

Falcon and Raptor Series

Application Note: DUT Probing Options

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Probing Configuration Options

There are several different probing options available for connecting to the device under test (DUT) depending on whether the use model is analyzer only or exerciser/analyzer. These options including solder-down probes, splitters, breakout boards, interposers and high-density connectors.

Analyzer use model

Solder-down

Solder-down probes allow for individual connection to each transmit-pair and receive-pair of each serial lane, allowing flexibility to connect to any accessible points on the surface of the PCB. Each connection uses a high-impedance electrical probe to minimize perturbation of the M-PHY bus signals, while providing reliable capture of all M-PHY traffic.

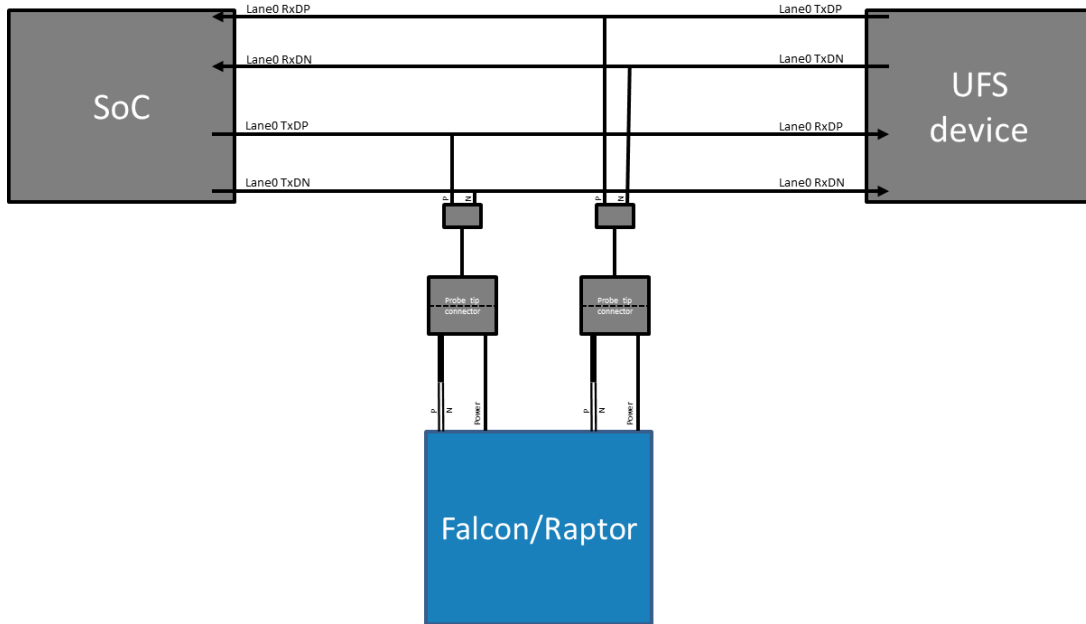
There are three different solder-down probing options for the Falcon and Raptor instruments. The **FG4PSD2B x2 Bundle** for Falcon B and Raptor is an elegant new probe design well suited for 95% of all applications. It eliminates the need for the multi-lead probe pod while capturing up to HS-G4B directly and drawing power from the Falcon/Raptor front-panel power connector. The FG4PSD2B x2 Bundle is only compatible with the Falcon B and Raptor instruments, it is not compatible with the original Falcon non-B instruments.

For extremely challenging signal integrity environments the **FG4PSD3 Multi-Lead Pod x2 Configuration** can be used in conjunction with the FG4PSD2B x2 Bundle. The FG4PSD3 adds a multi-lead pod to condition and clean-up the signal from the DUT for successful analyzer capture. The optional FG4PSD3 Multi-Lead Pod x2 Configuration is intended for use with the Falcon B and Raptor instruments and the FG4PSD2B x2 Bundle. It can be reconfigured for use with the original Falcon non-B instruments by swapping out the phase-matched SSMP-to-SMP back-end cables with SSMP-to-SMA cables.

The **FG4PSD2 x2 Bundle** is available for the original Falcon non-B instruments and provides a multi-lead pod, Carlisle cables, solder-down probe tips and a power supply. It can be reconfigured for the Falcon B and Raptor instruments by swapping out the phase-matched SSMP-to-SMA back-end cables with SSMP-to-SMP cables.

