

Ultra low power 32.768 kHz crystal oscillator

OVERVIEW

055UMC_OSC_01 is a crystal oscillator with Pierce architecture. The block implementation is optimized for very low power consumption.

The block consists of a feedback amplifier and buffers for generating CMOS output signal.

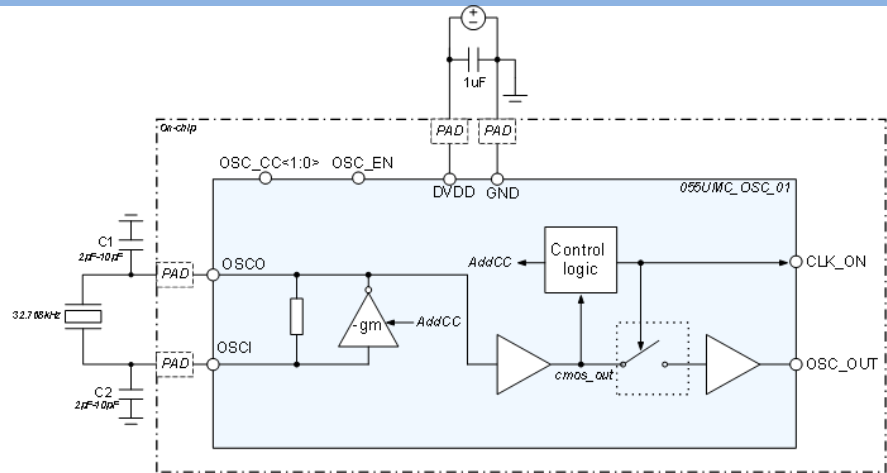
Current consumption adjustment is implemented by changing the feedback amplifier current.

Typical tuning range of total current consumption is from 0.25 μ A to 0.4 μ A.

IP technology: UMC 55nm eFlash CMOS technology.

IP status: pre-silicon verification.

Area: GDS value 0.0078mm².



ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units
			min	typ.	max	
Operating temperature range	T _j	-	-40	27	100	°C
Input supply voltage	DVDD	-	1.14	1.2	1.26	V
Input logic-high level	V _{IH}	For digital input	DVDD-0.1	-	DVDD+0.1	V
Input logic-low level	V _{IL}		0	-	0.2	
Current consumption	I _{CC}	OSC_CC = "00"	0.25	0.4	0.8	μ A
		OSC_CC = "01"	0.15	0.35	0.7	
		OSC_CC = "10"	0.12	0.3	0.6	
		OSC_CC = "11"	0.1	0.25	0.55	
Stand-by current	I _{std}	-	-	0.9	4.5	nA
Output frequency	F _{OSC}	-	-	32.768	-	kHz
Output signal high level	V _{OH}	-	DVDD-0.1	-	DVDD+0.1	V
Output signal low level	V _{OL}		0	-	0.2	
Output frequency accuracy	A _F	-	0.1	-	-	%
Duty cycle	DC _{OSC}	-	40	50	60	%
Frequency sensitivity to power supply	S _{DVDD}	-	-	70	-	ppm/V
Startup time	T _{start}	-	-	100	300	ms