

All Digital RF Communications Front End with the New & Revolutionary CiFET™

Current injection low noise amplifier (CiLNA™) can isolate, terminate, and sum one or two antennas at extreme high frequencies (THz) with PPM linearity and ultra low noise while providing resistive filter input ports at extremely low power supplies (as low as 10mV).

Low Noise Amplifiers

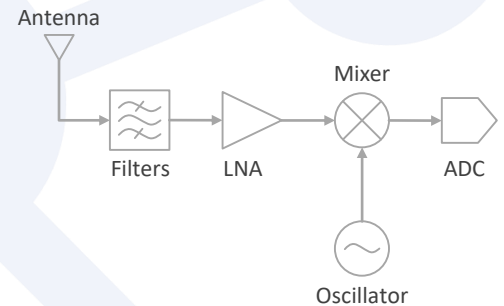
Analog signal processing
in one single
universal programmable chip!

Especially at nanoscale IC process nodes, an ultra-fast pipeline ADC can be directly tied to the LNA for DSP and logic signal processing.

Filters

The iPort is an excellent tie point for a filter in that it provides a fixed termination resistor current input port for a filter network.

ADC



RF Spectrally Pure Sinewave Oscillators

Phase Locked Loops with near perfect sine waves (-72dB harmonics) and variable frequencies over narrow or wide ranges can employ the CiFET as ring oscillators that are injection locked by cross-coupling them to model a near perfect distributed inductor.

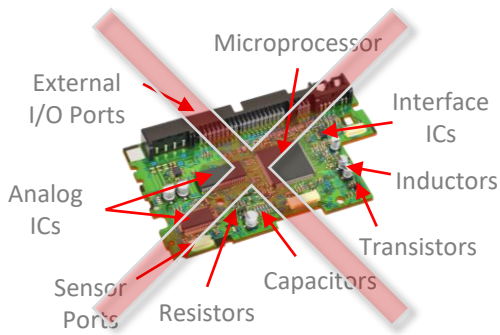
Wireless Communications RF Front End Global Market

~\$22B by 2022

	Market Size	CAGR	Circuit Seed™ % Relevancy Min	Circuit Seed™ Addressable Market
Filters	\$16B	21%	75%	\$12B
Antenna Tuners	\$270M	40%	60%	\$162M
Switches	\$2B	12%	5%	\$100M
PAs & LNAs	\$4B	1%	50%	\$14B
	~\$22B			~\$14B

Today's Sensor Designs Are **Obsolete**

The majority of sensors today require IC process extensions and numerous components that add complexity and drain the battery



- Many bulky active and passive devices (ICs with resistors, capacitors, and inductors on and off chip)
- Communication, calibration, and signal processing capability require additional digital and analog ICs
- Traditional analog circuits do not scale with digital designs on same chip
- Require multiple precision parts, matched transistors, current mirrors
- Demands calibration for parametric and temperature sensitive circuits
- Time consuming custom design at every IC process node and sensor type
- Non-portable designs restricted with long design and production cycles
- Noise and error prone circuits have significant speed and sensitivity limitations
- Relatively complex and costly assemblies for each sensor application
- Painful expandability
- Power hungry and more...

The Future of **Sensor Electronics**

What can **Circuit Seed™** enable for sensors?

Direct path to a revolutionary new generation of multipurpose **Sensor Systems integrated on a Chip**

- Common sensor hardware platform for software defined single chip sensors
- Fully integrates state-of-the-art processing with analog sensor electronics including high performance ADCs, DACs, and wire / RF communication capability within a single chip
- Extensive library of software reconfigurable analog IC functions using a wide range of software -defined sensing and excitation macros that lessen design time
- Activates, calibrates, and interrogates sensors with very low noise and high-speed
- Sensing extended into a new class of very smart adaptive sensors
- Sensor networking through bi-directional RF / wire communication
- Enables long-term remote battery powered or RFID sensor nodes
- Standardizes sensors to a single high-volume programmable chip for most applications
- Cost savings with greatly increased reliability and flexibility

Can do all sensing / signal processing in
one single universal programmable chip!

