

Prüfbericht-Nr.: <i>Test Report No.:</i>	11037604 001	Auftrags-Nr.: <i>Order No.:</i>	114021431	Seite 2 von 11 Page 2 of 11
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	22.04.2014	
Auftraggeber: <i>Client:</i>	Win Win Precision Technology Co., Ltd., 3F, No. 96, Hsinho Road, Sinfong Township, Hsinchu County 304, Taiwan, R.O.C.			
Prüfgegenstand: <i>Test item:</i>	Photovoltaic (PV) Module(s)			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	WST-250P6			
Auftrags-Inhalt: <i>Order content:</i>	Module performance measurement			
Prüfgrundlage: <i>Test specification:</i>	IEC 61215: 2005, EN 61215: 2005 "Crystalline silicon terrestrial photovoltaic (PV) modules – Design qualification and type approval" ; Clause 10.17 Hail test			
Wareneingangsdatum: <i>Date of receipt:</i>	12.05.2014	Please see Annex 3 for detailed picture.		
Prüfmuster-Nr.: <i>Test sample No.:</i>	Please see page 3 for sample details.			
Prüfzeitraum: <i>Testing period:</i>	13.05.2014 – 30.05.2014			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland Taiwan Ltd., Taichung Branch			
Prüflaboratorium: <i>Testing laboratory:</i>	Please see below for laboratory information.			
Prüfergebnis*: <i>Test result*:</i>	N/A			
geprüft von / tested by:		kontrolliert von / reviewed by:		
18.07.2014	Eric S. Y. Lin / Project Manager	18.07.2014	Robert Struwe / Technical Certifier	
Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>
				Unterschrift <i>Signature</i>
Sonstiges / Other:				
Details of testing laboratory:				
TÜV Rheinland Taiwan Ltd., Taichung Branch, Photovoltaic Laboratory				
No. 9, Ln. 36, Sec. 3, Minsheng Rd., Daya District, Taichung City 428, Taiwan, R.O.C.				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend N/A = nicht anwendbar	4 = ausreichend N/T = nicht getestet
Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

1. Test sample:

Type name	Sample number	Sample serial number	Test item
WST-250P6	S1405-043-04	W1404B04M0605257	10.17
Supplementary information: 10.17 Hail test			

2. Test item:**2.1 Initial tests****2.1.1 Visual inspection (Initial) (10.1)**

Test Date [DD/MM/YYYY]..... :	13/05/2014	—
Sample #	Nature and position of initial findings	—
S1405-043-04	No visual defects	P
Supplementary information:		

2.1.2 Maximum power determination (Initial) (10.2)

Test Date [DD/MM/YYYY]..... :	27/05/2014	—				
Module temperature [°C]..... :	Corrected to 25 °C	—				
Irradiance [W/m ²]..... :	1000*	—				
Sample #	Pmpp [W]	Vmpp [V]	Imp [A]	Voc [V]	Isc [A]	FF [%]
S1405-043-04	254.3	30.35	8.379	37.69	8.835	76.4
* A pulse solar simulator class AAA conforming to the requirements of IEC-60904-9 is used.						
Supplementary information:						

2.1.3 Insulation test (Initial) (10.3)

Test Date [DD/MM/YYYY]..... :	27/05/2014	—				
Maximum system voltage [V _{DC}]	1000	—				
High voltage applied [V _{DC}]..... :	3000	—				
Insulation resistance measured at [V _{DC}]..... :	1000	—				
Sample #	Measured	Area	Result*	Dielectric breakdown		—
	GΩ	m ²	GΩ * m ²	Yes (description)	No	
S1405-043-04	≥9.99	1.66	≥16.58		No	P
* Minimum requirement acc. to the standard is 0.04 GΩ*m ²						
Supplementary information:						

2.1.4 Wet leakage current test (Initial) (10.15)

Test Date [DD/MM/YYYY]..... :	27/05/2014	—		
Insulation resistance measured at [V _{DC}]..... :	1000	—		
Solution resistivity [Ω cm]..... :	< 3.500	—		
Surface tension [N/m]..... :	N/A	—		
Solution temperature [°C]..... :	22 ± 3	—		
Sample #	Measured	Area	Result*	—
	MΩ	m ²	MΩ * m ²	
S1405-043-04	≥9.99	1.66	≥16.58	P
* Minimum requirement acc. to the standard is 40 MΩ*m ²				
Supplementary information:				

2.2 Hail impact test (10.17)

Test Date [DD/MM/YYYY]..... :	30/05/2014	—
Ice ball size [mm]..... :	35	—
Ice ball weight [g]..... :	20.7 ± 2 %	—
Ice ball velocity [m/s]..... :	27.2 ± 5 %	—
Number of impact locations..... :	11	—
Sample #	—	—
S1405-043-04	—	P
Supplementary information:		

2.2.1 Visual inspection after hail impact test (10.1)

Test Date [DD/MM/YYYY]..... :	30/05/2014	—
Sample #	Nature and position of findings	—
S1405-043-04	No visual defects	P
Supplementary information:		

2.2.2 Maximum power determination after hail impact test (10.2)

Test Date [DD/MM/YYYY]..... :	30/05/2014	—						
Module temperature [°C]..... :	Corrected to 25 °C	—						
Irradiance [W / m ²]..... :	1000*	—						
Sample #	Pmpp [W]	Vmpp [V]	Impp [A]	Voc [V]	Isc [A]	FF [%]	Degradation [%]	—
S1405-043-04	254.9	30.44	8.373	37.67	8.866	76.3	+0.2	P

* A pulse solar simulator class AAA conforming to the requirements of IEC-60904-9 is used.

Supplementary information:

maximum allowable Pmpp degradation after this test is 5%

2.2.3 Insulation test after hail impact test (10.3)

Test Date [DD/MM/YYYY]..... :	30/05/2014	—				
High voltage applied [V _{DC}]..... :	3000	—				
Insulation resistance measured at [V _{DC}]..... :	1000	—				
Sample #	Measured	Area	Result*	Dielectric breakdown		—
	GΩ	m ²	GΩ * m ²	Yes (description)	No	
S1405-043-04	≥9.99	1.66	≥16.58			

* Minimum requirement acc. to the standard is 0.04 GΩ*m²

Supplementary information: