IEEE P802.15

**Wireless Personal Area Networks**

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| Project | Task Group 15.6a |
| Title | **TG15.6a Meeting Minutes for May 2022**  |
| Date Submitted | May 18th, 2022 |
| Source | [Ryuji Kohno1,2 Marco Hernandez1 Takumi Kobayashi2 Minsoo Kim1][1; YRP-IAI (YRP International Alliance Institute), Japan, 2; YNU (Yokohama National University), Japan3; Oulu, University of Oulu, Finland] | Voice: +81 90 5408 0611E-mail: kohno@ynu.ac.jp marco.hernandez@ieee.org kobayashi-takumi-ch@ynu.ac.jp minsoo@minsookim.com |
| Re: | Meeting Minutes |
| Abstract | Since PAR and CSD of SG15.6a as amendment of existing IEEE802.15.6-2012 for WBAN with enhanced dependability was approved by NesCom in September, Task Group TG15.6a has been drafting technical requirement in cases of WBAN for medical use case for human body(HBAN) and for automotive use case for vehicle body(VBAN) with their connected use cases. In November meeting, to summarize technical requirement TG15.6a has reviewed focused uses cases necessary for enhanced dependability in which channel propagation and environment of HBAN and VBAN with their mixed use can be categorized and modeled. Particularly to perform enhanced dependability in dense environment coexisting multiple overlaid BANs and different UWB and narrow band WPAN, WSN, WLAN etc. necessary technical requirement has been summarized in PHY and MAC layers. Then technical requirement document(TRD) has been approved by TG motion. Possible solutions to ensure enhanced dependability in PHY and MAC have been presented and discussed. Latest status of ETSI Smart BAN standard has been presented to find a way to make interoperability with IEEE802.15.6 and 6a. To harmonize activities of TG15.6a, 15.4ab and 15.14 using UWB PHY, TRD and technical guidance document(TGD) have been reviewed in joint and individual sessions. Next step has been discussed including telco for harmonization with TG15.4a and 14 and change to revision from amendment.  |
| Purpose | Minutes of Dependability Electronic Plenary Session on Webex, May 2022. |
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**TG15.6a 1st Session**

**Wednesday, May 10th, 2022, AM 9:10-11:00 EDT**

**Room: Webex Virtual Conference**

* 1. Meeting called to order AM 9:10

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*

Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).

Registration information.

By Chair Ryuji Kohno

* 1. Opening Report *Ryuji Kohno (YNU / YRP-IAI)* doc.# 802.15- 22-0221-01-06a

Chair showed IEEE Patent policy.

Chair issued Call for Potentially Essential Patents.

Þ No essential intellectual property in the scope of TG6a was declared.

Chair presented agenda of this meeting doc.# 802.15- 22-0222-03-06a

Þ Approved.

* 1. Approval of previous meeting minutes *Ryuji Kohno, Takumi Kobayashi (YNU / YRP-IAI)*

Þ Upon no comments on the November meeting minutes, doc. #15-22-0191-01-06a was approved.

**[Review]**

* 1. TG, SG15.6a & IG DEP Activity for Amendment of IEEE802.15.6 Wireless BAN with Enhanced Dependability, *Ryuji Kohno (YNU / YRP-IAI)* doc. # 21-0023-06-06dep
	2. Explanation to change amendment 15.6a to revision of 15.6ma, *Ryuji Kohno* (YNU / YRP-IAI)
	3. Comments from NesCom, *Marco Hernandez,* (YRP-IAI/CWC), doc.# 22-0167-03-06a
	4. Responses to 802.1, 802.3, 802.11 comments to the PAR and CSD revision, *Marco Hernandez*, (YRP-IAI/CWC), doc.# 22-0167-03-06a
	5. ~~PAR and CSD of the Revision IEEE 802.15.6a,~~ *~~Marco Hernandez, Ryuji Kohno~~*~~, doc. # 22-0087-01-06a and # 22-0088-00-06a~~
		+ Combined into 1.7 and 1.8
	6. Application Matrix: use cases for medical and automotive industry systems, #17-0398-00, #19-0545-01, #21-0484-00, *Ryuji Kohno* (YNU/YRP-IAI)
	7. Summary of Channel and Environmental Modeling Activities for BANs on TG15.6a, doc.#22-0091-02, *Takumi kobayashi* (YNU/YRP-IAI)
		+ Body surface to the same body surface channel and body surface to another body surface channel can be considered as different and these SAR should be considered. (*Ryuji Kohno*)
		+ Capsule endoscopy situation should be defined as implant to body surface channel model. (*Kamran Sayrafian*)
	8. Channel Model for Wearable and Implant BAN in use case of BMI and BCI, doc.#22-0269-00, *Takumi kobayashi* (YNU/YRP-IAI)
	9. Recessed

