2A, 4.5V-20V Input 500kHz Synchronous Step-Down Converter

■ General Description

LN8120 is a fully integrated, highï efficiency 2A synchronous rectified step-down converter. The LN8120 operates at high efficiency over a wide output current load range.

This device offers two operation modes, PWM control and PFM Mode switching control, which allows a high efficiency over the wider range of the load.

The LN8120 requires a minimum number of readily available standard external components and is available in an 6-pin SOT23 ROHS compliant package.

■ Applications

- Distributed Power Systems
- Digital Set Top Boxes
- Flat Panel Television and Monitors
- Wireless and DSL Modems
- Notebook Computer

■ Features

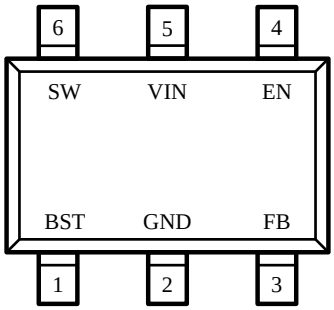
- High Efficiency: Up to 96%
- 500KHz Frequency Operation
- 2A Output Current
- No Schottky Diode Required
- 4.5V to 20V Input Voltage Range
- 0.6V Reference
- Slope Compensated Current Mode Control for Excellent Line and Load Transient Response
- Integrated internal compensation
- Stable with Low ESR Ceramic Output Capacitors
- Over Current Protection with Hiccup-Mode
- Thermal Shutdown
- Inrush Current Limit and Soft Start
- Available in SOT23-6 Package
- -40°C to +85°C Temperature Range

■ Ordering Information

LN8120P

Designator	Symbol	Description
	6	External feedback, Feedback Voltage 0.6V
		External feedback, Feedback Voltage 0.8V
	M	Package Type :SOT-23-6L
	R	Embossed Tape : Standard Feed
	L	Embossed Tape : Reverse Feed

■ Pin Configuration

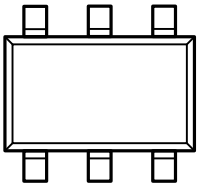


SOT-23-6L
(TOP VIEW)

■ Pin Assignment

Pin Number	

■ Marking Rule



SOT-23-6L
(TOP VIEW)

Represents the product name

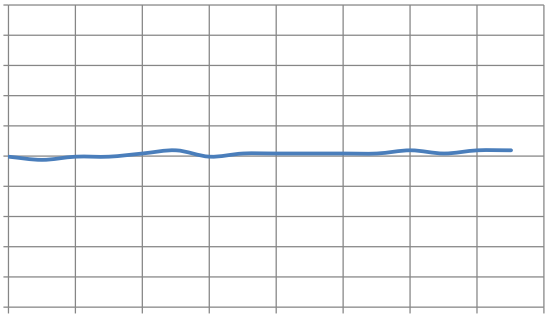
Symbol	Product Name

■ Function Block Diagram

■ Absolute Maximum Ratings

Parameter	Symbol	Maximum Rating	Unit
Input Voltage	V_{IN}	V_{SS}-0.3 V_{SS}+21	V
	$V_{ON/OFF}$	V_{SS}-0.3 V_{IN}+0.3	
SW Voltage		V_{SS}-0.3 V_{IN}+0.3	
BST Voltage		V_{SS}-0.3 SW+6	
FB Voltage		V_{SS}-0.3 V_{SS}+6	
Power Dissipation	P_D	SOT-23-6L 6	

Line Regulation



Input Voltage (V)

Line Regulation

Input Voltage (V)

Internal Soft-Start

The soft-start is implemented to prevent the converter output voltage from overshooting during startup. When the chip starts, the internal circuitry generates a soft-start voltage (SS) ramping up from 0V to 0.6V. When it is lower than the internal reference (REF), SS overrides REF so the error amplifier uses SS as the reference. When SS is higher than REF, REF regains control. The SS time is internally fixed to 1 ms.

