

| Ref. | Field (all fields must be filled in) |
|---|---|
| Vendor information | |
| | Vendor Name: |
| | Vendor Street Address: |
| | Vendor City: |
| | State: Postal Code: |
| | Vendor Country: |
| | Vendor Contact, Title: |
| | Vendor Phone Number: |
| | Vendor Email: |
| Product information | |
| | Product Name: |
| | Product Model Number: |
| | Product Revision Level: |
| | Product Test ID Number (issued by USB-IF): |
| | Product Silicon Name: |
| | Product Silicon Model Number: |
| | Product Silicon Revision Level: |
| | Product Silicon Test ID Number (issued by USB-IF): |
| PI1 | Product or Building block (select one): <input type="checkbox"/> Consumer Product <input type="checkbox"/> Building Block <input type="checkbox"/> Other |
| PI2 | Type of product (select one): <input type="checkbox"/> Embedded Host <input type="checkbox"/> OTG device <input type="checkbox"/> Peripheral-only |
| PI3 | Messaging Interface <input type="checkbox"/> Graphics screen <input type="checkbox"/> Text screen <input type="checkbox"/> Indicator lights <input type="checkbox"/> Other (please specify): |
| PI4 | Operating System and version: |
| Downstream ports | |
| PI5 | Number of downstream ports: |
| PI6 | Rated Current (mA): |
| PI7 | Is VBUS turned-on when A-plug attachment is detected? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A |
| PI8 | Is VBUS maintained while an A-plug is inserted? <input type="checkbox"/> Yes <input type="checkbox"/> No (supply parameter below) TA_WAIT_BCON max: _____ |
| PI9 | Signaling speeds supported: <input type="checkbox"/> High <input type="checkbox"/> Full <input type="checkbox"/> Low |
| PI10 | Transports supported: <input type="checkbox"/> Bulk <input type="checkbox"/> Interrupt <input type="checkbox"/> Isochronous |
| PI11 | Protocols supported: <input type="checkbox"/> SRP <input type="checkbox"/> ADP <input type="checkbox"/> HNP |
| PI12 | Power management supported: <input type="checkbox"/> Global suspend <input type="checkbox"/> Selective suspend <input type="checkbox"/> Remote wakeup <input type="checkbox"/> LPM |
| PI13 | Charging supported: <input type="checkbox"/> CDP <input type="checkbox"/> ACA |
| Upstream ports | |
| PI14 | Number of upstream ports: |
| PI15 | bMaxPower (one value per configuration): |
| PI16 | Signaling speeds supported: <input type="checkbox"/> High <input type="checkbox"/> Full <input type="checkbox"/> Low |
| PI17 | Transports supported: <input type="checkbox"/> Bulk <input type="checkbox"/> Interrupt <input type="checkbox"/> Isochronous |
| PI18 | Protocols supported: <input type="checkbox"/> SRP <input type="checkbox"/> ADP <input type="checkbox"/> HNP |
| PI19 | Power managed supported: <input type="checkbox"/> Remote wakeup <input type="checkbox"/> LPM |
| PI20 | Is USB charging supported? <input type="checkbox"/> Yes <input type="checkbox"/> No |
| PI21 | Is there an internal hub? <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Common to all ports | |
| PI22 | What is the value of TPWRUP_RDY used by this product? |
| Signature of Preparer: Date: | |

Revision History

| Revision | Issue Date | Comment |
|----------|--------------|---|
| 1.0 | July 1, 2010 | Checklist for the OTG & EH Supplement Revision 2.0 version 1.0. |
| | | |

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1 Introduction

This checklist helps designers of USB On-The-Go (OTG) devices, Embedded Hosts (EH) and Attach Detection Protocol (ADP)-capable or Session Request Protocol (SRP)-capable peripherals to assess their products' compliance with [OTG&EH2.0]. This checklist is also used, in part, to qualify such products and is required for the USB-IF Integrators List. This document and other USB compliance tools, including USBCV, are available in the developers section of the USB-IF's website, <http://www.usb.org/developers/compliance/>. The compliance checklists are updated periodically, so developers should check for updates when starting new projects.

Questions covering areas recommended by [OTG&EH2.0] are contained in some of the checklists. Answering these questions is not a requirement for compliance with the supplement or acceptance to the Integrators List. However, vendors are strongly encouraged to take these questions into consideration when designing their products.

Questions or comments regarding the Integrators List, Compliance Workshop testing results, or checklist submissions should be sent to admin@usb.org. If you have questions regarding the checklist itself, feel it fails to adequately cover an aspect of the USB specification, have found an error, or would like to propose a question, please contact the USB-IF at techadmin@usb.org.

2 General Notes

This document identifies critical design areas for compliance with the requirements specified in [OTG&EH2.0].

This checklist identifies peripheral, Targeted Host, and OTG specific criteria. An EH shall meet the requirements of either a Targeted Host or Standard USB Host. An OTG device shall meet both the requirements of a Targeted Host and a peripheral. Peripherals supporting ADP or SRP shall meet the requirements for peripheral-only B-devices. If the host controller and/or peripheral silicon of the device are already certified, then this checklist is all that is required. If the silicon is not certified, then the separate [USBPeripheralSilicon] must be filled out as well.

All voltages are referenced to the device's USB ground.

2.1 Reference Document(s)

The following referenced documents can be found on the USB-IF website www.usb.org:

| | |
|--------------------------|---|
| [OTG&EH2.0] | <i>On-The-Go and Embedded Host Supplement to the USB 2.0 Specification, Revision 2.0 plus errata and ECR</i> |
| [Micro-USB1.01] | <i>Universal Serial Bus Micro-USB Cables and Connectors Supplement to the USB 2.0 Specification, revision 1.01.</i> |
| [USB2.0] | <i>Universal Serial Bus Revision 2.0 Specification including ECNs and errata as listed in the "usb_20_040908.zip" document package.</i> |
| [USBSystemsChecklist] | <i>USB Compliance Checklist, Systems</i> |
| [USBPeripheralChecklist] | <i>USB Compliance Checklist, Peripheral (Excluding Hubs)</i> |
| [USBPeripheralSilicon] | <i>USB Compliance Checklist, Peripheral Silicon (Excluding Hub Silicon)</i> |

2.2 Checklist Summary

The tables below summarize the checklists which shall be completed based on the type of product being tested and the features which that product supports. These are based on the questions in the product information sheet found at the front of this document and apply to both Products and Building Blocks/Silicon (Question PI1).

