

500mA High PSRR, Low Noise, Fast Response Linear Regulator

DESCRIPTION

BL8568 series is a group of positive voltage output, low power consumption, low dropout voltage regulator.

BL8568 can provide output value in the range of 1.2V~4.5V every 0.1V step. It also can be customized on command.

BL8568 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module with discharge capability.

BL8568 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 $\pm 2\%$.

BL8568 is available in SOT-23-5, SC-70-5 packages which is lead free.

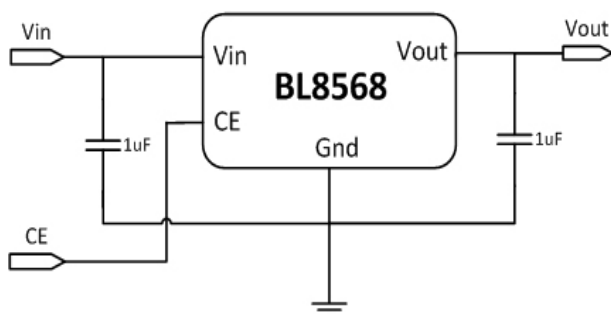
FEATURES

- Low Power Consumption: 30uA (Typ.)
- Low output noise (50uVRMS)
- Standby Mode: 0.1uA
- Low dropout Voltage: 0.08V@150mA (Typ.)
- High Ripple Rejection: 72dB@1000Hz (Typ.)
- Low Temperature Coefficient: $\pm 100\text{ppm}/^\circ\text{C}$
- Excellent Line regulation: 0.05%/V
- Build-in chip enable and discharge circuit
- Output Voltage Range: 1.2V~4.5V (customized on command every 0.1V step)
- Highly Accurate: $\pm 2\%$
- Output Current Limit

APPLICATIONS

- Power source for cellular phones and various kind of PCSs
- Battery Powered equipment
- Power Management of MP3, PDA, DSC, Mouse, PS2 Games
- Reference Voltage Source
- Regulation after Switching Power

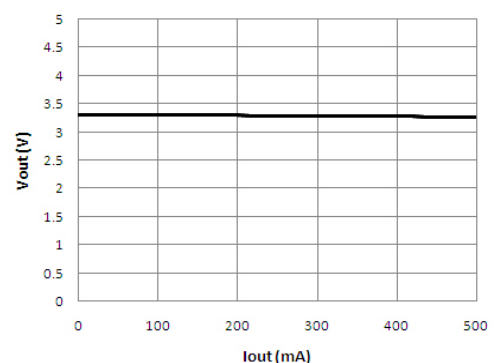
TYPICAL APPLICATION CIRCUIT



NOTE: Input capacitor ($C_{in}=1\mu\text{F}$) and Output capacitor ($C_{out}\geq 1\mu\text{F}$) are recommended in all application circuit.

ELECTRICAL CHARACTERISTICS

Load Regulation ($V_{in}=4.5\text{V}$, $V_{out}=3.3\text{V}$)



ORDERING INFORMATION

BL8568 ①②③④⑤

Code	Description
①	Temperature&Rohs: C: -40~85°C ,Pb Free Rohs Std.
②	Package type: A5: SC-70-5 B5A: SOT-23-5(A) B5B: SOT-23-5(B)
③	Packing type: TR:Tape&Reel (Standard)
④	Output voltage: e.g. 15=1.5V 18=1.8V 45=4.5V
⑤	Voltage accuracy: Blank(default)=±2%

MARKING DESCRIPTION

F: Product Code

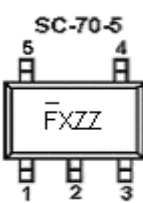
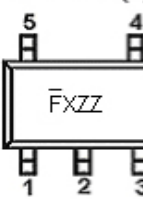
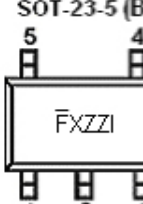
X: Output Voltage

Vout	Code	Vout	Code	Vout	Code
		2.6V	<u>6</u>	4.1V	<u>1</u>
1.2V	2	2.7V	<u>7</u>	4.2V	<u>2</u>
1.3V	3	2.8V	<u>8</u>	4.3V	<u>3</u>
1.4V	4	2.9V	<u>9</u>	4.4V	<u>4</u>
1.5V	5	3.0V	<u>0</u>	4.5V	<u>5</u>
1.6V	6	3.1V	<u>1</u>		
1.7V	7	3.2V	<u>2</u>		
1.8V	8	3.3V	<u>3</u>		
1.9V	9	3.4V	<u>4</u>		
2.0V	<u>0</u>	3.5V	<u>5</u>		
2.1V	<u>1</u>	3.6V	<u>6</u>		
2.2V	<u>2</u>	3.7V	<u>7</u>		
2.3V	<u>3</u>	3.8V	<u>8</u>		
2.4V	<u>4</u>	3.9V	<u>9</u>		
2.5V	<u>5</u>	4.0V	<u>0</u>		

Date code 1st Z: The year of manufacturing, "8" for year 2008, and "0" for year 2010.

