

10-40 MHz crystal oscillator

OVERVIEW

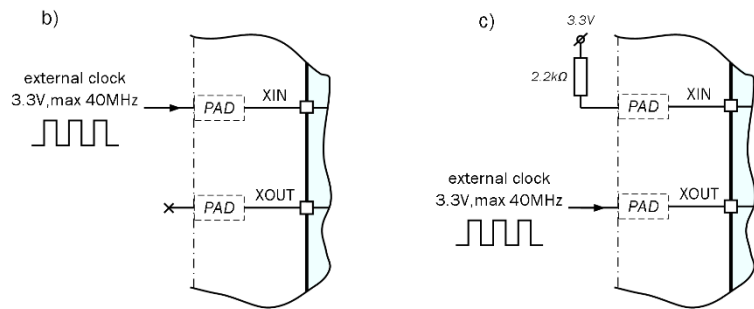
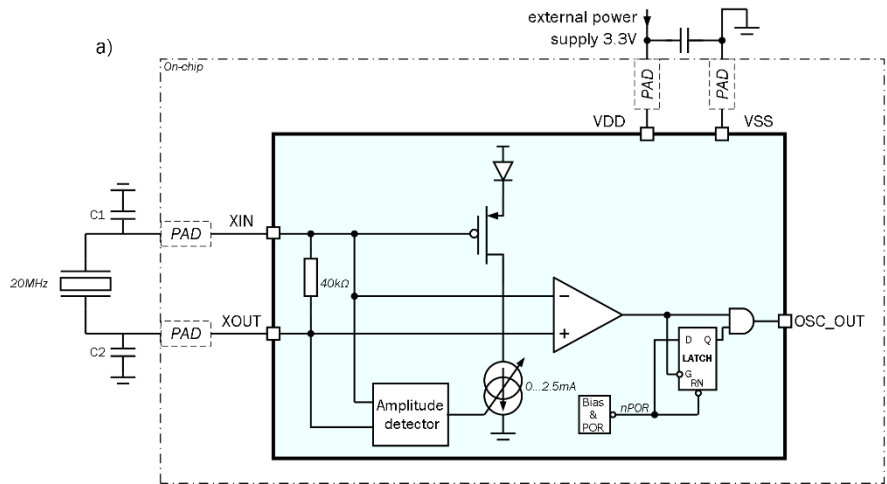
180GF_OSC_01 is a crystal oscillator with Pierce architecture. The block consists of a feedback amplifier, amplitude detector, reference source with POR signal and comparator for generating CMOS output signal. The POR signal allows to avoid clock glitches during power up.

The crystal oscillator has no external control and starts to operate after power-on.

Oscillator has 3 modes:

- quartz mode (a);
- bypass mode when external clock is applied to XIN (b);
- bypass mode when external clock is applied to XOUT (c).

IP technology: Global Foundries
 180nm MCU CMOS
 IP status: pre-silicon verification
 Total area: 0.1mm²



ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units	
			Min	Typ	Max		
Operating temperature range	T _j	-	-40	27	125	°C	
Power supply requirements							
Input supply voltage	VDD	-	2.97	3.3	3.63	V	
Input logic-high level	V _{IH}	-	VDD-0.3	-	VDD+0.3	V	
Input logic-low level	V _{IL}	-	0	-	0.3		
Current consumption	I _{cc}	quartz mode	F _{OSC} = 10MHz	-	1.4	2.2	mA
			F _{OSC} = 20MHz	-	1.5	2.3	
			F _{OSC} = 40MHz	-	2.4	3.2	
		bypass mode	clock is applied to XIN	-	3.4	4.1	
		clock is applied to XOUT	-	3.5	4.1		
Output							
Output frequency	F _{OSC}	quartz mode	10	-	40	MHz	
		bypass mode	-	-	40	MHz	
Output logic-high level	V _{OH}	-	VDD-0.3	-	VDD+0.3	V	
Output logic-low level	V _{OL}	-	0	-	0.3		
Frequency stability over the operating temperature	F _{TS}	-	-	-	50*	ppm	
Timing characteristics							
Duty cycle	DC _{OSC}	-	44.5	50	55.5	%	
Startup time	T _{start}	quartz mode	-	-	10	ms	
		bypass mode	-	170	220	us	

* Frequency stability of crystal oscillator is determined by external quartz crystal resonator.