

High Efficiency 6A Boost DC/DC Converter

General Description

The LP6212 is a current mode boost DC-DC converter. Its PWM circuitry with built-in 6A Current power MOSFET makes this converter highly efficient. Selectable high switching frequency allows faster loop response and easy filtering with a low noise output. The non-inverting input its error amplifier is connected to an internal 0.6V precision reference voltage. Soft-Start time can be programmed with an external capacitor, which sets the input current ramp rate. Current mode control and external compensation network make it easy and flexible to stabilize the system.

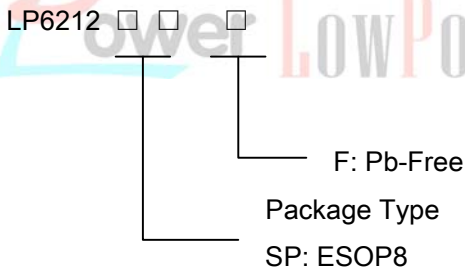
Features

- ◆ Up to 94% efficiency
- ◆ Output to Input Disconnect at Shutdown Mode
- ◆ Shut-down current:<1uA
- ◆ Output voltage Up to 5V/2.1A
- ◆ Internal Compensation
- ◆ 1.2MHz fixed frequency switching
- ◆ High switch on current:6A
- ◆ Available in ESOP8 Package

