

200mA Low Consumption Linear Regulator

LR8064

DESCRIPTION

LR8064 series is a group of positive voltage output, low power consumption, low dropout voltage, three terminal regulator. It can provide 200mA output current when input / output voltage differential drops to 430mV ($V_{out}=2.8V$), The very low power consumption of LR8064 ($I_q=1.0\mu A$) can greatly improve natural life of batteries.

LR8064 can provide output value in the range of 1.1V~5.5V in 0.1V steps. It also can customized on command.

LR8064 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

LR8064 has well load transient response and good temperature characteristic, And it uses trimming technique to guarantee output voltage accuracy within $\pm 2\%$.

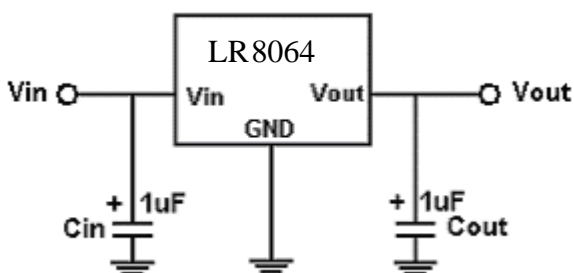
FEATURES

- Low Power Consumption:1.0 μA (Typ.)
- Maximum Output Current:200mA
- Small Dropout Voltage
 - 210mV@100mA ($V_{out}=2.8V$)
 - 430mV@200mA ($V_{out}=2.8V$)
- Input Voltage Range:1.5V~6V
- Output Voltage Range:1.1V~5.5V (customized on command in 0.1V steps)
- Highly Accurate: $\pm 2\%$ ($\pm 1\%$ customized)
- Output Current Limit

APPLICATIONS

- Battery Powered equipment
- Power Management of MP3、PDA、DSC、Mouse、PS2 Games
- Reference Voltage Source Regulation after Switching Power

TYPICAL APPLICATION



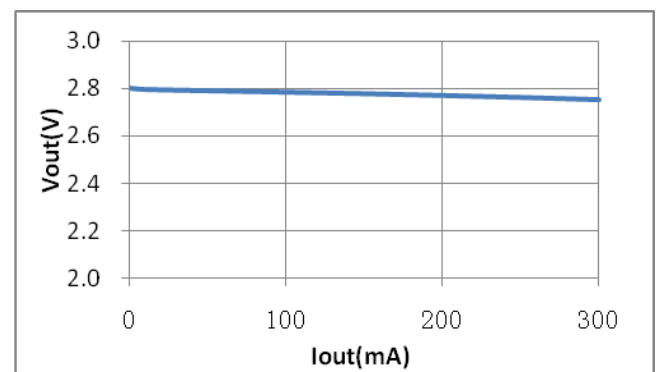
APPLICATION HINTS

NOTE1: Input capacitor ($C_{in}=1\mu F$) is recommended in all application circuit. Ceramic capacitor is recommended.

NOTE2: Output capacitor ($C_{out}=1\mu F$) is recommended in all application to assure the stability of circuit. Ceramic capacitor is recommended.

ELECTRICAL CHARACTERISTICS

Output Voltage VS. Output Current ($V_{out}=2.8V$)



ORDERING INFORMATION

LR8064 1 2 3 4 5




Code	Description
1	Temperature&RoHS: C:-40~85°C ,Pb Free RoHS Std.
2	Package type: B3:SOT-23-3 C3:SOT-89-3 H:TO-92
3	Packing type: TR:Tape&Reel (Standard) BG:Bag (TO-92)
4	Output voltage: e.g. 11=1.1V 15=1.5V 55=5.5V
5	Voltage accuracy: 1=±1% Blank(default)=±2%

ABSOLUTE MAXIMUM RATING

Parameter		Value
Max Input Voltage		8V
Operating Junction Temperature(Tj)		125°C
Ambient Temperature(Ta)		-40°C -85°C
Power Dissipation	SOT-23-3	250mW
	SOT-23-5	250mW
	SOT-89-3	500mW
	TO-92	500mW
Storage Temperature(Ts)		-40°C -150°C
Lead Temperature & Time		260°C,10S

Note:
Exceed these limits to damage to the device.
Exposure to absolute maximum rating conditions may affect device reliability.

PIN CONFIGURATION

Product Classification		LR8064CB3TR□□□
Marking		SOT-23-3 3  1 GND 2 Vout 3 Vin
NXYW	N:Product Code	
	X:Output Voltage	
YW: Date Code		
Product Classification		LR8064CC3TR□□□
Marking		SOT-89-3  1 GND 2 Vin 3 Vout
NXX LLBYW	N:Product Code	
	XX:Output Voltage	
	LL:LOT NO.	
	B:FAB Code	
	YW:Date Code	
Product Classification		LR8064CHBG□□□
Marking		TO-92  1 GND 2 Vin 3 Vout
NXX LLBYW	N:Product Code	
	XX:Output Voltage	
	LL:LOT NO.	
	B:FAB Code	
	YW:Date Code	
GND	Ground Pin	
Vin	Supply Voltage Input	
Vout	Output Voltage	

RECOMMENDED WORK CONDITIONS

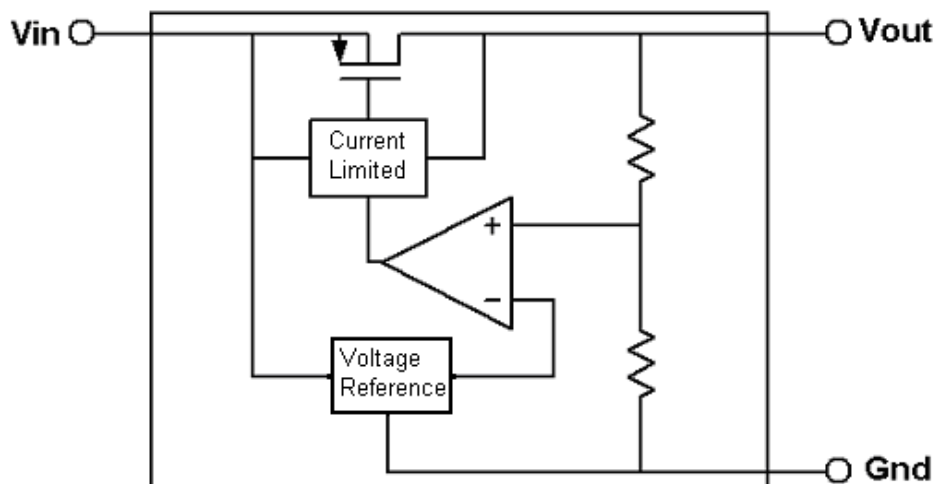
Item	Min	Recommended	Max.	Unit
Input Voltage Range			6	V
Ambient Temperature	-40		85	°C

ELECTRICAL CHARACTERISTICS

(Test Conditions: $C_{in}=1\mu F$, $C_{out}=1\mu F$, $T_A=25^\circ C$, Unless Otherwise Specified)

Symbol	Parameter	Conditions	Min	Type	Max	Units
V_{in}	Input Voltage				6	V
V_{out}	Output Voltage		$V_{out} \times 0.98$		$V_{out} \times 1.02$	V
$I_{out(Max.)}$	Maximum Output Current	$V_{in}-V_{out}=1V$	200			mA
Dropout Voltage	Input-Output Voltage Differential	$I_{out}=100mA$	$V_{out} \leq 1.8V$	600	1000	mV
			$V_{out} \geq 1.8V$	300	600	
$\frac{\Delta V_{out}}{\Delta V_{in} \cdot V_{out}}$	Line Regulation	$I_{out}=10mA$ $1.5V \leq V_{in} \leq 8V$		0.2	0.3	%/V
ΔV_{out}	Load Regulation	$V_{in} = Set\ V_{out} + 1V$ $1mA \leq I_{out} \leq 100mA$		20	40	mV
I_q	Quiescent Current	$V_{in} = Set\ V_{out} + 1V$		1.0	5.0	μA
$\frac{\Delta V_{out}}{\Delta T \cdot V_{out}}$	Output Voltage Temperature Coefficient	$I_{out}=10mA$		100		ppm/°C

BLOCK DIAGRAM



Explanation

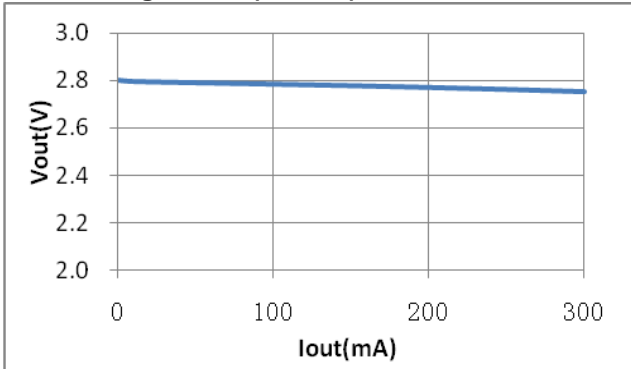
LR8064 is a series of low dropout voltage and low power consumption three pins regulator. Its application circuit is very simple, which only needs two outside capacitors. It is composed of these modules: high accuracy voltage reference, current limit circuit, error amplifier, output driver and power transistor.

Current Limit module can keep chip and power system away from danger when load current is more than 200mA.

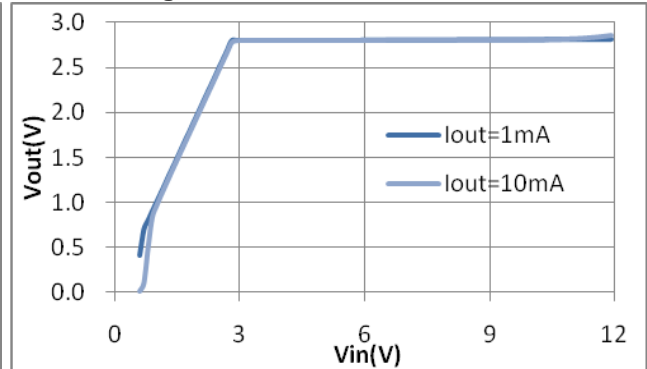
LR8064 uses trimming technique to assure the accuracy of output value within $\pm 2\%$, at the same time, temperature compensation is elaborately considered in this chip, which makes LR8064's temperature coefficient within 100ppm/ $^{\circ}\text{C}$ 。

TYPICAL PERFORMANCE CHARACTERISTICS

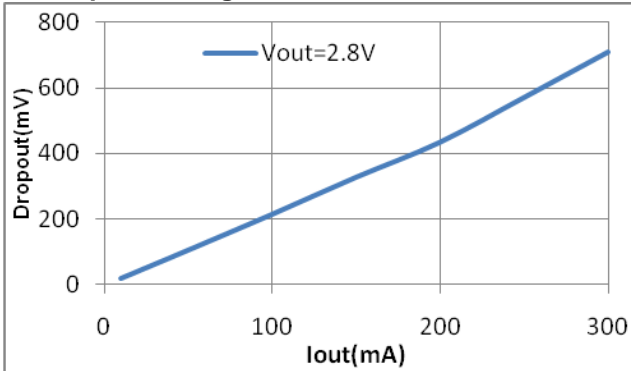
1. Load regulation (Vin=4V)



