LoRa® Alliance, Inc. Certification Policies and Procedures

November, 2015

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1 INTRODUCTION

This document defines policies and procedures related to LoRa Alliance Certified, the product certification and testing program implemented and maintained by the LoRa Alliance. Herein are described:

- The LoRa Alliance Certified program
- Types of certification
- Testing programs and authorized test services providers
- Golden Units and processes for selection and revision

Members of the LoRa Alliance committees and work groups contributed the content for this document. If you are interested in contributing to any of these LoRa Alliance activities your participation in the relevant work groups and committees is greatly welcomed.

2 NOTICE OF USE AND DISCLOSURE

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3 REFERENCES

3.1 Documents

LoRa Alliance End Device Certification Requirements

LoRa Alliance Logo and Trademark Policy

ISO Guide 27:1983 - Guidelines for corrective action to be taken by a certification body in the event of misuse of its mark of conformity

ISO/IEC Guide 17067: 2013 - Conformity assessment —Fundamentals of product certification and guidelines for product certification schemes

3.2 Abbreviations and Acronyms

AWG	Arbitrary Waveform Generator
DUT	Device Under Test
ERP	Equivalent Radiated Power compared to a dipole antenna (expressed in dBi)
EIRP	Equivalent Isotropic Radiated Power : ERP = EIRP – 2.15dB
TRP	Total Radiated Power

3.3 Revision History

Date	Description
6-11-2015	Comment resolution – see comment spreadsheet
13-11-2015	Remove 6 month time constraint to certify against older versions of the specification
2-2-2016	Add statement regarding Semtech ownership of LoRa Alliance logos Consistent use of “LoRa Alliance Certified” throughout

4 LORA ALLIANCE CERTIFIED PROGRAM

4.1 Introduction

The LoRa Alliance is an open, non-profit association of members that believes the internet of things era is now. It was initiated by industry leaders with a mission to standardize Low Power Wide Area Networks (LPWAN) being deployed around the world to enable Internet of Things (IoT), machine-to-machine (M2M), smart city, and industrial applications. The Alliance members will collaborate to drive the global success of the LoRa protocol (LoRaWAN), by sharing knowledge and experience to guarantee interoperability between operators in one open global standard.

LoRaWAN is a Low Power Wide Area Network (LPWAN) specification intended for wireless battery operated Things in regional, national or global network. LoRaWAN target key requirements of internet of things such as secure bi-directional communication, mobility and localization services. This standard will provide seamless interoperability among smart Things without the need of complex local installations and gives back the freedom to the user, developer, businesses enabling the role out of Internet of Things.

4.2 Description

LoRa Alliance Certified is the program which enables certification of products that conform to LoRa Alliance standards. The program defines various types of certifications and related policies including requirements for certification and testing programs and leverages the expertise of subject matter experts to ensure only quality products earn LoRa Alliance Certified product status.

LoRa Alliance Certified generally follows international standards for the definition and operation of a certification program. In particular, LoRa Alliance Certified is designed as a Type 1b certification program as defined in ISO/IEC Guide 17067: 2013. Type 1b systems consist of several types of activities:

- Determination of product characteristics: This is achieved through testing of submitted samples performed by independent authorized test service providers.
- Evaluation: This is achieved by formally evaluating the results of testing.
- Decision: This is the stage that controls granting, maintaining and extending suspending or withdrawing certification.
- Licensing: Licensing refers to granting, suspending, or withdrawing the rights to use certificates or marks such as logos.

