



# Purpose-Built Server Board Family

## Safety and EMC Self Certification Guidelines



*Revision 1.0*  
*May, 1998*



# Revision History

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Revision	Revision History	Date
1.0	Initial release	5/98

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# 1. Introduction

The information provided in this document is intended as a quick reference guide to the certification processes pertinent to Intel's Server product line and is provided as a convenience to our customers only. ***The information is provided as a guide only and is subject to change as safety, EMC, or OS vendor requirements and policies change. Approximate fees are shown in U.S. dollar amounts and are only to give the reader an idea of the approximate cost of some of the certifications, however each system is unique, and the reader needs to get an accurate quote from each vendor for their particular system. This information is provided as is and Intel assumes no responsibility for the accuracy of the data in this paper and does not commit to update this information. Users of this information should satisfy themselves as to the applicability and accuracy of the information provided herein prior to acting upon such information. Intel assumes no responsibility for the accuracy of the data in this paper.*** Further information can be found by accessing the Internet web sites listed in Appendix A of this guide.

Intel's Server system products are tested for safety and EMC certifications through a third-party, which specializes in this field. These vendors ensure compliance with all governmental regulations in their area and/or country. Certifications for Operating Systems follow different procedures depending on the OS vendor. These procedures are detailed later in this document.

## 1.1. Certification Symbols and Description

Safety Marks	Representation/Compliance Description
	Underwriters Laboratories and Canadian UL Standards for Safety of Information Technology Equipment
	Canadian Standard Association Standard for Safety of Information Technology Equipment
	Scandinavian Standards for Safety of Information Technology Equipment (Norway, Sweden, Denmark, Finland)
	European Union standard for Safety of Information Technology Equipment, as verified by a German Certification Organization, TUV Rheinland of N.A.
	European Union standard for Safety of Information Technology Equipment, as verified by the required CE marking
EMC Marks	Description
FCC	USA Regulations (FCC's 47 CFR, Parts 2 and 15) , as verified by testing to CISPR 22 and ANSI C63.4 Requirements
	Applicable standards for electromagnetic compatibility of Information Technology Equipment, in the European Union, as verified by the required CE marking
 C-Tick	Australian Regulation based on International CISPR 22 Requirements. Intel's supplier code is N232. Intel will apply the C-Tick mark (with our supplier code) with a minimum size of 1 mm. The preference is to use 3mm if possible.

## 2. Safety Certifications

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### 2.1. Underwriters Laboratories (UL)

UL is the leading safety testing organization in the world responsible for testing a broad range of products from computers to life jackets. A product with the UL mark guarantees it meets UL safety requirements and that consumers can use the product to safely perform the functions that it is intended to perform.

#### Contacts

Northbrook, Illinois 847-272-8800 (voice) 847-509-6220 (fax)	Research Triangle Park, North Carolina 919-549-1400 (voice) 919-547-6010 (fax)
Santa Clara, California 408-985-2400 (voice) 408-296-3256 (fax)	Camas, Washington 360-817-5500 (voice) 360-817-6021 (fax)
Melville, New York 516-271-6200 (voice) 516-271-8259 or 8260 (fax)	

**Web Address:** <http://www.ul.com>

#### Certification Procedure

Contact the client advisor to begin the process of testing a system. Involvement of the Underwriters Laboratories is recommended as early as possible in the design phases of a project for feedback and catching problems before the product is too far along to go back and fix economically.

The request for a UL product evaluation must be made in writing. Included in the request should be basic technical information about the product to be evaluated. Additional information should include:

- A description of the intended use(s) of the product
- Identification of the components and materials used in the final product
- Wiring diagrams and/or design drawings or photographs
- A copy of any information that will be supplied with the product such as an instruction manual, safety tips, and installation instructions
- A description of any alternate materials, components, or arrangements of parts that may be used to reduce test work in the future
- The exact company name as it will appear on the product and the exact address of the location(s) where the product will be manufactured

Once UL has this information, it will identify where and by what department the evaluation will be conducted. Upon submission of the application, preliminary deposits, and receipt of the test systems, testing will begin.

