Bluetooth LE module RYZ012x1

Bluetooth qualification acquisition

Introduction

This document describes how to acquire *Bluetooth*® qualification for a product with a Bluetooth Low Energy (hereinafter "Bluetooth LE") technology compatible module (hereinafter "Module") RYZ012x1.

Target Device

- Module
  - RYZ012A1
  - RYZ012B1

Note: This document will be a possibility that the contents change with a renewal in Bluetooth SIG website and change in the Bluetooth Qualification Program from now on.

Contents

1. Overview

This application note describes how to register (Declaration) a product using a Qualified Design Identification number (QDID) of our qualified design when selling a device equipped with the Module as a Bluetooth products.

Bluetooth SIG prescribes that it is necessary to satisfy the giving requirements of Bluetooth license to sell a product using Bluetooth technology and a trademark. Please confirm the governance document with the following URL for details.

https://www.bluetooth.com/about-us/governing-documents

1.1 Contents

The package contents of this application note are shown below.

```
r01an5900xx0100-ryz012x1-btcert.zip
    ├── r01an5900ej0100-ryz012x1-btcert.pdf        Application note (English)
    ├── r01an5900jj0100-ryz012x1-btcert.pdf        Application note (日本語)
    └── RYZ012A1-RFPHY-CF.zip
            └── RYZ012A1-RFPHY-CF\                  RYZ012A1 RF-PHY Compliance Folder(*1)
                    ├── 0_Contents\                 Contents manual storage
                    ├── 1_PICS_PIXIT\               ICS / IXIT(*2) documents storage
                    ├── 2_Test_Plan\                Test Plan documents storage
                    ├── 3_Test_Report\              Test Report and RF test system output data storage
                    └── 4_Declaration\              SDoC/DoC(*3) documents storage
```

*1: The "Compliance Folder" is a set of certification documents that summarizes the technical documents and test reports specified in the Qualification Program Reference Document (PRD).
*2: ICS - Implementation Conformance Statemen
    IXIT - Implementation Extra Information for Testing
*3: SDoC - Supplier Declaration of Conformity
    DoC - Declaration of Compliance

Figure 1-1 The package contents

1.2　QDID of the qualified design

Figure 1-2 descriptions the composition of the product type (Controller Subsystem / Host Subsystem) of referenced qualified design.
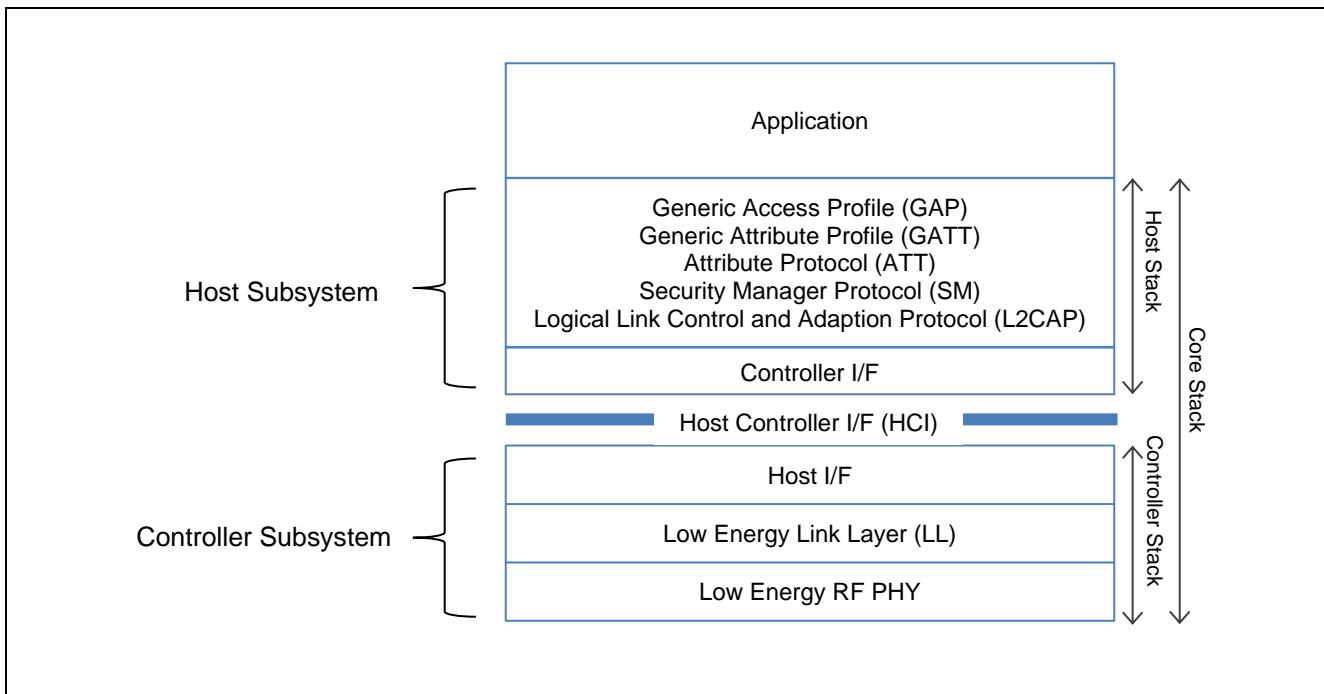

Figure 1-2　Product type composition

Table 1-1 descriptions the qualified designs to refer to when registering the Module mounted products.
Please refer to "3. Product Registration (Declaration)" for how to refer the qualified design.

Table 1-1　The qualified designs referenced in the Module mounted products

Qualified Design ID (QDID)	Product Type	Spec Name	Listing Date
136037	Controller Subsystem	5.0	2019-07-15
160268	Host Subsystem	5.2	2020-12-23

