300mA LOW POWER LDO

1.Overview

The FLD73XX is a low dropout linear regulator developed using CMOS technology. It delivers a maximum output current of 300mA and accepts an input voltage up to +48V. Several fixed output voltages are available, ranging from +1.8V to +5.0V. The CMOS process ensures low dropout voltage and low quiescent current.

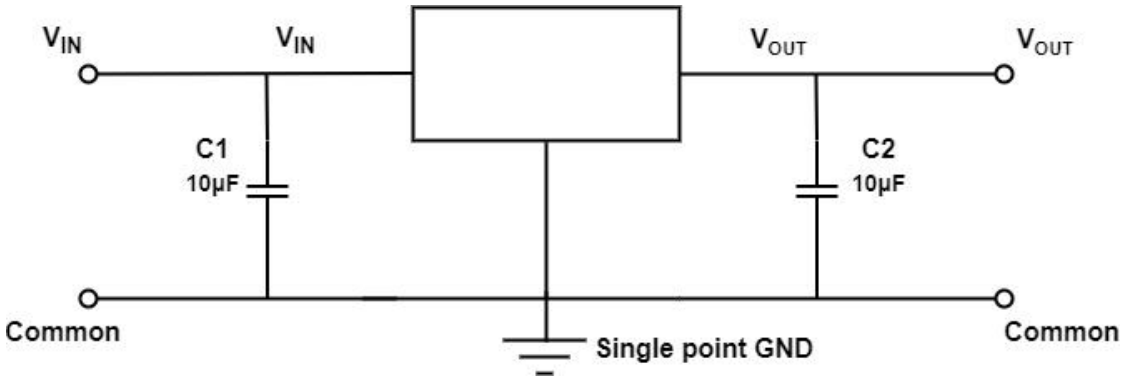
2.Features

- Low power consumption
- Low dropout voltage
- Low temperature coefficient
- Maximum input withstand voltage: +48V
- Typical quiescent current: 3μA
- Maximum output current: 300mA
- Output voltage accuracy: ±2%
- Packages: SOT23-3, SOT-89-3L

3.Applications

- Battery-powered equipment
- Communication devices
- Audio/Video equipment

4.Typical Application Circuit



Layout Recommendations：

1.Place input and output capacitors as close to the device as possible.

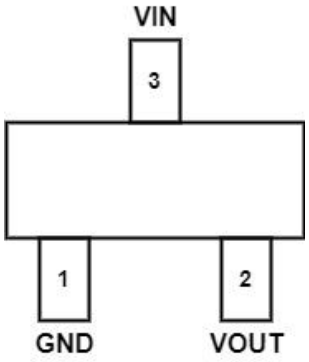
2.Use copper planes for device connections to optimize thermal performance.

3.Place thermal vias around the device to help dissipate heat.

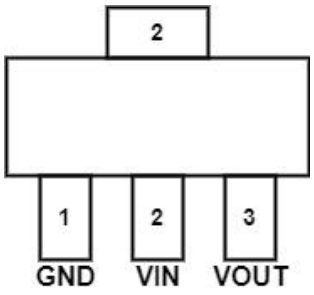
5.Ordering Information

Model	Output Voltage	Package	Ordering Code	Packing
FLD7318	1.8V	SOT23-3	FLD7318-SBA18CT	Tape and Reel,3000
		SOT-89-3L	FLD7318-SEA18CT	Tape and Reel,1000
			FLD7318-SEB18CT	Tape and Reel,1000
FLD7325	2.5V	SOT23-3	FLD7325-SBA25CT	Tape and Reel,3000
		SOT-89-3L	FLD7325-SEA25CT	Tape and Reel,1000
			FLD7325-SEB25CT	Tape and Reel,1000
FLD7330	3.0V	SOT23-3	FLD7330-SBA30CT	Tape and Reel,3000
		SOT-89-3L	FLD7330-SEA30CT	Tape and Reel,1000
			FLD7330-SEB30CT	Tape and Reel,1000
FLD7333	3.3V	SOT23-3	FLD7333-SBA33CT	Tape and Reel,3000
		SOT-89-3L	FLD7333-SEA33CT	Tape and Reel,1000
			FLD7333-SEB33CT	Tape and Reel,1000
FLD7336	3.6V	SOT23-3	FLD7336-SBA36CT	Tape and Reel,3000
		SOT-89-3L	FLD7336-SEA36CT	Tape and Reel,1000
			FLD7336-SEB36CT	Tape and Reel,1000
FLD7344	4.4V	SOT23-3	FLD7344-SBA44CT	Tape and Reel,3000
		SOT-89-3L	FLD7344-SEA44CT	Tape and Reel,1000
			FLD7344-SEB44CT	Tape and Reel,1000
FLD7350	5.0V	SOT23-3	FLD7350-SBA50CT	Tape and Reel,3000
		SOT-89-3L	FLD7350-SEA50CT	Tape and Reel,1000
			FLD7350-SEB50CT	Tape and Reel,1000

