

# Type2BP EVK

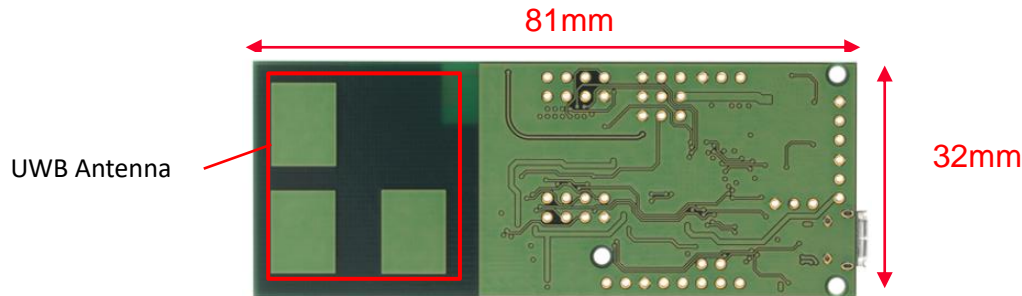
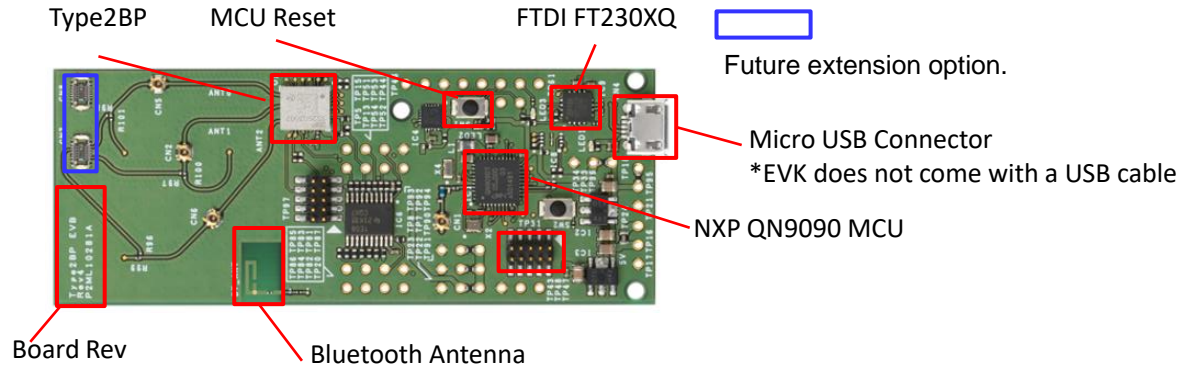
## Product Brief

October 24, 2023, RevA



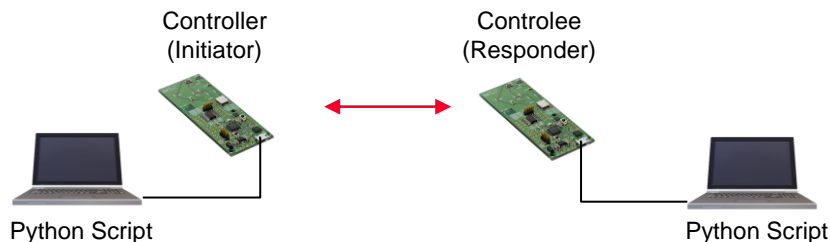


# Appearance of EVK



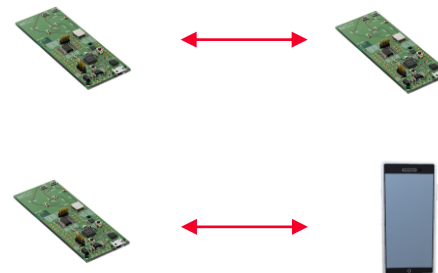
# Ranging Performance check

## 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-built 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).

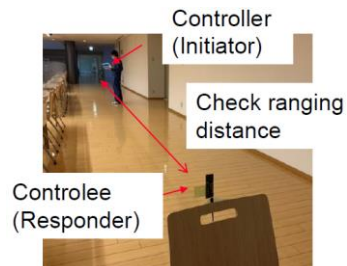
# Performance information

## Ranging Distance

TOP VIEW : Direction of EVK Antenna

Responder		Initiator	
0°	0°	90°	90°
0°	90°	90°	180°
0°	180°	180°	180°

Condition

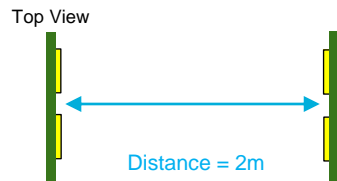


Type2BP EVK Controller / Controlee connected and check how long can keep ranging with several conditions.

