

Proposed TDD Distinct Identity Statement

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Introduction

- ❑ **Per previous discussion, the distinct identity of a PHY should be intrinsic to that technology, visible to the end user in a way that could influence why a customer would or would not choose it**
 - ❑ It should not be a matter of degree by which the PHY performance would be “better” in some sense when both satisfy the objectives
 - ❑ It should not be a technology distinction like TDD vs. ACT, since that is effectively invisible to the end user in terms of choosing which to use
- ❑ **MAC rates and media options are a common form of distinct identity, but both ACT and TDD are the same in these regards**
- ❑ **The distinct identity proposed in this presentation is inherently unique to TDD**

Proposed TDD Distinct Identity Statement

- ❑ **“Optimized to allow a single, flexible PHY with multiple rate options.”**
- ❑ **In particular, the flexibility has two aspects:**
 - ❑ Commonality between high-speed and low-speed PHY types, which allows ports with a single PHY supporting either direction (i.e., port reversibility)
 - ❑ Enabling the use of a single high-speed PHY that can operate at different rates

TDD Distinct Identity Specific Aspects

- **The same TDD cycle is used for all configurations**
- **The same “low speed” symbol PAM2 3.0 Gbps is used for all the high-speed rate options (2.5G, 5G and 10G)**
- **For 2.5 Gbps downstream, the high-speed PHY is identical to the low-speed PHY**
 - The analog portion of the PHY is identical. Only the burst duration is different
- **For 5 Gbps and 10 Gbps, the high-speed PHYs use the same 6.0 Gbps baud rate (PAM2 at 5G and PAM4 at 10G), which is exactly twice the 3.0 Gbps rate used for the 2.5 Gbps PHY**
- **FEC commonality:**
 - The same FEC is used for all high-speed PHYs, all of which have an identical FEC block period
 - The high-speed PHY FEC is a shortened version of the low-speed PHY FEC, allowing FEC engine reuse

Visibility & Potential Value to the End User

- ❑ Enables universal ECU ports to interface with different imager (or display) types.
- ❑ Enables universal ports on switch chips, including changing directions.
- ❑ Allows reducing the number of part SKUs that OEMs that Tier1s have to manage.
- ❑ Reduces the silicon development investment needed by the industry.
- ❑ Enables novel system architectures and flexibility that would otherwise require multiple back-to-back devices.

Draft Proposed New Objective

The proposed distinct identity is fully compatible with the existing PAR and CSD. However, it is best to capture it in a new objective.

❑ “Define an electrical PHY to support up to 10 Gbps in one direction, and up to 100 Mbps point-to-point operation in the other direction with the direction of asymmetry and high-speed rate determined at link startup over the defined [balanced pair / unbalanced coaxial] link segment.”

❑ Notes:

- ❑ Not all P802.3dm PHYs need to support this objective. It is only required that at least one of the P802.3dm PHY types is capable of supporting it.
- ❑ The “up to 10 Gbps” is intended to apply to 2.5, 5 and 10 Gbps or any combination of one or more of these rates, since they are all elaborated in the general objectives.

Conclusions

- ❑ **In summary, the propose distinct identity:**
 - ❑ Is inherently unique to TDD, especially with respect to enabling link reversibility.
 - ❑ Has observable tangible potential value to end users in their PHY type selection.
 - ❑ Is fully consistent with the existing P802.3dm PAR and CSD, so it only needs a new objective statement.

- ❑ **Accordingly, this proposal satisfies the 802.3 distinct identity requirements.**

- ❑ **We propose adopting this distinct identity for TDD in P802.3dm, which would allow both the TDD and ACT PHY technology to be included in the same P802.3dm baseline for Working Group approval**

Thank You