KEYENCE

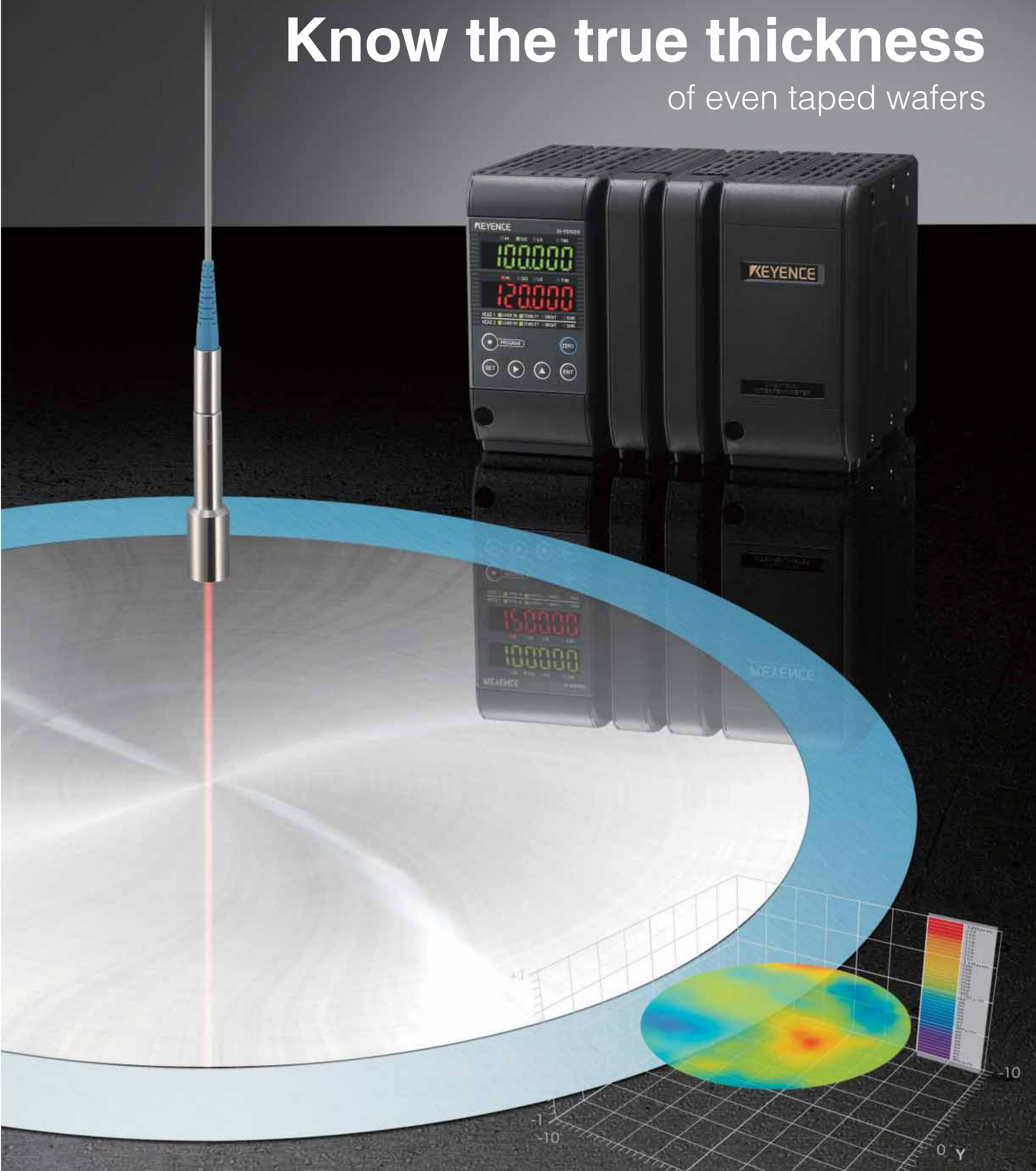
NEW Spectral-Interference Wafer Thickness Meter