1.3 How to read the application note

This application note will be easier to understand if you read it according to the flow of Figure 1-3 according to your purpose and conditions.
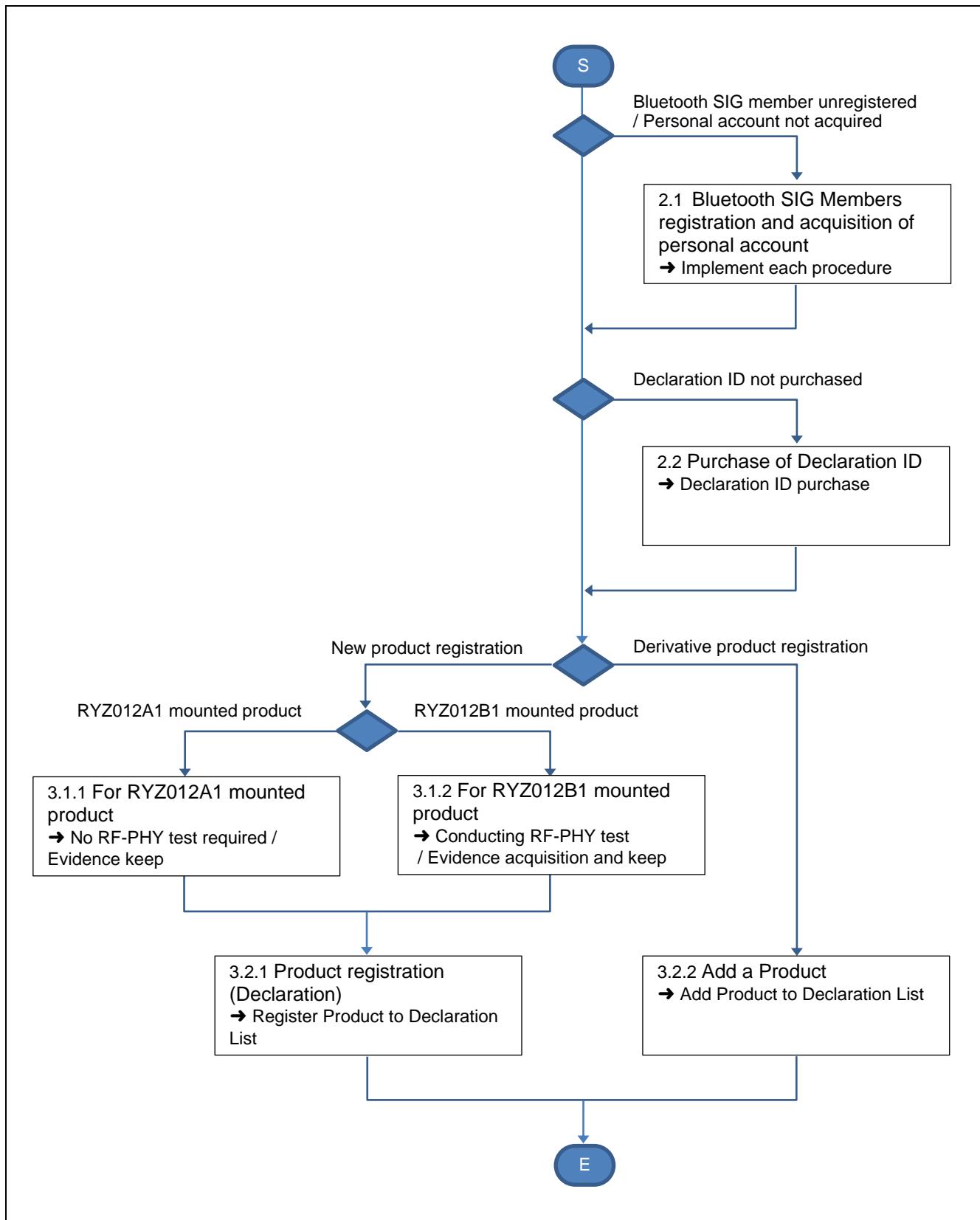

Figure 1-3 How to read the application note

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2. Pre-formalities

It is describing the pre-formalities required to acquire Bluetooth qualification.

2.1   Bluetooth SIG Members registration and acquisition of personal account

Member registration to SIG is needed to use a license of Bluetooth and the brand. Operation on the web necessary to qualification acquisition and product registration (Declaration) becomes possible after member registration. This application note describes registration of "Adopter" member class.

2.1.1   Register the company to members of Bluetooth SIG (no charge)

(1) Display the following URL by the browser. Click the [Apply for Adopter Membership] button at the middle of the displayed [Become a Bluetooth SIG Member] page.

https://www.bluetooth.com/develop-with-bluetooth/join
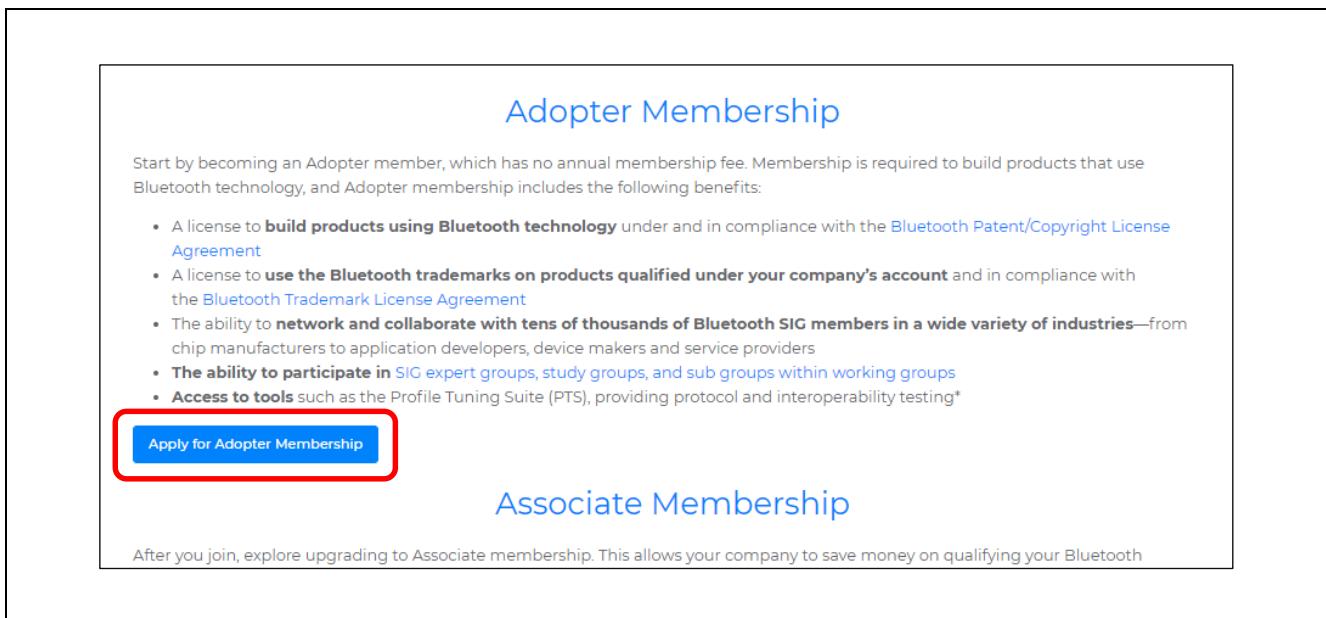
Figure 2-1   [Apply for Adopter Membership] button

(2) Since the application page for Bluetooth SIG membership will be displayed, please check the details on the preparation described in [① Prepare your application materials].

- Copy of corporate registration (PDF).

- Power of attorney

  If the applicant is different from the representative of the company, you may be asked for a power of attorney. Please prepare a letter of attorney in English that you can confirm that you have the authority to sign on behalf of the representative of the company. There is no official template, but the signature of the representative is mandatory.

