Kaben Wireless Silicon and Triad Semiconductor Partnership

Wireless & RF ASICs for Everyone!

Kaben Wireless Silicon & Triad Semiconductor Pursue a Comprehensive Partnership

Triad Semiconductor and Kaben Wireless Engage in a Comprehensive Partnership
Custom Wireless and RF ASICs now within the reach of Everyone

March 22, 2011

WINSTON-SALEM and OTTAWA ... r Inc. ("Triad") t... dustry's leading supplier of v... figurable m... reless Si... c. ("Kaben") an ...der o... slashed to i... n ye... production v... in a wide... ...dical, i... al, and automotive t... gh volume consu...

Triad Semiconductor
Via Configurable Array Technology

Kaben & Triad

Configurable

RF / Wireless ASICs for everyone

Kaben Wireless Silicon
RF / Wireless Expertise

About Triad Semiconductor

- **World's leading provider of via configurable array (VCA) solutions**

- **Mixed signal ASICs – *only better***
  - Lower development costs
  - Fastest possible time to profits
  - Significantly reduced risk
  - Any production volume

Markets	Aerospace & Defense	Industrial	Medical	Power/Energy	Consumer
Drivers	Size, Weight, Power SWaP+Cost	Long-term Supply, ROI	SWaP+Cost High Performance	Integrating Micros High-Voltage & Analog	Cost, Risk, Time-to-$
Applications	RADAR, Guidance, UAV, Munitions, Rad-Hard, Satellites, Obsolescence, Secure Comm, FPGA+Analog replacement	RS485, RS232, High Voltage ASICs, Sensor Fusion, Gas, Pressure, Humidity Detectors, Precision Analog + 32-bit Processors	Pulse Oximetry, Implantables, Nuero-Stim, Glucose Monitors, Smart Patient Monitors, Heart Rate, Fitness	Servers, Data Centers, Solar Inverters, Hand-Held Devices, Analog Sweep-Up ASICs, LED Lighting	Cell Phones, Tablets, Toys, Netbooks, 3DTV, 3D Gaming, Human-Interface

The Problem with ASICs – Triad's Solution

- **Traditional Full-Custom ASIC Design**
- ***Expensive, Slow, Risky***

$2,500,000

$2,300,000

$2,000,000

Full custom development costs → $1,500,000

16-months to first silicon

Re-spins…

6-month 1st Silicon

Re-spins
4 weeks
Zero - $50K

VCA costs → $400,000

- **Via Configurable Array Design**
- ***Affordable, Fast, Safe***

The VCA Advantage

To Market a Year Earlier

Save Millions

Easy, Fast Changes

KABEN
Wireless Silicon

TRIAD
SEMICONDUCTOR

# Triad's VCA Technology, Solutions, & Benefits

- **<u>The Low Cost, Low Risk, Fastest way to develop a mixed signal ASIC for any production volume</u>**

- Single via mask layer processed at the foundry against staged wafers resulting in prototypes in 4 weeks

- Configuration vias automatically placed in a single mask layer configures and connects all resources

- Resources overlaid with a global routing fabric

- Tiles arranged in via configurable arrays containing analog, digital and memory resources

- Full-custom / high-performance IP assembled into via configurable tiles

- High-performance analog & mixed-signal ASIC & IP development team & fabless silicon provider

6-month development

Industry's lowest NRE

Silicon Proven IP

KABEN Wireless Silicon

TRIAD SEMICONDUCTOR
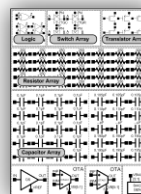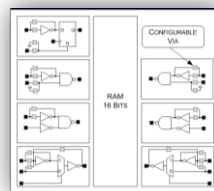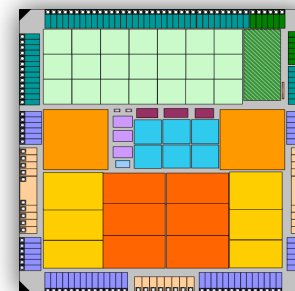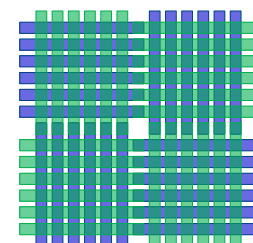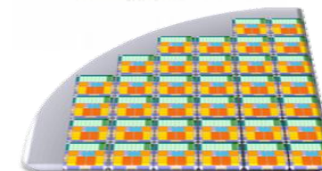
About Kaben Wireless Silicon

- **A world class team of industry-hardened, experienced engineers specializing in mixed signal and radio system architecture for the last 10 years.**

- **Industry-recognized, IP foundation for wireless, wireline and optical applications. At the heart of our systems, we employ our patent-protected, core technologies**
    - $\Delta\Sigma$-Fractional-N Frequency Synthesizers
    - Tunable, on-chip (SAW-like) filters
    - Data Converters (ADCs & DACs)

  - **Recent industry trends have pushed us to develop wideband technology**
    - Wideband tunable filters and high dynamic range ADCs, that can work on lower supply voltages

- **Latest accomplishments and/or developments for Tier 1 companies**
    - Ultra-robust FM radio for harsh environments – uses our filter technology
    - Programmable, low-jitter timing products – uses our synthesizer technology
    - Tunable, wideband on-chip filter for wireless infrastructure – uses our wideband filters
    - All-Digital PLL based synchronization development – uses our next generation synthesizers
    - High-resolution Analog Front End – uses our filter technology and data converters

Kaben & Triad means wireless/RF for everyone

- Kaben synthesizer technology → Can apply crucial optimization

- Kaben tunable filter technology → Custom made for any application

- Kaben Wireless & Wireline solutions → Product enhancement migration path

<u>No trade offs → we *crest* the power/performance curve</u>

- *Any Volume* ASIC solutions are now economical and accessible → perfect for proprietary products

- Clients have expressed an overriding desire to obtain a time-to-market advantage → Kaben-Triad VCA rapid prototyping facilitate this.

- Risk Mitigation → Changes are fast and inexpensive

<u>Applications the fit well – *Now Configurable*</u>

- FM/AM Radio Tuners
- GPS
- Satellite Receivers
- DVB –x/x2 TV Tuners
- UWB

- WLAN 802.11a/b/g/h/n
- WiMAX 802.16a, 3GPP/LTE
- Multimode Cellular/Basestation
- IEEE1588, SynchE, ToP
- Timing Products that need Jitter Attenuators/XO/VCXO

Media Contacts

Kaben Wireless Silicon

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