# DIN EN ISO 15118-9

ICS 43.120

# Straßenfahrzeuge – Kommunikationsschnittstelle zwischen Fahrzeug und Ladestation – Teil 9: Konformitätsprüfungen für die Bitübertragungs- und Sicherungsschicht für drahtlose Kommunikation (ISO 15118-9:2022); Englische Fassung EN ISO 15118-9:2023

Road vehicles –
Vehicle to grid communication interface –
Part 9: Physical and data link layer conformance test for wireless communication (ISO 15118-9:2022);
English version EN ISO 15118-9:2023

Véhicules routiers –
Interface de communication entre véhicule et réseau électrique –
Partie 9: Essai de conformité relatif à la couche physique et à la couche liaison de données pour la communication sans-fil (ISO 15118-9:2022);
Version anglaise EN ISO 15118-9:2023

Gesamtumfang 88 Seiten

DIN-Normenausschuss Auto und Mobilität (NAAutomobil)

# Nationales Vorwort

Dieses Dokument (EN ISO 15118-9:2023) wurde vom Technischen Komitee ISO/TC 22 „Road vehicles“ in Zusammenarbeit mit dem Technischen Komitee CEN/TC 301 „Straßenfahrzeuge“, dessen Sekretariat von AFNOR (Frankreich) gehalten wird, erarbeitet.

Das zuständige deutsche Normungsgremium ist der Arbeitsausschuss NA 052-00-31 AA „Datenkommunikation“ des DIN-Normenausschusses Automobiltechnik (NAAutomobil).

Dieses Dokument enthält unter Berücksichtigung des DIN-Präsidialbeschlusses 1/2004 nur die Englische Fassung von EN ISO 15118-9:2023.

Für die in diesem Dokument zitierten Dokumente wird im Folgenden auf die entsprechenden deutschen Dokumente hingewiesen:

| | | |
|---|---|---|
| ISO 15118-1 | siehe | DIN EN ISO 15118-1 |
| ISO 15118-2 | siehe | DIN EN ISO 15118-2 |
| ISO 15118-8:2020 | siehe | DIN EN ISO 15118-8:2021-02 |
| ISO 15118-20 | siehe | DIN EN ISO 15118-20 |

Um den Energieverbrauch von Fahrzeugen zu senken, werden Fahrzeuge mit elektrischem Teil- oder Komplettantrieb entwickelt. Um die Batterien dieser Fahrzeuge aufladen zu können, wird eine spezielle Lade-Infrastruktur benötigt.

Während verschiedene Teilaspekte in der Normung von Elektrofahrzeugen und Infrastruktur bei ISO und IEC bereits behandelt wurden, beschäftigt sich diese Normenreihe mit dem Informationsaustausch zwischen Elektrofahrzeug und Lade-Infrastruktur. Kommunikation ist für das effektive Aufladen von Fahrzeugen sowie die Entwicklung effizienter und komfortabler Abrechnungssysteme unabdingbar.

Dieser Teil der Normenreihe beschreibt spezifische Prüfungen basierend auf den Kommunikationsanforderungen, die in DIN EN ISO 15118-8:2021-02 beschrieben sind. Die Norm dient Systemlieferanten als Grundlage, um die Systemkonformität von Kommunikationssteuerungen entweder in Elektrofahrzeugen oder in Ladesäulen nachzuweisen.

# Nationaler Anhang NA
(informativ)

# Begriffe

Für die Anwendung dieses Dokuments gelten die folgenden Begriffe.

ISO und IEC stellen terminologische Datenbanken für die Verwendung in der Normung unter den folgenden Adressen bereit:

— IEC Electropedia: verfügbar unter https://www.electropedia.org/

— ISO Online Browsing Platform: verfügbar unter https://www.iso.org/obp

**3.1**
**abstrakter Prüffall**
en **abstract test case**
vollständige und unabhängige Spezifikation von Aktionen, die notwendig sind, um einen speziellen *Prüfzweck* (3.25) sicherzustellen, der auf dem Abstraktionsniveau für eine bestimmte abstrakte Prüfmethode festgelegt ist, wobei in einem stabilen Prüfzustand gestartet und in einem stabilen Prüfzustand geendet wird und dabei eine oder mehrere nachfolgende oder gleichzeitige Verbindungen eingebunden werden

Anmerkung 1 zum Begriff: Die Spezifikation sollte in der Art und Weise vollständig sein, um ein *Prüfurteil* (3.29) zu ermöglichen, welches eindeutig jedem potenziell überwachbaren Prüfergebnis zugeordnet werden kann (d.h. Reihe von Prüfereignissen).

Anmerkung 2 zum Begriff: Die Spezifikation sollte in der Art und Weise unabhängig sein, dass es möglich ist, den abgeleiteten *ausführbaren Prüffall* (3.7) isoliert von anderen Prüffällen dieser Art auszuführen (d.h. die Spezifikation sollte immer die Möglichkeit des Startens und Beendens im Zustand „Leerlauf" beinhalten).

[QUELLE: ITU-T X.290:1995, 3.3.3]

**3.2**
**abstrakte Prüfreihe**
**ATS,** en: abstract test suite
Prüfreihe, die sich aus *abstrakten Prüffällen* (3.1) zusammensetzt

[QUELLE: ITU-T X.290:1995, 3.3.6]

**3.3**
**zu prüfender Zugriffspunkt**
**APUT,** en: access point under test
ISO/OSI-Schicht 1 und 2-Komponente der Kommunikationssteuerung Ladeeinrichtung (en: supply equipment communication controller, SECC) [*zu prüfendes System (SUT)* (3.19)] zum Aufbau einer drahtlosen Kommunikationsverbindung

**3.4**
**Black-Box-Prüfung**
en **black box test**
Prüfverfahren, welches das Verhalten eines *zu prüfenden Systems (SUT)* (3.19) untersucht, ohne dabei die interne Implementierung und Struktur des SUT zu berücksichtigen und sich somit auf die offenen Prüfschnittstellen am SUT verlässt

**3.5**
**Konformitätsanforderung**
en **conformance requirement**
Konformität eines realen Systems, bestehend aus der Konformität zu jeder Anforderung und der Konformität zur Reihe

Anmerkung 1 zum Begriff: Reihe von zusammenhängenden Anforderungen, die zusammen das Verhalten des Systems und dessen Kommunikation festlegen. Konformität eines realen Systems wird deshalb auf zwei Ebenen ausgedrückt: Konformität zu jeder individuellen Anforderung und Konformität zur Reihe. Anwendbare Konformitätsprüfungen, die in diesem Dokument definiert sind, beinhalten Anforderungen und Anforderungen an die Übertragungssyntax, soweit diese mittels *Black-Box-Prüfung* (3.4) bestätigt werden können.

Anmerkung 2 zum Begriff: Siehe auch *statische Konformitätsanforderungen* (3.17) und *dynamische Konformitätsanforderungen* (3.6).

**3.6**
**dynamische Konformitätsanforderung**
en **dynamic conformance requirement**
eine der Anforderungen, die festlegt, welches überwachbare Verhalten nach der (den) relevanten Spezifikation(en) in Bezug auf die Kommunikation erlaubt ist

Anmerkung 1 zum Begriff: Die Anforderungen für diese Konformitätsspezifikation sind in ISO 15118-8 festgelegt.

[QUELLE: ITU-T X.290:1995, 3.3.29, modifiziert — Anmerkung 1 zum Begriff wurde ergänzt]

**3.7**
**ausführbarer Prüffall**
en **executable test case**
Umsetzung eines *abstrakten Prüffalls* (3.1)

[QUELLE: ITU-T X.290:1995, 3.3.31]

**3.8**
**erwartetes Verhalten**
en **expected behavior**
genaue Antwort des *zu prüfenden Systems (SUT)* (3.19), anhand der zugrundeliegenden Protokollspezifikation, auf den Stimulus, der im *Prüfverhalten* (3.20) festgelegt ist

**3.9**
**Konformitätsaussage zur Implementierung**
**ICS,** en: implementation conformance statement
Aussage des Lieferanten einer Implementierung oder eines Systems, deren (dessen) Konformität mit einer gegebenen Spezifikation erklärt wird, die ausdrückt, welche Fähigkeiten implementiert wurden

Anmerkung 1 zum Begriff: Das gegebene Dokument für diese Konformitätsspezifikation ist ISO 15118-8.

[QUELLE: ITU-T X.290:1995, 3.3.39, modifiziert — „Die ICS kann verschiedene Formen annehmen: Protokoll-ICS, Profil-ICS, profilspezifische ICS, sowie Informationsobjekt-ICS“ wurde aus der Definition gelöscht und Anmerkung 1 zum Begriff ergänzt]

**3.10**
**zusätzliche Prüfinformation zur Implementierung**
**IXIT**, en: implementation extra information for testing
Aussage, die von einem Lieferanten oder Umsetzer eines *zu prüfenden Systems (SUT)* (3.19) getroffen wurde, die alle Informationen [zusätzlich zu den in der *Konformitätsaussage zur Implementierung (ICS)* (3.9) gegebenen] bezogen auf die SUT und deren Testumgebung beinhaltet oder referenziert und dem Prüflabor ermöglicht, eine geeignete Prüfreihe gegen die SUT durchzuführen

[QUELLE: ITU-T X.290:1995, 3.3.41, modifiziert — „Eine IXIT kann verschiedene Formen annehmen: Protokoll-IXIT, Profil-IXIT, profilspezifische IXIT, sowie Informationsobjekt-IXIT, TMP-Implementierungs-aussage“ wurde aus der Definition gelöscht und IUT durch SUT ersetzt]

**3.11**
**Hauptprüfkomponente**
**MTC**, en: main test component
einzelne *Prüfkomponente* (3.21) in einer Prüfkomponentenkonfiguration, verantwortlich für die Erstellung und Steuerung *paralleler Prüfkomponenten* (3.12) sowie für die Berechnung und Zuordnung des *Prüfurteils* (3.29)

[QUELLE: ITU-T X.292:2002, 3.6.43]

**3.12**
**parallele Prüfkomponente**
**PTC,** en: parallel test component
*Prüfkomponente* (3.21), die von der *Hauptprüfkomponente* (3.11) erstellt wurde

[QUELLE: ITU-T X.292:2002, 3.6.53]

**3.13**
**Nachbedingung**
en **post-condition**
Prüfschritte, die für die Festlegung des Weges vom Ende des *Prüfverhaltens* (3.20) bis zum finalen stabilen Zustand des Prüffalls benötigt werden

**3.14**
**Vorbedingung**
en **pre-condition**
Prüfschritte, die für die Festlegung des Weges vom beginnenden stabilen Zustand des Prüffalls bis zum initialen Zustand, an dem das *Prüfverhalten* (3.20) beginnt, benötigt werden

**3.15**
**Erklärung zur Konformität der Protokollimplementierung**
**PICS**, en: protocol implementation conformance statement
*Konformitätsaussage zur Implementierung (ICS)* (3.9) für eine Implementierung oder ein System, deren (dessen) Konformität mit einer gegebenen Protokollspezifikation erklärt wird

Anmerkung 1 zum Begriff: Das gegebene Protokolldokument für diese Konformitätsspezifikation ist ISO 15118-8.

[QUELLE: ITU-T X.290:1995, 3.3.80, modifiziert — Anmerkung 1 zum Begriff wurde ergänzt]

**3.16**
**Zusatzinformation für die Prüfung der Protokollimplementierung**
**PIXIT**, en: protocol implementation extra information for testing
*zusätzliche Prüfinformation zur Implementierung* (IXIT) (3.10), die auf die Konformitätsprüfung nach einer gegebenen Protokollspezifikation bezogen ist

Anmerkung 1 zum Begriff: Das gegebene Protokolldokument für diese Konformitätsspezifikation ist ISO 15118-8.

[QUELLE: ITU-T X.290:1995, 3.3.81, modifiziert — Anmerkung 1 zum Begriff wurde ergänzt]

**3.17**
**statische Konformitätsanforderungen**
en **static conformance requirements**
eine der Anforderungen, die festlegt, welche Limitierungen der zulässigen Kombinationen von implementierten Fähigkeiten in einem realen offenen System bestehen, dessen Konformität mit der (den) relevanten Spezifikation(en) behauptet wird

[QUELLE: ITU-T X.290:1995, 3.3.95]

**3.18**
**zu prüfende Station**
**STAUT**, en: station under test
ISO/OSI-Schicht 1 und 2-Komponente der Kommunikationssteuerung Elektrofahrzeug (en: electric vehicle communication controller, EVCC) [*zu prüfendes System (SUT)* (3.19)] zum Aufbau einer drahtlosen Kommunikationsverbindung

**3.19**
**zu prüfendes System**
**SUT**, en: system under test
reales offenes System, in dem die Implementierung von einem oder mehreren OSI-Protokoll(en) in einer angrenzenden Nutzer/Anbieter-Beziehung durch Prüfungen zu untersuchen ist

Anmerkung 1 zum Begriff: Übernommen von ITU-T X.290:1995, 3.3.103 und 3.3.43.

**3.20**
**Prüfverhalten**
en **test behavior**
Reihe von Prüfschritten (Prüfkörper), die notwendig sind, um den *Prüfzweck* (3.25) sicherzustellen und um Urteile den möglichen Ergebnissen zuzuordnen

**3.21**
**Prüfkomponente**
en **test component**
benannte Untereinheit eines gleichzeitigen Prüffalls, der die Fähigkeit besitzt, parallel ausgeführt zu werden und mit einer festen Anzahl von Kontroll- und Beobachtungspunkten ausgewiesen ist sowie eine feste oder maximalen Anzahl von Koordinierungspunkten aufweist

[QUELLE: ITU-T X.290:1995, 3.3.80, modifiziert — „parallel mit anderen Prüfkomponenten“ wurde durch „parallel“ ersetzt]

**3.22**
**TTCN-3-Steuerungsschnittstelle**
**TCI**, en: TTCN-3 control interface
vier Schnittstellen, welche die Interaktion der TTCN-3-Software mit der Prüfsteuerung, die Kodierung und Dekodierung, den Umgang mit den *Prüfkomponenten* (3.21) und die Aufzeichnung in einem *Prüfsystem* (3.27) festlegen

[QUELLE: ETSI ES 201 873-6 V4.13.1:2022, 3.1]

**3.23**
**Prüfausführung**
en **test execution**
Interpretation oder Ausführung einer *abstrakten Prüfreihe* (3.2)

Anmerkung 1 zum Begriff: Konzeptionell kann die Prüfausführung in drei interagierende Einheiten unterteilt werden: eine ausführbare Prüfreihe, einen *Prüfrahmen* (3.24) und ein optionales internes Kodierungs-/Dekodierungssystem.

**3.24**
**Prüfrahmen**
en **test framework**
Einheit, die alle Aktionen von Prüffällen oder Funktionen ausführt

Anmerkung 1 zum Begriff: Der Prüfrahmen interagiert mit den Einheiten Prüfsteuerung, *zu prüfenden System* (SUT) (3.19) Adapter und Plattformadaptereinheiten über *TTCN-3-Steuerungsschnittstellen (TCI)* (3.22) und die *Prüflaufzeitschnittstelle (TRI)* (3.26) sowie zusätzlich die ausführbare Prüfreihe und das Kodierungs-/Dekodierungssystem handhabt. Der Prüfrahmen initialisiert die Adapter sowie die ausführbare Prüfreihe und Kodierungs-/Dekodierungssystem Einheiten. Diese Einheit führt alle notwendigen Aktionen aus, um einen Prüffall oder eine Funktion mit Parametern in der ETS-Einheit ordnungsgemäß auszuführen. Er befragt die Prüfsteuerungseinheit nach Modulparameterwerten, die für die ETS notwendig sind und sendet aufgezeichnete Informationen dorthin. Der Prüfrahmen sammelt und löst zugeordnete Urteile, die von der ausführbaren Prüfreiheneinheit zurückgegeben werden.

Anmerkung 2 zum Begriff: In diesem Dokument wird das TTCN-3-Laufzeitsystem verwendet, um eine Prüfrahmen-Funktionalität zu erläutern.

**3.25**
**Prüfzweck**
en **test purpose**
Prosabeschreibung eines hinreichend festgelegten Prüfziels, welche sich auf eine einzelne *Konformitätsanforderung* (3.5) oder einen Satz von in Beziehung stehenden Konformitätsanforderungen konzentriert, die in der entsprechenden OSI-Spezifikation festgelegt sind

BEISPIEL Überprüfung, ob ein spezifischer Wert eines spezifischen Parameters unterstützt wird.

[QUELLE: ITU-T X.290:1995, 3.3.118]

**3.26**
**Prüflaufzeitschnittstelle**
**TRI**, en: test runtime interface
zwei Schnittstellen, welche die Interaktion der TTCN-3-Prüfsystem Software zwischen dem zu *prüfenden System (SUT)* (3.19) und dem Programmadapter (PA) sowie dem Systemadapter (SA) in einem *Prüfsystem* (3.27) festlegen

[QUELLE: ETSI ES 201 873-5 V4.9.1:2022, 3.1, modifiziert — der Begriff war ursprünglich TTCN-3-Laufzeitschnittstelle.]

