

PVT Detector

OVERVIEW

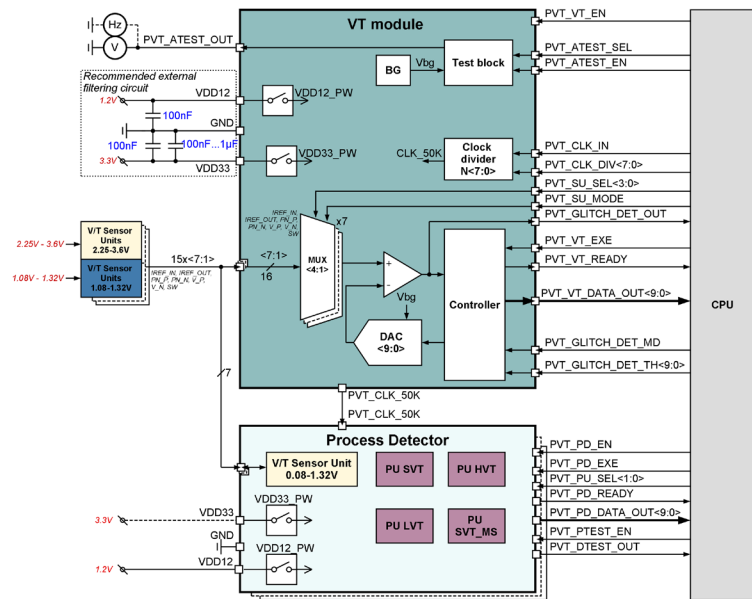
PVT Detector is a unique solution intended to continuously monitor IC status at several on-die locations. It is able to detect manufacturing process deviation, perform voltage and die temperature measurement.

PVT detector consists of VT module as a calculation center for voltage and temperature measurements, Process detector with process units, and voltage/temperature sensor units. VT module is able to maintain up to 15 external voltage/temperature sensor units of two types in any variations: from 1.08V to 1.32V (SU_12) and from 2.25V to 3.6V (SU_33) voltage measurement ranges.

IP technology: TSMC 55nm CMOS technology.

IP status: silicon proven.

Area: VT_module – 0.342 mm²; Process detector – 0.0248 mm²; Sensor_unit_33 – 0.00287 mm²; Sensor_unit_12 – 0.00257 mm².



ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units
			Min	Typ.	Max	
Analog supply voltage	VDD33	-	2.25	3.3	3.6	V
Digital supply voltage	VDD12	-	1.08	1.20	1.32	V
Operating temperature range	T _j	-	-55	27	150	°C
Digital input-logic high	V _{IH}	-	VDD12-0.2	-	VDD12	V
Digital input-logic low	V _{IL}	-	0	-	0.2	
Digital output-logic high	V _{OH}	-	VDD12-0.1	-	VDD12	
Digital output-logic low	V _{OL}	-	0	-	0.1	
Current consumption	I _{CC1}	@VDD33	-	372*	450*	μA
	I _{CC2}	@VDD12	-	1.5	32	
Stand-by current	I _{STBY1}	@VDD33	-	0.2*	66*	nA
	I _{STBY2}	@VDD12	-	3	1500	
Output DATA resolution	K	-	-	10	-	bit
Clock frequency	f _{CLK}	-	-	50	-	kHz
Bandgap voltage	V _{bg}	-	-	750*	-	mV
Voltage measurement range	V _{MR}	SU_33	2.25	-	3.6	V
		SU_12	1.08	-	1.32	
Voltage measurement accuracy	A _V	-	-	±5	-	%
		After trimming	-	±3	-	
Temperature measurement range	T _{MR}	-	-40	-	+125	°C
Temperature measurement accuracy	A _T	-	-	±7	-	°C
		After trimming	-	±3	-	

*The values correspond to the results of simulations