



Proposal of Small MOST Optical Connectors



April 5th, 2011

Yazaki Corporation

In-Vehicle Systems R&D Center

Naoshi Serizawa

- 1. Introduction of Yazaki Corporation**
- 2. Proposal of Small MOST Optical Connectors**
- 3. Summary**

Corporation in step with the world.

「世界とともにある企業」

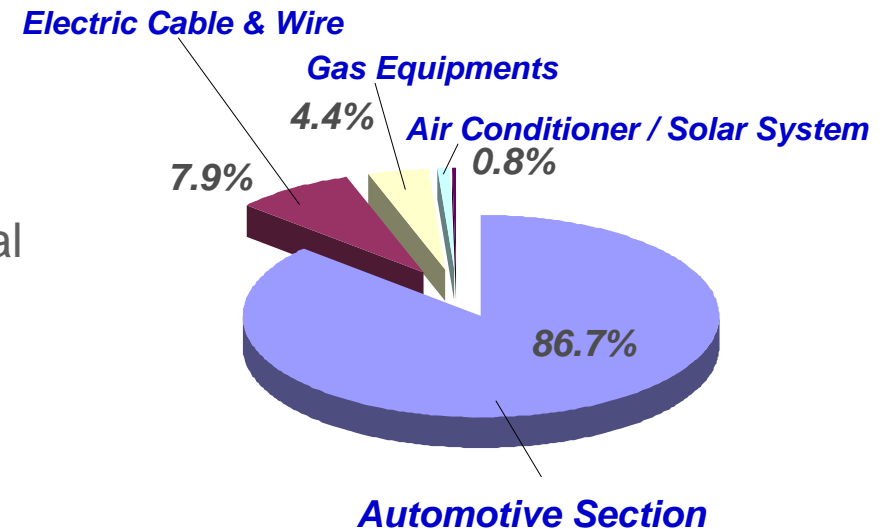


Corporation required by society.

「社会から必要とされる企業」



- **Top class wire harness market share in the world**
- **Global business**
 - 39 countries (Regions): 415 locations (incl. Japan) (As of December, 2010)
- **Business diversity**
 - Automotive section
 - Wire harness; Gauge; In-vehicle devices
 - Life-related section
 - Electric cable; Gas device; Environmental system equipment; Housing equipment
 - New business
 - Recycle; Nursing; Farming



[Total sales: 11,629 Hundred million yen]
(ca. 10 bil. Euro)

◆ Wire Harness



Wire Harness (Front End)



Wire Harness for Hybrid

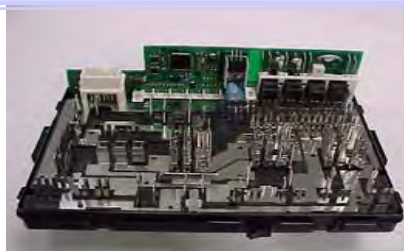
◆ Component



Connectors; Terminal



Optical Component



Junction Block (J/B)



Full Graphic Meter Cluster

◆ Meter; Sensor



Sensor

◆ Instrumentation Device



Taximeter



Drive Recorder

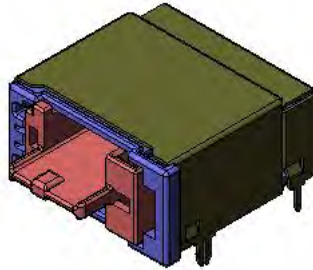


Taco Graph (Digital)

Header type (MOST25/MOST150)

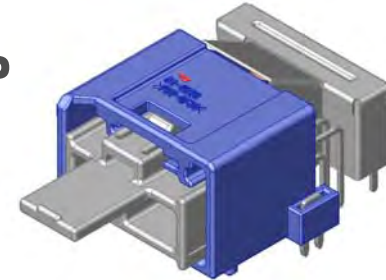
Embedded more than 10,000K connectors since 2002

2+0P



MOST25: Since 2002
MOST150: Sample Available

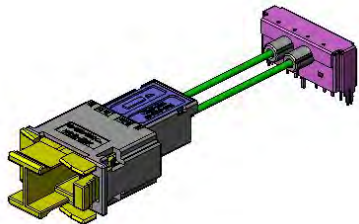
2+4P



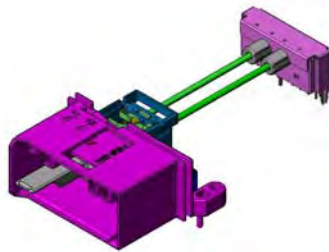
MOST25: Since 2002
MOST150: Sample Available

Pigtail type (MOST25/MOST150)

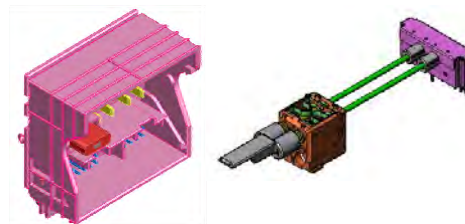
2+0Pigtail



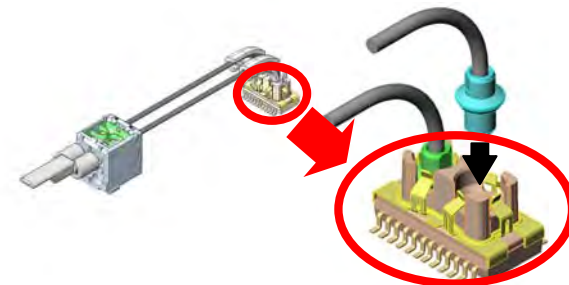
2+12Pigtail



4+40Pigtail



Pigtail (SMD)



MOST25: Since 2005 *MOST25: Since 2006* *MOST25: Since 2004*

For MOST150
Sample available

MOST150 Physical Layer / Topology Options

- MOST150 supports various Physical Layers:
 - POF/LED optical (oPhy) – also duplex
 - PCS/VCSEL optical – also duplex
 - STP electrical (ePhy)
 - Coax electrical – also duplex
 - Any mixture within one network

- MOST150 supports various topologies:
 - Ring
 - Daisy Chain
 - Double Ring
 - Star
 - Any mixture

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MOST Cooperation – The Long-Term Roadmap

Meeting Tomorrow's needs

Agenda:

- State of Affairs
- News & Events
- Standardization
- Compliance
- **Roadmap**

- Housekeeping: further development of specifications for...
 - cost reduction and premium quality
 - extended diagnostics capabilities

- Meeting needs of new applications
 - Networked video transmission with low system cost and content protection
 - Transport of camera signals and support of other driver assist use cases
 - Cost effective high speed data communication for new IP based services
 - Seamless connectivity of portable consumer devices

- And then...
 - ... increase of network speed

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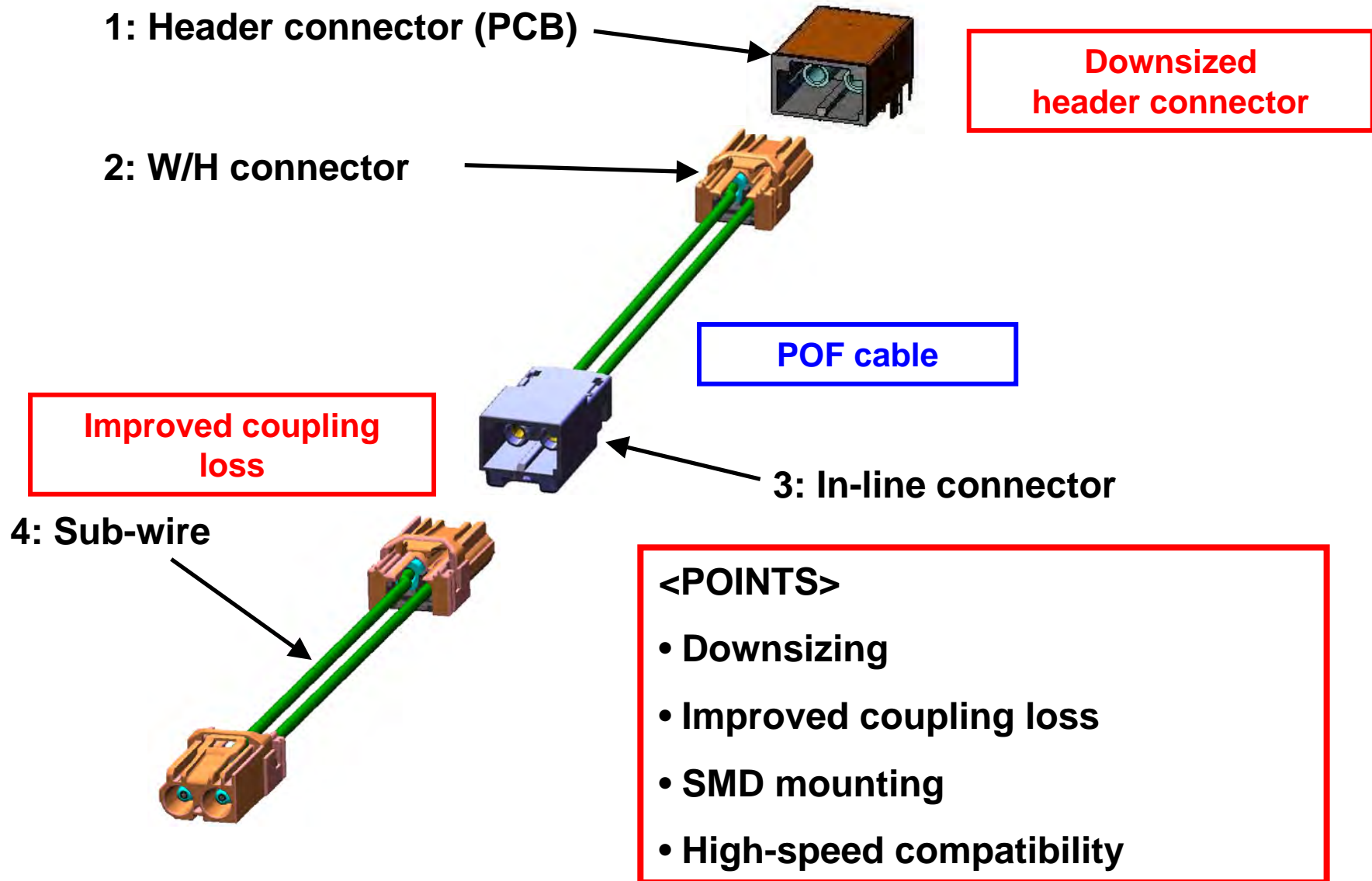
In order to diffuse the MOST network solutions, the physical layer taking into account the contents below is required.

