
**Road vehicles — Media Oriented
Systems Transport (MOST) —**

**Part 7:
Data link layer conformance test plan**

Véhicules routiers — Système de transport axé sur les médias —

Partie 7: Plan d'essais de conformité de la couche de liaison de données

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 ISO documents 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).

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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.

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 31, *Data communication*.

A list of all parts in the ISO 21806 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.

Introduction

The Media Oriented Systems Transport (MOST) communication technology was initially developed at the end of the 1990s in order to support complex audio applications in cars. The MOST Cooperation was founded in 1998 with the goal to develop and enable the technology for the automotive industry. Today, MOST¹⁾ enables the transport of high quality of service (QoS) audio and video together with packet data and real-time control to support modern automotive multimedia and similar applications. MOST is a function-oriented communication technology to network a variety of multimedia devices comprising one or more MOST nodes.

[Figure 1](#) shows a MOST network example.

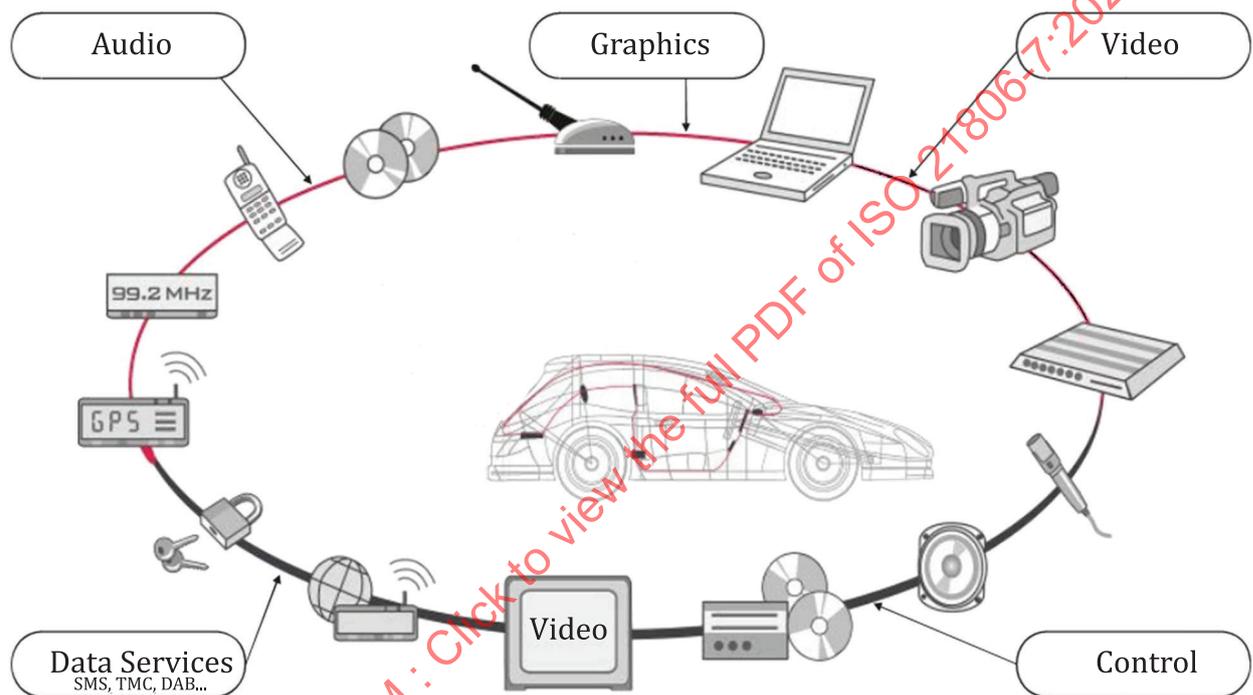


Figure 1 — MOST network example

The MOST communication technology provides:

- synchronous and isochronous streaming,
- small overhead for administrative communication control,
- a functional and hierarchical system model,
- API standardization through a function block (FBlock) framework,
- free partitioning of functionality to real devices,
- service discovery and notification, and
- flexibly scalable automotive-ready Ethernet communication according to ISO/IEC/IEEE 8802-3^[2].

MOST is a synchronous time-division-multiplexing (TDM) network that transports different data types on separate channels at low latency. MOST supports different bit rates and physical layers. The network clock is provided with a continuous data signal.

1) MOST® is the registered trademark of Microchip Technology Inc. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO.

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Within the synchronous base data signal, the content of multiple streaming connections and control data is transported. For streaming data connections, bandwidth is reserved to avoid interruptions, collisions, or delays in the transport of the data stream.

MOST specifies mechanisms for sending anisochronous, packet-based data in addition to control data and streaming data. The transmission of packet-based data is separated from the transmission of control data and streaming data. None of them interfere with each other.

A MOST network consists of devices that are connected to one common control channel and packet channel.

In summary, MOST is a network that has mechanisms to transport the various signals and data streams that occur in multimedia and infotainment systems.

The ISO standards maintenance portal (<https://standards.iso.org/iso/>) provides references to MOST specifications implemented in today's road vehicles because easy access via hyperlinks to these specifications is necessary. It references documents that are normative or informative for the MOST versions 4V0, 3V1, 3V0, and 2V5.

The ISO 21806 series has been established in order to specify requirements and recommendations for implementing the MOST communication technology into multimedia devices and to provide conformance test plans for implementing related test tools and test procedures.

To achieve this, the ISO 21806 series is based on the open systems interconnection (OSI) basic reference model in accordance with ISO/IEC 7498-1^[1] and ISO/IEC 10731^[3], which structures communication systems into seven layers as shown in [Figure 2](#). Stream transmission applications use a direct stream data interface (transparent) to the data link layer.

