

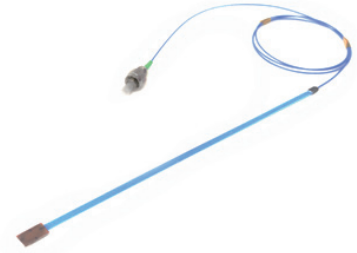
# FBG Strain Gauge

## Description

FBG strain sensor is a strain measurement sensor based on fiber Bragg grating. It can monitor the strain value of the measured object by measuring the spectral shifts of FBG.

## Features

- Gauge length the same as standard resistance strain gauges
- Passive and free from electromagnetic interference
- High networking with series or parallel connected
- Lifespan  $>10^7$  cycles ( $\pm 1500\mu\epsilon$ )
- High stability, no zero-point drift



## Applications

- Suitable for application scenarios where traditional resistance strain gauges used
- Suitable for application scenarios where traditional surface-mounted resistance strain gauges used
- Suitable for harsh environments with the requirements of high anti-electromagnetic interference and explosion-proof

## Specification

Strain	Unit	Specification
Gauge Length	mm	3
Strain Sensitivity $k_g$	$\mu\text{m}/\mu\epsilon$	$\sim 1.3$
Strain Range	$\mu\epsilon$	$\pm 2500$
Strain Accuracy	$\mu\epsilon$	5
Strain Resolution	$\mu\epsilon$	1
Linearity	%	99.9
Temperature Range	$^{\circ}\text{C}$	-40 to +85

Temperature	Unit	Specification
Temperature Sensitivity $k_t$	$\mu\text{m}/^{\circ}\text{C}$	$\sim 28$
Temperature Range	$^{\circ}\text{C}$	-40 to +85

Optical Parameters	Unit	Specification
Central Wavelength	nm	1510-1590
Reflectivity	%	≥10
SMSR	dB	≥15

Mechanical Parameters	Unit	Specification
Dimension	mm	~19×7×0.8
Connector Type	-	FC/APC or Customized
Pigtail Length	m	1.0 or Customized
Fiber Bending Radius	mm	10
Pigtail Protection Type	-	Optical fiber ribbon +0.9mm tube
Reliability	-	Conform to GR-1221-Core

### Microstrain (με) Calculation Formula:

$$\mu\epsilon = \frac{\lambda_{\epsilon} - \lambda_1}{k_{\epsilon}} \times 10^3 - (26.0 + \Delta) \times (T_{\epsilon} - T_1)$$

Where:

$\lambda_1$ (nm): The wavelength is measured at ambient temperature  $T_1$ (°C) with the strain gauge installed.

$\lambda_{\epsilon}$ (nm): The wavelength is measured under load when the ambient temperature is  $T_{\epsilon}$ (°C) and the strain gauge is installed.

$\Delta$ (/°C): The difference in the linear expansion coefficient is defined as that between the measured material under test and the strain gauge substrate material. It is calculated as  $\Delta = (\alpha - 18.4 \times 10^{-6}) \times 10^6$ , where  $\alpha$  is the coefficient of linear expansion of the measured material under test.