



MARROW INTERNATIONAL
C A N A D A

SOLAR ENERGY SAVING OPTIONS



LG U6 SOLAR PANELS

New Mono Perc product differentiates specs and performance by integrating LG own module technologies, which has led solar energy technology

MAXIMUM EFFICIENCY 20.2% (OUTPUT POWER 450W)

- Save on installation and labor costs
- Reduced costs due to reduced land usage

PRODUCT WARRANTY

- 15 years (Competitors 10~12 years)

PERFORMANCE WARRANTY

- Annual degradation: -0.4% (LG U6) vs over -0.55% (Competitor)
- After 25yrs: 87.4% (LG U6) vs 84.8% (Competitor) (Better long-term profitability)

LIGHT WEIGHT

- 2kg lighter than competitor (Easy to install, Saving cost)

ROBUST MECHANICAL STRENGTH

- Frame Thickness : 40mm (LG U6) vs 35mm (competitor)
- Mechanical load . Front 5400 Pa (LG U6) vs 5400 Pa (Competitor).
Rear 3000 Pa (LG U6) vs 2400 Pa (Competitor)

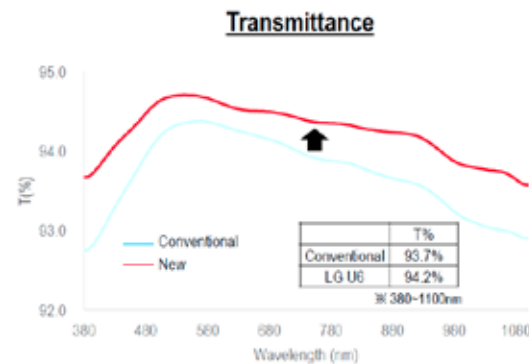
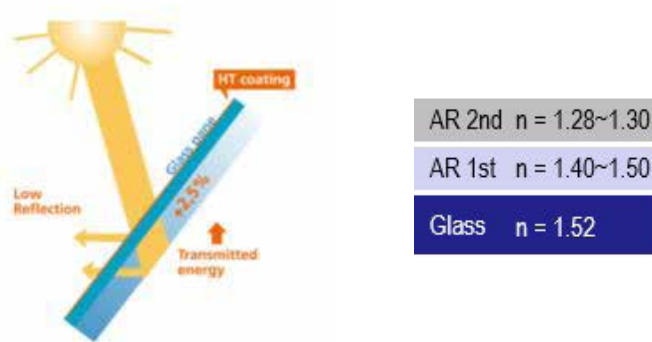


MAXIMUM EFFICIENCY

Module design with maximum light absorption and low loss leads to excellent module efficiency and output power. LG U6 provides more savings in installation space and system cost than competitors.

Max 20.2% efficiency, 450W power

- Improve glass transmittance(93.7% - 94.2%)

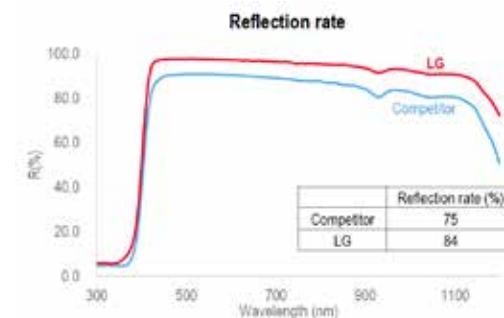
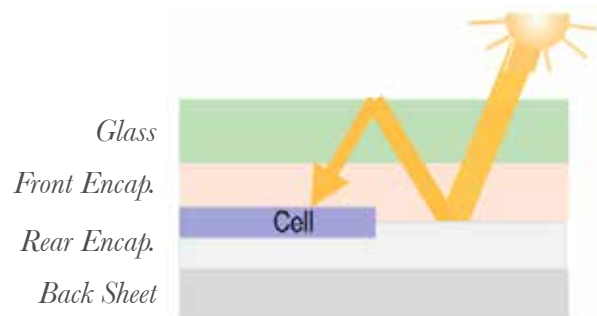


