



## Photovoltaic Cell Data Compilation

### Calibration Conducted For:

Lars Stolt  
Solibro Research AB  
Vallv. 5  
75651 Uppsala  
Sweden

### Data Collected By:

National Renewable Energy Laboratory  
Solar Cell/Module Performance Group  
15013 Denver West Parkway  
Golden, CO 80401-3305

### Contact:

Paul Cizek  
303-384-6647  
Paul.Cizek@nrel.gov

## Contents

<u>Cell ID</u>	<u>Graph type</u>	<u>Filename</u>	<u>Page</u>
140225-2B #1	X25 LIV	X25 LIV 140317-121747	3
140225-2B #1	X25 LIV	X25 LIV 140317-132211	4
140225-2B #2	X25 LIV	X25 LIV 140317-133232	5
140225-2B #2	X25 LIV	X25 LIV 140317-140113	6
140225-2B CELL #2	FQE	FQE 140317-105333	7

## Solibro

## CdS/Cu(In,Ga)(S,Se) Cell

Device ID: 140225-2B #1

Device Temperature:  $24.8 \pm 0.5$  °C

Mar 17, 2014 12:17

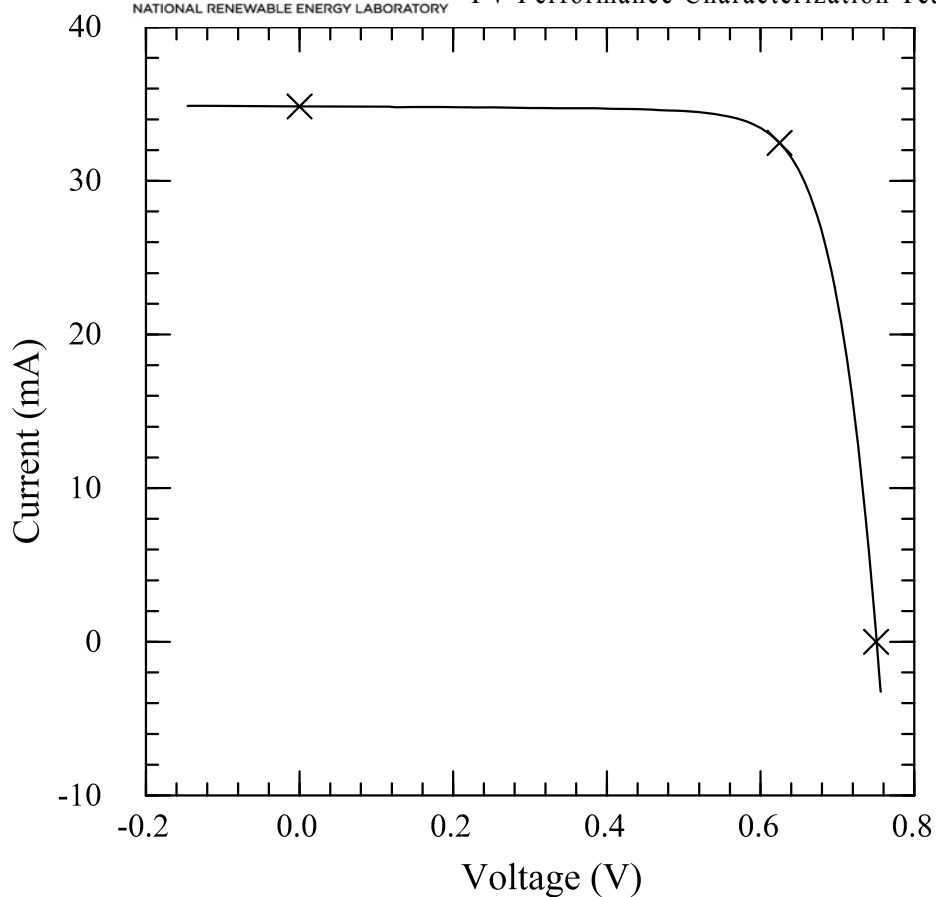
Device Area:  $0.9882 \text{ cm}^2$ 

Spectrum: ASTM G173 global

Irradiance:  $1000.0 \text{ W/m}^2$ 

X25 IV System

PV Performance Characterization Team



$$V_{oc} = 0.7505 \text{ V}$$

$$I_{max} = 32.464 \text{ mA}$$

$$I_{sc} = 34.847 \text{ mA}$$

$$V_{max} = 0.6247 \text{ V}$$

$$J_{sc} = 35.264 \text{ mA/cm}^2$$

$$P_{max} = 20.280 \text{ mW}$$

$$\text{Fill Factor} = 77.55 \%$$

$$\text{Efficiency} = 20.52 \%$$

Storage state

## Solibro

## CdS/Cu(In,Ga)(S,Se) Cell

Device ID: 140225-2B #1

Device Temperature:  $24.7 \pm 0.5$  °C

Mar 17, 2014 13:22

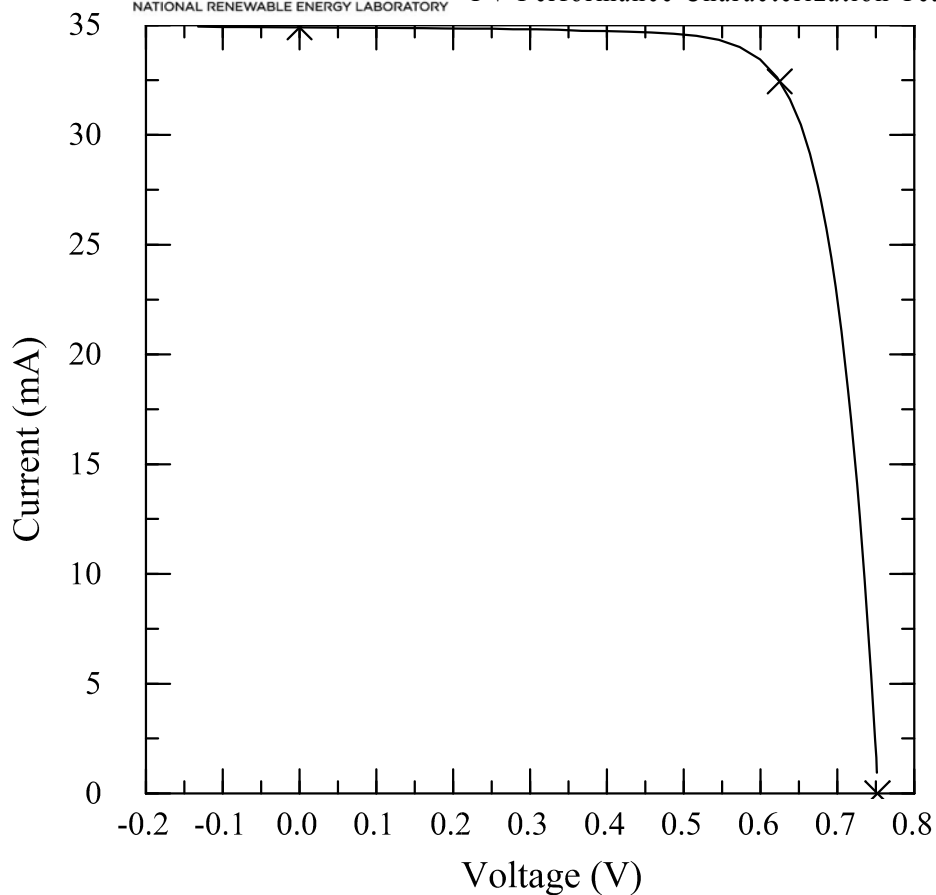
Device Area:  $0.9882 \text{ cm}^2$ 

Spectrum: ASTM G173 global

Irradiance:  $1000.0 \text{ W/m}^2$ 

X25 IV System

PV Performance Characterization Team



$$V_{oc} = 0.7521 \text{ V}$$

$$I_{max} = 32.441 \text{ mA}$$

$$I_{sc} = 34.901 \text{ mA}$$

$$V_{max} = 0.6249 \text{ V}$$

$$J_{sc} = 35.318 \text{ mA/cm}^2$$

$$P_{max} = 20.273 \text{ mW}$$

$$\text{Fill Factor} = 77.23 \%$$

$$\text{Efficiency} = 20.52 \%$$

After 10 minute soak at  $P_{max}$ , 5 minute cool.

