TEST REPORT

No.: WT185201047

Sample Description:	**Solar Charge Controller**
Model/Specification/Grade:	**MC2450N10/ MC2440N10/ MC2430N10/ MC2420N10**
Applicant:	**SRNE Solar Co., Ltd.**
Applicant Address:	**4-5F,13A Wutong Island, Neihuan Rd, Xixiang, Bao'an, Shenzhen, Guangdong, China**
Date of Receipt:	**2018-12-23**
Test Period:	**2018-12-23to2018-12-28**

Shenzhen Academy of Metrology & Quality Inspection (Stamp)

Approved by: 蔡纯（主任）

Issue Date: 2018-12-28 **Signature:**

Important statement

1. The academy is a non-profit and legal technical institute authorized by Shenzhen Municipal Government to undertake the quality supervision and inspection of products; provides technical support to relevant supervision administration and also conducts commission test from society.
2. The academy was set up in 1998 through the consolidation of by Shenzhen Institute of Quality Supervision and Testing and Shenzhen Institute of Metrology and Testing.
3. The academy ensures that all testing are carried out scientifically, impartially and accurately, also guarantees the confidential of the samples and the technical documents.
4. The sampling should be carried out according to the "sampling procedure" in the Procedure Document CX22-01 and the stipulation of the inspection rules.
5. Any reports without the signature, or audited, or without the special seal are considered invalidated. Copying or using select parts, or tampering with this document without the permission of our academy is forbidden.
6. The results of the commission test are only valid to the submitted samples. The sample information and the client information are provided by the applicant. The academy is not responsible for the integrity of the sample and its accuracy of identification information.
7. Applicant is not allowed to propagate with the test result without the agreement of the test institution.
8. The report without CMA logo of SMQ is only for the use of internal reference and does not have a role of proof in society. CAL symbol with the serial number of Guangdong are only applicable to product standards and decision standards.
9. Any objections to the report should be submitted in 15 days since the issuing of the report. Any objections to the results of agricultural products supervision and inspection should be applied for re-test within 5 days since receiving inspection report to administrative department of agriculture which organize and implement agricultural products supervision and inspection or its higher level of agricultural administrative department. Any objections to the report of food supervision and inspection should be applied for re-test within 7 days since receiving inspection report to the food and drug administrative department which implement sampling inspection or its higher level of food and drug administrative department.
10. The electronic certificate/report shall not be recalled after alteration. The applicant is responsible to supply the altered certificate/report to the related party using the original certificate/report.

Establishment of following institutions

National Hi-tech Metrology Station
National Digital Electronic Product Testing Center (NETC)
National Sports Product Testing Center (Guangdong)
National Urban Energy Measurement Center (Shenzhen)
National Nutritional Food Quality and Inspection Center (Guangdong)
Accredited Testing Station (Shenzhen) for Furniture by China National Light Industry Council (CNLIC)
Guangdong Quality Supervision and Inspection Institution for Furniture Products
Guangdong Quality Supervision and Inspection Institution for Food (Shenzhen)
Guangdong Quality Supervision and Inspection Institution for Generic Cabling System
Guangdong Quality Supervision and Inspection Institution for Bicycle Quality
Guangdong Quality Supervision and Inspection Institution for Electromagnetic Compatibility
Guangdong Quality Supervision and Inspection Institution for Leather Products
Guangdong Quality Supervision and Inspection Institution for Ecological Textile and Garment Products (Shenzhen)
Guangdong Quality Supervision and Inspection Institution for Horological Products (Shenzhen)
Guangdong Quality Supervision and Inspection Institution for Safety Performance of Environmental Protection and Energy Saving Products (Shenzhen)
Guangdong Quality Supervision and Inspection Institution for Student's Articles (Shenzhen)
Guangdong Quality Supervision and Inspection Institution for Eyewear Products (Shenzhen)
Shenzhen Quality Inspection Institution for Fiber and Textile
Shenzhen Quality Supervision and Inspection Institution for Building Materials
Shenzhen Testing Center for Burning Behavior of Fire Protection Products

Business contact information

Textile and Light Industrial Products Test	Tel: 0755-27528868	Fax: 0755-27528516
National Digital Electronic Product Testing Center (NETC)	Tel: 0755-86928963	Fax: 0755-86009898-31339
Catering Food Test	Tel: 0755-27528977	Fax: 0755-27528916
Chemical Products Test	Tel: 0755-27528987	Fax: 0755-27528479
Fire Protection Products Testing Center	Tel: 0755-89325252	Fax: 0755-89325282
Building Materials and Household Products Test	Tel: 0755-26002957 0755-27528884	Fax: 0755-26001771 0755-27528711
Complaint	Tel: 0755-26941613 (Longzhu) 0755-27528392 (Longhua)	

TEST REPORT

Sample Information:

Sample Description:	Solar Charge Controller
Trade Mark:	SRNE 硕日 光伏储能管控专家
Model/Specification/Grade:	MC2450N10/ MC2440N10/ MC2430N10/ MC2420N10
Serial/Batch No. of Sample:	/
Manufactured Date:	/
Manufacture:	SRNE Solar Co., Ltd.
Manufacture Address:	4F, Xinju Road No. 10, Shangjiao Village,Chang'an Town, Dongguan City, Guangdong, China
Factory:	SRNE Solar Co., Ltd.
Factory Address:	4F, Xinju Road No. 10, Shangjiao Village,Chang'an Town, Dongguan City, Guangdong, China
Sample Quantity:	Two for each model
Sample Description before Testing:	Normal

Client Information:

Applicant:	SRNE Solar Co., Ltd.
Applicant Address:	4-5F,13A Wutong Island, Neihuan Rd, Xixiang, Bao' an, Shenzhen, Guangdong, China
Applicant Telephone:	/
Applicant Post Code:	/

Test Information:

Date of Receipt:	2018-12-23
Applicant No.:	7878706
Environment Condition:	(19-27)℃,(45-70)%RH
Sample Method:	Delivered by Applicant
Test Method(s):	IEC 62509:2010
Test Period:	2018-12-23 to 2018-12-28

Test Conclusion：

Refer to appendix pages for detail.

Tested by: 彭能华 Checked by: 古南水

General product information:

The equipment under test is a MPPT solar charge controller for sealed lead-acid battery, Gel lead-acid battery, Open lead-acid battery, Li battery and other types of battery. The equipment can be connected to a solar panel to charge the battery. The voltage of the battery could be 12V/24V. The controller can automatically identify battery voltage. The unit is with overvoltage protection and PV short circuit protection, battery open circuit protection also with the LED indicator accordingly, which can assure the charging normally and safety use.

This report covers models MC2450N10, MC2440N10, MC2430N10 and MC2420N10. The main circuit principles of these models are the same.

