

Power consumption of small network equipment (SNE)



Legal Notice for Standards

Canadian Standards Association (operating as “CSA Group”) develops standards through a consensus standards development process approved by the Standards Council of Canada. This process brings together volunteers representing varied viewpoints and interests to achieve consensus and develop a standard. Although CSA Group administers the process and establishes rules to promote fairness in achieving consensus, it does not independently test, evaluate, or verify the content of standards.

Disclaimer and exclusion of liability

This document is provided without any representations, warranties, or conditions of any kind, express or implied, including, without limitation, implied warranties or conditions concerning this document’s fitness for a particular purpose or use, its merchantability, or its non-infringement of any third party’s intellectual property rights. CSA Group does not warrant the accuracy, completeness, or currency of any of the information published in this document. CSA Group makes no representations or warranties regarding this document’s compliance with any applicable statute, rule, or regulation.

IN NO EVENT SHALL CSA GROUP, ITS VOLUNTEERS, MEMBERS, SUBSIDIARIES, OR AFFILIATED COMPANIES, OR THEIR EMPLOYEES, DIRECTORS, OR OFFICERS, BE LIABLE FOR ANY DIRECT, INDIRECT, OR INCIDENTAL DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES, HOWSOEVER CAUSED, INCLUDING BUT NOT LIMITED TO SPECIAL OR CONSEQUENTIAL DAMAGES, LOST REVENUE, BUSINESS INTERRUPTION, LOST OR DAMAGED DATA, OR ANY OTHER COMMERCIAL OR ECONOMIC LOSS, WHETHER BASED IN CONTRACT, TORT (INCLUDING NEGLIGENCE), OR ANY OTHER THEORY OF LIABILITY, ARISING OUT OF OR RESULTING FROM ACCESS TO OR POSSESSION OR USE OF THIS DOCUMENT, EVEN IF CSA GROUP HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES.

In publishing and making this document available, CSA Group is not undertaking to render professional or other services for or on behalf of any person or entity or to perform any duty owed by any person or entity to another person or entity. The information in this document is directed to those who have the appropriate degree of experience to use and apply its contents, and CSA Group accepts no responsibility whatsoever arising in any way from any and all use of or reliance on the information contained in this document.

CSA Group is a private not-for-profit company that publishes voluntary standards and related documents. CSA Group has no power, nor does it undertake, to enforce compliance with the contents of the standards or other documents it publishes.

Intellectual property rights and ownership

As between CSA Group and the users of this document (whether it be in printed or electronic form), CSA Group is the owner, or the authorized licensee, of all works contained herein that are protected by copyright, all trade-marks (except as otherwise noted to the contrary), and all inventions and trade secrets that may be contained in this document, whether or not such inventions and trade secrets are protected by patents and applications for patents. Without limitation, the unauthorized use, modification, copying, or disclosure of this document may violate laws that protect CSA Group’s and/or others’ intellectual property and may give rise to a right in CSA Group and/or others to seek legal redress for such use, modification, copying, or disclosure. To the extent permitted by treaty or by law, CSA Group reserves all intellectual property rights in this document.

Patent rights

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. CSA Group shall not be held responsible for identifying any or all such patent rights. Users of this standard are expressly advised that determination of the validity of any such patent rights is entirely their own responsibility.

Authorized use of this document

This document is being provided by CSA Group for informational and non-commercial use only. The user of this document is authorized to do only the following:

If this document is in electronic form:

- load this document onto a computer for the sole purpose of reviewing it;
- search and browse this document; and
- print this document if it is in PDF form.

Limited copies of this document in print or paper form may be distributed only to persons who are authorized by CSA Group to have such copies, and only if this Legal Notice appears on each such copy.

In addition, users may not and may not permit others to

- alter this document in any way, or remove this Legal Notice from the attached standard;
- sell this document without authorization from CSA Group; or
- make an electronic copy of this document.

