14-bit 1GSPS Single-pass Direct Digital Frequency Synthesizer (DDS)

1 Main features:

- Converted bits: 14 bits
- Clock frequency: 1 GSPS
- Output current: 8 ~ 32 mA
- Supply voltage: 1.8V, 3.3V
- Power consumption: 750 mW
- Broadband SFDR: 67dBc@100MHz output
- Narrowband SFDR: greater than 80dBc
- Residual phase noise: -150dBc/Hz@20MHz

Output, frequency offset 1kHz

- Built-in anti-SINC filter
- Built-in phase-locked loop
- Built-in frequency, phase and amplitude modulation functions
- Built-in 1024x32bit RAM
- Serial input/output (I/O) control
- Encapsulation：LQFP100-EPAD

2. Typical applications

- Agile local oscillator signal synthesis
- Programmable clock generator
- FM source for radar and scanning systems
- Test and measurement equipment
- Acousto-optic device driver
- Polarization modulator
- Fast frequency hopping

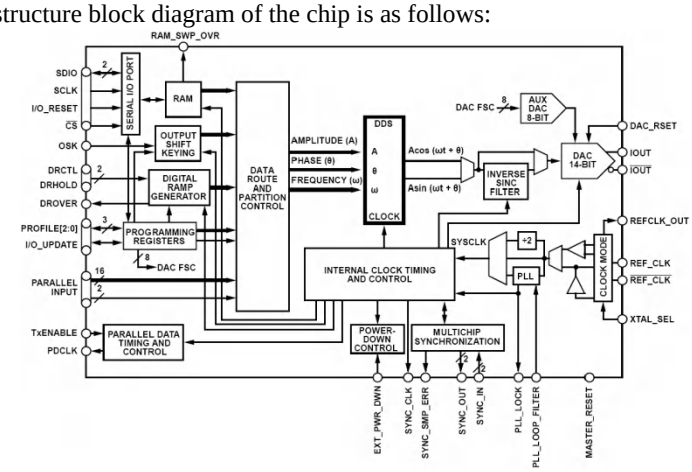
3 Product Description

This chip is a single channel direct digital frequency synthesizer (DDS) with a built-in 14-bit, 1GSPS DAC. The chip adopts advanced DDS algorithm to reduce the overall power consumption. The chip can be digitally programmed to generate high-frequency analog output signals, capable of generating fast frequency-hopping sine wave signals in the frequency range of 400MHz. The user can control the output signal through three control words: frequency, phase and amplitude. A 32-bit accumulator is used inside the chip to achieve fast frequency hopping and ensure good frequency resolution. At 1GSPS sampling rate, the tuning resolution of the chip is only 0.23 Hz. The chip also realizes the function of fast phase and amplitude switching. The user can program the internal control register of the chip through the serial I/O port. Static RAM is integrated inside the chip to support various combinations of frequency, phase, and amplitude modulation. The chip supports user - defined digital oblique mode

In this mode, the frequency, phase, or amplitude can change linearly with time. The chip built-in high-speed parallel data input port can realize frequency

Direct modulation of rate, phase and amplitude. The output current of the chip can be

Adjust from 8mA to 32mA. The chip uses 1.8V and 3.3V dual power supply. Chip adopts LQFP100-EPAD package, and foreign products The AD9910 pin is compatible and can be replaced. The internal structure block diagram of the chip is as follows:



4 Compared with similar foreign products

	precision	Clock frequency	Power dissipation	Narrow band SFDR	Residual phase noise	Output current range	Encapsulation form
AD9910 （ADI）	14Bit	1GHz	715mW@1G SPS	87dBc@101MHz	≤ −125 dBc/Hz @ 1 kHz offset	8.6-31.6mA	TQFP100
AD9912 （ADI）	14Bit	1GHz	729mW@1G SPS	96dBc@100MHz	−133 dBc/Hz@ 1 kHz offset	8.6-31.6mA	LFCSP64
HL9910	14Bit	1GHz	750mW@1G SPS	87dBc@100MHz	-150dBc/Hz@ 1 kHz offset	8-32mA	LQFP100

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