2.2.1 Embedded Hosts

If the answer to Type of Product (Question PI2) is Embedded Host then the sections listed below shall be completed:

| Type of product and supported features | Sections to be completed |
|---|---|
| For all Embedded Hosts | 3.1 Targeted Host Main Checklist 5 EH Specific Checklist |
| Downstream port supports SRP (Question PI11) | 3.2 SRP-Capable A-device Checklist |
| Downstream port supports ADP (Question PI11) | 7 General ADP Checklist 3.3 ADP-capable A-device Checklist |
| 1 or more upstream ports (Question PI14) | 4.1 B-device Main Checklist |
| Upstream port supports SRP (Question PI18) | 4.2 SRP-Capable B-device Checklist |
| Upstream port supports ADP (Question PI18) | 7 General ADP Checklist 4.3 ADP-capable B-device Checklist |

2.2.2 OTG devices

If the answer to Type of Product (Question PI2) is OTG device then the sections listed below shall be completed:

| Type of product and supported features | Sections to be completed |
|---|---|
| For all OTG devices | 3.1 Targeted Host Main Checklist 4.1 B-device Main Checklist 6.1 OTG Device Checklist |
| ADP is supported on the Micro-AB receptacle (Questions PI11 and PI18) | 7 General ADP Checklist 3.3 ADP-capable A-device Checklist 4.3 ADP-capable B-device Checklist |
| SRP is supported when attached as an A-device (Question PI11) | 3.2 SRP-Capable A-device Checklist |
| SRP is supported when attached as a B-device (Question PI18) | 4.2 SRP-Capable B-device Checklist |
| HNP is supported when attached as a B-device (Question PI18) | 6.2 OTG B-device HNP Checklist |

2.2.3 Peripheral-only B-device

If the answer to Type of Product (Question P12) is peripheral-only B-device then the sections listed below shall be completed:

| Type of product and supported features | Sections to be completed |
|---|---|
| For all peripheral-only B-devices | 4.1 B-device Main Checklist |
| SRP is supported (Question P18) | 4.2 SRP-Capable B-device Checklist |
| ADP is supported (Question P18) | 7 General ADP Checklist 4.3 ADP-capable B-device Checklist |

3 Targeted Host Checklists

CAUTION: The checklist questions should not replace a comprehensive validation suite.

3.1 Targeted Host Main Checklist

The following questions shall be completed for an Embedded Host (Standard-A port) or OTG device.

NOTES:

- When OTG B-host role is supported (HNP is supported when attached as a B-device) and OTG devices are listed on the TPL:
 - Questions TPL1 through TPL4, MSG1 through MSG4, and MSG9 apply to both OTG A-host and OTG B-host roles
 - Section 6.2 also applies.

| <u>ID</u> | <u>Question</u> | <u>Response</u> | <u>[OTG&E H2.0] Section</u> |
|--------------------------|---|--|---------------------------------|
| General Questions | | | |
| C1 | Has a [USBSystemsChecklist] been completed? NOTE: Answers to [USBSystemsChecklist] Questions M3, P1 and P4 are not required provided the OTG & EH Checklists have also been completed: <ul style="list-style-type: none"> • M3: EH may also have B-ports. OTG device has Micro-AB receptacle as defined in [Micro-USB1.01]. • P1: 500mA not required. Replaced by TPL7. • P4: Voltage range depends on rated current. Replaced by E4. | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4 |
| C2 | <i>If the Targeted Host supports [USB2.0] mechanisms of LPM, suspend, resume or remote wakeup when peripherals and hubs (if supported) are attached, detached or moved to another port during suspend do they operate correctly on resume?</i> Note: N/A shall only be selected if the mechanisms of LPM, suspend, resume or remote wakeup are not supported. | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 3.3.4, 3.4 |
| C3 | When a peripheral is attached prior to boot up of the Targeted Host is this peripheral handled in the same manner as it is handled when attached after boot up of the Targeted Host? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4 |
| C4 | <i>If the Targeted Host supports operation on multiple ports simultaneously</i> are peripherals on these ports handled can the Targeted Host operate the peripherals concurrently and independently or is there a selection method available for the end-user to select a device? Note: this question shall apply to all Targeted Hosts which support multiple ports either as part of an EH with multiple built-in ports or via the attachment of a hub. | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 3.4 |

| ID | Question | Response | [OTG&E H2.0] Section |
|---|--|--|----------------------|
| C5 | <p><i>If the Targeted Host supports bus powered hubs is a peripheral, attached via the downstream port of a bus powered hub, reported as unsupported if it indicates bMaxPower > 1 unit load?</i></p> <p>Note: N/A shall only be selected if the Targeted Host does not support bus powered hubs.</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 3.4 |
| Submission Materials | | | |
| C6 | <p><i>If the PET test modes are not supported have equivalent manual procedures to the features described in [OTG&EH2.0] Section 6.4.2 been provided?</i></p> <p>Note: N/A shall only be selected if the PET test modes as described in [OTG&EH2.0] Section 6.4.2 have been implemented.</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 6.4.2 |
| C7 | <p>Have details of the expected functionality of the Targeted Host been provided?</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> | |
| C8 | <p>Has each peripheral listed on the TPL been submitted for testing along with the Targeted Host?</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> | |
| C9 | <p><i>When the Targeted Host supports USB suspend features (including LPM) is there a mechanism provided to force the Targeted Host into low power operation during normal function in order to prove the suspend capability of each suspend feature?</i></p> <p>Note: N/A shall be selected only if the Targeted Host does not support USB suspend features</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | |
| Targeted Peripheral List (TPL) Questions | | | |
| TPL1 | <p>Has a Targeted Peripheral List (TPL) of supported peripherals and hubs been supplied (see Section 10)?</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4.1 |
| TPL2 | <p>Does the TPL accurately represent the device classes supported by the Targeted Host?</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4.1 |
| TPL3 | <p><i>If supported peripherals are identified by their VID/PID does the TPL list all supported VID/PID combinations?</i></p> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4.1 |
| TPL4 | <p>When a supported peripheral is connected (including those not declared on the TPL) is this taken into use without displaying a failure to the end user?</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4.1 |
| TPL5 | <p>Does the Targeted Host produce an “unsupported device” or similar error message when it enumerates the attached peripheral having an unsupported Vendor and Device ID or Device Class?</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4.2 |
| TPL6 | <p><i>If hubs are supported and IA_VBUS_RATED < 500mA are specific makes and models of hub listed on the TPL?</i></p> <p>Note: “N/A” shall only be selected if hubs are not supported.</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 3.4.3 |
| TPL7 | <p>Does the Targeted Host provide sufficient power to each peripheral on its TPL in at least one supported configuration?</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4.4 |

| ID | Question | Response | [OTG&E H2.0] Section |
|-----------------------------|--|--|----------------------|
| Messaging Questions | | | |
| MSG1 | Does the Targeted Host have a means for communicating messages to the user so that they are made aware of any failures which have occurred during device operation? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.5 |
| MSG2 | Does the Targeted Host report all failures during device operation to the end user? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.5 |
| MSG3 | Are all messages self explanatory, not requiring the user to reference a manual or other additional material? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.5 |
| MSG4 | Does the Targeted Host produce a “device not connected” or “device not responding” or similar error message to a non-responsive attached device? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.5 |
| MSG5 | <i>If hubs are not supported</i> does the Targeted Host produce a “hub not supported” or similar error message when hub is attached? Note: select N/A if hubs are supported | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 3.5 |
| MSG6 | <i>If hubs are supported</i> does the Targeted Host produce a “Max hub tier exceeded” or similar error message when more than the supported number of tiers of hubs are attached? Note: select N/A if hubs are not supported | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 3.5 |
| MSG7 | <i>If hubs are supported</i> does the Targeted Host produce a “Too many peripherals attached” or similar error message when more than the supported number of peripherals are attached? Note: select N/A if hubs are not supported | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 3.5 |
| MSG8 | <i>If hubs are supported</i> does the Targeted Host produce a “Too many peripheral instances attached” or similar error message when more than the supported number of instances of a supported peripheral are attached? Note: select N/A if hubs are not supported | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 3.5 |
| MSG9 | Does the Targeted Host produce an “unsupported device” or similar error message when an attached peripheral triggers an overcurrent condition? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.2.2 |
| Electrical Questions | | | |
| E1 | Does the A-device activate both the D+ and D- pull-down resistors when it is either idle or acting as host? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.1.2 |
| E2 | Are the A-device’s pull-down resistors within the range of RPD as defined in [USB2.0]? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.1.2 |
| E3 | Is the rated output current of the A-device (IA_VBUS_RATED) within IA_VBUS_OUT? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.2.1 |
| E4 | After configuring a B-device, for any steady state load current that is less than or equal to the rated current of the A-device (IA_VBUS_RATED), is the average output voltage from an A-device within VA_VBUS_AVG_LO (IA_VBUS_RATED ≤ 100mA) or VA_VBUS_AVG_HI (100mA < IA_VBUS_RATED)? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.2.1 |

| ID | Question | Response | [OTG&E H2.0] Section |
|---|--|--|---------------------------------|
| E5 | For a step change in load current with any amplitude less than or equal to the rated current of the A-device ($I_{A_VBUS_RATED}$), and an edge rate of less than 100mA/ μ sec, is the transient output voltage within $V_{A_VBUS_TRNS_LO}$ ($I_{A_VBUS_RATED} \leq 100mA$) or $V_{A_VBUS_TRNS_HI}$ ($100mA < I_{A_VBUS_RATED}$). | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.2.1 |
| E6 | After starting to drive VBUS does the output voltage from the A-device reach a voltage of $V_{A_VBUS_AVG_LO}$ min within a time of $T_{A_VBUS_RISE}$, providing the non-inrush load current does not exceed the rated current of the A-device ($I_{A_VBUS_RATED}$)? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.2.2 |
| E7 | After starting to drive VBUS, if VBUS does not reach $V_{A_VBUS_AVG_LO}$ min within $T_{A_VBUS_RISE}$, does the A-device turn off VBUS and indicate to the user that the B-device is not supported? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.2.2 |
| E8 | If an attached B-device draws more current than $I_{A_VBUS_RATED}$ after $T_{A_VBUS_RISE}$ such that VBUS becomes invalid due to an overcurrent condition does the A-device turn off VBUS and indicate to the user that the B-device is not supported? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.2.2 |
| E9 | Does the A-device have a VBUS capacitance of C_{A_VBUS} ? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.2.3 |
| Protocol and Electrical Tester (PET) Support Questions | | | |
| T1 | Is a device with VID=0x1A0A, PID=0x0200 recognized as a PET and does the A-device configure the test device to configuration 1, within T_{TST_CONFIG} max of completing the bus reset? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.4.2.1, 6.4.2.3 |
| T2 | When connected to the PET does the A-device maintain a session for at least T_{TST_MAINT} min during which time it allows at minimum $I_{A_VBUS_RATED}$ to be drawn, by the Protocol and Electrical Tester (PET), from VBUS? Note: for an OTG A-device which does not support HNP polling this assumes that the PET has not set its HNP support bit. | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.4.2.1.1, 6.4.2.1.2, 6.4.2.3 |
| T3 | Does the A-device recognize peripherals with VID=0x1A0A, and either PID=0x0201 or PID=0x0202 as unsupported? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.4.4, 6.4.5 |
| Recommended Questions (not mandatory) | | | |
| TPL8 | Where multiple configuration descriptors are supported by a B-device does the Targeted Host parse and evaluate these to determine whether the B-device can be supported by class and in order to select a configuration with sufficiently low power consumption? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4.8 |
| MSG10 | Does the Targeted Host distinguish between standalone hubs and compound peripherals when displaying messages? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.5 |
| TPL9 | If the same B-device disconnects and reconnects does the A-device examine its descriptors to ensure that the B-device is supporting the same device class as when it was previously connected? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 7.1.4 |

3.2 SRP-Capable A-device Checklist

This checklist shall be completed by an Embedded Host or OTG device which turns off VBUS while an A-plug is inserted.

| ID | Question | Response | [OTG&E H2.0] Section |
|---|--|--|-------------------------------------|
| SRP1 | If VBUS is not being driven, does VBUS decay from VOTG_SESS_VLD max to VOTG_VBUS_LKG within TSEND_LKG? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.1.1 |
| SRP2 | When the A-device is not driving VBUS or doing ADP probing or ADP sensing, does it source less than or equal to IVBUS_LKG_SRC max to VBUS when VBUS is grounded? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.1.1 |
| SRP3 | In response to SRP is a session always started by turning on VBUS and generating a reset within TA_SRP_RSPNS max of a valid SRP? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.1.6 |
| SRP4 | After starting to drive VBUS, does the A-device continue to drive VBUS for a time of TA_WAIT_BCON? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.2.1 |
| SRP5 | Does the A-device react to SRP only after having seen both the rising and falling edges of the D+ data-line pulse? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.1.3 |
| SRP6 | On detecting D+ high (while VBUS is low), for a period longer than the maximum D+ pulse width TB_DATA_PLS max, does the A-device determine that the B device is not compliant and therefore disable SRP until such time as D+ drops again? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.1.3 |
| Protocol and Electrical Tester (PET) Support Questions | | | |
| T4 | Does the A-device end the session before TTST_MAINT max (of enumerating the test device) and is it at this point prepared to accept SRP requests? Note: for an OTG A-device which does not support HNP polling this assumes that the PET has not set its HNP support bit. | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.4.2.1.1, 6.4.2.2.1, 6.4.2.3 |
| T5 | If the otg_vbus_off feature bit gets set by the PET during enumeration then, if the PET disconnects during the TTST_MAINT min period of configured state, does the host turn off VBUS? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.4.2.1.1, 6.4.2.1.2, 6.4.2.3 |
| Recommended Questions (not mandatory) | | | |
| SRP7 | When all running applications on the A-device have completed does it end the session? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.2 |
| SRP8 | Does the A-device respond to SRP in much less than TB_SRP_FAIL min in order to improve usability? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.5 |

