BTS2048-IR

https://www.gigahertz-optik.com/en-us/product/bts2048-ir

Product tags: NIR

Description

BTS2048-IR spectroradiometer with thermoelectrically cooled detector

The BTS2048-IR incorporates thermoelectric cooling of its InGaAs array detector and also a cooled InGaAs Diode for the BTS technology. The device meets all the requirements of a high-end diode array spectroradiometer and is favourably priced despite its cutting-edge design. Thermoelectric cooling of the array detector minimizes the dark noise signal.

Innovative detector technology

In order to make use of the advantages of an InGaAs chip that is less noisy compared to an extended InGaAs chip in the possible spectral ranges, a detector chip with both technologies is used. This matches the spectral ranges optimally and thus allows the best electro-optical properties. Other features such as an electronic shutter, OD filter and the proven BTS technology find their place as usual.

Features on a glance

- Spectral range from 950 nm to 2150 nm
- BTS technology (integrated additional diode)
- Electronic shutter and filter wheel with four positions (open, dark, OD1 and OD2)
- Convincing optical properties
- Compact dimensions
- Fast data transmission due to Ethernet and USB interface
- I/O connector
- Traceable calibration

User software and developer software

The standard S-BTS2048 user software has a customizable user interface and a large number of display and function modules that can be activated when configuring the BTS2048-IR with the respective accessory components from Gigahertz-Optik GmbH. The S-SDK-BTS2048 developer software is offered for the integration of the BTS2048-IR in custom software.

Calibration

One essential quality feature of photometric devices is their precise and traceable calibration. The BTS2048-IR is calibrated by Gigahertz-Optik's calibration laboratory that was accredited by DAkkS (D-K-15047-01-00) for the *spectral responsivity* and *spectral irradiance* according to ISO/IEC 17025. The calibration also included the corresponding accessory components. Every device is delivered with its respective calibration certificate.

The BTS2048-IR spectroradiometer with thermoelectrically cooled array detector

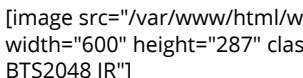*Cosine corrected diffuser and several trigger and I/O possibilities*
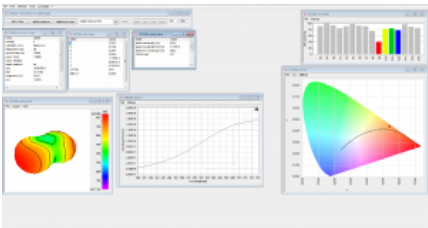
S-BTS2048 User software interface

Specifications

General

Short description	TE cooled spectroradiometer with a wide dynamic range for CW and short-term measurement of the irradiance, spectrum, and peak wavelength. Accessories for other parameters.

Main features	Compact device. BiTec detector with TE cooled detector (512 pixels, 9 nm optical resolution, electronic shutter), and additional InGaAs diode. Optical bandwidth correction (CIE214). Filter wheel with shutter and OD-Filter. Input lens with diffusor window. Cosine field of view.
Measurement range	Spectral: 2E-4 W/(m²nm) to 1E4 W/(m²nm) @1600 nm. Responsivity from 950 nm to 2150 nm. Integral: 2E1 W/m² to 6E7 W/m², responsivity from 1050 nm to 2100 nm.
typical applications	Diode array spectroradiometer for R&D applications and for the integration in testing systems.
Calibration	Factory calibration. Traceable to international calibration standards

Product

Measured Quantity	Spectral irradiance (W/(m² nm)), irradiance (W/m²), spectral radiant intensity (W/(sr nm)), radiant Intensity (W/sr), peak wavelength, center wavelength, centroid wavelength, etc.. Option integrating sphere: in addition spectral flux (W/nm). Option goniometer: in addition radiant intensity (W/sr)
Input optics	Diffusor, cosine corrected field of view
Filter wheel	4 positions (open, closed, OD1, OD2). Use for remote dark current measurement and dynamic range extension.
BiTec	Parallel measurement with diode and array is possible, thereby an online correction of the spectral mismatch of the diode through $a*(s_z(\lambda))$ respectively $F*(s_z(\lambda))$.