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

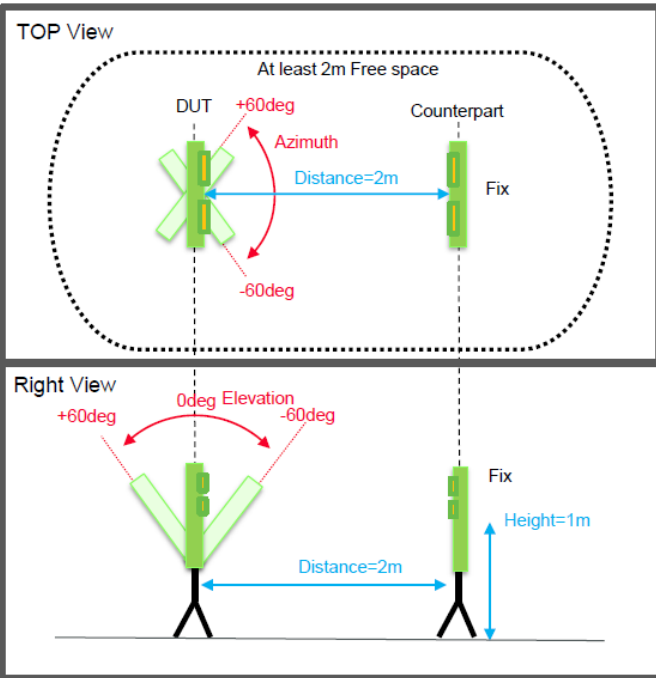
# Performance information

## Angle Accuracy

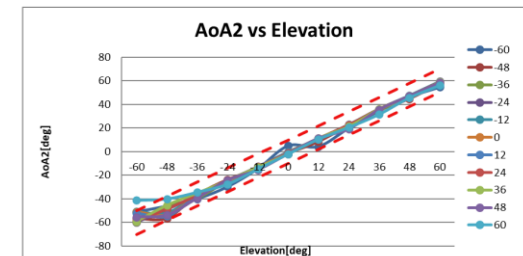
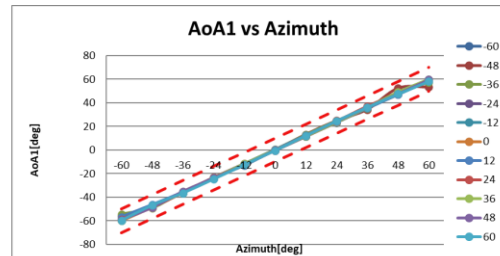
The Type2BP-EVK has been configured to achieve optimal AoA results in the range of +/- 60 deg.

In Azimuth, the error is within 10 deg.

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



Condition



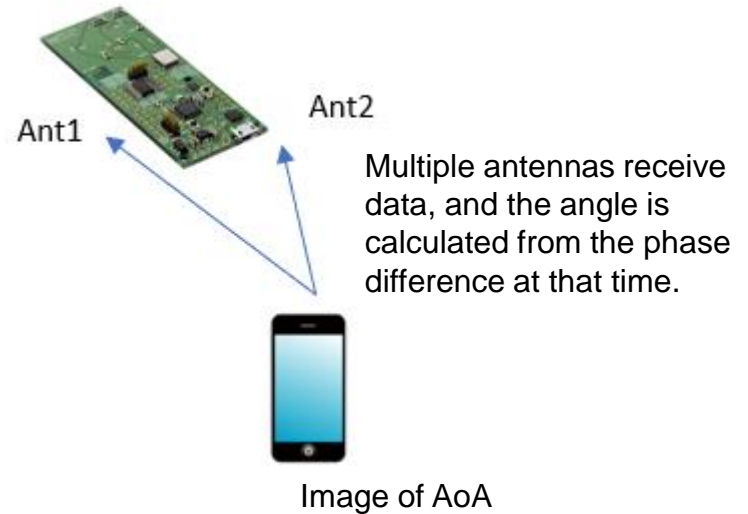
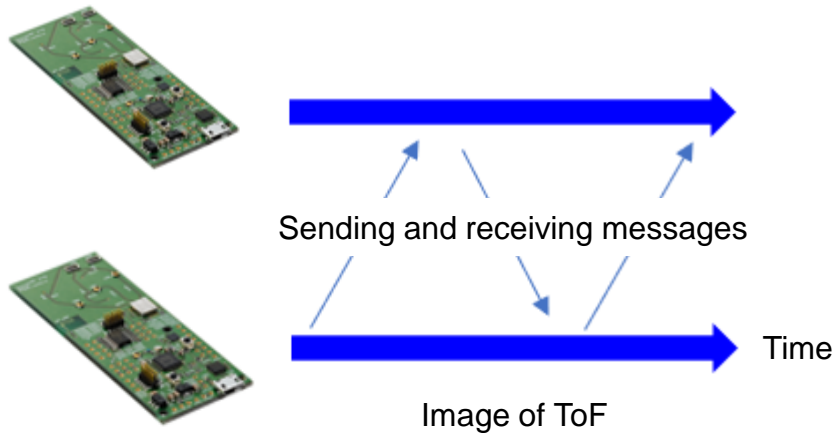
AoA1	Elevation	-60	-48	-36	-24	-12	0	12	24	36	48	60
Azimuth	-60	-59.07	-55.91	-54.25	-58.83	-59.44	-60.00	-56.82	-58.59	-59.67	-59.23	-59.61
-48	-47.65	-48.60	-49.05	-47.75	-47.67	-48.50	-46.38	-48.27	-47.69	-48.81	-46.83	
-36	-36.11	-36.24	-35.30	-36.03	-35.89	-36.20	-35.65	-35.92	-36.25	-35.29	-36.43	
-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	11.58	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	59.46	59.50	59.15	58.57	58.98	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	-59.80	-50.80	-51.01	-52.05	-58.43	-59.27	-50.39	-61.28
-48	-46.18	-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	-29.69	-23.64	-24.65	-26.42	-26.53	-25.10	-24.72	-24.83	-24.63	-24.18	-27.40	
-12	-14.45	-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	36.15	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	54.64	58.03	59.03	59.63	59.36	58.95	58.92	58.77	59.04	58.45	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)

