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# USB Compliance Checklist Systems

For the 2.0 USB Specification  
Checklist Version 1.07  
January 17, 2012

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## *USB Device Product Information*

<b>field</b>	<b>—all fields must be filled in—</b>
Date	
Vendor Name	
Vendor Street Address	
Vendor City, State, Postal Code	
Vendor Country	
Vendor Phone Number	
Vendor Contact, Title	
Vendor Email Address	
Product Name	
Product Model Number	
Product Revision Level	
Test ID Number	
Manufacture, Model, & TID of Receptacles used	
Manufacture & Model Identifier of the host controller used with this system	
Signature of Preparer	

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## Revision History

<u>version</u>	<u>changes</u>	<u>date</u>
1.05	Changes for 2.0	2001.10.5
1.04	added test ID field	1999.8.16
1.03	added E1, test description pointers, typo fixes	1999.4.9
1.02	revised introduction, fixed $\mu$ , $\Omega$ , typos	1999.2.5
1.01	added preparer's signature and changed checklist contact info	1999.1.4
1.00	initial release: numerous clarifications/bug fixes, added contact info	1998.11.20
.75	first public review draft, released for Taipei USB Plugfest	1998.10.26

## 1 Introduction

This checklist helps designers of desktop PCs, laptops, or other computers with USB ports to assess their products' compliance with the Universal Serial Bus Specification, Revision 2.0. Unless explicitly stated otherwise, all references to the USB Specification refer to Revision 2.0.

This checklist is also used, in part, to qualify a USB system for the USB-IF Integrators List. This document and other USB compliance tools, including USB Check, are available in the developers section of the USB-IF's web site, <http://www.usb.org/developers/>. The compliance checklists are updated periodically, so developers should check for updates when starting new projects.

Section 4, Recommended Questions, contains questions covering areas not required by the USB Specification. Answering these questions is not a requirement for compliance with the Specification 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](mailto: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 [checklists@usb.org](mailto:checklists@usb.org).

## 1.1 General Notes

- All voltages are referenced to the system's USB ground.

## 2 Mechanical Design and Layout

ID	question
M1	What is the manufacture and model identifier of the connectors or cable assemblies used with this system?  Manufacturer: _____  Model: _____ If the connectors or cable assemblies used with this system are <b>NOT</b> listed on the USB Integrators List attach Connector and Cable Assembly checklists covering this system's connectors or cable assemblies.
M2	What is the manufacture and model identifier of the host controllers used with this system?  Manufacturers: _____  Models: _____  Types (OHCI, UCHI) and Number of Ports: _____

System vendors are strongly encouraged to review the Connector and Cable Assembly checklist regardless of whether or not their system's connectors appear on the Integrators List.

ID	question	response	sections
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			<u>in spec</u>
M3	Do all user accessible USB ports use a series A receptacle?	yes no	6.2
M4	Can the system's USB data lines withstand voltages between -1.0 and 4.6V applied with a source impedance of $39\Omega \pm 2\%$ for up to 100ns?	yes no	7.1.1
M5	When tri-stated, can any data line be continuously shorted to $V_{BUS}$ , GND, another data line, or a connector's shield without damage occurring?	yes no	7.1.1
M6	When driving 50% of the time, can any data line be shorted to $V_{BUS}$ , GND, another data line, or a connector's shield without damage occurring?	yes no	7.1.1
M7	Do all D+ and D- traces present a characteristic impedance of $45\Omega \pm 15\%$ to GND and a differential impedance of $90\Omega \pm 15\%$ , between the system's series A receptacles and termination resistors?	yes no	7.1.6
M8	If edge rate control capacitors are used: Are they located between the transceiver pins and the system's termination resistors? Is their capacitance less than 75pF and balanced within 10%?	yes no yes no	7.1.6
M9	Are the receivers and transmitters for any USB port within 3ns of the receptacle for that port?	yes no	7.1.16
M10	Are you using the USB pins on any of the USB connectors on your device for any other purposes except for USB?	yes no	

### 3 Electrical Requirements

E1	Are the system's differential <i>and</i> single-ended USB signals within spec? Note: This test is especially important if ferrite beads or a common mode choke is used on the USB data lines, as these components often pose a significant signal integrity hazard.	yes no	7.1.6
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For details on testing USB signals, consult the USB-IF's signal quality test description, which can be downloaded from the USB-IF Compliance Program webpage.

#### 3.1 Power Delivery

P1	Can the system supply 0 to 500mA on each of its downstream ports, regardless of whether or not the system or USB is suspended?	yes no	7.2.1 7.2.3
P2	Does the system implement overcurrent protection to prevent more than 5A from being drawn from any downstream port?	yes no	7.2.1.2.1
P3	Is the system's overcurrent protection resettable without user mechanical intervention?	yes no	7.2.1.2.1
P4	Can the system maintain $V_{BUS}$ between 4.75 at 5.25V at all of its downstream connectors for DC loads between 0 and 500mA per downstream port?	yes no	7.2.2
P5	Does the system have at a total of at least 120 $\mu$ F of low ESR bypass capacitance at its ports?	yes no	7.2.4.1

P6	Does the system's port bypassing limit the maximum voltage droop at any of its downstream ports to 330mV, even when subjected to hot-plug inrush currents with peaks of 7.5A or more? (As of this writing, the highest inrush current the USB-IF has observed from a within spec configuration is 7.40A.)	yes	no	7.2.4.1
P7	Are overcurrent events reported to the host controller?	yes	no	10.2

For details on testing USB power provision, consult the USB-IF's drop and droop test description, which can be downloaded from the USB-IF Compliance Program webpage.

## 4 Recommended Questions

R1	If the system uses internal cabling are the cables keyed to prevent incorrect attachments, particularly those which would reverse $V_{BUS}$ and GND?	yes	no	
R2	Are all host controllers in the system fully compliant with either the OHCI or UHCI specifications?	yes	no	
R3	Does the system meet FCC/B or equivalent <i>radiated</i> emissions standards when full-speed devices are connected to each of the host ports and there is full-speed USB traffic?	yes	no	
R4	Does the system meet FCC/B or equivalent for <i>conducted</i> emissions when full-speed devices are connected to each of the host ports and there is full-speed USB traffic?	yes	no	
R5	Does the system meet FCC/B or equivalent radiated emissions standards when low-speed devices with unshielded cables are connected to each of the host's downstream ports and there is low-speed traffic on the bus?	yes	no	
R6	Does the system meet the RF and ESD susceptibility standards stipulated in IEC 802-xx. (Note: at present these standards are only required in the European Economic Community.)	yes	no	
R7	Does the system's overcurrent protection prevent a brownout or a blackout from occurring, even if a dead short is placed across a USB port?	yes	no	

## 5 Explanations

This section should be used to explain any “no” answers or clarify answers on checklist items above. Please key entries to the appropriate checklist question.

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