Legacy Connecter
FS-SQIDD Full / Low Speed Test Fixture

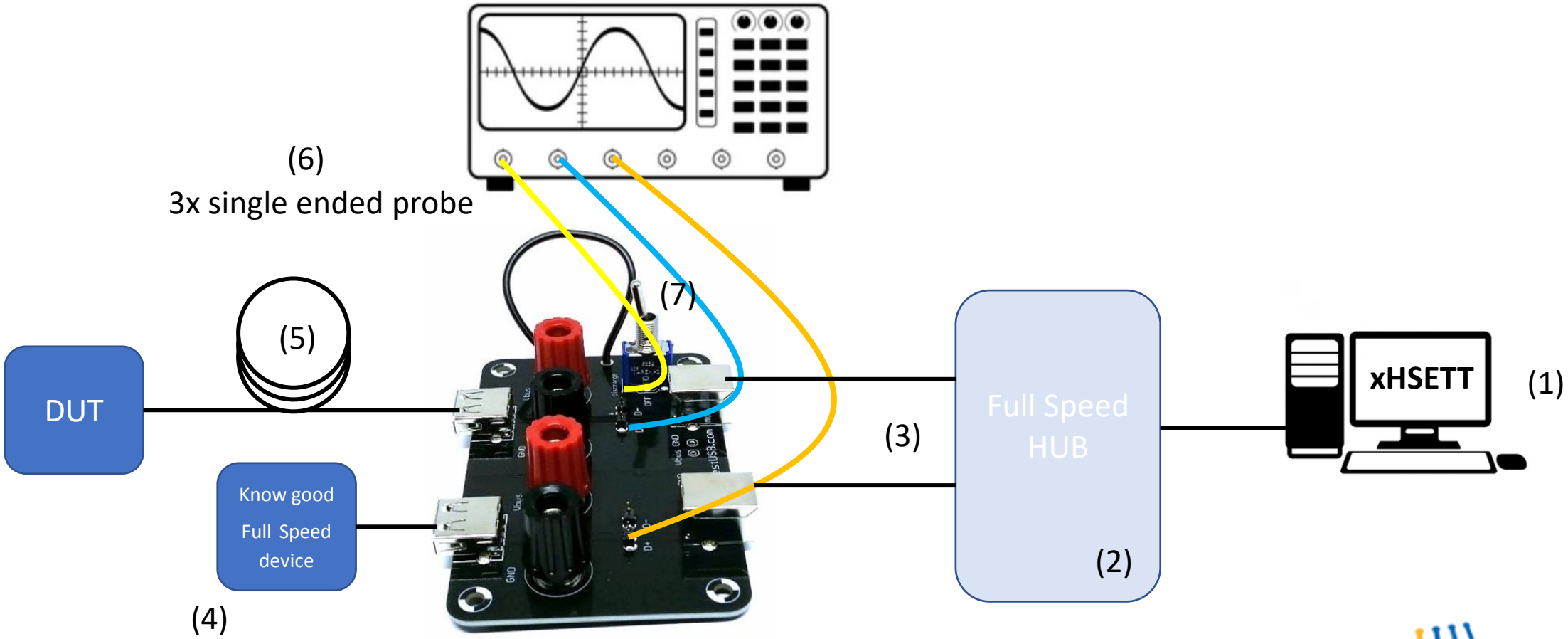
Signal EYE & Inrush Current

DRAFT0.3

FS-SQIDD Full / Low Speed Test Fixture - Fixture Solution

Fixture Solution

USB2.0 Full speed device UPSTREAM setup diagram



Fixture Solution

USB2.0 Full Speed Device UPSTREAM setup

(1) Loop device descriptor USB xHSETT tool.

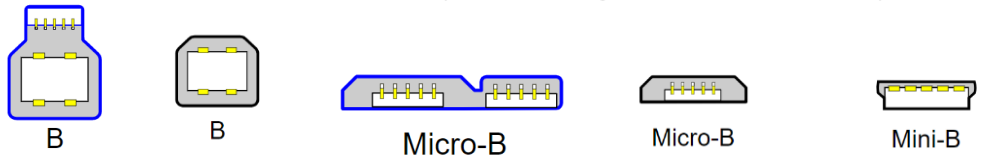
(2) When the DUT is High or Super Speed a Full Speed Hub is required to downgrade to full speed.
If the DUT is Full Speed a High or Super Speed Hub can be used instead.

