



<b>Prüfbericht-Nr.:</b> 10050909 001 <i>Test Report No.:</i>		<b>Auftrags-Nr.:</b> 114036552 <i>Order No.:</i>		Seite 1 von 20 Page 1 of 20	
<b>Kunden-Referenz-Nr.:</b> 460972 <i>Client Reference No.:</i>		<b>Auftragsdatum:</b> Jun., 1, 2015 <i>Order date:</i>			
<b>Auftraggeber:</b> <i>Client:</i>		Ablerex Electronics Co., Ltd. No.3, Lane 7, Baogao Road, Xindian District, New Taipei City 23144, Taiwan (R.O.C)			
<b>Prüfgegenstand:</b> <i>Test item:</i>		Grid Tie PV Inverter			
<b>Bezeichnung / Typ-Nr.:</b> ES 25600HC <i>Identification / Type No.:</i>					
<b>Auftrags-Inhalt:</b> <i>Order content:</i>		TÜV Rheinland-Partial Test Report			
<b>Prüfgrundlage:</b> <i>Test specification:</i>		IEEE 519:1992			
<b>Wareneingangsdatum:</b> Jul., 30, 2015 <i>Date of receipt:</i>					
<b>Prüfmuster-Nr.:</b> A0000234792 <i>Test sample No.:</i>					
<b>Prüfzeitraum:</b> Aug., 27, 2015 – Aug., 28, 2015 <i>Testing period:</i>					
<b>Ort der Prüfung:</b> TÜV Rheinland Taiwan Ltd., <i>Place of testing:</i> Taichung Laboratory					
<b>Prüflaboratorium:</b> TÜV Rheinland Taiwan Ltd., <i>Testing laboratory:</i>					
<b>Prüfergebnis*:</b> Pass <i>Test result*:</i>					
<b>geprüft von / tested by:</b> 			<b>kontrolliert von / reviewed by:</b> 		
Sep., 11, 2015 Kyle Chan / Senior Project Manager			Sep., 11, 2015 Best Chen / Senior Manager		
<b>Datum</b> <i>Date</i>	<b>Name / Stellung</b> <i>Name / Position</i>	<b>Unterschrift</b> <i>Signature</i>	<b>Datum</b> <i>Date</i>	<b>Name / Stellung</b> <i>Name / Position</i>	<b>Unterschrift</b> <i>Signature</i>
<b>Sonstiges / Other:</b> Detail see next page.					
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> <i>Condition of the test item at delivery:</i>			<b>Prüfmuster vollständig und unbeschädigt</b> <i>Test item complete and undamaged</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable 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>					

<b>TEST REPORT</b> <b>IEEE 519:1992</b> <b>IEEE Recommended Practice and Requirements for Harmonic Control in Electric Power Systems</b>	
Report reference No. ....	: 10050909 001
Compiled by (+ signature).....	: See cover sheet
Approved by (+ signature).....	: See cover sheet
Date of issue .....	: See cover sheet
Testing laboratory.....	: TÜV Rheinland Taiwan Ltd., Taichung Laboratory.
Address .....	: No. 9, Ln. 36, Sec. 3, Minsheng Rd., Daya District, Taichung City 428, Taiwan
Testing location .....	: Same as above
Applicant.....	: Ablere Electronics Co., Ltd.
Address .....	: No.3, Lane 7, Baogao Road, Xindian District, New Taipei City 23144, Taiwan (R.O.C)
Standard .....	: IEEE 519:1992
Test Report Form No. ....	: IEEE519_A
TRF originator. ....	: TÜV Rheinland Taiwan Ltd., Taichung Laboratory.
Master TRF .....	: 07.2015
Copyright blank test report.....	: TÜV Rheinland Taiwan Ltd., Taichung Laboratory.
Test procedure .....	: TÜV Rheinland-Partial Test Report
Procedure deviation .....	: N/A
Non-standard test method .....	: N/A
Type of test object.....	: Grid Tie PV Inverter
Model/type reference .....	: ES 25600HC
Rating.....	DC Rated input: DC input voltage working range: 370-950Vdc, DC input voltage MPPT range: 580-800Vdc, DC Max. Input current/Tracker: 22.7Ax2 (2 tracker provided), DC Max. input voltage: 1000Vdc, DC Max. PV Isc/Tracker: 35Ax2 (2 tracker provided) AC Rated output: 230V, 50/60Hz, 37.1A, 25600VA, 3N/PE, PF max. 1 or 230V, 50Hz, 37.1A, 25600VA, 3N/PE, PF max. 1
Possible test case verdicts:	
- test case does not apply to the test object .....	: N/A
- test object does meet the requirement.....	: P(ass)
- test object does not meet the requirement.....	: Fail

**Copy of marking plate:**

MODEL NO.: ES 25600HC  
 DC-Input  
 Max. Input Voltage 1000Vdc  
 Working Voltage 370Vdc~950Vdc(MPP)  
 MPPT Voltage 580Vdc~800Vdc(MPPT)  
 Max. Input Current 2 x 22.7A  
 DC Max PV Isc. 35 A x 2  
 AC-Output  
 Rate Output Voltage 230Vac 50Hz,3N/PE  
 Rate Output Power 25600VA  
 Max. Output Current 37,1A  
 P.F range : max .1 Enclosure IP IP65  
 Protective class I Pollution Degree PD3  
 Ambient Temperature -25 °C ~ +60 °C  
 Overvoltage Category III (AC mains), II (PV side)  
 Altitude 0~6600 ft Complying with VDE-AR-N 4105  
 ABLEREX ELECTRONICS CO., LTD.



  
 MA3C013000001


MODEL NO.: ES 25600HC  
 DC-Input  
 Max. Input Voltage 1000Vdc  
 Working Voltage 370Vdc~950Vdc(MPP)  
 MPPT Voltage 580Vdc~800Vdc(MPPT)  
 Max. Input Current 2 x 22.7A  
 DC Max PV Isc. 35 A x 2  
 AC-Output  
 Rate Output Voltage 230Vac 50Hz/60Hz,3N/PE  
 Rate Output Power 25600VA  
 Max. Output Current 37,1A  
 P.F range : max .1 Enclosure IP IP65  
 Protective class I Pollution Degree PD3  
 Ambient Temperature -25 °C ~ +60 °C  
 Overvoltage Category III (AC mains), II (PV side)  
 Altitude 0~6600 ft  
 ABLEREX ELECTRONICS CO., LTD.


  
  
  



  
 MA3C013000001

**Caution (Achtung)**

 Risk of electric shock.  
 Risk eines elektrischen Schlages

 Risk of electric shock, Energy storage timed discharge.  
 3min30S

 Risiko eines elektrischen Schlages, Entladungszelt for gespeicherte Energie  
 3min30S

 Refer to the operating instruction.  
 Siehe Betriebsanleitung

Harmonic Current Limit Test				P
AC output power Watts		8541		
AC output power VA		8541		
Vrms		230.3		
Arms		37.1		
PF		0.99		
Frequency		60 Hz		
Order	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (%)
1 <sup>st</sup>	36.7828	—	R	—
2 <sup>nd</sup>	0.0649	0.1764	R	1%
3 <sup>rd</sup>	0.1617	0.4397	R	4%
4 <sup>th</sup>	0.0577	0.1568	R	1%
5 <sup>th</sup>	0.5798	1.5762	R	4%
6 <sup>th</sup>	0.0473	0.1287	R	1%
7 <sup>th</sup>	0.7968	2.1663	R	4%
8 <sup>th</sup>	0.0434	0.1180	R	1%
9 <sup>th</sup>	0.0392	0.1067	R	4%
10 <sup>th</sup>	0.0281	0.0764	R	1%
11 <sup>th</sup>	0.3421	0.9301	R	2%
12 <sup>th</sup>	0.0190	0.0516	R	0.5%
13 <sup>th</sup>	0.2306	0.6268	R	2%
14 <sup>th</sup>	0.0290	0.0789	R	0.5%
15 <sup>th</sup>	0.0235	0.0640	R	2%
16 <sup>th</sup>	0.0166	0.0451	R	0.5%
17 <sup>th</sup>	0.1587	0.4314	R	1.5%
18 <sup>th</sup>	0.0135	0.0368	R	0.375%
19 <sup>th</sup>	0.1076	0.2925	R	1.5%
20 <sup>th</sup>	0.0269	0.0730	R	0.375%
21 <sup>th</sup>	0.0152	0.0413	R	1.5%
22 <sup>th</sup>	0.0173	0.0469	R	0.375%
23 <sup>th</sup>	0.0870	0.2364	R	0.6%
24 <sup>th</sup>	0.0161	0.0439	R	0.15%
25 <sup>th</sup>	0.0606	0.1648	R	0.6%
26 <sup>th</sup>	0.0113	0.0306	R	0.15%
27 <sup>th</sup>	0.0118	0.0321	R	0.6%
28 <sup>th</sup>	0.0117	0.0317	R	0.15%
29 <sup>th</sup>	0.0493	0.1339	R	0.6%
30 <sup>th</sup>	0.0127	0.0345	R	0.15%
31 <sup>th</sup>	0.0390	0.1061	R	0.6%
32 <sup>th</sup>	0.0090	0.0246	R	0.15%
33 <sup>th</sup>	0.0071	0.0193	R	0.6%
34 <sup>th</sup>	0.0074	0.0201	R	0.15%
35 <sup>th</sup>	0.0326	0.0887	R	0.3%
36 <sup>th</sup>	0.0070	0.0190	R	0.075%

37 <sup>th</sup>	0.0291	0.0792	R	0.3%
38 <sup>th</sup>	0.0072	0.0197	R	0.075%
39 <sup>th</sup>	0.0082	0.0223	R	0.3%
40 <sup>th</sup>	0.0091	0.0247	R	0.075%
Total harmonic distortion		3.03%		5 %
Note:				

<b>AC output power Watts</b>		8607		
<b>AC output power VA</b>		8607		
<b>Vrms</b>		230.1		
<b>Arms</b>		37.4		
<b>PF</b>		0.99		
<b>Frequency</b>		60 Hz		
Order	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (%)
1 <sup>st</sup>	37.2295	—	S	—
2 <sup>nd</sup>	0.2684	0.7209	S	1%
3 <sup>rd</sup>	0.1370	0.3680	S	4%
4 <sup>th</sup>	0.0452	0.1215	S	1%
5 <sup>th</sup>	0.4949	1.3293	S	4%
6 <sup>th</sup>	0.0499	0.1341	S	1%
7 <sup>th</sup>	0.8155	2.1904	S	4%
8 <sup>th</sup>	0.0490	0.1316	S	1%
9 <sup>th</sup>	0.0287	0.0770	S	4%
10 <sup>th</sup>	0.0299	0.0802	S	1%
11 <sup>th</sup>	0.3111	0.8355	S	2%
12 <sup>th</sup>	0.0236	0.0633	S	0.5%
13 <sup>th</sup>	0.2480	0.6662	S	2%
14 <sup>th</sup>	0.0275	0.0738	S	0.5%
15 <sup>th</sup>	0.0188	0.0504	S	2%
16 <sup>th</sup>	0.0211	0.0568	S	0.5%
17 <sup>th</sup>	0.1378	0.3702	S	1.5%
18 <sup>th</sup>	0.0196	0.0526	S	0.375%
19 <sup>th</sup>	0.1208	0.3244	S	1.5%
20 <sup>th</sup>	0.0227	0.0609	S	0.375%
21 <sup>th</sup>	0.0155	0.0415	S	1.5%
22 <sup>th</sup>	0.0262	0.0703	S	0.375%
23 <sup>th</sup>	0.0765	0.2054	S	0.6%
24 <sup>th</sup>	0.0165	0.0444	S	0.15%
25 <sup>th</sup>	0.0700	0.1880	S	0.6%
26 <sup>th</sup>	0.0094	0.0253	S	0.15%
27 <sup>th</sup>	0.0102	0.0275	S	0.6%
28 <sup>th</sup>	0.0092	0.0247	S	0.15%
29 <sup>th</sup>	0.0442	0.1186	S	0.6%
30 <sup>th</sup>	0.0134	0.0359	S	0.15%
31 <sup>th</sup>	0.0446	0.1198	S	0.6%

