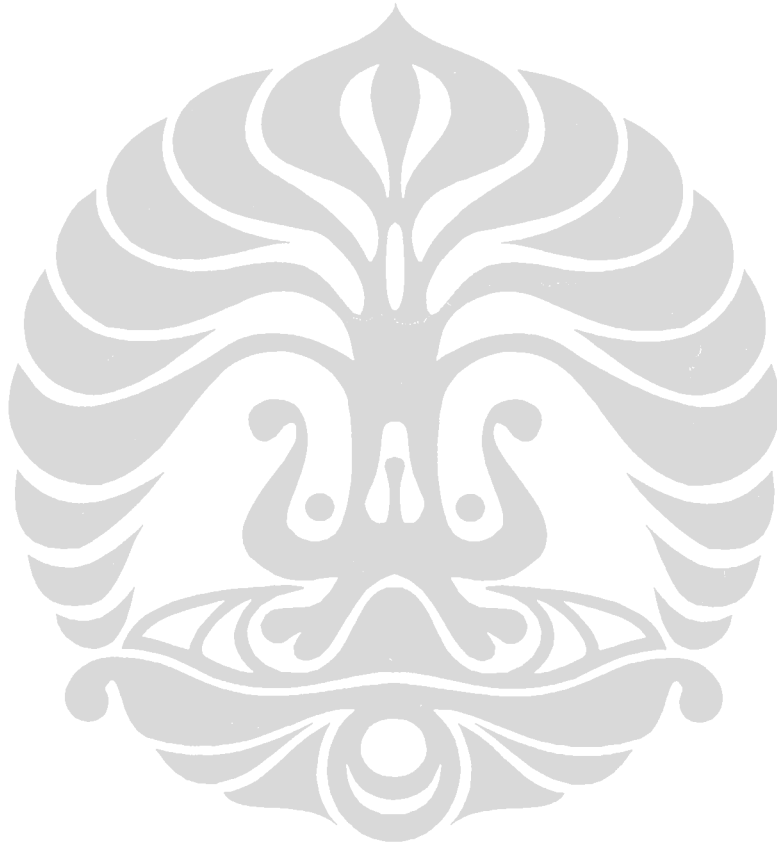
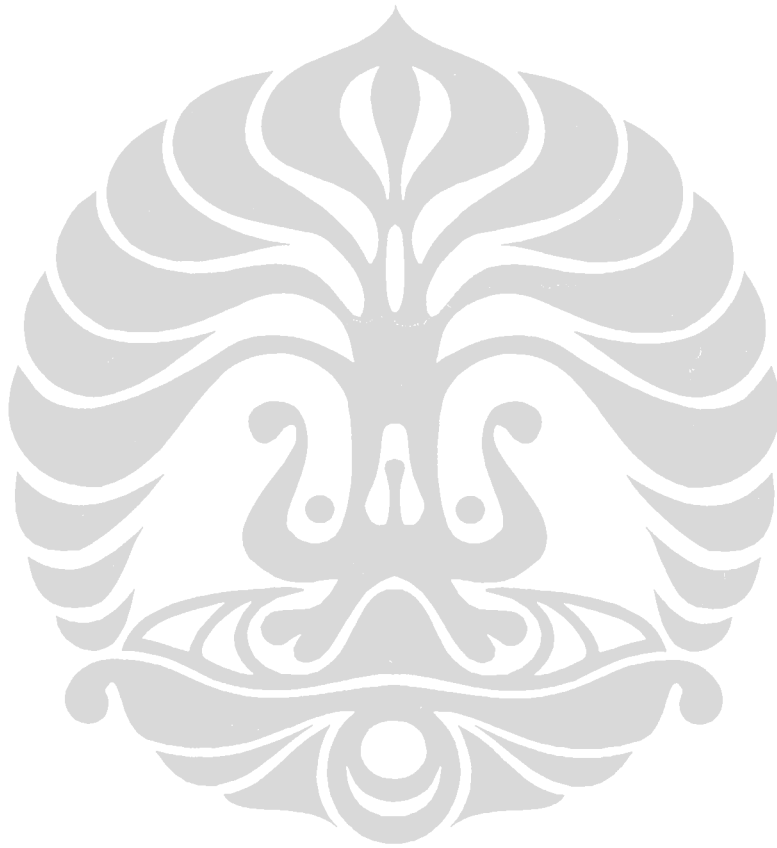


