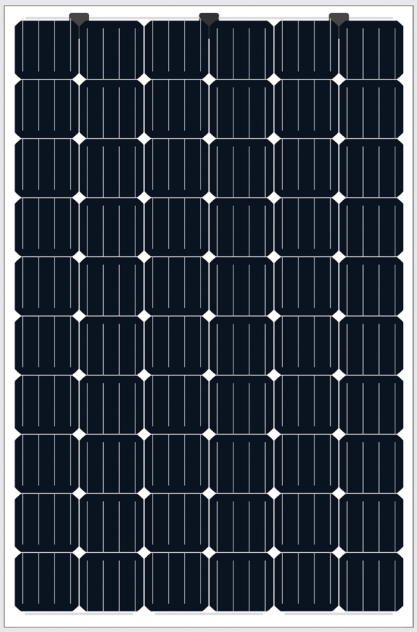
YINGLI SOLAR

TwinMAX 60 CELL

BIFACIAL SERIES

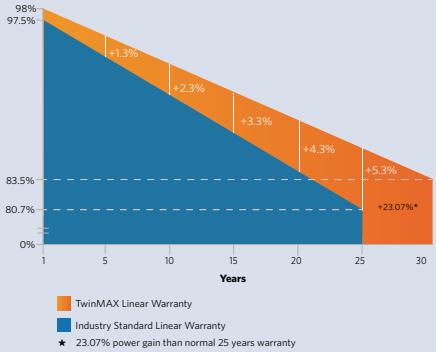


20.5%
CELL EFFICIENCY

10 YEAR
PRODUCT WARRANTY

0 - 5W
POWER TOLERANCE

TwinMAX 30 Years Linear Warranty



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DUAL POWER
MAXIMIZED YIELD

TwinMAX Bifacial modules generate power from the front as well as from the back side. Together with the cutting-edge PANDA n-type crystalline silicon solar cells, which wake up earlier than regular p-type and go to sleep later, the energy yield can be increased by 10-30%*.

Bifacial Power
In contrast to standard modules, TwinMAX Bifacial modules generate energy from both sides. As the backside makes use of the reflected light from the surroundings, the modules can yield up to 30% power more, depending on the albedo.

Optimal Self-cleaning
Optimal self-cleaning due to frameless module design.

Durability
Durable TwinMAX modules, independently tested for harsh environmental conditions such as exposure to salt mist, ammonia, or known PID risk factors.

PID Resistant
Tested at 85°C temperature and 85% relative humidity for 192 hrs beyond IEC standards, TwinMAX modules have demonstrated their resistance against PID, which provides greater investment security.

Yingli Green Energy
Yingli Green Energy Holding Company Limited (NYSE: YGE), known as "Yingli Solar," is one of the world's leading solar panel manufacturers with the mission to provide affordable green energy for all. Deploying more than 65 million solar panels worldwide, Yingli Solar makes solar power possible for communities everywhere by using our global manufacturing and logistics expertise to address unique local challenges.

*Depending on the environmental condition of installation.

TwinMAX 60 CELL BIFACIAL 270W

ELECTRICAL PERFORMANCE

YL270CG2530L-1 Electrical parameters at STC & NOCT

Test Conditions			Electrical parameters at Standard Test Conditions (STC)	Electrical parameters at Nominal Operating Cell Temperature (NOCT)
Power output tolerance	ΔP_{max}	W	0 / + 5	
Power output	P_{max}	W	270	198.8
Module efficiency	η_m	%	16.4	12.1
Voltage at P_{max}	V_{mpp}	V	31.1	28.8
Current at P_{max}	I_{mpp}	A	8.68	6.91
Open-circuit voltage	V_{oc}	V	38.4	35.6
Short-circuit current	I_{sc}	A	9.16	7.39

STC: 1000W/m² irradiance, 25°C cell temperature, AM1.5 spectrum according to EN 60904-3.
Average relative efficiency reduction of 1.9% at 200W/m² according to EN 60904-1.
NOCT: open-circuit module operation temperature at 800W/m² irradiance, 20°C ambient temperature, 1m/s wind speed.

