Qi Specification

Errata

Version 1.3
March 2021

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RELEASE HISTORY

Version	Release Date	Description
1.3	March 2021	Initial release of this document.

This document identifies errors in the version 1.3 *Qi Specification* that were discovered after the reviews were complete. These errors will be addressed in the next editorial update of the *Qi Specification.*

1. *Foreign Object Detection*, section 4.1.5, *Stop the power transfer*. A requirement was incorrectly presented as an option. The correct wording is given here in green underlined text.

4.1.5 Stop the power transfer

Upon receiving a NAK response to an FOD data packet, a Power Receiver ~~may~~shall switch to the power transfer phase of the Baseline Protocol (see the *Qi Specification, Communications Protocol*) limiting its Load Power level to 5 W or less. If the Power Transmitter assesses that the risk of heating a Foreign Object to unsafe temperatures is too high, it may remove the Power Signal.

2. *Foreign Object Detection*, section 5.2.2, *Calibration protocol*. The following note should be added to page 27, below the description of the RP/2 transition from state 11-3:

   NOTE: If a Power Receiver receives an ND Response Pattern to the transmitter RP/2 data packet during state 13-2, the Power Receiver should refrain from sending additional RP/2 data packets. The ND Response Pattern indicates that the Power Transmitter is a v1.2 device, which does not support multi-point calibration.

3. *Power Receiver Compliance Tests*, section 8.3.20.6, *Additional tests* (for test PRX.CPX.NEG.S10.BPX.002). The tests mentioned in this section are incorrectly numbered. The correct numbers are indicated here in green underlined text.

8.3.20.6 Additional tests

Apart from a difference in the Response Pattern to the SRQ/en data packet, the tests listed in the table below are identical to test PRX.CPX.NEG.S10.BPX.00~~1~~2.

Test	Response pattern
PRX.CPX.NEG.S10.BPX.00~~2~~3	ND

4. *Authentication Protocol,* section 3.2.1.3, *Certificate content.* In table 6, the OID for the Extensions.2 field is incorrectly shown as “2.23.255.1.1 {wpc-qi-policyFlags}”. The correct OID should be “2.23.255.1.1 {wpc-qi-policy}”.

   Similarly, in table 7, the OID for the Extensions.1 field is incorrectly shown as “2.23.255.1.2 {wpc-qi-auth-rsid}”. The correct OID should be “2.23.255.1.2 {wpc-qi-rsid}”.

5. *Power Transmitter Compliance Tests*, section 8.3.30.6, *Additional tests* (for test PTX.CPX.NEG.S07.GRQ.001). The descriptions of the inserted data packet for tests PRX.CPX.NEG.S10.BPX.008 and PRX.CPX.NEG.S10.BPX.009 are incorrect. The correct descriptions are indicated here in green underlined text.

8.3.30.6 Additional tests

Apart from differences in the inserted data packets, as well as in the expected Response Patterns, the tests listed in the table below are identical to test PTX.CPX.NEG.S07.GRQ.001.

Test	Inserted data packet	Logged Power Transmitter data packet
PTX.CPX.NEG.S09.GRQ.002	GRQ/id	ID
PTX.CPX.NEG.S09.GRQ.003	GRQ/cap	CAP
PTX.CPX.NEG.S09.GRQ.004	GRQ*	NULL
PTX.CPX.NEG.S09.GRQ.005	GRQ*	NULL
PTX.CPX.NEG.S09.GRQ.006	GRQ*	NULL
PTX.CPX.NEG.S09.GRQ.007	GRQ*	NULL
PTX.CPX.NEG.S09.GRQ.008	~~A randomly selected PROP data packet~~GRQ/prop*	NULL
PTX.CPX.NEG.S09.GRQ.009	~~A randomly selected PROP data packet~~GRQ/prop*	NULL

*Randomly chosen reserved Requested Power Transmitter Data Packet.
*Exclude the supported PROP data packets as listed on the Self-Declaration Form.

6. *Power delivery,* section 3.1, *Dual resonant circuit.* The prime is missing from the resonant frequency symbol (f_s') in the first equation below and in the paragraph that follows.

