CharIN Test Case Modification Guide

for CharIN Conformance and Interoperability Test for DC CCS EV

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Abbreviation

AC	Alternating current
BS	Basic Signaling
CCS	Combined Charging System
CCTS	CCS Conformance Test System
CP	Control Pilot
DC	Direct current
DIN	German Institute for Standardization
ECU	Electronic Control Unit
Ed	Edition
EIM	External Identification Means (External payment)
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
FC	Fast Charging
HLC	High Level Communication
HPC	High Power Charging
IC-CPD	In-Cable Control and Protection Device
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
OEM	Original Equipment Manufacturer, here automotive manufacturers
PE	Protective Earth
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation Extra Information for Testing
PLC	Power Line Communication
PnC	Plug and Charge
PP	Proximity Pilot
PWM	Pulse Width Modulation

QAP	Quality Assurance Plan
RFID	Radio Frequency Identification
SAE	Society of Automotive Engineers
SECC	Supply Equipment Communication Controller
EVCC	Electric Vehicle Communication Controller
SUT	System under Test
US	United States of America

1. Introduction

The DIN SPEC 70122:2018, ISO 15118-4:2018 and ISO 15118-5:2018 specify conformance tests for the communication between an Electric Vehicle (EV) and an EV Supply Equipment (EVSE). The actual communication protocol for the Combined Charging System is defined in the DIN SPEC 70121:2014, ISO 15118-2:2015 and ISO 15118-3:2015 respectively.

The DIN SPEC 70121 was first published in 2012 and updated in 2014. The CharIN DIN SPEC 70121 Implementation Guide summarizes new specifications derived from field experience. The Implementation Guide adds missing requirements, corrects wrong requirements and clarifies unclear requirements. An additional target is to ensure dual stack interoperability with future CCS implementations based on ISO 15118.

Based on the CharIN Technical Working Group – EV OEM Interoperability and Conformance and CharIN DIN SPEC 70121 Implementation Guide, this document list modified test cases and updates or deprecates test cases from the DIN SPEC 70122 or from the CharIN DIN SPEC 70121 Implementation Guide.

If a new or updated requirement is already covered in an existing test behavior of the DIN SPEC 70122:2018, or the CharIN guide, the reference to the CharIN requirement is added to the test case, in order to build the complete test coverage. The test case id (TC id) is extended by a CharIN_ prefix.

If a new or updated requirement demands a modification, the modified test behavior and the reference to the CharIN requirement is added to the test case. The test case id (TC id) is extended by a CharIN_ prefix and a new test case id (TC id).

Based on the CharIN Technical Working Group – EV OEM Interoperability and Conformance and ISO 15118-4, ISO 15118-5 Based on the outcome of this document, modified test cases are listed, and test cases of ISO 15118-4 or ISO 15118-5 standards are updated or deprecated.

2. Scope

No modification.

3. Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CharIN Implementation Guide to DIN SPEC 70121:2014 (V0.95, 4th November 2019)

CharIN Test Cases for DIN SPEC 70121:2014 Implementation Guide Version 1.1.3 July 2021

DIN 70122, Electromobility - Conformance tests for digital communication between a d.c. EV charging station and an electric vehicle for control of d.c. charging in the Combined Charging System (November 2018)

ISO 15118-4:2018 Road vehicles — Vehicle to grid communication interface — Part 4: Network and application protocol conformance test

ISO 15118-5:2018 Road vehicles — Vehicle to grid communication interface — Part 5: Physical layer and data link layer conformance test

IEC-61851-23, Implementation guide for system C in IEC 61851- 23 Edition 1: 2014-03; V1.2 2021-07-15

4. Terms and definitions

No modification.

5. Symbols (and abbreviated terms)

For the purpose of this document, the following abbreviations apply:

- **ALM** — Application Layer Message
- **ATS** — Abstract Test Suite
- **CPL** — Control Pilot Line
- **EDS** — Encoding/Decoding System
- **EV** — Electric Vehicle
- **EVCC** — Electric Vehicle Communication Controller
- **EVSE** — Electric Vehicle Supply Equipment
- **EXI** — Efficient XML Interchange
- **HAL** — Hardware Abstraction Layer
- **ICS** — Implementation Conformance Statement
- **ID(s)** — Identifier(s)
- **ITB** — Invalid Test Behavior
- **IUT** — Implementation under Test
- **IXIT** — Implementation eXtra Information for Testing
- **MTC** — Main Test Component
- **PICS** — Protocol Implementation Conformance Statement
- **PIXIT** — Protocol Implementation eXtra Information for Testing
- **PLC** — Power Line Communication
- **PTC** — Parallel Test Component
- **SDP** — SECC Discovery Protocol
- **SECC** — Supply Equipment Communication Controller
- **SLAC** — Signal Level Attenuation Characterization
- **SUT** — System Under Test
- **TC** — Test Case

