

DIN EN 16602-30-11:2014-12 (E)

Space product assurance - Derating - EEE components; English version EN 16602-30-11:2014

| Contents | Page |
|---|-----------|
| Foreword | 6 |
| Introduction | 7 |
| 1 Scope | 8 |
| 2 Normative references | 9 |
| 3 Terms, definitions and abbreviated terms | 10 |
| 3.1 Terms from other standards..... | 10 |
| 3.2 Terms specific to the present standard | 10 |
| 3.3 Abbreviated terms..... | 11 |
| 4 User responsibility | 13 |
| 5 Derating | 14 |
| 5.1 Overview | 14 |
| 5.2 Principles of derating | 14 |
| 5.3 Applicability and component selection | 15 |
| 5.4 Derating parameters | 17 |
| 5.5 Additional rules and recommendations | 18 |
| 6 Tables for load ratios or limits | 19 |
| 6.1 Overview | 19 |
| 6.2 Capacitors: ceramic - family-group code: 01-01 and 01-02..... | 20 |
| 6.3 Capacitors: solid tantalum - family-group code: 01-03 | 21 |
| 6.4 Capacitors: non-solid tantalum - family-group code: 01-04 | 22 |
| 6.5 Capacitors: Plastic metallized - family-group code: 01-05..... | 23 |
| 6.6 Capacitors: glass and porcelain - family-group code: 01-06..... | 24 |
| 6.7 Capacitors: mica and reconstituted mica - family-group code: 01-07 | 25 |
| 6.8 Capacitors: feedthrough - family-group code: 01-10 | 26 |
| 6.9 Capacitors: semiconductor technology (MOS type) - family-group code: 01-11 | 27 |
| 6.10 Capacitors: miscellaneous (variable capacitors) - family-group code: 01-99 | 28 |
| 6.11 Connectors - family-group code: 02-01, 02-02, 02-03, 02-07 and 02-09 | 29 |
| 6.12 Connectors RF - family-group code: 02-05 | 30 |

| | |
|---|-----------|
| 6.13 Piezo-electric devices: crystal resonator - family-group code: 03-01 | 31 |
| 6.14 Diodes - family-group code: 04-01, 04-02, 04-03, 04-04, 04-06, 04-08, 04-10 and 04-14 | 32 |
| 6.15 Diodes: RF/microwave - family-group code: 04-05, 04-11 to 04-13, 04-15, 04- 16 and 04-17 | 34 |
| 6.16 Feedthrough filters - family-group code: 05-01..... | 35 |
| 6.17 Fuses: Cermet (metal film on ceramic) - family-group code: 06-01 | 36 |
| 6.18 Inductors and transformers - family-group code: 07-01 to 07-03 and 14-01 | 37 |
| 6.19 Integrated circuits: logic - family-group code: 08-10, 08-20, 08-21, 08-29 to 08- 42, and 08-80 | 38 |
| 6.20 Integrated circuits: non-volatile memories - family-group code: 08-22, 08-23 and 08-24 | 39 |
| 6.21 Integrated circuits: linear - family-group code: 08-50 to 08-60 and 08-69..... | 40 |
| 6.22 Integrated circuits: linear converters - family-group code: 08-61 and 08-62 | 41 |
| 6.23 Integrated circuits: MMICs - family-group code: 08-95 | 42 |
| 6.24 Integrated circuits: miscellaneous - family-group code: 08-99..... | 43 |
| 6.25 Relays and switches - family-group code: 09-01, 09-02 and 16-01 | 44 |
| 6.26 Resistors - family-group code: 10-01 to 10-11 | 47 |
| 6.27 Thermistors - family-group code: 11-01 to 11-03 | 50 |
| 6.28 Transistors: bipolar - family-group code: 12-01 to 12-04 and 12-09 | 51 |
| 6.29 Transistors: FET - family-group code: 12-05 and 12-06 | 52 |
| 6.30 Transistors: RF: bipolar - family-group code: 12-10 and 12-13 | 53 |
| 6.31 Transistors: RF: FET - family-group code: 12-12, 12-14, 12-15(FET) and 12- 16(FET)..... | 55 |
| 6.32 Wires and cables - family-group code: 13-01 to 13-03 | 57 |
| 6.33 Opto-electronics - family-group code: 18-01 to 18-05 | 59 |
| 6.34 RF passive components: family-group code: 30-01, 30-07, 30-09, 30-10 and 30-99..... | 60 |
| 6.35 Fibre optic components: fibre and cable: family-group-code: 27-01 | 61 |
| 6.36 Hybrids | 62 |
| Bibliography..... | 68 |

Figures

| | |
|--|----|
| Figure 5-1: Parameter stress versus strength relationship..... | 15 |
|--|----|