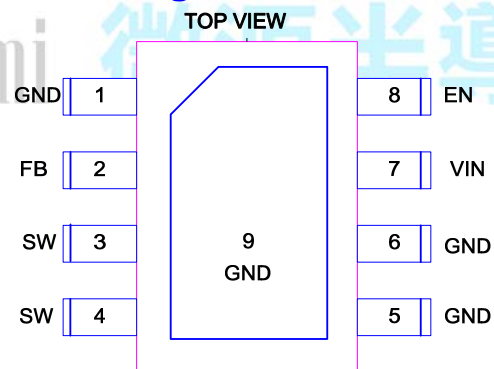
Applications

- ◇ Battery products
- ◇ Host Products
- ◇ Panel

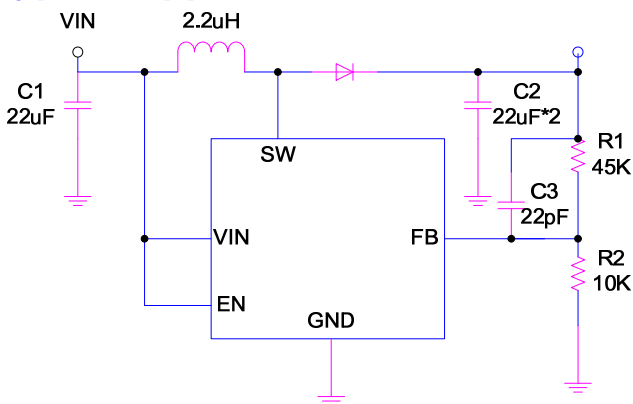
Ordering Information



Pin Configurations



Typical Application Circuit



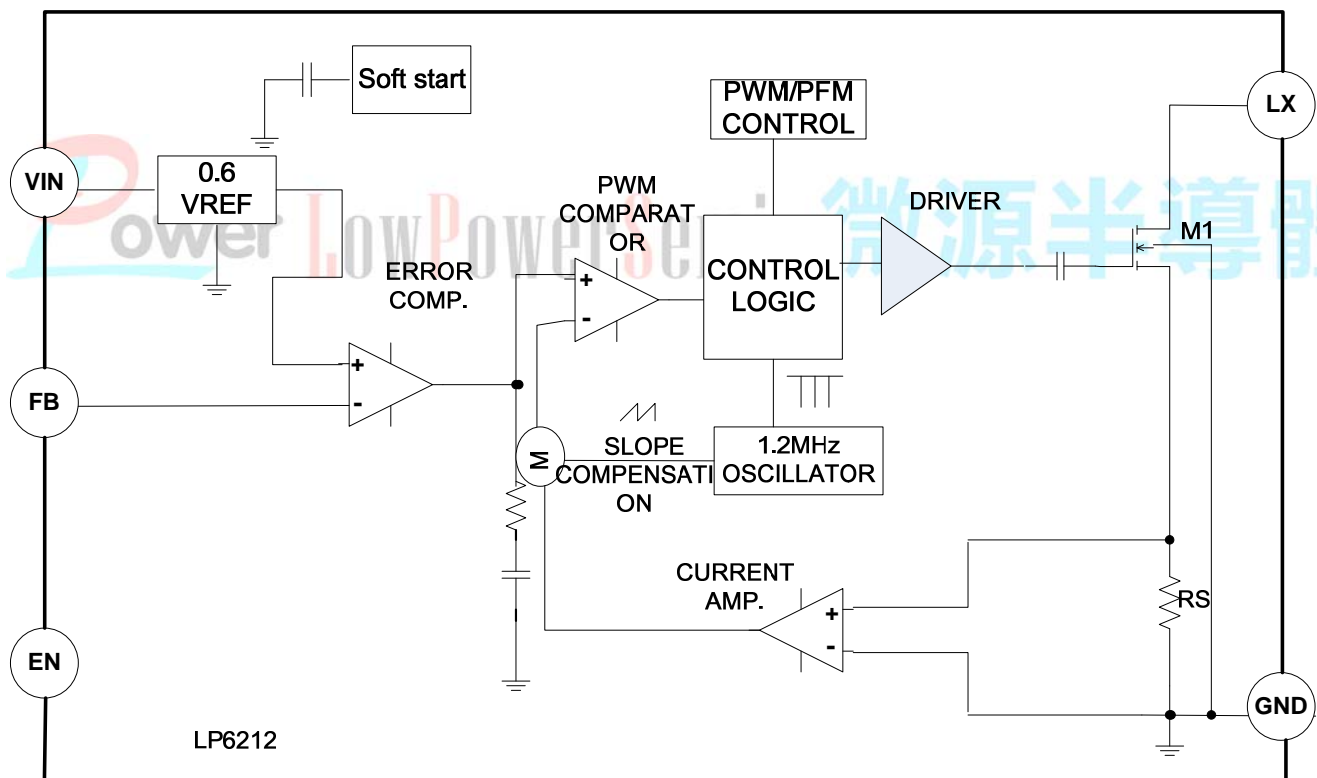
Marking Information

Device	Marking	Package	Shipping
LP6212	LPS LP6212 XXXX	ESOP8	3K/REEL

Functional Pin Description

PIN	PIN Name	Description
1	GND	Ground Pin.
2	FB	Feedback pin, the pin is 0.6V.
3	SW	Switching Pin.
4	SW	Switching Pin.
5	GND	Ground Pin.
6	GND	Ground Pin.
7	VIN	Voltage Input Pin.
8	EN	Chip Enable Pin.
9	PGND	Power Ground.

