3.5 to 7 GHz Voltage controlled oscillator

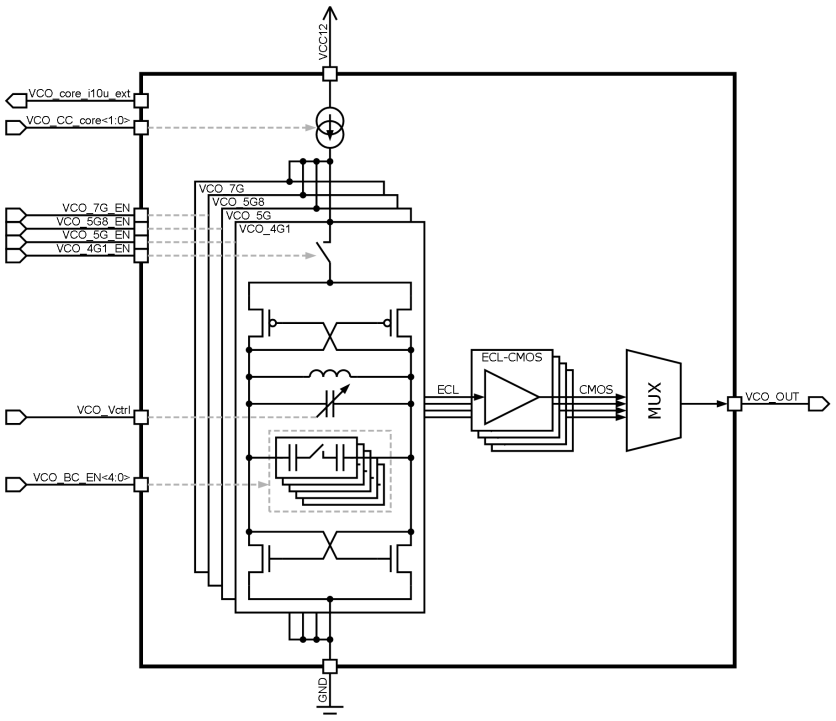
OVERVIEW

055TSMC_VCO_01 is voltage controlled oscillator (VCO) designed to generate a high frequency signal in the range from 3.5 to 7 GHz. The VCO consist of four LC-cores with frequency ranges: 3.5 – 4.15GHz (VCO_4G1), 4.15 – 5 GHz (VCO_5G), 5 – 5.85 GHz (VCO_5G8), 5.85 – 7GHz VCO_7G. Each LC-core has 32 capacitor units for roughly tune of frequency. A varactor is used to smoothly tune the frequency.

IP technology: TSMC CMOS 55nm technology.

IP status: silicon proven.

Area: 1.0 mm^2.



ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions		Value min	Value typ.	Value max	Units
Supply voltage	V_{CC12}	-		1.08	1.20	1.32	V
Operating temperature range	T_j	-		-40	+27	+85	°C
Current consumption	I_{CC12}	-		-	10	-	mA
VCO frequency range	F_{VCO}	7 GHz core		5.85	-	7.00	GHz
		5.8 GHz core		5.00	-	5.85	
		5 GHz core		4.15	-	5.00	
		4.1 GHz core		3.50	-	4.15	
Output amplitude	V_{OUT}	-		-	1.5	-	V
Phase noise	PN	F_{VCO} = 6 GHz	F_{OFFSET} = 1 kHz	-	-43.5	-	dBc/Hz
			F_{OFFSET} = 10 kHz		-73.5		
			F_{OFFSET} = 100 kHz	-	-99.6	-	
			F_{OFFSET} = 1 MHz		-123.7		
			F_{OFFSET} = 10 MHz	-	-143.8	-	
Input logic-high level	V_{IH}	For digital inputs		$0.8V_{CC12}$	-	V_{CC12}	V
Input logic-low level	V_{IL}			0	-	$0.25V_{CC12}$	V