## Solibro

## CdS/Cu(In,Ga)(S,Se) Cell

Device ID: 140225-2B #2

Device Temperature:  $24.6 \pm 0.5$  °C

Mar 17, 2014 13:32

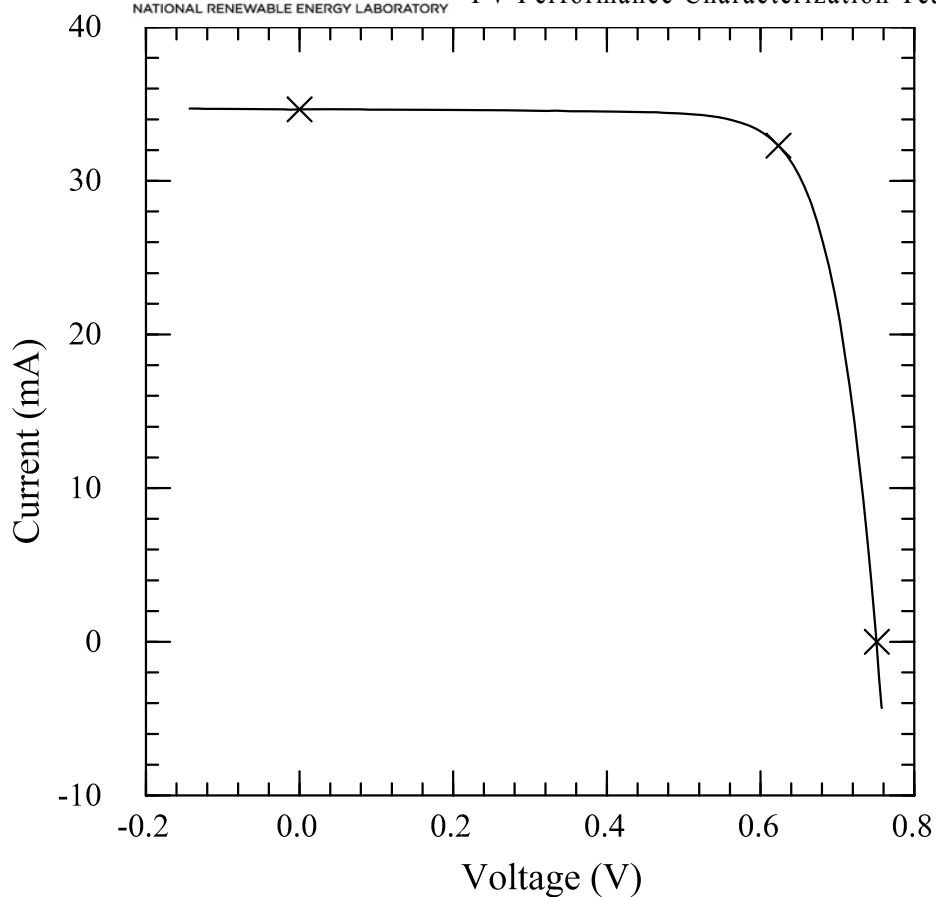
Device Area:  $0.9869 \text{ cm}^2$ 

Spectrum: ASTM G173 global

Irradiance:  $1000.0 \text{ W/m}^2$ 

X25 IV System

PV Performance Characterization Team



$$V_{oc} = 0.7515 \text{ V}$$

$$I_{max} = 32.300 \text{ mA}$$

$$I_{sc} = 34.660 \text{ mA}$$

$$V_{max} = 0.6232 \text{ V}$$

$$J_{sc} = 35.121 \text{ mA/cm}^2$$

$$P_{max} = 20.129 \text{ mW}$$

$$\text{Fill Factor} = 77.28 \%$$

$$\text{Efficiency} = 20.40 \%$$

Storage state.