LAMPIRAN

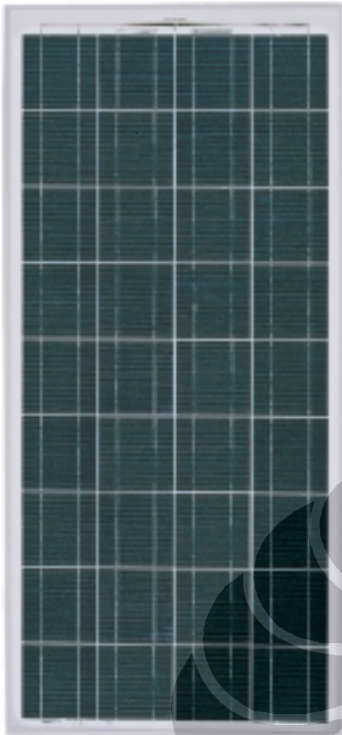


LAMPIRAN 1

Datasheet Solarex MSX-60



Solar module with EFG cells



- Narrow output tolerance
- Long-term stability
- Allround module
- EFG-Technology

ASE-50-ETF/17

Module type key:

E = EVA
T = Tedlar
F = framed

Narrow output tolerance: A very narrow module output selection permits serial connection with low connection losses.

Long-term stability: The module developed by SCHOTT Solar meets the latest technical standards. The use of state-of-the-art materials ensure long service life, even under extreme climatic conditions.

Allround module: The module is easy to handle, robust and suitable for a broad range of applications. Module dimensions of 975 mm x 452 mm provide for simple expansion of existing systems. The module is delivered with an anodized aluminum frame with four mounting holes on the outside of the frame.

EFG-Technology: The patented EFG-Technology employed by SCHOTT Solar provides for highly economical wafer-production and low raw-material consumption.

SCHOTT Solar produces high-performance modules in energy output classes 50 Wp and higher. High-quality crystalline EFG and MAIN cells ensure maximum energy yield. These modules have been awarded top ratings in a number of independent studies and surveys. Every module type is designed – from frame to connection box – for cost-effective system integration.

SCHOTT
solar

Technical Data

Electrical data

The electrical data apply to standard test conditions (STC):
Irradiance at the module level of 1.000 W/m² with spectrum AM 1.5 and a cell temperature of 25 °C.



Nominal power	P _{nom}	50 Wp	45 Wp
Voltage at maximum-power point	U _{mpp}	17.2 V	17.0 V
Current at maximum-power point	I _{mpp}	2.9 A	2.65 A
Open-circuit voltage	U _{oc}	20 V	20 V
Short-circuit current	I _{sc}	3.2 A	2.9 A

All electrical data ± 10%.

Dimensions and weights

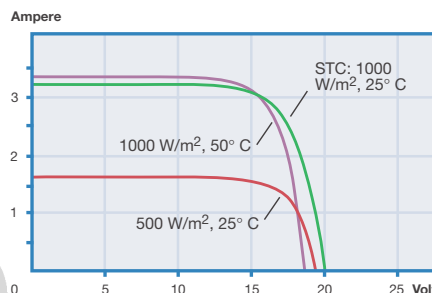


Dimensions (tolerances ± 2 mm)	975 x 452 mm ²
Thickness with frame	34.5 mm
Weight	approx. 6.1 kg

Characteristic data



Solar cells per module	36
Type of solar cell	EFG solar cell (multi-crystalline, 10 x 10 cm ² , full-square)
Connection	Connection box with screw terminals and two bypass diodes
Cable Entry	Prepared for cable glands (M12)



Current/voltage characteristics with dependence on irradiance and module-temperature.

