

SFP+ to SMA Breakout Board

FEATURES

- SFP+ Host Compliance Board
- Conforms to SFF-8431, Appendix C
- Rogers 4350 low-loss dielectric
- High-frequency SMA connectors for up to 11.1 Gbps data signals
- Certified 50 Ω microstrip transmission lines
- LED indicators and test points for VccT, VccR, Tx_Dis, RS0, and RS1
- 2-Wire Interface header pins
- Jumper control for Tx_Fault, Mod_ABS, and Rx_LOS signals

APPLICATIONS

- Test/Verification of SFP+ host
- Debug and test SFP+ equipment
- Injecting and monitoring SFP+ signals

DESCRIPTION

The SS-SFP-SMA breakout board is an SFP+ Host Compliance Board (HCB). It incorporates a standards compliant 20-pin SFP+ "gold finger" board-edge connector on one end of a printed circuit (PC) board and high-speed SMA connectors on the other end of the PC board. High-speed transmit and receive signals are routed to the SMA connectors via 50-ohm microstrip transmission lines over Rogers RO4350 low-loss dielectric for excellent signal integrity at data rates up to 11Gbps or more. Low-speed signals Tx_Fault, SDA, SCL, Mod_ABS, and Rx_LOS are routed to standard 0.1 inch header pins. Tx_Disable, RS0, RS1, VccT, and VccR are routed to test points and include LED indicators. The breakout boards enable test, debug, and development of SFP+ links.

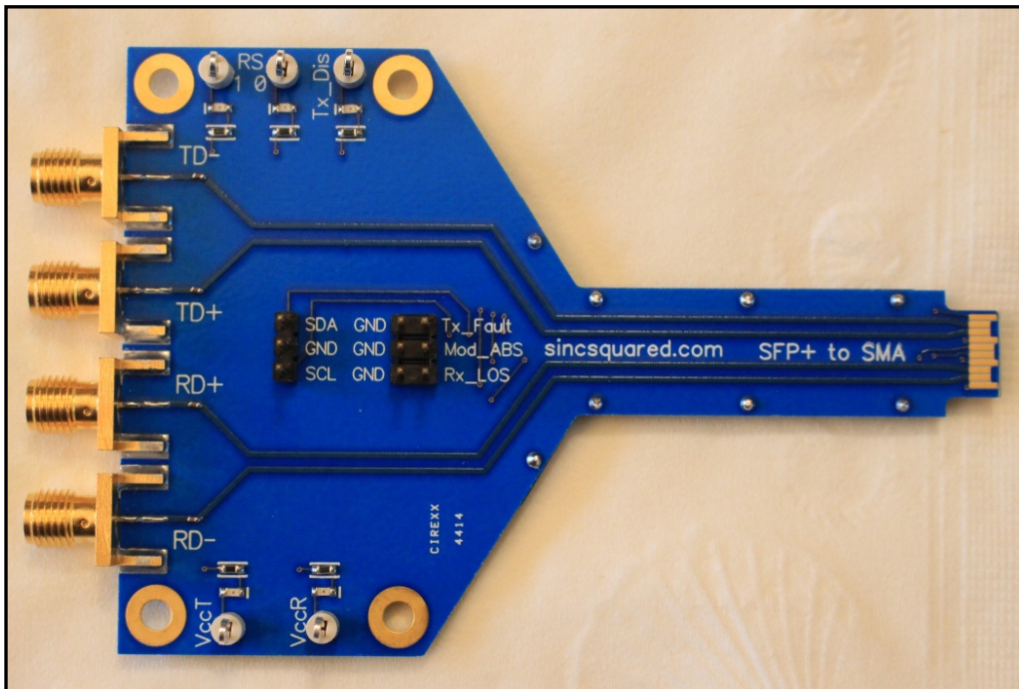


Figure 1: SS-SFP-SMA SFP+ to SMA Breakout Board (Host Compliance Board)

APPLICATIONS INFORMATION

The SS-SFP-SMA (SFP+ to SMA) host compliance/breakout board is used to test SFP+ host devices, as described in the SFP+ specifications (SFF-8431, Appendix C). It is also compatible with legacy SFP host devices, operating at any data rate between 155Mbps and 11.1Gbps. All of the high-frequency SFI signals are routed on the top layer of the board over a low-loss Rogers RO4350 dielectric layer. Low-speed signals and controls are routed on internal layers surrounded by standard FR-4 dielectric. Total board thickness is 1mm, for compatibility with the SFP+ edge connector.

