

TN001 ESD Target Adapter Line Calibration Method



Figure 1 Model A4002-N ESD Target Adapter Line

1. Calibration Objective

The objective of this report is to calibrate the ESD target adapter line and check its performance and compare the results to the requirements of the IEC 61000-4-2 standard.

Requirements from IEC 61000-4-2 standard:

The 50ohm conical adapter line connects the 50ohm cable to the input of the ESD target. Geometrically, it smoothly expands from the diameter of the 50ohm coaxial cable to the diameter of ESD target. If the target is made such that the impedance calculated from the diameter ratio d/D not being equal to 50, the target adapter line shall be made such that the outer diameter of its inner conductor equals the diameter of the inner electrode of the current target. The impedance is calculated considering the dielectric constant of the material that fills the conical adapter line (typically air). **The target adapter line shall show an impedance of 50ohm +/-2% from DC to 4GHz. The reflection coefficient of two target adapter lines face-to-face mounted shall be better than 30dB up to 1GHz and better than 20dB up to 4GHz while the insertion loss shall be less than 0.3dB in the same configuration.**

2. Measurement Setup and Results:

In the test, two identical ESD target adapter lines are mounted face to face and connected to a calibrated network analyzer.

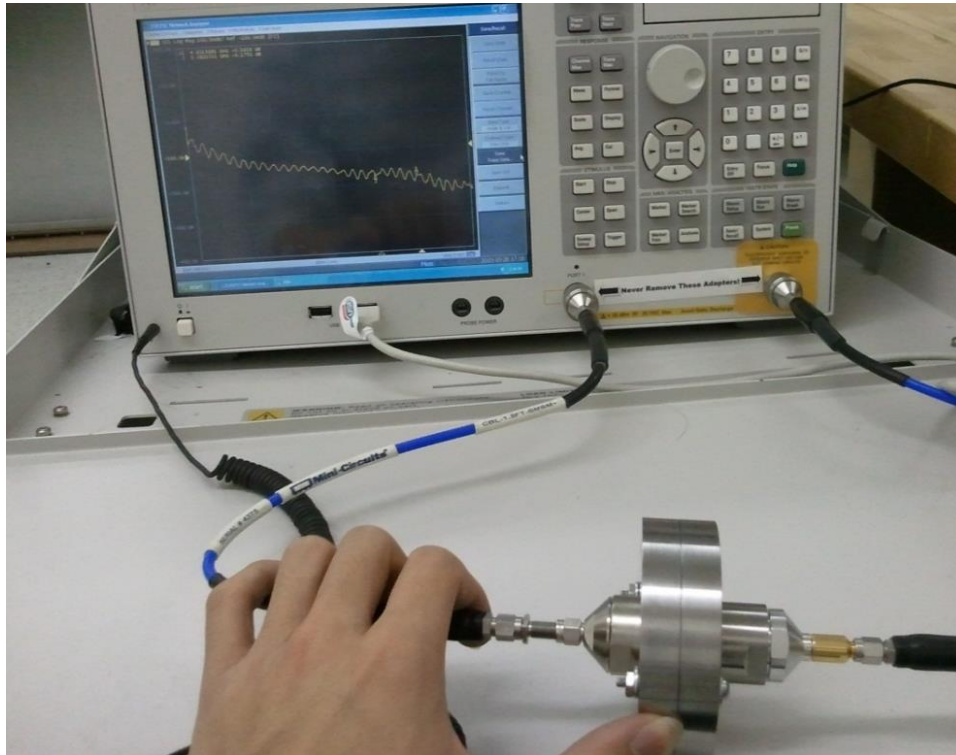


Figure 2 Face-to-face adapter line calibration test setup

The measure results, S11 and S22 values, show the reflection coefficient of the ESD Target adapter line. According to the standard:

1. The S11 or S22 value (return loss) should be ≤ 30 dB up to 1GHz and ≤ 20 dB up to 4GHz
2. The S21 value insertion loss should be < 0.3 dB.

