



Qi Receiver Simulator

Test List



99000029 Rev A.

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Test 0: Qi Compliant Receiver

DIP Switch Setting: 000000

This test configures the Qi Receiver Simulator with Qi compliant packets and timing. It is the ideal setting for testing operation with internal or external loads.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ID Packet
- 3) Extended ID Packet
- 4) Configuration Packet
- 5) Control Error Packet (sent every 250 ms typ.)
- 6) Rectified Power Packet (sent every 5 s typ.)

Tests 1 - 6: Communication data bit rate tests

DIP Switch Settings: 000001 - 000110

The purpose of these tests is to test the Transmitter's ability to demodulate and decode communications at various baud rates. The Low Power WPC specification requires the Receiver bit rate clock to be 2kHz +/- 4%.

Test 1: ***DIP Switch Setting: 000001:*** Comm. data bit rate = -30% (350 us / bit)

Test 2: ***DIP Switch Setting: 000010:*** Comm. data bit rate = -10% (450 us / bit)

Test 3: ***DIP Switch Setting: 000011:*** Comm. data bit rate = -4% (480 us / bit)

Test 4: ***DIP Switch Setting: 000100:*** Comm. data bit rate = +4% (520 us / bit)

Test 5: ***DIP Switch Setting: 000101:*** Comm. data bit rate = +10% (550 us / bit)

Test 6: ***DIP Switch Setting: 000110:*** Comm. data bit rate = +30% (650 us / bit)

The following packet sequence is sent during these tests:

- 1) Signal Strength Packet
- 2) ID Packet
- 3) Extended ID Packet
- 4) Configuration Packet
- 5) Control Error Packet (sent every 250 ms typ.)
- 6) Rectified Power Packet (sent every 5 s typ.)

Test 7: Invalid time between packets in the identification and configuration phase

DIP Switch Setting: 000111

The purpose of this test is to verify that the Transmitter removes the Power Signal when the time between the stop bit of the checksum byte of a Packet and the start bit of the header byte of the next Packet in the sequence is greater than 20 ms during the Configuration Phase.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ***ID Packet***
- 3) ***21.5 ms delay (Transmitter should removes the Power Signal after this delay. If it does not, the Receiver will turn on the red Status LED and proceed to send the packets listed below.)***
- 4) ***Extended ID Packet***
- 5) ***21.5 ms delay***
- 6) ***Configuration Packet***
- 7) ***21.5 ms delay***
- 8) Control Error Packet (sent every 250 ms typ.)
- 9) Rectified Power Packet (sent every 5 s)

Test 8: Sends First Control Error Packet (CEP) Late***DIP Switch Setting: 001000***

The purpose of this test is to verify that the Transmitter removes the Power Signal if the time between the configuration phase and the first control error packet is longer than 1500 ms.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ID Packet
- 3) Extended ID Packet
- 4) Configuration Packet
- 5) *1.8 second delay (Transmitter should remove the Power Signal after this delay. If it does not, the Receiver will turn on the red Status LED and proceed to send the packets listed below.)*
- 6) *Control Error Packet (0% sent every 1.8 s)*
- 7) Rectified Power Packet (sent every 5 s typ.)

Test 9: Sends Second Control Error Packet (CEP) Late***DIP Switch Setting: 001001***

The purpose of this test is to verify that the Transmitter removes the Power Signal if the time between control error packets is longer than 1500 ms.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ID Packet
- 3) Extended ID Packet
- 4) Configuration Packet
- 5) *15 ms delay*
- 6) *Control Error Packet (0%)*
- 7) *1.8 second delay (Transmitter should remove the Power Signal after this delay. If it does not, the Receiver will turn on the red Status LED and proceed to send the packets listed below.)*
- 8) *Control Error Packet (0% sent every 1.8 s)*
- 9) Rectified Power Packet (sent every 5 s typ.)

Test 10: Sends Control Error Packets at minimum intervals***DIP Switch Setting: 001010***

The purpose of this test is to verify that the Transmitter can demodulate and decode control error packets at the fastest allowable packet rate.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ID Packet
- 3) Extended ID Packet
- 4) Configuration Packet
- 5) *Control Error Packet (sent every 30 ms)*
- 6) Rectified Power Packet (sent every 5 s)

Test 11: Requests 50 ms Power Control Hold-Off Time

DIP Switch Setting: 001011

The purpose of this test is to verify that the Transmitter can decode and execute a request for 50 ms Power Control Hold-Off Time. This should force the Transmitter to insert a 50 ms delay after each non-zero Control Error Packet before adjusting the power level.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ID Packet
- 3) Extended ID Packet
- 4) ***Power Control Hold-Off Packet (50 ms Power Control Hold-Off Time)***
- 5) Configuration Packet
- 6) Control Error Packet (sent every 250 ms typ.)
- 7) Rectified Power Packet (sent every 5 s)

Test 12: Sends No Communication Packets

DIP Switch Setting: 001100

This setting can be used to test presence detection algorithms implemented by the Transmitter.

