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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 3859.3-2013

Replacing GB/T 3859.3-1993

**Semiconductor converters -- General requirements and line
commutated converters -- Part 1-3: Transformers and reactors
(English Translation)**

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Foreword

GB/T 3859 "Semiconductor convertors" is divided into the following sections.

- Part 1-1. Specification of basic requirements
- Part 1-2. Application guide
- Part 1-3. Transformers and reactors
- Part 2. including direct dc converters semiconductor self commutated converter this section Part 1-3 GB/T 3859's.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This Part replaces GB/T 3859.3-1993 "semiconductor converter transformers and reactors." this section compared with the GB/T 3859.3-1993, the main technical changes are as follows.

- Modify the standard name, the international standard IEC 60146-1-3 adopted. Consistent 1991 name;
- Modify the "scope" (see Chapter 1, Chapter 1, 1993 edition);
- Adjustment of the "standards" (see Chapter 2, Chapter 2, 1993 edition);
- Revised 1993 edition of the suspension segment prior to 5.1, and adjusted to "5.1 Overview", Chapter 5 in the rest of the article renumbered (see Chapter 5, Chapter 5, 1993 edition);
- No. adjusted Table 1 and Table 2;
- Increasing the temperature class F and the corresponding temperature rise limits (see Table 2);
- Added "At altitudes above 1000m, shall amend the relevant standard" requirement (see

5.4).

This section uses redrafted law revision adopted IEC 60146-1-3:1991 "Semiconductor convertors - General requirements and line-commutated converter Part 1-3. Transformers and reactors. " this part of IEC 60146-1-3:1991 and its technical differences for the following reasons.

- According to the standardization of the rules, revised the "scope" (see Chapter 1);
- According to the standard provisions of the actual citations, adjusted some normative references (see Chapter 2);
- Deleted the paragraph 3.2 of the suspension. "The temperature rise limit specified in 5.3."
- Revised Table 1, thereby GB/T 3859.2-2013 appropriate consistent with Table 1;
- Deleted Table 2 Column 2 Limits and Note 1, Note 4, which is consistent with the relevant provisions of the standard transformer;
- Increasing the temperature class F and the corresponding temperature rise limits (see Table 2);
- Added "At altitudes above 1000m, shall amend the relevant standard" requirement (see 5.4).

This part made the following editorial changes. Corrected number 5.1.2, 5.3 respective segment and 5.4 expressed in Tables 1 and 2.

This part is proposed by the China Electrical Equipment Industrial Association.

This part of the National Science Power Electronics Standardization Technical Committee (SAC/TC60) centralized.

This section is drafted. Xi'an Electronic Power Research Institute, Guangdong Zhicheng Champion Group Co., Ltd., Qingdao Economic and Technological Development Zone of EC Technology Development Co., Ltd., Wolong Electric Group Beijing Huatai Transformer Co., Ltd., Beijing gold from Tengen Intelligent Control Co., Ltd.

1 Scope

GB/T 3859 provisions of this part of the converter transformer power transformer is different from the general characteristics.

It should be noted, rectifier transformer operation, it is usually a non-sinusoidal currents circulate. In a single shot coupling, the current winding are each valve Containing the DC component, special attention should be designed and tested. In some cases, short circuit and external component failure cause abnormal stress, Thus the need for special design.

Some types of non-sinusoidal waveform voltage transformer normal operation. Its core loss as to have a voltage half cycle and run-time and the fundamental frequency is equal to the arithmetic average of the sine wave voltage is determined.

This section applies to GB/T 3859.1 prescribed power converter equipment supporting the use of converter transformers and reactors. In other all aspects, if national standards "power transformer" and this section does not conflict with the provisions of the rule also applies to the converter transformer.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 3859.1-2013 Semiconductor convertors - General requirements and line commutated converters - Part 1-1. Specification of basic requirements (IEC 60146-1-1:2009, MOD)

GB/T 3859.2-2013 Semiconductor convertors - General requirements and line-commutated converters Part 1-2. Application guide (IEC/TR60146-1-2:2011, MOD)

3.1.1 Valve Winding powered by a common single or dual converter

When maximum cooling temperature does not exceed its thermal limits, the converter transformer should be able to withstand the equivalent continuous DC current converter rated current and the subsequent predetermined duration (see GB/T 3859.1-2013 in 6.4.3 and 6.5) overload current (When specified).

3.1.2 Each component has a dual thyristor converter independent valve side windings

When maximum cooling temperature does not exceed its thermal limits, each converter transformer valve winding should be able to withstand the equivalent of the converter rated DC Current and subsequent provisions of the current duration (see GB/T 3859.1-2013 in 6.4.3 and 6.5) overload current.

When the two valve side windings share a winding network, its current rating is determined by 3.1.1.

3.2.1 Air-cooled outdoor equipment

Converter transformers shall be designed to operate at no more than 40 °C ambient temperature of the air operation, the annual average temperature is not higher than 20 °C, and any