Report No. : 12-04-YDY068

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CNAL
№. L0511

Test Report

Product Model SHS-6, 12V 6A

Product Name Solar charge controller

Client Morningstar Corporation

Test Type Consignment inspection

Post and Telecom. Industry Product Quality Surveillance and Inspection Center MII(PTPIC)

Test Report

Report No. : 12-04-YDY068

Product Model and Name	SHS-6,12V 6A Solar charge controller	Address of client	1098 Washington Crossing Road Washington Crossing PA 18977 USA
Client	Morningstar Corporation	Producing site	USA
Manufactory	ditto	Receiving sample date	Dec 2, 2004
Receiving sample site	PTPIC Lab	Deliverer of sample	Qing Kou
Sample quantity	1 pieces	Product SN or producing date	04390206
Test type	Consignment inspection	Total test items	10
Initial state of sample	In the condition that is fit for testing		
Test Reference	GEF/WB China Renewable Energy Development(RED) Project Specification		
Test Conclusion	The result inspected the SHS-612V 6A Solar charge controller indicates that : The all 10 items tested are acceptable according to the GEF/WB China Renewable Energy Development(RED) Project Specification. (Special Stamp of Test Report) Report date : Dec. 2, 2004		
Remark	———		

Permitted by : 陆宝善 Checked by: 吴京文 Inspected by: 陈俊民

Test Report

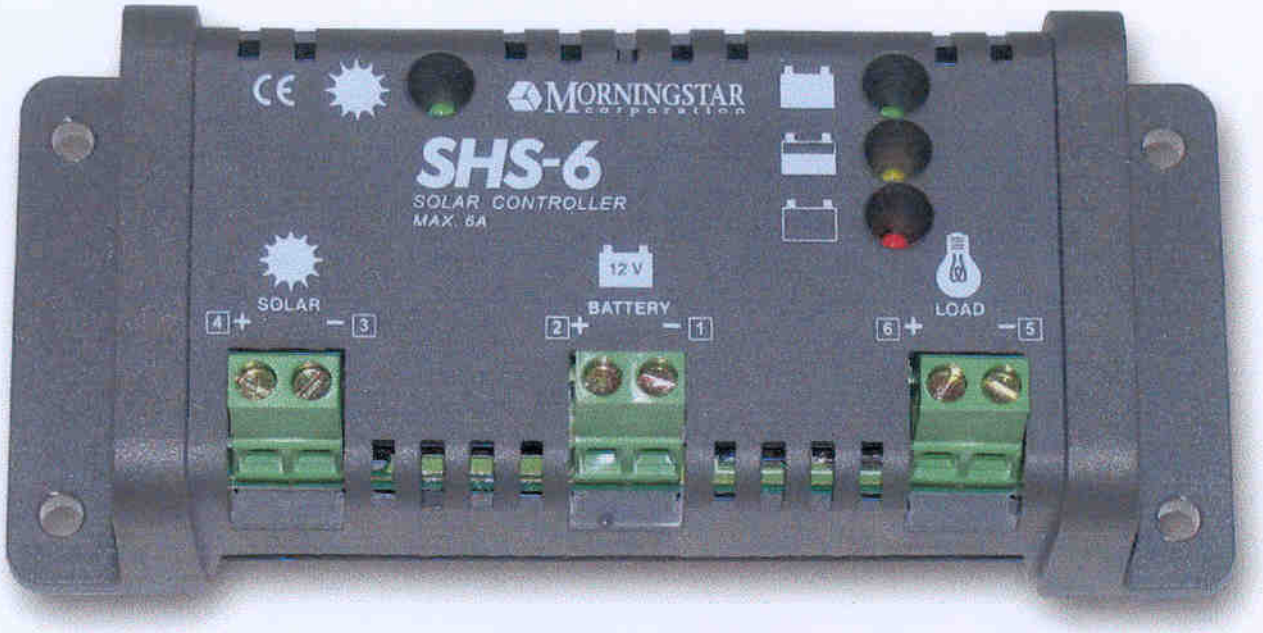
No.	Test Item	unit	Specifications	Test Result	Conclusion
1	Appearance	——	Manufacturer name and model; Serial number Input and output Voltage and rated power; Battery and load connection point and polarity must be clear and correct.	clear and correct.	Qualified
2	Controller set point	——	The controller set points must be factory preset and set point applicable to the specified battery characteristics to prevent battery over-charge or over-discharge.	Controller has been set point	Qualified
3	HVD	V	Controller should be have high-voltage-disconnect and reconnect set point. Disconnect: 14.1-14.5/battery Reconnect: 13.2/ battery	Disconnect: 14.34 Reconnect: 13.2	Qualified
4	LVD	V	Controller should be have low-voltage-disconnect and reconnect set point. Disconnect: 1.8-1.85/battery	Disconnect: 1.85	Qualified

Test Report

No.	Test Item	unit	Specifications	Test Result	Conclusion
5	Voltage drop	——	Voltage drop across the charge Controller when charging or dis-charging should be less than 5% of the nominal system voltage.	charging : 1.78% dis-charging : 1.01%	Qualified
6	Shocks and vibrations	——	(10 ~ 55)Hz、0.35mm,three axes: X.Y.Z, 30min per axis.	Normal work	Qualified
7	Controller Maximum quiescent current	——	Controller maximum se1f-current must not exceed 1% of the controller rated charge current.	0.08%	Qualified
8	Controller Protection	——	It should include the following protective features:		
			Short circuit of any loads	Have short circuit protection	Qualified
			Internal short in charge controller of other devices.	Have internal short protection	Qualified
			Nighttime discharge battery due to reverse current through the array.	Have reverse discharge protection	Qualified
			Reverse polarity of any load or battery module.	Have reverse polarity Discharge protection	Qualified
			Lightning induced transients when use in lightning-prone areas is expected.	——	——

Test Report

No.	Test Item	unit	Specifications	Test Result	Conclusion
9	Withstand voltage	——	Controller should be able to withstand voltage of 1.25 times the array nameplate open circuit voltage with the battery removed from the circuit for a1hour duration.	Accord with the demand	Qualified
10	Withstand current	——	Controller should be able to withstand current of 1.25 times the array nameplate short current voltage with the battery removed from the circuit for a1hour duration.	Accord with the demand	Qualified
	Blank.				



SHS-6, 12V 6A Solar charge controller

Instruments for the test

Report No. :12-04-YDY068

No.	Instrument	Model	ID	Remark
1	Programmable Power Supply	HP6675A	GS4731	
2	Digital Multimeters ($5\frac{1}{2}$ digit)	FLUKE8840A	RU2219	
3	Vibration Test Bench	D-200-2	G552	

Additional remark:

Blank.

Test site : PTPIC Lab		Test date: from Dec. 2,2004
Environmental condition	Room Temperature: 21℃	Humidity Relative: 32 %