Product Ratings

Model	MC2450N10	MC2440N10	MC2430N10	MC2420N10
Input voltage of the PV module:	100V			
Maximum power of the PV module:	660W/12V 1320W/24V	520W/12V 1040W/24V	400W/12V 800W/24V	260W/12V 520W/24V
Rating of the battery:	12V/24			
Charge current rating	50A	40A	30A	20A

Possible test case verdicts:

- Test case does not apply to the test object — N/A
- Test object does meet the requirement — Pass (P)
- Test object does not meet the requirement — Fail (F)

Copy of marking plate

TEST REPORT

IEC/EN 62509			
Clause	Requirement + Test	Result - Remark	Verdict
4.3	Battery lifetime protection requirements		P
4.3.1	Prevent leakage current from battery to PV generator		P
	The allowable reverse current on the PV side shall be ≤0.1% of the BCC rated input current when the battery voltage is equal to the rated voltage.	Rated input current:50A Allowable reverse current: 50mA	P
	Compliance shall be verified by the test according to 5.2.1	Adjust the Battery voltage to 2.1V/cell, thus the maixmum battery pack voltage is 25.2V Negligible current (0mA) is measured in the R_{PV} loop.	P
4.3.2	Basic battery charging functions		P
4.3.2.1	General		P
	The BCC shall provide appropriate charging set-point and load disconnect set-points for the specific battery technology or technologies it is intended to be used for	The controller is suitabe for sealed lead-acid battyer, Gel lead-acid battery, Open lead-acid battery and Lithium battery. When the user set the battery type to any of the above, the BCC will automatically match the different charging and load disconnect set-points for that type of battery. Besides the battery types above, the user could also self-customized the set points wihtin the allowable voltage range and accoring to the certain principles. The default system set-points of the sealed lead-acid battery are checked during the test..	P
4.3.2.2	Protect battery from over-charge		P

TEST REPORT

IEC/EN 62509			
Clause	Requirement + Test	Result - Remark	Verdict
	The BCC shall cut out or regulate the charging current to avoid over-charging of the battery according to battery manufacture recommended end of charge set-point	The controller cut out the charging current to avoid over-charging of the battery. Refer to below.	P
	Compliance shall be determined by test according to 5.2.2	Refer to the table 5.2.2 for detail.	P
4.3.2.3	Protect battery from over-discharge		N/A
	The BCC shall have a provision to prevent the battery from over-discharging	The BCC has no ouputput termianal, thus no over-discharge is provided.	N/A
	If battery over-discharge protection is achieved by means of audible or visible alarms that prompt the system user to disconnect all or non-essential load, this shall be clearly stated in the operation manual		N/A
	If over-discharge protection is reliant on the installation of an external device that provides over-discharge protection, this fact shall be clearly stated in the installation manual		N/A
	Battery over-discharge protection can be triggered by a battery voltage measurement, a state of charge calculation, a combination of both or other algorithms.		N/A
	The BCC documentation and/or interface shall clearly specify the algorithms and criteria used to establish the load disconnect and reconnect set-points		N/A
	Compliance shall be determined by test according to 5.2.3		N/A
4.3.2.4	Set-point accuracy		P
	The BCC measurement accuracy for voltage set-points for charge control shall be ±1% or better. For load disconnect it shall be ±2% or better.	The BCC measurement accuracy for voltage set-points for charge control is within ±1%. For load disconnect it is within ±2%. Refer to table 5.2.2 and 5.2.3 for details.	P
	Compliance shall be determined by test according to 5.2.2 and 5.2.3		P

TEST REPORT

IEC/EN 62509			
Clause	Requirement + Test	Result - Remark	Verdict
4.3.3	Charging regime		P
4.3.3.1	General		P
	The BCC shall be matched to the specific battery technology for its intended use to ensure that correct charging set-points are implemented.	The controller is suitabe for sealed lead-acid battyer, Gel lead-acid battery, Open lead-acid battery and Lithium battery. When the user set the battery type to any of the above, the BCC will automatically match the different charging and load disconnect set-points for that type of battery. Besides the battery types above, the user could also self-customized the set points wihtin the allowable voltage range and accoring to the certain principles.	P
4.3.3.2	Required charging stages		P
	As a minimum, PV battery charge controllers shall have bulk and float charging stages.	The BCC has bulk and float charging stages	P
4.3.3.3	Recommended charging stages		P
	In addition to 4.3.3.2, battery charge controllers should provide equalise charge periodically to the battery. The periodicity of equalise charge should be more than 7 days.	The controllers has equalise charge stage provided. And The periodicity of equalise charge is 30 days	P
4.3.3.4	Adjustable charging set-points		P

TEST REPORT

IEC/EN 62509			
Clause	Requirement + Test	Result - Remark	Verdict
	Charging set-points should be adjustable or automatically selected either by means of individual set-point adjustment, or by battery type selection or self-detection of type of battery.	The controller is suitabe for sealed lead-acid battyer, Gel lead-acid battery , Open lead-acid battery and Lithium battery. When the user set the battery type to any of the above, the BCC will automatically match the different charging and load disconnect set-points for that type of battery. Besides the battery types above, the user could also self-customized the set points wihtin the allowable voltage range and accoring to the certain principles..	P
	The specific charging regime used depends on the battery technology specified.	See above.	P
	Self-adaptive set-points based on advanced algorithms shall be able to be verified using information provided by the user interface and the BCC documentation.		N/A
4.3.3.5	Temperature compensated charging set-points	temperature compensated function is provided.	P

TEST REPORT

IEC/EN 62509			
Clause	Requirement + Test	Result - Remark	Verdict
	Bulk, float, and other high voltage or end of charge set-points should be temperature compensated.	The end of bulk charge voltage at 25℃ is as below: 28.815 (24V), 14.315 (12V), The end of bulk charge voltage at 40℃ is as below: 28.205 (24V), 14.034 (12V), The temperature compensation coefficient is calculated as follows. -3.4 mV/℃/cell（24V），-3.1 mV/℃/cell（12V）	P
	Temperature compensation if provided should be in accordance with battery manufacturer recommendations for the particular type of battery.		P
	Temperature compensated set-points shall be identifiable from the charge controller documentation.		P
4.3.3.6	Voltage drop compensation for set-point measurement	No voltage drop compenstion function is provided.	N/A
	The BCC should provide a means to compensate for voltage drop in battery cables, or provide installation instructions to minimize voltage drop.		N/A
	If the battery charge controller has the provision for battery sense cables, it shall be able to operate with or without these. This requirement is tested according to 5.2.2 and 5.2.3		N/A

TEST REPORT

IEC/EN 62509			
Clause	Requirement + Test	Result - Remark	Verdict
4.3.4	Set-point security	The controller is suitabe for sealed lead-acid battyer, Gel lead-acid battery, Open lead-acid battery and Lithium battery. When the user set the battery type to any of the above, the BCC will automatically match the different charging and load disconnect set-points for that type of battery. Besides the battery types above, the user could also self-customized the set points wihtin the allowable voltage range and accoring to the certain principles.	P
	Charging set-points shall be secured against change other than by a deliberate and qualified action		P
	Compliance shall be determined by inspection of the unit and accompanying operating instructions.		P
4.3.5	Load disconnect capability	The BCC has no ouputput termianal	N/A
	Where over-discharge protection is provided by means of load disconnect functionality the load disconnect and reconnect set-points shall be verified by testing according 5.2.3	Refer to the table 5.2.3 for detail.	N/A
	The load could be either a load directly switched or a load controlled by the BCC by other means.	The BCC has no ouputput termianal	N/A
	In case of a BCC directly switching the load this should be provided by means of an integrated load breaking switching device.	The BCC has no ouputput termianal	N/A
4.4	Energy performance requirements		P
4.4.1	Stand by self-consumption		P

