

# **JEDEC STANDARD**

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## **Universal Flash Storage (UFS) Test**

**Version 1.1**

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### **JESD224A**

(Revision of JESD224, March 2013)

**JULY 2017**

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# Universal Flash Storage (UFS) Test

## Contents

|                                                    | page       |
|----------------------------------------------------|------------|
| <b>1 Scope</b>                                     | <b>1</b>   |
| <b>2 Normative Reference</b>                       | <b>1</b>   |
| <b>3 Terms, Definitions, Acronyms, and Symbols</b> | <b>1</b>   |
| <b>4 Introduction</b>                              | <b>3</b>   |
| 4.1 Test specification Guiding Principles          | 3          |
| <b>5 Test Case Specifications Format</b>           | <b>4</b>   |
| <b>6 Assumption</b>                                | <b>5</b>   |
| <b>7 UFS SCSI Command Test</b>                     | <b>6</b>   |
| 7.1 INQUIRY Command                                | 6          |
| 7.2 REQUEST SENSE Command                          | 11         |
| 7.3 MODE SENSE Command                             | 15         |
| 7.4 MODE SELECT (10) Command                       | 34         |
| 7.5 UNMAP Command                                  | 55         |
| 7.6 START STOP UNIT Command                        | 62         |
| 7.7 READ CAPACITY (10) Command                     | 70         |
| 7.8 FORMAT UNIT Command                            | 71         |
| 7.9 TEST UNIT READY Command                        | 75         |
| 7.10 WRITE (6) Command                             | 77         |
| 7.11 WRITE (10) Command                            | 80         |
| 7.12 Read (6) Command                              | 86         |
| 7.13 Read (10) Command                             | 89         |
| 7.14 Verify (10) Command                           | 95         |
| 7.15 Send Diagnostic Command                       | 99         |
| 7.16 REPORT LUNS Command                           | 102        |
| 7.17 SYNCHRONIZE CACHE (10) Command                | 111        |
| 7.18 Pre Fetch (10) Command                        | 116        |
| <b>8 UFS Protocol Test</b>                         | <b>120</b> |
| 8.1 Context Management                             | 120        |
| 8.2 UFS Task Management                            | 124        |
| 8.3 UFS BOOT                                       | 128        |
| 8.4 UFS Descriptor                                 | 133        |
| 8.5 UFS Flag                                       | 149        |
| 8.6 UFS Attribute                                  | 174        |
| 8.7 UFS Power Mode                                 | 218        |
| 8.8 UFS RPMB                                       | 224        |
| 8.9 UFS UPIU                                       | 247        |
| 8.10 UFS UPIU Flags                                | 249        |
| 8.11 UFS Unit Attention Condition                  | 252        |

### Tables

|         |                                                                               |     |
|---------|-------------------------------------------------------------------------------|-----|
| TABLE 1 | Configuration Descriptor Header and Device Descriptor Configurable parameters | 124 |
| TABLE 2 | Unit Descriptor Configurable parameters                                       | 124 |





## Universal Flash Storage (UFS) Test

(From JEDEC Board Ballot JCB-13-18, formulated under the cognizance of the JC-64.5 Subcommittee on UFS Measurement.)

### 1 Scope

The primary objective of this test standard is to specify the test cases for UFS device protocol conformance testing. This test standard provides test cases for checking the functions defined in the following target standard:

JESD220, Universal Flash Storage (UFS) Standard version 1.1A

MIPI M-PHY and MIPI UniPro test cases are not in the scope of this document.

### 2 Normative Reference

- [UFS] JESD220C, Universal Flash Storage (UFS) version 2.1
- [UFS Card] JESD220-2, Universal Flash Storage (UFS) Card Extension version 1.0
- [UFSHCI] JESD223C, Universal Flash Storage (UFS) Host Controller Interface version 2.1
- [SAM] SCSI Architecture Model-5(SAM-5) Revision05, 19 May 2010
- [SPC] T10 Specification: SCSI Primary Commands – 4(SPC- 4) Revision 27, 11 October 2010
- [SBC] T10 Specification: SCSI Block Commands – 3(SBC -3) Revision 24, 05 August 2010

### 3 Terms, Definitions, Acronyms, and Symbols

**may:** Indicates flexibility of choice with no implied recommendation or requirement.

**shall:** Indicates a mandatory requirement. Designers shall implement such mandatory requirements to ensure interchangeability and to claim conformance with the specification.

**should:** Indicates a strong recommendation but not a mandatory requirement. Designers should give strong consideration to such recommendations, but there is still a choice in implementation.

#### 3.1 Acronyms

|           |                                     |
|-----------|-------------------------------------|
| ATTRVALUE | Attribute Value                     |
| GROUPEUM  | Group Number                        |
| LBA       | Logical Block Address               |
| LUN       | Logical Unit Number                 |
| MIPI      | Mobile Industry Processor Interface |
| PCODE     | Page Code                           |
| RPMB      | Replay Protected Memory Block       |
| SPCODE    | Sub Page Code                       |
| TSF       | Transaction Specific Fields         |
| UFS       | Universal Flash Storage             |
| UPIU      | UFS Protocol Information Unit       |
| UniPro    | Unified Protocol                    |
| ASVNC     | Out of order execution support      |

### **3.2 Naming Conventions**

Some terms are capitalized to distinguish their definition from their common English meaning. Words not capitalized retain their common English meaning.

### **3.3 Numbers and Number Bases**

Hexadecimal numbers are written with a lower case "h" suffix, e.g., FFFFh and 80h.

Binary numbers are written with a lower case "b" suffix (e.g., 10b).

Binary numbers larger than four digits are written with a space dividing each group of four digits, as in 1000 0101 0010b.

All other numbers are decimal.

### **3.4 Symbols**

Dash (-)            not applicable (n/a)

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## 4 Introduction

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Universal Flash Storage (UFS) is a simple, high performance, mass storage device with a serial Interface. It is primarily for use in mobile systems, between host processing and mass storage memory devices. The following is the summary of the UFS functional features,

- Similar functional features as eMMC
- Boot Operation Mode
- Device enumeration & discovery
- Supports Multiple partitions (LUNs) with partition Management
- Supports Multiple User Data Partition with Enhanced User Data Area options
- Support for boot partitions and RPMB partition
- Reliable write operation
- Background operations
- Secure operations, Purge and Erase to enhance data security
- Write Protection options, including Permanent & Power-On Write Protection
- Signed access to a Replay Protected Memory Block
- HW Reset Signals
- Task management operations
- Power management operations

### 4.1 Test specification Guiding Principles

- 1) Consistency – The principal is based on the need to generate a consistent result for all test items regardless of the testing implementation. The goal of this principal is to prevent a situation in which test implementations of a test item have different results due to a wide definition of the test item. According to this principal each test item provides detailed description for: commands, command sequence, specific command input parameters and specific expected output. Specific values are assigned to parameters, ranges are not used.

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## 5 Test Case Specifications Format

---

The test case specification contains following fields,

- **Ref. specs Section**

This field indicates the corresponding sections in the referenced document.

- **Test Purpose**

This field briefs about the intention of the test case.

- **Test Procedure**

This field contains test case execution procedure to be followed,

**[Precondition]**

The steps mentioned under this block shall be executed before main test case execution. The test steps mentioned in the **[Main]** block has dependency on these conditions. The output of test case may vary if precondition is not met.

**[Main]**

The test case execution procedure is mentioned in this section.

**[Clean up]**

Wherever mentioned, these steps to be followed after the test case execution to bring back the test environment to normal condition. These clean-up steps are needed to reset the test environment.