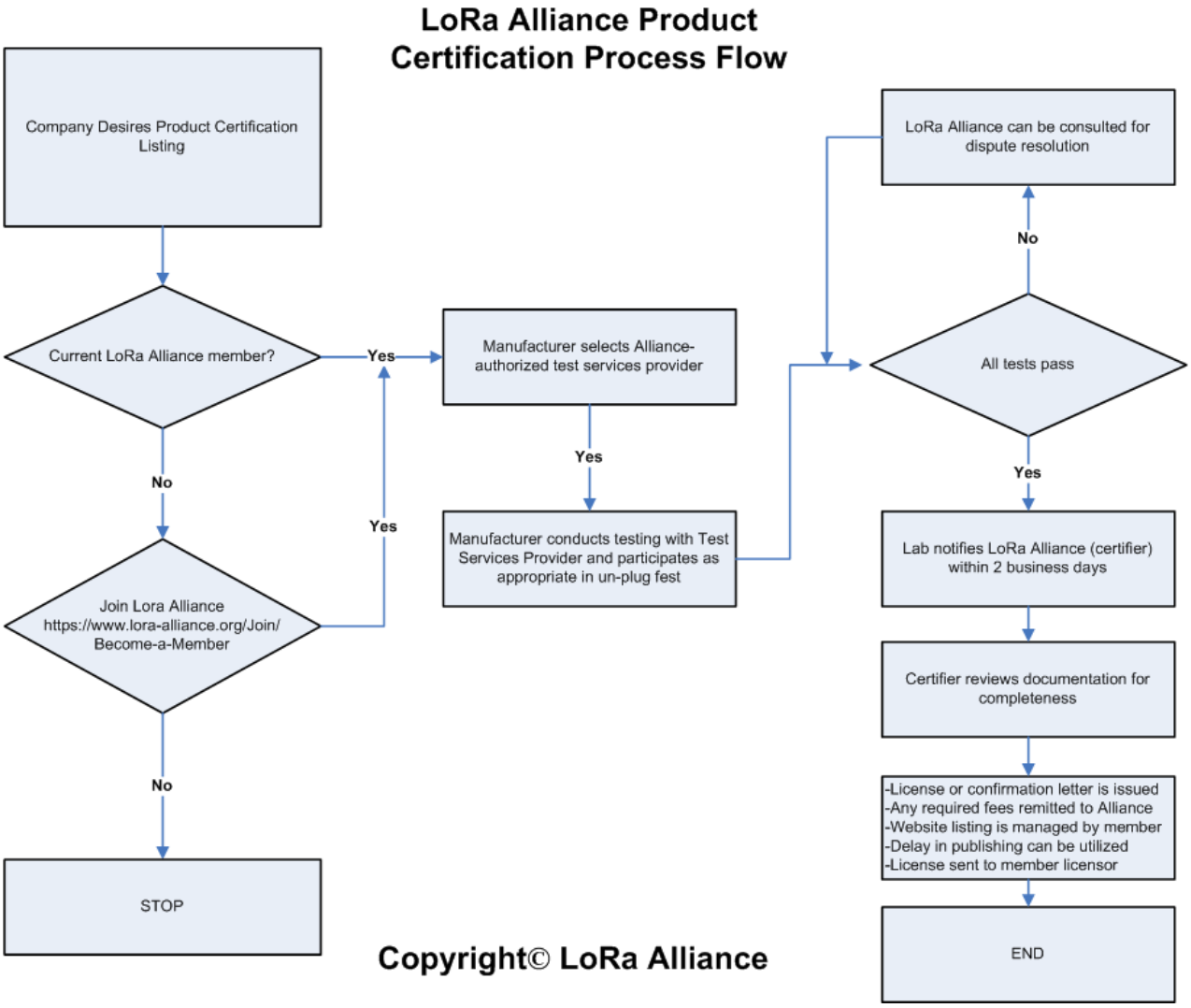
4.3 Testing Versus Certification

The LoRa Alliance Certified program maintains a strict distinction between testing and certification. Testing is the process verifying conformance to LoRa Alliance standards. Certification is granting official recognition that individual products conform to LoRa Alliance standards and that product manufacturers are conforming to all the relevant policies of the LoRa Alliance Certified program. Only the LoRa Alliance may grant certification.

5 CERTIFICATION PROCEDURES

5.1 Certification Process Flow

The LoRa certification process flow is outlined in the following diagram:



5.2 LoRa Certification Committee

The LoRa Certification Committee shall be responsible for development of policies related to certification (including this document) and for working with other technical working groups on certification related issues. The Certification Committee is chartered by the Board of Directors and is composed of volunteers from member organizations of the Alliance. Members are encouraged to join and actively participate in the committees and work groups toward the benefit of all members.

