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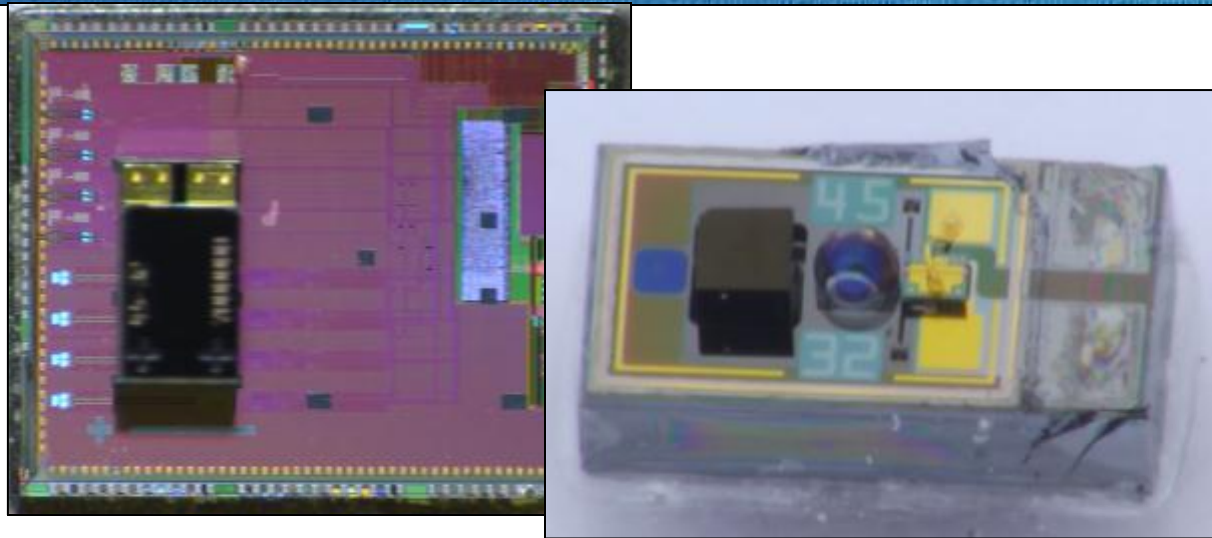
Reverse Costing analysis



Molex Active Optical Cable Luxtera Silicon Photonic Chip + MEMS Laser Source Module

November 2012- Version 1

Written by: Sylvain HALLEREAU

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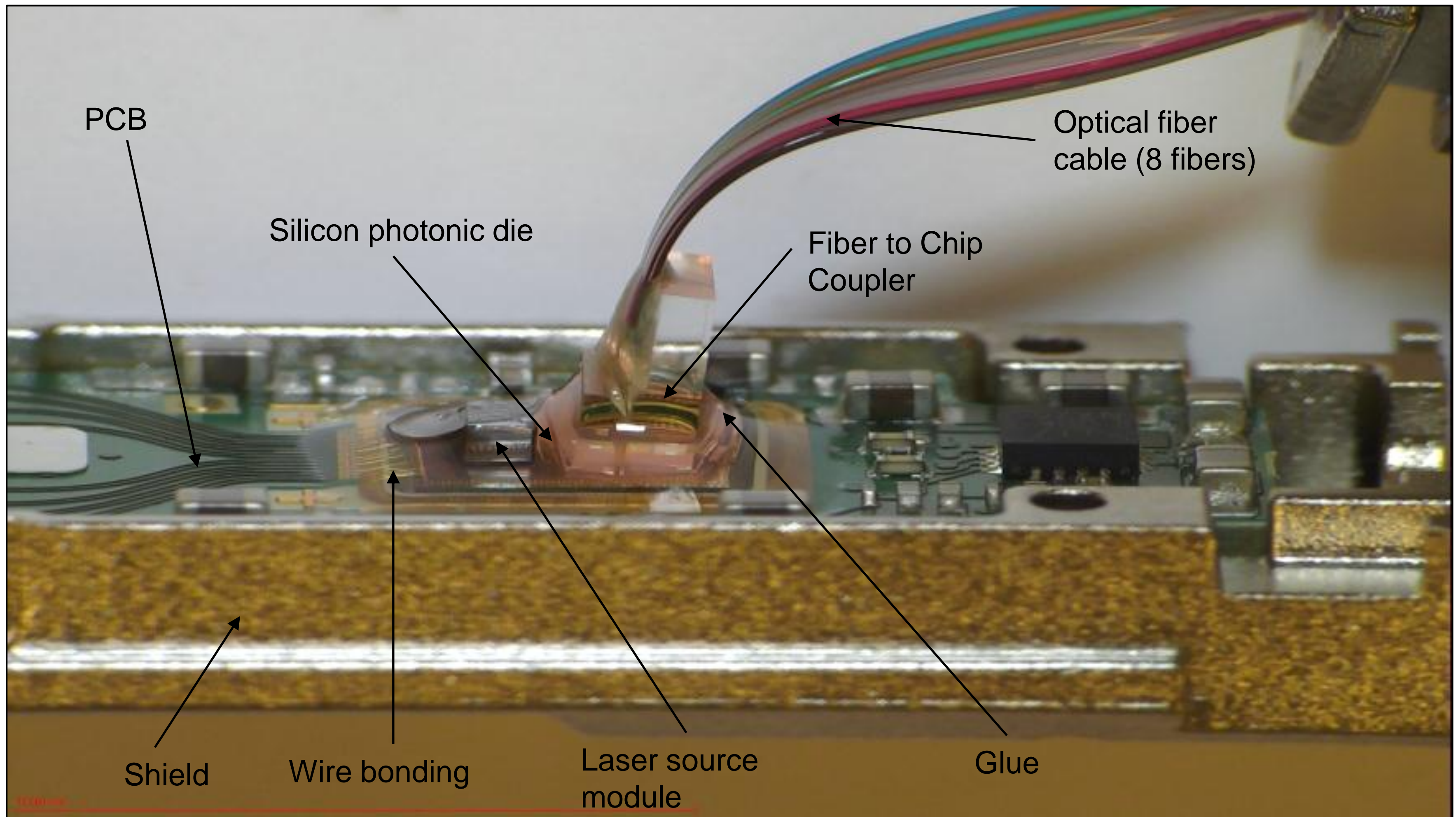
Optical Fiber Coupling