32 <sup>th</sup>	0.0077	0.0206	S	0.15%
33 <sup>th</sup>	0.0076	0.0203	S	0.6%
34 <sup>th</sup>	0.0069	0.0185	S	0.15%
35 <sup>th</sup>	0.0305	0.0818	S	0.3%
36 <sup>th</sup>	0.0058	0.0155	S	0.075%
37 <sup>th</sup>	0.0338	0.0908	S	0.3%
38 <sup>th</sup>	0.0072	0.0193	S	0.075%
39 <sup>th</sup>	0.0081	0.0218	S	0.3%
40 <sup>th</sup>	0.0075	0.0202	S	0.075%
Total harmonic distortion		2.98%		5 %
Note:				

<b>AC output power Watts</b>		8539		
<b>AC output power VA</b>		8539		
<b>Vrms</b>		230.2		
<b>Arms</b>		37.1		
<b>PF</b>		0.99		
<b>Frequency</b>		60 Hz		
Order	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (%)
1 <sup>st</sup>	36.7748	—	T	—
2 <sup>nd</sup>	0.3073	0.8355	T	1%
3 <sup>rd</sup>	0.0538	0.1462	T	4%
4 <sup>th</sup>	0.0850	0.2311	T	1%
5 <sup>th</sup>	0.5199	1.4137	T	4%
6 <sup>th</sup>	0.0485	0.1318	T	1%
7 <sup>th</sup>	0.7647	2.0794	T	4%
8 <sup>th</sup>	0.0483	0.1314	T	1%
9 <sup>th</sup>	0.0384	0.1044	T	4%
10 <sup>th</sup>	0.0467	0.1271	T	1%
11 <sup>th</sup>	0.3335	0.9068	T	2%
12 <sup>th</sup>	0.0267	0.0725	T	0.5%
13 <sup>th</sup>	0.2247	0.6111	T	2%
14 <sup>th</sup>	0.0356	0.0967	T	0.5%
15 <sup>th</sup>	0.0227	0.0616	T	2%
16 <sup>th</sup>	0.0233	0.0633	T	0.5%
17 <sup>th</sup>	0.1552	0.4219	T	1.5%
18 <sup>th</sup>	0.0189	0.0514	T	0.375%
19 <sup>th</sup>	0.1112	0.3025	T	1.5%
20 <sup>th</sup>	0.0291	0.0791	T	0.375%
21 <sup>th</sup>	0.0176	0.0478	T	1.5%
22 <sup>th</sup>	0.0320	0.0871	T	0.375%
23 <sup>th</sup>	0.0920	0.2503	T	0.6%
24 <sup>th</sup>	0.0127	0.0346	T	0.15%
25 <sup>th</sup>	0.0615	0.1671	T	0.6%
26 <sup>th</sup>	0.0106	0.0287	T	0.15%

27 <sup>th</sup>	0.0098	0.0266	T	0.6%
28 <sup>th</sup>	0.0154	0.0418	T	0.15%
29 <sup>th</sup>	0.0520	0.1414	T	0.6%
30 <sup>th</sup>	0.0136	0.0370	T	0.15%
31 <sup>th</sup>	0.0398	0.1083	T	0.6%
32 <sup>th</sup>	0.0090	0.0244	T	0.15%
33 <sup>th</sup>	0.0085	0.0231	T	0.6%
34 <sup>th</sup>	0.0063	0.0170	T	0.15%
35 <sup>th</sup>	0.0337	0.0917	T	0.3%
36 <sup>th</sup>	0.0073	0.0198	T	0.075%
37 <sup>th</sup>	0.0289	0.0787	T	0.3%
38 <sup>th</sup>	0.0065	0.0178	T	0.075%
39 <sup>th</sup>	0.0090	0.0245	T	0.3%
40 <sup>th</sup>	0.0075	0.0204	T	0.075%
Total harmonic distortion		2.98%		5 %
Note:				

AC output power Watts		8489		
AC output power VA		8489		
Vrms		230.46		
Arms		36.85		
PF		0.99		
Frequency		50 Hz		
Order	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (%)
1 <sup>st</sup>	36.8325	—	R	—
2 <sup>nd</sup>	0.0777	0.2110	R	1%
3 <sup>rd</sup>	0.1747	0.4743	R	4%
4 <sup>th</sup>	0.0521	0.1414	R	1%
5 <sup>th</sup>	0.5474	1.4862	R	4%
6 <sup>th</sup>	0.0392	0.1065	R	1%
7 <sup>th</sup>	0.8023	2.1783	R	4%
8 <sup>th</sup>	0.0537	0.1458	R	1%
9 <sup>th</sup>	0.0565	0.1535	R	4%
10 <sup>th</sup>	0.0368	0.0998	R	1%
11 <sup>th</sup>	0.3685	1.0006	R	2%
12 <sup>th</sup>	0.0183	0.0497	R	0.5%
13 <sup>th</sup>	0.2615	0.7100	R	2%
14 <sup>th</sup>	0.0302	0.0820	R	0.5%
15 <sup>th</sup>	0.0267	0.0724	R	2%
16 <sup>th</sup>	0.0197	0.0536	R	0.5%
17 <sup>th</sup>	0.1614	0.4382	R	1.5%
18 <sup>th</sup>	0.0142	0.0385	R	0.375%
19 <sup>th</sup>	0.1168	0.3170	R	1.5%
20 <sup>th</sup>	0.0178	0.0482	R	0.375%
21 <sup>th</sup>	0.0196	0.0532	R	1.5%

22 <sup>th</sup>	0.0145	0.0395	R	0.375%
23 <sup>th</sup>	0.0743	0.2017	R	0.6%
24 <sup>th</sup>	0.0124	0.0336	R	0.15%
25 <sup>th</sup>	0.0599	0.1627	R	0.6%
26 <sup>th</sup>	0.0129	0.0351	R	0.15%
27 <sup>th</sup>	0.0200	0.0544	R	0.6%
28 <sup>th</sup>	0.0135	0.0367	R	0.15%
29 <sup>th</sup>	0.0414	0.1123	R	0.6%
30 <sup>th</sup>	0.0091	0.0248	R	0.15%
31 <sup>th</sup>	0.0331	0.0898	R	0.6%
32 <sup>th</sup>	0.0088	0.0239	R	0.15%
33 <sup>th</sup>	0.0098	0.0265	R	0.6%
34 <sup>th</sup>	0.0107	0.0290	R	0.15%
35 <sup>th</sup>	0.0224	0.0609	R	0.3%
36 <sup>th</sup>	0.0082	0.0222	R	0.075%
37 <sup>th</sup>	0.0171	0.0465	R	0.3%
38 <sup>th</sup>	0.0083	0.0224	R	0.075%
39 <sup>th</sup>	0.0080	0.0216	R	0.3%
40 <sup>th</sup>	0.0088	0.0238	R	0.075%
Total harmonic distortion		3.04%		5 %
Note:				

<b>AC output power Watts</b>		8527		
<b>AC output power VA</b>		8529		
<b>Vrms</b>		230.60		
<b>Arms</b>		37.00		
<b>PF</b>		0.99		
<b>Frequency</b>		50 Hz		
Order	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (%)
1 <sup>st</sup>	36.9825	—	S	—
2 <sup>nd</sup>	0.2053	0.5550	S	1%
3 <sup>rd</sup>	0.1111	0.3004	S	4%
4 <sup>th</sup>	0.0324	0.0877	S	1%
5 <sup>th</sup>	0.4833	1.3069	S	4%
6 <sup>th</sup>	0.0325	0.0880	S	1%
7 <sup>th</sup>	0.8140	2.2011	S	4%
8 <sup>th</sup>	0.0543	0.1467	S	1%
9 <sup>th</sup>	0.0563	0.1521	S	4%
10 <sup>th</sup>	0.0384	0.1039	S	1%
11 <sup>th</sup>	0.3546	0.9587	S	2%
12 <sup>th</sup>	0.0188	0.0508	S	0.5%
13 <sup>th</sup>	0.2708	0.7322	S	2%
14 <sup>th</sup>	0.0243	0.0656	S	0.5%
15 <sup>th</sup>	0.0202	0.0547	S	2%
16 <sup>th</sup>	0.0247	0.0668	S	0.5%



17 <sup>th</sup>	0.1460	0.3949	S	1.5%
18 <sup>th</sup>	0.0151	0.0407	S	0.375%
19 <sup>th</sup>	0.1207	0.3264	S	1.5%
20 <sup>th</sup>	0.0124	0.0335	S	0.375%
21 <sup>th</sup>	0.0145	0.0391	S	1.5%
22 <sup>th</sup>	0.0162	0.0437	S	0.375%
23 <sup>th</sup>	0.0687	0.1858	S	0.6%
24 <sup>th</sup>	0.0121	0.0328	S	0.15%
25 <sup>th</sup>	0.0616	0.1666	S	0.6%
26 <sup>th</sup>	0.0109	0.0294	S	0.15%
27 <sup>th</sup>	0.0216	0.0585	S	0.6%
28 <sup>th</sup>	0.0113	0.0305	S	0.15%
29 <sup>th</sup>	0.0396	0.1070	S	0.6%
30 <sup>th</sup>	0.0087	0.0236	S	0.15%
31 <sup>th</sup>	0.0336	0.0908	S	0.6%
32 <sup>th</sup>	0.0093	0.0251	S	0.15%
33 <sup>th</sup>	0.0090	0.0243	S	0.6%
34 <sup>th</sup>	0.0088	0.0237	S	0.15%
35 <sup>th</sup>	0.0224	0.0606	S	0.3%
36 <sup>th</sup>	0.0071	0.0192	S	0.075%
37 <sup>th</sup>	0.0179	0.0485	S	0.3%
38 <sup>th</sup>	0.0089	0.0242	S	0.075%
39 <sup>th</sup>	0.0079	0.0213	S	0.3%
40 <sup>th</sup>	0.0073	0.0198	S	0.075%
Total harmonic distortion		2.98%		5 %
Note:				

<b>AC output power Watts</b>		8536		
<b>AC output power VA</b>		8537		
<b>Vrms</b>		230.61		
<b>Arms</b>		37.04		
<b>PF</b>		0.99		
<b>Frequency</b>		50 Hz		
Order	Current Magnitude (A)	% of Fundamental	Phase	Harmonic Current Limits (%)
1 <sup>st</sup>	37.0081	—	T	—
2 <sup>nd</sup>	0.2251	0.6083	T	1%
3 <sup>rd</sup>	0.0987	0.2667	T	4%
4 <sup>th</sup>	0.0383	0.1034	T	1%
5 <sup>th</sup>	0.4964	1.3413	T	4%
6 <sup>th</sup>	0.0434	0.1172	T	1%
7 <sup>th</sup>	0.8140	2.1996	T	4%
8 <sup>th</sup>	0.0553	0.1494	T	1%
9 <sup>th</sup>	0.0310	0.0839	T	4%
10 <sup>th</sup>	0.0442	0.1194	T	1%
11 <sup>th</sup>	0.3486	0.9419	T	2%

12 <sup>th</sup>	0.0237	0.0640	T	0.5%
13 <sup>th</sup>	0.2715	0.7336	T	2%
14 <sup>th</sup>	0.0243	0.0656	T	0.5%
15 <sup>th</sup>	0.0217	0.0586	T	2%
16 <sup>th</sup>	0.0287	0.0775	T	0.5%
17 <sup>th</sup>	0.1466	0.3962	T	1.5%
18 <sup>th</sup>	0.0173	0.0468	T	0.375%
19 <sup>th</sup>	0.1226	0.3312	T	1.5%
20 <sup>th</sup>	0.0146	0.0394	T	0.375%
21 <sup>th</sup>	0.0175	0.0473	T	1.5%
22 <sup>th</sup>	0.0177	0.0477	T	0.375%
23 <sup>th</sup>	0.0715	0.1933	T	0.6%
24 <sup>th</sup>	0.0137	0.0371	T	0.15%
25 <sup>th</sup>	0.0619	0.1673	T	0.6%
26 <sup>th</sup>	0.0120	0.0323	T	0.15%
27 <sup>th</sup>	0.0215	0.0580	T	0.6%
28 <sup>th</sup>	0.0150	0.0404	T	0.15%
29 <sup>th</sup>	0.0419	0.1133	T	0.6%
30 <sup>th</sup>	0.0098	0.0264	T	0.15%
31 <sup>th</sup>	0.0347	0.0937	T	0.6%
32 <sup>th</sup>	0.0108	0.0292	T	0.15%
33 <sup>th</sup>	0.0098	0.0265	T	0.6%
34 <sup>th</sup>	0.0114	0.0309	T	0.15%
35 <sup>th</sup>	0.0205	0.0554	T	0.3%
36 <sup>th</sup>	0.0080	0.0216	T	0.075%
37 <sup>th</sup>	0.0170	0.0460	T	0.3%
38 <sup>th</sup>	0.0099	0.0268	T	0.075%
39 <sup>th</sup>	0.0072	0.0195	T	0.3%
40 <sup>th</sup>	0.0079	0.0213	T	0.075%
Total harmonic distortion		3.00%		5 %
Note:				

Harmonic Voltage Limit Test				P
Vrms		230Vac		
Frequency		60Hz		
Order	Voltage Magnitude (V)	% of Fundamental	Phase	Harmonic Current Limits (%)
1 <sup>st</sup>	230.250	--	R	—
2 <sup>nd</sup>	0.007	0.003	R	3%
3 <sup>rd</sup>	0.071	0.031	R	3%
4 <sup>th</sup>	0.007	0.003	R	3%
5 <sup>th</sup>	0.092	0.040	R	3%
6 <sup>th</sup>	0.012	0.005	R	3%
7 <sup>th</sup>	0.189	0.082	R	3%
8 <sup>th</sup>	0.013	0.006	R	3%
9 <sup>th</sup>	0.024	0.011	R	3%
10 <sup>th</sup>	0.015	0.006	R	3%
11 <sup>th</sup>	0.172	0.075	R	3%
12 <sup>th</sup>	0.013	0.006	R	3%
13 <sup>th</sup>	0.110	0.048	R	3%
14 <sup>th</sup>	0.014	0.006	R	3%
15 <sup>th</sup>	0.016	0.007	R	3%
16 <sup>th</sup>	0.014	0.006	R	3%
17 <sup>th</sup>	0.105	0.045	R	3%
18 <sup>th</sup>	0.026	0.011	R	3%
19 <sup>th</sup>	0.078	0.034	R	3%
20 <sup>th</sup>	0.045	0.020	R	3%
21 <sup>th</sup>	0.071	0.031	R	3%
22 <sup>th</sup>	0.016	0.007	R	3%
23 <sup>th</sup>	0.092	0.040	R	3%
24 <sup>th</sup>	0.034	0.015	R	3%
25 <sup>th</sup>	0.060	0.026	R	3%
26 <sup>th</sup>	0.019	0.008	R	3%
27 <sup>th</sup>	0.026	0.011	R	3%
28 <sup>th</sup>	0.017	0.007	R	3%
29 <sup>th</sup>	0.059	0.026	R	3%
30 <sup>th</sup>	0.015	0.006	R	3%
31 <sup>th</sup>	0.046	0.020	R	3%
32 <sup>th</sup>	0.018	0.008	R	3%
33 <sup>th</sup>	0.015	0.007	R	3%
34 <sup>th</sup>	0.017	0.007	R	3%
35 <sup>th</sup>	0.044	0.019	R	3%
36 <sup>th</sup>	0.014	0.006	R	3%
37 <sup>th</sup>	0.037	0.016	R	3%
38 <sup>th</sup>	0.015	0.006	R	3%
39 <sup>th</sup>	0.014	0.006	R	3%
40 <sup>th</sup>	0.019	0.008	R	3%

41 <sup>th</sup>	0.036	0.016	R	3%
42 <sup>th</sup>	0.014	0.006	R	3%
43 <sup>th</sup>	0.044	0.019	R	3%
44 <sup>th</sup>	0.021	0.009	R	3%
45 <sup>th</sup>	0.018	0.008	R	3%
46 <sup>th</sup>	0.019	0.008	R	3%
47 <sup>th</sup>	0.043	0.019	R	3%
48 <sup>th</sup>	0.018	0.008	R	3%
49 <sup>th</sup>	0.017	0.007	R	3%
Total harmonic distortion		0.165%		5%
Note:				

Vrms			230Vac	
Frequency			60Hz	
Order	Voltage Magnitude (V)	% of Fundamental	Phase	Harmonic Current Limits (%)
1 <sup>st</sup>	230.144	--	S	—
2 <sup>nd</sup>	0.027	0.012	S	3%
3 <sup>rd</sup>	0.032	0.014	S	3%
4 <sup>th</sup>	0.005	0.002	S	3%
5 <sup>th</sup>	0.087	0.038	S	3%
6 <sup>th</sup>	0.011	0.005	S	3%
7 <sup>th</sup>	0.193	0.084	S	3%
8 <sup>th</sup>	0.011	0.005	S	3%
9 <sup>th</sup>	0.026	0.011	S	3%
10 <sup>th</sup>	0.015	0.006	S	3%
11 <sup>th</sup>	0.160	0.069	S	3%
12 <sup>th</sup>	0.014	0.006	S	3%
13 <sup>th</sup>	0.119	0.052	S	3%
14 <sup>th</sup>	0.009	0.004	S	3%
15 <sup>th</sup>	0.017	0.007	S	3%
16 <sup>th</sup>	0.018	0.008	S	3%
17 <sup>th</sup>	0.091	0.039	S	3%
18 <sup>th</sup>	0.030	0.013	S	3%
19 <sup>th</sup>	0.082	0.036	S	3%
20 <sup>th</sup>	0.042	0.018	S	3%
21 <sup>th</sup>	0.075	0.033	S	3%
22 <sup>th</sup>	0.020	0.009	S	3%
23 <sup>th</sup>	0.089	0.039	S	3%
24 <sup>th</sup>	0.034	0.015	S	3%
25 <sup>th</sup>	0.069	0.030	S	3%
26 <sup>th</sup>	0.021	0.009	S	3%
27 <sup>th</sup>	0.031	0.013	S	3%
28 <sup>th</sup>	0.016	0.007	S	3%
29 <sup>th</sup>	0.049	0.021	S	3%
30 <sup>th</sup>	0.014	0.006	S	3%

31 <sup>th</sup>	0.051	0.022	S	3%
32 <sup>th</sup>	0.020	0.009	S	3%
33 <sup>th</sup>	0.019	0.008	S	3%
34 <sup>th</sup>	0.015	0.006	S	3%
35 <sup>th</sup>	0.045	0.019	S	3%
36 <sup>th</sup>	0.012	0.005	S	3%
37 <sup>th</sup>	0.043	0.019	S	3%
38 <sup>th</sup>	0.016	0.007	S	3%
39 <sup>th</sup>	0.019	0.008	S	3%
40 <sup>th</sup>	0.016	0.007	S	3%
41 <sup>th</sup>	0.038	0.016	S	3%
42 <sup>th</sup>	0.015	0.007	S	3%
43 <sup>th</sup>	0.055	0.024	S	3%
44 <sup>th</sup>	0.023	0.010	S	3%
45 <sup>th</sup>	0.021	0.009	S	3%
46 <sup>th</sup>	0.017	0.007	S	3%
47 <sup>th</sup>	0.040	0.018	S	3%
48 <sup>th</sup>	0.017	0.007	S	3%
49 <sup>th</sup>	0.023	0.010	S	3%
Total harmonic distortion		0.161%		5%
Note:				

Vrms			230Vac	
Frequency			60Hz	
Order	Voltage Magnitude (V)	% of Fundamental	Phase	Harmonic Current Limits (%)
1 <sup>st</sup>	230.224	--	T	—
2 <sup>nd</sup>	0.030	0.013	T	3%
3 <sup>rd</sup>	0.048	0.021	T	3%
4 <sup>th</sup>	0.013	0.005	T	3%
5 <sup>th</sup>	0.094	0.041	T	3%
6 <sup>th</sup>	0.018	0.008	T	3%
7 <sup>th</sup>	0.177	0.077	T	3%
8 <sup>th</sup>	0.015	0.006	T	3%
9 <sup>th</sup>	0.027	0.012	T	3%
10 <sup>th</sup>	0.019	0.008	T	3%
11 <sup>th</sup>	0.171	0.074	T	3%
12 <sup>th</sup>	0.018	0.008	T	3%
13 <sup>th</sup>	0.112	0.049	T	3%
14 <sup>th</sup>	0.012	0.005	T	3%
15 <sup>th</sup>	0.026	0.011	T	3%
16 <sup>th</sup>	0.017	0.008	T	3%
17 <sup>th</sup>	0.102	0.044	T	3%
18 <sup>th</sup>	0.029	0.012	T	3%
19 <sup>th</sup>	0.083	0.036	T	3%
20 <sup>th</sup>	0.051	0.022	T	3%

21 <sup>th</sup>	0.064	0.028	T	3%
22 <sup>th</sup>	0.018	0.008	T	3%
23 <sup>th</sup>	0.104	0.045	T	3%
24 <sup>th</sup>	0.029	0.013	T	3%
25 <sup>th</sup>	0.062	0.027	T	3%
26 <sup>th</sup>	0.022	0.010	T	3%
27 <sup>th</sup>	0.029	0.013	T	3%
28 <sup>th</sup>	0.014	0.006	T	3%
29 <sup>th</sup>	0.059	0.026	T	3%
30 <sup>th</sup>	0.014	0.006	T	3%
31 <sup>th</sup>	0.051	0.022	T	3%
32 <sup>th</sup>	0.014	0.006	T	3%
33 <sup>th</sup>	0.018	0.008	T	3%
34 <sup>th</sup>	0.015	0.007	T	3%
35 <sup>th</sup>	0.048	0.021	T	3%
36 <sup>th</sup>	0.014	0.006	T	3%
37 <sup>th</sup>	0.043	0.019	T	3%
38 <sup>th</sup>	0.015	0.006	T	3%
39 <sup>th</sup>	0.015	0.006	T	3%
40 <sup>th</sup>	0.019	0.008	T	3%
41 <sup>th</sup>	0.039	0.017	T	3%
42 <sup>th</sup>	0.016	0.007	T	3%
43 <sup>th</sup>	0.045	0.019	T	3%
44 <sup>th</sup>	0.018	0.008	T	3%
45 <sup>th</sup>	0.022	0.009	T	3%
46 <sup>th</sup>	0.018	0.008	T	3%
47 <sup>th</sup>	0.040	0.017	T	3%
48 <sup>th</sup>	0.019	0.008	T	3%
49 <sup>th</sup>	0.022	0.010	T	3%
Total harmonic distortion		0.163%		5%
Note:				

Vrms			230Vac	
Frequency			50Hz	
Order	Voltage Magnitude (V)	% of Fundamental	Phase	Harmonic Current Limits (%)
1 <sup>st</sup>	230.46	--	R	—
2 <sup>nd</sup>	0.016	0.007	R	3%
3 <sup>rd</sup>	0.068	0.029	R	3%
4 <sup>th</sup>	0.013	0.006	R	3%
5 <sup>th</sup>	0.109	0.048	R	3%
6 <sup>th</sup>	0.009	0.004	R	3%
7 <sup>th</sup>	0.139	0.060	R	3%
8 <sup>th</sup>	0.005	0.002	R	3%
9 <sup>th</sup>	0.022	0.010	R	3%
10 <sup>th</sup>	0.012	0.005	R	3%

