Description

The CL9195 series are high ripple rejection, low power consumption, low dropout CMOS step-down voltage regulators with over-current and short circuit protection. These devices have very low quiescent bias current (60μA Typ.), they can deliver 500mA of output current with very small input and output voltage differences, and still maintain good regulation. Due to the small voltage difference between the input and output and the low quiescent bias current, these devices are especially suitable for battery-operated products such as computers, consumer products and industrial equipment, which want to prolong the useful battery life.
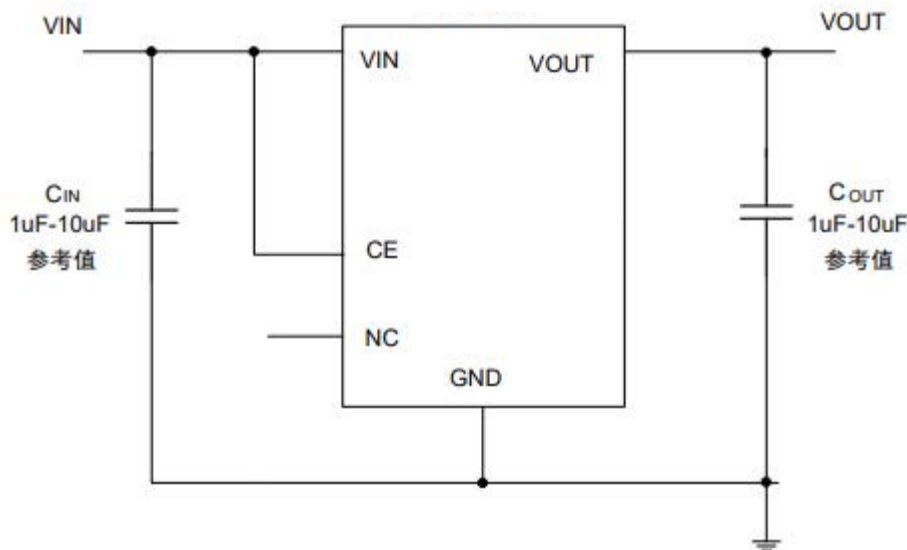
Feature

◆ Output Voltage Range：1.2V-5.0V
◆ Io(max) : 500mA
◆ PSRR：75dB/1KHz
◆ Stand-by Current : 60uA (Typ)
◆ Shunt-Down Current : 1μA (max)
◆ Operating Temperature Range : -40 °C ~ +85 °C

Applications

◆ CDMA / GSM
◆ PDAS/MP3
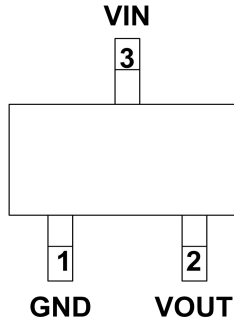◆ WLAN/Bluetooth
◆ Portable Device
◆ Battery Power System
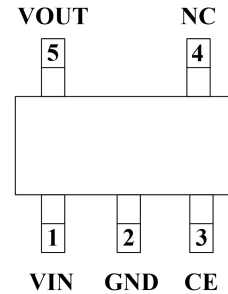
Package Type : SOT23-3L / SOT-23-5L

Application Circuit

Pin Description

SOT-23-3L

```
        VIN
        [3]
   ┌──────────┐
   │          │
   │          │
   └──────────┘
   [1]      [2]
   GND      VOUT
```

SOT-23-5L

```
VOUT          NC
[5]           [4]
┌──────────────┐
│              │
└──────────────┘
[1]    [2]    [3]
VIN    GND    CE
```

No SOT23-3L	No SOT23-5L	Name	Description
3	1	VIN	Power Supply
1	2	GND	Ground
	3	CE	Enable
	4	NC	No Connect
2	5	VOUT	Output

