Analog IP Cell

Low Power Realtime Clock

RTC32k XC10LV

SERMA PRODUCTIVITY ENGINEERING

General Description

The Realtime Clock analogue IP cell is a power optimized clock generator intended to be used in single battery cell powered watch applications. The cell comprises of the actual oscillator stage and a sinusoidal to square wave converter for digital clock generation.
For ensuring highest accuracy of the generated output frequency and to minimize the consumed power to the lowest possible level, the circuit uses an amplitude regulation loop to limit the amplitude of oscillation to a value of appr. 230mV.

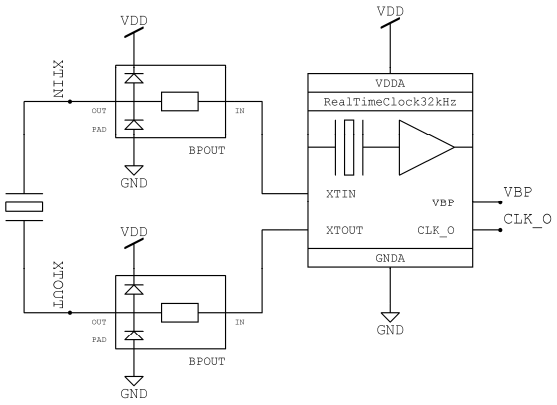
Ratings, Parameters and Conditions

Parameter / Condition	Symbol	Min	Typ.	Max	Unit	Comment
Electrical Parameters:						
Supply Voltage	V_{dd}	1.3	1.55	1.6	V	single cell
Active Supply Current	I_{dd}	105	160	400	nA	after final amplitude of oscillation is reached
Start Up Time	T_{SU}	300	650	2000	ms	depending on quartz quality factor and temperature
Oscillation Amplitude	V_{OSC}	100	230	300	mV	after start up
Frequency Accuracy			15		ppm	depending on quartz
Output Frequency	F_{CLK}		32768		Hz	depending on quartz; divider stages can derive 1s clock for watch applications
Absolute Maximum Ratings:						
Operating Temperature	T_{range}	-40		140	°C	
Supply Voltage	V_{dd}	-0.3		6	V	
Input Voltage	V_{in}	-0.3		V_{dd}+0.7		
Output Voltage	V_{out}	-0.3		V_{dd}+0.7		
Operating Conditions:						
Ambient Temperature	T_{amb}	-20	27	80	°C	

IO-Description

Interface	I/O	Function	Comment
GNDA	input	Supply	
VDDA	Input	Supply	
XTIN	InOut	Quartz	
XTOUT	InOut	Quartz	
VBP	Output	Bias Voltage	
CLK_O	Output	Clock Output	

Block schematic, ext. component diagram



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