

40V 150mA Low Consumption Linear Regulator

DESCRIPTION

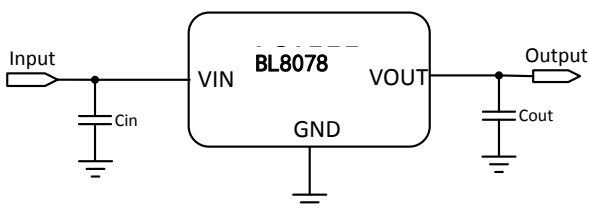
BL8078 series is a group of positive voltage output, low power consumption, low dropout voltage regulator. It can provide 150mA output current when input / output voltage differential drops to 400mV ($V_{out}=5V$), and it also provides foldback short-circuit protection, thermal protection and output 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

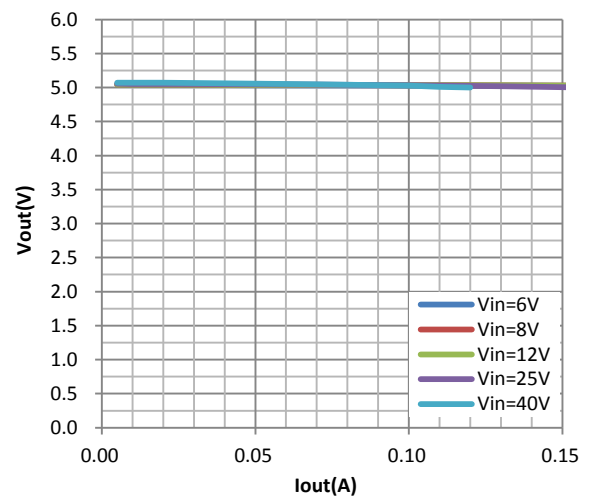
- Low Power Consumption: 2.5 μA (Typ.)
- Maximum Output Current: 150mA
- Small Dropout Voltage
400mV@100mA ($V_{out}=5V$)
- Input Voltage Range: 3V~40V
- Output Voltage Range: 1.2V~5.0V ($V_{out}>5V$ customized)
- Highly Accurate: $\pm 2\%$ ($\pm 1\%$ customized)
- Output Current Limit: 180mA

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 _D @Ta=25°C) | SOT-89-3 500mW |
| Storage Temperature(Ts) | -40°C -150°C |
| Lead Temperature & Time | 260°C,10S |

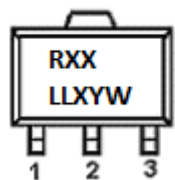
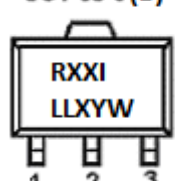
Note:

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 | |

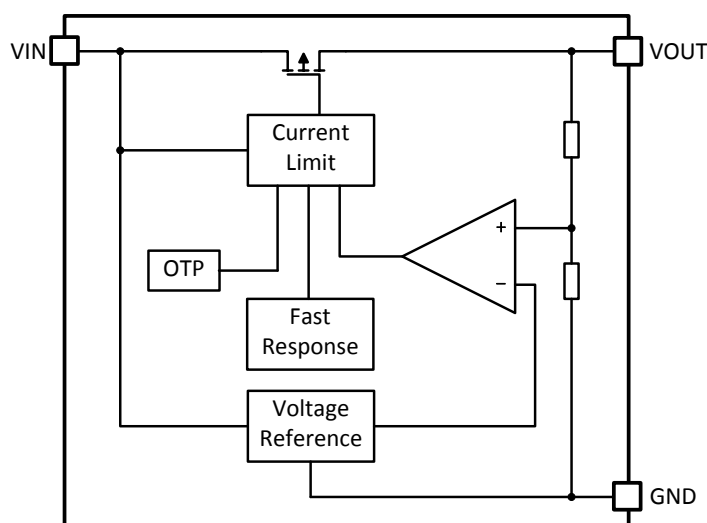
Y: The Year of manufacturing, "1" stands for year 2011, "2" stands for year 2012, and "8" stands for year 2018.
W: The week of manufacturing. "A" stands for week 1, "Z" stands for week 26, "A" stands for week 27, "Z" stands for week 52.