11 <sup>th</sup>	0.123	0.053	R	3%
12 <sup>th</sup>	0.007	0.003	R	3%
13 <sup>th</sup>	0.086	0.037	R	3%
14 <sup>th</sup>	0.008	0.003	R	3%
15 <sup>th</sup>	0.010	0.004	R	3%
16 <sup>th</sup>	0.009	0.004	R	3%
17 <sup>th</sup>	0.082	0.036	R	3%
18 <sup>th</sup>	0.007	0.003	R	3%
19 <sup>th</sup>	0.056	0.024	R	3%
20 <sup>th</sup>	0.009	0.004	R	3%
21 <sup>th</sup>	0.009	0.004	R	3%
22 <sup>th</sup>	0.008	0.004	R	3%
23 <sup>th</sup>	0.051	0.022	R	3%
24 <sup>th</sup>	0.008	0.003	R	3%
25 <sup>th</sup>	0.044	0.019	R	3%
26 <sup>th</sup>	0.010	0.004	R	3%
27 <sup>th</sup>	0.015	0.007	R	3%
28 <sup>th</sup>	0.010	0.004	R	3%
29 <sup>th</sup>	0.035	0.015	R	3%
30 <sup>th</sup>	0.007	0.003	R	3%
31 <sup>th</sup>	0.030	0.013	R	3%
32 <sup>th</sup>	0.007	0.003	R	3%
33 <sup>th</sup>	0.011	0.005	R	3%
34 <sup>th</sup>	0.008	0.004	R	3%
35 <sup>th</sup>	0.023	0.010	R	3%
36 <sup>th</sup>	0.009	0.004	R	3%
37 <sup>th</sup>	0.017	0.007	R	3%
38 <sup>th</sup>	0.009	0.004	R	3%
39 <sup>th</sup>	0.008	0.003	R	3%
40 <sup>th</sup>	0.009	0.004	R	3%
41 <sup>th</sup>	0.013	0.006	R	3%
42 <sup>th</sup>	0.008	0.003	R	3%
43 <sup>th</sup>	0.012	0.005	R	3%
44 <sup>th</sup>	0.014	0.006	R	3%
45 <sup>th</sup>	0.009	0.004	R	3%
46 <sup>th</sup>	0.013	0.006	R	3%
47 <sup>th</sup>	0.014	0.006	R	3%
48 <sup>th</sup>	0.015	0.006	R	3%
49 <sup>th</sup>	0.018	0.008	R	3%
Total harmonic distortion		0.12%		5%
Note:				

Vrms		230Vac		
Frequency		50Hz		
Order	Voltage Magnitude (V)	% of Fundamental	Phase	Harmonic Current Limits (%)

1 <sup>st</sup>	230.60	--	S	—
2 <sup>nd</sup>	0.025	0.011	S	3%
3 <sup>rd</sup>	0.045	0.020	S	3%
4 <sup>th</sup>	0.008	0.003	S	3%
5 <sup>th</sup>	0.098	0.043	S	3%
6 <sup>th</sup>	0.005	0.002	S	3%
7 <sup>th</sup>	0.142	0.061	S	3%
8 <sup>th</sup>	0.005	0.002	S	3%
9 <sup>th</sup>	0.028	0.012	S	3%
10 <sup>th</sup>	0.012	0.005	S	3%
11 <sup>th</sup>	0.120	0.052	S	3%
12 <sup>th</sup>	0.006	0.002	S	3%
13 <sup>th</sup>	0.090	0.039	S	3%
14 <sup>th</sup>	0.006	0.003	S	3%
15 <sup>th</sup>	0.011	0.005	S	3%
16 <sup>th</sup>	0.011	0.005	S	3%
17 <sup>th</sup>	0.070	0.030	S	3%
18 <sup>th</sup>	0.007	0.003	S	3%
19 <sup>th</sup>	0.059	0.026	S	3%
20 <sup>th</sup>	0.007	0.003	S	3%
21 <sup>th</sup>	0.016	0.007	S	3%
22 <sup>th</sup>	0.009	0.004	S	3%
23 <sup>th</sup>	0.043	0.018	S	3%
24 <sup>th</sup>	0.009	0.004	S	3%
25 <sup>th</sup>	0.045	0.020	S	3%
26 <sup>th</sup>	0.008	0.004	S	3%
27 <sup>th</sup>	0.014	0.006	S	3%
28 <sup>th</sup>	0.012	0.005	S	3%
29 <sup>th</sup>	0.027	0.012	S	3%
30 <sup>th</sup>	0.008	0.003	S	3%
31 <sup>th</sup>	0.031	0.013	S	3%
32 <sup>th</sup>	0.009	0.004	S	3%
33 <sup>th</sup>	0.008	0.003	S	3%
34 <sup>th</sup>	0.010	0.004	S	3%
35 <sup>th</sup>	0.014	0.006	S	3%
36 <sup>th</sup>	0.009	0.004	S	3%
37 <sup>th</sup>	0.018	0.008	S	3%
38 <sup>th</sup>	0.011	0.005	S	3%
39 <sup>th</sup>	0.008	0.004	S	3%
40 <sup>th</sup>	0.010	0.004	S	3%
41 <sup>th</sup>	0.010	0.004	S	3%
42 <sup>th</sup>	0.007	0.003	S	3%
43 <sup>th</sup>	0.015	0.006	S	3%
44 <sup>th</sup>	0.014	0.006	S	3%
45 <sup>th</sup>	0.010	0.004	S	3%

