

# 440-450-455-460W

### Outstanding Product Performance

- Better performance under shading effect.
- Excellent cell color control by dedicated cell blackening treatment.
- Thinner wires that appear all black at a distance

### Not only in big size, But with high power

- Small form factor. Generate a huge amount of energy even in limited space.
- Up to 460W, 21.5% module efficiency with high density interconnect technology.
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection.
- Reduce installation cost with higher power bin and efficiency.
- Boost performance in warm weather lower temperature coefficient (-0.34%) and operating temperature.

### Perfect fitting for commercial projects

- Designed for compatibility with existing mainstream optimizers, inverters and mounting systems.
- Perfect size and low weight. Easy for handling. Economy for transporting.
- Diverse installation solutions. Flexible for system deployment.

### High Reliability

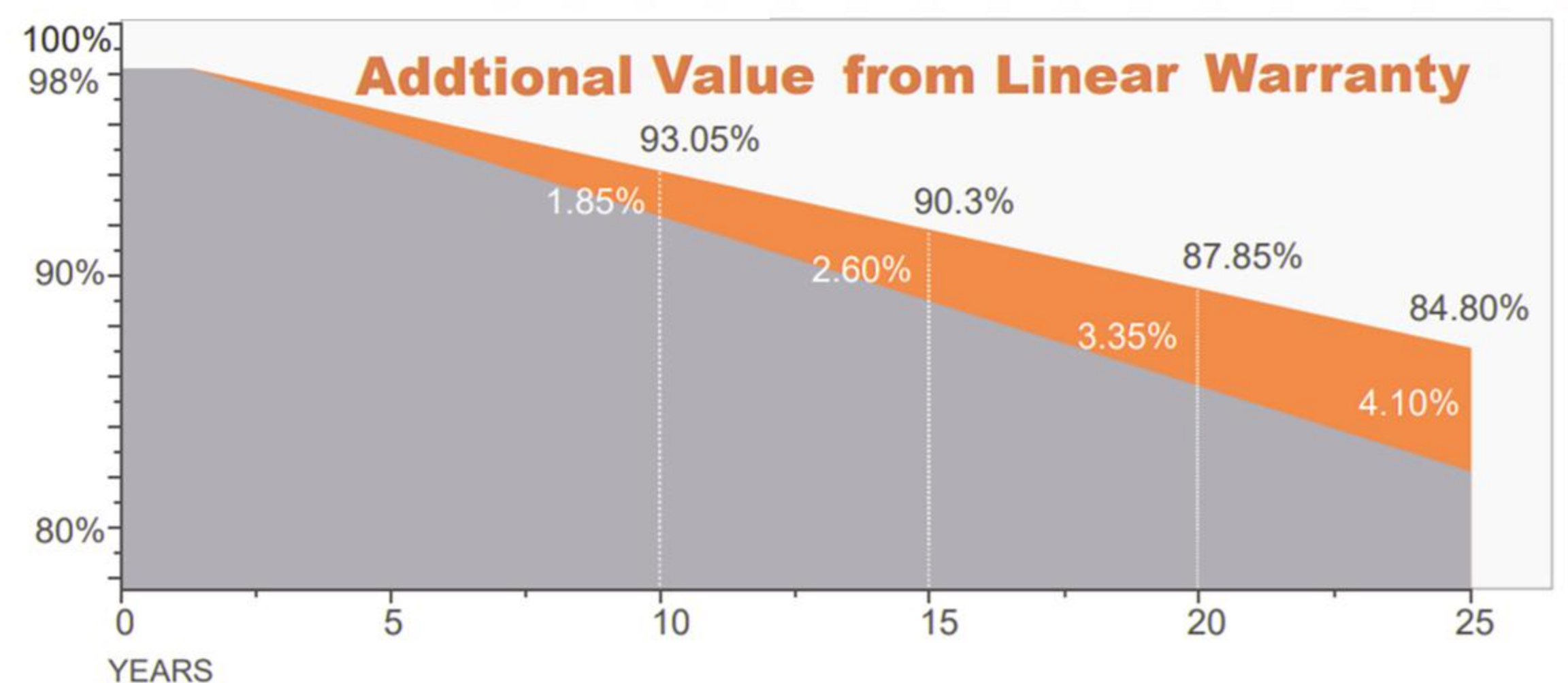
- 20 year product warranty.
- 25 year performance warranty with lowest degradation.
- Minimized micro-cracks with innovative non-destructive cutting technology.
- Ensured PID resistance through cell process and module material control.
- Mechanical performance up to 5400pa.

### Comprehensive Products and System Certificates

IEC61215/IEC61730/IEC61701/IEC62716  
 ISO9001:Quality Management System  
 ISO14001:Environmental Management System  
 ISO14064:Greenhouse Gases Emissions Verification  
 ISO45001:Occupational Health and Safety Management System



### Warranty

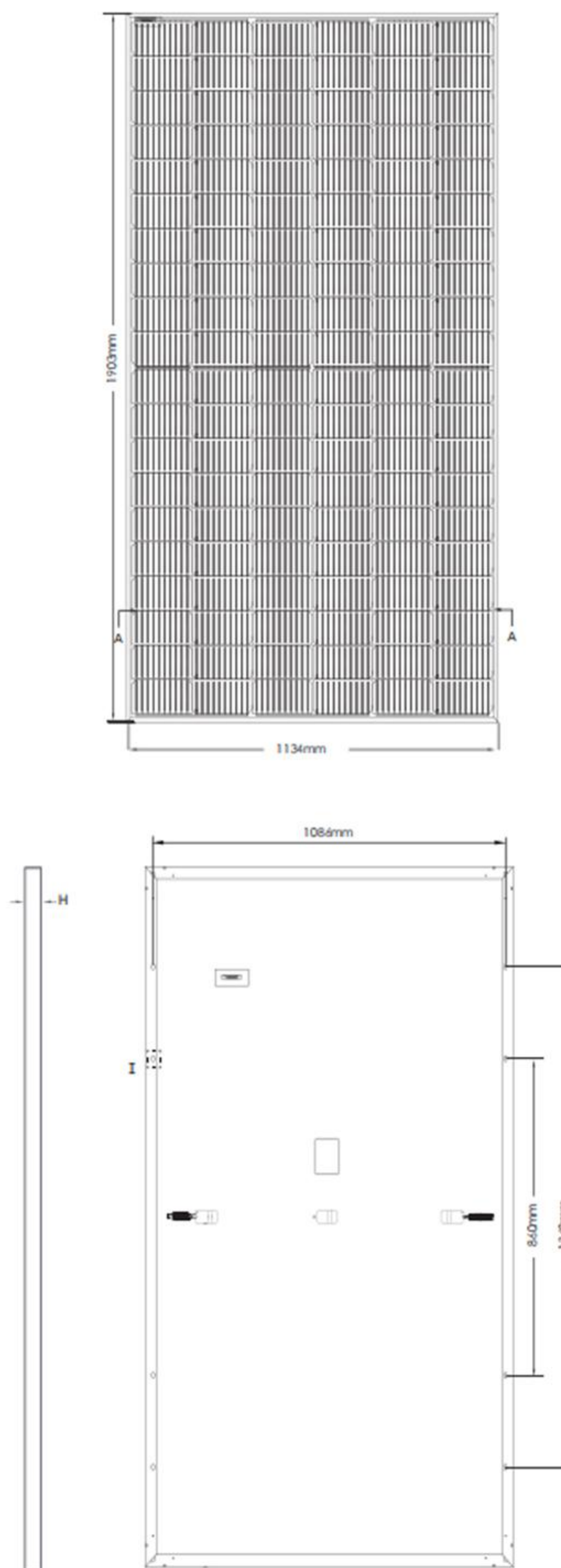


Guarantee on product material and workmanship

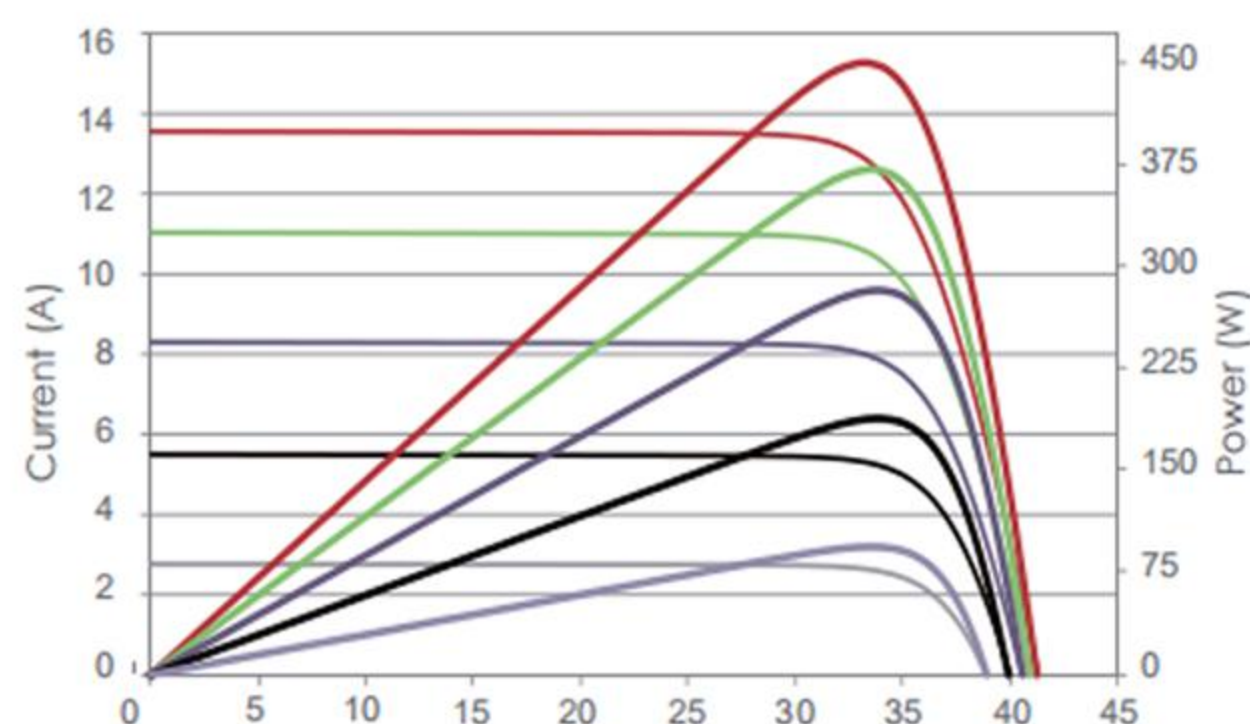


linear power output warranty

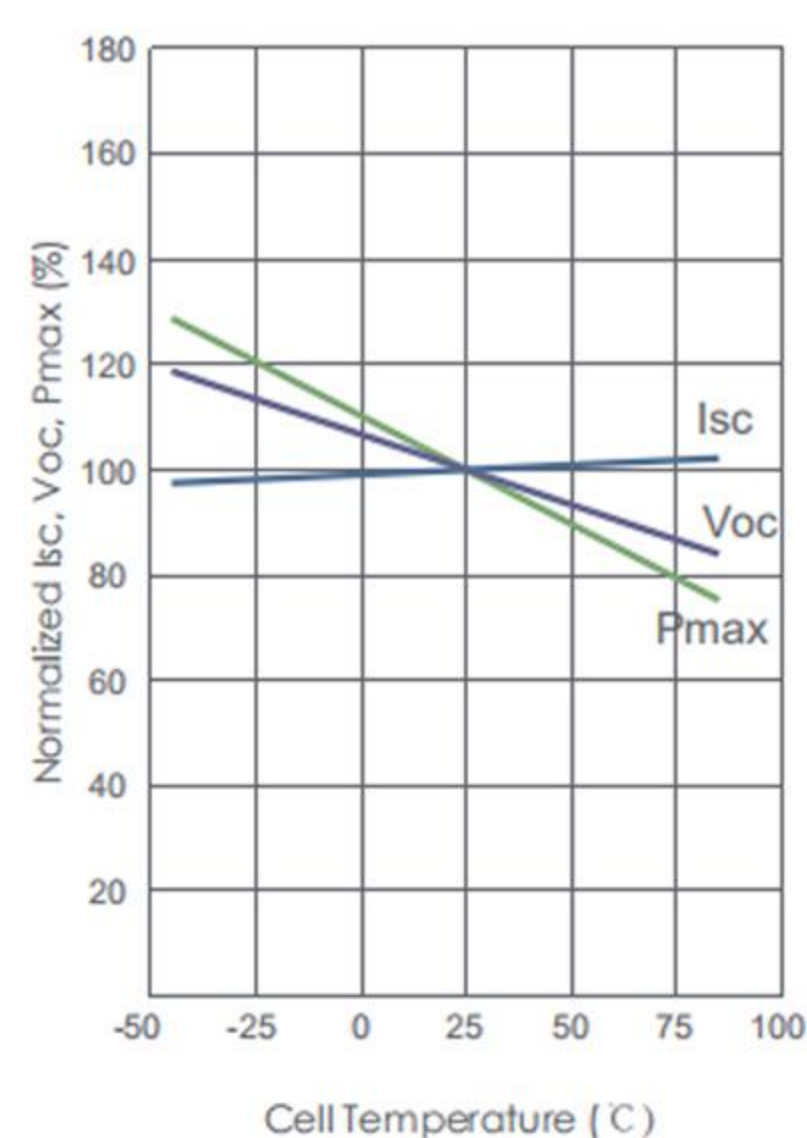
### DIMENSIONS OF PV MODULE(mm)



Current-Voltage & Power-Voltage Curves (450W)



Temperature Dependence of Isc, Voc, Pmax



### ELECTRICAL DATA(STC)

Part Number	OP440M60-P3	OP450M60-P3	OP455M60-P3	OP460M60-P3
Peak Power Watts- $P_{MAX}(W_p)^*$	440	450	455	460
Power Output Tolerance	0~+5			
Maximum Power Voltage- $V_{MPP}(V)$	34.2	34.6	34.8	35
Maximum Power Current- $I_{MPP}(A)$	12.84	12.96	13.02	13.08
Open Circuit Voltage- $V_{OC}(V)$	41	41.4	41.6	41.8
Short Circuit Current- $I_{SC}(A)$	13.58	13.68	13.73	13.78
Panel Efficiency (%)	20.5	21	21.2	21.5

STC:Irradiance 1000w/m<sup>2</sup>,Cell Temperature 25°C,Air Mass AM1.5  
\*Measuring tolerance:±3%.

### ELECTRICAL DATA(NOCT)

Maximum Power- $P_{MAX}(W_p)$	324	331	335	339
Maximum Power Voltage- $V_{MPP}(V)$	31.94	32.34	32.54	32.74
Maximum Power Current- $I_{MPP}(A)$	10.14	10.24	10.3	10.35
Open Circuit Voltage- $V_{OC}(V)$	38.28	38.68	38.88	39.08
Short Circuit Current- $I_{SC}(A)$	10.68	10.78	10.83	10.88
Temperature	41±3°C			

NMOT:Irradiance at 800W/m<sup>2</sup>,Ambient Temperature 20°C,Wind Speed 1m/s.

### MECHANICAL DATA

Panel Dimension(H/W/D)	1903 x 1134 x 35 mm
Weight	25.0kg
Cell Type	Monocrystalline
Cell Size	182 x 182 mm
Cell Number	120
Glass Type	2.0mm+2.0mm Glass
Encapsulant Type	POE/EVA
Frame Type	Anodized Aluminium Alloy
Junction Box Diodes	3
Junction Box Protection Class	IP 68
Connector Type	MC4
Cable Crosssection	4 mm <sup>2</sup>

\*Please refer to regional datasheet for specified connector.

### TEMPERATURE RATINGS

NMOT(Nominal Module Operating Temperature)	43°C(±2°C)
Temperature Coefficient of $P_{MAX}$	-0.36%/°C
Temperature Coefficient of $V_{OC}$	-0.28%/°C
Temperature Coefficient of $I_{SC}$	-0.05%/°C

(Do not connect Fuse in Combiner Box with two or more strings in parallel connection)

### MAXIMUM RATINGS

Operational Temperature	-40~±85°C
Maximum System Voltage	1000V DC(IEC)
	1000V DC(UL)
Max Series Fuse Rating	15A

### WARRANTY

20 year Product Workmanship Warranty

25 year Power Warranty

(Please refer to product warranty for details)

### PACKAGING CONFIGURATION

Modules per box:30 pieces

Modules per 40' container:936 pieces