POF@10G
POF@10G

Market opportunity

• 10GBE used mostly for
  – Routers
  – 1 GBE switch uplinks
  – High-end user server farms
  – Data centres

• Data centres requirements
  – rapid growth
  – high port volumes
  – links not as long as for data offices / backbones
  – fast deployment / flexibility in infrastructure is key
  – networks must be supremely robust

• Quest for new solutions
  ➔ 10GBase-T
  ➔ 10G over GI-POF

Source: Communications Industry Researchers, Inc, 2005
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POF@10G - The new alternative

• Old view is that copper (10GBASE-T) volumes will be greater than fibre volumes, because:
  – Shorter distances
  – Copper perceived to be easier to install, and installers to have the necessary expertise
  – Copper expected to require lower cost cables and transceivers

• But at 10Gbps the old assumptions do not apply:
  – Current installed copper cabling is not sufficient. New UTP cabling is significantly challenged. Shielded copper cables needed.
  – Low costs anticipated, but due to technology difficulties these may not be available
  – 10GBASE-T transceiver power dissipation currently expected to be about 15W

• GI-POF provides the new alternative
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New Multimode Plastic Optical Fiber

New Technology
• Very different from traditional automotive-type POF
• Graded-index structure, very similar to glass multimode fiber
• New material (perfluorinated polymer, similar to transparent version of Teflon)
• Suitable 10-gigabit networking

Recognized Advantages
• Low attenuation, usable to 100 meters
• Multi-wavelength (650, 850 & 1300 nm)
• Can use same optoelectronics as glass fiber
• High bandwidth (350-1000 MHz.km)

Non-proprietary Solution
• Standardised in IEC 60793-2-40
• Fibre Classes
  • A4g (120 mm core) for industrial applications
  • A4h (62.5 mm core) for data center and LAN applications
• Multiple sources available
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Gigabit Plastic Optical Fiber Technology

High-performance POF is as easy to field-terminate as Cat 5 copper cable

Connectors clip on instantly, no glues are needed
Fiber is terminated with a razor blade instead of a cleaver
30 second of polishing produces a low-loss connection

POF is by far the most flexible and durable 10-gigabit medium

reliable in tight bending radii down to 5 mm
Highly resistant to crushing loads and cable damage
10Gbit on copper (10GBASE-T)

- **Transceiver signal processing:**
  - 10-level coded PAM signaling
  - High symbol rate and high level modulation imply more complex signal processing and cancellation of FEXT
  - Alien Crosstalk issues
  - Transceiver power about 15W

- **New cable requirements:**
  - Use of four pairs / 8 wires
  - > 8-9 mm diameter cable
  - New high frequency (500 MHz) performance needed

- **New connectors required**
  - New high frequency (500 MHz) performance needed
  - Installer training required

10Gbit on fiber

- **Signal processing**
  - Direct modulation
  - Transceiver power < 1.5W

- **GI-POF cable**
  - Use 1 pair / 2 fibres
  - Small cable size (2.2mm x 4.5mm)

- **Clip-on connectors for GI-POF**
  - Easy to use
  - Very little installer training needed
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Comparison of connectors

COPPER

- RJ45 connector initially developed for 10Mbps
- First improvement for CAT6 needs compensations
- RJ45 CAT6a for 10Gbit application difficult to develop, produce and install

FIBER (LC connector example)

- LC connectors for multimode glass fiber (10Gbit application) requiring epoxy adhesive
- LC connectors for multimode glass fiber (10Gbit application) using hot-melt crimp technology
- LC connectors for 10Gbit POF uses new easy-to-use clip-on technology
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10G over GI-POF - Today
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Product Timeline

• GI-POF and clip-on connectors available now for trials

• GI-POF and clip-on connector in full production mid-year (2006)

• 10GBASE-SR transceivers available today
  – Suitable for 10G over shorter GI-POF links

• 100m, 10G GI-POF transceivers available mid-year (2006)
  – As 10GBASE-SR transceiver, with EDC enhanced receiver.
  – XFP modules with power dissipation less than 1.5W.
  – Component costs competitive with 10GBASE-T
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We invite you to our demo

Booth 1226

Thank you

archcomtech.com  agc.co.jp  chromisfiber.com
nexans.com  phyworks-ic.com  picolight.com