- **Input parameter values**

The applicable values for the parameters used in the test case.

- **Expected Output**

This field contains the expected result of the test case execution.

---

## 6 Assumption

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- **Expected Data Transfer Length**
  - In this specification, all test cases assume that Expected Data Transfer Length value in UPIU equals to Allocation Length or Transfer Length in byte.
  - If Transfer Length equal to zero in Read6 and Write6 command, Data Transfer Length value is set to 256 Logical blocks in byte.
- **Device Specific values shall not be checked.**
- **Expected Output defines output which shall be tested as pass/fail criteria.**
- **Device Initialization and Configuration shall be completed and LU shall be ready.**

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## 7 UFS SCSI Command Test

---

### 7.1 INQUIRY Command

The following test cases may be applied to all configured logical units and well-know logical units.

Standard INQUIRY data is 36bytes for UFS v1.1

#### 7.1.1 Test Case Id: UFS\_Inquiry\_01

| Ref. specs Section     | UFS: Section 11.3.2                                                                                                                                                                                                                                                                                                                  |           |                       |          |        |           |                       |                |      |   |   |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify that the INQUIRY command returns 36 bytes of Standard INQUIRY data.                                                                                                                                                                                                                                                        |           |                       |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]</b><br/>None.</p> <p><b>[Main]</b></p> <ol style="list-style-type: none"><li>1. Issue INQUIRY command.</li><li>2. Verify expected output.</li></ol> <p><b>[Clean up]</b><br/>None.</p>                                                                                                                          |           |                       |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>INQUIRY</b><br>EVPD = 0, PAGE CODE = 0, ALLOCATION LENGTH = 36, CONTROL = 00h.                                                                                                                                                                                                                                                    |           |                       |          |        |           |                       |                |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. The command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. The device shall return the 36 bytes of Standard INQUIRY data.</li></ol> |           |                       | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                               | Sense Key | Additional Sense Code |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                 | -         | -                     |          |        |           |                       |                |      |   |   |

7.1.2 Test Case Id: UFS\_Inquiry\_02

| Ref. specs Section     | UFS: Section 11.3.2                                                                                                                                                                                                                                                                                                                |                 |                                                               |  |          |        |           |                       |                |                 |                 |                                                               |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------------------------------|--|----------|--------|-----------|-----------------------|----------------|-----------------|-----------------|---------------------------------------------------------------|
| Test Purpose           | To verify status of the INQUIRY command with invalid page code parameter                                                                                                                                                                                                                                                           |                 |                                                               |  |          |        |           |                       |                |                 |                 |                                                               |
| Test Procedure         | <p><b>[Precondition]</b><br/>None</p> <p><b>[Main]</b></p> <div><div>1.</div><div>Issue INQUIRY command.</div></div> <div><div>2.</div><div>Verify expected output.</div></div> <p><b>[Clean up]</b><br/>None</p>                                                                                                                  |                 |                                                               |  |          |        |           |                       |                |                 |                 |                                                               |
| Input parameter values | <b>INQUIRY</b><br>EVPD = 0, PAGE CODE = 83h, ALLOCATION LENGTH = 36, CONTROL = 00h.                                                                                                                                                                                                                                                |                 |                                                               |  |          |        |           |                       |                |                 |                 |                                                               |
| Expected Output        | <div><div>1.</div><div>The command response shall be:</div></div> <table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Failure</td><td>CHECK CONDITION</td><td>ILLEGAL REQUEST</td><td>INVALID FIELD IN CDB<br/>or<br/>NO ADDITIONAL SENSE INFORMATION</td></tr></table> |                 |                                                               |  | Response | Status | Sense Key | Additional Sense Code | Target Failure | CHECK CONDITION | ILLEGAL REQUEST | INVALID FIELD IN CDB<br>or<br>NO ADDITIONAL SENSE INFORMATION |
| Response               | Status                                                                                                                                                                                                                                                                                                                             | Sense Key       | Additional Sense Code                                         |  |          |        |           |                       |                |                 |                 |                                                               |
| Target Failure         | CHECK CONDITION                                                                                                                                                                                                                                                                                                                    | ILLEGAL REQUEST | INVALID FIELD IN CDB<br>or<br>NO ADDITIONAL SENSE INFORMATION |  |          |        |           |                       |                |                 |                 |                                                               |

### 7.1.3 Test Case Id: UFS\_Inquiry\_03

| Ref. specs Section     | UFS: Section 11.3.2                                                                                                                                                                                                                                                                                                                                                                                  |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify that the INQUIRY command returns 36 bytes of Standard INQUIRY data if the ALLOCATION LENGTH is greater than 36                                                                                                                                                                                                                                                                             |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]</b><br/>None</p> <p><b>[Main]</b></p> <ol style="list-style-type: none"><li>1. Issue INQUIRY command.</li><li>2. Verify expected output.</li></ol> <p><b>[Clean up]</b><br/>None</p>                                                                                                                                                                                            |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>INQUIRY</b><br>EVPD = 0, PAGE CODE = 00h, ALLOCATION LENGTH = 37, CONTROL = 00h.                                                                                                                                                                                                                                                                                                                  |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. The command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. INQUIRY command shall return 36 bytes of Standard INQUIRY data</li><li>3. Underflow flag in RESPONSE UPIU shall be set to one.</li></ol> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                               | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                 | -         | -                     |  |          |        |           |                       |                |      |   |   |

#### 7.1.4 Test Case Id: UFS\_Inquiry\_04

| Ref. specs Section     | UFS: Section 11.3.2                                                                                                                                                                                                                                                                                                                                                             |           |                       |          |        |           |                       |                |      |   |   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify that the INQUIRY command returns the requested number of data bytes when the ALLOCATION LENGTH is less than 36.                                                                                                                                                                                                                                                       |           |                       |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]</b><br/>None.</p> <p><b>[Main]</b></p> <ol style="list-style-type: none"><li>1. Issue INQUIRY command.</li><li>2. Verify expected output.</li></ol> <p><b>[Clean up]</b><br/>None</p>                                                                                                                                                                      |           |                       |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>INQUIRY</b><br>EVPD = 0, PAGE CODE = 00h, ALLOCATION LENGTH = 35, CONTROL = 00h.                                                                                                                                                                                                                                                                                             |           |                       |          |        |           |                       |                |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. The command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. INQUIRY command shall return the amount of data specified in the ALLOCATION LENGTH field (i.e. 35 bytes).</li></ol> |           |                       | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                          | Sense Key | Additional Sense Code |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                            | -         | -                     |          |        |           |                       |                |      |   |   |

### 7.1.5 Test Case Id: UFS\_Inquiry\_05

| Ref. specs Section     | UFS: Section 11.3.2                                                                                                                                                                                                                                                                                                                 |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the INQUIRY command with pending UNIT ATTENTION condition.                                                                                                                                                                                                                                                                |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]</b></p> <p>1. Execute hardware reset to establish UNIT ATTENTION condition and not send REQUEST SENSE command.</p> <p><b>[Main]</b></p> <p>1. Issue INQUIRY command</p> <p>2. Verify expected output.</p> <p><b>[Clean up]</b></p> <p>1. Send REQUEST SENSE command to clear the UNIT ATTENTION condition.</p> |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>INQUIRY</b><br>EVPD = 0, Page code = 00h, Allocation length = 36, CONTROL = 00h.                                                                                                                                                                                                                                                 |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <p>1. The command response shall be:</p> <table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table> <p>2. INQUIRY command shall return 36 bytes of standard inquiry data</p>                                         |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                              | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                | -         | -                     |  |          |        |           |                       |                |      |   |   |

## 7.2 REQUEST SENSE Command

The following test cases may be applied to all configured logical units and well-know logical units.

