**IEEE 802.15**

**Wireless Specialty Networks (WSN)**

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| Project | IEEE 802.15 Working Group for Wireless Specialty Networks (WSN) | |
| Title | **IEEE 802.15 TG 4ab (NG-UWB) minutes** | |
| Date Submitted | [16 Jan, 2022] | |
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|  | [Billy Verso] [Qorvo] [--] | Voice: [--]  Fax: [--]  E-mail: [Billy.Verso@qorvo.com] |
| Re: | [Nov 802.15 Plenary Meeting held in Hybrid Mode] | |
| Abstract | [IEEE 802.15 Task Group 4ab minutes] | |
| Purpose | [Official minutes of IEEE 802.15 TG 4ab] | |
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# Monday, 17 Jan, 2023 – AM2

**Opening**

**10:37 AM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.  
(*15-23-0029-01-04ab*)

* >80 attendees joined the meeting

Chair reminded the group of registration for 802 LMSC and wireless interim.

Chair reminded people to join without audio or disable their device audio completely if they join the Webex in the meeting room.

## Legal

Chair reminded the group of the following from the 802.15 opening meeting:

* IEEE-SA patent policy
* Submission of Letter(s) of Assurance (LoA) or to identify patent claim(s)/patent application claim(s) and/or the holder of patent claim(s)/patent application claim(s) that the participant believes may be essential for any of the ongoing activities within the 802.15 WG.
  + No essential patent claims were brought forth
* IEEE Anti-Trust statement
* IEEE Copyright Policy, including Code of Ethics

**Announcements**

Chair announced the agenda doc. # for the week. After reviewing the agenda, there were some comments to update the document number. No one objected to approve the modified agenda. it was approved by unanimous consent.  
*(doc. # 15-22-0687-07-04ab)*

Chair raised the motion of minutes for Nov plenary *(doc. # 15-22-0676-00-04ab)* and telecons between Nov and Jan *(doc. # 15-23-0025-01-04ab)*. No one objected to approve the motion. The motion was approved by unanimous consent.

Chair emphasized the session objectives of this week and the major milestones update.

Chair announced the rules for the mix mode meetings in this week. Chair asked every attendee to announce his name and affiliation before he speaks.

**TG Meeting Activity**

Using the agenda *(doc. # 15-22-0687-07-04ab)* Chair proceeding with running the meeting.

Alexander Krebs (Apple) presented “NBA-MMS-UWB Native Discovery Concept”

(*doc. # 15-23-0033-01-04ab*)

This presentation introduces evolution of IEEE 802.15.4z enabling efficient scheduled positioning systems.

Questions/comments raised include the band/channel selection, roles in ranging mode, interreference in the case of multiple nodes in association phase, etc.

Jean-Marie Andre (ST microelectronics) and Sven Zeisberg (ZIGPOS) presented “MAC evolution to support air time efficient multi-mode many-2-many ranging”

(*doc. # 15-23-0034-01-04ab*)

This presentation proposes evolutionary extensions to IEEE 802.15.4z for scheduled ranging concerning ranging roles in slot assignments and initiator picking of responders.

Questions/comments raised include how to schedule different messages, clarity on multiple ranging.

Jingjing Jiang (Apple) presented “One-to-Many Ranging using MMR Technical Framework Proposal”

(*doc. # 15-23-0015-02-04ab*)

This presentation introduces a framework text on one-to-many ranging using MMR.

Questions/comments raised include complexity of the procedure, frequency offset, detailed message exchanges in the contention-based configuration etc.

Chair asked if anyone wanted to use the remaining time to discuss. No response heard.

Chair recessed the mtg. @ 12:30pm ICT, until Mon. PM2.

# Monday, 17 Jan, 2023 – PM2

**4:02 PM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.  
(*15-23-0029-01-04ab*)

* >90 attendees joined the meeting

## Legal

Chair reminded the group of the following from the 802.15 opening meeting:

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**TG Meeting Activity**

Using the agenda *(doc. # 15-22--0687-07-04ab)* Chair proceeding with running the meeting.

Lei Huang (Huawei) presented “Improvements on UWB in-band discovery”

(*doc. # 15-23-0002-01-04ab*)

This presentation proposes solutions to improve the UWB in-band discovery protocol.

Questions/comments raised include the topic that the proposal targets at.

Kangjin Yoon (Meta) presented “Compressed header IE for control message”

(*doc. # 15-23-0021-01-04ab*)

This presentation proposes a new header IE which can be used for control message.

Questions/comments raised include flexibility limit, the IE definitions, etc.

Collaboration breakout: There are two rooms for breakout/ad-hoc discussions. The meeting recessed at 4:55pm.