**3.27**
**Prüfsystem**
en **test system**
reales System, welches den *Prüfrahmen* (3.24), die *abstrakte Prüfreihe* (3.2), die *Prüfausführung* (3.23) und die Adapter sowie die Codecs umfasst

Anmerkung 1 zum Begriff: Typischerweise beinhaltet es auch eine gemeinsame Laufzeitumgebung, basierend auf einem Betriebssystem.

**3.28**
**Prüfsystemschnittstelle**
**TSI**, en: test system interface
*Prüfkomponente* (3.21), welche die Zuordnung der im (abstrakten) TTCN-3-*Prüfsystem* (3.27) verfügbaren Ports zu denjenigen bereitstellt, welche von einem realen System angeboten werden

[QUELLE: ETSI ES 201 873-5 V4.9.1:2022, 3.1]

**3.29**
**Urteil**
**Prüfurteil**
en **verdict, test verdict**
Aussage „bestanden“, „fehlgeschlagen“ oder „ergebnislos“, wie in einem *abstrakten Prüffall* (3.1) festgelegt, hinsichtlich der Konformität eines *zu prüfenden Systems (SUT)* (3.19) bezogen auf diesen Prüffall, wenn dieser gerade ausgeführt wird

[QUELLE: ITU-T X.290:1995, 3.3.124, modifiziert — IUT wurde durch SUT ersetzt]

# Nationaler Anhang NB
(informativ)

# Literaturhinweise

DIN EN ISO 15118-1, *Straßenfahrzeuge — Kommunikationsschnittstelle zwischen Fahrzeug und Ladestation — Teil 1: Allgemeine Informationen und Festlegungen der Anwendungsfälle*

DIN EN ISO 15118-2, *Straßenfahrzeuge — Kommunikationsschnittstelle zwischen Fahrzeug und Ladestation — Teil 2: Anforderungen an das Netzwerk- und Anwendungsprotokoll (ISO 15118-2:2014); Englische Fassung EN ISO 15118-2:2016, nur auf CD-ROM*

DIN EN ISO 15118-8:2021-02, *Straßenfahrzeuge — Kommunikationsschnittstelle zwischen Fahrzeug und Ladestation — Teil 8: Anforderungen an Bitübertragungs- und Sicherungsschicht für die drahtlose Kommunikation*

DIN EN ISO 15118-20, *Straßenfahrzeuge — Kommunikationsschnittstelle zwischen Fahrzeug und Ladestation — Teil 20: Anforderungen der 2. Generation an das Netzwerk- und Anwendungsprotokoll*

— Leerseite —

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN ISO 15118-9

October 2023

ICS 43.120

English Version

# Road vehicles - Vehicle to grid communication interface - Part 9: Physical and data link layer conformance test for wireless communication (ISO 15118-9:2022)

Véhicules routiers - Interface de communication entre véhicule et réseau électrique - Partie 9: Essai de conformité relatif à la couche physique et à la couche liaison de données pour la communication sans-fil (ISO 15118-9:2022)

Straßenfahrzeuge - Kommunikationsschnittstelle zwischen Fahrzeug und Ladestation - Teil 9: Konformitätsprüfungen für die Bitübertragungs- und Sicherungsschicht für drahtlose Kommunikation (ISO 15118-9:2022)

This European Standard was approved by CEN on 8 October 2023.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**



Ref. No. EN ISO 15118-9:2023 E

# European foreword

The text of ISO 15118-9:2022 has been prepared by Technical Committee ISO/TC 22 "Road vehicles" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 15118-9:2023 by Technical Committee CEN/TC 301 "Road vehicles" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2024, and conflicting national standards shall be withdrawn at the latest by April 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

# Endorsement notice

The text of ISO 15118-9:2022 has been approved by CEN as EN ISO 15118-9:2023 without any modification.

# Contents

Page

**Foreword** ... **iv**
**Introduction** ... **v**
**1 Scope** ... **1**
**2 Normative references** ... **1**
**3 Terms and definitions** ... **2**
**4 Abbreviated terms** ... **6**
**5 Conventions** ... **7**
5.1 Requirement structure ... 7
5.2 Test system description ... 8
**6 Test architecture reference model** ... **8**
6.1 General information ... 8
6.2 Platform adapter interface ... 8
6.3 SUT adapter interfaces ... 9
6.4 Codecs ... 9
**7 Test suite conventions** ... **10**
7.1 General information ... 10
7.2 Test suite structure (TSS) ... 10
7.3 Test profiles ... 11
7.3.1 Test configurations ... 12
7.3.2 Components and ports ... 12
7.3.3 Protocol implementation conformance statement (PICS) definition ... 14
7.3.4 Protocol implementation extra information for testing (PIXIT) definition ... 14
7.3.5 Test control ... 15
7.4 Test suite identifiers ... 15
7.4.1 Module identifiers ... 15
7.4.2 Test case identifiers ... 16
7.4.3 Template identifiers ... 16
7.4.4 Function identifiers ... 17
7.4.5 Timer identifiers ... 18
7.4.6 PICS/PIXIT identifiers ... 18
7.4.7 Verdict identifiers ... 19
7.5 Test suite coverage ... 19
7.6 Test case description ... 22
**8 Test case descriptions for ISO 15118-8 requirements** ... **23**
8.1 General information ... 23
8.2 SECC test cases ... 23
8.3 EVCC test cases ... 43
**Bibliography** ... **72**

# Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see https://patents.iec.ch).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

This document was prepared jointly by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 31, *Data communication*, and Technical Committee IEC/TC 69, *Electrical power/energy transfer systems for electrically propelled road vehicles and industrial trucks*.

A list of all parts in the ISO 15118 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

# Introduction

Resulting from the wireless physical and data link layer requirements defined in ISO 15118-8, a corresponding set of abstract test cases is necessary to verify the conformance of implementations. This document, therefore, defines a conformance test suite for the wireless physical and data link layer protocols in order to derive a common and agreed basis for conformance tests. The resulting test suite is a prerequisite for downstream interoperability tests. Since interoperability furthermore involves the actual application logic of an implementation, those tests are beyond the scope of this document. Hence, this document focuses on the interface aspects and the corresponding requirements given in ISO 15118-8 only.

INTERNATIONAL STANDARD ISO 15118-9:2022(E)

# Road vehicles — Vehicle to grid communication interface —

## Part 9: Physical and data link layer conformance test for wireless communication

## 1 Scope

This document specifies conformance tests in the form of an abstract test suite (ATS) for a system under test (SUT) implementing an electric-vehicle or supply-equipment communication controller (EVCC or SECC) with support for WLAN-based high-level communication (HLC) according to ISO 15118-8 and against the background of ISO 15118-1. These conformance tests specify the testing of capabilities and behaviours of an SUT, as well as checking what is observed against the conformance requirements specified in ISO 15118-8 and against what the implementer states the SUT implementation's capabilities are.

The capability tests within the ATS check that the observable capabilities of the SUT are in accordance with the static conformance requirements defined in ISO 15118-8. The behaviour tests of the ATS examine an implementation as thoroughly as practical over the full range of dynamic conformance requirements defined in ISO 15118-8 and within the capabilities of the SUT (see NOTE below).

A test architecture is described in correspondence to the ATS. The abstract test cases in this document are described leveraging this test architecture and are specified in descriptive tabular format for the ISO/OSI physical and data link layers (layers 1 and 2).

In terms of coverage, this document only covers normative sections and requirements in ISO 15118-8. This document can additionally refer to specific tests for requirements on referenced standards (e.g. IEEE, or industry consortia standards, like WiFi Alliance) as long as they are relevant in terms of conformance for implementations according to ISO 15118-8. However, it is explicitly not intended to widen the scope of this conformance specification to such external standards, if it is not technically necessary for the purpose of conformance testing for ISO 15118-8. Furthermore, the conformance tests specified in this document do not include the assessment of performance nor robustness or reliability of an implementation. They cannot provide judgments on the physical realization of abstract service primitives, how a system is implemented, how it provides any requested service, nor the environment of the protocol implementation. Furthermore, the abstract test cases defined in this document only consider the communication protocol and the system's behaviour defined ISO 15118-8. The power flow between the EVSE and the EV is not considered.

NOTE Practical limitations make it impossible to define an exhaustive test suite, and economic considerations can restrict testing even further. Hence, the purpose of this document is to increase the probability that different implementations are able to interwork. This is achieved by verifying them by means of a protocol test suite, thereby increasing the confidence that each implementation conforms to the protocol specification. However, the specified protocol test suite cannot guarantee conformance to the specification since it detects errors rather than their absence. Thus, conformance to a test suite alone cannot guarantee interworking. Instead, it gives confidence that an implementation has the required capabilities and that its behaviour conforms consistently in representative instances of communication.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 15118-1, *Road vehicles — Vehicle to grid communication interface — Part 1: General information and use-case definition*

ISO 15118-2, *Road vehicles — Vehicle-to-Grid Communication Interface — Part 2: Network and application protocol requirements*

ISO 15118-8:2020, *Road vehicles — Vehicle to grid communication interface — Part 8: Physical layer and data link layer requirements for wireless communication*

ISO 15118-20, *Road vehicles — Vehicle to grid communication interface — Part 20: 2nd generation network layer and application layer requirements*

ETSI ES 201 873-5 V4.9.1[1)], *Methods for Testing and Specification (MTS) — The Testing and Test Control Notation version 3 — Part 5: TTCN-3 Runtime Interface (TRI) (April 2022)*

ETSI ES 201 873-6 V4.13.1[2)], *Methods for Testing and Specification (MTS) — The Testing and Test Control Notation version 3 — Part 6: TTCN-3 Control Interface (TCI) (April 2022)*

IEEE 802.11-2012, *IEEE Standard for Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — specific requirements: Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15118-1, ISO 15118-2, ISO 15118-8, ISO 15118-20 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

**3.1**
**abstract test case**
complete and independent specification of the actions required to achieve a specific *test purpose* (3.25), defined at the level of abstraction of a particular abstract test method, starting in a stable testing state and ending in a stable testing state and optionally involves one or more consecutive or concurrent connections

Note 1 to entry: The specification should be complete in the sense that it is sufficient to enable a *test verdict* (3.29) to be assigned unambiguously to each potentially observable test outcome (i.e. sequence of test events).

Note 2 to entry: The specification should be independent in the sense that it should be possible to execute the derived *executable test case* (3.7) in isolation from other such test cases (i.e. the specification should always include the possibility of starting and finishing in the 'idle' state).

[SOURCE: ITU-T X.290:1995, 3.3.3].

**3.2**
**ATS**
abstract test suite
test suite composed of *abstract test cases* (3.1)

[SOURCE: ITU-T X.290:1995, 3.3.6]

1) Available at https://www.etsi.org/deliver/etsi_es/201800_201899/20187305/04.09.01_60/es_20187305v040901p.pdf.

2) Available at https://www.etsi.org/deliver/etsi_es/201800_201899/20187306/04.13.01_60/es_20187306v041301p.pdf.

**3.3**
**APUT**
access point under test
ISO/OSI layer 1 and 2 component of the SECC [*system under test (SUT)* (3.19)] for establishing a wireless communication connection

**3.4**
**black box test**
method of testing that examines the behaviour of a *system under test (SUT)* (3.19) without considering the internal implementation and structure of the SUT, thus relying on the SUT's open interface for testing

**3.5**
**conformance requirement**
conformance of a real system consisting of conformance to each requirement and conformance to the set

Note 1 to entry: Set of interrelated requirements which together define the behaviour of the system and its communication. Conformance of a real system will, therefore, be expressed at two levels, conformance to each individual requirement and conformance to the set. Applicable conformance tests defined in this document, include requirements and transfer syntax requirements as far as they can be validated by *black box tests* (3.4).

Note 2 to entry: See also *static conformance requirement* (3.17) and *dynamic conformance requirement* (3.6).

**3.6**
**dynamic conformance requirement**
one of the requirements which specifies what observable behaviour is permitted by the relevant specification(s) in instances of communication

Note 1 to entry: The requirements for this conformance specification are defined in ISO 15118-8.

[SOURCE: ITU-T X.290:1995, 3.3.29, modified — Note 1 to entry has been added.]

**3.7**
**executable test case**
realization of an *abstract test case* (3.1)

[SOURCE: ITU-T X.290:1995, 3.3.31]

**3.8**
**expected behaviour**
exact response of the *system under test (SUT)* (3.19) according to the underlying protocol specification to the stimulus defined in the *test behaviour* (3.20)

**3.9**
**ICS**
implementation conformance statement
statement made by the supplier of an implementation or system claimed to conform to a given specification, stating which capabilities have been implemented

Note 1 to entry: The given specification for this conformance specification is ISO 15118-8.

[SOURCE: ITU-T X.290:1995, 3.3.39, modified — "The ICS can take several forms: protocol ICS, profile ICS, profile specific ICS, and information object ICS." has been removed from the definition and Note 1 to entry has been added.]

**3.10**
**IXIT**
implementation extra information for testing
statement made by a supplier or implementer of a *system under test (SUT)* (3.19) which contains or references all of the information [in addition to that given in the *implementation conformance statement (ICS)* (3.9)] related to the SUT and its testing environment, which will enable the test laboratory to run an appropriate test suite against the SUT

[SOURCE: ITU-T X.290:1995, 3.3.41, modified — "An IXIT can take several forms: protocol IXIT, profile IXIT, profile specific IXIT, and information object IXIT, TMP implementation statement." removed from the defintiion and IUT replaced by SUT.]

**3.11**
**MTC**
main test component
single *test component* (3.21) in a test component configuration responsible for creating and controlling *parallel test components* (3.12) and computing and assigning the *test verdict* (3.29)

[SOURCE: ITU-T X.292:2002, 3.6.43]

**3.12**
**parallel test component**
**PTC**
*test component* (3.21) created by the *main test component* (3.11)

[SOURCE: ITU-T X.292:2002, 3.6.53]

**3.13**
**post-condition**
test steps needed to define the path from the end of the *test behaviour* (3.20) up to the finishing stable state for the test case

**3.14**
**pre-condition**
test steps needed to define the path from the starting stable state of the test case up to the initial state from which the *test bevaviour* (3.20) will start

**3.15**
**PICS**
protocol implementation conformance statement
*implementation conformance statement (ICS)* (3.9) for an implementation or system claimed to conform to a given protocol specification

Note 1 to entry: The given protocol specification for this conformance specification is ISO 15118-8.

[SOURCE: ITU-T X.290:1995, 3.3.80, modified — Note 1 to entry has been added.]

**3.16**
**PIXIT**
protocol implementation extra information for testing
*implementation extra information for testing (IXIT)* (3.10) related to testing for conformance to a given protocol specification

Note 1 to entry: The given protocol specification for this conformance specification is ISO 15118-8.

[SOURCE: ITU-T X.290:1995, 3.3.81, modified — Note 1 to entry has been added.]

**3.17**
**static conformance requirement**
one of the requirements that specify the limitations on the combinations of implemented capabilities permitted in a real open system which is claimed to conform to the relevant specification(s)

[SOURCE: ITU-T X.290:1995, 3.3.95]

**3.18**
**STAUT**
station under test
ISO/OSI layer 1 and 2 component of the EVCC [*system under test (SUT)* (3.19)] for establishing a wireless communication connection

**3.19**
**SUT**
system under test
real open system in which the implementation of one or more OSI protocols in an adjacent user/provider relationship are to be studied by testing.

Note 1 to entry: Adapted from ITU-T X.290:1995, 3.3.103 and 3.3.43.

**3.20**
**test behaviour**
set of test steps (test body) which are essential in order to achieve the *test purpose* (3.25) and assign verdicts to the possible outcomes

**3.21**
**test component**
named subdivision of a concurrent test case capable of being executed in parallel and declared as having a fixed number of points of control and observation and a fixed or maximal number of co-ordination points

[SOURCE: ITU-T X.292:2002, 3.6.72, modified — "in parallel with other test components" has been replaced by "in parallel".]

**3.22**
**TCI**
TTCN-3 control interfaces
four interfaces that define the interaction of the TTCN-3 Executable with the test management, the coding and decoding, the *test component* (3.21) handling and the logging in a *test system* (3.27)

[SOURCE: ETSI ES 201 873-6 V4.13.1:2022, 3.1]

**3.23**
**test execution**
interpretation or execution of an *abstract test suite* (3.2)

Note 1 to entry: Conceptually, the test execution can be decomposed into three interacting entities: an executable test suite, a *test framework* (3.24) and an optional internal encoding/decoding system entity.

**3.24**
**test framework**
entity to perform all actions of test cases or functions

Note 1 to entry: The test framework interacts with the test management, *system under test (SUT)* (3.19) adaptor and platform adaptor entities via *TTCN-3 control interfaces (TCI)* (3.22) and *test runtime interface (TRI)* (3.26) and additionally manages the executable test suite and encoding/decoding system entities. It initializes adaptors as well as executable test suite and encoding/decoding system entities. This entity performs all the actions necessary to properly start the execution of a test case or function with parameters in the executable test suite entity. It queries the test management entity for module parameter values required by the executable test suite and sends logging information to it. It also collects and resolves associated verdicts returned by the executable test suite entity.

Note 2 to entry: In this document, the TTCN-3 runtime system is used to explain a test framework functionality.

**3.25**
**test purpose**
prose description of a well-defined objective of testing, focusing on a single *conformance requirement* (3.5) or a set of related conformance requirements as specified in the appropriate OSI specification

EXAMPLE Verifying the support of a specific value of a specific parameter.

[SOURCE: ITU-T X.290:1995, 3.3.118]

**3.26**
**TRI**
test runtime interface
two interfaces that define the interaction of the TTCN-3 executable between the *system under test (SUT)* (3.19) and the platform adapter (PA) and the system adapter (SA) in a *test system* (3.27)

[SOURCE: ETSI ES 201 873-5 V4.9.1:2022, 3.1, modified — The term was originally TTCN-3 runtime interface.]

**3.27**
**test system**
real system combining the *test framework* (3.24), *abstract test suite* (3.2), *test execution* (3.23) and adapters as well as codecs

Note 1 to entry: Typically, also containing a common runtime environment based on an operating system.

**3.28**
**TSI**
test system interface
*test component* (3.21) that provides a mapping of the ports available in the (abstract) TTCN-3 *test system* (3.27) to those offered by a real test system

[SOURCE: ETSI ES 201 873-5 V4.9.1:2022, 3.1]

**3.29**
**test verdict**
statement of 'pass', 'fail' or 'inconclusive', as specified in an *abstract test case* (3.1), concerning conformance of a *system under test (SUT)* (3.19) with respect to that test case when it is executed

[SOURCE: ITU-T X.290:1995, 3.3.124, modified — IUT was replaced by SUT.]

## 4 Abbreviated terms

For the purposes of this document, the following abbreviated terms apply:

AP (wireless) access point

APUT access point under test

ATS abstract test suite

EDCA enhanced distributed channel access

ETSI european telecommunications standards institute

EV electric vehicle

EVCC electric vehicle communication controller

| | |
|---|---|
| EVSE | electric vehicle supply equipment |
| HAL | hardware abstraction layer |
| ICS | implementation conformance statement |
| ITB | invalid test behaviour |
| MAC | media access control |
| MTC | main test component |
| PICS | protocol implementation conformance statement |
| PIXIT | protocol implementation extra information for testing |
| PTC | parallel test component |
| SECC | supply equipment communication controller |
| STA | (wireless) station |
| STAUT | station under test |
| SUT | system under test |
| TC | test case |
| TCI | TTCN-3 control interface |
| TCI-CD | TCI-coding and decoding |
| TE | test execution |
| TRI | TTCN-3 runtime interface |
| TSI | TTCN-3 system interface |
| TSS | test suite structure |
| TTCN-3 | testing and test control notation version 3 |
| V2G | vehicle-to-grid |
| VTB | valid test behaviour |

# 5 Conventions

## 5.1 Requirement structure

This document uses unique number identifiers for each individual requirement. This requirement structure allows for easier requirement tracking and management. The following format is used throughout this document:

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

Where:

— 'V2G' represents the ISO 15118 series;

— Y represents the document part of the ISO 15118 series, for this document Y = 9;

— XXX represents the individual requirement number; and

— 'requirement text' includes the actual text of the requirement.

### 5.2 Test system description

TTCN-3 is used in this document to define/specify the test system architecture and test suite conventions, where applicable. TTCN-3 is, however, not mandatory for the implementation of a conformance test system according to this document.

**[V2G9-001]** The implementers of conformance tests shall verify that the test purposes implemented in their executable test cases are identical to the abstract test cases described in this document.

NOTE In this document, test cases are not programmatically specified in TTNC-3 core language. This will be revisited for the next edition of the document.

## 6 Test architecture reference model

### 6.1 General information

Figure 1 provides an overview of the test architecture for this document. The following subclauses define the interface requirements for platform and SUT adapters (see 6.2, 6.3) as well as the codecs (see 6.4). The test suite is defined in detail in the remainder of this document.

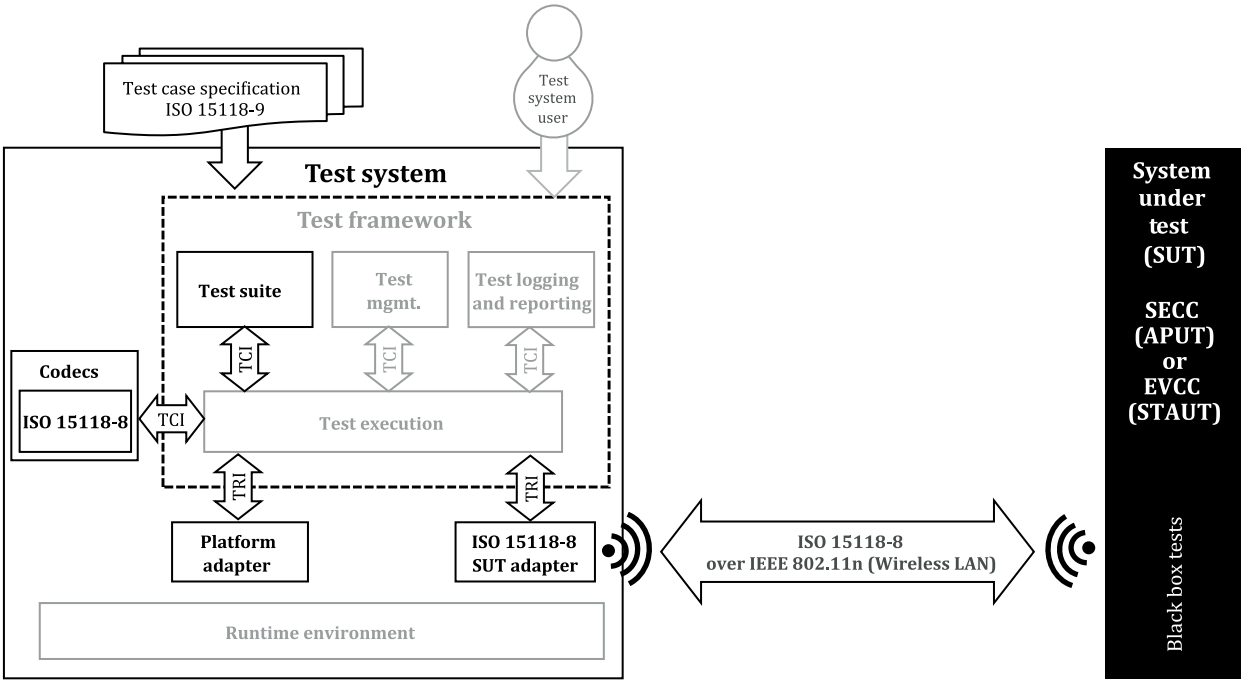


**Figure 1 — Test architecture reference model**

### 6.2 Platform adapter interface

The platform adapter within the test system is responsible for timers and external functions. Besides means for timers, which are typically provided as part of the test framework, no external functions are defined for this document.

**[V2G9-002]** The platform adapter of the test system shall implement the TriPlatformPA and the TriPlatformTE interfaces as defined in ETSI ES 201 873-5 V4.9.1:2022, 6.5.3.

## 6.3 SUT adapter interfaces

The SUT adapter within the test system adapts the TTCN-3 communication operations to the SUT based on an abstract test system interface and implements the real test system interface. It is responsible of propagating message requests and procedure-based calls from the test execution (see Figure 1) to the SUT, and of notifying the test execution of any received test events by appending them to its port queues.

**[V2G9-003]** Any SUT adapter of the test system shall implement the TriCommunicationSA and the TriCommunicationTE interfaces as defined in ETSI ES 201 873-5 V4.9.1:2022, 6.5.2.

NOTE 1 The actual implementation of these adapters is out of scope of this document.

**[V2G9-004]** The ISO 15118-8 SUT adapter of the test system shall send/receive the encoded MAC frame format to/from the SUT as defined in IEEE 802.11-2012, section 8.

NOTE 2 For association support according to ISO 15118-8 the management frames according to IEEE 802.11-2012, section 8.3.3 are used and embedded in the frame body field of the MAC frame format.

**[V2G9-005]** The wireless communication module of the ISO 15118-8 SUT adapter of the test system shall be certified by WiFi Alliance ('Wi-Fi CERTIFIED n').

The majority of requirements in ISO 15118-8 are based on IEEE 802.11n. WiFi Alliance certification is therefore required for the ISO 15118-8 SUT adapter in order to ensure the test system complies with IEEE 802.11n.

**[V2G9-006]** In case SUT is a STAUT, the ISO 15118-8 SUT adapter of the test system shall support operation at both the 2,4 GHz and 5 GHz frequency bands in parallel (simultaneous dual band support).

**[V2G9-007]** The wireless communication module of the ISO 15118-8 SUT adapter of the test system shall at least support all allowed channels per frequency band that are applicable for the SUT according to ISO 15118-8:2020, Tables 1, 2, and Annex D.

NOTE 3 Depending on the target market of the SUT, not all the channels listed in ISO 15118-8:2020, Tables 1 and 2 are allowed to be used due to national regulation.

NOTE 4 A collection of national regulations in usage of the U-NII band channels is listed in ISO 15118-8:2020, Annex D.

**[V2G9-008]** The ISO 15118-8 SUT adapter of the test system shall support active and passive scanning procedure according to IEEE 802.11-2012.

## 6.4 Codecs

A codec is responsible for the external encoding and decoding of TTCN-3 values into bit strings suitable to be sent to the SUT. The test execution (TE) determines which codec shall be used and passes the TTCN-3 data to the appropriate encoder to obtain the encoded data. Received data is decoded in this entity by using the appropriate decoder, which translates the received data into TTCN-3 values cf. ETSI ES 201 873-5 that can be matched against expected values or templates.

**[V2G9-009]** All codecs in this document shall implement the TCI-CD interface as defined in ETSI ES 201 873-6 V4.13.1:2022, 7.3.2.

NOTE 1 For conformance testing in this document, the IEEE 802.11n codec (see Figure 1) is used to encode or decode messages consumable by the tester into bit strings consumable by the SUT.

NOTE 2 The exact implementation of the IEEE 802.11n codec is out of scope of this document.

**[V2G9-010]** The ISO 15118-8 codec shall encode message values of the test system into corresponding MAC frames consumable by the SUT as defined in ISO 15118-8:2020, 7.2.6 and 7.3.5 and IEEE 802.11-2012.

**[V2G9-011]** The ISO 15118-8 codec shall decode MAC frames as defined in ISO 15118-8:2020, 7.2.6 and 7.3.5 and IEEE 802.11-2012 into message values consumable by the test system.

# 7 Test suite conventions

## 7.1 General information

This clause defines all conventions that are relevant for conformance tests of SUTs implementing ISO 15118-8.

## 7.2 Test suite structure (TSS)

A test suite is a complete set of test cases, possibly combined into groups or modules, that are necessary to perform conformance testing for a given SUT.

Each executable test case stimulates the SUT with specific inputs and the reactions are observed and evaluated. Depending on the test purpose different pre-conditions and post-conditions shall be considered for the formulation of the test behaviour. The pre-conditions, post-conditions as well as test behaviours are encapsulated into individual functions and stored within separate modules. Thus, a complete test case is composed by the actual test behaviour enveloped by pre- and post-conditions. The corresponding grouping of functions can therefore be assigned to the lowest abstract hierarchical level (see Figure 2). The test cases are defined on the second level.

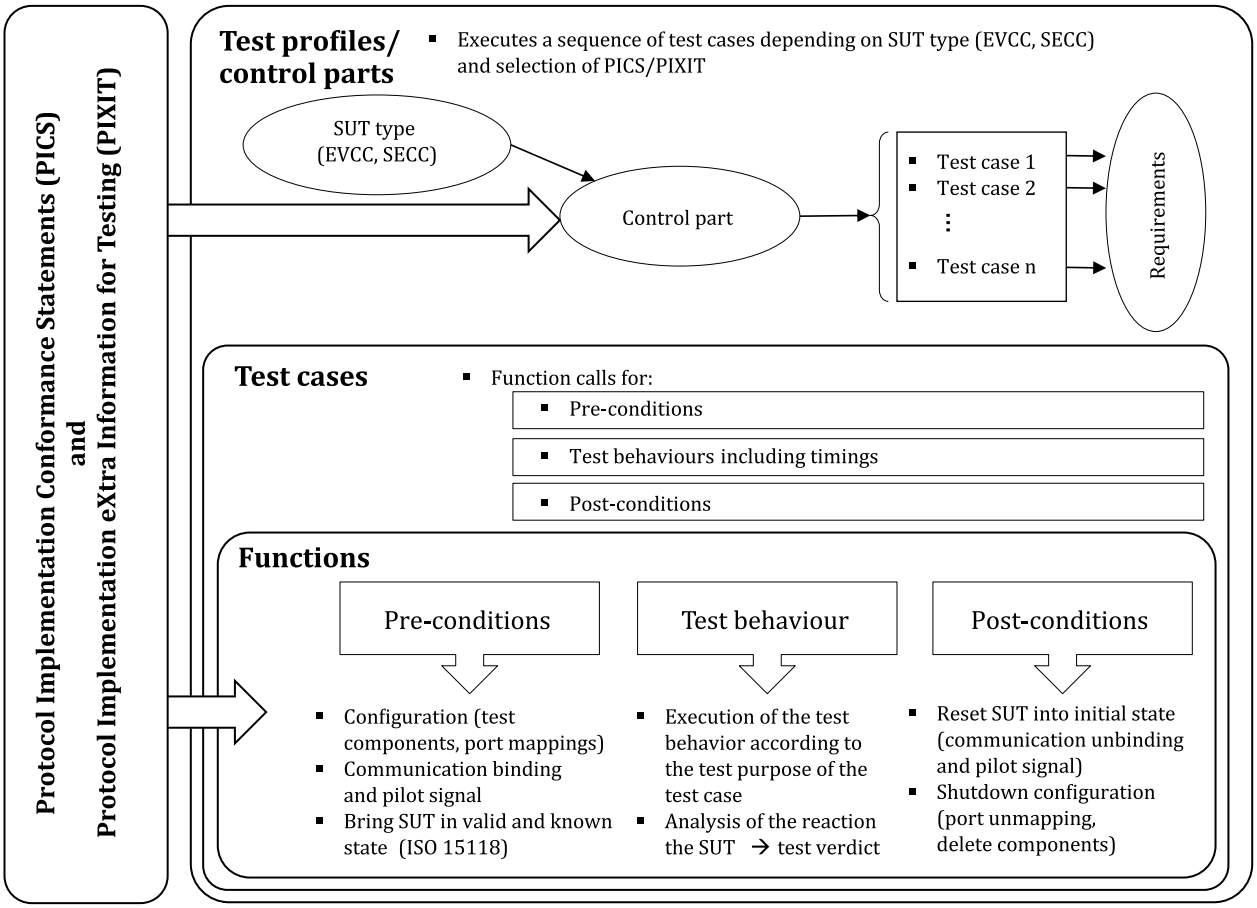


**Figure 2 — General overview of the test suite structure (TSS)**

The test profile is a collection of self-contained test cases as well as PICS (see 7.3.3) and PIXIT (see 7.3.4) in order to represent a given use case. The selection is based on the use cases of the ISO 15118 series and its corresponding requirements.

Hence, the test suite structure (TSS) is segmented into subgroups defined according to ISO 15118 use cases for conformance testing. Table 1 shows these subgroups, which are used for the organization of the test case specifications as well as for the test suite identifiers (see 7.4 for detail).

**Table 1 — Identifiers within the test suite structure (TSS)**

| Identifiers | Values | Description |
|---|---|---|
| <sut> | | System under test |
| | EVCC | Electric vehicle communication controller |
| | SECC | Supply equipment communication controller |
| <ctx> | {fullname} | Context (e.g. name of message pattern signal name according to standard) |

## 7.3 Test profiles

This subclause defines test profiles for conformance with ISO 15118-8. A test profile consists of a test configuration as well as a selection and assignment of PICS/PIXIT. Depending on the test configuration a set of test components and ports are defined. The test profile furthermore includes a test group defining the set of relevant test cases and the sequence in which they are executed in order to perform a conformance test for a given use case.

### 7.3.1 Test configurations

The test configuration reflects various ISO 15118 scenarios. The main entities for the system under test (SUT) are:

— electric vehicle communication controller (EVCC),

— supply equipment communication controller (SECC).

The combination of entities and additionally used test components are grouped by test configuration IDs (CF_Part_ID). Table 2 shows the test configurations for this document.

**Table 2 — Test configurations**

| CF_Part_ID | SUT | Tester | PTCs |
|---|---|---|---|
| CF_09_001 | SECC including wireless LAN interface | EVCC with ISO 15118-8 SUT adapter | none |
| CF_09_002 | EVCC including wireless LAN interface | SECC with ISO 15118-8 SUT adapter | none |

Figure 3 and Figure 4 illustrate configurations as defined in Table 2.

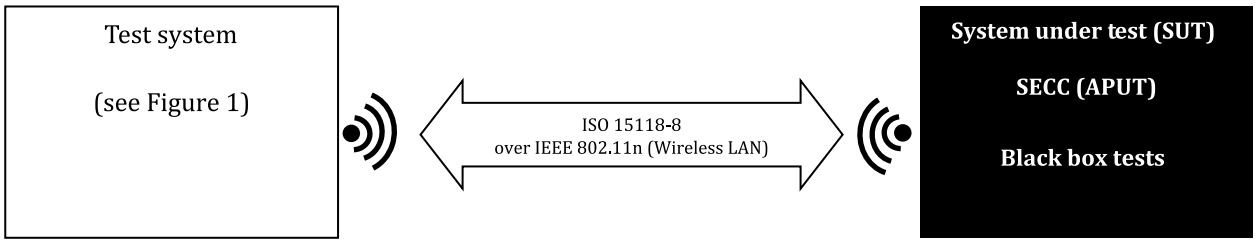


**Figure 3 — Test configuration CF_09_001 for SUT SECC (APUT)**

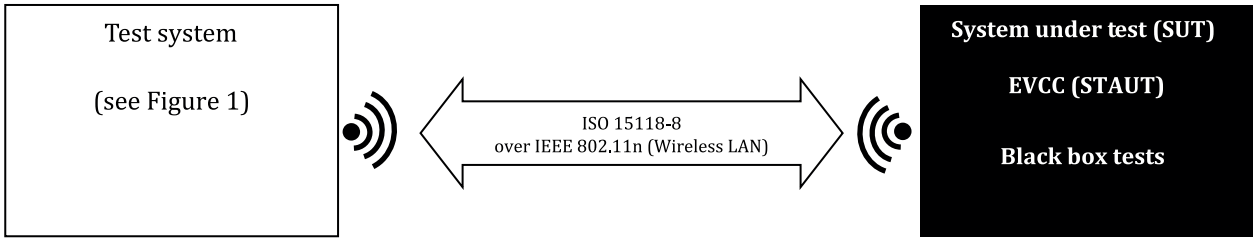


**Figure 4 — Test configuration CF_09_002 for SUT EVCC (STAUT)**

### 7.3.2 Components and ports

In correspondence to the identified set of relevant test configurations, this subclause defines test components which reflect the main entities needed for stimulation of the SUT with respect to the ISO 15118 series. Ports are used to connect these components with each other and the SUT. Port types define what kind of messages can be sent or received by this port. All relevant components and ports are defined in Table 3 and Table 5 respectively.

**Table 3 — Component definitions**

| Components | Description |
|---|---|
| SECC_Tester (MTC) | This component type is the main type for the tests of an SECC.<br>A WLAN_Port (see Table 4) is assigned to this component type. |

**Table 3** *(continued)*

| Components | Description |
|---|---|
| EVCC_Tester (MTC) | This component type is the main type for the tests of an EVCC.<br>A WLAN_Port (see Table 4) is assigned to this component type. |

**Table 4 — Port type definitions**

| Port Type | Description |
|---|---|
| WLAN_Port | This port is used to send/receive WLAN MAC Frames defined in ISO 15118-8 and IEEE 802.11-2012 to/from the EVCC/SECC. |

These components and ports comprise relevant test configurations for this document. Whether the type EVCC_Tester or SECC_Tester is to be used as MTC depends on the type of the SUT.

**[V2G9-012]** If the SUT is an EVCC, the MTC shall use the type EVCC_Tester.

**[V2G9-013]** If the SUT is an SECC, the MTC shall use the type SECC_Tester.

The MTC always contains a TTCN-3 test configuration and delimits the lifeline during test execution. Next to using ports for communication purposes, local timers, variables or constants may be assigned to components to store dynamic information during test case execution.

A test configuration also consists of respective test system interfaces (TSI). An abstract TSI is specified as a collection of ports. A TSI has no local timers, constants or variables; only ports are assigned to it. During the test case execution, test components ports can be mapped dynamically to the TSI ports to establish communication channel to the real test system interface.

In the test configuration the TSI uses the type System_EVCC or System_SECC depending on the type of the SUT.

— If the SUT is an EVCC, the TSI uses the type System_EVCC.

— If the SUT is an SECC, the TSI uses the type System_SECC.

The test configuration is illustrated in Figure 5. The type of the V2G components and ports (EVCC or SECC) depends on the SUT type.

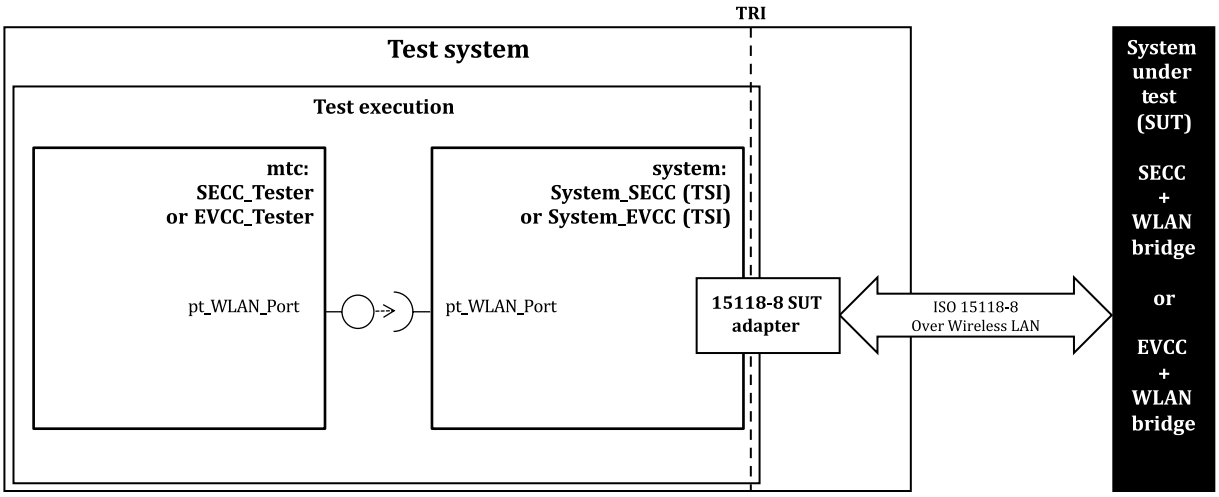


**Figure 5 — Test configuration of this document**

As shown in Figure 5 the port mappings are defined statically as follows:

— the port pt_WLAN_Port of the TSI is always mapped to port pt_WLAN_Port of the MTC.

### 7.3.3 Protocol implementation conformance statement (PICS) definition

To evaluate the conformance of a particular SUT, it is necessary to have implementation conformance statements (ICS) of the capabilities and options which have been implemented, and any features which have been omitted, so that the implementation can be tested for conformance against relevant requirements, and against those requirements only. Such a statement is called a protocol implementation conformance statement (PICS), compare to ITU-T X.290.

In this document, no PICS are defined in the ATS.

### 7.3.4 Protocol implementation extra information for testing (PIXIT) definition

In addition to the ICS, further statements (IXIT) made by a supplier or implementer may be required related to the SUT and its testing environment to enable the test laboratory to run the test suite against the SUT. With reference to ISO 15118-8 protocol conformance, the following set of PIXIT is defined in addition to the PICS in this document.

NOTE Due to the black box test paradigm in this document, it is not defined how to ensure that a corresponding PIXIT is set on the SUT side for a given test case execution.

All PIXIT defined in the ATS are summarized in Table 5 to Table 7

**Table 5 — Selected PIXIT for test system configurations CF_09_001 and CF_09_002 (SUT either SECC or EVCC)**

| PIXIT | Description |
|---|---|
| PIXIT_CMN_MACADDR_2_4GHz | MAC address of the 2,4 GHz network interface of the SUT |
| PIXIT_CMN_MACADDR_5GHz | MAC address of the 5 GHz network interface of the SUT |
| PIXIT_CMN_ ETT | Indication which energy transfer types are supported by the SUT<br>One octet with bitfield according to ISO 15118-8:2020, Table 4, e.g.:<br>— 00000011 or 0x3 (→ AC & DC support)<br>— 00000100 or 0x4 (→ WPT support)<br>— 00001000 or 0x8 (→ ACD support) |
| PIXIT_CMN_ADDINF | Indication which additional information is provided by the SUT<br>Hexbinary according to ISO 15118-8:2020, Table 5 |
| PIXIT_CMN_COUNTRY_CODE | Indication for a two-character country code according to ISO 3166-1 |
| PIXIT_CMN_OPERATOR_ID | Indication for an operator ID as defined in ISO 15118-2:2014, Annex H (see also ISO 15118-8:2020, Table 4 for further information) |
| PIXIT_CMN_CHARGING_SITE_ID | Indication for a unique identifier of the CS (see also ISO 15118-8:2020, Table 4 for further information) |

**[V2G9-014]** For the purpose of testing the values of country code, operator id and charging site id should be compatible between the test system and SUT regarding the values of PIXIT_CMN_COUNTRY_CODE, PIXIT_CMN_OPERATOR_ID, and PIXIT_CMN_CHARGING_SITE_ID.

**Table 6 — Selected PIXIT for test system configuration CF_09_001 (SUT equals SECC)**

| PIXIT | Description |
|---|---|
| PIXIT_SECC_NUMOUTLETS | Indication of whether the SECC supports one or multiple outlets<br>Choice: i) one, ii) multiple |
| PIXIT_SECC_SUPPORTED_CHANNEL_LIST | List of supported channels in the 2,4 GHz and 5 GHz band according to ISO 15118-8:2020, Tables 1, 2 and national/regional regulations in ISO 15118-8:2020, Annex D as key value pairs list |
| PIXIT_SECC_CHANNEL_SELECTED | Selected Channel ID in the either 2,4 GHz or 5 GHz band<br>Enumeration with reference to Channel IDs according to ISO 15118-8:2020, Tables 1 and 2. |

**Table 7 — Selected PIXIT for test system configuration CF_09_002 (SUT equals EVCC)**

| PIXIT | Description |
|---|---|
| PIXIT_EVCC_SCANNING_MODE | Indication whether SUT (EVCC) uses ACTIVE or PASSIVE scanning mode<br>Choice: i) active, ii) passive |

### 7.3.5 Test control

For test control the following requirements or recommendations apply for this document:

**[V2G9-015]** Test control shall execute all applicable test cases listed in 8.2 for SUT SECC and 8.3 for SUT EVCC.

**[V2G9-016]** Test control should execute test cases in the order as they appear in Table 19 for each SUT.

**[V2G9-017]** Test control shall implement the PICS and PIXIT parameters as defined in 7.3.3 and 7.3.4 and assign them as defined in each test case definition for SUT SECC (8.2) and for SUT EVCC (8.3).

## 7.4 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 ISO 15118 conformance test suite are defined.

### 7.4.1 Module identifiers

All modules defined in the TSS start with a capital letter. The ISO 15118 test suite specific module identifier for template, function or test case modules is defined as:

<modtype>_<sut>_<ctx>

The segments of this identifier are defined in Table 8. An example for test case module identifier is:

TestCases_SECC_VendorSpecificElement

**Table 8 — ISO 15118 test suite naming convention for modules**

| Identifier | Values | Description |
|---|---|---|
| <modtype> | | Module type |
| | TestCases | Module including test cases |
| | Functions | Module including functions |
| | Templates | Module including templates |
| <sut> | | System under test |
| | EVCC | Electric vehicle communication controller |
| | SECC | Supply equipment communication controller |
| | CMN | Common (exclusively for template modules) |
| <ctx> | {fullname} | Context (e.g. name of message pattern signal name according to standard) |

NOTE For module types other than templates, functions or test cases there is no identifier format defined.

### 7.4.2 Test case identifiers

The naming conventions for test cases are using a prefix, which is defined by ETSI as shown in Table 9.

**Table 9 — ETSI naming convention for test case names**

| Keyword | Definition | Example |
|---|---|---|
| testcase name | Every test case begins with TC (TC_)<br>TC_TestCaseName | TC_DNSResponse |

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

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

The segments of this identifier are described in Table 10. An example for test case identifier is:

TC_SECC_ VendorSpecificElement_001

**Table 10 — ISO 15118 test suite naming convention for test case identifiers**

| Identifier | Values | Description |
|---|---|---|
| <prefix> | TC | See Table 9 |
| <sut> | | System under test |
| | EVCC | Electric vehicle communication controller |
| | SECC | Supply equipment communication controller |
| <ctx> | {fullname} | Context (e.g. name of message pattern signal name according to standard) |
| <nn> | {xxx} | Sequential number from 001 to 999 |

### 7.4.3 Template identifiers

The naming conventions for templates are using a prefix, which is defined by ETSI as shown in Table 11.

**Table 11 — ETSI naming convention for templates**

| Keyword | Context | Definition | Example |
|---|---|---|---|
| template name | Templates with concrete attribute values | Every template begins with keyword m (m_) | m_DNSRequest |

**Table 11** *(continued)*

| Keyword | Context | Definition | Example |
|---|---|---|---|
| template name | Templates with wildcards or matching expression | If a template contains or refers to templates with wildcards {*\|?} then template name begins with keyword mw (mw_) | mw_DNSResponse |
| template name | Templates with parameters, which do not assign or refer to templates with wildcards or matching expression | If a template contains attributes which are defined by parameters or constant values, then template name begins with keyword md (md_) | md_DNSResponse (integer ip) |
| template name | Templates with parameters, which do assign or refer to templates with wildcards or matching expression | If a template contains attributes which are defined by parameters, constant values or wildcards, then template name begins with keyword mdw (mdw_) | mdw_DNSResponse (integer ip) |

The ISO 15118 test suite specific template identifier is defined as:

<prefix>_<sut>_<dtyp>_<nn>

The segments of this identifier are described in Table 12. An example for template identifier is:

md_EVCC_VendorSpecificElement_001

**Table 12 — ISO 15118 test suite naming convention for template identifiers**

| Identifier | Values | Description |
|---|---|---|
| <prefix> | | Type of template (see Table 11) |
| <sut> | | System under test |
| | EVCC | Electric vehicle communication controller |
| | SECC | Supply equipment communication controller |
| | CMN | Common |
| <dtyp> | {fullname} | Label of (root) data type according to standard |
| <nn> | {xxx} | Sequential number from 001 to 999 |

### 7.4.4 Function identifiers

The naming conventions for functions are using a prefix, which is defined by ETSI as shown in Table 13.

**Table 13 — ETSI naming convention for function names**

| Keyword | Context | Definition | Example |
|---|---|---|---|
| function name | All functions | Every function begins with f (f_) | f_functionName |

The ISO 15118 test suite naming convention for test case functions is defined as:

<prefix>_<sut>_<ctx>_<nn>

The segments of this identifier are described in Table 14. An example for template identifier is:

f_EVCC_ VendorSpecificElement_001

**Table 14 — ISO 15118 test suite naming convention for function names**

| Identifier | Values | Description |
|---|---|---|
| <prefix> | | f_ (see Table 13) |

**Table 14** *(continued)*

| Identifier | Values | Description |
|---|---|---|
| <sut> | | System under test |
| | EVCC | Electric vehicle communication controller |
| | SECC | Supply equipment communication controller |
| <ctx> | {fullname} | Context (e.g. name of message pattern signal name according to standard) |
| <nn> | {xxx} | Sequential number from 001 to 999 |

### 7.4.5 Timer identifiers

The naming conventions for timers are using a prefix, which is defined by ETSI as shown in Table 15.

**Table 15 — ETSI naming convention for timers**

| Keyword | Context | Definition | Example |
|---|---|---|---|
| timer name | t_ | Local timer | t_wait |
| timer name | tc_ | Timer defined within a component | tc_authMin |

The ISO 15118 test suite specific timer identifier is defined as:

<prefix>_<ctx>

The segments of this identifier are described in Table 16. An example for timer identifier is:

tc_Beacon

**Table 16 — ISO 15118 test suite naming convention for timer identifiers**

| Identifier | Values | Description |
|---|---|---|
| <prefix> | | Type of timer (see Table 15) |
| <ctx> | {fullname} | Context (e.g. name of timer according to ISO 15118-8 or if not part of ISO 15118-8 any given name describing the context of the timer) |

### 7.4.6 PICS/PIXIT identifiers

The ISO 15118 test suite naming convention for PICS/PIXIT is defined as:

<pic>_<sut>_<ctx>

The segments of this identifier are described in Table 17. An example for PICS/PIXIT identifier is:

PICS_SECC_ScanningMode

**Table 17 — ISO 15118 test suite naming convention for PICS/PIXIT identifiers**

| Identifier | Values | Description |
|---|---|---|
| <pic> | | Protocol implementation capability |
| | PICS | Protocol implementation conformance statement |
| | PIXIT | Protocol implementation extra information for testing |
| <sut> | | System under test |
| | EVCC | Electric vehicle communication controller |
| | SECC | Supply equipment communication controller |
| | CMN | Common |
| <ctx> | {fullname} | Context (e.g. name of message pattern signal name according to standard) |

### 7.4.7 Verdict identifiers

In this subclause the conventions for test verdicts are defined. The test verdicts defined in this document are listed in Table 18.

**Table 18 — ISO 15118 test suite conventions on verdict handling**

| Verdict type | TTCN-3 definition | ISO 15118 Test suite |
|---|---|---|
| none | Is implicitly assigned in the beginning of every test case by default and is reported as a final verdict in the absence of any other verdict assignment during the test case execution. | No TSS specific definition (see TTCN-3 definition). |
| pass | Means that everything is OK. A verdict given when the observed outcome satisfies the test purpose and is valid with respect to the relevant requirements and with respect to the PICS. See ITU-T X.290. | If in review of a requirement the SUT has a correct behaviour, then this verdict type shall be used. |
| inconc | A verdict given when the observed outcome is valid with respect to the relevant requirements but prevents the test purpose from being accomplished. See ITU-T X.290. | Means that neither pass nor fail can be reliably assigned. |
| fail | A verdict given when the observed outcome is syntactically invalid or inopportune with respect to the relevant requirements or the PICS/PIXIT. See ITU-T X.290. | If in review of a requirement the SUT has a wrong behaviour, then this verdict type shall be used. |

## 7.5 Test suite coverage

This subclause details the test coverage of this document per requirement in ISO 15118-8. Table 19 shows how the requirements in ISO 15118-8 are mapped against the test cases defined in 8.2 and 8.3.

X Indicates requirements that are covered in the ATS with one or more test cases.

P Indicates requirements that are only partially covered by one or more test cases in the ATS.

N Requirements that are not testable for the respective SUT.

- Requirements that are not applicable for the profile defined in the respective column.

O Requirements that are out of scope for the profile defined in the respective column.

**Table 19 — Requirements of ISO 15118-8 mapped to test cases in this document**

| Req. ID | SUT | | TestCase ID | Comment |
|---|---|---|---|---|
| | EVCC | SECC | | |
| V2G8-001 | - | O | - | Out of scope - requirement generally refers to external document reference IEEE 802.11-2012.<br>If the SUT is certified according to the corresponding WiFi Alliance certification program, this requirement may be considered correctly implemented by the SUT. |

**Table 19** *(continued)*

| Req. ID | SUT | | TestCase ID | Comment |
|---|---|---|---|---|
| | EVCC | SECC | | |
| V2G8-002 | - | P | TC_SECC_Advertising_001<br>TC_SECC_Advertising_002 | Test case provides only partial validation of requirement:<br>test case only validates Beacon frames and probe response frames. |
| V2G8-003 | - | P | TC_SECC_Advertising_003<br>TC_SECC_Advertising_004<br>TC_SECC_Advertising_005 | Test case provides only partial validation of requirement:<br>HT capability in reassociation response frame not testable - no deterministic trigger for black box test identified. |
| V2G8-004 | - | X | TC_SECC_Advertising_006<br>TC_SECC_Advertising_007 | |
| V2G8-005 | - | X | TC_SECC_BandSupport_001 | |
| V2G8-006 | - | X | TC_SECC_BandSupport_002 | |
| V2G8-007 | - | X | TC_SECC_BandSupport_003<br>TC_SECC_BandSupport_004 | |
| V2G8-008 | - | X | TC_SECC_ChannelSupport_001<br>TC_SECC_ChannelSupport_002 | |
| V2G8-009 | - | N | | With reference to ISO 15118-8:2020, 7.2.4, NOTE 4, the channel selection algorithm is out of the scope of ISO 15118-8. Therefore, testing of requirements in ISO 15118-8:2020, 7.2.4 is also out of scope of this document. |
| V2G8-010 | - | N | - | |
| V2G8-011 | - | N | | |
| V2G8-012 | - | N | | |
| V2G8-013 | - | N | | |
| V2G8-014 | - | N | | |
| V2G8-015 | - | N | | |
| V2G8-016 | - | O | | If the SUT is certified according to the corresponding WiFi Alliance certification program, this requirement may be considered correctly implemented by the SUT. |
| V2G8-017 | - | N | - | Not explicitly testable in black box test – requirement defines an internal behaviour. |
| V2G8-018 | - | X | TC_SECC_VendorSpecificElement_001 | |
| V2G8-019 | - | X | TC_SECC_VendorSpecificElement_002 | |
| V2G8-020 | - | X | TC_SECC_VendorSpecificElement_003<br>TC_SECC_VendorSpecificElement_004 | |
| V2G8-021 | - | N | - | Not explicitly testable in black box test – requirement defines an internal behaviour. |
| V2G8-022 | O | - | - | Out of scope – requirement generally refers to external document reference IEEE 802.11-2012.<br>If the SUT is certified according to the corresponding WiFi Alliance certification program, this requirement may be considered correctly implemented by the SUT. |

**Table 19** *(continued)*

| Req. ID | SUT | | TestCase ID | Comment |
|---|---|---|---|---|
| | EVCC | SECC | | |
| V2G8-023 | P | - | TC_EVCC_Scanning_001 | Test case provides only partial validation of requirement:<br>verdict 'fail' does not necessarily confirm non-conformance with respect to the requirement, because there may other reasons to prevent successful association with the AP. |
| V2G8-024 | P | - | TC_EVCC_Scanning_002<br>TC_EVCC_Scanning_003<br>TC_EVCC_Scanning_004<br>TC_EVCC_Scanning_005 | Test case provides only partial validation of requirement:<br>HT capability in reassociation request frame not testable - No deterministic trigger for black box test identified. |
| V2G8-025 | X | - | TC_EVCC_Scanning_006<br>TC_EVCC_Scanning_007<br>TC_EVCC_Scanning_008<br>TC_EVCC_Scanning_009 | |
| V2G8-026 | X | - | TC_EVCC_BandSupport_001<br>TC_EVCC_BandSupport_002<br>TC_EVCC_BandSupport_003<br>TC_EVCC_BandSupport_004 | |
| V2G8-027 | X | - | TC_EVCC_BandSupport_001<br>TC_EVCC_BandSupport_002<br>TC_EVCC_BandSupport_003<br>TC_EVCC_BandSupport_004 | |
| V2G8-028 | X | - | TC_EVCC_BandSupport_001<br>TC_EVCC_BandSupport_002<br>TC_EVCC_BandSupport_003<br>TC_EVCC_BandSupport_004 | |
| V2G8-029 | O | - | | If the SUT is certified according to the corresponding WiFi Alliance certification program, this requirement may be considered correctly implemented by the SUT. |
| V2G8-030 | N | - | - | Not explicitly testable in black box test – requirement defines an internal behaviour. |
| V2G8-031 | X | - | TC_EVCC_VendorSpecificElement_001 | |
| V2G8-032 | N | - | | VSE in reassociation request frame not testable - no deterministic trigger for black box test identified. |
| V2G8-033 | X | - | TC_EVCC_VendorSpecificElement_002 | |
| V2G8-034 | X | - | TC_EVCC_VendorSpecificElement_003<br>TC_EVCC_VendorSpecificElement_004 | VSE in reassociation request frame not testable - no deterministic trigger for black box test identified. |
| V2G8-035 | N | - | - | Not explicitly testable in black box test – requirement defines an internal behaviour. |

**Table 19** *(continued)*

| Req. ID | SUT | | TestCase ID | Comment |
|---|---|---|---|---|
| | EVCC | SECC | | |
| V2G8-036 | N | - | - | Not explicitly testable in black box test – requirement defines an internal behaviour. |

## 7.6 Test case description

The abstract test case descriptions in this document are described according to the template shown in Table 20.

**Table 20 — Abstract test case description template**

| | |
|---|---|
| **TC Id** | The TC Id is a unique identifier for a test case. It is specified according to the TC Id naming convention defined in 7.4.2. |
| **Test purpose** | Short description of test purpose according to the requirements from the base standard (ISO 15118-8).<br>For the definition of message elements and their value assignments, the following syntax is used:<br>— ElementName: <Value><br>→ Value assignment to ElementName with or without consideration of PIXIT;<br>— ElementName: (<Value> .. <Value>)<br>→ Possible value range for ElementName;<br>— ElementName: ?<br>→ mandatory element with any value according to the format defined in ISO 15118-8;<br>— ElementName: *<br>→ optional element with any value according to the format defined in ISO 15118-8 that may also be omitted.<br>EXAMPLE 1<br>— ElementID: 'DD'H ( → 'DD' in hex binary)<br>— Length: ('11'H .. 'FF'H) ( → value range from '11' to 'FF' in hex binary)<br>— ChargingSiteID: ?<br>— Additional Information (optional): * |
| **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:<br>Document: ISO15118-X:20XX:(IS\|FDIS)<br>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 15118-8:<br>[V2G8-YXX-ZZZ], … |
| **Config Id** | The Config Id references the ISO 15118-8 configuration selected for this test case according to 7.3.1. EXAMPLE 2<br>CF_09_001, … |
| **PICS selection** | The PICS selection references the PICS statement(s) for this test case in accordance with 7.3.3. EXAMPLE 3<br>None defined. |

**Table 20** *(continued)*

| | |
|---|---|
| **PIXIT selection** | The PIXIT selection references the PIXIT statement(s) for this test case in accordance with 7.3.4. EXAMPLE 4<br>PIXIT_CMN_ETT |

# 8 Test case descriptions for ISO 15118-8 requirements

## 8.1 General information

Subclause 8.2 covers all test cases for SECC according to ISO 15118-8 while 8.3 covers all test cases for EVCC according to ISO 15118-8, respectively.

## 8.2 SECC test cases

Table 21 lists the abstract test case description for 'TC_SECC_Advertising_001'.

**Table 21 — Abstract test case description for 'TC_SECC_Advertising_001'**

| | |
|---|---|
| **TC Id** | TC_SECC_Advertising_001 |
| **Test purpose** | This TC observes whether Beacon frames are sent by the APUT. If the channel of the APUT can be explicitly set, this test case shall be repeated for all supported channels by the APUT.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012 on one of the supported channels (PIXIT_SECC_SUPPORTED_CHANNEL_LIST).<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels according to ISO 15118-8:2020, Tables 1, 2.<br>NOTE National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (STA) captures incoming frames and checks whether Beacon frames from the APUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11-2012 are received.<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.2.2 |
| **Referenced requirement(s)** | [V2G8-002] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |

**Table 21** *(continued)*

| | |
|---|---|
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_SECC_SUPPORTED_CHANNEL_LIST |

Table 22 lists the abstract test case description for 'TC_SECC_Advertising_002'.

**Table 22 — Test case description for 'TC_SECC_Advertising_002'**

| | |
|---|---|
| **TC Id** | TC_SECC_Advertising_002 |
| **Test purpose** | This TC observes whether the APUT responds to probe request frames. If the channel of the APUT can be explicitly set, this test case shall be repeated for all supported channels by the APUT.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012 on one of the supported channels (PIXIT_SECC_SUPPORTED_CHANNEL_LIST).<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels according to ISO 15118-8:2020, Tables 1, 2.<br>NOTE National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (STA) sends a probe request frame according to the active scanning procedure as defined IEEE 802.11-2012 containing a valid VSE element with the following format:<br>ElementID: '0D'H<br>Length: '07'H<br>OrganizationID: '70B3D53190'H<br>ElementType: '02'H<br>ETT: '0F'H<br><br>The test system then checks whether a probe response frame from the APUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11-2012 is received.<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.2.2 |
| **Referenced requirement(s)** | [V2G8-002] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |

**Table 22** *(continued)*

| | |
|---|---|
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_SECC_SUPPORTED_CHANNEL_LIST |

Table 23 lists the abstract test case description for 'TC_SECC_Advertising_003'.

**Table 23 — Test case description for 'TC_SECC_Advertising_003'**

| | |
|---|---|
| **TC Id** | TC_SECC_Advertising_003 |
| **Test purpose** | This TC observes whether the Beacon frames of the APUT contain the HT capabilities element. If the channel of the APUT can be explicitly set, this test case shall be repeated for all supported channels by the APUT.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012 on one of the supported channels (PIXIT_SECC_SUPPORTED_CHANNEL_LIST).<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels according to ISO 15118-8:2020, Tables 1, 2.<br>NOTE National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (STA) captures incoming frames and checks whether Beacon frames from the APUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11-2012 are received containing the HT capabilities element and whether APUT replies with association response frame with Success flag set in response to the association request frame sent to APUT.<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.2.2 |
| **Referenced requirement(s)** | [V2G8-003] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_SECC_SUPPORTED_CHANNEL_LIST |

Table 24 lists the abstract test case description for 'TC_SECC_Advertising_004'.

**Table 24 — Abstract test case description for 'TC_SECC_Advertising_004'**

| | |
|---|---|
| **TC Id** | TC_SECC_Advertising_004 |

**Table 24** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether the probe response frames of the APUT contain the HT Capabilities element. If the channel of the APUT can be explicitly set, this test case shall be repeated for all supported channels by the APUT.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012 on one of the supported channels (PIXIT_SECC_SUPPORTED_CHANNEL_LIST).<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels according to ISO 15118-8:2020, Tables 1, 2.<br>NOTE National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (STA) sends a probe request frame according to the active scanning procedure as defined IEEE 802.11-2012 containing a valid VSE element with the following format:<br>ElementID: 'DD'H<br>Length: '07'H<br>OrganizationID: '70B3D53190'H<br>ElementType: '02'H<br>ETT: '0F'H<br><br>The test system then checks whether a probe response frame from the APUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11-2012 is received containing the HT capabilities element and whether APUT replies with association response frame with success flag set in response to the association request frame sent to APUT.<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.2.2 |
| **Referenced requirement(s)** | [V2G8-003] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_SECC_SUPPORTED_CHANNEL_LIST |

Table 25 lists the abstract test case description for 'TC_SECC_Advertising_005'.

**Table 25 — Abstract test case description for 'TC_SECC_Advertising_005'**

| | |
|---|---|
| **TC Id** | TC_SECC_Advertising_005 |
| **Test purpose** | This TC observes whether the association response frames of the APUT contain the HT capabilities element. If the channel of the APUT can be explicitly set, this test case shall be repeated for all supported channels by the APUT.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012 on one of the supported channels (PIXIT_SECC_SUPPORTED_CHANNEL_LIST).<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels according to ISO 15118-8:2020, Tables 1, 2.<br>NOTE National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (STA) sends an association request frame to the APUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11-2012 containing a valid VSE element with the following format:<br>ElementID: 'DD'H<br>Length: '07'H<br>OrganizationID: '70B3D53190'H<br>ElementType: '02'H<br>ETT: '0F'H<br><br>The test system then checks whether an association response frame from the APUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11-2012 is received containing the HT capabilities element and whether APUT replies with association response frame with success flag set in response to the association request frame sent to APUT.<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.2.2 |
| **Referenced requirement(s)** | [V2G8-003] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_SECC_SUPPORTED_CHANNEL_LIST |

Table 26 lists the abstract test case description for 'TC_SECC_Advertising_006'.

**Table 26 — Test case description for 'TC_SECC_Advertising_006'**

| | |
|---|---|
| **TC Id** | TC_SECC_Advertising_006 |
| **Test purpose** | This TC observes whether Beacon frames are sent by the APUT with T_beacon not exceeding 105 ms by the APUT in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012 on one of the supported channels (PIXIT_SECC_SUPPORTED_CHANNEL_LIST) in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>Test behaviour:<br>The test system (STA) captures at least 100 incoming Beacon frames from the APUT (PIXIT_CMN_MACADDR_2_4GHz) according to IEEE 802.11-2012 and checks whether the interval of 105 ms between two consecutive Beacon frames is not exceeded for the complete set of 100 samples.<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state.<br><br>NOTE The result of this test case is subject to environmental conditions such as interference from other transmissions on the selected channel or system load (e.g. high number of clients of the same access point). |
| **Document reference** | ISO 15118-8:2020, 7.2.2 |
| **Referenced requirement(s)** | [V2G8-004] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_SECC_SUPPORTED_CHANNEL_LIST |

Table 26 lists the abstract test case description for 'TC_SECC_Advertising_007'.

**Table 27 — Test case description for 'TC_SECC_Advertising_007'**

| | |
|---|---|
| **TC Id** | TC_SECC_Advertising_007 |

**Table 27** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether Beacon frames are sent by the APUT with T_beacon not exceeding 105 ms by the APUT in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012 on one of the supported channels (PIXIT_SECC_SUPPORTED_CHANNEL_LIST) in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 3 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (STA) captures at least 100 incoming Beacon frames from the APUT (PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11-2012 and checks whether the interval of 105 ms between two consecutive Beacon frames is not exceeded for the complete set of 100 samples.<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state.<br><br>NOTE 4 The result of this test case is subject to environmental conditions such as interference from other transmissions on the selected channel or system load (e.g. high number of clients of the same access point). |
| **Document reference** | ISO 15118-8:2020, 7.2.2 |
| **Referenced requirement(s)** | [V2G8-004] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |
| **PIXIT selection** | `PIXIT_CMN_MACADDR_5GHz`<br>`PIXIT_SECC_SUPPORTED_CHANNEL_LIST` |

Table 28 lists the abstract test case description for 'TC_SECC_BandSupport_001'.

**Table 28 — Abstract test case description for 'TC_SECC_BandSupport_001'**

| | |
|---|---|
| **TC Id** | `TC_SECC_BandSupport_001` |

**Table 28** *(continued)*

| | |
|---|---|
| **Test purpose** | In case the SECC supports WPT (PIXIT_CMN_ ETT), this TC observes whether concurrent dual band support is provided by the APUT.<br><br>Prerequisite:<br>The APUT implements support for WPT charging use case.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012 on any two supported channels (PIXIT_SECC_SUPPORTED_CHANNEL_LIST), but one in each of the 2,4 GHz according to ISO 15118-8:2020, Table 1 and 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels according to ISO 15118-8:2020, Tables 1, 2.<br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (STA) monitors all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 and 5 GHz band according to ISO 15118-8:2020, Table 2 (national/regional regulations can apply, see ISO 15118-8:2020, Annex D) and check if Beacon frames from the APUT (PIXIT_CMN_MACADDR_2_4GHz) in 2,4 GHz band and Beacon frames from the APUT (PIXIT_CMN_MACADDR_5GHz) in 5 GHz band are sent simultaneously. To check concurrent operation of both bands, Beacon frames from both addresses shall be received in some form of interleaving pattern for test verdict 'pass'.<br><br>Then the test system (STA) starts the association procedure with APUT addresses (PIXIT_CMN_MACADDR_2_4GHz and PIXIT_CMN_MACADDR_5GHz) by sending a probe request frame until receiving an association response frame according to IEEE 802.11-2012. To check concurrent operation of both bands, one association procedure shall be started before the other association procedure is finished, so that both association procedures significantly overlap in time for test verdict 'pass'.<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state.<br><br>NOTE 3 It is the test operator's discernment for the concurrency criteria which is used for the test verdict. |
| **Document reference** | ISO 15118-8:2020, 7.2.3 |
| **Referenced requirement(s)** | [V2G8-005] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |

**Table 28** *(continued)*

| | |
|---|---|
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_ ETT := 0000x1xx (Bitfield shall include WPT)<br>PIXIT_SECC_SUPPORTED_CHANNEL_LIST |

Table 29 lists the abstract test case description for 'TC_SECC_BandSupport_002'.

**Table 29 — Abstract test case description for 'TC_SECC_BandSupport_002'**

| | |
|---|---|
| **TC Id** | TC_SECC_BandSupport_002 |
| **Test purpose** | In case the SECC supports two or more power outlets at a time (PIXIT_SECC_NUMOUTLETS), this TC observes whether concurrent dual band support is provided by the APUT.<br><br>Prerequisite:<br>The APUT implements support for two or more power outlets at a time.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012 on any two supported channels (PIXIT_SECC_SUPPORTED_CHANNEL_LIST), but one in each of the 2,4 GHz band according to ISO 15118-8:2020, Table 1 and 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels according to ISO 15118-8:2020, Tables 1, 2.<br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (STA) monitors all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 and 5 GHz band according to ISO 15118-8:2020, Table 2 (national/regional regulations can apply, see ISO 15118-8:2020, Annex D) and check if Beacon frames from the APUT (PIXIT_CMN_MACADDR_2_4GHz) in 2,4 GHz band and Beacon frames from the APUT (PIXIT_CMN_MACADDR_5GHz) in 5 GHz band are sent simultaneously. To check concurrent operation of both bands, Beacon frames from both addresses shall be received in some form of interleaving pattern for test verdict 'pass'.<br><br>Then the test system (STA) starts an association procedure with APUT addresses (PIXIT_CMN_MACADDR_2_4GHz and PIXIT_CMN_MACADDR_5GHz) by sending a probe request frame until receiving an association response frame according to IEEE 802.11-2012. To check concurrent operation of both bands, one association procedure shall be started before the other association procedure is finished, so that both association procedures significantly overlap in time for test verdict 'pass'.<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state.<br><br>NOTE 3 It is the test operator's discernment for the concurrency criteria which is used for the test verdict. |

**Table 29** *(continued)*

| | |
|---|---|
| **Document reference** | ISO 15118-8:2020, 7.2.3 |
| **Referenced requirement(s)** | [V2G8-006] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |
| **PIXIT selection** | `PIXIT_CMN_MACADDR_2_4GHz`<br>`PIXIT_CMN_MACADDR_5GHz`<br>`PIXIT_SECC_NUMOUTLETS := multiple`<br>`PIXIT_SECC_SUPPORTED_CHANNEL_LIST` |

Table 30 lists the abstract test case description for 'TC_SECC_BandSupport_003'.

**Table 30 — Abstract test case description for 'TC_SECC_BandSupport_003'**

| | |
|---|---|
| **TC Id** | `TC_SECC_BandSupport_003` |
| **Test purpose** | In case the SECC controlling only one power outlet at a time (PIXIT_SECC_NUMOUTLETS), this TC observes whether 2,4 GHz band support according to ISO 15118-8:2020, Table 1 is provided by the APUT.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012 on one of the supported channels (PIXIT_SECC_SUPPORTED_CHANNEL_LIST) in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>Test behaviour:<br>The test system (STA) starts scanning all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1. The test system then checks whether Beacon frames from the APUT (PIXIT_CMN_MACADDR_2_4GHz) according to IEEE 802.11-2012 are received and whether APUT replies with association response frame with Success flag set in response to the association request frame sent to APUT.<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.2.3 |
| **Referenced requirement(s)** | [V2G8-007] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |

**Table 30** *(continued)*

| | |
|---|---|
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_SECC_NUMOUTLETS := one<br>PIXIT_CMN_ ETT := 0000x0xx (Bitfield shall NOT include WPT)<br>PIXIT_SECC_SUPPORTED_CHANNEL_LIST |

Table 31 lists the abstract test case description for 'TC_SECC_BandSupport_004'.

**Table 31 — Abstract test case description for 'TC_SECC_BandSupport_004'**

| | |
|---|---|
| **TC Id** | TC_SECC_BandSupport_004 |
| **Test purpose** | In case of an SECC controlling only one power outlet at a time (PIXIT_SECC_NUMOUTLETS), this TC observes whether 5 GHz band support according to ISO 15118-8:2020, Table 2 is provided by the APUT.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012 on one of the supported channels (PIXIT_SECC_SUPPORTED_CHANNEL_LIST) in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (STA) starts scanning all allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 3 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br>The test system then checks whether Beacon frames from the APUT (PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11-2012 are received and whether APUT replies with association response frame with success flag set in response to the association request frame sent to APUT.<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.2.3 |
| **Referenced requirement(s)** | [V2G8-007] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |

**Table 31** *(continued)*

| | |
|---|---|
| **PIXIT selection** | PIXIT_CMN_MACADDR_5GHz<br>PIXIT_SECC_NUMOUTLETS := one<br>PIXIT_CMN_ ETT := 0000x0xx (Bitfield shall NOT include WPT)<br>PIXIT_SECC_SUPPORTED_CHANNEL_LIST |

Table 32 lists the abstract test case description for 'TC_SECC_ChannelSupport_001'.

**Table 32 — Abstract test case description for 'TC_SECC_ChannelSupport_001'**

| | |
|---|---|
| **TC Id** | TC_SECC_ChannelSupport_001 |
| **Test purpose** | This TC observes whether a selected Channel ID is supported by the APUT. This TC shall be repeated for all supported channels ((PIXIT_SECC_SUPPORTED_CHANNEL_LIST) in the 2,4 GHz band according to ISO 15118-8:2020, Table 1, and the APUT shall behave correctly on at least three channels for test verdict 'pass'.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012 on one supported channel (PIXIT_SECC_CHANNEL_SELECTED) in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>Test behaviour:<br>The test system (STA) starts the scanning process in the 2,4 GHz band according to ISO 15118-8:2020, Table 1. The test system then checks whether Beacon frames from the APUT (PIXIT_CMN_MACADDR_2_4GHz) according to IEEE 802.11-2012 are received and whether connection can be successfully established on agreed channel (PIXIT_SECC_CHANNEL_SELECTED).<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.2.3 |
| **Referenced requirement(s)** | [V2G8-008] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_SECC_CHANNEL_SELECTED |

Table 33 lists the abstract test case description for 'TC_SECC_ChannelSupport_002'.

**Table 33 — Abstract test case description for 'TC_SECC_ChannelSupport_002'**

| | |
|---|---|
| **TC Id** | TC_SECC_ChannelSupport_002 |
| **Test purpose** | This TC observes whether a selected Channel ID is supported by the APUT. This TC shall be repeated for all supported channels ((PIXIT_SECC_SUPPORTED_CHANNEL_LIST) in the 5 GHz band according to ISO 15118-8:2020, Table 2 (national/regional regulations can apply, see ISO 15118-8:2020, Annex D) and the APUT shall behave correctly on at least three channels for test verdict 'pass'.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012 on one supported channel (PIXIT_SECC_CHANNEL_SELECTED) in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (STA) starts the scanning process in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 3 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br>The test system then checks whether Beacon frames from the APUT (PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11-2012 are received and whether connection can be successfully established on agreed channel (PIXIT_SECC_CHANNEL_SELECTED).<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.2.3 |
| **Referenced requirement(s)** | [V2G8-008] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_5GHz<br>PIXIT_SECC_CHANNEL_SELECTED |

Table 34 lists the abstract test case description for 'TC_SECC_VendorSpecificElement_001'.

**Table 34 — Abstract test case description for 'TC_SECC_VendorSpecificElement_001'**

| | |
|---|---|
| **TC Id** | TC_SECC_VendorSpecificElement_001 |

**Table 34** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether the Beacon frames of the APUT contain a well-formed VSE element. If the channel of the APUT can be explicitly set, this test case shall be repeated for all supported channels by the APUT.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012.<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels according to ISO 15118-8:2020, Tables 1, 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (STA) captures incoming frames and checks whether Beacon frames from the APUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11n are received containing a VSE with the following format:<br>ElementID: 'DD'H<br>Length: ('11'H .. 'FF'H)<br>OrganizationID: '70B3D53190'H<br>ElementType: '01'H<br>ETT: ett_value<br>Country Code: ?<br>OperatorID: ?<br>ChargingSiteID: ?<br>Additional Information (optional): *<br>and furthermore, compares the value of the length field with the number of bytes received starting from OrganizationID element up to and including Additional Information element.<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state.<br><br>NOTE 2 In case the Beacon frame includes multiple VSEs with or without OrganizationID: '70B3D53190'H the test system checks whether there is at least one VSE conforming to the format defined above. |
| **Document reference** | ISO 15118-8:2020, 7.2.6 |
| **Referenced requirement(s)** | [V2G8-018] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |

**Table 34** *(continued)*

| | |
|---|---|
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_ETT := ett_value |

Table 35 lists the abstract test case description for 'TC_SECC_VendorSpecificElement_002'.

**Table 35 — Abstract test case description for 'TC_SECC_VendorSpecificElement_002'**

| | |
|---|---|
| **TC Id** | TC_SECC_VendorSpecificElement_002 |

**Table 35** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether the probe response frames of the APUT contain a well-formed VSE element. If the channel of the APUT can be explicitly set, this test case shall be repeated for all supported channels by the APUT.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012.<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels according to ISO 15118-8:2020, Tables 1, 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (STA) sends a probe request frame according to active scanning procedure as defined IEEE 802.11-2012 containing a VSE with the following format:<br>ElementID: 'DD'H<br>Length: ('07'H)<br>OrganizationID: '70B3D53190'H<br>ElementType: '02'H<br>ETT: ett_value<br><br>The test system then checks whether a probe response frame from the APUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11-2012 is received containing a VSE with the following format:<br>ElementID: 'DD'H<br>Length: ('11'H .. 'FF'H)<br>OrganizationID: '70B3D53190'H<br>ElementType: '01'H<br>ETT: ett_value<br>Country Code: ?<br>OperatorID: ?<br>ChargingSiteID: ?<br>Additional Information (optional): *<br>and furthermore, compares the value of the length field with the number of bytes received starting from OrganizationID element up to and including Additional Information element.<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state.<br><br>NOTE 2 In case the probe response frame includes multiple VSEs with or without OrganizationID: '70B3D53190'H the test system checks whether there is at least one VSE conforming to the format defined above. |
| **Document reference** | ISO 15118-8:2020, 7.2.6 |
| **Referenced requirement(s)** | [V2G8-019] |

**Table 35** *(continued)*

| | |
|---|---|
| **Config Id** | CF_09_001 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_ETT := ett_value |

Table 36 lists the abstract test case description for 'TC_SECC_VendorSpecificElement_003'.

**Table 36 — Abstract test case description for 'TC_SECC_VendorSpecificElement_003'**

| | |
|---|---|
| **TC Id** | TC_SECC_VendorSpecificElement_003 |

**Table 36** *(continued)*

| | |
|---|---|
| **Test purpose** | In case the additional information element is sent by the APUT, this TC observes whether the Beacon frames of the APUT contain a well-formed additional information in the VSE element. If the channel of the APUT can be explicitly set, this test case shall be repeated for all supported channels by the APUT.<br><br>Prerequisite:<br>APUT implements Additional Information in VSE element in Beacon frames.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012.<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels according to ISO 15118-8:2020, Tables 1, 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (STA) captures incoming frames and checks whether Beacon frames from the APUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11n are received containing a VSE with additional information and with the following format:<br>ElementID: ?<br>Length: ?<br>OrganizationID: ?<br>ElementType: ?<br>ETT: ?<br>Country Code: ?<br>OperatorID: ?<br>ChargingSiteID: ?<br>Additional Information: addinf_value<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state.<br><br>NOTE 2 In case the Beacon frame includes multiple VSEs with or without Organization-ID: '70B3D53190'H the test system checks whether there is at least one VSE conforming to the format defined above. |
| **Document reference** | ISO 15118-8:2020, 7.2.6 |
| **Referenced requirement(s)** | [V2G8-020] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |

**Table 36** *(continued)*

| | |
|---|---|
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_ADDINF := addinf_value |

Table 37 lists the abstract test case description for 'TC_SECC_VendorSpecificElement_004'.

**Table 37 — Abstract test case description for 'TC_SECC_VendorSpecificElement_004'**

| | |
|---|---|
| **TC Id** | TC_SECC_VendorSpecificElement_004 |

**Table 37** *(continued)*

| | |
|---|---|
| **Test purpose** | In case the Additional Information element is sent by the APUT, this TC observes whether the probe response frames of the APUT contain a well-formed Additional Information in the VSE element. If the channel of the APUT can be explicitly set, this test case shall be repeated for all supported channels by the APUT.<br><br>Prerequisite:<br>APUT implements Additional Information in VSE element in probe response frames.<br><br>Pre-condition:<br>The APUT is ready to operate as an access point according to IEEE 802.11-2012.<br><br>The test system (STA) is initialized to a state, where it is configured as a STA without AP capability and ready to monitor Beacon frames from the APUT on all allowed channels according to ISO 15118-8:2020, Tables 1, 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (STA) sends a probe request frame according to active scanning procedure as defined IEEE 802.11-2012 containing a VSE with the following format:<br>ElementID: 'DD'H<br>Length: ('07'H)<br>OrganizationID: '70B3D53190'H<br>ElementType: '02'H<br>ETT: ett_value<br><br>The test system then checks whether a probe response frame from the APUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11-2012 is received containing a VSE with the following format:<br>ElementID: ?<br>Length: ?<br>OrganizationID: ?<br>ElementType: ?<br>ETT: ?<br>Country Code: ?<br>OperatorID: ?<br>ChargingSiteID: ?<br>Additional Information: addinf_value<br><br>Post-condition:<br>APUT and test system (STA) are reset to initial state.<br><br>NOTE 2 In case the probe response frame includes multiple VSEs with or without OrganizationID: '70B3D53190'H the test system checks whether there is at least one VSE conforming to the format defined above.<br><br>NOTE 3 According to [V2G8-020] in ISO 15118-8 the order of ETT and parameter values in the Additional Information element does not have an impact on the test verdict. |
| **Document reference** | ISO 15118-8:2020, 7.2.6 |
| **Referenced requirement(s)** | [V2G8-020] |

**Table 37** *(continued)*

| | |
|---|---|
| **Config Id** | CF_09_001 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_ADDINF := addinf_value |

## 8.3 EVCC test cases

Table 38 lists the abstract test case description for 'TC_EVCC_Scanning_001'.

**Table 38 — Abstract test case description for 'TC_EVCC_Scanning_001'**

| | |
|---|---|
| **TC Id** | TC_EVCC_Scanning_001 |

**Table 38** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether the STAUT establishes a connection to an AP.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association process according to IEEE 802.11-2012 on all allowed channels.<br><br>The test system is ready to operate as an access point according to IEEE 802.11-2012 supporting HT capabilities and HT operation on one of the allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 or 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (AP) starts sending Beacon frames and/or probe response frame according to IEEE 802.11-2012 with valid VSE element with the following format:<br>ElementID: 'DD'H<br>Length: '11'H<br>OrganizationID: '70B3D53190'H<br>ElementType: '01'H<br>ETT: '0F'H<br>Country Code: country_code<br>OperatorID: operator_id<br>ChargingSiteID: charging_site<br>on the channel selected by the test system (AP).<br><br>The test system (AP) then captures incoming frames and checks whether an association request frame from the STAUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz depdending on the selected channel) according to IEEE 802.11n is received.<br><br>Post-condition:<br>STAUT and test system (AP) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.3.2 |
| **Referenced requirement(s)** | [V2G8-023] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |

**Table 38** *(continued)*

| | |
|---|---|
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_COUNTRY_CODE := country_code<br>PIXIT_CMN_OPERATOR_ID := operator_id<br>PIXIT_CMN_CHARGING_SITE_ID := charging_site |

Table 39 lists the abstract test case description for 'TC_EVCC_Scanning_002'.

**Table 39 — Abstract test case description for 'TC_EVCC_Scanning_002'**

| | |
|---|---|
| **TC Id** | TC_EVCC_Scanning_002 |

**Table 39** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether the association request frames of the STAUT contain the HT Capabilities element. This test case shall be repeated for all allowed Channel IDs one after another in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 for a test verdict 'pass'.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association process according to IEEE 802.11-2012 on all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>The test system is ready to operate as an access point according to IEEE 802.11-2012 supporting HT Capabilities and HT Operation on one of the allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>Test behaviour:<br>The test system (AP) sends any Beacon frame and/or probe response frame according to IEEE 802.11-2012 with valid VSE element with the following format:<br>ElementID: 'DD'H<br>Length: '11'H<br>OrganizationID: '70B3D53190'H<br>ElementType: '01'H<br>ETT: '0F'H<br>Country Code: country_code<br>OperatorID: operator_id<br>ChargingSiteID: charging_site<br>on the channel selected by the test system (AP).<br><br>The test system (AP) then captures incoming frames and checks whether association request frames from the STAUT (PIXIT_CMN_MACADDR_2_4GHz) according to IEEE 802.11n are received containing the HT Capabilities element.<br><br>Post-condition:<br>STAUT and test system (AP) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.3.2 |
| **Referenced requirement(s)** | [V2G8-024] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |

**Table 39** *(continued)*

| | |
|---|---|
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_COUNTRY_CODE := country_code<br>PIXIT_CMN_OPERATOR_ID := operator_id<br>PIXIT_CMN_CHARGING_SITE_ID := charging_site |

Table 40 lists the abstract test case description for 'TC_EVCC_Scanning_003'.

**Table 40 — Abstract test case description for 'TC_EVCC_Scanning_003'**

| | |
|---|---|
| **TC Id** | TC_EVCC_Scanning_003 |

**Table 40** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether the association request frames of the STAUT contain the HT Capabilities element. This test case shall be repeated for all allowed Channel IDs one after another in the 5 GHz band according to ISO 15118-8:2020, Table 2 (national/regional regulations can apply, see ISO 15118-8:2020, Annex D) for test verdict 'pass'.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association process according to IEEE 802.11-2012 on all allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system is ready to operate as an access point according to IEEE 802.11-2012 supporting HT Capabilities and HT Operation on one of the allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (AP) sends any Beacon frame and/or probe response frame according to IEEE 802.11-2012 with valid VSE element with the following format:<br>ElementID: 'DD'H<br>Length: '11'H<br>OrganizationID: '70B3D53190'H<br>ElementType: '01'H<br>ETT: '0F'H<br>Country Code: country_code<br>OperatorID: operator_id<br>ChargingSiteID: charging_site<br>on the channel selected by the test system (AP).<br><br>The test system (AP) then captures incoming frames and checks whether association request frames from the STAUT (PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11n are received containing the HT Capabilities.<br><br>Post-condition:<br>STAUT and test system (AP) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.3.2 |
| **Referenced requirement(s)** | [V2G8-024] |
| **Config Id** | CF_09_001 |
| **PICS selection** | |

**Table 40** *(continued)*

| | |
|---|---|
| **PIXIT selection** | PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_COUNTRY_CODE := country_code<br>PIXIT_CMN_OPERATOR_ID := operator_id<br>PIXIT_CMN_CHARGING_SITE_ID := charging_site |

Table 41 lists the abstract test case description for 'TC_EVCC_Scanning_004'.

**Table 41 — Abstract test case description for 'TC_EVCC_Scanning_004'**

| | |
|---|---|
| **TC Id** | TC_EVCC_Scanning_004 |
| **Test purpose** | This TC observes whether the probe request frames of the STAUT contain the HT Capabilities element. This test case shall be repeated for all allowed Channel IDs one after another in the 2,4 GHz according to ISO 15118-8:2020, Table 1 for a test verdict 'pass'.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association process through active scanning (PIXIT_EVCC_SCANNING_MODE) according to IEEE 802.11-2012 on all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>The test system is ready to monitor probe request frames from the STAUT on one of the allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>Test behaviour:<br>The test system captures incoming frames on the channel selected by the test system and checks whether probe request frames according to IEEE 802.11n are received from the STAUT (PIXIT_CMN_MACADDR_2_4GHz) containing the HT Capabilities element.<br><br>Post-condition:<br>STAUT and test system are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.3.2 |
| **Referenced requirement(s)** | [V2G8-024] |
| **Config Id** | CF_09_002 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_COUNTRY_CODE := country_code<br>PIXIT_CMN_OPERATOR_ID := operator_id<br>PIXIT_CMN_CHARGING_SITE_ID := charging_site<br>PIXIT_EVCC_SCANNING_MODE := active |

Table 42 lists the abstract test case description for 'TC_EVCC_Scanning_005'.

**Table 42 — Abstract test case description for 'TC_EVCC_Scanning_005'**

| | |
|---|---|
| **TC Id** | TC_EVCC_Scanning_005 |
| **Test purpose** | This TC observes whether the probe request frames of the STAUT contain the HT Capabilities element. This test case shall be repeated for all allowed Channel IDs one after another in the 5 GHz according to ISO 15118-8:2020, Table 2 (national/regional regulations can apply, see ISO 15118-8:2020, Annex D) for test verdict 'pass'.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the Association process through active scanning (PIXIT_EVCC_SCANNING_MODE) according to IEEE 802.11-2012 on all allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system is ready to monitor probe request frames from the STAUT on one of the allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system captures incoming frames on the channel selected by the test system and checks whether probe request frames according to IEEE 802.11n are received from the STAUT (PIXIT_CMN_MACADDR_5GHz) containing the HT Capabilities element.<br><br>Post-condition:<br>STAUT and test system are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.3.2 |
| **Referenced requirement(s)** | [V2G8-024] |
| **Config Id** | CF_09_002 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_COUNTRY_CODE := country_code<br>PIXIT_CMN_OPERATOR_ID := operator_id<br>PIXIT_CMN_CHARGING_SITE_ID := charging_site<br>PIXIT_EVCC_SCANNING_MODE := active |

Table 43 lists the abstract test case description for 'TC_EVCC_Scanning_006'.

**Table 43 — Abstract test case description for 'TC_EVCC_Scanning_006'**

| | |
|---|---|
| **TC Id** | TC_EVCC_Scanning_006 |

**Table 43** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether passive scanning is performed by the STAUT for one selected Channel ID. This test case shall be performed for one allowed Channel ID in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 for a test verdict 'pass'.<br><br>Prerequisite:<br>The STAUT implemented passive scanning mode.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association process through passive scanning (PIXIT_EVCC_SCANNING_MODE) according to IEEE 802.11-2012 on all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>The test system is ready to operate as an access point according to IEEE 802.11-2012 supporting HT Capabilities and HT Operation on one of the allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>Test behaviour:<br>The test system (AP) starts sending Beacon frames according to IEEE 802.11-2012 with valid VSE element with the following format:<br>ElementID: 'DD'H<br>Length: '11'H<br>OrganizationID: '70B3D53190'H<br>ElementType: '01'H<br>ETT: '0F'H<br>Country Code: country_code<br>OperatorID: operator_id<br>ChargingSiteID: charging_site<br>on the channel selected by the test system (AP).<br><br>The test system (AP) captures incoming frames and checks whether an association request frame from the STAUT (PIXIT_CMN_MACADDR_2_4GHz) according to IEEE 802.11n is received. The test system (AP) also checks that no probe request frame from the STAUT (PIXIT_CMN_MACADDR_2_4GHz) according to IEEE 802.11n is received.<br><br>Post-condition:<br>STAUT and test system (AP) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.3.2 |
| **Referenced requirement(s)** | [V2G8-025] |
| **Config Id** | CF_09_002 |
| **PICS selection** | |

**Table 43** *(continued)*

| | |
|---|---|
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_COUNTRY_CODE := country_code<br>PIXIT_CMN_OPERATOR_ID := operator_id<br>PIXIT_CMN_CHARGING_SITE_ID := charging_site<br>PIXIT_EVCC_SCANNING_MODE := passive |

Table 44 lists the abstract test case description for 'TC_EVCC_Scanning_007'.

**Table 44 — Abstract test case description for 'TC_EVCC_Scanning_007'**

| | |
|---|---|
| **TC Id** | TC_EVCC_Scanning_007 |

**Table 44** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether passive scanning is performed by the STAUT for one selected Channel ID. This test case shall be performed for one allowed Channel ID in the 5 GHz band according to ISO 15118-8:2020, Table 2 (national/regional regulations can apply, see ISO 15118-8:2020, Annex D) for test verdict 'pass'.<br><br>Prerequisite:<br>The STAUT implemented passive scanning mode.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association process through passive scanning (PIXIT_EVCC_SCANNING_MODE) according to IEEE 802.11-2012 on all allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system is ready to operate as an access point according to IEEE 802.11-2012 supporting HT Capabilities and HT Operation on one of the allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (AP) starts sending Beacon frames according to IEEE 802.11-2012 with valid VSE element with the following format:<br>ElementID: 'DD'H<br>Length: '11'H<br>OrganizationID: '70B3D53190'H<br>ElementType: '01'H<br>ETT: '0F'H<br>Country Code: country_code<br>OperatorID: operator_id<br>ChargingSiteID: charging_site<br>on the channel selected by the test system (AP).<br><br>The test system (AP) captures incoming frames and checks whether an association request frame from the STAUT (PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11n is received. The test system (AP) also checks that no probe request frame from the STAUT (PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11n is received.<br><br>Post-condition:<br>STAUT and test system (AP) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.3.2 |
| **Referenced requirement(s)** | [V2G8-025] |
| **Config Id** | CF_09_002 |
| **PICS selection** | |

**Table 44** *(continued)*

| | |
|---|---|
| **PIXIT selection** | PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_COUNTRY_CODE := country_code<br>PIXIT_CMN_OPERATOR_ID := operator_id<br>PIXIT_CMN_CHARGING_SITE_ID := charging_site<br>PIXIT_EVCC_SCANNING_MODE := passive |

Table 45 lists the abstract test case description for 'TC_EVCC_Scanning_008'.

**Table 45 — Abstract test case description for 'TC_EVCC_Scanning_008'**

| | |
|---|---|
| **TC Id** | TC_EVCC_Scanning_008 |
| **Test purpose** | This TC observes whether active scanning is performed by the STAUT for one selected Channel ID in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>Prerequisite:<br>The STAUT implemented active scanning mode.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association process through active scanning (PIXIT_EVCC_SCANNING_MODE) according to IEEE 802.11-2012 on all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>The test system is ready to monitor probe request frames from the STAUT on one of the allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>Test behaviour:<br>The test system captures incoming frames on the channel selected by the test system and checks whether probe request frames according to IEEE 802.11n are received from the STAUT (PIXIT_CMN_MACADDR_2_4GHz).<br><br>Post-condition:<br>STAUT and test system are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.3.2 |
| **Referenced requirement(s)** | [V2G8-025] |
| **Config Id** | CF_09_002 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_EVCC_SCANNING_MODE := active |

Table 46 lists the abstract test case description for 'TC_EVCC_Scanning_009'.

**Table 46 — Abstract test case description for 'TC_EVCC_Scanning_009'**

| | |
|---|---|
| **TC Id** | TC_EVCC_Scanning_009 |

**Table 46** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether active scanning is performed by the STAUT for one selected Channel ID in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Prerequisite:<br>The STAUT implemented active scanning mode.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association process through active scanning (PIXIT_EVCC_SCANNING_MODE) according to IEEE 802.11-2012 on all allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system is ready to monitor probe request frames from STAUT on one of the allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 3 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system captures incoming frames on the channel selected by the test system and checks whether probe request frames according to IEEE 802.11n are received from the STAUT (PIXIT_CMN_MACADDR_5GHz).<br><br>Post-condition:<br>STAUT and test system are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.3.2 |
| **Referenced requirement(s)** | [V2G8-025] |
| **Config Id** | CF_09_002 |
| **PICS selection** | |
| **PIXIT selection** | `PIXIT_CMN_MACADDR_5GHz`<br>`PIXIT_EVCC_SCANNING_MODE := active` |

Table 47 lists the abstract test case description for ' TC_EVCC_BandSupport_001'.

**Table 47 — Abstract test case description for 'TC_EVCC_BandSupport_001'**

| | |
|---|---|
| **TC Id** | `TC_EVCC_BandSupport_001` |

**Table 47** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether a selected Channel ID is scanned through passive scanning method by the STAUT in the 2,4 GHz band. This test case shall be repeated for all allowed Channel IDs one after another in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 for test verdict 'pass'.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association process according to IEEE 802.11-2012 on all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>The test system is ready to operate as an access point according to IEEE 802.11-2012 supporting HT Capabilities and HT Operation on one of the allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>Test behaviour:<br>The test system (AP) starts sending Beacon frames according to IEEE 802.11-2012 with valid VSE element with the following format:<br>ElementID: 'DD'H<br>Length: '11'H<br>OrganizationID: '70B3D53190'H<br>ElementType: '01'H<br>ETT: '0F'H<br>Country Code: country_code<br>OperatorID: operator_id<br>ChargingSiteID: charging_site<br>on the channel selected by the test system (AP).<br><br>The test system (AP) captures incoming frames and checks whether an association request frame from the STAUT (PIXIT_CMN_MACADDR_2_4GHz) according to IEEE 802.11n is received. The test system (AP) also checks that no probe request frame from the STAUT (PIXIT_CMN_MACADDR_2_4GHz) according to IEEE 802.11n is received.<br><br>Post-condition:<br>STAUT and test system (AP) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.3.3 |
| **Referenced requirement(s)** | [V2G8-026] → pass if successful for at least one allowed channel, fail otherwise<br>[V2G8-027] → pass if successful for all allowed channels, fail otherwise<br>[V2G8-028] → pass if successful for all allowed channels, fail otherwise |
| **Config Id** | CF_09_002 |
| **PICS selection** | |

**Table 47** *(continued)*

| | |
|---|---|
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_COUNTRY_CODE := country_code<br>PIXIT_CMN_OPERATOR_ID := operator_id<br>PIXIT_CMN_CHARGING_SITE_ID := charging_site<br>PIXIT_EVCC_SCANNING_MODE := passive |

Table 48 lists the abstract test case description for ' TC_EVCC_BandSupport_002'.

