

## PVT Detector

### OVERVIEW

PVT Detector is a unique solution intended to continuously monitor IC status at several on-die locations. It is able to detect manufacturing process deviation, perform core voltage, IO voltage and die temperature measurement. PVT Detector consists of PVT module, core voltage/temperature sensor units, IO voltage/temperature sensor units and trimming units. PVT module is a calculation center that contains process detector units and is able to maintain up to 8 sensor units of any (core/IO) type.

IP technology: TSMC 40nm CLN40LP CMOS technology.

IP status: pre-silicon verification.

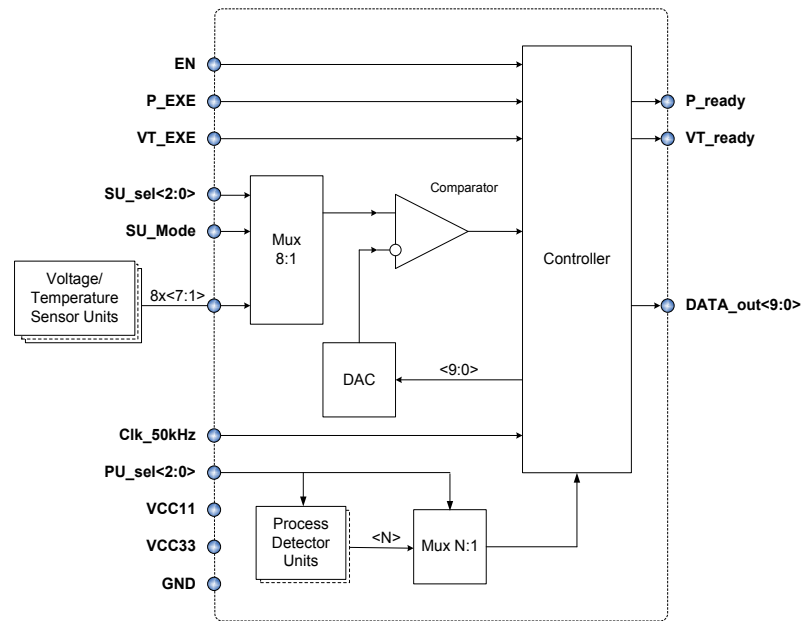
Area: PVT module – 0.086mm<sup>2</sup>;

sensor unit - 0.0004mm<sup>2</sup>;

sensor unit 3V - 0.00066mm<sup>2</sup>;

trimming unit1 - 0.000136mm<sup>2</sup>;

trimming unit2 - 0.000154mm<sup>2</sup>.



### ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Min	Typ.	Max	Units
Core supply voltage	V <sub>CC11</sub>	-	1.0	1.1	1.2	V
IO supply voltage	V <sub>CC33</sub>	-	3.0	3.3	3.6	V
Operating temperature range	T <sub>j</sub>	-	-40	-	+125	°C
PVT module current consumption	I <sub>CC11</sub>	-	-	250	400	uA
	I <sub>CC33</sub>	-	-	390	500	
PVT module current consumption in standby mode	I <sub>STBY11</sub>	@ V <sub>CC11</sub>	-	2.5	55	uA
	I <sub>STBY33</sub>	@ V <sub>CC33</sub>	-	-	2	uA
Digital input-logic high	V <sub>IH</sub>	-	*	-	*	V
Digital input-logic low	V <sub>IL</sub>	-	*	-	*	
Digital output-logic high	V <sub>OH</sub>	-	*	-	*	
Digital output-logic low	V <sub>OL</sub>	-	*	-	*	
Core voltage measurement range	V <sub>MR_core</sub>	-	0.8	-	1.35	V
IO voltage measurement range	V <sub>MR_IO</sub>	-	2.4	-	3.7	V
Temperature measurement range	T <sub>MR</sub>	-	-40	-	125	°C
Temperature measurement accuracy	A <sub>T</sub>	with trimming	-	-	±2	°C
		w/o trimming	-	-	±5	
Core voltage measurement accuracy	A <sub>V_core</sub>	with trimming	-	-	±2	%
		w/o trimming	-	-	±5	
IO voltage measurement accuracy	A <sub>V_IO</sub>	with trimming	-	-	±2	%
		w/o trimming	-	-	±5	
Output DATA resolution	K	-	-	10	-	bit
Clock frequency	f <sub>CLK</sub>	-	40	50	60	kHz

\*Value is defined by TSMC N40LP standard cell library tcbn40lpbw