USB3290

Small Footprint Hi-Speed USB 2.0 Device PHY with UTMI Interface

PRODUCT FEATURES

Data Brief

- Available in a 40 ball lead-free RoHS compliant (4 x 4 x 0.9mm) VFBGA package
- Interface compliant with the UTMI specification (60MHz, 8-bit bidirectional interface)
- Only one required power supply (+3.3V)
- Supports 480Mbps Hi-Speed (HS) and 12Mbps Full Speed (FS) serial data transmission rates
- Integrated 45Ω and 1.5kΩ termination resistors reduce external component count
- Internal short circuit protection of DP and DM lines
- On-chip oscillator operates with low cost 24MHz crystal
- Latch-up performance exceeds 150mA per EIA/JESD 78, Class II
- ESD protection levels of 5kV HBM without external protection devices
- SYNC and EOP generation on transmit packets and detection on receive packets
- NRZI encoding and decoding
- Bit stuffing and unstuffing with error detection
- Supports the USB suspend state, HS detection, HS Chirp, Reset and Resume
- Support for all test modes defined in the USB 2.0 specification
- 55mA Unconfigured Current (typical) - ideal for bus powered applications.
- 83uA suspend current (typical) - ideal for battery powered applications.
- Industrial Operating Temperature -40^{o}C to +85^{o}C

Applications

The USB3290 is the ideal companion to any ASIC, SoC or FPGA solution designed with a UTMI Hi-Speed USB device (peripheral) core.

The USB3290 is well suited for:

- Cell Phones
- MP3 Players
- Scanners
- External Hard Drives
- Digital Still and Video Cameras
- Portable Media Players
- Entertainment Devices
- Printers

ORDER NUMBER(S):

USB3290-FH FOR 40 BALL, VFBGA LEAD-FREE ROHS COMPLIANT PACKAGE

USB3290-FH-TR FOR 40 BALL, VFBGA LEAD-FREE ROHS COMPLIANT PACKAGE (TAPE AND REEL)

Reel Size is 4000 pieces.

80 ARKAY DRIVE, HAUPPAUGE, NY 11788 (631) 435-6000, FAX (631) 273-3123

General Description

The USB3290 provides the Physical Layer (PHY) interface to a USB 2.0 Device Controller. The IC is available in a 40 ball lead-free RoHS compliant VFBGA package. The small footprint package makes the USB3290 ideal for portable consumer electronics applications.

The USB3290 is an industrial temperature USB 2.0 physical layer transceiver (PHY) integrated circuit. SMSC's proprietary technology results in low power dissipation, which is ideal for building a bus powered USB 2.0 peripheral. The PHY uses an 8-bit bidirectional parallel interface, which complies with the USB Transceiver Macrocell Interface (UTMI) specification. It supports 480Mbps transfer rate, while remaining backward compatible with USB 1.1 legacy protocol at 12Mbps.

All required termination and 5.25V short circuit protection of the DP/DM lines are internal to the chip. The USB3290 also has an integrated 1.8V regulator so that only a 3.3V supply is required.

While transmitting data, the PHY serializes data and generates SYNC and EOP fields. It also performs needed bit stuffing and NRZI encoding. Likewise, while receiving data, the PHY de-serializes incoming data, stripping SYNC and EOP fields and performs bit un-stuffing and NRZI decoding.

