



# Test Report: PV-ML24-20

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20A MPPT controller

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Control Function Test

## ■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

## ■ RELIABILITY TEST

ENVIRONMENT TEST

### ■ DESIGN VERIFY TEST

#### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	BOOST CHARGE VOLTAGE (default)	14.4V(12V BAT) 28.8V(24V BAT)	I/P : PV O/P : BAT LOAD Ta : 25°C	14.37V 28.74V
2	FLOAT CHARGE VOLTAGE (default)	13.8V(12V BAT) 27.6V(24V BAT)	I/P : PV O/P : BAT LOAD Ta : 25°C	13.78V 27.52V
3	CHARGING CURRENT	20A	I/P: PV O/P:BAT LOAD Ta:25°C	20.28A
4	NO LOAD POWER CONSUMPTION	<1.2W	I/P : 24V O/P : NO LOAD Ta : 25°C	0.7923W

#### INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	~100V	I/P: Testing O/P: :NO LOAD Ta:25°C	5.7V~121.7V
2	EFFICIENCY (TYP)	98%	I/P: PV O/P:FULL LOAD Ta:25°C	98.34%
3	MPPT EFFICIENCY (MAX)	99%	I/P : PV O/P : BAT LOAD Ta : 25°C	99.96%

#### PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT OVER VOLTAGE	>100V	I/P: Testing O/P: Battery Ta:25°C	121.7V
2	OUTPUT OVER VOLTAGE	Shut off o/p voltage, clamping by zener diode	O/P: Testing Ta:25°C	42.5V
3	OVER-DISCHARGE VOLTAGE	11.1V	I/P: Testing O/P: Battery Ta:25°C	11.15V

4	OVER-DISCHARGE RECOVERY VOLTAGE	12.6V	I/P: NC O/P: Testing Ta:25°C	12.64V
5	OLP	>110%	I/P: NC O/P: Testing Ta:25°C	23.3A
6	SHORT	Shut down	I/P: PV O/P: Testing Ta:25°C	TEST : OK Shut down
7	BATTERY REVERSE CONNECTION	Shut down, Auto recovery	I/P: NC O/P: Battery Ta:25°C	TEST : OK Shut down, Auto recovery
8	PHOTOVOLTAIC INPUT REVERSE-CONNECTION	Shut down, Auto recovery	I/P: PV O/P: NC Ta:25°C	TEST : OK Shut down, Auto recovery

## CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	RESULT
1	BUTTON	UP	Page up; increase the parameter value in setting TEST : OK
		DOWN	Page down; decrease the parameter value in setting TEST : OK
		RETURN	Return to previous menu TEST : OK
		CONFIRM	Enter into sub-menu; set/ saveTurn on/off loads TEST : OK
2	LOAD MODEL SETTING	Sole light control	TEST : OK
		Light control + time control mode	TEST : OK
		Manual mode	TEST : OK
		Debugging mode	TEST : OK
		Normal on mode	TEST : OK
	BATTERY TYPE	Sealed System voltage12/24 Auto 1. Equalizing charging voltage 2. Boost charging voltage 3. Floating charging voltage 4. Over-discharge recovery voltage 5. Over-discharge voltage	TEST : OK 1.14.6V 2.14.4V 3.13.8V 4.12.6V 5..11.1V
		Gel System voltage12/24 Auto 1. Boost charging voltage 2. Floating charging voltage	TEST : OK 1.14.2V 2.13.8V

			3. Over-discharge recovery voltage 4. Over-discharge voltage	3.12.6V 4.11.1V
		Li	System voltage12/24 Auto 1. Boost charging voltage 2. Over-discharge recovery voltage 3. Over-discharge voltage	TEST : OK 1.14.4V 2.12.6V 3.11.1V
		Flooded	System voltage12/24 Auto 1. Equalizing charging voltage 2. Boost charging voltage 3. Floating charging voltage 4. Over-discharge recovery voltage 5. Over-discharge voltage	TEST : OK 1.14.8V 2.14.6V 3.13.8V 4.12.6V 5..11.1V
		User	System voltage12/24 Auto 1. Equalizing charging voltage 2. Boost charging voltage 3. Floating charging voltage 4. Over-discharge recovery voltage 5. Over-discharge voltage	TEST : OK Can set the voltage range: 9-17V

## ■ SAFETY& E.M.C. TEST

### SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	DC-FG: 1.5KVAC/min PV-FG :1.5KVAC/min	DC-FG: 1.5KVAC/min PV-FG :1.5KVAC/min	NO DAMAGE

### E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONDUCTED	BS EN/EN61000-6-3 Class A	I/P : PV O/P : FULL LOAD Ta : 25°C	TEST : OK
2.	RADIATION	BS EN/EN61000-6-4 Class B	I/P : PV O/P : FULL LOAD Ta : 25°C	TEST : OK
3	E.S.D	BS EN/EN61000-4-2 ■ MEDICAL AIR : 8KV / Contact : 4KV	I/P : PV O/P : FULL LOAD Ta : 25°C	TEST : OK
4	RF	BS EN/EN61000-4-3	I/P : PV O/P : FULL LOAD Ta : 25°C	TEST : OK

5	EFT	BS EN/EN61000-4-4	I/P : PV O/P : FULL LOAD Ta : 25°C	TEST : OK
6	SURGE	BS EN/EN61000-4-5	I/P : PV O/P : FULL LOAD Ta : 25°C	TEST : OK
7	CONDUCTED	BS EN/EN61000-4-6	I/P : PV O/P : FULL LOAD Ta : 25°C	TEST : OK
8	Magnetic field immunity	BS EN/EN61000-4-8	I/P : PV O/P : FULL LOAD Ta : 25°C	TEST : OK
<p>Test by certified Lab &amp; Test Report Prepare Any contradictions of the test results, please refer to the latest EMC test report</p>				

## ■ RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																				
1	TEMPERATURE RISE TEST	MODEL : PV-ML48-60 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 150VDC O/P : FULL LOAD Ta= 23.8 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 150VDC O/P : FULL LOAD Ta= 45.2 °C																																																																																						
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2	HIGH TEMPERATURE	NO DAMAGE 1 HOUR	I/P : PV O/P : BATTERY Ta : 45°C	TEST : OK
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : PV O/P : BATTERY Ta = -35°C	TEST : OK
4	VIBRATION TEST	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 3G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C	TEST : OK

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	Jinkj		Chenhm

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