Evaluation of a Low Frequency Clock Oscillation Circuit

SSP-T7-FL 4.4pF ATMEGA128A1-100P [TQFP(14x14) 0.5mm pitch]

SII

Measurement conditions : Vcc=1.6V to 3.6V

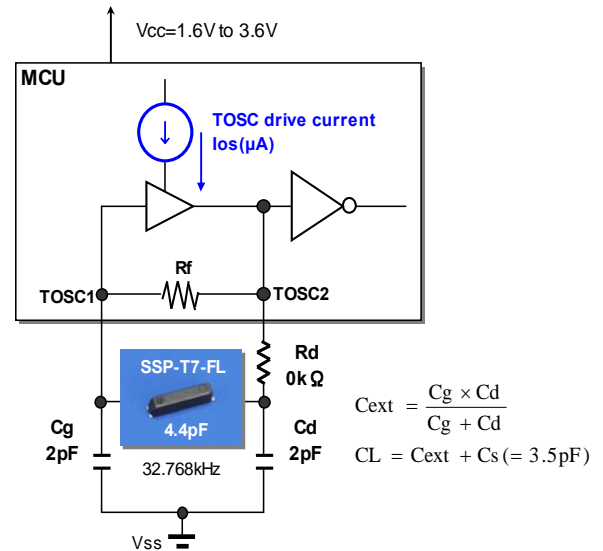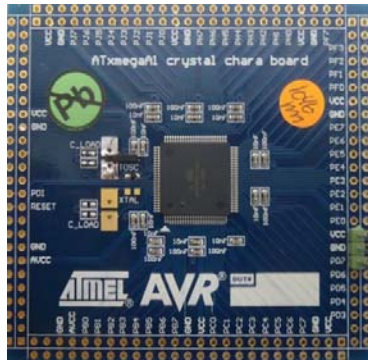**Ultra Low power consumption MCU**

XMEGA oscillation circuit and recommended load capacitance

AVR XMEGA : Ultra Low Power 32 kHz Crystal Oscillator

AVR XMEGA's Real Time Counter consumes only 500 nA while running from a 32.768 kHz Crystal Oscillator.

Minimize power consumption by clocking the RTC at 1kHz with an external crystal in low power mode.

SSP-T7 and VT-200 series

SSP-T7-FL CL=3.7pF,4.4pF,6.0pF and SSP-T7-F CL=7.0pF,9.0pF,12.5pF

VT-200-FL CL=3.7pF,4.4pF,6.0pF and VT-200-F CL=12.5pF

$$Cext = \frac{Cg \times Cd}{Cg + Cd}$$

$$CL = Cext + Cs (= 3.5pF)$$

Recommended CL resonator

As a result of our evaluation, our recommended resonators are CL=4.4pF as best, and CL=6.0pF as 2nd best, Low CL resonetor for ATXMEGA128A1 Low Mode. Table 1 shows that CL=4.4pF surpasses CL=6.0pF in all Osc.charactersitcs.

Table 1 Osc.characteristics CL=4.4pF and CL=6.0pF, Low CL resonator.

Mode	XTL	Vcc (V)	Ios (μA)	CL (pF)	Cg (pF) Cd (pF)	dF/Total [*1] ($*10^{-6}$)	Ts (sec.)	|-RL| (kΩ)	Osc. allowance
Low	SSP-T7-FL VT-200-FL	3.0	0.189	4.4	2 2	2.57	0.72	775	11.9
				6.0	5 5	2.86	1.22	480	7.4
		1.8	0.189	4.4	2 2	2.72	0.76	735	11.3
				6.0	5 5	2.92	1.27	460	7.1

*1 dF/Total=dF/Vcc(±10%) +dF/Cext(±5%)

Ultra Low Power consumption ATXMEGA128A1 and SSP-T7-FL
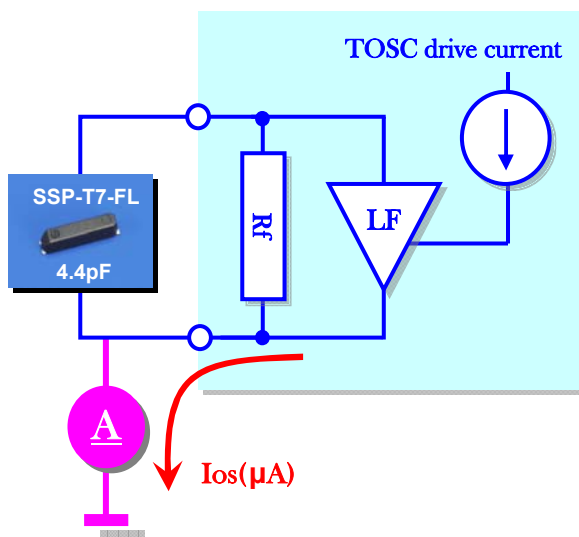
Voltage characteristics of TOSC drive current