



**National Standard of Canada
CAN/CSA-C22.2 No. 60065:03
Norme nationale du Canada**



International Standard **CEI/IEC 60065:2001 (seventh edition, 2001-12)** has been adopted with Canadian deviations (MOD) as CSA Standard **CAN/CSA-C22.2 No. 60065:03**, which has been approved as a National Standard of Canada by the Standards Council of Canada.

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**Appareils audio, vidéo et appareils
électroniques analogues –
Exigences de sécurité**

**Audio, video and similar electronic
apparatus –
Safety requirements**



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CAN/CSA-C22.2 No. 60065:03

Audio, video and similar electronic apparatus — Safety requirements

CSA Preface

This is the first edition of CAN/CSA-C22.2 No. 60065, *Audio, video and similar electronic apparatus — Safety requirements*, which is an adoption, with Canadian deviations, of the identically titled CEI/IEC (Commission Électrotechnique Internationale/International Electrotechnical Commission) Standard 60065 (seventh edition, 2001-12). It replaces the previous edition published in 2000 as CAN/CSA-E60065 (adopted CEI/IEC 60065:1998).

This Standard was reviewed for Canadian adoption by the CSA Subcommittee on Radio, Television, and Electronic Apparatus, under the jurisdiction of the Technical Committee on Consumer and Commercial Products and the Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the Technical Committee. This Standard has been approved as a National Standard of Canada by the Standards Council of Canada.

Interpretations: The Strategic Steering Committee on Requirements for Electrical Safety has provided the following direction for the interpretation of standards under its jurisdiction: "The literal text shall be used in judging compliance of products with the safety requirements of this Standard. When the literal text cannot be applied to the product, such as for new materials or construction, and when a relevant committee interpretation has not already been published, CSA's procedures for interpretation shall be followed to determine the intended safety principle."

April 2003

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Canadian Deviations

1 General

1.1 Scope

1.1.1

[Add the following paragraph and note]

This Standard applies to the safety of such equipment designed to be installed and used in accordance with the rules of the *Canadian Electrical Code, Part I*.

Note 4A: *Manufacturers designing products for use in Canada may find a helpful summary of the equipment-related requirements of the Canadian Electrical Code, Part I, in CSA SPE-2000.*

1.2 Normative references

[Add the following]



Reference publications

Where reference is made to CSA publications, such reference shall be considered to refer to the latest edition and all amendments published to that edition. This Standard refers to the following publications, and the years shown indicate the latest editions available at the time of printing:

CSA (Canadian Standards Association)

C22.1-02

Canadian Electrical Code, Part I

CAN/CSA-C22.2 No. 0-M91 (R2001)

General Requirements — Canadian Electrical Code, Part II

C22.2 No. 0.4-M1982 (R1999)

Bonding and Grounding of Electrical Equipment (Protective Grounding)

C22.2 No. 0.15-01

Adhesive Labels

C22.2 No. 1-98

Audio, Video, and Similar Electronic Equipment

C22.2 No. 21-95 (R1999)

Cord Sets and Power Supply Cords

C22.2 No. 39-M1987 (R1999)

Fuseholder Assemblies

C22.2 No. 42-99

General Use Receptacles, Attachment Plugs, and Similar Wiring Devices

C22.2 No. 49-98

Flexible Cords and Cables

CAN/CSA-C22.2 No. 94-M91 (R2001)

Special Purpose Enclosures



CAN/CSA-C22.2 No. 60065:03

C22.2 No. 127-99
Equipment and Lead Wires

C22.2 No. 209-M1985 (R1999)
Thermal Cut-Offs

CAN/CSA-C22.2 No. 210.2-M90 (R2001)
Appliance Wiring Material Products

CAN/CSA-C22.2 No. 223-M91 (R1999)
Power Supplies with Extra-Low-Voltage Class 2 Outputs