Date code 2nd Z: The week of manufacturing, "A" for week 1, "Z" for week 26, "A" for week 27, "Z" for week 52.

PIN CONFIGURATION

Part No.		BL8568CA5TR□□□
Marking		
FXZZ	F: product code	1 Vin
	X: output voltage	2 Vss
	ZZ: date code	3 CE
Part No.		BL8568CB5ATR□□□
Marking		
FXZZ	F: product code	1 Vin
	X: output voltage	2 Vss
	ZZ: date code	3 CE
Part No.		BL8568CB5BTR□□□
Marking		
FXZZI	F: product code	1 Vout
	X: output voltage	2 Vss
	ZZ: date code	3 Vin
		4 CE
		5 NC
		: Type B

PIN DESCRIPTION

Pin	Description
Vss	Ground
Vin	Input voltage supply
Vout	Output voltage
CE	Chip enable
NC	No connection

BLOCK DIAGRAM

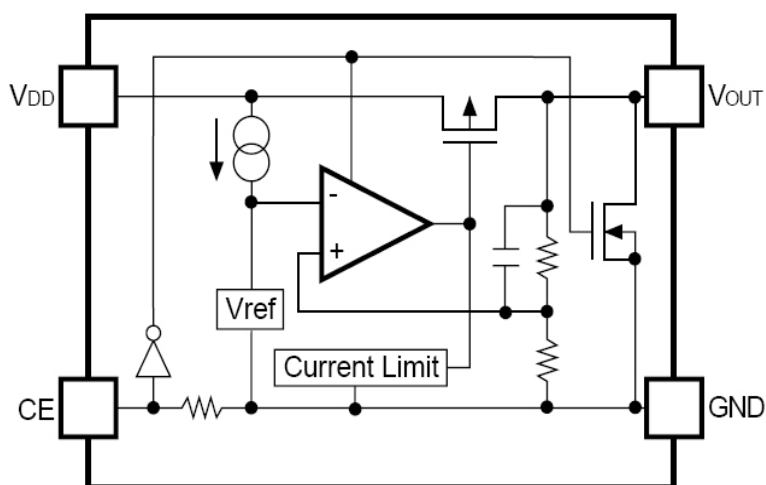


DIAGRAM EXPLANATION

BL8568 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module with discharge capability.

BL8568 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 $\pm 2\%$.

Low ESR ceramic capacitor can be used for BL8568 for both input and output ends. Both 1uF can keep BL8568 work stable. However, a larger output capacitor, such as 3.3uF /4.7uF is always recommended to compensate dynamic load current change.

ABSOLUTE MAXIMUM RATING

Parameters		Value
Input Voltage		-0.3 ~ 6 V
Operation Junction Temperature (Tj)		150 °C
Output Current		600 mA
Storage Temperature		-65 ~ 150 °C
Power Dissipation	SC70-5	250 mW
	SOT23-5	360 mW
IR Reflow Lead Temperature and Time		260°C , 10s
ESD Rating, Human Body Mode		3000 V

Note:

Exceed these limits to damage to the device.

Exposure to absolute maximum rating conditions may affect device reliability.

RECOMMENDED OPERATION RANGE

Parameters	Value
Input Voltage	1.2 ~ 6 V
Operation Ambient Temperature	-40 ~ 85 °C

ELECTRICAL CHARACTERISTICS

Test condition: $C_{in}=1\mu F$, $C_{out}=1\mu F$, $T_A=25^\circ C$, unless otherwise specified.