Chair initiated the discussion on the document of China’s MIIT consultation in the breakout time.

Bin Qian (Huawei) presented “China MIIT's consultation on UWB”

(*doc. # 15-23-0023-01-04ab*)

This presentation introduces the technical part of China MIIT's consultation and compares it with the version in 2008.

There were several discussions on the comments.

5:30PM ET Chair called the meeting to order.

Xiliang Luo (Apple) presented “Bitmap-based CIR Reporting for UWB Sensing”

(*doc. # 15-22-0570-00-04ab*)

This presentation proposes more details on the bitmap-based designs for CIR reporting.

Questions/comments raised include the definition of the threshold, signaling to change the bitmap length, the overhead analysis of negotiation and bitmaps, etc.

Chair recessed the mtg. @ 5:56pm ET, until Tue. AM1.

# Tuesday, 18 Nov, 2022 – AM1

**8:02 AM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.  
(*15-23-0029-03-04ab*)

* >90 attendees joined the meeting

## Legal

Chair reminded the group of the following from the 802.15 opening meeting:

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**TG Meeting Activity**

Using the agenda *(doc. # 15-22-0687-07-04ab)* Chair proceeding with running the meeting.

Kuan Wu (Huawei) presented “Enhanced poll and report based on compressed PSDU for NBA-MMS UWB”

(*doc. # 15-23-0037-00-04ab*)

This presentation introduces enhanced designs of request and report messages in compressed PSDU format for NBA-MMS UWB applications.

Questions/comments raised include extension, how to estimate the number of fragments, security issues in MAC header (e.g., secure Header IEs).

Huan-Bang Li (NICT) presented “Summary of NB CCA For UWB channel Access”

(*doc. # 15-23-0038-00-04ab*)

This presentation summarizes NB CCA and intends to improve coexistence among UWB systems.

Questions/comments raised include selecting subchannels, pattern definition, simulation settings, challenging to the pattern only in power level, etc.

Bin Qian (Huawei) presented “Time efficient one-to-many ranging using MMS-UWB”

(*doc. # 15-23-0048-00-04ab*)

This presentation proposes sequences to improve time efficiency of one-to-many ranging using MMS-UWB.

Questions/comments raised include examples of sensitive application, complexity and power consumption of sequences for parallel transmissions by multiple responders, how long of one-to-many ranging in time domain, etc.

Collaboration breakout: There are two rooms for breakout/ad-hoc discussions.

Chair asked if there any discussions using rooms for ad-hoc meeting. Pooria Pakrooh (Qualcomm) requested to use one room for sensing discussion starting from 10am.

Chair recessed the mtg. @ 9:40am ICT, until Tue. PM1.

# Tuesday, 17 Jan, 2023 – PM1

**1:36 PM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.  
(*15-23-0029-03-04ab*)

* >90 attendees joined the meeting

## Legal

Chair reminded the group of the following from the 802.15 opening meeting:

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**TG Meeting Activity**

There was some change to the agenda. No objection to the updated agenda.

*(doc. # 15-22-0687-08-04ab)*

Using the agenda *(doc. # 15-22-0687-08-04ab)* Chair proceeding with running the meeting.

Taeyoung Ha (Samsung) presented “Updates for the Multiple Transmission”

(*doc. # 15-23-0036-03-04ab*)

This presentation introduces the Multiple RSF Transmissions in a Slot Scenario to increase air time efficiency.

Pooria Pakrooh (Qualcomm) presented “Further Discussion on UWB Sensing for 802.15.4ab”

(*doc. # 15-23-0026-01-04ab*)

This presentation discusses more details on CIR report format for UWB sensing as well as considerations for sensing mask.

Questions/comments raised include details of bitmap, flexibility of the bitmap length, flexibility at the responder sider, etc.

Collaboration breakout: There were two rooms for breakout/ad-hoc discussions. Carlos (Meta) requested to use one room.

Chair recessed the mtg. @ 2:31pm ET, until Wed. AM1.

# Wednesday, 18 Jan, 2023 – AM1

**8:02 AM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.  
(*15-23-0029-03-04ab*)

* >90 attendees joined the meeting

## Legal

Chair reminded the group of the following from the 802.15 opening meeting:

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**TG Meeting Activity**

Using the agenda *(doc. # 15-22-0687-08-04ab)* Chair proceeding with running the meeting.

Carlos Aldana (Meta) presented “LDPC Results for different PHR designs in 802.15.4ab”

(*doc. # 15-23-0065-00-04ab*)

This presentation introduces LDPC simulation results for different PHR designs using 7.8 and 1.95 Mbps.

