

## Features

- External parts: Coil, capacitor
- Output voltage: Settable to between 2.1V to 5.5V in 0.1V steps
- Maximum Oscillation frequency :300KHz
- Accuracy of  $\pm 2\%$
- High efficiency :95%
- Package: SOT23,SOT23-3 and TO92

## Applications

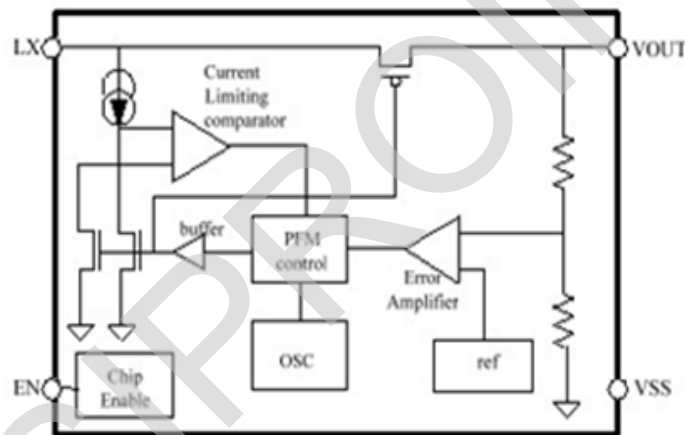
- Digital cameras
- Electronic notebooks and PDAS
- Portable CD/MD players
- Cameras , video equipment
- Communications equipment
- Power supply for microcomputers

## General Description

The H8116 Series is a Synchronous step-up DC/DC Converter with PFM Control. With the H8116 Series, a step-up switching DC/DC converter can be configured by using an external

coil, capacitor. The built-in MOSFET is turned off by a protection circuit when the voltage at the LX pin exceeds the limit to prevent it from being damaged.

## Block Diagram



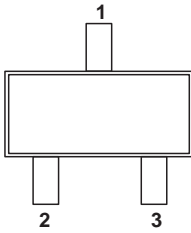
## Order Information

H8116①②③④⑤

| Designator | Symbol  | Description                                       |
|------------|---------|---|
| ①          | A       | Standard  |
| ②③         | Integer | Output Voltage (2.1V~5.5V)<br>e.g:3.0V=②: 3; ③: 0 |
| ④          | T       | Package:TO-92                                     |
|            | M       | Package:SOT23-3                                   |
|            | N       | Package:SOT23                                     |
| ⑤          | R       | RoHS / Pb Free                                    |
|            | G       | Halogen Free                                      |

## Pin Assignment

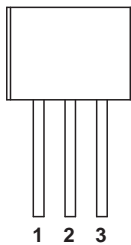
SOT23 or SOT23-3



**Table1 H8116A series (SOT23/SOT23-3 PKG)**

| PIN NO. | PIN NAME | FUNCTION                         |
|---------|----------|----------------------------------|
| 1       | VOUT     | Output voltage pin               |
| 2       | Vss      | GND pin                          |
| 3       | LX       | External inductor connection pin |

TO92



**Table2 H8116A series (TO92 PKG)**

| PIN NO. | PIN NAME | FUNCTION                         |
|---------|----------|----------------------------------|
| 1       | Vss      | GND pin                          |
| 2       | VOUT     | Output voltage pin               |
| 3       | LX       | External inductor connection pin |

## Absolute Maximum Ratings

(Unless otherwise specified, Ta=25°C)

| PARAMETER                    |         | SYMBOL       | RATINGS                   | UNITS |
|------------------------------|---------|--------------|---------------------------|-------|
| VOUT Pin Voltage             |         | $V_{OUT}$    | $V_{SS}-0.3\sim V_{SS}+8$ | V     |
| EN Pin Voltage               |         | EN           | $V_{SS}-0.3\sim V_{SS}+8$ | V     |
| LX Pin Voltage               |         | $V_{LX}$     | $V_{SS}-0.3\sim V_{SS}+8$ | V     |
| LX Pin Current               |         | $I_{LX}$     | 1000                      | mA    |
| Power Dissipation            | SOT23   | PD           | 250                       | mW    |
|                              | SOT23-3 |              | 250                       | mW    |
|                              | TO-92   |              | 500                       | mW    |
| Operating Temperature        |         | $T_{OPR}$    | -40~+85                   | °C    |
| Storage Temperature          |         | $T_{STG}$    | -40~+125                  | °C    |
| Soldering Temperature & Time |         | $T_{SOLDER}$ | 260°C, 10s                |       |