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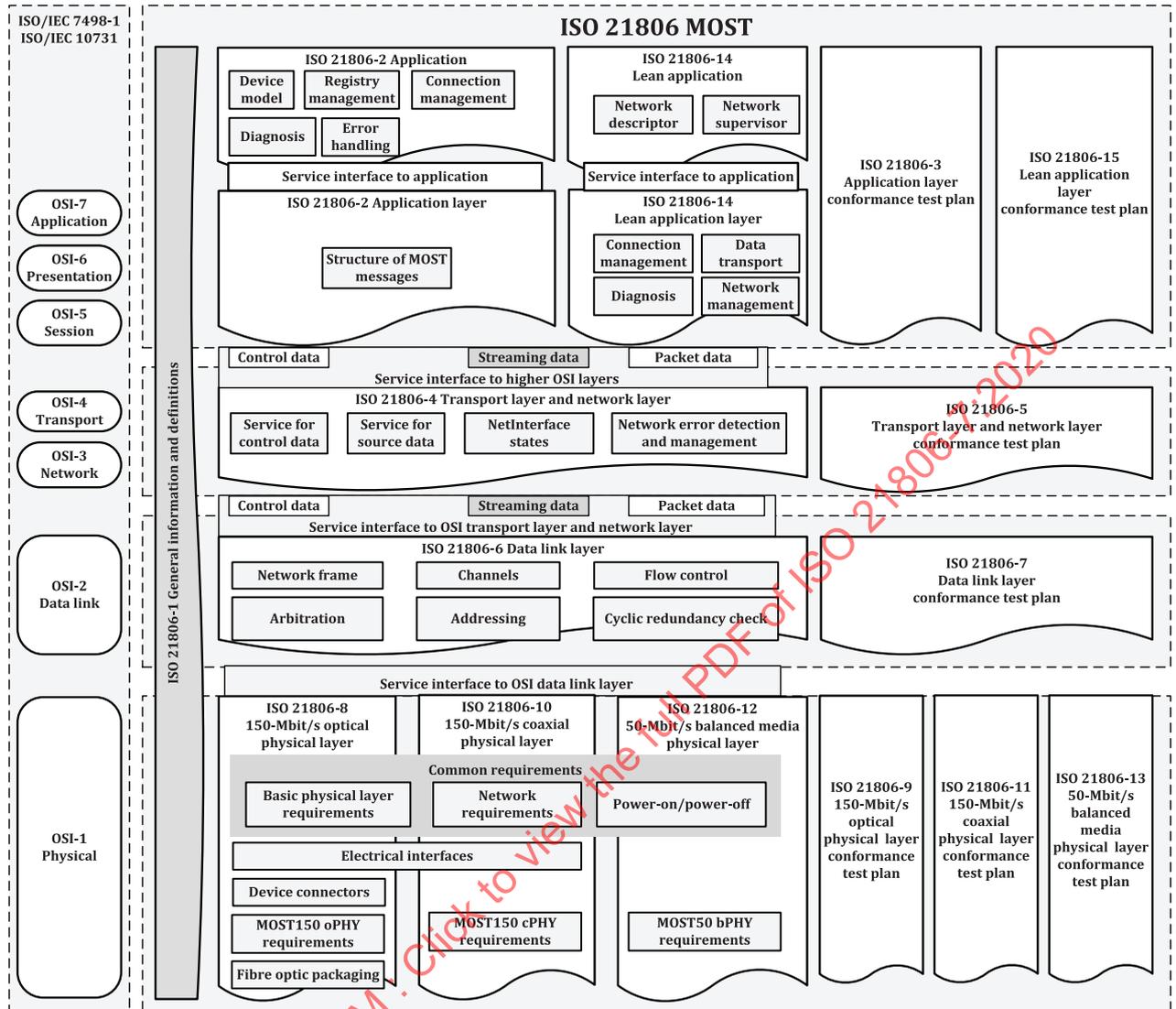


Figure 2 — The ISO 21806 series reference according to the OSI model

The International Organization for Standardization (ISO) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent.

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Road vehicles — Media Oriented Systems Transport (MOST) —

Part 7: Data link layer conformance test plan

1 Scope

This document specifies the conformance test plan (CTP) for the data link layer for MOST, a synchronous time-division-multiplexing network, as specified in ISO 21806-6.

This document specifies conformance test cases (CTCs) in the following categories:

- network frames;
- allocation channel;
- protected system channel;
- timestamp channel;
- flow control;
- cyclic redundancy check;
- arbitration;
- default packet channel.

Interoperability testing is not in the scope of this document.

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/IEC 9646-1, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 1: General concepts*

ISO 21806-1, *Road vehicles — Media Oriented Systems Transport (MOST) — Part 1: General information and definitions*

ISO 21806-6, *Road vehicles — Media Oriented Systems Transport (MOST) — Part 6: Data link layer*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 21806-1, ISO 21806-6, ISO/IEC 9646-1, and the following apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 REPEAT

pseudo code command for an iteration

3.2 REPEAT END

pseudo code command for ending an iteration

4 Symbols and abbreviated terms

4.1 Symbols

---	empty cell/undefined
N_{PBC}	packet bandwidth control
N_{TNBPF}	total number of bytes per frame

4.2 Abbreviated terms

For the purposes of this document, the abbreviated terms given in ISO 21806-1, ISO 21806-6, and the following apply.

CACK	CRC acknowledge
CTC	conformance test case
CTP	conformance test plan
IUT	implementation under test
LSb	least significant bit
LT	lower tester
MSb	most significant bit
OSI	Open Systems Interconnection
PACK	pre-emptive acknowledge
SOAF	start of allocation frame
UT	upper tester

5 Conventions

This document is based on OSI service conventions as specified in ISO/IEC 10731^[3] and ISO/IEC 9646-1 for conformance test system set-up.

