

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 two embedded voltage/temperature sensor units (the first one is connected to AVDD and the second one – to DVDD). Also it is able to maintain up to 14 external voltage/temperature sensor units.

IP technology: TSMC 55nm CMOS technology.

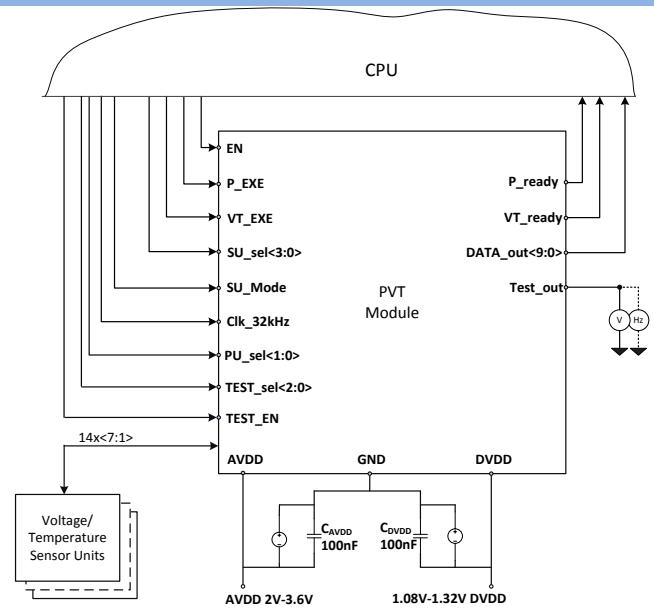
IP status: silicon proven.

Area: PVT module – 0.457 mm²;

sensor unit – 0.001748 mm²;

trimming unit1 – 0.000498 mm²;

trimming unit2 – 0.000576 mm².



ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units
			Min	Typ.	Max	
Analog supply voltage	AVDD	-	2.0	3.0	3.6	V
Digital supply voltage	DVDD	-	1.08	1.20	1.32	V
Operating temperature range	T _j	-	-40	27	110	°C
Digital input-logic high	V _{IH}	-	DVDD-0.2	-	DVDD	V
Digital input-logic low	V _{IL}	-	0	-	0.2	
Digital output-logic high	V _{OH}	-	DVDD-0.1	-	DVDD	
Digital output-logic low	V _{OL}	-	0	-	0.1	
Current consumption	I _{CC1}	@AVDD	-	391.7*	480*	μA
	I _{CC2}	@DVDD	-	135	230	
Stand-by current	I _{STBY1}	@AVDD	-	4.47*	32	nA
	I _{STBY2}	@DVDD	-	0.065	12	
Output DATA resolution	K	-	-	10	-	bit
Clock frequency	f _{CLK}	-	-	32.768	-	kHz
Bandgap voltage	V _{bg}	-	-	693	-	mV
Voltage measurement range	V _{MR}	-	1.0	-	3.6	V
Voltage measurement accuracy	A _V	-	-	±3	-	%
		After trimming	-	±2	-	
Temperature measurement range	T _{MR}	-	-40	-	+110	°C
Temperature measurement accuracy	A _T	-	-	±7	-	°C
		After trimming	-	±3	-	

*The values correspond to the results of simulations