If you do not agree with any of the terms and conditions contained in this Legal Notice, you may not load or use this document or make any copies of the contents hereof, and if you do make such copies, you are required to destroy them immediately. Use of this document constitutes your acceptance of the terms and conditions of this Legal Notice.



Revision History

CSA C872:14, Power consumption of small network equipment (SNE)

National Standard of Canada — June 2015
Outside front cover, National Standard of Canada text, title page, and preface.

Currently in preview, click buy full versi

Standards Update Service

CSA C872:14

June 2014

Title: *Power consumption of small network equipment (SNE)*

To register for e-mail notification about any updates to this publication

- go to store.csagroup.org
- click on **Product Updates**

The **List ID** that you will need to register for updates to this publication is **24231**.

If you require assistance, please e-mail techsupport@csagroup.org or call 416-747-2233.

Visit CSA Group's policy on privacy at www.csagroup.org/legal to find out how we protect your personal information.

Canadian Standards Association (operating as “CSA Group”), under whose auspices this National Standard has been produced, was chartered in 1919 and accredited by the Standards Council of Canada to the National Standards system in 1973. It is a not-for-profit, nonstatutory, voluntary membership association engaged in standards development and certification activities.

CSA Group standards reflect a national consensus of producers and users — including manufacturers, consumers, retailers, unions and professional organizations, and governmental agencies. The standards are used widely by industry and commerce and often adopted by municipal, provincial, and federal governments in their regulations, particularly in the fields of health, safety, building and construction, and the environment.

Individuals, companies, and associations across Canada indicate their support for CSA Group’s standards development by volunteering their time and skills to Committee work and supporting CSA Group’s objectives through sustaining memberships. The more than 7000 committee volunteers and the 2000 sustaining memberships together form CSA Group’s total membership from which its Directors are chosen. Sustaining memberships represent a major source of income for CSA Group’s standards development activities.

CSA Group offers certification and testing services in support of and as an extension to its standards development activities. To ensure the integrity of its certification process, CSA Group regularly and continually audits and inspects products that bear the CSA Group Mark.

In addition to its head office and laboratory complex in Toronto, CSA Group has regional branch offices in major centres across Canada and inspection and testing agencies in eight countries. Since 1919, CSA Group has developed the necessary expertise to meet its corporate mission: CSA Group is an independent service organization whose mission is to provide an open and effective forum for activities facilitating the exchange of goods and services through the use of standards, certification and related services to meet national and international needs.

For further information on CSA Group services, write to
CSA Group
178 Rexdale Boulevard
Toronto, Ontario, M9W 1R3
Canada



A National Standard of Canada is a standard developed by a Standards Council of Canada (SCC) accredited Standards Development Organization, in compliance with requirements and guidance set out by SCC. More information on National Standards of Canada can be found at www.scc.ca.

SCC is a Crown corporation within the portfolio of Innovation, Science and Economic Development (ISED) Canada. With the goal of enhancing Canada's economic competitiveness and social well-being, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates Canadian participation in standards development, and identifies strategies to advance Canadian standardization efforts.

Accreditation services are provided by SCC to various customers, including product certifiers, testing laboratories, and standards development organizations. A list of SCC programs and accredited bodies is publicly available at www.scc.ca.

Standards Council of Canada
600-55 Metcalfe Street
Ottawa, Ontario, K1P 6L5
Canada



Standards Council of Canada
Conseil canadien des normes

Cette Norme Nationale du Canada est disponible en versions française et anglaise.

Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users to judge its suitability for their particular purpose.

