





<b>Amendment to Test Report</b> <b>This Amendment is valid only together with the main Test Report</b>	
<b>Report No .</b> .....	<b>270272</b>
<b>Main Report No .</b> .....	<b>246038</b>
<b>Date of issue</b> .....	<b>September 23, 2014</b>
<b>Total number of pages</b> .....	<b>6</b>
<b>Applicant's Name</b> .....	<b>Power Integrations, Inc.</b>
<b>Address</b> .....	<b>5245 Hellyer Avenue, San Jose, CA 95138, U.S.A.</b>
<b>Test specification</b>	
<b>Standard</b> .....	<b>IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013 with CTL Decision, DSH 1080</b>
<b>Test procedure</b> .....	<b>CB scheme</b>
<b>Non-standard test method</b> .....	<b>N/A</b>
<b>Copyright © 2010 Worldwide System for Conformity Testing and Certification of Electrotechnical Equipment and Components (IECEE), Geneva, Switzerland. All rights reserved.</b>  This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.  If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.  <b>This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.</b>	
<b>Test item description</b> .....	<b>IC including capacitor discharge function (ICX)</b>
<b>Trade Mark</b> .....	<b>CAPZero</b>
<b>Manufacturer</b> .....	<b>Power Integrations, Inc.</b>
<b>Model/Type reference</b> .....	<b>CAP002DG; CAP003DG; CAP004DG; CAP005DG; CAP006DG; CAP007DG; CAP008DG; CAP009DG; CAP012DG; CAP013DG; CAP014DG; CAP015DG; CAP016DG; CAP017DG; CAP018DG; CAP019DG; SC1143</b>
<b>Ratings</b> .....	<b>230V AC nominal (tested for 85-265V AC, 47-63Hz)</b>

<b>Testing procedure and testing location:</b>		
<input checked="" type="checkbox"/>	<b>CB Testing Laboratory:</b>	Nemko A/S
<b>Testing location/ address .....</b>		Gaustadalléen 30, NO - 0373 Oslo, Norway
<input type="checkbox"/>	<b>Associated CB Laboratory:</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name + signature) .....</b>		Ole Morten Aaslund 
<b>Approved by (name + signature) ..</b>		Hans-Eirik Lie 
<input type="checkbox"/>	<b>Testing procedure: TMP</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name + signature) .....</b>		
<b>Approved by (name + signature) ..</b>		
<input type="checkbox"/>	<b>Testing procedure: WMT</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name + signature) .....</b>		
<b>Witnessed by (name + signature) ..</b>		
<b>Approved by (name + signature) ..</b>		
<input type="checkbox"/>	<b>Testing procedure: SMT</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name + signature) .....</b>		
<b>Approved by (name + signature) ..</b>		
<b>Supervised by (name + signature) :</b>		
<input type="checkbox"/>	<b>Testing procedure: RMT</b>	
<b>Testing location/ address .....</b>		
<b>Tested by (name + signature) .....</b>		
<b>Approved by (name + signature) ..</b>		
<b>Supervised by (name + signature) :</b>		

**List of Attachments (including a total number of pages in each attachment):**

Photos (2 pages)

**Summary of testing:**

The following additional tests were performed as per *DSH 1080* due to the introduction of different minimum and maximum X-capacitance and resistance values:

- 100 positive impulses and 100 negative impulses between line and neutral using a capacitor with the largest capacitance and a resistor with the smallest resistance specified by the manufacturer of the ICX; and repeated with a capacitor with the smallest capacitance and the resistor with the largest resistance. The time between any two impulses shall not be less than 1 s. The impulse shall be as specified in circuit 2 of Table N.1 (60950-1) / 1.2/50 $\mu$ s in Table K.1 (60065), with  $U_c$  equal to the transient voltage.

Impulse tests as described performed on models CAP002DG, CAP009DG, CAP012DG and CAP019DG.  $U_c = 2500V_{peak}$ .

- 10 000 cycles of power on and off using a capacitor with the smallest capacitance and a resistor with the largest resistance as specified by the manufacturer of ICX. The power on and off cycles time shall not be less than 1 s.

10 000 cycles of power on and off (cycle time is 1 s) performed on models CAP002DG and CAP012DG.

After above additional tests the capacitor discharge tests were performed according to clause 2.1.1.7 on models CAP002DG, CAP009DG, CAP012DG and CAP019DG. The circuit tested continue to comply with 2.1.1.7, refer 2.1.1.7 for details. Note that compliance with 2.1.1.7 must also be checked when the ICX forms part of an end product.