(3) Cable between Full Speed hub and fixture shall be as short as possible and shall not be longer than 20cm. FS-HS-AP-15-BP 15cm USB 2.0 Standard B-Plug – A-plug - Fixture Solution

(4) Use any full speed device, it's only for tiggering.

(5) Cable length between DUT is and fixture is depending on the receptacle the DUT have and shall be :

- Standard-B = 5m
- Mini-B = 4.5m
- Micro-B = 2m
- Captive / Tethered cable = as is, without extending the length.

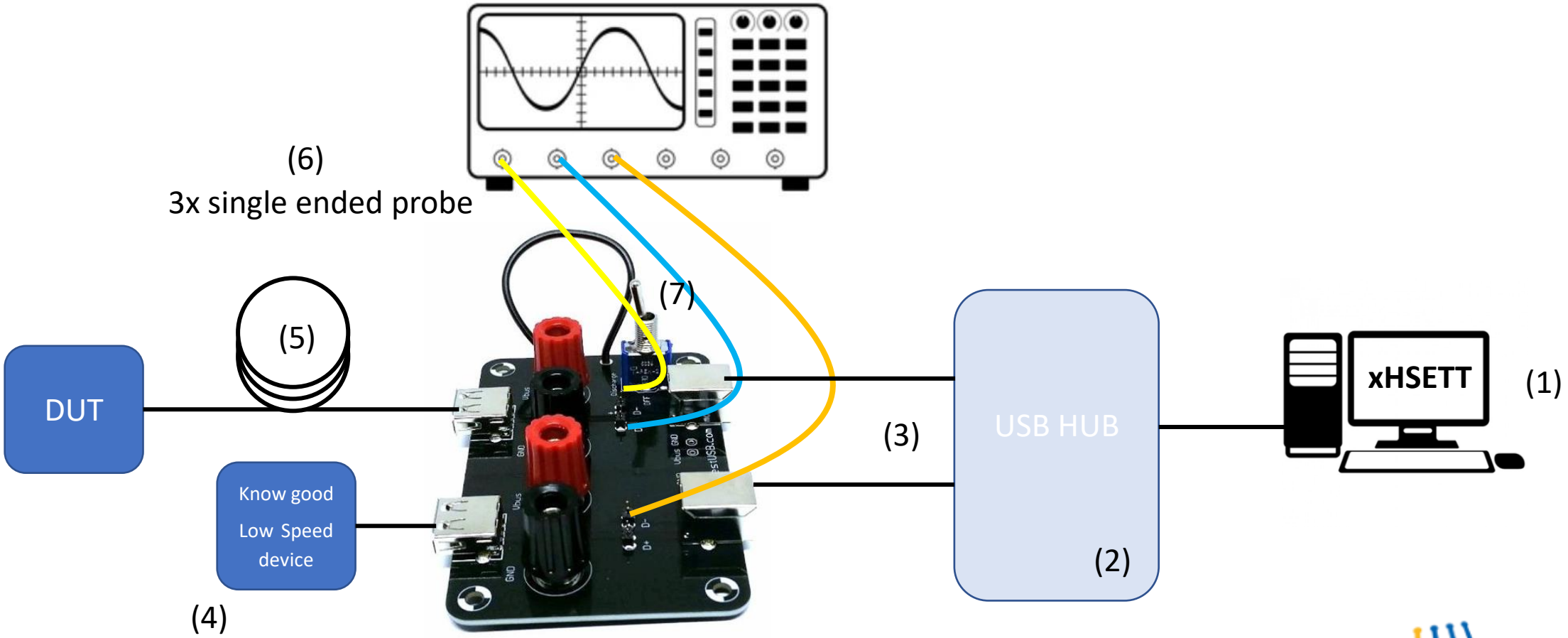


(6) Use 3 single ended probes. Probe channel selection is depending on scope setting and can different from picture above. Note that a differential probe can be used as single ended probe.
Make sure to connect probe to trigger on D+ for the adjected device.

