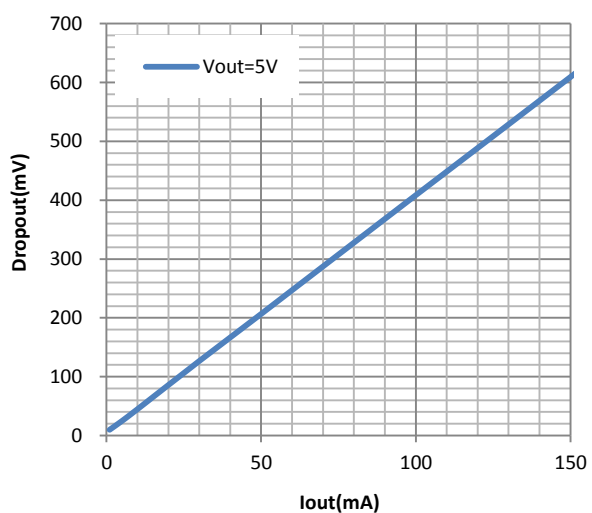
### Load Regulation



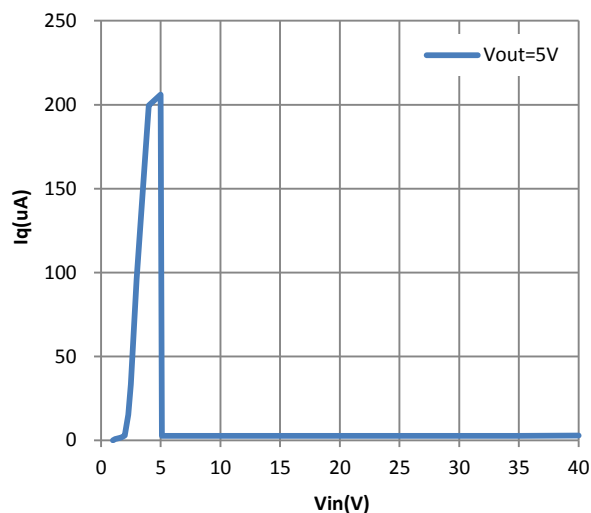
### Line Regulation



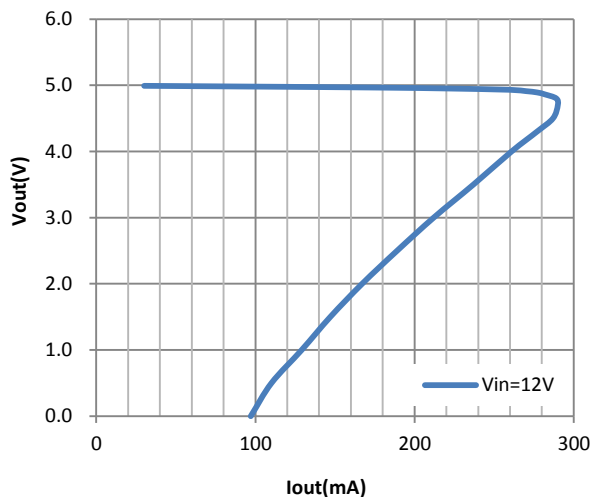
### Dropout



### Iq

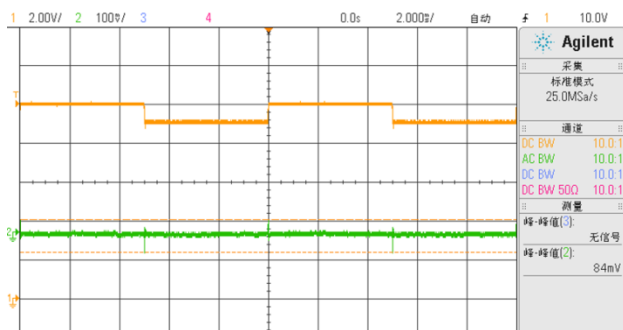


### Current Limit



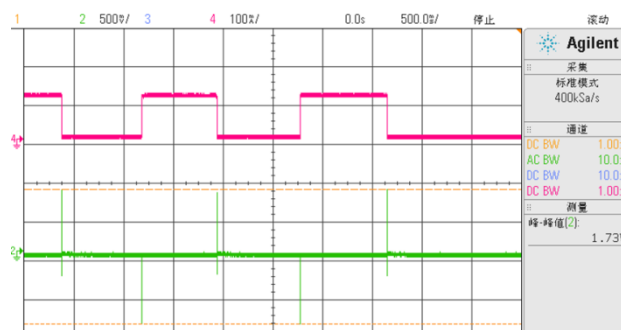
## Line transient response

Vin=6V~7V, Iout=10mA  
Ch1—Vin, Ch2—Vout



## Load transient response

Vin=12V, Iout=10mA~100mA  
Ch2—Vout, Ch4—Iout



## PACKAGE LINE

Package	SOT-89-3	Devices per reel	1000Pcs	Unit	mm
Package Dimension:					