

**Test Report No.:** PV181122E11

**Client**

**Name :** Ablerex Electronics Co., Ltd.  
**Address :** 1F, No. 3, Lane 7, Paokao Rd., Hsintien, New Taipei City, Taiwan

**Test Item :** Grid-tied photovoltaic inverter

**Identification :** ES 60000HC, ES 60000HC-S, ES 60000HC-I, ES 60000HC-SI

**Testing laboratory**


**Name :** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
**Address :** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

**Test specification**

**Standard :** IEEE 519:2014

**Test Result :** The test item passed.


**Prepared By :**

  
Signature  
Dino Kao  
Senior Engineer

2018-12-25

Date

**Approved By:**

  
Signature  
Edward Chiueh  
Technical Manager


2018-12-25

Date

**Other Aspects:**

The completed test report includes the following documents:  
IEEE 519:2014 report (29 pages)

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<b>TEST REPORT</b>	
<b>IEEE 519:2014</b>	
<b>IEEE Recommended Practice and Requirements for Harmonic Control in Electric Power Systems</b>	
<b>Report reference No.</b> .....	PV181122E11
Tested by (printed name and signature) .....	See cover sheet
Approved by (printed name and signature) .....	See cover sheet
Date of issue .....	2018-12-25
<b>Testing Laboratory Name</b> .....	
Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch	
Address.....	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Testing location.....	Bureau Veritas Consumer Product Services Limited, Taoyuan Branch
Address.....	No. 19, Hwa Ya 2nd Rd., Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan
<b>Applicant's Name</b> .....	Ablerex Electronics Co., Ltd.
Address .....	1F, No. 3, Lane 7, Paokao Rd., Hsintien, New Taipei City, Taiwan
<b>Test specification</b>	
Standard .....	IEEE 519:2014
Non-standard test method .....	None
<b>Test Report Form No.</b> .....	IEEE 519:2014_A
Master TRF .....	Bureau Veritas Consumer Product Services GmbH
Copyright © Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch	
<b>Test item description</b> .....	Solar Inverter
Trademark .....	
Model / Type .....	ES 60000HC, ES 60000HC-S, ES 60000HC-I, ES 60000HC-SI
<b>Ratings</b> .....	
PV Array Input DC voltage range [V]:	200-1000 Vdc
PV Array Input DC current [A] .....	26 A x 4
Output AC voltage [V] .....	480 Vac, 60Hz
Output AC current [A] .....	72,2 A x 3
Output power [kVA] .....	60 kVA

Copy of marking plate

太陽能變流器  
型號: ES 60000HC

|||||  
P/N : XXXXXXXXXXXXX

直流輸入  
電壓: 200~1,000 Vdc  
電流: 26 Amp x 4  
最大功率追蹤範圍: 200~1000 Vdc

額定交流輸出  
功率: 60 kVA  
功率因數: 0.8超前~0.8落後  
電壓: 480 Vac  
電流: 72.2 Amp x 3  
頻率: 60 Hz



保護等級: I  
侵入保護: IP65

盈正豫順電子股份有限公司  
ABLEREX ELECTRONICS CO., LTD.

S/N : MA3C013000001

太陽能變流器  
型號: ES 60000HC-S

|||||  
P/N : XXXXXXXXXXXXX

直流輸入  
電壓: 200~1,000 Vdc  
電流: 26 Amp x 4  
最大功率追蹤範圍: 200~1000 Vdc

額定交流輸出  
功率: 60 kVA  
功率因數: 0.8超前~0.8落後  
電壓: 480 Vac  
電流: 72.2 Amp x 3  
頻率: 60 Hz



保護等級: I  
侵入保護: IP65

盈正豫順電子股份有限公司  
ABLEREX ELECTRONICS CO., LTD.

S/N : MA3C013000001

太陽能變流器  
型號: ES 60000HC-I

|||||  
P/N : XXXXXXXXXXXXX

直流輸入  
電壓: 200~1,000 Vdc  
電流: 26 Amp x 4  
最大功率追蹤範圍: 200~1000 Vdc

額定交流輸出  
功率: 60 kVA  
功率因數: 0.8超前~0.8落後  
電壓: 480 Vac  
電流: 72.2 Amp x 3  
頻率: 60 Hz



保護等級: I  
侵入保護: IP65

盈正豫順電子股份有限公司  
ABLEREX ELECTRONICS CO., LTD.

S/N : MA3C013000001

太陽能變流器  
型號: ES 60000HC-SI

|||||  
P/N : XXXXXXXXXXXXX

直流輸入  
電壓: 200~1,000 Vdc  
電流: 26 Amp x 4  
最大功率追蹤範圍: 200~1000 Vdc

額定交流輸出  
功率: 60 kVA  
功率因數: 0.8超前~0.8落後  
電壓: 480 Vac  
電流: 72.2 Amp x 3  
頻率: 60 Hz



保護等級: I  
侵入保護: IP65

盈正豫順電子股份有限公司  
ABLEREX ELECTRONICS CO., LTD.

S/N : MA3C013000001

### History Sheet:

Name	Date	Comment	Revision
Dino Kao	2018-12-25	Initial report was written	Empty

### Address of the manufacturer sites:

**1) Ablere Electronics (SUZHOU) Co., Ltd.**

No. 36 Wang Wu Road, Wu Zhong District Suzhou, 215128, P.R. China

**2) Ablere Electronics Co., Ltd.**

No. 1-1, Gongye Rd., Pingtung City, Pingtung Country 90049, Taiwan

<b>Particulars:</b>											
Equipment mobility .....	Permanent connection										
Operating condition .....	Continuous										
Class of equipment .....	Class I										
<b>Test case verdicts:</b>											
Test case does not apply to the test object .....	<b>N/A</b>										
Test item does meet the requirement .....	<b>P(ass)</b>										
Test item does not meet the requirement .....	<b>F(ail)</b>										
<b>Testing:</b>											
Date of receipt of test item .....	2018-12-04										
Date(s) of performance of test .....	2018-12-04										
<p><b>General remarks:</b></p> <p>The test result presented in this report relate only to the object(s) tested.          This report shall not be reproduced, except in full, without the written approval of the applicant.          Throughout this report a comma is used as the decimal separator.</p> <p>All tests are performed on model ES 52000HC.</p> <p><b>Model Differences:</b></p> <p>The models are identical in Hardware and Software except followings.</p> <table border="1"> <thead> <tr> <th>Model</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>ES 60000HC</td> <td>Standard model</td> </tr> <tr> <td>ES 60000HC-S</td> <td>Include SPD</td> </tr> <tr> <td>ES 60000HC-I</td> <td>Include ICM2</td> </tr> <tr> <td>ES 60000HC-SI</td> <td>Include SPD and ICM2</td> </tr> </tbody> </table> <p><b>This Test Report consists of the following documents:</b></p> <ol style="list-style-type: none"> <li>1. Test Results</li> <li>2. Annex 1: Pictures of the unit</li> <li>3. Annex 2: Test equipment list</li> </ol>		Model	Description	ES 60000HC	Standard model	ES 60000HC-S	Include SPD	ES 60000HC-I	Include ICM2	ES 60000HC-SI	Include SPD and ICM2
Model	Description										
ES 60000HC	Standard model										
ES 60000HC-S	Include SPD										
ES 60000HC-I	Include ICM2										
ES 60000HC-SI	Include SPD and ICM2										

4.5 (B1) Harmonic Current Limit Test				P
Test Sample: ES 60000HC				
Watts [kW]		20,12		
VA [kVA]		20,14		
Vrms [V]		278,17		
Arms [A]		72,38		
Power Factor		0,9993		
THD [%]		3,64		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (%)
1st	72,38	—	R	--
2nd	0,28	0,39	R	1%
3rd	0,33	0,45	R	4%
4th	0,33	0,46	R	1%
5th	2,06	2,85	R	4%
6th	0,20	0,28	R	1%
7th	1,74	2,40	R	4%
8th	0,14	0,20	R	1%
9th	0,30	0,42	R	4%
10th	0,11	0,15	R	1%
11th	0,42	0,58	R	2%
12th	0,09	0,12	R	0,5%
13th	0,28	0,38	R	2%
14th	0,04	0,05	R	0,5%
15th	0,09	0,13	R	2%
16th	0,04	0,06	R	0,5%
17th	0,16	0,22	R	1,5%
18th	0,03	0,04	R	0,375%
19th	0,07	0,10	R	1,5%
20th	0,03	0,04	R	0,375%
21th	0,05	0,07	R	1,5%
22th	0,03	0,04	R	0,375%
23th	0,11	0,15	R	0,6%
24th	0,02	0,03	R	0,15%
25th	0,05	0,07	R	0,6%
26th	0,02	0,03	R	0,15%
27th	0,02	0,03	R	0,6%
28th	0,02	0,03	R	0,15%
29th	0,04	0,06	R	0,6%
30th	0,01	0,02	R	0,15%
31th	0,04	0,05	R	0,6%
32th	0,02	0,03	R	0,15%
33th	0,02	0,03	R	0,6%
34th	0,01	0,02	R	0,15%
35th	0,02	0,03	R	0,3%
36th	0,01	0,02	R	0,075%
37th	0,03	0,04	R	0,3%
38th	0,02	0,03	R	0,075%
39th	0,02	0,03	R	0,3%
40th	0,02	0,03	R	0,075%

Test Sample: ES 60000HC				
Watts [kW]		20,12		
VA [kVA]		20,14		
Vrms [V]		278,17		
Arms [A]		72,38		
Power Factor		0,9993		
THD [%]		3,64		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (%)
41th	0,04	0,05	R	0,3%
42th	0,03	0,04	R	0,075%
43th	0,04	0,05	R	0,3%
44th	0,04	0,05	R	0,075%
45th	0,04	0,06	R	0,3%
46th	0,02	0,03	R	0,075%
47th	0,03	0,04	R	0,3%
48th	0,02	0,03	R	0,075%
49th	0,04	0,05	R	0,3%
50th	0,03	0,04	R	0,075%
Note:				
Isc/IL = 1				
Ref. to Table 2 of the IEEE 519:2014				

Test Sample: ES 60000HC				
Watts [kW]		19,82		
VA [kVA]		19,83		
Vrms [V]		278,04		
Arms [A]		71,32		
Power Factor		0,9993		
THD [%]		3,29		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (%)
1st	71,32	—	S	--
2nd	0,34	0,47	S	1%
3rd	0,16	0,23	S	4%
4th	0,34	0,47	S	1%
5th	1,85	2,60	S	4%
6th	0,15	0,21	S	1%
7th	1,66	2,33	S	4%
8th	0,09	0,13	S	1%
9th	0,12	0,17	S	4%
10th	0,08	0,11	S	1%
11th	0,39	0,55	S	2%
12th	0,08	0,11	S	0,5%
13th	0,37	0,52	S	2%
14th	0,04	0,05	S	0,5%
15th	0,06	0,08	S	2%
16th	0,04	0,05	S	0,5%
17th	0,14	0,20	S	1,5%
18th	0,04	0,05	S	0,375%

**Test Sample: ES 60000HC**

<b>Watts [kW]</b>		19,82		
<b>VA [kVA]</b>		19,83		
<b>Vrms [V]</b>		278,04		
<b>Arms [A]</b>		71,32		
<b>Power Factor</b>		0,9993		
<b>THD [%]</b>		3,29		
<b>Harmonics</b>	<b>Current Magnitude (A)</b>	<b>% of Fundamental</b>	<b>Phase</b>	<b>Harmonic Current Limits (%)</b>
19th	0,08	0,11	S	1,5%
20th	0,03	0,04	S	0,375%
21th	0,04	0,05	S	1,5%
22th	0,03	0,04	S	0,375%
23th	0,11	0,15	S	0,6%
24th	0,02	0,03	S	0,15%
25th	0,03	0,04	S	0,6%
26th	0,02	0,03	S	0,15%
27th	0,03	0,04	S	0,6%
28th	0,02	0,03	S	0,15%
29th	0,04	0,06	S	0,6%
30th	0,01	0,02	S	0,15%
31th	0,04	0,05	S	0,6%
32th	0,02	0,03	S	0,15%
33th	0,03	0,04	S	0,6%
34th	0,02	0,03	S	0,15%
35th	0,03	0,04	S	0,3%
36th	0,01	0,02	S	0,075%
37th	0,03	0,04	S	0,3%
38th	0,03	0,04	S	0,075%
39th	0,02	0,03	S	0,3%
40th	0,04	0,05	S	0,075%
41th	0,04	0,06	S	0,3%
42th	0,03	0,04	S	0,075%
43th	0,04	0,05	S	0,3%
44th	0,03	0,04	S	0,075%
45th	0,04	0,06	S	0,3%
46th	0,02	0,03	S	0,075%
47th	0,04	0,06	S	0,3%
48th	0,02	0,03	S	0,075%
49th	0,04	0,05	S	0,3%
50th	0,02	0,03	S	0,075%

Note:

 $I_{sc}/I_L = 1$ 

Ref. to Table 2 of the IEEE 519:2014



Test Sample: ES 60000HC				
Watts [kW]		20,56		
VA [kVA]		20,57		
Vrms [V]		277,98		
Arms [A]		74,01		
Power Factor		0,9993		
THD [%]		3,54		
Harmonics	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (%)
1st	74,01	—	T	--
2nd	0,02	0,03	T	1%
3rd	0,24	0,33	T	4%
4th	0,05	0,07	T	1%
5th	0,28	0,38	T	4%
6th	0,04	0,06	T	1%
7th	0,44	0,59	T	4%
8th	0,04	0,06	T	1%
9th	0,10	0,13	T	4%
10th	0,03	0,04	T	1%
11th	0,18	0,24	T	2%
12th	0,03	0,04	T	0,5%
13th	0,13	0,17	T	2%
14th	0,01	0,02	T	0,5%
15th	0,07	0,09	T	2%
16th	0,01	0,02	T	0,5%
17th	0,09	0,12	T	1,5%
18th	0,01	0,02	T	0,375%
19th	0,03	0,04	T	1,5%
20th	0,01	0,02	T	0,375%
21th	0,02	0,03	T	1,5%
22th	0,01	0,02	T	0,375%
23th	0,04	0,06	T	0,6%
24th	0,01	0,01	T	0,15%
25th	0,02	0,03	T	0,6%
26th	0,01	0,02	T	0,15%
27th	0,01	0,01	T	0,6%
28th	0,01	0,01	T	0,15%
29th	0,02	0,03	T	0,6%
30th	0,01	0,01	T	0,15%
31th	0,01	0,02	T	0,6%
32th	0,01	0,01	T	0,15%
33th	0,01	0,02	T	0,6%
34th	0,01	0,01	T	0,15%
35th	0,01	0,01	T	0,3%
36th	0,01	0,01	T	0,075%
37th	0,01	0,01	T	0,3%
38th	0,01	0,02	T	0,075%
39th	0,01	0,02	T	0,3%
40th	0,02	0,03	T	0,075%
41th	0,02	0,03	T	0,3%
42th	0,02	0,03	T	0,075%
43th	0,02	0,03	T	0,3%



**Test Sample: ES 60000HC**

<b>Watts [kW]</b>		20,56		
<b>VA [kVA]</b>		20,57		
<b>Vrms [V]</b>		277,98		
<b>Arms [A]</b>		74,01		
<b>Power Factor</b>		0,9993		
<b>THD [%]</b>		3,54		
<b>Harmonics</b>	<b>Current Magnitude (A)</b>	<b>% of Fundamental</b>	<b>Phase</b>	<b>Harmonic Current Limits (%)</b>
44th	0,02	0,03	T	0,075%
45th	0,03	0,04	T	0,3%
46th	0,01	0,02	T	0,075%
47th	0,02	0,03	T	0,3%
48th	0,02	0,03	T	0,075%
49th	0,03	0,04	T	0,3%
50th	0,02	0,03	T	0,075%

Note:

$I_{sc}/I_L = 1$

Ref. to Table 2 of the IEEE 519:2014

4.5 (B1) Harmonic Voltage Limit Test				P
Test conditions:				
THD50			0,83	
Harmonics	Voltage Magnitude (V)	% of Fundamental	Phase	Harmonic Limits of Test Voltage (%)
1st	278,17	--	R	--
2nd	0,86	0,31	R	3%
3rd	0,95	0,34	R	3%
4th	1,34	0,48	R	3%
5th	6,40	2,30	R	3%
6th	0,83	0,30	R	3%
7th	7,62	2,74	R	3%
8th	0,45	0,16	R	3%
9th	0,89	0,32	R	3%
10th	0,36	0,13	R	3%
11th	1,31	0,47	R	3%
12th	0,31	0,11	R	3%
13th	1,75	0,63	R	3%
14th	0,11	0,04	R	3%
15th	0,25	0,09	R	3%
16th	0,19	0,07	R	3%
17th	0,58	0,21	R	3%
18th	0,11	0,04	R	3%
19th	0,42	0,15	R	3%
20th	0,11	0,04	R	3%
21th	0,14	0,05	R	3%
22th	0,11	0,04	R	3%
23th	0,33	0,12	R	3%
24th	0,08	0,03	R	3%
25th	0,17	0,06	R	3%
26th	0,08	0,03	R	3%
27th	0,11	0,04	R	3%
28th	0,08	0,03	R	3%
29th	0,19	0,07	R	3%
30th	0,06	0,02	R	3%
31th	0,14	0,05	R	3%
32th	0,06	0,02	R	3%
33th	0,08	0,03	R	3%
34th	0,08	0,03	R	3%
35th	0,14	0,05	R	3%
36th	0,06	0,02	R	3%
37th	0,08	0,03	R	3%
38th	0,11	0,04	R	3%
39th	0,08	0,03	R	3%
40th	0,11	0,04	R	3%
41th	0,17	0,06	R	3%
42th	0,11	0,04	R	3%
43th	0,14	0,05	R	3%
44th	0,19	0,07	R	3%
45th	0,14	0,05	R	3%
46th	0,08	0,03	R	3%

Test conditions:				
THD50			0,83	
Harmonics	Voltage Magnitude (V)	% of Fundamental	Phase	Harmonic Limits of Test Voltage (%)
47th	0,14	0,05	R	3%
48th	0,08	0,03	R	3%
49th	0,14	0,05	R	3%
50th	0,08	0,03	R	3%
Note:				

Test conditions:				
THD50			0,75	
Harmonics	Voltage Magnitude (V)	% of Fundamental	Phase	Harmonic Limits of Test Voltage (%)
1st	278,04	--	S	--
2nd	0,11	0,04	S	3%
3rd	0,86	0,31	S	3%
4th	0,17	0,06	S	3%
5th	0,95	0,34	S	3%
6th	0,11	0,04	S	3%
7th	1,53	0,55	S	3%
8th	0,11	0,04	S	3%
9th	0,22	0,08	S	3%
10th	0,08	0,03	S	3%
11th	0,64	0,23	S	3%
12th	0,08	0,03	S	3%
13th	0,58	0,21	S	3%
14th	0,06	0,02	S	3%
15th	0,22	0,08	S	3%
16th	0,06	0,02	S	3%
17th	0,31	0,11	S	3%
18th	0,06	0,02	S	3%
19th	0,08	0,03	S	3%
20th	0,06	0,02	S	3%
21th	0,06	0,02	S	3%
22th	0,06	0,02	S	3%
23th	0,14	0,05	S	3%
24th	0,03	0,01	S	3%
25th	0,03	0,01	S	3%
26th	0,03	0,01	S	3%
27th	0,06	0,02	S	3%
28th	0,03	0,01	S	3%
29th	0,06	0,02	S	3%
30th	0,03	0,01	S	3%
31th	0,08	0,03	S	3%
32th	0,03	0,01	S	3%
33th	0,08	0,03	S	3%
34th	0,03	0,01	S	3%
35th	0,08	0,03	S	3%
36th	0,03	0,01	S	3%
37th	0,08	0,03	S	3%



Test conditions:				
THD50			0,75	
Harmonics	Voltage Magnitude (V)	% of Fundamental	Phase	Harmonic Limits of Test Voltage (%)
38th	0,08	0,03	S	3%
39th	0,06	0,02	S	3%
40th	0,08	0,03	S	3%
41th	0,11	0,04	S	3%
42th	0,06	0,02	S	3%
43th	0,08	0,03	S	3%
44th	0,08	0,03	S	3%
45th	0,11	0,04	S	3%
46th	0,06	0,02	S	3%
47th	0,11	0,04	S	3%
48th	0,06	0,02	S	3%
49th	0,14	0,05	S	3%
50th	0,08	0,03	S	3%
Note:				

Test conditions:				
THD50			0.86	
Harmonics	Voltage Magnitude (V)	% of Fundamental	Phase	Harmonic Limits of Test Voltage (%)
1st	277,98	--	T	--
2nd	0,11	0,04	T	3%
3rd	0,83	0,30	T	3%
4th	0,22	0,08	T	3%
5th	0,78	0,28	T	3%
6th	0,19	0,07	T	3%
7th	1,89	0,68	T	3%
8th	0,11	0,04	T	3%
9th	0,28	0,10	T	3%
10th	0,11	0,04	T	3%
11th	0,56	0,20	T	3%
12th	0,11	0,04	T	3%
13th	0,72	0,26	T	3%
14th	0,06	0,02	T	3%
15th	0,19	0,07	T	3%
16th	0,06	0,02	T	3%
17th	0,33	0,12	T	3%
18th	0,06	0,02	T	3%
19th	0,17	0,06	T	3%
20th	0,06	0,02	T	3%
21th	0,06	0,02	T	3%
22th	0,06	0,02	T	3%
23th	0,14	0,05	T	3%
24th	0,03	0,01	T	3%
25th	0,06	0,02	T	3%
26th	0,03	0,01	T	3%
27th	0,06	0,02	T	3%
28th	0,03	0,01	T	3%



**Test conditions:**

THD50			0.86	
Harmonics	Voltage Magnitude (V)	% of Fundamental	Phase	Harmonic Limits of Test Voltage (%)
29th	0,08	0,03	T	3%
30th	0,03	0,01	T	3%
31th	0,06	0,02	T	3%
32th	0,03	0,01	T	3%
33th	0,06	0,02	T	3%
34th	0,03	0,01	T	3%
35th	0,08	0,03	T	3%
36th	0,03	0,01	T	3%
37th	0,06	0,02	T	3%
38th	0,08	0,03	T	3%
39th	0,08	0,03	T	3%
40th	0,08	0,03	T	3%
41th	0,11	0,04	T	3%
42th	0,06	0,02	T	3%
43th	0,11	0,04	T	3%
44th	0,11	0,04	T	3%
45th	0,08	0,03	T	3%
46th	0,06	0,02	T	3%
47th	0,11	0,04	T	3%
48th	0,06	0,02	T	3%
49th	0,14	0,05	T	3%
50th	0,08	0,03	T	3%

Note:

# **Annex 1**

## **Pictures of the unit**

**Inverter  
Enclosure front**



**Enclosure rear side**





**Enclosure Left side**



**Enclosure right side**



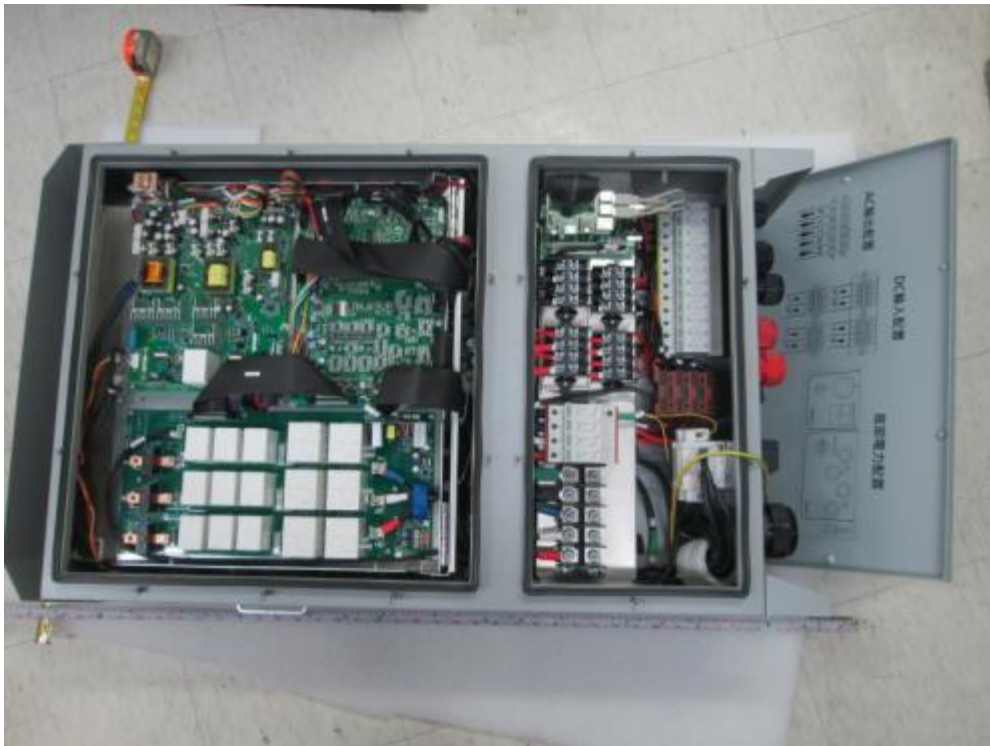
**Enclosure top side**



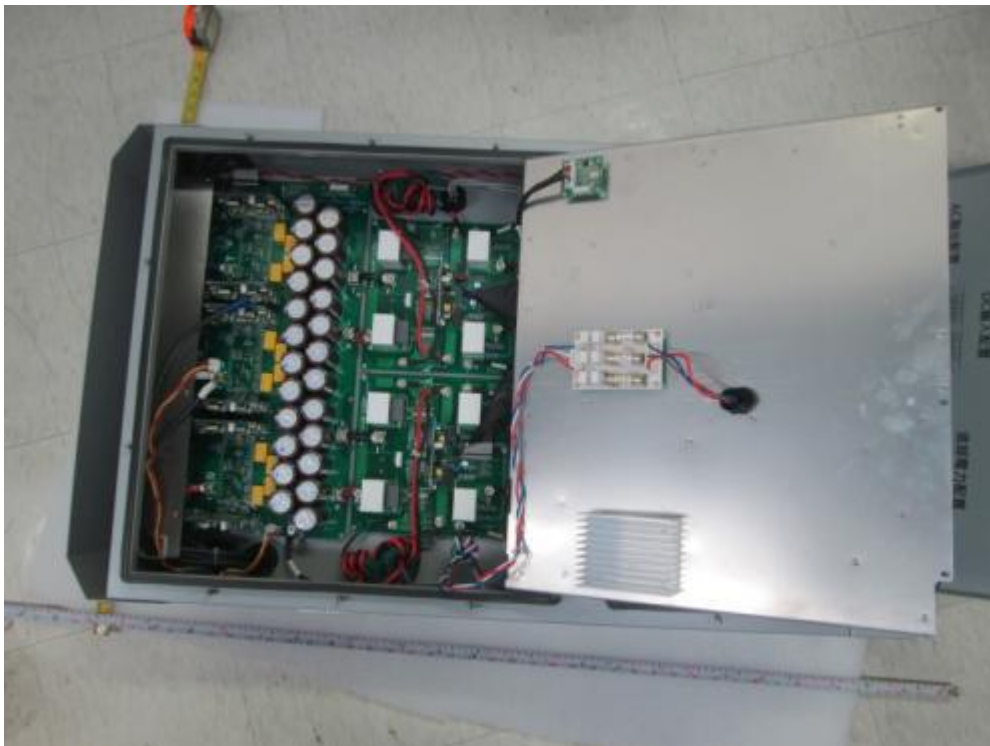
**Enclosure bottom side**



**Internal view-1**



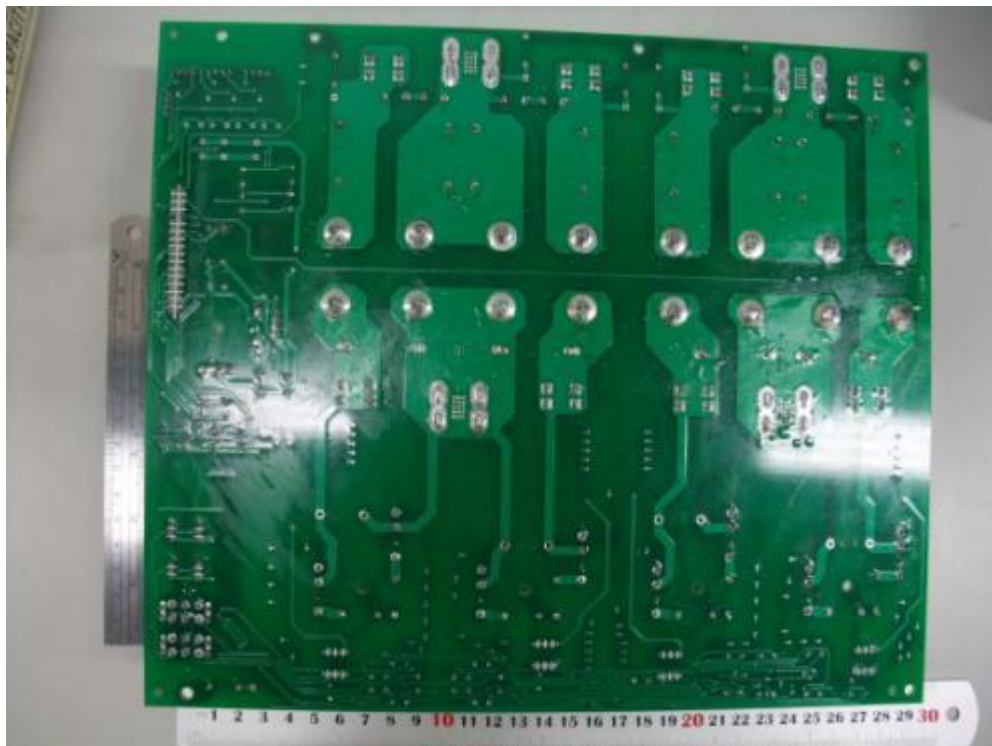
**Internal view-2**



**PCB\_PVLF4 component side**

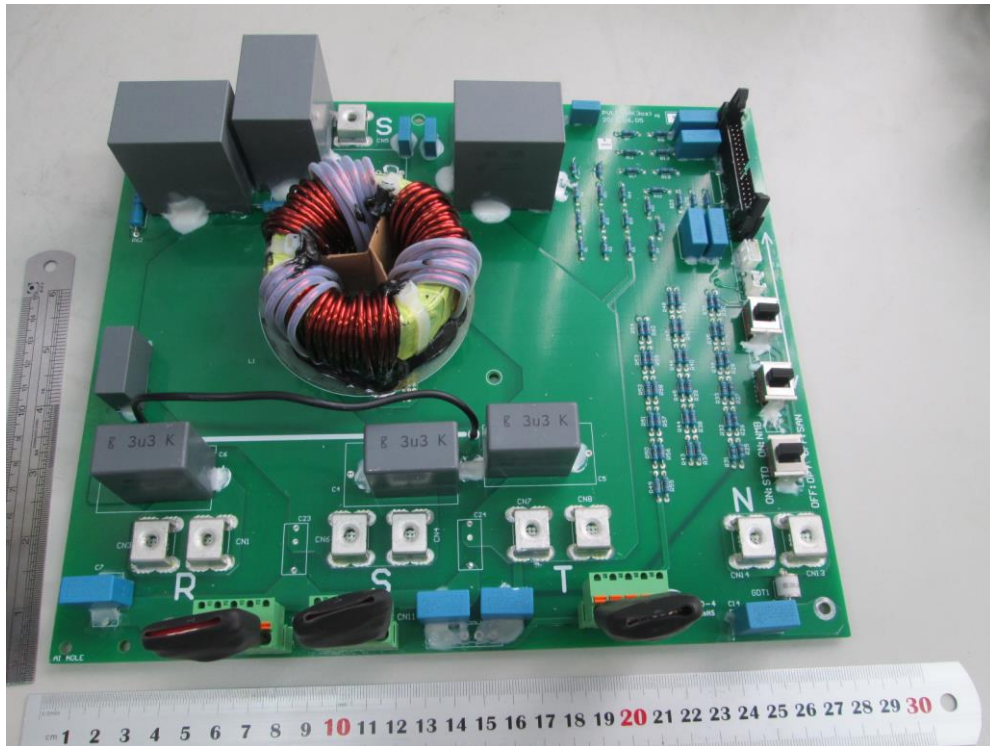


**PCB\_PVLF4 solder side**

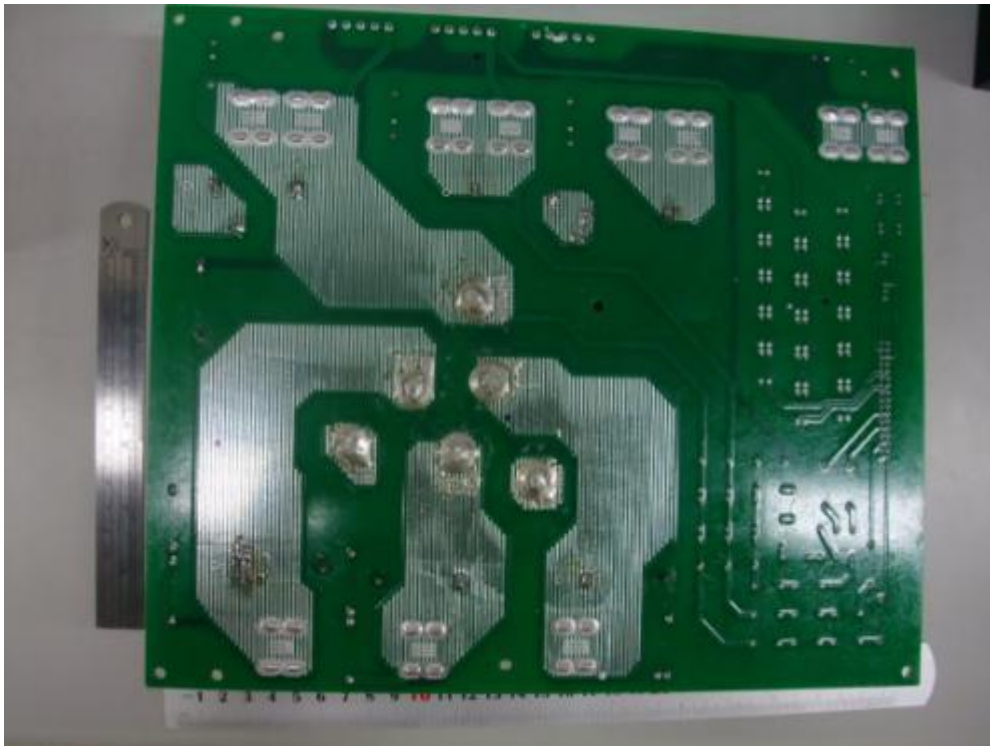




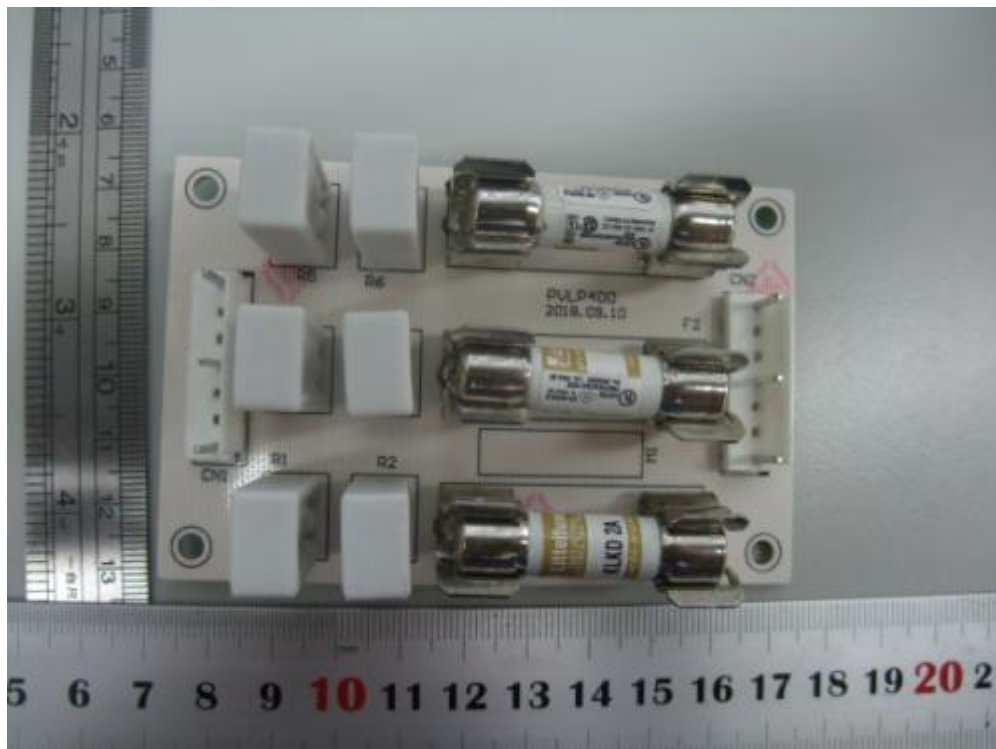
**PCB\_PVLF5 component side**



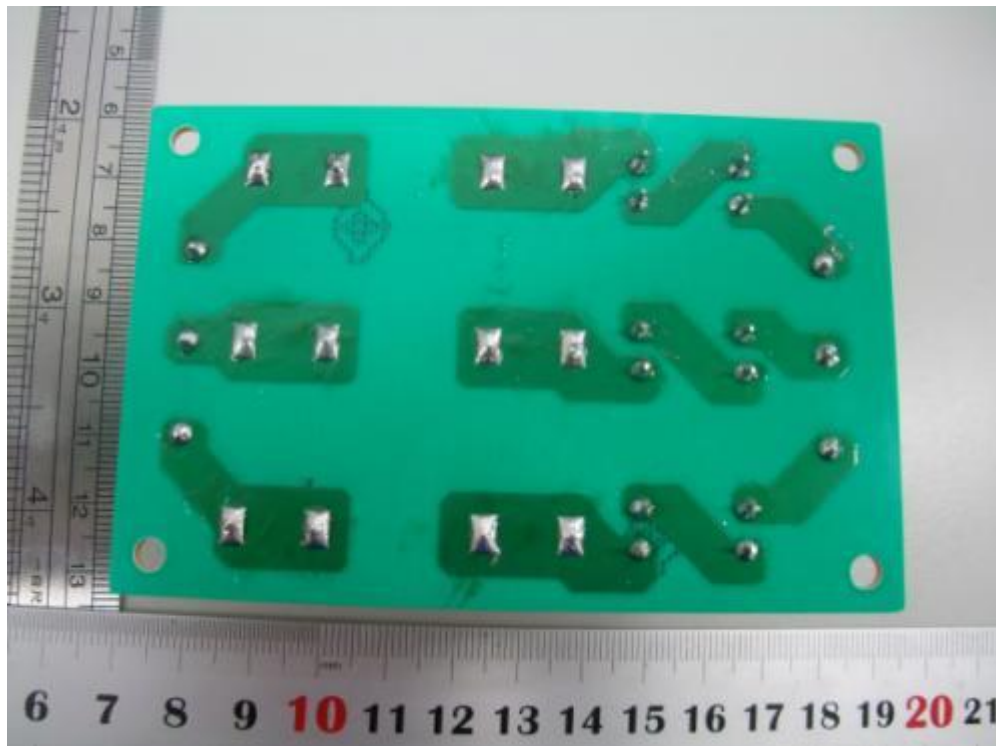
**PCB\_PVLF5 solder side**



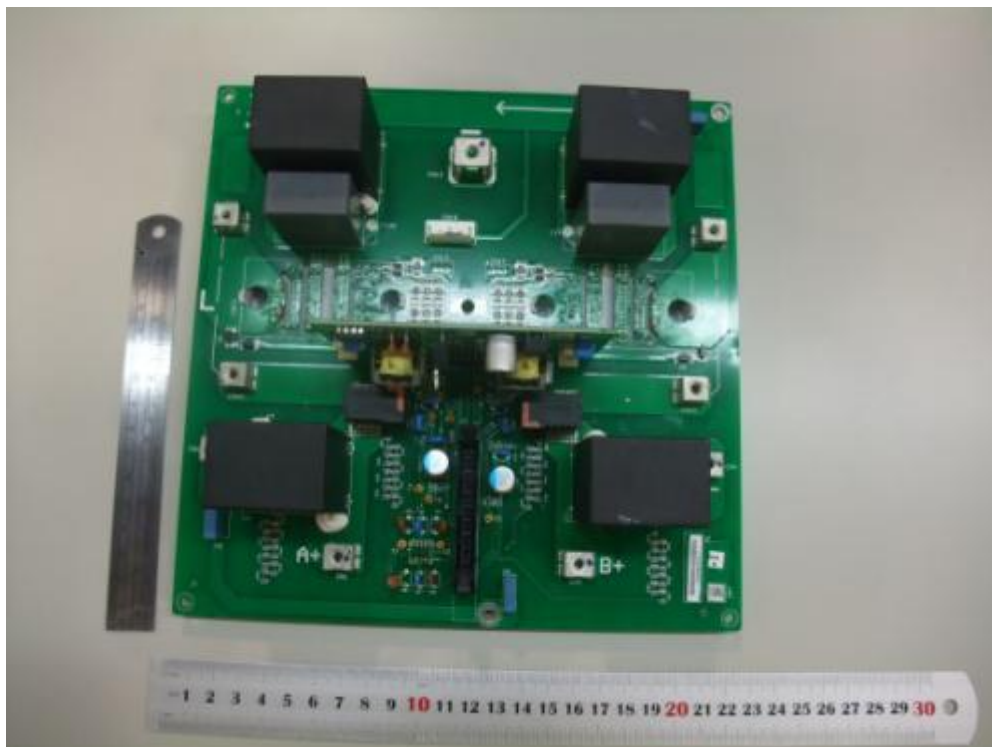
**PCB\_PVLP4 component side**



**PCB\_PVLP4 solder side**



**PCB\_PVLD4 component side**

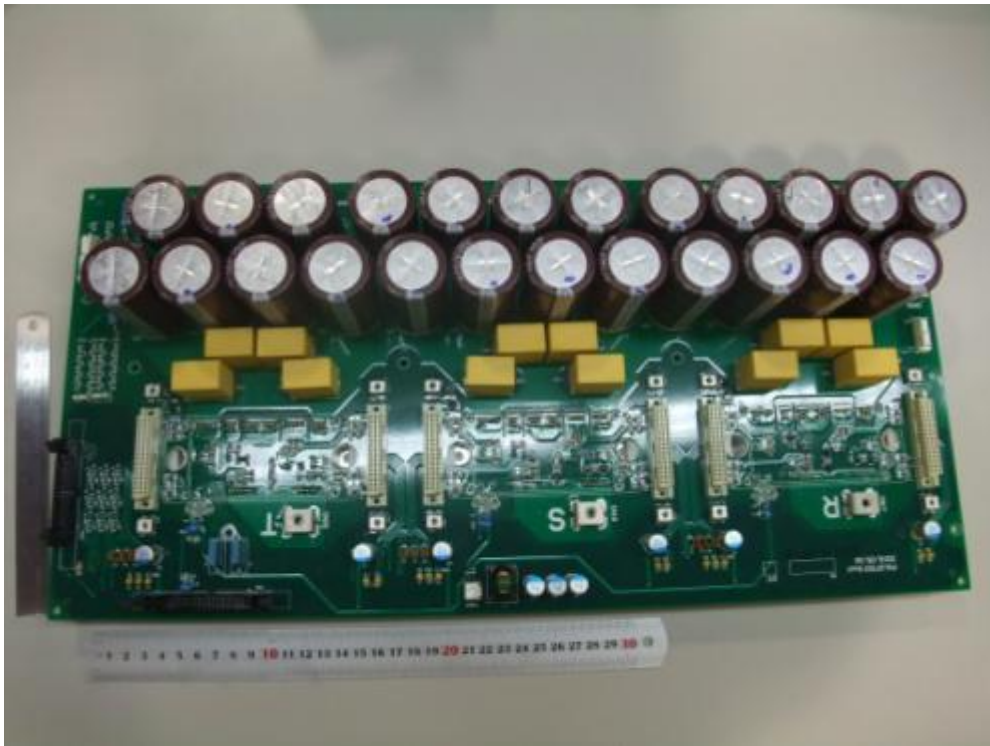


**PCB\_PVLD4 solder side**

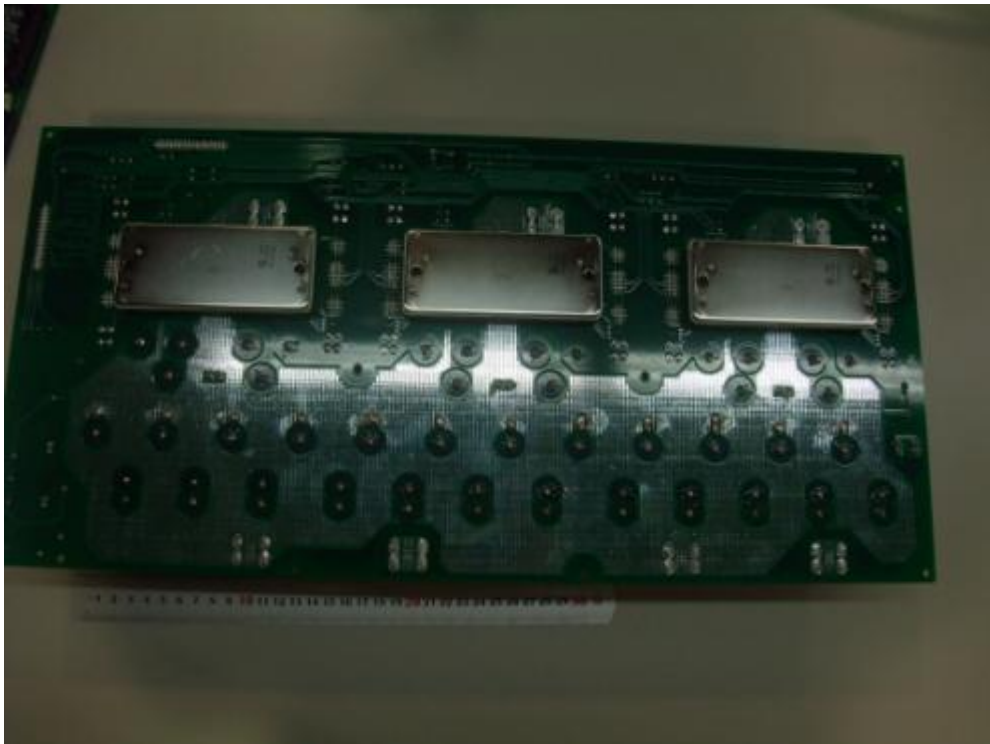




**PCB\_PVLD7 component side**



**PCB\_PVLD7 solder side**

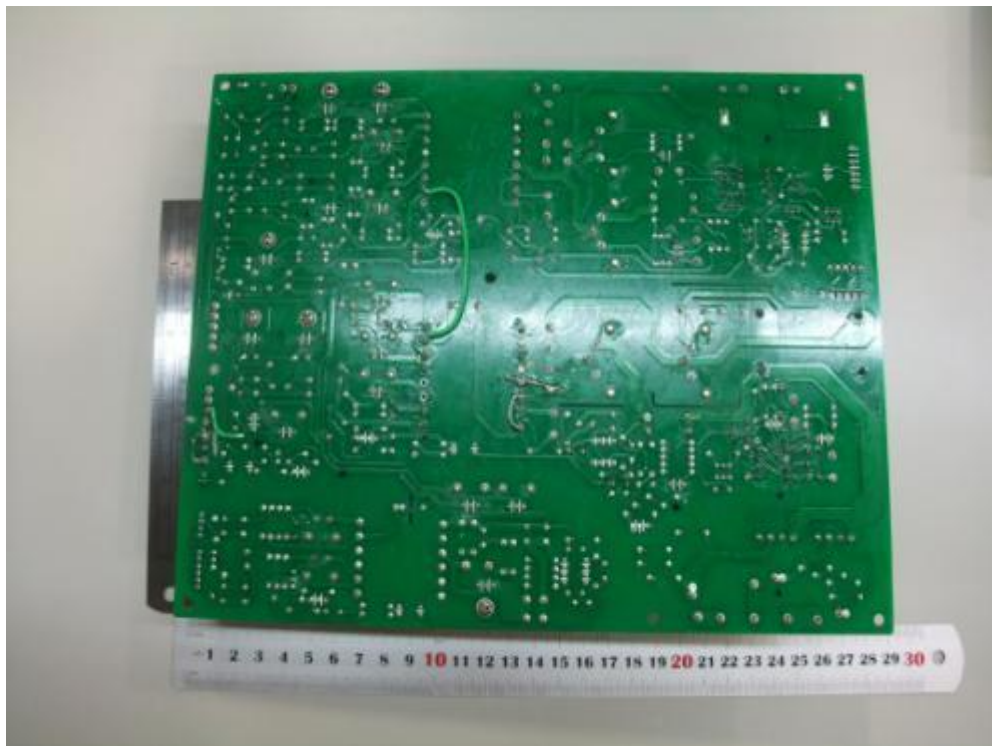




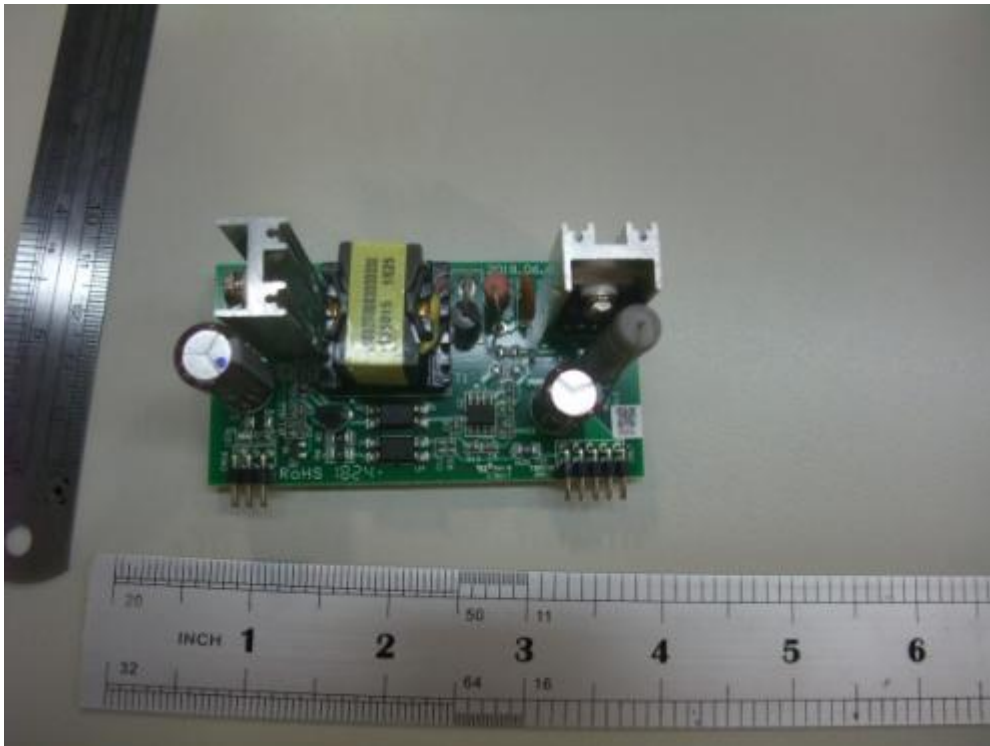
**PCB\_PVLP2 component side**



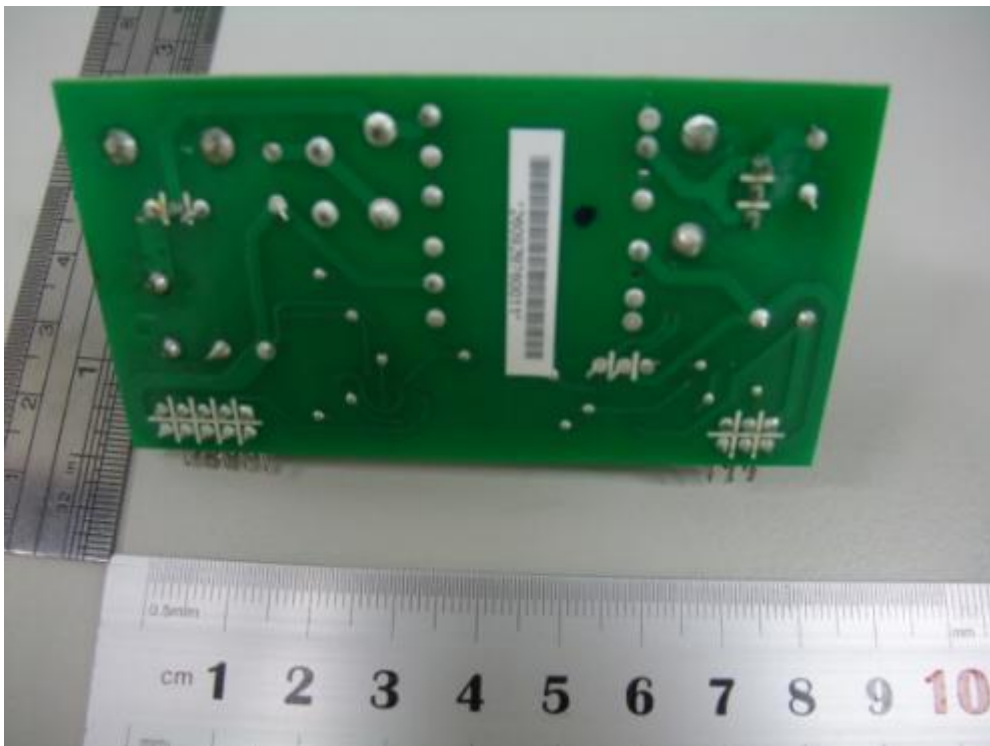
**PCB\_PVLP2 solder side**



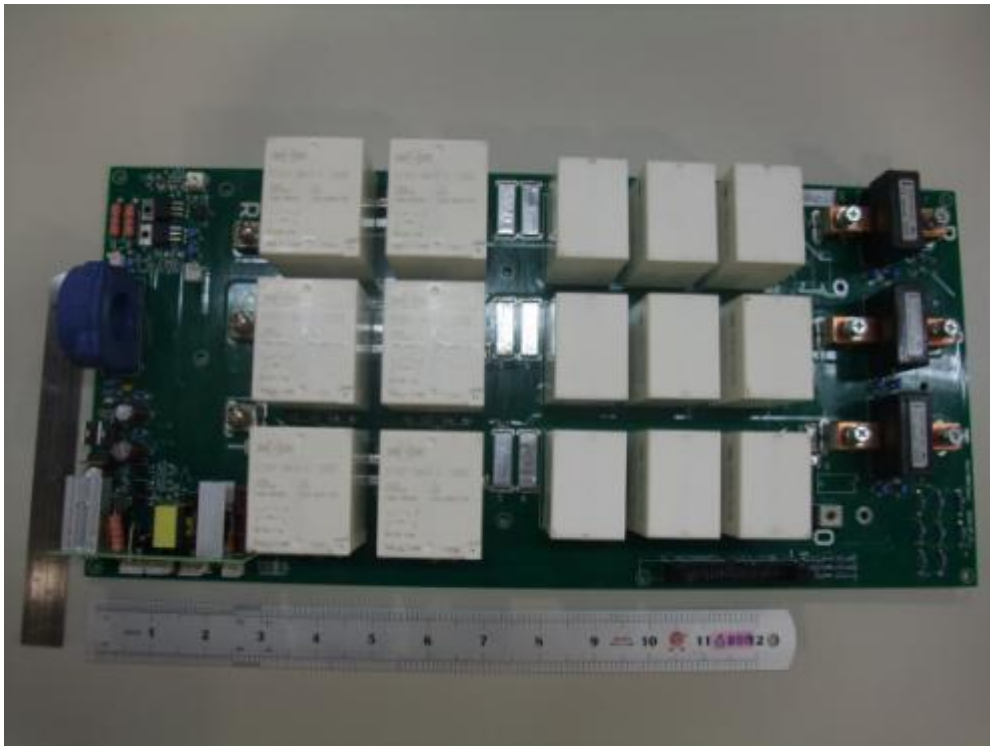
**PCB\_PVLP1 component side**



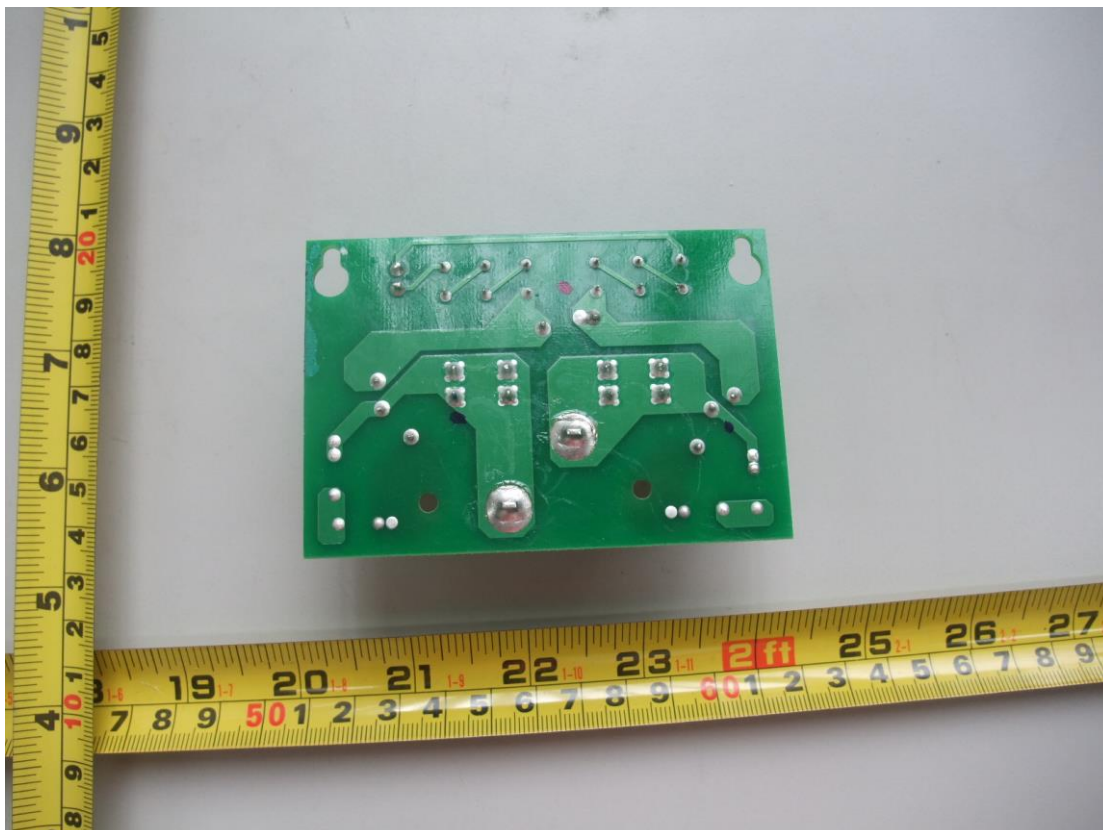
**PCB\_PVLP1 solder side**



**PCB\_PVLF30 component side**



**PCB\_PVLF30 solder side**



## **Annex 2**

### **Test equipment list**

<b>Testing Location:</b>	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
<b>Date(s) of performance test:</b>	2018-12-04

Equipment	Manufacturer	Type	Serial No.	Last Calibration
Thermo-Hygro Grapg	Isuzs	3-3127R	30360059	2018-06-13
Precision Power Analyzer	HIOKI	3390	100822876	2018-04-23
Current Transducer	HIOKI	2013	130302927	Combine calibration with HIOKI 3390
Current Transducer	HIOKI	2013	130302926	
Current Transducer	HIOKI	2013	130302925	
Programable DC Source	CHROMA	62150H-1000S	62150EF01541	Monitor by Power Analyzer
Programable DC Source	CHROMA	A620028	620028E00805	
Programable DC Source	CHROMA	62150H-1000S	615120000263	
Programable DC Source	CHROMA	A620028	620028E00801	
Programable DC Source	CHROMA	62150H-1000S	62150EF00857	
Programable DC Source	CHROMA	A620028	620028E00712	
Programable DC Source	CHROMA	62150H-1000S	62150EF01535	
Programable DC Source	CHROMA	A620028	620028E00713	
Programable AC Source	CHROMA	61860	618603800187	Monitor by Power Analyzer
Atmospheric pressure gauge	TESTO	TESTO 511	39108378	2017-06-09