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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Front Cover; Copyright; Contents; Introduction; 1 USB Basics; Uses and Limits; Benefits for Users; Benefits for Developers; What USB Can't Do; USB versus Ethernet; USB versus IEEE-1394; Evolution of an Interface; USB 1.0; USB 1.1; USB 2.0; USB 3.0; USB On-The-Go; Wireless USB; Bus Components; Topology; Bus Speed Considerations; Terminology; Division of Labor; The Host's Duties; The Device's Duties; Bus Speeds and Data Throughput; Developing a Device; Components; Tools for Developing; Steps in Developing a Project; USB 3.0 Frequently Asked Questions; Features; Compatibility; Cables; Power 2 Inside USB TransfersTransfer Basics; The Essentials; Purposes for Communication; Managing Data on the Bus; Elements of a Transfer; Endpoints: the Source and Sink of Data; Transaction Types; Pipes: Connecting Endpoints to the Host; Types of Transfers; Stream and Message Pipes; Initiating a Transfer; USB 2.0 Transactions; Transaction Phases; Packet Sequences; Timing Constraints and Guarantees; Split Transactions; Ensuring Successful Transfers; Status and Control; Reporting the Status of Control Transfers; Error Checking; SuperSpeed

Transactions; Packet Types; Transferring Data
Link Management Packets3 A Transfer Type for Every Purpose; Control Transfers; Availability; Structure; Data Size; Speed; Detecting and Handling Errors; Device Responsibilities; Bulk Transfers; Availability; Structure; Data Size; Speed; Detecting and Handling Errors; Device Responsibilities; Interrupt Transfers; Availability; Structure; Data Size; Speed; Detecting and Handling Errors; Device Responsibilities; Isochronous Transfers; Availability; Structure; Data Size; Speed; Detecting and Handling Errors; Device Responsibilities; More about Time-critical Transfers; Bus Bandwidth
Device CapabilitiesHost Capabilities; Host Latencies; 4 Enumeration: How the Host Learns about Devices; The Process; Enumeration Steps; Device Removal; Tips for Successful Enumeration; Descriptors; Types; Device; Device_Qualifier; Configuration; Other_Speed_Configuration; Interface Association; Interface; Endpoint; SuperSpeed Endpoint Companion; String; Binary Object Store and Device Capability; Other Standard Descriptors; Microsoft OS Descriptors; Updating Descriptors to USB 2.0; 5 Control Transfers: Structured Requests for Critical Data; Elements of a Control Transfer; Setup Stage
Data StageStatus Stage; Handling Errors; Device Firmware; Standard Requests; Get Status; Clear Feature; Set Feature; Set Address; Get Descriptor; Set Descriptor; Get Configuration; Set Configuration; Get Interface; Set Interface; Synch Frame; Set SEL; Set Isochronous Delay; Other Requests; Class-Specific Requests; Vendor-Defined Requests; 6 Chip Choices; Components of a USB Device; Inside a USB 2.0 Controller; Other Device Components; Simplifying Device Development; Device Requirements; Chip Documentation; Driver Choices; Debugging Tools; USB Microcontrollers; Microchip PIC18F4550
Cypress EZ-USB

Sommario/riassunto

Now in its fourth edition, this developer's guide to the Universal Serial Bus (USB) interface covers all aspects of project development, such as hardware design, device firmware, and host application software. Topics include how to choose a device controller chip, cut development time by using USB classes, and write software to access devices that perform vendor-specific functions. Example codes are provided using Visual Basic .NET and Visual C# .NET for performing tasks such as detecting device arrival and removal and transferring vendor-defined data usin