5.3 Expert Review Panel

The Expert Review Panel is a team volunteers from member companies appointed by the Certification Committee. The Panel provides expert technical advice to the LoRa Alliance Certified program. The role

of the Expert Review Panel Chair is to help the panel determine the division of responsibilities and to coordinate the panel review efforts. The Expert Review Panel shall contain no less than three (3) voting members – Contributor or higher membership. Representatives of LoRa Alliance Authorized Test Service Providers who may be present on the panel, are non-voting members of that panel. The Certification Committee Chair will only vote in the case of a tie.

An up-to-date list of the current Panel members is maintained at the front of the Certification Committee meeting minutes document.

Aside from their role in validation of test service providers, the Expert Review Panel maybe called on from time to time to provide other expert advice in regards to other matters such as review of test plans, review of interoperability concerns discovered in the field or to assist the Certification Committee in resolution of disputes.

5.4 Appeals

The LoRa Alliance shall have a procedure for the resolution of issues regarding the granting of certification.

Certification applicants may appeal a decision regarding certification if they believe this certification policy was applied in error. The basis of the appeal shall be (1) a specific concern about the misapplication of the policy or (2) an error on the part of an authorized test service provider or the Expert Review Panel.

5.4.1 Appeals Process

The process for appeals shall be:

1. Applicant shall send an appeal request to certification@LoRa-Alliance.org . The request shall document the issue, the specific basis of the appeal and the corrective action requested.
    a. Acknowledgement of receipt of the appeal by either the Chair of the Certification Committee or the Executive Director of the LoRa Alliance.
2. The Chair of the Certification Committee and the Executive Director of the LoRa Alliance shall consider the appeal.
    a. A preliminary decision shall be made either to take corrective action or to reject the appeal.
    b. If corrective action is to be taken, the Chair of the Certification Committee and the Executive Director of the LoRa Alliance shall implement the corrective action.
    c. If the appeal is proposed for rejection, the appeal shall be forwarded to the Appeals Committee (see section 5.4.2 below) for consideration.
    d. A report on the status of the appeal shall be given to the applicant.
3. The Appeals Committee shall consider the appeal.
    a. A decision shall be made either to take corrective action or to reject the appeal.
    b. If corrective action is to be taken, the Chair of the Certification Committee and the Executive Director of the LoRa Alliance shall implement the corrective action.
    c. If the appeal is rejected, the specific basis for rejection shall be documented.

4. A report on the final disposition of the appeal shall be given to the applicant by either the Chair of the Certification Committee or the Executive Director of the LoRa Alliance.

All parties shall treat any information related to an appeal as confidential information during the process.

5.4.2 Appeals Committee

The LoRa Alliance shall have a committee to address appeals. The Appeals Committee shall consist of the Executive Director of the Alliance, the chairperson of the Certification Committee and a representative of at least two authorized test service providers. The Executive Director of the Alliance shall act as chairperson of the Appeals Committee.

In order to insure the impartiality of the appeals process, any member of the Committee who may have any conflict of interest with the party making the appeal shall disclose the conflict. The member will not be allowed to vote or participate in Committee activities regarding the appeal. Conflicts of interest are defined as, at a minimum, a financial or competitive relationship with the appealing party. The Committee members themselves shall determine if other issues are conflicts of interest as well.

5.5 Requirements for Certification

Certification may be granted to a product based on an application submitted to the LoRa Alliance.

5.5.1 Membership

To submit a product for certification or compliance testing and to be granted certification, a company must be a member of the LoRa Alliance. The Alliance has several different types of membership which are documented on its web site: http://www.lora-alliance.org

5.5.2 Conformance to Standard

Certification shall be awarded based on a product's conformance to a LoRa Alliance standard.

Conformance is verified by testing performed by an authorized test service provider and demonstrated by a test report documenting successful completion of the entire test plan including all test cases for mandatory features and test cases for any optional features as required. The test service providers shall report any relevant information regarding the product's conformance to a standard in the test report. Once a new version of a standard is released, members may continue to certify products to the previous version of the standard. For the time being, the certification committee has elected not to impose any time restrictions on certifying products to older versions of the specification.

5.5.3 Documentation of Product

The LoRa Alliance shall require information sufficient to identify a product before granting certification including:

- Declaration of Conformity
  - Version numbers of product hardware, software, and firmware
  - For end products, a Stock Keeping Unit (SKU) and/or Universal Product Code (UPC)

- Signature of a representative of the product manufacturer
- Signature of a representative of the authorized test service provider performing product testing

- Product description
- Product image

5.6 Process for Certification

The certification process begins after the manufacturer completes development of the product to be certified.

1) Testing: Testing for conformance to LoRa standards is performed by Alliance authorized test service providers using test plans developed by the Alliance. The Alliance maintains a list of authorized test service providers on its web site at http://www.lora-alliance.org. Each test service provider has unique processes for product submission and will provide details on how to submit products. All test service providers will require submission of a Declaration of Conformity for the submitted product. In order to successfully pass test plans, a product must pass all mandatory test cases and any optional test cases that are applicable to the product based on the functionality it supports. In addition to the explicit functionality being checked by the test cases, the submitted product must not exhibit any behavior which is contrary to the behavior detailed in the underlying specifications in order to be considered to have passed a test plan.

2) Reporting: Test service providers will submit test results to the members. Members will submit the test reports to the online tool implemented by the Alliance.

3) Application: The Alliance grants certifications based on an application. The application is web based and is available in the Member's Area of http://www.lora-alliance.org.

4) Processing: The Alliance Help Desk personnel process applications under the direction of the Executive Director. Applications are processed for completeness to all requirements as described in Alliance policies including:

a. Submission of all required documentation

b. Membership in the Alliance

c. Completion of testing

d. Payment of applicable fees

5) Certification: Only the LoRa Alliance may grant certification and a product is only certified when the Alliance issues certification. The Alliance will issue certificates as evidence of successful certification.

A test service provider may occasionally submit non-compliant results to the Expert Panel to make a decision on the issuance of certification.

5.6.1 Certificates

The LoRa Alliance shall provide a certificate which will serve as evidence that a particular product is certified.

5.6.2 Logo Usage

Upon completion of certification, Members will receive the LoRa Alliance Certified logo (sample below) along with other LoRa-authorized logos for use on equipment and packaging. Please refer to the LoRa Alliance logo policy for proper use of the logos.

5.6.3 Length of Certification

Once a product is certified, it remains certified for the lifetime of the product unless the LoRa Alliance revokes the certification or the product is modified.

5.6.4 Revocation of Certification

The LoRa Alliance may revoke certification or participation in the certification process if any of the following occurs:

1) A product is found to be hazardous as defined in ISO Guide 27-1983.
2) The manufacturer has made any material misstatement of fact, or omission of fact, to the Alliance or its authorized test service providers.
3) The manufacturer fails to follow all Alliance certification requirements.
4) The manufacturer is misusing LoRa Alliance trademarks. Examples of misuse include (but are not limited to) misapplying logos/icons, using logos with products that have not been certified or otherwise not following the LoRa Logo and Trademark Policy.

5) The manufacturer has engaged in any form of misconduct which compromises the integrity of the LoRa Alliance or the LoRa Alliance Certified program.
6) The manufacturer leaves the LoRa Alliance and continues using logos, trademarks or any other branding in violation of the member agreement or bylaws.

Prior to revoking any certification, the Alliance shall notify the manufacturer with details and steps needed to resolve issues and take corrective action. After revocation, and the manufacturer made corrective action and successfully resolve all issues, the Alliance may, at its discretion, restore the certification or issue a new certification.

Corrective action shall follow ISO Guide 27-1983 "Guidelines for corrective action to be taken by a certification body in the event of misuse of its mark of conformity".

5.6.5 Testing and Certification Fees

There are two fees associated with the LoRa Alliance Certified program: testing and certification. The LoRa Alliance does not set testing fees. Testing fees are set by individual authorized test service providers.

Certification fees are set by the LoRa Alliance and may vary based on the type of membership in the Alliance. The current fee schedule is available at http://www.lora-alliance.org or by contacting the Alliance at help@lora-alliance.org .

6 TESTING PROCEDURES

Testing for conformance to LoRa Alliance standards is performed by authorized test service providers using test plans developed by the Alliance.

