Ultra Fast High PSRR Low Noise CMOS Voltage Regulators

CJ6109 Series

■ INTRODUCTION

The CJ6109 series are a group of positive voltage regulators manufactured by CMOS technology, which have high ripple rejection, ultra fast transient response and low dropout voltage, and can provide large output current even if the input and output voltage difference is small. Each of CJ6109 series consists of a high precision voltage reference, an error correction circuit and a current limiting output driver. Therefore, this series of products are very suitable for the following equipment application scenarios: industrial applications, battery power supply, wireless communication and so on.

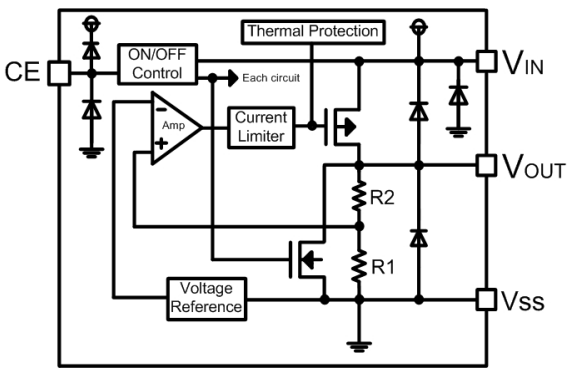
■ FEATURES

- Guaranteed Output Current：1.0A（Typ.）
- Low Quiescent Current：70μA（Typ.）
- Output Voltage Range：0.9V～4.0V
- Input Voltage Range：1.6V～6.0V
- High Accuracy：±2%（Typ.）
- Dropout Voltage：320mV@1.0A（3.3V Typ.）
- Excellent Line Regulation：0.02%/V
- High PSRR : 70dB@10KHz
- Built-in Current Limiter & Thermal Protection
- Short Circuit Current Fold-back
- Output Capacitor：Ceramic Compatible

■ APPLICATIONS

- CD/DVD-ROM, CD/RW
- Wireless devices
- Battery charger
- Portable instrumentations
- PC peripherals
- Battery-Powered systems

■ BLOCK DIAGRAM

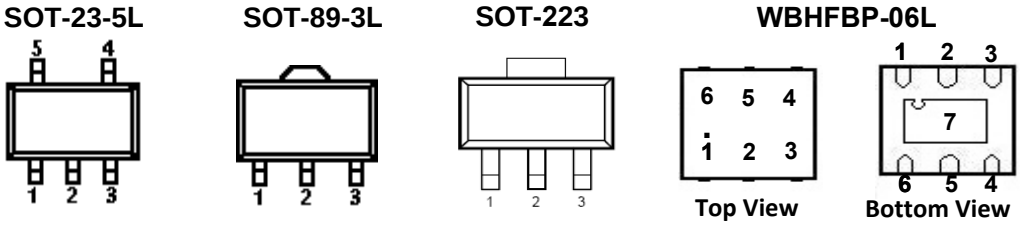


■ ORDER INFORMATION

CJ6109①②③④

DESIGNATOR	SYMBOL	DESCRIPITION
①	A	Standard
	B	With Shutdown Function
②③	Integer	Output Voltage(0.8~5.0V) e.g:3.0V=②:3, ③:0
④	M	Package:SOT-23-5L
	P	Package:SOT-89-3L
	GW	Package:SOT-223
	FB	Package:WBHFBP-06L

■ PIN CONFIGURATION



SOT-223/SOT-89-3L

PIN NUMBER			PIN NAME	FUNCTION
CJ6109AxxGW	CJ6109AxxP/PL			
GW	P	PL		
1	1	2	V_{SS}	Ground
3	2	1	V_{IN}	Power input
2	3	3	V_{OUT}	Output

SOT-23-5L/WBHFBP-06L

PIN NUMBER		SYMBOL	FUNCTION
M	FB		
1	3	V_{IN}	Power Input Pin
2	2	V_{SS}	Ground
3	1	CE	Chip Enable Pin
4	5	NC	No Connection
5	4	V_{OUT}	Output Pin
-	6	NC	No Connection
-	7		Thermal Pad

