

LxEASE Isolator User's Manual

Isolator for LxEASE™

* LxEASE™ is a trademark or registered trademark of ROHM Co., Ltd.

Notice

Precaution on using ROHM Products

- 1) When using ROHM Products, refer to the latest product information and ensure that usage conditions (absolute maximum ratings*1, recommended operating conditions, etc.) are within the ranges specified. ROHM disclaims any and all liability for any malfunctions, failure or accident arising out of or in connection with the use of ROHM Products outside of such usage conditions specified ranges, or without observing precautions. Even if it is used within such usage conditions specified ranges, semiconductors can break down and malfunction due to various factors. Therefore, in order to prevent personal injury, fire or the other damage from break down or malfunction of ROHM Products, please take safety at your own risk measures such as complying with the derating characteristics, implementing redundant and fire prevention designs, and utilizing backups and fail-safe procedures.
*1: Absolute maximum ratings: a limit value that must not be exceeded even momentarily.
- 2) The Products specified in this document are not designed to be radiation tolerant.
- 3) Descriptions of circuits, software and other related information in this document are provided only to illustrate the standard operation of semiconductor products and application examples. You are fully responsible for the incorporation or any other use of the circuits, software, and information in the design of your product or system. And the peripheral conditions must be taken into account when designing circuits for mass production. ROHM disclaims any and all liability for any losses and damages incurred by you or third parties arising from the use of these circuits, software, and other related information.
- 4) No license, expressly or implied, is granted hereby under any intellectual property rights or other rights of ROHM or any third party with respect to ROHM Products or the information contained in this document (including but not limited to, the Product data, drawings, charts, programs, algorithms, and application examples, etc.). Therefore, ROHM shall have no responsibility whatsoever for any dispute, concerning such rights owned by third parties, arising out of the use of such technical information.
- 5) ROHM intends our Products to be used in a way indicated in this document. Please be sure to contact a ROHM sales office if you consider the use of our Products in different way from original use indicated in this document. For use of our Products in medical systems, please be sure to contact a ROHM representative and must obtain written agreement. Do not use our Products in applications which may directly cause injuries to human life, and which require extremely high reliability, such as aerospace equipment, nuclear power control systems, and submarine repeaters, etc. ROHM disclaims any and all liability for any losses and damages incurred by you or third parties arising by using the Product for purposes not intended by us without our prior written consent.
- 6) Please use the Products in accordance with any applicable environmental laws and regulations, such as the RoHS Directive. ROHM shall have no responsibility for any damages or losses resulting non-compliance with any applicable laws or regulations.
- 7) When providing our Products and technologies contained in this document to other countries, you must abide by the procedures and provisions stipulated in all applicable export laws and regulations, including without limitation the US Export Administration Regulations and the Foreign Exchange and Foreign Trade Act.
- 8) Please contact a ROHM sales office if you have any questions regarding the information contained in this document or ROHM's Products.
- 9) This document, in part or in whole, may not be reprinted or reproduced without prior consent of ROHM.

(Note) "ROHM" as used in this document means ROHM Co., Ltd.

Other Precaution

- 1) All information contained in this document is subject to change for the purpose of improvement, etc. without any prior notice. Before purchasing or using ROHM Products, please confirm the latest information with a ROHM sales office.
- 2) ROHM has used reasonable care to ensure the accuracy of the information contained in this document, however, ROHM shall have no responsibility for any damages, expenses or losses arising from inaccuracy or errors of such information.

TSZ72037-01-001

Contents



Contents	4
Introduction	5
For Safe and Proper Use	5
Safety Precautions	6
Terminology	8
1. Overview	9
2. Package Contents	9
3. Specifications	9
3.1 CN1 Connector	11
3.2 CN2 Connector	11
3.3 ICE_CN1 Connector	11
3.4 ICE_CN2 Connector	11
4. How to Use	12
4.1 Connecting the Target System and LxEASE	12
4.2 Power-On Procedure	13
4.3 Power-Off Procedure	13
4.4 Hot-Plug Function	13
5. Precautions for Use	14
Revision history	15

Introduction

For Safe and Proper Use

This User's Manual uses terminology and pictograms to help you use the product safely and correctly and to prevent injury to yourself and others as well as damage to property. The meanings are as follows.

Meanings of terms

 WARNING	Indicates a potentially hazardous situation which, if mishandled, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if mishandled, could result in minor or moderate injury, or property damage.

Examples of pictograms



△ indicates the presence of a hazard and prompts caution. The symbol may include a specific warning (e.g., electric shock).










● indicates a required action or instruction. The symbol may include a specific instruction (e.g., unplug the power cord).









