

# PFM STEP-UP DC-DC CONVERTER WITH HIGH EFFICIENCY AND LOW NOISE

**A7530**

## Description

A7530 is CMOS-based PFM step-up DC-DC converter. The converter can start up by supply voltage as low as 0.8V, and capable of delivering maximum 200mA output current at 3.3V output with 1.8V input voltage. Quiescent current drawn from power source is as low as 7uA. All of these features make A7530 be suitable for the portable devices, which are supplied by a single battery for four-cell batteries.

To reduce the noise caused by the switch regulator, A7530 is well considerate in circuit design and manufacture. So that the interferer to other circuits by the device is reduced greatly.

The A7530 integrates stable reference circuits and trimming technology, so it can afford high precision and low temperature-drift coefficient of the output voltage.

The A7530 is available in SOT-23 and SOT-25 package. And in SOT-25 package, the device can be switch on or off easily by CE pin to minimize the standby supply current.

## Ordering Information

<b>E3</b>	SOT-23	PN: A7530E3-XXY
<b>E5</b>	SOT-25	PN: A7530E5-XXY
Note	Y	XX: Output voltage
		1: Internal Tr. Driver, W/O Enable Circuit
		2: Internal Tr. Driver, W/Enable Circuit
		3: External Tr. Driver, W/O Enable Circuit
		4: External Tr. Driver, W/Enable Circuit

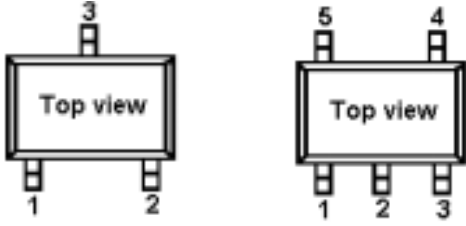
## Features

- Deliver 200mA at 3.3V Output Voltage with 1.8V Input Voltage
- Low Start-Up Voltage @1mA:0.8V
- The Converter Output Voltage Can Be Adjusted From 2.5V~6.0V (in 0.1V step)
- Output Voltage Accuracy:  $\pm 2\%$
- Low Temperature-Drift Coefficient of the Output Voltage:  $\pm 100\text{ppm}^\circ\text{C}$
- Only Three External Components are needed: an Inductor, a Schottky Diode and an Output Filter Capacitor.
- High Power Conversion Efficiency: 85%
- Low Quiescent Current Drawn from Power Source: <7uA

## Application

- Portable Source for PDA, DSC, MP3 Player, Electronic Toy and Wireless Mouse
- Power Source for a Single or Dual-Cell Battery-Powered Equipments
- Power Source for LED

## Pin Assignment





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**Absolute Maximum Ratings**

Input Voltage Range	0.3V~+12V
Input Voltage: Vi (Lx)	0.3V ~ (Vout+0.3V)
CE Pin Voltage	0.3V ~ (Vout+0.3V)
LX Pin Output Current	0.7A
Maximum Power Dissipation, T=25°C	
SOT-23	0.15W
SOT-25	0.15W
Maximum Junction Temperature	+150°C
Storage Temperature Range	-40°C ~ +125°C
Operating Free-air Temperature	-20°C ~ +80°C
Lead Temperature (Soldering, 10s)	+260°C, 10S

**Electrical Characteristics**

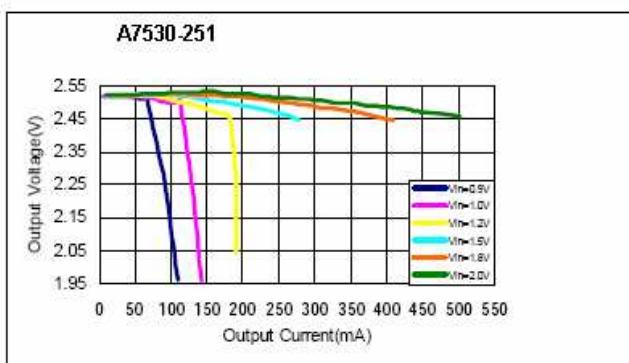
Parameter	Conditions	Min	Typ	Max	Unit
Vout (Output Voltage)		2.450	2.5	2.55	V
		2.646	2.7	2.754	
		2.94	3.0	3.06	
		3.234	3.3	3.366	
		3.528	3.6	3.672	
		3.920	4.0	4.080	
		4.900	5.0	5.100	
		5.880	6.0	6.120	
Vin (Input Voltage)				12	V
Iin (Input Current)	Iout=0mA, Vin=Vout*0.6		12	15	µA
Vstart (Start-up Voltage)	Iout=1mA, Vin: 0 ->2V		0.8	0.9	V
Vhold (Hold-on Voltage)	Iout=1mA, Vin: 2-> 0V	0.6	0.7		V
IDD (Quiescent Current Drawn From Power Source)	Without External Components, Vout=Vout*1.05		4	7	µA
Rswon (Switch On Resistance)			0.4	0.5	Ω
ILXleak (LX Leakage Current)	Vout=Vlx=6V			0.5	µA
VCEH (CE "H" Threshold Voltage)	VCE: 0 -> 2V	0.6	0.9		V
VCEL (CE "L" Threshold Voltage)	VCE: 2-> 0V		0.3	0.6	V
Fosc (Oscillation Frequency)	LX on "L" side, Vout=Vout*0.96	300	350	400	KHz
Maxdty (Oscillator Duty Cycle)	On (Vlx "L") Side	70	75	80	%
η (Efficiency)			85		%

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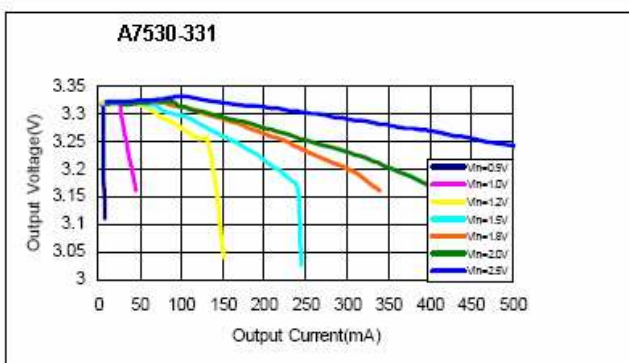
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## Typical Characteristics