BL8568, for arbitrary output voltage ($V_{out_{set}}$)

Symbol	Parameters	Condition	Min.	Typ.	Max.	Unit
V_{in}	Input Voltage		1.2		6	V
V_{out}	Output Voltage	$V_{in}=V_{out_{set}}+1V$ $1mA \leq I_{out} \leq 30mA$	$V_{out_{set}} \times 0.98$	$V_{out_{set}}$	$V_{out_{set}} \times 1.02$	V
$I_{out_{MAX}}$	Maximum Output Current		600			mA
V_{drop}	Dropout Voltage, $V_{out} \geq 2.8V$	$I_{out}=50mA$		25	40	mV
		$I_{out}=100mA$		50	75	mV
		$I_{out}=150mA$		75	115	mV
		$I_{out}=400mA$		220	280	mV
$\frac{\Delta V_{out}}{\Delta V_{in} \cdot V_{out}}$	Line Regulation	$I_{out}=40mA$; $2.8V \leq V_{in} \leq 6V$		0.05	0.1	%/V
$\Delta V_{out} / \Delta I_{out}$	Load Regulation	$V_{in}=V_{out_{set}}+1V$ $1mA \leq I_{out} \leq 500mA$		100	150	mV
I_{ss}	Supply Current when Operation	$V_{in}=V_{out_{set}}+1V$		30	50	μA
$I_{shutdown}$	Supply Current when Shut Down	$V_{in}=V_{out_{set}}+1V$, $V_{ce}=0V$		0.1	1	μA
$\frac{\Delta V_{out}}{\Delta T \cdot V_{out}}$	Output Voltage Temperature Coefficient	$V_{in}=Set$ $V_{out}+1V$ $I_{out}=30mA$		± 50		ppm/ $^\circ C$
PSRR	Power Supply Ripple Rejection Rate	$F=1000Hz$, $Ripple=0.5V_{pp}$ $V_{in}=V_{out_{set}}+1V$		72		dB
I_{limit}	Output Short Current Limit	$V_{out}=0V$		500		mA
V_{ceh}	CE Input Voltage for “High”		1.4			V
V_{cel}	CE Input Voltage for “Low”				0.25	V
e_n	Output Noise	Bandwith=10~100KHz		50		μV_{rms}

NOTE:

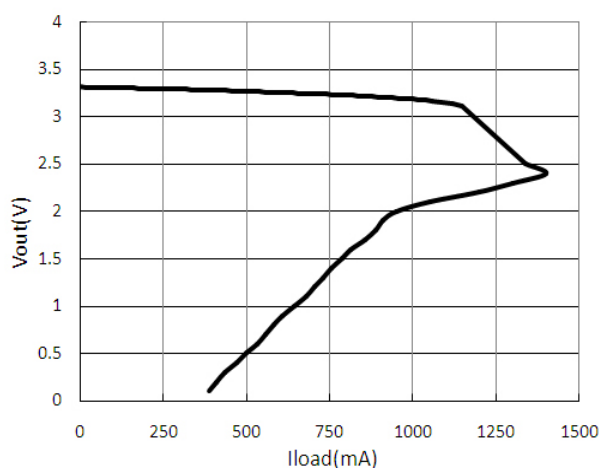
$V_{out_{set}}$ is the nominal output voltage that BL8568 is set to, for example, 3.3V.

$V_{drop}=V_{in}-(V_{out} \times 0.98)$, in which V_{out} is the output voltage when $V_{in}=V_{out_{set}}+1.0V$ at different output current, and V_{in} is the input voltage at which the output voltage becomes 98% of V_{out} after gradually decreasing the input voltage.

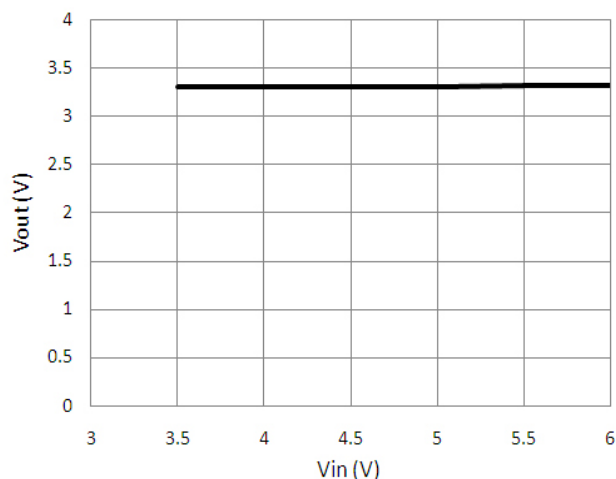
TYPICAL PERFORMANCE CHARACTERISTICS

Test condition: $C_{in}=1\mu F$, $C_{out}=1\mu F$, $T_A=25^\circ C$, CE pin is tied to V_{in} , $V_{out_set}=3.3V$, unless otherwise specified.

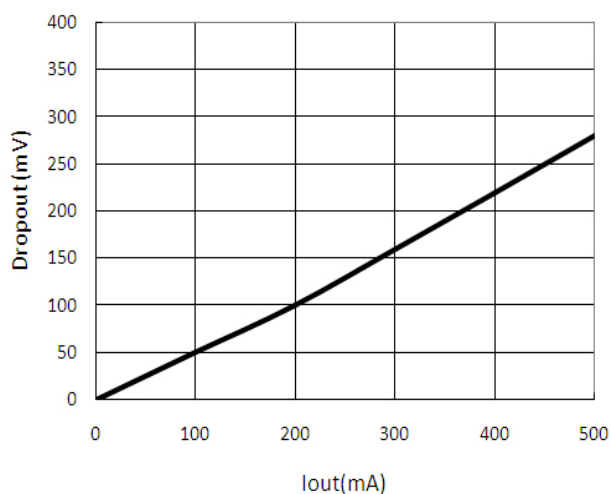
1) Output Voltage vs. Output Current



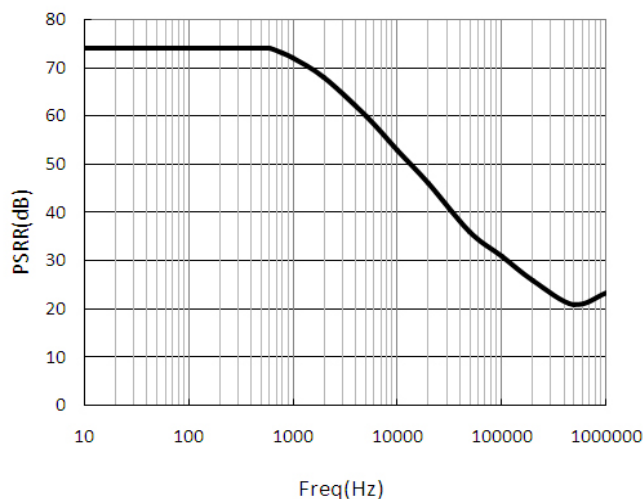
2) Output Voltage vs. Input Voltage



3) Dropout Voltage vs. Output Current



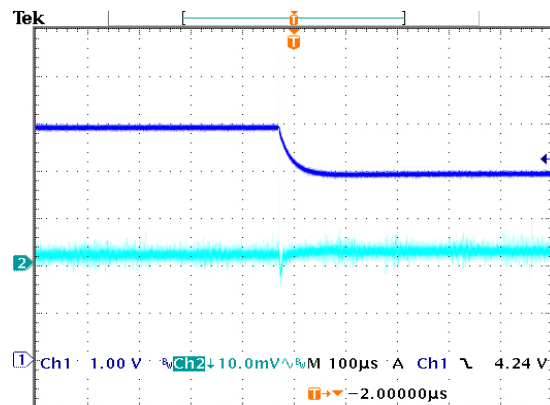
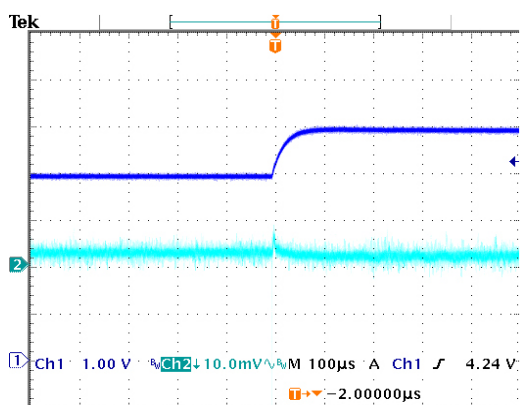
4) Ripple Rejection vs. Frequency



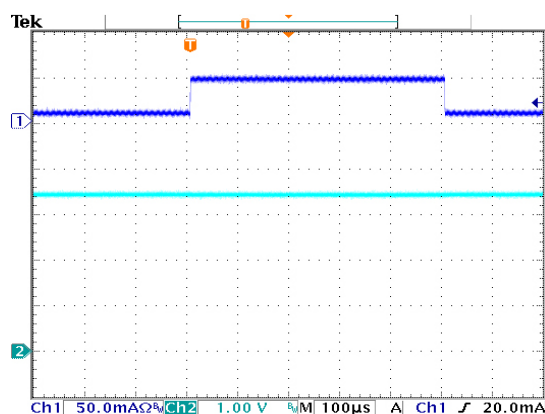
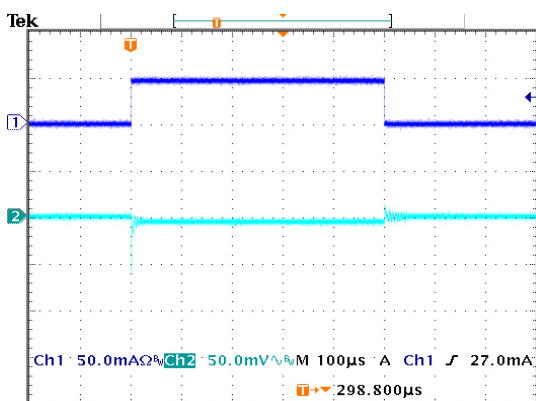
TYPICAL PERFORMANCE CHARACTERISTICS (Cont')

