

# Multi-Profile Specification

## **Bluetooth® Test Specification**

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### **Abstract:**

This document defines test structures and procedures for the interoperability and conformance tests implementing the Bluetooth Multi Profile Specification.



**Revision History**

| <b>Revision Number</b> | <b>Date<br/>(yyyy-mm-dd)</b> | <b>Comments</b>   |
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| 0.7.0r1                | 2011-08-08                   | 1 <sup>st</sup> draft of v0.7 including: List of test purposes, TCMT, TSS update  |
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| 0.9.0r3                | 2012-09-19                   | Added Test Cases for Call Termination MPMD and MPSD when no music had been present before the call  |
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| 1.0.3r01        | 2015-10-09        | Integrated review from Alicia Courtney regarding TSE 6408.   |
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# 1 Scope and Introduction

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This document contains the Test Suite Structure (TSS) and Test Cases (TC) to test the Multi Profile Specification (MPS).

The objective of this test specification is to provide interoperability tests for Bluetooth devices giving a high probability of air interface interoperability and implementation conformance from different manufacturers.

The following configurations are distinguished in order to define the scope of this test specification:

## 1.1 Configurations in scope of this Test Specification

- Multiple Profiles Single Device (MPSD): In this configuration, multiple Bluetooth profiles are used concurrently between two devices.
- Multiple Profiles Multiple Devices (MPMD): In this configuration, multiple Bluetooth profiles are used concurrently among several devices. The number of devices is defined case by case.

## 1.2 Configurations out of scope of this Test Specification

- Single Profile Single Device (SPSD): In this configuration, a single profile is used between any two Bluetooth devices. No other profile is used concurrently.
- Single Profile Multiple Devices (SPMD): In this configuration, a single profile is used concurrently between several Bluetooth devices. For example, one device runs multiple instances of the same profile and each instance is connected to a separate Bluetooth device supporting that profile.

## 2 References, Definitions, and Abbreviations

### 2.1 References

This Bluetooth document incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter.

- [1] Bluetooth Core Specification v2.1 or later
- [2] Bluetooth Test Strategy and Terminology Overview
- [3] Multi Profile Specification (MPS) v1.0
- [4] Hands Free Profile Specification (HFP) v1.5 or later
- [5] Advanced Audio Distribution Profile Specification (A2DP) v1.2 or later
- [6] Advanced/Video Distribution Transport Protocol Specification (AVDTP) v1.0 or later
- [7] Audio/Video Remote Control Profile (AVRCP) v1.3 or later
- [8] Audio/Video Control Transport Protocol Specification (AVCTP) v1.0 or later
- [9] Personal Area Network Profile Specification (PAN) v1.0 or later
- [10] Dial Up Networking Profile Specification (DUN) v1.1 or later
- [11] Generic Audio/Video Distribution Profile (GAVDP) v1.0 or later

### 2.2 Definitions and Abbreviations

For the purpose of this Bluetooth document, the abbreviations and definitions in [1], [2], and [3] apply as well as the following.

| Term | Definition                             |
|------|--|
| AG   | HFP Audio Gateway Role                 |
| AVP  | Combination of A2DP and AVRCP profiles |
| CLI  | Client Role (e.g. in PBAP)             |
| CT   | AVRCP Controller Role                  |
| DT   | DUN Data Terminal Role                 |
| GW   | DUN Gateway Role                       |
| HF   | HFP Hands-free Role                    |
| MD   | Multiple Devices                       |
| MPMD | Multiple Profiles Multiple Devices     |
| MPS  | Multi-Profile Specification            |
| MPSD | Multiple Profiles Single Device        |

| Term | Definition                         |
|------|------------------------------------|
| MSC  | Message Sequence Chart             |
| NAP  | PAN Network Access Point role      |
| PANU | PAN User Role                      |
| PSDM | Packet Switched Data Mode (in DUN) |
| SD   | Single Device                      |
| SDR  | Service Discovery Record           |
| SNK  | A2DP Sink Role                     |
| SPMD | Single Profile Multiple Devices    |
| SPSD | Single Profile Single Device       |
| SRC  | A2DP Source Role                   |
| SRV  | Server Role (e.g. PBAP)            |
| TG   | AVRCP Target Role                  |

## 3 Test Suite Structure (TSS)

### 3.1 Test Strategy

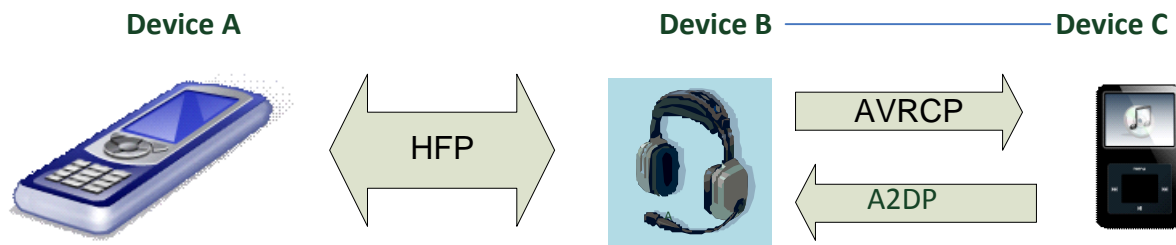
When qualifying MPS it is a prerequisite that the IUT passes qualification for the individual profiles and profile roles that the MPS behavior is based upon.

The test cases specified in this test specification verify

- On the protocol level, that devices use the correct PDUs at the correct time as specified in the MPS document,
- On the interoperability level, that devices provide the functionality as specified in the MPS document.
- On the conformance level, that devices follow the implementation specified in the MPS document.

Multi device scenarios are characterized by the following setup

Device B is physically connected over Bluetooth to multiple devices (Device A and Device C). Device A and Device C do not have any physical Bluetooth connection between each other nor are they paired or otherwise aware of each other's existence. However, as they operate in a multi device environment, the presence of specific features may be required according to the use case in which they operate. This is illustrated in the [Figure 3.1](#) below:



*Figure 3.1: Typical setup for multi-device scenarios*

A test set up with the IUT acting as Device B can be established in various ways, for example like this:

- Device C = Tester 1 (collecting test results, might give instructions to user what to do on Tester 2)
- Device B = IUT
- Device A = Tester 2 (serves as test condition, not collecting test results)
  - Or
- Device C = Tester
- Device B = IUT
- Device A = a complementary commercial device

Additional equipment, like protocol sniffer may be used to validate the MPS procedure requirements.

Note that depending on each test scenario, the IUT may act as Device A, Device B or Device C for that particular scenario.

The MPS test suite contains Valid Behavior (BV) tests complemented with Invalid Behavior (BI) tests where required. The test coverage mirrored in the test suite structure is the result of a process that started with catalogued specification requirements that were logically grouped and assessed for testability enabling coverage in defined test purposes.

The test suite structure is a tree with the first level representing the interacting multi-profile groups.

| Test Group  | Test Scenario  | MPSD/MPMD   |
|-------------|--|-------------|
| HFP+AVP     | Incoming Call during AVP Connection                    | MPSD + MPMD |
|             | Outgoing Call during AVP Connection                    | MPSD + MPMD |
|             | Reject/Ignore Incoming Call during Audio Streaming     | MPSD + MPMD |
|             | HFP Call termination during AVP Connection             | MPSD + MPMD |
|             | Press Play on Audio Player during active call          | MPSD + MPMD |
|             | Start Audio Streaming after AVRCP Play                 | MPSD + MPMD |
|             | Suspend Audio Streaming after AVRCP Pause              | MPSD + MPMD |
| AVP + OBEX  | Phonebook download during audio streaming              | MPSD        |
| DUN + Other | DUN communication during active voice call             | MPSD        |
|             | Outgoing voice call during DUN communication           | MPSD        |
|             | Incoming voice call during DUN communication           | MPSD        |
|             | Start Audio Streaming during DUN communication         | MPSD + MPMD |
|             | DUN communication establishment during Audio Streaming | MPSD + MPMD |
|             | Terminate Voice call during DUN data communication     | MPSD + MPMD |
| PAN + Other | PAN communication during active voice call             | MPSD        |
|             | Outgoing voice call during PAN communication           | MPSD        |
|             | Incoming voice call during PAN communication           | MPSD        |

|                |  |      |
|----------------|--|------|
|                | Start Audio Streaming during PAN communication         | MPSD |
|                | PAN communication establishment during Audio Streaming | MPSD |
| MPS Procedures | (Dis-)Connection Order/Behavior                        | MPSD |
|                | Service Discovery                                      | MPSD |

Figure 3.2: Multi-Profile Test Suite Structure Representation

### 3.2 Test Groups

The test groups are organized in 4 levels.

The first level defines the profiles involved. The second level defines the profile procedure groups representing the profile procedures. The third level separates the profile procedures in functional modules. The last level in each branch contains the standard ISO subgroups BV and BI.

## 4 Test Cases (TC)

### 4.1 Introduction

#### 4.1.1 Test Case Identification Conventions

Test cases shall be assigned unique identifiers per the conventions in [2]. The convention used here is **<spec abbreviation>/<IUT role>/<class>/<feat>/<func>/<subfunc>/<cap>/<xx>-<nn>-<y>**.

Bolded ID parts shall appear in the order prescribed. Non-bolded ID parts (if applicable) shall appear between the bolded parts. The order of the non-bolded parts may vary from test specification to test specification, but shall be consistent within each individual test specification.

The MPS Specification deals with various profiles in different use cases, the roles vary according to the particular profiles involved in each use case. The various roles are concatenated in a string separated by hyphens, e.g.: “AG-SRC” for tests with a device that calls out HFP AG profile and A2DP Source profile support by the IUT. The various roles in the concatenated string shall be ordered alphabetically in the name.

| Identifier | Feature identifier <class>                                    |
|------------|---|
| MPS        | Multiprofile Test Specification                               |
| IUT        | Test case is role agnostic and should be run for all MPS IUT. |
| HFAV       | HFP + A2DP + AVRCP  |
| AVO        | A2DP + AVRCP + OBEX   |
| DUN        | DUN + other profiles  |
| PAN        | PAN + other profiles  |
| HFPB       | HFP + PBAP  |
| SDP        | Service Discovery Profile                                     |

| Identifier | Feature identifier <feat> |
|------------|---------------------------|
| CLH        | Call Handling             |
| VCT        | Volume Control            |
| CTH        | Connection Handling       |



| Identifier | Feature identifier <feat>  |
|------------|----------------------------|
| ACT        | Audio Player Control       |
| DCT        | Data Communication Control |
| OBT        | Object Transfer            |

| Identifier | Feature identifier <func> |
|------------|---------------------------|
| SD         | Single Device             |
| MD         | Multi Device              |

#### 4.1.2 Conformance

When conformance is claimed, all capabilities indicated as mandatory for this Specification shall be supported in the specified manner (process-mandatory). This also applies for all optional and conditional capabilities for which support is indicated. All mandatory capabilities, and optional and conditional capabilities for which support is indicated, are subject to verification as part of the Bluetooth certification program.

The Bluetooth Qualification Program may employ tests to verify implementation robustness. The level of implementation robustness that is verified varies from one Specification to another and may be revised for cause based on interoperability issues found in the market.

Such tests may verify:

- That claimed capabilities may be used in any order and any number of repetitions that is not excluded by the Specification, OR
- That capabilities enabled by the implementations are sustained over durations expected by the use case, OR
- That the implementation gracefully handles any quantity of data expected by the use case, OR
- That the implementation gracefully rejects any attempt to exercise capabilities which were declared as not supported. Graceful rejection means that the implementation demonstrates uninterrupted conformance to the specification immediately after rejecting such attempts without any need to be externally reset or adjusted, OR
- That in cases where more than one valid interpretation of the Specification exist, the implementation complies with at least one interpretation and gracefully handles other interpretations OR
- That the implementation is immune to attempted security exploits

A single execution of each of the required tests is required in order to constitute a pass verdict. However, it is noted that in order to provide a foundation for interoperability, it is necessary that a qualified implementation consistently and repeatedly pass any of the applicable tests.

In any case, where a member finds an issue with the Test Plan Generator, the Test Case as described in the Test Specification, or with the Test System utilized, the Member is required to notify the responsible party via an errata request such that the issue may be addressed.

### 4.1.3 Pass/Fail Verdict Conventions

Each test case has an Expected Outcome section, which outlines all the detailed pass criteria conditions that shall be met by the IUT to merit a Pass Verdict.

The convention in this test specification is that, unless there is a specific set of fail conditions outlined in the test case, the IUT fails the test case as soon one of the pass criteria conditions cannot be met. If this occurs the outcome of the test shall be the Fail Verdict.

## 4.2 HFP + AVP

Test group objectives:

To verify the concurrent usage of A2DP, AVRCP, and HFP.

### 4.2.1 Incoming Call during AVP Connection

Test subgroup objectives:

To verify that A2DP Audio Streaming suspends upon reception of an incoming voice call.

#### 4.2.1.1 Incoming Call during AVP Connection – No In-band Ringing - SD

- Test Case ID(s)

**MPS/AG-SRC-TG/HFAV/CLH/SD/BV-01-I**

**MPS/CT-HF-SNK/HFAV/CLH/SD/BV-01-I**

- Test Purpose

To verify that Device B can answer an incoming call from Device A while audio is streaming and that Device A suspends the audio when no in-band ringing is used.

- Reference

Section 4.1.1 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |

- HFP Service Level Connection is established between Device A and Device B.
  - No in-band ringing is used.
  - Device A must be configured to alert Device B of an incoming call.
  - Device A streams A2DP audio over an AVDTP channel, which is in the state STREAMING, to Device B.
- Test Procedure

Perform the following procedures as shown in [Figure 4.1](#) below:

    1. Place a call from remote to Device A.
    2. Upon receipt of an incoming voice call indication on Device B (manufacturer specific) answer the voice call on Device B (manufacturer specific).

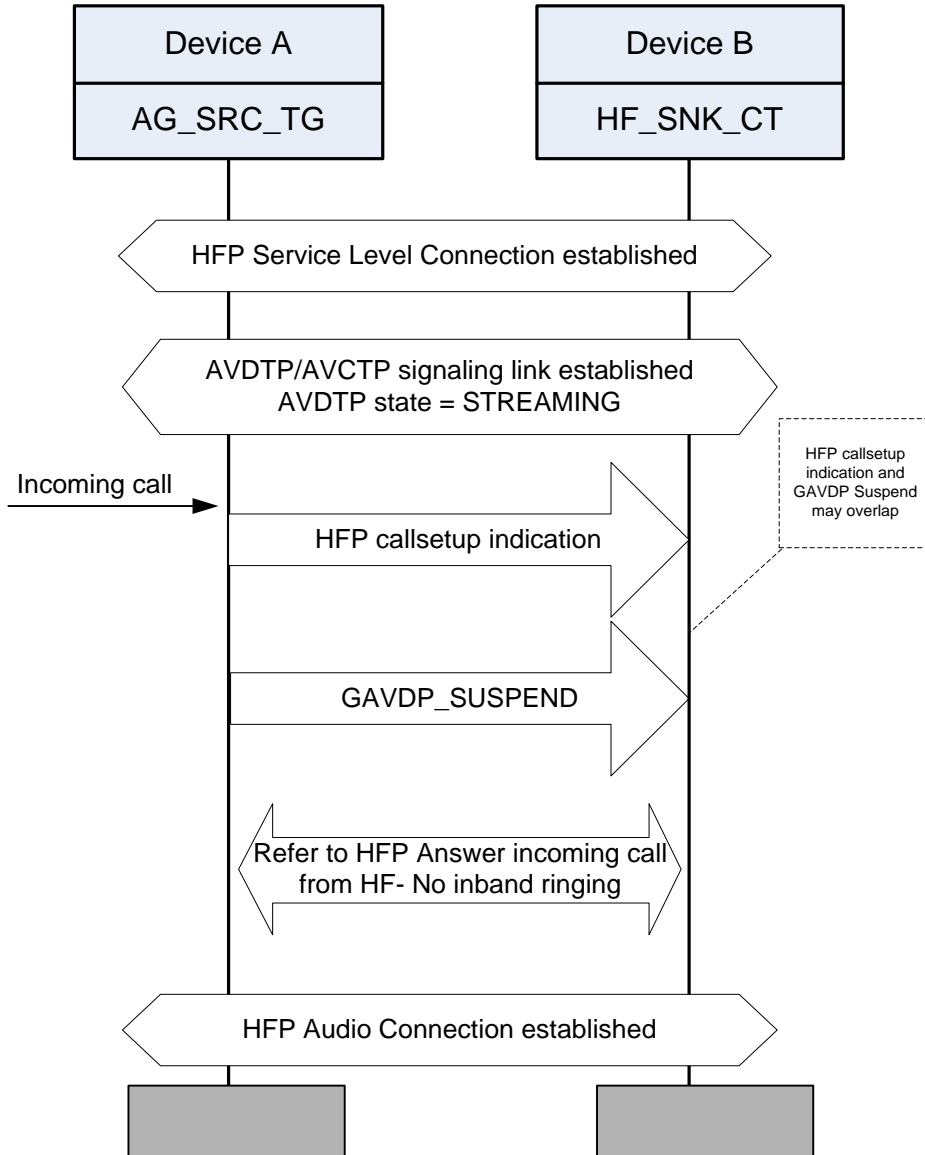


Figure 4.1: MPS/AG-SRC-TG/HFAV/CLH/SD/BV-01-I, MPS/CT-HF-SNK/HFAV/CLH/SD/BV-01-I  
[Incoming Call during AVP Connection - SD]

- Test Condition
  - Both devices are in communication range.
  - Manual user intervention shall not be used to suspend the streaming of audio from Device A to Device B.

- Expected Outcome

Pass verdict

Device A:

- Provides the HFP callsetup indication to Device B.
- Executes the *GAVDP\_Suspend* procedure.

- Establishes the HFP Audio Connection.

Device B:

- The HFP Audio Connection is established.

#### 4.2.1.2 Incoming Call during AVP Connection – In-band Ringing - SD

- Test Case ID(s)

**MPS/AG-SRC-TG/HFAV/CLH/SD/BV-02-I**

**MPS/CT-HF-SNK/HFAV/CLH/SD/BV-02-I**

- Test Purpose

To verify that Device B can answer an incoming call from Device A while audio is streaming and that Device A suspends the audio when in-band ringing is used.

- Reference

Section 4.1.1 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |

- HFP Service Level Connection is established between Device A and Device B.
  - In-band ringing is used.
  - Device A must be configured to alert Device B of an incoming call.
  - Device A streams A2DP audio over an AVDTP channel, which is in the state STREAMING, to Device B.
  - Test Procedure
- Perform the following procedures as shown in [Figure 4.2](#) below:
1. Place a call from remote to Device A.
  2. Upon receipt of an incoming voice call indication on Device B (manufacturer specific) answer the voice call on Device B (manufacturer specific).

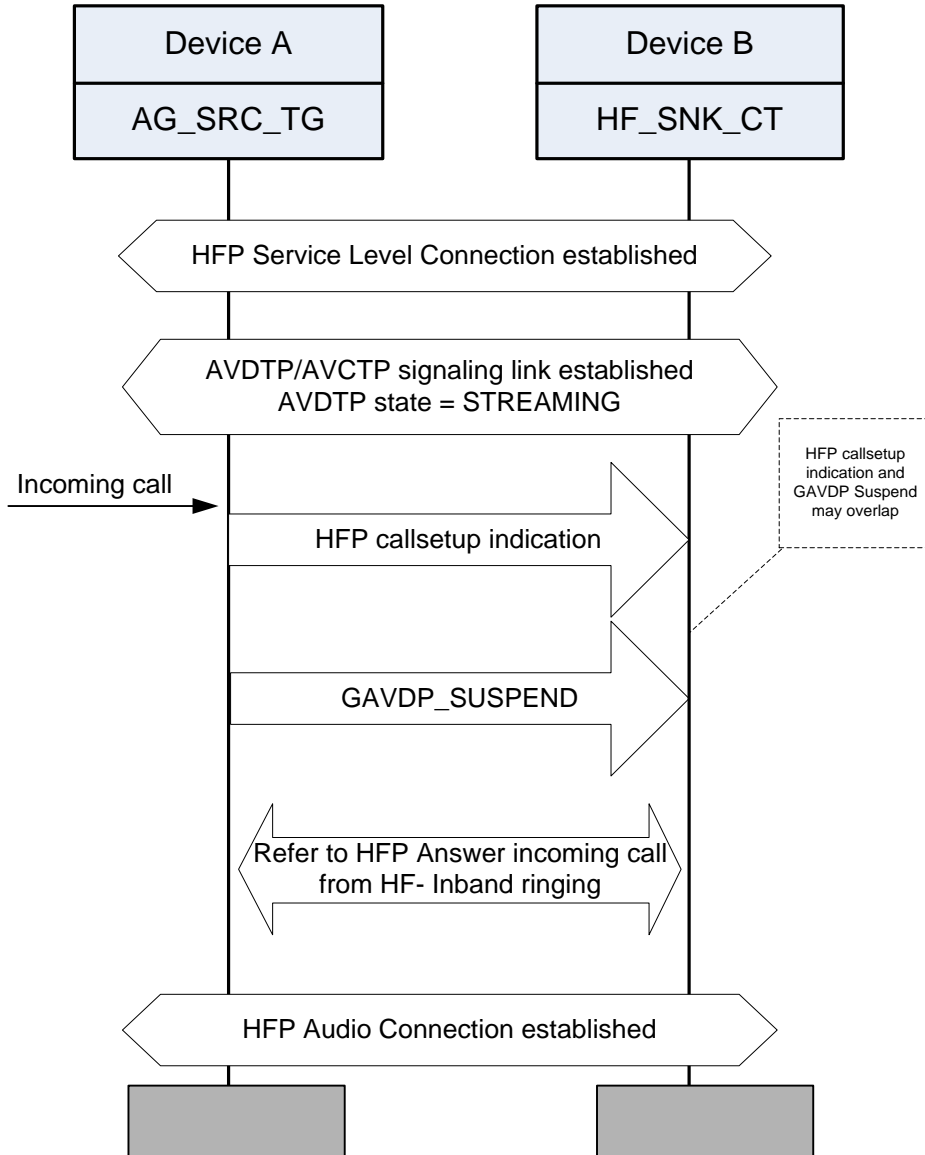


Figure 4.2: MPS/AG-SRC-TG/HFAV/CLH/SD/BV-02-I, MPS/CT-HF-SNK/HFAV/CLH/SD/BV-02-I  
[Incoming Call during AVP Connection - SD]

- Test Condition

Both devices are in communication range.

Manual user intervention shall not be used to suspend the streaming of audio from Device A to Device B.

- Expected Outcome

Pass verdict

Device A:

- Provides the HFP callsetup notification to Device B
- Executes the *GAVDP\_Suspend* procedure

- Establishes the HFP Audio Connection

Device B:

- The HFP Audio Connection is established

#### 4.2.1.3 Incoming Call during AVP Connection – No In-band ringing - MD

- Test Case ID(s)

**MPS/CT-HF-SNK/HFAV/CLH/MD/BV-01-I**

**MPS/SRC-TG/HFAV/CLH/MD/BV-01-I**

- Test Purpose

To verify that Device B can establish a voice call upon the reception of an incoming call from Device A while audio is streaming between Device B and Device C and that Device C suspends or stops the streaming audio on request from Device B.

