

Dual, Low noise, 150mA LDO regulator

Features:

- Two low dropout voltage regulators
- 150mA output current for each LDO
- 25uA operating supply current per LDO
- Low 27uVRMS output noise
- Standby Mode: 0.1uA
- Low 200mV dropout at 100mA load
- 65dB PSRR at 1kHz
- Excellent Line regulation: 0.05%/V
- Independent Shutdown controls
- 1.2V to 5.0V Factory-Preset Output
- Output Current Limit
- Highly Accurate: $\pm 2\%$ ($\pm 1\%$ customized)

Applications:

- Cellular phones
- Cordless phones and radio communication equipment
- Battery Powered equipment
- Notebook and hand-hold equipment
- Wireless LAN
- GPS receivers

General Description:

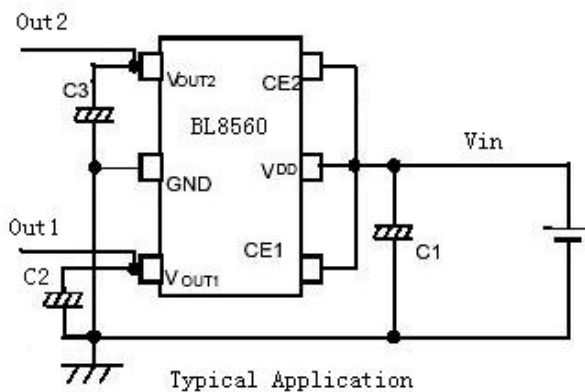
The BL8560 dual, low-noise, low-dropout regulator delivers at least 150mA of continuous output current. The output voltage for each regulator is set independently by trimming. Voltages are selectable in 100mV steps within a range of 1.2V to 5.0V. Typical output noise is 27uVrms, and PSRR is 65dB at 1KHz. The BL8560 includes two independent logic-controlled shutdown inputs and allows the output of each regulator to be turned off independently.

The BL8560 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

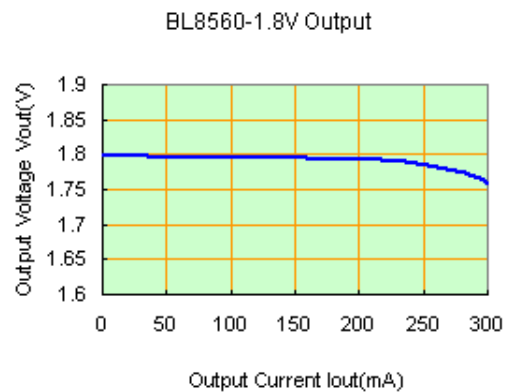
The BL8560 has excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within $\pm 2\%$.

The BL8560 is available in SOT-23-6 package which is lead (Pb)- free

BL8560 Typical Application Circuit

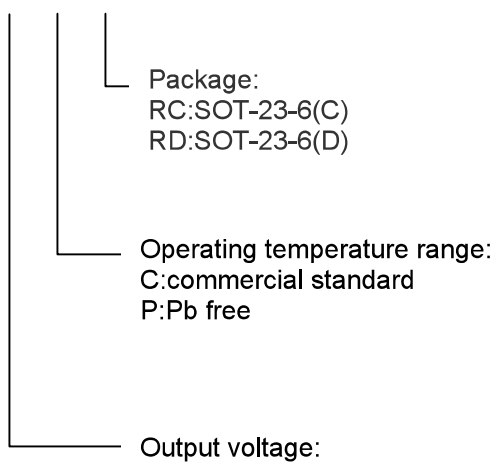


BL8560 Typical Performance Characteristics:



Selection Guide:

BL8560- X X XX



- A:1.5V(Output1),2.5V(Output2)
- B:1.5V(Output1),2.8V(Output2)
- C:1.5V(Output1),3.0V(Output2)
- D:1.5V(Output1),3.3V(Output2)
- E:1.5V(Output1),4.0V(Output2)
- F:1.8V(Output1),1.8V(Output2)
- G:1.8V(Output1),2.5V(Output2)
- H:1.8V(Output1),2.8V(Output2)
- I:1.8V(Output1),3.0V(Output2)
- J:1.8V(Output1),3.3V(Output2)
- K:2.5V(Output1),1.8V(Output2)
- L:2.5V(Output1),2.5V(Output2)
- M:2.8V(Output1),1.8V(Output2)
- N:2.8V(Output1),2.5V(Output2)
- O:2.8V(Output1),2.8V(Output2)
- P:2.8V(Output1),3.0V(Output2)
- Q:3.0V(Output1),2.5V(Output2)
- R:3.0V(Output1),3.0V(Output2)
- S:3.0V(Output1),3.3V(Output2)
- T:3.3V(Output1),1.8V(Output2)
- U:3.3V(Output1),2.5V(Output2)
- V:3.3V(Output1),2.8V(Output2)
- W:5.0V(Output1),3.3V(Output2)
- X:2.8V(Output1),1.5V(Output2)

Pin Assignment:

| Product Classification | Assembly type & Pin Configuration |
|----------------------------|-----------------------------------|
| BL8560-□□RC BL8560-□□RD | |

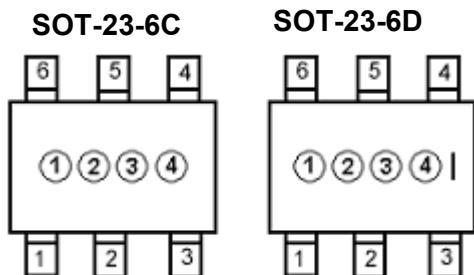
Pin Description:

| Pin Number | | Symbol | Function |
|------------|-----------|--------|------------------|
| SOT-23-6C | SOT-23-6D | | |
| 1 | 6 | Vout1 | Output1 pin |
| 2 | 2 | Vdd | Input Pin |
| 3 | 4 | Vout2 | Output2 pin |
| 4 | 3 | CE2 | Chip Enable Pin2 |
| 5 | 5 | GND | Ground Pin |
| 6 | 1 | CE1 | Chip Enable Pin1 |

Product Classification:

| Output Voltage | Package Type | Product Name | Package Type | Product Name |
|----------------|--------------|--------------|--------------|--------------|
| 1.5V/2.5V | SOT-23-6C | BL8560-APRC | SOT-23-6D | BL8560-APRD |
| 1.5V/2.8V | SOT-23-6C | BL8560-BPRC | SOT-23-6D | BL8560-BPRD |
| 1.5V/3.0V | SOT-23-6C | BL8560-CPRC | SOT-23-6D | BL8560-CPRD |
| 1.5V/3.3V | SOT-23-6C | BL8560-DPRC | SOT-23-6D | BL8560-DPRD |
| 1.5V/4.0V | SOT-23-6C | BL8560-EPRC | SOT-23-6D | BL8560-EPRD |
| 1.8V/1.8V | SOT-23-6C | BL8560-FPRC | SOT-23-6D | BL8560-FPRD |
| 1.8V/2.5V | SOT-23-6C | BL8560-GPRC | SOT-23-6D | BL8560-GPRD |
| 1.8V/2.8V | SOT-23-6C | BL8560-HPRC | SOT-23-6D | BL8560-HPRD |
| 1.8V/3.0V | SOT-23-6C | BL8560-IPRC | SOT-23-6D | BL8560-IPRD |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |
| 5.0V/3.3V | SOT-23-6C | BL8560-WPRC | SOT-23-6D | BL8560-WPRD |

Product Marking information:



- ① : Output current & EN availability
- ② : Output voltage
- ③ : Year of manufacturing
- ④ : Week of manufacturing

①

| Code | Iout | EN |
|------|----------------------|-----|
| K | dual 150mAChannel | Yes |

②

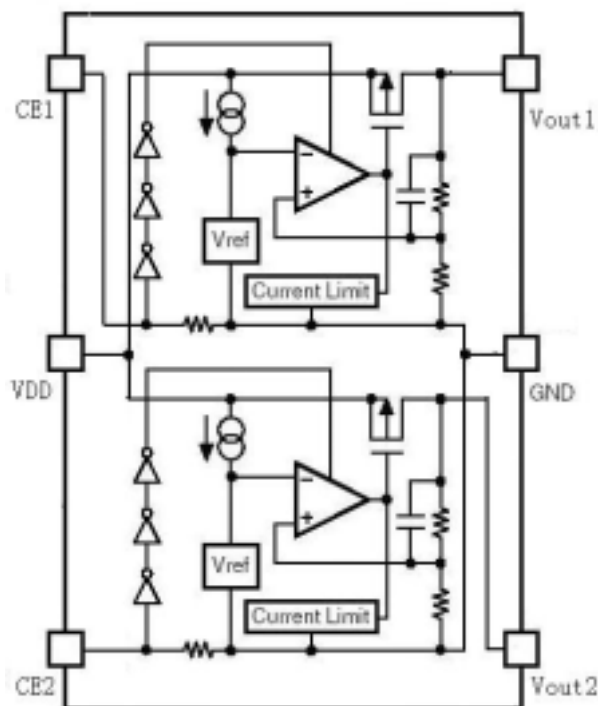
| Code | Vout1 | Vout2 | Code | Vout1 | Vout2 |
|------|-------|-------|------|-------|-------|
| A | 1.5V | 2.5V | N | 2.8V | 2.5V |
| B | 1.5V | 2.8V | O | 2.8V | 2.8V |
| C | 1.5V | 3.0V | P | 2.8V | 3.0V |
| D | 1.5V | 3.3V | Q | 3.0V | 2.5V |
| E | 1.5V | 4.0V | R | 3.0V | 3.0V |
| F | 1.8V | 1.8V | S | 3.0V | 3.3V |
| G | 1.8V | 2.5V | T | 3.3V | 1.8V |
| H | 1.8V | 2.8V | U | 3.3V | 2.5V |
| I | 1.8V | 3.0V | V | 3.3V | 2.8V |
| J | 1.8V | 3.3V | W | 5.0V | 3.3V |
| K | 2.5V | 1.8V | X | 2.8V | 1.5V |
| L | 2.5V | 2.5V | Y | | |
| M | 2.8V | 1.8V | Z | | |

③: The year of manufacturing, "5" stands for year 2005, "6" stands for year 2006, and "0" for year 2010.

④

| Code | Week of Mfg | Code | Week of Mfg | Code | Week of Mfg | Code | Week of Mfg | Code | Week of Mfg |
|------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|
| A | 1 | L | 12 | W | 23 | H | 34 | S | 45 |
| B | 2 | M | 13 | X | 24 | T | 35 | T | 46 |
| C | 3 | N | 14 | Y | 25 | J | 36 | U | 47 |
| D | 4 | O | 15 | Z | 26 | K | 37 | V | 48 |
| E | 5 | P | 16 | A | 27 | L | 38 | W | 49 |
| F | 6 | Q | 17 | B | 28 | M | 39 | X | 50 |
| G | 7 | R | 18 | C | 29 | N | 40 | Y | 51 |
| H | 8 | S | 19 | D | 30 | O | 41 | Z | 52 |
| I | 9 | T | 20 | E | 31 | P | 42 | | |
| J | 10 | U | 21 | F | 32 | Q | 43 | | |
| K | 11 | V | 22 | G | 33 | R | 44 | | |

Block Diagram:



Absolute Maximum Ratings:

| | | |
|--|-------|-------------|
| Max input voltage | ----- | 10V |
| Junction Temperature (T _J) | ----- | 125°C |
| Output Current | ----- | 200mA |
| Power Dissipation | | |
| SOT-23-6 | ----- | 200mW |
| Storage Temperature(T _s) | ----- | -45°C~150°C |
| Lead Temperature and Time | ----- | 260°C, 10S |

Recommended Work Conditions:

| Item | Min | Recommended | Max | unit |
|---------------------|-----|-------------|-----|------|
| Input Voltage Range | | | 8 | V |
| Ambient Temperature | -40 | | 85 | °C |

Electrical Characteristics:

(Test Conditions: C1=1uF,C2=C3=2.2uF,TA=25°C, unless otherwise specified.)

