

Type2BP EVK

Product Brief

October 24, 2023, RevA

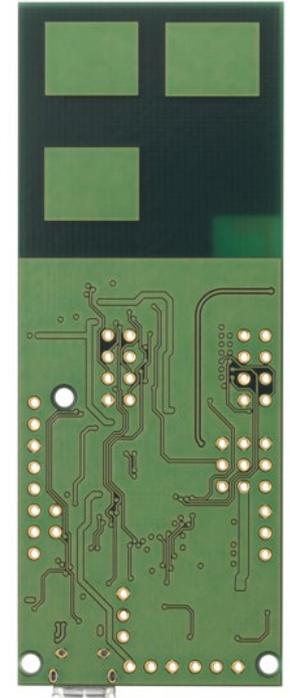
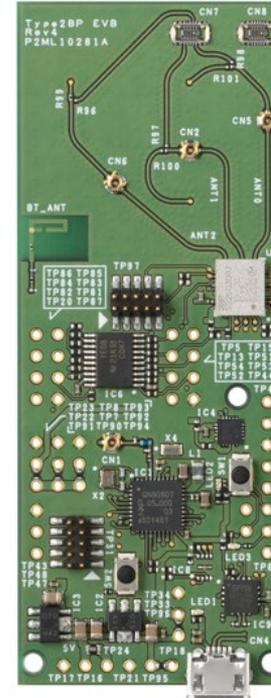


Type2BP EVK

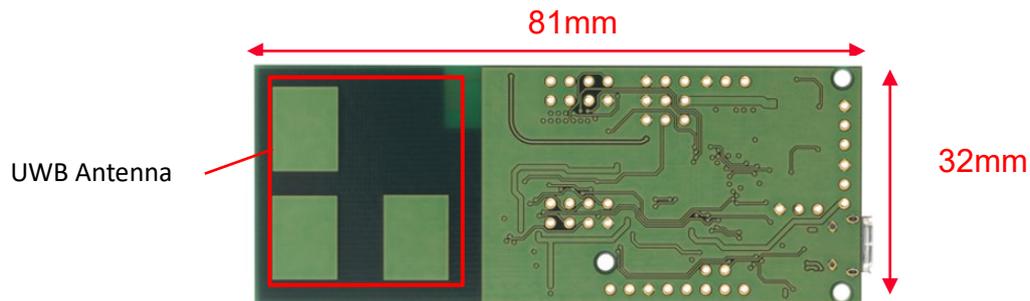
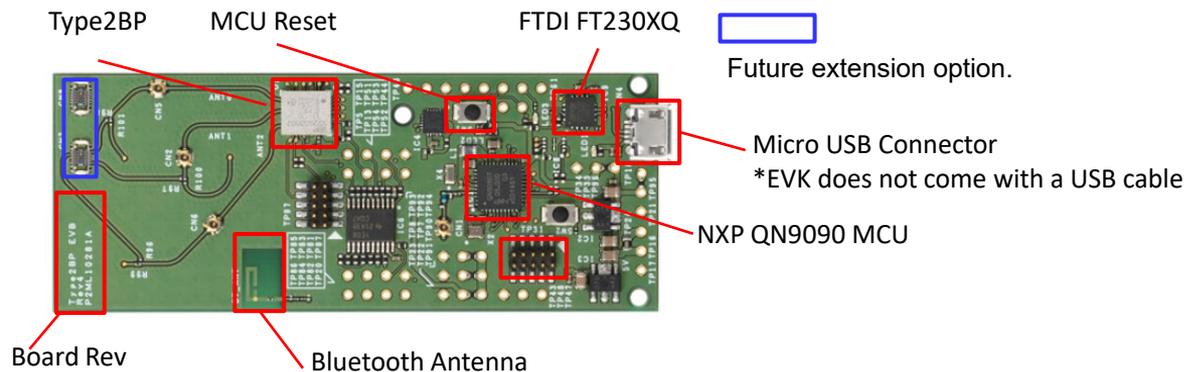
Type2BP-EVK(Evaluation Kit) is Starter Kit to start UWB development with Type2BP UWB module.

