





USB for Portable Devices



USB for Desktops

- USB was first introduced as a solution to desktop interconnectivity
- At the time, desktops had a number of different wired interfaces
 - Printer, mouse, keyboard, serial, parallel, PS2
- USB was very successful in replacing these wired interface ports, and has now become the de facto industry standard
- The success of USB in the desktop space has caused a number of portable devices to also adopt USB

USB for Portable Devices

- Virtually every portable device now uses USB for PC connectivity
- USB-IF is now expanding the functionality of USB in a portable device to include features like:
 - Charging
 - Host
 - Headset
 - Video
- The USB-IF is committed to addressing new requirements for portable device interfaces as they emerge

USB-IF Initiatives for Portable Devices

- The USB-IF has addressed and is addressing portable device requirements through the following efforts:
 - Micro-USB
 - On-The-Go
 - Battery Charging
 - Embedded Host
 - Audio Headset
 - Video Display
 - Media Transfer Protocol
 - Mass Storage
 - Serial Link PHY interface
- Industry participation in these activities is key to their success
- The goal of these efforts is to promote and support USB as a standard universal interface for portable devices

Micro-USB for Portable Devices



- Industry standard
 - Broad acceptance
 - Follow on to the widely accepted Mini-USB
- Mechanically suitable for mobile devices
 - Small size
 - Durable (>10,000 cycles)
 - Improved Latching
- Replaces multiple other connectors
 - Data, charging, audio, video, diagnostics
- Future looking
 - Features designed for USB 2.0 will map to USB 3.0

USB Battery Charging

Mobile device charges from host:

- Charge at 500mA on today's PCs and hubs
- Charge at 1.5A on future host chargers
- Dead battery charging without enumeration



Mobile device charges from USB charger:

- Dedicated low-cost USB charger design
- Charge at up to 1.5 A



Mobile device charges from docking station:

- Mobile device acts as host
- Charges instead of having to provide power to downstream devices

USB On-The-Go



- OTG enables portable devices to communicate directly with USB peripherals or each other
- OTG enables efficient power management of the portable interface
- Devices that need to attach to PCs and other accessories can do both over the same connector
- Enables high volume, low cost accessories by standardizing the interface between device and accessory
- New devices and accessories can be developed with the same interface

USB Audio Headset



- Audio Headset group defining a standard interface between a phone and a USB digital headset
- Headsets will have a basic set of features that will work with all compliant phones
- Headsets can support additional features for advanced functions. For example, additional display or buttons for audio player functions.
- Extremely low USB current consumption
- Phones with USB headset support do not need a 2.5mm jack
- USB headset is a low cost/power alternative to BT

USB Video Display

- Display connectivity (e.g. HDTV)
 - USB Embedded Host in display will support video class
 - Widely recognised USB connectivity
 - UI control in mobile device or display
 - Display charges mobile peripheral
- Best user experience: Digital clear audio and video
 - Up to HDTV quality video sharing
 - Hi-resolution photo, combined with digital music
 - Charging



USB Embedded Host



- Enable connectivity between USB devices without going through PC
- Embedded host ports:

- ★ Have a specific set of supported features. Do not need all the functionality of a PC.

- ★ Have a specific set of supported peripherals. Targeted peripheral list

- Examples include USB host ports on:

- ★ Car stereos, video displays, set top boxes, printers

Industry Support for USB in Portable Devices

- Open Mobile Terminal Platform (OMTP) forum has endorsed Micro-USB as the standard connector for portable cell phones
- China Electronics Standardization Institute (CESI) is looking at requiring all portable cell phones to use the Micro-USB connector for its charging port
- USB-IF has launched a number of standards and compliance efforts to optimize and enhance USB for the portable market, and is committed to addressing new requirements as they emerge

Portable Device Migration

- Today's Handset is a PC and then some
 - Multi-gigabyte memory capacity
 - Multiple processors and co-processors
 - Multiple wireless interfaces (CDMA, GSM, UMTS, WiFi, GPS, FM)
 - Digital Still and Video camera functions
 - Multi Media Players
 - Full function OS (WinMobile, Symbian, Linux)
 - Desktop equivalent applications (Word, Powerpoint, Excel, Outlook)
- Just as PC's benefit from a standard wired interface, so will portable devices