6 CTP overview

6.1 Test set-up

All CTCs are based on the same test set-up with an upper tester (UT) and a lower tester (LT). The LT contains the lower tester pre-IUT (LT pre-IUT) and the lower tester post-IUT (LT post-IUT).

Figure 3 specifies the test set-up.

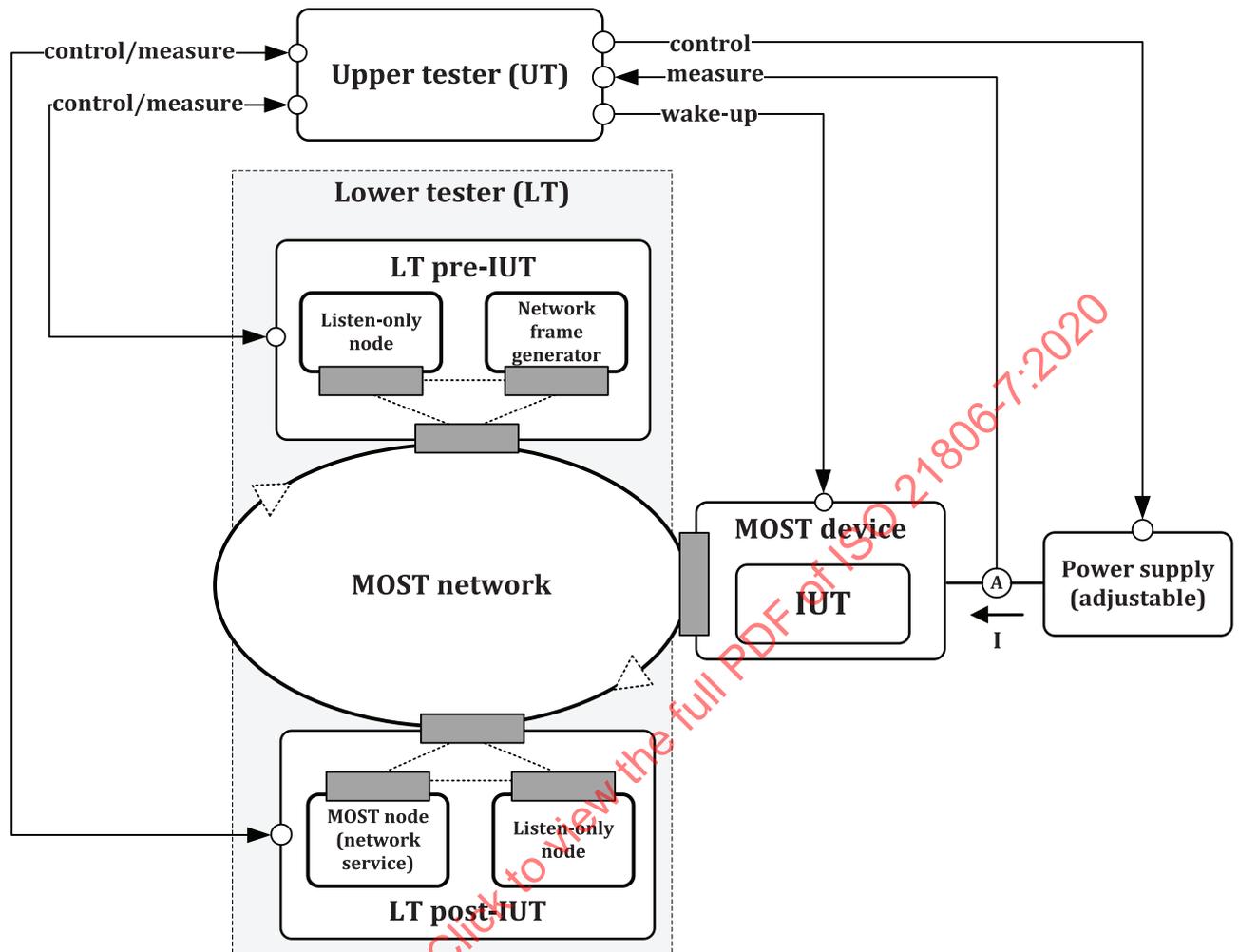


Figure 3 — Test set-up

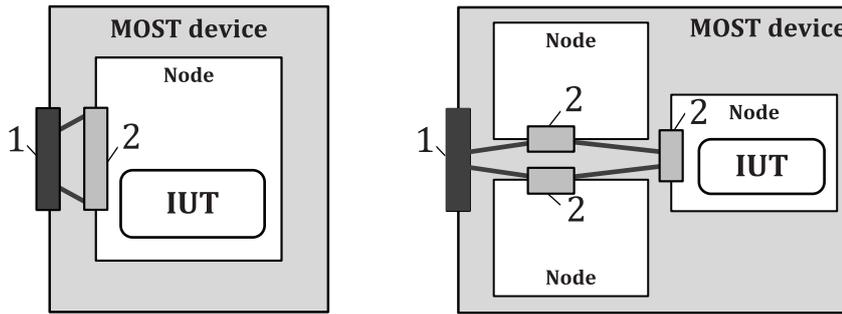
Every CTC specifies the roles of the LT pre-IUT and the LT post-IUT.

During testing of the MOST device that implements the IUT, avoid over-temperature by following the manufacturer recommendations regarding cooling.

The power supply of the MOST device that contains the IUT is adjustable and the power consumption can be monitored by the UT. This is necessary to determine whether a node enters `s_NetInterface_Sleep`.

A MOST device contains one or more nodes, which are connected to an external MOST physical interface. One of the nodes contains the implementation under test (IUT). All tests and timings, specified by the CTP, are related to the external MOST physical interface.

Figure 4 shows a MOST device with one node and a MOST device with three nodes.