Unfortunately, for conventional host compliance boards, the combination of the thin (1mm) board and the softer Rogers low-loss substrate results in a somewhat fragile board, susceptible to excessive flexing and potential breakage, particularly at the stress points illustrated in Figure 2. For example, when SMA cables are attached to the SMA connector, downward forces at the SMA connector can cause the host compliance board to flex downward, causing stresses at point (a) where the narrow neck of the board exits the SFP+ cage, and at point (b) where the host compliance board exits the SFP+ board edge connector.

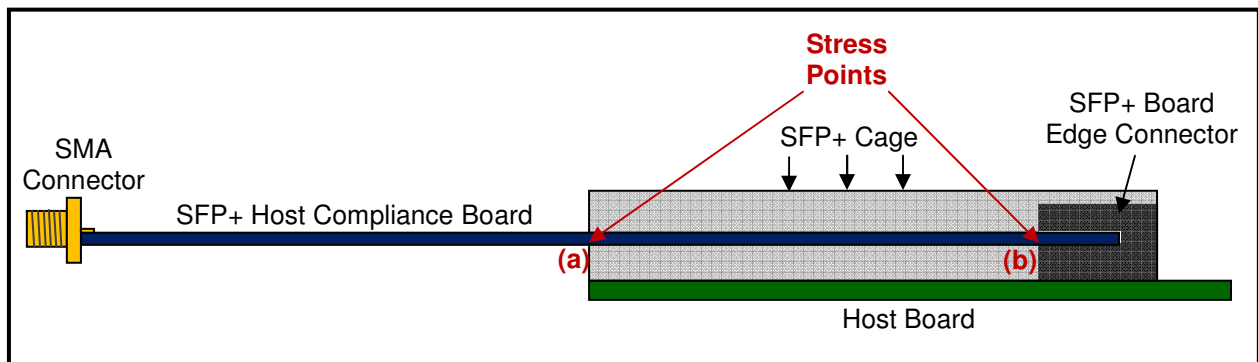


Figure 2. Side profile view of conventional host compliance board plugged into host board

The Sinc Squared SS-SFP-SMA host compliance board is enhanced by two extra layers of attached 1mm thick board material through the stressed areas of the board, as illustrated in Figure 3. In addition to re-enforcing the host compliance board to prevent breakage, these layers provide proper vertical spacing between the host board and the host compliance board so that the “gold fingers” of the host compliance board line up properly with the SFP+ board edge connector, enabling smooth insertion and damage consistent signal integrity.

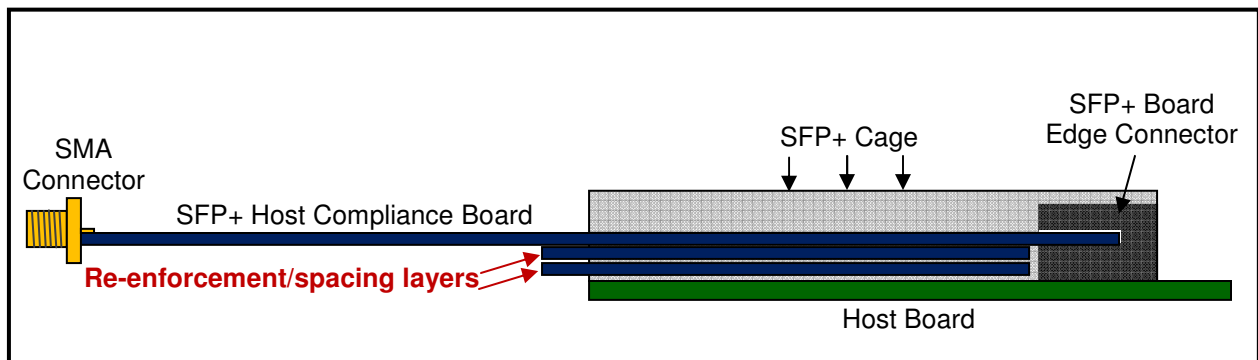


Figure 3. Side profile view of SS-SFP-SMA re-enforced host compliance board

The high-speed 50-ohm controlled impedance lines are labeled near the SMA connectors with the SFP+ standard signal names. TD+ and TD- are differential lines connected to the SFP+ host transmitter, meaning that these are the high-speed outputs. RD+ and RD- are the differential lines connected to the SFP+ host receiver, meaning that these are the high-speed inputs.