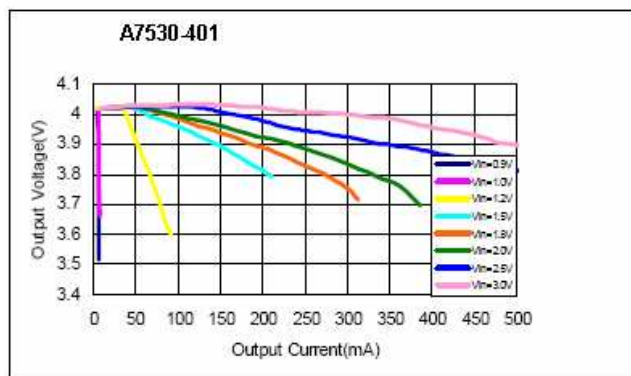
1. Output Voltage VS. Output Current



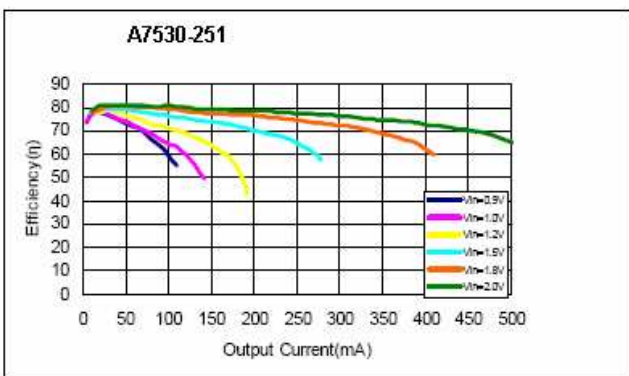
2. Output Voltage VS. Output Current



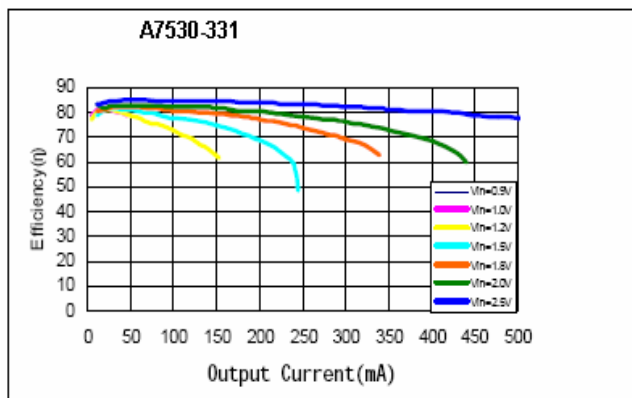
3. Output Voltage VS. Output Current



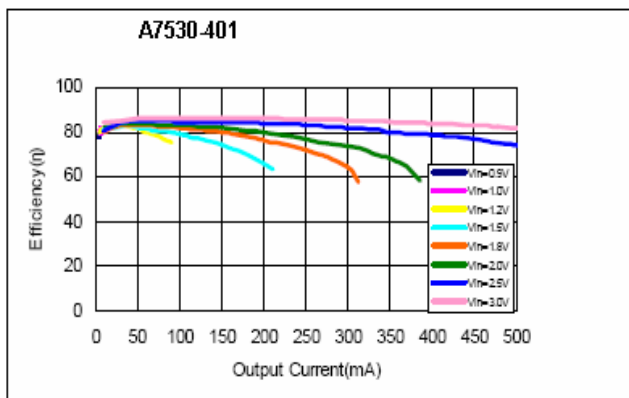
4. Efficiency VS. Output Current



5. Efficiency VS. Output Current



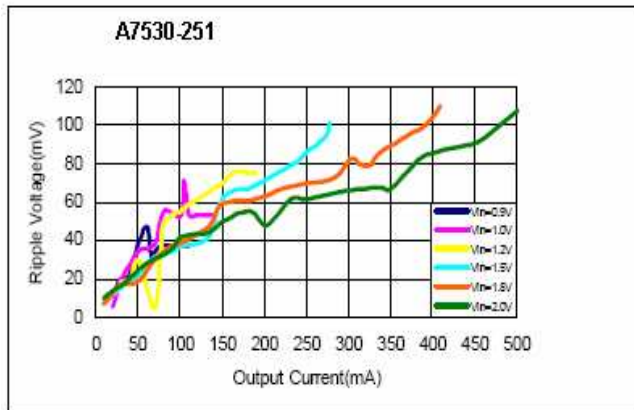
6. Efficiency VS. Output Current



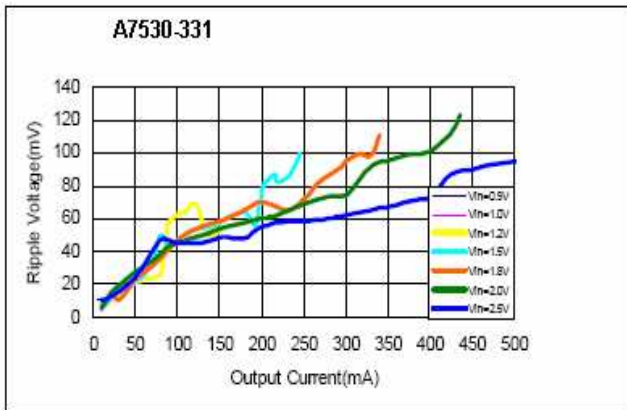
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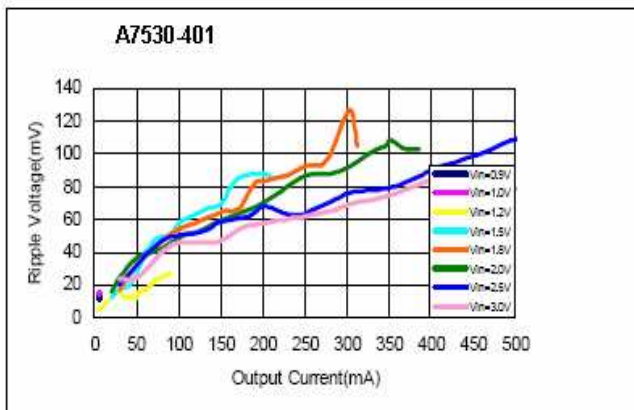
7. Ripple VS. Output Current



