



# LC1207

## 300mA, Wide Input Voltage, Low Consumption Linear Regulator

### GENERAL DESCRIPTION

LC1207 series are a group of positive voltage output, high precise, and high PSRR and low power consumption voltage regulator. Voltages are selectable in 100mV steps within a range of 2.5V to 5V. It also can be customized on command.

LC1207 series have excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within  $\pm 2\%$ .

LC1207 series are available in SOT-23-3, SOT-23-5, SOT-89-3 packages, which are lead (Pb)- free.

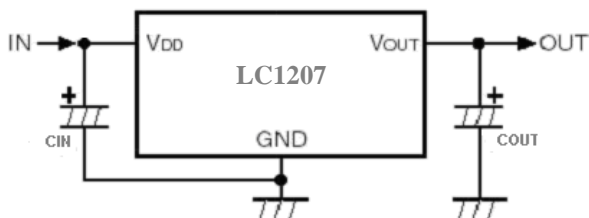
### FEATURES

- Low Quiescent Current: 8uA at 5V
- High PSRR: 60dB range to 10KHz
- Low Output Noise: 44uVRMS
- Low Dropout: 270mV at 150mA load
- Low Temperature Coefficient:  $\pm 100\text{ppm}/^\circ\text{C}$
- Excellent Line Regulation: 0.05%/V
- Highly Accurate:  $\pm 2\%$

### APPLICATIONS

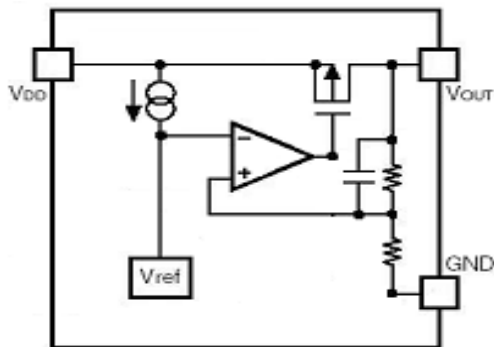
- Reference Voltage Source
- Battery Powered Equipment
- Hand-Hold Equipment
- Wireless LAN
- GPS Receivers

### TYPICAL APPLICATION

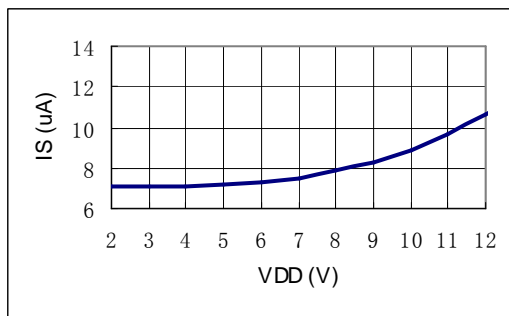


Note 1: Input capacitor ( $C_{IN}=1\mu\text{F}$ ) is recommended in all applications.  
 Note 2: Output capacitor ( $C_{OUT}=1\mu\text{F}/6.8\mu\text{F}$ ) is recommended in all applications to assure the stability of circuit.  $1\mu\text{F}$  Tantalum capacitor or  $6.8\mu\text{F}$  ceramic capacitor is recommended.

### BLOCK DIAGRAM



Supply Current vs. Input Voltage



## ORDERING INFORMATION

LC1207 [1](#) [2](#) [3](#) [4](#)

Code	Description
<a href="#">1</a>	Temperature & Rohs: C: -40~85°C, Pb Free Rohs Std.
<a href="#">2</a>	Package type: B3: SOT-23-3 B5: SOT-23-5 C3: SOT-89-3 C3B: SOT-89-3
<a href="#">3</a>	Packing type: TR: Tape&Reel (Standard)
<a href="#">4</a>	Output voltage: e.g. 25=2.5V 33=3.3V 50=5.0V