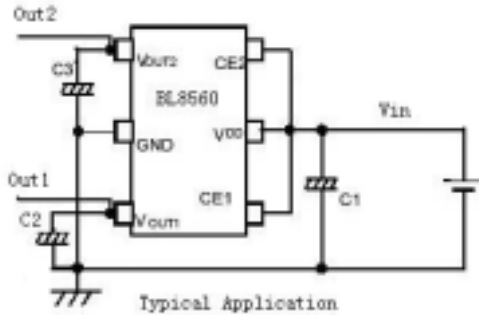
BL8560, for arbitrary output voltage

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|--|---|---|---------------|------|---------------|--------|
| Vin | Input Voltage | | 1.5 | | 8 | V |
| Vout | Output Voltage | Vin=Set Vout+1V 1mA≤Iout≤30mA | Vout x0.98 | | Vout X1.02 | V |
| Iout (Max.) | Maximun Output Current | Vin-Vout=1V | 150 | | | mA |
| Dropout Voltage | Input-Output Voltage Differentia | Refer to the ELECTRICAL CHARACTERISTICS by OUTPUT VOLTAGE | | | | |
| $\frac{\Delta V_{out}}{\Delta V_{in} \cdot V_{out}}$ | Line Regulation | Iout=40mA 1.6V≤Vin≤8V | | 0.05 | 0.2 | %/V |
| $\Delta V_{out} / \Delta I_{out}$ | Load Regulation | Vin=Set Vout+1V 1mA≤Iout≤80mA | | 12 | 40 | mV |
| I _{ss} | Supply Current | Vin=Set Vout+1V | | 25 | 50 | uA |
| I _{standby} | Supply Current (Srandby) | Vin=Set Vout+1V Vce=Gnd | | 0.1 | 1.0 | uA |
| $\frac{\Delta V_{out}}{\Delta T \cdot V_{out}}$ | Output Voltage Temperature Coefficiency | Iout=30mA | | ±100 | | ppm/°C |
| PSRR | Ripple Rejection | F=1kHz, Ripple=0.5Vp-p Vin=Set Vout+1V | | 65 | | dB |
| I _{lim} | Short Current Limit | Vout=0V | | 20 | | mA |
| R _{pd} | CE Pull down Resistance | | 2.0 | 5.0 | 10.0 | MΩ |
| V _{ceh} | CE Input Voltage "H" | | 1.5 | | Vin | V |
| V _{cel} | CE Input Voltage "L" | | 0 | | 0.25 | V |
| en | Output Noise | BW=10Hz~100kHz | | 27 | | uVrms |

Electrical Characteristics by Output Voltage

| Output Voltage Vout (V) | Dropout Voltage, V _{DIF} (V) | | |
|----------------------------|---------------------------------------|------|------|
| | Condition | Typ. | Max. |
| Vout =1.5V | Iout = 120mA | 0.38 | 0.70 |
| Vout = 1.6V | | 0.36 | 0.65 |
| Vout = 1.7V | | 0.34 | 0.60 |
| 1.8 ≤ Vout ≤ 2.0 | | 0.32 | 0.55 |
| 2.1 ≤ Vout ≤ 2.7 | | 0.28 | 0.50 |
| 2.8 ≤ Vout ≤ 4.0 | | 0.22 | 0.35 |

Typical Application Circuit:



Application hints:

NOTE1: Input capacitor (C1=1uF) is recommended in all application circuit.

NOTE2: Output capacitor (C2=C3=1uF/2.2uF) is recommended in all application to assure the stability of circuit.