○ indicates a prohibited action. The symbol may include a specific prohibition (e.g., do not disassemble).





Safety Precautions


Be sure to read this page before using the product.

 WARNING	
●Do not use a voltage other than the specified voltage. Doing so may result in fire, electric shock, or malfunction.	
●Do not modify this product. Doing so may result in fire, electric shock, or malfunction.	
●If smoke, unusual odor, or any other abnormal condition occurs, immediately disconnect the USB cable from LxEASE™. If an external power supply is used, turn it OFF, then remove the AC adapter from the outlet. Continued use may result in fire, electric shock, or malfunction.	
●Do not install this product in locations exposed to water droplets or high humidity. Doing so may result in fire, electric shock, or malfunction.	
●Do not place objects on this product. Doing so may result in fire, electric shock, or malfunction.	
●If you notice any failure, stop using the product. Immediately disconnect the USB cable from LxEASE. If an external power supply is used, turn it OFF, then remove the AC adapter from the outlet. Continued use may result in fire or electric shock.	

 CAUTION	
●Do not use this product on unstable or inclined surfaces. It may fall and cause injury.	
●Do not use this product in environments with excessive vibration, strong electromagnetic fields, or corrosive gas. Cable connections may loosen or disconnect, which may result in fire, electric shock, or malfunction.	
●Do not use this product outside the specified operating temperature range, in direct sunlight, or in dusty locations. Doing so may result in fire, electric shock, or malfunction.	
●Use only the supplied cables and accessories. Using different items may result in fire, electric shock, or malfunction.	
●Do not use the supplied cables and accessories for anything other than this system. Doing so may result in fire, electric shock, or malfunction.	

Be sure to read this page before using the product.

 CAUTION	
<ul style="list-style-type: none"> ●Do not apply a voltage exceeding the maximum rating of each power supply to the VDD terminal of the user cable. Doing so may result in fire, electric shock, or malfunction. 	
<ul style="list-style-type: none"> ●Pay particular attention to the power ON/OFF sequence. Incorrect sequencing may result in fire, electric shock, or malfunction. 	
<ul style="list-style-type: none"> ●Always turn OFF the power of both the LxEASE and the target system before connecting or disconnecting the LxEASE Isolator. Connecting or disconnecting while power is ON may cause fire, electric shock, or malfunction. 	

 NOTE	
<ul style="list-style-type: none"> ●The LxEASE Isolator is an isolator for LxEASE intended to support the development of equipment using ROHM MCUs. The safety and conformity of the final product must be evaluated and confirmed by the customer. 	
<ul style="list-style-type: none"> ●This product is intended for development and evaluation use; it is not intended for use as a finished consumer product. 	
<ul style="list-style-type: none"> ●Final verification of the electrical characteristics of the target LSI should be performed without using the LxEASE Isolator. 	
<ul style="list-style-type: none"> ●The warranty period for initial defects of the LxEASE Isolator is one year. Failures caused by incorrect use or modification are not covered. 	
<ul style="list-style-type: none"> ●The content of this document may be changed without notice due to product and technical improvements. Confirm that you are using the latest information. 	

Terminology

Terms used in this User's Manual and their descriptions are shown below.

Term	Description
LxEASE Isolator	An isolation board installed between the LxEASE and the target system to electrically isolate power and ground while transmitting signals.
LxEASE	A debug adapter for ROHM microcontrollers equipped with Arm® Cortex®-M cores.
LEXIDE-Ω	A Windows® application running on a PC that controls the on-chip emulator functions of LxEASE.
Target system	A board on which the target LSI is mounted; used for debugging, flash programming, and flash erase operations via LxEASE.
Host PC	A PC on which LEXIDE-Ω and the USB driver are installed.
USB cable	A cable used to connect LxEASE and the host PC.
Target LSI	The LSI being debugged by LxEASE.
LxEASE interface cable	A cable used to connect LxEASE and the target system.

* Arm® and Cortex® are registered trademarks of Arm Limited (or its subsidiaries or affiliates) in the United States and other countries.

* Windows® is a registered trademark of Microsoft Corporation in the United States and other countries.

1. Overview

The LxEASE Isolator is an isolation board that electrically isolates the power supply and ground between the ROHM Arm® Cortex®-M core-based microcontroller debug adapter “LxEASE™” and the target system, while safely transmitting signals. It is ideal for debugging in environments where differences in VSS potential or the effects of power supply noise are a concern.