Temperature coefficients



Power	T _K (P _n)	- 0.47 % / °C
Open-circuit voltage	T _K (U _{oc})	- 0.38 % / °C
Short-circuit current	T _K (I _{sc})	+ 0.10 % / °C

Limits



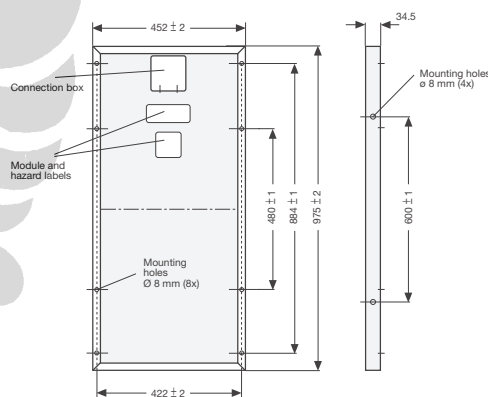
Max. system voltage	600 V _{DC}
Operating module temperature	- 40... + 90 °C
Max. load	2400 N/m ² or 245 kg/m ² (IEC 61215)

The right is reserved to make technical modifications.

Qualifications



The ASE-50-ETF/17 module complies with the requirements of IEC 61215 and the EWG guideline 89/392 (CE).



MANAGEMENT SYSTEM
Certified by DQS according to
DIN EN ISO 9001:2000 · Reg.-No. 2184
DIN EN ISO 14001:1996 · Reg.-No. 2184

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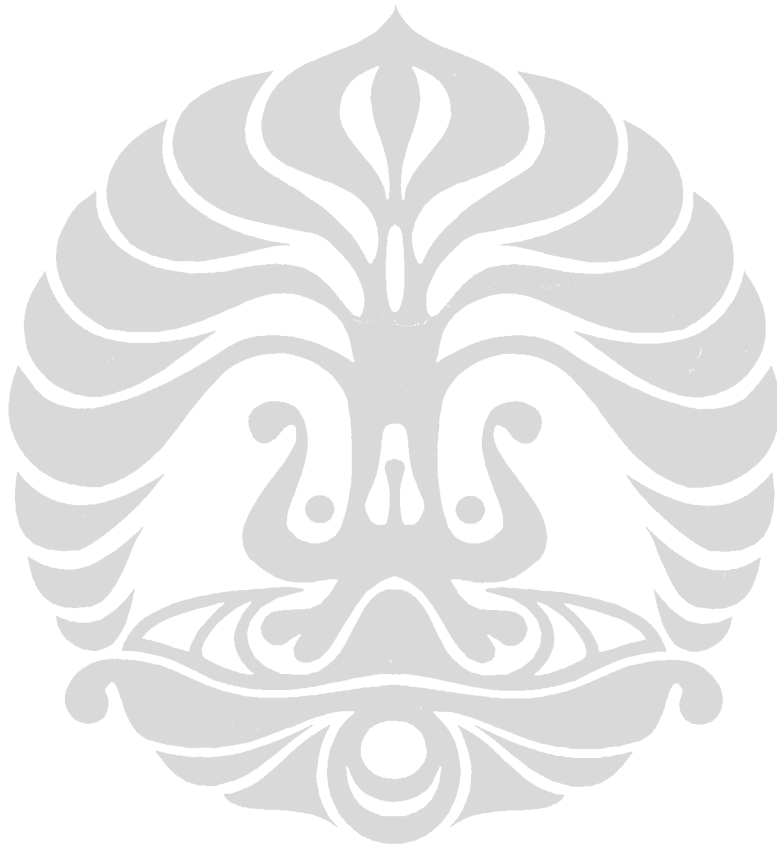
LAMPIRAN 1 (LANJUTAN)

Datasheet Solarex MSX-60



LAMPIRAN 1 (LANJUTAN)

