

## Low Power Consumption LDO 6209 Series

### General Description

The 6209 series are a group of positive voltage output, three –pin regulator, that provide a high current even when the input/output Voltage differential is small. Low power consumption and high accuracy is achieved through CMOS technology. They allow input voltages as high as 18V.

### Features

- Ultra low quiescent current: 3.0uA(typ)
- High input voltage (up to 18V)
- Low dropout voltage :80mV@Iout=40mA (V<sub>OUT</sub>=3.3V)
- Output voltage accuracy: ±2%
- Maximum output current: 250mA (within max.power dissipation,V<sub>OUT</sub> =3.3V)
- Low temperature coefficient

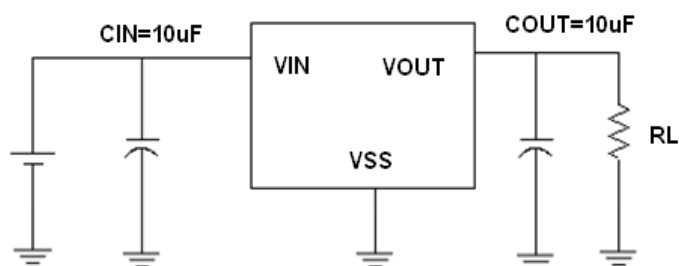
### Typical Application

- Cameras, video recorders
- Voltage regulator for microprocessor
- Voltage regulator for LAN cards
- Wireless communication equipment
- Audio/Video equipment

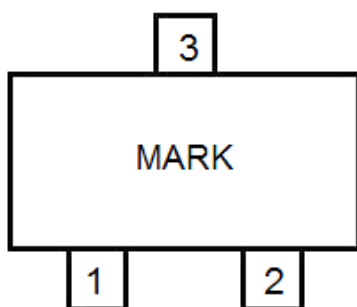
### Package

- 3-pin SOT23-3、SOT89-3、TO-92

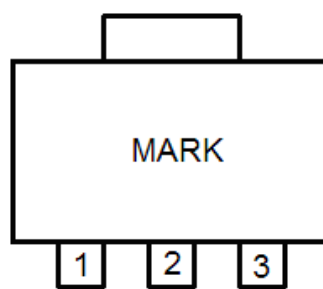
### Typical Application Circuit



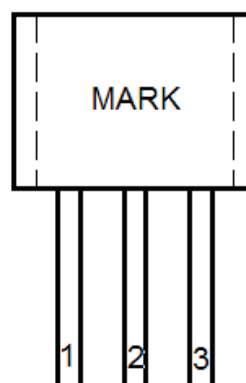
### Pin Configuration



SOT23-3



SOT89-3

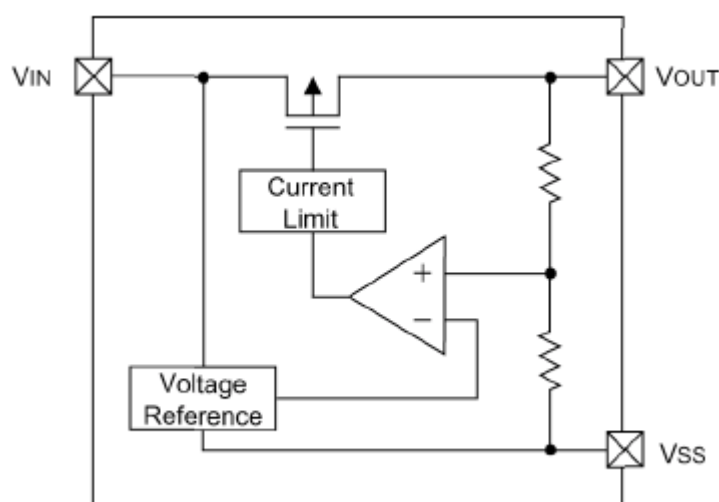


TO-92

## Pin Assignment

Pin Num		Symbol	Function
SOT89-3/TO-92	SOT23-3		
1	1	$V_{SS}$	Ground
2	3	$V_{IN}$	Input
3	2	$V_{OUT}$	Output

## Block Diagram



## Absolute Maximum Ratings

Parameter	Symbol	Ratings	Units	
Input Voltage	$V_{IN}$	18	V	
Output Voltage	$V_{OUT}$	$V_{SS}-0.3 \sim V_{IN} + 0.3$	V	
Output Current	$I_{OUT}$	500	mA	
Operating Temperature Range	$T_{OPR}$	$-45 \sim +150$	$^{\circ}\text{C}$	
Storage Temperature Range	$T_{STG}$	$-55 \sim +140$	$^{\circ}\text{C}$	
Power Dissipation	SOT89-3	$P_D$	500	mW
	TO-92		500	
	SOT23-3		300	

## Electrical Characteristics

### 6209A40

( $V_{IN} = V_{OUT} + 1.0V$ ,  $C_{IN} = C_L = 10\mu F$ ,  $T_a = 25^\circ C$ , unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	$V_{OUT(E)}$ (Note 2)	$I_{OUT} = 40mA$ , $V_{IN} = V_{OUT} + 1V$	X 0.98	$V_{OUT(T)}$ (Note 1)	X 1.02	V
Input Voltage	$V_{IN}$				18	V
Maximum Output Current	$I_{OUT\_max}$	$V_{IN} = V_{OUT} + 1V$		250	300	mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN} = V_{OUT} + 1V$ , $1mA \leq I_{OUT} \leq 60mA$		15	40	mV
Dropout Voltage (Note 3)	$V_{DIF}$	$I_{OUT} = 40mA$		70		mV
Supply Current	$I_{SS}$	$V_{IN} = V_{OUT} + 1V$		3	5	$\mu A$
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	$I_{OUT} = 40mA$ $V_{OUT} + 1V \leq V_{IN} \leq 18V$		0.1	0.2	%/V
$\Delta V_{OUT} / \Delta T_a$	Temperature Coefficient	$V_{IN} = V_{OUT} + 1V$ , $I_{OUT} = 40mA$ $-40^\circ C < T_a < 85^\circ C$		$\pm 0.7$		mV/ $^\circ C$

Note :

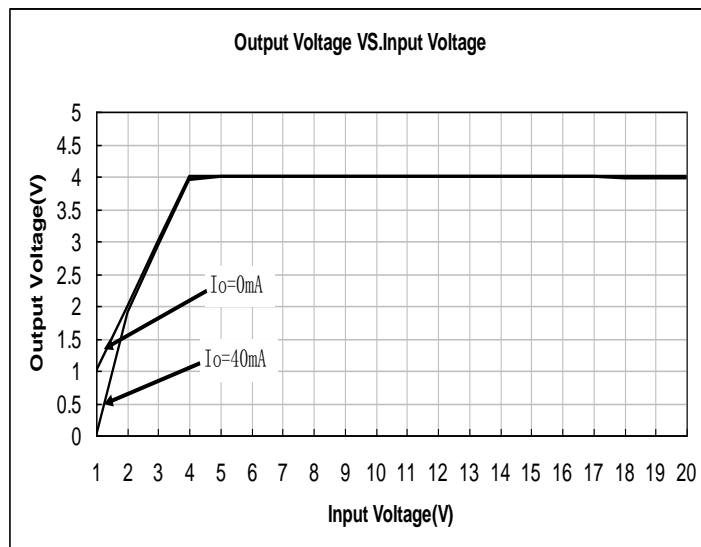
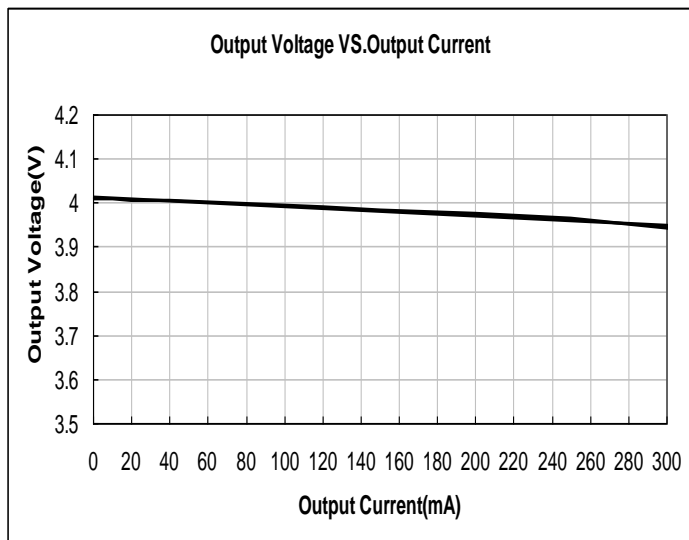
- $V_{OUT(T)}$  : Specified Output Voltage
- $V_{OUT(E)}$  : Effective Output Voltage ( ie. The output voltage when " $V_{OUT(T)} + 1.0V$ " is provided at the Vin pin while maintaining a certain  $I_{OUT}$  value.)
- $V_{DIF}$ :  $V_{IN1} - V_{OUT(E)}$   
 $V_{IN1}$  : The input voltage when  $V_{OUT(E)}$  appears as input voltage is gradually decreased.  
 $V_{OUT(E)}$  = A voltage equal to 98% of the output voltage whenever an amply stabilized  $I_{OUT}$  and  $\{V_{OUT(T)} + 1.0V\}$  is input.

