# CONTENTS

**FOREWORD** ........................................................................................................................................................................... 5
**INTRODUCTION** ........................................................................................................................................................................ 7
  1 Scope ................................................................................................................................................................................... 8
  2 Normative references .............................................................................................................................................................. 8
  3 Terms and definitions ............................................................................................................................................................. 9
  4 Conditions of use ................................................................................................................................................................. 10
    4.1 Introductory remarks ....................................................................................................................................................... 10
    4.2 Assumptions adopted for TR 62380 ........................................................................................................................................ 11
    4.3 Influencing factors .............................................................................................................................................................. 13
    4.4 How to use the data .............................................................................................................................................................. 14
    4.5 Uses and aims of a reliability prediction ................................................................................................................................ 15
  5 Environment influence ........................................................................................................................................................... 16
    5.1 General remarks ................................................................................................................................................................. 16
    5.2 Environment types defined ................................................................................................................................................. 16
    5.3 Electrical environment conditions ...................................................................................................................................... 20
    5.4 Validity model according to environment .......................................................................................................................... 20
    5.5 Components choice .......................................................................................................................................................... 20
    5.6 Learning during the deployment phase of new equipment .............................................................................................. 21
    5.7 Mission profile ................................................................................................................................................................. 22
    5.8 Mission profile examples ................................................................................................................................................... 23
  6 Equipped printed circuit boards and hybrid circuits (IEC 60326) ............................................................................................ 25
    6.1 Failure rate calculation of an equipped printed circuit board .......................................................................................... 25
    6.2 Hybrid circuits .................................................................................................................................................................... 26
  7 Integrated circuits ................................................................................................................................................................. 27
    7.1 Validity domain ................................................................................................................................................................. 27
    7.2 Junction temperature evaluation of an integrated circuit ................................................................................................ 27
    7.3 The reliability model ......................................................................................................................................................... 30
  8 Diodes and thyristors, transistors, optocouplers (IEC 60747-xx) .......................................................................................... 36
    8.1 Evaluating the junction temperature of diodes and transistors ........................................................................................ 36
    8.2 Low power diodes ............................................................................................................................................................... 38
    8.3 Power diodes ......................................................................................................................................................................... 40
    8.4 Low power transistors ...................................................................................................................................................... 42
    8.5 Power transistors ............................................................................................................................................................... 44
    8.6 Optocouplers ....................................................................................................................................................................... 46
  9 Optoelectronics ......................................................................................................................................................................... 49
    9.1 Light emitting diodes diode modules (IEC 60747-12-2, IEC 62007) ..................................................................................... 49
    9.2 Laser diodes modules - Failure rate ..................................................................................................................................... 52
    9.3 Photodiodes and receiver modules for telecommunications (IEC 60747-12) .................................................................. 53
    9.4 Passive optic components ................................................................................................................................................... 54
    9.5 Miscellaneous optic components ........................................................................................................................................ 54
  10 Capacitors and thermistors (ntc) .......................................................................................................................................... 55
    10.1 Fixed plastic, paper, dielectric capacitors - Radio interference suppression capacitors (plastic, paper) ......................... 55
10.2 Fixed ceramic dielectric capacitors – Defined temperature coefficient – Class I (IEC 60384) ................................................................. 56
10.3 Fixed ceramic dielectric capacitors – Non defined temperature coefficient – Class II – Radio interference suppression capacitors (Ceramic, class II) ................................................................. 57
10.4 Tantalum capacitors, solid electrolyte (IEC 60384) ........................................ 58
10.5 Aluminum, non-solid electrolyte capacitors - Life expectancy ....................... 59
10.6 Aluminum electrolytic capacitor, solid electrolyte ........................................... 61
10.7 Aluminum electrolytic capacitor, polymer electrolyte (IEC 60384) .................. 62
10.8 Variable ceramic capacitors, disks (Dielectric ceramic) (IEC 60384) ............ 63
10.9 Thermistors with negative temperature coefficient (NTC) (IEC 60539) ....... 64
11 Resistors and potentiometers (IEC 60115) .......................................................... 65
11.1 Fixed, low dissipation film resistors – High stability (rs), general purpose (rc), "minimelf" ................................................................. 65
11.2 Hot molded carbon composition, fixed resistors (IEC 60115) ......................... 66
11.3 Fixed, high dissipation film resistors (IEC 60115) ............................................. 67
11.4 Low dissipation wirewound resistors (IEC 60115) ............................................ 68
11.5 High dissipation wirewound resistors (IEC 60115) .......................................... 69
11.6 Fixed, low dissipation surface mounting resistors and resistive array (IEC 60115) 70
11.7 Non wirewound cermet potentiometer (one or several turn) (IEC 60393) ....... 71
12 Inductors and transformers (IEC 61248) ............................................................ 73
13 Microwave passive components, piezoelectric components and surface acoustic wave filters (IEC 61261, IEC 61019, IEC 60368) ................................................................. 74
13.1 Microwave passive components ...................................................................... 74
13.2 Piezoelectric components ............................................................................... 74
13.3 Surface acoustic wave filters ......................................................................... 74
14 Relays .................................................................................................................... 75
14.1 Evaluating voltage and current (vt, it) in transient conditions ......................... 75
14.2 Mercury wetted reed relays, low power (IEC 60255) ...................................... 78
14.3 Dry reed relays (IEC 60255) ........................................................................... 80
14.4 Electromechanical relays, miniature or card – European type, thermal relays (power up to 500 W) (IEC 60255) ................................................................. 82
14.5 Industrial relays, high voltage vacuum relays, power mercury wetted relays (IEC 60255) ......................................................................................... 84
15 Switches and keyboards (IEC 60948) ................................................................ 86
16 Connectors .............................................................................................................. 87
16.1 Circular, rectangular ...................................................................................... 87
16.2 Coaxial connectors ............................................................................................ 87
16.3 Connectors for PCBs and related sockets .......................................................... 87
17 Displays, solid state lamps ..................................................................................... 88
17.1 Displays (IEC 61747) ..................................................................................... 88
17.2 Solid state lamps (IEC 60747) ......................................................................... 88
18 Protection devices (IEC 60099, IEC 60269, IEC 60738, IEC 61051) .................... 89
18.1 Thermistors (PTC) .......................................................................................... 89
18.2 Varistors ........................................................................................................... 89
18.3 Fuses ............................................................................................................... 89
18.4 Arrestors .......................................................................................................... 89
19 Energy devices, thermal management devices, disk drive .................................. 90
19.1 Primary batteries ............................................................................................. 90
19.2 Secondary batteries ......................................................................................... 90
19.3 Fans ................................................................. 90
19.4 Thermoelectric coolers ........................................... 90
19.5 Disk drive ............................................................ 90
19.6 Converters (IEC 60146) ........................................... 90

