

List of accredited test procedures (D-K-11140-01-00)



Revision date: 12.03.2025

Monofacial PV devices

Standard	Title	Edition	Release	Status
IEC 60904-1	Photovoltaic devices - Part 1: Measurement of photovoltaic current-voltage characteristics	2,0	2006-09	Revised
		3,0	2020-09	Valid

Measurement quantity / Calibration item	Range		Measurement conditions / procedure	Expanded uncertainty of measurement ¹⁾
Short-circuit current Solar cells	0,1 mA	to 20 A	IEC 60904-1:2020	0,87%
Open-circuit voltage Solar cells	0,1 V	to 20 V	IEC 60904-1:2020	0,16%
Maximum power Solar cells	0,01 mW	to 40 W	IEC 60904-1:2020	0,91%
Fill factor Solar cells	20%	to 99%	IEC 60904-1:2020	0,41%
Efficiency Solar cells	0,01%	to 100%	IEC 60904-1:2020	1,00%
Shunt voltage Solar cells	1 mV	to 10 V		0,88%

Multi-Junction PV devices

Standard	Title	Edition	Release	Status
IEC 60904-1-1	Photovoltaic devices - Part 1-1: Measurement of photovoltaic current-voltage characteristics of multi-junction photovoltaic (PV) devices	1,0	2017-09	Valid

Measurement quantity / Calibration item	Range		Measurement conditions / procedure	Expanded uncertainty of measurement ¹⁾
Short-circuit current Solar cells	0,1 mA	to 20 A	IEC 60904-1-1: 2017	0,87%
Open-circuit voltage Solar cells	0,1 V	to 20 V	IEC 60904-1-1: 2017	0,10%
Maximum power Solar cells	0,01 mW	to 40 W	IEC 60904-1-1: 2017	0,96%
Fill factor Solar cells	20%	to 99%	IEC 60904-1-1: 2017	0,89%
Efficiency Solar cells	0,01%	to 100%	IEC 60904-1-1: 2017	0,97%

Bifacial PV devices

Standard	Title	Edition	Release	Status
IEC TS 60904-1-2	Photovoltaic devices - Part 1-2: Measurement of current-voltage characteristics of bifacial photovoltaic (PV) devices	2,0	2024-11	Valid

Measurement quantity / Calibration item	Range		Measurement conditions / procedure	Expanded uncertainty of measurement ¹⁾
Short-circuit current Solar cells	0,1 mA	to 20 A	IEC TS 60904-1-2:2024 (IV characteristics acc. to Ch. 6.2)	0,94%
Open-circuit voltage Solar cells	0,1 V	to 20 V	IEC TS 60904-1-2:2024 (IV characteristics acc. to Ch. 6.2)	0,16%
Maximum power Solar cells	0,01 mW	to 40 W	IEC TS 60904-1-2:2024 (IV characteristics acc. to Ch. 6.2)	0,98%
Fill factor Solar cells	20%	to 99%	IEC TS 60904-1-2:2024 (IV characteristics acc. to Ch. 6.2)	0,41%
Efficiency Solar cells	0,01%	to 100%	IEC TS 60904-1-2:2024 (IV characteristics acc. to Ch. 6.2)	1,00%

PV devices

Standard	Title	Edition	Release	Status
DIN EN 60904-8	Photovoltaic devices – Part 8: Measurement of spectral responsivity of a photovoltaic (PV) devices	3,0	2014-05	Valid

Standard	Title	Edition	Release	Status
IEC 60904-8-1	Photovoltaic devices – Part 8-1: Measurement of spectral responsivity of multi-junction photovoltaic (PV) devices	1,0	2017-05	Valid

Measurement quantity / Calibration item	Range		Measurement conditions / procedure	Expanded uncertainty of measurement ¹⁾	
spectral irradiance responsivity Solar cells	1,0 10 ⁻⁷ A m ² /W	to	0,1 A m ² /W	DIN EN 60904-8:2014	
				IEC 60904-8-1:2017	
				Wavelength	
				200 nm to < 320 nm	7,60%
				320 nm to < 350 nm	2,30%
				350 nm to < 450 nm	0,86%
				450 nm to < 1000 nm	0,75%
				1000 nm to < 1070 nm	1,50%
				1070 nm to < 1120 nm	1,90%
				1120 nm to < 1150 nm	3,00%
1150 nm to < 1180 nm	6,90%				
1180 nm to < 1200 nm	14,00%				

Abbreviations used:
 IEC International Electrotechnical Commission
 TS Technical Specification
 DIN German Institut for Standardization e.V.
 EN European Standard

¹⁾ Unless otherwise specified, the unit of a variable corresponds to the unit of the measuring range.