Instruction

Prepare for Z-Wave Certification Tests

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REVISION RECORD

Doc. Rev	Date	By	Pages affected	Brief description of changes
1	20181205	AMUNKHAUS	ALL	Initial release of document.

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1 ABBREVIATIONS

Abbreviation	Explanation
API	Application Programming Interface
CTT	Compliance Test Tool
OEM	Original Equipment Manufacturer
RF	Radio Frequency
SiP	System in Package
SoC	System on Chip

2 INTRODUCTION

2.1 Purpose

The purpose of this document is to give an overview of the Z-Wave Certification process for the Z-Wave 700 products.

The document is created with the intention to keep it short while describing both benefits of the certification program and highlight the steps in the process of certifying a product.

This document will also serve as a guide in where to find additional information.

2.2 Audience and Prerequisites

The audience is Z-Wave partners and OEM integrators. The document can be used by stakeholders to explain the benefits of the Z-Wave ecosystems as well as developers to guide them in completing the certification.

3 Z-WAVE IS INTEROPERABILITY

Many people understand different things for the word 'Interoperability'. Interoperability is *not* just having various nodes joining one network. A Wi-Fi thermostat and printer may operate on the same home network, but they don't talk to each other. When a consumer leaves his or her home, they want to push one button that will lock all doors, arm the alarm system, set the temperature, and switch off all the lights. The products are likely from different vendors, so just having them join the same network is not interoperability. They all need to speak the exact same language. This is called Application Layer Interoperability.

Z-Wave requires application interoperability in all products and has put in place a stringent certification program that all products go through to ensure correct commands are being used in products.

Each product must follow the Z-Wave Plus v2 specification to be able to pass the certification program and ensure interoperability in the ecosystem of existing products. The primary focus is ease of use for consumers, which can be summarized into:

- Shopping does not require intensive knowledge about which products work with other products.
- Installation is as simple as possible and intuitive.
- Operating the products does not require any technical knowledge.
- No tricky maintenance procedures such as exclude/include.

The certification program is executed by independent certification laboratories, and the process is simple:

1) Join the Z-Wave Alliance
2) Download the Self-Certification Tool on silabs.com
3) Access and fill out the online form and documentation
4) Submit the product to the third-party test house
5) Once the product passes certification and product and packaging labels are approved, the Z-Wave Cert Logo is awarded, and the product can go to the market.

These steps are further described in a later section.

Consumers and channel partners will recognize that the product is Z-Wave certified and will work seamlessly with other Z-Wave products. Z-Wave gives the freedom to choose devices from different vendors giving end users a choice and enabling manufacturers to leverage the ecosystem of devices.

Z-Wave is interoperability.

4 Z-WAVE CERTIFICATION

Interoperability between all Z-Wave products is the cornerstone of the brand. To make this brand promise to developers, customers, and consumers, there is a straight-forward certification program in place. All Z-Wave products must be certified before commercial launch. When the certification requirements have been met, products can feature the Z-Wave interoperability logo badges.

4.1 Certification Process Overview

Because the product must meet specific certification requirements, consider the technical requirements for your device ***early in the process***.

Scope the technical requirements prior to starting the development process as it is easier to ensure that the device will meet the requirements to pass certification if they have been incorporated from the beginning. A tip is to use the certification form as a guideline.

Use the resources available to your disposal to work as efficient as possible. For example, the Compliance Test Tool (CTT) [11] and Wiki test specification pages [6].

The certification process is simple, just follow these steps:

1. Create a Silicon Labs user account to get access to the Z-Wave technical site where all the specifications for certification [1] are available.

2. Request access to the web-based Z-Wave Plus Certification Portal [5] and start a device submission to help identify all the certification requirements.

3. The company whose brand will appear on the product MUST join the Z-Wave Alliance as a full member, as this is a requirement for market certification. Consider this step early in your development process, to take advantage of benefits the Alliance provides that can speed your time to market. Login to the Z-Wave Alliance member website [10] to review the latest Market Certification requirements and guidelines.

4. *Hardware specific* (see "*4.2* Z-Wave 700 Hardware")*:* If your product is using a SoC module you must also achieve QFN Certification before you can finalize your certification form. For more information, refer to 4.2.1.

5. Download the Compliance Test Tool [11] tool and use it during product development to test and verify your Z-Wave implementation and that all mandatory device and command class requirements have been implemented properly.