Optical fiber coupling – tilted view

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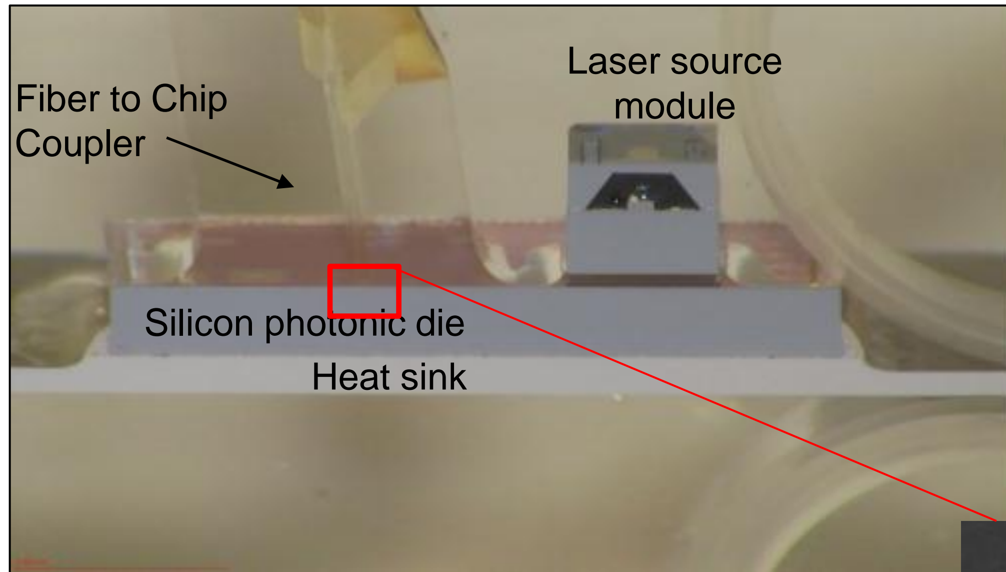
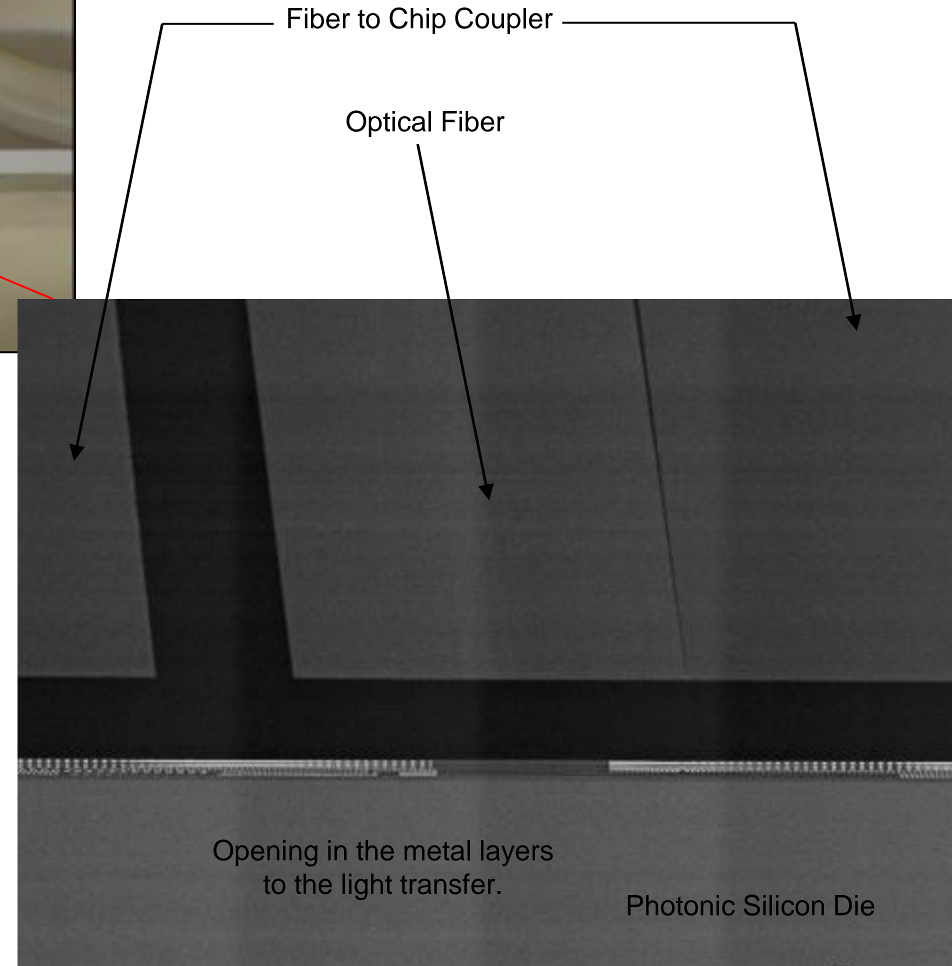
Fiber to Chip Coupler



System cross-section : Optical View



Detail cross section : SEM view

- The Fiber to Chip Coupler is composed of two plastic parts. The small part has 8 grooves to hold the optical fibers.

