

Starting with ATM34/e

Quick Start Guide

SUMMARY: This document provides direction for a new user to start the evaluation of the ATM34/e Wireless SoC and its EVK reference designs.



Atmosic™

Starting with ATM34/e Quick Start Guide

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1. Overview

This document provides direction for a new user to start the evaluation of the ATM34/e Wireless SoC and its EVK reference designs. It directs hardware and software engineers to the basic information to familiarize themselves with the Atmosic offerings and outlines the transition from EVK evaluation to product designs. This guide is not intended to be advanced material guidance for the user.

2. Evaluation Kits (EVK)

EVK	SoC Package	SoC Part Number	Kit Part Number	-Software Example Preloaded
Evaluation Kit for ATM3405 5x5 QFN	40-pin 5x5 mm QFN	ATM3405-5WCAQK	ATMEVK-3405-WQK-5	Zephyr atm_beacon sample in "simple-beacon" mode
Evaluation Kit for ATM3405 4x4 BGA	93-ball 4x4 mm BGA	ATM3405-5YCABV	ATMEVK-3405-YBV-5	Zephyr atm_beacon sample in "simple-beacon" mode
Evaluation Kit for ATM3430e 7x7 QFN	56-pin 7x7 mm QFN	ATM3430E-5YCAQN	ATMEVK-3430E-YQN-5	Zephyr atm_beacon sample in "simple-beacon" mode

3. For High-Level General Information

Users must be logged in to access most of the materials linked below.

3.1 General Product Documentation

Please **select the +** to expand the different sections for more materials.

ATM34/e SoC Documentation	+
EVK	+

- In the [ATM34/e SoC Documentation](#) section

- Product Briefs
 - [ATM34/e Series Product Brief](#)
- Product Datasheets
 - [ATM34/e Series Datasheet](#)
- Product White Papers
 - Please **select the +** to expand to view different Product White Papers

Product Briefs	+
Application Notes	+
Datasheets	+
White Papers	+

3.2 On-Line Power Profiler Tools

The links below point to the On-Line Power Profiler to calculate the ATM34/e current consumption with various configuration and parameters.

- [ADV \(Advertising\) Beacon Profiler](#)
- [Connection Interval \(CI\) Profiler](#)

4. For Hardware Engineers

All EVKs are shipped with software preloaded (with debug console output disabled) as shown in the section 2, Evaluation Kits table. This allows the hardware engineers to measure the low power consumption demonstrated by the Atmosic ATM34/e Wireless SoCs. Only the ATMEVK-3430e-YQN EVK supports energy harvesting measurements. The default board configuration is with a coin cell (Please insert a coin cell or read the hardware documents listed below to configure for other power supplies, like USB).

4.1 Hardware-Related Documentation

- [ATM34/e Series Evaluation Kit User Guide](#)
- [ATM34/e Series EVK Power Consumption Evaluation User Guide](#)
- [ATM33e Series and ATM34e Series Energy Harvesting EVK User Guide](#)
- [ATM33e and ATM34e Energy Harvesting and High Voltage Storage Device Support Application Note](#)

4.2 Hardware Design Files

Please **select the +** to expand the different sections for more materials.

ATM34/e SoC Documentation

+

EVK

+

- In the [EVK](#) section
 - Hardware design files
 - ATMEVK-3405-YBV
 - ATMEVK-3405-WQK
 - ATMEVK-3430e-YQN

4.3 Hardware Quick-Start Essentials

This section outlines the essential steps to begin your EVK evaluation efficiently. By following this sequence, you can focus on the critical configuration tasks needed to get your hardware running quickly.

To begin, please review the following documents in this order:

1. [ATM34/e Series Datasheet](#) – Review Section 1.3: Power Management Unit (PMU) for a foundational understanding.
2. [ATM34/e Series Evaluation Kit User Guide](#) – Follow the instructions to set the EVK jumpers for proper power-up. This will help you validate the PMU concepts from the datasheet against the physical evaluation board.
3. [ATM34 Series Reference Manual](#) – Consult Sections 8.1 and 8.2 for detailed PMU configurations. Identify the configuration that aligns with your specific design requirements:
 - VBAT: For power sources $\leq 3.3V$.
 - VBATLI: For power sources between 3.3V and 4.5V.
 - VDDIO: Select between an external source (1.8V–3.3V) or the internal 1.8V VDDIOP rail.
4. Configure the Hardware – Using the schematic, locate the appropriate header pins and install the jumpers to match your target PMU configuration.