Datasheet Solarex MSX-60



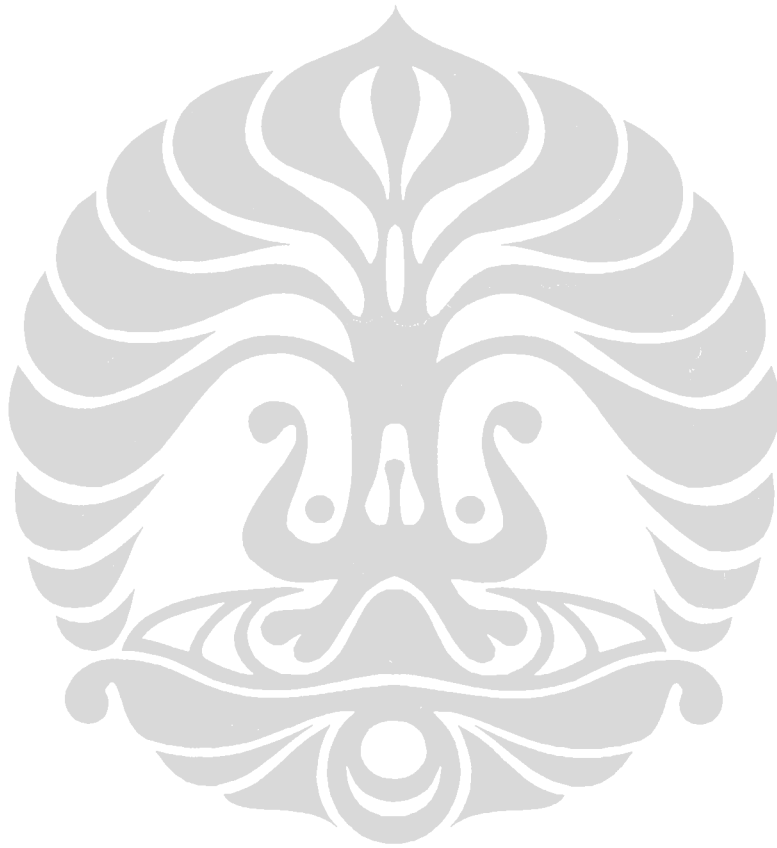
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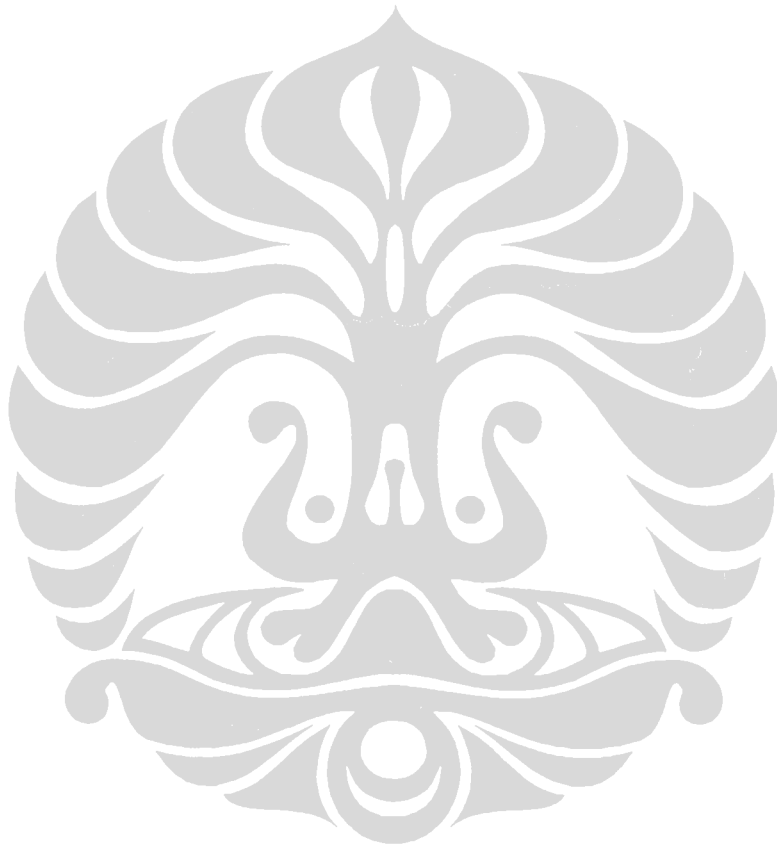
LAMPIRAN 2

Datasheet Schott Solar ASE-50-ETF

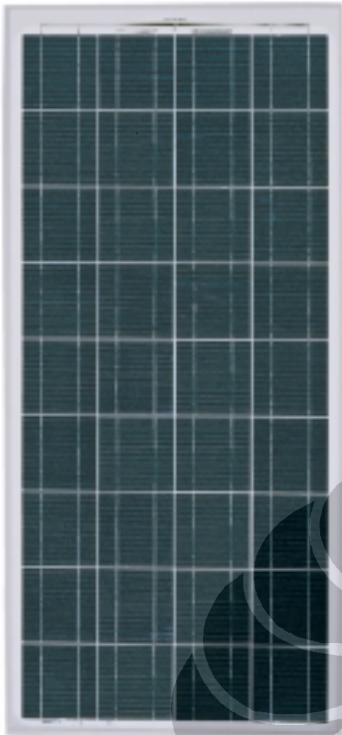


LAMPIRAN 2 (LANJUTAN)

