AS02210
VCO 7.5 GHz-9.5 GHz / 256 sub-bands

DESCRIPTION

The Argo Semi AS02210 IP is a low phase noise PFET-based Voltage Controlled Oscillator (VCO) covering the frequency range from 7.5 GHz to 9.5 GHz with a typical Kvco of 60 MHz/V. It consists of two overlapping VCOs, each of which has 128 coarse tuning bands with a band overlap of 85-90%. Fine tuning is achieved through a single-ended voltage Vtune that controls a varactor array. A 1.8V-input LDO provides the required supply voltage to the VCO (typically 1.35V). At 10 MHz offset the typical phase noise (including the noise contribution of the LDO) is in the range of -139 to -145 dBc/Hz, depending on the band of operation. Within the frequency tuning range, the total current consumption varies from 18 to 23 mA. The VCO has embedded temperature compensation using a capacitor array to correct frequency drifting. The scheme includes a temperature sensor, a 12-bit ADC to monitor Vtune and a counter to monitor the VCO frequency.

FEATURES

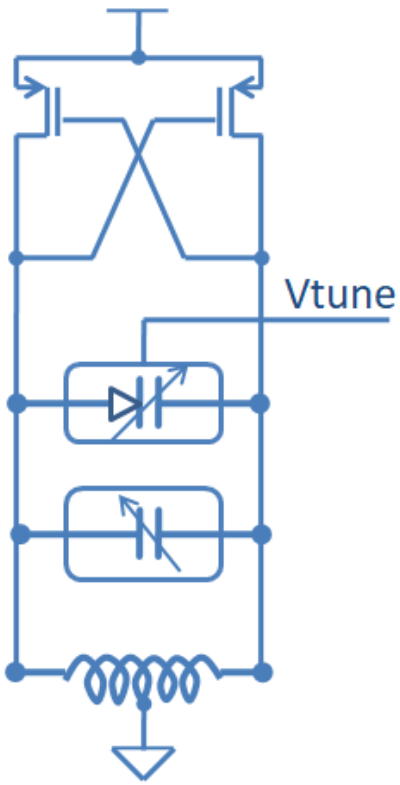
- ✓ VDD: 1.3-1.4V (provided by 1.8V LDO)
- ✓ Frequency range: 7.5-9.5 GHz
- ✓ Two overlapping VCOs to cover frequency range
- ✓ 128 coarse tuning bands each VCO
- ✓ Typical band overlap: 85-90%
- ✓ Typical Kvco: 60MHz/V
- ✓ Vtune voltage: single-ended
- ✓ Phase noise @10MHz offset: -139 to -145 dBc/Hz (depending on band)
- ✓ Current consumption: 18-23mA (depending on band)
- ✓ Temperature compensation using temp cap array
- ✓ Technology node: GF 22FDX CMOS SOI

APPLICATIONS

- ➢ WiFi6/6E/7
- ➢ Bluetooth
- ➢ 5GNR
- ➢ LTE

ABOUT ARGO SEMICONDUCTORS

Argo Semiconductors offers high quality RF IP products operating in the frequency region between 2 GHz and 10 GHz. Argo's team has a long experience on Wi-Fi RF silicon product development and cellular RF silicon product development, bringing billions of chips to the market. Leveraging on these capabilities and building on its solid IP base, Argo helps its customers develop products that can meet the most stringent requirements, while shrinking the development time. IP customization is possible upon request.



Simplified Block Diagram

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VCO Metrics

VCO Characteristics						
Parameter		**Minimum**	**Typical**	**Maximum**	**Units**	**Comments**
supply voltage		1.3		1.4	V	from 1.8V-input LDO
operating frequency range		7.5		9.5	GHz	two overlapping VCOs used
number of bands			256			128 bands/VCO
band overlap		85		90	%	
Kvco		40	60	90	MHz/V	
phase noise @ 9.5 GHz	10 KHz		-70.1		dBc/Hz	includes LDO noise
	200 KHz		-105.8		dBc/Hz	
	400 KHz		-112.4		dBc/Hz	
	1 MHz		-121.3		dBc/Hz	
	10 MHz		-142.5		dBc/Hz	
phase noise @ 8.5GHz	10 KHz		-72.8		dBc/Hz	
	200 KHz		-108.8		dBc/Hz	
	400 KHz		-115.3		dBc/Hz	
	1 MHz		-123.9		dBc/Hz	
	10 MHz		-144.7		dBc/Hz	
phase noise @7.5 GHz	10 KHz		-76.7		dBc/Hz	
	200 KHz		-110.1		dBc/Hz	
	400 KHz		-116.3		dBc/Hz	
	1 MHz		-124.4		dBc/Hz	
	10 MHz		-144.6		dBc/Hz	
area			0.62		mm^2	includes LDO
current consumption		18		23	mW	from 1.8V