

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 voltage and die temperature measurement. PVT Detector consists of PVT module, 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 16 voltage/temperature sensor units.

IP technology TSMC 28HPC+ CMOS 28nm.

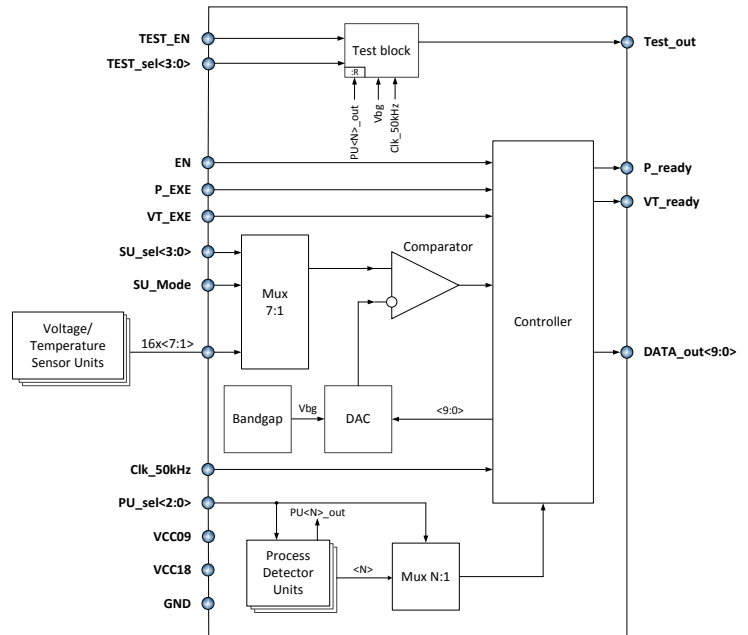
IP status: pre-silicon verification.

Total area: PVT module – 0.140mm²;

sensor unit – 0.0005mm²;

trimming unit1 – 0.00019mm²;

trimming unit2 – 0.00031mm².



ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units
			Min	Typ.	Max	
Core supply voltage	V _{CC09}	-	0.81	0.9	0.99	V
IO supply voltage	V _{CC18}	-	1.62	1.8	1.98	V
Operating temperature range	T _i	-	-40	25	+125	°C
Current consumption	I _{CC09}	-	-	250	400	uA
	I _{CC18}	-	-	390	500	
Current consumption in standby mode	I _{STBY09}	@ V _{CC09}	-	2.5	55	uA
	I _{STBY18}	@ V _{CC18}	-	-	2	uA
Digital input-logic high	V _{IH}	-	*	-	*	V
Digital input-logic low	V _{IL}	-	*	-	*	
Digital output-logic high	V _{OH}	-	*	-	*	
Digital output-logic low	V _{OL}	-	*	-	*	
Voltage measurement range	V _{MR}	-	0.8	0.9	1.0	V
Voltage bandgap	V _{bg}	-	-	716	-	mV
Temperature measurement range	T _{MR}	-	-40	-	+125	°C
Temperature measurement accuracy	A _T	with trimming	-	-	±2	°C
		w/o trimming	-	-	±5	
Voltage measurement accuracy	A _V	with trimming	-	-	±2	%
		w/o trimming	-	-	±5	
Output DATA resolution	K	-	-	10	-	bit
Clock frequency	f _{CLK}	-	-	50	-	kHz

*Value is defined by TSMC 28HPC+ standard cell library TBD