CAN/CSA-C22.2 No. 228-92 (R1999)
Cathode Ray Tubes

C22.2 No. 248.14-00
Low-Voltage Fuses — Part 14: Supplemental Fuses

CAN/CSA-C22.2 No. 60950-00
Safety of Information Technology Equipment

CAN/CSA-E61965-01
Mechanical safety of cathode ray tubes

SPE-2000-94
Guide for Electrical Equipment for Installation and Use in Canada

ANSI/IEEE (American National Standards Institute/Institute of Electrical and Electronics Engineers)

C62.1-1984
Surge Arresters for Alternating-Current Power Circuits

IEC (International Electrotechnical Commission)

60038:2002
IEC standard voltages

60083:1975
Plug and socket-outlets for domestic and similar general use

60173:1964
Colours of the cores of flexible cables and cords

60320 (all parts)
Appliance couplers for household and similar general purposes

60707:1981
Methods of test for the determination of the flammability of solid electrical insulating materials

60884 (all parts)
Plugs and socket-outlets for household and similar purposes

60906-1:1986
IEC system of plugs and socket-outlets for household and similar purposes — Part 1: Plugs and socket-outlets 16 A 250 V a.c.

60906-2:1997

IEC system of plugs and socket-outlets for household and similar purposes — Part 2: Plugs and socket outlets 15 A 125 V a.c.

60906-3:1994

IEC system of plugs and socket-outlets for household and similar purposes — Part 3: SELV plugs and socket-outlets, 16 A 6 V, 12 V, 24 V, 48 V, a.c. and d.c.

3 General requirements

3.2A

[Add the following clause]

A component power supply complying with CAN/CSA-C22.2 No. 60950 is considered to comply with this construction and fault conditions of this Standard after taking into account any relevant conditions of acceptability.

4.2 Normal operating conditions

4.2.1

[Add the following after the fifth paragraph]

For apparatus intended for use at nominal 120 V ac, the apparatus shall comply with this Standard at supply voltages between 108 and 125 V. For apparatus intended for use at nominal 240 V ac, the apparatus shall comply with this Standard at supply voltages between 216 and 250 V.

4.2.10

[Add the following after the second paragraph]

As an alternative, a supply apparatus for general use complying with CAN/CSA-C22.2 No. 223 or CAN/CSA-C22.2 No. 60950 shall be acceptable.

5 Marking and instructions

[Add the following paragraph]

Adhesive nameplates on commercial products shall comply with CSA C22.2 No. 0.15.

5.1 Identification and supply ratings

[Add the following item]

hA) date of manufacture: a date or code identifying the period of manufacture shall be marked on the apparatus;

5.3A

[Add the following clause]

Where a loudspeaker grille, removable from the outside, is relied on as part of the enclosure (see Clause 9.2), the following marking or equivalent shall be visible on the enclosure after removal of the grille:

“Caution — To prevent electric shock hazard, replace grille.”

Alternatively, the symbol in Clause 5.2 b) shall be visible after removal of the grille, and the caution wording above shall appear in the user instructions, accompanied by the symbol.

Compliance is checked by inspection.

8 Constructional requirements with regard to protection against shock

8.9

[Add the following title to this clause]

Mains wiring

[Add the following paragraph]

Wiring in circuits with voltages higher than 42 V peak shall comply with CSA C22.2 No. 127 or CAN/CSA-C22.2 No. 210.2.

9.1 Testing on the outside

9.1.1A Class I apparatus leakage

[Add the following clause]

For cord-connected Class I apparatus, the leakage current through the safety earthing conductor, expressed as voltages U_1 and U_2 , shall not exceed $U_1 = 105$ V (peak) and $U_2 = 1.05$ V (peak) (1.5 mA).

Apparatus having a leakage current between 0.75 mA and 1.5 mA shall be provided with a caution label on the mains cord with the following, or equivalent:

“CAUTION — TO REDUCE THE RISK OF ELECTRIC SHOCK, GROUNDING OF THE CENTRE PIN OF THIS PLUG MUST BE MAINTAINED”.