- Reference

Section 4.1.2 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B | Device C |
|----------|----------|----------|
| HFP AG   | HFP HF   | –        |
| –        | A2DP SNK | A2DP SRC |
| –        | AVRCP CT | AVRCP TG |

- HFP Service Level Connection is established between Device A and Device B.
  - Device A must be configured to alert Device B of an incoming voice call.
  - Device C streams A2DP audio over an AVDTP channel, which is in the state STREAMING, to Device B.
  - No in-band ringing is used.
  - Test Procedure
- Perform the following procedures as shown in [Figure 4.3](#) below:
1. Place a call from remote to Device A.
  2. Upon receipt of an incoming voice call indication on Device B (manufacturer specific), answer the call from Device A (manufacturer specific).

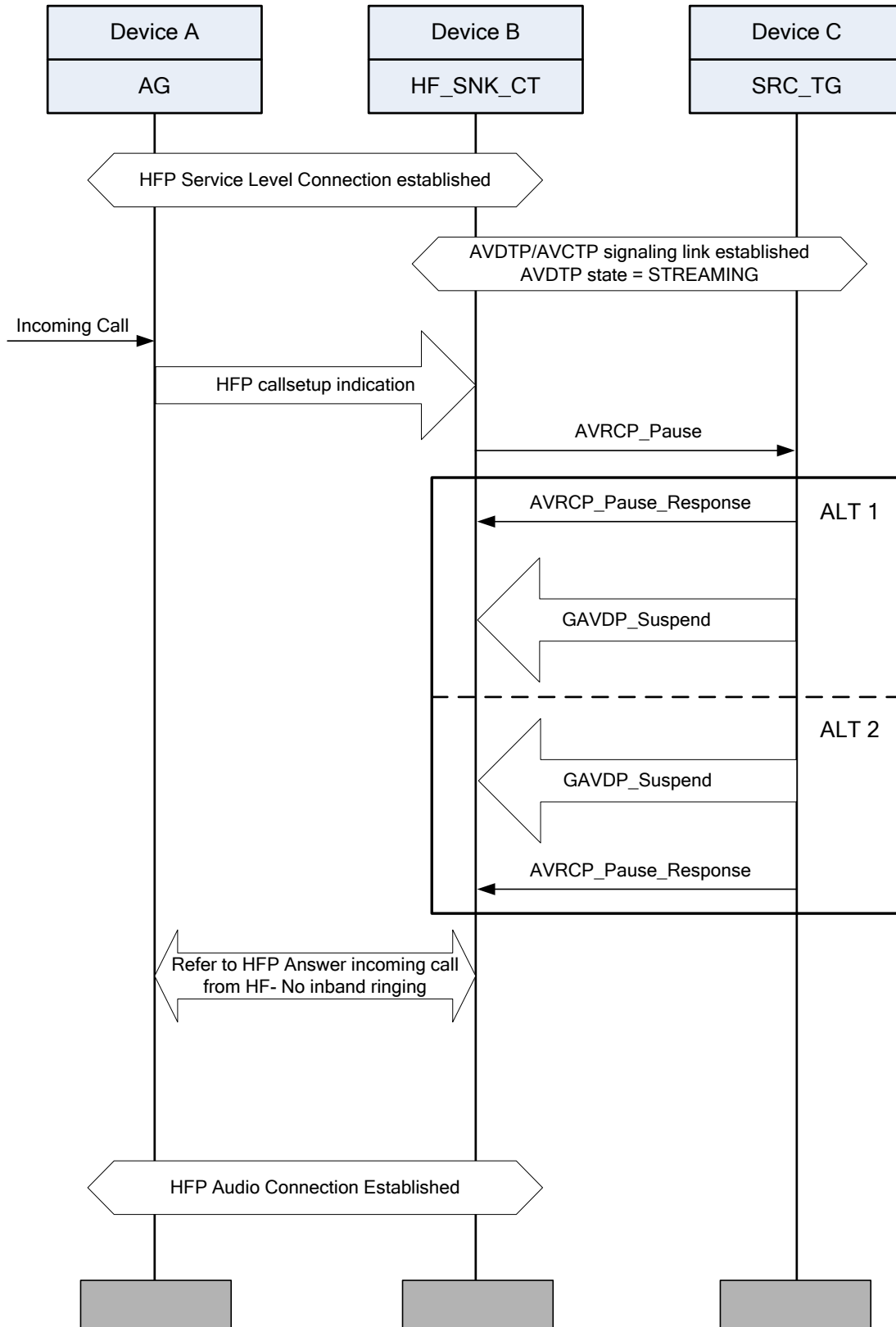


Figure 4.3: MPS/CT-HF-SNK/HFAV/CLH/MD/BV-01-I, MPS/SRC-TG/HFAV/CLH/MD/BV-01-I [Incoming Call during AVP Connection – No In-band ringing - MD]



- Test Condition

Devices are in communication range.

Manual user intervention shall not be used to suspend the streaming of audio from Device C to Device B.

In this test, the IUT is either Device B or Device C (as defined through the TCMT). As such the behavior noted under Expected Outcome describes required responses from the complementary device as well as the IUT.

- Expected Outcome

Pass verdict

Device B:

- An *AVRCP\_Pause* PASS THROUGH command is sent to Device C by Device B when Device B receives the HFP callsetup indication from Device A.
- Audio Stream from Device C is suspended before the HFP Audio Connection is established with Device A.
- When the user answers the call via Device B (manufacturer specific), the active call between Device B and Device A is established.

Device C:

- Initiates the *GAVDP\_Suspend* procedure with Device B upon reception of *AVRCP\_Pause* from Device B. The *GAVDP\_Suspend* procedure may occur prior to the confirmation of the *AVRCP\_Pause*.

#### 4.2.1.4 Incoming Call during AVP Connection – In-band Ringing MD

- Test Case ID(s)

**MPS/CT-HF-SNK/HFAV/CLH/MD/BV-02-I**

**MPS/SRC-TG/HFAV/CLH/MD/BV-02-I**

- Test Purpose

To verify that Device B can answer an incoming call from Device A while audio is streaming between Device B and Device C and that Device C suspends or stops the streaming audio on request from Device B.

- Reference

Section 4.1.2 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B | Device C |
|----------|----------|----------|
| HFP AG   | HFP HF   | –        |

| Device A | Device B | Device C |
|----------|----------|----------|
| –        | A2DP SNK | A2DP SRC |
| –        | AVRCP CT | AVRCP TG |

- HFP Service Level Connection is established between Device A and Device B.
  - Device A must be configured to alert Device B of an incoming call.
  - Device C streams A2DP audio over an AVDTP channel, which is in the state STREAMING, to Device B.
  - In-band ringing is used.
- Test Procedure

Perform the following procedures as shown in

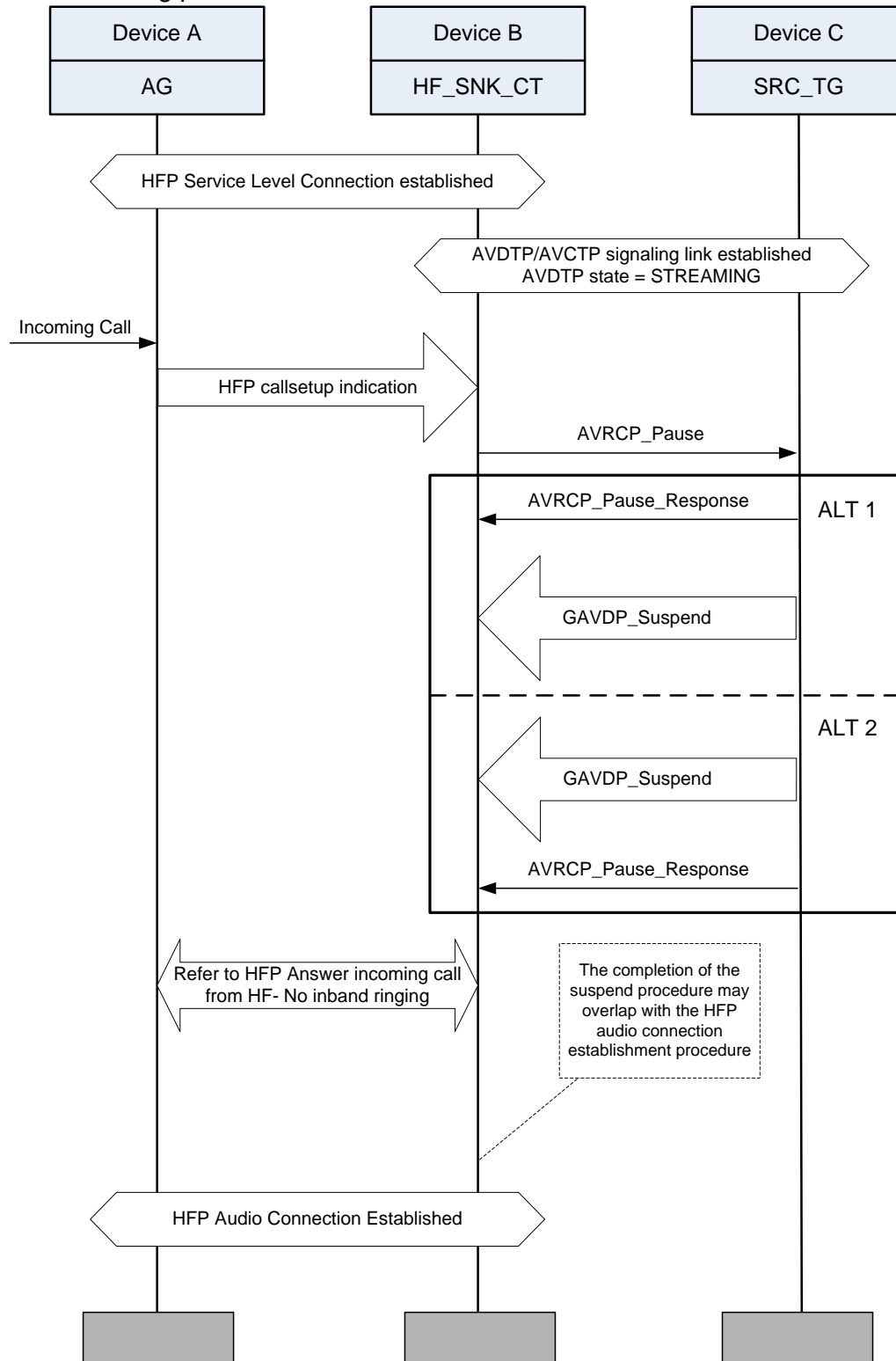


Figure 4.4 below:

1. Place a call from remote to Device A.

2. Upon receipt of an incoming call indication on Device B (manufacturer specific), answer the call from Device B (manufacturer specific).



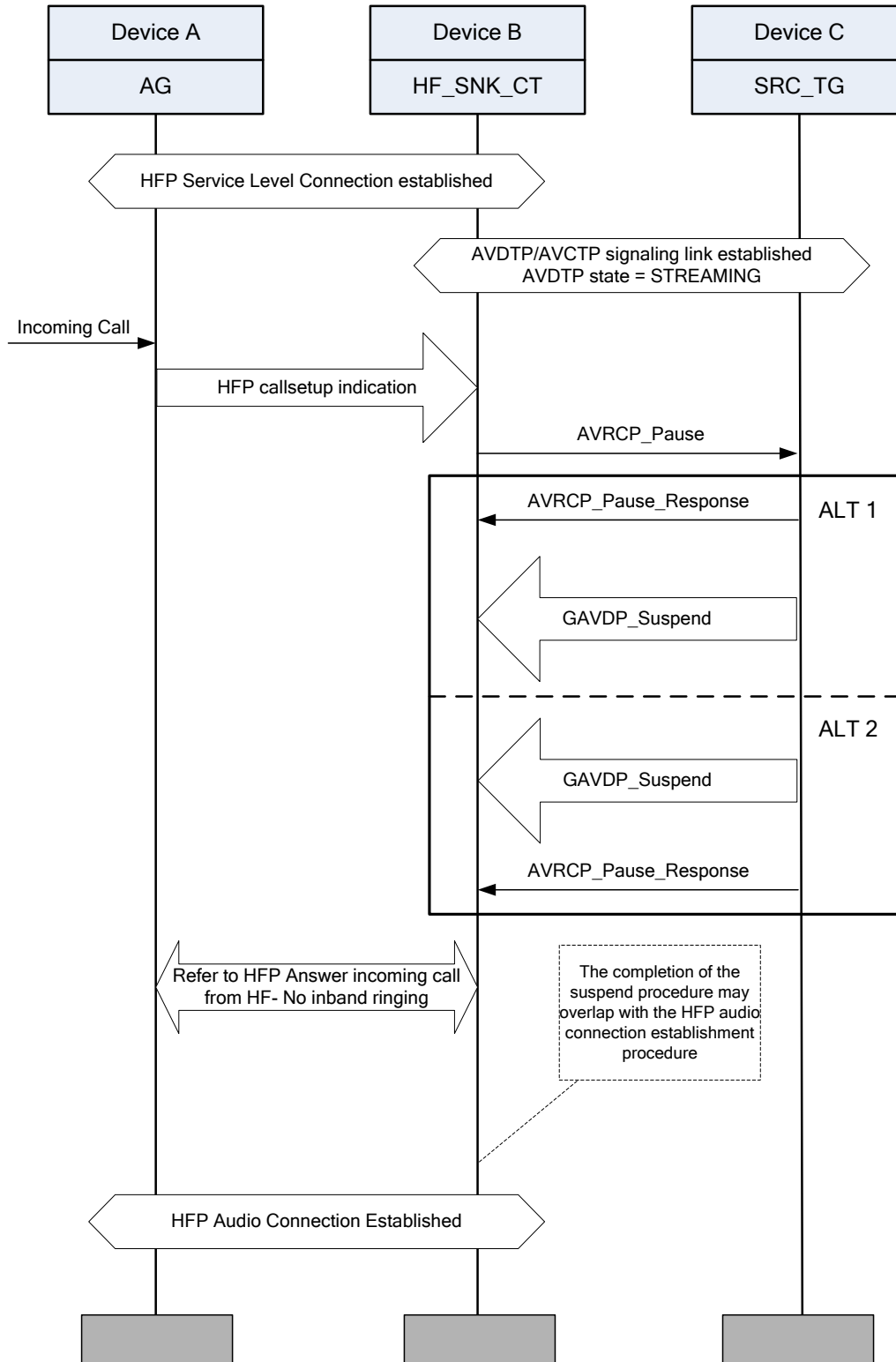


Figure 4.4: MPS/CT-HF-SNK/HFAV/CLH/MD/BV-02-I, MPS/SRC-TG/HFAV/CLH/MD/BV-02-I [Incoming Call during AVP Connection – In-band Ringing MD]

- Test Condition

- Devices are in communication range.
- Manual user intervention shall not be used to suspend the streaming of audio from Device C to Device B.

In this test, the IUT is either Device B or Device C (as defined through the TCMT). As such the behavior noted under Expected Outcome describes required responses from the complementary device as well as the IUT.

- Expected Outcome

#### Pass verdict

Device B:

- An *AVRCP\_Pause* PASS THROUGH command is sent to Device C by Device B when Device B receives the HFP callsetup indication from Device A.
- Audio Stream from Device C is suspended before the HFP Audio Connection is established with Device A.
- When the user answers the call via Device B, the active call between the Device B and Device A is established.

Device C:

- Initiates the *GAVDP\_Suspend* procedure with Device B upon reception of *AVRCP\_Pause* from Device B. The *GAVDP\_Suspend* procedure may occur prior to the confirmation of the *AVRCP\_Pause*.

## 4.2.2 Outgoing Call during AVP Connection

Test subgroup objectives:

To verify that A2DP Audio Streaming suspends or stops when an outgoing call is established.

### 4.2.2.1 Outgoing Call during AVP Connection - SD

- Test Case ID(s)

**MPS/AG-SRC-TG/HFAV/CLH/SD/BV-03-I**

**MPS/CT-HF-SNK/HFAV/CLH/SD/BV-03-I**

- Test Purpose

To verify that Device A can initiate an outgoing voice call while audio is streaming to Device B and Device A suspends the audio streaming.

- Reference

Section 4.1.3 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |

- HFP Service Level Connection is established between Device A and Device B.
  - Device A streams A2DP audio over AVDTP channel, which is in the state STREAMING, to Device B.
- Test Procedure
- Perform the following procedures as shown in [Figure 4.5](#) below:
1. Initiate an outgoing call on Device A.
  2. Observe that there is an indication on Device A that an outgoing voice call is being.
  3. Answer the call on the remote party being called.

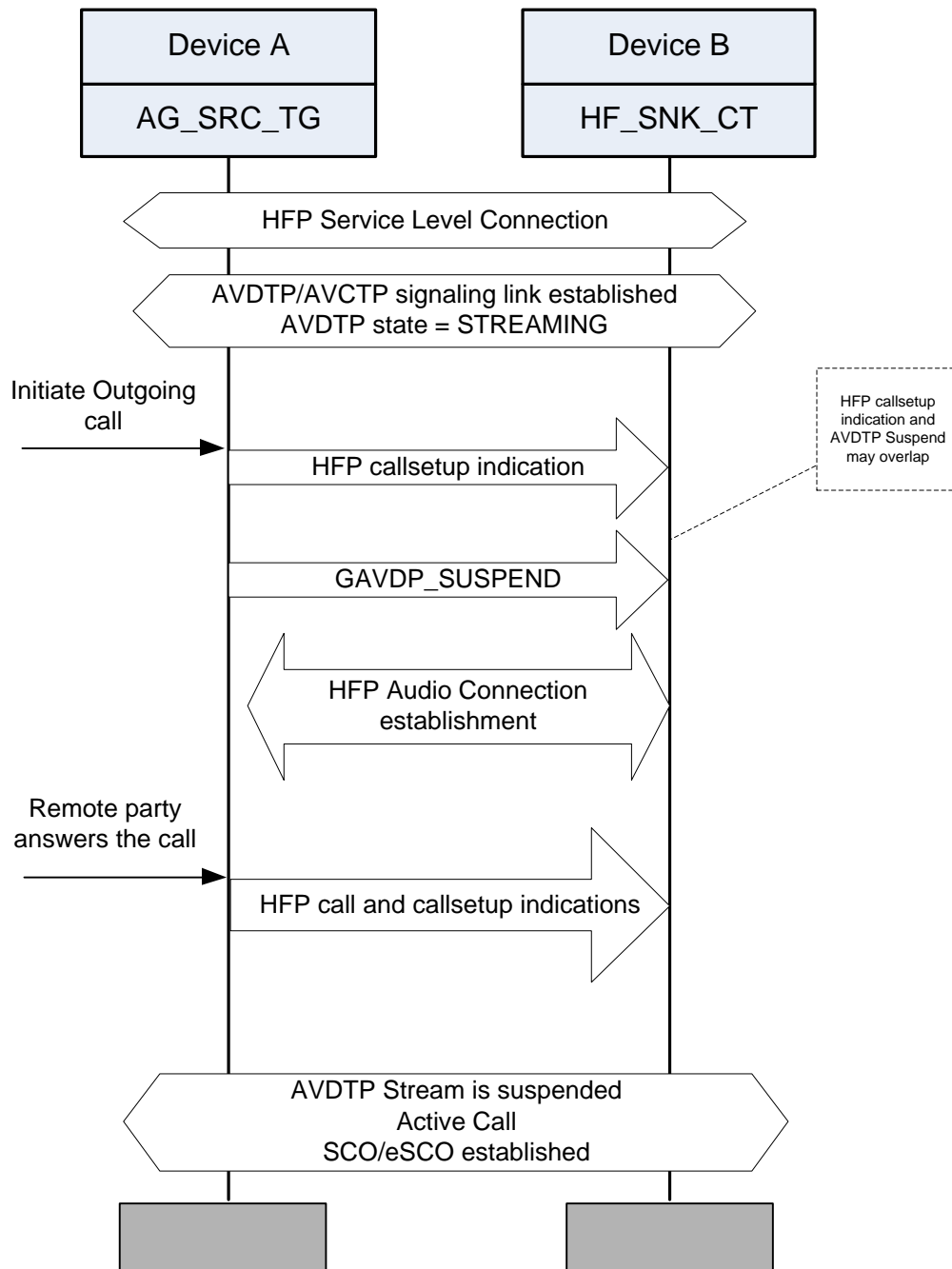


Figure 4.5: MPS/AG-SRC-TG/HFAV/CLH/SD/BV-03-I, MPS/CT-HF-SNK/HFAV/CLH/SD/BV-03-I  
[Outgoing Call during AVP Connection - SD]

- Test Condition

Devices are in communication range.

Manual user intervention shall not be used to suspend streaming of A2DP audio from Device A to Device B.



- Expected Outcome

Pass verdict

Device A:

- Upon HFP callsetup indication of the outgoing call to Device B, the *GAVDP\_Suspend* procedure is initiated.
- Audio Stream from Device A is suspended before the HFP audio channel is established with Device B.

Device B:

- When the user answers the call via the remote device, the active call between Device B and Device A is established.

#### 4.2.2.2 Outgoing Call during AVP Connection - MD

- Test Case ID(s)

**MPS/CT-HF-SNK/HFAV/CLH/MD/BV-03-I**

**MPS/SRC-TG/HFAV/CLH/MD/BV-03-I**

- Test Purpose

To verify that Device A can initiate an outgoing voice call while audio is streaming from Device C to Device B.

- Reference

Section 4.1.4 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B | Device C |
|----------|----------|----------|
| HFP AG   | HFP HF   | –        |
| –        | A2DP SNK | A2DP SRC |
| –        | AVRCP CT | AVRCP TG |

- HFP Service Level Connection is established between Device A and Device B.
- Device C streams A2DP audio over an AVDTP channel, which is in the state STREAMING, to Device B.

- Test Procedure

Perform the following procedures as shown in Figure 4.6 below:

1. Initiate an outgoing call on Device A.
2. Observe that there is an indication on Device A that an outgoing voice call is being placed.

3. Answer the call on the remote number being called.



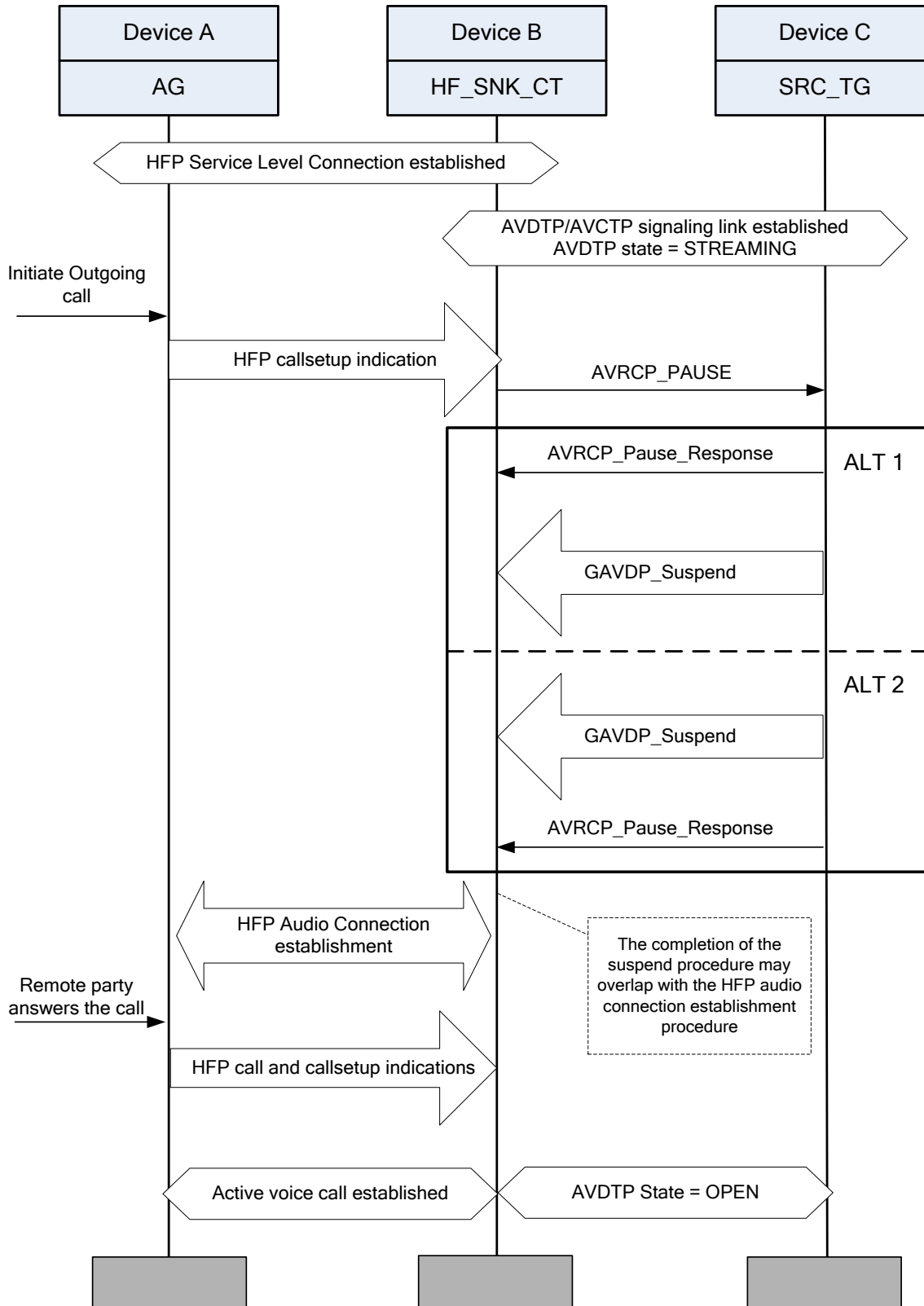


Figure 4.6: MPS/CT-HF-SNK/HFAV/CLH/MD/BV-03-I, MPS/SRC-TG/HFAV/CLH/MD/BV-03-I [Outgoing Call during AVP Connection - MD]

- Test Condition

Devices are in communication range

Manual user intervention shall not be used to suspend streaming of A2DP audio from Device C to the Device B.

In this test, the IUT is either Device B or Device C (as defined through the TCMT). As such the behavior noted under Expected Outcome describes required responses from the complementary device as well as the IUT.

- Expected Outcome

Pass verdict

Device B:

- An *AVRCP\_Pause* PASS THROUGH command is sent to Device C by Device B when Device B sends the HFP ATD command with the number provided.
- Audio Stream from Device C is suspended before the HFP Audio Connection is established with Device A.
- When the user answers the call via the remote number, the active call between Device B and Device A is established.

Device C:

- After reception of *AVRCP\_Pause* the *GAVDP\_Suspend* procedure is initiated with Device B. The *GAVDP\_Suspend* procedure may occur prior to the confirmation of the *AVRCP\_Pause*.

### 4.2.3 Reject/Ignore Incoming Call during Audio Streaming

Test subgroup objectives:

To verify that the behavior of the A2DP Audio Streaming when rejecting/ignoring an incoming call.

#### 4.2.3.1 Reject/Ignore Incoming Call during Audio Streaming - SD

- Test Case ID(s)

**MPS/AG-SRC-TG/HFAV/CLH/SD/BV-04-I**

**MPS/CT-HF-SNK/HFAV/CLH/SD/BV-04-I**

- Test Purpose

To verify that when an incoming call received on Device A is rejected/ignored from Device B, an A2DP audio stream from Device A that had been previously suspended on receipt of the incoming call on Device A is resumed.

- Reference

Section 4.1.5 in [3]

- Initial Condition

- The following combinations of profiles shall exist:



| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |

- HFP Service Level Connection is established between Device A and Device B.
  - Device A must be configured to alert Device B of an incoming call.
  - Device A streams A2DP audio over an AVDTP channel in the state STREAMING to Device B.
- Test Procedure
- Perform the following procedures as shown in [Figure 4.7](#) below:
1. Place a call from remote device to Device A.
  2. Upon receipt of an incoming call indication on the Device B (manufacturer specific) reject the call from Device B (manufacturer specific).

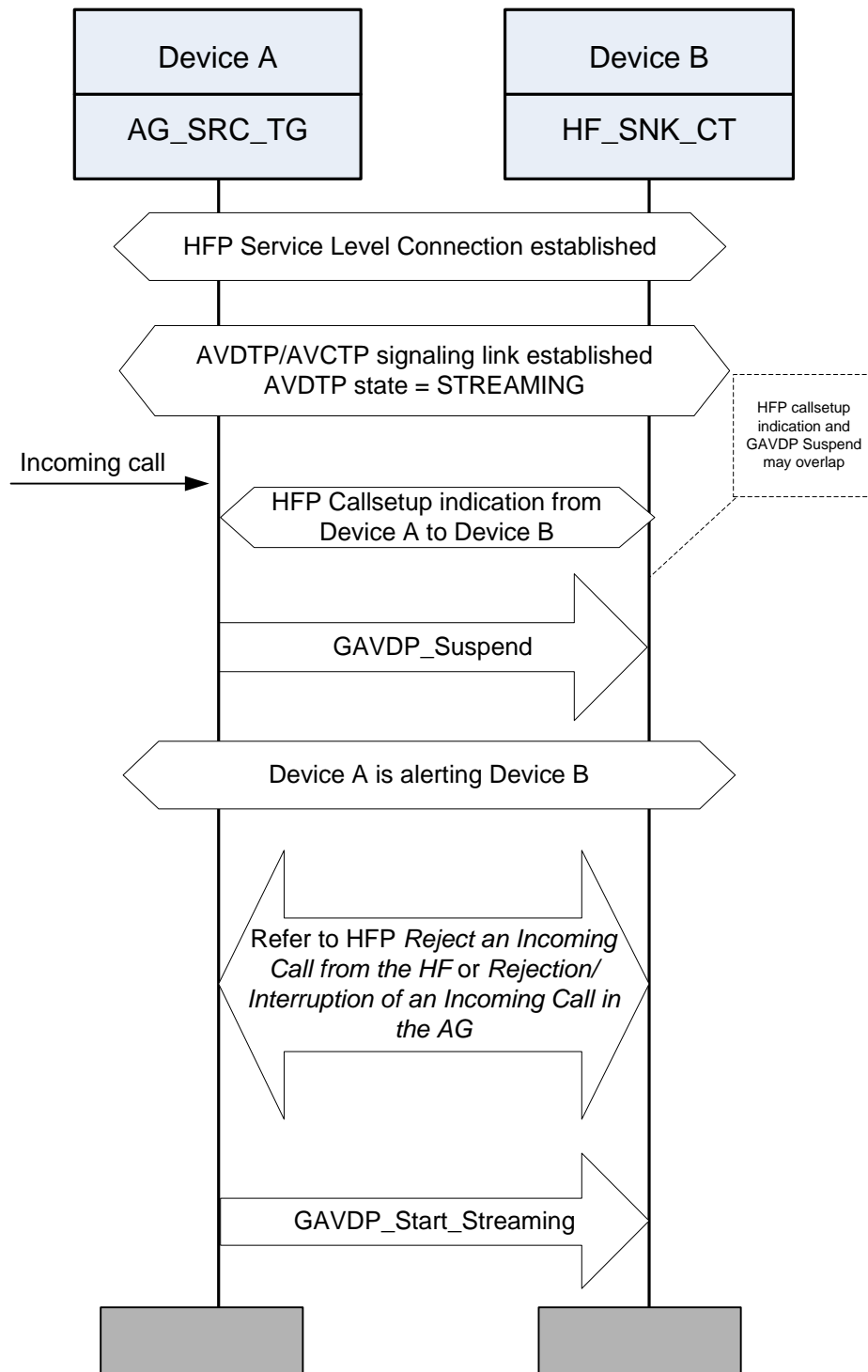


Figure 4.7: MPS/AG-SRC-TG/HFAV/CLH/SD/BV-04-I, MPS/CT-HF-SNK/HFAV/CLH/SD/BV-04-I  
[Reject/Ignore Incoming Call during Audio Streaming - SD]

- Test Condition

Devices are in communication range.

Manual user intervention shall not be used to suspend the streaming of A2DP audio from Device A to Device B on receipt of the incoming call indication from Device A.

Manual user intervention shall not be used to resume the streaming of A2DP audio from Device A to Device B after rejecting the call.

- Expected Outcome

Pass verdict

Device A:

- Initiates the *GAVDP\_Suspend* procedure upon HFP call indication of the incoming call to Device B.
- Initiates the *GAVDP\_Start\_Streaming* procedure with Device B after reception of the HFP indication of the call rejection from Device B.
- No HFP Audio Connection is established after the HFP call rejection.

Device B:

- Rejects incoming call after incoming call indication from Device A.

#### 4.2.3.2 Reject/Ignore Incoming Call during Audio Streaming - MD

- Test Case ID(s)

**MPS/CT-HF-SNK/HFAV/CLH/MD/BV-04-I**

**MPS/SRC-TG/HFAV/CLH/MD/BV-04-I**

- Test Purpose

To verify that when an incoming call received on Device A is rejected/ignored from Device B, an A2DP audio streaming from Device C that had been previously suspended on receipt of the incoming call on Device A is resumed.

- Reference

Section 4.1.6 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| DEVICE A | Device B | DEVICE C |
|----------|----------|----------|
| HFP AG   | HFP HF   | –        |
| –        | A2DP SNK | A2DP SRC |
| –        | AVRCP CT | AVRCP TG |

- HFP Service Level Connection is established between Device A and Device B.
- Device A shall be configured to alert Device B of an incoming call.

- Device C streams A2DP audio over an AVDTP channel in the state STREAMING to Device B.
- Test Procedure

Perform the following procedures as shown in [Figure 4.8](#) below:

1. Place a call from remote device to Device A.
2. Upon receipt of an incoming call indication on the Device B (manufacturer specific), reject the call from Device B (manufacturer specific).



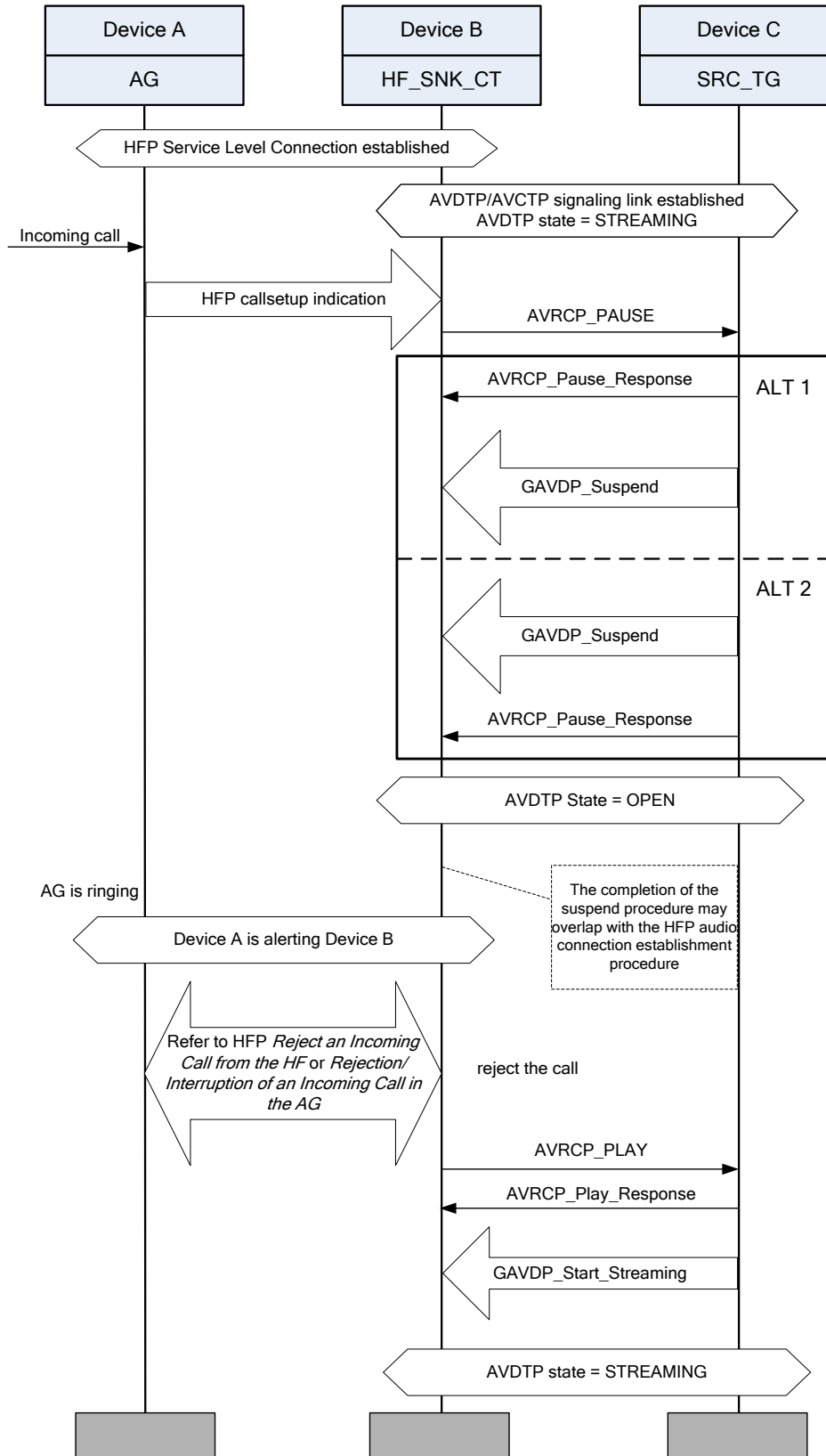


Figure 4.8: MPS/CT-HF-SNK/HFAV/CLH/MD/BV-04-I, MPS/SRC-TG/HFAV/CLH/MD/BV-04-I  
[Reject/Ignore Incoming Call during Audio Streaming - MD]

- Test Condition

Devices are in communication range.

Manual user intervention shall not be used to suspend the streaming of audio from Device C to Device B on receipt of the incoming call indication from Device A.

Manual user intervention shall not be used to resume the streaming of audio from Device C to Device B after rejecting the call.

In this test, the IUT is either Device B or Device C (as defined through the TCMT). As such the behavior noted under Expected Outcome describes required responses from the complementary device as well as the IUT.

- Expected Outcome

Pass verdict

Device B:

- An *AVRCP\_Pause* PASS THROUGH command is sent to Device C by Device B when Device B receives the HFP callsetup indication of the incoming call from Device A.
- When the user rejects the call via Device B (manufacturer specific), an *AVRCP\_Play* command is sent to Device C.

Device C:

- Initiates the *GAVDP\_Suspend* procedure with Device B upon reception of the *AVRCP\_Pause*. The *GAVDP\_Suspend* procedure may occur prior to the confirmation of the *AVRCP\_Pause*.
- Initiate the *GAVDP\_Start\_Streaming* procedure with Device B after receiving the *AVRCP\_Play* command from Device B.

#### 4.2.4 HFP Call termination during AVP connection

Test subgroup objectives:

To verify that A2DP audio streaming resumes after HFP voice call is terminated if present before the call and does not resume any audio if no streaming had been present.

##### 4.2.4.1 HFP Call termination during AVP connection - SD

- Test Case ID(s)

**MPS/AG-SRC-TG/HFAV/CLH/SD/BV-05-I**

**MPS/CT-HF-SNK/HFAV/CLH/SD/BV-05-I**

- Test Purpose

To verify that Device A resumes previously-streaming A2DP audio with Device B after an HFP voice call between Device A and Device B terminates.

- Reference

Section 4.1.7 in [3]

- Initial Condition



- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |

- HFP Service Level Connection is established between Device A and Device B.
  - An active voice call exists between Device A and Device B.
  - A2DP media connection from Device A to Device B is in the AVDTP state IDLE or OPEN
  - The A2DP media streaming had been in the AVDTP STREAMING state before the HFP voice call was established and has been suspended due to the voice call.
- Test Procedure

Perform the following procedures as shown in [Figure 4.9](#) below:

1. HFP voice call is terminated from Device B.

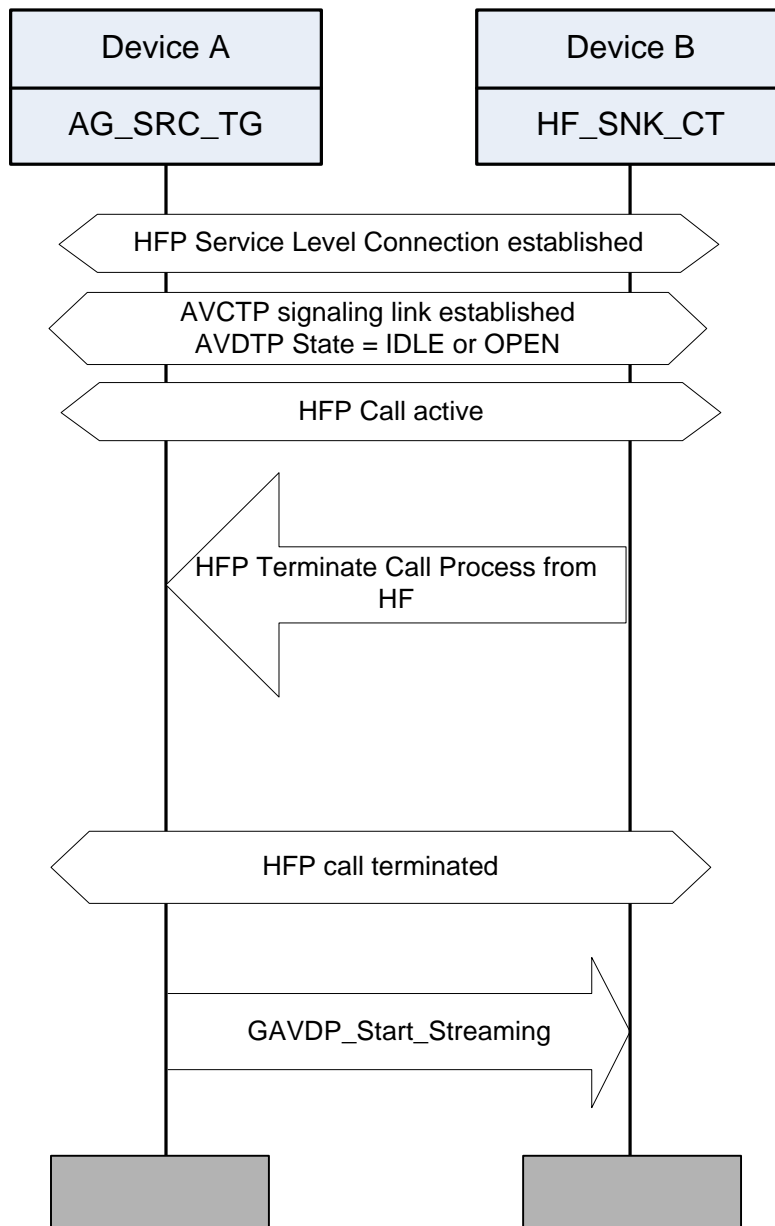


Figure 4.9: MPS/AG-SRC-TG/HFAV/CLH/SD/BV-05-I, MPS/CT-HF-SNK/HFAV/CLH/SD/BV-05-I [HFP Call termination during AVP connection - SD]

- Test Condition

Devices are in communication range.

Manual user intervention shall not be used to resume the streaming from Device A to Device B.

- Expected Outcome

Pass verdict

Device A:

- Initiates the *GAVDP\_Start\_Streaming* procedure with Device B after the HFP indication of the call termination from Device B.

Device B:

- Initiates the HFP Terminate call Process to Device A.

#### 4.2.4.2 HFP Call termination during AVP connection No Music - SD

- Test Case ID(s)

**MPS/AG-SRC-TG/HFAV/CLH/SD/BV-06-I**

**MPS/CT-HF-SNK/HFAV/CLH/SD/BV-06-I**

- Test Purpose

To verify that Device A does not resume any A2DP audio with Device B after an HFP voice call between Device A and Device B terminates and no A2DP stream had been present before the call.

- Reference

Section 4.1.7 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |

- HFP Service Level Connection is established between Device A and Device B.
- An active voice call exists between Device A and Device B.
- A2DP media connection from Device A to Device B is not in the AVDTP STREAMING state.
- The A2DP media streaming had not been in the AVDTP STREAMING state at the time of HFP voice call establishment.

- Test Procedure

Perform the following procedures as shown in [Figure 4.10](#) below:

1. HFP voice call is terminated from Device B.

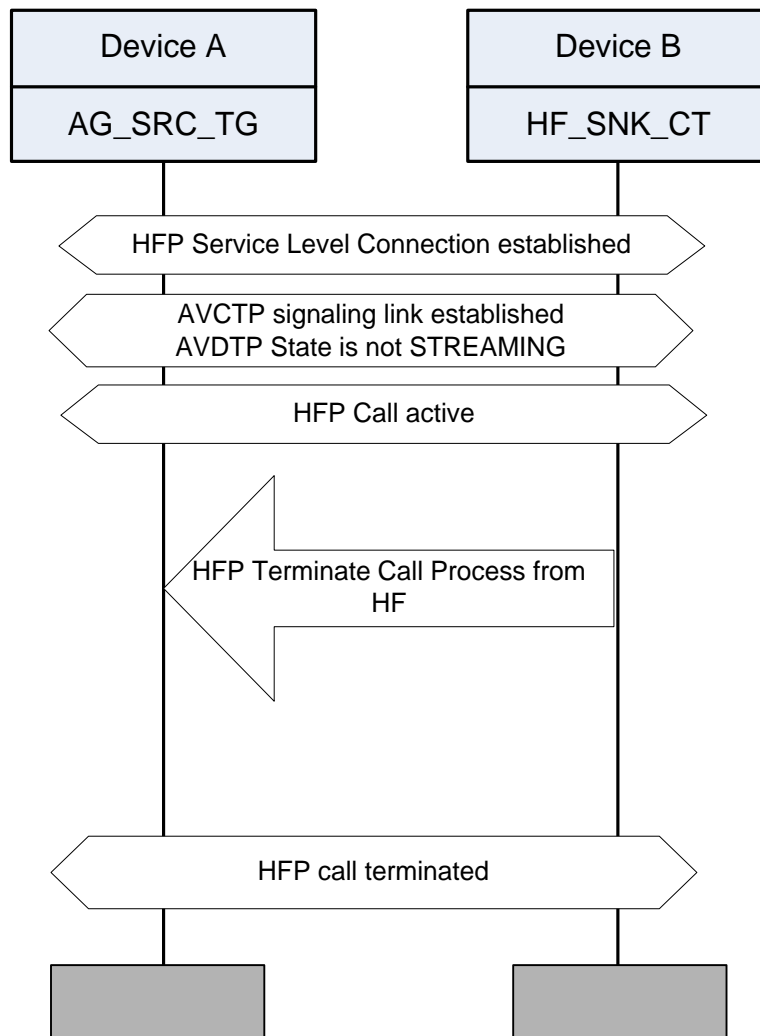


Figure 4.10: MPS/AG-SRC-TG/HFAV/CLH/SD/BV-06-I, MPS/CT-HF-SNK/HFAV/CLH/SD/BV-06-I [HFP Call termination during AVP connection No Music - SD]

- Test Condition

Devices are in communication range.

Manual user intervention shall not be used to resume the streaming from Device A to Device B.

- Expected Outcome

Pass verdict

Device A:

- Upon the HFP indication of the call termination from Device B, A2DP audio streaming is not started.

Device B:

- Initiates the HFP Terminate call Process to Device A.
- Upon the HFP indication of the call termination, A2DP audio streaming is not started.

#### 4.2.4.3 MPS/CT-HF-SNK/HFAV/CLH/MD/BV-05-I [HFP Call termination during AVP connection - MD]

- Test Purpose

To verify that an A2DP stream from Device C to device B that has been suspended for an HFP call from Device A is resumed after call termination.

- Reference

Section 4.1.8 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B | Device C |
|----------|----------|----------|
| HFP AG   | HFP HF   | –        |
| –        | A2DP SNK | A2DP SRC |
| –        | AVRCP CT | AVRCP TG |

- HFP Service Level Connection is established between Device A and Device B.
- An active voice call exists between Device A and Device B.
- Streaming A2DP audio from Device C to Device B is suspended due to the active voice call and the media connection is in the AVDTP OPEN state.

- Test Procedure

Perform the following procedures as shown in Figure 4.11 below:

1. HFP voice call between Device A and Device B is terminated from Device A.
2. Device B sends an *AVRCP\_Play* command to Device C.

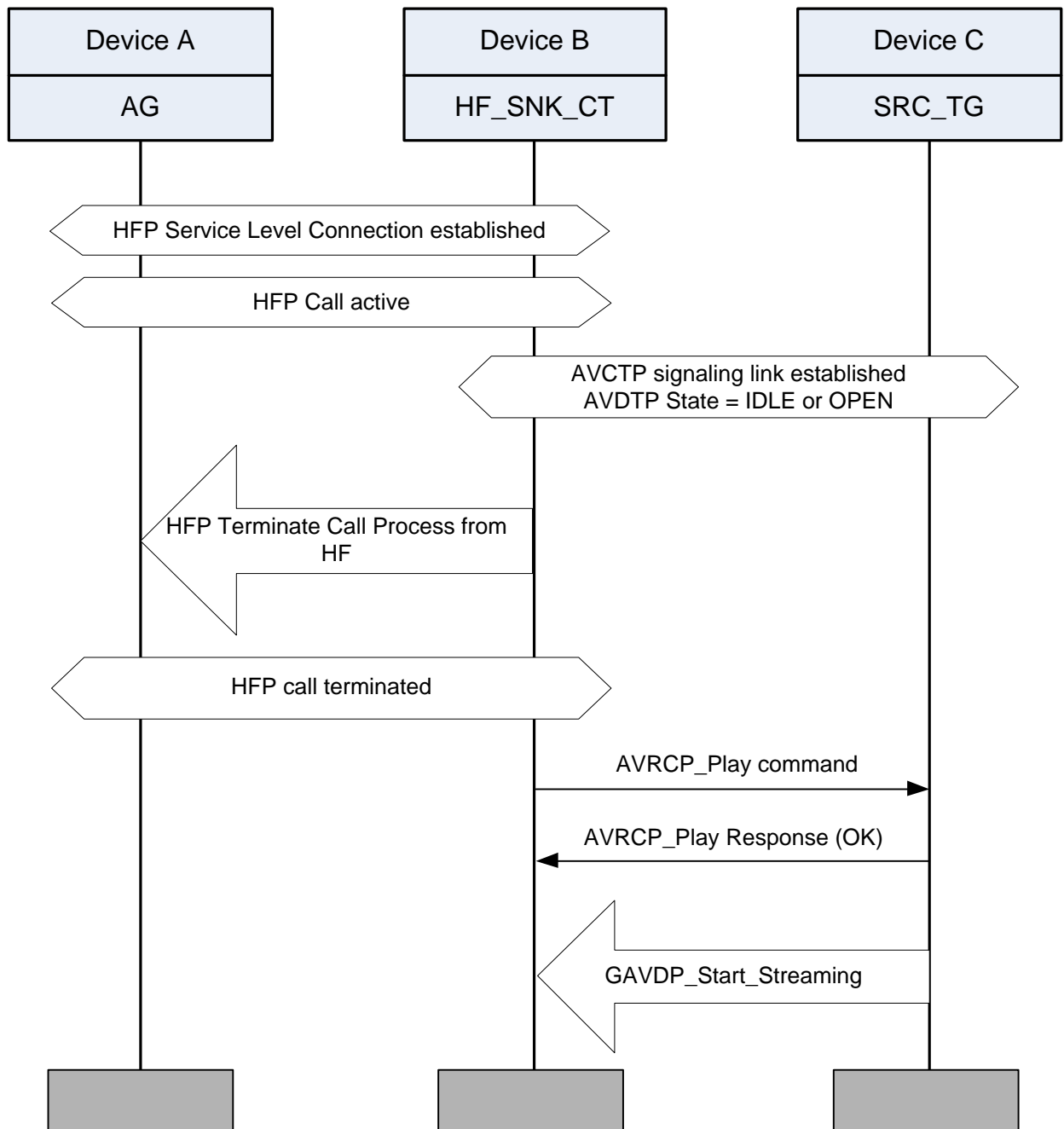


Figure 4.11: MPS/CT-HF-SNK/HFAV/CLH/MD/BV-05-I [HFP Call termination during AVP connection - MD]

- Test Condition

Devices are in communication range.

In this test, the IUT is Device B.



- Expected Outcome

Pass verdict

Device B:

- Initiates call termination with Device A.
- An *AVRCP\_Play* command is sent to Device C after the active voice call is terminated.

#### 4.2.4.4 HFP Call termination during AVP connection No Music - MD

- Test Case ID(s)

**MPS/CT-HF-SNK/HFAV/CLH/MD/BV-06-I**

**MPS/SRC-TG/HFAV/CLH/MD/BV-06-I**

- Test Purpose

To verify that no A2DP stream from Device C to Device B is started upon call termination with Device A when the stream had not been present before the call.

- Reference

Section 4.1.8 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B | Device C |
|----------|----------|----------|
| HFP AG   | HFP HF   | –        |
| –        | A2DP SNK | A2DP SRC |
| –        | AVRCP CT | AVRCP TG |

- HFP Service Level Connection is established between Device A and Device B.
- An active voice call exists between Device A and Device B.
- The A2DP media streaming has not been in the AVDTP STREAMING state between Device C and Device B at the time of HFP voice call establishment between Device A and Device B.

- Test Procedure

Perform the following procedures as shown in [Figure 4.12](#) below:

1. HFP voice call between Device A and Device B is terminated from Device A.

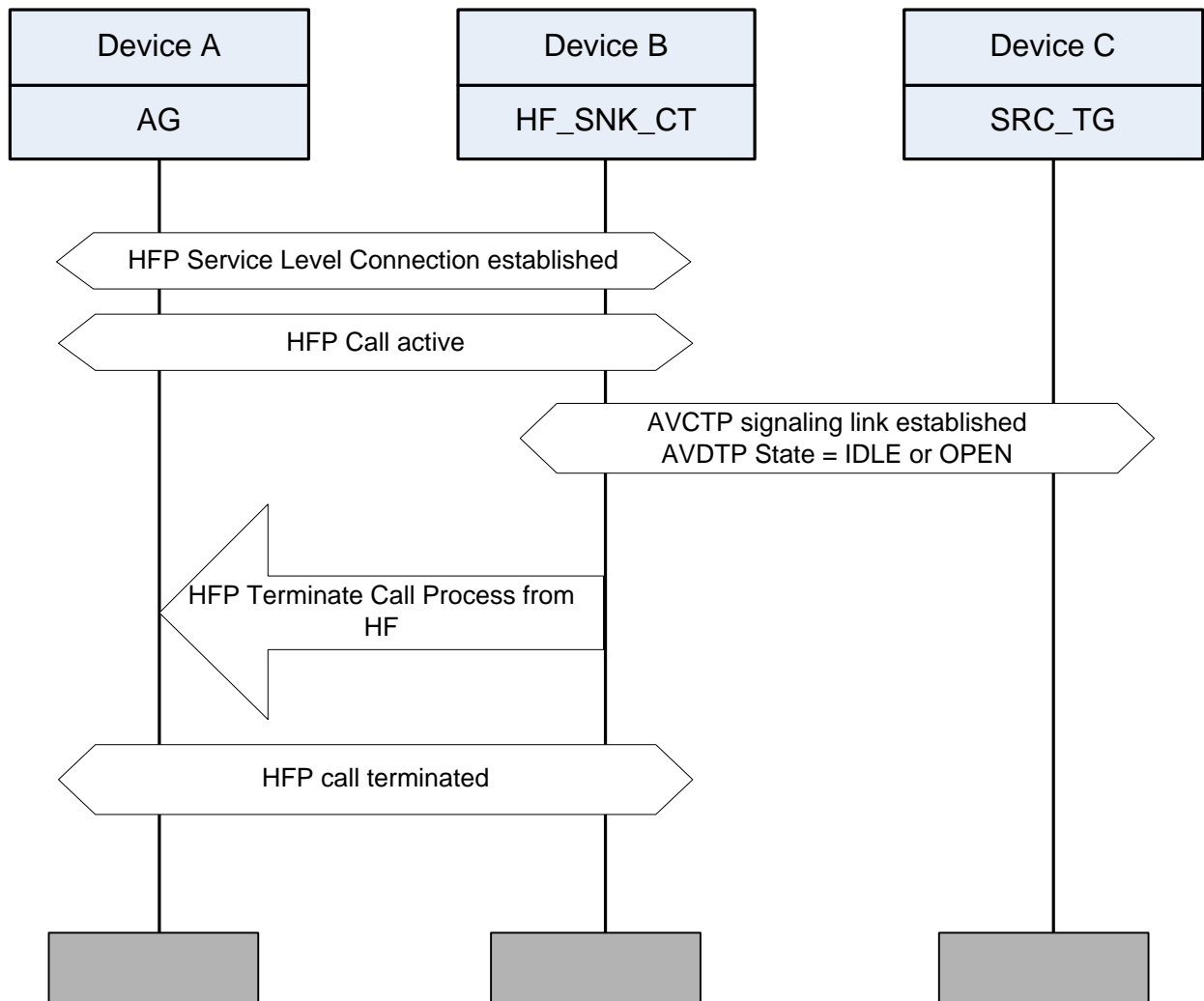


Figure 4.12 MPS/CT-HF-SNK/HFAV/CLH/MD/BV-06-I, MPS/SRC-TG/HFAV/CLH/MD/BV-06-I [HFP Call termination during AVP connection No Music - MD]

- Test Condition

Devices are in communication range.

In this test, the IUT is either Device B or Device C (as defined through the TCMT). As such the behavior noted under Expected Outcome describes required responses from the complementary device as well as the IUT.

- Expected Outcome

Pass verdict

Device B:

- Initiates call termination with Device A.
- An *AVRCP\_Play* command is not sent to Device C after the active voice call is terminated.
- A2DP audio streaming with Device C is not started.

Device C:

- A2DP audio streaming with Device B is not started.

#### 4.2.5 Press Play on Audio Player during active call

Test subgroup objectives:

To verify that A2DP Audio is not streaming during an active voice call.

##### 4.2.5.1 Press Play on Audio Player during active call - SD

- Test Case ID(s)

**MPS/AG-SRC-TG/HFAV/ACT/SD/BV-01-I**

**MPS/CT-HF-SNK/HFAV/ACT/SD/BV-01-I**

- Test Purpose

To verify that Device A does not initiate A2DP audio streaming when Play button is pressed on Device A during an active voice between Device A and Device B.

- Reference

Section 4.1.9 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |

- HFP Service Level Connection is established between Device A and Device B.
- An active voice call exists between Device A and Device B.
- A2DP media connection from Device A to Device B is in the AVDTP IDLE or OPEN state.

- Test Procedure

Perform the following procedures as shown in [Figure 4.13](#) below:

1. Play functionality is attempted on Device A by a Manufacturer Specific means.

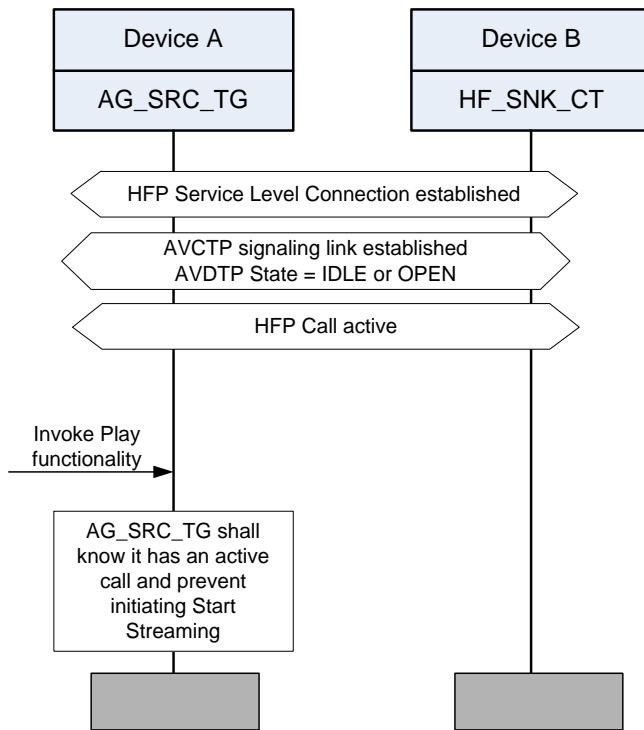


Figure 4.13: MPS/AG-SRC-TG/HFAV/ACT/SD/BV-01-I, MPS/CT-HF-SNK/HFAV/ACT/SD/BV-01-I [Press Play on Audio Player during active call - SD]

- Test Condition

Both devices are in communication range.

- Expected Outcome

Pass verdict

Device A:

- Media streaming is not started after play functionality has been attempted by Device A (The *GAVDP\_Start\_Streaming* procedure is not initiated with Device B).

Device B:

- Stays in active call after the Play button is pushed on Device A.

#### 4.2.5.2 MPS/CT-HF-SNK/HFAV/ACT/MD/BV-01-I [Audio Player streams audio during active call - MD]

- Test Purpose

To verify A2DP Audio Streaming is successful between Device B and Device C when the *GAVDP\_Start\_Streaming* procedure is initiated by Device C during an active HFP call between Device A and Device B, and Device B successfully suspends the streaming media.

- Reference

Section 4.1.10 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B | Device C |
|----------|----------|----------|
| HFP AG   | HFP HF   | –        |
| –        | A2DP SNK | A2DP SRC |
| –        | AVRCP CT | AVRCP TG |

- HFP Service Level Connection is established between Device A and Device B.
- An active HFP call exists between Device A and Device B.
- A2DP media connection from Device B to Device C is in the AVDTP IDLE or OPEN state.

- Test Procedure

Perform the following procedures as shown in [Figure 4.14](#) below:

1. Action is taken on Device C to initiate media streaming (manufacturer specific).
2. Device C initiates the *GAVDP\_Start\_Streaming* procedure to Device B.
3. Device B suspends the streaming media.

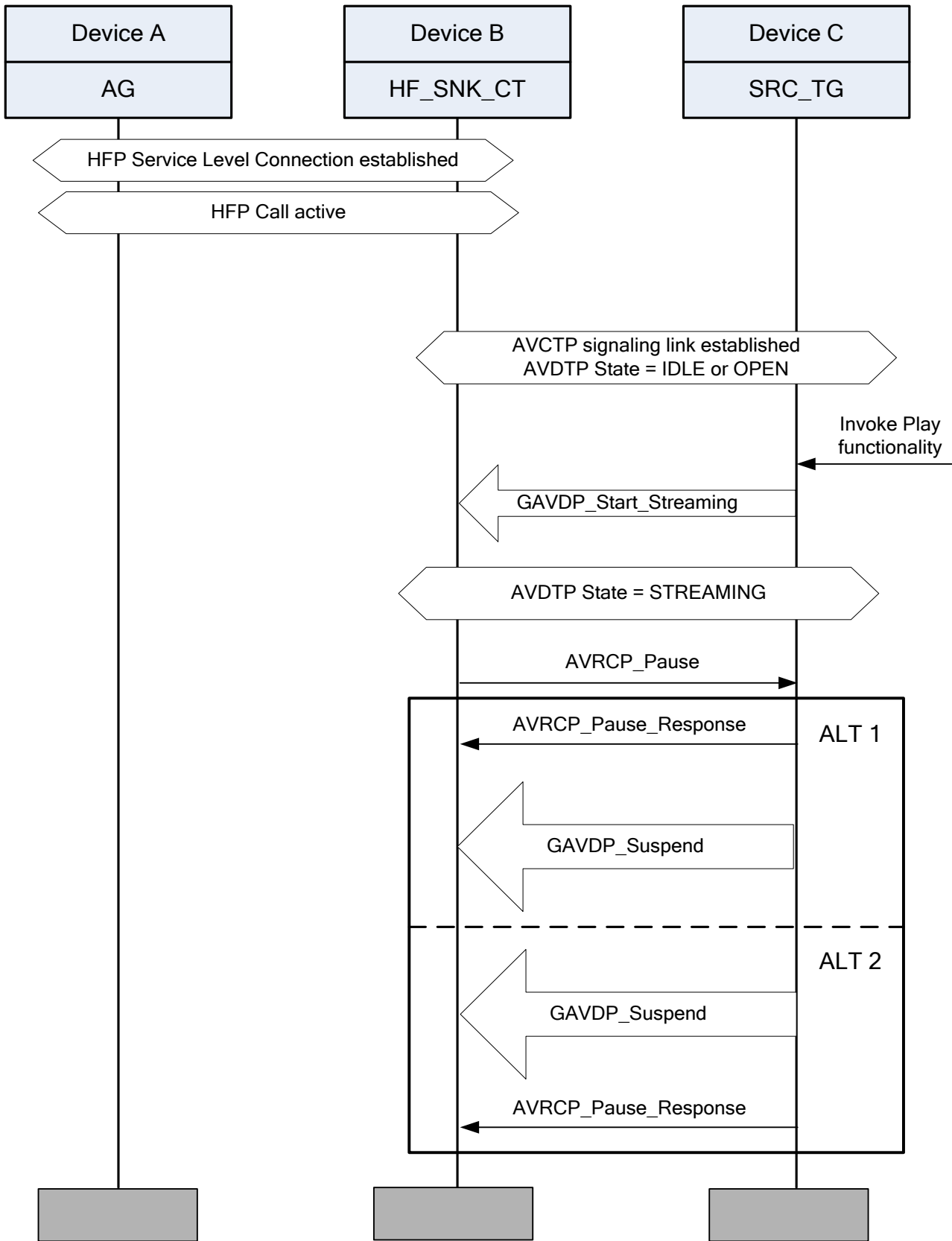


Figure 4.14: MPS/CT-HF-SNK/HFAV/ACT/MD/BV-01-I [Audio Player streams audio during active call - MD]

- Test Condition

Devices are in communication range.

- Expected Outcome

Pass verdict

Device B:

- The *GAVDP\_Start\_Streaming* procedure initiated by Device C is successful.
- Upon reaching the AVDTP state STREAMING, Device B sends the *AVRCP\_Pause* PASS THROUGH command to Device C.
- Successfully completes the *GAVDP\_Suspend* procedure initiated by Device C. The *GAVDP\_Suspend* procedure may occur prior to the confirmation of the *AVRCP\_Pause*.

#### 4.2.6 Start Audio Streaming after AVRCP Play

Test subgroup objectives:

To verify that audio streaming is started after the reception of an *AVRCP\_Play* PASS THROUGH command.

##### 4.2.6.1 Start Audio Streaming after AVRCP Play – SD

- Test Case ID(s)

**MPS/SRC-TG/HFAV/ACT/SD/BV-02-I**

**MPS/CT-SNK/HFAV/ACT/SD/BV-02-I**

- Test Purpose

To verify that Device A starts A2DP audio streaming after receiving an *AVRCP\_Play* PASS THROUGH command from Device B.

- Reference

Section 4.1.11 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |

- A2DP media connection from Device A to Device B is in the AVDTP IDLE or OPEN state.

- An AVCTP signaling connection is established between Device A and Device B.
- Test Procedure
 

Perform the following procedures as shown in [Figure 4.15](#) below:

  1. Device B sends an *AVRCP\_Play* PASS THROUGH command to Device A.
  2. After receiving the *AVRCP\_Play* command, Device A sends an *AVDTP\_Start* command to Device B.

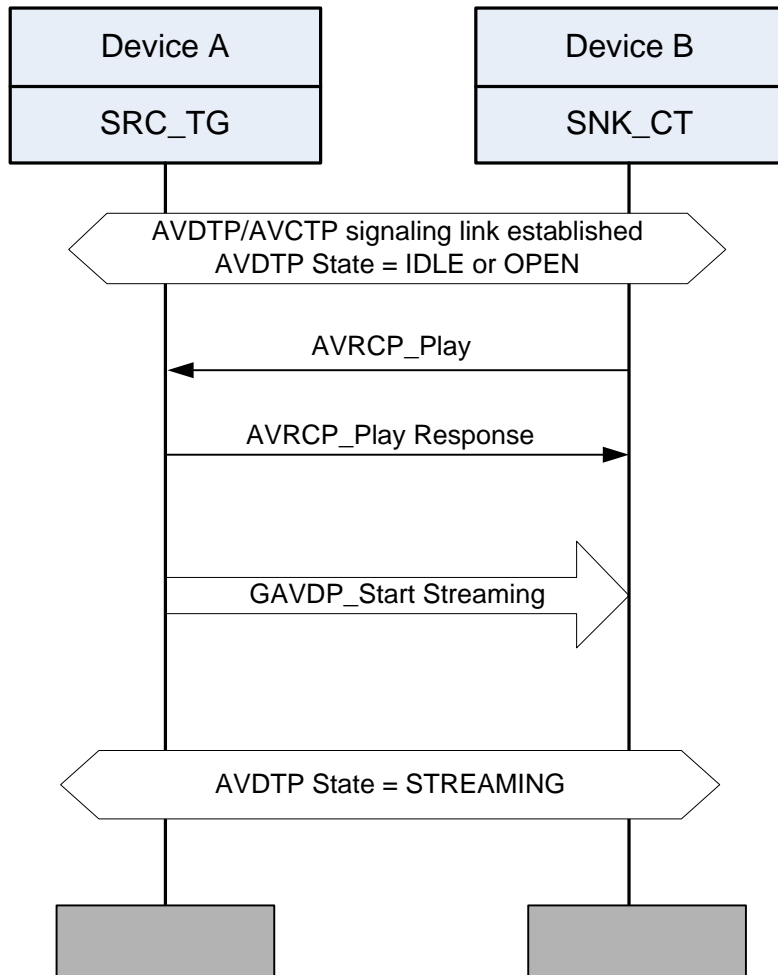


Figure 4.15: MPS/SRC-TG/HFAV/ACT/SD/BV-02-I, MPS/CT-SNK/HFAV/ACT/SD/BV-02-I [Start Audio Streaming after AVRCP Play – SD]

- Test Condition
 

Devices are in communication range.
- Expected Outcome

Pass verdict

Device A:

- The *AVRCP\_Play* PASS THROUGH command is accepted from Device B.
- The *GAVDP\_Start\_Streaming* procedure is initiated with Device B.



Device B:

- The *AVRCP\_Play* PASS THROUGH command is successfully sent to Device A.
- The *GAVDP\_Start\_Streaming* procedure initiated by Device A is successful and A2DP audio is streamed successfully.

## 4.2.7 Suspend Audio Streaming after AVRCP Pause

Test subgroup objectives:

To verify that audio streaming is suspended after the reception of an *AVRCP\_Pause* PASS THROUGH command.

### 4.2.7.1 Suspend Audio Streaming after AVRCP Pause - SD

- Test Case ID(s)

**MPS/SRC-TG/HFAV/ACT/SD/BV-03-I**

**MPS/CT-SNK/HFAV/ACT/SD/BV-03-I**

- Test Purpose

To verify that Device A suspends previously-streaming A2DP audio after receiving an *AVRCP\_Pause* PASS THROUGH command from Device B.

- Reference

Section 4.1.12 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |

- A2DP media connection from Device A to Device B is in the AVDTP state STREAMING.
- An AVCTP signaling connection is established between Device A and Device B.
- Test Procedure

Perform the following procedures as shown in [Figure 4.16](#) below:

1. Device B sends an *AVRCP\_Pause* PASS THROUGH command to Device A.

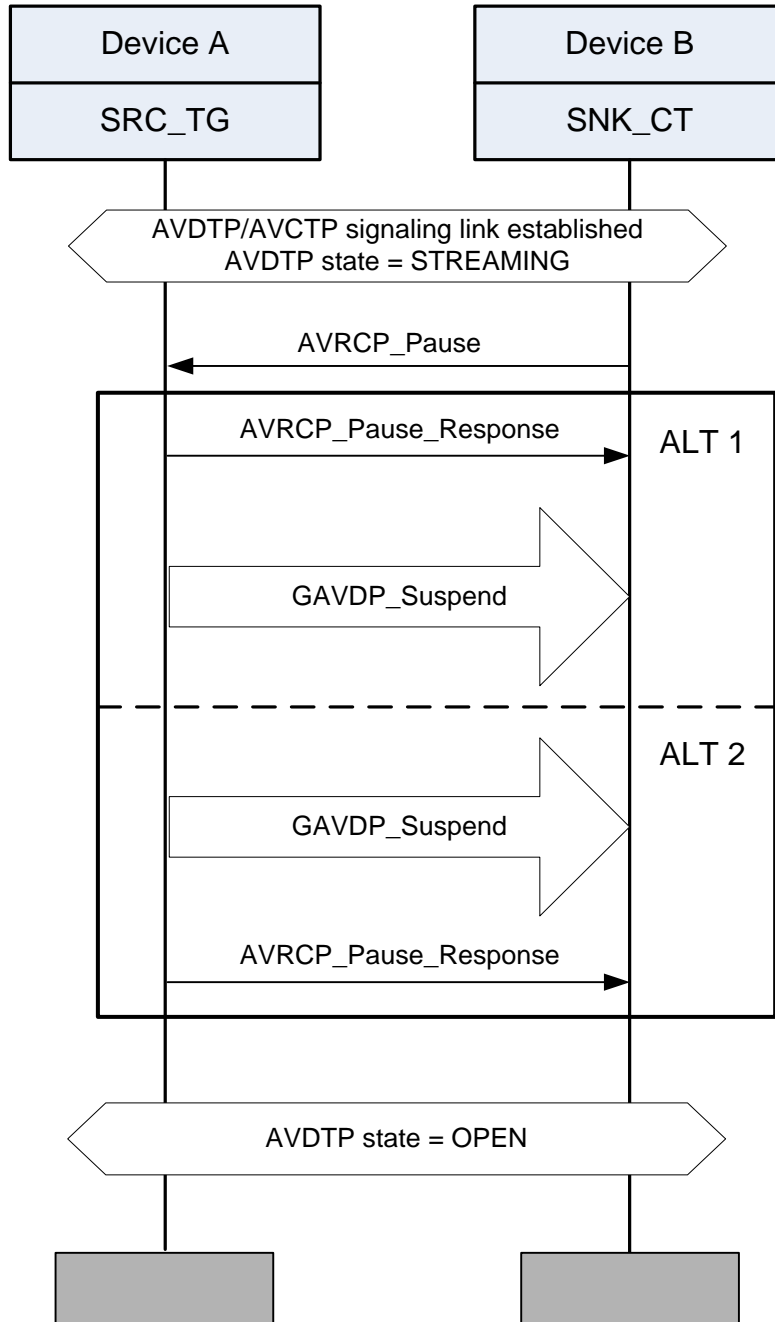


Figure 4.16: MPS/SRC-TG/HFAV/ACT/SD/BV-03-I, MPS/CT-SNK/HFAV/ACT/SD/BV-03-I [Suspend Audio Streaming after AVRCP Pause - SD]

- Test Condition  
Devices are in communication range.
- Expected Outcome  
Pass verdict

Device A:

- The *AVRCP\_Pause* PASS THROUGH command from Device B is accepted
- Upon receiving the *AVRCP\_Pause* PASS THROUGH command, the *GAVDP\_Suspend* procedure is initiated with Device B. The *GAVDP\_Suspend* procedure may occur prior to the confirmation of the *AVRCP\_Pause*.

Device B:

- An *AVRCP\_Pause* PASS THROUGH command is successfully sent to Device A.
- The *GAVDP\_Suspend* procedure initiated by Device A is successfully completed.

## 4.3 AVP + OBEX

Test group objectives:

To verify that streaming audio is successful during OBEX operations and the audio quality is not disturbed.

### 4.3.1 Receive files during A2DP connection (active streaming)

Test subgroup objectives:

To verify that streaming music is not disturbed while a phonebook is being successfully downloaded.

#### 4.3.1.1 Phonebook download during audio streaming – SD

- Test Case ID(s)

**MPS/PSE-SRC-TG/AVO/ACT/SD/BV-01-I**

**MPS/CT-PCE-SNK/AVO/ACT/SD/BV-01-I**

- Test Purpose

To verify that audio streaming is maintained throughout an active phonebook download between two devices.

- Reference

Section 4.5.1 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| PBAP PSE | PBAP PCE |
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |

- A2DP media connection from Device A to Device B is in the AVDTP STREAMING state.
  - An AVCTP signaling connection is established between Device A and Device B.
  - Device A contains a Phone Book with at least 1000 entries or 80% of the maximum number of entries the device supports. This Phone Book must be of interest for Device B.
- Test Procedure

Perform the following procedures as shown in [Figure 4.17](#) below:

1. Device B establishes a PBAP session with the Device A and in this session retrieves the Phone Book objects of interest.

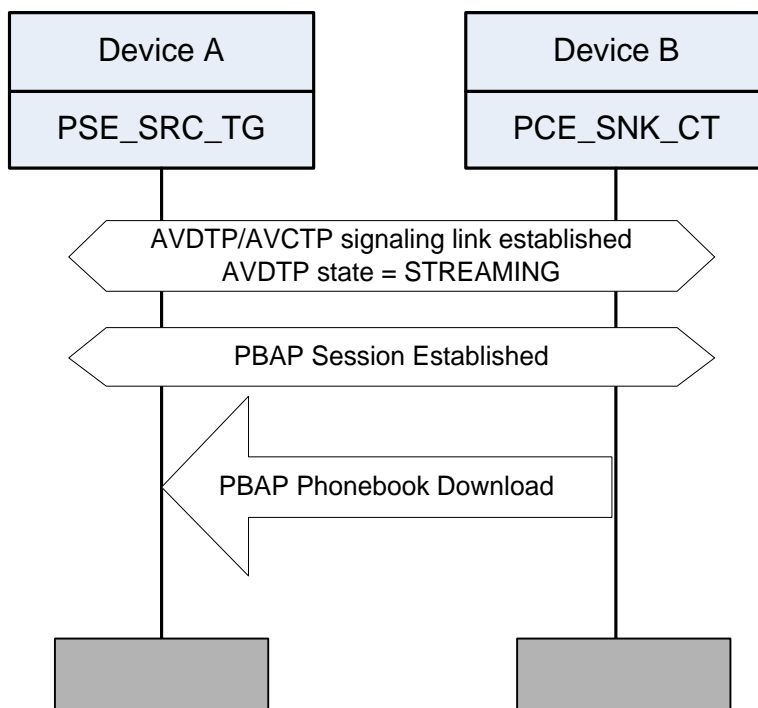


Figure 4.17: MPS/PSE-SRC-TG/AVO/ACT/SD/BV-01-I, MPS/CT-PCE-SNK/AVO/ACT/SD/BV-01-I  
[Phonebook download during audio streaming – SD]

- Test Condition
 

Both devices are in communication range.
- Expected Outcome
 

Pass verdict

Device A:

  - The PBAP download is successful.

- The A2DP audio stream maintains an acceptable level of audio quality and no observable changes are introduced by the PBAP download.

Device B:

- Device B retrieves the Phone Book objects of interest from Device A.
- Audio Streaming is maintained between Device A and Device B throughout the PBAP download.
- The A2DP audio maintains an acceptable level of audio quality and no observable changes are introduced by the PBAP download.

## 4.4 DUN + Other

Test group objectives:

To verify that DUN data communication is successful during other profile operations.

### 4.4.1 DUN communication during active voice call

Test subgroup objectives:

To verify that Data Communication is maintained during an active voice call.

#### 4.4.1.1 DUN communication during active voice call - SD

- Test Case ID(s)

**MPS/AG-GW/DUN/CLH/SD/BV-01-I**

**MPS/DT-HF/DUN/CLH/SD/BV-01-I**

- Test Purpose

To verify that an active voice call is maintained between Device A and Device B when a data communication is initiated from Device B.

- Reference

Section 4.2.1 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| DUN GW   | DUN DT   |

- HFP Service Level Connection is established between Device A and Device B.
- An active HFP call exists between Device A and Device B.
- Test Procedure

Perform the following procedures as shown in [Figure 4.18](#) below:

1. Device B sends a DUN connection request to Device A if a DUN connection does not already exist between the two devices (manufacturer specific).
2. Device B sends the ATD command to Device A to connect to the external network.

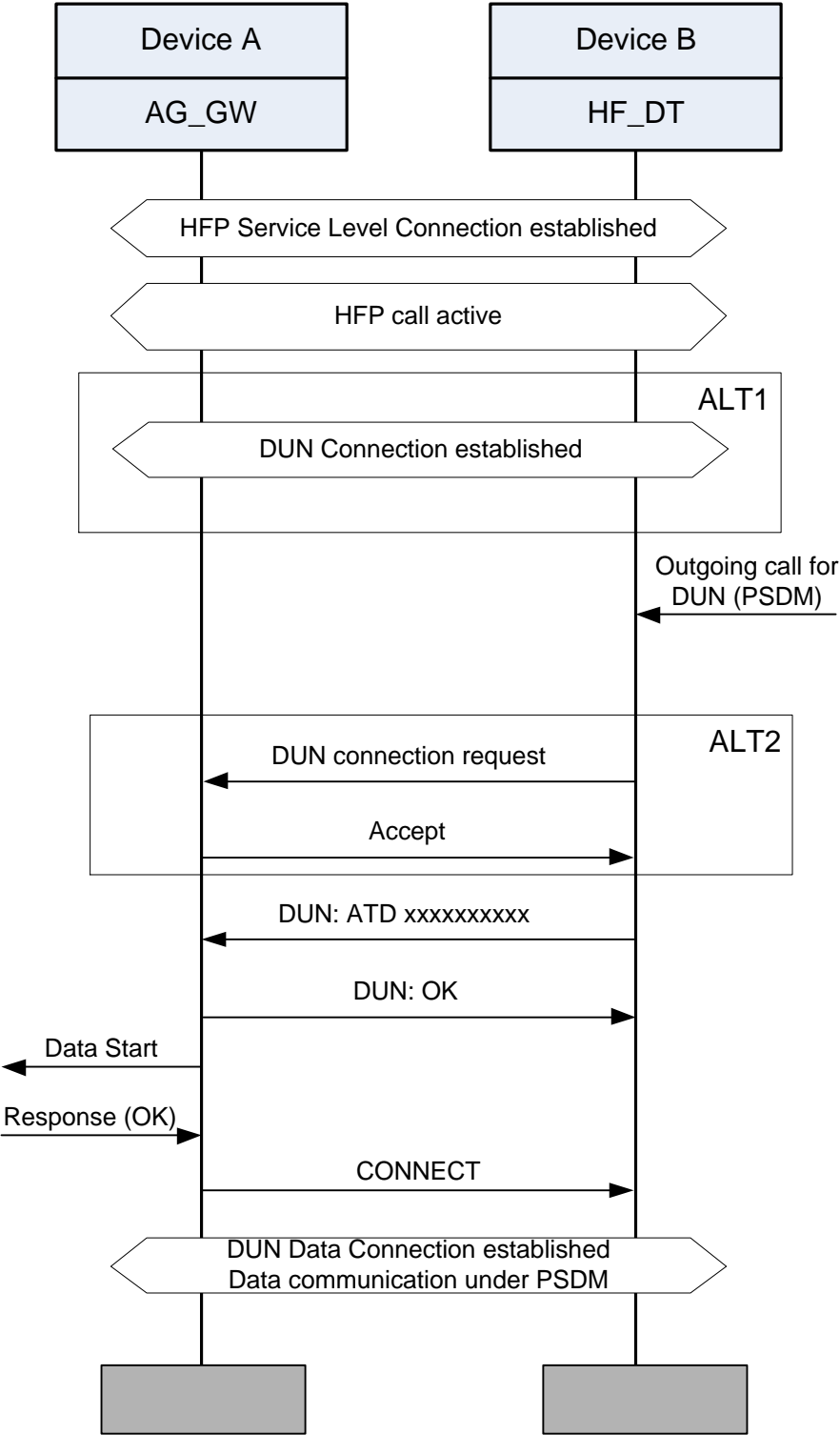


Figure 4.18: MPS/AG-GW/DUN/CLH/SD/BV-01-I, MPS/DT-HF/DUN/CLH/SD/BV-01-I [DUN communication during active voice call - SD]

- Test Condition

Devices are in communication range.

Cellular network is capable of simultaneous voice and data handling.

- Expected Outcome

Pass verdict

Device A:

- Device A receives the ATD command from Device B and Data communication under PSDM with remote network is successful.
- The active voice call is maintained during the DUN connection.

Device B:

- Device B successfully completes the DUN data connection to Device A.
- The active voice call is maintained during the DUN connection.

#### 4.4.2 Outgoing voice call during DUN communication

Test subgroup objectives:

To verify that data communication is maintained when an outgoing call is initiated.

##### 4.4.2.1 Outgoing voice call during DUN communication - SD

- Test Case ID(s)

**MPS/AG-GW/DUN/CLH/SD/BV-02-I**

**MPS/DT-HF/DUN/CLH/SD/BV-02-I**

- Test Purpose

To verify that data communication is maintained between Device A and Device B when an outgoing voice call is initiated from Device B.

- Reference

Section 4.2.2 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| DUN GW   | DUN DT   |

- HFP Service Level Connection is established between Device A and Device B.
- Data communication under PSDM by DUN is active between Device A and Device B.

- Test Procedure





Perform the following procedures as shown in Figure 4.19 below:

1. Initiate an outgoing call with a number provided by Device B to Device A.
2. Observe that there is an indication on Device A that an outgoing voice call is being placed to the number provided by Device B.

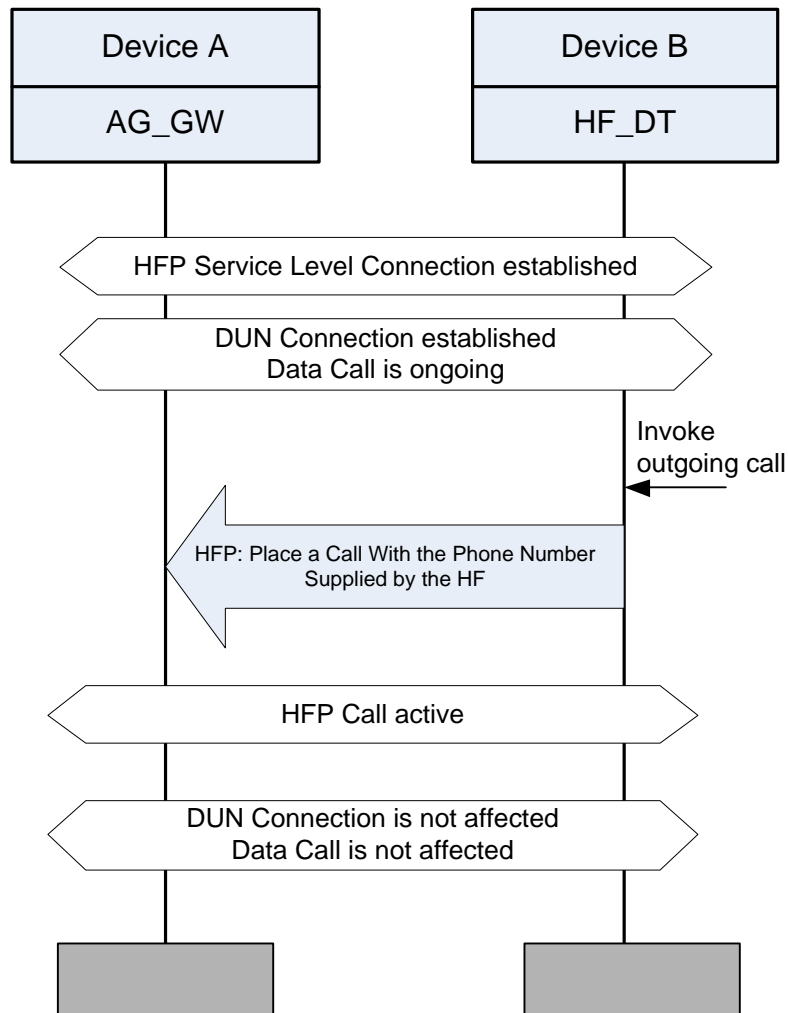


Figure 4.19: MPS/AG-GW/DUN/CLH/SD/BV-02-I, MPS/DT-HF/DUN/CLH/SD/BV-02-I [Outgoing voice call during DUN communication - SD]

- Test Condition

Devices are in communication range.

Cellular network is capable of simultaneous voice and data handling.

- Expected Outcome

Pass verdict

Device A:

- Initiates and correctly completes the HFP Place a Call with the phone number supplied by the HF procedure.
- The active HFP call is maintained during DUN connection.
- Data communication is maintained between Device A and Device B.

Device B:

- The call is successfully placed to the remote party following the HFP Place a Call with the phone number supplied by the HF procedure.
- When the remote party answers the call an active voice call between Device A and Device B is established.
- Data communication is maintained between Device A and Device B during the active call.

#### 4.4.3 Incoming voice call during DUN communication

Test subgroup objectives:

To verify that Data Communication is maintained when an incoming voice call is established.

##### 4.4.3.1 Incoming voice call during DUN communication - SD

- Test Case ID(s)

**MPS/AG-GW/DUN/CLH/SD/BV-03-I**

**MPS/DT-HF/DUN/CLH/SD/BV-03-I**

- Test Purpose

To verify that data communication is maintained between Device A and Device B when an incoming voice call is received on Device A.

- Reference

Section 4.2.3 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| DUN GW   | DUN DT   |

- HFP Service Level Connection is established between Device A and Device B.
- Device A is configured to alert Device B of an incoming voice call.

- DUN Data communication under PSDM is active between Device A and Device B.
- Test Procedure
 

Perform the following procedures as shown in [Figure 4.20](#) below:

  1. Place a call from a remote party to Device A.
  2. After receiving an incoming call indication on Device B (manufacturer specific) the call is answered by Device B (manufacturer specific).

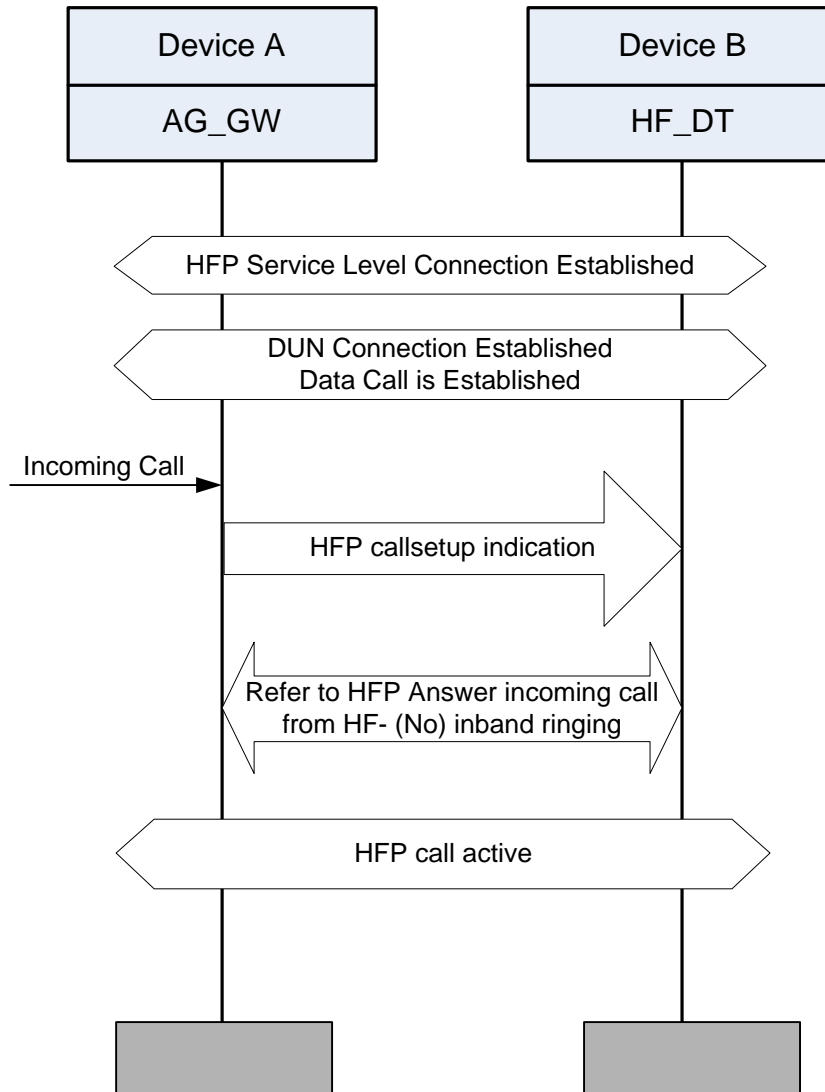


Figure 4.20: MPS/AG-GW/DUN/CLH/SD/BV-03-I, MPS/DT-HF/DUN/CLH/SD/BV-03-I [Incoming voice call during DUN communication - SD]

- Test Condition

Both devices are in communication range.

