

## 12-bit single-ended SAR ADC

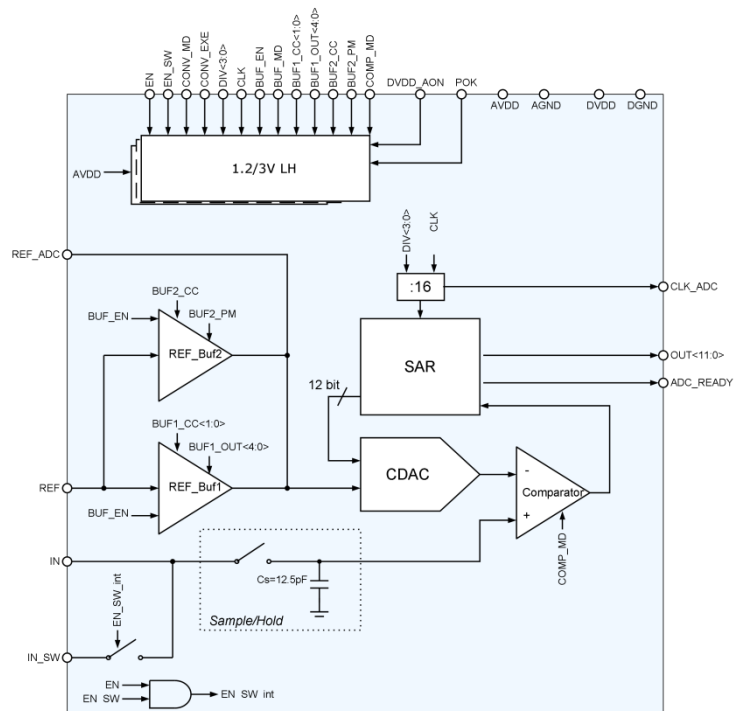
### OVERVIEW

055UMC\_ADC\_01 is 12-bit analog-to-digital converter (ADC) with single-ended input of 200kHz sample rate. The device operates with a 1.2V reference and includes a 12-bit successive approximation register (SAR) with inherent sample-and-hold. Two reference voltage buffers are implemented for high or low power consumption.

IP technology UMC eFlash 55nm.

IP status: pre-silicon verification.

Total area: 0.1168mm<sup>2</sup>.



### ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units
			Min	Typ.	Max	
Analog supply voltage	AVDD	From battery	2.0	3.0	3.6	V
Digital supply voltage	DVDD	-	1.08	1.20	1.32	V
Input reference voltage	V <sub>ref</sub>	REF	1.0	1.2	1.6	V
Current consumption	I <sub>CC</sub>	F <sub>IN</sub> = 90kHz, FS = 200kSPS	16.7	-	-	μA
Shutdown current	I <sub>SD</sub>	-	4.2	10.4	811.8	nA
Full scale input	V <sub>full</sub>	-	-	V <sub>ref</sub>	-	V
Operating input range	V <sub>IN</sub>	-	0	-	V <sub>ref</sub>	V
Input capacitance	C <sub>INT</sub>	EN = "1"	10.7	13.2	15.8	pF
Resolution	N	-	-	12	-	bits
Offset error	E <sub>O</sub>	F <sub>IN</sub> = 90kHz, FS = 200kSPS	-	-	11	mV
Differential Non-Linearity	DNL	-	0.07	0.16	0.07	LSB
Integral Non-Linearity	INL	-	0.30	0.45	0.30	LSB
Sample rates	F <sub>SR</sub>	-	20	200	-	kSPS
Power supply rejection ratio	PSRR	F <sub>IN</sub> = 90kHz, FS = 200kSPS, Amp = 600mV, BUF MD = "0"	70	-	-	dB
Effective number of bits	ENOB	F <sub>IN</sub> = 90kHz, FS = 200kSPS	10.8	11.3	11.6	bits
Signal-to-noise and distortion ratio	SINAD	F <sub>IN</sub> = 90kHz, FS = 200kSPS	67.7	70.2	71.7	dB
Digital input signals logic high	V <sub>IH</sub>	EN	DVDD_AON-0.1	-	DVDD_AON	V
		CONV_MD, CONV_EXE, COMP_MD, DIV<3:0>	DVDD-0.1	-	DVDD	
		POK	AVDD-0.15	-	AVDD	
Digital input signals logic low	V <sub>IL</sub>	-	0	-	0.2	V
Digital output signals logic high	V <sub>OH</sub>	-	DVDD-0.1	-	DVDD	V
Digital output signals logic low	V <sub>OL</sub>	-	0	-	0.2	V