Sense Data is 18 bytes for UFS.

### 7.2.1 Test Case Id: UFS\_RequestSense\_01

| Ref. specs Section     | UFS: Section 11.3.17                                                                                                                                                                                                                                                                                                                                                      |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the REQUEST SENSE command with DESC = 0 (fixed format sense data)                                                                                                                                                                                                                                                                                               |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None</p> <p><b>[Main]:</b></p> <ol style="list-style-type: none"><li>1. Issue REQUEST SENSE command.</li><li>2. Verify expected output.</li></ol> <p><b>[Clean up]:</b><br/>None.</p>                                                                                                                                                       |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>REQUEST SENSE</b><br>DESC = 0, Allocation Length = 12h, CONTROL = 00h.                                                                                                                                                                                                                                                                                                 |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. The command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. The value of the following fields shall be verified: Response Code=70h, ADDITIONAL SENSE LENGTH=0Ah</li></ol> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                    | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                      | -         | -                     |  |          |        |           |                       |                |      |   |   |

## 7.2.2 Test Case Id: UFS\_RequestSense\_02

| Ref. specs Section     | UFS: Section 11.3.17                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |                       |           |                       |                |      |   |   |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify that after receiving auto sense data for a command terminated with CHECK CONDITION status, a subsequent REQUEST SENSE command returns GOOD status and sense key in parameter data set to NO SENSE.                                                                                                                                                                                                                                                                             |           |                       |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b></p> <ol style="list-style-type: none"><li>1. Issue MODE SENSE command with InvalidPageCode<sup>1)</sup> value.</li><li>2. Verify that MODE SENSE command is terminated with CHECK CONDITION status.</li><li>3. Verify Auto Sense Data (Sense key set to ILLEGAL REQUEST).</li></ol> <p><b>[Main]</b></p> <ol style="list-style-type: none"><li>1. Issue REQUEST SENSE command.</li><li>2. Verify expected output.</li></ol> <p><b>[Clean up]:</b><br/>None</p> |           |                       |           |                       |                |      |   |   |
| Input parameter values | <b>REQUEST SENSE</b><br>DESC = 0, ALLOCATION LENGTH = 12h, CONTROL = 00h.                                                                                                                                                                                                                                                                                                                                                                                                                |           |                       |           |                       |                |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. The command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. REQUEST SENSE command shall return sense data with the sense key set to NO SENSE (00h) and the additional sense code set to NO ADDITIONAL SENSE INFORMATION (ASC = 00h, ASCQ = 00h).</li></ol>                               | Response  | Status                | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Sense Key | Additional Sense Code |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -         | -                     |           |                       |                |      |   |   |

NOTE 1 InvalidPageCode value shall be equal to the minimum Page Code value (except zero) not supported by the device. For example, if a device supports only the values:

- 01h (READ-WRITE ERROR RECOVERY mode page),
- 08h (CACHING mode page),
- 0Ah (CONTROL mode page),

the InvalidPageCode shall be set to 02h.

The list of supported mode pages may be obtained issuing MODE SENSE (10) command with Page Code set to 3F (ALL PAGES).

### 7.2.3 Test Case Id: UFS\_RequestSense\_03

| Ref. specs Section     | UFS: Section 11.3.17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |                       |           |                       |                |      |   |   |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify that the REQUEST SENSE command returns 18 data bytes if the allocation length is greater than 18                                                                                                                                                                                                                                                                                                                                                                                                |           |                       |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None.</p> <p><b>[Main]:</b></p> <div><div></div><div>1. Issue REQUEST SENSE command.</div><div>2. Verify expected output.</div></div> <p><b>[Clean up]:</b><br/>None</p>                                                                                                                                                                                                                                                                                                    |           |                       |           |                       |                |      |   |   |
| Input parameter values | <b>REQUEST SENSE</b><br>DESC = 0, ALLOCATION LENGTH = 13h, CONTROL = 00h.                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |                       |           |                       |                |      |   |   |
| Expected Output        | <div><div>1. The command response shall be:</div><table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></div> <div><div>2. The REQUEST SENSE command shall return 18 bytes of data</div><div>3. The value of the following fields shall be verified: RESPONSE CODE=70h, ADDITIONAL SENSE LENGTH=0Ah.</div><div>4. The Underflow flag in RESPONSE UPIU shall be set to one.</div></div> | Response  | Status                | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Sense Key | Additional Sense Code |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -         | -                     |           |                       |                |      |   |   |

#### 7.2.4 Test Case Id: UFS\_RequestSense\_04

| Ref. specs Section     | UFS: Section 11.3.17                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                       |           |                       |                |      |   |   |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify that the REQUEST SENSE command returns the requested number of data bytes if the allocation length is less than 18                                                                                                                                                                                                                                                                                                                  |           |                       |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None.</p> <p><b>[Main]:</b></p> <ol style="list-style-type: none"><li>1. Issue REQUEST SENSE command.</li><li>2. Verify expected output.</li></ol> <p><b>[Clean up]:</b><br/>None</p>                                                                                                                                                                                                                           |           |                       |           |                       |                |      |   |   |
| Input parameter values | <p><b>REQUEST SENSE</b><br/>DESC = 0, ALLOCATION LENGTH = 11h, CONTROL = 00h.</p>                                                                                                                                                                                                                                                                                                                                                             |           |                       |           |                       |                |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. The command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. The REQUEST SENSE command shall return 17 bytes of data</li><li>3. The value of the following fields shall be verified: RESPONSE CODE=70h, ADDITIONAL SENSE LENGTH=0Ah.</li></ol> | Response  | Status                | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                        | Sense Key | Additional Sense Code |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                          | -         | -                     |           |                       |                |      |   |   |

### 7.3 MODE SENSE Command

The following test cases shall be applied to all configured logical units.

#### 7.3.1 Test Case Id: UFS\_ModeSense\_01

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                     |           |                       |           |                       |                |      |   |   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify status of MODE SENSE (10) command with the Allocation Length = 0                                                                                                                                                                              |           |                       |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None.</p> <p><b>[Main]:</b></p> <ol style="list-style-type: none"><li>1. Issue MODE SENSE (10) command.</li><li>2. Verify expected output.</li></ol> <p><b>[Clean up]:</b><br/>None</p>                                   |           |                       |           |                       |                |      |   |   |
| Input parameter values | <p><b>MODE SENSE (10)</b><br/>PC = 00b, 01b, 10b; LLBAA = 0, DBD = 1, PAGE CODE = Ah,<br/>SUBPAGE CODE = 00h, ALLOCATION LENGTH = 0h, CONTROL = 00h</p>                                                                                                 |           |                       |           |                       |                |      |   |   |
| Expected Output        | <p>1. The command response shall be:</p> <table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table> <p>2. No data shall be returned.</p> | Response  | Status                | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                  | Sense Key | Additional Sense Code |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                    | -         | -                     |           |                       |                |      |   |   |

### 7.3.2 Test Case Id: UFS\_ModeSense\_02

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                          |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the status of MODE SENSE (10) command with<br>PAGE CODE = 0Ah (Control mode) and PC = 00b                                                                                                                                                                                          |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None.</p> <p><b>[Main]:</b></p> <div><div></div><div>1. Issue MODE SENSE (10) command.</div><div>2. Verify expected output.</div></div> <p><b>[Clean up]:</b><br/>None</p>                                                                                     |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 00b, LLBAA = 0, DBD = 1, PAGE CODE = 0Ah, SUBPAGE CODE = 00h, ALLOCATION LENGTH = 14h, CONTROL = 00h                                                                                                                                                          |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <div><div>1. The command response shall be:</div><table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></div> <div>2. Control mode page content is device specific.</div> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                       | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                         | -         | -                     |  |          |        |           |                       |                |      |   |   |