Cellular network is capable of simultaneous voice and data handling.

- Expected Outcome

Pass verdict

Device A:

- Data communication is maintained between Device A and Device B throughout the active HFP call.

Device B:

- The HFP Audio connection is established successfully for the active HFP call.
- Data communication is maintained between Device A and Device B throughout the active HFP call.

#### 4.4.4 Start Audio Streaming during DUN communication

Test subgroup objectives:

To verify that Data communication is maintained when A2DP Audio Steaming is initiated.

##### 4.4.4.1 Start Audio Streaming under PSDM - SD

- Test Case ID(s)

**MPS/GW-SRC-TG/DUN/ACT/SD/BV-01-I**

**MPS/CT-DT-SNK/DUN/ACT/SD/BV-01-I**

- Test Purpose

To verify that Device A successfully streams A2DP audio to Device B while data communication under PSDM is active between Device A and Device B.

- Reference

Section 4.2.4 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |
| DUN GW   | DUN DT   |

- A2DP media connection from Device A to Device B is in the AVDTP IDLE or OPEN state.
- An AVCTP signaling connection is established between Device A and Device B.

- DUN Data communication is active between Device A and Device B.
- Test Procedure
 

Perform the following procedures as shown in [Figure 4.21](#) below:

  1. Device B sends an *AVRCP\_Play* command to Device A.
  2. Device A initiates the *GAVDP\_Start\_Streaming* procedure with Device B.

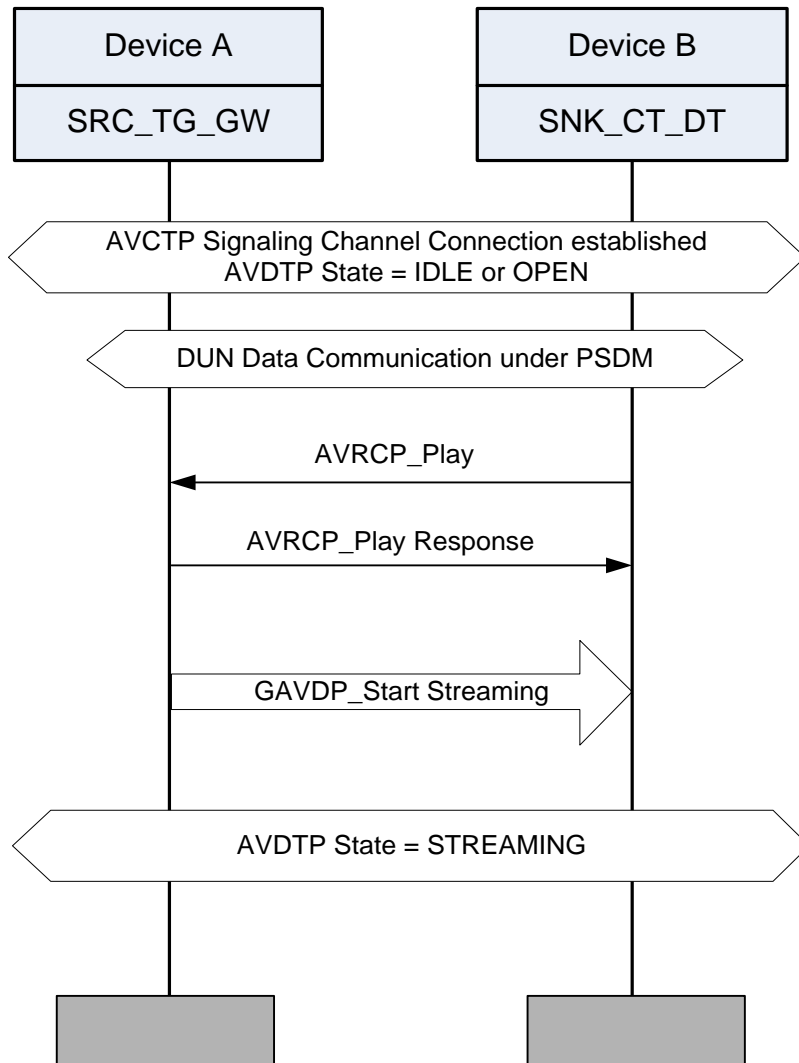


Figure 4.21: MPS/GW-SRC-TG/DUN/ACT/SD/BV-01-I, MPS/CT-DT-SNK/DUN/ACT/SD/BV-01-I [Start Audio Streaming under PSDM - SD]

- Test Condition:
 

Both devices are in communication range.
- Expected Outcome

Pass verdict

## Device A:

- The *AVRCP\_Play* PASS THROUGH command is accepted from Device B.
- The *GAVDP\_Start\_Streaming* procedure is initiated with Device B.
- Data communication is maintained between Device A and Device B during A2DP audio streaming.
- The A2DP audio stream maintains an acceptable level of audio quality.

## Device B:

- The *GAVDP\_Start\_Streaming* procedure is successful with Device A and streaming audio is present.
- Data communication is maintained between Device A and Device B during A2DP audio streaming.
- The A2DP audio stream maintains an acceptable level of audio quality.

**4.4.4.2 Start Audio Streaming under PSDM - MD**

- Test Case ID(s)

**MPS/SRC-TG/DUN/ACT/MD/BV-01-I****MPS/CT-DT-SNK/DUN/ACT/MD/BV-01-I**

- Test Purpose

To verify that Device A can initiate A2DP audio streaming to Device B while a data communication is maintained under PSDM between Device B and Device C.

- Reference

Section 4.2.5 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B | Device C |
|----------|----------|----------|
| A2DP SRC | A2DP SNK | –        |
| AVRCP TG | AVRCP CT | –        |
| –        | DUN DT   | DUN GW   |

- A2DP media connection from Device A to Device B is in the AVDTP IDLE or OPEN state.
- An AVCTP signaling connection is established between Device A and Device B.
- DUN Data communication is active between Device B and Device C.

- Test Procedure

Perform the following procedures as shown in Figure 4.22 below:

1. Device B sends an *AVRCP\_Play* command to Device A.
2. Device A initiates the *GAVDP\_Start\_Streaming* procedure with Device B.

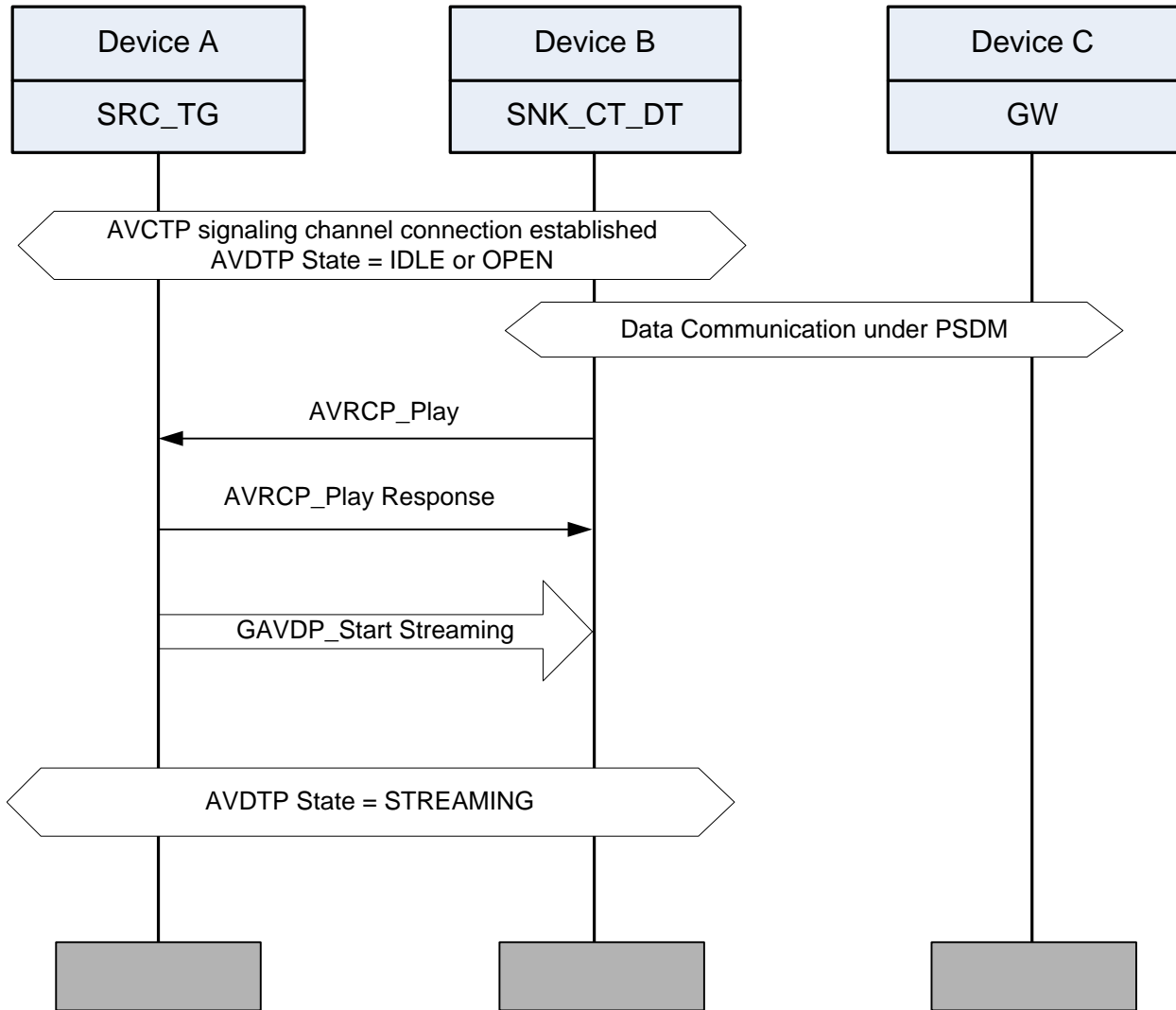


Figure 4.22: MPS/SRC-TG/DUN/ACT/MD/BV-01-I, MPS/CT-DT-SNK/DUN/ACT/MD/BV-01-I [Start Audio Streaming under PSDM - MD]

- Test Condition

Both devices are in communication range.

In this test, the IUT is either Device A or Device B (as defined through the TCMT). As such the behavior noted under Expected Outcome describes required responses from the complementary device as well as the IUT.

- Expected Outcome

Pass verdict

Device A:

- The *AVRCP\_Play* command is accepted from Device B.
- The *GAVDP\_Start\_Streaming* procedure is initiated with Device B.

Device B:

- The *GAVDP\_Start\_Streaming* procedure with Device A is successful and streaming audio is present.
- Data communication is maintained between Device B and Device C.

#### 4.4.5 DUN communication establishment during Audio Streaming

Test subgroup objectives:

To verify that A2DP audio streaming is maintained when a Data communication under PSDM is initiated.

##### 4.4.5.1 Start Data communication under PSDM during Audio Streaming - SD

- Test Case ID(s)

**MPS/GW-SRC-TG/DUN/DCT/SD/BV-01-I**

**MPS/CT-DT-SNK/DUN/DCT/SD/BV-01-I**

- Test Purpose

To verify that Device B can establish data communication under PSDM while A2DP Audio Streaming exists between Device A and Device B.

- Reference

Section 4.2.6 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |
| DUN GW   | DUN DT   |

- A2DP media connection from Device A to Device B is in the AVDTP STREAMING state.
- An AVCTP signaling connection is established between Device A and Device B.
- Test Procedure

Perform the following procedures as shown in [Figure 4.23](#) below:

1. Device B sends a DUN connection request to Device A.



2. Device B sends the ATD command to Device A to connect to the remote network.

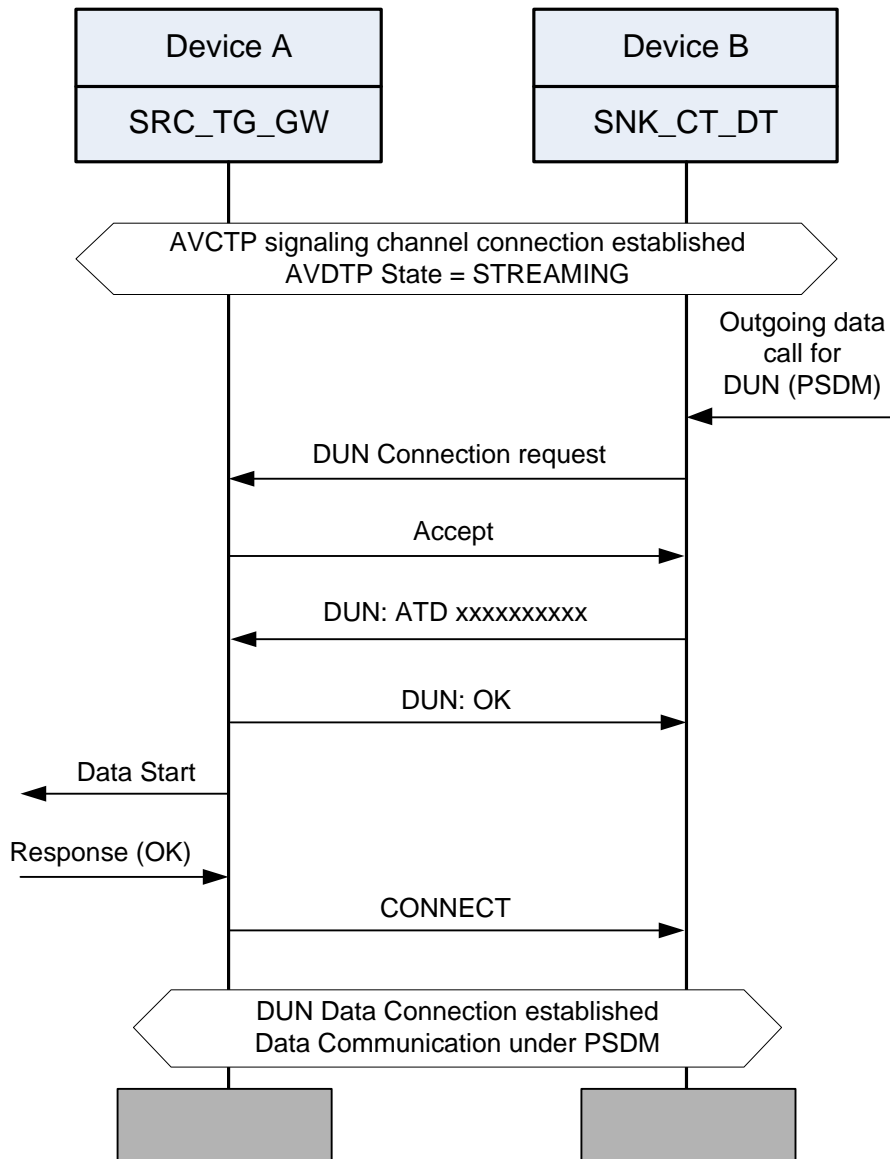


Figure 4.23: MPS/GW-SRC-TG/DUN/DCT/SD/BV-01-I, MPS/CT-DT-SNK/DUN/DCT/SD/BV-01-I [Start Data communication under PSDM during Audio Streaming - SD]

- Test Condition  
Both devices are in communication range.
- Expected Outcome  
Pass verdict  
Device A:

- The DUN connection is accepted and device A successfully receives the ATD command from Device B.
- Active data communication under PSDM with the remote network is successful.
- Audio Streaming is maintained between Device A and Device B throughout the data connection.

Device B:

- Device B sends a successful DUN connection request to Device A.
- Device B sends the DUN ATD command to Device A and an active data connection is established successfully.
- Audio streaming is maintained between Device A and Device B throughout the data connection.

#### 4.4.5.2 Start Data communication under PSDM during Audio Streaming - MD

- Test Case ID(s)

**MPS/SRC-TG/DUN/DCT/MD/BV-01-I**

**MPS/CT-DT-SNK/DUN/DCT/MD/BV-01-I**

- Test Purpose

To verify that A2DP audio streaming between Device A and Device B is maintained while data communication is established between Device B and Device C.

- Reference

Section 4.2.7 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B | Device C |
|----------|----------|----------|
| A2DP SRC | A2DP SNK | –        |
| AVRCP TG | AVRCP CT | –        |
| –        | DUN DT   | DUN GW   |

- A2DP media connection from Device A to Device B is in the AVDTP STREAMING state.
- An AVCTP signaling connection is established between Device A and Device B.
- Test Procedure

Perform the following procedures as shown in [Figure 4.24](#) below:

1. Device B sends a DUN connection request to Device C.
2. Device B sends the ATD command to Device C to connect to the remote network.

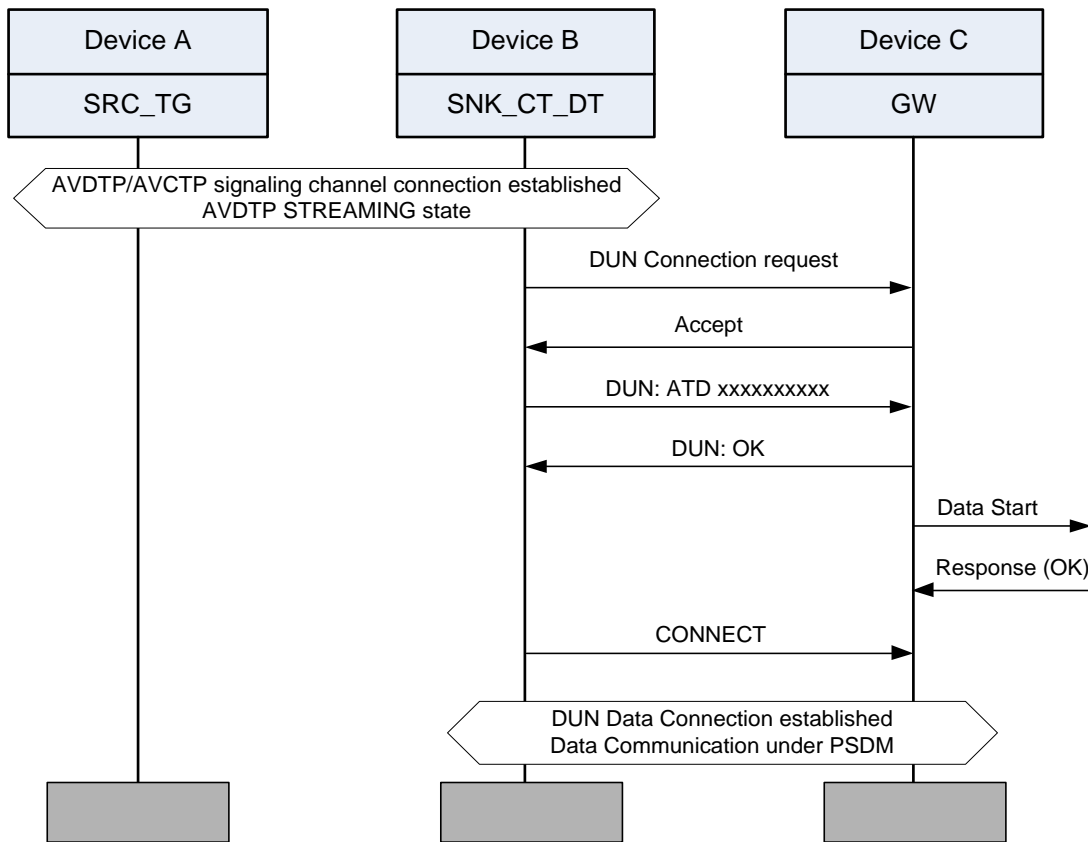


Figure 4.24: MPS/SRC-TG/DUN/DCT/MD/BV-01-I, MPS/CT-DT-SNK/DUN/DCT/MD/BV-01-I [Start Data communication under PSDM during Audio Streaming - MD]

- Test Condition

Both devices are in communication range.

In this test, the IUT is either Device A or Device B (as defined through the TCMT). As such the behavior noted under Expected Outcome describes required responses from the complementary device as well as the IUT.

- Expected Outcome

Pass verdict

Device A:

- Audio Streaming is maintained between Device A and Device B.

Device B:

- A successful DUN connection request is sent to Device C.
- The ATD command is sent to Device C and an active data connection is established successfully.
- Audio streaming is maintained between Device A and Device B throughout the data connection.

Device C:

- Receives the ATD command from Device B.
- Data communication under PSDM with the remote network is successful.

#### 4.4.6 Terminate Voice call during DUN data communication

Test subgroup objectives:

To verify that when a voice call is terminated during DUN data communication the DUN connection is not affected.

##### 4.4.6.1 Terminate Voice Call during Data Communication – SDJ

- Test Case ID(s)

**MPS/AG-GW/DUN/DCT/SD/BV-02-I**

**MPS/DT-HF/DUN/DCT/SD/BV-02-I**

- Test Purpose

To verify that a voice call can be terminated without terminating the data communication.