Features

- Type2BP(NXP Trimension SR150) and QN9090(NXP BLE chip)
- Interface: USB / SWD
- On board 3 Antenna
- USB/UART conversion IC
- Power supply via USB cable, and from COM port of PC, Type2BP can be controlled through QN9090

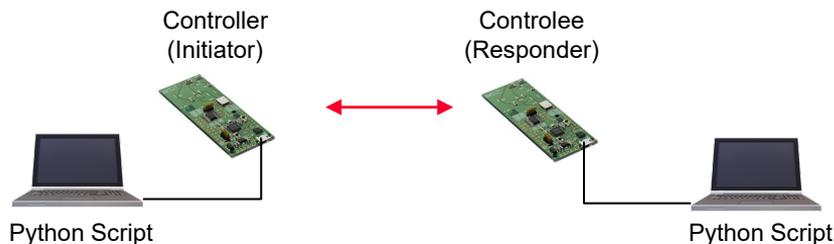


Appearance of EVK



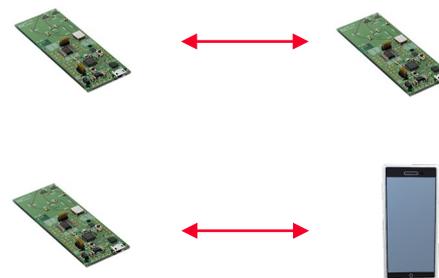
Ranging Performance check

Plug and Play mode



Easily check operation using FW pre-installed in EVK.
Run the python script file on the PC to control EVK.
It can check the performance of ToF and AoA.
(2 EVKs required).

Standalone mode



It is possible to verify the operation in the following modes by writing the pre-build binary file.
Pre-built binary files are available from each SDK download site.
Standalone mode:
It can check the performance of ToF and AoA.
(2 EVKs required).
Ranging with Mobile Phone:
It can check the performance with smart phone(iPhone and Android).

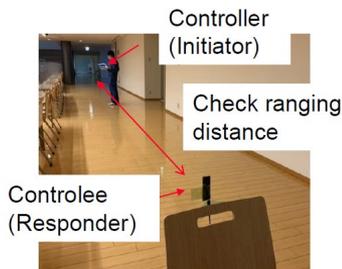
Performance information

Ranging Distance

TOP VIEW : Direction of EVK Antenna

| Responder | Initiator | Responder | Initiator |
|-----------|-----------|-----------|-----------|
| 0° | 0° | 90° | 90° |
| 0° | 90° | 90° | 180° |
| 0° | 180° | 180° | 180° |

Condition

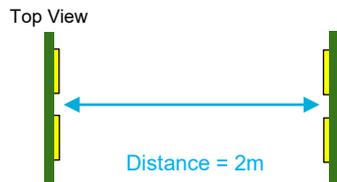


Type2BP EVK Controller / Controlee connected and check how long can keep ranging with several conditions.

| EVK (Responder) | EVK (Initiator) | Max ranging distance |
|-----------------|-----------------|----------------------|
| 0° | 0° | Around 50m |
| 0° | 90° | 26m |
| 0° | 180° | 25m |
| 90° | 90° | 10m |
| 90° | 180° | 9m |
| 180° | 180° | 4.5m |

Result

Ranging Accuracy



Condition

| | 5ch | 9ch |
|----------|-------|-------|
| Sample-A | 200 | 202 |
| Sample-B | 200 | 196 |
| Sample-C | 199 | 201 |
| Average | 199.6 | 199.6 |

