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Replace GB 3859-1983

Semiconductor Convertors-Specification of Basic Requirements

半导体变流器基本要求的规定

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Semiconductor Convertors-Specification of Basic Requirements

This standard is equivalent to IEC 146-1-1 (1991) "Semiconductor Convertors-General Requirements and Line Commutated Convertors-Part 1-1: Specifications of Basic Requirements".

1 Subject Content and Application Scope

1.1 Subject Content

This standard specifies the relevant definitions, types, parameters, basic performance and test requirements of semiconductor power convertors.

1.2 Application Scope

This standard is applicable to electronic power convertors and electronic power switches consisting of electronic valves. As for operating mode, it is mainly applicable to rectifiers and inverters based on line commutaion or convertors with such two operations.

The said electronic valves mainly cover circuit valves consisting of power semiconductor devices (such as diodes, various thyristors and power transistors, etc.). These devices may generally be controlled by electrical or optical signals and work in on-off state.

This standard may also be used as a standard of other electronic power convertors (for example self commutation line-commutated convertors, d.c.-a.c. convertors, convertors for motor transmission, convertors for electric railway, etc.) if no contradiction. Under general situation, respective classification product standard shall also be established based on this standard for such convertors.

2 Normative References

GB/T 2900.32 "Electrotechnical Terminology-Power Semiconductor Device"

GB/T 2900.32 "Electrotechnical Terminology-Power Electronic Technology"

GB/T 3886 "Thyristor Power Converter for DC Motor Speed Regulation"

GB/T 3859.2 "Semiconductor Convertors-Application Guide"

GB/T 3589.3 "Semiconductor Convertors-Transformers and Reactors"

JB 4276 "Technical Specifications for Power Convertor Packing"

GB/T 13384 "General Specifications for Packing of Mechanical and Electrical Products"

GB 10236 "Guide for Evaluation of Interference Effects and Com-patibility Technology between Semiconductor Convertors and Power Supply System"

GB/T 2423 "Basic Environmental Testing Procedures for Electric and Electronic Products"

GB/T 3768 "Determination of Sound Power Levels of Noise Sources-Survey Method"

GB 2536 "Transformer Oils"

JB 1505 "Preparation Method for Model of Semiconductor Power Convertor"

3 Terms and Symbols

3.1 Terms

Terms and definitions given here are only used in this standard or are main ones. Other terms and definitions with respect to power and electronic technology may refer to GB 2900.32, GB 2900.33 and GB/T 3859.2.

3.1.1 General terms

3.1.1.1 Semiconductor device

Device whose essential characteristics are due to the flow of charge carriers within a semiconductor.

3.1.1.2 Power semiconductor diode

Two-terminal semiconductor device having an asymmetrical voltage/current characteristic, designed for use in power convertor connections.

3.1.7.3 Thyristor

Bi-stable semiconductor device comprising three or more functions which can be switched from the off-state to the on-state.

Note: The term "thyristor" is used as a generic term to cover the whole range of PNPN type devices. It may be used by itself for any member of the thyristor family when such use does not result in ambiguity or misunderstanding. In particular, the term "thyristor" is widely used for reverse blocking triode thyristor.

3.1.1.4 Reverse blocking triode thyristor

Three-terminal thyristor which does not turn on for negative anode voltage but exhibits a reverse blocking gate.

3.1.1.5 Reverse conducting triode thyristor

Three-terminal thyristor which does not block for negative anode voltage but conducts large reverse currents at voltages comparable in magnitude to the forward on-state voltages.

3.1.1.6 Bidirectional triode thyristor

Three-terminal thyristor having substantially the same switching behaviour in the first and third quadrants of the principal characteristic.

3.1.1.7 Turn-off thyristor (GTO=Gate Turn Off)

Thyristor which can be switched from the on-state to the off-state and vice versa by applying control signals of appropriate polarity to the gate terminal.

3.1.1.8 Power transistor

Junction transistor for controlling power.

3.1.1.9 (valve device) stack

Single structure comprising one or more valve devices and relevant fixtures.

3.1.1.10 (valve device) assembly

Assembly in electrical and mechanical combination with valve devices or stacks,

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