- Reference

Section 4.2.8 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| DUN GW   | DUN DT   |

- HFP Service Level Connection is established between Device A and Device B.
- An active voice call exists between Device A and Device B.
- DUN data communication under PSDM is active between Device A and Device B.
- Test Procedure

Perform the following procedures as shown in [Figure 4.25](#) below:

1. Device B terminates the voice call (manufacturer specific) with Device A.

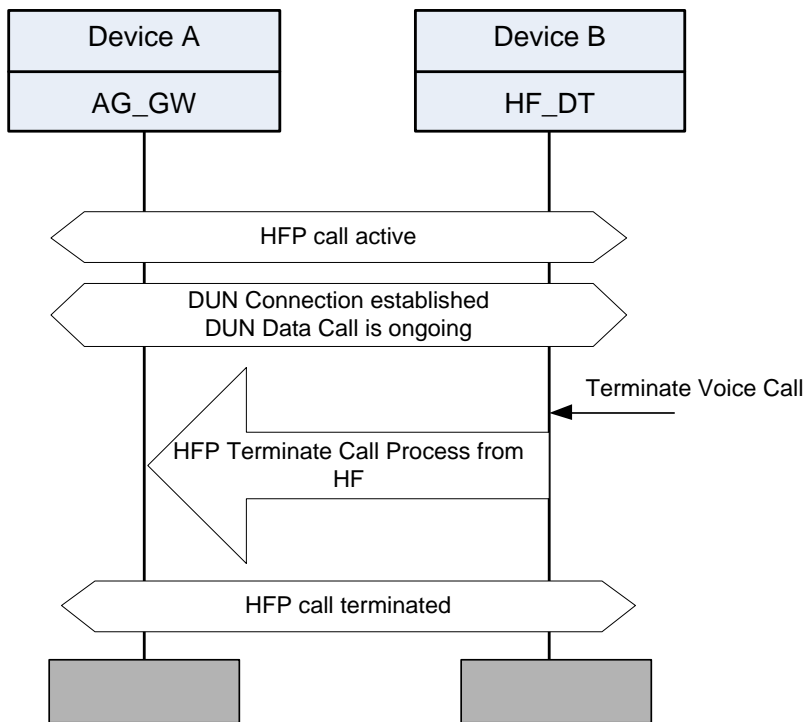


Figure 4.25: MPS/AG-GW/DUN/DCT/SD/BV-02-I, MPS/DT-HF/DUN/DCT/SD/BV-02-I [Terminate Voice Call during Data Communication – SD]

- Test Condition

Both devices are in communication range.

Cellular network is capable of simultaneous voice and data handling.

- Expected Outcome

Pass verdict

Device A:

- Correctly follows the HFP Terminate Call Process from HF initiated by device B.
- The ongoing data communication is maintained between Device A and Device B throughout the voice call termination.

Device B:

- Initiates and correctly completes the HFP Terminate Call Process from HF.
- The ongoing data communication is maintained between Device A and Device B throughout the voice call termination.

#### 4.4.6.2 Terminate Data Communication during active HFP call and data communication – SD

- Test Case ID(s)

**MPS/AG-GW/DUN/DCT/SD/BV-03-I****MPS/DT-HF/DUN/DCT/SD/BV-03-I**

- Test Purpose

To verify that data communication can be terminated without terminating a voice call.

- Reference

Section 4.2.8 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| DUN GW   | DUN DT   |

- HFP Service Level Connection is established between Device A and Device B.
- An active voice call exists between Device A and Device B.
- DUN data communication under PSDM is active between Device A and Device B.

- Test Procedure

Perform the following procedures as shown in [Figure 4.26](#) below:

1. Device B sends a data communication termination request to the Device A.
2. The DUN communication connection is disconnected.

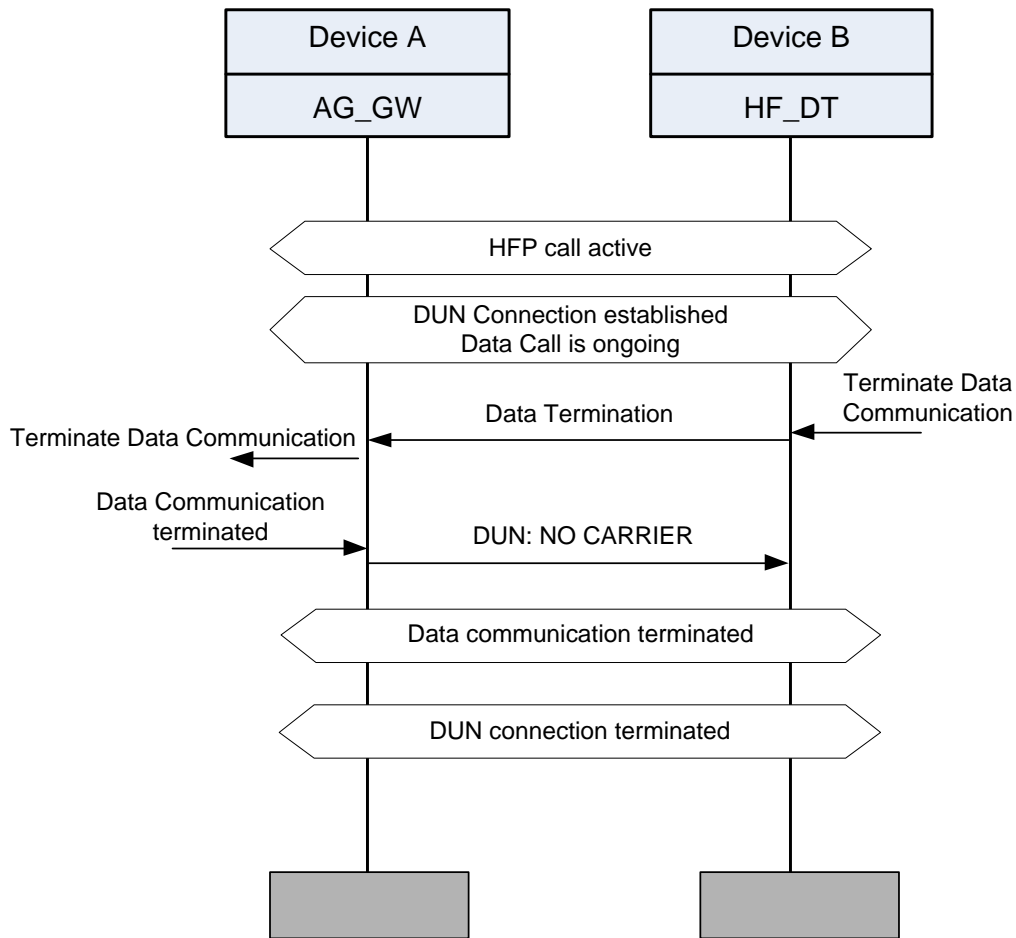


Figure 4.26: MPS/AG-GW/DUN/DCT/SD/BV-03-I, MPS/DT-HF/DUN/DCT/SD/BV-03-I [Terminate Data Communication during active HFP call and data communication – SD]

- Test Condition

Both devices are in communication range.

Cellular network is capable of simultaneous voice and data handling.

- Expected Outcome

Pass verdict

Device A:

- After receiving the DUN Data Termination, Device A sends a NO CARRIER result code and the DUN connection is successfully disconnected.
- The HFP voice call is maintained throughout the data communication termination process.

Device B:

- Device B initiates the DUN data termination with Device A.

- The DUN connection is successfully disconnected.
- The HFP voice call is maintained throughout the data communication termination process.

## 4.5 PAN + Other

Test group objectives:

To verify that PAN data communication is successful during other profile operations.

### 4.5.1 PAN communication during active voice call

Test subgroup objectives:

To verify that the PAN communication continues during an active voice call.

#### 4.5.1.1 Data communication in Personal Area Network during active voice call PANU connection – SD

- Test Case ID(s)

**MPS/AG-NAP/PAN/CLH/SD/BV-01-I**

**MPS/HF-PANU/PAN/CLH/SD/BV-01-I**

- Test Purpose

To verify that an active voice call between Device A and Device B is maintained while a data communication session over the PAN Network Access Point of Device A exists. The PANU device initiates the data communication.

- Reference

Section 4.3.1 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| PAN NAP  | PANU     |

- HFP Service Level Connection is established between Device A and Device B.
- An active voice call exists between Device A and Device B.
- Device A is configured to have a valid IP address.

- Test Procedure

Perform the following procedures as shown in [Figure 4.27](#) below:

1. Device B sends a BNEP service level connection to Device A if a BNEP connection doesn't already exist between the two devices.



2. Data communication is possible once the BNEP connection exists between the two devices.

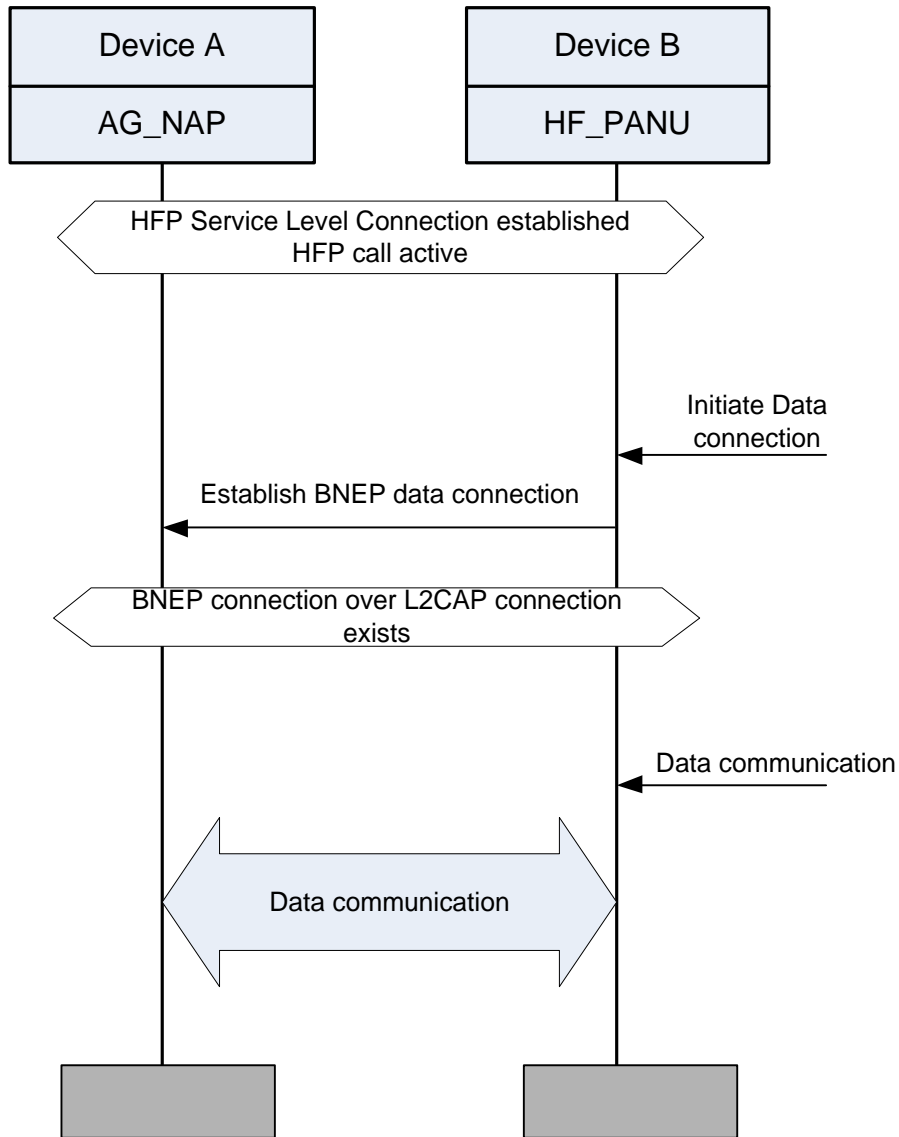


Figure 4.27: MPS/AG-NAP/PAN/CLH/SD/BV-01-I, MPS/HF-PANU/PAN/CLH/SD/BV-01-I [Data communication in Personal Area Network during active voice call PANU connection – SD]

- Test Condition

Both devices are in communication range.

- Expected Outcome

Pass verdict

Device A:

- Accepts the BNEP connection request from Device B.
- Data communication is successful.

- The active voice call is maintained during the PAN connection.

Device B:

- Device B sends a PAN connection request to Device A if there is not already connected to PAN.
- Data communication is successful.
- The active voice call is maintained during the PAN connection.

## 4.5.2 Outgoing voice call during PAN communication

Test subgroup objectives:

To verify that the PAN data communication is maintained when an outgoing voice call occurs.

### 4.5.2.1 Outgoing voice call during PAN communication – SD

- Test Case ID(s)

**MPS/AG-NAP/PAN/CLH/SD/BV-02-I**

**MPS/HF-PANU/PAN/CLH/SD/BV-02-I**

- Test Purpose

To verify that an outgoing voice call initiated from Device B to Device A is established while Data communication over PAN is maintained.

- Reference

Section 4.3.2 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| PAN NAP  | PANU     |

- HFP Service Level Connection is established between Device A and Device B.
- The L2CAP channel is open between Device A and Device B and configuration of the BNEP connection between Device and Device B is complete.
- Data communication to the remote network is possible.
- Test Procedure

Perform the following procedures as shown in [Figure 4.28](#) below:

1. Initiate an outgoing call with a number provided by Device B to Device A.
2. Observe that there is an indication on Device A that an outgoing voice call is being placed to the number provided by Device B.

3. Answer the call on the remote number being called.

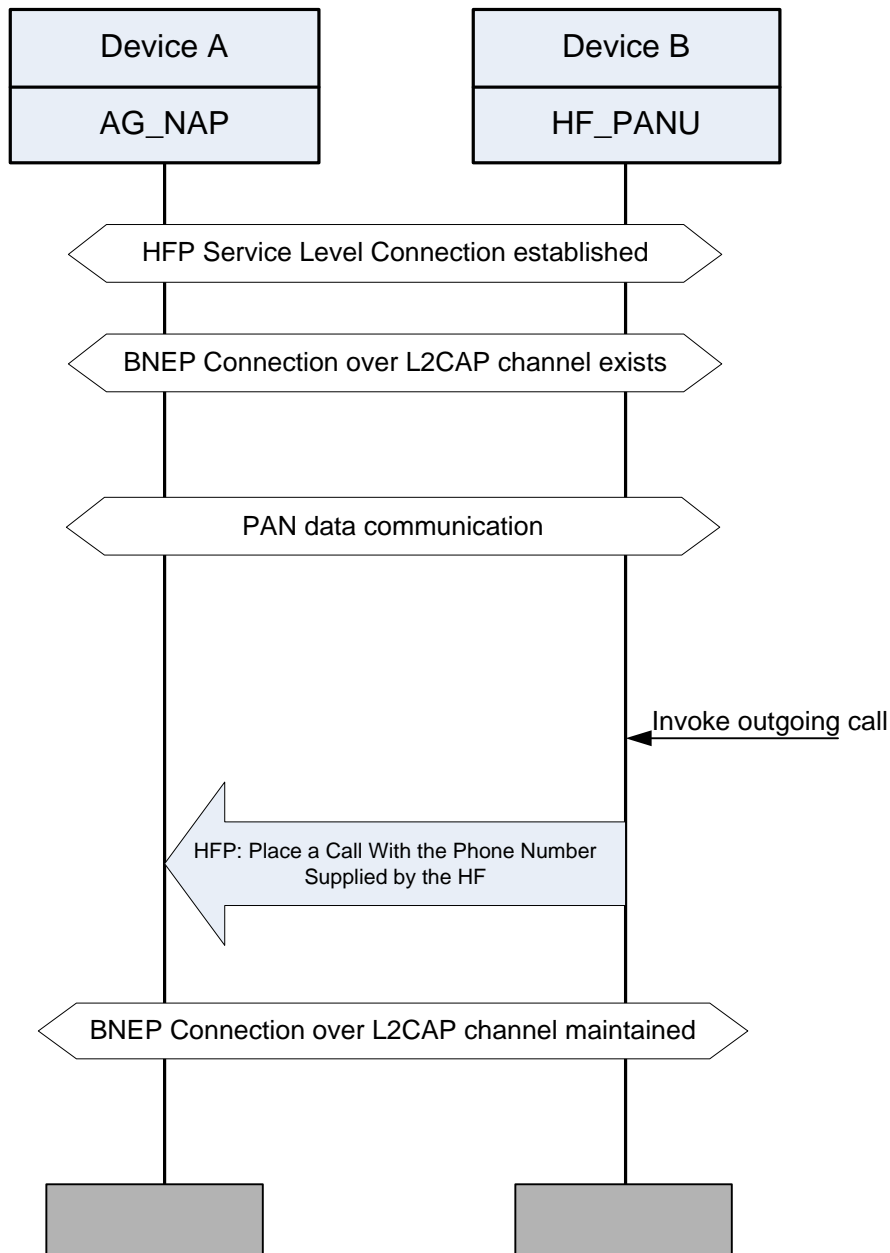


Figure 4.28: MPS/AG-NAP/PAN/CLH/SD/BV-02-I, MPS/HF-PANU/PAN/CLH/SD/BV-02-I [Outgoing voice call during PAN communication – SD]

- **Test Condition**  
Both devices are in communication range.
- **Expected Outcome**  
Pass verdict

**Device A:**

- The call is successfully placed to the remote party following the HFP Place a Call with the phone number supplied by the HF procedure.
- PAN data communication is maintained between Device A and Device B throughout the HFP call process.

**Device B:**

- Initiates and correctly completes the HFP Place a Call with the phone number supplied by the HF procedure.
- PAN data communication is maintained between Device A and Device B throughout the HFP call process.

### 4.5.3 Incoming voice call during PAN communication

Test subgroup objectives:

To verify that the PAN data communication is maintained with an incoming voice call.

#### 4.5.3.1 Incoming voice call during PAN communication – SD

- Test Case ID(s)

**MPS/AG-NAP/PAN/CLH/SD/BV-03-I**

**MPS/HF-PANU/PAN/CLH/SD/BV-03-I**

- Test Purpose

To verify that an incoming voice call between Device A and Device B is established while data communication over PAN is maintained.

- Reference

Section 4.3.3 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| PAN NAP  | PANU     |

- HFP Service Level Connection is established between Device A and Device B.
- Device A is configured to alert Device B of an incoming voice call.
- The L2CAP channel is open between Device A and Device B and configuration of the BNEP connection between Device and Device B is complete.
- Device A is configured to have a valid IP address.
- A network terminal must be connected to Device A by a non-Bluetooth network infrastructure.

- A remote network terminal sends data traffic which is forwarded over BNEP to Device B.
- Test Procedure

Perform the following procedures as shown in [Figure 4.29](#) below:

1. Place a call from a remote number to Device A.
2. After receiving an incoming call indication on Device B (manufacturer specific), answer the call on Device B (manufacturer specific).

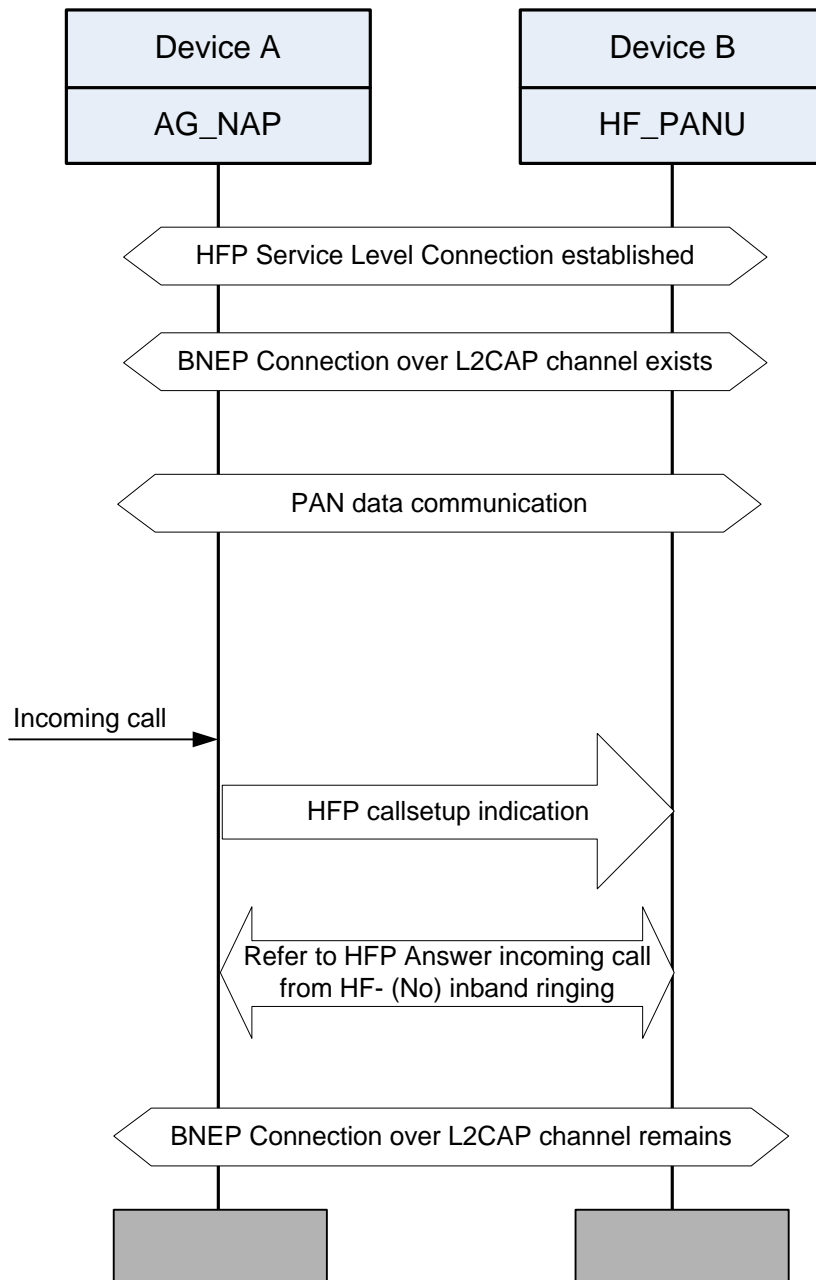


Figure 4.29: MPS/AG-NAP/PAN/CLH/SD/BV-03-I, MPS/HF-PANU/PAN/CLH/SD/BV-03-I [Incoming voice call during PAN communication – SD]

- Test Condition

Both devices are in communication range.

- Expected Outcome

Pass verdict

**Device A:**

- The incoming call is successfully connected once the HF answers the call and follows the HFP answer an incoming call process.
- PAN data communication is maintained between Device A and Device B throughout the HFP call process.

**Device B:**

- The HFP incoming call procedure is successfully completed.
- PAN data communication is maintained between Device A and Device B throughout the HFP call process.

#### 4.5.4 Start Audio Streaming during PAN communication

Test subgroup objectives:

To verify that PAN data communication is maintained when A2DP audio streaming is initiated.

##### 4.5.4.1 Start audio streaming during PAN communication – SD

- Test Case ID(s)

**MPS/NAP-SRC-TG/PAN/ACT/SD/BV-01-I**

**MPS/CT-PANU-SNK/PAN/ACT/SD/BV-01-I**

- Test Purpose

To verify that audio streaming is not disturbed during data communication over PAN, and that the establishment of audio streaming does not cause the PAN connection and the underlying BNEP and L2CAP connections to terminate.

- Reference

Section 4.3.4 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| PAN NAP  | PAN PANU |
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |

- A2DP media connection from Device A to Device B is in the AVDTP IDLE or OPEN state.
- An AVCTP signaling connection is established between Device A and Device B.
- Device A and Device B have established and configured L2CAP and BNEP connections.