YL270CG2530L-1 Optimized electrical parameters (considering the power gain from rear side)

Energy yield			5%	10%	15%	20%	25%
Power output	P_{max}	W	283	297	310	324	337
Module efficiency	η_m	%	17.2	18.1	18.8	19.7	20.5
Voltage at P_{max}	V_{mpp}	V	31.1	31.1	31.1	31.1	31.1
Current at P_{max}	I_{mpp}	A	9.11	9.55	9.98	10.4	10.9
Open-circuit voltage	V_{oc}	V	38.4	38.4	38.4	38.4	38.4
Short-circuit current	I_{sc}	A	9.62	10.1	10.5	11.0	11.5

THERMAL CHARACTERISTICS

Nominal operating cell temperature	NOCT	°C	46 + / - 2
Temperature coefficient of P_{max}	γ	%/°C	-0.38
Temperature coefficient of V_{oc}	β_{Voc}	%/°C	-0.30
Temperature coefficient of I_{sc}	α_{Isc}	%/°C	0.04

OPERATING CONDITIONS

Max. system voltage	1500V_{DC}
Max. series fuse rating	15A
Limiting reverse current	15A
Operating temperature range	-40°C to 85°C
Max. snow load, front*	5400Pa
Max. wind load, back*	2400Pa
Max. hailstone impact (diameter / velocity)	25mm / 23m/s

*Load bearing capacity depends on installation.

CONSTRUCTION MATERIALS

Front and back cover (material / thickness)	low-iron tempered glass / 2.5mm x 2
Cell (quantity / material / dimensions / number of busbar)	60 / monocrystalline silicon / 156mm x 156mm / 4
Frame	N / A
Junction box (protection degree)	≥ IP67
Cable (length / cross-sectional area)	250mm / 4mm²
Plug connector (type / protection degree)	RH 05-8/IP67 or LSC-R1/IP68 or LSC-R2/IP68

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- The data do not refer to a single module and they are not part of the offer, they only serve for comparison to different module types.

QUALIFICATIONS & CERTIFICATES

IEC 61215, IEC 61730, CE, ISO 9001:2008, ISO 14001:2004,
BS OHSAS 18001:2007, PV Cycle, SA 8000

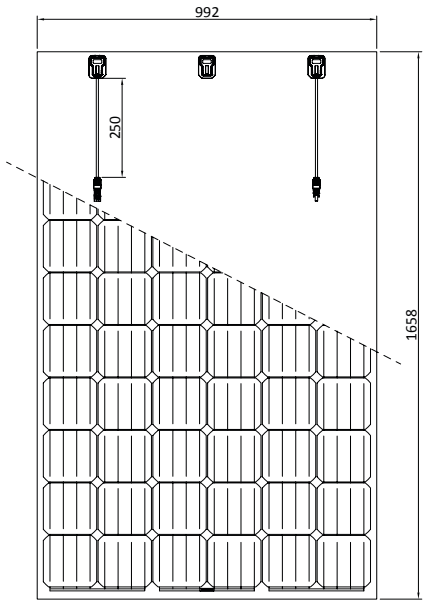
GENERAL CHARACTERISTICS

Dimensions (L / W / H)	1658mm / 992mm / 6mm
Weight	23kg

PACKAGING SPECIFICATIONS

Number of modules per pallet	33
Number of pallets per 40' container	26
Packaging pallets dimensions (L / W / H)	1780mm / 1140mm / 1183mm
Pallet weight	822kg

Unit: mm



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TwinMAX 60 CELL BIFACIAL - 275W

ELECTRICAL PERFORMANCE

YL275CG2530L-1 Electrical parameters at STC & NOCT

Test Conditions			Electrical parameters at Standard Test Conditions (STC)	Electrical parameters at Nominal Operating Cell Temperature (NOCT)
Power output tolerance	ΔP_{max}	W	0 / + 5	
Power output	P_{max}	W	275	202.4
Module efficiency	η_m	%	16.7	12.3
Voltage at P_{max}	V_{mpp}	V	31.4	29.0
Current at P_{max}	I_{mpp}	A	8.75	6.97
Open-circuit voltage	V_{oc}	V	38.6	35.8
Short-circuit current	I_{sc}	A	9.21	7.43

STC: 1000W/m² irradiance, 25°C cell temperature, AM1.5 spectrum according to EN 60904-3.
Average relative efficiency reduction of 1.9% at 200W/m² according to EN 60904-1.
NOCT: open-circuit module operation temperature at 800W/m² irradiance, 20°C ambient temperature, 1m/s wind speed.