### 7.3.3 Test Case Id: UFS\_ModeSense\_03

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                                                                                           |           |                       |           |                       |                |      |   |   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the status of MODE SENSE (10) command with<br>PAGE CODE = 0Ah (Control mode) and PC = 01b                                                                                                                                                                                                                                                           |           |                       |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None</p> <p><b>[Main]:</b></p> <div><div>1.</div><div>Issue MODE SENSE (10) command.</div></div> <div><div>2.</div><div>Verify expected output.</div></div> <p><b>[Clean up]:</b><br/>None</p>                                                                                                                                  |           |                       |           |                       |                |      |   |   |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 01b, LLBAA = 0, DBD = 1, PAGE CODE = 0Ah, SUBPAGE CODE = 00h,<br>ALLOCATION LENGTH = 14h, CONTROL = 00h                                                                                                                                                                                                                        |           |                       |           |                       |                |      |   |   |
| Expected Output        | <div><div>1.</div><div>The command response shall be:</div><table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></div> <div><div>2.</div><div>The value of the following fields shall be verified: TST=000b, SWP=1b and 0000h</div></div> | Response  | Status                | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                        | Sense Key | Additional Sense Code |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                          | -         | -                     |           |                       |                |      |   |   |

### 7.3.4 Test Case Id: UFS\_ModeSense\_04

|                        |                                                                                                                                                                                                                                                                                              |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                          |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Purpose           | To verify the status of MODE SENSE (10) command with<br>PAGE CODE = 0Ah (Control mode) and PC = 10b                                                                                                                                                                                          |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None</p> <p><b>[Main]:</b></p> <div><div></div><div>1. Issue MODE SENSE (10) command.</div><div>2. Verify expected output.</div></div> <p><b>[Clean up]:</b><br/>None.</p>                                                                                     |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 10b, LLBAA = 0, DBD = 1,PAGE CODE = 0Ah, SUBPAGE CODE = 00h,<br>ALLOCATION LENGTH = 14h CONTROL = 00h                                                                                                                                                         |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <div><div>1. The command response shall be:</div><table><tr><td>Response</td><td>Status</td><td>Sense Key</td><td>Additional Sense Code</td></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></div> <div>2. Control mode page content is device specific.</div> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                       | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                         | -         | -                     |  |          |        |           |                       |                |      |   |   |

### 7.3.5 Test Case Id: UFS\_ModeSense\_05

This test case may be applied only if PS bit of the Control mode page is equal to one.

|                        |                                                                                                                                                                                                                                                                                                                             |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                                                         |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Purpose           | To verify the status of MODE SENSE (10) command with<br>PAGE CODE = 0Ah (Control mode) and PC = 11b                                                                                                                                                                                                                         |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None</p> <p><b>[Main]:</b></p> <div><div>1.</div><div>Issue MODE SENSE (10) command.</div></div> <div><div>2.</div><div>Verify expected output.</div></div> <p><b>[Clean up]:</b><br/>None</p>                                                                                                |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 11b, LLBAA = 0, DBD = 1, PAGE CODE = 0Ah, SUBPAGE CODE = 00h,<br>ALLOCATION LENGTH = 14h, CONTROL = 00h                                                                                                                                                                                      |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <div><div>1.</div><div>The command response shall be:</div><table><tr><td>Response</td><td>Status</td><td>Sense Key</td><td>Additional Sense Code</td></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></div> <div><div>2.</div><div>Control mode page content is device specific.</div></div> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                      | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                        | -         | -                     |  |          |        |           |                       |                |      |   |   |

### 7.3.6 Test Case Id: UFS\_ModeSense\_06

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                                            |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the status of MODE SENSE (10) command with<br>PAGE CODE = 01h (Read-Write Error recovery mode) and PC = 00b                                                                                                                                                                                          |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None.</p> <p><b>[Main]:</b></p> <div><div></div><div>1. Issue MODE SENSE (10) command.</div><div>2. Verify expected output.</div></div> <p><b>[Clean up]:</b><br/>None</p>                                                                                                       |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 00b, LLBAA = 0, DBD = 1,PAGE CODE = 01h, SUBPAGE CODE = 00h,<br>ALLOCATION LENGTH = 14h, CONTROL = 00h                                                                                                                                                                          |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <div><div>1. The command response shall be:</div><table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></div> <div>2. Read-Write Error recovery mode page content is device specific.</div> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                         | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                           | -         | -                     |  |          |        |           |                       |                |      |   |   |

### 7.3.7 Test Case Id: UFS\_ModeSense\_07

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                            |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the status of MODE SENSE (10) command with<br>PAGE CODE = 01h (Read-Write Error recovery mode) and PC = 01b                                                                                                                          |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None</p> <p><b>[Main]:</b></p> <ol style="list-style-type: none"><li>1. Issue MODE SENSE (10) command.</li><li>2. Verify expected output.</li></ol> <p><b>[Clean up]:</b><br/>None</p>                           |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 01b, LLBAA = 0, DBD = 1, PAGE CODE = 01h, SUBPAGE CODE = 00h,<br>ALLOCATION LENGTH, CONTROL = 00h                                                                                                               |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <div><div>1. The command response shall be:</div><table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></div> <div>2.</div> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                         | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                           | -         | -                     |  |          |        |           |                       |                |      |   |   |

### 7.3.8 Test Case Id: UFS\_ModeSense\_08

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                                                       |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the status of MODE SENSE (10) command with<br>PAGE CODE = 01h (Read-Write Error recovery mode) and PC = 10b                                                                                                                                                                                                     |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None</p> <p><b>[Main]:</b></p> <div><div></div><div>1. Issue MODE SENSE (10) command.</div></div> <div><div></div><div>2. Verify expected output.</div></div> <p><b>[Clean up]:</b><br/>None</p>                                                                                            |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 10b, LLBAA = 0, DBD = 1,PAGE CODE = 01h, SUBPAGE CODE = 00h,<br>ALLOCATION LENGTH = 14h, CONTROL = 00h                                                                                                                                                                                     |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <div><div>1. The command response shall be:</div><table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></div> <div><div>2. Read-Write Error recovery mode page content is device specific.</div></div> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                    | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                      | -         | -                     |  |          |        |           |                       |                |      |   |   |

### 7.3.9 Test Case Id: UFS\_ModeSense\_09

This test case may be applied only if PS bit of the Read-Write Error recovery mode page is equal to one.

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                                            |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the status of MODE SENSE (10) command with<br>PAGE CODE = 01h (Read-Write Error recovery mode) and PC = 11b                                                                                                                                                                                          |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None</p> <p><b>[Main]:</b></p> <div><div></div><div>1. Issue MODE SENSE (10) command.</div><div>2. Verify expected output.</div></div> <p><b>[Clean up]:</b><br/>None</p>                                                                                                        |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 11b, LLBAA = 0, DBD = 1, PAGE CODE = 01h, SUBPAGE CODE = 00h,<br>ALLOCATION LENGTH = 14h                                                                                                                                                                                        |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <div><div>1. The command response shall be:</div><table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></div> <div>2. Read-Write Error recovery mode page content is device specific.</div> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                         | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                           | -         | -                     |  |          |        |           |                       |                |      |   |   |

### 7.3.10 Test Case Id: UFS\_ModeSense\_10

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                         |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the status of MODE SENSE (10) command with<br>PAGE CODE = 08h (caching mode) and PC = 00b                                                                                                                                                                                         |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None.</p> <p><b>[Main]:</b></p> <div><div></div><div>1. Issue MODE SENSE (10) command.</div><div>2. Verify expected output.</div></div> <p><b>[Clean up]:</b><br/>None</p>                                                                                    |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 00b, LLBAA = 0, DBD = 1,PAGE CODE = 08h, SUBPAGE CODE = 00h,<br>ALLOCATION LENGTH = 1Ch, CONTROL = 00h                                                                                                                                                       |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <div><div>1. The command response shall be:</div><table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></div> <div>2. Caching mode page content is device specific</div> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                      | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                        | -         | -                     |  |          |        |           |                       |                |      |   |   |

### 7.3.11 Test Case Id: UFS\_ModeSense\_11

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                                                                               |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the status of MODE SENSE (10) command with PAGE CODE = 08h (caching mode) and PC = 01b                                                                                                                                                                                                                                                  |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None</p> <p><b>[Main]:</b></p> <ol style="list-style-type: none"><li>1. Issue MODE SENSE (10) command.</li><li>2. Verify expected output.</li></ol> <p><b>[Clean up]:</b><br/>None</p>                                                                                                                              |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 01b, LLBAA = 0, DBD = 1, PAGE CODE = 08h, SUBPAGE CODE = 00h, ALLOCATION LENGTH = 1Ch, CONTROL = 00h                                                                                                                                                                                                               |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. The command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. Only the value of the following fields shall be verified: WCE= 1b, RCD = 1b</li></ol> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                            | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                              | -         | -                     |  |          |        |           |                       |                |      |   |   |

### 7.3.12 Test Case Id: UFS\_ModeSense\_12

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the status of MODE SENSE (10) command with<br>PAGE CODE = 08h (caching mode) and PC = 10b                                                                                                                                                                                |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <b>[Precondition]:</b><br>None<br><br><b>[Main]:</b><br><div>1. Issue MODE SENSE (10) command.</div> <div>2. Verify expected output.</div><br><b>[Clean up]:</b><br>None                                                                                                           |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 10b, LLBAA = 0, DBD = 1,PAGE CODE = 08h, SUBPAGE CODE = 00h,<br>ALLOCATION LENGTH = 1Ch, CONTROL = 00h                                                                                                                                              |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <div>1. The command response shall be:</div> <table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table> <div>2. Caching mode page content is device specific.</div> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                             | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                               | -         | -                     |  |          |        |           |                       |                |      |   |   |

### 7.3.13 Test Case Id: UFS\_ModeSense\_13

This test case may be applied only if PS bit of the Caching mode page is equal to one.

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                                                                         |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the status of MODE SENSE (10) command with PAGE CODE = 08h (caching mode) and PC = 11b                                                                                                                                                                                                                                            |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None</p> <p><b>[Main]:</b></p> <div><div></div><div>1. Issue MODE SENSE (10) command.</div><div>2. Verify expected output.</div></div> <p><b>[Clean up]:</b><br/>None</p>                                                                                                                                     |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 11b, LLBAA = 0, DBD = 1, PAGE CODE = 08h, SUBPAGE CODE = 00h, ALLOCATION LENGTH = 1Ch, CONTROL = 00h                                                                                                                                                                                                         |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <div><div>1. The command response shall be:</div><table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></div> <div><div>2. The returned page data contains the details of saved values of Control mode page.</div></div> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                      | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                        | -         | -                     |  |          |        |           |                       |                |      |   |   |

### 7.3.14 Test Case Id: UFS\_ModeSense\_14

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the status of MODE SENSE (10) command with<br>PAGE CODE = 3Fh (All mode pages) and PC = 00b                                                                                                                                                                                                                                                                                                                                                                                                                              |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None</p> <p><b>[Main]:</b></p> <div><div></div><div>1. Issue MODE SENSE (10) command.</div><div>2. Verify expected output.</div></div> <p><b>[Clean up]:</b><br/>None</p>                                                                                                                                                                                                                                                                                                                            |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 00b, LLBAA = 0, DBD = 1, PAGE CODE = 3Fh, SUBPAGE CODE = 00h,<br>ALLOCATION LENGTH = FFFFh, CONTROL = 00h                                                                                                                                                                                                                                                                                                                                                                                           |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <div><div>1. The command response shall be:</div><table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></div> <div><div>2. See <u>UFS_ModeSense_02</u> for Control Mode Page content,<br/>UFS <u>ModeSense_06</u> for Read-Write Error recovery Mode Page<br/>content and <u>UFS_ModeSense_10</u> for caching mode page content</div></div> <p>NOTE The data shall be in ascending order of Mode Page code.</p> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -         | -                     |  |          |        |           |                       |                |      |   |   |

### 7.3.15 Test Case Id: UFS\_ModeSense\_15

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                                                                       |                 |                                                         |  |          |        |           |                       |                |                 |                 |                                                         |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------------------------|--|----------|--------|-----------|-----------------------|----------------|-----------------|-----------------|---------------------------------------------------------|
| Test Purpose           | To verify the status of MODE SENSE (10) command with invalid page code parameter.                                                                                                                                                                                                                                                         |                 |                                                         |  |          |        |           |                       |                |                 |                 |                                                         |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None.</p> <p><b>[Main]:</b></p> <ol style="list-style-type: none"><li>1. Issue MODE SENSE (10) command.</li><li>2. Verify expected output.</li></ol> <p><b>[Clean up]:</b><br/>None</p>                                                                                                                     |                 |                                                         |  |          |        |           |                       |                |                 |                 |                                                         |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 00b,01b,10b,11b; LLBAA = 0, DBD = 1, PAGE CODE = InvalidPageCode <sup>(1)</sup> , SUBPAGE CODE = 00h, ALLOCATION LENGTH = 1Ch, CONTROL = 00h                                                                                                                                                               |                 |                                                         |  |          |        |           |                       |                |                 |                 |                                                         |
| Expected Output        | <ol style="list-style-type: none"><li>1. The command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Failure</td><td>CHECK CONDITION</td><td>ILLEGAL REQUEST</td><td>INVALID FIELD IN CDB or NO ADDITIONAL SENSE INFORMATION</td></tr></table></li></ol> |                 |                                                         |  | Response | Status | Sense Key | Additional Sense Code | Target Failure | CHECK CONDITION | ILLEGAL REQUEST | INVALID FIELD IN CDB or NO ADDITIONAL SENSE INFORMATION |
| Response               | Status                                                                                                                                                                                                                                                                                                                                    | Sense Key       | Additional Sense Code                                   |  |          |        |           |                       |                |                 |                 |                                                         |
| Target Failure         | CHECK CONDITION                                                                                                                                                                                                                                                                                                                           | ILLEGAL REQUEST | INVALID FIELD IN CDB or NO ADDITIONAL SENSE INFORMATION |  |          |        |           |                       |                |                 |                 |                                                         |

NOTE 1 InvalidPageCode value shall be equal to the minimum Page Code value (except zero) not supported by the device. For example, if a device supports only the values:

01h (READ-WRITE ERROR RECOVERY mode page),

08h (CACHING mode page),

0Ah (CONTROL mode page),

the InvalidPageCode shall be set to 02h.

The list of supported mode pages may be obtained issuing MODE SENSE (10) command with Page Code set to 3F (ALL PAGES).

