# CJ6300 Series

## ■ INTRODUCTION

The CJ6300 series are a group of positive voltage regulators manufactured by CMOS technologies with high ripple rejection, ultra low noise, low power consumption and low dropout voltage, which can prolong battery life in portable electronics. The CJ6300 series work with low-ESR ceramic capacitors, reducing the amount of board space necessary for power applications. The CJ6300 series consume less than 0.1μA in shutdown mode and have fast turn-on time less than 50μs.The series are very suitable for the battery-powered equipments, such as RF applications and other systems requiring a quiet voltage source.

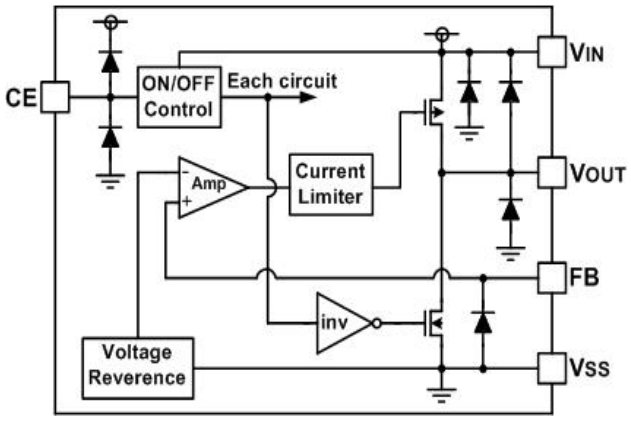
## ■ FEATURES

- 500mA RF Low-Dropout Regulator With Enable
- Ultralow-Noise：40μ$V_{RMS}$(10Hz~100kHz)
- High PSRR：70dB@1kHz
- Fast Start-Up Time (20μs)
- Excellent Load/Line Transient Response
- Low Dropout Voltage: 110mV@100mA
- Stable With a 1μF Ceramic Capacitor
- Available in Adjustable Voltage Version (0.6V to 5.5V)
- Built-in Current Limiter, Short-Circuit Protection

## ■ APPLICATIONS

- RF: VCOs, Receivers, ADCs
- Cellular and Cordless Telephones
- Handheld Organizers
- Audio
- Bluetooth, Wireless LAN
- Tablet, MID

## ■ BLOCK DIAGRAM



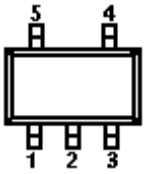

## ■ ORDER INFORMATION

**CJ6300 ①②**

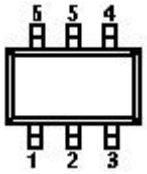
| DESIGNATOR | SYMBOL | DESCRIPTION |
|---|---|---|
| ① | **B** | High Active, pull-down resistor built in, with $C_{OUT}$ discharge resistor |
| ② | **M/E** | Package:SOT-23-5L/6L |
| | **N** | Package: WBHFBP-06L |

## ■ PIN CONFIGURATION

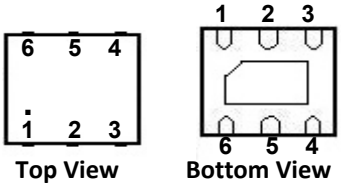
**SOT-23-5L**




**SOT-23-6L**




**WBHFBP-06L**




**SOT-23-5L**

| PIN NUMBER | PIN NAME | FUNCTION |
|---|---|---|
| M | | |
| 1 | $V_{IN}$ | Power input Pin |
| 2 | $V_{SS}$ | Ground |
| 3 | CE | Chip Enable Pin |
| 4 | FB | Feedback Pin: Used to Set Output Voltage |
| 5 | $V_{OUT}$ | Output Pin |

**SOT-23-6L /WBHFBP-06L**

| PIN NUMBER | | PIN NAME | FUNCTION |
|---|---|---|---|
| E | N | | |
| 1 | 3 | $V_{IN}$ | Power input Pin |
| 2 | 2 | $V_{SS}$ | Ground |
| 3 | 1 | CE | Chip Enable Pin |
| 5 | 6 | FB | Feedback Pin: Used to Set Output Voltage |
| 6 | 4 | $V_{OUT}$ | Output Pin |
| 4 | 5 | NC | Not Connection |
| - | 7 | | Thermal Pad |