■ TYPICAL APPLICATION

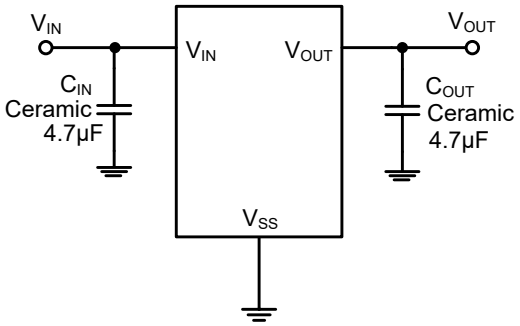


Figure1 CJ6109A Typical Application Circuit

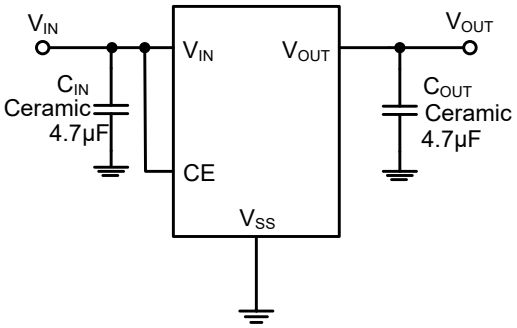


Figure2 CJ6109B Typical Application Circuit

Input capacitor (C_{IN}): 4.7μF or more;
Output capacitor (C_{OUT}): 4.7μF or more;
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.

■ ABSOLUTE MAXIMUM RATINGS(1)

(Unless otherwise specified, T_A=25°C)

PARAMETER		SYMBOL	RATINGS	UNITS
Input Voltage (2)		V_{IN}	V_{SS}-0.3~V_{SS}+7	V
Output Current (2)		I_{OUT}	1300	mA
Output Voltage		V_{OUT}	V_{SS}-0.3~V_{IN}+0.3	V
Power Dissipation	SOT-89-3L	Pd	600	mW
	SOT-23-5L	Pd	400	mW
	WBHFBP-06L	Pd	600	mW
	SOT-223	Pd	800	mW
Operating Ambient Temperature		T_A	-40~+85	°C
Operating Junction Temperature (3)		T_J	-40~+125	°C
Storage Temperature		T_{stg}	-40~+125	°C
Soldering Temperature & Time		T_{solder}	260°C,10s	

(1) Stresses beyond those listed under *absolute maximum ratings may* cause permanent damage to the device. These are stress ratingsonly, and functional operation of the device at these or any other conditions beyond those indicated under *recommended operatingconditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods my affect device reliability.

(2) All voltages are with respect to network ground terminal.

(3) This IC includes overtemperature protection that is intended toprotect the device during momentary overload. Junction temperature willexceed 125°C when overtemperature protection is active. Continuousoperation above the specified maximum operating junction temperaturemay impair device reliability.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	MIN.	NOM.	MAX.	UNITS
Supply voltage at V_{IN}	1.6		6	V
Operating junction temperature range, T_j	-40		125	°C
Operating free air temperature range, T_A	-40		85	°C

Electrical Characteristics

CJ6109 Series (V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=4.7μF, T_A=25℃, unless otherwise specified)

PARAMETER		SYMBOL	CONDITIONS	MIN.	TYP. (3)	MAX.	UNITS
Output Voltage		V_{OUT}(E) (4)	I_{OUT}=100mA	V_{OUT}*0.98(5)	V_{OUT}(5)	V_{OUT}*1.02(5)	V
Supply Current		I_{SS}	I_{OUT}=0		70	140	μA
Shutdown Current		I_{SHDN}	CE = V_{SS}		0.1	1.0	μA
Output Current		I_{OUT}	—	1000	1300		mA
Dropout Voltage (6)		V_{Dif1}	I_{OUT} =300mA		90		mV
		V_{Dif2}	I_{OUT} =1000mA		320		mV
Load Regulation		$\overline{\Delta}V_{OUT}$	V_{IN}= V_{OUT} +1V 1mA≤I_{OUT}≤1.0A		30		mV
Line Regulation		$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta V_{IN}}$	I_{OUT} =100mA V_{OUT} +1V≤V_{IN}≤6V		0.02	0.2	%/V
Output Voltage Temperature Characteristics		$\frac{\Delta V_{OUT}}{\Delta T \times V_{OUT}}$	I_{OUT} =10mA -40°C≤T≤+85°C		50		ppm/°C
Short Current		I_{Short}	V_{OUT} =V_{SS}		120		mA
Input Voltage		V_{IN}	—	1.6		6.0	V
Power Supply Rejection Rate	1kHz	PSRR	I_{OUT}=100mA		75		dB
	10kHz				70		
CE "High" Voltage		V_{CE}"H"		1.5		V_{IN}	V
CE "Low" Voltage		V_{CE}"L"				0.3	V
Thermal Shutdown Temperature		T_{SD}			150		°C
Thermal Shutdown Temperature Hysteresis		ΔT_{SD}			30		°C

NOTE:

(3) Typical numbers are at 25°C and represent the most likely norm.

