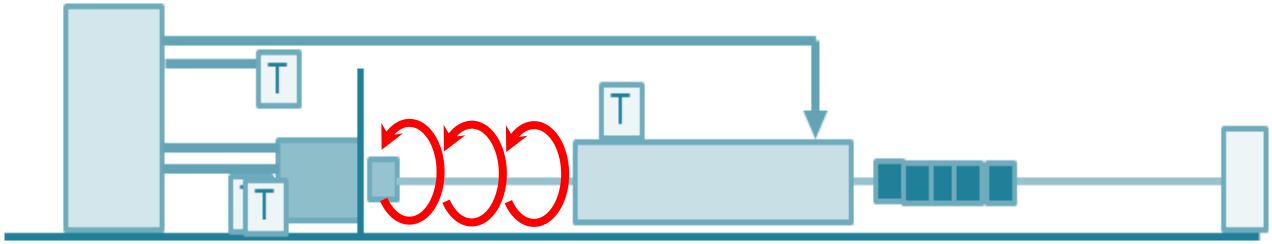
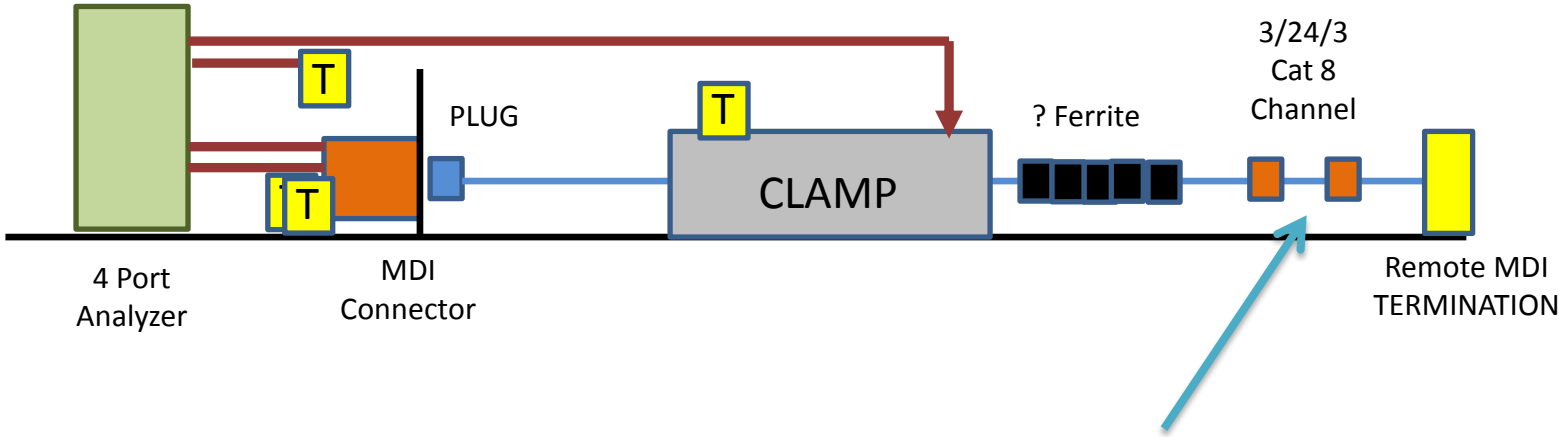
Evaluation of ferrites and channel management for 113 test



The original proposed test used only a cable and ferrites to contain shield currents to the localized test area and prevent significant currents propagating out to the far side, reflecting and adding to the variability of the test

A full length channel was proposed for this test and comments were raised regarding the requirements on the ferrites and managing the channel placement



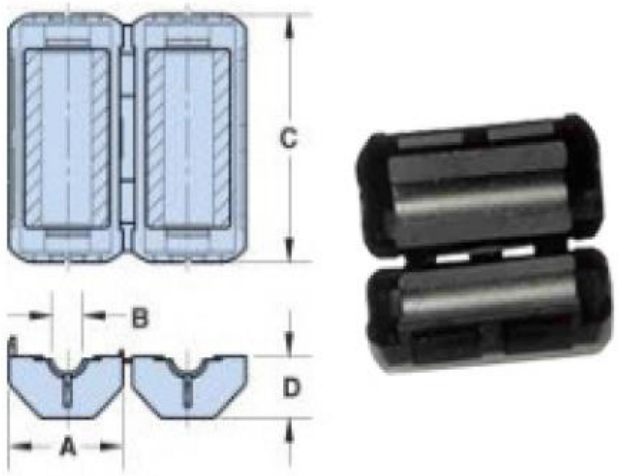
- The far side is long enough to be difficult to accurately control the shield as a repeatable transmission segment based on the test platform ground plane
- The far side contains two connections which may be grounded, and the details of the grounding can be varied since they are panel based connections

