

PV/Solar cell Quantum Efficiency Measurement System: QE-R

The Best Selling and Most Trustable QE / IPCE System in the World.

Introduction

QE-R quantum efficiency system is a PV cell tester which can provide cell's EQE, IPCE, IQE and spectral response data accurately and rapidly. The quantum efficiency spectra provided by QE-R quantum efficiency system is commonly used by PV researchers to illustrate and study the device design, device performance, process improving, material bandgap, impurity, or traps.

Due to its high repeatability and accuracy of QE-R quantum efficiency system, metrology engineers also use QE-R quantum efficiency system to do spectral mismatch calculation and the uncertainty evaluation of PV conversion efficiency. QE-R quantum efficiency system is adopted by over 500 outstanding PV research laboratories and published over 1,000 SCI papers in the past 10 years, including many flag-ship journals like Nature, Science, Joule, and Advanced Materials et al.



Application

- ◆ Perovskite solar cell testing
- ◆ Organic solar cell testing
- ◆ Tandem or multi-junction solar cell testing
- ◆ EQE Integral current density of, $J_{sc}(EQE)$, under AM1.5G spectrum
Manufacturing process quality check

Specification / Product Selection Guide

- ◆ The only one that complies with ASTM and IEC international standards, providing a dual optical path light intensity monitoring module and two lock-in amplifiers for spectral response/quantum efficiency testing simultaneously monitors light intensity for highly reproducible test results of over 99.5%.
- ◆ The system can provide measuring data of QE (quantum efficiency), PV-EQE (external quantum efficiency), IPCE (incident photon-electron conversion efficiency), SR (spectral response), IQE (internal quantum efficiency), and reflectivity.

Measuring Wavelength Range	300-1100nm 300-1800nm 300-2500nm
Functions	-Absolute light intensity calibration -EQE / IQE / IPCE / SR / Reflective rate (R) measuring -AM1.5G / AM1.5D / AM0 J_{sc} (EQE) Calculation -Auto in-situ $J_{sc}(EQE)$ calculation -Bandgap analysis -Mismatch factor (MMF) calculation
Options	-EQE measuring wavelength range extendable to 1800 nm -IQE measurement module -Transmission rate calculation -DC measuring module -Dual lamp system -Ultra-small light spot -Voltage bias module -White light bias -Double-junction solar cell measuring module

Testing Results / Publications

nature energy
A guest-assisted molecular-organization approach for >17% efficiency organic solar cells using environmentally friendly solvents

Haiyang Chen, Rui Zhang, Xiaobin Chen, Guang Zeng, Libor Kobers, Sabina Abbreut, Ben Zhang, Weiwei Chen, Guiyang Xu, Jiyoon Oh, So-Hyei Kang, Shanshan Chen, Changduk Yang, Jiri Brus, Jianhui Hou, Feng Gao, Yaowen Li & Yongfang Li

Joule
 Flexible perovskite solar cells with simultaneously improved efficiency, operational stability, and mechanical reliability

Qinghua Dong, Li Chen, Xiang Liu, Felix Eisenhammer, Weidong Zhao, Zhengrong Guo, Hongfeng Guo, Chen Jiang, Longsheng Tang, Xiangjun Li, Xiangrong Zhang, Shikui Han, Zhenzhen Li, Michael Gruber, Stefan A. Ringel, Robert F. O. Jones, and Li J. 1-8

A facile strategy for third-component selection in non-fullerene acceptor-based ternary organic solar cells†

Yun Li, Yunhao Cai, Yuanpeng Xie, Junhua Song, Hongbo Wu, Zheng Tang, Jie Zhang, Fei Huang, and Yanming Sun

Science Advances
Performance-limiting formation dynamics in mixed-halide perovskites

TANYI HUANG, SHUN TAN, SELIM MURTYEVA, LIHAN YU, FENI BARBE, YEPIN ZHANG, MAGED ABDEL-SAMEE, MARCEL WEBER, JIA WANG, KENDALL N. HOUS, CAROLINE M. SUTTERFELLO, AND YANJI YANG

nature communications
Discovery of temperature-induced stability reversal in perovskites using high-throughput robotic learning

Yicheng Zhao, Yuan Zhang, Zhenyuan Su, Shijiao Sun, Stefan Langer, Noor Khan, Puhui Wang, Thomas Houtemiller, Yi Hou, Jacki Xia, Ning Li, Gerhard J. Matt, Xiaoyan Du, Wei Meng, Andreas Coust, Kaitchen Zhang, Tobias Schuber, Yulin Feng, Jens Leusch, Edward S. Sargent, Tomo Suemitsu, & Christoph J. Brabec

nature communications
An efficient and stable solar flow battery enabled by a single-junction GaAs photoelectrode

Hui-Chun Fu, Wenjie Li, Ying Yang, Chun-Ho Lin, Astilla Veysal, Ji-Hau He, & Song Jin

nature COMMUNICATIONS
Polymerized small molecular acceptor based all-polymer solar cells with an efficiency of 16.16% via tuning polymer blend morphology by molecular design

Hui Du, Kai He, Jinyang Zhang, Li Meng, Bing Yue, Richard Apperment, Pengpeng Yan, Haoyang Guo, Xiaohua Kang, Chang Zhang, Guo-Qiang Han, Hui Chen, Farhad Akbari, & Yongfang Li

nature photonics
Stable and low-photovoltage-loss perovskite solar cells by multifunctional passivation

Guang Yang, Zhiwei Ren, Kuan Liu, Minchao Qin, Wanyuan Deng, Hengkai Zhang, Halbing Wang, Jiewei Liang, Feihong Ye, Qiong Liang, Hang Yin, Yuxuan Chen, Yuelin Zhuang, Siqi Li, Bowen Gao, Jianbo Wang, Tingting Shi, Xin Wang, Xinhui Lu, Hongbin Wu, Jianhui Hou, Danyuan Lei, Shu Kong So, Yang Yang, Guojia Fang, and Gang Li

NANO LETTERS
High-Performance Organic Photovoltaics Incorporating an Active Layer with a Few Nanometer-Thick Third-Component Layer on a Binary Blend Layer

Hao-Wen Cheng, Chien-Yao Juan, Anisha Mohapatra, Chung-Hao Chen, Yu-Chie Lin, Bin Chang, Pei Cheng, Hao-Cheng Wang, Chih Wei Chu, Yang Yang, and Kung-Hwa Wei



01 Efficiency Test — Light Simulator
 02 Efficiency Test — Quantum Efficiency Measurement System
 03 Characterization Analysis / Physical Property Analysis
 04 Detector Application
 05 Light-emitting Properties and Light-emitting Devices