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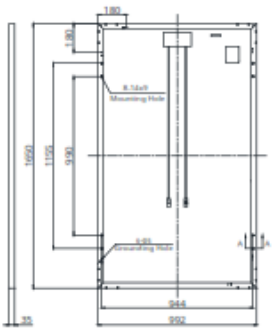
LAMPIRAN-LAMPIRAN

Lampiran 1 *Datasheet* panel surya *monocrystalline*

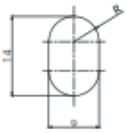
ENGINEERING DRAWING (mm)

Rear View

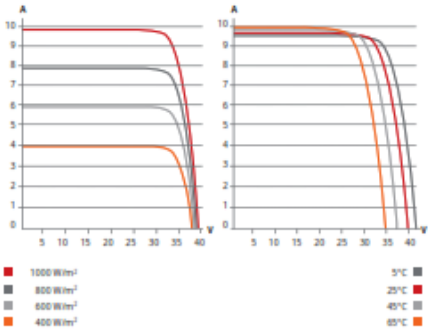


Frame Cross Section A-A

Mounting Hole



CS6K-305MS / I-V CURVES



ELECTRICAL DATA | STC*

CS6K	300MS	305MS	310MS	315MS
Nominal Max. Power (Pmax)	300 W	305 W	310 W	315 W
Opt. Operating Voltage (Vmp)	32.5 V	32.7 V	32.9 V	33.1 V
Opt. Operating Current (Imp)	9.24 A	9.33 A	9.43 A	9.52 A
Open Circuit Voltage (Voc)	39.7 V	39.9 V	40.1 V	40.3 V
Short Circuit Current (Isc)	9.83 A	9.91 A	9.99 A	10.07 A
Module Efficiency	18.33%	18.63%	18.94%	19.24%
Operating Temperature	-40°C ~ +85°C			
Max. System Voltage	1000 V (IEC/UL) or 1500 V (IEC/UL)			
Module Fire Performance	TYPE 1 (UL 1703) or CLASS C (IEC 61730)			
Max. Series Fuse Rating	15 A			
Application Classification	Class A			
Power Tolerance	0 ~ + 5 W			

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

ELECTRICAL DATA | NMOT*

CS6K	300MS	305MS	310MS	315MS
Nominal Max. Power (Pmax)	222 W	226 W	230 W	233 W
Opt. Operating Voltage (Vmp)	30.0 V	30.2 V	30.4 V	30.6 V
Opt. Operating Current (Imp)	7.40 A	7.48 A	7.55 A	7.63 A
Open Circuit Voltage (Voc)	37.2 V	37.4 V	37.6 V	37.8 V
Short Circuit Current (Isc)	7.93 A	7.99 A	8.06 A	8.12 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

PERFORMANCE AT LOW IRRADIANCE

Excellent performance at low irradiance, with an average relative efficiency of 97.5 % for irradiances between 200 W/m² and 1000 W/m² (AM 1.5, 25°C).

* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. Canadian Solar Inc. reserves the right to make necessary adjustment to the information described herein at any time without further notice.

MECHANICAL DATA

Specification	Data
Cell Type	Mono-crystalline, 6 inch
Cell Arrangement	60 (6 × 10)
Dimensions	1650 × 992 × 35 mm (65.0 × 39.1 × 1.38 in)
Weight	18.2 kg (40.1 lbs)
Front Cover	3.2 mm tempered glass
Frame Material	Anodized aluminium alloy
J-Box	IP68, 3 diodes
Cable	4.0 mm² (IEC), 12 AWG (UL), 1000 mm (39.4 in)
Connector	T4 series
Per Pallet	30 pieces
Per Container (40' HQ)	840 pieces

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.39 % / °C
Temperature Coefficient (Voc)	-0.29 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature (NMOT)	42 ± 3 °C

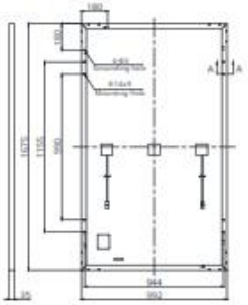
PARTNER SECTION

CANADIAN SOLAR INC.
545 Speedvale Avenue West, Guelph, Ontario N1K 1E6, Canada, www.canadiansolar.com, support@canadiansolar.com