(7) Place switch during the test at "ON" to pass through Vbus.

Fixture Solution

USB2.0 Low Speed Device UPSTREAM setup diagram



Fixture Solution

USB2.0 Low Speed Device UPSTREAM setup

(1) Loop device descriptor USB xHSETT tool.

(2) Any full, high or super speed hub is allowed.

(3) Cable between Full Speed hub and fixture shall be as short as possible and shall not be longer than 20cm. FS-HS-AP-15-BP 15cm USB 2.0 Standard B-Plug – A-plug - Fixture Solution

(4) Use any low speed device, it's only for tiggering.

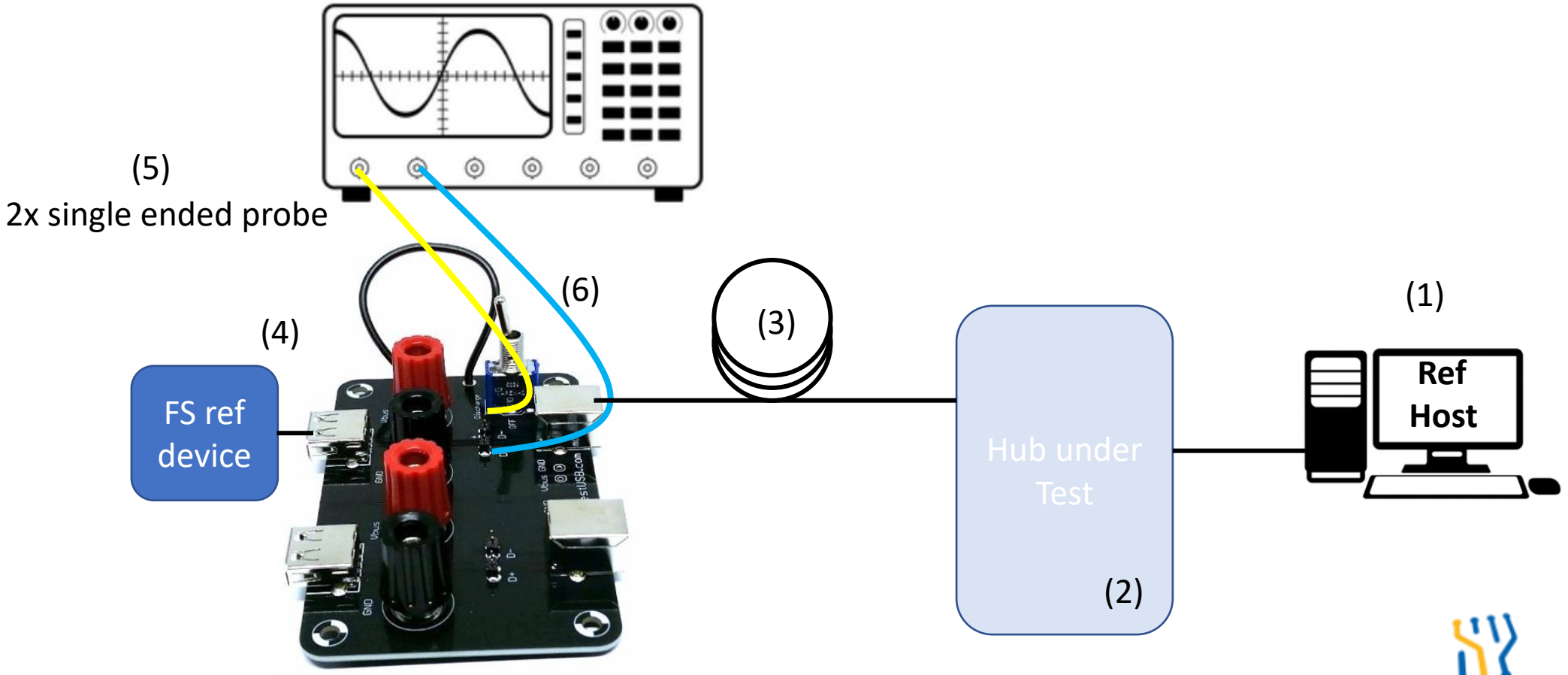
(5) It is mandatory for low speed device to use a captive cable therefore no additional cable extension is required.