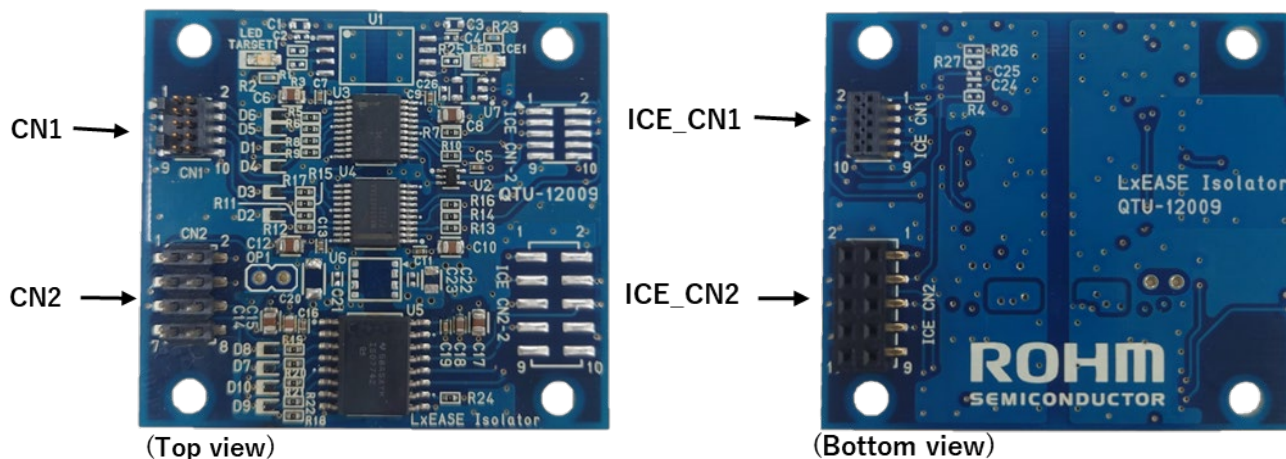


Figure 1. External View of the LxEASE Isolator

2. Package Contents

Table 2.1 Package Contents

Item	Description	Quantity
LxEASE Isolator (QTU-12009)	LxEASE isolator main unit	1
FEXTLxEASE ISOLATOR_UM	User's Manual (this document)	1

3. Specifications

Table 3.1 Specifications

Item	Description	Remarks
Power supply	Target system side circuitry: Supplied from the target system Voltage: 2.3 V to 5.5 V	When the LxEASE Isolator is used, power is not supplied from LxEASE to the target system.
	LxEASE side circuitry: Using the LxEASE power-supply function Voltage: 5.0 V (Note 1)	
LED	LED_TARGET: Lit when power is supplied to the target-system side circuit LED_ICE: Lit when power is supplied to the LxEASE-side circuit	Use the product with both LED_TARGET and LED_ICE lit.
Isolation voltage	1 kV RMS	-
Usage Environment	Temperature: 5 to 40 °C / Humidity: 30 to 80 % (no condensation)	-

[Notes]

Note 1: When using the LxEASE Isolator, be sure to set the LxEASE power supply function to 5.0 V. Communication will not operate correctly at the 3.3 V setting. Refer to the LEXIDE-Ω User's Manual and the LxEASE User's Manual for configuration details.

3.1 CN1 Connector

The interface specifications for the CN1 connector are shown below.

Table 3-2 CN1 Interface Pin List

Pin No.	LxEASE Isolator Signal	I/O	Description
1	VTref	-	Target LSI power input (VDD)
2	SWDIO	I/O	SWD data signal
3	VSS	-	Target LSI ground (VSS)
4	SWCLK	O	SWD clock signal
5	VSS	-	Target LSI ground (VSS)
6	SWO	I	SWO trace signal
7	N.C.	-	Not used (do not connect)
8	N.C.	-	Not used (do not connect)
9	VSS	-	Target LSI ground (VSS)
10	nRESET	O	Target LSI CPU reset signal

3.2 CN2 Connector

The interface specifications for the CN2 connector are shown below.

Table 3-3 CN2 Interface Pin List

Pin No.	LxEASE Isolator Signal	I/O	Description
1	—	-	Not used (do not connect) (Note 1)
2	VSS	-	Target LSI ground (VSS)
3	VTref	-	Target LSI power input (VDD)
4	TRGOUT1	O	External trigger output 1
5	TRGOUT2	O	External trigger output 2
6	TRGIN1	I	External trigger input 1
7	TRGIN2	I	External trigger input 2
8	RSV1	-	Reserved (do not connect)

[Notes]

Note 1: This pin is VDDOUT (power-supply output) on the LxEASE main unit; however, when using the LxEASE Isolator, power is not supplied to the target system due to the isolated configuration.

3.3 ICE_CN1 Connector

ICE_CN1 is the connector used to connect to LxEASE (LxEASE side). It is electrically isolated from CN1 (target side) by the LxEASE Isolator.