3.3 ADP-capable A-device Checklist

All Embedded Hosts or OTG devices which are ADP-capable shall first complete Section 7 General ADP Checklist and then complete the following checklist.

| ID | Question | Response | [OTG&E H2.0] Section |
|---|---|--|-------------------------------------|
| ADP1 | If the A-device is attached to a B-device and VBUS is not being driven does the A-device perform ADP probing? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.1 |
| ADP2 | Is the ADP probe cycle time for the A-device $T_{A_ADP_PRB}$? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP3 | <i>If an A-device has a valid ADP probe measurement taken immediately before the session, does it compare that measurement with the first measurement taken immediately after the session and if the two ramp times differ by more than C_{ADP_THR}, does it initiate a session within $T_{A_VBUS_ATT}$ of the last ADP probe?</i> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP4 | After a session has ended does the A-device issue its first ADP probe pulse within $T_{A_SSEND_PRB}$ of VBUS going below $V_{OTG_SESS_VLD}$ min? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.3 |
| ADP5 | When the A-device is first powered up, does it perform at least one ADP probe cycle in order to obtain an initial value for T_{ADP_RISE} and then turn on VBUS within $T_{A_VBUS_ATT}$ to see if a B-device is attached where the delay from power up until VBUS is turned on does not exceed T_{PWRUP_RDY} ? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.4 |
| ADP6 | When the capacitance changes by more than C_{ADP_THR} does the A-device detect this as either an attach or detach event and assert VBUS? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.4 |
| Protocol and Electrical Tester (PET) Support Questions | | | |
| T6 | If the <code>otg_vbus_off</code> feature bit gets set by the PET during enumeration then, if the PET disconnects during the T_{TST_MAINT} min period of configured state, does the host turn off VBUS and not perform any ADP probes for T_{TST_NOADP} ? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.4.2.1.1, 6.4.2.1.2, 6.4.2.3 |

4 B-device Checklists

CAUTION: The checklist questions should not replace a comprehensive validation suite.

4.1 B-device Main Checklist

This checklist shall be completed for an EH with B-ports, OTG device or peripheral-only B-device.

| <u>ID</u> | <u>Question</u> | <u>Response</u> | <u>[OTG&E H2.0] Section</u> |
|---|---|--|---------------------------------|
| General Questions | | | |
| C10 | Has a [USBPeripheralChecklist] been completed? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 1.1 |
| Device Framework Questions | | | |
| DF1 | Does the B-device return the correct OTG descriptor in response to all valid GetDescriptor(OTG) requests in <i>Default, Addressed</i> or <i>Configured</i> states? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.1 |
| DF2 | Is the correct OTG descriptor included in all configurations in response to all valid GetConfiguration requests? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.1 |
| Electrical Questions | | | |
| E10 | When VBUS is not being driven by an A-device and the B-device is not doing ADP probing or ADP sensing, does the B-device source less than or equal to $I_{VBUS_LKG_SRC}$ max to VBUS when VBUS is grounded? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.1.1 |
| E11 | When connected and unconfigured does the B-device draw an average current of less than I_{B_UNCFG} max current from VBUS (Current is averaged over a time of T_{AVG_VBUS})? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.3.1 |
| E12 | Can the B-device operate at a voltage of V_{B_VBUS} ? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.3.2 |
| E13 | Assuming an A-device as described in [OTG&EH2.0] 4.3.3 does the voltage on VBUS remain greater than or equal to either $V_{A_VBUS_TRNS_LO}$ min or $V_{A_VBUS_TRNS_HI}$ min taking into consideration transient currents generated by the B-device? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.3.3 |
| E14 | Does the B-device have a VBUS capacitance of C_{RPB} ([USB2.0] Table 7-7) with a value, including nominal tolerance of greater than or equal to C_{RPB} min? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.3.4 |
| Protocol and Electrical Tester (PET) Support Questions | | | |
| T7 | <i>If this B-device is not capable of SRP</i> , does it STALL a SetFeature (otg_srp_reqd) request? Note: N/A shall only be selected if this B-device is not capable of SRP | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 6.4.3.1.1 |
| T8 | <i>If this device is not capable of HNP when acting as a B-device</i> , does it STALL a SetFeature (otg_hnp_reqd) request? Note: N/A shall only be selected if this device is not capable of HNP when acting as a B-device | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 6.4.3.1.2 |

| <u>ID</u> | <u>Question</u> | <u>Response</u> | [OTG&E H2.0] Section |
|--|---|--|----------------------|
| Recommended Questions (not mandatory) | | | |
| TPL10 | Does the B-device offer at least one configuration requiring less than or equal to the minimum rated output current of an A-device or less in order to maximize interoperability with battery powered Targeted Hosts? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4.8 |

4.2 SRP-Capable B-device Checklist

This checklist shall be completed for an SRP-capable B-device which includes an EH with B-ports, OTG device or peripheral-only B-device. Note: that ADP-capable products are also required to be SRP-capable.

| <u>ID</u> | <u>Question</u> | <u>Response</u> | [OTG&E H2.0] Section |
|-----------------------------------|--|--|----------------------|
| Device Framework Questions | | | |
| DF3 | Does the B-device respond to a GetDescriptor(OTG) request with the correct OTG descriptor having <i>bcdOTG</i> set to the correct specification version and which has the SRP <i>bmAttribute</i> bit set to TRUE? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.1.1 |
| B-device SRP Questions | | | |
| SRP9 | If VBUS is not being driven, does VBUS decay from VOTG_SESS_VLD max to VOTG_VBUS_LKG within TSEND_LKG? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.1.1 |
| SRP10 | Is SRP only initiated TB_SSEND_SRP after VBUS has gone below VOTG_SESS_VLD, and both the D+ and D- data lines have been low (SE0) for at least TB_SE0_SRP min? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.1.3 |
| SRP11 | Is SRP initiated by turning on the D+ pull-up resistor for a period within the range specified by TB_DATA_PLS? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.1.3 |
| SRP12 | When the voltage on VBUS is greater than the Session Valid threshold (VOTG_SESS_VLD), does the B-device assert either the D+ or D- data-line within the period bounded by TB_SVLD_BCON max? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.1.5 |
| SRP13 | Is an indication made to the user that SRP has failed if a session has not been started within TB_SRP_FAIL of initiating SRP? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.1.6 |
| State Transition Questions | | | |
| ST1 | <i>If this is a peripheral-only B-device</i> does the B-device comply with the state behavior for an SRP-capable B-device as specified in [OTG&EH2.0]? Note: N/A shall only be selected if this is an OTG device. | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 7.3 |

| <u>ID</u> | <u>Question</u> | <u>Response</u> | [OTG&E H2.0] Section |
|---|--|--|---------------------------------|
| Protocol and Electrical Tester (PET) Support Questions | | | |
| T9 | When the otg_srp_reqd flag is set by the PET (acting as an A-device and using SetFeature) does it cause an SRP to be generated by the B-device, within TTST_SRP after the A-device (the PET) turns off VBUS? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.4.3.1.1 |
| Recommended Questions (not mandatory) | | | |
| SRP14 | Is SRP only issued once per event (typically user interaction or ADP change) with SRP failures not leading to the re-initiation of SRP? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.1.7 |