(6) Use 3 single ended probes. Probe channel selection is depending on scope setting and can different from picture above. Note that a differential probe can be used as single ended probe.
Make sure to connect probe to trigger on D- for the adjected device.

(7) Place switch during the test at "ON" to pass through Vbus.

Fixture Solution

USB2.0 Full speed Downstream Hub setup diagram



Fixture Solution

USB2.0 Full speed Downstream Hub setup diagram

(1) Any reference USB Host.

(2) Hub Under Test.

(3) Use a 5m cable between downstream port and fixture:

Hub with A-Receptacle FS-HC-CP-500-BP 5m long USB 2.0 Type-C® Plug – Standard-B Plug - Fixture Solution

Hub with Type-C Receptacle FS-HS-AP-500-BP 500cm USB 2.0 Standard B-Plug – Standard A-plug - Fixture Solution

(4) Use any Full Speed Reference device. Make sure the cable between Fixture and Full Speed Reference device is as short as possible (< 20cm). B, µB, C. Or use a product with very short captive cable or Aplug.

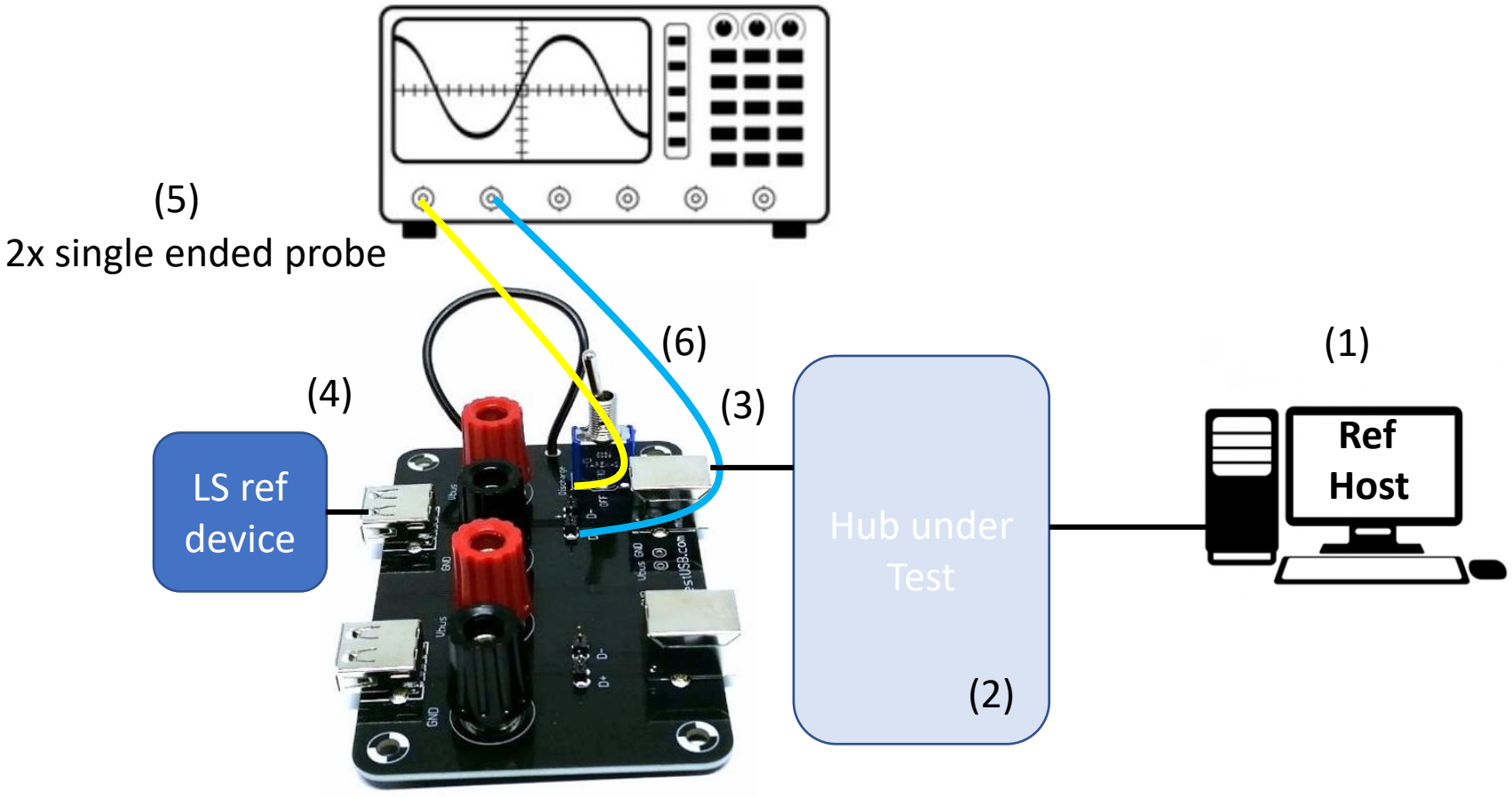
(5) Use 2 single ended probes. Probe channel selection is depending on scope setting and can different from picture above. Note that a differential probe can be used as single ended probe.

