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Različica specifikacije Qi 2.0 - 11. del: Mpp komunikacijski protokol (Hitri postopek)

Qi specification version 2.0 - Part 11: Mpp communications protocol (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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OF INTEREST TO THE FOLLOWING COMMITTEES: TC 106,TC 108	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY	
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WIRELESS POWER CONSORTIUM

Qi Specification

MPP Communications Protocol

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oSIST prEN IEC 63563-11:2024

Contents

Contents 2

List of Tables 5

1 Introduction 8
1.1 Overview 8

2 Magnetic Power Profile 10
2.1 Overview 10
2.1.1 Restricted Mode 10
2.1.2 Full Mode 10
2.2 Power Receiver Requirements 11
2.2.1 Amplitude Shift Keying (ASK) 11
2.2.2 Startup Behavior 11
2.2.3 Profile Activation 13
2.3 Power Transmitter Requirements 15
2.3.1 Frequency Shift Keying (FSK) 15
2.3.2 Timings Override 16
2.3.3 Startup Behavior 16
2.4 Supporting EPP and MPP protocols 19
2.4.1 MPP/EPP Support on PRx 19
2.4.2 MPP/EPP Support on PTx 20

3 Negotiation Phase 21
3.1 Overview 21
3.2 Requirements 21
3.2.1 Negotiation Phase Timings 22
3.2.2 FSK Cycles 22
3.2.3 Entering Negotiation Phase With Error Status 22
3.2.4 Power Transfer Contract Extension 23
3.3 Negotiation Phase - 128kHz 24
3.3.1 Nominal negotiation flow 24
3.3.2 Negotiation flow with PTx error status 26
3.3.3 Frequency Selection 27
3.4 Negotiation Phase - 360kHz 27
3.4.1 PRx Extended Capabilities 30
3.4.2 PTx Extended Capabilities 30
3.4.3 Exchange Power Loss Accounting Parameters 30

iTeh Standards (https://standards.iteh.ai) Document Preview
oSIST prEN IEC 63563-11:2024
https://standards.iteh.ai/catalog/standards/sist/1532-5173-4244-81b8-545cf4c3ab4c/osist-pren-iec-63563-11-2024

oSIST prEN IEC 63563-11:2024

3.4.4 Power Negotiation 30
3.4.5 Retrieve PTx Extended ID 30
3.4.6 Exchange Enabled Data Streams 30
3.4.7 Power Control Profile 30
3.4.8 Cloaking Duration 30
3.4.9 MPP Proprietary Requests / Packets 31
3.5 NFC Identification (Informative) 32

4 Power Transfer Phase **33**
4.1 Overview 33
4.2 Extended Control Error Packet 33
4.2.1 Handling 33
4.2.2 PTx Response 34
4.2.3 Example 34
4.3 Power Loss Accounting Packet 36
4.3.1 Handling 36
4.3.2 PTx Response 37
4.4 Control Status 37
4.5 GET Request 37
4.5.1 PRx Initiated 37
4.5.2 PTx Initiated 38
4.5.3 Examples 38
4.6 MPP-Restricted to Full mode Transition 39
4.6.1 Transition with power interruption 40
4.6.2 Transition without power interruption 40

5 Cloak Phase **43**
5.1 Overview 43
5.2 Cloak Ping Requirements 43
5.3 Cloak Entry 43
5.3.1 PRx Initiated 44
5.3.2 PTx Initiated 44
5.4 Cloak Exit 45
5.5 Detect ping 46
5.6 State Diagram 46
5.7 Cloak Timings 49
5.8 Examples 50

6 Extended Data Streams **56**
6.1 Overview 56
6.2 Simultaneous Data Stream Extension 56
6.2.1 Error Handling 57
6.2.2 Timings 57
6.2.3 Cloaking Compatibility 57
6.3 Data Integrity Extension 58
6.4 Examples 58

