

Although SystemC is considered the most promising language for system-on-chip functional modeling, it doesn't come with power modeling capabilities. This work presents PowerSC, a novel power estimation framework which instruments SystemC for power characterization, modeling and estimation. Since it is entirely based on SystemC, PowerSC allows consistent power modeling from the highest to the lowest abstraction level. Besides, the framework's API provides facilities to integrate alternative modeling techniques, either at the same or at different abstraction levels. As a result, the required power evaluation infrastructure is reduced to a minimum: the standard SystemC library, the PowerSC library itself and a C++ compiler. Experimental results show both the effectiveness and the efficiency of our framework. On the one hand, two well-known macromodeling techniques were easily integrated into the framework, leading to acceptable average errors at the RT level. On the other hand, library characterization was more than 13times faster as compared to a typical industrial flow.