Note: These are stress ratings only. Stresses exceeding the range specified under “Absolute Maximum Ratings” may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

## Electrical Characteristics

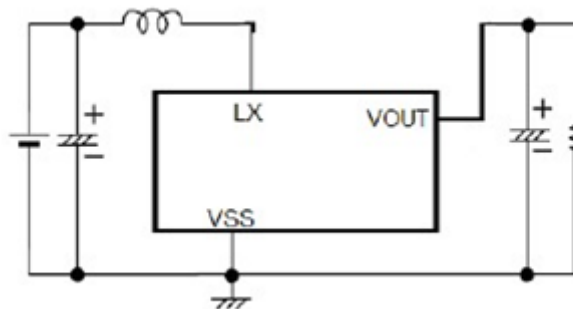
(Unless otherwise specified, Ta = 25°C)

| PARAMETER                           | SYMBOL           | MIN                           | TYP              | MAX                           | UNITS | CONDITION   |
|-------------------------------------|------------------|-------------------------------|------------------|-------------------------------|-------|---|
| Output Voltage                      | V <sub>OUT</sub> | V <sub>OUT(S)</sub><br>× 0.98 | V <sub>OUT</sub> | V <sub>OUT(S)</sub><br>× 1.02 | V     | -   |
| Input Voltage                       | V <sub>IN</sub>  | -                             | -                | 7.5                           | V     | -   |
| Operation Start Voltage             | V <sub>ST1</sub> |                               | -                | 0.9                           | V     | I <sub>OUT</sub> =1mA V <sub>OUT</sub> =2.2V~4.2V                     |
| Operation Start Voltage             | V <sub>ST1</sub> | -                             | -                | 1.2                           | V     | I <sub>OUT</sub> =1mA V <sub>OUT</sub> =4.2V~5.5V                     |
| Input Current At No Load            | I <sub>SS</sub>  |                               | 15               | 25                            | μA    | V <sub>IN</sub> =1.8V, V <sub>OUT</sub> =3.0V                         |
|                                     |                  |                               | 25               | 35                            | μA    | V <sub>IN</sub> =0.9V, V <sub>OUT</sub> =3.0V                         |
| Current Consumption 2               | I <sub>SS2</sub> | -                             | 6                | 10                            | μA    | V <sub>OUT</sub> =V <sub>OUT</sub> +0.5V                              |
| Current Consumption During Shutdown | I <sub>SSS</sub> | -                             | -                | 1.0                           | μA    | V <sub>EN</sub> =0V   |
| Maximum Oscillation Frequency       | fosc             |                               | 300              |                               | KHz   | V <sub>OUT</sub> =0.95xV <sub>OUT</sub> , measure Waveform at LX pin  |
| Duty Ratio1                         | Duty1            | 70                            | 78               | 85                            | %     | V <sub>OUT</sub> =0.95xV <sub>OUT</sub>                               |
| Efficiency                          | EFF1             |                               | 90               |                               | %     |   |
| Shutdown Pin Input Voltage          | V <sub>SH</sub>  | 0.75                          | -                | -                             | V     | V <sub>OUT</sub> =0.95xV <sub>OUT</sub> , judge Oscillation at LX pin |
|                                     | V <sub>SL1</sub> | -                             | -                | 0.3                           | V     | V <sub>OUT</sub> =0.95xV <sub>OUT</sub> , judge stop at LX pin        |
| Shutdown Pin input Current          | I <sub>SH</sub>  | -0.1                          | -                | 0.1                           | μA    | V <sub>EN</sub> =6V   |
|                                     | I <sub>SL</sub>  | -0.1                          | -                | 0.1                           | μA    | V <sub>EN</sub> =0V   |

Remark: V<sub>OUT(S)</sub> specified above is the set output voltage value, and V<sub>OUT</sub> is the typical value of the actual output voltage