### 7.3.16 Test Case Id: UFS\_ModeSense\_16

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |                       |  |          |        |           |                       |                |      |   |   |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the MODE SENSE (10) command status with ALLOCATION LENGTH value lower than the Control Mode page size.                                                                                                                                                                                                                                                                                                                                    |           |                       |  |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None.</p> <p><b>[Main]:</b></p> <ol style="list-style-type: none"><li>1. Issue MODE SENSE (10) command.</li><li>2. Verify expected output.</li></ol> <p><b>[Clean up]:</b><br/>None</p>                                                                                                                                                                                                                               |           |                       |  |          |        |           |                       |                |      |   |   |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 00b, LLBAA = 0, DBD = 1, PAGE CODE = 0Ah, SUBPAGE CODE = 00h, ALLOCATION LENGTH = 13h, CONTROL = 00h                                                                                                                                                                                                                                                                                                                 |           |                       |  |          |        |           |                       |                |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. The command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. The device server shall transfer a number of bytes equal to the ALLOCATION LENGTH value (i.e 19 bytes).</li><li>3. See <u>UFS_ModeSense_02</u> for Control Mode Page content.</li></ol> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                              | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                | -         | -                     |  |          |        |           |                       |                |      |   |   |

### 7.3.17 Test Case Id: UFS\_ModeSense\_17

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |                       |           |                       |                |      |   |   |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify that the MODE SENSE (10) command returns only the Control mode page content if ALLOCATION LENGTH value is greater than 20.                                                                                                                                                                                                                                                                                                                                                                                     |           |                       |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None.</p> <p><b>[Main]:</b></p> <ol style="list-style-type: none"><li>1. Issue MODE SENSE (10) command.</li><li>2. Verify expected output.</li></ol> <p><b>[Clean up]:</b><br/>None</p>                                                                                                                                                                                                                                                                                                    |           |                       |           |                       |                |      |   |   |
| Input parameter values | <p><b>MODE SENSE (10)</b><br/>PC = 10b, LLBAA = 0, DBD = 1, PAGE CODE = 0Ah, SUBPAGE CODE = 00h, ALLOCATION LENGTH = 15h, CONTROL = 00h</p>                                                                                                                                                                                                                                                                                                                                                                              |           |                       |           |                       |                |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. The command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. The device shall transfer only 20 bytes equal and not the amount bytes specified in ALLOCATION LENGTH field.</li><li>3. See <u>UFS ModeSense_02</u> for Control Mode Page content.</li><li>4. Underflow flag in RESPONSE UPIU shall be set to one.</li></ol> | Response  | Status                | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Sense Key | Additional Sense Code |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -         | -                     |           |                       |                |      |   |   |

### 7.3.18 Test Case Id: UFS\_ModeSense\_18

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                                                                               |           |                       |           |                       |                |      |   |   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify that the Mode parameter header values.                                                                                                                                                                                                                                                                                                  |           |                       |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None.</p> <p><b>[Main]:</b></p> <ol style="list-style-type: none"><li>1. Issue MODE SENSE (10) command.</li><li>2. Verify expected output.</li></ol> <p><b>[Clean up]:</b><br/>None</p>                                                                                                                             |           |                       |           |                       |                |      |   |   |
| Input parameter values | <p><b>MODE SENSE (10)</b><br/>PC = 00b, LLBAA = 0, DBD = 1, PAGE CODE = 0Ah, SUBPAGE CODE = 00h, ALLOCATION LENGTH = 14h, CONTROL = 00h</p>                                                                                                                                                                                                       |           |                       |           |                       |                |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. The command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. The value of the following fields shall be verified: MODE DATA LENGTH = 18.</li></ol> | Response  | Status                | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                            | Sense Key | Additional Sense Code |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                              | -         | -                     |           |                       |                |      |   |   |

### 7.3.19 Test Case Id: UFS\_ModeSense\_19

This test case shall be applied only if the device does not support the Control Extension mode page.

| Ref. specs Section     | UFS: Section 11.3.4                                                                                                                                                                                                                                                                                             |                 |                                                         |  |          |        |           |                       |                |                 |                 |                                                         |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------------------------|--|----------|--------|-----------|-----------------------|----------------|-----------------|-----------------|---------------------------------------------------------|
| Test Purpose           | To verify that MODE SENSE (10) command is terminated with CHECK CONDITION status when a Subpage is sensed and the device does not support the Subpage.                                                                                                                                                          |                 |                                                         |  |          |        |           |                       |                |                 |                 |                                                         |
| Test Procedure         | <p><b>[Precondition]</b></p> <p><b>[Main]</b></p> <ol style="list-style-type: none"><li>1. Issue MODE SENSE (10) command.</li><li>2. Verify expected output.</li></ol> <p><b>[Clean up]</b></p> <p>None</p>                                                                                                     |                 |                                                         |  |          |        |           |                       |                |                 |                 |                                                         |
| Input parameter values | <b>MODE SENSE (10)</b><br>PC = 00b, LLBAA = 0, DBD = 1, PAGE CODE = 0Ah, SUBPAGE CODE = 01h, ALLOCATION LENGTH = 28h.                                                                                                                                                                                           |                 |                                                         |  |          |        |           |                       |                |                 |                 |                                                         |
| Expected Output        | <div><div>1. The command response shall be:</div><table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Failure</td><td>CHECK CONDITION</td><td>ILLEGAL REQUEST</td><td>INVALID FIELD IN CDB or NO ADDITIONAL SENSE INFORMATION</td></tr></table></div> |                 |                                                         |  | Response | Status | Sense Key | Additional Sense Code | Target Failure | CHECK CONDITION | ILLEGAL REQUEST | INVALID FIELD IN CDB or NO ADDITIONAL SENSE INFORMATION |
| Response               | Status                                                                                                                                                                                                                                                                                                          | Sense Key       | Additional Sense Code                                   |  |          |        |           |                       |                |                 |                 |                                                         |
| Target Failure         | CHECK CONDITION                                                                                                                                                                                                                                                                                                 | ILLEGAL REQUEST | INVALID FIELD IN CDB or NO ADDITIONAL SENSE INFORMATION |  |          |        |           |                       |                |                 |                 |                                                         |

## 7.4 MODE SELECT (10) Command

The following test cases may be applied to all configured logical units.

### 7.4.1 Test Case Id: UFS\_ModeSelect10\_01

| Ref. specs Section     | UFS: 11.3.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |                       |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|-----------|-----------------------|----------------|------|---|---|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify that the MODE SELECT (10) command changes the current value of SWP parameter in Control mode page                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |                       |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b></p> <p><b>[Main]:</b></p> <ol style="list-style-type: none"><li>1. Issue MODE SENSE(10) command for getting SWP(N1) and BUSY TIMEOUT PERIOD(N2) current value.&lt;a&gt;</li><li>2. Issue MODE SELECT (10) command. &lt;b&gt;</li><li>3. Verify expected output.&lt;1&gt;</li><li>4. Issue MODE SENSE (10) command. &lt;c&gt;</li><li>5. Verify expected output.&lt;2&gt;</li></ol> <p><b>[Clean up]:</b></p> <ol style="list-style-type: none"><li>1. Restore the original mode page value</li></ol>                                                   |           |                       |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Input parameter values | <p><b>a) MODE SENSE (10)</b><br/>PC = 00b, LLBAA = 0, DBD = 1,PAGE CODE = 0Ah, Subpage code = 00h, ALLOCATION LENGTH = 14h</p> <p><b>b) MODE SELECT (10)</b><br/>PF = 1, SP = 0, Parameter List Length = 14h<br/>SWP = N(N != N1) and BUSY TIMEOUT PERIOD = N2 and all other fields set to zero.</p> <p><b>c) MODE SENSE (10)</b><br/>PC = 00b, LLBAA = 0, DBD = 1,PAGE CODE = 0Ah, Subpage code = 00h, ALLOCATION LENGTH = 14h</p>                                                                                                                                              |           |                       |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. MODE SELECT (10) command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. MODE SENSE (10) command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table><p>The value of the following fields shall be verified: SWP=N and BUSY</p></li></ol> | Response  | Status                | Sense Key | Additional Sense Code | Target Success | GOOD | - | - | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Sense Key | Additional Sense Code |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | -         | -                     |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Sense Key | Additional Sense Code |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | -         | -                     |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |

|  |                                                    |
|--|----------------------------------------------------|
|  | TIMEOUT PERIOD = N2 and all other fields are zero. |
|--|----------------------------------------------------|