TEST REPORT

IEC/EN 62509			
Clause	Requirement + Test	Result - Remark	Verdict
	With no PV input or load the self-consumption of a PV BCC shall be as detailed in table 1, when the battery voltage is equivalent to 3.9V/Cell ±2%, and the ambient temperature is 25℃±2℃	Nominal charging current:50A(MC2450N10), 40A(MC2440N10), 30A(MC2430N10) 20A(MC2420N10) Maximum self-consumption: 50mA(MC2450N10), 40mA(MC2440N10), 30mA(MC2430N10), 20mA(MC2420N10) Note: the Battery voltasge is adjusted to 2.1V/cell, thus the battery pack voltage is 25.2V(24V),12.6V(12V)	P
	Compliance shall be determined by test according to 5.3.1	Refer to the table 5.3.1 for detail.	P
4.4.2	BCC efficiency		P
	Power efficiency of the BCC shall be evaluated from 10% to 100% of the rated charging current, at a battery voltage equivalent to 4V/cell±2% and at ambient temperature of 25℃±2℃	Refer to the table 5.3.2 for detail.	P
	The efficiency shall be determined by test according to 5.3.2	Refer to the table 5.3.2 for detail.	P
4.5	Protection and fail safe requirements		P
4.5.1	Thermal performance		P
	The BCC shall be capable of handling rated input current/power from the generator and, simultaneously, rated load current to load terminals (if provided) for at least 1h at the manufacture's specified maximum rated ambient operating temperature ±2℃. Battery voltage shall be 4V/cell±2%	the manufacture's specified maximum rated ambient operating temperature: 60.0℃ Battery voltage: 26.4V Solar current: 50A Operating time: 1 h Note: the Battery voltage is adjusted to 2.2V/cell, thus the battery pack voltage is 26.4V	P

TEST REPORT

IEC/EN 62509			
Clause	Requirement + Test	Result - Remark	Verdict
	Compliance shall be determined by test according to 5.4.1	The BCCoperates for 1h normally. Refer to the table 5.4.1 for detail.	P
4.5.2	Overcurrent operation		P
4.5.2.1	PV side		P
	The BCC shall not be damaged by excessive current from the PV generator up to 125% of the full rated current. The BCC shall continue to operate normally after such an event and shall not require manual resetting	Rated current : 50A The maximum charging current is 52.8A. But since a current-limit charging mode is available, the BCC automatically reduced charging power until the it operated at the rated charging current. Operating time: 1h	P
	Compliance shall be determined by test according to 5.4.2	After 1h, the BCC is not damaged. The BCC continue to operate normally after such an event and does not require manual resetting. Refer to the table 5.4.2 for detail.	P
4.5.2.2	Load side		N/A
	If the BCC has a load terminal, this terminal shall be current protected to prevent over loads from causing damage to the operation of the essential PV BCC functions.	The BCC has not load terminals ,So the load terminals are not current protected to prevent over load.	N/A
	Compliance shall be determined by test according to 5.4.3	The BCC operates normally under normal condition. Refer to the table 5.4.3 for detail.	N/A
4.5.3	PV generator and battery reverse polarity		P

TEST REPORT

IEC/EN 62509			
Clause	Requirement + Test	Result - Remark	Verdict
	The BCC shall be protected from reverse polarity connection of the PV generator or the battery by hardware or by documented procedure and markings.	The PV generator or the battery reverse polarity won't cause any damage.	P
	Compliance shall be determined by test according to 5.4.4 and 5.4.5	After 5 min, the BBC is not damaged. The BCC operates normally under normal condition. Refer to the table 5.4.4 and 5.4.5 for detail.	P
4.5.4	Open circuit on battery terminals (no battery connection)		P
	BCC with load terminals shall be protected from damage to itself and protect the load from the open circuit voltage of the PV generator in case of battery disconnection	The BCC has not load terminals	N/A
	Compliance shall be determined by test according to 5.4.6	The BCC is not damaged and operates normally under normal condition.	P
4.6	User interface requirements		P
4.6.1	General		P
	The type of the user interface	LED indicator	P
	The user interface shall provide the user with valuable information about the system operation if implemented properly	Refer below	P
	The user interface may be integrated into another system component separate from the BCC.		N/A
4.6.2	Operational information		P
4.6.2.1	General		P
	The level of information provided to the user is determined by the intended application and its specific requirements		P

TEST REPORT

IEC/EN 62509			
Clause	Requirement + Test	Result - Remark	Verdict
4.6.2.2	Recommended operation information	There are theree indicatiors on the BCC. PV array indciation indicates the current charging mode of controller, the BAT indication indicates the state of battery and BAT type indication indicates the battery type	P
	An indication of charging status		P
	An indication of load-disconnect state		N/A
	An indication of the state-of-charge of the connected battery		P
	Other additional operational information displayed by the unit may include but is not limited to:		N/A
	Charging set-point		N/A
	Battery voltage		N/A
	Charging current		N/A
	Energy input/output		N/A
4.6.3	User adjustable set-points and parameters	The controller is suitabe for sealed lead-acid battyer, Gel lead-acid battery, Open lead-acid battery and Lithium battery. When the user set the battery type to any of the above, the BCC will automatically match the different charging and load disconnect set-points for that type of battery. Besides the battery types above, the user could also self-customized the set points wihtin the allowable voltage range and accoring to the certain principles.	P

TEST REPORT

IEC/EN 62509			
Clause	Requirement + Test	Result - Remark	Verdict
	If user-adjustable set-points or parameters are provided, the user interface shall provide a facility to modify and display those adjustments as specified in 4.3.3.4		P
	Compliance shall be determined by inspection of the unit and accompanying user/installation manual		P
4.6.4	Alarms		P
	The following condition should be signaled by the user interface:		P
	Low battery state of charge/low battery voltage/low availability		P
	Load disconnect		N/A
	BCC trip		N/A
	Visible and/or audible alarms, clearly identifiable by the system user, shall be triggered within the unit in case of any of the above conditions occurring. Audible alarms shall be time limited and revert to a visible alarm or be pulsed.	Visible provided	P
	Compliance shall be determined by test according to 5.2.2 and 5.2.3		P

TEST REPORT

5.2.2	Charging cycle test (ON-OFFcontroller)	N/A
Champer temperature (℃)	End of charge voltage (V)	Return to charge voltage (V)
--	--	--
--	--	--
Note: /		