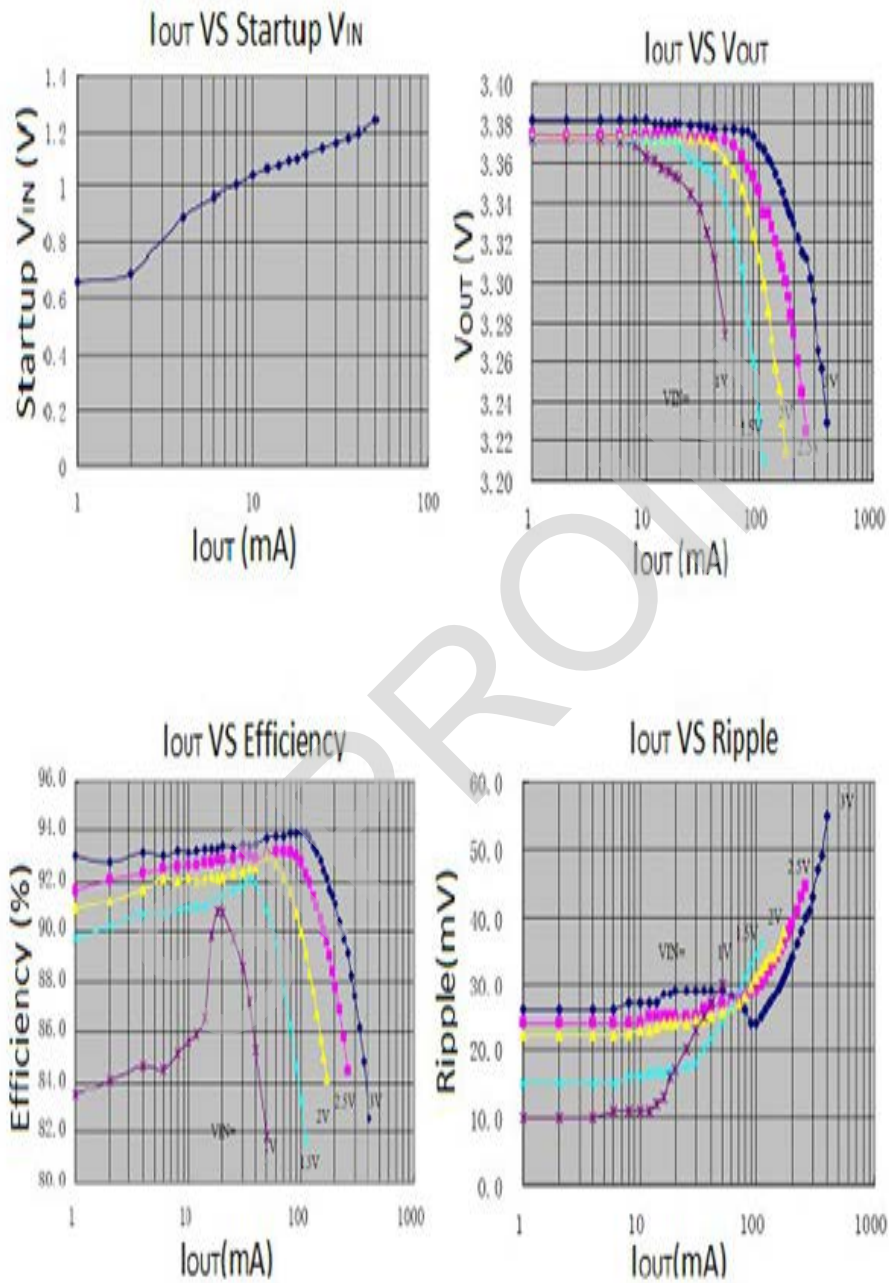
## Application Circuits

### H8116A



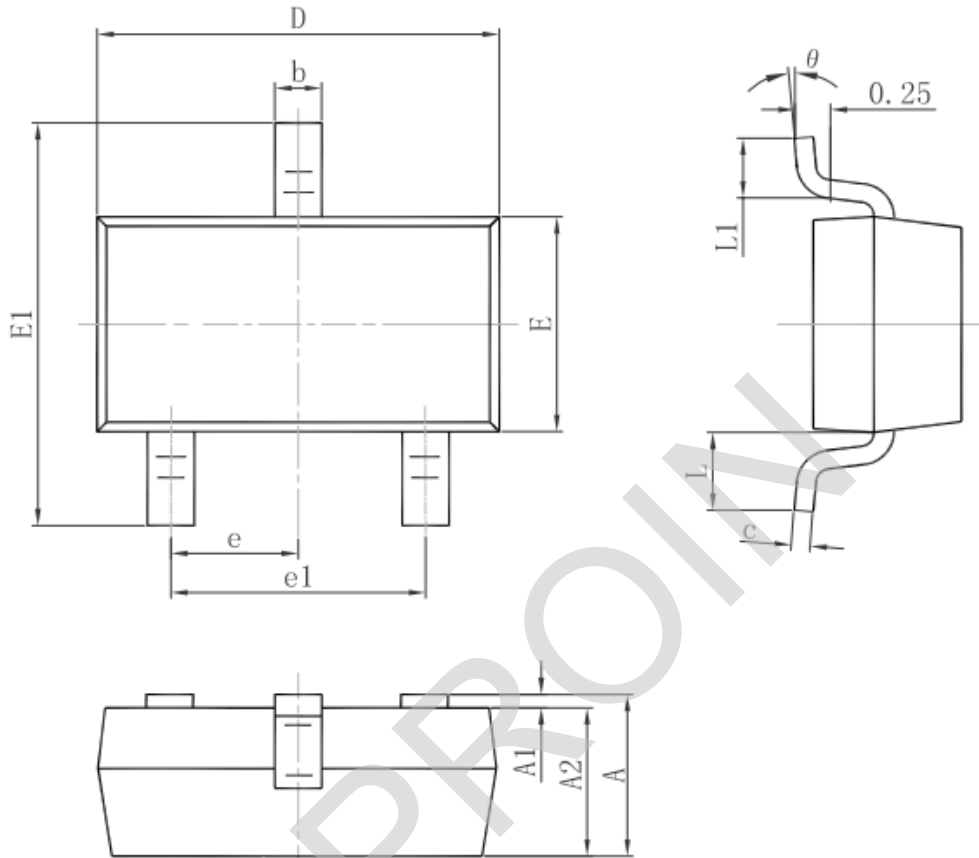
## TYPICAL PERFORMANCE CHARACTERISTICS

( $C_{in}=C_{out}=100\mu F, L=47\mu H$ )