**Tests performed (name of test and test clause):**

2.1.1.7 Discharge of capacitors in equipment

**Testing location:**

Nemko A/S  
Gaustadalléen 30, NO-0373 Oslo, Norway

**Summary of compliance with National Differences**

Samples tested comply with the applicable requirements covered by CTL Decision, DSH 1080.

**Copy of marking plate**

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Refer main report.

<b>Calibration</b>	All instruments used in the tests given in this test report are calibrated and traceable to national or international standards. Further information about traceability will be given on request.
<b>Measurement uncertainty</b>	Measurement uncertainties are calculated for all instruments and instrument set-ups given in this report. Calculations are based on the principles given in the standard EA-4/02 (Dec. 1999), IEC Guide 115:2007 and other relevant internal Nemko-procedures. Further information about measurement uncertainties will be given on request.
<b>Evaluation of results</b>	If not explicitly stated otherwise in the standard, the test is passed if the measured value is equal to or below (above) the limit line, regardless of the measurement uncertainty. If the measured value is above (below) the limit line, the test is not passed - ref IEC Guide 115:2007. The instrumentation accuracy is within limits agreed by IECEE-CTL.

**Possible test case verdicts:**

- test case does not apply to the test object ..... : Not Applicable (N/A)

- test object does meet the requirement..... : Pass (P)

- test object does not meet the requirement ..... : Fail (F)

**Testing** ..... :

**Date of receipt of test item** ..... : September 17, 2014

**Date(s) of performance of tests** ..... : September 17 – September 23, 2014

**General remarks:**

The test results presented in this report relate only to the object tested.  
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.  
"(see Enclosure #)" refers to additional information appended to the report.  
"(see appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

**Manufacturer's Declaration per sub-clause 6.2.5 of IECEE 02:**

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... : ☐ Yes ☒ Not applicable

When differences exist; they shall be identified in the General product information section.

**Name and address of factory (ies)** ..... : Millenium Microtech Shanghai  
No. 351 Guo Shou Jing Rd., Z.J. Hi Tech Park  
Pudong New Area, Shanghai,  
201203 CHINA

### General product information:

The update concerned in this amendment report covers the introduction of different minimum and maximum X-capacitance and resistance values as follows:

X-capacitance: Min. 100nF, max. 6μF

Resistance: Min. 142kΩ, max. 7.5MΩ

In addition it covers update to included Amd 2:2013 of IEC 60950-1(ed2).

Models covered by this amendment report are listed in table below. Models CAP002DG, CAP009DG, CAP012DG and CAP019DG were chosen to represent all models. During testing the ICX was mounted on a PCB together with a mains fuse (1A), X-capacitor and discharge resistors, refer attached photos. Values of X-capacitor and discharge resistors are as per recommendation from the manufacturer. Refer table below.

Model/Part No. (ICX)	BV <sub>DSS</sub>	Total X-capacitance - range	Total series resistance - range (R1+R2)
CAP002DG	825V	100nF–600nF	7.5MΩ–1.42MΩ
CAP003DG	825V	100nF–900nF	7.5MΩ–970kΩ
CAP004DG	825V	100nF–1.2μF	7.5MΩ–740kΩ
CAP005DG	825V	100nF–1.8μF	7.5MΩ–456kΩ
CAP006DG	825V	100nF–2.4μF	7.5MΩ–342kΩ
CAP007DG	825V	100nF–3.0μF	7.5MΩ–285kΩ
CAP008DG	825V	100nF–4.2μF	7.5MΩ–190kΩ
CAP009DG	825V	100nF–6μF	7.5MΩ–142kΩ
CAP012DG	1000V	100nF–600nF	7.5MΩ–1.42MΩ
CAP013DG	1000V	100nF–900nF	7.5MΩ–970kΩ
CAP014DG	1000V	100nF 1.2μF	7.5MΩ–740kΩ
CAP015DG	1000V	100nF–1.8μF	7.5MΩ–456kΩ
CAP016DG	1000V	100nF–2.4μF	7.5MΩ–342kΩ
CAP017DG	1000V	100nF–3.0μF	7.5MΩ–285kΩ
CAP018DG	1000V	100nF–4.2μF	7.5MΩ–190kΩ
CAP019DG	1000V	100nF–6μF	7.5MΩ–142kΩ
SC1143	1000V	100nF–6μF	7.5MΩ–142kΩ