Key

- 1 external MOST physical interface
- 2 internal MOST physical interface

Figure 4 — MOST device with one node and MOST device with three nodes

6.2 Conformance test plan organisation

CTCs are independent of one another. Each CTC checks the behaviour of the IUT for requirements stated in ISO 21806-6. Within CTCs, which require variations of individual parameters, each specified value of the parameter is iterated.

7 CTP general information

The following network frame elements require no initiative by the IUT and are observable in the MOST network during black box testing:

- a) network frame indicators:
 - PREAMBLE;
 - START;
 - END.
- b) system flags;
- c) node counter;
- d) visible nodes value;
- e) packet bandwidth control (N_{PBC});
- f) network frame data bytes:
 - control frame PACK and CACK;
 - packet frame PACK and CACK;
 - Ethernet frame PACK and CACK.
- g) allocation frame:
 - SOAF;
 - allocation-defend frame;
 - arbitration-result frame.

8 CTC specification

8.1 Network frame CTCs

8.1.1 CTC_7.1-1 – PREAMBLE test

[Table 1](#) specifies the CTC_7.1-1 – PREAMBLE test.

Table 1 — CTC_7.1-1 – PREAMBLE test

Item	Content
CTC # - Title	CTC_7.1-1 – PREAMBLE test
Purpose	This CTC verifies that a network frame consists of a network indicator of type PREAMBLE, indicating the start of the network frame, followed by a number of data bytes. This test applies to all MOST devices.
Reference	ISO 21806-6:2020: REQ 2.63 DLL – Network frame – PREAMBLE
Prerequisite	Ring closed
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster or a TimingSlave; — If the IUT is part of a MOST device that does not contain the TimingMaster, the LT pre-IUT shall be the TimingMaster; — If the IUT is part of a MOST device that contains the TimingMaster, the LT pre-IUT shall be a TimingSlave; — The LT post-IUT shall be a listen-only node.
Step	<ol style="list-style-type: none"> 1. The LT post-IUT shall acquire at least one network frame. 2. The UT shall determine the presence of exactly one PREAMBLE in the network frame. 3. The UT shall determine the presence of data bytes after the PREAMBLE by examining the visible nodes value, taken from the network frame.
Iteration	Not applicable
Expected response	<p>Step 3: IUT ok: within the duration of a network frame, the PREAMBLE appears once. The PREAMBLE is followed by data bytes.</p> <p>Step 2: IUT not ok (1): within the duration of a network frame, the PREAMBLE does not appear.</p> <p>Step 2: IUT not ok (2): within the duration of a network frame, the PREAMBLE appears more than once.</p> <p>Step 3: IUT not ok (3): after the PREAMBLE, no data bytes follow.</p>
Remark	---

8.1.2 CTC_7.1-2 – General bit order test

[Table 2](#) specifies the general bit order test.

Table 2 — CTC_7.1-2 – General bit order test

Item	Content
CTC # - Title	CTC_7.1-2 – General bit order test
Purpose	This CTC verifies that the correct order is present for data bytes in the network frame that are supposed to be transmitted in most significant bit (MSb) first order. This CTC applies to all MOST devices.
Reference	ISO 21806-6:2020: REQ 2.64 DLL – Network frame – General bit order
Prerequisite	Ring closed

Table 2 (continued)

Item	Content
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster or a TimingSlave. — If the IUT is part of a MOST device that does not contain the TimingMaster, the LT pre-IUT shall be the TimingMaster. — If the IUT is part of a MOST device that contains the TimingMaster, the LT pre-IUT shall be a TimingSlave. — The LT post-IUT shall be a listen-only node.
Step	<ol style="list-style-type: none"> 1. The LT post-IUT shall acquire one complete network frame. 2. The UT shall determine the bit order of the visible nodes value, taken from the network frame.
Iteration	Not applicable
Expected response	Step 2: IUT ok: the bit order of the visible nodes value is MSb. Step 2: IUT not ok (1): the bit order of the visible nodes value is not MSb.
Remark	---

8.1.3 CTC_7.1-3 – Node counter bit order test

Table 3 specifies the node counter bit order test.

Table 3 — CTC_7.1-3 – Node counter bit order test

Item	Content
CTC # - Title	CTC_7.1-3 – Node counter bit order test
Purpose	This CTC verifies that the correct order is present for the node counter in the network frame that is supposed to be transmitted in least significant bit (LSb) first order. This CTC applies to all MOST devices.
Reference	ISO 21806-6:2020: REQ 2.65 DLL – Network frame – Node counter bit order
Prerequisite	Ring closed
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster or a TimingSlave. — If the IUT is part of a MOST device that does not contain the TimingMaster, the LT pre-IUT shall be the TimingMaster. — If the IUT is part of a MOST device that contains the TimingMaster, the LT pre-IUT shall be a TimingSlave. — The LT post-IUT shall be a listen-only node.
Step	<ol style="list-style-type: none"> 1. The LT post-IUT shall acquire one complete network frame. 2. The UT shall determine the bit order of the node counter value, taken from the network frame.
Iteration	Not applicable
Expected response	Step 2: IUT ok: the bit order of the node counter value is LSb. Step 2: IUT not ok: the bit order of the node counter value is not LSb.
Remark	---

8.2 Allocation channel CTCs

8.2.1 CTC_7.2-1 – Allocation words

Table 4 specifies the allocation words test.