6. After ensuring a compliant product, finalize and submit your form on the portal. A case number is automatically assigned as soon as it is submitted. You can start working with the test house as soon as your submission has been reviewed and approved. For more information, refer to 4.3.

7. Start your Market Certification on the Z-Wave Alliance's website as soon as you have a case number. For more information, refer to 4.4.

8. Device certifications are issued after the device has passed the technical tests AND the Market Certification has been approved by the Alliance.

9. After approval, launch your product into the interoperable Z-Wave ecosystem, which enjoys over 70% market share in the smart home. The Z-Wave brand guidelines can be found here [12].

4.2 Z-Wave 700 Hardware

The certification process is slightly different depending on which Z-Wave 700 product you are developing. It is therefore important to understand the main differences of the Z-Wave 700 hardware. The Z-Wave 700 series consist of two hardware components:

- Z-Wave 700 EFR32ZG14 SoC Module
  This modem SoC part is suitable for Z-Wave gateways only and cannot be used for end-devices. The EFR32ZG14 consists of a simple serial port to communicate with the host controller, and a sub-GHz radio for RF communications to Z-Wave end devices. The Z-Wave protocol stack is fully implemented on chip, and a simple serial API is used for data and control.

- Z-Wave ZGM130S SiP Module
  This general-purpose module combines a SoC with a built-in microcontroller and RF transceiver, crystal, & passive RF components into one SiP module. It is mainly used for end-devices but can also be used for controllers.

4.2.1 QFN Certification

QFN Certification is used for certifying products where the SoC module is used in the design. This means designs using the SiP module do not have to go through QFN Certification. As such, an end-device do not need to pass the QFN Certification as end-devices can only be based on a SiP module. Only controllers based on a SoC module must pass this certification.

A QFN Certification involves comprehensive RF testing. This testing is conducted at Silicon Labs' facilities in Singapore and fees are paid to Silicon Labs.

The device must achieve QFN Certification before it is submitted for Z-Wave Plus v2 certification.

Fill out the QFN Certification Form [8] and contact the SiLabs Certification Manager to start the certification.

4.3 Z-Wave Plus v2 Certification

Z-Wave Plus certifications include stringent technical compliance testing and is carried out using the Z-Wave Plus Certification Portal. The forms in the portal should also be used during the definition stage of product development. Cases can be saved for completion at a later date, so it is easy to get started even if you don't have all the details.

Use the integrated Wiki to see the test specifications for your device. Question Mark icons "  " are located throughout the certification form. Clicking on these icons opens a Wiki page with more information and in many cases, the related test specification.

Certification cases are identified as being in one of the following phases:

1. **Initial Form Selection** – Developer identifies and selects what is being implemented.
2. **Self-Certification** – Developer conducts self-certification tests and verifies compliance.
3. **Initial Review** – Case has been submitted by the developer and is pending initial review.
4. **Wait for Verification Test** – Case has passed initial review and developer needs to pay the fees and submit required documentation and test samples to the selected test partner.
5. **Verification Test** – Test Partner has received everything (all required documentation, test samples and fees) and the device is ready to be tested. At the completion of testing, results will be submitted to the Certification Manager for review and processing.
6. **Wait for Ad Hoc Test** – Initial testing resulted in minor issues and the developer needs to submit fixes to the test partner. (Ad Hoc is a 30-day period during which the developer works directly with the test partner to resolve all issues.)
7. **Ad Hoc Test** – The test partner has received everything needed to re-test the device and verify the issues have been resolved. At the completion of testing, results will be submitted to the Certification Manager for review and processing.
8. **Market Certification** – A case may be in this phase for either of the following reasons:
    a. This is a review-only recertification that has passed the initial review. It will remain in this phase until the Z-Wave Alliance has approved the Market Certification for this device.
    b. The test results for this case have been received from the test partner; however, the Market Certification for this device has not yet been approved by the Z-Wave Alliance. A device certification cannot be issued until the Market Certification has been approved so this case will remain in this phase until that has been accomplished.
9. **Certification Finished** – The certification case has been closed. Possible outcomes are:
    a. Passed and certification issued.
    b. Failed - Device must be resubmitted as a new case.
    c. Cancelled
    d. Expired – Developer has exceeded the allowed time for ad hoc issue resolution.
    e. Revoked

Refer to the Z-Wave Certification Portal Getting Started Guide [6] for more information.