®A trademark of the Canadian Standards Association, operating as “CSA Group”

National Standard of Canada

CSA C872:14

***Power consumption of small
network equipment (SNE)***



*®A trademark of the Canadian Standards Association,
operating as "CSA Group."*



*Published in June 2014 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3*

*To purchase standards and related publications, visit our Online Store at store.csagroup.org
or call toll-free 1-800-463-6727 or 416-747-4044.*

*ICS 29.260
ISBN 978-1-77139-614-1*

*© 2014 Canadian Standards Association
All rights reserved. No part of this publication may be reproduced in any form whatsoever
without the prior permission of the publisher.*

Contents

Technical Committee on Residential Equipment	2
Energy Efficiency for Small Network Equipment	4
Preface	6
1 Scope	7
2 Reference publications	8
3 Definitions and abbreviations	9
3.1 Definitions	9
3.2 Abbreviations	13
4 Measurements	14
4.1 Applicability	14
4.2 Test conditions	15
4.2.1 Test setup and instrumentation	15
4.2.2 Input power	15
4.2.3 Test room	15
4.2.4 Power meter	15
4.2.5 Configuration and functionality	16
4.3 Test conduct	16
4.3.1 Test procedure order	16
4.3.2 Data source/transfer requirements	16
4.3.3 Battery operated products	17
4.4 Configuration	17
4.4.1 Supplied power configuration	17
4.4.2 Wired port UUT configuration	17
4.4.3 Wireless UUT configuration	17
4.4.4 UUT wired network settings	19
4.4.5 UUT preparation	19
4.4.6 Test client set-up	22
4.5 Test procedures for all products	23
4.5.1 Power measurement guidelines	23
4.5.2 Power consumption tests	24
4.6 Reporting	25
4.6.1 Reported UUT information and functionality	25
4.6.2 Reported test results	25
4.7 Test configuration references	26
4.8 Sampling size	26
Annex A (informative) — Sampling size	27

Technical Committee on Residential Equipment

G.R. Hamer	BC Hydro, Burnaby, British Columbia <i>Category: User Interest</i>	<i>Chair</i>
D.C. Dodge	Efficiency Nova Scotia Corporation, Dartmouth, Nova Scotia <i>Category: User Interest</i>	<i>Vice-Chair</i>
A. Boutin	SaskPower, Regina, Saskatchewan	<i>Associate</i>
R.L. Cane	Caneta Research Inc. / Caneta Energy, Mississauga, Ontario <i>Category: General Interest</i>	
A. Carrier	Hydro-Québec, Montréal, Québec	<i>Associate</i>
K.N. Delves	Natural Resources Canada, Ottawa, Ontario	<i>Associate</i>
S. Grubbe	Calgary, Alberta <i>Category: General Interest</i>	
W. Hassan	Northern Lights Asset Management Ltd., Oakville, Ontario	<i>Associate</i>
G.D. Henriques	Henriques Consulting, Richmond, British Columbia	<i>Associate</i>
P. Hikspoors	Giant Factories Inc. / Usines Giant Inc., Montréal, Québec	<i>Associate</i>
J. Hoare	Toronto, Ontario <i>Category: General Interest</i>	
A. Kelly	Canadian Electricity Association (CEA), Ottawa, Ontario	<i>Associate</i>

S. Krsikapa	Ontario Ministry of Energy, Toronto, Ontario <i>Category: User Interest</i>	
T.K. Lau	BC Hydro, Burnaby, British Columbia	<i>Associate</i>
C. Le Bel	Laboratoire des technologies de l'énergie (LTE), Shawinigan, Québec <i>Category: General Interest</i>	
C. Lesage	Giant Factories Inc. / Usines Giant Inc., Montréal Est, Québec <i>Category: Producer Interest</i>	
C. Li	Hydro One Networks Inc., Toronto, Ontario	<i>Associate</i>
R. Martel	Electro-Federation Canada, Toronto, Ontario <i>Category: Producer Interest</i>	
E. Milakowski	Ontario Ministry of Energy, Toronto, Ontario	<i>Associate</i>
R. Mortazavi	Natural Resources Canada, Ottawa, Ontario <i>Category: User Interest</i>	
T.J. Orris	AMCA International, Inc., Arlington Heights, Illinois, USA	<i>Associate</i>
B.L. Rebel	Association of Home Appliance Manufacturers Canada (AHAM), Ottawa, Ontario	<i>Associate</i>
H. Tse	Ontario Power Authority, Toronto, Ontario	<i>Associate</i>
W. Wood	Pool & Hot Tub Council of Canada, Brampton, Ontario <i>Category: Producer Interest</i>	
T. Donovska	CSA Group, Mississauga, Ontario	<i>Project Manager</i>