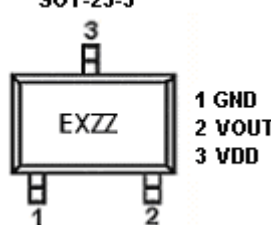
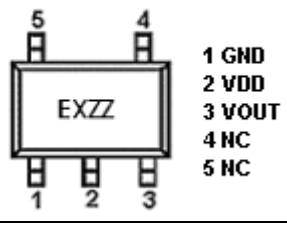
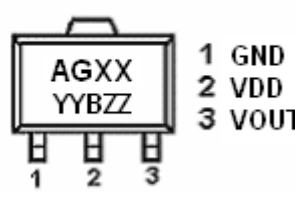
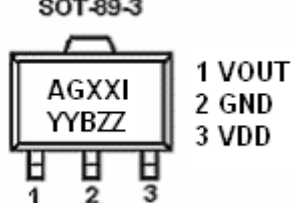
### Output Voltage Code

VOUT	Code	VOUT	Code	VOUT	Code
1.2V	2	3.3V	<u>3</u>	4.3V	<u>3</u>
1.5V	5	3.4V	<u>4</u>	4.4V	<u>4</u>
2.5V	<u>5</u>	3.5V	<u>5</u>	4.5V	<u>5</u>
2.6V	<u>6</u>	3.6V	<u>6</u>	4.6V	<u>6</u>
2.7V	<u>7</u>	3.7V	<u>7</u>	4.7V	<u>7</u>
2.8V	<u>8</u>	3.8V	<u>8</u>	4.8V	<u>8</u>
2.9V	<u>9</u>	3.9V	<u>9</u>	4.9V	<u>9</u>
3.0V	<u>0</u>	4.0V	<u>0</u>	5.0V	<u>0</u>
3.1V	<u>1</u>	4.1V	<u>1</u>		
3.2V	<u>2</u>	4.2V	<u>2</u>		

#### NOTE 3:

E: Product Code; X: Output Voltage;  
Z: The Year of manufacturing, "7" stands for year 2007, "8" stands for year 2008;  
Z: The week of manufacturing. "A" stands for week 1, "Z" stands for week 26, "A" stands for week 27, "Z" stands for week 52.

## MARKING DESCRIPTION

Product Classification		LC1207CB3TR□□
Marking		<p>SOT-23-3</p> 
EXZZ	E: Product Code X: Output Voltage ZZ: Date Code	
Product Classification		LC1207CB5TR□□
Marking (NOTE 3)		<p>SOT-23-5</p> 
EXZZ	E: Product Code X: Output Voltage ZZ: Date Code	
Product Classification		LC1207CC3TR□□
Marking		<p>SOT-89-3</p> 
AGXX YYBZZ	AG: Product Code XX: Output Voltage YY: Data Code B: Fab Code ZZ: Data Code	
Product Classification		LC1207CC3BTR□□
Marking		<p>SOT-89-3</p> 
AGXXI YYBZZ	AG: Product Code XX: Output Voltage YY: Data Code B: Fab Code ZZ: Data Code	
GND	Ground	
VOUT	Output Voltage	
VDD	Supply Voltage Input	
NC	Not Connected	

## ABSOLUTE MAXIMUM RATING

Parameter	Value
Max Input Voltage	14V
Operating Junction Temperature (T <sub>J</sub> )	125°C
Ambient Temperature (T <sub>A</sub> )	-40°C~85°C
Power Dissipation	SOT-23-3,SOT-23-5
	SOT-89-3
Storage Temperature (T <sub>S</sub> )	-40°C~150°C
Lead Temperature & Time	260°C, 10 Sec

Note 4: Exceed these limits to damage to the device.

Note 5: Exposure to absolute maximum rating conditions may affect device reliability.