4.3 ADP-capable B-device Checklist

Any OTG device, EH with B-ports or peripheral-only B-device which is ADP-capable shall first complete Section 7 General ADP Checklist and then complete the following checklist..

| <u>ID</u> | <u>Question</u> | <u>Response</u> | [OTG&E H2.0] Section |
|-----------------------------------|--|--|---------------------------------|
| Device Framework Questions | | | |
| DF4 | Does the B-device respond to a GetDescriptor(OTG) request with the correct OTG descriptor, having bcdOTG set to the correct specification version and which has both the SRP and ADP bmAttribute bits set to TRUE? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.1.3 |
| B-device ADP Questions | | | |
| ADP7 | Does this device support both ADP probing and ADP Sensing? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4.6 |
| ADP8 | Is the ADP probe cycle time for the B-device TB_ADP_PRB? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP9 | If a B-device starts doing ADP probing after a session (or session request) and it has a valid ADP probe measurement from immediately prior to the session (or session request), does it perform SRP, within TB_ADP_PRB_SRP of the last ADP probe, if the two ramp times differ by more than CADP_THR? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP10 | If any two ramp times, "n" and "n-2", differ by more than CADP_THR, does the B-device perform SRP within TB_ADP_PRB_SRP of the last ADP probe? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP11 | If a B-device starts doing ADP probing after a session or session, request) and it does not have a valid ADP probe measurement from immediately prior to the session (or session request), then does it perform SRP within TB_ADP_PRB_SRP of the first ADP probe, wait for TB_SRP_FAIL, then start probing again, having now acquired a pre-session measurement? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |

| ID | Question | Response | [OTG&E H2.0] Section |
|-----------|---|--|---------------------------------|
| ADP12 | After a session has ended, does the B-device do ADP sensing until it detects that the remote device is not doing ADP probing (after TB_ADP_DETACH of the session end or of the last sense comparator toggle) and then issue an ADP probe within TB_SNSEND_PRB of detecting the A-device is not probing, and continue probing? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.3 |
| ADP13 | When the B-device is first powered up, does it perform at least one ADP probe cycle in order to obtain an initial value for TADP_RISE and then perform SRP to see if an A-device is attached where the delay from power up until the SRP is less than TPWRUP_RDY? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.4 |
| ADP14 | When the capacitance changes by more than CADP_THR does the B-device detect this as either an attach or detach event and generate SRP? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.4 |
| ADP15 | After the B-device has performed SRP if an A-device does not assert VBUS within TB_SRP_FAIL does the B-device commence ADP probing within a further TB_ADP_PRB max? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.4 |
| ADP16 | If a B-device starts doing ADP probing after a session, and it already measured the ramp time before the session, does it do SRP if the two ramp times differ by more than CADP_THR? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP17 | If a B-device starts doing ADP probing after a session and it has not measured the ramp time before the session, does it do SRP immediately after the first ADP probe pulse? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |

5 EH Specific Checklist

CAUTION: The checklist questions should not replace a comprehensive validation suite.

These checklists shall be completed for an Embedded Host

| ID | Question | Response | [OTG&E H2.0] Section |
|-----------------------------------|--|--|----------------------|
| Submission Materials | | | |
| C11 | <p><i>If the Targeted Host is an EH with multiple ports</i> have two identical TPL peripherals been submitted for testing along with the EH?</p> <p>Note: N/A shall be selected only if this is not an EH with multiple ports.</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | |
| Mechanical Questions | | | |
| M1 | Does the EH have one or more Standard-A receptacles? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.1.3 |
| M2 | <p><i>For an EH with both Standard-A and Type-B receptacles</i> are these receptacles implemented such that the user is unlikely confuse the EH with a USB hub?</p> <p>NOTE: "N/A" shall be selected if there are no USB ports other than Standard-A ports on the EH.</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 3.1.3 |
| Electrical Questions | | | |
| E15 | <p>Does the EH support operation at one of the following combinations of speeds based on its TPL?</p> <ul style="list-style-type: none"> • High-speed, full-speed and low-speed • High-speed and full-speed • Full-speed only • Full-speed and low-speed • Low-speed only | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4.9 |
| E16 | <p><i>If this product is an EH which has multiple Standard-A ports</i> is this EH designed such that attaching a peripheral to one port does not cause VBUS to go outside the range of either VA_VBUS_TRNS_LO or VA_VBUS_TRNS_HI on an adjacent port?</p> <p>NOTE: "N/A" shall be selected if there is only one USB Standard-A port on the EH.</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 4.2.3 |
| E17 | <p><i>If this product is an EH which has multiple Standard-A ports</i> is this EH designed such that the ports operate independently and concurrently?</p> <p>NOTE: "N/A" shall be selected if there is only one USB Standard-A port on the EH.</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 1.1 |
| State Transition Questions | | | |
| ST2 | Does the EH comply with the state behavior for an Embedded Host as specified in [OTG&EH2.0]? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 7.1 |

6 OTG Device Specific Checklists

6.1 OTG Device Checklist

The following checklist shall be completed by all OTG Devices.

