LAN short cables

Balunless allows the measurement of shorter lengths

INTRODUCTION

Due to the use of baluns, usual HF test equipment cannot ensure a reasonable accuracy for a frequency range over 3 decades. AESA introduces Cobalt, a new balunless automatic test equipment based on the modal decomposition mathematical algorithms. This method enables measuring a very broad frequency range as well as very short cables, but also opens the door to many additional parameters like LCL and in-pair and individual wire parameters.

Short samples lengths are very appealing to order to lower the cost of testing and save material waste. Savings can reach hundreds of thousands of €s or $s yearly. The corresponding opportunity with Cobalt stems from the significantly lower corrections needed.

To document the possibilities and limits, AESA has made comparison tests. We first take a **99 meters** (325 feet) sample and measure it. We then cut **30 meters** (98.4 feet) and measure this new sample. Finally we cut **10 meters** (32.8 feet) and measure it again.

TEST CONDITIONS

Type of cable:	UTP Cat 6A
Frequency range:	1 – 650MHz
Nb of points:	801

The following selected graphs show results obtained with an AESA COBALT balunless automatic tester and normalized to 100m.

99m **30m** **10m**

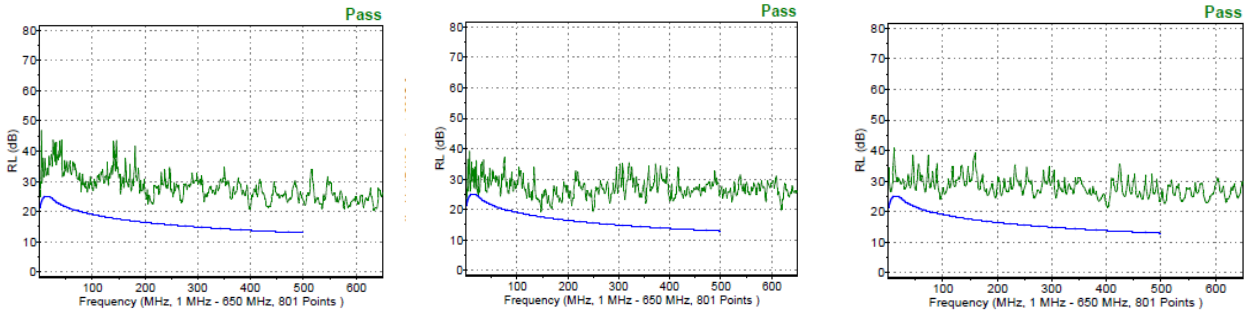

Fig 1 Return Loss test result

Return Loss: better margin for long length at low frequency due to higher IL; similar values after 250MHz because of theoretical independence of RL vs cable length

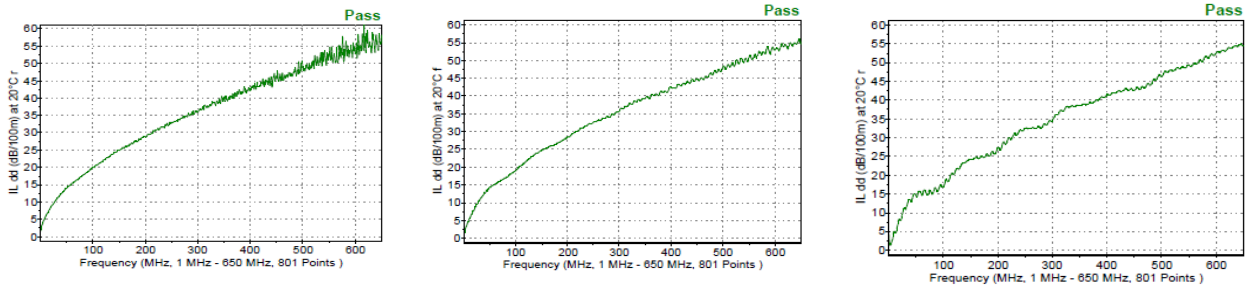

Fig 2 Insertion Loss test result

Insertion Loss: more ringing for short length (accuracy of fixture), but more noise for long length, depending on the packaging (box, reel, open air cable), especially for UTP.

