

ON Semiconductor

Is Now

The logo for onsemi, featuring the word "onsemi" in a dark teal, lowercase, sans-serif font. The letter "i" is stylized with a white dot and a teal vertical bar. A small orange triangle is positioned above the top right of the "i". A trademark symbol (TM) is located to the right of the logo.

To learn more about onsemi™, please visit our website at
www.onsemi.com

onsemi and **onsemi** and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi** product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner. Other names and brands may be claimed as the property of others.

Bluetooth® Certification Guidelines for EZAIRO® 7160 SL-Based Products



ON Semiconductor®

www.onsemi.com

INTRODUCTION

In order to sell a Bluetooth enabled device, there is a need for compliance and certification. The Bluetooth Compatibility Program complies with the requirements of Bluetooth license agreements and ensures a seamless user experience through the vast number of Bluetooth mobile devices that are available in the market.

This application note details the fundamental process of releasing a Bluetooth Low Energy product based on the Ezairo 7160 SL hybrid.

Once the design of a product based on Ezairo 7160 SL is complete, the product must be qualified before it can be ready for release to market. The ON Semiconductor RSL10 Qualification Design Identification (QDID) and profiles can be referred to and re-used when a new end product listing is created.

On 1 February 2014, the Bluetooth Special Interest Group (SIG) introduced a new qualification and listing process and fee structure for all new product listings. Detailed information can be found at: <https://www.bluetooth.com/develop-with-bluetooth/qualification-listing>.

Qualification Process

1. Become a Bluetooth SIG member and purchase a Declaration ID.

Detailed information can be found on the Bluetooth SIG website

(<https://www.bluetooth.com/develop-with-bluetooth/qualification-listing>).

2. Prepare product information and submit to a Bluetooth Qualification Test Facility (BQTF). The BQTF will estimate the qualification test and procedure costs.

The BQTF requires that following information be prepared and submitted:

- Core specification of the product
NOTE: For products based on Ezairo 7160 SL, this is 5.0.
- Product type (end product, subsystem, or component)
NOTE: For products based on Ezairo 7160 SL, this is “end product”.

APPLICATION NOTE

- Profiles supported

NOTE: For hearing aids, this is optional. Please check all the profiles that will be supported when the product is released in the Qualified Design Listing (QDL) information sheet. The profiles supported and tested by ON Semiconductor can be found at:

<https://launchstudio.bluetooth.com/ListingDetails/6253>

- Brand, model, and QDID of the product’s Bluetooth SoC

NOTE: The Ezairo 7160 SoC includes the RSL10 radio IC from ON Semiconductor. The QDID for the RSL10 is 92528, while the declaration ID for the Ezairo 7160 SL is D034220.

The BQTF will estimate the qualification test cost based on the information above and provide a quotation for testing. A list of all BQTFs can be obtained through the Bluetooth SIG. A Bluetooth Qualification Expert (BQE) from an authorized testing house can provide advice during the qualification test.

NOTE: ON Semiconductor used DEKRA Testing and Certification, S.A.U. for Bluetooth SIG testing, and Nemko North America, Inc., for FCC, IC and CE compliance testing. In addition, ON Semiconductor used Swift Labs Inc. to coordinate and assist with lab testing submissions.

3. Provide product samples to a BQTF for testing.

Several product samples are required to be submitted for testing, including:

- Product sample for RF testing
These samples must be ready for conducted RF tests. Therefore, the antenna must be disconnected by the vendor, and a 50 Ω SMA connector used to connect it to the test equipment. Additionally, instructions for entering Test Mode and for conducting the Bluetooth Low Energy RF PHY test must be provided by the product vendor. These test samples require that a UART interface is available.

- Product sample for profile test (optional for hearing aids)
In order for adoptable profiles to be listed in the QDL, a final product must be submitted for testing. Custom profiles do not require testing.

NOTE: A power supply connection must be provided for all samples, as a battery cannot support the current consumption in Test Mode for the duration of the test.

4. Create a new product listing. A Declaration of Compliance (DoC) must be signed. Once the qualification process is complete, the device is officially Bluetooth compliant, and the Bluetooth logo may be displayed on the product.