#### Fees

Assessed on a per case basis.

## **Requirements**

A witness from the agency must be present for the safety testing and investigation of the construction of products to safety standards. The testing can be done at the manufacturer's site or submitted to the safety agency. If testing is performed in-house, all testing equipment must be calibrated according to UL specifications.

Product documentation is also required. The manufacturer may provide this and/or the agency after it has finished drafting its reports, gathering information on the components and studying schematics. From this documentation final reports, listings, licenses, and declarations are generated for the final approvals.

Additionally the manufacturer needs to meet EMC requirements. To get EMC compliance, the manufacturer needs to go to a certified lab to have their product tested for radiated and conducted emissions, and immunity.

## 2.2. Canadian Safety Association (CSA)

The CSA mark is registered in Canada and other countries. When a product carries the CSA mark, it is telling consumers that it meets the requirements of a standard for safety and/or performance. The product cannot carry the CSA mark until it has been thoroughly tested and certified by CSA.

### Contacts

Etobicoke (Toronto)  
416-747-4007  
In U.S. and Canada only:  
1-800-463-6727 (Option #2)  
416-747-4149  
certinfo@csa.ca

Edmonton  
403-450-2111  
In U.S. and Canada only:  
1-800-463-6727 (Option #2)  
403-451-5322  
certinfo@csa.ca

Richmond (Vancouver)  
604-273-4581  
In U.S. and Canada only:  
1-800-463-6727 (Option #2)  
604-273-5815  
certinfo@csa.ca

Pointe-Claire (Montreal)  
514-694-8110  
In U.S. and Canada only:  
1-800-463-6727 (Option #2)  
514-694-5001  
certinfo@csa.ca

**Web Address:** <http://www.csa.ca>

### Certification Procedure

Contact a CSA representative to set up a CSA certification test.

CSA offers four different testing models depending on your expertise and the types of facilities you have access to:

1. **Model certification** – traditional approach. A sample is submitted for review.
2. **Witness testing** – your own staff tests equipment in your own facility with a CSA representative present.
3. **Category certification** – offers maximum flexibility over how and when product enters market. Requester arranges tests, either at own facility or at another approved facility. The requester then documents the results, prepares the test reports and determines if the product meets the necessary requirements. This allows CSA to give certifications without any delays. The requester must be CSA certified before they can use this option. In order to certify the requester must have a working knowledge of the applicable product standards, a demonstrated ability to design and manufacture products that consistently comply with the standards, and access to suitable test facilities. Once qualification is obtained, the requester will be able to test their products within a certain product category. A CSA representative will visit the facility usually four times a year to audit the control systems and the production process and examine the products.
4. **Field certification** – CSA representative does testing at requester's site.

### **Fee**

Assessed on a per case basis.

### **Requirements**

A witness from the agency must be present for the safety testing and investigating of the construction of products to safety standards (unless requester is certified for the Category Certification process). The testing can be done at the manufacturer's site or submitted to the safety agency. If done at the manufacturer's site, calibrated test equipment is a must.

Product documentation is also required. The manufacturer may provide this and/or the agency after it has finished drafting its reports, gathering information on the components and studying schematics. From this documentation final reports, listings, licenses, and declarations are generated for the final approvals.

Additionally the manufacturer needs to meet EMC requirements. To get EMC compliance, the manufacturer needs to go to a certified lab to have their product tested for radiated and conducted emissions, and immunity. Once this testing is done and the product is found compliant, certification reports are generated and these reports are used to obtain or self-declare compliance.

### **2.3. Nemko (N), Demko (D), Fimko (FI), Semko (S)**

Nemko, Demko, Fimko, and Semko are all independent test houses based in Scandinavia that offer test and certification services worldwide.