(6) Place switch during the test at “ON” to pass through Vbus.

The Downstream Port will send every 1ms keep alive SOF that can be used to do the Full Speed EYE measurement.

Fixture Solution

USB2.0 Low speed Downstream Hub setup diagram



Fixture Solution

USB2.0 Low speed Downstream Hub setup diagram

(1) Any reference USB Host.

(2) Hub Under Test.

(3) Cable between Hub under test and fixture shall be as short as possible and shall not be longer than 20cm. FS-HS-AP-15-BP 15cm USB 2.0 Standard B-Plug – A-plug - Fixture Solution

(4) Use any Low Speed Reference device. It is mandatory for low speed device to use a captive cable therefore no additional cable extension is required.

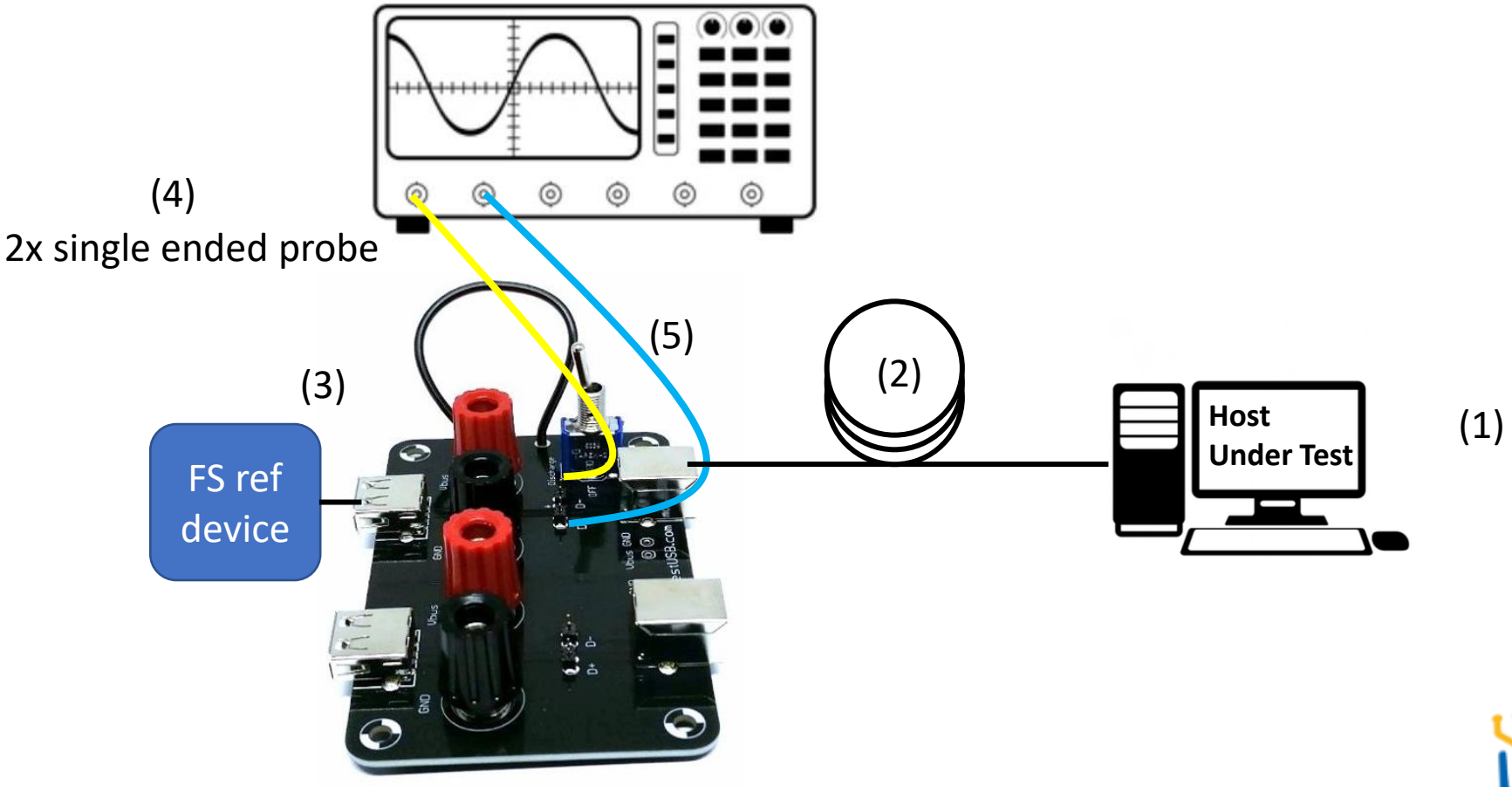
(5) Use 2 single ended probes. Probe channel selection is depending on scope setting and can different from picture above. Note that a differential probe can be used as single ended probe.

