



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 5.5V. 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, TO-92 packages, which are lead (Pb)- free.

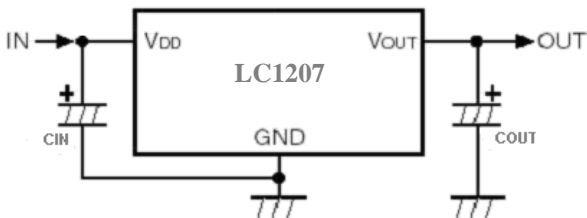
FEATURES

- 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

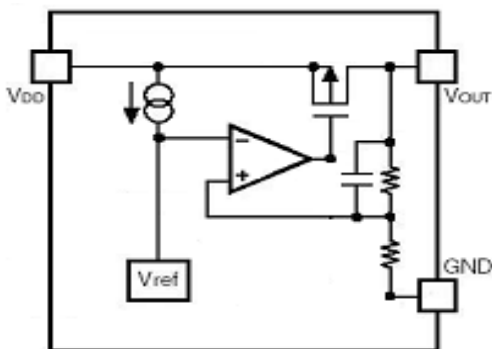
- Reference Voltage Source
- Battery Powered Equipment
- Hand-Hold Equipment
- Wireless LAN
- GPS Receivers

TYPICAL APPLICATION

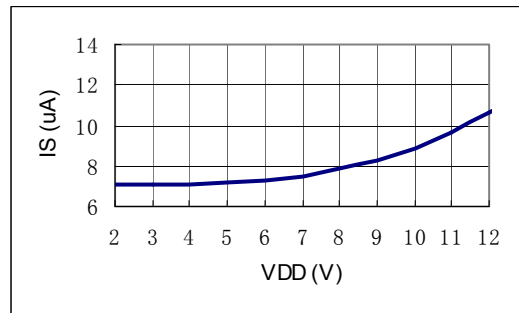


Note 1: Input capacitor ($C_{IN}=1\mu\text{F}$) is recommended in all applications.
 Note 2: Output capacitor ($C_{OUT}=1\mu\text{F}/6.8\mu\text{F}$) is recommended in all applications to assure the stability of circuit. 1uF Tantalum capacitor or 6.8uF ceramic capacitor is recommended.
 Note 3: Input voltage ($V_{DD}>V_{OUT}$) is required in all applications.

BLOCK DIAGRAM



Supply Current vs. Input Voltage





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ABSOLUTE MAXIMUM RATING

Parameter	Value	
Max Input Voltage	14V	
Operating Junction Temperature (T _J)	125°C	
Ambient Temperature (T _A)	-40°C~85°C	
Power Dissipation	SOT-23-3,SOT-23-5	250mW
	SOT-89-3,TO-92	500mW
Storage Temperature (T _S)	-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

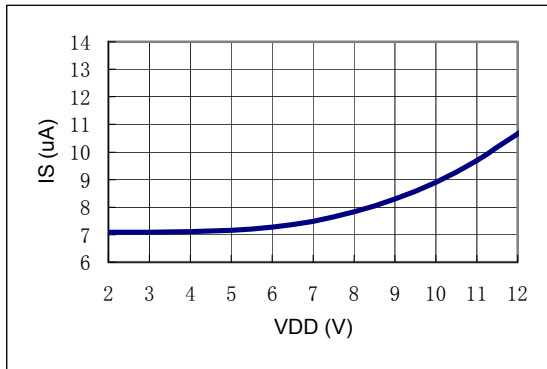
Test Conditions: C_{IN}=1uF, C_{OUT}=1uF, T_A=25°C, unless otherwise specified.

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

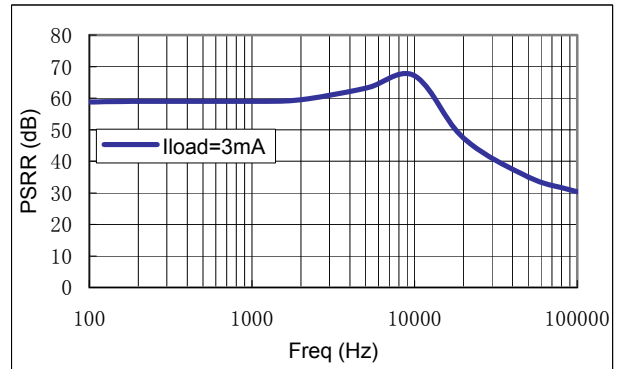
Note 6: The maximum power rating of each package is a constant, so along with the change of I_{LOAD}, the V_{DD}-V_{OUT} should be controlled to a certain range to ensure the normal operation.