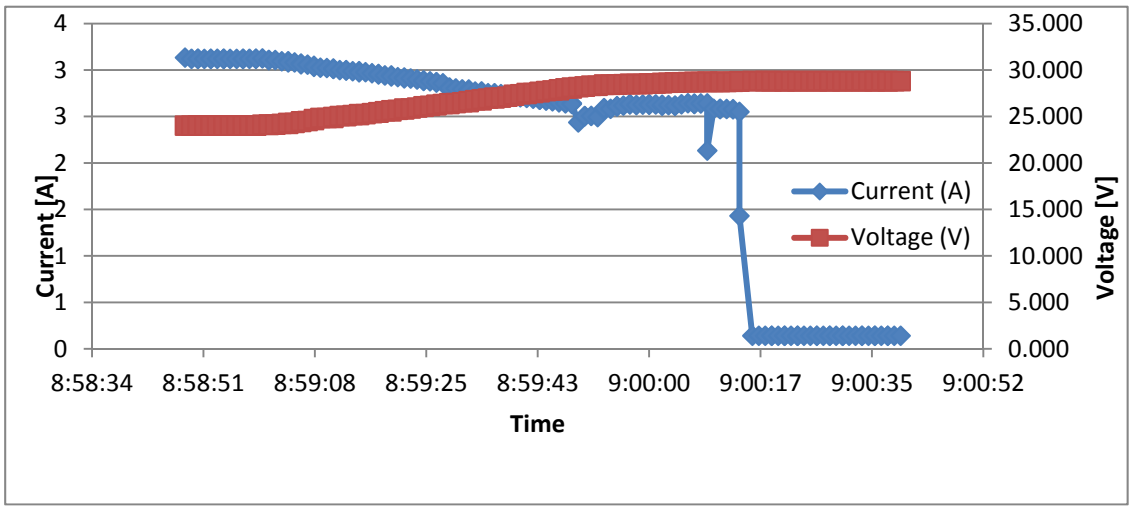
5.2.2	Charging cycle test (PWM or MPPT controller)						P
Charmber temperauter			25℃				
Battery voltage-2.1V/cell±2%			25.2				
Model number of the BCC			MC2450N10				
Charging stages	Input voltage(V)	Input current(A)	Output voltage(V)	Output current(A)	Set-point (V)	Measured Voltage(V)	Accuracy (%)
Bulk charge	40.01	1.932	28.77	2.551	/	/	/
End of Bulk charge	40.13	0.137	28.82	0.142	28.80	28.82	0.05
Charmber temperauter			40℃				
Battery voltage-2.1V/cell±2%			25.2				
Model number of the BCC			MC2450N10				
Charging stages	Input voltage(V)	Input current(A)	Output voltage(V)	Output current(A)	Set-point (V)	Measured Voltage(V)	Accuracy (%)
Bulk charge	38.68	2.037	28.07	2.661	/	/	/
End of Bulk charge	40.14	0.135	28.21	0.142	/	/	/
Charmber temperauter			25℃				
Battery voltage-2.1V/cell±2%			12.6				
Model number of the BCC			MC2450N10				
Charging stages	Input voltage(V)	Input current(A)	Output voltage(V)	Output current(A)	Set-point (V)	Measured Voltage(V)	Accuracy (%)
Bulk charge	40.00	1.957	14.22	5.130	/	/	/
End of Bulk charge	40.13	0.090	14.32	0.141	14.40	14.32	-0.6
Charmber temperauter			40℃				
Battery voltage-2.1V/cell±2%			12.6				
Model number of the BCC			MC2450N10				
Charging stages	Input voltage(V)	Input current(A)	Output voltage(V)	Output current(A)	Set-point (V)	Measured Voltage(V)	Accuracy (%)
Bulk charge	39.10	2.003	13.95	5.357	/	/	/
End of Bulk charge	40.13	0.089	14.03	0.141	/	/	/

TEST REPORT

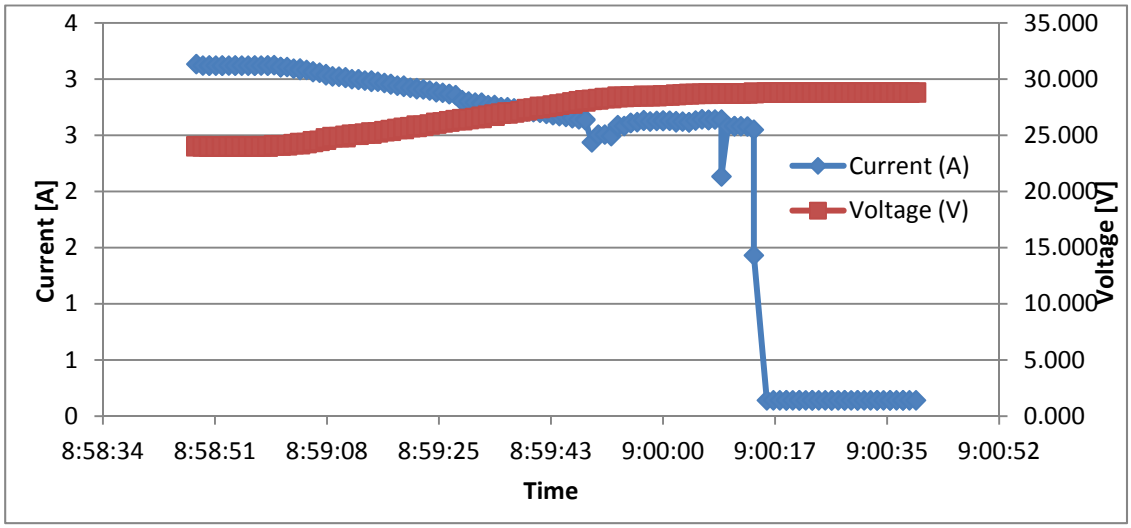
Charmber temperauter			25℃				
Battery voltage-2.1V/cell±2%			25.2				
Model number of the BCC			MC2440N10				
Charging stages	Input voltage(V)	Input current(A)	Output voltage(V)	Output current(A)	Set-point (V)	Measured Voltage(V)	Accuracy (%)
Bulk charge	39.95	2.016	28.86	2.646	/	/	/
End of Bulk charge	40.13	0.139	28.93	0.142	28.80	28.93	0.44
Charmber temperauter			40℃				
Battery voltage-2.1V/cell±2%			25.2				
Model number of the BCC			MC2440N10				
Charging stages	Input voltage(V)	Input current(A)	Output voltage(V)	Output current(A)	Set-point (V)	Measured Voltage(V)	Accuracy (%)
Bulk charge	/	/	/	/	/	/	/
End of Bulk charge	/	/	/	/	/	/	/
Charmber temperauter			25℃				
Battery voltage-2.1V/cell±2%			25.2				
Model number of the BCC			MC2430N10				
Charging stages	Input voltage(V)	Input current(A)	Output voltage(V)	Output current(A)	Set-point (V)	Measured Voltage(V)	Accuracy (%)
End of Bulk charge	39.17	2.015	28.88	2.603	/	/	/
Floating charing	40.14	0.132	29.02	0.142	28.8	29.02	0.75
Charmber temperauter			40℃				
Battery voltage-2.1V/cell±2%			25.2				
Model number of the BCC			MC2430N10				
Charging stages	Input voltage(V)	Input current(A)	Output voltage(V)	Output current(A)	Set-point (V)	Measured Voltage(V)	Accuracy (%)
Bulk charge	/	/	/	/	/	/	/
End of Bulk charge	/	/	/	/	/	/	/
Charmber temperauter			25℃				
Battery voltage-2.1V/cell±2%			25.2				
Model number of the BCC			MC2420N10				
Charging stages	Input voltage(V)	Input current(A)	Output voltage(V)	Output current(A)	Set-point (V)	Measured Voltage(V)	Accuracy (%)
Bulk charge	39.43	2.017	28.88	2.617	/	/	/

TEST REPORT

End of Bulk charge	40.12	0.132	28.97	0.142	28.80	28.97	0.6
Charmber temperauter			40℃				
Battery voltage-2.1V/cell±2%			25.2				
Model number of the BCC			MC2420N10				
Charging stages	Input voltage(V)	Input current(A)	Output voltage(V)	Output current(A)	Set-point (V)	Measured Voltage(V)	Accuracy (%)
Bulk charge	/	/	/	/	/	/	/
End of Bulk charge	/	/	/	/	/	/	/
Note：1. The BCC is provided with the temperature compensation function. The temperature compensation was only conducted on model MC 2450N10.							

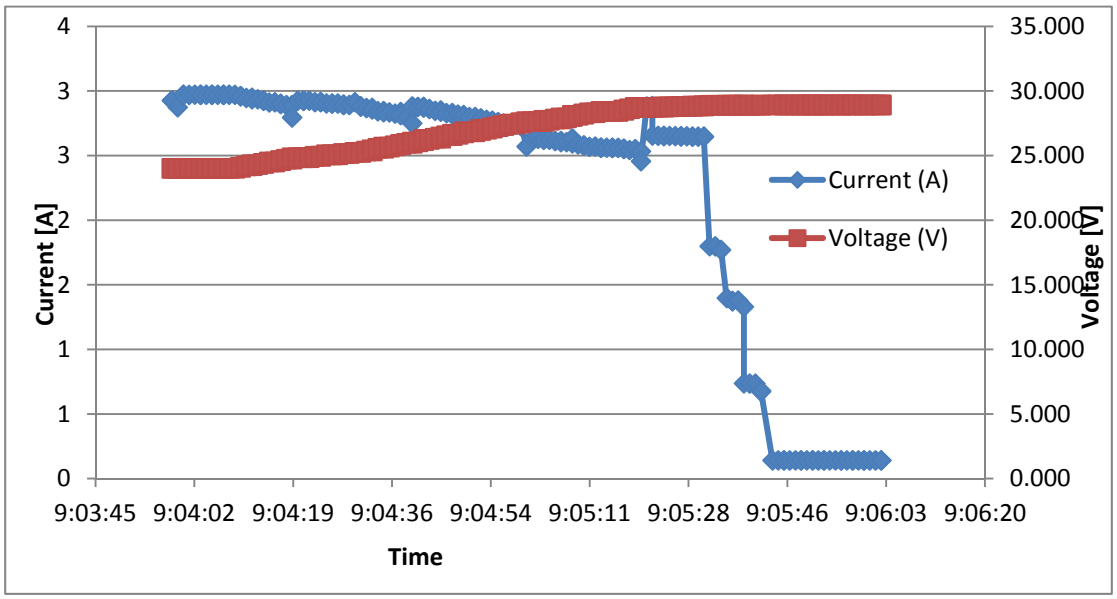


Charging curve at 24V@ 25℃ (MC2450N10)

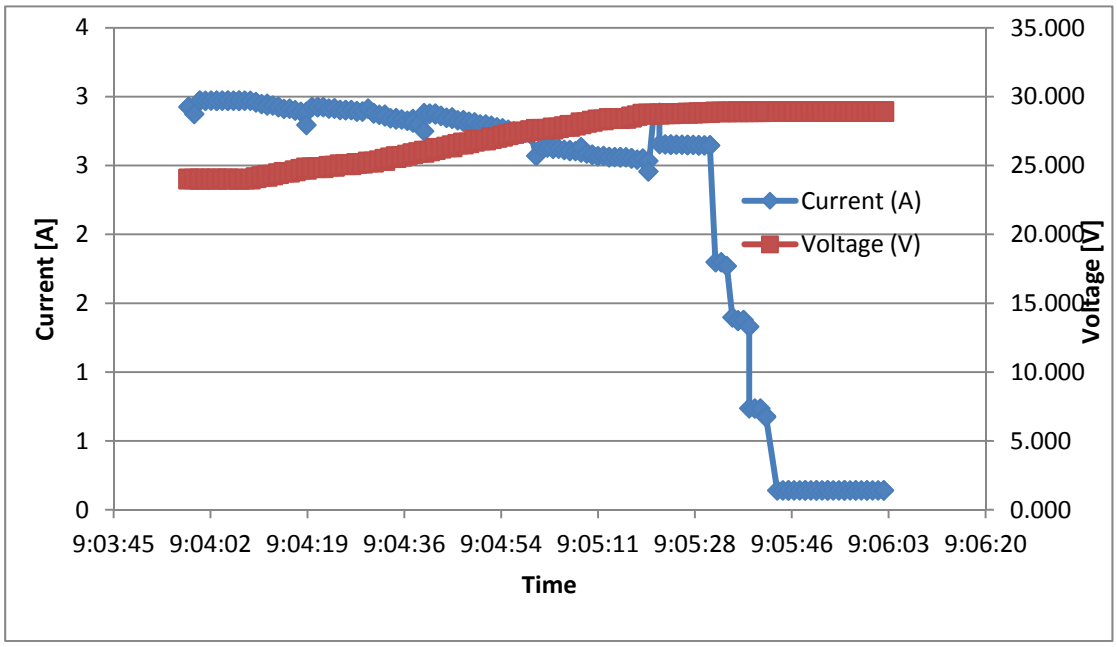


TEST REPORT

Charging curve at 24V@ 40℃ (MC2450N10)

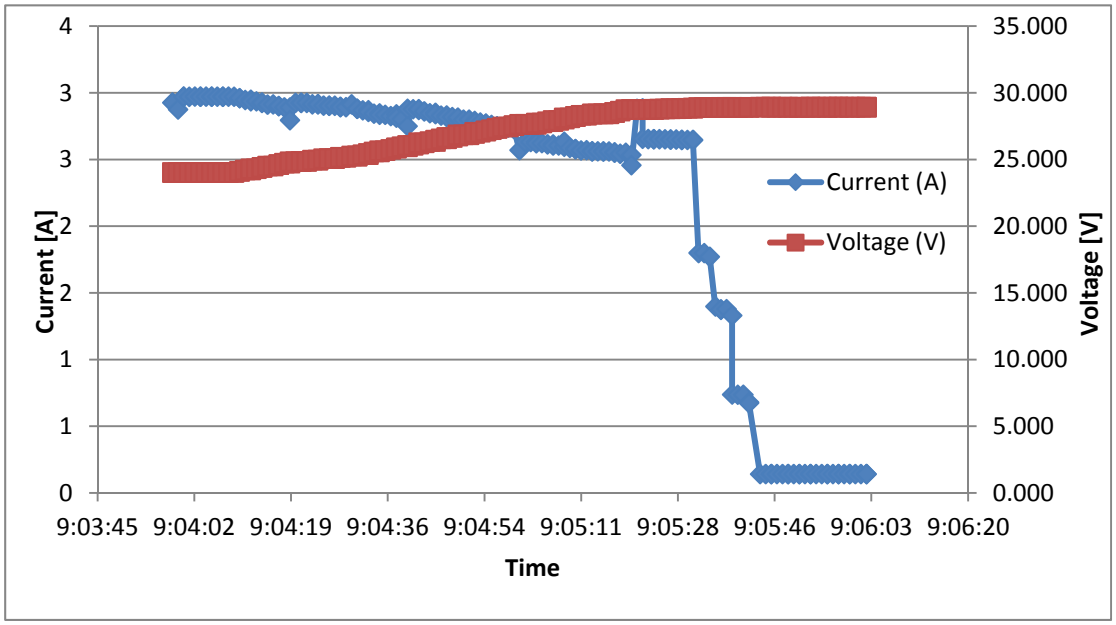


Charging curve at 12V@ 25℃ (MC2450N10)