| ID | Question | Response | [OTG&E H2.0] Section |
|-----------------------------|--|--|----------------------|
| Submission Materials | | | |
| C12 | <p><i>When the Targeted Host is an OTG device which supports hubs have two identical TPL devices as well as the hub or hubs listed on the TPL been submitted for testing?</i></p> <p>Note: N/A shall only be selected if the OTG does not support hubs.</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | |
| C13 | <p><i>When the Targeted Host is an OTG device which lists itself on the TPL have two identical versions of the OTG device been submitted for testing?</i></p> <p>Note: N/A shall only be selected if the OTG device does not list itself on the TPL.</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | |
| Mechanical Questions | | | |
| M3 | Does the OTG device have one, and only one USB connector: a Micro-AB receptacle? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.1.1 |
| M4 | Does the OTG device default to host role when a Micro-A plug is inserted in the Micro-AB receptacle? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.1.1 |
| M5 | Does the OTG device default to peripheral role when a Micro-B plug is inserted in the Micro-AB receptacle? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.1.1 |
| M6 | When a Micro-A plug is inserted has HNP been implemented in order to enable a third party device to use this OTG device in peripheral role? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4.1 |
| M7 | Has HNP only been implemented through the Micro-AB connector and through no other connector? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.3.2 |
| Electrical Questions | | | |
| E18 | Does the OTG device support full speed operation as both host and peripheral? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4.9 |
| E19 | <p>For a non-ADP capable OTG A-device, when the application is ready to act in host or peripheral roles does VBUS reach VOTG_SESS_VLD max within TA_VBUS_ATT of the ID pin becoming FALSE (assuming no over-current condition is reached)?</p> <p>NOTE: OTG A-devices which maintain VBUS when a Micro-A plug is not attached shall answer "N/A" to this question.</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 4.2.4 |
| Messaging Questions | | | |
| MSG11 | Does the OTG B-device produce a "device not responding" or similar error message when it is unable to start a session with the host using SRP? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.3.1 |

| | | | |
|---|--|--|---------|
| MSG12 | When two OTG devices are attached are messages displayed on the device the user is currently using? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.5 |
| Protocol and Electrical Tester (PET) Support Questions | | | |
| T10 | Does the OTG A-Host recognize a peripheral with VID=0x1A0A, PID=0x0201 as an unsupported peripheral which does not support HNP? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.4.4 |
| T11 | Does the OTG A-Host recognize a peripheral with VID=0x1A0A, PID=0x0202 as an unsupported peripheral which supports HNP? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.4.5 |
| Targeted Peripheral List Questions | | | |
| TPL11 | <i>If an OTG-device does not support HNP as a B-device</i> , in the case when the OTG device is an A-device are OTG devices unsupported in order to maintain symmetry? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4.2 |
| Device Framework Questions | | | |
| DF5 | Whenever there is an active session, where the bus is not suspended and the connected OTG B-peripheral is capable of HNP in the B-device role (HNP support bit = TRUE), does the OTG A-Host execute a GetStatus() with a frequency of THOST_REQ_POLL in order to determine the state of the Host request flag as defined in the OTG status information? Note: N/A shall only be selected in the case where the A-device enables HNP, by setting b_hnp_enable within THOST_REQ_POLL max and suspends within a further THOST_REQ_SUSP max from the time that the OTG A-host reads the OTG descriptor. | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 6.3.2 |
| DF6 | <i>If the OTG A-device does not enable HNP by setting b_hnp_enable</i> prior to suspend does it resume with a frequency of THOST_REQ_POLL, poll the status of the Host Request flag, and return to suspend? Note: N/A shall only be selected if the OTG A-device always sets b_hnp_enable prior to suspend. | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 6.3.2 |
| DF7 | When the A-device is acting as peripheral during an active session between two OTG devices is bit D0 of the OTG status information reset to zero when the peripheral doesn't wish to become host? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.2.3.1 |
| DF8 | When the A-device is acting as peripheral during an active session between two OTG devices is bit D0 of the OTG status information set to one when the peripheral wishes to become host? Note: N/A shall only be selected if the A-device never takes the host role in a connection between two OTG devices. | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 6.2.3.1 |
| DF9 | If the OTG A-host determines that the Host request flag is set to one does the OTG A-host allow the OTG B-peripheral to take the host role, by enabling HNP (setting b_hnp_enable) and then suspending the bus, within THOST_REQ_SUSP? Note: N/A shall only be selected in the case where the A-device enables HNP, by setting b_hnp_enable within THOST_REQ_POLL max and suspends within a further THOST_REQ_SUSP max from the time that the OTG A-host reads the OTG descriptor. | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 6.3.2 |
| DF10 | Does the A-device send the SetFeature(b_hnp_enable) command only to a directly connected B-device (no intervening hubs)? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.2.2.1 |

| | | | |
|-----------------------------------|--|--|---------|
| DF11 | <i>When the A-device detects a legacy HNP capable (OTG Supplement v1.3 or earlier) OTG B-device, is a SetFeature(a_hnp_support) command only sent between the start of a session and the selecting of an OTG B-device configuration?</i> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.2.2.2 |
| DF12 | If the OTG A-device determines from the OTG descriptor that the connected OTG B-device does not support HNP (HNP support bit = FALSE) then does it refrain from polling the Host Request flag? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.3.2 |
| DF13 | <i>If the OTG A-host detects an unsupported HNP capable OTG B-peripheral (HNP support bit = TRUE) does the OTG A-host either:</i> <ul style="list-style-type: none"> • <i>maintain the session and continue HNP polling or,</i> • <i>enable HNP by setting b_hnp_enable and suspend the bus for at least TA_BIDL_ADIS min before ending the session?</i> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.3.2 |
| DF14 | When connected to a legacy HNP capable OTG B-peripheral, which will not support HNP polling, does the OTG A-host give the OTG B-peripheral the opportunity to take the host role before ending the session by setting b_hnp_enable and suspending the bus for at least TA_BIDL_ADIS min? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.3.2 |
| OTG A-device HNP Questions | | | |
| HNP1 | When waiting for a B-device connect, is the connect debounced for TA_BCON_LDB at the start of a session or after waiting for more than TA_BCON_SDB_WIN, and debounced for at least TA_BCON_SDB at all other times? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.2.3 |
| HNP2 | When waiting for a B-device connect and using a debounce of TA_BCON_SDB is the debounce interval started after TLDIS_DSCHG? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.2.1 |
| HNP3 | When the A-device was successful in setting b_hnp_enable during the current session and a disconnect was detected during suspend, is its D+ pull-up resistor turned on within TA_BDIS_ACON of detecting the disconnect? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.2.1 |
| HNP4 | After detecting TA_BIDL_ADIS min of continuous idle whilst acting as a peripheral, does the A-device disconnect within TA_BIDL_ADIS max - TA_BIDL_ADIS min? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.2.1 |
| HNP5 | <i>For a HS capable OTG A-device while acting as a peripheral, if a bus reset is detected is the high-speed detection handshake started?</i> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 7.1.6 |
| HNP6 | <i>For a HS capable OTG A-device, if a lack of bus activity is detected and the bus is operating in HS mode, does it revert to FS suspend mode?</i> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.2.1 |
| HNP7 | Does the A-device, always either issue a reset within TA_BCON_ARST of a B device connect or end the session if it has no further actions? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.2.1 |
| HNP8 | Once the OTG A-device has initiated HNP does it always complete the HNP process? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.2.5.1 |
| HNP9 | Does the A-device always enumerate successfully as a peripheral following an HNP transition? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.2 |
| HNP10 | Once the A-device has initiated HNP (by enabling HNP and going to suspend) and detects SE0 (indicating that the B-device is requesting to become host) does it complete the HNP process and not reset or resume the bus at this point in order to remain as host? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.2.5.1 |