No Packets are sent with this setting selected.

Test 13: Sends No Rectified Power Packets

DIP Switch Setting: 001101

The purpose of this test is to verify that the power Transmitter removes the Power Signal when Rectified Power packets are not received.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ID Packet
- 3) Extended ID Packet
- 4) Configuration Packet
- 5) Control Error Packet (sent every 250 ms typ.)
- 6) ***Rectified Power Packets are NOT sent. (Transmitter should remove the Power Signal after the Rectified Power Timeout. If it does not, the Receiver will turn on the red Status LED and continue to send Control Error Packets.)***

Test 14: Sends Invalid Checksums in All Packets

DIP Switch Setting: 001110

The purpose of this test is to verify that the power Transmitter removes the Power Signal due to checksum errors.

The following packet sequence is sent during this test:

- 1) ***Signal Strength Packet with checksum error. (Transmitter should remove the Power Signal after this packet. If it does not, the Receiver will turn on the red Status LED and proceed to send the packets listed below.)***
- 2) ***ID Packet with checksum error***
- 3) ***Extended ID Packet with checksum error***
- 4) ***Configuration Packet with checksum error***
- 5) ***Control Error Packet with checksum error (sent every 250 ms typ.)***
- 6) ***Rectified Power Packet with checksum error (sent every 5 s)***

Test 15: Sends Invalid Checksums in ID Packet Only***DIP Switch Setting: 001111***

The purpose of this test is to verify that the power Transmitter removes the Power Signal due to a checksum error in the ID Packet.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet with correct checksum.
- 2) **ID Packet with checksum error** (*Transmitter should remove the Power Signal after this packet. If it does not, the Receiver will turn on the red Status LED and proceed to send the packets listed below.*)
- 3) Extended ID Packet
- 4) Configuration Packet with correct checksum
- 5) Control Error Packet with correct checksum (sent every 250 ms typ.)
- 6) Rectified Power Packet with correct checksum (sent every 5 s)

Test 16: Sends Proprietary Packet as first packet instead of Signal Strength***DIP Switch Setting: 010000***

The purpose of this test is to ensure that the Transmitter removes the Power Signal if the first packet received is not a Signal Strength Packet or End Power Transfer Packet.

The following packet sequence is sent during this test:

- 1) **Proprietary Packet** (*Transmitter should remove the Power Signal after this packet. If it does not, the Receiver will turn on the red Status LED and proceed to send the packets listed below.*)
- 2) ID Packet
- 3) Extended ID Packet
- 4) Configuration Packet
- 5) Control Error Packet (sent every 250 ms typ.)
- 6) Rectified Power Packet (sent every 5 s)

Test 17: ID Packet and Extended ID Packet not sent***DIP Switch Setting: 010001***

The purpose of this test is to ensure that the Transmitter removes the Power Signal if the ID packet is not the second packet received. The ID Packet is supposed to be sent after the Signal Strength Packet and before the Configuration Packet.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) **Configuration Packet**
- 3) Control Error Packet (sent every 250 ms typ.)
- 4) Rectified Power Packet (sent every 5 s)

Test 18: Sends Power Control Hold-Off Packet after the Configuration Packet***DIP Switch Setting: 010010***

The purpose of this test is to ensure that the Transmitter removes the Power Signal after receiving packets out of order. The Power Control Hold-Off Packet is required to be sent before the Configuration Packet.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ID Packet
- 3) Extended ID Packet
- 4) ***Configuration Packet***
- 5) ***Power Control Hold-Off Packet (Transmitter should remove the Power Signal after this packet. If it does not, the Receiver will turn on the red Status LED and proceed to send the packets listed below.)***
- 6) Control Error Packet (sent every 250 ms typ.)
- 7) Rectified Power Packet (sent every 5 s)

Test 19: Sends Maximum optional packets in Configuration Phase***DIP Switch Setting: 010011***

The purpose of this test is to ensure that the Transmitter can demodulate and decode the maximum number of packets that may be sent in the configuration phase.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ***ID Packet***
- 3) ***Extended ID Packet***
- 4) ***Power Control Hold-Off Packet***
- 5) ***Proprietary Packet (0x18)***
- 6) ***Proprietary Packet (0x19)***
- 7) ***Proprietary Packet (0x28)***
- 8) ***Proprietary Packet (0x29)***
- 9) ***Proprietary Packet (0x38)***
- 10) ***Proprietary Packet (0x48)***
- 11) ***Configuration Packet***
- 12) Control Error Packet (sent every 250 ms typ.)
- 13) Rectified Power Packet (sent every 5 s)

Test 20: Sends Invalid WPC spec version (v0.1)***DIP Switch Setting: 010100***

The purpose of this test is to ensure that the Transmitter can recognize an invalid WPC spec version.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ***ID Packet (with WPC version 0.1, Transmitter may or may not remove the Power Signal after this packet. If it does not, the Receiver will turn on the red Status LED indicating that it is not Qi compliant and proceed to send the packets listed below.)***
- 3) Extended ID Packet
- 4) Configuration Packet
- 5) Control Error Packet (sent every 250 ms typ.)
- 6) Rectified Power Packet (sent every 5 s)