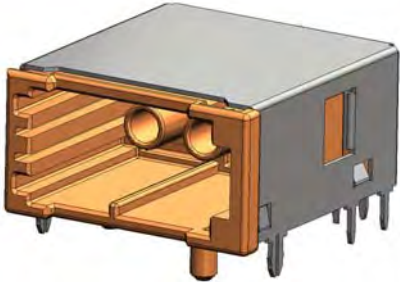
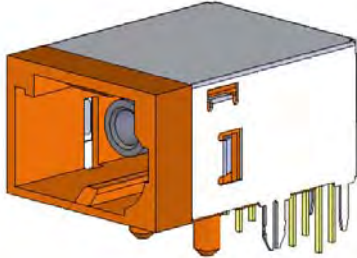
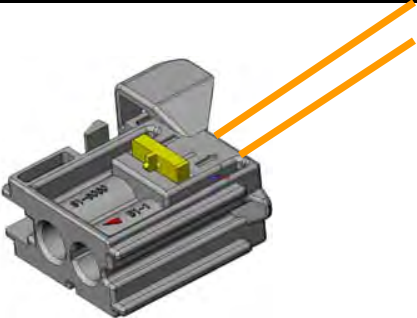

- Reduction in connector size and weight
- Supports high-speed (Gigabit network)

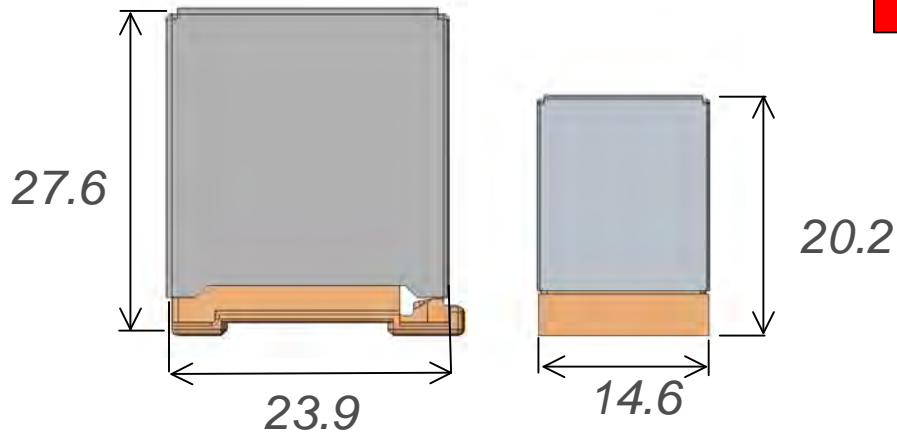
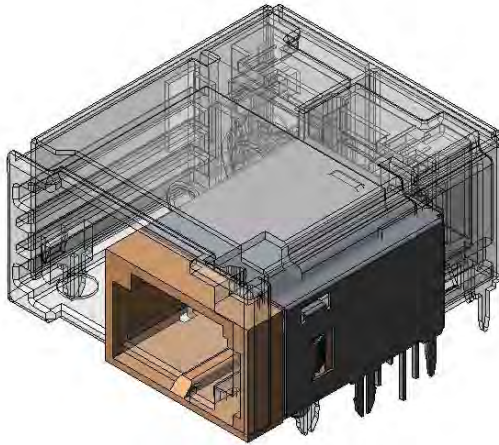
Also, in consideration of supporting high-speed solutions in the future,

- POF is difficult to use for gigabit solutions due to the lack of bandwidth.
- LED/RCLED cannot be used for gigabit solutions due to the slow response speed.

Thus, the optical connectors capable of meeting the above-mentioned needs are proposed.



Existing product	Proposed connector
 <p>Header connector dimension: W×L×H => 23.9×27.6×13.0 [mm] Weight[g]: 9.1 Light-emitting element: LED</p>	 <p>Header connector dimension: W×L×H => 14.6×20.2×10 [mm] Weight[g]: 2.88 Light-emitting element: RCLED</p>
 <p>Optical W/H-side connector dimension: W×L×H => 24.0×41.0×13.2 [mm] Sub-harness weight [g]: 14.32 Fiber: POF</p>	 <p>Optical W/H-side connector dimension: W×L×H => 13.6×35.5×10 [mm] Sub-harness weight [g]: 12.08 Fiber: POF</p>

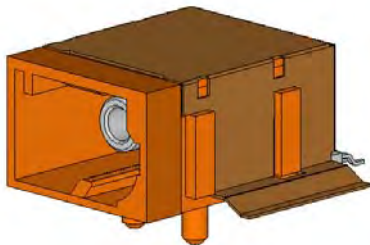
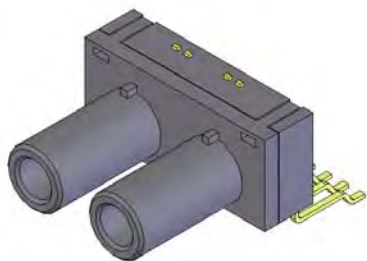


**MOST150
Standard**

**Small
MOST150**

- **Weight:**
Approx. 68% reduction
- **Cubic volume:**
Approx. 65% reduction

SMD Type

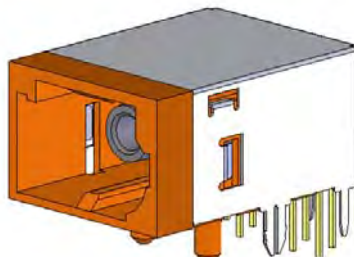
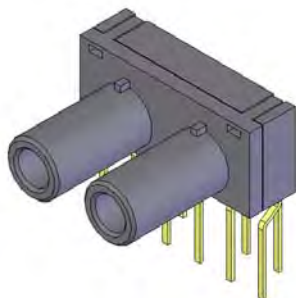
**Footprint :**

SMD alignment
Pitch 1.27mm x 10

Connector size :

23mm(W) x 10mm(H) x 23mm(D)

THD Type

**Footprint :**

Zigzag alignment
Pitch 2.54mm x (6+4)

Connector size :

15mm(W) x 10mm(H) x 20mm(D)

SMD connector Interface is completely the same as that of THD.

Specifications of basic properties:

Application Temp.: -40 to 105[deg.C]