Table 4 — CTC_7.2-1 – Allocation words

Item	Content
CTC # - Title	CTC_7.2-1 – Allocation words
Purpose	This CTC verifies the existence and completeness of the allocation frame. This CTC applies to all MOST devices.
Reference	ISO 21806-6:2020: REQ 2.66 DLL – Allocation channel – Allocation words
Prerequisite	Ring closed
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster or a TimingSlave. — If the IUT is part of a MOST device that does not contain the TimingMaster, the LT pre-IUT shall be the TimingMaster. — If the IUT is part of a MOST device that contains the TimingMaster, the LT pre-IUT shall be a TimingSlave. — The LT post-IUT shall be a listen-only node.
Step	<ol style="list-style-type: none"> 1. The LT post-IUT shall acquire as many network frames as necessary to obtain a complete allocation frame. 2. The UT shall determine whether the correct amount of allocation words (N_{TNBPF}) is present in the allocation frame.
Iteration	Not applicable
Expected response	Step 2: IUT ok: the allocation frame is present and contains the correct number of allocation words. Step 2: IUT not ok (1): the allocation frame cannot be assembled. Step 2: IUT not ok (2): the allocation frame does not contain the correct number of allocation words.
Remark	---

8.2.2 CTC_7.2-2 – Start of Allocation Frame (SOAF) test

Table 5 specifies the start of allocation frame (SOAF) test.

Table 5 — CTC_7.2-2 – Start of allocation frame (SOAF) test

Item	Content
CTC # - Title	CTC_7.2-2 – Start of allocation frame (SOAF) test
Purpose	This CTC verifies: <ul style="list-style-type: none"> — that the structure of the received allocation word, SOAF format, contains the START indicator in bits 15 to 8 and arbitrary data in bits 7 to 0, — that the IUT sends an allocation word in SOAF format if it is the TimingMaster, and — that the IUT does not alter the SOAF format if it is a TimingSlave. This CTC applies to all MOST devices.

Table 5 (continued)

Item	Content
Reference	ISO 21806-6:2020: REQ 2.67 DLL – Allocation channel – SOAF format; REQ 2.75 DLL – Allocation channel – TimingMaster sends SOAF; REQ 2.81 DLL – Allocation channel – START.
Prerequisite	Ring closed
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster or a TimingSlave. — If the IUT is part of a MOST device that does not contain the TimingMaster, the LT pre-IUT shall be the TimingMaster. — If the IUT is part of a MOST device that contains the TimingMaster, the LT pre-IUT shall be a TimingSlave. — The LT post-IUT shall be a listen-only node.
Step	<ol style="list-style-type: none"> 1. The LT post-IUT shall acquire as many network frames as necessary to obtain a complete allocation frame. 2. The UT shall determine whether the SOAF format is represented correctly.
Iteration	Not applicable
Expected response	<p>Step 2: IUT ok: the SOAF appears and the SOAF format is represented correctly.</p> <p>Step 2: IUT not ok (1): the IUT does not write an allocation word in SOAF format or the SOAF format is not represented correctly.</p> <p>Step 2: IUT not ok (2): a TimingSlave alters the SOAF format.</p>
Remark	---

8.2.3 CTC_7.2-3 – Reporting format test

Table 6 specifies the reporting format test.

Table 6 — CTC_7.2-3 – Reporting format test

Item	Content
CTC # - Title	CTC_7.2-3 – Reporting format test
Purpose	<p>This CTC verifies that the structure of the received allocation word in reporting format contains:</p> <ul style="list-style-type: none"> — the CRC in bits 15 to 12, — zeros in bits 11 to 10, — the new allocation flag in bit 9, — and the connection label in bits 8 to 0. <p>This CTC applies to all MOST devices.</p>
Reference	ISO 21806-6:2020: REQ 2.66 DLL – Allocation channel – Allocation words
Prerequisite	Ring closed
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster or a TimingSlave. — If the IUT is part of a MOST device that does not contain the TimingMaster, the LT pre-IUT shall be the TimingMaster. — If the IUT is part of a MOST device that contains the TimingMaster, the LT pre-IUT shall be a TimingSlave. — The LT post-IUT shall be a listen-only node.

Table 6 (continued)

Item	Content
Step	<ol style="list-style-type: none"> The LT post-IUT shall acquire as many network frames as necessary to obtain a complete allocation frame. The UT shall determine whether the allocation words in reporting format are well formed and contain information that is consistent with the current state of the MOST network.
Iteration	Not applicable
Expected response	Step 2: IUT ok: the allocation words in reporting format are well-formed. Step 2: IUT not ok (1): the allocation words in reporting format are not well-formed. Step 2: IUT not ok (2): the allocation words in reporting format contain inconsistent information.
Remark	---

8.2.4 CTC_7.2-4 – TimingMaster clears the allocation word test

Table 7 specifies the TimingMaster clears the allocation word test.

Table 7 — CTC_7.2-4 – TimingMaster clears the allocation word test

Item	Content
CTC # - Title	CTC_7.2-4 – TimingMaster clears the allocation word test
Purpose	This CTC verifies that the TimingMaster clears the allocation word when it is not defending a network frame byte. This CTC applies to all MOST devices that contain the TimingMaster.
Reference	ISO 21806-6:2020: REQ 2.76 DLL – Allocation channel – TimingMaster clears the allocation word
Prerequisite	Ring closed
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster. — The LT pre-IUT shall be a TimingSlave. — The LT post-IUT shall be a listen-only node.
Step	<ol style="list-style-type: none"> The LT post-IUT shall acquire as many network frames as necessary to obtain a complete allocation frame. The UT shall determine whether the allocation-defend frame contains 0000_{16} for bytes not allocated by the TimingMaster or a connection label for bytes that are allocated by the TimingMaster.
Iteration	Not applicable
Expected response	Step 2: IUT ok: the IUT fills the allocation-defend frame as expected. Step 2: IUT not ok: the IUT does not fill the allocation-defend frame correctly.
Remark	---

8.2.5 CTC_7.2-5 – TimingMaster not arbitrating test

Table 8 specifies the TimingMaster not arbitrating test.