- A network terminal must be connected Device A by a non-Bluetooth network infrastructure.
- Data is sent over the PAN connection.
- Test Procedure

Perform the following procedures as shown in [Figure 4.30](#) below:

1. Device B sends an *AVRCP\_Play* PASS THROUGH command to Device A.

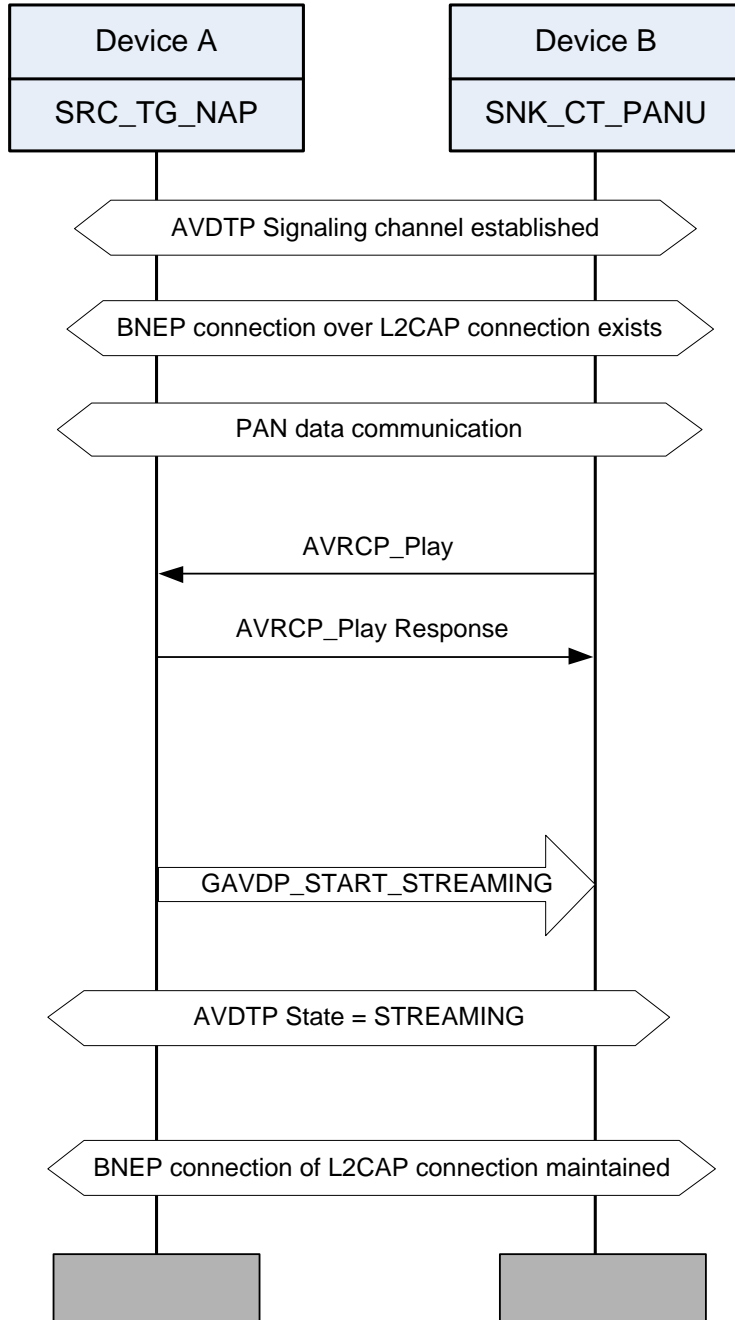




Figure 4.30: MPS/NAP-SRC-TG/PAN/ACT/SD/BV-01-I, MPS/CT-PANU-SNK/PAN/ACT/SD/BV-01-I [Start audio streaming during PAN communication – SD]

- Test Condition

Both devices are in communication range.

- Expected Outcome

Pass verdict

Device A:

- The *AVRCP\_Play* PASS THROUGH command from Device B is accepted.
- The *GAVDP\_Start\_Streaming* procedure is initiated with Device B.
- PAN data communication is maintained between Device A and Device B throughout A2DP streaming.

Device B:

- The *GAVDP\_Start\_Streaming* procedure is accepted from Device A and streaming media is present.
- PAN Data communication is maintained between Device A and Device B throughout A2DP streaming.

#### 4.5.5 PAN communication establishment during Audio Streaming

Test subgroup objectives:

To verify that PAN data communication can be established while A2DP audio streaming is maintained.

##### 4.5.5.1 PAN communication establishment during audio streaming – SD

- Test Case ID(s)

**MPS/NAP-SRC/PAN/DCT/SD/BV-01-I**

**MPS/PANU-SNK/PAN/DCT/SD/BV-01-I**

- Test Purpose

To verify that Device B can establish PAN communication while A2DP Audio Streaming exists between Device A and Device B.

- Reference

Section 4.3.5 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| PAN NAP  | PAN PANU |

|          |          |
|----------|----------|
| A2DP SRC | A2DP SNK |
|----------|----------|

- A2DP media connection from Device A to Device B is in the AVDTP STREAMING state.
  - An AVCTP signaling connection is established between Device A and Device B.
  - A network terminal must be connected to Device A by a non-Bluetooth network infrastructure.
- Test Procedure
- Perform the following procedures as shown in [Figure 4.31](#) below:
1. Device B sends a BNEP service level connection request to Device A if a BNEP connection doesn't already exist between the two devices.
  2. PAN Data traffic is sent once a BNEP connection exists between the two devices.

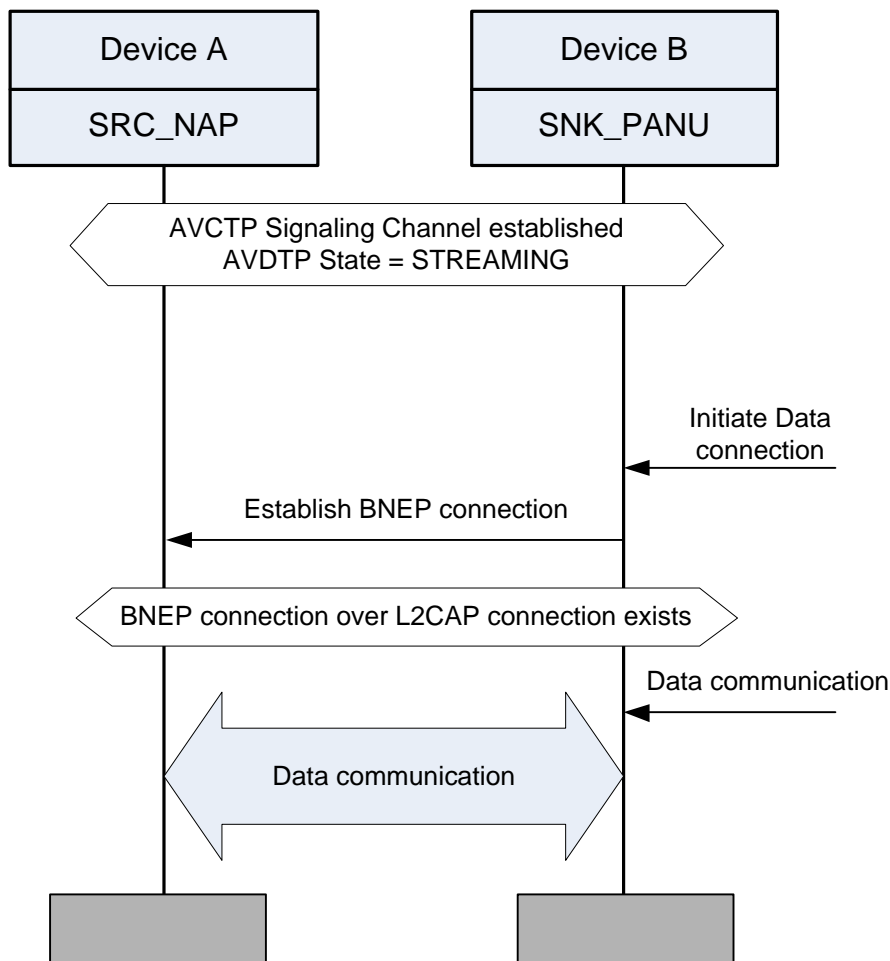


Figure 4.31: MPS/NAP-SRC/PAN/DCT/SD/BV-01-I, MPS/PANU-SNK/PAN/DCT/SD/BV-01-I [PAN communication establishment during audio streaming – SD]

- Test Condition

Both devices are in communication range.

- Expected Outcome

Pass verdict

Device A:

- The BNEP connection request from Device B is accepted.
- Sends data traffic from Device B to the external network.
- Audio Streaming is maintained between Device A and Device B throughout the PAN data communication.

Device B:

- PAN connection with Device A is successful.
- Data traffic is sent and received successfully with Device A.

## 4.6 MPS Procedure Test Cases

### 4.6.1 (Dis-)Connection Order/Behavior

To verify that the IUT follows the requirements on connection order defined in MPS.

#### 4.6.1.1 MPS/AG-PSE/HFPB/CTH/SD/BV-01-I [Connection Behavior]

To verify that PBAP can be connected with no HFP Service Level Connection being established.

- Reference

Section 5.2 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| PBAP PSE | PBAP PCE |

- Neither HFP nor PBAP are connected between Device A and Device B.

- Test Procedure

1. Device B initiates a PBAP connection to Device A.

- Test Condition

Devices are in communication range.

- Expected Outcome

Pass verdict

Device A:

- The PBAP connection requested from Device B is established.

#### 4.6.1.2 MPS/AG-SRC-TG/AVP/CTH/SD/BI-01-I [Disconnection Behavior HFP]

To verify that a device does not disconnect an existing HFP service level connection when A2DP and AVRCP connection requests are rejected.

- Reference

Section 5.2 in [3]

- Initial Condition

- The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| HFP AG   | HFP HF   |
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |

- An HFP Service Level Connection is established between Device A and Device B.

- Test Procedure

1. Device A initiates an A2DP connection and optionally an AVRCP connection to Device B.
2. Device B rejects the A2DP connection request and any AVRCP connection requests on an L2CAP level.

- Test Condition

Devices are in communication range.

- Expected Outcome

Pass verdict

Device A:

- The HFP Service Level Connection is not released due to the rejection of the A2DP or AVRCP connection request(s).

- Note

The initiation of the AVRCP control channel by Device A is Optional. However, if this feature is supported, Device B shall reject the request.

#### 4.6.1.3 MPS/SRC-TG/AVP/CTH/SD/BI-02-I [Disconnection Behavior A2DP]

To verify that a device does not disconnect an existing A2DP connection when AVRCP is disconnected.

- Reference

Section 5.2 in [3]

- Initial Condition
  - The following combinations of profiles shall exist:

| Device A | Device B |
|----------|----------|
| A2DP SRC | A2DP SNK |
| AVRCP TG | AVRCP CT |

- A2DP and AVRCP shall be connected.
- Test Procedure
  - Device B disconnects the AVRCP connection.
- Test Condition
 

Devices are in communication range.
- Expected Outcome
 

Pass verdict

Device A:

  - The A2DP Connection is not released due to the disconnection of AVRCP.

#### 4.6.2 Service Discovery

To verify what is returned in the IUT's Service Record.

##### 4.6.2.1 MPS/SDR/SDP/CTH/SD/BV-01-I [SDP Record]

To verify the IUT's Service (Discovery) Record is compliant to the Multi-Profile Specification and contains all mandatory elements and is correct for the declared supported profiles.

- Reference
 

Section 6.1 in [3]
- Initial Condition
 

The device is within communication range.
- Test Procedure
  1. The IUT's SDP record is retrieved by the Lower Tester.
- Test Condition
 

Devices are in communication range.
- Expected Outcome
 

Pass verdict

The bitmasks for MPSD, MPMD and Profile and Protocol Dependencies in the SDP record are correct for the declared supported profiles.

## 5 Test Case Mapping

The test case mapping list shown below determines which test case is applicable depending on whether feature MPS y/x is supported where y corresponds to the table and x corresponds to the feature number in the MPS ICS.

If a feature is claimed supported and the logical condition under "item" is true, then the corresponding test case(s) shall be performed.

If multiple role combinations for the same test case are supported by a device, the test case shall be executed for each role combination separately.

| Item                   | Feature   | Test Case(s)                      | Test Case Applicable |
|------------------------|---|-----------------------------------|----------------------|
| MPS 6/1<br>AND MPS 3/8 | Incoming Call during AVP Connection - SD                      | MPS/AG-SRC-TG/HFAV/CLH/SD/BV-01-I |                      |
| MPS 6/2                | Incoming Call during AVP Connection - SD                      | MPS/CT-HF-SNK/HFAV/CLH/SD/BV-01-I |                      |
| MPS 6/1<br>AND MPS 3/7 | Incoming Call during AVP Connection In-band Ringing - SD      | MPS/AG-SRC-TG/HFAV/CLH/SD/BV-02-I |                      |
| MPS 6/2                | Incoming Call during AVP Connection In-band Ringing - SD      | MPS/CT-HF-SNK/HFAV/CLH/SD/BV-02-I |                      |
| MPS 7/1<br>AND MPS 3/8 | Incoming Call during AVP Connection – No In-band ringing - MD | MPS/CT-HF-SNK/HFAV/CLH/MD/BV-01-I |                      |
| MPS 7/2                | Incoming Call during AVP Connection – No In-band ringing - MD | MPS/SRC-TG/HFAV/CLH/MD/BV-01-I    |                      |
| MPS 7/1<br>AND MPS 3/7 | Incoming Call during AVP Connection – In-band Ringing MD      | MPS/CT-HF-SNK/HFAV/CLH/MD/BV-02-I |                      |
| MPS 7/2                | Incoming Call during AVP Connection – In-band Ringing MD      | MPS/SRC-TG/HFAV/CLH/MD/BV-02-I    |                      |
| MPS 6/3                | Outgoing Call during AVP Connection - SD                      | MPS/AG-SRC-TG/HFAV/CLH/SD/BV-03-I |                      |
| MPS 6/4                | Outgoing Call during AVP Connection - SD                      | MPS/CT-HF-SNK/HFAV/CLH/SD/BV-03-I |                      |

| Item     | Feature  | Test Case(s)                      | Test Case Applicable |
|----------|--|-----------------------------------|----------------------|
| MPS 7/3  | Outgoing Call during AVP Connection – MD                   | MPS/CT-HF-SNK/HFAV/CLH/MD/BV-03-I |                      |
| MPS 7/4  | Outgoing Call during AVP Connection – MD                   | MPS/SRC-TG/HFAV/CLH/MD/BV-03-I    |                      |
| MPS 6/5  | Reject/Ignore Incoming Call during Audio Streaming - SD    | MPS/AG-SRC-TG/HFAV/CLH/SD/BV-04-I |                      |
| MPS 6/6  | Reject/Ignore Incoming Call during Audio Streaming - SD    | MPS/CT-HF-SNK/HFAV/CLH/SD/BV-04-I |                      |
| MPS 7/5  | Reject/Ignore Incoming Call during Audio Streaming - MD    | MPS/CT-HF-SNK/HFAV/CLH/MD/BV-04-I |                      |
| MPS 7/6  | Reject/Ignore Incoming Call during Audio Streaming - MD    | MPS/SRC-TG/HFAV/CLH/MD/BV-04-I    |                      |
| MPS 6/7  | HFP Call termination during AVP connection – SD            | MPS/AG-SRC-TG/HFAV/CLH/SD/BV-05-I |                      |
| MPS 6/8  | HFP Call termination during AVP connection – SD            | MPS/CT-HF-SNK/HFAV/CLH/SD/BV-05-I |                      |
| MPS 7/7  | HFP Call termination during AVP connection - MD            | MPS/CT-HF-SNK/HFAV/CLH/MD/BV-05-I |                      |
| MPS 7/7  | HFP Call termination during AVP connection (no music) - MD | MPS/CT-HF-SNK/HFAV/CLH/MD/BV-06-I |                      |
| MPS 7/8  | HFP Call termination during AVP connection (no music) - MD | MPS/SRC-TG/HFAV/CLH/MD/BV-06-I    |                      |
| MPS 6/7  | HFP Call termination during AVP connection No Music- SD    | MPS/AG-SRC-TG/HFAV/CLH/SD/BV-06-I |                      |
| MPS 6/8  | HFP Call termination during AVP connection No Music- SD    | MPS/CT-HF-SNK/HFAV/CLH/SD/BV-06-I |                      |
| MPS 6/9  | Press Play on Audio Player during active call - SD         | MPS/AG-SRC-TG/HFAV/ACT/SD/BV-01-I |                      |
| MPS 6/10 | Press Play on Audio Player during active call - SD         | MPS/CT-HF-SNK/HFAV/ACT/SD/BV-01-I |                      |
| MPS 7/9  | Play on Audio Player during active call - MD               | MPS/CT-HF-SNK/HFAV/ACT/MD/BV-01-I |                      |

| Item                    | Feature   | Test Case(s)                      | Test Case Applicable |
|-------------------------|---|-----------------------------------|----------------------|
| MPS 6/11<br>OR MPS 7/10 | Start Audio Streaming after AVRCP Play – SD                     | MPS/SRC-TG/HFAV/ACT/SD/BV-02-I    |                      |
| MPS 6/12                | Start Audio Streaming after AVRCP Play – SD                     | MPS/CT-SNK/HFAV/ACT/SD/BV-02-I    |                      |
| MPS 6/13                | Suspend Audio Streaming after AVRCP Pause - SD                  | MPS/SRC-TG/HFAV/ACT/SD/BV-03-I    |                      |
| MPS 6/14                | Suspend Audio Streaming after AVRCP Pause - SD                  | MPS/CT-SNK/HFAV/ACT/SD/BV-03-I    |                      |
| MPS 6/37                | Phonebook download during audio streaming – SD                  | MPS/PSE-SRC-TG/AVO/ACT/SD/BV-01-I |                      |
| MPS (6/38<br>AND 3/12)  | Phonebook download during audio streaming – SD                  | MPS/CT-PCE-SNK/AVO/ACT/SD/BV-01-I |                      |
| MPS 6/15                | DUN communication during active voice call - SD                 | MPS/AG-GW/DUN/CLH/SD/BV-01-I      |                      |
| MPS 6/16                | DUN communication during active voice call - SD                 | MPS/DT-HF/DUN/CLH/SD/BV-01-I      |                      |
| MPS 6/17                | Outgoing voice call during DUN communication – SD               | MPS/AG-GW/DUN/CLH/SD/BV-02-I      |                      |
| MPS (6/18<br>AND 3/9)   | Outgoing voice call during DUN communication – SD               | MPS/DT-HF/DUN/CLH/SD/BV-02-I      |                      |
| MPS 6/19                | Incoming voice call during DUN communication - SD               | MPS/AG-GW/DUN/CLH/SD/BV-03-I      |                      |
| MPS 6/20                | Incoming voice call during DUN communication - SD               | MPS/DT-HF/DUN/CLH/SD/BV-03-I      |                      |
| MPS 6/21                | Start Audio Streaming under PSDM - SD                           | MPS/GW-SRC-TG/DUN/ACT/SD/BV-01-I  |                      |
| MPS 6/22                | Start Audio Streaming under PSDM - SD                           | MPS/CT-DT-SNK/DUN/ACT/SD/BV-01-I  |                      |
| MPS 7/13                | Start Data communication under PSDM during Audio Streaming - MD | MPS/SRC-TG/DUN/DCT/MD/BV-01-I     |                      |
| MPS 7/14                | Start Data communication under PSDM during Audio Streaming - MD | MPS/CT-DT-SNK/DUN/DCT/MD/BV-01-I  |                      |



| Item               | Feature   | Test Case(s)                     | Test Case Applicable |
|--------------------|---|----------------------------------|----------------------|
| MPS 6/25           | Terminate Voice Call during Data Communication – SD                             | MPS/AG-GW/DUN/DCT/SD/BV-02-I     |                      |
| MPS 6/26           | Terminate Voice Call during Data Communication – SD                             | MPS/DT-HF/DUN/DCT/SD/BV-02-I     |                      |
| MPS 6/25           | Terminate Data Communication during active HFP call and data communication – SD | MPS/AG-GW/DUN/DCT/SD/BV-03-I     |                      |
| MPS 6/26           | Terminate Data Communication during active HFP call and data communication – SD | MPS/DT-HF/DUN/DCT/SD/BV-03-I     |                      |
| MPS 7/11           | Start Audio Streaming under PSDM – MD   | MPS/SRC-TG/DUN/ACT/MD/BV-01-I    |                      |
| MPS 7/12           | Start Audio Streaming under PSDM – MD   | MPS/CT-DT-SNK/DUN/ACT/MD/BV-01-I |                      |
| MPS 6/23           | Start Data communication under PSDM during Audio Streaming – SD                 | MPS/GW-SRC-TG/DUN/DCT/SD/BV-01-I |                      |
| MPS 6/24           | Start Data communication under PSDM during Audio Streaming – SD                 | MPS/CT-DT-SNK/DUN/DCT/SD/BV-01-I |                      |
| MPS 6/27           | Data communication in Personal Area Network during active voice call – SD       | MPS/AG-NAP/PAN/CLH/SD/BV-01-I    |                      |
| MPS 6/28           | Data communication in Personal Area Network during active voice call – SD       | MPS/HF-PANU/PAN/CLH/SD/BV-01-I   |                      |
| MPS 6/29           | Outgoing voice call during PAN communication – SD                               | MPS/AG-NAP/PAN/CLH/SD/BV-02-I    |                      |
| MPS (6/30 AND 3/9) | Outgoing voice call during PAN communication – SD                               | MPS/HF-PANU/PAN/CLH/SD/BV-02-I   |                      |
| MPS 6/31           | Incoming voice call during PAN communication – SD                               | MPS/AG-NAP/PAN/CLH/SD/BV-03-I    |                      |
| MPS 6/32           | Incoming voice call during PAN communication – SD                               | MPS/HF-PANU/PAN/CLH/SD/BV-03-I   |                      |

| Item     | Feature   | Test Case(s)                       | Test Case Applicable |
|----------|---|------------------------------------|----------------------|
| MPS 6/33 | Start audio streaming during PAN communication – SD         | MPS/NAP-SRC-TG/PAN/ACT/SD/BV-01-I  |                      |
| MPS 6/34 | Start audio streaming during PAN communication – SD         | MPS/CT-PANU-SNK/PAN/ACT/SD/BV-01-I |                      |
| MPS 6/35 | PAN communication establishment during audio streaming – SD | MPS/NAP-SRC/PAN/DCT/SD/BV-01-I     |                      |
| MPS 6/36 | PAN communication establishment during audio streaming – SD | MPS/PANU-SNK/PAN/DCT/SD/BV-01-I    |                      |
| MPS 6/39 | Connection Behavior   | MPS/AG-PSE/HFPB/CTH/SD/BV-01-I     |                      |
| MPS 8/2  | Disconnection Behavior HFP                                  | MPS/AG-SRC-TG/AVP/CTH/SD/BI-01-I   |                      |
| MPS 8/2  | Disconnection Behavior A2DP                                 | MPS/SRC-TG/AVP/CTH/SD/BI-02-I      |                      |
| MPS 10/1 | SDP Record  | MPS/SDR/SDP/CTH/SD/BV-01-I         |                      |

Table 5.1: Test Case Mapping