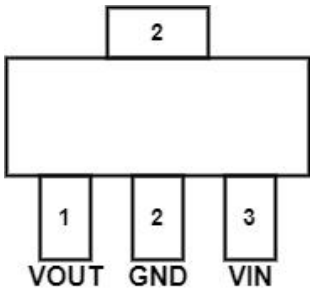
6.Pin Configuration and Functions



SOT23-3



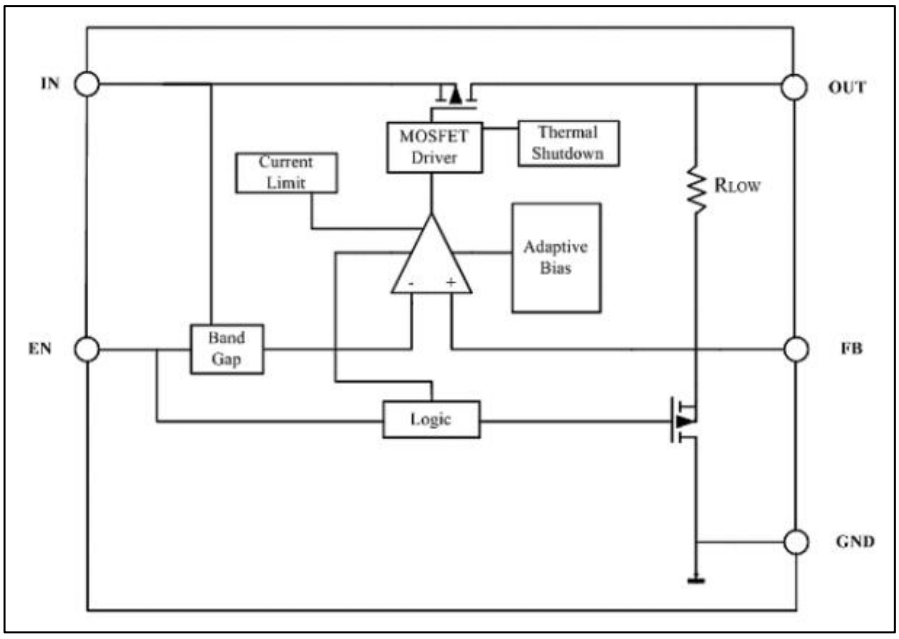
SOT-89-3L(SEA)



SOT-89-3L(SEB)

Pin Number			Name	Description
SOT23-3	SOT-89-3L(SEA)	SOT-89-3L(SEB)		
1	1	2	GND	Ground
3	2	3	VIN	Power supply input
2	3	1	VOUT	Output pin; must connect a ≥1μF capacitor to ground

7.Functional Block Diagram



8.Absolute Maximum Ratings

Parameter	Description	Range	Unit
V_{IN}	Input voltage	0~+45(Note1)	V
V_{OUT}	Output voltage	1.8~5.0	V
T_{STG}	Storage temperature	-45~+140	℃
Twk	Operating temperature	-40~+85	℃
ESD_{HBM}	Human Body Model	4000(Note2)	V
CDM	Charged Device Model	1500(Note2)	V
Latch up	Maximum latch-up current	200(Note2)	mA

Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. Operation beyond the indicated ranges is not guaranteed, and extended exposure may affect device reliability.

Note1： Refer to Electrical Characteristics and Application Information.

Note2： ESD protection is tested according to:

– EIA/JESD22-A114 for HBM

– JESD22-C101 for CDM

– JEDEC78 for latch-up current.

9.Thermal Information

Symbol	Parameter	Package	Max	Unit
θ_{JA}	Thermal resistance (junction-to-ambient, no airflow, no heatsink)	SOT23-3	360	℃/W
		SOT-89-3L	135	℃/W
P_D	Power dissipation	SOT23-3	0.2	W
		SOT-89-3L	0.5	W

Note: PD values are measured at T_A= 25℃.

10.Recommended Operating Conditions

Parameter	Description	Range	Unit
V_{IN}	Input voltage	+2.5~+45	V
I_{OUT}	Output current	0~300	mA
T_A	Operating temperature	-40~+85	℃
C_{IN}	Input polar capacitor	1~10	uF
C_{OUT}	Output polar capacitor	1~10	uF
ESR	ESR of input/output capacitors	5~100	mΩ

