

■ INTRODUCTION:

The CE8510 is a constant frequency, current mode step-down converter. The device integrates a main switch and a synchronous rectifier for high efficiency without an external Schottky diode. It is ideal for powering portable equipment that runs from a single cell Lithium-Ion (Li+) battery. The output voltage can be regulated as low as 0.6V. The CE8510 can also run at 100% duty cycle for low dropout operation, extending battery life in portable system. 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 CE8510 is offered in a low profile 5-pin, SOT package, and is available in an adjustable version.

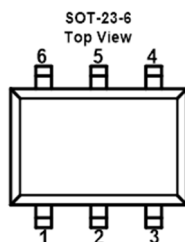
■ FEATURES:

- High efficiency :Up to 96%
- 500kHz Constant Frequency Operation
- 2A Output Current
- No Schottky Diode Required
- 4.5V to 18V Input Voltage Range
- Output Voltage as Low as 0.6V
- 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 Fault Protection
- Inrush Current Limit and Soft Start
- SOT23-6 package
- -40° C to +85° C Temperature Range

■ APPLICATIONS:

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

■ PIN CONFIGURATION:



■ ORDER INFORMATIO

CE8510①②

| DESIGNATOR | SYMBOL | DESCRIPTION |
|------------|--------|------------------|
| ① | A | Standard |
| ② | E | Package: SOT23-6 |

Tabel1. Pin Description

| PIN NUMBER | PIN NAME | FUNCTION |
|------------|-----------------|---|
| E | | |
| 1 | BS | Bootstrap. A capacitor connected between SW and BS pins is required to form a floating supply across the high-side switch driver. |
| 2 | V _{SS} | Analog ground pin. |
| 3 | FB | Adjustable version feedback input. Connect FB to the center point of the external resistor divider. |
| 4 | EN | Drive this pin to a logic-high to enable the IC Drive to a logic-low to disable the IC and enter micro-power shutdown mode. |
| 5 | V _{IN} | Power supply Pin |
| 6 | SW | Switching Pin |

■ ABSOLUTE MAXIMUM RATINGS(Note1)

| PARAMETER | SYMBOL | RATINGS | UNITS |
|------------------------------|---------------------|---|-------|
| Input Voltage | V _{IN} | V _{SS} -0.3~V _{SS} +20 | V |
| EN Voltages | V _{EN} | V _{SS} -0.3~V _{SS} +20 | V |
| FB Voltage | | V _{SS} -0.3~ V _{SS} +6 | V |
| SW Voltage | | V _{SS} -0.3~V _{IN} +0.5 | V |
| BS Voltage | | V _{SW} -0.3~V _{SW} +5 | V |
| Power Dissipation | SOT23-6 | P _D | 400 |
| Thermal Resistance | | | |
| Operating Temperature | T _{opr} | -40~+85 | °C |
| Junction Temperature | T _j | 150 | °C |
| Storage Temperature | T _{stg} | -40~+125 | °C |
| Soldering Temperature & Time | T _{solder} | 260°C, 10s | |
| ESD HBM(Human Body Mode) | - | 2 | kV |
| ESD MM(Machine Mode) | - | 200 | V |

■ ELECTRICAL CHARACTERISTICS

CE8510 Series ($V_{IN}=V_{EN}=3.6V$, $V_{OUT}=1.8V$, $T_A = 25^\circ C$, unless otherwise noted.)

| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|-----------------------------------|---|-------|-------|-------|------------|
| Input Voltage | | 4.5 | | 18 | V |
| Supply Current in Operation | $V_{EN}=2.0V$, $V_{FB}=1.1V$ | | 0.4 | 0.6 | mA |
| Supply Current in Shutdown | $V_{EN} = 0$ or $EN = GND$ | | 1 | | μA |
| Regulated Feedback Voltage VFB | $T_A = 25^\circ C$ $4.5V \leq V_{IN} \leq 18V$ | 0.588 | 0.600 | 0.612 | V |
| High-Side Switch On-Resistance | | | 90 | | m Ω |
| Low-Side Switch On-Resistance | | | 70 | | m Ω |
| High-Side Switch Leakage Current | $V_{EN}=0V$, $V_{SW}=0V$ | | 0 | 10 | μA |
| Upper Switch Current Limit | Minimum Duty Cycle | | 2.6 | | A |
| Oscillation Frequency | | | 0.5 | | MHZ |
| Maximum Duty Cycle | $V_{FB}=0.6V$ | | 92 | | % |
| Minimum On-Time | | | 60 | | ns |
| Soft-start Time | T_{SS} | | 4 | | ms |
| Thermal Shutdown | | | 160 | | $^\circ C$ |

Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

Note 2: T_J is calculated from the ambient temperature T_A and power dissipation P_D according to the following formula: $T_J = T_A + (P_D) \times (170^\circ C/W)$.

Note 3: 100% production test at $+25^\circ C$. Specifications over the temperature range are guaranteed by design and characterization.

■ TYPICAL APPLICATION CIRCUITS

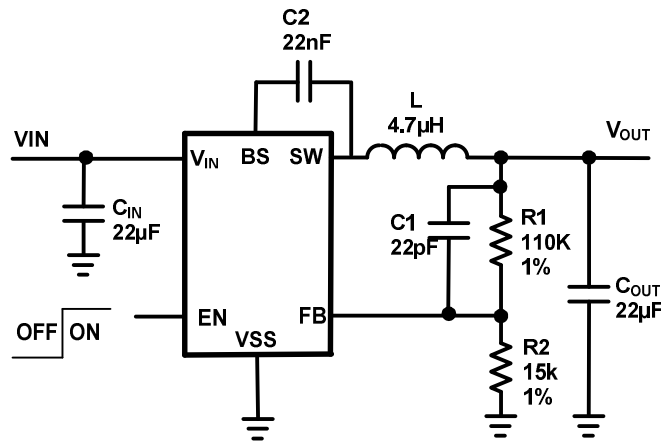
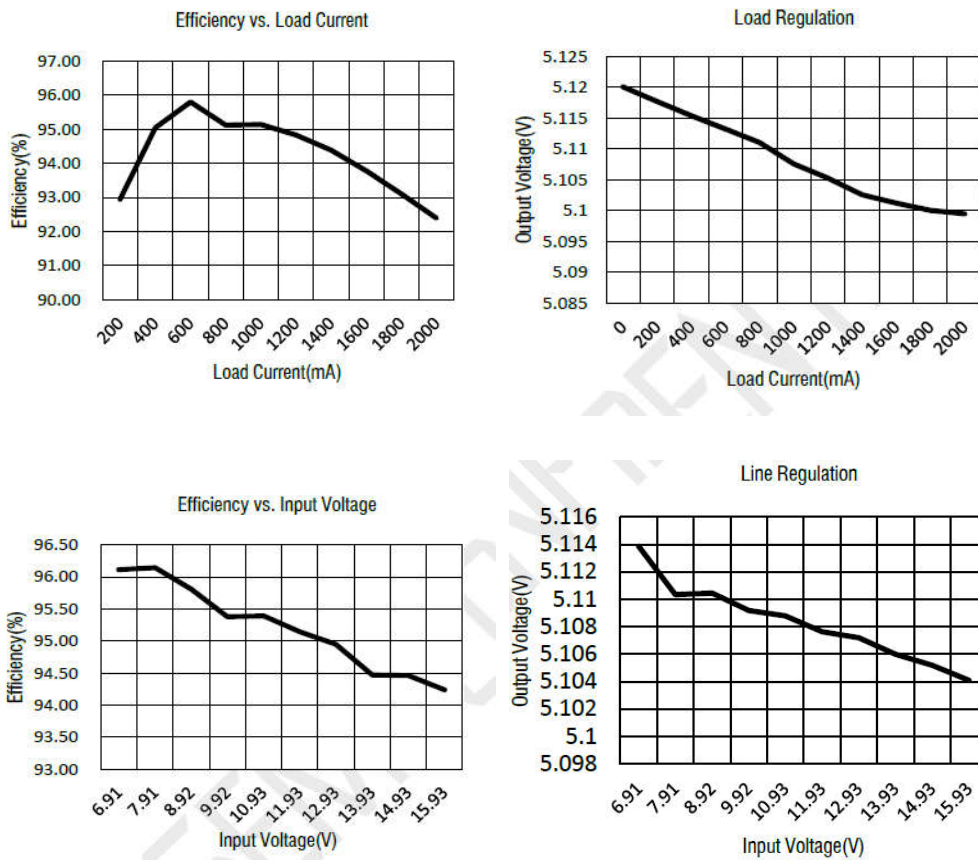


Figure1 Basic Application Circuit

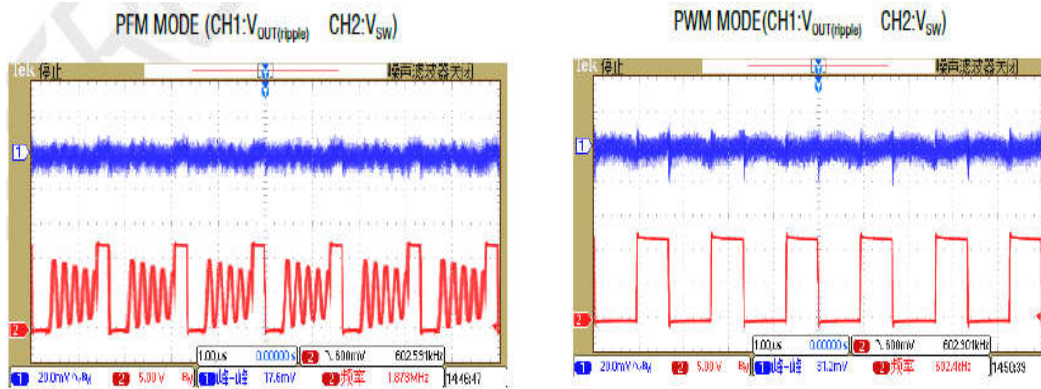
Note: $V_{OUT} = V_{FB} \times \left(1 + \frac{R1}{R2}\right)$

■ TYPICAL PERFORMANCE CHARACTERISTICS

(Test Figure1 above, unless otherwise specified)



■ TYPICAL PERFORMANCE CHARACTERISTICS
 (Test Figure1 above, unless otherwise specified)