Block Diagram

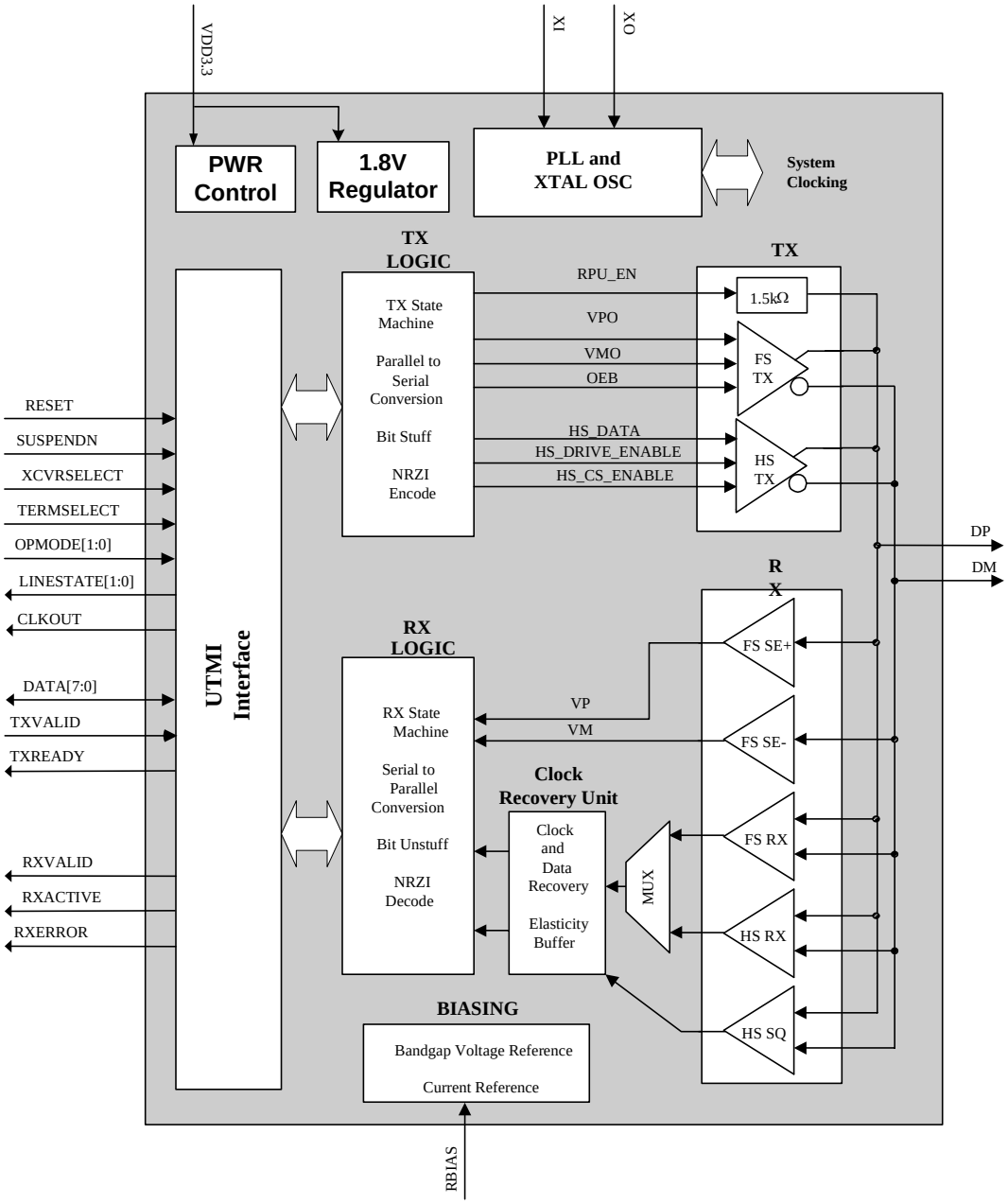
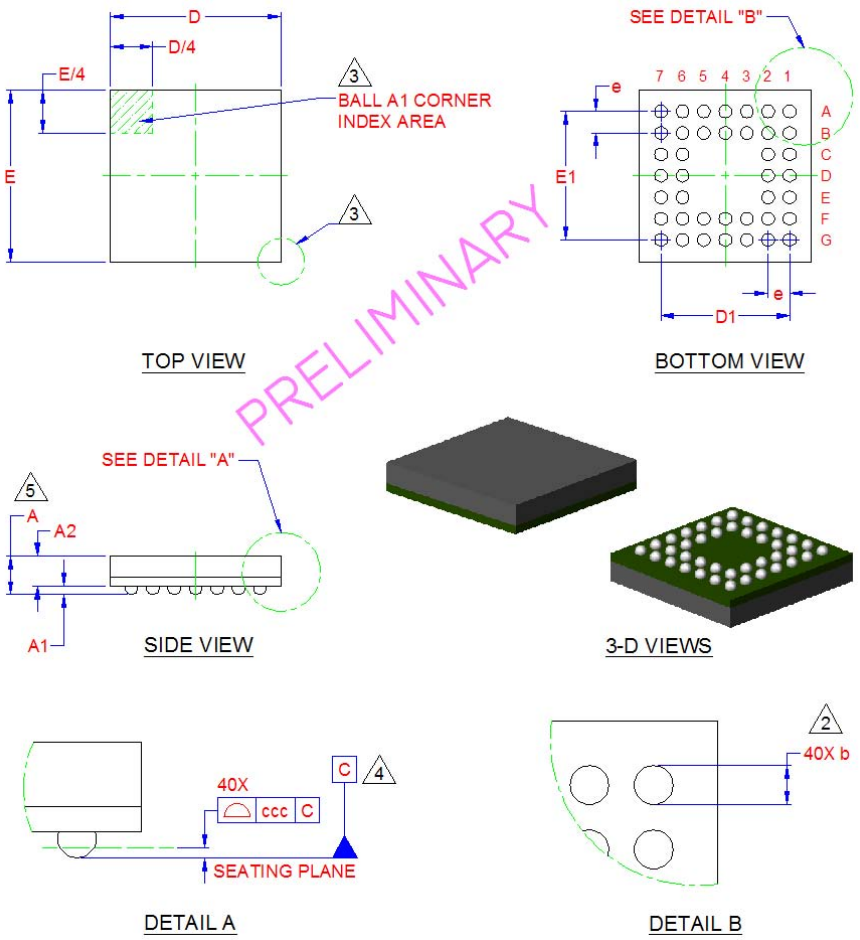


