

Dual 300mA High Speed Low Dropout CMOS Voltage Regulators

General Description

The LN1182 series are highly accurate, Dual, low noise, CMOS LDO voltage regulators. Performance features of the series includes low output noise, high ripple rejection ratio, low dropout and very fast turn-on times.

The LN1182 includes a reference voltage source, error amplifiers, driver transistors, current limiters and phase compensators internally. The LN1182's current limiter's foldback circuit also operates as a short protect for the output current limiter. The output voltage for each regulator is set independently by laser trimming. Voltages are selectable in 50mV steps within a range of 1.0V to 6.0V. The EN function allows the output of each regulator to be turned off independently, resulting in greatly reduced power consumption.

Features

- Output Voltage Range : 1.0V to 6.0V (selectable in 50mV steps)
- Highly Accurate : $\pm 2\%$
- Dropout Voltage : 180mV @ 100mA (3.0V type)

Ordering Information

LN1182 ①②③④⑤⑥⑦⑧

- High Ripple Rejection : 70dB (1 kHz)
- Low Power Consumption : 120 μ A (TYP.)
- Maximum Output Current : 300mA
- Standby Current : less than 0.1 μ A
- Internal protector : current limiter and short protector

Applications

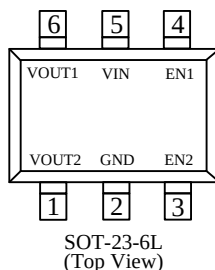
- Mobile phones
- Cordless phones and radio communication equipment
- Cameras, Video cameras
- Portable games
- Portable AV equipment
- PDAs

Package

- SOT-23-6L

Designator	Description	Symbol	Description
①	Regulator1 EN type	E	Active 'High' (pull-down resistor built in)
		F	Active 'High' (no pull-down resistor built in)
		G	Active 'Low' (pull-up resistor built in)
		H	Active 'Low' (no pull-up resistor built in)
②	Regulator2 EN type	E	Active 'High' (pull-down resistor built in)
		F	Active 'High' (no pull-down resistor built in)
		G	Active 'Low' (pull-up resistor built in)
		H	Active 'Low' (no pull-up resistor built in)
③④	Regulator1 Output Voltage	13~50	eg. 30 represents 3.0V
⑤⑥	Regulator2 Output Voltage	13~50	eg. 30 represents 3.0V
⑦	Packaging Types	M	SOT-23-6L(Vout1>Vout2)
		N	SOT-23-6L(Vout1<Vout2)
⑧	Device Orientation	R	Embossed tape: Standard feed
		L	Embossed tape: Reverse feed

Pin Configuration

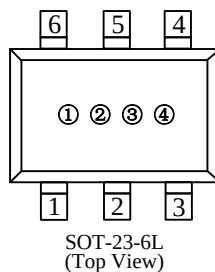


Pin Assignment

Pin Number	Pin Name	Function
SOT-23-6L		
4	EN1	ON/OFF Control1
5	VIN	Power Input
3	EN2	ON/OFF Control2
1	VOUT2	Output2
2	GND	Ground
6	VOUT1	Output 1