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 |
| ΔV_{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 | μA |
| $\frac{\Delta V_{out}}{\Delta T \cdot V_{out}}$ | Output Voltage Temperature Coefficient | $I_{out}=10mA$ | | ± 100 | | ppm/ $^\circ C$ |
| | Thermal Shutdown | | | 130 | | $^\circ C$ |

BLOCK DIAGRAM



EXPLANATION

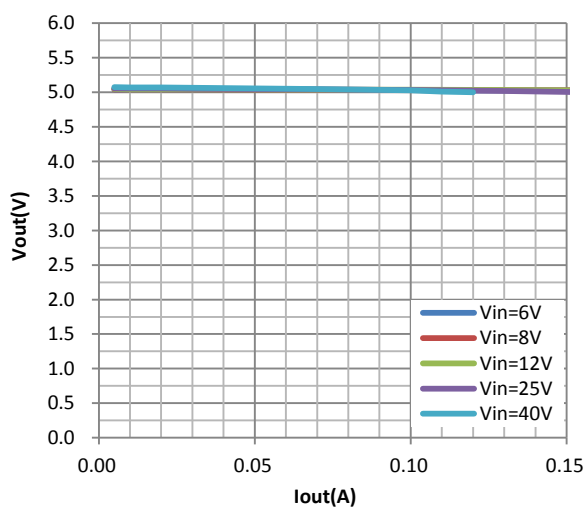
BL8078 is a series of low dropout voltage and low power consumption regulator. Its application circuit is very simple, which only needs two outside capacitors. It is composed of these modules: high accuracy voltage reference, current limit circuit, error amplifier, output driver and power transistor.

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

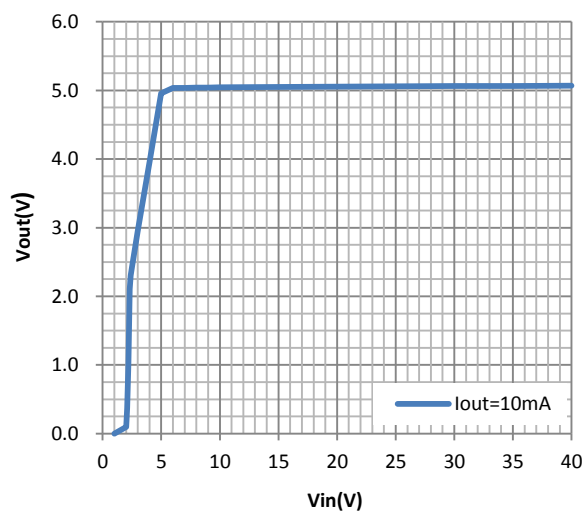
BL8078 uses trimming technique to assure the accuracy of output value within $\pm 2\%$, at the same time, temperature compensation is elaborately considered in this chip, which makes BL8078's temperature coefficient within $\pm 100\text{ppm}/^\circ C$.