Marking Information

Part Number	Package Type	Marking
CL9195A12L3M	SOT23-3L	HF=E**
CL9195A13L3M	SOT23-3L	ZU=E**
CL9195A15L3M	SOT23-3L	WG=J**
CL9195A18L3M	SOT23-3L	XB=N**
CL9195A25L3M	SOT23-3L	WH=U**
CL9195A27L3M	SOT23-3L	WK=F**
CL9195A28L3M	SOT23-3L	XD=U**
CL9195A29L3M	SOT23-3L	WN=C**
CL9195A30L3M	SOT23-3L	WW=P**
CL9195A33L3M	SOT23-3L	WA=E**
CL9195A12L5M	SOT23-5L	WE=F**
CL9195A13L5M	SOT23-5L	ZU=D**
CL9195A15L5M	SOT23-5L	WG=H**
CL9195A18L5M	SOT23-5L	XB=L**
CL9195A25L5M	SOT23-5L	WH=M**
CL9195A27L5M	SOT23-5L	WK=E**
CL9195A28L5M	SOT23-5L	XD=R**
CL9195A29L5M	SOT23-5L	WN=B**
CL9195A30L5M	SOT23-5L	WW=S**
CL9195A33L5M	SOT23-5L	WJ=K**
CL9195A36L5M	SOT23-5L	WA=C**

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Input Voltage	V_{IN}	7	V
Output Current	I_{out}	600	mA
Output Voltage	V_{out}	Vss-0.3 ~ Vout+0.3	V
Operating Temp	T_{Opr}	-40 ~ +85	℃
Storage Temp	T_{stg}	-55 ~ +125	℃
Lead Temp	T_{solder}	260℃, 10s	℃

Note : Exceeding the " **Absolute Maximum Ratings** " may damage the device. The device will operate within the recommended operating range, but its characteristics are not guaranteed. Exposure to absolute extreme parameter conditions for extended periods of time may affect device reliability.

Power Dissipation

Package Type	Pd(mW)
SOT-23-5L	300
SOT-23-3L	250

Block Diagram

Electrical Characteristics

(V_{IN}=5V, T_A = 25℃T unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	$V_{OUT}(E)$ (Note 2)	I_{OUT}=40mA, V_{IN}=Vout+1V	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	V
Input Voltage	V_{IN}				5.5	V
Maximum Output Current	I_{OUT}(max)	V_{IN}=Vout+1V		500		mA
EN starting voltage	V_{CE_ON}（Note3）		1.1			V
EN off voltage	V_{CE_OFF}				0.4	V
Load Regulation	ΔV_{OUT}	V_{IN}=Vout+1V, 1mA≤I_{OUT}≤100mA		50		mV
Dropout Voltage (Note 3)	V_{dif1}	I_{OUT} =100mA		100		mV
	V_{dif2}	I_{OUT} =200mA		300		mV
Stand-by Current	I_{SS}	V_{IN}=Vout+1V		60		µA
Shunt-down Current	I_{CEL}	Vce＝0V		1		µA
Line Regulation	$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	I_{OUT} =40mA Vout+1V ≤V_{IN}≤8V		0.03		%/V
Output Noise Voltage	en	I_{OUT} =40mA, 300Hz~50kHz		50		uVrms
Power Supply Rejection Ration	PSRR	Vin= [Vout+1]V +1Vp-pAC I_{OUT} =40mA,f=1kHz		75		dB

Note: 1、 V_{OUT} (T) ： Specified output voltage

2、 V_{OUT} (E) ： Effective output voltage (that is, the output voltage when VIN = (V_{OUT} (T)+1.0V) when I_{OUT} remains at a certain value.
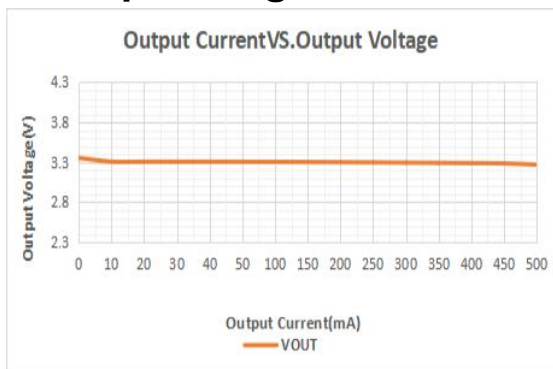
3、 VCE ： Considering the high and low temperature and process deviation, it is recommended that customers set the enable voltage of CE PIN to 1.1V with a margin.