## ■ TYPICAL APPLICATION

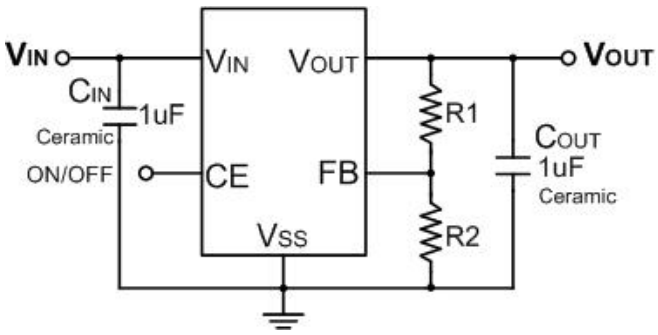



**Fig.1 Typical Application Circuit**

## Electrical Characteristics

### ■ ABSOLUTE MAXIMUM RATINGS

**(Unless otherwise specified, $T_A$=25°C)**

| PARAMETER | | SYMBOL | RATINGS | UNITS |
|---|---|---|---|---|
| Input Voltage | | $V_{IN}$ | $V_{SS}$ -0.3~$V_{SS}$+8 | V |
| Output Current | | $I_{OUT}$ | 750 | mA |
| Output Voltage | | $V_{OUT}$ | $V_{SS}$ -0.3~$V_{IN}$+0.3 | V |
| Power Dissipation | SOT-23-5L | Pd | 400 | mW |
| | SOT-23-6L | Pd | 400 | mW |
| | WBHFBP-06L | Pd | 300 | mW |
| Operating Ambient Temperature | | $T_A$ | -40~+85 | ℃ |
| Operating Junction Temperature | | $T_j$ | -40~+125 | ℃ |
| Storage Temperature | | $T_{stg}$ | -40~+125 | ℃ |
| Soldering Temperature & Time | | $T_{solder}$ | 260℃, 10s | |

### ■ ELECTRICAL CHARACTERISTICS

**($V_{IN}$=$V_{OUT}$+1V, $C_{IN}$=$C_{OUT}$=1μF，$T_A$=25℃,unless otherwise specified)**

| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|---|
| Input Voltage | $V_{IN}$ | — | 1.8(1) | | 7.0 | V |
| Output Current | $I_{OUT}$ | $V_{OUT}$ ≥ 1.8V | 500 | | | mA |
| Supply Current | $I_{SS}$ | $I_{OUT}$=0mA | | 45 | 80 | μA |
| Standby Current | $I_{STBY}$ | $V_{CE}$=0V | | | 0.1 | μA |
| CE "High" Voltage | $V_{CEH}$ | | 1.2 | | $V_{IN}$ | V |
| CE "Low" Voltage | $V_{CEL}$ | | | | 0.3 | V |
| CE pin current | | $V_{CE}$=0V | -1 | | 1 | μA |
| FB Voltage | $V_{FB}$ | $I_{OUT}$=1mA | 0.588 | 0.600 | 0.612 | V |
| FB pin current | | $V_{FB}$=1.8V | | | 1 | μA |
| Output voltage range | | | 0.6 | | 5.5 – $V_{DO}$ | V |
| Line Regulation | $\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta V_{IN}}$ | $I_{OUT}$ =10mA<br>$V_{OUT}$ +1V≤$V_{IN}$≤7V | | 0.01 | 0.2 | %/V |
| Load Regulation | $\Delta V_{OUT}$ | $V_{IN}$= $V_{OUT}$ +1V,<br>1mA≤$I_{OUT}$≤100mA | | 1 | | mV |
| Dropout Voltage(2) | $V_{dif}$ | $I_{OUT}$ =100mA<br>$V_{OUT}$≥3.0V | | 110 | | mV |
| Output Voltage Temperature Characteristics | $\frac{\Delta V_{OUT}}{\Delta T \times V_{OUT}}$ | $I_{OUT}$ =10mA<br>-40≤T≤+85 | | 50 | | ppm |
| Current Limit | $I_{LIM}$ | | 600 | 750 | | mA |
| Short Current | $I_{SHORT}$ | $V_{OUT}$ =$V_{SS}$ | | 20 | | mA |
| Power Supply Ripple Rejection ($V_{OUT}$ =1.2V) | PSRR | f=100Hz, $I_{OUT}$=50mA | | 80 | | dB |
| | | f=1kHz, $I_{OUT}$=50mA | | 70 | | |
| | | f=10kHz, $I_{OUT}$=50mA | | 50 | | |
| Output noise voltage | | BW=10Hz to<br>100kHz, $I_{OUT}$=10mA | | 40 | | $\mu V_{RMS}$ |
| Time, start-up | | $I_{OUT}$=0mA, $C_{OUT}$=1μF | | 20 | | μS |

**NOTE:**

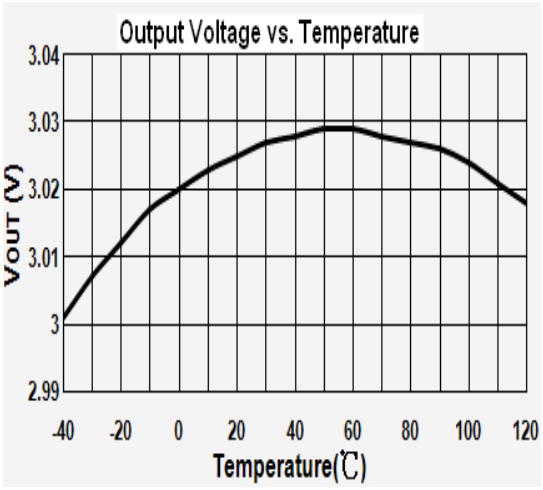
(1) Minimum $V_{IN}$ is 1.8V or $V_{OUT}$ + $V_{DO}$, whichever is greater.

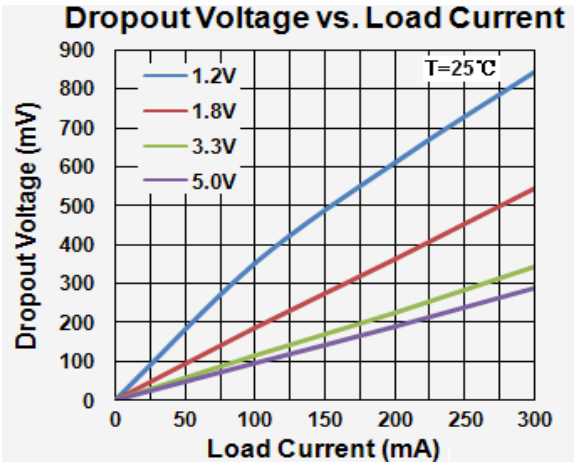
(2) $V_{dif}$: The difference of output voltage and input voltage when input voltage is decreased gradually till output voltage equals to 98% of $V_{OUT}$ (E).

