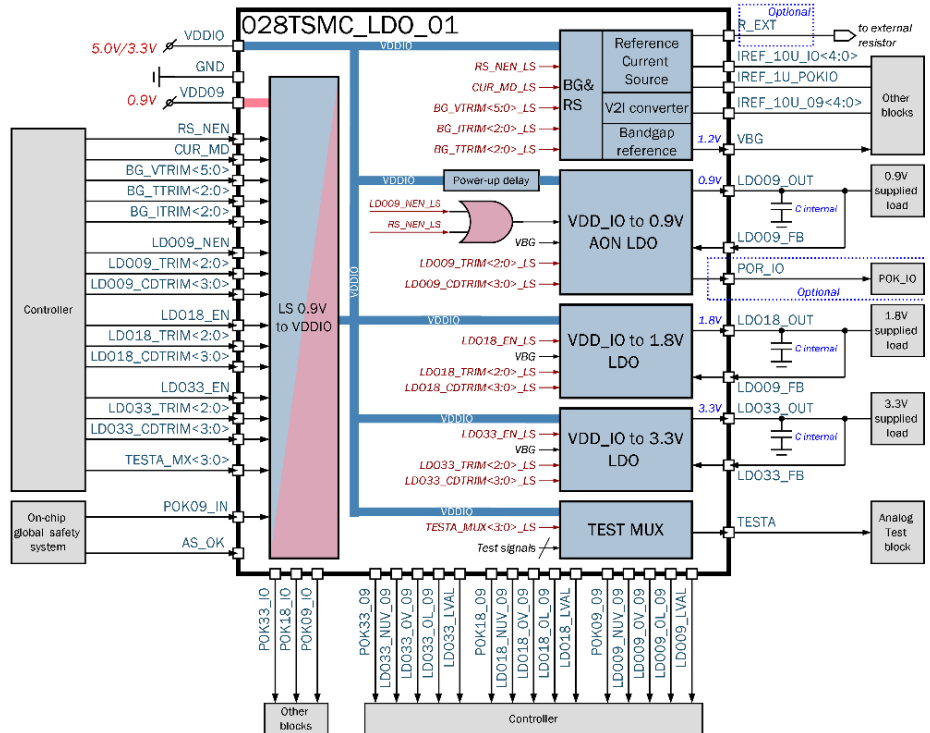


## Power management unit (0.9V, 1.8V, 3.3V output voltages, 1.2V reference voltage and 10uA/1uA reference currents)

### OVERVIEW

028TSMC\_LDO\_01 is a Power management unit, designed to supply integrated circuits with stable and precise voltage. IP includes Bandgap block, and 3 LDOs: always-ON LDO to convert IO voltage 5.0V/3.3V to 0.9V and supply digital circuits with load up to 5mA; LDO to convert IO voltage 5.0V/3.3V to 1.8V and supply analog circuits with load up to 100mA; LDO to convert IO voltage 5.0V to 3.3V and supply analog circuits with load up to 100mA. Bandgap is a voltage reference source, where voltage is formed independently from temperature and power supply variations, and where typical reference voltage is 1.2V. Bandgap includes also Voltage-to-Current (V2I) converter to generate required nominal values of reference current to analog blocks. Each of LDOs has an option of output voltage adjustment. The block operates directly from two main power supplies: IO voltage VDDIO, which can be 5.5V or 3.3, depending on application, and core voltage VDD09 supply. IP technology: TSMC 28nm eFlash. IP status: pre-silicon verification. Silicon total area: 0.455mm<sup>2</sup>.



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### ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units	
			min	typ.	max		
Analog supply voltage	V <sub>DDIO</sub>	Option 5V	4.5	5	5.5	V	
		Option 3.3V	2.97	3.3	3.63	V	
Digital supply voltage	V <sub>DD09</sub>	-	0.81	0.9	0.99	V	
V <sub>DDIO</sub> power-up/down slope time	Δt <sub>VDDIO</sub>	Option 5V	-	-	40	ms	
		Option 3.3V	-	-	50	ms	
Operating temperature range	T <sub>j</sub>	-	-40	27	150	°C	
Internal load capacitor	C <sub>load_AON</sub>	For AON LDO	50	-	300	pF	
	C <sub>load_18</sub>	For 1.8V LDO	300	-	2000	pF	
	C <sub>load_33</sub>	For 3.3V LDO	300	-	3000	pF	
AON LDO output current	I <sub>load_09</sub>	-	-	-	5	mA	
1.8V LDO output current	I <sub>load_18</sub>	-	-	-	100	mA	
3.3V LDO output current	I <sub>load_33</sub>	-	-	-	100	mA	
Quiescent current (no load)	I <sub>CC</sub>	T <sub>j</sub> =-40÷150 C	Option V <sub>DDIO</sub> = 5.0V	-	212	240	uA
			Option V <sub>DDIO</sub> = 3.3V	-	208	235	uA
		T <sub>j</sub> =+27 C	@V <sub>DD09</sub>	-	0.03	-	uA
		T <sub>j</sub> =+150 C		-	-	3.3	uA
Standby current (no load)	I <sub>SBY</sub>	Option V <sub>DDIO</sub> = 5.0V	-	103	120	uA	
		Option V <sub>DDIO</sub> = 3.3V	-	94	110	uA	
Shutdown current (no load)	I <sub>STD</sub>	Option V <sub>DDIO</sub> = 5.0V	-	16	30	uA	
		Option V <sub>DDIO</sub> = 3.3V	-	10	20	uA	
Output reference voltage	V <sub>BG</sub>	C <sub>load</sub> =1pF	-	1.198	-	V	
Output reference voltage deviation	dV <sub>REF</sub>	C <sub>load</sub> =1pF, with trimming	-1.0	-	1.0	%	