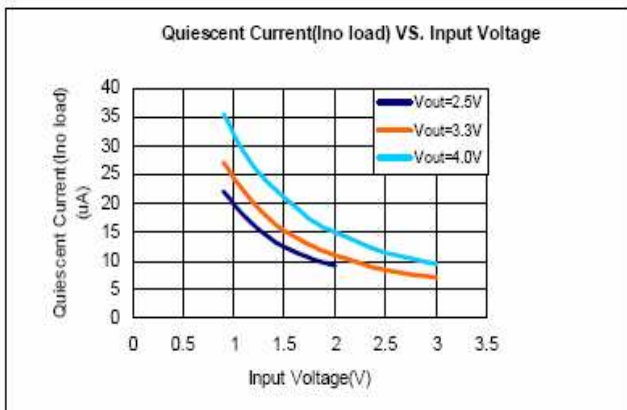
8. Ripple VS. Output Current



9. Ripple VS. Output Current



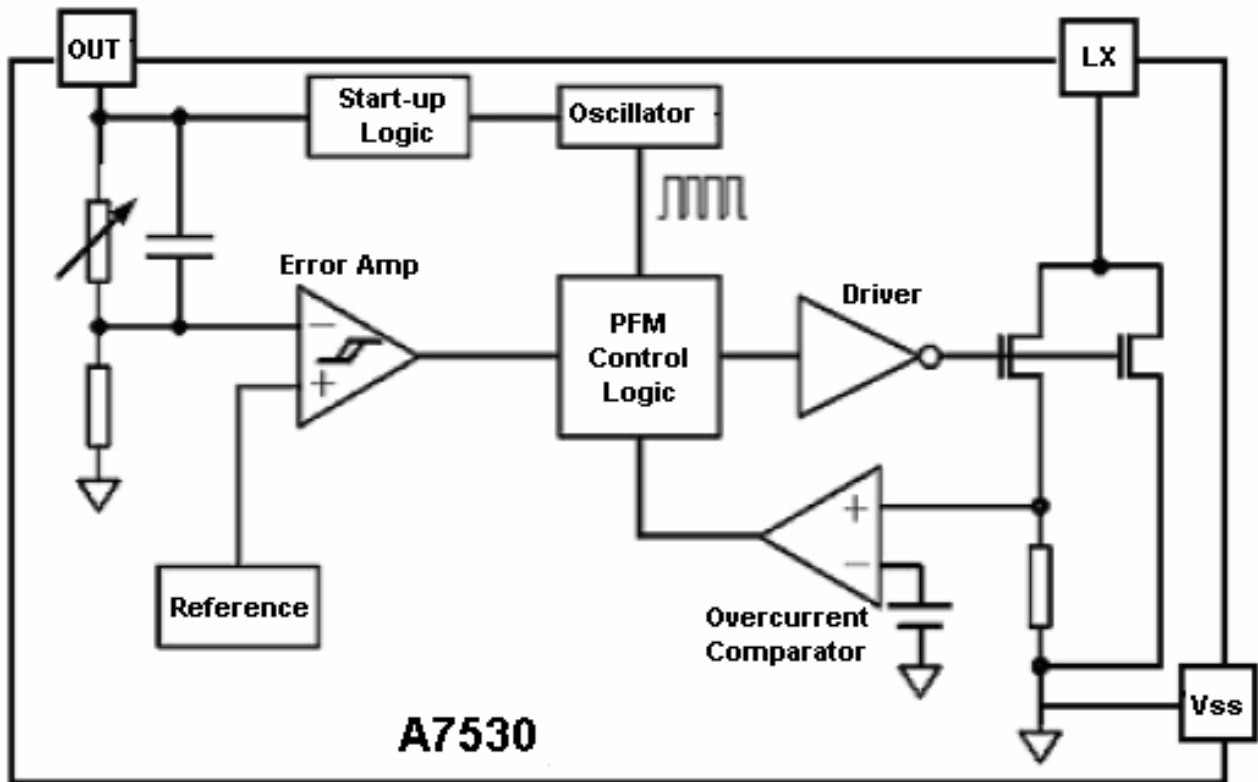
10. No load VS. Input Voltage



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**Block Diagram**