(6) Place switch during the test at “ON” to pass through Vbus.

Activate the low speed reference device device e.g. move mouse to see low speed traffic that can be used to do the Low Speed EYE measurement.

Fixture Solution

USB2.0 Full speed Downstream Host setup diagram



Fixture Solution

USB2.0 Full speed Downstream Host setup diagram

(1) Host Under Test.

(2) Use a 5m cable between downstream port and fixture:

Host with A-Receptacle FS-HC-CP-500-BP 5m long USB 2.0 Type-C® Plug – Standard-B Plug - Fixture Solution

Host with Type-C Receptacle FS-HS-AP-500-BP 500cm USB 2.0 Standard B-Plug – Standard A-plug - Fixture Solution

(3) Use any Full Speed Reference device. Make sure the cable between Fixture and Full Speed Reference device is as short as possible (< 20cm). B, µB, C. Or use a product with very short captive cable or Aplug.

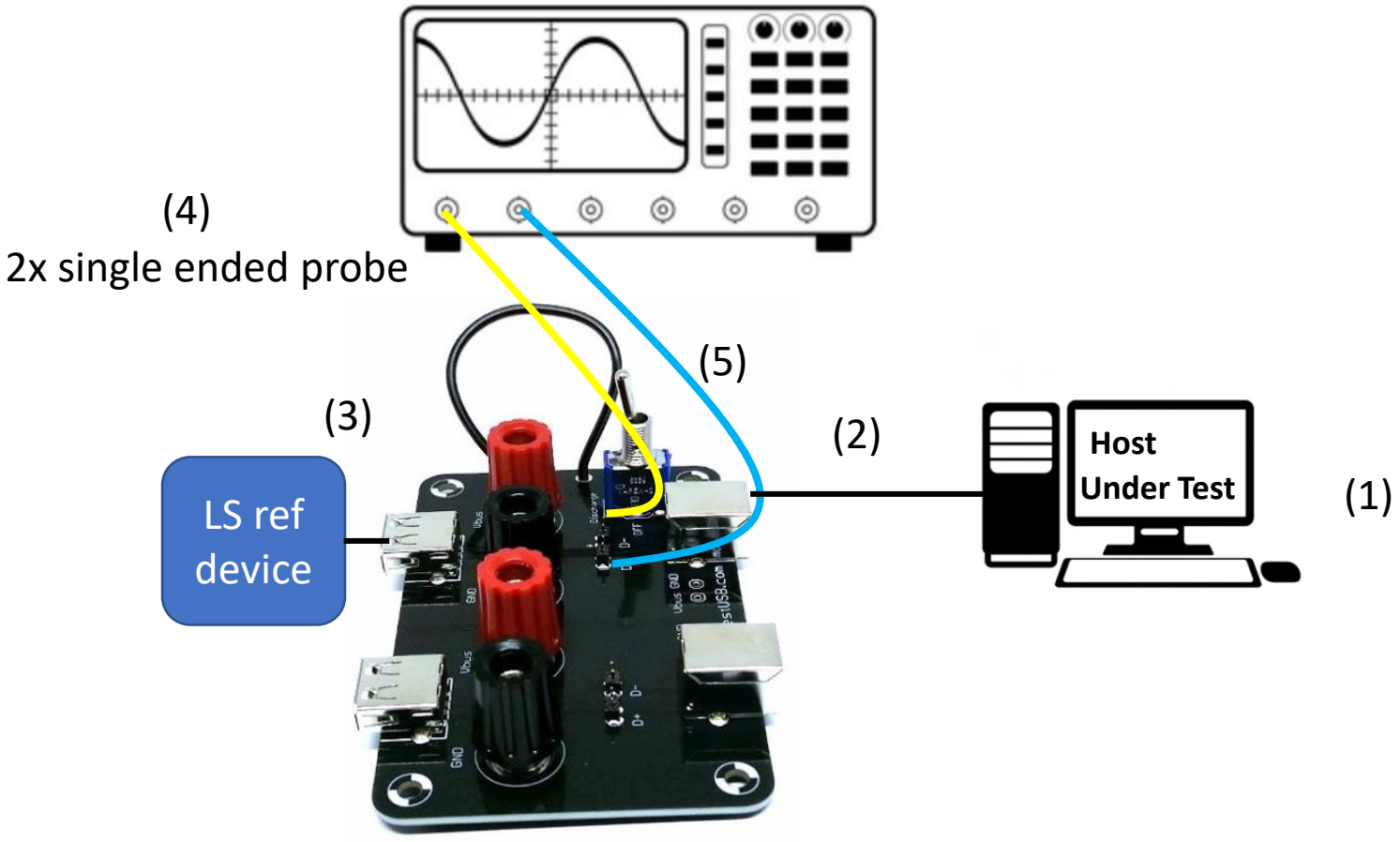
(4) Use 2 single ended probes. Probe channel selection is depending on scope setting and can different from picture above. Note that a differential probe can be used as single ended probe.