Evaluation step 1:

Test different ferrites and quantity under various channel positions

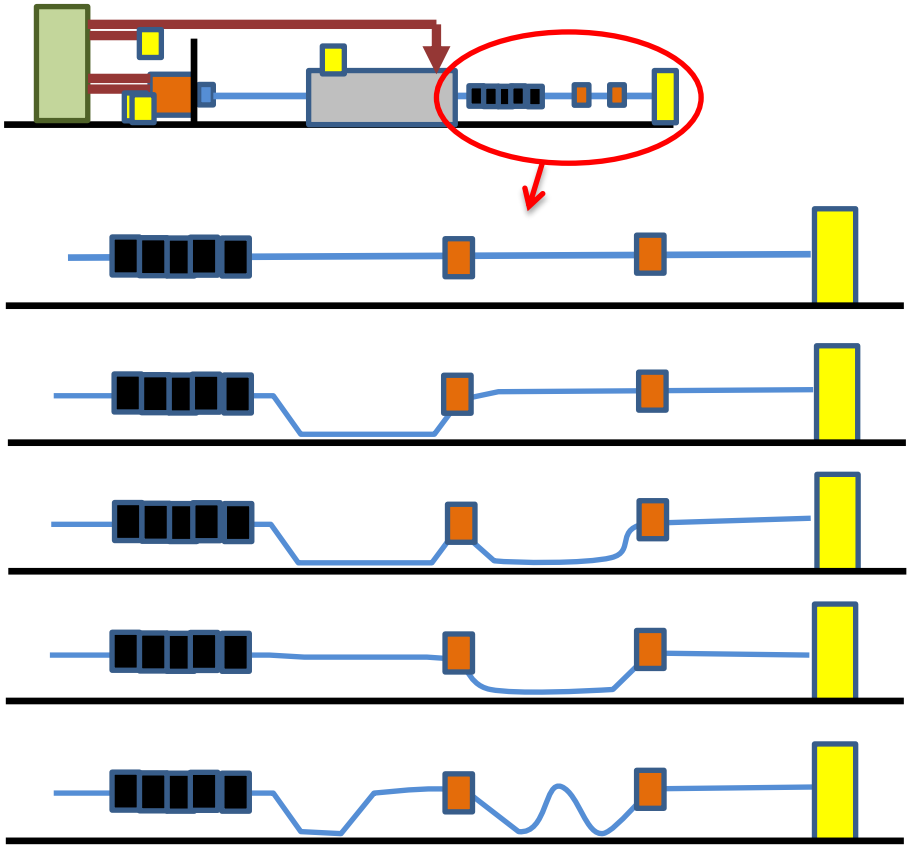
Several Fair-Rite Snap-on parts supporting the cable diameter covering different response ranges were tested –

75 Material- 0475178281
31 Material- 0431178281
43 Material- 0443178281
46 Material- 0446167281
61 Material- 0461167281



Evaluation step 2:

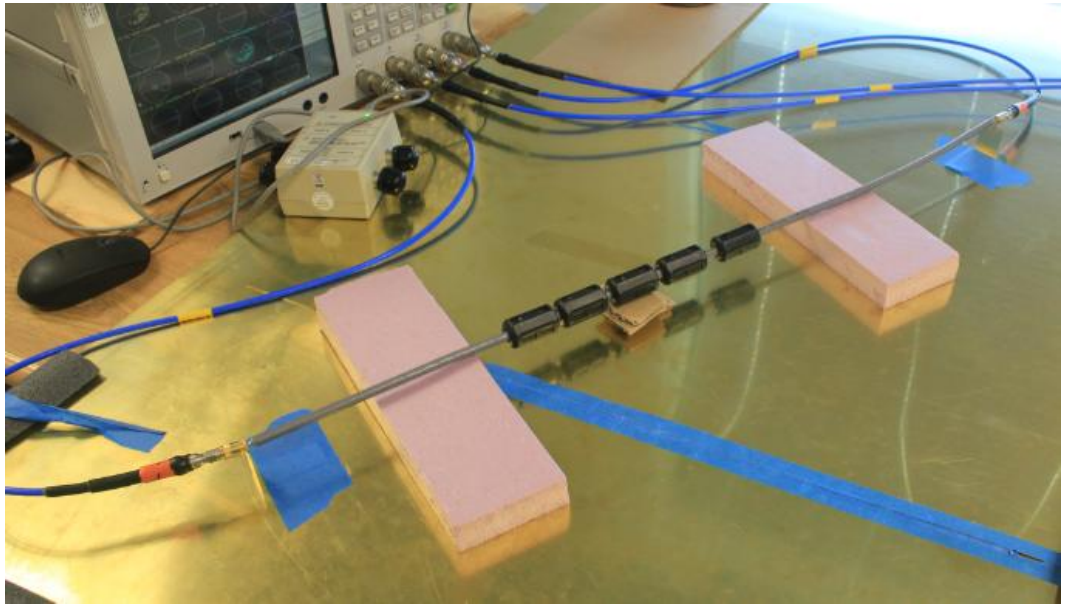
Use the most effective ferrite combination under various channel positions

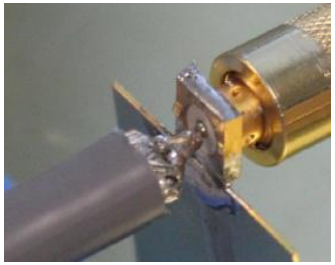


Here are 5 positional possibilities with both connectors floating

5*4=20 for 4 direct connector grounding variations

Step 1 Results



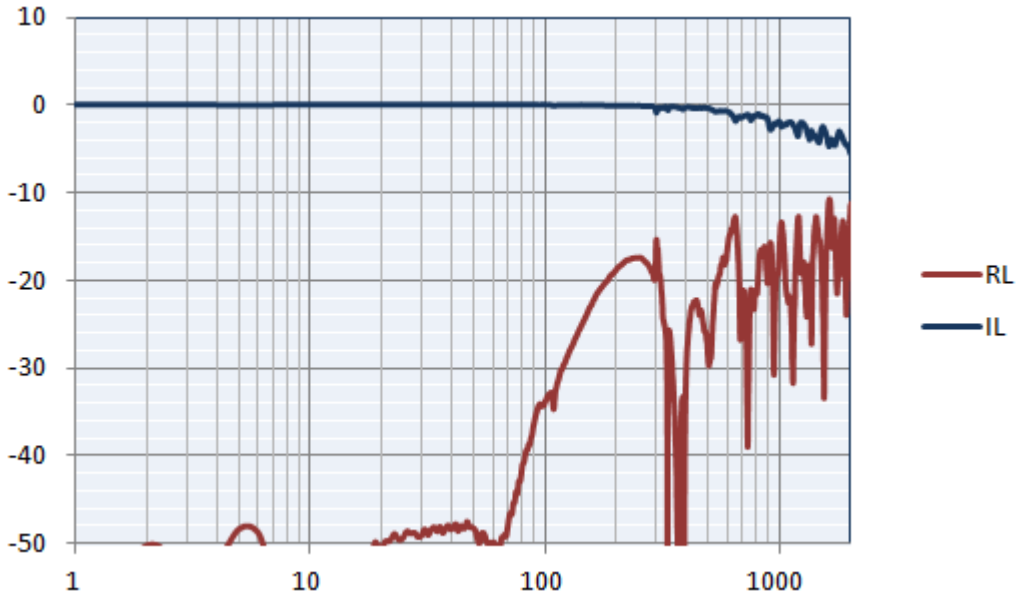


Shield driven directly through SMA ports

Shield section as 2 port measurement
(here shown with 5 ferrite clamps installed)

Step 1 Results

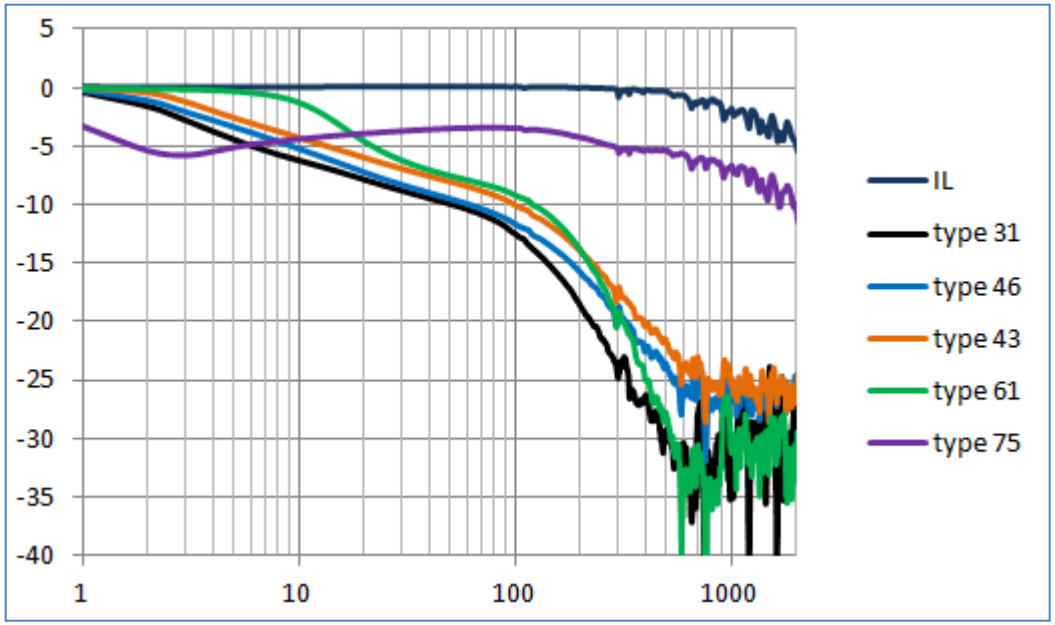
Reference measurement result without ferrites set up with SMA test heads de-embedded and port impedance set to 180 Ω (dominant mode)