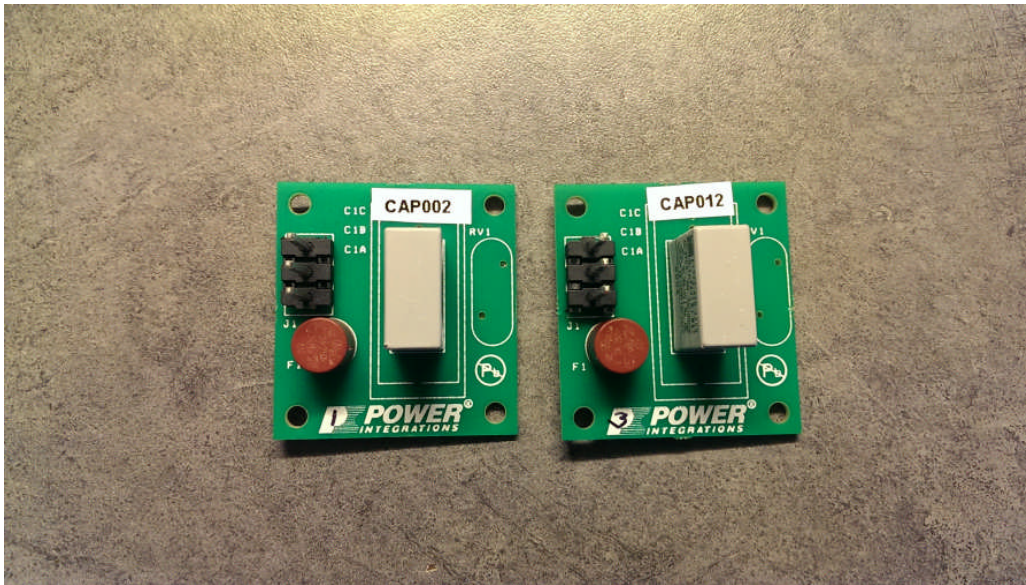
Project history:		
Nemko Report/ Order No.:	Modification to the appliances:	Changes/ Modifications in clause(s):
246038	Main Test Report	N/A
247613	Adding of voltage and frequency range; 85-265V AC, 47-63Hz.  Note that DSH 1080 only covers Installation Category II (2.5kV transients), and end products using the ICX covered by this report must follow the same Installation Category.	Summary of testing, Test items particulars, General product information, 2.1.1.7
270272	Introduction of different minimum and maximum X-capacitance and resistance values: X-capacitance: Min. 100nF, max. 6µF Resistance: Min. 142kΩ, max. 7.5MΩ Refer also General product information.  Upgrade to include Amd 2:2013 of IEC 60950-1(ed2).	Summary of testing, General product information, 2.1.1.7

2.1.1.7	Discharge of capacitors in equipment	Capacitor discharge tests performed on models CAP002DG, CAP009DG, CAP012DG and CAP019DG after tests described in Summary of testing were performed. Refer test results below. Discharge tests must also be performed when the ICX forms part of an end product.	P
	Measured voltage (V); time-constant (s) .....:	CAP002DG: Vpeak: 358V Vpeak, 37%: 132.5V Time-constant: 745ms CAP009DG: Vpeak: 352V Vpeak, 37%: 130.2 V Time-constant: 829ms CAP012DG: Vpeak: 356V Vpeak, 37%: 131.7V Time-constant: 738ms CAP019DG: Vpeak: 355V Vpeak, 37%: 131.4V Time-constant: 844ms	—

