

27.1.3 Supply Current of IO Modules

The tables and formulas below can be used to calculate the additional current consumption for the different I/O modules in Active and Idle mode. The enabling or disabling of the I/O modules are controlled by the Power Reduction Register. See ["Power Reduction Register" on page 42](#) for details.

Table 27-1. Additional Current Consumption for the different I/O modules (absolute values)

PRR bit	Typical numbers		
	V _{CC} = 2V, F = 1MHz	V _{CC} = 3V, F = 4MHz	V _{CC} = 5V, F = 8MHz
PRUSART0	5.58 uA	35.6 uA	136.5 uA
PRTWI	8.97 uA	57.0 uA	231.5 uA
PRTIM2	9.84 uA	64.7 uA	263.5 uA
PRTIM1	9.80 uA	62.8 uA	247.9 uA
PRTIM0	2.31 uA	15.3 uA	60.9 uA
PRSPI	7.88 uA	51.9 uA	215.7 uA
PRADC	9.35 uA	60.5 uA	237.7 uA

Table 27-2. Additional Current Consumption (percentage) in Active and Idle mode

PRR bit	Additional Current consumption compared to Active with external clock (see Figure 27-1 on page 329 and Figure 27-2 on page 329)	Additional Current consumption compared to Idle with external clock (see Figure 27-6 on page 331 and Figure 27-7 on page 332)
PRUSART0	1.9%	9.1%
PRTWI	3.1%	14.8%
PRTIM2	3.5%	16.6%
PRTIM1	3.4%	16.1%
PRTIM0	0.8%	3.9%
PRSPI	2.8%	13.4%
PRADC	3.3%	15.5%

It is possible to calculate the typical current consumption based on the numbers from [Table 27-2 on page 334](#) for other V_{CC} and frequency settings than listed in [Table 27-1 on page 334](#).

Example

Calculate the expected current consumption in idle mode with TIMER1, ADC, and SPI enabled at V_{CC} = 2.0V and F = 1MHz. From [Table 27-2 on page 334](#), third column, we see that we need to add 16.1% for the TIMER1, 15.5% for the ADC, and 13.4% for the SPI module. Reading from [Figure 27-6 on page 331](#), we find that the idle current consumption is ~0.055 mA at V_{CC} = 2.0V and F = 1MHz. The total current consumption in idle mode with TIMER1, ADC, and SPI enabled, gives:

$$I_{CC\text{total}} \approx 0.055 \text{ mA} \cdot (1 + 0.161 + 0.155 + 0.134) \approx 0.080 \text{ mA}$$