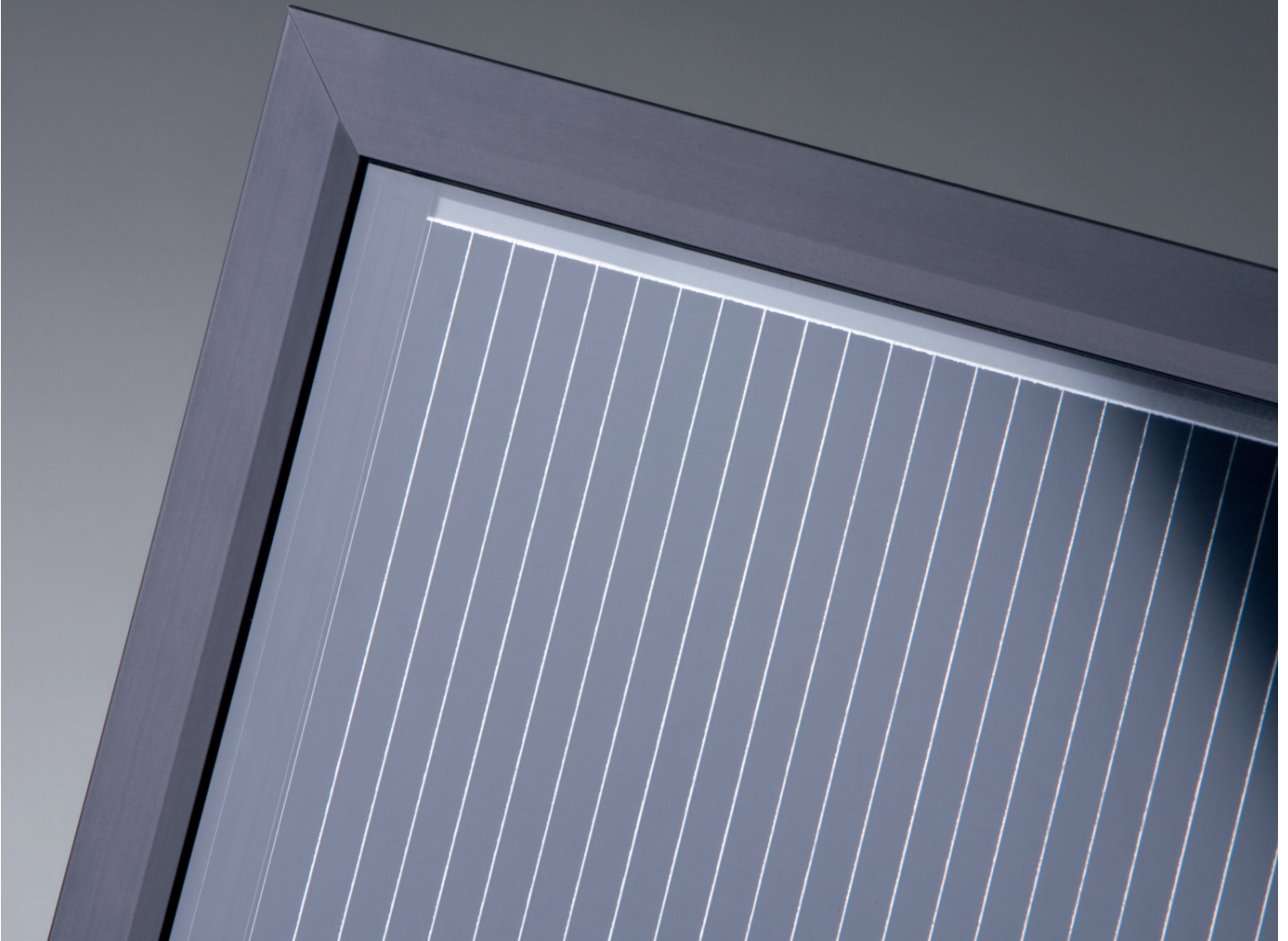


# CIGS THIN FILM MODULE SL 1-F

Power, Quality and Aesthetics



- THE THIN FILM MODULE WITH THE HIGHEST EFFICIENCY ON THE MARKET
- EXCELLENT ENERGY YIELD IN A WIDE RANGE OF APPLICATIONS
- ACCURACY AND STABILITY: QUALITY “MADE IN GERMANY”
- FRAMED MODULE IDEAL CHOICE FOR PITCHED ROOFS AND FAÇADES

## MECHANICAL SPECIFICATION

Thickness	36 mm
Weight	14.5 kg
Front Cover	4 mm tempered low iron glass
Back Cover	3 mm float glass
Frame	Black anodized aluminium frame
Cell Type	CIGS [Cu(In, Ga) Se <sub>2</sub> ]
Junction Box	Protection class IP 65 with by-pass diode
Connector	Multicontact MC4

## ELECTRICAL CHARACTERISTICS

PERFORMANCE AT STANDARD TEST CONDITIONS (STC: 1000 W / m<sup>2</sup>, 25°C, AM 1.5 SPECTRUM)<sup>1</sup>

