

20 to 50 MHz crystal oscillator

OVERVIEW

055TSMC_OSC_01 is a reference frequency generator designed to form a reference signal in the frequency range from 10 to 50MHz. The block consists of an amplifier, internal load capacitances, ecl-to-cmos convertor for generating CMOS output signal.

Tunable internal load capacitances (XO_C1<3:0> and XO_C2<3:0>) allow to adjust the quartz resonator frequency without using external components.

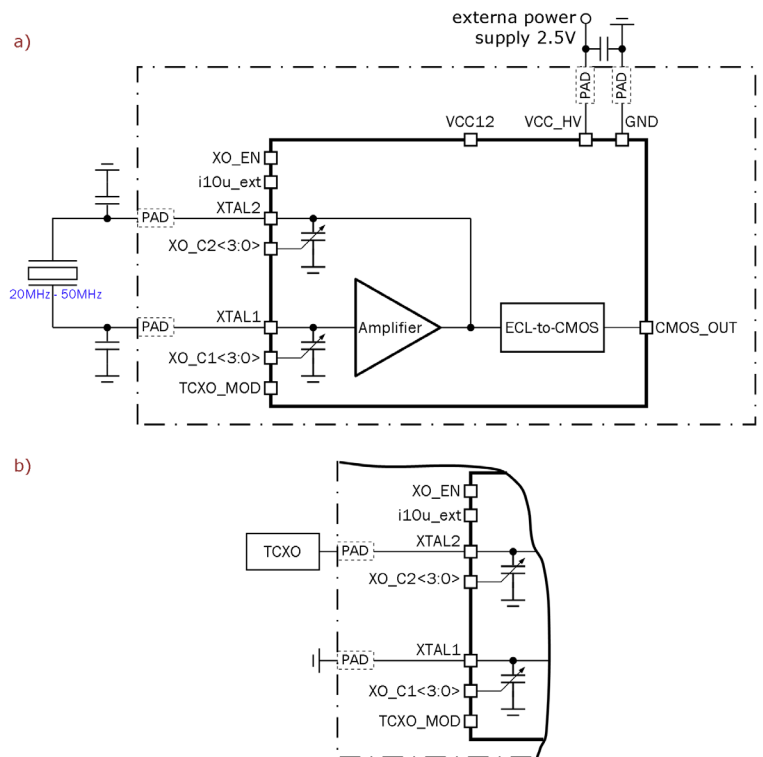
Oscillator has two modes:

- quartz mode (XTAL) (a);
- internal generator mode (TCXO) (b).

IP technology: TSMC CMOS 55 nm.

IP status: silicon proven.

Area: 0.051mm².



ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units	
			min	typ.	max		
Supply voltage	V _{CC_HV}	-	2.25	2.5	2.75	V	
	V _{CC12}	-	1.14	1.2	1.26		
Operating temperature range	T _j	-	-40	+27	+125	°C	
Startup time	t _{ST}	For XTAL mode	-	250	-	us	
Input frequency range	F _{in}	Accuracy depend on selected quartz	20	-	50	MHz	
Current consumption	I _{cc_XTAL}	@40MHz	-	240	-	uA	
	I _{cc_TCXO}	@40MHz	-	20	-	uA	
	I _{STB}	In StandBy mode	-	50	-	nA	
Peak-to-peak input voltage	A _{in_XTAL}	-	-	1.26	-	V	
Peak-to-peak output voltage	A _{out_XTAL}	-	1.14	1.2	1.26	V	
Phase noise	PN _{XTAL}	@40MHz, XO_C1 = XO_C2 = 16pF	@100Hz	-	-119	-	dBc/Hz
			@1kHz	-	-139	-	
			@10kHz	-	-141	-	
			@100kHz	-	-148	-	
			@1MHz	-	-148	-	
	PN _{TCXO}	@40MHz	@100Hz	-	-133	-	dBc/Hz
			@1kHz	-	-142	-	
			@10kHz	-	-147	-	
			@100kHz	-	-148	-	
			@1MHz	-	-148	-	
Duty cycle	DC	-	45	50	55	%	
Input logic-level high	V _{IH}	-	0.8V _{CC_HV}	-	V _{CC_HV}	V	
Input logic-level low	V _{IL}	-	0	-	0.2V _{CC_HV}	V	