The results below is an examples passed the Requirements from IEC 61000-4-2 standard:

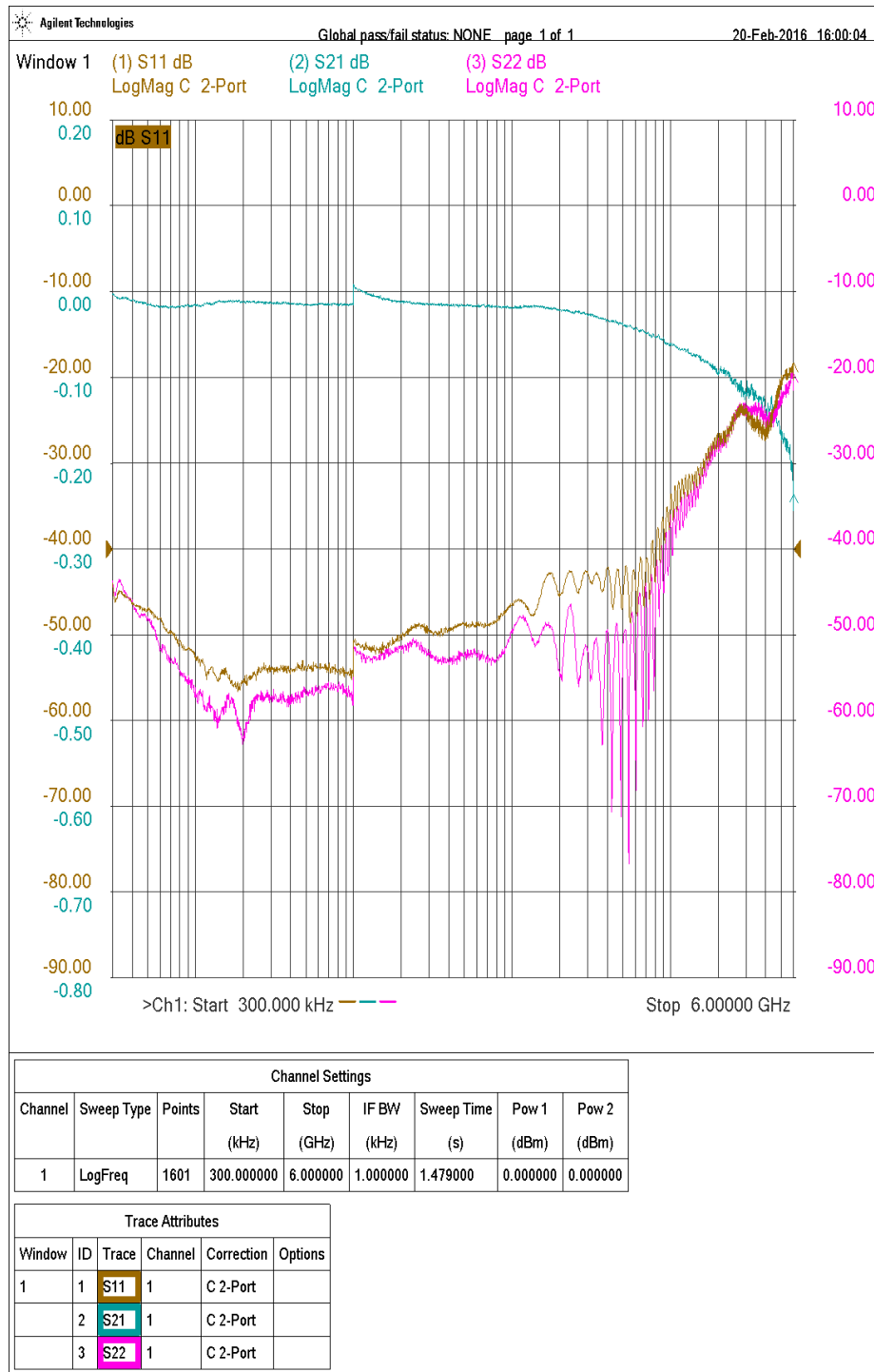


Figure 3 Insertion Loss and Reflection Coefficient of 2 Face to Face Mounted ESDEMC A4002 ESD Target Adapter Lines