

# Product Specification

XBLW MAX1044

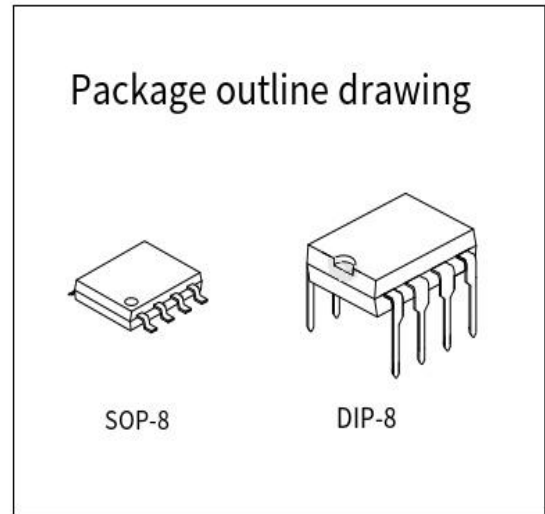
DC / DC Voltage Conversion

WEB | [www.xinboleic.com](http://www.xinboleic.com)



## Description

MAX1044 is a single chip DC/DC voltage conversion integrated circuit manufactured by a special process. It has the output of reverse, double voltage, partial voltage and multiple voltage. It can work stably in the range of 1.5V~9.0V, and does not need any diode in the whole temperature range. 10mA of current can be released for every 0.5V voltage drop. With the BOOST input, the oscillator frequency can be raised above the audio band, reducing the output ripple, and therefore, reducing the size of the external capacitor capacity. Combining low static current and high conversion efficiency, the chip has a built-in oscillator control circuit and four power MOSFET conversion switches. Applications include: negative voltage generation, voltage doubling generation, and input voltage 1/2 partial voltage. The series of products are widely used in data acquisition system, portable instrument and other electronic products.



## Features

- Input voltage: 1.5V ~ 9.0V
- Low static current typ.=65uA @5V
- 98% power conversion efficiency
- Invert, double voltage, partial voltage and multiple voltage
- BOOST pins are used to increase the oscillation frequency
- Package: DIP8, SOP8

## Application

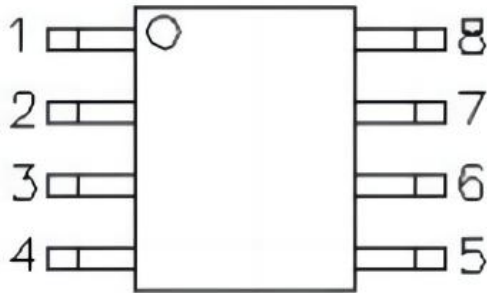
- Dual power supply operational amp power supply
- Data acquisition system
- PDA
- Can be used as voltage converter, voltage divider
- Portable meter

## Ordering information

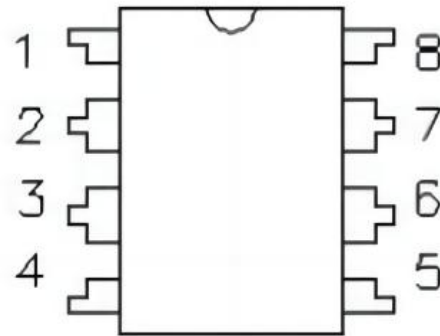
| Product Model | Package Type | Marking | Packing | Packing Qty  |
|---------------|--------------|---------|---------|--------------|
| MAX1044EPA    | DIP-8        | MAX1044 | Tube    | 2000Pcs/Box  |
| MAX1044ESA    | SOP-8        | MAX1044 | Tape    | 2500Pcs/Reel |
|               |              |         |         |              |
|               |              |         |         |              |
|               |              |         |         |              |