(4) V_{OUT} (E): Effective Output Voltage (I.e. The output voltage when V_{IN} = (V_{OUT} +1.0V) and maintain a certain I_{OUT} Value).

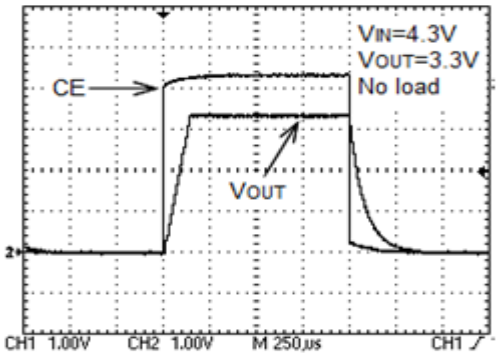
(5) V_{OUT}: Specified Output Voltage.

(6) V_{Dif}: The Difference Of Output Voltage And Input Voltage When Input Voltage Is Decreased Gradually Till Output Voltage Equals To 98% Of V_{OUT} (E).

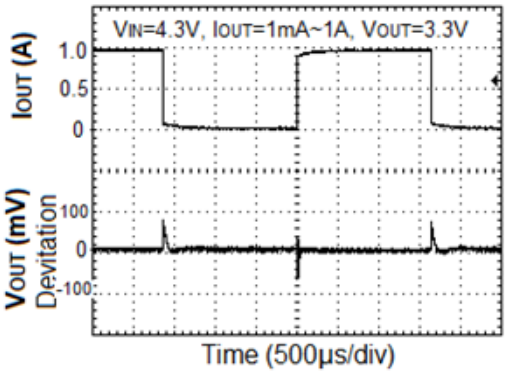
Typical Characteristics

(V_{CE}=V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1μF, T_A=25℃,unless otherwise specified)