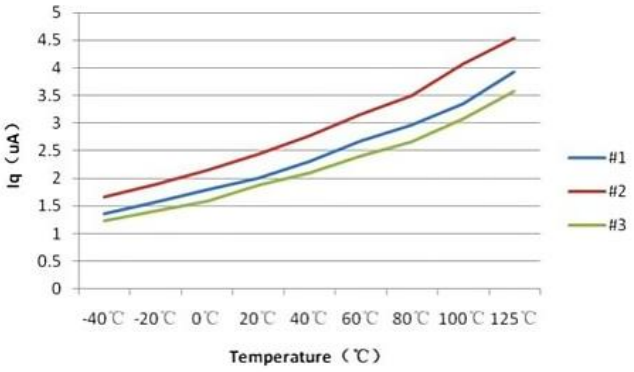
11.Electrical Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{IN}	Input voltage	-	-	-	+45	V
V_{OUT}	Output voltage	T_A=+25℃	-2%		+2%	V
		-40℃≤T_A ≤+85℃	-3%		+3%	V
V_{DROP}	Dropout voltage I_{OUT}=300mA	V_{OUT}=1.8V	-	1350	1650	mV
		V_{OUT}=2.5V	-	1150	1450	mV
		V_{OUT}=2.8V	-	1100	1400	mV
		V_{OUT}=3.0V	-	1050	1350	mV
		V_{OUT}=3.3V	-	1000	1300	mV
		V_{OUT}=4.4V	-	950	1250	mV
		V_{OUT}=5V	-	900	1200	mV
I_{OUT}	Output current	V_{IN}=V_{OUT}+2V	-	300	-	mA
$Load_{Reg}$	Load regulation	1mA≤I_{OUT} ≤300mA V_{IN} =Vout+1V	-	-	40	mV
I_LMT	Current limit	V_{IN}=V_{OUT}+1V	300	450	-	mA
I_{SHORT}	Short-circuit current limit	V_{OUT} =0V	-	100	-	mA
I_Q	Quiescent current	No load (I_{OUT}=0mA)	-	3	4.0	uA
PSRR	Power supply rejection ratio	V_{IN}=V_{OUT}+1V, I_{OUT}=20mA f=1KHz	-	60	-	dB
eN	Output Noise Voltage	V_{IN}=V_{OUT}+1V, I_{OUT}=1mA f=10Hz~100KHz (V_{OUT}=3V) C_{OUT}=1uF	-	100	-	uVrms
R_{LOW}	Output Discharge Resistance	C_{IN}=4V,Ven=0V	-	70	-	Ω
$\frac{\Delta VOUT}{\Delta VIN \times VOUT}$	Input voltage regulation	Vo+1V≤V_{IN}≤45V I_{OUT} =1mA	-	-	0.2	%/V
$\frac{\Delta VOUT}{\Delta Ta \times VOUT}$	Temperature coefficient	IOUT =10mA -40℃<Ta<85℃	-	100	-	ppm/℃

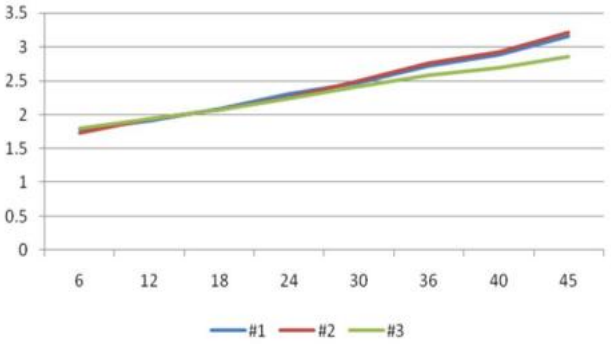
Note:

Dropout voltage is measured when the output voltage drops by 2% at V_{IN} = V_{OUT} + 2V under a fixed load.

