IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IEEE 802.11 AMP PAR Proposal | | | | |
| Date: 2023-06-08 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Bo Sun | Sanechips | Xi’An, China |  | Sun.bo1@sanechips.com.cn |
| Weijie Xu | OPPO |  |  | xuweijie@oppo.com |
| Yinan QI | OPPO |  |  | v-qiyinan@oppo.com |
|  |  |  |  |  |

Abstract

This submission includes the proposed content for IEEE 802.11 AMbient Power communication Project Authorization Request.

Revision History:

* Rev0: Initial draft for group discussion
* Rev1: scope content updated and marked as example content based on group discussion
* Rev2: PAR baseline version
* Rev3: Agreed baseline version
* Rev4: Updated and motioned in Nov meeting

# PAR

**P802.11**

**Submitter Email: sun.bo1@sanechips.com.cn**  
**Type of Project:** Amendment to IEEE Standard 802.11  
**PAR Request Date:** TBD  
**PAR Approval Date:   
PAR Expiration Date:   
Status:** PAR for an amendment to an existing IEEE Standard

**1.1 Project Number:** P802.11[bp]  
**1.2 Type of Document:** Standard   
**1.3 Life Cycle:** Full Use

**2.1 Title:** Standard for Information technology--Telecommunications and information exchange between systems Local and metropolitan area networks--Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications-- Amendment: Enhancements for Ambient Power Communication (AMP)

**3.1 Working Group:** Wireless LAN Working Group (C/LM/WG802.11)

**Contact Information for Working Group Chair**  
**Name: Dorothy Stanley**  
**Email Address:** dstanley@ieee.org  
**Phone:** +1 (630) 363-1389

**Contact Information for Working Group Vice-Chair Name:** Jon Rosdahl  
**Email Address:** jrosdahl@ieee.org  
**Phone:** 801-492-4023

**3.2 Sponsoring Society and Committee:** IEEE Computer Society/LAN/MAN Standards Committee (C/LM)

**Contact Information for Sponsor Chair**  
**Name:** Paul Nikolich  
**Email Address:** p.nikolich@ieee.org   
**Phone:** 857.205.0050

**Contact Information for Standards Representative**  
**Name:** James Gilb  
**Email Address:** gilb@ieee.org  
**Phone:** 858-229-4822

**4.1 Type of Ballot:** Individual  
**4.2 Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot:**Mar 2026  
**4.3 Projected Completion Date for Submittal to RevCom:**Dec 2026

**5.1 Approximate number of people expected to be actively involved in the development of this project:** 100

**5.2.a. Scope of the complete standard:** The scope of this standard is to define one medium access control (MAC) and several physical layer (PHY) specifications for wireless connectivity for fixed, portable, and moving stations (STAs) within a local area.

**5.2.b. Scope of the project:**

This amendment defines modifications to both the IEEE 802.11 Medium Access Control layer (MAC) and Physical Layers (PHY) to enable operation of AMbient Power communication (AMP) STA which is powered by energy harvesting. Operation in sub-1 GHz and 2.4 GHz will be defined.

This amendment shall provide coexistence of AMP STA with deployed STA compliant with IEEE Std 802.11™-2020 and operating in the same band as AMP STA.

**5.3 Is the completion of this standard dependent upon the completion of another standard:** NO

**5.4 Purpose:** The purpose of this standard is to provide wireless connectivity for fixed, portable, and moving stations within a local area. This standard also offers regulatory bodies a means of standardizing access to one or more frequency bands for the purpose of local area communication.

**5.5 Need for the Project:**

Current WLAN applications based on IEEE 802.11 technology have been deployed in many market segments, including traditional consumer electronic market and prospering IoT market. Legacy IoT devices are usually driven by batteries with a limited lifespan, which has significantly affected user experience in a negative way. The astronomical growth of IoT networks together with the advent of a huge amount of IoT devices has pushed the limits of maintenance expenditure, including both labor and battery costs, to a whole new level. A IEEE 802.11 based WLAN IoT network is competitive from the perspective of deployment cost, due to an already widespread deployment and use of unlicensed frequency band. However, there are still lots of use cases and applications that can not be addressed using existing IEEE 802.11 based WLAN IoT technologies due to requirements to maintenance-free, ultra-low complexity, very small size, very long life-cycle, and the limitation to complexityconventional battery.

Ambient power communication is a promising technology to enable battery-free communication and fulfil the requirements from various verticals. The operation of such technology relies on the energy harvested from a variety of sources including radio waves, light (sunlight), motion, heat, etc., so that the conventional battery can be removed.

To address future needs for supporting ambient power communication in WLAN and provide 802.11-based future-proof technology for AMP IoT applications, the definition of ambient power communication based on new and existing, proven IEEE 802.11 WLAN PHY/MAC technologies, are needed.

**5.6 Stakeholders for the Standard:**Semiconductor manufacturers and users of semiconductors, component providers, consumer electronic and mobile devices vendors, IoT devices vendors, and IoT operators, etc.

**Intellectual Property:  
6.1.a. Is the Sponsor aware of any copyright permissions needed for this project?:** No  
**6.1.b. Is the Sponsor aware of possible registration activity related to this project?:** No

**[If yes please explain:]**

* 1. **Are there other standards or projects with a similar scope?:** No
  2. **Joint Development**  
     **Is it the intent to develop this document jointly with another organization?:** No

**8.1 Additional Explanatory Notes (Item Number and Explanation)**

5.2 : This amendment defines:

* at least one mode of data communication in sub-1 GHz band
* at least one mode of data communication in 2.4 GHz band with the AMP communication access category (AC) being set to AC\_BK (background).
* at least one mode of wireless power transfer in sub-1 GHz band, to support RF energy harvesting

**References:**

IEEE Std 802.11™-2020 Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications

IEEE Std 802.11ax™-2021 Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 1: Enhancements for High Efficiency WLAN

IEEE Std 802.11ay™-2021 Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 2: Enhanced Throughput for Operations in License-exempt Bands above 45 GHz

IEEE Std 802.11az™-2022 Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 4: Enhancements for Positioning

IEEE Std 802.11ba™-2021 Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 3: Wake-Up Radio Operation

IEEE Std 802.11bd™-2022 Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 5: Enhancements for Next Generation V2X

IEEE P802.11be Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 8: Enhancements for Extremely High Thoughput (EHT)