| Protocol and Electrical Tester (PET) Support Questions | | | |
|---|---|--|-------------------------|
| T12 | <p><i>If this is an OTG A-device which performs HNP polling, after the OTG A-device has enumerated the PET does the OTG A-device maintain a session for at least TTST_MAINT min during which time it does not suspend the test device, allows at minimum IA_VBUS_RATED to be drawn, by the Protocol and Electrical Tester (PET), from VBUS and performs HNP polling?</i></p> <p>Note: N/A shall only be selected in the case where the OTG A-device does not poll the HNP status flag using GetStatus() but instead enables HNP and suspends the bus.</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 6.4.2.1.1 |
| T13 | <p><i>If this is an OTG A-device which does not perform HNP polling, if the PET has set its OTG descriptor HNP support bit, does the OTG A-device under test set b_hnp_enable, and suspend the PET within THOST_REQ_POLL max (2 sec) plus THOST_REQ_SUSP max (2 sec), and allow the B-device (the PET) to become host, in accordance with the HNP specification timings?</i></p> <p>Note: N/A shall only be selected in the case where the OTG A-device does poll the HNP status flag using GetStatus().</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 6.4.2.1.2 |
| T14 | <p><i>If this is an OTG A-device which performs HNP polling and if, within the period of TTST_MAINT HNP polling finds that Host request flag is set, does the OTG A-device allow the B-device (the PET) to become host, in accordance with the HNP specification timings?</i></p> <p>Note: N/A shall only be selected in the case where the OTG A-device does not poll the HNP status flag using GetStatus() but instead enables HNP and suspends the bus.</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 6.4.2.1.1 |
| T15 | <p>After the B-device (the PET) stops acting as a host, does the OTG A-device become host again, rather than exercising its option of ending the session and maintain the session until the B-device detaches?</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.4.2.1.1, 6.4.2.1.2 |
| State Transition Questions | | | |
| ST3 | <p>Does the OTG A-device comply with the state behavior for an OTG A-device as specified in [OTG&EH2.0]?</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 7.1 |
| ST4 | <p>Does the OTG B-device comply with the state behavior for an OTG B-device as specified in [OTG&EH2.0]?</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 7.2 |
| Recommended Questions (not mandatory) | | | |
| HNP11 | <p>Does the A-device respond to B-device connection with a reset <u>in far less time</u> than TA_BCON_ARST?</p> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.5 |

6.2 OTG B-device HNP Checklist

The following checklist shall be completed by OTG devices which support HNP while a B-plug is attached.

| <u>ID</u> | <u>Question</u> | <u>Response</u> | <u>[OTG&E H2.0] Section</u> |
|-----------------------------------|--|--|---------------------------------|
| TPL Questions | | | |
| TPL12 | Does the TPL contain any OTG devices? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.4.7 |
| TPL13 | <i>When this OTG device is attached to the OTG device on the TPL, do the OTG devices demonstrate the same behavior to the end user regardless of whether they are attached as the A-device or the B-device?</i> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 3.2 |
| Device Framework Questions | | | |
| DF15 | Does the B-device respond to a GetDescriptor(OTG) request with the correct OTG descriptor, having <i>bcdOTG</i> set to the correct specification version and which has both the SRP and HNP <i>bmAttribute</i> bits set to TRUE? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.1.1 |
| DF16 | Whenever there is an active session, where the bus is not suspended and the connected OTG A-peripheral is supported does the OTG B-Host execute a GetStatus() with a frequency of <i>THOST_REQ_POLL</i> in order to determine the state of the Host request flag as defined in the OTG status information? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.3.3 |
| DF17 | When the B-device is acting as peripheral is it able to accept the GetStatus command in the Default, Addressed and Configured states? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.2.3 |
| DF18 | When the OTG B-peripheral wishes to become host during an active session, does it signal its intention by setting the Host Request flag to one in response to the GetStatus() request from the OTG A-device and set it to zero at other times? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.2.3.1, 6.3.3 |
| DF19 | <i>If the OTG B-peripheral is not capable of HNP (HNP Support bit = FALSE) does it STALL the GetStatus() request from the OTG A-device?</i> Note: N/A shall be selected if the OTG B-peripheral is capable of HNP. | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | 6.3.3 |
| DF20 | If the OTG B-host determines that the Host request flag is set to one does the OTG B-host allow the OTG A-peripheral to take the host role, by suspending the bus, within <i>THOST_REQ_SUSP</i> ? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.3.3 |
| DF21 | Does the B-device accept SetFeature(<i>b_hnp_enable</i>) in the Default, Address and Configured states? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.2.2 |
| DF22 | Does the B-device accept SetFeature(<i>b_hnp_enable</i>) when it has already been set? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.2.2 |
| DF23 | Is the <i>b_hnp_enable</i> feature cleared on a bus reset and at the end of a session but not with a ClearFeature() command? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.2.2.1 |

| ID | Question | Response | [OTG&E H2.0] Section |
|---|--|--|----------------------|
| OTG B-device Electrical Questions | | | |
| E20 | Does the OTG B-device activate both the D+ and D- pull-down resistors when it is either idle or acting as host? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.1.2 |
| E21 | Are the OTG B-device's pull-down resistors within the range of RPD as defined in [USB2.0]? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.1.2 |
| OTG B-device HNP Questions | | | |
| HNP12 | When the B-device is operating as a peripheral, is HNP only started (by turning off the pull-up on D+) if the bus has been idle for more than TB_AIDL_BDIS min? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.2.1 |
| HNP13 | <i>For an HS capable OTG B-device, operating as a HS peripheral, when no bus activity is detected for TB_AIDL_BDIS, is FS mode entered, the D+ pull-up resistor turned on, and the D+ line checked to be high for at least TB_FS_BDIS min before starting HNP?</i> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.2.4 |
| HNP14 | <i>For an HS capable OTG B-device, after operating as a HS peripheral and entering FS mode so that HNP can be started, if the D+ line is not high within TWTRSTHS of turning on the D+ pull-up is a HS chirp started?</i> | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.2.4 |
| HNP15 | If the B-device, having initiated HNP, sees TB_ASE0_BRST min of SE0, does the B-device inform the user, return to being a peripheral and start to process the reset? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.3.1 |
| HNP16 | If the B-device, having initiated HNP, sees the D+ line is high after TLDIS_DSCHG min for at least TB_ACON_DBNC min after the B-device turns off its D+ pull-up, does the B-device become the host? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.2.1 |
| HNP17 | When the OTG B-device has successfully become host is a bus reset asserted within TB_ACON_BSE0 max of detecting the A-device connect? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.2.1 |
| Protocol and Electrical Tester (PET) Support Questions | | | |
| T16 | During testing, if the PET enumerates the OTG B-device and sets the otg_hnp_reqd feature bit does the B-device perform HNP and assume the host role? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.4.2.2 |
| T17 | When the OTG B-device, is acting as a host to the PET does it enumerate the test device within TTST_CONFIG max of the bus reset, Set_Configuration (0), suspend within TTST_SUSP of the Set_Configuration (0), and then hand back the host role to the A-device (the PET), in accordance with the HNP specification timings? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.4.2.2 |
| Recommended Questions (not mandatory) | | | |
| TPL14 | When the OTG B-device is first attached to an OTG A-device, both with full support for HNP, does the OTG B-device take the host role in order to discover the capabilities of the OTG A-device as a peripheral? Note: N/A shall only be selected if the OTG device is not capable of HNP when attached as a B-device. | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> | A.2.1 |