**Attendees list**

Attendees 23

***Name Affiliation***

* Abdelfattah Renesas
* Billy Verso Qorvo
* Carl Murray Qorvo
* Chris Hett L+G
* Daisuke Anzai Nagoya Institute of Technology
* Daoud Serang CML Microcircuits
* Enrico Rantala Zeku
* Hiroki Saito ARIS
* Huan-Bang Li NICT
* Jeng-Shiann Jiang Vertexcom
* Kamran Sayrafian NIST
* Marco Hernandez YRP-IAI
* Masayuki Hirata Osaka University
* Minsoo Kim YRP-IAI
* Pablo Corbalan NXP
* Phil Beecher WiSUN
* Ryuji Kohno YNU/YRP-IAI
* Seong-Soon Joo ETRI
* Stuart Kerry OK-Brit; Self
* T. Suzuki NICT
* Takumi Kobayashi YNU/YRP-IAI
* Yasuharu Amezawa Mobile Techno
* Youngwan So Samsung

**TG6a 2nd Session**

**Thursday, May 12th 2022, AM 9:10-11:00 EDT**

**Room: Webex Virtual Conference**

* 1. Meeting called to order AM 9:10

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).
	Registration Information, By Chair *Ryuji Kohno*
	2. Opening Report Ryuji Kohno (YNU / YRP-IAI) doc.# 802.15- 22-0221-01-06a

**[Process for the Revision]**

* 1. Review of the last session TG6a, *Ryuji Kohno* (YNU/YRP-IAI)

**[Presentations]**

* 1. ETSI SmartBAN in Medical/Wellbeing, *Lorenzo Mucchi* (University of Florence), doc.# 802.15-22-0237-00-06a
		+ What is a specific update? *(Ryuji Kohno)*
			- Security and privacy enhancement and also improvement from the point of view of dependability. *(Lorenzo Mucchi)*
		+ There are different CCA on 3 different channels. Frequency overlapping in mobility situation. Does it cause collision? *(Minsoo Kim)*
			- We can use different controlling channel and data channel. (*Lorenzo Mucchi*)
		+ How to solve the burst errors on GMFSK? Do you consider something like channel coding? (*Harry* *Bim*s)
			- Forward error correction with interleaver is used to solve the burst error. (*Lorenzo Mucchi*)
		+ What kind of application is assumed as Hub to hub communication in medical application? (*Kamran Sayrafian*)
		+ We wish to keep discussion with ETSI smartBAN to consider to interoperability. (*Ryuji Kohno*)
	2. Considerations on the MAC features for supporting high priority services, *Seong-Soon Joo* (ETRI),doc.# 802.15-22-0236-00-06a
		+ 4ms or every 8ms in p.14 is where coming from? (*Ryuji Kohno*)
			- These were come from some factory automation application requirement. (*Seong-Soon Joo*)
	3. MAC proposal for BAN with Enhanced Dependability. *Minsoo Kim* (YRP-IAI), doc.#802.15-22-0277-00-06a
		+ Did you try to consider about compatibility and interoperability to original 802.15.6-2012? *(Seong-Soon Joo)*
		+ Question about QoS definitions. (*Seong-Soon Joo*)
		+ These are quite depending of number of time slot allowed in a data frame. (*Minsoo Kim*)
		+ We can keep discuss about these things in future sessions. (*Ryuji Kohno*)
	4. ~~Practice of BAN Platform MIPARU in Hokkaido, Japan~~Skipped.
	5. ~~BAN Application for Healthcare under COVID-19; Field Trial of Detecting Symptom Using Machine Learning in Care Center~~Skipped.
	6. ~~Discussion for Harmonization with ETSI SmartBAN and IoT~~Skipped.
	7. Harmonization with TG4ab and TG14, Technical Requirements Document draft, *Marco Hernandez,* doc.#802.15-22-0278-00-06a
	8. Recessed

