High Impedance Transformer 50 Ω to 526 Ω HIT-526A

Advanced TLP/HMM/HBM Solutions

1 Features

- Combined switch for 50 Ω and 526 Ω standard and high impedance TLP measurements
- SMA interface
- SMA-to-cable interface (optional)
- DC to 2.8 GHz (−3 dB) 50 Ω bandwidth (at SMA interfaces)
- Controlled automatically by the TLP software

2 Description

The HIT-526A (Fig. 1) can be used for 526 Ω high impedance TLP measurements. If the RF switch (Fig. 2) is in the position 0 the resistor R1 is short circuit, R2 is not used, and the HIT-526A works as a through connection. If the RF switch is in the position 1 the pulse input is matched to 50 Ω with R1 and R2 plus DUT connected in parallel to ground. This mode is used for 526 Ω high impedance TLP measurements.

Figure 1: HIT-526A with SMA-to-cable interface (optional) at high impedance output.

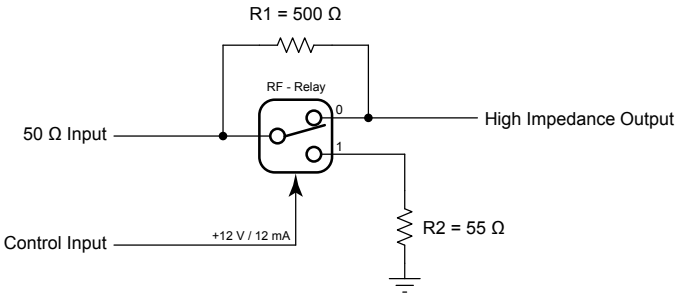

Figure 2: HIT-526A schematic diagram.

If the SMA-to-cable interface is used (Fig. 1), the bandwidth is limited and rise times ≥5 ns should be used in the TLP setup in order to avoid ringing due to the parasitic inductance. If a SMA 50 Ω line is connected to the high impedance output, the typical capacitive load of 1 pF/10 mm of the transmission line together with the 526 Ω output impedance will limit the rise time of the pulse.

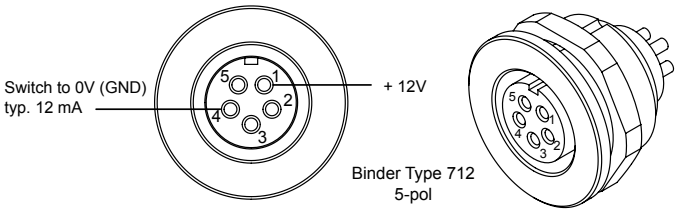

Figure 3: HIT-526A control connector pin diagram.

3 Electrical Characteristics

3.1 Frequency Response (50 Ω S-Parameter)

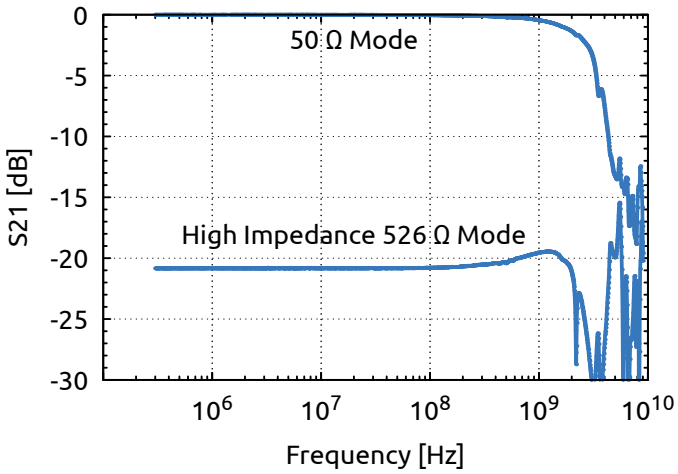

Figure 4: HIT-526A frequency response (input and output are terminated with 50 Ω).

4 Application Note

4.1 High Impedance TLP Measurement Setup using HIT-526A

The high impedance TLP measurement setup (Fig. 5) is used to investigate the DUT in a 526 Ω high impedance load line. Especially in case of snapback devices this gives more accuracy for the holding voltage and device failure levels which are more close to the values to be obtained in the high impedance HBM stress mode.

1. Connect all components, instruments and cables with part numbers shown in Fig. 5.
2. The current sensor CS-0V5-A should be mounted as close as possible to the HIT-526A high impedance output as shown in Fig. 6. Please check the correct direction of the CS-0V5-A (arrow) for positive current output signal polarity.

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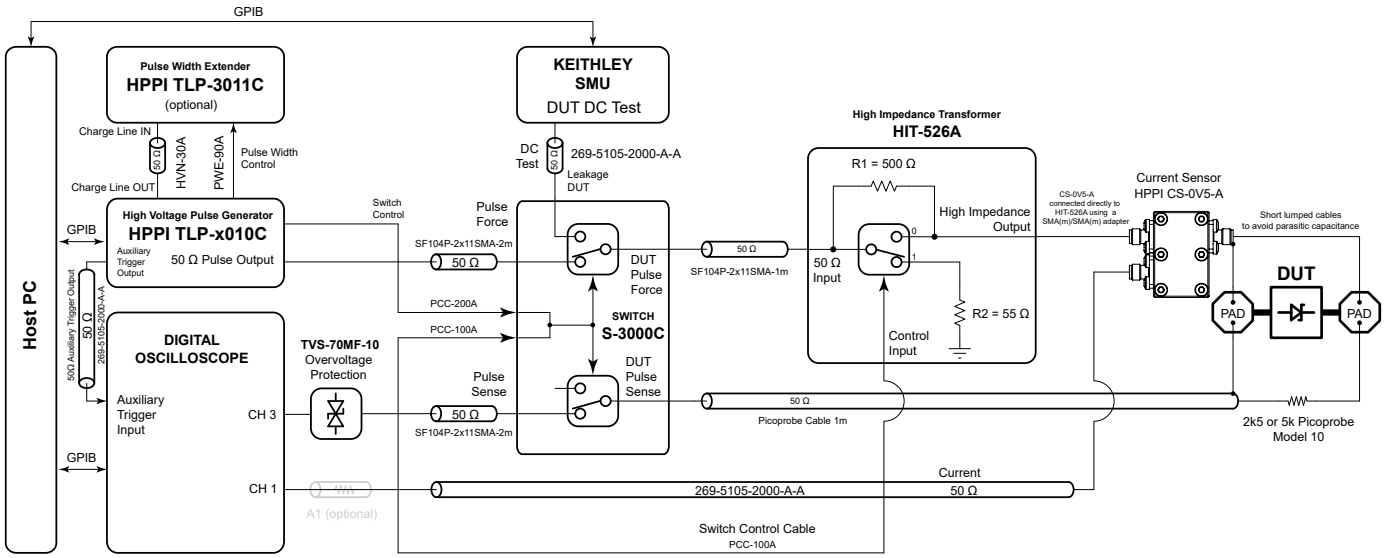

Figure 5: High impedance TLP on-wafer measurement setup.

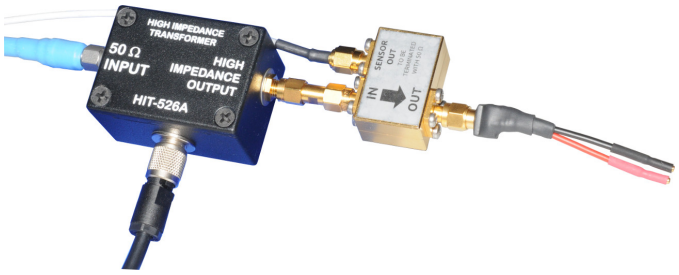

Figure 6: CS-0V5-A current sensor directly connected to the HIT-526A high impedance output.

3. Keep cable length from the current sensor output to the DUT as short as possible since a 50 Ω transmission line adds 1 pF per 10 mm, which may deteriorate the measurement result. For PCB or packaged device measurements the short cables (Fig. 1) can be used for low parasitics interconnections.

4. Choose the appropriate adaptor from leakage test cable 269-5105-2000-A-A with SMA (male) to the source meter input/output. There are different possibilities e.g. at Keithley: Triax to BNC to SMA or 2 x 4 mm to BNC to SMA.

5 Ordering Information

Pos.	Description	Part No.
01	High Impedance Transformer (50 Ω to 526 Ω)	HIT-526A

General

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