YL275CG2530L-1 Optimized electrical parameters (considering the power gain from rear side)

Energy yield			5%	10%	15%	20%	25%
Power output	P_{max}	W	288	302	316	330	343
Module efficiency	η_m	%	17.5	18.4	19.2	20.1	20.9
Voltage at P_{max}	V_{mpp}	V	31.4	31.4	31.4	31.4	31.4
Current at P_{max}	I_{mpp}	A	9.19	9.63	10.1	10.5	10.9
Open-circuit voltage	V_{oc}	V	38.6	38.6	38.6	38.6	38.6
Short-circuit current	I_{sc}	A	9.66	10.1	10.6	11.0	11.5

THERMAL CHARACTERISTICS

Nominal operating cell temperature	NOCT	°C	46 + / - 2
Temperature coefficient of P_{max}	γ	%/°C	-0.38
Temperature coefficient of V_{oc}	β_{Voc}	%/°C	-0.30
Temperature coefficient of I_{sc}	α_{Isc}	%/°C	0.04

OPERATING CONDITIONS

Max. system voltage	1500V_{DC}
Max. series fuse rating	15A
Limiting reverse current	15A
Operating temperature range	-40°C to 85°C
Max. snow load, front*	5400Pa
Max. wind load, back*	2400Pa
Max. hailstone impact (diameter / velocity)	25mm / 23m/s

*Load bearing capacity depends on installation.

CONSTRUCTION MATERIALS

Front and back cover (material / thickness)	low-iron tempered glass / 2.5mm x 2
Cell (quantity / material / dimensions / number of busbar)	60 / monocrystalline silicon / 156mm x 156mm / 4
Frame	N / A
Junction box (protection degree)	≥ IP67
Cable (length / cross-sectional area)	250mm / 4mm²
Plug connector (type / protection degree)	RH 05-8/IP67 or LSC-R1/IP68 or LSC-R2/IP68

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QUALIFICATIONS & CERTIFICATES

IEC 61215, IEC 61730, CE, ISO 9001:2008, ISO 14001:2004,
BS OHSAS 18001:2007, PV Cycle, SA 8000

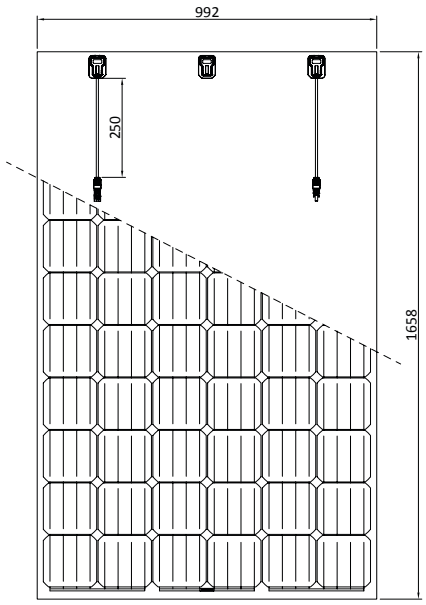
GENERAL CHARACTERISTICS

Dimensions (L / W / H)	1658mm / 992mm / 6mm
Weight	23kg

PACKAGING SPECIFICATIONS

Number of modules per pallet	33
Number of pallets per 40' container	26
Packaging pallets dimensions (L / W / H)	1780mm / 1140mm / 1183mm
Pallet weight	822kg

Unit: mm



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TwinMAX 60 CELL BIFACIAL - 280W

ELECTRICAL PERFORMANCE

YL280CG2530L-1 **Electrical parameters at** STC & NOCT

Test Conditions			Electrical parameters at Standard Test Conditions (STC)	Electrical parameters at Nominal Operating Cell Temperature (NOCT)
Power output tolerance	ΔP_{max}	W	0 / + 5	
Power output	P_{max}	W	280	206.1
Module efficiency	η_m	%	17.0	12.5
Voltage at P_{max}	V_{mpp}	V	31.7	29.3
Current at P_{max}	I_{mpp}	A	8.83	7.03
Open-circuit voltage	V_{oc}	V	38.8	36.0
Short-circuit current	I_{sc}	A	9.25	7.46

STC: 1000W/m² irradiance, 25°C cell temperature, AM1.5 spectrum according to EN 60904-3.
Average relative efficiency reduction of 1.9% at 200W/m² according to EN 60904-1.
NOCT: open-circuit module operation temperature at 800W/m² irradiance, 20°C ambient temperature, 1m/s wind speed.