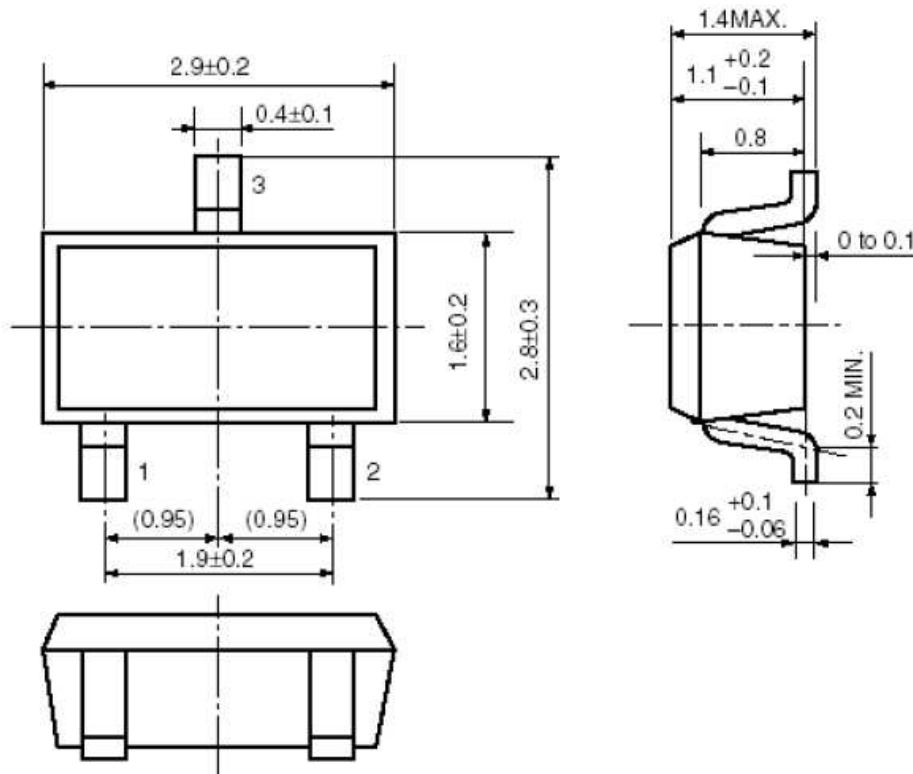


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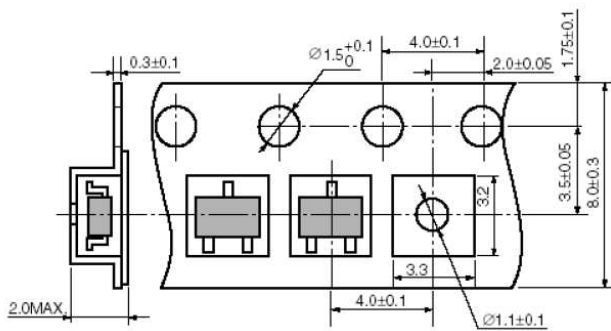
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**Package Information**

