

StackableUSB

Primary target applications:
Rugged industrial applications that require or can benefit from USB interfaces.

Sponsors:
Micro/sys Inc., Samtec

Specification release: April 2007

Specification information:
Free download available at StackableUSB.org.
Product royalties apply for usage. See www.stackableUSB.org.

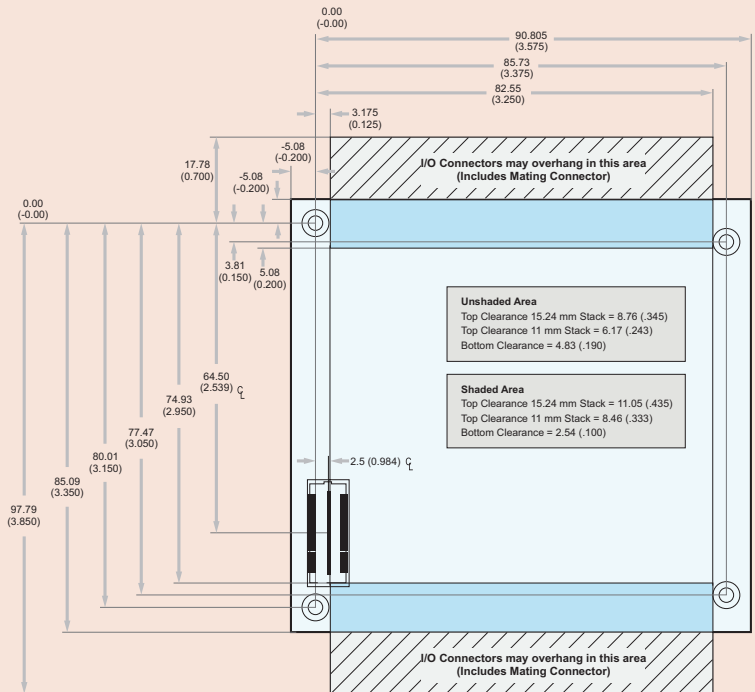
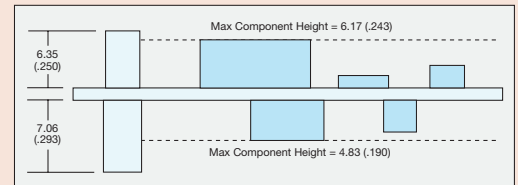
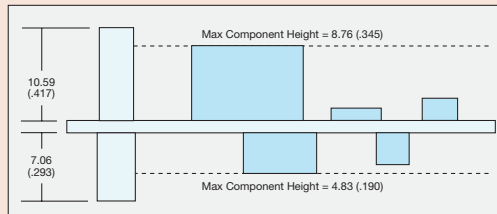
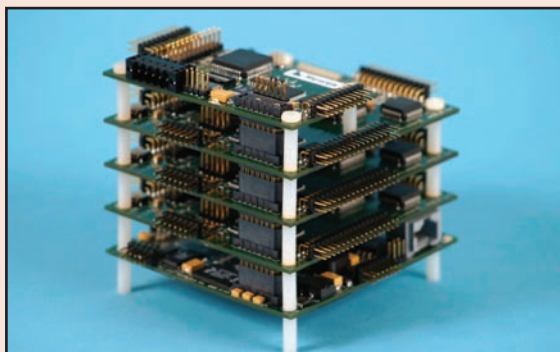
Dimensions:
Available on 3.550" x 3.775" PC/104 format; half and quarter size formats available. Implementation on other form factors in progress.

Mandatory features:
On approved form factors, connector locations, connector pinouts, and mounting hole locations are specified and required.

Mounting:
One SBC and one peripheral card are stacked together to produce a "brick." StackableUSB supports up to 16 USB peripherals stacked on top, on bottom, or both top and bottom of a single SBC without the use of a hub card. With the use of hub cards, 76 peripherals can be connected to a single SBC.

Power input:
+5 VDC, Samtec Q2 single bank connector.

Expansion bus interfaces:
At least one USB port must be present on the SBCs and one I2C port. Support for up to 16 USB ports, 8 on top and 8 on bottom. Peripherals usually consume one USB port but can use more if desired.



USB, minus the cables, connects boards

By Susan Wooley, Micro/sys, Inc.

StackableUSB was created to take advantage of USB's growing popularity as an I/O channel. With USB 2.0 as its foundation, StackableUSB incorporates all of USB 2.0's advantages while also providing new benefits in expansion, power supply, and ruggedness.

StackableUSB specifies the interconnection between a USB host SBC and USB devices without the use of any cables. It is based on stacking and bolting boards together to form a rugged "brick."

The architecture uses a pair of connectors to route up to 16 USB pairs to StackableUSB devices mounted both above and below a StackableUSB SBC. This innovative signal routing maintains the USB star topology (point-to-point) while preserving the signal integrity required by the high-speed serial links called for in USB 2.0.

Up to 10x more power is available for devices in both 5 V and 3.3 V, eliminating the need for regulators on StackableUSB devices. Removal of the standard USB cable is the key to making StackableUSB so robust. Standard USB cables do not have a retention mechanism and are therefore susceptible to inadvertent disconnection when exposed to rugged environments.

To leverage existing off-the-shelf enclosures, the initial StackableUSB form factor is the same as PC/104 with respect to board outline and mounting hole locations. Half and quarter size boards are being released.

With the number of USB ports growing and older alternatives such as ISA fading, StackableUSB provides the modern choice for designers creating compact and expandable systems.