Marking Rule

- SOT-23-6L



- ① Represents the product name

Symbol	Product Name
1	LN1182◆◆◆◆◆◆◆◆

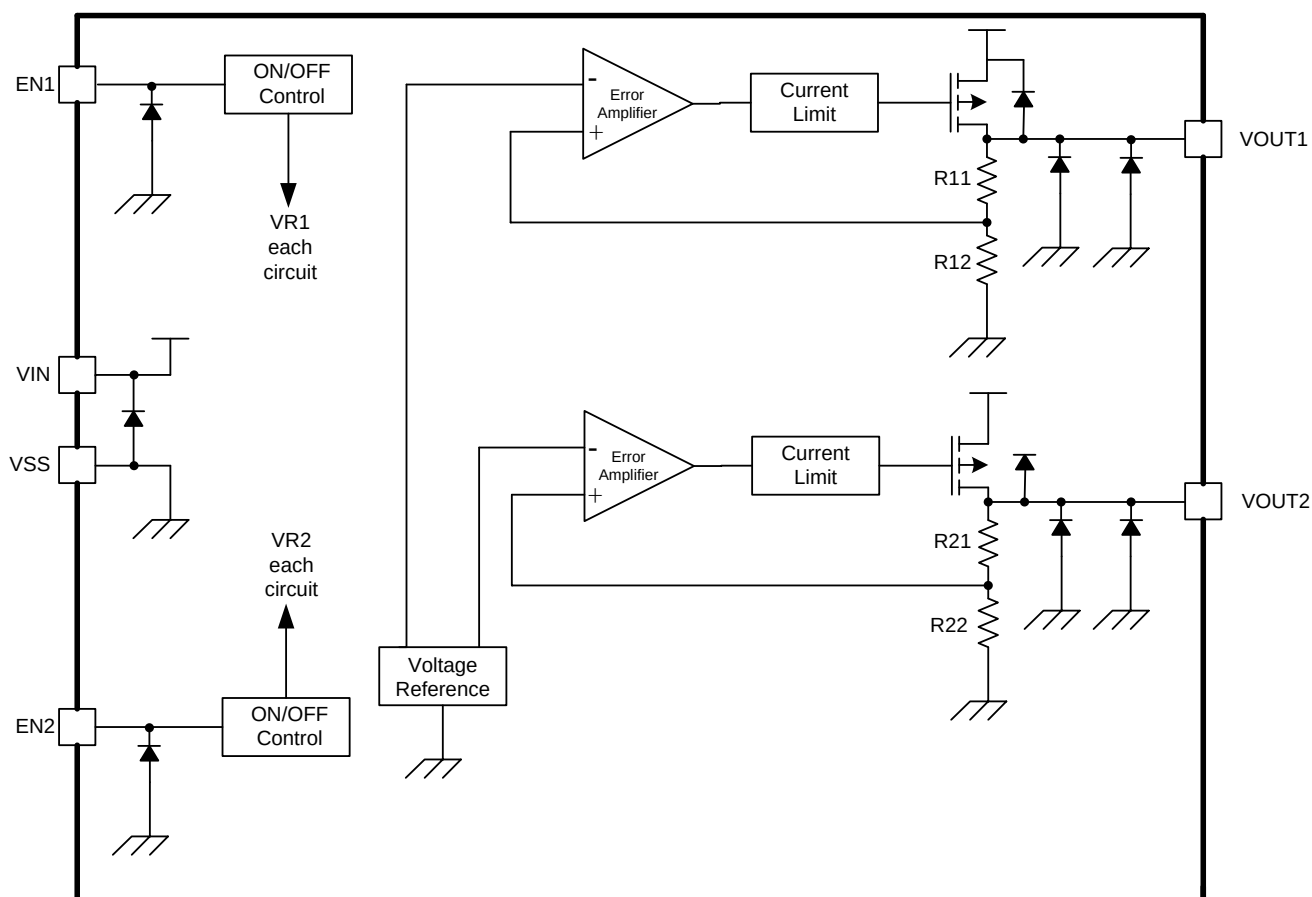
- ② ③ Represents internally set sequential number

Mark		Internally Set Sequentially Number	Product Series
②	③		
C	2	C2	LN1182EE2025
C	0	C0	LN1182EE2520
0	1	01	LN1182FF2825
1	8	18	LN1182FF2528
C	3	C3	LN1182FF3315

- ④ Represents the assembly lot no.

0 to 9, A to Z, reversed character of 0 to 9 and A to Z repeated(G,I,J,O,Q W excepted)

Function Block Diagram

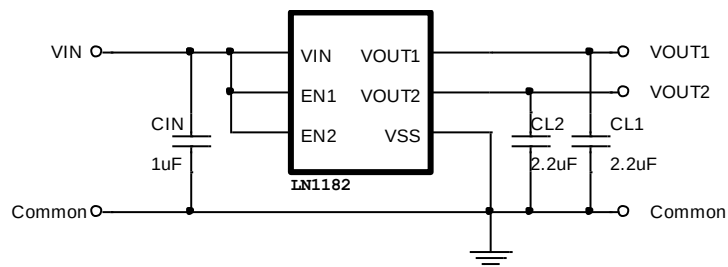


Absolute Maximum Ratings

Parameter	Symbol	Maximum Rating		Unit
Input Voltage	V _{IN}	V _{SS} -0.3~V _{SS} +10		V
	V _{EN}	V _{SS} -0.3~V _{IN} +0.3		
Output Voltage	V _{OUT}	V _{SS} -0.3~V _{IN} +0.3		
Output Current	I _{OUT1} +I _{OUT2}	700		mA
Power Dissipation	P _D	SOT-23-6L	250	mW
Operating Ambient Temperature	T _{opr}	-40~+85		°C
Storage Temperature	T _{stg}	-40~+125		

Caution: The absolute maximum ratings are rated values exceeding which the product could suffer physical damage. These values must therefore not be exceeded under any conditions.