7 Packets and Streams **67**
7.1 Power Receiver data packets 67
7.1.1 Cloak - CLOAK (0x18) 69
7.1.2 Extended Control Error - XCE (0x19) 70
7.1.3 Specific Request - SRQ (0x20) 71

iTeh Standards
(https://standards.iteh.ai)
Document Preview
oSIST prEN IEC 63563-11:2024
https://standards.iteh.ai/catalog/standards/sist/20a41532-5173-4244-81b8-545cf4c3ab4c/osist-pren-iec-63563-11-2024

oSIST prEN IEC 63563-11:2024

7.1.4 Specific Request [Frequency Selection] - SRQ/freqsel (0x20) 75
7.1.5 Specific Request [Power Level] - SRQ/egpl (0x20) 76
7.1.6 Specific Request [Cloak Ping Delay - Low Byte] - SRQ/cloakl (0x20) 77
7.1.7 Specific Request [Cloak Ping Delay - High Byte] - SRQ/cloakh (0x20) 78
7.1.8 Specific Request [Power Control Profile] - SRQ/pcp (0x20) 79
7.1.9 Specific Request [Cloak Detect Ping Delay] - SRQ/detect (0x20) 80
7.1.10 Specific Request [Proprietary Parameters] - SRQ/MppProp (0x20) 81
7.1.11 Get Request - GET (0x28) 82
7.1.12 Enabled Data Streams - EDS (0x29) 83
7.1.13 Simultaneous Auxiliary Data Transport - SADT (multiple header codes) 84
7.1.14 Simultaneous Data Stream Response - SDSR (0x38) 85
7.1.15 Simultaneous Auxiliary Data Control - SADC (0x48) 86
7.1.16 Report - REPORT (0x58:0) 87
7.1.17 Report [PRx Identification] (0x58:0) 88
7.1.18 Power Loss Accounting (0x58:1) 89
7.1.19 Power Loss Accounting Parameters - PLAP (0x78) 90
7.1.20 Qi MPP Extended Identification - MPP-XID (0x81) 91
7.1.21 Extended Power Receiver Capabilities - ECAP (0x84) 92
7.2 Power Transmitter data packets 93
7.2.1 Error Status - ERR (0x01) 94
7.2.2 Cloak Request - CLOAK (0x1E:0) 95
7.2.3 Regulation Control Status - RCS (0x1E:3) 96
7.2.4 Charge Status - CHS (0x1F) 97
7.2.5 Get Request - GET (0x2E) 98
7.2.6 Enabled Data Streams - EDS (0x2F) 99
7.2.7 Inverter Voltage - INV (0x3F:0) 100
7.2.8 Simultaneous Auxiliary Data Transport - SADT (multiple header codes) 101
7.2.9 Simultaneous Data Stream Response - SDSR (0x3F:1) 102
7.2.10 Estimated K - KEST (0x3F:2) 103
7.2.11 Simultaneous Auxiliary Data Control - SADC (0x4F) 104
7.2.12 Power Loss Accounting Parameters - PLAP (0x5F) 105
7.2.13 Extended Power Transmitter Identification - XID (0x8F:0) 106
7.2.14 Extended Power Transmitter Extended Capabilities - ECAP (0x8F:1) 107

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(https://standards.iteh.ai)
Document Preview
https://standards.iteh.ai/catalog/standards/sist/20a41552-3173-4244-8188-345e14e5a84c/osist-pren-iec-63563-11-2024

oSIST prEN IEC 63563-11:2024

List of Tables

1.1 MPP Specifications Departure from Qi EPP 8

2.1 MPP ID Packet Parameters 11
2.2 MPP FSK Parameters 14
2.3 MPP FSK Patterns 14
2.4 MPP PTx Parameters Override 15

3.1 PRx packets allowed during MPP negotiation phase 20
3.2 MPP Negotiation Phase Timing Parameters 21
3.3 MPP Power Transfer Contract Elements 23