## Solibro

## CdS/Cu(In,Ga)(S,Se) Cell

Device ID: 140225-2B #2

Device Temperature:  $24.7 \pm 0.5$  °C

Mar 17, 2014 14:01

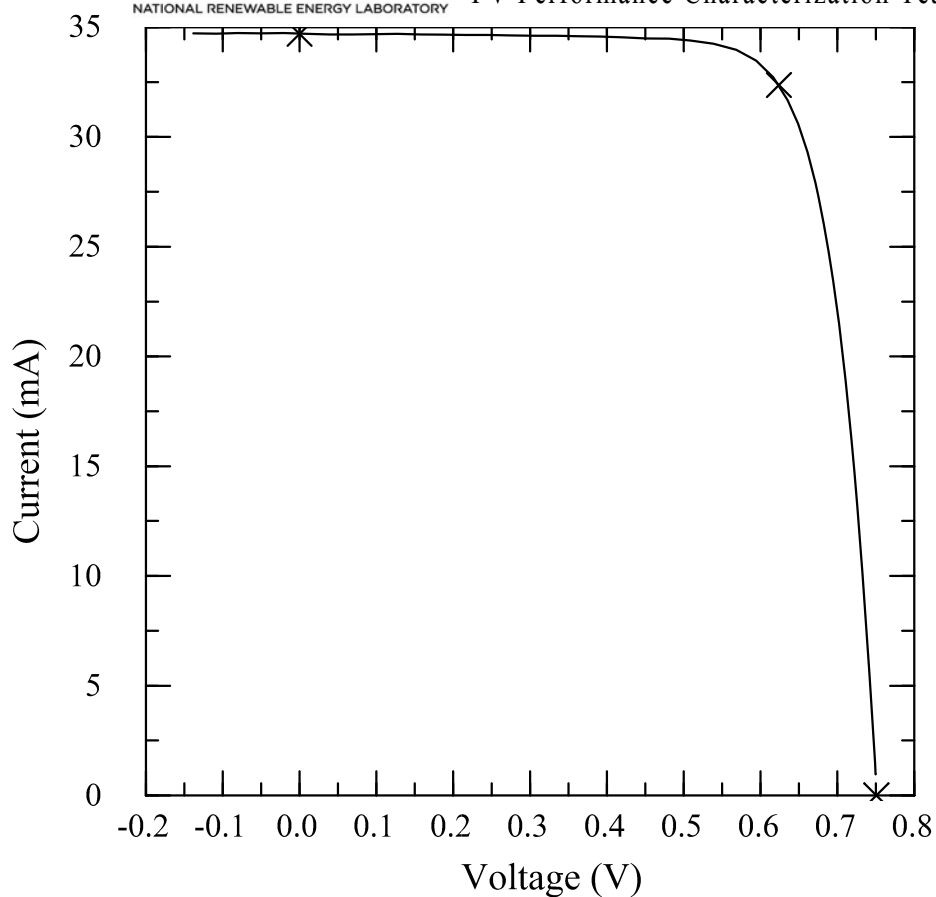
Device Area:  $0.9869 \text{ cm}^2$ 

Spectrum: ASTM G173 global

Irradiance:  $1000.0 \text{ W/m}^2$ 

X25 IV System

PV Performance Characterization Team



$$V_{oc} = 0.7506 \text{ V}$$

$$I_{max} = 32.364 \text{ mA}$$

$$I_{sc} = 34.702 \text{ mA}$$

$$V_{max} = 0.6239 \text{ V}$$

$$J_{sc} = 35.165 \text{ mA/cm}^2$$

$$P_{max} = 20.194 \text{ mW}$$