4.4 Z-Wave Alliance: Market Certification

The Z-Wave Alliance consists of over 700 companies and over 2400 products, all interoperable with each other.

Market Certification ensures that your product carries the proper logo and certification marks. Market certification is mandatory for all Z-Wave Plus products and is administered by the Z-Wave Alliance.

Market Certification verifies:

1. The placement and size of the Z-Wave Plus mark on your product and product packaging.
2. The placement, size, method, and material for the Z-Wave Security 2 Device Specific Key information on your product.
3. That the common and key information is present in the user guide/manual for your product.
4. That the image, description, and features of the product are accurate and helpful to consumers.

Start your Market Certification on the Z-Wave Alliance's website [10] as soon as you have a case number.

5 QUESTIONS ON CERTIFICATION?

To get access to the online Certification Portal or if you have any questions regarding certification, reach out to the Certification Manager.

Create a new case on silabs.com and make sure to select “Z-Wave Certification-Wireless-“ as the part number.

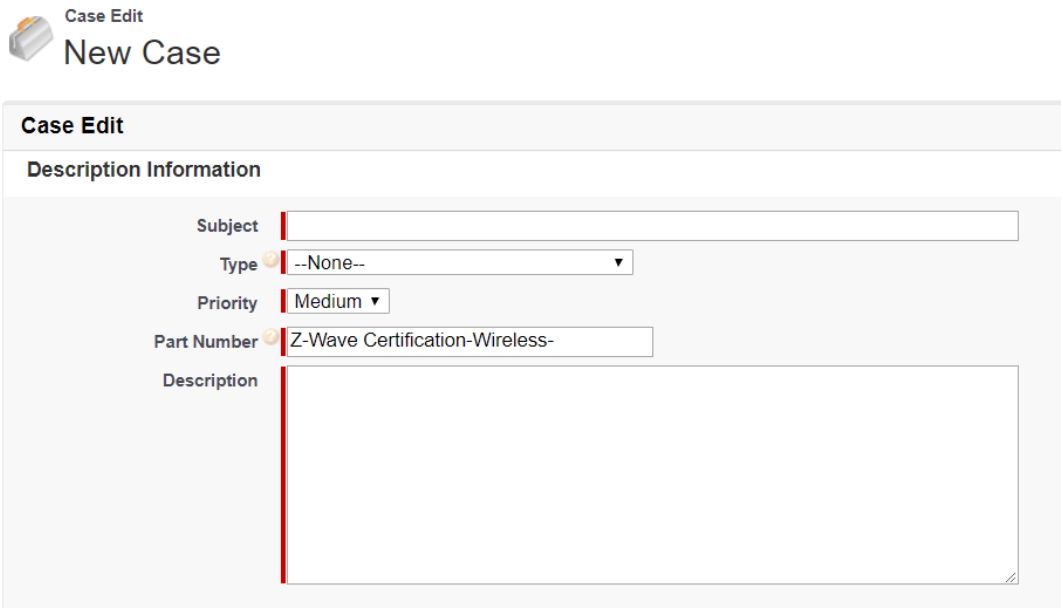

Figure 1: Contact the Z-Wave Certification Manager

REFERENCES

This section will summarize and link to important information to give the complete overview.

[1] Z-Wave Specification
Specification documents.

[2] Get Certified with Z-Wave
A short overview of the certification process similar to this document.

[3] Z-Wave Plus Certification Program
A short overview of Z-Wave Plus Certification similar to this document.

[4] INS10638 – Z-Wave Certification Overview
Document describing the entire Z-Wave Certification in a much greater detail than this document.

[5] Z-Wave Certification Portal
The Z-Wave Certification Portal is where you submit your device for certification.

[6] Z-Wave Certification Portal: Wiki Getting Started
A walkthrough guide for how to fill in the Certification Form.

[7] Z-Wave Certification Portal: Wiki Test Overview
An overview of all the test cases.

[8] INS12202 - Z-Wave QFN Certification Form
The certification form needed for QFN Certification.

[9] INS12578 - Z-Wave Certification Fee Schedule
Overview of fees applied to Z-Wave Certification.

[10] Z-Wave Alliance
Home of the Z-Wave Alliance.

[11] Z-Wave Compliance Test Tool (CTT)
A tool to assist in performing the self-certification tests required for verification that Command Classes (CCs) have been implemented correctly.

[12] Z-Wave Brand Guidelines
Logo usage and brand guidelines.