#### **Contacts**

NEMKO AS  
Gaustadaleen 30  
P.O. Box 73 Blindern  
N 0314 OSLO  
Norway  
Tel: +47 22 96 03 30  
Fax: +47 22 96 05 50

FIMKO LTD  
P.O.Box 30  
Särkiniementie 3  
FIN-00210 Helsinki  
Telephone +358 9 696 361  
Telefax +358 9 692 5474

DEMKO A/S  
Lyskaer 8  
P.O. Box 514  
DK-2730 Herlev  
Denmark  
Telephone: +45 44 85 65 65  
Fax: +45 44 85 65 00

SEMKO AB  
Torshamnsgatan 43  
Box 1103  
164 22 KISTA, SWEDEN  
Telephone: +46-8-750 00 00  
Fax: +46 8 750 60 30

#### **Web Addresses:**

<http://www.nemko.no/>

<http://www.demko.dk/>

<http://www.semko.se/>

<http://prosafety.fi/englanti.html>

#### **Certification Procedure**

Coordinate testing procedures with the appropriate safety organization representative.

#### **Fees**

Assessed on a per case basis.

#### **Requirements**

A witness from the agency must be present for the safety testing and investigating of the construction of products to safety standards. The testing can be done at the manufacturer site or submitted to the safety agency. If done at the manufacturer's site, calibrated test equipment is a must.

Product documentation is also required. The manufacturer and/or the agency may provide this after it has finished drafting its reports, gathering information on the components and studying schematics. From this documentation final reports, listings, licenses, and declarations are generated for the final approvals.

Additionally the manufacturer needs to meet EMC requirements. To get EMC compliance, the manufacturer needs to go to a certified lab to have their product tested for radiated and conducted emissions, and immunity. Once this testing is done and the product is found compliant, certification reports are generated and these reports are used to obtain or self-declare compliance.

## **2.4. TÜV Rheinland (TÜV)**

TÜV Rheinland provides expertise in product assessment, product safety testing and certification to assure compliance with both national and international standards.

### **Contacts**

TÜV Rheinland of North America, Inc.  
1-TUV-WRLD-WID  
(1-888-975-3943)

**Web Address:** <http://www.tuev-rheinland.de/enghome.htm>

### **Certification Procedure**

Contact a TÜV representative to set up a TÜV compliance test.

### **Fees**

Assessed on a per case basis.

### **Requirements**

Contact a TÜV representative for information on requirements for certification.

### **3. EMC Certifications**

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Electromagnetic compatibility (EMC) refers to the ability of an electrical or electronic device or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic interference (EMI) to anything in that environment. EMC encompasses controls of unintentional emissions from a range of products that can interfere with radio communications as well as protection of a range of devices that may be susceptible to intentional transmissions.

The effects of EMI can result in serious disruption for consumers, commerce and industry through product failure. As we expand our use of mobile communications and make greater use of devices that incorporate microprocessor controls, the lack of compatibility between electronic products and the electromagnetic environment will become more and more of a problem unless steps are taken to ensure compatibility.

#### **3.1. FCC (Federal Communications Commission) USA**

The mission of this independent government agency is to encourage competition in all communications markets and to protect the public interest. In response to direction from the Congress, the FCC develops and implements policy concerning interstate and international communications by radio, television, wire, satellite, and cable.

In the area of computers, they regulate the EMC emissions. This includes both conducted emissions and radiated emissions. The FCC has established two levels of certification for computers. They are listed below.

##### **Class A**

Class A devices are defined as a digital device marketed for use in a commercial, industrial or business environment. Class A devices are exclusive of a device which is marketed for use by the general public or is intended to be used in the home.

##### **Class B**

Class B devices are defined as a digital device marketed for use in a residential environment notwithstanding use in commercial, business and industrial environments. Examples of such devices include, but are not limited to, personal computers, calculators, and similar electronic devices that are marketed for use by the general public.

##### **Contacts**

Federal Communications Commission  
1919 M Street N.W.  
Washington DC 20554  
(202) 418-0200.

**Web Address:** <http://www.fcc.gov/>

<http://www.access.gpo.gov/nara/> (for copies of the FCC Rules [47 CFR] ).

##### **Certification Procedure**

Contact an FCC approved EMC contract test house to set up a compliance test. A list of approved test sites (both domestic and international) can be found at: <http://www.fcc.gov/oet/info/database/testsite/>

## Fees

Assessed on a per case basis but average between \$1,000 - \$2,000 US dollars.