(3)   Select the country with [★ Start Here:] at the bottom of the same page, enter the applicant's Email address, and click the [Start Membership Application] button to display the form input page.]
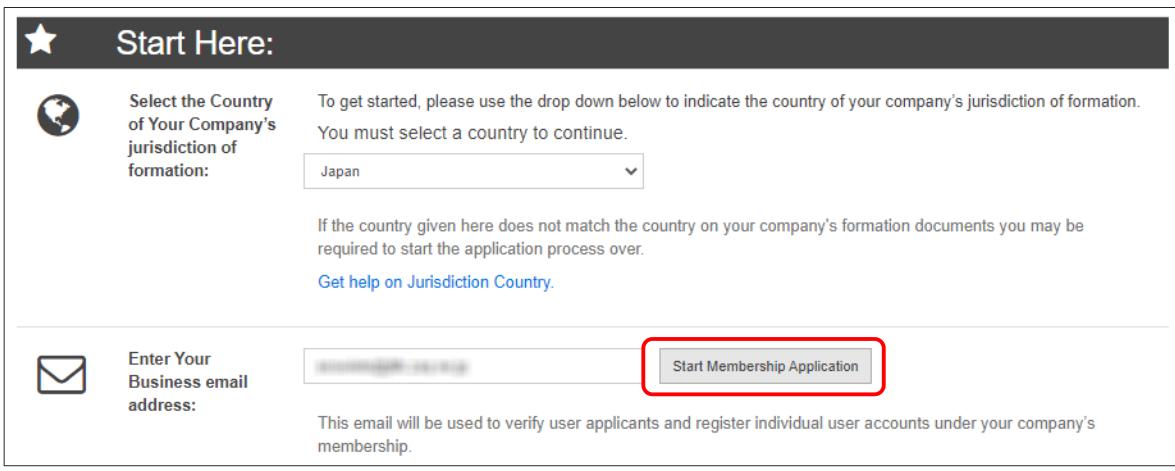
Figure 2-2 [Start Membership Application] button

(4)   Check the contents of the displayed form and enter necessary information.
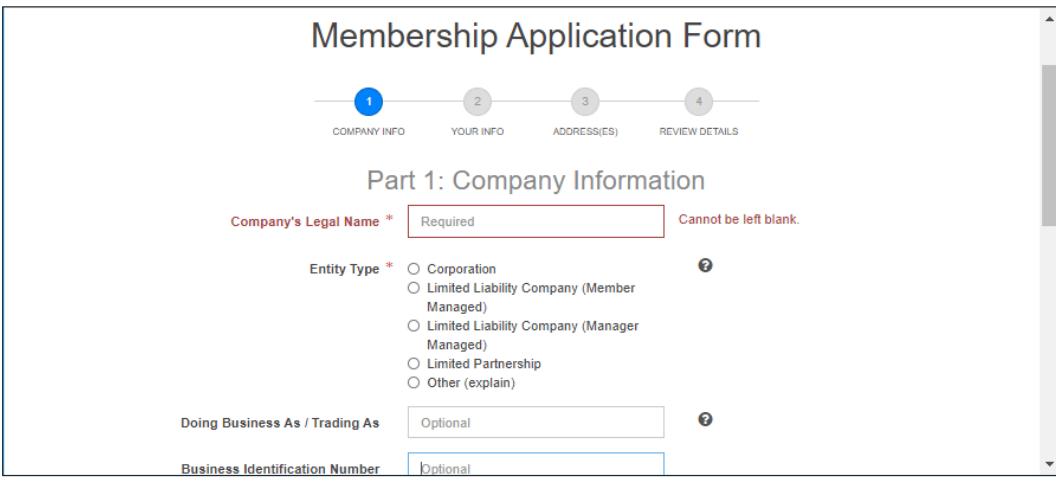
Figure 2-3 Form input page

The form will be displayed in the order of [Part 1: Company Information] → [Part 2: My Information] → [Part 3: Office Locations].

For [Company's Legal Name] in [Part 1: Company Information], enter the name stated in the copy of corporate registration. [Company's Formation Documents] will upload the PDF file of the copy of corporate registration.

When you have completed all forms, click the [Review Application Details] button under the [Part 3: Office Locations] form to display the [Review, Sign, and Submit] page.
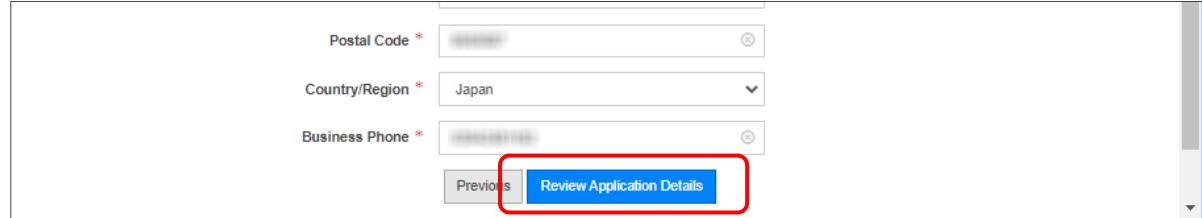

Figure 2-4 [Review Application Details] button

(5)   When the [Review, Sign, and Submit] page is displayed, confirm the input contents.
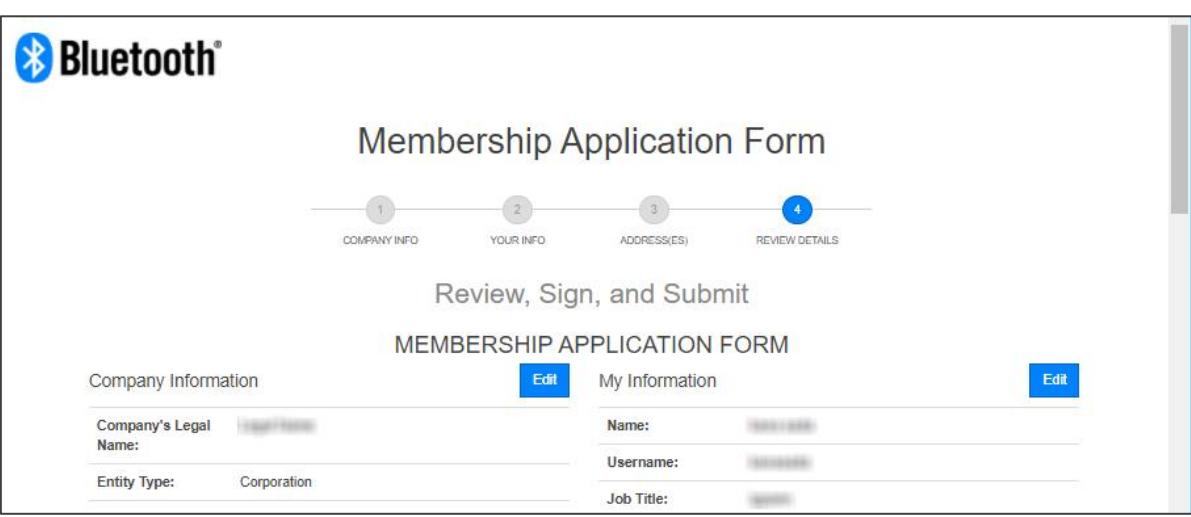
Figure 2-5 [Review, Sign, and Submit] page

(6) If there is no error in the input content, move to the [Signature and Submission] below than middle of the page, confirm the contents of the declaration statement of the membership agreement, check the check box at the beginning.

Figure 2-6 [Signature and Submission]

Finally sign the [Signature] text box under the declaration and click the [Signature Confirmed - Submit Application] button to complete the online process.

Figure 2-7 [Signature Confirmed - Submit Application] button

When the application is accepted, the applicant will receive an Email from the person in charge of the Bluetooth SIG, so please submit a power of attorney if requested.