#### 7.4.2 Test Case Id: UFS\_ModeSelect10\_02

| Ref. specs Section     | UFS: 11.3.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                       |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|-----------|-----------------------|----------------|------|---|---|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify that the MODE SELECT (10) command changes the current value of BUSY TIME PERIOD parameter in Control mode page                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |           |                       |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b></p> <p><b>[Main]:</b></p> <ol style="list-style-type: none"><li>1. Issue MODE SENSE(10) command for getting SWP(N1) and BUSY TIMEOUT PERIOD(N2) current value.&lt;a&gt;</li><li>2. Issue MODE SELECT (10) command. &lt;a&gt;</li><li>3. Verify expected output.&lt;1&gt;</li><li>4. Issue MODE SENSE (10) command. &lt;b&gt;</li><li>5. Verify expected output.&lt;2&gt;</li></ol> <p><b>[Clean up]:</b></p> <ol style="list-style-type: none"><li>1. Restore the original mode page value</li></ol>                                                                                                        |           |                       |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Input parameter values | <p><b>a) MODE SENSE (10)</b><br/>PC = 00b, LLBAA = 0, DBD = 1,PAGE CODE = 0Ah, Subpage code = 00h, ALLOCATION LENGTH = 14h</p> <p><b>b) MODE SELECT (10)</b><br/>PF = 1, SP = 0, Parameter List Length = 14h<br/>SWP = N1, BUSY TIME PERIOD = N(N != N2) and all other fields set to zero.</p> <p><b>c) MODE SENSE (10)</b><br/>PC = 00b, LLBAA = 0, DBD = 1,PAGE CODE = 0Ah, Subpage code = 00h, ALLOCATION LENGTH = 14h</p>                                                                                                                                                                                                         |           |                       |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. MODE SELECT (10) command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. MODE SENSE (10) command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table><p>The value of the following fields shall be verified: SWP = N1 and BUSY TIMEOUT PERIOD = N and all other fields are zero.</p></li></ol> | Response  | Status                | Sense Key | Additional Sense Code | Target Success | GOOD | - | - | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Sense Key | Additional Sense Code |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -         | -                     |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Sense Key | Additional Sense Code |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -         | -                     |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |

### 7.4.3 Test Case Id: UFS\_ModeSelect10\_03

This test case may be applied when READ RETRY COUNT parameter is changeable.

| Ref. specs Section     | UFS: 11.3.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |                       |  |          |        |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the status of the MODE SELECT (10) command changes the current value of READ RETRY COUNT parameter in Read-Write Error Recovery Mode Page                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |                       |  |          |        |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None</p> <p><b>[Main]:</b></p> <ol style="list-style-type: none"><li>1. Issue MODE SENSE(10) command for getting READ RETRY COUNT(N1), WRITE RETRY COUNT(N2)and RECOVERY TIME LIMIT(N3) current value.&lt;a&gt;</li><li>2. Issue MODE SELECT (10) command. &lt;b&gt;</li><li>3. Verify expected output &lt;1&gt;</li><li>4. Issue MODE SENSE (10) command. &lt;c&gt;</li><li>5. Verify expected output&lt;2&gt;.</li></ol> <p><b>[Clean up]:</b></p> <ol style="list-style-type: none"><li>1. Restore the original mode page value</li></ol>                                                                                                        |           |                       |  |          |        |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Input parameter values | <p><b>a) MODE SENSE (10)</b><br/>PC = 00b, LLBAA = 0, DBD = 1,PAGE CODE = 01h, Subpage code = 00h, ALLOCATION LENGTH = 14h</p> <p><b>b) MODE SELECT (10)</b><br/>PF = 1, SP = 0, Parameter List Length = 14h<br/>AWRE = 1b, READ RETRY COUNT = N(N != N1), WRITE RETRY COUNT = N2, RECOVERY TIME LIMIT = N3 and all other fields set to zero.</p> <p><b>c) MODE SENSE (10)</b><br/>PC = 00b, LLBAA = 0, DBD = 1,PAGE CODE = 01h, Subpage code = 00h, ALLOCATION LENGTH = 14h</p>                                                                                                                                                                                                  |           |                       |  |          |        |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. MODE SELECT (10) command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. MODE SENSE (10) command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table><p>The value of the following fields shall be verified: AWRE = 1b, READ RETRY COUNT= N, WRITE RETRY COUNT = N2, RECOVERY TIME LIMIT = N3 and all other fields are zero.</p></li></ol> |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -         | -                     |  |          |        |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -         | -                     |  |          |        |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |

#### 7.4.4 Test Case Id: UFS\_ModeSelect10\_04

This test case may be applied when WRITE RETRY COUNT parameter is changeable.

| Ref. specs Section     | UFS: 11.3.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |           |                       |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|-----------|-----------------------|----------------|------|---|---|----------|--------|-----------|-----------------------|----------------|------|---|---|
| Test Purpose           | To verify the status of the MODE SELECT (10) command changes the current value of WRITE RETRY COUNT parameter in Read-Write Error Recovery Mode Page                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |                       |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None</p> <p><b>[Main]:</b></p> <ol style="list-style-type: none"><li>1. Issue MODE SENSE(10) command for getting READ RETRY COUNT(N1), WRITE RETRY COUNT(N2) and RECOVERY TIME LIMIT(N3) current value.&lt;a&gt;</li><li>2. Issue MODE SELECT (10) command. &lt;b&gt;</li><li>3. Verify expected output &lt;1&gt;</li><li>4. Issue MODE SENSE (10) command. &lt;c&gt;</li><li>5. Verify expected output&lt;2&gt;.</li></ol> <p><b>[Clean up]:</b></p> <ol style="list-style-type: none"><li>1. Restore the original mode page value</li></ol>                                                              |           |                       |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Input parameter values | <p><b>a) MODE SENSE (10)</b><br/>PC = 00b, LLBAA = 0, DBD = 1,PAGE CODE = 01h, Subpage code = 00h, ALLOCATION LENGTH = 14h</p> <p><b>b) MODE SELECT (10)</b><br/>PF = 1, SP = 0, Parameter List Length = 14h<br/>AWRE = 1b, READ RETRY COUNT = N1, WRITE RETRY COUNT = N(N != N2), RECOVERY TIME LIMIT = N3 and all other fields set to zero.</p> <p><b>c) MODE SENSE (10)</b><br/>PC = 00b, LLBAA = 0, DBD = 1,PAGE CODE = 01h, Subpage code = 00h, ALLOCATION LENGTH = 14h</p>                                                                                                                                                         |           |                       |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. MODE SELECT (10) command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. MODE SENSE (10) command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table><p>The value of the following fields shall be verified: AWRE = 1b, READ RETRY COUNT = N1, WRITE RETRY COUNT = N, RECOVERY TIME</p></li></ol> | Response  | Status                | Sense Key | Additional Sense Code | Target Success | GOOD | - | - | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Sense Key | Additional Sense Code |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -         | -                     |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Sense Key | Additional Sense Code |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -         | -                     |           |                       |                |      |   |   |          |        |           |                       |                |      |   |   |

|  |                                           |
|--|-------------------------------------------|
|  | LIMIT = N3 and all other fields are zero. |
|--|-------------------------------------------|

