POF Markets for Less Than 100 Meters: Active Optical Cables

Paul Polishuk, Co-Chair
Plastic Optical Fiber Trade Organization (POFTO)
Contents

• Definition of AOC
• Benefits of AOC
• Market drivers
• Markets
• Market size and trends
• Speed Trends
• Summary
Active Optical Cables Market Report 2009

This material is taken from a market study on Active Optical Cables from IGI Consulting completed in January.

Report is 172 pages long, contains 166 figures, 120 tables and is available for viewing at booth 2134.

The report may be ordered directly at:

http://igigroup.com/st/pages/aoc.html
Definition

Active Optical Cable (AOC)
A term used to describe a cable that mates with standard electrical interfaces. It uses electrical-to-optical conversion on the cable ends to improve speed and distance performance of the cable without sacrificing compatibility with standard electrical interfaces.
Benefits of AOC

- Longer reach
- Higher bandwidth
- Independent of transceiver type
- Lower interconnection costs
- EMI Immunity
- Smaller size compared to copper cables
- Lower weight compared to copper cables
Market Drivers

• Small size
  – prevent blocking of air flow for HPCs
• Light weight
• Greater reach
• Higher bandwidth
Markets

- Mainframes/Supercomputers (HPC)
- Personal Computers (Desktop & Notebook)
- High definition Television (HDMI)
- Consumer electronics
AOC Protocols

- Infiniband
- USB
- HDMI
- DisplayPort
Market Size and Trends

- The AOC Market is estimated to be $221 million in 2009 growing to over $2.4 billion in 2013
- The average selling price in 2009 is $100.00 per AOC decreasing to $33.00 in 2013
- Two million units are forecasted to be shipped in 2009, rising to 74 million in 2013
- The total optical fiber length is 47 million meters in 2009 to nearly 1.1 billion in 2013
- VCSEL shipments across all speed range from 7.9 million in 2009 to over 200 million by 2013.
Revenue & Unit Forecast (2009-2013 All Platforms)

Source: Solutions By Design (c) 2009
Revenue & ASP Forecast (2009-2013 All Platforms)

Source: Solutions By Design (c) 2009
Revenue by Application Type (2009 All Platforms)

Source: Solutions By Design (c) 2009
Unit Share by Application (2009 All Platforms)

Source: Solutions By Design (c) 2009
Speed Trends

- In 2009, 10 Gbps AOC will dominate with 70% market share
- By 2013, 20 Gbps AOC will dominate with a 75% market share
- Bulk of the AOC business is centered on the 10-20Gbps
- For 40 Gbps and above, AOC usage is expected to dominate copper cable share
### Cable Suppliers by Protocol

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>Optical OEM Suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>InfiniBand</td>
<td>EMCORE (formerly Intel ICC), Luxtera, Reflex, Zarlink</td>
</tr>
<tr>
<td>USB</td>
<td>Numerous</td>
</tr>
<tr>
<td>HDMI</td>
<td>Opticis, OwlLink, HoyaPonent</td>
</tr>
<tr>
<td>DisplayPort</td>
<td>Luxtera</td>
</tr>
</tbody>
</table>
# Component Suppliers

<table>
<thead>
<tr>
<th>Core Component</th>
<th>OEM Suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCSELs &amp; PIN Diodes</td>
<td>Analog Devices, Avago, EMCORE, Finisar, Fuji-Xerox, JDS Uniphase, Zarlink</td>
</tr>
<tr>
<td>Optical Cable</td>
<td>Corning, HanWei, Hitachi Cable, Mitsubishi, others</td>
</tr>
<tr>
<td>Connectors</td>
<td>FoxConn, Japan Aerospace Electronics (JAE), Molex, Tyco</td>
</tr>
<tr>
<td>Cabling</td>
<td></td>
</tr>
</tbody>
</table>
Summary

• AOC is one of the most rapidly growing optical fiber markets – first shipments in 2007

• High Performance computers are the main driver

• Now market is moving towards HDMI and consumer electronics

• More companies expected to enter the market

• AOC represents a "Killer APP" for fiber optics