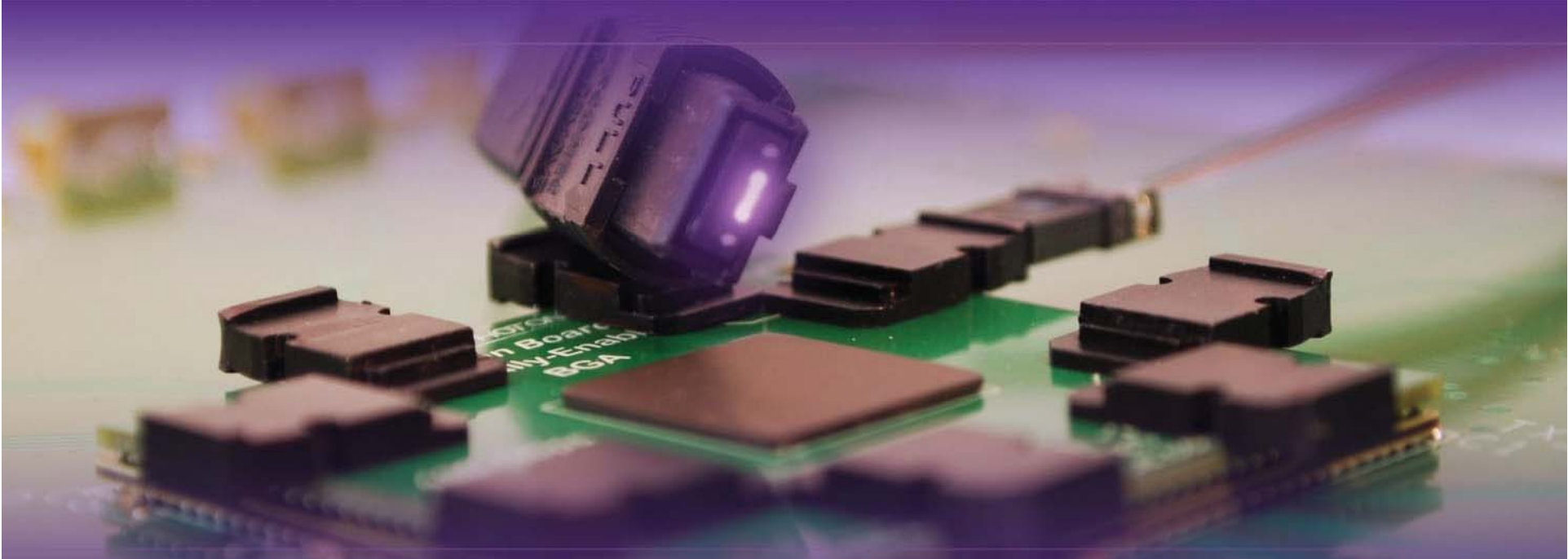


Reflex Photonics Inc.  
The *Light on Board*® Company



Maximizing short-reach optical density using  
Light on Board

**REFLEXPHOTONICS™**

Presenting: Robert Coenen

# The Problem

- ASICs are becoming more and more powerful, capable of processing multiple gigabytes of data per second which is leading to the problem of:

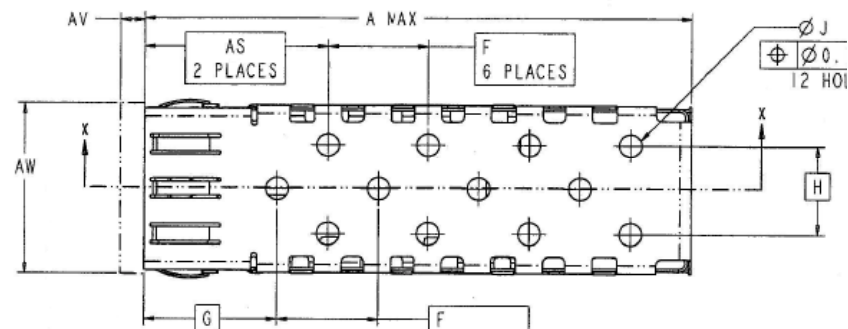
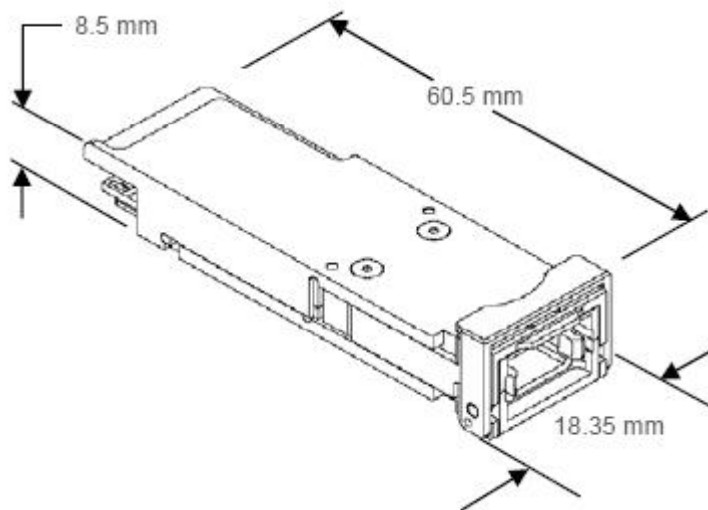
**How to get such large amounts of data  
into and out of the ASIC?**

- High bandwidth electrical data transfer is limited by package constraints, PCB materials and physical distances between ICs, circuit boards and chassis'.
- There is a need to augment copper lines with optical fibers to increase the rate and distance at which data flows to ICs.
- This needs to be done seamlessly and at low cost.

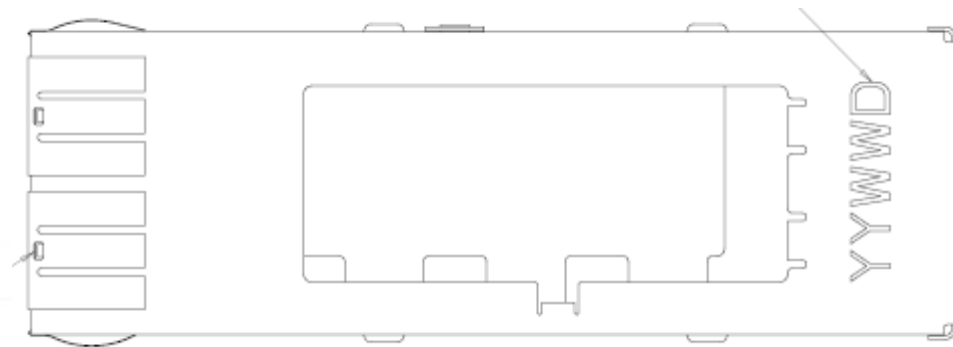
# Current optical solutions

# Current optical solutions

Existing commercial optical module form factors: SFP+, QSFP, Snap-12, and upcoming CXP and CFP.



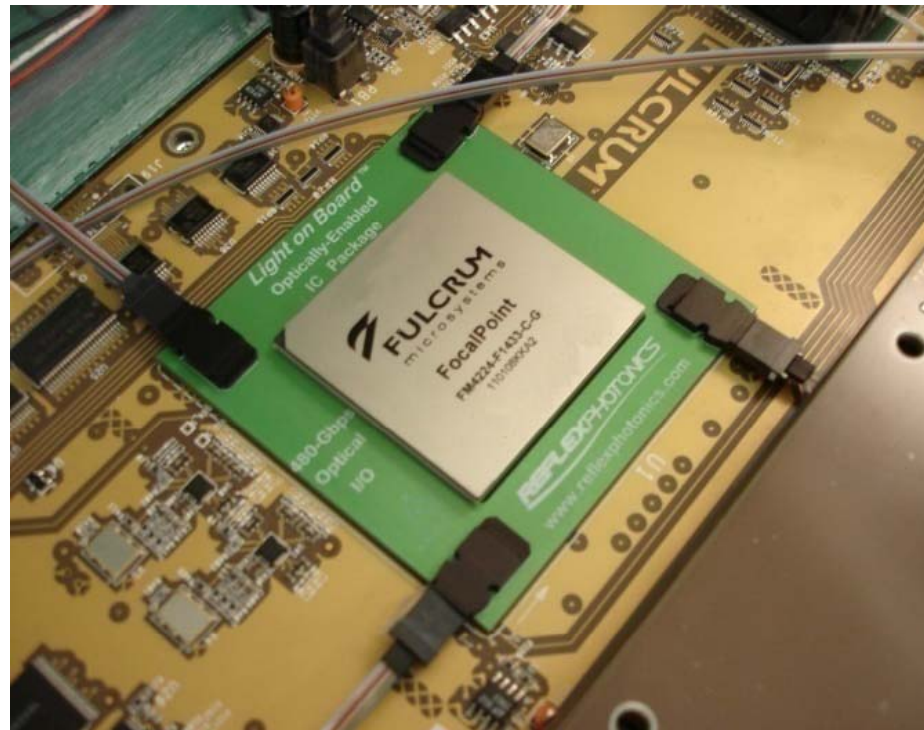
- Existing optical module packages are large and designed to address longer reaches.
- For strictly short reach applications (<300m), size and cost can be greatly reduced.



**The Reflex solution:**

***Light on Board®***

## *Light on Board*®



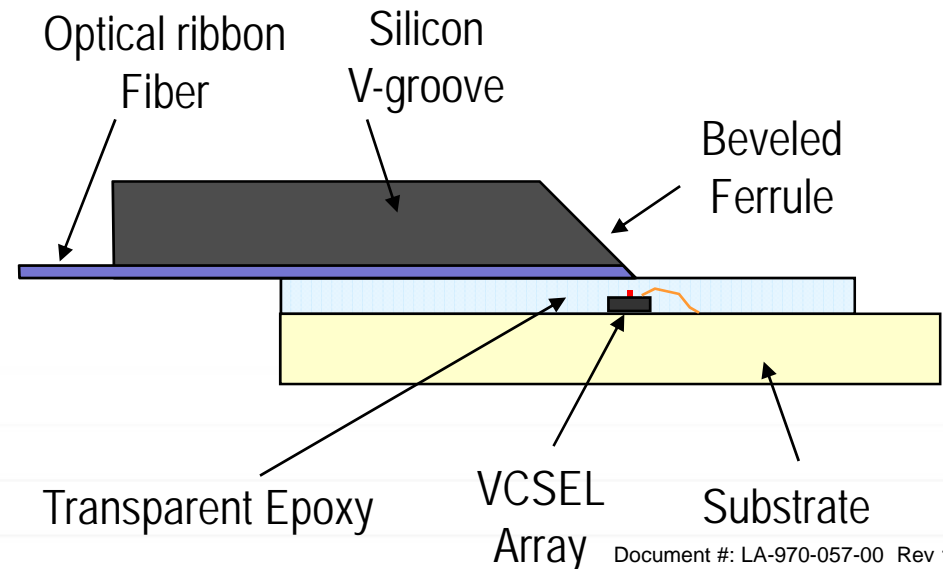
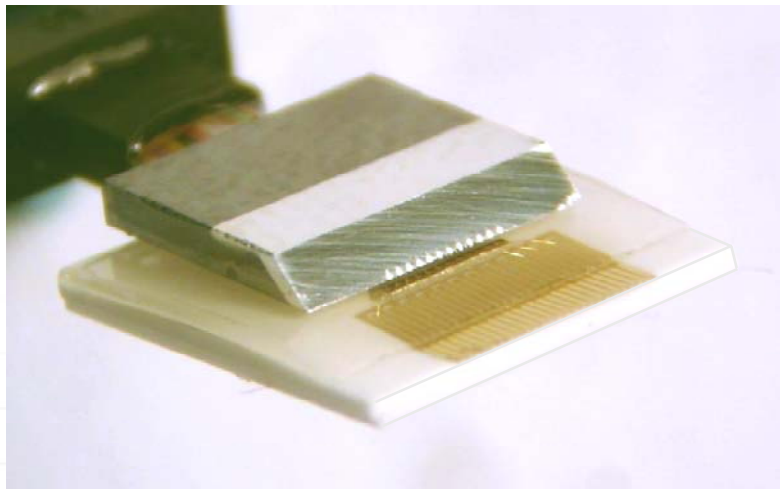
Tiny, low-profile optical engines (*LightABLE*™) mounted on a daughtercard with existing commercial ICs and employing 12x parallel ribbon fiber.

# ***Light*ABLE™ Core Technology**

# LightABLE™ Core Technology: Optical Sub Assembly (OSA)

REFLEXPHOTONICS™

- Modular
  - Planar Assembly → Low Profile
  - No Microlenses → Single Alignment Step
- Very low cost, pre-aligned, and small sub-module
  - Essential for parallel optic modules



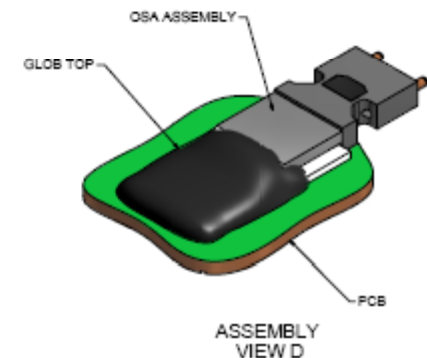
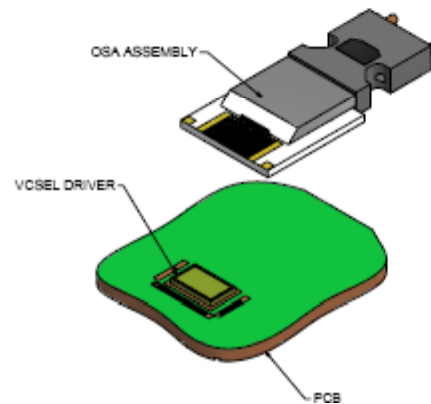
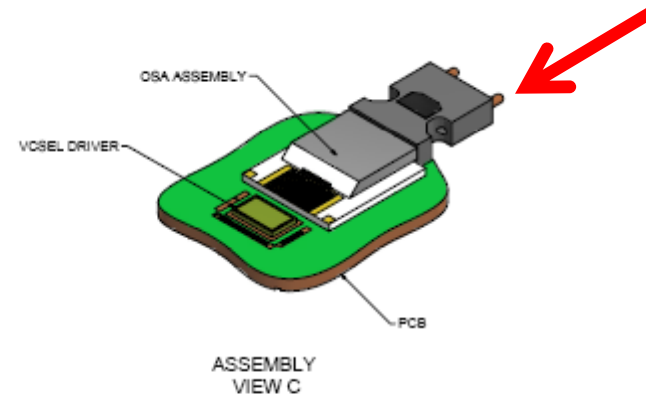
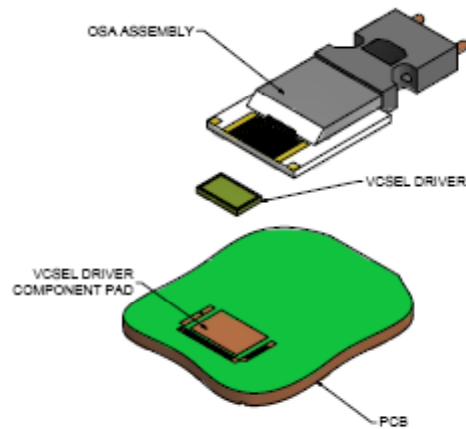
# ***LightABLE™* Optical Engine**

# The *LightABLE*™ Optical Engine

REFLEXPHOTONICS™

Combined with ICs, the OSA becomes an Optical Engine.

Standard MT optical connector.

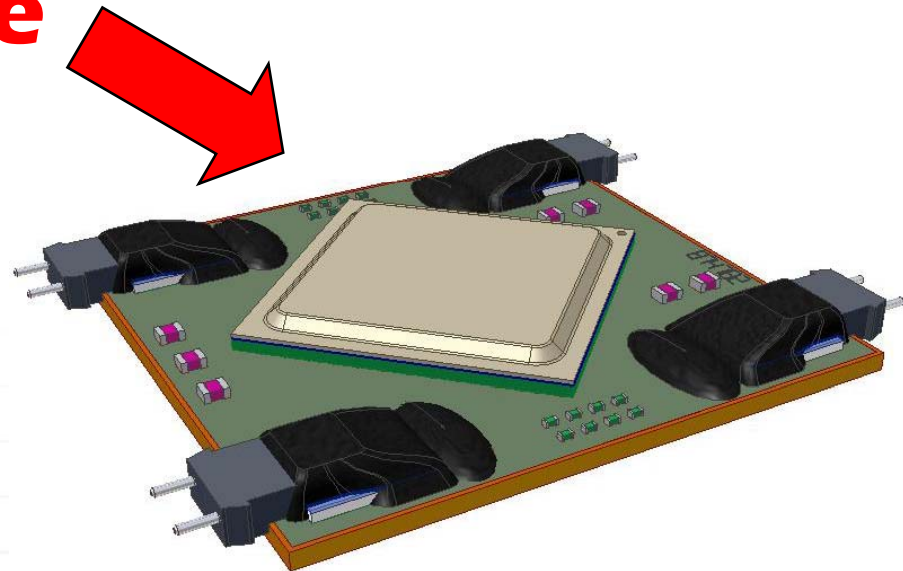


Shown here is a 12x TX optical engine.

