

Product Brief

Qmini AFBR-S20M2xx

Miniature Spectrometer with Onboard Processing for Mobile Applications and Industrial Integration

Overview

Spectroscopy is a powerful tool used to analyze the properties of materials and substances based on their interaction with light. In process analytics, mini spectrometers are used to monitor and control chemical reactions, assess the quality of materials, and optimize production processes. With the development of compact spectroscopic instruments, Broadcom helps customers ensure fast process analytics, providing real-time analytics.

The Broadcom® Qmini product line detects light from the very low ultraviolet wavelengths starting at 185 nm up to signals that appear in ranges up to 1100 nm.



Key Features

- High optical performance
- Miniature size
- Customizable OEM designs
- Low temperature dependency and resiliency to shock and vibration

Applications

- Color measurement
- Chemical analysis
- Quality control
- System integration
- Counterfeit detection
- Environmental analysis
- Biomedical applications
- Light analysis
- Process control and monitoring

Part Number	Product Configuration	Wavelength Range	Typical Spectral Resolution (FWHM)
AFBR-S20M2DUV	Qmini Deep UV	185 nm to 375 nm	0.5 nm
AFBR-S20M2UV	Qmini UV	220 nm to 400 nm	0.5 nm
AFBR-S20M2VI	Qmini VIS	370 nm to 750 nm	0.8 nm
AFBR-S20M2NI	Qmini NIR	730 nm to 1080 nm	0.8 nm
AFBR-S20M2WU	Qmini Wide UV Sensitivity optimized at 300 nm	225 nm to 1000 nm	1.5 nm
AFBR-S20M2WV	Qmini Wide VIS Sensitivity optimized at 500 nm	225 nm to 1000 nm	1.5 nm
AFBR-S20M2VN	Qmini VIS/NIR	480 nm to 1100 nm	1.5 nm

Specifications	
Focal length	50 mm
Grating	300 or 600 lines/mm
Entrance slit	20 μ m (changeable)
Dynamic range	1300:1
Numerical aperture	0.1
Stray light	<0.1 %
Exposure time range	3 μ s to 600s
Detector	2500-pixel linear CCD sensor
A/D converter	16-bit
Calibration	Wavelength, sensitivity, nonlinearity, and multiple dark spectra stored in device
Internal memory	32 MB (>3000 spectra)
Transfer speed to PC	USB 2.0 high-speed
Optical interface	SMA connector
Digital interfaces	USB 2.0 with Type-C connector, SPI, UART
Dimensions	64.0 mm \times 42.0 mm \times 14.5 mm
Weight	60g
Operating temperature	-15°C to 60°C (non-condensing)
Storage temperature	-25°C to 70°C
Power consumption	5V DC, up to 130 mA
PC operating system	Windows 10, 8, 7, Vista, XP

Within an amazingly small design, the Qmini delivers technical specifications that are unprecedented at this size. Its compact design enables tight integration in applications where space is limited, such as mobile analysis devices. The Qmini includes a powerful electronics board that enables fast and easy integration.

The Qmini also features a replaceable entrance slit, reduced stray light, and lower power consumption.

Application Software

Every Qmini spectrometer includes the Waves user software developed for general-purpose spectroscopy applications. Waves includes sophisticated algorithms for data acquisition and evaluation, which provides many features through a clear and straightforward user interface.

The software is available as a free download from each spectrometer's product page.

Software Library

A software development kit (SDK) is also included to control the spectrometer and take spectra from your own software. It consists of a Windows DLL library for the .NET framework, documentation, and sample code. The SDK can be used with any programming language that can use .NET DLLs, including C#, Visual Basic .NET, C++, Delphi, LabVIEW, Matlab, and Mathematica.

Communication Protocol

The spectrometer can also be directly controlled from an embedded microcontroller or other operating systems using the device communication protocol. Just like our application software, the protocol is designed to be both powerful and easy to use for software developers.

I/O Port

The Qmini includes a new auxiliary connector for analog and digital I/O, communication interfaces, and power supply (if USB is not used). The eight digital channels can be configured as trigger input, shutter or flash lamp control, process control, or general-purpose I/O pins.

The Qmini supports three trigger modes: software trigger, interval trigger, and external trigger. It can be set to trigger on the start or the end of the exposure period.

Support

For any questions, comments, or requests about the spectrometer product line, contact the support team via email support at spectrometer@broadcom.com.