> The dual resonant circuit shall have the following resonant frequencies:
>
> $$f_s' = \frac{1}{2\pi \cdot \sqrt{L_s' \cdot C_s}} = 100^{+x}_{-y} \text{ kHz},$$
>
> $$f_d = \frac{1}{2\pi \cdot \sqrt{L_s \cdot \left(\frac{1}{C_s} + \frac{1}{C_d}\right)^{-1}}} = (1000 \pm 10\%) \text{ kHz}.$$
>
> In these equations, L_s' is the self-inductance of the Secondary Coil when placed on the Interface Surface of a Power Transmitter and—if necessary—aligned to the Primary Cell; and L_s is the self-inductance of the Secondary Coil without magnetically active material that is not part of the Power Receiver design close to the Secondary Coil (e.g. away from the Interface Surface of a Power Transmitter). Moreover, the tolerances x and y on the resonant frequency f_s' are $x = y =$ 5% for Power Receivers that specify a Maximum Power value in the Configuration Packet of 3 W and above, and $x = 5\%$ and $y = 10\%$ for all other Power Receivers.

7. *Communications protocol,* section 6.6, *Negotiation phase timings.* There are errors in the table 14 footnote. The corrections are as follows:

> * The number of cycles the Power Receiver can use to determine the operating frequency f_{op} before the start of the Response Pattern is $N_{cycles} = 3$ ~~ms~~ $\cdot f_{op}$, with ~~fop~~f_{op} in kilohertz. For example, at $f_{op} = 125$ kHz, $N_{cycles} = 375$.

8. *Communications Protocol,* section 7, *Power transfer phase.* The note below figure 42 contains two errors. The corrections are as follows:

> **NOTE:** Figure 41 and Figure 42 ~~Figure 22~~ do not imply any particular required order or number of occurrences ~~order~~ of the data packets used in the power transfer phase.

9. *Power Transmitter Compliance Tests,* section 10.1.7.4 through 10.2.2.4, *Test procedure.* In step 2c of the test procedure, a reference to step (d) is incorrectly shown in roman numeral (iv).

> c) If the Power Transmitter Product removes the Power Signal within 10 minutes from entering the power transfer phase, continue from step (~~iv~~d). Otherwise, the test has been completed.

10. *Power Transmitter Compliance Tests,* section 10.2.3.4 and 10.2.4.4, *Test procedure.* In step 2b of the test procedure, a reference to step (d) is incorrectly shown in roman numeral (iv).

> b) If the Power Transmitter Product removes the Power Signal within 10 minutes from entering the power transfer phase, continue to step ~~(iv)~~(d). Otherwise, the test has been completed.

11. *Power Transmitter Compliance Tests*, section 7.1.1.4, *Test procedure,* step 2. Clarification:

7.1.1.4 Test procedure

1. Place the TPR on the Power Transmitter Product and let it proceed to the power transfer phase.
2. After 30 seconds in the power transfer phase, remove the TPR.
3. Repeat previous two steps at least two times.

12. *Power Transmitter Compliance Tests*, section 8.4.4.5, *Inconclusive*. Clarification:

Inconclusive

The test is inconclusive if the Power Transmitter Product does not stop the power transfer within one minute from the start of the CFG data packet. Refer to Section 3.4, *Inconclusive tests*, for a list of conditions that would render the test inconclusive.

13. *Power Transmitter Compliance Tests*, section 8.4.5.5, *Inconclusive*. Clarification:

Inconclusive

The test is inconclusive if the Power Transmitter Product does not stop the power transfer within one minute from the start of the CFG data packet. Refer to Section 3.4, *Inconclusive tests*, for a list of conditions that would render the test inconclusive.

14. *Power Transmitter Compliance Tests*, section 8.4.45.5, *Pass.* The pass criteria is incorrect: both of the conditions must apply.

8.4.45.5 Test result

Pass

The test passes if and only if ~~any one~~both of the following conditions ~~applies~~apply.

15. *Power Transmitter Compliance Tests*, section 10.1.8.3, *Differences from the default configuration*. One of the configuration requirements is missing.

Differences from the default configuration

- Operate the TPR at a target Load power of $P_L^{(tgt)}$ = 8 W
- In the SRQ/gp data packet, set the Requested Load Power level to 8 W.

16. *Power Transmitter Compliance Tests*, section 10.1.9.3, *Differences from the default configuration*. One of the configuration requirements is missing.

