

## Silicon Wafer Mapping Sensor

### F3M-S825-1

Allows Simultaneous Mapping of Up to 25 Silicon Wafers

- Economical—one sensor detects most wafer types
- 200 mm wafer size
- Automatic and remote teaching capability
- Self-diagnostic functions reduce downtime



## Ordering Information

Applicable wafer size	Number of cassette slots	Function	Remarks	Part number
8 inches (6.35-mm pitch)	25	Self-diagnosis	CE marking	F3M-S825-1

## Application Examples

### Detects Transparent Glass Wafers With a Transparency of 92%

The F3M-S825-1 allows the mapping of cassettes that have both silicon wafers and glass wafers.

### Automatic Teaching Saves Setting Time (Remote Teaching Available)

The F3M-S825-1 has an automatic teaching function that ensures easy adjustments in minimal time. The remote teaching function allows quick, on-the-fly set up.

### Answer-back Alarms for Setting Errors and Self-diagnostic Alarms for Operation Errors

These alarms help reduce system downtime and shorten troubleshooting time.

### Static Electricity Protection

OMRON's optical system (including emitter and receiver) prevents malfunction and damage—protecting the Sensor from static electricity if charged on the semiconductor wafers at the time of mapping.

# Specifications

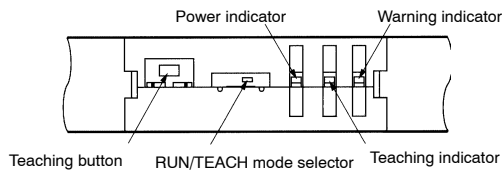
## ■ RATINGS/CHARACTERISTICS

Item		F3M-S825-1
Target object		8-inch semiconductor silicon wafers and transparent wafers (with transparency of 92% max.) (See Note.)
Number of channels		25
Optical axis pitch		6.35 mm
Optical axis width		1.5 mm
Light source		Infrared LED (940 nm)
Power supply voltage		12 to 24 VDC $\pm$ 10%, ripple (p-p): 10% max.
Current consumption		120 mA max.
Output	Control output	Load power supply voltage: 30 VDC Load current: 20 mA max. (residual voltage: 1 V max.); Inflow current: 20 mA.; Parallel output from all channels, NPN open collector; Dark-ON operation.
	Answer-back output	When remote teaching is ON, pin 28 will be used for this function.
	Self-diagnostic output	Load power supply voltage: 30 VDC max.; Load current: 20 mA max. (Residual voltage: 1 V max.); Inflow current: 20 mA; NPN open collector.
Indicators	Power	Green indicator is ON when power is being supplied.
	Warning	Red indicator is ON under the following conditions: Teaching, no target object, insufficient light, or error.
Response time		10 ms max.
Control output interrupt input		All outputs interrupted: GND and control output interrupt input terminals are short-circuited and 0-V short-circuit current is 1 mA max.; Output interrupt reset: GND and control output interrupt input terminals are opened or the voltage is between 9 V and the working power supply voltage.
Remote teaching input	ON	GND and remote input terminals are short-circuited and 0-V short-circuit current is 1 mA max.
	OFF	GND and remote input terminals are opened or the voltage is between 9 V and the working power supply voltage.
Teaching check function		Orange LED indicator
Ambient temperature	Operating	0°C to 40°C (32°F to 104°F) with no icing or condensation
	Storage	-25°C to 60°C (-13°F to 140°F)
Relative humidity		35% to 85% with no condensation
Ambient illumination		Fluorescent lamp: 1,500 lx max.
Noise resistance		Power supply line: $\pm$ 480 V in normal mode with noise simulator
		Static electrical noise: No malfunction or destruction at $\pm$ 8 kV
Vibration resistance		10 to 55 Hz, 0.5 mm double amplitude for 2 hrs each in X, Y, and Z axes
Shock resistance		300 m/s <sup>2</sup> (30G) 3 times each in X, Y, and Z axes
Degree of protection		IEC60529 IP40
Connection		Pre-wired cable (length: 500 mm $\pm$ 35 mm) IDC connector (insulation displacement)
Weight (packed state)		Approx. 110 g (3.8 oz)
Material	Optical axis	Polycarbonate
	Case	ABS
	Cable	Vinyl-insulated, bending type
Accessories		Spacer and instruction manual

Note: Operating conditions are restricted for the detection of transparent wafers. Contact your OMRON representatives for details.

**■ AUTOMATIC TEACHING FUNCTION**

F3M-S825-1



The remote or manual automatic teaching of the F3M-S825-1 is possible with the following two sensitivity settings:

1. Max. Sensitivity Setting: Detects semiconductor silicon wafers, and SIC wafers.
2. Teaching with No Target Object: Detects transparent wafers.

The sensitivity is set to maximum before shipping. Refer to the Instruction Manual when setting the sensitivity of the F3M-S825-1.

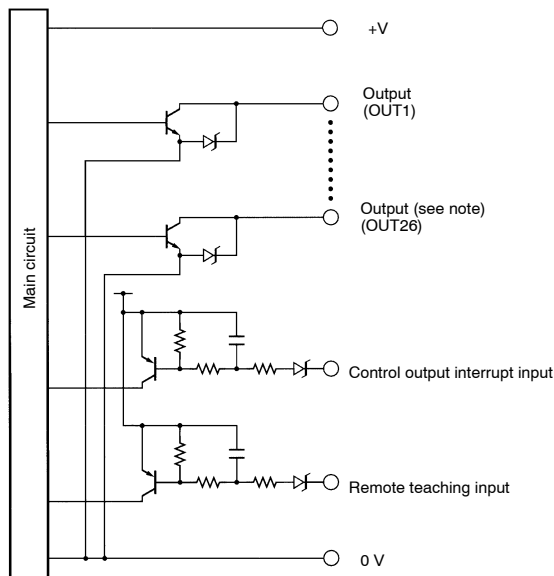
**■ ANSWER-BACK FUNCTION AND SELF-DIAGNOSTIC FUNCTION**

The F3M-S825-1 has an answer-back function to warn the user about setting errors and a self-diagnostic function to warn the user about operational errors.

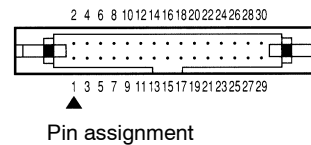
- Answer-back Function: Normal or error teaching output turns ON.
- Self-diagnostic Function: Warning output turns ON for a decrease in optical input.

**Operation**

**■ OUTPUT CIRCUIT DIAGRAM**



**■ I/O TERMINAL ARRANGEMENT**



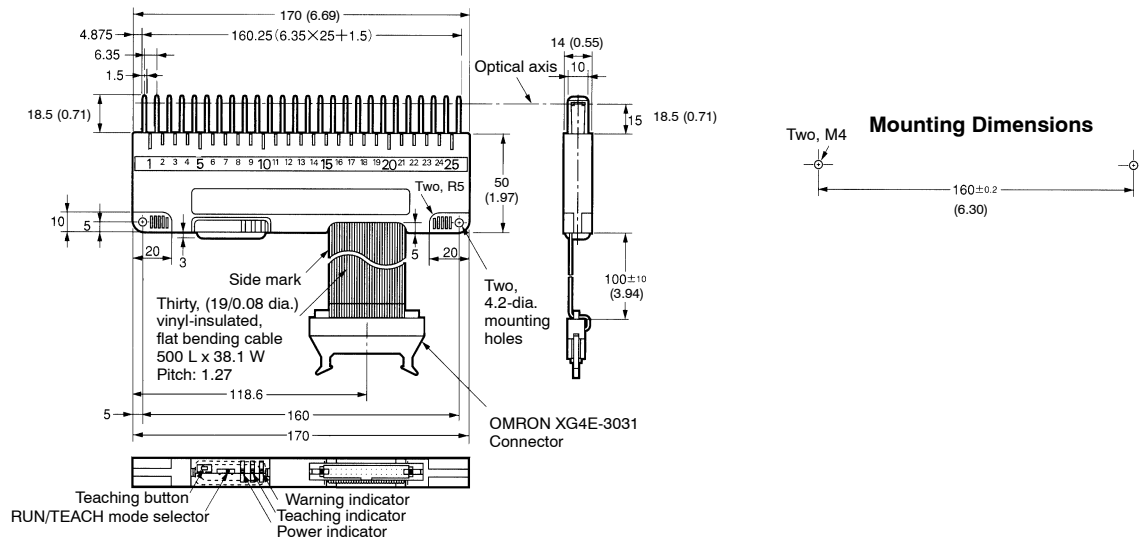
Pin	Assignment	Pin	Assignment
1	GND (0 V)	16	OUT14
2	V <sub>CC</sub> (12 to 24 V)	17	OUT15
3	OUT1	18	OUT16
4	OUT2	19	OUT17
5	OUT3	20	OUT18
6	OUT4	21	OUT19
7	OUT5	22	OUT20
8	OUT6	23	OUT21
9	OUT7	24	OUT22
10	OUT8	25	OUT23
11	OUT9	26	OUT24
12	OUT10	27	OUT25
13	OUT11	28	Self-diagnostic output/OUT26 (See Note.)
14	OUT12	29	Control output interrupt input
15	OUT13	30	Remote teaching input

Note: Pin 28 will have answer-back output only when remote teaching input is turned ON. Otherwise, this output is a self-diagnostic output.

# Dimensions

Unit: mm (inch)

## ■ F3M-S825-1



# Precautions

## ■ CORRECT USE—TO AVOID DAMAGE

- Do not use the F3M-S825-1 at a voltage that exceeds the rated voltage range.
- Do not make mistakes in wiring, such as mistakes in polarity.
- Do not short-circuit the load.
- Do not connect AC to the F3M-S825-1.

## ■ INSTALLATION/ENVIRONMENT

Do NOT use the F3M-S825-1 in the following locations:

- Locations exposed to direct sunlight.
- Locations with high humidity that may cause condensation.
- Locations with corrosive gas.
- Locations where vibration or shock directly affects the Sensor.

## ■ CLEANING

Do not attempt to clean the F3M-S825-1 using paint thinner, to avoid damaging the surface of the Sensor.

## ■ CONNECTION AND MOUNTING

- A maximum of 24 VDC+10% can be imposed on the F3M-S825-1. Check that the voltage of the power supply is within the permissible range before turning on the F3M-S825-1. The power supply must be constructed so that the secondary circuit is insulated with an isolating transformer.
- Do not wire power lines or high-voltage lines within the same conduit with the lines of the F3M-S825-1, or the sensor may be damaged or malfunction.
- Avoid mechanical impact when mounting the F3M-S825-1, or its water-resistant properties will be reduced.

## ■ POWER SUPPLY

If a standard switching power supply is connected to the F3M-S825-1, be sure to ground the FG (frame ground) and G (ground) terminals of the power supply. If these terminals are not grounded, the Sensor may malfunction due to switching noise that will be generated from the power supply.

**NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.**

# OMRON®

OMRON ELECTRONICS, INC.

One East Commerce Drive  
Schaumburg, IL 60173

1-800-55-OMRON

OMRON CANADA, INC.

885 Milner Avenue  
Scarborough, Ontario M1B 5V8

416-286-6465