Analog IP Cell
8kHz Low Power Real Time Clock
RTC8k XL035

General Description

Time is one of the elementary bases for signal acquisition and control. It's accurate generation with low power consumption is of high interest in many integrated circuits. Normally, a 32kHz low power crystal oscillator is used for clock generation with high accuracy and low current requirements. In cases where no external components (Quartz) are feasible or the ASIC pin count is limited, a monolithic RC oscillator like the cell presented here is the only way for clock generation.
The RTC8k real time clock uses an RC network to form a relaxation oscillator with a nominal frequency of 8.8kHz. For ensuring high accuracy (up to 2.5%), the oscillator is trimable by two 7Bit control words. The first one shifts the nominal operating frequency of the oscillator where the other one determines the temperature coefficient of the cell. The temperature dependent output frequency if a quadratic equation of the temperature having it's vertex at 25°C when trimmed correctly.
A connected digital divider can be used to generate common time bases like 1Hz or 1/60Hz.

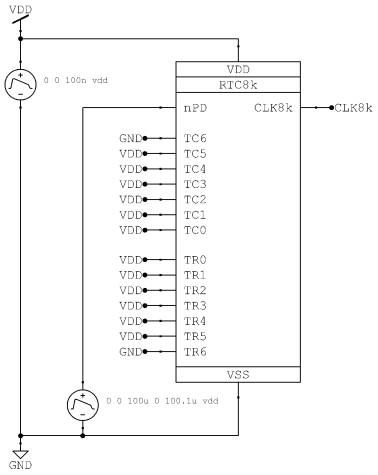
Ratings, Parameters and Conditions

Parameter / Condition	Symbol	Min	Typ.	Max	Unit	Comment
Electrical Parameters:						
Supply Voltage	V_{dd}	1.1	1.5	1.6	V	
Supply Current	I_{dd}	800	865	900	nA	@ 63,63 trim setting
Output Clock Frequency	F_{CLK}	8750	8880	8980	Hz	-20°C to 50°C
Power Up Time	$T_{startup}$		1		ms	
Temperature Coefficient	TC		450		ppm	-20°C to 50°C
Overall Accuracy after Trim	$F_{CLKDELTA}$		2.5		%	
Specified Temperature Range	T_{amb}	-20	27	50	°C	accuracy ensured in this range
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
VSS	input	Supply	
VDD	Input	Supply	
CLK8k	Output	Clock Signal	
TC0-TC6	Input	Temperature Co-efficient trim word	
TR0-TR6	Input	Trim word	

Block schematic, ext. component diagram



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