26.4 Clock Characteristics

26.4.1 Calibrated Internal RC Oscillator Accuracy

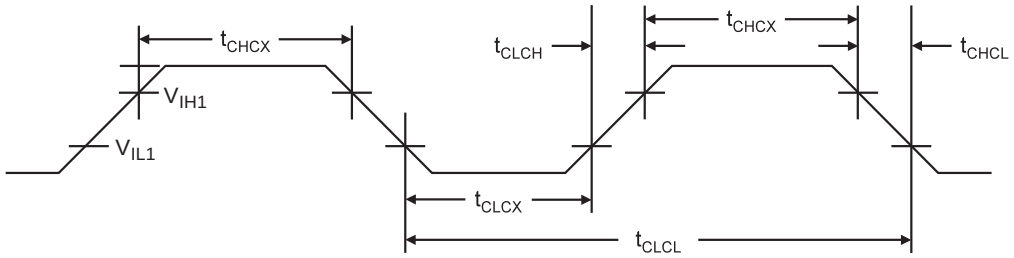
Table 26-1. Calibration Accuracy of Internal RC Oscillator

	Frequency	V_{CC}	Temperature	Calibration Accuracy
Factory Calibration	8.0 MHz	3V	25°C	±10%
User Calibration	7.3 - 8.1 MHz	1.8V - 5.5V(1) 2.7V - 5.5V(2)	-40°C - 85°C	±1%

Notes: 1. Voltage range for ATmega48PV/88PV/168PV/328PV.
2. Voltage range for ATmega48P/88P/168P/328P.

26.4.2 External Clock Drive Waveforms

Figure 26-4. External Clock Drive Waveforms



26.4.3 External Clock Drive

Table 26-2. External Clock Drive

Symbol	Parameter	V_{CC}=1.8-5.5V		V_{CC}=2.7-5.5V		V_{CC}=4.5-5.5V		Units
		Min.	Max.	Min.	Max.	Min.	Max.	
$1/t_{CLCL}$	Oscillator Frequency	0	4	0	10	0	20	MHz
t_{CLCL}	Clock Period	250		100		50		ns
t_{CHCX}	High Time	100		40		20		ns
t_{CLCX}	Low Time	100		40		20		ns
t_{CLCH}	Rise Time		2.0		1.6		0.5	µs
t_{CHCL}	Fall Time		2.0		1.6		0.5	µs
Δt_{CLCL}	Change in period from one clock cycle to the next		2		2		2	%

Note: All DC Characteristics contained in this datasheet are based on simulation and characterization of other AVR microcontrollers manufactured in the same process technology. These values are preliminary values representing design targets, and will be updated after characterization of actual silicon.