My comments to IEEE P802.3bv™/D1.1 are as follows.

Because I understand that the fiber optic cabling is the same meaning as the optical harness.

Hayato Yuki (AutoNetworks Technologies, Ltd. / Sumitomo Electric Group)

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IEEE P802.3bv™/D1.1, 12th June 2015

**IEEE P802.3bv™/D1.1**

**Draft Standard for Ethernet**

**Amendment:**

**Physical Layer Specifications and Management Parameters for 1000 Mb/s Operation over POF**

(P117)

115.8 Characteristics of the fiber optic cabling

115.8.1 Plastic Optical Cable(POF) cable

The PMD subject to this clause is for POF cable with a multimode optical fiber IEC 60793-2-40 types A4a.2. The POF cable shall have a step index core of poly-methyl methacrylate (PMMA). The POF cable core diameter shall be 980 ± 45μm and the clad diameter shall be 1000 ± 45μm with a single numerical aperture (NA) of 0.55 ± 0.05 or a dual (0.5/0.6) numerical aperture. This cable shall be duplex. The environmental tolerance of the POF cable should be same as other electric cable that is mounted together.

115.8.2 Optical connectors / Inline connectors

 The PMD subject to this clause includes a plastic optical connector with the stable optical-coupling performance on the system requirements(HA, FA, Automotive and others). Waterproof performance might be required. The recessed ferrule structure in the optical connector is often applied for the POF-end protection. The tolerance to the dust and to the chemical products of the optical connector is strongly demanded for the automotive use.

115.8.3 Header connector (FOT: Fiber Optical Transceiver)

 The PMD subject to this clause includes a header connector that the optical/electrical conversion elements are mounted. The functions of the header connector are not only the optical/electrical conversion but also the precise optical alignment between the optical/electrical conversion elements and fiber ends.

The header connector shall be capable of working in both a 3.3 +/- 0.3 Vdc and 5+/- 0.25 Vdc systems.

The transmitter shall have a maximum of 0.55 numerical aperture (NA). Its center wavelength (FWHM) at 25 degree centigrade shall be 635 to 670 nm with a maximum spectral width of 40 nm.

The transmitter shall have a minimum extinction ratio of 11 dB with a maximum overshoot of 25%.

The mean launch power shall be average between –9.0 dBm and +1.0 dBm.

The average minimum receiver input power of the FOT shall be –18.5 dBm at 25 degree centigrade.

115.8.4 Automotive specifications of the fiber optic cabling

 The PMD might be mounted on all places of the car. The each component of PMD should have the tolerance of automotive environment. Material used to manufacture the header connector must be capable of withstanding soldering temperatures. Thermoplastic materials used for the optical connectors and cable shall have a flammability rating of “HB” according to IEC 60695-11-10. All optical connector and cable materials shall not have their performance adversely affected as stated in the environmental section of the physical specification.

|  |  |  |
| --- | --- | --- |
| Parameter(automotive version) | Criteria | Note |
| POF-cable storage temperature | -40℃～+105℃ | ISO 8092 |
| POF-cable ambient temperature | -40℃～+105℃ | ISO 8092 |
| POF-cable min. bending radius(temporary) | 10mmR | IEC 60793， |
| POF-cable min. bending radius(permanently) | 25mmR | IEC 60793， |
| POF-cable bending loss | <0.1dB | IEC 60793，  |
| POF-cable min. tensile strength | 60N | EIA 364，  |
|  |  |  |
| POF-connector storage temperature | -40℃～+105℃ | ISO 8092 |
| POF-connector ambient temperature | -40℃～+105℃ | ISO 8092 |
| POF-connector max. coupling loss | 1.5dB | IEC 60793，  |
| POF-connector min. lock strength | 100N | EIA 364 |
| POF-connector min. cable grip strength | 110N | EIA 364 |
| POF-connector max. mating force | 45N | ANSI |
| POF-connector connect/disconnect tolerance | 10 times | OEM’s request |
|  |  |  |
| POF-harness max. length | 15m, (40m\*) | 1000BASE-RH |
| POF-harness max. attenuation loss | 9.5dB | 1000BASE-RH |
| POF-harness max. numbers of inline connection | 4, (zero\*) | 1000BASE-RH |

115.10.4.3 PMD to MDI optical specifications

The content of the description depends on the idea of EAF.

115.10.4.4 Optical measurement requirement

The content of the description depends on the idea of EAF.

115.10.4.5 Environment specification for automotive applications

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Item | Feature | Subclause | Value/Comments | Status | Support |
|  | Operating temperature | 115.8.4 | from -40℃to +105℃(maximum) |  | Yes [ ], NA [ ] |
|  | Humidity tolerance | 115.8.4 | See GS95006-6-3 |  | Yes [ ], NA [ ] |
|  | Vibration tolerance | 115.8.4 | See GS95006-6-3 |  | Yes [ ], NA [ ] |
|  | Water/Chemical products tolerance | 115.8.4 | See GS95006-6-3 |  | Yes [ ], NA [ ] |
|  | Dust tolerance | 115.8.4 | See GS95006-6-3 |  | Yes [ ], NA [ ] |
|  | Flame retardant efficiency | 115.8.4 | See IEC 60695-11-10 |  | Yes [ ], NA [ ] |

115.10.4.6 Optical components

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Item | Feature | Subclause | Value/Comments | Status | Support |
|  | POF cable | 115.8.1 | 115.8.4 table of automotive requirements |  | Yes [ ], NA [ ] |
|  | POF connector (cable socket) | 115.8.2 | 115.8.4 |  | Yes [ ], NA [ ] |
|  | POF connector (cable plug) | 115.8.2 | 115.8.4 |  | Yes [ ], NA [ ] |
|  | POF header connector | 115.8.3 | 115.8.4 |  | Yes [ ], NA [ ] |