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Proposed objectives for 100 Gb/s short-reach PMDs

David Lewis

January 23-24, 2020

IEEE 802.3 100 Gb/s Wavelength Short Reach PHYs Study Group

Proposal

- Objective for MMF backwards compatibility and intra Data Center reach
  - Define a physical layer specification that supports 100 Gb/s operation over a single pair of MMF with lengths of up to at least 50 m and with a single wavelength in the peak EMB region of OM4/OM5 fiber (840-860 nm).
- Objective for intra-rack and active cable applications
  - Define a physical layer specification that supports 100 Gb/s operation over a single pair of MMF with lengths of up to at least 30 m and with a single wavelength in the VCSEL back-emitting region (940 nm).

“850 nm Objective”

- Supports interop at lower data rates with 25GBASE-SR and 50GBASE-SR PMDs
- Supports re-use of existing installed OM4 or OM5 fiber
- Potential for 400G-SR4 or 800G-SR8 using standard module form factors such as QSFP, QSFP-DD, OSFP etc.

Why a 940 nm back-emitting objective?

- Cost reasons:
  - Leverages the extremely high volume of 940 nm VCSELs used for 3D sensing applications.
  - Supports pads-down configuration without the need for transparent substrate schemes.
  - Flip-chip, solder reflow assembly is the standard semiconductor IC assembly and test process.
  - Co-packaging potential with VCSEL array mounted directly onto silicon driver IC, thereby reducing separate packaging and interconnect costs.
  - Cable replacement inside the rack for 100 Gb/s from server to TOR is the highest volume, most cost sensitive part of the data center network. AOCs between switches are the next highest volume part. This volume, combined with the other advantages leads to a new lower cost level compared to “traditional” optics.

- Technical reasons:
  - High current density achievable at 940 nm means higher bandwidth than 850 nm VCSEL.
  - Back emission removes the parasitics of wirebonds, leading to higher overall bandwidth.

Thank you