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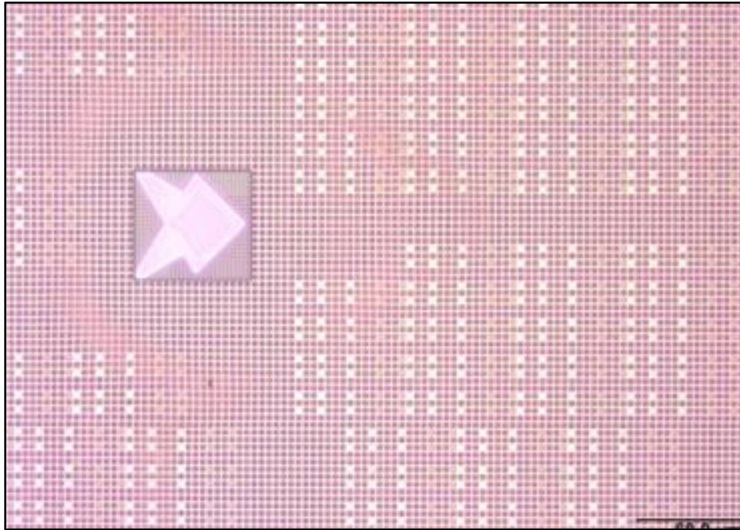
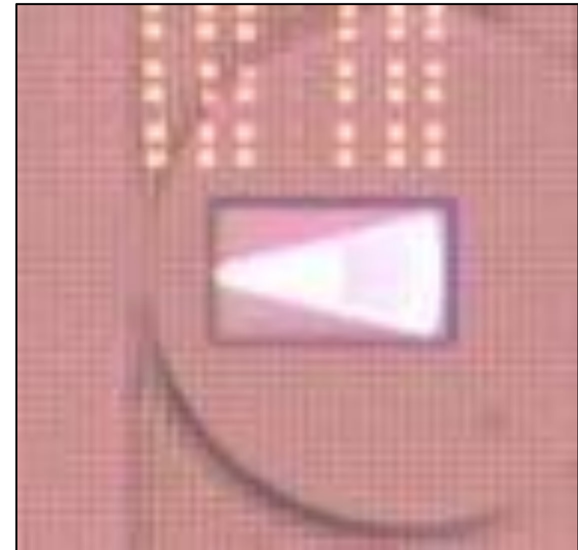
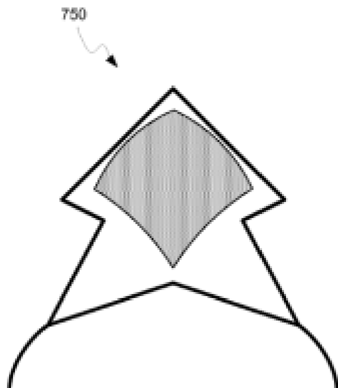
Grating Couplers



Polarization Splitting Grating Coupler (PSGC)



Output light grating coupler



The PSGC may enable the coupling of an incoming light signal and generating 2 signals in the silicon waveguide.

The grating coupler may enable to emit the light toward the optical fibers.

Fig. 7 patent WO xxxxxxxxx

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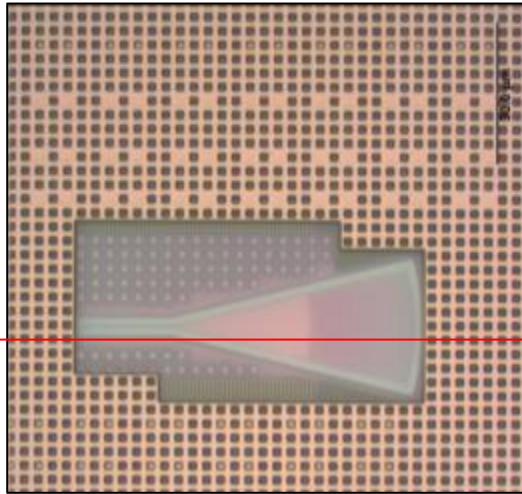
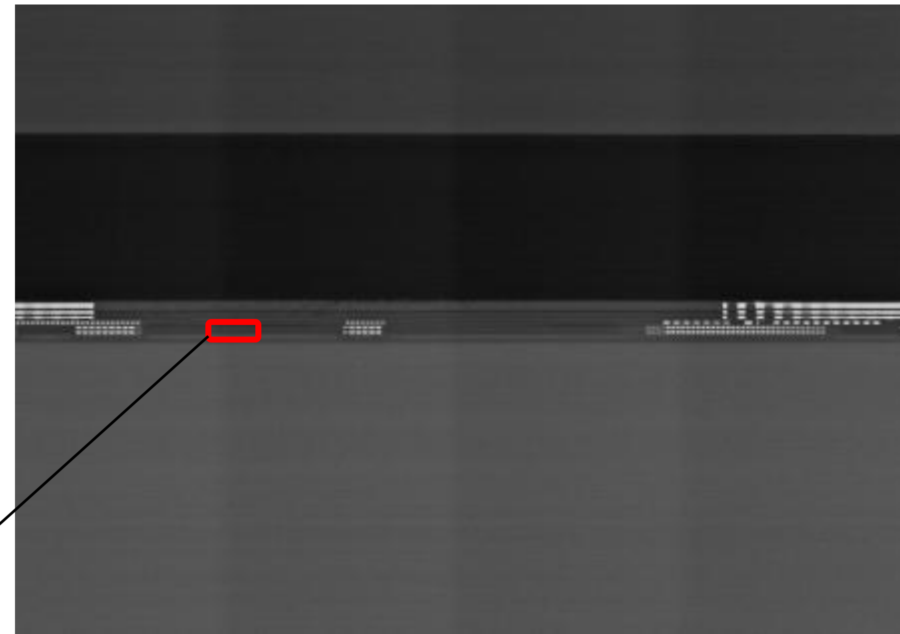
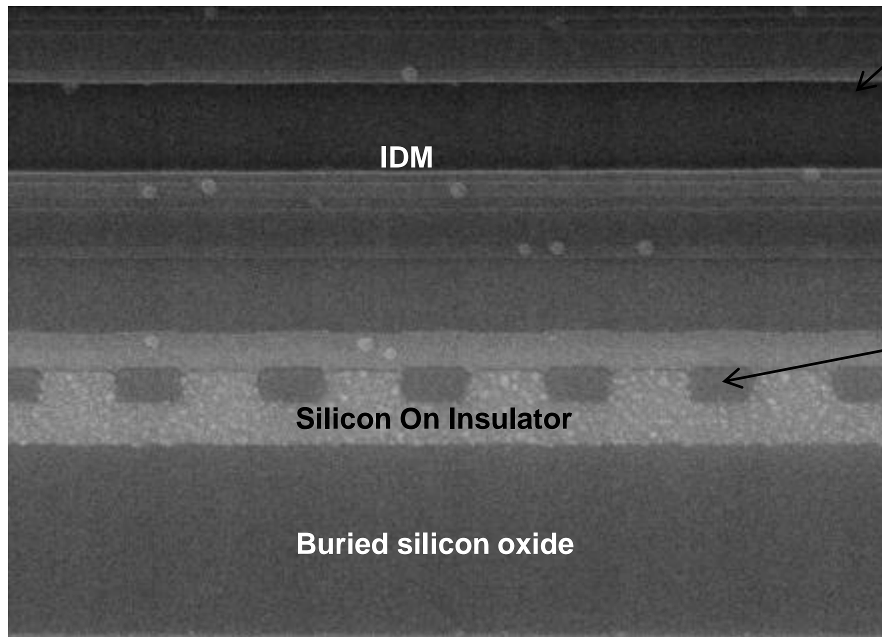
Grating coupler – Cross-section



Cross-section



Grating Coupler - Cross-section



Detail Grating Coupler - Cross-section

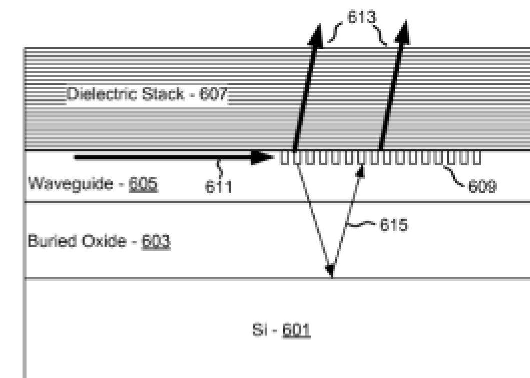


Fig. 6 patent WO xxxxxxxx

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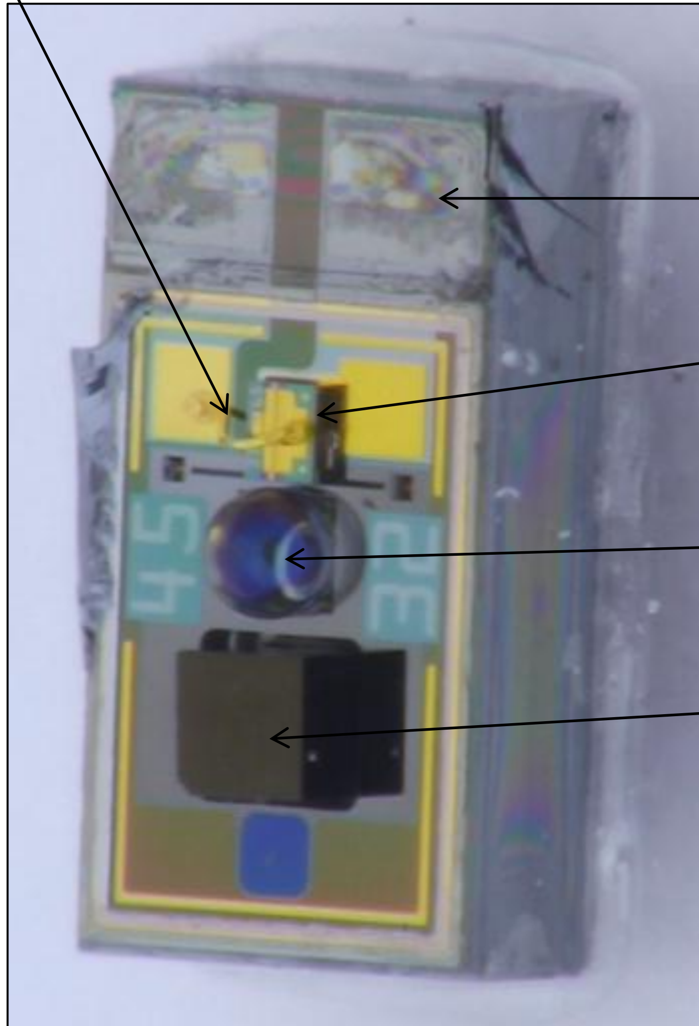
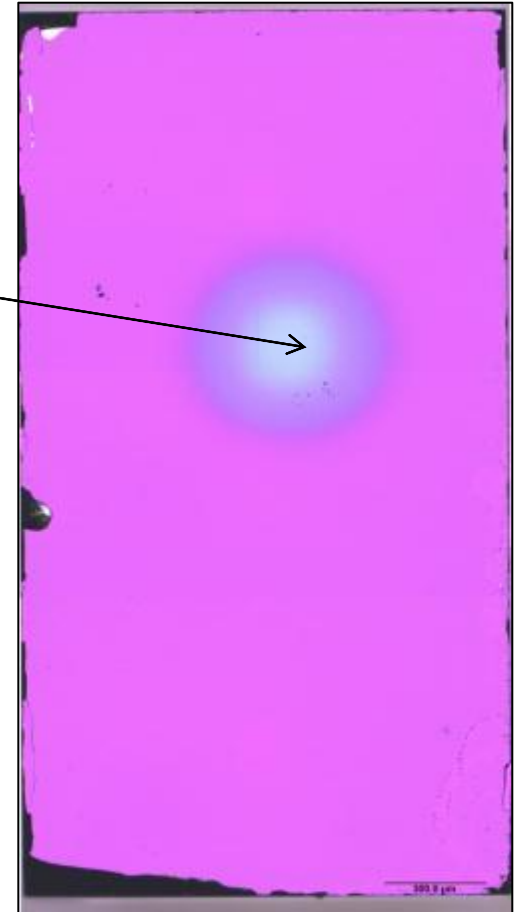
Laser – Ball Lens – Faraday Rotator



Laser Module after Lid removed : Optical view



Photonic die side of the Laser Module

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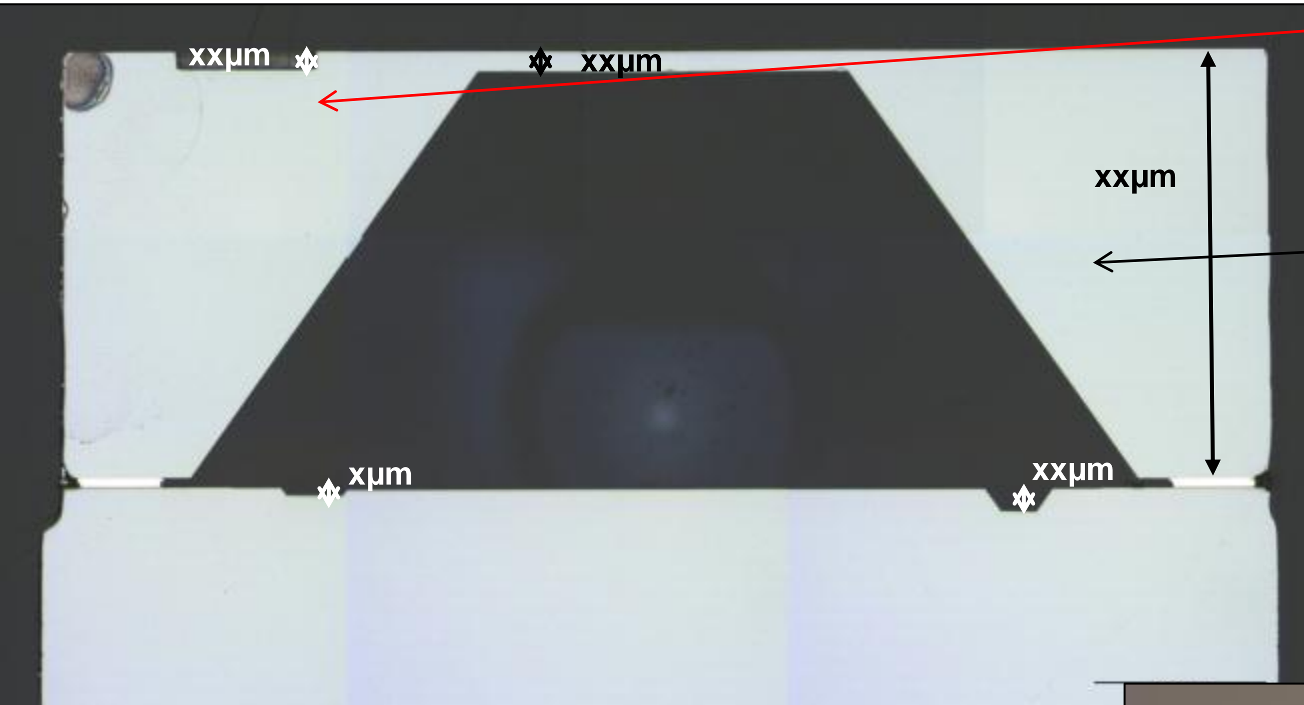
Lid