3.4 ICE_CN2 Connector

ICE_CN2 is the connector used to connect to LxEASE (LxEASE side). It is electrically isolated from CN2 (target side) by the LxEASE Isolator.

4. How to Use

4.1 Connecting the Target System and LxEASE

- (1) Confirm that the target system power is OFF.
- (2) Confirm that LxEASE is not connected to the USB cable.
- (3) Confirm that the LxEASE power-supply function is set to 5.0 V (Note 1).
- (4) Connect ICE_CN1 and ICE_CN2 on the LxEASE Isolator to CN1 and CN2 on LxEASE (Note 2).
- (5) Connect CN1 on the LxEASE Isolator to the target system connector using the LxEASE interface cable (Note 3).

[Notes]

Note 1: When using the LxEASE Isolator, set the LxEASE power-supply function to 5.0 V. Communication will not operate correctly at the 3.3 V setting. Refer to the LEXIDE-Ω User's Manual and the LxEASE User's Manual for details.

Note 2: Align pin 1 and ensure a secure connection.

Note 3: Align pin 1 and ensure a secure connection. If you use CN2 on the LxEASE Isolator, connect CN2 to the target system connection terminals at this timing using jumper wires, etc.

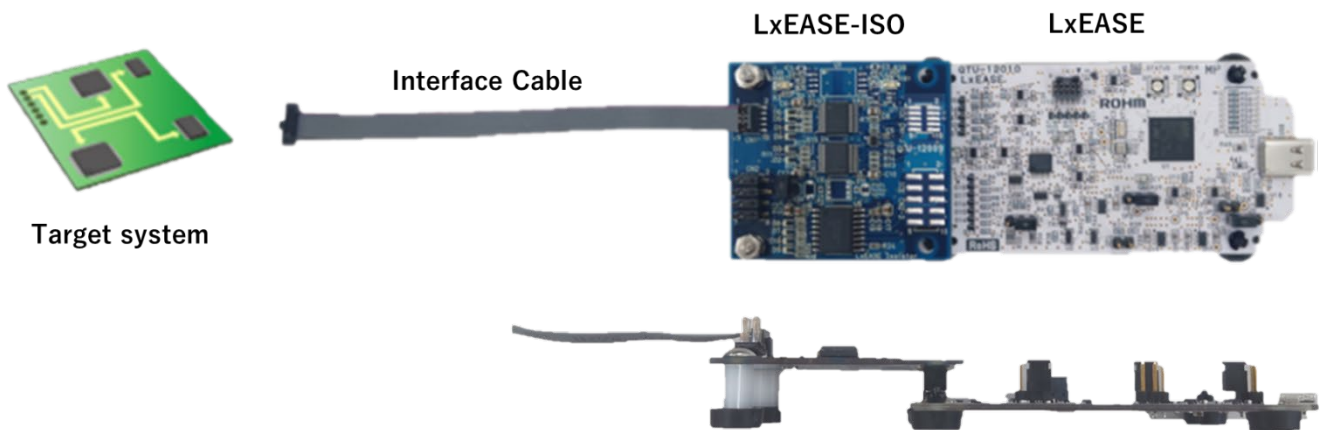


Figure 4-1 LxEASE Isolator system configuration

4.2 Power-On Procedure

- (1) Connect LxEASE to the host PC using the supplied USB cable.
- (2) The POWER indicator on LxEASE lights green.
- (3) Turn ON the target system power.
- (4) LED_TARGET lights.
- (5) Start LEXIDE-Ω on the host PC and begin debugging.
- (6) LED_ICE lights.

* For the LEXIDE-Ω startup procedure, refer to the 'LEXIDE-Ω Arm User's Manual'.

4.3 Power-Off Procedure

- (1) End debugging from LEXIDE-Ω on the host PC.
- (2) LED_ICE turns off.
- (3) Turn OFF the target system power.
- (4) LED_TARGET turns off.
- (5) Disconnect the USB cable from LxEASE.

4.4 Hot-Plug Function

This function allows the LxEASE Isolator to be connected and on-chip debugging to be started while the target system is operating.

Connect the LxEASE Isolator to the target system according to the procedure below.