## Precautions

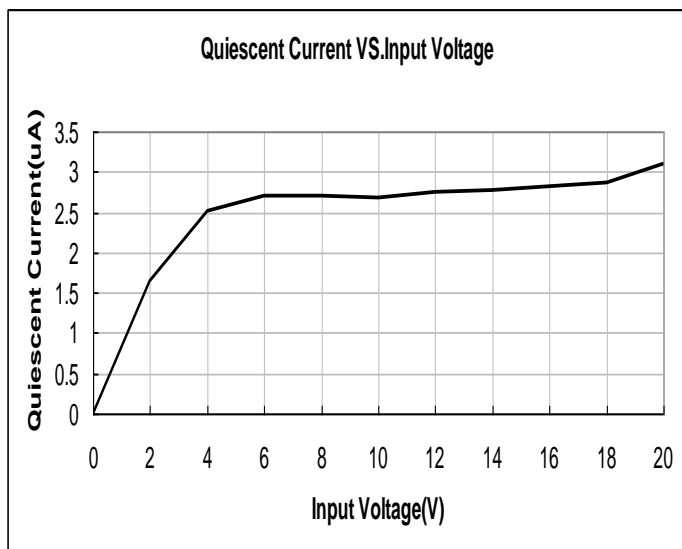
- During the test, if AC/DC power supply and the ceramic chip capacitors collocation are used, there may be serious voltage spike phenomenon instantaneously. When the power supply access to 16V, the voltage is rushed to about 30V instantaneously. Because of exceeding the limit voltage of chip, the chip is damaged. If you string a small resistance of 1 ohm in the input end during the test, the peak phenomenon can be avoided.
- In the test, there is serious burr phenomenon only when the AC/DC power is used with ceramic chip capacitors. But electrolytic capacitors and tantalum capacitance won't appear above phenomenon. Please be sure to pay attention to this point when you use AC/DC power.
- In normal use, when any type of capacitor is used with battery or the supply of fire power, the above phenomenon doesn't occur.

## Type Characteristics(6209A40)

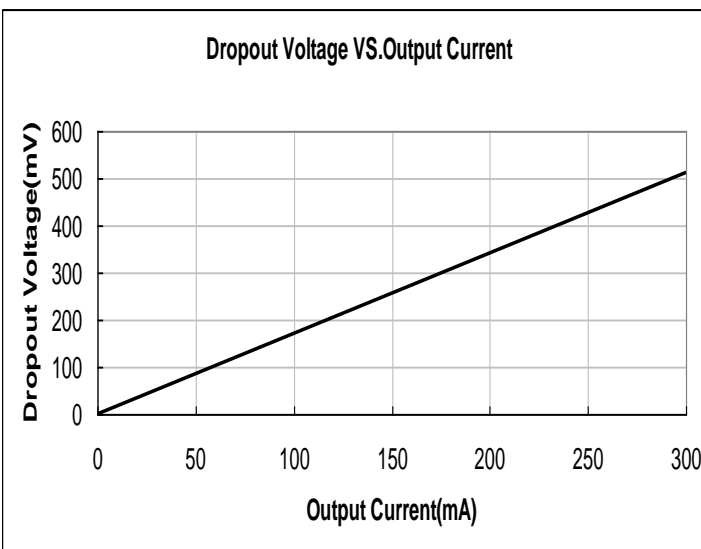
- (1) Output Voltage VS. Output Current (  $T_a = 25\text{ }^\circ\text{C}$  )      (2) Output Voltage VS. Input Voltage



