SLOVENSKI STANDARD
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Specifikacija Qi - Različica 2.3 - 5-2.del: Mpp - Zagotavljanje napajanja (hitri postopek)

Qi specification - Version 2.3 - Part 5-2: Mpp - Power delivery (Fast Track)

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29.240.99	Druga oprema v zvezi z omrežji za prenos in distribucijo električne energije	Other equipment related to power transmission and distribution networks
33.160.99	Druga avdio, video in avdiovizuelna oprema	Other audio, video and audiovisual equipment
35.200	Vmesniška in povezovalna oprema	Interface and interconnection equipment

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100/4544/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

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SECRETARIAT: Japan	SECRETARY: Ms Mahiru Uehara
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 106,TC 108	HORIZONTAL FUNCTION(S):
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Qi Specification - Version 2.3 - Part 5-2: MPP - Power delivery (Fast Track)

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WIRELESS POWER

CONSORTIUM

Qi Specification

MPP – Power Delivery



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1. General

The Wireless Power Consortium (WPC) is a worldwide organization that aims to develop and promote global standards for wireless power transfer in various application areas. An important application area comprises flat-surface devices such as mobile phones and chargers operating at power levels up to 25 W.

1.1 Structure of the Qi Specification

General documents

- Introduction
- Glossary, Acronyms, and Symbols
- Technical System Overview
- Power Profiles

System description documents

- Mechanical, Thermal, and User Interface
- Power Delivery
- Communications Physical Layer
- Communications Protocol
- Foreign Object Detection
- NFC Tag Protection
- Authentication Protocol
- MPP Communications Protocol
- MPP Magnetics Design
- MPP Power Delivery
- MPP Communications Physical Layer
- MPP Foreign Object Detection
- MPP Design Guidelines (Informative)
- Magnetic Covers
- Active Alignment System
- Thermal Management Protocol

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1.2 Scope

The *Qi Specification*, *MPP Power Delivery* (this document) comprises guidelines and requirements for Power Receiver design, including circuitry, power consumption, operating power levels, power transfer efficiency, and standby power.

1.3 Compliance

All provisions in the *Qi Specification* are mandatory, unless specifically indicated as recommended, optional, note, example, or informative. Verbal expression of provisions in this Specification follow the rules provided in ISO/IEC Directives, Part 2.

Table 1 - Verbal forms for expressions of provisions

Provision	Verbal form
requirement	“shall” or “shall not”
recommendation	“should” or “should not”
permission	“may” or “may not”
capability	“can” or “cannot”

1.4 References

For undated references, the most recently published document applies. The most recent WPC publications can be downloaded from http://www.wirelesspowerconsortium.com.

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1.5 Conventions

1.5.1 Notation of numbers

- Real numbers use the digits 0 to 9, a decimal point, and optionally an exponential part.
- Integer numbers in decimal notation use the digits 0 to 9.
- Integer numbers in hexadecimal notation use the hexadecimal digits 0 to 9 and A to F, and are prefixed by "0x" unless explicitly indicated otherwise.
- Single bit values use the words ZERO and ONE.

1.5.2 Tolerances

Unless indicated otherwise, all numeric values in the *Qi Specification* are exactly as specified and do not have any implied tolerance.

1.5.3 Fields in a data packet

A numeric value stored in a field of a data packet uses a big-endian format. Bits that are more significant are stored at a lower byte offset than bits that are less significant. Table 2 and Figure 1 provide examples of the interpretation of such fields.

Table 2 - Example of fields in a data packet (table)

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	b_7	b_6	b_5	b_4	b_3	b_2	b_1	b_0
B_0	(msb)							
B_1	16-bit Numeric Data Field							(lsb)
B_2	Other Field					(msb)		
B_3	16-bit Numeric Data Field						(lsb)	Field

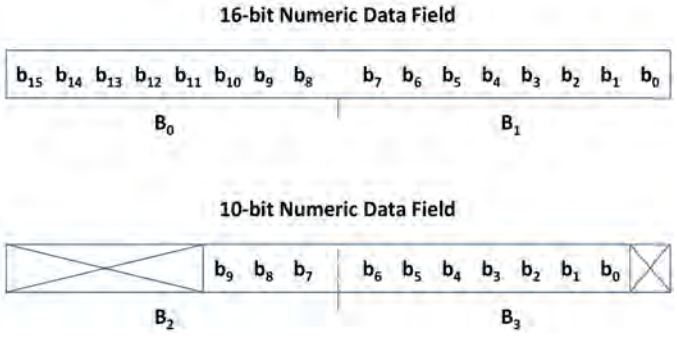


Figure 1 - Examples of fields in a data packet

1.5.4 Notation of text strings

Text strings consist of a sequence of printable ASCII characters (i.e. in the range of 0x20 to 0x7E) enclosed in double quotes ("). Text strings are stored in fields of data structures with the first character of the string at the lowest byte offset, and are padded with ASCII NUL (0x00) characters to the end of the field where necessary.

EXAMPLE: The text string “WPC” is stored in a six-byte fields as the sequence of characters 'W', 'P', 'C', NUL, NUL, and NUL. The text string “M:4D3A” is stored in a six-byte field as the sequence 'M', ':', '4', 'D', '3', and 'A'.

1.5.5 Short-hand notation for data packets

In many instances, the *Qi Specification* refers to a data packet using the following shorthand notation:

<MNEMONIC>/<modifier>

In this notation, <MNEMONIC> refers to the data packet's mnemonic defined in the *Qi Specification*, *Communications Protocol*, and <modifier> refers to a particular value in a field of the data packet. The definitions of the data packets in the *Qi Specification*,*Communications Protocol*, list the meanings of the modifiers.

For example, EPT/cc refers to an End Power Transfer data packet having its End Power Transfer code field set to 0x01.

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2. Power Delivery

Unless otherwise stated, all contents in this book apply to power delivery in MPP mode instead of BPP mode.

2.1 Power Profiles (BPP + MPP)

2.1.1 Specifications

2.1.1.1 Power Delivery Spec 1

The PTx shall provide a BPP PRx with at least 5 W of rectified power for r ≤ 8 mm, z ≤ 3 mm (Figure 3).

NOTE: See *Section 2.1.3.1, Definition of r and z* for the definition of r and z.

2.1.1.2 Power Delivery Spec 2

Unless the PTx operates in MPP Restricted Mode, it shall have the capability to provide an MPP PRx with at least 15 W of rectified power inside the 2x2 cylinder (r ≤ 2 mm, z ≤ 2 mm) Figure 2.

2.1.1.3 Power Delivery Spec 3

The PTx shall provide an MPP PRx with at least 5 W of rectified power for r ≤ 4 mm, z ≤ 3 mm.

2.1.1.4 Power Delivery Spec 4

The PTx shall provide an MPP PRx in restricted mode a maximum of 6.5 W received power in MPP Restricted mode. This is based on BPP system specification.

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2.1.1.5 Power Delivery Spec 5 (MPP25 PTx Only)

The PTx shall provide TPR#MPP4 with at least 25 W of rectified power for r = 0 mm, z ≤ 2 mm.

2.1.1.6 Power Delivery Spec 6 (MPP25 PTx Only)

The PTx that has a Vin less than or equal to 20 V shall have a Vinv-VRECT Ratio of at least 0.95 with TPR#MPP4 at position (0, 2).

NOTE: The PTx design should ensure that this requirement is satisfied using its lowest CTX to ensure the highest VRECT-Vinv ratio.

Please see *Section 3.2.9, Specification Notes* for the definition of supporting 25 W and Vinv-VRECT Ratio.

2.1.1.7 Power Delivery Spec 7 (MPP25 PRx Only)

The PRx shall have a Vinv-VRECT Ratio of at least 0.95 with TPT#MPP4 at position (0, 2).

Please see *Section 3.2.9, Specification Notes* for the definition of Vinv-VRECT Ratio.

2.1.1.8 Power Delivery Spec 8

When paired with a TPR, the PTx shall deliver its ECAP[Potential Load Power] continuously for at least 150 seconds without throttling.