

12-bit 1-channel up to 1.25MSPS SAR ADC

OVERVIEW

028TSMC_ADC_01 is a 12-bit 1-channel successive-approximation-register (SAR) analog to digital converter (ADC) with sample rates up to 1.25 MSPS.

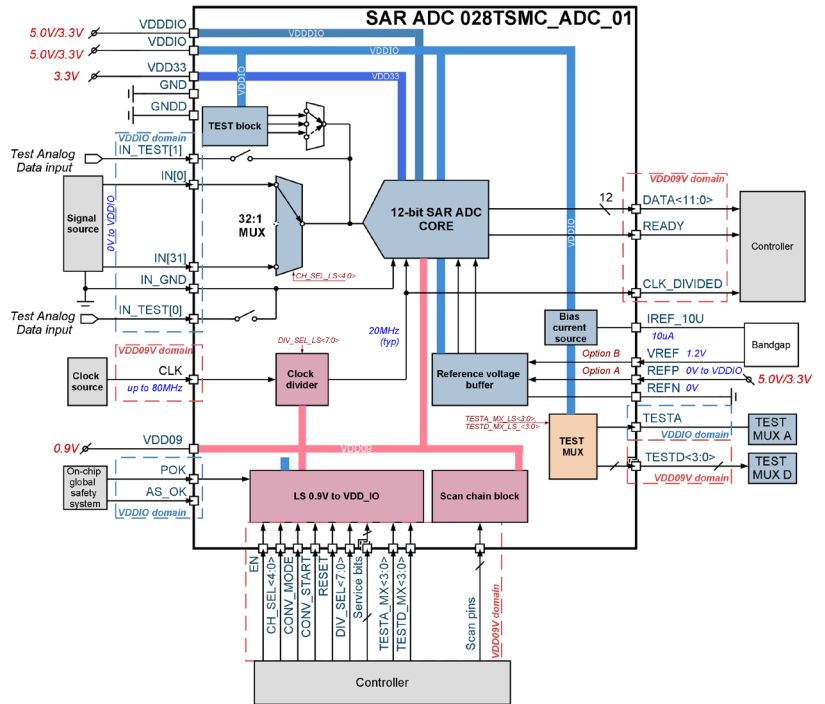
The IP includes an analog multiplexer which chooses one of 32 inputs to be driven into the ADC.

Block has a reference voltage buffer for the ADC.

The block operates directly from VDDIO/VDD33/VDD09 supplies.

Analog voltage references can be generated from internal buffer or supplied externally.

IP technology: TSMC eFlash 28nm.
 IP status: pre-silicon verification.
 Silicon area: 0.263mm².



ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units	
			min	typ.	max		
Analog supply voltage	VDDIO	Option 5V	4.5	5.0	5.5	V	
		Option 3.3V	2.97	3.3	3.63		
	VDD33	-	3	3.3	3.63		
Digital supply voltage	VDDDIO	Option 5V	4.5	5.0	5.5	V	
		Option 3.3V	2.97	3.3	3.63		
	VDD09	-	0.81	0.9	0.98		
Operating junction temperature range	T _j	-	-40	25	150	°C	
Full scale input	F _{SR}	-	-	VDDIO	-	V	
Operating input range	A _{IN}	-	0	-	VDDIO	V	
Reference voltage	V _{ref}	-	-	1.2	-	V	
Reference current	I _{ref}	-	-	10	-	uA	
Resolution	N	-	-	12	-	bits	
Sample rates	F _s	-	-	1.25	-	MSPS	
External clock frequency	F _{CLK}	-	-	80	-	MHz	
Operating clock frequency	F _{CLK_IN}	F _{CLK_IN} = 16 F _s	-	20	-	MHz	
Total current consumption	I _{CC}	F _s =1.25MSPS	VDDIO=5V	-	1.1	1.32	mA
			VDDIO=3.3V	-	0.974	-	
Differential non-linearity	DNL	No missing code	-	±1	-	LSB	
Integral non-linearity	INL	No missing code	-	±3	-	LSB	
Spurious-Free Dynamic Range	SFDR	F _s =1.25MSPS, F _{in} =107kHz	VDDIO=5V	-	79	-	dB
			VDDIO=3.3V	74	78	-	
		F _s =1.25MSPS, F _{in} =517kHz	VDDIO=5V	-	76	-	
			VDDIO=3.3V	62	71	-	
Signal to noise ratio	SNR	F _s =1.25MSPS, F _{in} =107kHz	VDDIO=5V	-	68	-	dB
			VDDIO=3.3V	66	68	-	
		F _s =1.25MSPS, F _{in} =517kHz	VDDIO=5V	-	68	-	
			VDDIO=3.3V	61	67	-	