2.1.2   Acquisition of the account of the member company's employee (no charge)

(1)   Display the following URL by the browser. Click the [Click hire] button of the [Employee User Accounts] at the bottom of the displayed page.

https://www.bluetooth.com/develop-with-bluetooth/join
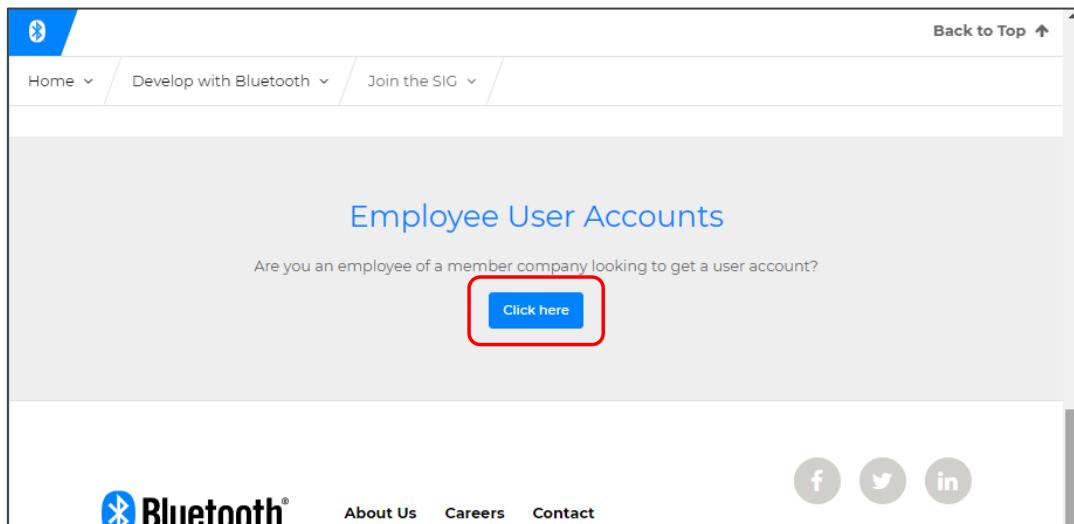
Figure 2-8 Apply for employee user account

(2)   In the text box on the displayed the [User Account Application] page, enter the Email address of the employee who applies for the account and click the [Submit Email Address] button.
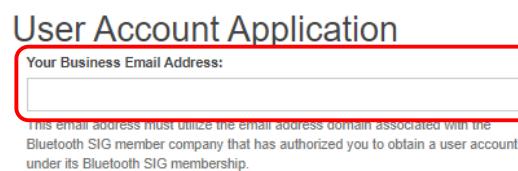
Figure 2-9 [User Account Application] page

(3)   A registration confirmation Email will be sent from the Bluetooth SIG to the account applicant. Click on the URL listed in the Email and enter the "My Information" on the opened WEB page.

(4)   After completing the entry you will receive an Email asking for the creation of a password so please access the URL stated in the Email and complete the creation of the password. Acquisition of the employee's user account is complete with this.

(5) By clicking the [Login] at the upper left of <https://www.bluetooth.com> and entering the user name and password on the [Log In] page opened, you will be accessible to the member page.

Figure 2-10 [Log In] page

2.2   Purchase of Declaration ID

When product registering (Declaration) by referring to the Qualified design, it is necessary to purchase Declaration ID. Below is the Web operation when the application company pays purchase cost directly to Bluetooth SIG.

Notes: 1.   When requesting remittance to a certification body, please follow the instructions of the certification body.
      2.   For the purchase procedure, please use the same user account as "3. Product Registration (Declaration)" described later.

(1)   After login to <https://www.bluetooth.com>, starting the Launch Studio from the following URL and select the [Manage Declaration IDs] tab.

      https://launchstudio.bluetooth.com
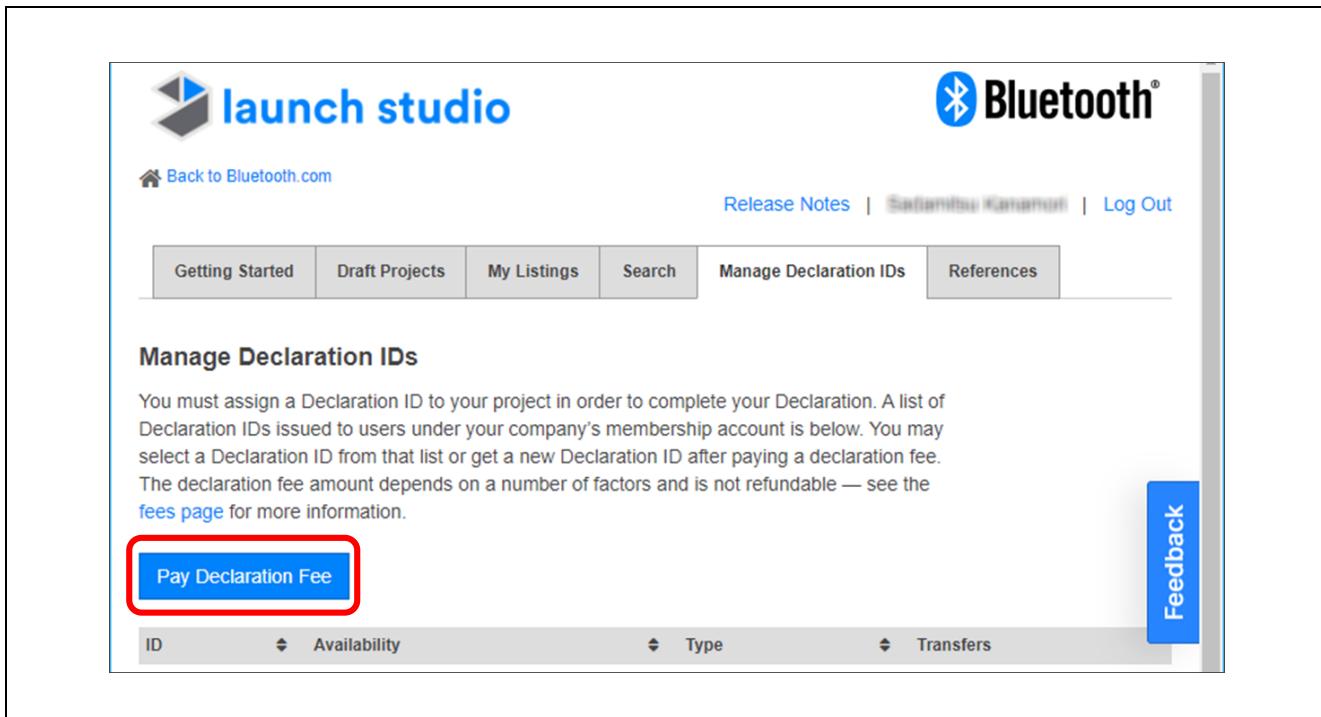
Figure 2-11   [Manage Declaration IDs] tab

      Click the "fees page" in the description to see the price of the Declaration ID.
      Click the [Pay Declaration Fee] button on the left side to display the [Pay Declaration Fee] panel.

(2)   Enter necessary items to the displayed [Pay Declaration Fee] panel.

- Select [Standard] for [Declaration Type].
- Enter "1" in [Quantity].

