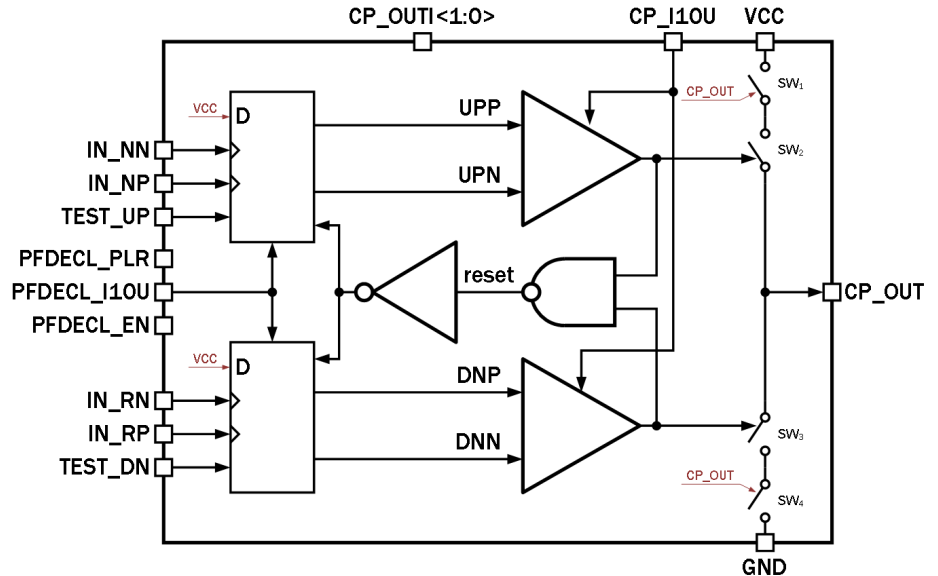# 24.84 MHz Phase-frequency detector with charge pump

OVERVIEW

180TSMC_PFD_04 is a phase-frequency detector (PFD) forms control signal for VCO tuning. PFD compares phases of divided VCO signal and divided reference oscillator signal and detects phase difference. Charge pump generates pulses for loop filter.

IP technology: TSMC018 SiGe BiCMOS 0.18um.

IP status: silicon proven.

Area: 0.051mm^2.

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units
			min	typ.	max	
Supply voltage	V_{CC}	-	3.0	3.15	3.3	V
Operating temperature range	Tj	-	-40	+27	+85	°C
Reference frequency	F_{ref}	-	-	24.84	-	MHz
Peak-to-peak voltage at the differential input	$A_{in\,p-p}$	For inputs IN_NP, IN_NN, IN_RP и IN_RN	0.2	-	2.0	V
DC operating point	V_{op}		$V_{cc}–1.2$	-	$V_{cc}–0.2$	V
Output current	I_{out}	CP_OUTI<1:0> = "00"	20.5	21.0	21.5	uA
		CP_OUTI<1:0> = "01"	40.5	41.0	42.5	
		CP_OUTI<1:0> = "10"	81.0	82.0	85.0	
		CP_OUTI<1:0> = "11"	101.0	102.5	106.0	
PFD reset time	t_{rst}	-	4.4	4.85	5.75	ns
PFD input amplitude	A_{in}	-	150	200	210	mV
Supply current	I_{cc}	I_{out} = 102.5 uA	1.37	1.44	1.61	mA
Stand-by current	I_{stb}	-	0.2	1.5	3.6	nA
Input logic-level high	V_{IH}	For digital inputs	$0.7V_{cc}$	-	$V_{cc}+0.25$	V
Input logic-level low	V_{IL}		-0.25	-	0.3	V