



# USB331x Family



Highly Integrated, Hi-Speed USB 2.0 ULPI Transceiver Family for Portable Consumer Electronics Applications

The USB331x family of Hi-Speed USB 2.0 transceivers provides a highly integrated, small footprint solution designed for portable consumer electronics devices including cell phones, PDAs, portable media players and GPS/personal navigation devices. The USB331x family eliminates the need for external USB switches and electrostatic discharge (ESD) protection devices, which minimizes eBOM part count and printed circuit board (PCB) area. The USB331x provides an extremely flexible solution which allows the USB connector to act as a single port of connection for high speed data transfer, battery charging and stereo/mono audio accessories.

## Highlights

- Highly integrated, Hi-Speed USB 2.0 transceivers
  - Integrated USB switch
  - Internal ESD protection circuits
  - Integrated 3.3V LDO regulator
  - External passive components minimized
- Industry's best current ESD performance in a Hi-Speed USB transceiver
  - ±8kV HBM
  - ±8kV/±15kV IEC (contact/air)
  - No external ESD protection circuits required
- Ability to use the USB connector as a single port of connection
  - Switch Hi-Speed data, battery charging and stereo/mono audio accessories
- SMSC flexPWR™ technology
  - Variable I/O voltage capability (fixed 1.8V or a range of 1.8V to 3.3V)
  - Low power and standby modes of operation to minimize power consumption
- Flexible reference clock to support major system clock frequencies - 13MHz, 19.2MHz, 24MHz and 26MHz
- Robust design tolerates “noisy” clock and power supplies
- Small package size and very low eBOM part count
- Hi-Speed USB On-The-Go (OTG) - host and device capable
- Supports commercial (0° to 70°C) and industrial (-40° to 85°C) temperature ranges

## Target Applications

- Cell Phones
- Smart Phones
- PDAs
- GPS Personal Navigation Devices
- Personal Media Players (PMPs)
- Digital Still and Video Cameras
- External Hard Disk Drives
- Printers
- Set-top Boxes
- Digital TVs
- Gaming Consoles
- Industrial Systems

## Features and Benefits

FEATURES	BENEFITS
Integrated USB switch and ESD protection	Provides lower eBOM part count and smaller PCB footprint area
USB utilized as a single port of connection	Reduction of end product size and cost
SMSC flexPWR technology	Longer battery life
Flexible and easy-to-use solution	Faster time-to-market and lower product development cost
Multiple clock input frequencies supported	Eliminates cost and size of external crystal oscillator for typical systems
Ability to tolerate “noisy” clocks and power supplies	Does not require costly filtering or clock generator circuits to preserve Hi-Speed eye diagram integrity
Small package footprint	Efficient PCB board space utilization

## What is SMSC flexPWR™ Technology?



### SMSC flexPWR provides:

- Low current design well-suited for battery powered applications
- Integrated battery to 3.3V linear regulator
- Variable I/O voltage to support a wide variety of processors
- Low current sleep mode tri-states all ULPI pins
- Allows OTG host to turn VBUS off to conserve battery

## USB331x Integrates Four Functions into One Solution!

FUNCTION	CURRENT IMPLEMENTATION	SMSC SOLUTION
HI-SPEED USB TRANSCEIVER	Discrete	<b>INTEGRATED SOLUTION!</b>  2uF
USB SWITCH	Discrete	
REGULATOR	Discrete	
ESD PROTECTION	External	
CAPACITORS	4.7uF	

## Which USB331x Family Member is Right for Your Design?

PART NUMBER	REFERENCE CLOCK FREQUENCY	I/O VOLTAGE	INTEGRATED USB SWITCH
USB3311	26MHz	1.8V	YES
USB3315	24MHz	1.8 - 3.3V	NO
USB3316	19.2MHz	1.8V	YES
USB3317	26MHz	1.8 - 3.3V	NO
USB3318	13MHz	1.8 - 3.3V	NO
USB3319	13MHz	1.8V	YES

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