Lampiran 2 *Datasheet* panel surya *polycrystalline*

ENGINEERING DRAWING (mm)

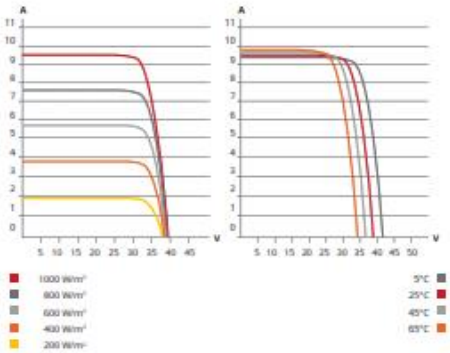
Rear View



Frame Cross Section A-A

Mounting Hole

CS3K-300P / I-V CURVES



ELECTRICAL DATA | STC*

CS3K	295P	300P	305P	310P
Nominal Max. Power (Pmax)	295 W	300 W	305 W	310 W
Opt. Operating Voltage (Vmp)	32.5 V	32.7 V	32.9 V	33.1 V
Opt. Operating Current (Imp)	9.08 A	9.18 A	9.28 A	9.37 A
Open Circuit Voltage (Voc)	39.1 V	39.3 V	39.5 V	39.7 V
Short Circuit Current (Isc)	9.57 A	9.65 A	9.73 A	9.81 A
Module Efficiency	17.8%	18.1%	18.4%	18.7%
Operating Temperature	-40°C ~ +85°C			
Max. System Voltage	1500V (IEC/UL) or 1000V (IEC/UL)			
Module Fire Performance	TYPE 1 (UL 1703) or Class C (IEC 61730)			
Max. Series Fuse Rating	30 A			
Application Classification	Class A			
Power Tolerance	0 ~ + 10 W			

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

MECHANICAL DATA

Specification	Data
Cell Type	Poly-crystalline
Cell Arrangement	120 [2 X (10 X 6)]
Dimensions	1675 X 992 X 35 mm (65.9 X 39.1 X 1.38 in)
Weight	18.5 kg (40.8 lbs)
Front Cover	3.2 mm tempered glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	4.0 mm² (IEC), 12 AWG (UL)
Cable Length (Including Connector)	Portrait: 400 mm (15.7 in) (+) / 280 mm (11.0 in) (-); landscape: 1160 mm (45.7 in)*
Connector	T4 series or H4 UTX or MC4-EVO2
Per Pallet	30 pieces
Per Container (40' HQ)	840 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

ELECTRICAL DATA | NMOT*

CS3K	295P	300P	305P	310P
Nominal Max. Power (Pmax)	220 W	223 W	227 W	231 W
Opt. Operating Voltage (Vmp)	30.2 V	30.4 V	30.6 V	30.8 V
Opt. Operating Current (Imp)	7.26 A	7.34 A	7.42 A	7.49 A
Open Circuit Voltage (Voc)	36.7 V	36.9 V	37.1 V	37.3 V
Short Circuit Current (Isc)	7.72 A	7.78 A	7.85 A	7.91 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.36 % / °C
Temperature Coefficient (Voc)	-0.28 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	42 ± 3°C

PARTNER SECTION

* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. Canadian Solar Inc. reserves the right to make necessary adjustments to the information described herein at any time without further notice. Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

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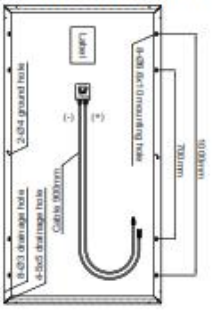
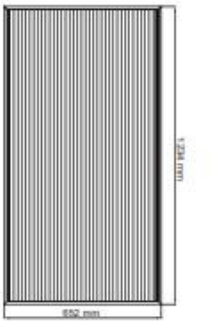
Lampiran 3 *Datasheet* panel surya *CIGS*

Mechanical Specification

Dimensions	1234mm x 652mm x 35mm (48.6 inches x 25.7 inches x 1.38 inches)
Weight	12.9 kg (28.44lbs)
Cell type	CIGS thin film
Front cover	3.2mm tempered glass with ARC
Cell substrates	1.8mm ultra-thin soda lime glass
Back cover	Al back sheet
Encapsulant	EVA
Frame	Anodized Al frame (black) with L-Key mounting
Junction Box	IP67 rated with bypass diode
Connectors	MC4 compatible
Cable length	900mm (35.4 inches)