## Package form and pin define function

SOP-8



DIP-8

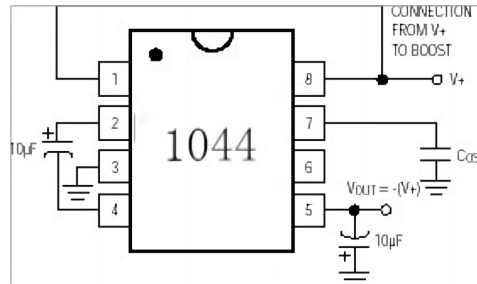


| Pin number | Pin definition | Pin number | Pin definition |
|------------|----------------|------------|----------------|
| 1          | BOOST          | 2          | CAP+           |
| 3          | GND            | 4          | CAP-           |
| 5          | VOUT           | 6          | LV             |
| 7          | OSC            | 8          | V+             |

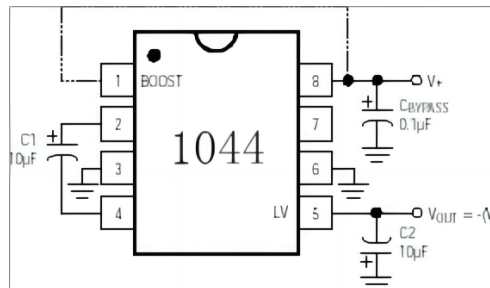
| Name  | Pin number | Function Description  |
|-------|------------|---|
| BOOST | 1          | Raise the frequency control end. Connecting BOOST and V+ increases the frequency of the internal oscillator by a factor of 6.<br>If using an external oscillator, the BOOST will do nothing and it should be suspended at this point. |
| CAP+  | 2          | Connect to the negative terminal of the charge pump capacitor.  |
| GND   | 3          | Be grounded. In most applications, the negative end of the accumulator capacitor should be connected to this pin.   |
| CAP-  | 4          | Connect to the positive terminal of the charge pump capacitor.  |
| VOUT  | 5          | Positive voltage output end. In most applications, the positive end of the accumulator capacitor should be connected to this pin.   |
| LV    | 6          | Low voltage operation select section. This end should be connected to ground when the supply voltage is below 3.5V.   |
| OSC   | 7          | Oscillator frequency control input. An external capacitor reduces the frequency of the internal oscillator.   |
| V+    | 8          | Power supply positive voltage input (1.5~9V), V+ is also the chip substrate connection point.   |

## Typical application

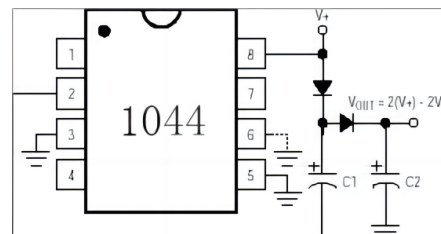
Negative voltage conversion (using BOOST and COSC)



Negative voltage conversion (using BOOST and LV)



Voltage doubler output circuit



### Limit parameters

| Items       | Symbols | Parameters                        | Limit values  | Units |
|-------------|---------|-----------------------------------|---------------|-------|
| Voltage     | V+      | Input voltage V+ to GND           | 9             | V     |
|             | Vout    | The output voltage is GND to VOUT | 9             | V     |
|             | Vin     | Pin6/Pin7 Port input voltage      | -0.3 ~V+ +0.3 | V     |
| Current     | ILV     | LV port input current             | 20            | uA    |
| Temperature | TA      | Operating temperature             | - 20 ~ 85     | °C    |
|             | TS      | Storage temperature               | - 65-150      | °C    |
|             | TW      | Pin welding temperature           | 260, 10s      | °C    |

Note:

The limit parameter refers to the limit value that cannot be exceeded under any conditions. If this limit value is exceeded, it may cause physical damage such as product deterioration; At the same time, it is not guaranteed that the chip can work normally when it is close to the limit parameter.

