



Datasheet

High-sensitivity, high-resolution Scientific, Mini Optic Fiber Spectrometer

EOC-SI-

Description:

- Detector: back-thinned CCD, cooled down to -15 °C
- CCD parameters: 2048x64 pixels
- Ultra-low noise CCD signal processing circuit
- Ultra-high dynamic range
- Ultra-low Etalon effect
- Quantum efficiency>90%
- Spectral range: 190-1100nm
- Spectral resolution: 0.01-4nm(depend on spectral range, slit width)
- Optical path: crossed Czerny-Turner (C-T)
- Integration time: 2ms-130s
- power supply: DC 5V±10% @ <2.3A
- 18 bit, 570KHz A/D Converter
- Entrance connector: SMA905 connector or free space
- Output interface: high speed USB2.0 or UART
- 20 pins, dual rows programmable extension connector

Application:

- Biological fluorescence measurement
- Raman spectrometer
- Small volume, fast spectrophotometer;
- Transmittance measurement;
- Reflectance measurement;

Description:

EOC-SI-6500 Fiber Optic Spectrometer employs Miniature, ultra-high performance, 2048 x 64 pixel, semiconductor-cooled, back-thinned CCD array, reduced dark current, CCD cooled down to -15°C under constant temperature. It greatly reduces sensor noise resulting in almost 2 times higher SNR than other competitors. It increases measuring reliability, and measuring results are not changed with temperature.

EOC tailor-designs ultra-low noise CCD signal processing circuit inside, resulting in first-class quantitative noise that is lower than 3 counts.

EOC-SI-6500 receive lights via SMA905 connector or free space, and it outputs spectrum data via USB2.0/UART.

EOC-SI-6500 requires only 5V DC supply, and convenient to apply integration.



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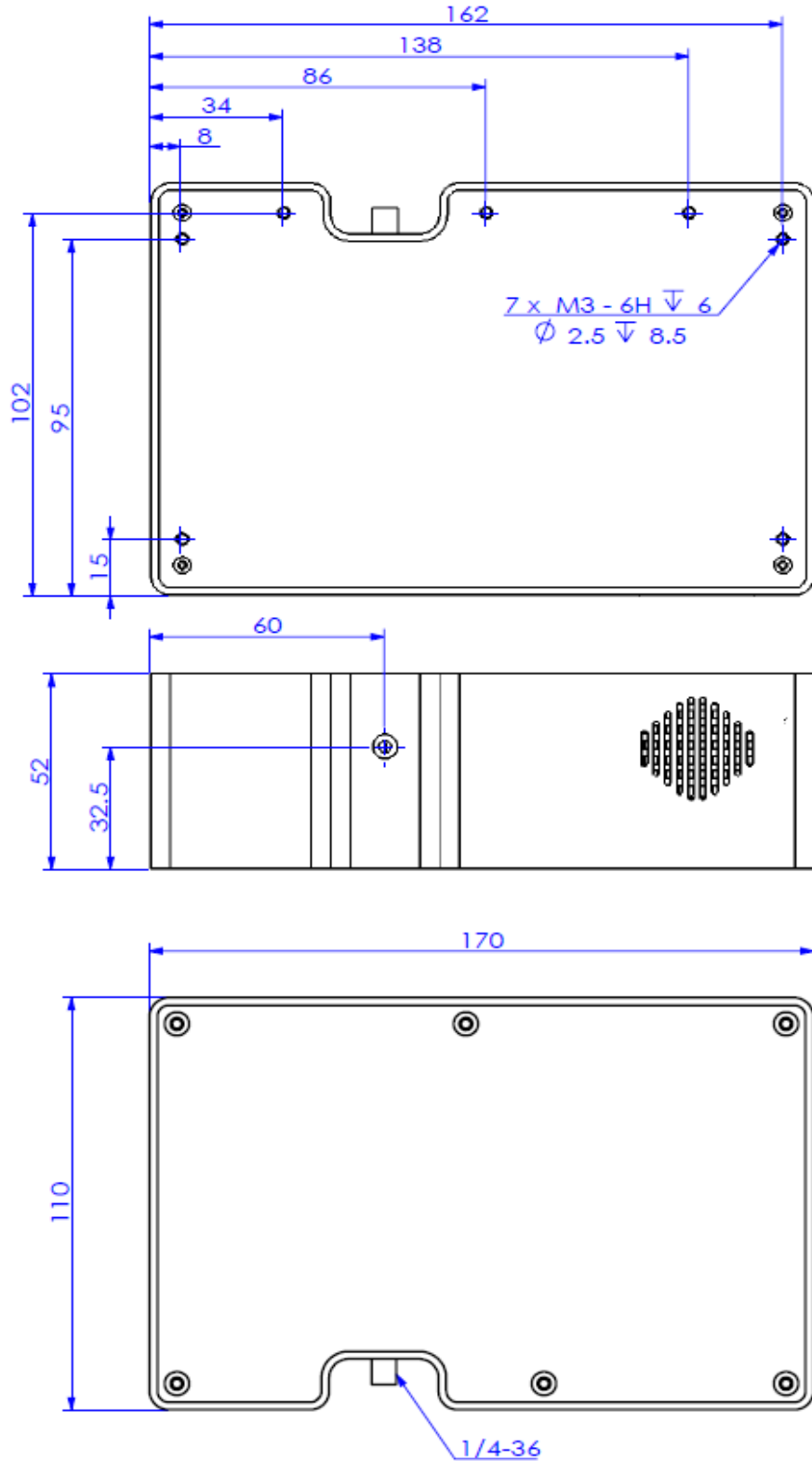
Performance parameters

| Detector | |
|-------------------------|---|
| Type | back-thinned linear CCD (cooled down to -20°C) |
| Spectral range | 180-1100 nm |
| Effective pixels | 1044 x 64 |
| Pixel size | 24µm × 24µm |
| Full range | ~600 ke ⁻ |
| Sensitivity | 6.5 uV/e ⁻ |
| Dark noise | 8 e ⁻ |
| Optical parameters | |
| Wavelength range | 180-1100 nm (available in custom wavelengths) |
| Resolution | 0.01-1.3 nm (decide on slit, spectral range) |
| SNR | >3000:1 |
| Dynamic range | >50000: 1 |
| Operating temperature | -10 - 45 °C |
| Operating humidity | < 85%RH |
| Optical path parameters | |
| Optical path | f/4 crossed C-T |
| Confocal distance | 98 mm for incidence / 107 mm for output |
| Entrance slit width | 5、 10、 25、 50、 100、 150、 200 µm optional, available in custom width |
| Incident connector | SMA905 connector or free space |
| Electrical parameters | |
| Integration time | 1 ms - 130 second |
| Data output interface | USB 2.0 |
| ADC bit depth | 18 bit (output 16bit) |
| Power supply | DC 5V±10% |
| Operating current | <3.2A |
| Storage temperature | -20°C to +70°C |
| Operating temperature | -10°C to +45°C |
| Physical parameters | |
| Dimension | 170×110×52 mm ³ |
| Weight | 0.8 kg |
| Sealing | Anti-sweat |

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Mechanical

Diagrams



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Table 1 Electrical Characteristics

| Parameter | Min | Typ | Max | Unit |
|---|------|-----|------|------|
| Power Supply | | | | |
| Operating voltage range | 4.5 | 5 | 5.5 | V |
| Operating current | 170 | 500 | 2000 | mA |
| Logic Inputs(3.3V LVTTTL, Five-volt tolerant) | | | | |
| High level input voltage | 1.7 | | 3.6 | V |
| Low level input voltage | -0.3 | | 1.0 | V |
| Logic Output(3.3V LVTTTL) | | | | |
| High level output voltage | 2.4 | | | V |
| Low level output voltage | | | 0.4 | V |

The module is equipped with a 20-pin male angled box header(2x10, 2.00 mm pitch) and USB2.0 B type interface. The 20-pin connector is a Samtec part # STMM-110-02-L-D-RA connector. The mate to this is a Samtec part # TCSD-10-D-XX.XX-01-N.

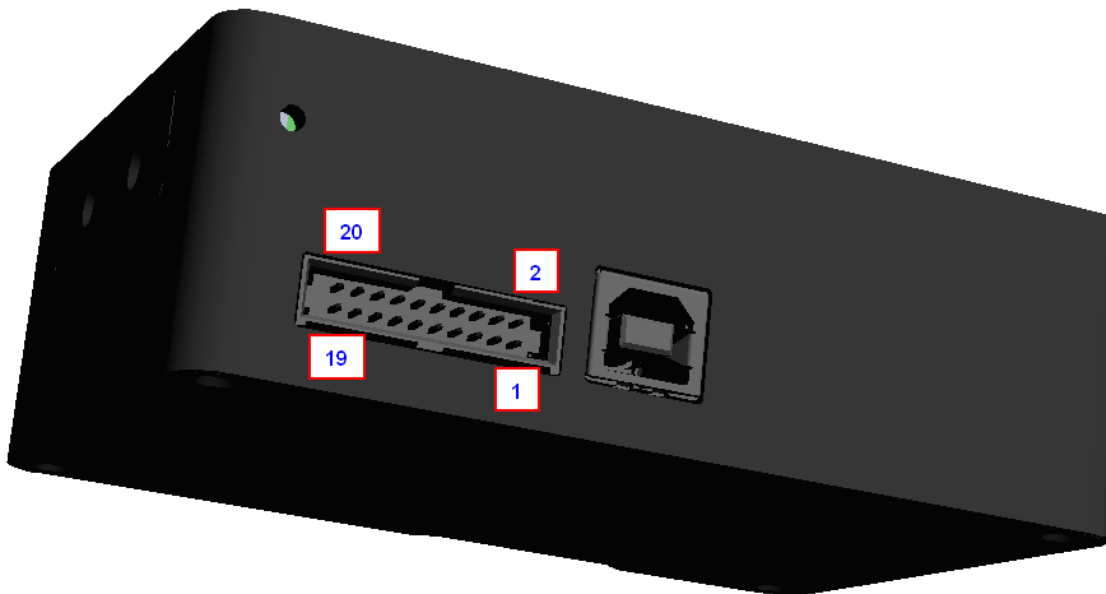


Table 2 Electrical Pin-Out

| Pin# | Description | I/O | Function Description |
|------|-------------------|--------|--|
| 1 | VCC | / | Power Supply, 5V±0.5, |
| 2 | GND | / | Ground |
| 3 | UART_TX | Output | UART Transmit signal |
| 4 | UART_RX | Input | UART Receive signal |
| 5 | Lamp_En | Output | LVTTTL output the lamp enable signal. |
| 6 | Continuous_strobe | Output | LVTTTL output the continues strobe signal. |
| 7 | Ext_trigger_in | Input | LVTTTL input the trigger signal. |

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|----|---------------|---------------|---|-----------------------|---------|
| 8 | Single_strobe | Output | LVTTTL output the single strobe signal. | | |
| 9 | SPI_SCK | Output | The SPI Clock signal for communications to other SPI peripherals | | |
| 10 | SPI_MOSI | Output | The SPI Master Out Slave In (MOSI) signal for communications to other SPI peripherals | | |
| 11 | SPI_MISO | Input | The SPI Master In Slave Out (MISO) signal for communications to other SPI peripherals | | |
| 12 | SPI_CS | Output | The SPI Chip/Device Select signal for communications to other SPI peripherals | | |
| 13 | GPIO0 | Input /Output | General Purpose | Software Programmable | Digital |
| 14 | GPIO1 | Input /Output | General Purpose | Software Programmable | Digital |
| 15 | GPIO2 | Input /Output | General Purpose | Software Programmable | Digital |
| 16 | GPIO3 | Input /Output | General Purpose | Software Programmable | Digital |
| 17 | GPIO4 | Input /Output | General Purpose | Software Programmable | Digital |
| 18 | GPIO5 | Input /Output | General Purpose | Software Programmable | Digital |
| 19 | GPIO6 | Input /Output | General Purpose | Software Programmable | Digital |
| 20 | GPIO7 | Input /Output | General Purpose | Software Programmable | Digital |

3 Order Guide

Order number Rules:

| Model | Spectral region | | Slit width | |
|-------------|------------------|-----------------|------------|--|
| EOC-SI-6500 | Short wavelength | Long wavelength | Slit width | |

For example:

What to buy EOC-SI-6500, spectral region: 200-850nm, slit width is 50 μ m, then the order no is:

EOC-SI-6500-200-850-050

| Order No | Spectral region (nm) | Slit | |
|--------------------------|----------------------|------------|--|
| EOC-SI-6500-200-400-### | 200~400 | 10 μ m | |
| EOC-SI-6500-200-850-### | 200~850 | 25 μ m | |
| EOC-SI-6500-200-1100-### | 200~1000 | 50 μ m | |

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| | | | |
|--------------------------|----------|--------------------|--|
| EOC-SI-6500-340-850-### | 340~850 | 100 μ m | |
| EOC-SI-6500-600-1100-### | 600~1100 | 200 μ m | |
| EOC-SI-6500-800-1000-### | 800-1000 | Other: _____ μ | |
| EOC-SI-6500-300-1100-### | 300-1100 | m | |
| EOC-SI-6500-###-###-### | Other | | |