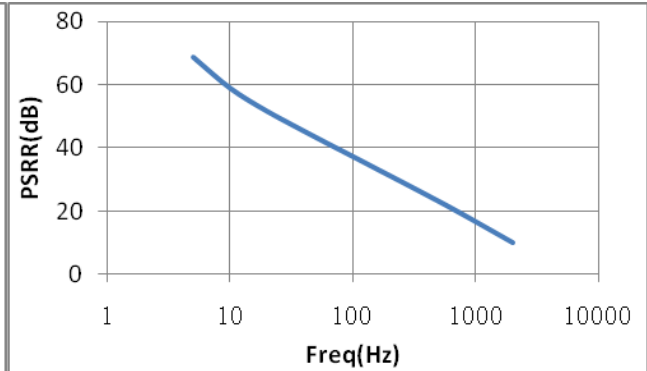
2. Line regulation



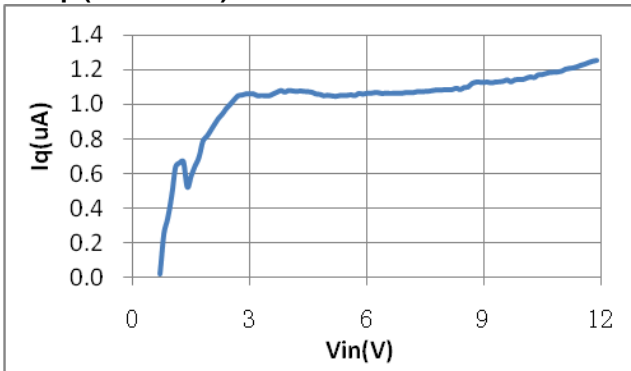
3. Dropout Voltage



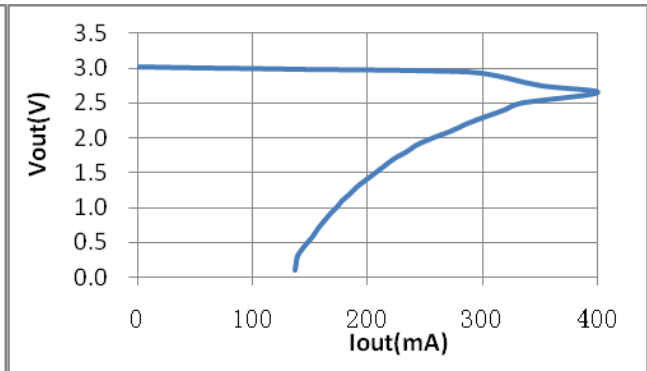
4. PSRR



5. Iq (Vout=2.8V)

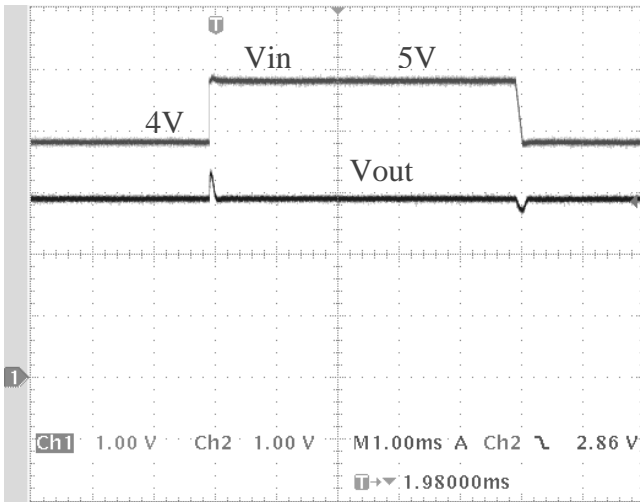


6. Current limit