Table 8 — CTC_7.2-5 – TimingMaster not arbitrating test

Item	Content
CTC # - Title	CTC_7.2-5 – TimingMaster not arbitrating test
Purpose	This CTC verifies that the TimingMaster forwards the allocation word from the allocation-defend frame in the arbitration-result frame without altering it. This CTC applies to all MOST devices that contain the TimingMaster.
Reference	ISO 21806-6:2020: REQ 2.78 DLL – Allocation channel – TimingSlave loses arbitration
Prerequisite	Ring closed
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster. — The LT pre-IUT shall be a TimingSlave. — The LT post-IUT shall be a listen-only node.
Step	<ol style="list-style-type: none"> 1. The LT pre-IUT shall determine which network frame bytes are allocated by the IUT. 2. Subsequently, the LT pre-IUT shall allocate all remaining network frame bytes. 3. The UT shall determine whether the arbitration-result frame contains the allocation word that the LT pre-IUT shall set to defend the network frame bytes.
Iteration	Not applicable
Expected response	<p>Step 3: IUT ok: the IUT fills the arbitration-result frame as expected.</p> <p>Step 3: IUT not ok: the IUT does not copy the content of the allocation-defend frame into the arbitration-result frame correctly.</p>
Remark	---

8.2.6 CTC_7.2-6 – TimingSlave forwards allocation word test

Table 9 specifies the CTC_7.2-6 – TimingSlave forwards allocation word test.

Table 9 — CTC_7.2-6 – TimingSlave forwards allocation word test

Item	Content
CTC # - Title	CTC_7.2-6 – TimingSlave forwards allocation word test
Purpose	This CTC verifies that a TimingSlave forwards the allocation word without altering it for network frame bytes it does not defend and is not trying to allocate. This CTC applies to all MOST devices that do not contain the TimingMaster.
Reference	ISO 21806-6:2020: <ul style="list-style-type: none"> — REQ 2.83 DLL – Allocation channel – TimingSlave forwards allocation word; — REQ 2.86 DLL – Allocation channel – TimingSlave not arbitrating.
Prerequisite	Ring closed
Set-up	<ul style="list-style-type: none"> — The IUT is contained in a TimingSlave. — The LT pre-IUT shall be the TimingMaster. — The LT post-IUT shall be a listen-only node.
Step	<ol style="list-style-type: none"> 1. The LT pre-IUT shall determine which network frame bytes are allocated by the IUT. 2. Subsequently, the LT pre-IUT shall allocate all remaining network frame bytes. 3. For all network frame bytes, the UT shall determine whether the allocation-defend and the arbitration-result frame contain the allocation word that the LT pre-IUT shall set to defend the network frame bytes.

Table 9 (continued)

Item	Content
Iteration	Not applicable
Expected response	Step 3: IUT ok: the IUT processes the frames as expected. Step 3: IUT not ok (1): the IUT applies unexpected modifications to the allocation-defend frame and the arbitration-result frame. Step 3: IUT not ok (2): the IUT applies unexpected modifications to the allocation-defend frame. Step 3: IUT not ok (3): the IUT applies unexpected modifications to the arbitration-result frame.
Remark	---

8.3 Protected system channel CTCs

8.3.1 CTC_7.3-1 – Size and location test

Table 10 specifies the size and location test.

Table 10 — CTC_7.3-1 – Size and location test

Item	Content
CTC # - Title	CTC_7.3-1 – Size and location test
Purpose	This CTC verifies that the TimingMaster fills the protected system channel with the expected values. This CTC applies to all MOST devices that contain the TimingMaster.
Reference	ISO 21806-6:2020: REQ 2.99 DLL – Protected system channel – Size and location; REQ 2.100 DLL – Protected system channel – TimingMaster's role; REQ 2.101 DLL – Protected system channel – Protected system frame structure; REQ 2.103 DLL – Protected system channel – START not included in CRC; REQ 2.117 DLL – Protected system channel – CRC calculation.
Prerequisite	Ring closed
Set-up	— The IUT is contained in the TimingMaster. — The LT pre-IUT shall be a TimingSlave. The LT post-IUT shall be a listen-only node.
Step	1. The LT post-IUT shall acquire sufficient network frames to gather one complete protected system frame. 2. The UT shall determine whether the protected system frame contains the expected values.
Iteration	Not applicable
Expected response	Step 2: IUT ok: the IUT creates the protected system frame correctly. Step 2: IUT not ok (1): the START indicator is missing. Step 2: IUT not ok (2): the node counter is corrupted. Step 2: IUT not ok (3): the visible nodes value is corrupted. Step 2: IUT not ok (4): the Byte4 value is corrupted. Step 2: IUT not ok (5): the system flags are corrupted. Step 2: IUT not ok (6): the CRC is incorrect.
Remark	---

8.3.2 CTC_7.3-2 – Reaction on CRC error test

Table 11 specifies the reaction on CRC error test.

Table 11 — CTC_7.3-2 – Reaction on CRC error test

Item	Content
CTC # - Title	CTC_7.3-2 – Reaction on CRC error test
Purpose	This CTC verifies that the TimingMaster replaces START with WAIT in the subsequent protected system frame if a CRC error occurred. This CTC applies to all MOST devices that contain the TimingMaster.
Reference	ISO 21806-6:2020: REQ 2.104 DLL – Protected system channel – Reaction on CRC error
Prerequisite	Ring closed
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster. — The LT pre-IUT shall be a TimingSlave. — The LT post-IUT shall be a listen-only node.
Step	<ol style="list-style-type: none"> 1. The LT pre-IUT shall transmit the protected system frame with an incorrect CRC value. 2. The UT shall determine whether the subsequent protected system frame contains the WAIT indicator.
Iteration	Not applicable
Expected response	Step 2: IUT ok: the IUT sends WAIT in the protected system frame correctly. Step 2: IUT not ok: the IUT does not send WAIT in the protected system frame.
Remark	---

8.3.3 CTC_7.3-3 – Node counter test

Table 12 specifies the node counter test.