- **Lower Cost** : save \$\$\$ per optical port.
- **Lower Power** : save ~1W per port (compared to SFP+ modules).
- **Lower EMI** : moving optics away from the faceplate reduces EMI emissions and ESD sensitivity.
- **Less Space = Higher Density** : eliminating long high-speed PCB traces, pluggable connectors and bulky modules results in huge space savings.

By combining several *LightABLE* Optical Engines with the Host ASIC; a *Light on Board* Optically Enabled ASIC is created.

**Your ASIC here**

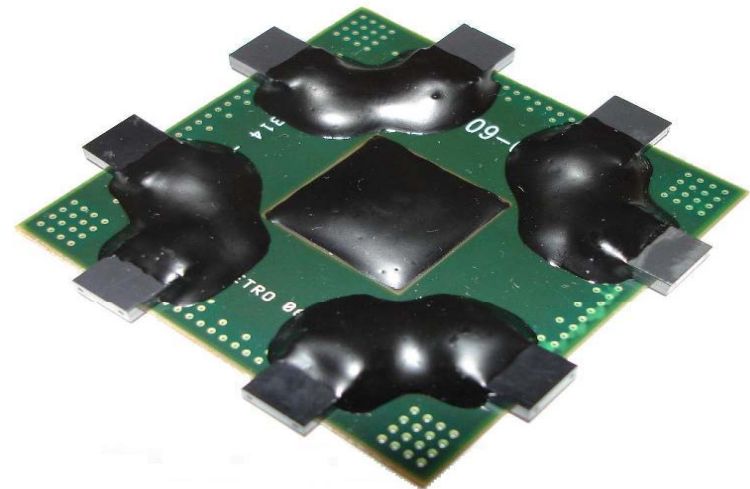
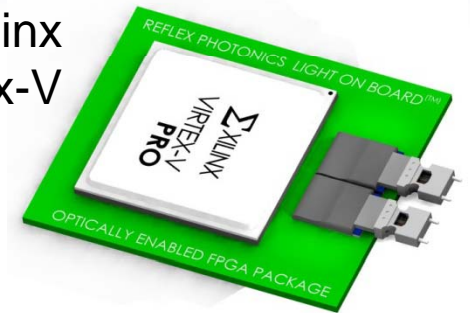


# Light on Board<sup>®</sup> = dense IO

REFLEXPHOTONICS™

- 8 optical engines, each with 12 optical channels, operating at 10.3125 Gbps each, allows for ~1 Tbps of aggregate data
- This is in addition to electrical connections
- Tiny LightABLE optical engines have been proven to be commercially producible and reliable.
- **Commercially available now**

Light on Board  
with Xilinx  
Virtex-V



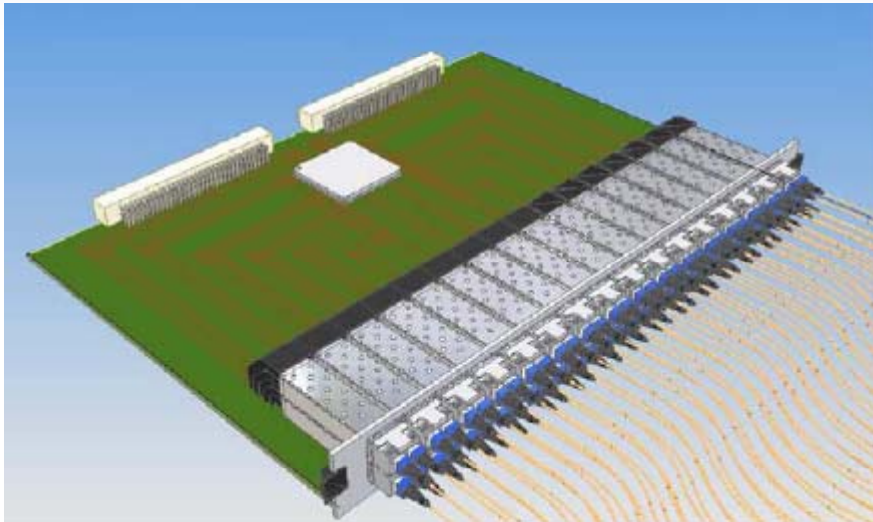
96-port *Light on Board*

# Sample Application

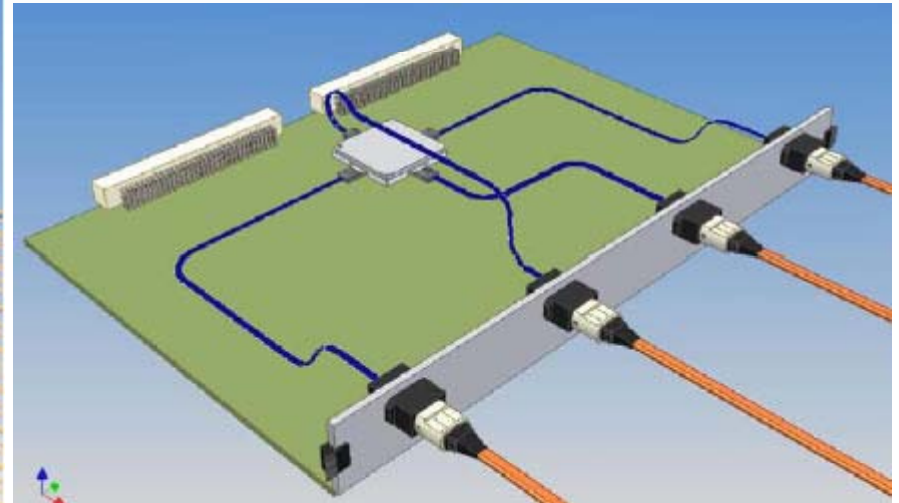
# Switch box

REFLEXPHOTONICS™

Traditional optics



Light on Board



- Reduces

- Optics cost
- Power
- EMI
- Complexity of PCB design
- Cost of PCB

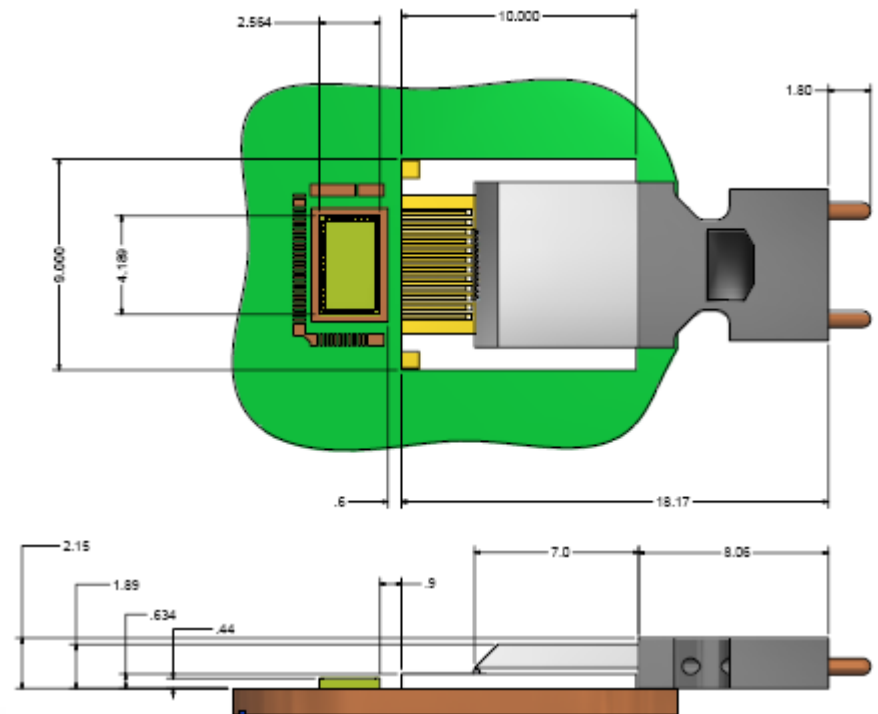
- Increases

- Data rate
- Port density
- Upgradeability (with socketed ASIC)

**To address the large number of possible applications in datacom, switching, high performance computing, video, medical and military ...**

The Reflex *LightABLE* Design Kit makes it easy to add optical connectivity to any PCB design.

- Package of:
  - Datasheets
  - Schematic files
  - Layout files
  - Integration instructions
  - Application notes
  - Quick engineering support



- Reflex *Light on Board* eliminates the need for long traces to modules saving space, power, EMI and cost.
- By bringing the optics to the IC, optical signal quality is improved without the need for pre-emphasis and EDC.
- EMI emissions reduced by moving electronics away from the faceplate.
- Maximum density
- Proven technology

For more information on this or other products:  
Contact sales at [sales@reflexphotonics.com](mailto:sales@reflexphotonics.com)

***Thank You***