Tabless

| | |
|---|----|
| Table 6-1: Derating of parameters for capacitors family-group code 01-01 and 01-02..... | 20 |
| Table 6-2: Derating of parameters for capacitors family-group code 01-03..... | 21 |
| Table 6-3: Derating of parameters for capacitors family-group code..... | 22 |

| | |
|--|----|
| Table 6-4: Derating of parameters for capacitors family-group code 01-05..... | 23 |
| Table 6-5: Derating of parameters for capacitors family-group code 01-06..... | 24 |
| Table 6-6: Derating of parameters for capacitors family-group code 01-07..... | 25 |
| Table 6-7: Derating of parameters for capacitors family-group code 01-10..... | 26 |
| Table 6-8: Derating of parameters for capacitors family-group code 01-11..... | 27 |
| Table 6-9: Derating of parameters for capacitors family-group code 01-99..... | 28 |
| Table 6-10: Derating of parameters for connectors family-group code 02-01, 02-02, 02-03, 02-07 and 02-09..... | 29 |
| Table 6-11: Derating of parameters for connectors RF family-group code 02-05..... | 30 |
| Table 6-12: Derating of parameters for piezo-electric devices family-group code 03-01 | 31 |
| Table 6-13: Derating of parameters for Diode (signal/switching, rectifier including Schottky, pin) | 32 |
| Table 6-14: Derating of parameters for Diode (Zener, reference, transient suppression)..... | 32 |
| Table 6-15: Derating of parameters for Diodes family-group code 04-05, 04-11 to 04-13, 04-15, 04-16 and 04-17 | 34 |
| Table 6-16: Derating of parameters for Feedthrough filters family-group code 05-01 | 35 |
| Table 6-17: Derating of parameters for Fuses family-group code 06-01 | 36 |
| Table 6-18: Derating of parameters for Inductors and transformers family-group code 07-01 to 07-03 and 14-01 | 37 |
| Table 6-19: Derating of parameters for Integrated circuits family-group code: 08-10, 08-20, 08-21, 08-29 to 08-42, and 08-80 | 38 |
| Table 6-20: Derating of parameters for Integrated circuits family-group code: 08-22, 08-23 and 08-24 | 39 |
| Table 6-21: Derating of parameters for Integrated circuits family-group code 08-50 to 08-60 and 08-69..... | 40 |
| Table 6-22: Derating of parameters for Integrated circuits family-group code 08-61 and 08-62..... | 41 |
| Table 6-23: Derating of parameters for Relays and switches family-group code 09-01, 09-02 and 16-01 | 45 |
| Table 6-24: Derating of parameters for Metal film precision resistor (type RNC, except RNC 90)..... | 47 |
| Table 6-25: Derating of parameters for Metal film semi-precision resistor (type RLR)..... | 47 |
| Table 6-26: Derating of parameters for Foil resistor (type RNC 90) | 48 |
| Table 6-27: Derating of parameters Wire-wound high precision resistor (type RBR 56)..... | 48 |
| Table 6-28: Derating of parameters for Wire-wound power resistor (type RWR, RER) | 48 |
| Table 6-29: Derating of parameters for Chip resistor (RM), network resistor | 49 |
| Table 6-30: Derating of parameters for Carbon composition resistor | 49 |
| Table 6-31: Derating of parameters for Heaters | 49 |
| Table 6-32: Derating of parameters for Thermistors family-group code 11-01 to 11-03 | 50 |
| Table 6-33: Derating of parameters for Transistors family-group code 12-01 to 12-04 and 12-09..... | 51 |

| | |
|---|----|
| Table 6-34: Derating of parameters for Transistors family-group code 12-05 and 12-06..... | 52 |
| Table 6-35: Derating of parameters for Transistors family-group code 12-10 and 12-13..... | 54 |
| Table 6-36: Derating of parameters for Transistors family-group code 12-12, 12-14, 12-15(FET) and 12-16(FET)..... | 55 |
| Table 6-37: Derating of parameters for Wires and cables family-group code 13-01 to 13-03..... | 57 |
| Table 6-38: Bundle factor K for calculation of the derated current for each individual wire in bundles of N wires | 58 |
| Table 6-39: Derating of parameters for Opto-electronics family-group code 18-01 to 18-05..... | 59 |
| Table 6-40: Derating of parameters for RF passive components from family-group code 30-01, 30-07, 30-09, 30-10 and 30-99 - Low power < 5 W | 60 |
| Table 6-41: Derating of parameters for RF passive components from family-group code 30-01, 30-07, 30-09, 30-10 and 30-99 - Low power \geq 5 W | 60 |
| Table 6-42: Derating of parameters for Fibre optic components | 61 |