The VccT and VccR test points connect to the transmitter 3.3V power and receiver 3.3V power supplied by the host board. These can be used to verify the voltage levels supplied by the host. The VccT and VccR LEDs illuminate to indicate that the host is providing power.

Similarly, the RS0, RS1, and TX_Dis test points connect to outputs from the host board and can be used to measure these signals from the host. LEDs connected to these signals provide visual indication of activity on these outputs from the host.

The SDA, GND, and SCL connectors provide convenient access to the bi-directional 2-wire communications interface with the host.

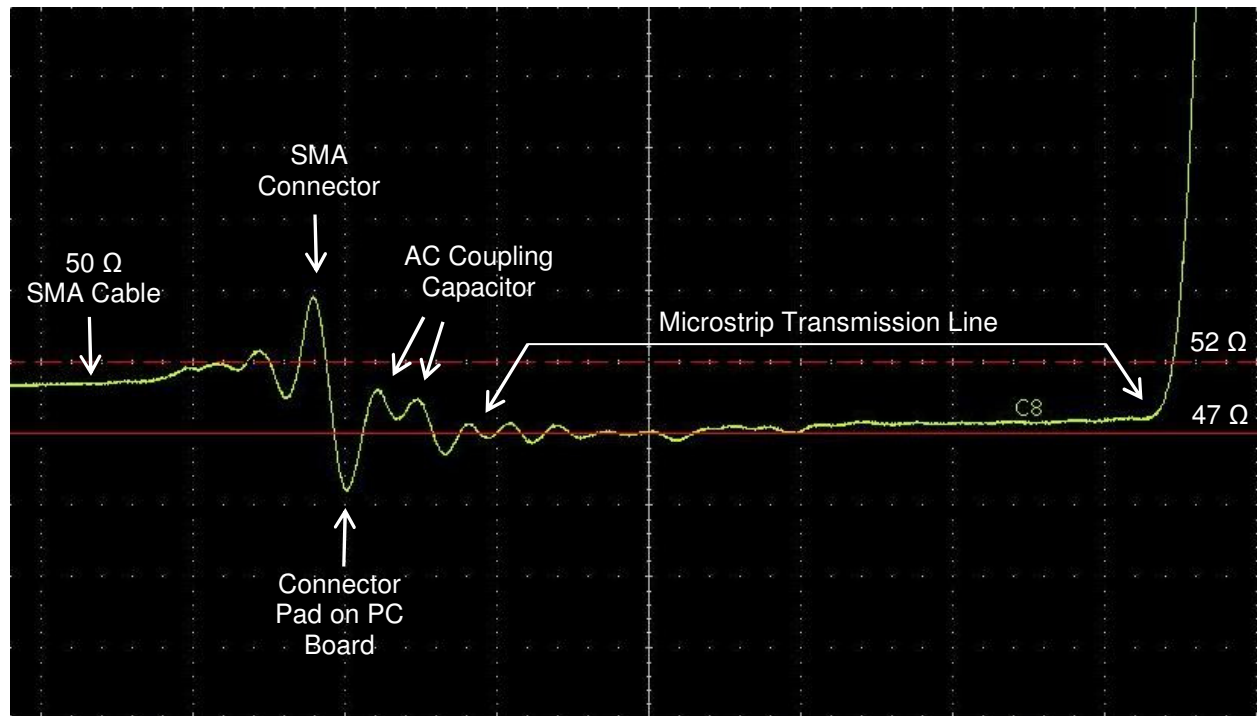
Finally, the Tx_Fault, Mod_ABS, Rx_LOS connections are digital inputs to the host and they are internally pulled up on the host board. Jumpers can be placed between these pins and ground to signal a “low” or left open to signal a “high.”