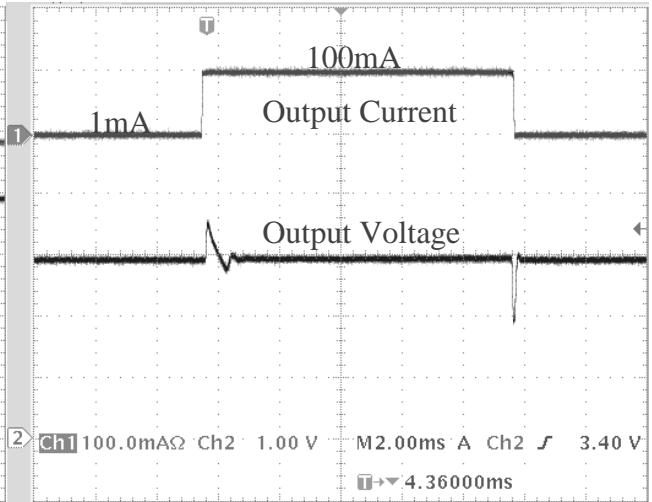
7. Line transient response

$C_{in}=C_{out}=1\mu F$ $I_{out}=10mA$ $V_{out}=2.8V$

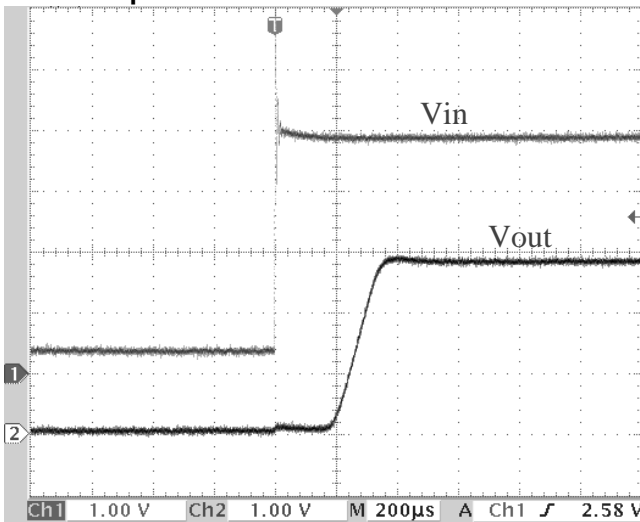


8. Load transient response

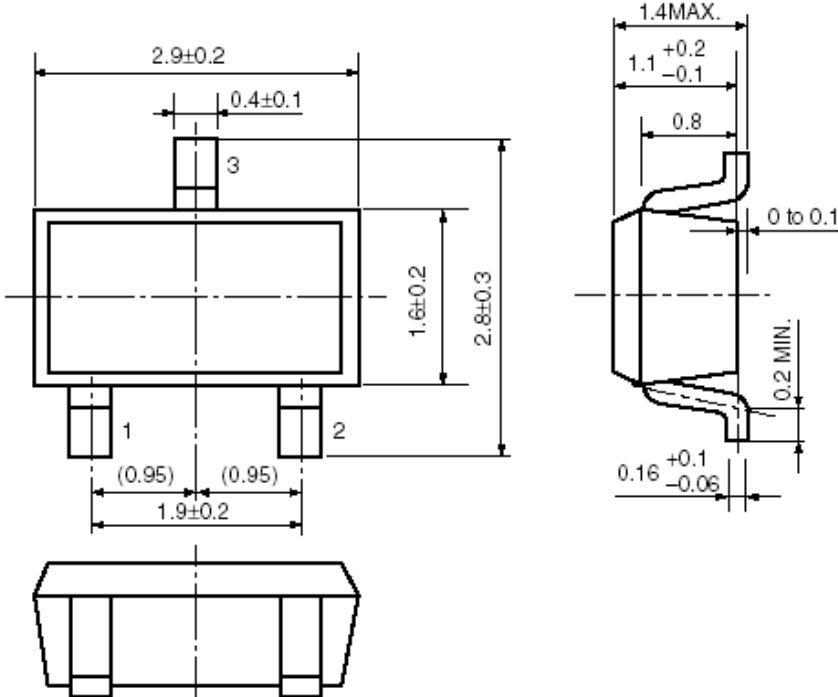
$C_{in}=C_{out}=1\mu F$ $V_{in}=4V$ $V_{out}=2.8V$

