

The USB high-speed on-the-go solution...



Provides a flexible, reliable interface connection when you are away from your PC.

Family features:

- USB 2.0 high-speed OTG-compliant devices
- Multiple external host interface options
- Small form-factor = 5x5 μ *JrBGA

Family members:

- TUSB6010B bridges to 16-bit MUXED-NOR-FLASH host interface such as the OMAP2420 or OMAP1710
- TUSB6020 enables functionality on VLYNQ communication interface product-enabled application processors, such as DaVinci™ processors and OMAP5912

Visit: www.ti.com/usb

Family benefits:

- Certified compliance and inter-operability
- Flexible architectures to interface to multiple processors
- Designed to meet the critical demands of portable, battery-powered target devices
- Meets the demands of small form-factor portable devices



TI knows digital interface.

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Why USB high-speed on-the-go?

To meet ongoing consumer demand for the best portable electronics available, today's devices require an interface connection when users are away from their personal computers (PC).

Until recently, the ability to share data among consumer electronics (CE) has been limited by the lack of industry standards. With the vast majority of these devices communicating with the PC via a universal serial bus (USB), the USB is an ideal candidate for mobile device-to-device connectivity.

However, USB specifications have inherent drawbacks for this type of communication. USB works from a "master-slave" protocol that relies on the PC's power to initiate the host's functionality. This protocol may be too complex to implement on many portable devices. In addition, a standard USB host significantly impairs the power available in low-power, battery-operated devices. Also, standard USB connectors may be too large for the form-factor on most devices.

The solution: USB high-speed on-the-go (OTG) for mobile device-to-device connectivity

The USB high-speed OTG addendum to the USB 2.0 specification enables enhancements to current peripherals that feature limited host functionality to provide interconnection between a defined set of peripheral devices. Examples of end-equipment that USB high-speed OTG supports include:

- Digital cameras
- Mega-pixel camera phones
- Personal digital assistants (PDAs)
- Portable audio players
- Smart phones
- Web tablets

What is USB high-speed OTG?

The new dual-role OTG device extends the functionality of a peripheral product to deliver limited host capabilities. These devices must operate as a standard USB peripheral when connected to standard USB host.

Unlike a standard USB host in a PC, a high-speed OTG device may not have an easy way to add drivers for unrecognized devices. Thus, an OTG device must supply a targeted peripheral list (TPL) that allows the device manufacturer to specify which peripherals it will support.

In addition, OTG devices must provide a "messaging" method to notify end users when an unsupported device has been connected. OTG devices are required to provide 8 mA of power to the connected peripheral when in host mode. Host Network Protocol (HNP) defines a method for dynamic switching between host and device roles. This method allows for cable "mis-connections" since the default roles of host and peripheral are determined by their cable orientation.

HNP allows devices to "switch roles" to determine which one should be the host based on the TPL for each device. The Session Request Protocol (SRP) enables a method for bus power to be turned "on" or "off" at the discretion of the host device. This on/off flexibility enables power savings when devices are not communicating to each other. In addition, this flexibility allows the peripheral to "wake up" the host when it wants to initiate data transfer.

Three scenarios: For USB high-speed OTG usage

No. 1

In this scenario, the high-speed OTG-enabled device acts as a standard USB peripheral. This device could be a USB-class one such as a: Media Transfer Protocol (MTP)-compliant MP3 player; a mass storage class (MSC) peripheral; or a digital still camera (DSC). As another option, this scenario could require users to load a customized driver on their computer to enable functionality. Example applications include: synching PDA /phone contacts; synching an MP3 player music library; and copying pictures from a DSC to a PC for editing and printing.



No. 2

In this scenario, the high-speed OTG device acts as the host to a peripheral from its TPL. The OTG device then will implement its operating system to include drivers needed to support an attached peripheral. The device must also notify the end user in the case an unsupported peripheral is attempting to connect. Finally, the device provides 8 mA of USB power. Non-OTG peripherals will likely receive no benefit from this limited amount of current. Thus the OTG device may want to supply more current, such as 100 mA, that can support many standard USB peripherals.

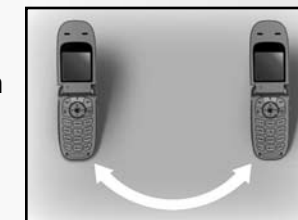


Why USB high-speed on-the-go?

Example applications include: adding a keyboard or mouse to a PDA; updating PDA /phone contents from USB flash memory; or copying pictures from a DSC to USB flash memory to free up digital space in a camera.

No. 3

In this scenario, the orientation in which an end user plugs the cable into two devices determines which device is the initial host and which one is the initial peripheral. HNP can be used to "switch" these roles. The host device must implement the operating system, including drivers, to support the attached peripheral device. The peripheral device is essential to implement the desired type of USB peripheral. Example applications for two OTG devices "talking" to each other include: sharing PDA/phone contacts; or sharing music between MP3 players.



TUSB60xx The family of high-speed OTG interface solution devices from Texas Instruments

This family of devices from Texas Instruments (TI) enables application processors (DSPs, OMAP™ and MCUs) that do not have integrated USB cores to function as either:

1. A USB 2.0 high-speed peripheral
2. An embedded USB 2.0 high-speed host controller
3. A full USB 2.0 high-speed OTG device

The TUSB60xx devices serve as bridges between a USB 2.0 high-speed bus and a local processor host interface.