- Improve reflection rate of EVA (75% - 84%)

Higher light absorption by recycling reflected light

- High reflection backsheet

Higher light absorption by recycling reflected light

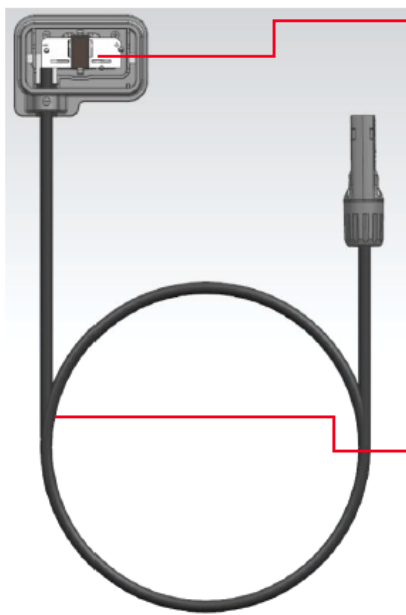


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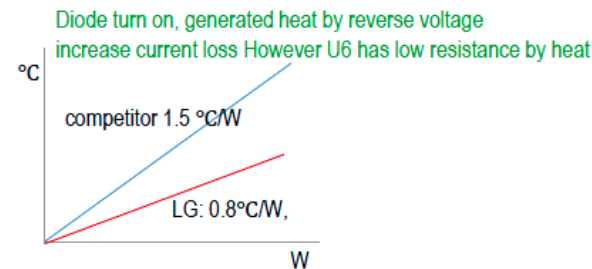
Max 20.2% efficiency, 450W power

- Low loss Junction box



■ Bypass Diode

- Improve heat transfer
- Improve conductor resistance by heat



■ Cable

- Minimize current loss
- LG : Conductor 56wire / 0.3mm
(competitors 48 or 50wire / 0.3mm)

- Low loss Wire

	Conventional	LG U6
Cross section (mm ²)	0.080	0.102
		Lower 20% in resistance



- Higher cell efficiency with high quality wafer

Cell efficiency : 22.2% - 22.4% (450W)



PRODUCT/PERFORMANCE WARRANTY

More stable system operation and more profit by providing enhanced product/performance warranty

- High durability materials
LG's unique module technologies combined with high durability materials integrated
- Reinforcement of frame design
Robust mechanical load by 40mm frame thickness
- Long-term reliability
 - *Improved strength by stress due to the thermal expansion coefficient difference*
 - *TC improved by optimizing yield strength of cell wire*
 - *DH improved by excellent passivation of rear cell*
 - *Enhanced reliability test*
 - *Protect humidity by applying high quality passivation*

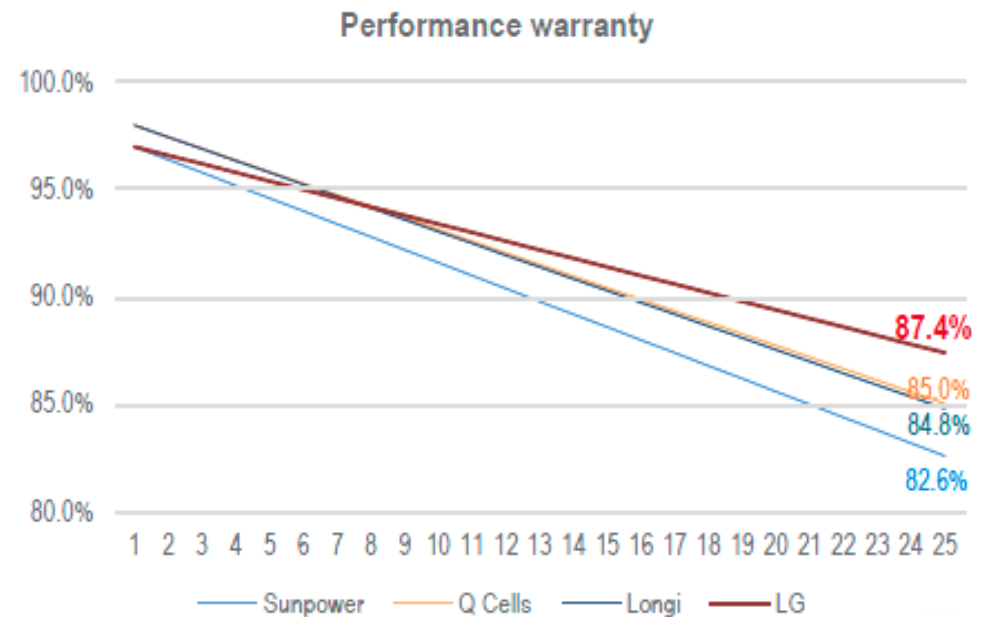
	IEC	LG	
DH (hr)	1000	2000	2x IEC
TC (cycle)	200	600	3x IEC

■ Product warranty



■ Performance warranty

- Annual -0.4% / After 25yrs : 87.4%



LIGHT WEIGHT/ROBUST MECHANICAL STRENGTH

Better mechanical strength by optimizing frame design even though thin glass achieves system stability

- Light weight design

- *Lightweight, tempered glass*
 - *LG U6 2.8t vs Competitor 3.2t*
- *Module weight*
 - *LG U6 22.3kg vs Competitor 24.5kg*

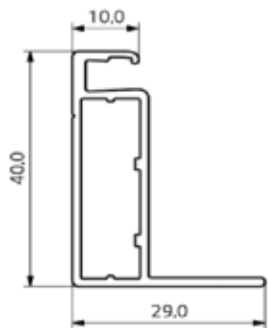
- Mechanical strength

- *Frame thickness*
 - *LG U6 40mm vs Competitor 35mm*
- *Cross section design for load improvement*

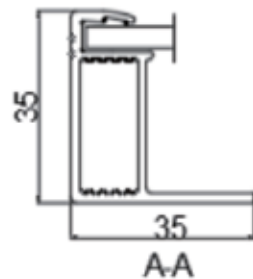
1MW Rooftop

	Competitor 430W	LG 450W	Note
Module Qty	2,325	2,222	
Module weight	24.5kg	22.3kg	9% lighter
Total weight	56,962.5	49,550.6	13% lighter

7,412kg lighter (structure weight not included)



LG



Competitor

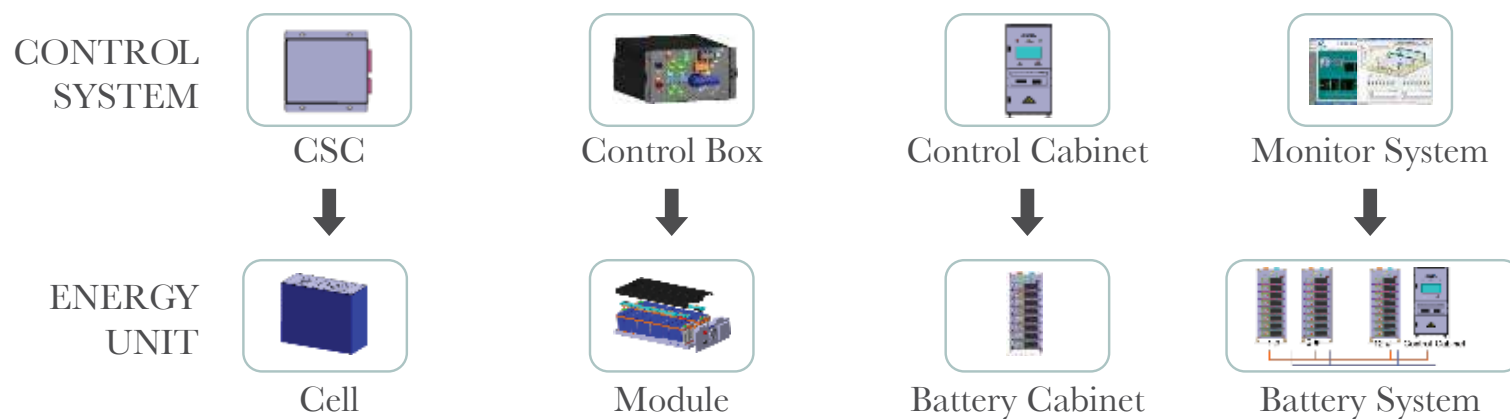
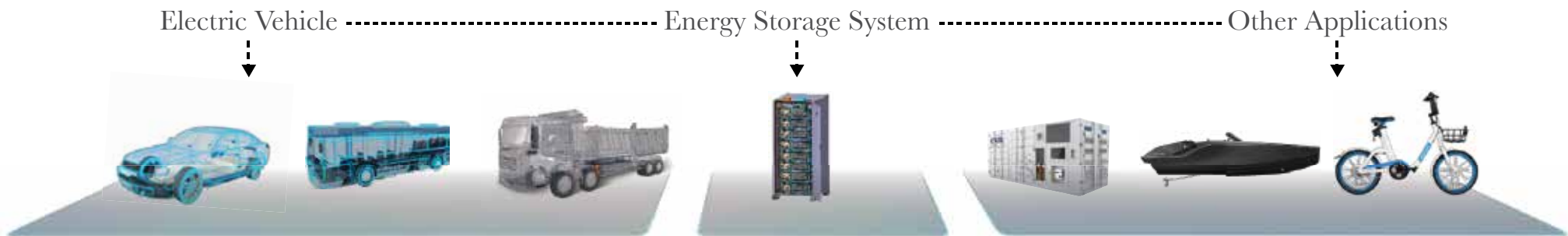
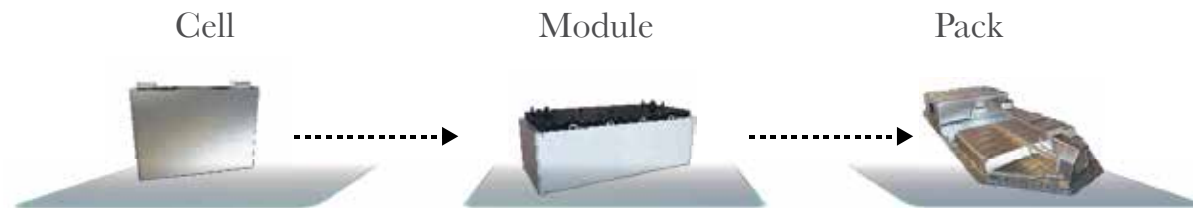
	Competitor 430W	LG 450W	Note
Front	5,400	5,400	
Rear	2,400	3,000	