SI-F80R Series

CE

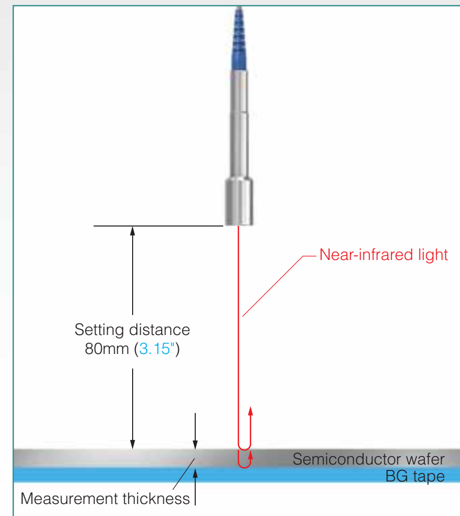
Know the true thickness

of even taped wafers



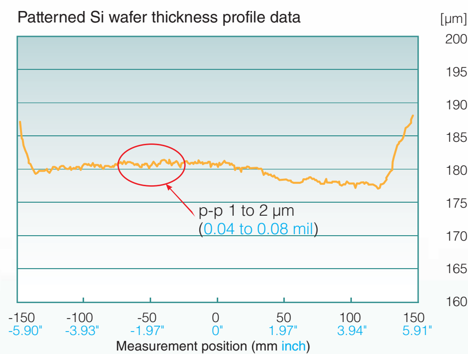
ACCURATELY MEASURE WAFER THICKNESS

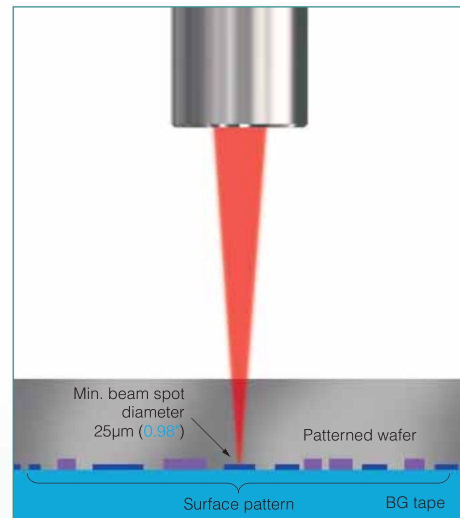
The SI-F80R Series employs a near-infrared SLD that can penetrate through Si, GaAs, SiC, InP, a-Si, and other semiconductors. It can accurately measure wafer thickness, even when covered with BG (backgrind) tape.



NOT INFLUENCED BY WAFER PATTERNS

Variations from wafer surface patterns and measurement alarms can be held to a minimum by decreasing the spot beam diameter and surface aberrations inside the beam spot.





BEST IN ITS CLASS SPECIFICATIONS

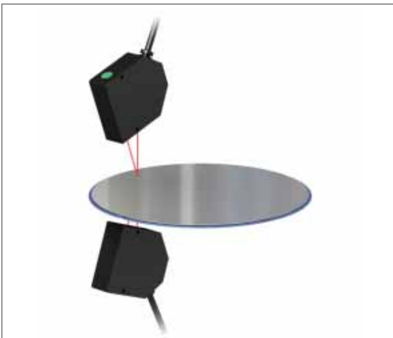
RESOLUTION	SAMPLING SPEED	WORKING DISTANCE	SMALL HEAD
0.25μm **(0.0098 mil)**	**5kHz**	**80mm** **3.15"**	**ø12mm** **ø0.47"**

SOLVES ALL PREVIOUS ISSUES

CONVENTIONAL METHOD

Contact measurement

- There is a risk of breaking wafers when measuring.
- Since the sensor measures the height including the BG tape, if the thickness of the tape changes, error is increased.



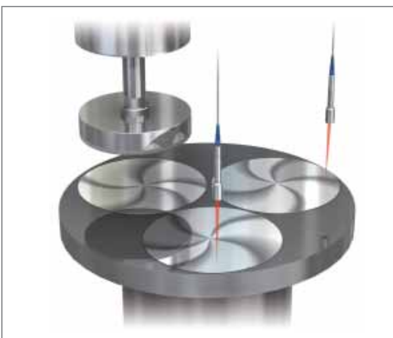
Non-contact measurement of wafers sandwiched between two sensors

- Very hard to align the optical axes of two sensors in a straight line.
- Since the sensors measure the thickness including the BG tape, if the thickness of the tape changes, the amount of error increases.

SI-F80R SERIES

Simple, accurate measurements next to the line

- The sensor can easily make measurements just by being positioned 80 mm (3.15") from wafers.
- Non-contact, so wafers are not damaged.
- The sensor can directly measure just wafer thickness, so measurements are not influenced by BG tape thickness.



Constant monitoring in process

- With a small head that can be installed 80 mm (3.15") from the wafer, wafer thickness can be constantly monitored inside equipment while polishing.

Specifications

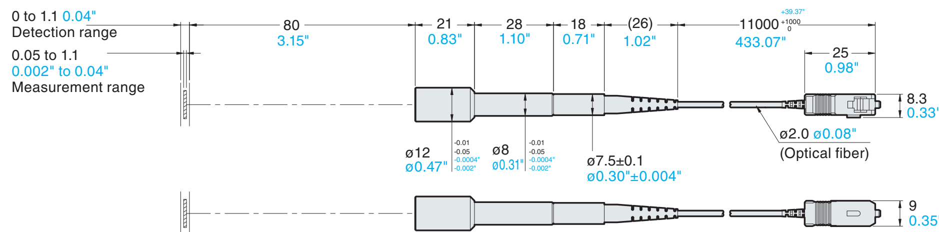
Unit: mm inch

Type			Wafer thickness measurement type
Model	Sensor head		SI-F80R
	Spectrum unit		SI-F80RU3
Measurement range *1			10 to 310 µm 0.39 mil to 12.2 mil (when n=3.5)
Possible detection distance			80 to 81.1 mm 3.15" to 3.19"
Light source			Infrared SLD Output 0.6 mW, Class 1 Laser Product (IEC60825-1, FDA (CDRH) Part 1040.10 *5)
Beam spot diameter *2			ø25 µm ø0.98 mil
Linearity *3			±0.1 µm ±0.004 mil (when n=3.5)
Resolution *4			0.25 µm 0.0098 mil
Sampling cycle			200 µs
LED display			Target near center of measurement range: green lights. Target within measurement range: orange lights. Target outside measurement range: flashes orange.
Temperature fluctuation	Spectrum unit		0.01% of F.S./°C
Environment resistance	Enclosure rating	Sensor head	IP64
	Ambient light		Incandescent lamp or fluorescent lamp: 10000 lux max.
	Ambient temperature	Sensor head	0 to +50°C 32 to 122°F
		Spectrum unit	0 to +35°C 32 to 95°F
	Relative humidity	Sensor head	35 to 85% RH (No condensation)
		Spectrum unit	35 to 85% RH (No condensation)
	Vibration	Sensor head	10 to 55 Hz, 1.5 mm 0.06" double amplitude in X, Y, and Z directions, 2 hours respectively
		Spectrum unit	10 to 55 Hz, 0.5 mm 0.02" double amplitude in X, Y, and Z directions, 2 hours respectively
Material	Sensor head		SUS
	Spectrum unit		Polycarbonate
Weight	Sensor head (including cable)		Approx. 70 g
	Spectrum unit		Approx. 1.2 kg

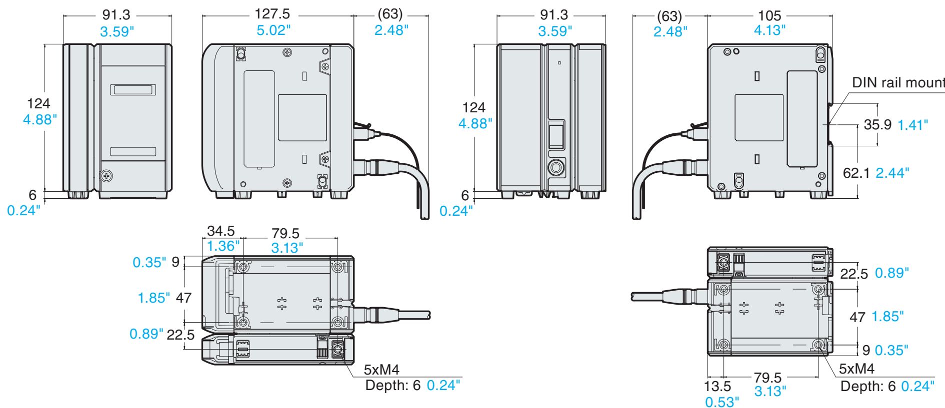
The sensor head and spectrum unit are calibrated as a pair. They are not interchangeable.
*1 Indicates the thickness measurement range when the refractive index is 3.5. (The thickness measurement range is 35 to 1100 µm 1.38 to 43.31 mil when the refractive index is 1.)
*2 Indicates the minimum beam spot diameter within the measurement range.
*3 This value is obtained by measuring the gap between two glass plates with the number of averaging measurements set to 256, converted to a refractive index of 3.5.
*4 This value is obtained by measuring a 0.3 mm 0.01" thick glass target within the possible detection distance with the number of averaging measurements set to 4096.
*5 The laser classification for FDA (CDRH) is implemented based on IEC60825-1 in accordance with the requirements of Laser Notice No. 50.

Dimensions

SI-F80R

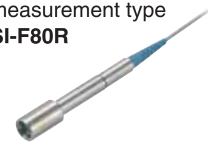


SI-F80RU3



Components

Wafer thickness measurement type
SI-F80R



Spectrum unit
SI-F80RU3

External device

IR sensor card

CALL TOLL FREE TO CONTACT YOUR LOCAL OFFICE **1-888-KEYENCE** 1-888-539-3623

www.keyence.com

SAFETY INFORMATION
Please read the instruction manual carefully in order to safely operate any KEYENCE product.

KEYENCE CORPORATION OF AMERICA

Corporate Office 669 River Drive, Suite 403, Elmwood Park, NJ 07407 PHONE: 201-930-0100 FAX: 201-930-0099 E-mail: keyence@keyence.com
Sales & Marketing Head Office 1100 North Arlington Heights Road, Suite 350, Itasca, IL 60143 PHONE: 888-539-3623 FAX: 630-285-1316

■ Regional offices

AL Birmingham, CA N.California, CA Los Angeles, CO Denver, FL Tampa, GA Atlanta, IL Chicago, IN Indianapolis, KS Kansas City, KY Louisville, MA Boston, MI Detroit, MI Grand Rapids, MN Minneapolis, MO St. Louis, NJ Elmwood Park, NY Rochester, NC Charlotte, NC Raleigh, OH Cincinnati, OH Cleveland, OR Portland, PA Philadelphia, SC Greenville, TN Knoxville, TN Nashville, TX Austin, TX Dallas, VA Richmond, WA Seattle, WI Milwaukee

KEYENCE CANADA INC.

Head Office PHONE: 905-696-9970 FAX: 905-696-8340 E-mail: keyencecanada@keyence.com
Montreal PHONE: 514-694-4740 FAX: 514-694-3206

KEYENCE MEXICO S.A. DE C.V.

PHONE: +52-81-8220-7900 FAX: +52-81-8220-9097
E-mail: keyencemexico@keyence.com

KEYENCE GLOBAL HEADQUARTERS

1-3-14, Higashi-Nakajima, Higashi-Yodogawa-ku, Osaka, 533-8555, Japan PHONE: +81-6-6379-2211

KA1-1031

The information in this publication is based on KEYENCE's internal research/evaluation at the time of release and is subject to change without notice.
Copyright (c) 2011 KEYENCE CORPORATION. All rights reserved.

SIF80-KA-C2-E 1041-1 611563 Printed in Japan