Table 12 — CTC_7.3-3 – Node counter test

Item	Content
CTC # - Title	CTC_7.3-3 – Node counter test
Purpose	This CTC verifies that the node counter value is set correctly. This CTC applies to all MOST devices.
Reference	ISO 21806-6:2020: <ul style="list-style-type: none"> — REQ 2.105 DLL – Protected system channel – Node counting; — REQ 2.106 DLL – Protected system channel – Node position of the TimingMaster; — REQ 2.107 DLL – Protected system channel – TimingMaster sets node counter; — REQ 2.108 DLL – Protected system channel – TimingSlave increments node counter.
Prerequisite	Ring closed
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster or a TimingSlave. — If the IUT is part of a MOST device that does not contain the TimingMaster, the LT pre-IUT shall be the TimingMaster. — If the IUT is part of a MOST device that contains the TimingMaster, the LT pre-IUT shall be a TimingSlave. — The LT post-IUT shall be a listen-only node.

Table 12 (continued)

Item	Content
Step	<ol style="list-style-type: none"> The LT post-IUT shall acquire sufficient network frames to gather one complete protected system frame. The UT shall determine whether the node counter in the protected system frame contains the correct value. If the IUT is contained in the TimingMaster, the expected value is 0; otherwise, it is 1.
Iteration	Not applicable
Expected response	Step 2: IUT ok: the node counter contains the correct value. Step 2: IUT not ok: the node counter contains an incorrect value.
Remark	---

8.3.4 CTC_7.3-4 – TimingMaster visible nodes value test

Table 13 specifies the TimingMaster stores valid number of nodes test.

Table 13 — CTC_7.3-4 – TimingMaster visible nodes value test

Item	Content
CTC # - Title	CTC_7.3-4 – TimingMaster visible nodes value test
Purpose	This CTC verifies that the TimingMaster sets the visible nodes value correctly. This CTC applies to all MOST devices that contain the TimingMaster.
Reference	ISO 21806-6:2020: — REQ 2.111 DLL – Protected system channel – TimingMaster stores valid number of nodes; — REQ 2.113 DLL – Protected system channel – Visible nodes value.
Prerequisite	Ring closed
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster. — The LT pre-IUT shall be a TimingSlave. — The LT post-IUT shall be a listen-only node.
Step	<ol style="list-style-type: none"> The LT post-IUT shall acquire sufficient network frames to gather one complete protected system frame. The UT shall determine whether the visible nodes value is correct.
Iteration	Not applicable
Expected response	Step 2: IUT ok: the visible nodes value is correct. Step 2: IUT not ok: the visible nodes value is incorrect.
Remark	---

8.3.5 CTC_7.3-5 – System flags test

Table 14 specifies the system flags test.

Table 14 — CTC_7.3-5 - System flags test

Item	Content
CTC # - Title	CTC_7.3-5 - System flags test
Purpose	This CTC verifies that the system flags are set correctly. This CTC applies to all MOST devices.
Reference	ISO 21806-6:2020: REQ 2.116 DLL - Protected system channel - System flags
Prerequisite	Ring closed
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster or a TimingSlave. — If the IUT is part of a MOST device that does not contain the TimingMaster, the LT pre-IUT shall be the TimingMaster. — If the IUT is part of a MOST device that contains the TimingMaster, the LT pre-IUT shall be a TimingSlave. — The LT post-IUT shall be a listen-only node.
Step	<ol style="list-style-type: none"> 1. The LT post-IUT shall acquire sufficient network frames to gather one complete protected system frame. 2. The UT shall determine whether the system flags are set like this: <ul style="list-style-type: none"> — diagnosis flag: 0₂; — static master flag: 0₂; — ring lock flag: 1₂; — shutdown flag: 0₂; — lock flag: 1₂.
Iteration	Not applicable
Expected response	Step 2: IUT ok: the system flags are set correctly. Step 2: IUT not ok: the system flags are not set correctly.
Remark	---

8.4 CTC_7.4-1 - Timestamp channel frame test

Table 15 specifies the timestamp channel frame test.

Table 15 — CTC_7.4-1 - Timestamp channel frame test

Item	Content
CTC # - Title	CTC_7.4-1 - Timestamp channel frame test
Purpose	This CTC verifies that the TimingMaster fills the timestamp channel frame correctly. This CTC applies to all MOST devices.
Reference	ISO 21806-6:2020: <ul style="list-style-type: none"> — REQ 2.118 DLL - Timestamp channel - Timestamp frame structure; — REQ 2.119 DLL - Timestamp channel - Timestamp frame counter; — REQ 2.126 DLL - Timestamp channel - CRC calculation.
Prerequisite	Ring closed

Table 15 (continued)

Item	Content
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster. — The LT pre-IUT shall be a TimingSlave. — The LT post-IUT shall be a listen-only node.
Step	<ol style="list-style-type: none"> 1. The LT post-IUT shall acquire sufficient network frames to gather three consecutive complete timestamp channel frames. 2. The UT shall determine whether the timestamp channel contains the following information: <ul style="list-style-type: none"> — START indicator; — timestamp frame counter; — 2 reserved bytes containing 00_{16}; — CRC. 3. The UT shall determine whether the timestamp frame counter is increased with each timestamp channel frame.
Iteration	Not applicable
Expected response	<p>Step 3: IUT ok: the timestamp channel contains the correct information.</p> <p>Step 1: IUT not ok (1): a timestamp channel frame cannot be obtained.</p> <p>Step 3: IUT not ok (2): the timestamp frame counter is inconsistent.</p> <p>Step 2: IUT not ok (3): the CRC is incorrect.</p>
Remark	---

8.5 Flow control CTCs

8.5.1 CTC_7.5-1 - Target address not matching test

Table 16 specifies the target address not matching test.

