muRata UWB Module Type2AB (Qorvo QM33120W) Development Overview

Rev. B
March 2024
UWB Section, muRata/SyChip

Development Steps

- muRata UWB Module(Type2AB) EVB User Manual v5.1
- Type2AB_Firmware_Upgrade_Guide v0.2.0
- SS0123-Type2AB-TestFW v0.7.0
- S10210-SP-Type2AB_Test_Firmware_Specification v0.6.0
- SS0199-Type2AB-DW3_QM33_SDK-Demo-FW v0.1.2
- S10286-Type2AB_UCI_CLI_FW_Quick_Start_Guide v1.3

For software development:
- SS0199-Type2AB-DW3_QM33_SDK-Patch v0.1.2
- S10285-Type2AB_DW3-QM33_SDK_Patch_Quick_Start_Guide v0.1.2

EVK Evaluation

Prototype Design

Final Design

- Quick testing
- Ranging performance check

- Prototype Design
- Software Development
- Application Specific Testing
- Antenna Design

- Fine Tuning
- Regulatory Certification

Test Guide:
- S10244-Type2AB EVB TWR Test Report
- S10271-Type2AB EVB TWR Distance Test Report

- UWB_BLE_Module Preliminary Datasheet SP-2AB-828 RevG
- Application Note_Type2AB Hardware Design Guide RevE
- Type2AB Module footprint.dxf
- JS-1055_2AB_EVB_Schematic
- JS-1055_2AB_EVB_Layout
- JS-1055_2AB-EVB_BOM RevB
- LBUA5QJ2AB UWB Module Antenna Specification v3.0

Description for EVK Evaluation

Items	Type	Description	Where to Download
muRata UWB Module(Type2AB) EVB User Manual v5.1	PDF	EVK user manual	[Type2AB page on murata.com](#)*
Type2AB_Firmware_Upgrade_Guide v0.2.0	PDF	FW upgrade guide	[myMurata Type2AB Document site](#)**
S10210-SP-Type2AB_Test_Firmware_Specification v0.6.0	PDF	TestFW specification	
S10223-QSG-Type2AB TWR Demo Quick Start Guide RevG	PDF	TWR Demo FW Quick Start guide (Obsolete)	
S10244-Type2AB EVB TWR Test Report v1.0	PDF	TWR accuracy test report	
S10271-Type2AB EVB TWR Distance Test Report v1.0	PDF	TWR distance test report	
SS0123-Type2AB-TestFW v0.7.0	ZIP	TestFW binary	[myMurata Type2AB Software site](#)**
SS0199-Type2AB-DW3_QM33_SDK-Demo-FW v0.1.2	ZIP	Demo FW based on Qorvo DW3_QM33 SDK	
S10286-Type2AB_UCI_CLI_FW_Quick_Start_Guide v1.3	PDF	Demo FW Quick Start Guide	
SS0141-Type2AB-TWR_Demo-FW-V0.6.1(For XR6.0C)	ZIP	TWR Demo FW based Qorvo DW300 XR6.0C SDK (Obsolete)	

Note:
* Any user can visit murata.com website and download Type2AB documents without registration.
** Registration is required to access *myMurata Type2AB Document site* or *Software site*. Please refer to *myMurata Access Guide* in the appendix.

Description for Prototype Design

Items	Type	Description	Where to Download
UWB_BLE_Module Preliminary Datasheet SP-2AB-828 Rev.G	PDF	Type2AB module datasheet	Type2AB page on murata.com
Application Note_Type2AB_Hardware Design Guide Rev.E	PDF	Type2AB HW design Guide	
JS-1055_2AB_EVB_Schematic	PDF	EVK Schematics	
LBUA5QJ2AB UWB Module Antenna Specification v3.0	PDF	Reference antennas	
Type2AB Module footprint	DXF	Type2AB module footprint for CAD design	myMurata Type2AB Document site
JS-1055_2AB_EVB_Layout	DXF	Type2AB EVB Layout design	
JS-1055_2AB-EVB_BOM ver.B	EXCEL	Type2AB EVB BOM	
SS0199-Type2AB-DW3_QM33_SDK-Patch v0.1.2*	ZIP	Patch file for Qorvo DW3_QM33 SDK	myMurata Type2AB Software site
S10285-Type2AB_DW3-QM33_SDK_Patch_Quick_Start_Guide v0.1.2	PDF	DW3_QM33 SDK Patch file Quick Start Guide	
SS0141-Type2AB-DW3000-XR-SDK-Patch-V0.6.1(For XR6.0C)	ZIP	Patch file for Qorvo DW3000 XR6.0C SDK (Obsolete)	
S10230-QSG-Type2AB_SDK_Patch_Quick_Start_Guide v0.5.4	PDF	DW3000 SDK Patch file Quick start Guide (Obsolete)	