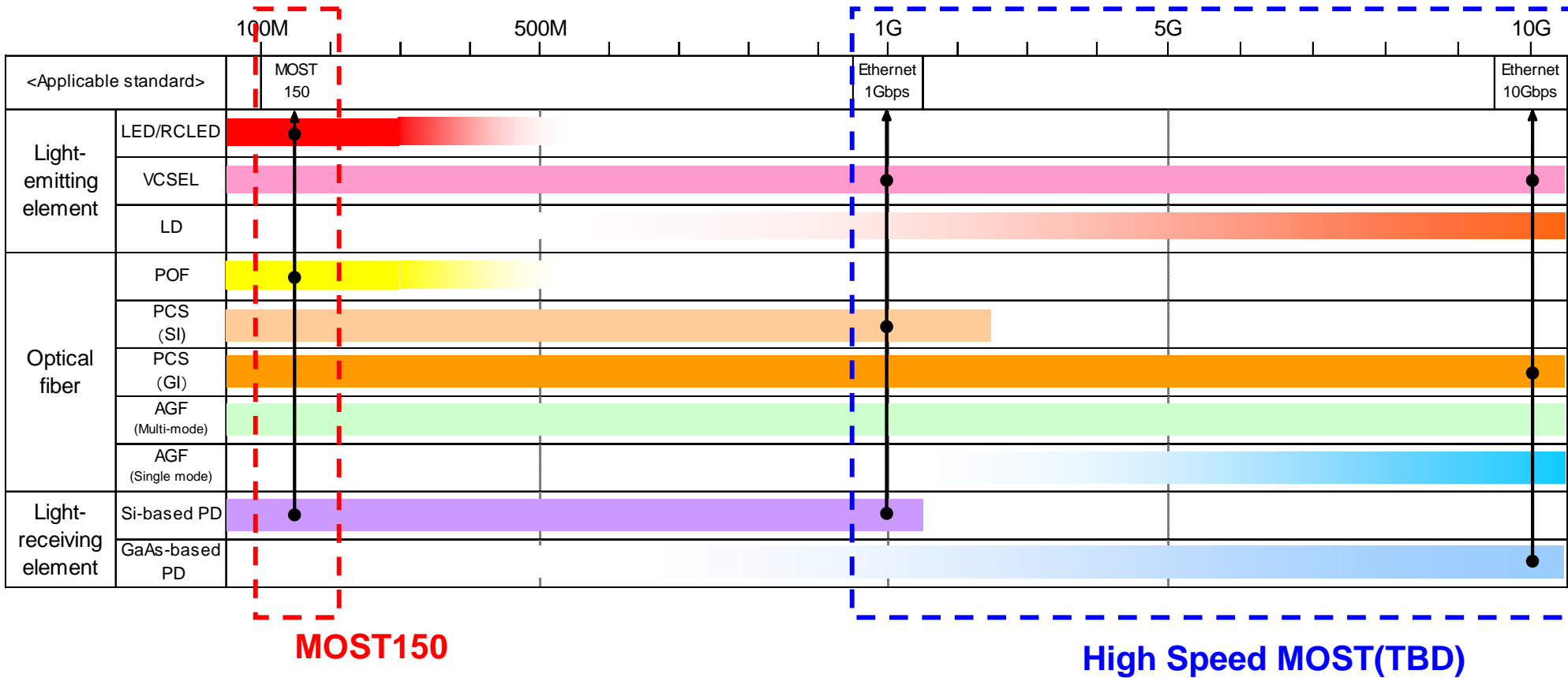
Storage condition: -40 to 105[deg.C]

Soldering condition: Flow / Reflow soldering
(Peak Temp.: 260[deg.C])

Sample Available

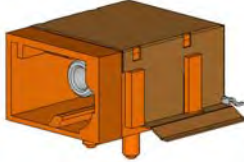
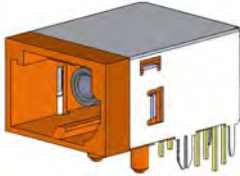


Technology map for optical networking

⇒ Transmission rate(bps)



POF: Plastic Optical Fiber AGF: All Glass Fiber HPCF: Hard Polymer Clad Fiber
 LED: Light Emitting Diode VCSEL: Vertical Cavity Surface Emitting Laser

Yazaki supports the technologies below

		MOST150		High Speed MOST(TBD)		
Header Connector	Connector					
	Light-emitting element	RCLED	VCSEL	VCSEL	VCSEL	VCSEL
	Light-receiving element	Si-based PD	Si-based PD	Si or GaAs PD	Si or GaAs PD	Si or GaAs PD
Optical W/H	Connector					
	Optical fiber	POF	PCS	PCS(SI)	PCS(GI)	AGF

Yazaki provides optical components compatible with the MOST technology and of course in the future, too

- Provision of small optical connectors

Size: Header connector	14.6(W) x 20.2(L) x 10(H) mm
W/H connector	13.6(W) x 35.5(L) x 10(H) mm

- The header connector can be both SMD and THD types.

Ready for samples, please contact Yazaki

- The above-mentioned connectors can be used for high-speed solutions in the future. (Optical fiber: HPCF)
 - No change any mechanical features (only the ferrule needs to change)



Thank you for your attention.
Please visit Demo-booth