

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

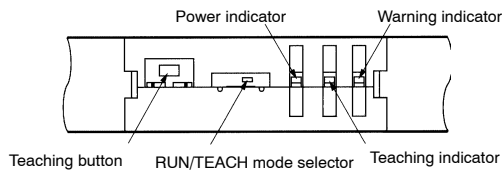
■ RATINGS/CHARACTERISTICS

| | | |
|--------------------------------|------------------------|--|
| 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: ± 480 V in normal mode with noise simulator |
| | | Static electrical noise: No malfunction or destruction at ± 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 ² (30G) 3 times each in X, Y, and Z axes |
| Degree of protection | | IEC60529 IP40 |
| Connection | | Pre-wired cable (length: 500 mm ± 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.

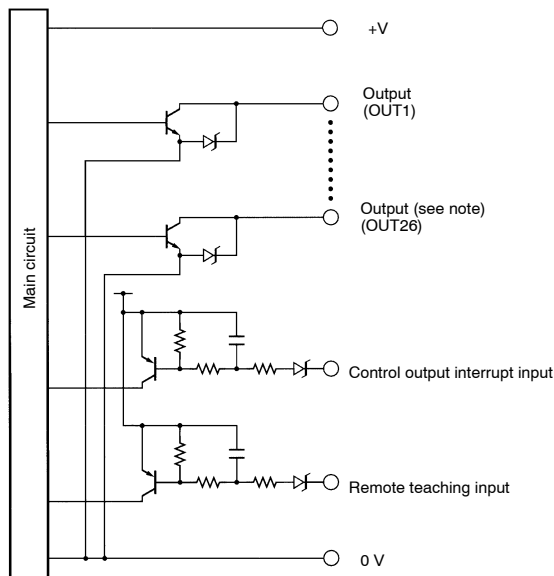
■ ANSWER-BACK FUNCTION AND SELF-DIAGNOSTIC FUNCTION

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.

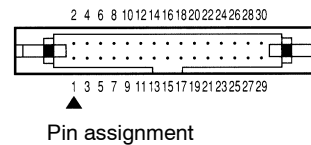
- Answer-back Function: Normal or error teaching output turns ON.
- Self-diagnostic Function: Warning output turns ON for a decrease in optical input.

Operation

■ OUTPUT CIRCUIT DIAGRAM



■ I/O TERMINAL ARRANGEMENT



| Pin | Assignment | Pin | Assignment |
|-----|------------------------------|-----|--|
| 1 | GND (0 V) | 16 | OUT14 |
| 2 | V _{CC} (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.