Module Drawing





Electrical Specification

*Power performance at STC (STC: 1000W/m², 25°C/77°F, AM 1.5)**

Module Models	CdF-	1000A1	1050A1	1100A1	1150A1	1200A1
Nominal power	P_{MPP} [W]	100	105	110	115	120
Power tolerance	[W]	+5/-0	+5/-0	+5/-0	+5/-0	+5/-0
Open circuit voltage	V_{OC} [V]	73.0	73.2	73.4	77.2	78.3
Short circuit current	I_{SC} [A]	2.10	2.10	2.10	2.07	2.06
Voltage at P_{MPP}	V_{MPP} [V]	54.6	55.7	56.9	59.3	61.2
Current at P_{MPP}	I_{MPP} [A]	1.83	1.88	1.93	1.94	1.96
Module efficiency	[%]	≧ 12.4	≧ 13.1	≧ 13.7	≧ 14.3	≧ 14.9

*Power performance at NOCT (NOCT: 800W/m², 20°C/68°F, AM1.5)**

Module Models	CdF-	1000A1	1050A1	1100A1	1150A1	1200A1
Nominal power	P_{MPP} [W]	77.1	81.0	84.9	88.7	95.2
Open circuit voltage	V_{OC} [V]	72.3	72.5	72.6	72.6	72.7
Short circuit current	I_{SC} [A]	1.73	1.75	1.76	1.77	1.79
Voltage at P_{max}	V_{MPP} [V]	51.7	52.8	54.0	55.2	56.4
Current at P_{max}	I_{MPP} [A]	1.49	1.53	1.57	1.60	1.68

*All STC characteristics are measured after pre-treatment of 43kWh/m² light soaking.
Measurement uncertainty: (P_{MPP} : +5%/-3% ; I_{SC}, V_{OC}, I_{MPP}, V_{MPP} : ±10%)

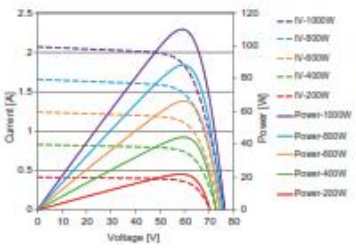
Temperature coefficients

NOCT	TC I_{SC} (α)	TC V_{OC} (β)	TC P_{MPP}(δ)
46°C	+0.01%/°C	-0.31%/°C	-0.23%/°C

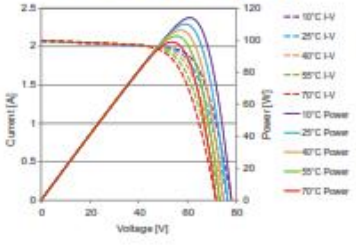
Properties for solar system construction design

Max. system voltage (V_{SYS})	Max. series overcurrent protective devices	Mechanical load	Safety class	Fire rating	Operating temperature
1000V	5A	2400Pa	II	Class C(IEC)	-40 ~ 85°C

I-V curves at various irradiation



I-V curves at various temperature



*This datasheet is for informational purposes only. No rights can be derived from the information contained herein.

3

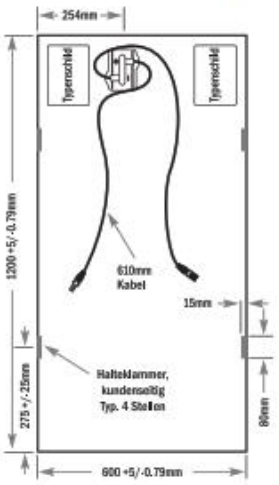
Lampiran 4 *Datasheet* panel surya *CdTe*