## RECOMMENDED WORK CONDITIONS

Parameter	Value
Input Voltage Range	Max. 12V
Ambient Temperature	-40°C~85°C

## ELECTRICAL CHARACTERISTICS

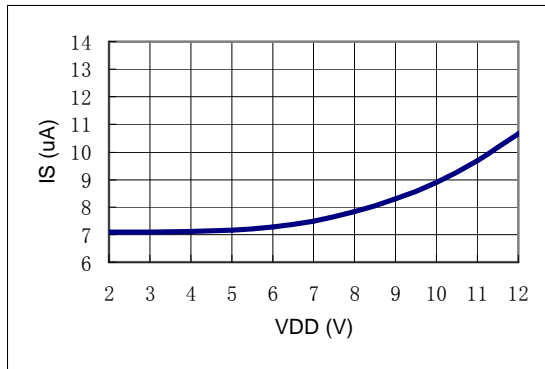
Test Conditions: C<sub>IN</sub>=1uF,C<sub>OUT</sub>=1uF,T<sub>A</sub>=25°C, unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Units
V <sub>DD</sub>	Input Voltage				12	V
V <sub>OUT</sub>	Output Voltage	V <sub>DD</sub> =Set V <sub>OUT</sub> +1V 1mA≤I <sub>OUT</sub> ≤10mA	V <sub>OUT</sub> X0.98	V <sub>OUT</sub> X 1	V <sub>OUT</sub> X1.02	V
I <sub>OUT</sub> (Max.) Note 6	Maximum Output Current	V <sub>DD</sub> -V <sub>OUT</sub> =1V	300			mA
V <sub>DROP</sub>	Dropout Voltage	I <sub>OUT</sub> =150mA		270		mV
$\frac{\Delta V_{out}}{\Delta V_{in} \cdot V_{out}}$	Line Regulation	I <sub>OUT</sub> =10mA 4V≤V <sub>DD</sub> ≤6V		0.05	0.2	%/V
$\Delta V_{out}$	Load Regulation	V <sub>DD</sub> =Set V <sub>OUT</sub> +1V 1mA≤I <sub>OUT</sub> ≤300mA		60		mV
I <sub>S</sub>	Supply Current	V <sub>DD</sub> =Set V <sub>OUT</sub> +1V V <sub>OUT</sub> Floating		8	15	uA
$\frac{\Delta V_{out}}{\Delta T \cdot V_{out}}$	Output Voltage Temperature Coefficient	I <sub>OUT</sub> =10mA		±100		ppm/°C
PSRR	Ripple Rejection	f=100Hz, Ripple=0.5Vp-p, V <sub>DD</sub> =Set V <sub>OUT</sub> +1V		60		dB
en	Output Noise	BW=10Hz~100KHz		44		uVrms

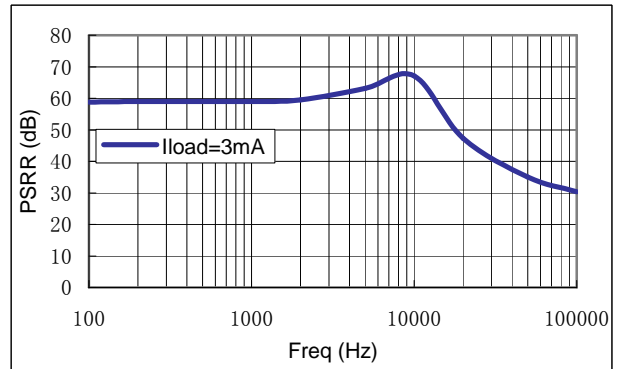
Note 6: The maximum power rating of each package is a constant, so along with the change of I<sub>LOAD</sub>, the V<sub>DD</sub>-V<sub>OUT</sub> should be controlled to a certain range to ensure the normal operation.