#### 7.4.5 Test Case Id: UFS\_ModeSelect10\_05

This test case may be applied when RECOVERY TIME LIMIT parameter is changeable.

| Ref. specs Section     | UFS: 11.3.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |                       |           |                       |                |      |   |   |          |        |           |                       |        |      |   |   |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|-----------|-----------------------|----------------|------|---|---|----------|--------|-----------|-----------------------|--------|------|---|---|
| Test Purpose           | To verify the status of the MODE SELECT (10) command changes the current value of RECOVERY TIME LIMIT parameter in Read-Write Error Recovery Mode Page                                                                                                                                                                                                                                                                                                                                                                                                                      |           |                       |           |                       |                |      |   |   |          |        |           |                       |        |      |   |   |
| Test Procedure         | <p><b>[Precondition]:</b><br/>None</p> <p><b>[Main]:</b></p> <ol style="list-style-type: none"><li>1. Issue MODE SENSE(10) command for getting READ RETRY COUNT(N1), WRITE RETRY COUNT(N2) and RECOVERY TIME LIMIT(N3) current value.&lt;a&gt;</li><li>2. Issue MODE SELECT (10) command. &lt;b&gt;</li><li>3. Verify expected output &lt;1&gt;</li><li>4. Issue MODE SENSE (10) command. &lt;c&gt;</li><li>5. Verify expected output&lt;2&gt;.</li></ol> <p><b>[Clean up]:</b></p> <ol style="list-style-type: none"><li>1. Restore the original mode page value</li></ol> |           |                       |           |                       |                |      |   |   |          |        |           |                       |        |      |   |   |
| Input parameter values | <p><b>a) MODE SENSE (10)</b><br/>PC = 00b, LLBAA = 0, DBD = 1,PAGE CODE = 01h, Subpage code = 00h, ALLOCATION LENGTH = 14h</p> <p><b>b) MODE SELECT (10)</b><br/>PF = 1, SP = 0, Parameter List Length = 14h<br/>AWRE = 1b, READ RETRY COUNT = N1, WRITE RETRY COUNT = N2, RECOVERY TIME LIMIT = N(N != N3) and all other fields set to zero.</p> <p><b>c) MODE SENSE (10)</b><br/>PC = 00b, LLBAA = 0, DBD = 1,PAGE CODE = 01h, Subpage code = 00h, ALLOCATION LENGTH = 14h</p>                                                                                            |           |                       |           |                       |                |      |   |   |          |        |           |                       |        |      |   |   |
| Expected Output        | <ol style="list-style-type: none"><li>1. MODE SELECT (10) command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li><li>2. MODE SENSE (10) command response shall be:<table><tr><th>Response</th><th>Status</th><th>Sense Key</th><th>Additional Sense Code</th></tr><tr><td>Target</td><td>GOOD</td><td>-</td><td>-</td></tr></table></li></ol>                                                                              | Response  | Status                | Sense Key | Additional Sense Code | Target Success | GOOD | - | - | Response | Status | Sense Key | Additional Sense Code | Target | GOOD | - | - |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Sense Key | Additional Sense Code |           |                       |                |      |   |   |          |        |           |                       |        |      |   |   |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | -         | -                     |           |                       |                |      |   |   |          |        |           |                       |        |      |   |   |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Sense Key | Additional Sense Code |           |                       |                |      |   |   |          |        |           |                       |        |      |   |   |
| Target                 | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | -         | -                     |           |                       |                |      |   |   |          |        |           |                       |        |      |   |   |

|  |                                                                                                                                                                       |  |  |  |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
|  | Success                                                                                                                                                               |  |  |  |
|  | The value of the following fields shall be verified: AWRE = 1b, READ RETRY COUNT = N1, WRITE RETRY COUNT = N2, RECOVERY TIME LIMIT = N and all other fields are zero. |  |  |  |

#### 7.4.6 Test Case Id: UFS\_ModeSelect10\_06

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                       |  |          |        |           |                       |                |      |   |   |          |        |       |                       |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|--|----------|--------|-----------|-----------------------|----------------|------|---|---|----------|--------|-------|-----------------------|
| Ref. specs Section     | UFS: 11.3.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |           |                       |  |          |        |           |                       |                |      |   |   |          |        |       |                       |
| Test Purpose           | To verify the status of the MODE SELECT (10) command changes the current value of WCE parameter in Caching Mode Page                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                       |  |          |        |           |                       |                |      |   |   |          |        |       |                       |
| Test Procedure         | <p><b>[Precondition]:</b></p> <p><b>[Main]:</b></p> <div><div>1.</div><div>Issue MODE SENSE(10) command for getting WCE(N1) and RCD(N2) current value.&lt;a&gt;</div></div> <div><div>2.</div><div>Issue MODE SELECT (10) command. &lt;a&gt;</div></div> <div><div>3.</div><div>Verify expected output &lt;1&gt;</div></div> <div><div>4.</div><div>Issue MODE SENSE (10) command. &lt;b&gt;</div></div> <div><div>5.</div><div>Verify expected output&lt;2&gt;.</div></div> <p><b>[Clean up]:</b></p> <div><div>1.</div><div>Restore the original mode page value</div></div> |           |                       |  |          |        |           |                       |                |      |   |   |          |        |       |                       |
| Input parameter values | <p><b>a) MODE SENSE (10)</b><br/>PC = 00b, LLBAA = 0, DBD = 1,PAGE CODE = 08h, Subpage code = 00h, ALLOCATION LENGTH = 1Ch</p> <p><b>b) MODE SELECT (10)</b><br/>PF = 1, SP = 0, Parameter List Length = 1Ch<br/>WCE = N(N != N1), RCD = N2 and all other fields set to zero.</p> <p><b>c) MODE SENSE (10)</b><br/>PC = 00b, LLBAA = 0, DBD = 1,PAGE CODE = 08h, Subpage code = 00h, ALLOCATION LENGTH = 1Ch</p>                                                                                                                                                               |           |                       |  |          |        |           |                       |                |      |   |   |          |        |       |                       |
| Expected Output        | <div><div>1.</div><div>MODE SELECT (10) command response shall be:</div><table><tr><td>Response</td><td>Status</td><td>Sense Key</td><td>Additional Sense Code</td></tr><tr><td>Target Success</td><td>GOOD</td><td>-</td><td>-</td></tr></table></div> <div><div>2.</div><div>MODE SENSE (10) command response shall be:</div><table><tr><td>Response</td><td>Status</td><td>Sense</td><td>Additional Sense Code</td></tr></table></div>                                                                                                                                      |           |                       |  | Response | Status | Sense Key | Additional Sense Code | Target Success | GOOD | - | - | Response | Status | Sense | Additional Sense Code |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Sense Key | Additional Sense Code |  |          |        |           |                       |                |      |   |   |          |        |       |                       |
| Target Success         | GOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | -         | -                     |  |          |        |           |                       |                |      |   |   |          |        |       |                       |
| Response               | Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Sense     | Additional Sense Code |  |          |        |           |                       |                |      |   |   |          |        |       |                       |