YL280CG2530L-1 Optimized electrical parameters (considering the power gain from rear side)

Energy yield			5%	10%	15%	20%	25%
Power output	P_{max}	W	294	308	322	336	350
Module efficiency	η_m	%	17.9	18.7	19.6	20.4	21.3
Voltage at P_{max}	V_{mpp}	V	31.7	31.7	31.7	31.7	31.7
Current at P_{max}	I_{mpp}	A	9.27	9.71	10.2	10.6	11.0
Open-circuit voltage	V_{oc}	V	38.8	38.8	38.8	38.8	38.8
Short-circuit current	I_{sc}	A	9.71	10.2	10.6	11.1	11.6

THERMAL CHARACTERISTICS

Nominal operating cell temperature	NOCT	°C	46 + / - 2
Temperature coefficient of P_{max}	γ	%/°C	-0.38
Temperature coefficient of V_{oc}	β_{Voc}	%/°C	-0.30
Temperature coefficient of I_{sc}	α_{Isc}	%/°C	0.04

OPERATING CONDITIONS

Max. system voltage	1500V_{DC}
Max. series fuse rating	15A
Limiting reverse current	15A
Operating temperature range	-40°C to 85°C
Max. snow load, front*	5400Pa
Max. wind load, back*	2400Pa
Max. hailstone impact (diameter / velocity)	25mm / 23m/s

*Load bearing capacity depends on installation.

CONSTRUCTION MATERIALS

Front and back cover (material / thickness)	low-iron tempered glass / 2.5mm x 2
Cell (quantity / material / dimensions / number of busbar)	60 / monocrystalline silicon / 156mm x 156mm / 4
Frame	N / A
Junction box (protection degree)	≥ IP67
Cable (length / cross-sectional area)	250mm / 4mm²
Plug connector (type / protection degree)	RH 05-8/IP67 or LSC-R1/IP68 or LSC-R2/IP68

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QUALIFICATIONS & CERTIFICATES

IEC 61215, IEC 61730, CE, ISO 9001:2008, ISO 14001:2004,
BS OHSAS 18001:2007, PV Cycle, SA 8000

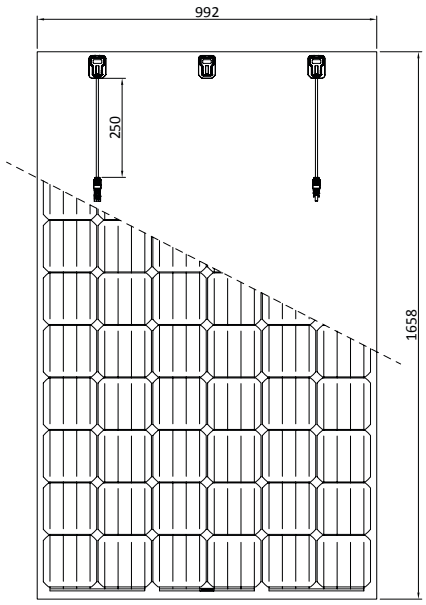
GENERAL CHARACTERISTICS

Dimensions (L / W / H)	1658mm / 992mm / 6mm
Weight	23kg

PACKAGING SPECIFICATIONS

Number of modules per pallet	33
Number of pallets per 40' container	26
Packaging pallets dimensions (L / W / H)	1780mm / 1140mm / 1183mm
Pallet weight	822kg

Unit: mm



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TwinMAX 60 CELL BIFACIAL - 285W