Figure 1 USB3290 Block Diagram

PRODUCT PREVIEW

Package Outline



COMMON DIMENSIONS					
SYMBOL	MIN	NOM	MAX	NOTE	REMARK
A	-	-	1.00	5	OVERALL PACKAGE HEIGHT
A1	0.15	-	-	-	STANDOFF
A2	0.65	-	-	-	PKG BODY THICKNESS
D/E	3.90	4.00	4.10	-	X/Y BODY SIZE
D1/E1		3.00 BSC		-	X/Y END BALLS DISTANCE
b	0.25	0.30	0.35	2	BALL DIAMETER
e		0.50 BSC		-	BALL PITCH
ccc	0	-	0.08	4	COPLANARITY

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. MAXIMUM RADIAL TRUE POSITION TOLERANCE OF EACH BALL IS ± 0.075mm AT MAXIMUM MATERIAL CONDITION. DIMENSION "b" IS MEASURED AT THE MAXIMUM BALL DIAMETER, PARALLEL TO PRIMARY DATUM "C".
3. THE BALL "A1" CORNER MUST BE IDENTIFIED IN THE INDICATED AREA OF THE TOP PACKAGE SURFACE BY USING A CORNER CHAMFER, INK/LASER/METALIZED MARKING, INDENTATION, OR OTHER FEATURE OF PACKAGE BODY. EXACT SHAPE OF EACH CORNER IS OPTIONAL, BUT TERMINAL "A1" CORNER MUST BE UNIQUE.
4. PRIMARY DATUM "C" AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE CONTACT SOLDER BALLS.
5. DIMENSION "A" DOES NOT INCLUDE ATTACHED EXTERNAL FEATURES, SUCH AS HEAT SINK OR CHIP CAPACITORS.

LAND PATTERN DIMENSIONS			
SYMBOL	MIN	NOM	MAX
D1'/E1'	-	3.00	-
b'	0.20	-	0.25
e'	-	0.50	-

THE USER MAY MODIFY THE PCB LAND PATTERN DIMENSIONS, BASED ON THEIR EXPERIENCE AND/OR PROCESS CAPABILITY

Figure 2 USB3290-FH 40 Ball, VFBGA Package Outline & Parameters 4x4x0.9mm Body, Lead-Free RoHS Compliant