CONEXANT™

Dual Fractional-N Synthesizer PLL Family™

CX72300/CX72301/ CX72302 and CX74038

Conexant's synthesizer phase-locked loop (PLL) family, which comprises the CX72300, CX72301, CX72302 and CX74038 dual fractional-N synthesizers, sets a benchmark for performance and functionality. These fractional-N synthesizer ICs resolve output frequency step sizes below 100 Hz. As precision tuners in next-generation narrowband and multiband digital radio products, these chips overcome the traditional trade-off associated with obtaining ultra-fine frequency resolution and low-phase noise performance.

Alternative solutions are unable to resolve step sizes below 200 KHz without dividing the crystal reference frequency many times, a technique that induces unwanted phase noise, degrades signal integrity and contributes to the cost of radio systems, potentially forcing designers to use a more expensive voltage controlled oscillator (VCO). While other solutions sacrifice phase noise performance to increase resolution, Conexant's fractional-N synthesizer family employs a high internal reference and delta-sigma (DS) technology to achieve both excellent phase noise performance and fine frequency resolution in a single chip.

In addition to offering fine frequency step size and low phase noise, the Conexant synthesizer PLL family offers fast frequency settling time, a performance feature required by current and future wireless network applications such as GPRS and W-CDMA. This feature enables such applications to send a signal and quickly reset to send another signal to meet data throughput requirements.

Distinguishing Features

- Industry's most comprehensive dual fractional-N synthesizer family
- Fast settling time (down to 100µs)
- Ultra-fine step size of 100 Hz or less
- Phase noise as low as -95 dBc/Hz
- Low spurious noise

The Design Solution

RF engineers face many design problems when using traditional integer-N synthesizers to build multimode or narrowband circuits. Phase noise is often the most important design consideration. When their requirements call for a fine step size, designers must divide the reference frequency to achieve a lower comparison frequency. This problem of low comparison frequency can be avoided using fractional-N techniques that employ DS technology. These techniques allow the designer to maintain a high comparison frequency, which in turn permits low phase noise.

Radio designers, in order to meet systems specifications, must often resort to very narrow loop filter bandwidths. This is done at the cost of increasing the VCO phase noise contributions. Conexant's fractional-N synthesizers allow designers to lower VCO noise, by widening the loop filter bandwidth. Switching speed is also a primary concern of next generation handset and base station manufacturers. The larger the loop frequency, the faster the switching speed.

CX72300/01/02 Dual Fractional-N Synthesizers

The CX7230x synthesizers are ideal for applications that need low phase noise, fine channel step size and fast switching speeds. Offering performance that meets stringent system requirements for a broad range of applications, these products are suited for use in next generation base stations, tactical radios, test equipment and instrumentation, satellite receivers and low bit rate FM/FSK/MSK/GMSK telemetry transmitters (Direct Digital Modulation feature).

Features common to this family are:

- Spur-free operation
- Step size <100 Hz (<400 Hz for -CX72302)
- Very fast switching speed (<100 us)
- On-chip oscillator circuit
- Direct Digital Modulation
- 28-pin TSSOP

CX72300 Specific Performance

- Dual 2.1 GHz Main/RF & 500 MHz Auxiliary/IF Synthesizer
- Low phase noise -91 dBc/Hz @ 1800 MHz measured inside the loop bandwidth

CX72301 Specific Performance:

- Dual 1.0 GHz Main/RF & 500 MHz Auxiliary/IF Synthesizer
- Low phase noise -96 dBc/Hz @ 950 MHz measured inside the loop bandwidth

CX72302 Specific Performance:

- Dual 6.1 GHz Main/RF & 1.0 GHz Auxiliary/IF Synthesizer
- Low phase noise -80 dBc/Hz @ 6.1 GHz measured inside the loop bandwidth'

CX74038 Dual Fractional-N/Interger-N Frequency Synthesizer

The Conexant CX74038 2.6 GHz/800 MHz dual frequency synthesizer is a complete, low power synthesizer IC tailored specifically for portable/battery operation. Housed in a tiny 3.5mm x 4.5mm chip scale package (also available in 20-pin TSSOP) the CX74038 fractional-N performance offers low phase noise and fast settling time necessary for use in next generation handset applications.

CX74038 features:

- Low power consumption for portable/handset applications
- Supply voltage as low as 2.6V
- Very fast switching speed (sub 100 us)
- Step size <5 Hz @ 2.6 GHz
- Dual 2.6 GHz Main/RF and 800 MHz Auxiliary/ IF Synthesizer

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