Table 16 — CTC_7.5-1 - Target address not matching test

Item	Content
CTC # - Title	CTC_7.5-1 - Target address not matching test
Purpose	<p>This CTC verifies that a node whose address does not match the target address of the channel frame, does not modify the PACK byte.</p> <p>This CTC applies to all MOST devices.</p>
Reference	<p>ISO 21806-6:2020:</p> <ul style="list-style-type: none"> — REQ 2.141 DLL - Pre-emptive acknowledge byte - Target address not matching; — REQ 2.179 DLL - Addressing - 16-bit address types - Compare incoming target address; — REQ 2.181 DLL - Addressing - 16-bit address types - Address types.
Prerequisite	Ring closed

Table 16 (continued)

Item	Content
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster or a TimingSlave. — If the IUT is part of a MOST device that does not contain the TimingMaster, the LT pre-IUT shall be the TimingMaster. — If the IUT is part of a MOST device that contains the TimingMaster, the LT pre-IUT shall be a TimingSlave. — The LT post-IUT is a TimingSlave.
Step	<ol style="list-style-type: none"> 1. The UT, using the LT pre-IUT, shall transmit a channel frame to the LT post-IUT. 2. The UT shall examine the PACK byte received by the LT post-IUT and shall determine whether the IUT modifies the PACK byte.
Iteration	<p>REPEAT Step 1 to Step 2; n = 3 times:</p> <ol style="list-style-type: none"> 1. The transmitted channel frame is a control frame; 2. The transmitted channel frame is a packet frame; 3. The transmitted channel frame is an Ethernet frame. <p>REPEAT END.</p>
Expected response	<p>Step 2: IUT ok: the PACK byte contains an unmodified value.</p> <p>Step 2: IUT not ok: the PACK byte contains a value that differs from the original value.</p>
Remark	---

8.5.2 CTC_7.5-2 - Modification of the PACK byte test

Table 17 specifies the modification of the PACK byte test.

Table 17 — CTC_7.5-2 - Modification of the PACK byte test

Item	Content
CTC # - Title	CTC_7.5-2 - Modification of the PACK byte test
Purpose	<p>This CTC verifies that a node modifies the PACK byte correctly.</p> <p>This CTC applies to all MOST devices.</p>
Reference	<p>ISO 21806-6:2020:</p> <ul style="list-style-type: none"> — REQ 2.142 DLL - Flow control - Pre-emptive acknowledge byte - Modification of the PACK byte; — REQ 2.179 DLL - Addressing - 16-bit address types - Compare incoming target address; — REQ 2.181 DLL - Addressing - 16-bit address types - Address types; — REQ 2.180 DLL - Addressing - 16-bit address types - Updating PACK byte.
Prerequisite	Ring closed
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster or a TimingSlave. — If the IUT is part of a MOST device that does not contain the TimingMaster, the LT pre-IUT shall be the TimingMaster. — If the IUT is part of a MOST device that contains the TimingMaster, the LT pre-IUT shall be a TimingSlave. — The LT post-IUT shall be a listen-only node.

Table 17 (continued)

Item	Content
Step	<ol style="list-style-type: none"> 1. The UT, using the LT pre-IUT, shall transmit a channel frame to the IUT. 2. The UT shall check whether the IUT modifies the PACK byte so that either bit 0 is set (the node is not ready to receive) or bit 2 is set (the node is ready to receive).
Iteration	REPEAT Step 1 to Step 2; n = 3 times: <ol style="list-style-type: none"> 1. The transmitted channel frame is a control frame; 2. The transmitted channel frame is a packet frame; 3. The transmitted channel frame is an Ethernet frame. REPEAT END.
Expected response	Step 2: IUT ok: bit 0 or bit 2 of the PACK byte is modified. Step 2: IUT not ok (1): the PACK byte is not modified. Step 2: IUT not ok (2): bit 0 and bit 2 of the PACK byte are modified. Step 2: IUT not ok (3): the PACK byte is corrupted.
Remark	For the iterations that involve an Ethernet frame, the MAC address that the device manufacturer provided is used as target address.

8.6 Cyclic redundancy check CTCs

8.6.1 CTC_7.6-1 – No reception of channel frame test

Table 18 specifies the no reception of channel frame test.

Table 18 — CTC_7.6-1 – No reception of channel frame test

Item	Content
CTC # - Title	CTC_7.6-1 – No reception of channel frame test
Purpose	This CTC verifies that a node whose address does not match the target address of the channel frame, shall not modify the CACK byte. This CTC applies to all MOST devices.
Reference	ISO 21806-6:2020: REQ 2.201 DLL – CRC acknowledge – No reception of channel frame
Prerequisite	Ring closed
Set-up	<ul style="list-style-type: none"> — The IUT is contained in the TimingMaster or a TimingSlave. — If the IUT is part of a MOST device that does not contain the TimingMaster, the LT pre-IUT shall be the TimingMaster. — If the IUT is part of a MOST device that contains the TimingMaster, the LT pre-IUT shall be a TimingSlave. — The LT post-IUT shall be a TimingSlave.
Step	<ol style="list-style-type: none"> 1. The UT, using the LT pre-IUT, shall transmit a packet frame to an address that is exclusively used by the LT post-IUT and not associated with the IUT. 2. The UT shall examine the CACK byte received by the LT post-IUT and shall determine whether the IUT modifies the CACK byte.
Iteration	REPEAT Step 1 to Step 2; n = 3 times: <ol style="list-style-type: none"> 1. The transmitted channel frame is a control frame; 2. The transmitted channel frame is a packet frame; 3. The transmitted channel frame is an Ethernet frame.