ELECTRICAL PERFORMANCE

YL285CG2530L-1 Electrical parameters at STC & NOCT

Test Conditions			Electrical parameters at Standard Test Conditions (STC)	Electrical parameters at Nominal Operating Cell Temperature (NOCT)
Power output tolerance	ΔP_{max}	W	0 / + 5	
Power output	P_{max}	W	285	209.8
Module efficiency	η_m	%	17.3	12.8
Voltage at P_{max}	V_{mpp}	V	32.0	29.6
Current at P_{max}	I_{mpp}	A	8.91	7.09
Open-circuit voltage	V_{oc}	V	39.0	36.2
Short-circuit current	I_{sc}	A	9.30	7.50

STC: 1000W/m² irradiance, 25°C cell temperature, AM1.5 spectrum according to EN 60904-3.
Average relative efficiency reduction of 1.9% at 200W/m² according to EN 60904-1.
NOCT: open-circuit module operation temperature at 800W/m² irradiance, 20°C ambient temperature, 1m/s wind speed.

YL285CG2530L-1 Optimized electrical parameters (considering the power gain from rear side)

Energy yield			5%	10%	15%	20%	25%
Power output	P_{max}	W	299	313	327	342	356
Module efficiency	η_m	%	18.2	19.0	19.9	20.8	21.6
Voltage at P_{max}	V_{mpp}	V	32.0	32.0	32.0	32.0	32.0
Current at P_{max}	I_{mpp}	A	9.36	9.80	10.2	10.7	11.1
Open-circuit voltage	V_{oc}	V	39.0	39.0	39.0	39.0	39.0
Short-circuit current	I_{sc}	A	9.77	10.2	10.7	11.2	11.6

THERMAL CHARACTERISTICS

Nominal operating cell temperature	NOCT	°C	46 + / - 2
Temperature coefficient of P_{max}	γ	%/°C	-0.38
Temperature coefficient of V_{oc}	β_{Voc}	%/°C	-0.30
Temperature coefficient of I_{sc}	α_{Isc}	%/°C	0.04

OPERATING CONDITIONS

Max. system voltage	1500V_{DC}
Max. series fuse rating	15A
Limiting reverse current	15A
Operating temperature range	-40°C to 85°C
Max. snow load, front*	5400Pa
Max. wind load, back*	2400Pa
Max. hailstone impact (diameter / velocity)	25mm / 23m/s

*Load bearing capacity depends on installation.

CONSTRUCTION MATERIALS

Front and back cover (material / thickness)	low-iron tempered glass / 2.5mm x 2
Cell (quantity / material / dimensions / number of busbar)	60 / monocrystalline silicon / 156mm x 156mm / 4
Frame	N / A
Junction box (protection degree)	≥ IP67
Cable (length / cross-sectional area)	250mm / 4mm²
Plug connector (type / protection degree)	RH 05-8/IP67 or LSC-R1/IP68 or LSC-R2/IP68

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QUALIFICATIONS & CERTIFICATES

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BS OHSAS 18001:2007, PV Cycle, SA 8000

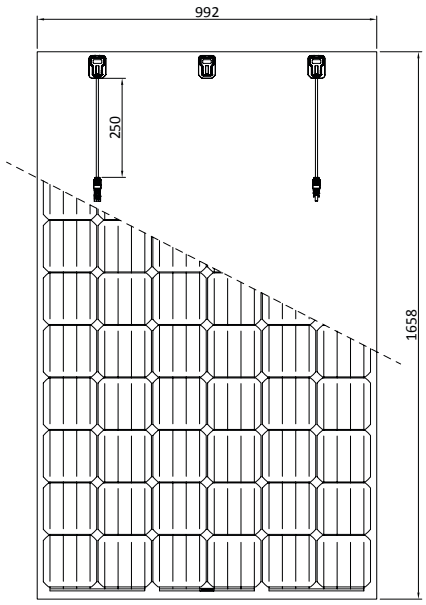
GENERAL CHARACTERISTICS

Dimensions (L / W / H)	1658mm / 992mm / 6mm
Weight	23kg

PACKAGING SPECIFICATIONS

Number of modules per pallet	33
Number of pallets per 40' container	26
Packaging pallets dimensions (L / W / H)	1780mm / 1140mm / 1183mm
Pallet weight	822kg

Unit: mm



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TwinMAX 60 CELL BIFACIAL 290W