- **TCI** — Test Control Interface
- **TCP** — Transmission Control Protocol
- **TE** — Test Execution
- **TFW** — Test Framework
- **TRI** — Test Runtime Interface
- **TSI** — Test System Interface
- **TSS** — Test Suite Structure
- **TTCN-3** — Testing and Test Control Notation version 3
- **V2G** — Vehicle-to-Grid
- **V2GTP** — V2G Transfer Protocol
- **VTB** — Valid Test Behavior
- **UDP** — User Datagram Protocol
- **XML** — Extensible Markup Language

6. Conventions

6.1. Requirement structure DIN 70121

DIN SPEC 70121 uses unique number identifiers for each individual requirement. The requirement structure allows for easier requirement tracking and management. The following format is used throughout DIN SPEC 70121:

"[V2G-DC-xyz]" requirement text

Where:

- "V2G-DC" represents the DIN SPEC 70121;
- “xyz” represents the individual requirement number and;
- "requirement text" represents the actual text of the requirement.

EXAMPLE [V2G-DC-001] This shall be an example

- "CharIN_V2G" represents the set of CharIN modifications,

6.2. Requirement structure ISO 15118-2

ISO 15118-2 uses a unique number to identify each individual requirement. This requirement structure allows for easier requirement tracking and test case specification. The following format is used:

"[V2G"Y"-"XXX"]" requirement text

Where:

- "V2G" represents the ISO 15118 set of standards,
- Y represents the document part of the ISO 15118 document set
- XXX represents the individual requirement number and
- "Requirement text" includes the actual text of the requirement.

EXAMPLE [V2G2-000] This shall be an example requirement.

- "CharIN_V2G2" represents the set of CharIN modifications,

6.3. Requirement structure ISO 15118-3

ISO 15118-2 uses a unique number to identify each individual requirement. This requirement structure allows for easier requirement tracking and test case specification. The following format is used:

[V2G3-YXX-ZZZ] requirement text

Where:

— “V2G3” represents the [ISO-3] set of standards,
— “Y” represents the main body (M)/Annexes (Annexes’ letter),
— “XX” represents the number of the current clause,
— “ZZZ” represents the individual requirement number and
— “requirement text” includes the actual text of the requirement.

EXAMPLE [V2G3-M01–01] This shall be an example requirement.

— "CharIN_V2G3" represents the set of CharIN modifications,

6.4. Test system description

No modification.

7. Test architecture reference model

No modification.

8. Test suite convention

8.1. General information

No modification.

8.2. Test suite structure (TSS)

No modification.

8.3. Test profiles

8.3.1. Test configuration

No modification.

8.3.2. Components and ports

No modification.

8.3.3. Protocol Implementation Conformance Statement (PICS) Definition

DIN 70122:2018 – Refer to document CharIN Test Cases for DIN SPEC 70121:2014 Implementation Guide V1.1.3

ISO 15114-4/-5 – no modifications

8.3.4. Protocol Implementation extra Information for Testing (PIXIT) Definition

DIN 70122:2018 – Refer to document CharIN Test Cases for DIN SPEC 70121:2014 Implementation Guide V1.1.3

ISO 15114-4/-5 – no modifications

8.4. Test suite identifiers

The selection of common naming conventions is one simple and often used mechanism to implement test suites which are consistent, maintainable and understandable for multiple users. Therefore, based on common ETSI naming conventions more specific naming conventions for the DIN SPEC 70121 conformance test suite are defined.

8.4.1. Module identifiers

No modification.

8.4.2. Test case identifiers

The naming conventions for test cases are using a prefix, which is defined by ETSI as shown in Table 1.

Table 1 – ETSI naming convention and CharIN extension for test case names

— **Keyword**	— **Definition**	— **Example**
— testcase name	— Every testcase begins with TC (TC_) — TC_TestCaseName	— TC_SupportedAppProtocol
— testcase name	— Every test case which was modified by CharIN begins with CharIN_TC (CharIN_TC) — CharIN_TC_TestCaseName	— CharIN_TC_SupportedAppProtocol

The DIN SPEC 70121 test suite specific test case identifier is defined as:

TC_<sut>_<ttyp>_<ctx>_<nn>

The ISO 15118 test suite specified test case identifier is defined as:

TC_<sut>_<ttyp>_<ctx>_<nn>

The modified CharIN test suite test case identifier is defined as:

CharIN_TC_<sut>_<ttyp>_<ctx>_<nn>

The segments of this identifier are described in **Fehler! Verweisquelle konnte nicht gefunden werden.**. An example for test case identifier is:

TC_SECC_VTB_SupportedAppProtocol_001

Table 2 — DIN SPEC or ISO test suite naming convention for test case identifiers

Identifier	Values	Description
<prefix>	TC or CharIN_TC	see **Fehler! Verweisquelle konnte nicht gefunden werden.** 1
<sut>		System under test
	EVCC	Electric Vehicle Communication Controller
	SECC	Supply Equipment Communication Controller
<ttyp>		Type of testing
	VTB	Valid test behavior
	ITB	Invalid test behavior
	IoP	Interoperability
<ctx>	{fullname}	Context (e.g. name of message pattern signal name according to standard)
<nn>	{xxx}	Sequential number from 001 to 999

8.4.3. Template identifiers

No modifications.