- (3) Quiescent Current VS. Input Voltage

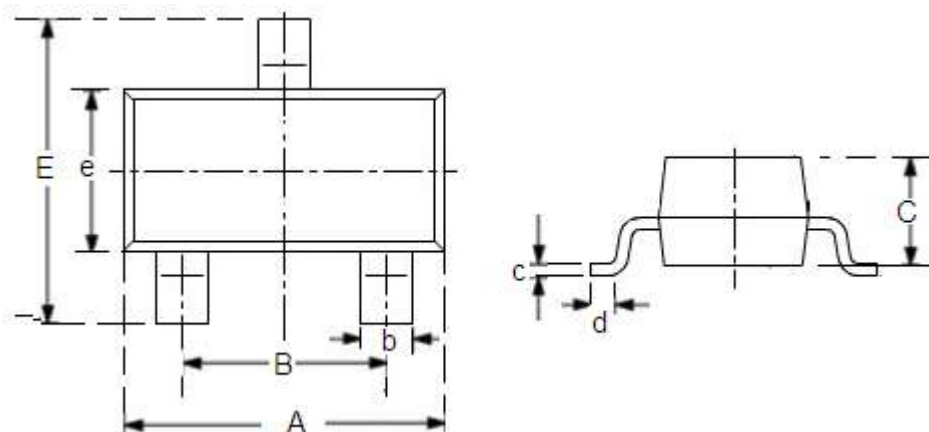


- (4) Dropout Voltage VS. Output Current



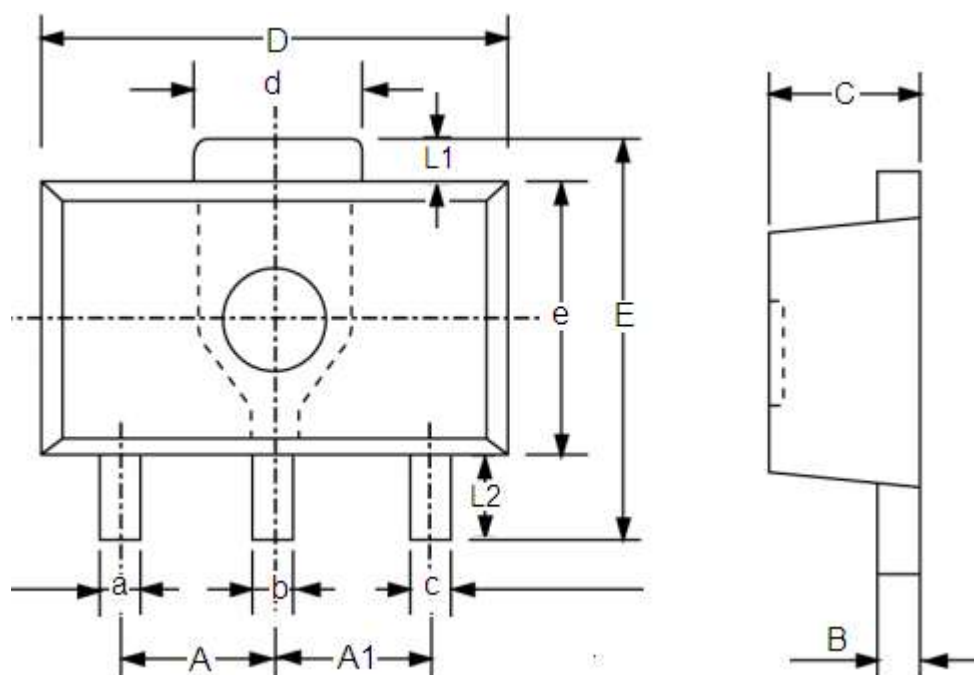
## Packaging Information

● Packaging Type: SOT23-3



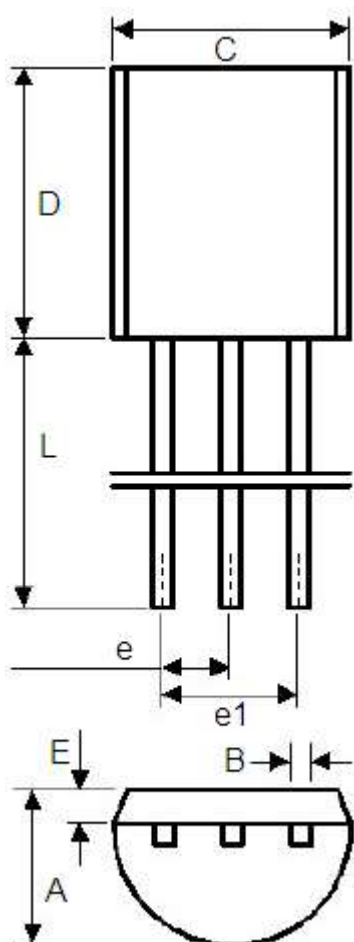
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.7	3.1	0.1063	0.122
B	1.7	2.1	0.0669	0.0827
b	0.35	0.5	0.0138	0.0197
C	1.0	1.2	0.0394	0.0472
c	0.1	0.25	0.0039	0.0098
d	0.2	-	0.0079	-
E	2.6	3.0	0.1023	0.1181
e	1.5	1.8	0.059	0.0708

● Packaging Type: SOT89-3



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.4	1.6	0.0551	0.0630
A1	1.4	1.6	0.0551	0.0630
a	0.36	0.48	0.0142	0.0189
b	0.41	0.53	0.0161	0.0209
c	0.36	0.48	0.0142	0.0189
d	1.4	1.75	0.0551	0.0689
B	0.38	0.43	0.015	0.0169
C	1.4	1.6	0.0551	0.0630
D	4.4	4.6	0.1732	0.181
E	-	4.25	-	0.1673
e	2.4	2.6	0.0945	0.1023
L1	0.4	-	0.0157	-
L2	0.8	-	0.0315	-

● Packaging Type:TO-92



	Min	Max	Min	Max
A	3.4	3.8	0.13386	0.1496
B	0.3	0.5	0.0118	0.0197
C	4.4	4.8	0.1732	0.189
D	4.4	4.8	0.1732	0.189
E	0.9	1.5	0.0354	0.059
e	1.17	1.37	0.046	0.0539
e1	2.39	2.69	0.094	0.1059
L	12	16	0.4724	0.6299