Youngwan So (Samsung) presented “Hyper Block Concept for Use of NBA-MMS”

(*doc. # 15-23-0059-00-04ab*)

This presentation shows how hyper block-based mode can play a role for NBA-MMS.

Questions/comments raised include whether the feature is mandatory or optional, etc.

Chenchen Liu (Huawei) presented “Comparison of Ipatov sequences of different lengths”

(*doc. # 15-23-0050-01-04ab*)

This presentation compares the performance of Ipatov sequences of lengths 91,121 and 127.

Questions/comments raised include cross-correlation peak, more simulations with new parameters, fairness of comparison, spreading factor and energy emission, coexistence with legacy devices, etc.

Kuan Wu (Huawei) presented “Configuration for MMS based ranging”

(*doc. # 15-23-0028-00-04ab*)

This presentation introduces new IE to enable the configuration for MMS based ranging in 802.15.4ab applications.

Questions/comments raised include how to proceed with the proposed design, design motivation, etc.

Collaboration breakout: There were two rooms for breakout/ad-hoc discussions.

Riku Pirhonen (NXP) proposed to have several discussions on the response to China’s MIIT.

Chair recessed the mtg. @ 2:13pm ET, until Thu. AM1.

# Wednesday, 18 Jan, 2023 – PM1

**1:30 PM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.  
(*15-23-0029-03-04ab*)

* >90 attendees joined the meeting

## Legal

Chair reminded the group of the following from the 802.15 opening meeting:

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**TG Meeting Activity**

Chair updated the agenda to r9. No objection to the updated agenda.

*(doc. # 15-22-0687-09-04ab)*

Using the agenda *(doc. # 15-22-0687-09-04ab)* Chair proceeding with running the meeting.

Kangjin Yoon (Meta) presented “Text for Application Control IE” (*doc. # 15-23-0061-00-04ab*), “Text for Scheduling IE” (*doc. # 15-23-0062-00-04ab*), and “Text for AIFS” (*doc. # 15-23-0071-00-04ab*).

This presentation provides the draft text for Application Control IE, the draft text for Scheduling IE, and the draft text for AIFS.

Vinod Kristem (Apple) presented “MMRS Repetition Number in RSF” (*doc. # 15-23-0017-02-04ab*) and “NBA-UWB Technical Framework Proposal” (*doc. # 15-23-0004-01-04ab*)

This presentation provides more details on the MMS UWB and introduces the corresponding update to the NBA-UWB technical framework proposal.

Questions/comments raised include the same value of N\_MSR in all RSFs and gating gain.

Vice Chair Clint Powell (Meta) shared the summarized talking points yesterday.

(*doc. # 15-22-0647-00-04ab*)

Chair recessed the mtg. @ 4:55pm ICT. The formal discussions on coexistence were moved to 802.11 COEX SC.

# Thursday, 19 Jan, 2023 – AM1

**8:01 AM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.  
(*15-23-0029-03-04ab*)

* >90 attendees joined the meeting

Chair reminded the group of registration for 802 LMSC and wireless interim.

## Legal

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**TG Meeting Activity**

Using the updated agenda *(doc. # 15-22-0687-09-04ab)* Chair proceeding with running the meeting.

08:10:    Doc: 15-23-0078-00-04ab “*Further Consensus on Data Comm Topic*” was presented by Carlos Aldana (Meta).

08:20:    Doc: 15-23-0067-00-04ab “*Updates on UWB Channel Usage Coordination*” was presented by Mingyu Lee (Samsung).

09:10:    Doc: 15-23-0010-00-04ab “*Updated Proposal on Channels for Frequency Stitching*” was presented by Steve Shellhammer (Qualcomm).

09:45:    General discussion on way forward.

09:50:    Meeting is recessed until PM1

# Thursday, 19 Jan, 2023 – PM1

**1:36 PM ICT** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.  
(*15-23-0029-03-04ab*)

* >90 attendees joined the meeting

Chair reminded the group of registration for 802 LMSC and wireless interim.

## Legal

Chair reminded the group of the following from the 802.15 opening meeting:

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**TG Meeting Activity**

Using the updated agenda *(doc. # 15-22-0541-10-04ab)* Chair proceeding with running the meeting.

Pooria Pakrooh (Qualcomm) presented “Latest Consensus on UWB Sensing for 802.15.4ab”.

(*doc. # 15-23-0079-00-04ab*)

This presentation introduced the latest consensus among co-authors on UWB sensing topics for 802.15.4ab.

Discussions on the progress of ad-hoc subgroups and draft 0. Chair encouraged people to converge through all the possible ways.

Discussions on the teleconference schedule. No objection to the updated schedule.

Discussions on the formulation of the initial draft.

Chair adjourned the mtg. @ 2:40pm ICT.