

gustav / August 27, 2010 11:02AM

[\[IC Design\] NCKU Innovates the IC Chip of the Lowest Power Consumption in the World](#)[IC Design] NCKU Innovates the IC Chip of the Lowest Power Consumption in the World ([Chinese Version](#))

NCKU Realtime News (2010/08/26) National Cheng Kung University (NCKU) keeps making breakthroughs in energy-saving IC design techniques. The research team led by Soon-Jyh CHANG, Associate Professor, Department of Electrical Engineering, NCKU, has recently presented three innovating IC design techniques, which can reduce 80% of the power consumption comparing to the traditional IC chips. The related findings have been presented in the IC Oscar – IEEE International Solid-State Circuits Conference (ISSCC), Symposium VLSI and DAC respectively.

The team focuses on one specific type of data converter – the successive-approximation analog-to-digital converter (ADC), which is advantageous for its high power efficiency and low size requirement. The team has presented several structural and circuit modifications upon the basis of the model, greatly elevating the operation speed, accuracy, and even the power efficiency. For instance, the team's design "Monotonic Capacitor Switching Procedure" can reduce 80% of the power consumption than the traditional, prolonging the operation and standby duration of the electrical devices.

These theories have also been verified through actual validations, through which the designs have been proved to effectively increase the operation speed and to reduce the power consumption. The circuit design techniques innovated by the team have excellent effectiveness validations as well and have been patented in the U.S. and in the R.O.C (Taiwan).

The three innovating IC design techniques presented by CHANG's team are: Monotonic Capacitor Switching Procedure, Binary-Scaled Error Compensation, and Switching Procedure with Variable Window Function, with all of which the accuracy, speed and power efficiency of IC chips can be greatly enhanced. Each of the techniques has made the lowest power consumption record in the world, and been presented in top international conferences. Among them, Binary-Scaled Error Compensation has been presented in the IC Oscar – IEEE International Solid-State Circuits Conference (ISSCC), which is regarded as an important index of the global development of solid-state circuits technology and semiconductor technology.

Further Information:

[NCKU Realtime News 2010/08/26](#) (Chinese)

Edited 1 time(s). Last edit at 08/27/2010 11:03AM by gustav.

---