Note: The EVB generates 3V from the USB 5V supply. You can utilize this power source to power up the chip for the FW Download purpose and then switch back to the final target power source for the performance evaluation.

5. For Software Engineers

We recommend that software engineers begin by setting up the development environment. This establishes a baseline understanding of directory structures, binary builds, and software examples within the OpenAir Zephyr SDK.

5.1 Software-Related Documentation

- [Zephyr Project Introduction page](#)
- [Getting Started Guide](#)

5.2 SDK Installation, Build, and Programming

1. Follow steps 1–4 in the [Install Atmosic OpenAir SDK toolchain](#) to download or upgrade the SDK.
2. If you have completed the hardware setup in section 4.3, connect the USB cable to power on the EVB. The board must be powered on before proceeding.
3. For steps 5–7 (building and flashing code to the EVK), refer to the documentation within the example directories:

The Atmosic provided sample application codes can be found in the following directory:

```
OS (C:) > atmoa > zephyrproject_26_01_0 > openair > applications
```

The open source and additional Atmosic provided sample application codes can be found here:

```
OS (C:) > atmoa > zephyrproject_26_01_0 > openair > samples >
```

The README in each of the samples details information on how to build and flash the sample to the EVB.

6. Performance Evaluation

There are mainly two performance indicators for the BLE designs.

1. Power consumption
2. RF performance

For the Power consumption performance evaluation, please refer to the [ATM34/e Series EVK Power Consumption Evaluation](#)

For the RF performance evaluation, please refer to the [RF Tool User Guide](#)

7. Product Design

The evaluation team and design team are often located in different departments meaning the design team may not have hands-on experience with the Evaluation Kit (EVK). This chapter provides the essential information to guide the design team through the hardware development process.

7.1 Hardware Design Flow

1. **Identify Hardware Configurations:** Consult section 8.2 in the [ATM34 Series Reference Manual](#) – to Identify the hardware configuration that aligns with your specific design requirements:
 - VBAT: For power sources $\leq 3.3V$.
 - VBATLI: For power sources between 3.3V and 4.5V.
 - VDDIO: Select between an external source (1.8V–3.3V) or the internal 1.8V VDDIOP rail.
2. **Pin Assignment:** Use the [Pinmux Tool](#) to confirm the IO functions and assign IO pins
3. **Schematic and Layout:** create your schematic and layout using Atmosic EVK designs and [ATM34/e Series Hardware Design Guide](#) as references. Note: Ensure the switcher inductor meets the spec. in chapter 5.4 of the Hardware Design Guide

and the programming test points or the connector listed in chapter 7.1 of the Hardware Design guide reserved for firmware download.

4. **ESD Protection:** Follow the [ESD Protection Application Notes](#) to add proper ESD protection if needed.
5. **Design Review:** Complete the checklist in the [Guidelines and Checklist for Board Designs with ATM33/e or ATM34/e Bluetooth SoC](#).
6. **FW Download Strategy:** Review the [Reference Design Programmer Board Design file](#), [Reference Design programmer board User Guide](#), and [MP Download board User Guide](#) to determine the best interface for R&D and mass production.
7. **Battery and Memory Protection Settings:** Refer to Table 8-1 in the section 8.1 of [ATM34 Series Reference Manual](#) to pick the batt-type, batt-level, vddio-type and vstore-max(ATM34e only) settings based on the hardware configuration. Use these to define the Brownout protection threshold following the section 8.4 (Brownout Detector) to convert these values into software settings. These parameters (batt-type, batt-level, vddio-type, vstore-max(ATM34e only), and Brownout thresholds) must be set before the designs enter stress tests or during the production firmware programming process.