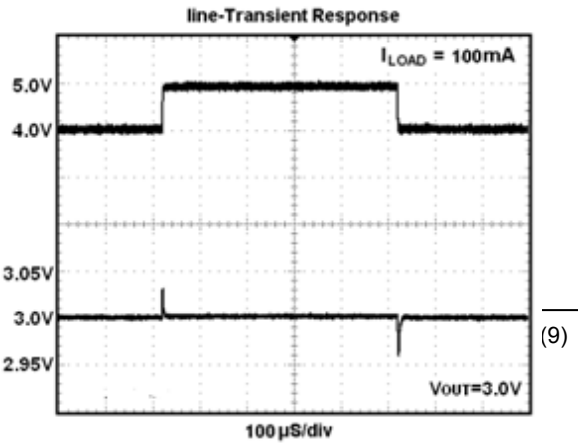
## ■ DROPOUT VOLTAGE CHART

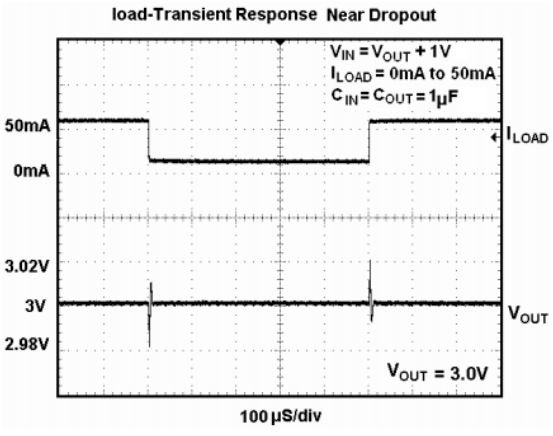
| Setting Output Voltage | Dropout Voltage (mV) Typ. | | | |
|---|---|---|---|---|
| $V_{OUT}$(V) | $I_{OUT}$=100mA | $I_{OUT}$=200mA | $I_{OUT}$=300mA | $I_{OUT}$=500mA |
| 1.2 | 380mV | 640mV | 880mV | |
| 1.5 | 250mV | 480mV | 680mV | |
| 1.8 | 190mV | 380mV | 570mV | 950mV |
| 2.1 | 155mV | 310mV | 470mV | 820mV |
| 2.5 | 130mV | 260mV | 400mV | 700mV |
| 2.8 | 120mV | 240mV | 360mV | 640mV |
| 3.0 | 110mV | 230mV | 350mV | 610mV |
| 3.3 | 105mV | 210mV | 320mV | 570mV |
| 3.6 | 100mV | 200mV | 310mV | 540mV |
| 4.0 | 95mV | 185mV | 290mV | 500Mv |
| 4.5 | 90mV | 180mV | 280mV | 470mV |
| 5.0 | 85mV | 170mV | 260mV | 440mV |

## ■ TYPICAL PERFORMANCE CHARACTERISTICS

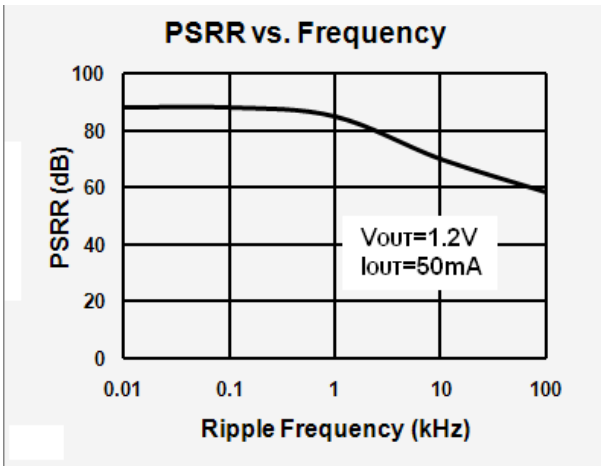


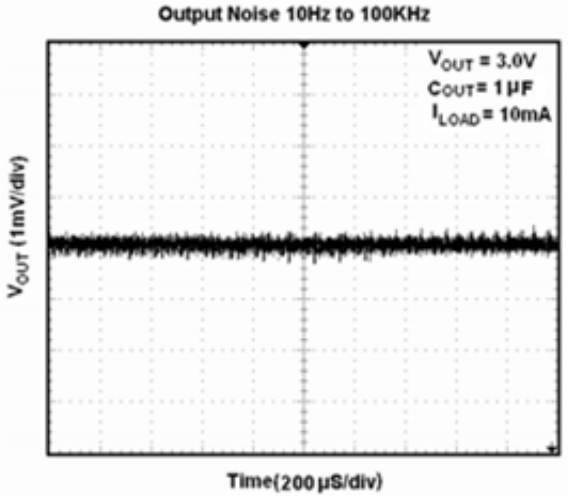



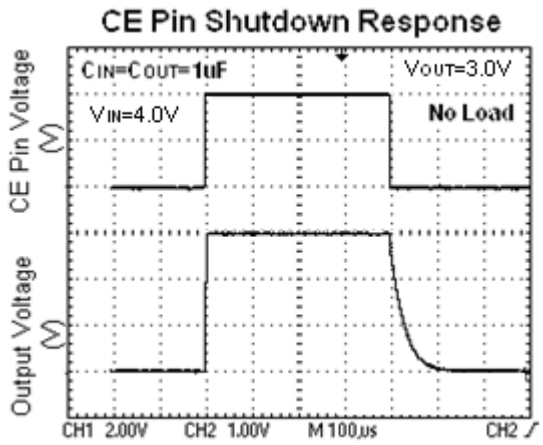



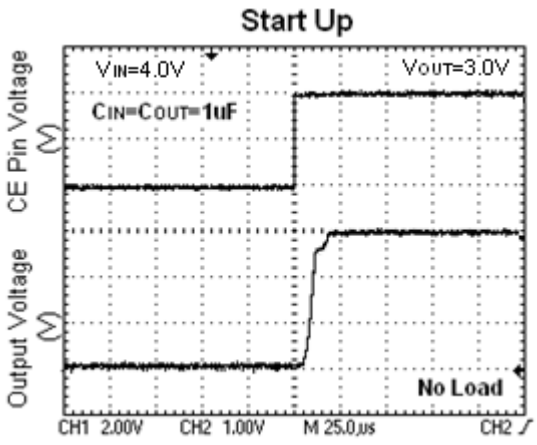



## Typical Characteristics (Continued)




## ■ APPLICATION INFORMATION

**Setting The Output Voltage**

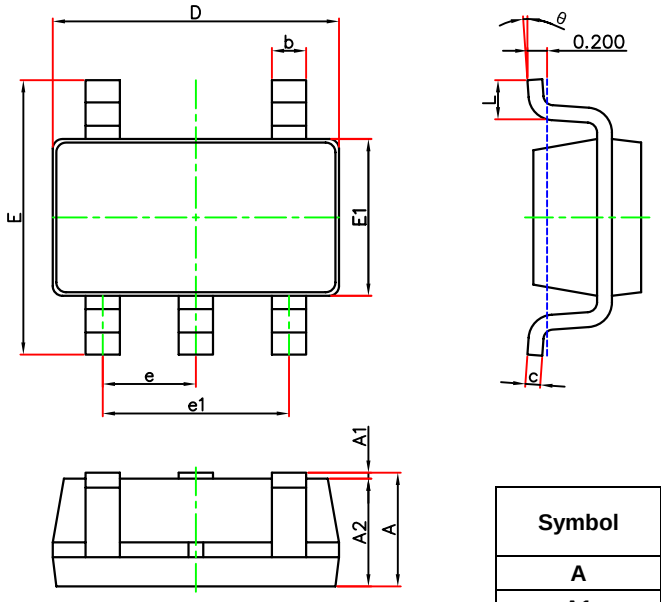
Figure 1 shows the typical application circuit with CJ6300 . The external resistor sets the output voltage according to the following equation:

$$V_{OUT} = 0.6V \times \left(1 + \frac{R1}{R2}\right)$$

Table 1.Resistor select for output voltage setting

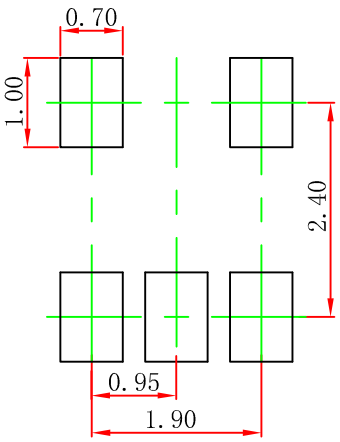
| $V_{OUT}$ | R1 | R2 |
|---|---|---|
| 1.2V | 30.1K | 30.1K |
| 1.5V | 45.3K | 30.1K |
| 1.8V | 60.4K | 30.1K |
| 2.5V | 95.3K | 30.1k |
| 2.8V | 110K | 30.1k |
| 3.0V | 120K | 30.1K |
| 3.3V | 137K | 30.1K |
| 5.0V | 221K | 30.1k |

## SOT-23-5L Package Outline Dimensions



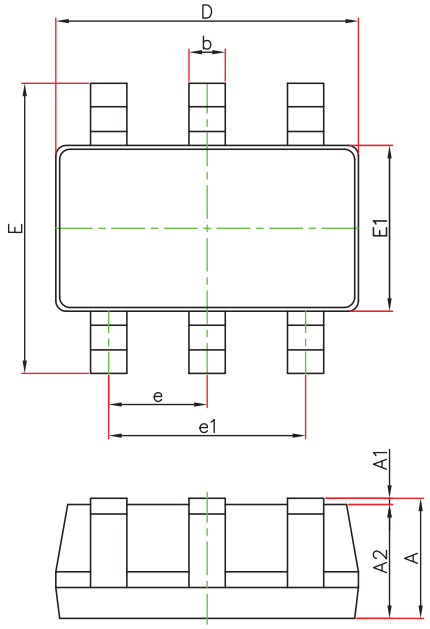

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E | 2.650 | 2.950 | 0.104 | 0.116 |
| E1 | 1.500 | 1.700 | 0.059 | 0.067 |
| 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° |