Spectral Detector

Calibration uncertainty	Spectral irradiance wavelength range / nm calibration uncertainty (k=2) / (950 to 1039) nm 4 (1040 to 1549) nm 4,5 (1550 to 1949) nm (Sensor part 1) 5 (1550 to 1949) nm (Sensor part 2) 6 (1950 to 2049) nm 6,8 (2050 to 2150) nm 7,5 Spectral irradiance responsivity (950 - 2150) nm
Integration Time	10 µs - 20 s *11
spectral range	(950 -2150) nm
Optical Bandwidth	9 nm
Pixel resolution	~2.3 nm/Pixel
Number of pixels	512
Chip	cooled highly sensitive InGaAs chip with second order filter
ADC	16bit
Peak wavelength	± 1 nm
Band-pass correction	mathematical online band-pass correction is supported
Linearity	completely linearized chip >99% *10
Base line noise	7 cts *1
SNR	5000 *2
dynamic range	8 Magnitudes
spectral irradiance responsivity range	[image src="/var/www/html/web/assets/7bdd9a75a0/spectral-responsivity-BTS2048-IR.png" id="6380" width="600" height="287" class="leftAlone ss-htmleditorfield-file image" title="spectral responsivity BTS2048 IR"]

Integral Detector

Filter	Spectral responsivity with radiometric matching. Online correction of the radiometric matching through spectral measurement data (spectral missmatch factor correction).
Measurement range	Nine (9) measurement ranges with offset correction
Measurement range	min. measurable irradiance (diode): 15 W/m²
	max. measurable irradiance (diode): 6E7 W/m²
	responsivity range: (1050 - 2100) nm
Miscellaneous	
Microprocessor	32bit for device control,16bit for detector array control, 8bit for photodiode control
Interface	USB V2.0, Ethernet (LAN UDP protocol), RS232, RS485
Data transfer	Standard for 512 float array values via ethernet 5 ms
Input Interfaces	2x (0 - 25) VDC, 1x optocoupler isolated 5 V / 5 mA
Output Interfaces	2x open collector, max. 25 V, max. 500 mA
Trigger	Trigger input incorporated (different options, rising/falling edge, delayed, etc.)
Software	User software S-BTS2048 Optional software development kit S-SDK-BTS2048 for user software set-ups based on .dll's in C, C++,C# or in LabView.
Power Supply	With power supply: DC Input 5V (±10 %) at 3000 mA
Dimensions	135 mm x 107 mm x 90 mm (Length x Width x Height)
Weight	1000g
Mounting	Tripod and M6 screw threads
	Front adapter UMPA-1.0-HL for use with integrating sphere port-frame UMPF-1.0-HL
temperature range	Storage: (-10 to 50) °C
	Operation: (10 to 30) °C *9
temperature range	Temperature stabilization chip: ≤ ± 0.25 °C
Info	*1 typical value measured without averaging with an integration time of 1ms (standard deviation). With averaging the base line noise reduces.
	*2 typical value measured without averaging with a measuring time of 1ms and full saturation of the detector. With averaging the SNR increases.
	*9 The device takes about 25 minutes to stabilize in temperature. If measurements are taken in the warm-up phase or at non-constant temperatures, a new dark measurement is required for each measurement.
	*10 The chip is basend on two different materials depending on the spectral range. Upper half (extendend InGaAs) may show a higher uncertainty at longer integration times.
	*11 At longer integration times the possible saturation for the extendend InGaAs range may be limited by ambient temperature

Downloads

Type	Description	File-Type	Download
Dimensions	BTS2048-IR technical drawing	pdf	https://www.gigahertz-optik.com/assets/Uploads/V127877.pdf

Purchasing information

Article-Nr	Modell	Description
Product		
15308288	BTS2048-IR	Measuring device, hard cover box, users guide, S-BTS2048 software, calibration certificate.
Software		
15298470	S-SDK-BTS2048	Software development kit, software CD with users guide.
Accessories		
15312474	BTS2048-Z03	Trigger cable. For use with LPS-20 power supply.