

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 as a calculation center with embedded process detector units, and voltage/temperature sensor units. PVT module is able to maintain up to 16 external voltage/temperature sensor units for Core voltage measurement from 0.8V to 1.0V.

IP technology TSMC 28HPC+ CMOS 28nm.

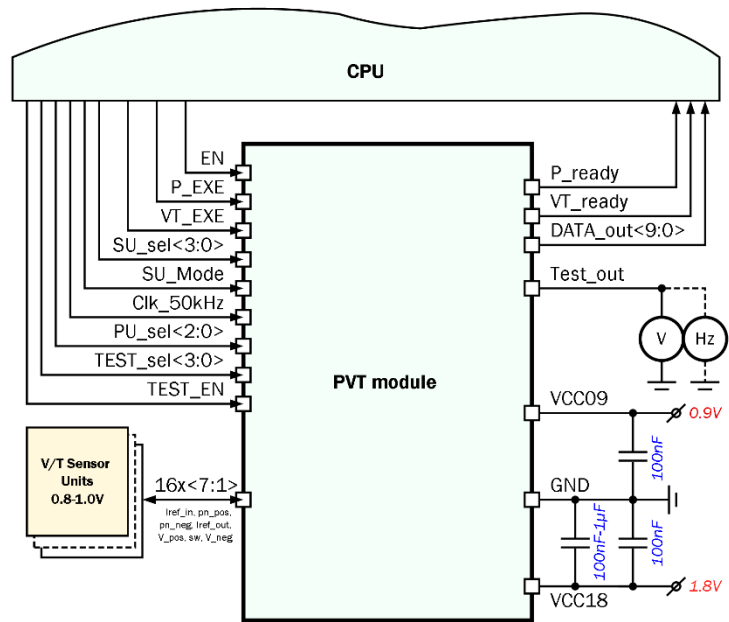
IP status: silicon proven.

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 _j	-	-40	25	+125	°C	
Current consumption in case of V/T measurement	I _{CC09 VT}	@ V _{CC09}	-	150	400	uA	
	I _{CC18 VT}	@ V _{CC18}	-	320	530		
Current consumption in case of Process detection	I _{CC09 P}	@ V _{CC09}	-	153	405	uA	
	I _{CC18 P}	@ V _{CC18}	-	304	306		
Current consumption in standby mode	I _{STBY09}	@ V _{CC09}	-	2.0	95	uA	
	I _{STBY18}	@ V _{CC18}	-	0.01	1	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}	-	*	-	*		
Output DATA resolution	K	-	-	10	-	bit	
Clock frequency	f _{CLK}	-	-	50	-	kHz	
Voltage bandgap	V _{bg}	-	-	711.8	-	mV	
Voltage measurement range	V _{MR09}	-	0.8	-	1.0	V	
Voltage measurement accuracy	A _V	w/o trimming	δ	-	-	0.7	%
			3δ	-	-	2.1	
Temperature measurement range	T _{MR}	-	-40	-	+125	°C	
Temperature measurement accuracy	A _T	with trimming	δ	-	-	1.45	°C
			3δ	-	-	4.35	
		w/o trimming	δ	-	-	1	
			3δ	-	-	4.5	

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