## Requirements

Requires that a complete system be submitted to the test house for testing. System is returned at the end of the test.

## **3.2. C-Tick (Australian Communications Authority)**

The C-Tick marking may be used only for the purpose of denoting product compliance according to the terms specified by the Australian Communications Authority (ACA) under the Radio Communications Act 1992. This marking is required to sell most electronic and electrical equipment in Australia.

## Contacts

Canberra	Melbourne
Purple Building	5 Queens Road
Benjamin Offices	PO Box 7443
PO Box 78	St Kilda Road
BELCONNEN ACT 2616	MELBOURNE VIC 3004
Australia	Australia
Phone: (06) 256 5555	Phone: (03) 9828 7300
Fax: (06) 256 5353	Fax: (03) 9820 3021

**Web Site Address:** <http://www.sma.gov.au/>

## Certification Procedure

Product needs to be tested by a testing organization that will test for Electromagnetic Compliance (see ACA homepage for a list of possible test houses in Australia). Once the product has been tested and complies with the EMC framework (set forth by the ACA) compliance can be obtained by either one of two routes. The procedure really depends on the nature of the device. Some devices require either the application of a test report or documentation through the Technical Construction File (TCF). For a server system it is wise to declare conformity to an Australian standard, not the European or CISPR equivalent (eg AS/NZS 1044:1995 NOT to EN55014 or CISPR14). A reference to an EN- or CISPR standard is appropriate in a test report as evidence of other conformity standards.

There are four basic items required before compliance with the EMC framework can be met. These are:

- Establishment of sound technical grounds for product compliance
- A formal Declaration of Conformity must be made and held in Australia
- A Compliance Folder must be prepared and maintained
- The C-Tick label must be applied to the product

The Compliance Folder is a set of documentation that must be assembled and maintained in order to adequately support the Declaration of Conformity for a particular product. There are five main components to the Compliance Folder. They are:

- Test reports via an accredited lab (NATA or MRA) or Technical Construction File
  - Ensure the product type with model number is listed to clearly identify the server system
  - It is wise to only make the declaration for the specific models being sold on the Australian server segment market

- Do not list any overseas model numbers concerning the server system
- A signed supplier's Declaration of Conformity with:
  - Registered name of the supplier
  - Business address of the supplier
  - ACN or ACA supplier code number... have both ready
- A description of the apparatus which positively identifies it
  - Include a photograph and /or block diagram of server system
  - Identify the product type by giving all model numbers and identification codes
  - A technical description of the server system
- A reference to specifications for conformity
- The relevant Australian Standard and date of issue
  - Name of authorized person signing declaration
  - The title of the authorized person, the date signed and of course their signature

When photocopies of test report are used, a statement on letterhead from the holder of the original test report is required. This is to indicate that the photocopy is identical to the original report. If an electronic copy of the test report is used and can be downloaded from a company overseas or from an Australian server, this is viewed as an original report provided. Access to the auditor must be provided. If the test report is to be printed in preparation for the audit a responsible representative is to sign and date the test report so it can be treated as an original. If the test report has been tested with a European server version and the exact same server system product is sold in Australia with a different model number, then it is legal to indicate in the compliance folder that the device XXXX is identical to the European version YYYYY.

When the basic model has been found to be compliant to the framework, certain variants may be presumed to be compliant without the need of further testing. This only true when the variations are cosmetic changes or the changes made do NOT increase the RF emissions. In these cases a signed statement must be made identifying the variants, describing the changes made to the basic model and the rationale for marketing the device and variants under a single Declaration of Conformity. The Declaration of Conformity should only be made after an experienced person has reviewed the contents of the Compliance Folder and made their recommendation to do so.

### **Fee**

Assessed on a per case basis

### **Requirements**

The supplier in Australia must hold the Declaration of Conformity, but the rest of the contents of the Compliance Folder may be held outside Australia. The contents of the folder, however, must be accessible to the Australian supplier of the product within 10 days of a written request. This declaration is required if an audit by the ACA is needed.

### 3.3. CE Mark (European Union Directives)

The CE Marking is the manufacturer's self-declaration, showing compliance with all applicable European Union directives. For most products sold in the European Community, the use of the CE Marking and the Declaration of Conformity are mandatory. In the year 1997, we saw the inclusion of the Low Voltage Directive (LVD) into the CE marking regime. CE marking for PCs now encompasses two very different directives; the Low voltage Directive and the EMC Directive. With this mark of conformity, products can circulate freely throughout the member countries. The CE Marking must be shown on the device or, if that is not possible, on the package. This information is an indication of what is required to be compliant with the LVD and EMC Directive and how to 'CE mark' for both directives where applicable.

Further information and a detailed analysis can be found at: **Error! Bookmark not defined.**

The CE mark and most of the EU directives are designed to ensure free movement of goods and services across the borders of the member states. The directives themselves, however, do not carry the force of the law. The member states must enact enabling legislation to comply with the directive. Both the low voltage and EMC directives are 'self declaration' directives. A blank version of the DoC is available upon request. The emission test is by far the most difficult for a PC to meet. Of the two emission tests (immunity and radiated) the radiated test is typically the more difficult. Most power supplies filter out high frequency emissions but failures are not unknown. Declaring as Class A product gives a huge extra emission margin over Class B. Class A products are permitted to emit more the three times the signal strength of Class B products. If you declare as a Class A product, the R440LX, N440BX or T440BX Integrator must put the warning in the user documentation.

The R440LX, N440BX or T440BX Integrator declares compliance and there is no obligation to submit the declaration to any authority. Some of the required information includes:

- Name and address of responsible person
- Description of product
- Numbers and titles of standards applied
- Declaration that the product complies with the directives
- Signature of manufacturer representative
- Date of issue

The R440LX, N440BX or T440BX Integrator has the responsibility to keep and make available on request the declarations of conformity for a period up to ten years after the last sale of the product in question. There is no obligation under the directives to maintain copies of the test reports or any other documentation other than the Declaration of Conformance. The guidelines are not the law and there is a large disclaimer at the start of the document pointing out that national legislation transposing the EMC directive is the law. If a GiD/IPI/IPD business were prosecuted for breaches of the EMC directive, Intel would like to hear about it. Contact your local Intel representative with full details.

Integration tips for better EMC

- Chassis
  - \* chassis elements must make good electrical contact
  - \* make sure all mounting and shielding hardware is used, use any EMC clips supplied
  - \* do not use chassis with bezel mounted LEDs
- Internal Cables
  - \* keep data cables away from power cables
  - \* keep cables close to chassis and as short as possible

- Add-in Cards
  - \* no gaps between card panel and chassis
- Purpose Built R440LX, N440BX and T440BX server boards
  - \* ensure all ground points are properly mounted
  - \* I/O shield is securely mounted to the chassis

## Appendix A Reference Information

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For more information, please check the following Internet addresses:

Mark	URL
UL	<a href="http://www.ul.com">http://www.ul.com</a>
CSA	<a href="http://www.csa.ca">http://www.csa.ca</a>
Nemko	<a href="http://www.nemko.no">http://www.nemko.no</a>
Semko	<a href="http://www.semko.se">http://www.semko.se</a>
Demko	<a href="http://www.demko.dk/">http://www.demko.dk/</a>
Fimko	<a href="http://prosafety.fi/englanti.html">http://prosafety.fi/englanti.html</a>
TUV	<a href="http://www.tuev-rheinland.de/enghome.htm">http://www.tuev-rheinland.de/enghome.htm</a> (World Headquarters Site) <a href="http://www.us.tuv.com/">http://www.us.tuv.com/</a> (North American Site)
VCCI	<a href="http://www1a.meshnet.or.jp/vcci/vccie/">http://www1a.meshnet.or.jp/vcci/vccie/</a>
FCC	<a href="http://www.fcc.gov">http://www.fcc.gov</a>
C-Tick	<a href="http://www.sma.gov.au">http://www.sma.gov.au</a>