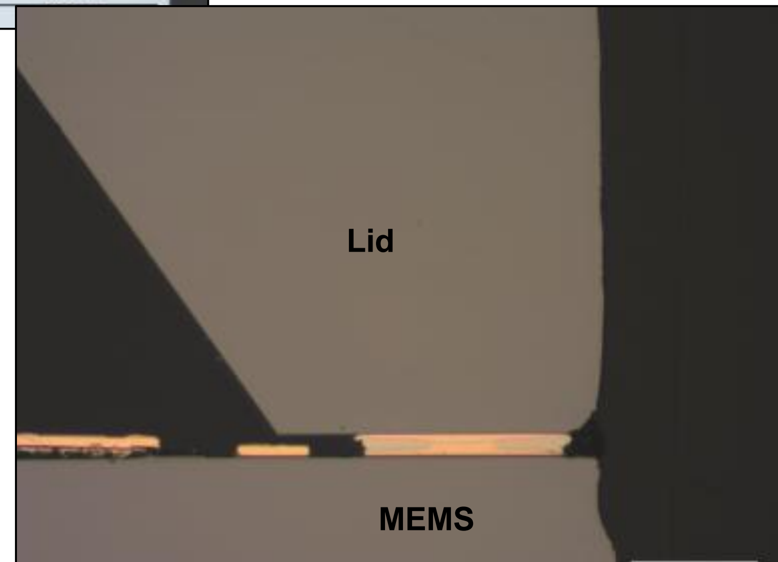


Mark on the top etched in the silicon

Lid
Thickness :xxµm

Lid cross-section : Optical view

The Lid and the MEMS are sealed using gold solder.



Metallic sealing

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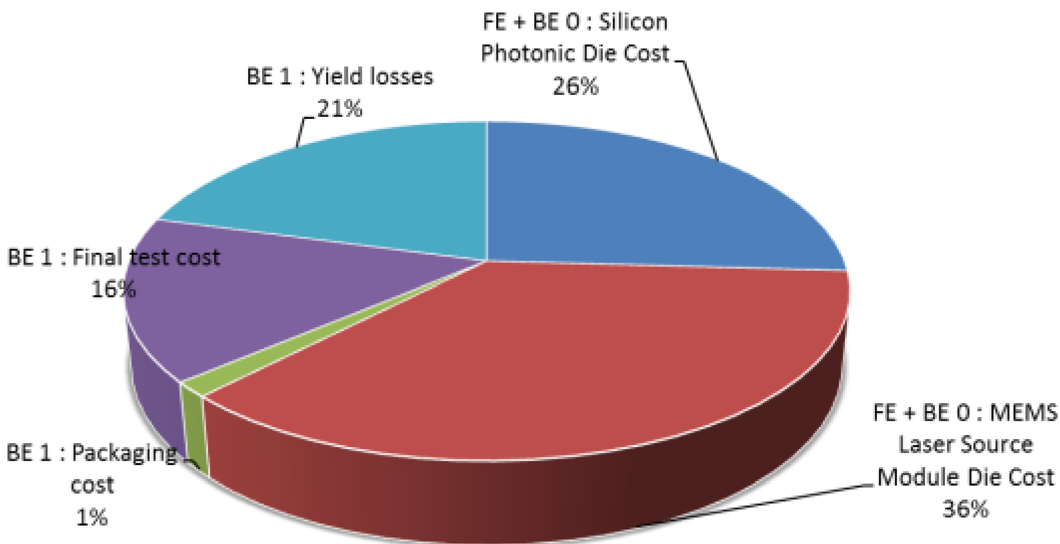
Photonic Component Cost

	Low Yield		Medium Yield		High Yield	
	Cost	Breakdown	Cost	Breakdown	Cost	Breakdown
FE + BE 0 : Silicon Photonic Die Cost						
FE + BE 0 : MEMS Laser Source Module Die Cost						
BE 1 : Packaging cost						
BE 1 : Final test cost						
BE 1 : Yield losses						
40Gbps Photonic component cost	**$0,000**	**0%**	**$0,000**	**0%**	**$0,000**	**0%**



- **The final die cost ranges from $xxx to $xxx according to yield variations.**
- **The back-end 0 cost (probe test and dicing) represents x% of the cost of the die.**
- **The yield losses costs due to probe and dicing represents xx% of the total manufacturing cost.**
  - **The die cost includes the rejects at probe test and dicing.**
  - **The yield losses represents the defective dies which are rejected.**

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Conclusion

• This reverse costing analysis represents the best cost/price evaluation given the publically available data, completed with industry expert estimates.

• Given the hypothesis presented in this analysis the major sources of correction would lead to a +/- 10% correction on the manufacturing cost (if all parameters are cumulated)

- **IC +/- 8%**
- **MEMS +/- 5%**
- **Optical +/- 10%**
- **Test +/- 20%**

• These results are open for discussion. We can re-evaluate this circuit with your information. Please contact us:

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