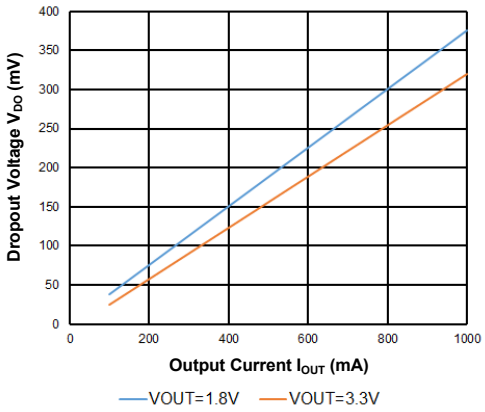
CE Start & Shutdown Response



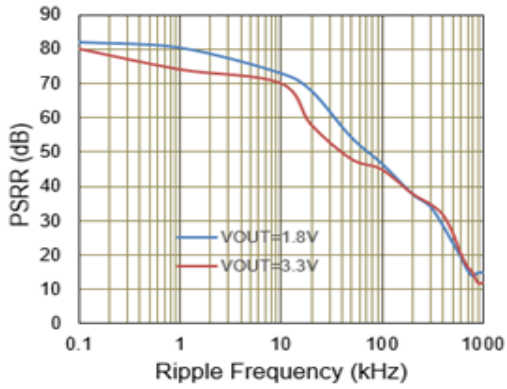
Load Transient Response



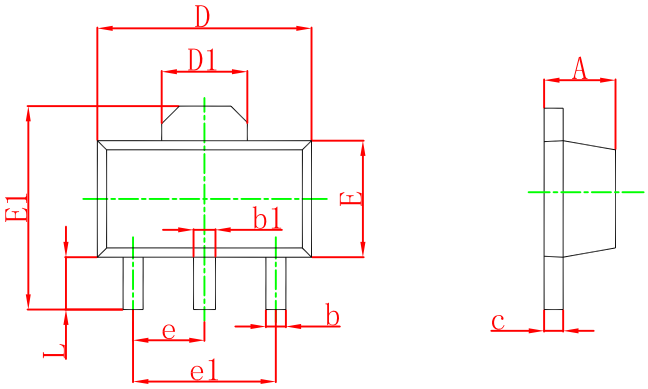
Dropout Voltage vs. Output Current



Power Supply Rejection Ratio

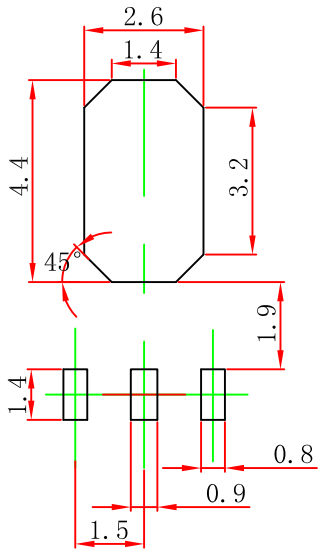


SOT-89-3L Package Outline Dimensions



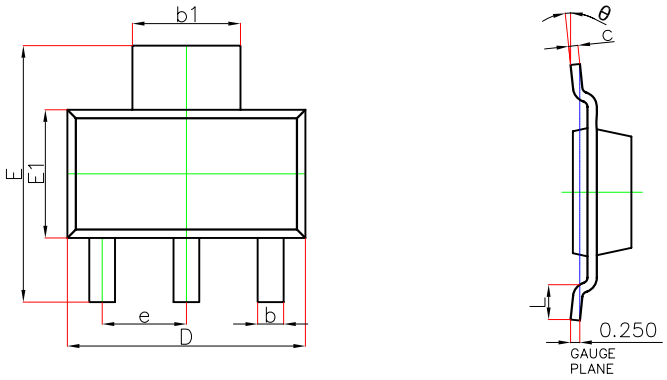
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060 TYP	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.200	0.035	0.047

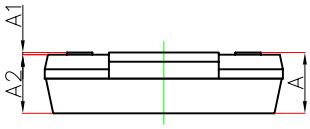
SOT-89-3L Suggested Pad Layout



Note:
1.Controlling dimemsion"in"milimeters.
2.General tolerance: ±0.05mm.
3.The pad layout is for reference purpose only.

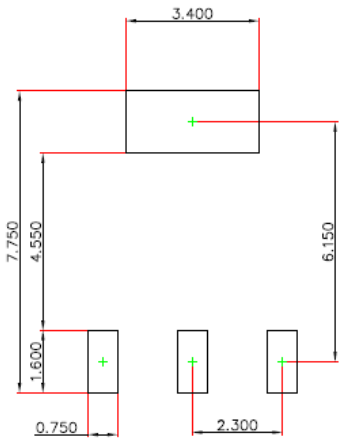
SOT-223 Package Outline Dimensions





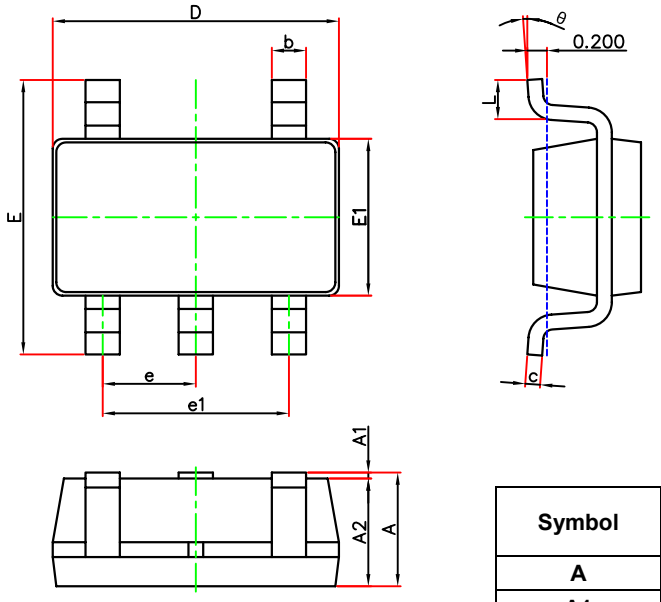
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	——	1.800	——	0.071
A1	0.020	0.100	0.001	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.840	0.026	0.033
b1	2.900	3.100	0.114	0.122
c	0.230	0.350	0.009	0.014
D	6.300	6.700	0.248	0.264
E	6.700	7.300	0.264	0.287
E1	3.300	3.700	0.130	0.146
e	2.300(BSC)		0.091(BSC)	
L	0.750	——	0.030	——
θ	0°	10°	0°	10°