Test 21: Sends Reserved Packet in the Configuration Phase

DIP Switch Setting: 010101

The purpose of this test is to ensure that the Transmitter can recognize a Reserved Packet received during the configuration phase and proceed with power transfer.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ID Packet
- 3) Extended ID Packet
- 4) ***Reserved Packet (Header Byte = 0x07)***
- 5) Configuration Packet
- 6) Control Error Packet (sent every 250 ms typ.)
- 7) Rectified Power Packet (sent every 5 s)

Test 22: Sends Reserved Packets in the Power Transfer Phase

DIP Switch Setting: 010110

The purpose of this test is to ensure that the Transmitter can recognize a Reserved Packet received during the power transfer phase and continue power transfer.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ID Packet
- 3) Extended ID Packet
- 4) Configuration Packet
- 5) Control Error Packet (sent every 250 ms typ.)
- 6) Rectified Power Packet (sent every 5.0 s typ.)
- 7) ***Reserved Packet (Header Byte = 0x07, sent every 5.0 s typ.)***

Test 23: Requests an Invalid Power Control Hold-Off time (210 ms)

DIP Switch Setting: 010111

The purpose of this test is to ensure that the Transmitter can decode the power control hold-off packet, recognize that the requested time is beyond the specified limits, and remove the Power Signal. Valid Power Control Hold-Off time includes 5ms to 205 ms.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ID Packet
- 3) Extended ID Packet
- 4) Configuration Packet
- 5) ***Power Control Hold-Off Packet with 210 ms hold-off time. (Transmitter should remove the Power Signal after this packet. If it does not, the Receiver will turn on the red Status LED and proceed to send the packets listed below.)***
- 6) Control Error Packet (sent every 250 ms typ.)
- 7) Rectified Power Packet (sent every 5 s)

Test 24: Sends EPT: CHARGED as the first packet

DIP Switch Setting: 011000

The purpose of this test is to ensure that the Transmitter can decode an EPT packet as the first packet and remove the Power Signal.

The following packet sequence is sent during this test:

- 1) ***EPT: CHARGED (If the Power Signal is not removed by the Transmitter the Receiver will repeatedly send this packet for 1.8 s, stop communicating, and turn the STATUS LED solid red; indicating that it expected the Transmitter to remove the Power Signal.)***

Tests 25-33: EPT Tests

DIP Switch Settings: 011001 - 100001

The purpose of these tests is to ensure that the Transmitter can decode the End Power Transfer Packet with all defined reason codes.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ID Packet
- 3) Extended ID Packet
- 4) Configuration Packet
- 5) Control Error Packet (sent every 250 ms typ.)
- 6) **EPT with the following reason code (EPT is sent 2 s after power transfer is initiated. The Transmitter is expected to remove the Power Signal after the EPT packet is received, with the exception of the Reconfigure EPT packet. See below for details.)**
 - a. **Test 25: DIP Switch Setting: 011001: Battery Fault**
 - b. **Test 26: DIP Switch Setting: 011010: Charged**
 - c. **Test 27: DIP Switch Setting: 011011: Internal Fault**
 - d. **Test 28: DIP Switch Setting: 011100: No Response**
 - e. **Test 29: DIP Switch Setting: 011101: Over Current**
 - f. **Test 30: DIP Switch Setting: 011110: Over Temperature**
 - g. **Test 31: DIP Switch Setting: 011111: Over Voltage**
 - h. **Test 32: DIP Switch Setting: 100000: Reconfigure**
 - i. **Power transfer is expected to continue after the Reconfigure EPT packet**
 - ii. **Reconfigure EPT Packet is followed by a Configuration packet**
 - iii. **The Reconfigure EPT Packet is repeated every 2 seconds in this test**
 - i. **Test 33: DIP Switch Setting: 100001: Unknown Reason**

Rectified Power Packets are NOT sent during these tests. If the Power Signal is not removed by the Transmitter the Receiver will repeatedly send this packet for 1.8 s, stop communicating, and turn the STATUS LED solid red; indicating that it expected the Transmitter to remove the Power Signal.

Test 34: Sends Only Negative Error Packets

DIP Switch Setting: 100010

The purpose of this test is to test the Transmitter's capability of operating at its lowest regulation point.

The following packet sequence is sent during this test:

- 1) Signal Strength Packet
- 2) ID Packet
- 3) Extended ID Packet
- 4) Configuration Packet
- 5) **Control Error Packet (-5% Error sent every 30 ms)**
- 6) Rectified Power Packet (sent every 5 s)

Test 35-63: Reserved

DIP Switch Setting: 100011 - 111111

These test settings are reserved.

No Packets are sent with these settings selected.