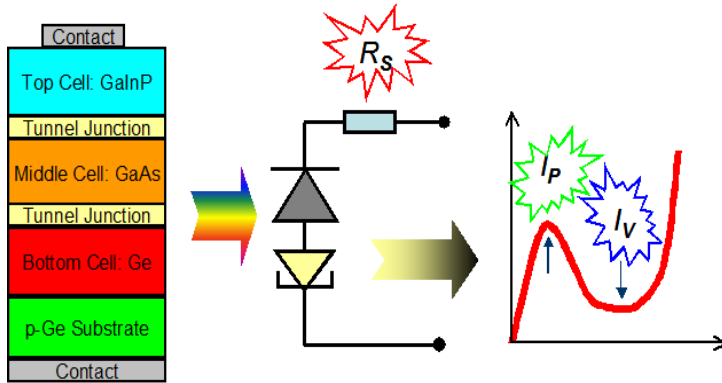


RPV Series

Concentrator solar cell test system*



The RPV series test system is designed for the characterisation of concentrator tandem multi-junction solar cell. It is suitable for quick and accurate characterisation of the solar cell **internal Series Resistance, tunnel junction Peak and Valley current** non-destructively both in wafer and modules.

Based on the patent pending method, the RPV system measures R_s , I_p , I_v with a single flash from sample without need any external power sources attached to the cell.

The system is suitable for research and development and industries applications. This system can be configured to cover the device type and size of your choice.

Core Features

- Measuring MJ solar cell internal Series Resistance, tunnel junction Peak and Valley current
- Determine R_s as a function of current
- Multiple IV curves with single pulse light illumination
- Up to 10,000x suns in single short light pulse
- Single solar cell, up to 100A of I_{sc} and 6V of V_{oc}
- CPV cells with area from $1 \times 1 \text{mm}^2$ to $15 \times 15 \text{mm}^2$
- Test solar cell on wafer, module
- Non-destructive test, safe to solar cell
- Compact size, USB powered, low energy consumption
- For both R&D and production lines

Example of pre configured RPV systems

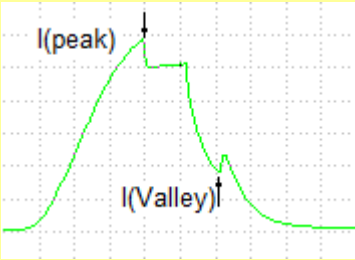
for commonly used concentrator triple junction solar cells ($V_{oc} \approx 3.2V$, $J_{sc} = 15 \text{mA/cm}^2$)

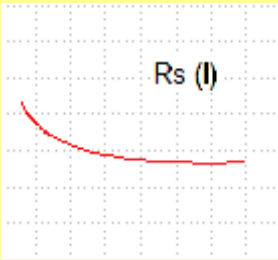
Model	TJ cell Area	Optimised for I_p and I_v Current (A)*	Equivalent Suns ($J_{sc} = 15 \text{mA/cm}^2 \cdot \text{sun}$)	Current Sensing
RPV 1	1mm^2	0.05 to 1	300 to 6700	2A/V
RPV 5	$\phi 2 \text{mm}, 2 \times 2 \text{mm}^2$	0.2 to 5	400 to 9500, 300 to 6700	10A/V
RPV 25	$5 \times 5, 7 \times 7 \text{mm}^2$	0.8 to 25	200 to 6700, 100 to 3400	50A/V
RPV 100	$10 \times 10, 15 \times 15 \text{mm}^2$	4 to 100	250 to 6700, 100 to 3000	200A/V

* The max current is determined by V_{oc} and generated and R_s
Please contact SW Link for your special requirement

Applications

RPV



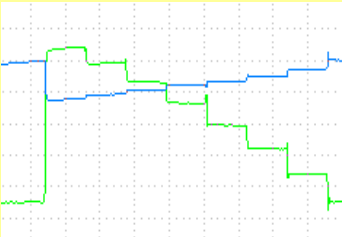


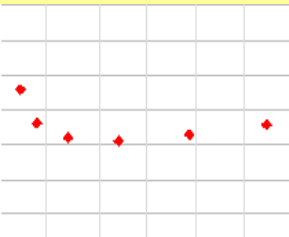
Parameter measured

I_{peak}: Peak current of tunnel junction
I_{valley}: Valley current of tunnel junction
Rs (I): Rs as function of terminal current

RPV Application measures Internal series resistance, Rs, Peak and Valley current; and Rs as function of current including solar cell operate current with single light pulse.