4.1 MPP Control Error Parameters 33
4.2 Power Loss Accounting Timing Parameters 35
4.3 PTx Initiated GET Timing Parameters 37
4.4 MPP Restricted to Full Transition Timing Parameters 39

5.1 Cloak Detect Parameters 45
5.2 Cloak Time Parameters 48

6.1 Data Streams Identifiers 55
6.2 Extended Data Streams Timing 56
6.3 Data Stream CRC Properties 57

7.1 MPP PRx ASK Packets 68
7.2 PRx End Of Power Reason Codes 69
7.3 End Of Power Request FSK Responses 69
7.4 Extended Control Error FSK Responses 70
7.5 MPP Specific Requests 71
7.6 Specific Request Frequency Selection parameters 72
7.7 Frequency Selection Request FSK Responses 72
7.8 Power Level Selection Request FSK Responses 73
7.9 Cloak Ping Delay Selection Request SRQ/cloakl - FSK Responses 74
7.10 Cloak Ping Delay Selection Request SRQ/cloakh - FSK Responses 75
7.11 Power Control Profile Values 76
7.12 Power Control Profile Selection Request FSK Responses 76
7.13 Cloak Detect Ping Delay Selection Request FSK Responses 77
7.14 Proprietary Specific Parameters Request FSK Responses 78
7.15 PRx Get Request Types 79
7.16 Simultaneous Auxiliary Data Transport - SADT FSK Responses 81

iTeh Standards
(https://standards.iteh.ai)
Document Preview
oSIST prEN IEC 63563-11:2024
https://standards.iteh.ai/catalog/standards/sist/20a41532-5173-4244-81b8-545cf4c3ab4c/osist-pren-iec-63563-11-2024

oSIST prEN IEC 63563-11:2024

7.17 PRx Simultaneous Data Stream Response Type 82
7.18 Simultaneous Auxiliary Data Control Request Field 83
7.19 Simultaneous Auxiliary Data Control Parameter Field 83
7.20 Report ID Field 84
7.21 Report [PRx Identification] FSK Responses 85
7.22 PLA FSK Responses 86
7.23 Received Power Parameters FSK Responses 87
7.24 PRx Capabilities Packet FSK Responses 89
7.25 MPP PTX FSK Packets 90
7.26 PTx Error Status Codes 91
7.27 PTx End Of Power Reason Codes 92
7.28 PTx Regulation Control Status Values 93
7.29 PTx Charge Status Values 94
7.30 PTx Get Request Fields 95
7.31 PTx Simultaneous Data Stream Response Type 99
7.32 PTx Power Limit Reason Code 104

iTeh Standards
(https://standards.iteh.ai)
Document Preview

oSIST prEN IEC 63563-11:2024
https://standards.iteh.ai/catalog/standards/sist/20a41532-5173-4244-81b8-545cf4c3ab4c/osist-pren-iec-63563-11-2024

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Introduction 1

1.1 Overview

Magnetic power profile (MPP) is a protocol extension that provides additional messages, new power states/modes, new power transfer contract elements, and aims to provide the following functionalities:

- Operating Frequency Negotiation
- Cloaking (Power Pause)
- Generic Information Exchange
- Simultaneous Data Stream Transactions
- Fast PTx to PRx communication
- Maximum Power and Power Control Profiles Determination
- Extended Power Negotiation
- Extended PTx/PRx Identification and Capabilities
- Extended Control Error Packets and Received Power Packets
- Power Transmitter Battery Level Reporting
- Ecosystem Scalability

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A summary of differences between Magnetic Power Profile and EPP is listed below in Table 1.1.

MPP extension allows devices to operate under Restricted mode (no PTx communication) at 360kHz without performing any explicit negotiation with the Power Transmitter. This flexibility enables devices with limited resources (e.g., devices with no FSK support) to take advantage of the frequency change feature.