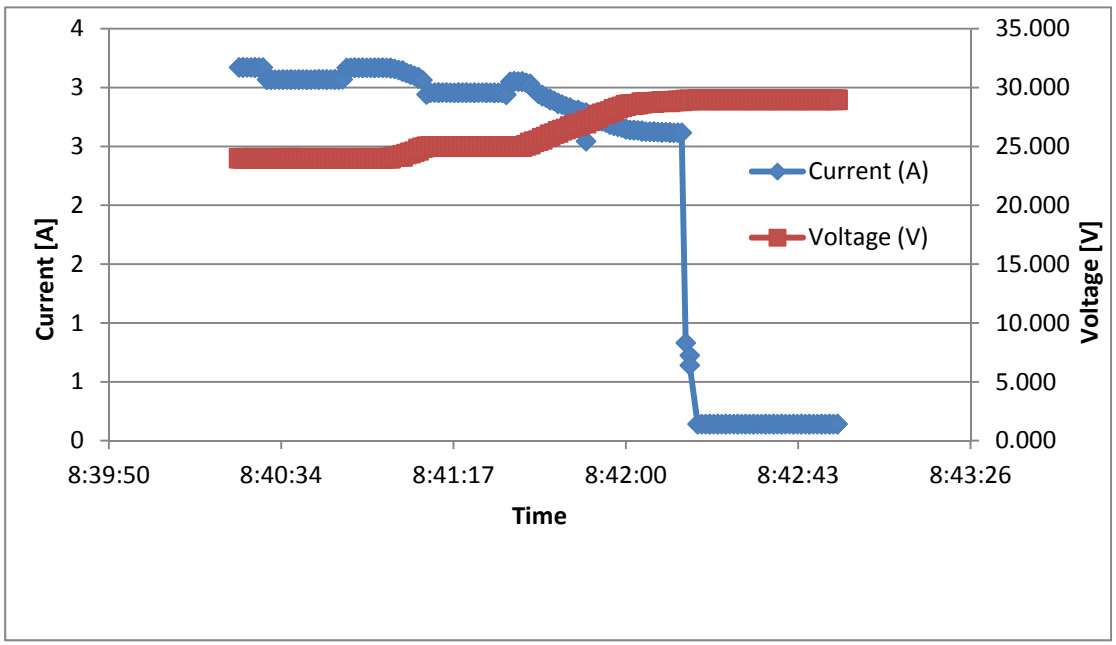


Charging curve at 12V@ 40℃ (MC2450N10)

TEST REPORT

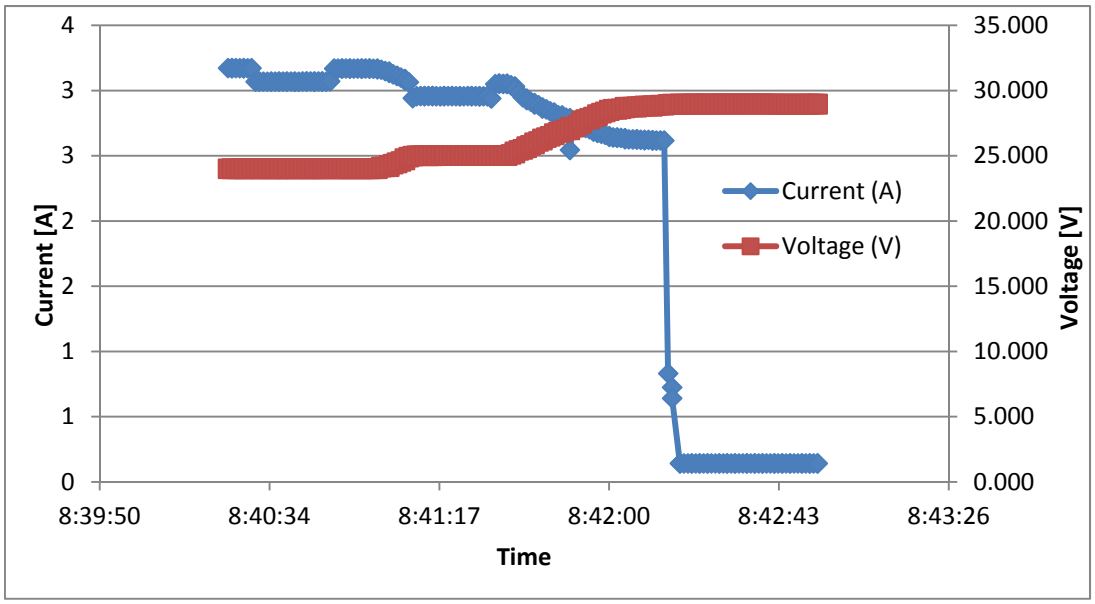


Charging curve at 24V@ 25℃ (MC2440N10)



Charging curve at 24V@ 25℃ (MC2430N10)

TEST REPORT



Charging curve at 24V@ 25℃ (MC2420N10)

5.2.3	Load disconnect/load reconnect test	N/A
Champer temperature (℃)	End of charge voltage (V)	Return to charge voltage (V)
25	--	--
40	--	--
Note：1.The BCC has no output terminals.		

5.3.1	Standby self-consumption test	P
Model	MC2450N10（24V）	
Battery voltage [V/Cell]	Battery voltage [V]	Battery current [mA]
2.1	25.23	5.30
2.0	23.95	5.24
1.9	22.87	5.42
1.8	21.62	5.65
1.7	20.45	5.91
Model	MC2450N10（12V）	
Battery voltage [V/Cell]	Battery voltage [V]	Battery current [mA]
2.1	12.64	8.80

TEST REPORT

2.0	12.06	8.36
1.9	11.47	8.14
1.8	10.87	8.00
1.7	10.21	7.63
Model	MC2440N10（24V）	
Battery voltage [V/Cell]	Battery voltage [V]	Battery current [mA]
2.1	25.24	5.48
2.0	23.99	5.50
1.9	22.81	5.68
1.8	21.65	5.81
1.7	20.38	6.03
Model	MC2440N10（12V）	
Battery voltage [V/Cell]	Battery voltage [V]	Battery current [mA]
2.1	12.57	8.44
2.0	11.98	8.63
1.9	11.39	8.45
1.8	10.81	8.26
1.7	10.21	8.22
Model	MC2430N10（24V）	
Battery voltage [V/Cell]	Battery voltage [V]	Battery current [mA]
2.1	25.26	5.24
2.0	24.01	4.98
1.9	22.84	5.45
1.8	21.66	5.66
1.7	20.40	5.90
Model	MC2430N10（12V）	
Battery voltage [V/Cell]	Battery voltage [V]	Battery current [mA]
2.1	12.59	9.02
2.0	12.01	8.56
1.9	11.42	8.41
1.8	10.82	8.22
1.7	10.23	8.12
Model	MC2420N10（24V）	
Battery voltage [V/Cell]	Battery voltage [V]	Battery current [mA]
2.1	25.25	5.07
2.0	24.01	5.12
1.9	22.84	5.44
1.8	21.67	5.66
1.7	20.38	5.88

TEST REPORT

Model	MC2420N10（12V）	
Battery voltage [V/Cell]	Battery voltage [V]	Battery current [mA]
2.1	12.57	8.95
2.0	11.98	8.74
1.9	11.4	8.25
1.8	10.81	7.77
1.7	10.22	8.02
Note：The battery is lead acid battery.		

5.3.2	Efficiency test	P

Charging

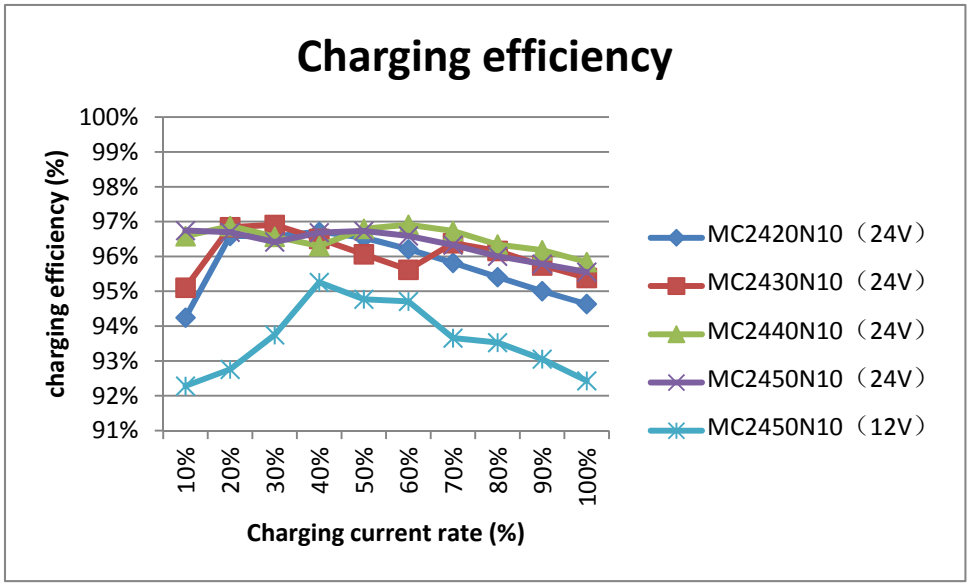
Model	MC2450N10（24V）						
PV input current is 50A							
PV input current [%]	PV voltage [V]	PV current [A]	PV power [W]	Battery voltage [V]	Battery current [A]	Battery power [W]	Charging efficiency [%]
10	39.429	3.471	136.86	26.443	5.007	132.4	96.74
20	39.494	6.938	274.00	26.449	10.017	264.94	96.69
30	39.517	10.443	412.66	26.443	15.046	397.87	96.42
40	39.124	14.018	548.44	26.459	20.04	530.26	96.69
50	39.133	17.53	685.99	26.457	25.081	663.56	96.73
60	39.148	21.041	823.73	26.455	30.075	795.64	96.59
70	39.162	24.566	962.04	26.456	35.028	926.69	96.33
80	39.833	28.595	1139.10	26.458	41.333	1093.600	96.01
90	39.057	31.334	1223.80	26.460	44.301	1172.200	95.78
100	38.531	35.992	1386.80	26.465	50.070	1325.100	95.55
Model	MC2450N10（12V）						
PV input current is 50A							
PV input current [%]	PV voltage [V]	PV current [A]	PV power [W]	Battery voltage [V]	Battery current [A]	Battery power [W]	Charging efficiency [%]
10	38.893	1.852	72.01	13.238	5.013	66.451	92.28
20	39.514	3.617	142.92	13.244	10.009	132.57	92.76
30	38.927	5.461	212.56	13.244	15.045	199.27	93.75
40	19.886	13.976	277.93	13.25	19.98	264.75	95.26
50	20.347	17.175	349.45	13.248	24.997	331.18	94.77
60	20.312	20.702	420.49	13.252	30.052	398.24	94.71
70	20.335	24.269	493.51	13.253	34.876	462.2	93.66

TEST REPORT

80	20.302	27.919	566.81	13.25	40.009	530.12	93.53
90	20.455	31.322	640.69	13.251	44.993	596.18	93.05
100	20.47	35.076	718.01	13.254	50.071	663.65	92.43
Model		MC2440N10（24V）					
PV input current is 40A							
PV input current [%]	PV voltage [V]	PV current [A]	PV power [W]	Battery voltage [V]	Battery current [A]	Battery power [W]	Charging efficiency [%]
10	39.434	2.792	110.08	26.452	4.019	106.32	96.58
20	39.487	5.557	219.43	26.453	8.036	212.57	96.87
30	39.541	8.316	328.82	26.448	12.006	317.53	96.57
40	39.553	11.113	439.56	26.447	16.005	423.29	96.30
50	39.552	13.851	547.83	26.456	20.043	530.27	96.79
60	39.199	16.744	656.35	26.462	24.037	636.07	96.91
70	39.143	19.579	766.38	26.456	28.021	741.32	96.73
80	39.154	22.477	880.06	26.455	32.051	847.88	96.34
90	39.612	24.96	988.69	26.449	35.952	950.91	96.18
100	39.825	27.764	1105.70	26.453	40.059	1059.700	95.84
Model		MC2430N10（24V）					
PV input current is 30A							
PV input current [%]	PV voltage [V]	PV current [A]	PV power [W]	Battery voltage [V]	Battery current [A]	Battery power [W]	Charging efficiency [%]
10	39.065	2.152	84.057	26.45	3.022	79.941	95.10
20	39.104	4.201	164.27	26.449	6.015	159.08	96.84
30	39.171	6.280	246	26.448	9.014	238.39	96.91
40	39.21	8.416	330	26.449	12.041	318.47	96.51
50	39.251	10.559	414.47	26.453	15.051	398.15	96.06
60	39.291	12.684	498.36	26.458	18.01	476.52	95.62
70	39.188	14.769	578.8	26.456	21.086	557.85	96.38
80	39.197	16.896	662.27	26.458	24.07	636.83	96.16
90	39.208	19.038	746.44	26.456	27.013	714.65	95.74
100	39.939	20.805	830.93	26.456	29.958	792.58	95.38
Model		MC2420N10（24V）					
PV input current is 20A							
PV input current [%]	PV voltage [V]	PV current [A]	PV power [W]	Battery voltage [V]	Battery current [A]	Battery power [W]	Charging efficiency [%]
10	39.113	1.4178	55.453	26.439	1.9767	52.261	94.24

TEST REPORT

20	39.146	2.8691	112.31	26.439	4.1028	108.48	96.59
30	39.181	4.209	164.91	26.429	6.0261	159.26	96.57
40	39.186	5.6662	222.04	26.427	8.1258	214.74	96.71
50	39.228	7.0138	275.14	26.455	10.04	265.6	96.53
60	39.268	8.435	331.22	26.456	12.045	318.66	96.21
70	39.232	9.8562	386.68	26.454	14.005	370.51	95.82
80	39.263	11.308	444	26.449	16.016	423.61	95.41
90	39.304	12.758	501.45	26.443	18.017	476.4	95.00
100	39.932	13.928	556.17	26.439	19.908	526.34	94.64



Discharging

Load current is

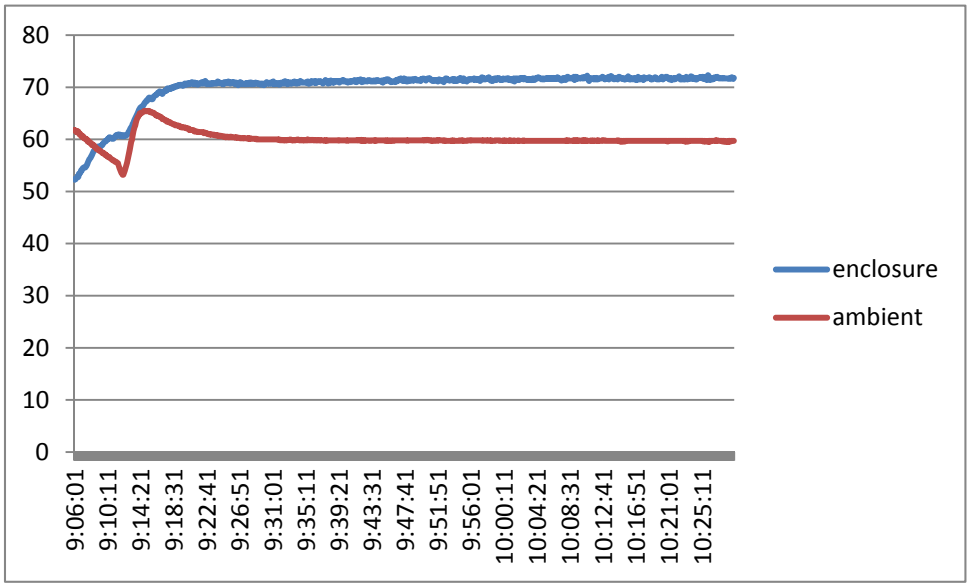
Battery voltage [V]	Battery current [A]	Battery power [W]	Load voltage [V]	Load current [A]	Load power [W]	Voltage drop（V）	Discharging efficiency [%]
--	--	--	--	--	--	--	--

Note: 1.The BCC has no output terminals.

5.4.1	Thermal performance test	P
Operatiing time	1h	
Chamber temperature [℃]	60	
Maximum temperature of the heatsink [℃]	71.8	

TEST REPORT

PV voltage [V]	PV current [A]	PV power [W]	Battery voltage [V]	Battery current [A]	Battery power [W]	Load voltage [V]	Load current [A]	Load power [W]
34.68	39.70	1376.80	26.40	49.90	1317.36	--	--	--



Temperature chart

Note: 1) The maximum temperature was measured at the BCC
2) The BCC has no output terminals.

5.4.2	PV over current protection test						P
Operating time	1h						
Chamber temperature [℃]	Heatsink maximum temperature [℃]	PV voltage [V]	PV current [A]	PV power [W]	Battery voltage [V]	Battery current [A]	Battery power [W]
25	81.5	39.84	36.80	1466.112	26.45	52.80	1396.56

Note: 1) Rated current: 50A. The test charging current is 52.8A.
2) A current-limit charging mode is available, the BCC automatically reduced charging power till

5.4.3	Load overcurrent protection test	N/A
Operating time	1h	
Chamber temperature [℃]	25	

TEST REPORT

Working condition 1	--
Working condition 2	--
Working condition 3	--

Working condition	Heatsink maximum temperature [℃]	Battery voltage [V]	Battery current [A]	Battery power [W]	Load voltage [V]	Load current [A]	Load power [W]
1	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--

Note: 1) no output terminals.

5.4.4	Battery reverse polarity test							P
Operating time		5min						
Battery voltage [V]	Battery current [mA]	Battery power [W]	Load voltage [V]	Load current [A]	Load power [W]	PV voltage [V]	PV current [A]	PV power [W]
22.02	-2.26	-0.05	--	--	--	0.00	0.00	0.00
Any alarms displayed by BCC?				No				
Any damage to the BCC?				No				
Has reverse voltage been fed to the load?				No				
Any others				/				

Note: 1）There is no damage when reverse the battery polarity.
2) No output terminals.

5.4.5	PV generator reverse polarity test							P
Operating time		5min						
Battery voltage [V]	Battery current [A]	Battery power [W]	Load voltage [V]	Load current [A]	Load power [W]	PV voltage [V]	PV current [mA]	PV power [W]
0.00	0.00	0.00	--	--	--	39.99	0.00	0.00
Any alarms displayed by BCC?				No				
Any damage to the BCC?				No				
Has reverse voltage been fed to the load?				No				

Note: no output terminals.

----The following are photos----

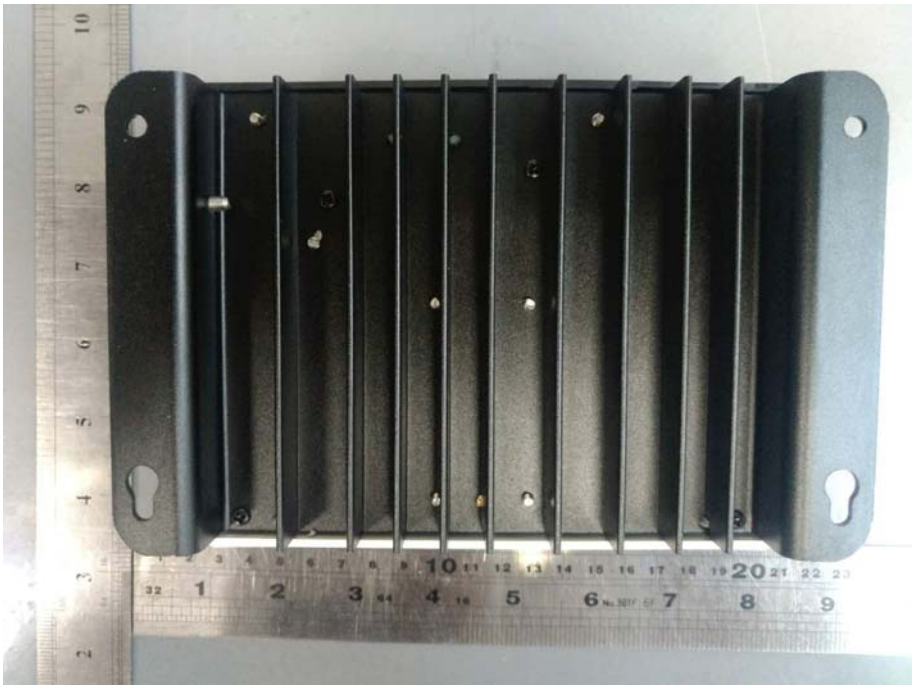
TEST REPORT

MC2450N10# front view of the BCC

MC2450N10# back view of the BCC

TEST REPORT

MC2440N10# front view of the BCC



MC2440N10# back view of the BCC

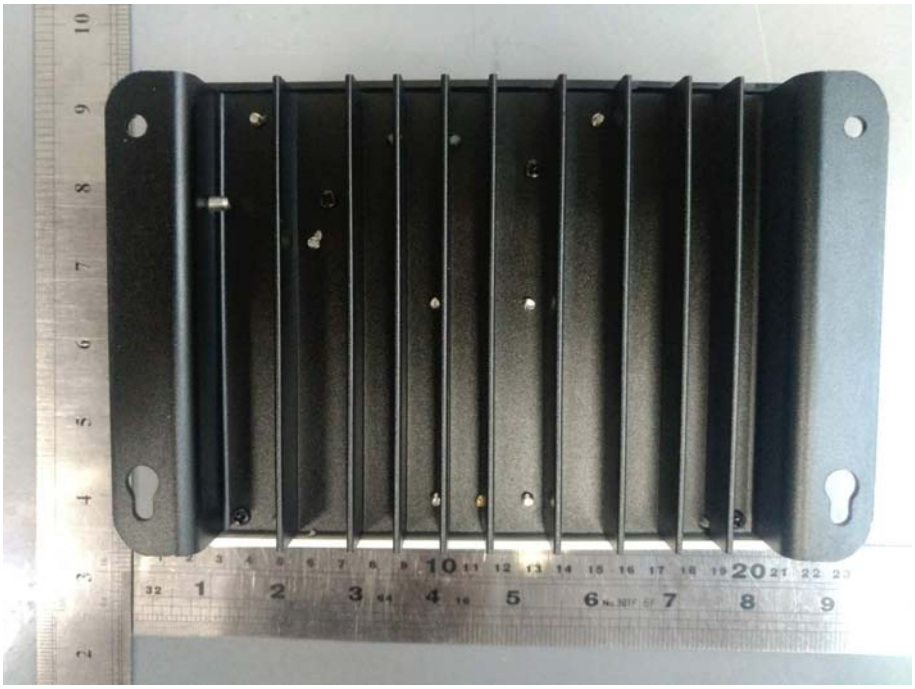
TEST REPORT

MC2430N10# front view of the BCC

MC2430N10# back view of the BCC

TEST REPORT

MC2420N10# front view of the BCC



MC2420N10# back view of the BCC

-The end-