***Note**: muRata provides the patch file tailored for Type2AB module and EVK. The SDK software and documents are available on Qorvo website. Please refer to the relevant *Quick Start Guide* for more information.

Understanding Type2AB TestFW

- TestFW is primarily used for UWB RF testing and BLE function testing. It's programmed to each Type2AB modules on the production line. All Type2AB modules and EVBs are delivered to customers with TestFW as the default firmware.

- TestFW Key Features including:
  - Support module calibration and testing on the production line.
  - Support UWB/BLE RF performance evaluation in the lab
  - Support UWB/BLE regulatory certification testing
  - Support basic ranging function evaluation

UWB

- ✓ RTX sensitivity
- ✓ Single-side TWR
- ✓ Continuous frame transmission
- ✓ Continuous ware transmission
- ✓ RF port switch
- ✓ TxPower Adjustment
- ✓ Register set/get
- ✓ Sleep/Wakeup

BLE

- ✓ TX power and RX sensitivity
- ✓ Frequency offset and drift
- ✓ Modulation characteristics
- ✓ Packet error rate
- ✓ Intermodulation performance

Misc.

- ✓ OTP RW
- ✓ GPIO set/get
- ✓ System mode switch
- ✓ Accelerometer self-test

Understanding the SDK and Patch File

- Qorvo provides the SDK for QM33/DW3000 series. The SDK architecture is shown in the figure on the right. For more details, please refer to the *SDK Developer Guide* provided in the SDK software package.

- Qorvo is mainly focused on the development of *DW3000 driver* and *UWB stack*. In addition, some examples are provided in *Apps* layer for reference and demonstration. The customers are expected to develop their own application firmware based on them.

- Although Type2AB EVB is supported in Qorvo SDK, muRata provides the patch file to achieve better HW/RF performance and support more features. The patch file mainly provides:
  - ✓ Add Type2AB module/EVB specific calibrations and configurations, for example the calibration data stored in OTP
  - ✓ Add the accelerometer driver and IMU-enabled functions (WiP)
  - ✓ Support BLE functions (WiP)
  - ✓ Support NFC functions (WiP)

- The demo firmware released by muRata has already applied the patch file. And the developers are also recommended to apply the patch file prior to building firmware based on Qorvo SDK. Please refer to the relevant *Quick Start Guide* for more details.
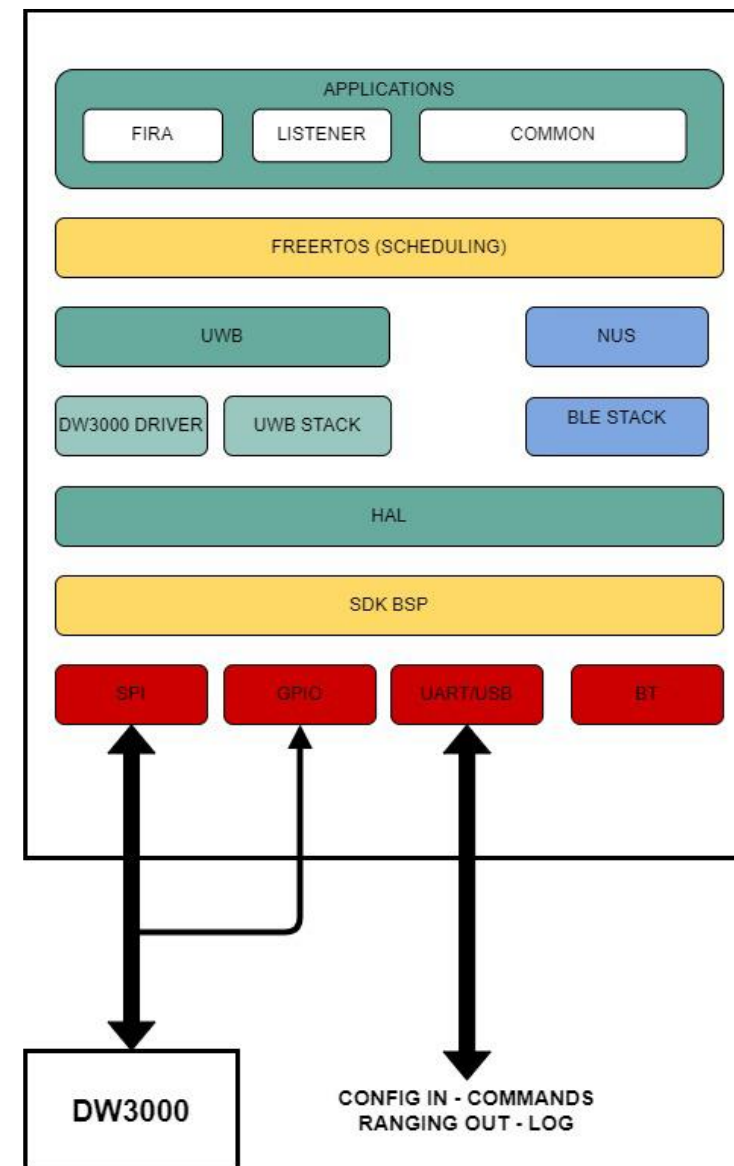
Appendix: myMurata Access Guide

Murata provides exclusive information on our UWB module to customers who have obtained Type2AB Evaluation Kit.
The application notes, firmware and other reference materials can be found on **<Type2AB Document Site>** and **<Type2AB Software Site>** on myMurata website.
To access the sites, please follow the five steps below.

STEP1	STEP2	STEP3	STEP4	STEP5
Locate the <Registration Code>	Create your <my Murata> account	Request access to the < Type2AB document Site>	Enter the <Registration Code>	Log in to the < Type2AB document Site > And browse topics

STEP1

The <REGISTRATION CODE> is provided in below

STEP2

Browse to:
https://my.murata.com/en/home (↑for English)
https://my.murata.com/ja/home (↑for Japanese)

And click
<Create account>
 and follow the instruction

STEP3

Login to your
my Murata account,
Locate the
 <Type2AB Document Site>
banner

Qorvo Based UWB Module
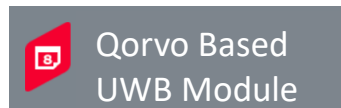
Click <Request access>

STEP4

Enter the
< REGISTRATION CODE>
(See below) and click
 <Request membership>

*Note: Your request will be processed within a few days. You will receive a confirmation e-mail upon successful registration.

STEP5

Once your request has been approved,
Log in to <my Murata>
and click the
< Type2AB document Site >
link at the top of the page

*You are all set to start accessing the exclusive information!

muRata   my Murata

製品情報 | アプリケーションガイド | 設計支援ツール | サポート | ムラタについて | my Murata

my Murata Home

Home

< Type2AB Document Site   へ会員リクエストを送る。

This is Type2AB product Site for customers.
Input the Serial No. written in the development kit and click the "Request Membership" button.
You will receive an email after the number is comforted.
(The confirmation process might take a few days. We appreciate for your kind understanding and cooperation.)

Please input a serial number. (Letter case 8 -16 characters)
(Registration code provided upon my Murata account ID registration process is NOT a serial code for here.)

Enter REGISTRATION CODE here

REGISTRATION CODE

"YourCode"
*Case sensitive

***Note**:
"YourCode" is NOT the appropriate registration code.
Please find the correct code printed on the sticker of the EVB.

Revision History

Revision	Date	Description
-	7/18/2022	Initial
A	9/23/2022	Add SDK link
B	3/07/2024	▪ Update contents according to the latest releases ▪ Add the download links ▪ Add contents about TestFW and SDK Patch file ▪ Add *myMurata Access Guide* in the appendix