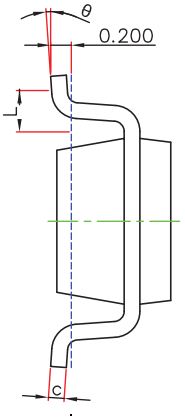
## SOT-23-5L Suggested Pad Layout




Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

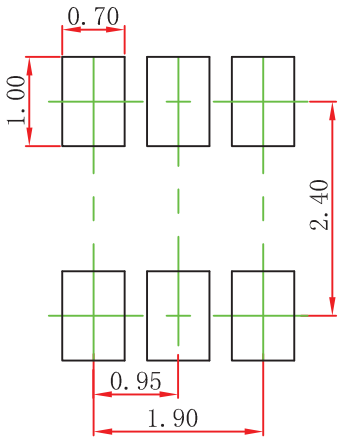
## SOT-23-6L Package Outline Dimensions



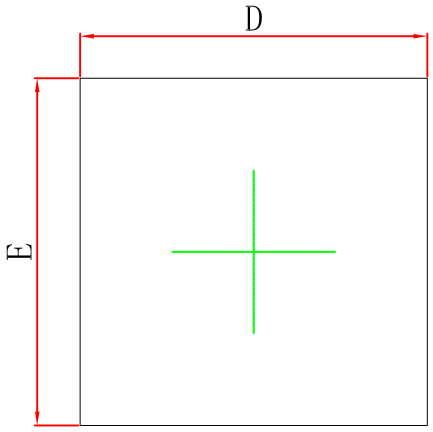

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E | 2.650 | 2.950 | 0.104 | 0.116 |
| E1 | 1.500 | 1.700 | 0.059 | 0.067 |
| 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° |

## SOT-23-6L Suggested Pad Layout

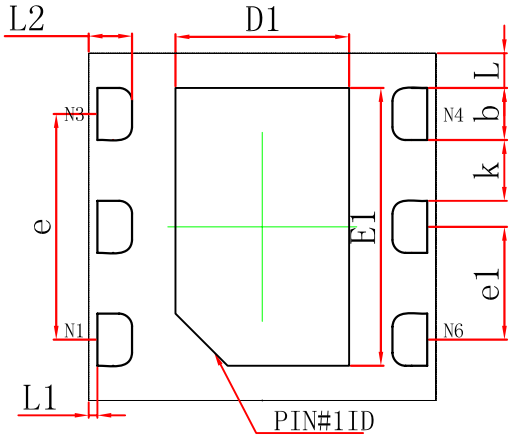



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

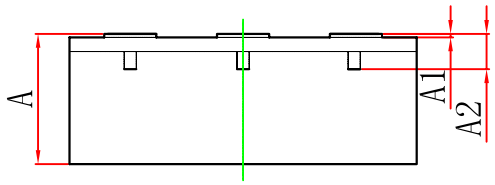
## WBHFBP-06L Package Outline Dimensions




Top View




Bottom View




Side View

| Symbol | Dimensions In Millimeters | | Dimension In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 0.700 | 0.800 | 0.028 | 0.031 |
| A1 | 0.000 | 0.050 | 0.000 | 0.002 |
| A2 | 0.203REF | | 0.008REF | |
| D | 1.950 | 2.050 | 0.077 | 0.081 |
| E | 1.950 | 2.050 | 0.077 | 0.081 |
| D1 | 0.950 | 1.050 | 0.037 | 0.041 |
| E1 | 1.550 | 1.650 | 0.061 | 0.065 |
| b | 0.250 | 0.350 | 0.010 | 0.014 |
| e | 1.300REF | | 0.051REF | |
| e1 | 0.650BSC | | 0.026BSC | |
| k | 0.350REF | | 0.014REF | |
| L | 0.200REF | | 0.008REF | |
| L1 | 0.050REF | | 0.002REF | |
| L2 | 0.200 | 0.300 | 0.008 | 0.012 |

# DISCLAIMER

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