■ FUNCTIONAL BLOCK DIAGRAM

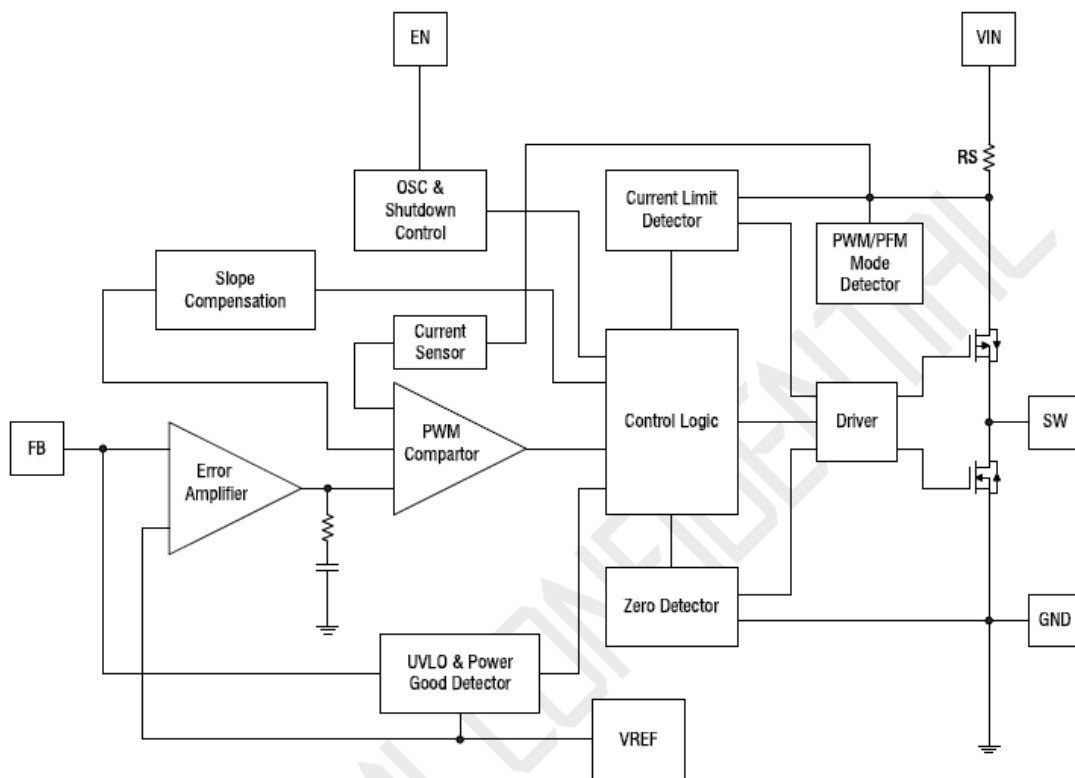
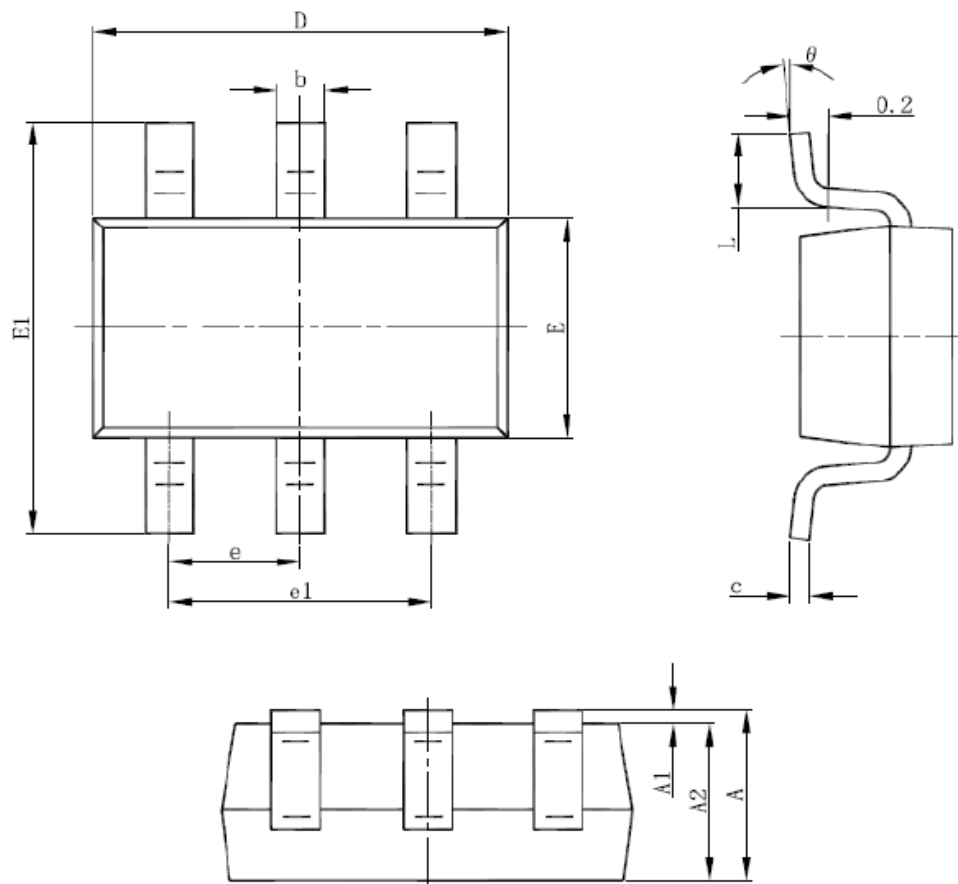


Figure2 Block Diagram

■ PACKAGING INFORMATION

● SOT23-6 Package Outline Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|----------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E | 1.500 | 1.700 | 0.059 | 0.067 |
| E1 | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |

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