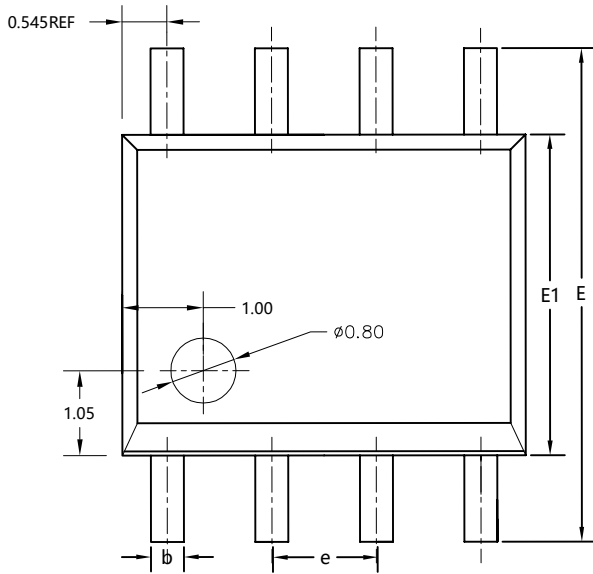
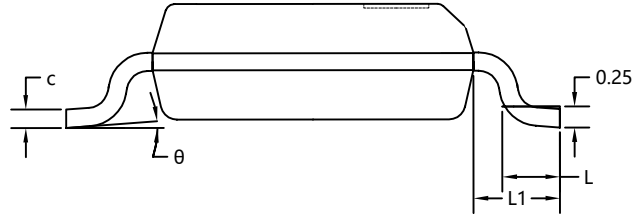
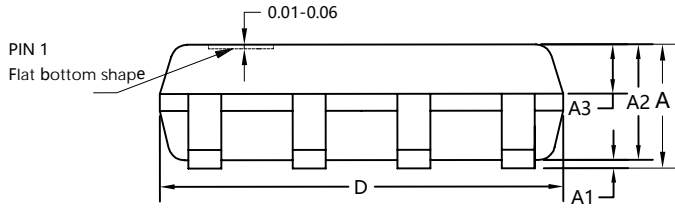
### Electrical characteristics unless otherwise specified

V+ = 5.0V, LVpin = 0V, BOOSTpin = open, ILOAD = 0mA, TA = TMIN ~ TMAX

| Parameters                      | Test conditions                            | Min                 | Typ  | Max | unit |
|---------------------------------|--|---------------------|------|-----|------|
| Power supply current            | RL = +∞, connect Pin1 and Pin7, LV open    | TA = +25°C          | 30   | 180 | μA   |
|                                 |  | TA = 0°C ~ +70°C    |      | 200 |      |
|                                 |  | TA = -20°C ~ +85 °C |      | 200 |      |
|                                 | RL = +∞, Pin 1 = Pin 7 = V+ = 3V           |                     | 10   |     |      |
| Supply voltage range            | RL = 10KΩ, LV open                         |                     |      |     | V    |
|                                 | RL = 10KΩ, LV to GND                       | 1.5                 |      | 10  |      |
| Power supply current            | IL = 20mA, fOSC = 5kHz, LV open            | TA = +25°C          | 65   | 100 | Ω    |
|                                 |  | TA = 0°C ~ +70°C    |      | 130 |      |
|                                 |  | TA = -20°C ~ +85 °C |      | 130 |      |
|                                 | fOSC = 1kHz, V+ = 2V, IL = 3mA, LV to GND  | TA = +25°C          |      | 325 |      |
|                                 |  | TA = 0°C ~ +70°C    |      | 325 |      |
|                                 |  | TA = -20°C ~ +85 °C |      | 325 |      |
| Oscillator frequency            | COSC = 1pF, LV to GND                      | V+ = 5V             | 5    |     | kHz  |
|                                 |  | V+ = 2V             | 1    |     |      |
| Power supply power              | RL = 5kΩ, TA = +25°C, fOSC = 5kHz, LV open | 95                  | 98   |     | %    |
| Voltage reversal power          | RL = +∞, TA = +25 °C, LV open              | 97.0                | 99.9 |     | %    |
| Oscillator source drain current | VOSC = 0V or V+, LV open                   | Pin 1 = 0v          |      | 3   | M Ω  |
|                                 |  | Pin 1 = V+          |      | 20  |      |
| Oscillator impedance            | TA = +25°C                                 | V+ = 5V             | 1000 |     | K Ω  |
|                                 |  | V+ = 2V             | 100  |     |      |