(5) Place switch during the test at “ON” to pass through Vbus.

The Downstream Port will send every 1ms keep alive SOF that can be used to do the Full Speed EYE measurement.

Fixture Solution

USB2.0 Low speed Downstream Host setup diagram



Fixture Solution

USB2.0 Low speed Downstream Host setup diagram

(1) Host Under Test.

(3) Cable between Host under test and fixture shall be as short as possible and shall not be longer than 20cm. FS-HS-AP-15-BP 15cm USB 2.0 Standard B-Plug – A-plug - Fixture Solution

(4) Use any Low Speed Reference device. It is mandatory for low speed device to use a captive cable therefore no additional cable extension is required.

(5) Use 2 single ended probes. Probe channel selection is depending on scope setting and can different from picture above. Note that a differential probe can be used as single ended probe.

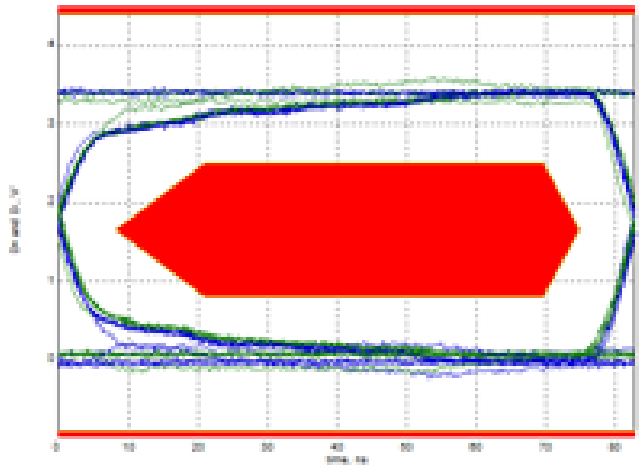
(6) Place switch during the test at “ON” to pass through Vbus.