Function Block Diagram



Absolute Maximum Ratings

Supply Input Voltage-----6V

Power Dissipation, PD @ TA = 25°C

ESOP8-----2.6W

Package Thermal Resistance

ESOP8, θ_{JA} -----45°C/W

Lead Temperature (Soldering, 10 sec.) -----260°C

Recommended Operating Conditions

Supply Input Voltage-----2.2V to 6V

EN Input Voltage -----0V to 5.5V

Operation Junction Temperature Range -----40°C to 125°C

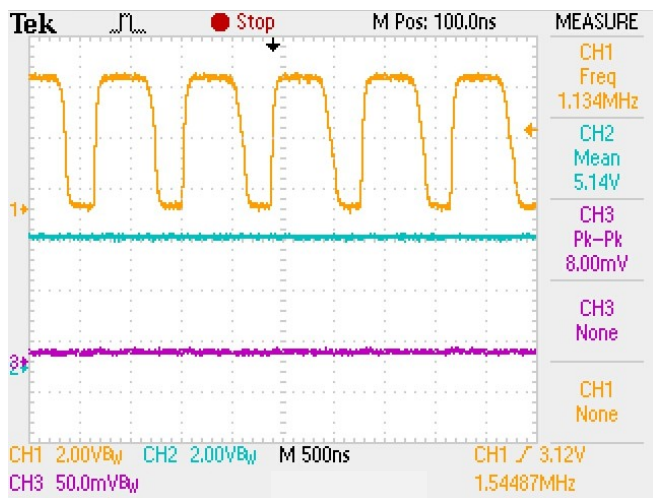
Operation Ambient Temperature Range-----40°C to 85°C

Electrical Characteristics

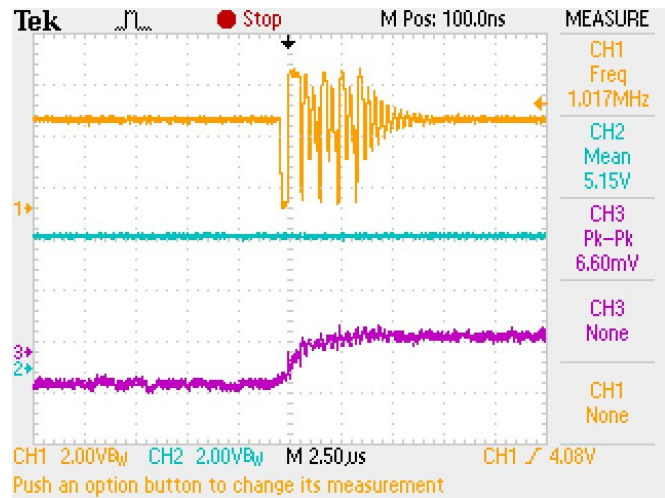
(Vin=3.6V,Vout=5V,Cin=10uF,Cout=22uF//10uF,L1=2.2uH)

Parameter	Conditions	LP6212			Units
		Min	Typ	Max	
Supply Voltage		2.2		5.5	V
Output Voltage Range		2.5		6	V
Supply Current(Shutdown)	VEN=VOUT=0V,VSW=5V		3		uA
Supply Current	VFB=0.7V		150		uA
Feedback Voltage		0.588	0.6	0.612	V
Feedback Input Current	VFB=1.2V		50		nA
Switching Frequency	FREQ=VCC		1200		KHz
Maximum Duty Cycle		85	90		%
EN Input Low Voltage				0.4	V
EN Input High Voltage		1.4			V
Power mosfet Current Limit			6		A
High-side On Resistance	Vout=3.3V		100		mΩ