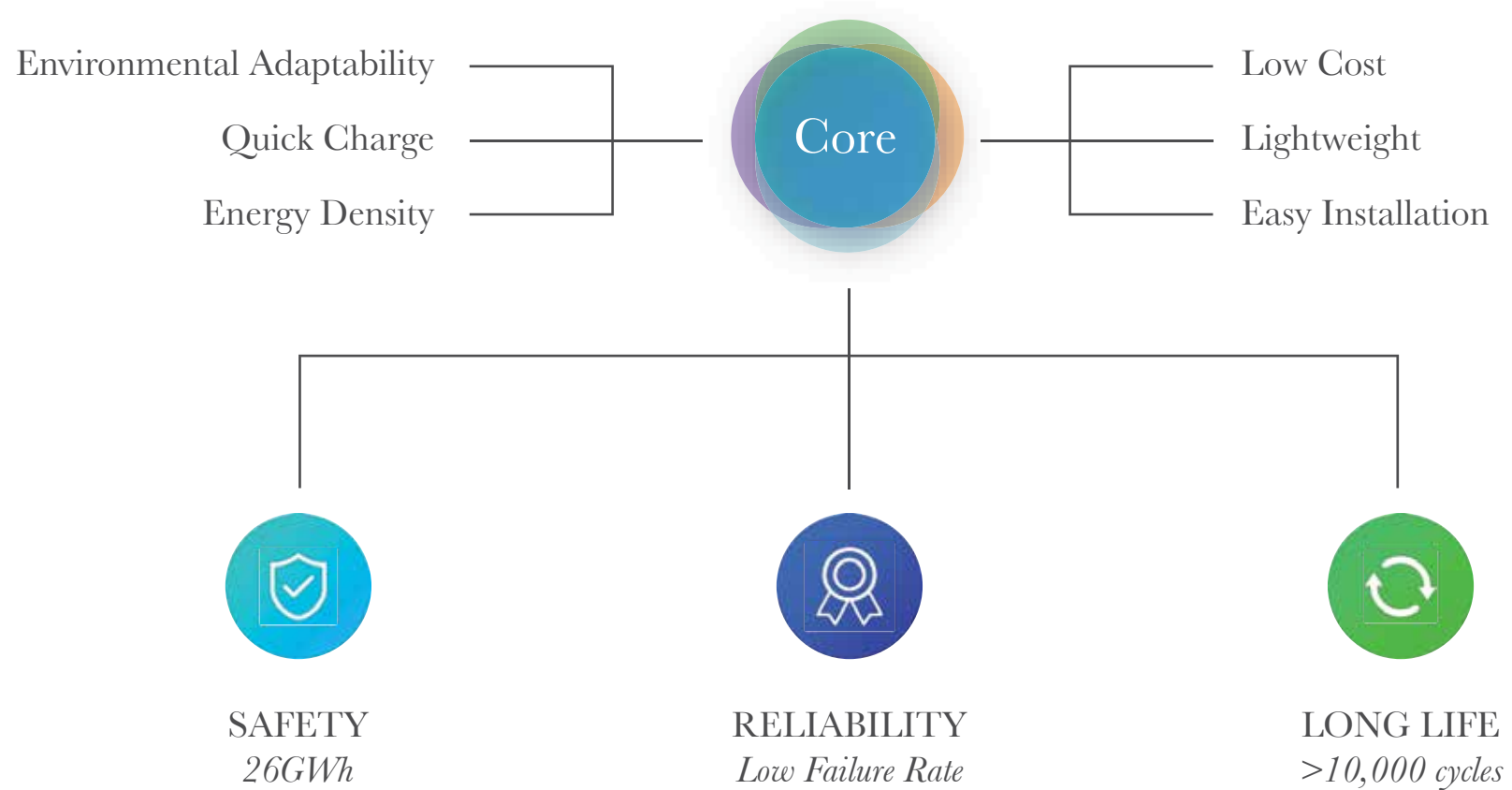
BATTERY



PRODUCT STRUCTURE



ADVANTAGES



ADVANTAGES - SAFETY

PRECISE CONTROL

- Precise data collection & monitor
- LFP SOC estimation error < 3%
- Efficient equalization

THOROUGH SAFE FUNCTIONS

- Authorized by BMW, VW & PSA etc.
- Diagnose malfunctions & potential risks timely
- Ensure HV safety

STRONG R & D

- >300 domestic & international patents
- 350 BMS engineers
- Know-how like Wireless BMS



ADVANTAGES - RELIABILITY

Reliability Exceed Customer Expectations With Perfect Product Quality

INTELLIGENT

Integrate resources, facilities & info
Network: EPR+MES+Data+Automation

AUTOMATION

100% automated production
Consistency of process & quality

INFORMATION

IOT big data
15 year's traceability



ADVANTAGES - LONG LIFE

BATTERY DECAY MECHANISM

With our technology, battery lasts very long and does not wear out easily.
Longer lasting than all competitors.

SELF-HEALING TECHNOLOGY

Optimize Anode/ Cathode/ Electrolyte
Select graphite with self-healing structure
Martial coating Technology





A Royal Experience