Datasheet Schott Solar ASE-50-ETF



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- Narrow output tolerance
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ASE-50-ETF/17

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SCHOTT
solar

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Dimensions and weights

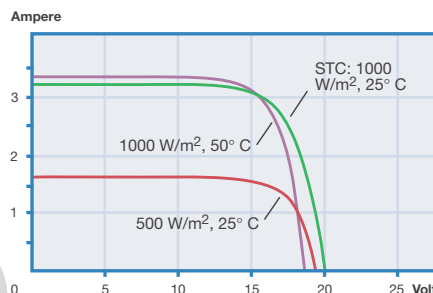


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Limits



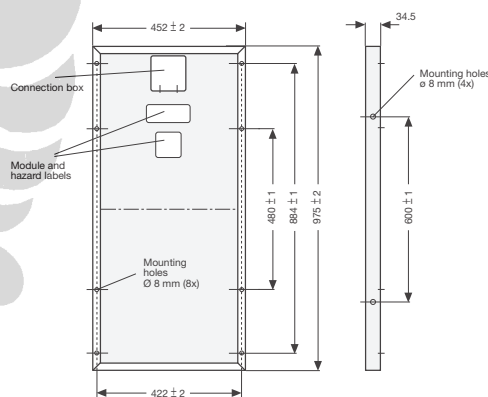
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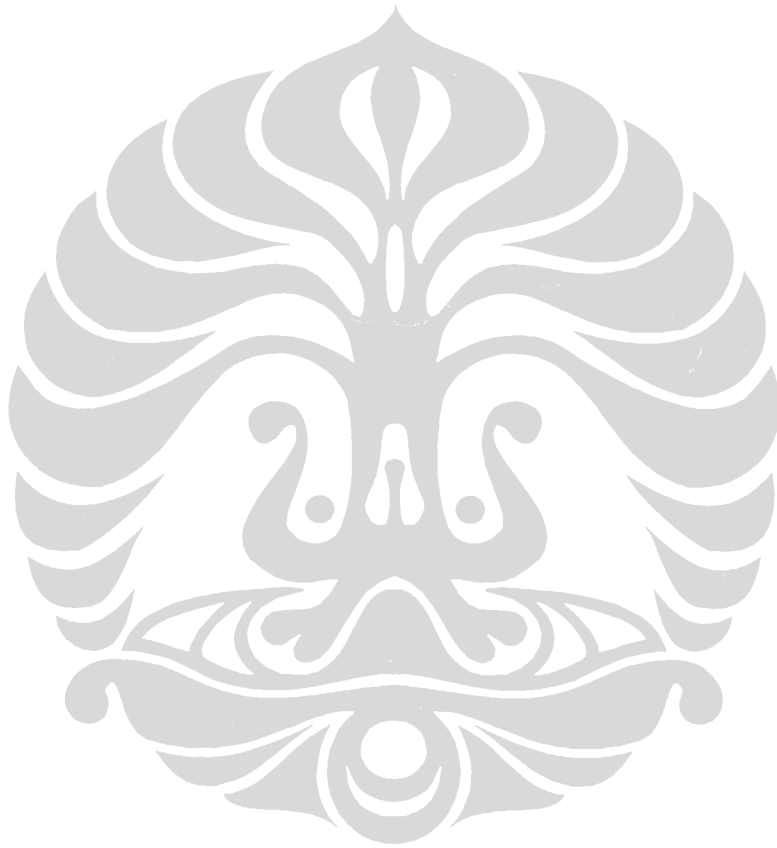
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LAMPIRAN 3

Datasheet Swissco Solar STP005S-12/Db



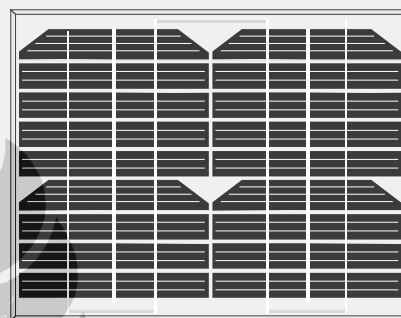
STP005S-12/Db

High Efficiency, High Quality PV Module

Suntech's STPDb features total efficiency of 7.6% Which delivers the maximum power output at peak hours. Ideal for off-grid and remote power systems. With a 25 year warranty, the module has high efficiency and long-lasting operating time even in a variety of rigorous conditions. Unique textured cell surface and bypass diode design is critical for the module to fully utilize and absorb sunlight and offer maximum usable power per square foot of solar array.

Features and benefits

- High efficiency
- Nominal 12 V DC for standard output
- Outstanding low-light performance
- High transparent low-iron, tempered glass
- Unique techniques give the panel following features: esthetic appearance, with stands high wind-pressure and snow load, and easy installation
- Unique technology ensure that problems of water freezing and warping do not occur
- Design to meet unique demand of customer
- 25 year module output warranty

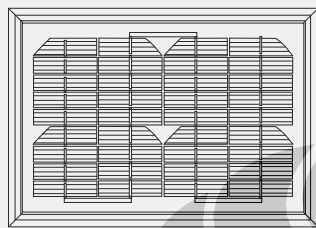


Electrical Characteristics

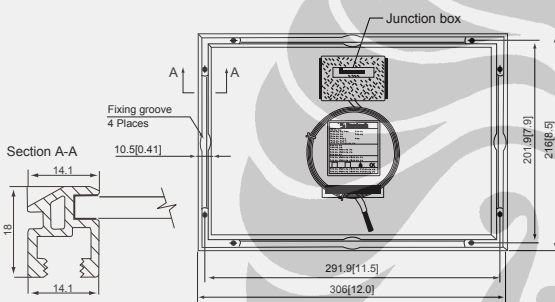
Model	STP005S-12/Db
Open-circuit voltage (Voc)	21.6V
Optimum operating voltage (Vmp)	17.4V
Short-circuit current (Isc)	0.32A
Optimum operating current (Imp)	0.29A
Maximum power at STC (Pmax)	5Wp
Operating temperature	-40°C to +85°C
Maximum system voltage	715V DC

STC: Irradiance 1000W/m², Module temperature 25°C, AM=1.5

Module Diagram



(Front View)



(Back View)

Note: mm[inch]

Specifications

Cell	Monocrystalline silicon solar cells 62.5mm×15.62mm
No. of cells and connections	36(4×9)
Dimension of module	216mm×306mm×18mm
Weight	0.8kg

Temperature Coefficients

NOCT	48°C±2°C
Short-circuit current temperature coefficient	(0.055±0.01) %/K
Open-circuit voltage temperature coefficient	-(78±10) mV/K
Peak power temperature coefficient	-(0.48±0.05) %/K
Power tolerance	±10%

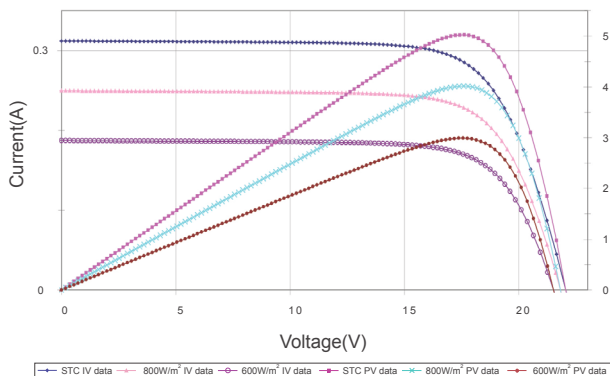
NOCT: Nominal Operating Cell Temperature
(the data is only for reference)

Output

Cable	YUSHENG(18AWG×2C)
Lengths	3000mm

Characteristics

Module IV Graph 5W



LAMPIRAN 3 (LANJUTAN)

Datasheet Swissco Solar STP005S-12/Db



LAMPIRAN 4 PENGUKURAN RANGKAIAN MODUL SURYA

