

COORNING

How many PMDs for 802.3cz?

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Motivation

- Based on Straw Polls conducted at the IEEE 802.3cz meeting on March 17, 2021 it is clear that **no consensus exists** to select a PMD for baseline text
For example, my poll yielded the following results:
- **Straw poll #3 (Swanson)**
- I will support the following PMD in the IEEE 802.3cz draft standard
 - A: a proposal based on 850/980nm VCSELs and 50/125 μ m multimode glass optical fiber
 - B. a proposal based on 850/980nm VCSELs and 55/490 μ m graded-index plastic optical fiber
 - C: a proposal based on 1310nm silicon photonics and 50/125 μ m multimode glass fiber

Results: Chicago rules

A: 38

B: 23

C: 25

A History Lesson

- 100BASE-TX
 - -T2
 - -T4
- Targeted essentially the same reach objective
 - 100m on UTP
- Only one garnered mainstream acceptance
- Most Gig Data Center IEEE standards have *one and only one* PMD targeted at each application space
 - Application space based on reach objective
 - Typically 100m on MMF
 - 500m, 2km, 10km and 40km on SMF
- 2.5, 5, 10, 25 and 50G automotive
 - Only difference is the data rate
 - Target reach is similar for all objectives

How many PMDs for 802.3cz?

If at all possible, IEEE 802.3cz should only develop one PMD per data rate that satisfies all of the objectives

Critical Criteria for Standards Development

- Broad Market Potential
 - Broad set(s) of applications
 - Multiple vendors, multiple users
 - Balanced cost, LAN Vs. attached stations
- Technical Feasibility
 - Demonstrated feasibility; reports - - working models
 - Proven technology, reasonable testing
 - Confidence in reliability
- Economic Feasibility
 - Cost factors known, reliable data
 - Reasonable cost for performance expected
 - Total Installation costs considered

What is important to the customer?

- Affordability (Economic Feasibility)
 - Relative costs of the PMDs is important
- Availability (Broad Market Potential)
 - PMD needs to be available from multiple suppliers
 - Must be interoperable
- Scalability (Technical Feasibility)
 - Support approved objectives @ 2.5, 5, 10, 25 and 50G
- Reliability

Customers don't care about the technology!

What is important to the suppliers?

- Suppliers want Certainty
 - to mitigate risk in product development
- Suppliers want Volume
 - Too many PMDs fragments the market
 - Too many PMDs fragments development efforts across the supply chain
- Suppliers want Simplicity
 - # of SKUs, product mix

Multiple solutions addressing the same application space is a big problem

Current options could result in 50 PMDs!!

Data Rate (Gbs)	Link Length (m)	850 VCSEL + OM3	980 VCSEL + OM3	850 VCSEL + GIPOF	SiP + OM3	SiP + POF
2.5	15					
5	15					
10	15					
25	15					
50	15					
2.5	40					
5	40					
10	40					
25	40					
50	40					

PMD Options

- Columns are differentiated by technology
- Only the rows solve customer problems
- We need one solution optimized to solve each problem
- Which PMD addresses each problems the best?

	850 VCSEL + OM3	980 VCSEL +OM3	850 VCSEL + GIPOF	SiP + OM3	SiP + POF
Affordability					
Availability					
Reliability					
Scalability					

How can we drive a decision?

- Pick a column
- Pick one from each row
- Don't decide; pick them all
- Don't decide; wait

	850 VCSEL + OM3	980 VCSEL +OM3	850 VCSEL + GIPOF	SiP + OM3	SiP + POF
Affordability					
Availability					
Reliability					
Scalability					

PMD evaluation needed

- Time to standardization
- Time to market
- Rate ability to meet broadest set of customer requirements
- Relative cost comparison - short/long term
- Qualitative Reliability (e.g. MTBF, etc.)

My View

- We cannot pick them all
- We cannot afford to wait
- Based on contributions to date, I would rate the options as follows

	850 VCSEL + OM3	980 VCSEL +OM3	850 VCSEL + GIPOF	SiP + OM3	SiP + POF
Affordability	●	●	●	●	●
Availability	●	●	●	●	●
Reliability	●	●	●	●	●
Scalability	●	●	●	●	●

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