- (1) Confirm that LxEASE is not connected to the USB cable.
- (2) Confirm that the LxEASE power-supply function is set to 5.0 V (Note 1).
- (3) Connect ICE_CN1 and ICE_CN2 on the LxEASE Isolator to CN1 and CN2 on LxEASE (Note 2).
- (4) Connect LxEASE to the host PC using the supplied USB cable. LxEASE operates on USB bus power. When the USB cable is connected to LxEASE, power is supplied and the POWER indicator on LxEASE lights green.
- (5) Connect the VSS pin of CN2 (pin 2) to VSS of the target system.
- (6) Connect CN1 on the LxEASE Isolator to the target system connector using the LxEASE interface cable (Note 3).
- (7) Start LEXIDE-Ω on the host PC.
- (8) After configuring the hot-plug settings in LEXIDE-Ω, start debugging.

* For CN2 connector information, see '3.2 CN2 Connector'.

* For LEXIDE-Ω hot-plug configuration, refer to the 'LEXIDE-Ω Arm User's Manual'.

[Notes]

Note 1: When using the LxEASE Isolator, set the LxEASE power-supply function to 5.0 V. Communication will not operate correctly at the 3.3 V setting. Refer to the LEXIDE-Ω User's Manual and the LxEASE User's Manual for details.

Note 2: Align pin 1 and ensure a secure connection.

Note 3: Align pin 1 and ensure a secure connection. If you use CN2 on the LxEASE Isolator, connect CN2 to the target system connection terminals at this timing using jumper wires, etc.

5. Precautions for Use

- (1) The contents of this manual may be changed without notice due to product improvements and technical enhancements. Before use, confirm that the information is up to date.
- (2) Before using the LxEASE Isolator, read the LEXIDE-Ω User's Manual and the LxEASE User's Manual carefully and use the product only after understanding the contents.
- (3) Because the LxEASE Isolator has patterns on the back side, placing it on a conductive material may cause a short circuit and abnormal operation. Use it on an insulating material. If necessary, attach a protective sheet to prevent the back-side patterns from contacting other objects, or attach spacers/feet.

Revision history

Version	Issue date	Page (before)	Page (after)	Description
First edition	2026-02-25	–	–	First edition published

Notice

- 1) The information contained in this document is intended to introduce ROHM Group (hereafter referred to as ROHM) products. When using ROHM products, please verify the latest specifications or datasheets before use.
- 2) ROHM products are designed and manufactured for use in general electronic equipment and applications (such as Audio Visual equipment, Office Automation equipment, telecommunication equipment, home appliances, amusement devices, etc.) or specified in the datasheets. Therefore, please contact the ROHM sales representative before using ROHM products in equipment or devices requiring extremely high reliability and whose failure or malfunction may cause danger or injury to human life or body or other serious damage (such as medical equipment, transportation, traffic, aircraft, spacecraft, nuclear power controllers, fuel control, automotive equipment including car accessories, etc. hereafter referred to as Specific Applications). Unless otherwise agreed in writing by ROHM in advance, ROHM shall not be in any way responsible or liable for any damages, expenses, or losses incurred by you or third parties arising from the use of ROHM Products for Specific Applications.
- 3) Electronic components, including semiconductors, can fail or malfunction at a certain rate. Please be sure to implement, at your own responsibilities, adequate safety measures including but not limited to fail-safe design against physical injury, and damage to any property, which a failure or malfunction of products may cause.
- 4) The information contained in this document, including application circuit examples and their constants, is intended to explain the standard operation and usage of ROHM products, and is not intended to guarantee, either explicitly or implicitly, the operation of the product in the actual equipment it will be used. As a result, you are solely responsible for it, and you must exercise your own independent verification and judgment in the use of such information contained in this document. ROHM shall not be in any way responsible or liable for any damages, expenses, or losses incurred by you or third parties arising from the use of such information.
- 5) When exporting ROHM products or technologies described in this document to other countries, you must abide by the procedures and provisions stipulated in all applicable export laws and regulations, such as the Foreign Exchange and Foreign Trade Act and the US Export Administration Regulations, and follow the necessary procedures in accordance with these provisions.
- 6) The technical information and data described in this document, including typical application circuits, are examples only and are not intended to guarantee to be free from infringement of third parties intellectual property or other rights. ROHM does not grant any license, express or implied, to implement, use, or exploit any intellectual property or other rights owned or controlled by ROHM or any third parties with respect to the information contained herein.
- 7) No part of this document may be reprinted or reproduced in any form by any means without the prior written consent of ROHM.
- 8) All information contained in this document is current as of the date of publication and subject to change without notice. Before purchasing or using ROHM products, please confirm the latest information with the ROHM sales representative.
- 9) ROHM does not warrant that the information contained herein is error-free. ROHM shall not be in any way responsible or liable for any damages, expenses, or losses incurred by you or third parties resulting from errors contained in this document.



Thank you for your accessing to ROHM product informations.
More detail product informations and catalogs are available, please contact us.

ROHM Customer Support System

<https://www.rohm.com/contactus>