There is a built-in 1MΩ resistor between CE PIN and GND PIN inside the chip.
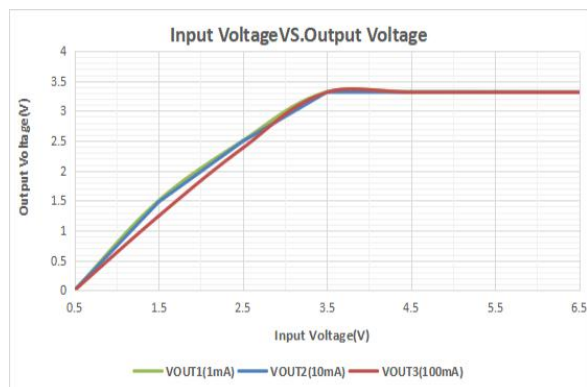
3、 V_{dif} ： V_{IN1} −V_{OUT} (E)'

V_{IN1} ： Gradually reduce the input voltage, the input voltage when the output voltage drops to 98% of VOUT (E).

V_{OUT} (E)'= V_{OUT} (E)X98%。

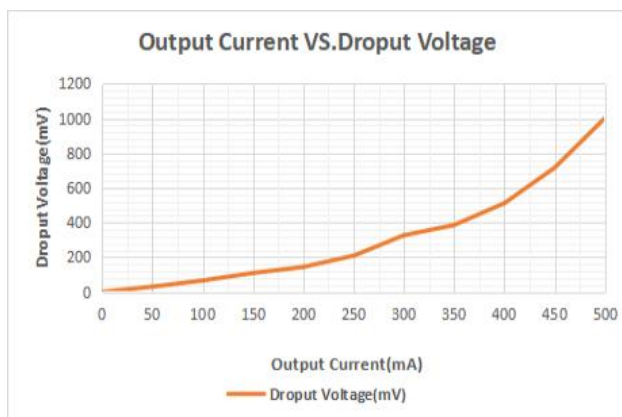# Typical Operating Characteristics

Output Current VS.Output Voltage

Output Current VS Output Voltage

Input Voltage VS.Output Voltage
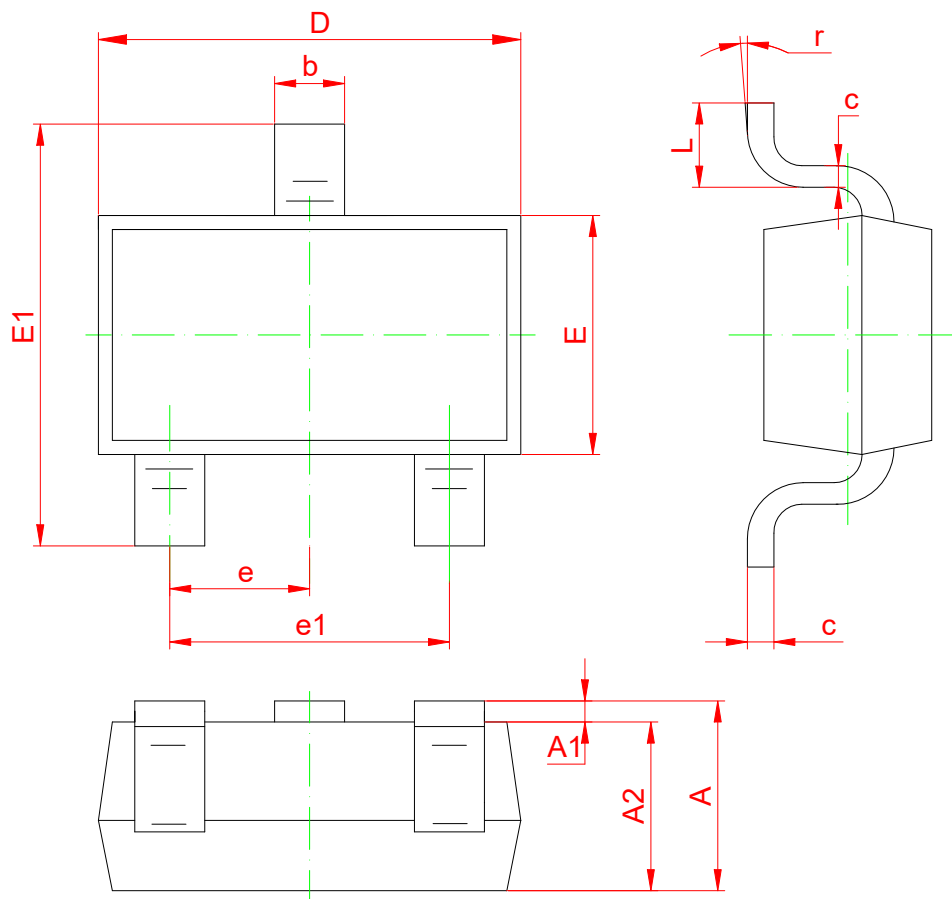
Input Voltage VS Output Voltage