Test condition: $C_{in}=1\mu F$, $C_{out}=1\mu F$, $T_A=25^\circ C$, CE pin is tied to V_{in} , $V_{out_set}=3.3V$, unless otherwise specified.

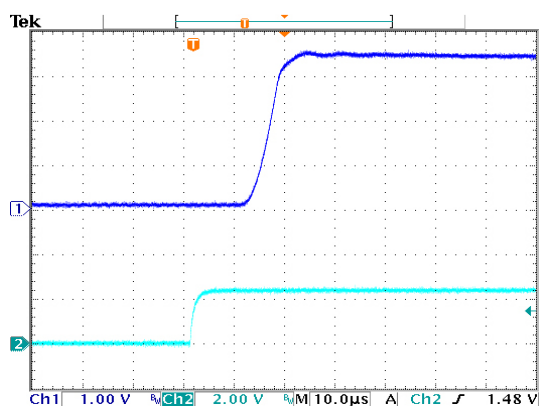
5) Line Transient Response (Ch1: V_{in} 4 $\leftrightarrow$ 5V; Ch2: V_{out})



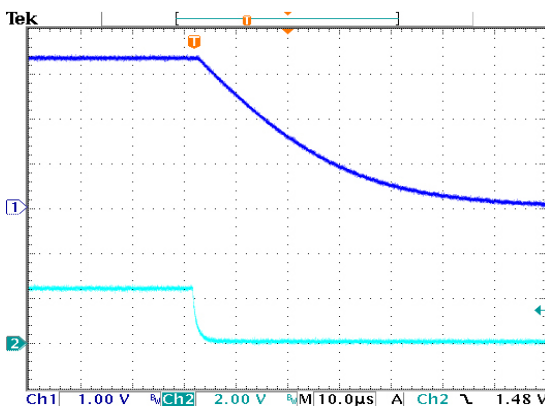
6) Load Transient Response (Ch1: I_{out} 1 $\leftrightarrow$ 50mA; Ch2: V_{out})



7) Startup by CE (Ch1: V_{out} ; Ch2: CE)

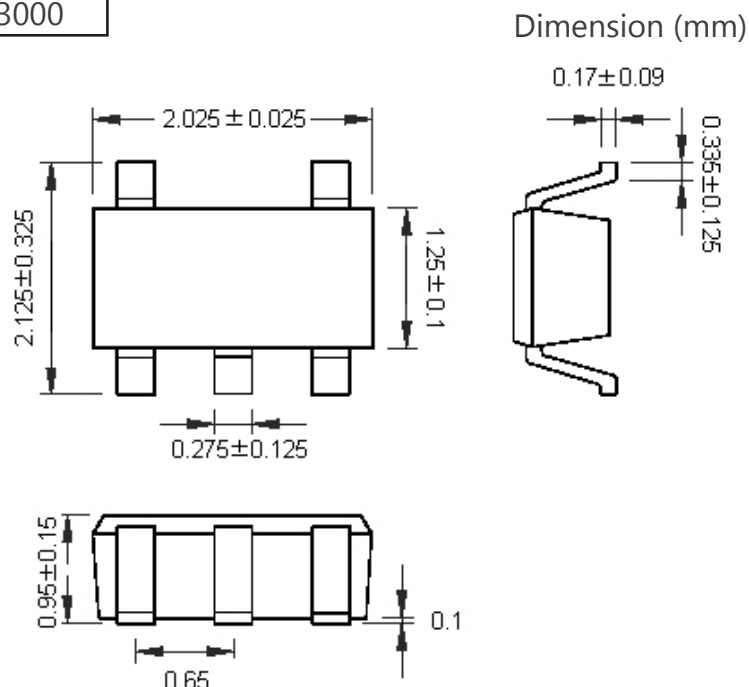


8) Shutdown by CE (Ch1: V_{out} ; Ch2: CE)



PACKAGE OUTLINE DIMENSION

Package	SC70-5
Devices per reel	3000



Package	SOT23-5
Devices per reel	3000