Attendees 21

***Name Affiliation***

* Abdelfattah Renesas
* Akifumi Kasamatsu NICT
* Daisuke Anzai Nagoya Institute of Technology
* Daoud Serang CML Microcircuits
* Harry Bims Bim's Laboratories
* Hiroki Saito ARIS
* Iwao Hosako NICT
* Kamran Sayrafian NIST
* Lorenzo Mucchi University of Florence
* Marco Hernandez YRP-IAI
* Masayuki Hirata Osaka University
* Minsoo Kim YRP-IAI
* Norihiko Sekine NICT
* Ryuji Kohno YNU/YRP-IAI
* Sang-Kyu Lim ETRI
* Seong-Soon Joo ETRI
* Shigenobu Minami Miruus
* Shigenobu Sasaki Niigata University
* Takafumi Suzuki NICT
* Takumi Kobayashi YNU/YRP-IAI
* Yasuharu Amezawa Mobile Techno

**802.15 TG 4ab / 14 / 6a Joint Session**

**Friday, May 13th , 2022, AM 9:10- 11:00 EDT**

**Room: Webex Virtual Conference**

* 1. Meeting called to order AM 9:10
	By Chairs *Clint Powel, Benjamin Rolfe and Ryuji Kohno*
	2. Roll Call *Clint Powel*
	Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).
	Registration information.
	Chair showed IEEE Patent policy.
	Chair issued Call for Potentially Essential Patents.
	doc.# 15-22-0281-00-0000
	3. Opening information and agenda, *Clint Powel*, doc.# 15-22-0281-00-0000
	4. TG6a PHY Specification table, *Marco Hernandez,* *Ryuji Kohno*, doc.#15-22-0281-00-0000 & 15-22-0278-01-006a
		+ 3m coverage may be too large for human body application. *(Benjamin Rolfe)*
			- It is also considering distance between HBAN coordinator to VBAN coordinator. *(Marco Hernandez)*
		+ For localization application, 4ab is thinking as same as 4z? *(Ryuji Kohno)*
			- Data communication is a key focused on 4ab as well as ranging. *(Benjamin Rolfe)*
		+ We would like to discuss about channel for UWB to avoid interference between frequency channels. *(Ryuji Kohno)*
		+ For example, we call ch.9 but it is just defined in 4a. *(Ryuji Kohno)*
		+ If we in the same WG15 can use the common channel mapping, frequency allocation and numbering, it makes easy to avoid interference. *(Ryuji Kohno)*
	5. Next Steps?
		+ Discussion of time slots for next meeting in July.
	6. Any other business?
		+ No.
	7. Adjourn