Activate the low speed reference device device e.g. move mouse to see low speed traffic that can be used to do the Low Speed EYE measurement.

Fixture Solution

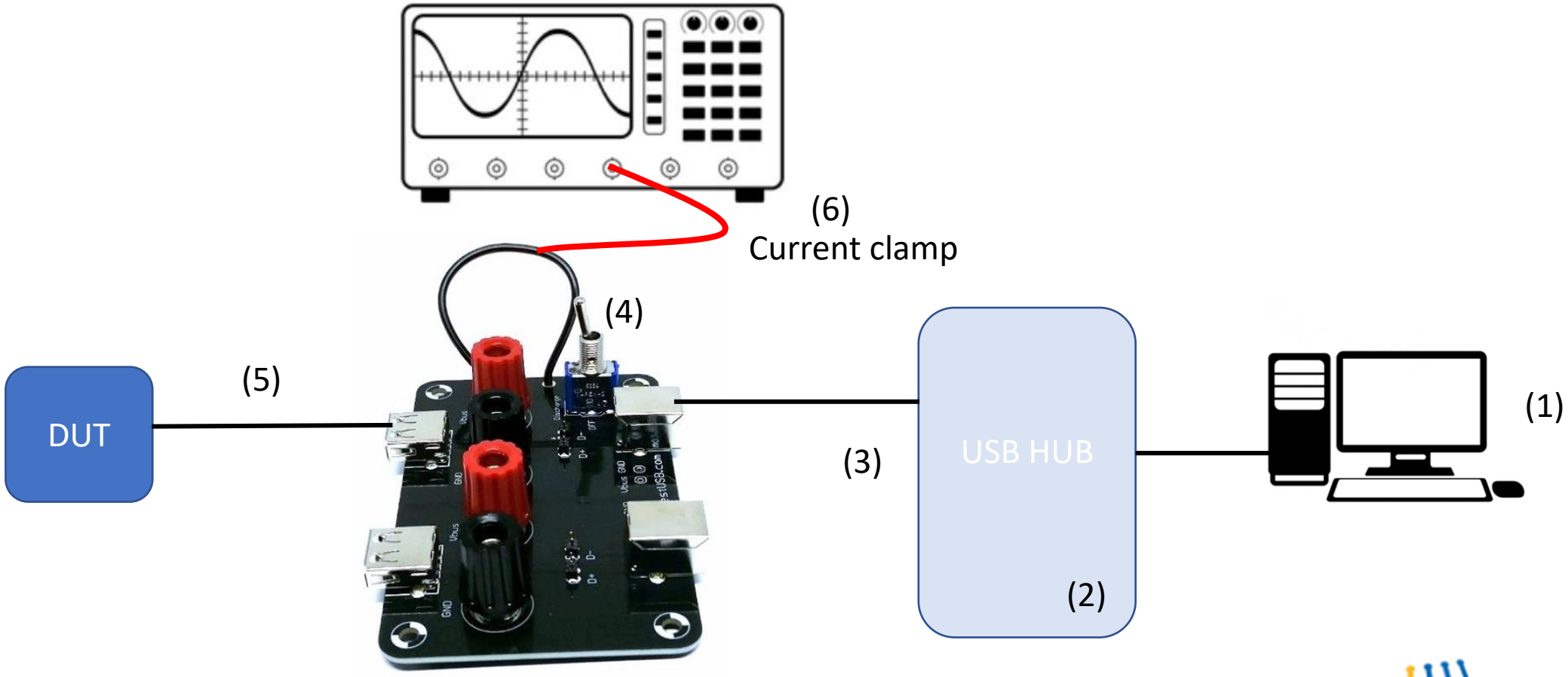
Full & Low Speed Device additional info

- A tier of 5 hubs is not required anymore
- For steps to take check USB20 TypeC Device Electrical MOI 0.88.pdf (testusb.com) at chapter 4.7 (Full) 4.8 (Low)
- More info at USB Full Low Speed Signal Quality (testusb.com)



Fixture Solution

USB Inrush device setup diagram



[USB Inrush Current]

Fixture Solution