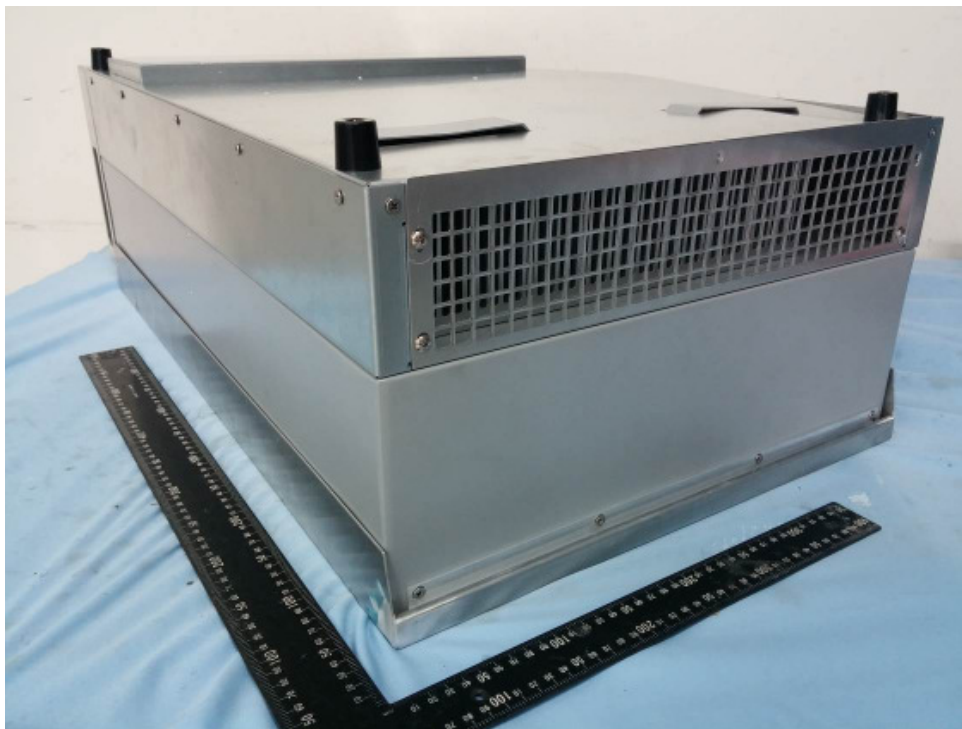


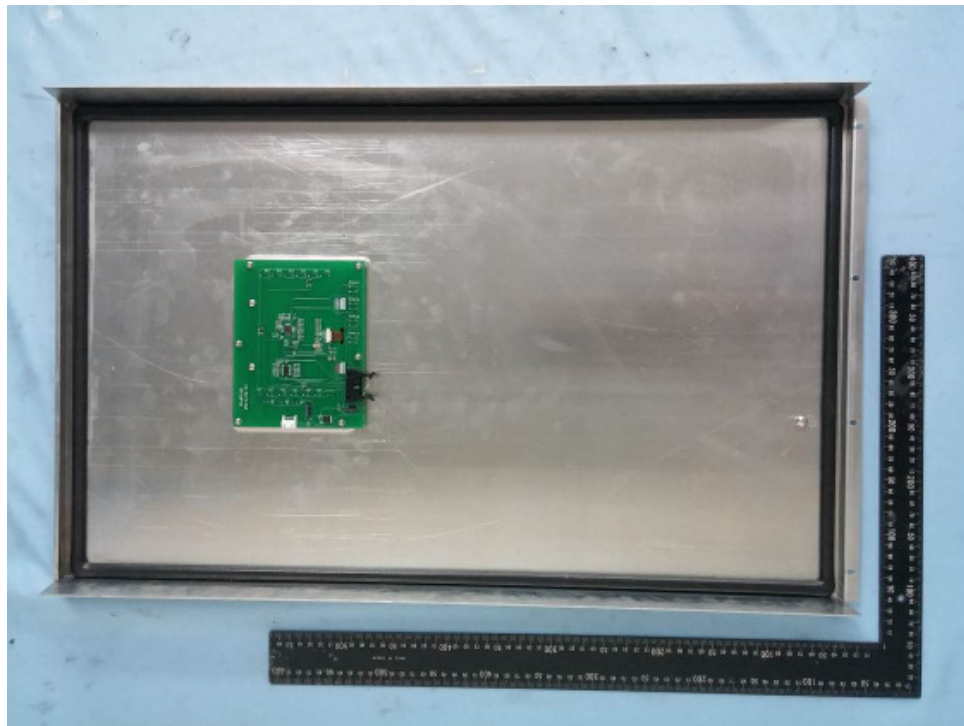
46 <sup>th</sup>	0.012	0.005	S	3%
47 <sup>th</sup>	0.013	0.006	S	3%
48 <sup>th</sup>	0.013	0.006	S	3%
49 <sup>th</sup>	0.019	0.008	S	3%
Total harmonic distortion		0.12%		5%
Note:				

Vrms			230Vac	
Frequency			50Hz	
Order	Voltage Magnitude (V)	% of Fundamental	Phase	Harmonic Current Limits (%)
1 <sup>st</sup>	230.61	--	T	—
2 <sup>nd</sup>	0.025	0.011	T	3%
3 <sup>rd</sup>	0.043	0.019	T	3%
4 <sup>th</sup>	0.008	0.004	T	3%
5 <sup>th</sup>	0.103	0.045	T	3%
6 <sup>th</sup>	0.005	0.002	T	3%
7 <sup>th</sup>	0.140	0.061	T	3%
8 <sup>th</sup>	0.005	0.002	T	3%
9 <sup>th</sup>	0.018	0.008	T	3%
10 <sup>th</sup>	0.013	0.006	T	3%
11 <sup>th</sup>	0.116	0.050	T	3%
12 <sup>th</sup>	0.007	0.003	T	3%
13 <sup>th</sup>	0.090	0.039	T	3%
14 <sup>th</sup>	0.007	0.003	T	3%
15 <sup>th</sup>	0.013	0.006	T	3%
16 <sup>th</sup>	0.013	0.006	T	3%
17 <sup>th</sup>	0.071	0.031	T	3%
18 <sup>th</sup>	0.010	0.004	T	3%
19 <sup>th</sup>	0.060	0.026	T	3%
20 <sup>th</sup>	0.008	0.003	T	3%
21 <sup>th</sup>	0.019	0.008	T	3%
22 <sup>th</sup>	0.010	0.005	T	3%
23 <sup>th</sup>	0.046	0.020	T	3%
24 <sup>th</sup>	0.008	0.003	T	3%
25 <sup>th</sup>	0.046	0.020	T	3%
26 <sup>th</sup>	0.010	0.004	T	3%
27 <sup>th</sup>	0.016	0.007	T	3%
28 <sup>th</sup>	0.015	0.006	T	3%
29 <sup>th</sup>	0.030	0.013	T	3%
30 <sup>th</sup>	0.011	0.005	T	3%
31 <sup>th</sup>	0.034	0.015	T	3%
32 <sup>th</sup>	0.010	0.005	T	3%
33 <sup>th</sup>	0.010	0.004	T	3%
34 <sup>th</sup>	0.011	0.005	T	3%
35 <sup>th</sup>	0.017	0.007	T	3%

36 <sup>th</sup>	0.011	0.005	T	3%
37 <sup>th</sup>	0.017	0.008	T	3%
38 <sup>th</sup>	0.010	0.004	T	3%
39 <sup>th</sup>	0.010	0.004	T	3%
40 <sup>th</sup>	0.011	0.005	T	3%
41 <sup>th</sup>	0.012	0.005	T	3%
42 <sup>th</sup>	0.009	0.004	T	3%
43 <sup>th</sup>	0.012	0.005	T	3%
44 <sup>th</sup>	0.018	0.008	T	3%
45 <sup>th</sup>	0.013	0.005	T	3%
46 <sup>th</sup>	0.011	0.005	T	3%
47 <sup>th</sup>	0.012	0.005	T	3%
48 <sup>th</sup>	0.012	0.005	T	3%
49 <sup>th</sup>	0.015	0.006	T	3%
Total harmonic distortion		0.12%		5%
Note:				

**Photos:**





END of Test Report

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