

## 14-bit 1-channel 100/125 MSPS pipeline ADC

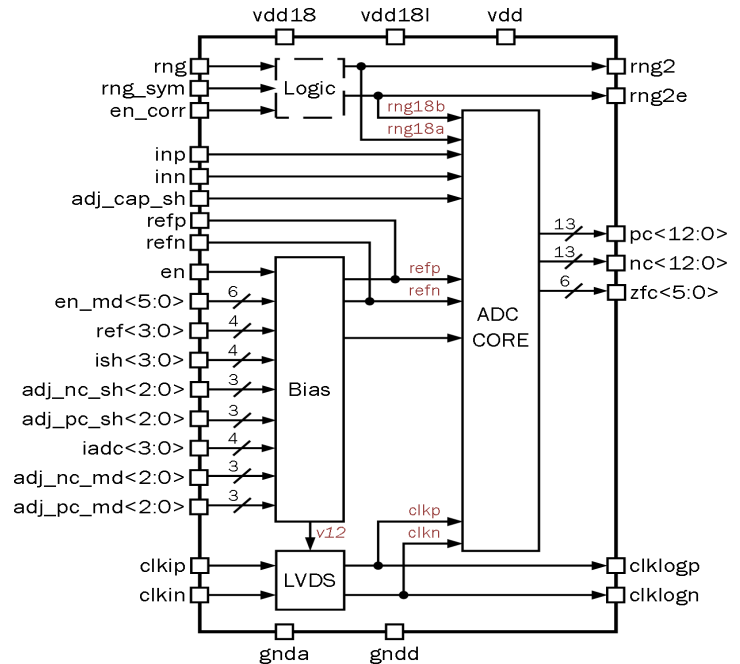
### OVERVIEW

090TSMC\_ADC\_04 is a high-speed 14-bit ADC, employs a high-performance differential pipeline architecture. The block consists of a core ADC, LVDS clock receiver, reference voltages and currents circuit. 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<3:0>** adjusts current of the sample and hold, register **iadc<3:0>** adjusts current of the core ADC.

IP technology: TSMC CMOS 90nm.

IP status: silicon proven.

Area: 1.24mm<sup>2</sup>.



### ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units	
			min	typ.	max		
Analog blocks supply voltage	$V_{dd18}, V_{dd18l}$	–	1.62	1.8	1.98	V	
Digital blocks supply voltage	$V_{dd}$	–	0.9	1	1.1	V	
Operating temperature range	$T_j$	–	-40	+27	+125	°C	
Current consumption	$I_{dd}$	@ $V_{dd18}$	–	263	–	mA	
		@ $V_{dd18l}$	–	17.7	–	mA	
		@ $V_{dd}$	–	25	–	uA	
Standby current	$I_{stb}$	–	–	10	–	uA	
Resolution	N	–	–	14	–	bit	
Sample rate	$F_s$	–	–	100/125	–	MSPS	
Bandwidth	BW	–	–	355	–	MHz	
Reference voltages for the input signal	$V_{REF+}$	–	1.31	1.42	1.51	V	
	$V_{REF-}$	–	0.31	0.4	0.47		
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	$F_s=100MSPS$	$F_{IN} = 1.5625MHz$	–	-71	-73	dB
			$F_{IN} = 2.3437MHz$	–	-58.5	-73	
		$F_s=125MSPS$	$F_{IN} = 1.5625MHz$	–	-65.2	-70	
			$F_{IN} = 2.3437MHz$	–	-59.7	-70	
Signal-to-noise ratio	SNR	$F_s=100MSPS$	$F_{IN} = 1.5625MHz$	–	62	64	dB
			$F_{IN} = 2.3437MHz$	–	60.5	64	
		$F_s=125MSPS$	$F_{IN} = 1.5625MHz$	–	59.2	63	
			$F_{IN} = 2.3437MHz$	–	56.1	63	
Spurious free dynamic range	SFDR	$F_s=100MSPS$	$F_{IN} = 1.5625MHz$	–	73.3	76	dB
			$F_{IN} = 2.3437MHz$	–	58.9	76	
		$F_s=125MSPS$	$F_{IN} = 1.5625MHz$	–	66.3	71	
			$F_{IN} = 2.3437MHz$	–	60.3	71	
High level input voltage	$V_{IH}$	For digital inputs	0.7	–	–	V	
Low level input voltage	$V_{IL}$		–	–	0.3	V	