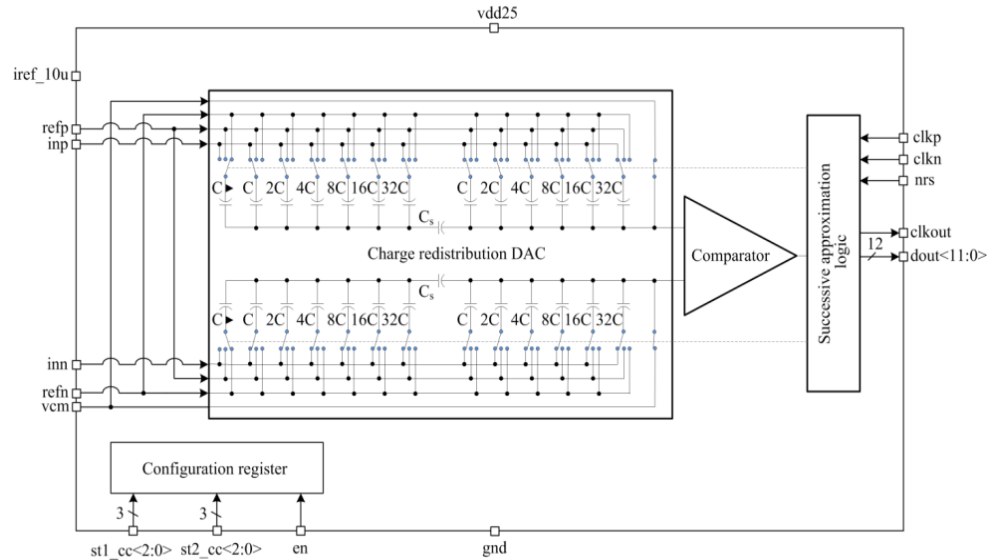


12-bit 1-channel 4 MSPS SAR ADC

OVERVIEW

065TSMC_ADC_10 employs high-performance differential successive approximation architecture with sub-ranging and output offset compensation techniques. The ADC operates with sampling rate up to 4 MSPS and a corresponding input clock up to 52 MHz. The ADC supports standby mode and features low power consumption, compact area. IP technology: TSMC CMOS 65 nm. IP status: silicon proven. Area: 0.124mm².



ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units	
			min	typ.	max		
Supply voltage	V_{dd25}	-	2.25	2.5	2.75	V	
Operating temperature range	T_j	-	-40	+27	+85	°C	
Analog current consumption	I_{CC}	$F_S = 1.5$ MSPS	-	0.75	-	mA	
		$F_S = 2.5$ MSPS	-	0.85	-	mA	
		$F_S = 4$ MSPS	-	1	-	mA	
Current consumption in standby mode	I_{CC_STB}	-	-	50	-	nA	
Reference current	I_{REF}	-	9.9	10	10.1	uA	
Positive voltage reference	V_{REFP}	-	-	1.75	-	V	
Negative voltage reference	V_{REFN}	-	-	0.75	-	V	
Common-mode voltage reference	V_{CM}	-	-	1.25	-	V	
Total power consumption	P_{CN}	$F_S = 1.5$ MSPS	-	1.9	-	mW	
		$F_S = 2.5$ MSPS	-	2.1	-	mW	
		$F_S = 4$ MSPS	-	2.5	-	mW	
Resolution	N	-	-	12	-	bit	
Differential full-scale range	A_{IN_p-p}	-	-	2	-	V	
Input common-mode voltage	V_{CM_IN}	-	-	1.25	-	V	
Input clock	F_{CLK}	-	1	-	52	MHz	
Sampling rate	F_S	-	0.1	-	4	MSPS	
Duty cycle	S	-	45	-	55	%	
Signal-to-noise ratio	SNR	$F_S = 1.5$ MSPS	$F_{IN} = 5$ MHz	-	57.4	-	dB
			$F_{IN} = 10.7$ MHz	-	55.4	-	dB
		$F_S = 2.5$ MSPS	$F_{IN} = 5$ MHz	-	56.2	-	dB
			$F_{IN} = 10.7$ MHz	-	54.7	-	dB
		$F_S = 4$ MSPS	$F_{IN} = 5$ MHz	-	52.5	-	dB
			$F_{IN} = 10.7$ MHz	-	53.5	-	dB
Spurious-free dynamic range	SFDR	$F_S = 1.5$ MSPS	$F_{IN} = 5$ MHz	-	70.2	-	dB
			$F_{IN} = 10.7$ MHz	-	70.9	-	dB
		$F_S = 2.5$ MSPS	$F_{IN} = 5$ MHz	-	69.0	-	dB
			$F_{IN} = 10.7$ MHz	-	69.1	-	dB
		$F_S = 4$ MSPS	$F_{IN} = 5$ MHz	-	69.5	-	dB
			$F_{IN} = 10.7$ MHz	-	71.1	-	dB
High level input voltage	V_{IH}	-	$0.7V_{dd25}$	-	V_{dd25}	V	
Low level input voltage	V_{IL}	-	0	-	$0.3V_{dd25}$	V	