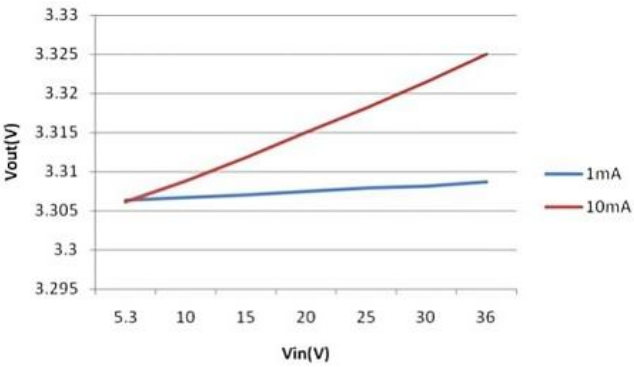
12.Typical Performance Characteristics



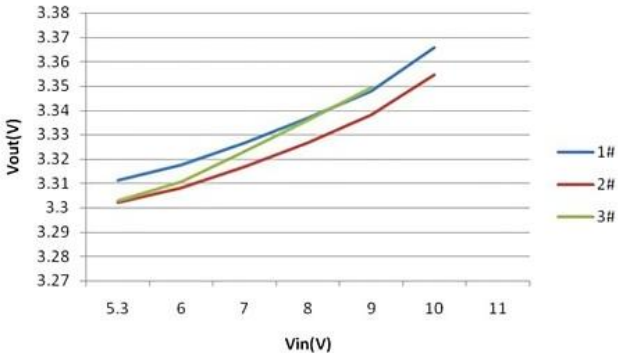
DC Supply Question Current



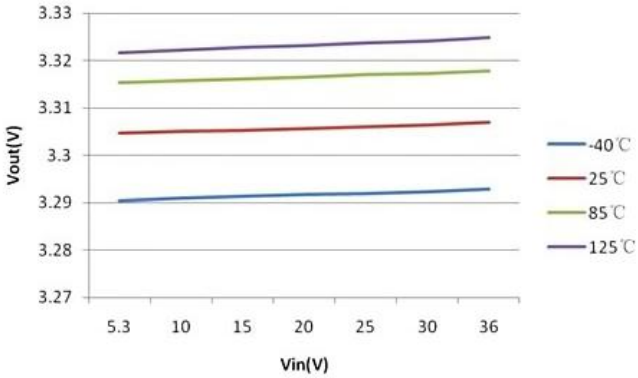
I_Q VS V_{IN}



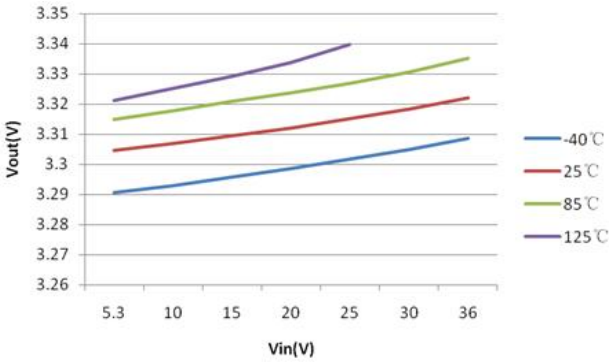
Line Regulation(Load=1mA&10mA)



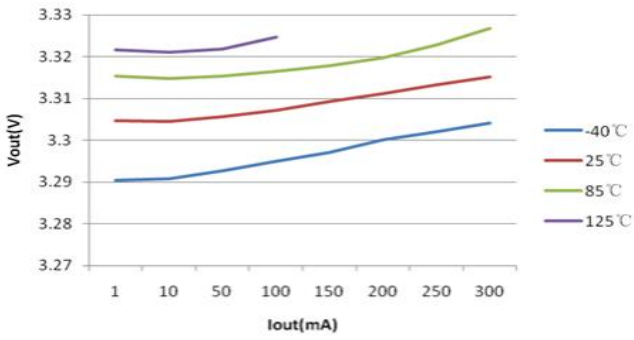
Line Regulation(Iout=300mA)



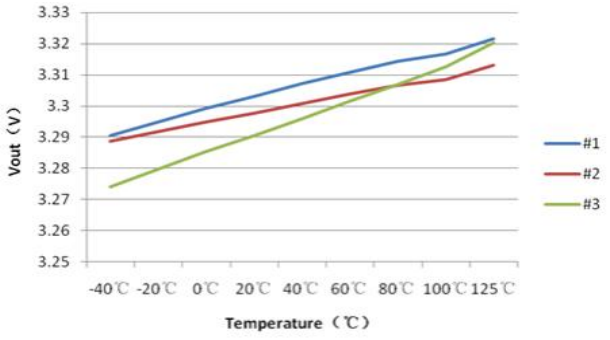
Line Regulation(Iout=1mA)



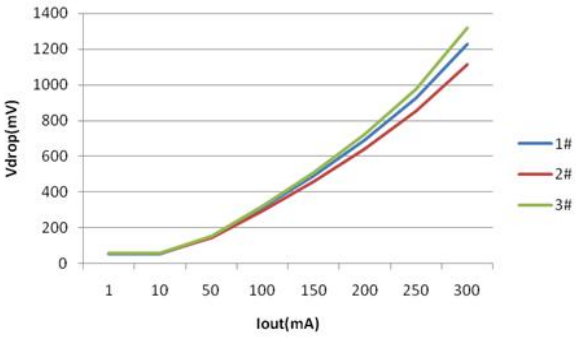
Line Regulation(Iout=10mA)