Typical Application Circuit



Caution: The above connection diagram and constant will not guarantee successful operation. Perform thorough evaluation using the actual application to set the constant.

Application Conditions

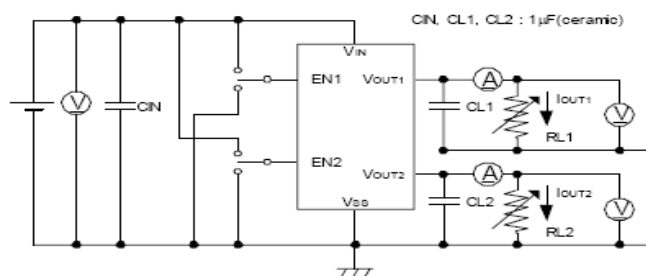
Input capacitor (CIN): 1.0 μ F or more

Output capacitor (CL): 2.2 μ F or more (tantalum capacitor)

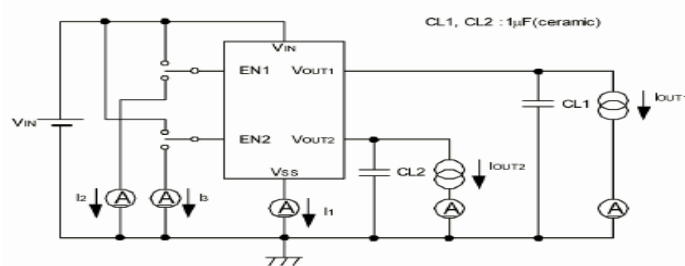
Caution A general series regulator may oscillate, depending on the external components selected. Check that no oscillation occurs with the application using the above capacitor.