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Table 1.1: MPP Specifications Departure from Qi EPP

Feature	EPP	MPP
PTx Handshake Message	EPP FSK ACK Message	MPP FSK ACK Message (Section 2.3.1)
FSK Parameters Negotiation	EPP allows FSK parameters negotiation	Fixed FSK parameters
Data Streams	Single Stream Transfer	Multiple Concurrent Transfer
Foreign Object Detection	FOD Packet, Calibration, RP	Replaced with MPP Power Loss Accounting Packet

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Magnetic Power Profile

2

2.1 Overview

This chapter describes the Power Receiver and Power Transmitter requirements for Magnetic Power Profile and the modes devices may use to communicate.

MPP supports two protocol modes:

1. **Restricted Mode**: One-way communication (PRx to PTx) with limited power levels *(5W PRECT)* using Qi Baseline Protocol
2. **Full Mode**: Supports bi-directional communication and enables negotiation of higher power levels

2.1.1 Restricted Mode

MPP Restricted mode allows PRx to establish a charging session with PTx using one-way communication (PRx to PTx) at 360kHz operating frequency using Qi Baseline Protocol.

PTx and PRx shall follow the Qi Baseline Protocol specifications when operating in Restricted mode.

(Informative)
MPP Restricted mode can be used when PRx is operating under a constrained environment e.g., device is fully discharged

PRx is allowed to transition from MPP Restricted to MPP Full mode to enable bi-directional communication and higher power levels. Refer to Section 4.6 for more details on how to perform the transition.

2.1.2 Full Mode

MPP Full mode enables a charging session with bi-directional communication between PTx and PRx allowing devices to perform more complex operations such as exchange of identification information, devices capabilities, ecosystem scalability coefficients, power negotiation and perform authentication.

In MPP Full mode, devices may transition between different protocol phases such as Negotiation, Power Transfer, Cloak and are able to negotiate higher power levels compared to Restricted mode.

MPP Full mode is based on Qi Extended Power Profile (EPP) protocol. PTx and PRx shall follow the Qi EPP specifications when operating in this mode. Changes to the EPP specifications are explicitly stated in this document.

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Changes to specifications include:

1. Added MPP Power Transfer Contract Elements and removed support for EPP RP (Received Power) contract elements
2. Added MPP data packets and removed support for EPP FOD data packets
3. Overriding time parameters

2.2 Power Receiver Requirements

MPP ASK specification is based on Qi EPP, all the timing requirements/specifications specified by Extended Power Profile apply to MPP.

All standard Qi packets used in MPP follow the Qi specifications. Changes to the handling or the definition of the packets are explicitly stated in this document.

2.2.1 Amplitude Shift Keying (ASK)

MPP follows the Qi ASK specifications.

2.2.2 Startup Behavior

An MPP-compatible Power Receiver shall start by sending the following sequence of packets during the ping/configuration phase.

1. Signal Strength (SIG)
2. Identification (ID)
3. Extended Identification (XID)
4. Power Control Hold-Off (PCH) - *Optional*
5. Configuration Packet (CFG)

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The packets shall contain the MPP identifiers as described in this section to allow an MPP-compatible Power Transmitter to identify the Power Receiver.

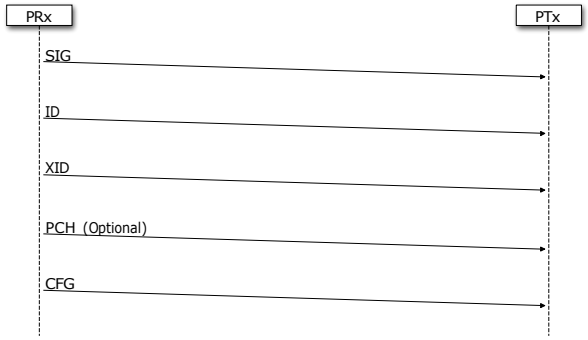

Figure 2.1: MPP ID/CFG Phase Packets

Signal Strength (SIG)

Power Receiver shall report the Signal Strength (SIG) data packet following the Qi specifications.