## TYPICAL PERFORMANCE CHARACTERISTICS

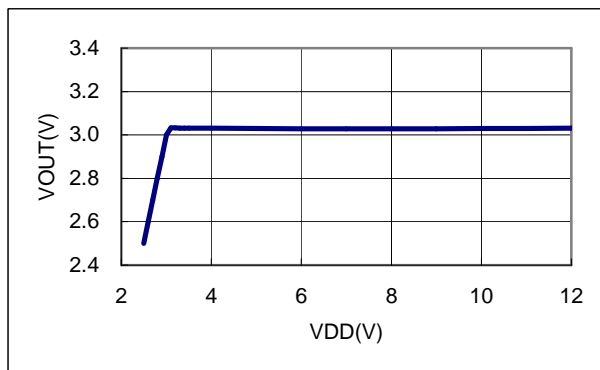
### Supply Current vs. Input Voltage



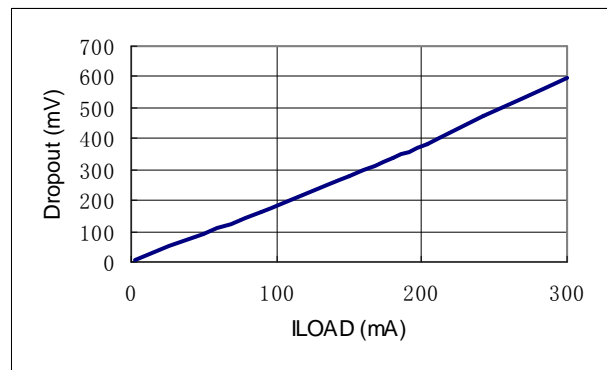
### Ripple Rejection vs. Frequency



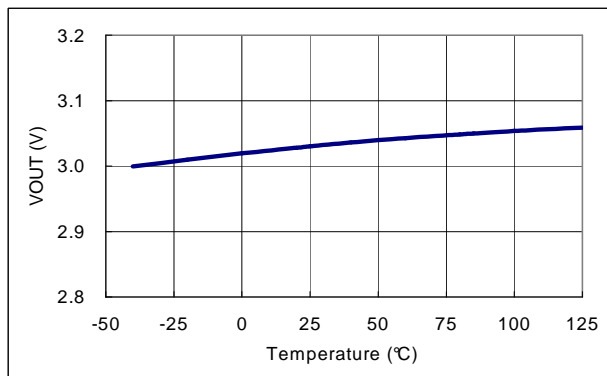
### Output Voltage vs. Input Voltage



### Dropout Voltage vs. Output Current

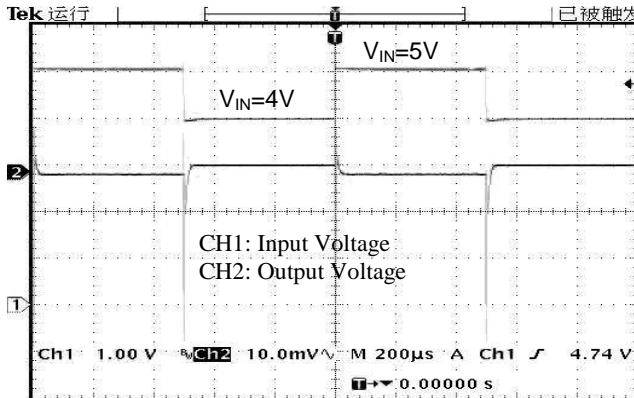


### Output Voltage vs. Temperature

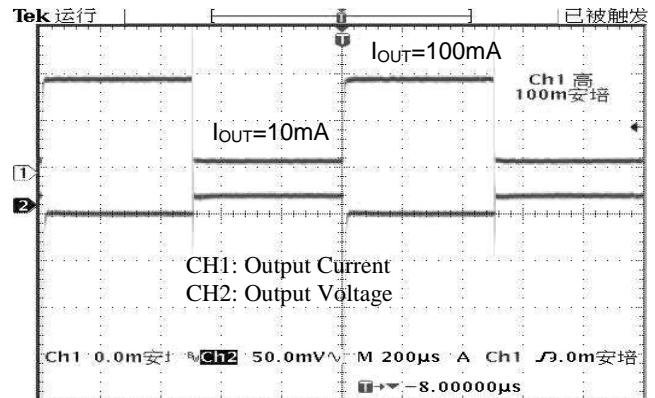


## TEST WAVEFORMS

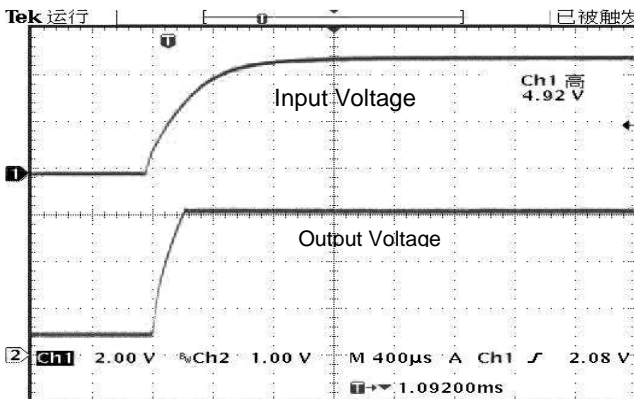