Differences from the default configuration

- Operate the TPR at a target Load power of $P_L^{(tgt)}$ = 12 W
- In the SRQ/gp data packet, set the Requested Load Power level to 12W.

17. *Power Transmitter Compliance Tests*, section 10.1.11.3, *Differences from the default configuration*. One of the configuration requirements is missing.

Differences from the default configuration

- In the FOD/qf data packet, set the FOD Support data to a 10% lower value than the default
- In the SRQ/gp data packet, set the Requested Load Power level to 5 W.

18. *Power Transmitter Compliance Tests*, section 10.2.6.2, *Applicability.* Incorrect applicability statement.

10.2.6.2 Applicability

~~All~~ EPP and EPP5 Power Transmitter Products

19. *Power Transmitter Compliance Tests*, section 10.1.4.4, *Test result.* The conditions for passing and failing the test are incorrect.

10.1.4.4 Test result

~~Pass~~

~~The test passes if and only if all of the following conditions apply.~~

- ~~The Power Transmitter Product NAKs one or more FOD data packets~~
- ~~The Power Transmitter Product removes the Power Signal within t_{FOD} = 5,000 ms after the end of the NAK Response Pattern~~

~~Fail~~

~~The test fails if any one of the following conditions applies.~~

- ~~The Power Transmitter Product does not NAK any FOD data packets~~
- ~~The Power Transmitter Product does not remove the Power Signal within t_{FOD} = 5,000 ms after the end of the NAK Response Pattern~~

Pass

The test passes if and only if any one of the following conditions applies.

- The Power Transmitter Product NAKS one or more FOD data packets and removes the Power Signal within t_{FOD} = 5,000 ms from the end of the first NAK Response Pattern
- The Power Transmitter Product ACKs all FOD data packets

Fail

The test fails if the Power Transmitter Product NAKs one or more FOD data packets and does not remove the Power Signal within t_{FOD} = 5,000 ms from the end of the first NAK Response Pattern.

20. *Power Transmitter Compliance Tests*, section 10.1.6.5, *Test result.* The conditions for passing and failing the test are incorrect.

10.1.6.5 Test result

~~Pass~~

~~The test passes if and only if all of the following conditions apply.~~

- ~~The Power Transmitter Product NAKs one or more FOD data packets~~
- ~~The Power Transmitter Product removes the Power Signal within t_{FOD} = 5,000 ms after the end of the NAK Response Pattern~~

~~Fail~~

~~The test fails if any one of the following conditions applies.~~

- ~~The Power Transmitter Product does not NAK any FOD data packets~~
- ~~The Power Transmitter Product does not remove the Power Signal within t_{FOD} = 5,000 ms after the end of the NAK Response Pattern~~
- ~~The Power Transmitter does not remove the Power Signal within $t_{terminate}$ = 28 ms after the end of the first RP data packet~~

Pass

The test passes if and only if any one of the following conditions applies.

- The Power Transmitter Product NAKS one or more FOD data packets and removes the Power Signal within t_{FOD} = 5,000 ms from the end of the first NAK Response Pattern
- The Power Transmitter Product ACKs all FOD data packets

Fail

The test fails if the Power Transmitter Product NAKs one or more FOD data packets and does not remove the Power Signal within t_{FOD} = 5,000 ms from the end of the first NAK Response Pattern

21. *Authentication Protocol*, section 3.2.1, *Format of Certificates.* In Table 5, the ECDSA method incorrectly references Sec 2.2 of RFC**5280** instead of RFC**5480**.

22. *Power Transmitter Test Tools,* section 10.3.1, *Operating characteristics*. In the Negotiation phase section, the Reference Q Factor range is incorrect.

- Report a Reference Q Factor (FOD/qf) in the range of $Q_t^{(ref)}$ = 124 to ~~128~~138

23. *Power Receiver Compliance Tests*, section 8.3.19.5, *Test result*. The “Inconclusive” part of the test result section should read:
"The test is inconclusive if the TPT has not received a CE data packet within 60 seconds from the start of the CFG/ep data packet."

24. *Foreign Object Detection,* section 5.2.2, *Calibration protocol.* Figure 12 incorrectly shows an early draft of the diagram. The updated diagram, approved in v1.3 Release Candidate 3, is as follows.