

# A High Accuracy and Configurable Voltage (1.2/1.8/2.5/3.3V) Bandgap Reference with Base Current Compensation for DC-DC Converters

Hao Zhou<sup>1</sup>, Yuanfei Wang<sup>2</sup>, and Hao Min<sup>1</sup>

<sup>1</sup>Fudan University

<sup>2</sup>Zhuhai UM Science & Technology Research Institute

May 18, 2022

## Abstract

Presented is an improved bandgap reference, which has the performance of high accuracy and can generate the required voltage reference. In this bandgap reference, the improved base current compensation is proposed to eliminate the effect of the base current. Meanwhile, a high reference voltage generator is used to provide configurable output voltages of 1.2/1.8/2.5/3.3V needed by DC-DC converters. The bandgap reference is realized in a standard 180nm CMOS process with an area of 0.05 mm $\times$ mm. Among the 5 sample chips of the reference, in the temperature range of -40 oC to 125 oC, the temperature coefficients of all the reference voltages range from 3 ppm/oC to 38 ppm/oC. The best average value of temperature coefficients is 6.03 ppm/oC when the reference voltage is 2.5V. The best line sensitivities (LS) is 0.23%/V when the reference voltage is 1.8V with the power consumption of 150 $\mu$ W@VDD=5V;

## Hosted file

A High Accuracy and Configurable Voltage (1.2 1.8 2.5 3.3V) Bandgap Reference with Base Current Compensation is available at <https://authorea.com/users/483389/articles/569529-a-high-accuracy-and-configurable-voltage-1-2-1-8-2-5-3-3v-bandgap-reference-with-base-current-compensation-for-dc-dc-converters>