Line Transient Response  
 $C_{IN}=C_{OUT}=1\mu F$ ,  $V_{IN}=4\leftrightarrow 5V$ ,  $V_{OUT}=3V$



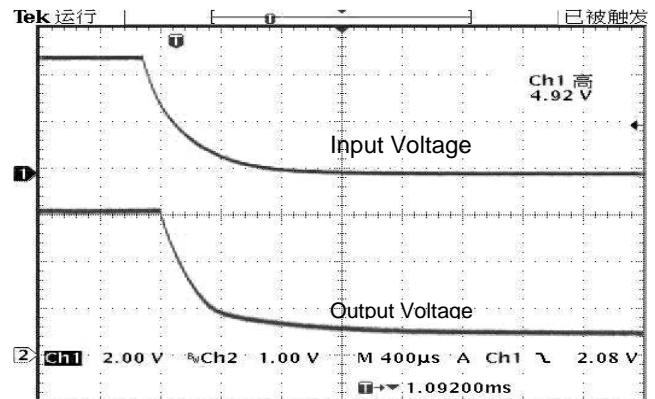
Load Transient Response  
 $C_{IN}=C_{OUT}=1\mu F$ ,  $I_{OUT}=10\leftrightarrow 100mA$ ,  $V_{OUT}=3V$



Power On Sequence ( $V_{IN}: 0\rightarrow 5V$ )  
 $C_{IN}=C_{OUT}=1\mu F$ ,  $I_{OUT}=10\leftrightarrow 100mA$ ,  $V_{OUT}=3V$



Power Off Sequence ( $V_{IN}: 5\rightarrow 0V$ )  
 $C_{IN}=C_{OUT}=1\mu F$ ,  $I_{OUT}=10\leftrightarrow 100mA$ ,  $V_{OUT}=3V$