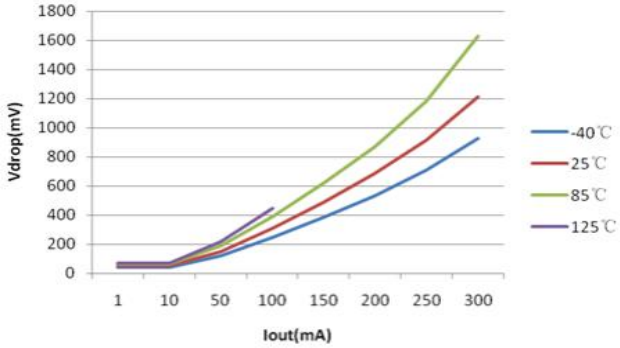
Load Regulation



Output Voltage



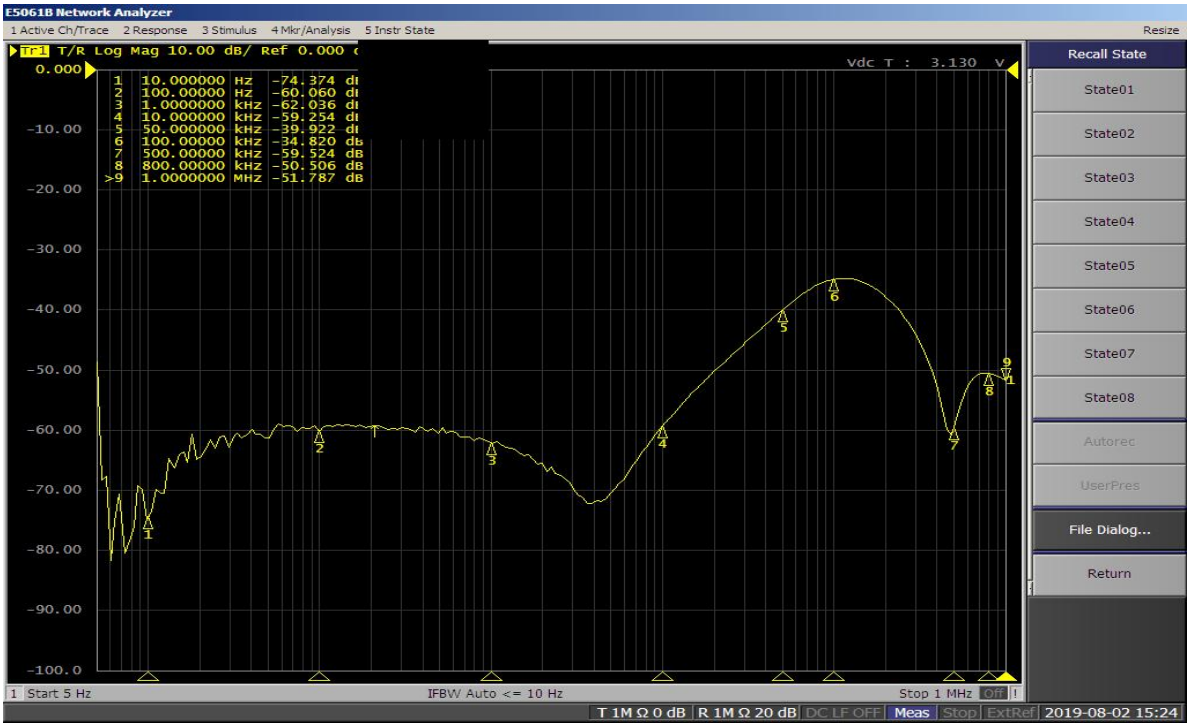
V_{drop} VS Iout



V_{drop} VS Iout

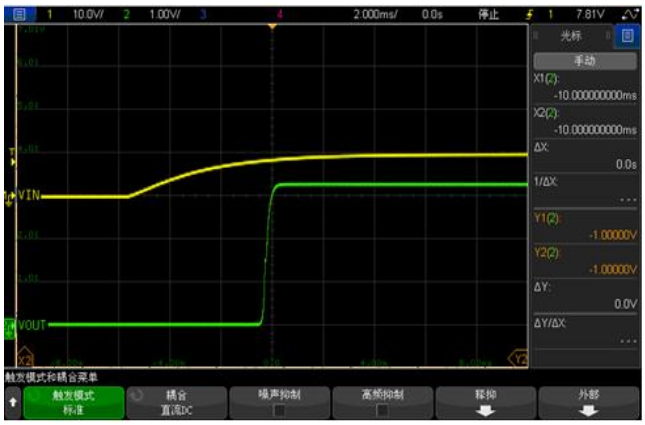
13.Typical Performance Characteristics(Continue)