Elektrische Spezifikationen

TYPEN UND NENNDATEN BEI STANDARDTESTBEDINGUNGEN[1]*						
Nennwerte		FS-375	FS-377	FS-380	FS-382	FS-385
Nennleistung (+/-5%)	P_{MPP}(W)	75,0	77,5	80,0	82,5	85,0
Spannung bei P_{MAX}	V_{MPP}(V)	46,9	48,3	48,5	48,3	48,5
Elektrischer Strom bei P_{MAX}	I_{MPP}(A)	1,60	1,61	1,65	1,71	1,76
Leerlaufspannung	V_{OC}(V)	60,1	60,7	60,8	60,8	61,0
Kurzschlussstrom	I_{SC}(A)	1,82	1,84	1,88	1,94	1,98
Maximale Systemspannung	V_{SYS}(V)			1000		
Temperaturkoeffizient von P_{MPP}	$T_K(P_{MPP})$			-0,25%/°C		
Temperaturkoeffizient von V_{OC}, für hohe Temp. (>25°C)	$T_K(V_{OC,\ hohe\ Temp.})$			-0,27%/°C		
Temperaturkoeffizient von V_{OC}, niedrige Temp. (-40°C bis + 25°C)	$T_K(V_{OC,\ niedrige\ Temp.})$			-0,20%/°C		
Temperaturkoeffizient von I_{SC}	$T_K(I_{SC})$			+0,04%/°C		
Rückstrombelastbarkeit	I_R(A)			3,5		
Strangsicherung max.	I_{CF}(A)			3,5		

TYPEN UND NENNDATEN BEI 800W/m², NOCT[2] 45°C, AM 1,5*						
Nennwerte		FS-375	FS-377	FS-380	FS-382	FS-385
Nennleistung (+/-5%)	P_{MPP}(W)	56,3	58,1	60,0	61,9	63,8
Spannung bei P_{MAX}	V_{MPP}(V)	44,0	45,3	45,5	45,3	45,5
Elektrischer Strom bei P_{MAX}	I_{MPP}(A)	1,28	1,29	1,32	1,37	1,41
Leerlaufspannung	V_{OC}(V)	55,9	56,5	56,5	56,5	56,7
Kurzschlussstrom	I_{SC}(A)	1,49	1,51	1,54	1,59	1,62

Technische Zeichnung



* Alle Werte +/-10%, falls nicht anders ausgewiesen. Änderungen vorbehalten.

[1] Standardtestbedingungen: 1000W/m², AM 1,5, 25°C

[2] Zelltemperatur im Nominalbetrieb: Modultemperatur bei 800W/m² Einstrahlung, 20°C Lufttemperatur, 1m/s Windgeschwindigkeit

Zuverlässigkeit und Sicherheit

Von international führenden Instituten getestet und für Zuverlässigkeit und Sicherheit zertifiziert:

- Zertifiziert nach IEC 61646
- Zertifiziert nach IEC 61730
- CE-Kennzeichnung
- Schutzklasse II @1000V

Über First Solar

First Solar ist ein führender Hersteller von Photovoltaik Solar Modulen und Anbieter von solaren Lösungen. Indem First Solar die Herstellungskosten kontinuierlich senkt, schaffen wir eine bezahlbare und umweltfreundliche Alternative zur Energieerzeugung auf Basis fossiler Energieträger. Von der Rohstoffbeschaffung bis hin zum Recycling konzentriert sich First Solar auf die Entwicklung kosteneffizienter Lösungen für erneuerbare Energien, die die Umwelt schützen und fördern.

First Solar.

First Solar PV-Module der Serie FS 3 PD-5-401-03 DE FEB 2011 | © Copyright 2011, First Solar, Inc.