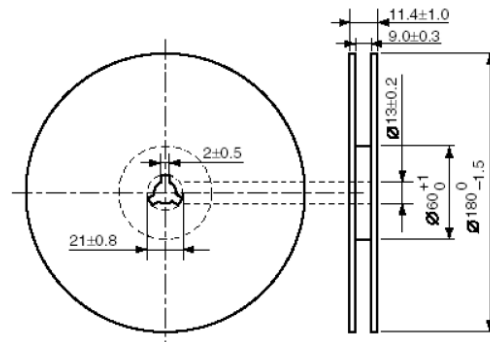
Dimension in SOT-23 (Unit: mm)



**Tape Dimension**



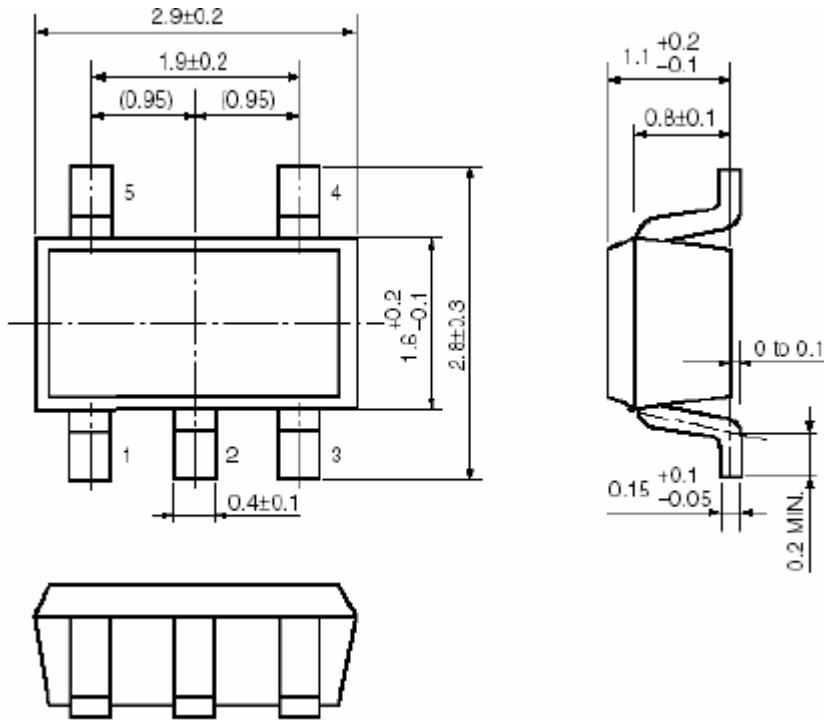
**Reel Dimension**



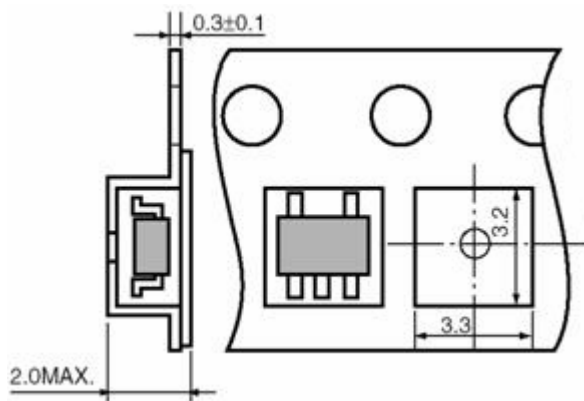
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Dimension in SOT-25 (Unit: mm)



Tape Dimension



Reel Dimension