Explanation:

The BL8560 series are highly accurate ,Dual,low noise,CMOS low dropout voltage regulators.

The output voltage for each regulator is set independently by trimming.Voltages are selectable in 100mV steps within a range of 1.2V to 5.0V . It also can be customized on command.

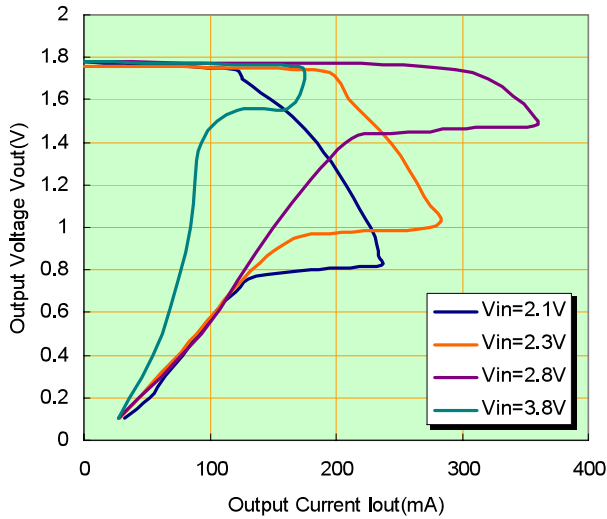
The BL8560 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

The BL8560 has 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 $\pm 2\%$.

Typical Performance Characteristics:

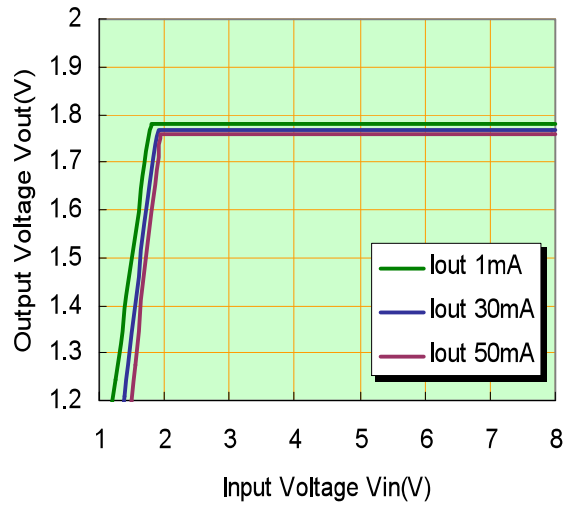
1) Output Voltage vs. Output Current (with output short protection)

