



JinKOSolar Co., Ltd

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Visual Inspection Standard for Modules

Version	Effective date	Reasons of amended	Compiled Date	Audited Date	Approved Date
07	2024.08.14	Added the standard of film stamping	Jie Li 2024.08.09	Dejian Zhang 2024.08.12	Xiang Wan 2024.08.14
08	2024-09-20	Revise the standards for film tape leakage and barcode labeling; Newly added marking standards for busbar bends, as well as inspection standards for OBB components, anti dust components, and 2000V components.	Rong Yuan 2024-09-12	Dejian Zhang 2024-09-12	Xiang Wan 2024-09-18
09	2025-03-06	Added visual calibration point definition and corrected 24BB&20BB adhesive point standards for visual welding errors, front/back welding tape offset, and correction	Dorothy 2025-02-25	Dejian Zhang 2025-02-25	Xiang Wan 2025-03-04
10	2025-07-23	Added a standard for measuring component dimensions based on the front	Feng Wu 2025-07-16	Dejian Zhang 2025-07-17	Xiang Wan 2025-07-22

Applicable scope: Jinkosolar Component Division: Shangrao Base, Haining base, Yuhuan base, Feidong base, American base, Vietnam base ,OEM.

Review Department	Review Department	Assessor	Review Department	Assessor	Review Department	Assessor
	Technical Support Group	Pengkui Che	Shangrao Component Manufacturing Department	Jin Wang		
	Module Quality Management Department	Ling Huang	Quality management department	Yuming Zhang		
	Module Quality Management	Xianping Peng	Pre Sales Technical Service	Yuan Tian		

	Department		Department		
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晶科密级：商密AA
Classification:L2

1 Purpose

Define the visual inspection criteria of the pv module in order to ensure the quality of the solar modules to meet the requirements.

2 Applicable scope

2.1 This requirement is applicable to the visual judgment criteria of P/N type modules finished products produced by Jinko.

2.2 This specification is only applicable to the internal production process control and quality process inspection, and is not intended as an external document.

3 Definition

3.1 Grades of module product quality: Critical Defect, Major Defect, Minor Defect.

3.2 Critical Defect: May cause harm to the human body or violation of laws and regulations.

3.3 Major Defect: May affect the basic performance, usability and operation of the product.

3.4 Minor Defect: Appearance quality defects that will not affect the basic performance, usability and operation of the product.

3.5 Blank area: area outside the module cell layout.

3.6 Cell area: area on the module cell layout.

3.7 Bubble: visible bubble formed by gas remaining in the module after encapsulation.

3.8 Chipped cell: missing edge that completely break through the cell thickness.

3.9 Ribbon deviation: the deviation of ribbon which visibly expose the width of main grid line.

3.10 Soldering scar: A visible mark on the busbar and ribbon soldering area.

3.11 Back sheet scratch mark: Visible mark on the surface fluorine film of back sheet.

3.12 Back sheet laceration: the fluorine film on the surface of the back sheet is broken which expose the PET material.

3.13 Silicone bubbles: visible bubble formed by gas remaining in the silicone.

3.14 Back sheet convex point: convex point generated by the contact position between the back sheet and the ribbon.

3.15 Back sheet bump / delamination: bump / delamination that is caused by foreign matter or gas inside the back sheet.

3.16 Mark on the bend of busbar: during the shaping process of the solder tin block of the junction box, heat and mold withdrawal will cause the intensive convex points on the bending area of busbar.

3.17 Visual calibration point: a rectangular point (printed silver paste) inside the battery cell harpoon.

3.18 Letter code

L Length	W Width	A Area
N Number	H High	D Depth
S Space	Φ Diameter	QT Total Quantity
TL Total Length		

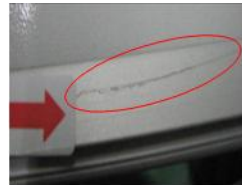
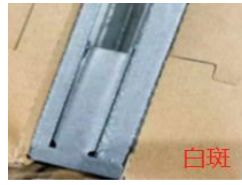
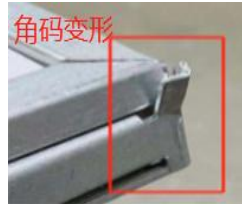
4 Management responsibility

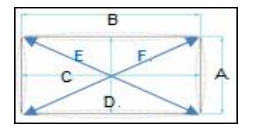
4.1 Quality Control Department: Responsible for the revision, formulation and maintenance of the document.

4.2 Other departments: Check and judge the appearance of modules according to this document standard.

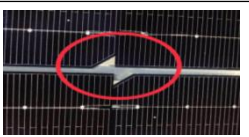
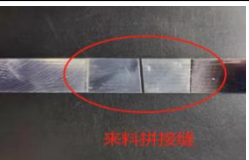
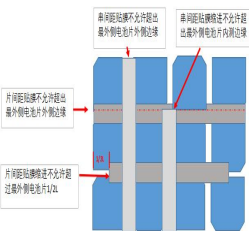
5 File content

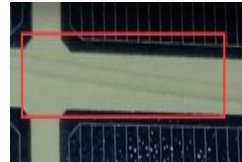
Module inspection Condition: Light intensity ≥ 1000 lux, Overall appearance must be viewed at a distance of 80 cm. Corrective vision > 1.0 . Inspect the defective area perpendicularly for 5 seconds.

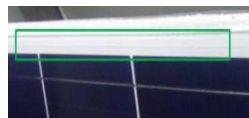
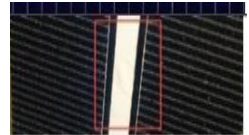
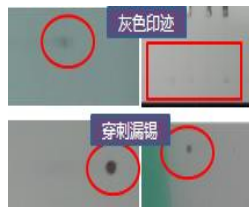
Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	
5.1 Frame	5.1.1 Frame scratches	Plug gauge Film	5.1.1.1 Frame scratch $W \leq 0.3\text{mm}$, $L \leq 50\text{mm}$, allowed; $W \leq 1\text{mm}$: (1) Side A :allow length: $15 < L \leq 30\text{mm}$, number: Long side ≤ 2 /side, number: short side ≤ 1/side; $\leq 15\text{mm}$ Allow; (2) Side BC: allow length: $30 < L \leq 50\text{mm}$, number: Long side ≤ 2/ side ,short side ≤ 1/side; $\leq 30\text{mm}$ Allow. 5.1.1.2 Non-electrophoretic high strength frame scratches $W \leq 0.3\text{mm}$, allowed; $W \leq 1\text{mm}$: (1) A side frame: $15 < L \leq 30\text{mm}$, $W \leq 1\text{mm}$, injury : $A \leq 10\text{mm}^2$, $Q \leq 3$; $L \leq 15\text{mm}$, allowed; (2) B side frame: $30 < L \leq 50\text{mm}$, $W \leq 1\text{mm}$, injury : $A \leq 8\text{mm}^2$, $Q \leq 3$; $L \leq 30\text{mm}$, allowed; (3) C side frame: $30 < L \leq 50\text{mm}$, $W \leq 1\text{mm}$, injury : $A \leq 12\text{mm}^2$, $Q \leq 3$; $L \leq 50\text{mm}$, allowed; (4) Frame surface slight scratch : $A \leq 30\text{mm}^2$, allow; $A > 30\text{mm}^2$, the number per side $Q \leq 5$; (5) White spot, allowed; (6) Corner connector skew, deformation, tear, not allowed; 5.1.1.3 Frame deformation, not allowed				   
	5.1.2 Frame misplacement	Plug gauge Film	5.1.2.1 A side misplacement $t \leq 0.3\text{mm}$, B side misplacement $\leq 0.3\text{mm}$, C side misplacement $\leq 0.5\text{mm}$.			*	

Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	
5.1 Frame	5.1.3 Frame gap	Plug gauge	5.1.3.1 A side, distance of gap $\leq 0.4\text{mm}$, B side, distance of gap $\leq 0.4\text{mm}$, C side, distance of gap $\leq 0.5\text{mm}$.			*	
			5.1.3.2 Anti-dust accumulation modules: on the short side of the front, the gap between the glass and the frame $W \leq 1.0\text{mm}$. For the rest of the standards, refer to 5.1.3.1.			*	
	5.1.4 Module size	Tape	5.1.4.1 Long and short sides of the Module are in accordance with the requirements of technical documents, For diagonal: The maxim size deducts the minimum size $\leq 3\text{mm}$. (Based on the front)		*		
		Viewing Plug gauge	5.1.4.2 【Bifacial module】The shading of frame for the back cell should be inspection with reference to technical drawings;The shading of high strength frame for the back cell $\leq 5\text{mm}$, allowed;			*	
	5.1.5 Frame Assembly Sealant (front side and back side)	Viewing Plug gauge	5.1.5.1 Automatic glue overflow: continuous glue overflow, no glue breakage, cracking phenomenon, (Anti- dust accumulation modules: on the short side of the back, glue line $1 < W < 7\text{mm}$), allowing the four corners of the module to pile up. Bubbles of sealant not affect the sealing effect of the module is allowed. Crimping length $> 100\text{mm}$ is not allowed. Crimping length $\leq 100\text{mm}$, $N \leq 3$ / long side. Crimping length $\leq 100\text{mm}$, $N \leq 2$ / short side. Crimping length $\leq 30\text{mm}$ is ignored. When the customer has doubts about the silicone sealing effect of the frame, the frame can be removed to confirm the situation of glue overflow. (Anti- dust accumulation modules: no overflow glue on the front.)		*		

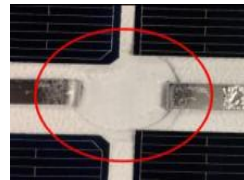
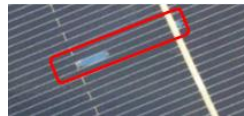
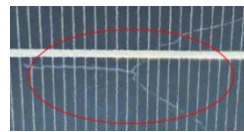
			5.1.5.2 【Bifacial module】 the overflow sealant Width $\leq 5\text{mm}$, but the lack of glue is not permitted; The width $\leq 7\text{mm}$ in the four corners 150mm long edge and 100mm short edge High strength frame module back allows no overflow glue; Overflow glue $W \leq 5\text{mm}$, allowed.		*		
Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	
5.1 Frame	5.1.5 Frame Assembly Sealant (front side and back side)	Viewing Plug gauge	5.1.5.3 Backboard repair glue: There is no gap or broken glue between the backplane and the frame.			*	
			5.1.5.4 [Bifacial module] Lack of glue/void in the four corners of the front side of the module: $A < 5\text{mm}^2$, allowed; $5\text{mm}^2 \leq A \leq 100\text{mm}^2$, $N \leq 2$; $A > 100\text{mm}^2$, not allowed; Non-quadrangle area (long/short frame) lack of glue/void: $L \leq 300\text{mm}$, $N \leq 1$; $L > 300\text{mm}$, not allowed.			*	
	5.1.6 Corner of frame	Viewing touch	5.1.6.1 No burrs, no sharp edge, no sharp corner.		*		
	5.1.7 Stain	Viewing	5.1.7.1 No pitting, dirty, silica residue on the frames. If stains are not able to wipe out, it is acceptable only when satins are not visible far from 80cm distance; There is no dirt and silica gel residue on the surface of the high-strength frame. Silica gel residue in the gap of the rear corner connector of the frame, allowed; If stains are not able to wipe out, it is acceptable only when satins are not visible far from 80cm distance;			*	
	5.1.8 Ground mark		5.1.8.1 Missing ground mark is unacceptable.		*		

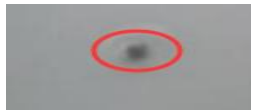
	5.1.9 Mounting holes		5.1.9.1 The number and location of the mounting holes shall meet the technical requirements. The un-punched mounting hole is not allowed.			*		
Inspection item	Defect Name	Method	Inspection content		Defect grade			Reference pictures
					CR	MA	MI	
5.2 Gap film	5.2.1 light-leaking	Film	5.2.1.1 Light-leaking between the gap film and cell edge.				*	
			Different spacing	The edge of the band extends beyond the width of the edge of the cell				
			2.5mm	$\geq 0.5\text{mm}$				
			1.9mm	$\geq 0.4\text{mm}$				
			1.8mm	$\geq 0.3\text{mm}$				
			$\leq 1.5\text{mm}$	$\geq 0.2\text{mm}$				
		Viewing	5.2.1.2 Light leaking at the chamfer of the large chamfer cell is allowed.				*	
	5.2.2 gap film fold/joint	Film	5.2.2.1 Membrane folds/burns $L \leq 10\text{mm}$, $W \leq 3\text{mm}$; Incoming material with splicing seam is allowed.				*	
	5.2.3 The head & tail length of gap film		5.2.3.1 Cell gap film: the head & tail of film shall not exceed the outer edge of the outermost cell, and the indentation shall not exceed 1/2L of the outermost cell; String gap film: the head & tail of film shall not exceed the outer edge of the outermost cell, and the indentation shall not exceed the inner edge of the outermost cell.				*	

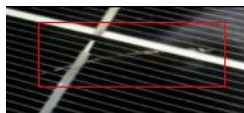
	5.2.4 gap film bubble		5.2.4.1 The bubble $A \leq 1\text{mm}^2$ on the gap film is ignored; $1\text{mm}^2 < A \leq 2\text{mm}^2$, 5 places are allowed; $A > 2\text{mm}^2$ is not allowed, Bubbles on the gap film are judged by single point.					*		
Inspection item	Defect Name	Method	Inspection content				Defect grade			Reference pictures
							CR	MA	MI	
5.3 White EVA	5.3.1 Overflow of white EVA	Steel ruler Film	5.3.1.1 In the cell area, white EVA overflow with length $\leq 15\text{mm}$ not exceeding the fine grid line, allowed; white EVA overflow exceeding the fine grid line at the edge of the cell, not allowed; white EVA transparent form visible grid line gel, not exceeding the second grid line.						*	
			5.3.1.2 bus-bar wire							
			(mm)	$2\text{mm} < W \leq 3\text{mm}$	$1\text{mm} \leq W \leq 2\text{mm}$	$W < 1\text{mm}$				
			$L \leq 20\text{mm}$	$N \leq 3$	$N \leq 5$	允许				
			$20\text{mm} < L \leq 40\text{mm}$	$N \leq 1$	$N \leq 2$					
			total		$Q \leq 5$, $TL \leq 100\text{mm}$					
			5.3.1.3 EVA spills or shelter on interconnect strips $A > 5\text{mm}^2$, $N \leq 4$; $2 \leq A \leq 5\text{mm}^2$, $N \leq 8$; $A < 2\text{mm}^2$, Allow.							
	5.3.2 Folds and piling marks of white EVA	Steel ruler Film	5.3.2.1 Folds and piling marks of white EVA							
			L (mm)	≤ 10	$10 < L \leq 30$	$30 < L \leq 60$	$60 < L \leq 100$			
			(N)	不计	≤ 6	≤ 4	≤ 2			
			total	$Q \leq 6$						

			5.3.2.2 【Double glass modules】（Blank area outside the cell matrix ）Parallel to module edge allowed. Perpendicular to module edge and not arrive cell edge,（for other areas, please refer to 5.4.2.1） $W\leq 10\text{mm}$, $L\leq 100\text{mm}$, $Q\leq 4$.					*			
Inspection item	Defect Name	Method	Inspection content			Defect grade			Reference pictures		
						CR	MA	MI			
5.3 White EVA	5.3.3 Fold	Steel ruler Film	5.3.3.1 High temperature tape position crease ,allow					*			
	5.3.4 EVA dent Hollow		5.3.4.1Don't allow					*			
	5.3.5 EVA fault		5.3.5.1 EVA fault is not allowed.				*				
	5.3.6 Grey-mar ks Tin-mark s		5.3.6.1 "Double glass modules" Grey-marks& EVA puncture Tin-marks					*			
			Grey-marks	$L\leq 10\text{mm}$, $Q\leq 4$;							
			EVA puncture tin-marks	$A\leq 1\text{mm}^2$ 允许 Allow; $1\text{mm}^2 < A\leq 3\text{mm}^2$, $Q\leq 4$							
5.4 Bubbles	5.4.1 EVA Bubbles Delamina	film	5.4.1.1 Modules of bubble: Cell gap area					*			
				conventional modules	Bifacial module						

	tion		A(mm ²)	≤0.5	≤1	1<A≤2	>2	≤1	1<A≤7	>7				
		N	Allow	2	1	0	Allow	4	0					
		Total	Q≤3											
Inspection item	Defect Name	Method	Inspection content								Defect grade			Reference pictures
											CR	MA	MI	
5.4 Bubbles	5.4.1 EVA Bubbles Delamination	film	Edge area outside the cell matrix (frame and cell/ barcode area/ area between bus bars)								*			
				conventional modules			Bifacial module							
			A(mm ²)	≤0.5	≤3	≤1	1<A≤7	>7						
			N	Allow	2	Allow	5	0						
			Distance between bubble and edge of cells S ≥ 0.5mm. Distance between each bubble S ≥ 10mm.											
			5.4.1.2 No bubbles on cells area. Delaminating of the module visual area is not allowed.									*		
			5.4.1.3 【Bifacial module】 Bubbles on the cell: φ ≤ 1mm, ignored; 1mm<φ ≤ 3mm, N≤1/cell, Q≤5/module.									*		
			5.4.1.4 【Bifacial module】 High temperature tape hollow: A≤1mm ² , ignored; 1mm ² <A≤3mm ² , N≤3 ; 3mm ² <A≤6mm ² , N≤1 ; A>6mm ² , not allowed.										*	

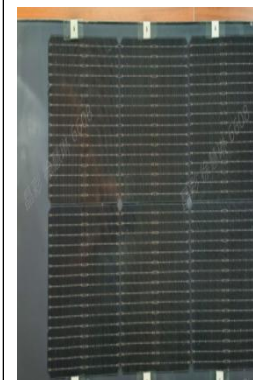
			5.4.1.5 Back sheet opening area: a. Bubble area $A \leq 2\text{mm}^2$ in the opening area of A single module, 2 bubbles are allowed, and only 1 bubble is allowed in one area/hole. 【Half cell】 The bubble area of the open area of the single module is $2\text{mm}^2 < A \leq 3\text{mm}^2$, only one bubble is allowed.		*		
			5.4.1.6 【Double glass modules】 bubbles in the opening of module glass: $A < 0.5\text{mm}^2$, allowed; $A \leq 4\text{mm}^2$, the number of bubbles in the same component shall not exceed 3.		*		
Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	
5.4 Bubbles	5.4.1 EVA Bubbles Delamination	film	5.4.1.7 EVA/POE particle imprinted at the opening of the back glass by high temperature cloth extrusion is allowed			*	
	5.4.2 EVA /POE without melting		5.4.2.1 Not allowed.		*		
	5.4.3 Electrostatic grain	Viewing	5.4.3.1 Not allowed.		*		
5.5 Back sheet	5.5.1 Stains on back sheet	Viewing	5.5.1.1 Back-sheet surface without silica gel, Eva Glue, paper scraps residue .Stains cannot be cleaned but not visible from 80cm, allowed			*	

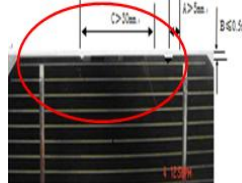
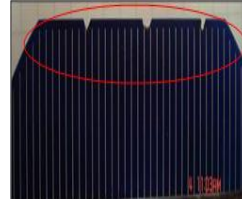
	5.5.2 Back sheet scratches	Steel Ruler vernier caliper Film	5.5.2.1 Regular backplane scratches: $L < 100\text{mm}$, $W \leq 1\text{mm}$, $N \leq 3$; Scratches on the transparent back sheet: scratch length $L \leq 4$ pieces of cell (whole piece), $W \leq 1\text{mm}$, $N \leq 1$.			*	
			5.5.2.2 Back sheet laceration / Damage of back sheet :not allowed.		*		
	5.5.3 Bump/Delamination		5.5.3.1 For bump/delamination on back sheet: not allowed		*		
Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	
5.5 Back sheet	5.5.4 Back sheet fold	Steel Ruler vernier caliper Film	5.5.4.1 The back sheet fold protrusion $L \leq 50\text{mm}$, $N \leq 3$ is allowed and can not touch the inside of frame.		*		
	5.5.5 Convex point		5.5.5.1 Convex point height $H \leq 0.5\text{mm}$ is ignored. $H > 0.5\text{mm}$, $Q \leq 5$ module is allowed.			*	
	5.5.6 Bulges		5.5.6.1 Bulges $L > 500\text{mm}$, not allowed; $300 < L \leq 500\text{mm}$, $Q \leq 1$ /module; $100 < L \leq 300\text{mm}$, $Q \leq 3$ /module; $L < 100\text{mm}$, $Q \leq 6$ /module.			*	
	5.5.7 Light leaking	Steel ruler Film	5.5.7.1 Grid transparent Backsheet: the width of light leaking between the grid coating edge and the cell edge, $W \leq 2\text{mm}$.			*	

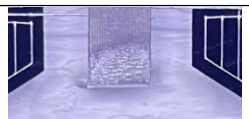
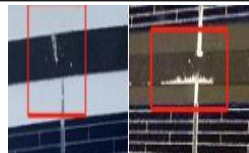
	5.5.8 Dent on back sheet	Vernier caliper Film	5.5.8.1 $\phi \leq 3\text{mm}$, ignore, $3\text{mm} < \phi \leq 10\text{mm}$ or $L*W \leq 100\text{mm}^2$, $Q \leq 3$.			*	
5.6 Glass	5.6.1 Glass bubbles	Ruler Viewing	5.6.1.1 Glass bubbles Round bubbles: $1\text{mm}^2 \leq A \leq 2\text{mm}^2$ $N \leq 4$, $A < 1\text{mm}^2$ is ignored; Long bubble: $W < 0.5\text{mm}$, $L \leq 1.5\text{mm}$ is ignored, $1.5\text{mm} < L \leq 5\text{mm}$, $N \leq 2$; $0.5\text{mm} < W \leq 1\text{mm}$, $L \leq 1.5\text{mm}$, $N \leq 2$; $1.5\text{mm} < L \leq 5\text{mm}$, $N \leq 1$.			*	
	5.6.2 Pits, convex points		5.6.2.1 Glass pits, convex points are allowed.			*	
Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	
5.6 Glass	5.6.3 Glass Scratches	Ruler Viewing	5.6.3.1 Scratches: If $L \leq 10\text{mm}$ and $W < 1\text{mm}$, $N \leq 3$; If $10\text{mm} < L \leq 30\text{mm}$ and $W \leq 1\text{mm}$, $N \leq 1$.			*	
			5.6.3.2 【Double glass modules】 Scratches On the back: $L \leq 10\text{mm}$, $N \leq 6$; $10\text{mm} < L \leq 30\text{mm}$, $N \leq 4$; $30\text{mm} < L \leq 50\text{mm}$, $N \leq 2$.			*	
	5.6.4 Stains	Steel ruler Film	5.6.4.1 Glass surface layer damage or remaining marks (finger print, sucker print, conveyor belt, bright spots/rainbow stripes, etc) visible from 80cm is not allowed.			*	
	5.6.5 stones		5.6.5.1 Not allowed.			*	

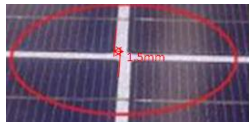
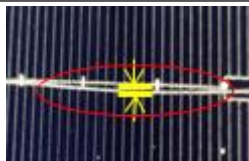
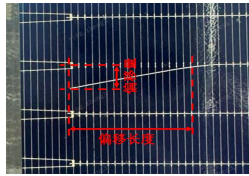
	5.6.6 open bubbles		5.6.6.1 Glass opening bubbles $\leq 2\text{mm}^2$ (1 per square meter allowed).		*		
	5.6.7 Glass spots	Steel ruler Viewing	5.6.7.1 If glass mottling $L \leq 200\text{mm}$, $W \leq 1.5\text{mm}$, $N \leq 3$. "Double glass modules" Glass mottling on back of module $L \leq 300\text{mm}$, $W \leq 1.5\text{mm}$, $N \leq 5$			*	
			5.6.7.2 When module be placed at a flat position, any dotted scatter spots shall not be visible far from 80cm distance.			*	
	5.6.8 Glass stack differen ce		5.6.8.1 Glass stack difference: None sealing edge modules allow stack difference $\leq 3\text{mm}$			*	
Inspecti on item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	
5.6 Glass	5.6.9 light-le aking	Steel ruler Viewing	5.6.9.1 "Double glass modules" The light-leaking between ceramics coating and cells should be not more than 2mm for the ceramics grid double glass modules.			*	
5.7 Foreign body	5.7.1 Conducti ve foreign body	Steel ruler Film	5.7.1.1 In blank area, if $A \leq 0.5\text{mm}^2$, allowed; $A \leq 2\text{mm}^2$, $N \leq 2$, If $A \leq 4\text{mm}^2$, $Q \leq 1$ and distance from glass edge $> 5\text{mm}$, cannot cause internal conduction, and the min electric clearance should $> 1\text{mm}$, $Q \leq 2$.		*		

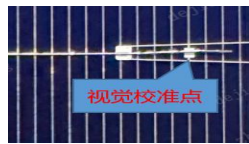
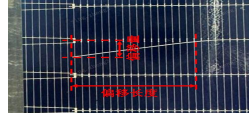
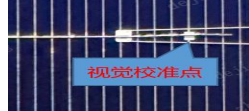
			5.7.1.2 Solder wire length $\leq 5\text{mm}$, acceptable. Welding slag $0.5\text{mm}^2 \leq A \leq 3\text{mm}^2$, acceptable. $A < 0.5\text{mm}^2$ is ignored; For single cell, only one solder wire or solder slag is acceptable. Total $\leq 2/\text{module}$.		*		
			5.7.1.3 Insects, hair all unacceptable.		*		
			5.7.1.4 Solder tin slags or conductive foreign matter between cells, when the area $(L*W) \leq 1\text{mm}^2$ and cannot cause internal conduction, which is allowed.		*		
Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	
5.7 foreign body	5.7.2 Non-conductive foreign body	Steel ruler Film	5.7.2.1 At cells area, for non-conductive foreign matter $A \leq 0.5\text{mm}^2$, ignored; the area $\leq 3\text{mm}^2$ or $L \leq 5\text{mm}$, Total ≤ 2 (Flux residue, allow $Q \leq 2\%$ number of batteries (half), The mantissa is rounded by the carry method: if 3.12, it is 4) 【Bifacial module】 Back side: $A \leq 6\text{mm}^2$, $Q \leq 3$ or $A \leq 15 * 0.5\text{mm}^2$, $Q \leq 5$; $A \leq 0.5\text{mm}^2$, ignored.			*	
			5.7.2.2 Blank area: non-conductive foreign body $A \leq 0.5\text{mm}^2$, ignored, $L \leq 10\text{mm}$ or $A \leq 3\text{mm}^2$, $Q \leq 2$.			*	
			5.7.2.3 At blank area, dirt or signet 80cm invisible is allowed.			*	
5.8	5.8.1	Film	5.8.1.1 The cells are classified as dark blue, blue, light			*	

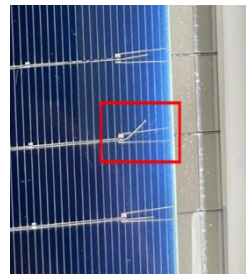
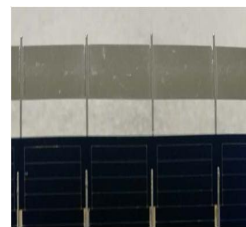
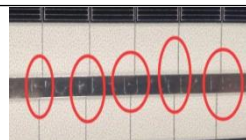
cells	Color difference	Viewing	blue refer to samples.				
			5.8.1.2 Components do not allow obvious color jumping (based on the actual sealing sample); yellow is unacceptable.			*	
			5.8.1.3 【Bifacial module】 For the back of the bifacial cells, color difference is accepted , and refer to the sealed sample for yellowing on the back of the battery.			*	
			5.8.1.4 All Black Components: The light intensity vertical inspection machine is $\geq 1000\text{LUX}$ above the middle, $600\text{LUX} \geq$ the lower end, and the visual inspection distance of the overall appearance is 60~80cm;The color difference of the whole string is not allowed; Single piece color difference reference color difference seal sample determination; The monochromatic color value of the standard is sealed in 6 intervals from high to low, and the label (1) and (5) and (6) are not allowed to be mixed with the same component, and the remaining intervals can be freely combined.				
5.8.2 Finger defects	Film	5.8.2.1 The coarse grid area of a single battery is less than 20% half of the area, and the number of coarse grid pieces of a single component is less than 10;			*		
		5.8.2.2 Bus bar break $L\leq 0.5\text{mm}$, I ignore. 【Bifacial module】 Back bus bar break $L\leq 1\text{mm}$, Ignore.			*		
Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	

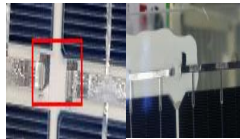
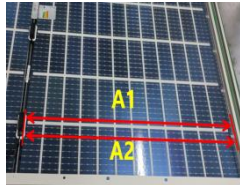
5.8 cells	5.8.2 Finger defects	Film	5.8.2.3 $L \leq 2\text{mm}$ (no continuous grid break allowed), $N \leq 2$, $Q \leq 8$ pieces: $L \leq 0.5\text{mm}$ quantity is not limited 【Bifacial module】 back fine grid line break point: $L \leq 5\text{mm}$, $N \leq 3$ / cell, total $Q \leq 10$ / module ; $L \leq 2\text{mm}$ Ignore. The false printing is equal to the break point.		*	
			5.8.2.4 Oxidized and yellow fingers are not accepted.		*	
	5.8.3 contamin ation	Film Viewing	5.8.3.1 Finger prints is unacceptable. Other stains not invisible over 80cm visual distance is acceptable.		*	
	5.8.4 missing crystal	Film	5.8.4.1 Missing crystal: area $A \leq 2\text{mm}^2$, $N \leq 2$/cell, total $Q \leq 5$/module. 【Half cell】 Missing crystal on cutting surface $A \leq 3\text{mm}^2$, $N \leq 2$/cell, total $Q \leq 10$/module; the distance between the missing crystal shall be $\geq 30\text{mm}$.		*	
	5.8.5 Chipped/ broken cells		5.8.5.1 Chips size: V-shaped chip unacceptable; U-shaped chip: $L \leq 3\text{mm}$, $N \leq 1$/cell, $D \leq 0.5\text{mm}$, total $N \leq 3$ / module; distance between each defect $\geq 30\text{mm}$ and defects not on the same side of the cell. Edge breakage: $L \leq 3\text{mm}$, $D \leq 1\text{mm}$, shall not touch the edge fine grid line; $N \leq 2$ /cell, $Q \leq 6$/module.		*	
	5.8.6 Visible solderin g defect		5.8.6.1 Welding of battery cells, with the welding strip controlled within the U-shaped harpoon at the starting point position		*	

Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	
5.8 cells	5.8.6 Visible soldering defect	Film	5.8.6.2 The spacing between the two lead wires from the glass holes shall be $\geq 2\text{mm}$		*		
			5.8.6.3 The non-parallel deviation between bus bars is controlled according to the technical document.			*	
	5.8.7 mark	Viewing	5.8.7.1 【Bifacial module】 The back of the cells string high temperature tape imprint and cells grid line diffusion are allowed.		*		
	5.8.8 bus bar		5.8.8.1 Yellow bus bar is not allowed.			*	
			5.8.8.2 The mark at the bend of the middle bus bar is allowed.			*	
	5.8.9 Black bus bar	Viewing Steel ruler film	5.8.9.1 Surface black paint falling off: $A \leq 0.5\text{mm}^2$, ignore; The scratch area $\leq 3\text{mm}^2$ or the length $\leq 5\text{mm}$, Qty ≤ 2			*	
			5.8.9.2 ‘Half cell module’ White at the bend of the intermediate bus bar: $A \leq 24\text{mm}^2$, allowed.			*	
	5.8.10 Cells scratches	Steel ruler Film	5.8.10.1 Scratches: $L \leq 30\text{mm}$, $W \leq 1\text{mm}$, $N \leq 1/\text{cell}$ and total $Q \leq 5/\text{module}$. Scratches $L \leq 10\text{mm}$, Ignore. 【Bifacial module】 Scratches on the back side $L \leq 30\text{mm}$, $N \leq 5$; Scratches $L \leq 10\text{mm}$, Ignore.			*	

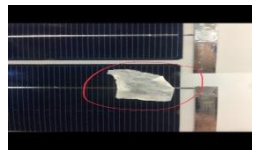
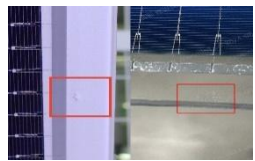
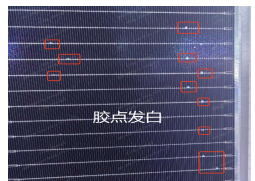
			5.8.10.2 【Bifacial module】 Aluminum back field shedding $A \leq 4\text{mm}^2$, $N \leq 3/\text{cell}$, total Q unlimited.			*	
Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	
5.8 cells	5.8.11 String dislocation	film	5.8.11.1 Cells string dislocation $\leq 1.5\text{mm}$ is allowed.			*	
	5.8.12 Distance		5.8.12.1 All dimensions shall be checked against technical documents and layout drawings.		*		
	5.8.13 creep age distance	Steel ruler Film	5.8.13.1 The distance between the conductor and the glass edge (creepage distance) conforms to the IEC standard creepage distance.		*		
5.9 Solder Strip	5.9.1 Ribbon deviation	viewing Steel ruler/film	5.9.1.1 Ribbon deviation in the front: Empty soldering joints per ribbon ≤ 2 (not including head and tail solder joints, Visual calibration points are not counted) ; deviation of ribbon from main grid line $\leq 1.5\text{mm}$, deviated quantity of whole module $\leq 0.36\%$ * the total quantity of ribbon per module (unit: place; Integers are rounded, and non-integers are rounded to scale). For OBB module: ribbon offset width $\leq 0.3\text{mm}$, allowed; width $\leq 1.5\text{mm}$ and length $< 35\text{mm}$, deviated quantity of whole module $\leq 0.36\%$ * the total NO. of ribbons per module, and each cell ≤ 2 places (unit: place; Numbers rounded up to the next integer).			*	  

							
			5.9.1.2 Ribbon deviation in the back: Empty soldering joints per ribbon ≤ 1 (Visual calibration points are not counted); deviation of ribbon from main grid line $\leq 3.5\text{mm}$, each battery contains no more than two grid cables, and each component contains no more than two batteries. For OBB module: ribbon offset width $\leq 0.4\text{mm}$, allowed; width $\leq 3.5\text{mm}$ and length $< 35\text{mm}$, each cell allows 1 place, each module allows 2 cells.			*	   
Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	

5.9 Solder Strip	5.9.2 U-shape Weld deviation	viewing vernier caliper/ film	5.9.2.1 Ribbon deviation at U-shape harpoon area, the vertical distance from the farthest point of ribbon to the extension line of the adjacent harpoon line, $L \leq 1 \text{ mm}$, allowed; If $L > 1 \text{ mm}$, the quantity of cell with deviated ribbon $Q \leq 2\% \times$ the quantity of cell (half cell), and the mantissa is rounded by the one-step method (e.g. 78 half cell, $Q = 78 \times 2\% = 3.12$, it is 4pcs).			*	
	5.9.3 Standard for Bus bar welding		5.9.3.1 The deviation of the ribbon caused by the no welding of the round ribbon and the bus bar, not allowed; The deviation between the ribbon and the bus bar: $L < 3 \text{ mm}$, and the ribbon exceed the U-shaped harpoon, allowed.			*	
			5.9.3.2 In the middle welding position, the distance between the welding ribbons on both sides and the bus bar $\leq 2 \text{ mm}$, and the distortion of the welding ribbon is allowed.			*	
			5.9.3.3 The effective welding of the welding strip on the bus bar is $\geq 2 \text{ mm}$, and the welding strip exceeds the bus bar by $\leq 2 \text{ mm}$ (For 2000V module: The ribbon is not allowed to exceed the busbar). At the welding place where the interconnection strip and the bus bar are connected, the bus bar must fully cover the welding strip, and the bus bar must exceed the coincidence position $0 \leq L \leq 3 \text{ mm}$.			*	
			5.9.3.4 There should be welding scar or visible welding mark at the welding place of welding strip and bus bar (except black bus bar and reflective bus bar).		*		
Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	
5.10 Junction	5.10.1 Junction	Viewing	5.10.1.1 Specifications and type are consistent with the technical documentation requirements.		*		

box	box		5.10.1.2 During junction box installation, the silica gel should-overflow. Visible chink, bubbles and lack of glue is not allowed. Around the bottom side of the junction box, silica gel stacking is not allowed, Overflow width $\geq 2\text{mm}$		*		
			5.10.1.3 The opening position of the lead wire allows the bottom leakage color of the junction box to be less than or equal to 100mm ² .			*	
			5.10.1.4 Interconnecting ribbons should be sealed well and no visible gap.		*		
			5.10.1.5 Shell no shrinkage, no cracks, no burr, no damage to the top cover four buckles, font and icon clear, accurate and complete, connected to the upper and lower shell buckle intact and solid.		*		
			5.10.1.6 Firm contacts of male and female connectors with automatic locking function, and no loose happen by human hand-pulling.		*		
			5.10.1.7 Sealing ring stick firmly, shedding-free.			*	
Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	
5.10 Junction box	5.10.2 Junction box stick askew	Steel rule Viewing	5.10.2.1 Install position of junction box meets the technical requirements. Junction boxes wire fixed mode meets file requirements.		*		
			5.10.2.2 Junction box left and right side to the edge of glass $ A1-A2 \leq 5\text{mm}$.			*	
			5.10.2.3 Damage of wire insulation layer is unacceptable.		*		

			5.10.2.4 The bus-bar shall not be higher than the junction box and shall not touch any plastic parts of the junction box; Intelligent junction box: confirm whether the screw is loose, falling-off and etc. The bus-bar in the junction box should be inserted into the junction box $>5\text{mm}$.		*		
			5.10.2.5 Confirm that the lid is tightly closed: No falling off after vertical lifting by hand.		*		
	5.10.3 Internal connection defect	Steel rule Viewing	5.10.3.1 Uncured sealant is unacceptable. After potting the sealant, sealant shall cover all the conductive parts. No visible bubbles on surface after curing.		*		
			5.10.3.2 【Bifacial module】 The overflow of silicone line between J-box and glass shall refer to the technical drawings.		*		
5.11 Bar code	5.11.1 Bar code	Steel ruler	5.11.1.1 Bar code skew shall not cover the cell, up-side-down, duplication, and bar code missing, are not allowed; serial number can be scanned, the position of label on the back covers the cell $\leq 2\text{mm}$.		*		
Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	
5.11 Bar code	5.11.1 Bar code	Steel ruler	5.11.1.2 The missing of whole bar code identification line is not allowed; the missing part of the break point $\leq 1/4$ of the whole bar, allowed; and the missing part run across the entire barcode, not allowed.			*	
5.12 Nameplate	5.12.1 Nameplate	Viewing Alcohol	5.12.1.1 Correct content. The module nameplate shall meet the requirements of the technical documents, and the power shall be in conformity with the actual output power.		*		

			5.12.1.2 Print font is clear and legible; paste at the correct position (in line with the requirements of the layout), do not allow bubbles, tilt, crease; 【Bifacial module】nameplate masking the width of the back of the battery cells shall refer to the technical drawings requirements.			*	
5.13 Appearance	5.13.1 Appearance	Viewing	5.13.1.1 No foreign residue, such as textured tape, logo paper, on the glass, back-sheet surface and frame of modules after packaging process.			*	
			5.13.1.2 Stamping of the fixed position of the hot film is allowed. (Reference to foreign body standard for hot and dirty marks)			*	
			5.13.1.3 24BB&20BB component adhesive points: Visual inspection of the appearance shows that the adhesive points are transparent and visible, but whitening of the adhesive points is not allowed.			*	 
5.14 Sealing membrane Positive tape	5.14.1 Front tape	Visual	5.14.1.1 Glass front: the glue shall not exceed the edge of the aluminum frame, while meeting the requirements of visual glue; if it cannot be visually measured, use 0.3mm plug gauge, plug depth $\leq 4\text{mm}$.			*	
Inspection item	Defect Name	Method	Inspection content	Defect grade			Reference pictures
				CR	MA	MI	

5.14 Sealing membrane Positive tape	5.14.2 Back tape	Visual	5.14.2.1 Glass back: the tape shall exceed the edge of the aluminum frame $\leq 2\text{mm}$, and the rubber and the frame must be visible and smooth with no protruding.			*	
5.15 model package "Double glass modules	5.15.1 No sealing edge	Steel ruler Film	5.15.1.1 EVA on the edge incomplete: shall cover the edge of double-glass modules, and EVA missing is not allowed. EVA on the corner incomplete: [No glass stack difference] Raised area $L*W*H \leq 3*3*3\text{mm}^3$; [Glass stack difference] Raised area $L*W*H \leq 2*2*2\text{mm}^3$ (calculate from outermost glass).			*	
			5.15.1.2 Loose and missing angle protectors are not allowed; Angle protectors skew: $H \leq 4\text{mm}$, and $ h1-h2 \leq 2\text{mm}$.			*	
			5.15.1.3 Module glass edge explosion is not allowed			*	
			5.15.1.4 Fuzzy edge: [continuous long edge] $H*L \leq 2*1000\text{mm}^2$; [continuous short edge] $H*L \leq 2*600\text{mm}^2$ (if with glass stack difference, calculate from the outermost glass); Edge bubble [continuous bubble] individual bubble if $A \leq 12\text{mm}^2$, ignored; if $A > 12\text{mm}^2$, $L \leq 500\text{mm}$ / long side, $L \leq 300\text{mm}$ / short side; [discontinuous bubbles] ignored.			*	

6 Release and execution

6.1 Jinkosolar Quality Management System module Quality Department is responsible for formulating, updating and organizing

the implementation of this system, and the General Manager of Quality Management System is responsible for approving this system.

6.2 Jinkosolar Quality Management System module Quality Department has the right to the final interpretation of this system.