- In [Payment Method], select [Credit Card] or [Invoice]. The following input items change according to the selection contents of [Payment Method], so please enter the necessary items for each. Items related to company address are automatically entered from user account information.
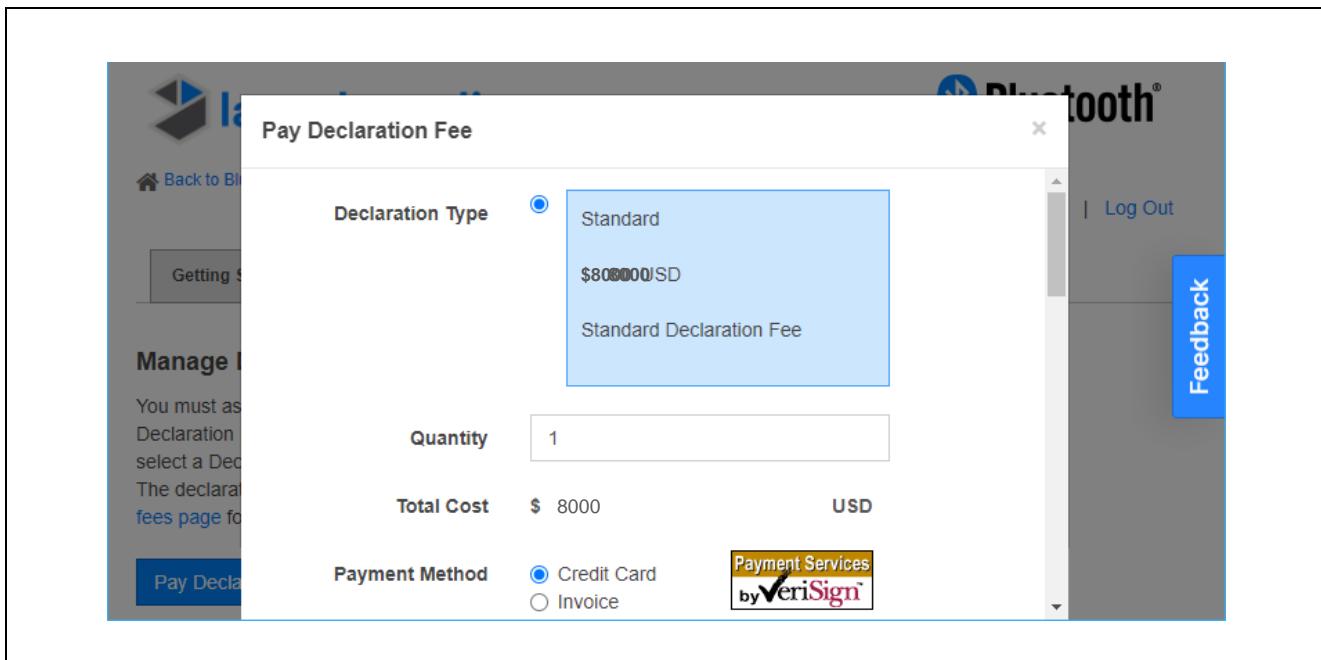
Figure 2-12 [Pay Declaration Fee] panel

(3) When all input is completed, click the completion button at the bottom of the panel. The completion button changes depending on the item selected in [Payment Method]. When [Credit Card] is selected, it becomes [Pay Declaration Fee], and if you select [Invoice] it will be [Create Invoice]. The payment procedure when [Credit Card] is selected is now complete.
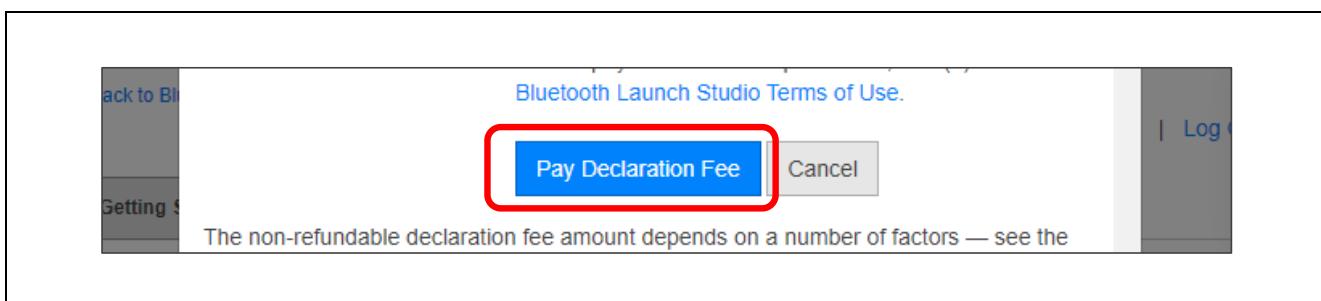
Figure 2-13 [Pay Declaration Fee] button
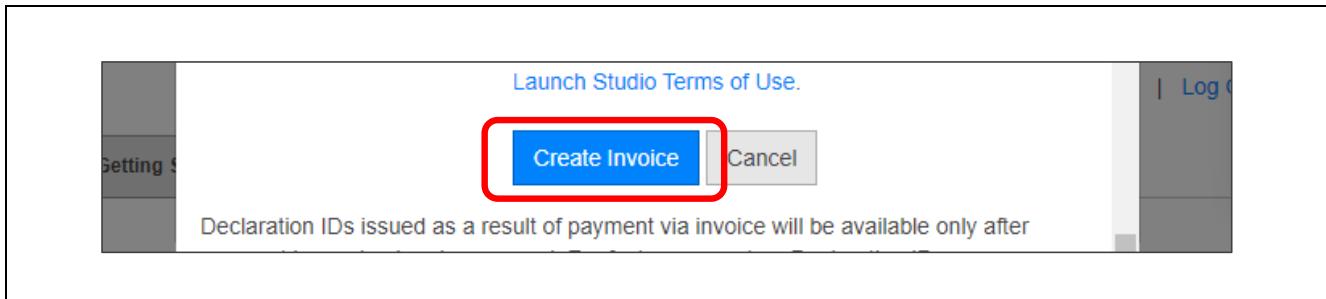
Figure 2-14 [Create Invoice] button

Click on the [Create Invoice] button to open Invoice PDF file and save it. (The same invoice is also attached to the Email sent from the Bluetooth SIG to the Invoice applicant.)

Please make overseas remittance procedure to the account described in Invoice.