TYPICAL PERFORMANCE CHARACTERISTICS

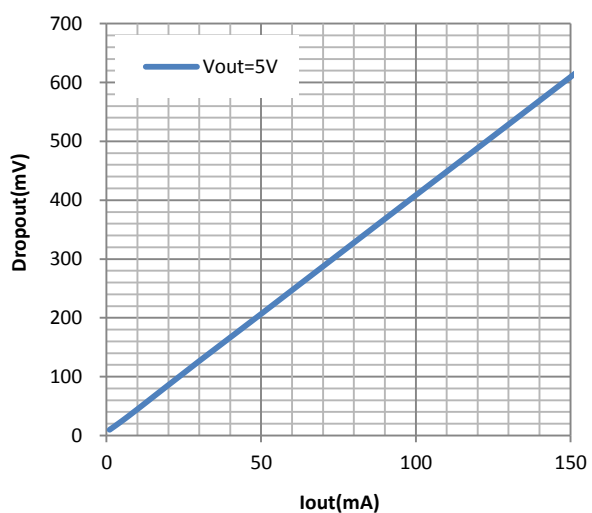
Load Regulation



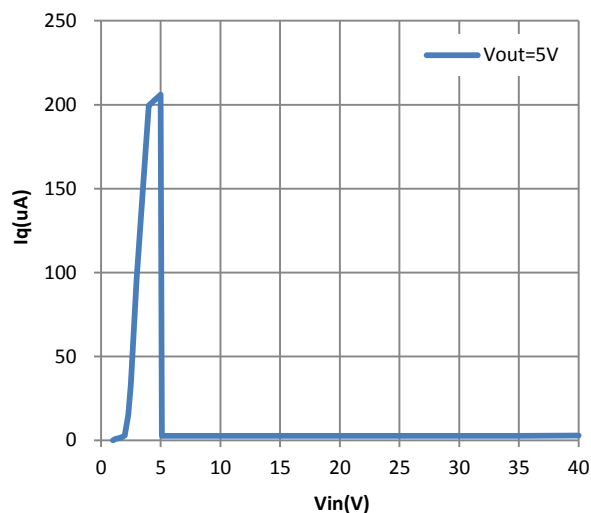
Line Regulation



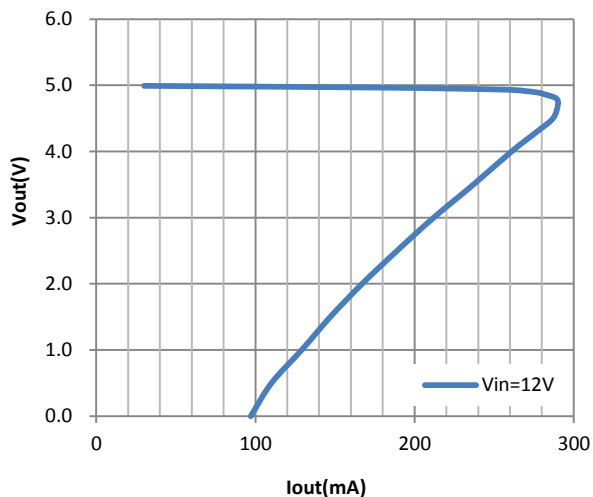
Dropout



Iq

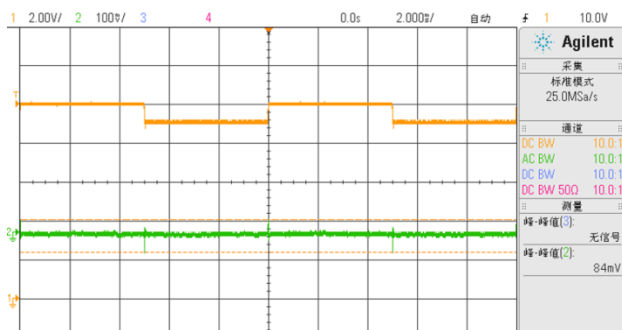


Current Limit



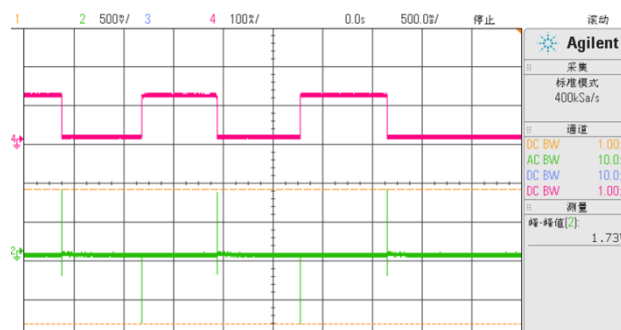
Line transient response

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: | | | | | |
| | | | | | |