

PVT Detector

OVERVIEW

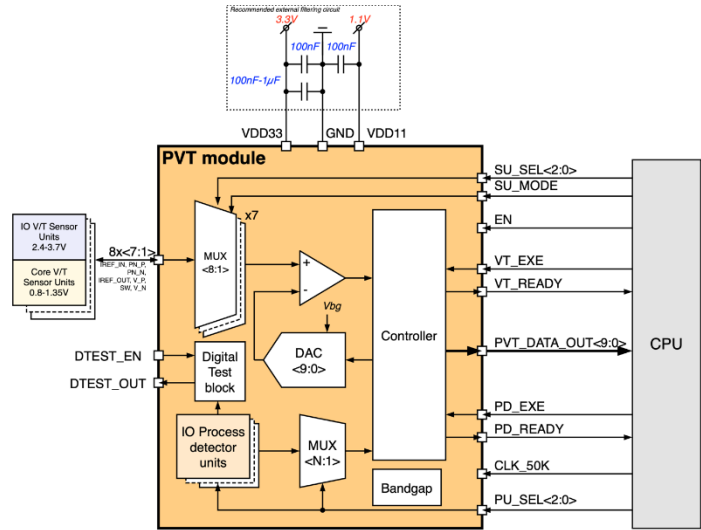
PVT Detector is a unique solution intended to continuously monitor IC status at several on-die locations. It is able to detect manufacturing process deviation, perform voltage and die temperature measurement.

PVT detector consists of PVT module as a calculation center for voltage and temperature measurements with Process detector units for Low VT, Standard VT and High VT transistors, and voltage/temperature sensor units.

PVT module is able to maintain up to 8 external voltage/ temperature sensor units of two types in any variations: for Core voltage measurement range from 0.8V to 1.35V and for IO voltage measurement range from 2.4V÷3.7V. IP technology: TSMC 40nm CMOS technology. IP status: silicon proven.

Area: PVT module – 0.1125 mm²;

sensor units for Core/IO measurements – 0.000484 mm²/0.000659 mm²



ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units
			Min	Typ.	Max	
Analog supply voltage	AVDD	-	1.0	1.1	1.2	V
Digital supply voltage	DVDD	-	3.0	3.3	3.6	V
Operating temperature range	T _j	-	-40	27	+125	°C
Current consumption in case of V/T measurement	I _{VDD11_VT}	@VDD11	-	0.000003	0.00004	µA
	I _{VDD33_VT}	@VDD33	-	458	605	
Current consumption in case of Process detection	I _{VDD11_P}	@VDD11	-	60	160	µA
	I _{VDD33_P}	@VDD33	-	375	400	
Current consumption in shutdown mode	I _{STB_VDD11}	@VDD11	-	2.8	62	µA
	I _{STB_VDD33}	@VDD33	-	0.008	0.1	µA
Output DATA resolution	K	-	-	10	-	bit
Clock frequency	f _{CLK}	-	-	50	-	kHz
Voltage measurement range	V _{MR}	-	1.0	-	3.6	V
	V _{MR33}	-	2.4	-	3.7	V
Voltage measurement inaccuracy 1.1V/3.3V VT sensor unit	A _V	-	-	±2.5/2.7	-	%
		After trimming	-	±1.6/2.0	-	
Temperature measurement range	T _{MR}	-	-40	-	+125	°C
Temperature measurement inaccuracy by one/three temperature point on the die	A _T	-	-	±6.1	-	°C
		After trimming	-	±2.8/1.0	-	

*The values correspond to the results of simulations