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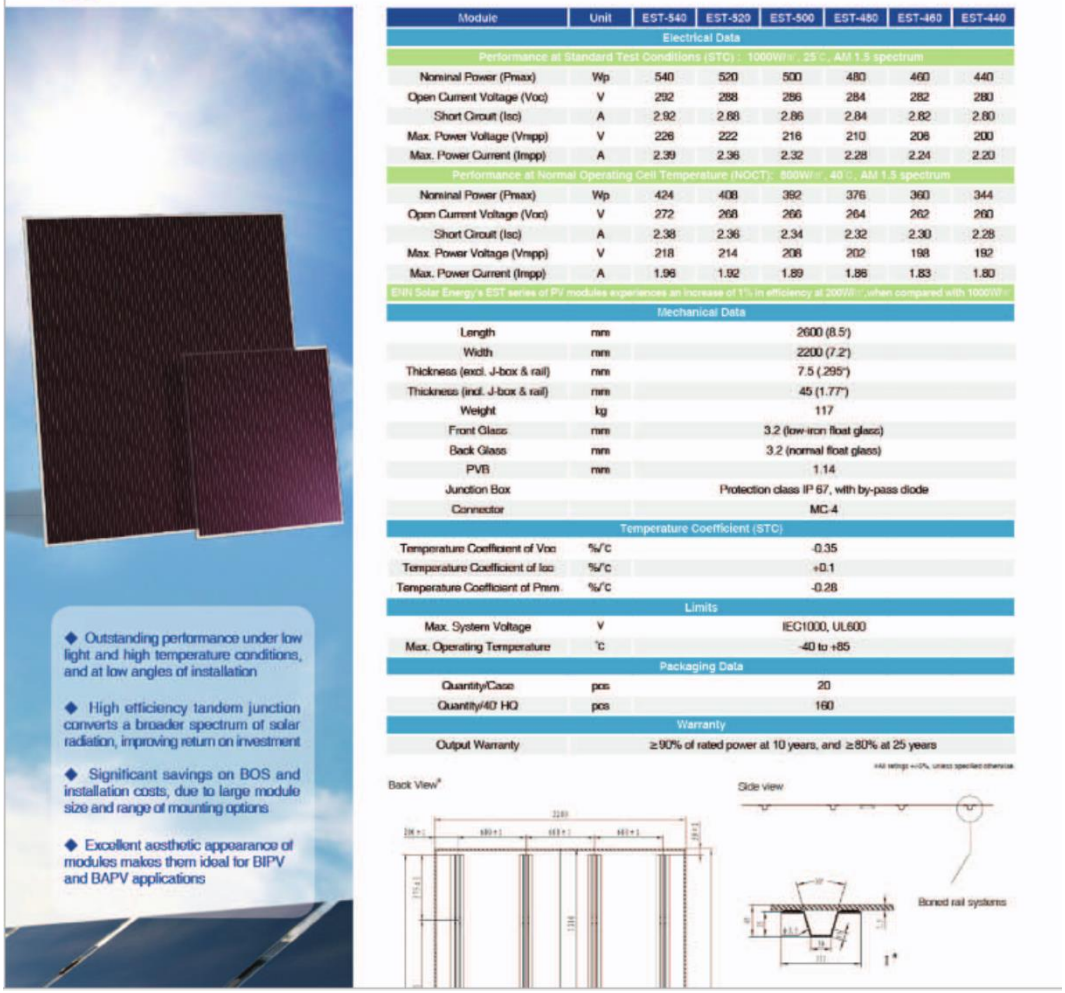
Lampiran 5 *Datasheet* panel surya *CdTe*

ENN SOLAR ENERGY
EST PV Modules - F11 Series

ENN



- Outstanding performance under low light and high temperature conditions, and at low angles of installation
- High efficiency tandem junction converts a broader spectrum of solar radiation, improving return on investment
- Significant savings on BOS and installation costs, due to large module size and range of mounting options
- Excellent aesthetic appearance of modules makes them ideal for BIPV and BAPV applications

Module	Unit	EST-540	EST-520	EST-500	EST-480	EST-460	EST-440
Electrical Data							
Performance at Standard Test Conditions (STC): 1000W/m², 25°C, AM 1.5 spectrum							
Nominal Power (Pmax)	Wp	540	520	500	480	460	440
Open Current Voltage (Voc)	V	292	288	286	284	282	280
Short Circuit (Isc)	A	2.92	2.88	2.86	2.84	2.82	2.80
Max. Power Voltage (Vmpp)	V	226	222	216	210	206	200
Max. Power Current (Impp)	A	2.39	2.36	2.32	2.28	2.24	2.20
Performance at Normal Operating Cell Temperature (NOCT): 800W/m², 40°C, AM 1.5 spectrum							
Nominal Power (Pmax)	Wp	424	408	392	376	360	344
Open Current Voltage (Voc)	V	272	268	266	264	262	260
Short Circuit (Isc)	A	2.38	2.36	2.34	2.32	2.30	2.28
Max. Power Voltage (Vmpp)	V	218	214	208	202	198	192
Max. Power Current (Impp)	A	1.96	1.92	1.89	1.86	1.83	1.80
ENN Solar Energy's EST series of PV modules experiences an increase of 1% in efficiency at 200W/m² when compared with 1000W/m²							
Mechanical Data							
Length	mm	2600 (8.5')					
Width	mm	2200 (7.2')					
Thickness (excl. J-box & rail)	mm	7.5 (.295")					
Thickness (incl. J-box & rail)	mm	45 (1.77")					
Weight	kg	117					
Front Glass	mm	3.2 (low-iron float glass)					
Back Glass	mm	3.2 (normal float glass)					
PVB	mm	1.14					
Junction Box		Protection class IP 67, with by-pass diode					
Connector		MC-4					
Temperature Coefficient (STC)							
Temperature Coefficient of Voc	%/°C	-0.35					
Temperature Coefficient of Isc	%/°C	+0.1					
Temperature Coefficient of Pmm	%/°C	-0.28					
Limits							
Max. System Voltage	V	IEC1000, UL600					
Max. Operating Temperature	°C	-40 to +85					
Packaging Data							
Quantity/Case	pcs	20					
Quantity/40' HQ	pcs	160					
Warranty							
Output Warranty		≥90% of rated power at 10 years, and ≥80% at 25 years					

