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Part 2: In-band Control Protocol for Wireless Power Transfer

Technologies de l'information — Téléinformatique — Réseau de zone de champ magnétique (MFAN) —

Partie 2: Protocole de contrôle dans la bande pour le transfert de puissance sans fil

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword — Supplementary information.

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*.

ISO/IEC 15149 consists of the following parts, under the general title *Information technology — Telecommunications and information exchange between systems — Magnetic field area network (MFAN)*:

— *Part 1: Air interface*

— *Part 2: In-band control protocol for wireless power transfer*

— *Part 3: Relay protocol for extended range*

— *Part 4: Security protocol for authorization*

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Introduction

This International Standard provides protocols for magnetic field area network (MFAN). MFAN can support the service based on wireless communication and wireless power transfer in harsh environment. MFAN is composed of four protocols; air interface, in-band control protocol, relay protocol, and security protocol.

ISO/IEC 15149–1 specifies the physical layer and media access control layer protocols of wireless network over a magnetic field.

ISO/IEC 15149–2 specifies the control protocol for wireless power transfer based on magnetic field area network.

ISO/IEC 15149–3 specifies the relay protocol to extend effective network coverage of magnetic field area network.

ISO/IEC 15149–4 specifies the security protocol to authorize nodes to communicate in magnetic field area network.

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Information technology — Telecommunications and information exchange between systems — Magnetic field area network (MFAN) —

Part 2:
In-band Control Protocol for Wireless Power Transfer

1 Scope

This International Standard establishes a system for an in-band network, from which both wireless power transfer and data transmission are carried out simultaneously at the same frequency band. It provides technical solution for a remote and consistent power supply, along with a stable network.

For the purpose of this International Standard, the system is designed based on the principles described in ISO/IEC 15149 (Magnetic Field Area Network). In this way, it is expected to achieve superiority in control of devices, while managing wireless power transfer to multiple devices in request. The focus is on the physical and media access control layer protocol; it will not discuss matters on the upper layer protocols. As together, the PHY and MAC layers have to be able to carry out the following tasks: data transmission, signal control, wireless power transfer.

This International Standard is applicable in various situations and environments, but is expected to perform excellently in the following certain use cases:

— mobile phones: provide ubiquitous charging environments for portable devices;

— home appliances: allow unrestrained placement of appliances with the elimination of wire cables and plugs for power supply.

The media access control layer protocol is designed for the following scope:

— variable superframe structure for wireless power transfer to multiple devices;

— simple and effective network topology for efficient wireless power transfer;

— dynamic address assignment for efficient timesharing among multiple devices.

The physical layer protocol is designed for the following scope:

— one frequency band for both wireless power transfer and magnetic field communication;

— simple and robust modulation for low-cost implementation and minimized margin of error;

— variable coding and bandwidth for dynamic charging environment.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 15149-1:2014, *Information technology — Telecommunications and information exchange between systems — Magnetic field area network (MFAN) — Part 1: Air interface*

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