8.4.4. Function identifiers

No modifications.

8.4.5. Timer identifiers

DIN 70121:2014 and DIN 70122:2018 – Refer to document CharIN Test Cases for DIN SPEC 70121:2014 Implementation Guide V1.1.3

ISO 15118 – no modifications

8.4.6. PICS/PIXIT identifiers

No modification.

8.4.7. Verdict identifiers

No modification.

8.5. Test suite coverage

DIN 70121:2014 and DIN 70122:2018 – Refer to document CharIN Test Cases for DIN SPEC 70121:2014 Implementation Guide V1.1.3

ISO 15118 – no modifications

8.6. Test case description

DIN 70121:2014 and DIN 70122:2018 – Refer to document CharIN Test Cases for DIN SPEC 70121:2014 Implementation Guide V1.1.3

ISO 15118 – refer to relevant section of ISO 15118-4 or ISO 15118-5

Type of Change	Modification/Addition/Deletion
Old TC Id	The old TC Id is a unique identifier for a test case. It is specified according to the TC Id naming convention defined in sub clause 8.4.2
New TC Id	The new TC Id is a unique identifier for a modified or new CharIN test case. It is specified according to the TC Id naming convention defined in sub clause 8.4.2
Test objective	— Short description of test objective according to the requirements from the base standard. — Changes must be marked: Removed Text -> strikethrough New text -> Bold Font
Document reference	The document reference indicates the subclauses of the reference standard specifications in which the conformance requirement(s) is/are expressed. The references are provided according to the following format: Document: ISO15118-X:20XX:(IS|FDIS) Section(s): x.x.x.x.x, y.y.y.y.y, …
Referenced requirement(s)	The referenced requirement(s) refers to the subclauses of the referenced standard specification requirement(s). The requirements are referenced

	according to the format defined in ISO 15118-2 or ISO 15118-3: [V2GX-XXX], or [CharIN_V2GX-XXX]
Config Id	The Config Id references the ISO 15118-2 configuration selected for this test case according to 7.3.1. Example: CF_04_001, …
PICS selection	The PICS selection references the PICS statement(s) for this test case in accordance with 7.3.3. if the corresponding test behavior requires a specific assignment. Example: PICS_CMN_CMN_IdentificationMode := eIM
PIXIT selection	The PIXIT selection references the PIXIT statement(s) for this test case in accordance with 7.4.6. if the corresponding test behavior requires a specific assignment on SUT side. Example: PIXIT_EVCC_CMN_VAS := serviceDetail
Description / Reason	
Why is there the amendment/deletion/replacement?	

8.7. Test case specification

No modification.

9. Test case descriptions for SDP messages

9.1. EVCC Test Cases for SDP

9.1.1. TC_EVCC_CMN_VTB_SDP_005

Type of Change	Modification of Test Scope
Old TC Id	TC_EVCC_CMN_VTB_SDP_005
New TC Id	CharIN_TC_EVCC_CMN_VTB_SDP_005
Test objective	Test System executes GoodCase procedure, starts SDP server and counts the number of SDP request messages without sending an SDP response message. **Test System then checks that the SUT repeats sending SDP request messages for 5 times or more.**
Document reference	Document: ISO:15118-2:2014:IS Section(s): 15118-2:7.10.1.4; 15118-2:7.10.1.6; 15118-2:7.4
Referenced requirement(s)	[V2G2-142], [V2G2-623], [V2G2-157], [V2G2-159], [V2G2-160], [V2G2-161], [V2G2- 018], [V2G2-019]
Config Id	CF_04_002
PICS selection	
PIXIT selection	
Description / Reason	
It was decided not to impose an upper limit but to ensure that EVCC sends at least 5 SDP requests.	

10. Test case description for DIN SPEC 70121 V2G application layer messages

10.1. EVCC Test case for ContractAuthentication

10.1.1. CharIN_TC_EVCC_VTB_ContractAuthentication_015

Type of Change	Modification of Test Scope
Old TC Id	CharIN_TC_EVCC_VTB_ContractAuthentication_007
New TC Id	CharIN_TC_EVCC_VTB_ContractAuthentication_015
Test objective	Test System executes GoodCase procedure, sends continuously a ContractAuthenticationRes message with the current SessionID, ResponseCode 'OK' and EVSEProcessing 'Ongoing' and waits for another valid ContractAuthenticationReq message until the V2G_EVCC_Ongoing_Timer is equal or larger than V2G_EVCC_Ongoing_Timeout. **Test System checks that the SUT does not close the TCP connection before V2G_EVCC_Ongoing_Timer is equal or larger than V2G_EVCC_Ongoing_Timeout.**
Document reference	Document: DIN:SPEC:70121:2014-12; CharIN:DIN:70121:IMPG, ISO:15118-2:2014:IS Section(s): DIN:SPEC:70121:8.4.1; DIN:SPEC:70121:9.6.5.5; DIN:SPEC:70121:8.3.1.1.2; CharIN:DIN:70121:IMPG:7.3.4.1; 15118-2:8.7.3.4
Referenced requirement(s)	[V2G-DC-644], [V2G-DC-107], [V2G-DC-008], [V2G-DC-CharIN-122], [V2G2-710], [V2G2- 711]
Config Id	CF_02_002
PICS selection	
PIXIT selection	
Description / Reason	
It was decided to ensure that the EVCC waits at least until V2G_EVCC_Ongoing_Timer is equal or larger than V2G_EVCC_Ongoing_Timeout before terminating the session. If the EVCC does not close the TCP connection before the V2G_EVCC_Ongoing_Timer is equal or larger than V2G_EVCC_Ongoing_Timeout the test case shall be considered successful.	

10.2. EVCC Test case for PreCharge

10.2.1. CharIN_TC_EVCC_VTB_PreCharge_014

Type of Change	Modification of Test Scope
Old TC Id	CharIN_TC_EVCC_VTB_PreCharge_006
New TC Id	CharIN_TC_EVCC_VTB_PreCharge_014
Test objective	Test System executes GoodCase procedure and sends continuously a PreChargeRes message with the current SessionID, ResponseCode 'OK', EVSEStatusCode 'EVSE_Ready', present voltage equals to 0 and all additional mandatory parameters and waits for another PreChargeReq message with the current SessionID, target voltage and current and all additional mandatory parameters until the V2G_EVCC_PreCharge_Timer is equal or larger than V2G_EVCC_PreCharge_Timeout. **The V2G_EVCC_PreCharge_Timeout of 7s from DIN 70121:2018 shall be used.** **Test System checks that the SUT does not close the TCP connection before the V2G_EVCC_PreCharge_Timer is equal or larger than V2G_EVCC_PreCharge_Timeout.**
Document reference	Document: DIN:SPEC:70121:2014-12; CharIN:DIN:70121:IMPG Section(s):DIN:SPEC:70121:8.4.1;DIN:SPEC:70121:9.6.5.4; DIN:SPEC:70121:9.6.5.5;DIN:SPEC:70121:8.3.1.1.2; CharIN:DIN:70121:IMPG:7.3.12.3
Referenced requirement(s)	[V2G-DC-644], [V2G-DC-382], [V2G-DC-385], [V2G-DC-107], [V2G-DC-008], [V2GDC-CharIN-076]
Config Id	CF_02_002
PICS selection	
PIXIT selection	
Description / Reason	
Modification of the existing CharIN testcase to reflect the opinion that a minimum V2G_EVCC_PreCharge_Timeout of 7s of DIN 70121 shall be used while recommending a V2G_EVCC_PreCharge_Timeout of 10s as mentioned in [V2G-DC-CharIN-076]	

10.3. EVCC test cases for CurrentDemand

10.3.1. CharIN_TC_EVCC_VTB_CurrentDemand_016

Type of Change	Modification of Test Scope
Old TC Id	CharIN_TC_EVCC_VTB_CurrentDemand_005
New TC Id	CharIN_TC_EVCC_VTB_CurrentDemand_016
Test objective	Test System executes GoodCase procedure, sends valid PowerDeliveryRes message and waits until the 'V2G_Msg_Timeout (par_V2G_EVCC_Msg_Timeout_CurrentDemandReq)' timer has expired (no CurrentDemandRes message is sent) after receiving a CurrentDemandReq message with the current SessionID, target voltage and current and all additional mandatory parameters. **V2G_EVCC_Msg_Timeout_CurrentDemandReq of 0.25s from DIN 70121:2018 shall be used.** **Test System checks that the SUT does not close the TCP connection or apply state B before V2G_EVCC_Msg_Timer_ CurrentDemandReq is equal or larger than V2G_EVCC_Msg_Timeout_CurrentDemandReq**.
Document reference	Document: DIN:SPEC:70121:2014-12; CharIN:DIN:70121:IMPG Section(s): DIN:SPEC:70121:8.4.1; DIN:SPEC:70121:9.6.2; DIN:SPEC:70121:9.6.3; DIN:SPEC:70121:8.3.1.1.2, CharIN:DIN:70121:IMPG:7.3.13.4
Referenced requirement(s)	[V2G-DC-357], [V2G-DC-359], [V2G-DC-361], [V2G-DC-107], [V2G-DC-008], [V2G-DC-CharIN-136]
Config Id	CF_02_002
PICS selection	
PIXIT selection	
Description / Reason	
Modification of the existing CharIN testcase to reflect the opinion that a minimum V2G_EVCC_Msg_TimeoutCurrentDemandReq of 0.25 of DIN 70121 shall be used while recommending a V2G_EVCC_Msg_TimeoutCurrentDemandReq of 0.5s as mentioned in [V2G-DC_CharIN-136]	

10.4. EVCC test cases for CurrentDemandOrPowerDelivery

10.4.1. CharIN_TC_EVCC_VTB_CurrentDemandOrPowerDelivery_020

Type of Change	Modification of Test Scope
Old TC Id	CharIN_TC_EVCC_VTB_CurrentDemandOrPowerDelivery_016
New TC Id	CharIN_TC_EVCC_VTB_CurrentDemandOrPowerDelivery_020
Test objective	Test System executes GoodCase procedure and sends a CurrentDemandRes message with the current SessionID, ResponseCode 'OK', EVSEStatusCode 'EVSE_Ready' and all additional mandatory parameters. This process will be continued for 'PICS_CMN_LoopCounter' message sequences if a new valid CurrentDemandReq message was received afterwards within defined timing range of 100ms–1s. In the last sequence EVSEStatusCode will be changed to 'EVSE_Shutdown'. **Test System then checks that the SUT sends a correct PowerDeliveryReq message with the current sessionID, ReadyToChargeState 'false' and all additional mandatory parameters within defined timing range of 100ms–1s.** **The test system shall check that the SUT does not send a CurrentDemandReq or PowerDeliveryReq (ReadyToChargeState 'false') sooner than 100ms and not later than 1s after receiving the last response message.**
Document reference	Document: DIN:SPEC:70121:2014-12; CharIN:DIN:70121:IMPG Section(s): DIN:SPEC:70121:9.3.2; DIN:SPEC:70121:9.3.3; DIN:SPEC:70121:9.3.4; DIN:SPEC:70121:9.4.1.7.2; DIN:SPEC:70121:9.5.3.5; DIN:SPEC:70121:9.7.4.1.4; DIN:SPEC:70121:9.4.2.4.2; DIN:SPEC:70121:9.5.3.2; DIN:SPEC:70121:9.5.2.4; DIN:SPEC:70121:9.4.1.2.1; DIN:SPEC:70121:8.3.1.1.1; DIN:SPEC:70121:9.7.4.1.1; DIN:SPEC:70121:8.3.1.1.2; CharIN:DIN:70121:IMPG:7.3.13.3
Referenced requirement(s)	[V2G-DC-234], [V2G-DC-235], [V2G-DC-236], [V2G-DC-237], [V2G-DC-548], [V2G-DC-619], [V2G-DC-263], [V2G-DC-264], [V2G-DC-558], [V2G-DC-355], [V2G-DC-356], [V2G-DC-279], [V2G-DC-280], [V2G-DC-348], [V2G-DC-349], [V2G-DC-350], [V2G-DC-297], [V2G-DC-298], [V2G-DC-425], [V2G-DC-420], [V2G-DC-238], [V2G-DC-239], [V2G-DC-560], [V2G-DC-645], [V2G-DC-646], [V2G-DC-008], [V2G-DC-CharIN-083], [V2G-DC-CharIN-125]
Config Id	CF_02_002
PICS selection	

PIXIT selection	
Description / Reason	
Change description to make clear what is expected from the EV timing.	

11. Test case description for ISO 15118 V2G EIM application layer messages

11.1. EVCC test cases for Authorization

11.1.1. CharIN_ TC_EVCC_CMN_VTB_Authorization_009

Type of Change	Modification of Test Scope
Old TC Id	TC_EVCC_CMN_VTB_Authorization_009
New TC Id	CharIN_ TC_EVCC_CMN_VTB_Authorization_009
Test objective	Test System executes GoodCase procedure, sends continuously an AuthorizationRes message with the current SessionID, ResponseCode 'OK', EVSEProcessing 'Ongoing' and all additional mandatory parameters and waits for another AuthorizationReq message with the current SessionID and all additional mandatory parameters until the V2G_EVCC_Ongoing_Timer is equal or larger than V2G_EVCC_Ongoing_Timeout. **Test System checks that the SUT does not close the TCP connection before V2G_EVCC_Ongoing_Timer is equal or larger than V2G_EVCC_Ongoing_Timeout.**
Document reference	Document: ISO:15118-2:2014:IS Section(s): 15118-2:7.4; 15118-2:8.8.4.2.1; 15118-2:8.7.3.1; 15118-2:8.7.3.4; 15118- 2:8.7.4.2
Referenced requirement(s)	[V2G2-728], [V2G2-025], [V2G2-605], [V2G2-710], [V2G2-711], [V2G2-684], [V2G2- 845]
Config Id	CF_04_002
PICS selection	
PIXIT selection	
Description / Reason	
Modification of the existing ISO testcase to reflect the opinion that a minimum **V2G_EVCC_Ongoing_Timeout of 60** shall be used while a longer timeout shall not constitute fail.	

11.2. EVCC test cases for ChargeParameterDiscovery

11.2.1. CharIN_TC_EVCC_DC_VTB_ChargeParameterDiscovery_007

Type of Change	Modification of Test Scope
Old TC Id	TC_EVCC_DC_VTB_ChargeParameterDiscovery_007
New TC Id	CharIN_TC_EVCC_DC_VTB_ChargeParameterDiscovery_007
Test objective	Test System executes GoodCase procedure, sends continuously a ChargeParameterDiscoveryRes message with the current SessionID, ResponseCode 'OK', EVSEProcessing 'Ongoing', a valid schedule List and all additional mandatory parameters and waits for another valid ChargeParameterDiscoveryReq message until the V2G_EVCC_Ongoing_Timer is equal or larger than V2G_EVCC_Ongoing_Timeout **Test System checks that the SUT does not close the TCP connection before V2G_EVCC_Ongoing_Timer is equal or larger than V2G_EVCC_Ongoing_Timeout.**
Document reference	Document: ISO:15118-2:2014:IS Section(s): 15118-2:7.4; 15118-2:8.8.4.2.1; 15118-2:8.7.3.1; 15118-2:8.7.3.4
Referenced requirement(s)	[V2G2-728], [V2G2-025], [V2G2-605], [V2G2-710], [V2G2-711], [V2G2-685]
Config Id	CF_04_002
PICS selection	PICS_CMN_CMN_ChargingMode:= dC
PIXIT selection	
Description / Reason	
Modification of the existing ISO testcase to reflect the opinion that a minimum V2G_EVCC_Ongoing_Timeout of 60 s shall be used while a longer timeout shall not constitute fail.	

11.3. EVCC test cases for PreCharge

11.3.1. CharIN_TC_EVCC_DC_VTB_PreCharge_006

Type of Change	Modification of Test Scope
Old TC Id	TC_EVCC_DC_VTB_PreCharge_006
New TC Id	CharIN_TC_EVCC_DC_VTB_PreCharge_006
Test objective	Test System executes GoodCase procedure and sends continously a PreChargeRes message with the current SessionID, ResponseCode 'OK', EVSEPresentVoltage '0' and all additional mandatory parameters and waits for another PreChargeReq message with the current SessionID, target voltage and current and all additional mandatory parameters until the V2G_EVCC_PreCharge_Timer is equal or larger than V2G_EVCC_PreCharge_Timeout **Test System checks that the SUT does not close the TCP connection before the V2G_EVCC_PreCharge_Timer is equal or larger than V2G_EVCC_PreCharge_Timeout.**
Document reference	Document: ISO:15118-2:2014:IS Section(s): 15118-2:7.4; 15118-2:8.8.4.2.1; 15118-2:8.7.3.1; 15118-2:8.7.3.7; 15118- 2:8.8.4.2.3
Referenced requirement(s)	[V2G2-728], [V2G2-025], [V2G2-605], [V2G2-704], [V2G2-705], [V2G2-706], [V2G2- 832], [V2G2-618]
Config Id	CF_04_002
PICS selection	PICS_CMN_CMN_ChargingMode:= dC
PIXIT selection	
Description / Reason	
Modification of the existing ISO testcase to reflect the opinion that a longer V2G_EVCC_PreCharge_Timeout than 7 s shall not constitute fail.	

11.4. EVCC test case for PreChargeOrPowerDelivery

11.4.1. CharIN_TC_EVCC_DC_VTB_PreChargeOrPowerDelivery_001

Type of Change	Modification of Test Scope
Old TC Id	TC_EVCC_DC_VTB_PreChargeOrPowerDelivery_001
New TC Id	CharIN_ TC_EVCC_DC_VTB_PreChargeOrPowerDelivery_001
Test objective	Test System executes GoodCase procedure and sends a PreChargeRes message with the current SessionID, ResponseCode 'OK' and all additional mandatory parameters. If another PreChargeReq message is received, Test System then sends a new valid PreChargeRes message until the PreCharge process has finished or the 'PreCharge_Timeout' has expired. Test System then checks that the SUT sends a correct PowerDeliveryReq message with the current SessionID, ChargeProgress 'Start_', a charging profile and all additional mandatory parameters
Document reference	Document: ISO:15118-2:2014:IS Section(s): 15118-2:8.3.2; 15118-2:8.3.3; 15118-2:8.3.4; 15118-2:8.4.3.9.2, 15118- 2:8.4.3.9.3; 15118-2:8.8.4.2.3; 15118-2:8.4.5.3; 15118-2:8.4.3.9.1; 15118-2:8.5.4.2; 15118-2:8.5.4.5; 15118-2:8.6.2.4.1; 15118-2:8.6.2.4.2; 15118-2:8.6.3.1; 15118- 2:8.6.2.1; 15118-2:8.5.2.10; 15118-2:8.5.2.11; 15118-2:8.8.4.1
Referenced requirement(s)	[V2G2-179], [V2G2-180], [V2G2-181], [V2G2-182], [V2G2-183], [V2G2-221], [V2G2- 222], [V2G2-374], [V2G2-375], [V2G2-747], [V2G2-836], [V2G2-253], [V2G2-254], [V2G2-705], [V2G2-367], [V2G2-368], [V2G2-369], [V2G2-278], [V2G2-279], [V2G2- 286], [V2G2-528], [V2G2-390], [V2G2-394], [V2G2-403], [V2G2-405], [V2G2-659], [V2G2-660], [V2G2-661], [V2G2-662], [V2G2-832], [V2G2-284], [V2G2-606], [V2G2- 288], [V2G2-607], [V2G2-293], [V2G2-673]
Config Id	CF_04_002
PICS selection	PICS_CMN_CMN_ChargingMode:= dC
PIXIT selection	PIXIT_EVCC_CMN_ChargingProfileOptimization:= unknown none
Description / Reason	
It was agreed during the discussion to consider the test as “passed” also if the EV does not send a ChargingProfile.	

