[0009] To realize the object, the invention provides a full swing voltage conversion circuit, comprising:

[0010] an input terminal for inputting a first level signal;

[0011] an output terminal for outputting a second level signal;

[0012] a differential input unit for inverting the first level signal of the input terminal, and outputting a differential input signal;

[0013] a conversion unit for converting a first level of the differential input signal into the second level signal, wherein the conversion unit comprises a current mirror; and

[0014] an output driving unit for outputting the second level signal to the output terminal;

[0015] wherein the full swing voltage conversion circuit further comprises an auxiliary pull-down unit, which is set between the input terminal and a gate node of the current mirror of the conversion unit for receiving a feedback signal from the output driving unit and the first-level signal; and

[0015a] wherein when the first-level signal jumps from low to high, the auxiliary pull-down unit conducts to form a pull-down path independent of the conversion unit, accelerating the voltage pull-down at the gate node of the current mirror to drive the second-level signal to rise rapidly.

[0016] In the full swing voltage conversion circuit, capability of the conversion unit in recognizing the differential input unit is improved by auxiliary pull-down paths of the conversion unit formed by the auxiliary pull-down unit in a turn-on state.

[0017] In the full swing voltage conversion circuit, the auxiliary pull-down unit comprises two or more transistors sequentially connected in series.

[0018] In the full swing voltage conversion circuit, the auxiliary pull-down unit comprises a first NMOS transistor and a second NMOS transistor connected in series.

[0019] In the full swing voltage conversion circuit, a gate electrode of the first NMOS transistor is connected to an input signal, and a gate electrode of the second NMOS transistor is connected to the output driving unit.

WHAT IS CLAIMED IS:

1. A full swing voltage conversion circuit, comprising:

an input terminal for inputting a first level signal;

an output terminal for outputting a second level signal;

a differential input unit for inverting the first level signal of the input terminal, and outputting a differential input signal;

a conversion unit for converting a first level of the differential input signal into the second level signal, wherein the conversion unit comprises a current mirror; and

an output driving unit for outputting the second level signal to the output terminal;

wherein the full swing voltage conversion circuit further comprises an auxiliary pull-down unit, which is set between the input terminal and a gate node of the current mirror of the conversion unit for receiving a feedback signal from the output driving unit and the first-level signal; and

wherein when the first-level signal jumps from low to high, the auxiliary pull-down unit conducts to form a pull-down path independent of the conversion unit, accelerating the voltage pull-down at the gate node of the current mirror to drive the second-level signal to rise rapidly.

2. The full swing voltage conversion circuit according to claim 1, wherein capability of the conversion unit in recognizing the differential input unit is improved by auxiliary pull-down paths of the conversion unit formed by the auxiliary pull-down unit in a turn-on state.

3. The full swing voltage conversion circuit according to claim 2, wherein the auxiliary pull-down unit comprises two or more transistors sequentially connected in series.

4. The full swing voltage conversion circuit according to claim 3, wherein the auxiliary pull-down unit comprises a first NMOS transistor and a second NMOS transistor connected in series.

5. The full swing voltage conversion circuit according to claim 4, wherein a gate electrode of the first NMOS transistor is connected to the first level signal of the input terminal, and a gate electrode of the second NMOS transistor is connected to the feedback signal of the output driving unit.

6. The full swing voltage conversion circuit according to claim 5, wherein the output driving unit comprises a first inverter and a second inverter connected in series, and an output terminal of the first inverter outputs the feedback signal.

7. A data operation unit, comprising a control circuit, an operational circuit, a memory circuit and a plurality of full swing voltage conversion circuits interconnected with each other, wherein the plurality of full swing voltage conversion circuits are the full swing voltage conversion circuit according to any one of claims 1 to 6.

8. A chip, comprising any one of the data operation units according to claim 7.

9. A hash board for a computing device, comprising any one of the chips according to claim 8.

10. A computing device, comprising a power supply board, a control board, a connection board, a radiator and a plurality of hash boards, the control board connected to

the hash boards through the connection board, the radiator provided around the hash boards, and the power supply board configured to supply a power supply for the connection board, the control board, the radiator and the hash boards, wherein the hash board is any one of the hash boards according to claim 9.