SOT-223 Suggested Pad Layout



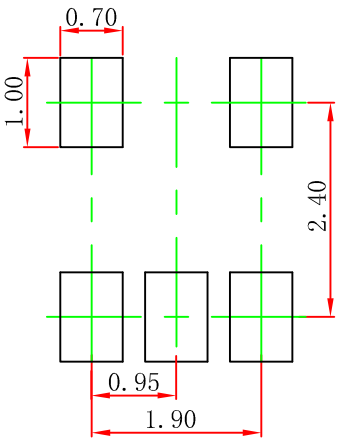
Note:
1.Controlling dimemsion"in"milimeters.
2.General tolerance: ±0.05mm.
3.The pad layout is for reference purpose only.

SOT-23-5L Package Outline Dimensions



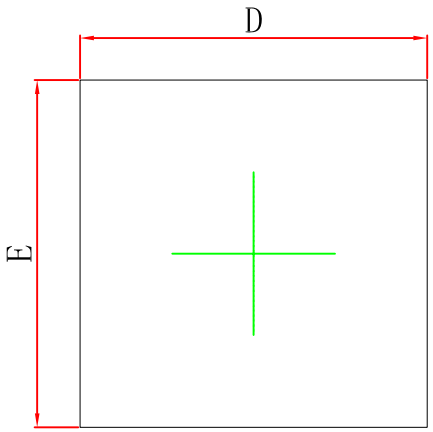
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	2.650	2.950	0.104	0.116
E1	1.500	1.700	0.059	0.067
e	0.950(BSC)		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°

SOT-23-5L Suggested Pad Layout

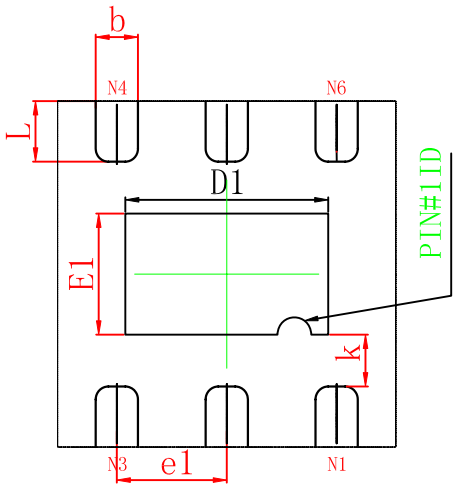


Note:
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2.General tolerance: ±0.05mm.
3.The pad layout is for reference purpose only.

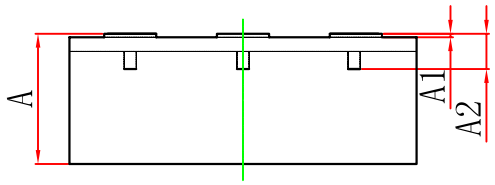
WBHFBP-06L Package Outline Dimensions



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimension In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203REF		0.008REF	
D	1.950	2.050	0.077	0.081
E	1.950	2.050	0.077	0.081
D1	1.150	1.250	0.045	0.049
E1	0.650	0.750	0.026	0.030
b	0.200	0.300	0.008	0.012
e1	0.650TYP		0.026TYP	
k	0.200MIN		0.008MIN	
L	0.300	0.400	0.012	0.016

DISCLAIMER

IMPORTANT NOTICE, PLEASE READ CAREFULLY

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Any person who purchases or uses SZCJ products for design shall: 1. Select products suitable for circuit application and design; 2. Design, verify and test the rationality of circuit design; 3. Procedures to ensure that the design complies with relevant laws and regulations and the requirements of such laws and regulations. SZCJ makes no warranty or representation as to the accuracy or completeness of the information contained in this data sheet and assumes no responsibility for the application or use of any of the products described in this data sheet.

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