ELECTRICAL PERFORMANCE

YL290CG2530L-1 **Electrical parameters at** STC & NOCT

Test Conditions			Electrical parameters at Standard Test Conditions (STC)	Electrical parameters at Nominal Operating Cell Temperature (NOCT)
Power output tolerance	ΔP_{max}	W	0 / + 5	
Power output	P_{max}	W	290	213.5
Module efficiency	η_m	%	17.6	13.0
Voltage at P_{max}	V_{mpp}	V	32.3	29.8
Current at P_{max}	I_{mpp}	A	8.98	7.15
Open-circuit voltage	V_{oc}	V	39.2	36.4
Short-circuit current	I_{sc}	A	9.34	7.54

STC: 1000W/m² irradiance, 25°C cell temperature, AM1.5 spectrum according to EN 60904-3.
Average relative efficiency reduction of 1.9% at 200W/m² according to EN 60904-1.
NOCT: open-circuit module operation temperature at 800W/m² irradiance, 20°C ambient temperature, 1m/s wind speed.

YL290CG2530L-1 Optimized electrical parameters (considering the power gain from rear side)

Energy yield			5%	10%	15%	20%	25%
Power output	P_{max}	W	304	319	333	348	362
Module efficiency	η_m	%	18.5	19.4	20.2	21.2	22.0
Voltage at P_{max}	V_{mpp}	V	32.3	32.3	32.3	32.3	32.3
Current at P_{max}	I_{mpp}	A	9.43	9.88	10.3	10.8	11.2
Open-circuit voltage	V_{oc}	V	39.0	39.0	39.0	39.0	39.0
Short-circuit current	I_{sc}	A	9.81	10.3	10.7	11.2	11.7

THERMAL CHARACTERISTICS

Nominal operating cell temperature	NOCT	°C	46 + / - 2
Temperature coefficient of P_{max}	γ	%/°C	-0.38
Temperature coefficient of V_{oc}	β_{Voc}	%/°C	-0.30
Temperature coefficient of I_{sc}	α_{Isc}	%/°C	0.04

OPERATING CONDITIONS

Max. system voltage	1500V_{DC}
Max. series fuse rating	15A
Limiting reverse current	15A
Operating temperature range	-40°C to 85°C
Max. snow load, front*	5400Pa
Max. wind load, back*	2400Pa
Max. hailstone impact (diameter / velocity)	25mm / 23m/s

*Load bearing capacity depends on installation.

CONSTRUCTION MATERIALS

Front and back cover (material / thickness)	low-iron tempered glass / 2.5mm x 2
Cell (quantity / material / dimensions / number of busbar)	60 / monocrystalline silicon / 156mm x 156mm / 4
Frame	N / A
Junction box (protection degree)	≥ IP67
Cable (length / cross-sectional area)	250mm / 4mm²
Plug connector (type / protection degree)	RH 05-8/IP67 or LSC-R1/IP68 or LSC-R2/IP68

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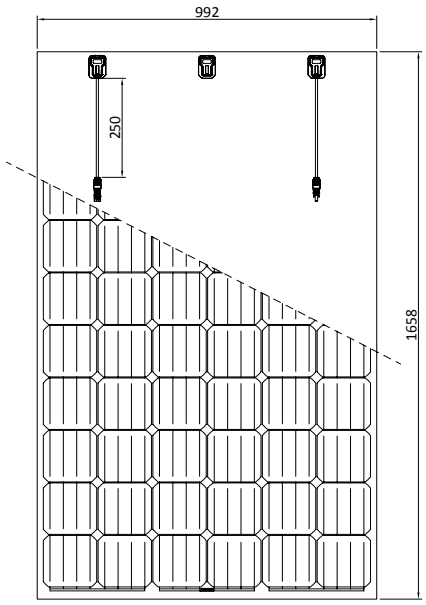
GENERAL CHARACTERISTICS

Dimensions (L / W / H)	1658mm / 992mm / 6mm
Weight	23kg

PACKAGING SPECIFICATIONS

Number of modules per pallet	33
Number of pallets per 40' container	26
Packaging pallets dimensions (L / W / H)	1780mm / 1140mm / 1183mm
Pallet weight	822kg

Unit: mm



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