

27. Typical Characteristics

The following charts show typical behavior. These figures are not tested during manufacturing. All current consumption measurements are performed with all I/O pins configured as inputs and with internal pull-ups enabled. A square wave generator with rail-to-rail output is used as clock source.

All Active- and Idle current consumption measurements are done with all bits in the PRR register set and thus, the corresponding I/O modules are turned off. Also the Analog Comparator is disabled during these measurements. The ["Supply Current of IO Modules" on page 334, page 358 and page 382](#) shows the additional current consumption compared to I_{CC} Active and I_{CC} Idle for every I/O module controlled by the Power Reduction Register. See ["Power Reduction Register" on page 42](#) for details.

The power consumption in Power-down mode is independent of clock selection.

The current consumption is a function of several factors such as: operating voltage, operating frequency, loading of I/O pins, switching rate of I/O pins, code executed and ambient temperature. The dominating factors are operating voltage and frequency.

The current drawn from capacitive loaded pins may be estimated (for one pin) as $C_L \cdot V_{CC} \cdot f$ where C_L = load capacitance, V_{CC} = operating voltage and f = average switching frequency of I/O pin.

The parts are characterized at frequencies higher than test limits. Parts are not guaranteed to function properly at frequencies higher than the ordering code indicates.

The difference between current consumption in Power-down mode with Watchdog Timer enabled and Power-down mode with Watchdog Timer disabled represents the differential current drawn by the Watchdog Timer.