



## High Efficiency 4A Boost DC/DC Convertor

### General Description

The LP6212A is a current mode boost DC-DC converter. Its PWM circuitry with built-in 4A Current power MOSFET makes this converter highly efficient. The LP6212A implements a constant frequency 1MHz PWM control scheme. The high frequency PWM operation also saves board space by reducing external component sizes. The LP6212A features automatic shifting to pulse frequency modulation mode at light loads. Highly integration and internal compensation network minimizes as 6 external component counts. Optimized operation frequency can meet the requirement of small LC filters value and low operation current with high efficiency. The LP6212A includes under-voltage lockout, current limiting, and thermal overload protection to prevent damage in the event of an output overload. The LP6212A is available in a small SOT23-6 package.

### Order Information

LP6212A     
 F: Pb-Free  
 Package Type  
 B6: SOT23-6

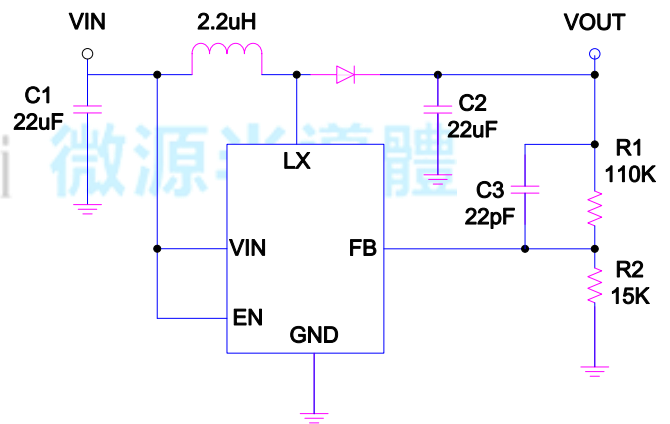
### Applications

- ✧ Battery products
- ✧ Host Products
- ✧ Panel

### Features

- ◆ Up to 90% efficiency
- ◆ Output to Input Disconnect at Shutdown Mode
- ◆ Shut-down current:<1uA
- ◆ Output voltage Up to 10V
- ◆ Internal Compensation, Soft-start
- ◆ 1MHz fixed frequency switching
- ◆ High switch on current:4A
- ◆ Available in SOT23-6 Package

### Typical Application Circuit



### Marking Information

Device	Marking	Package	Shipping
LP6212AB6F		SOT23-6	3K/REEL

Y: Year code. W: Week code. X: Batch numbers.

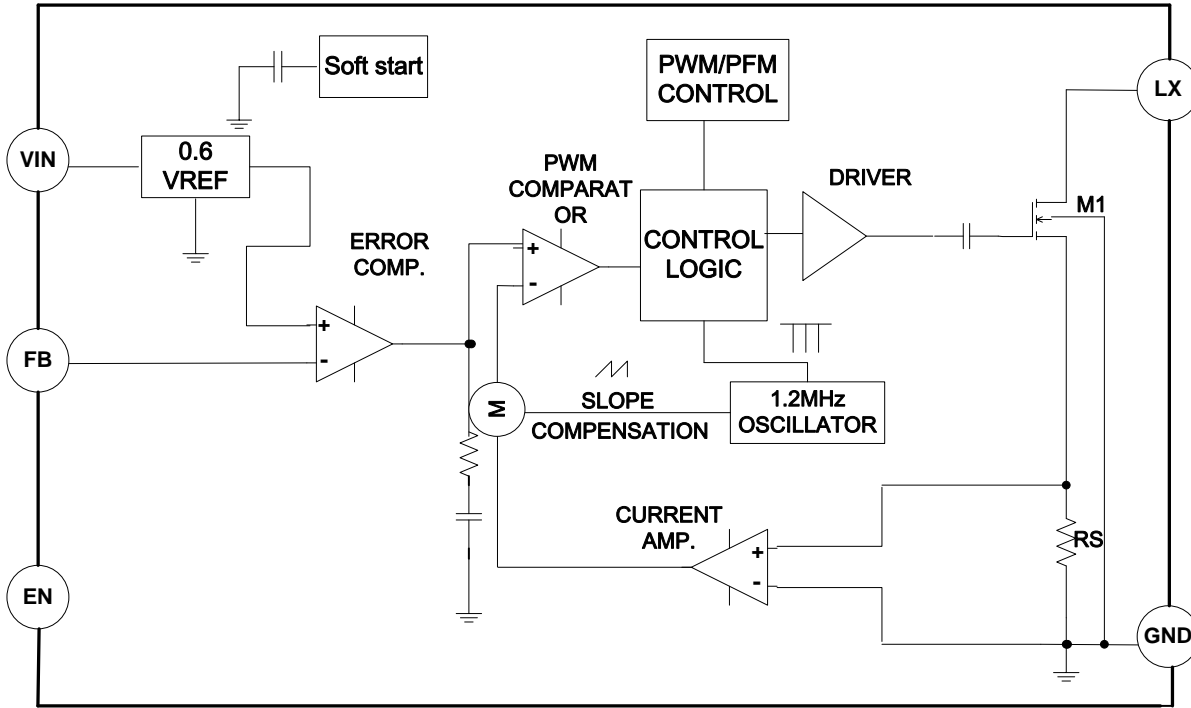


### Functional Pin Description

Package Type		Pin Configurations
SOT23-6		<p>The diagram shows a rectangular SOT23-6 package with six pins. Pin 1 (LX) is at the bottom left, Pin 2 (GND) is at the bottom center, Pin 3 (FB) is at the bottom right, Pin 4 (EN) is at the top right, Pin 5 (VIN) is at the top center, and Pin 6 (NC) is at the top left. A small circle is located inside the package outline on the left side.</p>
Pin	Name	Description
1	LX	Switching Pin.
2	GND	Ground Pin.
3	FB	Feed back.
4	EN	Chip Enable Pin.
5	VIN	Voltage Input Pin.
6	NC	No Connector.



### Function Block Diagram



### Absolute Maximum Ratings <sup>Note 1</sup>

- ✧ Supply Input Voltage ----- 6V
- ✧ LX Voltage to GND ----- 12V
- ✧ Other Pin Voltage to GND ----- 6V
- ✧ Maximum Junction Temperature ----- 150°C
- ✧ Maximum Soldering Temperature (at leads, 10 sec) ----- 260°C

#### Power Dissipation, PD @ TA = 25°C

- ✧ SOT23-6 ----- 450mW

#### Package Thermal Resistance

- ✧ SOT23-6,  $\theta_{JA}$  ----- 250°C/W

#### Recommended Operating Conditions

- ✧ Operation Ambient Temperature Range ----- -20°C to 85°C

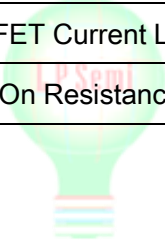
**Note 1.** Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



## Electrical Characteristics

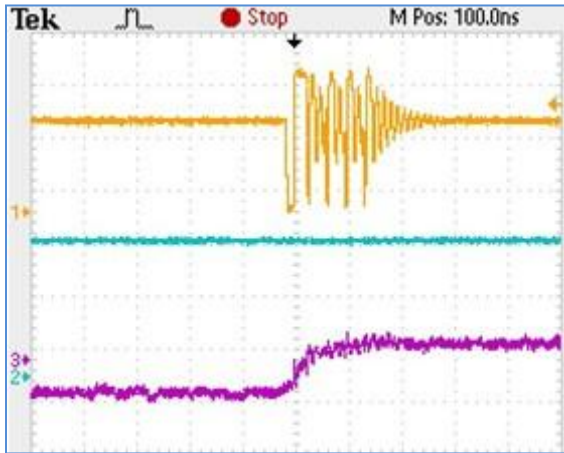
( $V_{IN}=3.4V$ ,  $V_{OUT}=5V$ ,  $C_{IN}=22\mu F$ ,  $C_{OUT}=22\mu F$ ,  $L=2.2\mu H$ )

Parameter	Condition	Min	Typ	Max	Units
Supply Voltage		2.2		5.5	V
Output Voltage Range		2.5		10	V
Supply Current(Shutdown)	$V_{EN}=0V$ , $V_{SW}=5V$			1	$\mu A$
Supply Current	$V_{FB}=0.7V$			150	$\mu A$
Feedback Voltage		0.588	0.6	0.612	V
Feedback Input Current	$V_{FB}=0.6V$			50	nA
Switching Frequency			1200		KHz
Maximum Duty Cycle		85		95	%
EN Input Low Voltage				0.4	V
EN Input High Voltage		1.4		5.5	V
Power MOSFET Current Limit			4		A
High-side On Resistance	$V_{OUT}=3.3V$			100	m $\Omega$

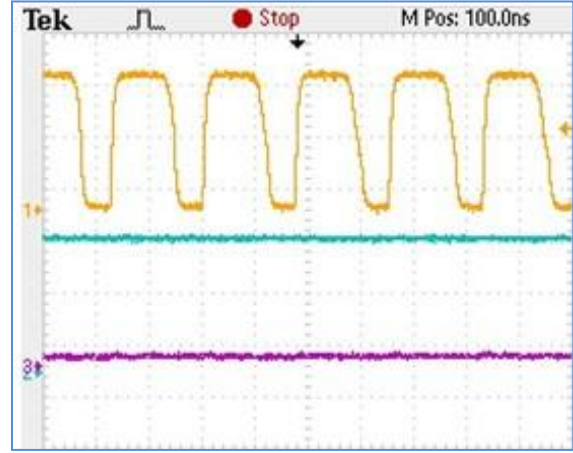




### Typical Operating Characteristics



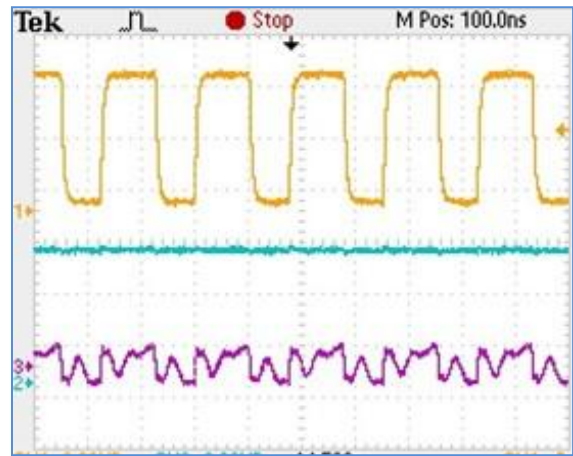
$V_{IN}=3.3V, V_{OUT}=5V, I_{OUT}=0mA$



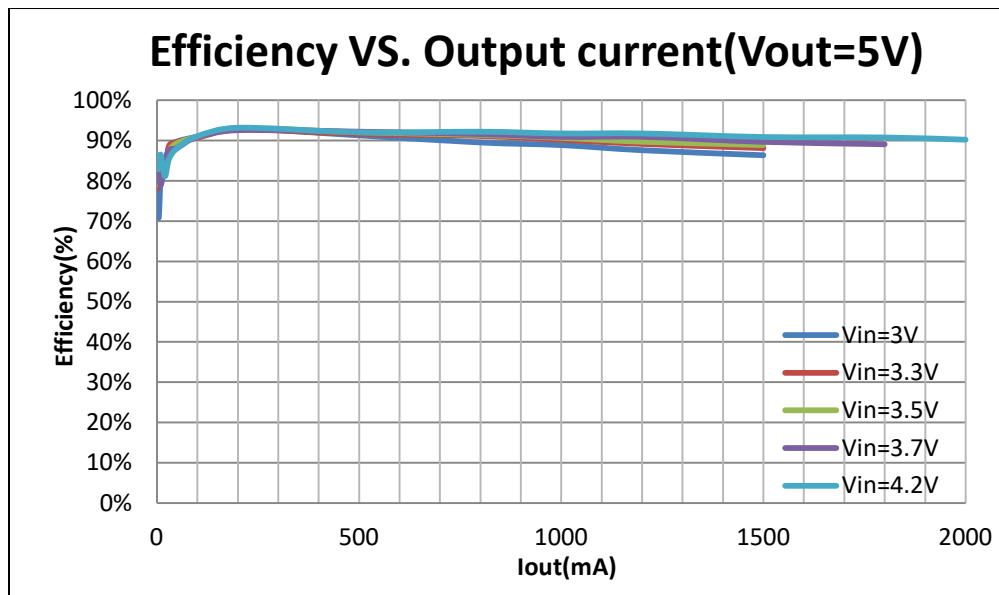
$V_{IN}=3.3V, V_{OUT}=5V, I_{OUT}=50mA$



$V_{IN}=3.3V, V_{OUT}=5V, I_{OUT}=100mA$



$V_{IN}=3.3V, V_{OUT}=5V, I_{OUT}=2A$





## Operation Information

The LP6212A uses a fixed frequency, peak current mode boost regulator architecture to regulate voltage at the feedback pin. At the start of each oscillator cycle the MOSFET is turned on through the control circuitry. To prevent sub-harmonic oscillations at duty cycles greater than 50 percent, a stabilizing ramp is added to the output of the current sense amplifier and the result is fed into the negative input of the PWM comparator. When this voltage equals the output voltage of the error amplifier the power MOSFET is turned off. The voltage at the output of the error amplifier is an amplified version of the difference between the 0.6V bandgap reference voltage and the feedback voltage. In this way the peak current level keeps the output in regulation. If the feedback voltage starts to drop, the output of the error amplifier increases. These results in more current to flow through the power MOSFET, thus increasing the power delivered to the output. The LP6212A has internal soft start to limit the amount of input current at startup and to also limit the amount of overshoot on the output.

### Setting the Output Voltage

Set the output voltage by selecting the resistive voltage divider ratio. The voltage divider drops the output voltage to the 0.6V feedback voltage. Use a 100K resistor for  $R_2$  of the voltage divider. Determine the high-side resistor  $R_1$  by the equation:

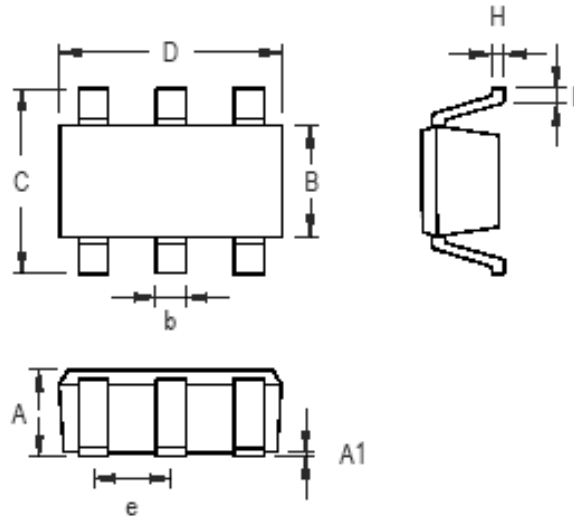
$$V_{OUT} = ( R_1 / R_2 + 1 ) \times V_{FB}$$

$$V_{OUT} = ( R_1 / R_2 + 1 ) \times 0.6V$$



## Packaging Information

### SOT23-6



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.889	1.295	0.031	0.051
A1	0.000	0.152	0.000	0.006
B	1.397	1.803	0.055	0.071
b	0.250	0.560	0.010	0.022
C	2.591	2.997	0.102	0.118
D	2.692	3.099	0.106	0.122
e	0.838	1.041	0.033	0.041
H	0.080	0.254	0.003	0.010
L	0.300	0.610	0.012	0.024

SOT-23-6 Surface Mount Package