ORDERING

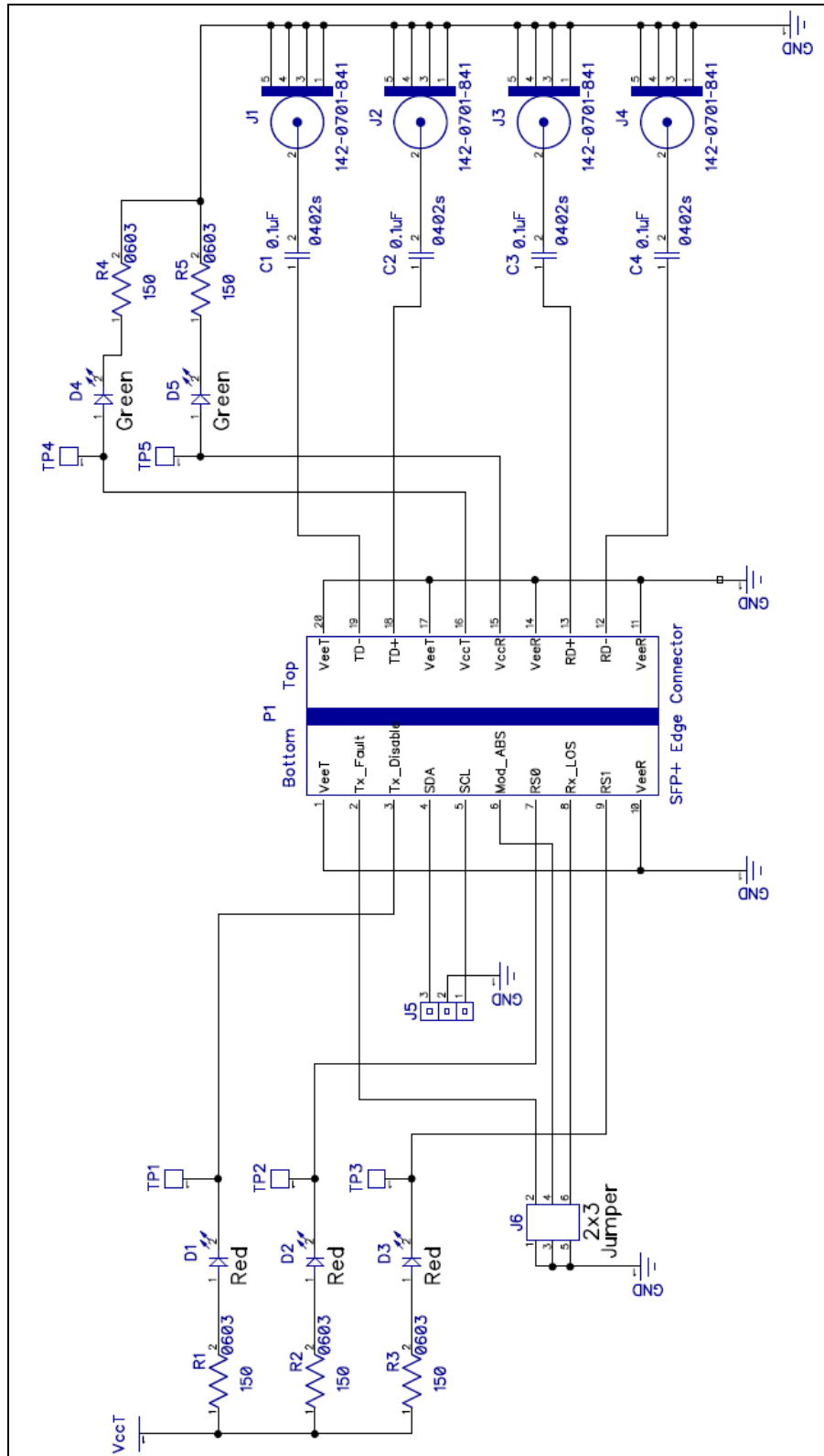
Part Number	Description	Data Rates
SS-SFP-SMA	(SFP+ to SMA) host compliance/breakout board	155Mbps to 11.1Gbps

TECHNICAL DETAILS

TDR



Schematic



Schematic Diagram: SS-SFP-SMA