Result

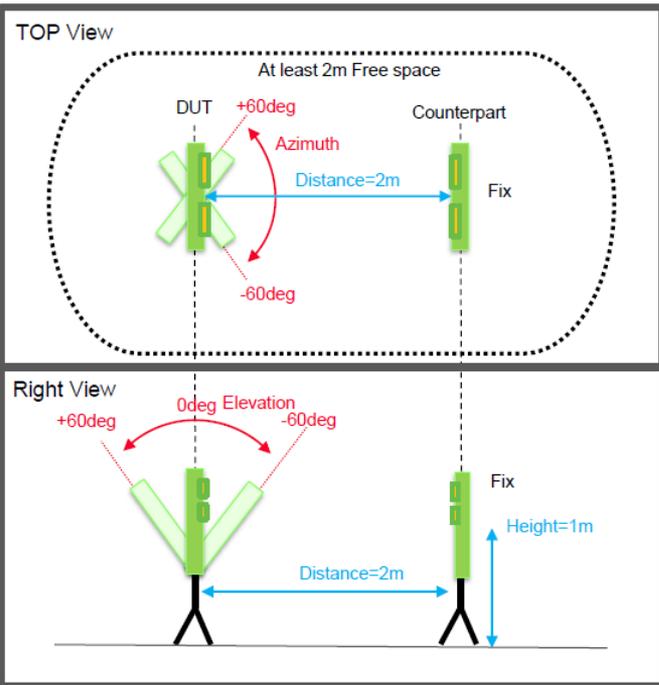
Performance information

Angle Accuracy

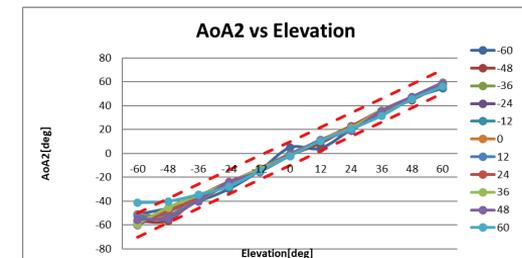
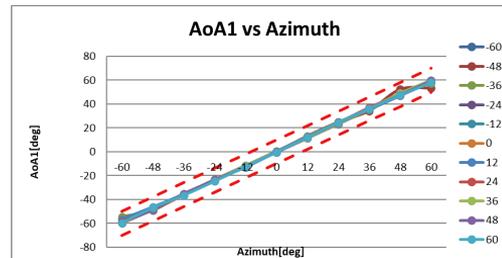
The Type2BP-EVK has been configured to achieve optimal AoA results in the range of +/- 60 deg.

In Azimuth, the error is within 10 deg.

In Elevation, the error is within 10 deg except for the boundary.



Condition



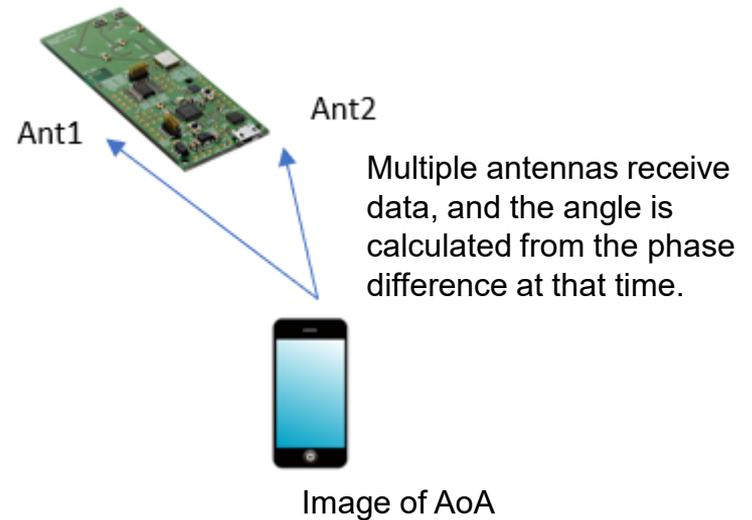
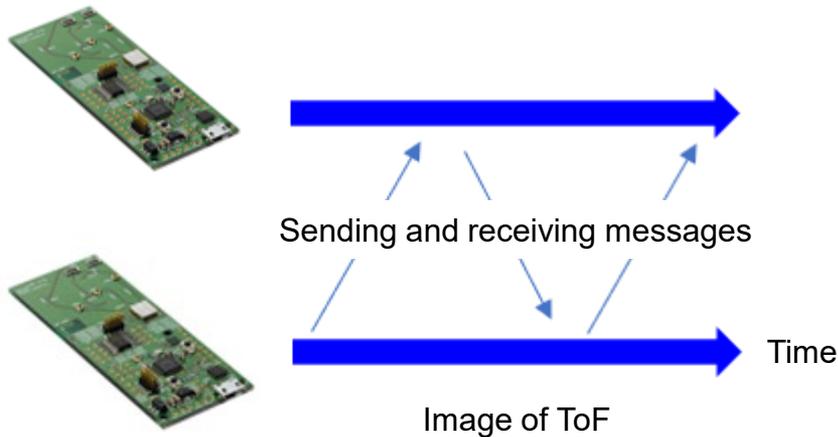
| AoA1 | Elevation | -60 | -48 | -36 | -24 | -12 | 0 | 12 | 24 | 36 | 48 | 60 |
|---------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Azimuth | -60 | -59.07 | -55.91 | -54.28 | -58.83 | -59.44 | -60.00 | -56.82 | -58.59 | -59.67 | -59.23 | -59.61 |
| | -48 | -47.65 | -48.60 | -49.06 | -47.75 | -47.67 | -48.50 | -46.38 | -48.27 | -47.69 | -48.81 | -46.83 |
| | -36 | -36.11 | -36.24 | -35.30 | -36.03 | -35.89 | -36.20 | -35.65 | -35.92 | -36.25 | -35.29 | -36.43 |
| | -24 | -23.30 | -23.62 | -23.75 | -23.62 | -23.36 | -24.22 | -23.83 | -23.30 | -23.79 | -23.84 | -24.62 |
| | -12 | -12.96 | -11.75 | -11.97 | -12.20 | -11.46 | -11.88 | -12.14 | -11.81 | -11.83 | -12.67 | -12.47 |
| | 0 | 0.05 | -0.35 | 0.23 | -0.26 | 0.56 | 0.09 | 0.15 | 0.01 | 0.09 | -0.12 | -0.37 |
| | 12 | 11.98 | 13.14 | 12.90 | 11.51 | 12.54 | 11.78 | 12.04 | 12.00 | 11.65 | 12.21 | 12.17 |
| | 24 | 23.30 | 24.80 | 24.60 | 23.74 | 24.10 | 23.75 | 23.93 | 24.42 | 23.38 | 24.28 | 24.70 |
| | 36 | 35.34 | 34.26 | 35.30 | 36.21 | 35.39 | 36.09 | 35.70 | 37.17 | 35.86 | 36.16 | 36.25 |
| | 48 | 47.22 | 52.25 | 48.41 | 47.02 | 49.19 | 49.02 | 47.22 | 48.25 | 48.86 | 47.59 | 47.43 |
| | 60 | 59.92 | 53.25 | 57.31 | 58.46 | 59.50 | 59.15 | 58.57 | 58.58 | 59.77 | 59.47 | 58.11 |