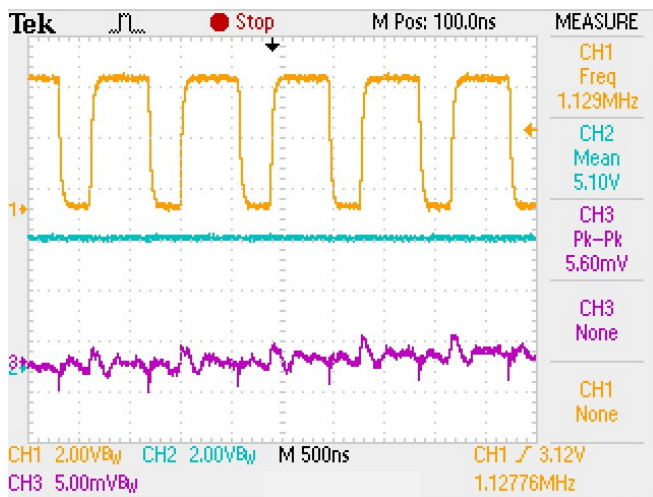
Typical Operating Characteristics



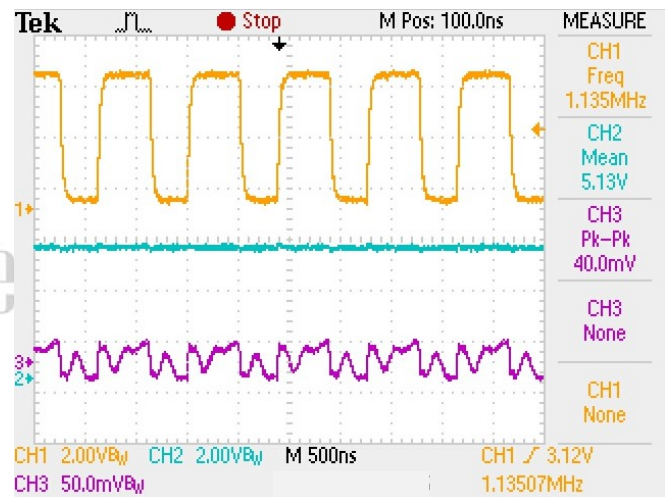
Vin=3.3V Vout=5V/0mA



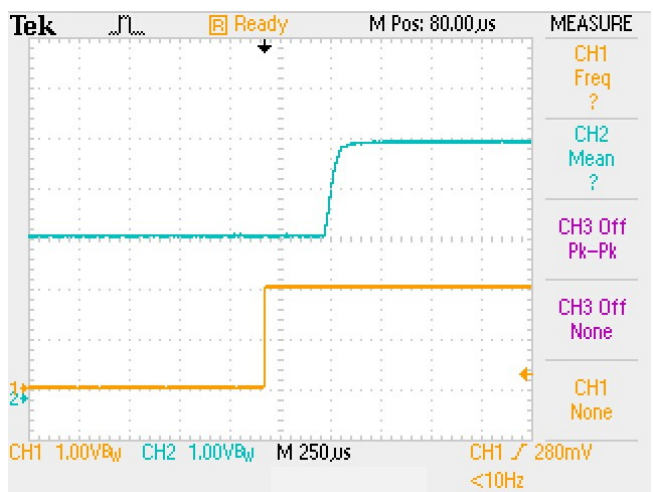
Vin=3.3V Vout=5V/50mA



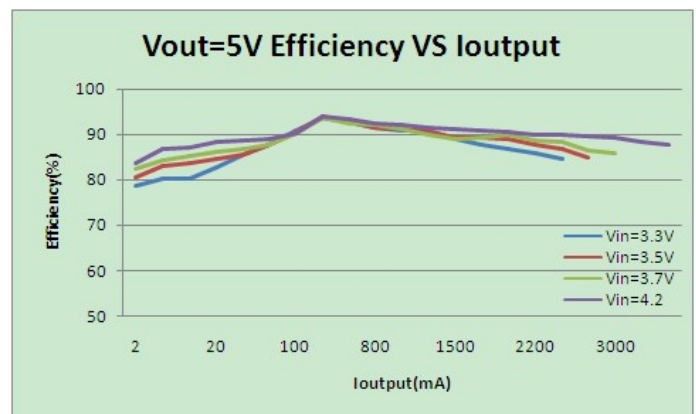
Vin=3.3V Vout=5V/100mA



Vin=3.3V Vout=5V/2A



Delay time when EN is on IN



Efficiency VS IOUTPUT

Operation Information

The LP6212 uses a 1.2MHz fixed frequency, current-mode regulation architecture to regulate the output voltage. The LP6212 measures the output voltage through an external resistive voltage divider and compares that to the internal 0.6V reference to generate the error voltage to the inductor current to regulate the output voltage. The use of current-mode regulation improves transient response and control loop stability.