PSRR@Iout=20mA

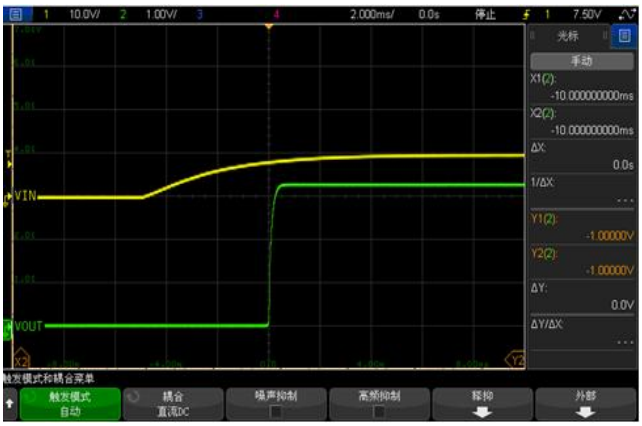


PSRR@Iout=300mA

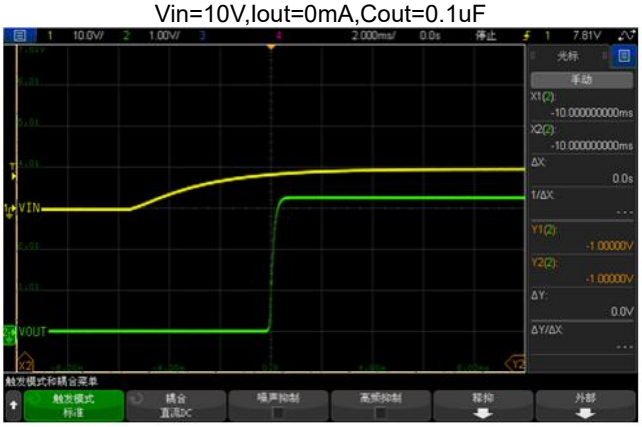
13.Start-up Characteristics



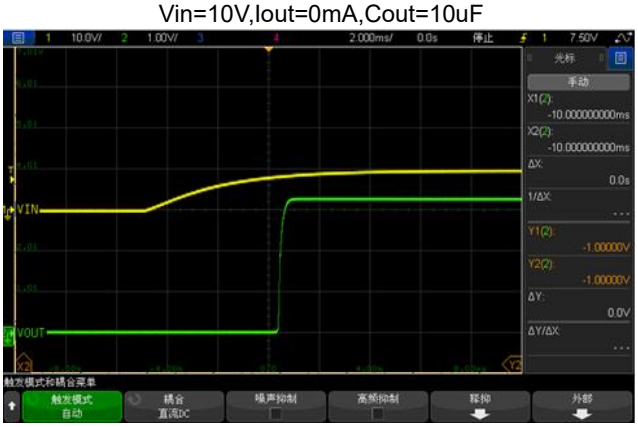
Vin=10V,Iout=0mA,Cout=0.1uF



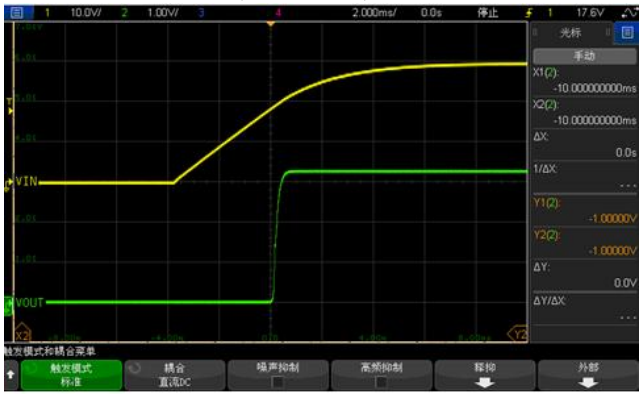
Vin=10V,Iout=0mA,Cout=10uF



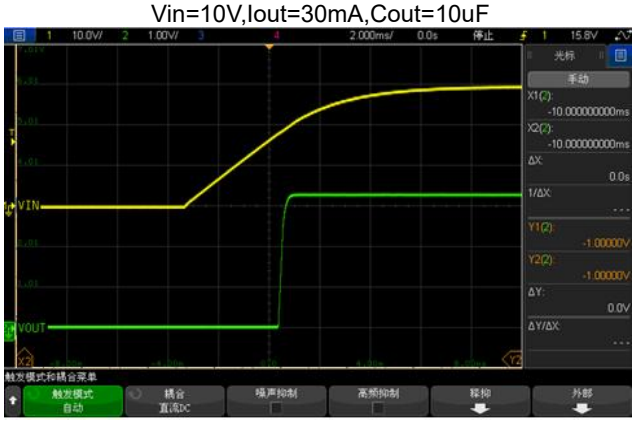
Vin=10V,Iout=30mA,Cout=0.1uF



Vin=10V,Iout=30mA,Cout=10uF

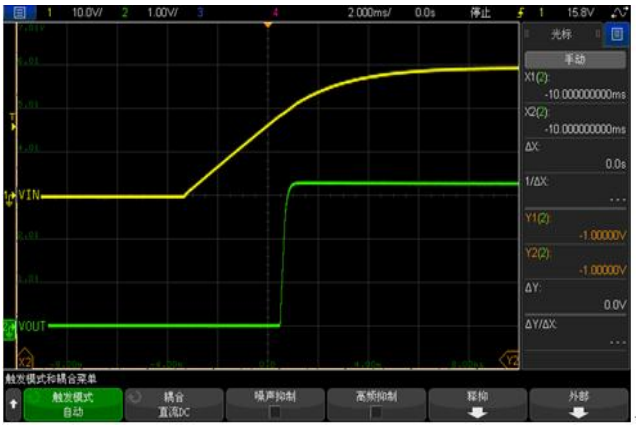


Vin=30V,Iout=0mA,Cout=0.1uF



Vin=30V,Iout=30mA,Cout=10uF

Vin=30V,Iout=30mA,Cout=0.1uF



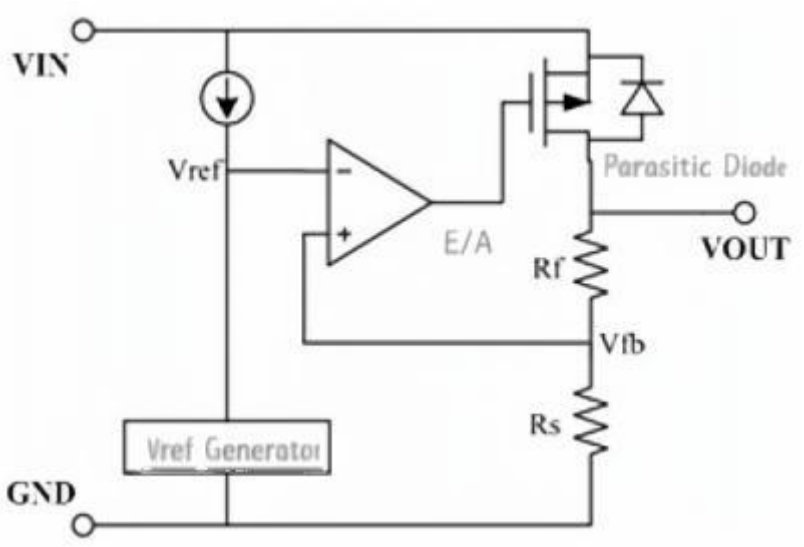
Vin=30V,Iout=30mA,Cout=10uF

14.Current Limit Protection

The device incorporates a current-limit function to protect against damage during overload or short-circuit conditions. The current is sensed by an internal sensing transistor.

15.Functional Description

The error amplifier compares the voltage Vfb from the feedback divider (resistors Rs and Rf) with the reference voltage Vref. The error amplifier then drives the gate of the output transistor to keep the output voltage constant regardless of variations in input voltage or temperature.