PRODUCT NAME			SL1-70F	SL1-75F	SL1-80F	SL1-85F	SL1-90F
Nominal Efficiency	$\eta$	[%]	9.2	9.8	10.5	11.1	11.8
Nominal Power (+5/-0 W)	$P_{max}$	[W]	70.0	75.0	80.0	85.0	90.0
Short Circuit Current	$I_{sc}$	[A]	1.58	1.58	1.60	1.60	1.60
Open Circuit Voltage	$V_{oc}$	[V]	71.1	72.3	72.8	73.5	74.3
Current at Maximum Power	$I_{mp}$	[A]	1.34	1.37	1.42	1.45	1.49
Voltage at Maximum Power	$V_{mp}$	[V]	54.7	56.9	57.7	59.1	60.4

PERFORMANCE AT NORMAL OPERATING CELL TEMPERATURE (NOCT: 800 W/m<sup>2</sup>, 51± 2°C, AM 1.5 SPECTRUM)

PRODUCT NAME			SL1-70F	SL1-75F	SL1-80F	SL1-85F	SL1-90F
Nominal Power	$P_{max}$	[W]	49.3	52.9	56.4	59.9	65.1
Short Circuit Current	$I_{sc}$	[A]	1.27	1.27	1.29	1.29	1.28
Open Circuit Voltage	$V_{oc}$	[V]	63.6	64.7	65.1	65.8	67.5
Current at Maximum Power	$I_{mp}$	[A]	1.06	1.09	1.12	1.15	1.19
Voltage at Maximum Power	$V_{mp}$	[V]	48.8	50.7	51.5	52.8	54.8

### PERFORMANCE AT LOW IRRADIANCE

The typical relative change in module efficiency at an irradiance of 200 W/m<sup>2</sup> in relation to 1000 W/m<sup>2</sup> (both at 25°C and AM 1.5 spectrum) is -7%.

### TEMPERATURE COEFFICIENTS (AT 1000 W / m<sup>2</sup>, AM 1.5 SPECTRUM)

Temperature Coefficient of $I_{sc}$	$\alpha$	[%/K]	-0.01 ± 0.04
Temperature Coefficient of $V_{oc}$	$\beta$	[%/K]	-0.30 ± 0.04
Temperature Coefficient of $P_{max}$	$\gamma$	[%/K]	-0.38 ± 0.04

<sup>1)</sup> The power classes are defined by positive sorting (+5W/-0W) according to measured Pmax under STC. The accuracy of this measurement is ±3%.  $I_{sc}$ ,  $V_{oc}$ ,  $I_{mp}$ ,  $V_{mp}$  are within ±10% of the indicated values under STC. Valid indoor measurement of STC performance is obtained by pretreating the modules before measurement with 1 hour light soak (at approx. 1000 W/m<sup>2</sup> in open circuit) followed by cool down to 25°C.

## PROPERTIES FOR SYSTEM DESIGN

Safety Class		II
Maximum System Voltage	$V_{sys}$	[V] 1000 (IEC) / 600 (Canada / USA)
Maximum Reverse Current	$I_R$	[A] 6.5
Wind / Snow Load		[Pa] 5400
Fire Rating		C

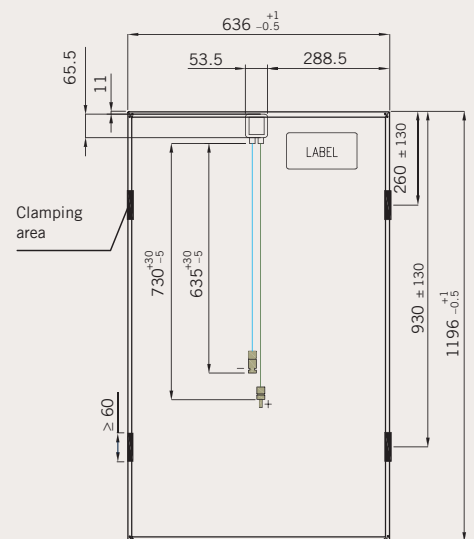
See the Installation and Operating Manual or contact the Technical Service for further information on approved installation and use of this product.

## QUALIFICATIONS AND CERTIFICATES

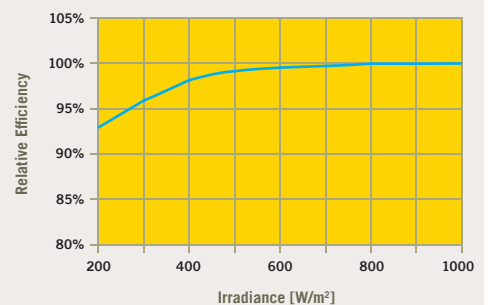
IEC 61646; IEC 61730 Application Class A; UL 1703; ISO 9001:2008



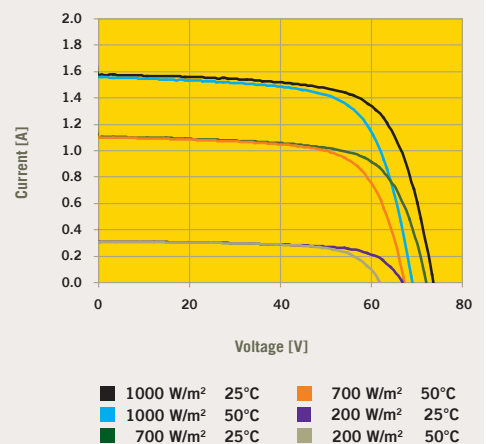
## MECHANICAL DRAWING



## PERFORMANCE AT LOW IRRADIANCE



## CHARACTERISTICS AT DIFFERENT TEMPERATURES AND IRRADIANCES (FOR SL1-80F)



Partner:

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