When the LP6212 is disabled (EN=Low), both power switches are off. There is no current path from SW to OUT. Therefore, the output voltage discharges to ground. When the LP6212 is enabled (EN=High), a limited start-current charges the output voltage rising to SW, then TH part operates in force PWM mode for regulating the output voltage to the target value. At the beginning of each cycle, the N-channel MOSFET switch is turned on, forcing the inductor current to rise. The current at the source of the switch is internally measured and converted to a voltage by the current sense amplifier. That voltage is compared to the error

voltage. When the inductor current rises sufficiently, the PWM comparator turns off the switch, forcing the inductor current to the output capacitor through the internal P-Channel MOSFET rectifier, which forces the inductor current to decrease. The peak inductor current is controlled by the error voltage. Thus the output voltage controls the inductor current to satisfy the load.

Setting the Output Voltage

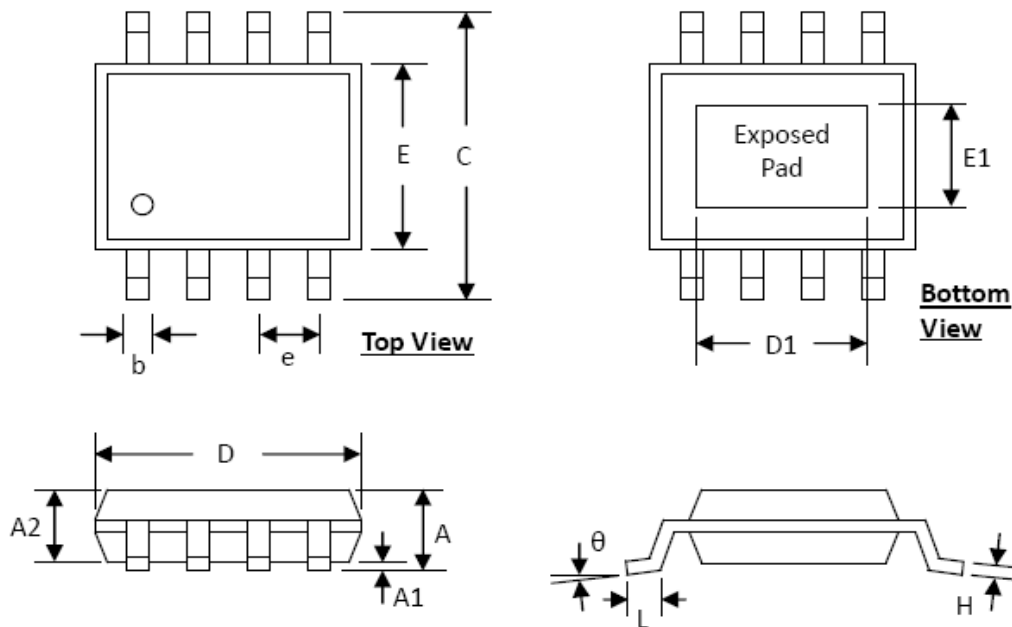
Set the output voltage by selecting the resistive voltage divider ratio. The voltage divider drops the output voltage to the 0.6V feedback voltage. Use a 100K resistor for R2 of the voltage divider. Determine the high-side resistor R1 by the equation:

$$V_{out} = (R1/R2 + 1) \times V_{FB}$$

$$V_{out} = (R1/R2 + 1) \times 0.6V$$

Packaging Information

ESOP8



SYMBOLS	DIMENSION (MM)		DIMENSION (INCH)	
	MIN	MAX	MIN	MAX
A	1.30	1.70	0.051	0.067
A1	0.00	0.15	0.000	0.006
A2	1.25	1.52	0.049	0.060
b	0.33	0.51	0.013	0.020
C	5.80	6.20	0.228	0.244
D	4.80	5.00	0.189	0.197
D1	3.15	3.45	0.124	0.136
E	3.80	4.00	0.150	0.157
E1	2.26	2.56	0.089	0.101
e	1.27 BSC		0.050 BSC	
H	0.19	0.25	0.0075	0.0098
L	0.41	1.27	0.016	0.050
θ	0°	8°	0°	8°