## PACKAGE LINE

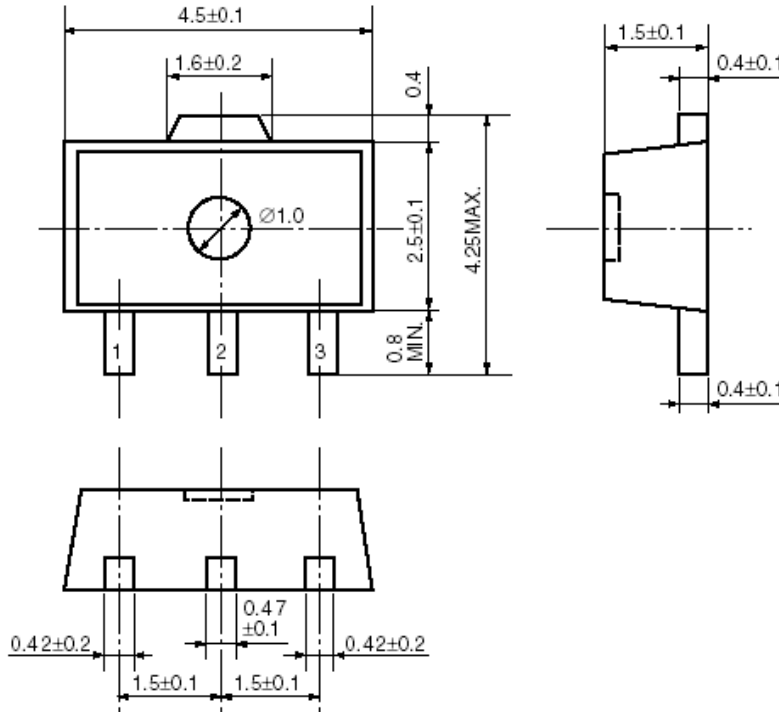
Package	SOT23-3	Devices per reel	3000Pcs	Unit	mm
Package dimension:					
<p>Top view dimensions: Total width <math>2.9 \pm 0.2</math>, lead width <math>0.4 \pm 0.1</math>, lead spacing <math>1.9 \pm 0.2</math> (with <math>0.95</math> spacing between leads), body width <math>1.6 \pm 0.2</math>, and total height <math>2.8 \pm 0.3</math>. Lead height is <math>1.4 \text{ MAX.}</math>. Lead angle is <math>1.1^{+0.2}_{-0.1}</math>. Lead thickness is <math>0.8</math>. Lead width at base is <math>0.16^{+0.1}_{-0.06}</math>. Lead thickness at base is <math>0.2 \text{ MIN.}</math>. Lead width at top is <math>0 \text{ to } 0.1</math>.</p> <p>Side view dimensions: Total height <math>2.8 \pm 0.3</math>, body width <math>1.6 \pm 0.2</math>, and lead height <math>1.4 \text{ MAX.}</math>. Lead angle is <math>1.1^{+0.2}_{-0.1}</math>. Lead thickness is <math>0.8</math>. Lead width at base is <math>0.16^{+0.1}_{-0.06}</math>. Lead thickness at base is <math>0.2 \text{ MIN.}</math>. Lead width at top is <math>0 \text{ to } 0.1</math>.</p> <p>Perspective view shows the package with leads 1, 2, and 3.</p>					

Package	SOT-23-5	Devices per reel	3000Pcs	Unit	mm
Package Dimension:					
<p>Top view dimensions: Total width <math>2.9 \pm 0.2</math>, lead width <math>0.4 \pm 0.1</math>, lead spacing <math>1.9 \pm 0.2</math> (with <math>0.95</math> spacing between leads), body width <math>1.6^{+0.2}_{-0.1}</math>, and total height <math>2.8 \pm 0.3</math>. Lead height is <math>1.1^{+0.2}_{-0.1}</math>. Lead thickness is <math>0.8 \pm 0.1</math>. Lead width at base is <math>0.15^{+0.1}_{-0.05}</math>. Lead thickness at base is <math>0.2 \text{ MIN.}</math>. Lead width at top is <math>0 \text{ to } 0.1</math>.</p> <p>Side view dimensions: Total height <math>2.8 \pm 0.3</math>, body width <math>1.6^{+0.2}_{-0.1}</math>, and lead height <math>1.1^{+0.2}_{-0.1}</math>. Lead angle is <math>1.1^{+0.2}_{-0.1}</math>. Lead thickness is <math>0.8 \pm 0.1</math>. Lead width at base is <math>0.15^{+0.1}_{-0.05}</math>. Lead thickness at base is <math>0.2 \text{ MIN.}</math>. Lead width at top is <math>0 \text{ to } 0.1</math>.</p> <p>Perspective view shows the package with leads 1, 2, 3, 4, and 5.</p>					

# LC1207

Package	SOT-89-3	Devices per reel	1000Pcs	Unit	mm
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Package Dimension:



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