Test Circuits

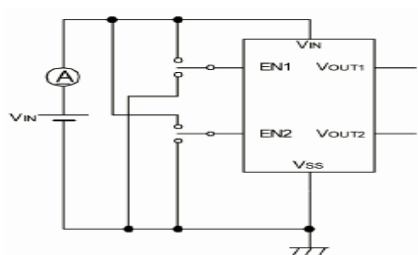
Circuit ①



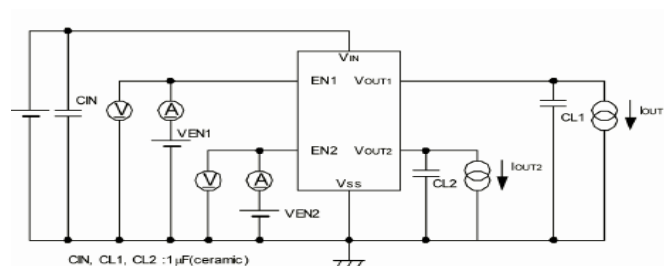
Circuit ②



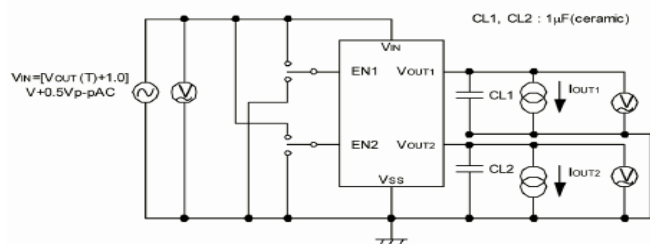
Circuit ③



Circuit ④



Circuit ⑤

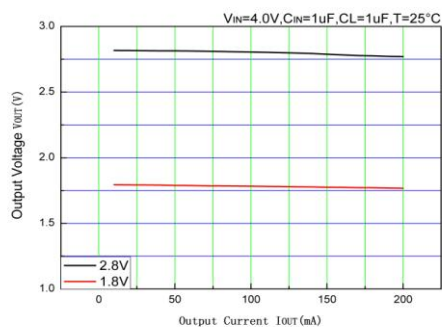


■ Electrical Characteristics

Parameter	Symbol	CONDITION	MIN	TYP	MAX	UNIT	CIRCUIT
Output Voltage	$V_{OUT(E)}$	$V_{IN} = V_{OUT(S)} + 1.0 \text{ V}$, $I_{OUT} = 10 \text{ mA}$	$V_{OUT(S)} \times 0.98$	$V_{OUT(S)}$	$V_{OUT(S)} \times 1.02$	V	1
Output Current	I_{OUT}	$V_{IN} \geq V_{OUT(S)} + 1.0 \text{ V}$	300	—	—	mA	1
Dropout Voltage	V_{drop}	$I_{OUT} = 50 \text{ mA}$	—	0.06	0.10	V	1
		$I_{OUT} = 100 \text{ mA}$	—	0.15	0.20		
Line Regulations	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	$V_{OUT(S)} + 0.5 \text{ V} \leq V_{IN} \leq 7 \text{ V}$ $I_{OUT} = 10 \text{ mA}$	—	0.01	0.2	%/V	
Load Regulation	ΔV_{OUT2}	$V_{IN} = V_{OUT(S)} + 1.0 \text{ V}$ $1.0 \text{ mA} \leq I_{OUT} \leq 100 \text{ mA}$	—	15	50	mV	
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T_a \bullet V_{OUT}}$	$V_{IN} = V_{OUT(S)} + 1.0 \text{ V}$, $I_{OUT} = 10 \text{ mA}$ $-40^\circ\text{C} \leq T_a \leq 85^\circ\text{C}$	—	± 100	—	ppm/ $^\circ\text{C}$	
Supply Current	I_{SS1}	$V_{IN} = V_{OUT(S)} + 1.0 \text{ V}$	—	90	120	μA	2
Standby Current	I_{STB}	$V_{IN} = V_{EN} = V_{OUT(T)} + 1 \text{ V}$, $V_{EN} = V_{SS}$	—	0.01	1	μA	3
Input Voltage	V_{IN}	—	2.0	—	7	V	—
Ripple-Rejection	PSRR	$V_{IN} = V_{OUT(S)} + 1.0 \text{ V}$, $f = 1 \text{ kHz}$ $V_{rip} = 0.5 \text{ V}_{rms}$, $I_{OUT} = 30 \text{ mA}$	—	70	—	dB	5
Short-circuit Current	I_{short}	$V_{IN} = V_{OUT(S)} + 1.0 \text{ V}$, $V_{IN} = V_{EN}$	—	300	—	mA	1
Current limiter	I_{lim}	$V_{IN} = V_{EN} = V_{OUT(T)} + 1 \text{ V}$	—	450	—	mA	1
CE “High” Voltage	V_{CEH}		1.3		V_{IN}	V	2
CE “Low” Voltage	V_{CEL}				0.25	V	2
CE “High” Current	I_{CEH}	$V_{IN} = V_{EN} = V_{OUT(T)} + 1 \text{ V}$	-0.1		0.1	μA	2
CE “Low” Current	I_{CEL}	$V_{IN} = V_{EN} = V_{OUT(T)} + 1 \text{ V}$, $V_{EN} = V_{SS}$	-0.1		0.1	μA	2

Typical Performance Characteristics (3.0V output)

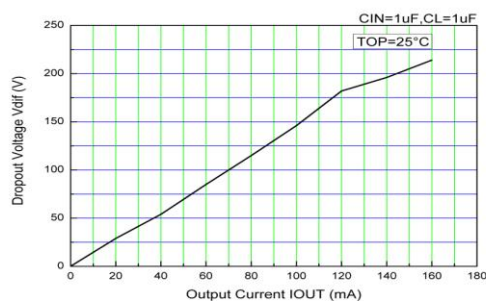
1、Output Voltage vs. Output Current



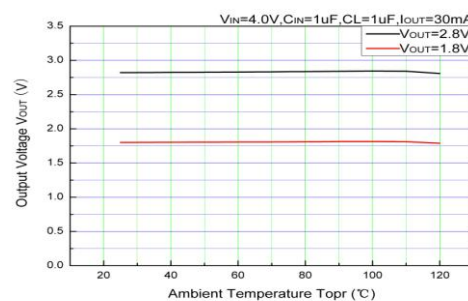
2、Outpout Voltage vs. Input Current (Contd)