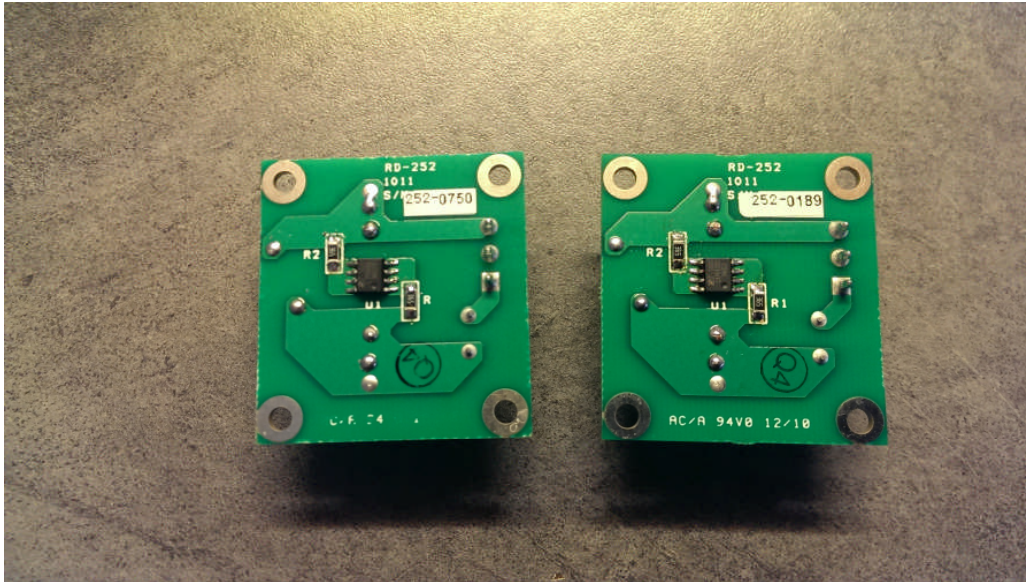


## Photos

Report No. 270272



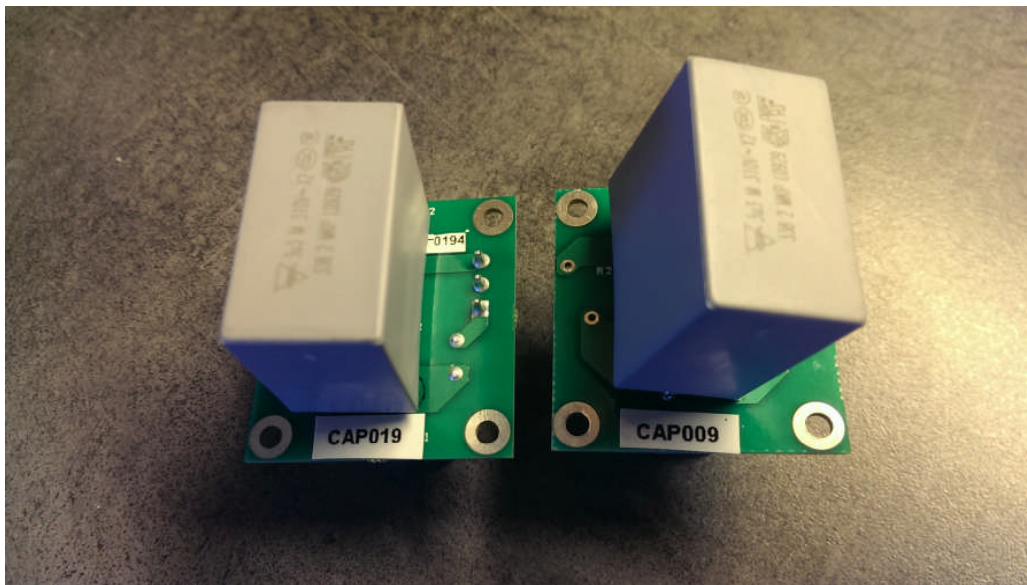
Test board of CAP002DG and CAP012DG



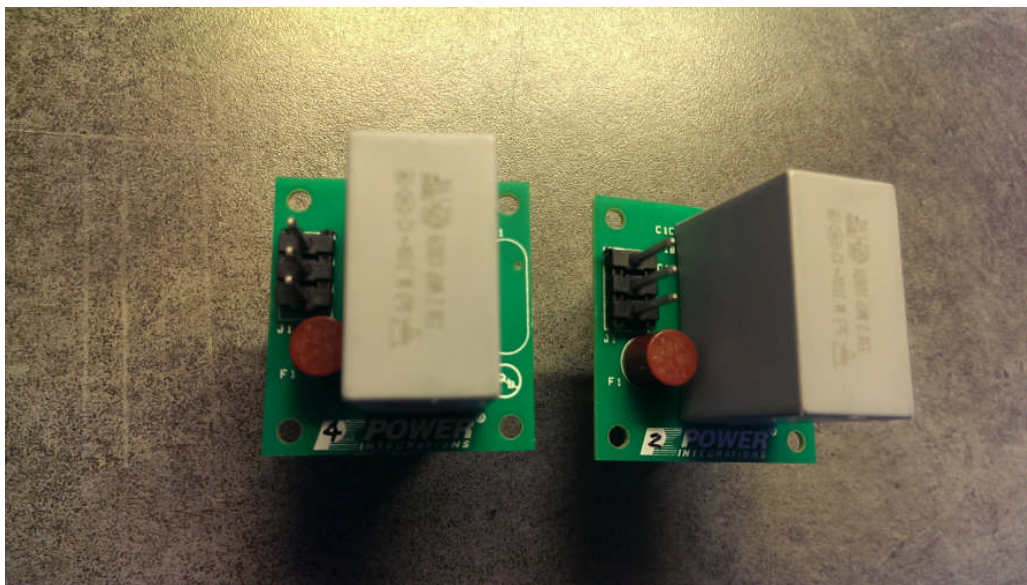
Test board of CAP002DG and CAP012DG

## Photos

Report No. 270272



Test board of CAP009DG and CAP019DG



Test board of CAP009DG and CAP019DG