Note: Please write Invoice number "INVxxxxx" of the top right of the Invoice in the telegram (message) column of the overseas remittance request form submit to the bank. If this number is not described, Issuance destination of the Declaration ID becomes the unknown.
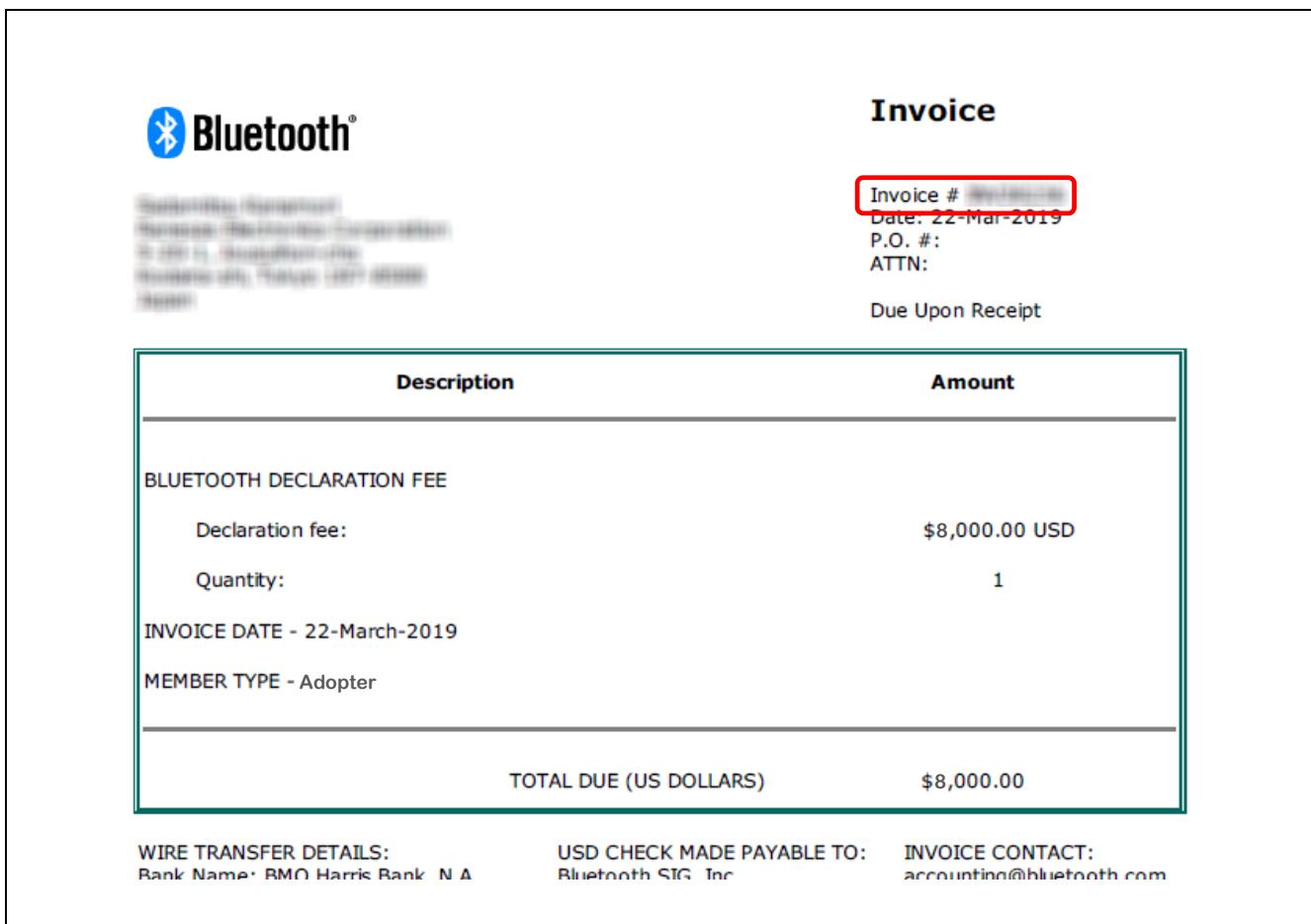
Figure 2-15 Invoice sample

You can confirm the Declaration ID you purchased on the [Manage Declaration IDs] tab of the Launch Studio.

3. Product Registration (Declaration)

3.1   Perform RF-PHY test

Product registration (Declaration) cannot register a product whose design does not match the referenced qualified design. If there is a change in the design of the RF part, it is necessary to perform RF-PHY test at the Bluetooth Qualification Test Facility (BQTF) and obtain evidence to prove that there is no problem with the characteristics. If your product is subject to audit under Bluetooth SIG Enforcement and you are required to provide evidence, you will need to submit the evidence obtained.

3.1.1   For RYZ012A1 mounted product

RYZ012A1 has already obtained evidence to prove that there is no problem with its characteristics by perform RF-PHY test on the design changes of the RF part.

Please keep the compliance folder ("RYZ012A1-RFPHY-CF.zip" in "Figure 1-1 The package contents") included in the application note as evidence.

3.1.2   For RYZ012B1 mounted product

Since RYZ012B1 uses an external antenna, the RF pattern (including antenna change) from the RF output terminal to the antenna is different from RYZ012A1. Perform the RF-PHY test according to the following procedure for the design changes in the RF part.

(1)   Supports the following Implementation requirements for the equipment under test (EUT)

- Operation with regulated power supply
- Wired connection using a coaxial connector such as SMA

(2)   Ask BQTF for RF-PHY test and Bluetooth Qualification Consultants (BQC) support.
       Select BQTF from the following URL.
       https://www.bluetooth.com/develop-with-bluetooth/qualification-listing/qualification-test-facilities

(3)   Submit the following information and data to BQTF

- Product Information (Product Name, Model Number, Product Description)
- ICS / IXIT
- Operating manual
- When correcting for loss of SMA conversion cable or pattern, inform each loss value

(4)   Conducting the following two items RF-PHY test at BQTF

Table 3-1 QDID of Core Specification

Test Case ID (TCID)	Description
RF-PHY/RCV/BV-01-C	Receiver sensitivity
RF-PHY/TRM/BV-01-C	Output power

(5)   Keep of compliance folder
       The compliance folder will be sent from BQTF via an electronic medium (CD-R) or file transfer system after the test, so keep it with the compliance folder included in the application note ("RYZ012A1-RFPHY-CF.zip" in Figure 1-1 The package contents) as evidence.

3.2　　Registering a device that implements Module

This section describes how to register (Declaration) a device mounted the Module as a Bluetooth product. Purchase of Declaration ID is required for product registration. Refer to "2.2 Purchase of Declaration ID" and perform necessary procedures.

3.2.1　　Product registration (Declaration)

After purchasing the Declaration ID, please perform product registration operation on the Bluetooth SIG WEB site as follows.

(1)　After log In to <https://www.bluetooth.com>, starting the Launch Studio from the following URL and select the [Getting Started] tab.
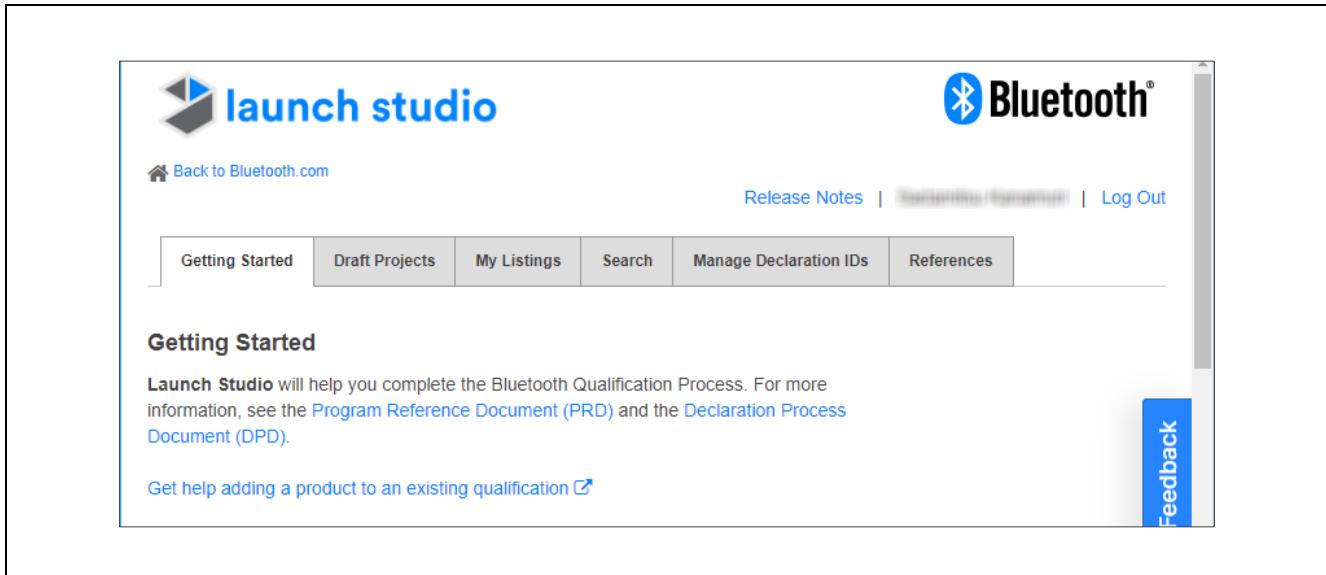
Figure 3-1　[Getting Started] tab

(2)   Click the [Start the Bluetooth Qualification Process with No Required Testing] button at the displayed
      [Getting Started] tab.
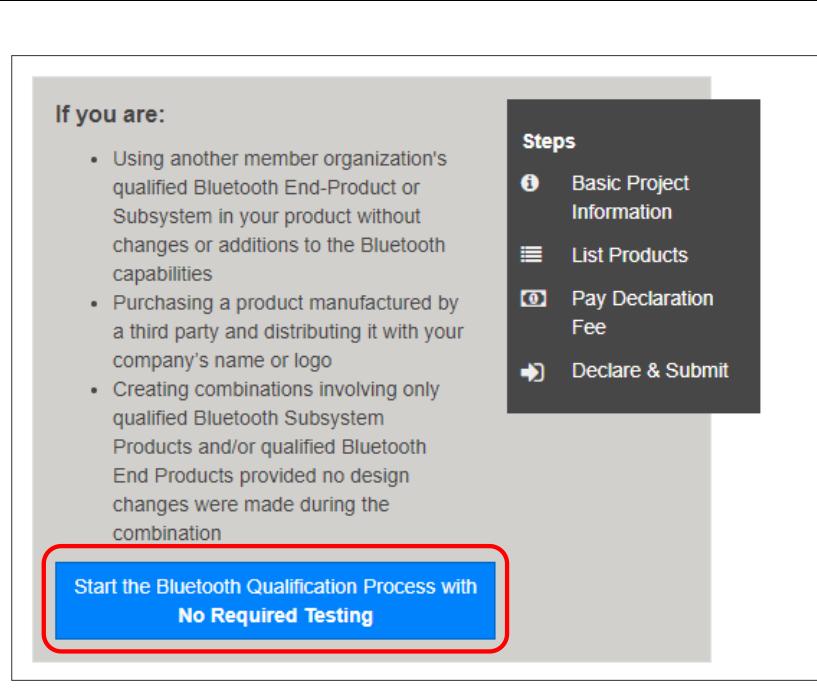
Figure 3-2 [Start the Bluetooth Qualification Process with No Required Testing] button

(3)   Enter the basic information of the project on the displayed page.

Figure 3-3 [Project Basics] input

- In [Project Name], enter any project name.

Figure 3-4　Referenced QDID input

- In "Referenced Qualified Design", enter the two QDIDs of "Table 1-1　The qualified designs referenced in the Module mounted products".

Figure 3-5 [Save and continue to Product Declaration] button

- When input is completed, click the [Save and continue to Product Declaration] button in the lower left.

(4) When the [Product Declaration] page is displayed, set "Listing Date" (Date on which you want to display the registered product in the public list database) in the [Required for submission, YYYY-MM-DD] text box. "Listing Date" can also be set using the calendar displayed by clicking on the text box. Listing Date can be specified up to 90 days later.

Figure 3-6 [Product Declaration] page

Click [+Add a Product] button displayed at the bottom of the page after setting "Listing Date".
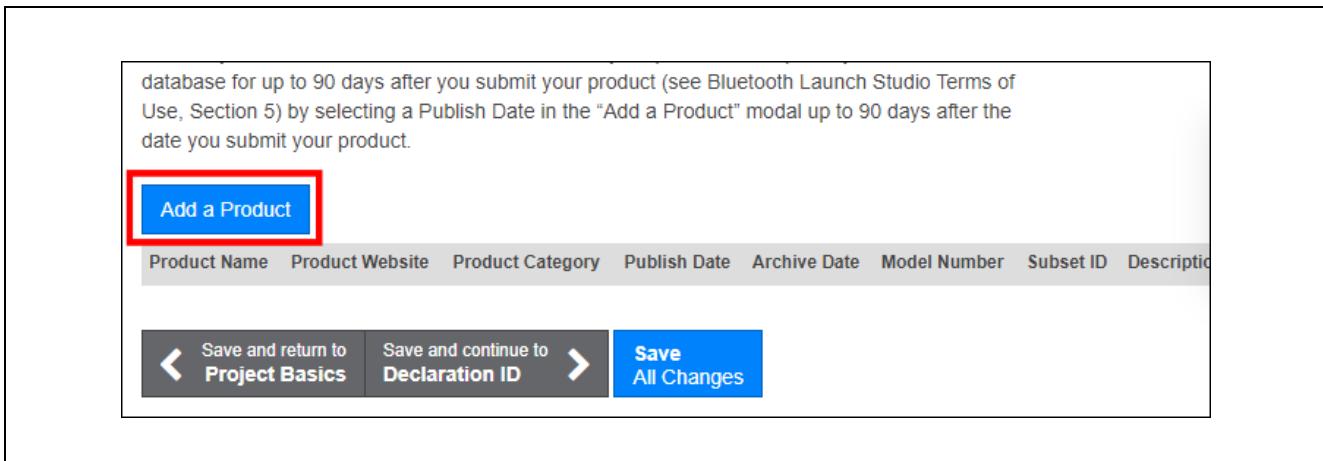
Figure 3-7 [+Add a Product] button

The [Add/Edit products] panel will be displayed, please enter product information. When input is completed, click [Save] button.
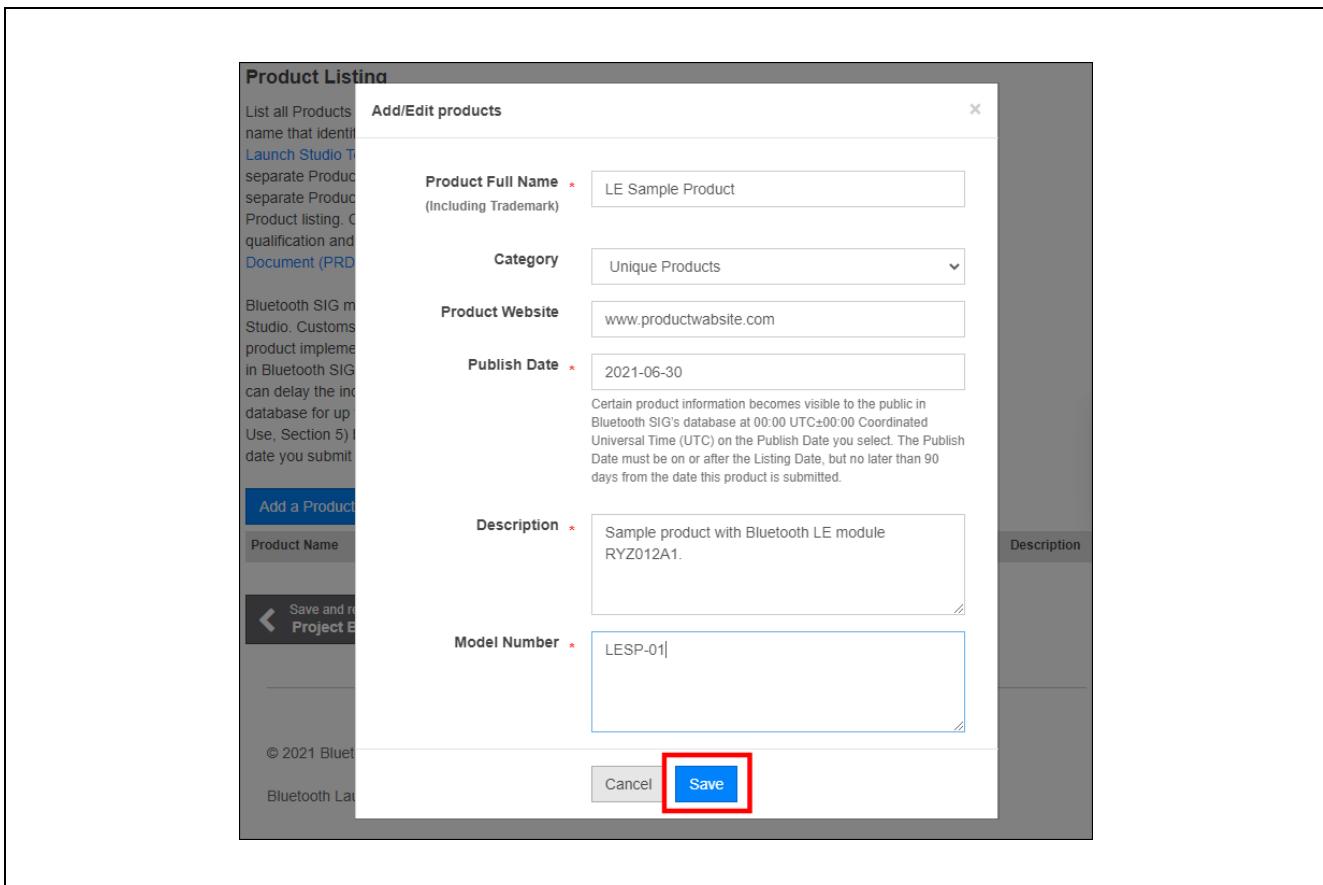
Figure 3-8 [Add/Edit products] panel

(5)   Confirm that the input contents are displayed in the product list and click the [Save and continue to Declaration ID] button.

Figure 3-9 Product List

(6)   A list of available Declaration IDs is displayed. Select the ID to be used for this product registration and click the [Save and continue to Review] button.
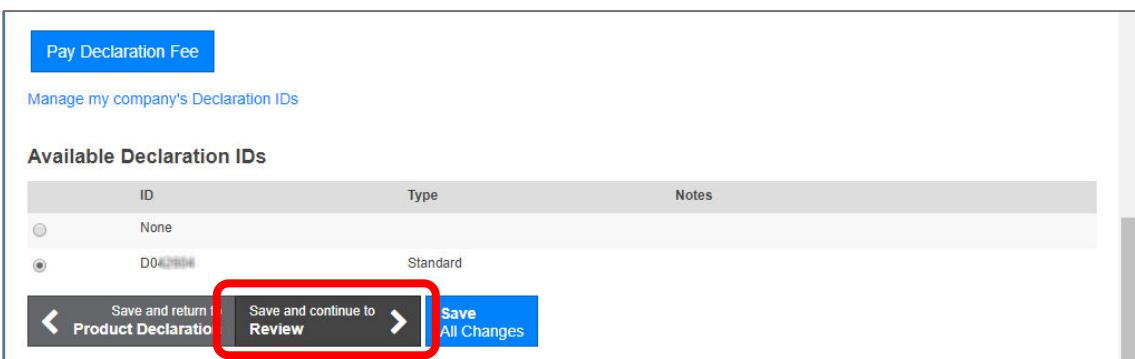
Figure 3-10 [Available Declaration IDs] list

(7) Since the [Review] page is displayed, confirm that the contents of [Project Details] are correct.

Figure 3-11 [Project Details]

If the contents are correct, check the declaration statement at the bottom of the page and check the check box at the beginning of the declaration statement.

Finally sign the [Signature] text box below the declaration and click the [Signature Confirmed - Complete Project & Submit Product (s) for Qualification] button to complete the online procedure.

Figure 3-12 [Signature Confirmed - Complete Project & Submit Product (s) for Qualification]

(8) After registration is complete, download SDoC / DoC and keep it in the compliance folder.

Registered products can be confirmed on the Launch Studio's [My Listings] tab.

3.2.2   Add a Product

This section describes how to add another device implementing the Module to the list registered (Declared) with "3.2.1".

(1)   After login to <https://www.bluetooth.com> using the same account as 3.2.1, to start Launch Studio from the following URL and select the [My Listings] tab.

https://launchstudio.bluetooth.com

(2)   Click the Declaration ID number of the list created in 3.2.1 to display the [Declaration Details] page.

(3)   Click the [+Add a Product] link on the left side of the page to start the "Add Products" process.

(4)   Click the [+Add a Product] button at the bottom of the displayed page.

(5)   The [Add/Edit products] panel will be displayed, please enter product information. When input is completed, click [Save] button.

(6)   Confirm that the input content is displayed in the product list and click [Continue to Review & Submit] button.

(7)   Since the [Review] page will be displayed, confirm that the contents of [Product Listing (s)] are correct.

If the contents are correct, check the declaration statement at the bottom of the page and check the check box at the beginning of the declaration statement.

Finally sign the [Signature] text box below the declaration statement and click the [Signature Confirmed - Complete Project & Submit Product (s) for Qualification] button to complete the online procedure.

(8)   After registration is complete, download SDoC / DoC and keep it in the compliance folder.

Revision History

Rev.	Date	Description	
		Page	**Summary**
1.00	Jun.30.21	–	First edition issued

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Precaution against Electrostatic Discharge (ESD)

    A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.

2. Processing at power-on

    The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.

3. Input of signal during power-off state

    Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.

4. Handling of unused pins

    Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.

5. Clock signals

    After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.

6. Voltage application waveform at input pin

    Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).

7. Prohibition of access to reserved addresses

    Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.

8. Differences between products

    Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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    "High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control (traffic lights); large-scale communication equipment; key financial terminal systems; safety control equipment; etc.

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8. When using Renesas Electronics products, refer to the latest product information (data sheets, user's manuals, application notes, "General Notes for Handling and Using Semiconductor Devices" in the reliability handbook, etc.), and ensure that usage conditions are within the ranges specified by Renesas Electronics with respect to maximum ratings, operating power supply voltage range, heat dissipation characteristics, installation, etc. Renesas Electronics disclaims any and all liability for any malfunctions, failure or accident arising out of the use of Renesas Electronics products outside of such specified ranges.

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