Energy Efficiency for Small Network Equipment

A.L. Rosemann	TU/e, Eindhoven, , Netherlands	<i>Chair</i>
T. Bolioli	Terra Novum, LLC, Lynnfield, Massachusetts, USA	
D. Carr	Ontario Power Authority, Toronto, Ontario	
D.C. Cassano	Apple Inc., Cupertino, California, USA	
C. Cheng	Ontario Ministry of Energy, Toronto, Ontario	
G.R. Hamer	BC Hydro, Burnaby, British Columbia	
J.K. Hodge	Toronto, Ontario	
D. Johnson	Consumer Electronics Association (CEA), Arlington, Virginia, USA	
S. Krsikapa	Ontario Ministry of Energy, Toronto, Ontario	
A. Liga	Apple Inc., Cupertino, California, USA	
R. Martel	Electro-Federation Canada, Toronto, Ontario	
T. ...	BC Hydro, Burnaby, British Columbia	

Preface

This is the first edition of CSA C872, *Power consumption of small network equipment (SNE)*.

This Standard specifies the test method for measuring and reporting the power consumption of small network equipment.

This Standard has been harmonized with the requirements for testing and evaluating the power consumption of small network equipment specified in the Energy Star *Small Network Equipment Specification*, Version 1.0 (revised November 2013).

CSA Group acknowledges that the development of this Standard was made possible, in part, by the financial support of Ontario Ministry of Energy, BC Hydro, Natural Resources Canada (NRCan), Efficiency Nova Scotia, Manitoba Hydro, Sask Power, and the Ontario Power Authority.

The Standard was prepared by the Subcommittee on Energy Efficiency for Small Network Equipment, under the jurisdiction of the Technical Committee on Residential Equipment and the Strategic Steering Committee on Performance, Energy Efficiency, and Renewables, and has been formally approved by the Technical Committee.

This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

Notes:

- 1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
- 2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*
- 3) *This Standard was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.*
- 4) *To submit a request for interpretation of this Standard, please send the following information to **inquiries@csagroup.org** and include “Request for interpretation” in the subject line:*
 - a) *define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;*
 - b) *provide an explanation of circumstances surrounding the actual field condition; and*
 - c) *where possible, phrase the request in such a way that a specific “yes” or “no” answer will address the issue.*

*Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are available on the Current Standards Activities page at **standardsactivities.csa.ca**.*
- 5) *This Standard is subject to review within five years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to **inquiries@csagroup.org** and include “Proposal for change” in the subject line:*
 - a) *Standard designation (number);*
 - b) *relevant clause, table, and/or number;*
 - c) *wording of the proposed change; and*
 - d) *rationale for the change.*

CSA C872:14

Power consumption of small network equipment (SNE)

1 Scope

1.1

This Standard specifies the test method for measuring and reporting the power consumption of small network equipment.

Note: *This Standard is technology neutral.*

1.2

The following products are not covered by this Standard:

- a) network equipment capable of accepting interchangeable modules, such as line cards or additional power supplies;
- b) network equipment with one or more network ports using pluggable or modular media adapters such as Gigabit Interface Converter (GBIC) or Small Form-factor Pluggable (SFP) modules. This does not include USB ports;
- c) network equipment whose primary wireless capability is not IEEE 802.11 (Wi-Fi);
- d) network equipment that receive direct dc power (PoE, USB) or provide power through PoE;
- e) large network equipment; and
- f) network equipment that is marketed and sold as enterprise network equipment and can be controlled and configured for operation by an external controller.

1.3

In this Standard, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or and may be written as requirements.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

1.4

The values given in SI (metric) units are the standard. The values given in parentheses are for information only.