3、Dropout Voltage vs. Output Current

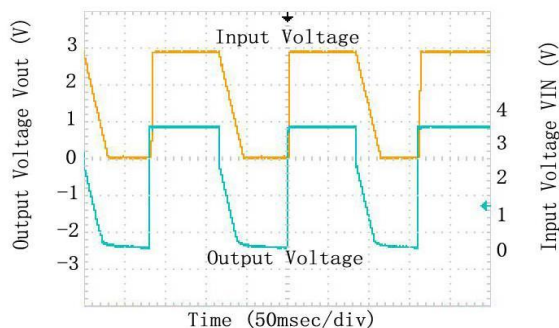


4、Dropout Voltage vs. Output Voltage

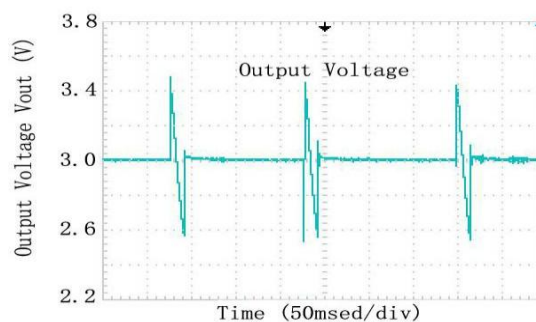


5、Transient Response

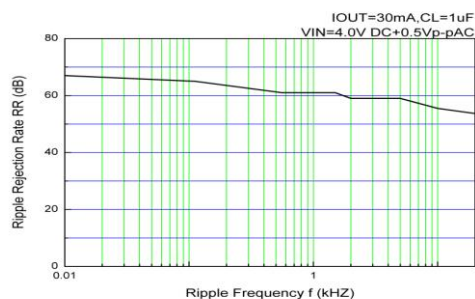
Input Transient Response



Load Transient Response

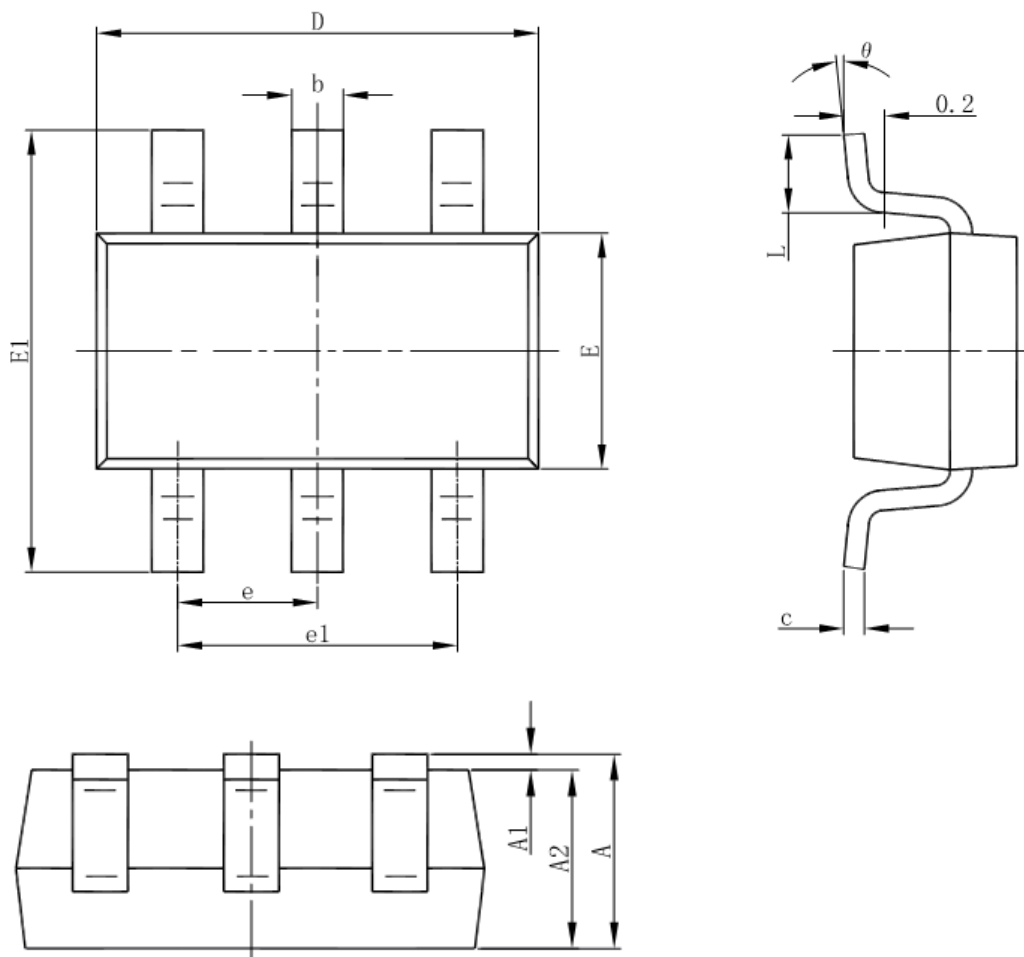


6、Ripple Rejection Rate



■ Package Information

● SOT-23-6L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°