$$\text{Fill Factor} = 77.52 \%$$

$$\text{Efficiency} = 20.46 \%$$

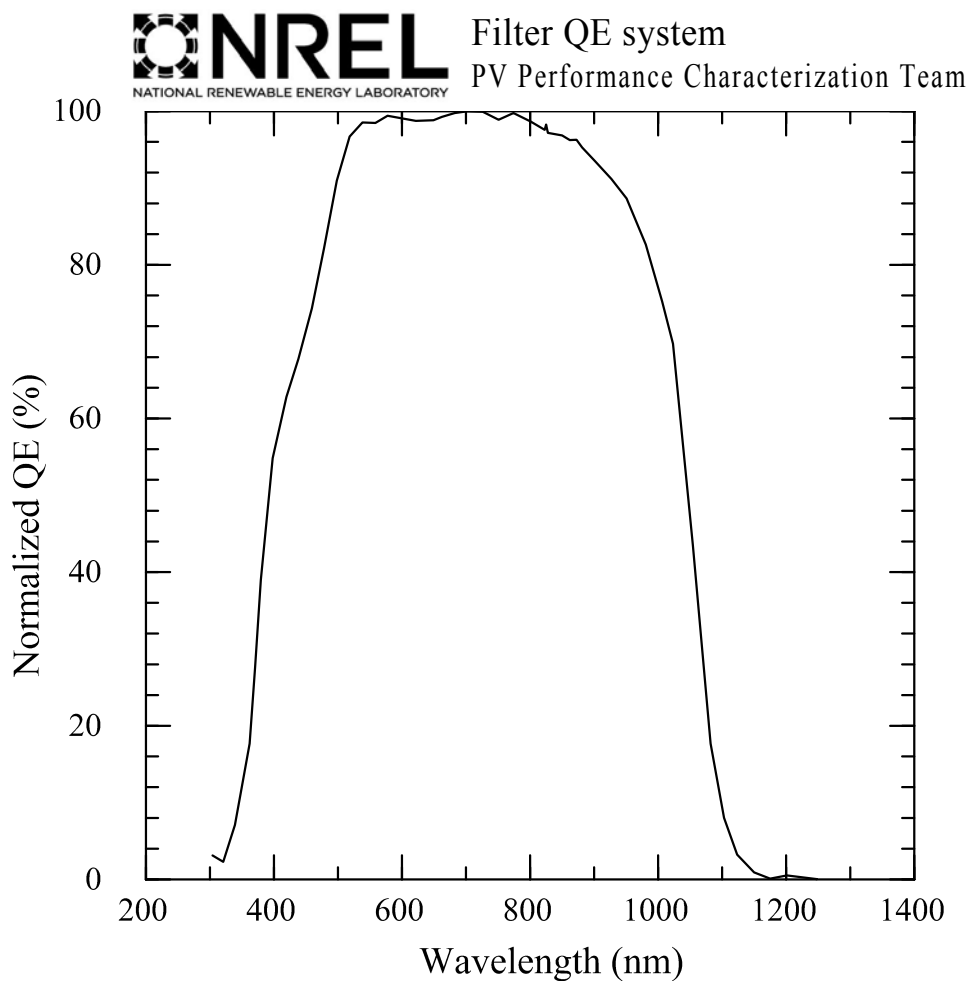
After 10 minute soak at  $P_{max}$ , 5 minute cool.

**Solibro Research AB**  
**CdS/Cu(Ga,In)S,Se) Cell**

Device ID: 140225-2B cell #2

Device Temperature:  $24.6 \pm 0.1^\circ\text{C}$ 

Mar 17, 2014 10:53

Device Area:  $1.00 \text{ cm}^2$ Voltage bias:  $0.000\text{E}+0 \text{ V}$ 

Cal: FQE pyro - ref cell cal 140317-10044

Light bias current: 11.9 mA

Light Biased area:  $1.00 \text{ cm}^2$ Light bias current density:  $12 \text{ mA/cm}^2$