BL8560-1.8V

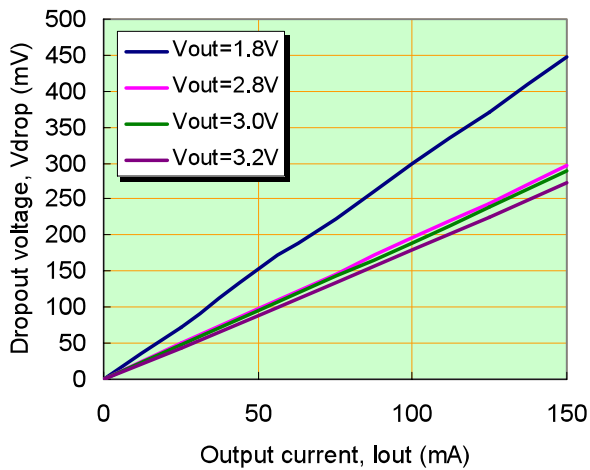


2) Output Voltage vs. Input Voltage

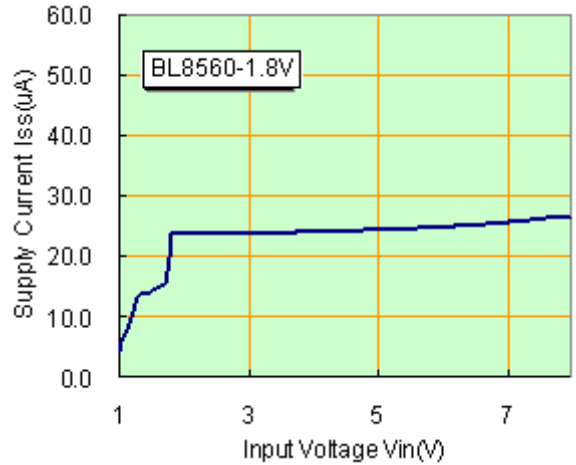
BL8560-1.8V



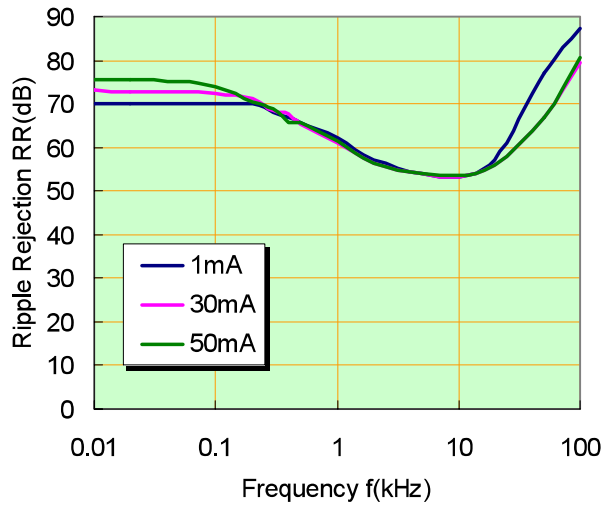
3) Dropout Voltage vs. Output Current



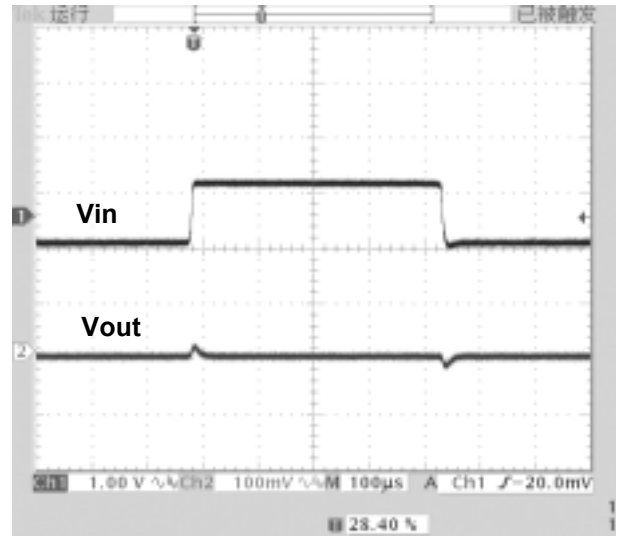
4) Supply Current vs. Input Voltage



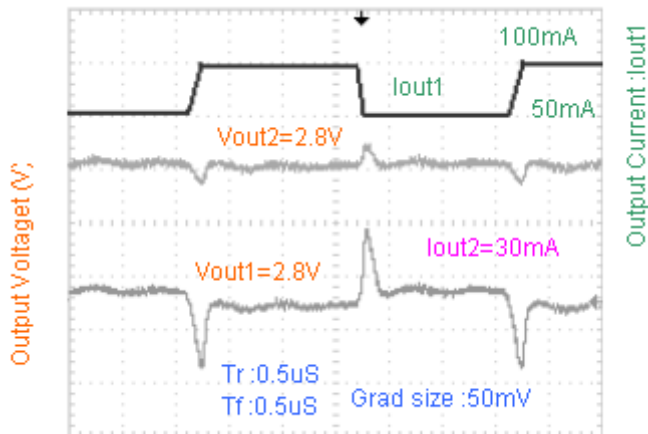
5) Ripple rejection vs. Frequency



6) Line transient response



7) Load transient response



Package Information:

