



**Universal Mobile Telecommunications System (UMTS);  
LTE;  
Internet Protocol (IP) multimedia call control protocol based on  
Session Initiation Protocol (SIP)  
and Session Description Protocol (SDP);  
User Equipment (UE) conformance specification;  
Part 3: Abstract test suite (ATS)  
(3GPP TS 34.229-3 version 15.4.0 Release 15)**



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**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

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Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C  
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## Foreword

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## Introduction

The present document is 3<sup>rd</sup> part of a multi-part conformance test specification for UE and is *valid for 3GPP Release 5 and above*. The specification contains a TTCN design frame work and the detailed test specifications in TTCN for the UE conformance at the Gm reference point.

3GPP TS 34.229-1 [5] contains a conformance test description in prose.

3GPP TS 34.229-2 [6] contains a pro-forma for the UE Implementation Conformance Statement (ICS).

3GPP TS 34.229-3 the present document.

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# 1 Scope

The present document specifies the protocol conformance testing in TTCN for the 3GPP User Equipment (UE) at the Gm interface.

The present document is the 3<sup>rd</sup> part of a multi-part test specification, 3GPP TS 34.229. The following TTCN test specification and design considerations can be found in the present document:

- the overall test suite structure;
- the testing architecture;
- the test methods and PCO definitions;
- the test configurations;
- the design principles, assumptions, and used interfaces to the TTCN tester (System Simulator);
- TTCN styles and conventions;
- the partial PIXIT proforma;
- the TTCN files for the mentioned protocols tests.

The Abstract Test Suites designed in the document are based on the test cases specified in prose (3GPP TS 34.229-1 [5]).

The present document is valid for UE implemented according 3GPP Releases starting from Release 5 up to the Release indicated on the cover page of the present document.

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document unless the context in which the reference is made suggests a different Release is relevant (information on the applicable release in a particular context can be found in e.g. test case title, description or applicability, message description or content).

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 34.123-1: "User Equipment (UE) conformance specification; Part 1: Protocol conformance specification".
- [3] 3GPP TS 34.123-2: "User Equipment (UE) conformance specification; Part 2: Implementation Conformance Statement (ICS) proforma specification".
- [4] 3GPP TS 34.123-3: "User Equipment (UE) conformance specification; Part 3: Abstract Test Suites (ATS)".
- [5] 3GPP TS 34.229-1: "Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification".

- [6] 3GPP TS 34.229-2: "Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); User Equipment (UE) conformance specification; Part 2: Implementation Conformance Statement (ICS) specification".
- [7] 3GPP TS 34.108: "Common test environments for User Equipment (UE) conformance testing".
- [8] ISO/IEC 9646-1: "Information technology - Open systems interconnection - Conformance testing methodology and framework - Part 1: General concepts".
- [9] ISO/IEC 9646-7: "Information technology - Open systems interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".
- [10] ETSI ETS 300 406 (1995): "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".
- [11] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".
- [12] ETSI ES 201 873: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3".
- [13] IETF RFC 3320: "Signalling Compression (SigComp)".
- [14] IETF RFC 3485: "The Session Initiation Protocol (SIP) and Session Description Protocol (SDP) Static Dictionary for Signalling Compression (SigComp)".
- [15] IETF RFC 3486: "Compressing the Session Initiation Protocol (SIP)".
- [16] IETF RFC 3261: "SIP: Session Initiation Protocol".
- [17] IETF RFC 4566: "SDP: Session Description Protocol".
- [18] IETF RFC 1035: "Domain names - implementation and specification".
- [19] IETF RFC 1533: "DHCP Options and BOOTP Vendor Extensions".
- [20] IETF RFC 2131: "Dynamic Host Configuration Protocol".
- [21] IETF RFC 3315: "Dynamic Host Configuration Protocol for Ipv6 (DHCPv6)".
- [22] IETF RFC 3319: "Dynamic Host Configuration Protocol (DHCPv6) Options for Session Initiation Protocol (SIP) Servers".
- [23] IETF RFC 3361: "Dynamic Host Configuration Protocol (DHCP-for-Ipv4) Option for Session Initiation Protocol (SIP) Servers".
- [24] IETF RFC 3680: "A Session Initiation Protocol (SIP) Event Package for Registrations".
- [25] 3GPP TS 24.173: "IMS multimedia telephony communication service and supplementary services; Stage 3".
- [26] IETF RFC 4825: "The Extensible Markup Language (XML) Configuration Access Protocol (XCAP)".
- [27] IETF RFC 2616: "Hypertext Transfer Protocol – HTTP/1.1".
- [28] 3GPP TS 36.523-1: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification".
- [29] 3GPP TS 36.523-2: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification; Part 2: Implementation Conformance Statement (ICS) proforma specification".
- [30] 3GPP TS 36.523-3: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification; Part 3: Test suites".



- [31] 3GPP TS 36.508: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); Common test environments for User Equipment (UE) conformance testing".
- [32] 3GPP TS 24.173: "IMS Multimedia telephony communication service and supplementary services; Stage 3".
- [33] 3GPP TS 24.109: "Bootstrapping interface (Ub) and network application function interface (Ua); Protocol details".
- [34] 3GPP TS 33.220: "Generic Authentication Architecture (GAA); Generic Bootstrapping Architecture".
- [35] 3GPP TS 33.222: "Generic Authentication Architecture (GAA); Access to network application functions using Hypertext Transfer Protocol over Transport Layer Security (HTTPS)".
- [36] 3GPP TS 24.623: "Extensible Markup Language (XML) Configuration Access Protocol (XCAP) over the Ut interface for Manipulating Supplementary Services".
- [37] RFC 2617: "HTTP Authentication: Basic and Digest Access Authentication".
- [38] RFC 3966: "The tel URI for Telephone Numbers".
- [39] RFC 2141: "URN Syntax".
- [40] 3GPP TS 24.604: "Communication Diversion (CDIV) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [41] 3GPP TS 24.607: "Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [42] 3GPP TS 24.608: "Terminating Identification Presentation (TIP) and Terminating Identification Restriction (TIR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [43] 3GPP TS 24.611: "Anonymous Communication Rejection (ACR) and Communication Barring (CB) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [44] IETF RFC 4119 "A Presence-based GEOPRIV Location Object Format".
- [45] IETF RFC 4575: "A Session Initiation Protocol (SIP) Event Package for Conference State".
- [46] IETF RFC 5628: "Registration Event Package Extension for Session Initiation Protocol (SIP) Globally Routable User Agent URIs (GRUUs)".
- [47] IETF RFC 3863 "Presence Information Data Format (PIDF)".
- [48] IETF RFC 4745: "Common Policy: A Document Format for Expressing Privacy Preferences".
- [49] 3GPP TS 27.007: "AT command set for 3G User Equipment (UE)".
- [50] 3GPP TS 34.229-4: "User Equipment (UE) conformance specification; Part 4: Enabler for IP multimedia applications testing".
- [51] 3GPP TS 24.237: "IP Multimedia (IM) Core Network (CN) subsystem IP Multimedia Subsystem (IMS) Service Continuity".
- [52] 3GPP TS 31.121: "UICC-terminal interface; Universal Subscriber Identity Module (USIM) application test specification".
- [53] 3GPP TS 24.390: "Unstructured Supplementary Service Data (USSD) using IP Multimedia (IM) Core Network (CN) subsystem IMS".
- [54] 3GPP TS 38.523-3: "5GS; UE conformance specification; Part 3: Protocol Test Suites".

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## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and 3GPP TS 34.229-1 [5] apply.

### 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and 3GPP TS 34.229-1 [5] apply.

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## 4 Requirements on the TTCN development

A number of requirements are identified for the development and production of TTCN specification for 3GPP UE at the Gm reference point.

1. Top-down design, following 3GPP 34.229-1 [5], 3GPP TS 34.123-1 [2], 3GPP TS 34.108 [7].
2. A unique testing architecture and test method for testing all protocol layers of UE.
3. Uniform TTCN style and naming conventions.
4. Improve TTCN readability.
5. Using TTCN-3 (ES 201 873-1 [12]).
6. TTCN specification feasible, implementable and compilable.
7. Test cases shall be designed in a way for easily adaptable, upwards compatible with the evolution of the 3GPP core specifications and the future Releases.
8. The test declarations, data structures and data values shall be largely reusable.
9. Modularity and modular working method.
10. Minimizing the requirements of intelligence on the emulators of the lower testers.
11. Giving enough design freedom to the test equipment manufacturers.
12. Maximizing reuse of RFC BNF definitions from the relevant IETF core specifications.

In order to fulfil these requirements and to ensure the investment of the test equipment manufacturers having a stable testing architecture for a relatively long period, a unique testing architecture and test method are applied to the 3GPP UE protocol tests.

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## 5 Test method and test model

### 5.1 Test method

### 5.2 IMS CC test model

The test model over E-UTRA is shown in Figure 5.2-1a, the test model over UTRAN is shown in figure 5.2-1b, the test model over WLAN is shown in figure 5.2-1c, the test model over fixed access is shown in figure 5.2-1d (NOTE: the IPsec is not used by this model), and the test model over NR5GC is shown in Figure 5.2-1e.

The IMS CC test cases are executed on top of the multi-testers test model according to TS 36.523-3 [30] for E-UTRA, TS 34.123-3 [4] clause 6A for UTRAN and TS 38.523-3 [54] for NR5GC.

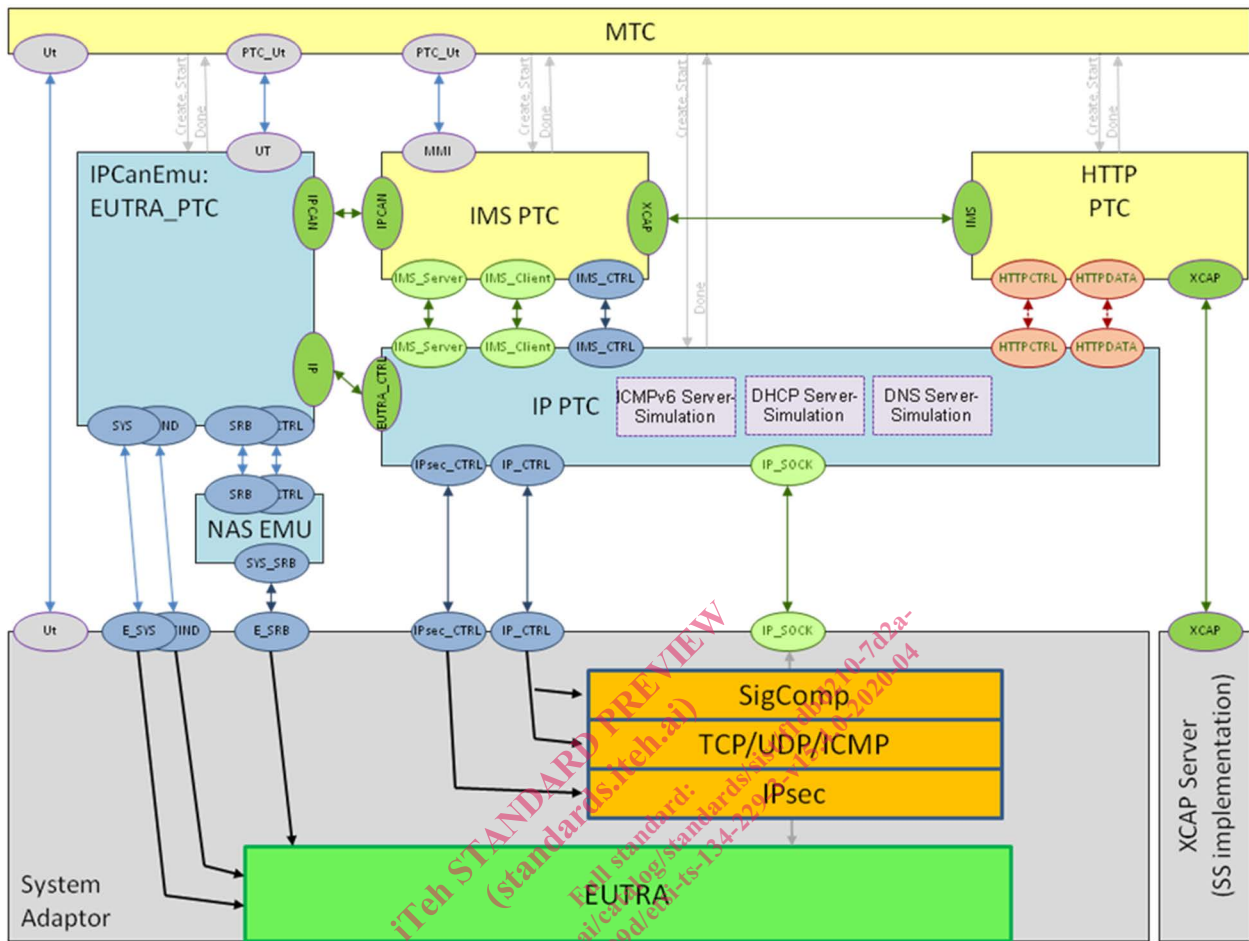


Figure 5.2-1a: Multi-Testers Test Model to support E-UTRA SS interface

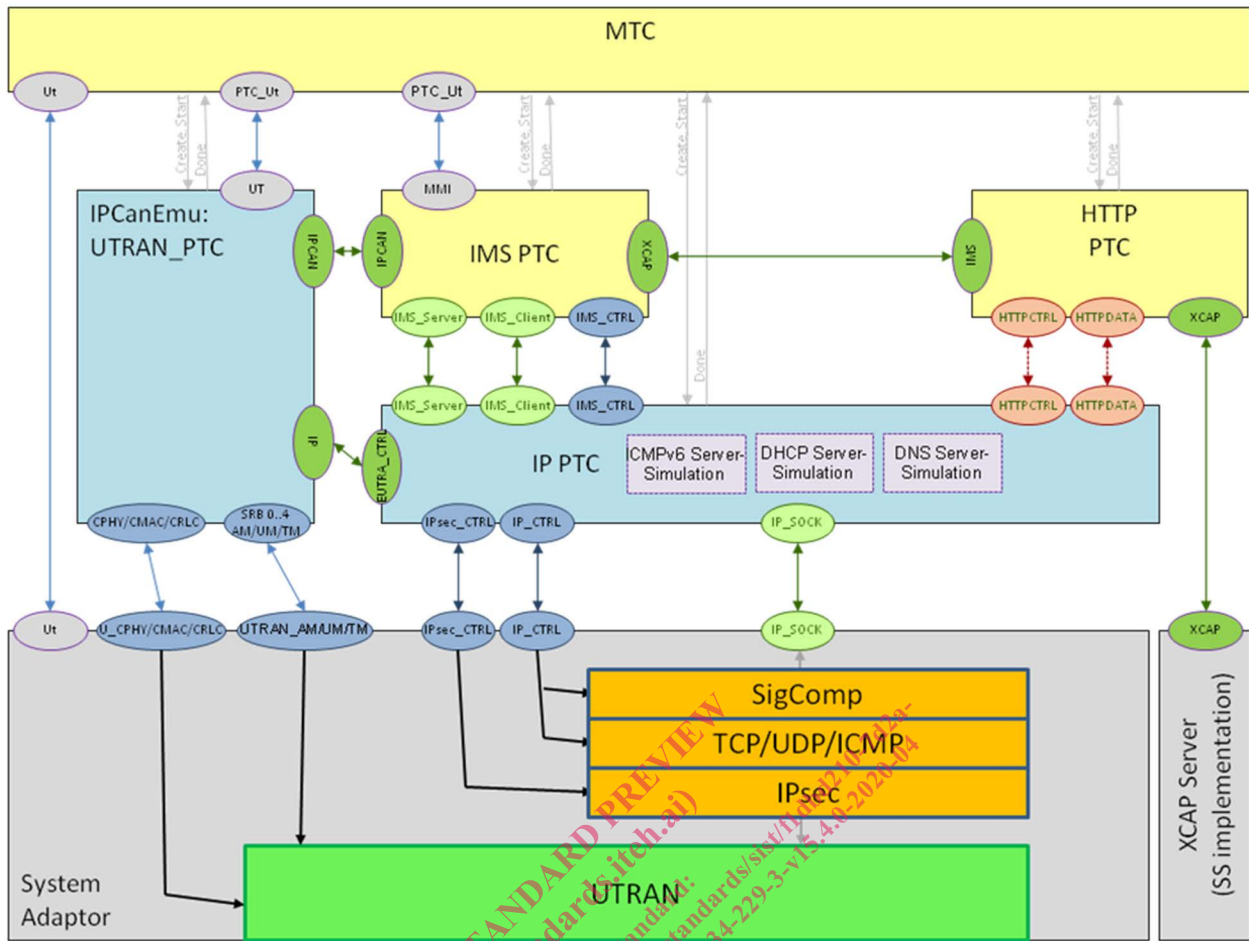


Figure 5.2-1b: Multi-Testers Test Model to support UTRAN SS interface

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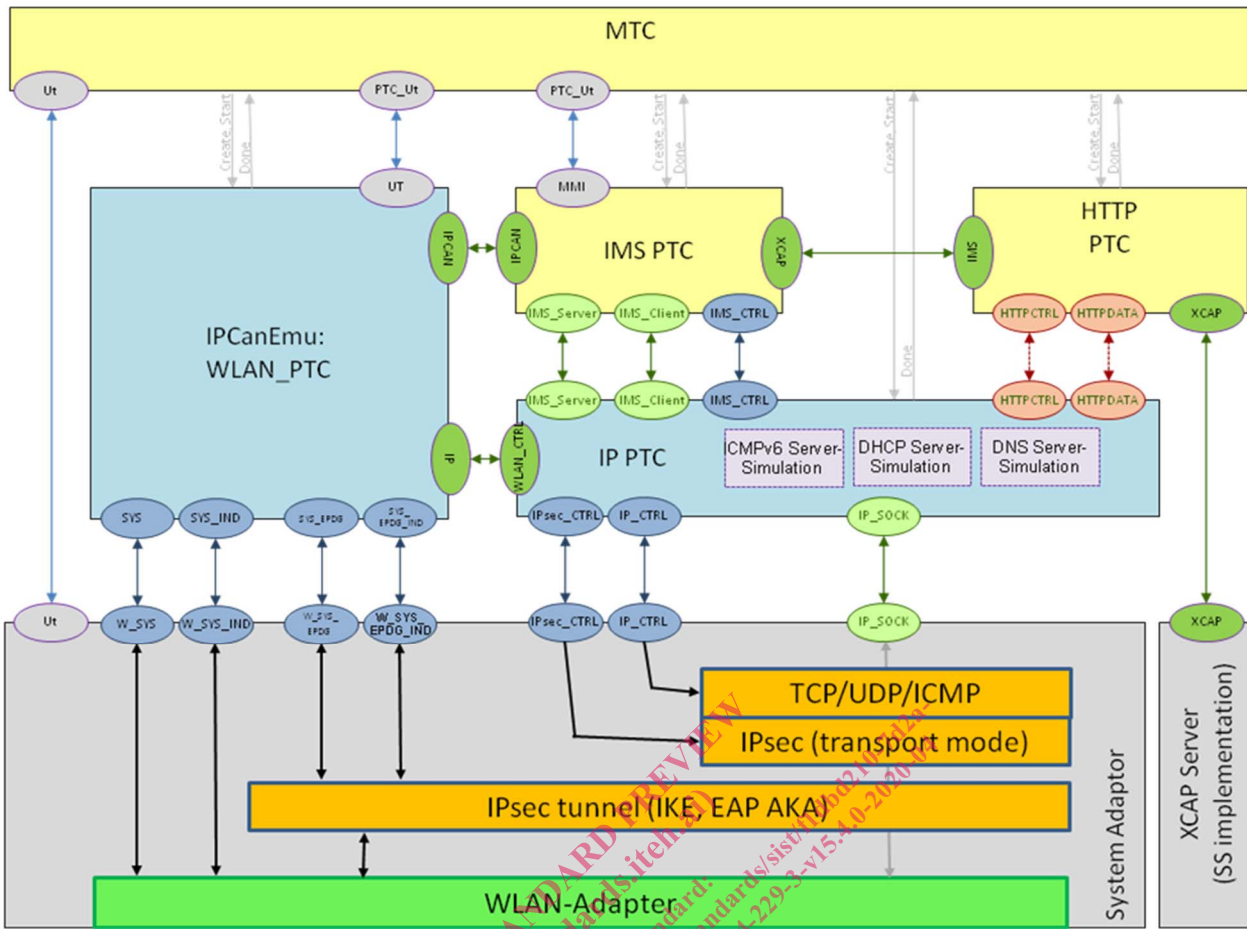


Figure 5.2-1c: Multi-Testers Test Model to support WLAN SS interface

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