VIAVI Solutions

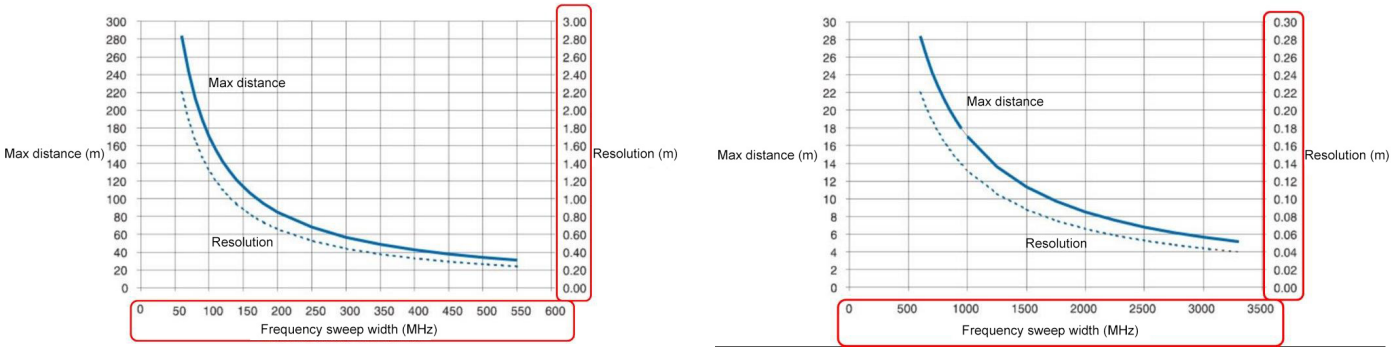
Case Study

Analyzing DTF and VSWR Efficiently with the CellAdvisor JD720C

Alternate DTF band feature enables simultaneous measurements

Selecting the appropriate frequency range is not as obvious as it may seem. For return loss measurements, the specification usually calls out the frequency range over which the data is to be taken. For distance to fault (DTF) analysis, the resolution and maximum distance range are dependent upon the frequency sweep range, the number of frequency data points, and the relative propagation velocity of the cable being tested. Therefore, the frequency range must be chosen carefully.

For checking DTF on transmission lines, a large frequency span is desirable to highlight potential faults or areas of performance degradation (better resolution). However, there is a constraint that limits the frequency range: the maximum distance is inversely related to the frequency range.



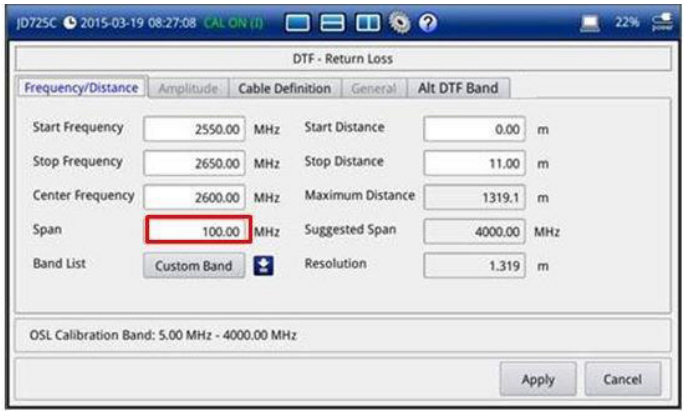
Examples of maximum distance and resolution vs. frequency span (V_p = 88%)

Background

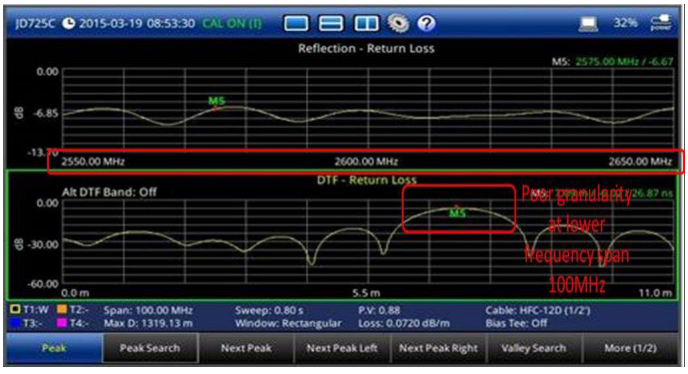
As part of installing and commissioning a Tier-1 NEM cell site, technicians in Germany performed return loss/VSWR and DTF tests. The two tests, reflection measurements (return loss or VSWR) and distance to fault, are carried out over different frequency bandwidths. For reflection tests, the bandwidth of the test is set to the frequency range over which the data is to be taken. However, to get a better resolution of the DTF test, it is done over a much wider frequency span.

Challenge

Previously, to execute both the reflection and DTF tests simultaneously was a challenge. Either the cell technicians had to compromise on return loss accuracy or they had to run the two tests separately, slowing down the troubleshooting process. This was adding unnecessary time to the installation process.



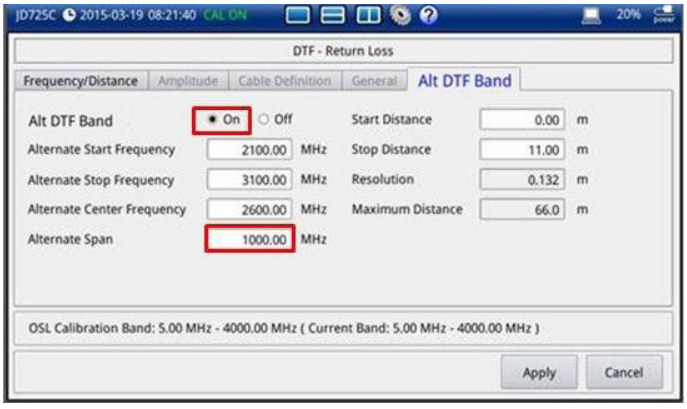
100 MHz alternate band settings



Poor results from a relatively narrow frequency span

Solution

The VIAVI Solutions JD720C cable and antenna analyzer offers an alternate band configuration for DTF tests. This valuable feature lets cell-site technicians run two independent sweeps for the reflection and DFT measurement—saving valuable time with one-time frequency settings and calibration.



Wider, 1000 MHz alternate band settings

Improved results from a wider frequency span

VIAVI Solutions

Contact Us **+1 844 GO VIAVI**
(+1 844 468 4284)

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visit viavisolutions.com/contact

jd720c-cs-cpo-nse-ae
30179605 000 1215