7.2 Production Flow

1. **Interface Setup:** Once the PCBAs are available, connect the chip to your chosen FW download interface board. Refer to the [Reference Design Programmer Board Design file](#), [Reference Design programmer board User Guide](#), [MP Download board User Guide](#), and [MP Download Board Design file](#).
2. **Firmware Download:** Use the [Atmosic Zephyr installation Guide](#), [Flash Programming Tool User Guide](#) or the [MP Download User Guide](#) to flash the firmware. The Atmosic Zephyr installation Guide explains how to compile code and flash code to memory with west commands. The west command can also burn the otp_batt_type and otp_vbatt_level bits (details can be found in [ATM34 Series Reference Manual](#) section 8.1). The Flash Programming tool is primarily for firmware loading and memory dumping, while the MP Download tool supports firmware loading, RX DC calibration, clock trimming, and production testing.

7.3 Certification

FCC certification processes often require significant testing time in the certification lab. To minimize certification costs and ensure a smooth approval process, please refer to the [FCC Compliance Preparation Application Notes](#), which explain the FCC certification rules. To control the device under test (DUT) and send signals for certification testing, refer to the [RF Tool User Guide](#).

Typically, if a product passes FCC certification, it should also pass CE certification.

8. Evaluation and Design Flow

Evaluating a BLE solution requires assessing software compatibility and capability, as well as hardware RF performance and power consumption. The following performance evaluation flow is the most efficient way to become familiar with the Atmosic solution.

Performance evaluation flow (Atmosic Evaluation Boards):

- 1) [ATM34/e Series Datasheet](#) (Section 1.3): Understand PMU voltage rail functions.
- 2) [ATM34 Series Reference Manual](#) (Section 8.2): Select the PMU configuration matching your product requirements.
- 3) [ATM34/e Series Evaluation Kit User Guide](#): Configure jumpers to match your target design specifications.
- 4) **Software** [Getting Started Guide](#): Install Atmosic Zephyr SDK.
- 5) [atm_beacon](#) **sample code**: Evaluate BLE power consumption and explore software structure.
- 6) [HCI_Vendor](#) **sample code**: Control EVKs with the standard HCI commands for RF or system link performance measurement
- 7) **Compilation and Flashing**: Follow README instructions to build and flash firmware to NVM
- 8) [ATM34/e Series EVK Power Consumption Evaluation User Guide](#): Measure power consumption.
- 9) [RF Tool User Guide](#): verify RF performance.
- 10) **Third-Party Equipment**: Use HCI-compatible equipment to validate TX/RX, and link layer, like BLE certification and channel sounding, performance

Design Start Flow (For the design teams):

- 1) [ATM34/e Series Datasheet](#) (Section 1.3): Understand PMU voltage rail functions.
- 2) [ATM34 Series Reference Manual](#) (Section 8.2): Select the PMU configuration matching your product requirements.
- 3) **Atmosic EVB/Reference design schematic, layout and [Pinmux Tool](#)**: plan IO assignments for peripheral digital control interfaces and for optimization of the final form factor layout.
- 4) [ATM34/e Series Hardware Design Guide](#)
- 5) [ESD Protection Application Notes](#): Ensure adequate ESD protection.
- 6) [Guidelines and Checklist for Board Designs with ATM33/e or ATM34/e Bluetooth SoC](#)
- 7) **Design Review**: Submit design files to Atmosic for expert review.
- 8) FW Download Interface: [Reference Design Programmer Board Design file](#), [Reference Design programmer board User Guide](#), and [MP Download board User Guide](#)
- 9) **Battery/Memory Protection** ([ATM34 Series Reference Manual](#) Section 8.1 and 8.4): Configure the otp_batt_type and otp_vbatt_level bits and set the brownout and power up voltage check thresholds in software.
- 10) **Performance Validation, Product Certifications and Mass Productions**: [Atmosic Zephyr installation Guide](#), [Flash Programming Tool User Guide](#), [MP Download User Guide](#), [FCC Compliance Preparation Application Notes](#)

Revision History

Date	Version	Description
September 15, 2026	0.13	Added Evaluation and Design Flow
August 25, 2026	0.12	Updated For Hardware Engineers - update to ATMEVK-3430e-YQN; Updated document list in Hardware-Related Documentation
August 21, 2026	0.11	Update Hardware Design Flow and Production Flow
October 14, 2024	0.10	Initial Release



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