Output Current VS.Dropout Voltage

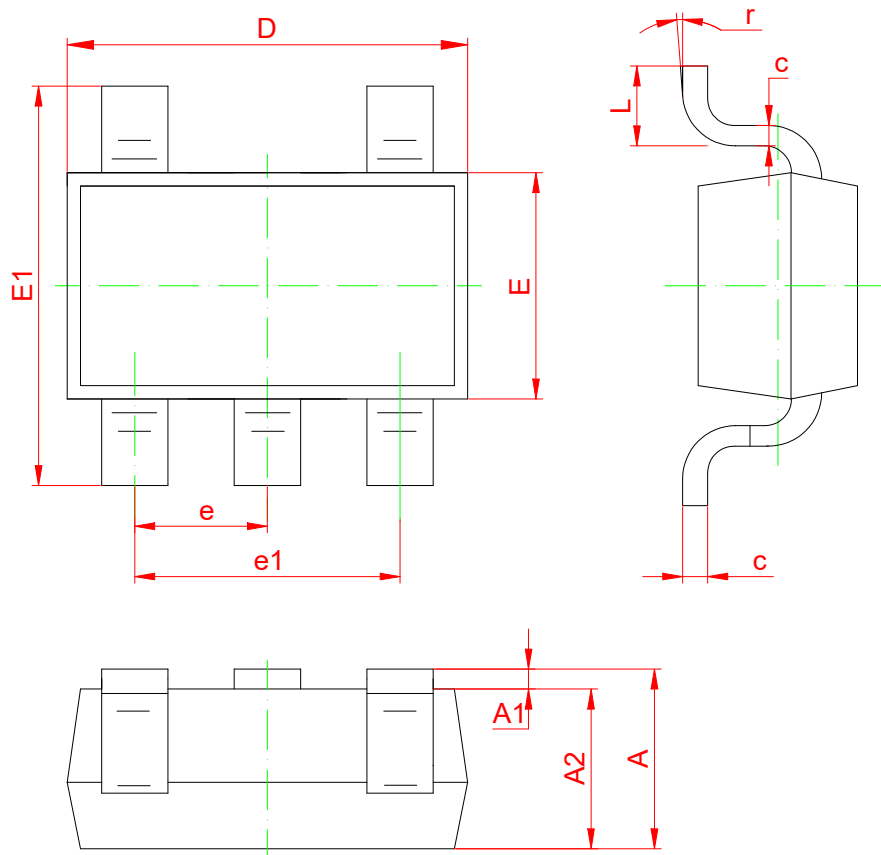**Output Current VS Dropout Voltage**

Package Outline：SOT-23-3L

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
r	0°	8°	0°	8°

Package Outline：SOT-23-5L

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
r	0º	8º	0º	8º

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