| AoA2 | Azimuth | -60 | -48 | -36 | -24 | -12 | 0 | 12 | 24 | 36 | 48 | 60 |
|-----------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Elevation | -60 | -50.97 | -56.59 | -59.97 | -59.60 | -50.80 | -51.01 | -52.05 | -58.43 | -59.27 | -56.39 | -61.88 |
| | -48 | -46.10 | -56.25 | -46.17 | -48.90 | -52.03 | -53.67 | -54.65 | -48.38 | -45.39 | -53.72 | -39.86 |
| | -36 | -39.93 | -36.61 | -39.33 | -36.83 | -36.64 | -37.40 | -37.29 | -36.83 | -35.16 | -39.38 | -34.22 |
| | -24 | -24 | -29.69 | -23.64 | -24.65 | -26.42 | -26.53 | -25.10 | -24.72 | -24.83 | -24.63 | -24.18 |
| | -12 | -14.46 | -14.14 | -12.79 | -12.56 | -13.00 | -13.21 | -12.72 | -12.86 | -13.22 | -15.42 | -14.64 |
| | 0 | 5.05 | -1.45 | -1.64 | -0.97 | -0.18 | -0.49 | -0.62 | -1.24 | -1.81 | -1.91 | -1.87 |
| | 12 | 4.35 | 8.59 | 10.83 | 10.99 | 10.89 | 10.81 | 10.53 | 11.18 | 11.48 | 11.35 | 10.59 |
| | 24 | 19.98 | 22.47 | 22.94 | 22.96 | 22.75 | 22.49 | 22.66 | 22.64 | 21.36 | 19.18 | 20.57 |
| | 36 | 34.56 | 35.19 | 35.00 | 35.71 | 36.19 | 36.16 | 35.77 | 35.76 | 35.89 | 35.64 | 31.57 |
| | 48 | 46.30 | 44.89 | 46.78 | 46.99 | 47.46 | 46.97 | 46.91 | 46.94 | 46.23 | 47.07 | 45.59 |
| | 60 | 54.68 | 58.03 | 59.03 | 59.63 | 59.36 | 58.95 | 58.92 | 58.77 | 59.04 | 58.46 | 56.04 |

Result

Usage of EVK[1/2]

1. Ranging (Distance and Angle) between EVKs and/or smartphone
Relative positioning detection by using ToF / AoA
2. Data communication while Ranging



3.RTLS(system using location algorithm) Absolute positioning detection by Anchor(TDoA)