Multiple Rs



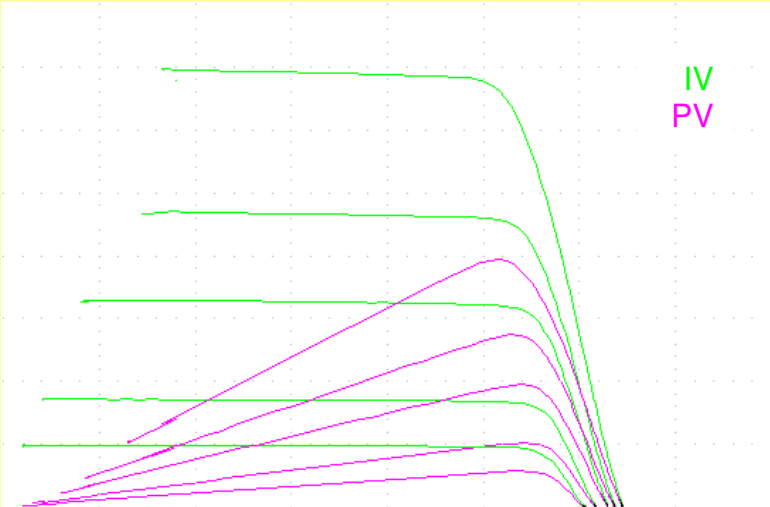


Parameter measured

Rs (I): Internal series resistance at multiple discrete terminal currents

The function measure the Rs at multiple discrete terminal current level determined by the load resistors applied.

Multiple Curves (option)



Parameter measured

I_{peak}: Peak current of tunnel junction
I_{valley}: Valley current of tunnel junction
Rs (I): Rs as function of terminal current

From each IV curve

I_{sc}: Short circuit current
V_{oc}: Open circuit voltage
P_{max}: Max power
FF: Filling factor
I_{max}: The current at max power
V_{max}: The voltage at max power
Eff*: Conversion efficiency

*Calibrated irradiance detector required

The Multiple IV curves function acquires a group of IV curves with a single pulse light illumination to gather with the RPV application. The most important parameters of concentrator multijunction solar cell are extracted in a single measurement. The conversion efficiency of the solar cell is measured by calculated by using calibrated detector, which measures the irradiance on the sample simultaneously. The max possible irradiance to the sample is larger than 10,000 suns for the CPV cell size up to 15x15mm².

RPV System specifications

Light source (common for all configuration)

Type:	Xenon flash lamp	Min working distance	20mm
Max Pulse duration	1.5 mS (FHWM)	High adjustment	Manual
Pulse width control	0 to 5mS	Lamp support	12"x12"x0.5" base , 12" post
Illumination to sample	Direct	Power source for flash	4xAA battery
Max peak irradiance	10,000 suns	No of flash (full power)	>250

Data acquisition:

Number of Channel	4 DiFF	Impedance	1 M Ohm / 30 pF
Resolution	14bits	Interface	USB 2.0
Max sample Rate	3.15MHz	Voltage range	200mV.....20V
Accuracy	0.3% ± 1 LSB	Power requirement	500mA from USB
Memory	0-130,000 sample/channel		

Dynamic electrical load unit (general)

	Range	Number channel (per unit)	Combinations Per unit	Accuracy
Resistors (Ω)	0.005 to 128	6	64	1%
Ramp Coeff ($\mu\text{SA/V}$)	0.2 to 1000	5	32	
Current sensing resistor (Ω)	0.001 to 128	1	1	1%
Power requirement	500mA power from USB			
Interface	USB			

Pre-configured systems

Dynamic electrical load unit (Discrete)

Model	Max Z (ohms)	Min Z	Combinations	Current sensing
RPV 1	64	2	64	2A/V
RPV 5	16	0.5	64	10A/V
RPV 25	4	0.125	64	50A/V
RPV 100	1	0.0315	64	200A/V

Dynamic electrical load unit (Ramp)

Model	Min ramp Coeff. ($\mu\text{SA/V}$)	Max ramp Coeff ($\mu\text{SA/V}$)	Combinations
RPV 1	0.22	9	32
RPV 5	1	44	32
RPV 25	4	200	32
RPV 100	20	900	32

Dimensions and weight:

Electronics unit: 55mm x225mm x 165mm
 Weight: 1.7 kg

In line with our policy of continual product improvement specifications are subject to change without notice

* Patent Pending GB 0903212.9

SW Link LTD
 105 Hollybush Lane, Hemel Hempstead Herts, HP1 2PJ UK
 Tel: +44 7792911529 www.swlink.co.uk sales@swlink.co.uk