**Attendees list**

Attendees 63

***Name Affiliation***

* Abdelfattah Renesas
* Alexander Krebs Apple
* Ankur Samsung
* Ayman Naguib Apple
* Benjamin Rolfe Blind Creek Associates
* Billy Verso Qorvo
* Bin Tian Qualcomm
* Boris Danev 3db
* Carlos Aldana Facebook
* Clark Palmer Meteorcomm LLC
* Claudio da Silva Meta
* Clint Chaplin SRA
* Clint Powell Meta
* Daisuke Anzai Nagoya Institute of Technology
* Daoud Serang CML Microcircuits
* David Barras 3db
* Dries Neirynck
* Enrico Rantala Zeku
* Frank Suraci BCA
* Frederic Nabki Spark
* Gary Stuebing
* Hakon A. Hjortland Novelda
* Harry Bims Bim's Laboratories
* Huan-Bang Li NICT
* Ido Bettesh
* Igor Dotlic Qorvo
* Jack Zou
* Joerg Robert TU Ilmenau/Fraunhofer IIS
* Kamran Sayrafian NIST
* Kangjin Yoon Meta
* Lennert Bober Fraunhofer HHI
* Lochan Verma Apple
* Marco Hernandez YRP-IAI
* Martin Schmidhammer DLR
* Masayuki Hirata Osaka University
* Minsoo Kim YRP-IAI
* Nicolas Paillusseau Spark Microsystems
* Pooria Pakrooh Qualcomm
* Riku Pirhonen NXP
* Robert Golshan Apple
* Run Chen NRT
* Ryuji Kohno YNU/YRP-IAI
* Seong-Soon Joo ETRI
* Shimi Shilo Huawei
* SK Yong
* Srivathsa NXP
* Stefan Lemsitzer NXP
* Stuart Kerry OK-Brit; Self
* Sven Zeisberg HTW
* Takafumi Suzuki NICT
* Takumi Kobayashi YNU/YRP-IAI
* Tero Kivinen Self
* Tetsushi Ikegami Meiji University
* Tuncer Baykas Kadir Has Univerity
* Vamsi Amalladinne Qualcomm
* Vinod Kristem
* Wei Lin Huawei
* Xiaohui Peng Huawei
* Xiliang Luo Apple
* Yong Liu
* Yongsen Ma Redpoint Positioning
* Youngwan So Samsung
* Zhenzhen Ye Redpoint positioning

**TG6a 3rd Session**

**Tuesday, March 17th 2022, AM 9:10-11:00 EDT**

**Room: Webex Virtual Conference**

* 1. Meeting called to order AM 9:10

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).
	Registration Information, doc.#15-22-0221-01-006a, By Chair Ryuji Kohno
	2. Agenda, doc.# 15-22-0222-05, *Ryuji Kohno* (YNU/YRP-IAI)
	3. Review of joint meeting with 802.15.6a/4ab/14 on March 13th , doc.# 15-21-0278-02-06a, *Marco Hernandez* (YRP-IAI)
		+ 50 Mbps may sufficiently enough for the next generation BCI. (*Masayuki Hirata*)
	4. Comments from NesCom
		+ 15.6a PAR withdrawal was approved. 15.6 revision has been approved as well. These will be officially informed tomorrow. (*Marco Hernandez*)

**[Presentations]**

* 1. Wearable Wireless Brain Computer Interface for Daily Healthcare, *Chin-Teng Lin and Ryuji Kohno*
	2. BAN Application for Healthcare under COVID-19; Field Trial of Detecting Symptom Using Machine Learning in Care Center, *Ryuji Kohno, Yuichi Tsutatani, Chika Sugimoto*

**[Drafting Documents]**

* 1. Channel Model for Wearable and Implant BAN in use case of BMI and BCI & Summary of Channel and Environmental Modeling Activities for BANs on TG15.6a, *Takumi Kobayashi*, doc.# 15-22-0269-01-06a
		+ What kind of material is covering wireless interface devices? (*Kamran Sayrafian*)
			- Titanium is used in our case. (*Masayuki Hirata*)
		+ Let us discuss about head gear type interface on the surface of head. (*Ryuji Kohno*)
		+ Also we will consider about more general use cases like around cardiac surgery application. (*Ryuji Kohno*)
	2. MAC proposal for BAN with Enhanced Dependability: for Revision, *Minsoo Kim*, doc.# 15-22-0186-01-6a and 15-22-0277-01-6a
		+ Discussion about communication range for high data rate application (BCI)
			- This will be discussed on next July meeting.
	3. Any other business?
		+ No.
	4. Adjourn

Attendees 12

***Name Affiliation***

* Kamran Sayrafian NIST
* Kento Takabayashi Okayama Prefectural University
* Marco Hernandez YRP-IAI
* Masayuki Hirata Osaka University
* Minsoo Kim YRP-IAI
* Ryuji Kohno YNU/YRP-IAI
* Sang-Kyu Lim ETRI
* Seong-Soon Joo ETRI
* Takafumi Suzuki NICT
* Takumi Kobayashi YNU/YRP-IAI
* Yasuharu Amezawa Mobile Techno