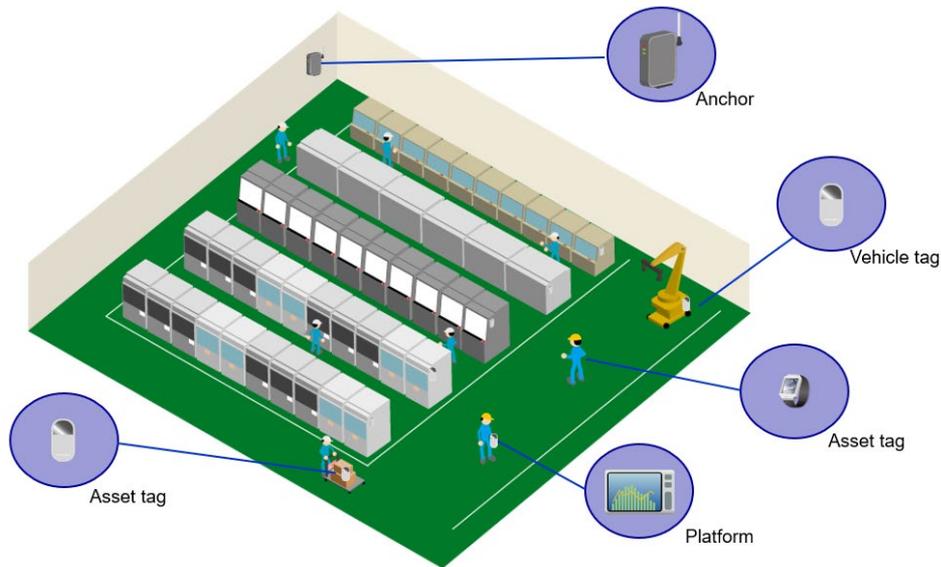


Image of RTLS

The RTLS system receives the signal originating from the TAG at each Anchor and needs an algorithm to estimate the location of the TAG based on the time information obtained at the Anchor. Algorithms for estimating time synchronization and TAG location information need to be considered by the customer.

Technical Document Site(my Murata 2BP site)

EVK purchasers will have access to the Type2BP Document Site. Document Site provides a wide range of technical information to support your product development.

| Category | Category name in document site | Contents |
|----------|----------------------------------|---|
| Overview | Datasheet / Development overview | Type2BP summary information |
| Hardware | Reference Schematic Design | HW summary information for the module. Design Guide, EVK Information (schematic, BOM, layout), Antenna Design Information |
| Software | SW Guide | Information about SW development. Setting up the QN9090 development environment and operating procedures. Operating instructions for a Linux/nRF52840 environment. |
| Other | Test Guide | Summary of evaluation results such as AoA/ToF/Multicast/Multisession |
| | Calibration Guide | Guide to More Accurate Ranging (AoA/ToF/CenterPosition) |
| | Certification Guide | Test report. Radio Certification, FiRa Certification Guide, and Test Tool Operating Procedures |

SDK Site(my Murata 2BP site)

We have published the SDK required to run Type2BP.
We publish SDKs provided by NXP, patch files to optimize modules, and prebuild binaries.

| Title | Update Date | |
|--------------------------------------|-------------|----------------------|
| UWBIOT SR150 v03.13.03 MCUx Site | 2023/2/8 | Link |
| UWBIOT SR150 v03.13.03 Linux Site | 2023/4/28 | Link |
| UWBIOT SR150 v03.14.05 MCUx Site | 2022/7/1 | Link |
| UWBIOT SR150 v03.14.05 Linux Site | 2022/7/1 | Link |
| UWBIOT SR150 v03.15.11 MCUx Site | 2022/7/6 | Link |
| UWBIOT SR150 v03.15.11 Linux Site | 2022/7/6 | Link |
| UWBIOT SR150 v04.02.01 MCUx Site | 2022/11/21 | Link |
| UWBIOT SR150 v04.02.01 Linux Site | 2022/12/23 | Link |
| UWBIOT SR150 v04.02.01 NRF52840 Site | 2023/2/22 | Link |
| UWBIOT SR150 v04.04.03 MCUx | 2023/6/2 | Link |

SDK Site list



Type2BP SDK UWBIOT SR150 v04.04.03 MCUx

| Title | Date | File name |
|--|-----------|---|
| UWBIOT_SR150_v04.04.03_MCUx | 2023/5/31 | UWBIOT_SR150_v04.04.03_MCUx.zip |
| PnP binary for Type2BP EVK (v04.04.03) | 2023/6/1 | Please use the binary file included in the SDK for v04.04.03. UWBIOT_SR150_v04.04.03_MCUx\uwbiot-top\binaries\Rhodes4\pnp3MFW_Rhodes4_SR150-ROW_PROD-v04.04.03.bin |
| Standalone binary for Type2BP EVK(v04.04.03) | 2023/6/1 | Standalone binary for Type2BP EVK(v04.04.03)_Correct_ver.zip This Zip file contains a patch file that applies Murata's settings. See document(MCM-22F-0075_Type2BP-How_to_build_pre-built-binary) for more details. This document is available on Type2BP Document site. 2bp_NearbyInteraction_v04.04.03_bonding.bin : The passkey used for pairing is "999999" |

SDK Site

Revision history



| Rev | Date | Description |
|-----|------------------|-----------------|
| A | October 24, 2022 | Initial release |