11.5. EVCC test cases for Reliability

11.5.1. CharIN_TC_EVCC_DC_VTB_Reliability_008

Type of Change	Modification of Test Scope
Old TC Id	TC_EVCC_DC_VTB_Reliability_001
New TC Id	CharIN_TC_EVCC_DC_Reliability_008
Test objective	**Test System initiates a plug-in, executes GoodCase procedure and enters the DC charging process for a minimum of 2 min or as indicated by the OEM.** **Afterwards, Test System stops the charging process for a non-critical reason, initiates a plug-out and waits for at least 20s or as indicated by the OEM. This process will be executed at least 5 times or as indicated by OEM.** **Test System checks that the SUT is able to charge for at least 2 min. Furthermore, Test System checks that this process is successful for 5 times in a row.**
Document reference	ISO/DIS 15118-4:2024(en)
Referenced requirement(s)	
Config Id	CF_02_002
PICS selection	PICS_CMN_CMN_ChargingMode := dC, PICS_EVCC_CMN_ReceiptRequired := false
PIXIT selection	PIXIT_EVCC_DC_WeldingDetection := unknown, PIXIT_EVCC_CMN_Pause == unknown
Description / Reason	
It was decided to adjust the test case with a flexible waiting time and a reduced number of repetitions.	

12. Test case description for ISO 15118 V2G PnC application layer messages

12.1. EVCC test cases for Authorization

12.1.1. CharIN_ TC_EVCC_CMN_VTB_Authorization_009

Type of Change	Modification of Test Scope
Old TC Id	TC_EVCC_CMN_VTB_Authorization_009
New TC Id	CharIN_ TC_EVCC_CMN_VTB_Authorization_009
Test objective	Test System executes GoodCase procedure, sends continuously an AuthorizationRes message with the current SessionID, ResponseCode 'OK', EVSEProcessing 'Ongoing' and all additional mandatory parameters and waits for another AuthorizationReq message with the current SessionID and all additional mandatory parameters until the V2G_EVCC_Ongoing_Timer is equal or larger than V2G_EVCC_Ongoing_Timeout. **Test System then checks that the SUT does not terminate the V2G communication session by closing the TCP before V2G_EVCC_Ongoing_Timer is equal or larger than V2G_EVCC_Ongoing_Timeout**
Document reference	Document: ISO:15118-2:2014:IS Section(s): 15118-2:7.4; 15118-2:8.8.4.2.1; 15118-2:8.7.3.1; 15118-2:8.7.3.4; 15118- 2:8.7.4.2
Referenced requirement(s)	[V2G2-728], [V2G2-025], [V2G2-605], [V2G2-710], [V2G2-711], [V2G2-684], [V2G2- 845]
Config Id	CF_04_002
PICS selection	PICS_CMN_CMN_IdentificationMode; = pnC
PIXIT selection	
Description / Reason	
Modification of the existing ISO testcase to reflect the opinion that a minimum **V2G_EVCC_Ongoing_Timeout of 60** shall be used while a longer timeout shall not constitute fail.	

12.2. EVCC test cases for ChargeParameterDiscovery

12.2.1. TC_EVCC_DC_VTB_ChargeParameterDiscovery_007

Type of Change	Modification of Test Scope
Old TC Id	TC_EVCC_DC_VTB_ChargeParameterDiscovery_007
New TC Id	CharIN_TC_EVCC_DC_VTB_ChargeParameterDiscovery_007
Test objective	Test System executes GoodCase procedure, sends continuously a ChargeParameterDiscoveryRes message with the current SessionID, ResponseCode 'OK', EVSEProcessing 'Ongoing', a valid scheduleList and all additional mandatory parameters and waits for another valid ChargeParameterDiscoveryReq message until the V2G_EVCC_Ongoing_Timer is equal or larger than V2G_EVCC_Ongoing_Timeout **Test System then checks that the SUT does not terminate the V2G communication session by closing the TCP or apply state B before V2G_EVCC_Ongoing_Timer is equal or larger than V2G_EVCC_Ongoing_Timeout**
Document reference	Document: ISO:15118-2:2014:IS Section(s): 15118-2:7.4; 15118-2:8.8.4.2.1; 15118-2:8.7.3.1; 15118-2:8.7.3.4
Referenced requirement(s)	[V2G2-728], [V2G2-025], [V2G2-605], [V2G2-710], [V2G2-711], [V2G2-685]
Config Id	CF_04_002
PICS selection	PICS_CMN_CMN_ChargingMode:= dC PICS_CMN_CMN_IdentificationMode := pnC
PIXIT selection	
Description / Reason	
Modification of the existing ISO testcase to reflect the opinion that a minimum **V2G_EVCC_Ongoing_Timeout of 60** shall be used while a longer timeout shall not constitute fail.	

12.3. EVCC test cases for PreCharge

12.3.1. CharIN_TC_EVCC_DC_VTB_PreCharge_006

Type of Change	Modification of Test Scope
Old TC Id	TC_EVCC_DC_VTB_PreCharge_006
New TC Id	CharIN_TC_EVCC_VTB_PreCharge_006
Test objective	Test System executes GoodCase procedure and sends continuously a PreChargeRes message with the current SessionID, ResponseCode 'OK', EVSEPresentVoltage '0' and all additional mandatory parameters and waits for another PreChargeReq message with the current SessionID, target voltage and current and all additional mandatory parameters until the V2G_EVCC_PreCharge_Timer is equal or larger than V2G_EVCC_PreCharge_Timeout = 7 s **Test System then checks that the SUT does not terminate the V2G communication session by closing the TCP or apply state B before V2G_EVCC_PreCharge_Timer is equal or larger than V2G_EVCC_PreCharge_Timeout**
Document reference	Document: ISO:15118-2:2014:IS Section(s): 15118-2:7.4; 15118-2:8.8.4.2.1; 15118-2:8.7.3.1; 15118-2:8.7.3.7; 15118- 2:8.8.4.2.3
Referenced requirement(s)	[V2G2-728], [V2G2-025], [V2G2-605], [V2G2-704], [V2G2-705], [V2G2-706], [V2G2-832], [V2G2-618]
Config Id	CF_04_002
PICS selection	PICS_CMN_CMN_ChargingMode:= dC PICS_CMN_CMN_IdentificationMode := pnC
PIXIT selection	
Description / Reason	
Modification of the existing ISO testcase to reflect the opinion that a longer V2G_EVCC_PreCharge_Timeout than 7 s shall not constitute fail.	

12.4. EVCC test cases for PreChargeOrPowerDelivery_001

12.4.1. CharIN_TC_EVCC_DC_VTB_PreChargeOrPowerDelivery_001

Type of Change	Modification of Test Scope
Old TC Id	TC_EVCC_DC_VTB_PreChargeOrPowerDelivery_001
New TC Id	CharIN_ TC_EVCC_DC_VTB_PreChargeOrPowerDelivery_001
Test objective	Test System executes GoodCase procedure and sends a PreChargeRes message with the current SessionID, ResponseCode 'OK' and all additional mandatory parameters. If another PreChargeReq message is received, Test System then sends a new valid PreChargeRes message until the PreCharge process has finished or the 'PreCharge_Timeout' has expired. Test System then checks that the SUT sends a correct PowerDeliveryReq message with the current SessionID, ChargeProgress 'Start_', a charging profile and all additional mandatory parameters
Document reference	Document: ISO:15118-2:2014:IS Section(s): 15118-2:8.3.2; 15118-2:8.3.3; 15118-2:8.3.4; 15118-2:8.4.3.9.2, 15118- 2:8.4.3.9.3; 15118-2:8.8.4.2.3; 15118-2:8.4.5.3; 15118-2:8.4.3.9.1; 15118-2:8.5.4.2; 15118-2:8.5.4.5; 15118-2:8.6.2.4.1; 15118-2:8.6.2.4.2; 15118-2:8.6.3.1; 15118- 2:8.6.2.1; 15118-2:8.5.2.10; 15118-2:8.5.2.11; 15118-2:8.8.4.1
Referenced requirement(s)	[V2G2-179], [V2G2-180], [V2G2-181], [V2G2-182], [V2G2-183], [V2G2-221], [V2G2- 222], [V2G2-374], [V2G2-375], [V2G2-747], [V2G2-836], [V2G2-253], [V2G2-254], [V2G2-705], [V2G2-367], [V2G2-368], [V2G2-369], [V2G2-278], [V2G2-279], [V2G2- 286], [V2G2-528], [V2G2-390], [V2G2-394], [V2G2-403], [V2G2-405], [V2G2-659], [V2G2-660], [V2G2-661], [V2G2-662], [V2G2-832], [V2G2-284], [V2G2-606], [V2G2- 288], [V2G2-607], [V2G2-293], [V2G2-673]
Config Id	CF_04_002
PICS selection	PICS_CMN_CMN_ChargingMode:= dC
PIXIT selection	PIXIT_EVCC_CMN_ChargingProfileOptimization:= unknown none
Description / Reason	
It was agreed during the discussion to consider the test as passed also if the EV does not send a ChargingProfile.	

Reference

This document was created by the FG Conformance Test & IOP of the CharIN association.