6.1 Test Plans

It is the responsibility of the relevant technical working group to develop test plans. The test plan shall include all items agreed to by the committee. Once completed the test plan must be passed to the Certification Committee for initial review. The Certification Committee review will be advisory in nature and will provide feedback on the feasibility/practicality of implementing the tests detailed within the plan.

6.2 Authorized Test Services Providers

The LoRa Alliance authorizes independent test service providers to administer the testing associated with the LoRa Alliance Certified program.

The current list of authorized test service providers is maintained at the Alliance web site: www.lora-alliance.org

6.3 Test Harnesses

Test harnesses may be developed by authorized test service providers for use in executing testing. The Alliance does not develop or distribute test harnesses.

Test harnesses are not certified by the Alliance unless they comply with all requirements of a LoRa Alliance Certified Product. Only authorized test service providers may claim to provide test harnesses used in certification testing.

6.4 Requirements for Testing

Manufacturers must provide any technical support structure required to assist in the implementation of their product into the test environment.

6.5 Reporting of Test Results

Authorized test service provider shall report results of successful tests to the LoRa Alliance. Unsuccessful test results are not reported to the Alliance unless an application for certification has been made and the Alliance requests reporting of test results.

The test reports shall conform to reporting as defined by ISO/IEC 17025:2005 Section 5.10 and at a minimum shall include:

- Test Information: Location and dates of testing, any tracking or other information necessary to trace results such as test project numbers, responsible testing engineer
- Tested Device: Company, address, contact information, product name, hardware and software product versions, serial number, LoRa device Class, and other information necessary to identify the device
- Standard Used: Name and version information
- Test Plan: Documentation of Test Plan and version numbers used or a list of test cases if a complete test plan is not used
- Test Equipment: Documentation of any equipment used in the test including test harness, script, sniffers, Golden Units, and other information necessary to identify the testing equipment including version information
- Test Results: List of individual tests conducted with individual test results
- Test Results Summary: Overall Pass / Fail
- Test Results Observations: Observations outside the scope of the test cases
- Signatures: Test engineer, any reviewer or quality engineers

6.6 Certification by Similarity

The LoRa Alliance may consider Certification by Similarity. Certification by Similarity allows a product that is derived from a previously tested and certified LoRa product to be considered for certification based on its similarity to the tested certified product, depending on the differences between the two. Typically cosmetic differences are allowed but different hardware, firmware or software will require individual certification testing. When certifying a module, it must be proven that it cannot be used in a way that the product's Application software can interfere with the execution of the LoRaWAN protocol stack. If this cannot be proven, the module itself cannot be certified and each product using that module must be certified instead. The purpose of this type of certification is to speed time-to-market and to minimize certification costs.

7 MODIFICATIONS AND REVISIONS

7.1 Modification of Products

Certification is awarded to particular version of a product. Any modification to that product will result in a new version and that version may not claim certification without going through the LoRa Alliance Certified program.

The new version of the product may not require testing in order to be certified. Changes that affect conformance to LoRa Alliance standards (hardware, firmware or software changes) will usually require testing. Cosmetic changes such as differences in packaging or color, for example, generally do not require testing. If it can be proven by the manufacturer that there is no change to the LoRa hardware or software then a full retest may not be required, and the existing certification already delivered will continue to be pertinent.

The original version of the product retains certification for the life of the product, unless revoked by action of the LoRa Alliance.

7.2 Revisions to Specifications

In the interests of continuous improvement in the quality of the compliance program, the LoRa Alliance may, from time to time, change the compliance testing procedures through a change to a test plan. Because a product's certification is good for the life of the product, there will be no requirements for vendors to go through certification again. However, the LoRa Alliance encourages vendors to resubmit their devices to test service providers for verification of compliance to those changes.

The LoRa Alliance will maintain records sufficient to identify the version of a test plan under which certified products were tested.

7.2.1 Grace Period for Testing

For the time being, the certification committee has elected not to impose any restrictions on certifying products to older versions of the specification

The work group creating the standard may recommend a grace period for revisions affecting end products, to be approved by the Certification Committee. This grace period will generally be based on the quantity of changes introduced by the new specification and the current state of deployment of devices based on the previous version of the specification or similar considerations.

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