Most of the residual IL and RL is likely due to the limited de-embedding and additional modes

Step 1 Results

Reference measurement compared with the different ferrites
(5 are clamped on the shield for each measurement)



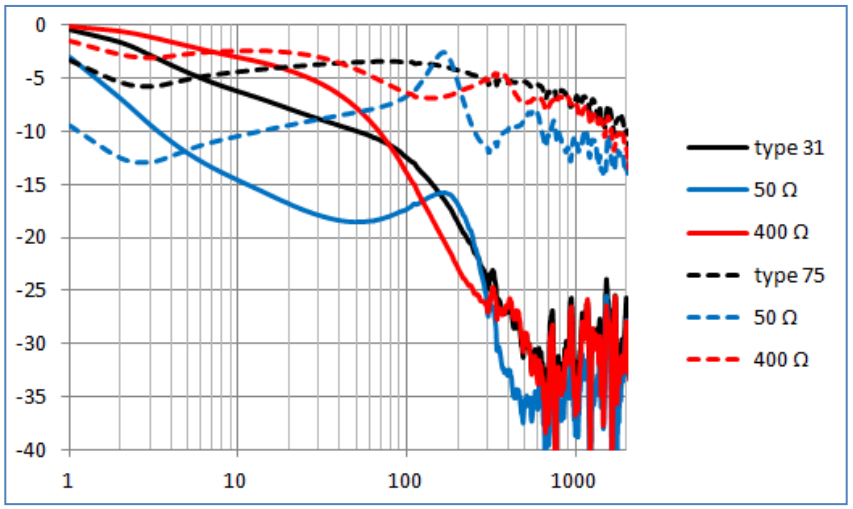
Fare-Rite posted Impedance:
75 Material- 0475178281 115@2
31 Material- 0431178281 275@250
43 Material- 0443178281 265@250
46 Material- 0446167281 275@250
61 Material- 0461167281 355@250

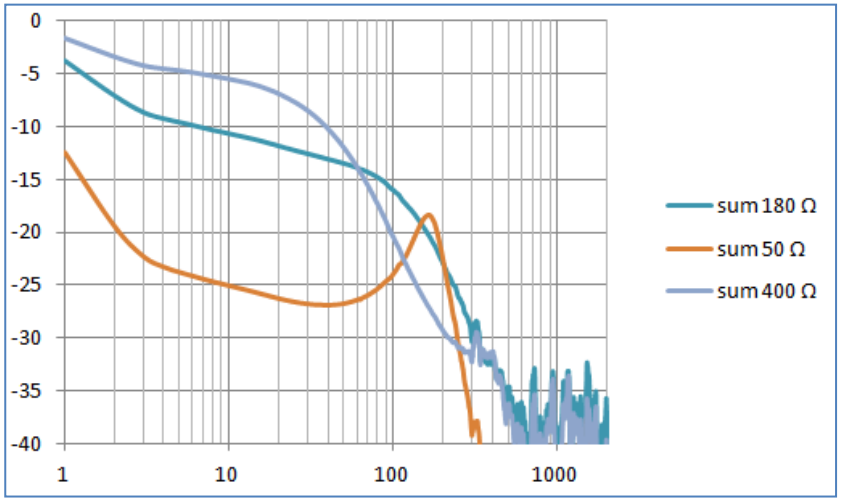
High loss is only achieved at the higher frequencies with every one but type 75

It appears that a combination of type 31 and type 75 material would cover the range, although more than 5 of each of these particular snap-ons might be needed

Step 1 Results

The left plots show the type 31 and type 75 5 ferrite loss under low and high port impedance (from the 180 Ω)





The right plot shows a summation of type 31 and type 75 material (as if 5 of each is used)

Step 2 yet to be done