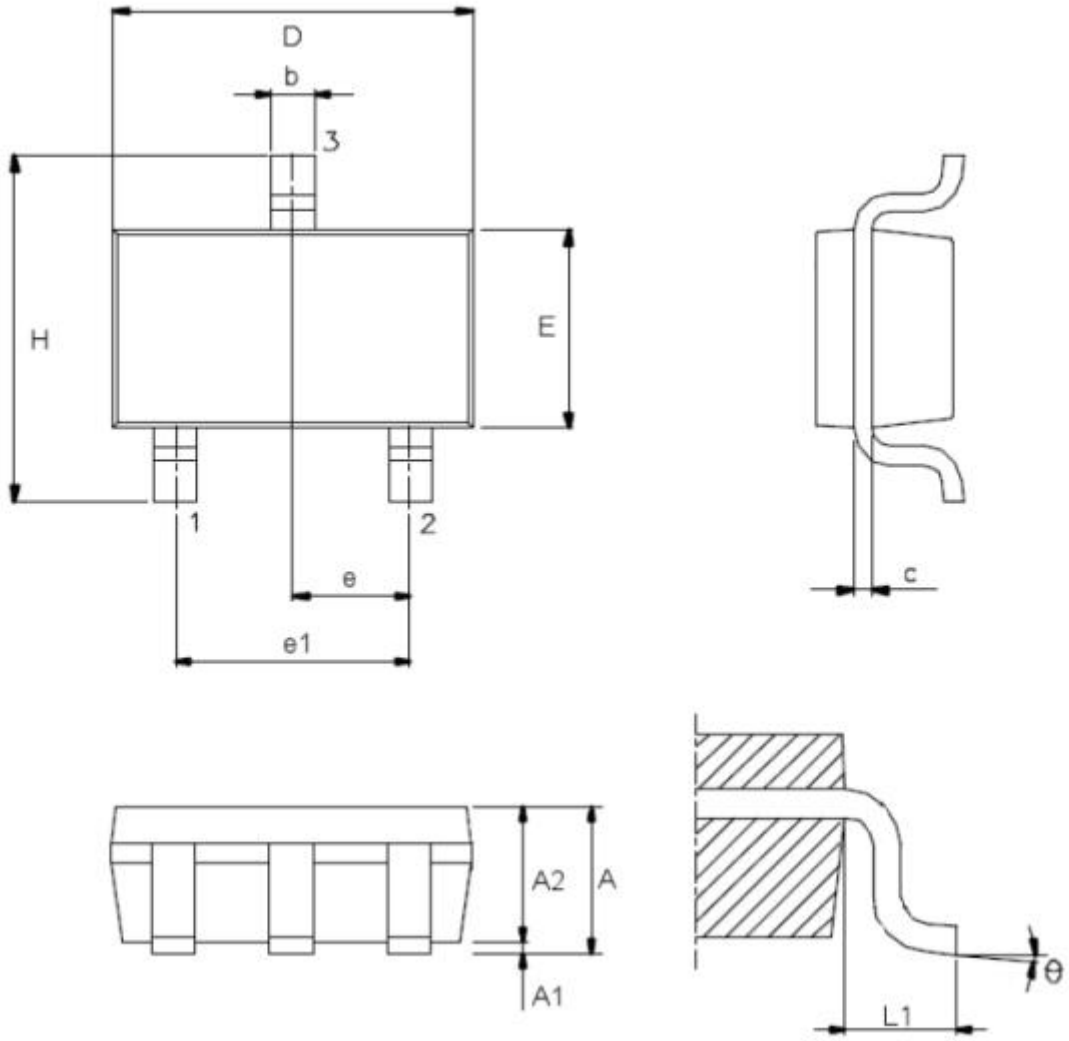
Application Notes：

1. An internal phase-compensation circuit and the ESR of the output capacitor are used for compensation. Therefore, a capacitor ≥1μF should be connected between VOUT and GND.
2. It is recommended to use 10μF polar capacitors for both input and output, and place them as close as possible to the VIN and VOUT pins.
3. Pay attention to the input/output voltage and load current conditions to ensure that the internal power dissipation (PD) does not exceed the maximum allowed for the package.

- PD is calculated as: PD = (VIN – VOUT) × IOUT
- Example: For VOUT=5V, SOT-89-3L package, VIN=12V, IOUT=100mA, PD = (12–5)×100mA = 0.7W, which exceeds the 0.5W rating of SOT-89-3L and may damage the IC. Refer to the “Thermal Information” section for PD limits of each package.

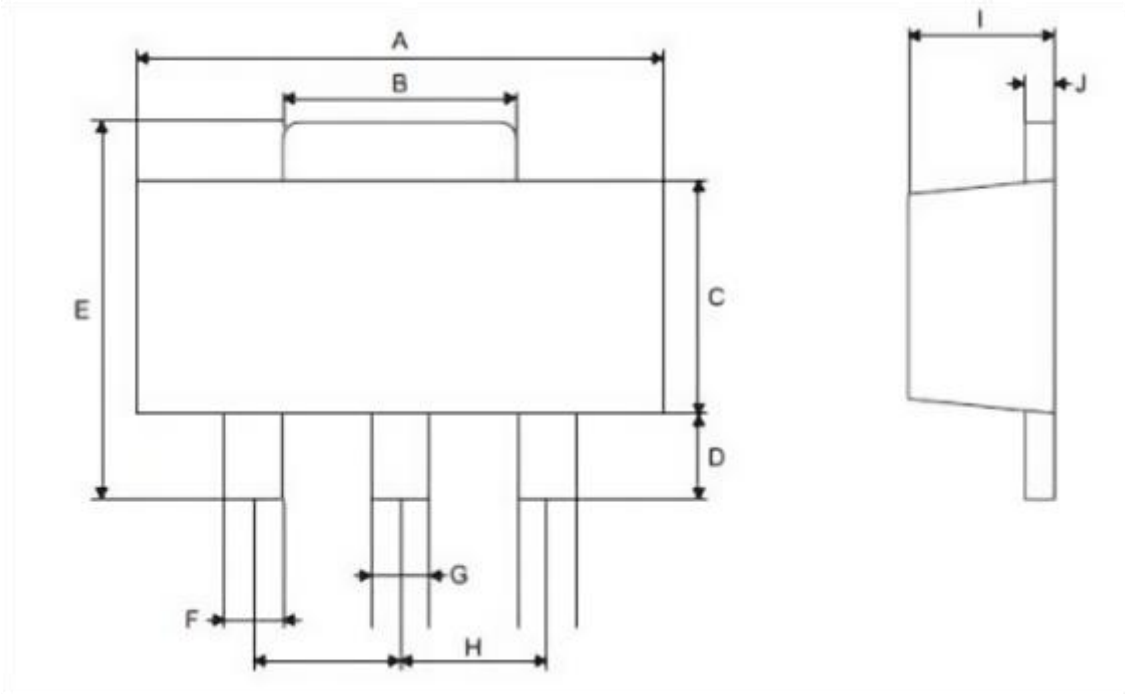
16.Package Dimensions

(1)SOT23-3：



Symbol	Dimensions (mm)		
	Min	Typ	Max
A	—	—	1.45
A1	—	—	0.15
A2	0.90	1.15	1.30
b	0.30	—	0.50
C	0.08	—	0.22
D	—	2.90	—
E	—	1.60	—
e	—	0.95	—
e1	—	1.90	—
H	—	2.80	—
L1	—	0.60	
θ	0°	—	9°

(2)SOT-89-3L：



Symbol	Dimensions (mm)		
	Min	Typ	Max
A	4.40	—	4.60
B	1.35	—	1.83
C	2.29	—	2.60
D	0.89	—	1.20
E	3.94	—	4.25
F	0.36	—	0.48
G	0.44	—	0.56
H	—	1.50	—
I	1.40	—	1.60
J	0.35	—	0.44

17.Important Notice And Disclaimer

- We reserve the right to change the instruction manual without prior notice.
- Any semiconductor product has a certain possibility of failure or malfunction under specific conditions. The buyer is responsible for complying with safety standards and taking safety measures when using our products for system design and overall manufacturing to avoid potential failure risks that may cause personal injury or property damage.
- The improvement of product quality is endless, our company will be dedicated to provide customers with better products.