Putting the RSL10 Radio IC into Test Mode

In order to put the radio IC into Test Mode, the Test Mode firmware must be flashed onto the Ezairo 7160 SL hybrid. This can be done using the DTM configuration tool, which streamlines the process of updating the firmware images of both Ezairo 7100 and RSL10. Usage instructions for this tool are contained within its readme file.

Connecting the Tester to the DUT

The tester’s UART interface must be connected to the DUT. There are two options to make this connection, depending on which hybrid pads are exposed: the tester can be connected either to two RSL10 DIOs directly or to two Ezairo 7100 DIOs which are then relayed to RSL10.

Two wires must be soldered onto the selected pads, and connected to a level shifter since the logic level of the Ezairo 7160 is 2 V, which is not compatible with that of the RS–232 interface. This setup is shown in Figure 1.

1. To connect to RSL10 requires access to pads RFIO2 (F4) and RFIO3 (F6). In this configuration, connect the tester’s level–shifted UART TX to RFIO2 and the UART level–shifted RX to RFIO3.
2. To connect to Ezairo requires access to pads DIO24 (D10) and DIO29 (C10). In this configuration, connect the tester’s UART level–shifted TX to DIO24 and UART level–shifted RX to DIO29.

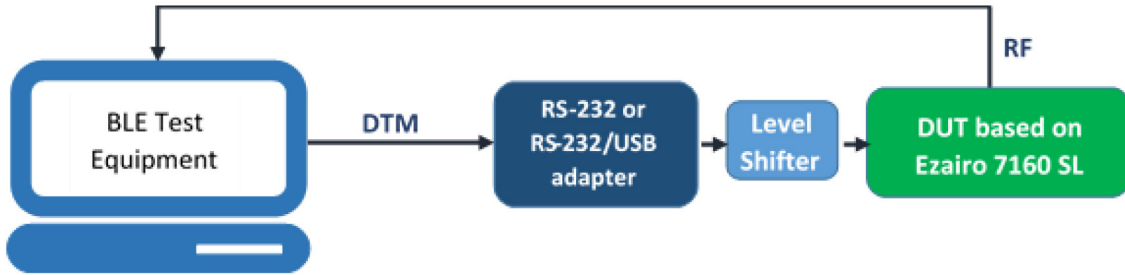


Figure 1. Connecting Diagram for Bluetooth Test

Manufacturer Configuration

When conducting the Bluetooth C/I performance test, the image frequency should be set for the 1 Mbps and 2 Mbps data rates. The image frequency suggested for the Bluetooth

Low Energy 1 Mbps performance test is -2 MHz from the configured carrier frequency. The image frequency suggested for the Bluetooth Low Energy 2 Mbps performance test is -4 MHz from the configured carrier frequency.

When conducting the inter-modulation performance test the inter-modulation distance must be set. The recommended inter-modulation distance, 'n' is 3 for RLS10.

Certification Process

A Bluetooth product contains a wireless radio operating in the 2.4 GHz ISM band. In order to sell such a product in different countries and regions, some certification tests must be passed.

Here is a list of certification tests required in specific countries or regions:

- United States of America (FCC)

- Canada (IC/ISED)
- Europe (CE)
- China (SRRC)
- Korea (KCC)
- Japan (JRF TELEC)

For detailed information on the certification testing required in other countries or regions, please contact an authorized testing facility.


The Ezairo 7160 SL Hybrid Demonstrator Board has passed FCC and CE certification testing at Nemko North America, Inc. During the certification and emission test, ON Semiconductor used an off-the-shelf SMA antenna, ANT-2.4-CW-RAH-SMA-ND from Linx Technologies, which has 1.6 dBi peak gain.

Further Reading

Bluetooth qualification and certification test reports for the Ezairo 7160 SL are available on request for reference. Please contact your account manager or sales representative for more information.

Bluetooth is a registered trademark of Bluetooth SIG.

EZAIRO is a registered trademark of Semiconductor Components Industries, LCC (SCILLC) or its subsidiaries in the United States and/or other countries.

ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative