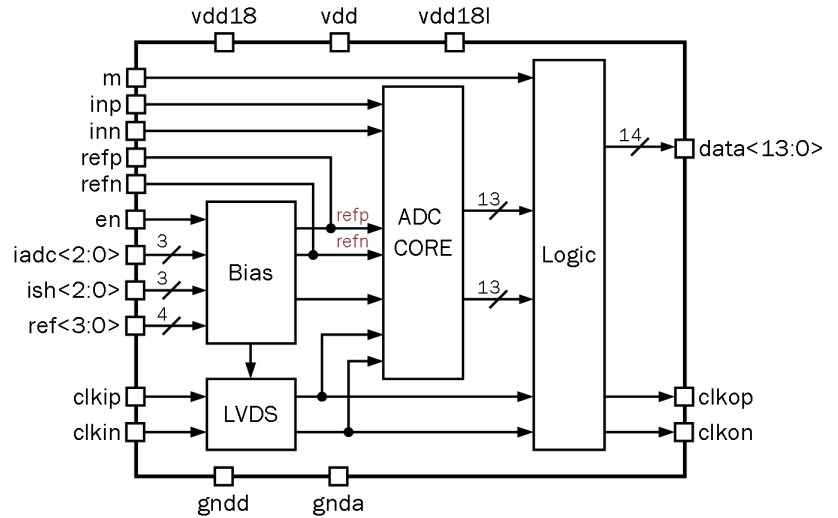


14-bit 1-channel 50 MSPS pipeline ADC

OVERVIEW

090TSMC_ADC_05 is a high-speed 14-bit ADC employs a high-performance differential pipeline architecture. The block consists of a core ADC, LVDS clock receiver, output logic block, reference voltages and currents circuit. The output block aligns intermediate data at each stage, forms output code, and passes completed data to the output buffers. The ADC requires 1.62 ÷ 1.98V analog supply and 0.9 ÷ 1.1V, 1.62 ÷ 1.98V digital supply voltages. This block supports standby mode which allows state with minimum power consumption. There is also the ability to configure the operating modes of the ADC with digital registers: register **ref<3:0>** controls the differential reference voltages, register **ish<2:0>** adjusts current of the sample and hold, register **iadc<2:0>** adjusts current of the core ADC.



IP technology: TSMC CMOS 90nm.

IP status: silicon proven.

Area: 0.84mm².

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units
			min	typ.	max	
Analog blocks supply voltage	V _{dd18}	–	1.62	1.8	1.98	V
Digital blocks supply voltage	V _{dd18l}	–	1.62	1.8	1.98	V
	V _{dd}	–	0.9	1	1.1	V
Operating temperature range	T	–	-40	+27	+125	°C
Resolution	N	–	–	14	–	bit
Sample rate	F _s	–	–	50	–	MSPS
Bandwidth	BW	–	–	300	–	MHz
Current consumption	I _{cc}	@V _{dd18}	82	90	97.5	mA
		@V _{dd18l}	4.1	5	6	mA
		@V _{dd}	–	100	–	µA
Standby current	I _{stb}	–	–	5	µA	
Reference voltages for the input signal	V _{REF+}	–	1.31	1.43	1.51	V
	V _{REF-}	–	0.37	0.41	0.44	V
Differential peak-to-peak input voltage range	A _{IN d p-p}	–	–	2	–	V
Input common mode voltage	U	–	0.5V _{dd18} -0.1V	0.5V _{dd18}	0.5V _{dd18} +0.1V	V
Total harmonic distortion	THD	F _{IN} = 1.5625MHz	–	-76	-80	dB
		F _{IN} = 2.34375MHz	–	-68	-80	
		F _{IN} = 51.5625MHz	–	-58.9	-80	
Signal-to-noise ratio	SNR	F _{IN} = 1.5625MHz	–	64	67	dB
		F _{IN} = 2.34375MHz	–	62	67	
		F _{IN} = 51.5625MHz	–	52.8	67	
Spurious free dynamic range	SFDR	F _{IN} = 1.5625MHz	–	77	82	dB
		F _{IN} = 2.34375MHz	–	68.1	82	
		F _{IN} = 51.5625MHz	–	59.9	82	
High level input voltage	V _{IH}	For digital inputs	0.7	–	–	V
Low level input voltage	V _{IL}	For digital inputs	–	–	0.3	V