TYPICAL PERFORMANCE CHARACTERISTICS

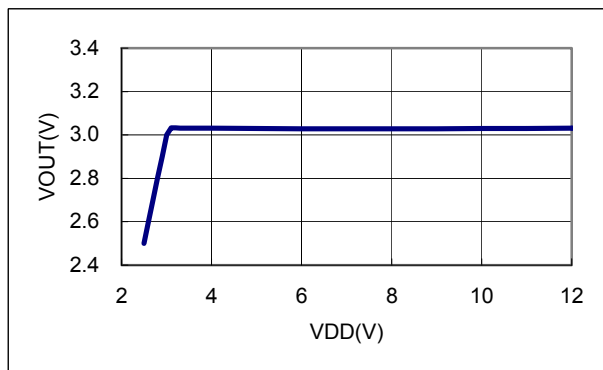
Supply Current vs. Input Voltage



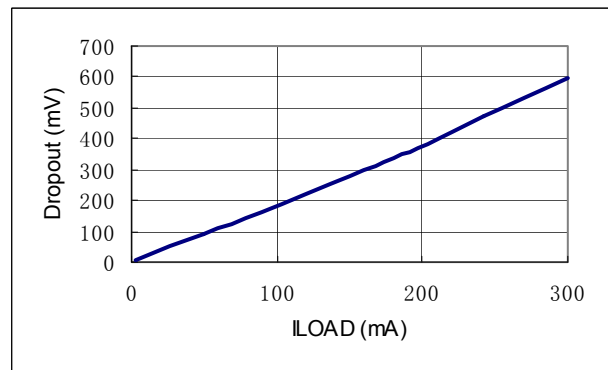
Ripple Rejection vs. Frequency



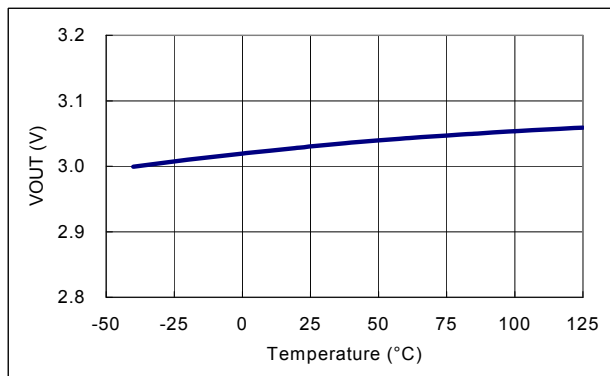
Output Voltage vs. Input Voltage



Dropout Voltage vs. Output Current

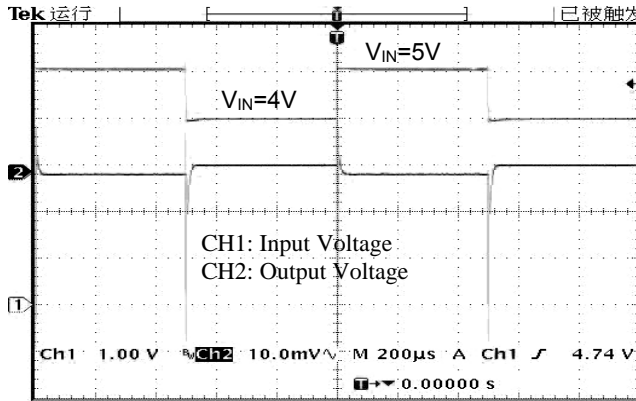


Output Voltage vs. Temperature

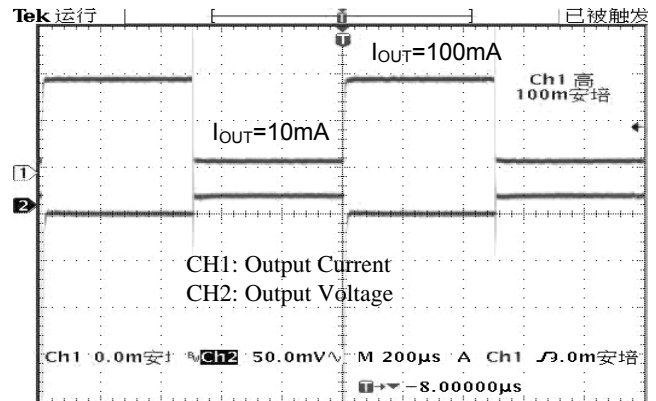


TEST WAVEFORMS

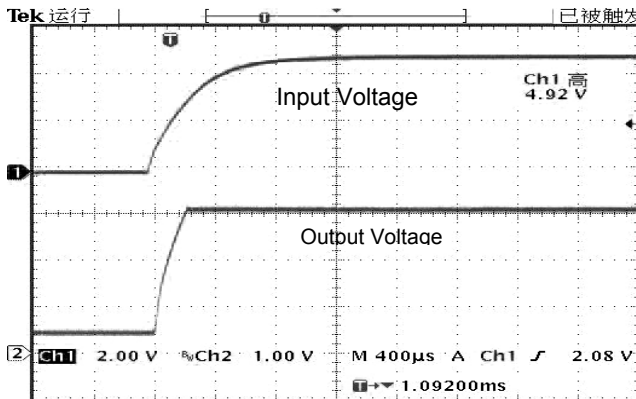
Line Transient Response
 $C_{IN}=C_{OUT}=1\mu F$, $V_{IN}=4\leftrightarrow 5V$, $V_{OUT}=3V$



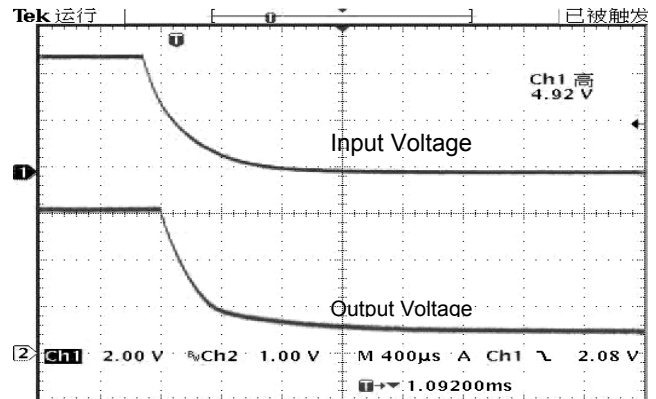
Load Transient Response
 $C_{IN}=C_{OUT}=1\mu F$, $I_{OUT}=10\leftrightarrow 100mA$, $V_{OUT}=3V$



