TECHNICAL REPORT

IEC TR 62380

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Reliability data handbook – Universal model for reliability prediction of electronics components, PCBs and equipment

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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RELIABILITY DATA HANDBOOK – UNIVERSAL MODEL FOR RELIABILITY PREDICTION OF ELECTRONICS COMPONENTS, PCBs AND EQUIPMENT

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The text of this standard is based on the following documents:

Enquiry draft	Report on voting
47/1705/DTR	47/1722A/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

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- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

This reliability calculation guide for electronic and optical card, is an important progress compared to older guides. Calculation models take directly into account the influence of the environment. The thermal cycling seen by cards, function of mission profiles undergone by the equipment, replace environment factor which is difficult to evaluate. These models can handle permanent working, on/off cycling and dormant applications. On the other hand, failure rate related to the component soldering, is henceforth-included in component failure rate.

RELIABILITY DATA HANDBOOK – UNIVERSAL MODEL FOR RELIABILITY PREDICTION OF ELECTRONICS COMPONENTS, PCBs AND EQUIPMENT

1 Scope

This technical report provides elements to calculate failure rate of mounted electronic components. It makes equipment reliability optimization studies easier to carry out, thanks to the introduction of influence factors.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60086 (all parts), *Primary batteries*

IEC 60099 (all parts), *Surge arresters*

IEC 60115 (all parts), *Fixed arrestors for use in electronic equipment*

IEC 60146, (all parts), *Semiconductor convertors – General requirements and line commutated convertors*

IEC 60255 ((all parts), *Electrical relays*

IEC 60269 (all parts), *Low-voltage fuses*

IEC 61951 (all parts), *Secondary cells and batteries containing alkaline or other non-alkaline electrolytes – Portable sealed rechargeable single cells*

IEC 60326 (all parts), *Printed boards*

IEC 60368 (all parts), *Piezoelectric filtgers of assessed quality*

IEC 60384 (all parts), *Fixed capacitors for use in electronic equipment*

IEC 60393 (all parts), *Potentiometers for use in electronic equipment*

IEC 60535, *Jet fans and regulators*

IEC 60539 (all parts), *Directly heated negative temperature coefficient thermistors*

IEC 60721-3 (all Parts 3), *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities*

IEC 60738 (all parts), *Thermistors - Directly heated positive step-function temperature coefficient*

IEC 60747 (all parts) *Semiconductor devices - Discrete devices*

IEC 60747-12 (all Parts 12) *Semiconductor devices - Part 12: Optoelectronic devices*

IEC 60747-12-2, *Semiconductor devices – Part 12: Optoelectronic devices – Section 2: Blank detail specification for laser diode modules with pigtail for fibre optic systems and sub-systems*

IEC 60748 (all parts) *Semiconductor devices – Integrated circuits*

IEC 60879, *Performance and construction of electric circulating fans and regulators*

IEC 60948, *Numeric keyboard for home electronic systems (HES)*

IEC 61019 (all parts), *Surface acoustic wave (SAW) resonators*

IEC 61051 (all parts), *Varistors for use in electronic equipment*

IEC 61248 (all parts), *Transformers and inductors for use in electronic and telecommunication equipment*

IEC 61747 (all parts), *Liquid crystal and solid-state display devices*

IEC 61261 (all parts), *Piezoelectric ceramic filters for use in electronic equipment – A specification in the IEC quality assessment system for electronic components (IECQ)*

IEC 61951 (all parts), *Secondary cells and batteries containing alkaline or other non-acid electrolytes*

IEC 61951-1, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Portable sealed rechargeable single cells*

IEC 61951-2, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Nickel-metal hydride*

IEC 62007 (all parts), *Semiconductor optoelectronic devices for fibre optic system applications*

IEC 62255 (all parts), *Multicore and symmetrical pair/quad cables for broadband digital communications (high bit rate digital access telecommunication networks) - Outside plant cables*

ETS 300 019, *Environmental engineering (EE); Environmental conditions and environmental tests for telecommunications equipment*

ISO 9000:2000, *Quality management systems – Fundamentals and vocabulary*

UTE C 96-024:1990, *Modèles thermiques simplifiés des circuits intégrés monolithiques*