

Final Report Summary

Study into the Real-World Performance and Scope for Manufacturing of a Simple, Low-Cost MEMS Switch Device for WSS Applications



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Ovisor Technologies Ltd develops DWDM products to serve the telecommunications market. Recently Ovisor demonstrated and patented a series of significant cost reductions in a compact and colourless (any wavelength to any network), Drop and Continue (D&C), Wavelength Selective Switch (WSS) for the low cost, high volume fibre to the home market.

Market dynamics means that Carriers such as BT, Verizon, etc. need operational expenditure savings whilst catering for increased traffic demands. This has moved the Carriers towards agile optical networks that provide both operational flexibility and adaptability. The WSS is central to the idea of the agile optical network. It allows for remote, on-the-fly provisioning of bandwidth (i.e., moving the optical traffic between fibres of different networks) without the need for costly manual intervention.

Ovisor's WSS is unique in the market. It is the only low-cost, small port count WSS that offers fully colourless operation as well as D&C operation (where a small part of the optical power is dropped, while the remaining power continues on.) To the Carrier, this allows for multicast (or broadcast) enabled networks, the basis of the growing Video-On-Demand market.

The architecture of the WSS (based on "components off-the-shelf" to minimise cost) was devised with the goal of simplifying the most expensive aspect in the system – the optical switch – while retaining full colourless operation. Ovisor then collaborated with iSLI to study the real-world performance and scope for manufacturing of a simple, low-cost MEMS switch device. Ovisor chose iSLI for this collaboration given their wealth of MEMS design experience and access to a proactive cost competitive design/foundry.

The project:

- Successfully applied Finite Element Modelling to the problem of the performance trade-offs between possible actuation / drive schemes. A design now exists that meets the performance specifications adopted at the start of the program. Crucially, the device has an operating voltage a full order of magnitude lower than first envisaged.
- Successfully demonstrated the performance of the candidate design against a set of generalised foundry fabrication rules. Arising from this is a top-level fabrication plan, wherein the dominant issues where the subject of a risk analysis exercise.

Successful completion of the project has finalised the WSS offering and demonstrated a realistic, cost-effective colourless WSS proposition; two vital components in gaining confirmed customer interest and critical to gathering investment.

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