12-bit 1-channel 44/70/90 MSPS pipeline ADC

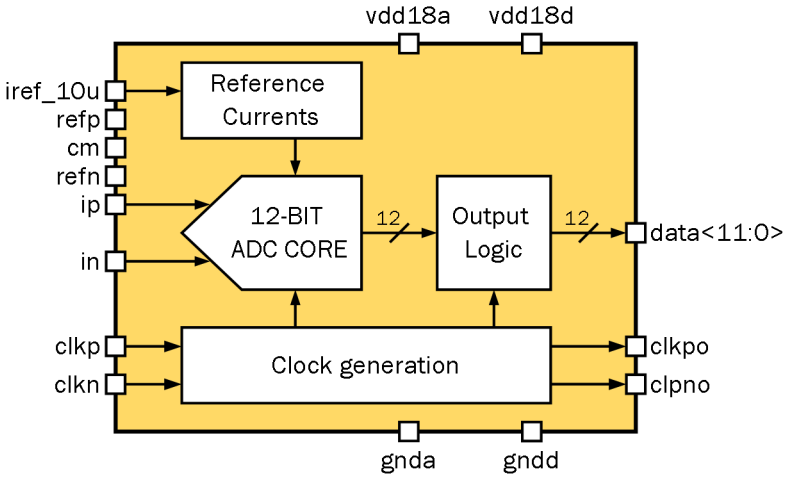
OVERVIEW

180XFAB_ADC_13 is a low-power high-speed 12-bit ADC that employs high-performance differential pipeline architecture. The ADC consists of a core ADC, output logic, timing generation, reference currents circuits. The ADC requires: 1.7 ÷ 2 V analog supply, 1.7 ÷ 2 V digital supply, differential reference voltages 1.15 V and 0.65 V, common mode voltage 0.85 ÷ 1 V, reference current 9.9 ÷ 10.1 uA and differential input clock. The ADC supports standby mode which allows state with minimum power consumption. There is also the ability to configure the operating modes of the ADC by using digital registers.

IP technology: TSMC 180nm CMOS.

IP status: silicon proven.

Area: 1.44mm^2.



ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions		Value min	Value typ.	Value max	Units
Analog blocks supply voltage	V_{dd18a}	-		1.7	1.8	2	V
Digital blocks supply voltage	V_{dd18d}	-		1.7	1.8	2	V
Junction temperature	T_j	-		-40	+27	+85	°C
Reference current	I_{REF}	-		9.9	10	10.1	uA
Resolution	N	-		-	12	-	bit
Sample rate	F_S	-		-	44	90	MHz
Standby current	I_{STB}	V_{dd18a} + V_{dd18d}		-	0.2	-	uA
Full power bandwidth	BW	-		-	45	-	MHz
Current consumption	I_{CC}	V_{dd18a} + V_{dd18d}, F_S = 44 MHz		-	33	-	mA
		V_{dd18a} + V_{dd18d}, F_S = 70 MHz		-	47	-	
		V_{dd18a} + V_{dd18d}, F_S = 90 MHz		-	59	-	
Total power consumption	P_{TOTAL}	V_{dd18a} + V_{dd18d}, F_S = 44 MHz		-	59.4	-	mW
		V_{dd18a} + V_{dd18d}, F_S = 70 MHz		-	84.6	-	
		V_{dd18a} + V_{dd18d}, F_S = 90 MHz		-	106.2	-	
Input common mode voltage	V_{CM}	-		-	0.5 V_{dd18a}	-	V
Differential reference voltages	V_{REFP}	-		-	V_{CM} +0.25	-	V
	V_{REFN}	-		-	V_{CM} - 0.25	-	
Spurious free dynamic range	SFDR	F_S = 44 MHz	F_{IN} = 1.9 MHz	70.9	72.7	73.3	dB
			F_{IN} = 5 MHz	69.2	72.1	73	
		F_S = 70 MHz	F_{IN} = 1.9 MHz	70.5	73	75	
			F_{IN} = 5 MHz	67	67.5	70	
		F_S = 90 MHz	F_{IN} = 1.9 MHz	-	74.6	-	
			F_{IN} = 5 MHz	-	71.1	-	
Signal-to-noise ratio	SNR	F_S = 44 MHz	F_{IN} = 1.9 MHz	61.5	61.6	62.2	dB
			F_{IN} = 5 MHz	61.4	61.5	62.9	
		F_S = 70 MHz	F_{IN} = 1.9 MHz	61.7	62.4	62.7	
			F_{IN} = 5 MHz	59.3	59.4	59.7	
		F_S = 90 MHz	F_{IN} = 1.9 MHz	-	61.6	-	
			F_{IN} = 5 MHz	-	61.6	-	
Differential nonlinearity	DNL	F_S = 44 MHz	F_{IN} = 1.9 MHz	-	0.89	-	LSB
		F_S = 70 MHz		-	1.09	-	LSB
Integral nonlinearity	INL	F_S = 44 MHz	F_{IN} = 1.9 MHz	-	2.84	-	LSB
		F_S = 70 MHz		-	2.17	-	LSB
Input logic high level	V_{IH}	For digital inputs		0.7 V_{dd18d}	-	V_{dd18d}	V
Input logic low level	V_{IL}			0	-	0.3 V_{dd18d}	V