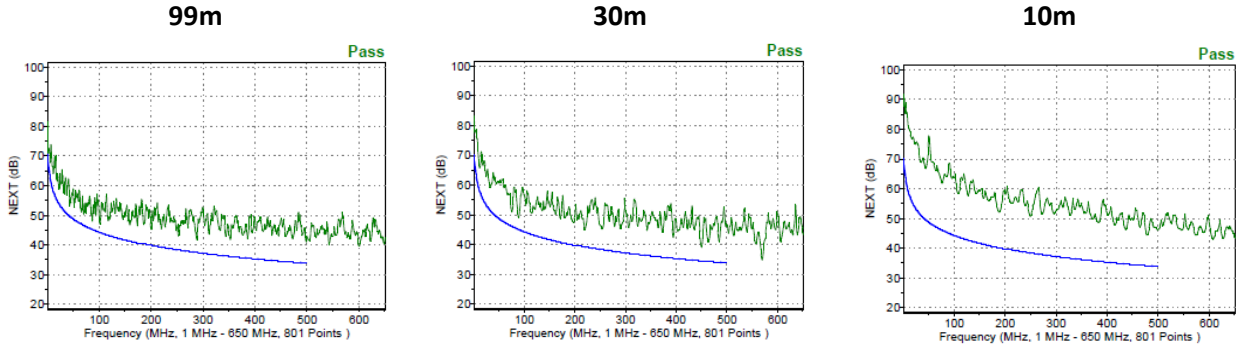

Fig 3 Next test result

NEXT: better margin at low frequency for short length. Similar results at high frequency due to higher IL and better matching with Cobalt accurate terminations loads.

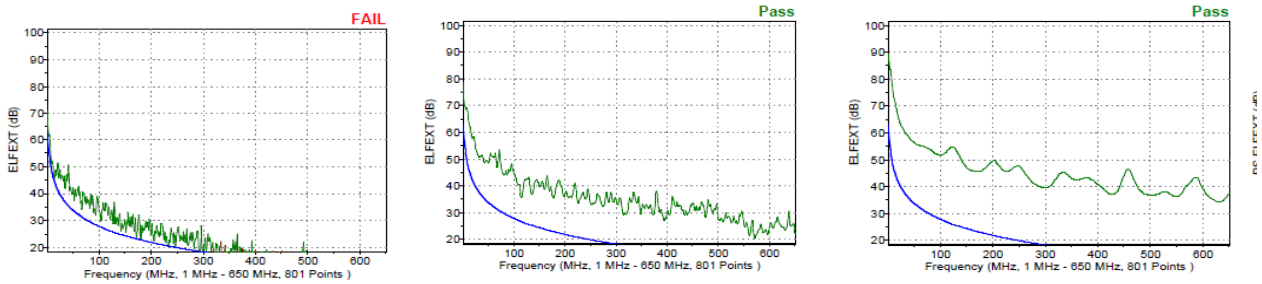

Fig 4 ELFEXT test result

ELFEXT Loss= FEXT-IL: the shorter the better result of course!

Other parameters like TCL or the phase delay give very similar results for the three lengths in consideration and are therefore less relevant for the comparison.

Fig 5 AESA Cobalt balunless system

CONCLUSIONS

The balunless test system COBALT offers many high performance features like a better accuracy and stability, better floor noise and IL dynamics as well as perfect balance and termination (for more details, please ask for our Cobalt leaflet). Its effectiveness allows also generating substantial savings on tests and material by allowing for shorter sample lengths. Test results show that 10m samples require competent interpretation but could still be attractive e.g. during the development of a new product. For 30m samples, the results are close to the normalized 100m. 30 m samples can therefore be a useful alternative for production testing, even if reference and acceptance tests remain on the 100m standard.

Dick Gigon, R&D Manager, AESA Cortaillod
Denis Milz, Senior Sales Manager, AESA Cortaillod