





Amendment to Test Report	
This Amendment is valid only together with the main Test Report	
Report No	247613
Main Report No	246038
Date of issue	November 5, 2013
Total number of pages	7
Applicant's Name	Power Integrations, Inc.
Address	5245 Hellyer Avenue, San Jose, CA 95138, U.S.A.
Test specification	
Standard	IEC 60950-1:2005 (Second Edition) + Am 1:2009 with CTL Decision, DSH 1080
Test procedure	CB scheme
Non-standard test method	N/A
<p>Copyright © 2010 Worldwide System for Conformity Testing and Certification of Electrotechnical Equipment and Components (IECEE), Geneva, Switzerland. All rights reserved.</p> <p>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.</p> <p>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.</p> <p>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.</p>	
Test item description	IC including capacitor discharge function (ICX)
Trade Mark	CAPZero
Manufacturer	Power Integrations, Inc.
Model/Type reference	CAP002DG; CAP003DG; CAP004DG; CAP005DG; CAP006DG; CAP007DG; CAP008DG; CAP009DG; CAP012DG; CAP013DG; CAP014DG; CAP015DG; CAP016DG; CAP017DG; CAP018DG; CAP019DG; SC1143
Ratings	230V AC nominal (tested for 85-265V AC, 47-63Hz)

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

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

N/A

Summary of testing:

The following additional tests were performed as per *DSH 1080* due to adding of voltage and frequency range (85-265V AC, 47-63Hz):

- *Application of an a.c. voltage that is 110% of the rated voltage for 2.5 minutes.*

Test voltage used: 265V AC as declared by the manufacturer.

A voltage of 265V AC was applied for 2.5 minutes on models CAP002DG, CAP009DG, CAP012DG and CAP019DG.

- *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. Tests performed twice; with 85V AC and 265V AC input voltage. CAP002DG and CAP012DG were tested with both input voltages.

If any of the associated circuitry components other than those critical for the discharge function fails, it may be replaced with a new component.

No components failed during above tests.

Compliance criteria:

Compliance is checked by evaluation of the available data or by conducting the above tests. The capacitor discharge test is conducted after above tests, ensuring the ICX or the EUT provided with the ICX continues to provide the safeguard function.

NOTE: Evaluation of available data should include information of failure of any associated circuitry components keeps the discharge modes in the on/stay mode.

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.

In addition to above tests, evaluation of available data from the manufacturer have been made to prove that the discharge function of the ICX remains the same also during single fault conditions. Refer general product information and clause 5.3.7 in main report for details.

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.

Calibration	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.
Measurement uncertainty	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.
Evaluation of results	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 IECCEE-CTL.

Test item particulars:	
Equipment mobility	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> stationary <input checked="" type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in
Connection to the mains.....	<input type="checkbox"/> pluggable equipment <input type="checkbox"/> type A <input type="checkbox"/> type B <input type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input type="checkbox"/> not directly connected to the mains
Operating condition.....	Must be evaluated in the end product. <input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
Access location	<input checked="" type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location
Over voltage category (OVC)	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other: 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.
Mains supply tolerance (%) or absolute mains supply values	Additionally tested for 85-265V AC according to DSH 1080
Tested for IT power systems	<input type="checkbox"/> Yes <input type="checkbox"/> No Not applicable for this type of component.
IT testing, phase-phase voltage (V)	230V nominal
Class of equipment	<input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input checked="" type="checkbox"/> Not classified
Considered current rating of protective device as part of the building installation (A)	N/A
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
IP protection class	IP20
Altitude during operation (m)	< 2000m
Altitude of test laboratory (m)	< 2000m
Mass of equipment (kg)	< 10g

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** : October 1, 2013**Date(s) of performance of tests** : November 4 – November 5, 2013**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 IEC 60384-14:

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 updates concerned in this test report are as follows; refer Project history.

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.

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

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: 356V Vpeak, 37%: 129.5V Time-constant: 732ms CAP009DG: Vpeak: 352V Vpeak, 37%: 129.0V Time-constant: 755ms CAP012DG: Vpeak: 356V Vpeak, 37%: 130.0V Time-constant: 725ms CAP019DG: Vpeak: 358V Vpeak, 37%: 134.5V Time-constant: 780ms	—