Table 1 – Mission profiles for spatial .................................... 10
Table 2 – Mission profiles for military ................................... 10
Table 3 – Description and typical applications of the commonest types of environment ........ 17
Table 4 – Mechanical conditions according to the environment: characteristic shocks and vibrations .......................................................... 18
Table 5 – Mechanically active substances .................................. 19
Table 6 – Chemically active substances .................................... 19
Table 7 – Typical conditions for each environment type according to Table 3 (mechanically and chemically active substances and climatic conditions) .................................................. 19
Table 8 – Table of climates ................................................... 23
Table 9 – Mission profiles for Telecom .................................... 23
Table 10 – Mission profiles for military and civil avionics ...................... 24
Table 11 – Mission profiles for automotive .................................. 24
Table 12 – Thermal resistance as a function of package type, the pin number and airflow factor ......................................................... 28
Table 13 – Typical values of the air flow speed $V$, and the air flow factor $K$ ......................... 29
Table 14 – Thermal expansion coefficients $\alpha_s$ and $\alpha_c$ ........................................ 32
Table 15 – Failure distribution (for non interfaces integrated circuits) ................................. 32
Table 16 – Values of $\lambda_1$ and $\lambda_2$ for integrated circuits families ................................ 33
Table 17a – $\lambda_3$ values for integrated circuits as a function of $S$ (pin number of the package) 34
Table 17b – $\lambda_3$ values for surface mounted integrated circuits packages as a function of $D$ (package diagonal) .................................................. 35
Table 18 – Values of $\lambda_B$ and junction resistances for active discrete components ............ 37

Figure 1 – Time dependant failure rate of a new electronic printed circuit board .................. 21
Figure 2 – Equivalent diagram representing the circuit of a relay contact ................................ 75
Figure 3 – Positions of capacitors in the real circuit diagram for which the values must be counted in $C$ .............................................................. 75
Figure 4 – Regions adopted for the purposes of Figures 5, 6 and 7 ..................................... 76
Figure 5 – Evaluating the ratios $\frac{V}{V_t}$ and $\frac{I}{I_t}$ according to $R=R_1+R_2$, $C$, $L$, and $C_p$, $L_p$ $\left( R \text{ in k}\Omega, C, C_p \text{ in nF}; L, L_p \text{ in mH} \right)$ ................................................. 76
Figure 6 – Evaluating ratios $\frac{V}{V_t}$ and $\frac{I}{I_t}$ when $L$ and $C$ are not known ....................... 77
Figure 7 – Default values of $\frac{V}{V_t}$ and $\frac{I}{I_t}$ when nothing is known about the electrical circuit of the contact ................................................................. 77
INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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IEC 62380, which is a technical report, has been prepared by IEC technical committee 47: Semiconductor devices.

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

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<th>Enquiry draft</th>
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<tbody>
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- reconfirmed,
- 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.
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 filters 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
Terms and definitions

For the purposes of this technical report, the following definitions apply.

3.1 spatial

Mission profiles corresponding to the MIL-HDBK-217F “Space; flight” environment.

NOTE Only one working phase is taken into account during each orbital revolution (LEO), or earth revolution (GEO).