**Table 48 — Abstract test case description for 'TC_EVCC_BandSupport_002'**

| | |
|---|---|
| **TC Id** | TC_EVCC_BandSupport_002 |

**Table 48** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether a selected Channel ID is scanned through passive scanning by the STAUT in the 5 GHz band. This test case shall be repeated for all allowed Channel IDs one after another in the 5 GHz band according to ISO 15118-8:2020, Table 2 (national/ regional regulations can apply, see ISO 15118-8:2020, Annex D) for test verdict 'pass'.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association process according to IEEE 802.11-2012 on all allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system is ready to operate as an access point according to IEEE 802.11-2012 supporting HT Capabilities and HT Operation on one of the allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (AP) starts sending Beacon frames according to IEEE 802.11-2012 with valid VSE element with the following format:<br>ElementID: 'DD'H<br>Length: '11'H<br>OrganizationID: '70B3D53190'H<br>ElementType: '01'H<br>ETT: '0F'H<br>Country Code: country_code<br>OperatorID: operator_id<br>ChargingSiteID: charging_site<br>on the channel selected by the test system (AP).<br><br>The test system (AP) captures incoming frames and checks whether an association request frame from the STAUT (PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11n is received. The test system (AP) also checks that no probe request frame from the STAUT (PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11n is received.<br><br>Post-condition:<br>STAUT and test system (AP) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.3.3 |
| **Referenced requirement(s)** | [V2G8-026] → pass if successful for at least one allowed channel, fail otherwise<br>[V2G8-027] → pass if successful for all allowed channels, fail otherwise<br>[V2G8-028] → pass if successful for all allowed channels, fail otherwise |
| **Config Id** | CF_09_002 |

**Table 48** *(continued)*

| | |
|---|---|
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_COUNTRY_CODE := country_code<br>PIXIT_CMN_OPERATOR_ID := operator_id<br>PIXIT_CMN_CHARGING_SITE_ID := charging_site<br>PIXIT_EVCC_SCANNING_MODE := passive |

Table 49 lists the abstract test case description for ' TC_EVCC_BandSupport_003'.

**Table 49 — Abstract test case description for 'TC_EVCC_BandSupport_003'**

| | |
|---|---|
| **TC Id** | TC_EVCC_BandSupport_003 |

**Table 49** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether a selected Channel ID is scanned through active scanning method by the STAUT in the 2,4 GHz band. This test case shall be repeated for all allowed Channel IDs one after another in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 for test verdict 'pass'.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association process according to IEEE 802.11-2012 on all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>The test system is ready to operate as an access point according to IEEE 802.11-2012 supporting HT Capabilities and HT Operation on one of the allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1.<br><br>Test behaviour:<br>The test system captures incoming frames on the channel selected by the test system and checks whether probe request frames according to IEEE 802.11n are received from the STAUT (PIXIT_CMN_MACADDR_2_4GHz).<br><br>If a probe request frame according to IEEE 802.11n is received from the STAUT (PIXIT_CMN_MACADDR_2_4GHz) by the test system (AP), it shall respond with a probe response frame according to IEEE 802.11-2012 with a valid VSE element with the following format:<br>ElementID: 'DD'H<br>Length: '11'H<br>OrganizationID: '70B3D53190'H<br>ElementType: '01'H<br>ETT: '0F'H<br>Country Code: country_code<br>OperatorID: operator_id<br>ChargingSiteID: charging_site<br>on the channel selected by the test system (AP).<br><br>The test system (AP) captures incoming frames and checks whether an association request frame from the STAUT (PIXIT_CMN_MACADDR_2_4GHz) according to IEEE 802.11n is received.<br><br>Post-condition:<br>STAUT and test system (AP) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.3.3 |

**Table 49** *(continued)*

| | |
|---|---|
| **Referenced requirement(s)** | [V2G8-026] → pass if successful for at least one allowed channel, fail otherwise<br>[V2G8-027] → pass if successful for all allowed channels, fail otherwise<br>[V2G8-028] → pass if successful for all allowed channels, fail otherwise |
| **Config Id** | CF_09_002 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_COUNTRY_CODE := country_code<br>PIXIT_CMN_OPERATOR_ID := operator_id<br>PIXIT_CMN_CHARGING_SITE_ID := charging_site<br>PIXIT_EVCC_SCANNING_MODE := active |

Table 50 lists the abstract test case description for ' TC_EVCC_BandSupport_004'.

**Table 50 — Abstract test case description for 'TC_EVCC_BandSupport_004'**

| | |
|---|---|
| **TC Id** | TC_EVCC_BandSupport_004 |

**Table 50** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether a selected Channel ID is scanned by the STAUT in the 5 GHz band. This test case shall be repeated for all allowed Channel IDs one after another in the 5 GHz band according to ISO 15118-8:2020, Table 2 (national/regional regulations can apply, see ISO 15118-8:2020, Annex D) for test verdict 'pass'.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association process according to IEEE 802.11-2012 on all allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system is ready to operate as an access point according to IEEE 802.11-2012 supporting HT Capabilities and HT Operation on one of the allowed channels in the 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system captures incoming frames on the channel selected by the test system and checks whether probe request frames according to IEEE 802.11n are received from the STAUT (PIXIT_CMN_MACADDR_5GHz).<br><br>If a probe request frame according to IEEE 802.11n is received from the STAUT (PIXIT_CMN_MACADDR_5GHz) by the test system (AP), it shall respond with a probe response frame according to IEEE 802.11-2012 with a valid VSE element with the following format:<br>ElementID: 'DD'H<br>Length: '11'H<br>OrganizationID: '70B3D53190'H<br>ElementType: '01'H<br>ETT: '0F'H<br>Country Code: country_code<br>OperatorID: operator_id<br>ChargingSiteID: charging_site<br>on the channel selected by the test system (AP).<br><br>The test system (AP) captures incoming frames and checks whether an association request frame from the STAUT (PIXIT_CMN_MACADDR_5GHz) according to IEEE 802.11n is received.<br><br>Post-condition:<br>STAUT and test system (AP) are reset to initial state. |
| **Document reference** | ISO 15118-8:2020, 7.3.3 |

**Table 50** *(continued)*

| | |
|---|---|
| **Referenced requirement(s)** | [V2G8-026] → pass if successful for at least one allowed channel, fail otherwise<br>[V2G8-027] → pass if successful for all allowed channels, fail otherwise<br>[V2G8-028] → pass if successful for all allowed channels, fail otherwise |
| **Config Id** | CF_09_002 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_COUNTRY_CODE := country_code<br>PIXIT_CMN_OPERATOR_ID := operator_id<br>PIXIT_CMN_CHARGING_SITE_ID := charging_site<br>PIXIT_EVCC_SCANNING_MODE := active |

Table 51 lists the abstract test case description for 'TC_EVCC_VendorSpecificElement_001'.

**Table 51 — Abstract test case description for 'TC_EVCC_VendorSpecificElement_001'**

| | |
|---|---|
| **TC Id** | TC_EVCC_VendorSpecificElement_001 |

**Table 51** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether the association request frames of the STAUT contain a well-formed VSE element.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association process according to IEEE 802.11-2012 on all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 or 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system is ready to operate as an access point according to IEEE 802.11-2012 supporting HT Capabilities and HT Operation on one of the allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 or 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (AP) starts sending Beacon frames according to IEEE 802.11-2012 with valid VSE element with the following format:<br>ElementID: 'DD'H<br>Length: '11'H<br>OrganizationID: '70B3D53190'H<br>ElementType: '01'H<br>ETT: '0F'H<br>Country Code: country_code<br>OperatorID: operator_id<br>ChargingSiteID: charging_site<br>on the channel selected by the test system (AP).<br><br>If a probe request frame according to IEEE 802.11n is received from the STAUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz depdending on the selected channel) by the test system (AP), it shall respond with a probe response frame according to IEEE 802.11-2012 with a valid VSE element as described above for the Beacon frame.<br><br>The test system (AP) captures incoming frames on the channel selected by the test system (AP) and checks whether association request frames according to IEEE 802.11n are received from the STAUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz depdending on the selected channel) containing a VSE with the following format:<br>ElementID: 'DD'H<br>Length: ('07'H .. 'FF'H)<br>OrganizationID: '70B3D53190'H<br>ElementType: '02'H<br>ETT: ett_value<br>Additional Information (optional): *<br>and furthermore, compares the value of the length field with the number of bytes received starting from OrganizationID element up to and including Additional Information element.<br><br>Post-condition:<br>STAUT and test system (AP) are reset to initial state.<br><br>NOTE 3 In case the association request frame includes multiple VSEs with or without OrganizationID: '70B3D53190'H the test system checks whether there is at least one VSE conforming to the format defined above.<br><br>NOTE 4 According to ISO 15118-8:2020, [V2G8-020] the order of ETT and parameter values in the Additional Information element does not have an impact on the test verdict. |
| **Document reference** | ISO 15118-8:2020, 7.3.5 |
| **Referenced requirement(s)** | [V2G8-031] |

**Table 51** *(continued)*

| | |
|---|---|
| **Config Id** | CF_09_002 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_COUNTRY_CODE := country_code<br>PIXIT_CMN_OPERATOR_ID := operator_id<br>PIXIT_CMN_CHARGING_SITE_ID := charging_site<br>PIXIT_CMN_ETT := ett_value |

Table 52 lists the abstract test case description for 'TC_EVCC_VendorSpecificElement_002'.

**Table 52 — Abstract test case description for 'TC_EVCC_VendorSpecificElement_002'**

| | |
|---|---|
| **TC Id** | TC_EVCC_VendorSpecificElement_002 |

**Table 52** *(continued)*

| | |
|---|---|
| **Test purpose** | This TC observes whether the probe request frames of the STAUT contain a well-formed VSE element.<br><br>Prerequisite:<br>No prerequisite.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association through active scanning (PIXIT_EVCC_SCANNING_MODE) according to IEEE 802.11-2012 on all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 or 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system is ready to operate as an access point according to IEEE 802.11-2012 supporting HT Capabilities and HT Operation on one of the allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 or 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (AP) captures incoming frames on the channel selected by the test system (AP) and checks whether probe request frames according to IEEE 802.11n are received from the STAUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz depdending on the selected channel) containing a VSE with the following format:<br>ElementID: 'DD'H<br>Length: ('07'H .. 'FF'H)<br>OrganizationID: '70B3D53190'H<br>ElementType: '02'H<br>ETT: ett_value<br>Additional Information (optional): *<br>and furthermore, compares the value of the length field with the number of bytes received starting from OrganizationID element up to and including Additional Information element.<br><br>Post-condition:<br>STAUT and test system (AP) are reset to initial state.<br><br>NOTE 3 In case the probe request frame includes multiple VSEs with or without OrganizationID: '70B3D53190'H the test system checks whether there is at least one VSE conforming to the format defined above. |
| **Document reference** | ISO 15118-8:2020, 7.3.5 |
| **Referenced requirement(s)** | [V2G8-033] |
| **Config Id** | CF_09_002 |
| **PICS selection** | |

**Table 52** *(continued)*

| | |
|---|---|
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_ETT := ett_value<br>PIXIT_EVCC_SCANNING_MODE := active |

Table 53 lists the abstract test case description for 'TC_EVCC_VendorSpecificElement_003'.

**Table 53 — Abstract test case description for 'TC_EVCC_VendorSpecificElement_003'**

| | |
|---|---|
| **TC Id** | TC_EVCC_VendorSpecificElement_003 |

**Table 53** *(continued)*

| | |
|---|---|
| **Test purpose** | In case the Additional Information element is sent by the STAUT, this TC observes whether the association request frames of the STAUT contain a well-formed Additional Information in the VSE element.<br><br>Prerequisite:<br><br>STAUT implemented Additional Information in VSE element in association request frames.<br><br>Pre-condition:<br><br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the association process according to IEEE 802.11-2012 on all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 or 5 GHz band according to ISO 15118-8:2020, Table 2.<br><br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system is ready to operate as an access point according to IEEE 802.11-2012 supporting HT Capabilities and HT Operation on one of the allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 or 5 GHz band according to ISO 15118-8:2020, Table 2.<br><br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br><br>The test system (AP) starts sending Beacon frames according to IEEE 802.11-2012 with valid VSE element with the following format:<br><br>ElementID: 'DD'H<br>Length: '11'H<br>OrganizationID: '70B3D53190'H<br>ElementType: '01'H<br>ETT: '0F'H<br>Country Code: country_code<br>OperatorID: operator_id<br>ChargingSiteID: charging_site<br>on the channel selected by the test system (AP).<br><br>If a probe request frame according to IEEE 802.11n is received from the STAUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz depdending on the selected channel) by the test system (AP), it shall respond with a probe response frame according to IEEE 802.11-2012 with a valid VSE element as described above for the Beacon frame.<br><br>The test system (AP) captures incoming frames on the channel selected by the test system (AP) and checks whether association request frames according to IEEE 802.11n are received from the STAUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz depdending on the selected channel) containing a VSE with the following format:<br>ElementID: ?<br>Length: ?<br>OrganizationID: ?<br>ElementType: ?<br>ETT: ?<br>Additional Information: addinf_value<br><br>Post-condition:<br><br>STAUT and test system (AP) are reset to initial state.<br><br>Test system needs to consider the interoperability with SUT for the values of PIXIT_CMN_COUNTRY_CODE, PIXIT_CMN_OPERATOR_ID, and PIXIT_CMN_CHARGING_SITE_ID depending on the implementation, intended market, or testing purposes of the SUT.<br><br>NOTE 3 In case the association request frame includes multiple VSEs with or without OrganizationID: '70B3D53190'H the test system checks whether there is at least one VSE conforming to the format defined above.<br><br>NOTE 4 According to ISO 15118-8:2020, [V2G8-034] the order of ETT and parameter values in the Additional Information element does not have an impact on the test verdict. |
| **Document reference** | ISO 15118-8:2020, 7.3.5 |

**Table 53** *(continued)*

| | |
|---|---|
| **Referenced requirement(s)** | [V2G8-034] |
| **Config Id** | CF_09_002 |
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_COUNTRY_CODE := country_code<br>PIXIT_CMN_OPERATOR_ID := operator_id<br>PIXIT_CMN_CHARGING_SITE_ID := charging_site<br>PIXIT_CMN_ADDINF := addinf_value |

Table 54 lists the abstract test case description for 'TC_EVCC_VendorSpecificElement_004'.

**Table 54 — Abstract test case description for 'TC_EVCC_VendorSpecificElement_004'**

| | |
|---|---|
| **TC Id** | TC_EVCC_VendorSpecificElement_004 |

**Table 54** *(continued)*

| | |
|---|---|
| **Test purpose** | In case the Additional Information element is sent by the STAUT, this TC observes whether the probe request frames of the STAUT contain a well-formed Additional Information in the VSE element.<br><br>Prerequisite:<br>STAUT implemented Additional Information in VSE element in probe request frames.<br><br>Pre-condition:<br>The STAUT is initialized to a state, where it is configured as a STA without AP capability and ready to start the Association through active scanning (PIXIT_EVCC_SCANNING_MODE) according to IEEE 802.11-2012 on all allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 or 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 1 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>The test system is ready to operate as an access point according to IEEE 802.11-2012 supporting HT Capabilities and HT Operation on one of the allowed channels in the 2,4 GHz band according to ISO 15118-8:2020, Table 1 or 5 GHz band according to ISO 15118-8:2020, Table 2.<br>NOTE 2 National/regional regulations can apply. See ISO 15118-8:2020, Annex D.<br><br>Test behaviour:<br>The test system (AP) captures incoming frames on the channel selected by the test system (AP) and checks whether probe request frames according to IEEE 802.11n are received from the STAUT (PIXIT_CMN_MACADDR_2_4GHz or PIXIT_CMN_MACADDR_5GHz depdending on the selected channel) containing a VSE with the following format:<br>ElementID: ?<br>Length: ?<br>OrganizationID: ?<br>ElementType: ?<br>ETT: ?<br>Additional Information: addinf_value<br><br>Post-condition:<br>STAUT and test system (AP) are reset to initial state.<br><br>NOTE 3 In case the probe request frame includes multiple VSEs with or without OrganizationID: '70B3D53190'H the test system checks whether there is at least one VSE conforming to the format defined above.<br><br>NOTE 4 According to ISO 15118-8:2020, [V2G8-034] the order of ETT and parameter values in the Additional Information element does not have an impact on the test verdict. |
| **Document reference** | ISO 15118-8:2020, 7.3.5 |
| **Referenced requirement(s)** | [V2G8-034] |
| **Config Id** | CF_09_002 |

**Table 54** *(continued)*

| | |
|---|---|
| **PICS selection** | |
| **PIXIT selection** | PIXIT_CMN_MACADDR_2_4GHz<br>PIXIT_CMN_MACADDR_5GHz<br>PIXIT_CMN_ADDINF := addinf_value<br>PIXIT_EVCC_SCANNING_MODE := active |

# Bibliography

[1] ITU-T X.290:1995[3], *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications — General concepts*

[2] ITU-T X.292:2002[4], *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications — The Tree and Tabular Combined Notation (TTCN)*

3) Available at https://www.itu.int/rec/T-REC-X.290-199504-I/en.

4) Available at https://www.itu.int/rec/T-REC-X.292-200205-I/en