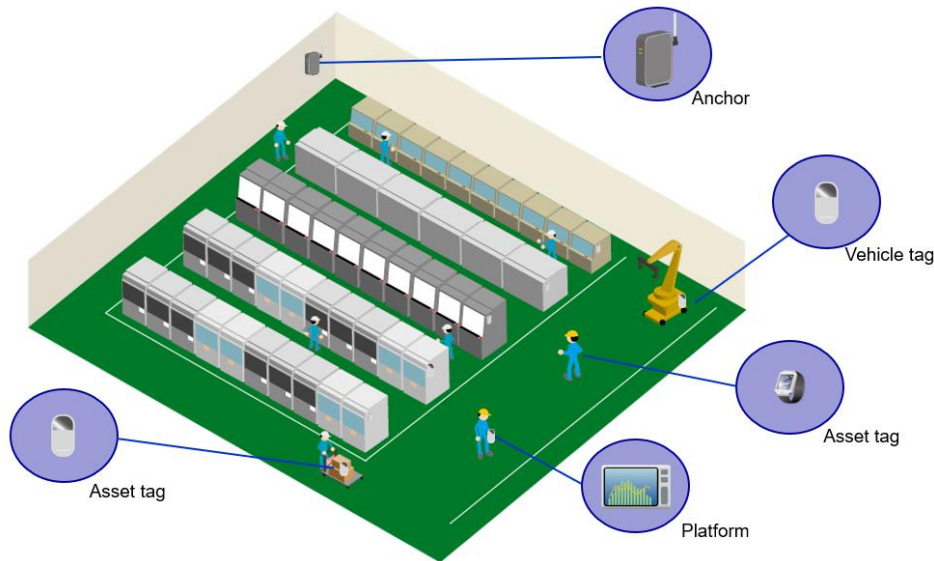


Image of RTLS

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	<a href="#">Link</a>
UWBIOT SR150 v03.13.03 Linux Site	2023/4/28	<a href="#">Link</a>
UWBIOT SR150 v03.14.05 MCUx Site	2022/7/1	<a href="#">Link</a>
UWBIOT SR150 v03.14.05 Linux Site	2022/7/1	<a href="#">Link</a>
UWBIOT SR150 v03.15.11 MCUx Site	2022/7/6	<a href="#">Link</a>
UWBIOT SR150 v03.15.11 Linux Site	2022/7/6	<a href="#">Link</a>
UWBIOT SR150 v04.02.01 MCUx Site	2022/11/21	<a href="#">Link</a>
UWBIOT SR150 v04.02.01 Linux Site	2022/12/23	<a href="#">Link</a>
UWBIOT SR150 v04.02.01 NRF52840 Site	2023/2/22	<a href="#">Link</a>
UWBIOT SR150 v04.04.03 MCUx	2023/6/2	<a href="#">Link</a>

SDK Site list



## Type2BP SDK UWBIOT SR150 v04.04.03 MCUx

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

SDK Site

# Revision history

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Rev	Date	Description
A	October 24, 2022	Initial release