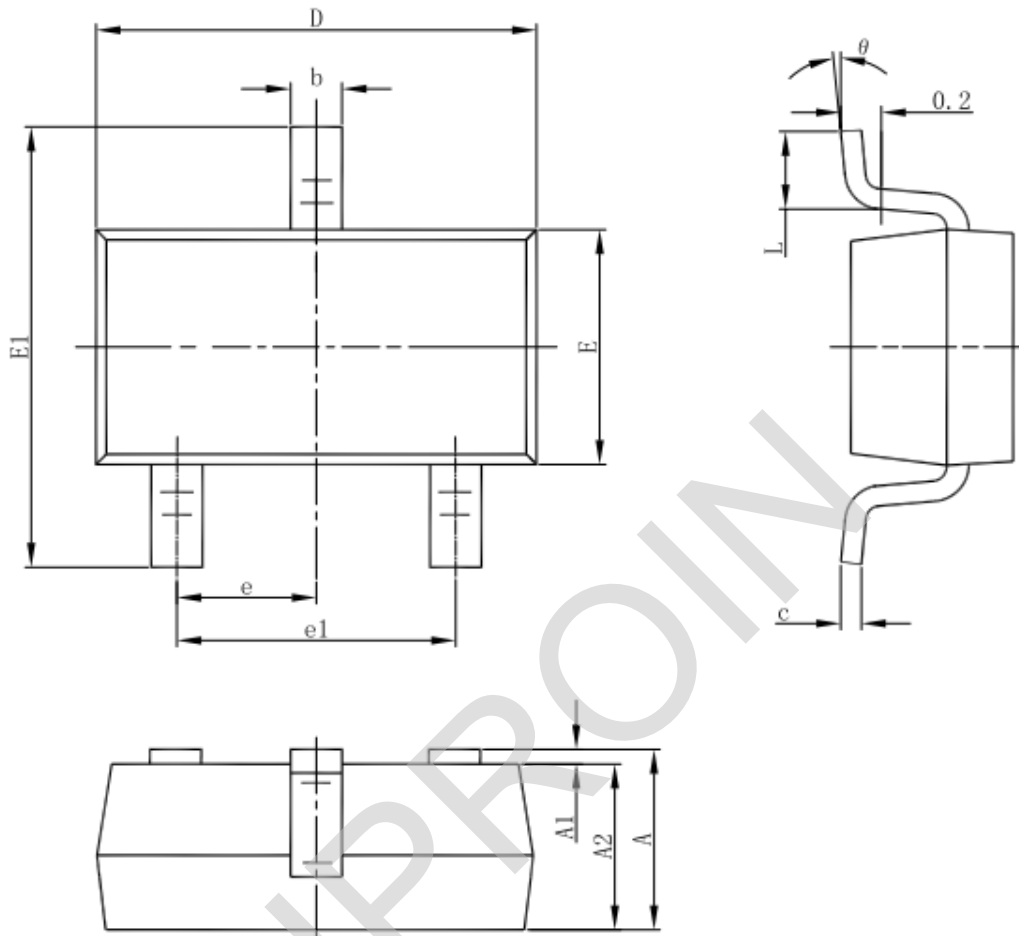
## Package Information

### 3-pin SOT23 Outline Dimensions



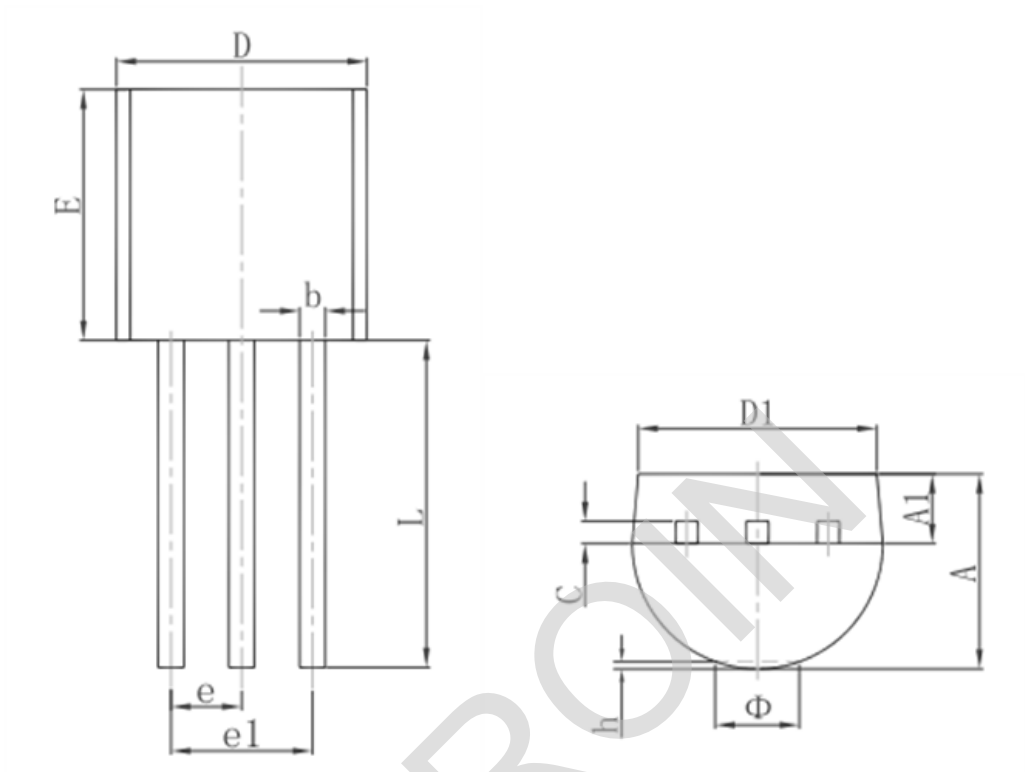
| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.950 TYP.                |       | 0.037 TYP.           |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550 REF.                |       | 0.022 REF.           |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| theta  | 0°                        | 8°    | 0°                   | 8°    |

## 3-pin SOT23-3 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°    |

## 3-pin TO92 Outline Dimensions



| Symbol | Dimensions in Millimeters |        | Dimensions in Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 3.300                     | 3.700  | 0.130                | 0.146 |
| A1     | 1.100                     | 1.400  | 0.043                | 0.055 |
| b      | 0.380                     | 0.550  | 0.015                | 0.022 |
| c      | 0.360                     | 0.510  | 0.014                | 0.020 |
| D      | 4.300                     | 4.700  | 0.169                | 0.185 |
| D1     | 3.430                     |        | 0.135                |       |
| E      | 4.300                     | 4.700  | 0.169                | 0.185 |
| e      | 1.270 TYP.                |        | 0.050 TYP.           |       |
| e1     | 2.440                     | 2.640  | 0.096                | 0.104 |
| L      | 14.100                    | 14.500 | 0.555                | 0.571 |
| Φ      |                           | 1.600  |                      | 0.063 |
| h      | 0.000                     | 0.380  | 0.000                | 0.015 |

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