DSR600 Photodetector Spectral Response System, 200–2400 nm, Lock-in Detection

Model DSR600 Series · waveqvanta.com/products/dsr600-photodetector-spectral-response-system

Turnkey platform for measuring spectral responsivity, quantum efficiency and reflectance of photodetectors and optoelectronic materials.



The DSR600 is a turnkey, multifunctional platform built around spectral response measurement that automatically performs spectral response, quantum efficiency, reflectance and mapping tests on optoelectronic devices and materials. It uses the substitution method, the standard approach of metrology institutes for spectral responsivity, so only the standard detector needs periodic calibration and no alignment is needed before measurements. Optional spectral coverage within 200–2400 nm suits deep-UV solar-blind detectors, solar cells and near-infrared sensors.

Key features

- Spectral response, bias-voltage spectral response, EQE/IQE, reflectance, transmittance, short-circuit current density and I-V measurement
- Substitution-method design: only the standard detector requires regular calibration, no alignment before tests
- All-reflective optical path keeps spot size and position constant as the wavelength changes
- Light source options: EQ source (190–2100 nm), xenon (250–2000 nm), dual source (250–2500 nm) and blackbody (300–1500 °C)
- Lock-in detection with DCS540 optical chopper (20 Hz–5 kHz) and DCS500PA digital lock-in amplifier (50 mHz–120 kHz)
- Sample chamber with monitoring CCD, probe stage, triaxial-cable probes and optional vacuum adsorption stage
- Software stores test plans and sample information, runs bias-voltage tests automatically and exports TXT or Excel files

Specifications

Measurement Functions	Spectral response, bias SR, EQE, IQE, reflectance, transmittance, Jsc, I-V
Spectral Range	200–2400 nm (optional, depends on configuration)
Measurement Method	Substitution method with standard detector
Detector Types	Photovoltaic (solar cells, FETs, PSDs, array devices) and photoconductive detectors
Probe Spot	≤ 1 mm
Data Acquisition	Lock-in
Optical Path	All-reflective, no chromatic aberration
EQ Light Source	190–2100 nm, 100 µm luminous point, 9000 h lifetime, high UV output
Xenon Light Source	250–2000 nm, 1 mm luminous point
Dual Light Source	250–2500 nm, UV to NIR
Blackbody Source	300–1500 °C, 38 or 58 mm aperture, stability 0.3 K, resolution 0.1 K
Optical Chopper DCS540	20 Hz–5 kHz, 0.01 Hz resolution, 2.4-inch LCD, TTL/CMOS input and output
Lock-in Amplifier DCS500PA	50 mHz–120 kHz, 1 nV–1 V full-scale sensitivity, up to 100 dB dynamic reserve

Lock-in Inputs	Low-noise current and voltage inputs
Source Meter	5½-digit, 200 mV–20 V ranges, > 2000 readings/s, GPIB/RS-232, 20 W
Sample Chamber	Monitoring CCD, probe stage, triaxial-cable probes, optional vacuum adsorption stage
Data Export	TXT, Excel

Model overview

Model	Light Source	Spectral Range	Repeatability 200–400 nm	Repeatability 400–1000 nm	Repeatability 1000–1700 nm	Data Acquisition	Spot
DSR600-3111	Xenon	300–1700 nm	≥98%	≥99%	≥98%	Lock-in	≤1 mm
DSR600-3121	Tungsten	400–2400 nm	–	≥99%	≥98%	Lock-in	≤1 mm

Typical applications

- Deep-UV solar-blind detector characterization
- Solar cell spectral response and EQE
- Near-infrared fiber sensor testing
- Photovoltaic and photoconductive detector research
- Reflectance and transmittance of optoelectronic materials