9.1.1.2 Determination of accessible parts

[Add the following after the fourth paragraph]

Moving parts of loudspeaker systems, such as dust caps, cones of drivers, or passive radiators, are not regarded as preventing accessibility.

Note 1A: See also Clause 13.3.1.

9.2 Removal of protective covers

[Add the following after the second paragraph]

This requirement applies also to internal parts of loudspeaker systems that become accessible by removal of a loudspeaker grille from the outside either by hand or with the use of a tool, coin, or other object. In such cases, the apparatus shall be marked according to Clause 5.3A.

[Replace the third paragraph with the following]

Compliance is checked by inspections and by application of the tests of Clause 9.1.1, except that the measurements are made 2 s after removal of the cover or grille.

10 Insulation requirements

10.2A Enclosure type designation and use

[Add the following clause]

If equipment is installed in environments where the enclosure is required to prevent ingress of water or dust, the enclosure shall be classified as a type recognized by the *Canadian Electrical Code, Part I*, and shall comply with the requirements of CAN/CSA-C22.2 No. 94.

11.2 Heating

[Add the following paragraph]

Flammable gases shall not be emitted from a component for more than 10 s.

12 Mechanical strength

12.3A Television impacts

[Add the following clause]

12.3A.1

For television sets and similar apparatus using a cathode ray tube larger than 160 mm diagonally, the top, sides, front, and rear of the enclosure, including the safety screen where provided, shall be capable of withstanding a single impact of 7 J in accordance with Clause 12.3A.2 without developing any opening larger than 130 mm² in the enclosure of the cathode ray tube, unless the minor dimension of any opening is not more than 7 mm.

When applied to a safety screen, the impact shall not result in damage to its mounting to the extent that it is mechanically unsuitable for reuse, nor shall tempered glass, if used, be cracked.

When applied to the face of a directly viewed cathode ray tube, the impact shall not cause any opening in the face of the tube. Scaling and cracking of the glass shall be permissible. A cathode ray tube that has been shown to comply with CAN/CSA-C22.2 No. 228 or CAN/CSA-E61965 shall be considered acceptable with no further tests.

12.3A.2

The impact specified in Clause 12.3A.1 shall be caused by allowing a solid, smooth, steel sphere 51 mm in diameter and weighing approximately 0.5 kg to strike the enclosure with the specified impact in a direction perpendicular to the enclosure surface. If deemed necessary, the enclosure shall be tested with the proper cathode ray tube mounted.

13.3 Clearances

13.3.1 General

[Add the following after the third paragraph]

Clearances between a loudspeaker voice coil and adjacent conductive parts shall be disregarded.

14.2 Capacitors and RC-units

14.2.1

[Add the following paragraph]

As an alternative, an isolating capacitor complying with the applicable requirements of CSA C22.2 No. 1 shall be acceptable for bridging basic or supplementary insulation.

14.2.2

[Add the following paragraph]

As an alternative, an across-line capacitor complying with the applicable requirements of CSA C22.2 No. 1 shall be acceptable.

14.5.1 Thermal releases

14.5.1.2

[Add the following paragraph]

As an alternative, a thermal link complying with CSA C22.2 No. 209 shall be acceptable.

14.5.2 Fuse-links and fuse holders

14.5.2.1

[Add the following paragraph]

As an alternative, a fuse-link complying with CSA C22.2 No. 248.14 shall be acceptable.

14.5.2.4

[Add the following paragraph]

As an alternative, a fuseholder assembly complying with CSA C22.2 No. 39 shall be acceptable.

14.6 Switches

14.6.1

[Add the following paragraph]

As an alternative, a TV-rated switch complying with CSA C22.2 No. 1, Clause 9, shall be acceptable.

14.6.2

[Add the following paragraph]

As an alternative, a TV-rated switch complying with CSA C22.2 No. 1, Clause 9, shall be acceptable.

14.6.3

[Add the following paragraph]

As an alternative, a TV-rated switch complying with CSA C22.2 No. 1, Clause 9, shall be acceptable.