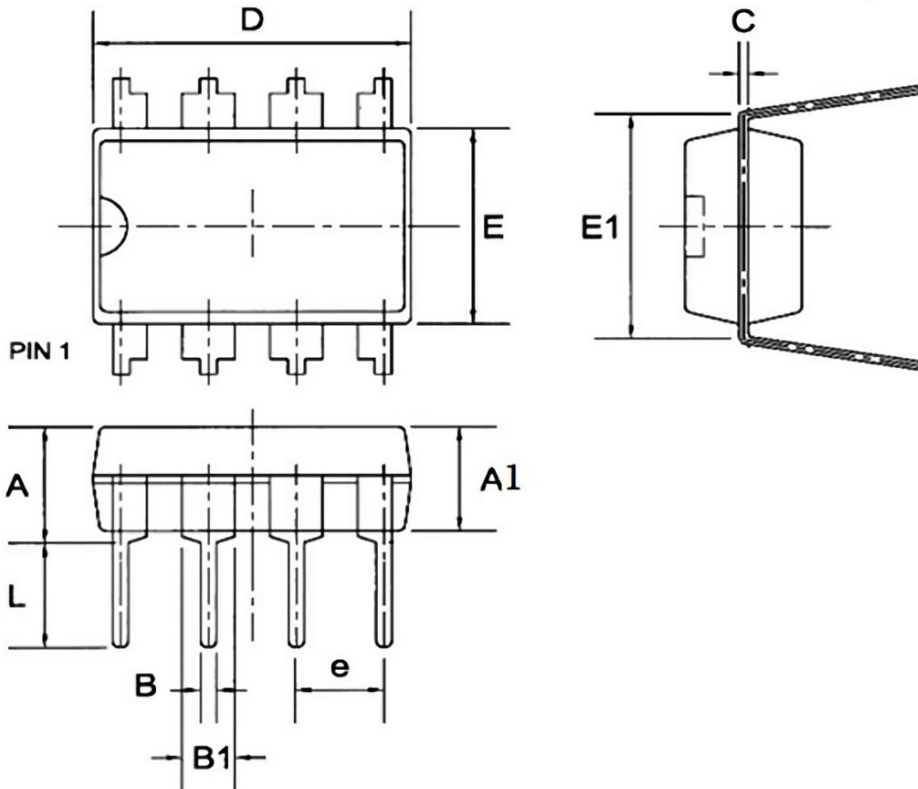
## Package Outline Dimensions

### SOP-8



| SYMBOL   | MILLIMETER |      |      |
|----------|------------|------|------|
|          | MIN        | NOM  | MAX  |
| A        | 1.55       | 1.65 | 1.75 |
| A1       | 0.10       | 0.15 | 0.20 |
| A2       | 1.35       | 1.45 | 1.55 |
| A3       | 0.60       | 0.70 | 0.80 |
| b        | 0.30       | 0.40 | 0.50 |
| c        | 0.17       | 0.20 | 0.25 |
| D        | 4.80       | 4.90 | 5.00 |
| E        | 5.80       | 6.00 | 6.20 |
| E1       | 3.80       | 3.90 | 4.00 |
| e        | 1.27BSC    |      |      |
| L        | 0.50       | 0.60 | 0.70 |
| L1       | 1.05REF    |      |      |
| $\theta$ | 0°         | 4°   | 8°   |

DIP-8



| Symbol | Dimensions in Millimeters |      |      |
|--------|---------------------------|------|------|
|        | Min                       | Nom  | Max  |
| A      | --                        | --   | 4.31 |
| A1     | 3.15                      | 3.30 | 3.65 |
| B      | 0.38                      | 0.46 | 0.51 |
| B1     | 1.27                      | 1.55 | 1.77 |
| C      | 0.20                      | 0.25 | 0.30 |
| D      | 8.95                      | 9.40 | 9.45 |
| E      | 6.15                      | 6.20 | 6.65 |
| E1     | --                        | 7.60 | --   |
| e      | --                        | 2.54 | --   |
| L      | 3.00                      | 3.30 | 3.60 |

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