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IEEE Standard for Universal Power Adapter for Mobile Devices

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Microprocessor Standards Committee

IEEE
3 Park Avenue
New York, NY 10016-5997
USA

IEEE Std 1823™-2015

IEEE Standard for Universal Power Adapter for Mobile Devices

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Microprocessor Standards Committee
of the
IEEE Computer Society

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IEEE-SA Standards Board

Abstract: A power delivery connection between a power adapter and a power using device greater than 10 W and up to, but less than 240 W, is defined in this standard. A communications link between the power adapter and the mobile power-using device is also defined. The communications may be used to coordinate the power delivery and provide identification between the power adapter and the power-using device. While intended for portable computing and entertainment devices, power adapters conforming to this standard may also be used with other devices (including simple devices, with no communications capabilities, up to 20 W).

Keywords: communications controlled power, IEEE 1823™, low-energy connect and disconnect, mobile power, power delivery, smart power, universal power, Universal Power Adapter for Mobile Devices, UPAMD

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Mark Anderson
RadhaKrishna Arvapally
Lee Atkinson
Vern Brethour
Edgar Brown
C. T. Chuang
Stephen Colclough
Liu Dan
Bob Davis
Liang Downey
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Tom Hildner
Kenneth Joyner
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Bob Noseworthy
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Osman Sakr
Mark Schaffer
Alexander Schneider
Steve Sedio
Per-Hassel Sorensen
Eugene Stoudenmire
Ravi Subramaniam
Jim Tomcik
Garry Tomlin
Gary Verdun
Zhang Xia
Spike Yen
John Yurtin

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Hugh Barrass
Vern Brethour
Bill Brown
Edgar Brown
William Bush
Juan Carreon
Keith Chow
Glenn Davis
James Davis
Sourav Dutta
Randall Groves
Werner Hoelzl
Kenneth Joyner
Piotr Karocki
Thomas Kurihara
Kin Hong Lee
Greg Luri
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James Moore
Jeremy Moore
Michael Newman
Charles Ngethe
Nick S.A. Nikjoo
Ghery Pettit
George Riley
Jesse Rorabaugh
Osman Sakr
Bartien Sayogo
Alexander Schneider
Stephen Schwarm
Kapil Sood
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Walter Struppler
David Thompson
Leonard Tsai
John Vergis
M. Karen Woolf
Forrest Wright
Jian Yu
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Introduction

This introduction is not part of IEEE Std 1823™-2015, IEEE Standard for Universal Power Adapter for Mobile Devices.

This standard focuses on a generic power adapter designed for reuse across brands, models, and years. A compliant adapter will supply a nominal 21 V at up to 130 W and may negotiate voltages up to 60 V at power levels up to, but less than, 240 W. Each power adapter will have one or more power ports to service load devices with control of each port via a serial communications link, an electrical variant of the CAN bus standard. Input power may be ac or dc depending on the market being served.

A group of laptop, notebook, and other computing device, entertainment, and gaming system manufacturers approached the Microprocessor Standards Committee to define a common connector configuration, a power specification, and a communications protocol for a reusable durable power adapter system. This standard is the result of the foresight of that group.

IEEE Std 1823-2015 defines a power delivery and communication connection between a power adapter and a power-using device greater than 10 W up to, but less than, 240 W range. The communications are used to coordinate the power delivery and provide identification between the power adapter and the power-using device. While primarily intended for portable computing and entertainment devices, this standard applies to adapters serving other mobile devices in use around the office, home, or vehicle. To enable the powering of a wider class of low-cost devices, low-power devices with no communications capabilities are also supported under this standard.

To Bob Davis, for his leadership, contribution, and dedication
to better the standards and computing practice.

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IEEE Standard for Universal Power Adapter for Mobile Devices

1. Overview

Historical design practice for laptops, notebooks, and other computing devices with external power adapters is to design a power adapter for each device. The adapter design is optimized for the device design to be powered but is not generally usable with other devices. The rationale for this standard is to greatly reduce the electronic waste caused by the inability to reuse a power adapter with changing mobile devices.

Adoption of a single standard will encourage better, more efficient, design of each adapter. With a known adapter standard, each portable device design can optimize for the standard. This common adapter can also promote portable power ports being available for public use in hotels and conference centers and other facilities. It can enable travelers to carry a single adapter to power multiple devices.

Most highly portable systems, such as laptops, are being served by more than one power adapter for the convenience of the user. The inability to reuse existing power adapters with new devices leads to disposal of hundreds of millions of working power adapters due to the failure or obsolescence of the device they are intended to supply. This Universal Power Adapter for Multiple Devices (UPAMD) will also help reduce user costs for power adapters.

1.1 Scope

IEEE Std 1823-2015 defines a power delivery connection between a power adapter and a power using device greater than 10 W and up to, but less than 240 W.[1] A communications link between the power adapter and the mobile power-using device is also defined. The communications may be used to coordinate

[1] IEEE Std 1823-2015 is also referred to here as the "UPAMD standard."