| ID | Question | Response | [OTG&E H2.0] Section |
|-----------|---|--|---|
| DF24 | Does the OTG device acting as peripheral warn users of the possible consequences before using HNP polling to force a role swap in situations where a badly timed role swap may cause data loss or corruption? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 6.3 |

7 General ADP Checklist

The following questions shall be completed for all products with ADP-Capability.

| ID | Question | Response | [OTG&E H2.0] Section |
|-----------|---|--|---------------------------------|
| ADP18 | Does the device have a VBUS resistance to ground of ROTG_VBUS when VBUS < VADP_PRB max? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.1.1, 5.4.2 |
| ADP19 | Does the device have a VBUS capacitance of CADP_VBUS? Note: This capacitance may be CA_VBUS provided the answer to ADP21 is "Yes". | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP20 | Does the device have a noise level of VADP_NOISE? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP21 | Does the device use either the specification probing implementation or another probing implementation with a probe ramp that crosses VADP_SNS? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 4.3.4 |
| ADP22 | When performing ADP probing does the device first discharge the VBUS line below VADP_DSCHG by turning on the current sink (IADP_SINK) for a fixed time (TADP_DSCHG) long enough to ensure that VBUS goes below VADP_DSCHG for all valid combinations of remote resistance, capacitance, initial voltage (up to VOTG_SESS_VLD max), and leakage current? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP23 | After the VBUS voltage is below VADP_DSCHG is the current sink turned off, and the current source (IADP_SRC) turned on such that the VBUS voltage reaches VADP_PRB? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP24 | When the VBUS voltage reaches VADP_PRB is the current source turned off? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP25 | Is the probe cycle timing for successive probe measurements on a given device within TADP_PRB_JTR? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP26 | When the device begins probing after a session does it compare the first measurement taken after the session to the last measurement taken immediately before the session and if the capacitance has changed by more than CADP_THR, does the device detect that as an ADP change event? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP27 | When doing ADP probing, does the device ignore any changes in capacitance that are less than CADP_THR min? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP28 | For a series of "n" probes, when the capacitance changes by more than CADP_THR between probes "n" and "n-2" does the device detect this as an ADP change event? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |
| ADP29 | When the A-device is ready to act in host or peripheral role does VBUS reach VOTG_SESS_VLD within TA_VBUS_ATT of an attachment event being detected by ADP unless an over-current condition is reached? | Yes <input type="checkbox"/> No <input type="checkbox"/> | 5.4.2 |

8 General Questions

The following questions shall be completed for all products.

| ID | Question | Response | [OTG&E H2.0] Section |
|-----------|---|--|---|
| T18 | Is the device ready to perform USB activity at a time no longer than TPWRUP_RDY from an identifiable powering on action or sequence of actions (e.g. switching on)? | Yes <input type="checkbox"/> No <input type="checkbox"/> | A.3.5 |

10 TPL Forms

10.1 Targeted Peripheral List Form

| Field | Enter the following information for each supported peripheral (all fields must be filled in) | | |
|--|--|---|--|
| Targeted Peripheral | | | |
| Vendor Name: | | | |
| Product Name: | | | |
| Product Model Number: | | | |
| Product Revision Level: | | | |
| Vendor ID | | | |
| Product ID | | | |
| Type of product (select one): | <input type="checkbox"/> OTG device | <input type="checkbox"/> Peripheral-only B-device | |
| Category (tick all which apply): | <input type="checkbox"/> Storage | <input type="checkbox"/> Human Interface | <input type="checkbox"/> Multimedia <input type="checkbox"/> Video |
| | <input type="checkbox"/> Audio | <input type="checkbox"/> Charging | <input type="checkbox"/> Other |
| Supported peripherals identified by: | <input type="checkbox"/> VID + PID | <input type="checkbox"/> Device class | |
| Supported function(s) (e.g. headset, Keyboard, mouse, SCSI drive etc.): | | | |
| Max. operating current for all supported configurations (mA): | | | |
| Signaling speeds | <input type="checkbox"/> High | <input type="checkbox"/> Full | <input type="checkbox"/> Low |
| Transports | <input type="checkbox"/> Bulk | <input type="checkbox"/> Interrupt | <input type="checkbox"/> Isochronous |
| Protocols | <input type="checkbox"/> SRP | <input type="checkbox"/> ADP | <input type="checkbox"/> HNP |
| Remote wakeup | <input type="checkbox"/> Yes | <input type="checkbox"/> No | |
| Charging via USB | <input type="checkbox"/> Yes | <input type="checkbox"/> No | |
| No. of instances supported through a hub: | | | |

10.2 Targeted Peripheral List Form For Hubs

| field | Enter the following information for the DUT and for each supported Hub where relevant (all fields must be filled in) | |
|--|--|---|
| Hub class support? | <input type="checkbox"/> Yes (rated current at least 500mA) | <input type="checkbox"/> No (list makes and models of supported hubs below) |
| Max. tier of hubs supported: | | |
| Max. no. of hubs supported: | | |
| Max. no. of ports supported: | | |
| Max no. of concurrently supported peripherals: | | |
| Targeted Hub | | |
| Vendor Name: | | |
| Product Name: | | |
| Product Model Number: | | |
| Product Revision Level: | | |
| Vendor ID | | |
| Product ID | | |
| Number of upstream ports: | | |
| Operating Current (mA): | | |
| Signaling speeds supported | <input type="checkbox"/> High | <input type="checkbox"/> Full |
| Targeted Hub | | |
| Vendor Name: | | |
| Product Name: | | |
| Product Model Number: | | |
| Product Revision Level: | | |
| Vendor ID | | |
| Product ID | | |
| Number of upstream ports: | | |
| Operating Current (mA): | | |
| Signaling speeds supported | <input type="checkbox"/> High | <input type="checkbox"/> Full |