

LASER WELDING FOR PIGTAILING AND PACKAGING OF PHOTONIC DEVICES USING SINGLE BALL LENS.

Fadhali M*, Sakitioto, Zainal J., Munajat Y., Ali J. And Rahman R

Institute of advanced Photonic Sciences,

Faculty of Science

University Technology Malaysia

81310 Skudai, Johor, Malaysia.

Fax: 006075566162

e-mail: mohamedfadhali@yahoo.com

Abstract:

In this paper we present some investigations and analysis of various parameters that contribute for increasing the coupling efficiency of laser diode of single mode fiber coupling using single ball lens coupling scheme. The fiber attachment process and the fixing of various coupling components have been performed in what is so called active alignment process, where the system continues measuring the coupled power during the process of coupling and welding of (lens holder, fiber ferrule and welding clips). Nd: YAG laser welding system (**LW4000S** from Newport) has been used for the alignment and welding of the coupling components. We also studied the effect of axial, lateral and angular misalignment on coupling efficiency of the proposed coupling scheme. Our results showed a significant relaxation in misalignment tolerance using ball lens for coupling with optimum coupling efficiency of about 65% at optimum working distance. Results of optimizing laser beam parameters to get good welds with small heat affected zones (**HAZ**) such as (variation of weld dimensions with changing of laser beam parameters) are also presented.