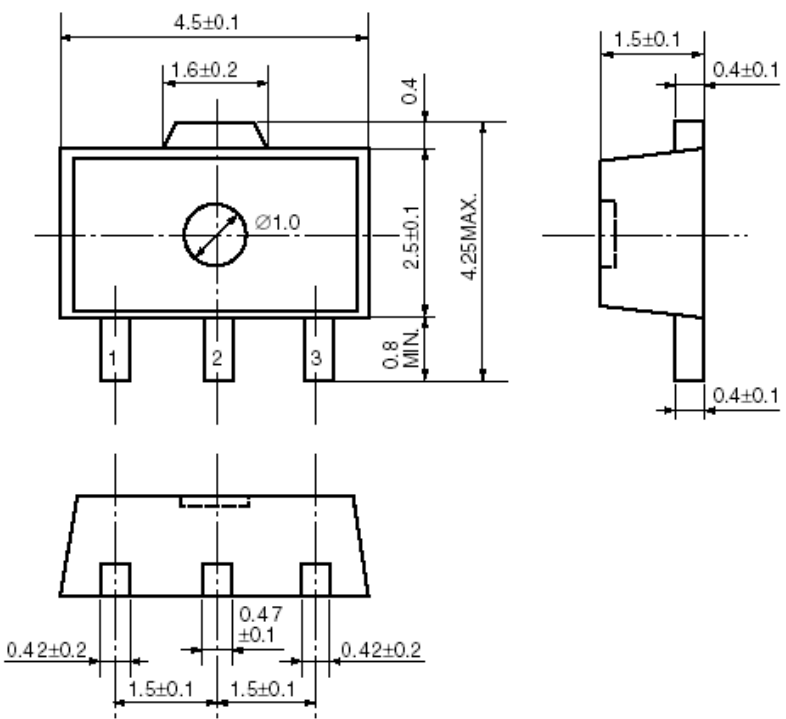


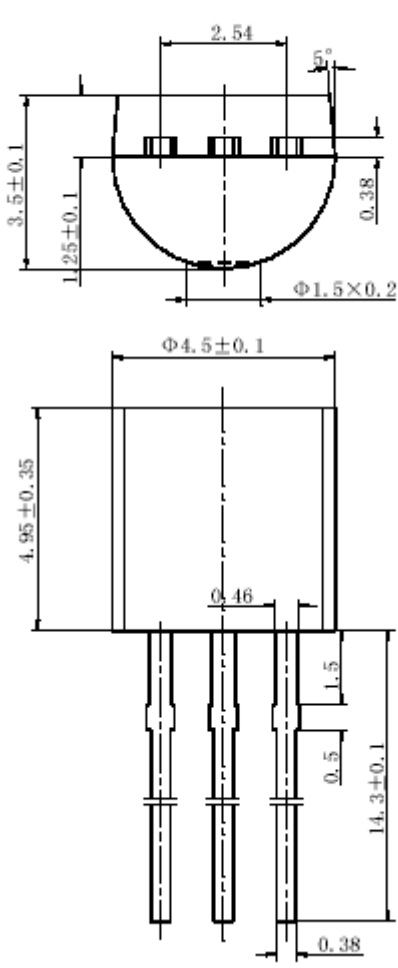
9. Start up



PACKAGE LINE

Package	SOT-23-3	Devices per reel	3000Pcs	Unit	mm
<p>Package dimension:</p>  <p>Technical drawing of SOT-23-3 package showing top, side, and bottom views with dimensions:</p> <ul style="list-style-type: none"> Top view: Total width 2.9 ± 0.2, lead width 0.4 ± 0.1, lead spacing 1.9 ± 0.2 (with 0.95 offset), body width 1.6 ± 0.2, total height 2.8 ± 0.3. Side view: Maximum width 1.4 MAX., lead height 1.1 (tolerance $+0.2 / -0.1$), lead width 0.8, lead thickness 0 to 0.1, body thickness 0.2 MIN., bottom lead width 0.16 (tolerance $+0.1 / -0.06$). Bottom view: Shows three leads labeled 1, 2, and 3. 					

Package	SOT-89-3	Devices per reel	1000Pcs	Unit	mm
<p>Package Dimension:</p>  <p>Technical drawing of SOT-89-3 package showing top, side, and bottom views with dimensions:</p> <ul style="list-style-type: none"> Top view: Total width 4.5 ± 0.1, lead width 1.6 ± 0.2, body width 2.5 ± 0.1, maximum height 4.25 MAX., lead height 0.4, lead thickness 0.8 MIN., hole diameter $\varnothing 1.0$. Side view: Lead width 1.5 ± 0.1, lead height 0.4 ± 0.1, body thickness 0.4 ± 0.1. Bottom view: Lead spacing 1.5 ± 0.1, lead width 0.42 ± 0.2, body width 0.47 ± 0.1. 					

Package	TO-92	Devices per Bag	1000Pcs	Unit	mm
<p>Package Dimension:</p> <p style="text-align: center;">TO-92</p>  <p>The drawing shows the following dimensions for the TO-92 package:</p> <ul style="list-style-type: none"> Top view: Total width is 2.54 mm. The distance from the center to the edge of the lead is 1.25 ± 0.1 mm. The lead thickness is 0.38 mm. The lead angle is 5°. Side view: The diameter of the package body is Φ4.5 ± 0.1 mm. The height of the package body is 4.95 ± 0.35 mm. The diameter of the lead is Φ1.5 × 0.2 mm. The length of the lead is 14.3 ± 0.1 mm. The distance from the package body to the start of the lead is 0.46 mm. The lead has a diameter of 0.5 mm and a length of 1.5 mm from the package body. 					