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



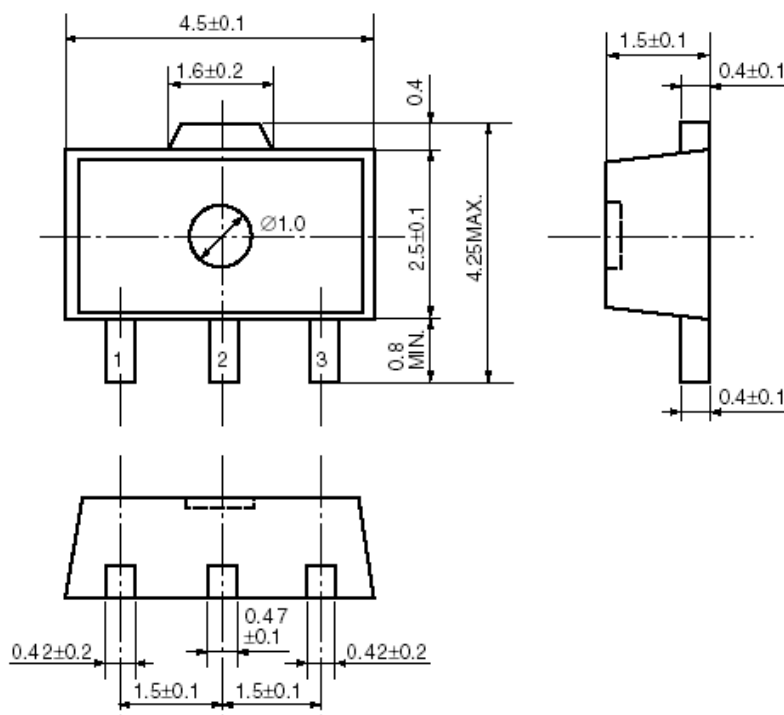
PACKAGE LINE

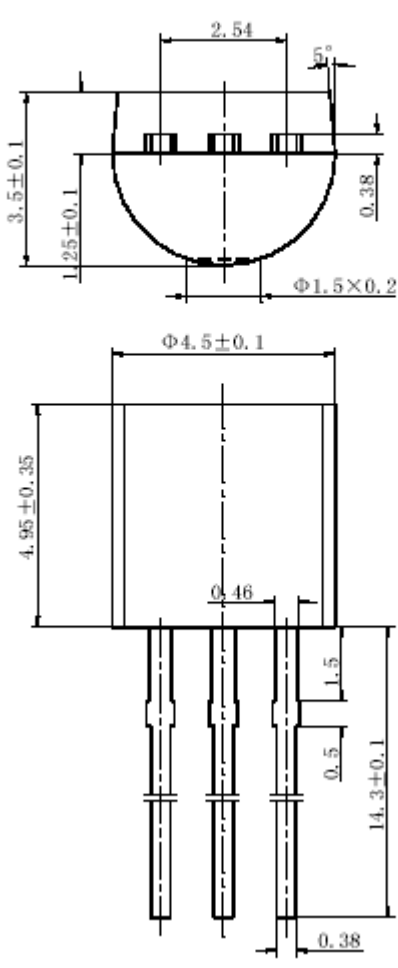
Package	SOT23-3	Devices per reel	3000Pcs	Unit	mm
Package dimension:					
<p>Technical drawing of the SOT23-3 package. The top view shows a rectangular body with a width of 2.9 ± 0.2 mm and a length of 1.9 ± 0.2 mm. The distance between the two leads (1 and 2) is 1.9 ± 0.2 mm, with each lead offset by (0.95) mm from the center. The lead length is 0.4 ± 0.1 mm. The body height is 1.6 ± 0.2 mm, and the total height including the lead is 2.8 ± 0.3 mm. The side view shows a lead height of 1.4 mm maximum, a lead width of 1.1 ± 0.2 mm (with a tolerance of -0.1), and a lead thickness of 0.8 mm. The lead angle is 0 to 0.1 degrees. The lead tip thickness is 0.16 ± 0.1 mm (with a tolerance of -0.06). The lead tip height is 0.2 mm minimum.</p>					

Package	SOT-23-5	Devices per reel	3000Pcs	Unit	mm
Package Dimension:					
<p>Technical drawing of the SOT-23-5 package. The top view shows a rectangular body with a width of 2.9 ± 0.2 mm and a length of 1.9 ± 0.2 mm. The distance between the two leads (1 and 2) is 1.9 ± 0.2 mm, with each lead offset by (0.95) mm from the center. The lead length is 0.4 ± 0.1 mm. The body height is 1.6 ± 0.2 mm, and the total height including the lead is 2.8 ± 0.3 mm. The side view shows a lead height of 1.1 ± 0.2 mm (with a tolerance of -0.1), a lead width of 0.8 ± 0.1 mm, and a lead thickness of 0.15 ± 0.1 mm (with a tolerance of -0.05). The lead angle is 0 to 0.1 degrees. The lead tip height is 0.2 mm minimum.</p>					

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



Package	TO-92	Devices per Bag	1000Pcs	Unit	mm
Package Dimension:					
TO-92					
 <p>The technical drawing shows two views of the TO-92 package. The top view is a semi-circular shape with a diameter of $\Phi 1.5 \pm 0.2$ mm. The width of the top flat portion is 2.54 mm. The total height from the top flat surface to the bottom of the semi-circle is 3.5 ± 0.1 mm. The height of the top flat portion is 1.25 ± 0.1 mm. The thickness of the top flat portion is 0.38 mm. The side view shows a cylindrical body with a diameter of $\Phi 4.5 \pm 0.1$ mm and a height of 4.95 ± 0.35 mm. The distance from the top of the cylindrical body to the top of the leads is 0.46 mm. The leads are spaced 1.5 mm apart. The length of the leads is 14.3 ± 0.1 mm. The thickness of the leads is 0.38 mm.</p>					