501 and 601, are designed with a delay function. Speed is reduced by using high threshold devices, electric leakage and transmission speed are reduced by using a small size, and transmission speed is slowed by using layout of parasitic resistor and capacitor, such that holding time of the dynamic D flip-flops can be reduced. Alternatively, the clock buffer of the dynamic D flip-flops is designed by a high speed unit, and comprises at least one cascaded clock buffer unit. Driving capability is strengthened by using low threshold voltage devices and increasing size of the devices. Driving balance between loads is balanced, and an overall driving speed is improved using the scheme of reasonably distributing clock delay, thereby reducing holding time of the dynamic D flip-flops.

[0097] It shall be noted that the dynamic D flip-flops shown in FIGS. 4A-4D also can be applied in multi-parallel connection. Each of the dynamic D flip-flops comprises an input terminal and an output terminal, and receives external clock signals through the clock buffer, and the clock signals CLKP and CLKN are supplied to each dynamic D flip-flop after the clock signals are buffered.

[0098] Hereinafter working principle of the dynamic D flip-flop according to the invention is explained in details.

[0099] FIG. 5A is an equivalent circuit diagram when the dynamic D flip-flop of the invention writes data, and FIG. 5B is an equivalent circuit diagram when data of the dynamic D flip-flop of the invention are in a holding state.

[00100] As shown in FIGS. 4A, 4B, 4C, 4D and 5A, when CLKP is a high level and CLKN is a low level, the transistors controlled by the clock in the three-state inverters 502 and 602 are turned on, and data transmitted from the transmission gates 501 and 601 are written into a parasitic capacitor 100. When input data are “0”, the PMOS transistors 510, 511, 610 and 611 of the three-state inverters 502 and 602 are in a turn-on state to form pull-up paths to charge the parasitic capacitor 100, the second nodes 551 and 651 become a high.