Santec's Swept Photonics Analyzer (SPA-100) Facilitates Solid State FMCW Lidar Development With OFDR Technology

Application Note AN-101 Rev C

Topics

- **Lidar technology**
- **Photonic integrated Circuits**
- **Optical Frequency Domain Reflectometry**
- **Silicon Photonics**

The utilization of lidar technology is rapidly expanding, with a growing push to implement photonic integrated circuits (PICs) as a replacement for larger mechanical lidar systems. One such PIC is being developed at Yokohama National University by M. Kamata and T. Baba.

During the design qualification process, researchers detected interference on the received signal and were unsure of its origin. After ruling out external sources, they realized that the internal structure of the device needed to be examined. However, visual inspection under a microscope did not provide any answers. Further analysis of the waveguide's optical properties was necessary.

The compact size of the PIC made traditional measurement methods, such as an OTDR (optical time domain reflectometer), unsuitable due to their coarse spatial resolution. Instead, the SPA-100, which utilizes OFDR technology and has a fine spatial resolution of less than 5μm, was chosen for the analysis.

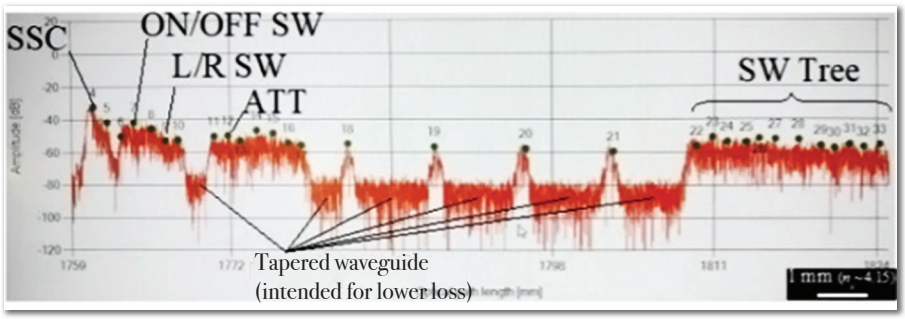

Figure 1: Reflectance scan of Lidar PIC using the santec SPA-100

Using the SPA-100, researchers were able to obtain previously unattainable details about the device's internal structure. Upon analysis, the SPA-100 revealed high spurious reflection points within the device, which were spaced approximately 6.5mm apart. These reflection points were found to correspond to tight waveguide bends located on a section of the circuit with zigzag waveguides.

The SPA-100's capabilities enable researchers to improve the PIC design with precision and accuracy, resulting in a faster development turnaround and quicker release of the product to the market.