

Improve Throughput and Maintain Performance with the ILX Lightwave Integrated Carrier Solution (ICS)

Introduction

A primary and valid concern when using high volume laser diode test systems to test and burn-in numerous devices is device handling. Manually loading and unloading multiple devices into a test fixture is not only cumbersome, but also increases the potential of device damage and can greatly inflate overall test times. In addition, thermal and electrical results can be compromised when devices are moved amongst various test stages, each with its own unique interface to the devices under test (DUT).

To address these concerns, ILX Lightwave has designed a revolutionary integrated device carrier solution (ICS) that:

- Is transferrable from one test stage to the next
- Ensures excellent thermal stability and performance during burn-in and test cycles
- Maintains the same device electrical connections between test stages
- Eliminates the necessity to manually handle devices
- Speeds up the loading/unloading process
- Streamlines the overall test process
- Reduces device damage susceptibility



Figure 1 – ICS for a Chip on Carrier (CoC) package

The ICS has been designed to work with our ILX Lightwave LRS-9434 Reliability and Burn-In systems, LMS-9406 Limited Monitoring Burn-In systems, and LCS-9408 Characterization Station and, as mentioned above, is transferable from one test system (stage) to another. This is not only convenient for the user, but also can provide a significant reduction in overall device test times and component damage through repeated handling. These factors result in an overall higher device throughput and lower operational costs during the reliability testing process.

Excellent thermal performance is another feature that has been designed into the ICS. Unlike competitive offerings that are mechanical device carriers only, the ICS includes a Nickel-plated Aluminum base that provides stable and accurate temperature control of each device location and reduced thermal resistance between the device and the base. The devices remain secured to the base under constant applied force while loaded in the ICS. Consistent thermal resistance and repeatable performance are, therefore, maintained across test stages and throughout various system locations.

Maintaining independent electrical connections at each individual device is yet another advantage the ICS provides. Carriers that are mechanical in nature rely on the electrical connections at each individual test stage to provide the required stimulus and response. With the ILX integrated carrier solution, however, the electrical signals to each device are housed on the ICS itself, ensuring consistency and repeatability in test results independent of each individual ILX test stage. Therefore, any noticeable

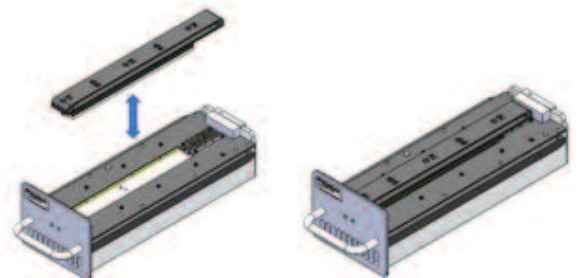


Figure 2 – ICS mounting on a test fixture base

changes in device performance are contributable to the device itself and not a function of the control or measurement electronics associated with different systems/stages.

In ILX's modular test system architecture, a fixture is used to house devices that are controlled and monitored, based upon user defined test parameters. Up until now, it was generally required that an end user manually load and unload devices into each fixture. To eliminate that requirement, the ICS was designed to be a unique stand-alone module that would load onto a fixture or directly onto a characterization plate once populated. Separating the ICS from the fixture now makes it conducive to use pick and place machines to automate the loading/unloading of devices. Not only is this faster and more convenient but it also reduces device handling requirements – thus reducing any additional potential for device damage. Figure 2 showcases how the ICS is mounted and removed from an example test fixture base, significantly decreasing the carrier's footprint. The ICS handling size can be further reduced by removing the DUT guide mounting base from its top clamp electrical contact assembly, as shown in Figure 3.



Figure 3 – Expanded ICS with exposed device mounting locations

Summary

In summary, the ICS from ILX provides a revolutionary means to simplify the loading/unloading of devices, allows a single carrier to be used across multiple test stages, and provides the repeatable thermal and electrical performance you have come to expect with ILX test system products. Not only does this streamline the overall device testing process from an end-user's perspective, it also reduces susceptibility of device damage and decreases test times – ensuring both test results and throughput are optimized.