14.6.4

[Add the following paragraph]

As an alternative, a TV-rated switch complying with CSA C22.2 No. 1, Clause 9, shall be acceptable.

14.6.5

[Add the following paragraph]

As an alternative, a TV-rated switch complying with CSA C22.2 No. 1, Clause 9, shall be acceptable.

14.11 Optocouplers

[Add the following paragraph]

As an alternative, an optocoupler complying with CSA C22.2 No. 1 shall be acceptable.

14.12 Surge suppression varistors

[Add the following paragraph]

As an alternative, a varistor complying with CSA C22.2 No. 1 shall be acceptable.

14.12A Gas discharge tubes

[Add the following clause]

Gas discharge tubes complying with the following tests may be connected to bridge basic or reinforced insulation. Ten samples of gas discharge tubes isolating the ac supply from exposed parts shall be subjected to the varistor pulse tests of Clause 14.12. Following the pulses, the device shall be allowed to return to room temperature. The dielectric breakdown voltage of the gas tube shall not decrease by more than 50%, and the gas discharge tube shall comply with the dielectric strength test of Clause 10.3, with the test voltage reduced to twice the mains voltage.

15.1 Plugs and sockets

15.1.1

[Add the following paragraph]

A receptacle provided for general purpose mains output shall comply with the requirements of CSA C22.2 No. 42 (dimensional requirements are also specified in IEC 60906-2). The attachment plug cap shall be of the polarized type when the apparatus is provided with a manually operated, mains-connected single-pole switch for apparatus on-off operation, a socket screwshell lampholder, or a 15 or 20 A socket-outlet.

15.1.2

[Add the following paragraph]

Banana plugs shall be acceptable.

15.1.3

[Add the following title]

Adapter output connectors

[Replace the first paragraph with the following]

Terminals and connectors used in output circuits of supply apparatus, whose output voltage is not a standard nominal mains voltage according to IEC 60038, Table 1, shall not be compatible with those specified for household and similar general purposes, for example those described in IEC 60083 [1], IEC 60320, IEC 60884, IEC 60906 (parts 1, 2, and 3), and CSA C22.2 No. 42.

15.2 Provisions for protective earthing

[Replace the third paragraph with the following]

Earthing connections shall comply with the test requirements of CSA C22.2 No. 0.4.

15.3 Terminals for external flexible cords and for permanent connection to the mains supply

15.3.1A

[Add the following clause]

Equipment intended for permanent connection to the mains shall have provisions for connection to the wiring system in accordance with the *Canadian Electrical Code, Part I*.

The terminal parts and all other provisions for permanent connection to fixed wiring shall comply with CAN/CSA-C22.2 No. 0.

15.4 Devices forming a part of the mains plug

15.4.2

[Add the following paragraphs]

Mains plugs of non-permanently installed equipment shall comply with

- a) CSA C22.2 No. 21 for moulded-on-type attachment plugs; and
- b) CSA C22.2 No. 42 for disassembly-type attachment plugs (dimensional requirements are also specified in IEC 60906-2).

Class II equipment provided with a general purpose mains outlet, or a lampholder, shall be provided with a polarized-type plug.

If the plug is a polarized type, single-pole switches or overcurrent protectors shall not be connected in the identified conductor.

16 External flexible cords

16.1

[Replace this clause with the following]

Flexible cord used for mains supply shall comply with the requirements of CSA C22.2 No. 49. The cord type shall be in accordance with Table 4 of CSA C22.2 No. 1.

The attachment plug shall be rated not less than 125% of the apparatus rated current.

Cord sets shall comply with the requirements of CSA C22.2 No. 21.

Non-detachable flexible cables and cords of Class I apparatus shall be provided with a green/yellow core connected to the protective earthing terminal of the apparatus and, if a plug is provided, to the protective earthing contact of the plug.

Compliance is checked by inspection.

Note: The colour for cores of flexible mains cords is contained in IEC 60173 [4].

17 Electrical connections and mechanical fixings

17.9A Adhesive securement and conductive coatings

[Add the following clause]

17.9A.1 Adhesive securement

The following parts, the displacement of which may result in a fire or shock hazard, shall not be secured solely by adhesive, unless the adhesive system complies with the resistance to external forces test of Clause 9.1.7, the bump test of Clause 12.1.1, and the impact test of Clause 12.1.3, after conditioning in accordance with Clause 17.9A.2:

- a) internal metal parts/conductive coatings;
- b) barriers; and
- c) required enclosure parts.

Note: Cathode ray tubes are excluded from this test.

17.9A.2 Adhesive and conductive coating securement conditioning

17.9A.2.1 General

Where required by Clause 17.9A.1, one sample of the apparatus or enclosure section shall be conditioned in accordance with the requirements of Clause 17.9A.2.2. Equivalent aging test data supplied by the manufacturer may be considered in lieu of aging.

17.9A.2.2 Aging

Day 1: Place sample in oven at $100 \pm 1^\circ\text{C}$ for 1 week, or $82 \pm 1^\circ\text{C}$ for 8 weeks, at the manufacturer's option.

Day 8 or day 57:

1. Remove from oven and leave at room temperature for 1 h.
2. Place in freezer at -35°C for 2 h.
3. Remove from freezer and allow to reach room temperature overnight.

Day 9 or day 58:

1. Place in a compartment at 96% relative humidity for 3 h.
2. Remove and leave at room temperature and humidity for 1 h.
3. Place in oven at a temperature selected in the first cycle for 3 h.
4. Remove and allow to come to room temperature overnight.

Day 10 or day 59:

1. Place in freezer at -35°C for 2 h.
2. Remove and leave at room temperature for 1 h.
3. Place in humidity chamber at 96% relative humidity for 3 h.
4. Remove and allow to come to room temperature overnight.

Day 11 or day 60:

1. Place in oven at the temperature selected in the first cycle for 3 h.
2. Remove for 1 h.
3. Place in freezer at -35°C for 2 h.
4. Remove and allow to come to room temperature overnight.

Day 12 or day 61:

1. Place in humidity chamber at 96% relative humidity for 3 h.
2. Remove and perform mechanical tests as required by Clause 17.9A.1 as applicable.

18 Mechanical strength of picture tubes and protection against the effects of implosion

18.1A

[Add the following clause]

A picture tube with a maximum face dimension exceeding 75 mm either shall be intrinsically protected with respect to effects of implosion and to mechanical impact, in accordance with CAN/CSA-C22.2 No. 228 or CAN/CSA-E61965, or the enclosure of the apparatus shall provide adequate protection against the effects of an implosion of the tube (see Clause 12).

19 Stability and mechanical hazards

[Add the following after the second paragraph]

The test of Clause 19.3 is only required for

- a) apparatus with a mass of 25 kg or more;
- b) apparatus, excluding loudspeaker systems, with a height of 1 m or more; or
- c) apparatus, including loudspeaker systems, in combination with a supplied or recommended cart or stand with a total height of 1 m or more.

[Add the following paragraph]

Apparatus not tested because it is intended to be fastened in place shall be provided with the following warning, marked on the apparatus or on a durable label attached to the mains cord:

“WARNING: This apparatus must be securely attached to the floor/wall per installation instructions. Tipping, shaking, or rocking the machine may cause injury/death.”

20.2 Fire enclosure

20.2.1A

[Add the following clause]

Enclosures of apparatus containing high-voltage or projection lamps shall have a minimum flammability rating of category FV 1 according to IEC 60707 at the minimum thickness used.



Annex B (normative)
**Apparatus to be connected to the
telecommunication networks**

[Replace this annex with the following]

Apparatus intended for direct connection to a telecommunication network shall comply with

- a) Clause 19 of CSA C22.2 No. 1; or
- b) CAN/CSA-C22.2 No. 60950.