*All ratings +/-5%, unless specified otherwise.

Back View*

Side view

Lampiran 6 *Datasheet* inverter

XS Series

GOODWE

Technical Data	GW700-XS	GW1000-XS	GW1500-XS	GW2000-XS	GW2500-XS	GW3000-XS
Input						
Max. Input Voltage (V)	500	500	500	500	500	500
MPPT Operating Voltage Range (V)	40 ~ 450	40 ~ 450	50 ~ 450	50 ~ 450	50 ~ 450	50 ~ 450
Start-up Voltage (V)	40	40	50	50	50	50
Nominal Input Voltage (V)	360	360	360	360	360	360
Max. Input Current per MPPT (A)	12.5	12.5	12.5	12.5	12.5	12.5
Max. Short Circuit Current per MPPT (A)	15.6	15.6	15.6	15.6	15.6	15.6
Number of MPP Trackers	1	1	1	1	1	1
Number of Strings per MPPT	1	1	1	1	1	1
Output						
Nominal Output Power (W)	700	1000	1500	2000	2500	3000
Nominal Output Apparent Power (VA)	700	1000	1500	2000	2500	3000
Max. AC Active Power (W)	800	1100	1650	2200	2750	3300
Max. AC Apparent Power (VA)	800	1100	1650	2200	2750	3300
Nominal Output Voltage (V)	230	230	230	230	230	230
Nominal AC Grid Frequency (Hz)	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Max. Output Current (A)	3.5	4.8	7.2	9.6	12.0	14.3
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)					
Max. Total Harmonic Distortion	<3%	<3%	<3%	<3%	<3%	<3%
Efficiency						
Max. Efficiency	97.2%	97.2%	97.3%	97.5%	97.6%	97.6%
European Efficiency	96.0%	96.4%	96.6%	97.0%	97.2%	97.2%
Protection						
PV Insulation Resistance Detection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
PV Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Anti-Islanding Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
DC Switch	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
DC Surge Protection	Type III	Type III	Type III	Type III	Type III	Type III
AC Surge Protection	Type III	Type III	Type III	Type III	Type III	Type III
General Data						
Operating Temperature Range (°C)	-25 ~ +60	-25 ~ +60	-25 ~ +60	-25 ~ +60	-25 ~ +60	-25 ~ +60
Relative Humidity	0~100%	0~100%	0~100%	0~100%	0~100%	0~100%
Max. Operating Altitude (m)*1	4000	4000	4000	4000	4000	4000
Cooling Method	Natural Convection					
User Interface	LED, LCD (Optional), WLAN + APP					
Communication	WiFi, LAN or RS485 (Optional)					
Weight (kg)	5.8	5.8	5.8	5.8	5.8	5.8
Dimension (W × H × D mm)	295 × 230 × 113					
Noise Emission (dB)	<25	<25	<25	<25	<42	<42
Topology	Non-isolated	Non-isolated	Non-isolated	Non-isolated	Non-isolated	Non-isolated
Self-consumption at Night (W)	<1	<1	<1	<1	<1	<1
Ingress Protection Rating	IP65	IP65	IP65	IP65	IP65	IP65
DC Connector	MC4 (2.5 ~ 4mm²)					
AC Connector	Plug and Play Connector					

*1: For Australia, Max. Operating Altitude (m) is 3000.
*: Optional functions or devices are purchased separately.
*: All pictures shown are for reference only. Actual appearance may vary.
*: Please visit GoodWe website for the latest certificates.

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