Over-Temperature Protection

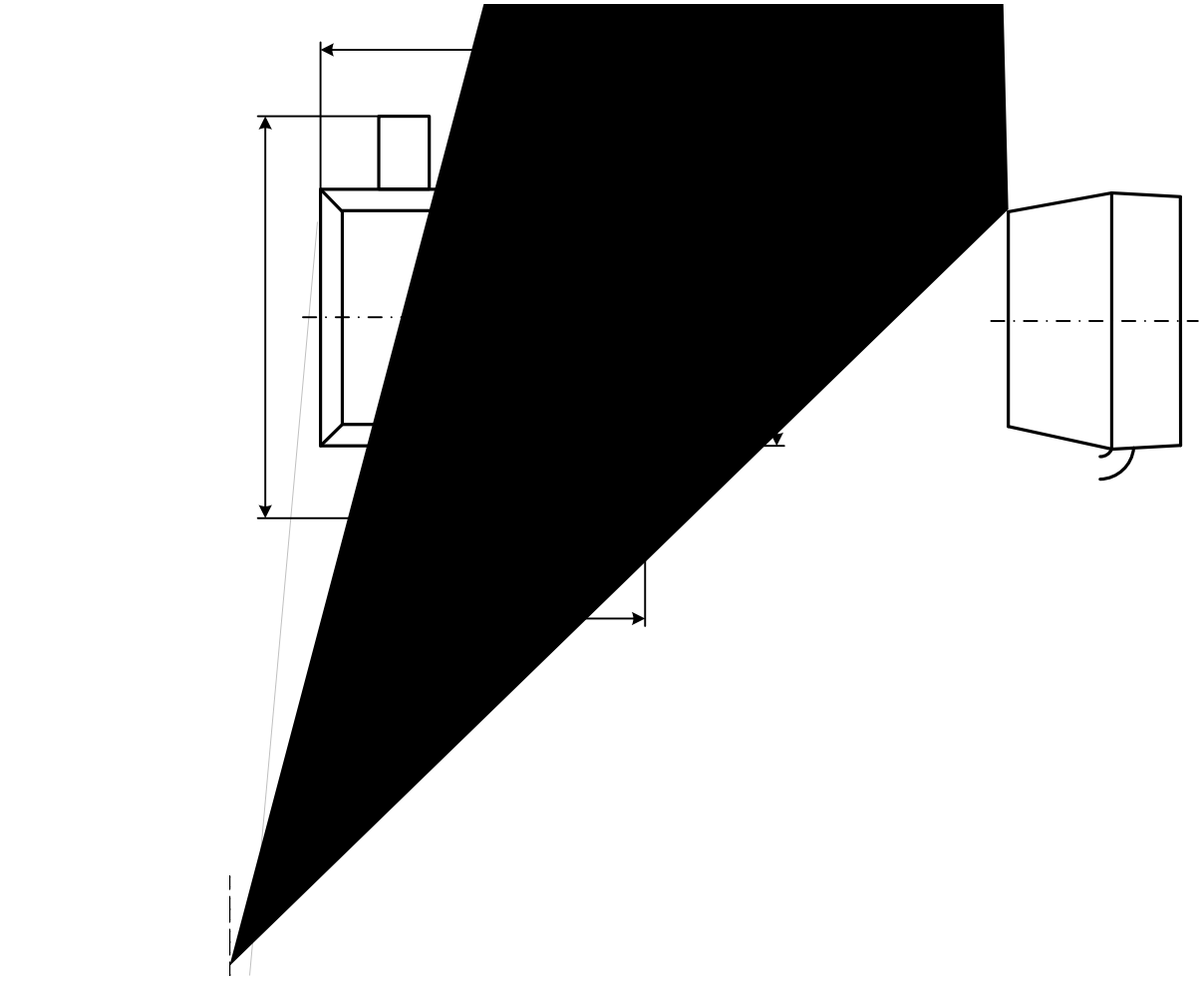
Thermal protection disables the output when the junction temperature rises to approximately 150°C, allowing the device to cool down. When the junction temperature cools to approximately 12

Resistors R2 has to be between 1kOhm to 20KOhm and thus R1 is calculated by following equation.

Input Capacitor Selection

■ Package Information

- **SOT-23-6L**



Symbol	Dimensions In Millimeters	Dimensions In Inches