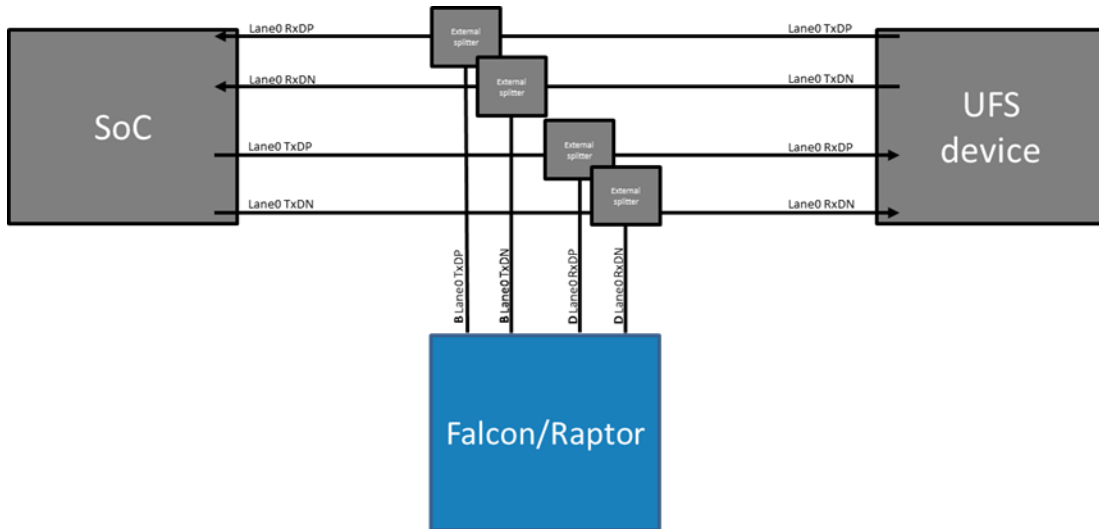
All the three different solder-down probing options for the Falcon and Raptor instruments support both HS-G3 and HS-G4B. The existing HS-G4B and HS-G3 solder-down probe tips are compatible with all three of the probing configurations above.

x1 link example

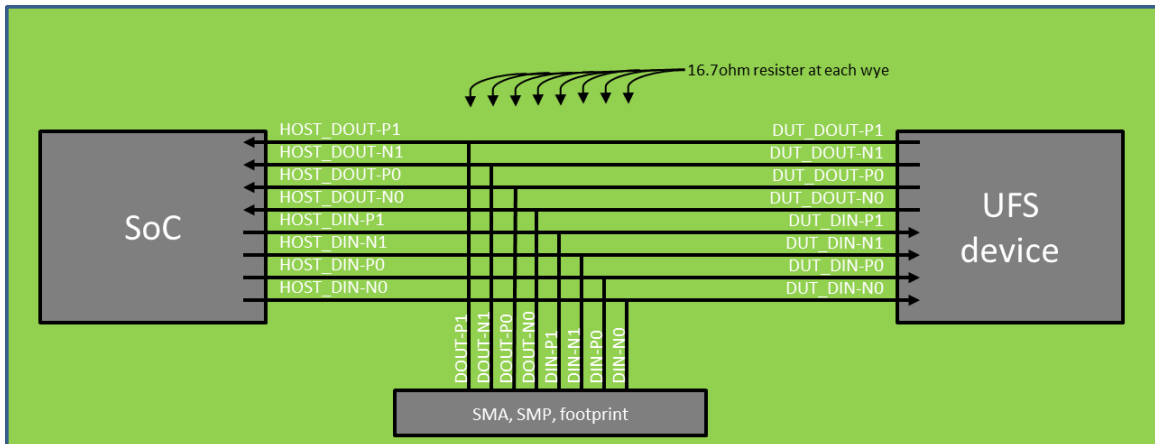


Splitters

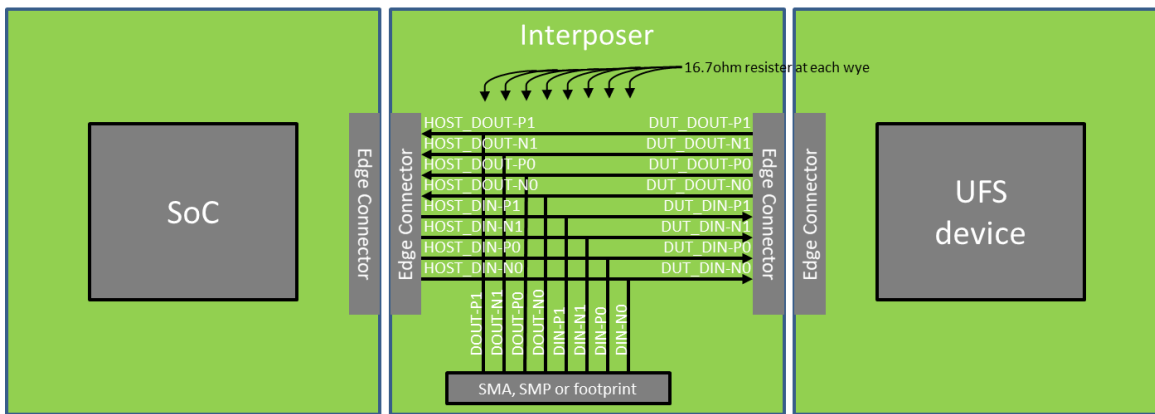
Off-the-shelf power splitters such as the Mini-Circuits DC-18 GHz ZFRSC-183-S+ can be used with standard SMA to SMA cables of $\geq 18\text{GHz}$ and maximum of 12 inches in length. Each lane requires four power splitters and 12 SMA cables as shown in this x1 link example:



Breakout DUT (50% split = 16.7 ohms resistor)



Interposer (50% split = 16.7 ohms resistor)



Exerciser use model (direct connection)



Other connection options

High density connectors

Ardent 4 and 16 channel 50-ohm footprint connectors

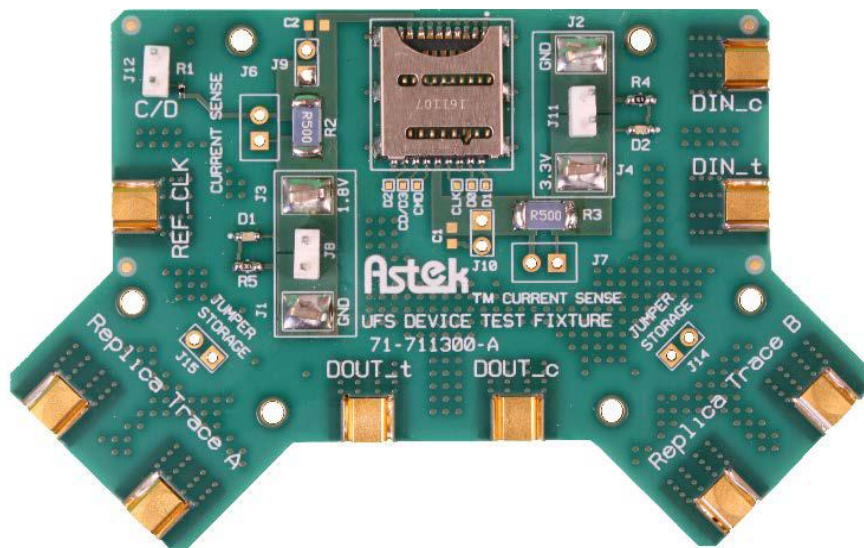
- Ardent Concepts SMA cable TR4X1-2.54-XXXX-2-REVA
- Ardent Concepts SMA cable TR16X2-2.54-XXXX-1-REV-A



UFS Card test fixture

Astek UFS Device Test Fixture A9-UFS-02

The A9-UFS-02 Test Fixtures enable designers to verify compliance of UFS Card devices to the JEDEC UFS Test Specification.



Coax connectors

Ardent QUICKLINK connector

QUICKLINK is a single channel connector-less compression mount coaxial connector technology delivering DC to 70 GHz+.



SMA connectors

≥18GHz recommended for HS-G3B and HS-G4B



Probe Connection

Analyzer Configuration

Note: the labels on the analyzer front panel are from the instrument perspective.

1. Connect the Sublink 0 Rx_1N to TxDN from the device M-Tx lane 1.
2. Connect the Sublink 0 Rx_1P to TxDP from the device M-Tx lane 1.
3. Connect the Sublink 0 Rx_0N to TxDN from the device M-Tx lane 0.
4. Connect the Sublink 0 Rx_0P to TxDP from the device M-Tx lane 0.
5. Connect the Sublink 1 Rx_1N to RxDN from the device M-Rx lane 1.
6. Connect the Sublink 1 Rx_1P to RxDP from the device M-Rx lane 1.
7. Connect the Sublink 1 Rx_0N to RxDN from the device M-Rx lane 0.
8. Connect the Sublink 1 Rx_0P to RxDP from the device M-Rx lane 0.

Exerciser Configuration - Falcon G350/G450 only

Note: the labels on the analyzer front panel are from the instrument perspective.

1. Connect the Sublink 0 Rx_1N to TxDN from the device M-Tx lane 1.
2. Connect the Sublink 0 Rx_1P to TxDP from the device M-Tx lane 1.
3. Connect the Sublink 0 Rx_0N to TxDN from the device M-Tx lane 0.
4. Connect the Sublink 0 Rx_0P to TxDP from the device M-Tx lane 0.
5. Connect the Sublink 1 Tx_1N to RxDN from the device M-Rx lane 1.
6. Connect the Sublink 1 Tx_1P to RxDP from the device M-Rx lane 1.
7. Connect the Sublink 1 Tx_0N to RxDN from the device M-Rx lane 0.
8. Connect the Sublink 1 Tx_0P to RxDP from the device M-Rx lane 0.
9. Connect the UFS RST_N to the DUT reset signal
10. If desired, connect the UFS REF CLK to the DUT ref clock input.

Contact Information

1. For additional information, to request a demonstration or quote, or place an order, please contact your local Protocol Insight representative or sales@protocolinsight.com
2. Support materials and examples files are available at <http://www.protocolinsight.com/support-materials/>
3. For technical support please contact your local Protocol Insight representative or support@protocolinsight.com