



## **Product Brief - Low Power Devices Enabling the IOT**

**Ambiq Micro AB0801 Real Time Clock – Circuit Analysis**  
**Dialog DA14580 Bluetooth Smart SoC – Circuit Analysis**



Q1 2016

# Low Power Devices Enabling the IOT



Ambiq Micro AB0801  
Real Time Clock

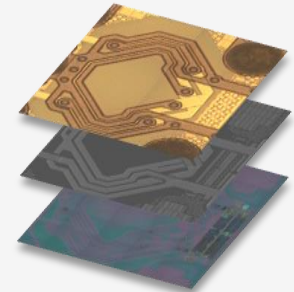


Dialog DA14580  
Bluetooth Smart SoC

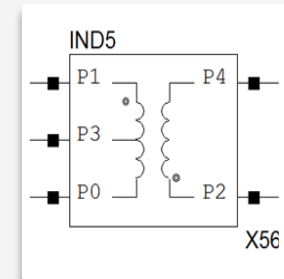
Chipworks has performed highly detailed Circuit Analysis of the Ambiq Micro AB0801 and the Dialog DA14580. Both devices feature incredibly low power consumption, the kind of efficiency that will enable the IOT.

[Learn more about ICWorks Browser »](#)

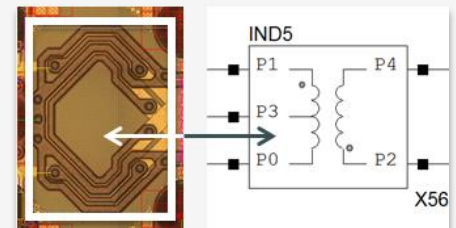
## Delivered in ICWorks Browser



Multi-Layer Image Sets



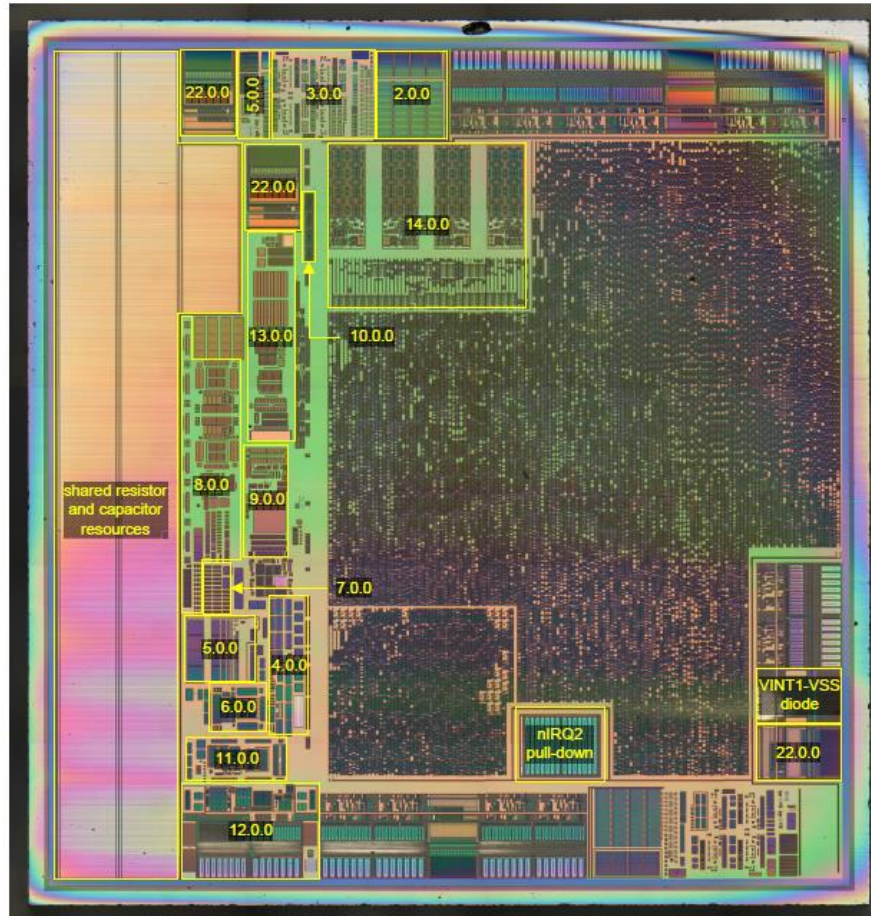
Schematics



Cross-probe  
Images and Schematics

# Ambiq Micro AB0801 Real Time Clock

CAR-1512-901



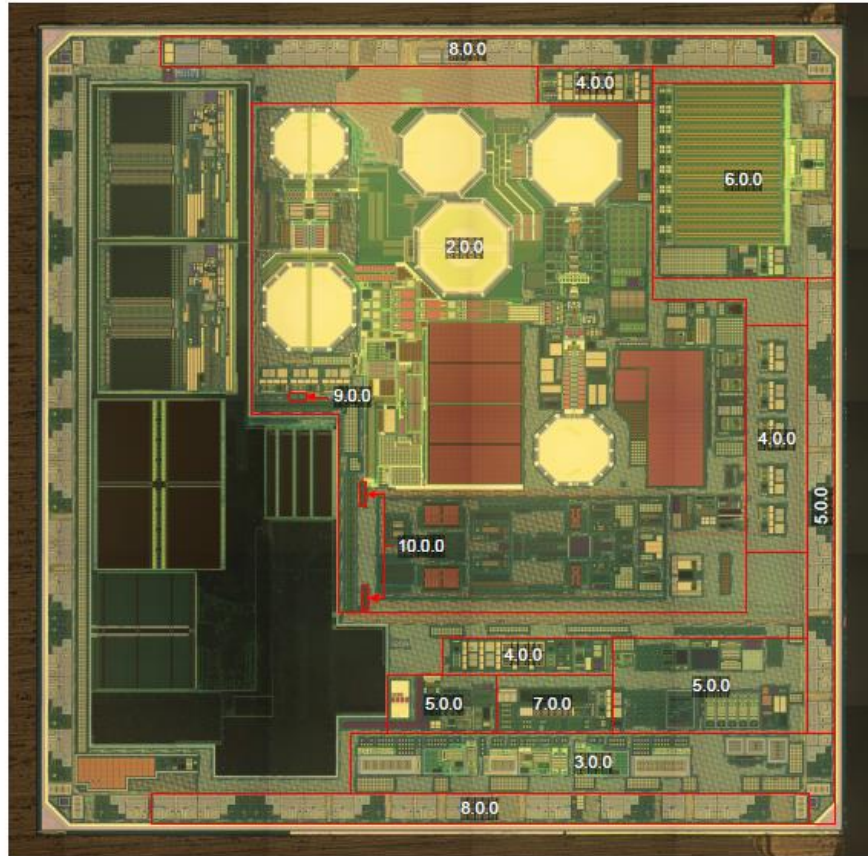
2.0.0 Reference Voltage Source	7.0.0 Voltage Divider	11.0.0 Crystal Oscillator Voltage Regulator
3.0.0 Level Detectors	8.0.0 Programmable Voltage-to-Current Generator	12.0.0 Crystal Oscillator
4.0.0 Logic	9.0.0 Relaxation Oscillator	13.0.0 OTP Memory Voltage Regulator
5.0.0 Internal Voltage Generator	10.0.0 Frequency Divider	14.0.0 OTP Memory
6.0.0 Differential Amplifier		22.0.0 Pad Cell

Analyzed  
Blocks

- The AB0801 is part of the AB08XX real time clock family designed by Ambiq Micro. It features a crystal oscillator, an R-C oscillator with auto-calibration, a 128-bit one-time-programmable (OTP) memory, two general purpose outputs, and I2C interface
- The device uses Ambiq's **Subthreshold Power Optimized Technology (SPOT)** in order to achieve minimal power consumption. According to Ambiq, both the analog and digital sections of the die contribute to the power saving by utilizing **CMOS transistors operating in the subthreshold regime**

# Dialog DA14580 Bluetooth Smart SoC

CAR-1502-901



## Analyzed Blocks

2.0.0	Radio Transceiver	8.0.0	I/O Drivers and ESDs
3.0.0	Buck-Boost Converter	9.0.0	Control Circuit I
4.0.0	LDO Regulators	10.0.0	Control Buffers
5.0.0	Reference Generators	11.0.0	Latch
6.0.0	XTAL 16 MHz	12.0.0	Unused Buffers
7.0.0	Charge Scaling DAC		

- The Dialog Semiconductor DA14580 integrated circuit is a **fully integrated radio transceiver and baseband processor for Bluetooth® Smart**. It can be used as an application processor as well as a data pump in fully hosted systems.
- Packaged in a **2.45 mm x 2.45 mm x 0.5 mm** thick, 34-pin, wafer-level chip scale package (WL CSP) and requires just five external components.
- Designers have the freedom to increase battery lifetimes or **use fewer batteries, create small form factors that were previously impossible, reduce system cost**, and still include attractive extra features and design elements

# List of Available Reports

Chipworks Report	Date	Links
<b>Dialog DA14580 Basic Functional Analysis Report</b> (FAR-1406-801) <ul style="list-style-type: none"> <li>• Package photographs, X-rays, and die photo with die size measurements</li> <li>• Annotated metal 1 or poly die photo showing major functional blocks</li> <li>• Table summarizing the length, width, area, and percentage die area of each block</li> <li>• SEM cross sections</li> <li>• Node assessment (metal 1 pitch, transistor measurements, ITRS assessment)</li> <li>• IC cost estimate</li> </ul>	Available	\$7,500  <a href="#">Table of Contents »</a>
<b>Dialog DA14580 Circuit Analysis Report</b> (CAR-1502-901) <ul style="list-style-type: none"> <li>• Circuit Analysis reports are delivered in ICWorks Browser which includes:               <ul style="list-style-type: none"> <li>• Multi-layer image set</li> <li>• Schematics</li> <li>• Cross Probing</li> </ul> </li> </ul>	Available	Call for pricing  <a href="#">Table of Contents »</a>
<b>Ambiq Micro AB0801 Circuit Analysis Report</b> (CAR-1512-901) <ul style="list-style-type: none"> <li>• Circuit Analysis reports are delivered in ICWorks Browser which includes:               <ul style="list-style-type: none"> <li>• Multi-layer image set</li> <li>• Schematics</li> <li>• Cross Probing</li> </ul> </li> </ul>	Available	Call for pricing  <a href="#">Table of Contents »</a>



## Thank You

Our experienced engineers and analysts deliver top-notch investigative results. You can expect a comprehensive, factual, and detailed report which will give you a solid understanding of your product and market position, and more importantly – your market potential.

For more information on these reports, report bundles, and how we can better suit your needs, please contact Hamza Iqbal at:

[hiqbal@chipworks.com](mailto:hiqbal@chipworks.com)

[www.chipworks.com](http://www.chipworks.com)