

# 採択テーマ シリコンフォトニクス光多値受信モジュールの研究開発

## 世界最小の400Gbit/sシリコンフォトニクス光多値受信モジュールを開発

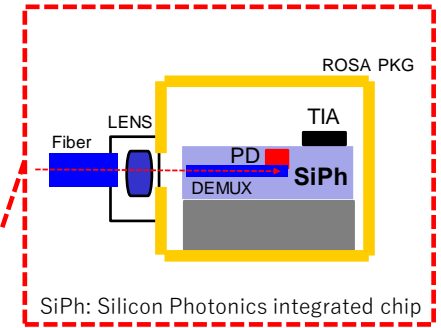
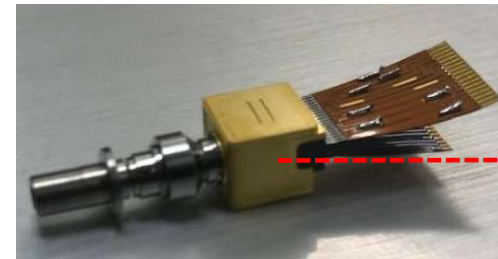
### 【研究開発概要】

2022年に市場規模が一兆円に達する400Gbit/s 光リンクデータセンター向けに、量産・低コスト化が期待できるシリコンフォトニクス技術を採用した世界最小の400Gbit/s 受信モジュールを開発した。

### 【開発品の主な特徴】

- シリコンフォトニクス光集積回路技術を世界に先駆けて採用し、世界最少(0.24cc:従来比1/30)の小型モジュール化を実現しました。
- 広い動作温度領域(0~70°C)と低い偏波依存(1dB以内)を有した受信特性を実現し、実用環境に耐え得ることを示しました。
- 光集積回路により部品点数を大幅に削減(従来比1/3)するとともに、光軸ずれに強い光学設計を行うことによって、組み立て工程時間の短縮化(従来比1/10)を実現し、大幅な低コスト化への可能性を示しました。

### 【開発品概要】



### 【開発品の特性】

	Kyosemi Specs	
Description	Value	Unit
PAM4 Signaling rate, each lane (range)	53.125±100ppm	GBd
Lane wavelengths (passband)	1264.5 to 1277.5 1284.5 to 1297.5 1304.5 to 1317.5 1324.5 to 1337.5	nm
Damage threshold, each lane (min)	+10 (typ.)	dBm
Insertion Loss of PIC (except for Ge PD)	4.0 (typ.)	dB
PDL	1.0 (max.)	dB
SMSR	20.0 (min.)	dB
3dB Bandwidth for Ge PD <sup>1</sup>	45 (min.)	GHz
Sensitivity for PD	0.8 (min.)	A/W
Operating Temperature of PIC chip	0 to +70	°C
Storage Temperature	-40 to +85	°C

# Silicon Photonics Circuit integrated 400Gbps Optical PAM4 receiver module

**The world's smallest 400 Gbit / s silicon photonics optical PAM4 receiver module has been developed**

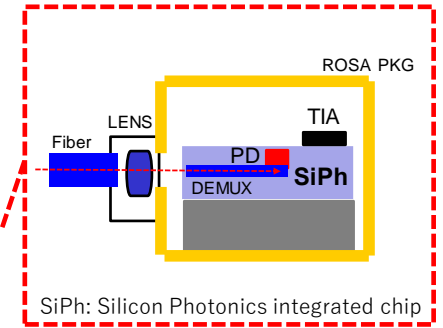
## 【Development overview】

We have developed the world's smallest 400 Gbit / s receiver module that uses silicon photonics technology, which is expected to be mass-produced and cost-effective, for the 400 Gbit / s optical link data center whose market size will reach 1 trillion yen in 2022.

## 【Main feature】

- The world's smallest (0.24cc: 1/30 compared to the conventional one) compact receiver module has been developed by silicon photonics optical integrated circuit technology for the first time in the world.
- It can be utilized under a practical environment with a wide operating temperature range (0 to 70 degree) and low polarization dependence (within 1 dB).
- It shows the possibility of drastic cost reduction because the number of parts has been significantly reduced by the optical integrated circuit (1/3 compared to the conventional one), and the assembly process time has been shortened (1/10 compared to the conventional one) by optical design with a large offset tolerance of optical axis .

## 【Appearance】



## 【Specifications】

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